ELEMENT

2003-2005
Service Manual

Chassis and Paint Codes

2003 Model

Vehicle Identification Number

5J6 YH1 8 2 * 3 L 000001

a b c d e f g h

a. **Manufacturer, Make, and Type of Vehicle**
   5J6: HONDA OF AMERICA MFG., INC., U.S.A.
   HONDA multipurpose passenger vehicle
b. **Line, Body, and Engine Type**
   YH1: ELEMENT 2WD/K24A4
   YH2: ELEMENT 4WD/K24A4
c. **Body Type and Transmission Type**
   7: 5-door/5-speed Manual
   8: 5-door/4-speed Automatic
d. **Vehicle Grade (Series)**
   2: DX
   5: EX with ABS
   6: EX with Side Airbags and ABS
e. **Check Digit**
f. **Model Year**
   3: 2003
g. **Factory Code**
   L: East Liberty, Ohio Factory in U.S.A.
h. **Serial Number**
   000001—: U.S. model
   800001—: Canada model

Vehicle Identification Number, Color label, and Federal Motor Vehicle Safety Standard Certification.
Vehicle Identification Number, Color label, and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

K24A4 - 1600001

a b

a. **Engine Type**
   K24A4: 2.4 L DOHC VTEC Sequential Multiport Fuel-injected engine
b. **Serial Number**

Transmission Number

BZKA - 5000001

a b

a. **Transmission Type**
   BZKA: 4-speed Automatic (2WD)
   MZKA: 4-speed Automatic (4WD)
   ZFJ3: 5-speed Manual (2WD)
   ZGM3: 5-speed Manual (4WD)
b. **Serial Number**
   BZKA: 5000001—
   MZKA: 1000001—
   ZFJ3: 1500001—
   ZGM3: 1500001—

Paint Code

Code	Color
B-92P	Nighthawk Black Pearl
B-96P	Eternal Blue Pearl
G-511M	Galapagos Green Metallic
NH-623M	Satin Silver Metallic
YR-528M	Shoreline Mist Metallic
YR-539P	Sunset Orange Pearl

2004 Model

Vehicle Identification Number

5J6 YH1 8 2 * 4 L 000001

a b c d e f g h

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   5J6: HONDA OF AMERICA MFG., INC., U.S.A.
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   YH1: ELEMENT 2WD/K24A4
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c. **Body Type and Transmission Type**
   7: 5-door/5-speed Manual
   8: 5-door/4-speed Automatic
d. **Vehicle Grade (Series)**
   2: DX
   5: EX with ABS
   6: EX with Side Airbags and ABS
e. **Check Digit**
f. **Model Year**
   4: 2004
g. **Factory Code**
   L: East Liberty, Ohio Factory in U.S.A.
h. **Serial Number**
   000001—: U.S. model
   800001—: Canada model

Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification.
Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification.
COLOR LABEL

Engine Number

K24A4 - 2600001

a b

a. **Engine Type**
   K24A4: 2.4 L DOHC VTEC Sequential Multiport Fuel-injected engine
b. **Serial Number**

Transmission Number

BZKA - 6000001

a b

a. **Transmission Type**
   BZKA: 4-speed Automatic (2WD)
   MZKA: 4-speed Automatic (4WD)
   ZFJ3: 5-speed Manual (2WD)
   ZGM3: 5-speed Manual (4WD)
b. **Serial Number**
   BZKA: 6000001—
   MZKA: 2000001—
   ZFJ3: 2500001—
   ZGM3: 2500001—

Paint Code

Code	Color
B-92P	Nighthawk Black Pearl
B-529P	Fiji Blue Pearl
G-511M	Galapagos Green Metallic
NH-623M	Satin Silver Metallic
YR-528M	Shoreline Mist Metallic
YR-539P	Sunset Orange Pearl

Chassis and Paint Codes (cont'd)

2005 Model

Vehicle Identification Number

5J6 YH1 8 3 * 5 L 000001

a b c d e f g h

a. **Manufacturer, Make, and Type of Vehicle**
   5J6: HONDA OF AMERICA MFG., INC., U.S.A.
   HONDA multipurpose passenger vehicle
b. **Line, Body, and Engine Type**
   YH1: ELEMENT 2WD/K24A4
   YH2: ELEMENT 4WD/K24A4
c. **Body Type and Transmission Type**
   7: 5-door/5-speed Manual
   8: 5-door/4-speed Automatic
d. **Vehicle Grade (Series)**
   3: LX
   6: EX
e. **Check Digit**
f. **Model Year**
   5: 2005
g. **Factory Code**
   L: East Liberty, Ohio Factory in U.S.A.
h. **Serial Number**
   000001—: U.S. model
   800001—: Canada model

Vehicle Identification Number, Color label, and Federal Motor Vehicle Safety Standard Certification.
Vehicle Identification Number, Color label, and Canadian Motor Vehicle Safety Standard Certification.

Engine Number

K24A4 - 3600001

a b

a. **Engine Type**
   K24A4: 2.4 L DOHC VTEC Sequential Multiport Fuel-injected engine
b. **Serial Number**

Transmission Number

BZKA - 7000001

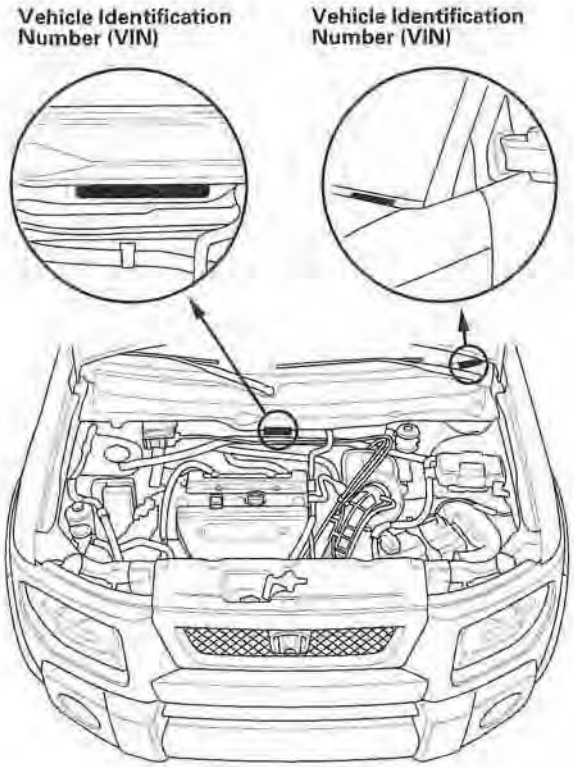
a b

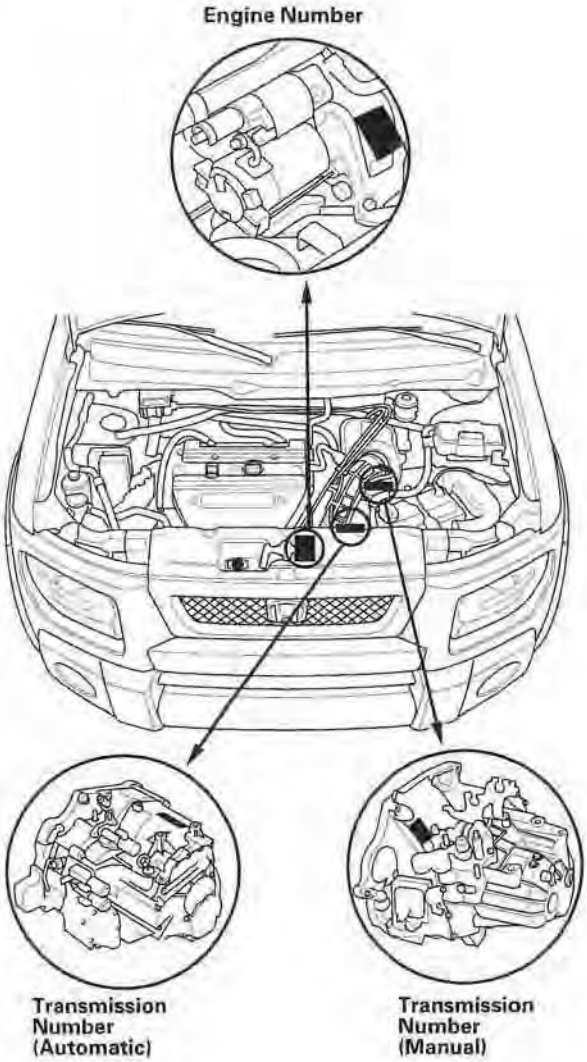
a. **Transmission Type**
   BZKA: 4-speed Automatic (2WD)
   MZKA: 4-speed Automatic (4WD)
   ZFJ3: 5-speed Manual (2WD)
   ZGM3: 5-speed Manual (4WD)
b. **Serial Number**
   BZKA: 7000001—
   MZKA: 3000001—
   ZFJ3: 3500001—
   ZGM3: 3500001—

Paint Code

Code	Color	U.S.	Canada
NH-623M	Satin Silver Metallic	○	○
NH-675M	Magnesium Metallic	○	○
B-92P	Nighthawk Black Pearl	○	○
B-529P	Fiji Blue Pearl	○	○
G-511M	Galapagos Green Metallic	○	
R-513	Rallye Red	○	○
YR-539P	Sunset Orange Pearl	○	○
YR-547	Cargo Khaki	○	○

Identification Number Locations

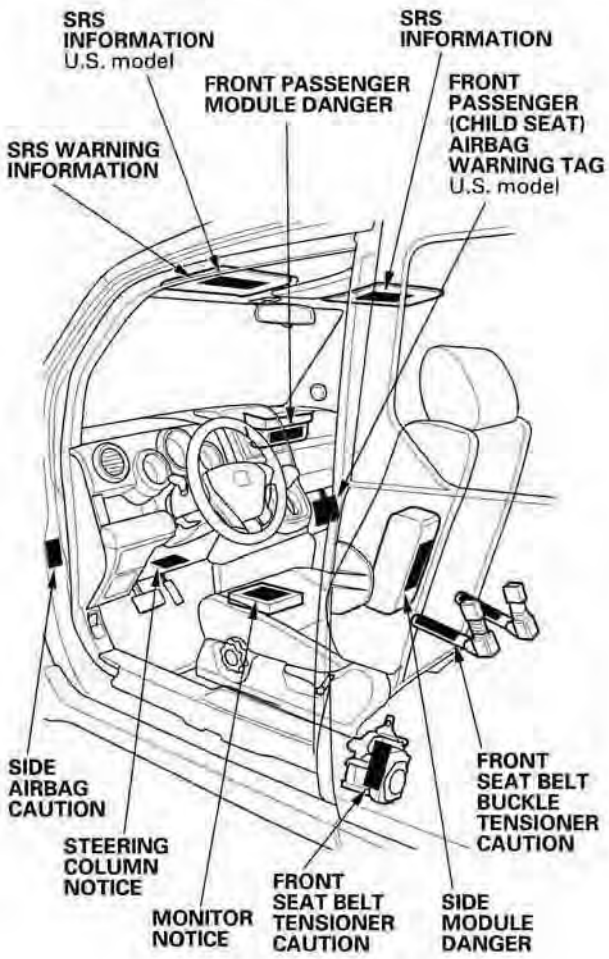




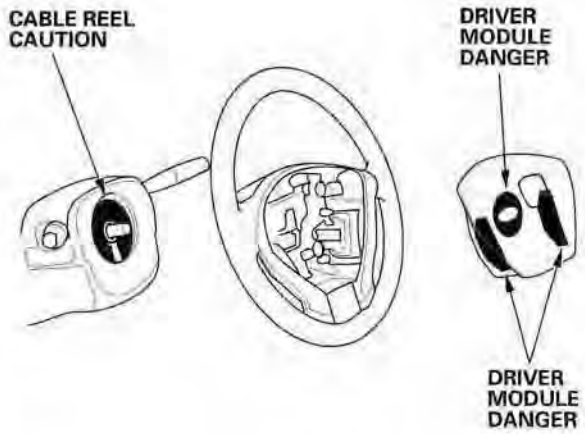
Warning/Caution Label Locations

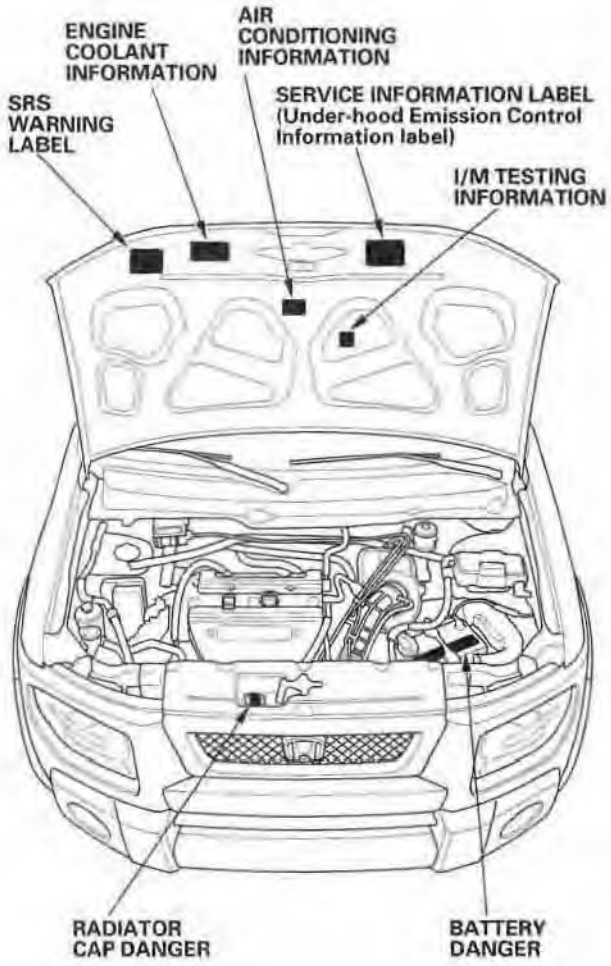
NOTE: FRONT PASSENGER (CHILD SEAT) AIRBAG WARNING TAG is installed on the glove box on the U.S. model.

Passenger's Compartment:



Steering Wheel:



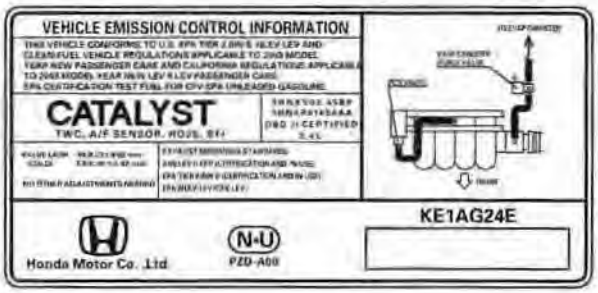

ENGINE COOLANT INFORMATION
AIR CONDITIONING INFORMATION
SRS WARNING LABEL
SERVICE INFORMATION LABEL (Under-hood Emission Control Information label)
I/M TESTING INFORMATION
RADIATOR CAP DANGER
BATTERY DANGER


TIRE INFORMATION

Under-hood Emission Control Label

Emission Group Identification

Example:



2003 Model:

THIS VEHICLE CONFORMS TO U.S. EPA TIER 2 BIN 5 NLEV LEV AND CLEAN-FUEL VEHICLE REGULATIONS APPLICABLE TO 2003 MODEL YEAR NEW PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2003 MODEL YEAR NEW LEV II LEV PASSENGER CARS. EPA CERTIFICATION TEST FUEL FOR CFV: EPA UNLEADED GASOLINE.

2004 Model:

THIS VEHICLE CONFORMS TO U.S. EPA TIER 2 BIN 5 NLEV LEV AND CLEAN-FUEL VEHICLE REGULATIONS APPLICABLE TO 2004 MODEL YEAR NEW PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2004 MODEL YEAR NEW LEV II LEV PASSENGER CARS. EPA CERTIFICATION TEST FUEL FOR CFV: EPA UNLEADED GASOLINE.

2005 Model:

THIS VEHICLE CONFORMS TO U.S. EPA TIER 2 BIN 5 AND CFV LEV REGULATIONS APPLICABLE TO 2005 MODEL YEAR NEW PASSENGER CARS AND CALIFORNIA REGULATIONS APPLICABLE TO 2005 MODEL YEAR NEW LEV II LEV PASSENGER CARS. EPA CERTIFICATION TEST FUEL FOR CFV: EPA UNLEADED GASOLINE.

Engine and Evaporative Families

Engine Family:

5 HNX V 02.4 KBP

a b c d e

- **a. Model Year**
  3: 2003
  4: 2004
  5: 2005
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  V: LDV
- **d. Displacement Group**
- **e. Sequence Characters**
  5BP: 2003 Model
  6BP: 2004 Model
  KBP: 2005 Model

Evaporative Family:

5 HNX R 0140 AAA

a b c d e

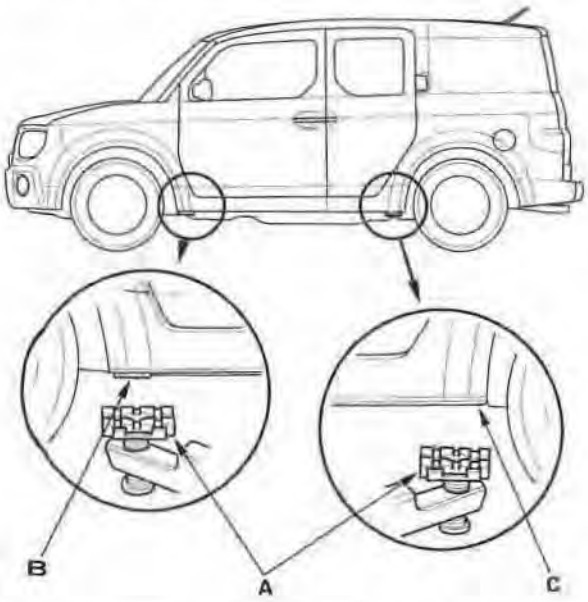
- **a. Model Year**
  3: 2003
  4: 2004
  5: 2005
- **b. Manufacturer Subcode**
  HNX: HONDA
- **c. Family Type**
  R: EVAP/ORVR
- **d. Canister Work Capacity**
- **e. Sequence Characters**

Lift and Support Points

NOTE: If you are going to remove heavy components such as suspension or the fuel tank from the rear of the vehicle, first support the front of the vehicle with tall safety stands. When substantial weight is removed from the rear of the vehicle, the center of gravity can change and cause the vehicle to tip forward on the hoist.

Frame Hoist

1. Position the hoist lift blocks (A), on safety stands, under the vehicle's front support points (B) and rear support points (C).



2. Raise the hoist a few inches, and rock the vehicle gently to be sure it is firmly supported.

3. Raise the hoist to full height, and inspect the lift points for solid contact with the lift blocks.

Safety Stands

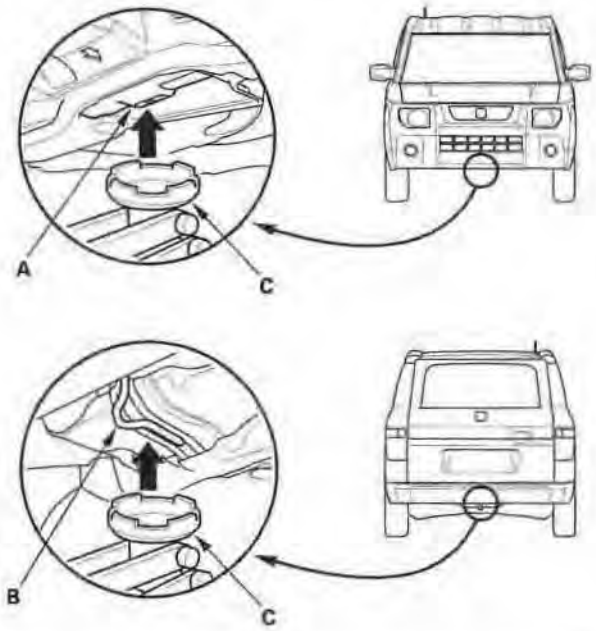
To support the vehicle on safety stands, use the same support points (B and C) as for a frame hoist. Always use safety stands when working on or under any vehicle that is supported only by a jack.

Floor Jack

1. When lifting the front of the vehicle, set the parking brake. When lifting the rear of the vehicle, put the gearshift lever in reverse for manual transmission, or in P position for automatic transmission.

2. Block the wheels that are not being lifted.

3. Position the floor jack under the front jacking bracket (A) or rear jacking bracket (B). Center the jacking bracket in the jack lift platform (C) and jack up the vehicle high enough to fit the safety stands under it.



4. Position the safety stands under the support points and adjust them so the vehicle is level.

5. Lower the vehicle onto the stands.

Towing

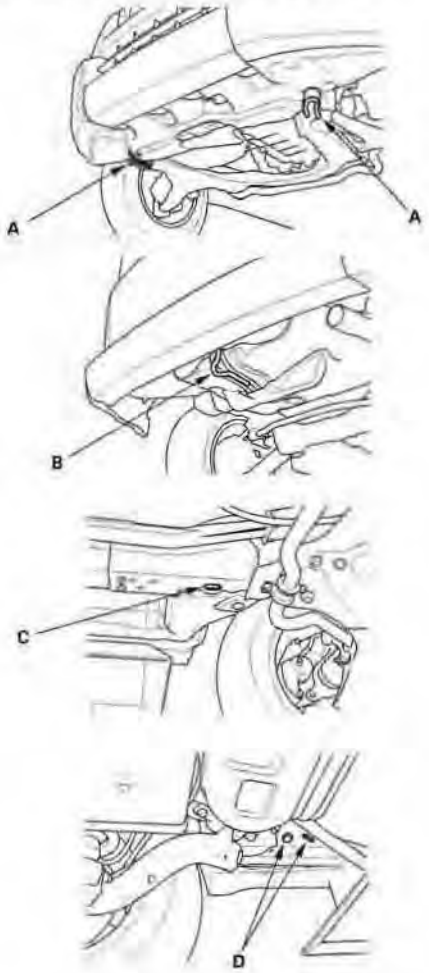
If the vehicle needs to be towed, call a professional towing service. Never tow the vehicle behind another vehicle with just a rope or chain. It is very dangerous.

Emergency Towing
There are three popular methods of towing a vehicle.

Flat-bed Equipment — The operator loads the vehicle on the back of a truck. **This is the best way to transport the vehicle.**

To accommodate flat-bed equipment, the vehicle is equipped with front towing hooks (A), rear towing hook (B), front tie down hook (C), and rear tie down hooks (D).

The towing hook can be used with a winch to pull the vehicle onto the truck, and the tie down hooks slots can be used to secure the vehicle to the truck.



Wheel Lift Equipment — The tow truck uses two pivoting arms that go under the tires (front or rear) and lift them off the ground. The other two wheels remain on the ground. Never tow the vehicle with wheel lift equipment.

Sling-type Equipment — The tow truck uses metal cables with hooks on the ends. These hooks go around parts of the frame or suspension and the cables lift that end of the vehicle off the ground. The vehicle's suspension and body can be seriously damaged if this method of towing is attempted. This method of towing the ELEMENT is unacceptable.

The only recommended way of towing the ELEMENT is on a flat-bed truck.
Towing the 4WD ELEMENT with only two wheels on the ground will damage parts of the 4WD system.
The 2WD ELEMENT may also be towed with the front wheels off the ground, or with all four wheels on the ground.

If the 2WD ELEMENT cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, or if the vehicle is towed with all four wheels on the ground, do the following:

Manual Transmission
- Release the parking brake.
- Shift the transmission to Neutral.

Automatic Transmission
- Release the parking brake.
- Start the engine.
- Shift to the D position, then to the N position.
- Turn off the engine.

It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).

NOTICE
- Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), the vehicle must be transported on a flat-bed.
- Trying to lift or tow the vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.

Parts Marking

To deter vehicle theft, certain major components are marked with the vehicle identification number (VIN). Original parts have self-adhesive labels. Replacement body parts have generic self-adhesive labels. These labels should not be removed. The original engine or transmission VIN plates are not transferable to the replacement engine or transmission.

NOTE: Be careful not to damage the parts marking labels during body repair. Mask the labels before repainting the part.

Precautions for Real-time 4WD (Four-wheel Drive)

Under normal conditions, the vehicle is in 2WD (front-wheel drive). However, the system will instantly transmit appropriate driving force to the rear wheels (depending on the driving force of the front wheels and the road conditions).

The Real-time 4WD-Dual Pump System does not have a manual switch to disable the 4WD system. Whenever service work requires spinning the front or rear wheels with the engine, always lift up and support the vehicle so all four wheels are off the ground.

Specifications

Standards and Service Limits

Design Specifications

Body Specifications

Standards and Service Limits

Engine Electrical

Item	Measurement	Qualification	Standard or New	Service Limit
Ignition coil	Rated voltage		12 V	
	Firing order		1—3—4—2	
Spark plug	Type		NGK IZFR6K11 DENSO SKJ20DR-M11	
	Gap		1.0—1.1 mm (0.039—0.043 in.)	——
Ignition timing	At idle Check the *red* mark	M/T in neutral	8±2 ° BTDC	
		A/T in N or P position	8±2 ° BTDC	
Drive belt	Tension		Auto tensioner	
Alternator	Output	At 13.5 V and normal engine temperature	105 A	
	Coil (rotor) resistance	At 68 °F (20 °C)	2.5 Ω	
	Slip ring O.D.		14.4 mm (0.57 in.)	14.0 mm (0.55 in.)
	Brush length		10.5 mm (0.41 in.)	1.5 mm (0.06 in.)
	Brush spring tension		3.2 N (0.33 kgf, 0.7 lbf)	
Starter (M/T)	Output		1.7 kW	
	Commutator mica depth		0.4—0.6 mm (0.016—0.024 in.)	0.2 mm (0.008 in.)
	Commutator runout		0.05 mm (0.002 in.) max.	0.1 mm (0.004 in.)
	Commutator O.D.		29.3—29.5 mm (1.154—1.161 in.)	28.8 mm (1.134 in.)
	Brush length		7.7—8.0 mm (0.30—0.31 in.)	0.9 mm (0.04 in.)
Starter (A/T)	Output		1.6 kW	
	Commutator mica depth		0.4—0.5 mm (0.016—0.020 in.)	0.15 mm (0.006 in.)
	Commutator runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	Commutator O.D.		28.0—28.1 mm (1.102—1.106 in.)	27.5 mm (1.083 in.)
	Brush length		11.1—11.5 mm (0.44—0.45 in.)	4.3 mm (0.17 in.)

Engine Assembly

Item	Measurement	Qualification	Standard or New	Service Limit
Compression	Pressure	Minimum	930 kPa (9.5 kgf/cm², 135 psi)	——
	Check with the starter cranking the engine	Maximum variation	200 kPa (2.0 kgf/cm², 28 psi)	——

Cylinder Head

Item	Measurement	Qualification	Standard or New	Service Limit
Head	Warpage		—	0.05 mm (0.002 in.)
	Height		103.95—104.05 mm (4.093—4.096 in.)	—
Camshaft	End play		0.05—0.20 mm (0.002—0.008 in.)	0.4 mm (0.02 in.)
	Camshaft-to-holder oil clearance	No. 1 journal	0.030—0.069 mm (0.001—0.003 in.)	0.15 mm (0.006 in.)
		No. 2, 3, 4, 5 journals	0.060—0.099 mm (0.002—0.004 in.)	0.15 mm (0.006 in.)
	Total runout		0.03 mm (0.001 in.) max.	0.04 mm (0.002 in.)
	Cam lobe height	Intake, primary	33.925 mm (1.3356 in.)	—
		Intake, secondary	29.638 mm (1.1668 in.)	—
		Exhaust	34.092 mm (1.3422 in.)	—
Valve	Clearance (cold)	Intake	0.21—0.25 mm (0.008—0.010 in.)	—
		Exhaust	0.28—0.32 mm (0.011—0.013 in.)	—
	Stem O.D.	Intake	5.475—5.485 mm (0.2156—0.2159 in.)	5.445 mm (0.214 in.)
		Exhaust	5.450—5.460 mm (0.2146—0.2150 in.)	5.42 mm (0.213 in.)
	Stem-to-guide clearance	Intake	0.030—0.055 mm (0.0012—0.0022 in.)	0.08 mm (0.003 in.)
		Exhaust	0.055—0.080 mm (0.0022—0.0031 in.)	0.11 mm (0.004 in.)
Valve seat	Width	Intake	1.25—1.55 mm (0.049—0.061 in.)	2.00 mm (0.079 in.)
		Exhaust	1.25—1.55 mm (0.049—0.061 in.)	2.00 mm (0.079 in.)
	Stem installed height	Intake	44.0—44.6 mm (1.73—1.76 in.)	—
		Exhaust	44.0—44.6 mm (1.73—1.76 in.)	—
Valve spring	Free length	Intake	47.61 mm (1.874 in.)	—
		Exhaust	49.64 mm (1.954 in.)	—
Valve guide	I.D.	Intake	5.515—5.530 mm (0.2171—0.2177 in.)	5.55 mm (0.219 in.)
		Exhaust	5.515—5.530 mm (0.2171—0.2177 in.)	5.55 mm (0.219 in.)
	Installed height	Intake	15.2—16.2 mm (0.598—0.638 in.)	—
		Exhaust	15.5—16.5 mm (0.610—0.650 in.)	—
Rocker arm	Arm-to-shaft clearance	Intake	0.025—0.052 mm (0.0010—0.0020 in.)	0.08 mm (0.003 in.)
		Exhaust	0.018—0.056 mm (0.0007—0.0022 in.)	0.08 mm (0.003 in.)

Standards and Service Limits

Engine Block

Item	Measurement	Qualification	Standard or New	Service Limit
Block	Warpage of deck		0.07 mm (0.003 in.) max.	0.10 mm (0.004 in.)
	Bore diameter	A or I	87.010—87.020 mm (3.4256—3.4260 in.)	87.070 mm (3.4279 in.)
		B or II	87.000—87.010 mm (3.4252—3.4256 in.)	87.070 mm (3.4279 in.)
	Bore taper		—	0.05 mm (0.002 in.)
	Reboring limit		—	0.25 mm (0.01 in.)
Piston	Skirt O.D. at 13 mm (0.5 in.) from bottom of skirt	No letter or A	86.980—86.990 mm (3.4244—3.4248 in.)	86.930 mm (3.4224 in.)
		Letter B	86.970—86.980 mm (3.4240—3.4244 in.)	86.920 mm (3.4220 in.)
	Clearance in cylinder		0.020—0.040 mm (0.0008—0.0016 in.)	0.05 mm (0.002 in.)
	Ring groove width	Top	1.230—1.240 mm (0.0484—0.0488 in.)	1.26 mm (0.0450 in.)
		Second	1.240—1.250 mm (0.0488—0.0492 in.)	1.270 mm (0.050 in.)
		Oil	2.005—2.025 mm (0.0789—0.0797 in.)	2.05 mm (0.081 in.)
Piston ring	Ring-to-groove clearance	Top	0.045—0.070 mm (0.0018—0.0028 in.)	0.13 mm (0.005 in.)
		Second	0.050—0.075 mm (0.0020—0.0030 in.)	0.13 mm (0.005 in.)
	Ring end gap	Top	0.20—0.35 mm (0.008—0.014 in.)	0.60 mm (0.024 in.)
		Second	0.40—0.55 mm (0.016—0.022 in.)	0.70 mm (0.028 in.)
		Oil	0.20—0.70 mm (0.008—0.028 in.)	0.80 mm (0.031 in.)
Piston pin	O.D.		21.961—21.965 mm (0.8646—0.8648 in.)	21.953 mm (0.8643 in.)
	Pin-to-piston clearance		−0.005 to +0.002 mm (−0.00020 to +0.00008 in.)	0.005 mm (0.0002 in.)
Connecting rod	Pin-to-rod clearance		0.005—0.015 mm (0.0002—0.0006 in.)	0.02 mm (0.0008 in.)
	Small-end bore diameter		21.970—21.976 mm (0.8650—0.8652 in.)	—
	Large-end bore diameter		51.0 mm (2.01 in.)	—
	End play installed on crankshaft		0.15—0.35 mm (0.006—0.014 in.)	0.40 mm (0.016 in.)
Crankshaft	Main journal diameter	No. 1 journal No. 2 journal No. 4 journal No. 5 journal	54.984—55.008 mm (2.1648—2.1657 in.)	—
		No. 3 journal	54.976—55.000 mm (2.1644—2.1654 in.)	—
	Rod journal diameter		47.976—48.000 mm (1.8888—1.8898 in.)	—
	Rod/main journal taper		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	Rod/main journal out-of-round		0.005 mm (0.0002 in.) max.	0.010 mm (0.0004 in.)
	End play		0.10—0.35 mm (0.004—0.014 in.)	0.45 mm (0.018 in.)
	Runout		0.03 mm (0.0012 in.) max.	0.04 mm (0.0016 in.)
Crankshaft bearing	Main bearing-to-journal oil clearance	No. 1 journal No. 2 journal No. 4 journal No. 5 journal	0.017—0.041 mm (0.0007—0.0016 in.)	0.050 mm (0.0020 in.)
		No. 3 journal	0.025—0.049 mm (0.0010—0.0019 in.)	0.055 mm (0.0022 in.)
	Rod bearing clearance		0.020—0.050 mm (0.0008—0.0020 in.)	0.060 mm (0.0024 in.)

Engine Lubrication

Item	Measurement	Qualification	Standard or New	Service Limit
Engine oil	Capacity	Engine overhaul	5.3 L (5.6 US qt)	
		Oil change, including filter	4.2 L (4.4 US qt)	
		Oil change, without filter	4.0 L (4.2 US qt)	
Oil pump	Inner-to-outer rotor clearance		0.06—0.16 mm (0.002—0.006 in.)	0.20 mm (0.008 in.)
	Pump housing-to-outer rotor clearance		0.15—0.21 mm (0.006—0.008 in.)	0.23 mm (0.009 in.)
	Pump housing-to-rotor axial clearance		0.035—0.070 mm (0.0014—0.0028 in.)	0.12 mm (0.005 in.)
	Balancer shafts, journal diameter	No. 1 journal, front shaft	19.938—19.950 mm (0.7850—0.7854 in.)	19.92 mm (0.784 in.)
		No. 1 journal, rear shaft	23.938—23.950 mm (0.9424—0.9429 in.)	23.92 mm (0.942 in.)
		No. 2 journal, front and rear shafts	32.949—32.961 mm (1.2972—1.2977 in.)	32.93 mm (1.296 in.)
	Balancer shafts, journal taper		0.005 mm (0.0002 in.) max.	——
	Balancer shafts, end play	Front	0.063—0.108 mm (0.0025—0.0043 in.)	0.14 mm (0.0055 in.)
		Rear	0.063—0.108 mm (0.0025—0.0043 in.)	0.14 mm (0.0055 in.)
	Balancer shafts, shaft-to-bearing clearance	No. 1 journal, front shaft	0.050—0.082 mm (0.0020—0.0032 in.)	0.10 mm (0.004 in.)
		No. 1 journal, rear shaft	0.050—0.082 mm (0.0020—0.0032 in.)	0.10 mm (0.004 in.)
		No. 2 journal, front and rear shafts	0.060—0.120 mm (0.0024—0.0047 in.)	0.15 mm (0.006 in.)
	Balancer shaft bearings, I.D.	No. 1 journal, front shaft	20.000—20.020 mm (0.7874—0.7882 in.)	20.03 mm (0.789 in.)
		No. 1 journal, rear shaft	24.000—24.020 mm (0.9449—0.9457 in.)	24.03 mm (0.946 in.)
		No. 2 journal, front and rear shafts	33.021—33.069 mm (1.3000—1.3019 in.)	33.09 mm (1.303 in.)
	Relief valve, oil pressure with oil temperature at 176 °F (80 °C)	At idle	70 kPa (0.7 kgf/cm², 10 psi) min.	
		At 3,000 rpm	300 kPa (3.1 kgf/cm², 44 psi) min.	

Cooling

Item	Measurement	Qualification	Standard or New
Radiator	Coolant capacities (including engine, heater, hoses, and reservoir) Use Honda All Season Antifreeze/ Coolant Type 2	M/T at engine overhaul	7.2 L (1.90 US gal)
		M/T at coolant change	5.1 L (1.35 US gal)
		A/T at engine overhaul	7.1 L (1.88 US gal)
		A/T at coolant change	5.0 L (1.32 US gal)
Reservoir	Coolant capacity		0.6 L (0.16 US gal)
Radiator cap	Opening pressure		93—123 kPa (0.95—1.25 kgf/cm², 14—18 psi)
Thermostat	Opening temperature	Begins to open	169—176 °F (76—80 °C)
		Fully open	194 °F (90 °C)
	Valve lift at fully open		8.0 mm (0.31 in.) min.
Radiator fan switch	Switching temperature	Turns ON	196—203 °F (91—95 °C)
		Turns OFF	Subtract 5—15 °F (3—8 °C) from actual ON temperature

Standards and Service Limits

Fuel and Emissions

Item	Measurement	Qualification	Standard or New
Fuel pressure regulator	Pressure with fuel pressure gauge connected		330—380 kPa (3.4—3.9 kgf/cm², 48—55 psi)
Fuel tank	Capacity		60 L (15.9 US gal)
Engine idle	Idle speed without load	M/T in neutral	700±50 rpm
		A/T in N or P position	700±50 rpm
	Idle speed with high electric load (A/C switch ON, temperature set to Max Cool, blower fan on High, rear window defogger ON, and headlights on high beam)	M/T in neutral	720±50 rpm
		A/T in N or P position	720±50 rpm

Clutch

Item	Measurement	Qualification	Standard or New	Service Limit
Clutch pedal	Height from floor		200 mm (7.87 in.)	—
	Stroke		125—135 mm (4.92—5.31 in.)	—
	Play		6—17 mm (0.24—0.67 in.)	—
	Disengagement height from floor		112 mm (4.41 in.) min.	—
Flywheel	Runout on clutch mating surface		0.05 mm (0.002 in.) max.	0.15 mm (0.006 in.)
Clutch disc	Rivet head depth		1.65—2.25 mm (0.065—0.089 in.)	0.7 mm (0.03 in.)
	Thickness		8.6—9.2 mm (0.34—0.36 in.)	6.0 mm (0.24 in.)
Pressure plate	Warpage		0.03 mm (0.001 in.) max.	0.15 mm (0.006 in.)
	Height of diaphragm spring fingers measured with special tool and feeler gauge		0.6 mm (0.02 in.) max.	0.8 mm (0.03 in.)

Manual Transmission and M/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
Transmission fluid	Capacity	Fluid change	1.90 L (2.0 US qt)	
	Use Honda MTF	Overhaul	2WD: 2.15 L (2.3 US qt)	
			4WD: 2.25 L (2.4 US qt)	
Mainshaft	End play		0.11—0.17 mm (0.004—0.007 in.)	Adjust
	Diameter of bushing surface		20.80—20.85 mm (0.8189—0.8209 in.)	20.75 mm (0.817 in.)
	Diameter of distance collar		31.984—32.000 mm (1.2594—1.2598 in.)	31.93 mm (1.257 in.)
	Diameter of ball bearing contact area (clutch housing side)		27.977—27.990 mm (1.1015—1.1020 in.)	27.94 mm (1.100 in.)
	Diameter of needle bearing contact area		38.984—39.000 mm (1.5348—1.5354 in.)	38.93 mm (1.533 in.)
	Diameter of ball bearing contact area (transmission housing side)		27.987—28.000 mm (1.1019—1.1024 in.)	27.94 mm (1.100 in.)
	Runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
Mainshaft 3rd, 4th, and 5th gears	I.D.		44.009—44.025 mm (1.7326—1.7333 in.)	44.08 mm (1.735 in.)
	End play		0.06—0.16 mm (0.002—0.006 in.)	0.25 mm (0.010 in.)
	Thickness		23.92—23.97 mm (0.941—0.944 in.)	23.80 mm (0.937 in.)
Mainshaft 4th and 5th gears distance collar	I.D.		32.00—32.01 mm (1.2598—1.2602 in.)	32.02 mm (1.261 in.)
	O.D.		38.989—39.000 mm (1.5350—1.5354 in.)	38.94 mm (1.533 in.)
	Length 	A	51.95—52.05 mm (2.045—2.049 in.)	—
		B	24.03—24.08 mm (0.946—0.948 in.)	—
MBS distance collar	I.D.		28.00—28.01 mm (1.102—1.103 in.)	28.02 mm (1.103 in.)
	Length		23.95—24.05 mm (0.943—0.947 in.)	—
Countershaft	Diameter of needle bearing contact area (clutch housing side)		35.000—35.015 mm (1.3780—1.3785 in.)	34.95 mm (1.376 in.)
	Diameter of distance collar contact area		39.937—39.950 mm (1.5723—1.5728 in.)	39.88 mm (1.570 in.)
	Diameter of ball bearing contact area (transmission housing side)		30.020—30.033 mm (1.1819—1.1824 in.)	29.97 mm (1.180 in.)
	Runout		0.02 mm (0.001 in.) max.	0.05 mm (0.002 in.)
	35 mm shim-to-bearing inner race clearance		0.04—0.10 mm (0.0016—0.0039 in.)	Adjust
Countershaft 1st gear	I.D.		52.010—52.029 mm (2.0476—2.0484 in.)	52.08 mm (2.050 in.)
	End play		0.06—0.16 mm (0.002—0.006 in.)	0.25 mm (0.010 in.)
	Thickness		22.92—22.97 mm (0.902—0.904 in.)	22.87 mm (0.900 in.)
Countershaft 2nd gear	I.D.		52.010—52.029 mm (2.0476—2.0484 in.)	52.08 mm (2.050 in.)
	End play		0.06—0.16 mm (0.002—0.006 in.)	0.25 mm (0.010 in.)
	Thickness		27.92—27.97 mm (1.099—1.101 in.)	27.87 mm (1.097 in.)
Countershaft 1st gear distance collar	I.D.		39.95—39.96 mm (1.5728—1.5732 in.)	39.97 mm (1.574 in.)
	O.D.		46.989—47.000 mm (1.8499—1.8504 in.)	46.94 mm (1.848 in.)
	Length		23.03—23.08 mm (0.907—0.909 in.)	—
Countershaft 2nd gear distance collar	I.D.		39.95—39.96 mm (1.5728—1.5732 in.)	39.97 mm (1.574 in.)
	O.D.		46.989—47.000 mm (1.8499—1.8504 in.)	46.94 mm (1.848 in.)
	Length		28.03—28.08 mm (1.104—1.106 in.)	—

(cont'd)

Standards and Service Limits

Manual Transmission and M/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Reverse idler gear	I.D.		20.016—20.043 mm (0.7880—0.7891 in.)	20.90 mm (0.832 in.)
	Gear-to-reverse gear shaft clearance		0.036—0.084 mm (0.0014—0.0033 in.)	0.16 mm (0.006 in.)
Synchro ring	Ring-to-gear clearance	Ring pushed against gear	0.70—1.49 mm (0.028—0.059 in.)	0.4 mm (0.016 in.)
Double cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70—1.19 mm (0.028—0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.50—1.04 mm (0.020—0.041 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	0.95—1.68 mm (0.037—0.066 in.)	0.6 mm (0.024 in.)
Triple cone synchro	Outer synchro ring-to-synchro cone clearance	Ring pushed against gear	0.70—1.19 mm (0.028—0.047 in.)	0.3 mm (0.012 in.)
	Synchro cone-to-gear clearance	Ring pushed against gear	0.50—1.04 mm (0.020—0.041 in.)	0.3 mm (0.012 in.)
	Outer synchro ring-to-gear cone clearance	Ring pushed against gear	0.95—1.68 mm (0.037—0.066 in.)	0.6 mm (0.024 in.)
Shift fork	Finger thickness		7.4—7.6 mm (0.29—0.30 in.)	—
	Fork-to-synchro sleeve clearance		0.35—0.65 mm (0.014—0.026 in.)	1.0 mm (0.039 in.)
Reverse shift fork	Finger thickness		13.4—13.7 mm (0.527—0.539 in.)	—
	Fork-to-reverse idler gear clearance		0.20—0.59 mm (0.007—0.024 in.)	1.2 mm (0.047 in.)
Shift arm	I.D.		13.973—14.000 mm (0.5501—0.5512 in.)	—
	Shift arm diameter at contact area		16.9—17.0 mm (0.665—0.669 in.)	—
	Shift arm-to-shift lever clearance		0.2—0.5 mm (0.008—0.020 in.)	0.6 mm (0.023 in.)
Select lever	Finger width		14.85—14.95 mm (0.585—0.589 in.)	—
Change lever	Change-to-select lever clearance		0.05—0.25 mm (0.002—0.010 in.)	0.5 mm (0.020 in.)
	Groove (to select lever)		15.00—15.10 mm (0.591—0.594 in.)	—
	Shaft-to-shift arm clearance		0.013—0.07 mm (0.0005—0.003 in.)	0.1 mm (0.004 in.)
M/T differential carrier	Pinion shaft contact area I.D.		18.010—18.028 mm (0.7091—0.7098 in.)	—
	Carrier-to-pinion shaft clearance		0.027—0.057 mm (0.0011—0.0022 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		28.025—28.045 mm (1.1033—1.1041 in.)	—
M/T differential pinion gear	Backlash		0.05—0.15 mm (0.002—0.006 in.)	—
	I.D.		18.042—18.066 mm (0.7103—0.7113 in.)	—
	Pinion gear-to-pinion shaft clearance		0.059—0.095 mm (0.0023—0.0037 in.)	0.15 mm (0.006 in.)
80 mm shim	80 mm shim-to-bearing outer race clearance in transmission housing		0—0.10 mm (0—0.0039 in.)	Adjust
Transfer assembly (4WD)	Diameter of tapered roller bearing contact area (transfer shaft)		24.975—24.990 mm (0.9833—0.9838 in.)	24.92 mm (0.9811 in.)
	Diameter of tapered roller bearing contact area (transfer drive gear)		40.002—40.018 mm (1.5749—1.5755 in.)	38.95 mm (1.5335 in.)
	Diameter of tapered roller bearing contact area (driven gear side)		35.002—35.018 mm (1.3780—1.3786 in.)	34.95 mm (1.3760 in.)
	Diameter of tapered roller bearing contact area (splined side)		26.975—26.988 mm (1.0620—1.0625 in.)	26.92 mm (1.0598 in.)
	Transfer gear backlash		0.06—0.16 mm (0.0024—0.0063 in.)	Adjust
	Total starting torque		2.24—3.71 N·m (22.0—36.4 kgf·cm, 19.1—31.6 lbf·in.)	Adjust

Automatic Transmission and A/T Differential

Item	Measurement	Qualification	Standard or New	Service Limit
ATF (Automatic Transmission Fluid)	Capacity Use Honda ATF-Z1	4WD at fluid change	3.1 L (3.3 US qt)	
		4WD at overhaul	7.2 L (7.6 US qt)	
		2WD at fluid change	3.2 L (3.4 US qt)	
		2WD at overhaul	6.8 L (7.2 US qt)	
ATF pressure	Line pressure	At 2,000 rpm in N or P position	900—960 kPa (9.2—9.8 kgf/cm², 130—140 psi)	850 kPa (8.7 kgf/cm², 120 psi)
	1st clutch pressure	At 2,000 rpm in 1st gear in 1 position	890—970 kPa (9.1—9.9 kgf/cm², 130—140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	2nd clutch pressure	At 2,000 rpm in 2nd gear in 2 position	890—970 kPa (9.1—9.9 kgf/cm², 130—140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	3rd clutch pressure	At 2,000 rpm in 3rd gear in D position	890—970 kPa (9.1—9.9 kgf/cm², 130—140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
	4th clutch pressure	At 2,000 rpm in 4th gear in D position	890—970 kPa (9.1—9.9 kgf/cm², 130—140 psi)	840 kPa (8.6 kgf/cm², 120 psi)
Torque converter	Stall speed Check with vehicle on level ground		2,100 rpm	1,950—2,250 rpm

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Standards and Service Limits

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Clutch	Clutch end-plate-to-top-disc clearance	1st	——	1.28—1.48 mm (0.050—0.058 in.)
		2nd (2003-2004 models)	——	0.85—1.05 mm (0.033—0.041 in.)
		2nd (2005 model)	——	0.88—1.08 mm (0.034—0.042 in.)
		3rd and 4th (2003-2004 models)	——	0.73—0.93 mm (0.029—0.037 in.)
		3rd and 4th (2005 model)	——	0.93—1.13 mm (0.036—0.044 in.)
	Clutch return spring free length	1st, 2nd, and 3rd (2003-2004 models)	50.8 mm (2.00 in.)	48.8 mm (1.92 in.)
		3rd (2005 model) and 4th	33.5 mm (1.32 in.)	31.5 mm (1.24 in.)
	Clutch disc thickness		1.94 mm (0.076 in.)	——
	Clutch plate thickness	1st	1.6 mm (0.063 in.)	When discolored
		2nd, 3rd, and 4th	2.00 mm (0.079 in.)	When discolored
	Clutch waved-plate phase difference		0.07—0.20 mm (0.003—0.008 in.)	0.05 mm (0.002 in.)
	1st and 2nd clutch end plate thickness	Mark 1	2.6 mm (0.102 in.)	When discolored
		Mark 2	2.7 mm (0.106 in.)	When discolored
		Mark 3	2.8 mm (0.110 in.)	When discolored
		Mark 4	2.9 mm (0.114 in.)	When discolored
		Mark 5	3.0 mm (0.118 in.)	When discolored
		Mark 6	3.1 mm (0.122 in.)	When discolored
		Mark 7	3.2 mm (0.126 in.)	When discolored
		Mark 8	3.3 mm (0.130 in.)	When discolored
		Mark 9	3.4 mm (0.134 in.)	When discolored
	3rd and 4th clutch end plate thickness	Mark 1	2.1 mm (0.083 in.)	When discolored
		Mark 2	2.2 mm (0.087 in.)	When discolored
		Mark 3	2.3 mm (0.091 in.)	When discolored
		Mark 4	2.4 mm (0.094 in.)	When discolored
		Mark 5	2.5 mm (0.098 in.)	When discolored
		Mark 6	2.6 mm (0.102 in.)	When discolored
		Mark 7	2.7 mm (0.106 in.)	When discolored
		Mark 8	2.8 mm (0.110 in.)	When discolored
		Mark 9	2.9 mm (0.114 in.)	When discolored

Item	Measurement	Qualification	Standard or New	Service Limit
Mainshaft	Diameter of needle bearing contact area	At stator shaft	22.984—23.000 mm (0.905—0.906 in.)	When worn or damaged
		At 3rd gear	51.975—51.991 mm (2.046—2.047 in.)	When worn or damaged
		At 4th gear collar	33.975—33.991 mm (1.3376—1.3382 in.)	When worn or damaged
	I.D. of gears	3rd gear	57.000—57.019 mm (2.2441—2.2448 in.)	When worn or damaged
		4th gear	40.000—40.016 mm (1.5748—1.5754 in.)	When worn or damaged
	End play of gears	3rd gear (2003-2004 models)	0.03—0.31 mm (0.001—0.012 in.)	———
		3rd gear (2005 model)	0.03—0.11 mm (0.001—0.004 in.)	———
		4th gear	0.1—0.212 mm (0.004—0.008 in.)	———
	41 x 68 mm thrust washer thickness	No. 1	6.35 mm (0.250 in.)	When worn or damaged
		No. 2	6.40 mm (0.252 in.)	When worn or damaged
		No. 3	6.45 mm (0.254 in.)	When worn or damaged
		No. 4	6.50 mm (0.256 in.)	When worn or damaged
		No. 5	6.55 mm (0.258 in.)	When worn or damaged
		No. 6	6.60 mm (0.260 in.)	When worn or damaged
	4th gear collar length		66.3—66.4 mm (2.610—2.614 in.)	———
	Length of 4th gear collar flange from end		19.15—19.30 mm (0.754—0.760 in.)	When worn or damaged
	Sealing ring thickness		1.91—1.97 mm (0.0752—0.0776 in.)	1.86 (0.0732 in.)
	Width of sealing ring groove		2.025—2.060 mm (0.0797—0.0811 in.)	2.080 mm (0.0819 in.)
	Clutch feed pipe O.D.		7.97—7.98 mm (0.3138—0.3142 in.)	7.95 mm (0.313 in.)
	Clutch feed pipe bushing I.D.		8.000—8.015 mm (0.3150—0.3156 in.)	8.030 mm (0.3161 in.)
Countershaft	Diameter of needle bearing contact area	At torque converter housing	36.005—36.015 mm (1.4175—1.4179 in.)	When worn or damaged
		At 4th gear	34.982—34.998 mm (1.3772—1.3778 in.)	When worn or damaged
		At reverse selector hub	39.979—40.000 mm (1.5740—1.5748 in.)	When worn or damaged
	I.D. of gears	4th gear	41.000—41.016 mm (1.6141—1.6148 in.)	When worn or damaged
		Reverse gear	46.000—46.016 mm (1.8110—1.8116 in.)	When worn or damaged
	End play of gears	1st gear	0—0.42 mm (0.000—0.017 in.)	———
		2nd gear	0—0.42 mm (0.000—0.017 in.)	———
		3rd gear	0—0.42 mm (0.000—0.017 in.)	———
		4th gear	0.04—0.27 mm (0.001—0.010 in.)	———
		Reverse gear	0.10—0.25 mm (0.004—0.010 in.)	———
	Distance collar length		82.75—82.80 mm (3.258—3.259 in.)	———
	Reverse selector hub width		25.45—25.65 mm (1.002—1.010 in.)	———
	Reverse selector hub O.D.		55.87—55.90 mm (2.200—2.201 in.)	When worn or damaged

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Standards and Service Limits

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New	Service Limit
Secondary shaft	Diameter of needle bearing contact area	At 1st gear	39.986—39.999 mm (1.5742—1.5748 in.)	When worn or damaged
		At 2nd gear	39.986—39.999 mm (1.5742—1.5748 in.)	When worn or damaged
	I.D. of gears	1st gear	47.000—47.016 mm (1.8504—1.8510 in.)	When worn or damaged
		2nd gear	46.000—46.016 mm (1.8110—1.8116 in.)	When worn or damaged
	End play of gears	1st and 2nd gears	0.04—0.12 mm (0.002—0.005 in.)	———
	37 x 58 mm thrust washer thickness	No. 1	3.900 mm (0.154 in.)	When worn or damaged
		No. 2	3.925 mm (0.155 in.)	When worn or damaged
		No. 3	3.950 mm (0.156 in.)	When worn or damaged
		No. 4	3.975 mm (0.156 in.)	When worn or damaged
		No. 5	4.000 mm (0.157 in.)	When worn or damaged
		No. 6	4.025 mm (0.158 in.)	When worn or damaged
		No. 7	4.050 mm (0.159 in.)	When worn or damaged
		No. 8	4.075 mm (0.160 in.)	When worn or damaged
		No. 9	4.100 mm (0.161 in.)	When worn or damaged
		No. 10	4.125 mm (0.162 in.)	When worn or damaged
		No. 11	4.150 mm (0.163 in.)	When worn or damaged
		No. 12	4.175 mm (0.164 in.)	When worn or damaged
		No. 13	4.200 mm (0.165 in.)	When worn or damaged
		No. 14	4.225 mm (0.166 in.)	When worn or damaged
		No. 15	4.250 mm (0.167 in.)	When worn or damaged
		No. 16	4.275 mm (0.168 in.)	When worn or damaged
		No. 17	4.300 mm (0.169 in.)	When worn or damaged
		No. 18	4.325 mm (0.170 in.)	When worn or damaged
		No. 19	4.350 mm (0.171 in.)	When worn or damaged
		No. 20	4.375 mm (0.172 in.)	When worn or damaged
	40 x 51.5 mm thrust washer thickness	No. 1	4.80 mm (0.189 in.)	When worn or damaged
		No. 2	4.85 mm (0.191 in.)	When worn or damaged
		No. 3	4.90 mm (0.193 in.)	When worn or damaged
		No. 4	4.95 mm (0.195 in.)	When worn or damaged
		No. 5	5.00 mm (0.197 in.)	When worn or damaged
		No. 6	5.05 mm (0.199 in.)	When worn or damaged
	27 x 45 x 44 mm gear collar length		43.9—44.0 mm (1.728—1.732 in.)	———
	Sealing ring thickness		1.91—1.97 mm (0.0752—0.0776 in.)	1.86 (0.0732 in.)
	Width of sealing ring groove		2.025—2.060 mm (0.0797—0.0811 in.)	2.080 mm (0.0819 in.)
	Clutch feed pipe O.D.		7.97—7.98 mm (0.3138—0.3142 in.)	7.95 mm (0.3130 in.)
	Clutch feed pipe bushing O.D.		11.500—11.518 mm (0.4527—0.4534 in.)	11.530 mm (0.4539 in.)
	ATF guide of sealing ring contact I.D.		29.000—29.021 mm (1.1417—1.1426 in.)	29.05 mm (1.144 in.)

Item	Measurement	Qualification	Standard or New	Service Limit
Idler gear shaft	Diameter of needle bearing contact area	End cover side	32.003—32.013 mm (1.2600—1.2604 in.)	When worn or damaged
	Thickness of cotters		1.39—1.42 mm (0.0547—0.0559 in.)	———
Reverse idler gear	Reverse idler gear shaft diameter at needle bearing contact area		14.99—15.00 mm (0.5902—0.5906 in.)	When worn or damaged
	I.D.		20.007—20.020 mm (0.7877—0.7882 in.)	When worn or damaged
	I.D. of reverse idler gear shaft contact area on transmission housing		14.800—14.818 mm (0.5827—0.5834 in.)	———
	I.D. of reverse idler gear shaft holder		14.800—14.824 mm (0.5827—0.5836 in.)	When worn or damaged
ATF pump	ATF pump thrust clearance		0.03—0.05 mm (0.001—0.002 in.)	0.07 mm (0.003 in.)
	ATF pump gear-to-body clearance	Drive gear	0.210—0.265 mm (0.0083—0.0104 in.)	———
		Driven gear	0.070—0.125 mm (0.003—0.005 in.)	———
	ATF pump driven gear I.D.		14.016—14.034 mm (0.5518—0.5525 in.)	When worn or damaged
	ATF pump driven gear shaft O.D.		13.980—13.990 mm (0.5504—0.5508 in.)	When worn or damaged
Stator shaft	Needle bearing contact I.D.	Torque converter side	27.000—27.021 mm (1.063—1.064 in.)	When worn or damaged
		ATF pump side	29.000—29.021 mm (1.1417—1.1426 in.)	———
	Sealing ring contact area I.D.		29.000—29.021 mm (1.1417—1.1426 in.)	29.05 mm (1.144 in.)
Reverse shift fork	Fork finger thickness		5.90—6.00 mm (0.232—0.236 in.)	5.40 mm (0.213 in.)
Park gear and pawl	———		———	When worn or damaged
Servo body	Shift fork shaft bore I.D.		14.000—14.010 mm (0.5512—0.5516 in.)	———
	Shift fork shaft valve bore I.D.		37.000—37.039 mm (1.4567—1.4582 in.)	37.045 mm (1.4585 in.)
Regulator valve body	Sealing ring contact I.D.		29.000—29.021 mm (1.1417—1.1426 in.)	29.05 mm (1.144 in.)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coil
Main valve body springs (see page 14-270)	Shift valve A spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9
	Shift valve B spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9
	Shift valve C spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9
	Relief valve spring		1.0 mm (0.039 in.)	9.6 mm (0.378 in.)	34.1 mm (1.343 in.)	10.2
	Lock-up control valve spring		0.65 mm (0.026 in.)	7.1 mm (0.280 in.)	23.1 mm (0.909 in.)	12.7
	Cooler check valve spring		0.9 mm (0.035 in.)	6.6 mm (0.260 in.)	26.5 mm (1.043 in.)	12.6
	Servo control valve spring		0.7 mm (0.028 in.)	6.6 mm (0.260 in.)	35.7 mm (1.406 in.)	17.2
	Shift valve E spring		0.8 mm (0.031 in.)	5.6 mm (0.220 in.)	28.1 mm (1.106 in.)	15.9

(cont'd)

Standards and Service Limits

Automatic Transmission and A/T Differential (cont'd)

Item	Measurement	Qualification	Standard or New			
			Wire Diameter	O.D.	Free Length	No. of Coil
Regulator valve body springs (see page 14-272)	Stator reaction spring		4.5 mm (0.177 in.)	35.4 mm (1.394 in.)	30.3 mm (1.193 in.)	1.92
	Regulator valve spring A		1.9 mm (0.075 in.)	14.7 mm (0.579 in.)	80.6 mm (3.173 in.)	16.1
	Regulator valve spring B		1.6 mm (0.063 in.)	9.2 mm (0.362 in.)	44.0 mm (1.732 in.)	12.5
	Torque converter check valve spring		1.2 mm (0.047 in.)	8.6 mm (0.339 in.)	33.8 mm (1.331 in.)	12.2
	Lock-up shift valve spring		1.0 mm (0.039 in.)	6.6 mm (0.260 in.)	35.5 mm (1.398 in.)	18.2
	1st accumulator spring A		2.4 mm (0.094 in.)	18.6 mm (0.732 in.)	49.0 mm (1.929 in.)	7.1
	1st accumulator spring B		2.3 mm (0.091 in.)	12.2 mm (0.480 in.)	31.5 mm (1.240 in.)	6.6
Servo body springs (see page 14-274)	CPB valve spring		0.7 mm (0.028 in.)	9.1 mm (0.358 in.)	32.3 mm (1.272 in.)	8.6
	4th accumulator spring B		2.3 mm (0.091 in.)	12.2 mm (0.480 in.)	31.5 mm (1.240 in.)	6.6
	4th accumulator spring A		2.4 mm (0.094 in.)	18.6 mm (0.732 in.)	49.0 mm (1.929 in.)	7.1
	2nd accumulator spring B		2.0 mm (0.079 in.)	10.6 mm (0.417 in.)	34.0 mm (1.339 in.)	8.0
	2nd accumulator spring A		2.2 mm (0.087 in.)	16.6 mm (0.654 in.)	48.2 mm (1.898 in.)	8.5
	3rd accumulator spring		2.5 mm (0.098 in.)	14.6 mm (0.575 in.)	29.9 mm (1.177 in.)	4.9

Item	Measurement	Qualification	Standard or New	Service Limit
A/T differential carrier	Pinion shaft contact area I.D.		18.000—18.025 mm (0.709—0.710 in.)	——
	Carrier-to-pinion shaft clearance		0.013—0.054 mm (0.001—0.002 in.)	0.1 mm (0.004 in.)
	Driveshaft contact area I.D.		28.015—28.045 mm (1.103—1.104 in.)	——
	Carrier-to-driveshaft clearance		0.035—0.086 mm (0.001—0.003 in.)	0.12 mm (0.005 in.)
	Intermediate shaft contact I.D.		28.015—28.045 mm (1.103—1.104 in.)	——
	Carrier-to-intermediate shaft clearance		0.065—0.111 mm (0.003—0.004 in.)	0.12 mm (0.005 in.)
	Carrier bearing starting torque (preload)	For new bearing	2.7—3.9 N·m (28—40 kgf·cm, 24—35 lbf·in.)	Adjust
		For used bearing	2.5—3.6 N·m (25—37 kgf·cm, 22—32 lbf·in.)	Adjust
	Final driven gear backlash	References	0.087—0.146 mm (0.003—0.006 in.)	0.2 mm (0.008 in.)
A/T differential pinion gear	Backlash		0.05—0.15 mm (0.002—0.006 in.)	——
	I.D.		18.042—18.066 mm (0.7103—0.7113 in.)	——
	Pinion gear-to-pinion shaft clearance		0.055—0.095 mm (0.0022—0.0037 in.)	0.12 mm (0.005 in.)

Item	Measurement	Qualification	Standard or New	Service Limit
Transfer assembly (4WD)	Diameter of transfer shaft on bearing contact area	At roller bearing	38.485—38.500 mm (1.5152—1.5157 in.)	38.43 mm (1.513 in.)
		At tapered roller bearing	24.975—24.990 mm (0.9833—0.9839 in.)	24.92 mm (0.9811 in.)
	Transfer drive gear diameter	At tapered roller bearing	40.002—40.018 mm (1.5749—1.5755 in.)	38.95 mm (1.533 in.)
	Diameter of transfer driven gear on tapered roller bearing contact area	At driven gear side	35.002—35.018 mm (1.3780—1.3787 in.)	34.95 mm (1.376 in.)
		At shaft splines side	26.975—26.988 mm (1.0620—1.0625 in.)	26.92 mm (1.060 in.)
	Transfer gear backlash		0.06—0.16 mm (0.02—0.06 in.)	Adjust
	Total starting torque (preload)	2003-2004 models	2.16—3.57 N·m (22.0—36.4 kgf·cm, 19.2—31.6 lbf·in.)	Adjust
		2005 model	2.66—4.08 N·m (27.1—41.8 kgf·cm, 23.7—36.5 lbf·in.)	Adjust

Rear Differential

Item	Measurement	Qualification	Standard or New
Differential fluid	Capacity	At fluid change	1.0 L (1.1 US qt)
	Use Honda Dual Pump Fluid	At overhaul	1.2 L (1.3 US qt)

Steering

Item	Measurement	Qualification	Standard or New
Steering wheel	Rotational play measured at outside edge with engine running		0—10 mm (0—0.39 in.)
	Starting load measured at outside edge with engine running		29 N (3.0 kgf, 6.6 lbf)
Gearbox	Angle of rack guide screw loosened from locked position		20 ° max.
Pump	Output pressure with shut-off valve closed		7,460—8,140 kPa (76—83 kgf/cm², 1,080—1,180 psi)
Power steering fluid	Capacity Use Honda Power Steering Fluid	Reservoir capacity	0.27 L (0.28 US qt)
		System overhaul	0.83 L (0.87 US qt)

Suspension

Item	Measurement	Qualification	Standard or New	Service Limit
Wheel alignment	Camber	Front	−0 ° 13 ′±45 ′	
		Rear	−1 ° 00 ′±45 ′	
	Caster	Front	1 ° 50 ′±1 °	
	Total Toe-in	Front	0±3 mm (0±0.11 in.)	
		Rear	2^{+2}_{-1} mm ($0.08^{+0.09}_{-0.04}$ in.)	
	Front wheel turning angle	Inside wheel	40 ° 05 ′±2 °	
		Outside wheel	32 ° 16 ′ (Reference)	
Wheel	Aluminum wheel runout	Axial	0—0.6 mm (0—0.02 in.)	2.0 mm (0.08 in.)
		Radial	0—0.6 mm (0—0.02 in.)	1.5 mm (0.06 in.)
	Steel wheel runout	Axial	0—1.4 mm (0—0.05 in.)	2.0 mm (0.08 in.)
		Radial	0—1.4 mm (0—0.05 in.)	1.5 mm (0.06 in.)
Wheel bearing	End play	Front	0—0.05 mm (0—0.002 in.)	
		Rear	0—0.05 mm (0—0.002 in.)	

Standards and Service Limits

Brakes

Item	Measurement	Qualification	Standard or New	Service Limit
Parking brake lever	Distance traveled when lever pulled with 196 N (20 kgf, 44 lbf) of force		4 to 7 clicks	
Brake pedal	Pedal height (carpet removed)	M/T	178 mm (7.0 in.)	
		A/T	180 mm (7.1 in.)	
	Free play		1—5 mm (0.04—0.2 in.)	
Master cylinder	Piston-to-pushrod clearance		0—0.4 mm (0—0.02 in.)	
Brake disc	Thickness	Front	23.0 mm (0.91 in.)	21.0 mm (0.83 in.)
		Rear	8.9—9.1 mm (0.350—0.358 in.)	7.5 mm (0.30 in.)
	Runout	Front	——	0.10 mm (0.004 in.)
		Rear	——	0.10 mm (0.004 in.)
	Parallelism	Front and rear	——	0.015 mm (0.0006 in.)
Brake pad	Thickness	Front	10.6—11.2 mm (0.42—0.44 in.)	1.6 mm (0.06 in.)
		Rear	8.6—9.7 mm (0.34—0.38 in.)	1.6 mm (0.06 in.)
Parking brake	Brake drum I.D.		169.9—170.0 mm (6.689—6.693 in.)	171 mm (6.732 in.)
	Brake shoe lining thickness		2.5 mm (0.098 in.)	1.0 mm (0.04 in.)

Air Conditioning

Item	Measurement	Qualification	Standard or New
Refrigerant	Type		HFC-134a (R-134a)
	Capacity of system		500—550 g (17.6—19.4 oz)
Refrigerant oil	Type		DENSO ND-OIL 8 (P/N 38897-PR7-A01AH or 38899-PR7-A01)
	Capacity of components	Condenser	25 mL (5/6 fl oz)
		Evaporator	45 mL (1 1/2 fl oz)
		Each line and hose	10 mL (1/3 fl oz)
		Compressor	160—175 mL (5 1/3—5 2/3 fl oz)
Compressor	Starter coil resistance	At 68 °F (20 °C)	3.9— 4.3 Ω
	Pulley-to-pressure plate clearance		0.35—0.6 mm (0.014—0.024 in.)

Design Specifications

Item	Measurement	Qualification	Specification
DIMENSIONS	Overall length		4,300 mm (169.3 in.)
	Overall width		1,815 mm (71.5 in.)
	Overall height		1,788 mm (70.4 in.)
	Wheelbase		2,575 mm (101.4 in.)
	Track	Front	1,577 mm (62.1 in.)
		Rear	1,582 mm (62.3 in.)
	Seating capacity		Four (4)
WEIGHT (U.S.A.)	Gross Vehicle Weight Rating (GVWR)		4,450 lbs
WEIGHT (CANADA)	Gross Vehicle Weight Rating (GVWR)		2,020 kg
ENGINE	Type		Water cooled, 4-stroke DOHC i-VTEC engine
	Cylinder arrangement		Inline 4-cylinder, transverse
	Bore and stroke		87 x 99 mm (3.43 x 3.90 in.)
	Displacement		2,354 cm^3 (144 cu in.)
	Compression ratio		9.7
	Valve train		Chain drive, DOHC i-VTEC 4 valves per cylinder
	Lubrication system		Forced, wet sump, with trochoid pump
	Oil pump displacement	At 6,000 rpm	52.8 L (55.8 US qt)/minute
	Water pump displacement	At 6,000 rpm	95.5 L (101 US qt)/minute
	Fuel required		UNLEADED gasoline with 86 pump octane number or higher
STARTER	Type		Gear reduction
	Normal output	M/T	1.7 kW
		A/T	1.6 kW
	Nominal voltage		12 V
	Hour rating		30 seconds
	Direction of rotation		Clockwise as viewed from gear end
CLUTCH	Clutch type	M/T	Single plate dry, diaphragm spring
		A/T	3-element torque converter with lock-up clutch
	Clutch friction material surface area	M/T	174 cm^3 (26.97 sq in.)
MANUAL TRANSMISSION	Type		Synchronized, 5-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio	1st	3.533
		2nd	2.042
		3rd	1.355
		4th	1.028
		5th	0.825
		Reverse	3.583
	Final reduction	Type	Single helical gear
		Gear ratio	4.765

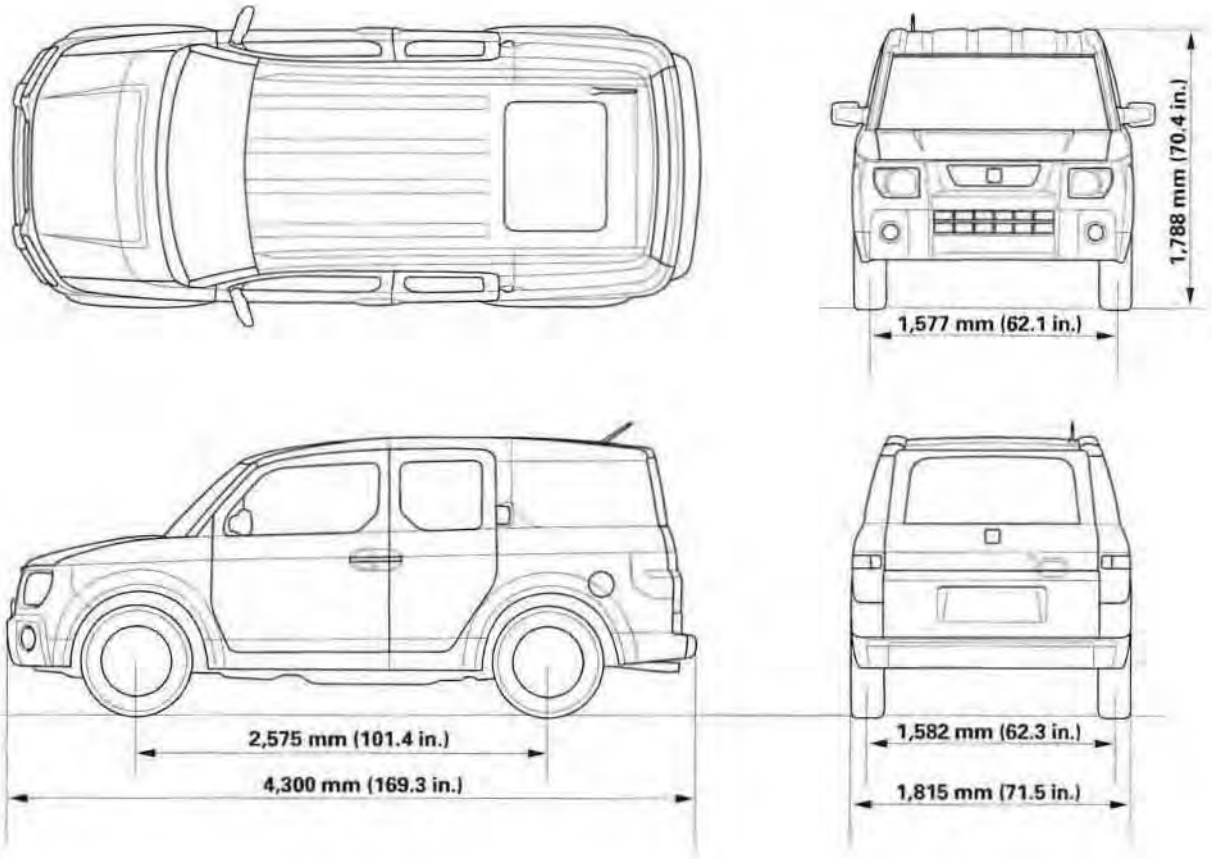
(cont'd)

Design Specifications

(cont'd)

Item	Measurement	Qualification	Specification
AUTOMATIC TRANSMISSION	Type		Electronically controlled automatic, 4-speed forward, 1 reverse
	Primary reduction		Direct 1:1
	Gear ratio	1st	2.684
		2nd	1.534
		3rd	1.081
		4th	0.733
		Reverse	2.000
	Transfer gear	Type	Single helical gear
		Gear ratio	4.765
	Differential final gears	Type	Single helical gear
		Gear ratio	4.437
STEERING	Type		Power-assisted rack and pinion
	Overall ratio		16.2
	Turns, lock-to-lock		3.26
	Steering wheel diameter		360 mm (14.2 in.)
SUSPENSION	Type	Front	Independent strut with stabilizer, coil spring
		Rear	Double wishbone
	Shock absorber	Front	Telescopic, hydraulic, nitrogen gas-filled
		Rear	Telescopic, hydraulic, nitrogen gas-filled
WHEEL ALIGNMENT	Camber	Front	0 ° 13 '
		Rear	−1 ° 00 '
	Caster	Front	1 ° 50 '
	Total Toe-in	Front	0 mm (0 in.)
		Rear	2 mm (1/16 in.)
BRAKES	Type of service brake	Front	Power-assisted self-adjusting ventilated disc
		Rear	Power-assisted self-adjusting solid disc
	Type of parking brake		Mechanical actuating, rear wheels
	Pad friction surface area	Front	46 cm^2 (7.1 sq in.) x 2
		Rear	27 cm^2 (4.1 sq in.) x 2
	Shoe friction surface area	Rear	49.0 cm^2 (7.60 sq in.) x 2
TIRES	Size		P215/70R16 99S

Item	Measurement	Qualification	Specification
AIR CONDITIONING	Compressor	Type	Swash plate
		Capacity	188 mL (11.47 cu in.)/rev.
		Maximum speed	7,922 rpm
		Lubricant capacity	160 mL (5 1/3 fl oz)
		Lubricant type	DENSO ND-OIL 8
	Condenser	Type	Corrugated fin
	Evaporator	Type	Corrugated fin
	Blower	Type	Radial fan
		Motor type	190 W/12 V
		Speed control	Infinite variable
		Maximum capacity	480 m^3 (16.900 cu ft)/h
	Temperature control		Air-mix type
	Compressor clutch	Type	Dry, single plate, poly-V belt drive
		Electrical power consumption at 68 °F (20 °C)	35 W max. at 12 V
	Refrigerant	Type	HFC-134a (R-134a)
		Capacity	500—550 g (17.6—19.4 oz)
ELECTRICAL RATINGS	Battery		12 V—45 AH
	Starter	M/T	12 V—1.7 kW
		A/T	12 V—1.6 kW
	Alternator		12 V—90 A
	Fuses	Under-hood fuse/ relay box	100 A, 50 A, 40 A, 30 A, 20 A, 15 A, 10 A
		Under-dash fuse/ relay box	20 A, 15 A, 10 A, 7.5 A
	Light bulbs	Headlight (high beam)	12 V—60 W
		Headlight (low beam)	12 V—51 W
		Front turn signal/ parking lights	12 V—21/5 W
		Front side marker lights	12 V—5 W
		Rear turn signal lights	12 V—21 W
		Taillights	12 V—3 CP
		Brake/taillights	12 V—21/5 W
		High mount brake light	12 V—21 W
		Back-up lights	12 V—21 W
		License plate light	12 V—5 W
		Ceiling lights	12 V—8 W
		Spotlights	12 V—4 CP
		Gauge lights	12 V—1.4 W
		Indicator lights	LED, 12 V—1.4 W


1,788 mm (70.4 in.)
1,577 mm (62.1 in.)
2,575 mm (101.4 in.)
4,300 mm (169.3 in.)
1,582 mm (62.3 in.)
1,815 mm (71.5 in.)

Maintenance

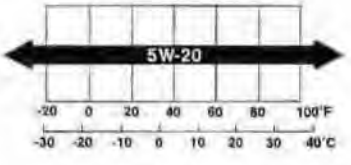
Lubricants and Fluids

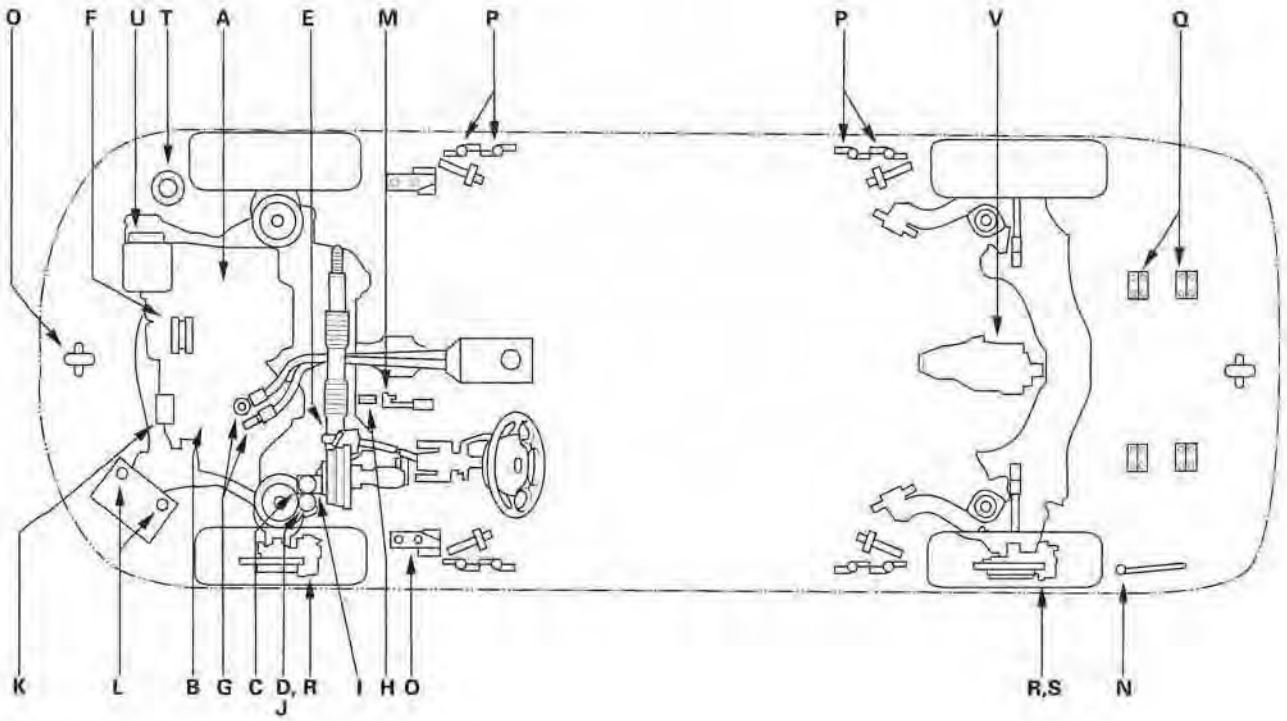
For details of lubrication points and type of lubricants to be applied, refer to the illustrated index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

	LUBRICATION POINTS	LUBRICANT
A	Engine	Honda Motor Oil: P/N 08798-9023 Use 5W-20 motor oil. Look for the API certification seal on the oil container as shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
B	Manual transmission	Honda Manual Transmission Fluid (MTF): P/N 08798-9016 Always use Honda MTF. Using motor oil can cause stiffer shifting because it does not contain the proper additives.
	Automatic transmission	Honda Automatic Transmission Fluid (ATF-Z1): P/N 08200-9001 Always use Honda ATF-Z1. Using a non-Honda ATF can affect shift quality.
C	Brake system (including ABS line)	Honda Heavy Duty DOT 3 Brake Fluid: P/N 08798-9008 Always use Honda Heavy Duty DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
D	Clutch line	Honda Heavy Duty DOT 3 Brake Fluid: P/N 08798-9008 Always use Honda Heavy Duty DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
E	Power steering gearbox	Steering Grease: P/N 08733-B070E
F	Throttle cable end (throttle link)	Super High Temp Urea Grease: P/N 08798-9002
G	Shift and select cable ends	Honda Silicone Grease: P/N 08C30-B0234M
H	Throttle cable end (below dashboard)	
I	Brake booster clevis	Multipurpose Grease
J	Clutch master cylinder clevis	
K	Release fork	
L	Battery terminals	
M	Pedal linkage	
N	Fuel fill door	
O	Hood hinges and hood latch	
P	Door hinges: upper and lower	
Q	Tailgate hinges: upper and lower	
R	Caliper piston boot, caliper pins, and boots	Honda Silicone Grease: P/N 08C30-B0234M
S	Rear brake shoe linkage	Molykote Grease 44MA
T	Power steering system	Honda Power Steering Fluid Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.
U	Air conditioning compressor	Compressor oil: DENSO ND-OIL 8 (P/N 38897-PR7-A01AH or 38899-PR7-A01) for refrigerant HFC-134a (R-134a)
V	Rear differential (4WD model)	Honda Dual Pump Fluid: P/N 08200-9002

API CERTIFICATION SEAL

Recommended Engine Oil
Engine oil viscosity for ambient temperature ranges

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Maintenance Schedule

Listed by Distance/Time for Normal Conditions

Service at the indicated distance or time whichever comes first. This Maintenance Schedule outlines the minimum required maintenance. For Canada model, use the Severe Conditions Maintenance Schedule.

Distance		Time	Maintenance Items
10,000 miles	16,000 km	———	Do items in A.
20,000 miles	32,000 km	1 year	Do items in A and B.
30,000 miles	48,000 km	———	Do items in A and C.
40,000 miles	64,000 km	2 years	Do items in A and B.
50,000 miles	80,000 km	———	Do items in A.
60,000 miles	96,000 km	3 years	Do items in A, B, and C.
———	———	3 years	Replace brake fluid, every 3 years. Use Honda Heavy Duty DOT 3 Brake Fluid.
70,000 miles	112,000 km	———	Do items in A.
80,000 miles	128,000 km	4 years	Do items in A and B.
90,000 miles	144,000 km	———	Do items in A, C, and D.
100,000 miles	160,000 km	5 years	Do items in A and B.
110,000 miles	176,000 km	———	Do items in A and E.
120,000 miles	192,000 km	6 years	Do items in A, B, C, F, G, and H.
———	———	6 years	Replace brake fluid, every 3 years. Use Honda Heavy Duty DOT 3 Brake Fluid.
130,000 miles	208,000 km	———	Do items in A.
140,000 miles	224,000 km	7 years	Do items in A and B.
150,000 miles	240,000 km	———	Do items in A and C.
160,000 miles	256,000 km	———	Inspect idle speed (see page 11-206), every 160,000 miles (256,000 km). M/T: 700±50 rpm in neutral, A/T: 700±50 rpm in P or N position.
160,000 miles	256,000 km	8 years	Do items in A and B.
———	———	9 years	Replace brake fluid, every 3 years. Use Honda Heavy Duty DOT 3 Brake Fluid.

Do the items in parts A, B, C, D, E, F, G, and H as required for the mileage/time interval listed.

Part	Maintenance Items
A	Replace engine oil (see page 8-6), every 10,000 miles (16,000 km) or 1 year. Engine oil capacity without oil filter: 4.0 L (4.2 US qt).
	Rotate tires (follow the pattern shown in the Owner's Manual), every 10,000 miles (16,000 km).
B	Replace engine oil filter (see page 8-7), every 20,000 miles (32,000 km) or 1 year. Engine oil capacity with oil filter: 4.2 L (4.4 US qt).
	Check front and rear brakes (see page 19-3), every 20,000 miles (32,000 km) or 1 year. • Check pads and discs for wear (thickness), damage, and cracks. • Check brake linings for cracking, glazing, wear, or contamination. • Check calipers for damage, leaks, and tightness of mounting bolts.
	Check parking brake adjustment (see page 19-7), every 20,000 miles (32,000 km) or 1 year. Check the number of clicks (4 to 7) when the parking brake lever is pulled up with 196 N (20 kgf, 44 lbf) of force.
	Inspect tie-rod ends, steering gearbox, and boots (see page 17-8), every 20,000 miles (32,000 km) or 1 year. • Check rack grease and steering linkage. • Check boots for damage and leaking grease. • Check fluid lines for damage and leaks.
	Inspect suspension components (see page 18-3), every 20,000 miles (32,000 km) or 1 year. • Check bolts for tightness. • Check condition of ball joint boots for deterioration and damage.
	Inspect driveshaft boots (see page 16-3), every 20,000 miles (32,000 km) or 1 year. Check boots for cracks and boot bands for tightness.
	Inspect brake hoses and lines including ABS (see page 19-33), every 20,000 miles (32,000 km) or 1 year. Check the master cylinder, proportioning control valve, and ABS modulator for damage and leakage.
	Inspect all fluid levels and condition of fluids, every 20,000 miles (32,000 km) or 1 year. • Manual transmission fluid (MTF) (see page 13-3). • Automatic transmission fluid (ATF) (see page 14-184). • Power steering fluid (see page 17-12). • Brake fluid (see page 19-9). • Windshield washer fluid.
	Inspect exhaust system (see page 9-8)*, every 20,000 miles (32,000 km) or 1 year. Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness.
	Inspect fuel lines and connections (see page 11-216)*, every 20,000 miles (32,000 km) or 1 year. Check for loose connections, cracks, and deterioration; retighten loose connections and replace damaged parts.

NOTE: According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void the customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended intervals to ensure long-term reliability.

(cont'd)

Maintenance Schedule

Listed by Distance/Time for Normal Conditions (cont'd)

Service at the indicated distance or time whichever comes first. This Maintenance Schedule outlines the minimum required maintenance. For Canada model, use the Severe Conditions Maintenance Schedule.

Do the items in parts A, B, C, D, E, F, G, and H as required for the mileage/time interval listed.

Part	Maintenance Items
C	Inspect drive belts (see page 4-36), every 30,000 miles (48,000 km) or 2 years. Look for cracks and damage, then check the position of the drive belt auto-tentioner indicator (see page 4-37).
	Replace dust and pollen filter (see page 21-40), every 30,000 miles (48,000 km) or 2 years. • Replace it twice as often (at 15,000 miles intervals) if the vehicle is driven mostly in urban areas that have high concentrations of soot in the air from industry and diesel-powered vehicles. • Replace it whenever airflow from the climate control system is less than normal.
	Replace air cleaner element (see page 11-232), every 30,000 miles (48,000 km), (independent of time).
D	Replace rear differential fluid (see page 15-13), every 90,000 miles (144,000 km). Use Honda Dual Pump Fluid.
E	Replace spark plugs (see page 4-26), every 110,000 miles (176,000 km). Use IZFR6K11 (NGK) or SKJ20DR-M11 (DENSO).
	Inspect the valve clearance (see page 6-9), every 110,000 miles (176,000 km), otherwise adjust if noisy. Intake: 0.21—0.25 mm (0.008—0.010 in.), Exhaust: 0.28—0.32 mm (0.011—0.13 in.).
F	Replace manual transmission fluid (see page 13-3), every 120,000 miles (192,000 km) or 6 years. Capacity: 1.9 L (2.0 US qt); use Honda MTF.
G	Replace automatic transmission fluid (see page 14-185) at 120,000 miles (192,000 km) or 6 years, then every 90,000 miles (144,000 km) or 5 years. Capacity: 4WD: 3.1 L (3.3 US qt), 2WD: 3.2 L (3.4 US qt); use Honda ATF-Z1.
H	Replace engine coolant (see page 10-6) at 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years. Capacity: M/T: 5.1 L (1.35 US gal), A/T: 5.0 L (1.32 US gal); use Honda All Season Antifreeze/Coolant Type 2.

NOTE: According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void the customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended intervals to ensure long-term reliability.

Listed by Distance/Time for Severe Conditions

Service at the indicated distance or time, whichever comes first. Use this schedule if the vehicle is driven MAINLY in Canada or in any of the following conditions. If only OCCASIONALLY driven in these conditions, use the Normal Conditions Schedule.

Severe Driving Conditions

- Driving less than 5 miles (8 km) per trip or in freezing temperature.
- Driving in extremely hot (over 90 °F/32 °C) conditions.
- Extensive idling or long periods of stop-and-go driving, such as a taxi or a commercial delivery vehicle.
- Driving on muddy, dusty, or de-iced roads.
- Trailer towing, driving with a roof rack, or driving in mountainous conditions.

Distance		Time	Maintenance Items
50,000 miles	8,000 km	———	Do item in A.
10,000 miles	16,000 km	———	Do items in A and B.
15,000 miles	24,000 km	———	Do items in A and C.
20,000 miles	32,000 km	1 year	Do items in A, B, and D.
25,000 miles	40,000 km	———	Do item in A.
30,000 miles	48,000 km	———	Do items in A, B, C, and E.
35,000 miles	56,000 km	———	Do item in A.
40,000 miles	64,000 km	2 years	Do items in A, B, and D.
45,000 miles	72,000 km	———	Do items in A and C.
50,000 miles	80,000 km	———	Do items in A and B.
55,000 miles	88,000 km	———	Do item in A.
60,000 miles	96,000 km	3 years	Do items in A, B, C, D, E, F, and G.
———	———	3 years	Replace brake fluid, every 3 years. Use Honda Heavy Duty DOT 3 Brake Fluid.
65,000 miles	104,000 km	———	Do item in A.
70,000 miles	112,000 km	———	Do items in A and B.
75,000 miles	120,000 km	———	Do items in A and C.
80,000 miles	128,000 km	4 years	Do items in A, B, and D.
85,000 miles	136,000 km	———	Do item in A.
90,000 miles	144,000 km	———	Do items in A, B, C, E, and F.

(cont'd)

Listed by Distance/Time for Severe Conditions (cont'd)

Service at the indicated distance or time, whichever comes first. Use this schedule if the vehicle is driven MAINLY in Canada or in any of the following conditions. If only OCCASIONALLY driven in these conditions, use the Normal Conditions Schedule.

Severe Driving Conditions
- Driving less than 5 miles (8 km) per trip or in freezing temperature.
- Driving in extremely hot (over 90 °F/32 °C) conditions.
- Extensive idling or long periods of stop-and-go driving, such as a taxi or a commercial delivery vehicle.
- Driving on muddy, dusty, or de-iced roads.
- Trailer towing, driving with a roof rack, or driving in mountainous conditions.

Distance		Time	Maintenance Items
95,000 miles	152,000 km	———	Do item in A.
100,000 miles	160,000 km	5 years	Do items in A, B, and D.
105,000 miles	168,000 km	———	Do items in A and C.
110,000 miles	176,000 km	———	Do items in A, B, and H.
115,000 miles	184,000 km	———	Do item in A.
120,000 miles	192,000 km	6 years	Do items in A, B, C, D, E, F, G, and I.
———	———	6 years	Replace brake fluid, every 3 years. Use Honda Heavy Duty DOT 3 Brake Fluid.
125,000 miles	200,000 km	———	Do item in A.
130,000 miles	208,000 km	———	Do items in A and B.
135,000 miles	216,000 km	7 years	Do items in A and C.
140,000 miles	224,000 km	7 years	Do items in A, B, and D.
145,000 miles	232,000 km	———	Do item in A.
150,000 miles	240,000 km	———	Do items in A, B, C, E, and F.
155,000 miles	248,000 km	———	Do item in A.
160,000 miles	256,000 km	———	Inspect idle speed (see page 11-206), every 160,000 miles (256,000 km). M/T: 700±50 rpm in neutral, A/T: 700±50 rpm in P or N position.
160,000 miles	256,000 km	8 years	Do items in A, B, and D.
———	———	9 years	Replace brake fluid, every 3 years. Use Honda Heavy Duty DOT 3 Brake Fluid.

Do the items in parts A, B, C, D, E, F, G, H, and I as required for the mileage/time interval listed.

Part	Maintenance Items
A	Replace engine oil (see page 8-6), every 5,000 miles (8,000 km) or 6 months. Engine oil capacity without oil filter: 4.0 L (4.2 US qt).
B	Replace engine oil filter (see page 8-7), every 10,000 miles (16,000 km) or 1 year. Engine oil capacity with oil filter: 4.2 L (4.4 US qt).
	Check front and rear brakes (see page 19-3), every 10,000 miles (16,000 km) or 1 year. • Check pads and discs for wear (thickness), damage, and cracks. • Check brake linings for cracking, glazing, wear, or contamination. • Check calipers for damage, leaks, and tightness of mounting bolts.
	Lubricate all hinges, locks, and latches. Use Honda White Lithium Grease or Multipurpose Grease.
	Rotate tires (follow the pattern shown in the Owner's Manual), every 10,000 miles (16,000 km).
	Inspect tie-rod ends, steering gearbox, and boots (see page 17-8), every 10,000 miles (16,000 km) or 1 year. • Check rack grease and steering leakage. • Check boots for damage and leaking grease. • Check fluid lines for damage and leaks.
	Inspect suspension components (see page 18-3), every 10,000 miles (16,000 km) or 1 year. • Check bolts for tightness. • Check condition of ball joint boots for deterioration and damage.
	Inspect driveshaft boots (see page 16-3), every 10,000 miles (16,000 km) or 1 year. Check boots for cracks and boot bands for tightness.
C	Replace air cleaner element (see page 11-232), every 15,000 miles (24,000 km) when driving in dusty conditions; otherwise use normal conditions schedule, (independent of time).
D	Check parking brake adjustment (see page 19-7), every 20,000 miles (32,000 km) or 1 year. Check the number of clicks (4 to 7) when the parking brake lever is pulled up with 196 N (20 kgf, 44 lbf) of force.
	Inspect brake hoses and lines including ABS (see page 19-33), every 20,000 miles (32,000 km) or 1 year. Check the master cylinder, proportioning cotrol valve, and ABS modulator for damage and leakage.
	Inspect all fluid levels and condition of fluids, every 20,000 miles (32,000 km) or 1 year. • Manual transmission fluid (MTF) (see page 13-3). • Automatic transmission fluid (ATF) (see page 14-184). • Power steering fluid (see page 17-12). • Brake fluid (see page 19-9). • Windshield washer fluid.
	Inspect exhaust system (see page 9-8)*, every 20,000 miles (32,000 km) or 1 year. Check catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness.
	Inspect fuel lines and connections (see page 11-216)*, every 20,000 miles (32,000 km) or 1 year. Check for loose connections, cracks, and deterioration; retighten loose connections and replace damaged parts.
	Check lights and controls, every 20,000 miles (32,000 km) or 1 year. Check function of interior lights (see page 22-92) and exterior lights (see page 22-71), and position of the headlights (see page 22-82).
	Inspect vehicle underbody, every 20,000 miles (32,000 km) or 1 year. Check the paint for damage, scratches, stone chipping, and dents.

NOTE: According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void the customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended intervals to ensure long-term reliability.

(cont'd)

Listed by Distance/Time for Severe Conditions (cont'd)

Service at the indicated distance or time, whichever comes first. Use this schedule if the vehicle is driven MAINLY in Canada or in any of the following conditions. If only OCCASIONALLY driven in these conditions, use the Normal Conditions Schedule.

Severe Driving Conditions
- Driving less than 5 miles (8 km) per trip or in freezing temperature.
- Driving in extremely hot (over 90 °F/32 °C) conditions.
- Extensive idling or long periods of stop-and-go driving, such as a taxi or a commercial delivery vehicle.
- Driving on muddy, dusty, or de-iced roads.
- Trailer towing, driving with a roof rack, or driving in mountainous conditions.

Do the items in parts A, B, C, D, E, F, G, H, and I as required for the mileage/time interval listed.

Part	Maintenance Items
E	Inspect drive belts (see page 4-36), every 30,000 miles (48,000 km). Look for cracks and damage, then check the position of the drive belt auto-tensioner indicator (see page 4-37).
	Replace dust and pollen filter (see page 21-40), every 30,000 miles (48,000 km). • Replace it twice as often (at 30,000 miles intervals) if the vehicle is driven mostly in urban areas that have high concentrations of soot in the air from industry and diesel-powered vehicles. • Replace it whenever airflow from the climate control system is less than normal.
F	Replace automatic transmission fluid (see page 14-185) at 60,000 miles (96,000 km) or 3 years, then every 30,000 miles (48,000 km) or 2 years. Capacity: 4WD: 3.1 L (3.3 US qt), 2WD: 3.2 L (3.4 US qt); use Honda ATF-Z1.
G	Replace manual transmission fluid (see page 13-3), every 60,000 miles (96,000 km) or 3 years. Capacity: 1.9 L (2.0 US qt); use Honda MTF.
	Replace rear differential fluid (see page 15-13), every 60,000 miles (96,000 km) or 4 years. Use Honda Dual Pump Fluid.
H	Replace spark plugs (see page 4-26), every 110,000 miles (176,000 km). Use IZFR6K11 (NGK) or SKJ20DR-M11 (DENSO).
	Inspect the valve clearance (see page 6-9), every 110,000 miles (176,000 km), otherwise adjust if noisy. Intake: 0.21—0.25 mm (0.008—0.010 in.), Exhaust: 0.28—0.32 mm (0.011—0.013 in.).
I	Replace engine coolant (see page 10-6) at 120,000 miles (192,000 km) or 10 years, then every 60,000 miles (96,000 km) or 5 years. Capacity: M/T: 5.1 L (1.35 US gal), A/T: 5.0 L (1.32 US gal); use Honda All Season Antifreeze/Coolant Type 2.

NOTE: According to state and federal regulations, failure to do the maintenance items marked with an asterisk (*) will not void the customer's emissions warranties. However, Honda recommends that all maintenance services be done at the recommended intervals to ensure long-term reliability.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If engine electrical maintenance is required)

The ELEMENT SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items require special precautions and tools, and should be done only by an authorized Honda dealer.

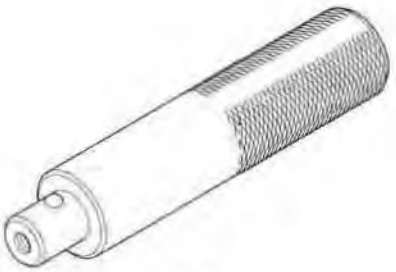
- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors when the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Engine Electrical

Special Tools

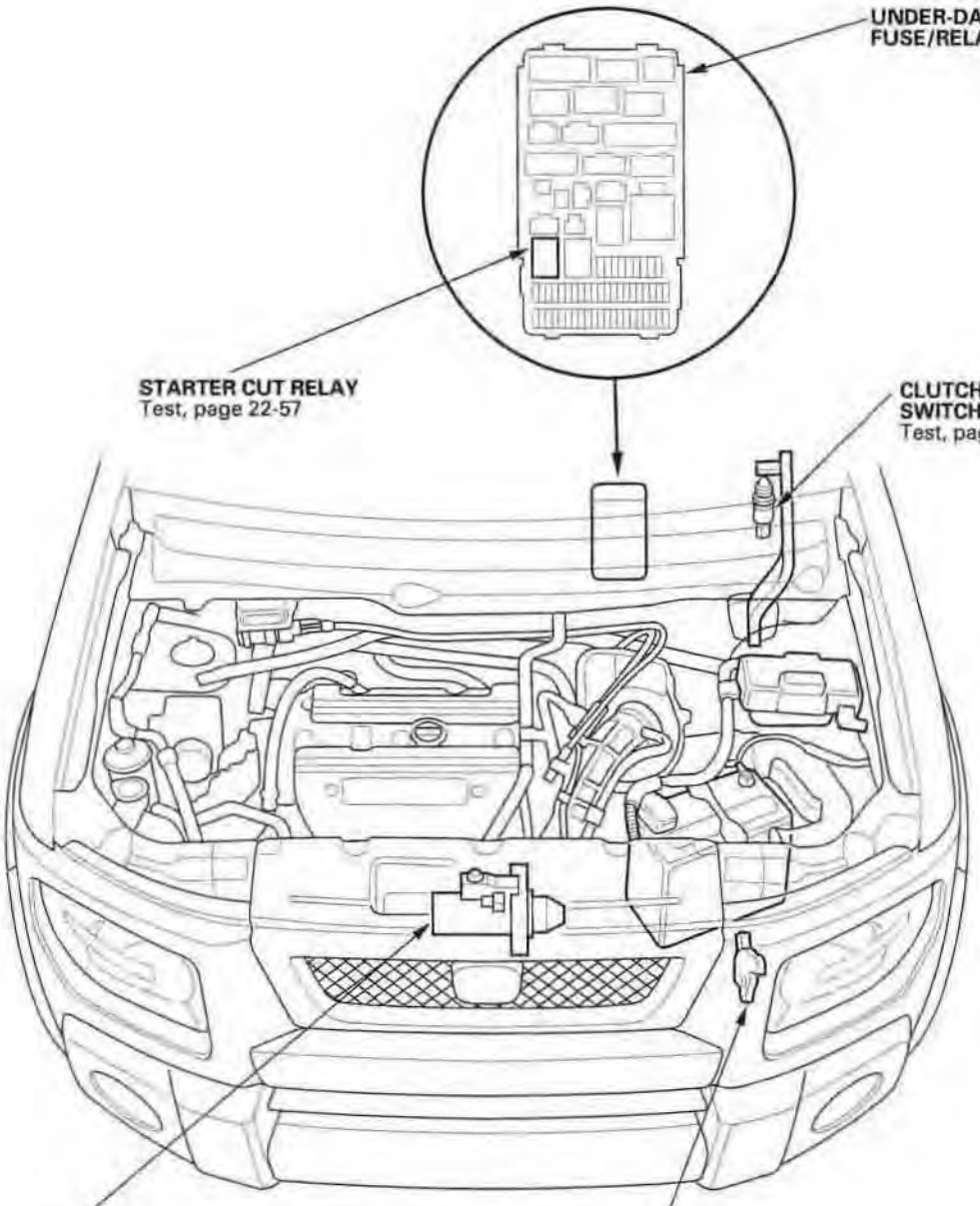
Ref. No.	Tool Number	Description	Qty
①	07746-0010300	Driver Attachment, 42 x 47 mm	1
②	07749-0010000	Handle Driver	1

①



②

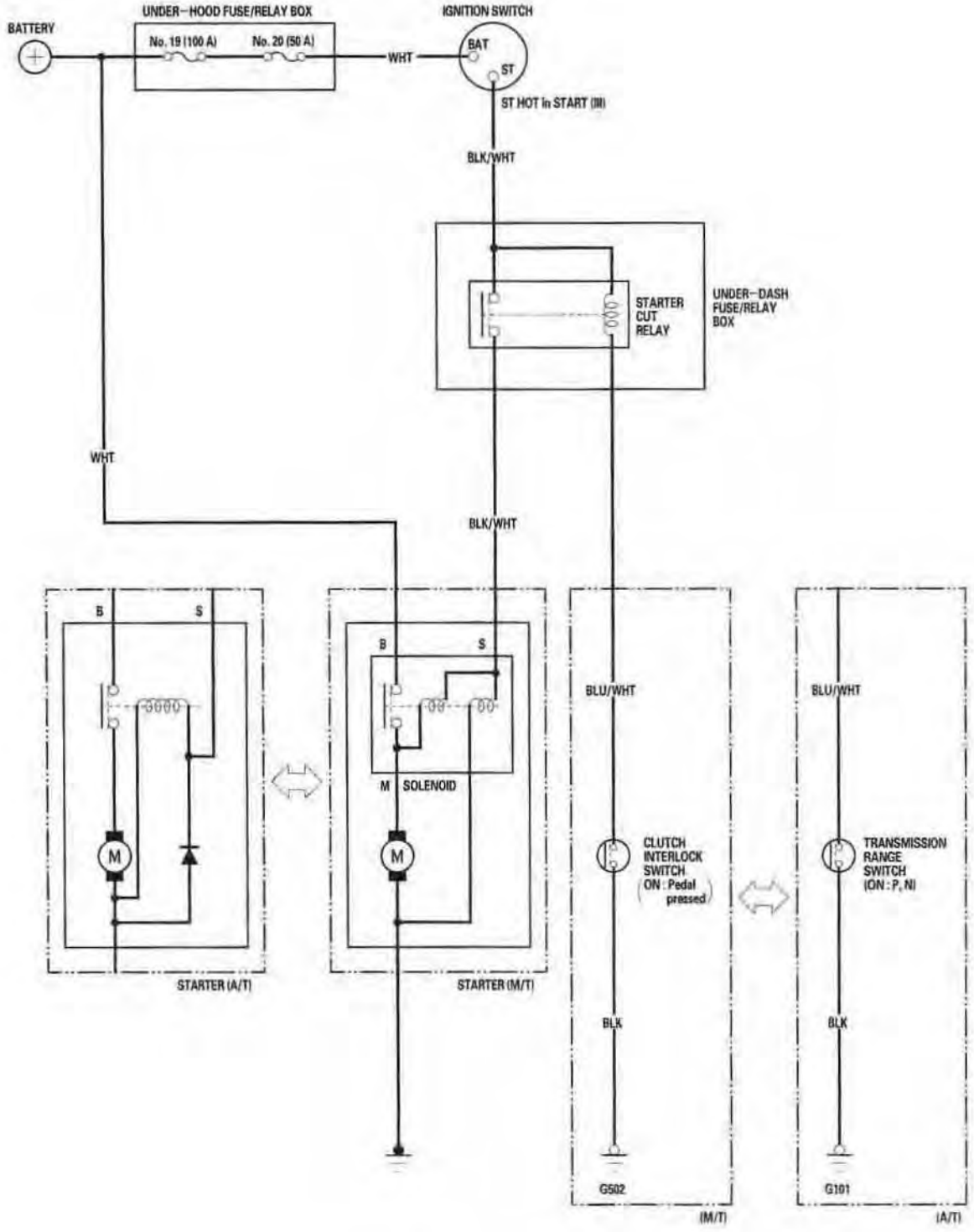
Component Location Index



Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Engine does not start (does not crank)	1. Check for loose battery terminals or connections. 2. Test the battery for a low charge (see page 22-56). 3. Check the starter (see page 4-6). 4. Check the starter cut relay (see page 22-57). 5. Check the transmission range switch (A/T) (see page 14-229). 6. Check the clutch interlock switch (M/T) (see page 4-8). 7. Check the ignition switch or wire (see page 22-59).	Poor ground at G101 (A/T) or G502 (M/T)
Engine cranks, but does not start	1. Check for PGM-FI DTCs. 2. Test the fuel pump (see page 11-214). 3. Check for a plugged or damaged fuel line (see page 11-216). 4. Check for a plugged fuel filter (see page 11-223). 5. Check the throttle body (see page 11-229). 6. Check for low engine compression (see page 6-6). 7. Check for a damaged or broken cam chain.	
Engine is hard to start	1. Check for PGM-FI DTCs. 2. Test the fuel pump (see page 11-214). 3. Check for a plugged or damaged fuel line (see page 11-216). 4. Check for a plugged fuel filter (see page 11-223).	
Engine cranks slowly	1. Check for loose battery terminals or connections. 2. Test the battery for a low charge (see page 22-56). 3. Check for drag in the starter (see page 4-6). 4. Check for excessive drag in the engine.	

Circuit Diagram



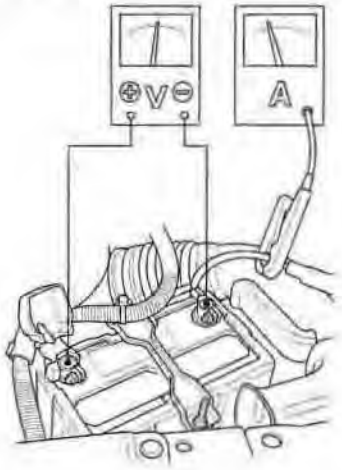
Starter Circuit Troubleshooting

NOTE:
- Air temperature must be between 59 and 100 °F (15 and 38 °C) during this procedure.
- After this inspection, you must reset the engine control module (ECM)/powertrain control module (PCM), using the Honda Diagnostic System (HDS) (see page 11-4), otherwise the ECM/PCM will continue to stop the fuel injectors.
- The battery must be in good condition and fully charged.

Recommended Procedure:
- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.

Alternate Procedure

1. Hook up the following equipment:
   - Ammeter, 0—400 A
   - Voltmeter, 0—20 V (accurate within 0.1 V)



2. Connect the HDS to the data link connector (DLC) (see step 2 on page 11-3).
3. Select PGM-FI, INSPECTION, and then ALL INJECTORS OFF on the HDS.
4. With the shift lever in N or P (A/T) or the clutch pedal pressed (M/T), turn the ignition switch to START (III).

   Did the starter crank the engine normally?

   YES—The starting system is OK. Go to step 11.

   NO—Go to step 5.
5. Check the battery condition. Check electrical connections at the battery, the negative battery cable to body, the engine ground cables, and the starter for looseness and corrosion. Then try cranking the engine again.

   Did the starter crank the engine?

   YES—Repairing the loose connection corrected the problem. The starting system is OK. Go to step 11.

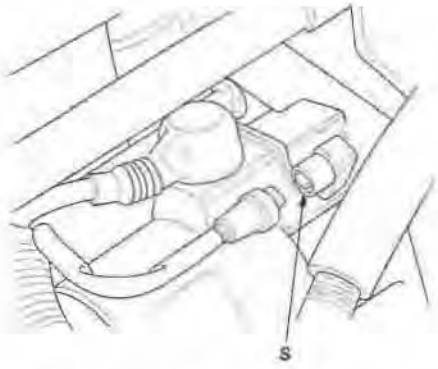
   NO—Check the following:

   - If the starter will not crank the engine at all, go to step 6.
   - If it cranks the engine erratically or too slowly, go to step 8.
   - If it won't disengage from the flywheel or torque converter ring gear when you release the key, check for the following until you find the cause.
     - Solenoid plunger and switch malfunction
     - Dirty drive gear or damaged overrunning clutch

6. Make sure the transmission is in Neutral, then disconnect the BLK/WHT wire from the starter solenoid S terminal. Connect a jumper wire from the battery positive terminal to the solenoid terminal.

M/T:

A/T:



Did the starter crank the engine?

YES—Go to step 7.

NO—Remove the starter, and repair or replace as necessary. ■

7. Check the following items in the order listed until you find the open circuit: ■

- Check the BLK/WHT wire and connectors between the under-dash fuse/relay box and the ignition switch, and between the under-dash fuse/relay box and the starter.
- Check the ignition switch (see page 22-59).
- Check the transmission range switch and connector (A/T) or the clutch interlock switch and connector (M/T).
- Check the starter cut relay (see page 22-57).

8. Check the cranking voltage and current draw.

Is the cranking voltage greater than or equal to 7.7 V (M/T)/8.5 V (A/T) and the current draw less than or equal to 400 A (M/T)/380 A (A/T)?

YES—Go to step 9.

NO—Replace the starter, or remove and disassemble it, and check for the following until you find the cause: ■

- Drag in the starter armature
- Shorted armature winding
- Excessive drag in the engine

9. Check the engine speed while cranking the engine.

Is the engine speed above 100 rpm?

YES—Go to step 10.

NO—Replace the starter, or remove and disassemble it, and check for the following until you find the cause: ■

- Open circuit in starter armature commutator segments
- Excessively worn starter brushes
- Open circuit in commutator brushes
- Dirty or damaged helical splines or drive gear
- Faulty drive gear clutch

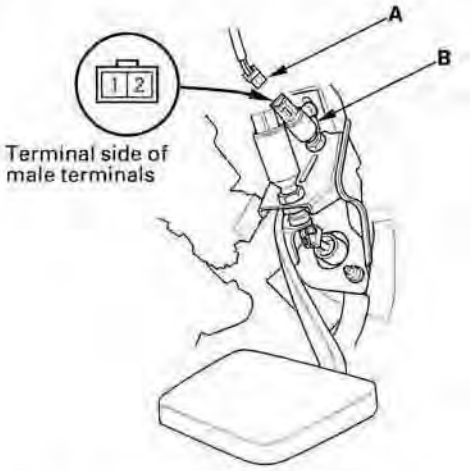
10. Remove the starter, and inspect its drive gear and the flywheel or torque converter ring gear for damage. Replace any damaged parts.

11. Select ECM/PCM reset (see page 11-4) to cancel ALL INJECTORS OFF on the HDS.

12. Do the ECM/PCM idle learn procedure (see page 11-207).

Clutch Interlock Switch Test

1. Disconnect the clutch interlock switch 2P connector (A).



2. Remove the clutch interlock switch (B).
3. Check for continuity between the terminals according to the table.

   - If the continuity is not as specified, replace the clutch interlock switch.
   - If OK, install the clutch interlock switch, and adjust the pedal height (see page 12-4).

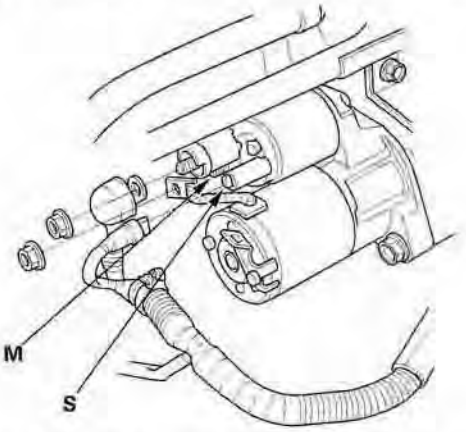
Terminal / Clutch Interlock Switch	1	2
PRESSED	○	○
RELEASED		

Starter Solenoid Test

M/T

1. Check the hold-in coil for continuity between the S terminal and the armature housing (ground). There should be continuity.

   - If there is continuity, go to step 2.
   - If there is no continuity, replace the solenoid.



2. Check the pull-in coil for continuity between the S terminal and M terminal. There should be continuity.

   - If there is continuity, the solenoid is OK.
   - If there is no continuity, replace the solenoid.

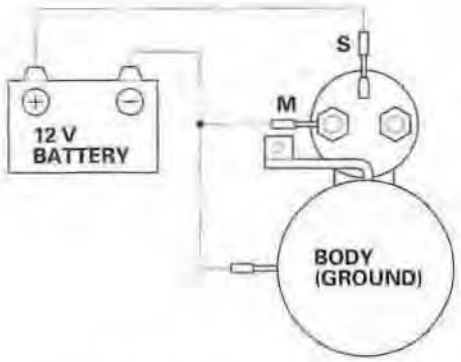
Starter Performance Test

M/T

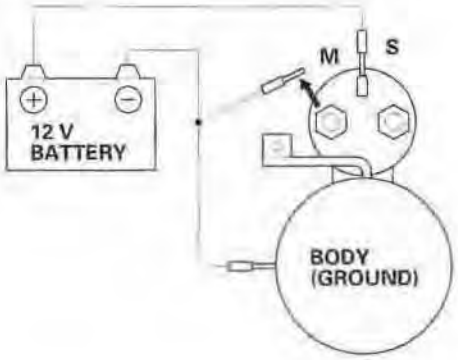
1. Disconnect the wire from the M terminal.

   NOTE: To avoid damaging the starter, do not leave the battery connected for more than 10 seconds.

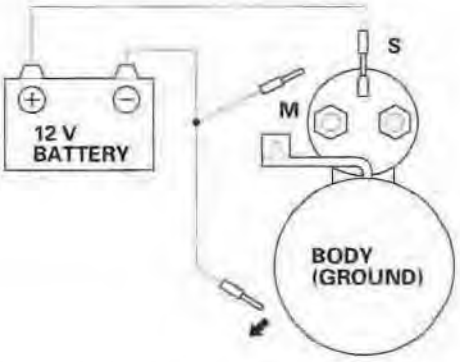
2. Connect the battery to the starter as shown using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). If the starter pinion moves out, it is working properly.



3. Disconnect the negative battery terminal from the M terminal as shown. If the pinion does not retract, the hold-in coil of the solenoid is working properly.



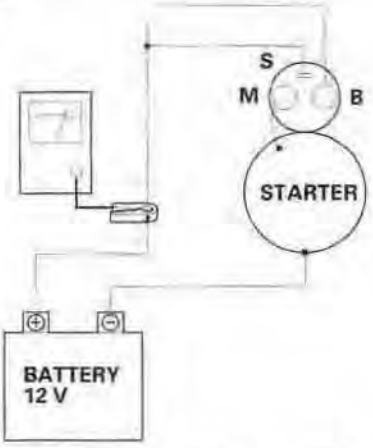
4. Disconnect the negative battery terminal from the starter body as shown. If the pinion retracts immediately, it is working properly.



5. Clamp the starter firmly in a vise.

6. Reconnect the wire to the M terminal.

7. Connect the starter to the battery as shown in the diagram, and check that the motor starts and keeps rotating.



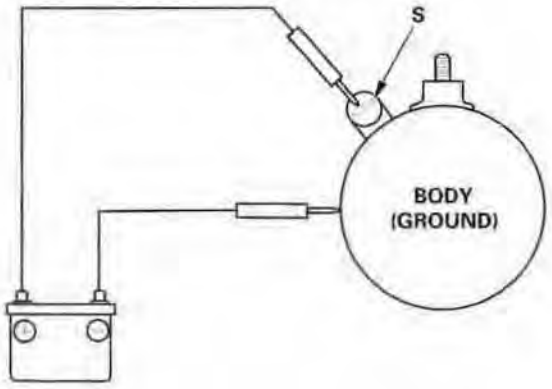
8. If the electric current and motor speed meet the specifications when the battery voltage is at 11 V, the starter is working properly.

Specifications
Electric Current: 90 A or less
Motor Speed: 2,000 rpm or more

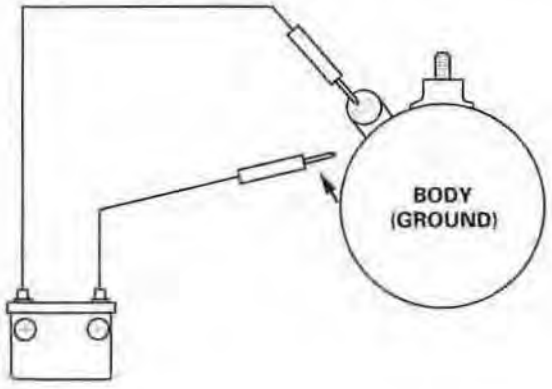
Starter Performance Test (cont'd)

A/T

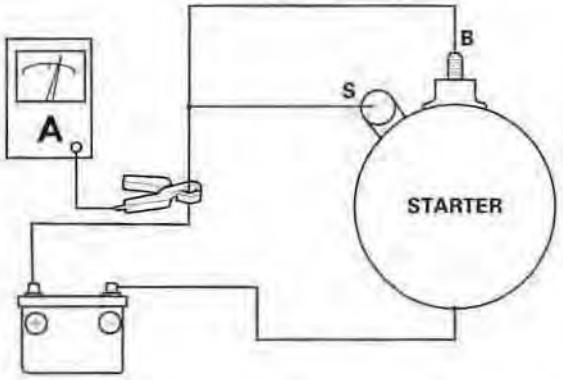
1. Connect the battery to the starter as shown using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle). To avoid damaging the starter, never leave the battery connected for more than 10 seconds.



2. If the starter pinion moves out, it is working properly.
3. Disconnect the negative battery terminal from the starter as shown. If the pinion retracts immediately, it is working properly.



4. Clamp the starter firmly in a vise.
5. Connect the starter to the battery as shown, and check that the motor starts and keeps rotating.



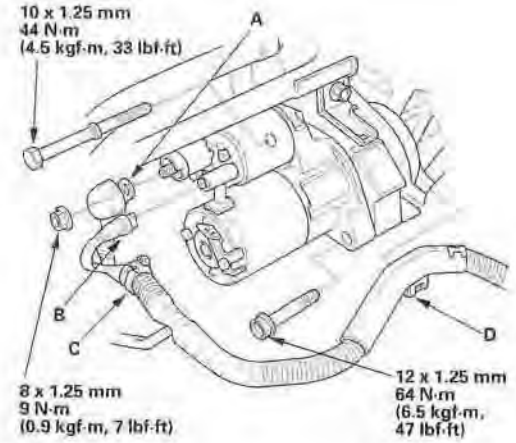
6. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications
Electric Current: 80 A or less
Motor Speed: 2,300 rpm or more

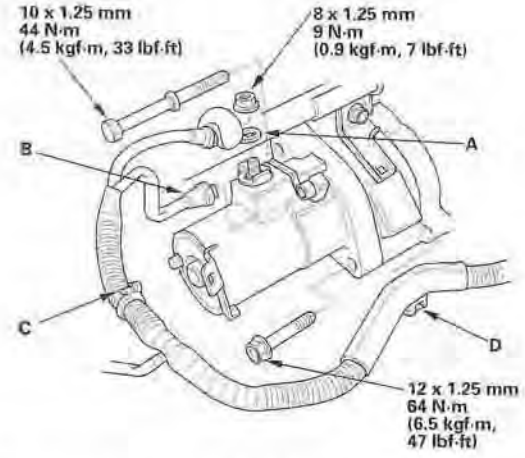
Starter Replacement

1. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets.
2. Disconnect the negative cable from the battery first, then disconnect the positive cable.
3. Remove the intake manifold (see page 9-2).
4. Disconnect the starter cable (A) from the B terminal, then disconnect the BLK/WHT wire (B) from the S terminal.

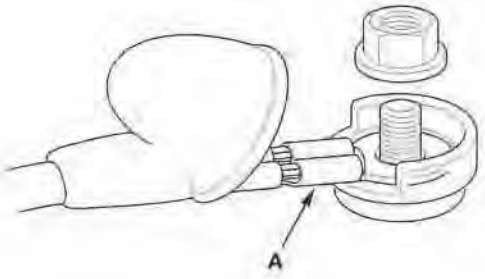
M/T:



A/T:



5. Remove the harness clamp (C).
6. Remove the harness holder (D).
7. Remove the two bolts holding the starter, then remove the starter.
8. Install the starter in the reverse order of removal. Make sure the crimped side of the ring terminal (A) is facing out.

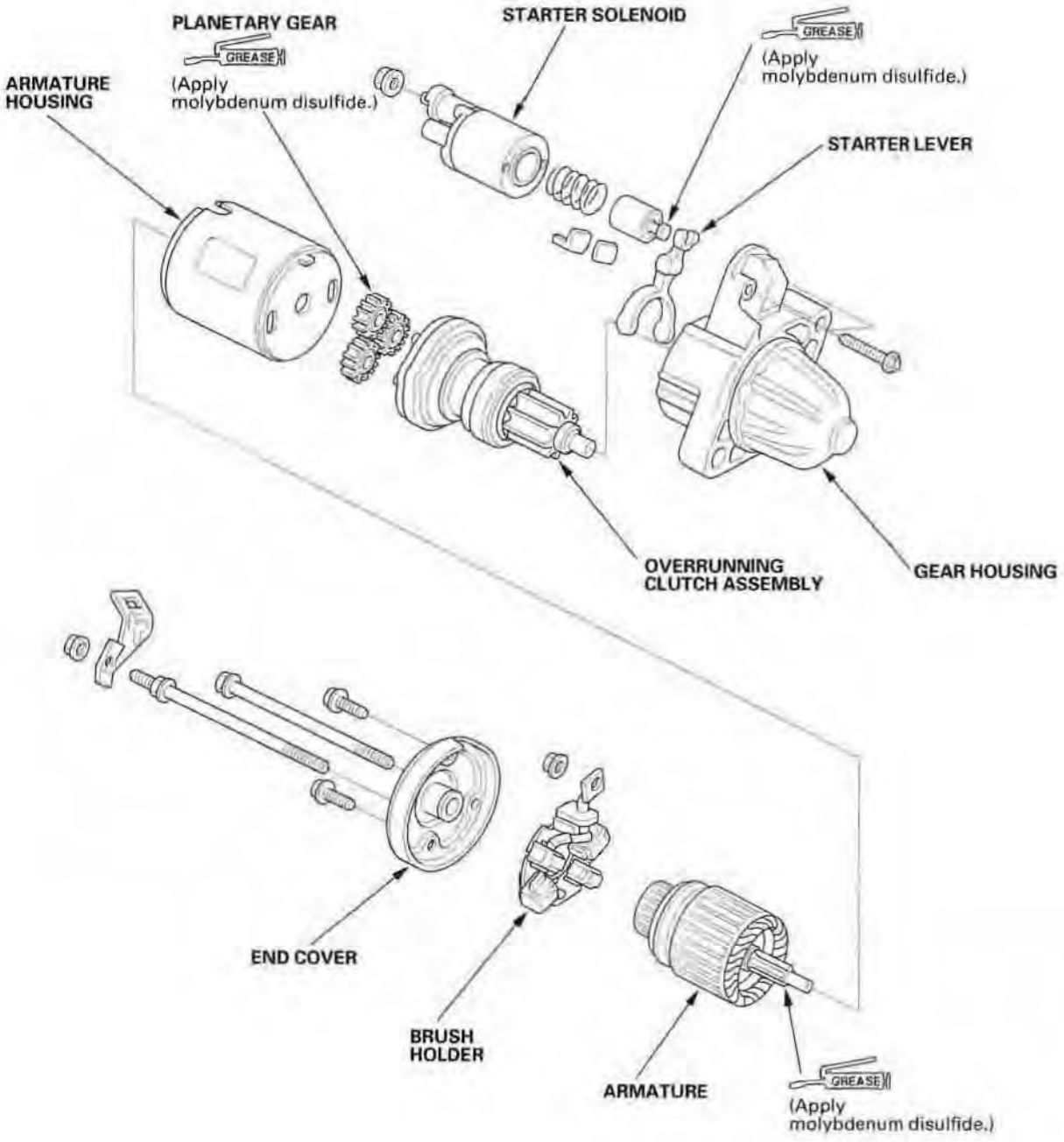


9. Install the intake manifold (see page 9-2).
10. Connect the battery positive cable to the battery first, then connect the negative cable.
11. Start the engine to make sure the starter works properly.
12. Enter the anti-theft code for the radio, then enter the customer's radio station and XM radio channel presets.
13. Set the clock.
14. Do the power window control unit reset procedure (see page 22-115).

Starter Overhaul

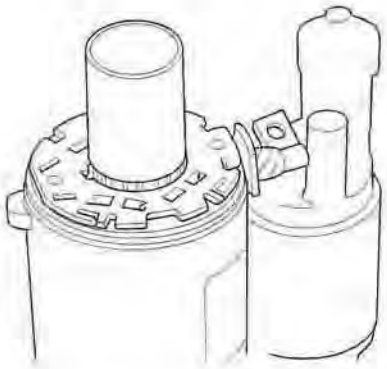
M/T

Disassembly/Reassembly

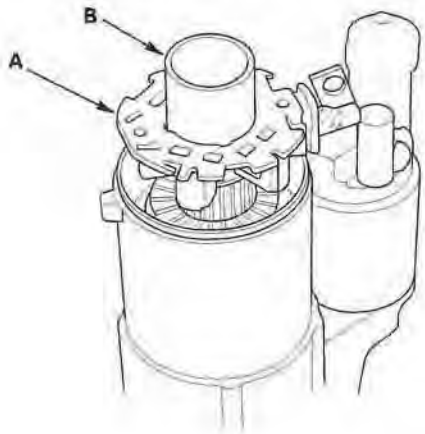


Brush Holder Removal

1. Remove the starter (see page 4-11).
2. Disconnect the wire from the M terminal, and remove the end cover.
3. Place a 29.4 mm (1.16 in.) outside diameter plastic pipe on the armature.

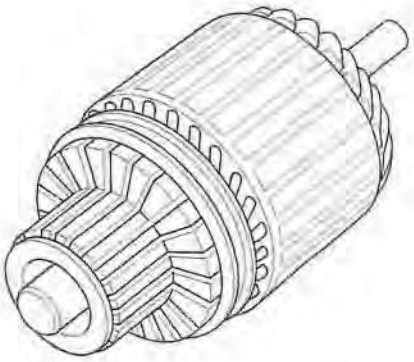


4. Move the brush holder (A) up to the pipe (B) while holding the pipe so the brushes do not pop out from the holder.

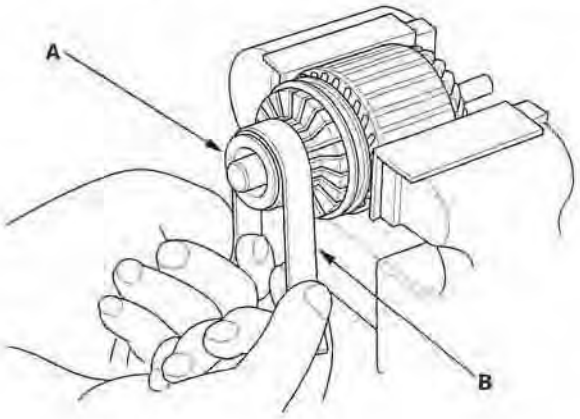


Armature Inspection and Test

5. Disassemble the starter as shown at the beginning of this procedure.
6. Inspect the armature for wear or damage from contact with the permanent magnet. If there is wear or damage, replace the armature.



7. Check the commutator (A) surface. If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications in step 8, or recondition with #500 or #600 sandpaper (B).

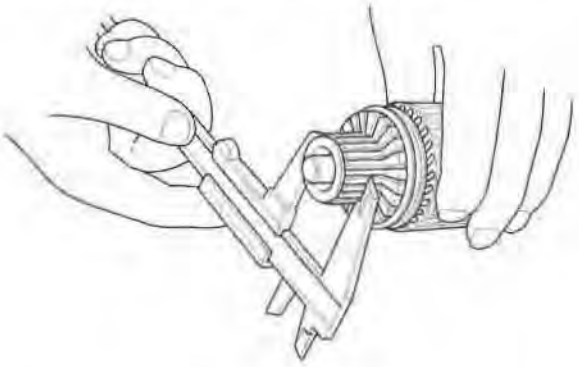


(cont'd)

Starter Overhaul (cont'd)

8. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

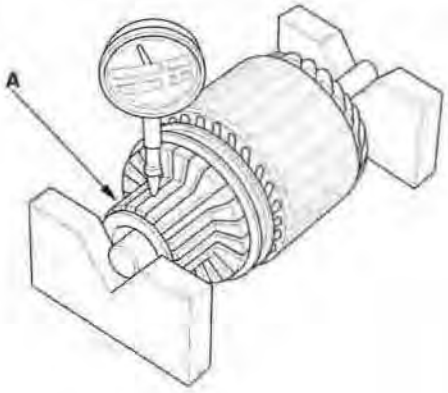
Commutator Diameter
Standard (New): 29.3—29.5 mm (1.154—1.161 in.)
Service Limit: 28.8 mm (1.134 in.)



9. Measure the commutator (A) runout.

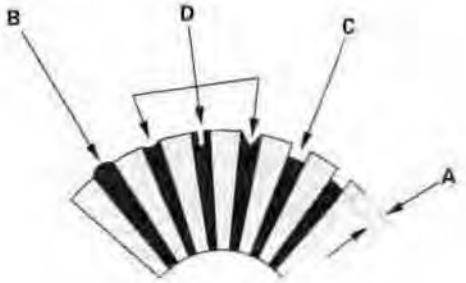
- If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
- If the commutator runout is not within the service limit, replace the armature.

Commutator Runout
Standard (New): 0.05 mm (0.002 in.) max.
Service Limit: 0.1 mm (0.004 in.)

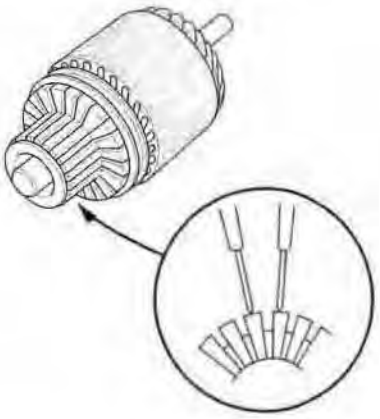


10. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

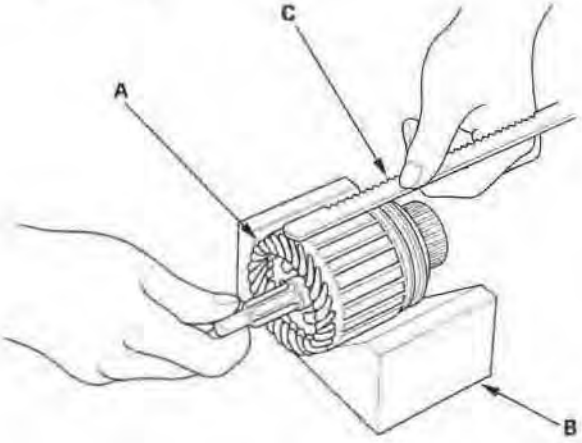
Commutator Mica Depth
Standard (New): 0.40—0.60 mm (0.016—0.024 in.)
Service Limit: 0.20 mm (0.008 in.)



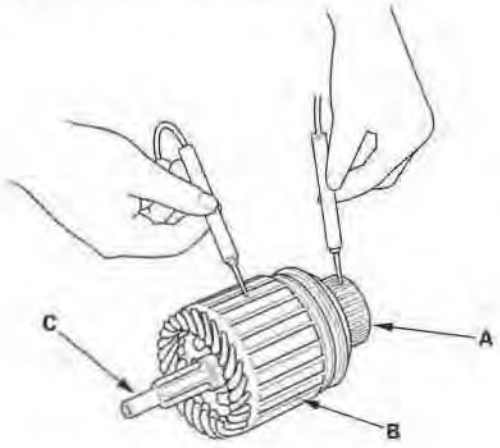
11. Check for continuity between the segments of the commutator. If there is an open circuit between any segments, replace the armature.



12. Place the armature (A) on an armature tester (B). Hold a hacksaw blade (C) on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



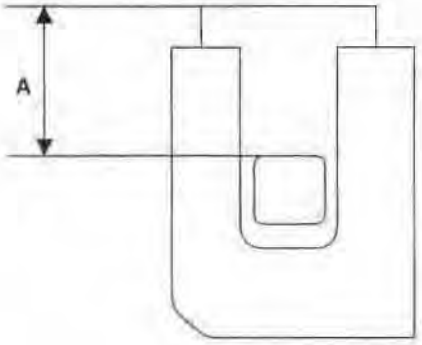
13. Check with an ohmmeter for continuity between the commutator (A) and armature coil core (B), and between the commutator and armature shaft (C). If there is continuity, replace the armature.



Starter Brush Inspection

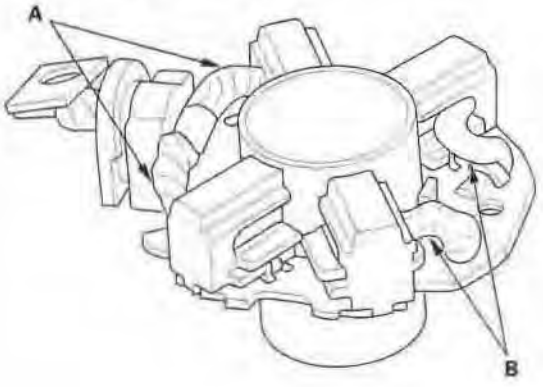
14. Measure the brush length (A). If it is shorter than the service limit, replace the brush holder assembly.

Brush Length
Standard (New): 7.7—8.0 mm (0.30—0.31 in.)
Service Limit: 0.9 mm (0.04 in.)



Starter Brush Holder Test

15. Check for continuity between the (+) brush (A) and (—) brush (B). If there is continuity, replace the brush holder assembly.

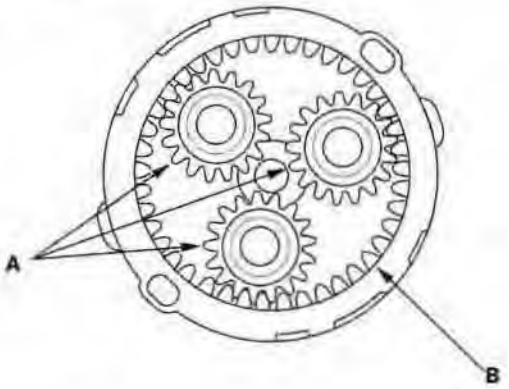


(cont'd)

Starter Overhaul (cont'd)

Planetary Gear Inspection

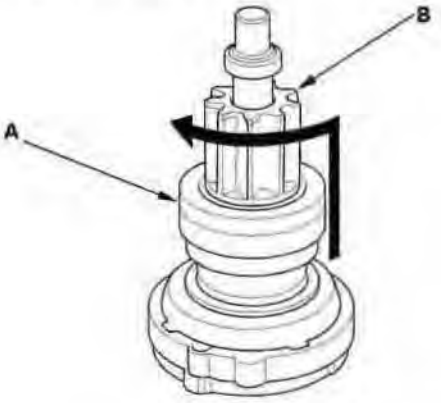
16. Check the planetary gears (A) and ring gear (B) for wear or damage. Replace them if they are worn or damaged.



Overrunning Clutch Inspection

17. Slide the overrunning clutch along the shaft. Replace it if it does not slide smoothly.

18. Rotate the overrunning clutch (A) both ways. If it does not lock in either direction or it locks in both directions, replace it.

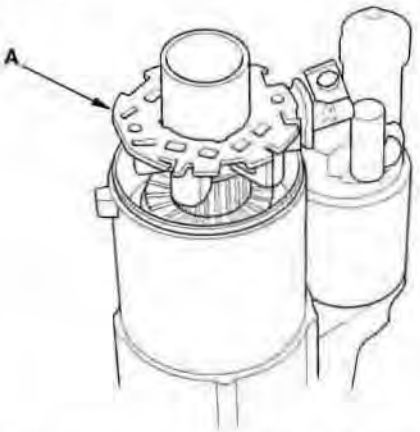


19. If the starter drive gear (B) is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately. Check the condition of the flywheel ring gear to see if the starter drive gear teeth are damaged.

Starter Reassembly

20. Install the armature into the housing.

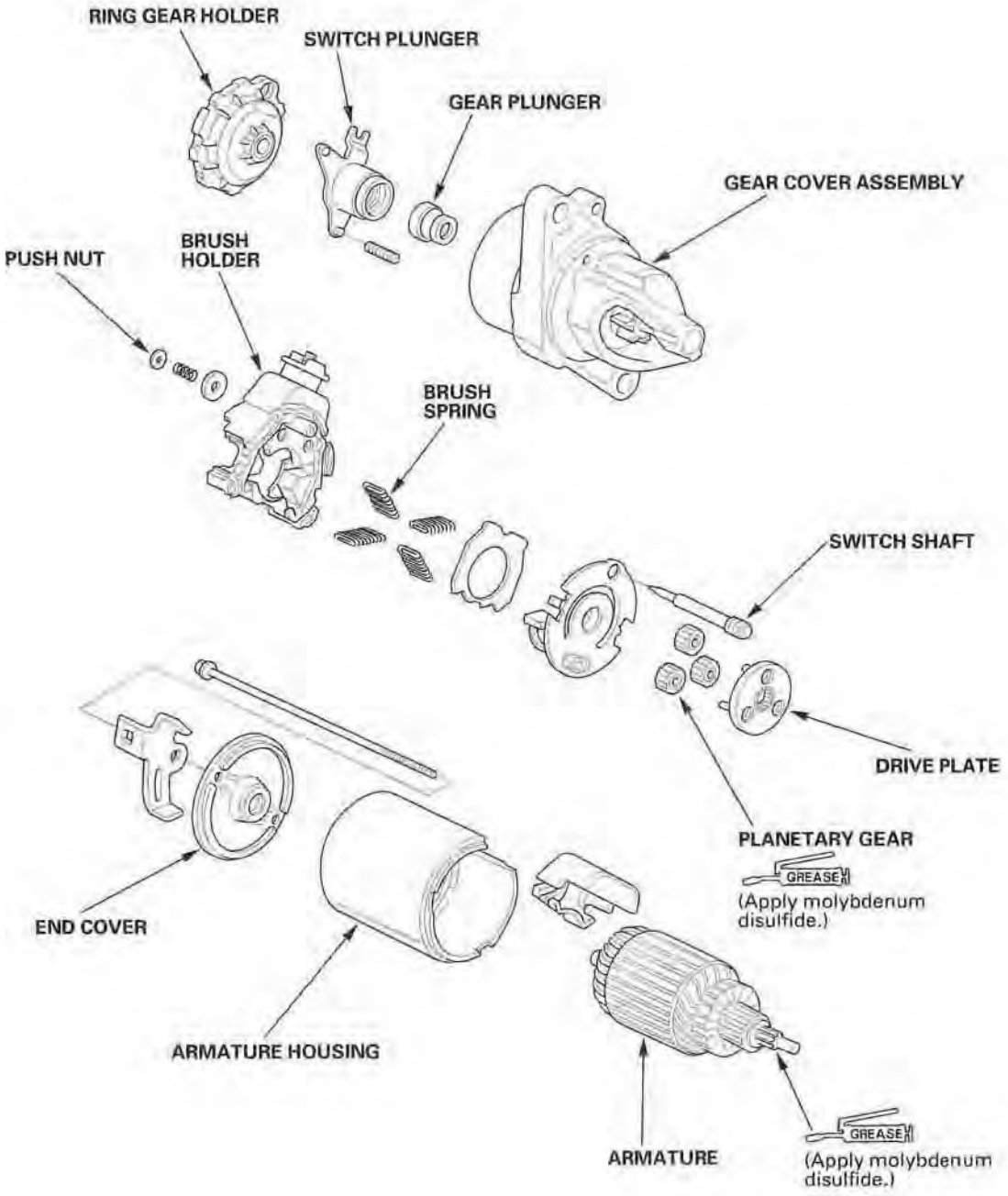
21. Place the brush holder assembly on the armature, then move the brush holder (A) down to the armature.



22. Install the end cover to retain the brush holder.

A/T

Disassembly/Reassembly

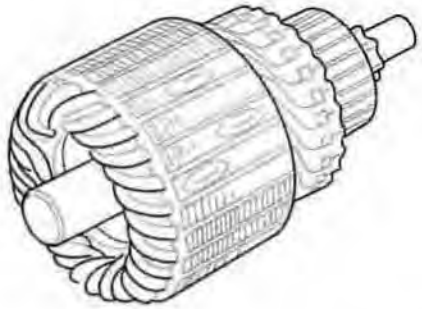


(cont'd)

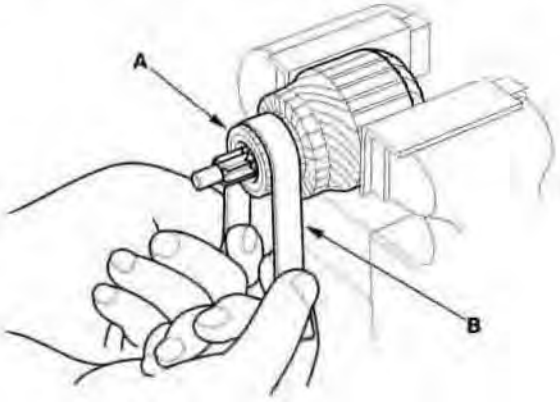
Starter Overhaul (cont'd)

Armature Inspection and Test

1. Remove the starter (see page 4-11).
2. Disassemble the starter as shown at the beginning of this procedure.
3. Inspect the armature for wear or damage from contact with the permanent magnet. If there is wear or damage, replace the armature.

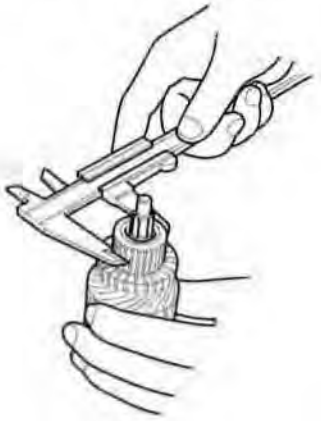


4. Check the commutator (A) surface. If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications in step 5, or recondition with #500 or #600 sandpaper (B).



5. Check the commutator diameter. If the diameter is below the service limit, replace the armature.

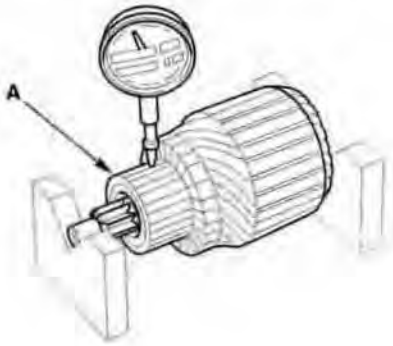
Commutator Diameter
Standard (New): 28.0—28.1 mm (1.102—1.106 in.)
Service Limit: 27.5 mm (1.083 in.)



6. Measure the commutator (A) runout.

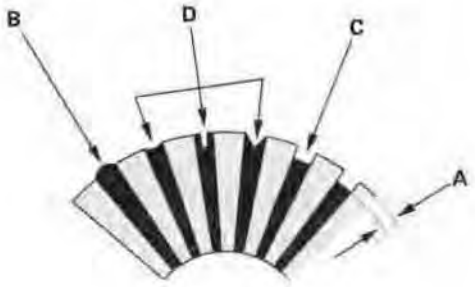
- If the commutator runout is within the service limit, check the commutator for carbon dust or brass chips between the segments.
- If the commutator runout is not within the service limit, replace the armature.

Commutator Runout
Standard (New): 0.02 mm (0.001 in.) max.
Service Limit: 0.05 mm (0.002 in.)

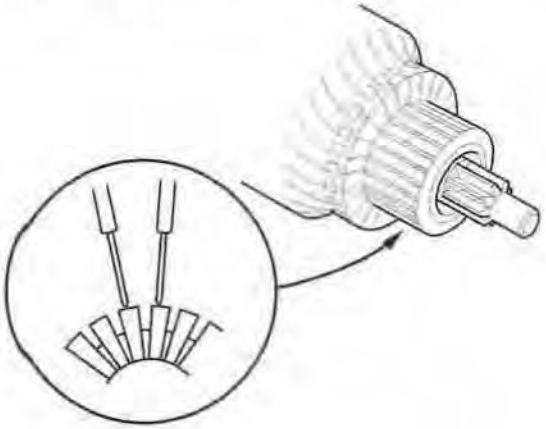


7. Check the mica depth (A). If the mica is too high (B), undercut the mica with a hacksaw blade to the proper depth. Cut away all the mica (C) between the commutator segments. The undercut should not be too shallow, too narrow, or V-shaped (D).

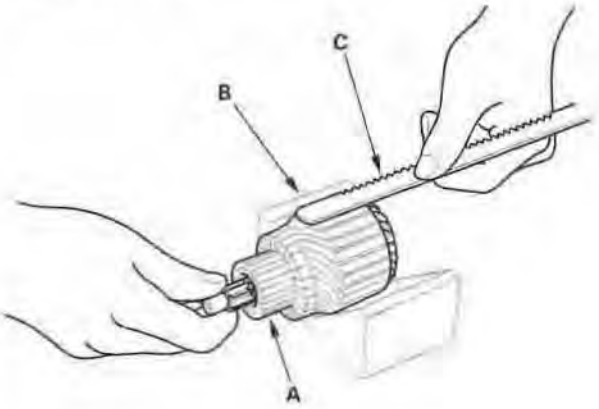
Commutator Mica Depth
Standard (New): 0.40—0.50 mm (0.016—0.020 in.)
Service Limit: 0.15 mm (0.006 in.)



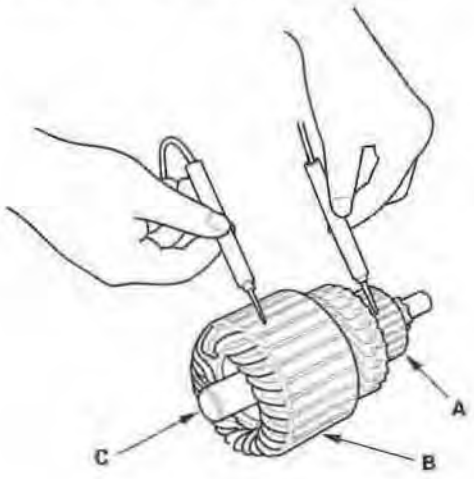
8. Check for continuity between the segments of the commutator. If there is an open circuit between any segments, replace the armature.



9. Place the armature (A) on an armature tester (B). Hold a hacksaw blade (C) on the armature core. If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.



10. Check with an ohmmeter for continuity between the commutator (A) and armature coil core (B), and between the commutator and armature shaft (C). If there is continuity, replace the armature.



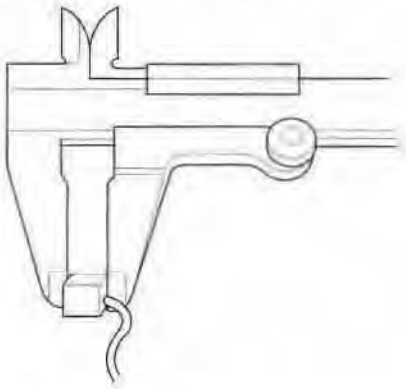
(cont'd)

Starter Overhaul (cont'd)

Starter Brush Inspection

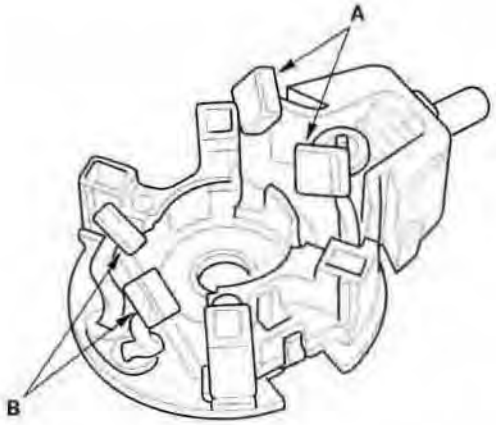
11. Measure the brush length. If it is shorter than the service limit, replace the brush holder assembly.

Brush Length
Standard (New): 11.1—11.5 mm (0.44—0.45 in.)
Service Limit: 4.3 mm (0.17 in.)



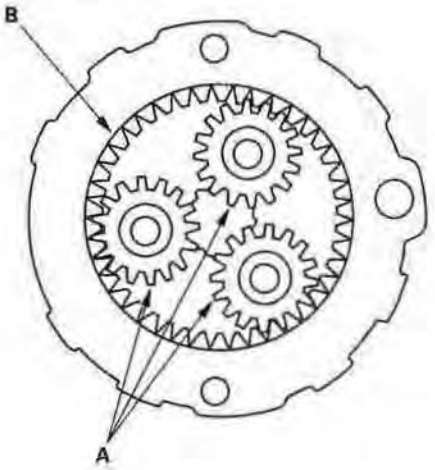
Starter Brush Holder Test

12. Check for continuity between the (+) brush (A) and (—) brush (B). If there is continuity, replace the brush holder assembly.



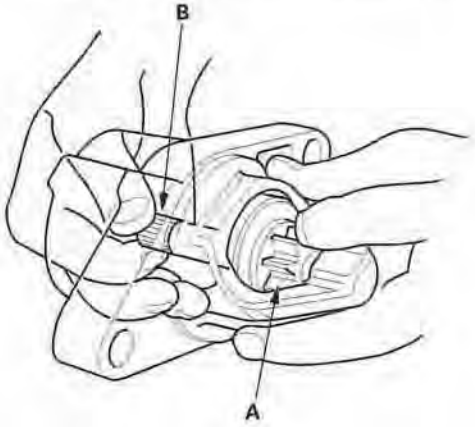
Planetary Gear Inspection

13. Check the planetary gears (A) and ring gear (B) for wear or damage. Replace them if they are worn or damaged.



Overrunning Clutch Inspection

14. While holding the drive gear (A), turn the gear shaft (B) clockwise. Check that the drive gear comes out to the other end. If the drive gear does not move smoothly, replace the gear cover assembly.



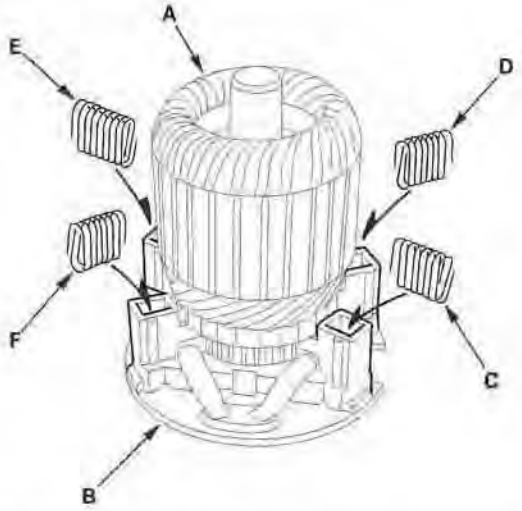
15. While holding the drive gear, turn the gear shaft counterclockwise. The gear shaft should rotate freely. If the gear shaft does not rotate smoothly, replace the gear cover assembly.

16. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
Check the condition of the torque converter ring gear to see if the gear teeth are damaged.

Starter Reassembly

17. Install the brush into the brush holder, and set the armature (A) in the brush holder (B).

NOTE: To seat the new brushes, slip a strip of #500 or #600 sandpaper, with the grit side up, between the commutator and each brush, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.

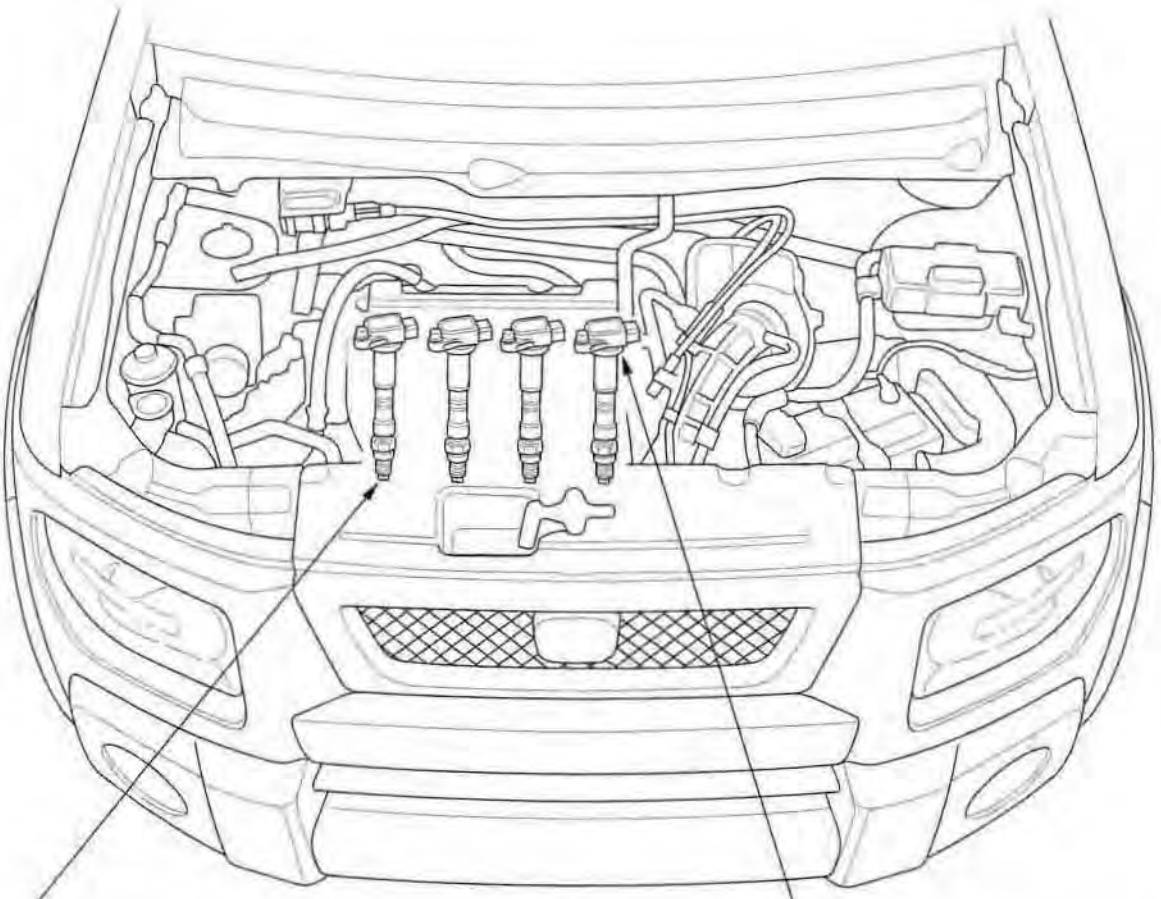


18. While squeezing a spring (C), insert it in the hole on the brush holder, and push it until it bottoms. Repeat this for the other three springs (D, E, and F).

19. Install the armature and brush holder assembly into the housing.

NOTE: Make sure the armature stays in the holder.

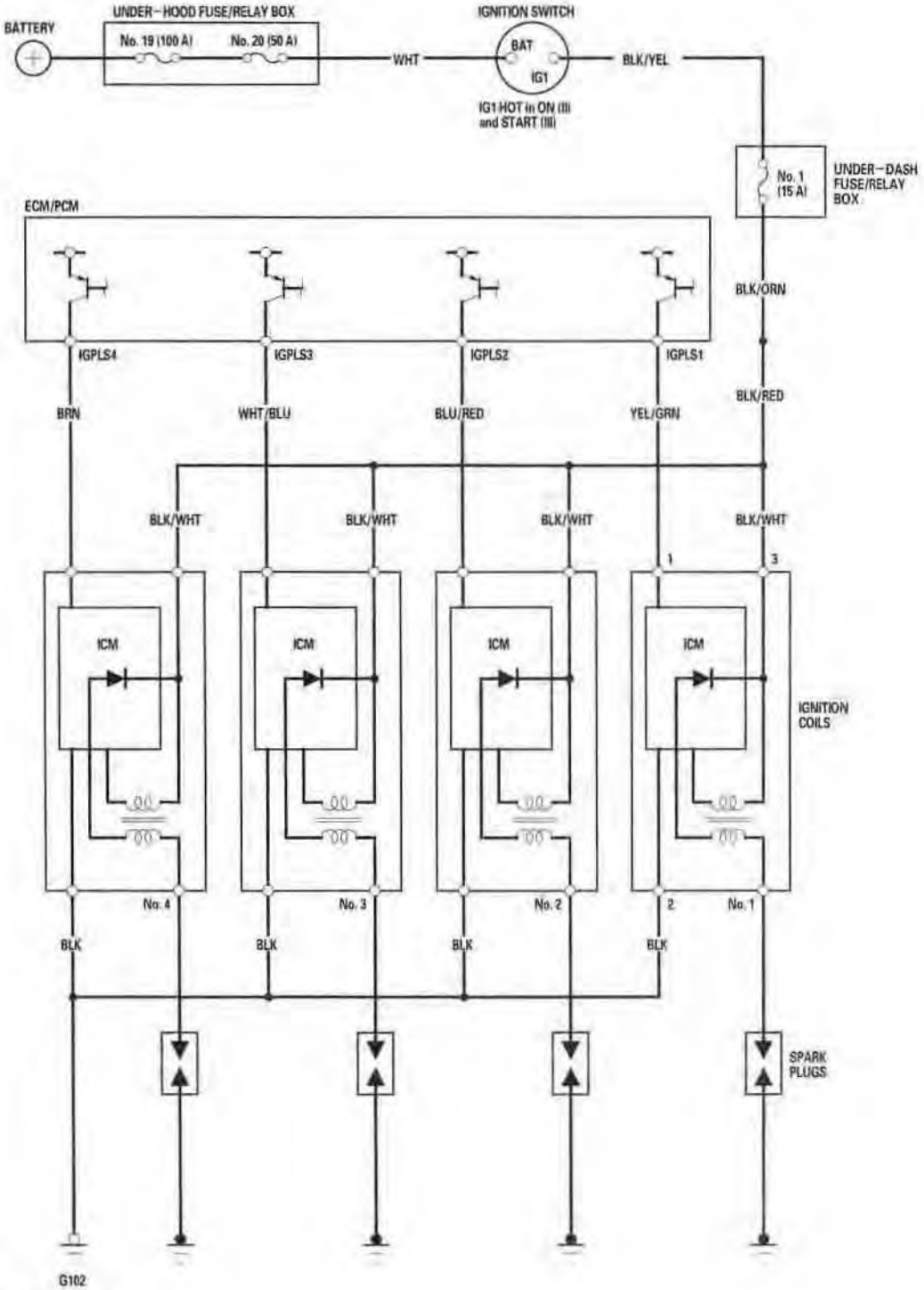
Component Location Index



SPARK PLUG
Inspection, page 4-26

IGNITION COIL
Ignition Timing Inspection, page 4-24
Removal/Installation, page 4-25

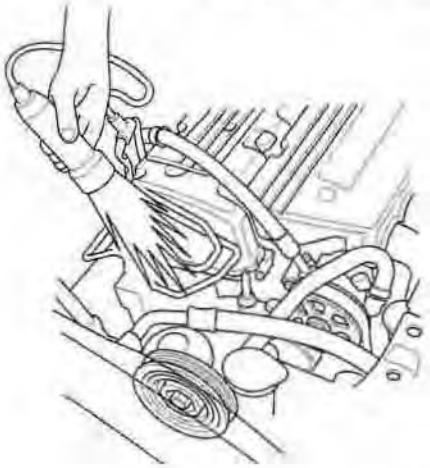
Circuit Diagram



ICM : Ignition Control Module

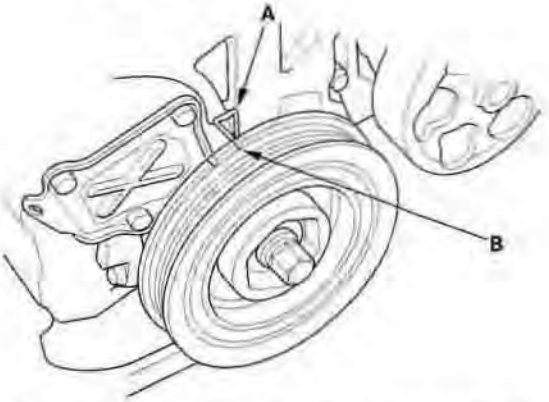
Ignition Timing Inspection

1. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3), and check for DTCs. If a DTC is present, diagnose and repair the cause before inspecting the ignition timing.
2. Start the engine. Hold the engine at 3,000 rpm with no load (in Neutral) until the radiator fan comes on, then let it idle.
3. Check the idle speed (see page 11-206).
4. Select "SCS" mode using the HDS.
5. Free the service loop from the wire harness, then connect the timing light to the service loop.



6. Aim the light toward the pointer (A) on the cam chain case. Check the ignition timing under a no load condition. Headlights, blower fan, rear window defogger, and air conditioner are turned off.

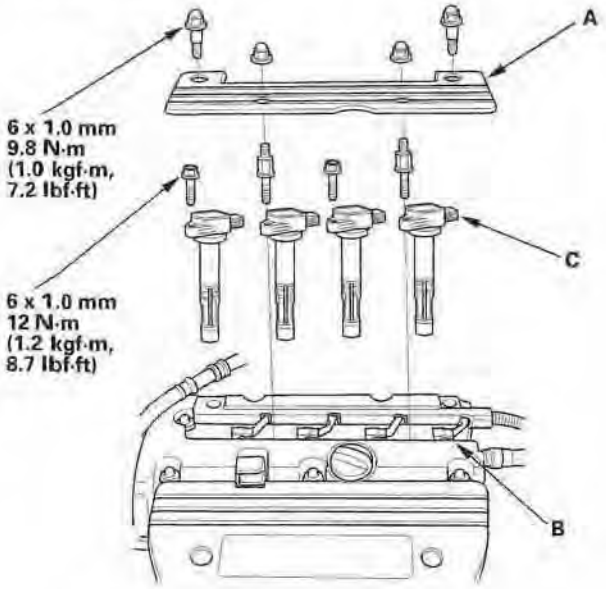
Ignition Timing
M/T: 8 °±2 ° BTDC (RED mark (B)) at idle in Neutral
A/T: 8 °±2 ° BTDC (RED mark (B)) at idle in Park or Neutral



7. If the ignition timing differs from the specification, update the engine control module (ECM)/ powertrain control module (PCM) if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the system works properly, and the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).
8. Disconnect the HDS and the timing light.
9. Secure the service loop to the wire harness with wire ties.

Ignition Coil Removal/Installation

1. Remove the ignition coil cover (A), disconnect the ignition coil connectors (B), then remove the ignition coils (C).



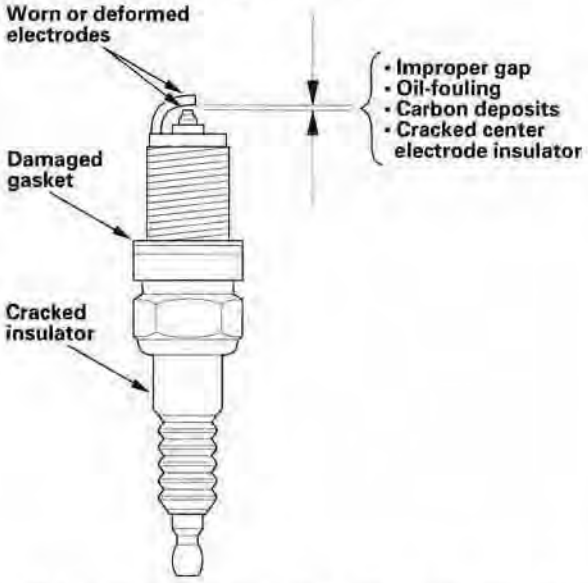
2. Install the ignition coils in the reverse order of removal.

Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator.

   - Burned or worn electrodes may be caused by:
     - Advanced ignition timing
     - Loose spark plug
     - Plug heat range too hot
     - Insufficient cooling

   - Fouled plug may be caused by:
     - Retarded ignition timing
     - Oil in combustion chamber
     - Incorrect spark plug gap
     - Plug heat range too cold
     - Excessive idling/low speed running
     - Clogged air cleaner element
     - Deteriorated ignition coils

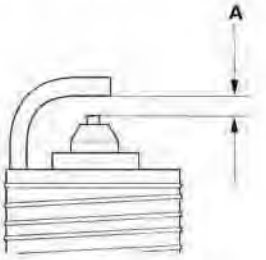


2. If the spark plug electrode is dirty or contaminated, clean the electrode with a plug cleaner.

   NOTE:
   - Do not use a wire brush or scrape the iridium electrode since this will damage the electrode.
   - Use a chemical cleaner such as Carb Spray to clean contamination on the electrode.
   - When using a sand blaster spark plug cleaner, do not clean for more than 20 seconds to avoid damaging the electrode.

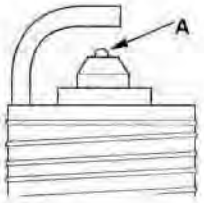
3. Do not adjust the gap (A) of iridium tip plugs; replace the spark plug if the gap is out of specification.

   Electrode Gap
   Standard (New): 1.0—1.1 mm (0.039—0.043 in.)



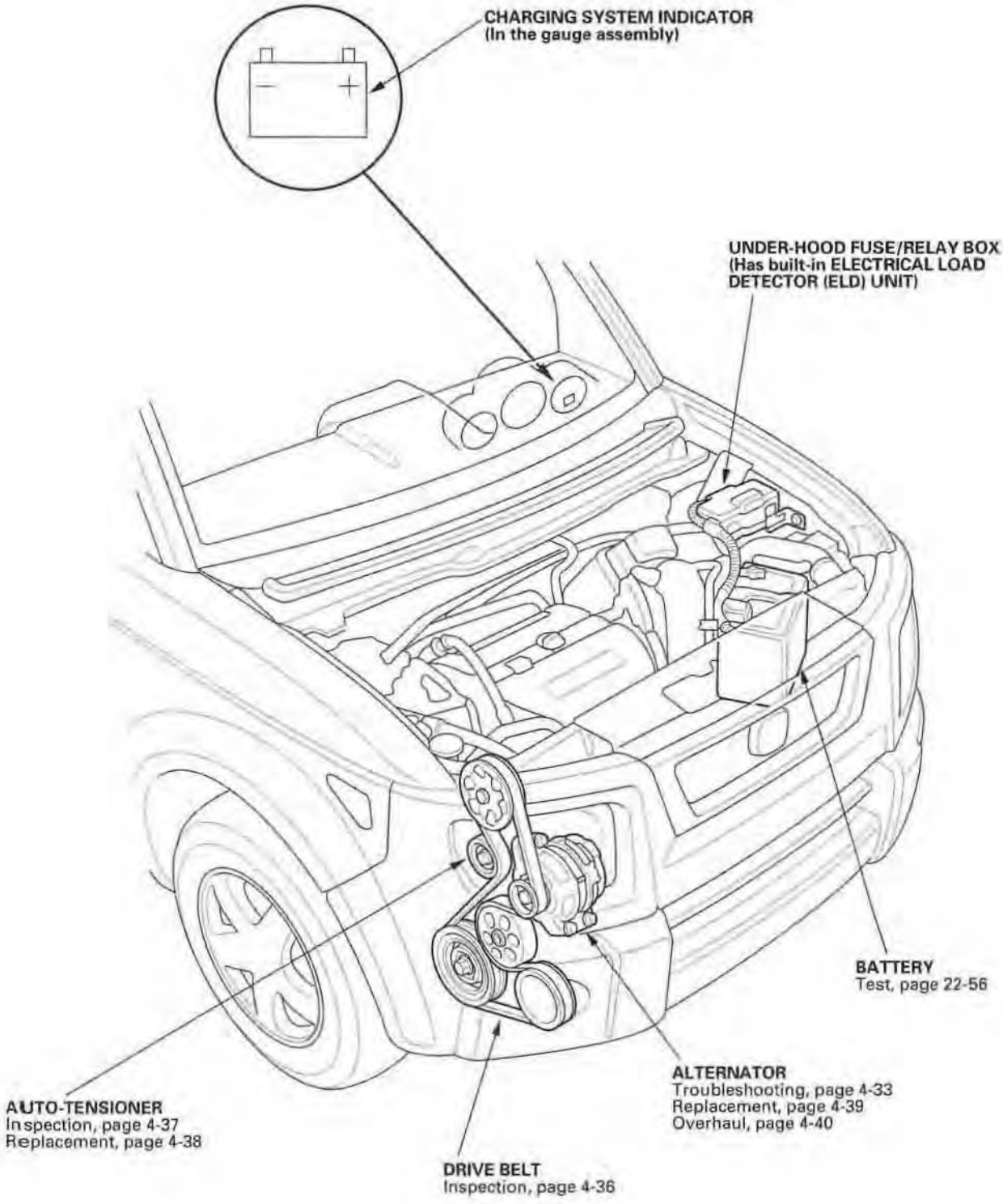
4. Replace the plug at the specified interval or if the center electrode is rounded (A). Use only the spark plugs as listed.

   Spark Plugs
   IZFR6K11 (NGK)
   SKJ20DR-M11 (DENSO)



5. Apply a small amount of anti-seize compound to the plug threads, and screw the plugs into the cylinder head, finger-tight. Then torque them to 18 N·m (1.8 kgf·m, 13 lbf·ft).

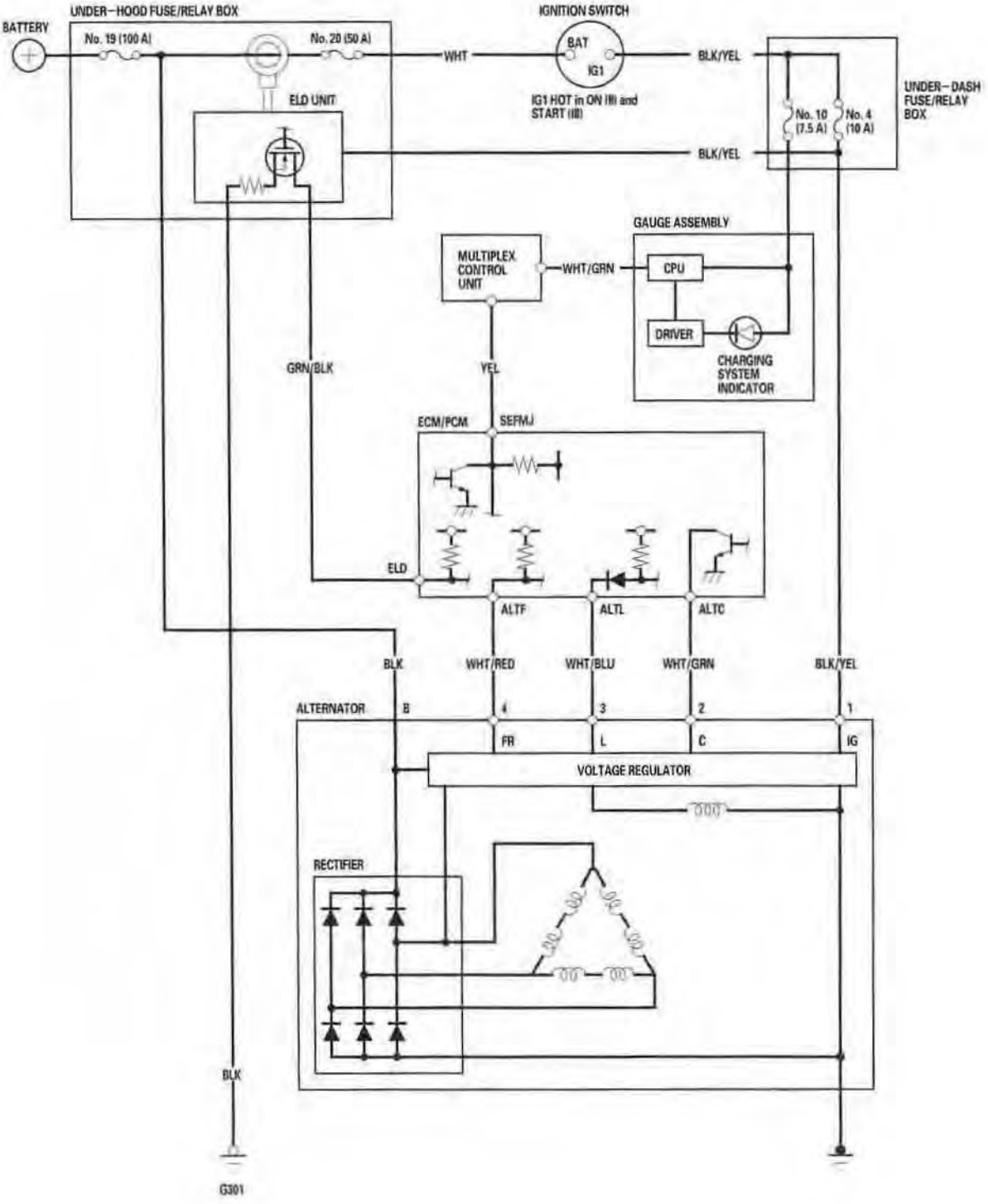
Component Location Index



Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Charging system indicator does not come on with the ignition switch ON (II)	Troubleshoot the charging system indicator circuit (see page 4-30).	
Charging system indicator stays on	1. Troubleshoot the charging system indicator circuit (see page 4-30). 2. Check for a broken drive belt (see page 4-36). 3. Check the drive belt auto-tensioner (see page 4-37).	
Battery discharged	1. Check for a poor connection and for open or shorted wire(s) in charging system. 2. Check for parasitic electrical current draw. 3. Check for a broken drive belt (see page 4-36). 4. Check the drive belt auto-tensioner (see page 4-37). 5. Troubleshoot the alternator and regulator circuit (see page 4-33). 6. Check for a poor connection at the battery terminal. 7. Test the battery (see page 22-56).	
Battery overcharged	1. Troubleshoot the alternator and regulator circuit (see page 4-33). 2. Test the battery (see page 22-56).	

Circuit Diagram



Charging System Indicator Circuit Troubleshooting

2003-2004 Models

1. Turn the ignition switch ON (II).

   Does the charging system indicator come on?

   YES—Go to step 2.

   NO—Go to step 3.

2. Start the engine.

   Does the charging system indicator go off?

   YES—Charging system indicator circuit is OK. Go to the Alternator and Regulator Circuit Troubleshooting (see page 4-33).■

   NO—Go to step 3.

3. Troubleshoot the multiplex control system (see page 22-149).

   Is the multiplex control system OK?

   YES—Go to step 4.

   NO—Check the multiplex control system as indicated by the DTC (see page 22-149).■

4. Do the gauge assembly self-diagnostic function procedure (see page 22-62).

   Does the charging system indicator flash?

   YES—Go to step 5.

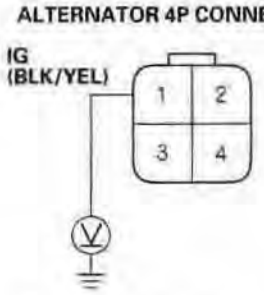
   NO—Replace the gauge assembly (see page 22-69). ■

5. Turn the ignition switch OFF.

6. Disconnect the alternator 4P connector.

7. Turn the ignition switch ON (II).

8. Measure the voltage between alternator 4P connector terminal No. 1 and body ground.



Wire side of female terminals

   Is there battery voltage?

   YES—Go to step 9.

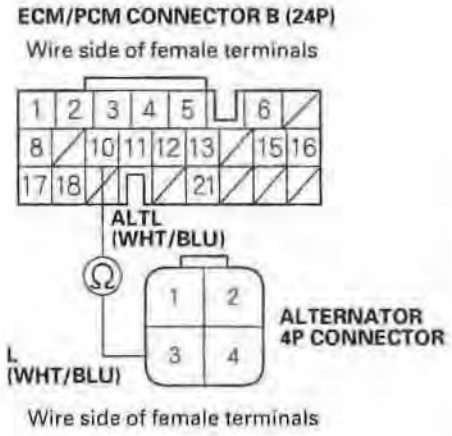
   NO—Check for a blown No. 4 (10 A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the alternator and under-dash fuse/relay box.■

9. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

   NOTE: This must be done to protect the engine control module (ECM)/powertrain control module (PCM) from damage.

10. Disconnect ECM/PCM connector B (24P).

11. Check for continuity between ECM/PCM connector terminal B10 and alternator 4P connector terminal No. 3.

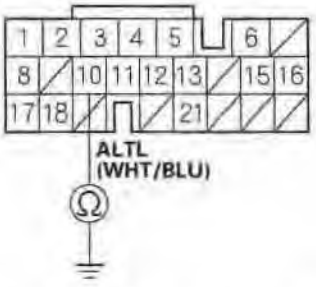


Is there continuity?

YES—Go to step 12.

NO—Repair an open in the wire between the alternator and the ECM/PCM. ■

12. Check for continuity between ECM/PCM connector terminal B10 and body ground.



Is there continuity?

YES—Repair a short in the wire between the alternator and the ECM/PCM. ■

NO—Go to the Alternator and Regulator Circuit Troubleshooting (see page 4-33). ■

2005 Model

1. Turn the ignition switch ON (II).

   Does the charging system indicator come on?

   YES—Go to step 2.

   NO—Go to step 12.

2. Shift to Park or Neutral, and start the engine. Hold the engine speed at 2,000 rpm for 1 minute.

   Does the charging system indicator go off?

   YES—Charging system indicator circuit is OK. Go to the Alternator and Regulator Circuit Troubleshooting (see page 4-33). ■

   NO—Go to step 3.

3. Troubleshoot the multiplex control system (see page 22-149).

   Is the multiplex control system OK?

   YES—Go to step 4.

   NO—Check the multiplex control system as indicated by the DTC (see page 22-149). ■

4. Do the gauge assembly self-diagnostic function procedure (see page 22-62).

   Does the charging system indicator flash?

   YES—Go to step 5.

   NO—Replace the gauge assembly (see page 22-69). ■

5. Turn the ignition switch OFF.

6. Disconnect the alternator 4P connector.

7. Turn the ignition switch ON (II).

   Does the charging system indicator go off?

   YES—Repair the alternator (see page 4-40) or replace the alternator (see page 4-39). ■

   NO—Go to step 8.

(cont'd)

Charging System Indicator Circuit Troubleshooting (cont'd)

8. Turn the ignition switch OFF.

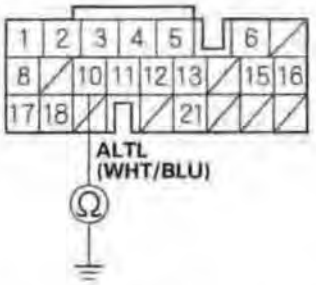
9. Connect the Honda Diagnostic System (HDS) to the data link connecter (DLC) (see step 2 on page 11-3). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

   NOTE: This must be done to protect the engine control module (ECM)/powertrain control module (PCM) from damage.

10. Disconnect ECM/PCM connector B (24P).

11. Check for continuity between ECM/PCM connector terminal B10 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Repair a short in the wire between the alternator and the ECM/PCM. ■

NO—Update the ECM/PCM if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

12. Troubleshoot the multiplex control system (see page 22-149).

    Is the multiplex control system OK?

    YES—Go to step 13.

    NO—Check the multiplex control system as indicated by the DTC (see page 22-149). ■

13. Do the gauge assembly self-diagnostic function procedure (see page 22-62).

    Does the charging system indicator flash?

    YES—Go to step 14.

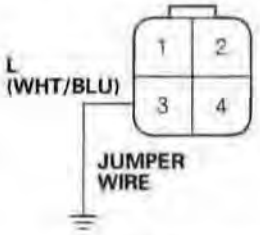
    NO—Replace the gauge assembly (see page 22-69). ■

14. Turn the ignition switch OFF.

15. Disconnect the alternator 4P connector.

16. Connect alternator 4P connector terminal No. 3 and body ground with a jumper wire.

ALTERNATOR 4P CONNECTOR



Wire side of female terminals

17. Turn the ignition switch ON (II).

    Does the charging system indicator come on?

    YES—Repair the alternator (see page 4-40) or replace the alternator (see page 4-39). ■

    NO—Go to step 18.

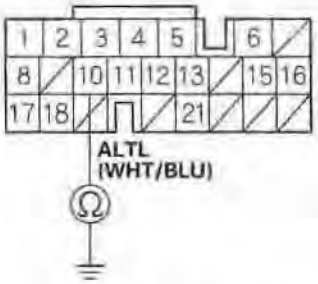
18. Connect the HDS to the DLC (see step 2 on page 11-3). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

    NOTE: This must be done to protect the ECM/PCM from damage.

19. Disconnect ECM/PCM connector B (24P).

20. Check for continuity between ECM/PCM connector terminal B10 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

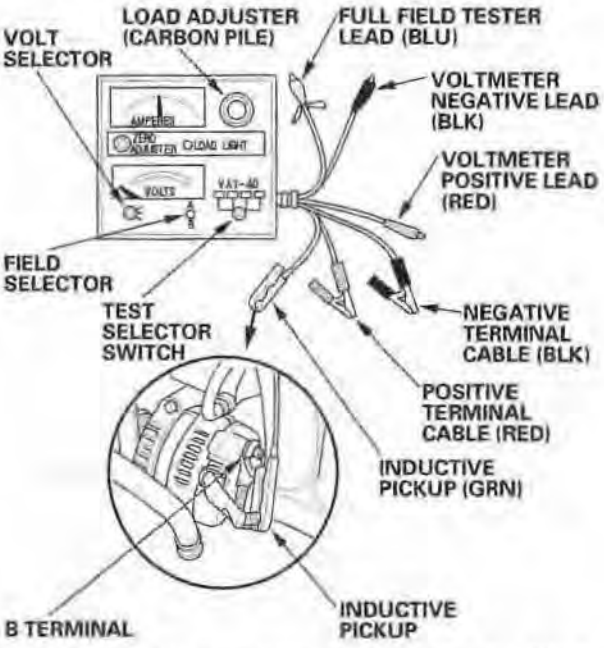
YES—Update the ECM/PCM if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

NO—Repair an open in the wire between the alternator and the ECM/PCM.■

Alternator and Regulator Circuit Troubleshooting

1. Make sure the battery connections are good, and the battery is sufficiently charged (see page 22-56).

2. Connect a VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).



3. Shift to Park or Neutral, and start the engine. Hold the engine at 3,000 rpm, with no load until the radiator fan comes on, then let it idle.

4. Raise the engine speed to 2,000 rpm, and hold it there.

   Is the voltage over 15.1 V?

   YES—Replace the alternator (see page 4-39) or the rear housing assembly.■

   NO—Go to step 5.

(cont'd)

Alternator and Regulator Circuit Troubleshooting (cont'd)

5. Release the accelerator pedal, and let the engine idle.
6. Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).
7. Remove the inductive pickup, and zero the ammeter.
8. Place the inductive pickup over the B terminal wire of the alternator so the arrow points away from the alternator.
9. Raise the engine speed to 2,000 rpm, and hold it there.

   Is the voltage less than 13.5 V?

   YES—Go to Alternator Control Circuit Troubleshooting (see page 4-34). ■

   NO—Go to step 10.
10. Apply a load with the VAT-40 until the battery voltage drops to between 12—13.5 V.

    Is the amperage 60 A or more?

    YES—The charging system is OK. ■

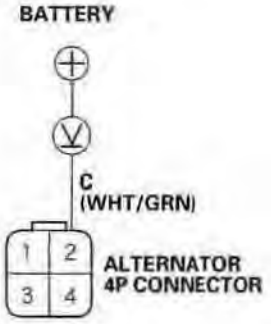
    NOTE: If the charging system indicator is still on, replace the alternator (see page 4-39) or the rear housing assembly.

    NO—Replace the alternator (see page 4-39) or repair the alternator (see page 4-40). ■

Alternator Control Circuit Troubleshooting

1. Check for proper operation of the electrical load detector (ELD) by checking for a DTC. If a DTC is present, diagnose and repair the cause before continuing with this test.

   NOTE: The ELD DTC does not turn on the MIL.
2. Disconnect the alternator 4P connector from the alternator.
3. Start the engine, and turn on the headlights to high beam.
4. Measure the voltage between alternator 4P connector terminal No. 2 and the positive terminal of the battery.



Wire side of female terminals

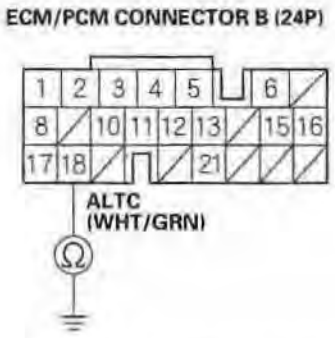
   Is there 1 V or less?

   YES—Go to step 5.

   NO—Go to step 9.
5. Turn off the headlights.
6. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

   NOTE: This step must be done to protect the engine control module (ECM)/powertrain control module (PCM) from damage.
7. Disconnect ECM/PCM connector B (24P).

8. Check for continuity between ECM/PCM connector terminal B18 and body ground.



Is there continuity?

YES—Repair a short in the wire between the alternator and the ECM/PCM. ■

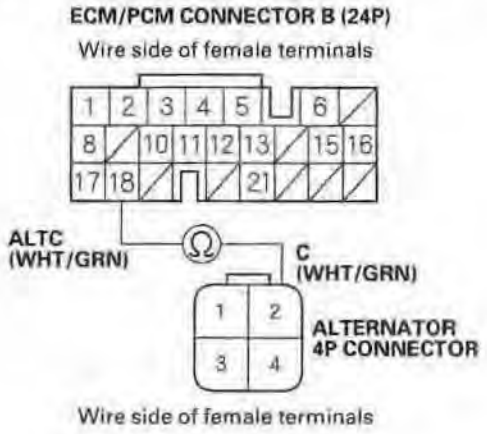
NO—Update the ECM/PCM if it does not have the latest software (see page 11-6), or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

9. Connect the HDS to the DLC. Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

   NOTE: This step must be done to protect the ECM/PCM from damage.

10. Disconnect ECM/PCM connector B (24P).

11. Check for continuity between ECM/PCM connector terminal B18 and alternator 4P connector terminal No. 2.



Is there continuity?

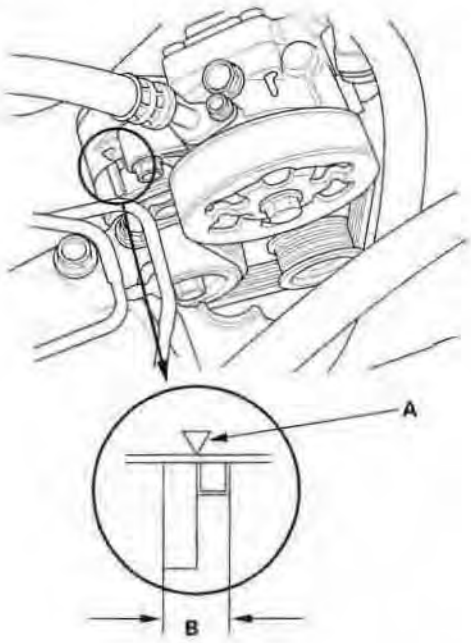
YES—Replace the alternator (see page 4-39) or repair the alternator (see page 4-40). ■

NO—Repair an open in the wire between the alternator and the ECM/PCM. ■

Drive Belt Inspection

1. Inspect the belt for cracks or damage. If the belt is cracked or damaged, replace it.

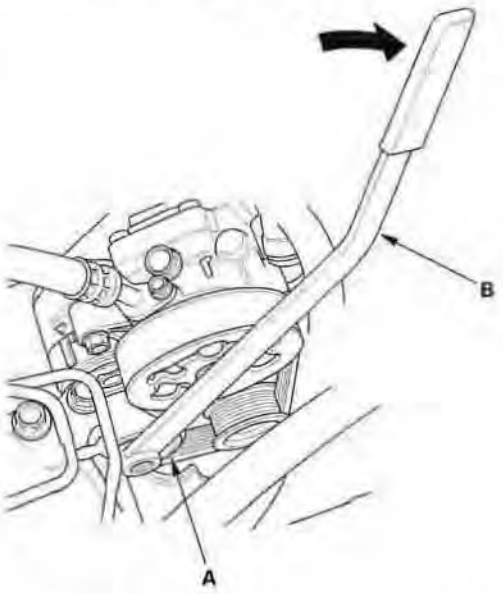
2. Check that the auto-tensioner indicator (A) is within the standard range (B) as shown. If it is out of the standard range, replace the drive belt (see page 4-36).



Drive Belt Replacement

Special Tools Required
Belt tension release tool
Snap-on YA9317 or equipment, commercially available

1. Move the auto-tensioner (A) with the belt tension release tool (B) to relieve tension from the drive belt, and remove the drive belt.

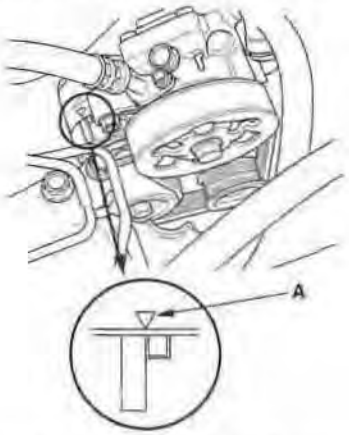


2. Install the new belt in the reverse order of removal.

Drive Belt Auto-tensioner Inspection

Special Tools Required
Belt tension release tool
Snap-on YA9317 or equipment, commercially available

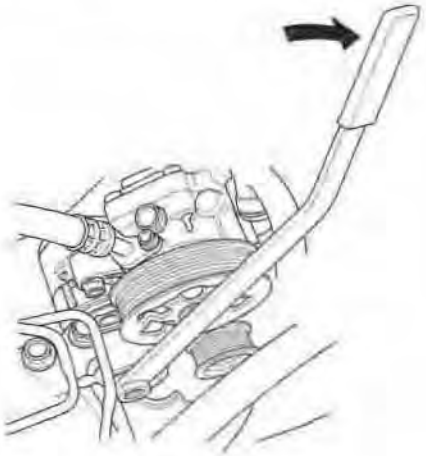
1. With the engine OFF, check the position of the auto-tensioner indicator's pointer (A). Start the engine, then check the position again with the engine idling. If the position of the indicator moves or fluctuates, replace the auto-tensioner (see page 4-38).



2. Check for abnormal noise from the tensioner pulley. If you hear abnormal noise, replace the tensioner pulley (see page 4-38).

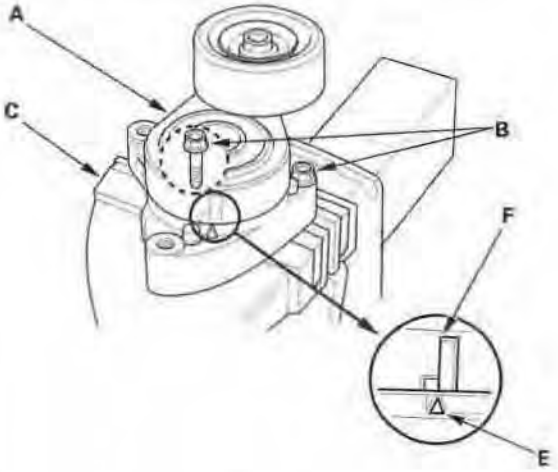
3. Remove the drive belt (see page 4-36).

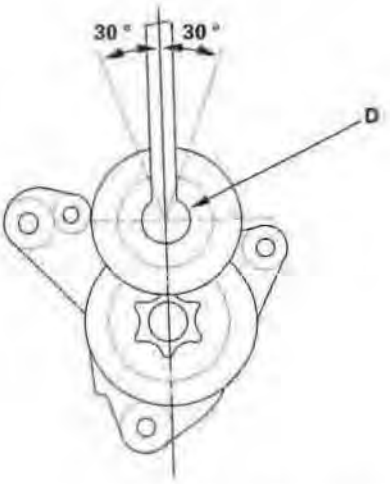
4. Move the auto-tensioner within its limit with the belt tension release tool in the direction shown. Check that the tensioner moves smoothly and without any abnormal noise. If the tensioner does not move smoothly or you hear abnormal noise, replace the auto-tensioner (see page 4-38).



5. Remove the auto-tensioner (see page 4-38).

6. Clamp the auto-tensioner (A) by using two 8 mm bolts (B) and a vise (C) as shown. Do not clamp the auto-tensioner itself.





7. Set the torque wrench (D) in the pulley bolt in the direction shown.

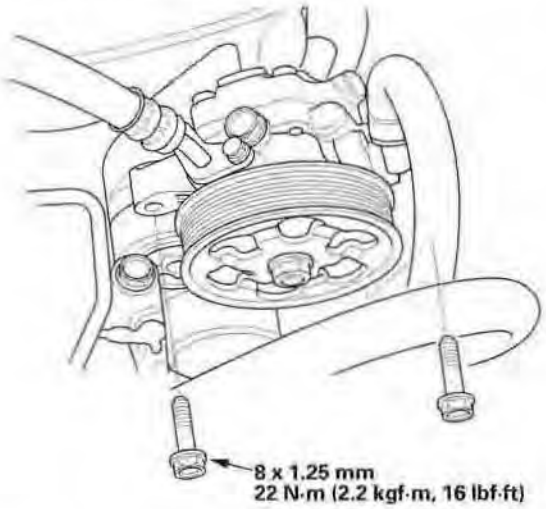
8. Align the indicator (E) on the tensioner base with center mark (F) on the tensioner arm by using the torque wrench, and measure the torque. If the torque value is out of specification, replace the auto-tensioner.

   NOTE: If the indicator exceeds the center mark, recheck the torque.

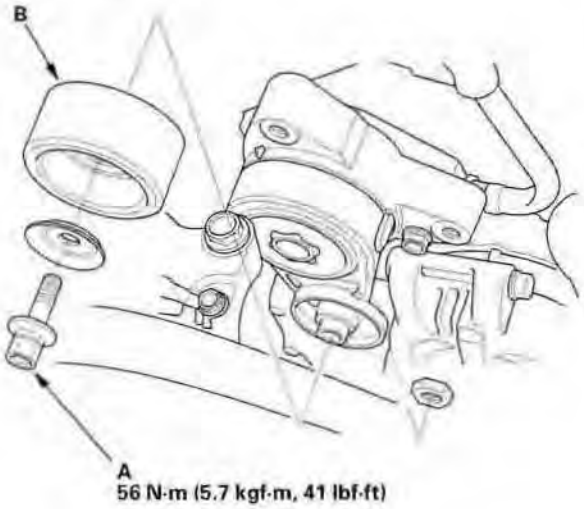
   Auto-tensioner Spring Torque
   32.5—39.7 N·m (3.31—4.05 kgf·m, 23.9—29.3 lbf·ft)

Drive Belt Auto-tensioner Replacement

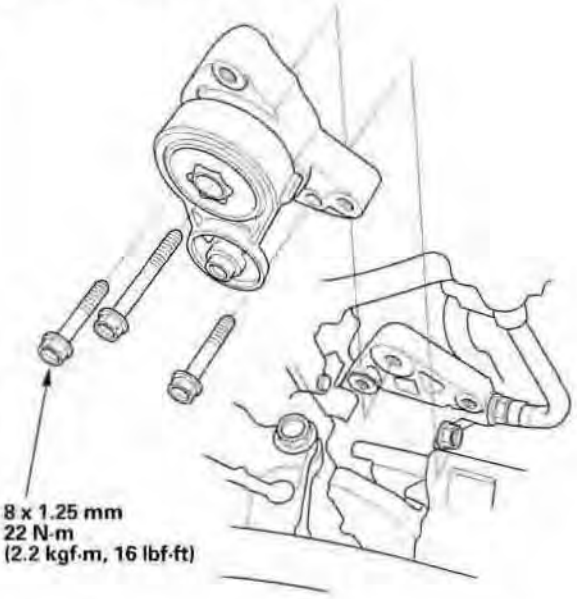
1. Remove the drive belt (see page 4-36).
2. Remove the power steering (P/S) pump without disconnecting the P/S hoses.



3. Remove the pulley bolt (A), and remove the tensioner pulley (B).



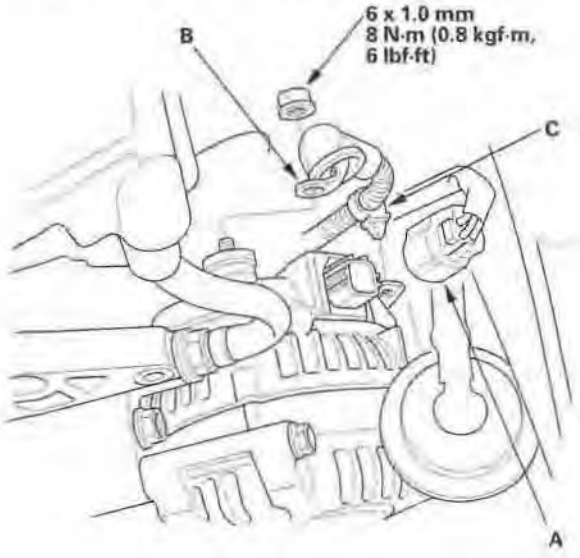
4. Remove the auto-tensioner.



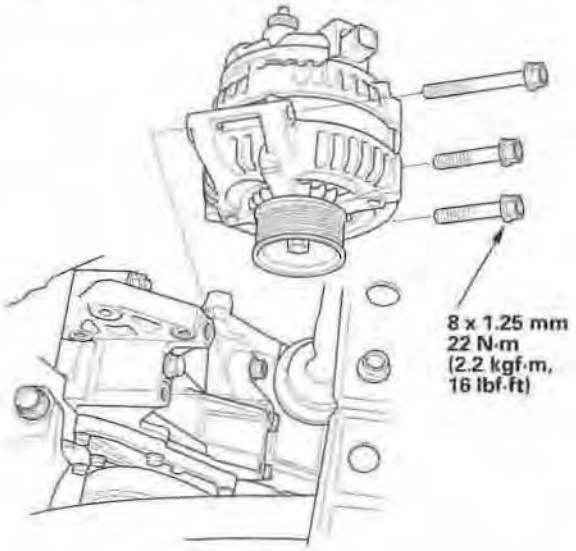
5. Install the auto-tensioner in the reverse order of removal.

Alternator Replacement

1. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets.
2. Disconnect the negative cable from the battery first, then disconnect the positive cable.
3. Remove the drive belt (see page 4-36).
4. Remove the auto-tensioner (see page 4-38).
5. Disconnect the alternator connector (A), BLK wire (B), and harness clamp (C) from the alternator.



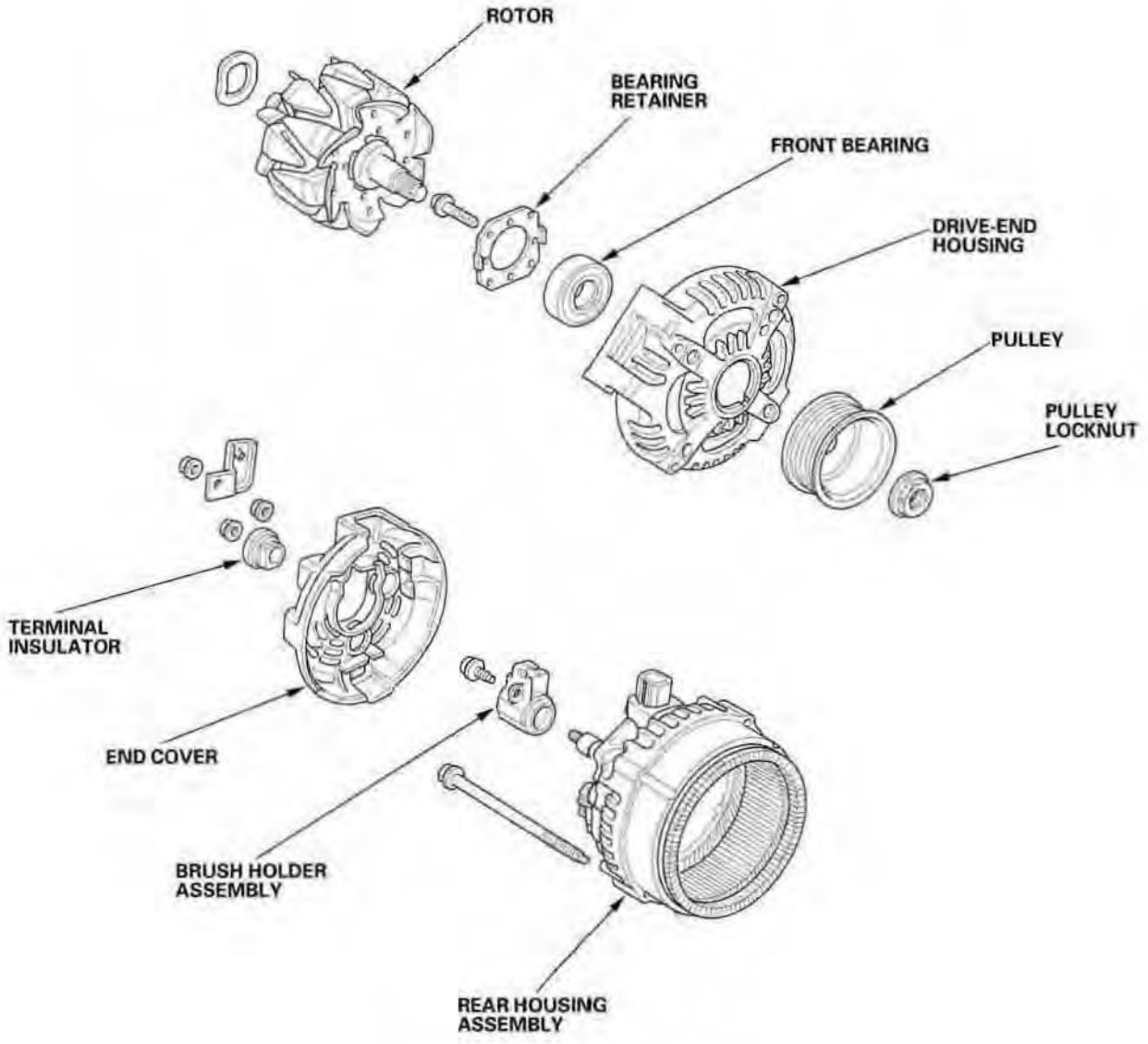
6. Remove the positive crankcase ventilation (PCV) valve (see page 11-242).
7. Remove the three bolts securing the alternator.



8. Install the alternator and drive belt in the reverse order of removal.
9. Connect the battery positive cable to the battery first, then connect the negative cable.
10. Enter the anti-theft code for the radio, then enter the customer's radio station and XM radio channel presets.
11. Do the power window control unit reset procedure (see page 22-115).
12. Set the clock.

Alternator Overhaul

Exploded View



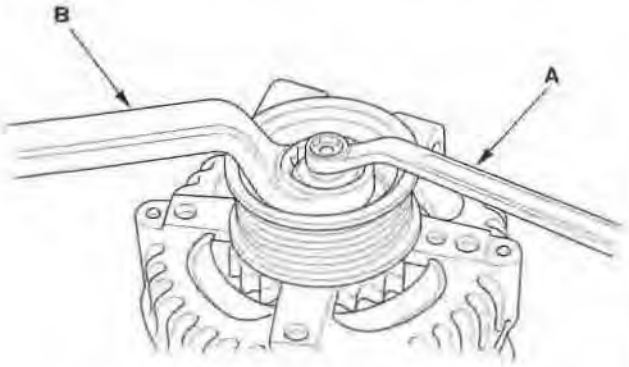
Special Tools Required
- Handle driver 07749-0010000
- Driver attachment, 42 x 47 mm 07746-0010300

NOTE: Refer to the Exploded View as needed during this procedure.

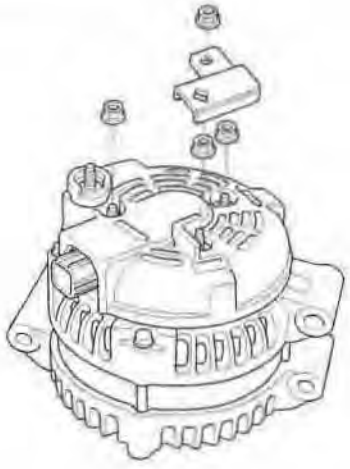
1. Test the alternator and regulator before you remove them (see page 4-33).

2. Remove the alternator (see page 4-39).

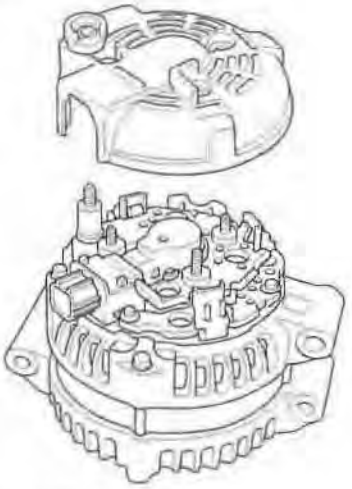
3. If the front bearing needs replacing, remove the pulley locknut with a 10 mm wrench (A) and a 22 mm wrench (B). If necessary, use an impact wrench.



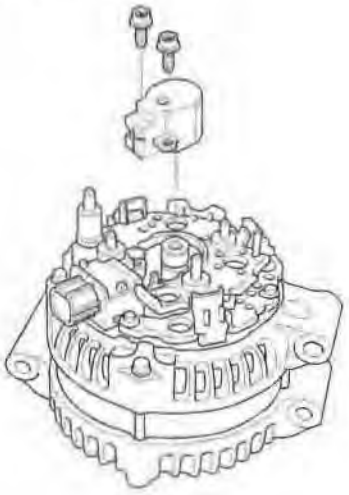
4. Remove the harness stay and the three flange nuts from the alternator.



5. Remove the end cover.



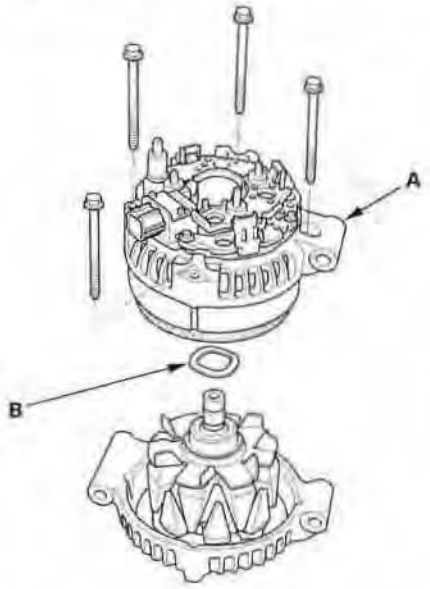
6. Remove the brush holder.



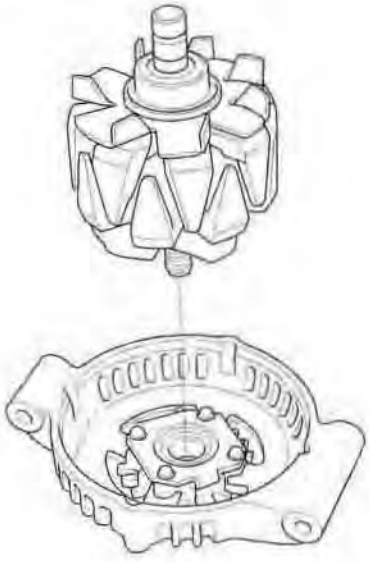
(cont'd)

Alternator Overhaul (cont'd)

7. Remove the four bolts, then remove the rear housing assembly (A), and washer (B).

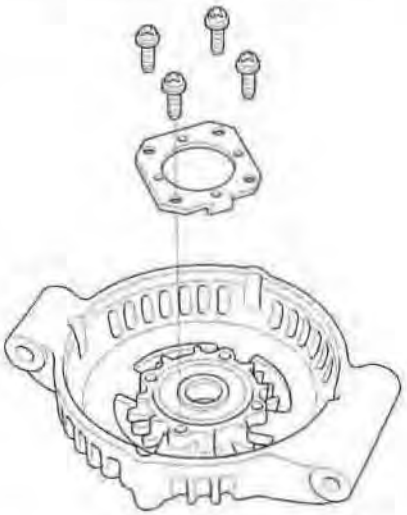


8. If you are not replacing the front bearing, go to step 13. Remove the rotor from the drive-end housing.

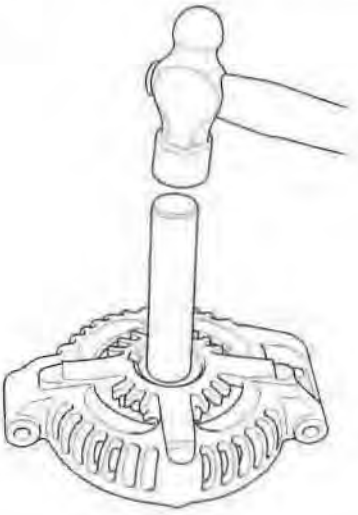


9. Inspect the rotor shaft for scoring, and inspect the bearing journal surface in the drive-end housing for seizure marks.
   - If the rotor is damaged, replace the rotor assembly.
   - If the rotor is OK, go to step 10.

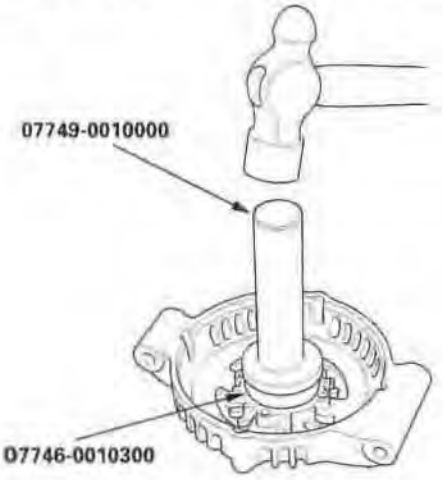
10. Remove the front bearing retainer plate.



11. Drive out the front bearing with a brass drift and hammer.



12. With a hammer and special tools, install a new front bearing in the drive-end housing.

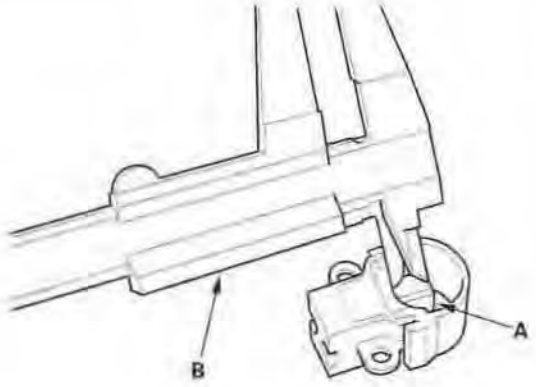


Alternator Brush Inspection

13. Measure the length of both brushes (A) with vernier calipers (B).

- If either brush is shorter than the service limit, replace the brush holder assembly.
- If the brush length is OK, go to step 14.

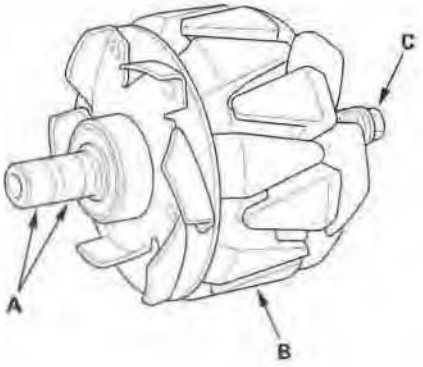
Alternator Brush Length
Standard (New): 10.5 mm (0.41 in.)
Service Limit: 1.5 mm (0.06 in.)



Rotor Slip Ring Test

14. Check for continuity between the slip rings (A).

- If there is continuity, go to step 15.
- If there is no continuity, replace the rotor assembly.



15. Check for continuity between each slip ring and the rotor (B) and the rotor shaft (C).

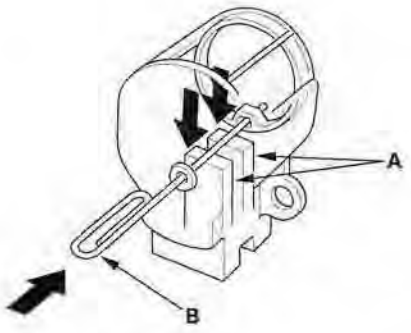
- If there is no continuity, replace the rear housing assembly, and go to step 16.
- If there is continuity, replace the rotor assembly.

(cont'd)

Alternator Overhaul (cont'd)

Alternator Reassembly

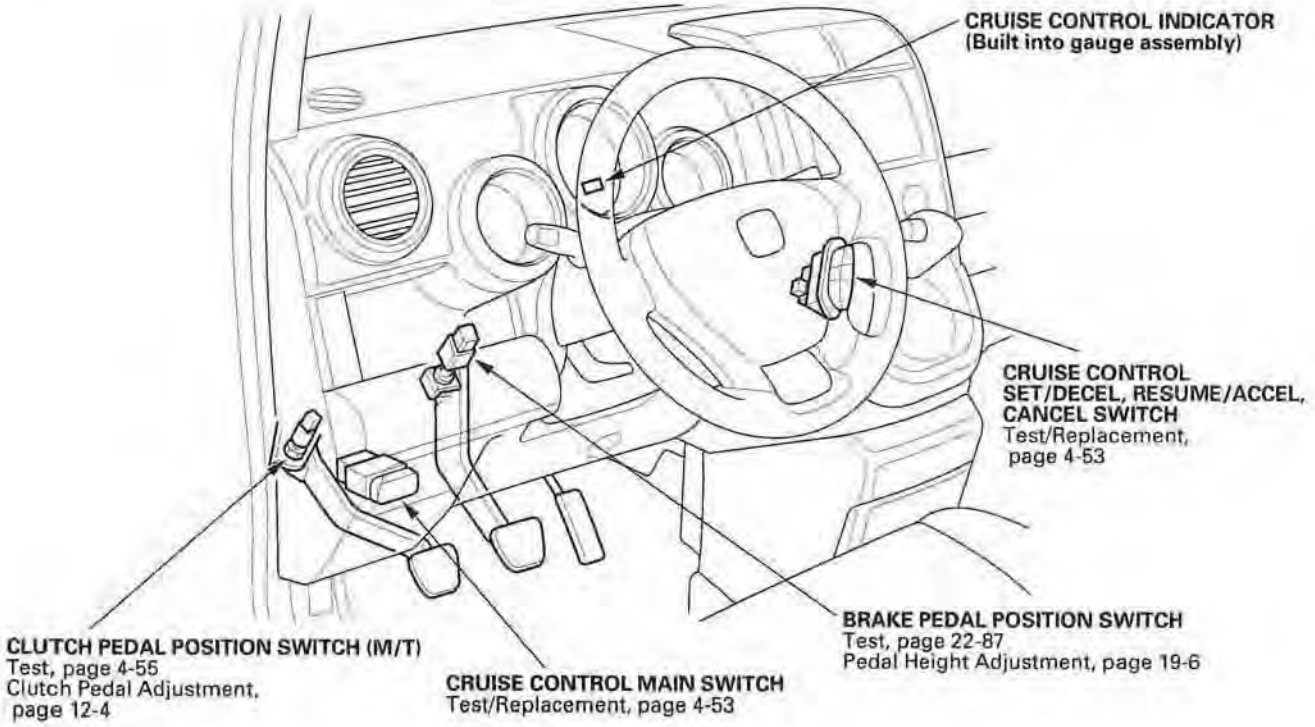
16. If you removed the pulley, put the rotor in the drive-end housing, then tighten its locknut to 110 N·m (11.2 kgf·m, 81.0 lbf·ft).
17. Remove any grease or any oil from the slip rings.
18. Put the rear housing assembly and drive-end housing/rotor assembly together, tighten the four through bolts.
19. Push in the brushes (A), then insert a pin or drill bit (B) (about 1.6 mm (0.06 in.) diameter) to hold them there.

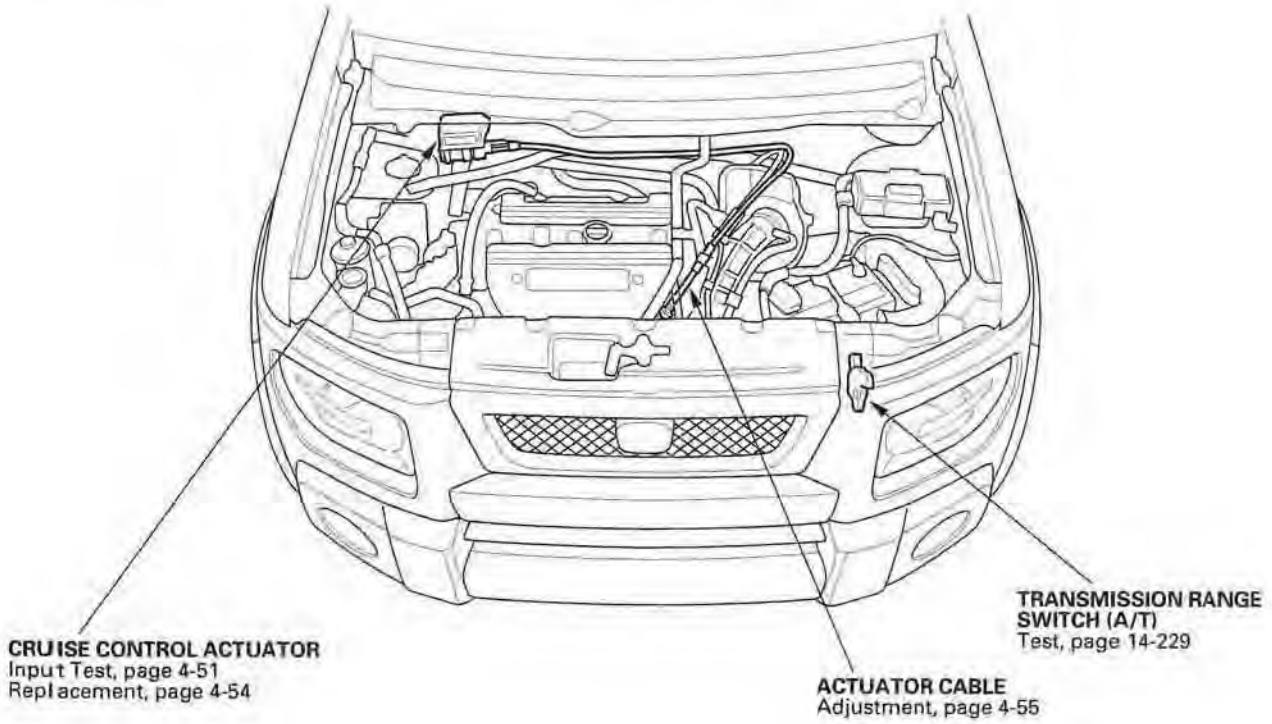


20. Install the brush holder, and pull out the pin.

21. Install the end cover.
22. After assembling the alternator, turn the pulley by hand to make sure the rotor rotates smoothly and without noise.
23. Install the alternator (see page 4-39) and drive belt (see page 4-36).

Component Location Index



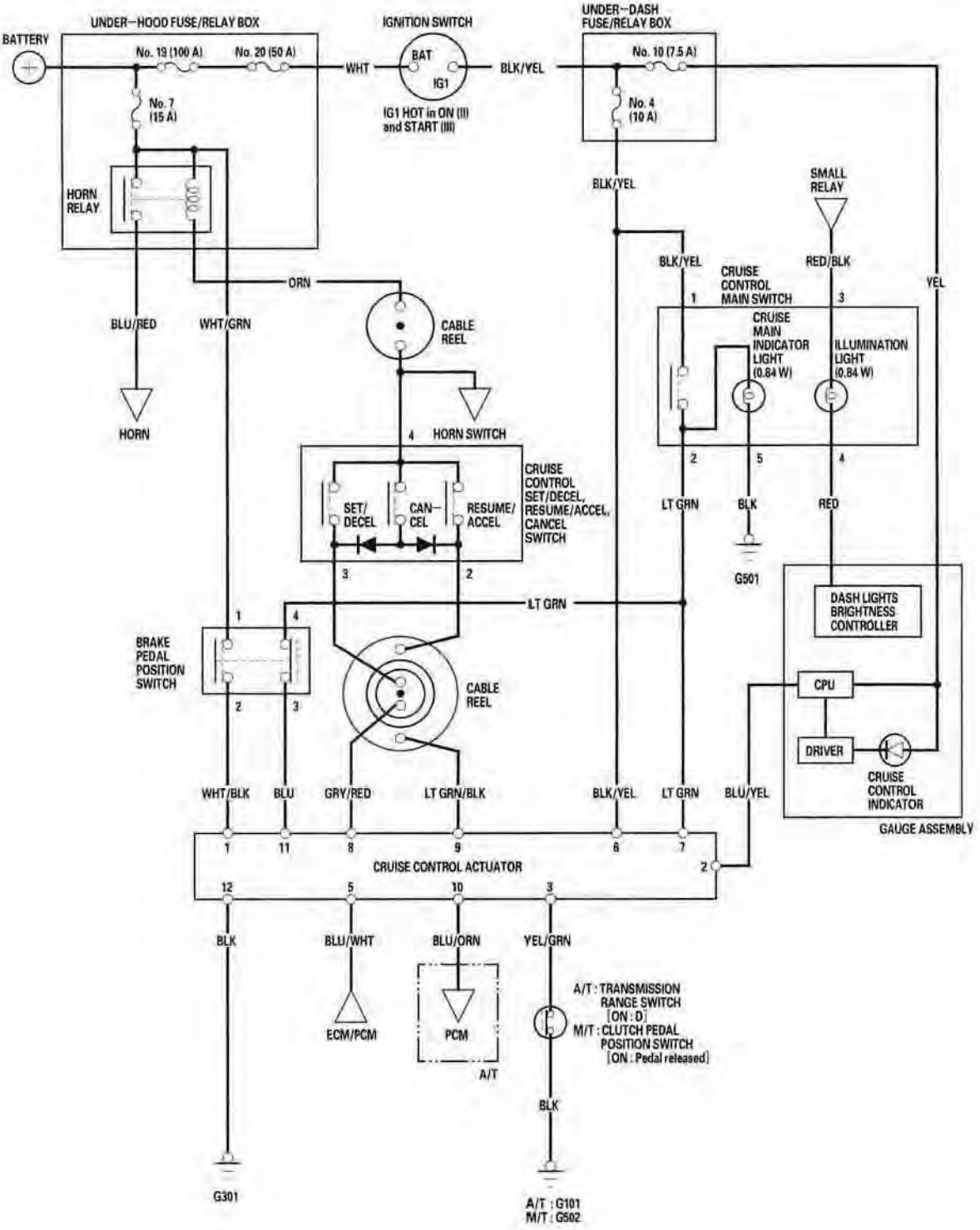


Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Cruise control cannot be set	1. Check for PGM-FI DTCs (see page 11-3). 2. Check horn operation. 3. Check the cruise control main switch (see page 4-53). 4. Check the cruise control set/decel, resume/accel, cancel switch (see page 4-53). 5. Test the brake pedal position switch (see page 22-87) and check its adjustment (see page 19-6). 6. Test the clutch pedal position switch (see page 4-55) and check its adjustment (M/T) (see page 12-4). 7. Check the transmission range switch (A/T) (see page 14-229). 8. Do the cruise control unit input test (see page 4-51).	• Blown No. 4 (10 A) fuse in the under-hood fuse/relay box • Blown No. 7 (15 A) fuse in the under-dash fuse/relay box • Poor ground: G101 (A/T), G301, G502 (M/T) • Faulty horn relay • Open circuit, loose or disconnected terminals: BLK/YEL, LT GRN, BLU, YEL/GRN, BLU/WHT
Cruise control can be set, but the CRUISE CONTROL indicator does not come on	1. Do the gauge control module self-diagnostic function procedure (see page 22-62). 2. Do the cruise control unit input test on pin No. 2 (see page 4-51).	Open circuit, loose or disconnected terminals: BLU/YEL
Cruise speed is noticeably higher or lower than what was set	1. Adjust the cruise control cable (see page 4-55). 2. Do the cruise control unit input test on pin No. 5 (see page 4-51).	
Excessive overshooting or undershooting when trying to set speed	1. Adjust the cruise control cable (see page 4-55). 2. Do the cruise control unit input test on pin No. 5 (see page 4-51).	
Speed fluctuates on a flat road with the cruise control set	1. Adjust the cruise control cable (see page 4-55). 2. Do the cruise control unit input test on pin No. 5 (see page 4-51).	
Vehicle does not decelerate or accelerate accordingly when the set/decel or resume/accel switch is pressed	1. Check the cruise control set/decel, resume/accel, cancel switch (see page 4-53). 2. Do the cruise control unit input test on pins No. 8 and No. 9 (see page 4-51).	Open circuit, loose or disconnected terminals: GRY/RED, LT GRN/BLK
Set speed does not cancel (engine rpm stays high) when the clutch pedal is pressed (M/T)	1. Test the clutch pedal position switch (see page 4-55) and check its adjustment (see page 12-4). 2. Do the cruise control unit input test on pin No. 3 (see page 4-51).	Short to ground in the YEL/GRN wire
Set speed does not cancel (engine rpm stays high) when the shift lever is moved to N (A/T)	1. Check the transmission range switch (see page 14-229). 2. Do the cruise control unit input test on pin No. 3 (see page 4-51).	Short to ground in the YEL/GRN wire

Symptom	Diagnostic procedure	Also check for
Set speed does not cancel when the brake pedal is pressed	1. Test the brake pedal position switch (see page 22-87) and check its adjustment (see page 19-6). 2. Do the cruise control unit input test on pins No. 1 and No. 11 (see page 4-51).	Short to power on BLU wire
Set speed does not cancel when the cruise control main switch is turned off	1. Check the cruise control main switch (see page 4-53). 2. Do the cruise control unit input test on pin No. 7 (see page 4-51).	Short power in the LT GRN wire
Set speed does not cancel when the cancel switch is pressed	1. Check the cruise control set/decel, resume/accel, cancel switch (see page 4-53). 2. Do the cruise control unit input test on pins No. 8 and No. 9 (see page 4-51).	Open circuit, loose or disconnected terminals: GRY/RED, LT GRN/BLK
Set speed will not resume when the resume/accel switch is pressed (with the cruise control main switch turned on, and set speed temporarily canceled by pressing the brake pedal)	1. Check the cruise control set/decel, resume/accel, cancel switch (see page 4-53). 2. Do the cruise control unit input test on pins No. 8 and No. 9 (see page 4-51).	• Faulty brake pedal position switch • Open circuit, loose or disconnected terminals: LT GRN/BLK
The transmission shifts down slower than normal when going uphill with the cruise control on (A/T)	Troubleshoot the cruise control communication circuit (see page 4-49).	Open circuit, loose or disconnected terminals: BLU/ORN

Circuit Diagram



Cruise Control Communication Circuit Troubleshooting

A/T

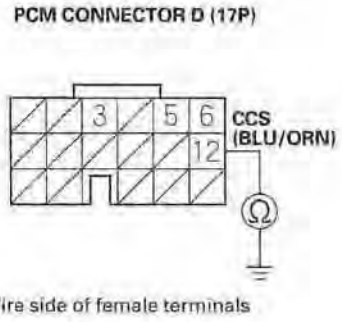
1. Start the engine.
2. Turn on the cruise control master switch, then drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set.

   Does the cruise control operate?

   YES—Go to step 3.

   NO—Check the cruise control actuator (see page 4-51). ■
3. Turn the ignition switch OFF.
4. Connect the Honda Diagnostic System (HDS) to the data link connector (DLC) (see step 2 on page 11-3). Turn the ignition switch ON (II), and jump the SCS line with the HDS, then turn the ignition switch OFF.

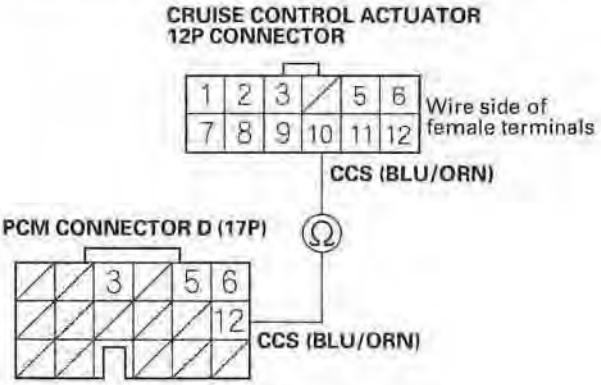
   NOTE: This step must be done to protect the powertrain control module (PCM) from damage.
5. Disconnect PCM connector D (17P) and cruise control actuator 12P connector.
6. Check for continuity between PCM connector terminal D12 and body ground.



   Is there continuity?

   YES—Repair a short to ground in the wire between PCM connector terminal D12 and the cruise control actuator 12P connector terminal No. 10. ■

   NO—Go to step 7.
7. Check for continuity between PCM connector terminal D12 and cruise control actuator 12P connector terminal No. 10.



   Is there continuity?

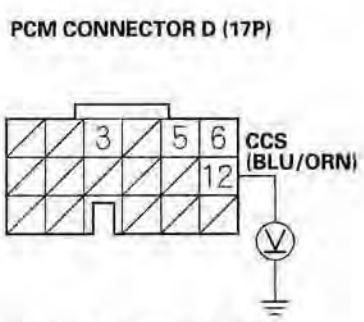
   YES—Go to step 8.

   NO—Repair an open in the wire between PCM connector terminal D12 and cruise control actuator 12P connector terminal No. 10. ■
8. Reconnect the PCM connector D (17P) and the cruise control actuator 12P connector.
9. Disconnect the HDS.

(cont'd)

Cruise Control Communication Circuit Troubleshooting (cont'd)

10. Connect a voltmeter between PCM connector terminal D12 and body ground. Drive the vehicle at speeds over 25 mph (40 km/h) with the cruise control set, and watch the voltmeter.



Wire side of female terminals

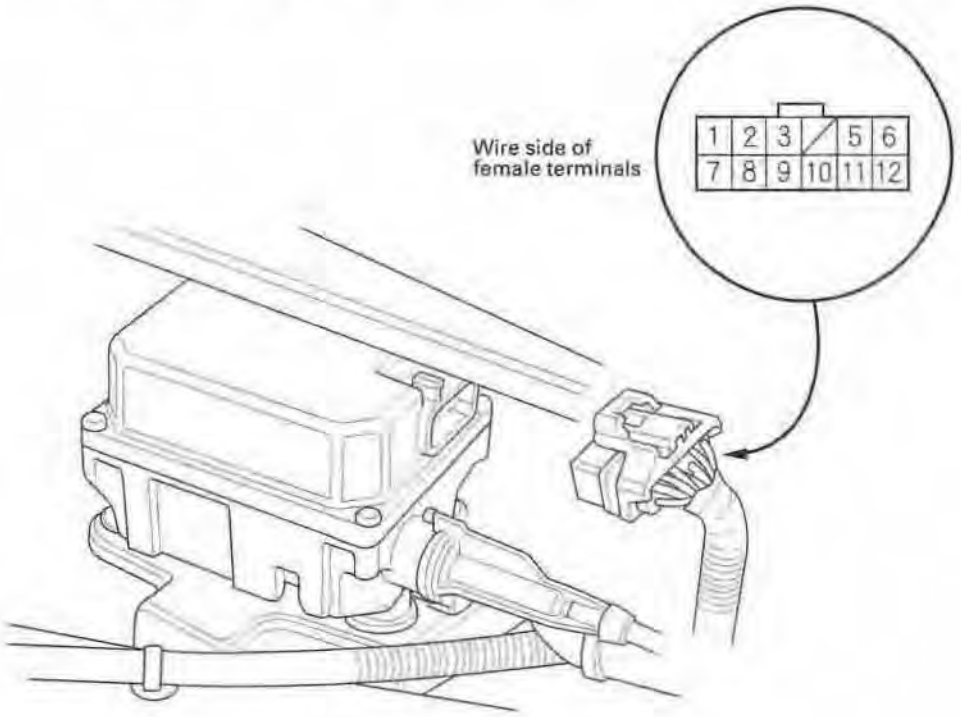
Is there about 1 V?

YES—Update the PCM if it does not have the latest software (see page 11-6), or substitute a known-good PCM (see page 11-6), then recheck. If the system works properly, and the PCM was updated, troubleshooting is complete. If the PCM was substituted, replace the original PCM (see page 11-5).■

NO—Substitute a known-good cruise control actuator, then recheck. If the system works properly, replace the original cruise control actuator (see page 4-54).■

Cruise Control Actuator Input Test

1. Disconnect the 12P connector from the cruise control actuator.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 3.



3. With the 12P connector disconnected, do these input tests.
   - If the test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the cruise control actuator may be faulty. Substitute a known-good cruise control actuator, and retest. If the system works properly, replace the original cruise control actuator.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	WHT/BLK	Brake pedal pressed, then released	Check for voltage to ground: There should be battery voltage with the pedal pressed, and 0 V with the pedal released.	• Blown No. 7 (15 A) fuse in the under-hood fuse/relay box • Faulty brake pedal position switch • An open in the wire
2	BLU/YEL	Ignition switch ON (II)	Attach to ground: Cruise indicator in the gauge assembly should come on.	• Blown bulb • Blown No. 10 (7.5 A) fuse in the under-dash fuse/relay box • Faulty gauge assembly • An open in the wire

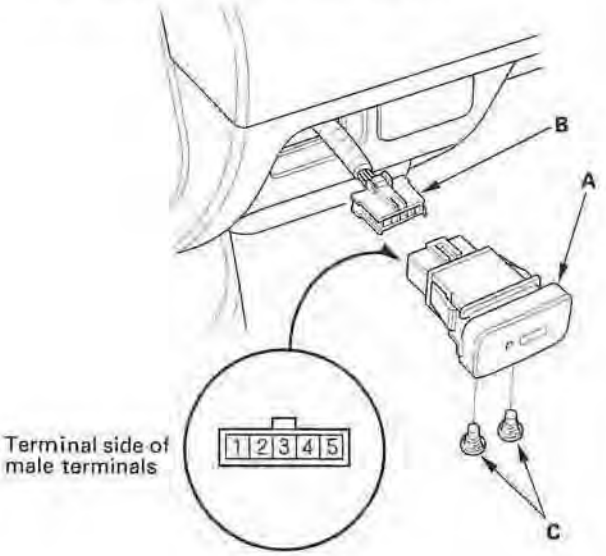
(cont'd)

Cruise Control Actuator Input Test (cont'd)

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
3	YEL/ GRN	Clutch pedal released (M/T)	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when the clutch pedal is pressed.	• Faulty clutch pedal position switch • Poor ground (G502) • An open in the wire
		Shift lever in D (A/T)	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when the shift lever is in other positions.	• Faulty transmission range switch • Poor ground (G101) • An open in the wire
5	BLU/ WHT	Ignition switch ON (II), raise the front of the vehicle, and rotate one wheel slowly while holding the other wheel	Check for voltage between the BLU/WHT (+) and BLK (−) terminals: There should be 0 V, then 5 V or more repeatedly.	• Faulty ECM/PCM • An open in the wire • Short to ground
6	BLK/ YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
7	LT GRN	Ignition switch ON (II) and cruise control main switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 4 (10 A) fuse in the under-dash fuse/relay box • Faulty cruise control main switch • An open in the wire
8	GRY/ RED	Set/decel switch pressed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 8, there should be no voltage on terminal No. 9.	• Blown No. 7 (15 A) fuse in the under-dash fuse/relay box • Faulty horn relay • Faulty cruise control set/decel, resume/accel, cancel switch • Faulty cable reel • An open in the wire
9	LT GRN /BLK	Resume/accel switch pressed	Check for voltage to ground: There should be battery voltage. When testing terminal No. 9, there should be no voltage on terminal No. 8.	
11	BLU	Ignition switch ON (II), cruise control main switch ON and brake pedal pressed, then released	Check for voltage to ground: There should be 0 V with the pedal pressed, and battery voltage with the pedal released.	• Faulty brake pedal position switch • An open in the wire • Open in cruise control main switch • Blown No. 4 (10 A) fuse in the under-dash fuse/relay box
12	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G301) • An open in the wire
10	BLU/ ORN	Reconnect the cruise control actuator 12P connector, start the engine, turn the cruise control main switch ON and drive the vehicle to speeds over 25 mph (40 km/h) with the cruise control set	Check for voltage to ground: There should be about 1 V.	• Faulty cruise control actuator • Short to ground

Cruise Control Main Switch Test/ Replacement

1. Release the clips of the switch and push the switch (A) out of the panel, then disconnect the 5P connector (B) from the main switch.



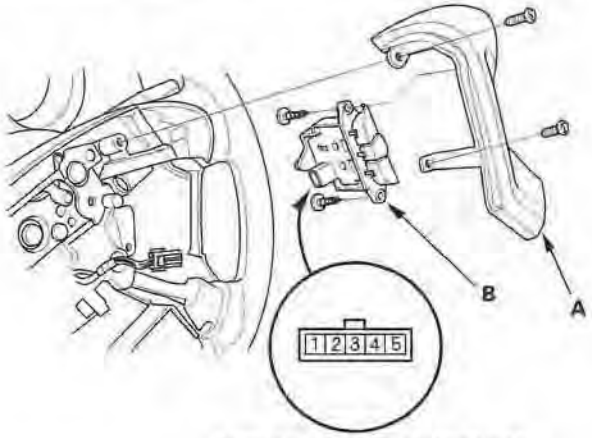
2. Check for continuity between the terminals in each switch position according to the table. If there is no continuity, replace illumination bulbs (C) or the switch.

Position \ Terminal	2		5	1	3		4
OFF	○	⊗	○		○	⊗	○
ON	○	⊗	○	○	○	⊗	○

Cruise Control Set/Decel, Resume/ Accel, Cancel Switch Test/ Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-10), and the precautions and procedures (see page 23-11), before performing repairs or service.

1. Remove the driver's airbag (see page 23-118).
2. Remove the cover (A), then remove the cruise control set/decel, resume/accel, cancel switch (B).



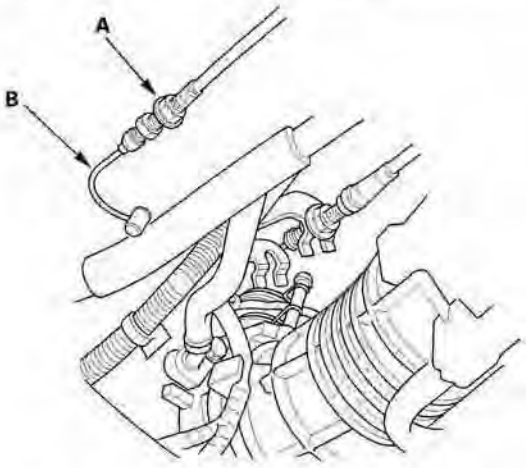
Terminal side of male terminals

3. Check for continuity between the terminals in each switch position according to the table.
   - If there is continuity, and it matches the table, but switch failure occurred on the cruise control actuator input test, check and repair the wire harness on the switch circuit.
   - If there is no continuity in one or both positions, replace the switch.

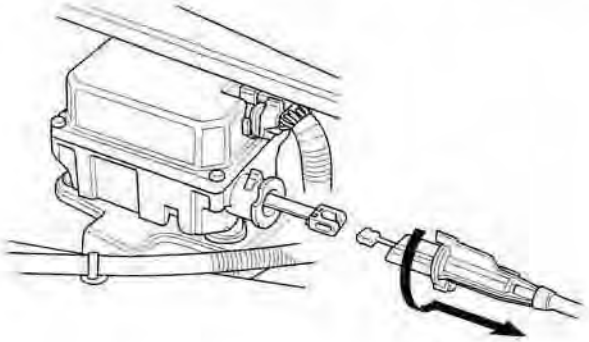
Position \ Terminal	2		3	4
Set/decel (PRESSED)	○			○
Resume/accel (PRESSED)	○		○	
Cancel (PRESSED)	○	✕		○
		✕	○	

Cruise Control Actuator/Cable Replacement

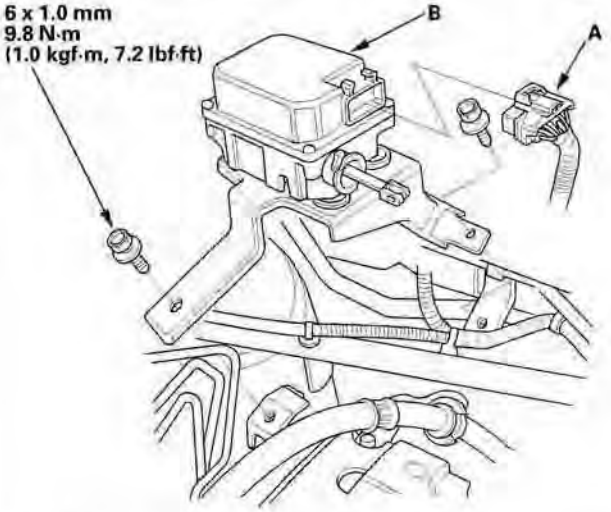
1. Loosen the locknut (A), then remove the actuator cable (B) from the throttle linkage.



2. Turn the connector to disconnect it from the actuator, then remove the cable from the actuator.



3. Disconnect the 12P connector (A) from the cruise control actuator (B).



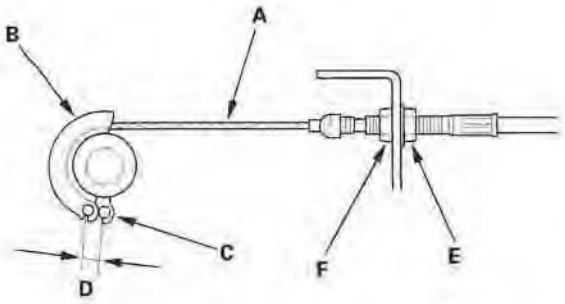
4. Remove the two mounting bolts from the mounting bracket.

5. Remove the three mounting bolts attaching the cruise control actuator to the mounting bracket.

6. Install in the reverse order of removal, and adjust the free play (see page 4-55) at the throttle linkage after connecting the actuator cable.

Cruise Control Actuator Cable Adjustment

1. Check that the actuator cable (A) moves smoothly with no binding or sticking.

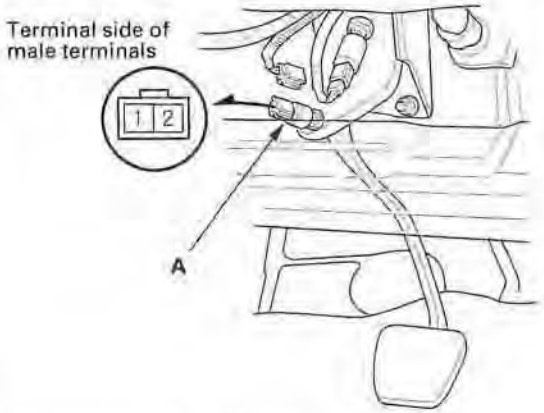


2. Measure the amount of movement of the output linkage (B) until the engine speed starts to increase. At first, the output linkage should be located at the fully closed position (C). The free play (D) should be 3.75±0.5 mm (0.15±0.02 in.).

3. If the free play is not within specs, loosen the locknut (E), and turn the adjusting nut (F) until the free play is as specified, then retighten the locknut.

Clutch Pedal Position Switch Test

1. Disconnect the 2P connector from the clutch pedal position switch (A).



2. Remove the clutch pedal position switch.

3. Check for continuity between the terminals according to the table.

   - If the continuity is not as specified, replace the clutch pedal position switch.
   - If OK, install the clutch pedal position switch and adjust the pedal height (see page 12-4).

Terminal / Clutch Pedal Position Switch	1	2
PRESSED		
RELEASED	○	○

Engine Mechanical

Engine Assembly

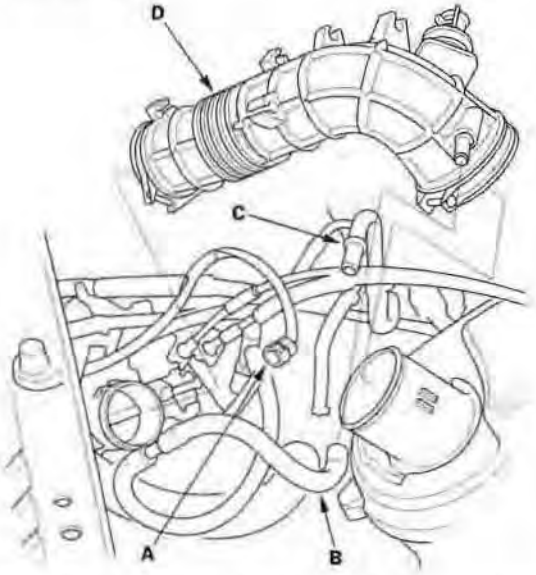
Engine Removal

Special Tools Required
- Engine hanger/adapter VSB02C000015 *
- Engine support hanger, A & Reds AAR-T-12566 *
- Subframe adapter EQS02C000011 *

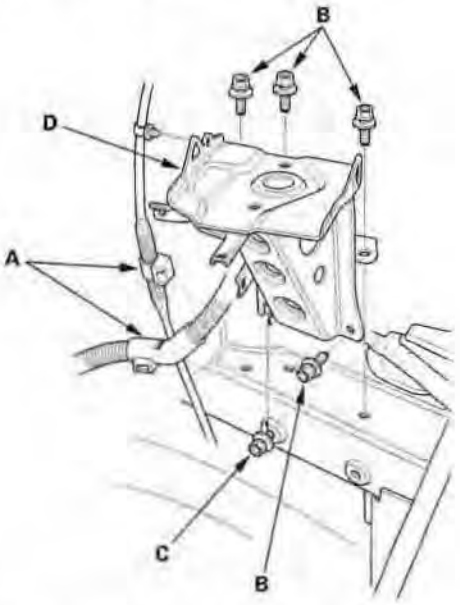
*: Available through the Honda Tool and Equipment Program at 888-424-6857.

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- To avoid damaging the wires and terminals, unplug the wiring connectors carefully while holding the connector portion.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

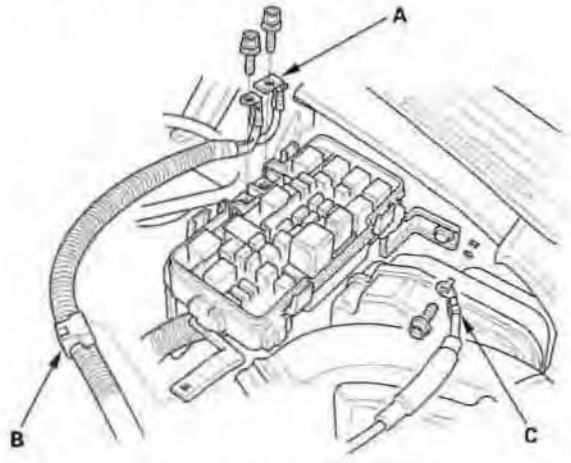
1. Secure the hood in the vertical position by using a rope.
2. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets.
3. Relieve fuel pressure (see page 11-212).
4. Disconnect the negative cable from the battery first, then the positive cable.
5. Disconnect the intake air temperature (IAT) sensor connector (A).



6. Remove the vacuum hose (B) and breather pipe (C), then remove the intake air duct (D).
7. Remove the battery.
8. Remove the air cleaner housing (see page 11-232).
9. Remove the harness clamps (A).

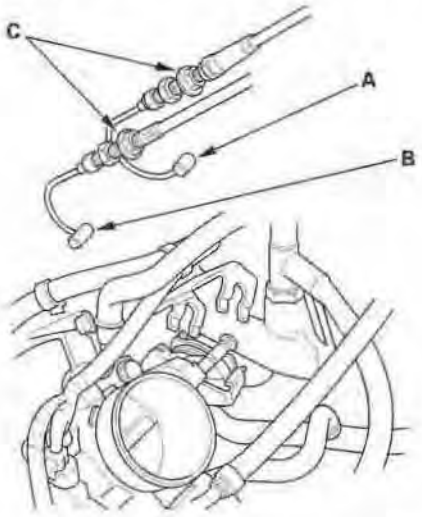


10. Remove the four bolts (B), and loosen the bolt (C) securing the battery base, then remove the battery base (D).
11. Remove the battery cables (A) and harness clamp (B) from the under-hood fuse/relay box.

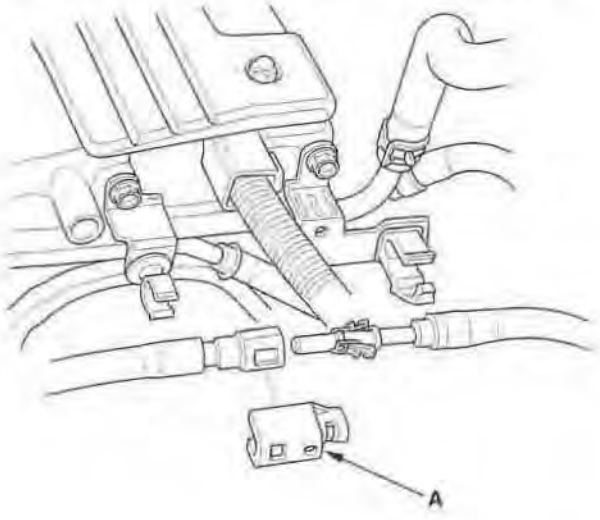


12. Remove the ground cable (C).

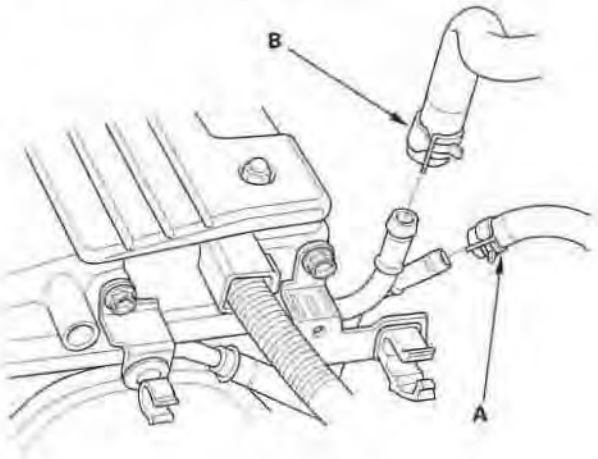
13. Remove the throttle cable (A) and cruise control actuator cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



14. Remove the quick-connect fitting cover (A), then disconnect the fuel feed hose (see page 11-219).



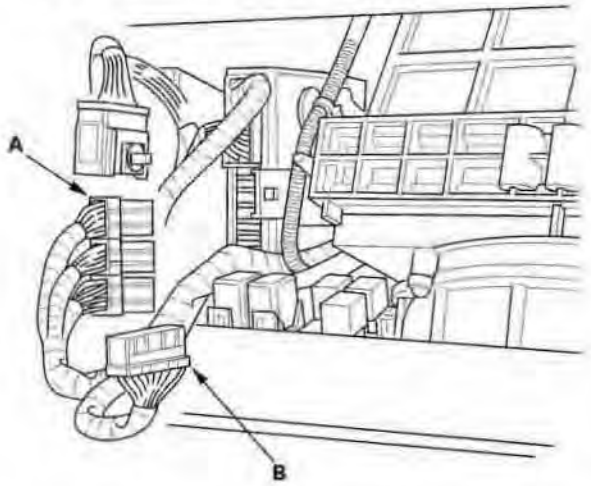
15. Remove the evaporative emission (EVAP) canister hose (A) and brake booster vacuum hose (B).



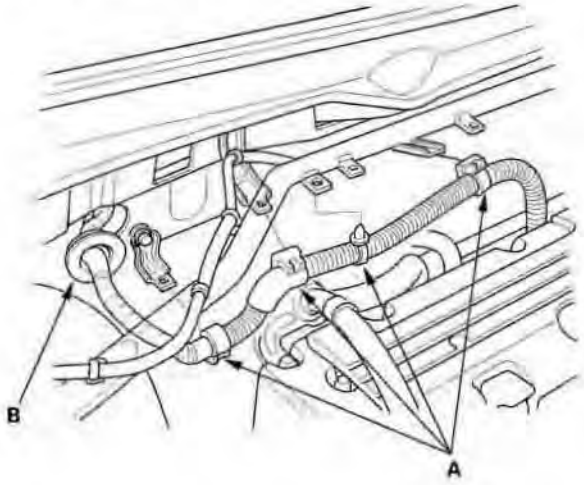
(cont'd)

Engine Removal (cont'd)

16. Disconnect the engine control module (ECM)/ powertrain control module (PCM) connectors (A) and the ECM/PCM wire harness connector (B).



17. Remove the harness clamps (A) and grommet (B), then pull the engine wire harness through the bulkhead.

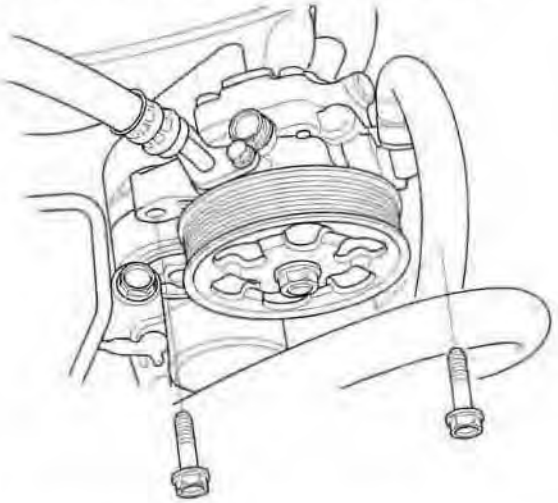


18. M/T model: Remove the clutch slave cylinder and clutch line bracket mounting bolt (see step 9 on page 13-5).

19. M/T model: Remove the shift cables (see step 8 on page 13-4).

20. Remove the drive belt (see page 4-36).

21. Remove the power steering (P/S) pump without disconnecting the P/S hoses from the pump.



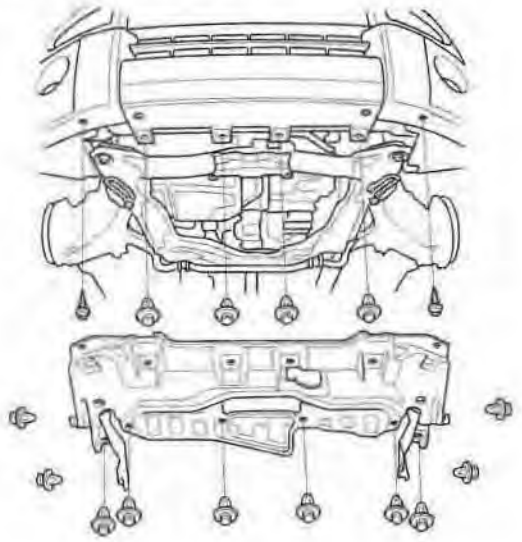
22. Remove the P/S hose from the bracket on the cylinder head cover.

23. Remove the radiator cap.

24. Raise the vehicle on the hoist to full height.

25. Remove the front tires/wheels.

26. Remove the splash shield.



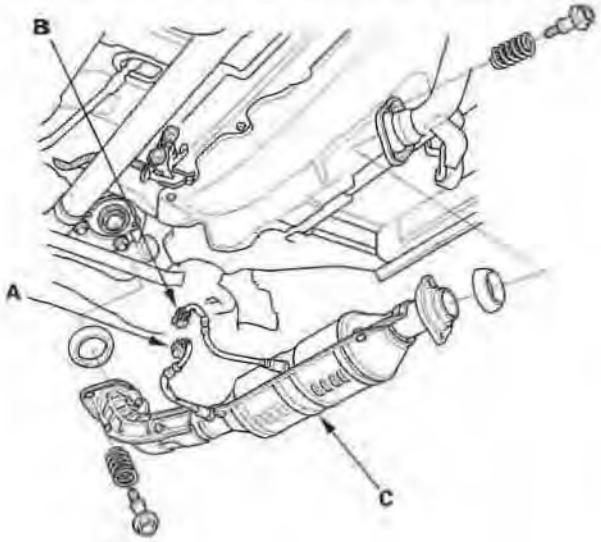
27. Loosen the drain plug in the radiator, and drain the engine coolant (see page 10-6).

28. Drain the transmission fluid:

    - Manual transmission (see page 13-3)
    - Automatic transmission (see page 14-185)

29. Drain the engine oil (see page 8-6).

30. Disconnect the air fuel ratio (A/F) sensor connector (A) and the secondary heated oxygen sensor (secondary HO2S) connector (B), then remove the three way catalytic converter (TWC) assembly (C).



31. Disconnect the stabilizer links (see page 18-17).

32. Disconnect the suspension lower arm ball joints (see page 18-19).

33. Remove the driveshafts (see step 9 on page 16-4). Coat all precision-finished surfaces with clean engine oil. Tie plastic bags over the driveshaft ends.

34. A/T model: Remove the shift cable:

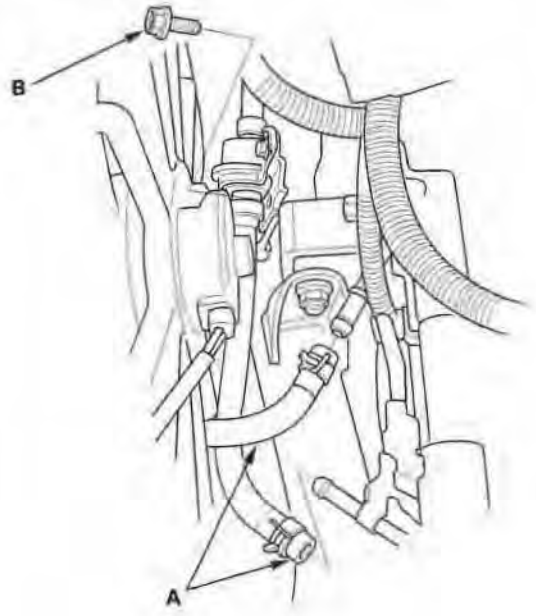
    - 2WD (see step 25 on page 14-193)
    - 4WD (see step 24 on page 14-192)

35. 4WD model: Remove the propeller shaft from the transfer assembly:

    - Manual transmission (see step 4 on page 13-63)
    - Automatic transmission (see step 33 on page 14-194)

36. Lower the vehicle on the hoist.

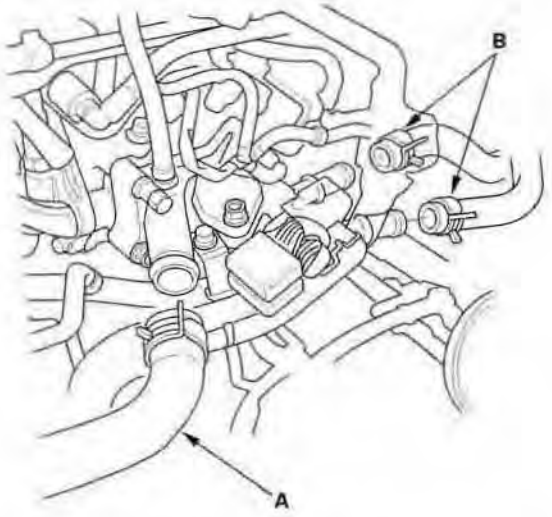
37. A/T model: Remove the automatic transmission fluid (ATF) cooler hoses (A) and ATF filter mounting bolt (B).



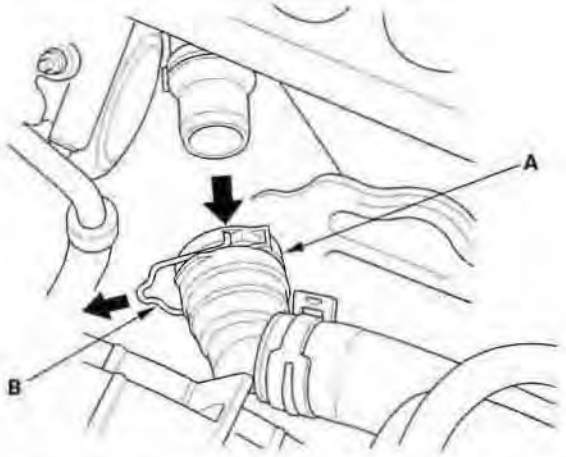
(cont'd)

Engine Removal (cont'd)

38. Remove the upper radiator hose (A) and heater hoses (B).

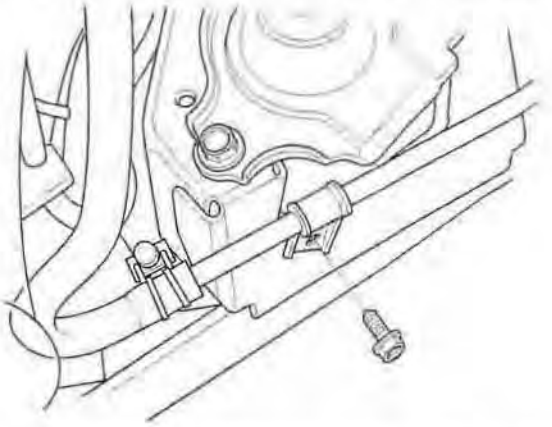


39. Clean any dirt off the quick connector (A), thermostat cover, and lower radiator hose.



40. Pull out the lock (B) by hand, then wiggle the quick connector to remove it from the thermostat cover. Do not use any tools to remove the quick connector.

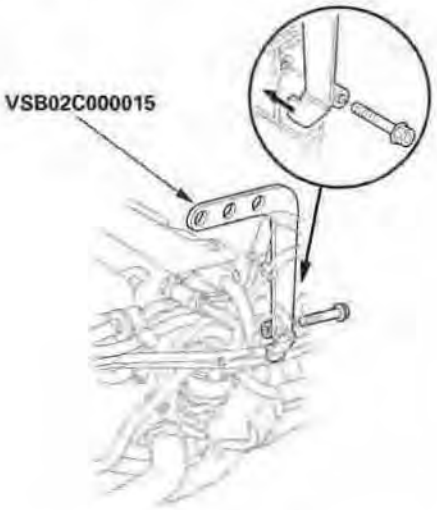
41. A/T model: Remove the bolt securing the P/S line.



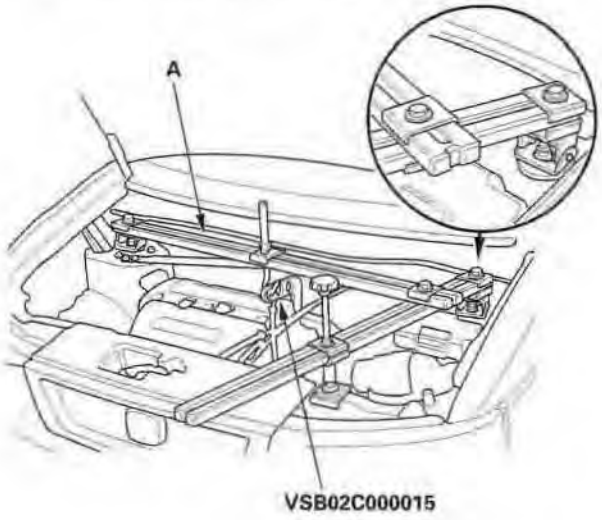
42. A/T model: Support the transmission with a jack and wood block.

43. A/T model: Remove the transmission mount.

44. Attach the special tool to the threaded holes in the cylinder head.

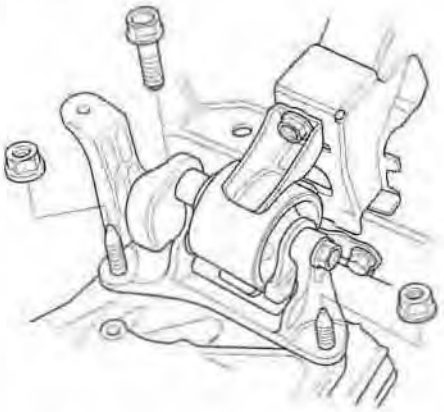


45. Install the engine support hanger (A) to the vehicle, then attach the hook to the special tool.

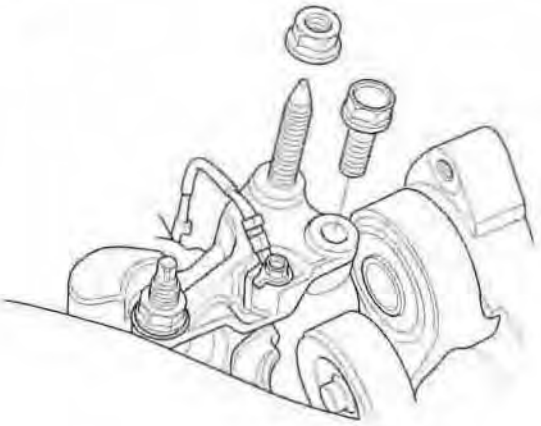


46. A/T model: Remove the jack and wood block.

47. M/T model: Remove the transmission mount bracket support bolt/nuts.



48. Remove the upper engine mount bracket bolt and nut.

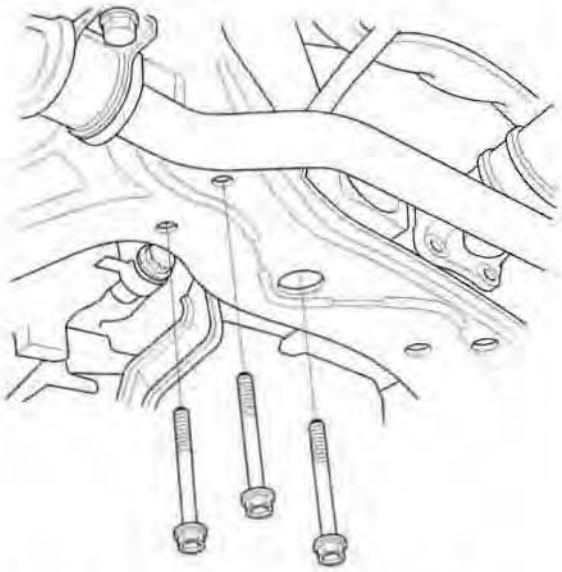


(cont'd)

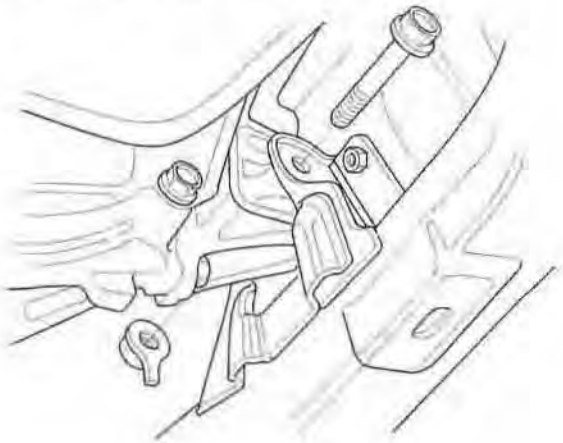
Engine Removal (cont'd)

49. Make sure the hoist brackets are positioned properly. Raise the hoist to full height.

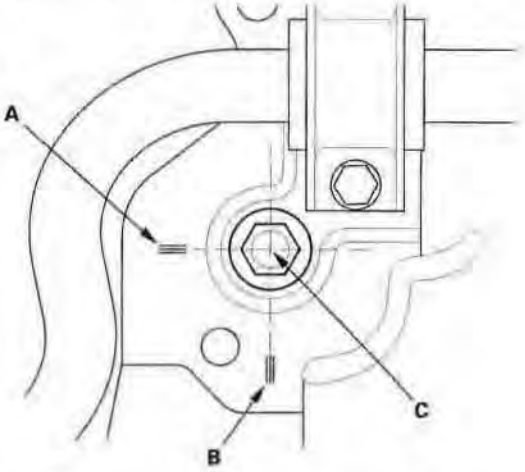
50. Remove the rear mount mounting bolts.



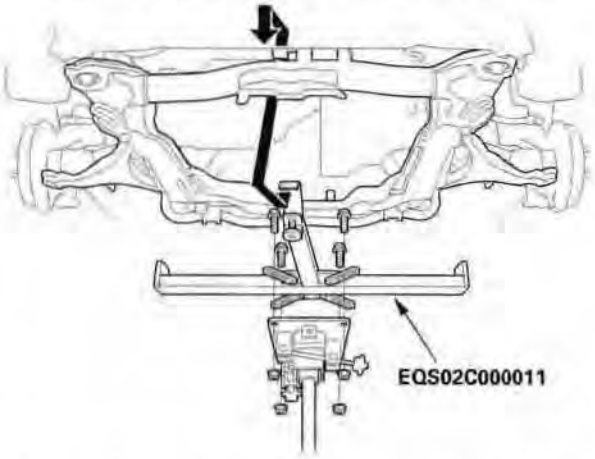
51. Remove the front mount mounting bolt.



52. Make the appropriate reference lines at positions (A) and (B) that line up with the center of each subframe mounting bolt (C).

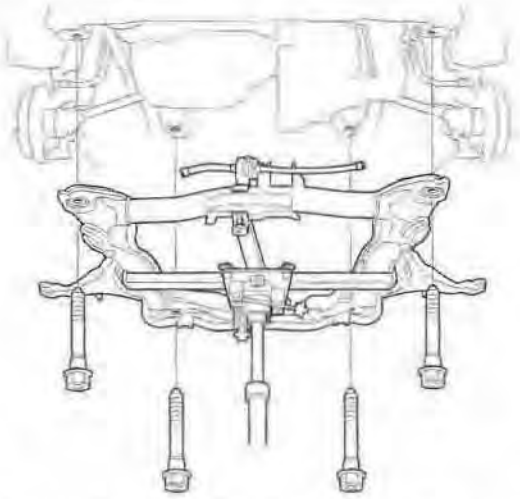


53. Attach the special tool to the subframe by hanging the hook of the special tool over the front of the subframe, then tighten the special tool screws.

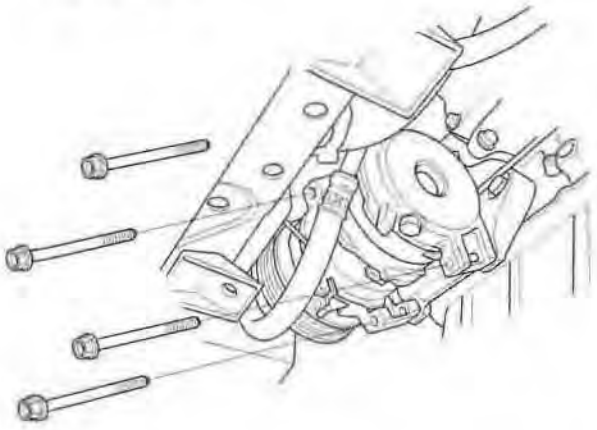


54. Raise the jack and line up the slots in the arms with the bolt holes on the corner of the jack base, then attach them with the bolts securely.

55. Remove the four subframe mounting bolts, then lower the subframe.



56. Remove the A/C compressor without disconnecting the A/C hoses.



57. Check that the engine/transmission is completely free of vacuum hoses, fuel and coolant hoses, and electrical wiring.

58. Slowly lower the engine about 150 mm (6 in.). Check once again that all hoses and wires are disconnected from the engine/transmission.

59. Lower the engine/transmission assembly all the way. Remove the special tools.

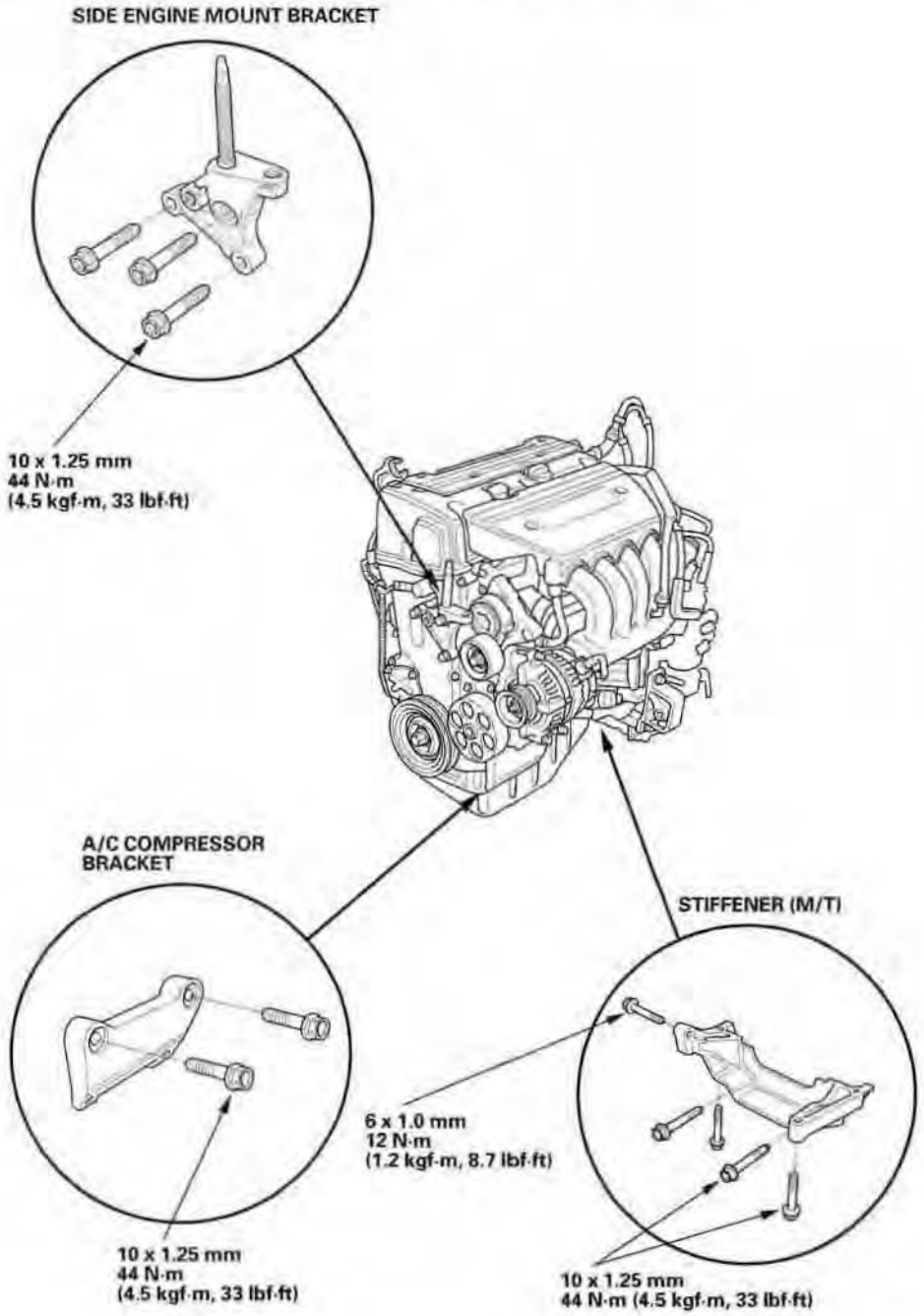
60. Remove the engine/transmission assembly from under the vehicle.

Engine Installation

Special Tools Required
- Engine hanger/adapter VSB02C000015 *
- Engine support hanger, A & Reds AAR-T-12566 *
- Subframe adapter EQS02C000011 *

*: Available through the Honda Tool and Equipment Program at 888-424-6857.

1. Install the accessory brackets, and tighten their bolts to the specified torques.

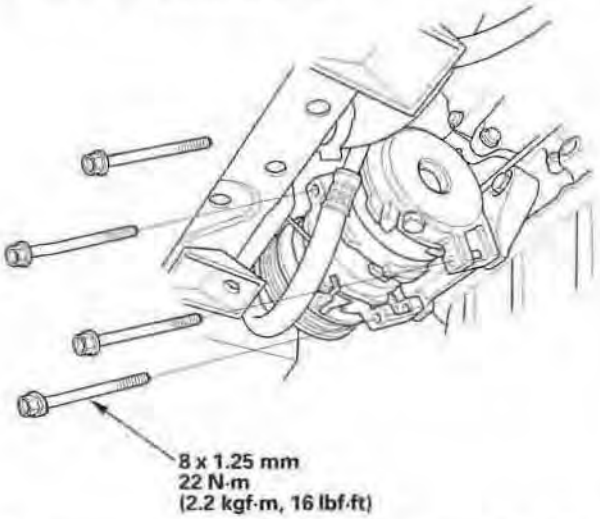


2. Position the engine/transmission assembly under the vehicle. Attach the engine support hanger to the engine, then lift the engine into position in the vehicle.

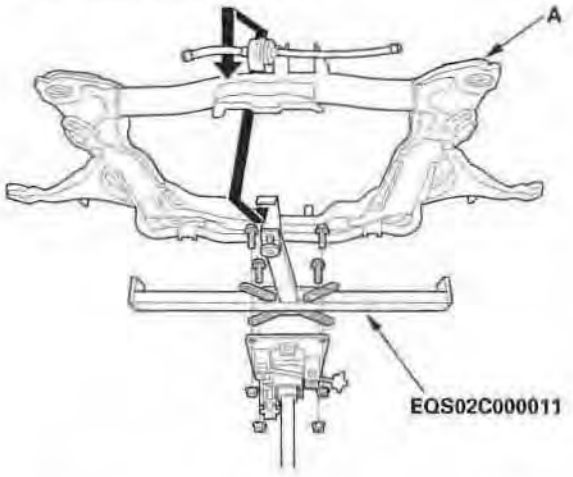
NOTICE

Reinstall the mounting bolts/support nuts in the sequence given. Failure to follow this sequence may cause excessive noise and vibration, and reduce bushing life.

3. Install the A/C compressor.

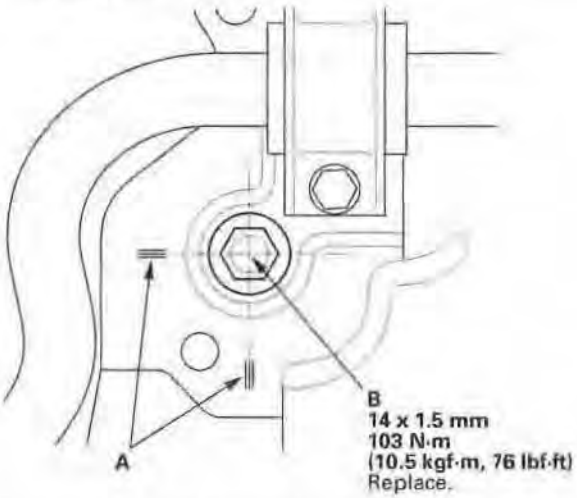


4. Support the subframe (A) with the special tool and a jack, and lift it up to body.

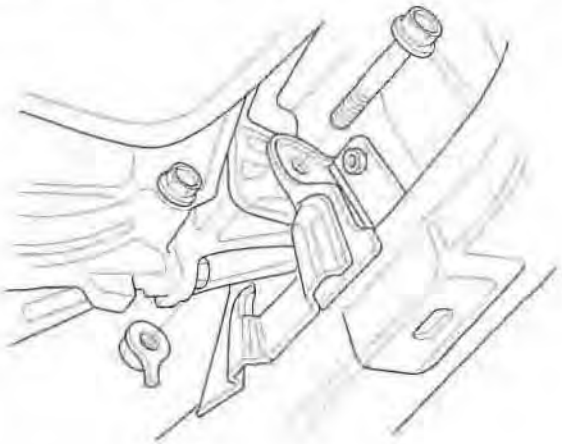


5. Loosely install the new subframe mounting bolts. Remove the special tool.

6. Align the reference marks (A) with the center of the subframe mounting bolts (B), then tighten the bolts to the specified torque.



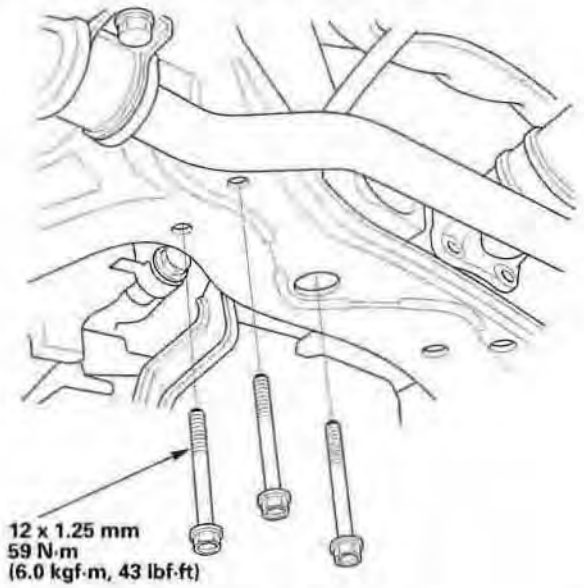
7. Loosely install the new front mount mounting bolt.



(cont'd)

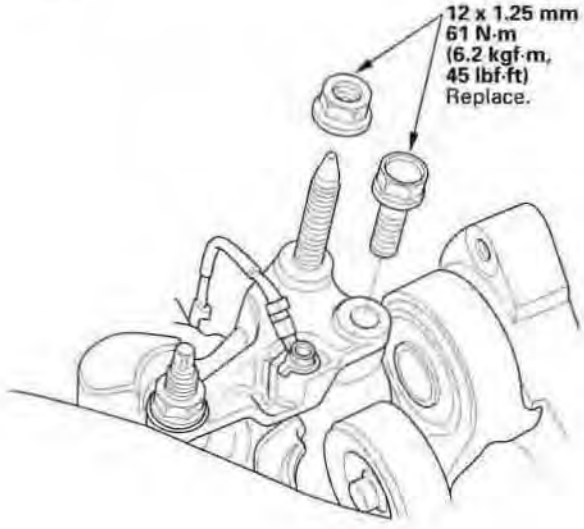
Engine Installation (cont'd)

8. Tighten the rear mount mounting bolts.

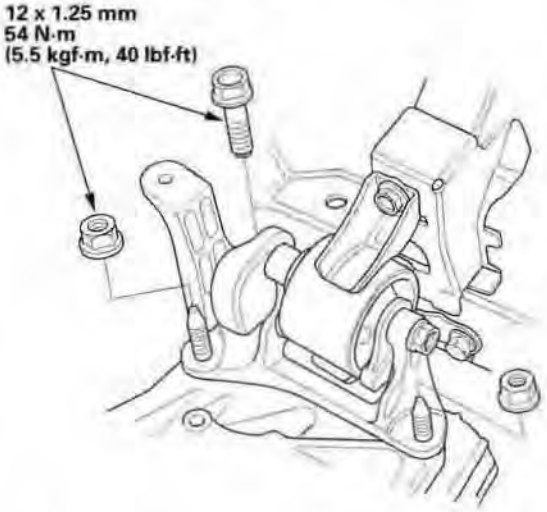


9. Lower the vehicle on the hoist.

10. Tighten the upper engine mount bracket bolt and nut.



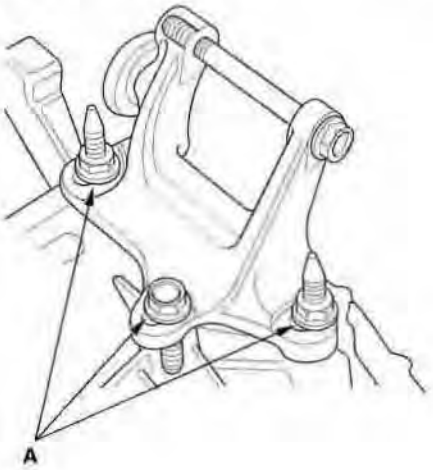
11. M/T model: Tighten the transmission mount bracket support bolt/nuts.



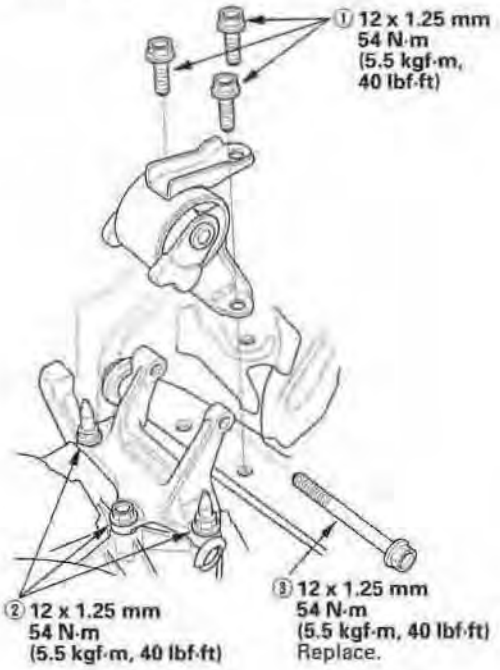
12. A/T model: Support the transmission with a jack and wood block.

13. Remove the engine support hanger.

14. A/T model: Loosen the transmission mount bracket support bolt/nuts (A).



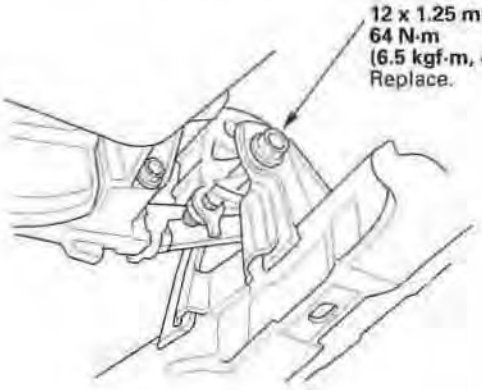
15. A/T model: Install the transmission mount and all bolts/nuts, then tighten the bolts/nuts in the numbered sequence shown.



16. A/T model: Remove the jack and wood block.

17. Raise the vehicle on the hoist to full height.

18. Tighten the front mount mounting bolt.



19. 4WD model: Install the propeller shaft on the transfer assembly:

    - Manual transmission (see step 3 on page 13-63)
    - Automatic transmission (see step 18 on page 14-202)

20. A/T model: Install the shift cable:

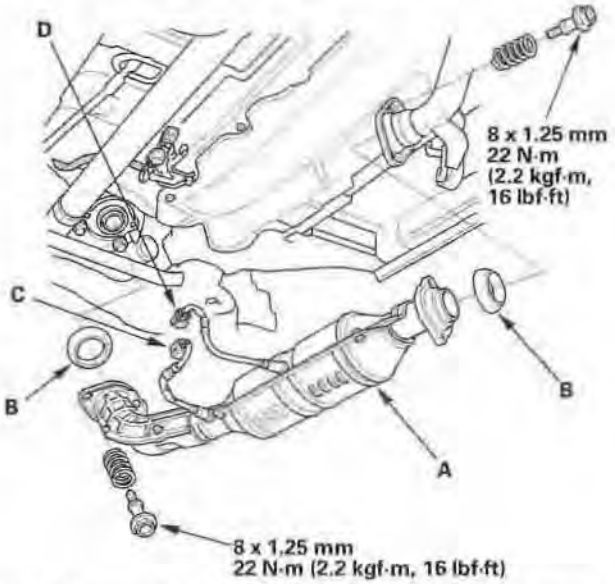
    - 2WD (see step 25 on page 14-204)
    - 4WD (see step 24 on page 14-203)

21. Install a new set ring on the end of each driveshaft, then install the driveshafts. Make sure each ring "clicks" into place on the differential and intermediate shafts.

22. Connect the suspension lower arm ball joints (see page 18-19).

23. Connect the stabilizer links (see page 18-17).

24. Install the three way catalytic converter (TWC) assembly (A); use new gaskets (B).

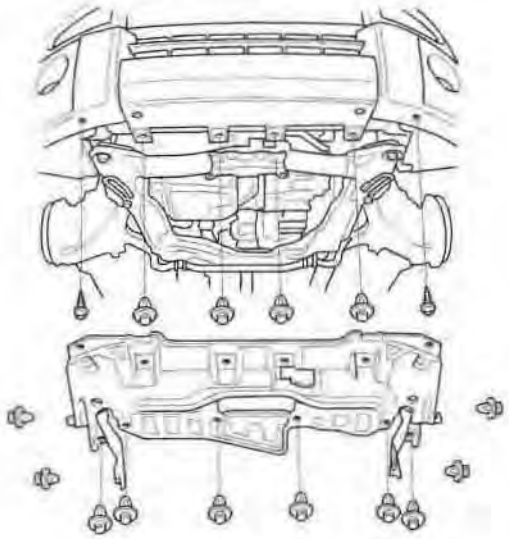


25. Connect the air fuel ratio (A/F) sensor connector (C) and the secondary heated oxygen sensor (secondary HO2S) connector (D).

(cont'd)

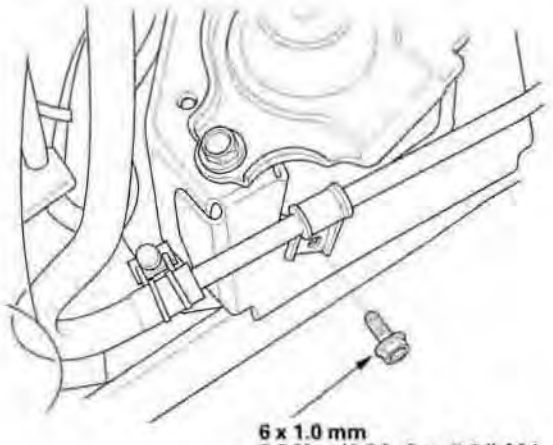
Engine Installation (cont'd)

26. Install the splash shield.

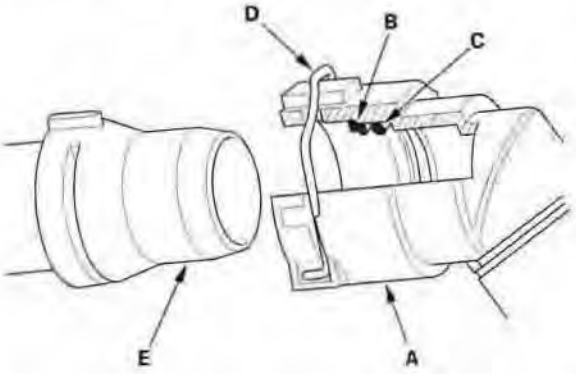


27. Lower the vehicle on the hoist.

28. Tighten the bolt securing the power steering (P/S) line (A/T).



29. Check the quick connector (A) and set ring (B) for cracks or damage. If the connector and/or set ring are cracked or damaged, replace the connector.



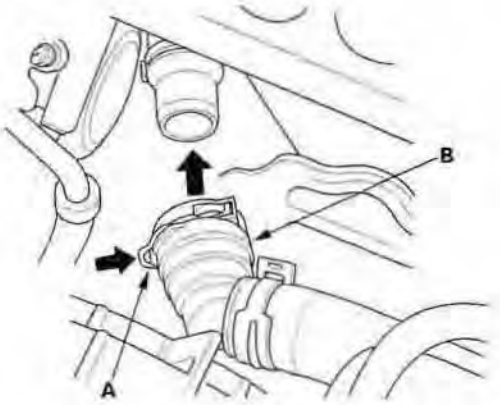
30. Make sure the set ring is in place inside the quick connector. If the set ring is off the connector, replace the quick connector.

31. Replace the O-ring (C) in the quick connector.

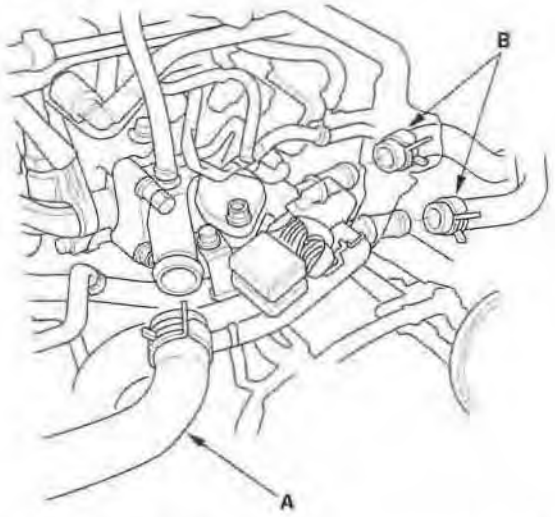
32. Check the lock (D) for damage or deformation. If the lock is damaged or deformed, replace it. When installing the new lock to the connector, push it straight down along the groove.

33. Clean the connecting surface of the thermostat cover (E), then apply clean engine coolant around the connecting surface.

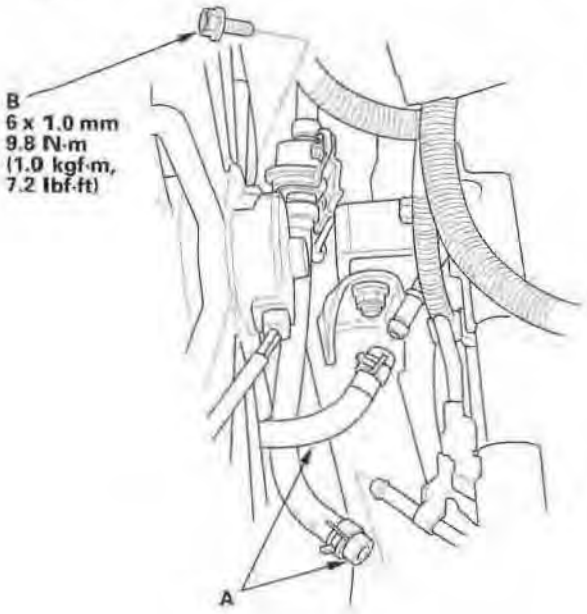
34. Push the lock (A) down, then push the quick connector (B) onto the thermostat cover until you hear it click.



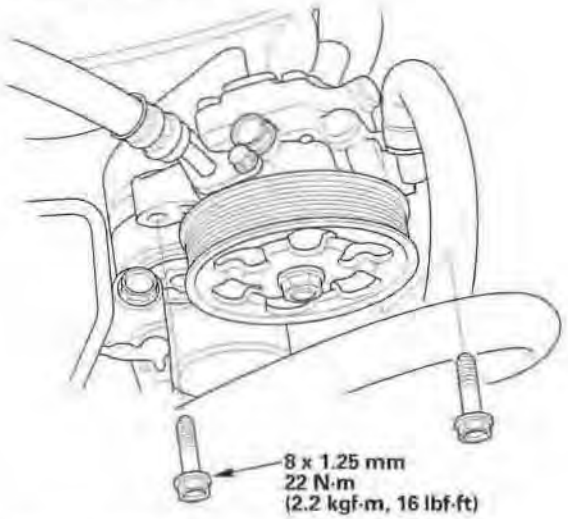
35. Install the upper radiator hose (A) and heater hoses (B).



36. A/T model: Install the automatic transmission fluid (ATF) cooler hoses (A) and ATF filter mounting bolt (B).



37. Install the P/S pump.

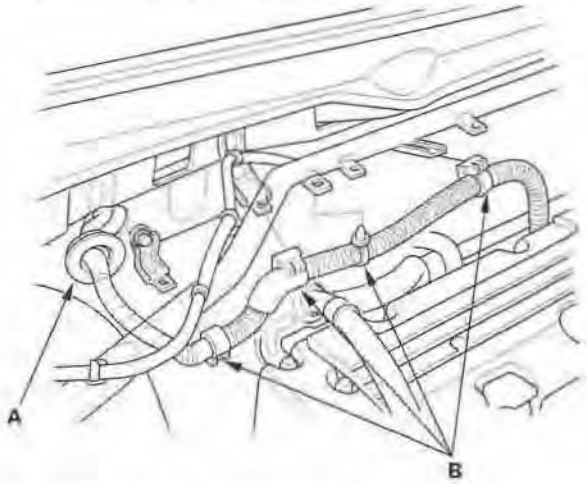


38. Install the drive belt (see page 4-36).

39. M/T model: Install the shift cables (see step 21 on page 13-12).

40. M/T model: Install the clutch slave cylinder and clutch line bracket mounting bolt (see step 20 on page 13-12).

41. Push the engine control module (ECM)/powertrain control module (PCM) connecter through the bulkhead, then install the grommet (A).

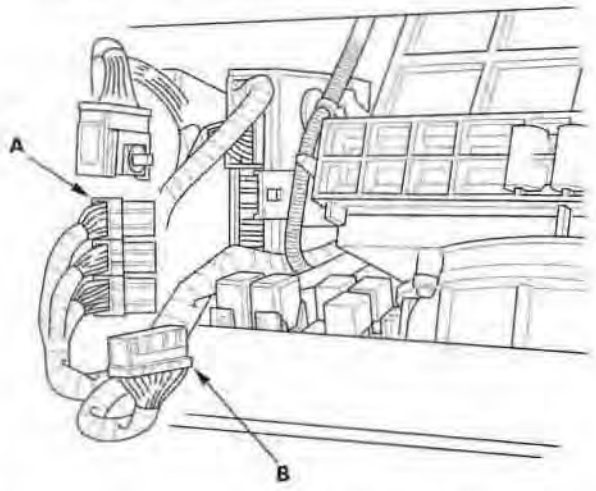


42. Install the harness clamps (B).

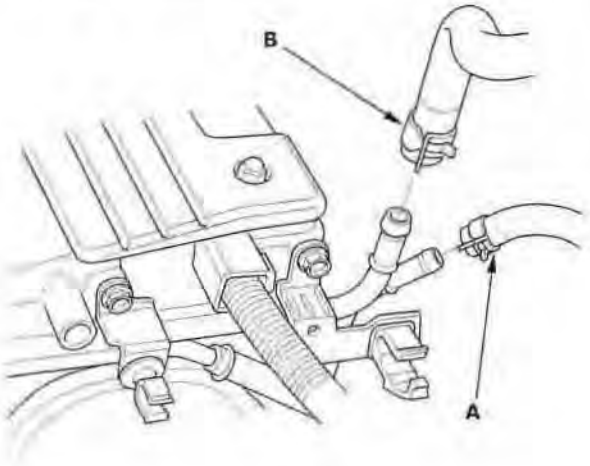
(cont'd)

Engine Installation (cont'd)

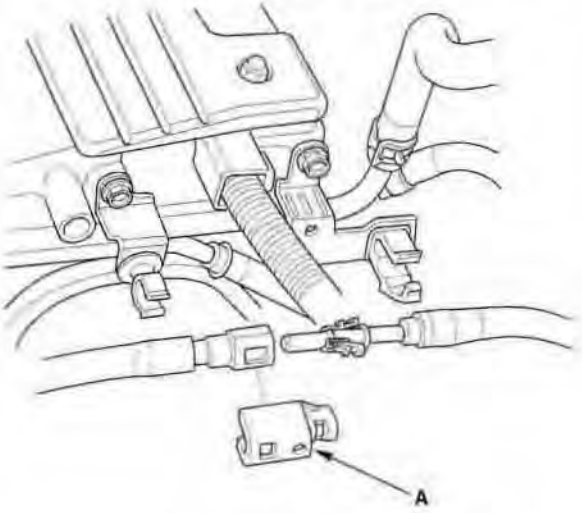
43. Connect the ECM/PCM connectors (A) and ECM/PCM wire harness connector (B).



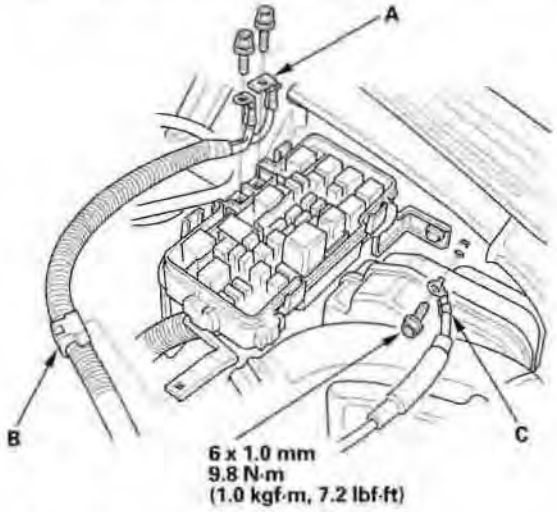
44. Install the evaporative emission (EVAP) canister hose (A) and brake booster vacuum hose (B).



45. Connect the fuel feed hose (see page 11-220), then install the quick-connect fitting cover (A).



46. Install the battery cables (A) and harness clamp (B) to the under-hood fuse/relay box.

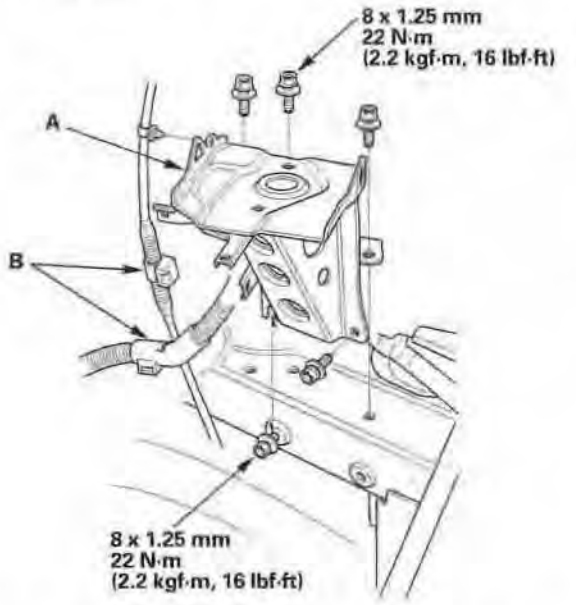


47. Install the ground cable (C).

48. Install the throttle cable (see page 11-234), then adjust it (see page 11-233).

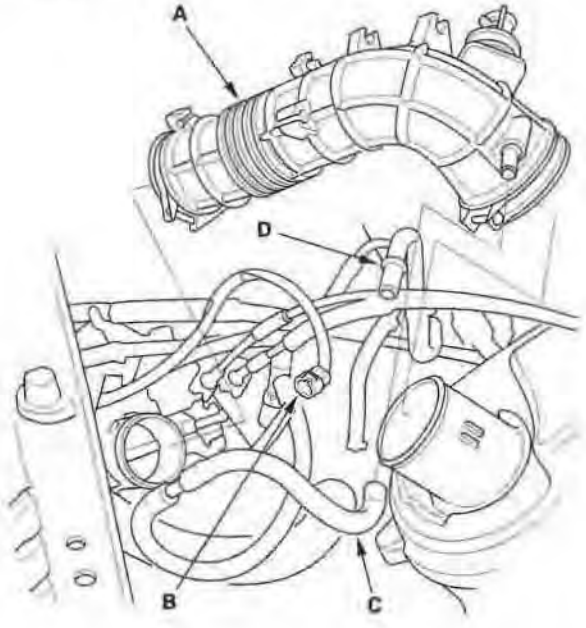
49. Install the cruise control actuator cable (see page 4-54), then adjust it (see page 4-55).

50. Install the battery base (A), then install the harness clamps (B).



51. Install the air cleaner housing (see page 11-232).

52. Install the intake air duct (A), then connect the intake air temperature (IAT) sensor connector (B), and install the vacuum hose (C) and breather pipe (D).



53. Install the battery. Clean the battery posts and cable terminals with sandpaper, then assemble them and apply grease to prevent corrosion.

54. A/T model: Move the shift lever to each gear, and verify that the A/T gear position indicator follows the transmission range switch.

55. M/T model: Check that the transmission shifts into gear smoothly.

56. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

57. Refill the engine with engine oil (see page 8-6).

58. Refill the transmission with fluid:

- Manual transmission (see page 13-3)
- Automatic transmission (see page 14-185)

59. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7 on page 10-7).

60. Do the ECM/PCM reset procedure (see page 11-4).

61. Do the crankshaft position (CKP) pattern clear/CKP pattern learn procedure (see page 11-4).

62. Do the ECM/PCM idle learn procedure (see page 11-207) and the power window control unit reset procedure (see page 22-115).

63. Inspect the idle speed (see page 11-206).

64. Inspect the ignition timing (see page 4-24).

65. Enter the anti-theft codes for the radio, then enter the customer's radio station and XM radio channel presets.

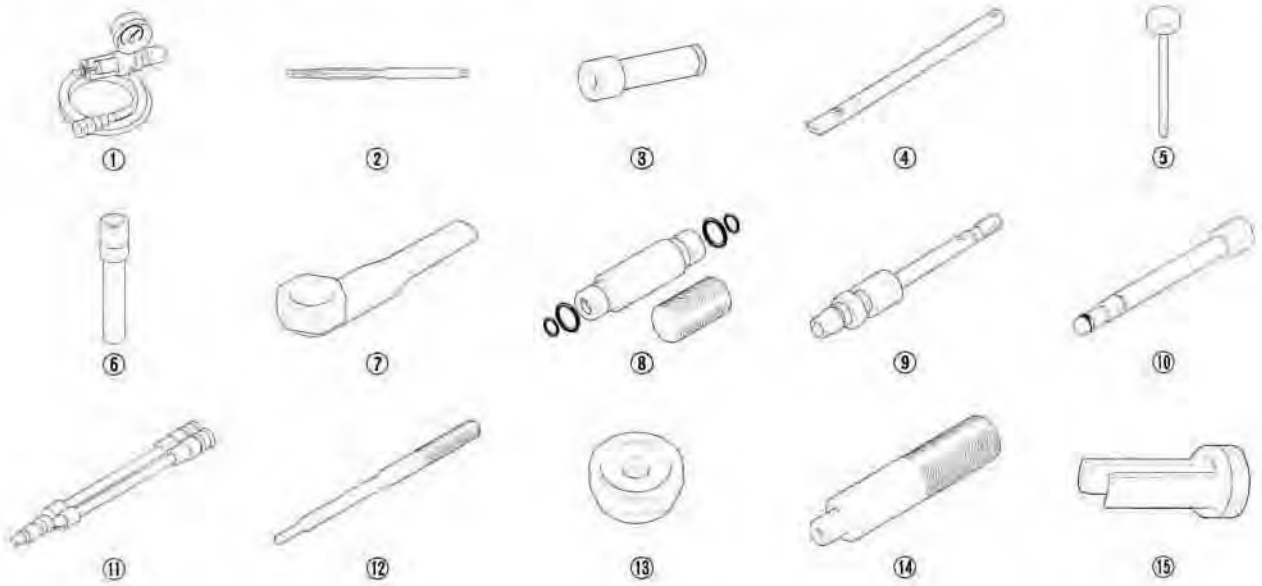
66. Set the clock.

Engine Mechanical

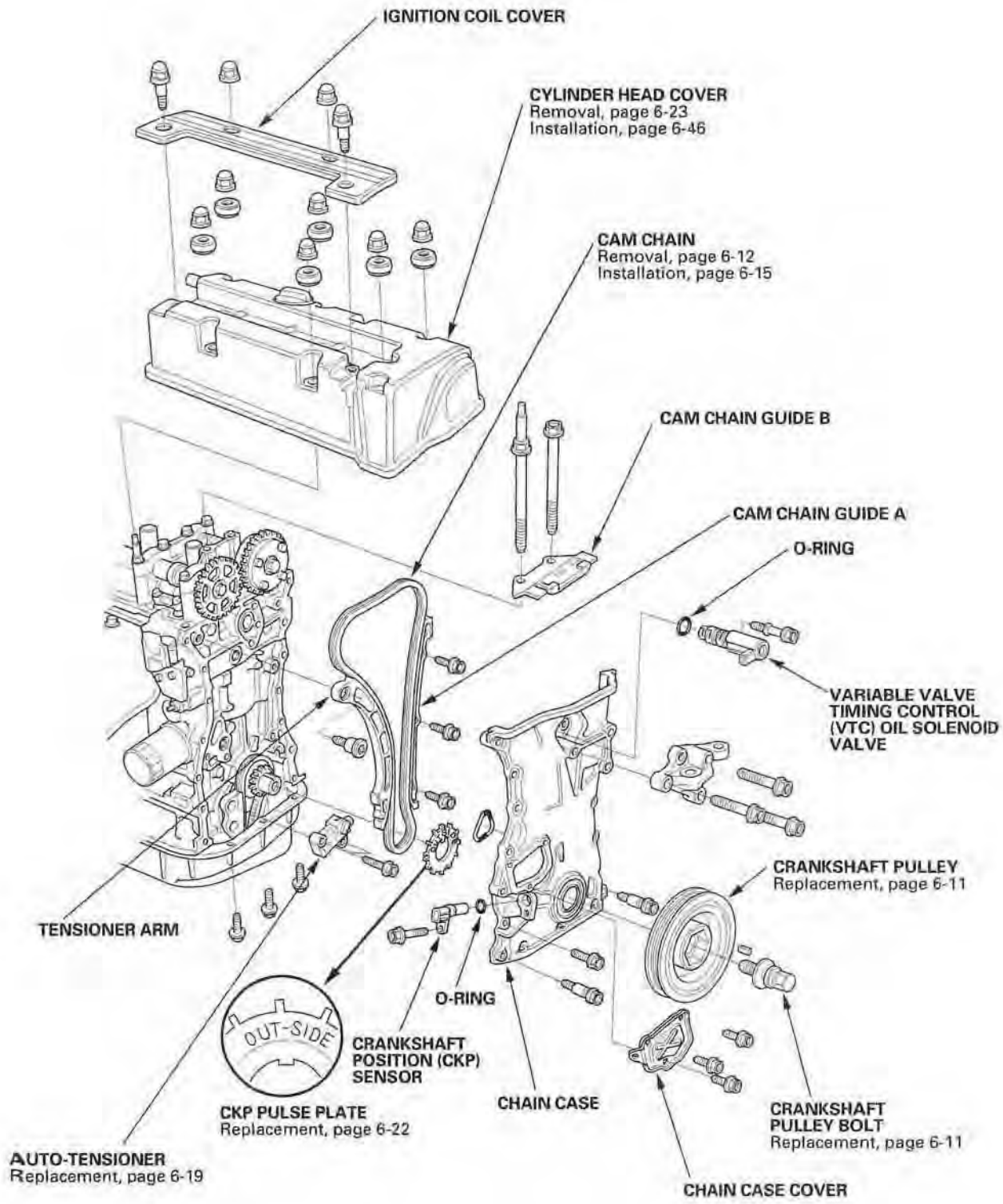
Cylinder Head

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07AAJ-PNAA100	Air Pressure Regulator	1
②	07HAH-PJ7010B	Valve Guide Reamer, 5.5 mm	1
③	07JAA-001020A	Socket, 19 mm	1
④	07JAB-001020B	Holder Handle	1
⑤	07MAA-PR70110	Adjuster	1
⑥	07MAA-PR70120	Locknut Wrench	1
⑦	07NAB-001040A	Holder Attachment, 50 mm	1
⑧	07PAD-0010000	Stem Seal Driver	1
⑨	07ZAJ-PNAA100	VTEC Air Adapter	2
⑩	07ZAJ-PNAA200	VTEC Air Stopper	1
⑪	07ZAJ-PNAA300	Air Joint Adapter	1
⑫	07742-0010100	Valve Guide Driver, 5.5 mm	1
⑬	07746-0010400	Attachment, 52 x 55 mm	1
⑭	07749-0010000	Driver	1
⑮	07757-PJ1010A	Valve Spring Compressor Attachment	1



Component Location Index



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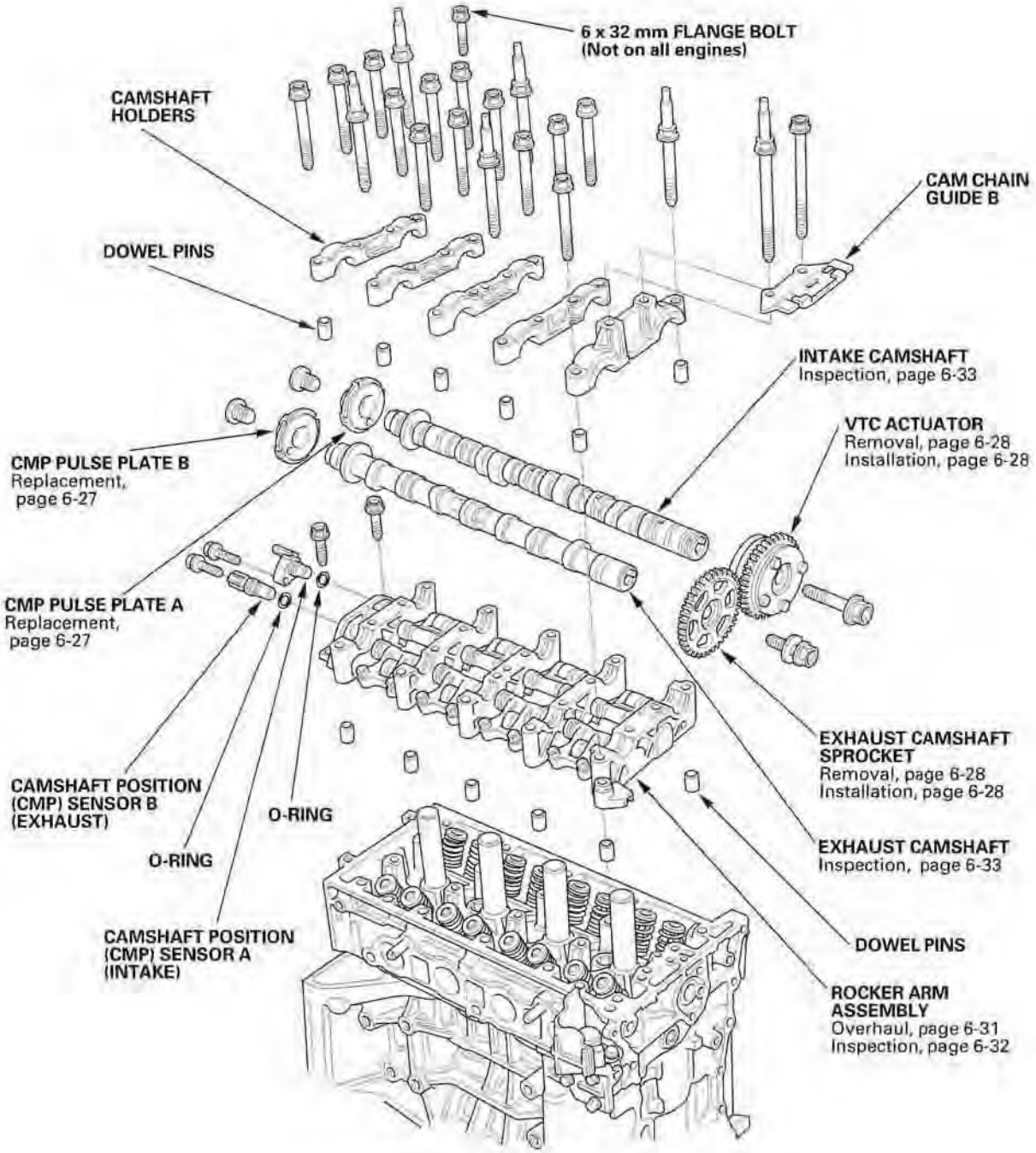
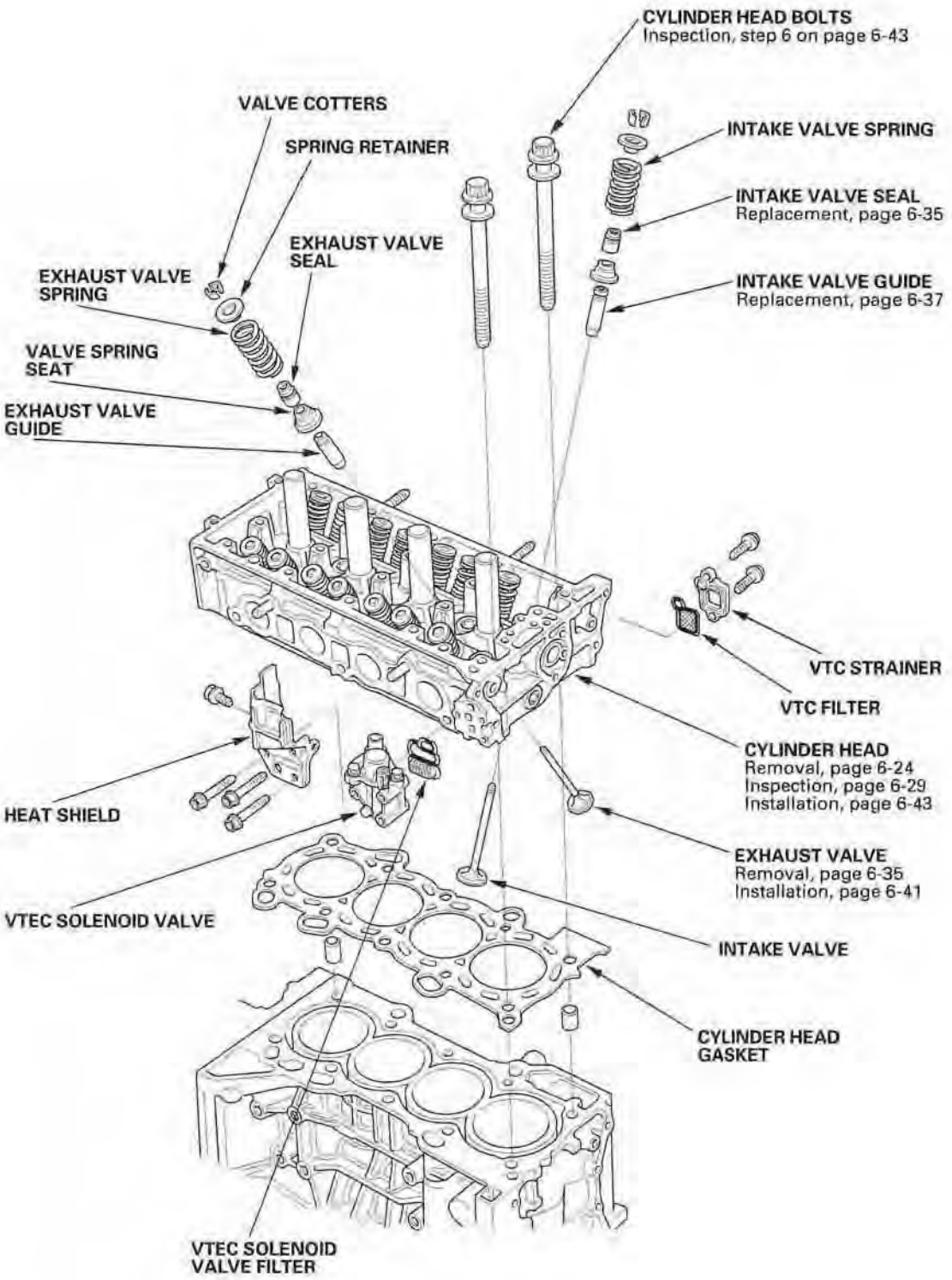
Component Location Index (cont'd)

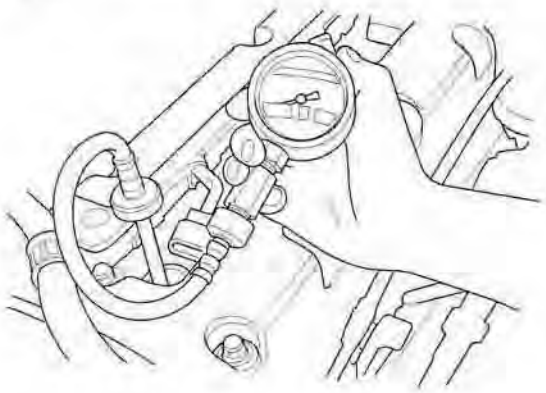



CYLINDER HEAD BOLTS
Inspection, step 6 on page 6-43
VALVE COTTERS
SPRING RETAINER
INTAKE VALVE SPRING
INTAKE VALVE SEAL
Replacement, page 6-35
EXHAUST VALVE SEAL
EXHAUST VALVE SPRING
INTAKE VALVE GUIDE
Replacement, page 6-37
VALVE SPRING SEAT
EXHAUST VALVE GUIDE
VTC STRAINER
VTC FILTER
CYLINDER HEAD
Removal, page 6-24
Inspection, page 6-29
Installation, page 6-43
HEAT SHIELD
EXHAUST VALVE
Removal, page 6-35
Installation, page 6-41
VTEC SOLENOID VALVE
INTAKE VALVE
CYLINDER HEAD GASKET
VTEC SOLENOID VALVE FILTER

Engine Compression Inspection

NOTE: After this inspection, you must reset the engine control module (ECM)/powertrain control module (PCM), using the Honda Diagnostic System (HDS) (see page 11-4), otherwise the ECM/PCM continues to stop the fuel injectors.

1. Warm up the engine to normal operating temperature (cooling fan comes on).
2. Turn the ignition switch OFF.
3. Connect the HDS to the data link connector (DLC) (see step 2 on page 11-3).
4. Select PGM-FI, INSPECTION, and then ALL INJECTORS OFF on the HDS.
5. Remove the four ignition coils (see page 4-25).
6. Remove the four spark plugs.
7. Attach the compression gauge to the spark plug hole.



8. Open the throttle fully, then crank the engine with the starter motor and measure the compression.

   Compression Pressure:
   Above 930 kPa (9.5 kgf/cm², 135 psi)

9. Measure the compression on the remaining cylinders.

   Maximum Variation:
   Within 200 kPa (2.0 kgf/cm², 28 psi)

10. If the compression is not within specifications, check the following items, then remeasure the compression.

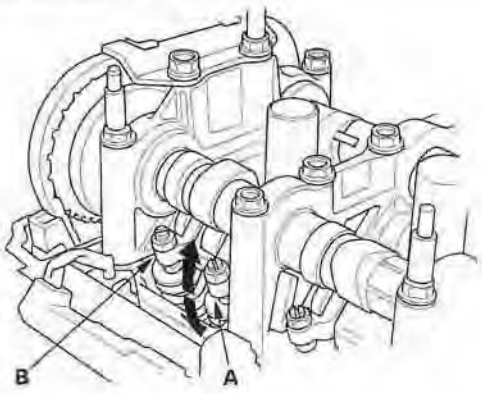
    - Damaged or worn valves and seats
    - Damaged cylinder head gasket
    - Damaged or worn piston rings
    - Damaged or worn piston and cylinder bore

11. Select the ECM/PCM reset (see page 11-4) to cancel ALL INJECTORS OFF.
12. Do the ECM/PCM idle learn procedure (see page 11-207).

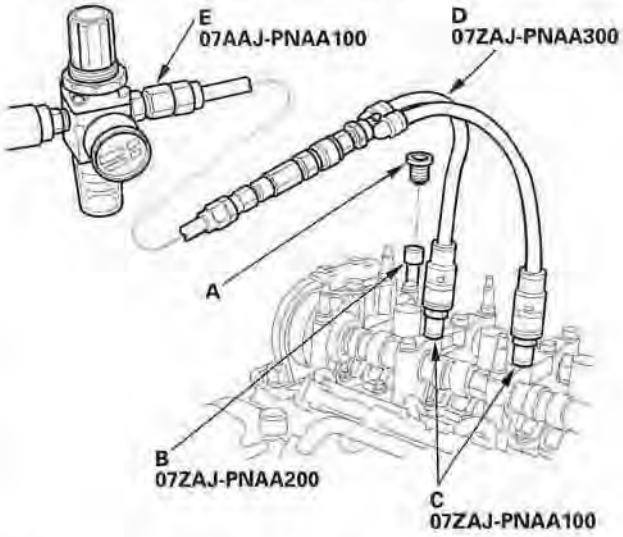
VTEC Rocker Arm Test

Special Tools Required
- Air pressure regulator 07AAJ-PNAA100
- VTEC air adapter 07ZAJ-PNAA100
- VTEC air stopper 07ZAJ-PNAA200
- Air joint adapter 07ZAJ-PNAA300

1. Start the engine and let it run for 5 minutes, then turn the ignition switch OFF.
2. Remove the cylinder head cover (see page 6-23).
3. Set the No. 1 piston at top dead center (TDC) (see step 1 on page 6-12).
4. Verify that the intake primary rocker arm (A) moves independently of the intake secondary rocker arm (B).
   - If the intake primary rocker arm moves freely, go to step 5.
   - If the intake primary rocker arm does not move, remove the primary and secondary rocker arms as an assembly and check that the pistons in the secondary and primary rocker arms move smoothly. If any rocker arm needs replacing, replace the primary and secondary rocker arms as an assembly, and test.



5. Repeat step 4 on the remaining intake primary rocker arms with each piston at TDC. When all the primary rocker arms pass the test, go to step 6.
6. Inspect the valve clearance (see page 6-9).
7. Check that the air pressure on the shop air compressor gauge indicates over 400 kPa (4.0 kgf/cm², 57 psi).
8. Remove the sealing bolt (A) from the relief hole, and install the VTEC air stopper (B).



9. Remove the No. 2 and No. 3 camshaft holder bolts, and install the VTEC air adapters (C) finger-tight.
10. Connect the air joint adapter (D) and air pressure regulator (E).

(cont'd)

VTEC Rocker Arm Test (cont'd)

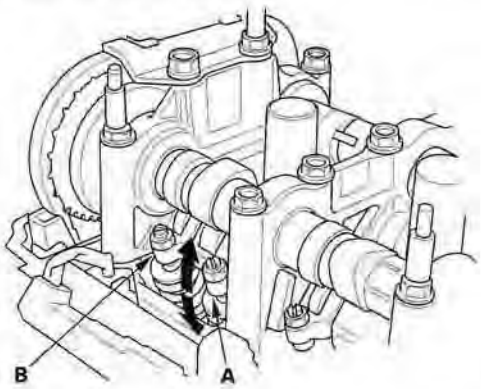
11. Loosen the valve on the regulator, and apply the specified air pressure.

    Specified Air Pressure:
    290 kPa (3.0 kgf/cm², 42 psi)

    NOTE: If the synchronizing piston does not move after applying air pressure, move the primary or secondary rocker arm up and down manually by rotating the crankshaft clockwise.

12. With the specified air pressure applied, move the intake primary rocker arm (A) for the No. 1 cylinder. The primary rocker arm and secondary rocker arm (B) should move together.

    If the intake secondary rocker arm does not move, remove the primary and secondary rocker arms as an assembly, and check that the pistons in the primary and secondary rocker arms move smoothly. If any rocker arm needs replacing, replace the primary and secondary rocker arms as an assembly, and test.



13. Repeat steps 11 and 12 for the remaining cylinders. Be sure to set the cylinder's piston at TDC before beginning work.

14. Remove the special tools.

15. Tighten the camshaft holder mounting bolts to 22 N·m (2.2 kgf·m, 16 lbf·ft).

16. Tighten the sealing bolt to 20 N·m (2.0 kgf·m, 14 lbf·ft).

17. Install the cylinder head cover (see page 6-46).

VTC Actuator Inspection

1. Remove the cam chain (see page 6-12).

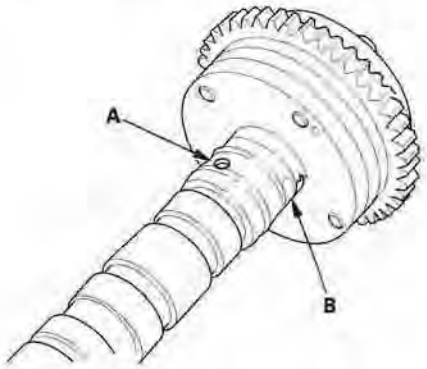
2. Loosen the rocker arm adjusting screws (see step 2 on page 6-30).

3. Remove the camshaft holders (see step 3 on page 6-30).

4. Remove the intake camshaft.

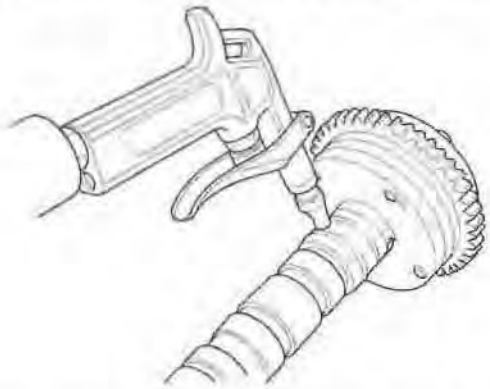
5. Check that the variable valve timing control (VTC) actuator is locked by turning the VTC actuator clockwise and counterclockwise. If the VTC actuator does not lock, replace the VTC actuator.

6. Seal the advance holes (A) and retard holes (B) in the No. 1 camshaft journal with tape.



7. Punch a hole in the tape over one of the advance holes.

8. Apply air to the advance hole to release the lock.



9. Check that the VTC actuator moves smoothly. If the VTC actuator does not move smoothly, replace the VTC actuator.

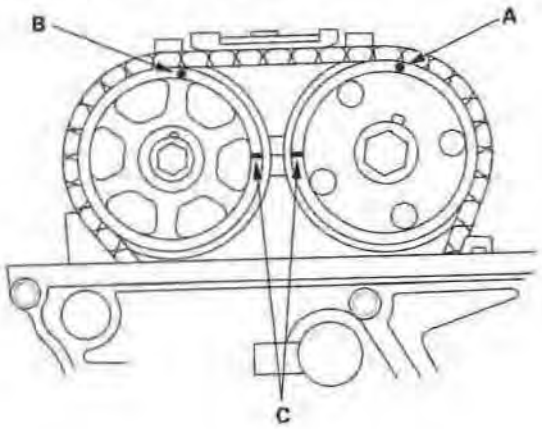
10. Remove the tape from the No. 1 camshaft journal.
11. Make sure the punch marks on the VTC actuator and exhaust camshaft sprocket are facing up, then set the camshafts in the rocker shaft holder (see step 6 on page 6-42).
12. Set the camshaft holders and chain guide B in place (see step 7 on page 6-42).
13. Tighten the camshaft holder bolts to the specified torque (see step 8 on page 6-42).
14. Install the cam chain (see page 6-15).
15. Adjust the valve clearance (see page 6-9).

Valve Clearance Adjustment

Special Tools Required
- Adjuster 07MAA-PR70110
- Locknut wrench 07MAA-PR70120

NOTE: Adjust the valves only when the cylinder head temperature is less than 100 °F (38 °C).

1. Remove the cylinder head cover (see page 6-23).
2. Set the No. 1 piston at top dead center (TDC). The punch mark (A) on the variable valve timing control (VTC) actuator and the punch mark (B) on the exhaust camshaft sprocket should be at the top. Align the TDC marks (C) on the VTC actuator and exhaust camshaft sprocket.

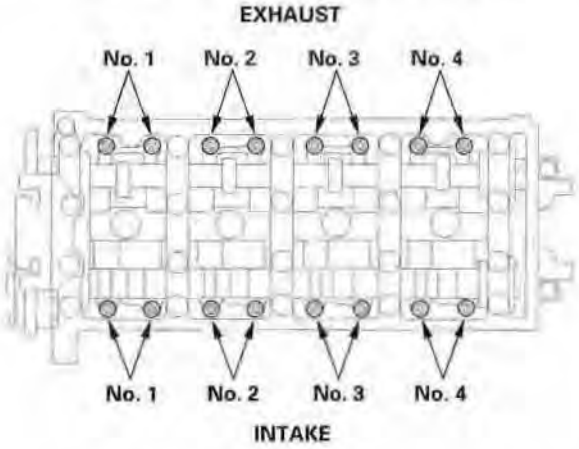


(cont'd)

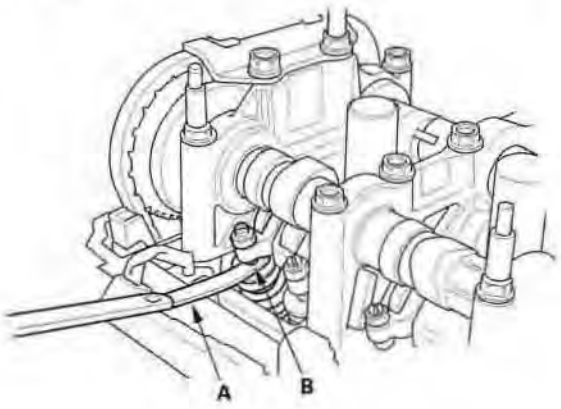
Valve Clearance Adjustment (cont'd)

3. Select the correct thickness feeler gauge for the valves you're going to check.

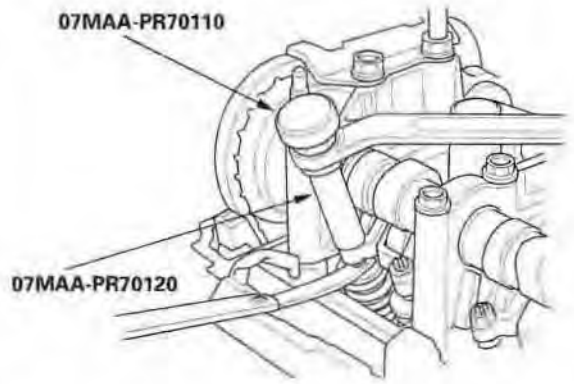
Valve Clearance
Intake: 0.21—0.25 mm (0.008—0.010 in.)
Exhaust: 0.28—0.32 mm (0.011—0.013 in.)



4. Insert the feeler gauge (A) between the adjusting screw (B) and the end of the valve stem, and slide it back and forth; you should feel a slight amount of drag.



5. If you feel too much or too little drag, loosen the locknut with the special tools, and turn the adjusting screw until the drag on the feeler gauge is correct.

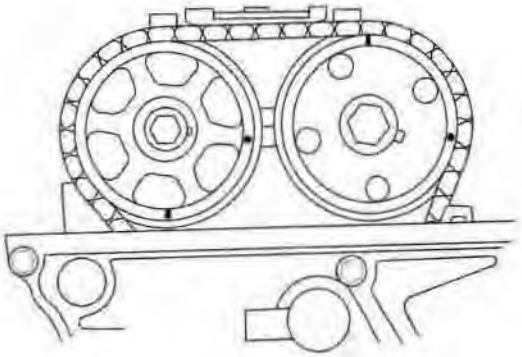


6. Tighten the locknut.

Specified Torque
Intake: 20 N·m (2.0 kgf·m, 14 lbf·ft)
Exhaust: 14 N·m (1.4 kgf·m, 10 lbf·ft)

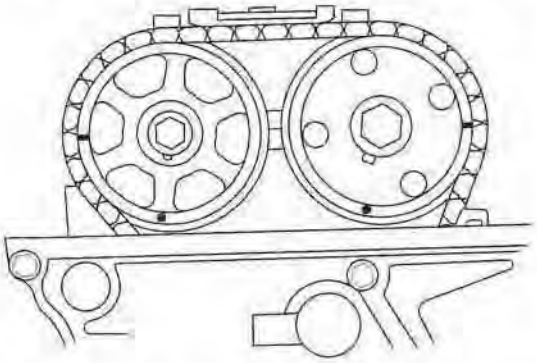
7. Recheck the valve clearance. Repeat the adjustment if necessary.

8. Rotate the crankshaft 180 ° clockwise (camshaft pulley turns 90 °).



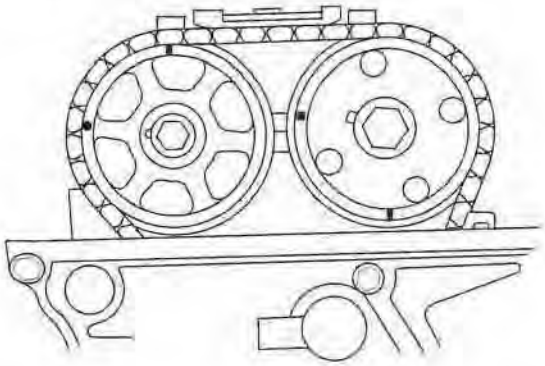
9. Check and, if necessary, adjust the valve clearance on No. 3 cylinder.

10. Rotate the crankshaft 180 ° clockwise (camshaft pulley turns 90 °).



11. Check and, if necessary, adjust the valve clearance on No. 4 cylinder.

12. Rotate the crankshaft 180 ° clockwise (camshaft pulley turns 90 °).



13. Check and, if necessary, adjust the valve clearance on No. 2 cylinder.

14. Install the cylinder head cover (see page 6-46).

Crankshaft Pulley Removal and Installation

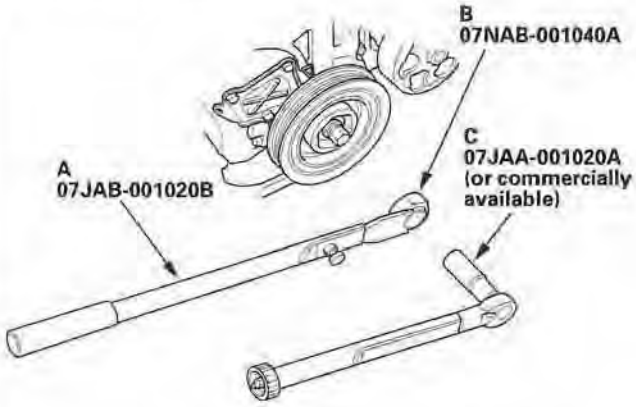
Special Tools Required
- Holder handle 07JAB-001020B
- Holder attachment, 50 mm 07NAB-001040A
- Socket, 19 mm 07JAA-001020A or a commercially available 19 mm socket

Removal

1. Remove the right front tire/wheel.

2. Remove the splash shield (see step 26 on page 5-5).

3. Hold the pulley with holder handle (A) and holder attachment (B).



4. Remove the bolt with a 19 mm socket (C) and breaker bar, then remove the crankshaft pulley.

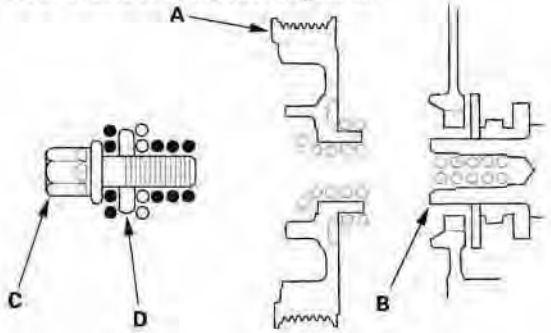
(cont'd)

Crankshaft Pulley Removal and Installation (cont'd)

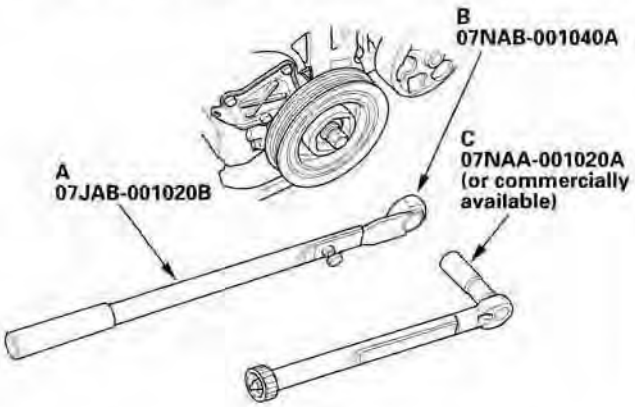
Installation

1. Clean the crankshaft pulley (A), crankshaft (B), bolt (C), and washer (D). Lubricate with the new engine oil as shown.

○: Clean
●: Lubricate with the new engine oil



2. Install the crankshaft pulley, and hold the pulley with holder handle (A) and holder attachment (B).

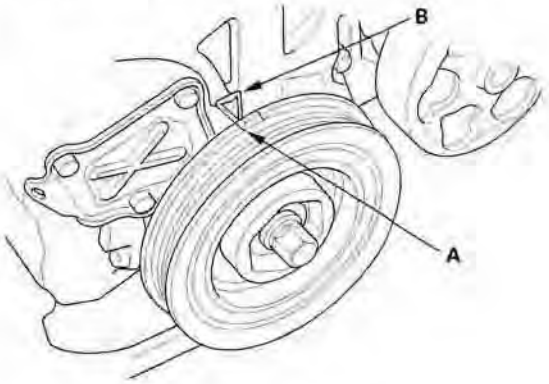


3. Tighten the bolt to 49 N·m (5.0 kgf·m, 36 lbf·ft) with a torque wrench and 19 mm socket (C). Do not use an impact wrench.
4. Tighten the pulley bolt an additional 90 °.
5. Install the splash shield (see step 26 on page 5-14).
6. Install the right front tire/wheel.

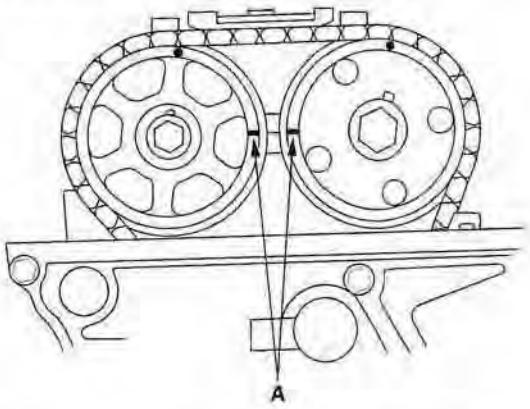
Cam Chain Removal

NOTE: Keep the cam chain away from magnetic fields.

1. Turn the crankshaft pulley so its top dead center (TDC) mark (A) lines up with the pointer (B).

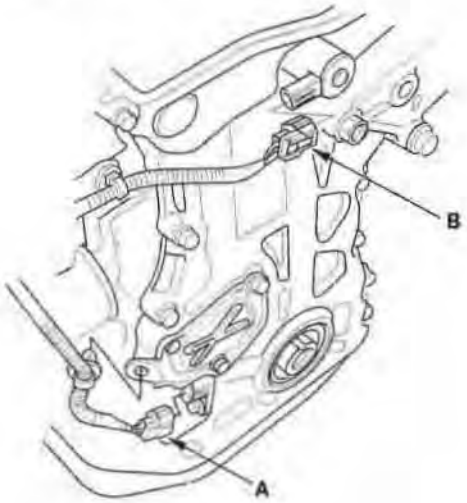


2. Remove the right front tire/wheel.
3. Remove the splash shield (see step 26 on page 5-5).
4. Remove the drive belt (see page 4-36).
5. Remove the cylinder head cover (see page 6-23).
6. Check that the No. 1 piston TDC marks (A) on the variable valve timing control (VTC) actuator and exhaust camshaft sprocket are aligned.



7. Remove the crankshaft pulley (see page 6-11).

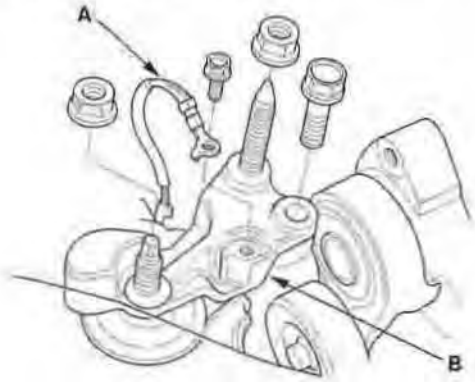
8. Disconnect the crankshaft position (CKP) sensor connector (A) and VTC oil control solenoid valve connector (B).



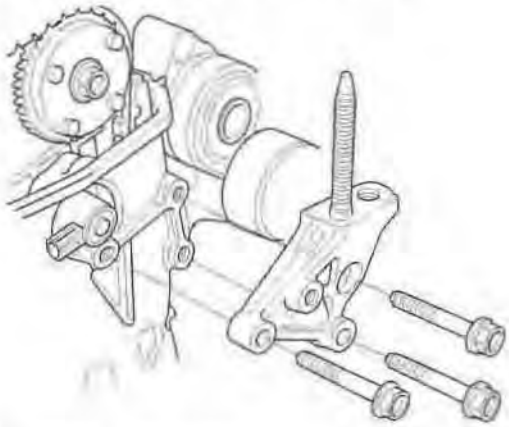
9. Remove the VTC oil control solenoid valve (see page 11-190).

10. Support the engine with a jack and wood block under the oil pan.

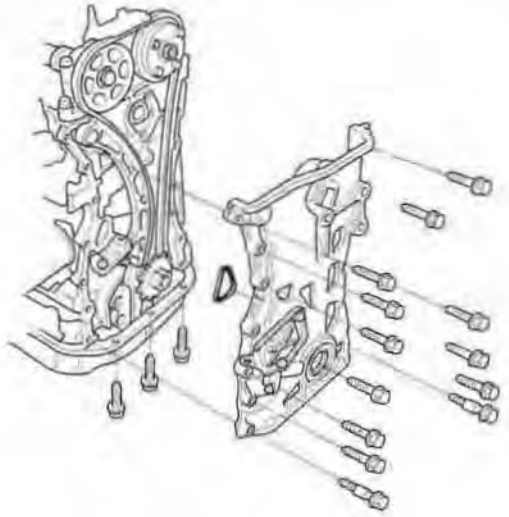
11. Remove the ground cable (A), and remove the upper engine mount bracket (B).



12. Remove the side engine mount bracket.



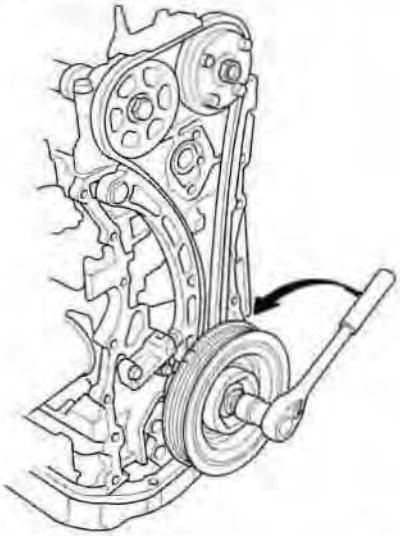
13. Remove the chain case.



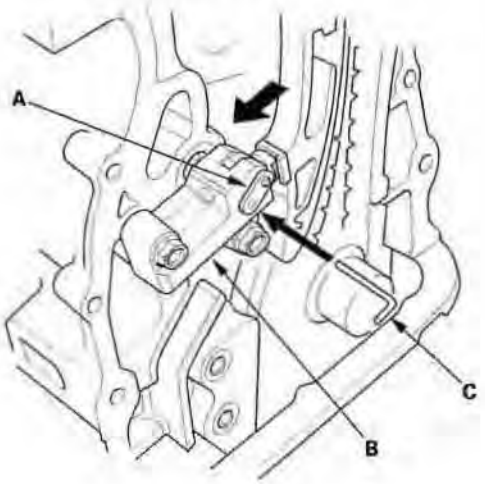
(cont'd)

Cam Chain Removal (cont'd)

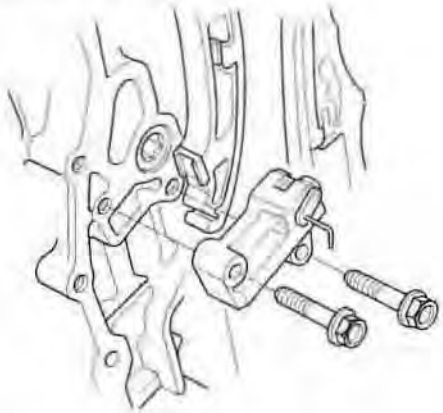
14. Loosely install the crankshaft pulley.
15. Turn the crankshaft counterclockwise to compress the auto-tensioner.



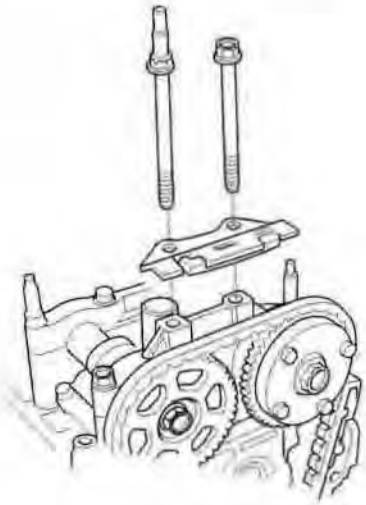
16. Align the holes on the lock (A) and the auto-tensioner (B), then insert a 1.5 mm (0.06 in.) diameter pin (C) into the holes. Turn the crankshaft clockwise to secure the pin.



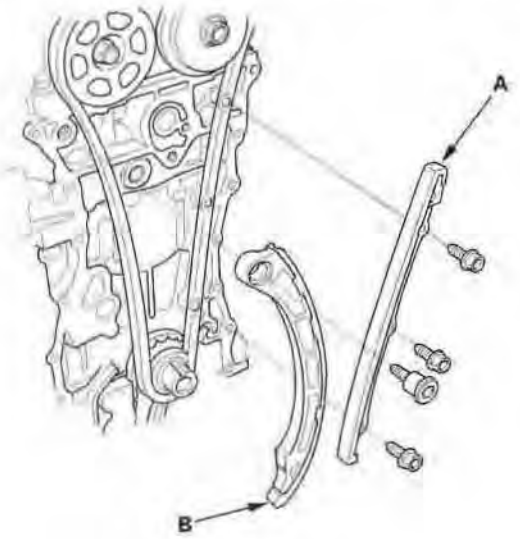
17. Remove the auto-tensioner.



18. Remove the crankshaft pulley.
19. Remove the cam chain guide B.



20. Remove the cam chain guide A and tensioner arm (B).

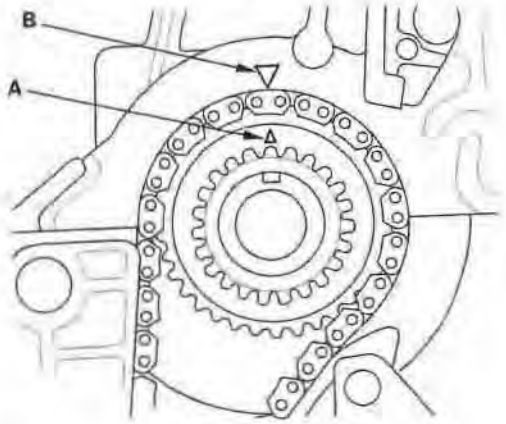


21. Remove the cam chain.

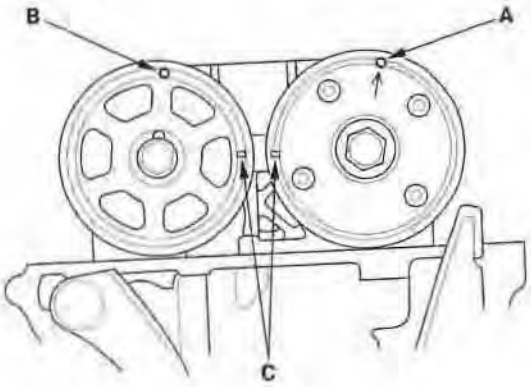
Cam Chain Installation

NOTE: Keep the cam chain away from magnetic fields.

1. Set the crankshaft to top dead center (TDC). Align the TDC mark (A) on the crankshaft sprocket with the pointer (B) on the engine block.



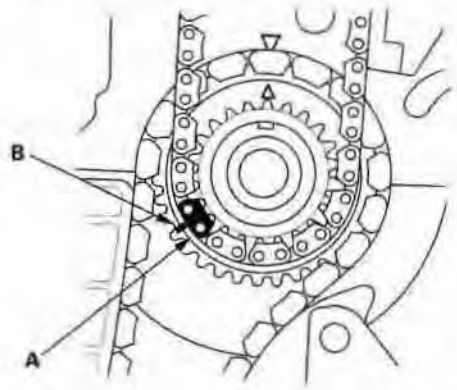
2. Set the camshafts to TDC. The punch mark (A) on the variable valve timing control (VTC) actuator and the punch mark (B) on the exhaust camshaft sprocket should be at the top. Align the TDC marks (C) on the VTC actuator and exhaust camshaft sprocket.



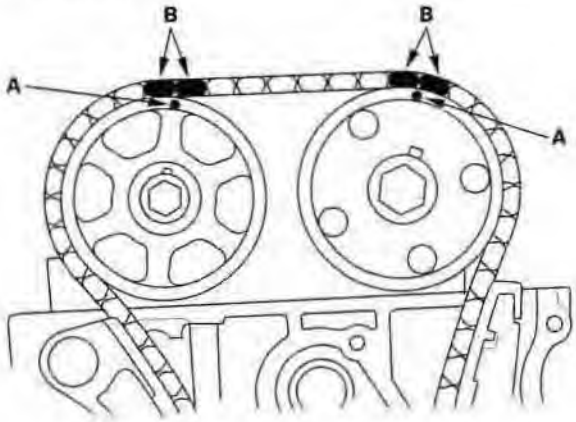
(cont'd)

Cam Chain Installation (cont'd)

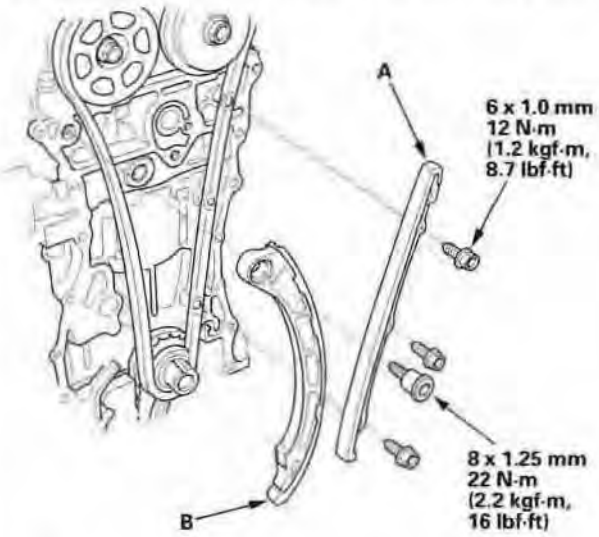
3. Install the cam chain on the crankshaft sprocket with the colored piece (A) aligned with the mark (B) on the crankshaft sprocket.



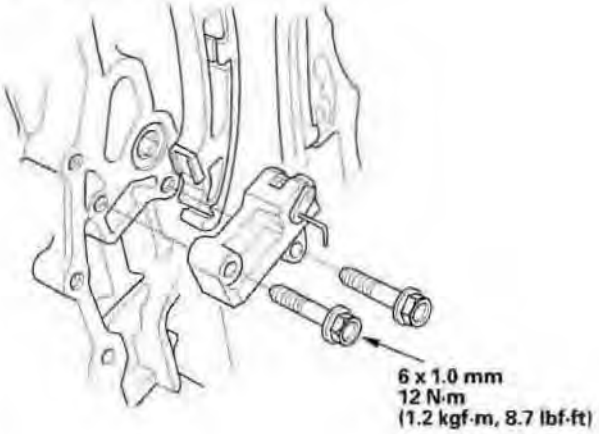
4. Install the cam chain on the VTC actuator and the exhaust camshaft sprocket with the punch marks (A) aligned with the center of the two colored pieces (B).



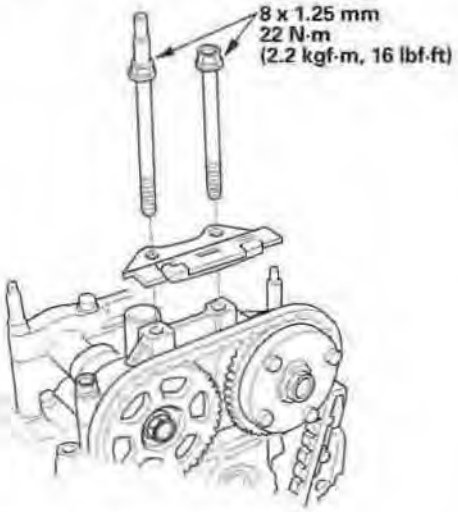
5. Install the cam chain guide A and tensioner arm (B).



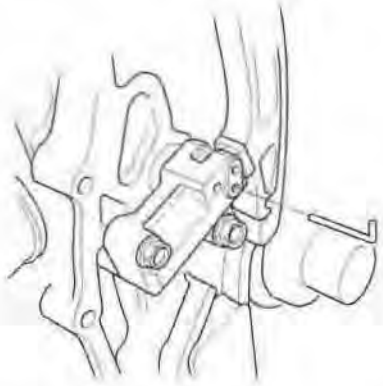
6. Install the auto-tensioner.



7. Install the cam chain guide B.



8. Remove the pin from the auto-tensioner.

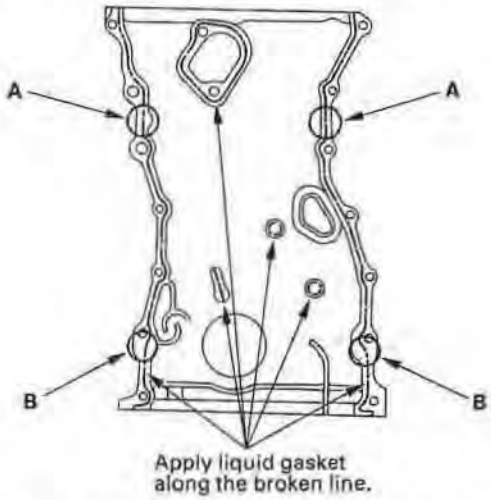


9. Check the chain case oil seal for damage. If the oil seal is damaged, replace the chain case oil seal (see page 6-21).

10. Remove any old liquid gasket from the chain case mating surfaces, bolts, and bolt holes.

11. Clean and dry the chain case mating surfaces.

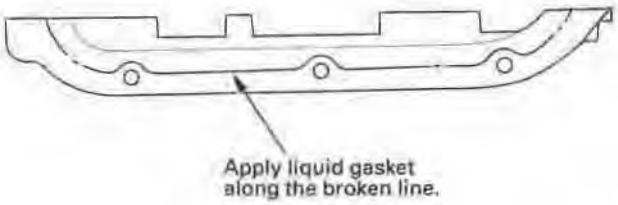
12. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the chain case.



13. Apply liquid gasket to the engine block upper surface contact areas (A) on the chain case and lower block upper surface contact areas (B) of the chain case.

14. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the oil pan mating surface of the chain case.

NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.

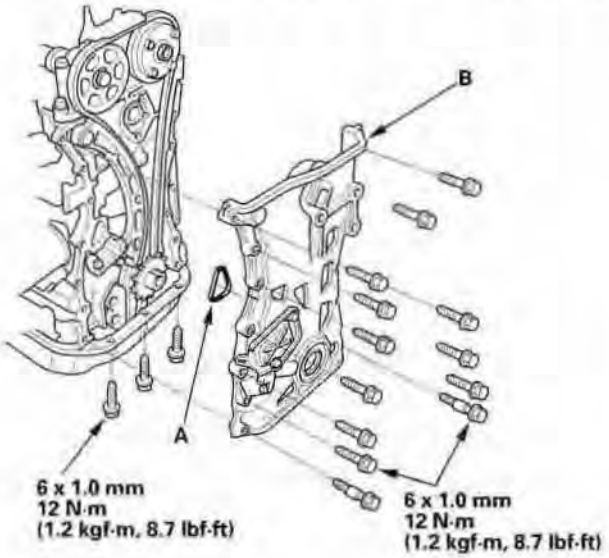


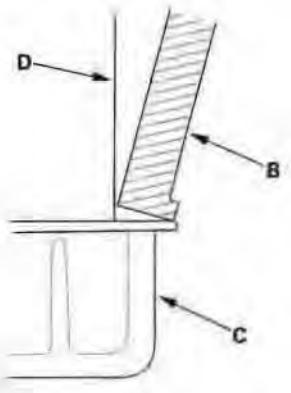
(cont'd)

Cam Chain Installation (cont'd)

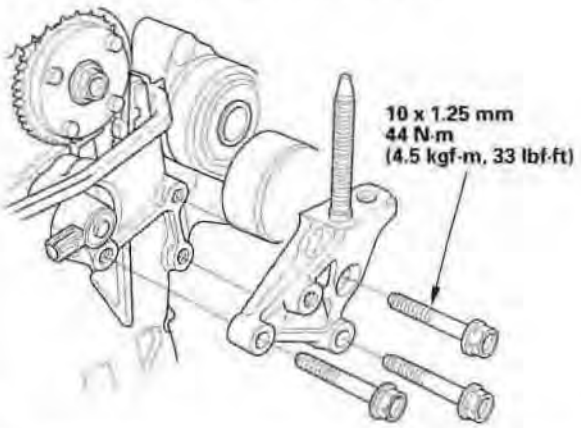
15. Install the new O-ring (A) on the chain case. Set the edge of the chain case (B) to the edge of the oil pan (C), then install the chain case on the engine block (D). Wipe off excess liquid gasket on the oil pan and chain case mating area.

    NOTE: When installing the chain case, do not slide the bottom surface on the oil pan mounting surface.

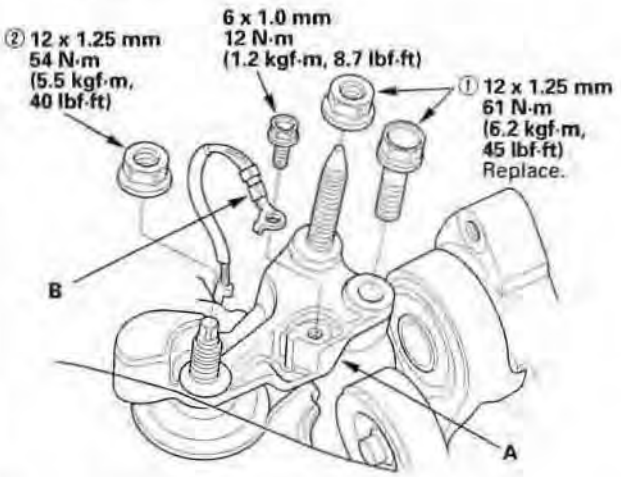




16. Install the side engine mount bracket.



17. Install the upper engine mount bracket (A), then tighten the bolt/nuts in the numbered sequence shown.



18. Install the ground cable (B).

19. Install the variable valve timing control (VTC) oil control solenoid valve (see page 11-190).

20. Connect the crankshaft position (CKP) sensor connector (A) and VTC oil control solenoid valve connector (B).

21. Install the crankshaft pulley (see page 6-12).

22. Install the cylinder head cover (see page 6-46).

23. Install the drive belt (see page 4-36).

24. Install the splash shield (see step 26 on page 5-14).

25. Install the right front tire/wheel.

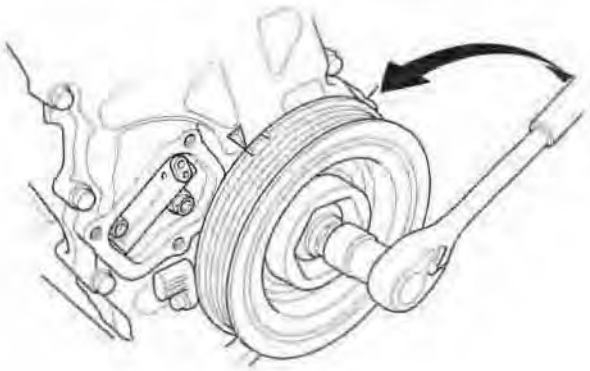
26. Do the CKP pattern clear/CKP learn procedure (see page 11-4).

Auto-tensioner Removal and Installation

Removal

1. Remove the chain case cover.

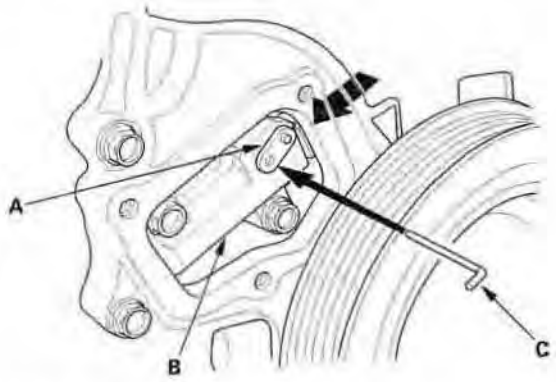
2. Turn the crankshaft counterclockwise to compress the auto-tensioner.



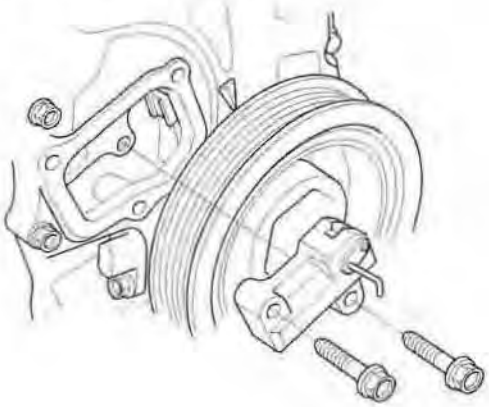
(cont'd)

Auto-tensioner Removal and Installation (cont'd)

3. Align the holes on the lock (A) and the auto-tensioner (B), then insert a 1.5 mm (0.06 in.) diameter pin (C) into the holes. Turn the crankshaft clockwise to secure the pin.

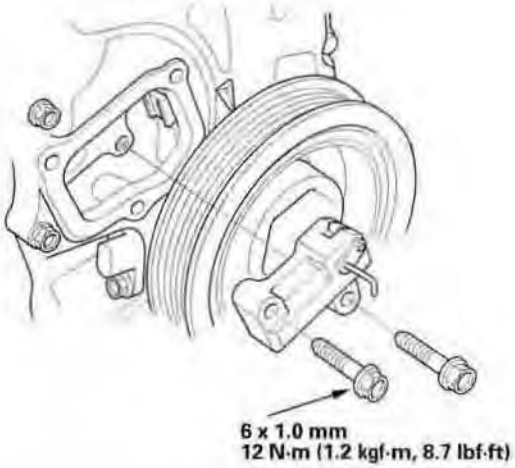


4. Remove the auto-tensioner.

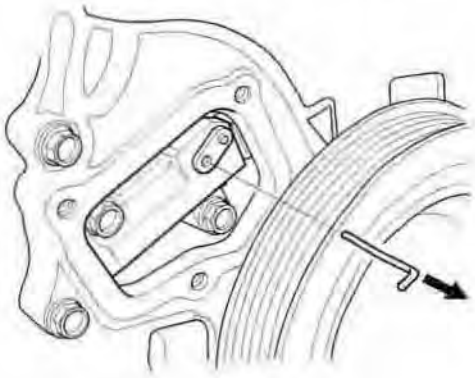


Installation

1. Install the auto-tensioner.



2. Remove the pin from the auto-tensioner.

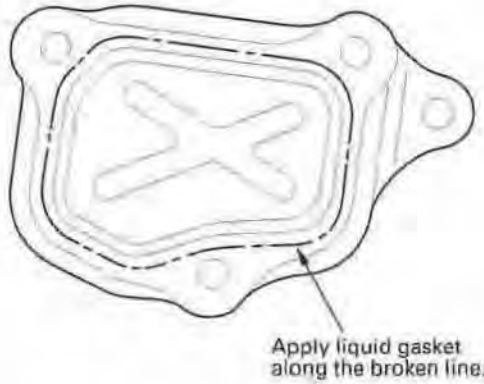


3. Remove any old liquid gasket from the chain case cover mating surfaces, bolts, and bolt holes.

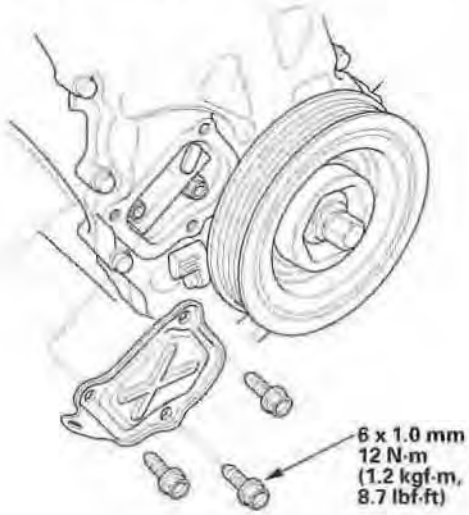
4. Clean and dry the chain case cover mating surfaces.

5. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the chain case mating surface of the chain case cover.

   NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.



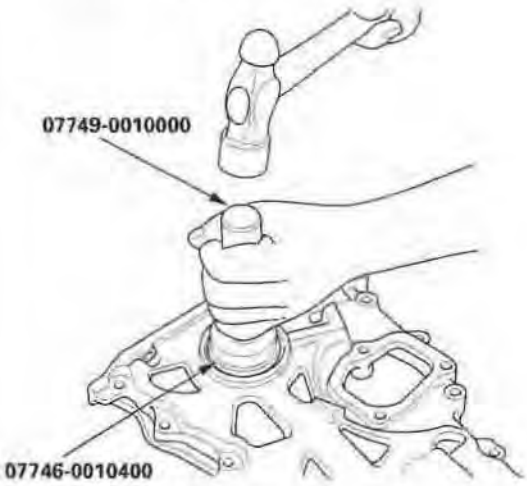
6. Install the chain case cover.



Chain Case Oil Seal Installation

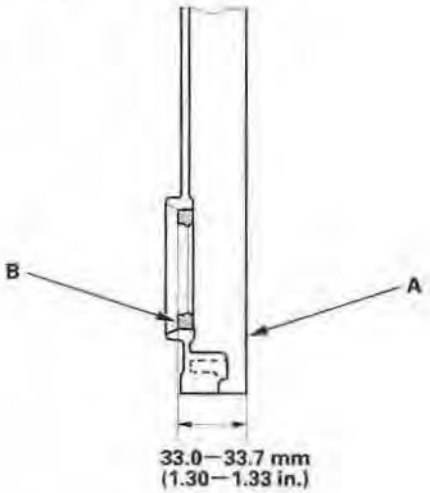
Special Tools Required
- Driver 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400

1. Use the special tools to drive a new oil seal squarely into the chain case to the specified installed height.



2. Measure the distance between the chain case surface (A) and oil seal (B).

   Oil Seal Installed Height:
   33.0—33.7 mm (1.30—1.33 in.)



CKP Pulse Plate Replacement

1. Remove the right front tire/wheel.
2. Remove the splash shield (see step 26 on page 5-5).
3. Remove the drive belt (see page 4-36).
4. Remove the cylinder head cover (see page 6-23).
5. Remove the crankshaft pulley (see page 6-11).
6. Disconnect the crankshaft position (CKP) sensor connector and variable valve timing control (VTC) oil control solenoid valve connector (see step 8 on page 6-13).
7. Remove the VTC oil control solenoid valve (see page 11-190).
8. Support the engine with a jack and wood block under the oil pan.
9. Remove the ground cable, and remove the upper bracket (see step 11 on page 6-13).
10. Remove the side engine mount bracket (see step 12 on page 6-13).
11. Remove the chain case (see step 13 on page 6-13).
12. Remove the CKP pulse plate.

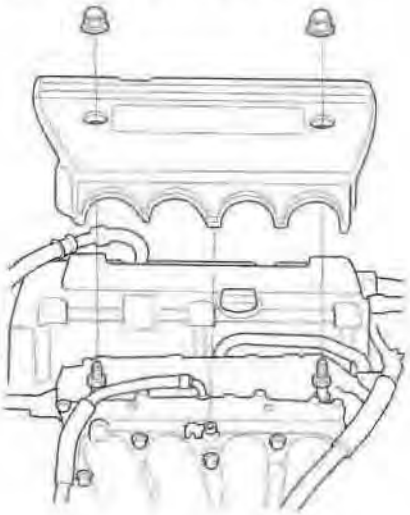
13. Install the CKP pulse plate.
14. Check the chain case oil seal for damage. If the oil seal is damaged, replace the chain case oil seal (see page 6-21).
15. Remove any old liquid gasket from the chain case mating surfaces, bolt, and bolt holes.
16. Clean and dry the chain case mating surfaces.
17. Apply liquid gasket, P/N 08718-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the chain case (see step 12 on page 6-17).
18. Apply liquid gasket to the engine block upper surface contact areas of the chain case and lower block upper surface contact areas of the chain case (see step 13 on page 6-17).
19. Apply liquid gasket, P/N 08718-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the oil pan mating surface of the chain case (see step 14 on page 6-17).

    NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.
20. Install the new O-ring on the chain case. Set the edge of the chain case to the edge of the oil pan, then install the chain case on the engine block (see step 15 on page 6-18).

    NOTE: When installing the chain case, do not slide the bottom surface on the oil pan mounting surface.
21. Install the side engine mount bracket (see step 16 on page 6-18).
22. Install the upper bracket and the ground cable (see step 17 on page 6-18).
23. Install the VTC oil control solenoid valve (see page 11-190).
24. Connect the CKP sensor connector and VTC oil control solenoid valve connector (see step 20 on page 6-19).
25. Install the crankshaft pulley (see page 6-12).
26. Install the cylinder head cover (see page 6-46).
27. Install the drive belt (see page 4-36).
28. Install the splash shield (see step 26 on page 5-14).
29. Install the right front tire/wheel.
30. Do the CKP pattern clear/CKP learn procedure (see page 11-4).

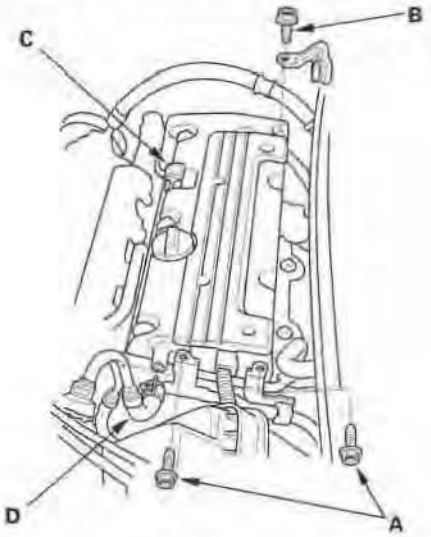
Cylinder Head Cover Removal

1. Remove the intake manifold cover.



2. Remove the four ignition coils (see page 4-25).

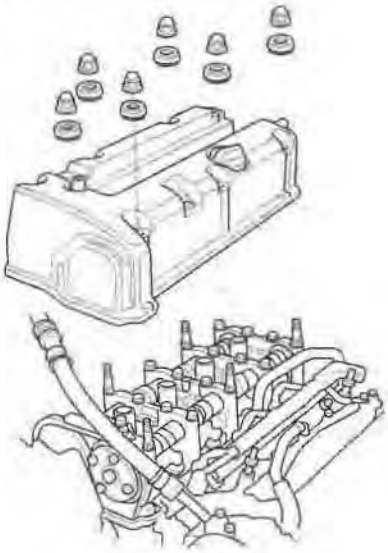
3. Remove the two bolts (A) securing the vacuum line.



4. Remove the bolt (B) securing the power steering hose bracket.

5. Remove the dipstick (C) and breather hose (D).

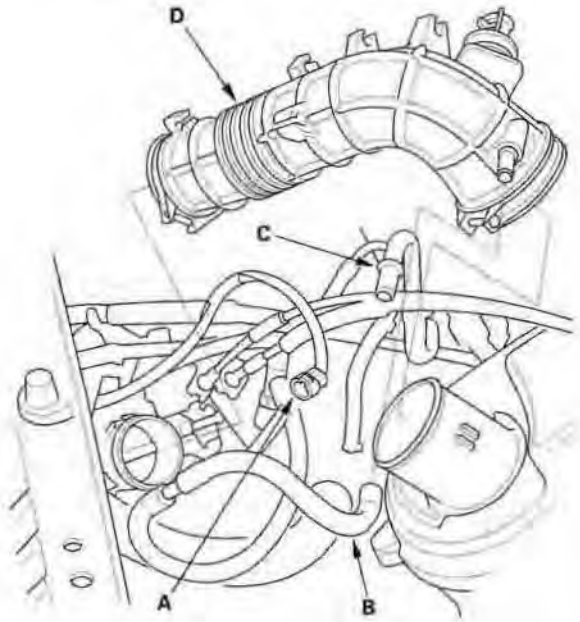
6. Remove the cylinder head cover.



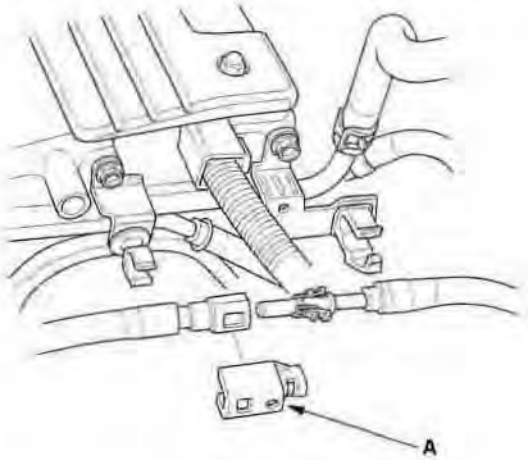
Cylinder Head Removal

NOTE:
- Use fender covers to avoid damaging the painted surfaces.
- To avoid damaging the wires and terminals, unplug the wiring connectors carefully while holding the connector portion.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100 °F (38 °C) before loosening the cylinder head bolts.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.

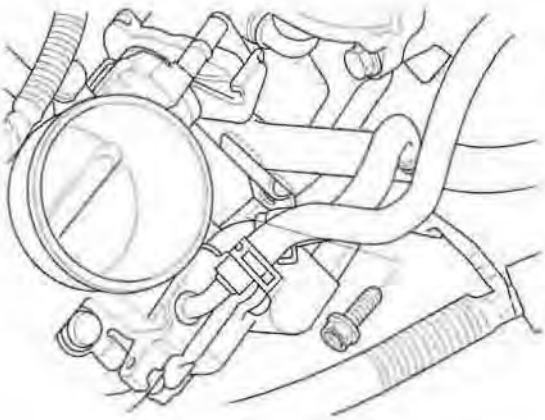
1. Relieve fuel pressure (see page 11-212).
2. Drain the engine coolant (see page 10-6).
3. Remove the drive belt (see page 4-36).
4. Disconnect the intake air temperature (IAT) sensor connector (A).



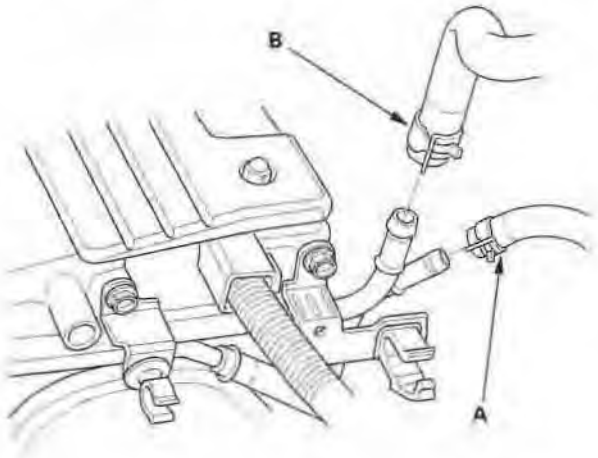
5. Remove the vacuum hose (B) and breather pipe (C), then remove the intake air duct (D).
6. Remove the quick-connect fitting cover (A), then disconnect the fuel feed hose (see page 11-219).



7. Remove the bolt securing the connecting pipe support bracket to the engine block.



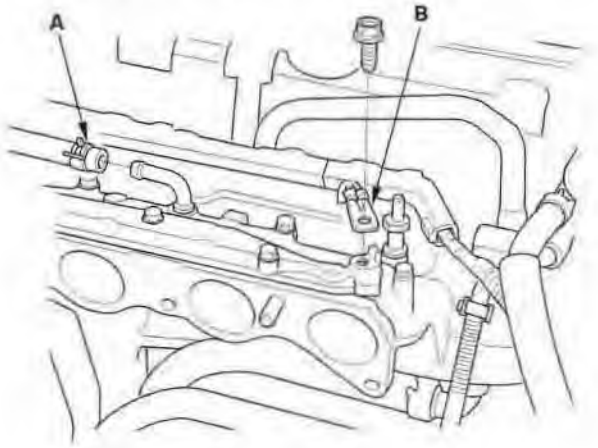
8. Remove the evaporative emission (EVAP) canister hose (A) and brake booster vacuum hose (B).



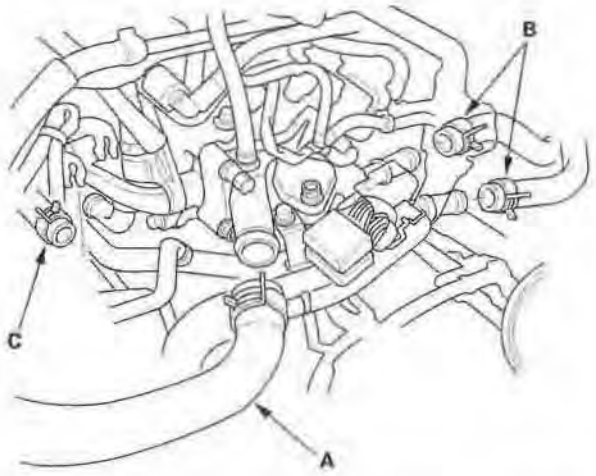
9. Remove the intake manifold (see page 9-3).

10. Remove the exhaust manifold (see page 9-7).

11. Remove the positive crankcase ventilation (PCV) hose (A) and ground cable (B).



12. Remove the upper radiator hose (A), heater hoses (B), and water bypass hose (C).



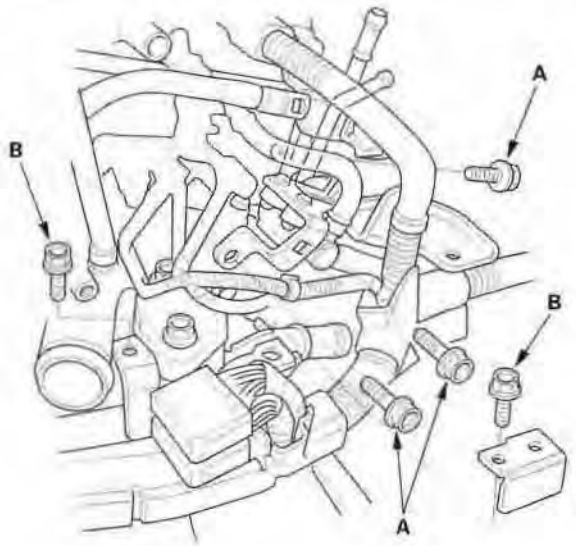
13. Remove the engine wire harness connectors and wire harness clamps from the cylinder head.

- Four injector connectors
- Engine coolant temperature (ECT) sensor connector
- Camshaft position (CMP) sensor A (Intake) connector
- Camshaft position (CMP) sensor B (Exhaust) connector
- VTEC solenoid valve connector
- Engine oil pressure (EOP) sensor connector

(cont'd)

Cylinder Head Removal (cont'd)

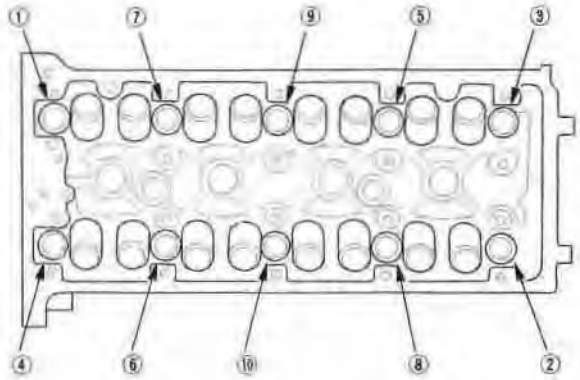
14. Remove the three bolts (A) securing the EVAP canister purge valve bracket and remove the two bolts (B) securing the harness bracket.



15. Remove the cam chain (see page 6-12).

16. Remove the rocker arm assembly (see page 6-30).

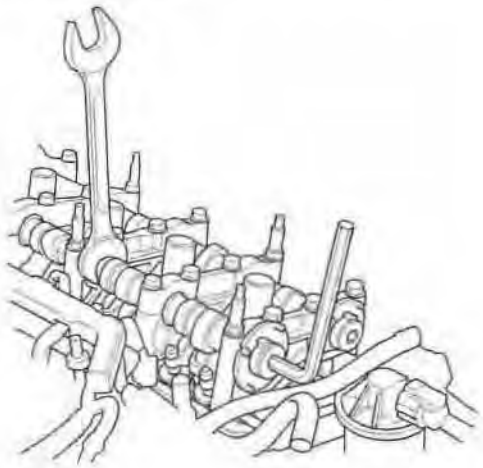
17. Remove the cylinder head bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.



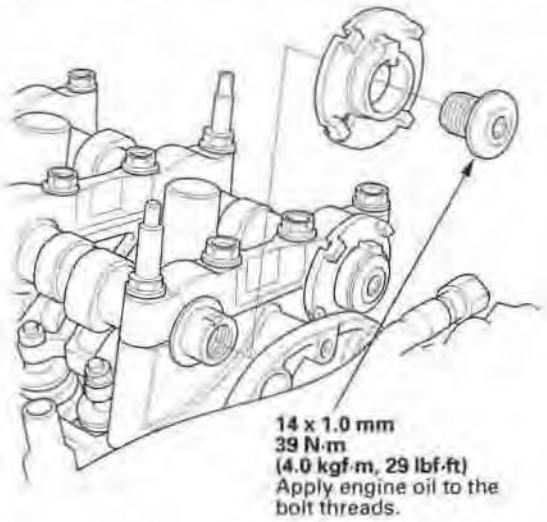
18. Remove the cylinder head.

CMP Pulse Plate A Replacement

1. Remove the cylinder head cover (see page 6-23).
2. Hold the intake camshaft with an open-end wrench, then loosen the bolt.



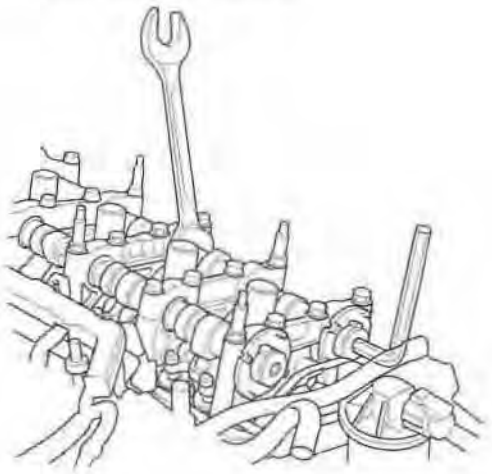
3. Remove the camshaft position (CMP) pulse plate A.



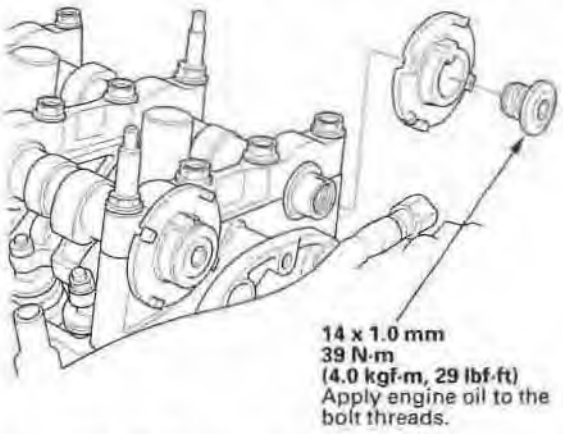
4. Install the CMP pulse plate A in the reverse order of removal.

CMP Pulse Plate B Replacement

1. Remove the cylinder head cover (see page 6-23).
2. Hold the exhaust camshaft with an open-end wrench, then loosen the bolt.



3. Remove the camshaft position (CMP) pulse plate B.

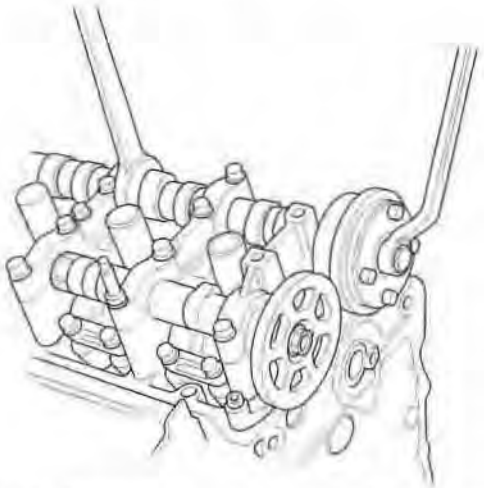


4. Install the CMP pulse plate B in the reverse order of removal.

VTC Actuator, Exhaust Camshaft Sprocket Removal and Installation

Removal

1. Remove the cam chain (see page 6-12).
2. Hold the camshaft with an open-end wrench, then loosen the variable valve timing control (VTC) actuator mounting bolt and exhaust camshaft sprocket mounting bolt.



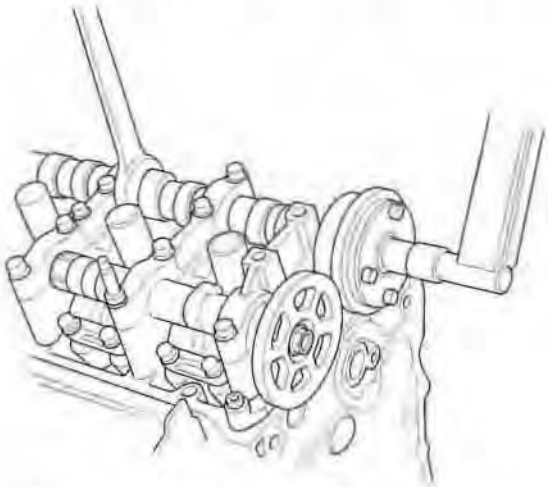
3. If the VTC actuator will be reused, do the following steps.
   - -1 Remove the intake camshaft, and seal the advance holes and retard holes in the No. 1 camshaft journal with tape (see step 6 on page 6-8).
   - -2 Punch a hole in the tape over one of the advance holes (see step 7 on page 6-8).
   - -3 Apply air to the advance hole to release the lock (see step 8 on page 6-9).
   - -4 Remove the tape from the No. 1 camshaft journal.
4. Remove the VTC actuator and exhaust camshaft sprocket.

Installation

1. Install the VTC actuator and exhaust camshaft sprocket.

   NOTE: Install the VTC actuator in the unlocked position.
2. Apply engine oil to the threads of the VTC actuator mounting bolt and exhaust camshaft sprocket mounting bolt, then install them.
3. Hold the camshaft with an open-end wrench, then tighten the bolts.

   Specified Torque
   VTC Actuator Mounting Bolt:
   113 N·m (11.5 kgf·m, 83 lbf·ft)
   Exhaust Camshaft Sprocket Mounting Bolt:
   72 N·m (7.3 kgf·m, 53 lbf·ft)

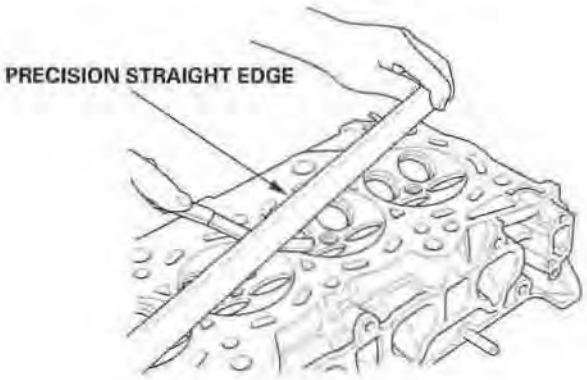


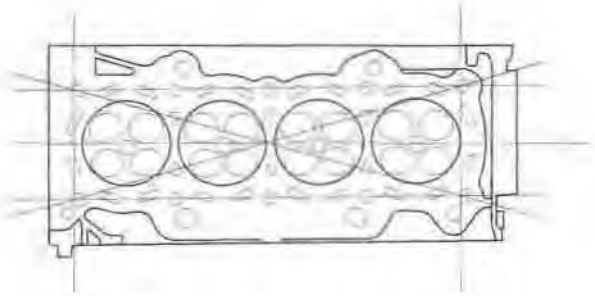
4. Hold the camshaft, and turn the VTC actuator clockwise until you hear it click.
5. Install the cam chain (see page 6-15).

Cylinder Head Inspection for Warpage

1. Remove the cylinder head (see page 6-24).
2. Inspect the camshaft (see page 6-33).
3. Check the cylinder head for warpage. Measure along the edges, and three ways across the center.
   - If warpage is less than 0.05 mm (0.002 in.), cylinder head resurfacing is not required.
   - If warpage is between 0.05 mm (0.002 in.) and 0.2 mm (0.008 in.), resurface the cylinder head.
   - Maximum resurface limit is 0.2 mm (0.008 in.) based on a height of 104 mm (4.09 in.).

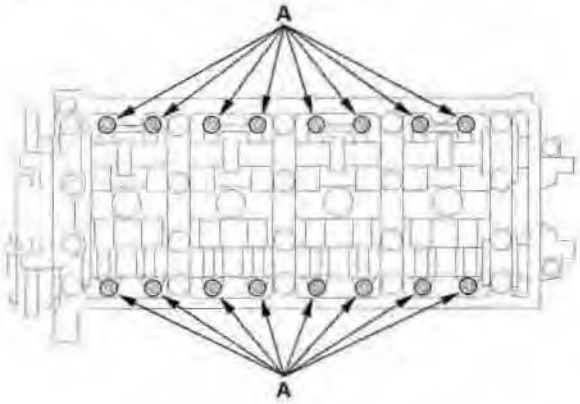
Cylinder Head Height
Standard (New): 103.95—104.05 mm (4.093—4.096 in.)





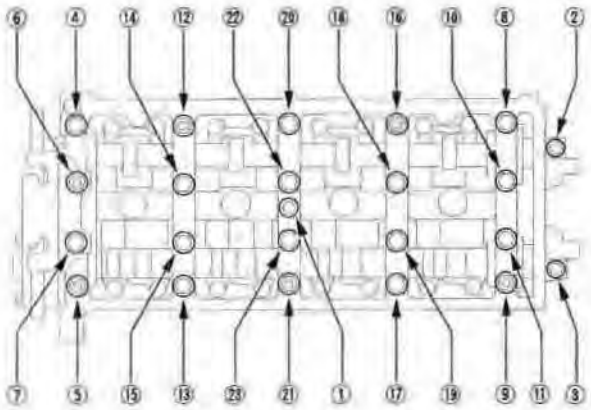
Rocker Arm Assembly Removal

1. Remove the cam chain (see page 6-12).
2. Loosen the rocker arm adjusting screws (A).

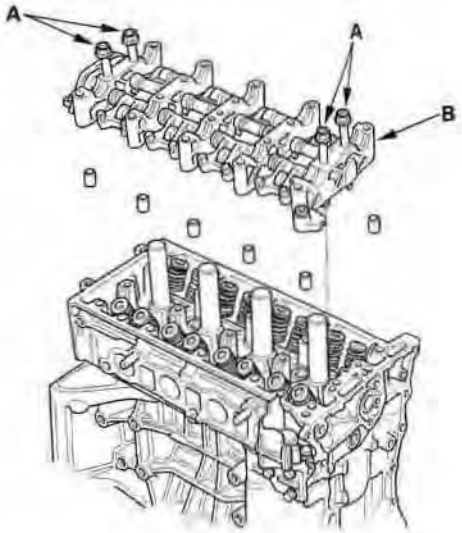


3. Remove the camshaft holder bolts. To prevent damaging the camshafts, unscrew the bolts two turns at a time, in a crisscross pattern.

   NOTE: Bolt ① is not on all engines.

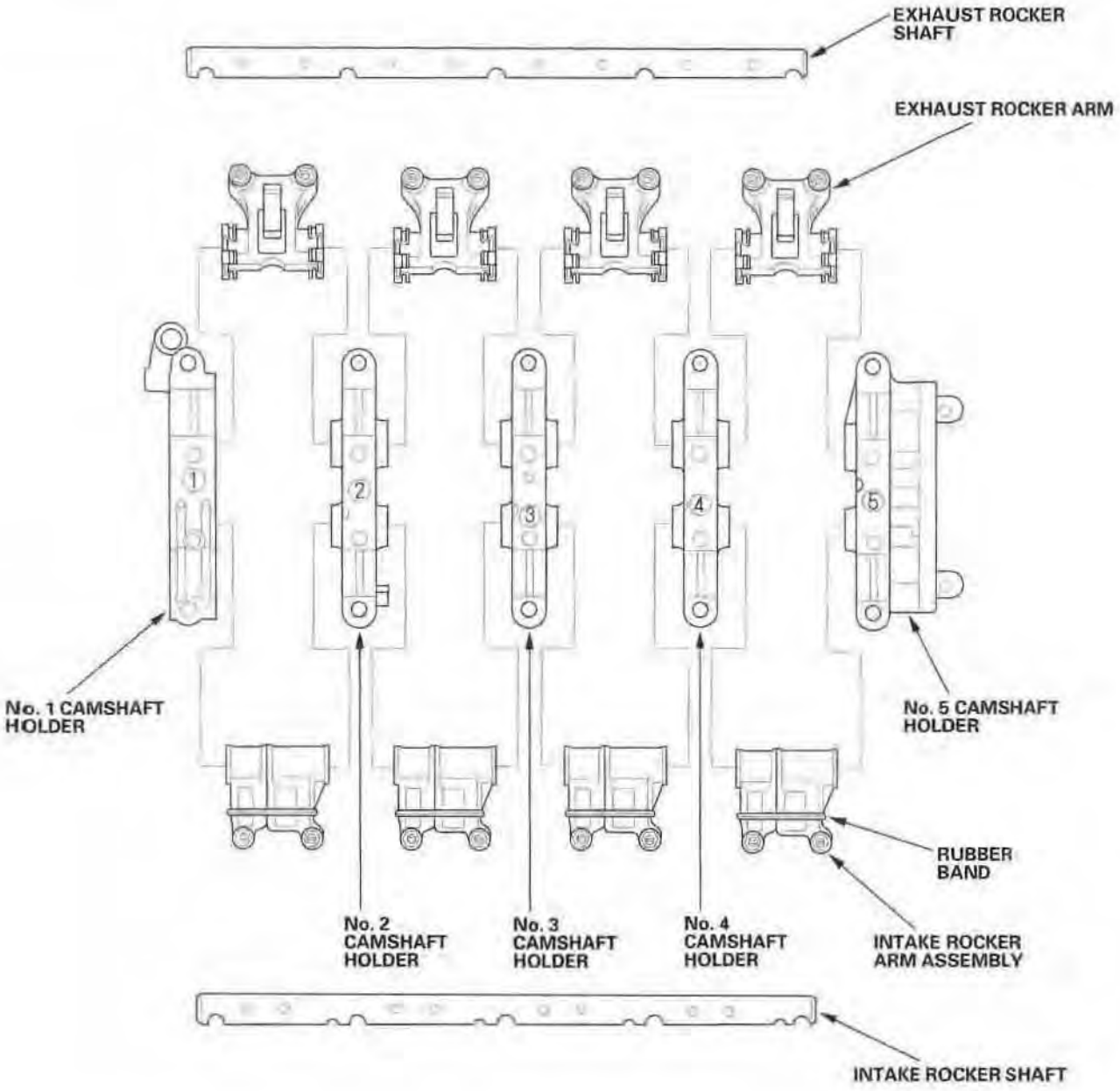


4. Remove the cam chain guide B, camshaft holders, and camshafts.
5. Insert the bolts (A) into the rocker shaft holder, then remove the rocker arm assembly (B).



Rocker Arm and Shaft Disassembly/Reassembly

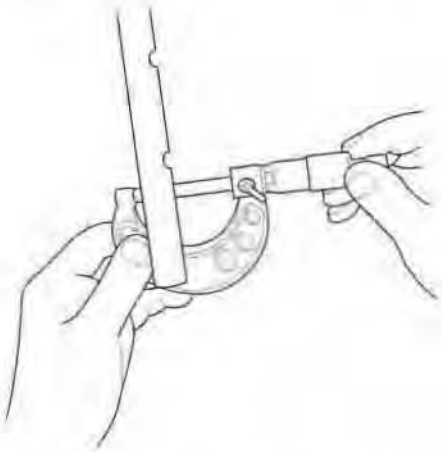
NOTE:
- Identify parts as they are removed to ensure reinstallation in their original location.
- Inspect the rocker arm shaft and rocker arms (see page 6-32).
- The rocker arms must be installed in the same positions if reused.
- When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders and rocker arms on the shaft.
- Prior to reassembling, clean all the parts in solvent, dry them, and apply new engine oil to any contact points.
- Bundle the intake rocker arms with rubber bands to keep them together as a set.
- When replacing the intake rocker arm assembly, remove the fastening hardware from the new intake rocker arm assembly.



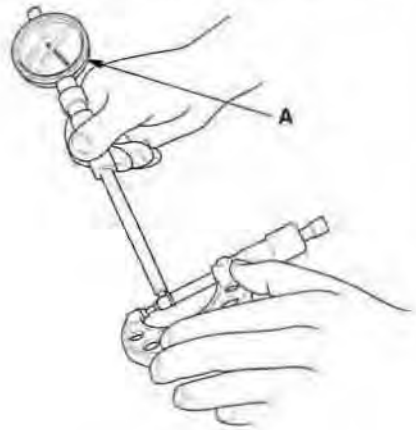
Rocker Arm and Shaft Inspection

1. Remove the rocker arm assembly (see page 6-30), then disassemble the rocker arm assembly (see page 6-31).

2. Measure the diameter of the shaft at the first rocker location.



3. Zero the gauge (A) to the shaft diameter.



4. Measure the inside diameter of the rocker arm, and check it for an out-of-round condition.

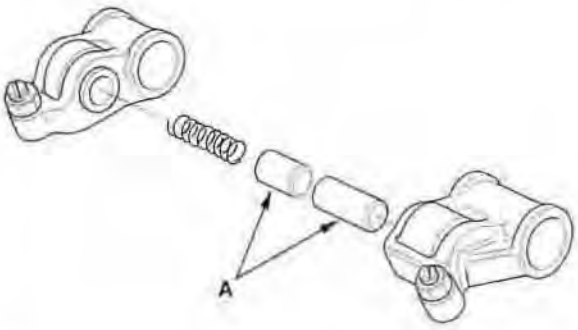
Rocker Arm-to-Shaft Clearance
Standard (New):

Intake:	**0.025—0.052 mm (0.0010—0.0020 in.)**
Exhaust:	**0.018—0.056 mm (0.0007—0.0022 in.)**
Service Limit:	**0.08 mm (0.003 in.)**

5. Repeat for all rocker arms and both shafts. If the clearance is over the limit, replace the rocker shaft and all overtolerance rocker arms. If any VTEC rocker arm needs replacement, replace the rocker arms (primary and secondary), as a set.

6. Inspect the rocker arm pistons (A). Push each piston manually. If it does not move smoothly, replace the rocker arm as set.

   NOTE: Apply new engine oil to the pistons when reassembling.



7. Install the rocker arm assembly (see page 6-42).

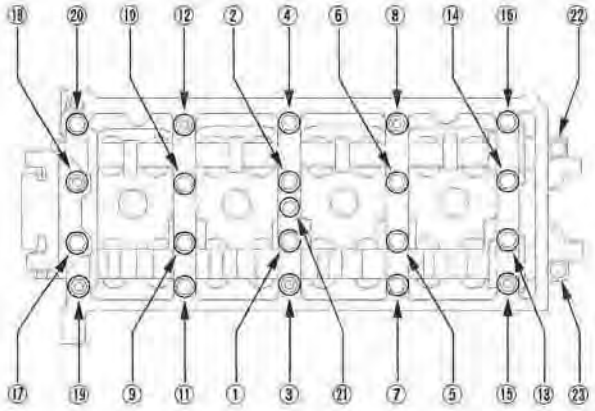
Camshaft Inspection

NOTE: Do not rotate the camshaft during inspection.

1. Remove the rocker arm assembly (see page 6-30).
2. Put the rocker shaft holders, camshaft, and camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

   NOTE: If the engine does not have bolt ㉑, skip it and continue the torque sequence.

   Specified Torque
   8 mm Bolts: 22 N·m (2.2 kgf·m, 16 lbf·ft)
   6 mm Bolts: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
   6 mm Bolts: ㉑, ㉒, ㉓



3. Seat the camshaft by pushing it away from the cam chain end of the cylinder head.
4. Zero the dial indicator against the end of the camshaft, then push the camshaft back and forth and read the end play. If the end play is beyond the service limit, replace the cylinder head and recheck. If it is still beyond the service limit, replace the camshaft.

   Camshaft End Play
   Standard (New): 0.05—0.20 mm (0.002—0.008 in.)
   Service Limit: 0.4 mm (0.02 in.)

(cont'd)

Camshaft Inspection (cont'd)

5. Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern. Then remove the camshaft holders from the cylinder head.

6. Lift the camshafts out of the cylinder head, wipe them clean, then inspect the lift ramps. Replace the camshaft if any lobes are pitted, scored, or excessively worn.

7. Clean the camshaft journal surfaces in the cylinder head, then set the camshafts back in place. Place a plastigage strip across each journal.

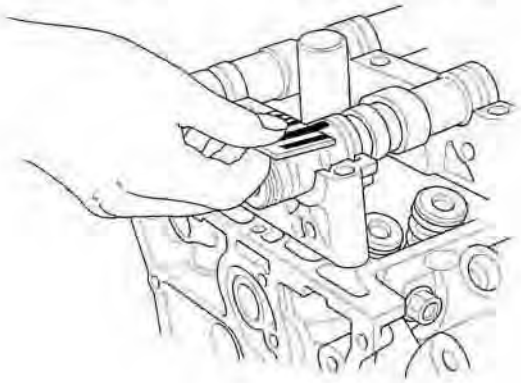
8. Install the camshaft holders, then tighten the bolts to the specified torque as shown in step 2.

9. Remove the camshaft holders. Measure the widest part of plastigage on each journal.

   - If the camshaft-to-holder clearance is within limits, go to step 11.
   - If the camshaft-to-holder clearance is beyond the service limit and the camshaft has been replaced, replace the cylinder head.
   - If the camshaft-to-holder clearance is beyond the service limit and the camshaft has not been replaced, go to step 10.

Camshaft-to-Holder Oil Clearance
Standard (New):

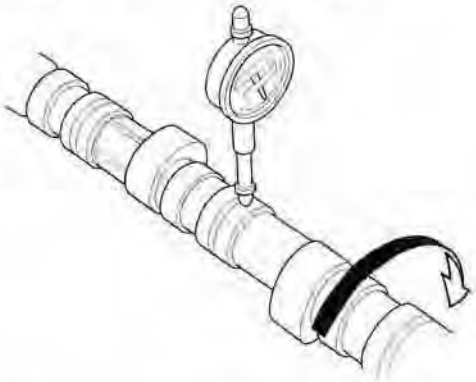
No. 1 Journal:	**0.030—0.069 mm (0.001—0.003 in.)**
No. 2, 3, 4, 5 Journals:	**0.060—0.099 mm (0.002—0.004 in.)**
Service Limit:	**0.15 mm (0.006 in.)**



10. Check the total runout with the camshaft supported on V-blocks.

    - If the total runout of the camshaft is within the service limit, replace the cylinder head.
    - If the total runout is beyond the service limit, replace the camshaft and recheck the camshaft-to-holder oil clearance. If the oil clearance is still beyond the service limit, replace the cylinder head.

Camshaft Total Runout
Standard (New): 0.03 mm (0.001 in.) max.
Service Limit: 0.04 mm (0.002 in.)

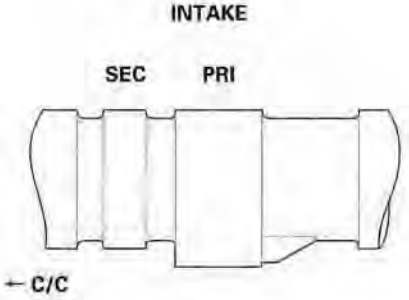


11. Measure cam lobe height.

Cam Lobe Height Standard (New):

	INTAKE	EXHAUST
PRI	33.925 mm (1.3356 in.)	34.092 mm (1.3422 in.)
SEC	29.638 mm (1.1668 in.)	

PRI: Primary SEC: Secondary C/C: Cam Chain

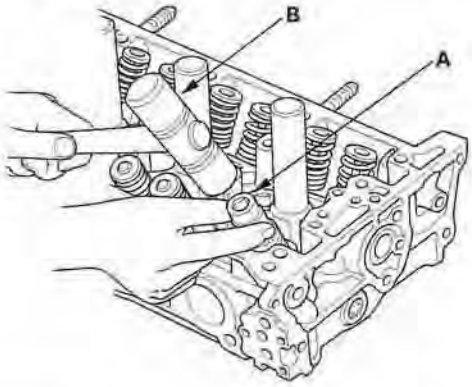


Valve, Spring, and Valve Seal Removal

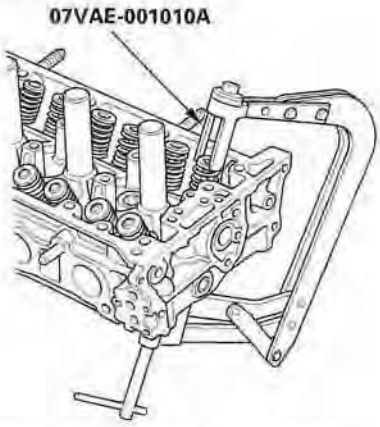
Special Tools Required
Valve spring compressor attachment 07VAE-001010A

Identify the valves and valve springs as they are removed so that each item can be reinstalled in its original position.

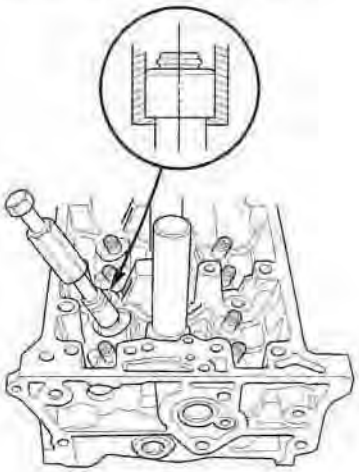
1. Remove the cylinder head (see page 6-24).
2. Using an appropriate-sized socket (A) and plastic mallet (B), lightly tap the valve retainer to loosen the valve cotters.



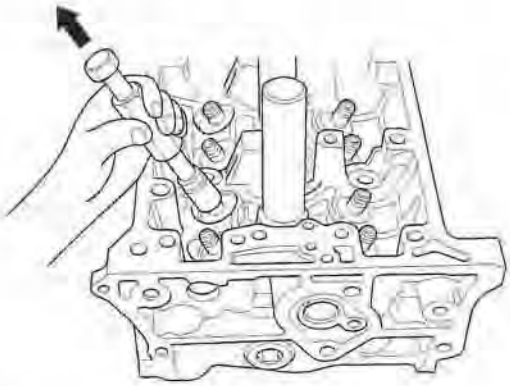
3. Install the special tool. Compress the spring, and remove the valve cotters.



4. Remove the special tool, then remove the valve retainer and valve spring.
5. Install the valve guide seal remover.



6. Remove the valve seal.



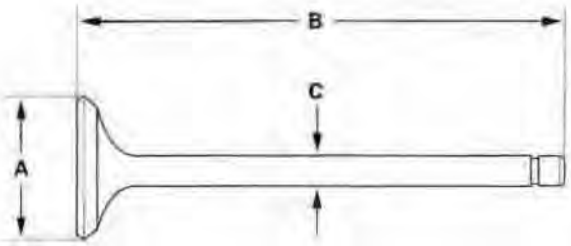
7. Remove the valve.

Valve Inspection

1. Remove the valves (see page 6-35).
2. Measure the valve in these areas.

Intake Valve Dimensions
A Standard (New): 34.85—35.15 mm (1.372—1.384 in.)
B Standard (New): 108.7—109.5 mm (4.280—4.311 in.)
C Standard (New): 5.475—5.485 mm (0.2156—0.2159 in.)
C Service Limit: 5.445 mm (0.214 in.)

Exhaust Valve Dimensions
A Standard (New): 29.85—30.15 mm (1.175—1.187 in.)
B Standard (New): 108.3—109.1 mm (4.264—4.295 in.)
C Standard (New): 5.450—5.460 mm (0.2146—0.2150 in.)
C Service Limit: 5.42 mm (0.213 in.)



Valve Stem-to-Guide Clearance Inspection

1. Remove the valves (see page 6-35).
2. Slide the valve out of its guide about 10 mm (3/8 in.), then measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

- If the measurement exceeds the service limit, recheck it using a new valve.
- If the measurement is now within the service limit, reassemble using a new valve.
- If the measurement with a new valve still exceeds the service limit, go to step 3.

Intake Valve Stem-to-Guide Clearance
Standard (New): 0.06—0.11 mm (0.002—0.004 in.)
Service Limit: 0.16 mm (0.006 in.)

Exhaust Valve Stem-to-Guide Clearance
Standard (New): 0.11—0.16 mm (0.004—0.006 in.)
Service Limit: 0.22 mm (0.009 in.)

3. Subtract the O.D. of the valve stem, measured with a micrometer, from the I.D. of the valve guide, measured with an inside micrometer or ball gauge. Take the measurements in three places along the valve stem and three places inside the valve guide. The difference between the largest guide measurement and the smallest stem measurement should not exceed the service limit.

Intake Valve Stem-to-Guide Clearance
Standard (New): 0.030—0.055 mm (0.0012—0.0022 in.)
Service Limit: 0.08 mm (0.003 in.)

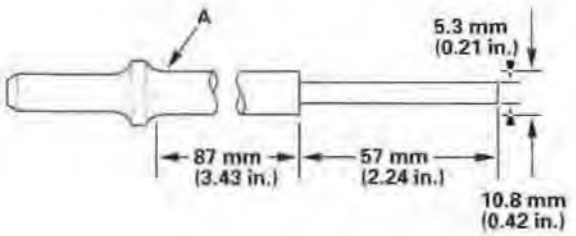
Exhaust Valve Stem-to-Guide Clearance
Standard (New): 0.055—0.080 mm (0.0022—0.0031 in.)
Service Limit: 0.11 mm (0.004 in.)

Valve Guide Replacement

Special Tools Required
- Valve guide driver, 5.5 mm 07742-0010100
- Valve guide reamer, 5.5 mm 07HAH-PJ7010B

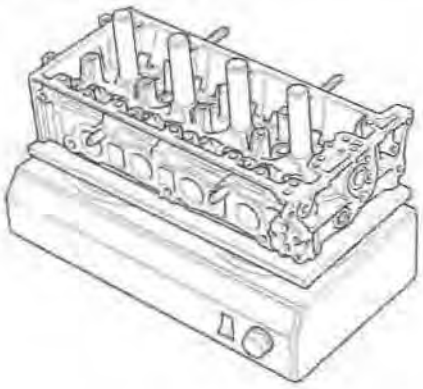
1. Inspect valve stem-to-guide clearance (see page 6-36).

2. As illustrated, use a commercially available air-impact valve guide driver (A) modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.



3. Select the proper replacement guides, and chill them in the freezer section of a refrigerator for about an hour.

4. Use a hot plate or oven to evenly heat the cylinder head to 300 °F (150 °C). Monitor the temperature with a cooking thermometer. Do not get the head hotter than 300 °F (150 °C); excessive heat may loosen the valve seats.



5. Working from the camshaft side, use the driver and an air hammer to drive the guide about 2 mm (0.1 in.) towards the combustion chamber. This will knock off some of the carbon and make removal easier. Hold the air hammer directly in line with the valve guide to prevent damaging the driver. Wear safety goggles or a face shield.

6. Turn the head over, and drive the guide out toward the camshaft side of the head.

7. If a valve guide won't move, drill it out with a 8 mm (5/16 in.) bit, then try again. Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.

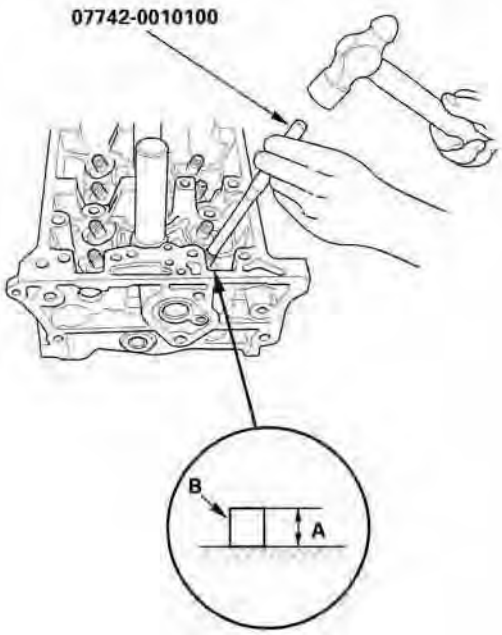
8. Take out the new guide(s) from the freezer, one at a time, as you need them.

(cont'd)

Valve Guide Replacement (cont'd)

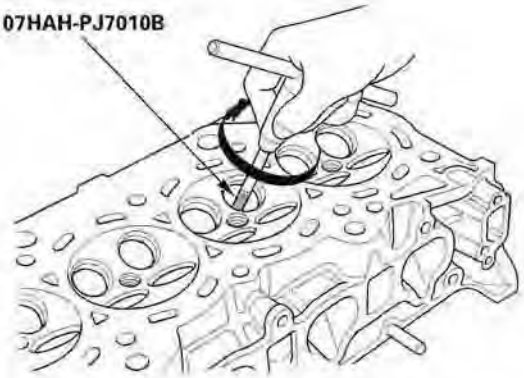
9. Apply a thin coat of clean engine oil to the outside of the new valve guide. Install the guide from the camshaft side of the head; use the special tool to drive the guide into the specified installed height (A) of the guide (B). If you have all 16 guides to do, you may have to reheat the head.

Valve Guide Installed Height
Intake: 15.2—16.2 mm (0.598—0.638 in.)
Exhaust: 15.5—16.5 mm (0.610—0.650 in.)



10. Coat both reamer and valve guide with cutting oil.

11. Rotate the reamer clockwise the full length of the valve guide bore.



12. Continue to rotate the reamer clockwise while drawing it from the bore.

13. Thoroughly wash the guide in detergent and water to remove any cutting residue.

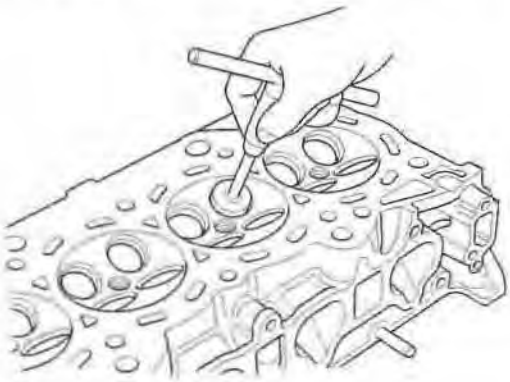
14. Check the clearances with a valve (see page 6-36). Verify that a valve slides in the intake and exhaust valve guides without being stuck.

15. Inspect the valve seating, If necessary, renew the valve seat using a valve seat cutter (see page 6-39).

Valve Seat Reconditioning

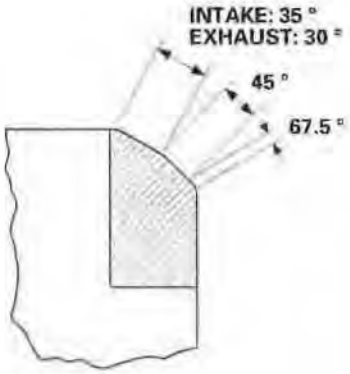
1. Inspect valve stem-to-guide clearance (see page 6-36). If the valve guides are worn, replace them (see page 6-37) before cutting the valve seats.

2. Renew the valve seats in the cylinder head using a valve seat cutter.



3. Carefully cut a 45 ° seat, removing only enough material to ensure a smooth and concentric seat.

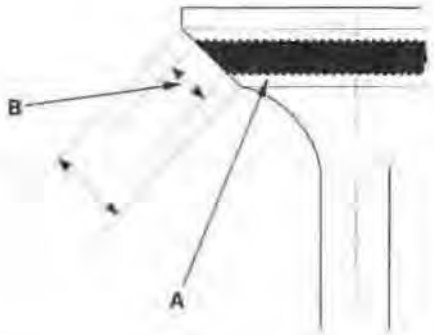
4. Bevel the upper and lower edges at the angles shown in the illustration. Check the width of the seat and adjust accordingly.



5. Make one more very light pass with the 45 ° cutter to remove any possible burrs caused by the other cutters.

Valve Seat Width
Standard (New): 1.25—1.55 mm (0.049—0.061 in.)
Service Limit: 2.00 mm (0.079 in.)

6. After resurfacing the seat, inspect for even valve seating. Apply Prussian Blue compound (A) to the valve face. Insert the valve in its original location in the head, then lift it and snap it closed against the seat several times.



7. The actual valve seating surface (B), as shown by the blue compound, should be centered on the seat.

   - If it is too high (closer to the valve stem), you must make a second cut with the 67.5 ° cutter to move it down, then one more cut with the 45 ° cutter to restore seat width.
   - If it is too low (close to the valve edge), you must make a second cut with the 35 ° cutter (intake side) or the 30 ° cutter (exhaust side) to move it up, then make one more cut with the 45 ° cutter to restore seat width.

   NOTE: The final cut should always be made with the 45 ° cutter.

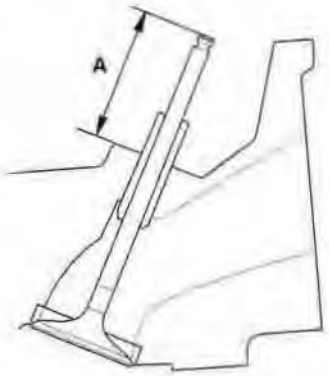
(cont'd)

Valve Seat Reconditioning (cont'd)

8. Insert the intake and exhaust valves in the head, and measure valve stem installed height (A).

Intake Valve Stem Installed Height
Standard (New): 44.0—44.5 mm (1.73—1.75 in.)
Service Limit: 44.7 mm (1.76 in.)

Exhaust Valve Stem Installed Height
Standard (New): 44.1—44.6 mm (1.74—1.76 in.)
Service Limit: 44.8 mm (1.76 in.)



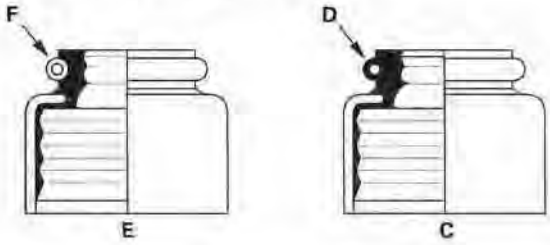
9. If valve stem installed height is over the service limit, replace the valve and recheck. If it is still over the service limit, replace the cylinder head; the valve seat in the head is too deep.

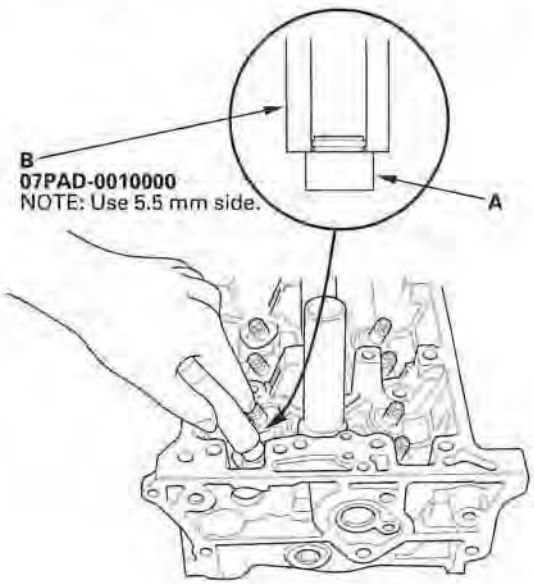
Valve, Spring, and Valve Seal Installation

Special Tools Required
- Valve spring compressor attachment 07757-PJ1010A
- Stem seal driver 07PAD-0010000

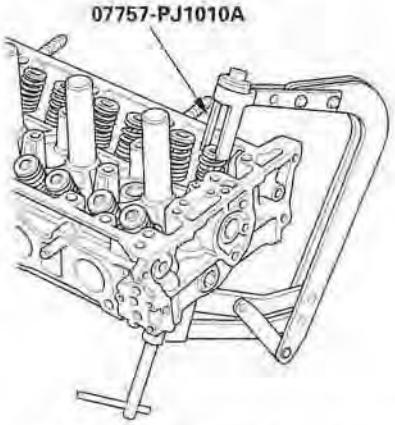
1. Coat the valve stems with new engine oil. Install the valves in the valve guides.
2. Check that the valves move up and down smoothly.
3. Install the spring seats on the cylinder head.
4. Install the new valve seals (A) using the stem seal driver (B).

   NOTE: The exhaust valve seal (C) has a black spring (D), and the intake valve seal (E) has a white spring (F). They are not interchangeable.

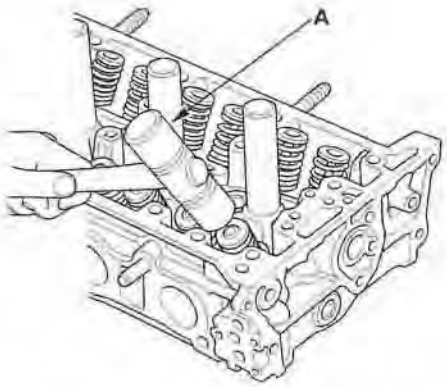




5. Install the valve spring. Place the end of the valve spring with closely wound coils toward the cylinder head.
6. Install the valve retainer.
7. Install the valve spring compressor. Compress the spring, and install the valve cotters.



8. Lightly tap the end of each valve stem two or three times with a plastic mallet (A) to ensure proper seating of the valve and valve cotters. Tap the valve stem only along its axis so you do not bend the stem.



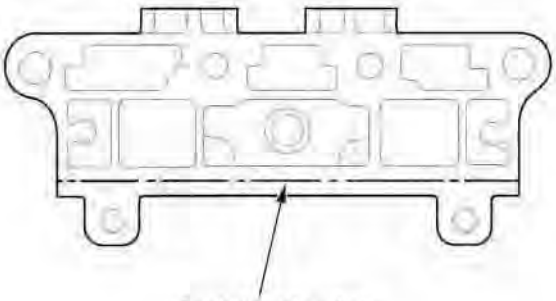
Rocker Arm Assembly Installation

1. Reassemble the rocker arm assembly (see page 6-31).

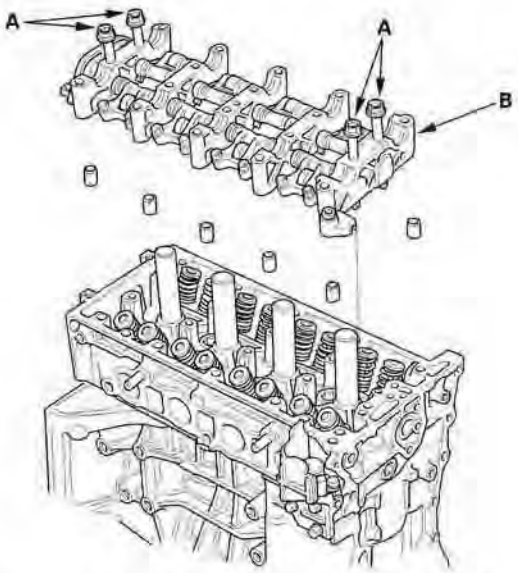
2. Clean and dry the No. 5 rocker shaft holder mating surface.

3. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the cylinder head mating surface of the No. 5 rocker shaft holder.

   NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.

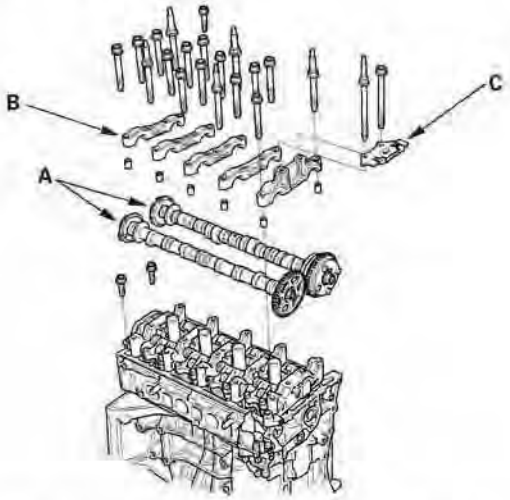


4. Insert the bolts (A) into the rocker shaft holder, then install the rocker arm assembly (B) on the cylinder head.



5. Remove the bolts from the rocker shaft holder.

6. Make sure the punch marks on the variable valve timing control (VTC) actuator and exhaust camshaft sprocket are facing up, then set the camshafts (A) in the holder. Apply new engine oil to the camshaft journals and lobes.

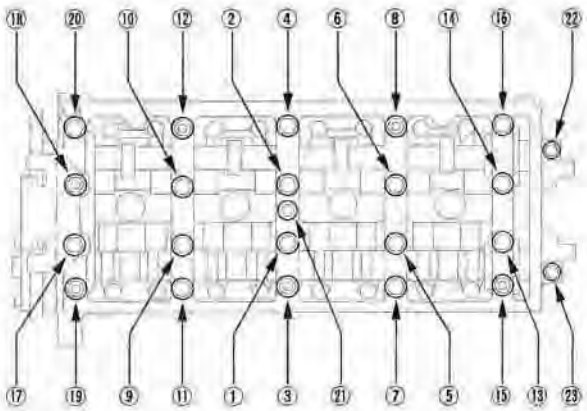


7. Set the camshaft holders (B) and cam chain guide B (C) in place.

8. Tighten the bolts in sequence to the specified torque.

   NOTE: If the engine does not have bolt ㉑, skip it and continue the torque sequence.

Specified Torque
8 mm Bolts: 22 N·m (2.2 kgf·m, 16 lbf·ft)
6 mm Bolts: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
6 mm Bolts: ㉑, ㉒, ㉓

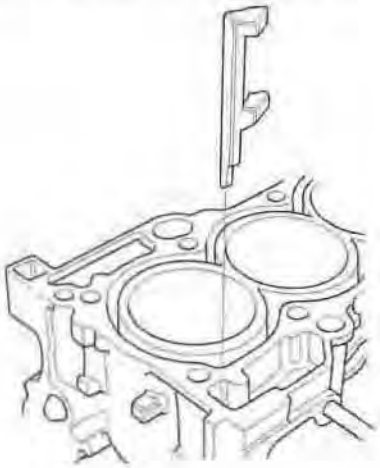


9. Install the cam chain (see page 6-15), and adjust the valve clearance (see page 6-9).

Cylinder Head Installation

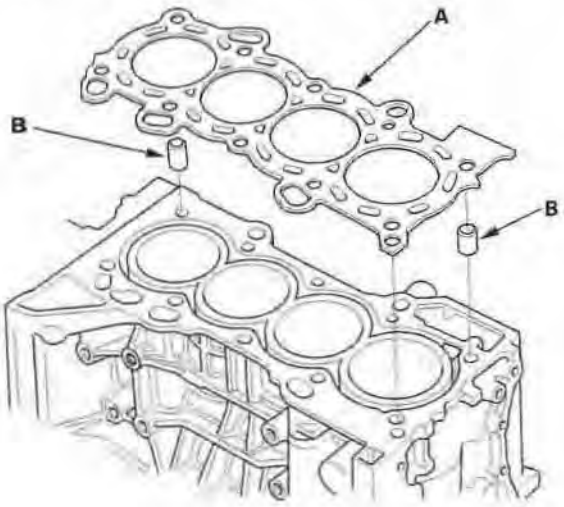
Install the cylinder head in the reverse order of removal:

1. Install the new coolant separator in the engine block, when replacing the engine block.

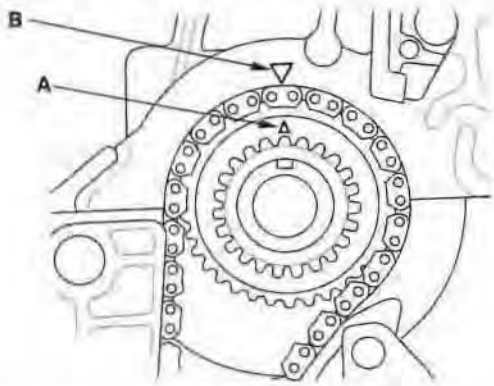


2. Clean the cylinder head and engine block surface.

3. Install the new cylinder head gasket (A) and dowel pins (B) on the engine block. Always use a new cylinder head gasket.

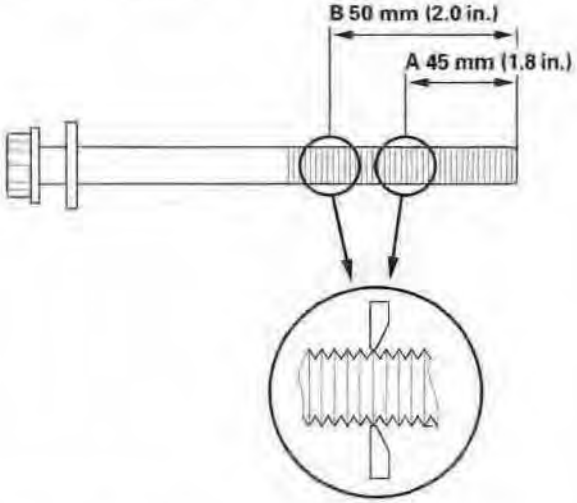


4. Set the crankshaft to top dead center (TDC). Align the TDC mark (A) on the crankshaft sprocket with the pointer (B) on the engine block.



5. Install the cylinder head on the engine block.

6. Measure the diameter of each cylinder head bolt at point A and point B.



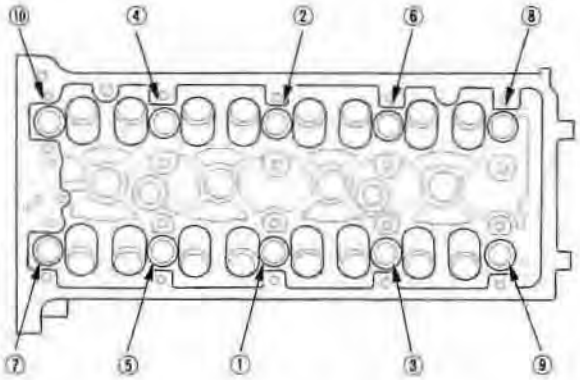
7. If either diameter is less than 10.6 mm (0.42 in.), replace the cylinder head bolt.

(cont'd)

Cylinder Head Installation (cont'd)

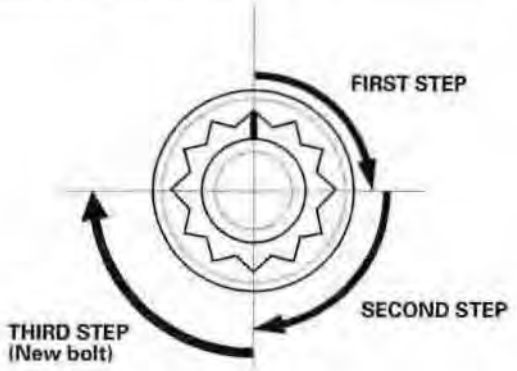
8. Apply new engine oil to the threads and flange of all the cylinder head bolts.

9. Tighten the cylinder head bolts in sequence to 39 N·m (4.0 kgf·m, 29 lbf·ft) using a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and do not overtighten. If a bolt makes any noise while you are torquing it, loosen the bolt and retighten it from the first step.



10. After torqueing, tighten all cylinder head bolts in two steps (90 ° per step) using a torque angle gauge. If you are using a new cylinder head bolt, tighten the bolt an extra 90 °.

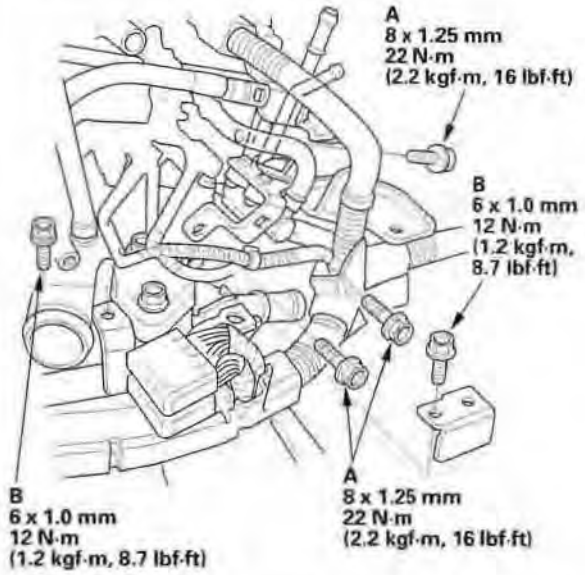
    NOTE: Remove the cylinder head bolt if you tightened it beyond the specified angle, and go back to step 6 of the procedure. Do not loosen it back to the specified angle.



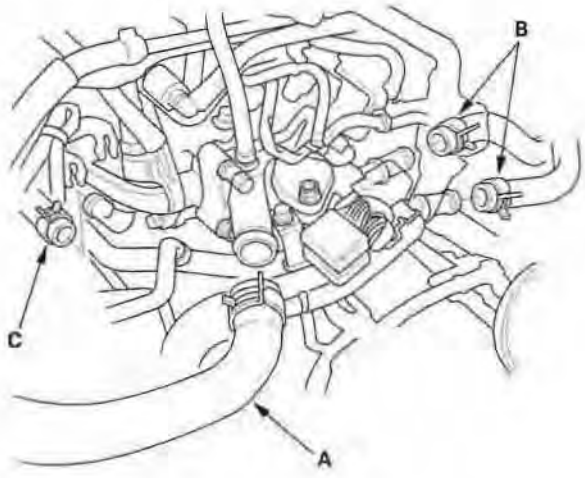
11. Install the rocker arm assembly (see page 6-42).

12. Install the cam chain (see page 6-15).

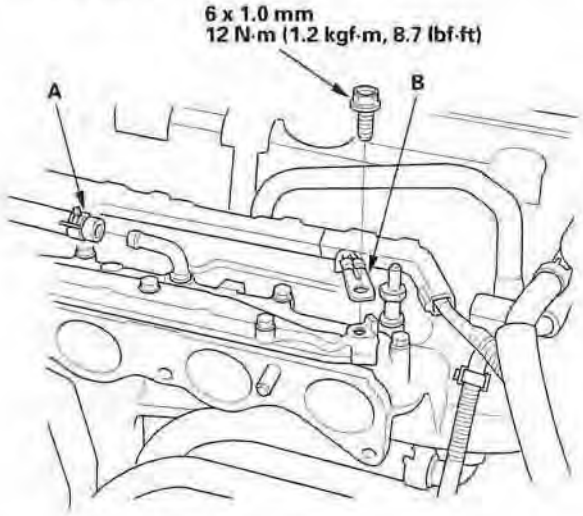
13. Tighten the three bolts (A) securing the evaporative emission (EVAP) canister purge valve bracket, and tighten the two bolts (B) securing the harness brackets.



14. Install the upper radiator hose (A), heater hoses (B), and water bypass hose (C).



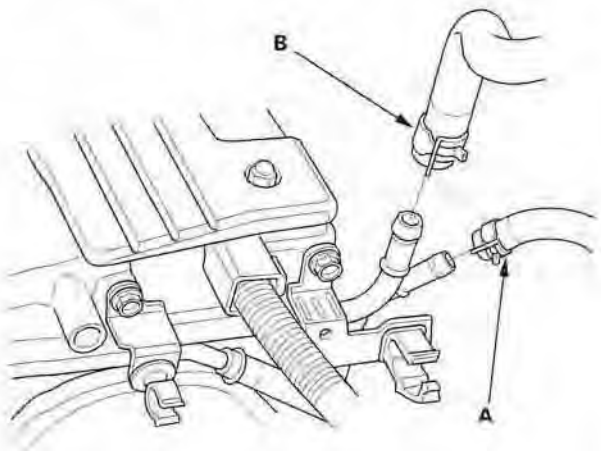
15. Install the positive crankcase ventilation (PCV) hose (A) and ground cable (B).



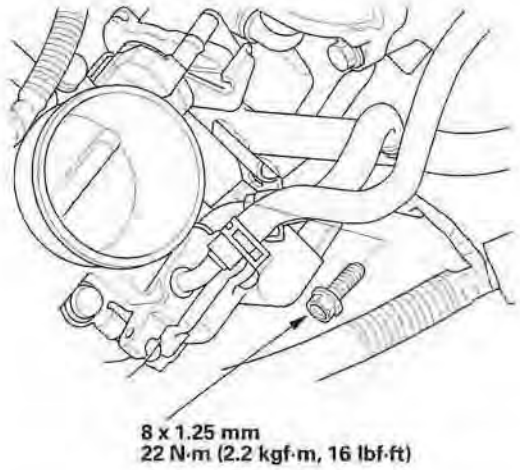
16. Install the exhaust manifold (see page 9-7).

17. Install the intake manifold (see page 9-5).

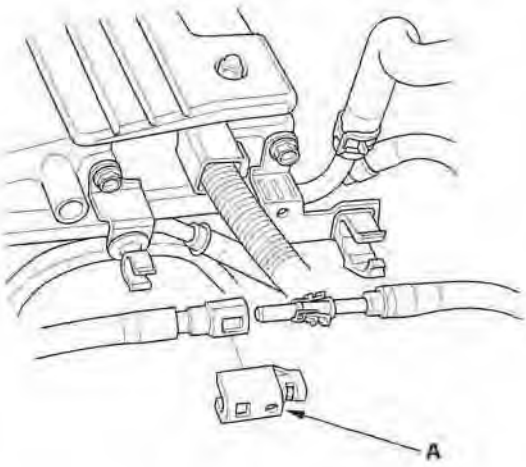
18. Install the EVAP canister hose (A) and brake booster vacuum hose (B).



19. Tighten the bolt securing the connecting pipe support bracket to the engine block.



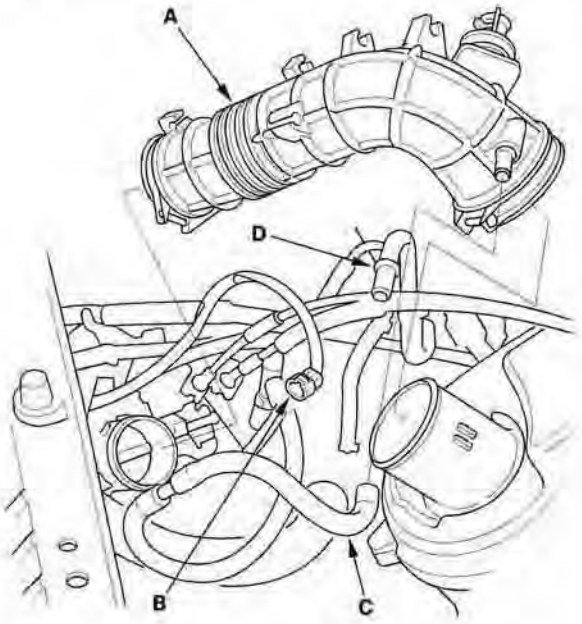
20. Connect the fuel feed hose (see page 11-220), then install the quick-connect fitting cover (A).



(cont'd)

Cylinder Head Installation (cont'd)

21. Install the intake air duct (A), then connect the intake air temperature (IAT) sensor connector (B), and install the vacuum hose (C) and breather pipe (D).



22. After installation, check that all tubes, hoses, and connectors are installed correctly.

23. Inspect for fuel leaks. Turn the ignition switch ON (II) (do not operate the starter) so the fuel pump runs for about 2 seconds and pressurizes the fuel line. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.

24. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see page 10-6).

25. Do the engine control module (ECM)/powertrain control module (PCM) idle learn procedure (see page 11-207), and power window control unit reset procedure (see page 22-115).

26. Inspect the idle speed (see page 11-206).

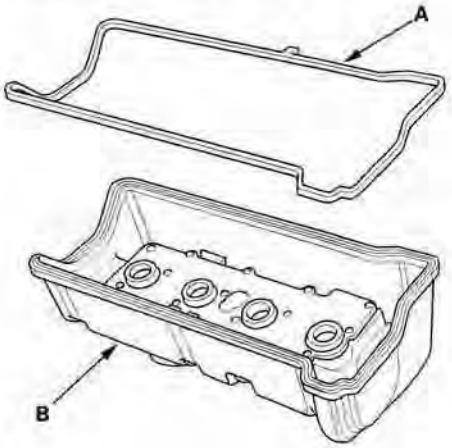
27. Inspect the ignition timing (see page 4-24).

28. Set the clock.

Cylinder Head Cover Installation

1. Thoroughly clean the head cover gasket and the groove.

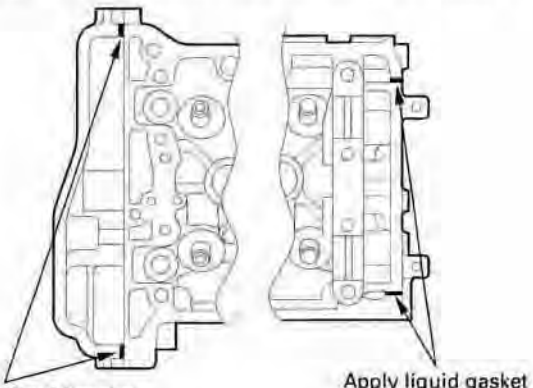
2. Install the head cover gasket (A) in the groove of the cylinder head cover (B).



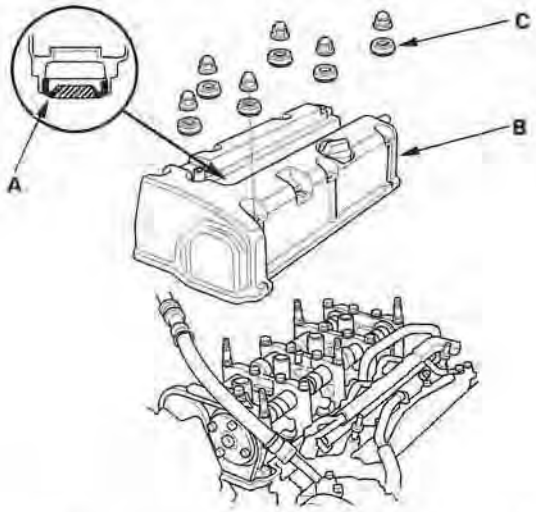
3. Check that the mating surfaces are clean and dry.

4. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, on the chain case and the No. 5 rocker shaft holder mating areas.

   NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.

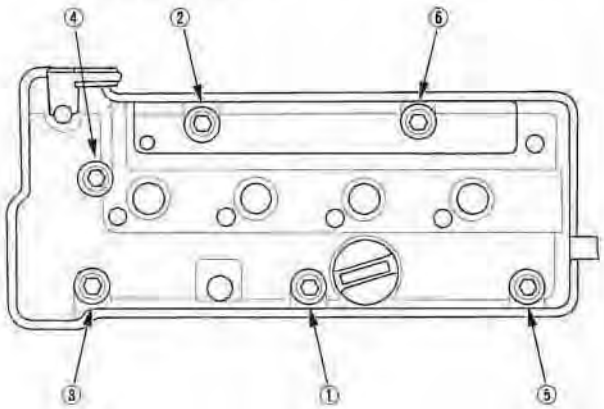


5. Set the spark plug seals (A) on the spark plug tubes. Place the cylinder head cover (B) on the cylinder head, then slide the cover slightly back and forth to seat the head cover gasket.

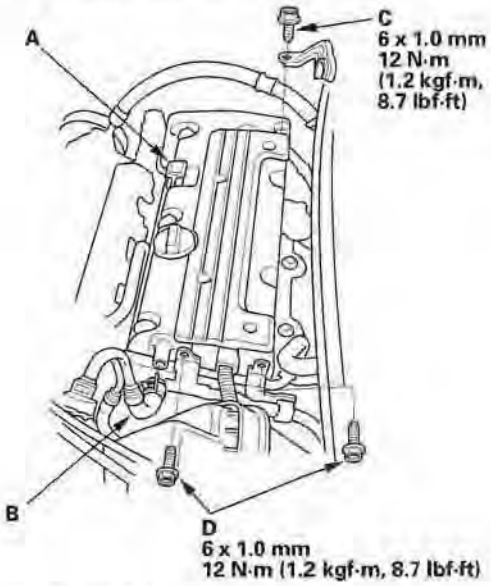


6. Inspect the cover washers (C). Replace any washer that is damaged or deteriorated.

7. Tighten the bolts in two or three steps. In the final step tighten all bolts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



8. Install the dipstick (A) and breather hose (B).



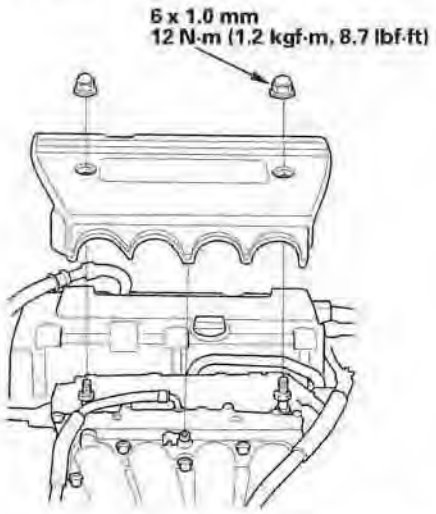
9. Tighten the bolt (C) securing the power steering hose bracket.

10. Tighten the two bolts (D) securing the vacuum line.

11. Install the four ignition coils (see page 4-25).

12. Check that all tubes, hoses, and connectors are installed correctly.

13. Install the intake manifold cover.



14. After assembly, wait at least 30 minutes before filling the engine with oil.

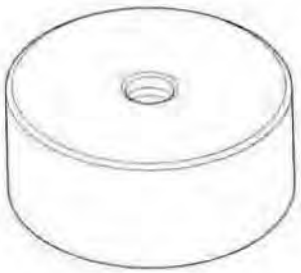
Engine Mechanical

Engine Block

Engine Block

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07ZAD-PNAA100	Oil Seal Driver Attachment 96	1
②	07746-0010700	Attachment, 24 x 26 mm	1
③	07749-0010000	Driver	1



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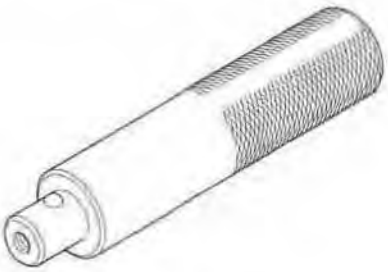
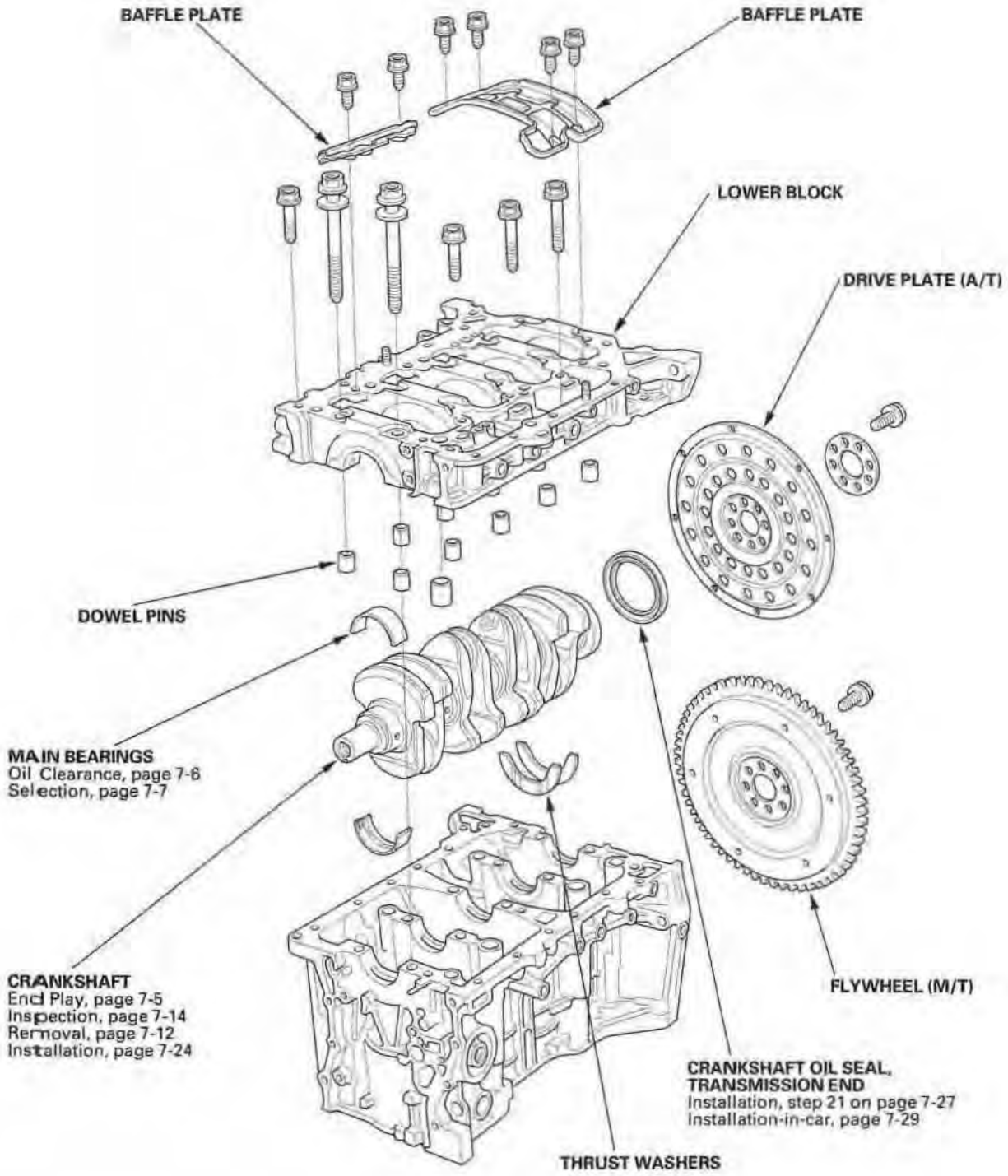
②



③

Component Location Index



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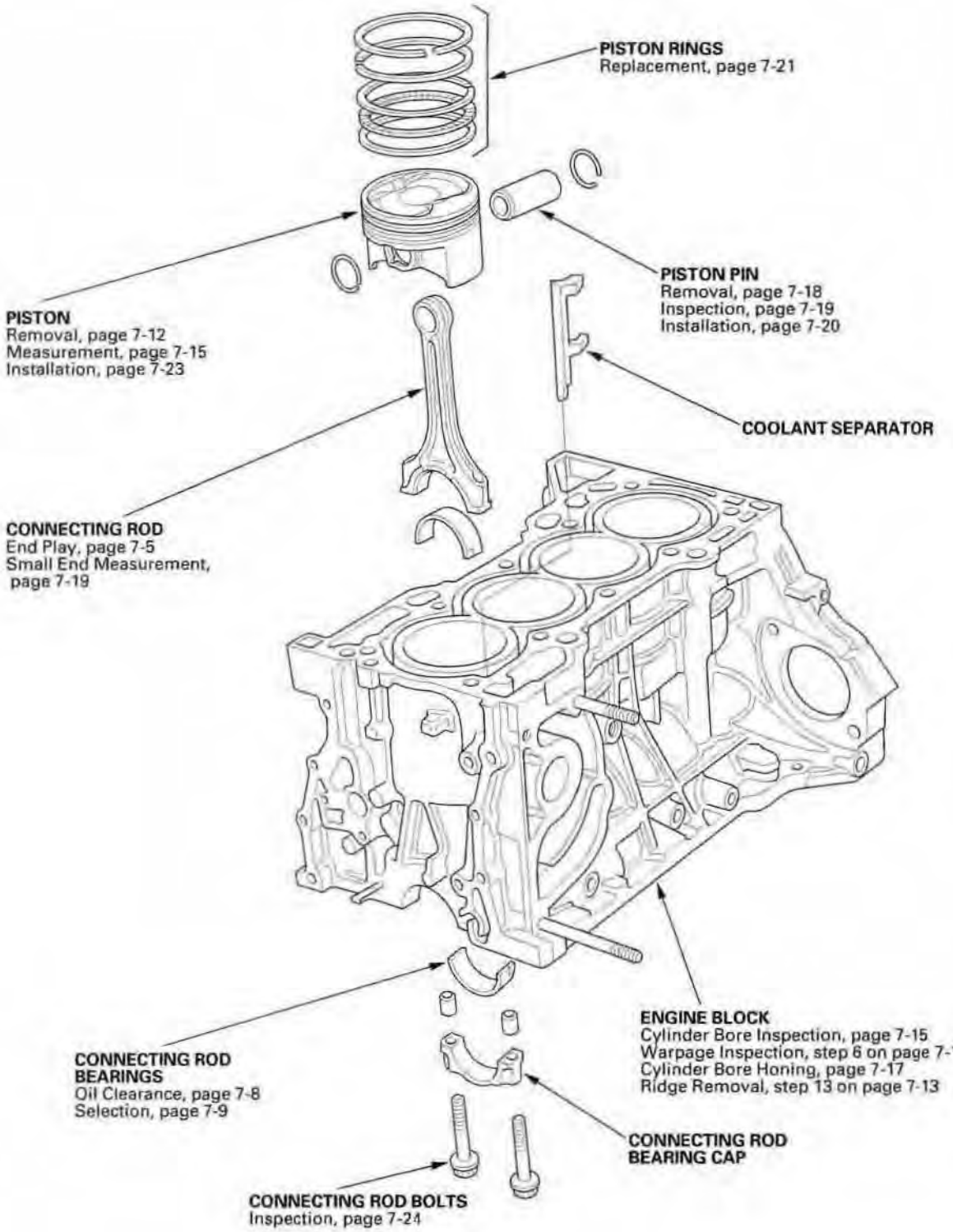
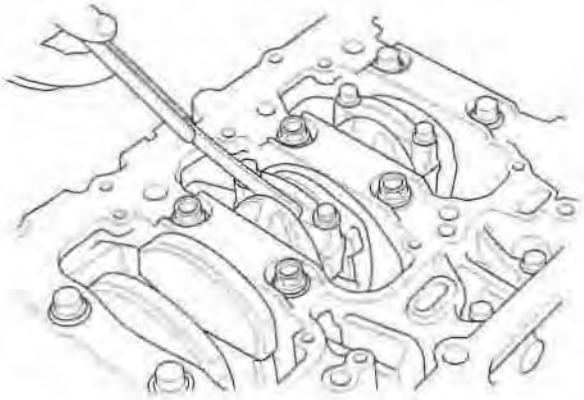
Component Location Index (cont'd)



Connecting Rod and Crankshaft End Play Inspection

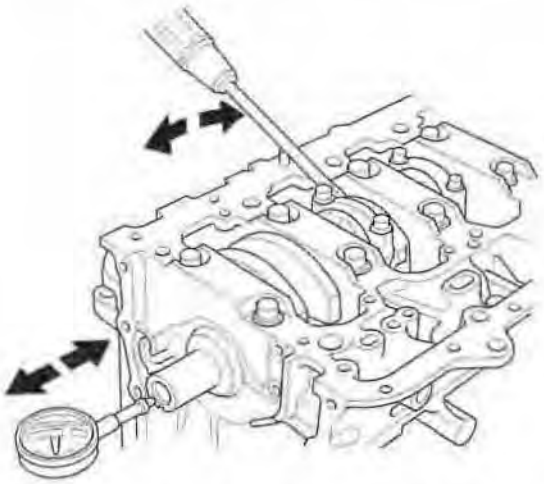
1. Remove the oil pump (see page 8-10).
2. Remove the baffle plates (see step 8 on page 7-12).
3. Measure the connecting rod end play with a feeler gauge between the connecting rod and crankshaft.

Connecting Rod End Play
Standard (New): 0.15—0.35 mm (0.006—0.014 in.)
Service Limit: 0.40 mm (0.016 in.)



4. If the connecting rod end play is out-of-tolerance, install a new connecting rod, and recheck. If it is still out-of-tolerance, replace the crankshaft (see page 7-12).
5. Push the crankshaft firmly away from the dial indicator, and zero the dial against the end of the crankshaft. Then pull the crankshaft firmly back toward the indicator; the dial reading should not exceed the service limit.

Crankshaft End Play
Standard (New): 0.10—0.35 mm (0.004—0.014 in.)
Service Limit: 0.45 mm (0.018 in.)



6. If the end play is out-of-tolerance, replace the thrust washers, and recheck. If it is still out-of-tolerance, replace the crankshaft (see page 7-12).

Crankshaft Main Bearing Replacement

Main Bearing Clearance Inspection

1. Remove the lower block and bearing halves (see page 7-12).
2. Clean each main journal and bearing half with a clean shop towel.
3. Place one strip of plastigage across each main journal.
4. Reinstall the bearings and lower block, then torque the bolts to 29 N·m (3.0 kgf·m, 22 lbf·ft) + 56 ° using a commercially available torque angle gauge.

   NOTE: Do not rotate the crankshaft during inspection.

5. Remove the lower block and bearings again, and measure the widest part of the plastigage.

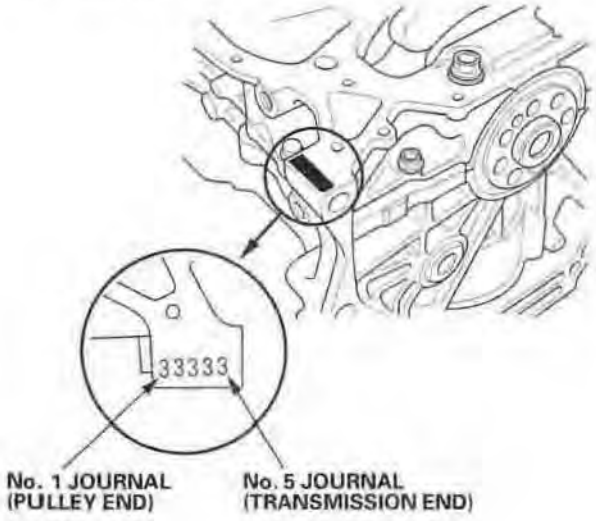
   Main Bearing-to-Journal Oil Clearance
   No. 1, 2, 4, 5 Journals:
   Standard (New): 0.017 — 0.041 mm (0.0007 — 0.0016 in.)
   Service Limit: 0.050 mm (0.0020 in.)
   No. 3 Journal:
   Standard (New): 0.025 — 0.049 mm (0.0010 — 0.0019 in.)
   Service Limit: 0.055 mm (0.0022 in.)

6. If the plastigage measures too wide or too narrow, remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code(s), and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.
7. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Main Bearing Selection

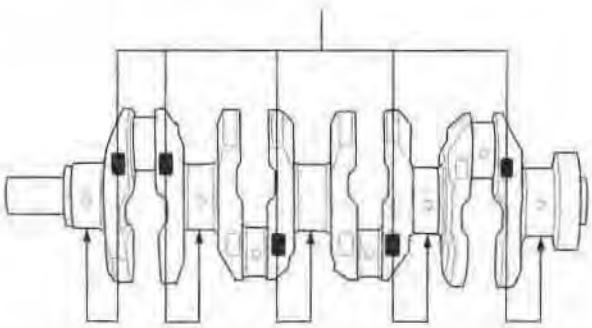
Crankshaft Bore Code Location

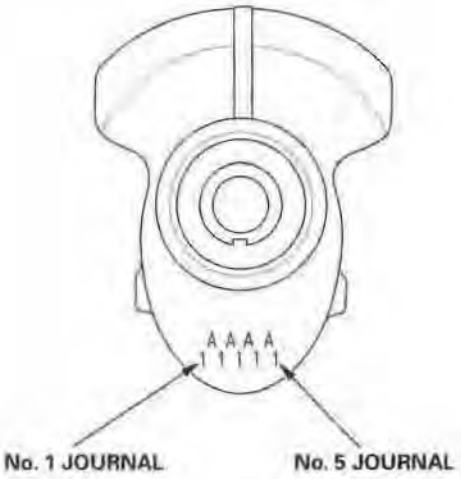
1. Numbers or letters or bars have been stamped on the end of the engine block as a code for the size of each of the five main journal bores. Write down the crank bore codes. If you can't read the codes because of accumulated dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.



Main Journal Code Location

2. The main journal codes are stamped on the crankshaft in either location.





(cont'd)

Crankshaft Main Bearing Replacement (cont'd)

3. Use the crank bore codes and crank journal codes to select the appropriate replacement bearings from the following table.

   NOTE:
   - The color code is on the edge of the bearing.
   - When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

Main journal code	Crank bore code: 1 or A or I	2 or B or II	3 or C or III	4 or D or IIII
	← Larger crank bore			
	→ Smaller bearing (Thicker)			
1	Pink	Pink/ Yellow	Yellow	Green
2	Pink/ Yellow	Yellow	Green	Green/ Brown
3	Yellow	Green	Green/ Brown	Brown
4	Green	Green/ Brown	Brown	Black
5	Green/ Brown	Brown	Black	Black/ Blue
6	Brown	Black	Black/ Blue	Blue

Smaller main journal ↓ Smaller bearing (Thicker) ↓

Connecting Rod Bearing Replacement

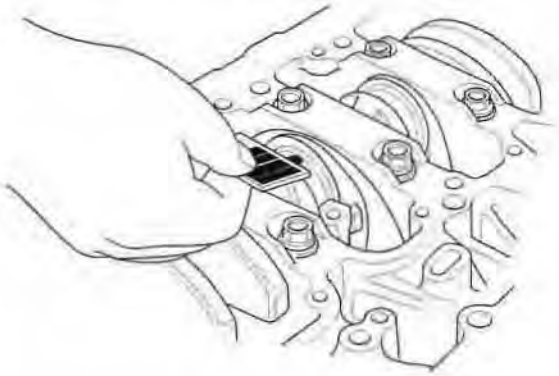
Rod Bearing Clearance Inspection

1. Remove the oil pump (see page 8-10).
2. Remove the baffle plates (see step 8 on page 7-12).
3. Remove the connecting rod cap and bearing half.
4. Clean the crankshaft rod journal and bearing half with a clean shop towel.
5. Place plastigage across the rod journal.
6. Reinstall the bearing half and cap, and torque the bolts to 20 N·m (2.0 kgf·m, 14 lbf·ft) + 90 ° using a commercially available torque angle gauge.

   NOTE: Do not rotate the crankshaft during inspection.

7. Remove the rod cap and bearing half, and measure the widest part of the plastigage.

Connecting Rod Bearing-to-Journal Oil Clearance
Standard (New): **0.020—0.050 mm (0.0008—0.0020 in.)**
Service Limit: **0.060 mm (0.0024 in.)**



8. If the plastigage measures too wide or too narrow, remove the upper half of the bearing, install a new, complete bearing with the same color code(s), and recheck the clearance. Do not file, shim, or scrape the bearings or the caps to adjust clearance.

9. If the plastigage shows the clearance is still incorrect, try the next larger or smaller bearing (the color listed above or below that one), and check clearance again. If the proper clearance cannot be obtained by using the appropriate larger or smaller bearing, replace the crankshaft and start over.

Rod Bearing Selection

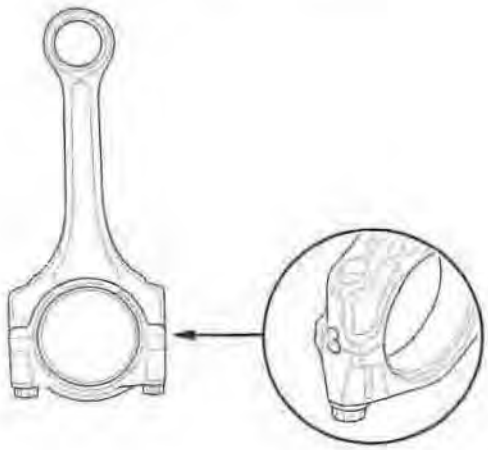
1. Inspect each connecting rod for cracks and heat damage.

Connecting Rod Big End Bore Code Locations

2. Each rod has a tolerance range from 0 to 0.024 mm (0.0009 in.), and in 0.006 mm (0.0002 in.) increments, depending on the size of its big end bore. It's then stamped with a number or bar (1, 2, 3, or 4/I, II, III, or IIII) indicating the range. You may find any combination of numbers and bars in any engine. (Half the number or bar is stamped on the bearing cap, the other half is on the rod.)

   If you can't read the code because of an accumulation of oil and varnish, do not scrub it with a wire brush or scraper. Clean it only with solvent or detergent.

   Normal Bore Size: 51.0 mm (2.01 in.)

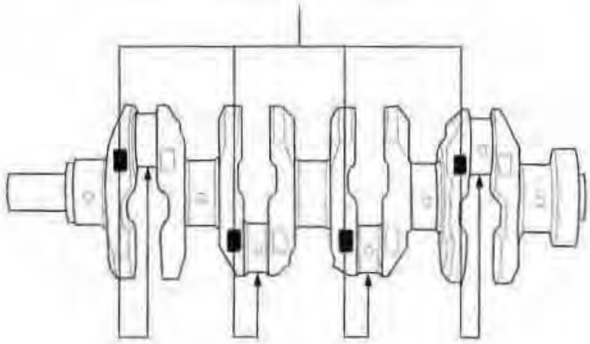


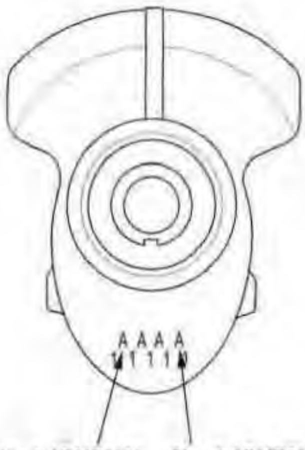
(cont'd)

Connecting Rod Bearing Replacement (cont'd)

Connecting Rod Journal Code Location

3. The connecting rod journal codes are stamped on the crankshaft in either location.





4. Use the big end bore codes and rod journal codes to select appropriate replacement bearings from the following table.

NOTE:
- The color code is on the edge of the bearing.
- When using bearing halves of different colors, it does not matter which color is used in the top or bottom.

Big end bore code → Larger big end bore; → Smaller bearing (Thicker)

Rod journal code ↓ Smaller rod journal; ↓ Smaller bearing (Thicker)

Rod journal code	1 or I	2 or II	3 or III	4 or IIII
A	Pink	Pink/ Yellow	Yellow/ Green	Green
B	Yellow	Yellow/ Green	Green/ Brown	Brown
C	Green	Green/ Brown	Brown/ Black	Black
D	Brown	Brown/ Black	Black/ Blue	Blue

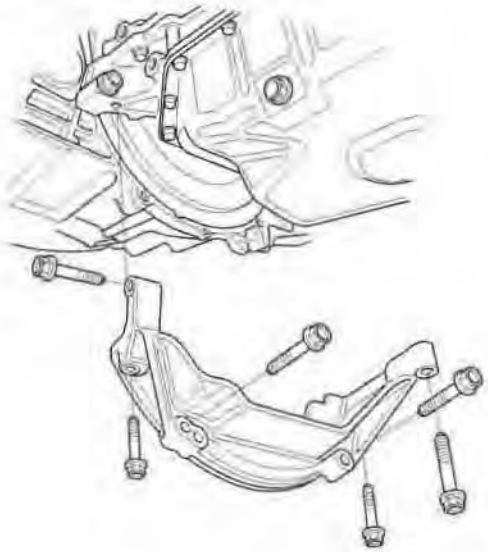
Oil Pan Removal

1. Drain the engine oil (see page 8-6).

2. If the engine is still in the vehicle, remove the subframe.

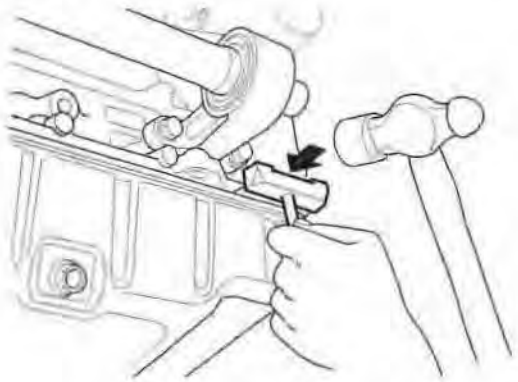
   -1 Attach the engine support hanger to the engine (see step 44 on page 5-7).
   -2 Disconnect the suspension lower arm ball joints (see page 18-19).
   -3 Remove the rear mount mounting bolts (see step 50 on page 5-8).
   -4 Remove the front mount mounting bolt (see step 51 on page 5-8).
   -5 A/T model: Remove the automatic transmission fluid (ATF) filter mounting bolt (see step 37 on page 5-5).
   -6 Make the appropriate reference lines at positions A and B that line up with the center of the subframe mounting bolts (see step 52 on page 5-8).
   -7 Attach the special tool to the subframe, then attach the jack to the special tool (see step 53 on page 5-8).
   -8 Remove the front subframe mounting bolts, then lower the subframe (see step 55 on page 5-9).

3. M/T model: Remove the stiffener.

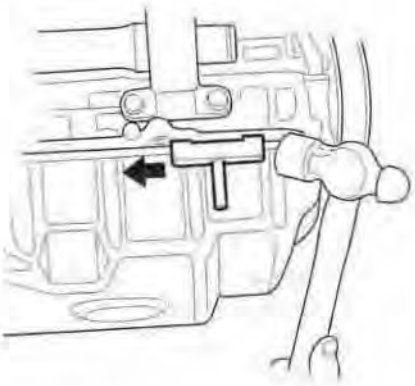


4. Remove the bolts/nuts securing the oil pan.

5. Drive an oil pan seal cutter between the oil pan and engine block.



6. Cut the oil pan seal by striking the side of the cutter to slide the cutter along the oil pan.

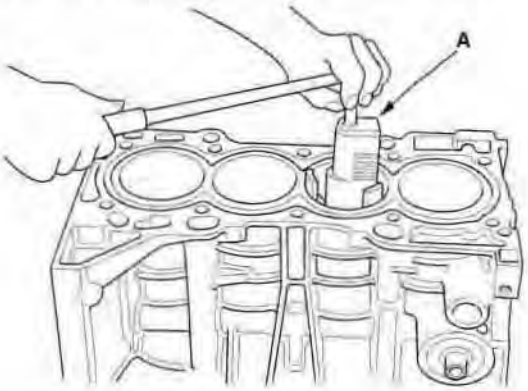


7. Remove the oil pan.

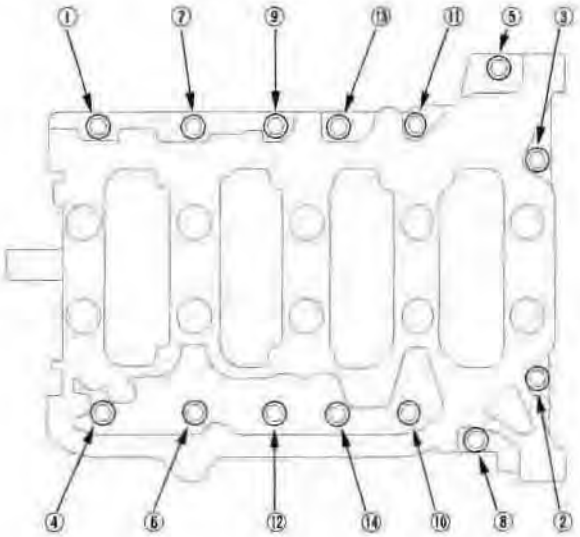
Crankshaft and Piston Removal

1. Remove the engine assembly (see page 5-2).
2. Remove the transmission:
   - Manual transmission (see page 13-4)
   - Automatic transmission (see page 14-189)
3. M/T model: Remove the pressure plate (see page 12-10), clutch disc (see page 12-10), and flywheel (see page 12-12).
4. A/T model: Remove the drive plate (see page 14-198).
5. Remove the oil pan (see page 7-11).
6. Remove the oil pump (see page 8-10).
7. Remove the cylinder head (see page 6-24).
8. Remove the baffle plates.

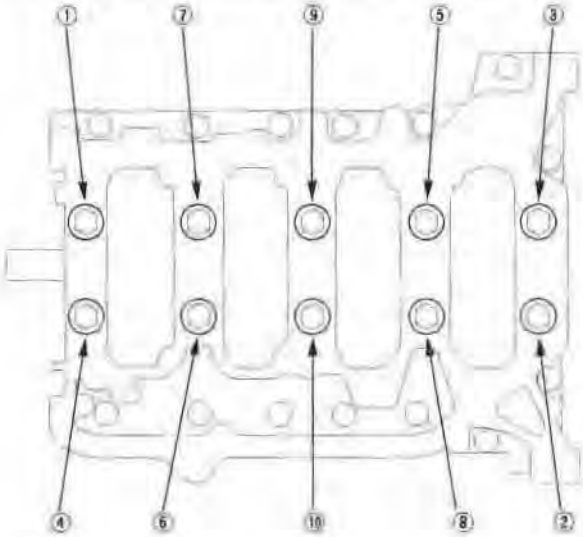
9. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer (A). Follow the reamer manufacturer's instructions. If the ridge is not removed, it may damage the pistons as they are pushed out.



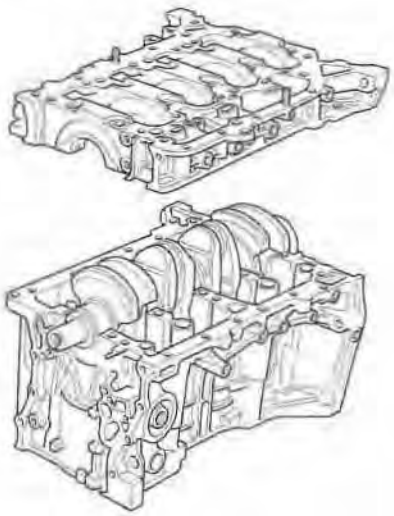
10. Remove the 8 mm bolts.



11. Remove the bearing cap bolts. To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time. Repeat the sequence until all bolts are loosened.

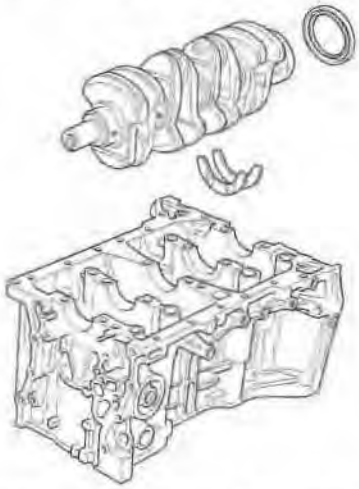


12. Remove the lower block and bearings. Keep all bearings in order.



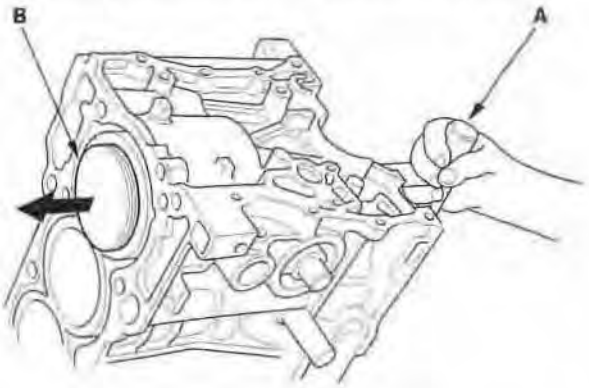
13. Remove the rod caps/bearings. Keep all caps/bearings in order.

14. Lift the crankshaft out of the engine, being careful not to damage the journals.



15. Remove the upper bearing halves from the connecting rods, and set them aside with their respective caps.

16. Use the wooden handle of a hammer (A) to drive out the piston/connecting rod assembly (B).



17. Reinstall the lower block and bearings on the engine in the proper order.

18. Reinstall the connecting rod bearings and caps after removing each piston/connecting rod assembly.

19. To avoid mixup on reassembly, mark each piston/connecting rod assembly with its cylinder number.

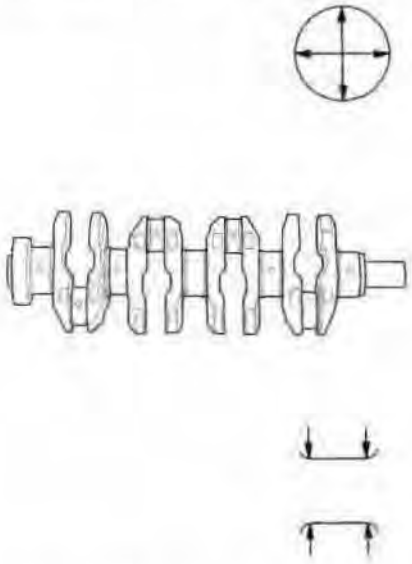
    NOTE: The existing number on the connecting rod does not indicate its position in the engine, it indicates the rod bore size.

Crankshaft Inspection

Out-of-Round and Taper

1. Remove the crankshaft from the engine block (see page 7-12).
2. Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
3. Clean the keyway and threads.
4. Measure out-of round at the middle of each rod and main journal in two places. The difference between measurements on each journal must not be more than the service limit.

   Journal Out-of-Round
   Standard (New): 0.005 mm (0.0002 in.) max.
   Service Limit: 0.010 mm (0.0004 in.)



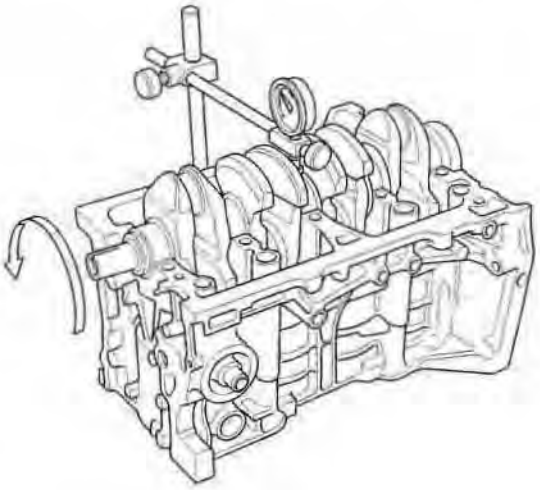
5. Measure taper at the edges of each rod and main journal. The difference between measurements on each journal must not be more than the service limit.

   Journal Taper
   Standard (New): 0.005 mm (0.0002 in.) max.
   Service Limit: 0.010 mm (0.0004 in.)

Straightness

6. Place the engine block on the surface plate.
7. Clean and install the bearings on the No. 1 and No. 5 journals of the engine block.
8. Lower the crankshaft into the engine block.
9. Measure the runout on all of the main journals. Rotate the crankshaft two complete revolutions. The difference between measurements on each journal must not be more than the service limit.

   Crankshaft Total Runout
   Standard (New): 0.03 mm (0.0012 in.) max.
   Service Limit: 0.04 mm (0.0016 in.)

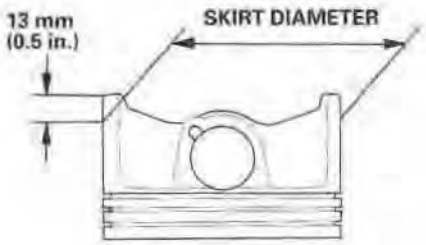


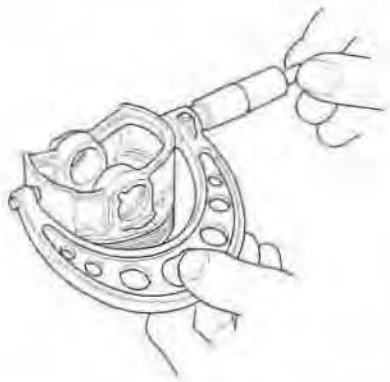
Block and Piston Inspection

1. Remove the crankshaft and pistons (see page 7-12).
2. Check the piston for distortion or cracks.
3. Measure the piston diameter at a point 13 mm (0.5 in.) from the bottom of the skirt. There are two standard-size pistons (No Letter or A, and B). The letter is stamped on the top of the piston. Letters are also stamped on the engine block as cylinder bore sizes.

Piston Diameter
Standard (New):
No Letter (or A): 86.980—86.990 mm (3.4244—3.4248 in.)
B: 86.970—86.980 mm (3.4240—3.4244 in.)
Service Limit:
No Letter (or A): 86.930 mm (3.4224 in.)
B: 86.920 mm (3.4220 in.)

Oversize Piston Diameter
0.25: 87.230—87.240 mm (3.4342—3.4346 in.)





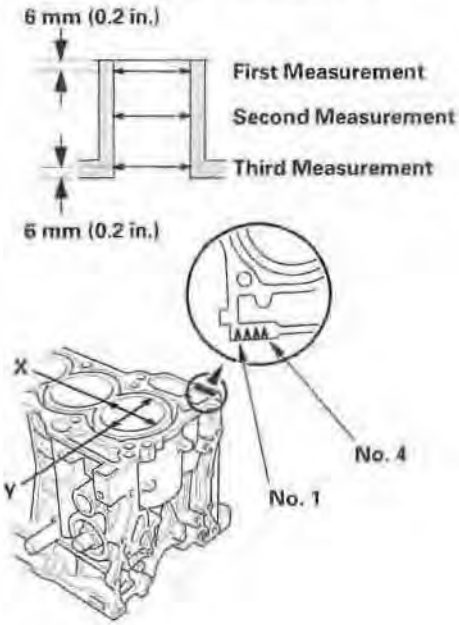
4. Measure wear and taper in direction X and Y at three levels in each cylinder as shown. If measurements in any cylinder are beyond the Oversize Bore Service Limit, replace the engine block. If the engine block is to be rebored, refer to step 7 after reboring.

Cylinder Bore Size
Standard (New):
A or I: 87.010—87.020 mm (3.4256—3.4260 in.)
B or II: 87.000—87.010 mm (3.4252—3.4256 in.)
Service Limit: 87.070 mm (3.4279 in.)

Oversize
0.25: 87.250—87.260 mm (3.4350—3.4354 in.)

Reboring Limit: 0.25 mm (0.01 in.) max.

Bore Taper
Limit: (Difference between first and third measurement) 0.05 mm (0.002 in.)



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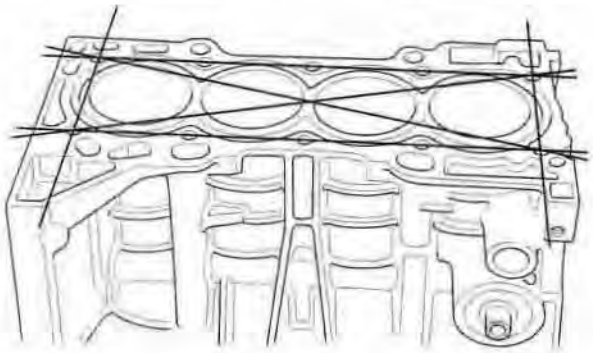
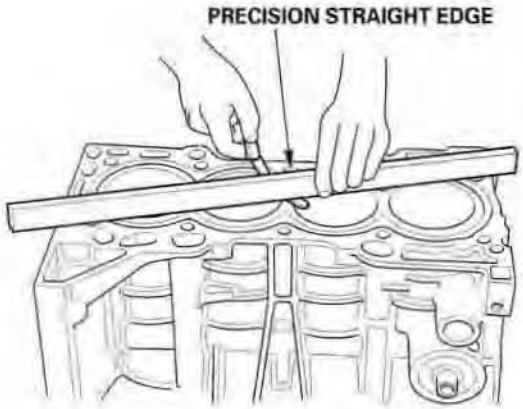
Block and Piston Inspection (cont'd)

5. Scored or scratched cylinder bores must be honed.

6. Check the top of the engine block for warpage. Measure along the edges and across the center as shown.

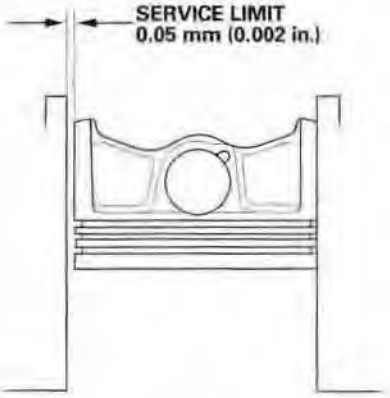
Engine Block Warpage
Standard (New): 0.07 mm (0.003 in.) max.
Service Limit: 0.10 mm (0.004 in.)





7. Calculate the difference between the cylinder bore diameter and the piston diameter. If the clearance is near or exceeds the service limit, inspect the piston and cylinder bore for excessive wear.

Piston-to-Cylinder Bore Clearance
Standard (New): 0.020—0.040 mm (0.0008—0.0016 in.)
Service Limit: 0.05 mm (0.002 in.)



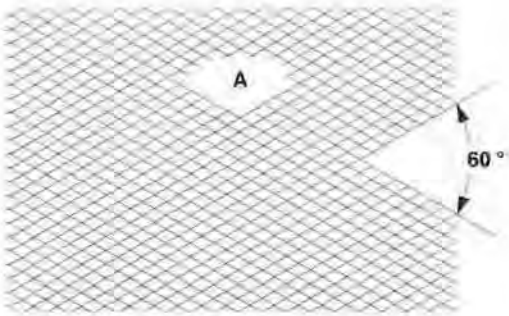
Cylinder Bore Honing

Only a scored or scratched cylinder bore must be honed.

1. Measure the cylinder bores (see page 7-15). If the engine block is to be reused, hone the cylinders and remeasure the bores.

2. Hone the cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree cross-hatch pattern (A).

   NOTE: Use only a rigid hone with 400 grit or finer stone such as Sunnen, Ammco, or equivalent. Do not use stones that are worn or broken.



3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil them immediately to prevent rusting. Never use solvent, it will only redistribute the grit on the cylinder walls.

4. If scoring or scratches are still present in the cylinder bores after honing to the service limit, rebore the engine block. Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.

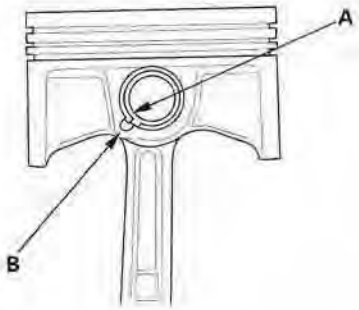
Piston, Pin, and Connecting Rod Replacement

Disassembly

1. Remove the piston from the engine block (see page 7-12).

2. Apply new engine oil to the piston pin snap rings (A), and turn them in the ring grooves until the end gaps are lined up with the cutouts in the piston pin bores (B).

   NOTE: Take care not to damage the ring grooves.



3. Remove both snap rings (A). Start at the cutout in the piston pin bore. Remove the snap rings carefully so they do not go flying or get lost. Wear eye protection.

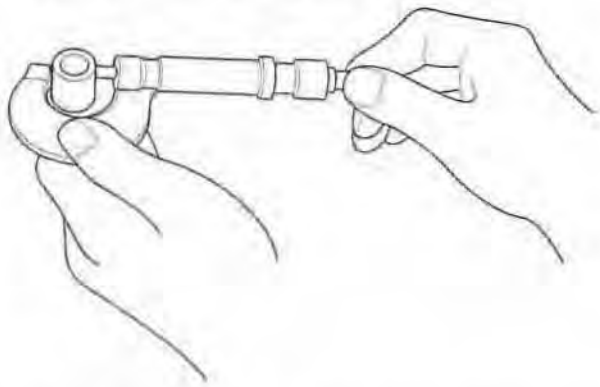
4. Heat the piston and connecting rod assembly to about 158 °F (70 °C), then remove the piston pin.

Inspection

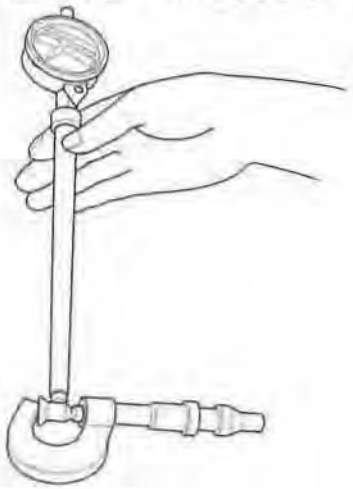
NOTE: Inspect the piston, piston pin, and connecting rod when they are at room temperature.

1. Measure the diameter of the piston pin.

Piston Pin Diameter
Standard (New): 21.961–21.965 mm (0.8646–0.8648 in.)
Service Limit: 21.953 mm (0.8643 in.)



2. Zero the dial indicator to the piston pin diameter.

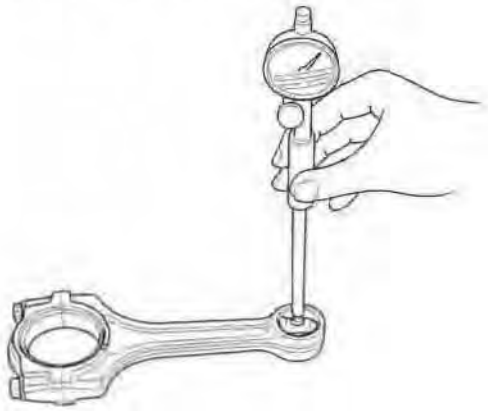


3. Check the difference between the piston pin diameter and piston pin hole diameter in the piston.

Piston Pin-to-Piston Clearance
Standard (New): −0.005 to +0.002 mm (−0.00020 to +0.00008 in.)
Service Limit: 0.005 mm (0.0002 in.)

4. Measure the piston pin-to-connecting rod clearance.

Piston Pin-to-Connecting Rod Clearance
Standard (New): 0.005–0.015 mm (0.0002–0.0006 in.)
Service Limit: 0.02 mm (0.0008 in.)



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Piston, Pin, and Connecting Rod Replacement (cont'd)

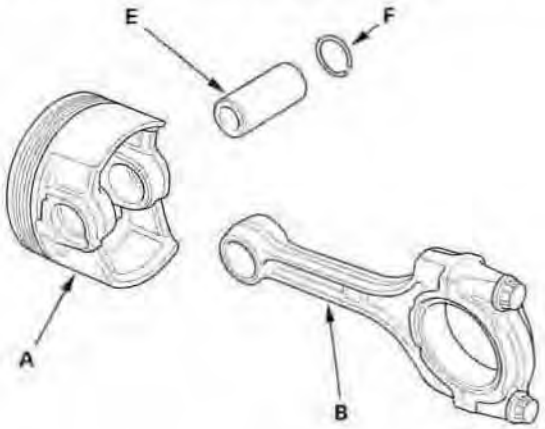
Reassembly

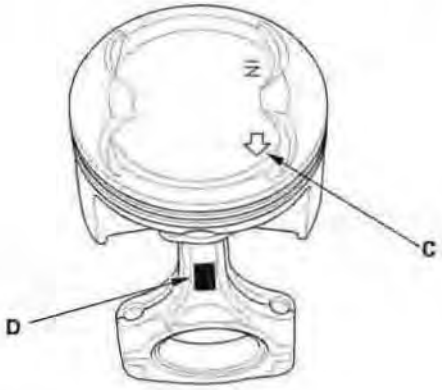
1. Install a piston pin snap ring (A) only one side.

2. Coat the piston pin bore in the piston, the bore in the connecting rod, and the piston pin with new engine oil.

3. Heat the piston to about 158 °F (70 °C).

4. Assemble the piston (A) and connecting rod (B) with the arrow (C) and the embossed mark (D) on the same side. Install the piston pin (E).





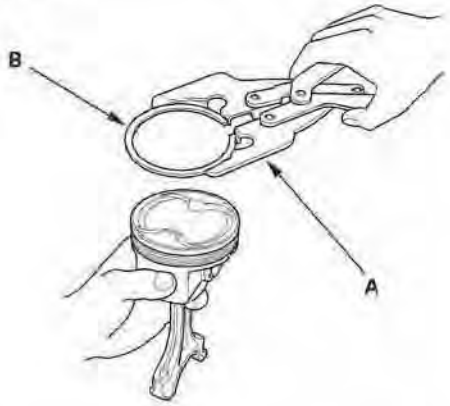
5. Install the remaining snap ring (F).

6. Turn the snap rings in the ring grooves until the end gaps are positioned at the bottom of the piston.

Piston Ring Replacement

1. Remove the piston from the engine block (see page 7-12).

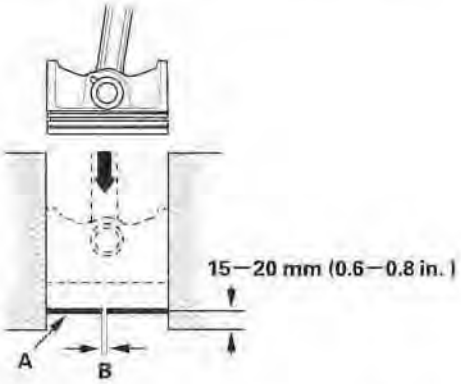
2. Using a ring expander (A), remove the old piston rings (B).



3. Clean all ring grooves thoroughly with a squared-off broken ring or ring groove cleaner with a blade to fit the piston grooves. The top and 2nd ring grooves are 1.2 mm (0.05 in.) wide. The oil ring groove is 2.0 mm (0.08 in.) wide. File down a blade if necessary. Do not use a wire brush to clean the ring grooves, or cut the ring grooves deeper with the cleaning tools.

   NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

4. Using a piston, push a new ring (A) into the cylinder bore 15—20 mm (0.6—0.8 in.) from the bottom.



5. Measure the piston ring end-gap (B) with a feeler gauge:

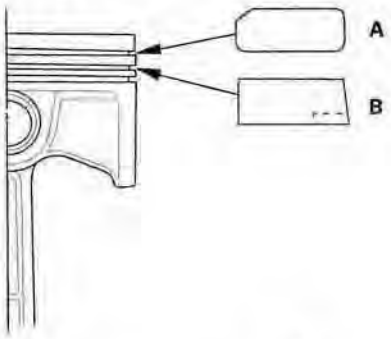
   - If the gap is too small, check to see if you have the proper rings for your engine.
   - If the gap is too large, recheck the cylinder bore diameter against the wear limits (see page 7-15). If the bore is over the service limit, the engine block must be rebored.

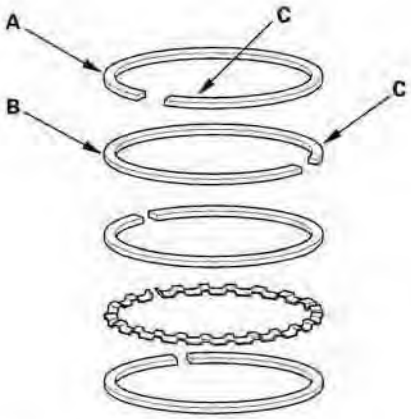
Piston Ring End-Gap
Top Ring:
Standard (New): 0.20—0.35 mm (0.008—0.014 in.)
Service Limit: 0.60 mm (0.024 in.)
Second Ring:
Standard (New): 0.40—0.55 mm (0.016—0.022 in.)
Service Limit: 0.70 mm (0.028 in.)
Oil Ring:
Standard (New): 0.20—0.70 mm (0.008—0.028 in.)
Service Limit: 0.80 mm (0.031 in.)

(cont'd)

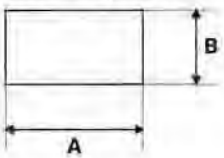
Piston Ring Replacement (cont'd)

6. Install the top ring and second ring as shown. The top ring (A) has a 1R mark and the second ring (B) has a 2R mark. The manufacturing marks (C) must be facing upward.





Piston Ring Dimensions:

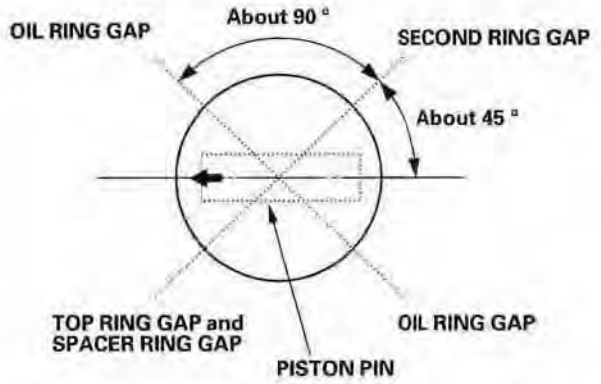


Top Ring (Standard)
A: 3.1 mm (0.12 in.)
B: 1.2 mm (0.05 in.)

Second Ring (Standard)
A: 3.4 mm (0.13 in.)
B: 1.2 mm (0.05 in.)

7. Rotate the rings in their grooves to make sure they do not bind.

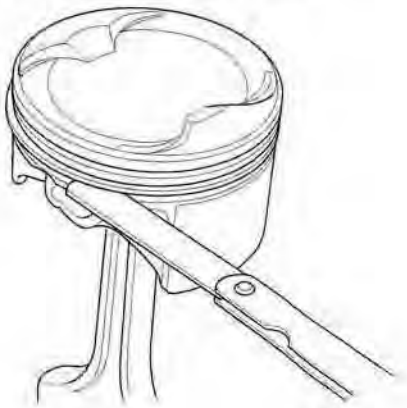
8. Position the ring end gaps as shown:



9. After installing a new set of rings, measure the ring-to-groove clearances:

Top Ring Clearance
Standard (New): 0.045—0.070 mm (0.0018—0.0028 in.)
Service Limit: 0.13 mm (0.005 in.)

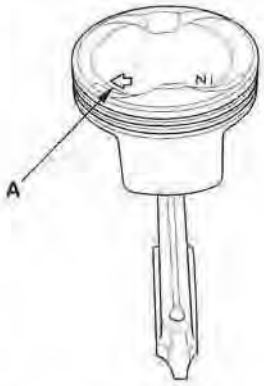
Second Ring Clearance
Standard (New): 0.050—0.075 mm (0.0020—0.0030 in.)
Service Limit: 0.13 mm (0.005 in.)



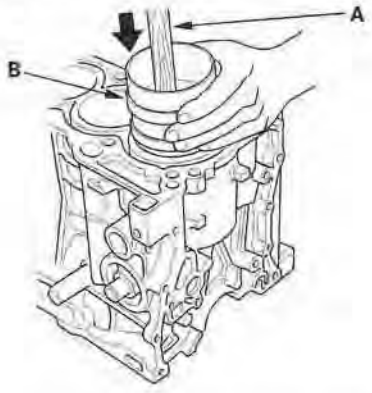
Piston Installation

If the Crankshaft is Already Installed

1. Set the crankshaft to bottom dead center (BDC) for the cylinder you are installing the piston in.
2. Remove the connecting rod caps. Check that the bearing is securely in place.
3. Apply new engine oil to the piston, inside of the ring compressor, and cylinder bore, then attach the ring compressor to the piston/connecting rod assembly.
4. Position the mark (A) to face the cam chain side of the engine.

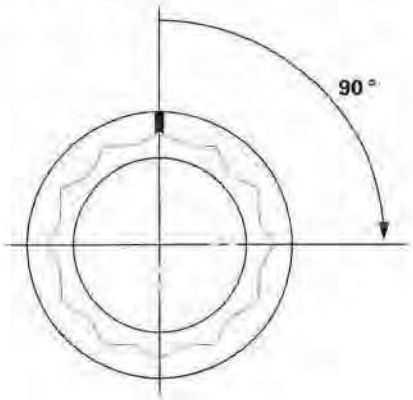


5. Position the piston/connecting rod assembly in the cylinder, and tap it in using the wooden handle of a hammer (A). Maintain downward force on the ring compressor (B) to prevent the rings from expanding before entering the cylinder bore.



6. Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.
7. Check the connecting rod bearing clearance with plastigage (see page 7-8).
8. Inspect the connecting rod bolts (see page 7-24).
9. Apply new engine oil to the bolt threads, then install the rod caps with bearings. Torque the bolts to 20 N·m (2.0 kgf·m, 14 lbf·ft).
10. Tighten the connecting rod bolts an additional 90 °.

    NOTE: Remove the connecting rod bolt if you tightened it beyond the specified angle, and go back to step 8 of the procedure. Do not loosen it back to the specified angle.

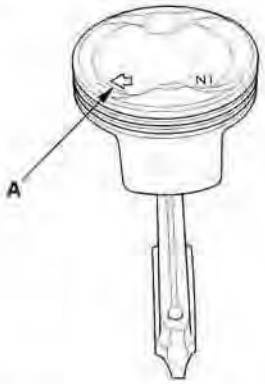


(cont'd)

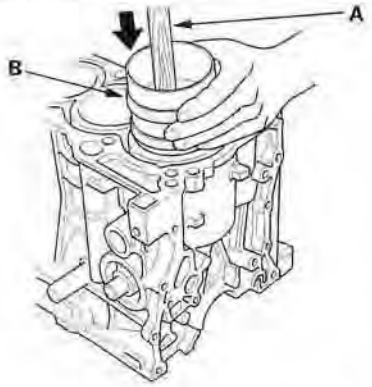
Piston Installation (cont'd)

If the Crankshaft is Not Installed

1. Remove the connecting rod caps. Check that the bearing is securely in place.
2. Apply new engine oil to the piston, inside of the ring compressor, and cylinder bore, then attach the ring compressor to the piston/connecting rod assembly.
3. Position the mark (A) to face the cam chain side of the engine.



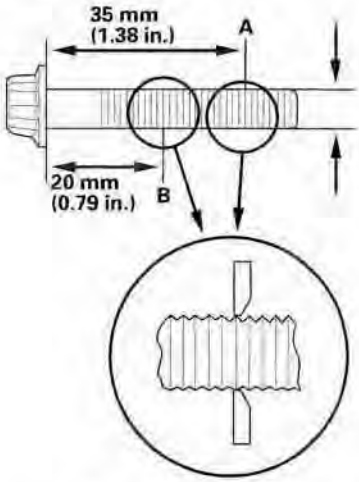
4. Position the piston/connecting rod assembly in the cylinder, and tap it in using the wooden handle of a hammer (A). Maintain downward force on the ring compressor (B) to prevent the rings from expanding before entering the cylinder bore.



5. Position all pistons at top dead center (TDC).

Connecting Rod Bolt Inspection

1. Measure the diameter of each connecting rod bolt at point A and point B.



2. Calculate the difference in diameter between point A and point B.

   Point A—Point B = Difference in Diameter

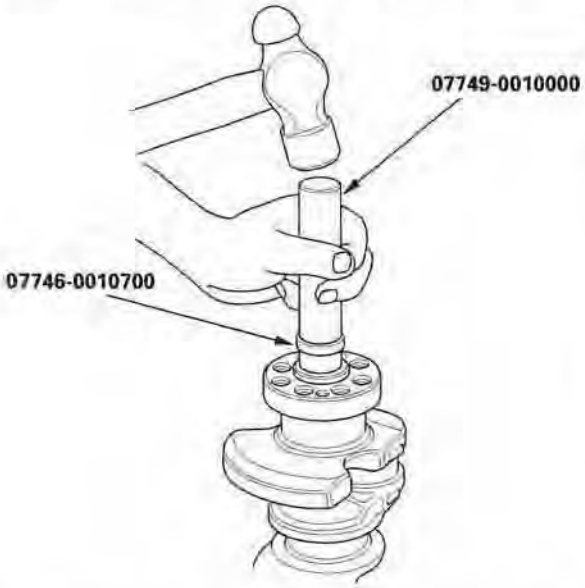
   Difference in Diameter:
   Specification: 0—0.1 mm (0—0.004 in.)

3. If the difference in diameter is out of tolerance, replace the connecting rod bolt.

Crankshaft Installation

Special Tools Required
- Driver 07749-0010000
- Attachment, 24 x 26 mm 07746-0010700
- Oil seal driver attachment 96 07ZAD-PNAA100

1. M/T model: Install the crankshaft end bushing when replacing the crankshaft. Using the special tools, drive in the crankshaft end bushing until the special tools bottom against the crankshaft.



2. Check the connecting rod bearing clearance with plastigage (see page 7-8).

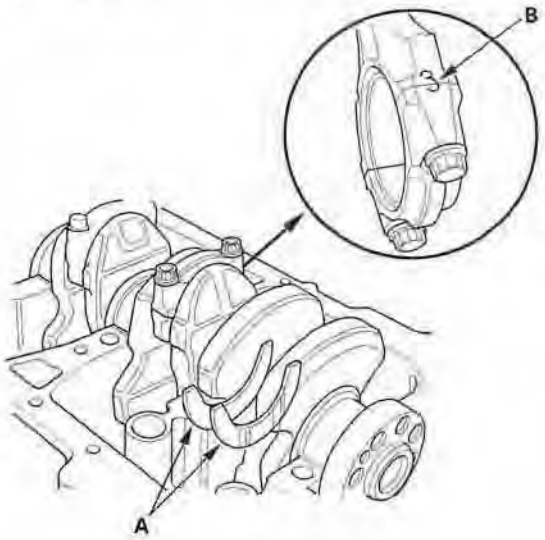
3. Check the main bearing clearance with plastigage (see page 7-6).

4. Install the bearing halves in the engine block and connecting rods.

5. Apply a coat of new engine oil to the main bearings and rod bearings.

6. Hold the crankshaft so rod journal No. 2 and rod journal No. 3 are straight up, and lower the crankshaft into the engine block.

7. Apply new engine oil to the thrust washer surfaces. Install the thrust washers (A) in the No. 4 journal of the engine block.



8. Inspect the connecting rod bolts (see page 7-24).

9. Apply new engine oil to the threads of the connecting rod bolts.

10. Seat the rod journals into connecting rod No. 1 and connecting rod No. 4. Line up the mark (B) on the connecting rod and cap, then install the caps and bolts finger-tight.

11. Rotate the crankshaft clockwise, and seat the journals into connecting rod No. 2 and connecting rod No. 3. Line up the mark on the connecting rod and cap, then install the caps and bolts finger-tight.

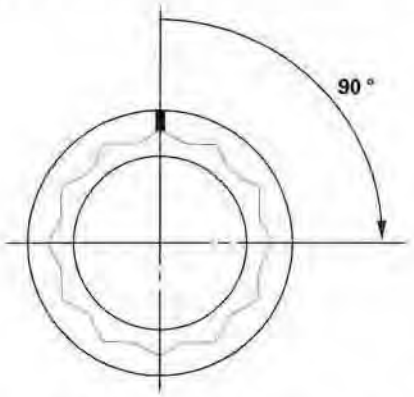
(cont'd)

Crankshaft Installation (cont'd)

12. Tighten the connecting rod bolts to 20 N·m (2.0 kgf·m, 14 lbf·ft).

13. Tighten the connecting rod bolts an additional 90 °.

    NOTE: Remove the connecting rod bolt if you tightened it beyond the specified angle, and go back to step 8 of the procedure. Do not loosen it back to the specified angle.

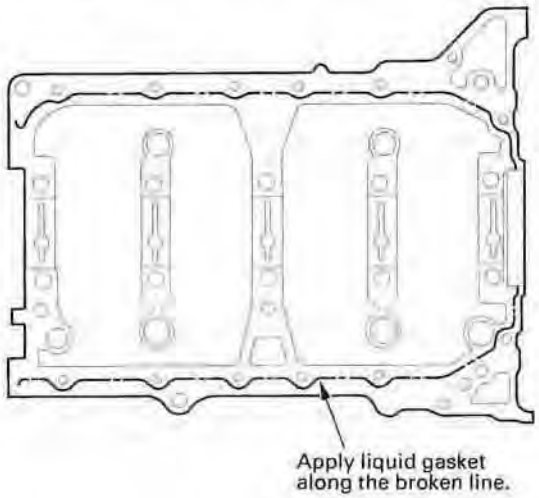


14. Remove all of the old liquid gasket from the lower block mating surfaces, bolts, and bolt holes.

15. Clean and dry the lower block mating surfaces.

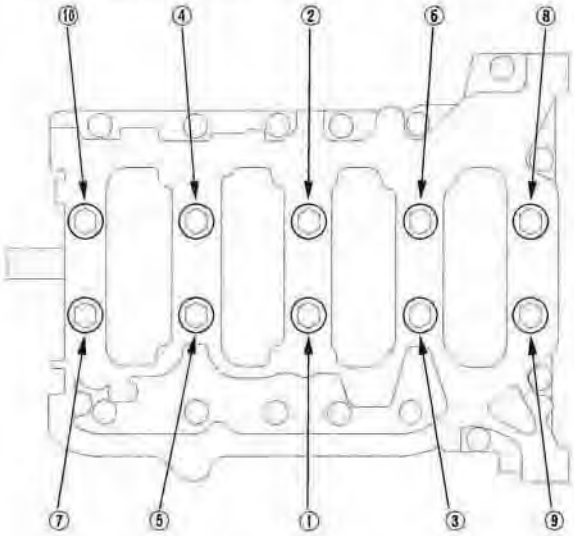
16. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the lower block.

    NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.

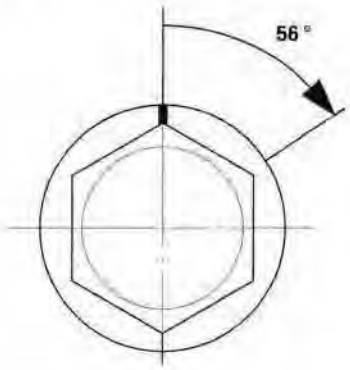


17. Put the lower block on the engine block.

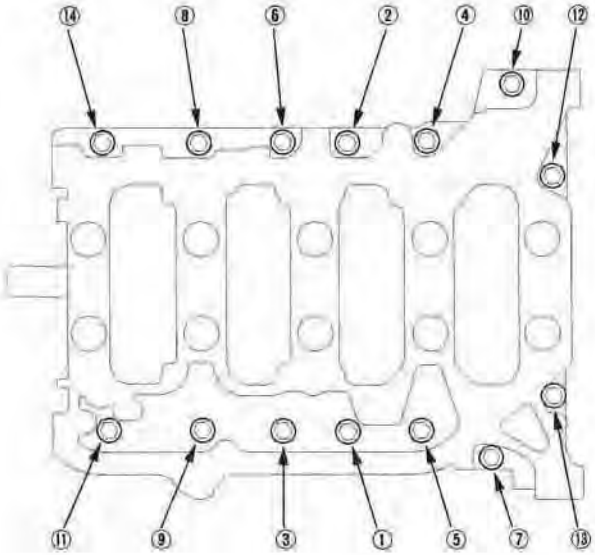
18. Apply new engine oil to the bearing cap bolts. Tighten the bearing cap bolts in sequence to 29 N·m (3.0 kgf·m, 22 lbf·ft).



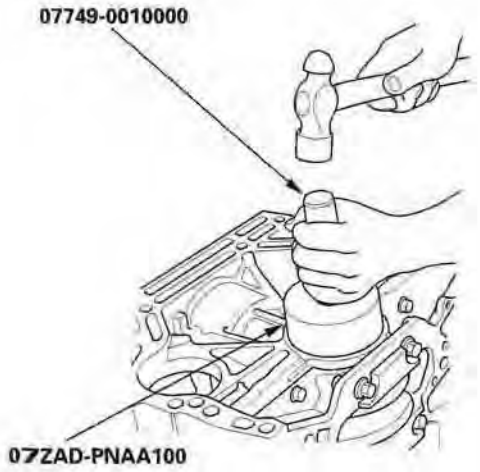
19. Tighten the bearing cap bolts an additional 56 °.



20. Tighten the 8 mm bolts in sequence to 22 N·m (2.2 kgf·m, 16 lbf·ft).

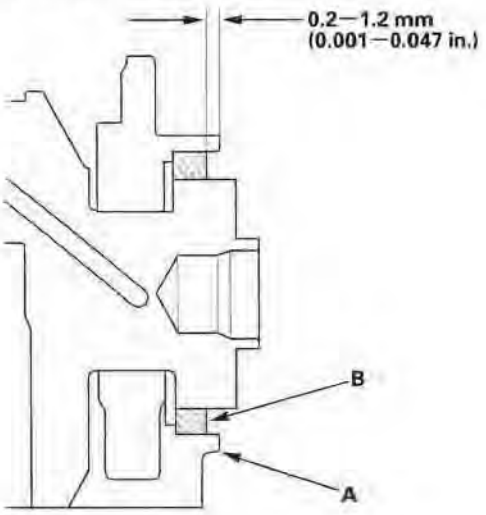


21. Use the special tools to drive a new crankshaft oil seal squarely into the engine block to the specified installed height.

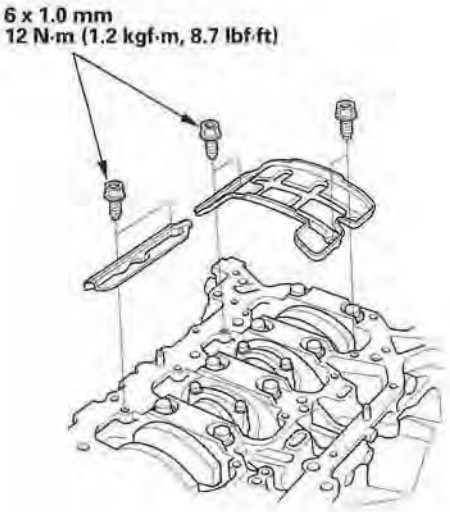


22. Measure the distance between the engine block (A) and crankshaft oil seal (B).

Crankshaft Oil Seal Installed Height:
0.2—1.2 mm (0.001—0.047 in.)



23. Install the baffle plates.



(cont'd)

Crankshaft Installation (cont'd)

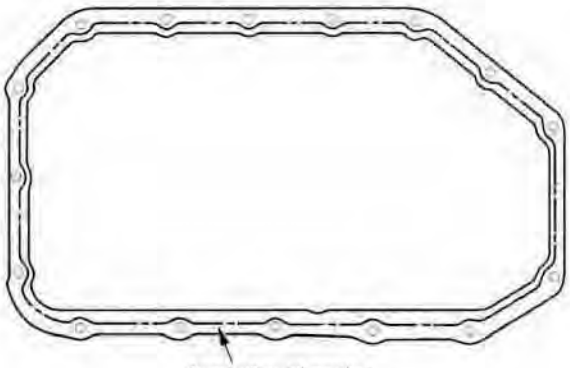
24. Install the oil pump (see page 8-15).
25. Install the oil pan (see page 7-28).
26. Install the cylinder head (see page 6-43).
27. M/T model: Install the flywheel (see page 12-12), clutch disc (see page 12-13), and pressure plate (see page 12-13).
28. A/T model: Install the drive plate (see page 14-198).
29. Install the transmission:
    - Manual transmission (see page 13-9)
    - Automatic transmission (see page 14-199)
30. Install the engine assembly (see page 5-10).

    NOTE: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for about 15 minutes.

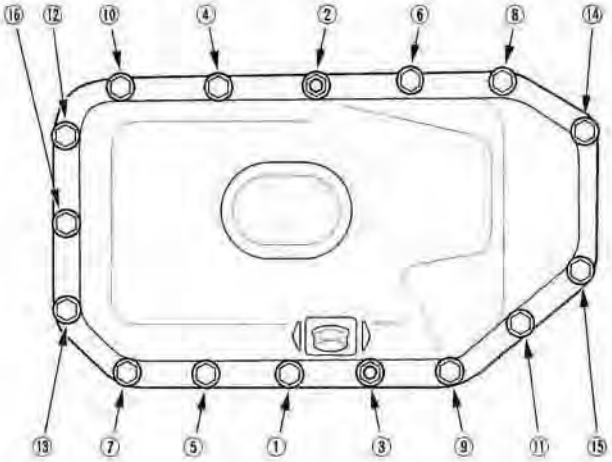
Oil Pan Installation

1. Remove all of the old liquid gasket from the oil pan mating surfaces, bolts, and bolt holes.
2. Clean and dry the oil pan mating surfaces.
3. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the oil pan.

   NOTE: Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.



4. Install the oil pan.
5. Tighten the bolts/nuts in two or three steps. In the final step, tighten all bolts, in sequence, to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).



6. M/T model: Install the stiffener.

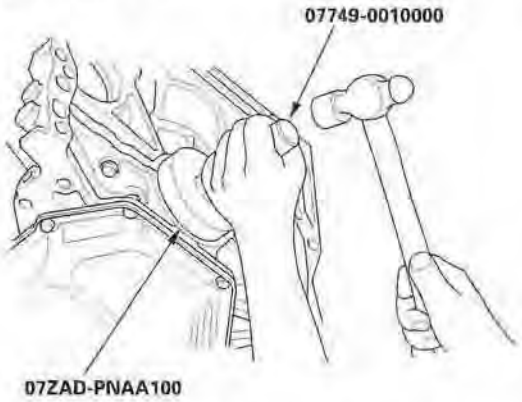
7. If the engine is still in the vehicle, install the subframe.
   - –1 Support the subframe with the special tool and a jack, and lift it up to body, then loosely install the new subframe mounting bolts (see step 4 on page 5-11).
   - –2 Align the reference marks with the center of the subframe mounting bolts, then tighten the bolts to the specified torque (see step 6 on page 5-11).
   - –3 A/T model: Install the automatic transmission fluid (ATF) filter mounting bolt (see step 36 on page 5-15).
   - –4 Tighten the rear mount mounting bolts (see step 8 on page 5-12).
   - –5 Tighten the front mount mounting bolt (see step 18 on page 5-13).
   - –6 Connect the suspension lower arm ball joints (see page 18-19).

8. After assembly, wait at least 30 minutes before filling the engine with oil.

Transmission End Crankshaft Oil Seal Installation - In Car

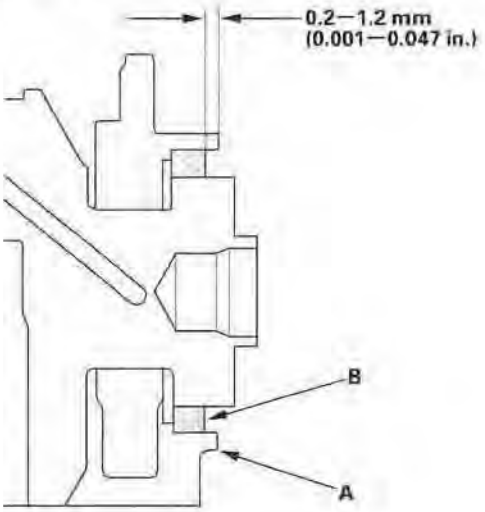
Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment 96 07ZAD-PNAA100

1. Clean and dry the crankshaft oil seal housing.
2. Apply a light coat of multipurpose grease to the crankshaft and to the lip of the seal.
3. Use the special tools to drive a new oil seal squarely into the engine block to the specified installed height.



4. Measure the distance between the engine block (A) and crankshaft oil seal (B).

Crankshaft Oil Seal Installed Height:
0.2—1.2 mm (0.001—0.047 in.)



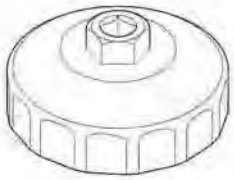
Engine Mechanical

Engine Lubrication

Engine Lubrication

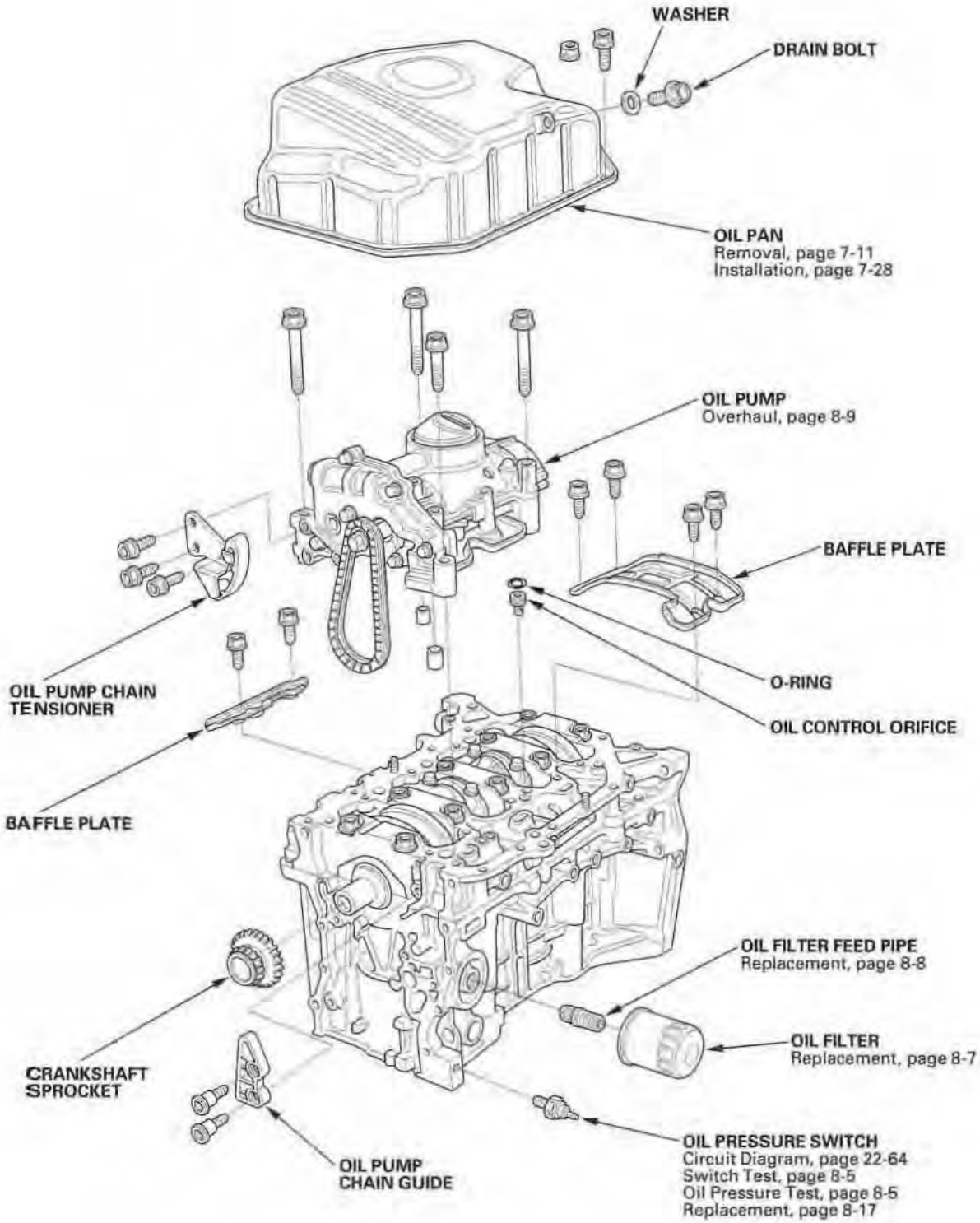
Special Tools

Ref. No.	Tool Number	Description	Qty
①	07HAA-PJ70100	Oil Filter Wrench	1



①

Component Location Index

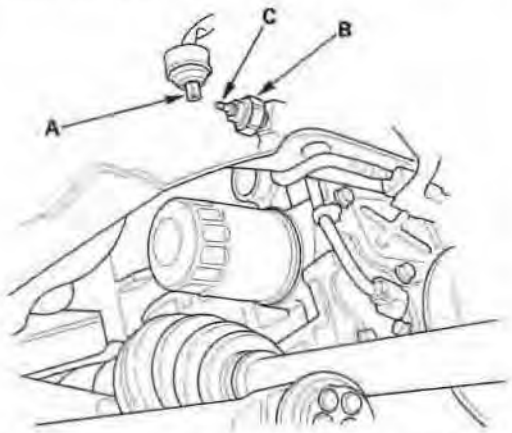


Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Excessive engine oil consumption	1. Check for worn valve guide(s) (see page 6-36) or worn valve stem seal(s). 2. Check for damaged or worn piston ring(s). 3. Check for damaged or worn engine internal parts (cylinder wall, pistons, etc.) (see page 7-15). 4. Check for oil leaks. 5. Check the operation of the positive crankcase ventilation (PCV) system (see page 11-242). 6. Check the engine oil for dirt or improper viscosity.	
Low engine oil pressure	1. Check the oil screen for clogging. 2. Check the oil pump (see page 8-11). 3. Check the relief valve. 4. Test the oil pressure switch (see page 8-5). 5. Check for excessive clearance in the engine (bearing-to-jounal, etc.). 6. Check the engine oil for dirt or improper viscosity.	
High engine oil pressure	Check the relief valve.	

Oil Pressure Switch Test

1. Remove the YEL/RED wire (A) from the engine oil pressure switch (B).



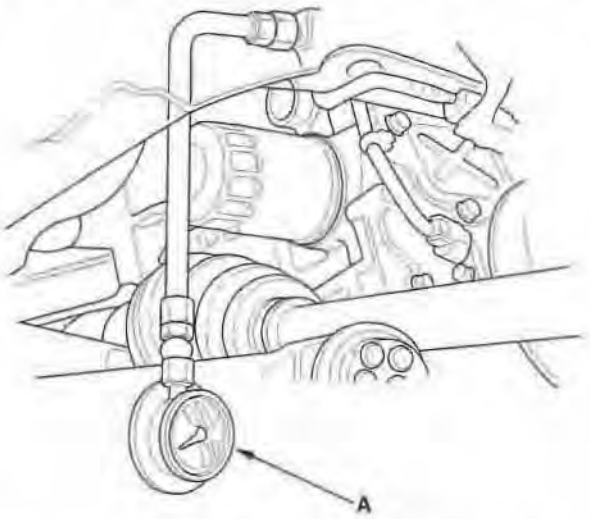
2. Check for continuity between the positive terminal (C) and the engine (ground). There should be continuity with the engine stopped. There should be no continuity with the engine running.

3. If the switch fails to operate, check the engine oil level. If the engine oil level is OK, check the engine oil pressure. If the oil pressure is OK, replace the oil pressure switch.

Oil Pressure Test

If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Remove the engine oil pressure switch, and install an oil pressure gauge (A).



2. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.

3. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

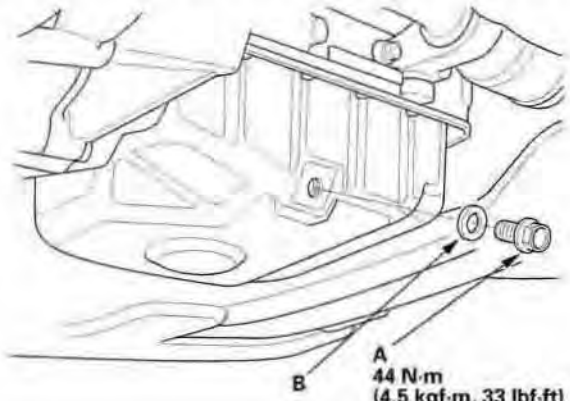
Engine Oil Temperature: 176 °F (80 °C)
Engine Oil Pressure:
At Idle: 70 kPa (0.7 kgf/cm², 10 psi) min.
At 3,000 rpm: 300 kPa (3.1 kgf/cm², 44 psi) min.

4. If the oil pressure is not within specifications, inspect these items:

   - Check the oil screen for clogging.
   - Inspect the oil pump (see page 8-11).

Engine Oil Replacement

1. Warm up the engine.
2. Remove the drain bolt (A), and drain the engine oil.



A
44 N·m
(4.5 kgf·m, 33 lbf·ft)
Do not overtighten.

3. Reinstall the drain bolt with a new washer (B).
4. Refill with the recommended oil (see page 3-2).

Capacity
At Oil Change:
4.0 L (4.2 US qt)
At Oil Change including Filter:
4.2 L (4.4 US qt)
After Engine Overhaul:
5.3 L (5.6 US qt)

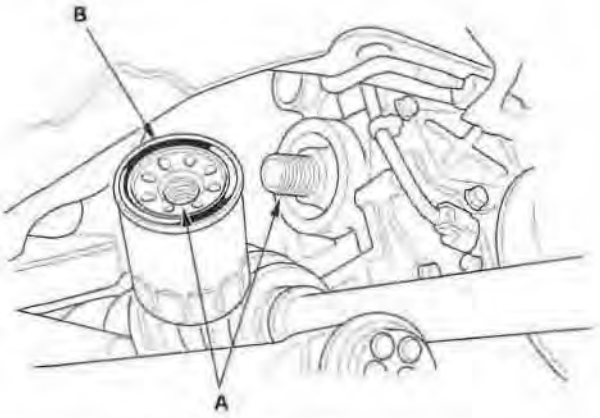
5. Run the engine for more than 3 minutes, then check for oil leakage.

Engine Oil Filter Replacement

Special Tools Required
Oil filter wrench 07HAA-PJ70100

1. Remove the oil filter with the special tool.

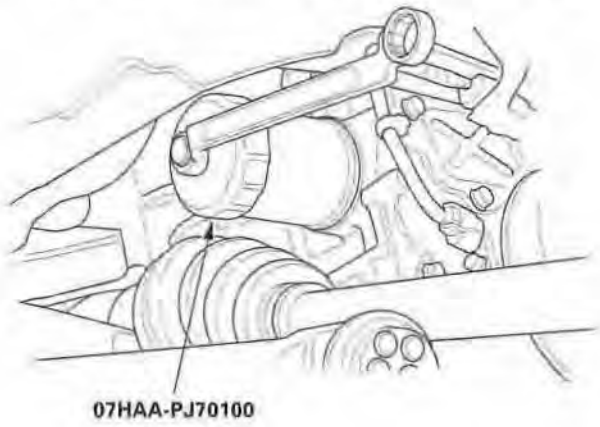
2. Inspect the threads (A) and rubber seal (B) on the new filter. Clean the seat on the engine block, then apply a light coat of new engine oil to the filter rubber seal. Use only filters with a built-in bypass system.



3. Install the oil filter by hand.

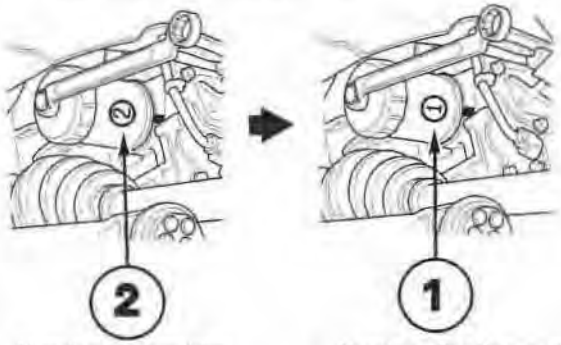
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: **3/4 Turn Clockwise**
Tightening Torque: **12 N·m (1.2 kgf·m, 8.7 lbf·ft)**



5. If four numbers or marks (1 to 4 or ▼ to ▼▼▼▼) are printed around the outside of the filter, use the following procedure to tighten the filter.

   - Spin the filter on until its seal lightly seats against the block, and note which number or mark is at the bottom.
   - Tighten the filter by turning it clockwise three numbers or marks from the one you noted. For example, if number 2 is at the bottom when the seal is seated, tighten the filter until the number 1 comes around the bottom.



Number when rubber seal is seated.

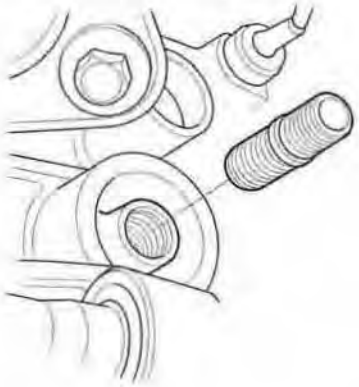
Number after tightening.

Number or Mark when rubber seal is seated	1 or ▼	2 or ▼▼	3 or ▼▼▼	4 or ▼▼▼▼
Number or Mark after tightening	4 or ▼▼▼▼	1 or ▼	2 or ▼▼	3 or ▼▼▼

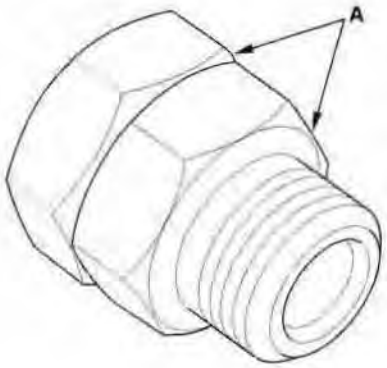
6. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

Oil Filter Feed Pipe Replacement

1. Remove the oil filter (see page 8-7).
2. Remove the oil filter feed pipe.



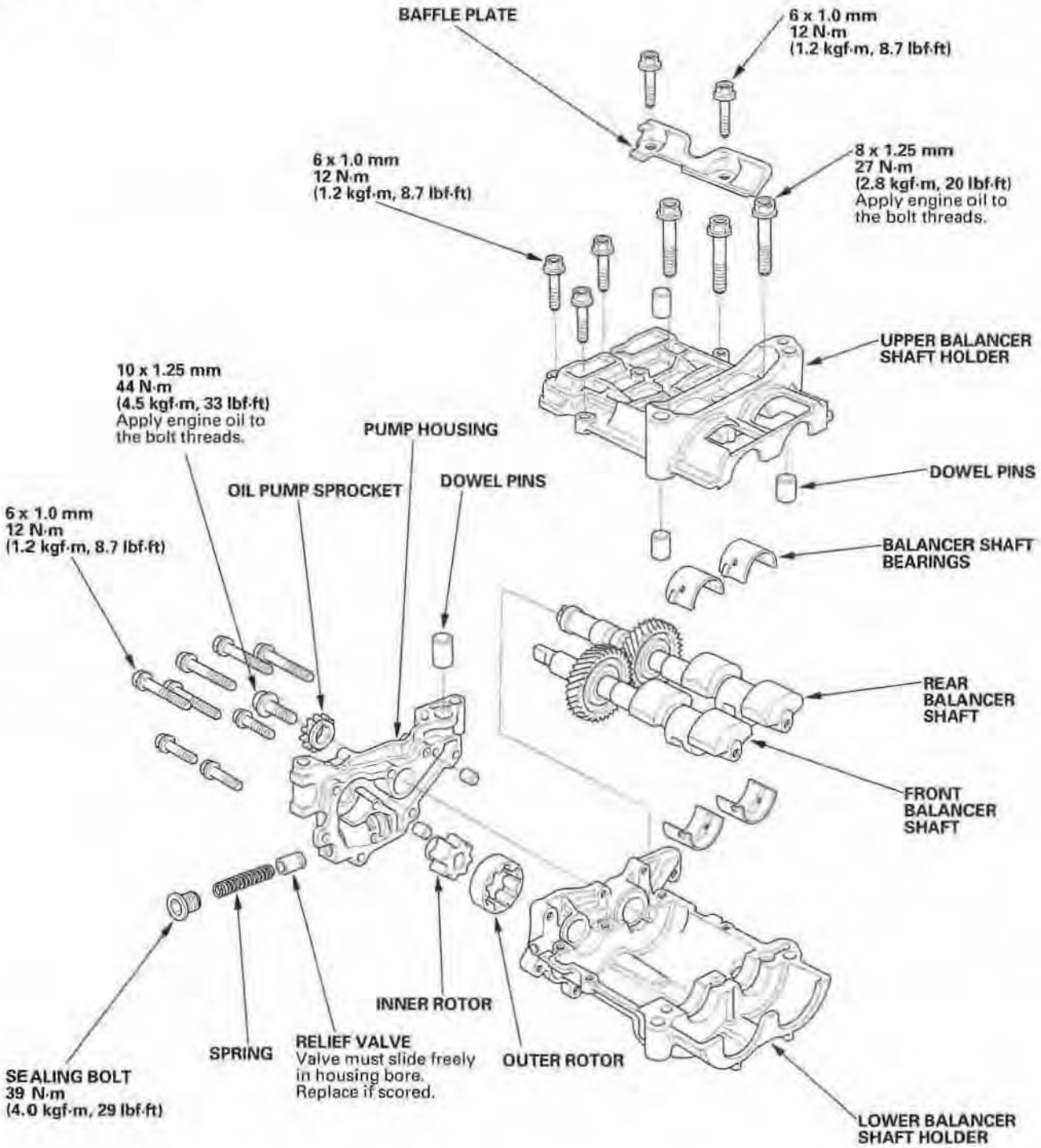
3. Install the two 20 x 1.5 mm nuts (A) onto the new oil filter feed pipe. Hold the nut with a wrench, then tighten the other nut.



4. Tighten the oil filter feed pipe to the engine block to 49 N·m (5.0 kgf·m, 36 lbf·ft), then remove the nuts from the oil filter feed pipe.

Oil Pump Overhaul

Exploded View

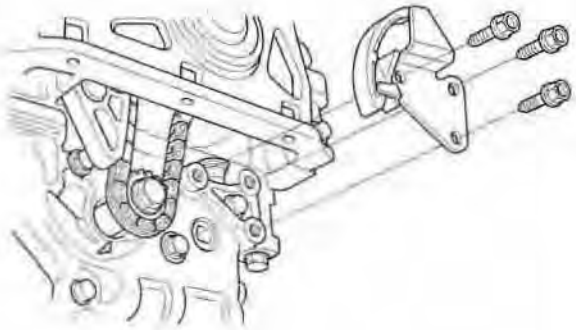


(cont'd)

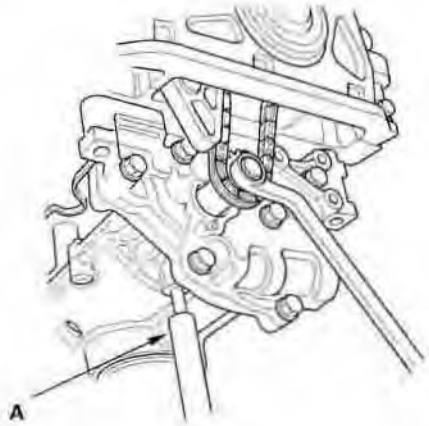
Oil Pump Overhaul (cont'd)

Oil Pump Removal

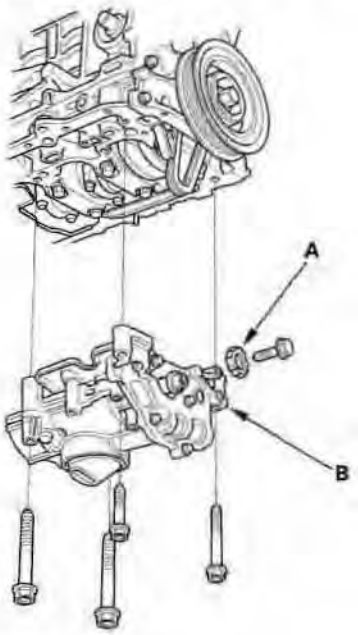
1. Set the No. 1 piston at top dead center (TDC) (see step 1 on page 6-12).
2. Remove the oil pan (see page 7-11).
3. Remove and discard the oil pump chain tensioner.



4. To hold the rear balancer shaft, insert a 6 mm pin driver (A) into the maintenance hole in the lower balancer shaft holder and through the rear balancer shaft.

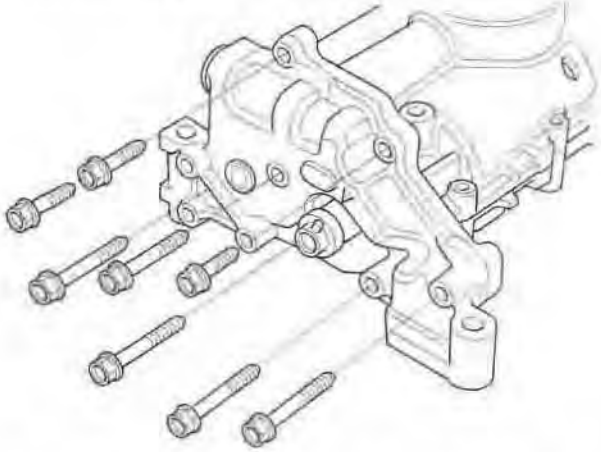


5. Loosen the oil pump sprocket mounting bolt.
6. Remove the oil pump sprocket (A), then remove the oil pump (B).



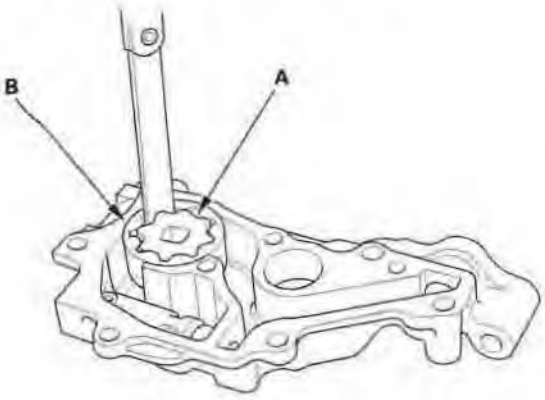
Oil Pump Inspection

1. Remove the pump housing.



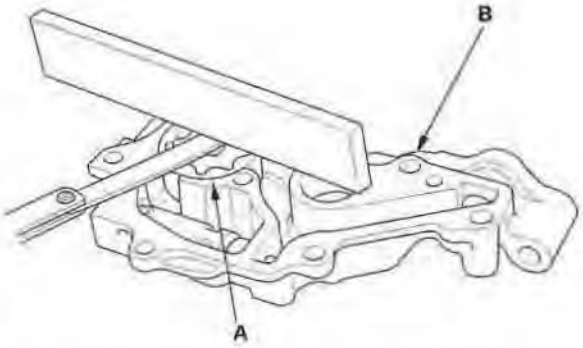
2. Check the inner-to-outer rotor radial clearance between the inner rotor (A) and outer rotor (B). If the inner-to-outer rotor radial clearance exceeds the service limit, replace the oil pump.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.06—0.16 mm (0.002—0.006 in.)
Service Limit: 0.20 mm (0.008 in.)



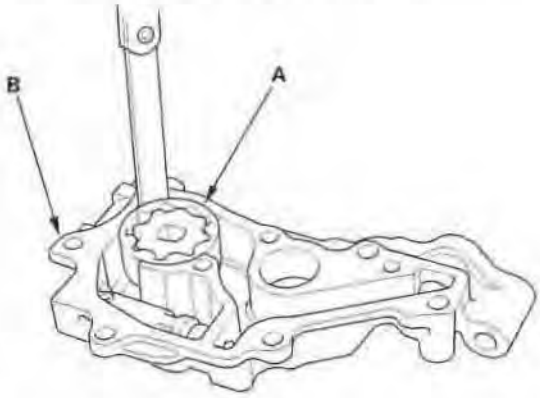
3. Check the housing-to-rotor axial clearance between the rotor (A) and pump housing (B). If the housing-to-rotor axial clearance exceeds the service limit, replace the oil pump.

Housing-to-Rotor Axial Clearance
Standard (New): 0.035—0.070 mm (0.0014—0.0028 in.)
Service Limit: 0.12 mm (0.005 in.)



4. Check the housing-to-outer rotor radial clearance between the outer rotor (A) and pump housing (B). If the housing-to-outer rotor radial clearance exceeds the service limit, replace the oil pump.

Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.15—0.21 mm (0.006—0.008 in.)
Service Limit: 0.23 mm (0.009 in.)



5. Inspect both rotors and the pump housing for scoring or other damage. Replace the damaged parts if necessary.

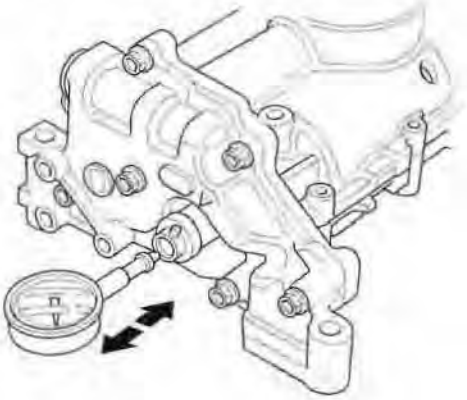
(cont'd)

Oil Pump Overhaul (cont'd)

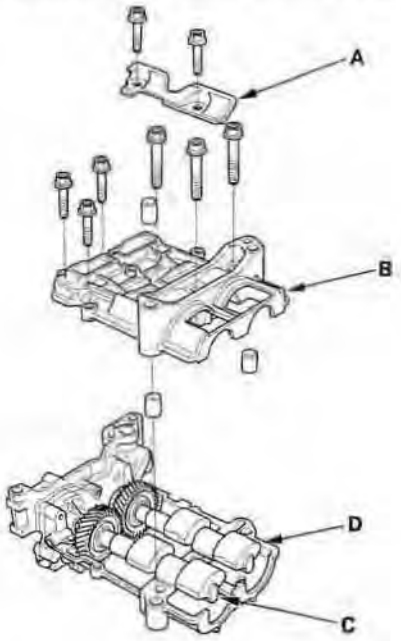
Balancer Shaft Inspection

1. Seat the balancer shaft by pushing it away from the oil pump sprocket end of the oil pump.
2. Zero the dial indicator against the end of the balancer shaft, then push the balancer shaft back and forth and read the end play.

Balancer Shaft End Play
Front Balancer Shaft:
Standard (New): 0.063—0.108 mm (0.0025—0.0043 in.)
Service Limit: 0.14 mm (0.0055 in.)
Rear Balancer Shaft:
Standard (New): 0.063—0.108 mm (0.0025—0.0043 in.)
Service Limit: 0.14 mm (0.0055 in.)



3. Remove the baffle plate (A) and upper balancer shaft holder (with bearings) (B), then remove the front balancer shaft (C) and rear balancer shaft (D).



4. Measure the inner diameter of the No. 1 bearing for the front balancer shaft hole and the rear balancer shaft hole.

Bearing Inner Diameter
Front:
Standard (New): 20.000—20.020 mm (0.7874—0.7882 in.)
Service Limit: 20.03 mm (0.789 in.)
Rear:
Standard (New): 24.000—24.020 mm (0.9449—0.9457 in.)
Service Limit: 24.03 mm (0.946 in.)

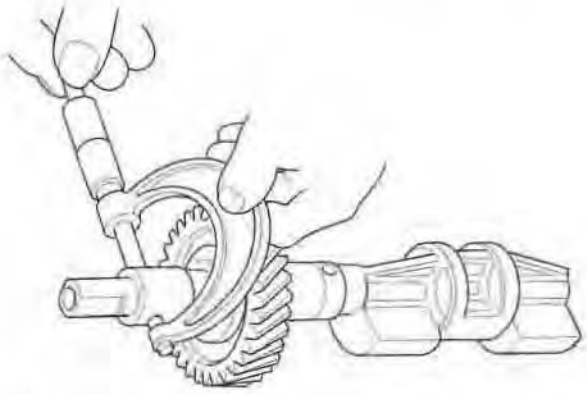
Front:

Rear:

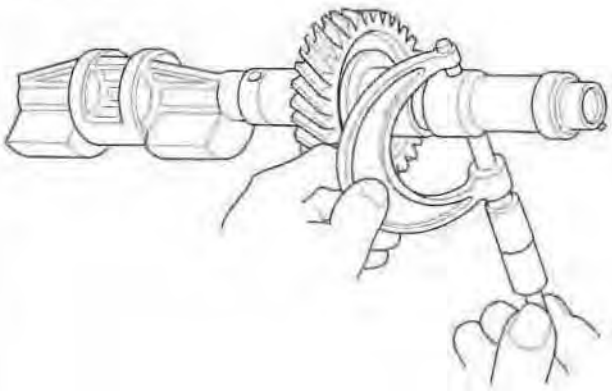
5. Measure the diameters of the No. 1 journals on the front balancer shaft and rear balancer shaft.

Journal Diameter
Front:
Standard (New): 19.938—19.950 mm (0.7850—0.7854 in.)
Service Limit: 19.92 mm (0.784 in.)
Rear:
Standard (New): 23.938—23.950 mm (0.9424—0.9429 in.)
Service Limit: 23.92 mm (0.942 in.)

Front:



Rear:



(cont'd)

Oil Pump Overhaul (cont'd)

6. Clean both balancer shaft No. 2 journals and bearing halves with a clean shop towel.

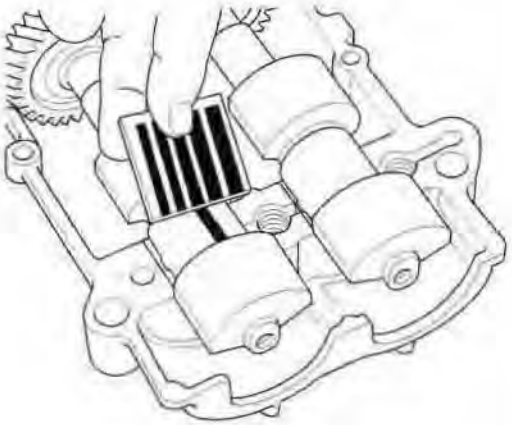
7. Place one strip of plastigage across each No. 2 journal.

8. Reinstall the bearings and upper balancer shaft holder, then torque the bolts.

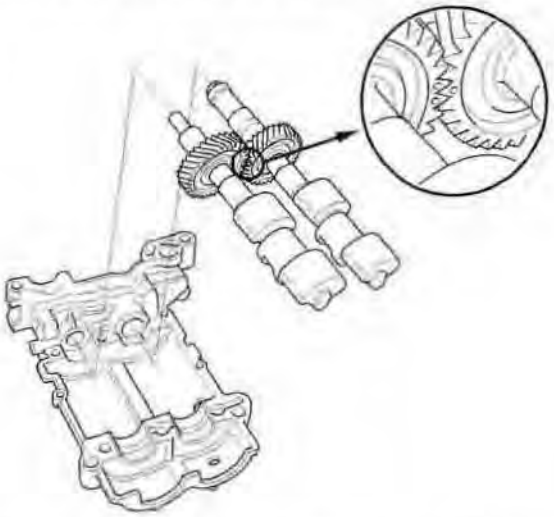
   NOTE: Do not rotate the balancer shafts during inspection.

9. Remove the upper balancer shaft holder and bearings again, and measure the widest part with the plastigage. If the balancer shaft No. 2 journal oil clearance is out-of-tolerance, install new bearings, and recheck. If it is still out-of-tolerance, replace the balancer shafts.

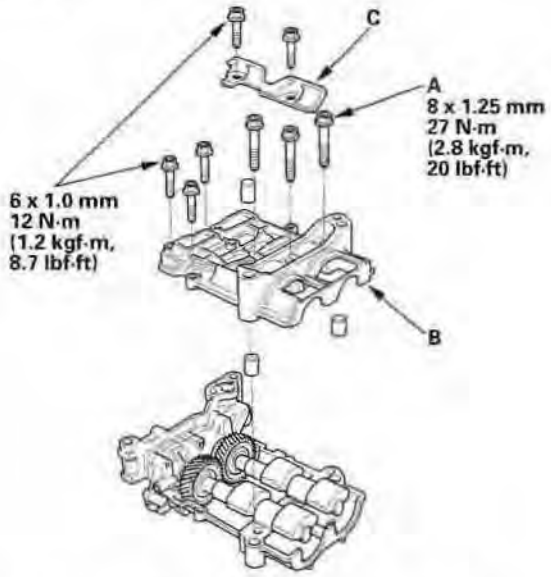
   No. 2 Journal Oil Clearance
   Standard (New): 0.060—0.120 mm (0.0024—0.0047 in.)
   Service Limit: 0.15 mm (0.006 in.)



10. Align the punch mark on the rear balancer shaft in the center of the two punch marks on the front balancer shaft, then install the balancer shafts on the lower balancer shaft holder.

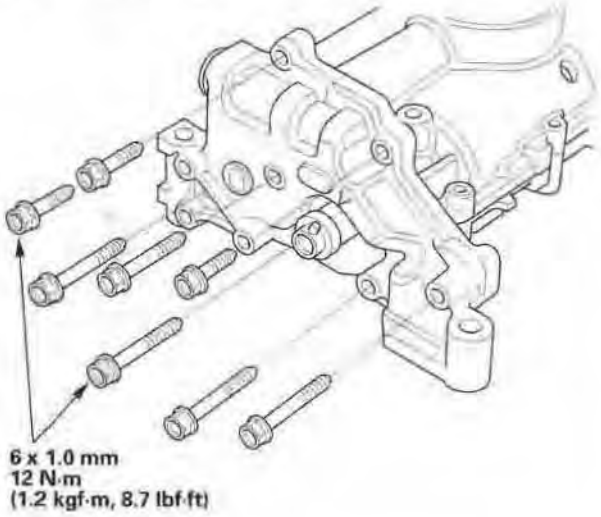


11. Apply new engine oil to the threads of the 8 mm bolts (A).



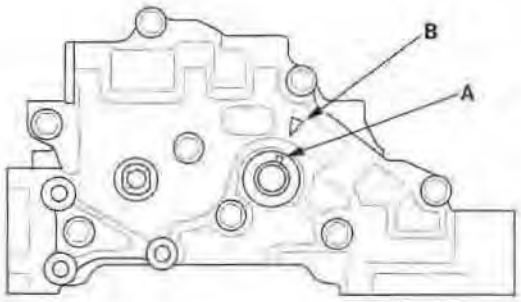
12. Install the upper balancer shaft holder (B) and baffle plate (C).

13. Install the pump housing.

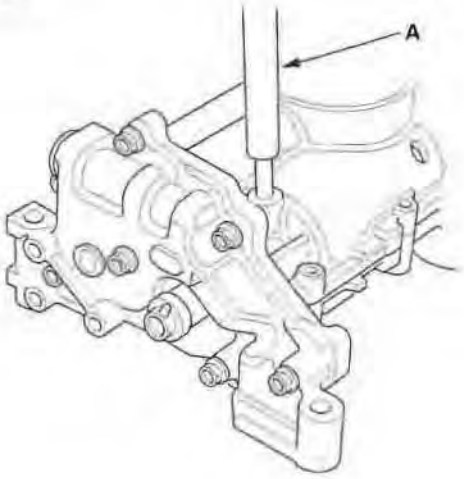


Oil Pump Installation

1. Make sure the No. 1 piston is at TDC (see step 1 on page 6-12).
2. Align the dowel pin (A) on the rear balancer shaft with the mark (B) on the oil pump.



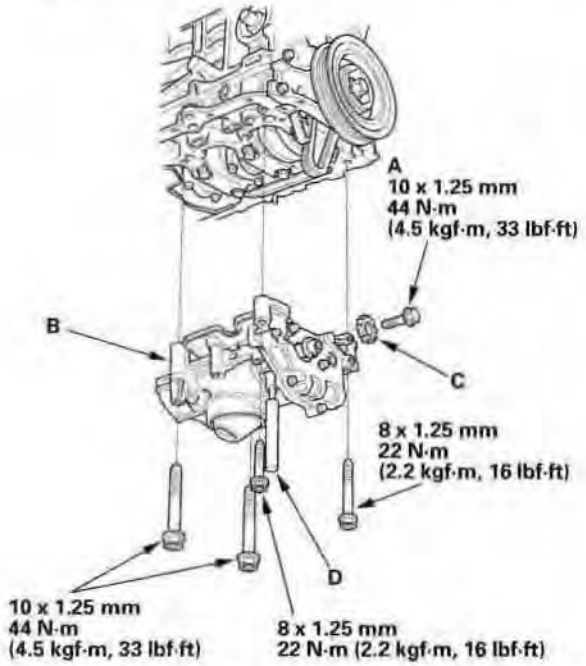
3. To hold the rear balancer shaft, insert a 6 mm pin driver (A) into the maintenance hole in the lower balancer shaft holder and through the rear balancer shaft.



(cont'd)

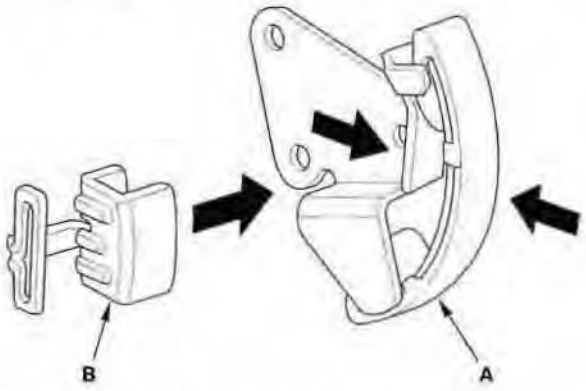
Oil Pump Overhaul (cont'd)

4. Apply new engine oil to the threads of the oil pump sprocket mounting bolt (A).

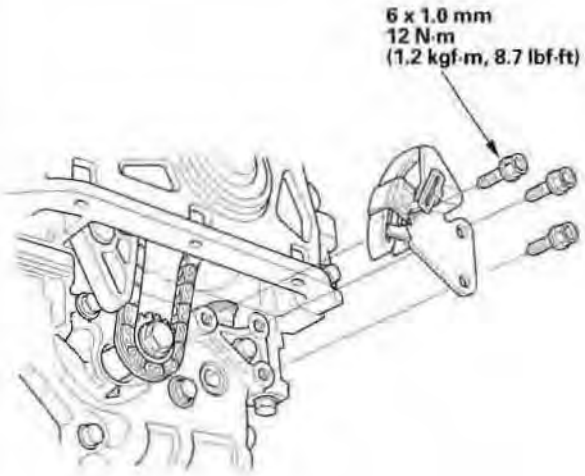


5. Loosely install the oil pump (B), then install the oil pump sprocket (C).
6. Remove the pin driver (D).
7. Tighten the oil pump mounting bolts.
8. Squeeze the new oil pump chain tensioner (A), then install the set clip (B) on it as shown.

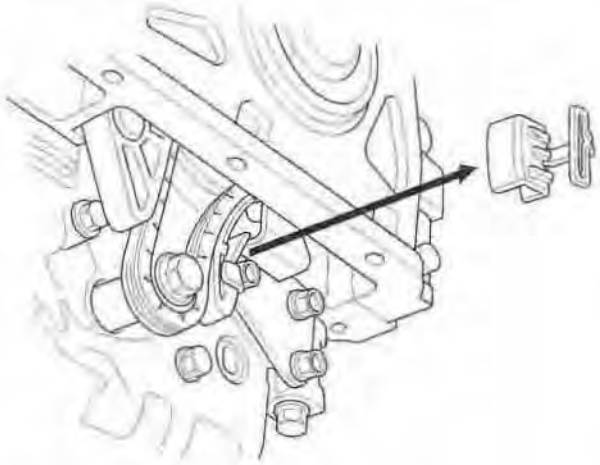
   NOTE: The set clip is supplied with the oil pump chain tensioner.



9. Install the new oil pump chain tensioner.



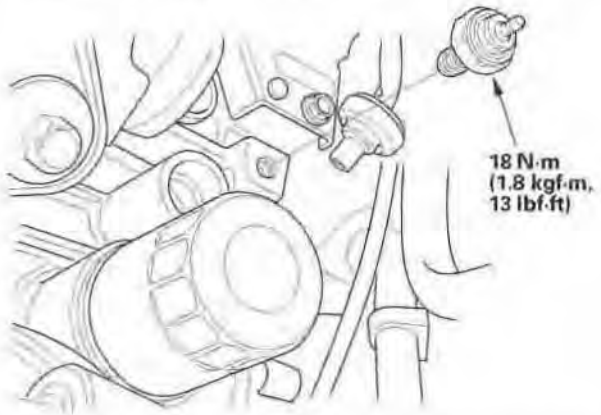
10. Remove the set clip from the oil pump chain tensioner.



11. Install the oil pan (see page 7-28).

Oil Pressure Switch Replacement

1. Disconnect the oil pressure switch connector, then remove the oil pressure switch.



2. Remove any old liquid gasket from the switch and switch mounting hole.

3. Apply liquid gasket to the new oil pressure switch threads, then install the oil pressure switch.

   NOTE: Do not install the part if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.

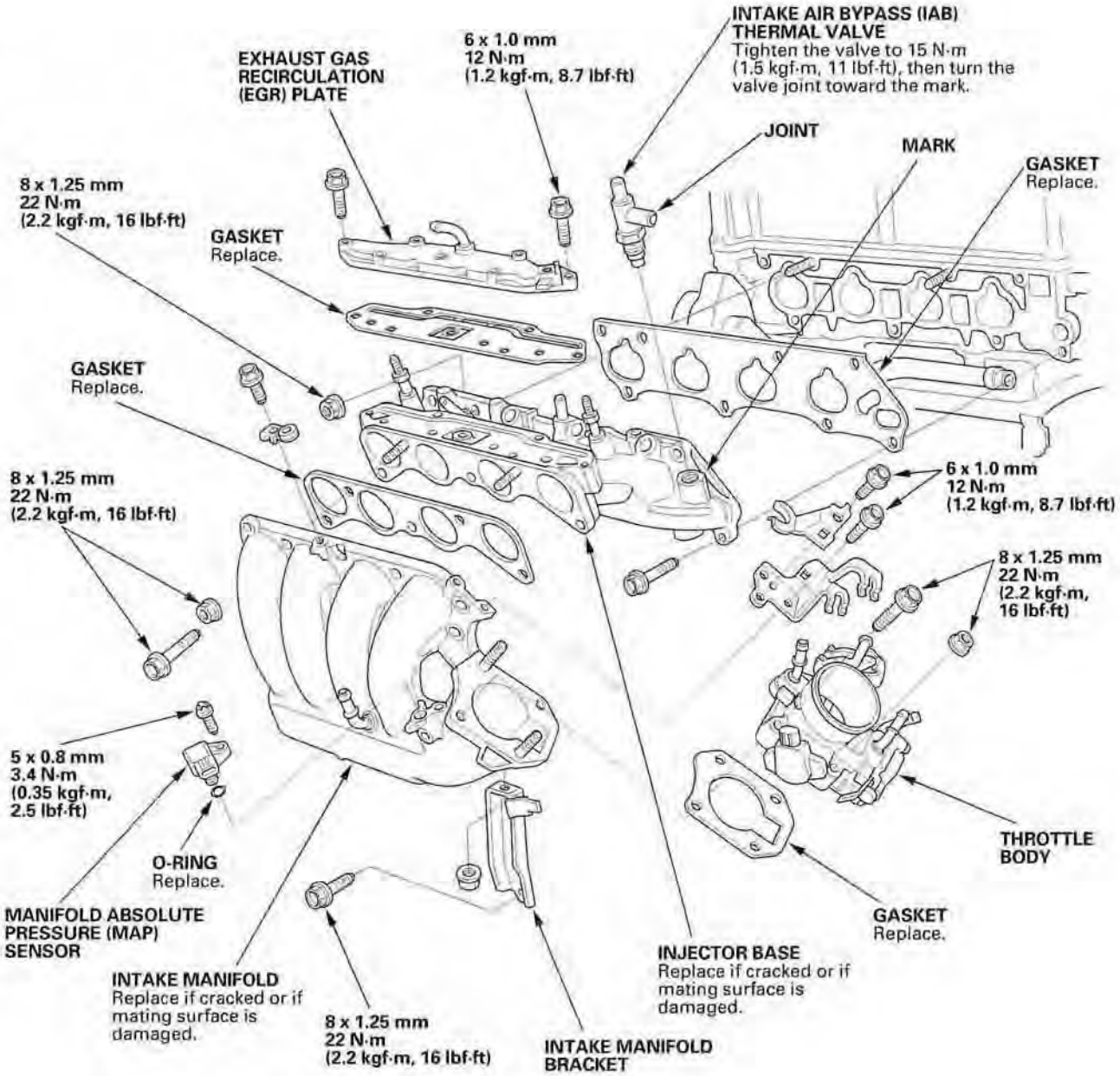
Engine Mechanical

Intake Manifold and Exhaust System

Intake Manifold and Exhaust System

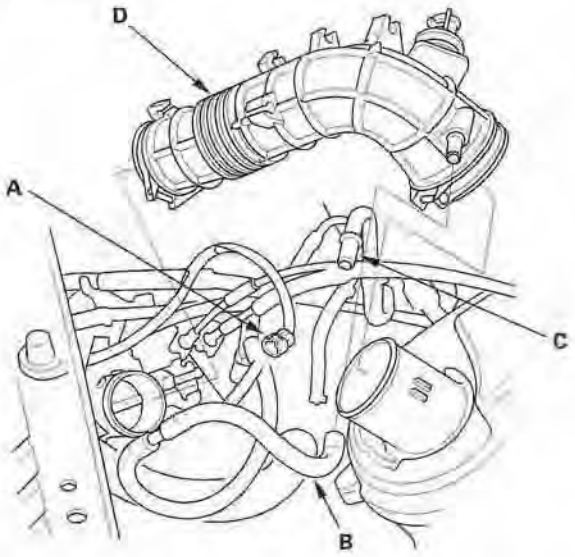
Intake Manifold Removal and Installation

Exploded View



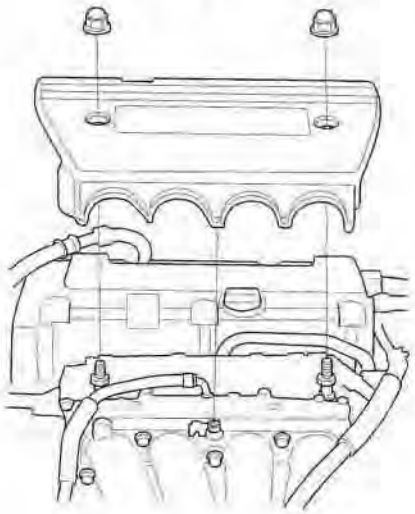
Removal

1. Disconnect the intake air temperature (IAT) sensor connector (A).

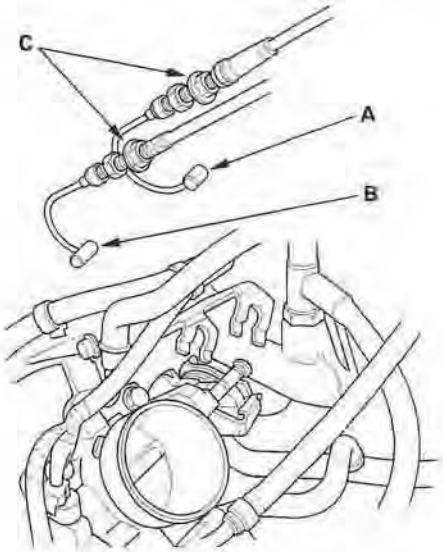


2. Remove the vacuum hose (B) and breather pipe (C), then remove the intake air duct (D).

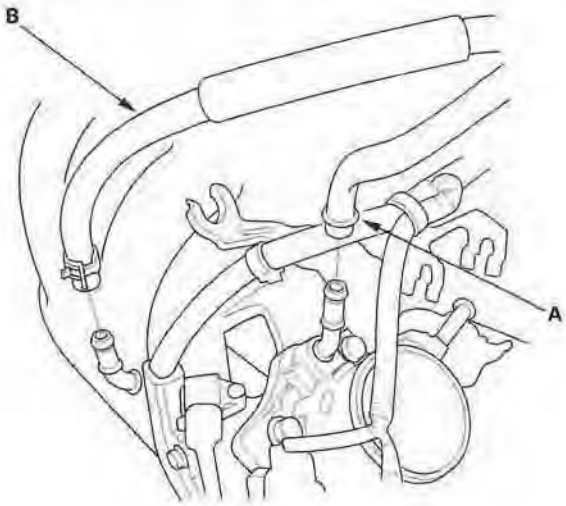
3. Remove the intake manifold cover.



4. Remove the throttle cable (A) and cruise control actuator cable (B) by loosening the locknuts (C), then slipping the cable ends out of the accelerator linkage. Take care not to bend the cables when removing them. Always replace any kinked cable with a new one.



5. Remove the evaporative emission (EVAP) canister hose (A) and brake booster vacuum hose (B).

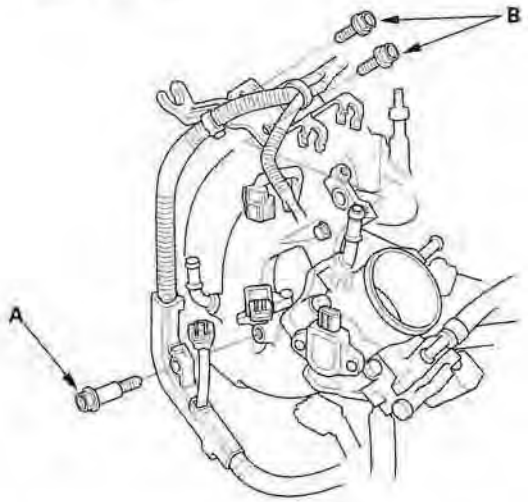


(cont'd)

Intake Manifold Removal and Installation (cont'd)

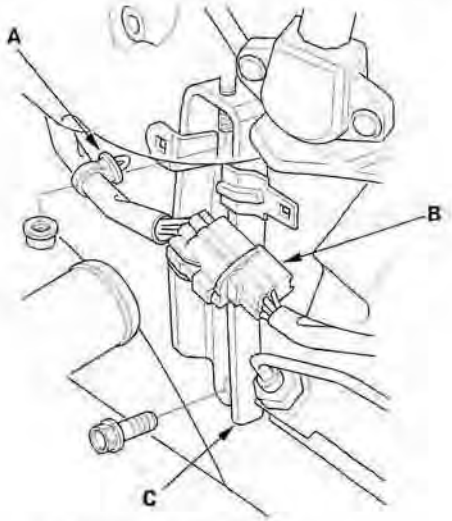
6. Remove the engine wire harness connectors and wire harness clamps from the intake manifold.
   - Idle air control (IAC) valve connector
   - Throttle position (TP) sensor connector
   - Manifold absolute pressure (MAP) sensor connector

7. Remove the bolt (A) securing the harness holder, and remove the two bolts (B) securing the throttle cable bracket.

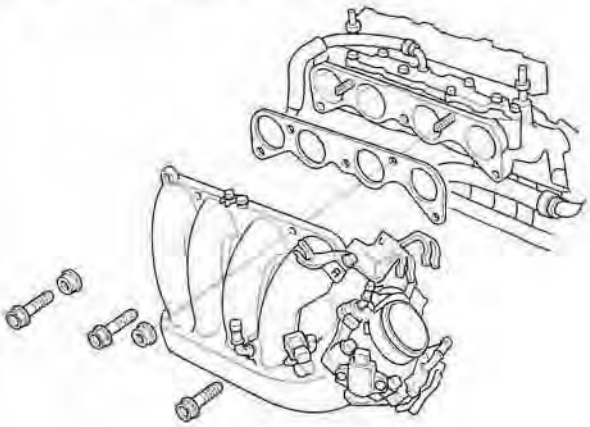


8. Remove and plug the water bypass hoses.

9. Remove the harness clamp (A), and the harness connector (B) from the intake manifold bracket, then remove the intake manifold bracket (C).

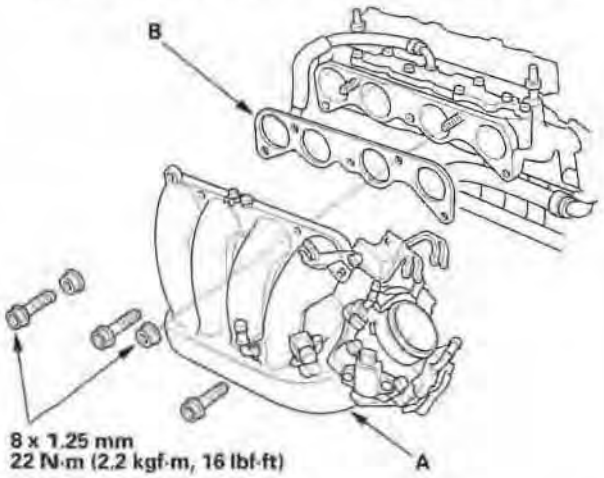


10. Remove the intake manifold.

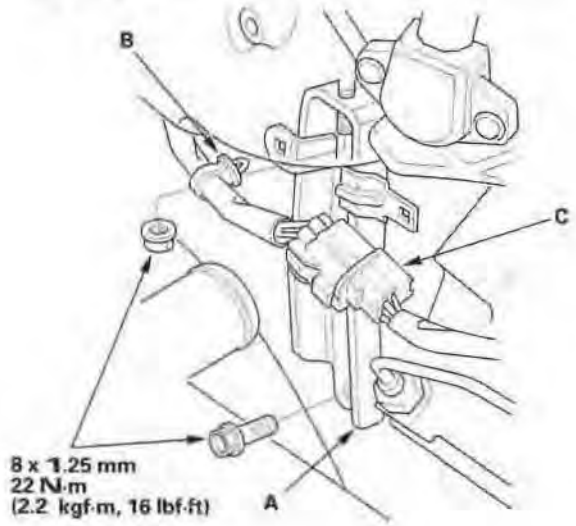


Installation

1. Install the intake manifold (A) with a new gasket (B), and tighten the bolts/nuts in a crisscross pattern in two or three steps, beginning with the inner bolt.

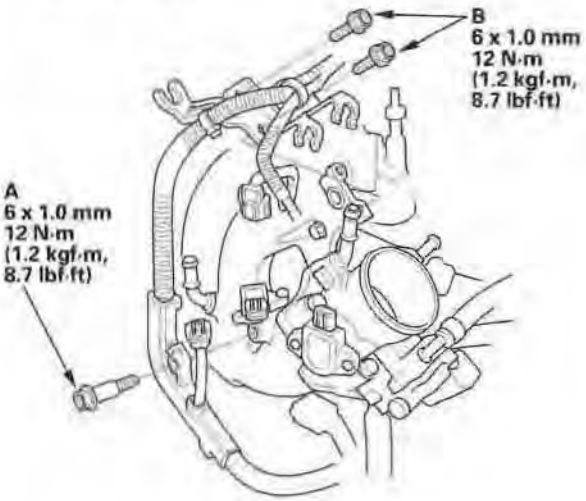


2. Install the intake manifold bracket (A), then install the harness clamp (B), and harness connector (C) to the intake manifold bracket.



3. Install the water bypass hoses.

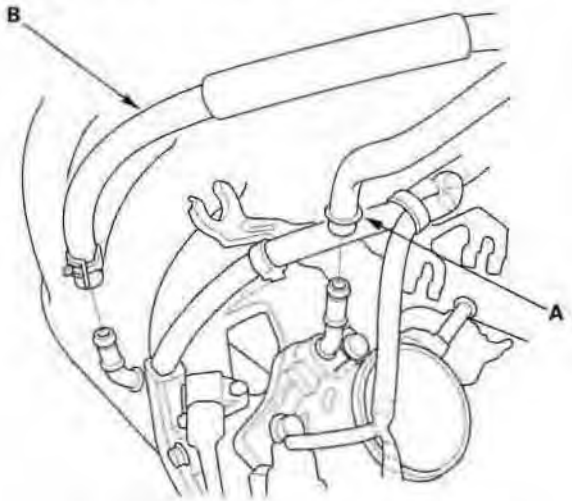
4. Tighten the bolt (A) securing the harness holder, and tighten the two bolts (B) securing the throttle cable bracket.



(cont'd)

Intake Manifold Removal and Installation (cont'd)

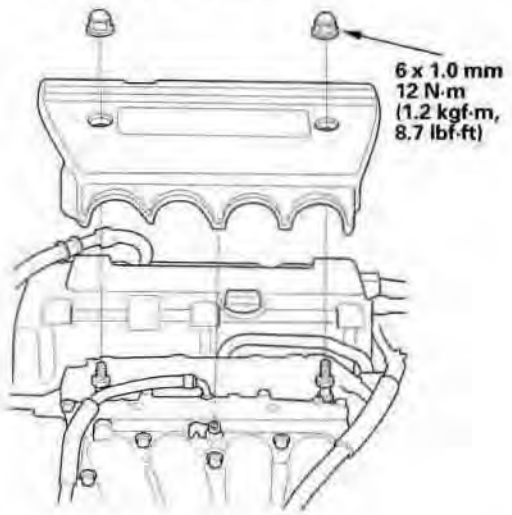
5. Install the evaporative emission (EVAP) canister hose (A) and brake booster vacuum hose (B).



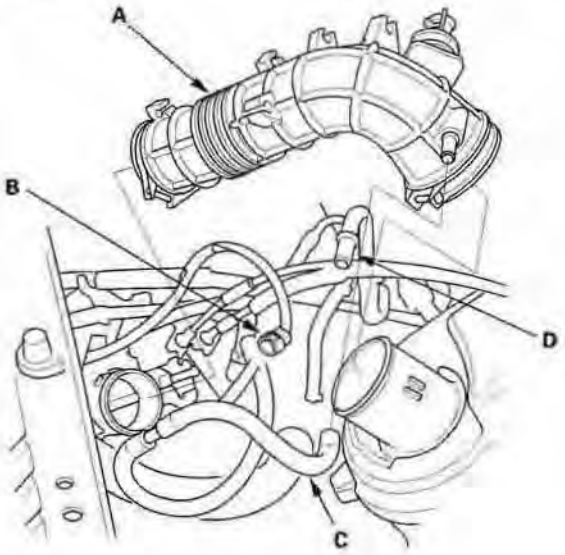
6. Install the throttle cable (see page 11-234), then adjust the cable (see page 11-233).

7. Install the cruise control actuator cable (see page 4-54), then adjust the cable (see page 4-55).

8. Install the intake manifold cover.



9. Install the intake air duct (A), then connect the intake air temperature (IAT) sensor connector (B), and install the vacuum hose (C) and breather pipe (D).



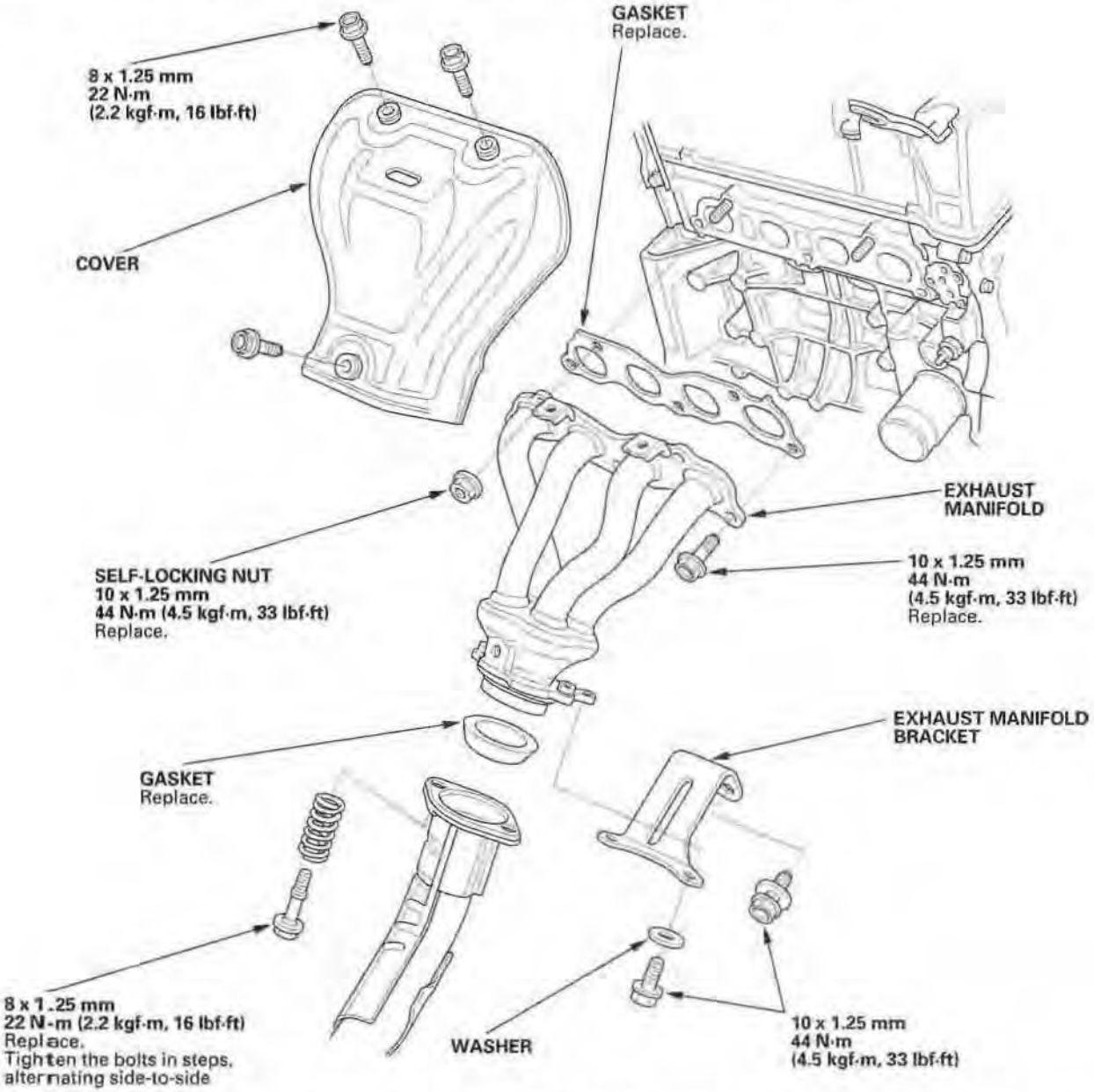
10. Clean up any spilled engine coolant.

11. After installation, check that all tubes, hoses, and connectors are installed correctly.

12. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7 on page 10-7).

Exhaust Manifold Removal and Installation

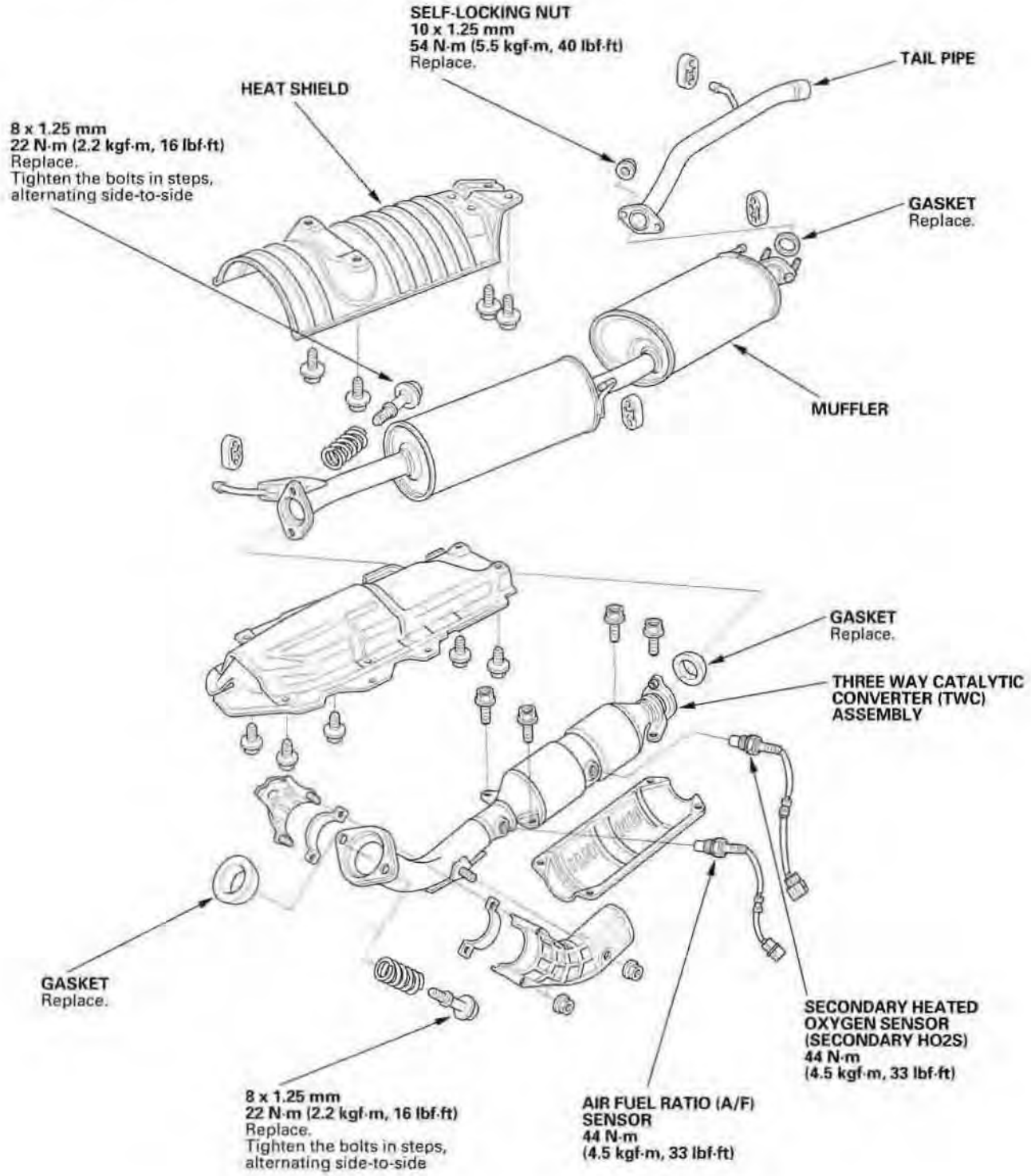
1. Remove the VTEC solenoid valve (see page 11-192).
2. Remove the intermediate shaft heat shield (see step 3 on page 16-18).
3. Remove the cover and exhaust manifold bracket, then remove the exhaust manifold.



4. Install the exhaust manifold and tighten the bolts/nuts in a crisscross pattern in two or three steps, beginning with the inner bolt.
5. Install in the reverse order of removal.

Exhaust Pipe and Muffler Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

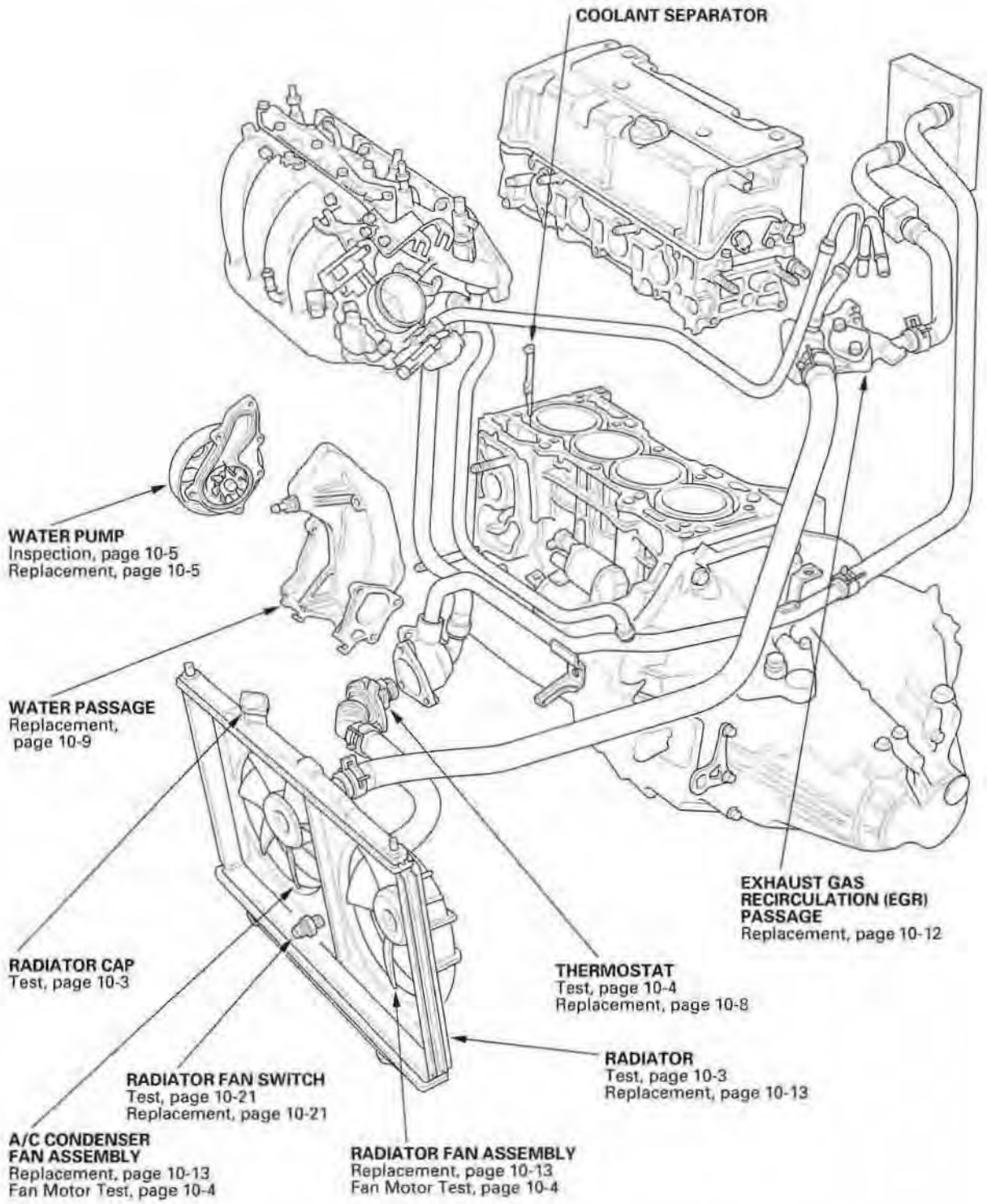


Engine Cooling

Cooling System

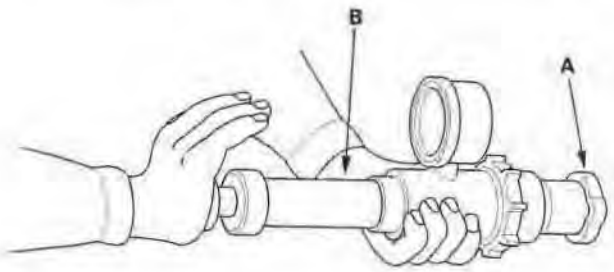
Fan Controls

Component Location Index



Radiator Cap Test

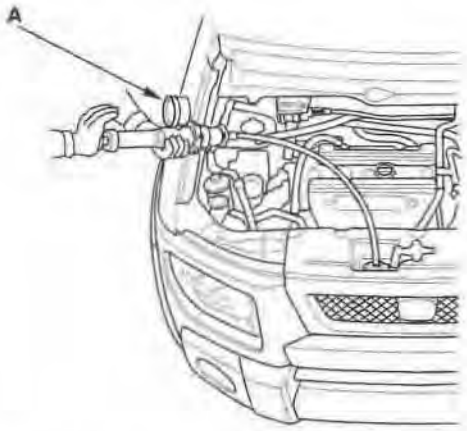
1. Remove the radiator cap (A), wet its seal with engine coolant, then install it on the pressure tester (B) (commercially available).



2. Apply a pressure of 93—123 kPa (0.95—1.25 kgf/cm², 14—18 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.

Radiator Test

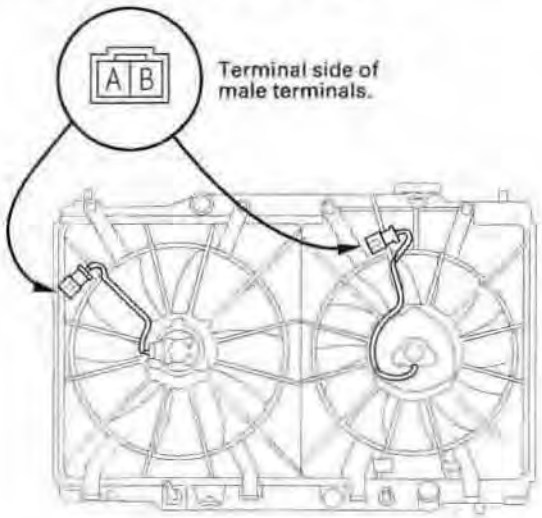
1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with engine coolant to the top of the filler neck.
2. Attach the pressure tester (A) (commercially available) to the radiator.



3. Apply a pressure of 93—123 kPa (0.95—1.25 kgf/cm², 14—18 psi).
4. Inspect for engine coolant leaks and a drop in pressure.
5. Remove the tester, and reinstall the radiator cap.
6. Check for engine oil in the coolant and/or coolant in the engine oil.

Fan Motor Test

1. Disconnect the 2P connectors from the radiator fan motor and condenser fan motor.



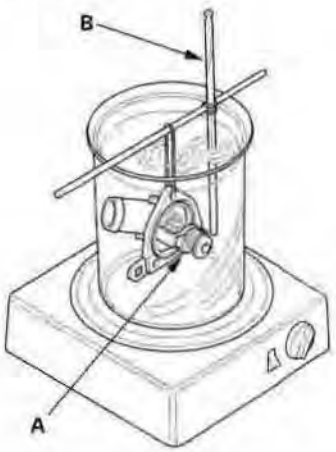
2. Test the motor by connecting battery power to the B terminal and ground to the A terminal.
3. If the motor fails to run or does not run smoothly, replace it.

Thermostat Test

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat (A) in a container of water. Do not let the thermometer (B) touch the bottom of the hot container.



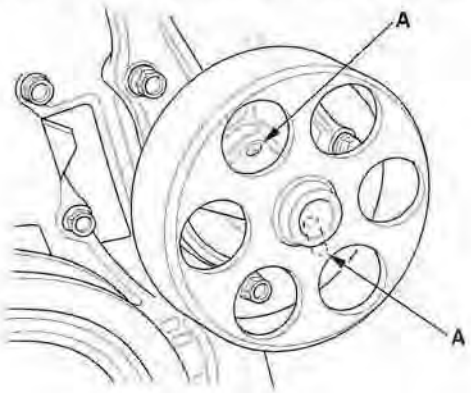
2. Heat the water, and check the temperature with a thermometer. Check the temperature at which the thermostat first opens, and at which it is fully open.
3. Measure the lift height of the thermostat when it is fully open.

Standard Thermostat

Lift Height:	**Above 8.0 mm (0.31 in.)**
Starts Opening:	**169—176 °F (76—80 °C)**
Fully Open:	**194 °F (90 °C)**

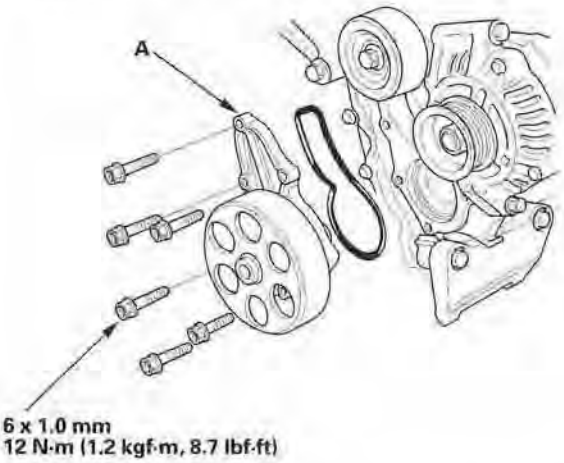
Water Pump Inspection

1. Remove the drive belt (see page 4-36).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage. A small amount of "weeping" from the bleed holes (A) is normal.



Water Pump Replacement

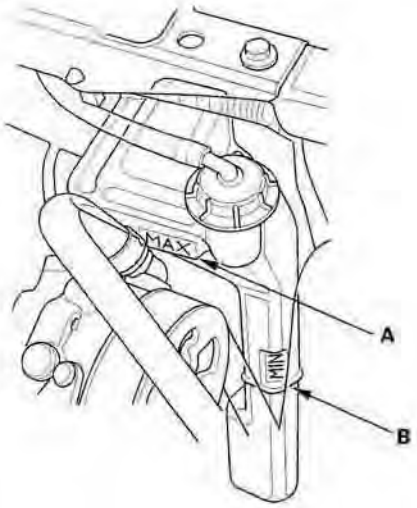
1. Remove the drive belt (see page 4-36).
2. Drain the engine coolant (see page 10-6).
3. Remove the crankshaft pulley (see page 6-11).
4. Remove the six bolts securing the water pump, then remove the water pump (A).



5. Inspect and clean the O-ring groove and mating surface with the water passage.
6. Install the water pump with new O-rings in the reverse order of removal.
7. Clean up any spilled engine coolant.
8. Install the crankshaft pulley (see page 6-12).
9. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7 on page 10-7).

Coolant Check

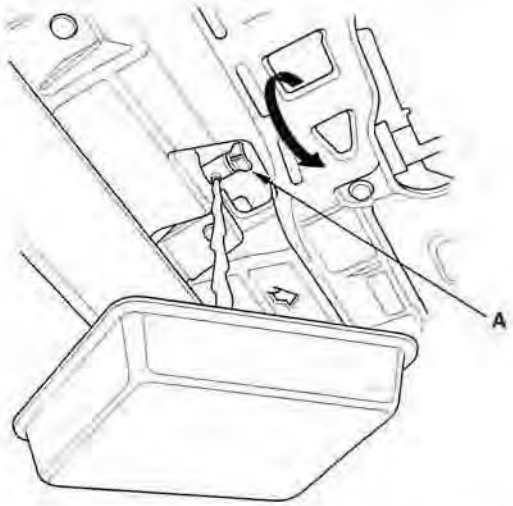
1. Look at the coolant level in the reserve tank. Make sure it is between the MAX mark (A) and MIN mark (B).



2. If the coolant level in the reserve tank is at or below the MIN mark, add coolant to bring it up to the MAX mark, and inspect the cooling system for leaks.

Coolant Replacement

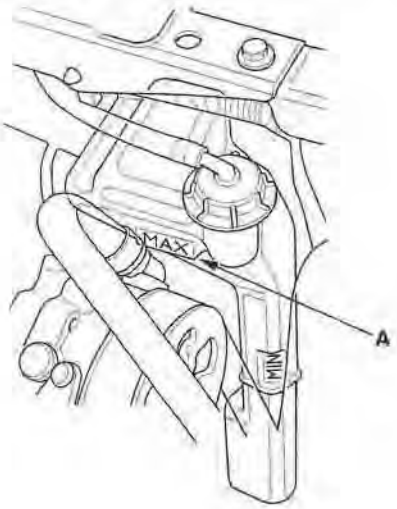
1. Start the engine. Set the heater temperature control dial to maximum heat, then turn the ignition switch OFF. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug (A), and drain the coolant.



4. After the coolant has drained, tighten the radiator drain plug.

5. Remove, drain, and reinstall the reserve tank.

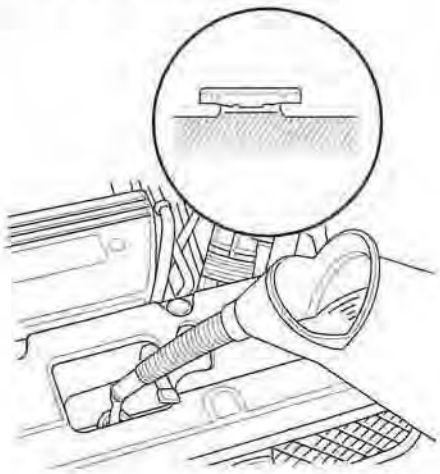
6. Fill the reserve tank to the MAX mark (A) with Honda All Season Antifreeze/Coolant Type 2 (P/N OL999-9001).



7. Pour Honda All Season Antifreeze/Coolant Type 2 into the radiator up to the base of the filler neck.

   NOTE:
   - Always use Honda All Season Antifreeze/Coolant Type 2 (P/N OL999-9001). Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
   - Honda All Season Antifreeze/Coolant Type 2 is a mixture of 50 % antifreeze and 50 % water. Do not add water.

   Engine Coolant Capacities (Including the reserve tank capacity of 0.6L (0.16 US gal))
   After Coolant Change:
   M/T: 5.1 L (1.35 US gal)
   A/T: 5.0 L (1.32 US gal)
   After Engine Overhaul:
   M/T: 7.2 L (1.90 US gal)
   A/T: 7.1 L (1.88 US gal)



8. Install the radiator cap loosely.

9. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).

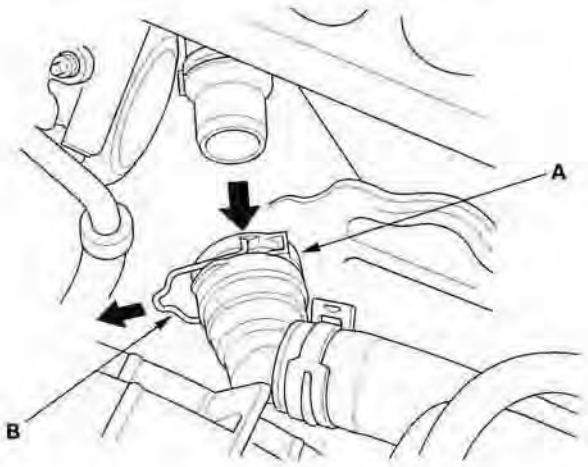
10. Turn off the engine. Check the level in the radiator and add Honda All Season Antifreeze/Coolant Type 2 if needed.

11. Put the radiator cap on tightly, then run the engine again and check for leaks.

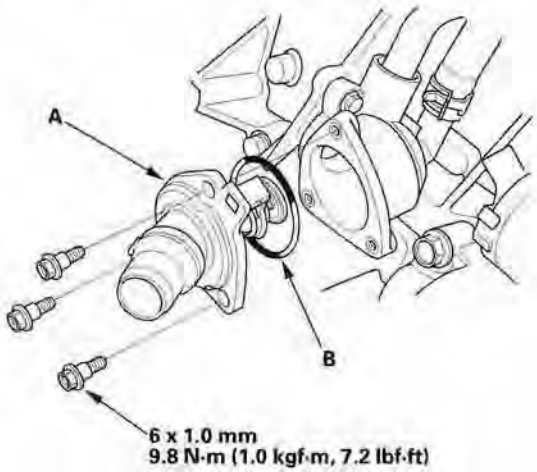
12. Clean up any spilled engine coolant.

Thermostat Replacement

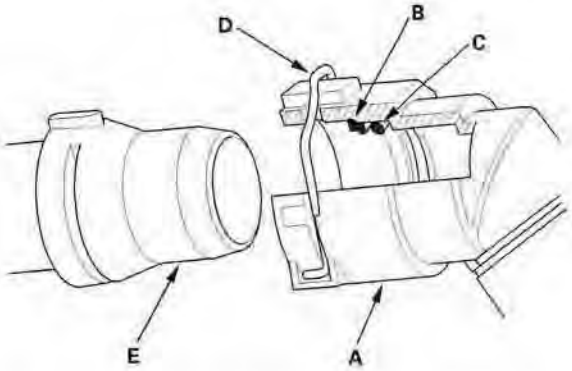
1. Drain the engine coolant (see page 10-6).
2. Clean the dirt off the quick connector (A), thermostat cover, and lower radiator hose.



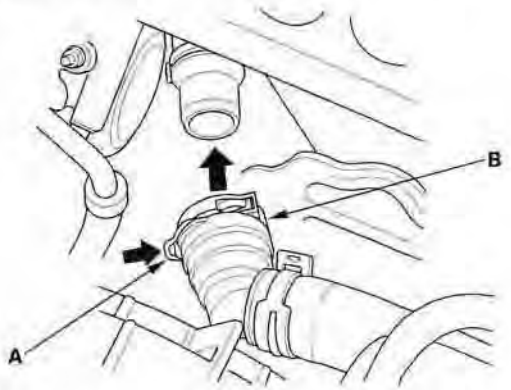
3. Pull out lock (B) by hand, then wiggle the quick connector to remove it from the thermostat cover. Do not use any tools to remove the quick connector.
4. Remove the thermostat (A).



5. Install the thermostat with a new O-ring (B).
6. Check the quick connector (A) and set ring (B) for cracks or damage. If the connector and/or set ring are cracked or damaged, replace the connector.



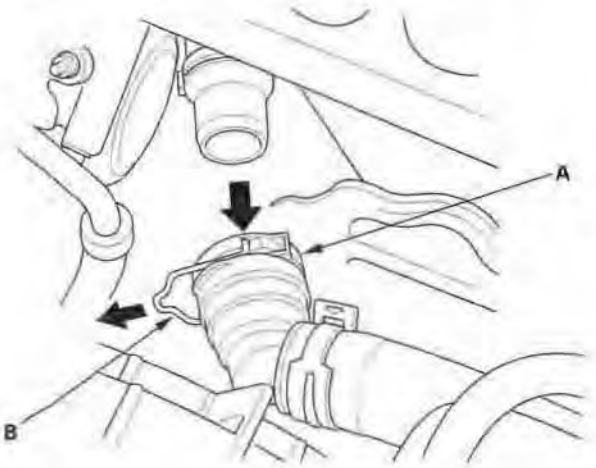
7. Make sure the set ring is in place inside the quick connector. If the set ring is off the connector, replace the quick connector.
8. Replace the O-ring (C) in the quick connector.
9. Check the lock (D) for damage or deformation. If the lock is damaged or deformed, replace it. When installing the new lock to the connector, push it straight down along the groove.
10. Clean the connecting surface of the thermostat cover (E), then apply clean engine coolant around the connecting surface.
11. Push the lock (A) down, then push the quick connector (B) onto the thermostat cover until you hear it click.



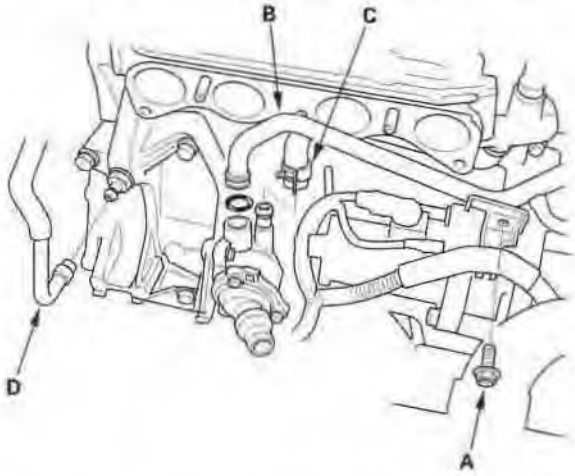
12. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7 on page 10-7).

Water Passage Replacement

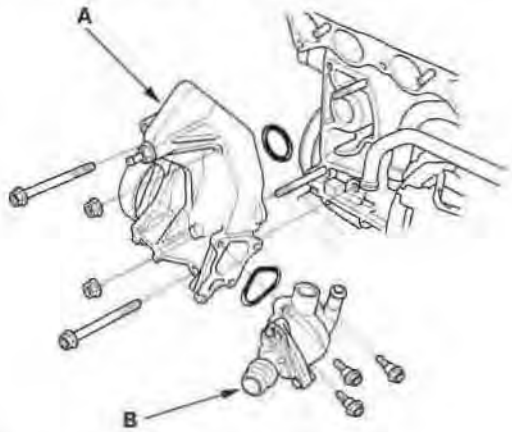
1. Drain the engine coolant (see page 10-6).
2. Clean any dirt off the quick connector (A), thermostat cover, and lower radiator hose.



3. Pull out the lock (B) by hand, then wiggle the quick connector to remove it from the thermostat cover. Do not use any tools to remove the quick connector.
4. Remove the alternator (see page 4-39).
5. Remove the splash shield (see step 26 on page 5-5).
6. Remove the A/C compressor without disconnecting the A/C hoses (see step 56 on page 5-9).
7. Remove the intake manifold (see page 9-3).
8. Remove a bolt (A) securing the connecting pipe.



9. Remove the connecting pipe (B), water bypass hose (C), and positive crankcase ventilation (PCV) hose (D).
10. Remove the water passage (A).



11. Remove the thermostat housing (B).
12. Remove the water pump (see page 10-5).

(cont'd)

Water Passage Replacement (cont'd)

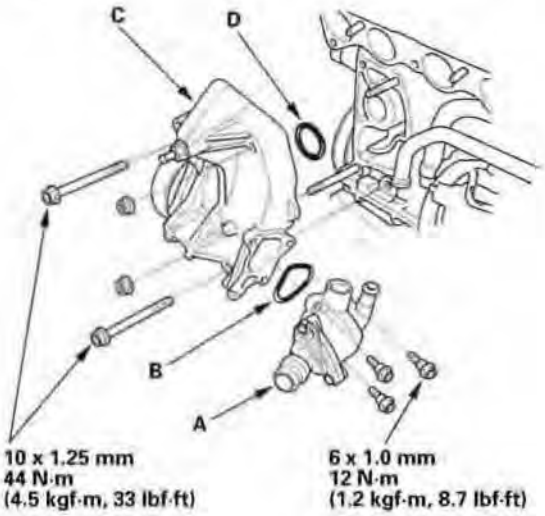
13. Clean and dry the water passage mating surfaces.

14. Apply liquid gasket, P/N 08717-0004, 08718-0001, 08718-0003, or 08718-0009, evenly to the engine block mating surface of the water passage.

    NOTE:
    - Do not install the parts if 4 minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing the old residue.
    - Do not run the engine for at least 3 hours after installing the water passage.

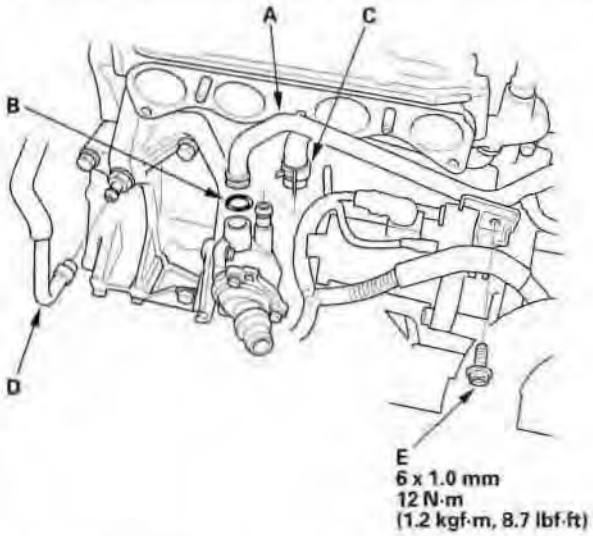
15. Install the water pump (see page 10-5).

16. Install the thermostat housing (A) with a new O-ring (B).



17. Install the water passage (C) with a new O-ring (D).

18. Install the connecting pipe (A) with a new O-ring (B).



19. Install the water bypass hose (C) and PCV hose (D), then tighten a bolt (E) securing the connecting pipe.

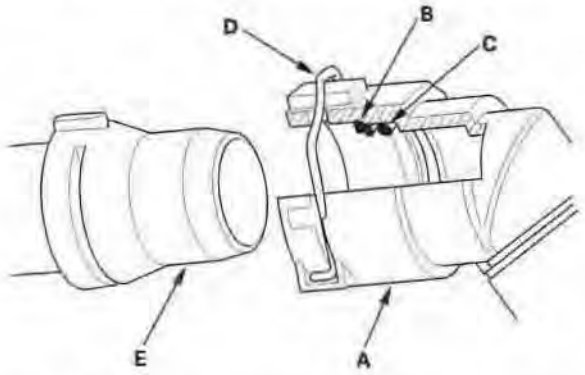
20. Install the intake manifold (see page 9-5).

21. Install the A/C compressor (see step 3 on page 5-11).

22. Install the splash shield (see step 26 on page 5-14).

23. Install the alternator (see page 4-39).

24. Check the quick connector (A) and set ring (B) for cracks or damage. If the connector and/or set ring are cracked or damaged, replace the connector.



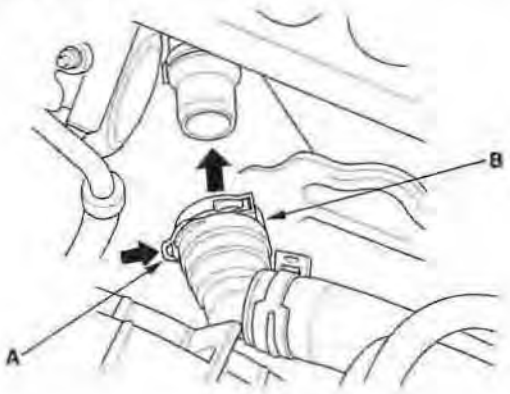
25. Make sure the set ring is in place inside the quick connector. If the set ring is off the connector, replace the quick connector.

26. Replace the O-ring (C) in the quick connector.

27. Check the lock (D) for damage or deformation. If the lock is damaged or deformed, replace it. When installing the new lock on the connector, push it straight down along the groove.

28. Clean the connecting surface of the thermostat cover (E), then apply clean engine coolant around the connecting surface.

29. Push the lock (A) down, then push the quick connector (B) onto the thermostat cover until you here it click.

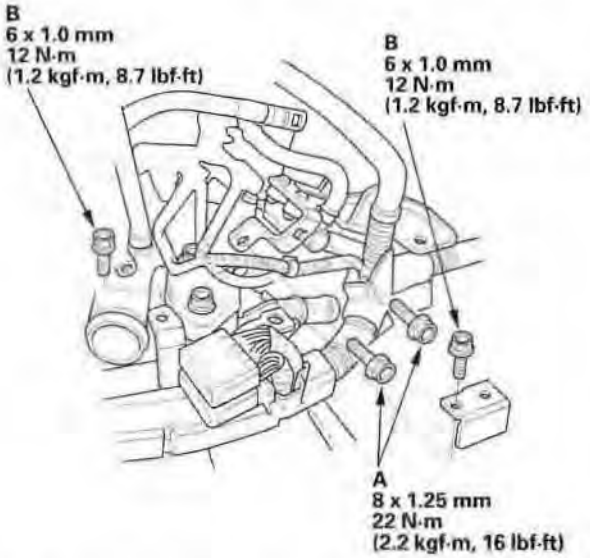


30. After assembly, wait at least 30 minutes before filling the engine with coolant or oil.

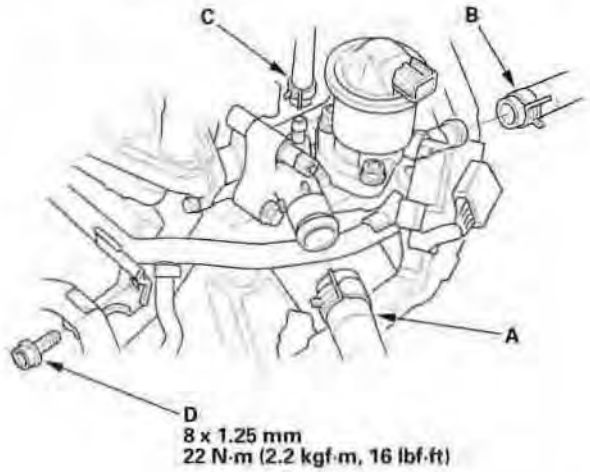
EGR Passage Replacement

1. Drain the engine coolant (see page 10-6).

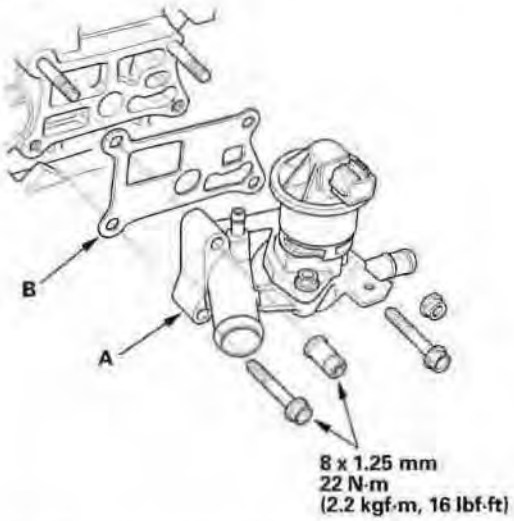
2. Remove the two bolts (A) securing the evaporative emission (EVAP) canister purge valve bracket and remove the two bolts (B) securing the harness bracket.



3. Remove the upper radiator hose (A), heater hose (B), water bypass hose (C), and connecting pipe mounting bolt (D).



4. Remove the exhaust gas recirculation (EGR) passage (A).



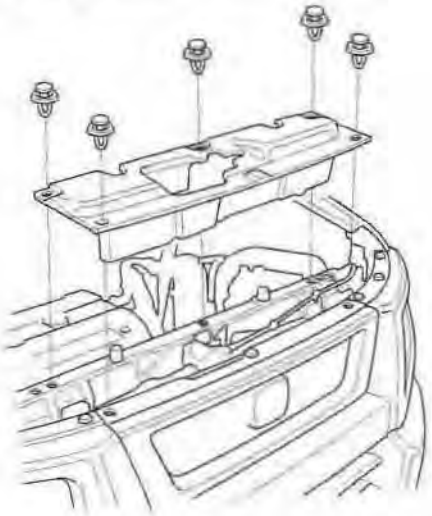
5. Install the EGR passage with a new gasket (B).

6. Install the other parts in the reverse order of removal.

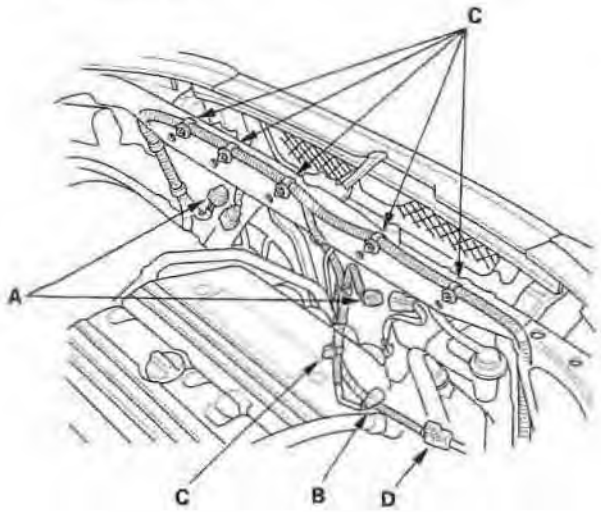
7. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7 on page 10-7).

Radiator and Fan Replacement

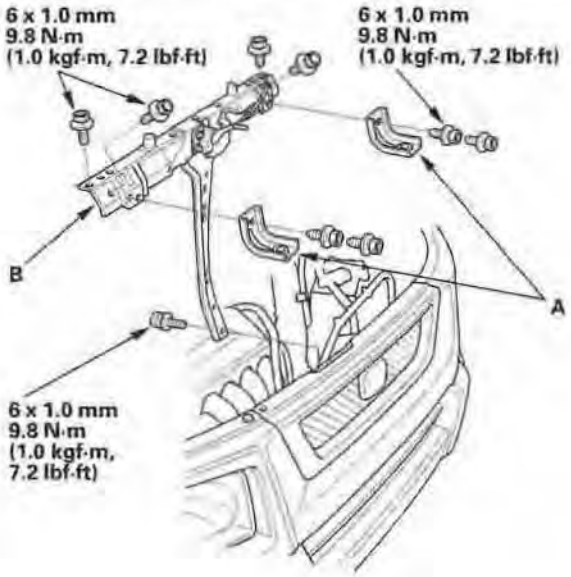
1. Drain the engine coolant (see page 10-6).
2. Remove the bulkhead cover.



3. Disconnect the fan motor connectors (A) and radiator fan switch connector (B), then remove the harness clamps (C) and compressor clutch connector (D).



4. Remove the upper brackets and cushions (A), then remove the bulkhead (B).



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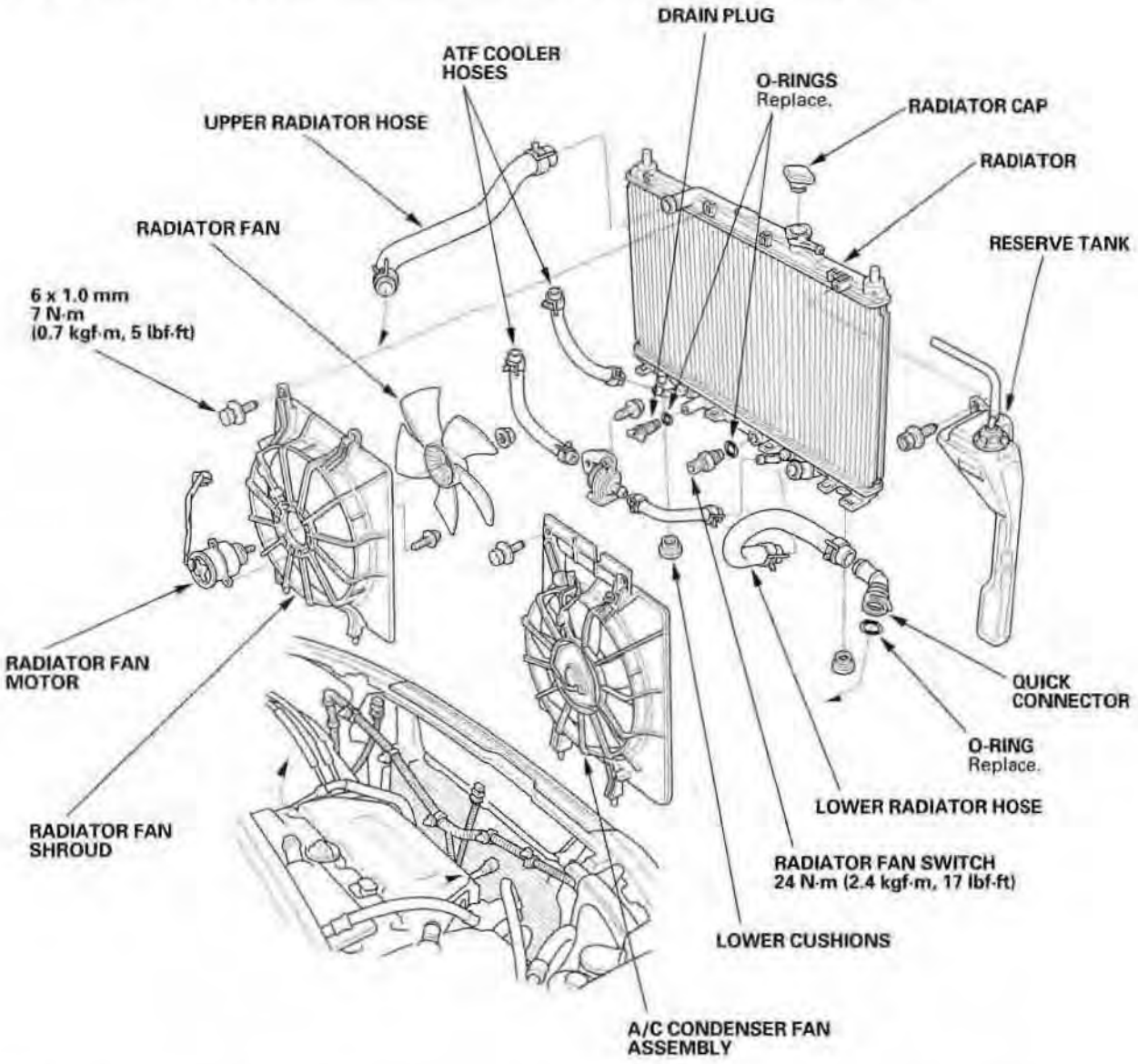
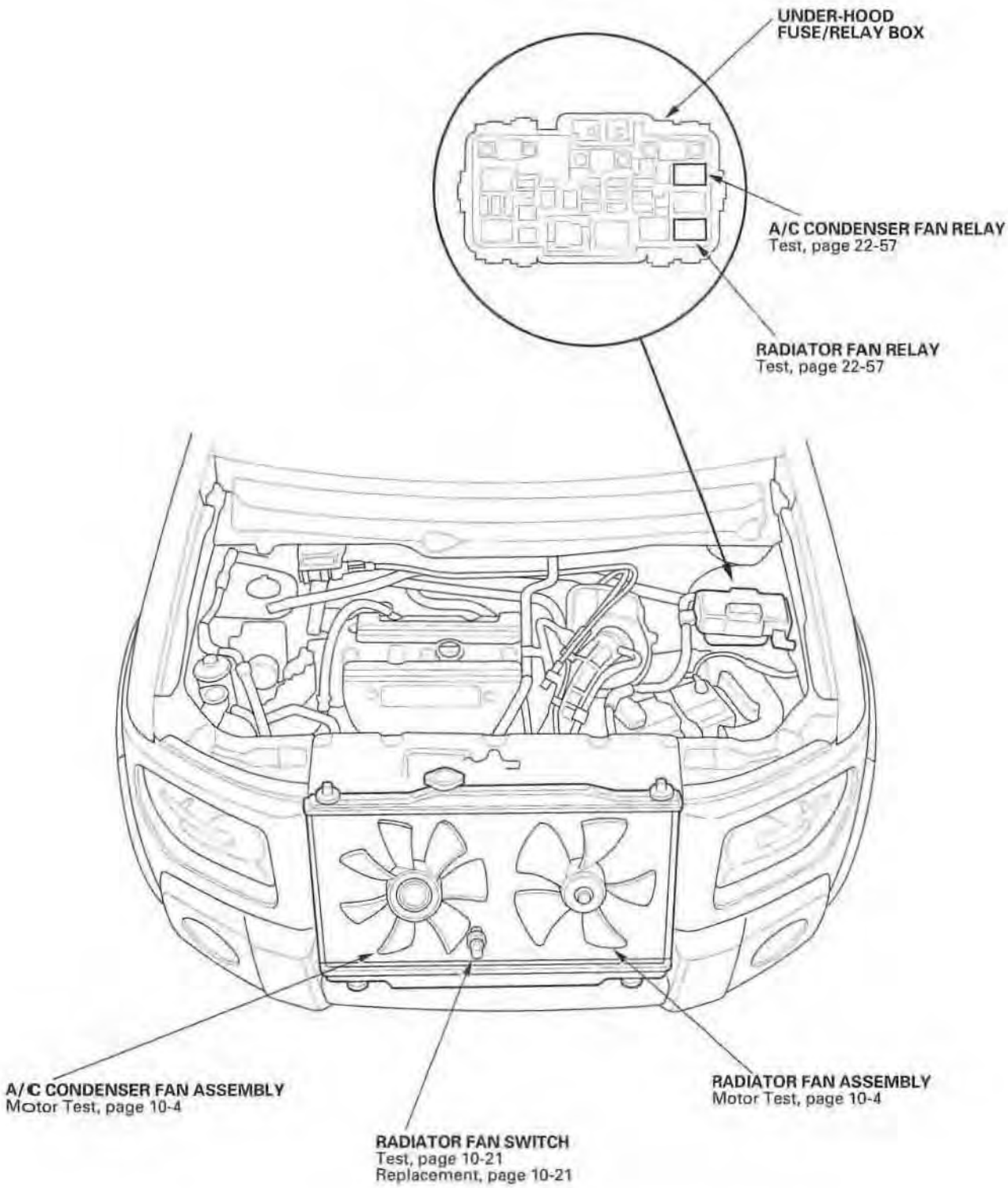
Radiator and Fan Replacement (cont'd)

5. A/T model: Remove the automatic transmission fluid (ATF) cooler hoses (see page 14-210).



6. Remove the upper radiator hose and lower radiator hose from the radiator, then pull up the radiator.
7. Remove the fan shroud assemblies and other parts from the radiator.
8. Install the radiator in the reverse order of removal. Make sure the upper and lower cushions are set securely.
9. Install the bulkhead in the reverse order of removal. Apply touch-up paint to the bulkhead mounting bolts.
10. Fill the radiator with engine coolant, and bleed the air from the cooling system with the heater valve open (see step 7 on page 10-7).

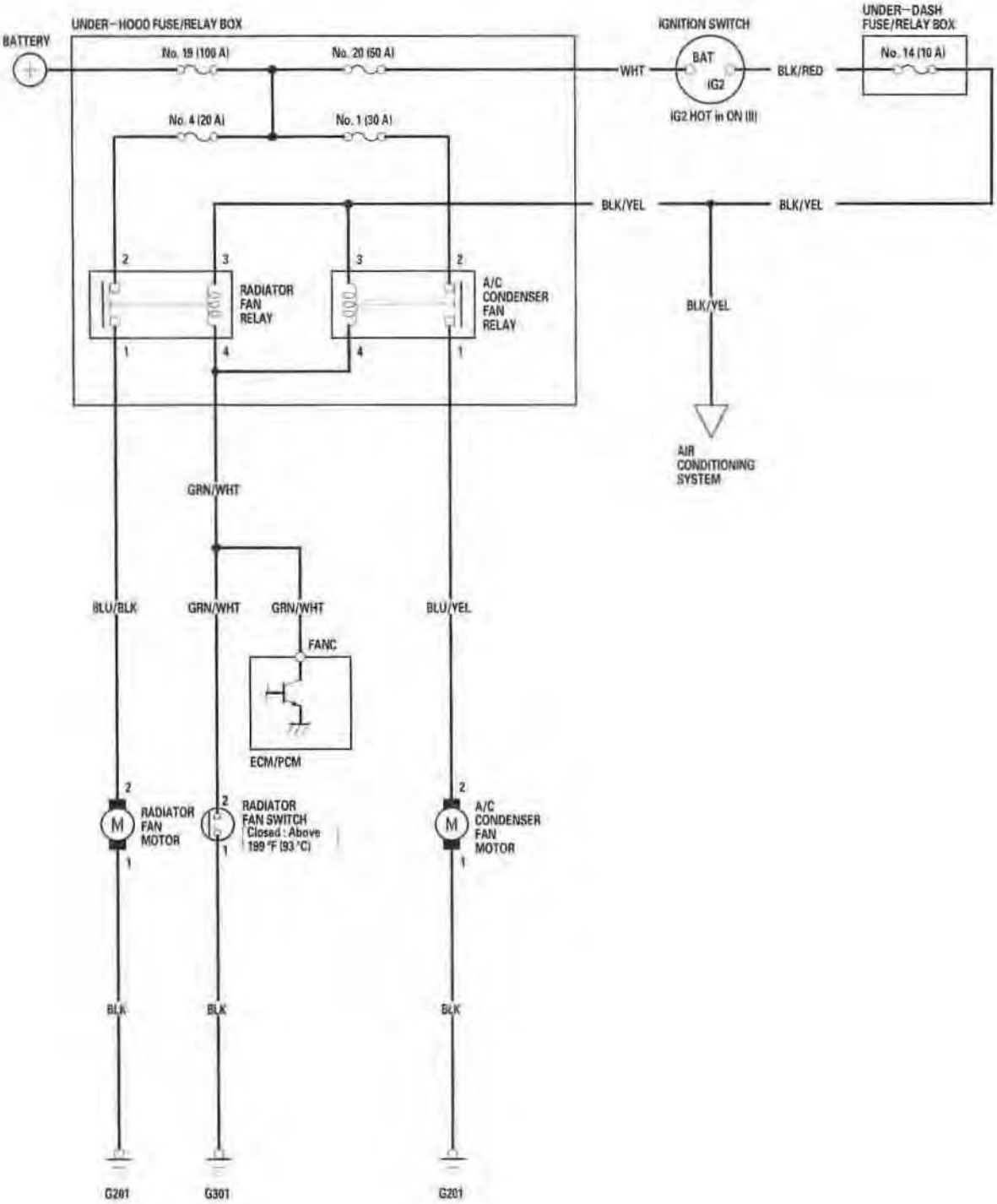
Component Location Index



Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Engine overheats	1. Inspect the water pump (see page 10-5). 2. Check for a broken drive belt (see page 4-36). 3. Check the drive belt auto-tensioner (see page 4-37). 4. Check the thermostat (see page 10-4). 5. Check for the coolant leakage (from gaskets, hoses, O-rings, etc.). 6. Check for dirt, leaves, or insects on the radiator and A/C condenser. 7. Check the fan shroud for damage or deformation. 8. Check for plugged or deteriorated on the radiator hoses. 9. Check the radiator cap (see page 10-3). 10. Inspect the fan motors or fan relays. 11. Check for a plugged heater core or hose(s). 12. Check the coolant level. 13. Check for deteriorated coolant. 14. Check for a damaged cylinder head gasket.	
The radiator fan does not run at all	Radiator fan circuit troubleshooting (see page 10-18).	Cleanliness and tightness of all connectors
The radiator fan does not run for engine cooling, but it runs with the A/C on	Radiator fan switch circuit troubleshooting (Open) (see page 10-20).	Cleanliness and tightness of all connectors
The radiator fan runs with the ignition switch ON (II), the A/C off, and the engine coolant temperature below 199 °F (93 °C)	Radiator fan switch circuit troubleshooting (Short) (see page 10-20).	Cleanliness and tightness of all connectors
The A/C condenser fan does not run at all (but the radiator fan runs with the A/C on)	A/C condenser fan circuit troubleshooting (see page 21-30).	• HVAC DTCs (see page 21-8) • Cleanliness and tightness of all connectors
Both the radiator fan and the A/C condenser fan do not run with the A/C on (but the A/C compressor runs with the A/C on)	Radiator and A/C condenser fan common circuit troubleshooting (see page 21-31).	• HVAC DTCs (see page 21-8) • Cleanliness and tightness of all connectors
The A/C compressor clutch does not engage (but both the radiator fan and the A/C condenser fan run with the A/C on)	A/C compressor clutch circuit troubleshooting (see page 21-32).	• HVAC DTCs (see page 21-8) • Cleanliness and tightness of all connectors

Circuit Diagram



Radiator Fan Circuit Troubleshooting

NOTE: Before beginning this troubleshooting procedure, refer to the symptom troubleshooting index.

1. Check the No. 4 (20 A) fuse in the under-hood fuse/relay box, and the No. 14 (10 A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse(s) and recheck. ■

2. Remove the radiator fan relay from the under-hood fuse/relay box, and test it (see page 22-57).

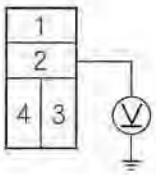
   Is the relay OK?

   YES—Go to step 3.

   NO—Replace the radiator fan relay. ■

3. Measure the voltage between radiator fan relay 4P socket terminal No. 2 and body ground.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

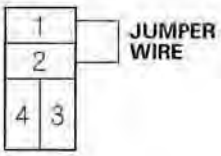
Is there battery voltage?

YES—Go to step 4.

NO—Replace the under-hood fuse/relay box. ■

4. Connect radiator fan relay 4P socket terminal No. 1 and No. 2 with a jumper wire.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

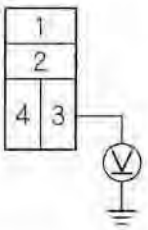
Does the radiator fan run?

YES—Go to step 5.

NO—Go to step 6.

5. Disconnect the jumper, and turn the ignition switch ON (II). Check for voltage between radiator fan relay 4P socket terminal No. 3 and body ground.

RADIATOR FAN RELAY 4P SOCKET



Terminal side of female terminals

Is there battery voltage?

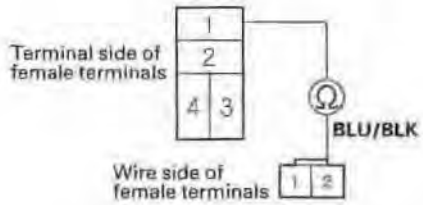
YES—Go to step 9.

NO—Check for an open in the wire between the under-hood fuse/relay box and under-dash fuse/relay box. ■

6. Disconnect the radiator fan motor 2P connector.

7. Check for continuity between radiator fan relay 4P socket terminal No. 1 and radiator fan motor 2P connector terminal No. 2.

RADIATOR FAN RELAY 4P SOCKET



RADIATOR FAN MOTOR 2P CONNECTOR

Is there continuity?

YES—Go to step 8.

NO— Check for an open in the wire between the under-hood fuse/relay box and radiator fan motor 2P connector terminal No. 2. ■

8. Check for continuity between radiator fan motor 2P connector terminal No. 1 and body ground.

RADIATOR FAN MOTOR 2P CONNECTOR

Wire side of female terminals

Is there continuity?

YES—Replace the radiator fan motor. ■

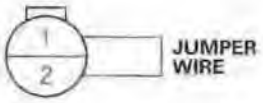
NO—Check for an open in the wire between the radiator fan motor 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G201. ■

9. Reinstall the radiator fan relay.

10. Disconnect the radiator fan switch 2P connector.

11. Connect radiator fan switch 2P connector terminals No. 1 and No. 2 with a jumper wire.

RADIATOR FAN SWITCH 2P CONNECTOR



Wire side of female terminals

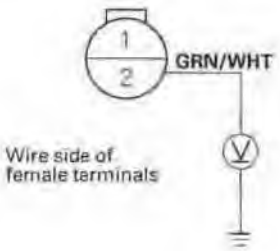
Does the radiator fan run?

YES—Replace the radiator fan switch. ■

NO—Go to step 12.

12. Remove the jumper wire, and measure the voltage between radiator fan switch 2P connector terminal No. 2 and body ground.

RADIATOR FAN SWITCH 2P CONNECTOR



Is there battery voltage?

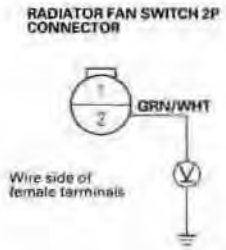
YES—Check for an open in the wire between radiator fan switch 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G301. ■

NO— Check for an open in the wire between radiator fans witch 2P connector terminal No. 2 and the under-hood fuse/relay box. ■

Radiator Fan Switch Circuit Troubleshooting (Open)

NOTE: Before beginning this troubleshooting procedure, refer to the symptom troubleshooting index.

1. Disconnect the radiator fan switch 2P connector.
2. Turn the ignition switch ON (II).
3. Measure voltage between radiator fan switch 2P connector terminal No. 2 and body ground.

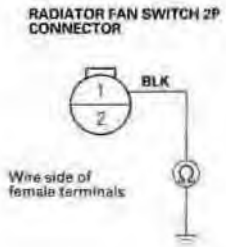


Is there battery voltage?

YES—Go to step 4.

NO—Check for an open in the wire between radiator fans witch 2P connector terminal No. 2 and under-hood fuse/relay box. ■

4. Turn the ignition switch OFF, and check for continuity between radiator fan switch 2P connector terminal No. 1 and body ground.



Is there continuity?

YES—Replace the radiator fan switch. ■

NO—Check for an open in the wire between the radiator fan switch 2P connector terminal No. 1 and body ground. If the wire is OK, check for a poor ground at G301. ■

Radiator Fan Switch Circuit Troubleshooting (Short)

NOTE: Before beginning this troubleshooting procedure, refer to the symptom troubleshooting index.

1. Remove the radiator fan relay from the under-hood fuse/relay box, and test it (see page 22-57).

   Is the relay OK?

   YES—Go to step 2.

   NO—Replace the radiator fan relay. ■

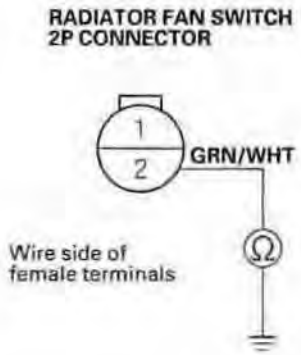
2. Remove the radiator fan switch, and test it (see page 10-21).

   Is the radiator fan switch OK?

   YES—Go to step 3.

   NO—Replace the radiator fan switch. ■

3. Disconnect the under-hood fuse relay box 14P connector.
4. Check for continuity between radiator fan switch 2P connector terminal No. 2 and body ground.



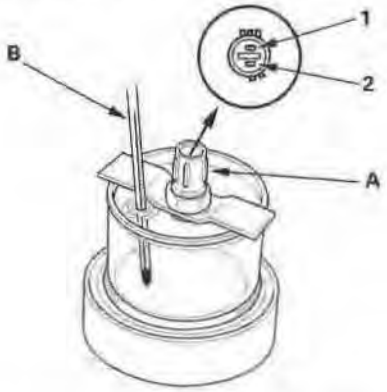
Is there continuity?

YES— Check for a short in the wire between radiator fan switch 2P connector terminal No. 2 and under-hood fuse/relay box. ■

NO—Replace the under-hood fuse/relay box. ■

Radiator Fan Switch Test

1. Remove the radiator fan switch from the radiator (see page 10-21).
2. Suspend the radiator fan switch (A) in a container of water as shown.



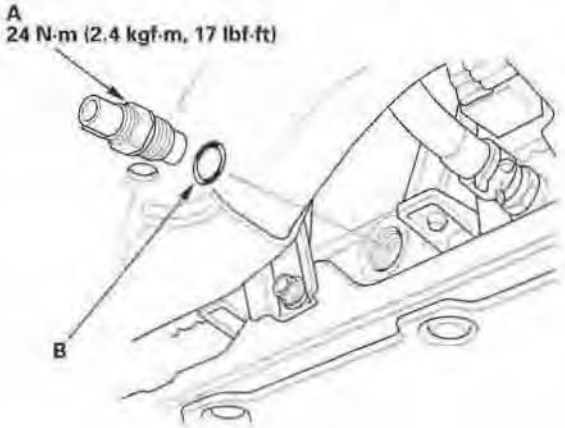
3. Heat the water, and check the temperature with a thermometer. Do not let the thermometer (B) touch the bottom of the hot container.
4. Measure the continuity between terminal No. 1 and terminal No. 2 according to the table.

Operation		Temperature	Terminal 1	Terminal 2
SWITCH	ON	196—203 °F (91—95 °C)	○—○	
	OFF	5—15 °F (3—8 °C) lower than the temperature when it goes on		

5. Replace, if necessary, and install the radiator fan switch (see page 10-21).

Radiator Fan Switch Replacement

1. Drain the engine coolant (see page 10-6).
2. Remove the splash shield.
3. Disconnect the radiator fan switch connector, then remove the radiator fan switch (A).



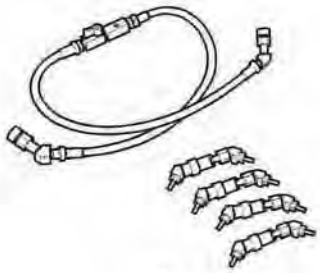
4. Install the radiator fan switch with a new O-ring (B).
5. Refill the radiator with engine coolant, and bleed air from the cooling system with the heater valve open (see step 7 on page 10-7).

Fuel and Emissions

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07AAA-S0XA100	Fuel Sender Wrench	1
②	07AAJ-S6MA150	Fuel Pressure Gauge Attachment Set	1
③	07JAZ-001000B	Vacuum/Pressure Gauge, 0—4 in.Hg	1
④	07SAZ-001000A	Backprobe Set	2
⑤	07NAJ-P07010A	Pressure Gauge Adapter	1
⑥	07ZAJ-S5A0200	Oil Pressure Hose	1
⑦-1	07406-0020201	A/T Pressure Hose	1
⑦-2	07406-0070300	A/T Low Pressure Gauge W/Panel	1
⑦-3	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	1
⑦-4	07MAJ-PY40120	A/T Pressure Hose, Adapter	1
⑧	07406-004000A	Fuel Pressure Gauge	1

①



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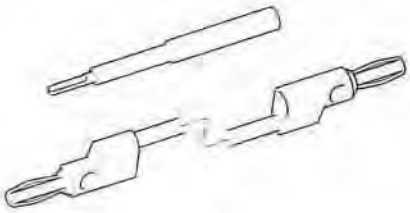
③



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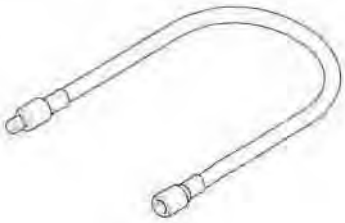
⑤



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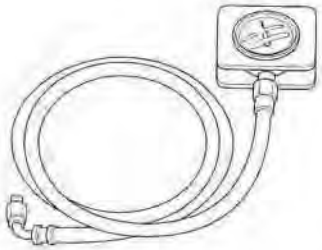


⑦-1, ⑦-2, ⑦-3, ⑦-4

⑧

General Troubleshooting Information

Intermittent Failures

The term "intermittent failure" means a system may have had a failure, but it checks OK now. If the malfunction indicator lamp (MIL) on the dash does not come on, check for poor connections or loose pins at all connectors related to the circuit that you are troubleshooting. If the MIL was on but then went out, the original problem may have been intermittent.

Opens and Shorts

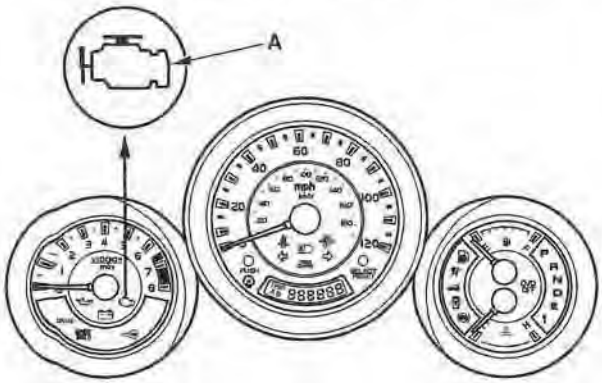
"Open" and "short" are common electrical terms. An open is a break in a wire or at a connection. A short is an accidental connection of a wire to ground or to another wire. In simple electronics, this usually means something won't work at all. With complex electronics (such as ECM/PCMs) this can sometimes mean something works, but not the way it's supposed to.

How to Use the HDS (Honda Diagnostic System)

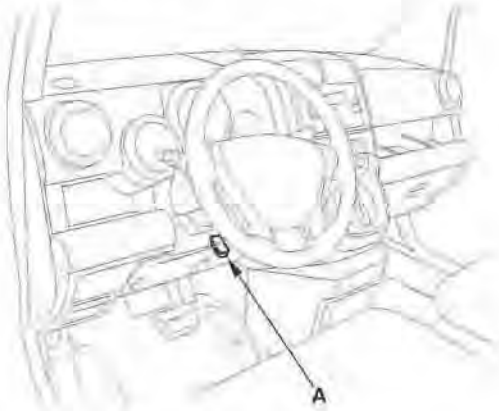
If the MIL (malfunction indicator lamp) has come on

1. Start the engine, and check the MIL (A).

   NOTE: If the ignition switch is turned ON (II), and the engine is not started, the MIL will stay on for 15—20 seconds (see page 11-51).



2. If the MIL stays on, connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



3. Turn the ignition switch ON (II).

4. Check the diagnostic trouble code (DTC) and note it. Also check the freeze data. Refer to the DTC Troubleshooting, and begin the appropriate troubleshooting procedure.

   - Freeze data indicates the engine conditions when the first malfunction, misfire, or fuel trim malfunction was detected.
   - The HDS can read the DTC, freeze data, current data, and other engine control module (ECM)/ powertrain control module (PCM) data.
   - For specific operations, refer to the user's manual that came with the HDS.

5. If no DTCs are found, go to MIL troubleshooting (see page 11-152).

If the MIL did not stay on

If the MIL did not stay on but there is a driveability problem, refer to the Symptom Troubleshooting.

If you can't duplicate the DTC

Some of the troubleshooting requires you to reset the ECM/PCM and try to duplicate the DTC. If the problem is intermittent and you can't duplicate the code, do not continue through the procedure. To do so will only result in confusion and possibly, a needlessly replaced ECM/PCM.

(cont'd)

General Troubleshooting Information (cont'd)

HDS Clear Command

The ECM/PCM stores various specific data to correct the system even if there is no electrical power such as when the battery negative terminal or No. 6 ECU (ECM/PCM) (15 A) fuse are disconnected. Stored data based on failed parts should be cleared by using the "CLEAR COMMAND" of the HDS, if parts are replaced.

The HDS has three kinds of clear commands to meet this purpose. They are DTC clear, ECM/PCM clear, and CKP pattern clear. DTC clear command erases all stored DTC codes, freeze data, and readiness codes. This must be done with the HDS after reproducing the DTC during troubleshooting in this service manual.
The ECM/PCM clear command erases all stored DTC codes, freeze data, readiness codes, and all specific data to correct the system except CKP pattern. If the CKP pattern data in the ECM/PCM was cleared, you must do the CKP pattern learn procedure. The CKP pattern clear command erases only CKP pattern data. This command is for repair of a misfire or the CKP sensor.

DTC Clear

1. Clear the DTC with the HDS while the engine is stopped.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON (II). Wait for 30 seconds.
4. Turn the ignition switch OFF, and disconnect the HDS from the DLC.

ECM/PCM Reset

This command clears stored specific data from each vehicle such as DTCs, freeze data, and readiness codes. It does not clear CKP PATTERN data.

1. Reset the ECM/PCM with the HDS while the engine is stopped.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON (II), and wait for 30 seconds.
4. Turn the ignition switch OFF, and disconnect the HDS from the DLC.
5. Do the ECM/PCM idle learn procedure (see page 11-207).

CKP Pattern Clear/CKP Pattern Learn

NOTE: The ECT needs to be at 176 °F (80 °C) or higher.

1. Clear the CKP pattern while the engine is stopped.
2. Turn the ignition switch OFF.
3. Turn the ignition switch ON (II), and wait for 30 seconds.
4. Test-drive the vehicle on a level road: decelerate (with the throttle fully closed) from an engine speed of 2,500 rpm to 1,000 rpm with the A/T in 2 position, or M/T in 1st gear.
5. Stop the vehicle, but keep the engine running.
6. Check PULSER F/B LEARN in the DATA LIST with the HDS. If it is NOT COMPLETED, go to step 4. If it is COMPLETED, go to step 7.
7. Turn the ignition switch OFF.
8. Turn the ignition switch ON (II), and wait for 30 seconds. The CKP learning procedure is completed.

How to End a Troubleshooting Session (required after any troubleshooting)

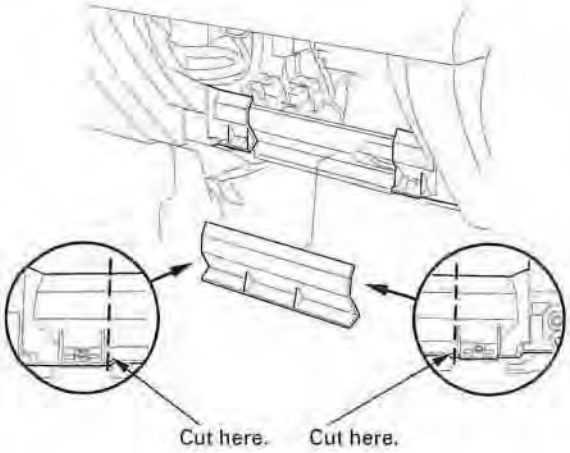
1. Reset the ECM/PCM with the HDS.
2. Do the ECM/PCM idle learn procedure (see page 11-207).
3. Turn the ignition switch OFF.
4. Disconnect the HDS from the DLC.

   NOTE: The ECM/PCM is part of the immobilizer system. If you replace the ECM/PCM, it will have a different immobilizer code. In order for the engine to start, you must rewrite the immobilizer code with the HDS.

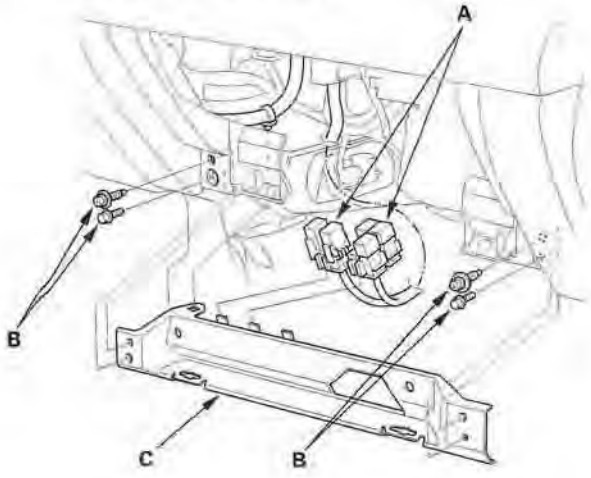
How to Remove the ECM/PCM for Testing

If the troubleshooting for a code requires voltage or resistance checks at the ECM/PCM connectors, remove the ECM/PCM and test it:

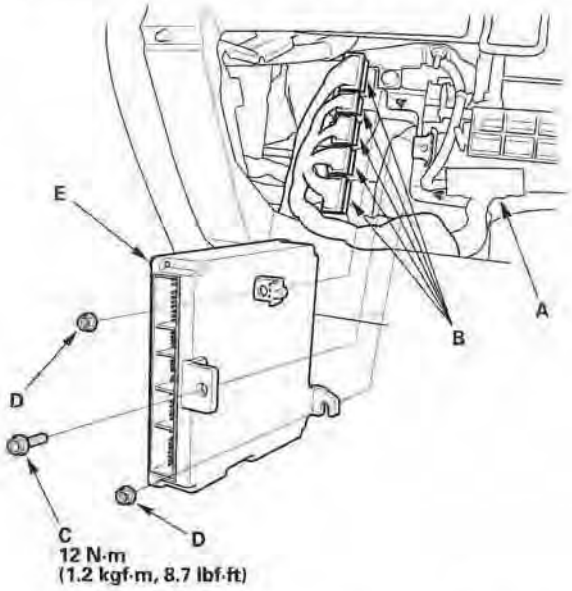
1. Turn the ignition switch OFF.
2. Jump the SCS line with the HDS.
3. Remove the passenger's dashboard under cover (see page 20-78), the passenger's kick panel (see page 20-58), and the glove box (see page 20-78).
4. Cut the plastic cross brace in the glove box opening with diagonal cutters in the area shown, and discard it.



5. Remove the relays (A), then remove the bolts (B) and the glove box frame (C).



6. Remove the gray 20P ECM/PCM wire harness connector (A) from the ECM/PCM mounting bracket.



7. Disconnect the ECM/PCM connectors (B).
8. Remove the ECM/PCM mounting bolt (C) and the bracket.
9. Remove the nuts (D), then remove the ECM/PCM (E).
10. Install the ECM/PCM in the reverse order of removal.
11. Exit the SCS mode with the HDS.
12. Turn the ignition switch ON (II).

    NOTE: For 2005 model: DTC P0630 "VIN Not Programmed or Mismatch" will be stored because a VIN has not been programmed into the ECM/PCM, ignore it, and continue this procedure.

13. Input the VIN to the ECM/PCM with the HDS.
14. Rewrite the immobilizer code with the ECM/PCM replacement procedure in the HDS; it allows you to start the engine.
15. Reset the ECM/PCM with the HDS.
16. Do the ECM/PCM idle learn procedure (see page 11-207).

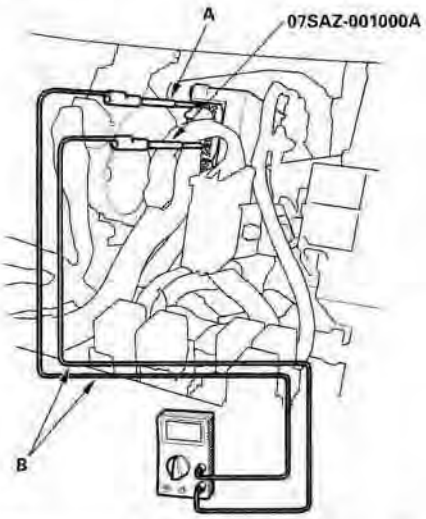
(cont'd)

General Troubleshooting Information (cont'd)

How to Troubleshoot Circuits at the ECM/PCM

Special Tools Required
- Digital multimeter KS-AHM-32-003 (1) or a commercially available digital multimeter
- Backprobe set 07SAZ-001000A (2)

1. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a digital multimeter.

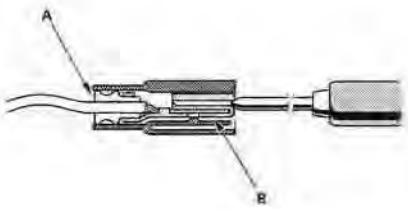


2. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it touches the end of the wire terminal.

3. If you cannot get to the wire side of the connector or the wire side is sealed (A), disconnect the connector and probe the terminals (B) from the terminal side. Do not force the probe into the connector.

NOTICE

Do not puncture the insulation on a wire. Punctures can cause poor or intermittent electrical connections.



ECM/PCM Updating and Substitution for Testing

Special Tools Required

Honda interface module (HIM) EQS05A35570

Use this procedure when you have to substitute a known-good ECM/PCM in a troubleshooting procedure. Update the ECM/PCM only if the ECM/PCM does not have the latest software loaded.

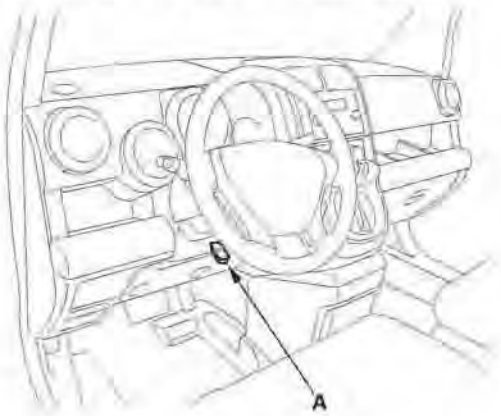
NOTE: Do not turn the ignition switch OFF while updating the ECM/PCM. If you turn the ignition switch OFF before completion, the ECM/PCM can be damaged.

How to Update the ECM/PCM

NOTE:
- To ensure the latest program is installed, do an ECM/PCM update whenever the ECM/PCM is substituted or replaced.
- You cannot update an ECM/PCM with the program it already has. It will only accept a new program.
- Before you update the ECM/PCM, make sure the vehicle's battery is fully charged.
- To prevent ECM/PCM damage, do not operate anything electrical (audio system, brakes, A/C, power windows, door locks, etc.) during the update.
- If you need to diagnose the Honda interface module (HIM) because the HIM's red (#3) light came on or was flashing during the update, leave the ignition switch in the ON (II) position when you disconnect the HIM from the data link connector (DLC). This will prevent ECM/PCM damage.

1. Turn the ignition switch ON (II). Do not start the engine.

2. Connect the HDS or the Honda interface module (HIM) to the data link connector (DLC) (A) located under the driver's side of the dashboard.



3. Do the ECM/PCM update procedure as described on the HIM label and in the ECM/PCM update system.

4. Do the ECM/PCM idle learn procedure (see page 11-207).

5. Clear the CKP pattern with the HDS while the engine is stopped.

How to Substitute the ECM/PCM

1. Remove the ECM/PCM from the vehicle.

2. Install a known-good ECM/PCM.

3. Rewrite the immobilizer code with the ECM/PCM replacement procedure in the HDS; it allows you to start the engine.

4. After completing your tests, install the original ECM/PCM, and rewrite the immobilizer code with the ECM/PCM replacement procedure in the HDS.

OBD Status

The OBD status shows the current system status of each DTC and all of the parameters. This function is used to see if the repair was successful. The results of diagnostic tests for the DTC are displayed as:

- PASSED: On-board diagnosis is successfully finished.
- FAILED: On-board diagnosis has finished but failed.
- EXECUTING: The vehicle is in enable criteria conditions for the DTC and the on board diagnosis is running.
- NOT COMPLETED: The on-board diagnosis was running but is out of the enable conditions of the DTC.
- OUT OF CONDITION: The vehicle has stayed out of the enable conditions of the DTC.

DTC Troubleshooting Index

DTC (MIL indication*1)	Temporary DTC	Detection Item	MIL	Note
P0010 (56)	——	Variable Valve Timing Control (VTC) Oil Control Solenoid Valve Malfunction	ON	(see page 11-171)
P0011 (56)	P0011	Variable Valve Timing Control (VTC) System Malfunction	ON	(see page 11-174)
P0107 (3)	——	Manifold Absolute Pressure (MAP) Sensor Circuit Low Voltage	ON	(see page 11-56)
P0108 (3)	——	Manifold Absolute Pressure (MAP) Sensor Circuit High Voltage	ON	(see page 11-59)
P0112 (10)	——	Intake Air Temperature (IAT) Sensor Circuit Low Voltage	ON	(see page 11-62)
P0113 (10)	——	Intake Air Temperature (IAT) Sensor Circuit High Voltage	ON	(see page 11-63)
P0116 (86)	P0116	Engine Coolant Temperature (ECT) Sensor Range/Performance Problem	ON	(see page 11-65)
P0117 (6)	——	Engine Coolant Temperature (ECT) Sensor Circuit Low Voltage	ON	(see page 11-66)
P0118 (6)	——	Engine Coolant Temperature (ECT) Sensor Circuit High Voltage	ON	(see page 11-67)
P0122 (7)	——	Throttle Position (TP) Sensor Circuit Low Voltage	ON	(see page 11-69)
P0123 (7)	——	Throttle Position (TP) Sensor Circuit High Voltage	ON	(see page 11-73)
P0125 (86)	P0125	Engine Coolant Temperature (ECT) Sensor Malfunction/Slow Responce	ON	(see page 11-75)
P0128 (87)	P0128	Cooling System Malfunction	ON	(see page 11-76)
P0133 (61)	P0133	Air Fuel Ratio (A/F) Sensor (Sensor 1) Response Malfunction	ON	(see page 11-78)
P0134 (41)	——	Air Fuel Ratio (A/F) Sensor (Sensor 1) Heater System Malfunction	ON	(see page 11-79)
P0135 (41)	——	Air Fuel Ratio (A/F) Sensor (Sensor 1) Heater Circuit Malfunction	ON	(see page 11-80)
P0137 (63)*1	P0137	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Low Voltage	ON	(see page 11-84)
P0137 (63)*4	——	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Low Voltage	ON	(see page 11-86)
P0138 (63)*1	P0138	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit High Voltage	ON	(see page 11-88)
P0138 (63)*4	——	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit High Voltage	ON	(see page 11-91)
P0139 (63)*1	P0139	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Slow Response	ON	(see page 11-94)
P0139 (63)*4	P0139	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Slow Response	ON	(see page 11-95)
P0141 (65)	——	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Heater Circuit Malfunction	ON	(see page 11-96)
P0171 (45)	P0171	Fuel System Too Lean	ON	(see page 11-99)
P0172 (45)	P0172	Fuel System Too Rich	ON	(see page 11-99)
P0300 (75) and some of P0301 (71) P0302 (72) P0303 (73) P0304 (74)	P0300 and some of P0301 P0302 P0303 P0304	Random Misfire Detected	ON	(see page 11-100)
P0301 (71)	P0301	No. 1 Cylinder Misfire Detected	ON	(see page 11-103)
P0302 (72)	P0302	No. 2 Cylinder Misfire Detected	ON	(see page 11-103)
P0303 (73)	P0303	No. 3 Cylinder Misfire Detected	ON	(see page 11-103)
P0304 (74)	P0304	No. 4 Cylinder Misfire Detected	ON	(see page 11-103)

NOTE: These DTCs are indicated when the PGM-FI system is selected in the HDS.
Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check for automatic transmission DTCs.

* 1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.
* 4: 2005 model
* 5: 2003-2004 models

DTC (MIL indication*1)	Temporary DTC	Detection Item	MIL	Note
P0325 (23)	——	Knock Sensor Circuit Malfunction	ON	(see page 11-110)
P0335 (4)	——	Crankshaft Position (CKP) Sensor No Signal	ON	(see page 11-112)
P0339 (4)	——	Crankshaft Position (CKP) Sensor Intermittent Interruption	ON	(see page 11-114)
P0340 (57)	——	Camshaft Position (CMP) Sensor A No Signal	ON	(see page 11-176)
P0341 (57)	——	Camshaft Position (CMP) Sensor A and Crankshaft Position (CKP) Sensor Incorrect Phase Detected	ON	(see page 11-178)
P0344 (57)	——	Camshaft Position (CMP) Sensor A Intermittent Interruption	ON	(see page 11-180)
P0365 (8)	——	Camshaft Position (CMP) Sensor B No Signal	ON	(see page 11-115)
P0369 (8)	——	Camshaft Position (CMP) Sensor B Intermittent Interruption	ON	(see page 11-117)
P0420 (67)*5	P0420	Catalyst System Efficiency Below Threshold	ON	(see page 11-237)
P0420 (67)*4	P0420	Catalyst System Efficiency Below Threshold	ON	(see page 11-239)
P0442 (90)	P0442	Evaporative Emission (EVAP) System Small Leak Detected	ON	(see page 11-244)
P0443 (92)	——	Evaporative Emission (EVAP) Canister Purge Valve Circuit Malfunction	ON	(see page 11-247)
P0451 (91)	P0451	Fuel Tank Pressure (FTP) Sensor Range/Performance Problem	ON	(see page 11-251)
P0452 (91)	——	Fuel Tank Pressure (FTP) Sensor Circuit Low Voltage	ON	(see page 11-252)
P0453 (91)	——	Fuel Tank Pressure (FTP) Sensor Circuit High Voltage	ON	(see page 11-255)
P0456 (90)	P0456	Evaporative Emission (EVAP) System Very Small Leak Detected	ON	(see page 11-244)
P0457 (90)	P0457	Evaporative Emission (EVAP) System Leak Detected/Fuel Cap Loose or Missing	ON	(see page 11-258)
P0496 (92)	P0496	Evaporative Emission (EVAP) System High Purge Flow	ON	(see page 11-260)
P0497 (90)	P0497	Evaporative Emission (EVAP) System Low Purge Flow	ON	(see page 11-261)
P0498 (117)	——	Evaporative Emission (EVAP) Canister Vent Shut Valve Circuit Low Voltage	ON	(see page 11-264)
P0499 (117)	——	Evaporative Emission (EVAP) Canister Vent Shut Valve Circuit High Voltage	ON	(see page 11-266)
P0506 (14)	P0506	Idle Control System RPM Lower Than Expected	ON	(see page 11-195)
P0507 (14)	P0507	Idle Control System RPM Higher Than Expected	ON	(see page 11-196)
P0511 (14)	——	Idle Air Control (IAC) Valve Circuit Malfunction	ON	(see page 11-197)
P0562 (34)*4	——	Charging System Low Voltage	OFF	(see page 11-118)
P0563 (34)	——	Engine Control Module (ECM)/Powertrain Control Module (PCM) Power Source Circuit Unexpected Voltage	OFF	(see page 11-119)
P0600 (39)	——	Serial Communication Link Malfunction	OFF	Refer to the Multiplex Control System troubleshooting (see page 22-149).
P0602 (196)*4	——	Engine Control Module (ECM)/Powertrain Control Module (PCM) Programming Error	OFF	(see page 11-122)
P0603 (131)	——	Engine Control Module (ECM)/Powertrain Control Module (PCM) Internal Control Module (Keep Alive Memory (KAM) Error)	ON	(see page 11-122)
P0606 (0)	——	Engine Control Module (ECM)/Powertrain Control Module (PCM) Processor Malfunction	ON	(see page 11-123)
P0630 (139)*4	——	VIN Not Programmed or Mismatch	ON	(see page 11-124)
P0685 (135)	P0685	Engine Control Module (ECM)/Powertrain Control Module (PCM) Power Control Circuit Malfunction	ON	(see page 11-125)

NOTE: These DTCs are indicated when the PGM-FI system is selected in the HDS.
Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check for automatic transmission DTCs.

* 1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.
* 4: 2005 model
* 5: 2003-2004 models

(cont'd)

DTC Troubleshooting Index (cont'd)

DTC (MIL indication*1)	Temporary DTC	Detection Item	MIL	NOTE
P07xx (70)*2	———	Automatic Transaxle System Malfunction	ON/ OFF	Refer to the Automatic Transmission DTC Troubleshooting
P0720 (122)*3	———	Output Shaft (Countershaft) Speed Sensor Circuit Malfunction	ON	(see page 11-126)
P1009 (56)	———	VTC Advance Malfunction	ON	(see page 11-181)
P1109 (13)*4	———	Barometric Pressure (BARO) Sensor Circuit Out of Range High	ON	(see page 11-128)
P1121 (7)	P1121	Throttle Position (TP) Sensor Signal Lower Than Expected	ON	(see page 11-129)
P1122 (7)	P1122	Throttle Position (TP) Sensor Signal Higher Than Expected	ON	(see page 11-130)
P1128 (5)	P1128	Manifold Absolute Pressure (MAP) Sensor Signal Lower Than Expected	ON	(see page 11-131)
P1129 (5)	P1129	Manifold Absolute Pressure (MAP) Sensor Signal Higher Than Expected	ON	(see page 11-132)
P1157 (48)	———	Air Fuel Ratio (A/F) Sensor (Sensor 1) Line High Voltage	ON	(see page 11-133)
P1172 (161)*3	———	Air Fuel Ratio (A/F) Sensor (Sensor 1) Circuit Out of Range High	ON	(see page 11-135)
P1297 (20)	———	Electrical Load Detector (ELD) Circuit Low Voltage	OFF	(see page 11-136)
P1298 (20)	———	Electrical Load Detector (ELD) Circuit High Voltage	OFF	(see page 11-138)
P1454 (91)	P1454	Fuel Tank Pressure (FTP) Sensor Range/Performance Problem	ON	(see page 11-268)
P1549 (34)*4	———	Charging System High Voltage	OFF	(see page 11-140)
P16BB (116)*4	———	Alternator B Terminal Circuit Low Voltage	OFF	(see page 11-141)
P16BC (116)*4	———	Alternator FR Terminal Circuit/IGP Circuit Low Voltage	OFF	(see page 11-142)
P2195 (48)	———	Air Fuel Ratio (A/F) Sensor (Sensor 1) Signal Stuck Lean	ON	(see page 11-145)
P2227 (13)	P2227	Barometric Pressure (BARO) Range/Performance Problem	ON	(see page 11-146)
P2228 (13)	———	Barometric Pressure (BARO) Sensor Circuit Low Voltage	ON	(see page 11-147)
P2229 (13)	———	Barometric Pressure (BARO) Sensor Circuit High Voltage	ON	(see page 11-147)
P2238 (48)	———	Air Fuel Ratio (A/F) Sensor (Sensor 1) AFS+ Line Low Voltage	ON	(see page 11-148)
P2252 (48)	———	Air Fuel Ratio (A/F) Sensor (Sensor 1) AFS− Line Low Voltage	ON	(see page 11-149)
P2270 (63)*4	P2270	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Signal Stuck Lean	ON	(see page 11-150)
P2271 (63)*4	P2271	Secondary Heated Oxygen Sensor (Secondary HO2S (Sensor 2)) Circuit Signal Stuck Rich	ON	(see page 11-150)
P2279 (109)	P2279	Intake Air System Leak Detected	ON	(see page 11-241)
P2422 (117)	P2422	Evaporative Emission (EVAP) Canister Vent Shut Valve Stuck Closed Malfunction	ON	(see page 11-268)
P2646 (22)	———	VTEC Oil Pressure Switch Circuit Low Voltage	ON	(see page 11-182)
P2647 (22)	———	VTEC Oil Pressure Switch Circuit High Voltage	ON	(see page 11-184)
P2648 (21)	———	VTEC Solenoid Valve Circuit Low Voltage	ON	(see page 11-186)
P2649 (21)	———	VTEC Solenoid Valve Circuit High Voltage	ON	(see page 11-188)
P2A00 (61)	P2A00	Air Fuel Ratio (A/F) Sensor (Sensor 1) Range/Performance Problem	ON	(see page 11-151)

NOTE: These DTCs are indicated when the PGM-FI system is selected in the HDS.
Some automatic transmission DTCs cause the MIL to come on. If the MIL is on and no DTCs are indicated in the PGM-FI system, select the A/T system, and check for automatic transmission DTCs.

*1: These DTCs are indicated by a blinking MIL when the SCS line is jumped with the HDS.
*2: M/T model
*3: A/T model
*4: 2005 model

Symptom Troubleshooting Index

When the vehicle has one of these symptoms, check for a diagnostic trouble code (DTC) with the HDS. If there is no DTC, do the diagnostic procedure for the symptom, in the sequence listed, until you find the cause.

Symptom	Diagnostic procedure	Also check for
Engine will not start (MIL works OK, no DTCs set)	1. Test the battery (see page 22-56). 2. Test the starter (see page 4-9). 3. Check the fuel pressure (see page 11-214). 4. Troubleshoot the fuel pump circuit (see page 11-209).	• Low compression • No ignition spark • Intake air leaks • Locked up engine • Broken cam chain • Contaminated fuel
Engine will not start (MIL comes on and stays on, or never comes on at all, no DTCs set)	Troubleshoot the MIL circuit (see page 11-152).	
Engine will not start (immobilizer indicator stays on or flashes)	Troubleshoot the immobilizer system (see page 22-125).	
Engine is hard to start (MIL works OK, no DTCs set)	1. Test the battery (see page 22-56). 2. Check the fuel pressure (see page 11-214).	• Low compression • Intake air leaks • Contaminated fuel • Weak spark
Cold fast idle too low (MIL works OK, no DTCs set)	1. Do the ECM/PCM idle learn procedure (see page 11-207). 2. Check the idle speed (see page 11-206).	
Cold fast idle too high (MIL works OK, no DTCs set)	1. Do the ECM/PCM idle learn procedure (see page 11-207). 2. Check the idle speed (see page 11-206). 3. Inspect/adjust the throttle cable (see page 11-233). 4. Inspect and test the throttle body (see page 11-229).	
Idle speed fluctuates (MIL works OK, no DTCs set)	1. Do the ECM/PCM idle learn procedure (see page 11-207). 2. Check the idle speed (see page 11-206). 3. Inspect/adjust the throttle cable (see page 11-233). 4. Inspect and test the throttle body (see page 11-229)	Intake vacuum leaks
After warming up, idle speed is below specification without load (MIL works OK, no DTCs set)	1. Troubleshoot the alternator FR signal circuit (see page 11-201). Inspect and test the throttle body (see page 11-229). 2.	
After warming up, idle speed is above specification without load (MIL works OK, no DTCs set)	1. Inspect/adjust the throttle cable (see page 11-233). 2. Troubleshoot the alternator FR signal circuit (see page 11-201).	
Low power (MIL works OK, no DTCs set)	1. Check the fuel pressure (see page 11-214). 2. Inspect and test the throttle body (see page 11-229). 3. Inspect/adjust the throttle cable (see page 11-233).	• Low compression • Incorrect camshaft timing • Incorrect engine oil level
Engine stalls (MIL works OK, no DTCs set)	1. Do the ECM/PCM idle learn procedure (see page 11-207). 2. Check the fuel pressure (see page 11-214). 3. Check the idle speed (see page 11-206). 4. Troubleshoot the brake pedal position switch signal circuit (see page 11-205).	• Intake air leaks • Faulty harness and sensor connections

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Symptom Troubleshooting Index (cont'd)

Symptom	Diagnostic procedure	Also check for
Difficult to refuel (MIL works OK, no DTCs set)	1. Check the fuel vent tube between the EVAP canister and the fuel tank. 2. Check the fuel tank vapor recirculation tube between the fuel pipe and the fuel tank. 3. Replace the fuel tank (see page 11-225).	Malfunctioning gas station filling nozzle.
Fuel overflows during refueling (No DTCs set)	Replace the fuel tank (see page 11-225).	Malfunctioning gas station filling nozzle.

System Description

Electronic Control System

The functions of the fuel and emission control systems are managed by the engine control module (ECM) on vehicles with manual transmissions or the powertrain control module (PCM) on vehicles with automatic transmissions.

Self-diagnosis
The ECM/PCM detects a failure of a signal from a sensor or from another control unit and stores a temporary DTC or a permanent DTC in the erasable memory (RAM). Depending on the failure, permanent DTC is stored whether in the first or the second drive cycle. When a permanent DTC is stored, the ECM/PCM indicates the malfunction indicator lamp (MIL) by supplying ground to the MIL circuit.

- **One Drive Cycle Detection Method**
  When an abnormality occurs in the signal from a sensor or from another control unit, the ECM/PCM stores a permanent DTC for the failure in the RAM and indicates the MIL immediately.

- **Two Drive Cycle Detection Method**
  When an abnormality occurs in the signal from a sensor or from another control unit in the first drive cycle, the ECM/PCM stores a temporary DTC for the failure in the RAM. The MIL does not come on at this time. If the failure continues in the second drive cycle, the ECM/PCM stores a permanent DTC in the erasable memory and indicates the MIL.

Fail-safe Function
When an abnormality occurs in the signal from a sensor or from another control unit, the ECM/PCM ignores that signal and assumes a pre-programmed value for them and allows the engine to continue running. DTC is stored at this time and MIL come on.

MIL Bulb Check and Readiness Code Condition
When the ignition switch is first turned ON (II), the ECM/PCM supplies ground to the MIL circuit and indicate it for about 15 to 20 seconds to check the bulb condition. If any readiness codes are not set to complete, the MIL flashes five times during this time. If all readiness codes are set to complete, the MIL will go out.

Self Shut Down (SSD) Mode
After the ignition switch is turned OFF, the ECM/PCM stays on (up to 40 minutes) to keep watching the condition of the vehicle. If the ECM/PCM connector is disconnected during this time, the ECM/PCM may be damaged. To cancel this mode, disconnect the negative cable from the battery or jump the SCS line with the HDS after the ignition switch is turned OFF.

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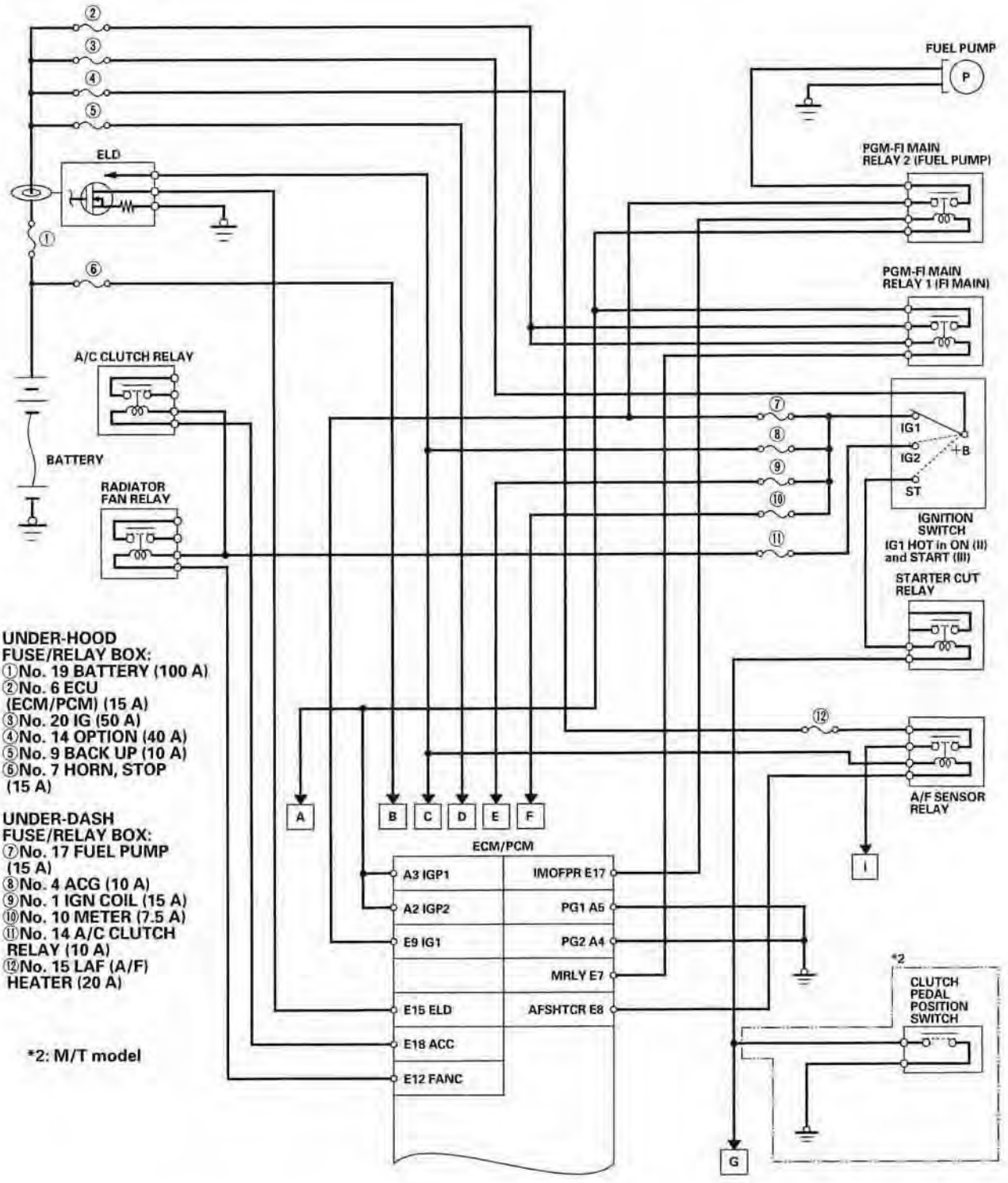
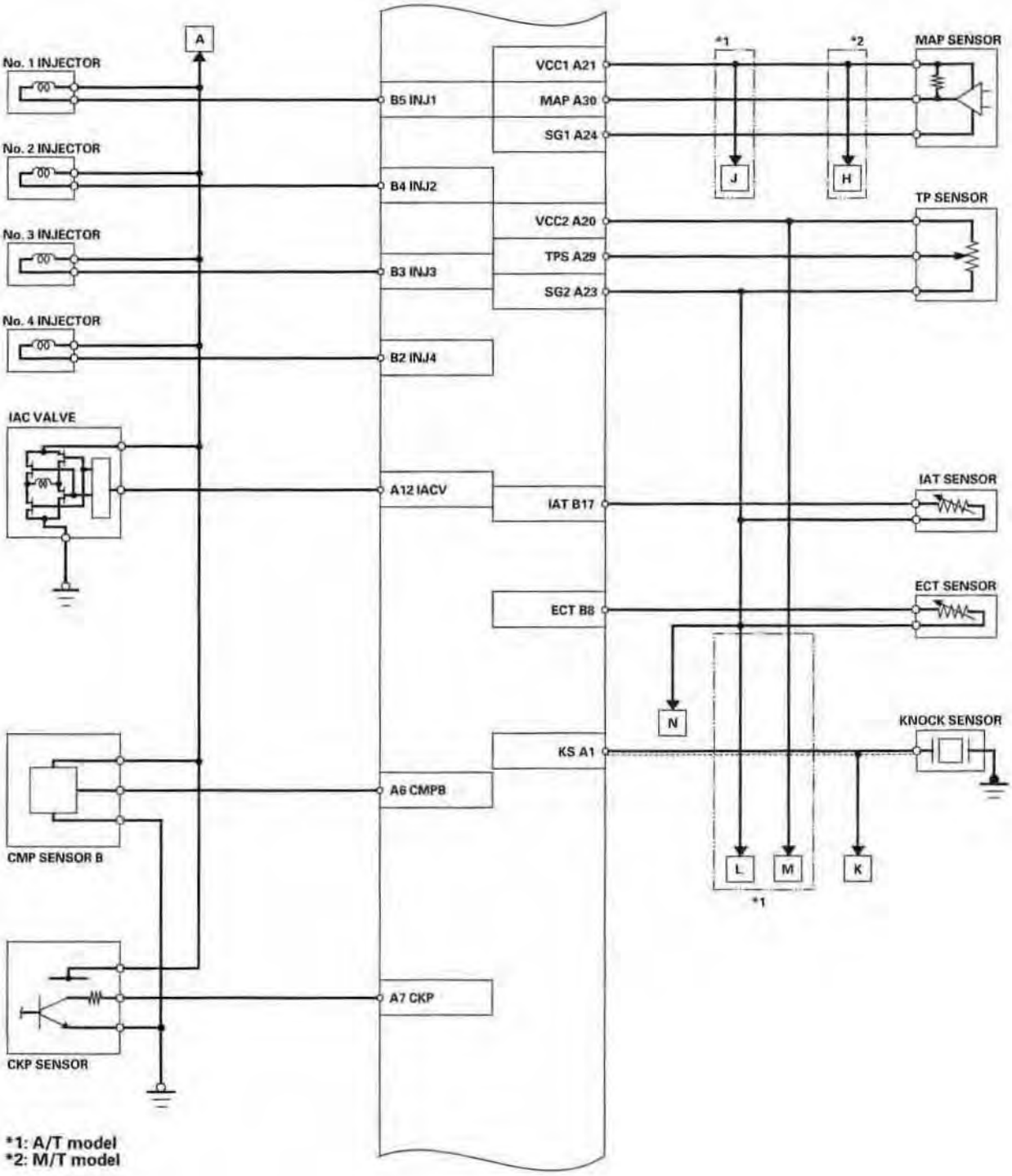
System Description (cont'd)

ECM/PCM Electrical Connections





*1: A/T model
*2: M/T model

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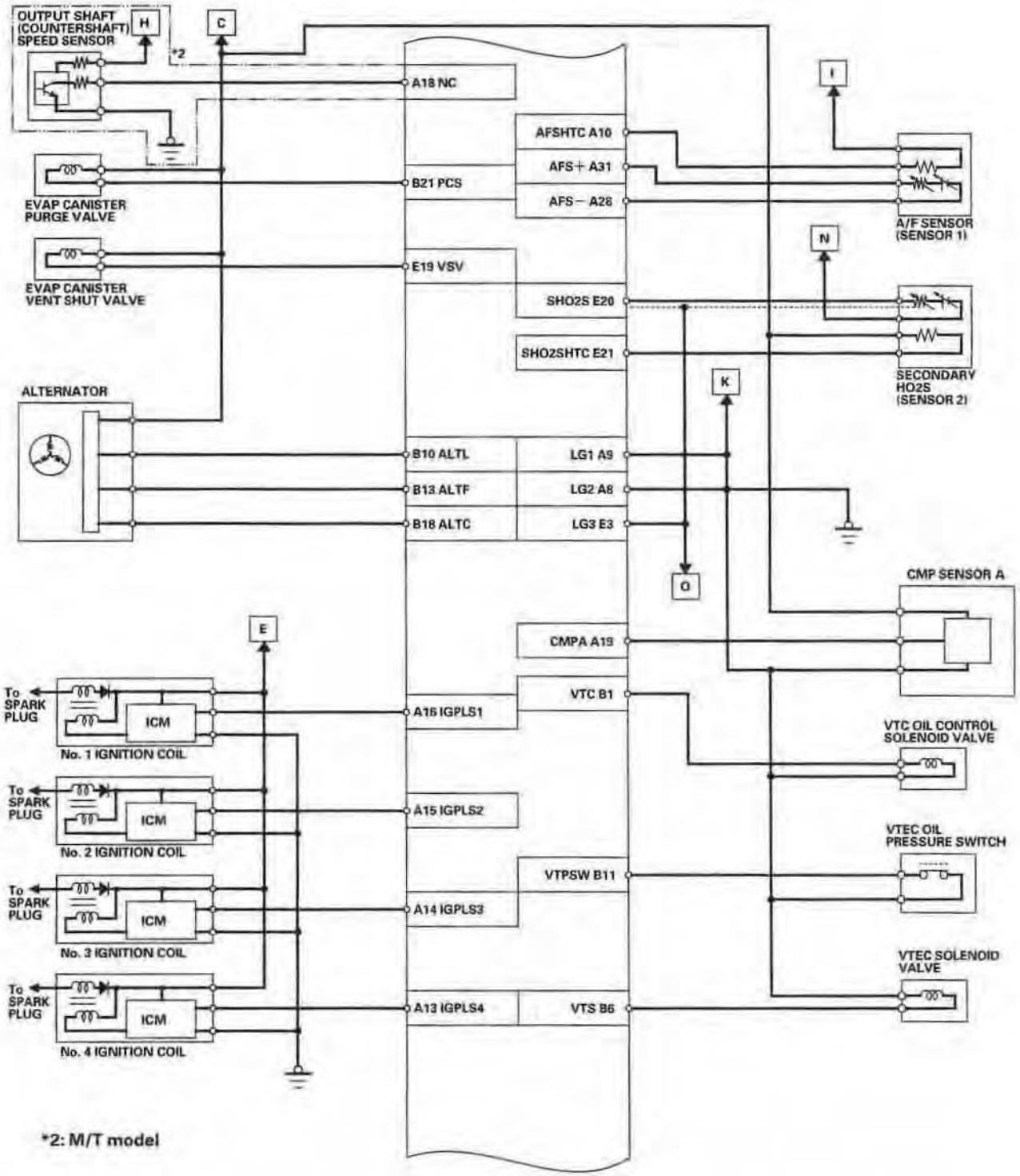
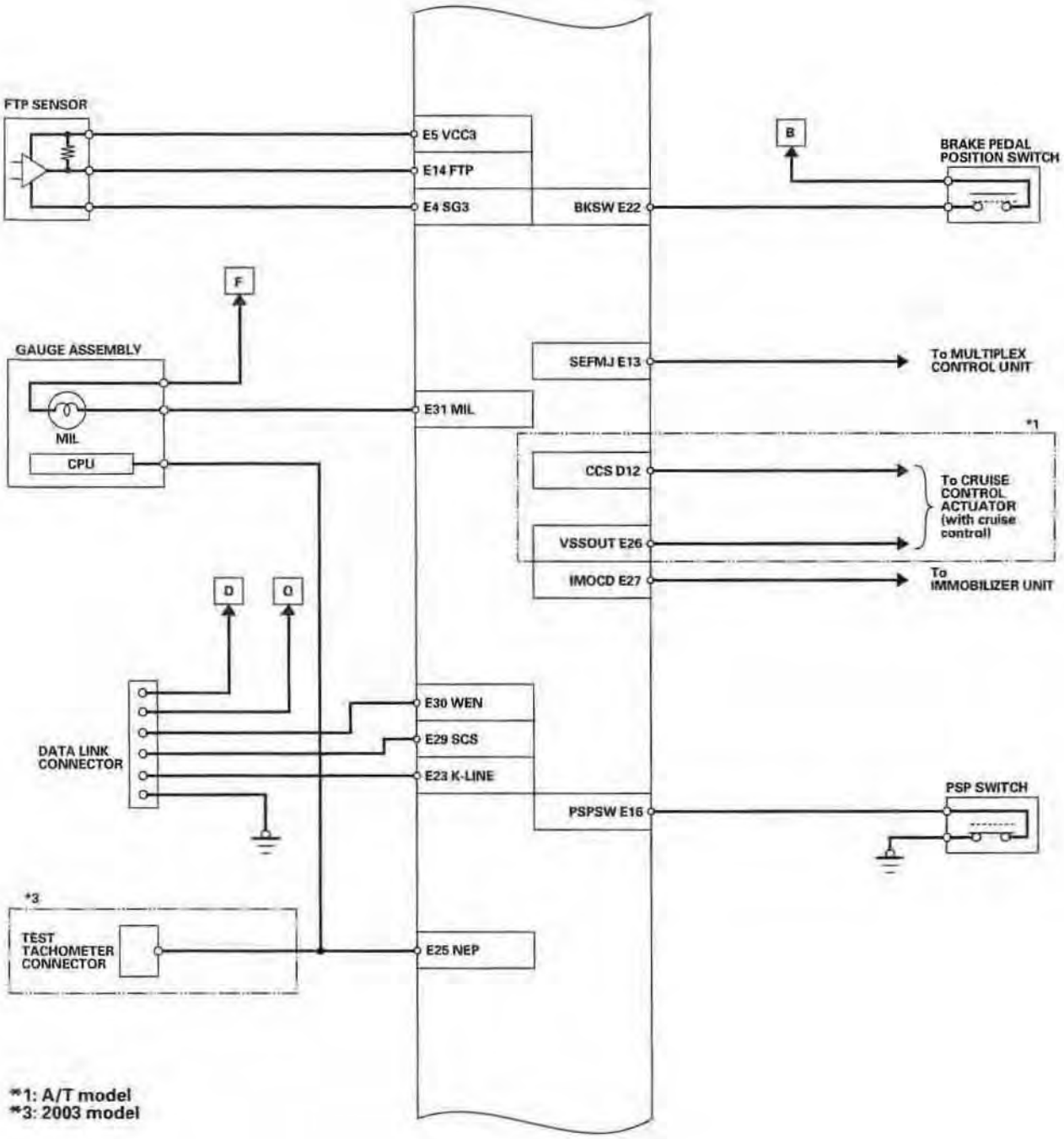
System Description (cont'd)

ECM/PCM Electrical Connections (cont'd)





*1: A/T model
*3: 2003 model

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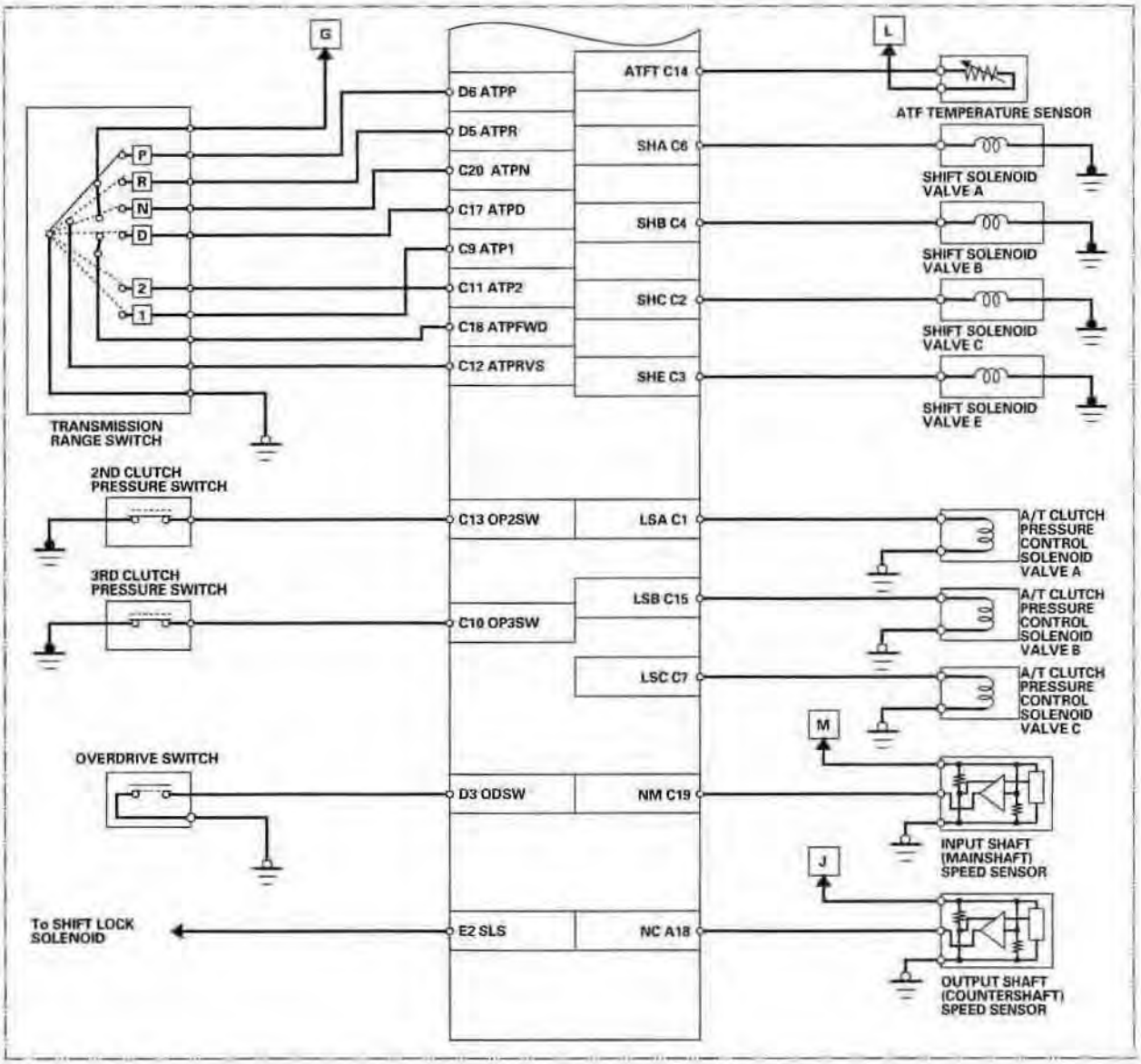
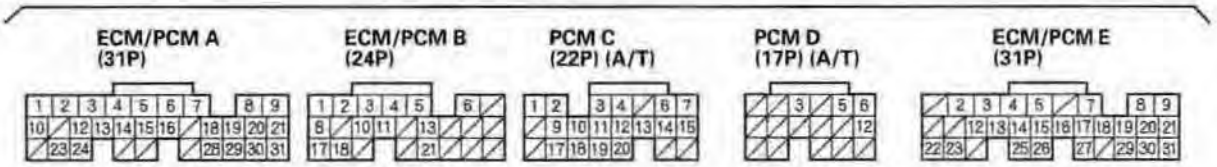
System Description (cont'd)

ECM/PCM Electrical Connections (cont'd)

*1

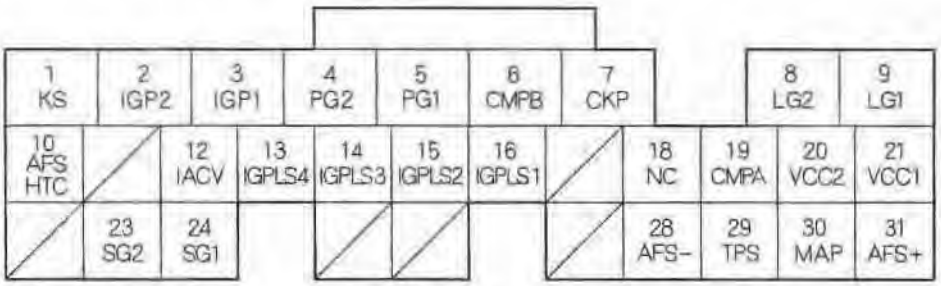


*1: A/T model



TERMINAL LOCATIONS

ECM/PCM Inputs and Outputs at Connector A (31P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	WHT	KS (KNOCK SENSOR)	Detects knock sensor signal	With engine knocking: pulses
2	YEL/BLK	IGP2 (POWER SOURCE)	Power source for ECM/PCM circuit	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
3	YEL/BLK	IGP1 (POWER SOURCE)	Power source for ECM/PCM circuit	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
4	BLK	PG2 (POWER GROUND)	Ground circuit for ECM/PCM	Less than 1.0 V at all times
5	BLK	PG1 (POWER GROUND)	Ground circuit for ECM/PCM	Less than 1.0 V at all times
6	GRN	CMPB (CAMSHAFT POSITION SENSOR B)	Detects CMP sensor B signal	With engine running: pulses With ignition switch ON (II): about 5 V
7	YEL	CKP (CRANKSHAFT POSITION SENSOR)	Detects CKP sensor signal	With engine running: pulses With ignition switch ON (II): about 5 V
8	BRN/YEL	LG2 (LOGIC GROUND)	Ground circuit for ECM/PCM	Less than 1.0 V at all times
9	BRN/YEL	LG1 (LOGIC GROUND)	Ground circuit for ECM/PCM	Less than 1.0 V at all times
10	BLK/WHT	AFSHTC (AIR FUEL RATIO (A/F) SENSOR HEATER CONTROL)	Drives A/F sensor heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: about 0 V
12	BLK/RED	IACV (IDLE AIR CONTROL (IAC) VALVE)	Drives IAC valve	With engine running: duty controlled
13	BRN	IGPLS4 (No. 4 IGNITION COIL PULSE)	Drives No. 4 ignition coil	With ignition switch ON (II): about 0 V With engine running: pulses
14	WHT/BLU	IGPLS3 (No. 3 IGNITION COIL PULSE)	Drives No. 3 ignition coil	
15	BLU/RED	IGPLS2 (No. 2 IGNITION COIL PULSE)	Drives No. 2 ignition coil	
16	YEL/GRN	IGPLS1 (No. 1 IGNITION COIL PULSE)	Drives No. 1 ignition coil	
18	BLU	NC (OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR)	Detects output shaft (countershaft) speed sensor signal	With ignition switch ON (II): about 0 V or about 5 V While driving: about 2.5 V
19	BLU/WHT	CMPA (CAMSHAFT POSITION SENSOR A)	Detects CMP sensor A signal	With engine running: pulses With ignition switch ON (II): about 5 V

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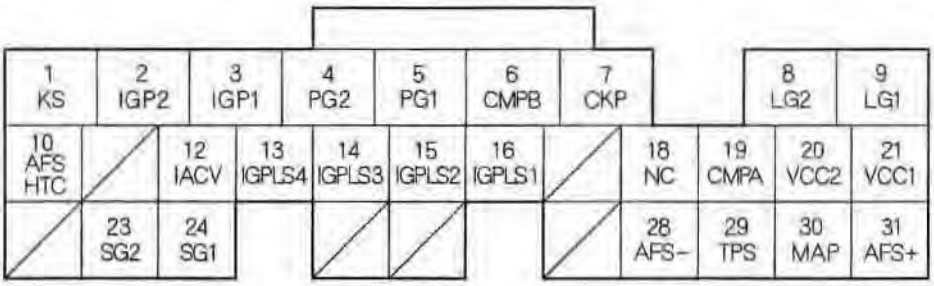
System Description (cont'd)

ECM/PCM Inputs and Outputs at Connector A (31P)

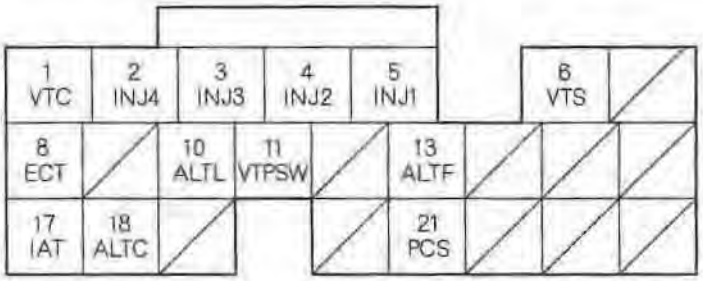


Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
20	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
21	YEL/RED	VCC1 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
23	GRN/BLK	SG2 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
24	GRN/WHT	SG1 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
28	BLU	AFS− (AIR FUEL RATIO (A/F) SENSOR, SENSOR 1 −SIDE)	Detects A/F sensor (sensor 1) signal	
29	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal	With throttle fully open: about 4.5 V With throttle fully closed: about 0.5 V
30	GRN/RED	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
31	RED	AFS+ (AIR FUEL RATIO (A/F) SENSOR, SENSOR 1 +SIDE)	Detects A/F sensor (sensor 1) signal	

ECM/PCM Inputs and Outputs at Connector B (24P)



Wire side of female terminals

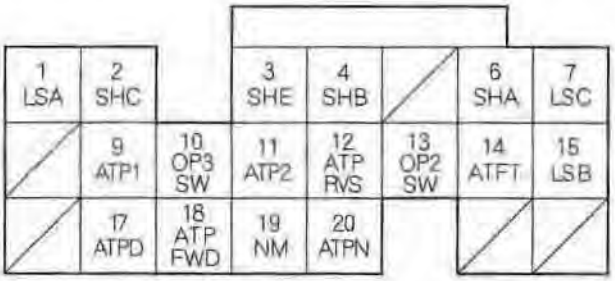
NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLU/WHT	VTC (VTC OIL CONTROL SOLENOID VALVE)	Drives VTC oil control solenoid valve	With ignition switch ON (II): 0 V
2	YEL	INJ4 (No. 4 INJECTOR)	Drives No. 4 injector	At idle: duty controlled With ignition switch ON (II): battery voltage
3	BLU	INJ3 (No. 3 INJECTOR)	Drives No. 3 injector	
4	RED	INJ2 (No. 2 INJECTOR)	Drives No. 2 injector	
5	BRN	INJ1 (No. 1 INJECTOR)	Drives No. 1 injector	
6	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve	At idle: about 0 V
8	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal	With ignition switch ON (II): about 0.5—4.8 V (depending on engine coolant temperature) With fully warmed up engine: about 0.5—0.7 V
10	WHT/BLU	ALTL (ALTERNATOR L SIGNAL)	Detects alternator signal	With ignition switch ON (II): about 0 V With engine running: battery voltage
11	BLU/BLK	VTPSW (VTEC OIL PRESSURE SWITCH)	Detects VTEC oil pressure switch signal	With engine at low speed: about 0 V With engine at high speed: battery voltage
13	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal	With engine running: about 0—5 V (depending on electrical load)
17	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal	With ignition switch ON (II): about 0.5—4.8 V (depending on intake air temperture)
18	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal	With engine running and fully warmed up: about 8 V
21	YEL/GRN	PCS (EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE)	Drives EVAP canister purge valve	With engine running, engine coolant below 131 °F (55 °C): battery voltage With engine running, engine coolant above 131 °F (55 °C): duty controlled

(cont'd)

System Description (cont'd)

PCM Inputs and Outputs at Connector C (22P)



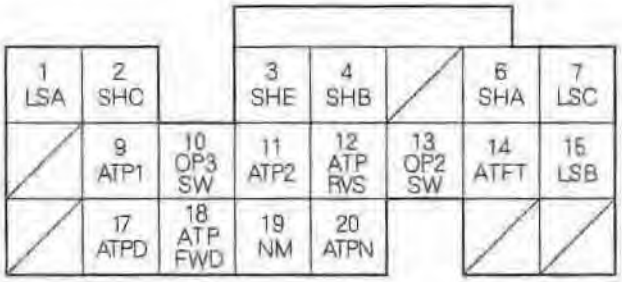
Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1*1	BLK/BLU	LSA (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A)	Drives A/T clutch pressure control solenoid valve A	With ignition switch ON (II): duty controlled
2*1	GRN	SHC (SHIFT SOLENOID VALVE C)	Drives shift solenoid valve C	With engine running in N and 1 position, or in D position (in 1st and 3rd gears): battery voltage With engine running in P, R position, 2, or D position (in 2nd, 4th gears): about 0 V
3*1	YEL	SHE (SHIFT SOLENOID VALVE E)	Drives shift solenoid valve E	With engine running in P, R position: battery voltage With engine running in N position, or in D, 2, and 1 position: about 0 V
4*1	GRN/WHT	SHB (SHIFT SOLENOID VALVE B)	Drives shift solenoid valve B	With engine running in P, R, N, 2, and 1 position, or D position (in 1st, 2nd gears): battery voltage With engine running in D position (in 3rd, 4th gears): about 0 V
6*1	BLU/BLK	SHA (SHIFT SOLENOID VALVE A)	Drives shift solenoid valve A	With engine running in R and 1 position, or D position (in 1st, 4th gears): battery voltage With engine running in P, N, and 2 position, or D position (in 2nd, 3rd gears): about 0 V
7*1	BLU/YEL	LSC (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C)	Drives A/T clutch pressure control solenoid valve C	With the ignition switch ON (II): duty controlled
9*1	BRN	ATP1 (TRANSMISSION RANGE SWITCH 1 POSITION)	Detects transmission range switch 1 position signal input	In 1 position: about 0 V In any other position: battery voltage
10*1	BLU/WHT	OP3SW (3RD OIL PRESSURE SWITCH)	Detects 3rd oil pressure switch signal output	With ignition switch ON (II): about 5 V With 3rd clutch pressure: 0 V
11*1	BLU	ATP2 (TRANSMISSION RANGE SWITCH 2 POSITION)	Detects transmission range switch 2 position signal input	In 2 position: about 0 V In any other position: battery voltage
12*1	RED/WHT	ATPRVS (TRANSMISSION RANGE SWITCH R POSITION)	Detects transmission range switch R position signal input	In R position: about 0 V In any other position: battery voltage
13*1	BLU/RED	OP2SW (2ND OIL PRESSURE SWITCH)	Detects 2nd oil pressure switch signal input	With ignition switch ON (II): about 5 V With 2nd clutch pressure: 0 V
14*1	RED/YEL	ATFT (ATF TEMPERATURE SENSOR)	Detects ATF temperature sensor signal input	With ignition switch ON (II): about 0.2—3 V (depending on ATF temperature)

*1: A/T model

PCM Inputs and Outputs at Connector C (22P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

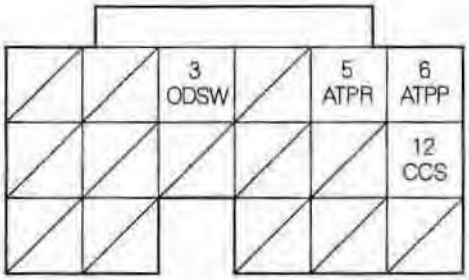
Terminal number	Wire color	Terminal name	Description	Signal
15*1	BRN/WHT	LSB (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B)	Drives A/T clutch pressure control solenoid valve B	With ignition switch ON (II): duty controlled
17*1	YEL/GRN	ATPD (TRANSMISSION RANGE SWITCH D POSITION)	Detects transmission range switch D position signal	In D position: about 0 V In any other position: battery voltage
18*1	YEL/RED	ATPFWD (TRANSMISSION RANGE SWITCH D/2 POSITION)	Detects transmission range switch D, 2 position signal	In D and 2 position: about 0 V In any other position: battery voltage
19*1	WHT/RED	NM (INPUT SHAFT (MAINSHAFT) SPEED SENSOR)	Detects input shaft (mainshaft) speed sensor signal	With ignition switch ON (II): about 0 V or about 5 V With engine running in N position: about 2.5 V
20*1	RED/BLK	ATPN (TRANSMISSION RANGE SWITCH NEUTRAL POSITION)	Detects transmission range switch N position signal	In N position: about 0 V In any other position: battery voltage

* 1: A/T model

(cont'd)

System Description (cont'd)

PCM Inputs and Outputs at Connector D (17P)



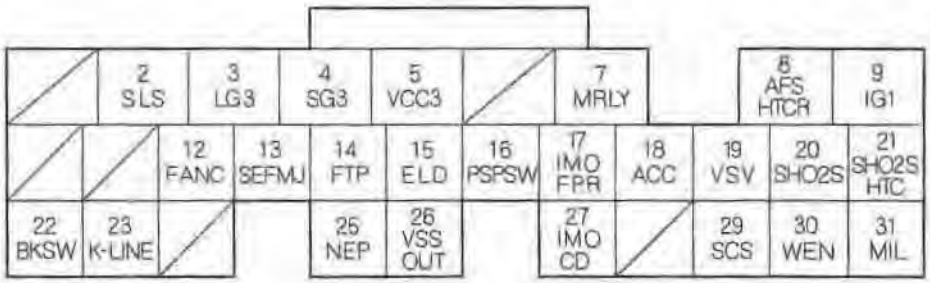
Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
3*1	GRN	ODSW (OVERDRIVE SWITCH)	Detects overdrive switch	With overdrive switch ON: about 0V With overdrive switch OFF: battery voltage
5*1	WHT	ATPR (TRANSMISSION RANGE SWITCH R POSITION)	Detects transmission range switch R position signal	In R position: about 0 V In any other position: battery voltage
6*1	BLK/BLU	ATTP (TRANSMISSION RANGE SWITCH PARK POSITION)	Detects transmission range switch P position signal	In P position: about 0 V In any other position: battery voltage
12*2	BLU/ORN	CCS (CRUISE CONTROL SIGNAL)	Detects cruise control signal	With cruise control on: pulses

* 1: A/T model
* 2: with cruise control

ECM/PCM Inputs and Outputs at Connector E (31P)



Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

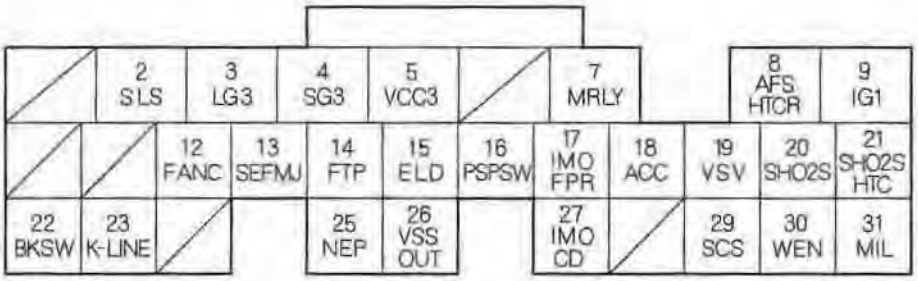
Terminal number	Wire color	Terminal name	Description	Signal
2*1	WHT/BLU	SLS (SHIFT LOCK SOLENOID)	Drives shift lock solenoid	With ignition switch ON (II), in P position, brake pedal pressed, and accelerator released: 0 V
3	BRN/YEL	LG3 (LOGIC GROUND)	Ground for ECM/PCM control circuit	Less than 1.0 V at all times
4	WHT/GRN	SG3 (SENSOR GROUND)	Sensor ground	Less than 1.0 V at all times
5	YEL/BLU	VCC3 (SENSOR VOLTAGE)	Provides sensor voltage	With ignition switch ON (II): about 5 V With ignition switch OFF: about 0 V
7	RED/YEL	MRLY (PGM-FI MAIN RELAY)	Drives PGM-FI main relay 1 (FI MAIN) Power source for DTC memory	With ignition switch ON (II): about 0 V With ignition switch OFF: battery voltage
8	ORN	AFSHTCR (AIR FUEL RATIO (A/F) SENSOR HEATER CONTROL RELAY)	Drives A/F sensor heater relay	With ignition switch ON (II): 0 V
9	BLK/YEL	IG1 (IGNITION SIGNAL)	Detects ignition signal	With ignition switch ON (II): battery voltage With ignition switch OFF: about 0 V
12	GRN/WHT	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay	With radiator fan running: about 0 V With radiator fan stopped: battery voltage
13	YEL	SEFMJ	Communicates with multiplex control unit	With ignition switch ON (II): about 5 V With engine running under load: pulses
14	LT GRN	FTP (FUEL TANK PRESSURE (FTP) SENSOR)	Detects FTP sensor signal	With ignition switch ON (II) and fuel fill cap off: about 2.5 V
15	GRN/BLK	ELD (ELECTRICAL LOAD DETECTOR)	Detects ELD signal	With ignition switch ON (II): about 0.1—4.8 V (depending on electrical load)
16	LT GRN/BLK	PSPSW (POWER STEERING PRESSURE SWITCH SIGNAL)	Detects PSP switch signal	At idle with steering wheel straight ahead: 0 V At idle with steering wheel at full lock: battery voltage
17	GRN/YEL	IMOFPR (IMMOBILIZER FUEL PUMP RELAY)	Drives PGM-FI main relay 2 (FUEL PUMP)	0 V for 2 seconds after turning ignition switch ON (II), then battery voltage
18	RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay	With compressor ON: about 0 V With compressor OFF: battery voltage
19	LT GRN/RED	VSV (EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE)	Drives EVAP canister vent shut valve	With ignition switch ON (II): battery voltage
20	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR (SECONDAY HO2S), SENSOR 2)	Detects secondary HO2S (sensor 2) signal	With throttle fully closed at idle and fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
21	GRN/RED	SHO2SHTC (SECONDARY HEATED OXYGEN SENSOR (SECONDAY HO2S) HEATER CONTROL)	Drives secondary HO2S heater	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled

*1: A/T model

(cont'd)

System Description (cont'd)

ECM/PCM Inputs and Outputs at Connector E (31P)

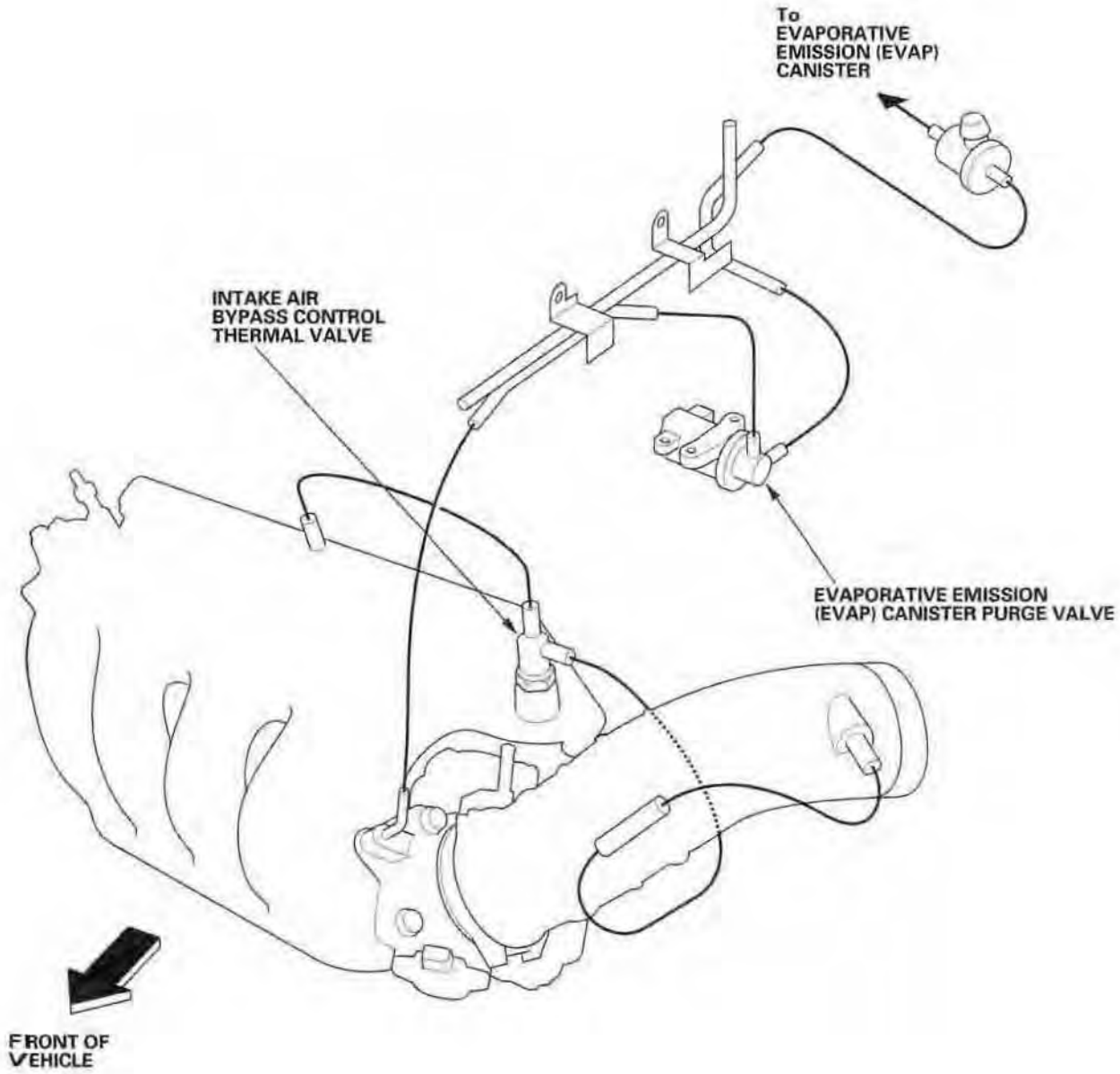


Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
22	WHT/BLK	BKSW (BRAKE PEDAL POSITION SWITCH)	Detects brake pedal position switch signal	With brake pedal released: about 0 V With brake pedal pressed: battery voltage
23	LT BLU	K-LINE	Sends and receives scan tool signals	With ignition switch ON (II): pulses or battery voltage
25	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse	With engine running: pulses
26	BLU/WHT	VSSOUT (VEHICLE SPEED SENSOR OUTPUT SIGNAL)	Sends vehicle speed sensor signal	Depending on vehicle speed: pulses With ignition switch ON (II): battery voltage
27	WHT	IMOCD (IMMOBILIZER CODE)	Detects immobilizer signal	
29	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check signal	With the service check signal shorted using HDS: about 0 V With the service check signal open: about 5 V
30	RED/WHT	WEN (WRITE ENABLE SIGNAL)	Detects write enable signal	With ignition switch ON (II): about 0 V
31	GRN/BLU	MIL (MALFUNCTION INDICATOR LAMP)	Drives MIL	With MIL ON: about 0 V With MIL OFF: battery voltage

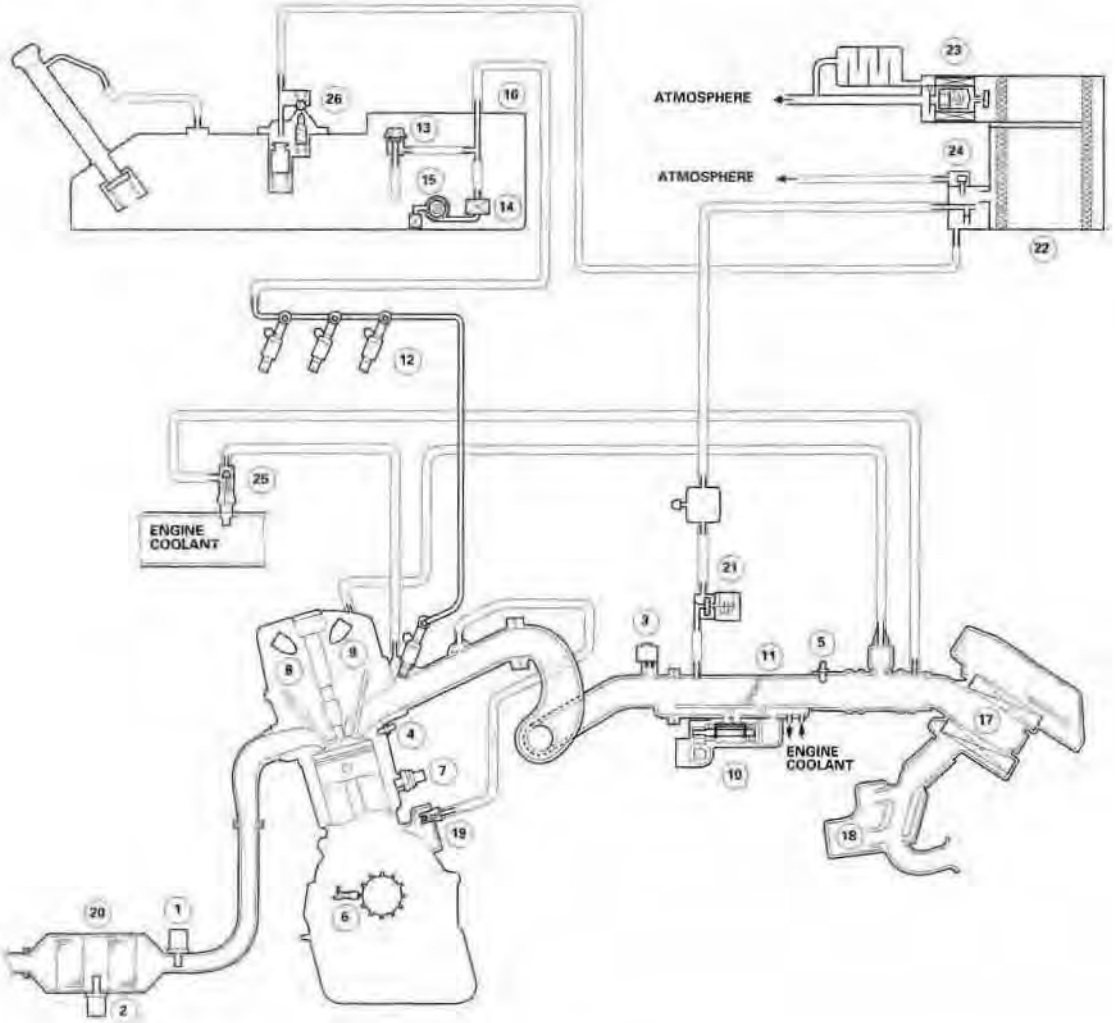
Vacuum Hose Routing



(cont'd)

System Description (cont'd)

Vacuum Distribution



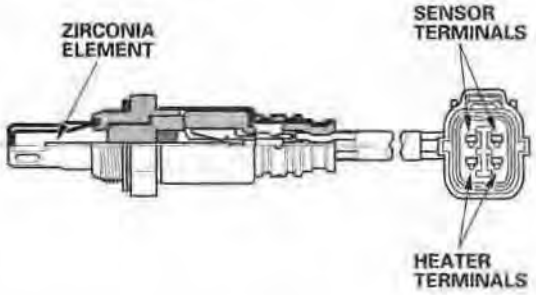
① AIR FUEL RATIO (A/F) SENSOR (SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑥ CRANKSHAFT POSITION (CKP) SENSOR
⑦ KNOCK SENSOR
⑧ CAMSHAFT POSITION (CMP) SENSOR B
⑨ CAMSHAFT POSITION (CMP) SENSOR A
⑩ IDLE AIR CONTROL (IAC) VALVE
⑪ THROTTLE BODY
⑫ INJECTOR
⑬ FUEL PRESSURE REGULATOR
⑭ FUEL FILTER
⑮ FUEL PUMP
⑯ FUEL TANK
⑰ AIR CLEANER
⑱ RESONATOR
⑲ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
⑳ THREE WAY CATALYTIC CONVERTER
㉑ EVAPORATIVE EMISSION (EVAP) CANISTER PURGE VALVE
㉒ EVAPORATIVE EMISSION (EVAP) CANISTER
㉓ EVAPORATIVE EMISSION (EVAP) CANISTER VENT SHUT VALVE
㉔ FUEL TANK PRESSURE (FTP) SENSOR
㉕ INTAKE AIR BYPASS CONTROL THERMAL VALVE
㉖ FUEL TANK VAPOR CONTROL VALVE

PGM-FI System

The programmed fuel injection (PGM-FI) system is a sequential multiport fuel injection system.

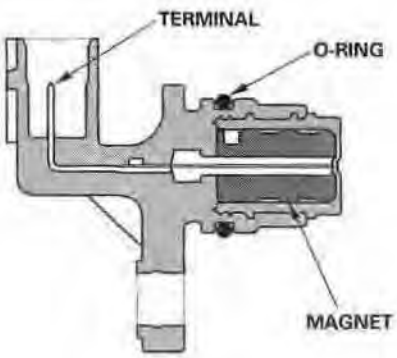
Air Conditioning (A/C) Compressor Clutch Relay
When the ECM/PCM receives a demand for cooling from the A/C system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.

Air Fuel Ratio (A/F) Sensor
The A/F sensor operates over a wide air/fuel range. The A/F sensor is installed upstream of the TWC. It sends signals to the ECM/PCM which varies the duration of fuel injection accordingly.

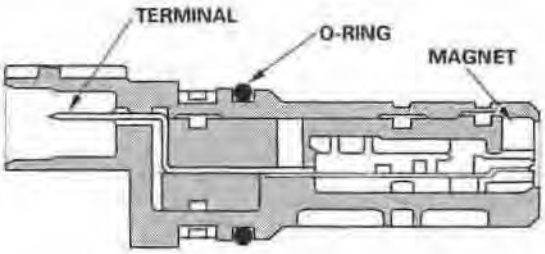


Barometric Pressure (BARO) Sensor
The BARO sensor is inside the ECM/PCM. It converts atmospheric pressure into a voltage signal that modifies the basic duration of the fuel injection discharge.

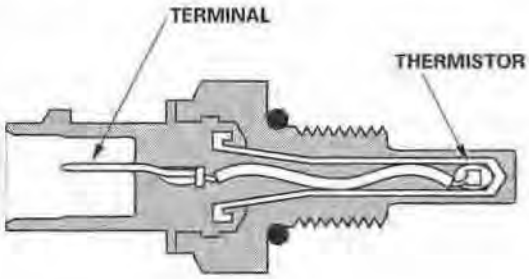
Camshaft Position (CMP) Sensor B
CMP sensor B detects the position of the No. 1 cylinder as a reference for sequential fuel injection to each cylinder.



Crankshaft Position (CKP) Sensor
The CKP sensor detects crankshaft speed and is used by the ECM/PCM to determine ignition timing and timing for fuel injection of each cylinder as well as detecting engine misfire.



Engine Coolant Temperature (ECT) Sensor
The ECT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases.



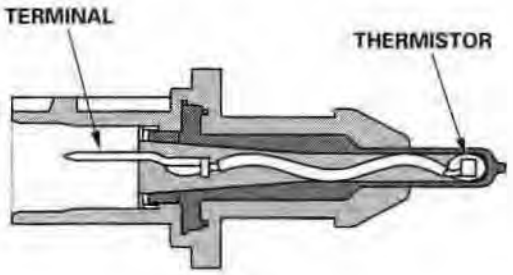
Ignition Timing Control
The ECM/PCM contains the memory for basic ignition timing at various engine speeds and manifold absolute pressures. It also adjusts the timing according to engine coolant temperature and intake air temperature.

(cont'd)

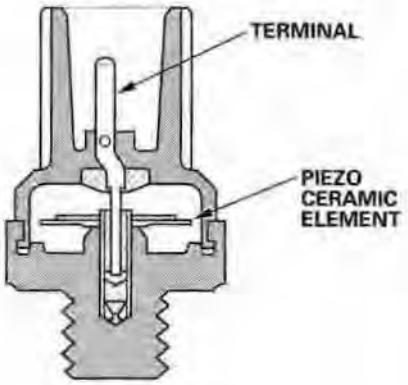
System Description (cont'd)

Injector Timing and Duration
The ECM/PCM contains the memory for basic discharge duration at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.
By monitoring long term fuel trim, the ECM/PCM detects long term malfunctions in the fuel system and sets a diagnostic trouble code (DTC).

Intake Air Temperature (IAT) Sensor
The IAT sensor is a temperature dependent resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases.



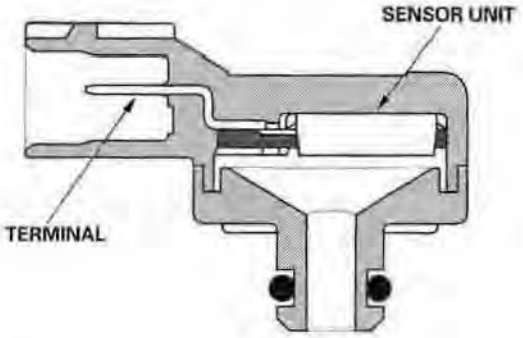
Knock Sensor
The knock control system adjusts the ignition timing to minimize knock.



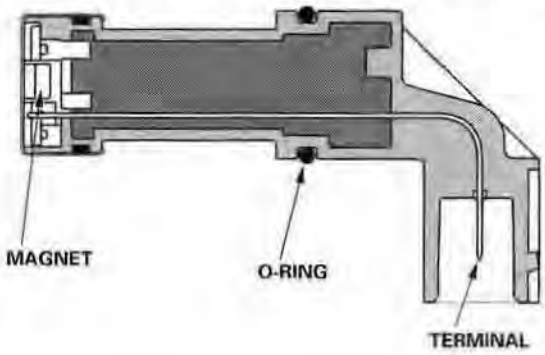
Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)
The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, if the DTCs have been cleared, or if the ECM/PCM has been reset, these codes are reset. In some states, part of the emissions testing is to make sure these codes are set to complete. If all of them are not set to complete, the vehicle may fail the test, or the test cannot be finished.

To check if the readiness codes are set to complete, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are complete. If it flashes five times, one or more readiness codes are not complete. To set each code, drive the vehicle or run the engine as described in the procedures (see page 11-51).

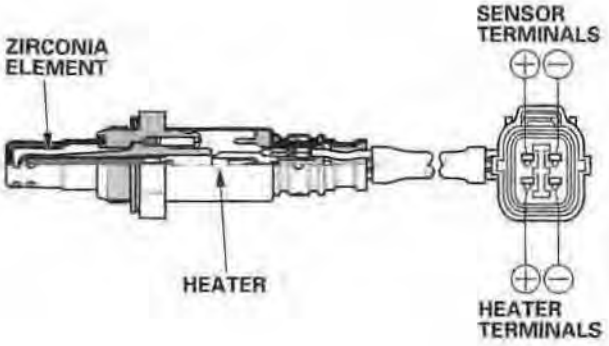
Manifold Absolute Pressure (MAP) Sensor
The MAP sensor converts manifold absolute pressure into electrical signals to the ECM/PCM.



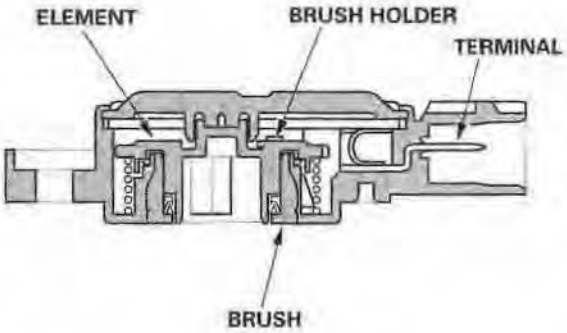
Output Shaft (Countershaft) Speed Sensor (M/T model)
This sensor detects output shaft (countershaft) speed.



Secondary Heated Oxygen Sensor (Secondary HO2S)
The secondary HO2S detects the oxygen content in the exhaust gas downstream of the three way catalytic converter (TWC), and sends signals to the ECM/PCM which varies the duration of fuel injection accordingly. To stabilize its output, the sensor has an internal heater. The ECM/PCM compares the HO2S output with the A/F sensor output to determine catalyst efficiency. The secondary HO2S is located on the TWC.



Throttle Position (TP) Sensor
The TP sensor is a potentiometer connected to the throttle valve shaft. As the throttle position changes, the sensor varies the signal voltage to the ECM/PCM. The TP sensor is not available separately from the throttle body.



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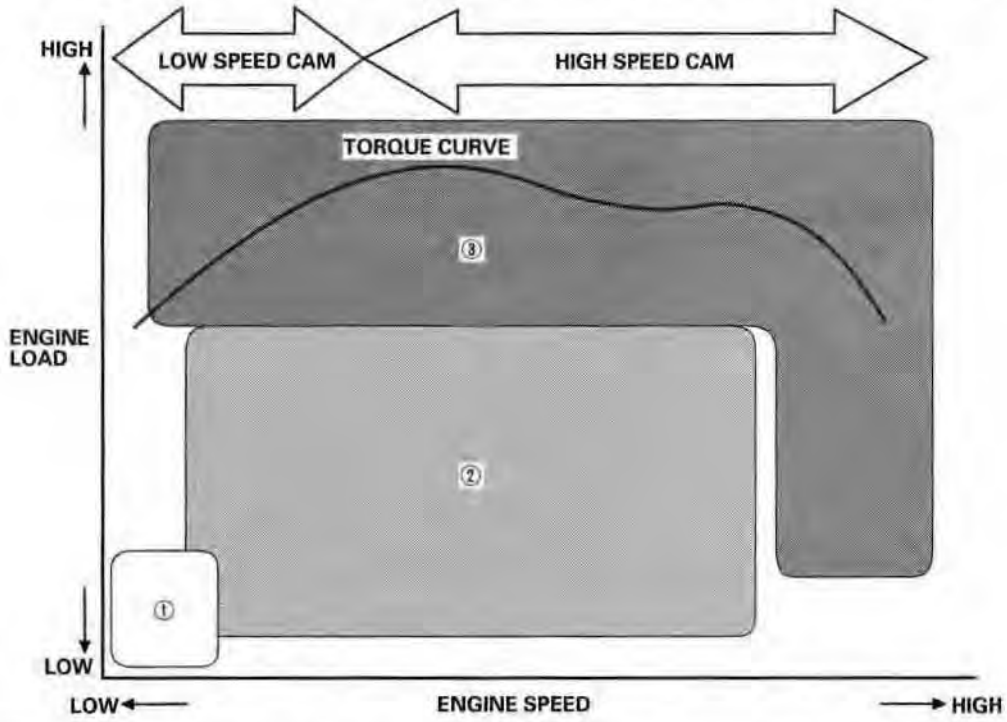
System Description (cont'd)

VTEC/VTC

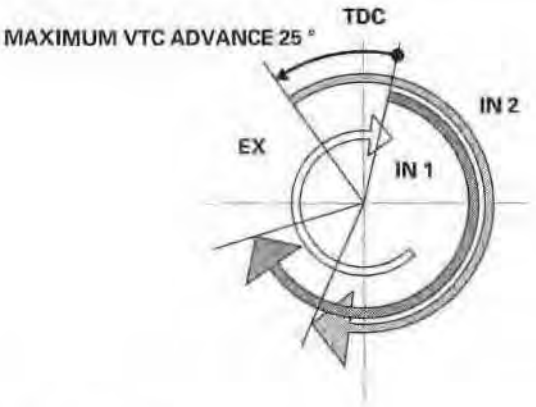
- The i-VTEC has a VTC (variable valve timing control) mechanism on the intake camshaft in addition to the usual VTEC.
  This mechanism improves fuel efficiency and reduces exhaust emissions at all levels of engine speed, vehicle speed, and engine load.
- The VTEC mechanism changes the valve lift and timing by using more than one cam profile.
- The VTC changes the phase of the intake camshaft via oil pressure. It changes the intake valve timing continuously.

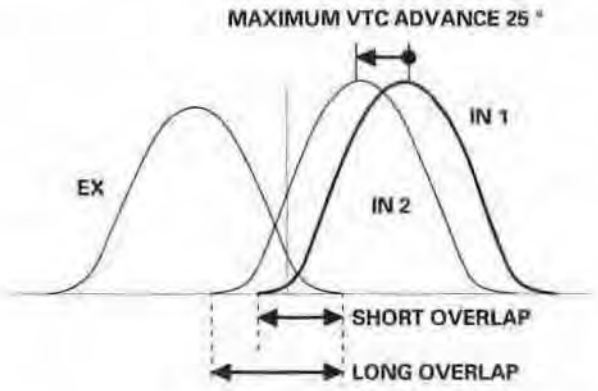


Driving Condition	VTC Control	Description
① Light-load	Base Position	Cam angle is retarded to reduce the entry of exhaust gas into the intake port.
② Medium/high-load	Advance Control	To reduce pumping loss, the intake valve is closed quickly to help reduce the entry of air/fuel mixture into the intake port and improve the charging effect.
③ High speed	Advance-Base Position	Cam phase angle is controlled for optimum valve timing and maximum engine power.

VTC System

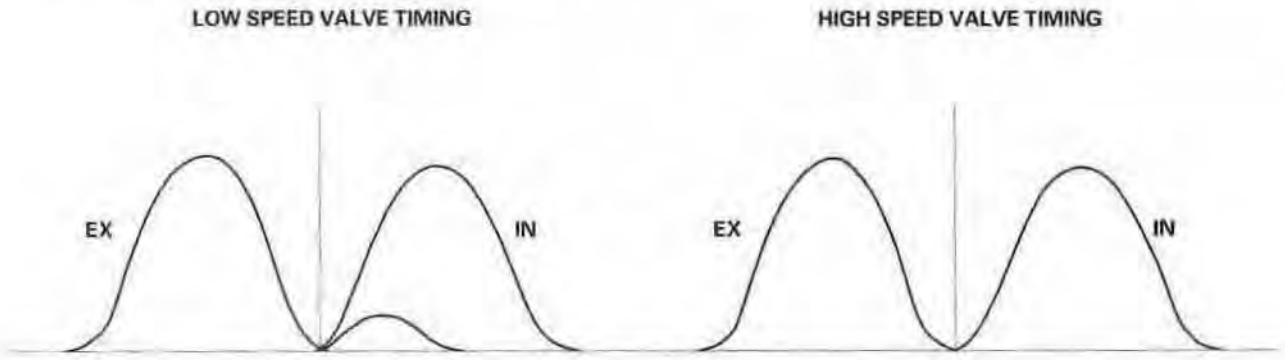
- The VTC system makes continuous intake valve timing changes based on operating conditions.
- Intake valve timing is optimized to allow the engine to produce maximum power.
- Cam angle is advanced to obtain the EGR effect and reduce pumping loss. The intake valve is closed quickly to reduce the entry of the air/fuel mixture into the intake port and improve the charging effect.
- The system reduces the cam advance at idle, stabilizes combustion, and reduces engine speed.
- If a malfunction occurs, the VTC system control is disabled, and the valve timing is fixed at the fully retarded position.





VTEC System

- The VTEC system changes the cam profile to correspond to the engine speed. It maximizes torque at low engine speed and output at high engine speed.
- The low lift cam is used at low engine speeds, and the high lift cam is used at high engine speeds.



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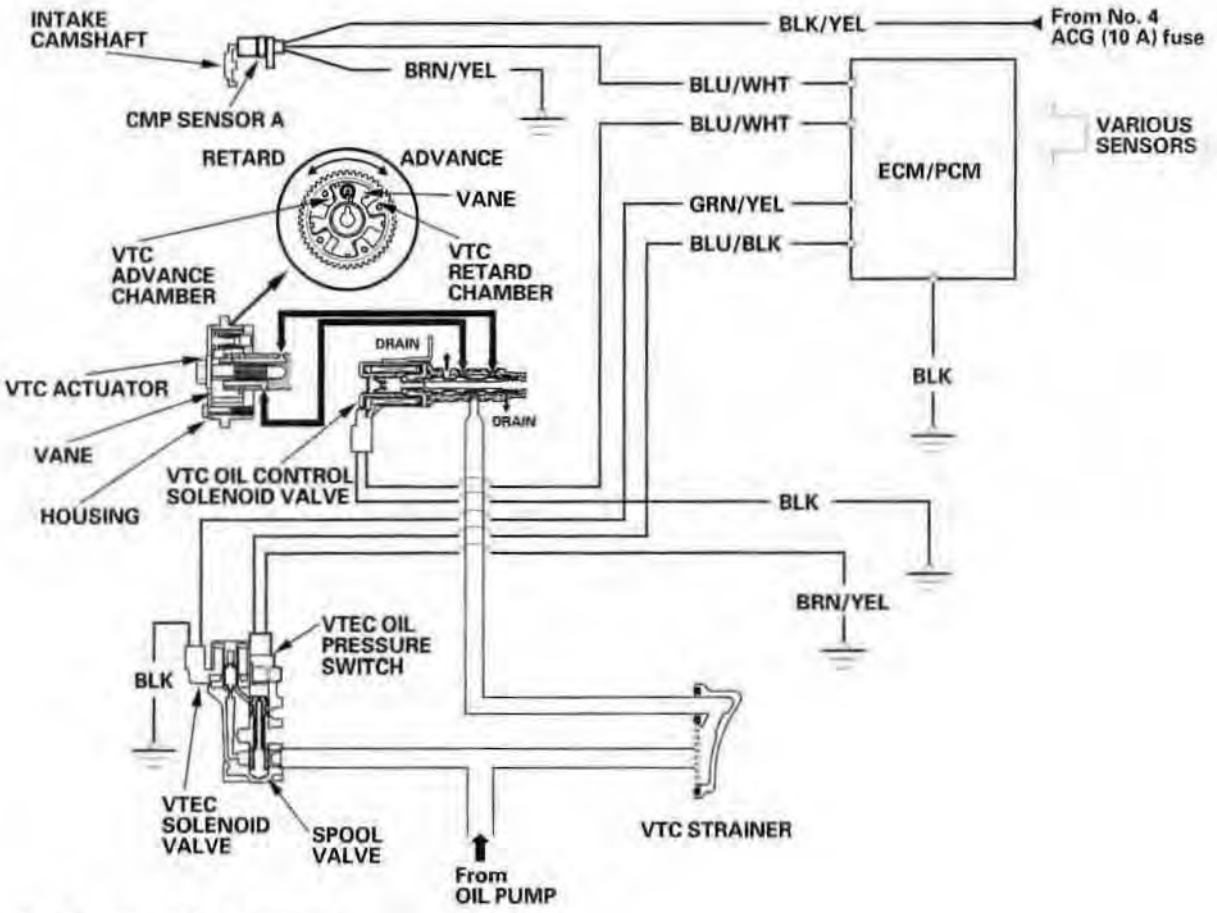
System Description (cont'd)

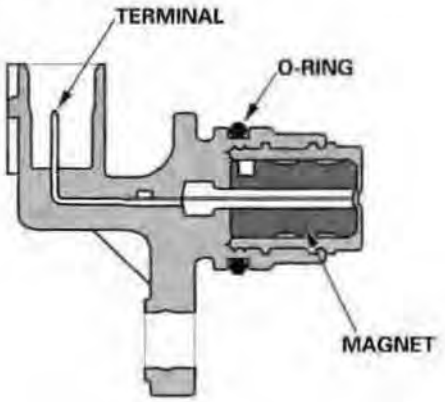
VTEC/VTC

System Diagram



Camshaft Position (CMP) Sensor A

This sensor detects camshaft angle position for the VTC system.

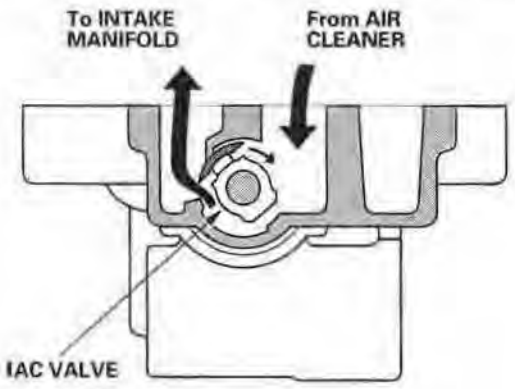


Idle Control System

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is pressed, the power steering load is high, or the alternator is charging, the ECM/PCM controls current to the idle air control (IAC) valve to maintain the correct idle speed. Refer to the System Diagram to see the functional layout of the system.

Brake Pedal Position Switch
The brake pedal position switch signals the ECM/PCM when the brake pedal is pressed.

Idle Air Control (IAC) Valve
To maintain proper idle speed, the IAC valve changes the amount of air bypassing the throttle body in response to an electrical signal from the ECM/PCM.



Power Steering Pressure (PSP) Switch
The PSP switch signals the ECM/PCM when the power steering load is high.

Fuel Supply System

Fuel Cut-off Control
During deceleration with the throttle valve closed, current to the injectors is cut off to improve fuel economy at engine speeds over 1,000 rpm. Fuel cut-off control also occurs when the engine speed exceeds 6,700 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving. When the vehicle is stopped, the ECM/PCM cuts the fuel at engine speeds over 5,000 rpm (M/T: 4,000 rpm). Fuel cutoff rpm is lower on a cold engine.

Fuel Pump Control
When the ignition is turned on, the ECM/PCM grounds PGM-FI main relay 2 (FUEL PUMP) which feeds current to the fuel pump for 2 seconds to pressurize the fuel system. With the engine running, the ECM/PCM grounds PGM-FI main relay 2 (FUEL PUMP) and feeds current to the fuel pump. When the engine is not running and the ignition is on, the ECM/PCM cuts ground to PGM-FI main relay 2 (FUEL PUMP) which cuts current to the fuel pump.

PGM-FI Main Relay 1 and 2
The PGM-FI main relay consists of two separate relays. PGM-FI main relay 1 (FI MAIN) is energized whenever the ignition switch is ON (II) to supply battery voltage to the ECM/PCM, power to the injectors, and power for PGM-FI main relay 2 (FUEL PUMP). PGM-FI main relay 2 (FUEL PUMP) is energized to supply power to the fuel pump for 2 seconds when the ignition switch is turned ON (II), and when the engine is cranking or running.

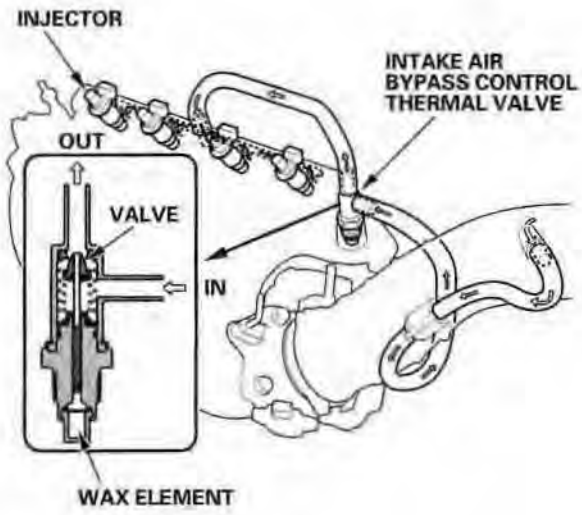
(cont'd)

System Description (cont'd)

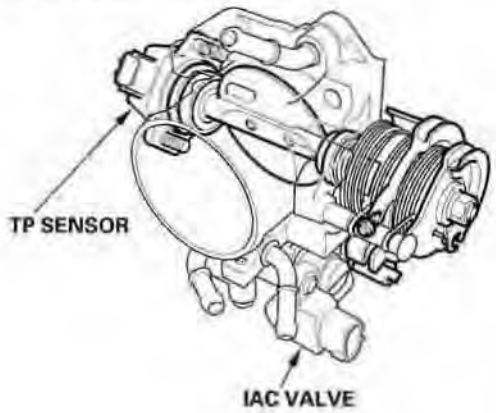
Intake Air System

Refer to the System Diagram to see the functional layout of the system.

Intake Air Bypass Control Thermal Valve
When the engine is cold, the intake air bypass control thermal valve sends air to the injector.
The amount of air is regulated by engine coolant temperature. Once the engine is hot, the intake air bypass control thermal valve closes, stopping air to the injector.

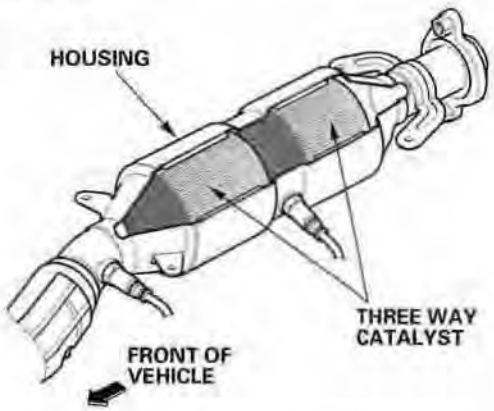


Throttle Body
The throttle body is a single-barrel side draft type. The lower portion of the idle air control (IAC) valve is heated by engine coolant from the cylinder head to prevent icing of the throttle plate.



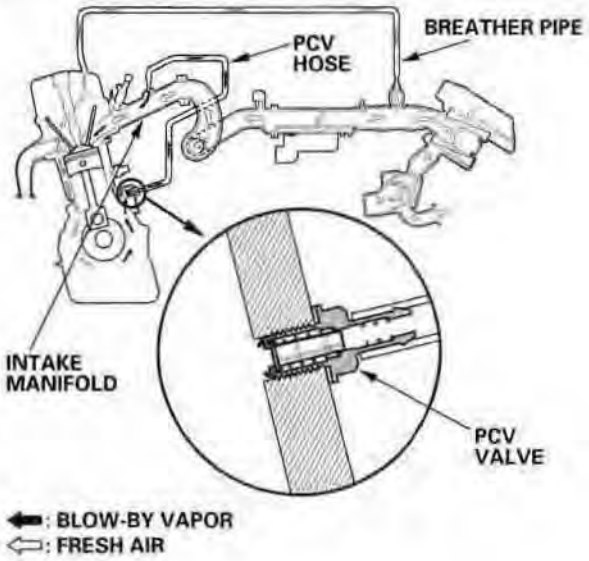
Catalytic Converter System

Three Way Catalytic Converter (TWC)
The TWC converts hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO_2), nitrogen (N_2), and water vapor.



Positive Crankcase Ventilation (PCV) System

The PCV valve prevents blow-by gasses from escaping into the atmosphere by venting them into the intake manifold.



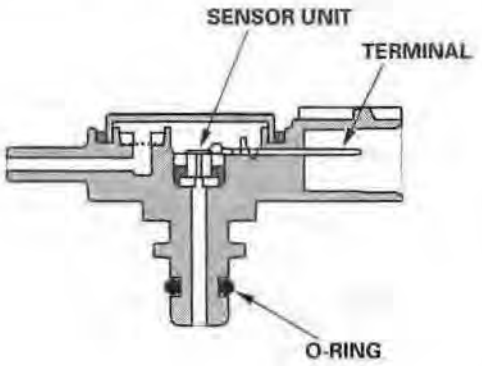
Evaporative Emission (EVAP) Control System

Refer to the System Diagram to see the functional layout of the system.

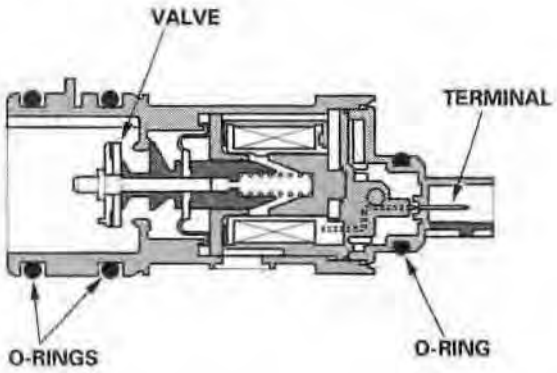
EVAP Canister
The EVAP canister temporarily stores fuel vapor from the fuel tank until it can be purged from the EVAP canister into the engine and burned.

EVAP Canister Purge Valve
When the engine coolant temperature is below 131 °F (55 °C), the ECM/PCM turns off the EVAP canister purge valve which cuts vacuum to the EVAP canister.

Fuel Tank Pressure (FTP) Sensor
The FTP sensor converts fuel tank absolute pressure into an electrical input to the ECM/PCM during the EVAP leak check.



EVAP Canister Vent Shut Valve
The EVAP canister vent shut valve is on the EVAP canister.
The EVAP canister vent shut valve controls the venting of the EVAP canister.



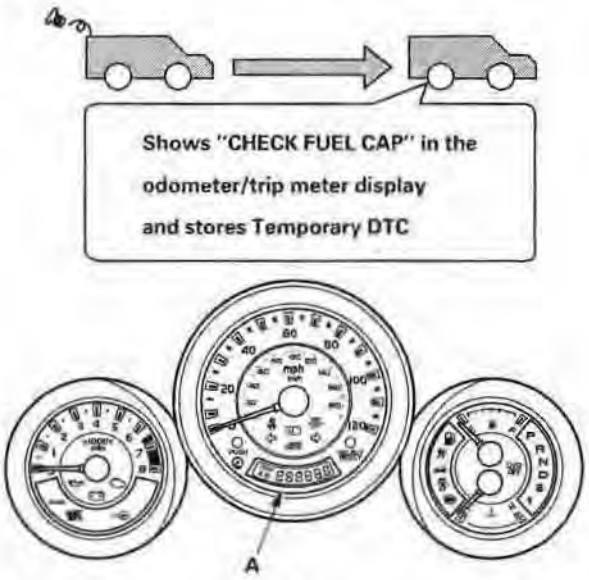
(cont'd)

System Description (cont'd)

Fuel Cap Warning Message

The ECM/PCM detects whether the fuel fill cap is loose or missing under certain conditions and alerts the driver by showing the information in the odometer/trip meter display. If the ECM/PCM detects a small volume leak, the MIL may come on during the second drive cycle and store a DTC.

First drive cycle
During the first drive cycle after a cold start, the ECM/PCM alerts the driver to check the fuel fill cap by showing a "CHECK FUEL CAP" message in the odometer/trip meter display (A), and it stores Temporary DTC P0457 "Evaporative Emission (EVAP) System Leak Detected/Fuel Cap Loose or Missing". Tightening the fuel cap does not make the message go off immediately.

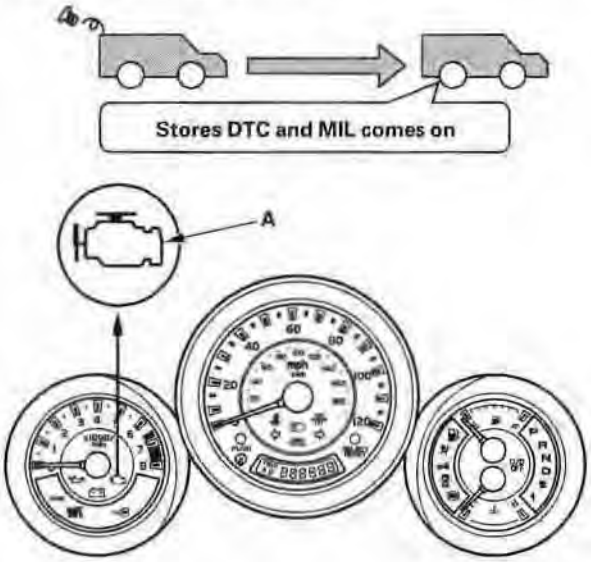


To make the message go off
Tighten the fuel fill cap three clicks, and do this procedure several times.

1. Turn the ignition switch OFF.
2. Start the engine, and drive at a steady speed over 28 mph (45 km/h), without moving the accelerator pedal, for about 1 minute.

Second drive cycle
During the second drive cycle after a cold start, if the fuel fill cap is still loose or missing, the ECM/PCM alerts the driver to check the fuel fill cap by showing a "CHECK FUEL CAP" message in the odometer/trip meter display as same as the first drive cycle. Tightening the fuel cap does not make the message go off immediately.

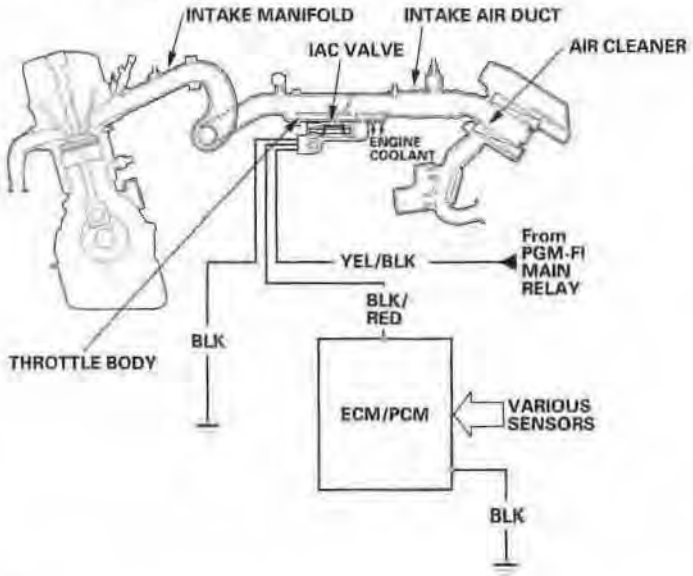
Third drive cycle
During the third drive cycle after a cold start, if the fuel fill cap is still loose or missing, the ECM/PCM stores DTC P0457 "Evaporative Emission (EVAP) System Leak Detected/Fuel Cap Loose or Missing". The malfunction indicator lamp (MIL) (A) comes on, and the "CHECK FUEL CAP" message goes off.



Idle Control System Diagram

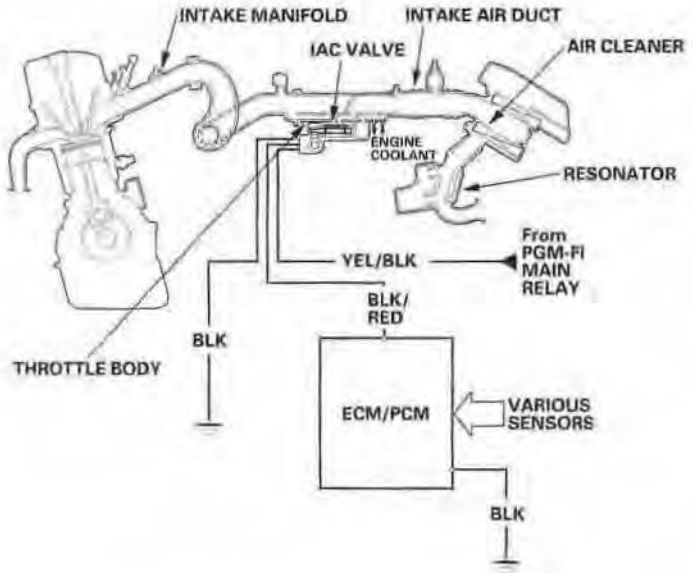
The idle speed of the engine is controlled by the idle air control (IAC) valve:

- After the engine starts, the IAC valve opens for a certain amount of time. The amount of air is increased to raise the idle speed.
- When the engine coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is controlled in relation to engine coolant temperature.



Intake Air System Diagram

This system supplies air for engine needs. A resonator in the intake air duct provides additional silencing as air is drawn into the system.



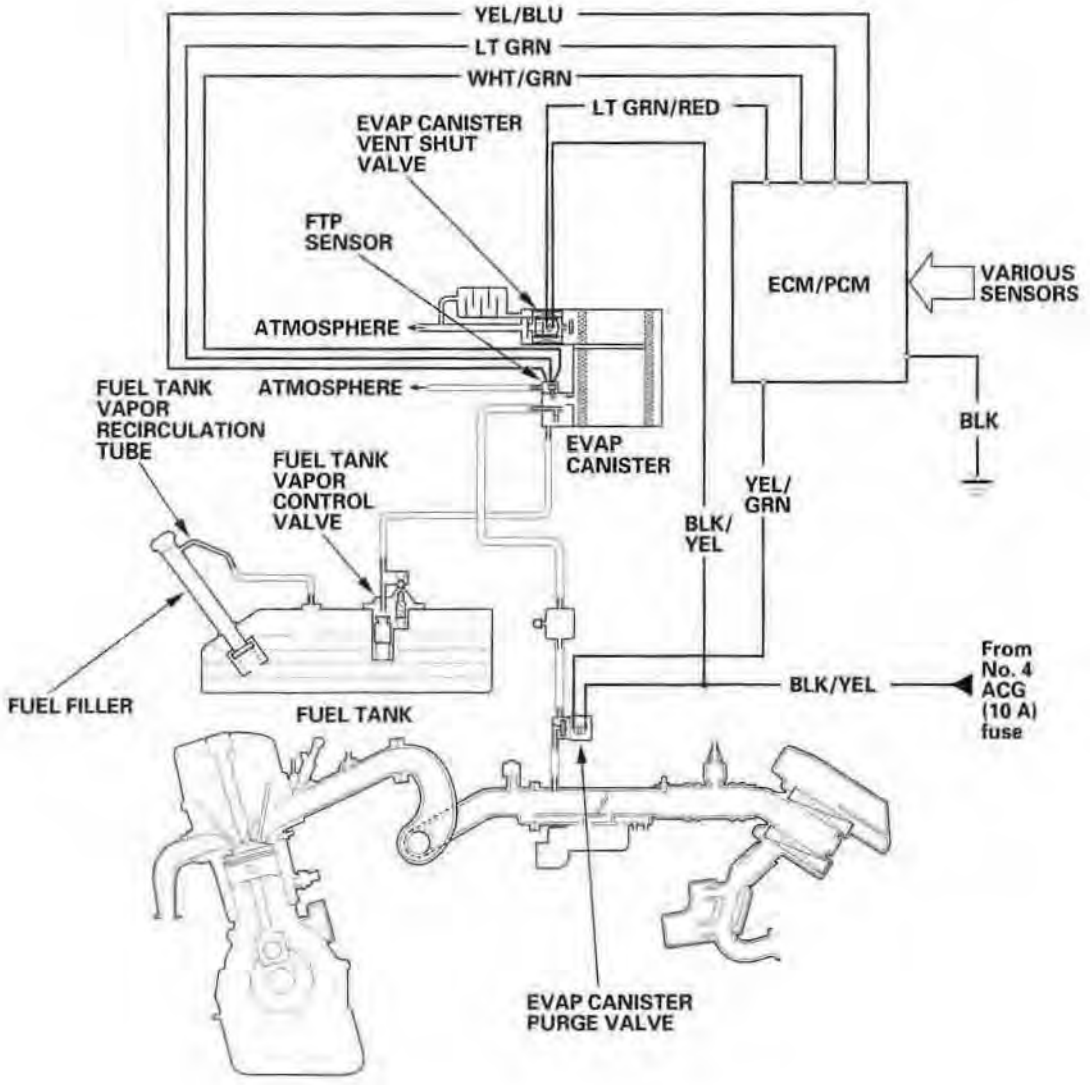
(cont'd)

System Description (cont'd)

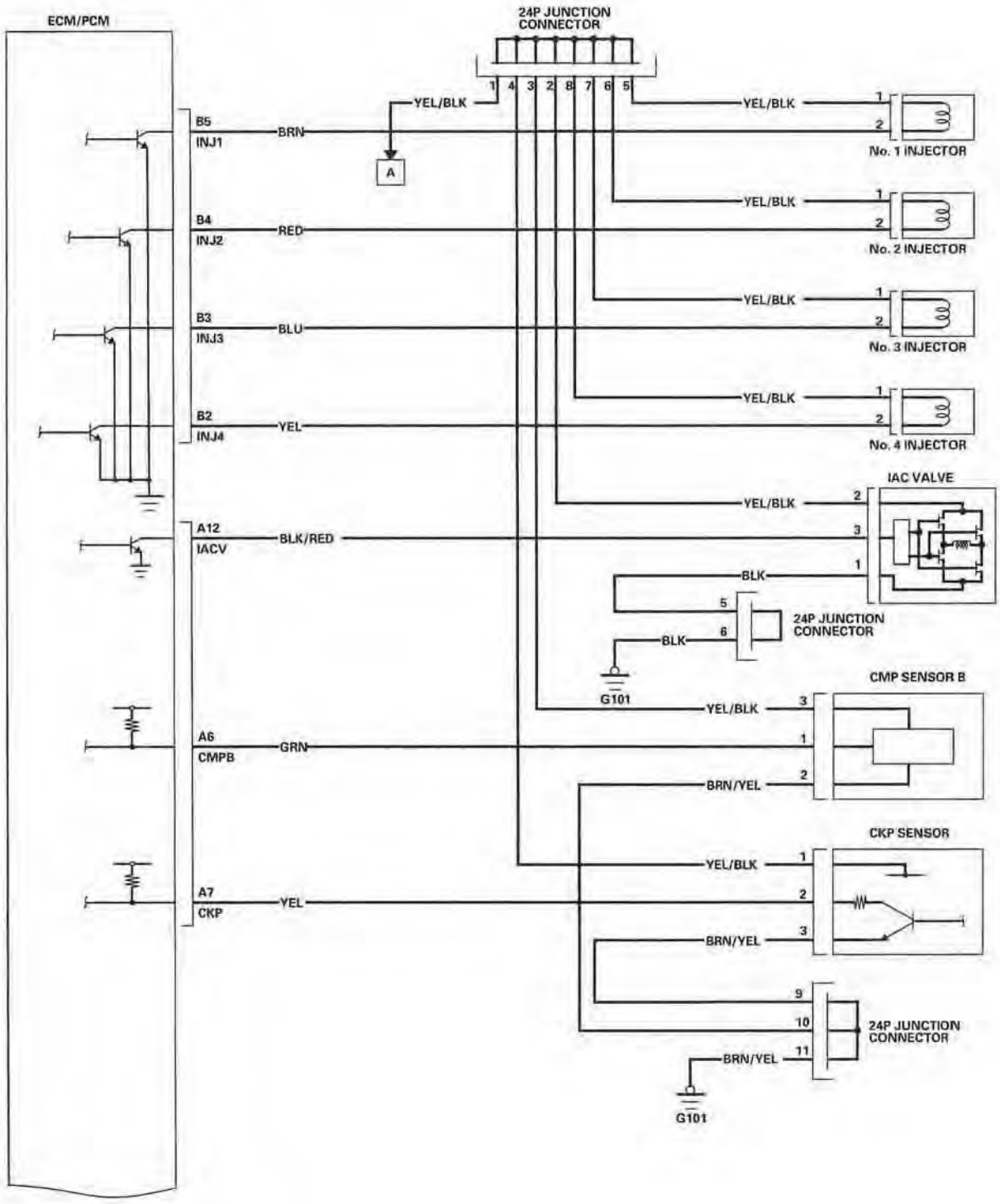
Evaporative Emission (EVAP) Control Diagram

The EVAP controls minimize the amount of fuel vapor escaping to the atmosphere. Vapor from the fuel tank is temporarily stored in the EVAP canister until it can be purged from the canister into the engine and burned.

The EVAP canister is purged by drawing fresh air through it and into a port on the intake manifold. The purging vacuum is controlled by the EVAP canister purge valve, which operates whenever engine coolant temperature is above 131 °F (55 °C).



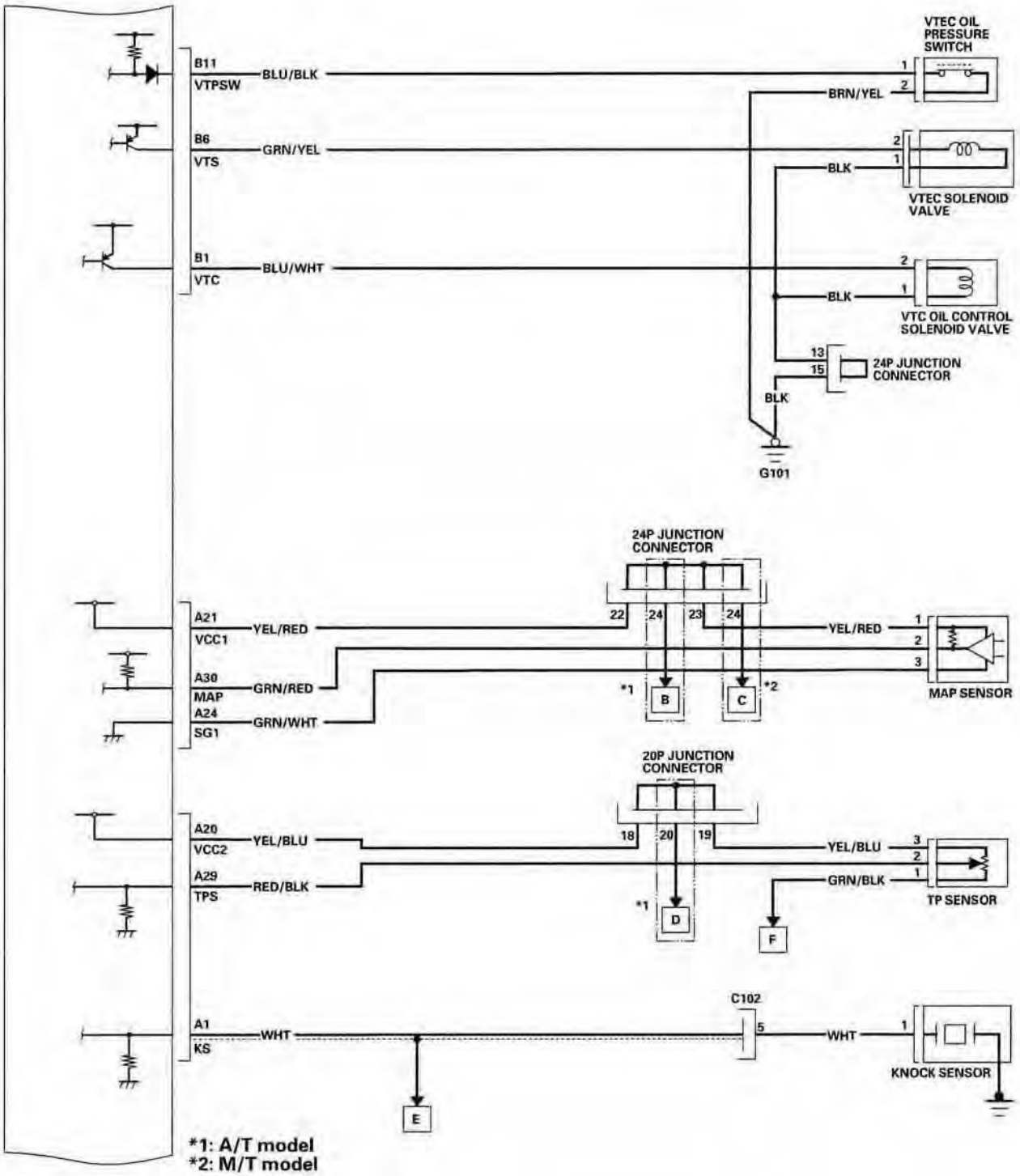
ECM/PCM Circuit Diagram

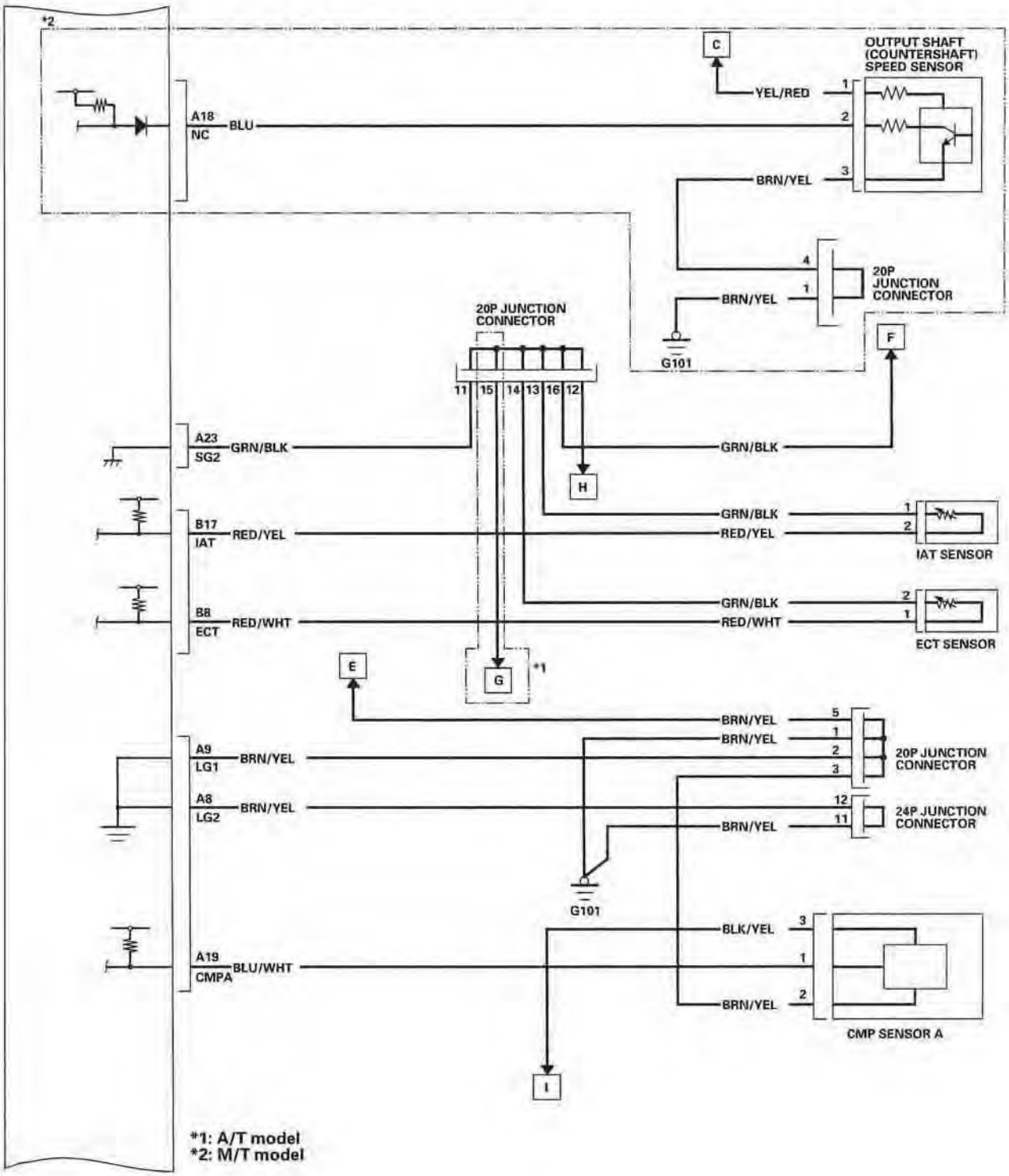


(cont'd)

System Description (cont'd)

ECM/PCM Circuit Diagram (cont'd)

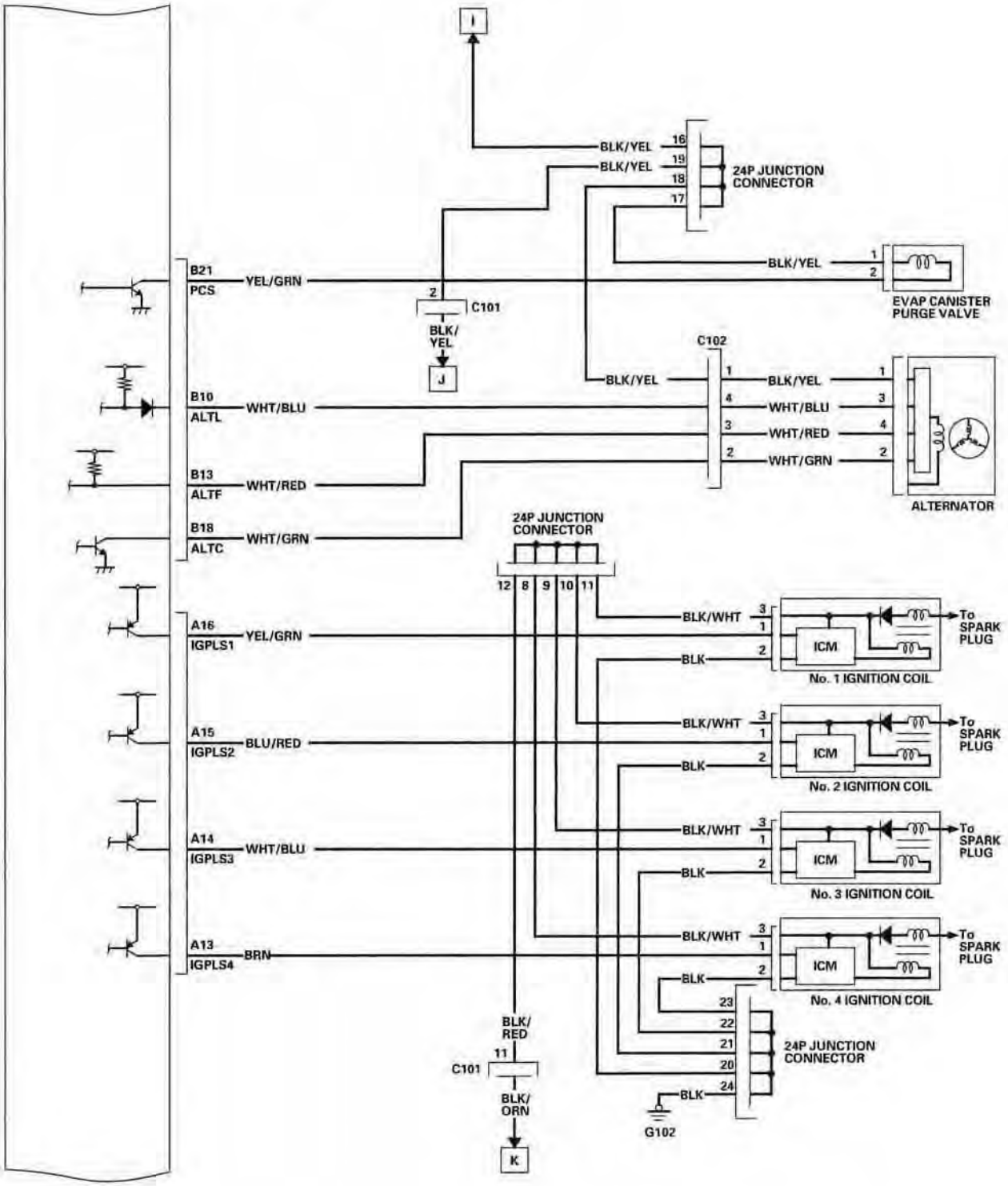


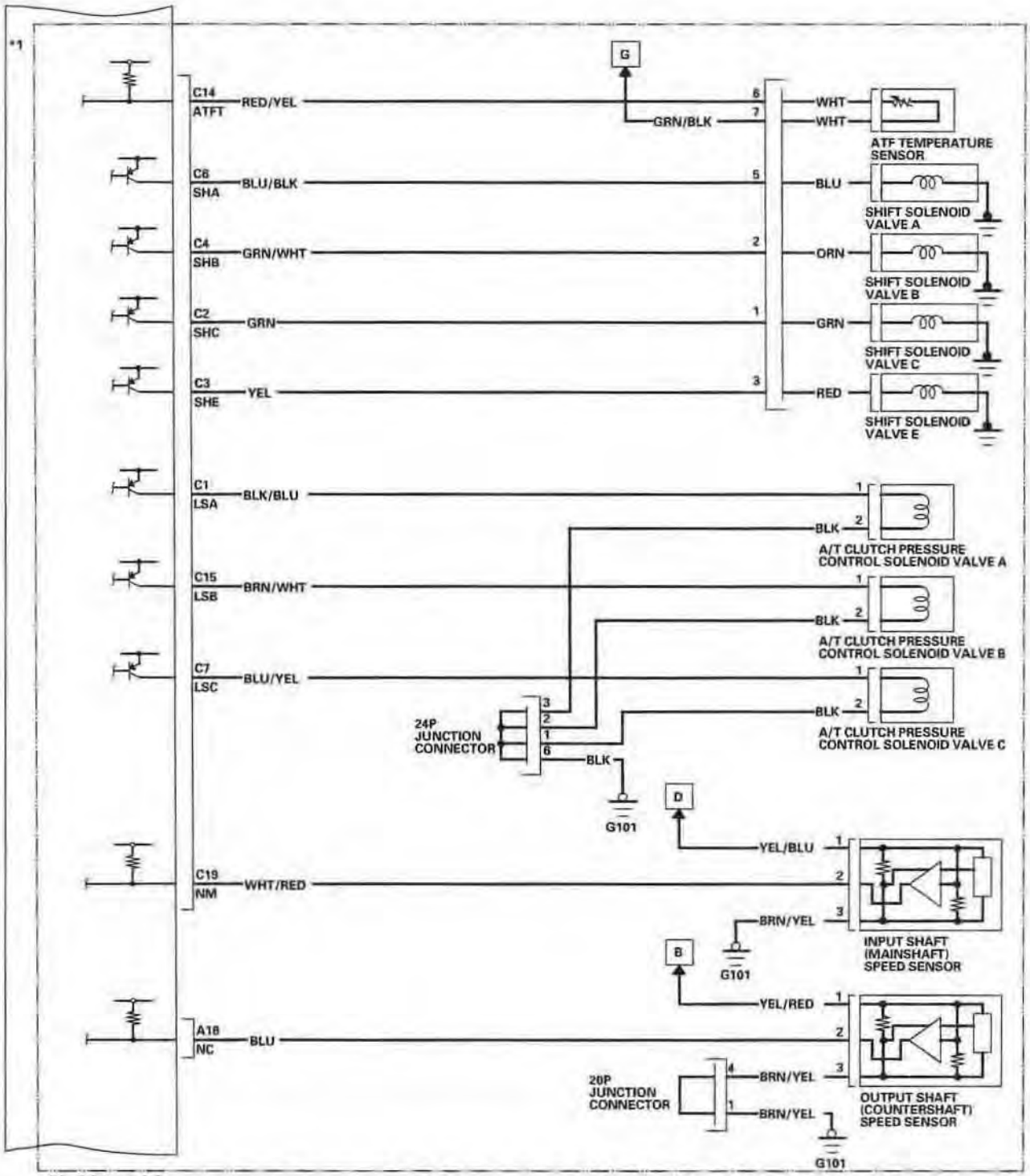

*2
C
OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR
YEL/RED
1
A18
NC
BLU
2
BRN/YEL
3
4
20P JUNCTION CONNECTOR
1
BRN/YEL
G101
20P JUNCTION CONNECTOR
F
11 15 14 13 16 12
A23
SG2
GRN/BLK
GRN/BLK
H
GRN/BLK
1
B17
IAT
RED/YEL
RED/YEL
2
IAT SENSOR
GRN/BLK
2
B8
ECT
RED/WHT
RED/WHT
1
ECT SENSOR
E
G
*1
BRN/YEL
5
BRN/YEL
1
A9
LG1
BRN/YEL
2
20P JUNCTION CONNECTOR
3
A8
LG2
BRN/YEL
12
24P JUNCTION CONNECTOR
11
BRN/YEL
G101
BLK/YEL
3
A19
CMPA
BLU/WHT
1
BRN/YEL
2
CMP SENSOR A
I
*1: A/T model
*2: M/T model

(cont'd)

System Description (cont'd)

ECM/PCM Circuit Diagram (cont'd)



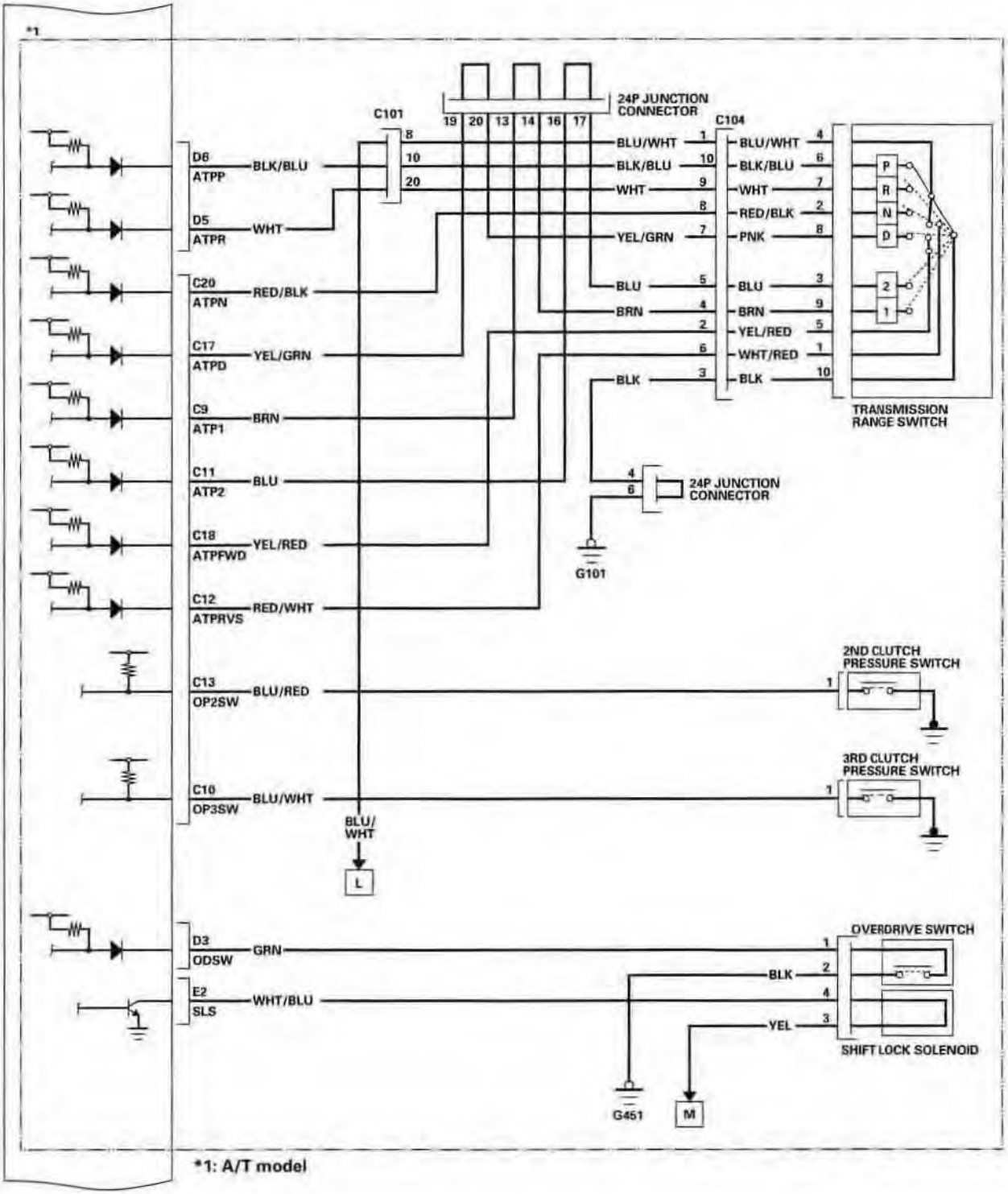


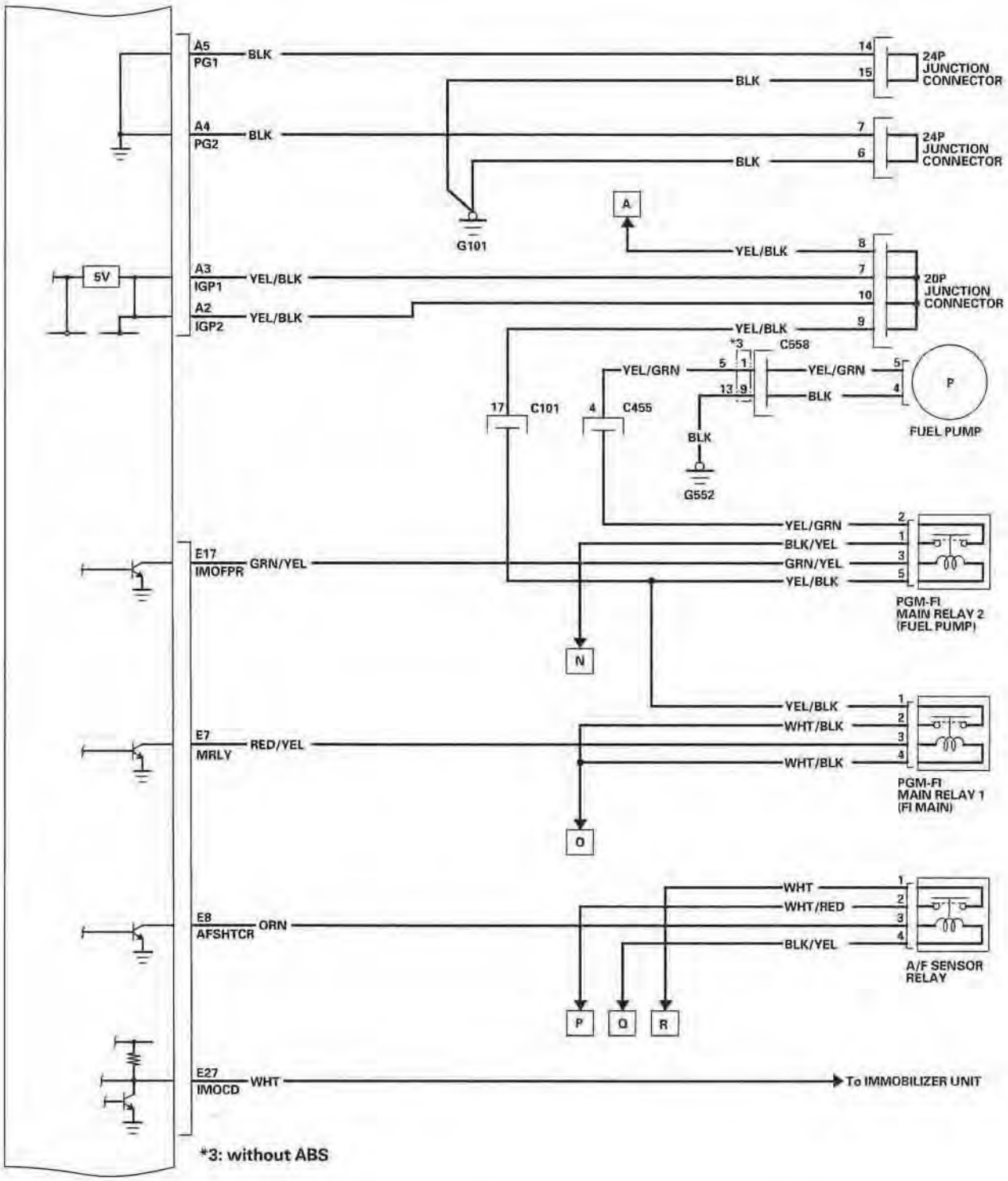
*1: A/T model

(cont'd)

System Description (cont'd)

ECM/PCM Circuit Diagram (cont'd)

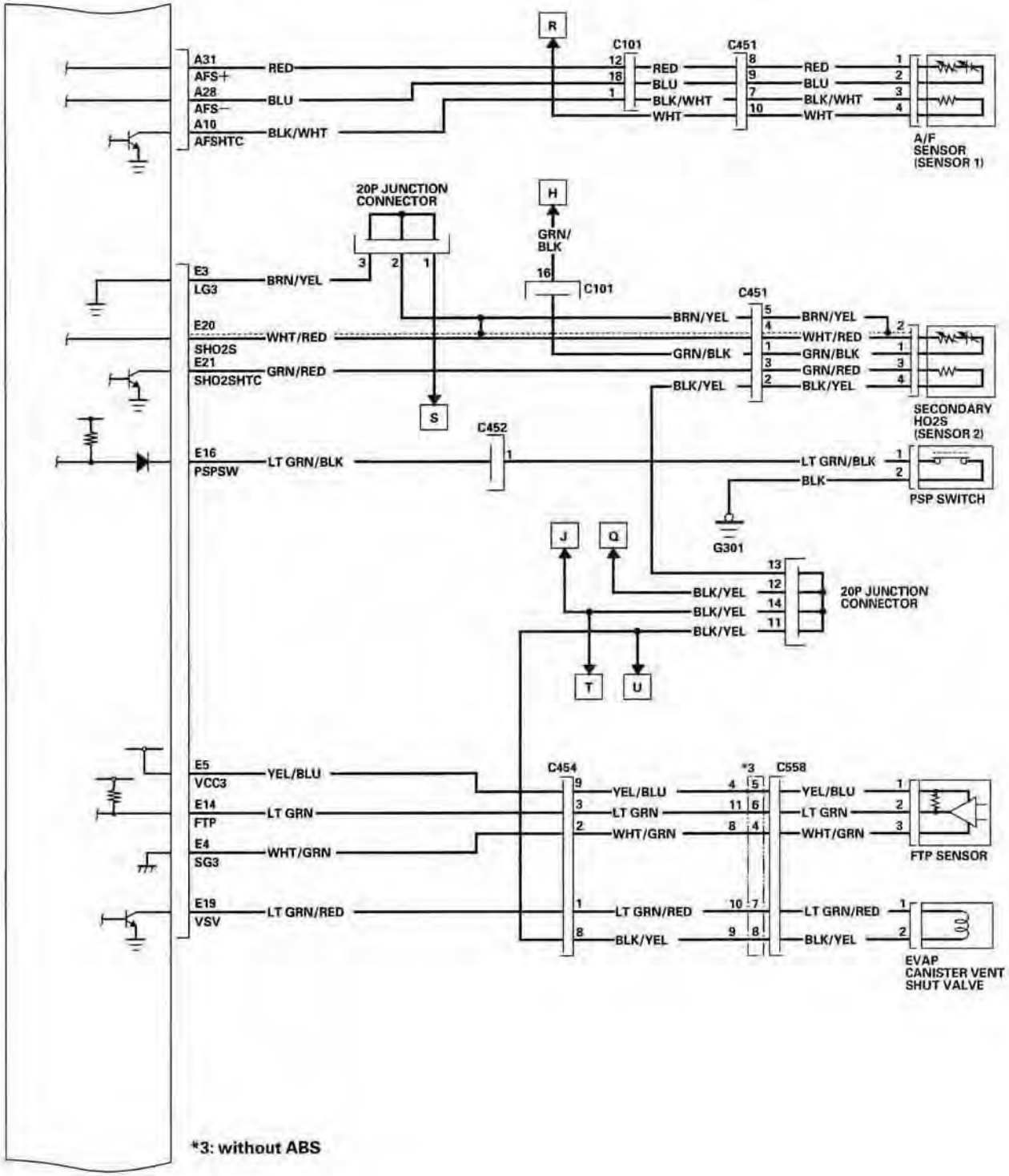



A5
PG1
BLK
A4
PG2
BLK
G101
14
15
24P JUNCTION CONNECTOR
BLK
7
6
24P JUNCTION CONNECTOR
BLK
A
YEL/BLK
8
5V
A3
IGP1
YEL/BLK
A2
IGP2
YEL/BLK
7
10
9
20P JUNCTION CONNECTOR
YEL/BLK
*3
C558
YEL/GRN
5
1
13
9
YEL/GRN
5
BLK
4
P
FUEL PUMP
17
C101
4
C455
BLK
G552
YEL/GRN
2
BLK/YEL
1
GRN/YEL
3
YEL/BLK
5
PGM-FI MAIN RELAY 2 (FUEL PUMP)
N
E17
IMOFPR
GRN/YEL
YEL/BLK
1
WHT/BLK
2
3
WHT/BLK
4
PGM-FI MAIN RELAY 1 (FI MAIN)
O
E7
MRLY
RED/YEL
WHT
1
WHT/RED
2
3
BLK/YEL
4
A/F SENSOR RELAY
E8
AFSHTCR
ORN
P
Q
R
E27
IMOCD
WHT
To IMMOBILIZER UNIT
*3: without ABS

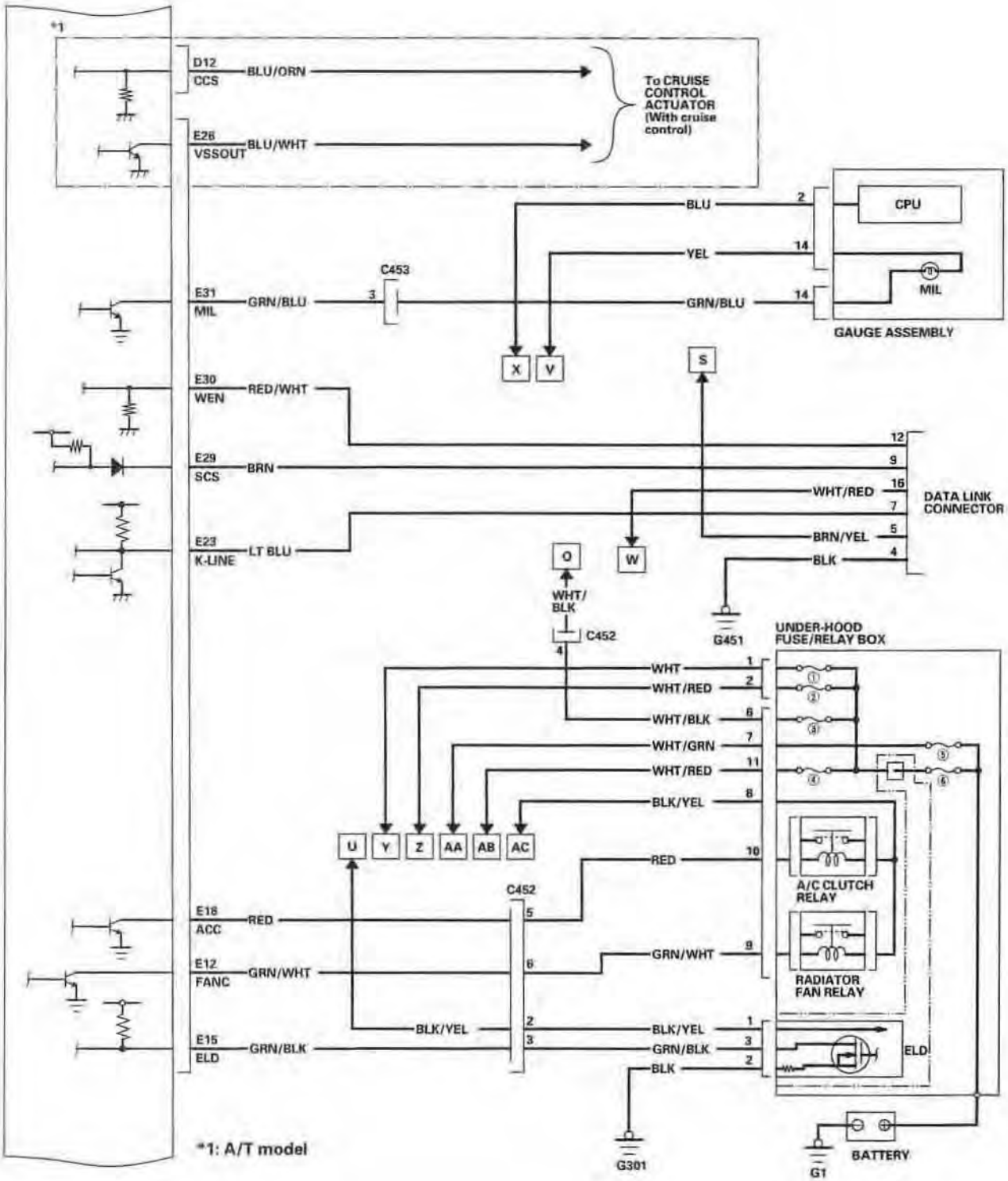
(cont'd)

System Description (cont'd)

ECM/PCM Circuit Diagram (cont'd)



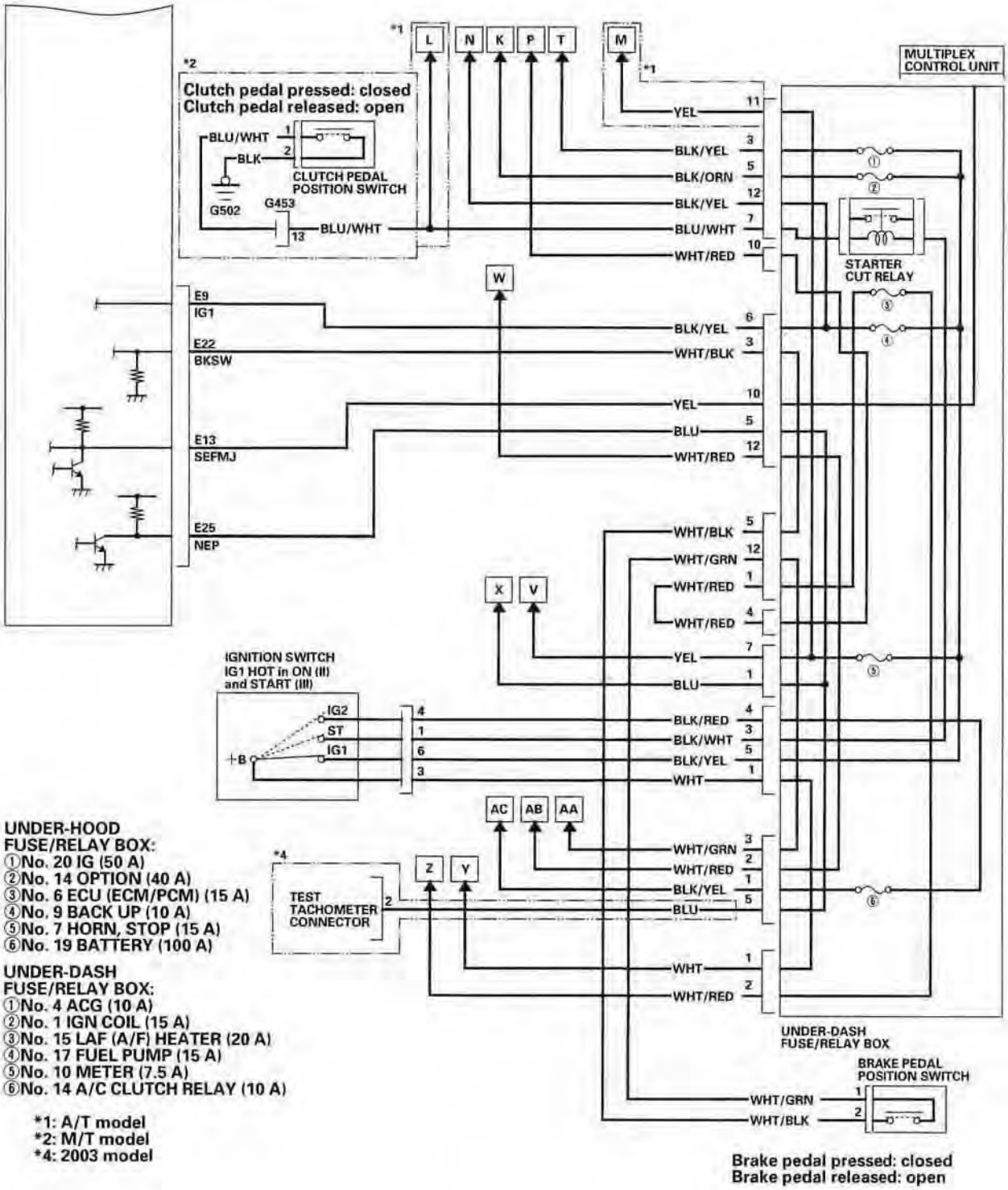
*3: without ABS


*1
D12
CCS
BLU/ORN
To CRUISE CONTROL ACTUATOR (With cruise control)
E26
VSSOUT
BLU/WHT
BLU
2
CPU
YEL
14
MIL
C453
E31
MIL
GRN/BLU
3
GRN/BLU
14
GAUGE ASSEMBLY
X
V
S
E30
WEN
RED/WHT
12
E29
SCS
BRN
9
WHT/RED
16
7
DATA LINK CONNECTOR
BRN/YEL
5
E23
K-LINE
LT BLU
BLK
4
O
W
WHT/BLK
C452
4
G451
UNDER-HOOD FUSE/RELAY BOX
WHT
1
WHT/RED
2
WHT/BLK
6
WHT/GRN
7
WHT/RED
11
BLK/YEL
8
U
Y
Z
AA
AB
AC
RED
10
A/C CLUTCH RELAY
C452
E16
ACC
RED
5
GRN/WHT
9
E12
FANC
GRN/WHT
6
RADIATOR FAN RELAY
BLK/YEL
2
BLK/YEL
1
E15
ELD
GRN/BLK
3
GRN/BLK
3
ELD
BLK
2
G301
G1
BATTERY
*1: A/T model

(cont'd)

System Description (cont'd)

ECM/PCM Circuit Diagram (cont'd)



UNDER-HOOD FUSE/RELAY BOX:
①No. 20 IG (50 A)
②No. 14 OPTION (40 A)
③No. 6 ECU (ECM/PCM) (15 A)
④No. 9 BACK UP (10 A)
⑤No. 7 HORN, STOP (15 A)
⑥No. 19 BATTERY (100 A)

UNDER-DASH FUSE/RELAY BOX:
①No. 4 ACG (10 A)
②No. 1 IGN COIL (15 A)
③No. 15 LAF (A/F) HEATER (20 A)
④No. 17 FUEL PUMP (15 A)
⑤No. 10 METER (7.5 A)
⑥No. 14 A/C CLUTCH RELAY (10 A)

*1: A/T model
*2: M/T model
*4: 2003 model

How to Set Readiness Codes

Malfunction Indicator Lamp (MIL) Indication (In relation to Readiness Codes)

The vehicle has certain "readiness codes" that are part of the on-board diagnostics for the emissions systems. If the vehicle's battery has been disconnected or gone dead, if the DTCs have been cleared, or if the ECM/PCM has been reset, these readiness codes are reset. In some states, part of the emissions testing is to make sure these codes are set to complete. If all of them are not set to complete, the vehicle may fail the emission test, or the test cannot be finished.

To check if the readiness codes are set to complete, turn the ignition switch ON (II), but do not start the engine. The MIL will come on for 15—20 seconds. If it then goes off, the readiness codes are complete. If it flashes five times, one or more readiness codes are not set to complete. To set readiness codes from incomplete to complete, do the procedure for the appropriate code.

To check the status of a specific DTC system, check the OBD status in the DTC MENU with the HDS (see page 11-7). This screen displays the code, the current data list of the enable criteria, and the status of the readiness testing.

Catalytic Converter Monitor and Readiness Code

NOTE:
- Do not turn the ignition switch off during the procedure.
- All readiness codes are cleared when the battery is disconnected or when the ECM/PCM is cleared with the HDS.
- Low ambient temperatures or excessive stop-and-go traffic may increase the drive time needed to switch the readiness code from incomplete to complete.
- The readiness code will not switch to complete until all the enable criteria are met.
- If a fault in the secondary HO2S system caused the MIL to come on, the readiness code cannot be set to complete until you correct the fault.

Enable Criteria

- ECT at 158 °F (70 °C) or higher.
- Intake air temperature (IAT) at 20 °F (—7 °C) or higher.
- Vehicle speed sensor (VSS) reads more than 25 mph (40km/h).

Procedure

1. Connect the HDS to the vehicle's data link connector (DLC), and bring up the READINESS CODEs screen for Catalyst.
2. Start the engine.
3. Test-drive the vehicle under stop-and-go conditions with short periods of steady cruise. After about 5 miles (8 km), the readiness code should switch to complete.
4. If the readiness code is still not set to complete, check for a Temporary DTC with the HDS. If there is no DTC, one or more of the enable criteria were probably not met; repeat the procedure.

(cont'd)

How to Set Readiness Codes (cont'd)

Evaporative Emission (EVAP) Control System Monitor and Readiness Code

NOTE: All readiness codes are cleared when the battery is disconnected or when the ECM/PCM is cleared with the HDS.

Enable Criteria

- Battery voltage is higher than 10.5 V.
- Engine at idle.
- ECT sensor between 176 °F (80 °C) and 212 °F (100 °C).
- MAP sensor less than 46.6 kPa (14 in.Hg, 350 mmHg).
- Vehicle speed 0 mph (0 km/h).
- IAT sensor between 32 °F (0 °C) and 212 °F (100 °C).

Procedure

1. Connect the HDS to the vehicle's data link connector (DLC).
2. Start the engine.
3. Select EVAP TEST in the INSPECTION MENU with the HDS, then select the FUNCTION TEST in the EVAP TEST MENU.
   - If they are normal, readiness is complete.
   - If they are not normal, go to the next step.
4. If the readiness code is still not set to complete, check for a Temporary DTC. If there is no DTC, one or more of the enable criteria were probably not met; repeat the procedure.

Air Fuel Ratio (A/F) Sensor Monitor and Readiness Code

NOTE:
- Do not turn the ignition switch off during the procedure.
- All readiness codes are cleared when the battery is disconnected or when the ECM/PCM is cleared with the HDS.

Enable Criteria

ECT at 140 °F (60 °C) or higher.

Procedure

1. Start the engine.
2. Test-drive the vehicle under stop-and-go conditions with short periods of steady cruise. During the drive, decelerate (with the throttle fully closed) for 5 seconds. After about 3.5 miles (5.6 km), the readiness code should switch from incomplete to complete.
3. Check the readiness codes screen for AIR FUEL RATIO (A/F) SENSOR in the DTCs MENU with the HDS.
   - If the screen shows complete, readiness is complete.
   - If the screen shows not complete, go to the next step.
4. If the readiness code is still not set to complete, check for a Temporary DTC. If there is no DTC, the enable criteria was probably not met. Select the DATA LIST Menu. Check the ECT in the ALL DATA LIST with the HDS. If the ECT is lower than 140 °F (60 °C), run the engine until it is higher than 140 °F (60 °C), then repeat the procedure.

Air Fuel Ratio (A/F) Sensor Heater Monitor Readiness Code

NOTE: All readiness codes are cleared when the battery is disconnected or when the ECM/PCM is cleared with the HDS.

Procedure

1. Start the engine, and let it idle for 1 minute. The readiness code should switch from incomplete to complete.

2. If the readiness code is still not set to complete, check for a Temporary DTC. If there is no DTC, repeat the procedure.

Misfire Monitor and Readiness Code

- This readiness code is always set to available because misfiring is continuously monitored.
- Monitoring pauses, and the misfire counter resets, if the vehicle is driven over a rough road.
- Monitoring also pauses, and the misfire counter holds at its current value, if the throttle position changes more than a predetermined value, or if driving conditions fall outside the range of any related enable criteria.

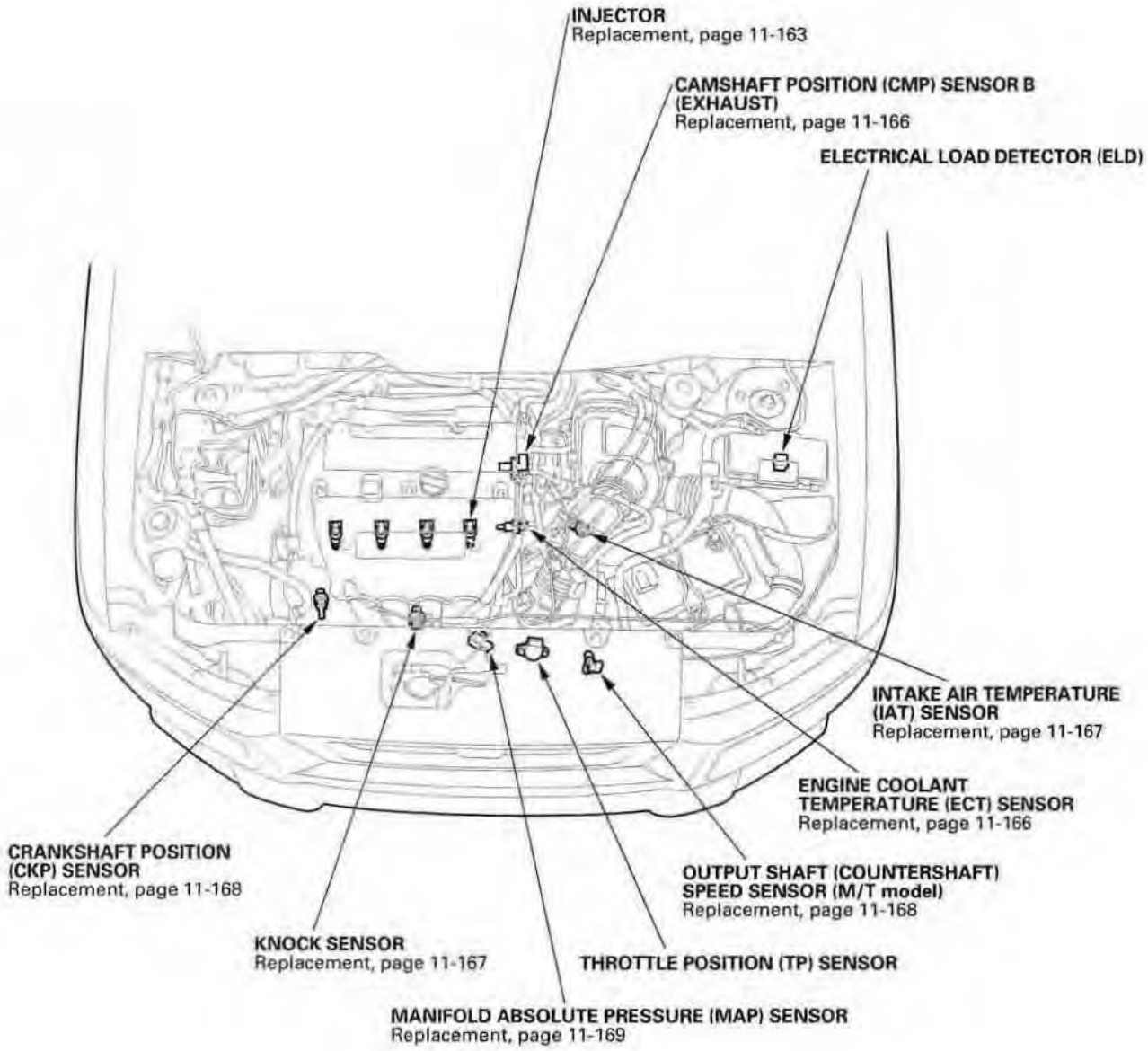
Fuel System Monitor and Readiness Code

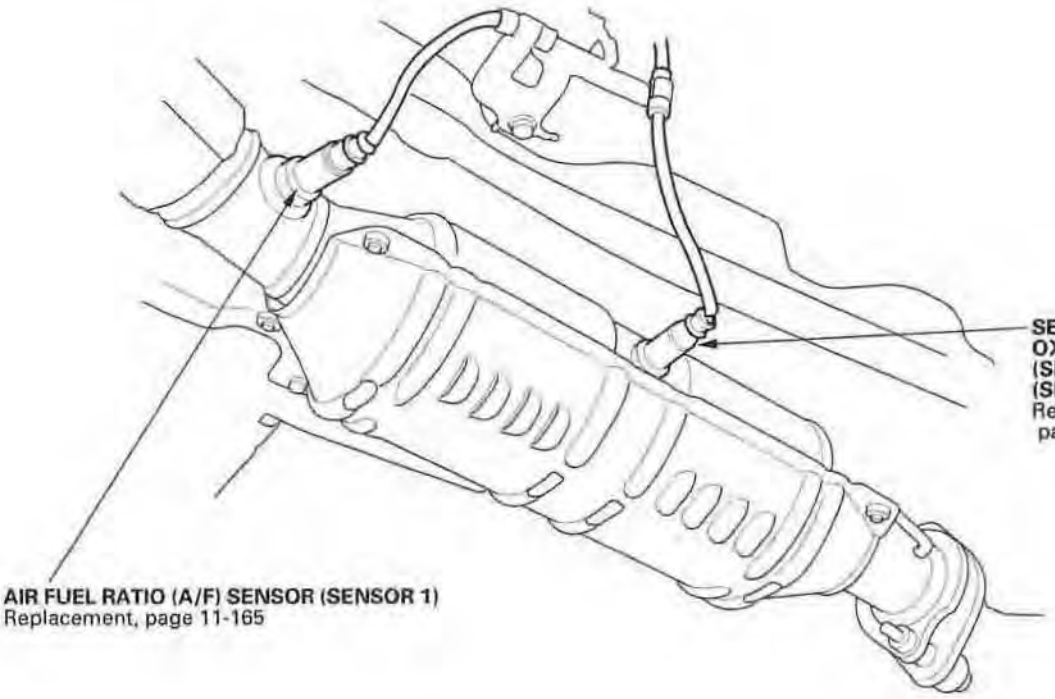
- This readiness code is always set to available because the fuel system is continuously monitored during closed loop operation.
- Monitoring pauses when the catalytic converter, EVAP control system, and A/F sensor monitors are active.
- Monitoring also pauses when any related enable criteria are not being met. Monitoring resumes when the enable criteria is again being met.

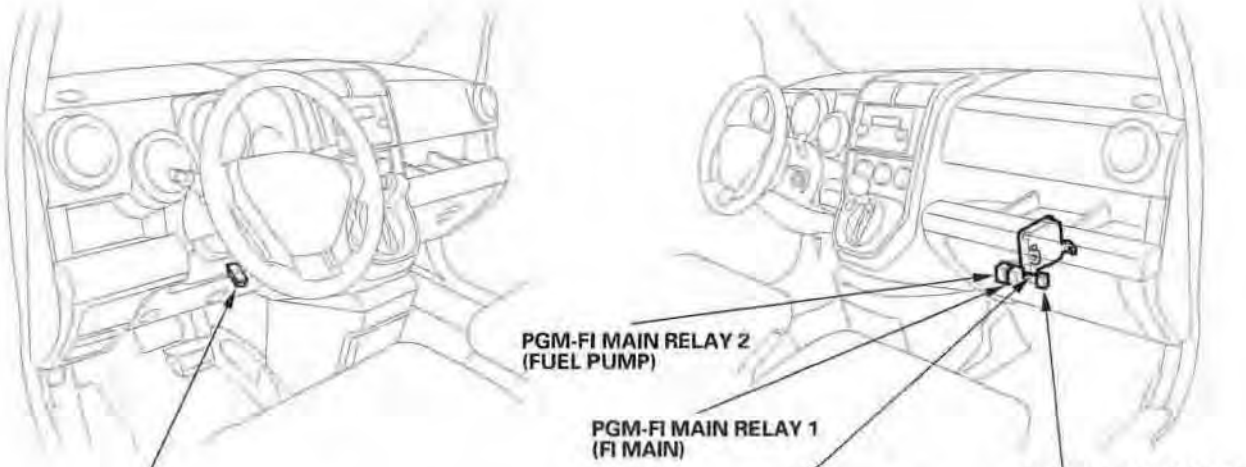
Comprehensive Component Monitor and Readiness Code

This readiness code is always set to available because the comprehensive component monitor is continuously running whenever the engine is cranking or running.

Component Location Index




SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S) (SENSOR 2)
Replacement, page 11-165
AIR FUEL RATIO (A/F) SENSOR (SENSOR 1)
Replacement, page 11-165


PGM-FI MAIN RELAY 2 (FUEL PUMP)
PGM-FI MAIN RELAY 1 (FI MAIN)
AIR FUEL RATIO (A/F) SENSOR RELAY
DATA LINK CONNECTOR (DLC)
General Troubleshooting Information, page 11-3
Troubleshooting, page 11-161
ENGINE CONTROL MODULE (ECM)/ POWERTRAIN CONTROL MODULE (PCM)
General Troubleshooting Information, page 11-3

DTC Troubleshooting

DTC P0107: MAP Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0107, P0122, and P0452 indicated at the same time?

   YES—Go to step 17.

   NO—Go to step 6.
6. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is about 3 kPa (1.0 in.Hg, 26 mmHg), or 0.23 V or less indicated?

   YES—Go to step 7.

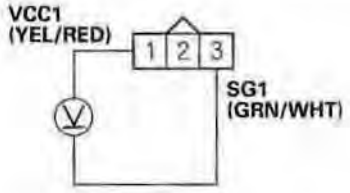
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the MAP sensor and the ECM/PCM. ■
7. Turn the ignition switch OFF.
8. Disconnect the MAP sensor 3P connector.
9. Turn the ignition switch ON (II).
10. Check the MAP SENSOR in the DATA LIST with the HDS.

    Is about 3 kPa (1.0 in.Hg, 26 mmHg), or 0.23 V or less indicated?

    YES—Go to step 13.

    NO—Go to step 11.
11. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

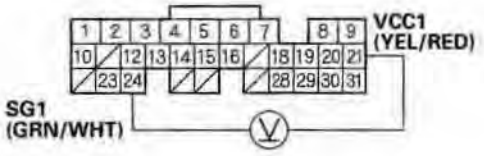
Is there about 5 V?

YES—Go to step 26.

NO—Go to step 12.

12. Measure voltage between ECM/PCM connector terminals A21 and A24.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

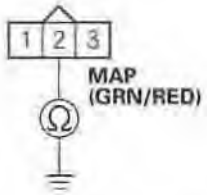
YES—Repair open in the wire between the ECM/PCM (A21) and the MAP sensor, then go to step 28.

NO—Go to step 33.

13. Turn the ignition switch OFF.
14. Jump the SCS line with the HDS.
15. Disconnect ECM/PCM connector A (31P).

16. Check for continuity between MAP sensor 3P connector terminal No. 2 and body ground.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A30) and the MAP sensor, then go to step 28.

NO—Go to step 33.

17. Turn the ignition switch OFF.

18. Jump the SCS line with the HDS.

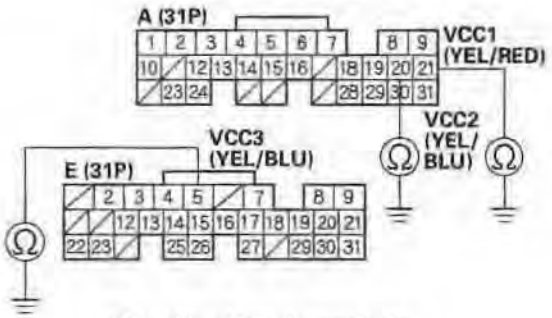
19. Disconnect ECM/PCM connectors A (31P) and E (31P).

20. Disconnect the connectors from these sensors:

- MAP sensor
- TP sensor
- FTP sensor
- Input shaft (mainshaft) speed sensor
- Output shaft (countershaft) speed sensor

21. Check for continuity between body ground and ECM/PCM connector terminals A20, A21, and E5 individually.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A20, A21, or E5) and each sensor, then go to step 28.

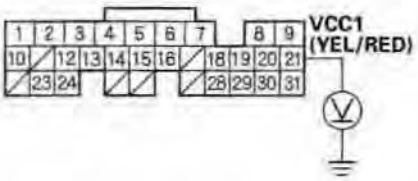
NO—Go to step 22.

(cont'd)

DTC Troubleshooting (cont'd)

22. Reconnect ECM/PCM connectors A (31P) and E (31P).
23. Turn the ignition switch ON (II).
24. Measure voltage between ECM/PCM connector terminal A21 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Go to step 25.

NO—Go to step 33.

25. Continue to monitor voltage at ECM/PCM connector terminal A21 while reconnecting the following sensors, one at a time.
    - MAP sensor
    - TP sensor
    - FTP sensor
    - Input shaft (mainshaft) speed sensor
    - Output shaft (countershaft) speed sensor

    Did the voltage drop to about 0 V?

    YES—Replace the sensor that caused the voltage to drop, then go to step 30.

    NO—Go to step 33.

26. Turn the ignition switch OFF.
27. Replace the MAP sensor (see page 11-169).
28. Reconnect all connectors.
29. Turn the ignition switch ON (II).
30. Reset the ECM/PCM with the HDS.
31. Do the ECM/PCM idle learn procedure (see page 11-207).
32. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0107 is indicated, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

33. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
34. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0107 is indicated, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P0108: MAP Sensor Circuit High Voltage

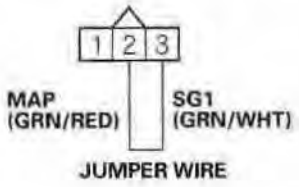
1. Turn the ignition switch ON (II).
2. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the MAP sensor and the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the MAP sensor 3P connector.
5. Connect MAP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

MAP SENSOR 3P CONNECTOR



Wire side of female terminals

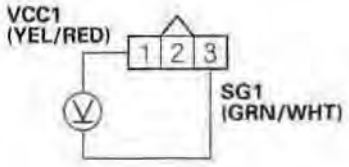
6. Turn the ignition switch ON (II).
7. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 19.
8. Remove the jumper wire from the MAP sensor 3P connector.
9. Measure voltage between MAP sensor 3P connector terminals No. 1 and No. 3.

MAP SENSOR 3P CONNECTOR



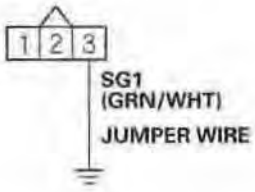
Wire side of female terminals

   Is there about 5 V?

   YES—Go to step 15.

   NO—Go to step 10.
10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect ECM/PCM connector A (31P).
13. Connect MAP sensor 3P connector terminal No. 3 to body ground with a jumper wire.

MAP SENSOR 3P CONNECTOR

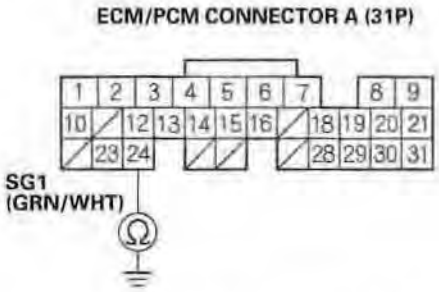


Wire side of female terminals

(cont'd)

DTC Troubleshooting (cont'd)

14. Check for continuity between ECM/PCM connector terminal A24 and body ground.



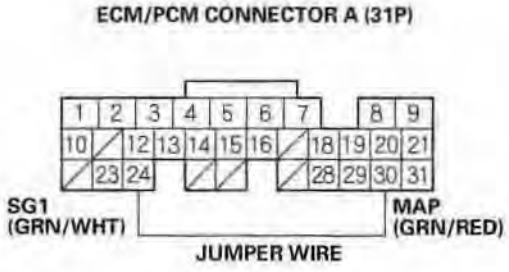
Is there continuity?

YES—Go to step 26.

NO—Repair open in the wire between the ECM/PCM (A24) and the MAP sensor, then go to step 21.

15. Turn the ignition switch OFF.

16. Connect ECM/PCM connector terminals A24 and A30 with a jumper wire.



17. Turn the ignition switch ON (II).

18. Check the MAP SENSOR in the DATA LIST with the HDS.

Is 160 kPa (47.1 in.Hg, 1,197 mmHg), or 4.49 V or more indicated?

YES—Go to step 26.

NO—Repair open in the wire between the ECM/PCM (A30) and the MAP sensor, then go to step 21.

19. Turn the ignition switch OFF.

20. Replace the MAP sensor (see page 11-169).

21. Reconnect all connectors.

22. Turn the ignition switch ON (II).

23. Reset the ECM/PCM with the HDS.

24. Do the ECM/PCM idle learn procedure (see page 11-207).

25. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0108 is indicated, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Troubleshooting is complete.■

26. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

27. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0108 is indicated, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0112: IAT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT SENSOR in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or higher, or 0.08 V or less indicated?

   YES—Go to step 3.

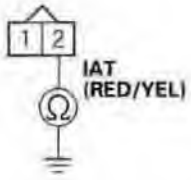
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the IAT sensor and the ECM/PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the IAT sensor 2P connector.
5. Turn the ignition switch ON (II).
6. Check the IAT SENSOR in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or higher, or 0.08 V or less indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect ECM/PCM connector B (24P).
10. Check for continuity between IAT sensor 2P connector terminal No. 2 and body ground.

IAT SENSOR 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the IAT sensor and the ECM/PCM (B17), then go to step 13.

NO—Go to step 18.

11. Turn the ignition switch OFF.
12. Replace the IAT sensor (see page 11-167).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the ECM/PCM with the HDS.
16. Do the ECM/PCM idle learn procedure (see page 11-207).
17. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0112 is indicated, check for poor connections or loose terminals at the IAT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■
18. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0112 is indicated, check for poor connections or loose terminals at the IAT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P0113: IAT Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the IAT SENSOR in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the IAT sensor and the ECM/PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the IAT sensor 2P connector.
5. Connect IAT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

IAT SENSOR 2P CONNECTOR

Wire side of female terminals

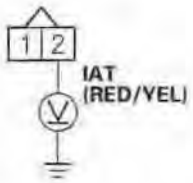
6. Turn the ignition switch ON (II).
7. Check the IAT SENSOR in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 18.
8. Turn the ignition switch OFF.
9. Remove the jumper wire from the IAT sensor 2P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between IAT sensor 2P connector terminal No. 2 and body ground.

IAT SENSOR 2P CONNECTOR



Wire side of female terminals

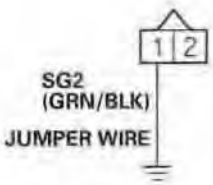
Is there about 5 V?

YES—Go to step 12.

NO—Go to step 17.

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect ECM/PCM connector A (31P).
15. Connect IAT sensor 2P connector terminal No. 1 to body ground with a jumper wire.

IAT SENSOR 2P CONNECTOR

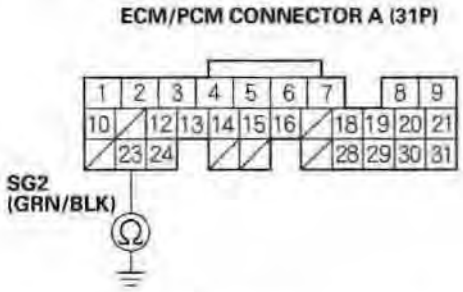


Wire side of female terminals

(cont'd)

DTC Troubleshooting (cont'd)

16. Check for continuity between ECM/PCM connector terminal A23 and body ground.

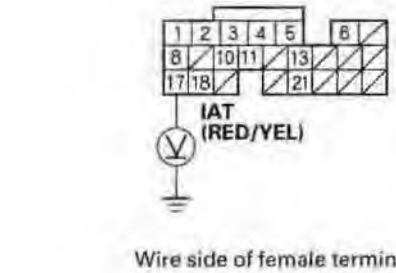


Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the ECM/PCM (A23) and the IAT sensor, then go to step 20.

17. Measure voltage between ECM/PCM connector terminal B17 and body ground.



Is there about 5 V?

YES—Repair open in the wire between the ECM/PCM (B17) and the IAT sensor, then go to step 20.

NO—Go to step 25.

18. Turn the ignition switch OFF.
19. Replace the IAT sensor (see page 11-167).
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the ECM/PCM with the HDS.
23. Do the ECM/PCM idle learn procedure (see page 11-207).
24. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0113 is indicated, check for poor connections or loose terminals at the IAT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

25. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
26. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0113 is indicated, check for poor connections or loose terminals at the IAT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P0116: ECT Sensor Range/Performance Problem

1. Turn the ignition switch ON (II).
2. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about 176 °F (80 °C) or higher, or 0.86 V or less indicated?

   YES—Go to step 3.

   NO—Go to step 7.
3. Note the current coolant temperature.
4. Turn the ignition switch OFF.
5. Let the engine cool off for 1 hour.
6. Check the ECT SENSOR in the DATA LIST with the HDS.

   Did the ECT change 3.6 °F (2 °C) or more?

   YES—Intermittent failure, system is OK at this time. Check the thermostat and the cooling system. ■

   NO—Go to step 10.
7. Note the current coolant temperature.
8. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
9. Check the ECT SENSOR in the DATA LIST with the HDS.

   Does the ECT change 3.6 °F (2 °C) or more?

   YES—Intermittent failure, system is OK at this time. Check the thermostat and the cooling system. ■

   NO—Go to step 10.
10. Turn the ignition switch OFF.
11. Replace the ECT sensor (see page 11-166).
12. Turn the ignition switch ON (II).
13. Reset the ECM/PCM with the HDS.
14. Do the ECM/PCM idle learn procedure (see page 11-207).
15. Allow the engine to cool to between 23 °F (−5 °C) and 77 °F (25 °C).
16. Start the engine, and let it idle 20 minutes.
17. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0116 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 18.
18. Monitor the OBD STATUS for DTC P0116 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 15 and recheck.

DTC Troubleshooting (cont'd)

DTC P0117: ECT Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or higher, or 0.08 V or less indicated?

   YES—Go to step 3.

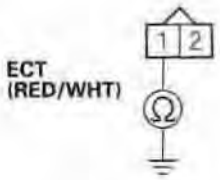
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the ECT sensor and the ECM/PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 2P connector.
5. Turn the ignition switch ON (II).
6. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about 356 °F (180 °C) or higher, or 0.08 V or less indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect ECM/PCM connector B (24P).
10. Check for continuity between ECT sensor 2P connector terminal No. 1 and body ground.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECT sensor and the ECM/PCM (B8), then go to step 13.

NO—Go to step 18.

11. Turn the ignition switch OFF.
12. Replace the ECT sensor (see page 11-166).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the ECM/PCM with the HDS.
16. Do the ECM/PCM idle learn procedure (see page 11-207).
17. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0117 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■
18. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0117 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P0118: ECT Sensor Circuit High Voltage

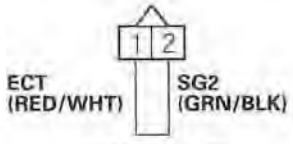
1. Turn the ignition switch ON (II).
2. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the ECT sensor and the ECM/PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ECT sensor 2P connector.
5. Connect ECT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

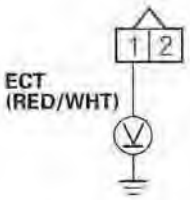
6. Turn the ignition switch ON (II).
7. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about −40 °F (−40 °C) or less, or 4.90 V or more indicated?

   YES—Go to step 8.

   NO—Go to step 18.
8. Turn the ignition switch OFF.
9. Remove the jumper wire from the ECT sensor 2P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between ECT sensor 2P connector terminal No. 1 and body ground.

ECT SENSOR 2P CONNECTOR



Wire side of female terminals

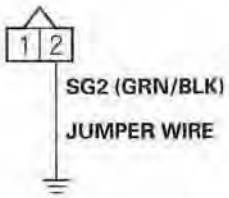
Is there about 5 V?

YES—Go to step 12.

NO—Go to step 17.

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect ECM/PCM connector A (31P).
15. Connect ECT sensor 2P connector terminal No. 2 to body ground with a jumper wire.

ECT SENSOR 2P CONNECTOR

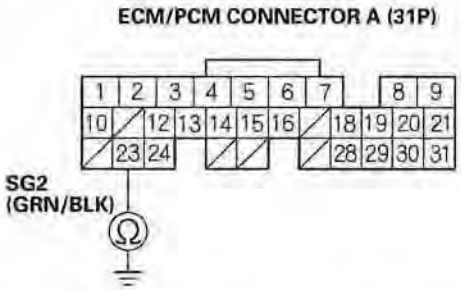


Wire side of female terminals

(cont'd)

DTC Troubleshooting (cont'd)

16. Check for continuity between ECM/PCM connector terminal A23 and body ground.



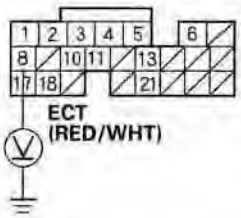
Wire side of female terminals

Is there continuity?

YES—Go to step 25.

NO—Repair open in the wire between the ECM/PCM (A23) and the ECT sensor, then go to step 20.

17. Measure voltage between ECM/PCM connector terminal B8 and body ground.



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between the ECM/PCM (B8) and the ECT sensor, then go to step 20.

NO—Go to step 25.

18. Turn the ignition switch OFF.
19. Replace the ECT sensor (see page 11-166)
20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Reset the ECM/PCM with the HDS.
23. Do the ECM/PCM idle learn procedure (see page 11-207).
24. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0118 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

25. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
26. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0118 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P0122: TP Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0107, P0122, and P0452 indicated at the same time?

   YES—Go to step 20.

   NO—Go to step 6.

6. Check the TP SENSOR in the DATA LIST with the HDS.

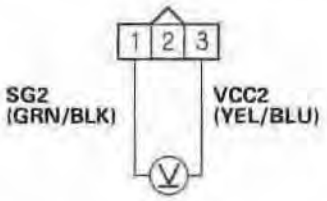
   Is there about 0.5 V when the throttle is fully closed, and about 4.5 V when the throttle is fully opened?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the TP sensor and the ECM/PCM. ■

   NO—Go to step 7.

7. Turn the ignition switch OFF.
8. Disconnect the TP sensor 3P connector.
9. Turn the ignition switch ON (II).
10. On the wire harness side, measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

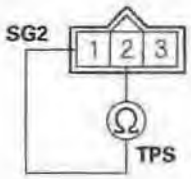
Is there about 5 V?

YES—Go to step 11.

NO—Go to step 19.

11. Turn the ignition switch OFF.
12. On the sensor side, measure resistance between TP sensor 3P connector terminals No. 1 and No. 2 with the throttle fully closed.

TP SENSOR 3P CONNECTOR



Terminal side of male terminals

Is there about 0.5 – 0.9 kΩ?

YES—Go to step 13.

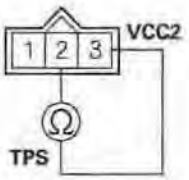
NO—Go to step 29.

(cont'd)

DTC Troubleshooting (cont'd)

13. On the sensor side, measure resistance between TP sensor 3P connector terminals No. 2 and No. 3 with the throttle fully closed.

TP SENSOR 3P CONNECTOR



Terminal side of male terminals

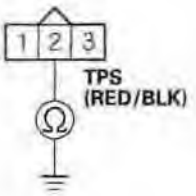
Is there about 5.0 kΩ ?

YES—Go to step 14.

NO—Go to step 29.

14. Jump the SCS line with the HDS.
15. Disconnect ECM/PCM connector A (31P).
16. On the wire harness side, check for continuity between TP sensor 3P connector terminal No. 2 and body ground.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

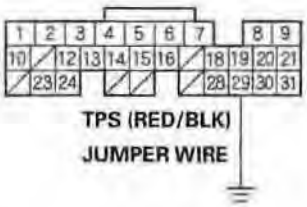
Is there continuity?

YES—Repair short in the wire between the TP sensor and the ECM/PCM (A29), then go to step 30.

NO—Go to step 17.

17. Connect ECM/PCM connector terminal A29 to body ground with a jumper wire.

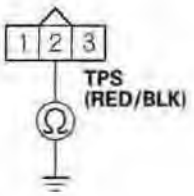
ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

18. On the wire harness side, check for continuity between TP sensor 3P connector terminal No. 2 and body ground.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

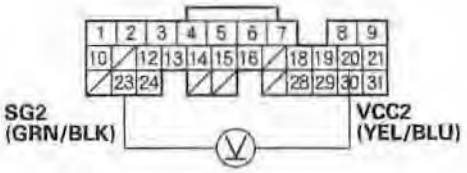
Is there continuity?

YES—Go to step 35.

NO—Repair open in the wire between the TP sensor and the ECM/PCM (A29), then go to step 30.

19. Measure voltage between ECM/PCM connector terminals A20 and A23.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between the ECM/PCM (A20) and the TP sensor, then go to step 30.

NO—Go to step 35.

20. Turn the ignition switch OFF.

21. Jump the SCS line with the HDS.

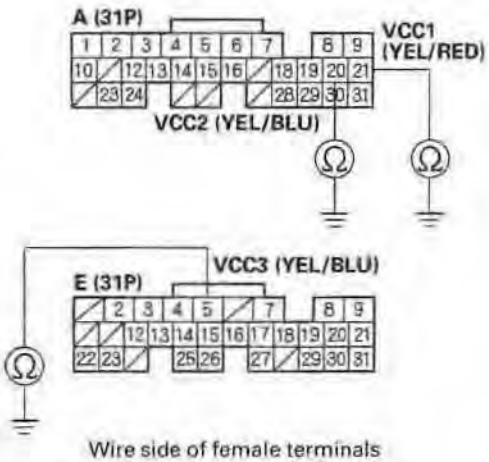
22. Disconnect ECM/PCM connectors A (31P) and E (31P).

23. Disconnect the connectors from these sensors:

- MAP sensor
- TP sensor
- FTP sensor
- Input shaft (mainshaft) speed sensor
- Output shaft (countershaft) speed sensor

24. Check for continuity between body ground and ECM/PCM connector terminals A20, A21, and E5 individually.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A20, A21, or E5) and each sensor, then go to step 30.

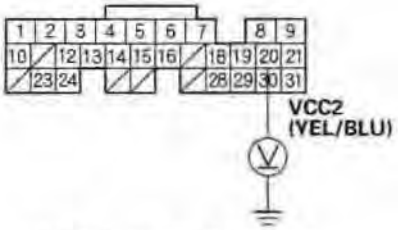
NO—Go to step 25.

(cont'd)

DTC Troubleshooting (cont'd)

25. Reconnect ECM/PCM connectors A (31P) and E (31P).
26. Turn the ignition switch ON (II).
27. Measure voltage between ECM/PCM connector terminal A20 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Go to step 28.

NO—Go to step 35.

28. Continue to monitor voltage at ECM/PCM connector terminal A20 while reconnecting the following sensors, one at a time.
    - MAP sensor
    - TP sensor
    - FTP sensor
    - Input shaft (mainshaft) speed sensor
    - Output shaft (countershaft) speed sensor

    Did the voltage drop to about 0 V?

    YES—Replace the sensor that caused the voltage to drop, then go to step 30.

    NO—Go to step 35.

29. Replace the throttle body (the TP sensor is not available separately) (see page 11-235).
30. Reconnect all connectors.
31. Turn the ignition switch ON (II).
32. Reset the ECM/PCM with the HDS.
33. Do the ECM/PCM idle learn procedure (see page 11-207).
34. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0122 is indicated, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

35. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
36. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0122 is indicated, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P0123: TP Sensor Circuit High Voltage

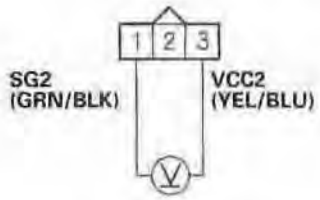
1. Turn the ignition switch ON (II).
2. Check the TP SENSOR in the DATA LIST with the HDS.

   Is there about 0.5 V when the throttle is fully closed, and about 4.5 V when the throttle is fully opened?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the TP sensor and the ECM/PCM. ■

   NO—Go to step 3.
3. Turn the ignition switch OFF.
4. Disconnect the TP sensor 3P connector.
5. Turn the ignition switch ON (II).
6. At the wire harness side, measure voltage between TP sensor 3P connector terminals No. 1 and No. 3.

TP SENSOR 3P CONNECTOR



Wire side of female terminals

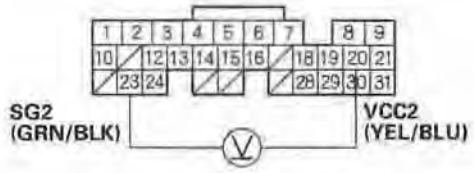
Is there about 5 V?

YES—Go to step 8.

NO—Go to step 7.

7. Measure voltage between ECM/PCM connector terminals A20 and A23.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between the ECM/PCM (A23) and the TP sensor, then go to step 10.

NO—Go to step 15.

8. Turn the ignition switch OFF.
9. Replace the throttle body (the TP sensor is not available separately) (see page 11-235).
10. Reconnect all connectors.
11. Turn the ignition switch ON (II).
12. Reset the ECM/PCM with the HDS.
13. Do the ECM/PCM idle learn procedure (see page 11-207).
14. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0123 is indicated, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

(cont'd)

DTC Troubleshooting (cont'd)

15. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

16. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0123 is indicated, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P0125: ECT Sensor Malfunction/Slow Response

1. Start the engine, and let it idle.
2. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about 86 °F (30 °C) or less, or 2.61 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check the thermostat and the cooling system. ■
3. Let the engine idle for 6 minutes.
4. Check the ECT SENSOR in the DATA LIST with the HDS.

   Is about 86 °F (30 °C) or less, or 2.61 V or more indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check the thermostat and the cooling system. ■
5. Turn the ignition switch OFF.
6. Replace the ECT sensor (see page 11-166).
7. Turn the ignition switch ON (II).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Allow the engine to cool to between 23 °F (−5 °C) and 95 °F (35 °C).
11. Start the engine, and let it idle 20 minutes.
12. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0125 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 13.
13. Monitor the OBD STATUS for DTC P0125 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 10 and recheck.

DTC Troubleshooting (cont'd)

DTC P0128: Cooling System Malfunction

NOTE: If the DTCs listed below are stored at the same time as DTC P0128, troubleshoot those DTCs first, then recheck for P0128.

P0112, P0113: Intake air temperature (IAT) sensor
P0116, P0117, P0118, P0125: Engine coolant temperature (ECT) sensor
P0300: Random misfire
P0301, P0302, P0303, P0304: No. 1, No. 2, No. 3, or No. 4 cylinder misfire
P0335, P0339: Crankshaft position (CKP) sensor
P2227, P2228, P2229: Barometric pressure (BARO) sensor
P2646, P2647, P2648, P2649: VTEC system
P0506, P0507: Idle control system malfunction
P0511: Idle air control (IAC) valve

DTC P0128 can occasionally set when the hood is opened while the engine is running.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the blower switch OFF.
4. Turn the A/C switch OFF.
5. Check the FAN CTRL in the DATA LIST with the HDS.

   Is it OFF?

   YES—Go to step 6.

   NO—Wait until the FAN CTRL is turned off, then go to step 6.
6. Check the ECT SENSOR in the DATA LIST with the HDS, then check the radiator fan operation.

   Does the radiator fan keep running when the engine coolant temperature is less than 158 °F (70 °C)?

   YES—Check the radiator fan circuit (see page 10-18), the radiator fan switch circuit for open (see page 10-20), the radiator fan switch circuit for short (see page 10-20), and the radiator fan switch (see page 10-21). If the circuits and the switch are OK, go to step 21.

   NO—Go to step 7.
7. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
8. Turn the ignition switch OFF.
9. Turn the ignition switch ON (II).
10. Do the RADIATOR FAN TEST in the INSPECTION MENU with the HDS for 20 minutes.
11. Check the ECT SENSOR in the DATA LIST with the HDS.

    Is about 140 °F (60 °C) or less, or 1.25 V or more indicated?

    YES—Intermittent failure, system is OK at this time. ■

    NO—Go to step 12.
12. Turn the ignition switch OFF.
13. Cool down the engine until the coolant temperature is between 23 °F (−5 °C) and 95 °F (35 °C).
14. Replace the thermostat (see page 10-8).
15. Turn the ignition switch ON (II).
16. Reset the ECM/PCM with the HDS.
17. Do the ECM/PCM idle learn procedure (see page 11-207).

18. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0128 is indicated, check the cooling system, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting. ■

    NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P0128 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check the cooling system, then go to step 1. If the screen indicates NOT COMPLETED, go to step 18 and recheck.

21. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

22. Cool down the engine until the coolant temperature is between 23 °F (−5 °C) and 95 °F (35 °C).

23. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

24. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0128 is indicated, check for poor connections or loose terminals at the ECT sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0133: A/F Sensor (Sensor 1) Response Malfunction

NOTE: If DTC P0139 is stored at the same time as DTC P0133, troubleshoot DTC P0139 first, then recheck for DTC P0133.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 5th gear)
   - Vehicle speed at 30 mph (48 km/h) or more, and engine speed between 1,000 and 3,000 rpm
5. Monitor the OBD STATUS for DTC P0133 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the A/F sensor (Sensor 1) (see page 11-165).
8. Turn the ignition switch ON (II).
9. Reset the ECM/PCM with the HDS.
10. Do the ECM/PCM idle learn procedure (see page 11-207).
11. Test-drive under these conditions:
    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Vehicle speed at 30 mph (48 km/h) or more, and engine speed between 1,000 and 3,000 rpm
12. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0133 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 13.
13. Monitor the OBD STATUS for DTC P0133 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 10 and recheck.

DTC P0134: A/F Sensor (Sensor 1) Heater System Malfunction

NOTE: If the vehicle was out of fuel and the engine stalled before this DTC was stored, refuel, and clear the DTC with the HDS. If DTC P0135 is stored at the same time as DTC P0134, troubleshoot DTC P0135 first, then recheck for DTC P0134.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral) until the radiator fan comes on.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0134 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the A/F sensor relay and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Replace the A/F sensor (Sensor 1) (see page 11-165).
7. Turn the ignition switch ON (II).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0134 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1), the A/F sensor relay and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 11.
11. Monitor the OBD STATUS for DTC P0134 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1), the A/F sensor relay and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 8 and recheck.

DTC Troubleshooting (cont'd)

DTC P0135: A/F Sensor (Sensor 1) Heater Circuit Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0135 indicated?

   YES—Go to step 5.

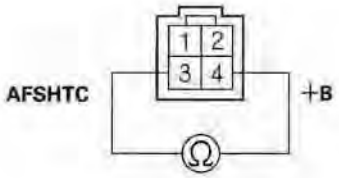
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1), the A/F sensor relay and the ECM/PCM.■
5. Turn the ignition switch OFF.
6. Check these fuses:
   - No. 14 OPTION (40 A) fuse in the under-hood fuse/relay box.
   - No. 4 ACG (10 A) fuse in the under-dash fuse/relay box.
   - No. 15 LAF (A/F) HEATER (20 A) fuse in the under-dash fuse/relay box.

   Are any of the fuses blown?

   YES—Repair short in the wire between the A/F sensor relay and the fuses, then go to step 24.

   NO—Go to step 7.
7. Disconnect the A/F sensor (Sensor 1) 4P connector.
8. At the A/F sensor (Sensor 1), measure resistance between A/F sensor (Sensor 1) 4P connector terminals No. 3 and No. 4.

   A/F SENSOR (SENSOR 1) 4P CONNECTOR



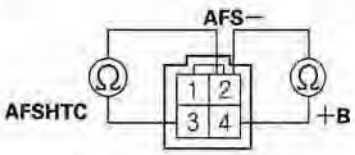
   Terminal side of male terminals

   Is there 2.1—2.9 Ω at room temperature?

   YES—Go to step 9.

   NO—Go to step 23.
9. At the A/F sensor (sensor 1), check for continuity between A/F sensor (Sensor 1) 4P connector terminals No. 2 and No. 3, and No. 2 and No. 4 individually.

   A/F SENSOR (SENSOR 1) 4P CONNECTOR



   Terminal side of male terminals

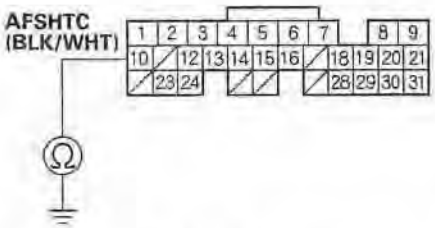
   Is there continuity?

   YES—Go to step 23.

   NO—Go to step 10.

10. Jump the SCS line with the HDS.
11. Disconnect ECM/PCM connector A (31P).
12. Check for continuity between ECM/PCM connector terminal A10 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

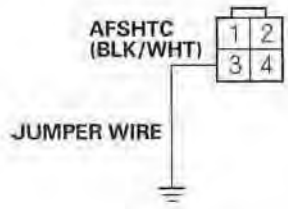
Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A10) and the A/F sensor (Sensor 1), then go to step 24.

NO—Go to step 13.

13. Connect A/F sensor (Sensor 1) 4P connector terminal No. 3 to body ground with a jumper wire.

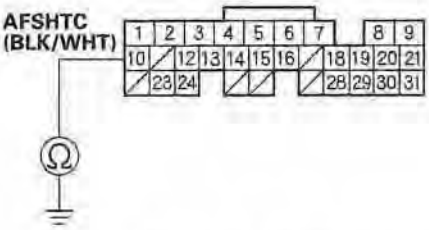
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

14. Check for continuity between ECM/PCM connector terminal A10 and body ground.

ECM/PCM CONNECTOR A (31P)



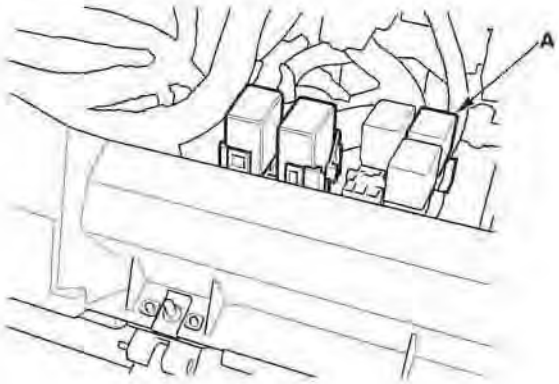
Wire side of female terminals

Is there continuity?

YES—Go to step 15.

NO—Repair open in the wire between the ECM/PCM (A10) and the A/F sensor (Sensor 1), then go to step 24.

15. Remove the glove box (see page 20-78).
16. Remove the A/F sensor relay (A).

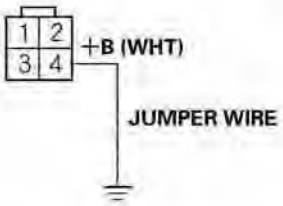


(cont'd)

DTC Troubleshooting (cont'd)

17. Connect A/F sensor (Sensor 1) 4P connector terminal No. 4 to body ground with a jumper wire.

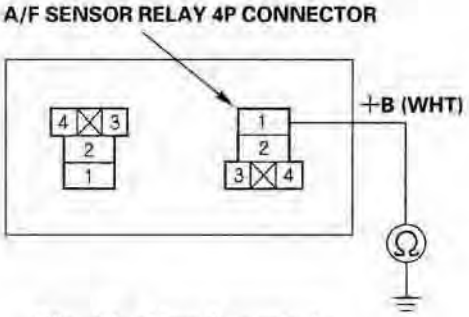
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

18. Check for continuity between A/F sensor relay 4P connector terminal No. 1 and body ground.

A/F SENSOR RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

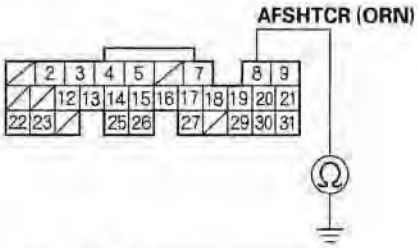
YES—Go to step 19.

NO—Repair open in the wire between the A/F sensor (Sensor 1) and the A/F sensor relay, then go to step 24.

19. Disconnect ECM/PCM connector E (31P).

20. Check for continuity between ECM/PCM connector terminal E8 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

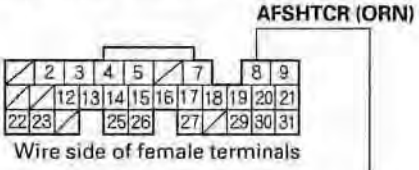
Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E8) and the A/F sensor relay, then go to step 24.

NO—Go to step 21.

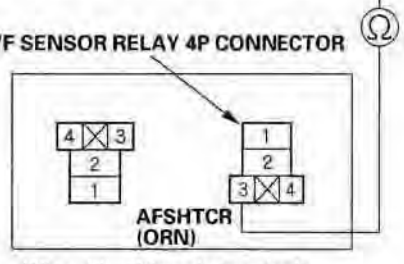
21. Check for continuity between ECM/PCM connector terminal E8 and A/F sensor relay 4P connector terminal No. 3.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

A/F SENSOR RELAY 4P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 22.

NO—Repair open in the wire between the ECM/PCM (E8) and the A/F sensor relay, then go to step 24.

22. Check the A/F sensor relay (see page 22-57).

    Is the A/F sensor relay OK?

    YES—Go to step 30.

    NO—Replace the A/F sensor relay, then go to step 24.

23. Replace the A/F sensor (Sensor 1) (see page 11-165).

24. Reconnect all connectors.

25. Turn the ignition switch ON (II).

26. Reset the ECM/PCM with the HDS.

27. Do the ECM/PCM idle learn procedure (see page 11-207).

28. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0135 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 29.

29. Monitor the OBD STATUS for DTC P0135 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 26 and recheck.

30. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

31. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0135 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1), the A/F sensor relay, and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0137: Secondary HO2S (Sensor 2) Circuit Low Voltage ('03–04 models)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.29 V or less?

   YES—Go to step 5.

   NO—Go to step 9.
5. Turn the ignition switch OFF.
6. Disconnect the secondary HO2S (Sensor 2) 4P connector (see page 11-165).
7. Turn the ignition switch ON (II).
8. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.29 V or less?

   YES—Go to step 11.

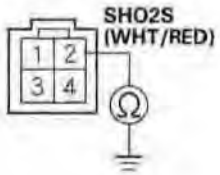
   NO—Go to step 15.
9. Test-drive under these conditions:
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 5th gear)
   - Engine speed at 2,000–3,000 rpm
   - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds
10. Monitor the OBD STATUS for DTC P0137 in the DTCs MENU with the HDS.

    Does the screen indicate FAILED?

    YES—Go to step 16.

    NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 9 and recheck.
11. Turn the ignition switch OFF.
12. Jump the SCS line with the HDS.
13. Disconnect ECM/PCM connector E (31P).
14. Check for continuity between secondary HO2S (Sensor 2) 4P connector terminal No. 2 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E20) and the secondary HO2S (Sensor 2), then go to step 17.

NO—Go to step 25.

15. Turn the ignition switch OFF.

16. Replace the secondary HO2S (Sensor 2) (see page 11-165).

17. Reconnect all connectors.

18. Turn the ignition switch ON (II).

19. Reset the ECM/PCM with the HDS.

20. Do the ECM/PCM idle learn procedure (see page 11-207).

21. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

22. Test-drive under these conditions:

    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 2,000—3,000 rpm
    - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds

23. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0137 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 24.

24. Monitor the OBD STATUS for DTC P0137 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 21 and recheck.

25. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

26. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

27. Test-drive under these conditions:

    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 2,000—3,000 rpm
    - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds

28. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0137 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0137: Secondary HO2S (Sensor 2) Circuit Low Voltage ('05 model)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.29 V or less?

   YES—Go to step 5.

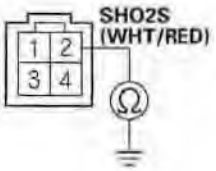
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the secondary HO2S (Sensor 2) 4P connector (see page 11-165).
7. Turn the ignition switch ON (II).
8. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.29 V or less?

   YES—Go to step 9.

   NO—Go to step 13.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect ECM/PCM connector E (31P).
12. Check for continuity between secondary HO2S (Sensor 2) 4P connector terminal No. 2 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E20) and the secondary HO2S (Sensor 2), then go to step 15.

NO—Go to step 23.

13. Turn the ignition switch OFF.
14. Replace the secondary HO2S (Sensor 2) (see page 11-165).
15. Reconnect all connectors.
16. Turn the ignition switch ON (II).
17. Reset the ECM/PCM with the HDS.
18. Do the ECM/PCM idle learn procedure (see page 11-207).
19. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

20. Test-drive under these conditions:

    - Engine coolant temperature above 176 °F (80 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 1,500—3,000 rpm
    - Drive about 1 minute or more

21. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0137 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 22.

22. Monitor the OBD STATUS for DTC P0137 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 19 and recheck.

23. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

24. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

25. Test-drive under these conditions:

    - Engine coolant temperature above 176 °F (80 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 1,500—3,000 rpm
    - Drive 1 minute or more

26. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0137 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0138: Secondary HO2S (Sensor 2) Circuit High Voltage ('03–04 models)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 0.75 V or more?

   YES—Go to step 7.

   NO—Go to step 5.
5. Test-drive under these conditions:

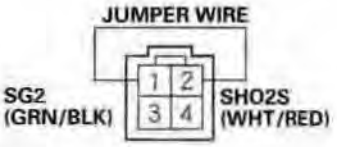
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 5th gear)
   - Engine speed at 2,000–3,000 rpm
   - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds
6. Monitor the OBD STATUS for DTC P0138 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 19.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 5 and recheck.
7. Turn the ignition switch OFF.
8. Disconnect the secondary HO2S (Sensor 2) 4P connector (see page 11-165).
9. Connect secondary HO2S (sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

10. Turn the ignition switch ON (II).
11. Check the HO2S S2 in the DATA LIST with the HDS.

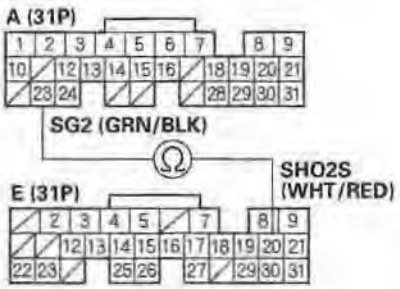
    Does the voltage stay at 0.75 V or more?

    YES—Go to step 12.

    NO—Go to step 19.
12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect ECM/PCM connector E (31P).

15. Check for continuity between ECM/PCM connector terminals A23 and E20.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there continuity?

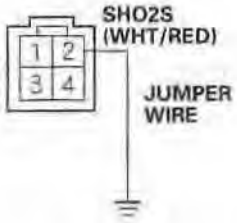
YES—Go to step 29.

NO—Go to step 16.

16. Remove the jumper wire from the secondary HO2S (Sensor 2) 4P connector.

17. Connect secondary HO2S (Sensor 2) 4P connector terminal No. 2 to body ground with a jumper wire.

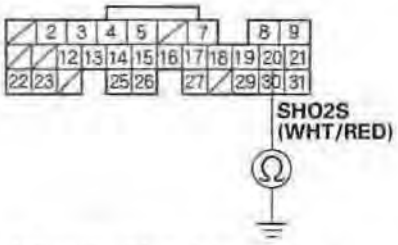
SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

18. Check for continuity between ECM/PCM connector terminal E20 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

YES—Repair open in the wire between the ECM/PCM (A23) and the secondary HO2S (Sensor 2), then go to step 21.

NO— Repair open in the wire between the ECM/PCM (E20) and the secondary HO2S (Sensor 2), then go to step 21.

19. Turn the ignition switch OFF.

20. Replace the secondary HO2S (Sensor 2) (see page 11-165).

21. Reconnect all connectors.

22. Turn the ignition switch ON (II).

23. Reset the ECM/PCM with the HDS.

24. Do the ECM/PCM idle learn procedure (see page 11-207).

25. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

26. Test-drive under these conditions:

- Engine coolant temperature above 158 °F (70 °C)
- A/T in D position (M/T in 5th gear)
- Engine speed at 2,000—3,000 rpm
- Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds

(cont'd)

DTC Troubleshooting (cont'd)

27. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0138 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 28.

28. Monitor the OBD STATUS for DTC P0138 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 25 and recheck.

29. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

30. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

31. Test-drive under these conditions:

    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 2,000—3,000 rpm
    - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds

32. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0138 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P0138: Secondary HO2S (Sensor 2) Circuit High Voltage ('05 model)

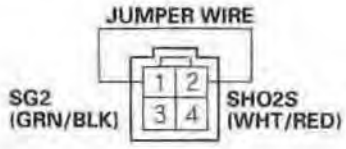
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 1.25 V or more?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the secondary HO2S (Sensor 2) 4P connector (see page 11-165).
7. Connect secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

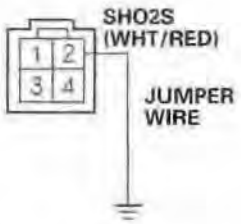
8. Turn the ignition switch ON (II).
9. Check the HO2S S2 in the DATA LIST with the HDS.

   Does the voltage stay at 1.25 V or more?

   YES—Go to step 10.

   NO—Go to step 19.
10. Turn the ignition switch OFF.
11. Remove the jumper wire from the secondary HO2S (Sensor 2) 4P connector.
12. Connect secondary HO2S (Sensor 2) 4P connector terminal No. 2 to body ground with a jumper wire.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

13. Turn the ignition switch ON (II).
14. Check the HO2S S2 in the DATA LIST with the HDS.

    Does the voltage stay at 1.25 V or more?

    YES—Go to step 15.

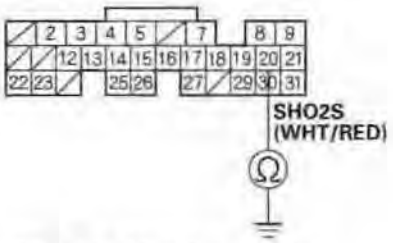
    NO—Repair open in the wire between the ECM/PCM (A23) and the secondary HO2S (Sensor 2), then go to step 21.

(cont'd)

DTC Troubleshooting (cont'd)

15. Turn the ignition switch OFF.
16. Jump the SCS line with the HDS.
17. Disconnect ECM/PCM connector E (31P).
18. Check for continuity between ECM/PCM connector terminal E20 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

YES—Go to step 29.

NO—Repair open in the wire between the ECM/PCM (E20) and the secondary HO2S (Sensor 2), then go to step 21.

19. Turn the ignition switch OFF.
20. Replace the secondary HO2S (Sensor 2) (see page 11-165).
21. Reconnect all connectors.
22. Turn the ignition switch ON (II).
23. Reset the ECM/PCM with the HDS.
24. Do the ECM/PCM idle learn procedure (see page 11-207).
25. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
26. Test-drive under these conditions:
    - Engine coolant temperature above 176 °F (80 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 1,500—3,000 rpm
    - Drive 1 minute or more
27. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0138 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 28.
28. Monitor the OBD STATUS for DTC P0138 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 25 and recheck.

29. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

30. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

31. Test-drive under these conditions:

    - Engine coolant temperature above 176 °F (80 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 1,500—3,000 rpm
    - Drive 1 minute or more

32. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0138 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0139: Secondary HO2S (Sensor 2) Circuit Slow Response ('03–04 models)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 5th gear)
   - Engine speed at 2,000–3,000 rpm
   - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds
5. Monitor the OBD STATUS for DTC P0139 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the secondary HO2S (Sensor 2) (see page 11-165).
8. Turn the ignition switch ON (II).
9. Reset the ECM/PCM with the HDS.
10. Do the ECM/PCM idle learn procedure (see page 11-207).
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Test-drive under these conditions:
    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Engine speed at 2,000–3,000 rpm
    - Drive about 10 minutes, then decelerate (with the throttle fully closed) for 5 seconds
13. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0139 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P0139 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11 and recheck.

DTC P0139: Secondary HO2S (Sensor 2) Circuit Slow Response ('05 model)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 176 °F (80 °C)
   - A/T in D position (M/T in 5th gear)
   - Vehicle speed between 35 mph (56 km/h) and 55 mph (88 km/h)
   - Drive 5 minutes or more
5. Monitor the OBD STATUS for DTC P0139 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the secondary HO2S (Sensor 2) (see page 11-165).
8. Turn the ignition switch ON (II).
9. Reset the ECM/PCM with the HDS.
10. Do the ECM/PCM idle learn procedure (see page 11-207).
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Test-drive under these conditions:
    - Engine coolant temperature above 176 °F (80 °C)
    - A/T in D position (M/T in 5th gear)
    - Vehicle speed between 35 mph (56 km/h) and 55 mph (88 km/h)
    - Drive 5 minutes or more
13. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0139 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P0139 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11 and recheck.

DTC Troubleshooting (cont'd)

DTC P0141: Secondary HO2S (Sensor 2) Heater Circuit Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0141 indicated?

   YES—Go to step 5.

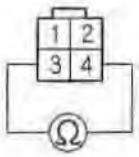
   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. ■
5. Check the No. 4 ACG (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 6.

   NO—Repair short in the wire between the secondary HO2S (Sensor 2) and the No. 4 ACG (10 A) fuse, then go to step 24.
6. Turn the ignition switch OFF.
7. Disconnect the secondary HO2S (Sensor 2) 4P connector.
8. At the secondary HO2S (Sensor 2), measure resistance between secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4.

   SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



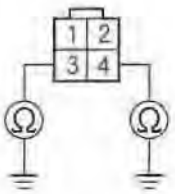
   Wire side of female terminals

   Is there 5.0 – 6.4 Ω at room temperature?

   YES—Go to step 9.

   NO—Go to step 23.
9. At the secondary HO2S (Sensor 2), check for continuity between body ground and secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4 individually.

   SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



   Wire side of female terminals

   Is there continuity?

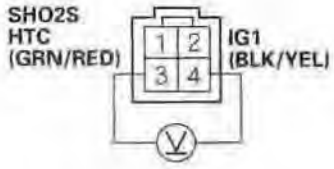
   YES—Go to step 23.

   NO—Go to step 10.

10. Turn the ignition switch ON (II).

11. On the harness side, measure voltage between secondary HO2S (Sensor 2) 4P connector terminals No. 3 and No. 4.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there battery voltage?

YES—Go to step 12.

NO—Go to step 16.

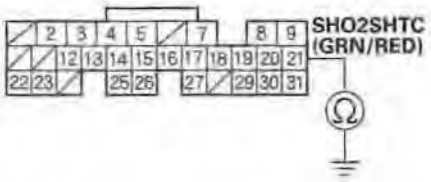
12. Turn the ignition switch OFF.

13. Jump the SCS line with the HDS.

14. Disconnect ECM/PCM connector E (31P).

15. Check for continuity between ECM/PCM connector terminal E21 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

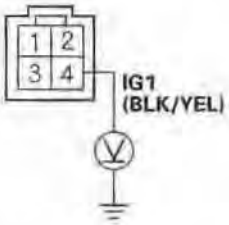
Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E21) and the secondary HO2S (Sensor 2), then go to step 24.

NO—Go to step 30.

16. Measure voltage between secondary HO2S (Sensor 2) 4P connector terminal No. 4 and body ground.

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR



Terminal side of male terminals

Is there battery voltage?

YES—Go to step 17.

NO—Check the No. 4 ACG (10 A) fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the secondary HO2S (Sensor 2) and the No. 4 ACG (10 A) fuse, then go to step 24.

17. Turn the ignition switch OFF.

18. Jump the SCS line with the HDS.

19. Reconnect the secondary HO2S (Sensor 2) 4P connector.

20. Disconnect ECM/PCM connector E (31P).

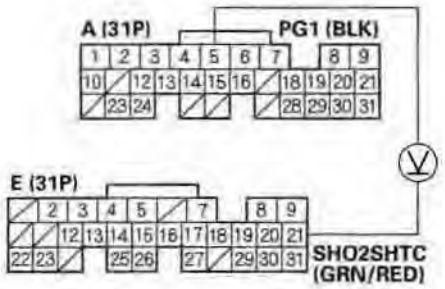
21. Turn the ignition switch ON (II).

(cont'd)

DTC Troubleshooting (cont'd)

22. Measure voltage between ECM/PCM connector terminals A5 and E21.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there 0.1 V or less?

YES—Repair open in the wire between the ECM/PCM (E21) and the secondary HO2S (Sensor 2), then go to step 25.

NO—Go to step 30.

23. Replace the secondary HO2S (Sensor 2) (see page 11-165).

24. Reconnect all connectors.

25. Turn the ignition switch ON (II).

26. Reset the ECM/PCM with the HDS.

27. Do the ECM/PCM idle learn procedure (see page 11-207).

28. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0141 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Go to step 29.

29. Monitor the OBD STATUS for DTC P0141 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. ■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 26 and recheck.

30. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

31. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0141 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P0171: Fuel System Too Lean

DTC P0172: Fuel System Too Rich

NOTE: If some of the DTCs listed below are stored at the same time as DTC P0171 and/or P0172. Troubleshoot those DTCs first, then recheck for P0171 and/or P0172.

P0107, P0108, P1128, P1129: Manifold absolute pressure (MAP) sensor
P0133, P1157, P2195, P2238, P2252, P2A00: Air fuel ratio (A/F) sensor (Sensor 1)
P0134, P0135: Air fuel ratio (A/F) sensor (Sensor 1) heater
P0137, P0138, P0139: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S (Sensor 2) heater
P2646, P2647, P2648, P2649: VTEC system
P2279: Intake air leakage

1. Check the fuel pressure (see page 11-214).

   Is the fuel pressure OK?

   YES—Check the engine valve clearances, and adjust if necessary. If the valve clearances are OK, replace the injectors (see page 11-163), then go to step 2.

   NO—Check these items:

   - If the pressure is too high, replace the fuel pressure regulator (see page 11-222), then go to step 2.
   - If the pressure is too low, check the fuel pump and the fuel feed line, then go to step 2.

2. Turn the ignition switch ON (II).

3. Reset the ECM/PCM with the HDS.

4. Do the ECM/PCM idle learn procedure (see page 11-207).

5. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral, until the radiator fan comes on, then let it idle.

6. Test-drive under these conditions:

   - Engine coolant temperature above 158 °F (70 °C)
   - Transmission in 5th gear (A/T in D position)
   - Drive at a steady speed between 15—75 mph (24—120 km/h)

   NOTE: DTC P0171 and/or P0172 may take up to 40 minutes of test driving to set. Using the HDS, monitor the long term fuel trim (LTFT) or air fuel feedback AVE (AF FB AVE) for 15 minutes of driving. If the fuel trim/AF AVE stays within 10 % of 1.0 (0.0 %), there is no problem at this time.

7. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—If DTC P0171 or P0172 is indicated, go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

   NO—Troubleshooting is complete.■

DTC Troubleshooting (cont'd)

DTC P0300: Random Misfire and Any Combination of the Following:

DTC P0301: No. 1 Cylinder Misfire Detected

DTC P0302: No. 2 Cylinder Misfire Detected

DTC P0303: No. 3 Cylinder Misfire Detected

DTC P0304: No. 4 Cylinder Misfire Detected

Special Tools Required
- Pressure gauge adapter 07NAJ-P07010A
- A/T low pressure gauge w/panel 07406-0070300
- A/T pressure hose 07406-0020201
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure adapter 07MAJ-PY40120
- Oil pressure hose 07ZAJ-S5A0200

NOTE:
- If the misfire is frequent enough to trigger detection of increased emissions during two consecutive driving cycles, the MIL will come on, and DTC P0300 (and some of the combination of P0301 through P0304) will be stored.
- If the misfire is frequent enough to damage the catalyst, the MIL will flash whenever the misfire occurs, and DTC P0300 (and some of the combination of P0301 through P0304) will be stored. When the misfire stops, the MIL will remain on.
- Troubleshoot the following DTCs first if any of them were stored along with the random misfire DTC(s):

P0107, P0108, P1128, P1129: Manifold absolute pressure (MAP) sensor
P0171, P0172: Fuel system
P0335, P0339: Crankshaft position (CKP) sensor
P0365, P0369: Camshaft position (CMP) sensor B
P0506, P507: Idle control system
P0511: Idle air control (IAC) valve

1. Note this freeze data:
   - Engine speed
   - Vehicle speed
   - Throttle position
   - Caluculated load value (CLV)
   - Gear position
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle without load (in Park or neutral).
4. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 5. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, wait for several minutes, and recheck.
5. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Go to step 6.
6. Test-drive the vehicle for several minutes in the range of the recorded freeze data.
7. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 8. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 6 and recheck.

8. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Intermittent failure, system is OK at this time. Clear the CKP PATTERN with the HDS, then do the CKP pattern learn procedure (see page 11-4).■

9. Turn the ignition switch OFF.

10. Check the fuel quality.

    Is the quality good?

    YES—Go to step 11.

    NO—Drain the tank and fill it with known-good fuel, then go to step 20.

11. Inspect the spark plugs (see page 4-26). If the spark plugs are fouled or worn, replace them.

12. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

13. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 14.

    NO—Go to step 20.

14. Check the fuel pressure (see page 11-214).

    Is the fuel pressure OK?

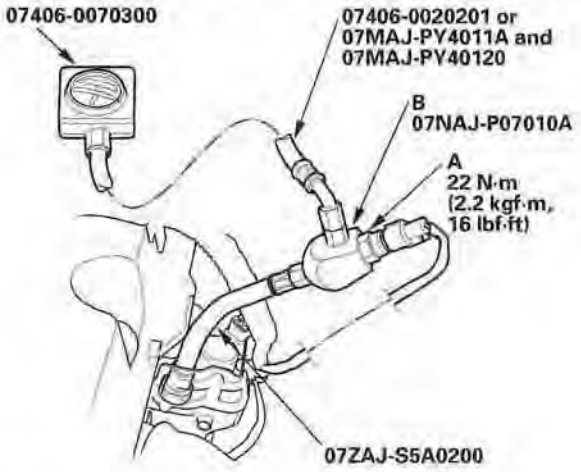
    YES—Go to step 15.

    NO—
    - If the pressure is too high, replace the fuel pressure regulator (see page 11-222), then go to step 20.
    - If the pressure is too low, check the fuel pump, the fuel feed pipe, and the fuel filter. If they are OK, replace the fuel pressure regulator (see page 11-222), then go to step 20.

15. Turn the ignition switch OFF.

16. Remove the VTEC oil pressure switch (A), and install the special tools as shown, then install the VTEC oil pressure switch in the pressure gauge adapter (B).

    NOTE: Install the switch in the reverse order of removal with a new O-ring.



17. Reconnect the VTEC oil pressure switch 2P connector.

18. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on.

(cont'd)

DTC Troubleshooting (cont'd)

19. Check the oil pressure at engine speeds of 1,000 and 2,000 rpm. Keep the test time as short as possible (less than 1 minute) because the engine is running without load.

    Is the oil pressure below 49 kPa (0.5 kgf/cm², 7psi)?

    YES—Check the fuel pressure (see page 11-214), repair if needed, then go to step 20.

    NO—Inspect the VTEC system, then go to step 20.

20. Turn the ignition switch ON (II).

21. Reset the ECM/PCM with the HDS.

22. Clear the CKP PATTERN with the HDS.

23. Do the ECM/PCM idle learn procedure (see page 11-207).

24. Do the CKP pattern learn procedure (see page 11-4).

25. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

26. Check for Temporary DTCs or DTC with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0300, P0301, P0302, P0303, or P0304 are indicated, check for poor connections or loose terminals at the ignition coil, the injector, and the ECM/PCM, then go to troubleshooting DTC P0301, P0302, P0303, or P0304 (see page 11-103). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 27.

27. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 25 and recheck.

DTC P0301: No. 1 Cylinder Misfire Detected

DTC P0302: No. 2 Cylinder Misfire Detected

DTC P0303: No. 3 Cylinder Misfire Detected

DTC P0304: No. 4 Cylinder Misfire Detected

1. Note this freeze data:

   - Engine speed
   - Vehicle speed
   - Throttle position
   - Calculated load value (CLV)
   - Gear position

2. Clear the DTC with the HDS.

3. Start the engine, and let it idle without load (in Park or neutral).

4. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 5. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, wait for several minutes, and recheck.

5. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Go to step 6.

6. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

7. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, go to step 8. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 6 and recheck.

8. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

   Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

   YES—Go to step 9.

   NO—Intermittent failure, system is OK at this time.■

9. Turn the ignition switch OFF.

10. Remove the intake manifold cover (see step 3 on page 9-3).

11. Start the engine, and listen for a clicking sound at the injector of the problem cylinder.

    Does the injector click?

    YES—Go to step 12.

    NO—Go to step 43.

12. Turn the ignition switch OFF.

(cont'd)

DTC Troubleshooting (cont'd)

13. Exchange the ignition coil from the problem cylinder with one from another cylinder.
14. Test-drive the vehicle for several minutes in the range of the recorded freeze data.
15. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 16.

    NO—Intermittent misfire due to poor contact at the ignition coil connector (no misfire at this time). Make sure the coil connections are secure. Clear the CKP PATTERN with the HDS, then do the CKP pattern learn procedure (see page 11-4).■
16. Determine which cylinder had the misfire.

    Does the misfire occur in the cylinder where the ignition coil was moved?

    YES—Replace the faulty ignition coil (see page 4-25), then go to step 64.

    NO—Go to step 17.
17. Turn the ignition switch OFF.
18. Exchange the spark plug from the problem cylinder with one from another cylinder.
19. Test-drive the vehicle for several minutes in the range of the recorded freeze data.
20. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 21.

    NO—Intermittent misfire due to spark plug fouling (no misfire at this time). Clear the CKP PATTERN with the HDS, then do the CKP pattern learn procedure (see page 11-4).■
21. Determine which cylinder had the misfire.

    Does the misfire occur in the cylinder where the spark plug was moved?

    YES—Replace the faulty spark plug, then go to step 64.

    NO—Go to step 22.
22. Turn the ignition switch OFF.
23. Exchange the injector from the problem cylinder with one from another cylinder.
24. Start the engine, and let it idle 2 minutes.
25. Test-drive the vehicle for several minutes in the range of the recorded freeze data.
26. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

    Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

    YES—Go to step 27.

    NO—Intermittent misfire due to bad contact in the injector connector (no misfire at this time). Check for poor connections or loose terminals at the injector. Clear the CKP PATTERN with the HDS, then do the CKP pattern learn procedure (see page 11-4).■
27. Determine which cylinder had the misfire.

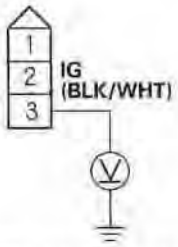
    Does the misfire occur in the cylinder where the injector was moved?

    YES—Replace the faulty injector (see page 11-163), then go to step 64.

    NO—Go to step 28.
28. Turn the ignition switch OFF.
29. Disconnect the ignition coil 3P connector from the problem cylinder.
30. Turn the ignition switch ON (II).

31. Measure voltage between ignition coil 3P connector terminal No. 3 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

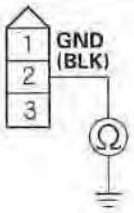
YES—Go to step 32.

NO—Repair open in the wire between the ignition coil and the No. 1 ignition coil (15 A) fuse, then go to step 63.

32. Turn the ignition switch OFF.

33. Check for continuity between ignition coil 3P connector terminal No. 2 and body ground.

IGNITION COIL 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 34.

NO—Repair open in the wire between the ignition coil and G102, then go to step 63.

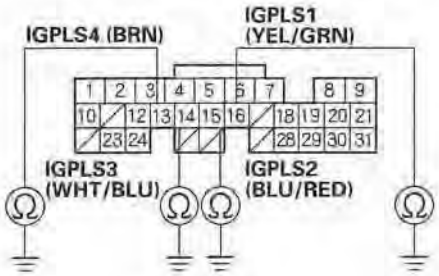
34. Turn the ignition switch OFF.

35. Jump the SCS line with the HDS.

36. Disconnect ECM/PCM connector A (31P).

37. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	A16	YEL/GRN
No. 2	P0302	A15	BLU/RED
No. 3	P0303	A14	WHT/BLU
No. 4	P0304	A13	BRN

Is there continuity?

YES—Repair short in the wire between the ECM/PCM and the ignition coil, then go to step 63.

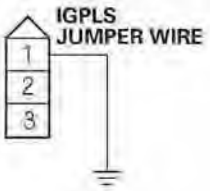
NO—Go to step 38.

(cont'd)

DTC Troubleshooting (cont'd)

38. Connect the appropriate ignition coil 3P connector terminal No. 1 to body ground with a jumper wire (see table).

IGNITION COIL 3P CONNECTOR

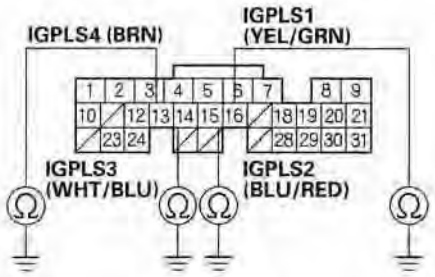


Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	YEL/GRN
No. 2	P0302	BLU/RED
No. 3	P0303	WHT/BLU
No. 4	P0304	BRN

39. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	A16	YEL/GRN
No. 2	P0302	A15	BLU/RED
No. 3	P0303	A14	WHT/BLU
No. 4	P0304	A13	BRN

Is there continuity?

YES—Go to step 40.

NO—Repair open in the wire between the ECM/PCM and the ignition coil, then go to step 63.

40. Reconnect the ignition coil 3P connector and ECM/PCM connector A (31P).

41. Do an engine compression and a cylinder leakdown test.

Did the engine pass both tests?

YES—Go to step 42.

NO—Repair the engine, then go to step 63.

42. Do the VTEC rocker arms test (see page 6-7).

Did the VTEC rocker arms pass the test?

YES—Go to step 71.

NO—Repair as necessary, then go to step 63.

43. Turn the ignition switch OFF.

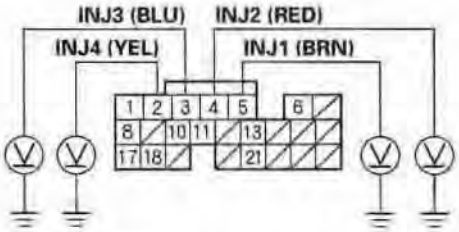
44. Jump the SCS line with the HDS.

45. Disconnect ECM/PCM connector B (24P).

46. Turn the ignition switch ON (II).

47. Measure voltage between body ground and the appropriate ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	B5	BRN
No. 2	P0302	B4	RED
No. 3	P0303	B3	BLU
No. 4	P0304	B2	YEL

Is there battery voltage?

YES—Go to step 57.

NO—Go to step 48.

48. Turn the ignition switch OFF.

49. Remove the intake manifold cover (see step 3 on page 9-3).

50. Disconnect the injector 2P connector from the problem cylinder.

51. Turn the ignition switch ON (II).

52. Measure voltage between injector 2P connector terminal No. 1 and body ground.

INJECTOR 2P CONNECTOR

Wire side of female terminals

Is there battery voltage?

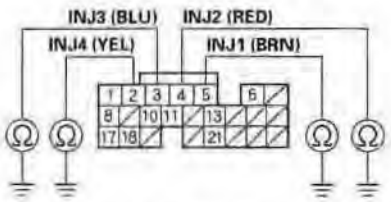
YES—Go to step 53.

NO—Repair open in the wire between the injector and the PGM-FI main relay, then go to step 63.

53. Turn the ignition switch OFF.

54. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	B5	BRN
No. 2	P0302	B4	RED
No. 3	P0303	B3	BLU
No. 4	P0304	B2	YEL

Is there continuity?

YES—Repair short in the wire between the ECM/PCM and the injector, then go to step 63.

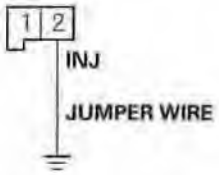
NO—Go to step 55.

(cont'd)

DTC Troubleshooting (cont'd)

55. Connect the appropriate injector 2P connector terminal No. 2 to body ground with a jumper wire (see table).

INJECTOR 2P CONNECTOR

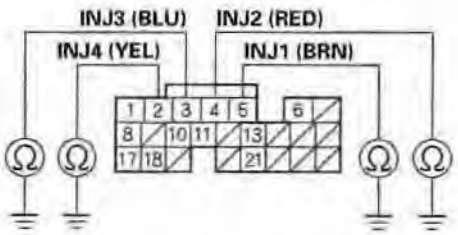


Wire side of female terminals

PROBLEM CYLINDER	DTC	WIRE COLOR
No. 1	P0301	BRN
No. 2	P0302	RED
No. 3	P0303	BLU
No. 4	P0304	YEL

56. Check for continuity between body ground and the appropriate ECM/PCM connector terminal (see table).

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

PROBLEM CYLINDER	DTC	ECM/PCM TERMINAL	WIRE COLOR
No. 1	P0301	B5	BRN
No. 2	P0302	B4	RED
No. 3	P0303	B3	BLU
No. 4	P0304	B2	YEL

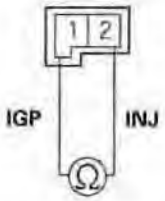
Is there continuity?

YES—Go to step 57.

NO—Repair open in the wire between the ECM/PCM and the injector, then go to step 63.

57. Measure resistance between injector 2P connector terminals No. 1 and No. 2.

INJECTOR 2P CONNECTOR



Terminal side of male terminals

Is there 10– 13 Ω ?

YES—Go to step 58.

NO—Replace the injector (see page 11-163), then go to step 63.

58. Exchange a known-good injector from another cylinder with the one from the problem cylinder.

59. Reconnect ECM/PCM connector B (24P).

60. Start the engine, and let it idle 2 minutes.

61. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

62. Check the CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE in the DATA LIST for 10 minutes with the HDS.

Does CYL1 MISFIRE, CYL2 MISFIRE, CYL3 MISFIRE, and/or CYL4 MISFIRE show misfire counts?

YES—Go to step 72.

NO—Replace the original injector (see page 11-163), then go to step 63.

63. Reconnect all connectors.

64. Turn the ignition switch ON (II).

65. Reset the ECM/PCM with the HDS.

66. Clear the CKP PATTERN with the HDS.

67. Do the ECM/PCM idle learn procedure (see page 11-207).

68. Do the CKP pattern learn procedure (see page 11-4).

69. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

70. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0301, P0302, P0303, or P0304 are indicated, check for poor connections or loose terminals at the ignition coil, the injector, and the ECM/PCM, then go to troubleshooting DTC P0300, P0301, P0302, P0303, or P0304 (see page 11-100). If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 71.

71. Monitor the OBD STATUS for DTC P0301, P0302, P0303, or P0304 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 69 and recheck.

72. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

73. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

74. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0301, P0302, P0303, or P0304 are indicated, check for poor connections or loose terminals at the injector, the ignition coil, and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0325: Knock Sensor Circuit Malfunction

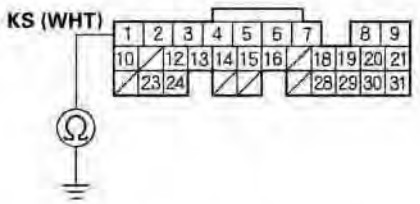
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Hold the engine speed at 3,000—4,000 rpm for at least 10 seconds.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0325 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the knock sensor and the ECM/PCM. ■
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect the knock sensor 1P connector.
9. Disconnect ECM/PCM connector A (31P).
10. Check for continuity between ECM/PCM connector terminal A1 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

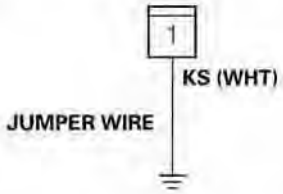
Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A1) and the knock sensor, then go to step 14.

NO—Go to step 11.

11. Connect the knock sensor 1P connector terminal to body ground with a jumper wire.

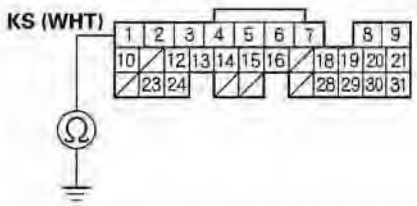
KNOCK SENSOR 1P CONNECTOR



Wire side of female terminals

12. Check for continuity between ECM/PCM connector terminal A1 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Go to step 13.

NO—Repair open in the wire between the ECM/PCM (A1) and the knock sensor, then go to step 14.

13. Replace the knock sensor (see page 11-167).

14. Reconnect all connectors.

15. Turn the ignition switch ON (II).

16. Reset the ECM/PCM with the HDS.

17. Do the ECM/PCM idle learn procedure (see page 11-207).

18. Hold the engine speed at 3,000—4,000 rpm for at least 10 seconds.

19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—Go to step 21.

    NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P0325 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 18 and recheck.

21. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

22. Hold the engine speed at 3,000—4,000 rpm for at least 10 seconds.

23. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0325 is indicated, check for poor connections or loose terminals at the knock sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0335: CKP Sensor No Signal

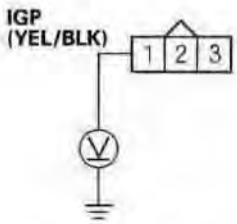
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0335 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the CKP sensor and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the CKP sensor 3P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between CKP sensor 3P connector terminal No. 1 and body ground.

CKP SENSOR 3P CONNECTOR



Wire side of female terminals

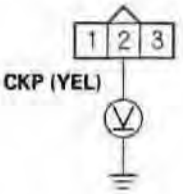
Is there battery voltage?

YES—Go to step 9.

NO—Repair open in the wire between the CKP sensor and PGM-FI main relay 1 (FI MAIN), then go to step 18.

9. Measure voltage between CKP sensor 3P connector terminal No. 2 and body ground.

CKP SENSOR 3P CONNECTOR



Wire side of female terminals

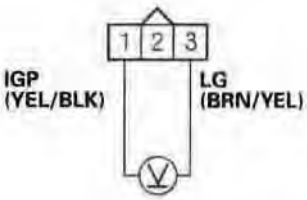
Is there about 5 V?

YES—Go to step 10.

NO—Go to step 11.

10. Measure voltage between CKP sensor 3P connector terminals No. 1 and No. 3.

CKP SENSOR 3P CONNECTOR



Wire side of female terminals

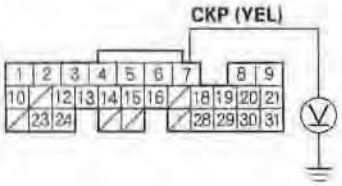
Is there battery voltage?

YES—Go to step 16.

NO—Repair open in the wire between the CKP sensor and G101, then go to step 18.

11. Measure voltage between ECM/PCM connector terminal A7 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between the ECM/PCM (A7) and the CKP sensor, then go to step 18.

NO—Go to step 12.

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect ECM/PCM connector A (31P).
15. Check for continuity between ECM/PCM connector terminal A7 and body ground.

ECM/PCM CONNECTOR A (31P)

Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A7) and the CKP sensor, then go to step 18.

NO—Go to step 25.

16. Turn the ignition switch OFF.
17. Replace the CKP sensor (see page 11-168).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the ECM/PCM with the HDS.
21. Clear the CKP PATTERN with the HDS.
22. Do the ECM/PCM idle learn procedure (see page 11-207).
23. Do the CKP pattern learn procedure (see page 11-4).
24. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0335 is indicated, check for poor connections or loose terminals at the CKP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

25. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
26. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0335 is indicated, check for poor connections or loose terminals at the CKP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0339: CKP Sensor Intermittent Interruption

1. Note this freeze data:
   - Engine speed
   - Vehicle speed
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle 10 seconds.
4. Check the CKP NOISE COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Go to step 5.
5. Test-drive the vehicle for several minutes in the range of the recorded freeze data.
6. Check the CKP NOISE COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the CKP sensor and the ECM/PCM. ■
7. Check for poor or loose connections and terminals at these locations:
   - CKP sensor
   - ECM/PCM
   - Engine ground
   - Body ground

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Reconnect the connectors or terminals, then go to step 11.
8. Remove the cam chain case (see page 6-12), and check for damage on the CKP sensor pulse plate.

   Is the plate damaged?

   YES—Replace the CKP sensor pulse plate, then go to step 11.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Replace the CKP sensor (see page 11-168).
11. Turn the ignition switch ON (II).
12. Reset the ECM/PCM with the HDS.
13. Clear the CKP PATTERN with the HDS.
14. Do the ECM/PCM idle learn procedure (see page 11-207).
15. Do the CKP pattern learn procedure (see page 11-4).
16. Start the engine, and let it idle 10 seconds.
17. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0339 is indicated, check for poor connections or loose terminals at the CKP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

DTC P0365: CMP Sensor B No Signal

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

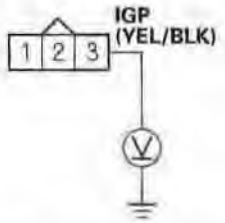
   Is DTC P0365 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at CKP sensor B and the ECM/PCM. ■

5. Turn the ignition switch OFF.
6. Disconnect CMP sensor B 3P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between CMP sensor B 3P connector terminal No. 3 and body ground.

CMP SENSOR B 3P CONNECTOR



Wire side of female terminals

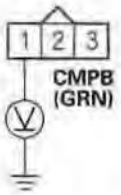
Is there battery voltage?

YES—Go to step 9.

NO—Repair open in the wire between CMP sensor B and PGM-FI main relay 1 (FI MAIN), then go to step 18.

9. Measure voltage between CMP sensor B 3P connector terminal No. 1 and body ground.

CMP SENSOR B 3P CONNECTOR



Wire side of female terminals

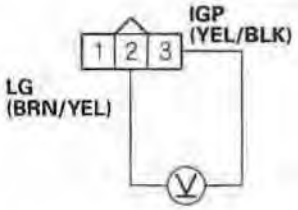
Is there about 5 V?

YES—Go to step 10.

NO—Go to step 11.

10. Measure voltage between CMP sensor B 3P connector terminals No. 2 and No. 3.

CMP SENSOR B 3P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 16.

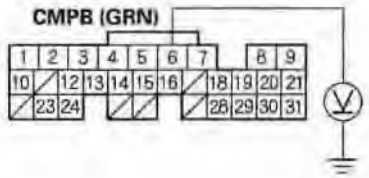
NO—Repair open in the wire between CMP sensor B and G101, then go to step 18.

(cont'd)

DTC Troubleshooting (cont'd)

11. Measure voltage between ECM/PCM connector terminal A6 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

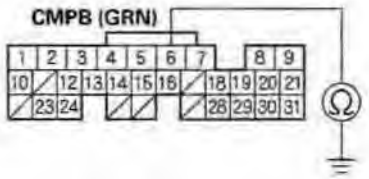
Is there about 5 V?

YES— Repair open in the wire between the ECM/PCM (A6) and CMP sensor B, then go to step 18.

NO—Go to step 12.

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect ECM/PCM connector A (31P).
15. Check for continuity between ECM/PCM connector terminal A6 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A6) and CMP sensor B, then go to step 18.

NO—Go to step 24.

16. Turn the ignition switch OFF.
17. Replace CMP sensor B (see page 11-166).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the ECM/PCM with the HDS.
21. Do the ECM/PCM idle learn procedure (see page 11-207).
22. Start the engine.
23. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0365 is indicated, check for poor connections or loose terminals at CMP sensor B and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Troubleshooting is complete.■

24. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
25. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0365 is indicated, check for poor connections or loose terminals at CMP sensor B and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P0369: CMP Sensor B Intermittent Interruption

1. Note this freeze data:

   - Engine speed
   - Vehicle speed

2. Clear the DTC with the HDS.

3. Start the engine, and let it idle 10 seconds.

4. Check the CMP NOISE B COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Go to step 5.

5. Test-drive the vehicle for several minutes in the range of the recorded freeze data.

6. Check the CMP NOISE B COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 7.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at CMP sensor B and the ECM/PCM. ■

7. Check for poor or loose connections and terminals at these locations:

   - CMP sensor B
   - ECM/PCM
   - Engine ground
   - Body ground

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO— Repair the connectors or terminals, then go to step 11.

8. Check for damage on the CMP sensor B pulse plate (see page 6-27).

   Is the plate damaged?

   YES—Replace the CMP sensor B pulse plate (see page 6-27), then go to step 11.

   NO—Go to step 9.

9. Turn the ignition switch OFF.

10. Replace CMP sensor B (see page 11-166).

11. Turn the ignition switch ON (II).

12. Reset the ECM/PCM with the HDS.

13. Do the ECM/PCM idle learn procedure (see page 11-207).

14. Start the engine, and let it idle 10 seconds.

15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0369 is indicated, check for poor connections or loose terminals at CMP sensor B and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

DTC Troubleshooting (cont'd)

DTC P0562: Charging System Low Voltage

NOTE:
- If any high current load accessories are installed, this DTC can be set.
- If DTC P16BB and/or P16BC is stored at the same time as DTC P0562, troubleshoot DTC P16BB and/or P16BC first, then recheck for DTC P0562.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check under these conditions:
   - A/C on
   - Temperature control at maximum cool
   - Blower fan at maximum speed
   - Rear window defogger on
   - Headlights on high beam
5. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0562 indicated?

   YES—Replace the alternator (see page 4-39), then go to step 7.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, and check the battery performance (see page 22-56).■
7. Turn the ignition switch ON (II).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Start the engine.
11. Check under these conditions:
    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam
12. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
13. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0562 is indicated, check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

DTC P0563: ECM/PCM Power Source Circuit Unexpected Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Wait 10 seconds.
5. Turn the ignition switch ON (II).
6. Check for Temporary DTCs or DTCs with the HDS.

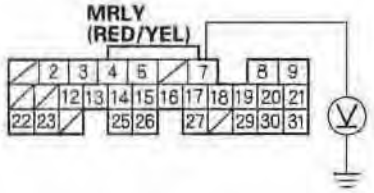
   Is DTC P0563 indicated?

   YES—Go to step 7.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the No. 6 ECU (ECM/PCM) (15 A) fuse in the under-hood fuse/relay box, PGM-FI main relay 1 (FI MAIN), and the ECM/PCM. ■

7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect ECM/PCM connector E (31P).
10. Measure voltage between ECM/PCM connector terminal E7 and body ground.

ECM/PCM CONNECTOR E (31P)



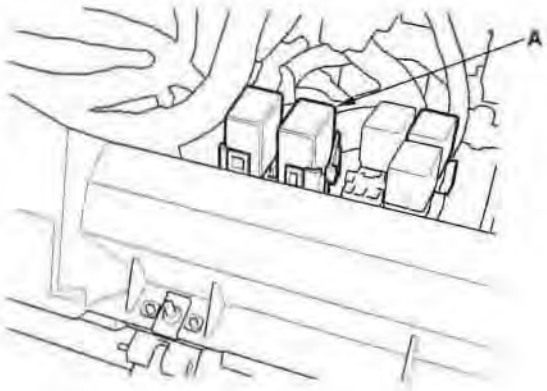
Wire side of female terminals

Is there battery voltage?

YES—Go to step 13.

NO—Go to step 11.

11. Remove the glove box (see page 20-78), then remove PGM-FI main relay 1 (FI MAIN) (A).

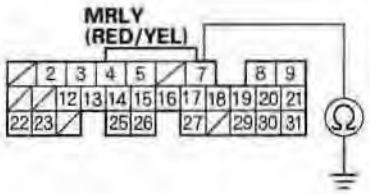


(cont'd)

DTC Troubleshooting (cont'd)

12. Check for continuity between ECM/PCM connector terminal E7 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

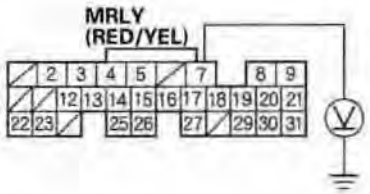
YES—Repair short in the wire between the ECM/PCM (E7) and PGM-FI main relay 1 (FI MAIN), then go to step 20.

NO—Go to step 19.

13. Reconnect ECM/PCM connector E (31P).

14. Measure voltage between ECM/PCM connector terminal E7 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there battery voltage?

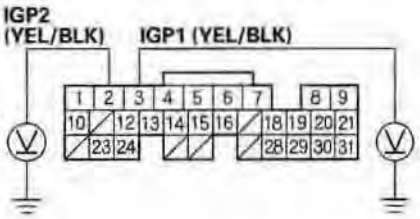
YES—Go to step 15.

NO—Go to step 26.

15. Disconnect ECM/PCM connector A (31P).

16. Measure voltage between body ground and ECM/PCM connector terminals A3 and A2 individually.

ECM/PCM CONNECTOR A (31P)



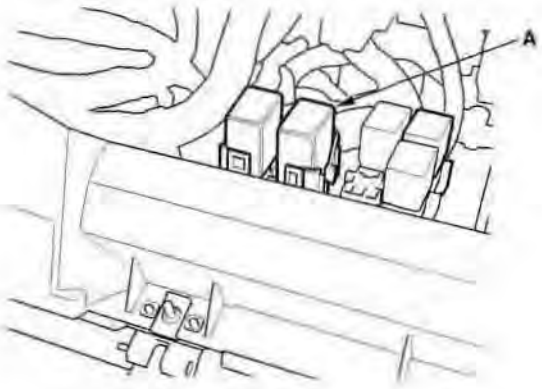
Wire side of female terminals

Is there battery voltage?

YES—Go to step 17.

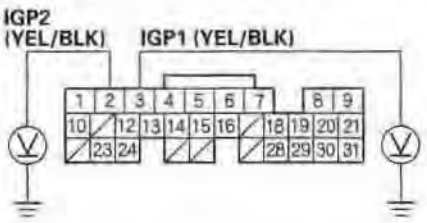
NO—Go to step 27.

17. Remove the glove box (see page 20-78), then remove PGM-FI main relay 1 (FI MAIN) (A).



18. Measure voltage between body ground and ECM/PCM connector terminals A3 and A2 individually.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there battery voltage?

YES—Repair short to power in the wire between the ECM/PCM (A2, A3) and PGM-FI main relay 1 (FI MAIN), then go to step 20.

NO—Go to step 19.

19. Replace PGM-FI main relay 1 (FI MAIN) (A).

20. Reconnect all connectors.
21. Turn the ignition switch ON (II).
22. Clear the DTC with the HDS.
23. Turn the ignition switch OFF.
24. Wait 10 seconds.
25. Do the ECM/PCM idle learn procedure (see page 11-207).
26. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0563 is indicated, check for poor connections or loose terminals at PGM-FI main relay 1 (FI MAIN) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Troubleshooting is complete.■

27. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
28. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0563 is indicated, check for poor connections or loose terminals at PGM-FI main relay 1 (FI MAIN) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0602: ECM/PCM Programming Error

NOTE:
- This DTC is indicated when the ECM/PCM update is not completed.
- Do not turn the ignition switch OFF while updating the ECM/PCM. If you turn the ignition switch OFF before completion, the ECM/PCM can be damaged.

1. Do the ECM/PCM update procedure (see page 11-6).
2. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0602 indicated?

   YES—Replace the original ECM/PCM (see page 11-5). ■

   NO—Update is complete. ■

DTC P0603: ECM/PCM Internal Control Module (Keep Alive Memory (KAM) Error)

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

   NO—Intermittent failure, system is OK at this time. ■

DTC P0606: ECM/PCM Processor Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Wait 40 seconds.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0606 indicated?

   YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

   NO—Intermittent failure, system is OK at this time. ■

DTC Troubleshooting (cont'd)

DTC P0630: VIN Not Programmed or Mismatch

NOTE: This DTC is stored only when the ECM/PCM does not have the VIN information of the vehicle. Use the HDS to fill the missing VIN information.

1. Turn the ignition switch ON (II).
2. Check the VIN with the HDS.

   Does the HDS show the vehicle's VIN?

   YES—Go to step 5.

   NO—Go to step 3.
3. Input the VIN to the ECM/PCM with the HDS.

   Does the screen show COMPLETE?

   YES—Go to step 5.

   NO—Go to step 4.
4. Check for DTCs with the HDS.

   Is DTC P0603 indicated?

   YES—Go to the DTC P0603 troubleshooting.■

   NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■
5. Clear the DTC with the HDS.
6. Turn the ignition switch OFF.
7. Turn the ignition switch ON (II), and wait 5 seconds.
8. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—If DTC P0630 is indicated, update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.■

   NO—Intermittent failure, system is OK at this time.■

DTC P0685: ECM/PCM Power Control Circuit Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, then let it idle 30 seconds.
4. Turn the ignition switch OFF.
5. Start the engine, then let it idle 30 seconds.
6. Turn the ignition switch OFF.
7. Turn the ignition switch ON (II).
8. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0685 indicated?

   YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

   NO—Intermittent failure, system is OK at this time. ■

DTC Troubleshooting (cont'd)

DTC P0720: Output Shaft (Countershaft) Speed Sensor Circuit Malfunction (M/T model)

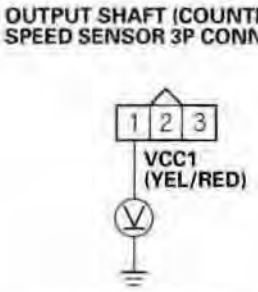
NOTE: This DTC only occurs on M/T vehicles.

1. Start the engine. Hold the engine speed at 3,000 rpm without load (in neutral) until the radiator fan comes on, then let it idle.
2. Test-drive several miles.
3. Check the C SHAFT SPD in the DATA LIST with the HDS.

   Is any vehicle speed indicated?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and the ECM. ■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the output shaft (countershaft) speed sensor 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between output shaft (countershaft) speed sensor 3P connector terminal No. 1 and body ground.



Wire side of female terminals

Is there about 5 V?

YES—Go to step 8.

NO—Repair open in the wire between the ECM (A21) and the output shaft (countershaft) speed sensor, then go to step 17.

8. Measure voltage between output shaft (countershaft) speed sensor 3P connector terminal No. 2 and body ground.

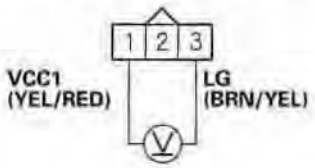
Wire side of female terminals

Is there about 5 V?

YES—Go to step 9.

NO—Go to step 10.

9. Measure voltage between output shaft (countershaft) speed sensor 3P connector terminals No. 1 and No. 3.



Wire side of female terminals

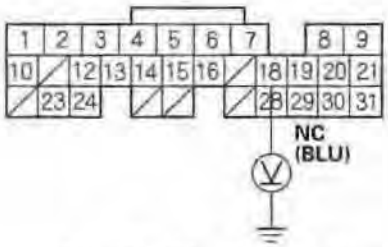
Is there about 5 V?

YES—Go to step 15.

NO—Repair open in the wire between the output shaft (countershaft) speed sensor and G101, then go to step 17.

10. Measure voltage between ECM connector terminal A18 and body ground.

ECM CONNECTOR A (31P)



Wire side of female terminals

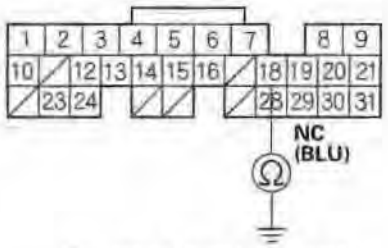
Is there about 5 V?

YES—Repair open in the wire between the ECM (A18) and the output shaft (countershaft) speed sensor, then go to step 17.

NO—Go to step 11.

11. Turn the ignition switch OFF.
12. Jump the SCS line with the HDS.
13. Disconnect ECM connector A (31P).
14. Check for continuity between ECM connector terminal A18 and body ground.

ECM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM (A18) and the output shaft (countershaft) speed sensor, then go to step 17.

NO—Go to step 24.

15. Turn the ignition switch OFF.
16. Replace the output shaft (countershaft) speed sensor (see page 11-168).
17. Reconnect all connectors.
18. Turn the ignition switch ON (II).
19. Reset the ECM with the HDS.
20. Do the ECM idle learn procedure (see page 11-207).
21. Test-drive under these conditions:
    - Engine coolant temperature above 158 °F (70 °C)
    - Transmission in 5th gear
    - Engine speed at 2,000—3,000 rpm
    - Drive for several minutes, then decelerate (with the throttle fully closed) for 8 seconds
22. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0720 is indicated, check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and the ECM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 23.
23. Monitor the OBD STATUS for DTC P0720 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 21 and recheck.

(cont'd)

DTC Troubleshooting (cont'd)

24. Update the ECM if it does not have the latest software, or substitute a known-good ECM (see page 11-6).

25. Test-drive under these conditions:

    - Engine coolant temperature above 158 °F (70 °C)
    - Transmission in 5th gear
    - Engine speed at 2,000—3,000 rpm
    - Drive for several minutes, then decelerate (with the throttle fully closed) for 8 seconds

26. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0720 is indicated, check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and the ECM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM was updated, troubleshooting is complete. If the ECM was substituted, replace the original ECM (see page 11-5).■

DTC P1109: BARO Sensor Circuit Out of Range High

1. Reset the ECM/PCM with the HDS.

2. Start the engine.

3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1109 indicated?

   YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

   NO—Intermittent failure, system is OK at this time.■

DTC P1121: TP Sensor Signal Lower Than Expected

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Open the throttle fully.
4. Check the TP SENSOR in the DATA LIST with the HDS.

   Does the throttle position show less than 4.0 ° (REL) (14 % (REL)) for 5 seconds?

   YES—Go to step 8.

   NO—Go to step 5.
5. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
6. Test-drive the vehicle at 16 mph (25 km/h) or more, and at 1,400 rpm or more.
7. Monitor the OBD STATUS for DTC P1121 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 8.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 5 and recheck.
8. Turn the ignition switch OFF.
9. Replace the throttle body (the TP sensor is not available separately) (see page 11-235).
10. Turn the ignition switch ON (II).
11. Reset the ECM/PCM with the HDS.
12. Do the ECM/PCM idle learn procedure (see page 11-207).
13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
14. Test-drive the vehicle at 16 mph (25 km/h) or more, and at 1,400 rpm or more.
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1121 is indicated, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 16.
16. Monitor the OBD STATUS for DTC P1121 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 13 and recheck.

DTC Troubleshooting (cont'd)

DTC P1122: TP Sensor Signal Higher Than Expected

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check the TP SENSOR in the DATA LIST with the HDS.

   Does the throttle position show less than 6.4 ° (REL) (16 % (REL)) for 5 seconds?

   YES—Go to step 8.

   NO—Go to step 5.
5. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
6. Test-drive the vehicle at 16 mph (25 km/h) or more, and at 1,400 rpm or more.
7. Monitor the OBD STATUS for DTC P1122 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 8.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 5 and recheck.
8. Turn the ignition switch OFF.
9. Replace the throttle body (the TP sensor is not available separately) (see page 11-235).
10. Turn the ignition switch ON (II).
11. Reset the ECM/PCM with the HDS.
12. Do the ECM/PCM idle learn procedure (see page 11-207).
13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
14. Test-drive the vehicle at 16 mph (25 km/h) or more, and at 1,400 rpm or more.
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1122 is indicated, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 16.
16. Monitor the OBD STATUS for DTC P1122 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the TP sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 13 and recheck.

DTC P1128: MAP Sensor Signal Lower Than Expected

1. Turn the ignition switch ON (II).
2. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is less than 54.1 kPa (16.0 in.Hg, 406 mmHg) or 1.61 V held for more than 5 seconds?

   YES—Go to step 7.

   NO—Go to step 3.
3. Clear the DTC with the HDS.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Test-drive under these conditions:

   - Engine coolant temperature above 158 °F (70 °C)
   - Engine speed between 1,400 and 6,500 rpm
   - A/T in D position (M/T in 3rd gear)
   - Vehicle speed accelerated from 16 mph (25 km/h) to 31 mph (50 km/h) under half throttle
6. Monitor the OBD STATUS for DTC P1128 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 7.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 4 and recheck.
7. Turn the ignition switch OFF.
8. Replace the MAP sensor (see page 11-169).
9. Turn the ignition switch ON (II).
10. Reset the ECM/PCM with the HDS.
11. Do the ECM/PCM idle learn procedure (see page 11-207).
12. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
13. Test-drive under these conditions:

    - Engine coolant temperature above 158 °F (70 °C)
    - Engine speed between 1,400 and 6,500 rpm
    - A/T in D position (M/T in 3rd gear)
    - Vehicle speed accelerated from 16 mph (25 km/h) to 31 mph (50 km/h) under half throttle
14. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1128 is indicated, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 15.
15. Monitor the OBD STATUS for DTC P1128 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 13 and recheck.

DTC Troubleshooting (cont'd)

DTC P1129: MAP Sensor Signal Higher Than Expected

1. Check for vacuum leaks in these parts:

   - PCV valve
   - PCV hose
   - EVAP canister purge valve
   - Throttle body
   - Brake booster hose

   Are the parts OK?

   YES—Go to step 2.

   NO—Repair or replace leaking parts, then go to step 9.

2. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

3. Check the MAP SENSOR in the DATA LIST with the HDS.

   Is more than 36.9 kPa (11.0 in.Hg, 277 mmHg) or 1.1 V held for more than 5 seconds?

   YES—Go to step 7.

   NO—Go to step 4.

4. Clear the DTC with the HDS.

5. Test-drive under these conditions:

   - Engine coolant temperature above 158 °F (70 °C)
   - Engine speed between 1,400 and 6,500 rpm
   - A/T in D position (M/T in 5th gear)
   - Vehicle speed decelerated from more than 50 mph (80 km/h) with the throttle fully closed for at least 5 seconds

6. Monitor the OBD STATUS for DTC P1129 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 7.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 5 and recheck.

7. Turn the ignition switch OFF.

8. Replace the MAP sensor (see page 11-169).

9. Turn the ignition switch ON (II).

10. Clear the ECM/PCM with the HDS.

11. Do the ECM/PCM idle learn procedure (see page 11-207).

12. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

13. Test-drive under these conditions:

    - Engine coolant temperature above 158 °F (70 °C)
    - Engine speed between 1,400 and 6,500 rpm
    - A/T in D position (M/T in 5th gear)
    - Vehicle speed decelerated from more than 50 mph (80 km/h) with the throttle fully closed for at least 5 seconds

14. Check for Temporary DTCs or DTC with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1129 is indicated, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 15.

15. Monitor the OBD STATUS for DTC P1129 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the MAP sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 12 and recheck.

DTC P1157: A/F Sensor (Sensor 1) Line High Voltage

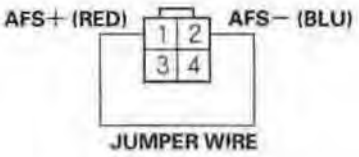
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1157 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect the A/F sensor (Sensor 1) 4P connector.
8. Disconnect ECM/PCM connector A (31P).
9. Connect A/F sensor (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.

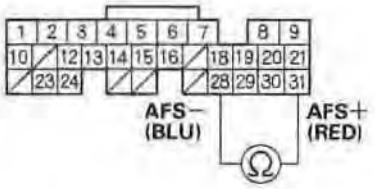
A/F SENSOR (SENSOR 1) 4P CONNECTOR



Wire side of female terminals

10. Check for continuity between ECM/PCM connector terminals A28 and A31.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

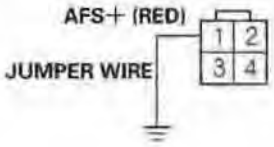
Is there continuity?

YES—Go to step 14.

NO—Go to step 11.

11. Remove the jumper wire from the A/F sensor (Sensor 1) 4P connector.
12. Connect A/F sensor (Sensor 1) 4P connector terminal No. 1 to body ground with a jumper wire.

A/F SENSOR (SENSOR 1) 4P CONNECTOR

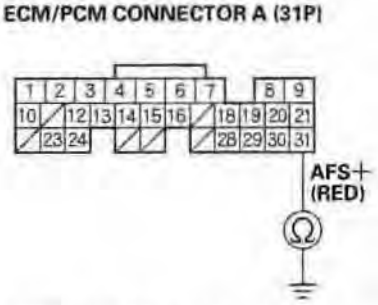


Wire side of female terminals

(cont'd)

DTC Troubleshooting (cont'd)

13. Check for continuity between ECM/PCM connector terminal A31 and body ground.



Is there continuity?

YES—Repair open in the wire between the ECM/PCM (A28) and the A/F sensor (Sensor 1), then go to step 15.

NO—Repair open in the wire between the ECM/PCM (A31) and the A/F sensor (Sensor 1), then go to step 15.

14. Replace the A/F sensor (Sensor 1) (see page 11-165).

15. Reconnect ECM/PCM connector A (31P).

16. Turn the ignition switch ON (II).

17. Reset the ECM/PCM with the HDS.

18. Do the ECM/PCM idle learn procedure (see page 11-207).

19. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P1157 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the connector and terminal fits are OK, go to step 21. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P1157 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete.■

NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 19 and recheck.

21. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

22. Check for Temporary DTCs or DTCs with the HDS.

Is DTC P1157 indicated?

YES—Go to step 20 and recheck.

NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P1172: A/F Sensor (Sensor 1) Circuit Out of Range High

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Monitor the OBD STATUS for DTC P1172 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 5.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
5. Turn the ignition switch OFF.
6. Replace the A/F sensor (Sensor 1) (see page 11-165).
7. Turn the ignition switch ON (II).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
11. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1172 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 12.
12. Monitor the OBD STATUS for DTC P1172 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 10 and recheck.

DTC Troubleshooting (cont'd)

DTC P1297: ELD Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the ELD in the DATA LIST with the HDS.

   Is 72 A or more indicated?

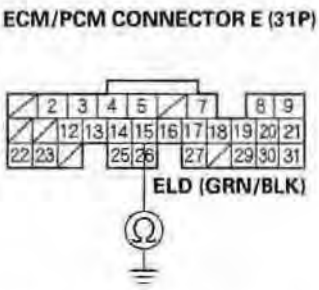
   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the ELD and the ECM/PCM. ■
3. Turn the ignition switch OFF.
4. Disconnect the ELD 3P connector.
5. Turn the ignition switch ON (II).
6. Check the ELD in the DATA LIST with the HDS.

   Is 72 A or more indicated?

   YES—Go to step 7.

   NO—Go to step 11.
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect ECM/PCM connector E (31P).
10. Check for continuity between ECM/PCM connector terminal E15 and body ground.



Wire side of female terminals

   Is there continuity?

   YES—Repair short in the wire between the ECM/PCM (E15) and the ELD, then go to step 13.

   NO—Go to step 20.
11. Turn the ignition switch OFF.
12. Replace the under-hood fuse/relay box (see page 22-71).
13. Reconnect all connectors.
14. Turn the ignition switch ON (II).
15. Reset the ECM/PCM with the HDS.
16. Do the ECM/PCM idle learn procedure (see page 11-207).
17. Start the engine.
18. Turn on the headlights.
19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1297 is indicated, check for poor connections or loose terminals at the ELD and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

20. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

21. Start the engine.

22. Turn on the headlights.

23. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1297 is indicated, check for poor connections or loose terminals at the ELD and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P1298: ELD Circuit High Voltage

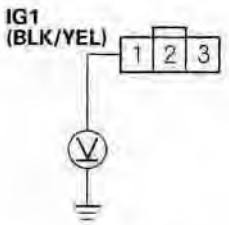
1. Start the engine, and let it idle.
2. Check the ELD in the DATA LIST with the HDS.

   Is 0.2 A or less indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the ELD and the ECM/PCM.■
3. Turn the ignition switch OFF.
4. Disconnect the ELD 3P connector.
5. Turn the ignition switch ON (II).
6. Measure voltage between ELD 3P connector terminal No. 1 and body ground.

ELD 3P CONNECTOR



Wire side of female terminals

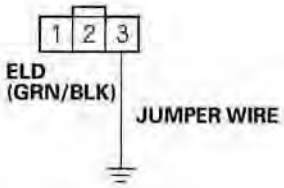
Is there battery voltage?

YES—Go to step 7.

NO—Repair open in the wire between the No. 4 ACG (10 A) fuse and the ELD, then go to step 14.

7. Turn the ignition switch OFF.
8. Connect ELD 3P connector terminal No. 3 to body ground with a jumper wire.

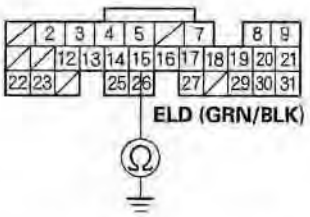
ELD 3P CONNECTOR



Wire side of female terminals

9. Jump the SCS line with the HDS.
10. Disconnect ECM/PCM connector E (31P).
11. Check for continuity between ECM/PCM connector terminal E15 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

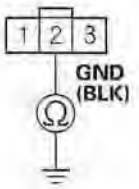
Is there continuity?

YES—Go to step 12.

NO—Repair open in the wire between the ECM/PCM (E15) and the ELD, then go to step 14.

12. Check for continuity between ELD 3P connector terminal No. 2 and body ground.

ELD 3P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 13.

NO—Repair open in the wire between the ELD and G301, then go to step 14.

13. Replace the under-hood fuse/relay box (see page 22-71).

14. Reconnect all connectors.

15. Turn the ignition switch ON (II).

16. Reset the ECM/PCM with the HDS.

17. Do the ECM/PCM idle learn procedure (see page 11-207).

18. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—Go to step 19.

NO—Troubleshooting is complete.■

19. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

20. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P1298 is indicated, check for poor connections or loose terminals at the ELD and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P1549: Charging System High Voltage

NOTE: This DTC can be stored, if a high voltage battery (24 V, etc.) is connected to the vehicle.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check under these conditions:
   - A/C off
   - Headlights off
   - Rear window defogger off
5. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1549 indicated?

   YES—Replace the alternator (see page 4-39), then go to step 7.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box.■
7. Turn the ignition switch ON (II).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Start the engine.
11. Check under these conditions:
    - A/C off
    - Headlights off
    - Rear window defogger off
12. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
13. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES— If DTC P1549 is indicated, check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

DTC P16BB: Alternator B Terminal Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with HDS.
3. Start the engine.
4. Check under these conditions:
   - A/C on
   - Temperature control at maximum cool
   - Blower fan at maximum speed
   - Rear window defogger on
   - Headlights on high beam
5. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
6. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P16BB indicated?

   YES—Go to step 7.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, and check the battery performance (see page 22-56).■
7. Check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box (+B line).

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Reconnect the connectors or terminals, then go to step 9.
8. Check for an open in the wire between the alternator and under fuse/relay box at the starter subharness.

   Is the harness OK?

   YES—Replace the alternator (see page 4-39), then go to step 9.

   NO—Repair open in the wire between the alternator and the under-hood fuse/relay box, then go to step 9.
9. Turn the ignition switch ON (II).
10. Reset the ECM/PCM with the HDS.
11. Do the ECM/PCM idle learn procedure (see page 11-207).
12. Start the engine.
13. Check under these conditions:
    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam
14. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P16BB is indicated, check for poor connections or loose terminals at the alternator and the under-hood fuse/relay box, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

DTC Troubleshooting (cont'd)

DTC P16BC: Alternator FR Terminal Circuit/ IGP Circuit Low Voltage

1. Check for poor connections at the alternator 4P connector.

   Are the connections OK?

   YES—Go to step 2.

   NO—Reconnect the connector, then go to step 18.

2. Turn the ignition switch ON (II).
3. Clear the DTC with the HDS.
4. Start the engine.
5. Check under these conditions:
   - A/C on
   - Temperature control at maximum cool
   - Blower fan at maximum speed
   - Rear window defogger on
   - Headlights on high beam
6. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
7. Check for Temporary DTCs or DTCs with the HDS.

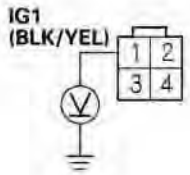
   Is DTC P16BC indicated?

   YES—Go to step 8.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the alternator. ■

8. Turn the ignition switch OFF.
9. Disconnect the alternator 4P connector.
10. Turn the ignition switch ON (II).
11. Measure voltage between alternator 4P connector terminal No. 1 and body ground.

ALTERNATOR 4P CONNECTOR



Wire side of female terminals

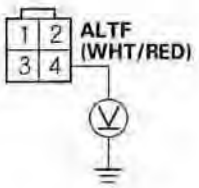
Is there battery voltage?

YES—Go to step 12.

NO—Repair open in the wire between the alternator (IG1 line) and the No. 4 ACG (10 A) fuse in under-dash fuse/relay box, then go to step 18.

12. Measure voltage between alternator 4P connector terminal No. 4 and body ground.

ALTERNATOR 4P CONNECTOR



Wire side of female terminals

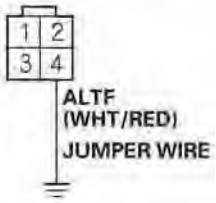
Is there about 5 V?

YES—Replace the alternator (see page 4-39), then go to step 18.

NO—Go to step 13.

13. Turn the ignition switch OFF.
14. Jump the SCS line with the HDS.
15. Disconnect ECM/PCM connector B (24P).
16. Connect alternator 4P connector terminal No. 4 to body ground with a jumper wire.

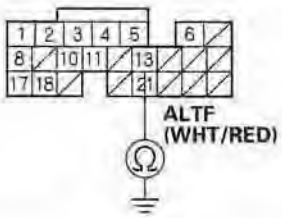
ALTERNATOR 4P CONNECTOR



Wire side of female terminals

17. Check for coutinuity between ECM/PCM connector terminal B13 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Go to step 26.

NO—Repair open in the wire between the ECM/PCM (B13) and the alternator, then go to step 18.

18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the ECM/PCM with the HDS.
21. Do the ECM/PCM idle learn procedure (see page 11-207).
22. Start the engine.
23. Check under these conditions:
    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam
24. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.
25. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P16BC is indicated, check for poor connections or loose terminals at the alternator and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

(cont'd)

DTC Troubleshooting (cont'd)

26. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

27. Start the engine.

28. Check under these conditions:

    - A/C on
    - Temperature control at maximum cool
    - Blower fan at maximum speed
    - Rear window defogger on
    - Headlights on high beam

29. Hold the engine speed at 2,000 rpm (in Park or neutral) for 1 minute.

30. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P16BC is indicated, check for poor connections or loose terminals at the alternator and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P2195: A/F Sensor (Sensor 1) Signal Stuck Lean

NOTE: If the vehicle was out of fuel and the engine stalled before this DTC was stored, refuel, and clear the DTC with the HDS.

1. Inspect the condition of the A/F sensor (Sensor 1).

   Is it loose in the exhaust pipe?

   YES—Go to step 2.

   NO—Go to step 4.

2. Turn the ignition switch OFF.

3. Reinstall the A/F sensor (Sensor 1) (see page 11-165).

4. Turn the ignition switch ON (II).

5. Reset the ECM/PCM with the HDS.

6. Do the ECM/PCM idle learn procedure (see page 11-207).

7. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—If DTC P2195 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the connection and terminal fits are OK, go to step 9. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 8.

8. Monitor the OBD STATUS for DTC P2195 in the DTCs MENU with the HDS.

   Does the screen indicate PASSED?

   YES—Troubleshooting is complete. ■

   NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 2. If the screen indicates NOT COMPLETED, go to step 5 and recheck.

9. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM.

10. Start the engine, and run it at 3,000 rpm without load (A/T in Park or neutral) until the radiator fan comes on.

11. Let the engine idle for 2 minutes.

12. Check for temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2195 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. ■

    NO—Troubleshooting is complete. ■

DTC Troubleshooting (cont'd)

DTC P2227: BARO Sensor Range/ Performance Problem

NOTE: If DTC P0122, P0123, P1121, P1122, P0107, P0108, P1128 and/or P1129 are stored at the same time as DTC P2227, troubleshoot those DTCs first, then recheck for DTC P2227.

1. Turn the ignition switch ON (II), and wait 2 seconds.
2. Check the BARO SENSOR in the DATA LIST with the HDS.

   Is it about 101 kPa (29.9 in.Hg, 760 mmHg), or about 2.9 V at sea level?

   YES—Go to step 3.

   NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■
3. Clear the DTC with the HDS.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
5. Test-drive under these conditions:

   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 4th gear)
   - Throttle position between 12 ° and 20 ° for 2 seconds
6. Monitor the OBD STATUS for DTC P2227 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 7.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 4 and recheck.
7. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2227 is indicated, check for poor connections or loose terminals at the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P2228: BARO Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Check the BARO SENSOR in the DATA LIST with the HDS.

   Is about 53 kPa (15.6 in.Hg, 397 mmHg), or 1.58 V or less indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time.■
3. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
4. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—If DTC P2228 is indicated, check for poor connections or loose terminals at the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

   NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P2229: BARO Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Check the BARO SENSOR in the DATA LIST with the HDS.

   Is about 160 kPa (47.2 in.Hg, 1200 mmHg), or 4.5 V or more indicated?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time.■
3. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
4. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—If DTC P2229 is indicated, check for poor connections or loose terminals at the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

   NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

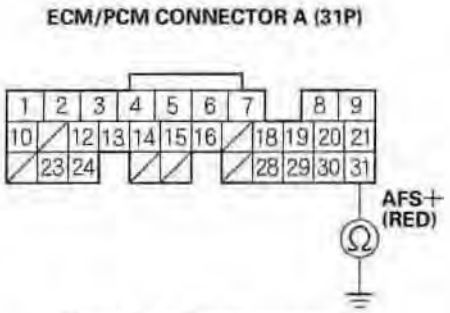
DTC P2238: A/F Sensor (Sensor 1) AFS+ Line Low Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2238 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. ■
4. Turn the ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect the A/F sensor (Sensor 1) 4P connector.
7. Disconnect ECM/PCM connector A (31P).
8. Check for continuity between ECM/PCM connector terminal A31 and body ground.



   Is there continuity?

   YES—Repair short in the wire between the ECM/PCM (A31) and the A/F sensor (Sensor 1), then go to step 10.

   NO—Go to step 9.
9. Replace the A/F sensor (Sensor 1) (see page 11-165).
10. Reconnect all connectors.
11. Turn the ignition switch ON (II).
12. Reset the ECM/PCM with the HDS.
13. Do the ECM/PCM idle learn procedure (see page 11-207).
14. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2238 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. If the connector and terminal fits are OK, go to step 16. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 15.
15. Monitor the OBD STATUS for DTC P2238 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 13 and recheck.
16. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
17. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2238 indicated?

    YES—Go to step 1 and recheck.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC P2252: A/F Sensor (Sensor 1) AFS— Line Low Voltage

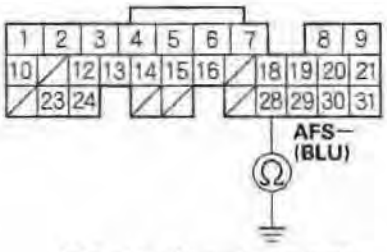
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2252 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect the A/F sensor (Sensor 1) 4P connector.
8. Disconnect ECM/PCM connector A (31P).
9. Check for continuity between ECM/PCM connector terminal A28 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A28) and the A/F sensor (Sensor 1), then go to step 11.

NO—Go to step 10.

10. Replace the A/F sensor (Sensor 1) (see page 11-165).
11. Reconnect all connectors.
12. Turn the ignition switch ON (II).
13. Reset the ECM/PCM with the HDS.
14. Do the ECM/PCM idle learn procedure (see page 11-207).
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2252 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. If the connector and terminal fits are OK, go to step 17. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 16.
16. Monitor the OBD STATUS for DTC P2252 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 14 and recheck.
17. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
18. Check for Temporary DTCs or DTCs with the HDS.

    Is DTC P2252 indicated?

    YES—Go to step 1 and recheck.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P2270: Secondary HO2S (Sensor 2) Circuit Signal Stuck Lean

DTC P2271: Secondary HO2S (Sensor 2) Circuit Signal Stuck Rich

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 176 °F (80 °C)
   - Vehicle speed between 35 mph (56 km/h) and 55 mph (88 km/h)
   - Drive 1 minute or more
5. Monitor the OBD STATUS for DTC P2270 or P2271 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the secondary HO2S (Sensor 2) (see page 11-165).
8. Turn the ignition switch ON (II).
9. Reset the ECM/PCM with the HDS.
10. Do the ECM/PCM idle learn procedure (see page 11-207).
11. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
12. Test-drive under these conditions:
    - Engine coolant temperature above 176 °F (80 °C)
    - Vehicle speed between 35 mph (56 km/h) and 55 mph (88 km/h)
    - Drive 1 minute or more
13. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2270 or P2271 is indicated, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P2270 or P2271 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the secondary HO2S (Sensor 2) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 11 and recheck.

DTC P2A00: A/F Sensor (Sensor 1) Range/ Performance Problem

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 3rd gear)
   - Vehicle speed at 26 mph (41 km/h) or more, and engine speed at 3,250 rpm or less
   - Drive with the throttle fully opened for 5 seconds from an engine speed of 1,600 rpm, then slow down with the throttle completely closed.
5. Monitor the OBD STATUS for DTC P2A00 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 3 and recheck.
6. Turn the ignition switch OFF.
7. Replace the A/F sensor (Sensor 1) (see page 11-165).
8. Turn the ignition switch ON (II).
9. Reset the ECM/PCM with the HDS.
10. Do the ECM/PCM idle learn procedure (see page 11-207).
11. Test-drive under these conditions:
    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 3rd gear)
    - Vehicle speed at 26 mph (41 km/h) or more, and engine speed at 3,250 rpm or less
    - Drive with the throttle fully opened for 5 seconds from an engine speed of 1,600 rpm, then slow down with the throttle completely closed.
12. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2A00 is indicated, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 13.
13. Monitor the OBD STATUS for DTC P2A00 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the A/F sensor (Sensor 1) and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 10 and recheck.

MIL Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Do the gauge self-diagnostic procedure (see page 22-62).

   Does the MIL flash?

   YES—Go to step 3.

   NO—Substitute a known-good gauge assembly, and recheck. If the MIL circuit is OK, replace the original gauge assembly. ■
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II), and watch the MIL.

   Does the MIL stay off?

   YES—Go to step 19.

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Turn the ignition switch ON (II), wait 20 seconds, and watch the MIL.

   Does the MIL stay on or flash more than 5 times?

   YES—Go to step 7.

   NO—The MIL circuit is OK. ■
7. Turn the ignition switch OFF.
8. Connect the HDS (see page 11-3).
9. Turn the ignition switch ON (II), and read the HDS.

   Does the HDS communicate with the ECM/PCM?

   YES—Go to step 10.

   NO—Go to "DLC Circuit Troubleshooting" (see page 11-161).
10. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—Go to the indicated DTC's troubleshooting.

    NO—Go to step 11.
11. Check the MIL in the DATA LIST with the HDS.

    Is ON indicated?

    YES—Go to step 12.

    NO—Substitute a known-good gauge assembly, and recheck. If the MIL circuit is OK, replace the original gauge assembly. ■
12. Check the SCS in the DATA LIST with the HDS.

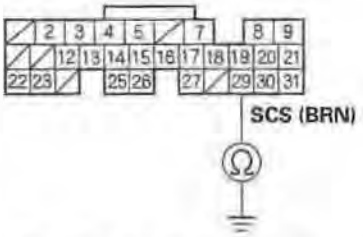
    Is a short indicated?

    YES—Go to step 13.

    NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■
13. Turn the ignition switch OFF.
14. Jump the SCS line with the HDS.
15. Disconnect ECM/PCM connector E (31P) and the HDS.

16. Check for continuity between ECM/PCM connector terminal E29 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

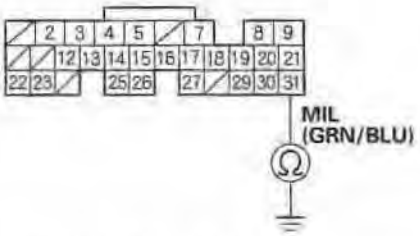
YES—Repair short in the wire between the ECM/PCM (E29) and the DLC. ■

NO—Go to step 17.

17. Disconnect gauge assembly connector B (16P).

18. Check for continuity between ECM/PCM connector terminal E31 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E31) and the gauge assembly. ■

NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

19. Try to start the engine.

Does the engine start?

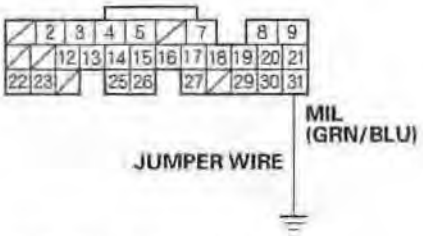
YES—Go to step 20.

NO—Go to step 26.

20. Turn the ignition switch OFF.

21. Connect ECM/PCM connector terminal E31 to body ground with a jumper wire.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

22. Turn the ignition switch ON (II).

Is the MIL on?

YES—Go to step 23.

NO—Check for an open in the wire between the ECM/PCM (E31) and the gauge assembly. ■

23. Turn the ignition switch OFF.

24. Connect the HDS (see page 11-3).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

25. Turn the ignition switch ON (II), and read the HDS.

    Does the HDS communicate with the ECM/PCM?

    YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

    NO—Go to "DLC Circuit Troubleshooting" (see page 11-161).

26. Turn the ignition switch OFF.

27. Inspect the No. 20 IG (50 A) fuse in the under-hood fuse/relay box.

    Is the fuse OK?

    YES—Check for an open in the wire between the No. 20 IG (50 A) fuse and the ignition switch. If the wire is OK, go to step 28.

    NO—Repair short in the wire between No. 20 IG (50 A) fuse and the under-hood fuse/relay box. Also replace the No. 20 IG (50 A) fuse.■

28. Inspect the No. 6 ECU (ECM/PCM) (15 A) fuse in the under-hood fuse/relay box.

    Is the fuse OK?

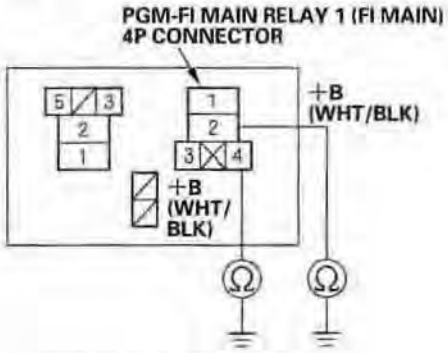
    YES—Go to step 35.

    NO—Go to step 29.

29. Remove the blown No. 6 ECU (ECM/PCM) (15 A) fuse from the under-hood fuse/relay box.

30. Remove the glove box (see page 20-78) and PGM-FI main relay 1 (FI MAIN) (A).

31. Check for continuity between body ground and PGM-FI main relay 1 (FI MAIN) 4P connector terminals No. 2 and No. 4 individually.



Wire side of female terminals

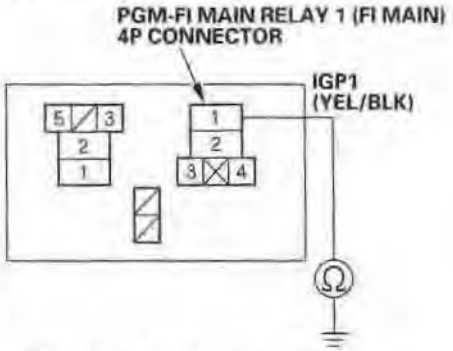
Is there continuity?

YES—Repair short in the wire between the No. 6 ECU (ECM/PCM) (15 A) fuse and PGM-FI main relay 1 (FI MAIN). Also replace the No. 6 ECU (ECM/PCM) (15 A) fuse.■

NO—Go to step 32.

32. Disconnect each of the components or connectors below, one at a time, and check for continuity between PGM-FI main relay 1 (FI MAIN) 4P connector terminal No. 1 and body ground.

- PGM-FI main relay 2 (FUEL PUMP)
- ECM/PCM connector A (31P)
- Each injector 2P connector
- Idle air control (IAC) valve 3P connector
- Camshaft position (CMP) sensor B 3P connector
- Crankshaft position (CKP) sensor 3P connector



Wire side of female terminals

Is there continuity?

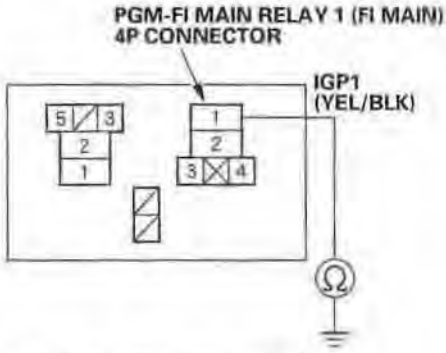
YES—Go to step 33.

NO—Replace the component that made the short to body ground go away when disconnected. If the item is the ECM/PCM, update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). Also replace the No. 6 ECU (ECM/PCM) (15 A) fuse. ■

33. Disconnect the connectors from these components:

- PGM-FI main relay 2 (FUEL PUMP)
- ECM/PCM connector A (31P)
- Injectors
- Idle air control (IAC) valve
- Camshaft position (CMP) sensor B
- Crankshaft position (CKP) sensor

34. Check for continuity between PGM-FI main relay 1 (FI MAIN) 4P connector terminal No. 1 and body ground.



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between PGM-FI main relay 1 (FI MAIN) and each item. Also replace the No. 6 ECU (ECM/PCM) (15 A) fuse. ■

NO—Replace PGM-FI main relay 1 (FI MAIN). Also replace the No. 6 ECU (ECM/PCM) (15 A) fuse. ■

35. Inspect the No. 17 FUEL PUMP (15 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES—Go to step 48.

NO—Go to step 36.

36. Remove the blown No. 17 FUEL PUMP (15 A) fuse from the under-dash fuse/relay box.

37. Jump the SCS line with the HDS.

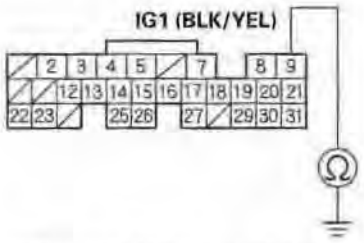
38. Disconnect ECM/PCM connector E (31P).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

39. Check for continuity between ECM/PCM connector terminal E9 and body ground.

ECM/PCM CONNECTOR E (31P)



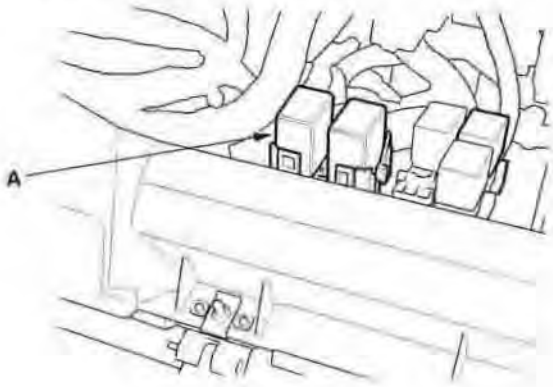
Wire side of female terminals

Is there continuity?

YES—Go to step 40.

NO—Replace the No. 17 FUEL PUMP (15 A) fuse, and update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

40. Remove the glove box (see page 20-78), and remove PGM-FI main relay 2 (FUEL PUMP) (A) from the under-hood fuse/relay box.



41. Check for continuity between ECM/PCM connector terminal E9 and body ground.

ECM/PCM CONNECTOR E (31P)

Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the No. 17 FUEL PUMP (15 A) fuse and the ECM/PCM (E9), or between the No. 17 FUEL PUMP (15 A) fuse and PGM-FI main relay 2 (FUEL PUMP). Also replace the No. 17 FUEL PUMP (15 A) fuse.■

NO—Go to step 42.

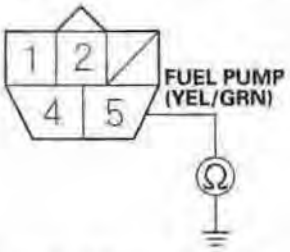
42. Remove the center console (see page 20-71), the cargo floor covering (see page 20-69), and both door sill trims (see page 20-58).

43. Fold back the floor covering until the access panel is accessible.

44. Disconnect the fuel pump 5P connector.

45. Check for continuity between fuel pump 5P connector terminal No. 5 and body ground.

FUEL PUMP 5P CONNECTOR



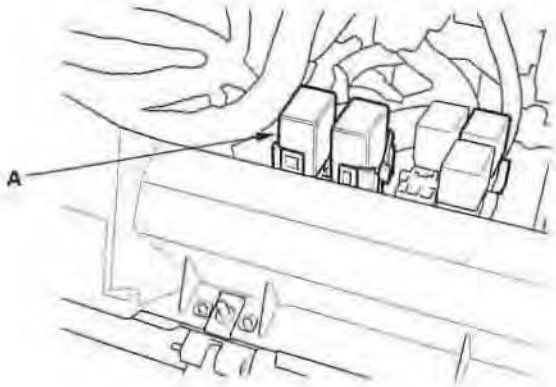
Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the fuel pump and PGM-FI main relay 2 (FUEL PUMP). Also replace the No. 17 FUEL PUMP (15 A) fuse. ■

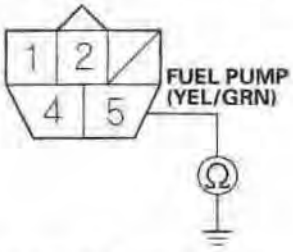
NO—Go to step 46.

46. Reinstall PGM-FI main relay 2 (FUEL PUMP) (A).



47. Check for continuity between fuel pump 5P connector terminal No. 5 and body ground.

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Replace PGM-FI main relay 2 (FUEL PUMP). Also replace the No. 17 FUEL PUMP (15 A) fuse. ■

NO—Check the fuel pump, and replace it if necessary. Also replace the No. 17 FUEL PUMP (15 A) fuse. ■

48. Jump the SCS line with the HDS.

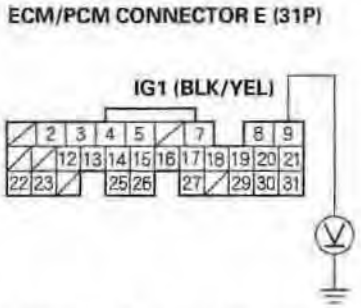
49. Disconnect ECM/PCM connector E (31P).

50. Turn the ignition switch ON (II).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

51. Measure voltage between ECM/PCM connector terminal E9 and body ground.



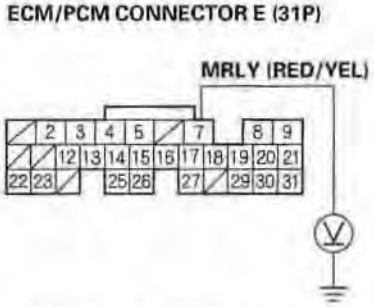
Wire side of female terminals

Is there battery voltage?

YES—Go to step 52.

NO—Repair open in the wire between the No. 17 FUEL PUMP (15 A) fuse and the ECM/PCM (E9). ■

52. Measure voltage between ECM/PCM connector terminal E7 and body ground.



Wire side of female terminals

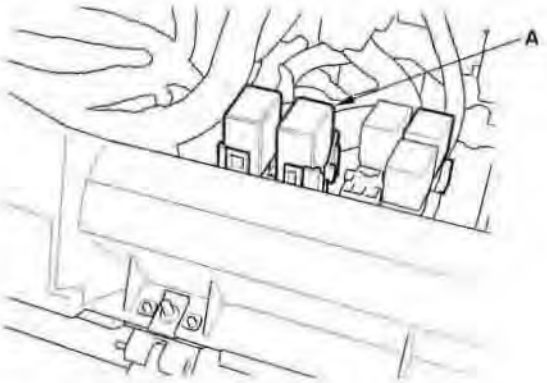
Is there battery voltage?

YES—Go to step 57.

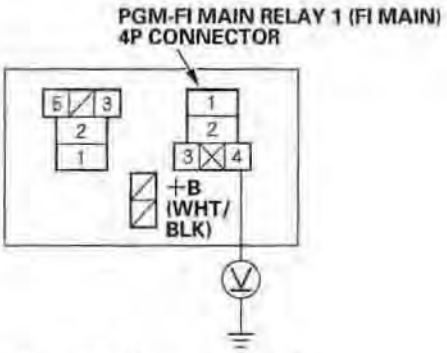
NO—Go to step 53.

53. Turn the ignition switch OFF.

54. Remove the glove box (see page 20-78), then remove PGM-FI main relay 1 (FI MAIN) (A) from the under-hood fuse/relay box.



55. Measure voltage between PGM-FI main relay 1 (FI MAIN) 4P connector terminal No. 4 and body ground.



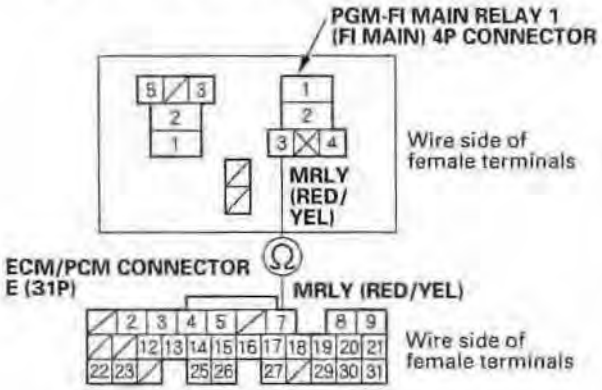
Wire side of female terminals

Is there battery voltage?

YES—Go to step 56.

NO—Repair open in the wire between the No. 6 ECU (ECM/PCM) (15 A) fuse and PGM-FI main relay 1 (FI MAIN). ■

56. Check for continuity between PGM-FI main relay 1 (FI MAIN) 4P connector terminal No. 3 and ECM/PCM connector terminal E7.



Is there continuity?

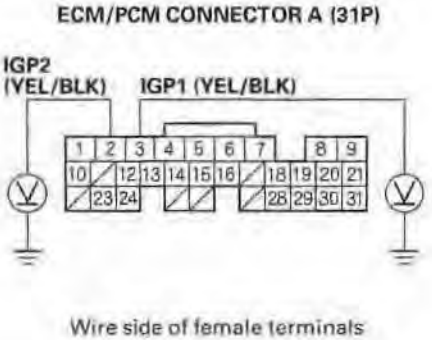
YES—Test PGM-FI main relay 1 (FI MAIN) (see page 22-57). If the relay is OK, update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

NO—Repair open in the wire between PGM-FI main relay 1 (FI MAIN) and the ECM/PCM (E7). ■

57. Reconnect ECM/PCM connector E (31P).

58. Turn the ignition switch ON (II).

59. Measure voltage between body ground and ECM/PCM connector terminals A2 and A3 individually.



Is there battery voltage?

YES—Go to step 66.

NO—Go to step 60.

60. Turn the ignition switch OFF.

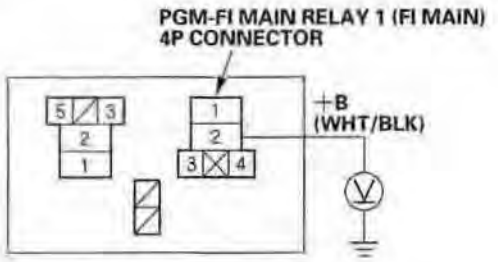
61. Remove PGM-FI main relay 1 (FI MAIN) (A).

62. Turn the ignition switch ON (II).

(cont'd)

MIL Circuit Troubleshooting (cont'd)

63. Measure voltage between PGM-FI main relay 1 (FI MAIN) 4P connector terminal No. 2 and body ground.



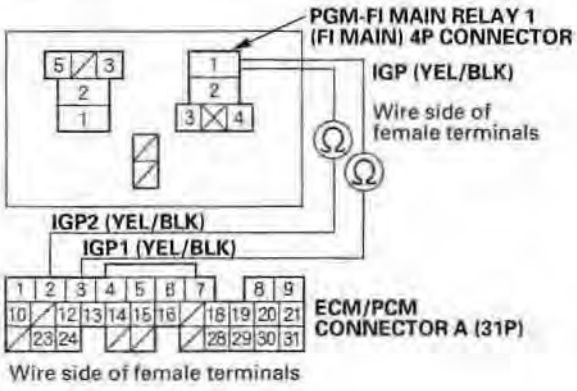
Is there battery voltage?

YES—Go to step 64.

NO—Repair open in the wire between the No. 6 ECU (ECM/PCM) (15 A) fuse and PGM-FI main relay 1 (FI MAIN). ■

64. Turn the ignition switch OFF.

65. Check for continuity between PGM-FI main relay 1 (FI MAIN) 4P connector terminal No. 1 and ECM/PCM connector terminals A2 and A3 individually.

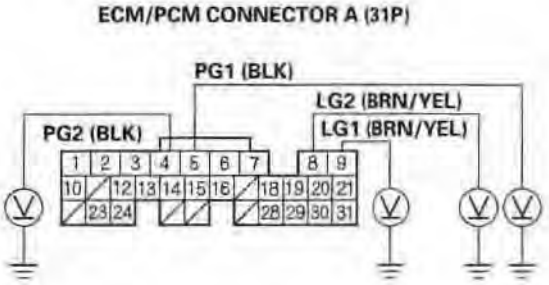


Is there continuity?

YES—Replace PGM-FI main relay 1 (FI MAIN). ■

NO—Repair open in the wire between PGM-FI main relay 1 (FI MAIN) and the ECM/PCM (A2, A3). ■

66. Measure voltage between body ground and ECM/PCM connector terminals A4, A5, A8, and A9 individually.



Is there more than 0.2 V?

YES—Repair open in the wire(s) that had more than 0.2 V between G101 and the ECM/PCM (A4, A5, A8, A9). ■

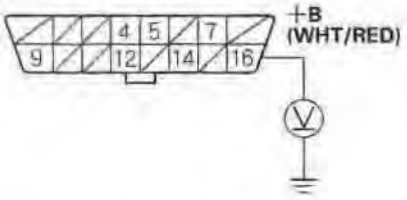
NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

DLC Circuit Troubleshooting

NOTE:
- If the ECM/PCM does not communicate with the HDS or I/M test equipment, do this troubleshooting procedure.
- Check that MIL circuit is normal, then do this troubleshooting.

1. Measure voltage between DLC terminal No. 16 and body ground.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

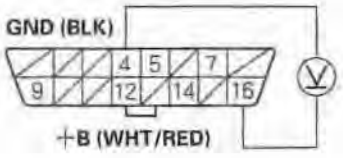
Is there battery voltage?

YES—Go to step 2.

NO—Repair open in the wire between DLC terminal No. 16 and the No. 9 BACK UP (10 A) fuse in the under-hood fuse/relay box. ■

2. Measure voltage between DLC terminals No. 4 and No. 16.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

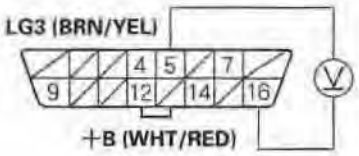
Is there battery voltage?

YES—Go to step 3.

NO—Repair open in the wire between DLC terminal No. 4 and body ground (G451). ■

3. Measure voltage between DLC terminals No. 5 and No. 16.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

Is there battery voltage?

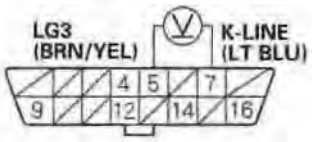
YES—Go to step 4.

NO—Repair open in the wire between the ECM/PCM (E3) and DLC terminal No. 5. ■

4. Turn the ignition switch ON (II).

5. Measure voltage between DLC terminals No. 5 and No. 7.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

Is there 8.5 V or more?

YES—Go to step 11.

NO—Go to step 6.

6. Turn the ignition switch OFF.

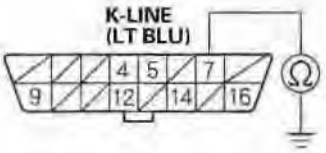
7. Jump the SCS line with the HDS

(cont'd)

DLC Circuit Troubleshooting (cont'd)

8. Disconnect ECM/PCM connector E (31P).
9. Check for continuity between DLC terminal No. 7 and body ground.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

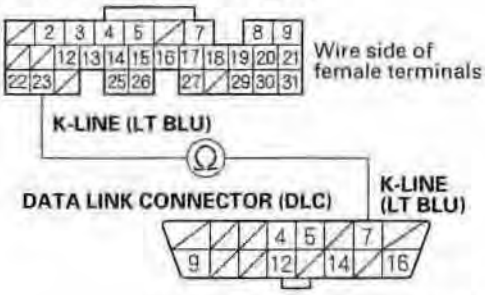
Is there continuity?

YES—Repair short to ground in the wire between DLC terminal No. 7 and the ECM/PCM (E23). After repairing the wire, check for a DTC with the HDS, then go to the DTC Troubleshooting. ■

NO—Go to step 10.

10. Check for continuity between DLC terminal No. 7 and ECM/PCM terminal E23.

ECM/PCM CONNECTOR E (31P)



Terminal side of female terminals

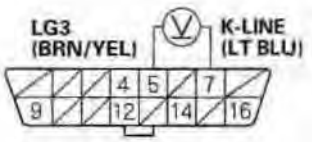
Is there continuity?

YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

NO—Repair open in the wire between DLC terminal No. 7 and the ECM/PCM (E23). After repairing the wire, check for a DTC with the HDS, then go to the DTC Troubleshooting. ■

11. Turn the ignition switch OFF.
12. Jump the SCS line with the HDS.
13. Disconnect ECM/PCM connector E (31P).
14. Turn the ignition switch ON (II).
15. Measure voltage between DLC terminals No. 5 and No. 7.

DATA LINK CONNECTOR (DLC)



Terminal side of female terminals

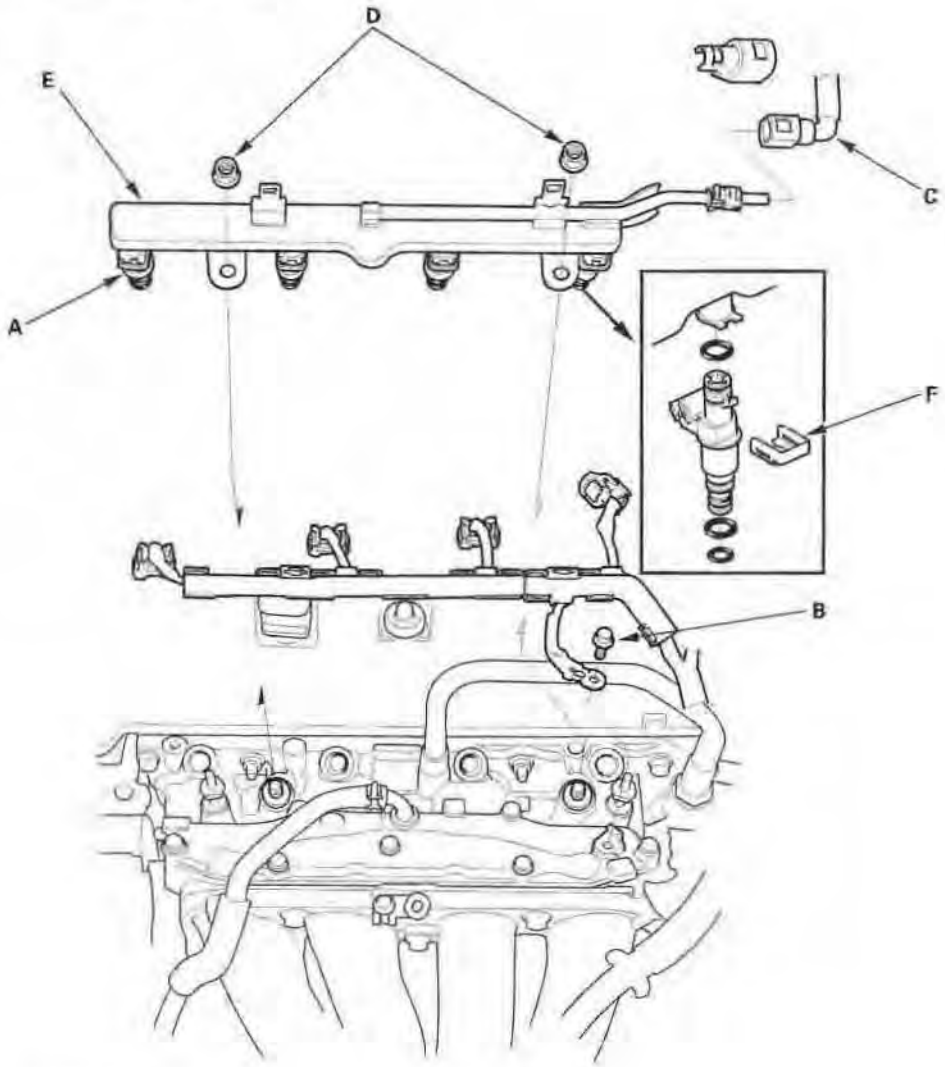
Is there 0 V?

YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

NO—Repair short to power in the wire between DLC terminal No. 7 and the ECM/PCM (E23). After repairing the wire, check for a DTC with the HDS, then go to the DTC Troubleshooting. ■

Injector Replacement

1. Relieve fuel pressure (see page 11-212).
2. Remove the intake manifold cover (see step 3 on page 9-3).
3. Disconnect the connectors from the injectors (A).
4. Remove the ground cable bolt (G101) (B).

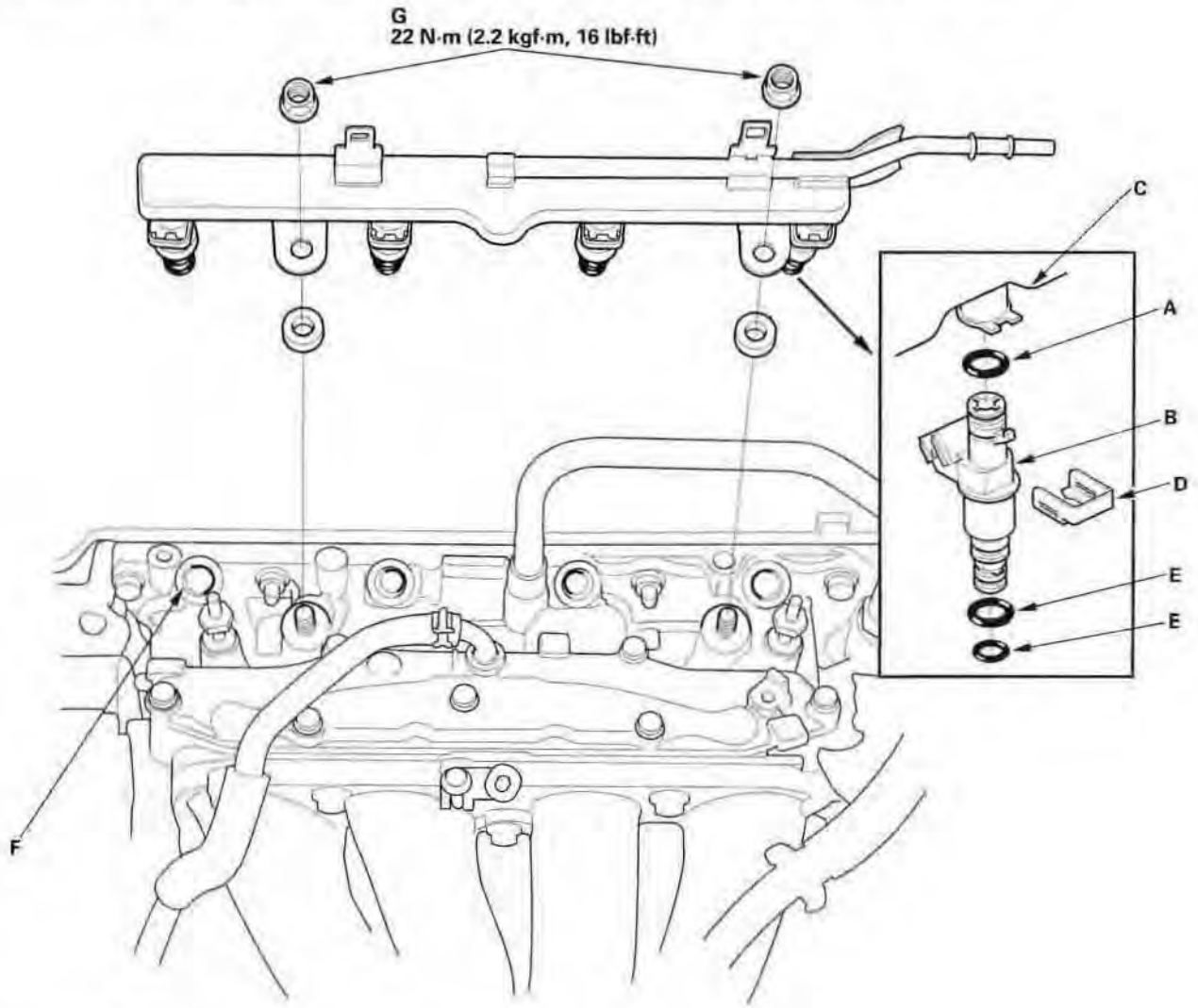


5. Disconnect the quick-connect fittings (C).
6. Remove the fuel rail mounting nuts (D) from the fuel rail (E).
7. Remove the injector clip (F) from the injector.
8. Remove the injector from the fuel rail.

(cont'd)

Injector Replacement (cont'd)

9. Coat the new O-rings (A) with clean engine oil, and insert the injectors (B) into the fuel rail (C).

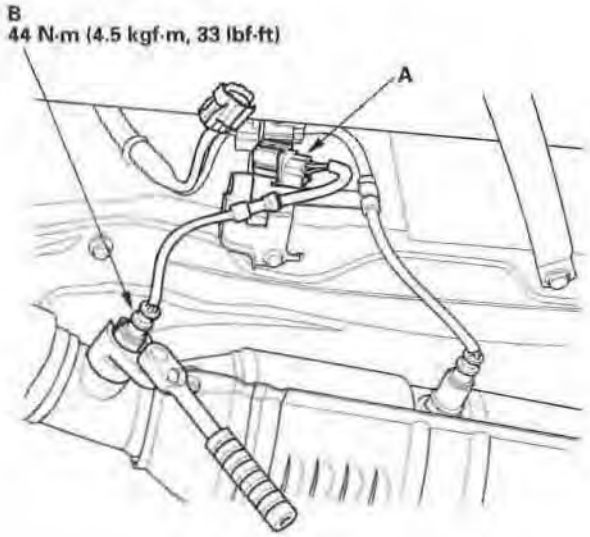


10. Install the injector clip (D).
11. Coat the injector O-rings (E) with clean engine oil.
12. Install the injectors in the injector base (F).
13. Install the fuel rail mounting nuts (G) and the ground cable bolt (G101).
14. Connect the connectors on the injectors.
15. Connect the quick-connect fitting.
16. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for about 2 seconds, the fuel rail will be pressurized. Repeat this two or three times, then check for fuel leakage.

A/F Sensor Replacement

Special Tools Required
O2 sensor wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

1. Disconnect the A/F sensor 4P connector (A), then remove the A/F sensor (B).

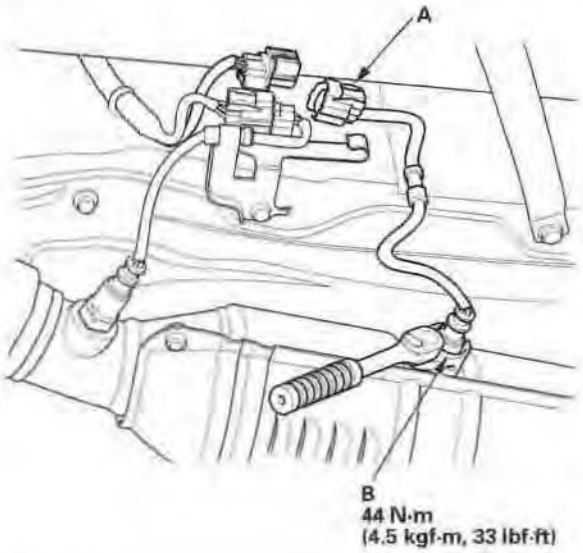


2. Install the A/F sensor in the reverse order of removal.

Secondary HO2S Replacement

Special Tools Required
O2 sensor wrench, Snap-on YA8875, SP Tools 93750, or equivalent, commercially available

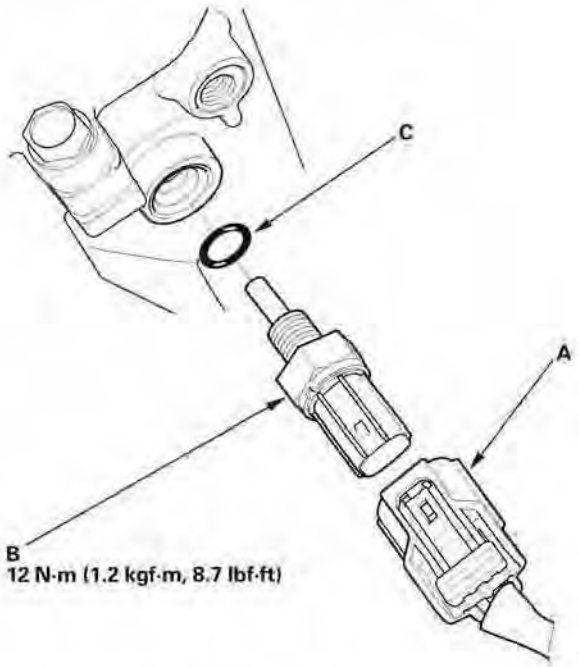
1. Disconnect the secondary HO2S 4P connector (A), then remove the secondary HO2S (B).



2. Install the secondary HO2S in the reverse order of removal.

ECT Sensor Replacement

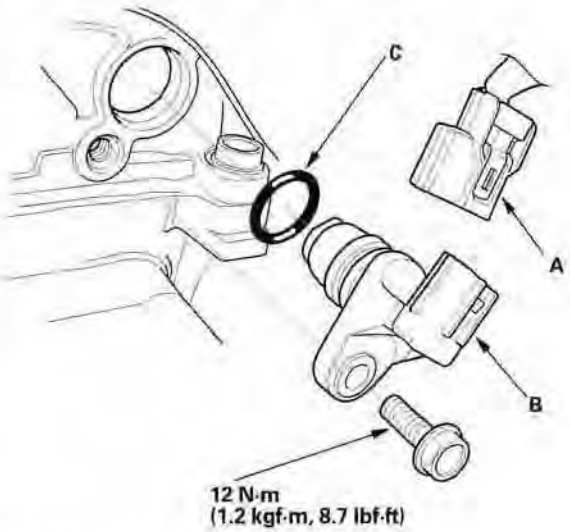
1. Remove the air cleaner (see page 11-232).
2. Remove the EVAP canister purge valve (see page 11-272).
3. Unbolt the under-hood fuse/relay box bolt, and move the assembly aside.
4. Disconnect the ECT sensor connector (A).



5. Remove the ECT sensor (B).
6. Install the sensor in the reverse order of removal with a new O-ring (C).

CMP Sensor B Replacement

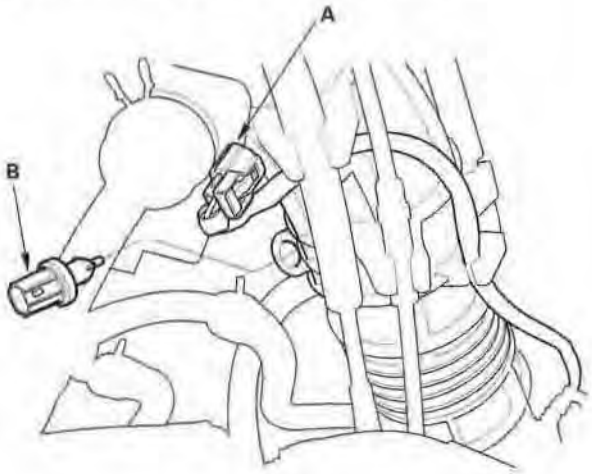
1. Remove the air cleaner (see page 11-232).
2. Remove the EVAP canister purge valve (see page 11-272).
3. Disconnect the CMP sensor B connector (A).



4. Remove CMP sensor B (B).
5. Install the sensor in the reverse order of removal with a new O-ring (C).

IAT Sensor Replacement

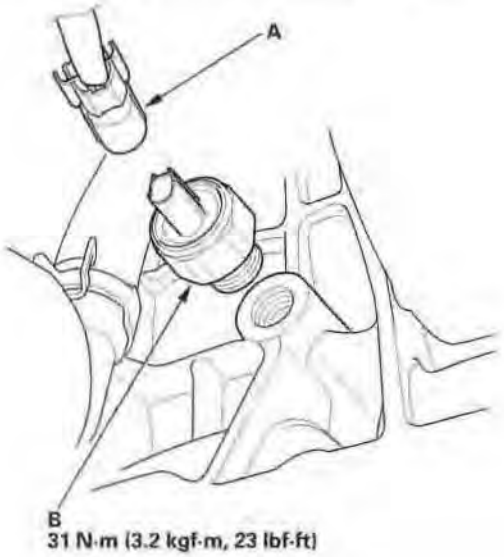
1. Disconnect the IAT sensor connector (A).



2. Remove the IAT sensor (B).
3. Install the sensor in the reverse order of removal.

Knock Sensor Replacement

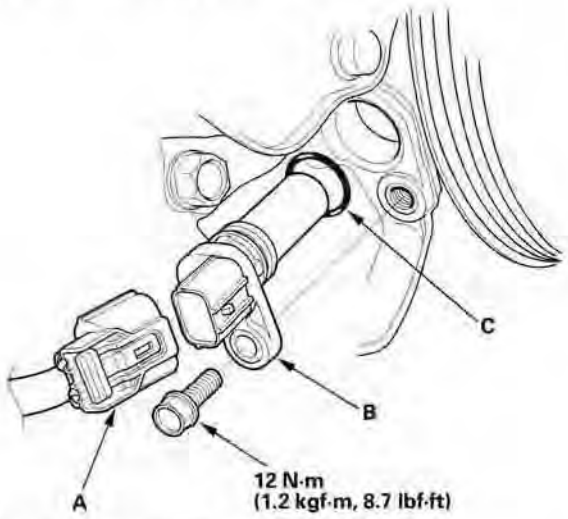
1. Disconnect the knock sensor connector (A).



2. Remove the knock sensor (B).
3. Install the sensor in the reverse order of removal.

CKP Sensor Replacement

1. Disconnect the CKP sensor (A).

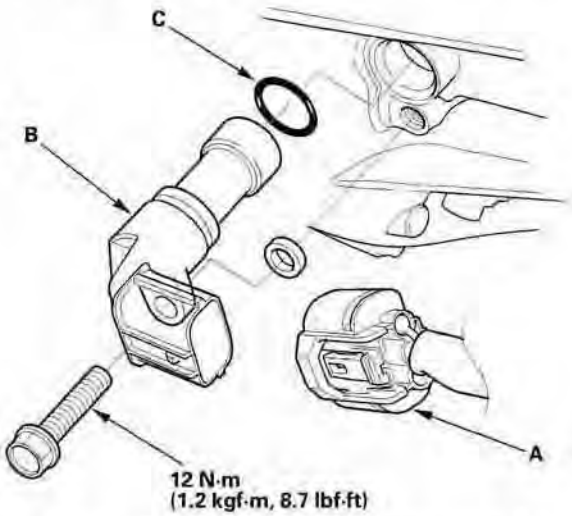


2. Remove the CKP sensor (B).
3. Install the sensor in the reverse order of removal with a new O-ring (C).

Output Shaft (Countershaft) Speed Sensor Replacement

M/T model

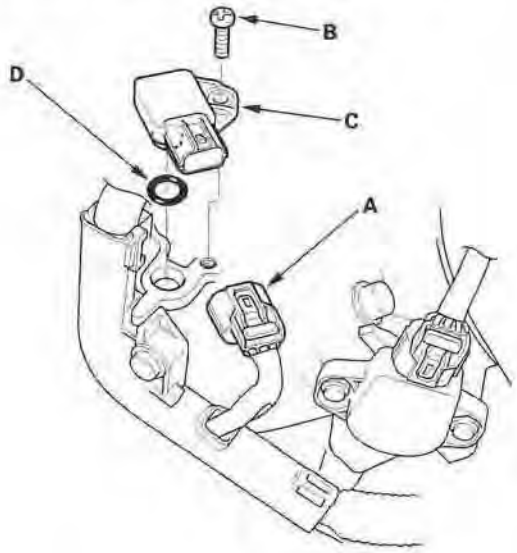
1. Remove the air cleaner (see page 11-232).
2. Disconnect the output shaft (countershaft) speed sensor connector (A).



3. Remove the output shaft (countershaft) speed sensor (B).
4. Install the sensor in the reverse order of removal with a new O-ring (C).

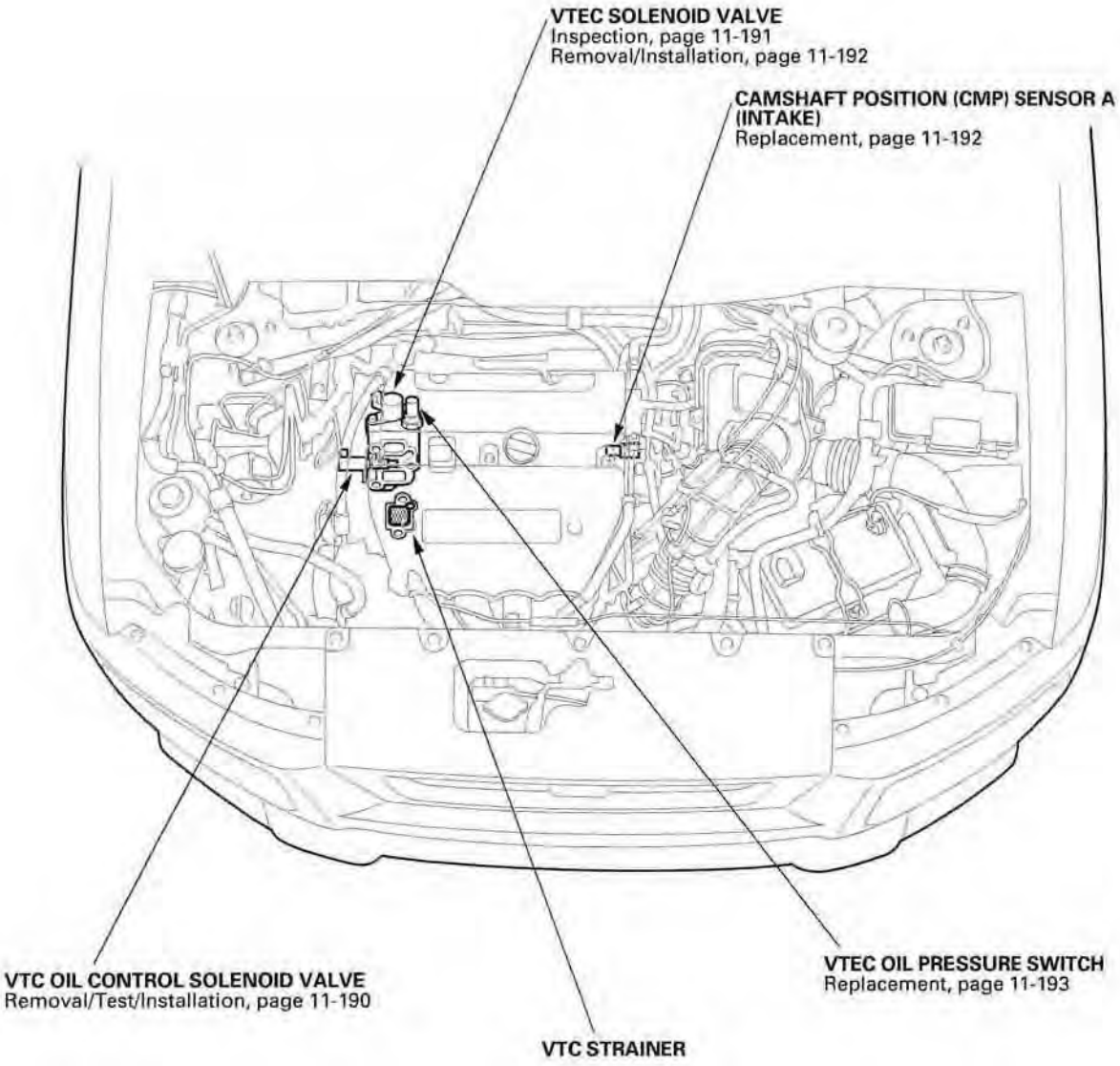
MAP Sensor Replacement

1. Disconnect the MAP sensor connector (A).



2. Remove the screw (B).
3. Remove the MAP sensor (C).
4. Install the sensor in the reverse order of removal with a new O-ring (D).

Component Location Index



DTC P0010: VTC Oil Control Solenoid Valve Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Do the VTC TEST in the INSPECTION MENU with the HDS.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0010 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM. ■
6. Turn the ignition switch OFF.
7. Disconnect the VTC oil control solenoid valve 2P connector.
8. Measure resistance between VTC oil control solenoid valve 2P connector terminals No. 1 and No. 2.

VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR

Terminal side of male terminals

Is there 6.75 – 8.25 Ω?

YES—Go to step 9.

NO—Go to step 15.

9. Check for continuity between VTC oil control solenoid valve 2P connector terminal No. 1 and body ground.

VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR

Wire side of female terminals

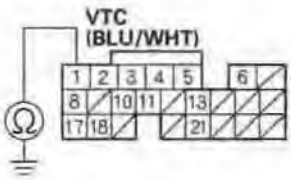
Is there continuity?

YES—Go to step 10.

NO—Repair open in the wire between the VTC oil control solenoid valve and G101, then go to step 16.

10. Jump the SCS line with the HDS.
11. Disconnect ECM/PCM connector B (24P).
12. Check for continuity between ECM/PCM connector terminal B1 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (B1) and the VTC oil control solenoid valve, then go to step 16.

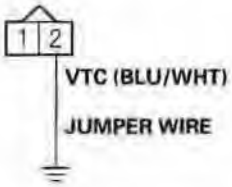
NO—Go to step 13.

(cont'd)

DTC Troubleshooting (cont'd)

13. Connect VTC oil control solenoid valve 2P connector terminal No. 2 to body ground with a jumper wire.

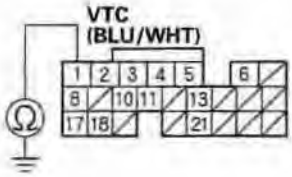
VTC OIL CONTROL SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

14. Check for continuity between ECM/PCM connector terminal B1 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the ECM/PCM (B1) and the VTC oil control solenoid valve, then go to step 16.

15. Replace the VTC oil control solenoid valve (see page 11-190).

16. Reconnect all connectors.

17. Turn the ignition switch ON (II).

18. Reset the ECM/PCM with the HDS.

19. Do the ECM/PCM idle learn procedure (see page 11-207).

20. Do the VTC TEST in the INSPECTION MENU with the HDS.

21. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0010 is indicated, check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Go to step 22.

22. Monitor the OBD STATUS for DTC P0010 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 20 and recheck.

23. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

24. Do the VTC TEST in the INSPECTION MENU with the HDS.

25. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0010 is indicated, check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0011: VTC System Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Watch the low oil pressure indicator with the engine running.

   Is the low oil pressure indicator on?

   YES—Check the oil pressure (see page 8-5), then go to step 15.

   NO—Go to step 5.
5. Do the VTC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Go to step 6.

   NO—Go to step 9.
6. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
7. Check the VTC STATUS in the DATA LIST with the HDS.

   Does it indicate ON?

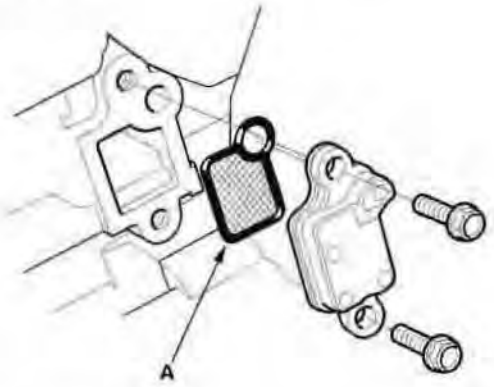
   YES—Go to step 8.

   NO—Go to step 6 and recheck.
8. Monitor the OBD STATUS for DTC P0011 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 5 and recheck.
9. Turn the ignition switch OFF.
10. Remove the power steering pump (see page 17-14) and the auto-tensioner (see page 4-38).
11. Remove the VTC strainer (A), and check it for clogging.



   Is the strainer OK?

   YES—Go to step 12.

   NO—Clean the VTC strainer, replace the engine oil filter and the engine oil, then go to step 14.
12. Test the VTC oil control solenoid valve (see page 11-190).

   Is the VTC oil control solenoid valve OK?

   YES—Go to step 13.

   NO—Replace the VTC oil control solenoid valve (see page 11-190), then go to step 14.

13. Inspect the VTC actuator (see page 6-8).

    Is the VTC actuator OK?

    YES—Go to step 14.

    NO—Replace the VTC actuator (see page 6-28), then go to step 14.

14. Turn the ignition switch ON (II).

15. Reset the ECM/PCM with the HDS.

16. Clear the CKP PATTERN with the HDS.

17. Do the ECM/PCM idle learn procedure (see page 11-207).

18. Do the CKP pattern learn procedure (see page 11-4).

19. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.

20. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0011 is indicated, check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 21.

21. Monitor the OBD STATUS for DTC P0011 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 19 and recheck.

DTC Troubleshooting (cont'd)

DTC P0340: CMP Sensor A No Signal

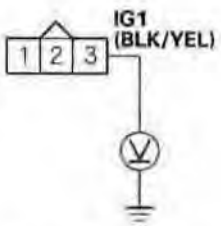
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0340 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at CMP sensor A and the ECM/PCM.■
5. Turn the ignition switch OFF.
6. Disconnect the CMP sensor A 3P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between CMP sensor A 3P connector terminal No. 3 and body ground.

CMP SENSOR A 3P CONNECTOR



Wire side of female terminals

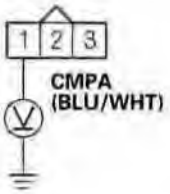
Is there battery voltage?

YES—Go to step 9.

NO—Repair open in the wire between the No. 4 ACG (10 A) fuse in the under-dash fuse/relay box and CMP sensor A, then go to step 18.

9. Measure voltage between CMP sensor A 3P connector terminal No. 1 and body ground.

CMP SENSOR A 3P CONNECTOR



Wire side of female terminals

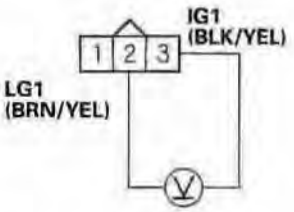
Is there about 5 V?

YES—Go to step 10.

NO—Go to step 11.

10. Measure voltage between CMP sensor A 3P connector terminals No. 2 and No. 3.

CMP SENSOR A 3P CONNECTOR



Wire side of female terminals

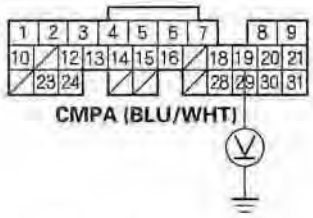
Is there battery voltage?

YES—Go to step 16.

NO—Repair open in the wire between CMP sensor A and G101, then go to step 18.

11. Measure voltage between ECM/PCM connector terminal A19 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

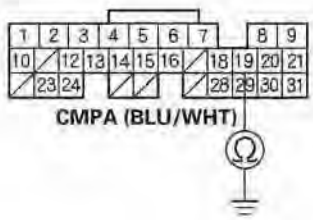
Is there about 5 V?

YES—Repair open in the wire between the ECM/PCM (A19) and CMP sensor A, then go to step 18.

NO—Go to step 12.

12. Turn the ignition switch OFF.
13. Jump the SCS line with the HDS.
14. Disconnect ECM/PCM connector A (31P).
15. Check for continuity between ECM/PCM connector terminal A19 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A19) and CMP sensor A, then go to step 18.

NO—Go to step 24.

16. Turn the ignition switch OFF.
17. Replace CMP sensor A (see page 11-192).
18. Reconnect all connectors.
19. Turn the ignition switch ON (II).
20. Reset the ECM/PCM with the HDS.
21. Do the ECM/PCM idle learn procedure (see page 11-207).
22. Start the engine.
23. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0340 is indicated, check for poor connections or loose terminals at CMP sensor A and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

24. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
25. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0340 is indicated, check for poor connections or loose terminals at CMP sensor A and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0341: CMP Sensor A and CKP Sensor Incorrect Phase Detected

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0341 indicated?

   YES—Go to step 9.

   NO—Go to step 5.
5. Do the VTC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Go to step 6.

   NO—Go to step 9.
6. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
7. Check the VTC STATUS in the DATA LIST with the HDS.

   Does it indicate ON?

   YES—Go to step 8.

   NO—Go to step 6 and recheck.
8. Monitor the OBD STATUS for DTC P0341 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 9.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM. If the screen indicates NOT COMPLETED, go to step 6 and recheck.
9. Turn the ignition switch OFF.
10. Test the VTC oil control solenoid valve (see page 11-190).

    Is the VTC oil control solenoid valve OK?

    YES—Go to step 11.

    NO—Replace the VTC oil control solenoid valve (see page 11-190), then go to step 14.
11. Check the camshaft timing (see step 1 on page 6-15).

    Is the camshaft timing OK?

    YES—Go to step 12.

    NO—Reset the camshaft timing (see page 6-15), then go to step 14.
12. Check for damage to the cam chain (see page 6-3).

    Is the cam chain damaged?

    YES—Replace the cam chain (see page 6-12), then go to step 14.

    NO—Go to step 13.
13. Inspect the VTC actuator (see page 6-8).

    Is the actuator OK?

    YES—Go to step 14.

    NO—Replace the VTC actuator (see page 6-28), then go to step 14.

14. Turn the ignition switch ON (II).
15. Reset the ECM/PCM with the HDS.
16. Clear the CKP pattern with the HDS.
17. Do the ECM/PCM idle learn procedure (see page 11-207).
18. Do the CKP pattern learn procedure (see page 11-4).
19. Test-drive at a steady speed between 19—38 mph (30—60 km/h) for 10 minutes.
20. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0341 is indicated, check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 21.
21. Monitor the OBD STATUS for DTC P0341 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the VTC oil control solenoid valve and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 19 and recheck.

DTC Troubleshooting (cont'd)

DTC P0344: CMP Sensor A Intermittent Interruption

1. Note this freeze data:
   - Engine speed
   - Vehicle speed
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle 10 seconds.
4. Check the CMP NOISE A COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Go to step 5.

   NO—Go to step 7.
5. Test-drive the vehicle for several minutes in the range of the recorded freeze data.
6. Check the CMP NOISE A COUNT in the DATA LIST with the HDS.

   Are 0 counts indicated?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at CMP sensor A and the ECM/PCM. ■

   NO—Go to step 7.
7. Check for poor or loose connections and terminals at these locations:
   - CMP sensor A
   - ECM/PCM
   - Engine ground
   - Body ground

   Are the connections and terminals OK?

   YES—Go to step 8.

   NO—Repair the connectors or terminals, then go to step 11.
8. Check for damage on the CMP sensor A pulse plate (see page 6-27).

   Is the pulse plate damaged?

   YES—Replace the CMP sensor A pulse plate (see page 6-27), then go to step 11.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Replace CMP sensor A (see page 11-192).
11. Turn the ignition switch ON (II).
12. Reset the ECM/PCM with the HDS.
13. Do the ECM/PCM idle learn procedure (see page 11-207).
14. Start the engine, and let it idle 10 seconds.
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0344 is indicated, check for poor connections or loose terminals at CMP sensor A and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■

DTC 1009: VTC Advance Malfunction

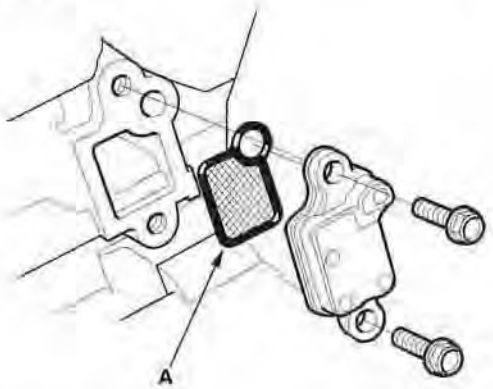
NOTE: If DTC P0341 is stored at the same time as DTC P1009, troubleshoot DTC P1009 first, then recheck for DTC P0341.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P1009 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time.■
5. Turn the ignition switch OFF.
6. Remove the power steering pump (see page 17-14) and auto-tensioner (see page 4-38).
7. Remove the VTC strainer (A), and check it for clogging.



   Is the strainer OK?

   YES—Go to step 8.

   NO—Clean the VTC strainer, replace the engine oil filter and the engine oil, then go to step 10.
8. Test the VTC oil control solenoid valve (see page 11-190).

   Is the valve OK?

   YES—Go to step 9.

   NO—Replace the VTC oil control solenoid valve (see page 11-190), then go to step 10.
9. Inspect the VTC actuator (see page 6-8).

   Is the actuator OK?

   YES—Check engine oil pressure (see page 8-5), then go to step 10.

   NO—Replace the VTC actuator (see page 6-28), then go to step 10.
10. Turn the ignition switch ON (II).
11. Reset the ECM/PCM with the HDS (see page 11-4).
12. Clear the CKP pattern with the HDS (see page 11-4).
13. Do the ECM/PCM idle learn procedure (see page 11-207).
14. Do the CKP pattern learn procedure (see page 11-4).
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1009 is indicated, check the oil passages for the VTC system, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

DTC Troubleshooting (cont'd)

DTC P2646: VTEC Oil Pressure Switch Circuit Low Voltage

Specal Tools Required
- Pressure gauge adapter 07NAJ-P07010A
- A/T low pressure gauge w/panel 07406-0070300
- A/T pressure hose 07406-0020201
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure adapter 07MAJ-PY40120
- Oil pressure hose 07ZAJ-S5A0200

1. Check the engine oil level.

   Is the level OK?

   YES—Go to step 2.

   NO—Adjust the engine oil to the proper level, then go to step 20.

2. Turn the ignition switch ON (II).
3. Clear the DTC with the HDS.
4. Do the VTEC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the VTEC oil pressure switch, the VTEC solenoid valve, and the ECM/PCM.■

   NO—Go to step 5.

5. Turn the ignition switch OFF.
6. Disconnect the VTEC oil pressure switch 2P connector.
7. Turn the ignition switch ON (II).
8. Check the VTEC PRES SW in the DATA LIST with the HDS.

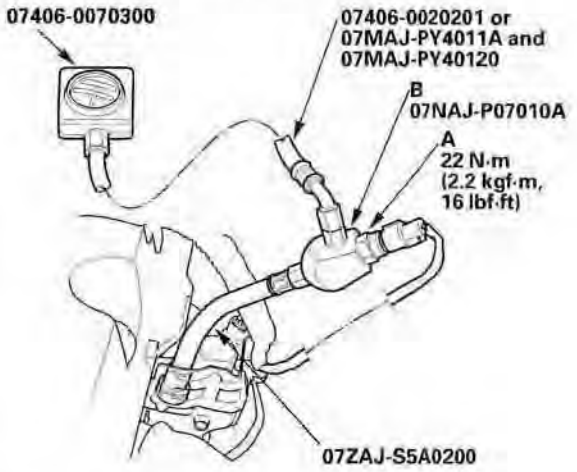
   Is switch ON indicated?

   YES—Go to step 9.

   NO—Replace the VTEC oil pressure switch (see page 11-193), then go to step 21.

9. Turn the ignition switch OFF.
10. Remove the VTEC oil pressure switch (A) and install the special tools as shown, then install the VTEC oil pressure switch in the oil pressure gauge adapter (B).

    NOTE: Install the switch in the reverse order of removal with a new O-ring.



11. Turn the ignition switch ON (II).
12. Do the VTEC TEST in the INSPECTION MENU with the HDS.
13. Check the oil pressure.

    Is the oil pressure below 49 kPa (0.5 kgf/cm², 7 psi)?

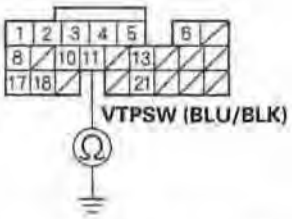
    YES—Inspect the VTEC system. If it is OK, replace the VTEC solenoid valve (see page 11-192), then go to step 21.

    NO—Go to step 14.

14. Turn the ignition switch OFF.
15. Jump the SCS line with the HDS.
16. Disconnect the VTEC oil pressure switch 2P connector.
17. Disconnect ECM/PCM connector B (24P).

18. Check for continuity between ECM/PCM connector terminal B11 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (B11) and the VTEC oil pressure switch, then go to step 19.

NO—Go to step 27.

19. Reconnect the VTEC oil pressure switch 2P connector.

20. Reconnect ECM/PCM connector B (24P).

21. Turn the ignition switch ON (II).

22. Reset the ECM/PCM with the HDS.

23. Do the ECM/PCM idle learn procedure (see page 11-207).

24. Do the VTEC TEST in the INSPECTION MENU with the HDS.

25. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P2646 is indicated, check for poor connections or loose terminals at the VTEC oil pressure switch, the VTEC solenoid valve, and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Go to step 26.

26. Monitor the OBD STATUS for DTC P2646 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete.■

NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 24 and recheck.

27. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

28. Do the VTEC TEST in the INSPECTION MENU with the HDS.

29. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P2646 is indicated, check for poor connections or loose terminals at the VTEC oil pressure switch, the VTEC solenoid valve, and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P2647: VTEC Oil Pressure Switch Circuit High Voltage

1. Check the engine oil level.

   Is the level OK?

   YES—Go to step 2.

   NO—Adjust the engine oil to the proper level, then go to step 14.

2. Turn the ignition switch ON (II).
3. Clear the DTC with the HDS.
4. Do the VTEC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, sytem is OK at this time. Check for poor connections or loose terminals at the VTEC oil pressure switch and the ECM/PCM. ■

   NO—Go to step 5.

5. Check the result of step 4.

   - VTEC Switch Failure
   - VTEC Switch Open
   - VTEC Switch SIG Line Open
   - VTEC Switch GND Line Open

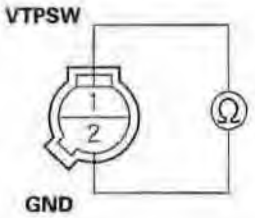
   Is the test result any of the above?

   YES—Go to step 6.

   NO—Check for poor connections or loose terminals at the VTEC oil pressure switch. If it is OK, replace the VTEC solenoid valve (see page 11-192), then go to step 14.

6. Turn the ignition switch OFF.
7. Disconnect the VTEC oil pressure switch 2P connector.
8. Check for continuity between VTEC oil pressure switch 2P connector terminals No. 1 and No. 2.

   VTEC OIL PRESSURE SWITCH 2P CONNECTOR

   Terminal side of male terminals

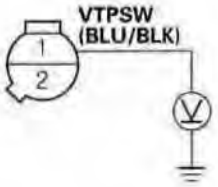
   Is there continuity?

   YES—Go to step 9.

   NO—Replace the VTEC oil pressure switch (see page 11-193), then go to step 13.

9. Turn the ignition switch ON (II).
10. Measure voltage between VTEC oil pressure switch 2P connector terminal No. 1 and body ground.

    VTEC OIL PRESSURE SWITCH 2P CONNECTOR

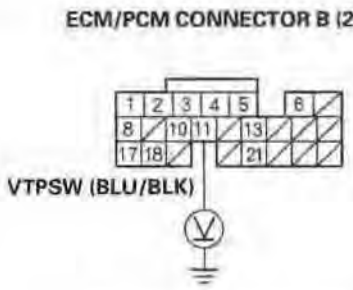
    Wire side of female terminals

    Is there battery voltage?

    YES—Repair open in the wire between the VTEC oil pressure switch and G101, then go to step 13.

    NO—Go to step 11.

11. Measure voltage between ECM/PCM connector terminal B11 and body ground.



Is there battery voltage?

YES—Repair open in the wire between the ECM/PCM (B11) and the VTEC oil pressure switch, then go to step 12.

NO—Go to step 19.

12. Turn the ignition switch OFF.
13. Reconnect the VTEC oil pressure switch 2P connector.
14. Turn the ignition switch ON (II).
15. Reset the ECM/PCM with the HDS.
16. Do the ECM/PCM idle learn procedure (see page 11-207).
17. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2647 is indicated, check for poor connections or loose terminals at the VTEC oil pressure switch and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 18.

18. Monitor the OBD STATUS for DTC P2647 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 16, and recheck.

19. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
20. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2647 is indicated, check for poor connections or loose terminals at the VTEC oil pressure switch and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P2648: VTEC Solenoid Valve Circuit Low Voltage

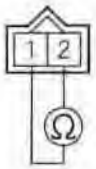
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Do the VTEC TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the VTEC solenoid valve and the ECM/PCM. ■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Disconnect the VTEC solenoid valve 2P connector.
6. Measure resistance between VTEC solenoid valve 2P connector terminals No. 1 and No. 2.

VTEC SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

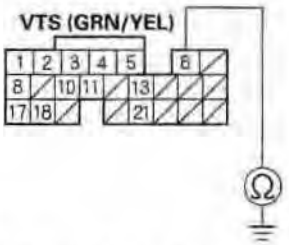
Is there 14 – 30 Ω at room temperature?

YES—Go to step 7.

NO—Go to step 10.

7. Jump the SCS line with the HDS.
8. Disconnect ECM/PCM connector B (24P).
9. Check for continuity between ECM/PCM connector terminal B6 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (B6) and the VTEC solenoid valve, then go to step 11.

NO—Go to step 18.

10. Replace the VTEC solenoid valve (see page 11-192).
11. Reconnect all connectors.
12. Turn the ignition switch ON (II).
13. Reset the ECM/PCM with the HDS.
14. Do the ECM/PCM idle learn procedure (see page 11-207).
15. Do the VTEC TEST in the INSPECTION MENU with the HDS.
16. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2648 is indicated, check for poor connections or loose terminals at the VTEC solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 17.

17. Monitor the OBD STATUS for DTC P2648 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 15 and recheck.

18. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

19. Do the VTEC TEST in the INSPECTION MENU with the HDS.

20. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2648 is indicated, check for poor connections or loose terminals at the VTEC solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P2649: VTEC Solenoid Valve Circuit High Voltage

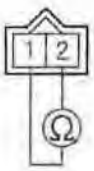
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P2649 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the VTEC solenoid valve and the ECM/PCM. ■
5. Turn the ignition switch OFF.
6. Disconnect the VTEC solenoid valve 2P connector.
7. Measure resistance between VTEC solenoid valve 2P connector terminals No. 1 and No. 2.

VTEC SOLENOID VALVE 2P CONNECTOR



Terminal side of male terminals

Is there 14—30 Ω ?

YES—Go to step 8.

NO—Go to step 13.

8. Check for continuity between VTEC solenoid valve 2P connector terminal No. 1 and body ground.

VTEC SOLENOID VALVE 2P CONNECTOR

Wire side of female terminals

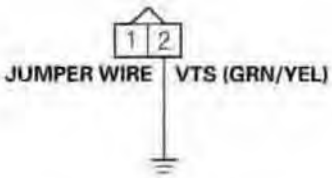
Is there continuity?

YES—Go to step 9.

NO—Repair open in the wire between the VTEC solenoid valve and G101, then go to step 14.

9. Jump the SCS line with the HDS.
10. Disconnect ECM/PCM connector B (24P).
11. Connect VTEC solenoid valve 2P connector terminal No. 2 to body ground with a jumper wire.

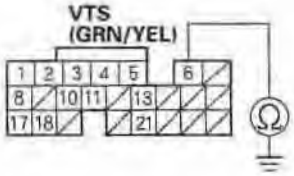
VTEC SOLENOID VALVE 2P CONNECTOR



Wire side of female terminals

12. Check for continuity between ECM/PCM connector terminal B6 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Go to step 20.

NO—Repair open in the wire between the ECM/PCM (B6) and the VTEC solenoid valve, then go to step 14.

13. Replace the VTEC solenoid valve (see page 11-192).
14. Reconnect all connectors.
15. Turn the ignition switch ON (II).
16. Reset the ECM/PCM with the HDS.
17. Do the ECM/PCM idle learn procedure (see page 11-207).
18. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2649 is indicated, check for poor connections or loose terminals at the VTEC solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 19.

19. Monitor the OBD STATUS for DTC P2649 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 17 and recheck.

20. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
21. Check for Temporary DTCs or DTCs with the HDS.

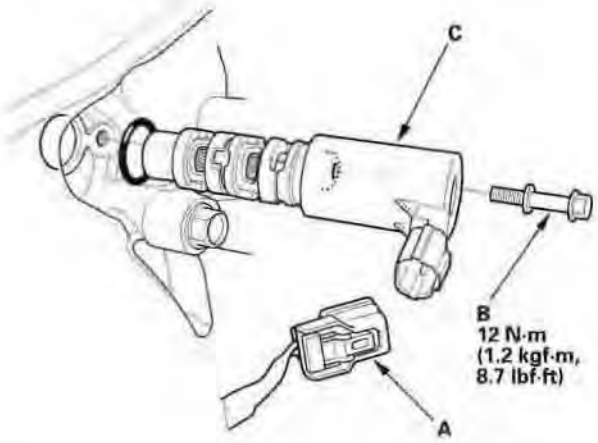
    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P2649 is indicated, check for poor connections or loose terminals at the VTEC solenoid valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

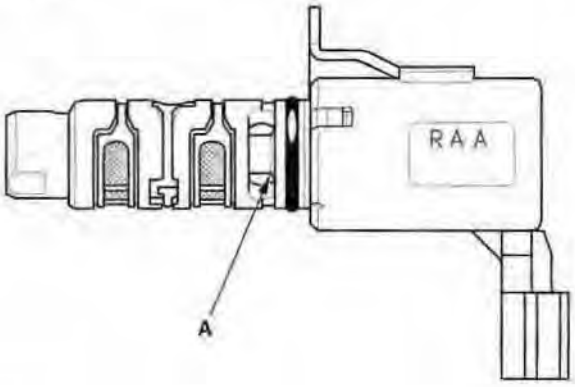
    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

VTC Oil Control Solenoid Valve Removal/Test/Installation

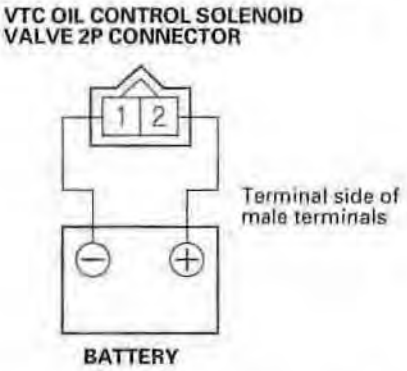
1. Disconnect the VTC oil control solenoid valve connector (A).



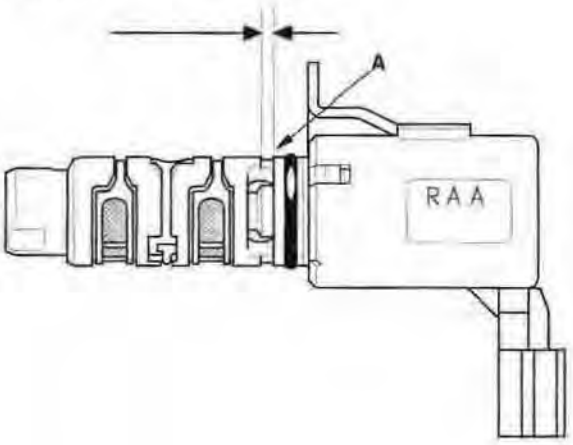
2. Remove the bolt (B) and the VTC oil control solenoid valve (C).
3. Check the VTC oil control solenoid valve for sticking or clogging. If the valve is stuck or clogged, replace it, then go to step 7.
4. Check the clearance between the port (advance side) and the valve. Make sure the valve (A) closes fully.



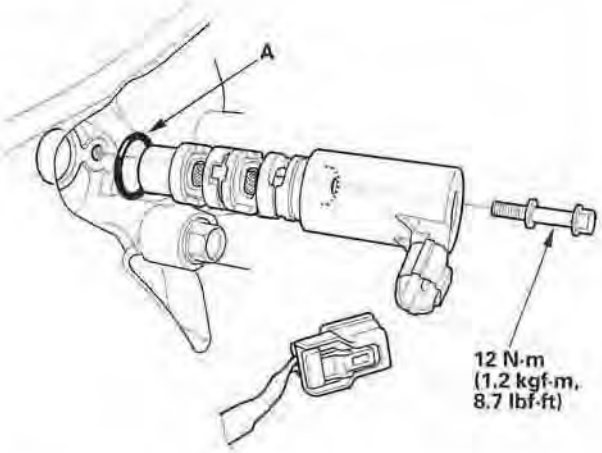
5. Connect the battery positive terminal to VTC oil control solenoid valve 2P connector terminal No. 2.



6. Connect the battery negative terminal to VTC oil control solenoid valve 2P connector terminal No. 1. Clearance (A) should be at least 2.3 mm (1/16 in.). If the valve does not open, replace it; then go to step 7.



7. Replace the VTC oil control solenoid valve O-ring (A).



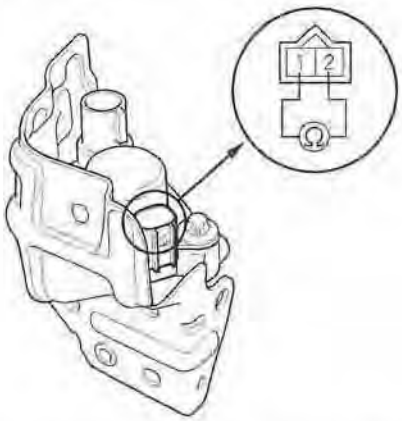
8. Coat the new O-ring with engine oil, then install it.
9. Clean and dry the mating surface of the valve.
10. Install the valve.

NOTE: Do not install the valve while wearing cloth fiberous gloves. Be careful not to contaminate the cylinder head opening.

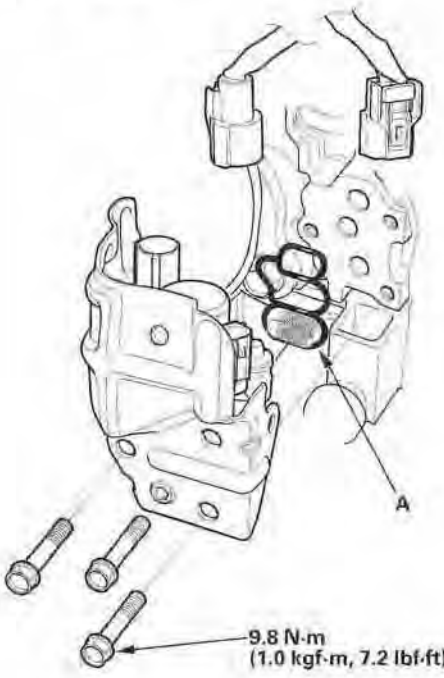
VTEC Solenoid Valve Inspection

1. Disconnect the VTEC solenoid valve connector and the VTEC oil pressure switch connector.
2. Remove the VTEC solenoid valve assembly from the cylinder head assembly (see page 11-192).
3. Measure resistance between VTEC solonoid valve 2P connector terminals No. 1 and No. 2.

Resistance: 14—30 Ω

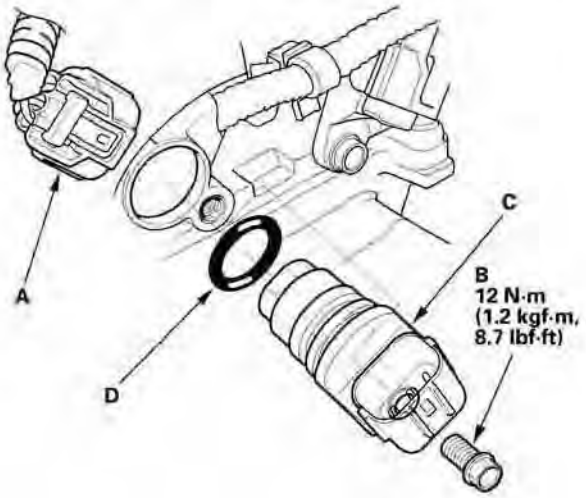


4. If the resistance is within specification, check the solenoid valve filter (A) for clogging. If it is clogged, replace the solenoid valve filter, the engine oil filter, and the engine oil.



CMP Sensor A Replacement

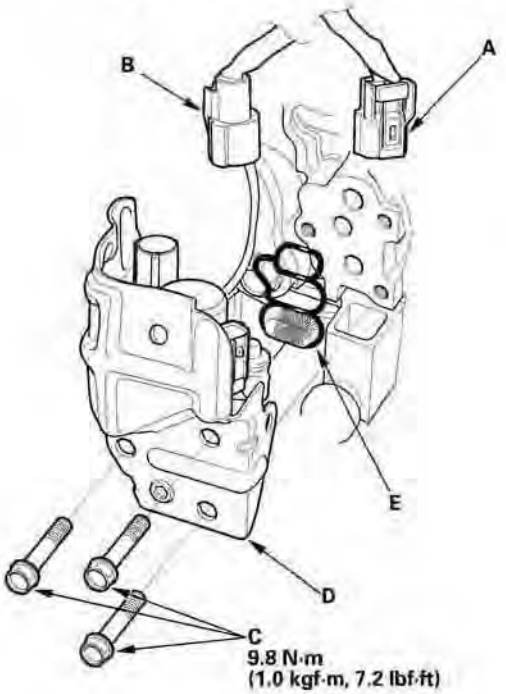
1. Remove the air cleaner (see page 11-232).
2. Disconnect the CMP sensor A connector (A).



3. Remove the bolt (B).
4. Remove CMP sensor A (C).
5. Install the sensor in the reverse order of removal with a new O-ring (D).

VTEC Solenoid Valve Removal/ Installation

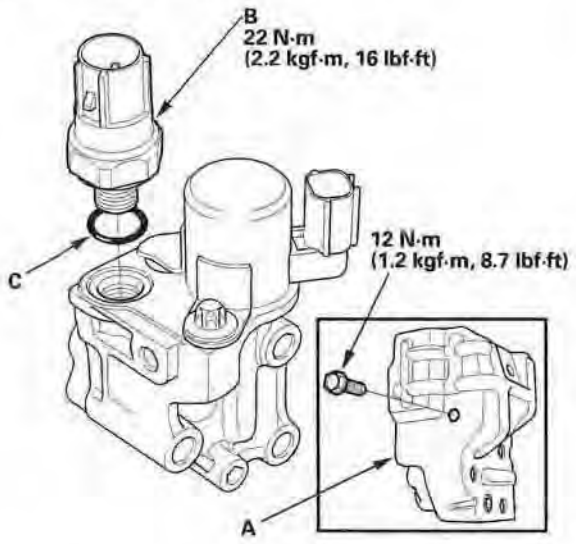
1. Disconnect the VTEC solenoid valve connector (A) and the VTEC oil pressure switch connector (B).



2. Remove the bolts (C).
3. Remove the VTEC solenoid valve (D).
4. Install the valve in the reverse order of removal with a new solenoid valve filter (E).

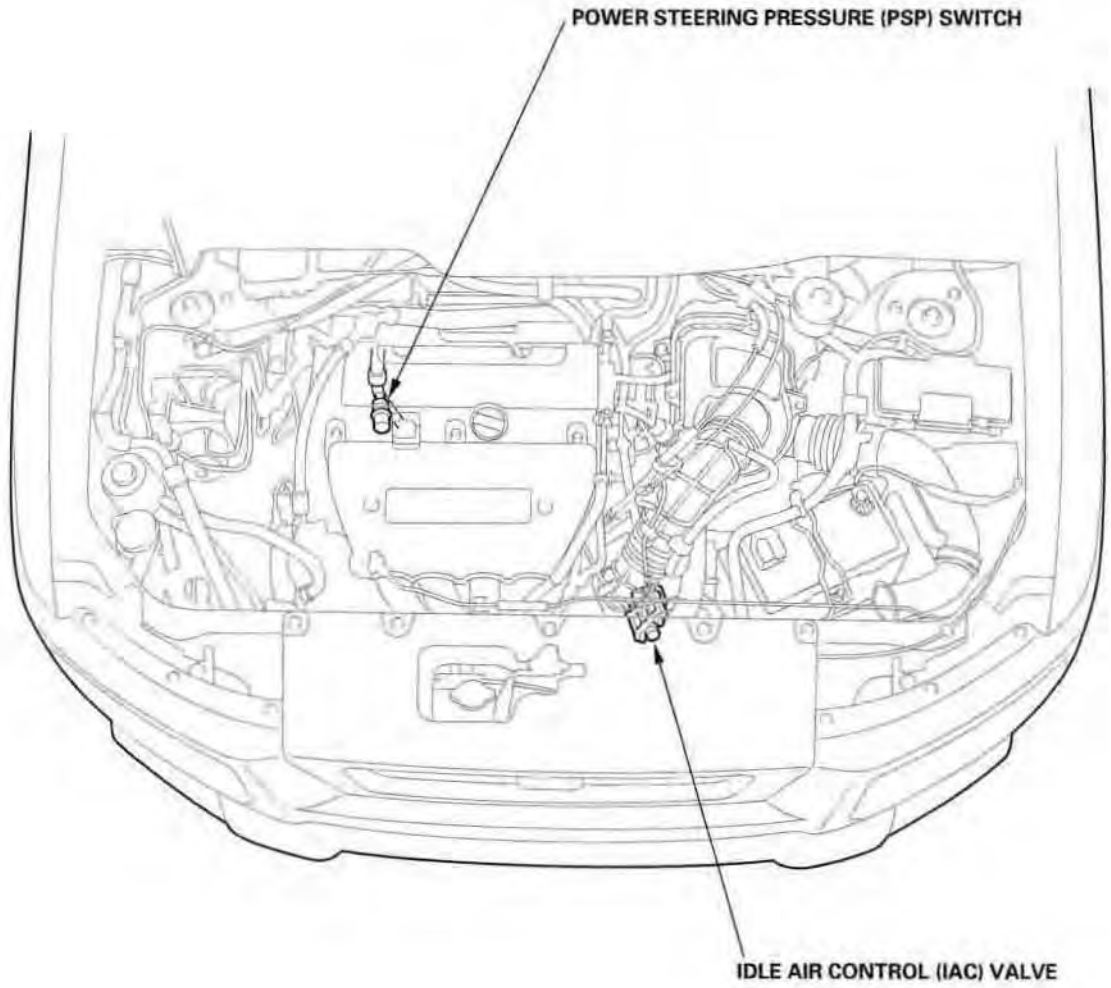
VTEC Oil Pressure Switch Replacement

1. Remove the VTEC solenoid valve assembly (see page 11-192).
2. Remove the cover (A).



3. Remove the VTEC oil pressure switch (B).
4. Install the switch in the reverse order of removal with a new O-ring (C).

Component Location Index



DTC Troubleshooting

DTC P0506: Idle Control System RPM Lower Than Expected

NOTE: If DTC P0511 is stored at the same time as DTC P0506, troubleshoot DTC P0511 first, then recheck for DTC P0506.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.
4. Check this data in the DATA LIST with the HDS:
   - Engine coolant temperature above 158 °F (70 °C)
   - Intake air temperature above 32 °F (0 °C)
   - Vehicle speed is 0 mph (0 km/h)
   - FSS is CLOSED
   - ST FUEL TRIM between 0.65 and 1.47
5. Monitor the OBD STATUS for DTC P0506 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 6.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the IAC valve and the ECM/PCM. If it is EXECUTING, keep the engine idling until a result comes on. If the screen indicates OUT OF CONDITION, recheck with a different load condition (electrical, A/C, gear position, etc.), then go to step 3.
6. Clear the DTC with the HDS.
7. Do the IACV TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Check the A/C system and the power steering system, then go to step 10.

   NO—Go to step 8.
8. Turn the ignition switch OFF.
9. Replace the IAC valve (see page 11-236).
10. Turn the ignition switch ON (II).
11. Reset the ECM/PCM with the HDS.
12. Do the ECM/PCM idle learn procedure (see page 11-207).
13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.
14. Check this data in the DATA LIST with the HDS:
    - Engine coolant temperature above 158 °F (70 °C)
    - Intake air temperature above 32 °F (0 °C)
    - Vehicle speed is 0 mph (0 km/h)
    - FSS is CLOSED
    - ST FUEL TRIM between 0.65 and 1.47
15. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0506 is indicated, check for poor connections or loose terminals at the IAC valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 16.
16. Monitor the OBD STATUS for DTC P0506 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the IAC valve and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep the engine idling until a result comes on. If the screen indicates OUT OF CONDITION, recheck with a different load condition (electrical, A/C, gear position, etc.), then go to step 13.

DTC Troubleshooting (cont'd)

DTC P0507: Idle Control System RPM Higher Than Expected

NOTE: If DTC P0511 is stored at the same time as DTC P0507, troubleshoot DTC P0511 first, then recheck for DTC P0507.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.
4. Monitor the OBD STATUS for DTC P0507 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 5.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the IAC valve and the ECM/PCM. If the screen indicates EXECUTING, keep the engine idling until a result comes on. If the screen indicates OUT OF CONDITION, recheck with a different load condition (electrical, A/C, gear position, etc.), then go to step 3.
5. Clear the DTC with the HDS.
6. Do the IACV TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Check these parts for vacuum leaks, then go to step 7:

   - PCV valve
   - PCV hose
   - EVAP canister purge valve
   - Throttle body
   - Intake manifold
   - Brake booster hose

   NO—Go to step 7.
7. Turn the ignition switch OFF.
8. Replace the IAC valve (see page 11-236).
9. Turn the ignition switch ON (II).
10. Reset the ECM/PCM with the HDS.
11. Do the ECM/PCM idle learn procedure (see page 11-207).
12. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 20 seconds.
13. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0507 is indicated, check for poor connections or loose terminals at the IAC valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 14.
14. Monitor the OBD STATUS for DTC P0507 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the IAC valve and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep the engine idling until a result comes on. If the screen indicates OUT OF CONDITION, recheck with a different load condition (electrical, A/C, gear position, etc.), then go to step 12.

DTC P0511: IAC Valve Circuit Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Check for Temporary DTCs or DTCs with the HDS.

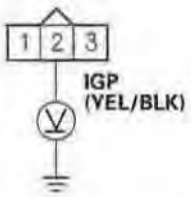
   Is DTC P0511 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the IAC valve and the ECM/PCM. ■

4. Turn the ignition switch OFF.
5. Disconnect the IAC valve 3P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between IAC valve 3P connector terminal No. 2 and body ground.

IAC VALVE 3P CONNECTOR



Wire side of female terminals

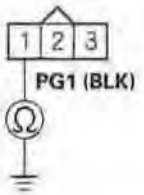
Is there battery voltage?

YES—Go to step 8.

NO—Repair open in the wire between the IAC valve and PGM-FI main relay 1 (FI MAIN), then go to step 21.

8. Turn the ignition switch OFF.
9. Check for continuity between body ground and IAC valve 3P connector terminal No. 1.

IAC VALVE 3P CONNECTOR



Wire side of female terminals

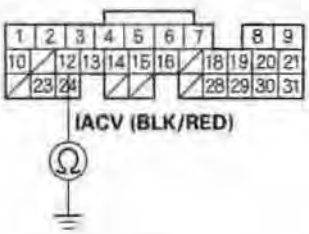
Is there continuity?

YES—Go to step 10.

NO—Repair open in the wire between the IAC valve and G101, then go to step 21.

10. Turn the ignition switch OFF.
11. Jump the SCS line with the HDS.
12. Disconnect ECM/PCM connector A (31P).
13. Check for continuity between ECM/PCM connector terminal A12 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (A12) and the IAC valve, then go to step 21.

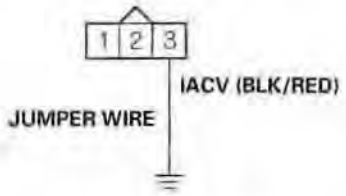
NO—Go to step 14.

(cont'd)

DTC Troubleshooting (cont'd)

14. Connect IAC valve 3P connector terminal No. 3 to body ground with a jumper wire.

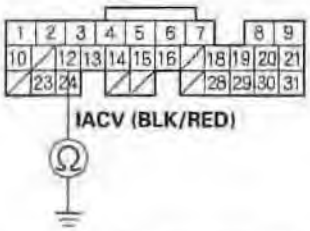
IAC VALVE 3P CONNECTOR



Wire side of female terminals

15. Check for continuity between ECM/PCM connector terminal A12 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

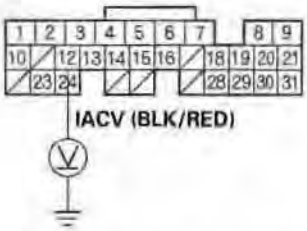
Is there continuity?

YES—Go to step 16.

NO—Repair open in the wire between the ECM/PCM (A12) and the IAC valve, then go to step 21.

16. Reconnect the IAC valve 3P connector.
17. Turn the ignition switch ON (II).
18. Measure voltage between ECM/PCM connector terminal A12 and body ground.

ECM/PCM CONNECTOR A (31P)



Wire side of female terminals

Is there battery voltage?

YES—Go to step 26.

NO—Go to step 19.

19. Turn the ignition switch OFF.
20. Replace the IAC valve (see page 11-236).
21. Turn the ignition switch ON (II).
22. Reset the ECM/PCM with the HDS.
23. Do the ECM/PCM idle learn procedure (see page 11-207).
24. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0511 is indicated, check for poor connections or loose terminals at the IAC valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Go to step 25.

25. Monitor the OBD STATUS for DTC P0511 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 23 and recheck.

26. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

27. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0511 is indicated, check for poor connections or loose terminals at the IAC valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

A/C Signal Circuit Troubleshooting

1. Start the engine.
2. Turn the blower switch on.
3. Turn the A/C switch on.
4. Check the A/C CLUTCH in the DATA LIST with the HDS.

   Is it ON?

   YES—Go to step 5.

   NO—Go to the A/C pressure switch troubleshooting (see page 21-34).
5. Check the A/C system.

   Does the A/C system operate?

   YES—The air conditioning system circuit is OK. ■

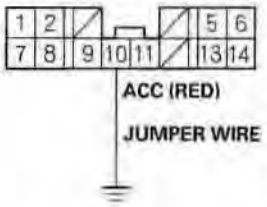
   NO—Go to step 6.
6. Turn the ignition switch OFF.
7. Turn the ignition switch ON (II).
8. Activate the A/C CLUTCH in the INSPECTION MENU with the HDS.

   Is there a clicking noise from the A/C compressor clutch?

   YES—Do the A/C system test (see page 21-59). ■

   NO—Go to step 9.
9. Momentarily connect under-hood fuse/relay box 14P connector terminal No. 10 to body ground with a jumper wire several times.

UNDER-HOOD FUSE/RELAY BOX 14P CONNECTOR



Wire side of female terminals

Is there a clicking noise from the A/C compressor clutch?

YES—Repair open in the wire between the ECM/PCM (E18) and the A/C clutch relay. ■

NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

Alternator FR Signal Circuit Troubleshooting

2003-2004 models

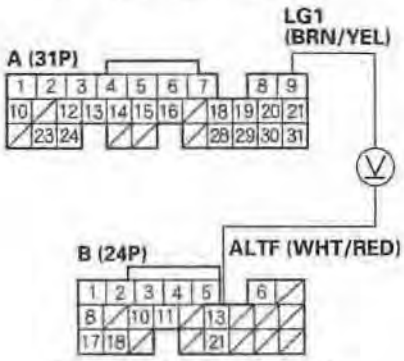
1. Start the engine, and let it idle.
2. Monitor the ALTERNATOR in the DATA LIST with the HDS.
3. Check if the indicated percentage varies when the headlight switch is on.

   Does the percentage vary?

   YES—The alternator signal circuit is OK.■

   NO—Go to step 4.
4. Turn the headlight switch and ignition switch OFF.
5. Disconnect the alternator 4P connector.
6. Turn the ignition switch ON (II).
7. Measure voltage between ECM/PCM connector terminals A9 and B13.

ECM/PCM CONNECTORS



Wire side of female terminals

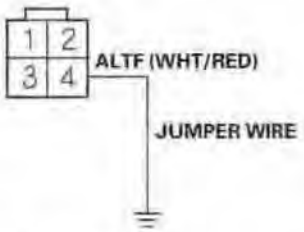
Is there about 5 V?

YES—Go to step 8.

NO—Go to step 13.

8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect ECM/PCM connector B (24P).
11. Connect alternator 4P connector terminal No. 4 to body ground with a jumper wire.

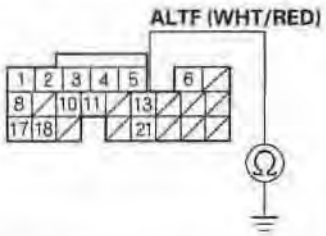
ALTERNATOR 4P CONNECTOR



Wire side of female terminals

12. Check for continuity between body ground and ECM/PCM connector terminal B13.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Test the alternator (see page 4-33).■

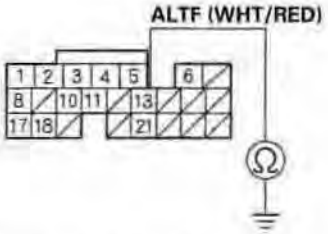
NO—Repair open in the wire between the ECM/PCM (B13) and the alternator.■

(cont'd)

Alternator FR Signal Circuit Troubleshooting (cont'd)

13. Turn the ignition switch OFF.
14. Jump the SCS line with the HDS.
15. Disconnect ECM/PCM connector B (24P).
16. Check for continuity between body ground and ECM/PCM connector terminal B13.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (B13) and the alternator.■

NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

2005 model

1. Start the engine, and let it idle.
2. Monitor the ALTERNATOR in the DATA LIST with the HDS.
3. Check if the indicated percentage varies when the headlight switch is on.

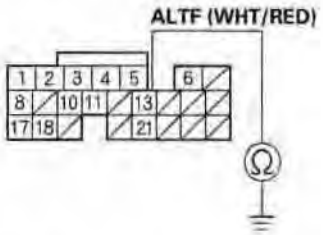
Does the percentage vary?

YES—The alternator signal circuit is OK.■

NO—Go to step 4.

4. Turn the headlight switch and ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect the alternator 4P connector.
7. Disconnect ECM/PCM connector B (24P).
8. Check for coutinuity between body ground and ECM/PCM connector terminal B13.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (B13) and the alternator.■

NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

PSP Switch Signal Circuit Troubleshooting

1. Start the engine, and let it idle.
2. Align the steering wheel straight ahead.
3. Check the PSP SWITCH in the DATA LIST with the HDS.

   Does it indicate ON?

   YES—Go to step 4.

   NO—Go to step 12.
4. Turn the steering wheel to the full lock position.
5. Check the PSP SWITCH in the DATA LIST with the HDS.

   Does it change to OFF?

   YES—The PSP switch signal circuit is OK.■

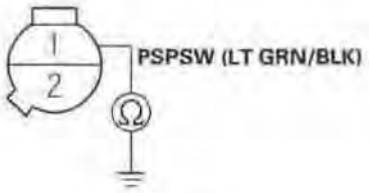
   NO—Go to step 6.
6. Disconnect the PSP switch 2P connector.
7. Check the PSP SWITCH in the DATA LIST with the HDS.

   Does it change to OFF?

   YES—Replace the PSP switch.■

   NO—Go to step 8.
8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect ECM/PCM connector E (31P).
11. Check for continuity between PSP switch 2P connector terminal No. 1 and body ground.

PSP SWITCH 2P CONNECTOR



Wire side of female terminals

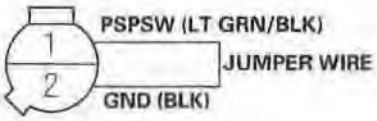
Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E16) and the PSP switch.■

NO—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

12. Turn the ignition switch OFF.
13. Disconnect the PSP switch 2P connector.
14. Connect PSP switch 2P connector terminals No. 1 and No. 2 with a jumper wire, then start the engine.

PSP SWITCH 2P CONNECTOR



Wire side of female terminals

(cont'd)

PSP Switch Signal Circuit Troubleshooting (cont'd)

15. Check the PSPSW in the DATA LIST with the HDS.

    Does it change to ON?

    YES—Replace the PSP switch.■

    NO—Go to step 16.

16. Turn the ignition switch OFF.

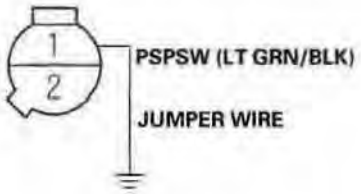
17. Remove the jumper wire from the PSP switch 2P connector.

18. Jump the SCS line with the HDS.

19. Disconnect ECM/PCM connector E (31P).

20. Connect PSP switch 2P connector terminal No. 1 to body ground with a jumper wire.

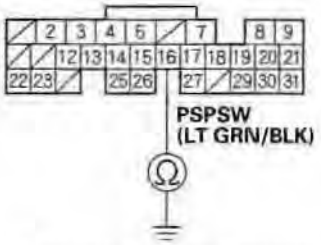
PSP SWITCH 2P CONNECTOR



Wire side of female terminals

21. Check for continuity between body ground and ECM/PCM connector terminal E16.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

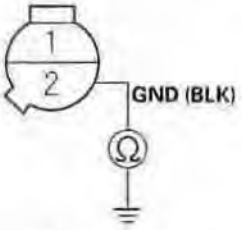
Is there continuity?

YES—Go to step 22.

NO—Repair open in the wire between the PSP switch and the ECM/PCM (E16).■

22. Check for continuity between PSP switch 2P connector terminal No. 2 and body ground.

PSP SWITCH 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5).■

NO—Repair open in the wire between the PSP switch and G301.■

Brake Pedal Position Switch Signal Circuit Troubleshooting

1. Turn the ignition switch ON (II).
2. Check the BRAKE SWITCH in the DATA LIST with the HDS.

   Does it indicate OFF?

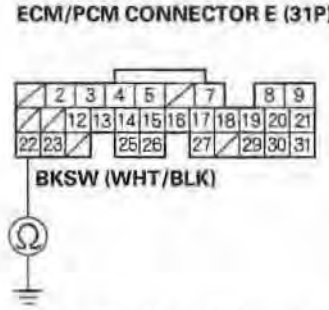
   YES—Go to step 3.

   NO—Inspect the brake pedal position switch (see page 19-6).■
3. Press the brake pedal, and check the BRAKE SWITCH in the DATA LIST with the HDS.

   Does it change to ON?

   YES—The brake pedal position switch signal circuit (BKSW line) is OK.■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Jump the SCS line with the HDS.
6. Disconnect the brake pedal position switch 4P connector.
7. Disconnect ECM/PCM connector E (31P).
8. Check for continuity between ECM/PCM connector terminal E22 and body ground.



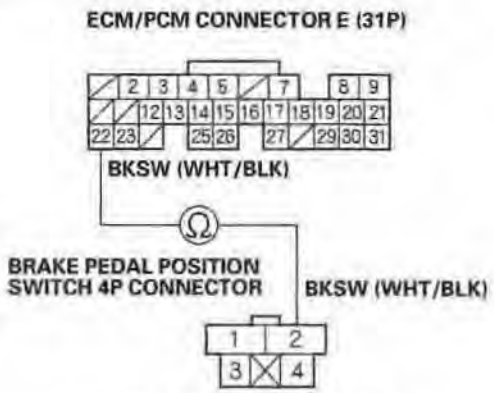
Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E22) and the No. 7 HORN, STOP (15 A) fuse. Replace the No. 7 HORN, STOP (15 A) fuse.■

NO—Go to step 9.

9. Check for continuity between ECM/PCM connector terminal E22 and brake pedal position switch 4P connector terminal No. 2.



Wire side of female terminals

Is there continuity?

YES—Repair open in the wire between the brake pedal position switch and the No. 7 HORN, STOP (15 A) fuse. Inspect the brake position switch (see page 19-6).■

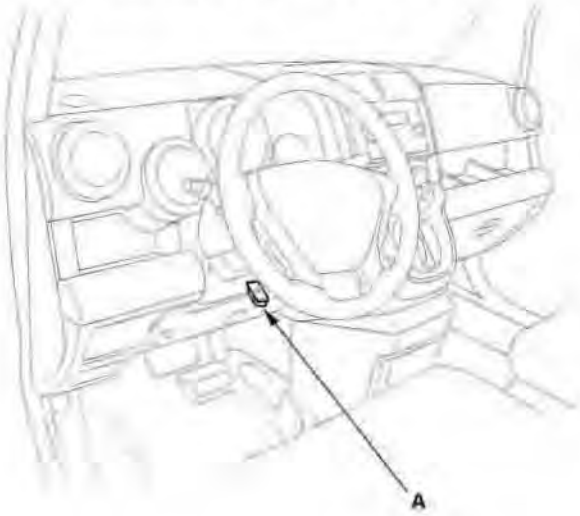
NO—Repair open in the wire between the ECM/PCM (E22) and the brake pedal position switch.■

Idle Speed Inspection

NOTE:
- Leave the idle air control (IAC) valve connected.
- Before checking the idle speed, check these items:
  - The malfunction indicator lamp (MIL) has not been reported on.
  - Ignition timing
  - Spark plugs
  - Air cleaner
  - PCV system
- Pull the parking brake lever up.

1. Disconnect the evaporative emission (EVAP) canister purge valve connector.

2. Connect the HDS to the data link connector (DLC) (A) located under the driver's side of the dashboard.



3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

4. Check the idle speed without load conditions: headlights, blower fan, radiator fan, and air conditioner off.

Idle speed should be:

M/T	**700±50 rpm**
A/T	**700±50 rpm (in Park or neutral)**

5. Let the engine idle for 1 minute with a high electrical load (A/C switch on, temperature set to MAX cool, blower fan on high, rear window defogger on, and headlights on high beam).

Idle speed should be:

M/T	**720±50 rpm**
A/T	**720±50 rpm (in Park or neutral)**

NOTE: If the idle speed is not within specification, do the ECM/PCM idle learn procedure (see page 11-207). If the idle is still out of specification, go to the Symptom Troubleshooting.

6. Reconnect the EVAP canister purge valve connector.

ECM/PCM Idle Learn Procedure

The idle learn procedure must be done so the ECM/PCM can learn the engine idle characteristics.

Do the idle learn procedure whenever you do any of these actions:

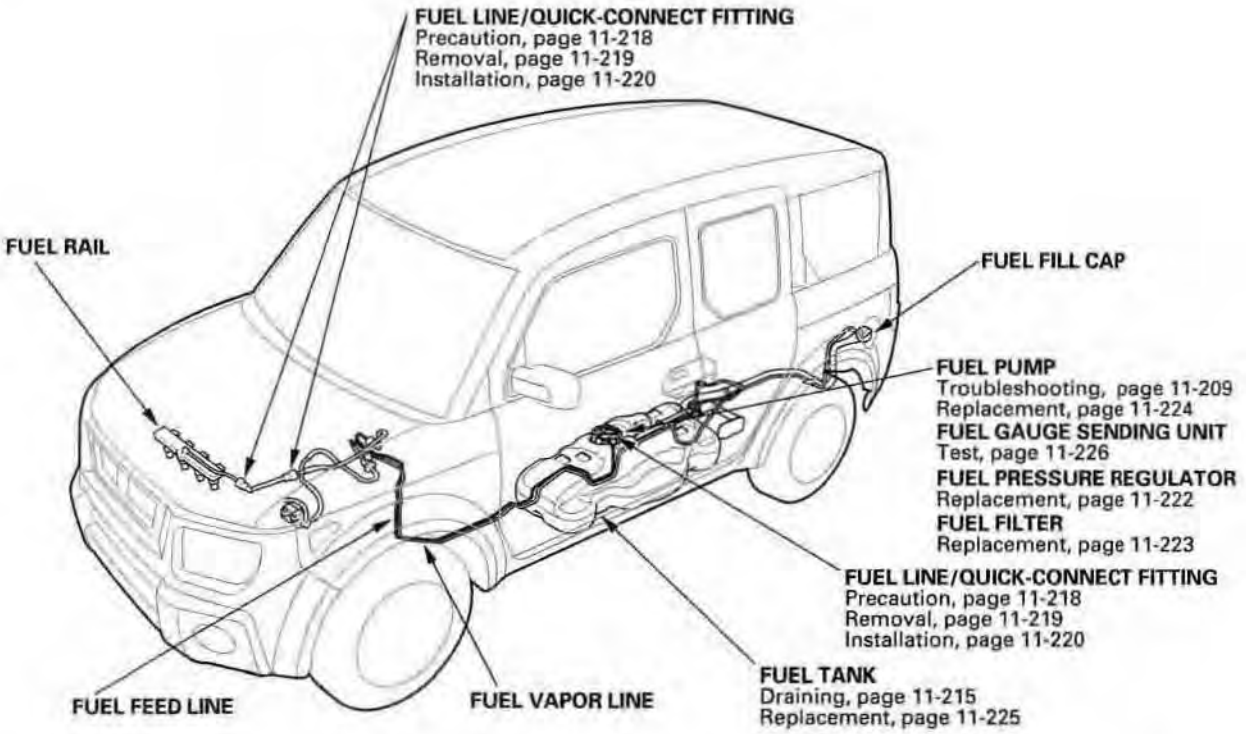
- The ECM/PCM is replaced.
- The ECM/PCM updated.
- The ECM/PCM is reset.
  NOTE: Erasing DTCs with the HDS does not require you to do the idle learn procedure.
- The throttle body is replaced or cleaned.

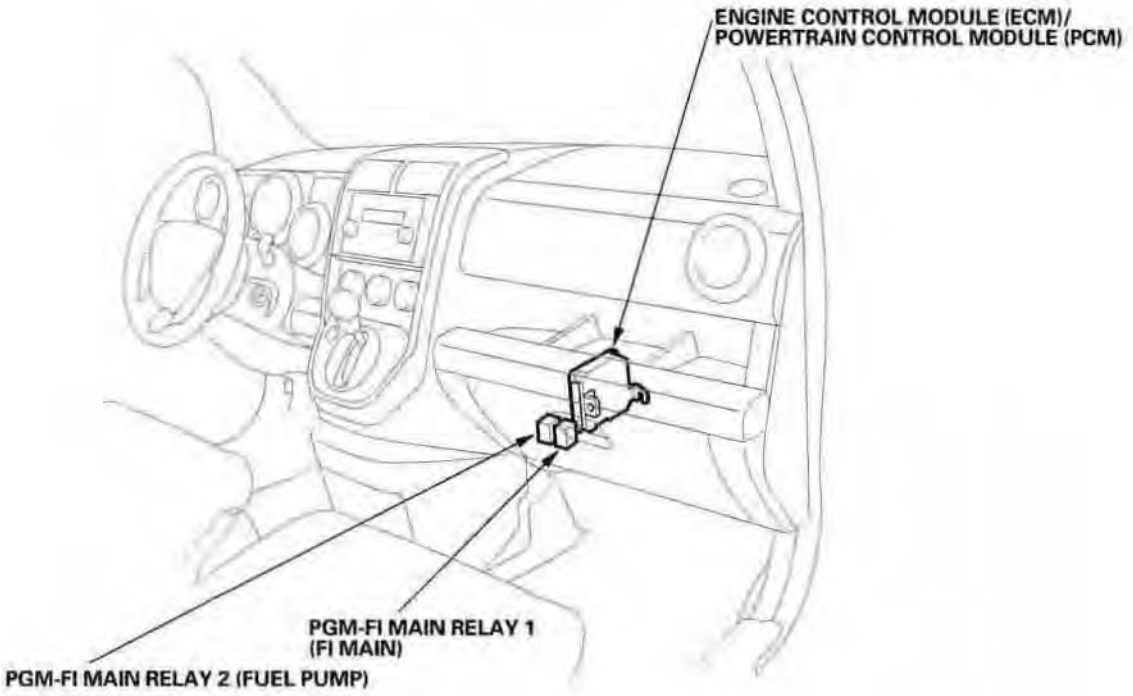
Procedure

1. Make sure all electrical items (A/C, audio, rear window defogger, lights, etc.) are off.
2. Reset the ECM/PCM with the HDS.
3. Turn the ignition switch ON (II), and wait 2 seconds.
4. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, or until the engine coolant temperature reaches 194 °F (90 °C).
5. Let the engine idle for about 5 minutes with the throttle fully closed.

   NOTE: If the radiator fan comes on, do not include its running time in the 5 minutes.

Component Location Index



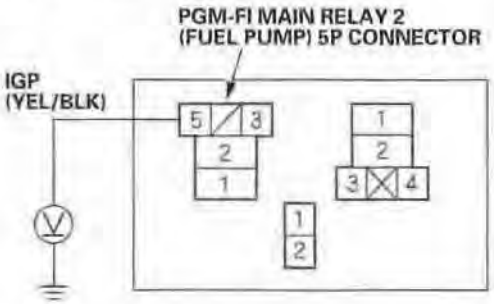


Fuel Pump Circuit Troubleshooting

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is on, you will hear some noise if you listen to the fuel fill port with the fuel fill cap removed. The fuel pump should run for 2 seconds when the ignition switch is first turned on. If the fuel pump does not make noise, check as follows:

1. Turn the ignition switch OFF.
2. Remove the glove box (see page 20-78), then remove PGM-FI main relay 2 (FUEL PUMP) (A).

3. Turn the ignition switch ON (II).
4. Measure voltage between PGM-FI main relay 2 (FUEL PUMP) 5P connector terminal No. 5 and body ground.



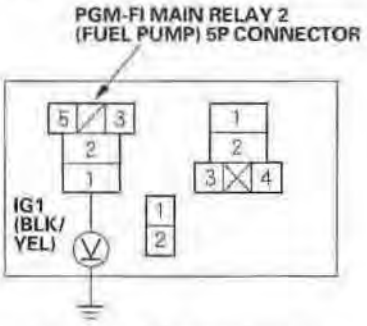
Wire side of female terminals

Is there battery voltage?

YES—Go to step 5.

NO—Repair open in the wire between PGM-FI main relay 1 (FI MAIN) and PGM-FI main relay 2 (FUEL PUMP).■

5. Measure voltage between PGM-FI main relay 2 (FUEL PUMP) 5P connector terminal No. 1 and body ground.



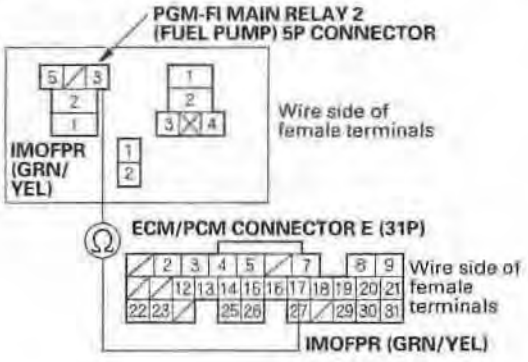
Wire side of female terminals

Is there battery voltage?

YES—Go to step 6.

NO—Repair open in the wire between the under-dash fuse/relay box No. 17 Fuel Pump (15 A) fuse and PGM-FI main relay 2 (FUEL PUMP).■

6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect ECM/PCM connector E (31P).
9. Check for continuity between PGM-FI main relay 2 (FUEL PUMP) 5P connector terminal No. 3 and ECM/PCM connector terminal E17.



Is there continuity?

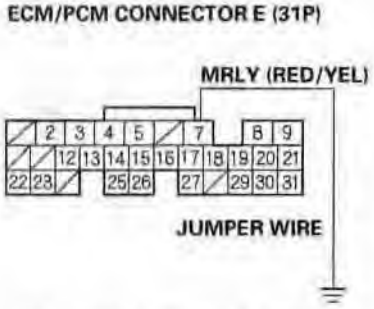
YES—Go to step 10.

NO—Repair open in the wire between PGM-FI main relay 2 (FUEL PUMP) and the ECM/PCM (E17).■

(cont'd)

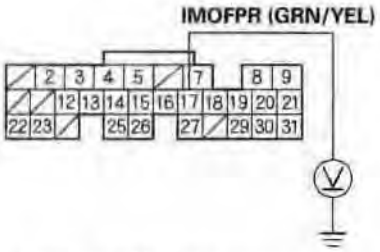
Fuel Pump Circuit Troubleshooting (cont'd)

10. Reinstall PGM-FI main relay 2 (FUEL PUMP).
11. Connect ECM/PCM connector terminal E7 to body ground with a jumper wire.



Wire side of female terminals

12. Turn the ignition switch ON (II).
13. Measure voltage between ECM/PCM connector terminal E17 and body ground.



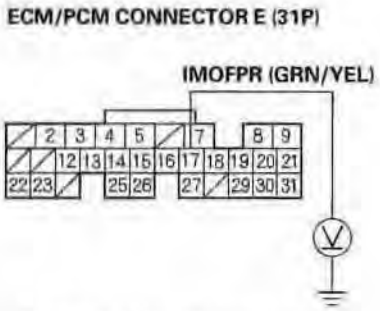
Wire side of female terminals

Is there battery voltage?

YES—Go to step 14.

NO—Replace PGM-FI main relay 2 (FUEL PUMP). ■

14. Turn the ignition switch OFF.
15. Remove the jumper wire, then reconnect ECM/PCM connector E (31P).
16. Open the SCS line with the HDS.
17. Turn the ignition switch ON (II), and measure voltage between ECM/PCM connector terminal E17 and body ground within 2 seconds.



Wire side of female terminals

Is there battery voltage for 2 seconds?

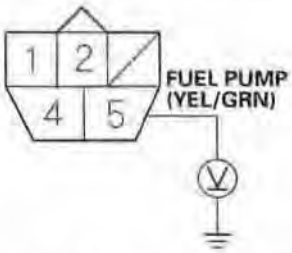
YES—Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6), then recheck. If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM (see page 11-5). ■

NO—Go to step 18.

18. Turn the ignition switch OFF.
19. Remove the center console (see page 20-71), both track floor coverings (see page 20-69), and both door sill trims (see page 20-58).
20. Fold back the rear floor covering until the access panel is accessible (see page 20-70). Remove the access panel from the floor.

21. Turn the ignition switch ON (II), and measure voltage between fuel pump 5P connector terminal No. 5 and body ground within 2 seconds.

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

Is there battery voltage for 2 seconds?

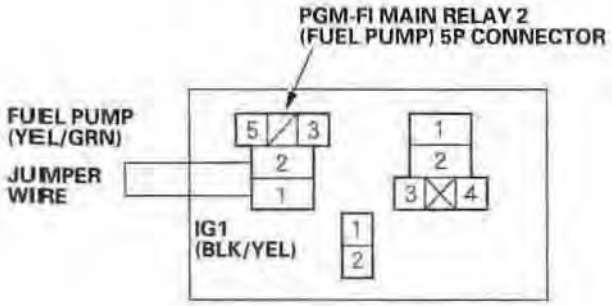
YES—Go to step 27.

NO—Go to step 22.

22. Turn the ignition switch OFF.

23. Remove PGM-FI main relay 2 (FUEL PUMP).

24. Connect PGM-FI main relay 2 (FUEL PUMP) 5P connector terminals No. 1 and No. 2 with a jumper wire.

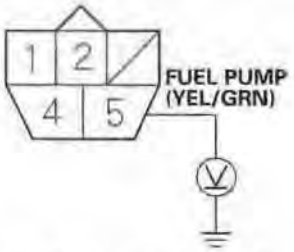


Wire side of female terminals

25. Turn the ignition switch ON (II).

26. Measure voltage between fuel pump 5P connector terminal No. 5 and body ground.

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

Is there battery voltage?

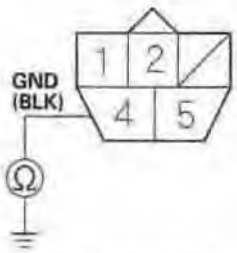
YES—Replace PGM-FI main relay 2 (FUEL PUMP).■

NO—Repair open in the wire between PGM-FI main relay 2 (FUEL PUMP) and the fuel pump 5P connector.■

27. Turn the ignition switch OFF.

28. Check for continuity between fuel pump 5P connector terminal No. 4 and body ground.

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Replace the fuel pump (see page 11-224).■

NO—Repair open in the wire between the fuel pump 5P connector and G552.■

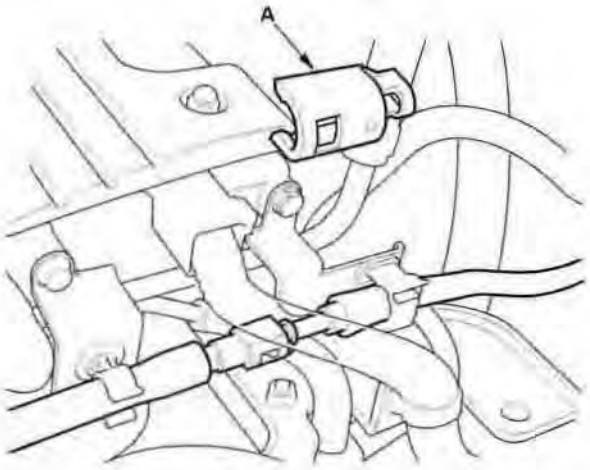
Fuel Pressure Relieving

Before disconnecting fuel lines or hoses, relieve pressure from the system by stopping the fuel pump and disconnecting the fuel tube/quick connect fitting in the engine compartment.

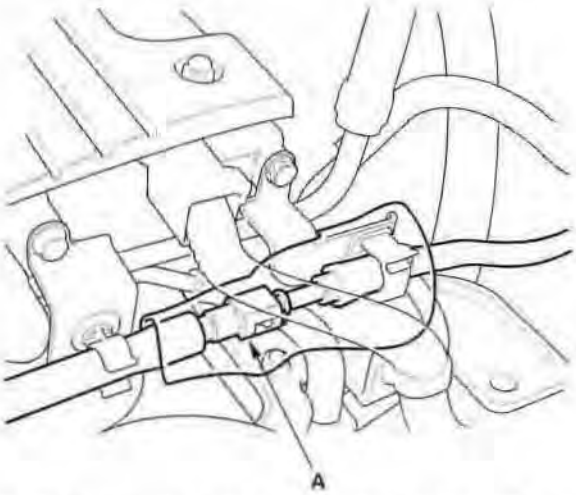
With the HDS

1. Remove the fuel fill cap.
2. Turn the ignition switch ON (II).
3. From the INSPECTION MENU of the HDS, select FUEL PUMP OFF, then start the engine, and let it idle until it stalls.

   NOTE:
   - Do not allow the engine to idle above 1,000 rpm or the ECM/PCM will continue to operate the fuel pump.
   - A DTC or a Temporary DTC may be set during this procedure. Check for DTCs, and clear them as needed (see page 11-3).
4. Turn the ignition switch OFF.
5. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets.
6. Disconnect the negative cable from the battery.
7. Remove the quick-connect fitting cover (A).

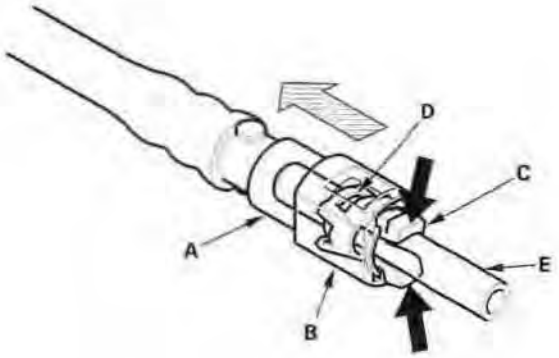


8. Check the fuel quick-connect fitting for dirt, and clean it if needed.
9. Place a rag or shop towel over the quick-connect fitting (A).



10. Disconnect the quick-connect fitting (A): Hold the connector (B) with one hand, and squeeze the retainer tabs (C) with the other hand to release them from the locking tabs (D). Pull the connector off.

    NOTE:
    - Be careful not to damage the line (E) or other parts.
    - Do not use tools.
    - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
    - Do not remove the retainer from the line; once removed, the retainer must be replaced with a new one.



11. After disconnecting the quick-connect fitting, check it for dirt or damage (see step 4 on page 11-220).

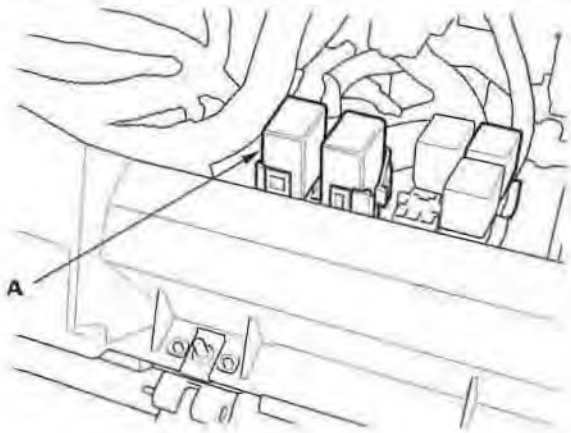
12. Reconnect the negative cable to the battery, and do these items:

    - Power window control unit reset procedure (see page 22-115).
    - Enter the anti-theft code for the radio, then enter the customer's radio station and XM radio channel presets.
    - Reset the clock.

Without the HDS

1. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets.

2. Remove the glove box (see page 20-78), then remove PGM-FI main relay 2 (FUEL PUMP) (A).



3. Start the engine, and let it idle until it stalls.

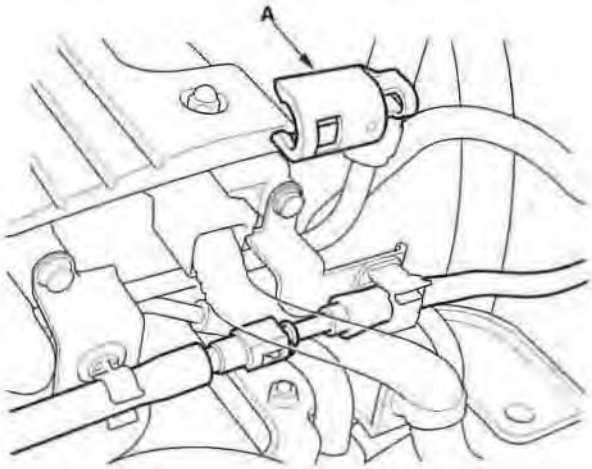
   NOTE: If any DTCs are stored, clear and ignore them.

4. Turn the ignition switch OFF.

5. Remove the fuel fill cap.

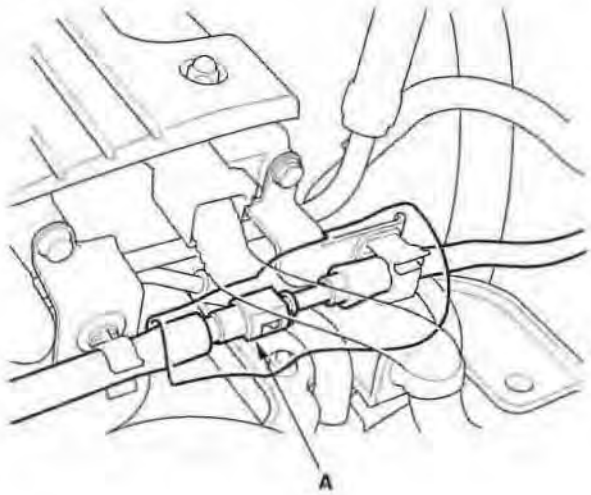
6. Disconnect the negative cable from the battery.

7. Remove the quick-connect fitting cover (A).



8. Check the fuel quick-connect fitting for dirt, and clean it if needed.

9. Place a rag or shop towel over the quick-connect fitting (A).

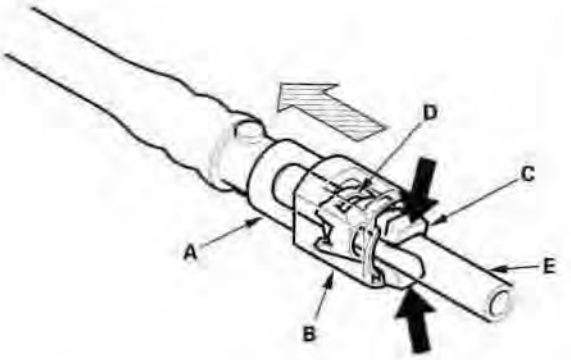


(cont'd)

Fuel Pressure Relieving (cont'd)

10. Disconnect the quick-connect fitting (A): Hold the connector (B) with one hand, and squeeze the retainer tabs (C) with the other hand to release them from the locking tabs (D). Pull the connector off.

    NOTE:
    - Be careful not to damage the line (E) or other parts.
    - Do not use tools.
    - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
    - Do not remove the retainer from the line; once removed, the retainer must be replaced with a new one.



11. After disconnecting the quick-connect fitting, check it for dirt or damage (see step 4 on page 11-220).

12. Reconnect the negative cable to the battery, and do these items:

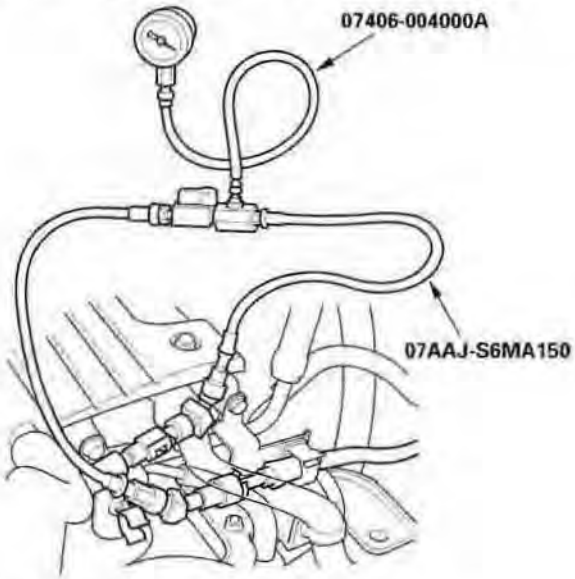
    - Power window control unit reset procedure (see page 22-115).
    - Enter the anti-theft code for the radio, then enter the customer's radio station and XM radio channel presets.
    - Reset the clock.

Fuel Pressure Test

Special Tools Required
- Fuel pressure gauge 07406-004000A
- Fuel pressure gauge attachment set 07AAJ-S6MA150

1. Relieve the fuel pressure (see page 11-212).

2. Disconnect the quick-connect fitting. Attach the fuel pressure gauge set and the fuel pressure gauge.



3. Start the engine, and let it idle.

    - If the engine starts, go to step 5.
    - If the engine does not start, go to step 4.

4. Check to see if the fuel pump is running: listen to the fuel filler port with the fuel fill cap removed. The fuel pump should run for 2 seconds when the ignition switch is first turned on.

    - If the pump runs, go to step 5.
    - If the pump does not run, do the fuel pump circuit troubleshooting (see page 11-209).

5. Read the fuel pressure gauge. The pressure should be:

   330–380 kPa (3.4–3.9 kgf/cm², 48–55 psi)

   - If the pressure is OK, the test is complete.
   - If the pressure is out of specification, replace the fuel pressure regulator (see page 11-222) and the fuel filter (see page 11-223), then recheck the fuel pressure.

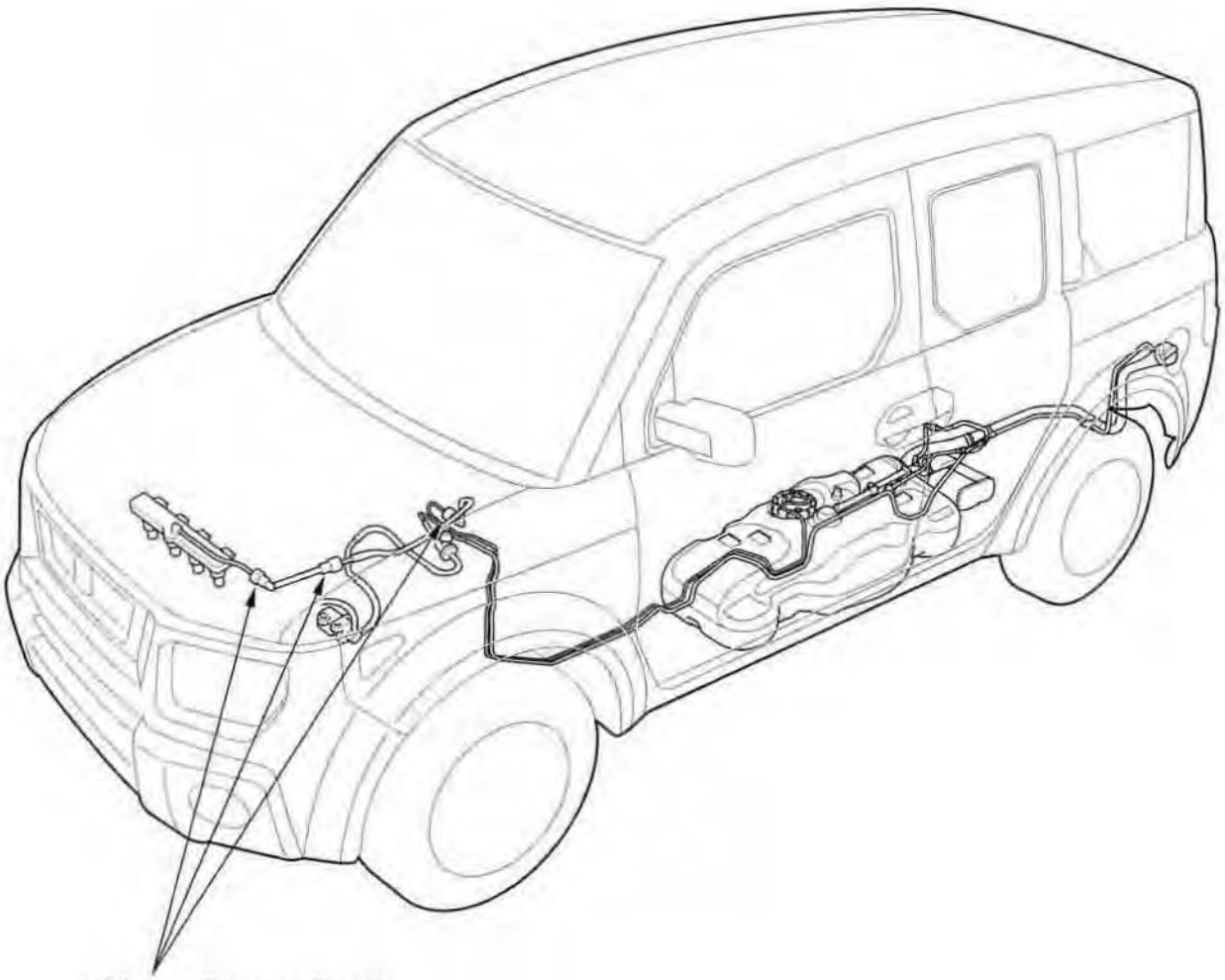
Fuel Tank Draining

1. Remove the fuel tank unit (see page 11-224).

2. Using a hand pump, a hose, and a container suitable for fuel, draw the fuel from the fuel tank.

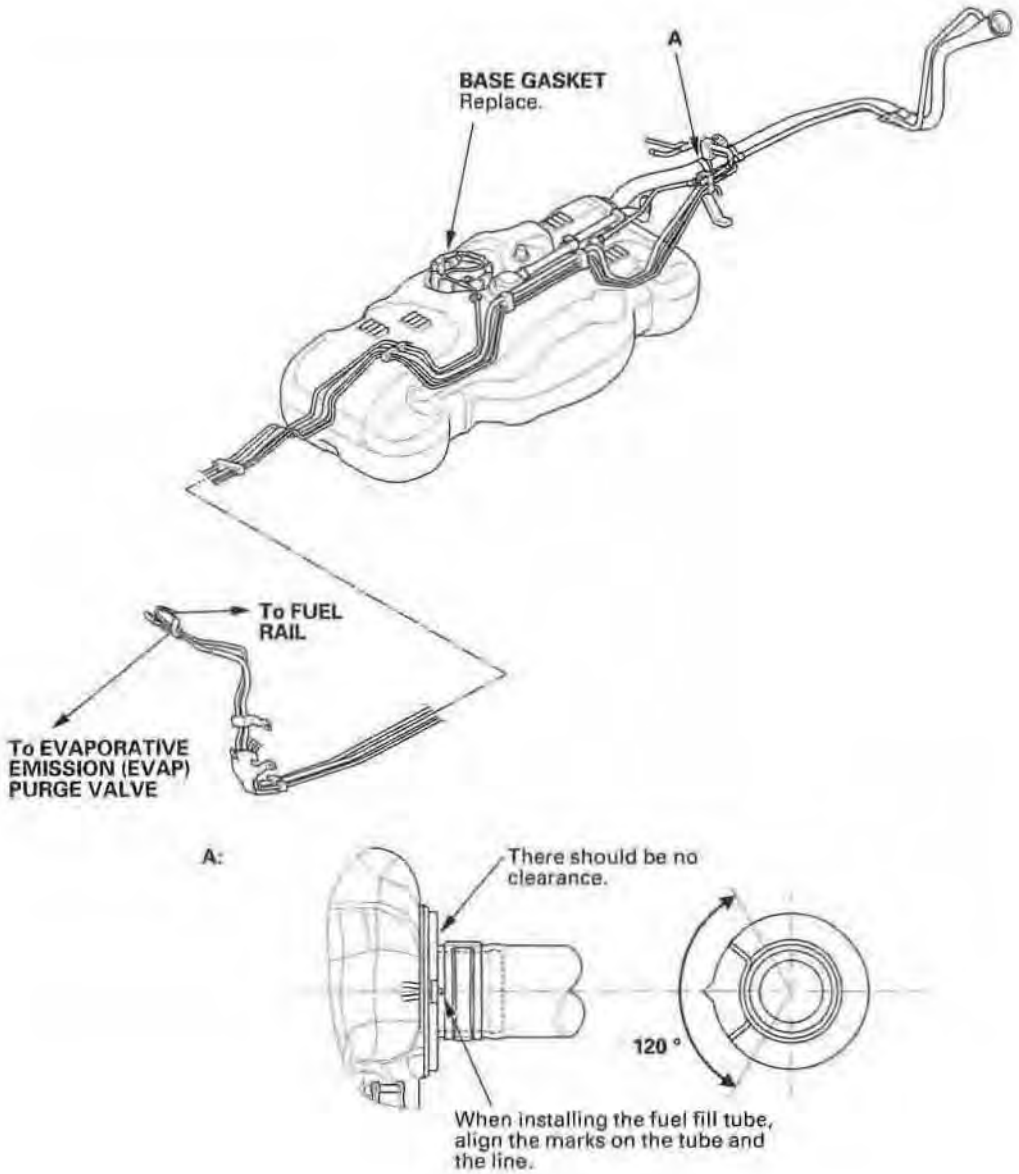
Fuel Line Inspection

Check the fuel system lines and hoses for damage, leaks, and deterioration. Replace any damaged parts.



Make sure the connections are secure and the quick-connect fitting covers are firmly locked in place.

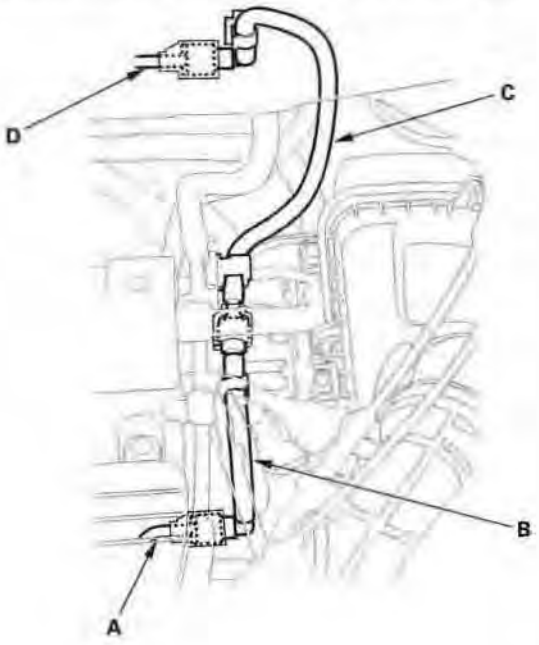
Check all clamps, and retighten any if necessary.

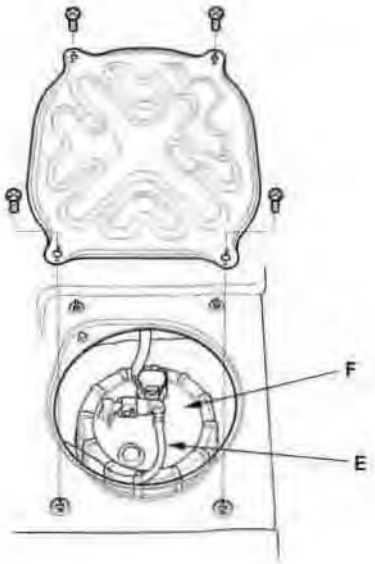


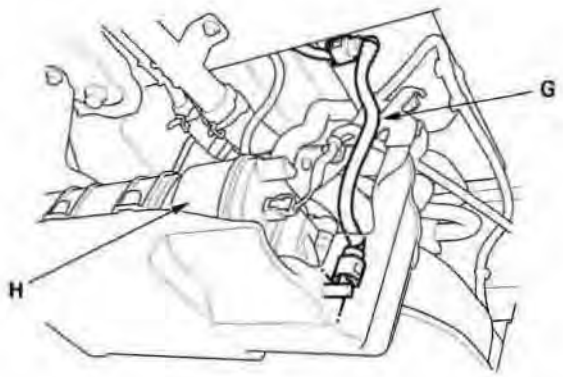
Fuel Line/Quick-Connect Fitting Precaution

The fuel line/quick-connect fittings connect the fuel rail (A) to the fuel feed hose (B), the fuel feed hose (B) to the fuel feed hose (C), the fuel feed hose (C) to the fuel line (D), the fuel line (E) to the fuel tank unit (F), and the fuel vapor line (G) to the EVAP canister (H). When removing or installing the fuel feed hose, the fuel tank unit, or the fuel tank, it is necessary to disconnect or connect the quick-connect fittings.
Pay attention to these items:

- The fuel feed hoses, the fuel line, the fuel vapor line, and quick-connect fittings are not heat-resistant; be careful not to damage them during welding or other heat-generating procedures.
- The fuel feed hoses, fuel line, fuel vapor line, and the quick-connect fittings are not acid-proof; do not touch them with a shop towel that was used for wiping battery electrolyte. Replace them if they came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel feed hose, the fuel line, the fuel vapor line, and the quick-connect fittings, be careful not to bend or twist them excessively. Replace them if they are damaged.







A disconnected quick-connect fitting can be reconnected, but the retainer on the mating line cannot be reused once it has been removed from the line. Replace the retainer when:

- replacing the fuel rail.
- replacing the fuel line.
- replacing the fuel pump.
- replacing the fuel filter.
- replacing the fuel gauge sending unit.
- it has been removed from the line.
- it is damaged.

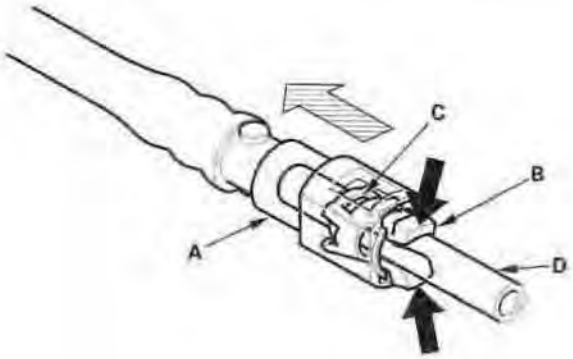
Retainer location	Manufacturer	Retainer color	Piping diameter
Engine compartment fuel feed hose A, fuel rail side	Tokai	Blue green	0.31 in. (8.0 mm)
Engine compartment fuel feed hose A, fuel feed hose B side, and fuel hose B	Tokai	Green	0.25 in. (6.35 mm)
Fuel tank unit: Fuel feed line, fuel tank unit side	Sanoh	White	0.37 in. (9.5 mm)
EVAP canister: fuel vapor line	Tokai	Orange	0.37 in. (9.5 mm)

Fuel Line/Quick-Connect Fitting Removal

NOTE: Read the "Fuel Line/Quick-Connect Fitting Precaution" (see page 11-218) before this procedure.

1. Relieve the fuel pressure (see page 11-212).
2. Check the fuel quick-connect fitting for dirt, and clean it if needed.
3. Place a rag or shop towel over the quick-connect fitting. Hold the connector (A) with one hand, and squeeze the retainer tabs (B) with the other hand to release them from the locking tabs (C). Pull the connector off.

   NOTE:
   - Be careful not to damage the line (D) or other parts. Do not use tools.
   - If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
   - Do not remove the retainer from the line; once removed, the retainer must be replaced with a new one.



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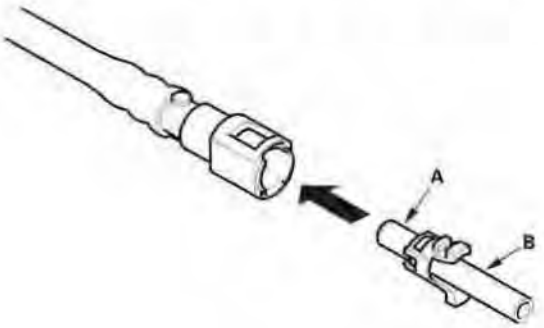
Fuel Line/Quick-Connect Fitting Removal (cont'd)

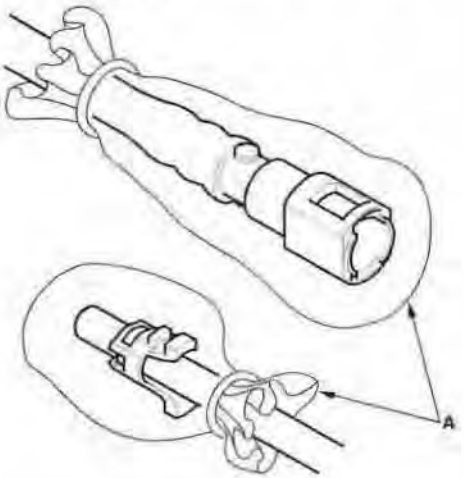
4. Check the contact area (A) of the line (B) for dirt or damage.

   - If the surface is dirty, clean it.
   - If the surface is rusty or damaged, replace the fuel pump, the fuel filter, or the fuel feed line.



5. To prevent damage and keep foreign matter out, cover the disconnected connector and line ends with plastic bags (A).

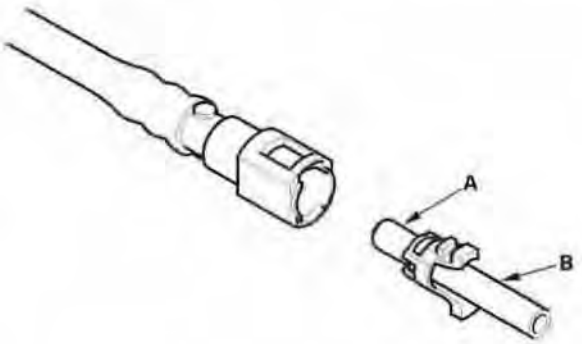
   NOTE:
   - The retainer cannot be reused once it has been removed from the line.
     Replace the retainer when:
     - replacing the fuel rail.
     - replacing the fuel feed line.
     - replacing the fuel pump.
     - replacing the fuel filter.
     - replacing the fuel gauge sending unit.
     - it has been removed from the line.
     - it is damaged.



Fuel Line/Quick-Connect Fitting Installation

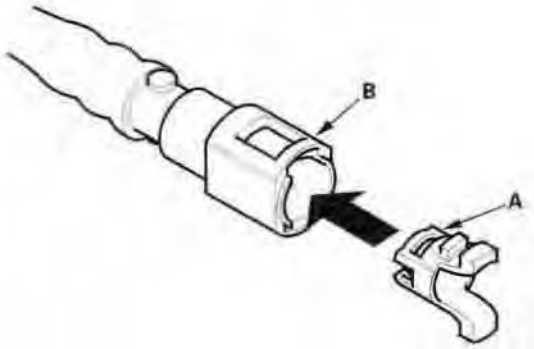
NOTE: Read the "Fuel Line/Quick-Connect Fitting Precaution" (see page 11-218) before this procedure.

1. Check the contact area (A) of the line (B) for dirt or damage, and clean it if needed.

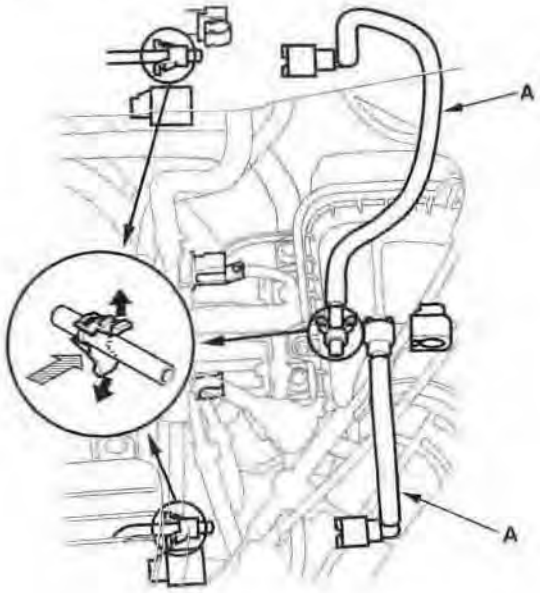


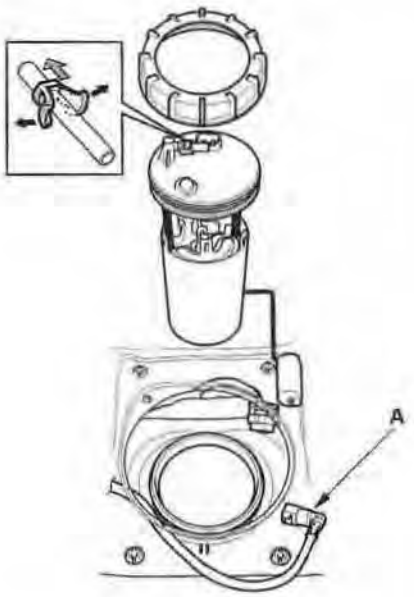
2. Insert a new retainer (A) into the connector (B) if the retainer is damaged, or after:

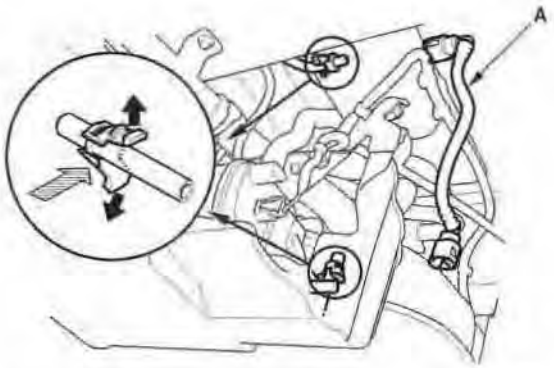
   - replacing the fuel rail.
   - replacing the fuel feed line.
   - replacing the fuel pump.
   - replacing the fuel filter.
   - replacing the fuel gauge sending unit.
   - removing the retainer from the line.



3. Before connecting a new fuel tube/quick-connect fitting assembly (A), remove the old retainer from the mating line.



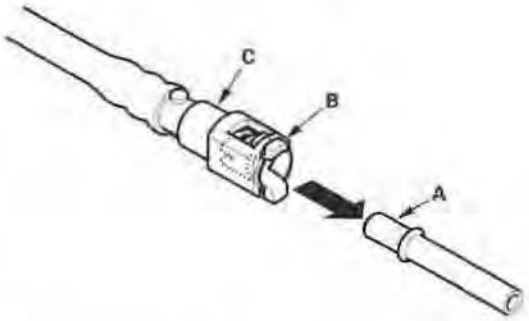




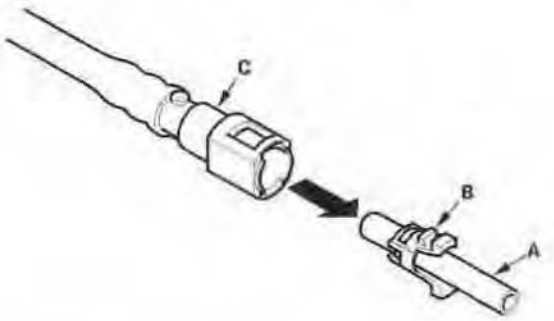
4. Align the quick-connect fittings with the line (A), and align the retainer locking tabs (B) with the connector grooves (C). Then press the quick-connect fittings onto the line until both retainer tabs lock with a clicking sound.

NOTE: If it is hard to connect, put a small amount of new engine oil on the line end.

Connection with new retainer:



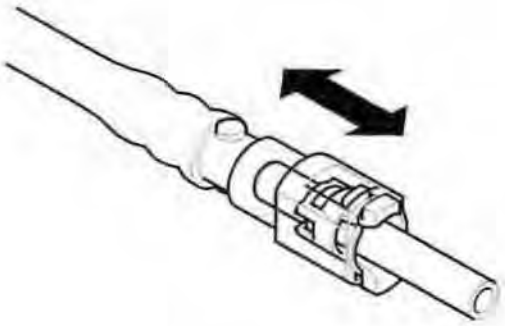
Reconnection to existing retainer:



(cont'd)

Fuel Line/Quick-Connect Fitting Installation (cont'd)

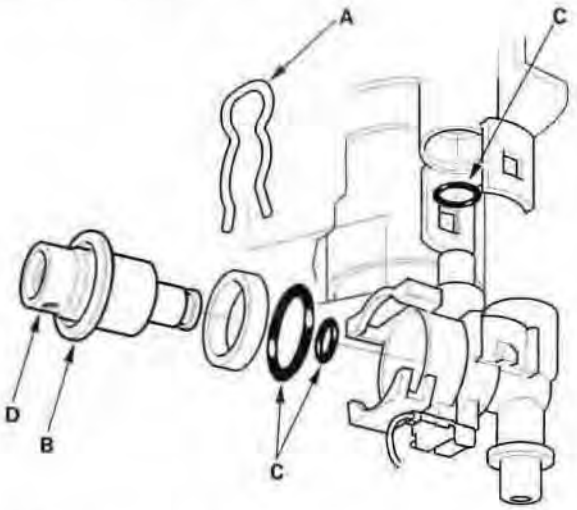
5. Make sure the connection is secure and the tabs are firmly locked into place; check visually and by pulling the connector.



6. Reconnect the negative cable to the battery, and turn the ignition switch ON (II). The fuel pump will run for about 2 seconds, and fuel pressure will rise. Repeat two or three times, and check that there is no leakage in the fuel supply system.

Fuel Pressure Regulator Replacement

1. Remove the fuel pump (see page 11-224).
2. Remove the clip (A).

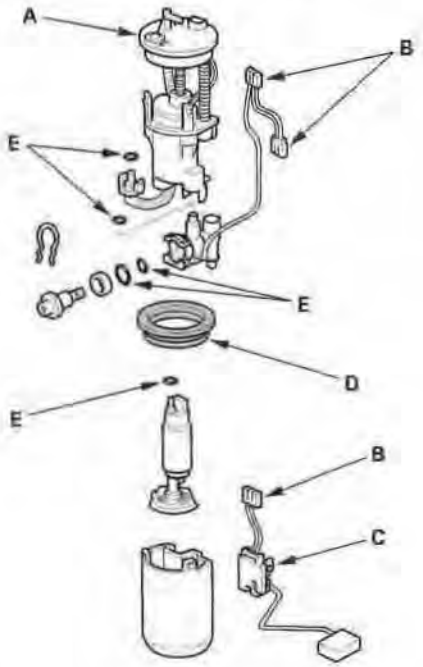


3. Remove the fuel pressure regulator (B).
4. Install the regulator in the reverse order of removal with new O-rings (C).
   Make sure the regulator is installed with the drain hole (D) facing down.

Fuel Filter Replacement

The fuel filter should be replaced whenever the fuel pressure drops below the specified value (see page 11-214), after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Remove the fuel tank unit (see page 11-224).
2. Remove the fuel filter assembly (A).

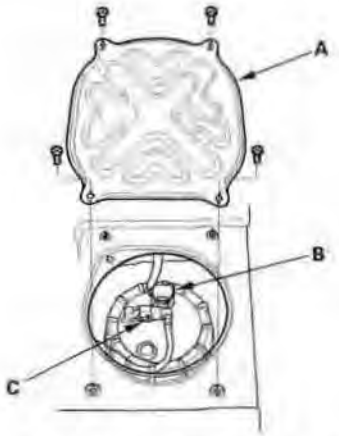


3. Check these items before installing the fuel tank unit:
   - When connecting the wire harness, make sure the connection is secure and the connectors (B) are firmly locked into place.
   - When installing the fuel gauge sending unit (C), make sure the connection is secure and the connectors (B) is firmly locked into place. Be careful not to bend or twist it excessively.
4. Install the parts in the reverse order of removal with a new base gasket (D) and new O-rings (E). When installing the fuel tank unit, align the marks on the unit and the fuel tank (see step 11 on page 11-224).

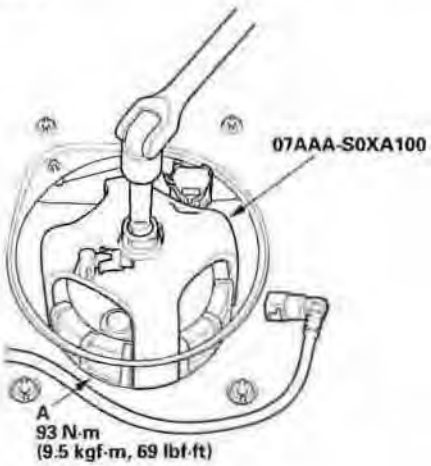
Fuel Pump/Fuel Gauge Sending Unit Replacement

Special Tools Required
Fuel sender wrench 07AAA-S0XA100

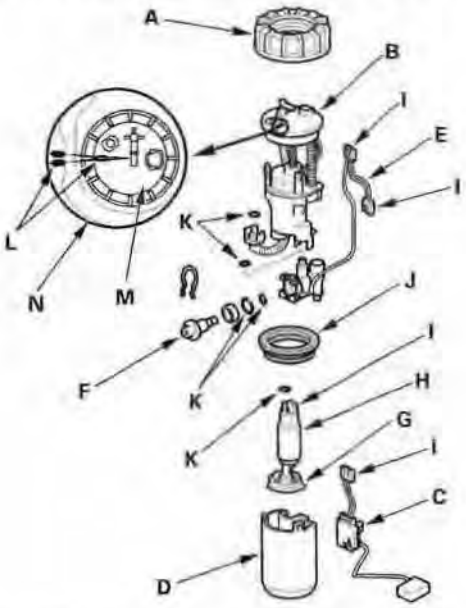
1. Relieve the fuel pressure (see page 11-212).
2. Remove the fuel fill cap.
3. Remove the center console (see page 20-71), both track floor coverings (see page 20-69), and both sill trims (see page 20-58).
4. Fold back the floor mat until the access panel is accesible. Remove the access panel (A) from the floor.



5. Disconnect the fuel pump 5P connector (B).
6. Disconnect the quick-connect fitting (C) from the fuel tank unit.
7. Using the special tool, loosen the fuel tank unit locknut (A).



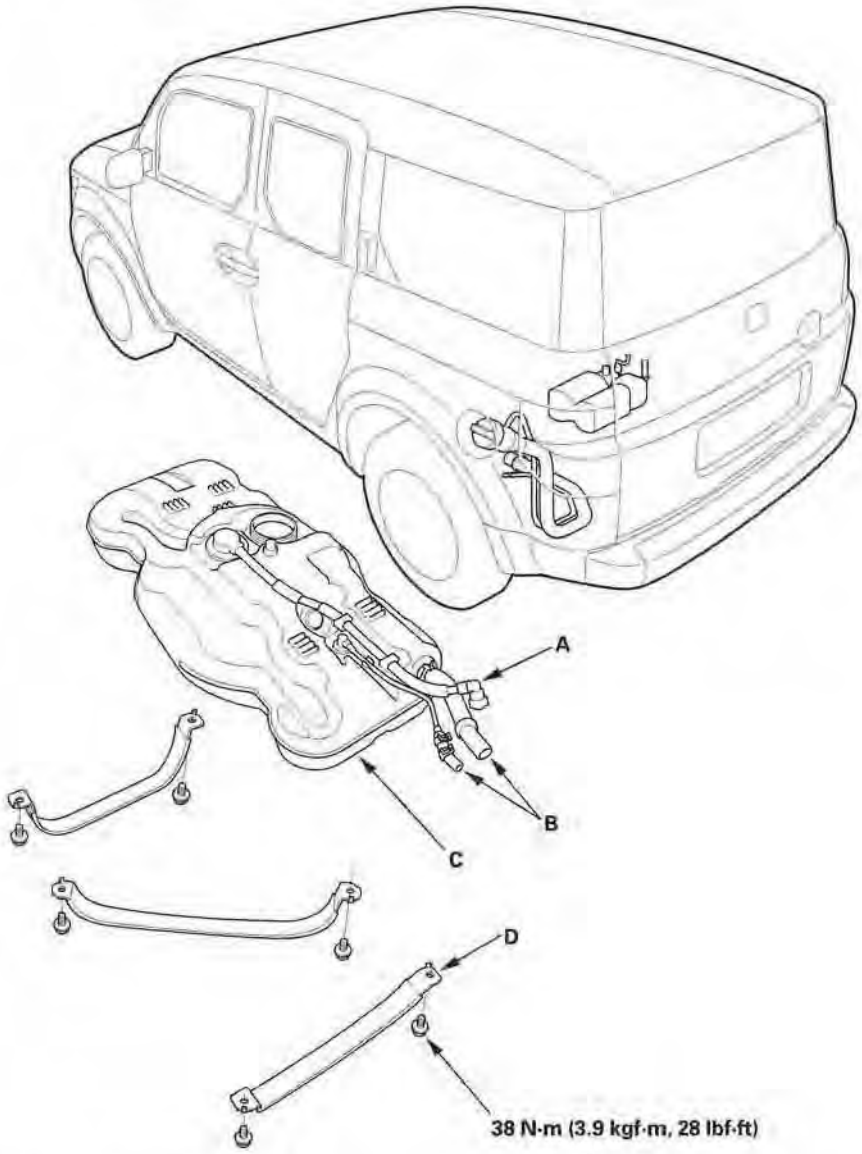
8. Remove the locknut (A) and the fuel tank unit.



9. Remove the fuel filter (B), the fuel gauge sending unit (C), the case (D), the wire harness (E), and the fuel pressure regulator (F).
10. Check these items before installing the fuel tank unit:
    - Make sure the connection is secure and the suction filter (G) is firmly connected to the fuel pump (H).
    - When connecting the wire harness, make sure the connection is secure and the connectors (I) are firmly locked into place.
    - When installing the fuel gauge sending unit, make sure the connection is secure and the connector is firmly locked into place. Be careful not to bend or twist it excessively.
11. Install the parts in the reverse order of removal with a new base gasket (J), new locknut (A), and new O-rings (K). When installing the fuel tank unit, align the marks (L) on the unit (M) and the fuel tank (N).

Fuel Tank Replacement

1. Drain the fuel tank (see page 11-215).
2. Raise the vehicle, and support it with jackstands.
3. Disconnect the filler neck, the fuel vapor hose (A), and hoses (B). Slide back the clamps, then twist the hoses as you pull to avoid damaging them.



4. Place a jack or other support under the tank (C).
5. Remove the strap bolts and the strap (D).
6. Remove the fuel tank.
7. Install the parts in the reverse order of removal.

Fuel Gauge Sending Unit Test

NOTE: For the fuel gauge system circuit diagram, refer to the Gauges Circuit Diagram (see page 22-64).

1. Check the No. 10 METER (7.5 A) fuse in the under-dash fuse/relay box before testing.

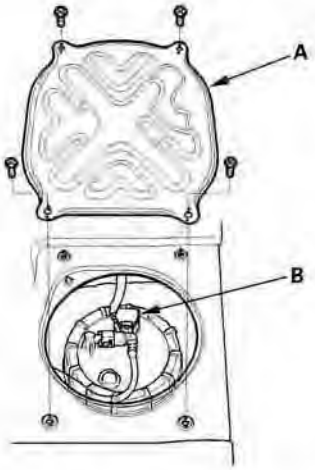
2. Do the gauge drive circuit check (see page 22-62).

   - If the fuel gauge needle moves from the minimum to maximum position and then returns to the minimum position, the gauge is OK. Go to step 3.
   - If the fuel gauge needle does not move as stated above, replace the gauge assembly and retest.

3. Turn the ignition switch OFF.

4. Remove the center console (see page 20-71), both track floor coverings (see page 20-69), and both door sill trims (see page 20-58).

5. Fold back the floor mat until the access panel is accessible. Remove the access panel (A) from the floor.



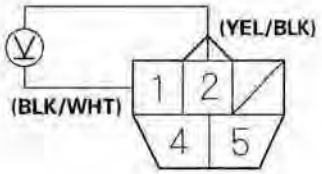
6. Disconnect the fuel pump 5P connector (B).

7. Measure voltage between fuel pump 5P connector terminals No. 1 and No. 2 with the ignition switch ON (II). There should be battery voltage.

   - If the voltage is OK, go to step 8.
   - If the voltage is not as specified, check for:

     – a short in the YEL/BLK wire to ground.
     – an open in the YEL/BLK or BLK/WHT wire.
     – poor ground (G552).

FUEL PUMP 5P CONNECTOR

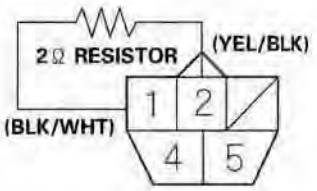


Wire side of female terminals

8. Turn the ignition switch OFF. Remove the No. 9 BACK UP (10 A) fuse from the under-hood fuse/relay box for at least 30 seconds, then reinstall it.

9. Install a 2 Ω resistor between fuel pump 5P connector terminals No. 1 and No. 2, then turn the ignition switch ON (II).

FUEL PUMP 5P CONNECTOR



Wire side of female terminals

10. Check that the needle of the fuel gauge indicates "F".

    - If the pointer of the fuel gauge does not indicate "F", replace the gauge.
    - If the pointer points to "F", the fuel gauge is OK; go to step 11.

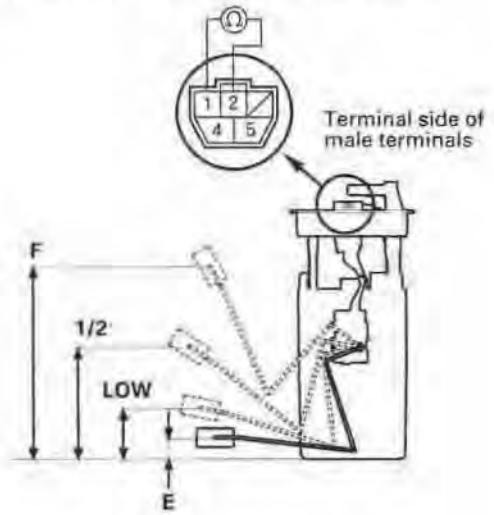
    NOTE: The needle of the fuel gauge returns to the bottom of the gauge dial when the ignition switch is OFF, regardless of the fuel level.

11. Remove the fuel tank unit from the fuel tank (see page 11-224).

12. Measure the resistance between the No. 1 and No. 2 terminals of the fuel gauge sending unit with the float at E (EMPTY), L (LOW), 1/2 (HALF FULL), and F (FULL) positions.
    If you do not get these readings, replace the sending unit (see page 11-224).

Float Position	F 5.8 in. (148.4 mm)	1/2 3.2 in. (80.4 mm)	LOW 1.2 in. (30.4 mm)	E 0.5 in. (13.7 mm)
Resistance (Ω)	19 to 20	233.1 to 243.1	526.9 to 692.6	770 to 790

NOTE: Remove the No. 9 BACK UP (10 A) fuse from the under-hood fuse/relay box for at least 10 seconds after completing troubleshooting, otherwise it may take up to 20 minutes for the fuel gauge to indicate the correct fuel level.



Low Fuel Indicator Test

1. Do the fuel gauge sending unit test (see page 11-226).

    - If the system is OK, go to step 2.
    - If the system has any malfunction, repair it.

2. Turn the ignition switch OFF. Remove the No. 9 BACK UP (10 A) fuse from the under-hood fuse/relay box for at least 30 seconds, then reinstall it.

3. Turn the ignition switch ON (II) with the float at the E (EMPTY) position.

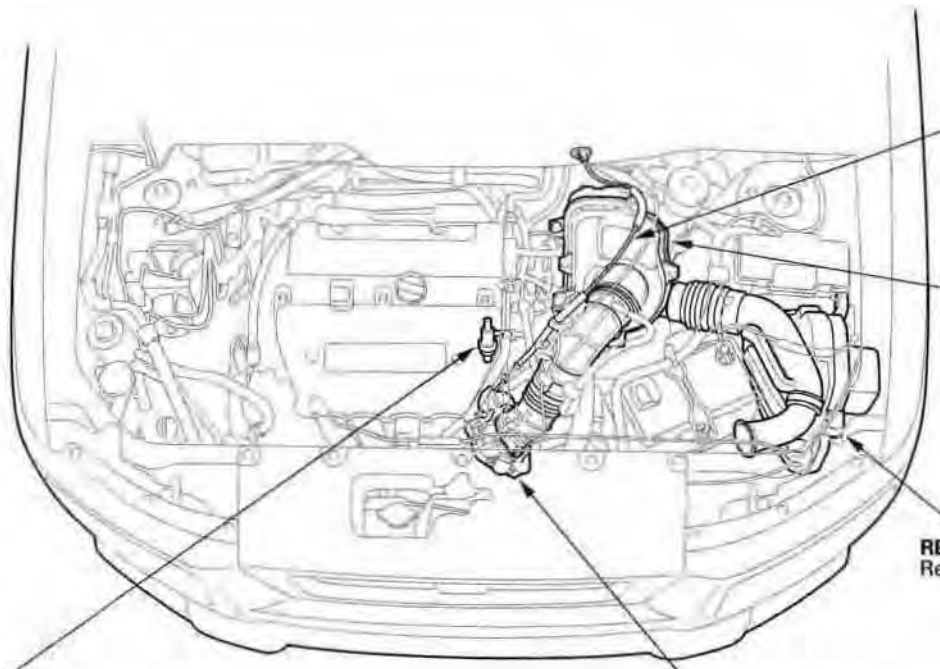
    - If the low fuel indicator is on, go to step 4.
    - If the low fuel indicator is not on, refer to the low fuel indicator circuit diagram (see page 22-64) and check the circuit.

4. Turn the ignition switch OFF. Remove the No. 9 BACK UP (10 A) fuse from the under-hood fuse/relay box for at least 30 seconds, then reinstall it.

5. Lift the float above the LOW position.

    - If the low fuel indicator goes off, the system is OK.
    - If the low fuel indicator is still on, refer to the low fuel indicator circuit diagram (see page 22-64), and check the circuit.

Component Location Index



THROTTLE CABLE
Adjustment, page 11-233
Removal/Installation, page 11-234

AIR CLEANER
Removal/Installation, page 11-232
AIR CLEANER ELEMENT
Inspection/Replacement, page 11-232

RESONATOR
Replacement, page 11-233

INTAKE AIR BYPASS CONTROL THERMAL VALVE
Test, page 11-230
Replacement, page 11-231

THROTTLE BODY
Test, page 11-229
Cleaning, page 11-229
Removal/Installation, page 11-235
Disassembly/Reassembly, page 11-236

Throttle Body Test

NOTE:
- Do not adjust the throttle stop screw. It is preset at the factory.
- If the malfunction indicator lamp (MIL) has been reported on, check for diagnostic trouble codes (DTCs) (see page 11-3).

1. With the engine off, check the throttle cable movement. The cable should move without binding or sticking.

   - If the cable moves OK, go to step 2.
   - If the cable binds or sticks, check it and its routing. If the cable is faulty, reroute it or replace it, then adjust it (see page 11-233). Go to step 2.

2. Move the throttle lever by hand to see if the throttle valve and/or shaft are too loose or too tight.

   - If there is excessive play in the throttle valve shaft, or any binding in the throttle valve at the fully closed or fully opened position, replace the throttle body.
   - If the throttle valve and shaft are OK, go to step 3.

3. Connect the HDS to the data link connector (DLC).

4. Turn the ignition switch ON (II).

5. Check the throttle position with the HDS. The reading should be about 0 ° (REL), 0 % (REL) or 0.5 V when the throttle is fully closed and about 80 ° (REL), 89 % (REL) or 4.5 V when the throttle is fully opened.

   - If the throttle position is correct, the throttle body is OK.
   - If the throttle position is not correct, replace the throttle body.

Throttle Body Cleaning

1. Check for damage to the air cleaner.
2. Remove the throttle body (see page 11-235).
3. Clean off any carbon from the throttle valve and inside of the throttle body with carburetor cleaner.
4. Install the throttle body (see page 11-235).
5. Do the ECM/PCM idle learn procedure (see page 11-207).

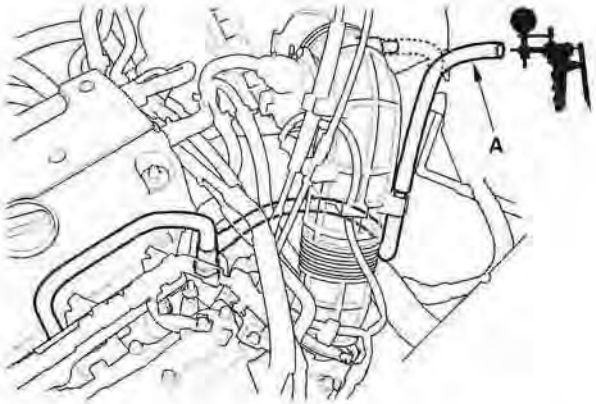
Intake Air Bypass Control Thermal Valve Test

Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

1. Start the engine, and let it idle.

   NOTE: The engine coolant temperature must be below 131 °F (55 °C).

2. Remove the vacuum hose (A) from the intake air duct, and connect a vacuum pump/gauge, 0—30 in.Hg, to the hose.



3. Raise and lower the engine speed, making sure the vacuum gauge reading changes as the engine speed changes.

   If the vacuum reading does not change, check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass control system vacuum lines.
   - A cracked or damaged intake air bypass control thermal valve.

4. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

5. Raise and lower the engine speed, making sure the vacuum pump/gauge reading does not indicate any vacuum as the rpm changes.

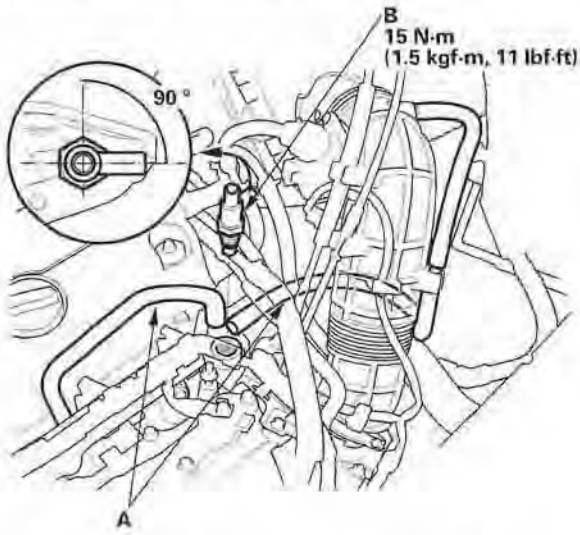
   If there is a vacuum reading, check for these problems:

   - Misrouted, leaking, broken, or clogged intake air bypass control system vacuum lines.
   - A cracked or damaged intake air bypass control thermal valve.

Intake Air Bypass Control Thermal Valve Replacement

1. Remove the intake manifold cover (see step 3 on page 9-3).

2. Disconnect the hoses (A).



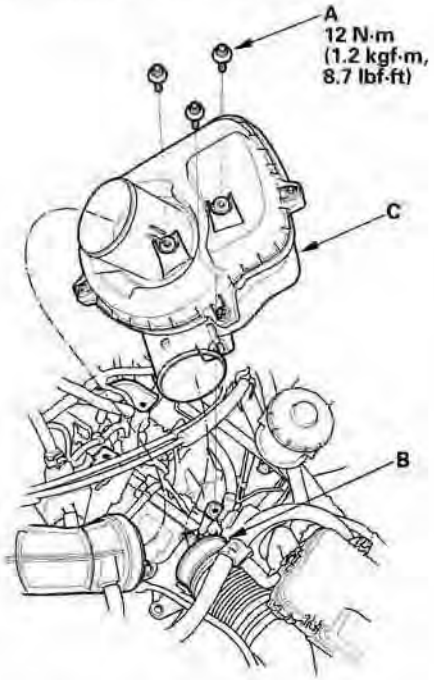
3. Remove the intake air bypass control thermal valve (B).

4. Install the valve in the reverse order of removal.

   NOTE: Position the valve angle as shown.

Air Cleaner Removal/Installation

1. Remove the bolts (A) and the clamp (B).

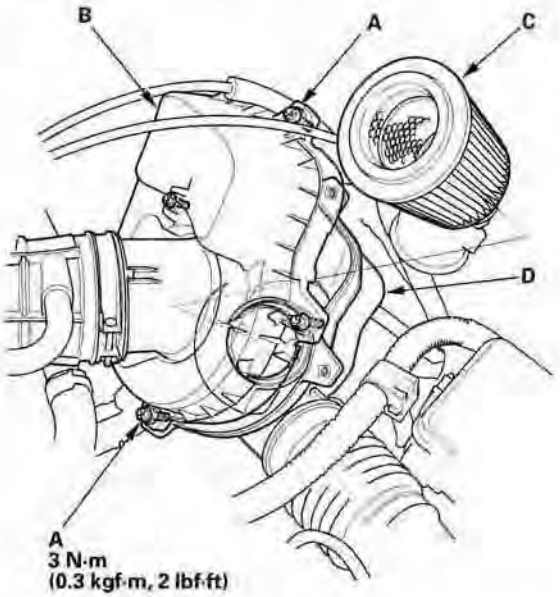


2. Remove the air cleaner (C).
3. Install the parts in the reverse order of removal.

Air Cleaner Element Inspection/ Replacement

NOTE: Do not use compressed air to clean the air cleaner element.

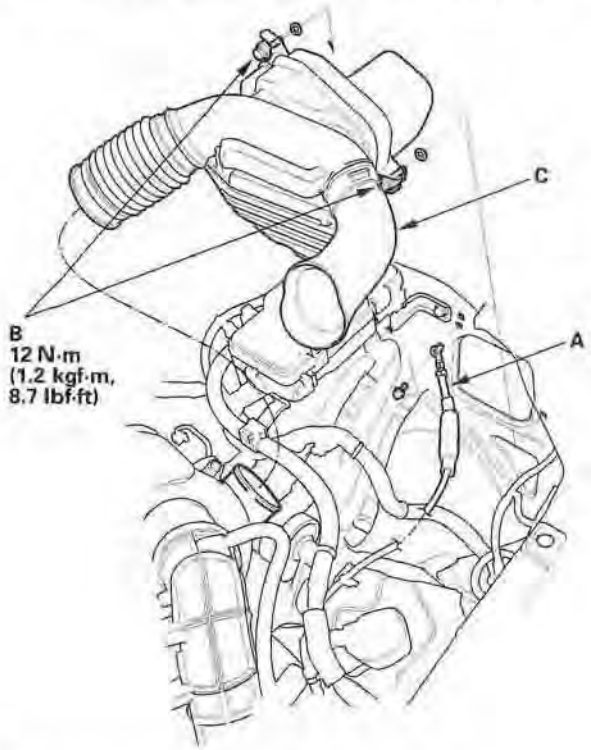
1. Remove the air cleaner bolts (A) and the air cleaner housing cover (B).



2. Remove the air cleaner element (C) from the air cleaner housing (D).
3. Check the air cleaner element for damage or clogging. If there are damage or clogging, replace the air cleaner element. Clean and remove any debris from inside the air cleaner housing.
4. Install the parts in the reverse order of removal.

Resonator Removal/Installation

1. Remove the ground cable (A) and the bolts (B).

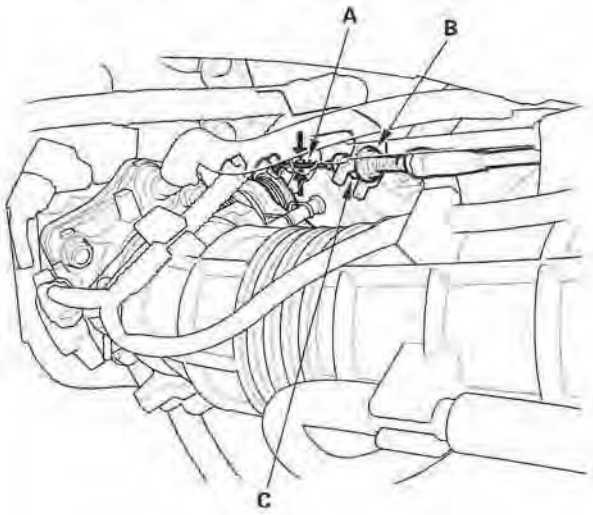


2. Remove the resonator (C).

3. Install the parts in the reverse order of removal.

Throttle Cable Adjustment

1. Check cable free play at the throttle linkage. Cable free play (A) should be 10—12 mm (3/8—1/2 in.).

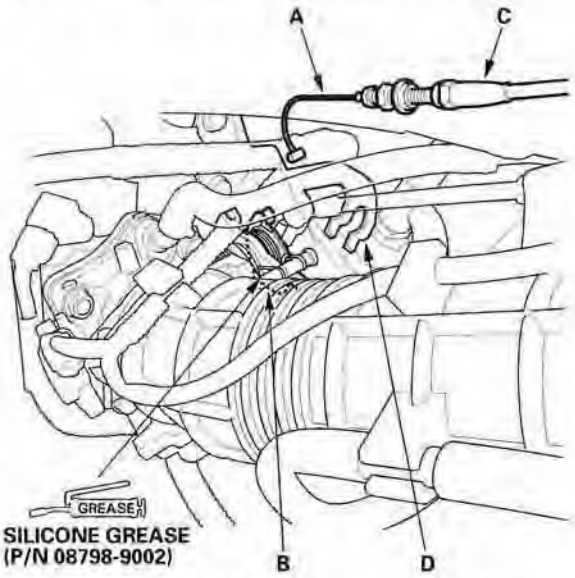


2. If the free play is not within spec (10—12 mm, 3/8—1/2 in.), loosen the locknut (B), turn the adjusting nut (C) until the deflection is as specified, then retighten the locknut.

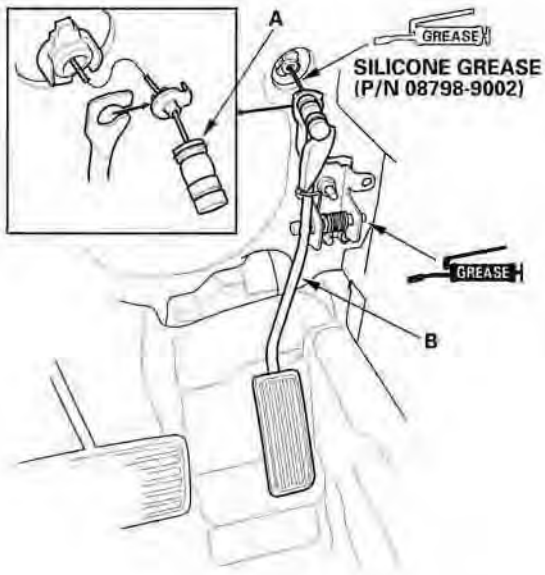
3. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Throttle Cable Removal/Installation

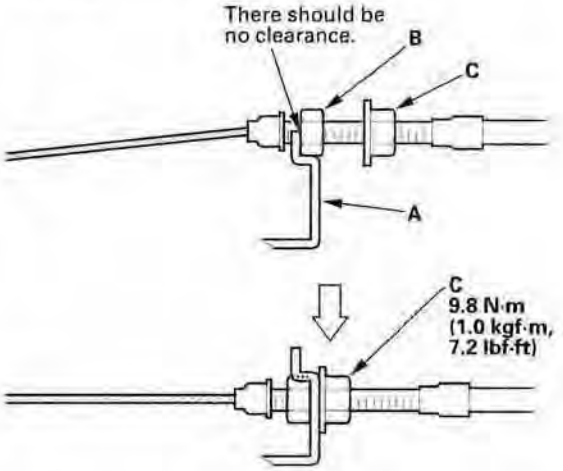
1. Remove the intake manifold cover (see step 3 on page 9-3).
2. Fully open the throttle valve, then remove the throttle cable (A) from the throttle link (B).



3. Remove the cable housing (C) from the cable bracket (D).
4. Remove the throttle cable (A) from the accelerator pedal (B).



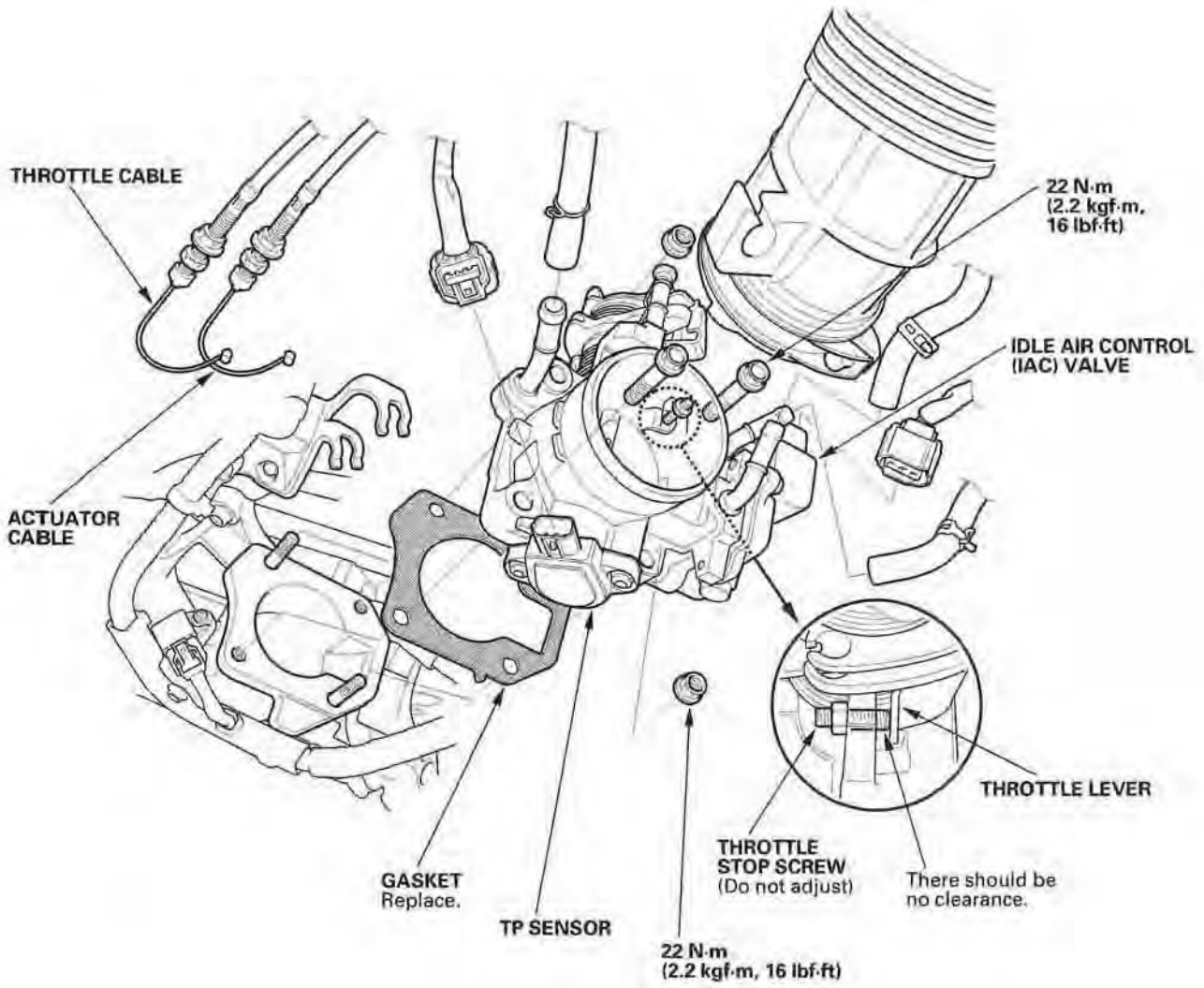
5. Install the cable in the reverse order of removal.
6. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
7. Hold the cable, removing all slack from it.
8. Set the cable on the bracket (A).
   Adjust the adjusting nut (B) so that its free play is 0 mm.



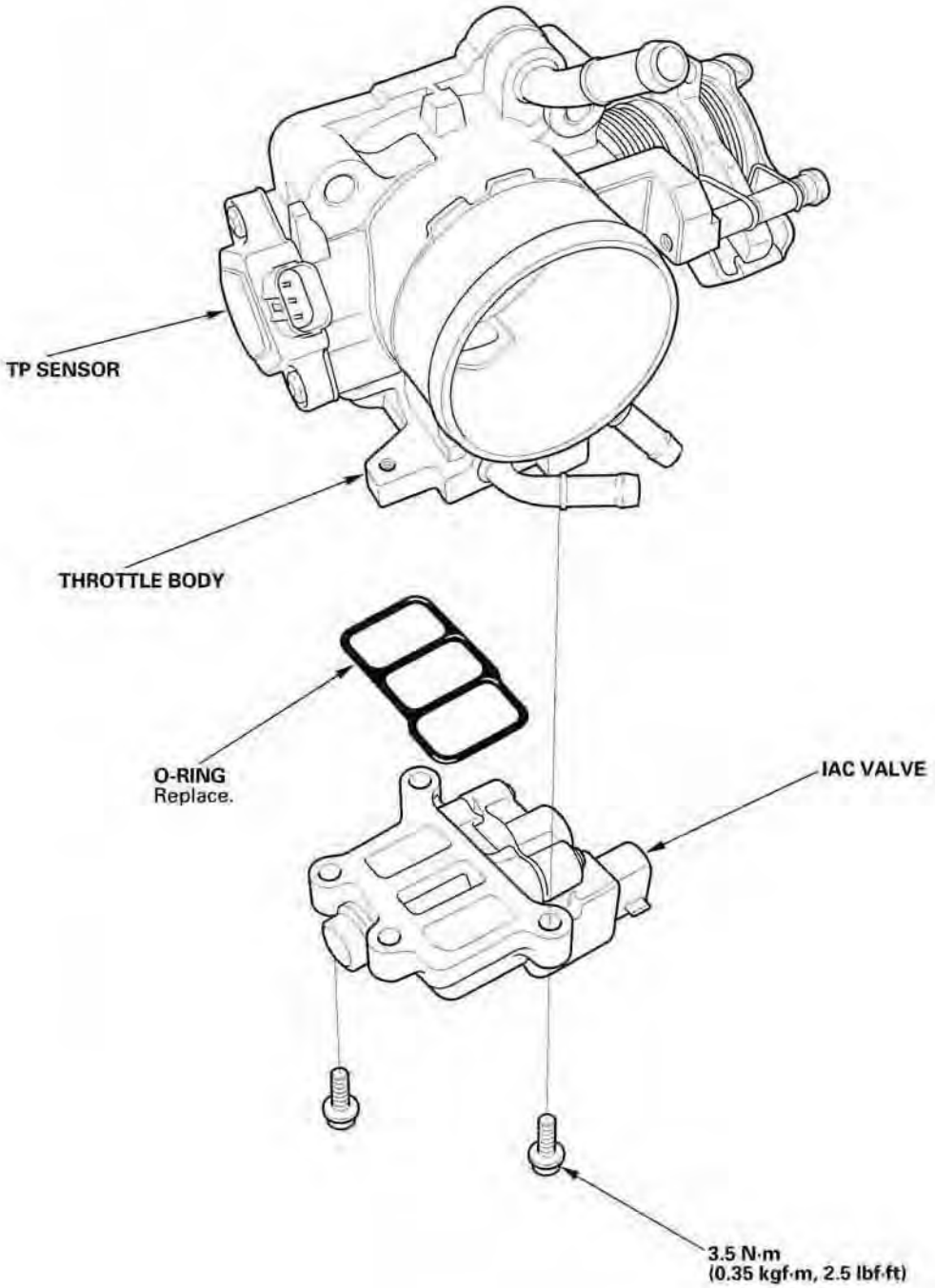
9. Position the adjusting nut on the other side of the bracket, then tighten the locknut (C).
10. Check the throttle cable free play (see page 11-233).
11. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Throttle Body Removal/Installation

NOTE:
- Do not adjust the throttle stop screw.
- After reassembly, adjust the actuator cable (see page 4-55) and the throttle cable (see page 11-233).
- The throttle position (TP) sensor is not removable.



Throttle Body Disassembly/Reassembly



DTC Troubleshooting

DTC P0420: Catalyst System Efficiency Below Threshold ('03–04 models)

NOTE:
- If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot them first, then recheck for DTC P0420.
  P0137, P0138: Secondary HO2S (Sensor 2)
  P0141: Secondary HO2S (Sensor 2) heater
- Poor quality fuel may cause this DTC.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 5th gear)
   - Vehicle speed between 50 mph (80 km/h) and 55 mph (88 km/h) with cruise control set
   - Drive about 2 minutes, decelerate for at least 4 seconds with the throttle completely closed, then maintain 55 mph (88 km/h) for 20 minutes with cruise control set
5. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

   Does the screen indicate EXECUTING?

   YES—Go to step 6.

   NO—Go to step 4 and recheck.
6. Continue test driving until a result comes on.
7. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 8.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 4 and recheck.
8. Turn the ignition switch OFF.
9. Replace the three way catalytic converter (TWC) (see page 9-8).
10. Turn the ignition switch ON (II).
11. Reset the ECM/PCM with the HDS.
12. Do the ECM/PCM idle learn procedure (see page 11-207).
13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
14. Test-drive for about 10 minutes, varying the vehicle speed.
15. Check the CATA MON TEMP in the DATA LIST with the HDS.

    Is the temperature OK?

    YES—Go to step 16.

    NO—Go to step 13 and recheck.
16. Test-drive under these conditions:
    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Vehicle speed between 50 mph (80 km/h) and 55 mph (88 km/h) with cruise control set
    - Drive about 2 minutes, decelerate for at least 4 seconds with the throttle completely closed, then maintain 55 mph (88 km/h) for 20 minutes with cruise control set

(cont'd)

DTC Troubleshooting (cont'd)

17. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

    Does the screen indicate EXECUTING?

    YES—Go to step 18.

    NO—Go to step 16 and recheck.

18. Continue test driving until a result comes on.

19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—Go to the indicated DTC's troubleshooting. ■

    NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check the fuel quality. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 13 and recheck.

DTC P0420: Catalyst System Efficiency Below Threshold (05 model)

NOTE:
- If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot them first, then recheck for DTC P0420.
  P0137, P0138: Secondary HO2S (Sensor 2)
  P0141: Secondary HO2S (Sensor 2) heater
- Poor quality fuel may cause this DTC.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Test-drive under these conditions:
   - Engine coolant temperature above 158 °F (70 °C)
   - A/T in D position (M/T in 5th gear)
   - Vehicle speed between 45 mph (72 km/h) and 75 mph (120 km/h) for 5 minutes or more with cruise control set
   - Maintain the vehicle speed at 55 mph (88 km/h) for 5 minutes or more with cruise control set
5. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

   Does the screen indicate EXECUTING?

   YES—Go to step 6.

   NO—Go to step 4 and recheck.
6. Continue test driving until a result comes on.
7. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 8.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 4 and recheck.
8. Turn the ignition switch OFF.
9. Replace the three way catalytic converter (TWC) (see page 9-8).
10. Turn the ignition switch ON (II).
11. Reset the ECM/PCM with the HDS.
12. Do the ECM/PCM idle learn procedure (see page 11-207).
13. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
14. Test-drive for about 10 minutes, varying the vehicle speed.
15. Check the CATA MON TEMP in the DATA LIST with the HDS.

    Is the temperature OK?

    YES—Go to step 16.

    NO—Go to step 13 and recheck.
16. Test-drive under these conditions:
    - Engine coolant temperature above 158 °F (70 °C)
    - A/T in D position (M/T in 5th gear)
    - Vehicle speed at 55 mph (88 km/h) for 5 minutes or more with cruise control set

(cont'd)

DTC Troubleshooting (cont'd)

17. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

    Does the screen indicate EXECUTING?

    YES—Go to step 18.

    NO—Go to step 16 and recheck.

18. Continue test driving until a result comes on.

19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—Go to the indicated DTC's troubleshooting.■

    NO—Go to step 20.

20. Monitor the OBD STATUS for DTC P0420 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check the fuel quality. If the screen indicates EXECUTING, keep driving until a result comes on. If the screen indicates OUT OF CONDITION, go to step 13 and recheck.

DTC Troubleshooting

DTC P2279: Intake Air System Leak Detected

NOTE: If DTC P0443 is stored at the same time as DTC P2279, troubleshoot DTC P0443 first, then recheck for DTC P2279.

1. Check for vacuum leaks at these parts:

   - PCV valve
   - PCV hose
   - EVAP canister purge line
   - Throttle body
   - Intake manifold
   - Brake booster hose

   Are the parts OK?

   YES—Go to step 2.

   NO—Repair or replace the leaking part(s), then go to step 4.

2. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 1 minute.

3. Monitor the OBD STATUS for DTC P2279 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Check the camshaft timing (see step 1 on page 6-15), then go to step 4.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. If the screen indicates NOT COMPLETED, go to step 2 and recheck.

4. Reset the ECM/PCM with the HDS.

5. Do the ECM/PCM idle learn procedure (see page 11-207).

6. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle for 1 minute.

7. Check for Temporary DTCs or DTCs with the HDS.

   Are any Temporary DTCs or DTCs indicated?

   YES—If DTC P2279 is indicated, check for vacuum leaks at the PCV valve, the PCV hose, the EVAP canister purge line, the throttle body, the intake manifold, or the brake booster hose, then go to step 4. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

   NO—Go to step 8.

8. Monitor the OBD STATUS for DTC P2279 in the DTCs MENU with the HDS.

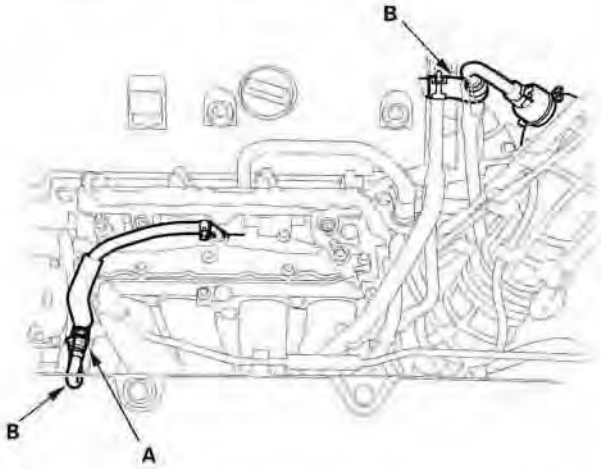
   Does the screen indicate PASSED?

   YES—Troubleshooting is complete.■

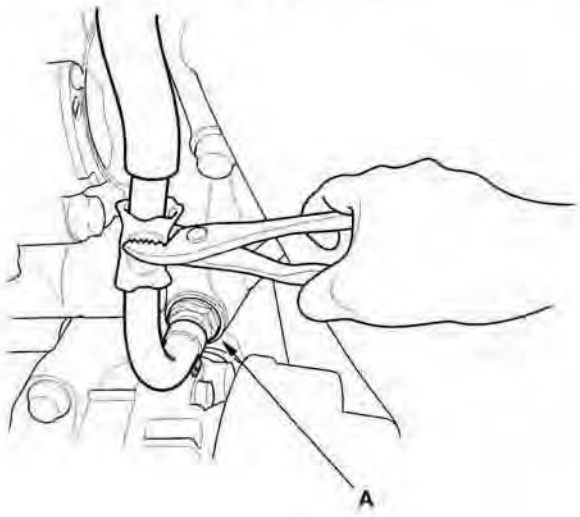
   NO—If the screen indicates FAILED, go to step 1 and recheck. If the screen indicates NOT COMPLETED, go to step 6 and recheck.

PCV Valve Inspection and Test

1. Check the PCV valve (A), hoses (B), and connections for leaks or restrictions.

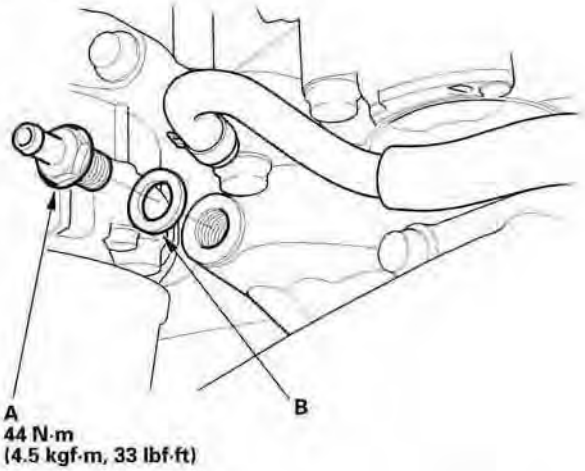


2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and intake manifold is lightly pinched (A) with your fingers or pliers.
   If there is no clicking sound, check the PCV valve washer for cracks or damage. If the washer is OK, replace the PCV valve and recheck.



PCV Valve Replacement

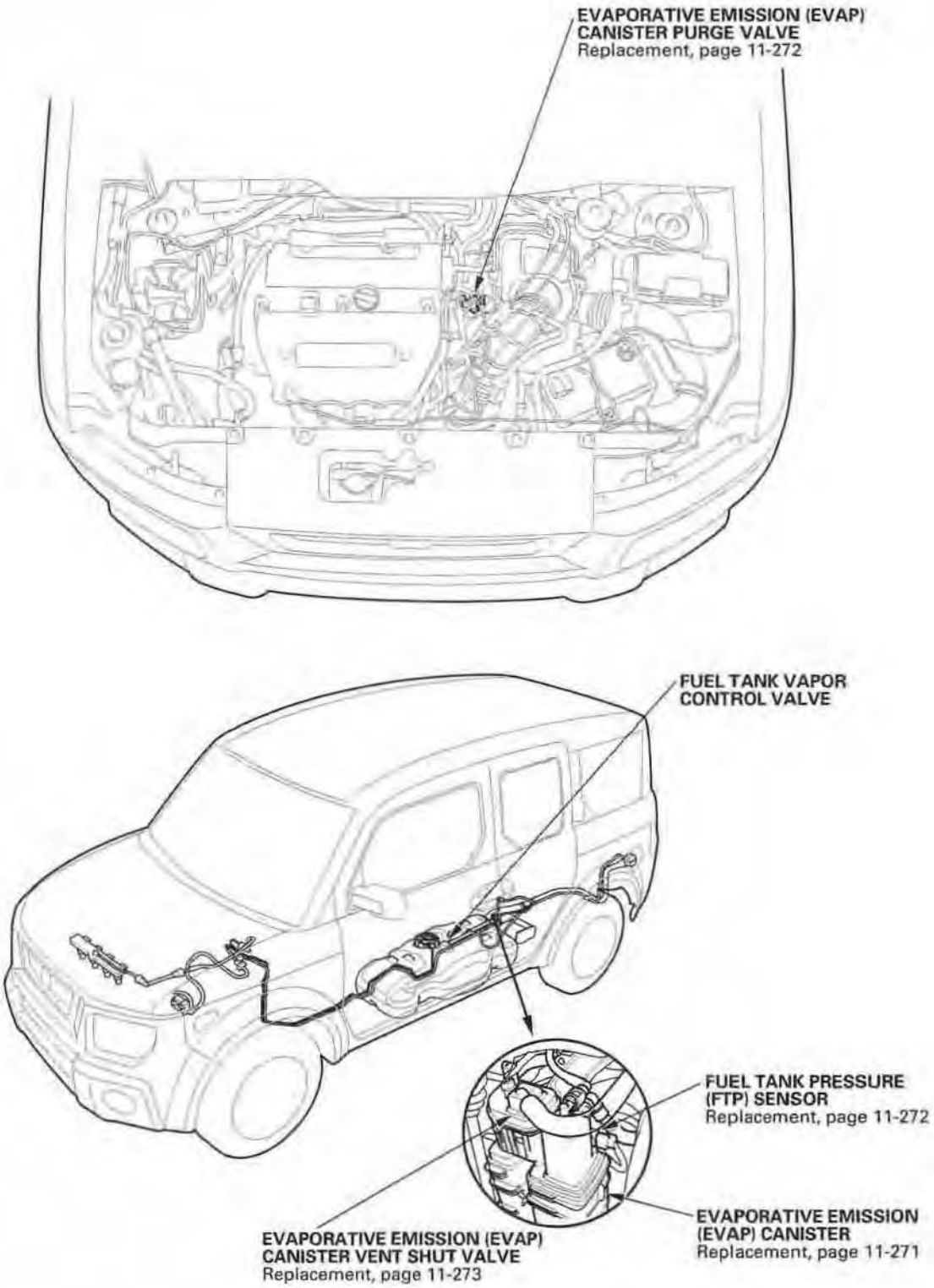
1. Disconnect the PCV hose.
2. Remove the PCV valve (A).



A
44 N·m
(4.5 kgf·m, 33 lbf·ft)

3. Install the valve in the reverse order of removal with a new washer (B).

Component Location Index



DTC Troubleshooting

DTC P0442: EVAP System Small Leak Detected

DTC P0456: EVAP System Very Small Leak Detected

NOTICE

The fuel system is designed to allow specified maximum vacuum and pressure conditions. Do not deviate from the vacuum and pressure tests as indicated in these procedures. Excessive pressure/vacuum would damage the EVAP components or cause eventual fuel tank failure.

Special Tools Required

- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B
- Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

NOTE: Fresh fuel has a higher volatility that will create greater pressure/vacuum. The optimum condition for testing is less than a full tank of fresh fuel. If possible, to assist in leak detection, add 1 gallon (3.8 liter) of fresh fuel to the tank (as long as it will not fill the tank) just before starting these procedures.

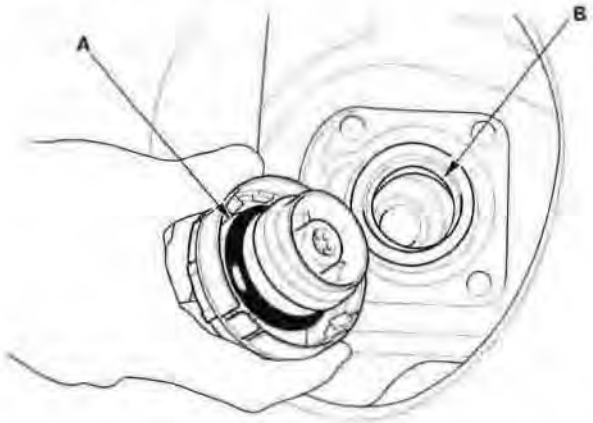
1. Check the fuel fill cap (the cap must say "If not tightened 3 clicks check engine light may come on").

   Is the correct fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap, then go to step 22.

2. Check the fuel fill cap seal (A) and the fuel fill pipe mating surface (B).



   Is the fuel fill cap seal missing or damaged, or is the fuel fill pipe damaged?

   YES—Replace the fuel fill cap or the fuel fill pipe, then go to step 22.

   NO—Go to step 3.

3. Turn the ignition switch ON (II).

4. Clear the DTC with the HDS.

5. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve and the ECM/PCM. ■

   NO—Go to step 6.

6. Turn the ignition switch OFF.

7. Turn the ignition switch ON (II).

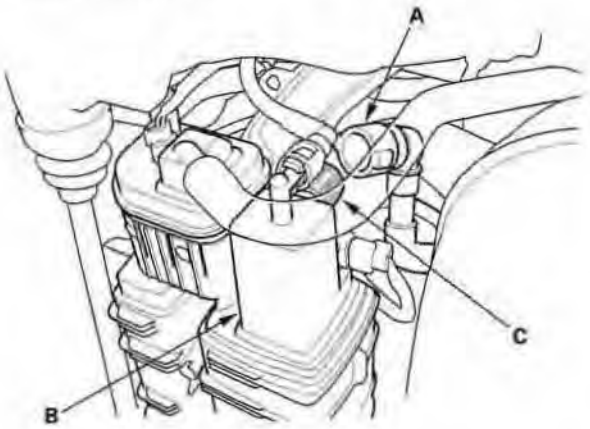
8. Check for a poor connection or damage at the fuel tank vapor recirculation tube.

   Is the tube OK?

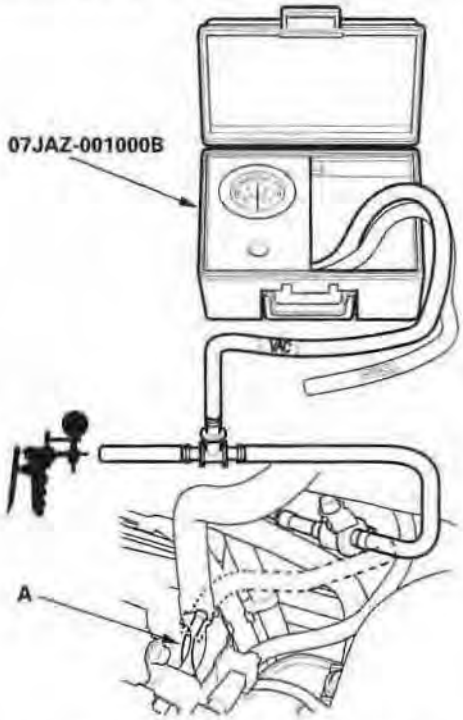
   YES—Go to step 9.

   NO—
   - Replace the fuel tank vapor recirculation tube, then go to step 22.
   - If necessary, replace the fuel tank (see page 11-225), then go to step 22.

9. Disconnect the fuel tank vapor recirculation tube (A) from the EVAP canister (B), and plug the EVAP canister port (C).



10. Disconnect the vacuum hose (purge line) from the EVAP canister purge valve (A), and connect a vacuum pump/gauge, 0—30 in.Hg, to the hose.



11. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

12. Apply vacuum to the hose until the FTP reads 1.90 V (−0.5 in.Hg, −14.6 mmHg).

13. Monitor the FTP SENSOR in the DATA LIST for 1 minute with the HDS.

    Does the voltage increase more than 0.2 V (0.1 in.Hg, 0.5 mmHg)?

    YES—Go to step 14.

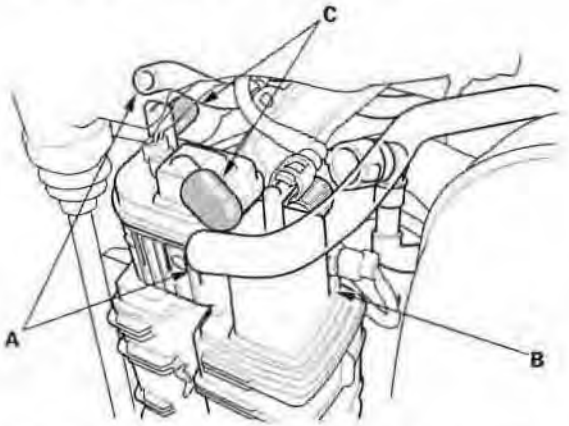
    NO—Go to step 19.

14. Do the EVAP CVS OFF in the INSPECTION MENU with the HDS.

(cont'd)

DTC Troubleshooting (cont'd)

15. Disconnect the purge air hoses (A) from the EVAP canister vent shut valve (B), and plug the EVAP canister vent shut valve ports (C).



16. Apply vacuum to the hose until the FTP reads 1.90 V (−0.5 in.Hg, −14.6 mmHg).

17. Monitor the FTP SENSOR in the DATA LIST for 1 minute with the HDS.

    Does the voltage increase more than 0.2 V (0.1 in.Hg, 0.5 mmHg)?

    YES—Replace the EVAP canister vent shut valve, then go to step 18.

    NO—Go to step 21.

18. Check for a loose or damaged EVAP canister purge line between the EVAP canister and the EVAP canister purge valve.

    Is the line OK?

    YES—Replace these parts, then go to step 21.

    - FTP sensor O-ring (see page 11-272)
    - EVAP canister vent shut valve case and O-ring (see page 11-273)
    - EVAP canister (see page 11-271)

    NO—Reconnect or repair the EVAP canister purge hose, then go to step 21.

19. Do the EVAP CVS OFF in the INSPECTION MENU with the HDS.

20. Check for looseness or damage at these parts:

    - Fuel fill pipe
    - Fuel vapor return pipe

    Are the parts OK?

    YES—Check the fuel tank unit base gasket (see page 11-224), and check the fuel tank, then go to step 21.

    NO—Repair or replace the damaged parts, then go to step 21.

21. Reconnect all hoses.

22. Turn the ignition switch ON (II).

23. Reset the ECM/PCM with the HDS.

24. Do the ECM/PCM idle learn procedure (see page 11-207).

25. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve and the ECM/PCM, then go to step 1 and recheck.

DTC P0443: EVAP Canister Purge Valve Circuit Malfunction

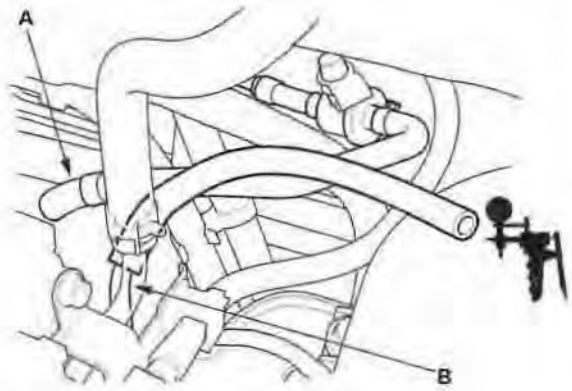
Special Tools Required
Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0443 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the EVAP canister purge valve and the ECM/PCM. ■
5. Turn the ignition switch OFF, and allow the engine to cool below 131 °F (55 °C).
6. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B) in the engine compartment, and connect a vacuum pump/gauge, 0—30 in.Hg, to the hose.



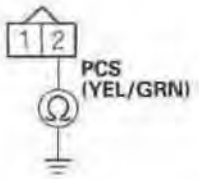
7. Start the engine, and let it idle.

   Is there vacuum?

   YES—Go to step 8.

   NO—Go to step 14.
8. Turn the ignition switch OFF.
9. Disconnect the EVAP canister purge valve 2P connector.
10. Check for continuity between EVAP canister purge valve 2P connector No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 11.

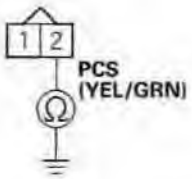
NO—Go to step 24.

(cont'd)

DTC Troubleshooting (cont'd)

11. Jump the SCS line with the HDS.
12. Disconnect ECM/PCM connector B (24P).
13. Check for continuity between EVAP canister purge valve 2P connector terminal No. 2 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

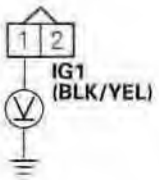
Is there continuity?

YES—Repair short in the wire between the EVAP canister purge valve and the ECM/PCM (B21), then go to step 25.

NO—Go to step 32.

14. Turn the ignition switch OFF.
15. Disconnect the EVAP canister purge valve 2P connector.
16. Turn the ignition switch ON (II).
17. Measure voltage between EVAP canister purge valve 2P connector terminal No. 1 and body ground.

EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

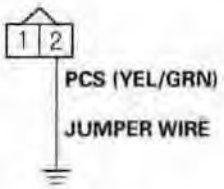
Is there battery voltage?

YES—Go to step 18.

NO—Repair open in the wire between the EVAP canister purge valve and the No. 4 ACG (10 A) fuse in the under-dash fuse/relay box, then go to step 26.

18. Turn the ignition switch OFF.
19. Jump the SCS line with the HDS.
20. Disconnect ECM/PCM connector B (24P).
21. Connect EVAP canister purge valve 2P connector terminal No. 2 to body ground with a jumper wire.

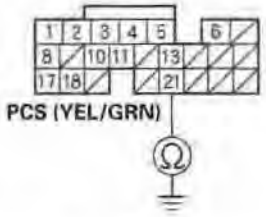
EVAP CANISTER PURGE VALVE 2P CONNECTOR



Wire side of female terminals

22. Check for continuity between ECM/PCM connector terminal B21 and body ground.

ECM/PCM CONNECTOR B (24P)



Wire side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the EVAP canister purge valve and the ECM/PCM (B21), then go to step 25.

23. Measure resistance between EVAP canister purge valve 2P connector terminals No. 1 and No. 2.

EVAP CANISTER PURGE VALVE 2P CONNECTOR

Terminal side of male terminals

Is there about 33 Ω at room temperature?

YES—Go to step 32.

NO—Go to step 24.

24. Replace the EVAP canister purge valve (see page 11-272).

25. Reconnect ECM/PCM connector B (24P).

26. Reconnect the EVAP canister purge valve 2P connector.

27. Turn the ignition switch ON (II).

28. Reset the ECM/PCM with the HDS.

29. Do the ECM/PCM idle learn procedure (see page 11-207).

30. Check for Temporary DTCs or DTCs with the HDS.

Are any Temporary DTCs or DTCs indicated?

YES—If DTC P0443 is indicated, check for poor connections or loose terminals at the EVAP canister purge valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

NO—Go to step 31.

31. Monitor the OBD STATUS for DTC P0443 in the DTCs MENU with the HDS.

Does the screen indicate PASSED?

YES—Troubleshooting is complete. ■

NO—If the screen indicate FAILED, check for poor connections or loose terminals at the EVAP canister purge valve and the ECM/PCM, then go to step 1. If the screen indicates EXECUTING, keep idling until a result comes on. If the screen indicates OUT OF CONDITION, go to step 29 and recheck.

(cont'd)

DTC Troubleshooting (cont'd)

32. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

33. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0443 is indicated, check for poor connections or loose terminals at the EVAP canister purge valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P0451: FTP Sensor Range/Performance Problem

NOTE: If DTC P2422 is stored at the same time as DTC P0451, troubleshoot DTC P2422 first, then recheck for DTC P0451.

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Start the engine, and let it idle 1 minute.
4. Monitor the OBD STATUS for DTC P0451 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 5.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the ECM/PCM. If the screen indicates NOT COMPLETED, go to step 3 and recheck.
5. Turn the ignition switch OFF.
6. Replace the FTP sensor (see page 11-272).
7. Turn the ignition switch ON (II).
8. Reset the ECM/PCM with the HDS.
9. Do the ECM/PCM idle learn procedure (see page 11-207).
10. Start the engine, and let it idle 1 minute.
11. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0451 is indicated, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 12.
12. Monitor the OBD STATUS for DTC P0451 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 10 and recheck.

DTC Troubleshooting (cont'd)

DTC P0452: FTP Sensor Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON (II).
5. Check for Temporary DTCs or DTCs with the HDS.

   Are DTC P0107, P0122, and P0452 indicated at the same time?

   YES—Go to step 23.

   NO—Go to step 6.
6. Turn the ignition switch OFF.
7. Remove the fuel fill cap.
8. Turn the ignition switch ON (II).
9. Check the FTP SENSOR in the DATA LIST with the HDS.

   Is about −7.3 kPa (−2.16 in.Hg, −55 mmHg), or 0.3 V or less indicated?

   YES—Go to step 13.

   NO—Go to step 10.
10. Install the fuel fill cap.
11. Start the engine.
12. Monitor the OBD STATUS for DTC P0452 in the DTCs MENU with the HDS.

    Does the screen indicate FAILED?

    YES—Go to step 13.

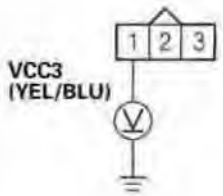
    NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the ECM/PCM. If the screen indicates NOT COMPLETED, go to step 8 and recheck.
13. Turn the ignition switch OFF.
14. Disconnect the FTP sensor 3P connector.
15. Turn the ignition switch ON (II).
16. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is about 7.3 kPa (2.15 in.Hg, 54.7 mmHg), or 4.90 V indicated?

    YES—Go to step 32.

    NO—Go to step 17.
17. Measure voltage between FTP sensor 3P connector terminal No. 1 and body ground.

    FTP SENSOR 3P CONNECTOR

    Wire side of female terminals

    Is there about 5 V?

    YES—Go to step 19.

    NO—Go to step 18.

18. Measure voltage between ECM/PCM connector terminal E5 and body ground.

ECM/PCM CONNECTOR E (31P)

Wire side of female terminals

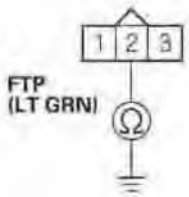
Is there 5 V?

YES—Repair open in the wire between the ECM/PCM (E5) and the FTP sensor, then go to step 35.

NO—Go to step 41.

19. Turn the ignition switch OFF.
20. Jump the SCS line with the HDS.
21. Disconnect ECM/PCM connector E (31P).
22. Check for continuity between FTP sensor 3P connector terminal No. 2 and body ground.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

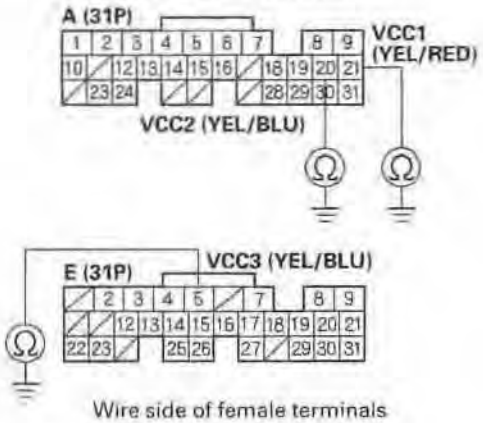
Is there continuity?

YES—Repair short in the wire between the ECM/PCM (E14) and the FTP sensor, then go to step 34.

NO—Go to step 41.

23. Turn the ignition switch OFF.
24. Jump the SCS line with the HDS.
25. Disconnect ECM/PCM connectors A (31P) and E (31P).
26. Disconnect the connectors from these sensors:
    - MAP sensor
    - TP sensor
    - FTP sensor
    - Input shaft (mainshaft) speed sensor
    - Output shaft (countershaft) speed sensor
27. Check for continuity between body ground and ECM/PCM connector terminals A20, A21, and E5 individually.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there continuity?

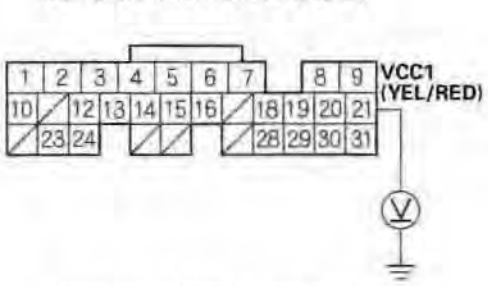
YES—Repair short in the wire between the ECM/PCM (A20, A21, or E5) and each disconnected part, then go to step 34.

NO—Go to step 28.

(cont'd)

DTC Troubleshooting (cont'd)

28. Reconnect ECM/PCM connectors A (31P) and E (31P).
29. Turn the ignition switch ON (II).
30. Measure voltage between ECM/PCM connector terminal A21 and body ground.



Wire side of female terminals

Is there about 5 V?

YES—Go to step 31.

NO—Go to step 41.

31. Continue to monitor voltage at ECM/PCM connector terminal A21 while reconnecting these sensors, one at a time:
    - MAP sensor
    - TP sensor
    - FTP sensor
    - Input shaft (mainshaft) speed sensor
    - Output shaft (countershaft) speed sensor

    Did the voltage drop to about 0 V?

    YES—Replace the sensor that caused the voltage to drop, then go to step 36.

    NO—Go to step 41.
32. Turn the ignition switch OFF.
33. Replace the FTP sensor (see page 11-272).
34. Reconnect ECM/PCM connectors.
35. Reconnect the FTP sensor 3P connector.
36. Turn the ignition switch ON (II).
37. Reset the ECM/PCM with the HDS.
38. Do the ECM/PCM idle learn procedure (see page 11-207).
39. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0452 is indicated, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 40.
40. Monitor the OBD STATUS for DTC P0452 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete.■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If the sereen indicates NOT COMPLETED, go to step 38 and recheck.
41. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
42. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0452 is indicated, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC P0453: FTP Sensor Circuit High Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Remove the fuel fill cap.
5. Turn the ignition switch ON (II).
6. Check the FTP SENSOR in the DATA LIST with the HDS.

   Is about 7.3 kPa (2.16 in.Hg, 55 mmHg), or 4.7 V or more indicated?

   YES—Go to step 10.

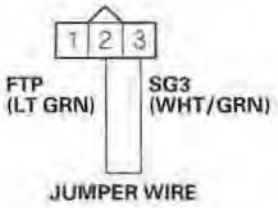
   NO—Go to step 7.
7. Install the fuel fill cap.
8. Start the engine.
9. Monitor the OBD STATUS for DTC P0453 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor and the ECM/PCM. If the screen indicates NOT COMPLETED, go to step 6 and recheck.
10. Turn the ignition switch OFF.
11. Disconnect the FTP sensor 3P connector.
12. Connect FTP sensor 3P connector terminals No. 2 and No. 3 with a jumper wire.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

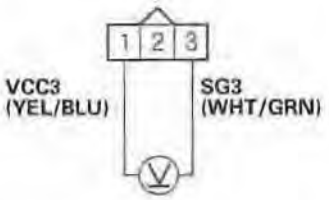
13. Turn the ignition switch ON (II).
14. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is about 7.3 kPa (2.16 in.Hg, 55 mmHg), or 4.7 V or more indicated?

    YES—Go to step 15.

    NO—Go to step 25.
15. Measure voltage between FTP sensor 3P connector terminals No. 1 and No. 3.

FTP SENSOR 3P CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Go to step 21.

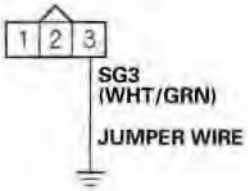
NO—Go to step 16.

(cont'd)

DTC Troubleshooting (cont'd)

16. Turn the ignition switch OFF.
17. Jump the SCS line with the HDS.
18. Disconnect ECM/PCM connector E (31P).
19. Connect FTP sensor 3P connector terminal No. 3 to body ground with a jumper wire.

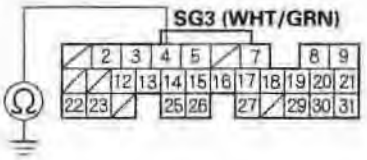
FTP SENSOR 3P CONNECTOR



Wire side of female terminals

20. Check for continuity between ECM/PCM connector terminal E4 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

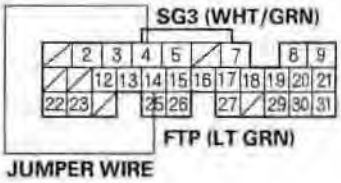
Is there continuity?

YES—Go to step 33.

NO—Repair open in the wire between the ECM/PCM (E4) and the FTP sensor, then go to step 27.

21. Turn the ignition switch OFF.
22. Connect ECM/PCM connector terminals E4 and E14 with a jumper wire.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

23. Turn the ignition switch ON (II).
24. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is about 7.3 kPa (2.16 in.Hg, 55 mmHg), or 4.7 V or more indicated?

    YES—Go to step 33.

    NO—Repair open in the wire between the ECM/PCM (E14) and the FTP sensor, then go to step 27.
25. Turn the ignition switch OFF.
26. Replace the FTP sensor (see page 11-272).
27. Reconnect all connectors.

28. Turn the ignition switch ON (II).

29. Reset the ECM/PCM with the HDS.

30. Do the ECM/PCM idle learn procedure (see page 11-207).

31. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0453 is indicated, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 32.

32. Monitor the OBD STATUS for DTC P0453 in the DTCs MENU with the HDS.

    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 30 and recheck.

33. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

34. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0453 is indicated, check for poor connections or loose terminals at the FTP sensor and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P0457: EVAP System Leak Detected/Fuel Cap Loose or Missing

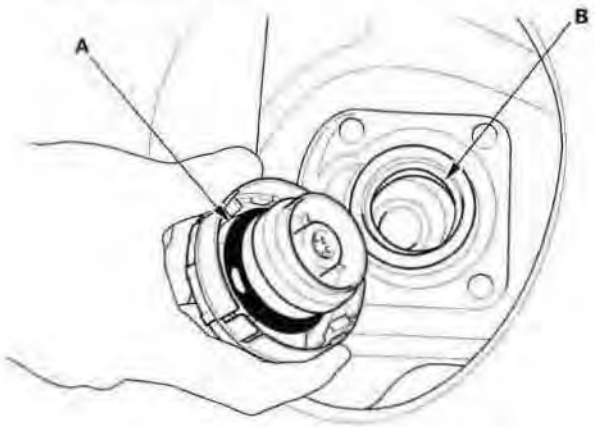
1. Check the fuel fill cap (the cap must say "If not tightened 3 clicks check engine light may come on").

   Is the correct fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap, then go to step 19.

2. Check the fuel fill cap seal (A) and the fuel fill pipe mating surface (B).



   Is the fuel fill cap seal missing or damaged, or is the fuel fill pipe damaged?

   YES—Replace the fuel fill cap or the fuel fill pipe, then go to step 19.

   NO—Go to step 3.

3. Turn the ignition switch ON (II).

4. Clear the DTC with the HDS.

5. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor or the EVAP canister vent shut valve and the ECM/PCM. ■

   NO—Go to step 6.

6. Turn the ignition switch OFF.

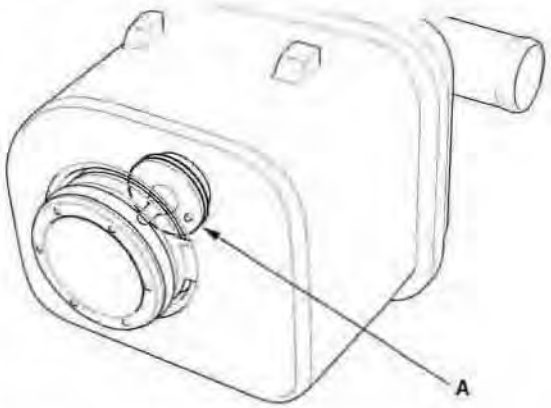
7. Remove the EVAP canister vent shut valve from the EVAP canister (see page 11-273).

8. Connect the 2P connector to the EVAP canister vent shut valve.

9. Turn the ignition switch ON (II).

10. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

11. Check the EVAP canister vent shut valve (A) operation.



    Does the valve operate?

    YES—Check the routing of the EVAP canister vent tube, then go to step 18.

    NO—Go to step 12.

12. Turn the ignition switch OFF.

13. Replace the EVAP canister vent shut valve (see page 11-273).

14. Turn the ignition switch ON (II).

15. Reset the ECM/PCM with the HDS.

16. Do the ECM/PCM idle learn procedure (see page 11-207).

17. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check for poor connections or loose terminals at the FTP sensor or the EVAP canister vent shut valve and the ECM/PCM, then go to step 16.

18. Reinstall the EVAP canister vent shut valve (see page 11-273).

19. Turn the ignition switch ON (II).

20. Reset the ECM/PCM with the HDS.

21. Do the ECM/PCM idle learn procedure (see page 11-207).

22. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check for poor connections or loose terminals at the FTP sensor or the EVAP canister vent shut valve and the ECM/PCM, then go to step 21.

DTC Troubleshooting (cont'd)

DTC P0496: EVAP System High Purge Flow

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve and the ECM/PCM. ■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Replace the EVAP canister purge valve (see page 11-272).
6. Turn the ignition switch ON (II).
7. Reset the ECM/PCM with the HDS.
8. Do the ECM/PCM idle learn procedure (see page 11-207).
9. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Troubleshooting is complete. ■

   NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve and the ECM/PCM, then go to step 1.

DTC P0497: EVAP System Low Purge Flow

Special Tools Required
- Vacuum/pressure gauge, 0—4 in.Hg 07JAZ-001000B
- Vacuum pump/gauge, 0—30 in.Hg, Snap-on YA4000A or equivalent, commercially available

1. Check the fuel fill cap (the cap must say "If not tightened 3 clicks check engine light may come on").

   Is the correct fuel fill cap installed and properly tightened?

   YES—Go to step 2.

   NO—Replace or tighten the cap, then go to step 24.

2. Turn the ignition switch ON (II).

3. Clear the DTC with the HDS.

4. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

   Is the result OK?

   YES—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve and the ECM/PCM. ■

   NO—Go to step 5.

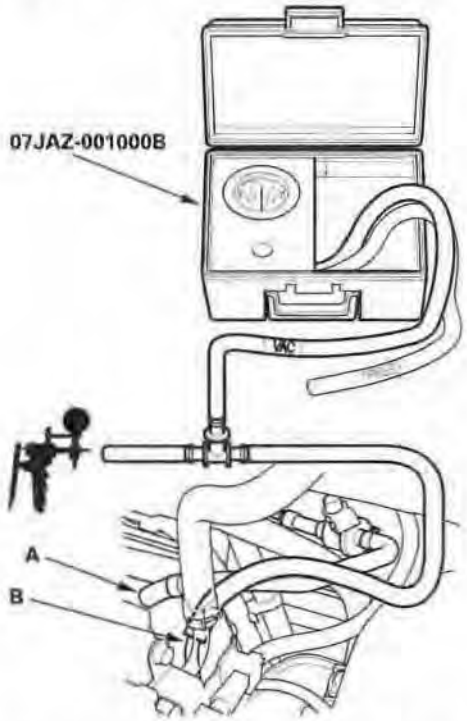
5. Check for loose or damaged EVAP canister purge line between the intake manifold and the EVAP canister purge valve.

   Is the line OK?

   YES—Go to step 6.

   NO—Reconnect or repair the EVAP canister purge line, then go to step 24.

6. Disconnect the vacuum hose (A) from the EVAP canister purge valve (B), and connect a vacuum pump/gauge, 0—30 in.Hg, to the EVAP canister purge valve.



7. Do the EVAP PCS ON in the INSPECTION MENU with the HDS.

8. Slowly apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

   Does it hold vacuum?

   YES—Check for blockage on the EVAP canister purge line between the intake manifold and the EVAP canister purge valve. If the vacuum hose is OK, replace the EVAP canister purge valve, then go to step 24.

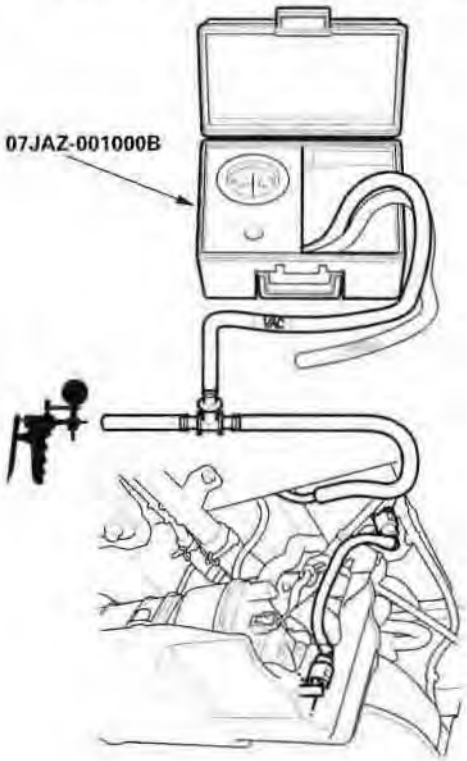
   NO—Go to step 9.

9. Reconnect the vacuum hose to the EVAP canister purge valve.

(cont'd)

DTC Troubleshooting (cont'd)

10. Disconnect the vacuum hoses from the EVAP canister purge line (EVAP canister side), and connect a vacuum pump/gauge, 0—30 in.Hg.



11. Do the EVAP PCS ON in the INSPECTION MENU with the HDS.

12. Slowly apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

    Does it hold vacuum?

    YES—Check for a restricted in the EVAP canister purge line between the EVAP canister purge valve and the EVAP canister, then go to step 23.

    NO—Go to step 13.

13. Remove the FTP sensor with its connector connected (see page 11-272).

14. Connect a T-fitting (A) from the vacuum gauge and the vacuum pump/gauge, 0—30 in.Hg, to the FTP sensor (B) as shown.

15. Check and record the FTP SENSOR reading in the DATA LIST with the HDS.

16. Slowly apply about 1.3 kPa (0.4 in.Hg, 10 mmHg) of vacuum to the hose.

17. Check the FTP SENSOR in the DATA LIST with the HDS.

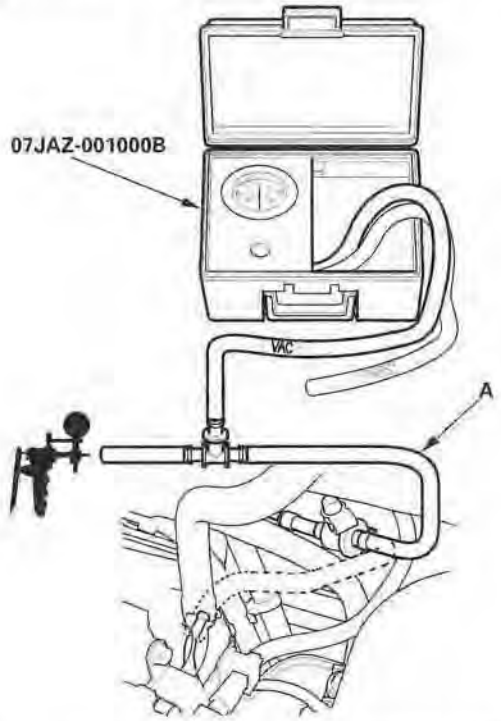
    Is the difference more than 1.1 kPa (0.31 in.Hg, 8 mmHg) before and after applying vacuum?

    YES—Go to step 18.

    NO—Replace the FTP sensor (see page 11-272), then go to step 23.

18. Reconnect the vacuum hoses to the EVAP canister purge line (EVAP canister side), and reinstall the FTP sensor.

19. Disconnect the vacuum hose (A) from the EVAP canister purge line (EVAP canister purge valve side), and connect a vacuum pump/gauge, 0—30 in.Hg, to the hose.



20. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

21. Slowly apply about 2 kPa (0.6 in.Hg, 15 mmHg) of vacuum to the hose.

    Does the hose hold vacuum?

    YES—Check for blockage at the EVAP canister port, then go to step 22.

    NO—Replace the EVAP canister vent shut valve, then go to step 22.

22. Install the FTP sensor (see page 11-272).

23. Reconnect all hoses.

24. Turn the ignition switch ON (II).

25. Reset the ECM/PCM with the HDS.

26. Do the ECM/PCM idle learn procedure (see page 11-207).

27. Do the EVAP FUNCTION TEST in the INSPECTION MENU with the HDS.

    Is the result OK?

    YES—Troubleshooting is complete.■

    NO—Check for poor connections or loose terminals at the FTP sensor, the EVAP canister purge valve, or the EVAP canister vent shut valve and the ECM/PCM, then go to step 1.

DTC Troubleshooting (cont'd)

DTC P0498: EVAP Canister Vent Shut Valve Circuit Low Voltage

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS, then wait 5 seconds.
3. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0498 indicated?

   YES—Go to step 6.

   NO—Go to step 4.
4. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.
5. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0498 indicated?

   YES—Go to step 6.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the EVAP canister vent shut valve and the ECM/PCM. ■
6. Turn the ignition switch OFF.
7. Disconnect the EVAP canister vent shut valve 2P connector.
8. Measure resistance between EVAP canister vent shut valve 2P connector terminals No. 1 and No. 2.

EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR

Terminal side of male terminals

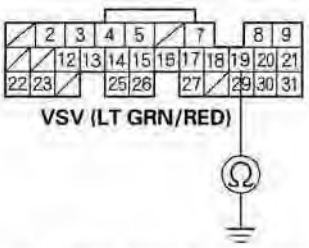
Is there about 25—30 Ω at room temperature?

YES—Go to step 9.

NO—Go to step 12.

9. Jump the SCS line with the HDS.
10. Disconnect ECM/PCM connector E (31P).
11. Check for continuity between ECM/PCM connector terminal E19 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between the EVAP canister vent shut valve and the ECM/PCM (E19), then go to step 13.

NO—Go to step 20.

12. Replace the EVAP canister vent shut valve (see page 11-273).

13. Reconnect ECM/PCM connector E (31P).

14. Reconnect the EVAP canister vent shut valve 2P connector.

15. Turn the ignition switch ON (II).

16. Reset the ECM/PCM with the HDS.

17. Do the ECM/PCM idle learn procedure (see page 11-207).

18. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

19. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0498 is indicated, check for poor connections or loose terminals at the EVAP canister vent shut valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete.■

20. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).

21. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.

22. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0498 is indicated, check for poor connections or loose terminals at the EVAP canister vent shut valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5).■

DTC Troubleshooting (cont'd)

DTC P0499: EVAP Canister Vent Shut Valve Circuit High Voltage

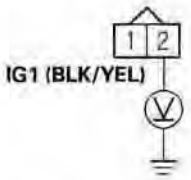
1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS, then wait 5 seconds.
3. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.
4. Check for Temporary DTCs or DTCs with the HDS.

   Is DTC P0499 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the EVAP canister vent shut valve and the ECM/PCM.■
5. Turn the ignition switch OFF.
6. Disconnect the EVAP canister vent shut valve 2P connector.
7. Turn the ignition switch ON (II).
8. Measure voltage between EVAP canister vent shut valve 2P connector terminal No. 2 and body ground.

   EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



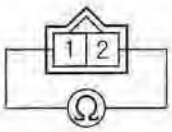
Wire side of female terminals

   Is there battery voltage?

   YES—Go to step 9.

   NO—Repair open in the wire between the EVAP canister vent shut valve and the No. 4 ACG (10 A) fuse in the under-dash fuse/relay box, then go to step 17.
9. Turn the ignition switch OFF.
10. Measure resistance between EVAP canister vent shut valve 2P connector terminals No. 1 and No. 2.

    EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



Terminal side of male terminals

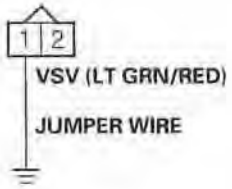
    Is there about 25—30 Ω at room temperature?

    YES—Go to step 11.

    NO—Go to step 15.

11. Jump the SCS line with the HDS.
12. Disconnect ECM/PCM connector E (31P).
13. Connect EVAP canister vent shut valve 2P connector terminal No. 1 to body ground with a jumper wire.

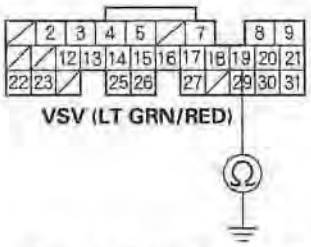
EVAP CANISTER VENT SHUT VALVE 2P CONNECTOR



Wire side of female terminals

14. Check for continuity between ECM/PCM connector terminal E19 and body ground.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there continuity?

YES—Go to step 23.

NO—Repair open in the wire between the EVAP canister vent shut valve and the ECM/PCM (E19), then go to step 16.

15. Replace the EVAP canister vent shut valve (see page 11-273).
16. Reconnect ECM/PCM connector E (31P).
17. Reconnect the EVAP canister vent shut valve 2P connector.
18. Turn the ignition switch ON (II).
19. Reset the ECM/PCM with the HDS.
20. Do the ECM/PCM idle learn procedure (see page 11-207).
21. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.
22. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0499 is indicated, check for poor connections or loose terminals at the EVAP canister vent shut valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Troubleshooting is complete. ■
23. Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM (see page 11-6).
24. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.
25. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P0499 is indicated, check for poor connections or loose terminals at the EVAP canister vent shut valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—If the ECM/PCM was updated, troubleshooting is complete. If the ECM/PCM was substituted, replace the original ECM/PCM (see page 11-5). ■

DTC Troubleshooting (cont'd)

DTC P1454: FTP Sensor Range/Performance Problem

DTC P2422: EVAP Canister Vent Shut Valve Stuck Closed Malfunction

1. Turn the ignition switch ON (II).
2. Clear the DTC with the HDS.
3. Turn the ignition switch OFF.
4. Remove the fuel fill cap, and wait 1 minute.
5. Check the FTP SENSOR in the DATA LIST with the HDS.

   Is it between −0.67 kPa and 0.67 kPa (−0.2−0.2 in.Hg, −5−5 mmHg), or 2.4−2.6 V?

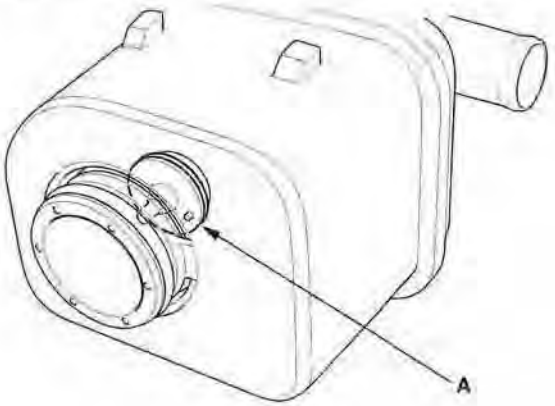
   YES—Go to step 6.

   NO—Go to step 17.
6. Install the fuel fill cap.
7. Clear the DTC with the HDS.
8. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.
9. Monitor the OBD STATUS for DTC P1454 or P2422 in the DTCs MENU with the HDS.

   Does the screen indicate FAILED?

   YES—Go to step 10.

   NO—If the screen indicates PASSED, intermittent failure, system is OK at this time. Check for poor connections or loose terminals at the FTP sensor, or the EVAP canister vent shut valve and the ECM/PCM. If the screen indicates NOT COMPLETED, go to step 7 and recheck.
10. Clear the DTC with the HDS.
11. Turn the ignition switch OFF.
12. Remove the EVAP canister vent shut valve from the EVAP canister (see page 11-273).
13. Connect the 2P connector to the EVAP canister vent shut valve.
14. Turn the ignition switch ON (II).
15. Do the EVAP CVS ON in the INSPECTION MENU with the HDS.
16. Check the EVAP canister vent shut valve (A) operation.

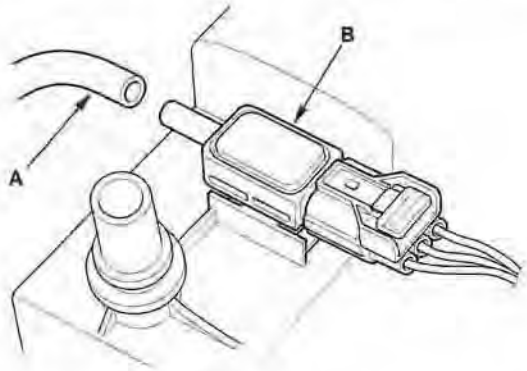


Does the valve operate?

YES—Check for a blockage in the EVAP canister, then install the EVAP canister vent shut valve, and go to step 23.

NO—Replace the EVAP canister vent shut valve (see page 11-273), then go to step 23.

17. Disconnect the air tube (A) from the FTP sensor (B).



18. Check the FTP SENSOR in the DATA LIST with the HDS.

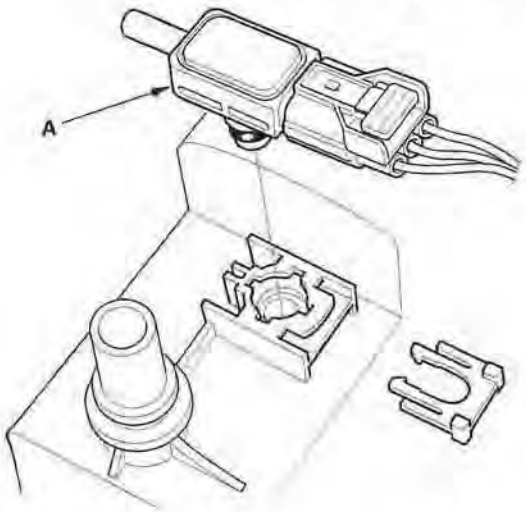
    Is it between −0.67 kPa and 0.67 kPa (−0.2−0.2 in.Hg, −5−5 mmHg), or 2.4−2.6 V?

    YES—Go to step 19.

    NO—Check for a blockage in the FTP sensor air tube, then go to step 23.

19. Turn the ignition switch OFF.

20. Remove the FTP sensor (A) from the EVAP canister with its connector connected (see page 11-272).



21. Turn the ignition switch ON (II).

22. Check the FTP SENSOR in the DATA LIST with the HDS.

    Is it between −0.67 kPa and 0.67 kPa (−0.2−0.2 in.Hg, −5−5 mmHg), or 2.4−2.6 V?

    YES—Check for debris or clogging at the EVAP canister and the FTP sensor port, then go to step 23.

    NO—Replace the FTP sensor (see page 11-272), then go to step 23.

23. Turn the ignition switch ON (II).

24. Reset the ECM/PCM with the HDS.

25. Do the ECM/PCM idle learn procedure (see page 11-207).

26. Start the engine. Hold the engine speed at 3,000 rpm without load (in Park or neutral) until the radiator fan comes on, then let it idle.

27. Check for Temporary DTCs or DTCs with the HDS.

    Are any Temporary DTCs or DTCs indicated?

    YES—If DTC P1454 and/or P2422 is indicated, check for poor connections or loose terminals at the FTP sensor, or the EVAP canister vent shut valve and the ECM/PCM, then go to step 1. If any other Temporary DTCs or DTCs are indicated, go to the indicated DTC's troubleshooting.

    NO—Go to step 28.

(cont'd)

DTC Troubleshooting (cont'd)

28. Monitor the OBD STATUS for DTC P1454 or P2422 in the DTCs MENU with the HDS.

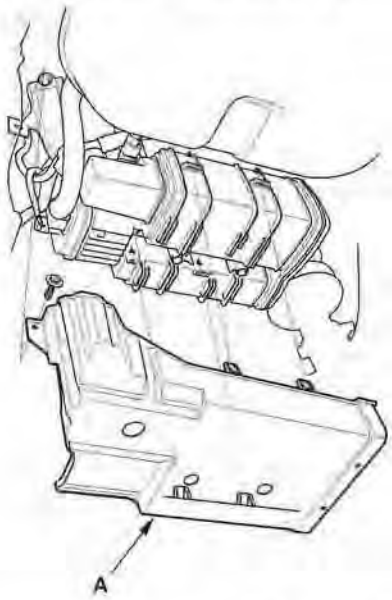
    Does the screen indicate PASSED?

    YES—Troubleshooting is complete. ■

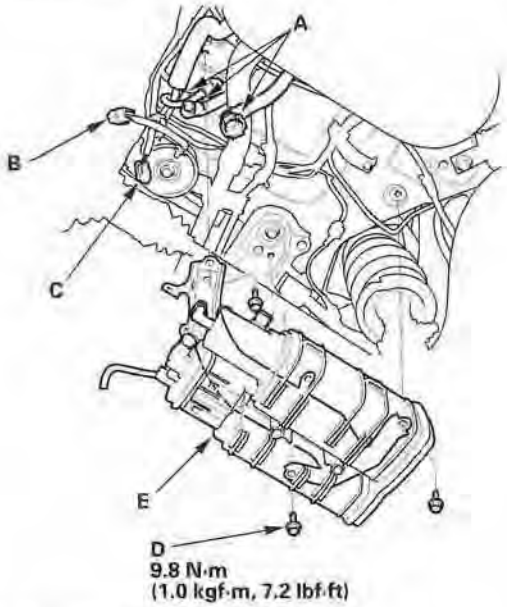
    NO—If the screen indicates FAILED, check for poor connections or loose terminals at the FTP sensor, or the EVAP canister vent shut valve and the ECM/PCM, then go to step 1. If the screen indicates NOT COMPLETED, go to step 26 and recheck.

EVAP Canister Replacement

1. Remove the EVAP canister cover (A).



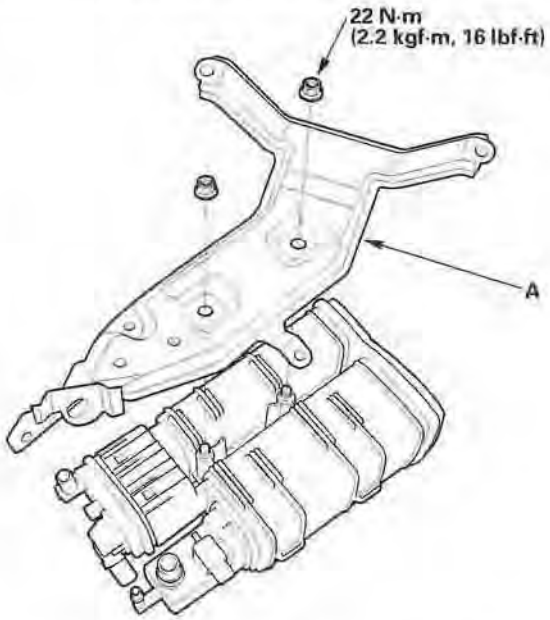
2. Remove the hoses (A), the FTP sensor 3P connector (B), and the EVAP canister vent shut valve 2P connector (C).



3. Remove the bolts (D).

4. Remove the EVAP canister (E).

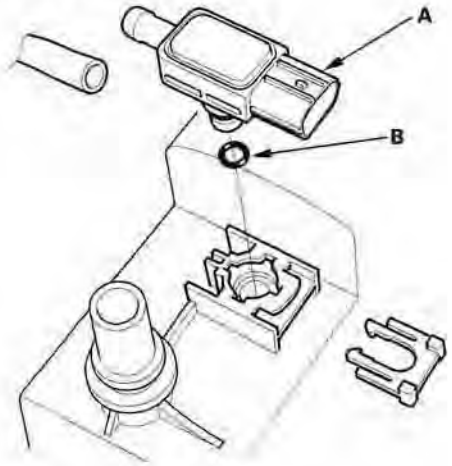
5. Remove the EVAP canister bracket (A).



6. Install the canister in the reverse order of removal.

FTP Sensor Replacement

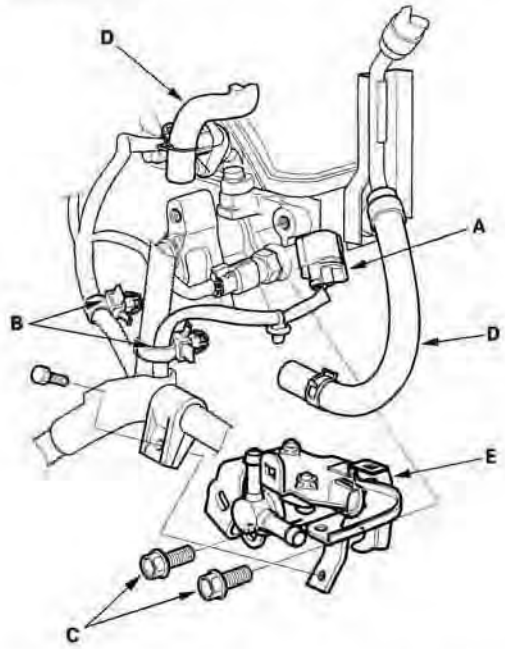
1. Remove the EVAP canister (see page 11-271).
2. Remove the FTP sensor (A).



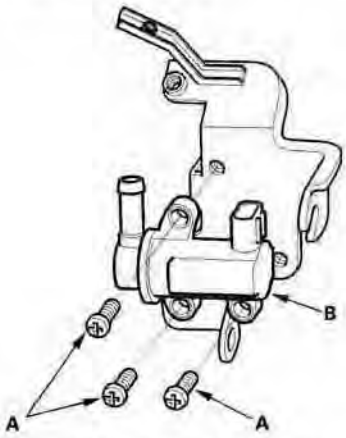
3. Install the sensor in the reverse order of removal with a new O-ring (B).

EVAP Canister Purge Valve Replacement

1. Disconnect the EVAP canister purge valve 2P connector (A).



2. Remove the harness clips (B), the bolts (C), and the hoses (D), then remove the EVAP canister purge valve assembly (E).
3. Remove the screws (A).

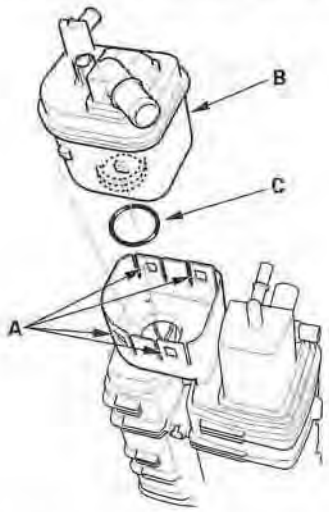


4. Remove the EVAP canister purge valve (B) from the bracket.
5. Install the valve in the reverse order of removal.

EVAP Canister Vent Shut Valve Replacement

1. Remove the EVAP canister (see page 11-271).
2. Pry the lock tabs outward (A), then remove the EVAP canister vent shut valve (B).

   NOTE: Be careful not to damage the lock tabs.



3. Install the valve in the reverse order of removal with a new O-ring (C).

   NOTE: Do not coat the O-ring with engine oil, etc.

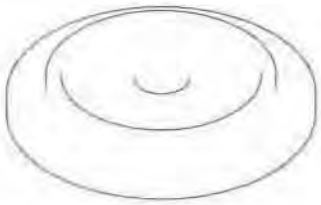
Transaxle

Clutch

Clutch

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07JAF-PM7011A	Clutch Alignment Disc	1
②	07LAB-PV00100 or 07924-PD20003	Ring Gear Holder	1
③	07ZAF-PR8A100	Clutch Alignment Shaft	1
④	07936-3710100	Remover Handle	1



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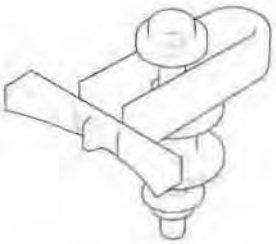

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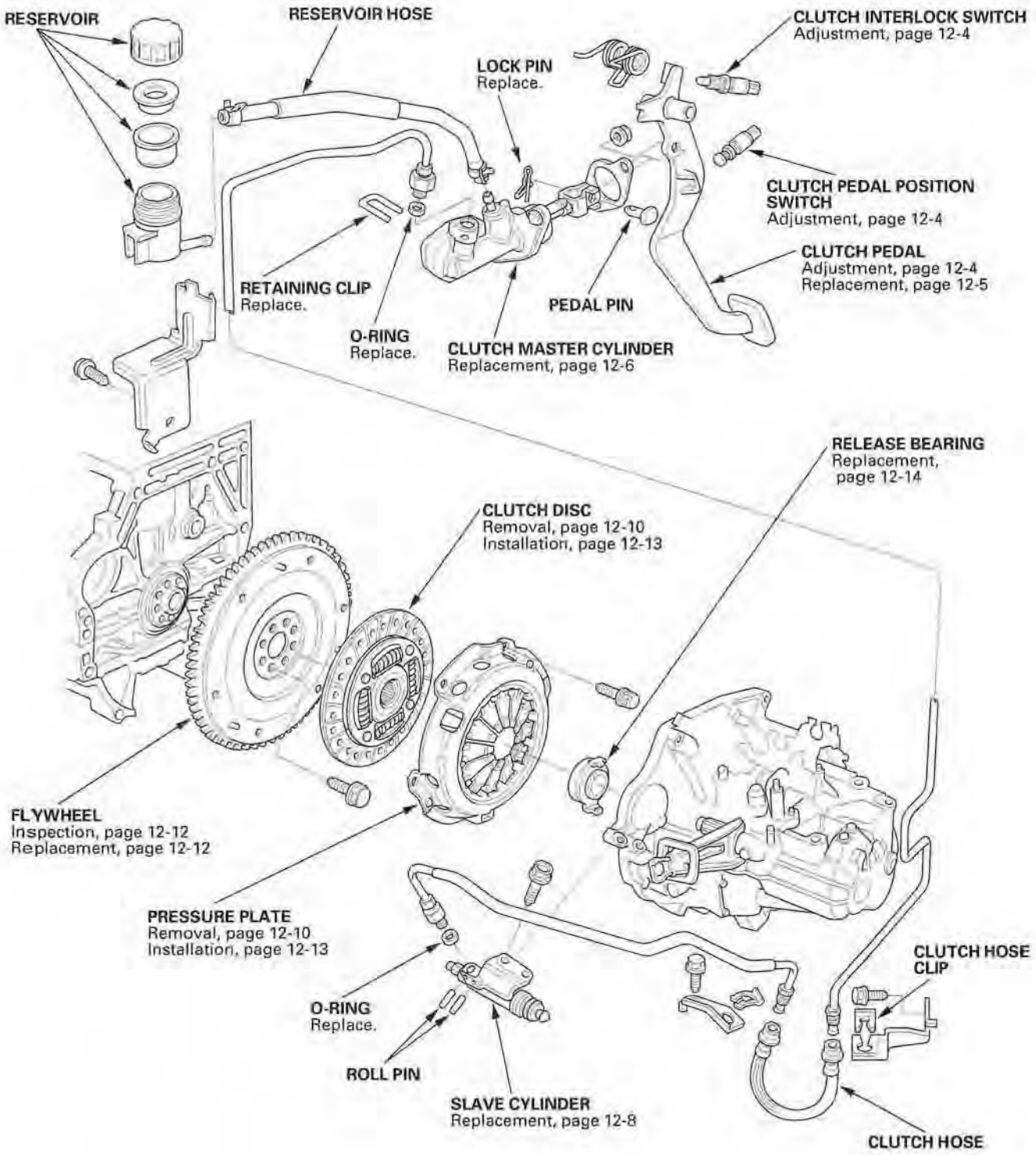
③

④

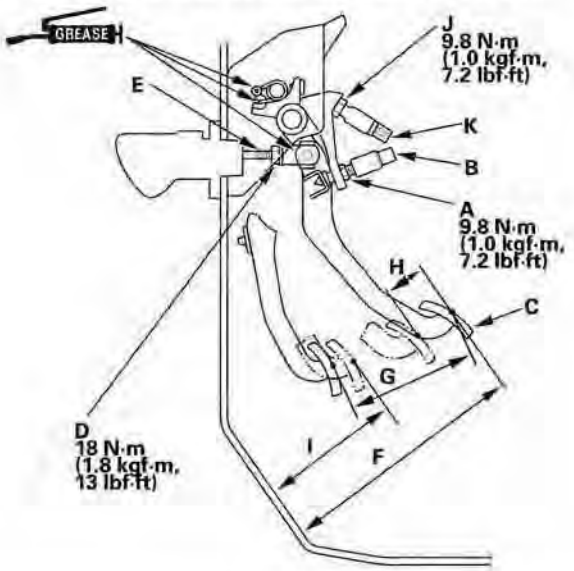
Component Location Index



Clutch Pedal, Clutch Pedal Position Switch, and Clutch Interlock Switch Adjustment

NOTE:
- Check the clutch pedal position switch (see page 4-55).
- Check the clutch interlock switch (see page 4-8).
- Remove the driver's floor mat before adjusting the clutch pedal.
- The clutch is self-adjusting to compensate for wear.
- If there is no clearance between the master cylinder piston and pushrod, the release bearing will be held against the diaphragm spring, which can result in clutch slippage or other clutch problems.

1. Loosen the clutch pedal position switch locknut (A), and back off the clutch pedal position switch (B) until it no longer touches the clutch pedal (C).



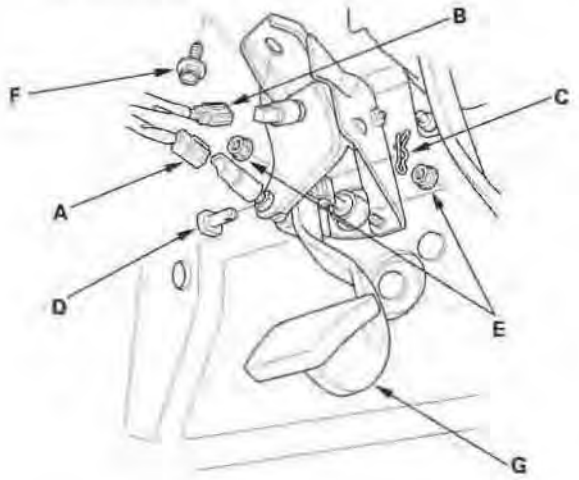
2. Loosen the clutch pushrod locknut (D), and turn the pushrod (E) in or out to get the specified height (F), stroke (G), free play (H), and disengagement height (I) at the clutch pedal.

Clutch Pedal Stroke:	**125—135 mm (4.92—5.31 in.)**
Clutch Pedal Free Play:	**6—17 mm (0.24—0.67 in.)**
Clutch Pedal Height:	**200 mm (7.87 in.)**
Clutch Pedal Disengagement Height:	**112 mm (4.41 in.)**

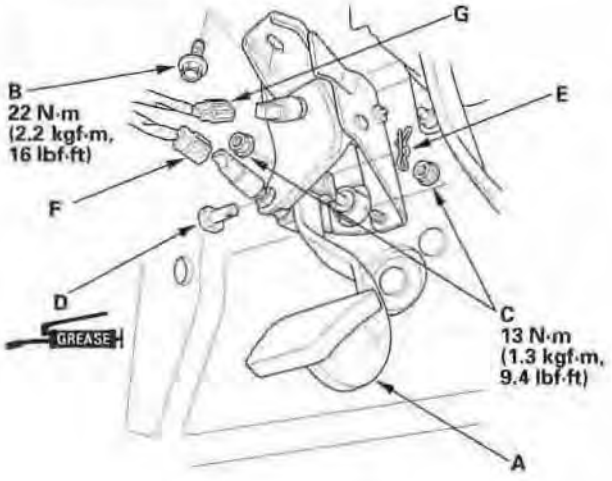
3. Tighten the clutch pushrod locknut (D).
4. With the clutch pedal released, turn the clutch pedal position switch (B) until it contacts the clutch pedal (C).
5. Turn in the clutch pedal position switch (B) an additional 3/4 to 1 turn.
6. Tighten the clutch pedal position switch locknut (A).
7. Loosen the clutch interlock switch locknut (J).
8. Press the clutch pedal to the floor.
9. Release the clutch pedal 10—16 mm (0.39—0.63 in.) from the fully pressed position, and hold it there. Adjust the position of the clutch interlock switch (K) so the engine will start with the clutch pedal in this position.
10. Tighten the clutch interlock switch locknut (J).

Clutch Pedal Replacement

1. Disconnect the clutch pedal position switch connector (A) and clutch interlock switch connector (B).



2. Pry out the lock pin (C), and pull the pedal pin (D) out of the yoke.
3. Remove the master cylinder mounting nuts (E) and clutch pedal mounting bolt (F).
4. Remove the clutch pedal (G).
5. Install the clutch pedal (A).

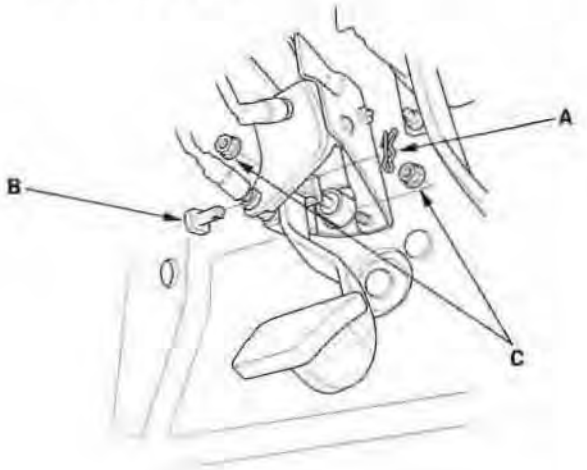


6. Install the clutch pedal mounting bolt (B) and master cylinder mounting nuts (C).
7. Apply grease to the pedal pin (D), and slide it into the yoke, then install a new lock pin (E).
8. Connect the clutch pedal position switch connector (F) and clutch interlock switch connector (G).
9. Adjust the clutch pedal, clutch pedal position switch, and clutch interlock switch (see page 12-4).

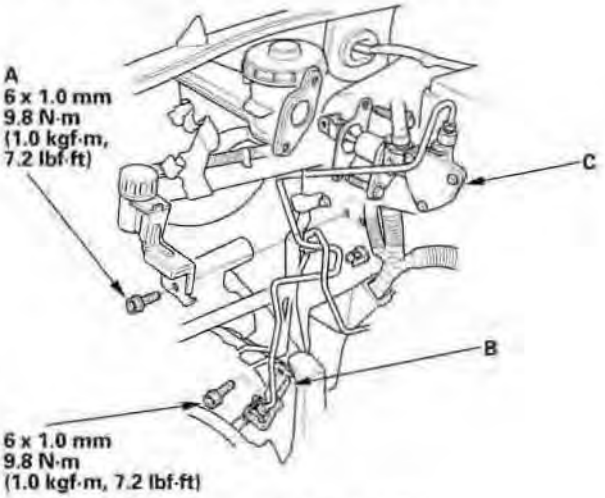
Clutch Master Cylinder Replacement

NOTE: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

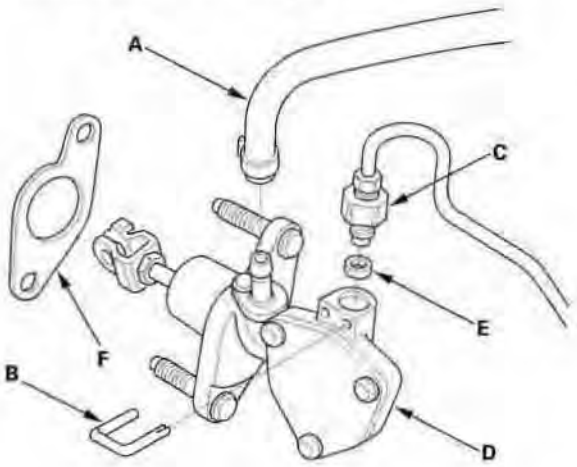
1. Remove the brake fluid from the clutch master cylinder reservoir with a syringe.
2. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets. Disconnect the negative (−) cable from the battery first, then the positive (+) cable. Remove the battery.
3. Remove the air cleaner housing (see page 11-232).
4. Remove the battery tray (see step 5 on page 13-4).
5. Pry out the lock pin (A), and pull the pedal pin (B) out of the yoke. Remove the master cylinder mounting nuts (C).



6. Remove the reservoir mounting bolt (A).



7. Remove the clutch line bracket (B).
8. Remove the clutch master cylinder (C).
9. Disconnect the reservoir hose (A), then remove the retaining clip (B) and clutch line (C) from the clutch master cylinder (D). Plug the end of the reservoir hose and clutch line with a shop towel to prevent brake fluid from coming out.

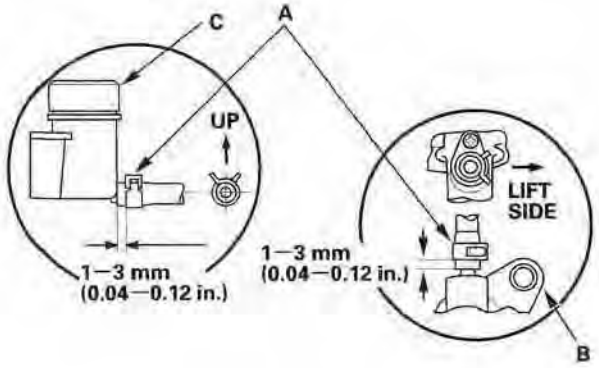


10. Remove the O-ring (E) and clutch master cylinder seal (F) from the clutch master cylinder

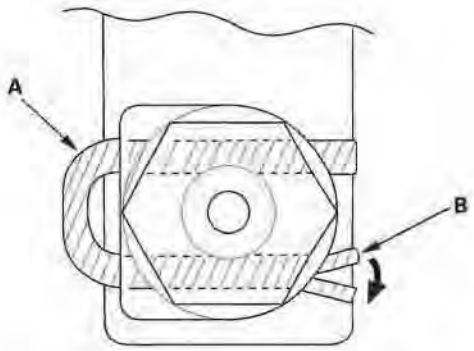
11. Install the clutch master cylinder in the reverse order of removal, and note these items:

    - Apply brake assembly lube to the clutch line, and install a new O-ring.
    - Tighten the master cylinder mounting nuts to 13 N·m (1.3 kgf·m, 9.4 lbf·ft).
    - Install the battery tray (see step 25 on page 13-13).
    - Install the air cleaner housing (see page 11-232).
    - Connect the positive (+) cable to the battery first, then connect the negative (−) cable.
    - Do the idle learn procedure (see page 11-207).
    - Enter the anti-theft code for the radio, then enter the customer's radio station and XM radio channel presets.
    - Do the power window control unit reset procedure (see page 22-115).

12. Make sure the hose clamps (A) are positioned on the master cylinder (B) and reservoir (C) as shown.



13. To prevent the retaining clip (A) from coming off, pry apart the tip of the retaining clip (B) with a screwdriver.



14. Bleed the clutch hydraulic system (see step 11 on page 12-9).

    NOTE: Reservoir filling is covered in the bleeding procedure.

Slave Cylinder Replacement

NOTE:
- Use fender covers to avoid damaging painted surfaces.
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

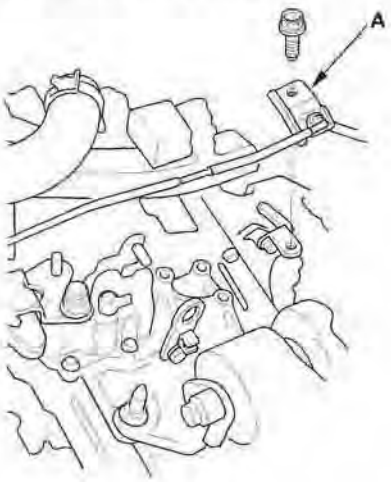
1. Make sure you have the anti-theft code for the radio, then write down the customer's radio station and XM radio channel presets.

2. Disconnect the negative (−) cable from the battery first, then disconnect the positive (+) cable. Remove the battery.

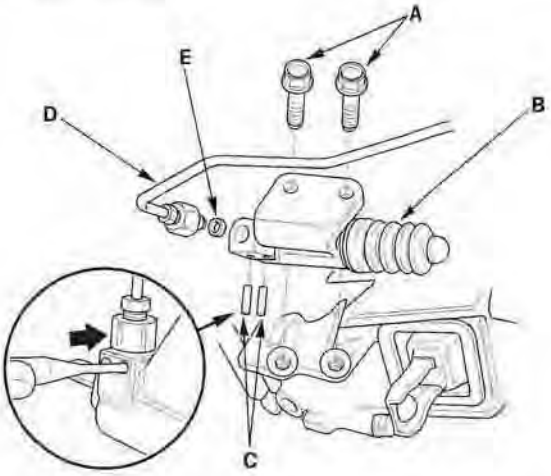
3. Remove the air cleaner housing (see page 11-232).

4. Remove the battery tray (see step 5 on page 13-4).

5. Remove the clutch line bracket (A).

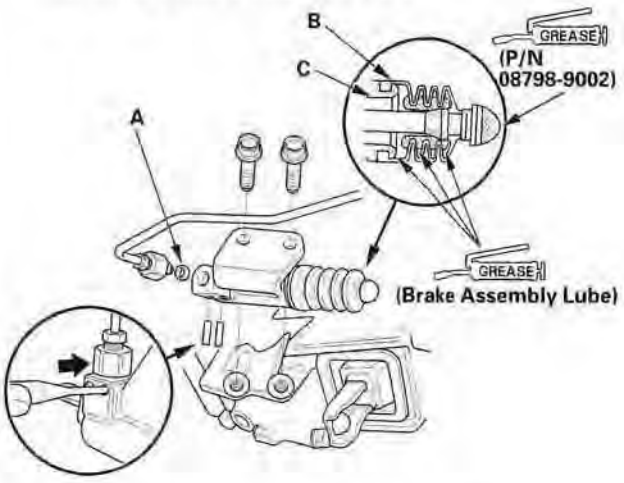


6. Remove the mounting bolts (A) and the slave cylinder (B).



7. Remove the roll pins (C). Disconnect the clutch line (D), and remove the O-ring (E). Plug the end of the clutch line with a shop towel to prevent brake fluid from coming out.

8. Install the slave cylinder in the reverse order of removal. Install a new O-ring (A).

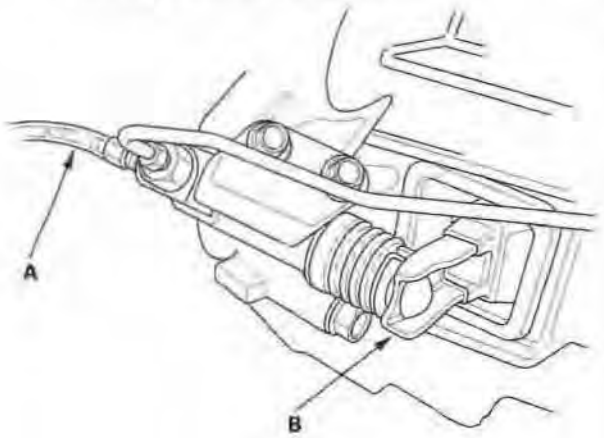


9. Pull back the boot (B), and apply brake assembly lube to the boot and slave cylinder rod (C). Reinstall the boot.

10. Apply super high temp urea grease (P/N 08798-9002) to the pushrod of the slave cylinder. Tighten the slave cylinder mounting bolts to 22 N·m (2.2 kgf·m, 16 lbf·ft).

11. Bleed the clutch hydraulic system.

    - Attach a hose (A) to the bleeder screw, and suspend the hose in a container of brake fluid.
    - Make sure there is an adequate supply of fluid in the clutch master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
    - It may be necessary to limit the movement of the release fork (B) with a block of wood to remove all the air from the system.
    - Tighten the bleeder screw to 8 N·m (0.8 kgf·m, 5.8 lbf·ft); do not overtighten it.
    - Refill the clutch master cylinder with fluid when done.
    - Use only Honda Heavy Duty DOT 3 brake fluid from an unopened container.



12. Install the air cleaner housing (see page 11-232).

13. Connect the positive (+) cable to the battery first, then connect the negative (−) cable.

14. Do the idle learn procedure (see page 11-207).

15. Enter the anti-theft code for the radio, then enter the customer's radio station and XM radio channel presets. Set the clock.

16. Do the power window control unit reset procedure (see page 22-115).

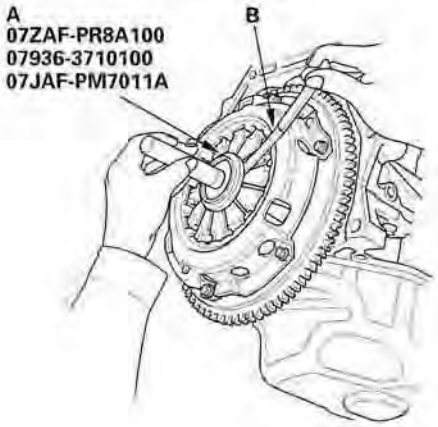
Clutch Replacement

Special Tools Required
- Clutch alignment disc 07JAF-PM7011A
- Ring gear holder 07LAB-PV00100 or 07924-PD20003
- Clutch alignment shaft 07ZAF-PR8A100
- Remover handle 07936-3710100

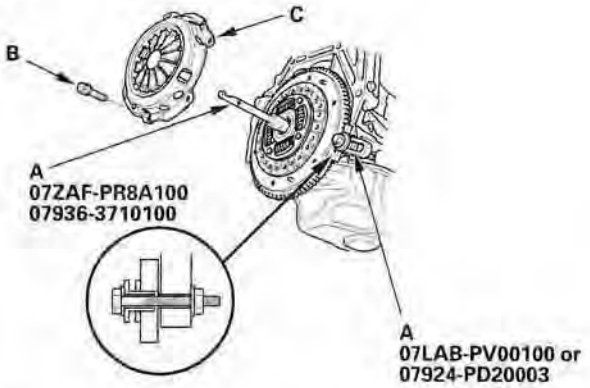
Pressure Plate and Clutch Disc Removal

1. Check the height of the diaphragm spring fingers using the special tools (A) and a feeler gauge (B). If the height is more than the service limit, replace the pressure plate.

   Standard (New): 0.6 mm (0.02 in.) max.
   Service Limit: 0.8 mm (0.03 in.)

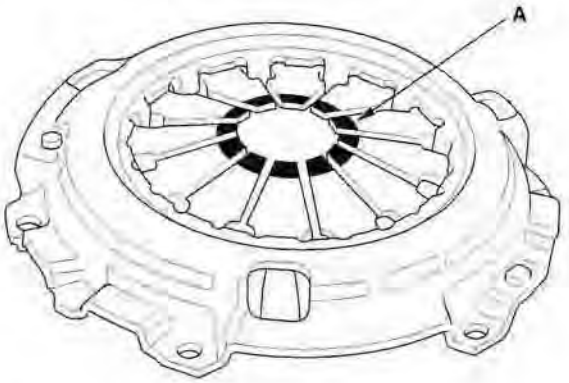


2. Install the special tools (A).

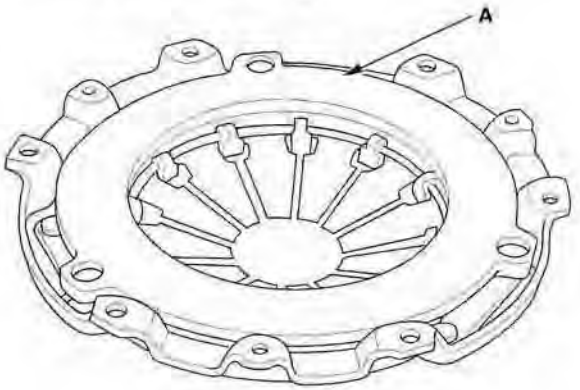


3. To prevent warping, unscrew the pressure plate mounting bolts (B) in a crisscross pattern in several steps, then remove the pressure plate (C).

4. Inspect the fingers of the diaphragm spring (A) for wear at the release bearing contact area.

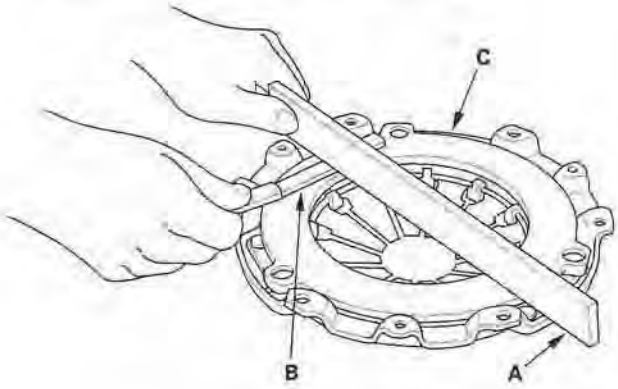


5. Inspect the surface of the pressure plate (A) for wear, cracks, and burning.

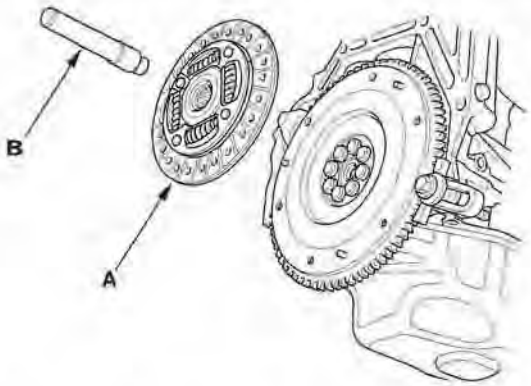


6. Inspect for warpage using a straight edge (A) and a feeler gauge (B). Measure across the pressure plate (C). If the warpage is more than the service limit, replace the pressure plate.

Standard (New): 0.03 mm (0.001 in.) max.
Service Limit: 0.15 mm (0.006 in.)



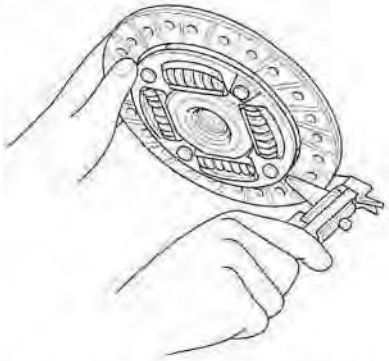
7. Remove the clutch disc (A) and special tools (B).



8. Inspect the lining of the clutch disc for signs of slippage or oil. If the clutch disc looks burnt or is soaked with oil, replace it. Find the source of the oil leak if the clutch disc is soaked.

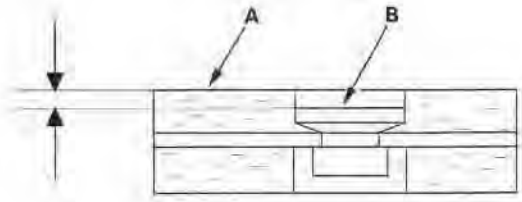
9. Measure the clutch disc thickness. If the thickness is less than the service limit, replace the clutch disc.

Standard (New): 8.6—9.2 mm (0.34—0.36 in.)
Service Limit: 6.0 mm (0.24 in.)



10. Measure the rivet depth from the clutch disc lining surface (A) to the rivets (B) on both sides. If the rivet depth is less than the service limit, replace the clutch disc.

Standard (New): 1.65—2.25 mm (0.065—0.089 in.)
Service Limit: 0.7 mm (0.03 in.)



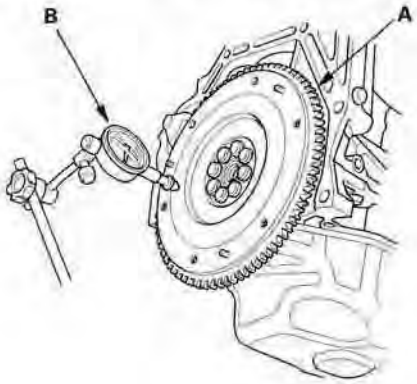
(cont'd)

Clutch Replacement (cont'd)

Flywheel Inspection

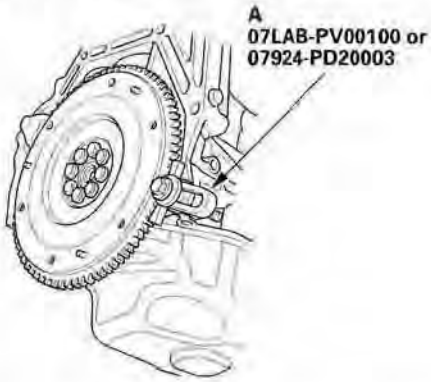
1. Inspect the ring gear teeth for wear and damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks, and burning.
3. Measure the flywheel (A) runout using a dial indicator (B) through at least two full turns with the engine installed. Push against the flywheel each time you turn it to take up the crankshaft thrust washer clearance. If the runout is more than the service limit, replace the flywheel, and recheck the runout. Resurfacing the flywheel is not recommended.

Standard (New): 0.05 mm (0.002 in.) max.
Service Limit: 0.15 mm (0.006 in.)

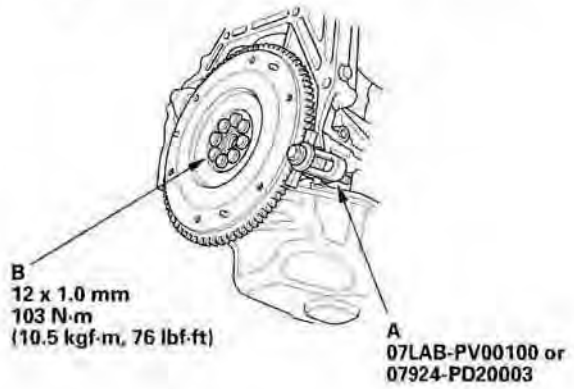


Flywheel Replacement

1. Install the special tool (A).



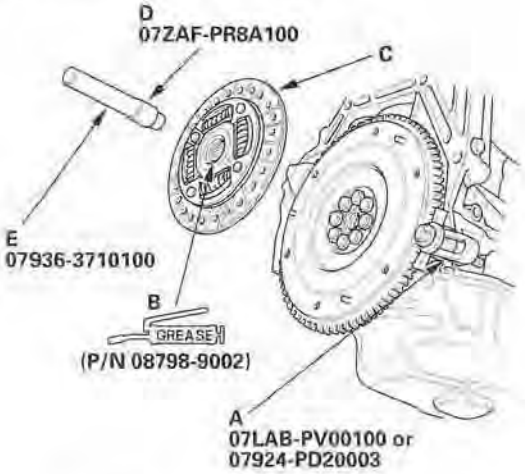
2. Remove the flywheel mounting bolts in a crisscross pattern in several steps, then remove the flywheel.
3. Install the flywheel on the crankshaft, and install the mounting bolts, finger-tight.
4. Install the special tool (A), then torque the flywheel mounting bolts (B) in a crisscross pattern in several steps.



Clutch Disc and Pressure Plate Installation

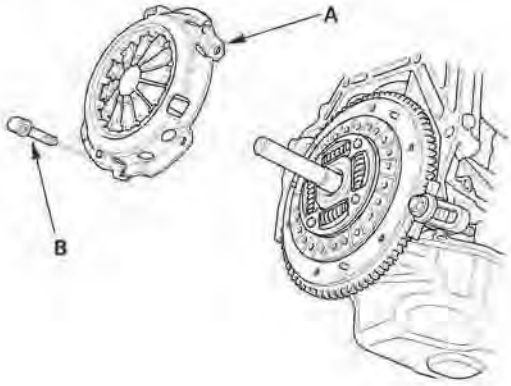
1. Temporarily install the clutch disc onto the splines of the transmission mainshaft. Make sure the clutch disc slides freely on the mainshaft.

2. Install the ring gear holder (A).



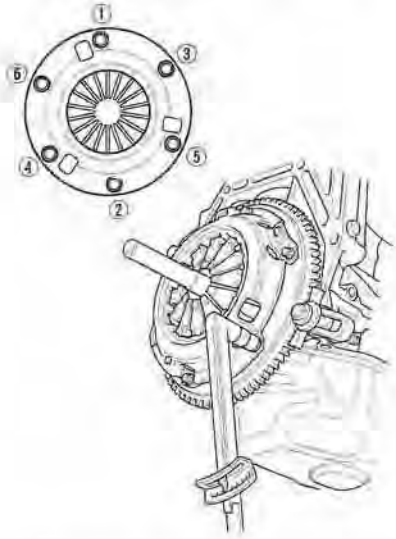
3. Apply super high temp urea grease (P/N 08798-9002) to the splines (B) of the clutch disc (C), then install the clutch disc using the special tools (D) and (E).

4. Install the pressure plate (A) and the mounting bolts (B), finger-tight.



5. Torque the mounting bolts in a crisscross pattern. Tighten the bolts in several steps to prevent warping the diaphragm spring.

Pressure Plate Mounting Bolt Torque:
25 N·m (2.6 kgf·m, 19 lbf·ft)



6. Remove the special tools.

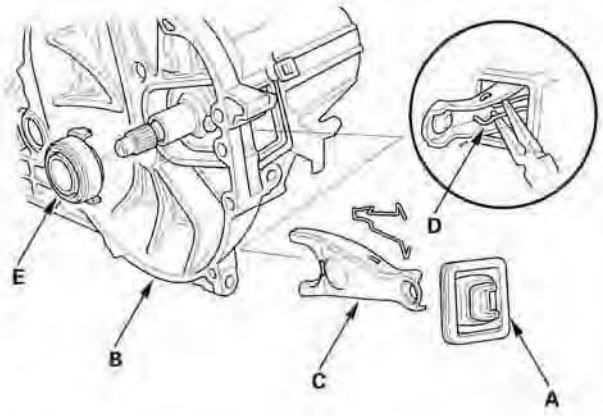
7. Make sure the diaphragm spring fingers are all the same height.

(cont'd)

Clutch Replacement (cont'd)

Release Bearing Replacement

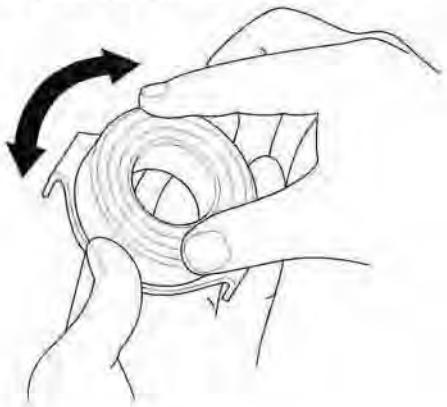
1. Remove the release fork boot (A) from the clutch housing (B).



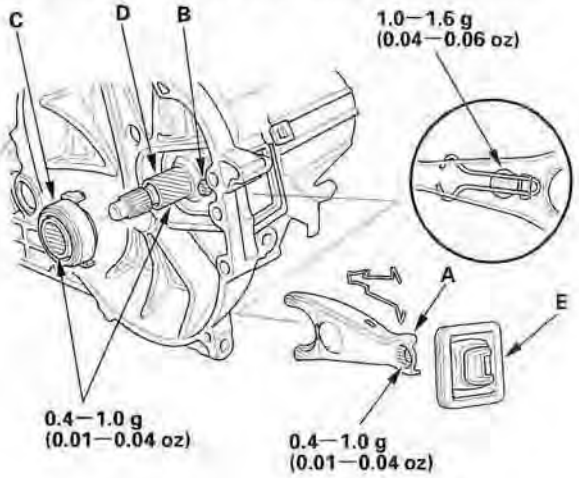
2. Remove the release fork (C) from the clutch housing by squeezing the release fork set spring (D) with pliers. Remove the release bearing (E).

3. Check the play of the release bearing by spinning it with your hand. If there is excessive play, replace the release bearing.

   NOTE: The release bearing is packed with grease. Do not wash it in solvent.



4. Apply super high temp urea grease (P/N 08798-9002) to the release fork (A), the release fork bolt (B), the release bearing (C), and the release bearing guide (D) in the shaded areas.

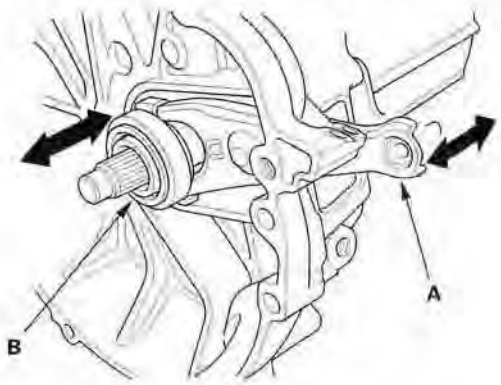


5. With the release fork slid between the release bearing pawls, install the release bearing on the mainshaft while inserting the release fork through the hole in the clutch housing.

6. Align the detent of the release fork with the release fork bolt, then press the release fork over the release fork bolt squarely.

7. Install the release fork boot (E). Make sure the boot seals around the release fork and clutch housing.

8. Move the release fork (A) right and left to make sure it fits properly against the release bearing (B) and the release bearing slides smoothly.



Manual Transmission

Manual Transmission

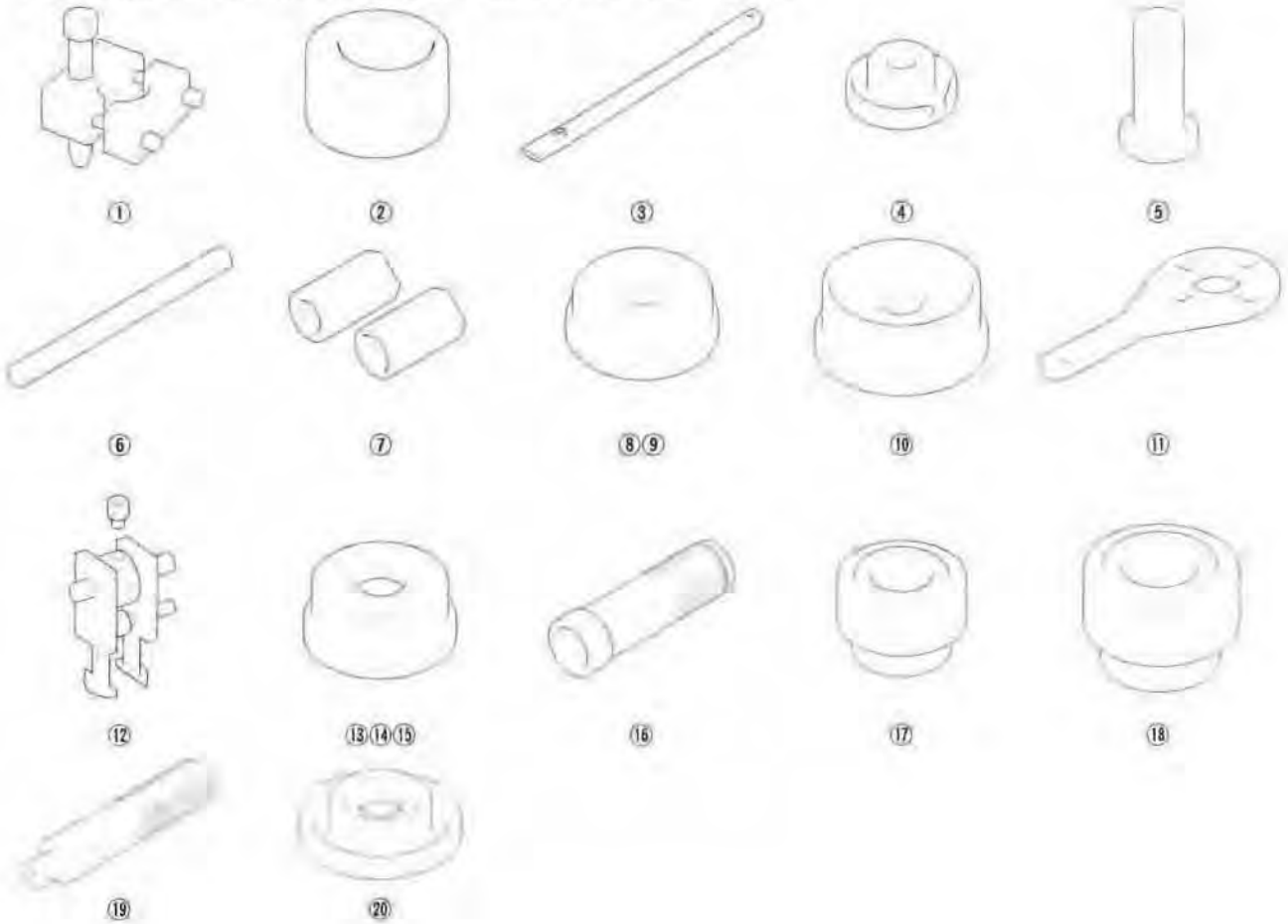
M/T Differential

M/T Transfer Assembly

Special Tools

Ref. No.	Tool Number	Description	Qty
*①	07GAJ-PG20110	Mainshaft Holder	1
*②	07GAJ-PG20130	Mainshaft Base	1
③	07JAB-001020B	Holder Handle	1
④	07JAD-PH80101	Oil Seal Driver Attachment	1
⑤	07JAD-PL90100	Oil Seal Driver	1
⑥	07JAF-SJ80110	Installer Shaft 14 x 165 mm	1
⑦	07JAF-SJ80120	Installer Nut 14 mm	1
⑧	07KAF-PS30120	Bearing Installer Attachment	1
⑨	07LAF-PZ70110	Bearing Installer Attachment	1
⑩	07NAD-P20A100	Oil Seal Driver Attachment	1
⑪	07RAB-TB4010A or 07RAB-TB4010B	Companion Flange Holder	1
**⑫	07736-A01000B	Adjustable Bearing Puller, 20—40 mm	1
⑬	07746-0010200	Attachment, 37 x 40 mm	1
⑭	07746-0010300	Attachment, 42 x 47 mm	1
⑮	07746-0010600	Attachment, 72 x 75 mm	1
⑯	07746-0030100	Driver, 40 mm I.D.	1
⑰	07746-0030300	Driver, 30 mm I.D.	1
⑱	07746-0030400	Attachment, 35 mm I.D.	1
⑲	07749-0010000	Driver	1
⑳	07947-SD90101	Oil Seal Driver Attachment	1

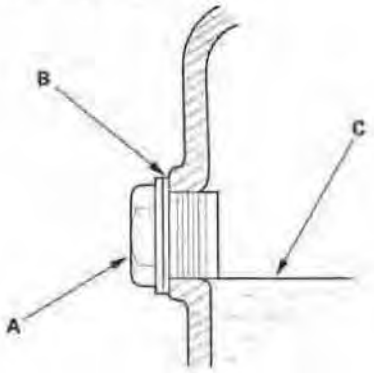
* Part of Mainshaft Inspection Tool Set, 07GAJ-PG20102.
* * Must be used with commercially available 3/8 "-16 " Slide Hammer.



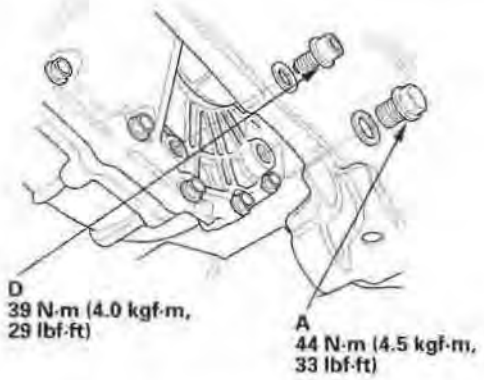
Transmission Fluid Inspection and Replacement

1. Park the vehicle on level ground, and turn the ignition switch to LOCK (0).

2. Remove the oil filler plug (A) and washer (B), check the condition of the fluid, and make sure it is at the proper level (C).



3. If the fluid is dirty, remove the drain plug (D) and drain the fluid.



4. Install the drain plug with a new washer, and refill the transmission fluid to the proper level.

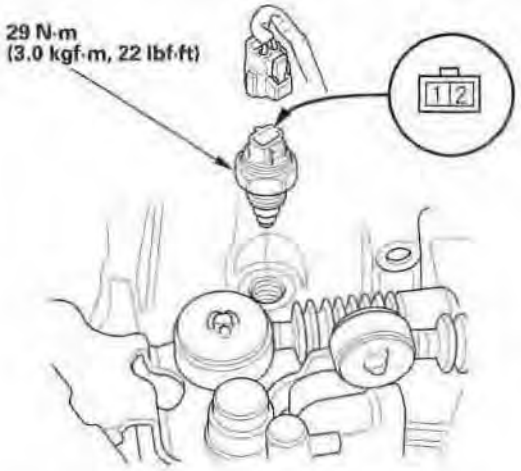
Fluid Capacity
4WD model:
1.9 L (2.0 US qt) at fluid change
2.25 L (2.4 US qt) at overhaul
2WD model:
1.9 L (2.0 US qt) at fluid change
2.15 L (2.3 US qt) at overhaul

Always use Honda Manual Transmission Fluid (MTF). Using engine oil can cause stiffer shifting because it does not contain the proper additives.

5. Install the oil filler plug with a new washer.

Back-up Light Switch Test

1. Disconnect the back-up light switch connector.



2. Check for continuity between the No. 1 and No. 2 terminals of the back-up light switch. There should be continuity when the shift lever is in reverse.

3. If necessary, replace the back-up light switch. Apply liquid gasket (P/N 08718-0001) to the switch threads, and install the switch on the transmission housing.

Transmission Removal

Special Tools Required
- Engine hanger/adapter VSB02C000015 *
- Engine support hanger, A & Reds AAR-T-12566 *
- Subframe adapter EQS02C000011 *

* Available through the Honda Tool and Equipment Program at 888-424-6857.

NOTE: Use fender covers to avoid damaging painted surfaces.

1. Make sure you have the anti-theft codes for the radio, then write down the customer's radio station and XM radio channel presets. Disconnect the negative (−) cable from the battery first, then disconnect the positive (+) cable. Remove the battery.

2. Secure the hood in its vertical position (A).

3. Remove the air cleaner housing (see page 11-232).

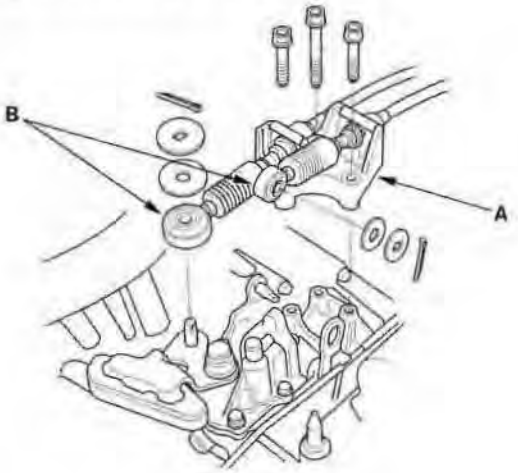
4. Remove the intake air duct (see step 5 on page 5-2).

5. Remove the battery tray (A).

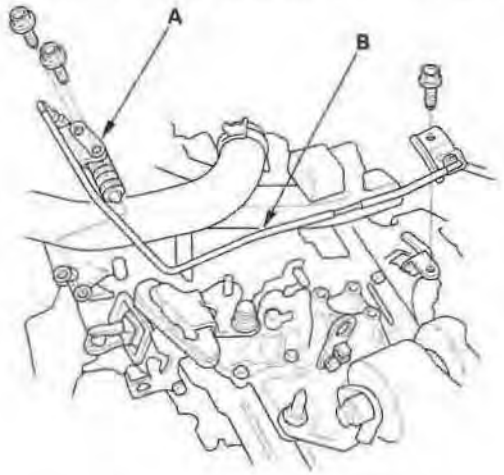
6. Remove the ground cable (A).

7. Disconnect the mainshaft speed sensor connector (B) and back-up light switch connector (C).

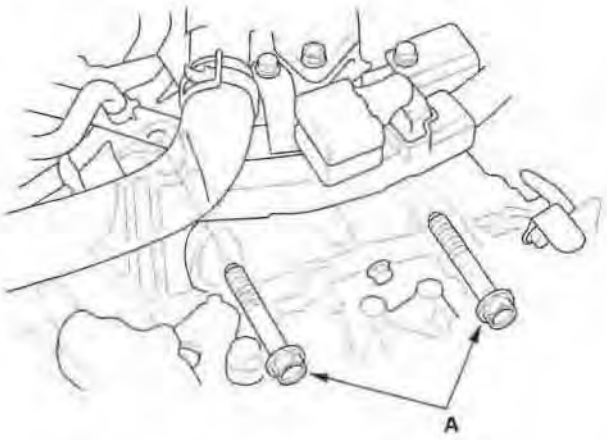
8. Remove the cable bracket (A), then disconnect the cables (B) from the top of the transmission housing . Carefully remove both cables and the bracket together to avoid bending the cables.



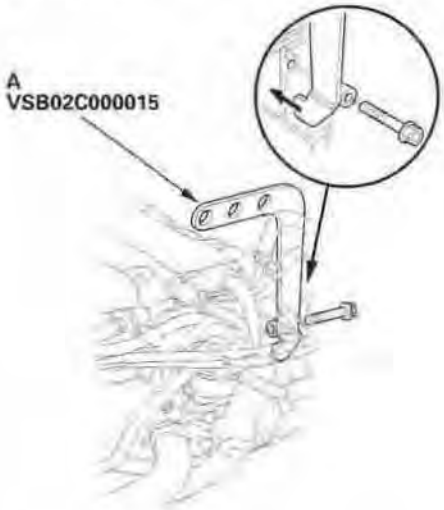
9. Carefully remove the slave cylinder (A) without bending the clutch line (B). Do not press the clutch pedal once the slave cylinder has been removed.



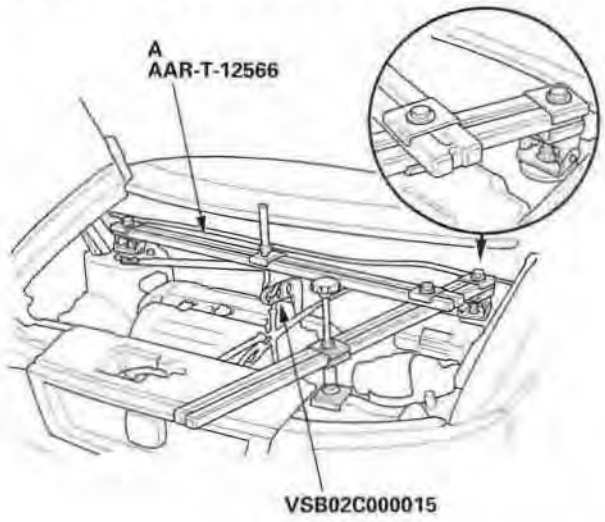
10. Remove the two transmission upper mounting bolts (A).



11. Attach the special tool (A) to the threaded holes in the cylinder head.



12. Install the engine support hanger (A) to the vehicle, then attach the hook to the special tool.



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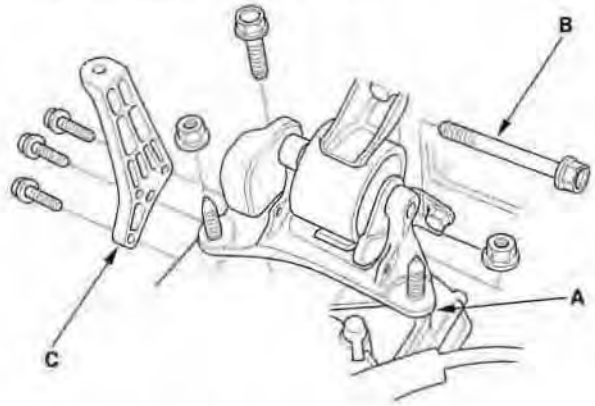
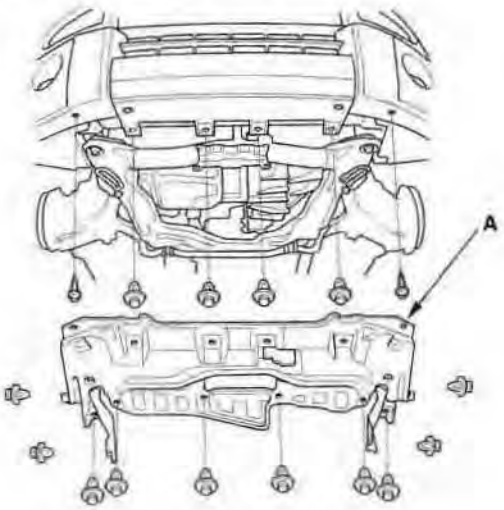
Transmission Removal (cont'd)

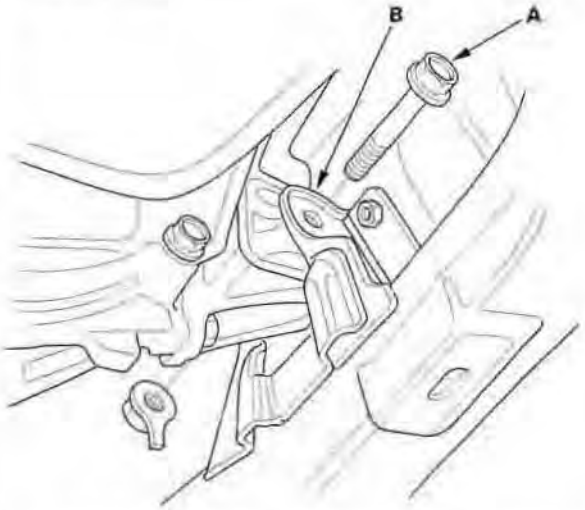
13. Remove the transmission mount bracket (A) and transmission mounting bolt (B).



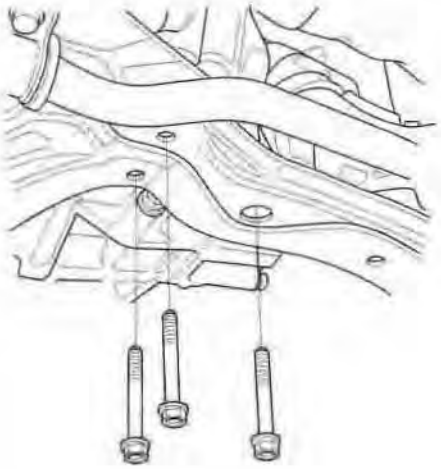
14. Remove the air cleaner bracket (C).
15. Raise the vehicle, and make sure it is securely supported.
16. Drain the transmission fluid. Install the drain bolt with a new washer (see page 13-3).
17. Remove the splash shield (A).



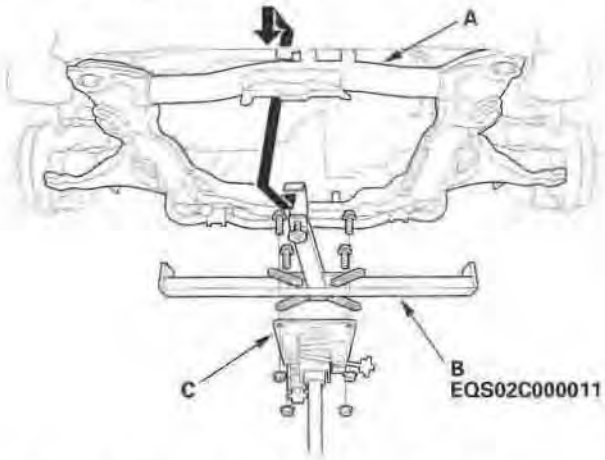
18. Remove the front driveshafts (see page 16-3).
19. Remove the intermediate shaft (see page 16-18).
20. Remove the bolt (A) from the front engine mount bracket (B).



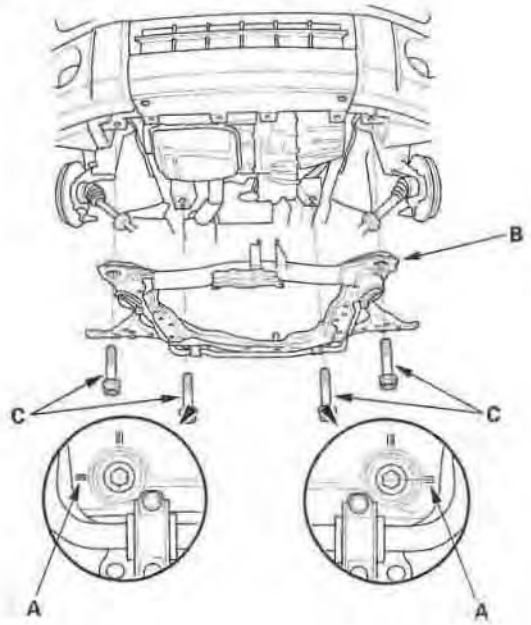
21. Remove the three bolts securing the transmission rear mount.



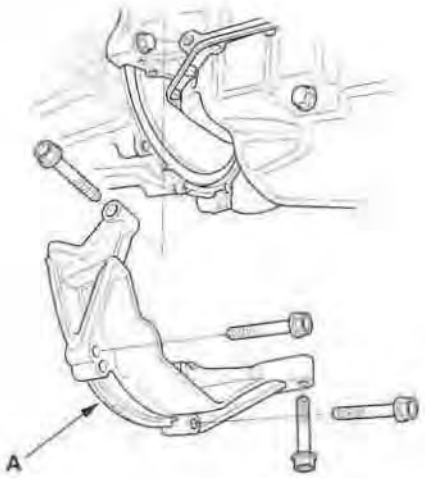
22. Support the subframe (A) with the subframe adapter (B) and a jack (C).



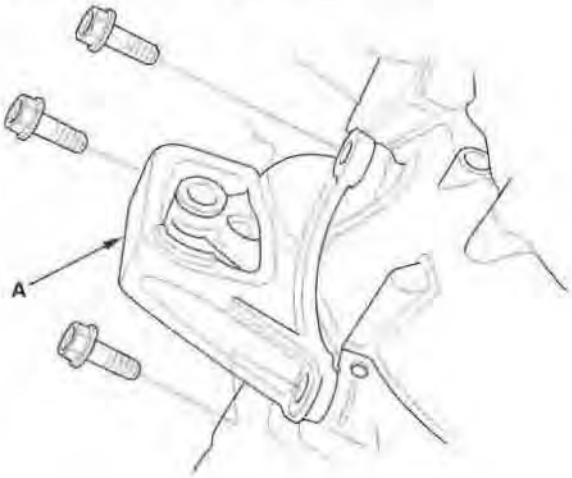
23. Make reference marks (A) on the front suspension subframe (B) and mounting bolts (C), then remove the front suspension subframe.



24. Remove the clutch cover (A).



25. Remove the front engine mount (A).



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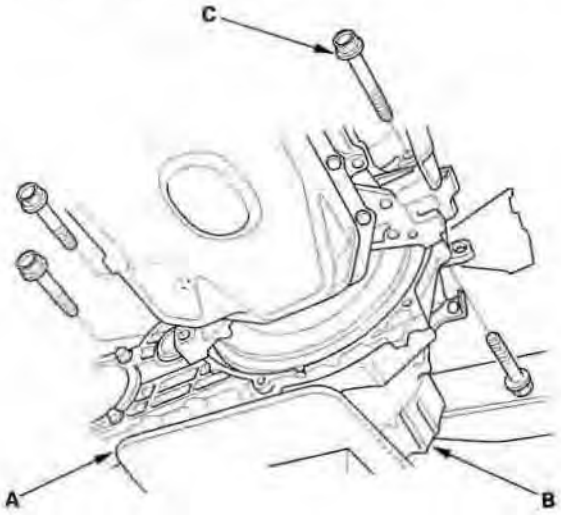
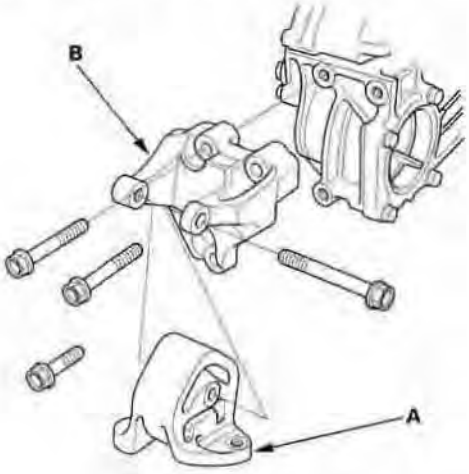
Transmission Removal (cont'd)

26. Place the transmission jack (A) under the transmission (B), and remove the four transmission lower mounting bolts (C).

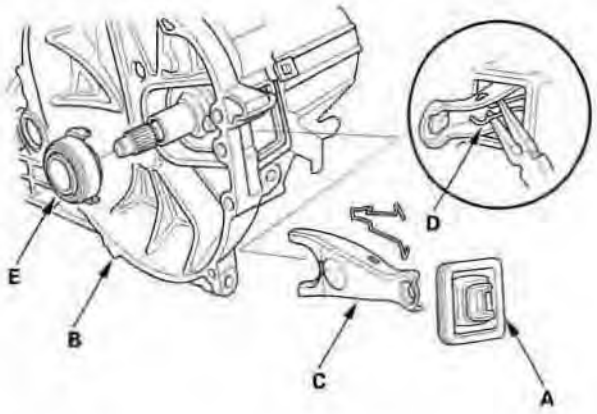


27. Pull the transmission away from the engine until the transmission mainshaft clears the clutch pressure plate, then lower the transmission on the transmission jack.

28. Remove the transmission rear mount (A) and the transmission rear mount bracket (B).



29. Remove the release fork boot (A) from the clutch housing (B).



30. Remove the release fork (C) from the clutch housing by squeezing the release fork set spring (D) with pliers. Remove the release bearing (E).

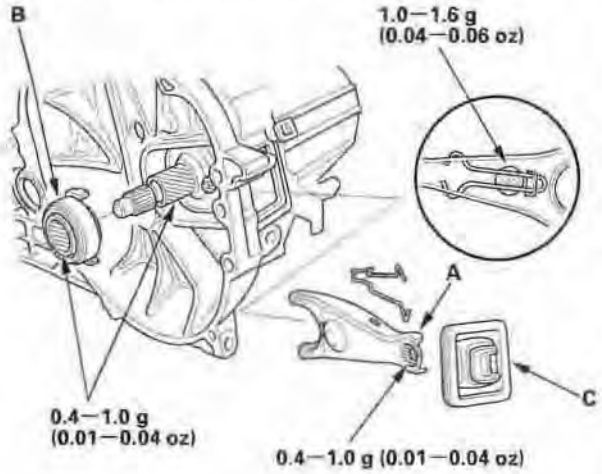
Transmission Installation

Special Tools Required
- Engine hanger/adapter VSB02C000015 *
- Engine support hanger, A & Reds AAR-T-12566 *
- Subframe adapter EQS02C000011 *

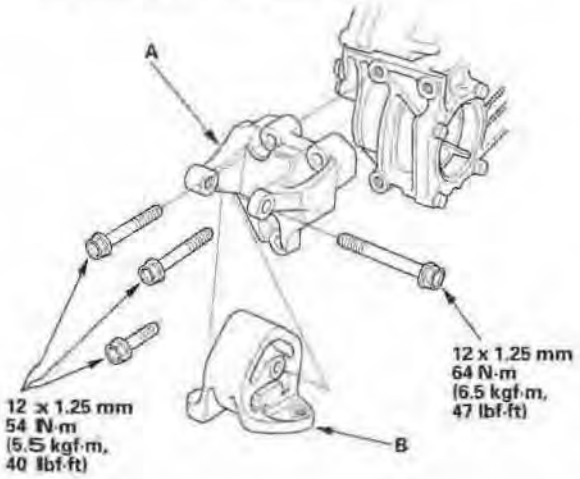
* Available through the Honda Tool and Equipment Program at 888-424-6857.

1. Check that the two dowel pins are installed in the clutch housing.

2. Apply super high temp urea grease (P/N 08798-9002) to the release fork (A) and the release bearing (B). Install the release fork, the release bearing, and the boot (C).

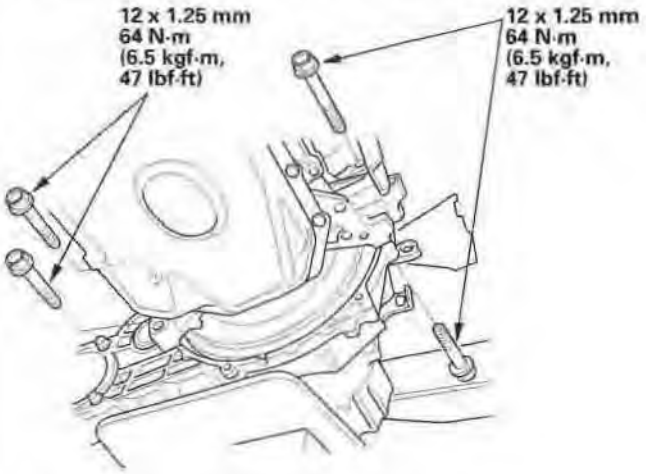


3. Install the transmission rear mount bracket (A) and the transmission rear mount (B).

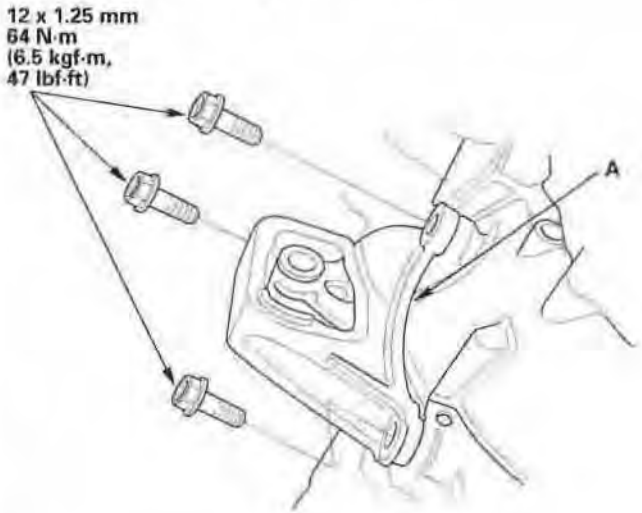


4. Place the transmission on the transmission jack, and raise it to the engine level.

5. Install the four transmission lower mounting bolts.



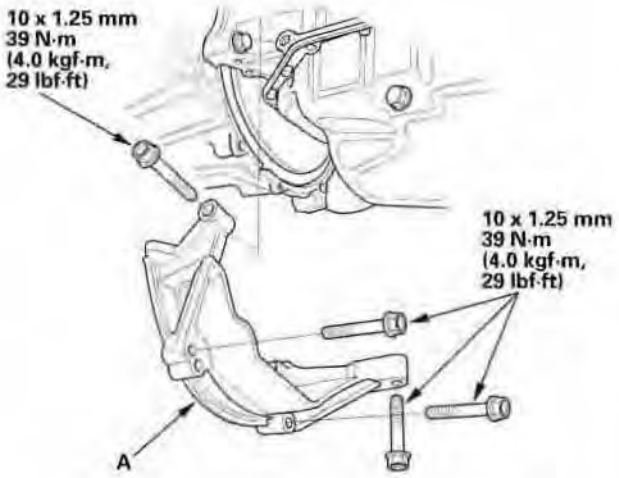
6. Install the front engine mount (A).



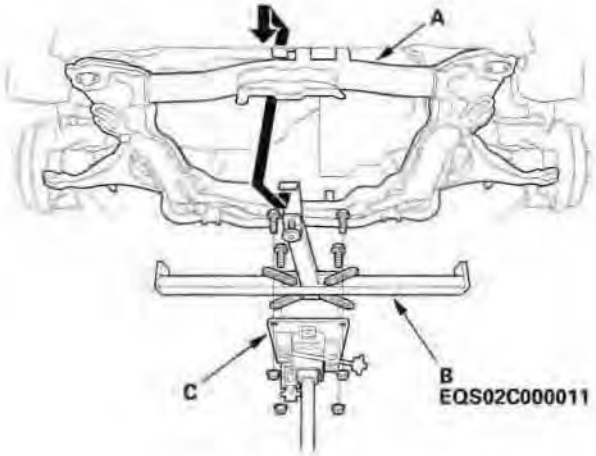
(cont'd)

Transmission Installation (cont'd)

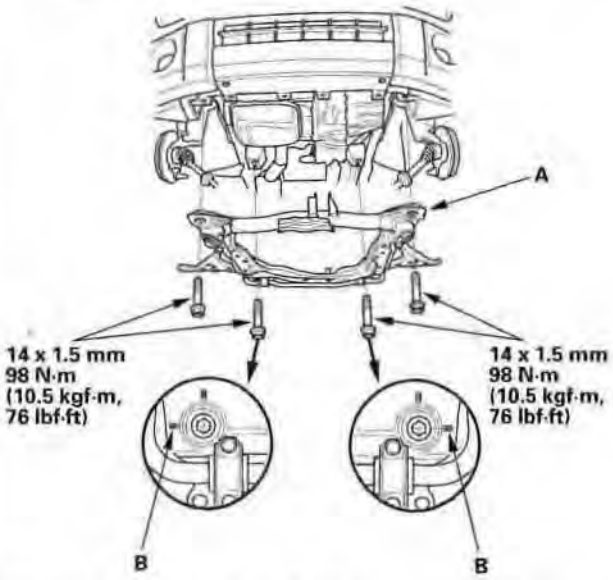
7. Install the clutch cover (A).



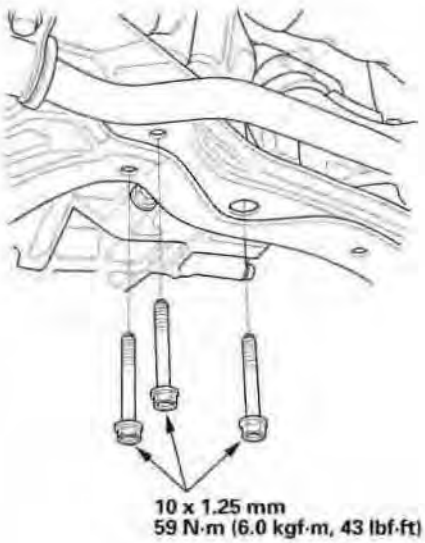
8. Support the subframe (A) with the subframe adapter (B) and a jack(C).



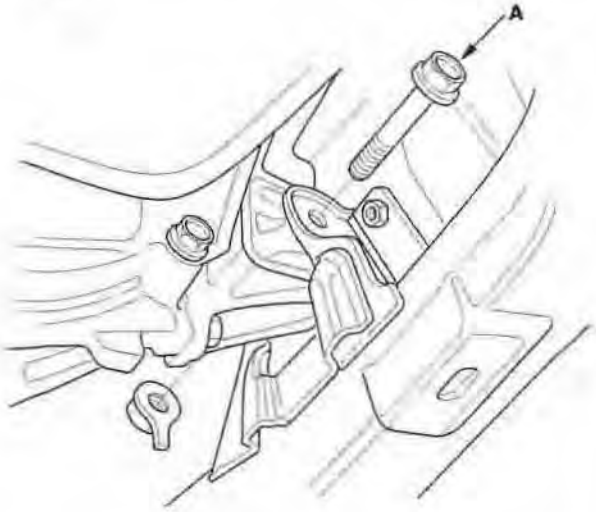
9. Install the front suspension subframe (A) in its original position by aligning the marks (B) you made in the removal procedure.



10. Install the three bolts for the transmission rear mount.



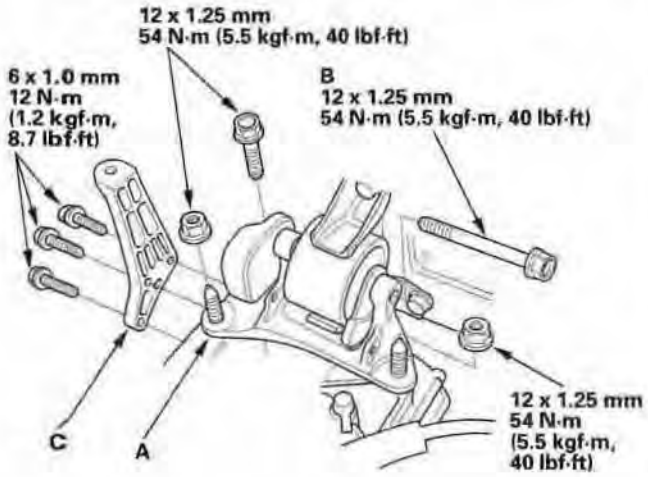
11. Loosely install the front engine mount bracket bolt (A).



12. Install the intermediate shaft (see page 16-23).

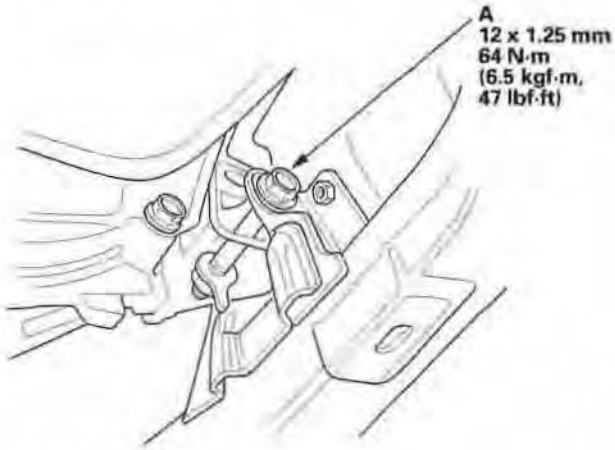
13. Install the front driveshafts (see page 16-16).

14. Install the transmission mount bracket (A) and the transmission mounting bolt (B).

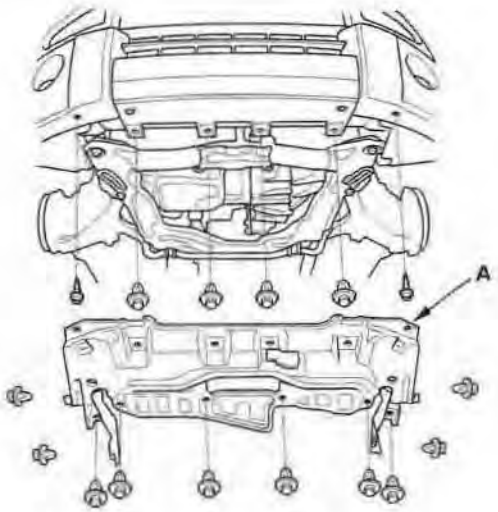


15. Install the air cleaner bracket (C).

16. Loosen the front engine mount bracket mounting bolt (A), then tighten the front engine mount bracket mounting bolt.



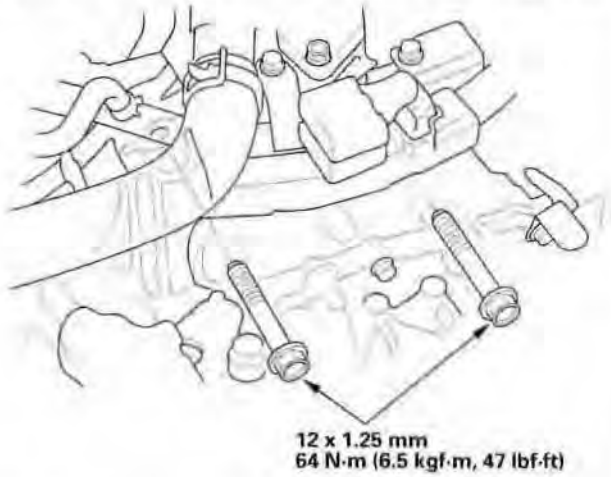
17. Install the splash shield (A).



(cont'd)

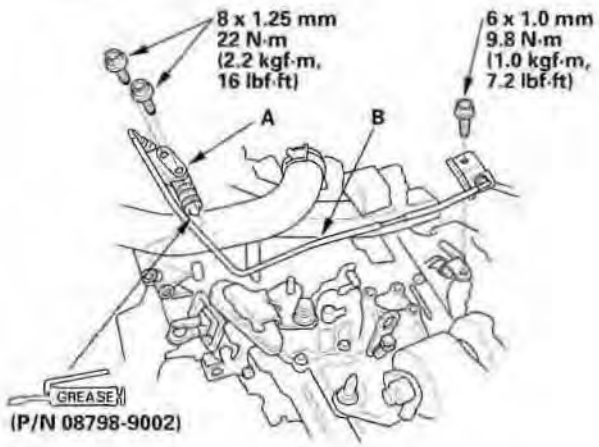
Transmission Installation (cont'd)

18. Install the two transmission upper mounting bolts.

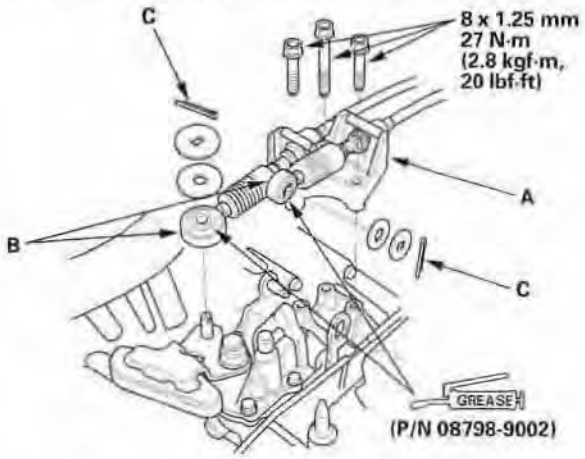


19. Remove the engine hanger and special tool from the engine.

20. Apply super high temp urea grease (P/N 08798-9002) to the end of the cylinder rod. Install the slave cylinder (A). Be careful not to bend the clutch line (B).

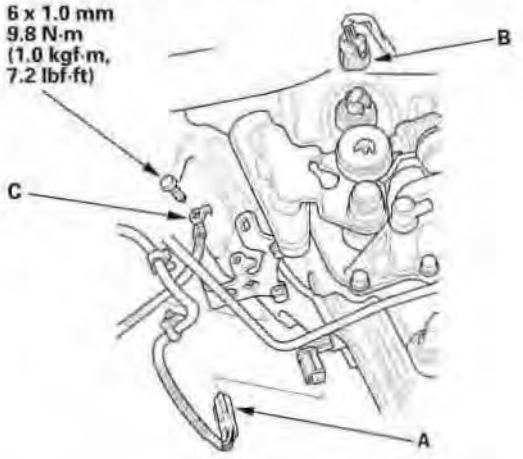


21. Install the cable bracket (A) and cables (B).



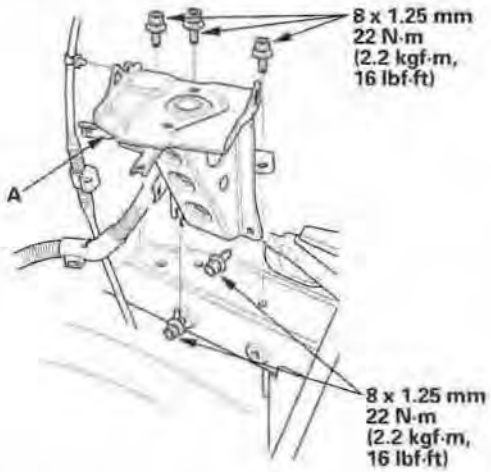
22. Apply a light coat of super high temp urea grease (P/N 08798-9002) to the cable ends, and install new cotter pins (C).

23. Connect the mainshaft speed sensor connector (A) and back-up light switch connector (B).



24. Install the ground cable (C).

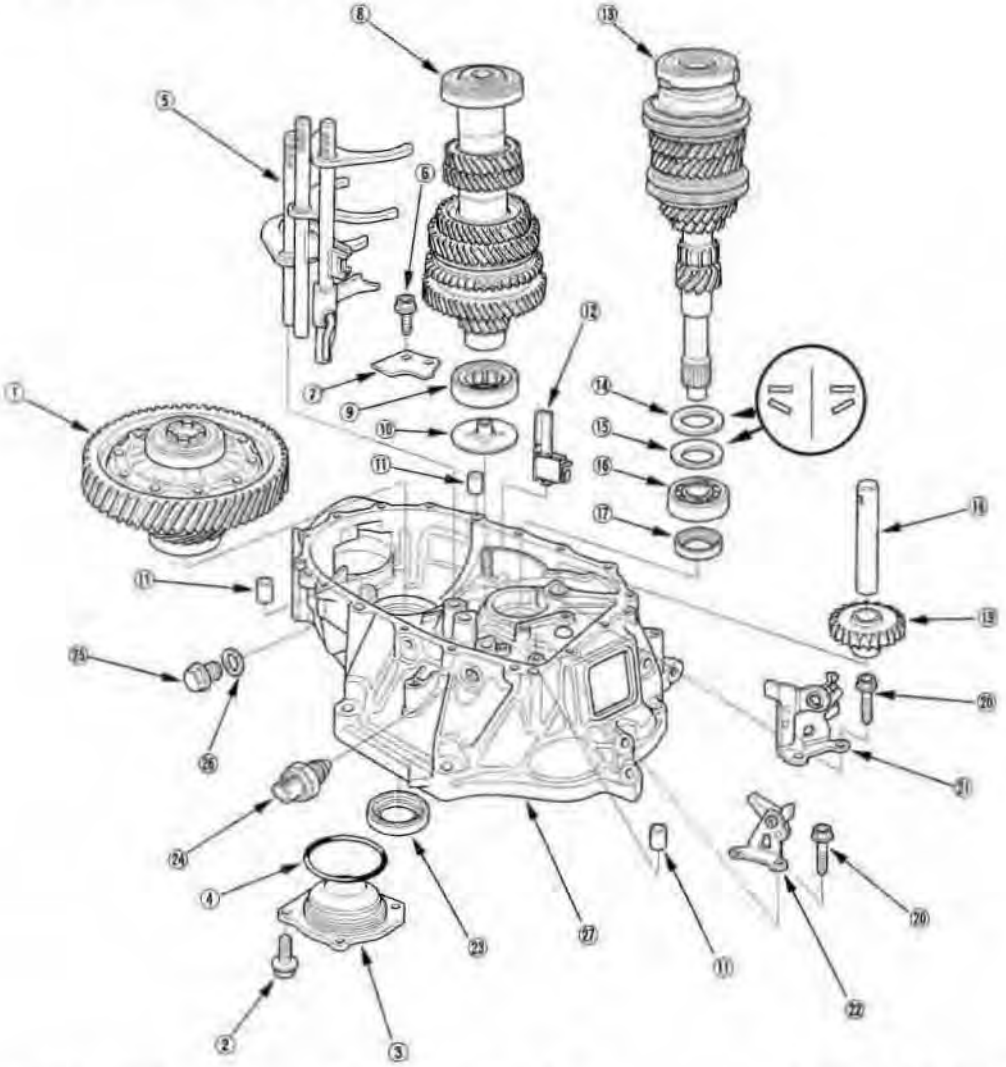
25. Install the battery tray (A).



26. Install the intake air duct (see step 52 on page 5-17).
27. Install the air cleaner housing (see page 11-232).
28. Connect the positive (+) cable to the battery first, then connect the negative (−) cable.
29. Refill the transmission fluid (see page 13-3).
30. Do the idle learn procedure (see page 11-207).
31. Test-drive the vehicle.
32. Check the clutch operation.
33. Check the front wheel alignment (see page 18-5).
34. Enter the anti-theft codes for the radio, then enter the customer's radio station and XM radio channel presets. Set the clock.
35. Do the power window control unit reset procedure (see page 22-115).

Transmission Disassembly

Exploded View - Clutch Housing: 2WD Model

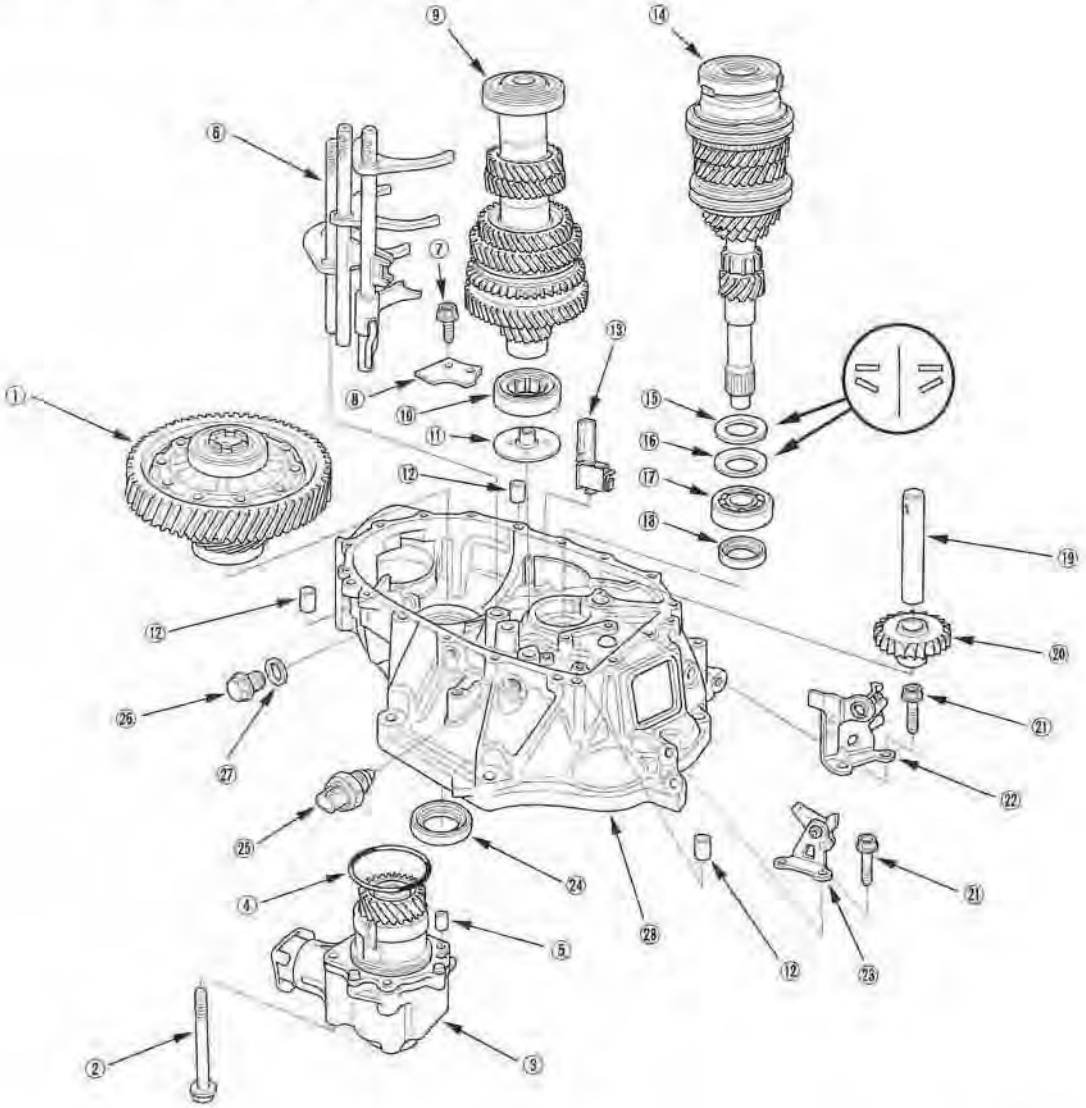


① DIFFERENTIAL ASSEMBLY
② 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
③ SIDE COVER
④ O-RING
Replace.
⑤ SHIFT FORK ASSEMBLY
⑥ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 9 lbf·ft)
⑦ BEARING SET PLATE
⑧ COUNTERSHAFT ASSEMBLY
⑨ NEEDLE BEARING
⑩ OIL GUIDE PLATE C

⑪ 14 x 20 mm DOWEL PIN
⑫ MAGNET
⑬ MAINSHAFT ASSEMBLY
⑭ 28 mm WASHER
⑮ 28 mm SPRING WASHER
⑯ BALL BEARING
⑰ 28 x 43 x 7 mm OIL SEAL
Replace.
⑱ REVERSE GEAR SHAFT
⑲ REVERSE IDLER GEAR
⑳ 6 mm SPECIAL BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)

㉑ REVERSE SHIFT FORK
㉒ REVERSE LOCK CAM
㉓ 35 x 58 x 8 mm OIL SEAL
Replace.
㉔ BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)
㉕ 20 mm BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
㉖ 20 mm WASHER
㉗ CLUTCH HOUSING

Exploded View - Clutch Housing: 4WD Model

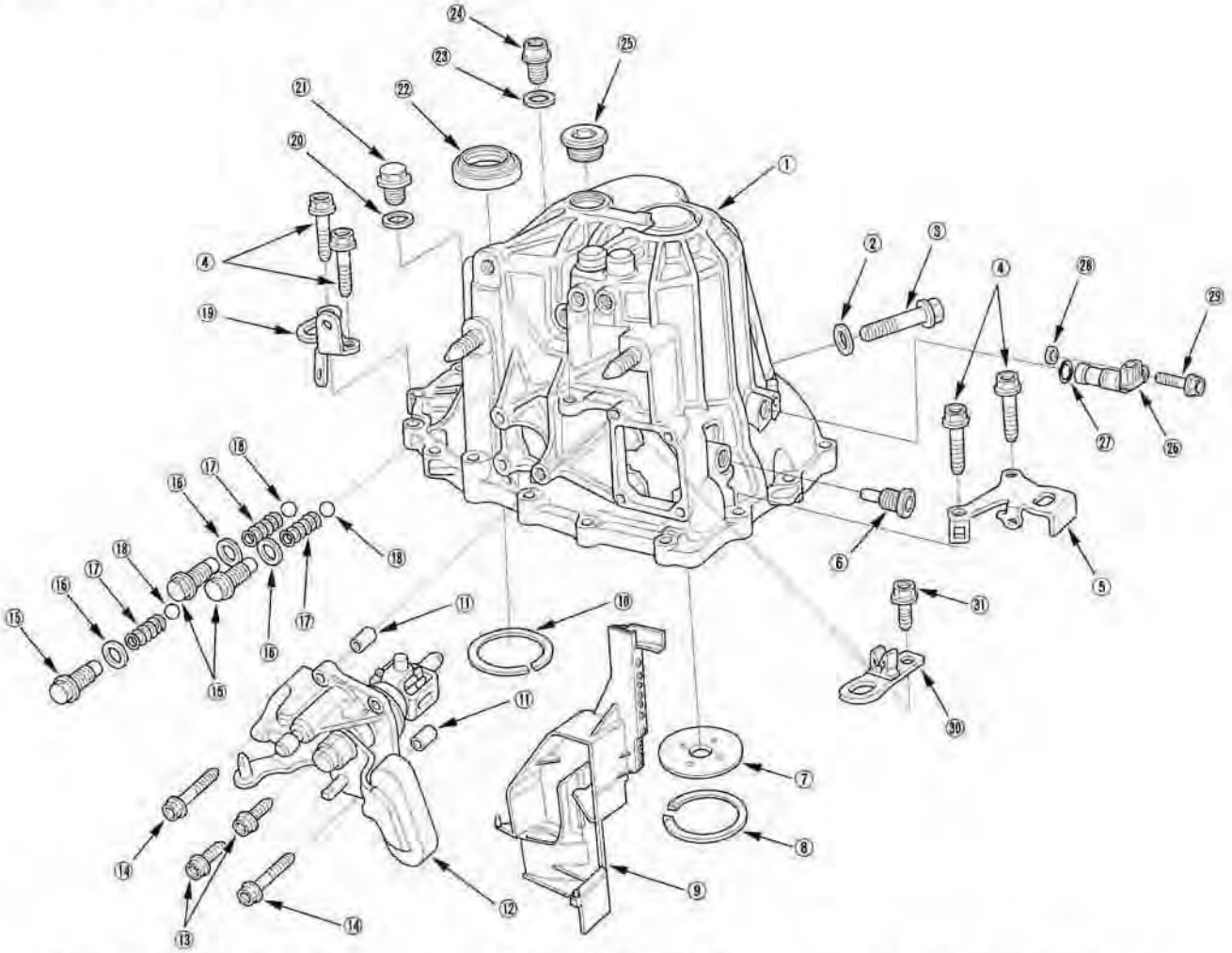


① DIFFERENTIAL ASSEMBLY
② 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
③ SIDE COVER
④ O-RING
Replace.
⑤ 10 x 20 mm DOWEL PIN
⑥ SHIFT FORK ASSEMBLY
⑦ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 9 lbf·ft)
⑧ BEARING SET PLATE
⑨ COUNTERSHAFT ASSEMBLY
⑩ NEEDLE BEARING
⑪ OIL GUIDE PLATE C
⑫ 14 x 20 mm DOWEL PIN
⑬ MAGNET
⑭ MAINSHAFT ASSEMBLY
⑮ 28 mm WASHER
⑯ 28 mm SPRING WASHER
⑰ BALL BEARING
⑱ 28 x 43 x 7 mm OIL SEAL
Replace.
⑲ REVERSE GEAR SHAFT
⑳ REVERSE IDLER GEAR
㉑ 6 mm SPECIAL BOLT
15 N·m (1.5 kgf·m, 11 lbf·ft)
㉒ REVERSE SHIFT FORK
㉓ REVERSE LOCK CAM
㉔ 35 x 58 x 8 mm OIL SEAL
Replace.
㉕ BACK-UP LIGHT SWITCH
29 N·m (3.0 kgf·m, 22 lbf·ft)
㉖ 20 mm BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
㉗ 20 mm WASHER
㉘ CLUTCH HOUSING

(cont'd)

Transmission Disassembly (cont'd)

Exploded View - Transmission Housing

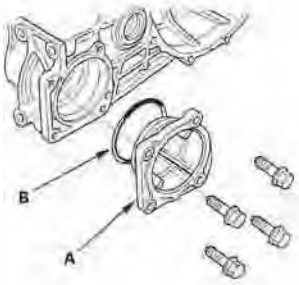


① TRANSMISSION HOUSING
② 10 mm WASHER
Replace.
③ 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)
④ 8 mm FLANGE BOLT
27 N·m (2.8 kgf·m, 20 lbf·ft)
⑤ TRANSMISSION HANGER A
⑥ INTERLOCK BOLT
39 N·m (4.0 kgf·m, 29 lbf·ft)
⑦ OIL GUIDE PLATE M
⑧ 72 mm SHIM
⑨ OIL GUTTER PLATE
⑩ 80 mm SHIM
⑪ 8 x 14 mm DOWEL PIN
⑫ CHANGE LEVER ASSEMBLY
⑬ 6 x 20 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
⑭ 6 x 30 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
⑮ DETENT BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)
⑯ 12 mm WASHER
Replace.
⑰ SPRING
⑱ STEEL BALL
⑲ TRANSMISSION HANGER B
⑳ 20 mm WASHER
Replace.
㉑ FILLER PLUG
44 N·m (4.5 kgf·m, 33 lbf·ft)
㉒ 40 x 56 x 8 mm OIL SEAL
Replace.
㉓ 14 mm WASHER
Replace.
㉔ DRAIN PLUG
39 N·m (4.0 kgf·m, 29 lbf·ft)
㉕ 32 mm SEALING CAP
34 N·m (3.5 kgf·m, 25 lbf·ft)
㉖ COUNTERSHAFT SPEED SENSOR
㉗ O-RING
Replace.
㉘ PLAIN WASHER
㉙ 6 mm FLANGE BOLT
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
㉚ TRANSMISSION HANGER
㉛ 10 mm FLANGE BOLT
44 N·m (4.5 kgf·m, 33 lbf·ft)

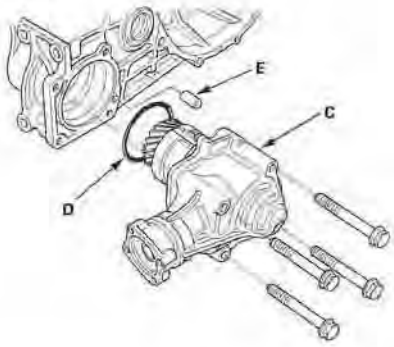
NOTE: Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

1. 2WD model: Remove the side cover (A) and O-ring (B).
   4WD model: Remove the transfer assembly (C), O-ring (D), and 10 x 20 mm dowel pin (E).

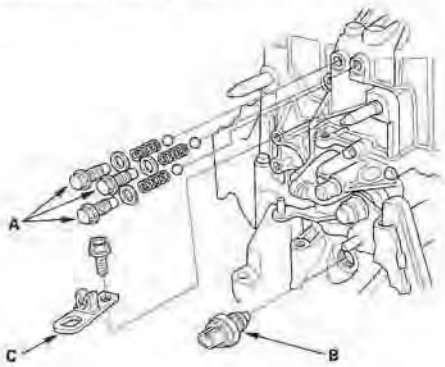
2WD Model:



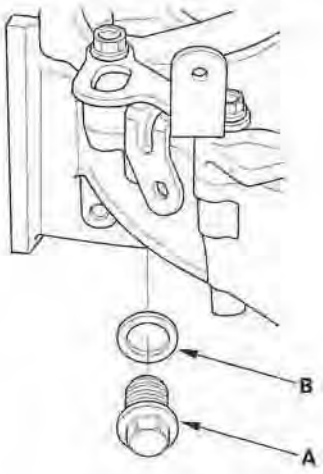
4WD Model:



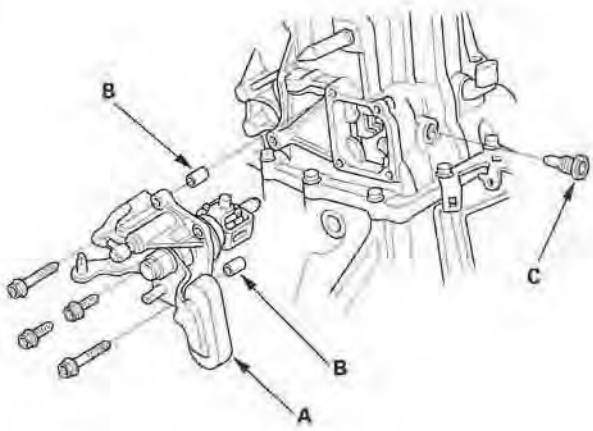
2. Remove the detent bolts (A), springs, steel balls and washers, the back-up light switch (B), and the transmission hanger (C).



3. Remove the 20 mm bolt (A) and 20 mm washer (B).



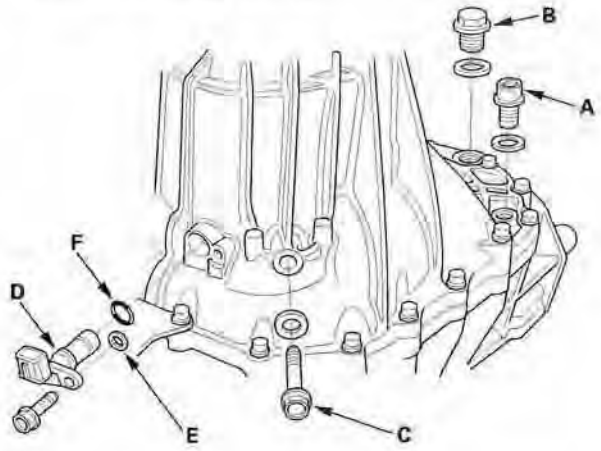
4. Remove the change lever assembly (A), the 8 x 14 mm dowel pins (B), and the interlock bolt (C).



(cont'd)

Transmission Disassembly (cont'd)

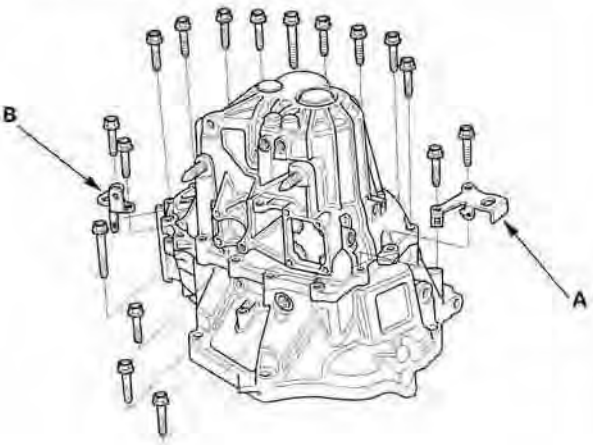
5. Remove the drain plug (A), the filler plug (B), and the 10 mm flange bolt (C).



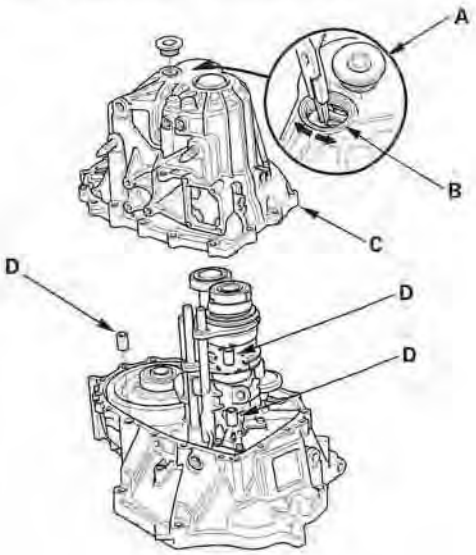
6. Remove the countershaft speed sensor (D), the plain washer (E), and the O-ring (F).

7. Remove the 8 mm flange bolts in a crisscross pattern in several steps.

8. Remove transmission hanger A and transmisson hanger B.



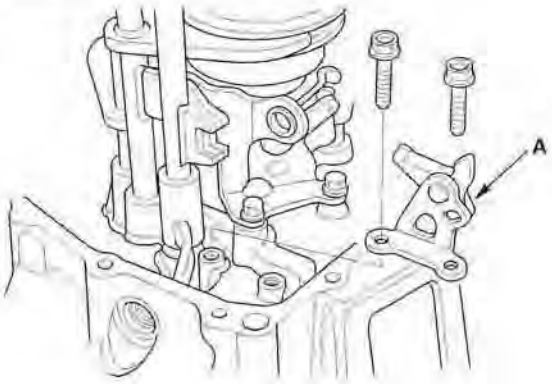
9. Remove the 32 mm sealing cap (A).



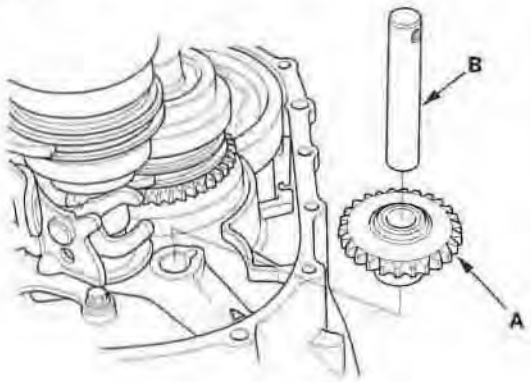
10. Expand the 72 mm snap ring (B) on the countershaft ball bearing, and remove it from the groove with snap ring pliers.

11. Remove the transmission housing (C) and 14 x 20 mm dowel pins (D).

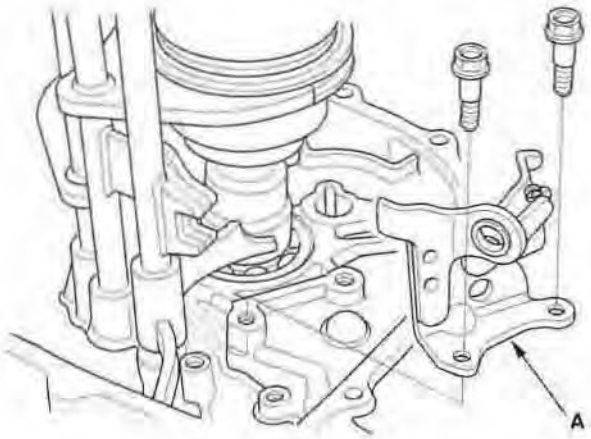
12. Remove the reverse lock cam (A).



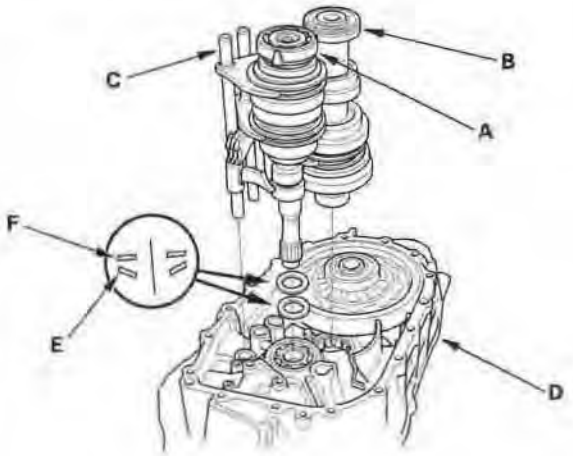
13. Remove the reverse idler gear (A) and reverse gear shaft (B).



14. Remove the reverse shift fork (A).



15. Apply tape to the mainshaft splines to protect the seal, then remove the mainshaft assembly (A) and countershaft assembly (B) with the shift forks (C) from the clutch housing (D).



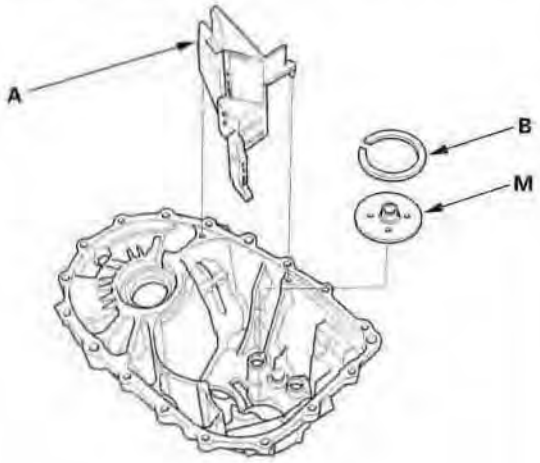
16. Remove the 28 mm spring washer (E) and 28 mm washer (F).

17. Remove the differential assembly (A) and magnet (B).

(cont'd)

Transmission Disassembly (cont'd)

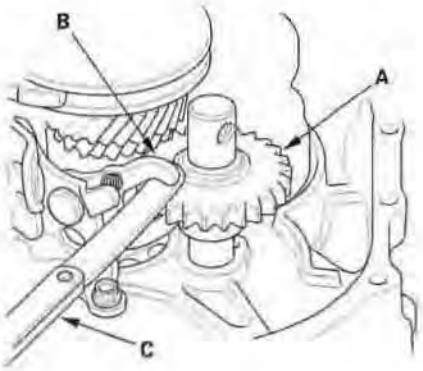
18. Remove the oil gutter plate (A), the 72 mm shim (B), and the oil guide plate M.



Reverse Shift Fork Clearance Inspection

1. Measure the clearance between the reverse idler gear (A) and the reverse shift fork (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

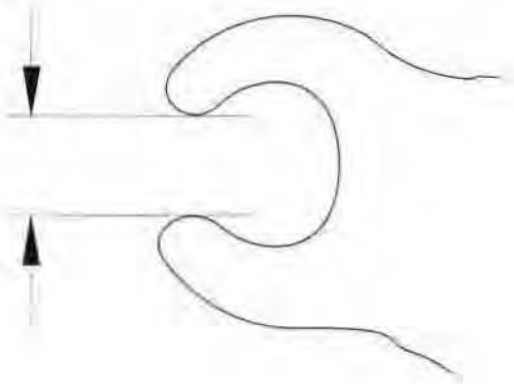
Standard: 0.20—0.59 mm (0.007—0.024 in.)
Service Limit: 1.2 mm (0.047 in.)



2. Measure the width of the reverse shift fork.

- If the width is not within the standard, replace the reverse shift fork.
- If the width is within the standard, replace the reverse gear.

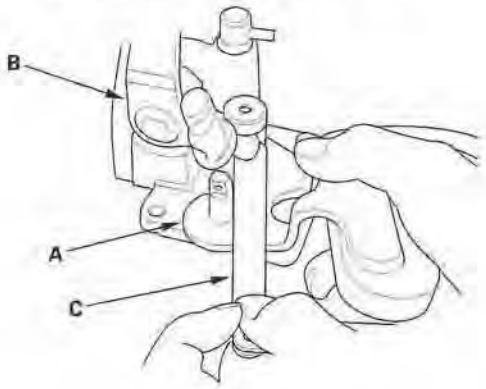
Standard: 13.4—13.7 mm (0.527—0.539 in.)



Change Lever Clearance Inspection

1. Measure the clearance between change lever (A) and the select lever (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

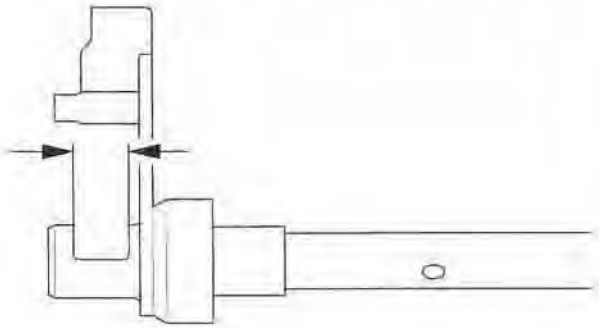
   Standard: 0.05—0.25 mm (0.002—0.010 in.)
   Service Limit: 0.5 mm (0.020 in.)



2. Measure the groove of the change lever.

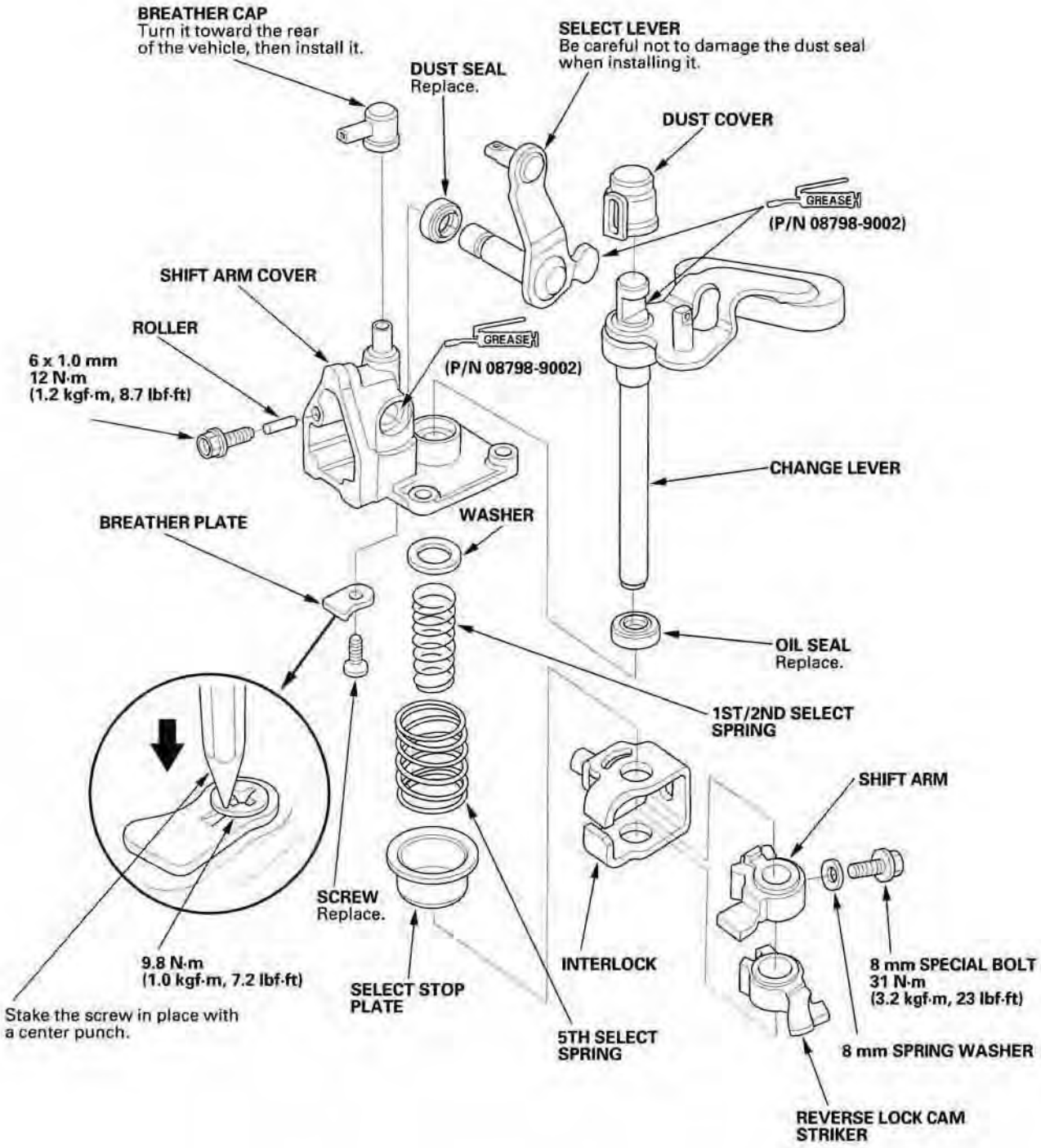
   - If the groove is not within the standard, replace the change lever.
   - If the groove is within the standard, replace the select lever.

   Standard: 15.00—15.10 mm (0.591—0.594 in.)



Change Lever Assembly Disassembly/Reassembly

Prior to reassembling, clean all parts in solvent, dry them, and apply grease to the contact surfaces as shown.

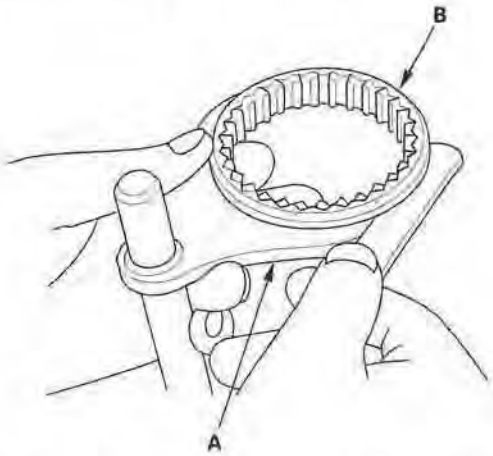


Shift Fork Clearance Inspection

NOTE: The synchro sleeve and synchro hub should be replaced as a set.

1. Measure the clearance between each shift fork (A) and its matching synchro sleeve (B). If the clearance exceeds the service limit, go to step 2.

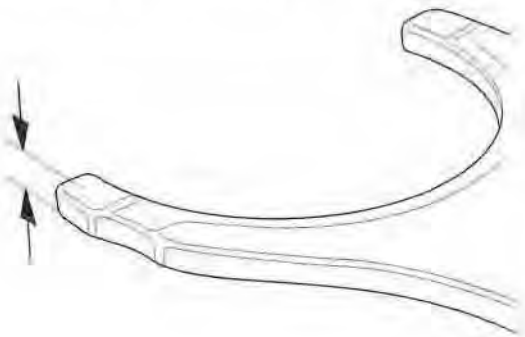
Standard: 0.35—0.65 mm (0.014—0.026 in.)
Service Limit: 1.0 mm (0.039 in.)



2. Measure the thickness of the shift fork fingers.

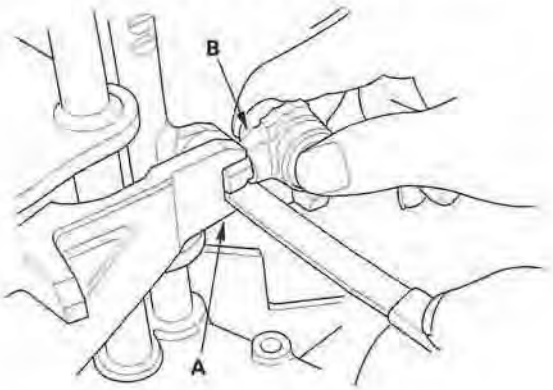
- If the thickness is not within the standard, replace the shift fork.
- If the thickness is within the standard, replace the synchro sleeve.

Standard: 7.4—7.6 mm (0.29—0.30 in.)



3. Measure the clearance between the shift fork (A) and the shift arm (B). If the clearance exceeds the service limit, go to step 4.

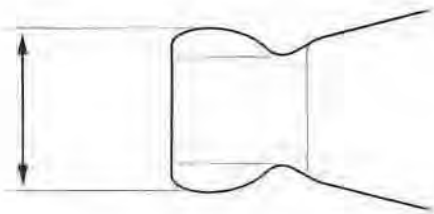
Standard: 0.2—0.5 mm (0.008—0.020 in.)
Service Limit: 0.6 mm (0.023 in.)



4. Measure the width of the shift arm.

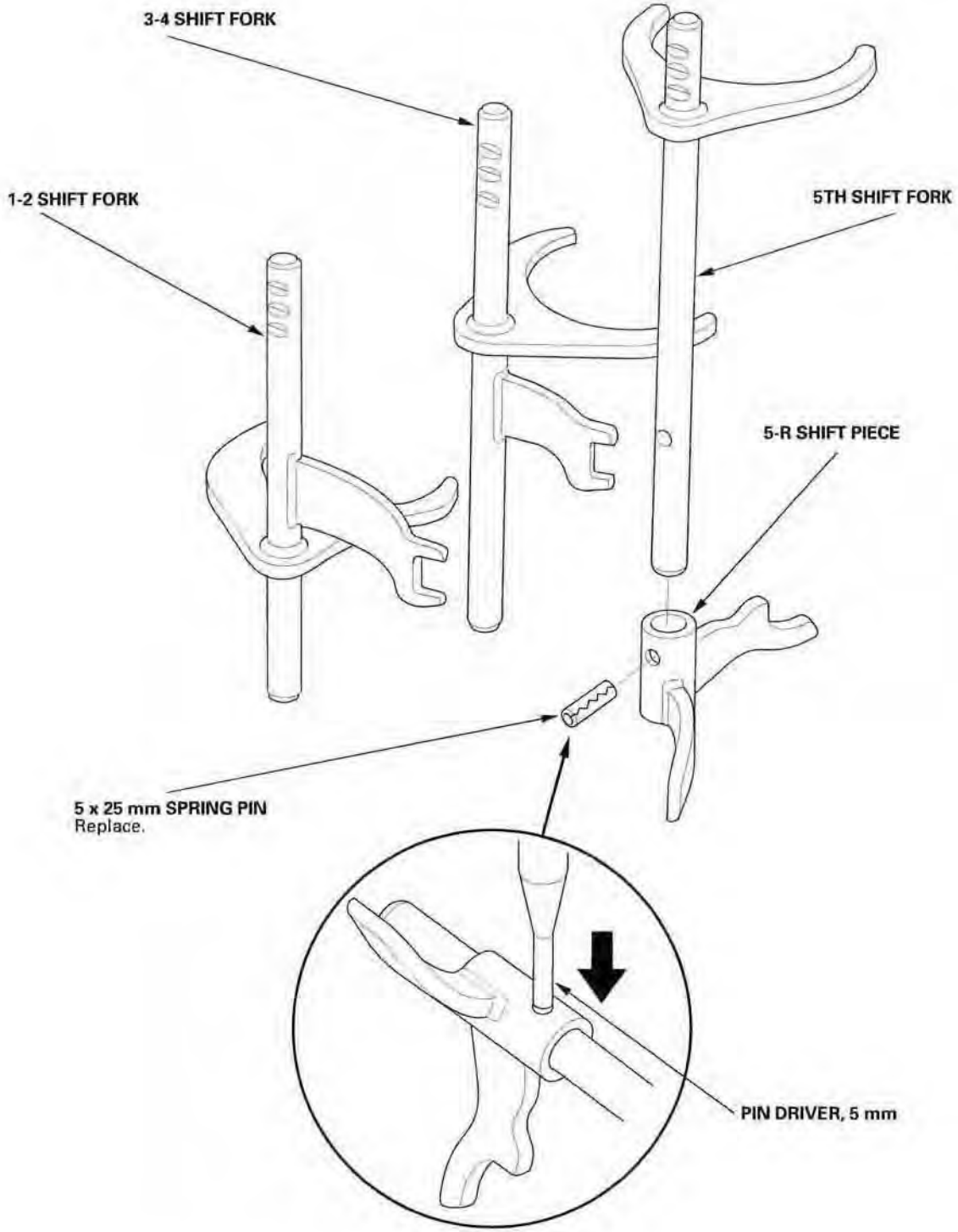
- If the width is not within the standard, replace the shift arm.
- If the width is within the standard, replace the shift fork or the shift piece.

Standard: 16.9—17.0 mm (0.665—0.669 in.)



Shift Fork Disassembly/Reassembly

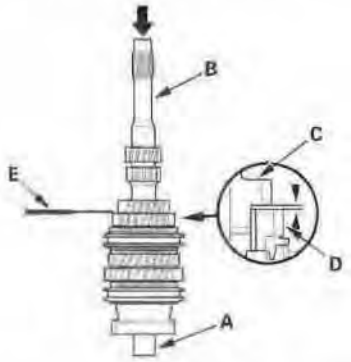
Prior to reassembling, clean all parts in solvent, dry them, and apply lubricant to all contact surfaces.



Mainshaft Assembly Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

1. Support the bearing inner race with an appropriate sized socket (A), and push down on the mainshaft (B).



2. Measure the clearance between 2nd gear (C) and 3rd gear (D) with a feeler gauge (E).

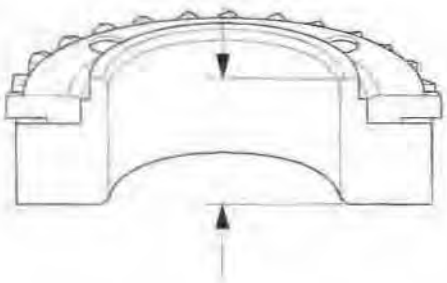
   - If the clearance is more than the service limit, go to step 3.
   - If the clearance is within the service limit, go to step 4.

   Standard: 0.06—0.16 mm (0.002—0.006 in.)
   Service Limit: 0.25 mm (0.010 in.)

3. Measure the thickness of 3rd gear.

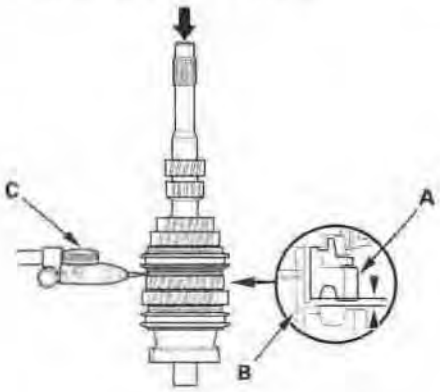
   - If the thickness is less than the service limit, replace 3rd gear.
   - If the thickness is within the service limit, replace the 3rd/4th synchro hub.

   Standard: 23.92—23.97 mm (0.941—0.944 in.)
   Service Limit: 23.80 mm (0.937 in.)



4. Measure the clearance between 4th gear (A) and the distance collar (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 5.

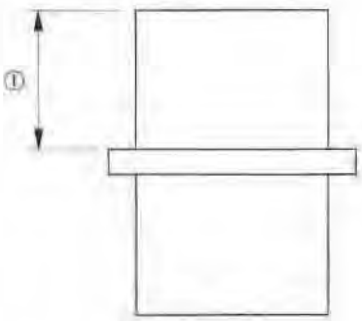
   Standard: 0.06—0.16 mm (0.002—0.006 in.)
   Service Limit: 0.25 mm (0.010 in.)



5. Measure distance ① on the distance collar.

   - If distance ① is not within the standard, replace the distance collar.
   - If distance ① is within the standard, go to step 6.

   Standard: 24.03—24.08 mm (0.946—0.948 in.)



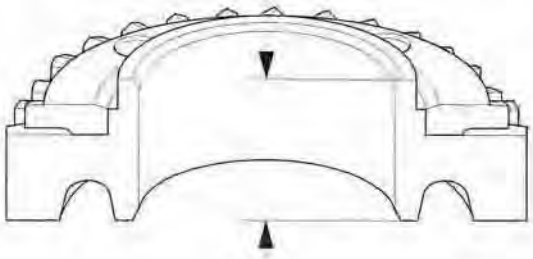
(cont'd)

Mainshaft Assembly Clearance Inspection (cont'd)

6. Measure the thickness of 4th gear.

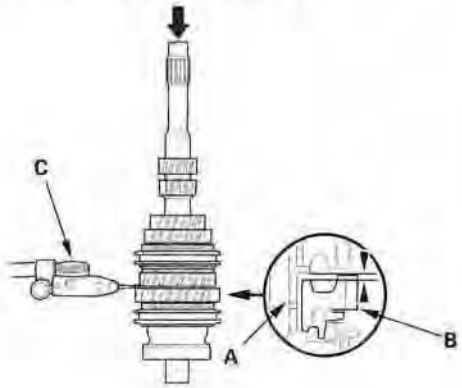
   - If the thickness is less than the service limit, replace 4th gear.
   - If the thicknes is within the service limit, replace the 3rd/4th synchro hub.

   Standard: 23.92—23.97 mm (0.941—0.944 in.)
   Service Limit: 23.80 mm (0.937 in.)



7. Measure the clearance between the distance collar (A) and 5th gear (B) with a dial indicator (C). If the clearance is more than the service limit, go to step 8.

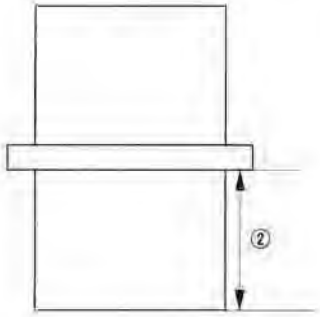
   Standard: 0.06—0.16 mm (0.002—0.006 in.)
   Service Limit: 0.25 mm (0.010 in.)



8. Measure distance ② on the distance collar.

   - If distance ② is not within the standard, replace the distance collar.
   - If distance ② is within the standard, go to step 9.

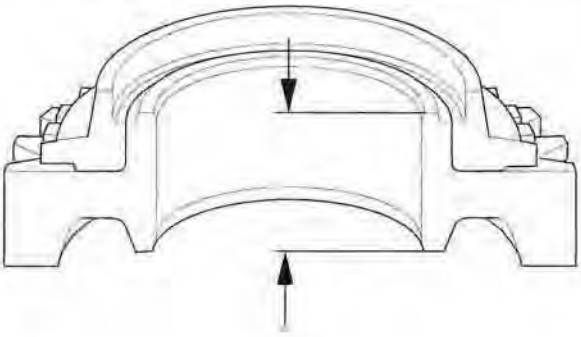
   Standard: 24.03—24.08 mm (0.946—0.948 in.)



9. Measure the thickness of 5th gear.

   - If the thickness is less than the service limit, replace 5th gear.
   - If the thickness is within the service limit, replace the 5th synchro hub.

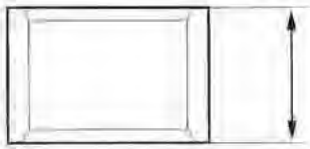
   Standard: 23.92—23.97 mm (0.941—0.944 in.)
   Service Limit: 23.80 mm (0.937 in.)



10. Measure the thickness of the MBS distance collar.

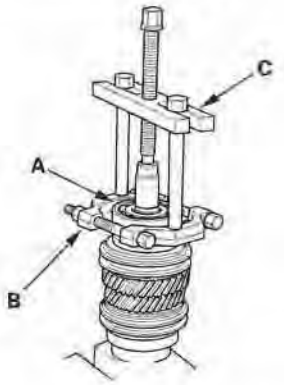
    If the thickness of is not within standard, replace the MBS distance collar.

    Standard: 23.95—24.05 mm (0.943—0.947 in.)

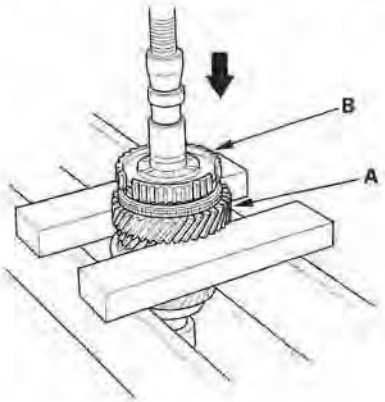


Mainshaft Disassembly

1. Remove the angular ball bearing (A) and the tapered cone ring using a commercially available bearing separator (B) and a commercially available bearing puller (C). Make sure the bearing separator is under the tapered cone ring.



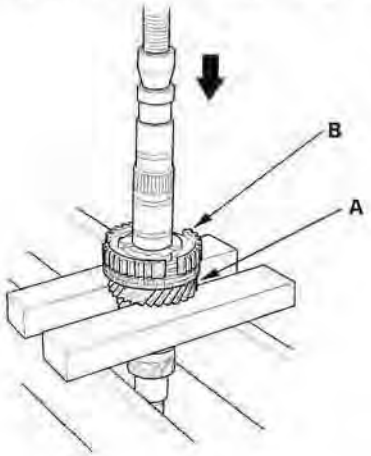
2. Support 5th gear (A) on steel blocks, and press the mainshaft out of the 5th synchro hub (B). Use of a jaw-type puller can damage the gear teeth.



(cont'd)

Mainshaft Disassembly (cont'd)

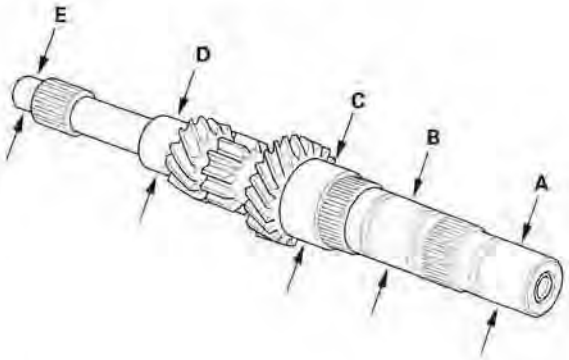
3. Support 3rd gear (A) on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub (B). Use of a jaw-type puller can damage the gear teeth.



Mainshaft Inspection

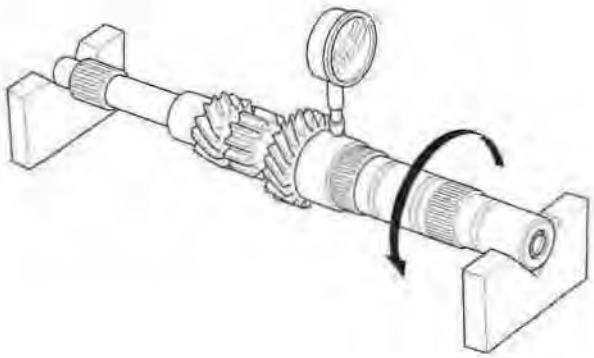
1. Inspect the gear and bearing surfaces for wear and damage, then measure the mainshaft at points A, B, C, D, and E. If any part of the mainshaft is less than the service limit, replace it.

Standard:
A Ball Bearing Surface (Transmission Housing Side):
27.987—28.000 mm (1.1019—1.1024 in.)
B Distance Collar Surface:
31.984—32.000 mm (1.2594—1.2598 in.)
C Needle Bearing Surface:
38.984—39.000 mm (1.5348—1.5354 in.)
D Ball Bearing Surface (Clutch Housing Side):
27.977—27.990 mm (1.1015—1.1020 in.)
E Bushing Surface:
20.80—20.85 mm (0.8189—0.8209 in.)
Service Limit:
A: 27.94 mm (1.100 in.)
B: 31.93 mm (1.257 in.)
C: 38.93 mm (1.533 in.)
D: 27.94 mm (1.100 in.)
E: 20.75 mm (0.817 in.)



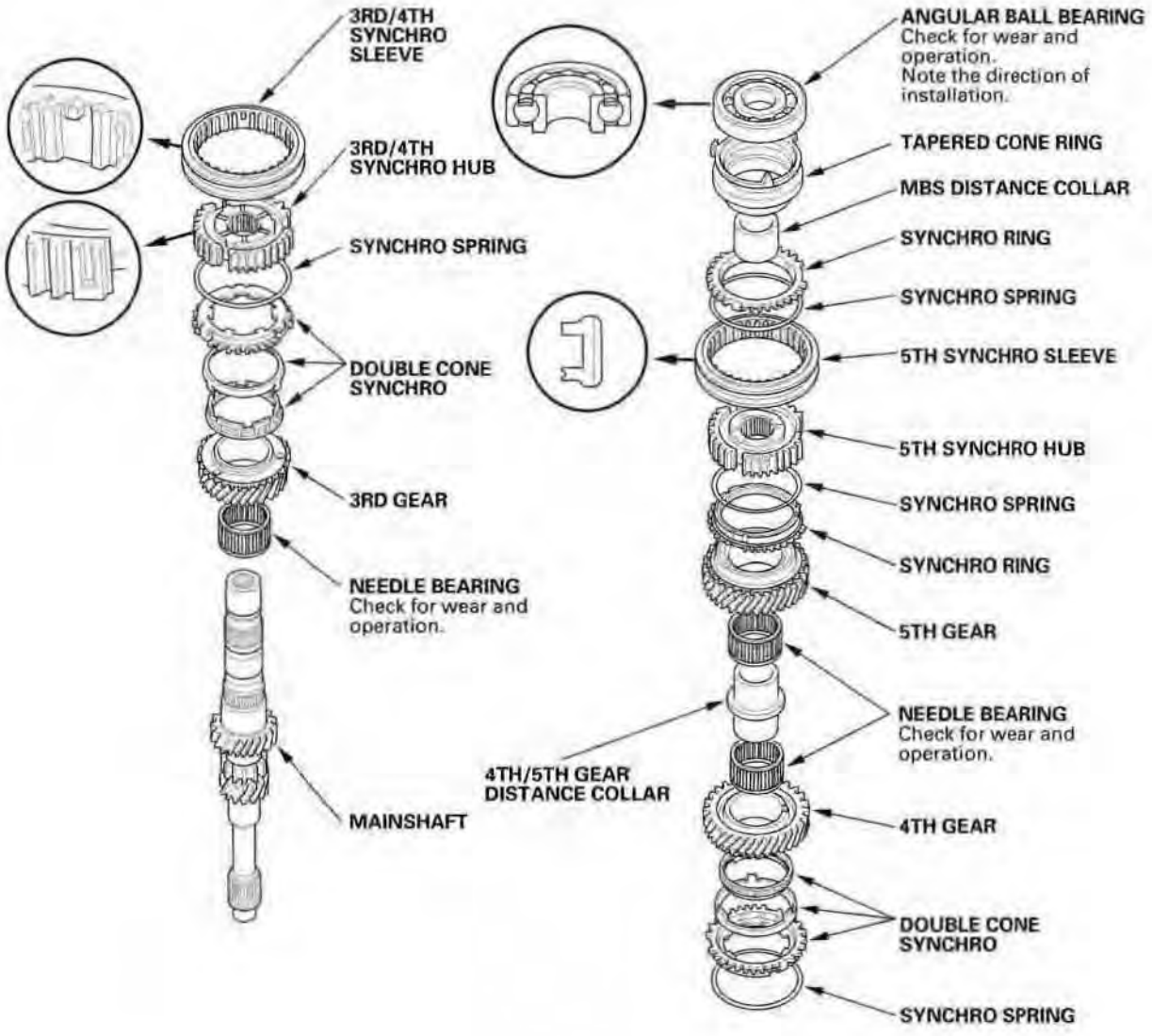
2. Inspect the runout by supporting both ends of the mainshaft. Then rotate the mainshaft two complete turns while measuring with a dial gauge. If the runout is more than the service limit, replace the mainshaft.

Standard: **0.02 mm (0.001 in.) max.**
Service Limit: **0.05 mm (0.002 in.)**



Mainshaft Reassembly

Exploded View



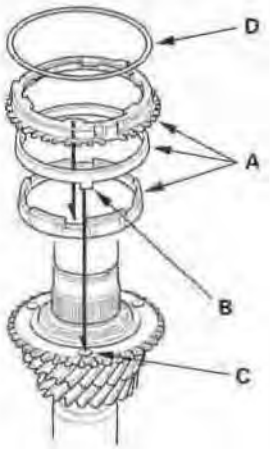
Special Tools Required
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 30 mm I.D. 07746-0030300

NOTE: Refer to the Exploded View as needed during this procedure.

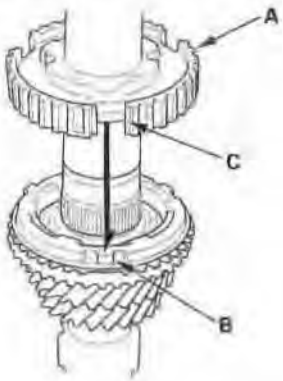
1. Clean all parts in solvent, dry them, and apply lubricant to all contact surfaces except the 3rd/4th and 5th synchro hubs.

2. Install the needle bearing and 3rd gear on the mainshaft.

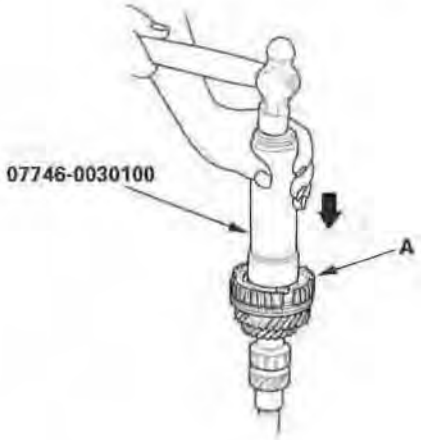
3. Install the double cone synchro assembly (A) by aligning the synchro cone fingers (B) with the holes in 3rd gear (C), then install the synchro spring (D).



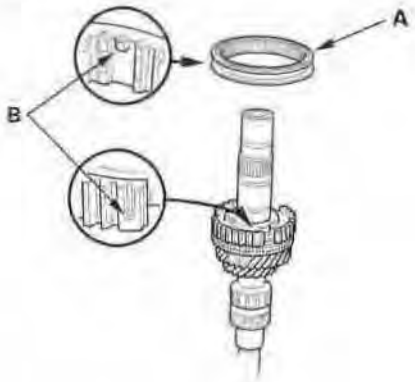
4. Install the 3rd/4th synchro hub (A) by aligning the synchro cone fingers (B) with the grooves in the 3rd/4th synchro hub (C).



5. Install the 3rd/4th synchro hub (A) using the special tool.



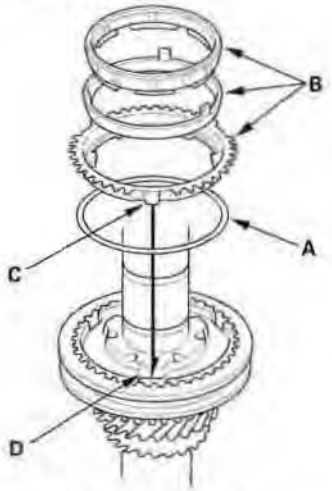
6. Install the 3rd/4th synchro sleeve (A) by aligning the stops (B) with the 3rd/4th synchro sleeve and hub. After installing, check the operation of the 3rd/4th synchro hub set.



(cont'd)

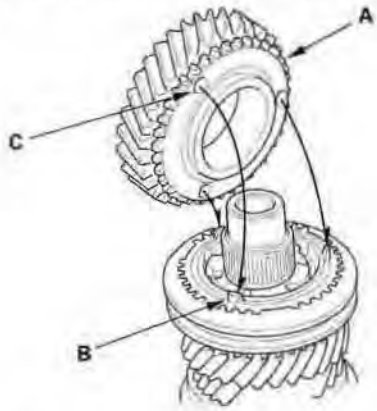
Mainshaft Reassembly (cont'd)

7. Install the synchro spring (A).



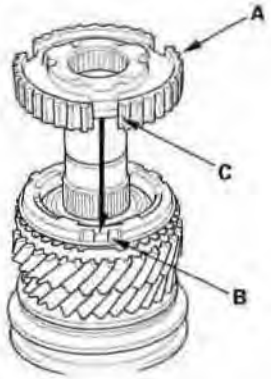
8. Install the double cone synchro assembly (B) by aligning the synchro cone fingers (C) with the grooves in the 3rd/4th synchro hub (D).

9. Install 4th gear (A) by aligning the synchro cone fingers (B) with holes in 4th gear (C).

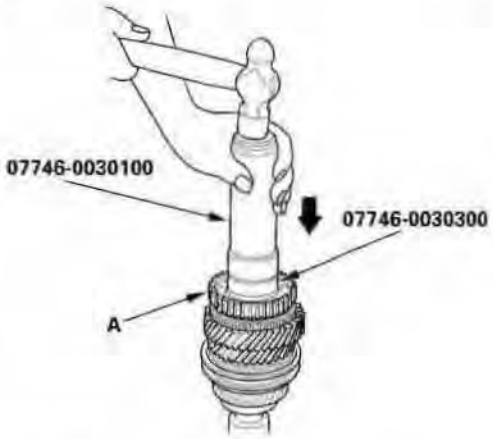


10. Install the needle bearings, distance collar, 5th gear, and 5th gear synchro spring and ring.

11. Install the 5th synchro hub (A) by aligning the synchro cone fingers (B) with the grooves in the 5th synchro hub (C).

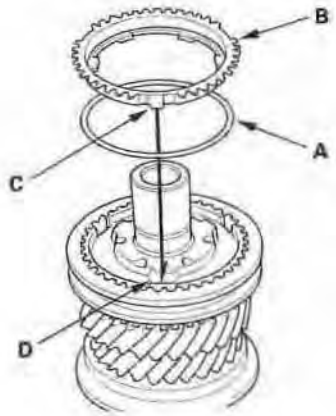


12. Install the 5th synchro hub (A) using the special tools.



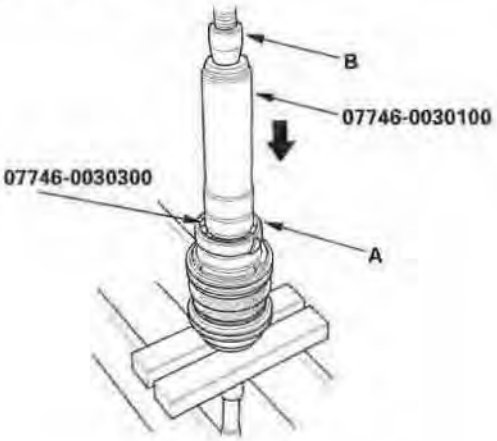
13. Install the 5th synchro sleeve.

14. Install the synchro spring (A).



15. Install the synchro ring (B) by aligning the synchro cone fingers (C) with the grooves in the 5th synchro hub (D).

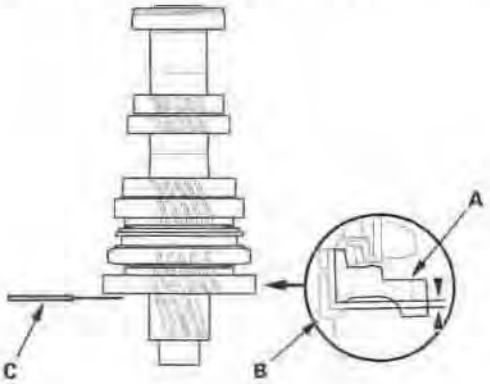
16. Install the new ball bearing (A) using the special tools and a press (B).



Countershaft Assembly Clearance Inspection

1. Measure the clearance between 1st gear (A) and the distance collar (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 2.

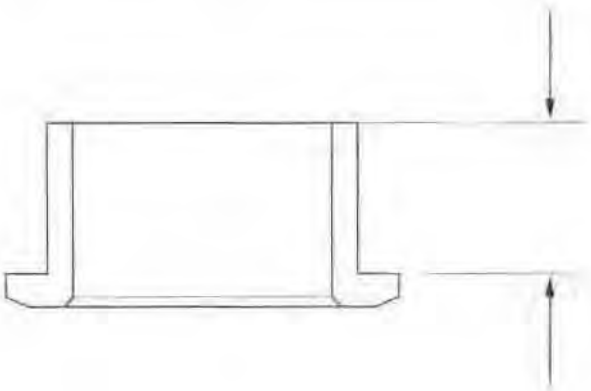
Standard: 0.06—0.16 mm (0.002—0.006 in.)
Service Limit: 0.25 mm (0.010 in.)



2. Measure the thickness of the distance collar.

- If the thickness is not within the standard, replace the distance collar.
- If the thickness is within the standard, go to step 3.

Standard: 23.03—23.08 mm (0.907—0.909 in.)



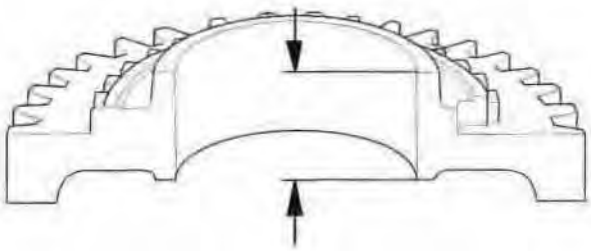
(cont'd)

Countershaft Assembly Clearance Inspection (cont'd)

3. Measure the thickness of 1st gear.

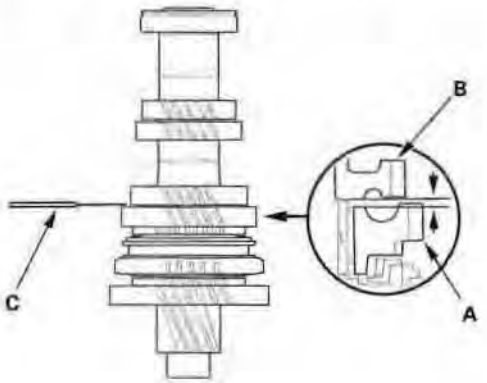
   - If the thickness is less than the service limit, replace 1st gear.
   - If the thickness is within the service limit, replace the 1st/2nd synchro hub.

   Standard: 22.92—22.97 mm (0.902—0.904 in.)
   Service Limit: 22.87 mm (0.900 in.)



4. Measure the clearance between 2nd gear (A) and 3rd gear (B) with a feeler gauge (C). If the clearance is more than the service limit, go to step 5.

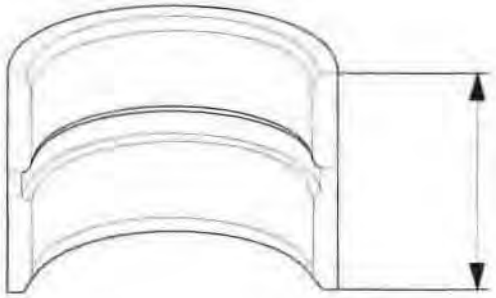
   Standard: 0.06—0.16 mm (0.002—0.006 in.)
   Service Limit: 0.25 mm (0.010 in.)



5. Measure the thickness of the distance collar.

   - If the thickness is not within the standard, replace the distance collar.
   - If the thickness is within the standard, go to step 6.

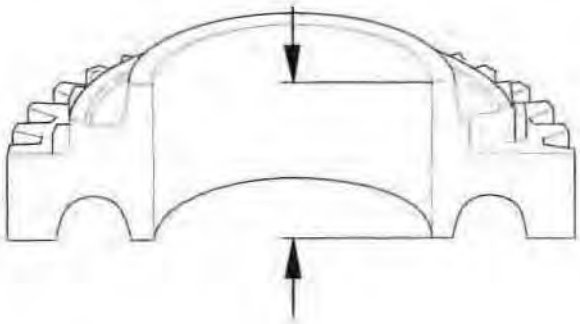
   Standard: 28.03—28.08 mm (1.104—1.106 in.)



6. Measure the thickness of 2nd gear.

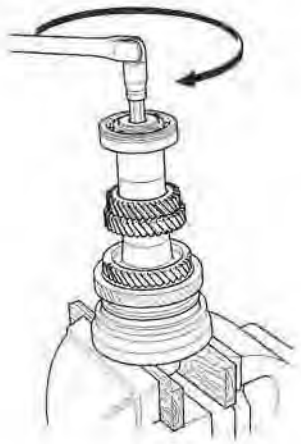
   - If the thickness is less than the service limit, replace 2nd gear.
   - If the thickness is within the service limit, replace the 1st/2nd synchro hub.

   Standard: 27.92—27.97 mm (1.099—1.101 in.)
   Service Limit: 27.87 mm (1.097 in.)



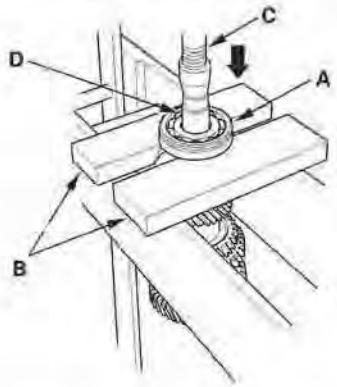
Countershaft Disassembly

1. Securely clamp the countershaft assembly in a bench vise with wood blocks.



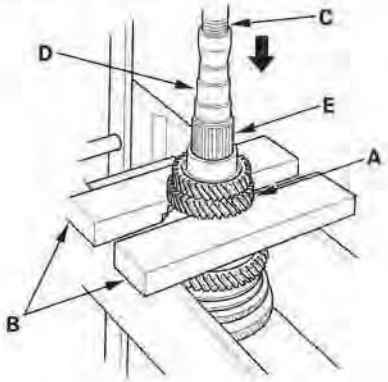
2. Remove the special bolt (left-hand threads).

3. Support the ball bearing (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft out of the ball bearing.

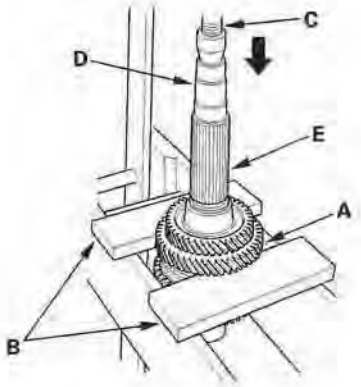


4. Remove the 35 mm shim and distance collar.

5. Support 4th gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of 5th gear.



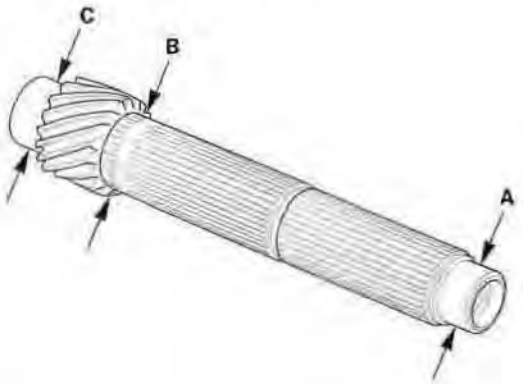
6. Support 2nd gear (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of 3rd gear.



Countershaft Inspection

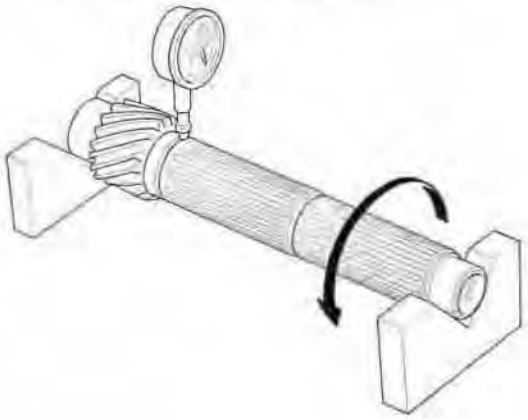
1. Inspect the gear and bearing surfaces for wear and damage, then measure the countershaft at points A, B, and C. If any part of the countershaft is less than the service limit, replace it.

Standard:
A Ball Bearing Surface (Transmission Housing Side):
30.020–30.033 mm (1.1819–1.1824 in.)
B Distance Collar Surface:
39.937–39.950 mm (1.5723–1.5728 in.)
C Needle Bearing Surface (Clutch Housing Side):
35.000–35.015 mm (1.3780–1.3785 in.)
Service Limit:
A: 29.97 mm (1.180 in.)
B: 39.88 mm (1.570 in.)
C: 34.95 mm (1.376 in.)



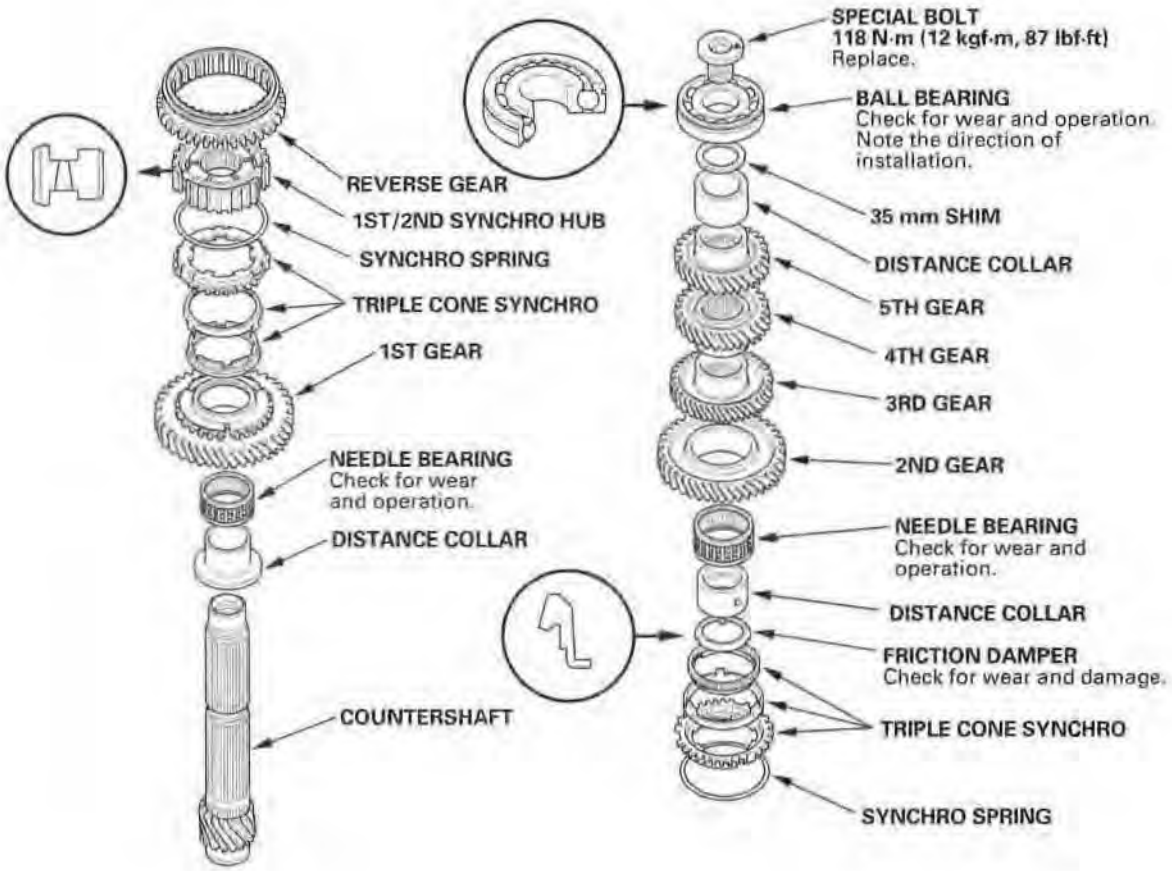
2. Inspect the runout by supporting both ends of the countershaft. Then rotate the countershaft two complete turns while measuring with a dial gauge. If the runout exceeds the service limit, replace the countershaft.

Standard: 0.02 mm (0.001 in.) max.
Service Limit: 0.05 mm (0.002 in.)



Countershaft Reassembly

Exploded View



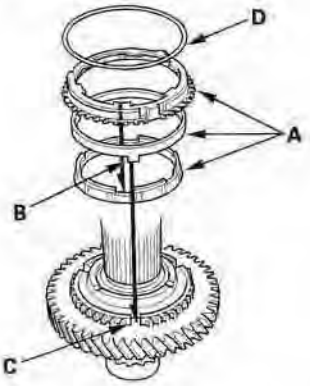
(cont'd)

Countershaft Reassembly (cont'd)

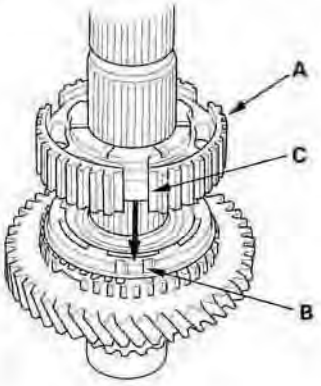
Special Tools Required
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 30 mm 07746-0030300

NOTE: Refer to the Exploded View as needed during this procedure.

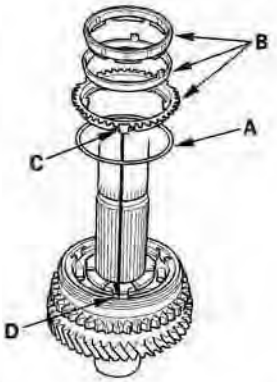
1. Clean all parts in solvent, dry them, and apply lubricant to all contact surfaces.
2. Install the distance collar and needle bearing onto the countershaft.
3. Install the triple cone synchro assembly (A) by aligning the synchro cone fingers (B) with the grooves in 1st gear (C), then install the synchro spring (D).



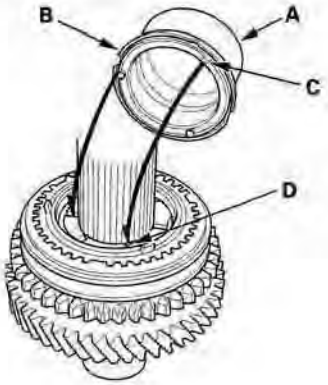
4. Install the 1st/2nd synchro hub (A) by aligning the synchro cone fingers (B) with the grooves in the 1st/2nd synchro hub (C).



5. Install the reverse gear.
6. Install the synchro spring (A).

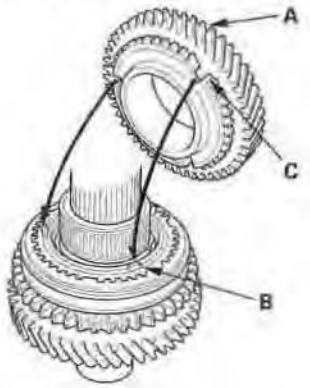


7. Install the triple cone synchro assembly (B) by aligning the synchro cone fingers (C) with the grooves in the 1st/2nd synchro hub (D).
8. Install the distance collar (A) and friction damper (B) by aligning the friction damper fingers (C) with the grooves in the 1st/2nd synchro hub (D).

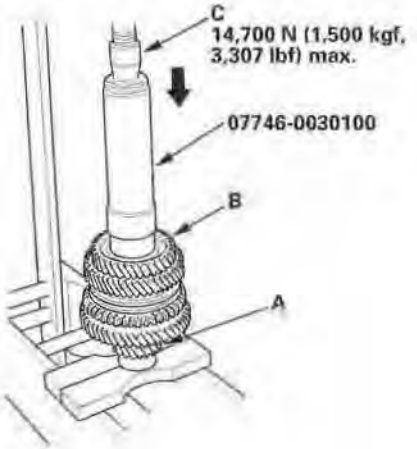


9. Install the needle bearing.

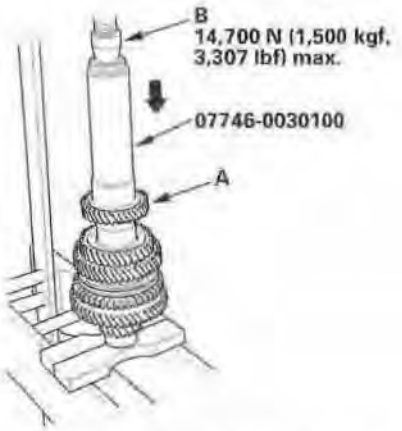
10. Install 2nd gear (A) by aligning the synchro cone fingers (B) with the grooves in 2nd gear (C).



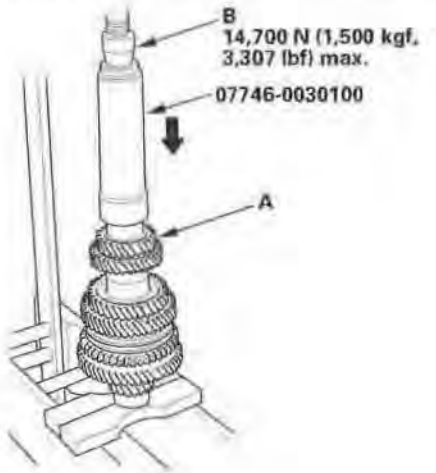
11. Support the countershaft (A) on steel blocks, then install 3rd gear (B) using the special tool and a press (C). Do not exceed the maximum pressure.



12. Install 4th gear (A) using the special tool and a press (B). Do not exceed the maximum pressure.



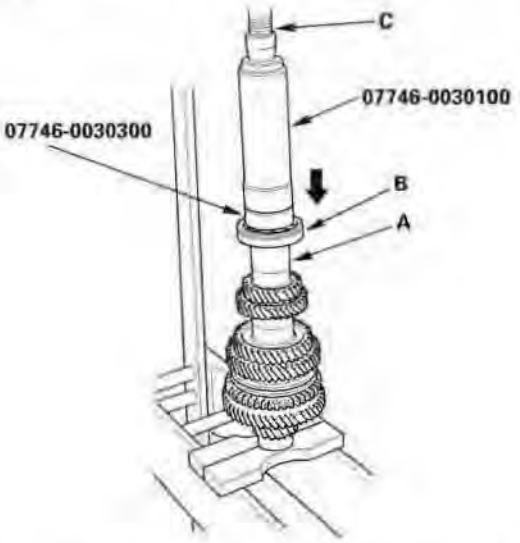
13. Install 5th gear (A) using the special tool and a press (B). Do not exceed the maximum pressure.



(cont'd)

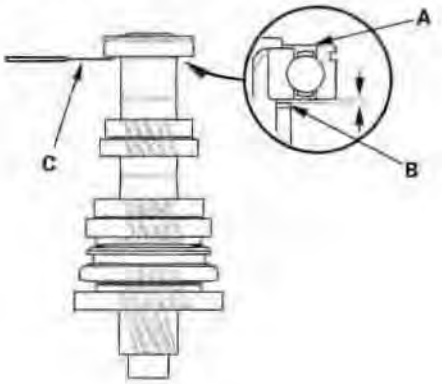
Countershaft Reassembly (cont'd)

14. Install the distance collar (A), 35 mm shim, and old ball bearing (B) using the special tools and a press (C).



15. Measure the clearance between the old bearing (A) and the 35 mm shim (B) with a feeler gauge (C).

Standard: 0.04—0.10 mm (0.0016—0.0039 in.)

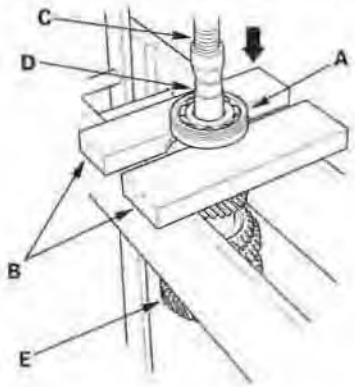


16. If the clearance is more than the standard, select a new shim from the following table. If the clearance measured in step 15 is within the standard, replace only the ball bearing.

35 mm Shim

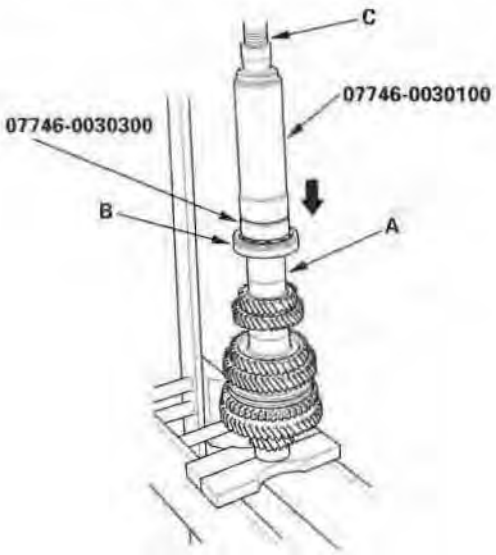
	Part Number	Thickness
A	23981-PPP-000	0.87 mm (0.034 in.)
AA	23981-PPP-900	0.91 mm (0.036 in.)
B	23982-PPP-000	0.95 mm (0.037 in.)
AB	23982-PPP-900	0.99 mm (0.039 in.)
C	23983-PPP-000	1.03 mm (0.041 in.)
AC	23983-PPP-900	1.07 mm (0.042 in.)
D	23984-PPP-000	1.11 mm (0.044 in.)
AD	23984-PPP-900	1.15 mm (0.045 in.)
E	23985-PPP-000	1.19 mm (0.047 in.)
AE	23985-PPP-900	1.23 mm (0.048 in.)
F	23986-PPP-000	1.27 mm (0.050 in.)
AF	23986-PPP-900	1.31 mm (0.052 in.)
G	23987-PPP-000	1.35 mm (0.053 in.)
AG	23987-PPP-900	1.39 mm (0.055 in.)
H	23988-PPP-000	1.43 mm (0.056 in.)
AH	23988-PPP-900	1.47 mm (0.058 in.)
J	23989-PPP-000	1.51 mm (0.060 in.)
AJ	23989-PPP-900	1.55 mm (0.061 in.)
K	23990-PPP-000	1.59 mm (0.063 in.)
AK	23990-PPP-900	1.63 mm (0.064 in.)
L	23991-PPP-000	1.67 mm (0.066 in.)
AL	23991-PPP-900	1.71 mm (0.067 in.)
M	23992-PPP-000	1.75 mm (0.069 in.)
AM	23992-PPP-900	1.79 mm (0.070 in.)
N	23993-PPP-000	1.83 mm (0.072 in.)
AN	23993-PPP-900	1.87 mm (0.074 in.)
P	23994-PPP-000	1.91 mm (0.075 in.)
AP	23994-PPP-900	1.95 mm (0.077 in.)
Q	23995-PPP-000	1.99 mm (0.078 in.)

17. Support the ball bearing (A) on steel blocks (B), then use a press (C) and an attachment (D) to press the countershaft (E) out of the ball bearing.

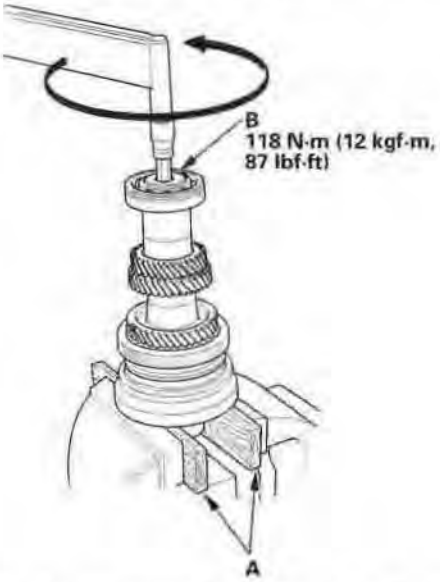


18. If necessary, install the 35 mm shim selected in step 16, then recheck the clearance.

19. Install the distance collar (A), 35 mm shim, and new ball bearing (B) using the special tools and a press (C).



20. Securely clamp the countershaft assembly in a bench vise with wood blocks (A).

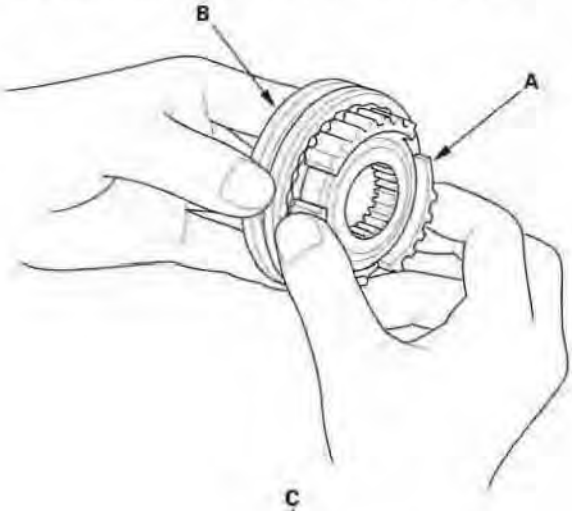


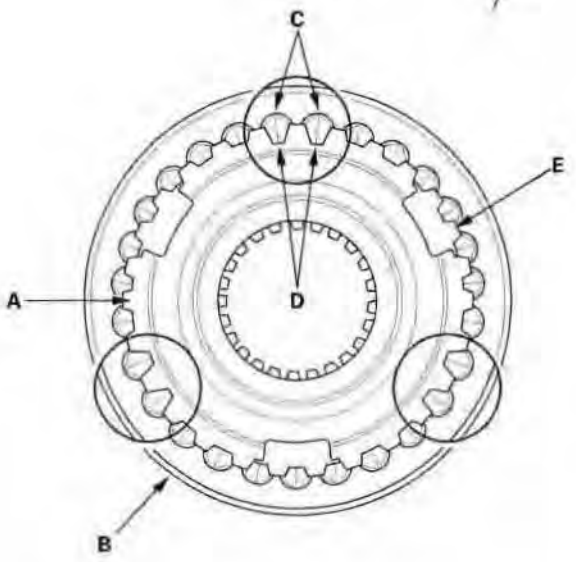
21. Tighten the new special bolt (B) (left-hand threads).

Synchro Sleeve and Hub Inspection and Reassembly

1. Inspect gear teeth on all synchro hubs and synchro sleeves for wear (rounded off corners).
2. Install each synchro hub (A) in its mating synchro sleeve (B), and check for free movement. Make sure you match the three sets of longer teeth (C) (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves (D) in the synchro hub. Do not install the synchro sleeve with its longer teeth in the 1st/2nd synchro hub slots (E) because it will damage the spring ring.

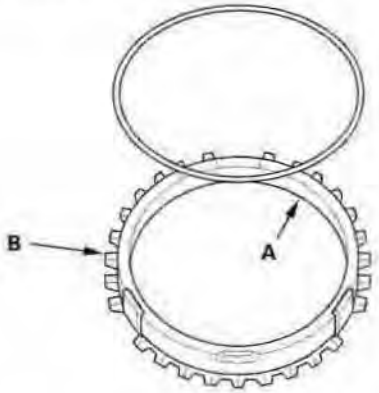
   NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.





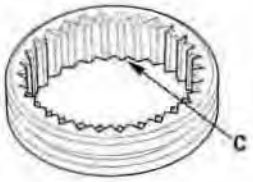
Synchro Ring and Gear Inspection

1. Inspect the inside of each synchro ring (A) for wear. Inspect the teeth (B) on each synchro ring for wear (rounded off).

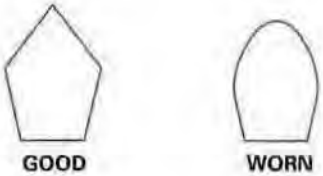


Example of synchro ring teeth

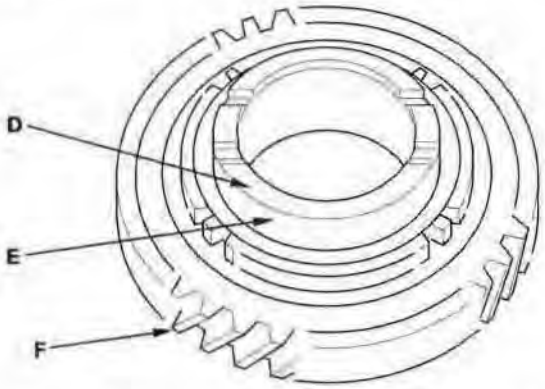
2. Inspect the teeth (C) on each synchro sleeve and matching teeth on each gear for wear (rounded off).



Example of synchro sleeve teeth and gear teeth



3. Inspect the thrust surface (D) on each gear hub for wear.



4. Inspect the cone surface (E) on each gear hub for wear and roughness.

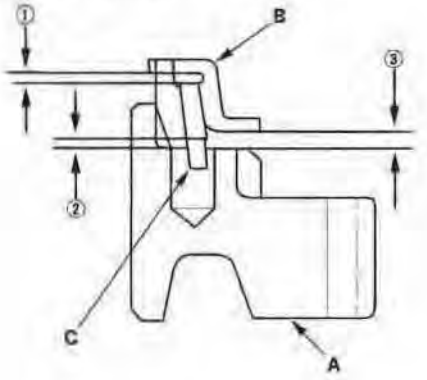
5. Inspect the teeth on all gears (F) for uneven wear, scoring, galling, and cracks.

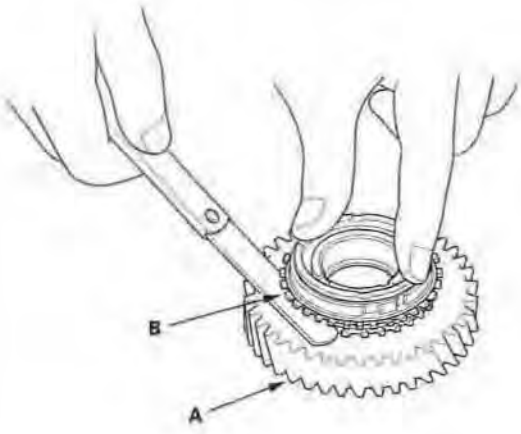
6. Coat the cone surface of each gear (E) with oil, and place its synchro ring on it. Rotate the synchro ring, making sure that it does not slip.

7. Measure the clearance between each gear (A) and its synchro ring (B) all around the gear. Hold the synchro ring against the gear evenly while measuring the clearance. If the clearance is less than the service limit, replace the synchro ring and gear.

Synchro Ring-to-Gear Clearance
Standard: 0.70—1.49 mm (0.028—0.059 in.)
Service Limit: 0.4 mm (0.016 in.)

Double Cone Synchro and Triple Cone Synchro-to-Gear Clearance
Standard:
①: Outer Synchro Ring (B) to Synchro Cone (C) 0.70—1.19 mm (0.028—0.047 in.)
②: Synchro Cone (C) to Gear (A) 0.50—1.04 mm (0.020—0.041 in.)
③: Outer Synchro Ring (B) to Gear (A) 0.95—1.68 mm (0.037—0.066 in.)
Service Limit:
①: 0.3 mm (0.012 in.)
②: 0.3 mm (0.012 in.)
③: 0.6 mm (0.024 in.)



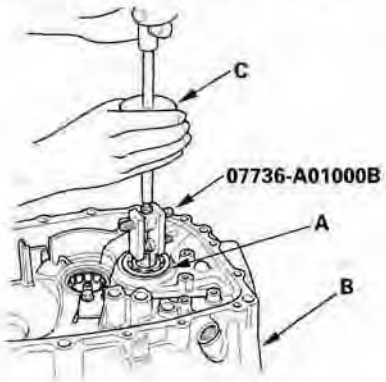


Mainshaft Bearing and Oil Seal Replacement

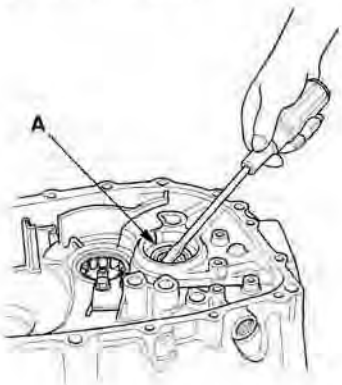
Special Tools Required
- Oil seal driver 07JAD-PL90100
- Adjustable bearing puller, 20—40 mm 07736-A01000B
- Attachment, 42 x 47 mm 07746-0010300
- Driver 07749-0010000
- Slide hammer, commercially available

1. Remove the differential assembly.

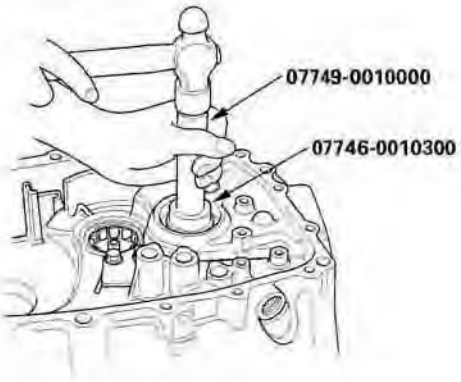
2. Remove the ball bearing (A) from the clutch housing (B) using the special tool and a commercially available 3/8 "-16 " slide hammer (C).



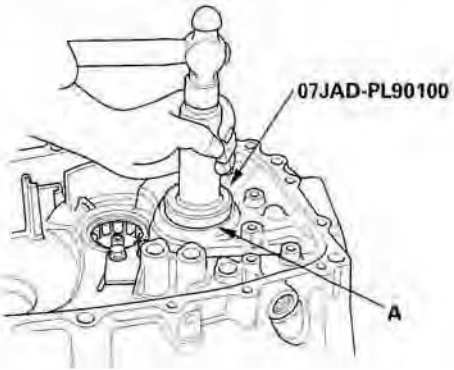
3. Remove the oil seal (A) from the clutch side. Be careful when removing the seal so the clutch housing is not damaged.



4. Drive in the new oil seal from the transmission side using the special tools.



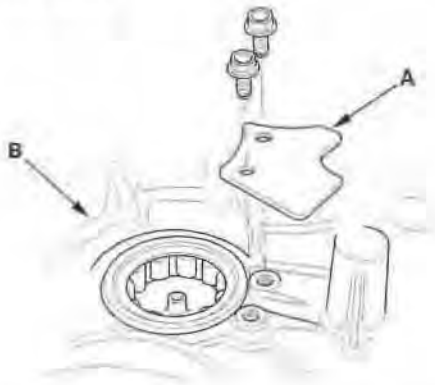
5. Drive in the new ball bearing (A) from the transmission side using the special tool.



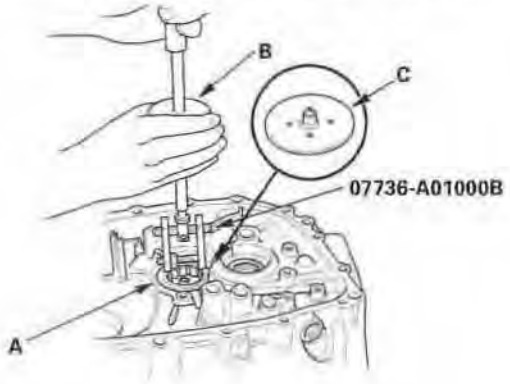
Countershaft Bearing Replacement

Special Tools Required
- Oil seal driver 07JAD-PL90100
- Adjustable bearing puller, 20—40 mm 07736-A01000B
- Slide hammer, commercially available

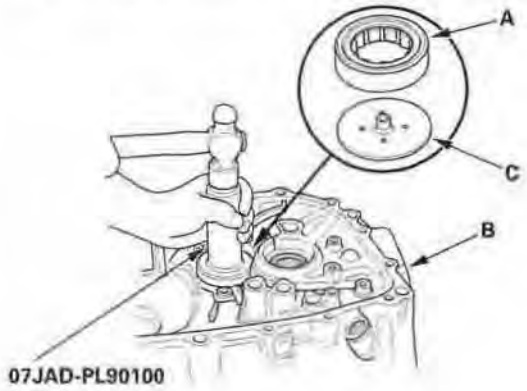
1. Remove the bearing set plate (A) from the clutch housing (B).



2. Remove the needle bearing (A) using the special tool and a commercially available 3/8 "-16 " slide hammer (B), then remove the oil guide plate C.

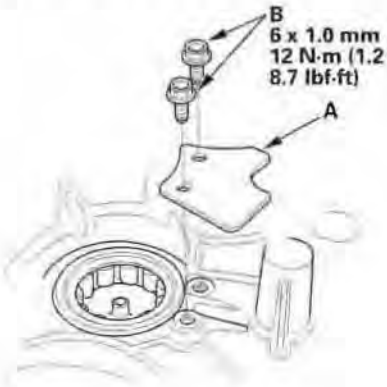


3. Position the oil guide plate C and new needle bearing (A) in the bore of the clutch housing (B).



4. Install the needle bearing using the special tool.

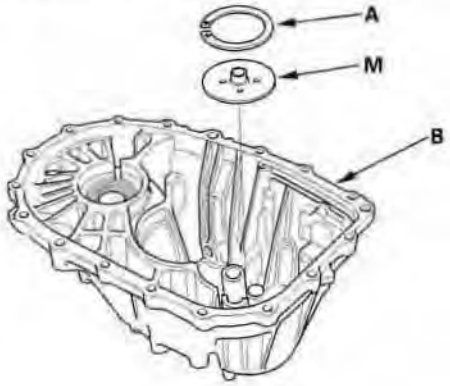
5. Install the bearing set plate (A) with bolts (B).



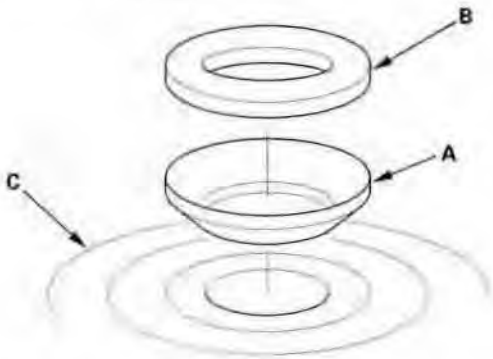
Mainshaft Thrust Clearance Adjustment

Special Tools Required
- Mainshaft base 07GAJ-PG20130
- Mainshaft holder 07GAJ-PG20110

1. Remove the 72 mm shim (A) and oil guide plate M from the transmission housing (B).



2. Throughly clean the spring washer (A) and washer (B) before installing them on the clutch housing side ball bearing (C). Note the installation direction of the spring washer.



3. Install the 3rd/4th synchro hub, the distance collar, the 5th synchro hub, the distance collar, and the ball bearing on the mainshaft.

   NOTE: Refer to the mainshaft reassembly Exploded View (see page 13-30).

4. Install the mainshaft in the clutch housing.

5. Place the transmission housing over the mainshaft and onto the clutch housing.

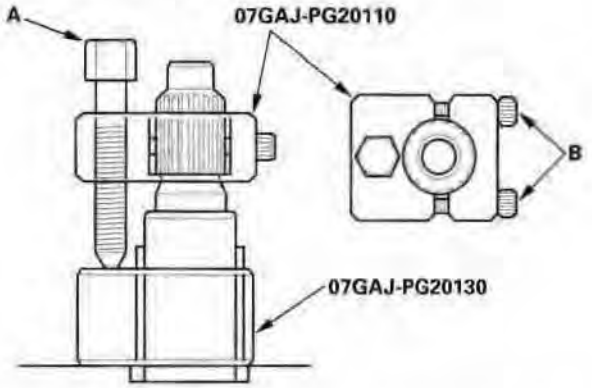
6. Secure the clutch and transmission housings with several 8 mm bolts.

   NOTE: It is not necessary to use sealing agent between the housing for this procedure.

7. Light tap on the mainshaft with a plastic hammer.

8. Attach the special tools to the mainshaft as follows:

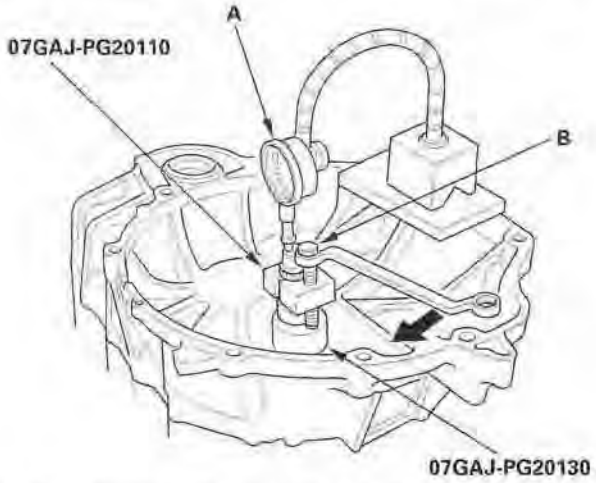
   - Back-out the mainshaft holder bolt (A), and loosen the two hex bolts (B).
   - Fit the holder over the mainshaft so its lip is towards the transmission.
   - Align the mainshaft holder lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



9. Seat the mainshaft fully by tapping its end with a plastic hammer.

10. Thread in the mainshaft holder bolt until it just contacts the wide surface of the mainshaft base.

11. Zero a dial gauge (A) on the end of the mainshaft.



12. Turn the mainshaft holder bolt (B) clockwise; stop turning when the dial gauge (A) has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft thrust clearance.

    NOTE: Do not turn the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving. Applying more pressure with the mainshaft holder bolt could damage the transmission.

13. If the reading is with in the standard, the clearance is correct. If the reading is not within the standards, select the appropriate shim needed from the table, and recheck the thrust clearance.

    Standard: 0.11—0.17 mm (0.004—0.007 in.)

    (Example)
    Measure reading: 1.93 mm (0.0759 in.)

    Subtract the total clearance measurement from the middle of the clearance standard 0.14 mm (0.0056 in.)

    1.93 — 0.14 = 1.79 mm (0.0704 in.)

    Select the shim closest to the amount calculated, for example the 1.80 mm (0.0709 in.) shim.

14. With oil guide plate M and the appropriate size shim installed in the transmission housing, check the thrust clearance again to verify the clearance is within the standard.

72 mm Shim

	Part Number	Thickness
A	23931-P21-000	0.60 mm (0.024 in.)
B	23932-P21-000	0.63 mm (0.025 in.)
C	23933-P21-000	0.66 mm (0.026 in.)
D	23934-P21-000	0.69 mm (0.027 in.)
E	23935-P21-000	0.72 mm (0.028 in.)
F	23936-P21-000	0.75 mm (0.030 in.)
G	23937-P21-000	0.78 mm (0.031 in.)
H	23938-P21-000	0.81 mm (0.032 in.)
I	23939-P21-000	0.84 mm (0.033 in.)
J	23940-P21-000	0.87 mm (0.034 in.)
K	23941-P21-000	0.90 mm (0.035 in.)
L	23942-P21-000	0.93 mm (0.037 in.)
M	23943-P21-000	0.96 mm (0.038 in.)
N	23944-P21-000	0.99 mm (0.039 in.)
O	23945-P21-000	1.02 mm (0.040 in.)
P	23946-P21-000	1.05 mm (0.041 in.)
Q	23947-P21-000	1.08 mm (0.043 in.)
R	23948-P21-000	1.11 mm (0.044 in.)
S	23949-P21-000	1.14 mm (0.045 in.)
T	23950-P21-000	1.17 mm (0.046 in.)
U	23951-P21-000	1.20 mm (0.047 in.)
V	23952-P21-000	1.23 mm (0.048 in.)
W	23953-P21-000	1.26 mm (0.050 in.)
X	23954-P21-000	1.29 mm (0.051 in.)
Y	23955-P21-000	1.32 mm (0.052 in.)
Z	23956-P21-000	1.35 mm (0.053 in.)
AA	23957-P21-000	1.38 mm (0.054 in.)
AB	23958-P21-000	1.41 mm (0.056 in.)
AC	23959-P21-000	1.44 mm (0.057 in.)
AD	23960-P21-000	1.47 mm (0.058 in.)
AE	23961-P21-000	1.50 mm (0.059 in.)
AF	23962-P21-000	1.53 mm (0.060 in.)
AG	23963-P21-000	1.56 mm (0.061 in.)
AH	23964-P21-000	1.59 mm (0.063 in.)
AI	23965-P21-000	1.62 mm (0.064 in.)
AJ	23966-P21-000	1.65 mm (0.065 in.)
AK	23967-P21-000	1.68 mm (0.066 in.)
AL	23968-P21-000	1.71 mm (0.067 in.)
AM	23969-P21-000	1.74 mm (0.069 in.)
AN	23970-P21-000	1.77 mm (0.070 in.)
AO	23971-P21-000	1.80 mm (0.071 in.)

(cont'd)

Mainshaft Thrust Clearance Adjustment (cont'd)

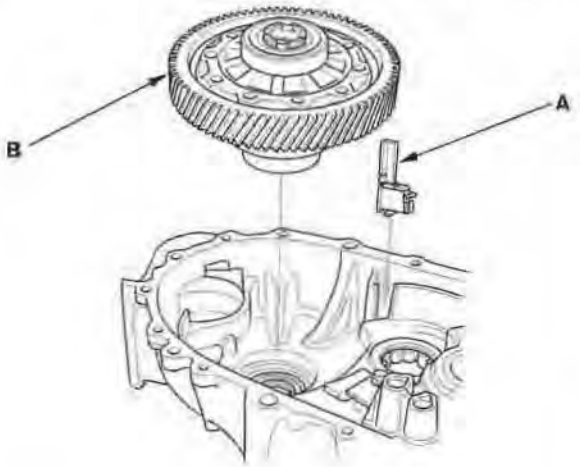
72 mm Shim

	Part Number	Thickness
AP	23972-PPP-J000	1.83 mm (0.072 in.)
AQ	23973-PPP-J000	1.86 mm (0.073 in.)
AR	23974-PPP-J000	1.89 mm (0.074 in.)
AS	23975-PPP-J000	1.92 mm (0.075 in.)
AT	23976-PPP-J000	1.95 mm (0.076 in.)
AV	23977-PPP-J000	1.98 mm (0.077 in.)
AW	23978-PPP-J000	2.01 mm (0.079 in.)
AX	23979-PPP-J000	2.04 mm (0.080 in.)
AY	23980-PPP-J000	2.07 mm (0.081 in.)
AZ	23981-PPP-J000	2.10 mm (0.082 in.)
BA	23982-PPP-J000	2.13 mm (0.083 in.)
BB	23983-PPP-J000	2.16 mm (0.085 in.)
BC	23984-PPP-J000	2.19 mm (0.086 in.)
BD	23985-PPP-J000	2.22 mm (0.087 in.)
BE	23986-PPP-J000	2.25 mm (0.088 in.)

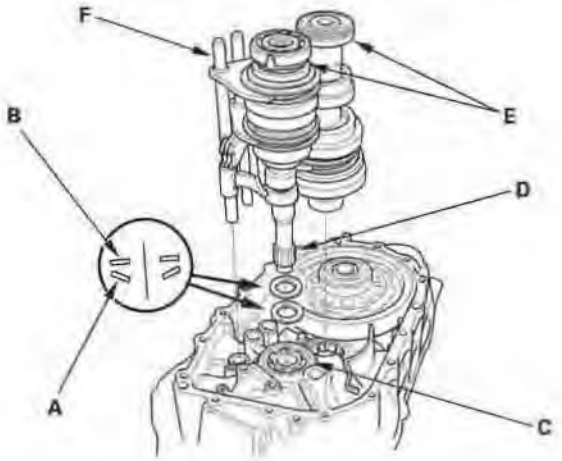
Transmission Reassembly

NOTE: Prior to reassembling, clean all parts in solvent, dry them, and apply lubricant to any contact surfaces.

1. Install the magnet (A) and differential assembly (B).

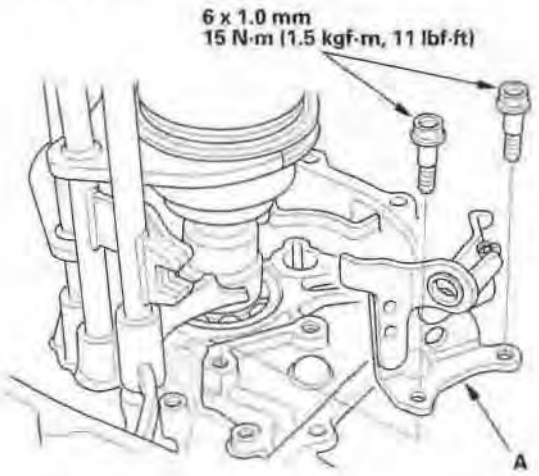


2. Install the 28 mm spring washer (A) and 28 mm washer (B) over the ball bearing (C). Note the installation direction of the spring washer (A).

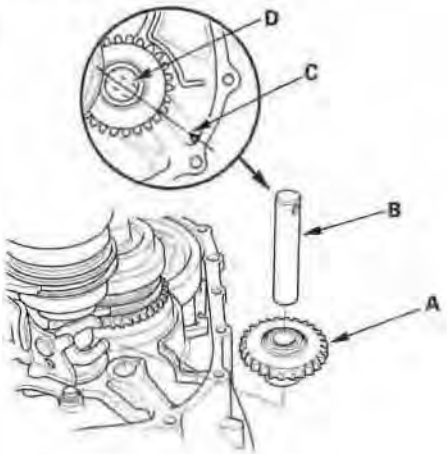


3. Apply vinyl tape to the mainshaft splines (D) to protect the seal. Install the mainshaft and countershafts (E) into the shift forks (F), as an assembly.

4. Install the reverse shift fork (A).



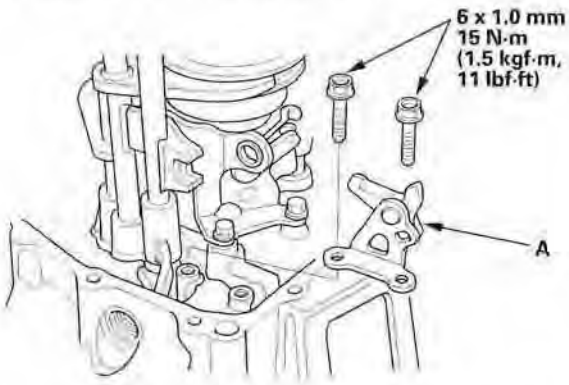
5. Install the reverse idler gear (A) and reverse gear shaft (B) by aligning the mark (C) with the reverse gear shaft hole (D).



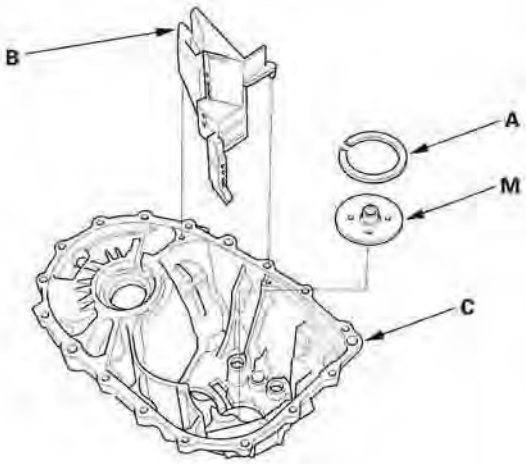
(cont'd)

Transmission Reassembly (cont'd)

6. Install the reverse lock cam (A).

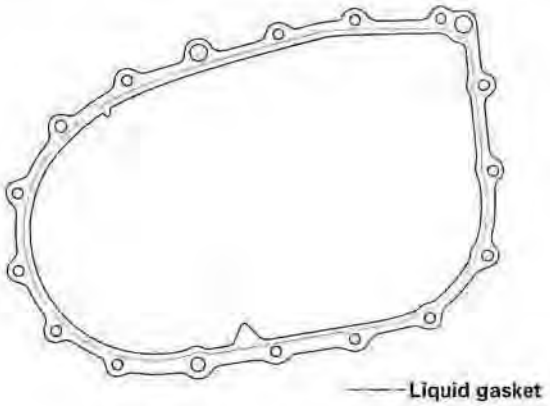


7. Select the proper size 72 mm shim (A) according to the measurements made during the Mainshaft Thrust Clearance Adjustment (see page 13-46). Install the oil gutter plate (B), oil guide plate M, and 72 mm shim into the transmission housing (C).

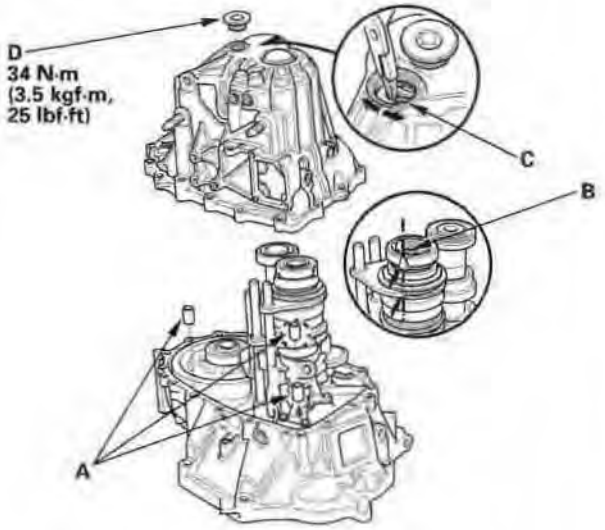


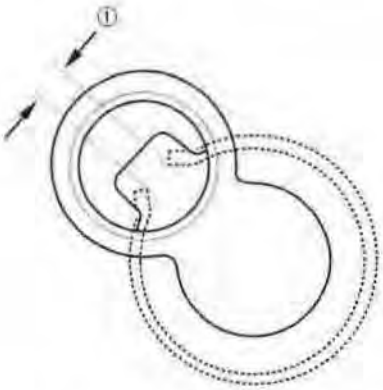
8. Remove any dirt or oil from the transmission housing sealing surface. Apply liquid gasket (P/N 08718-0001) to the sealing surface. Make sure you seal the entire circumference of the bolt holes to prevent oil leakage.

   NOTE: If 5 minutes have passed after applying liquid gasket, reapply it, and assemble the housings. Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.



9. Install the 14 x 20 mm dowel pins (A).





10. Set the tapered cone ring (B) as shown. Place the transmission housing over the clutch housing, being careful to line up the shafts.

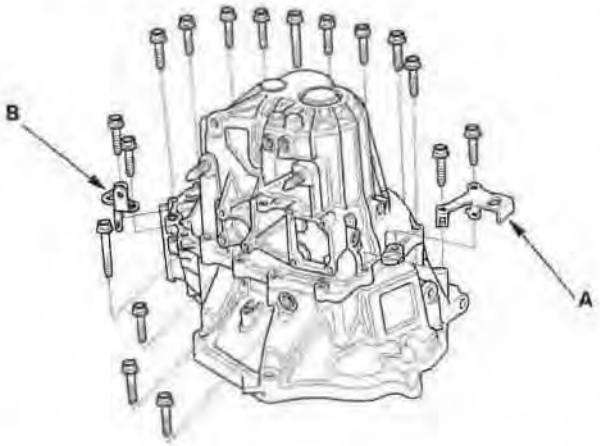
11. Lower the transmission housing the rest of the way as you expand the 72 mm snap ring (C). Release the snap ring so it seats in the groove of the countershaft bearing.

12. Check that the 72 mm snap ring is securely seated in the groove of the countershaft bearing.

Dimension ① as installed: 3.3—6.0 mm (0.13—0.24 in.)

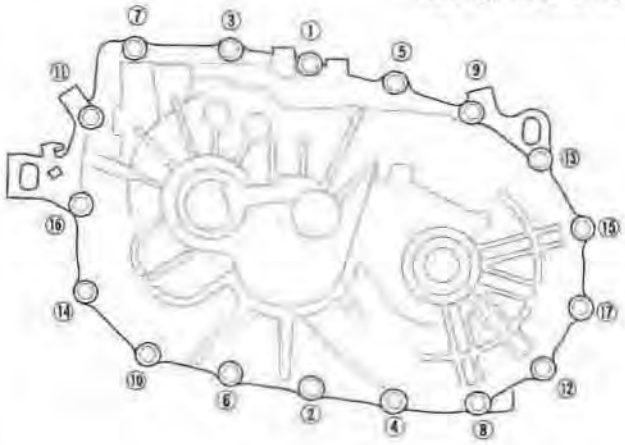
13. Apply liquid gasket (P/N 08718-0001) to the threads of the 32 mm sealing cap (D), and install it on the transmission housing.

14. Install transmission hangers (A), and (B), and the 8 mm flange bolts, finger-tight.



15. Tighten the 8 mm flange bolts in a crisscross pattern in several steps.

8 x 1.25 mm
27 N·m
(2.8 kgf·m, 20 lbf·ft)

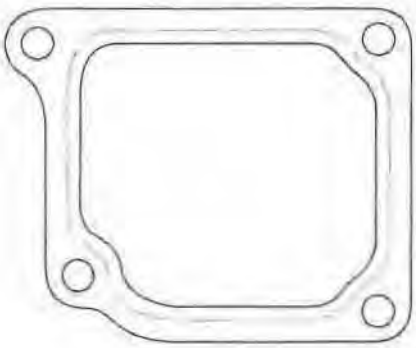


(cont'd)

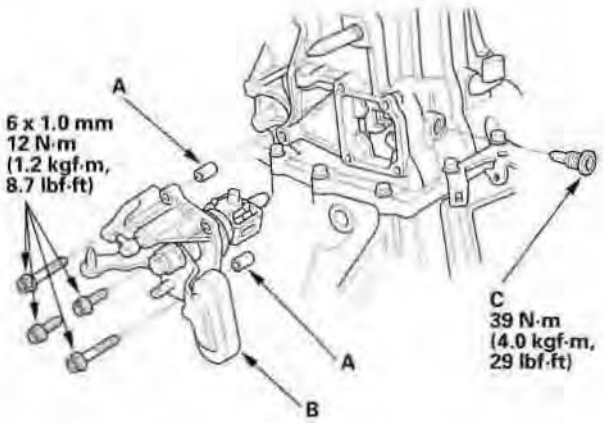
Transmission Reassembly (cont'd)

16. Remove any dirt or oil from the shift lever cover sealing surface. Apply liquid gasket (P/N 08718-0001) to the sealing surface.

    NOTE: If 5 minutes have passed after applying liquid gasket, reapply it, and assemble the housings. Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.

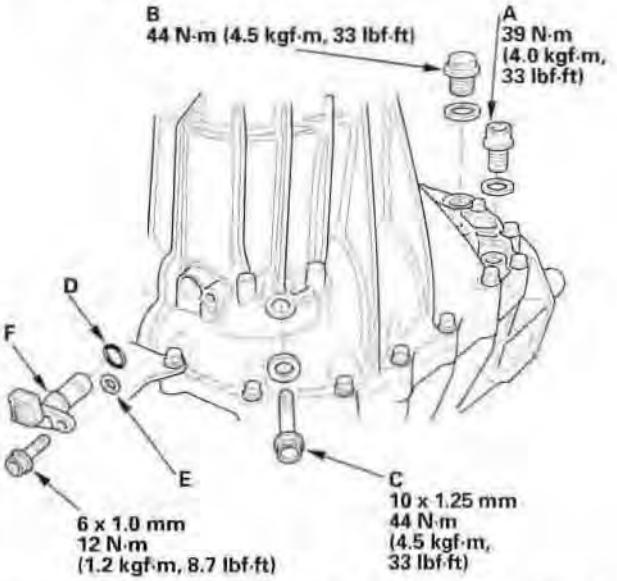


17. Install the 8 x 14 mm dowel pins (A) and the change lever assembly (B).



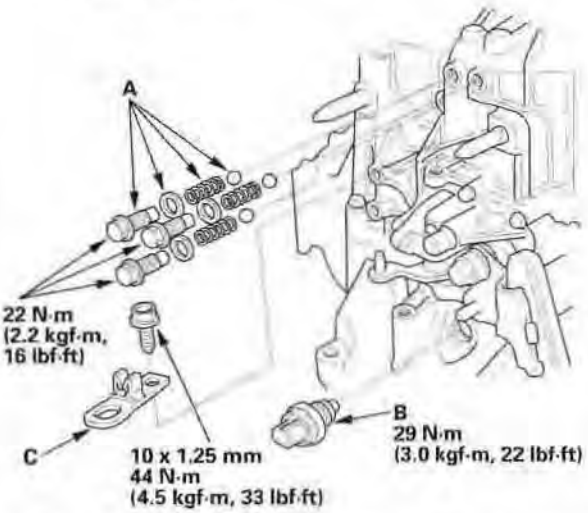
18. Apply liquid gasket (P/N 08718-0001) to the threads of the interlock bolt (C), and install it on the transmission housing.

19. Install the drain plug (A), filler plug (B), and 10 mm flange bolt (C) with new washers.



20. Install the new O-ring (D), the plain washer (E), and the countershaft speed sensor (F).

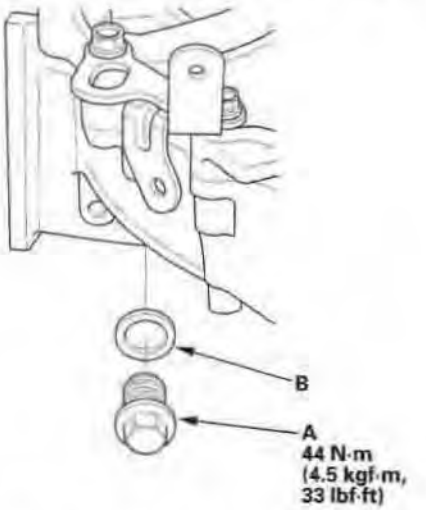
21. Install the detent bolts, spring, and steel balls with new washers (A).



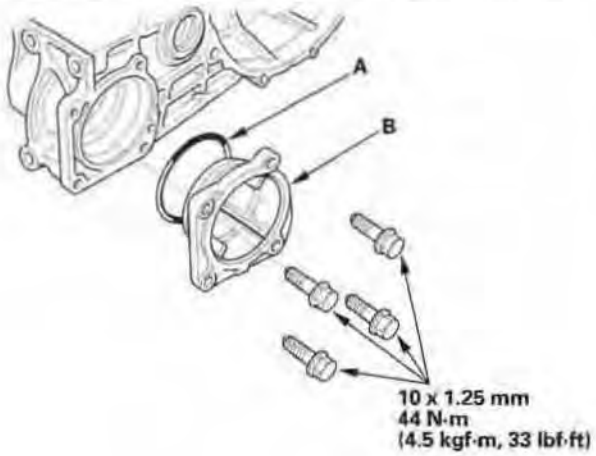
22. Apply liquid gasket (P/N 08718-0001) to the threads of the back-up light switch (B), and install the switch on the transmission housing.

23. Install the transmission hanger (C).

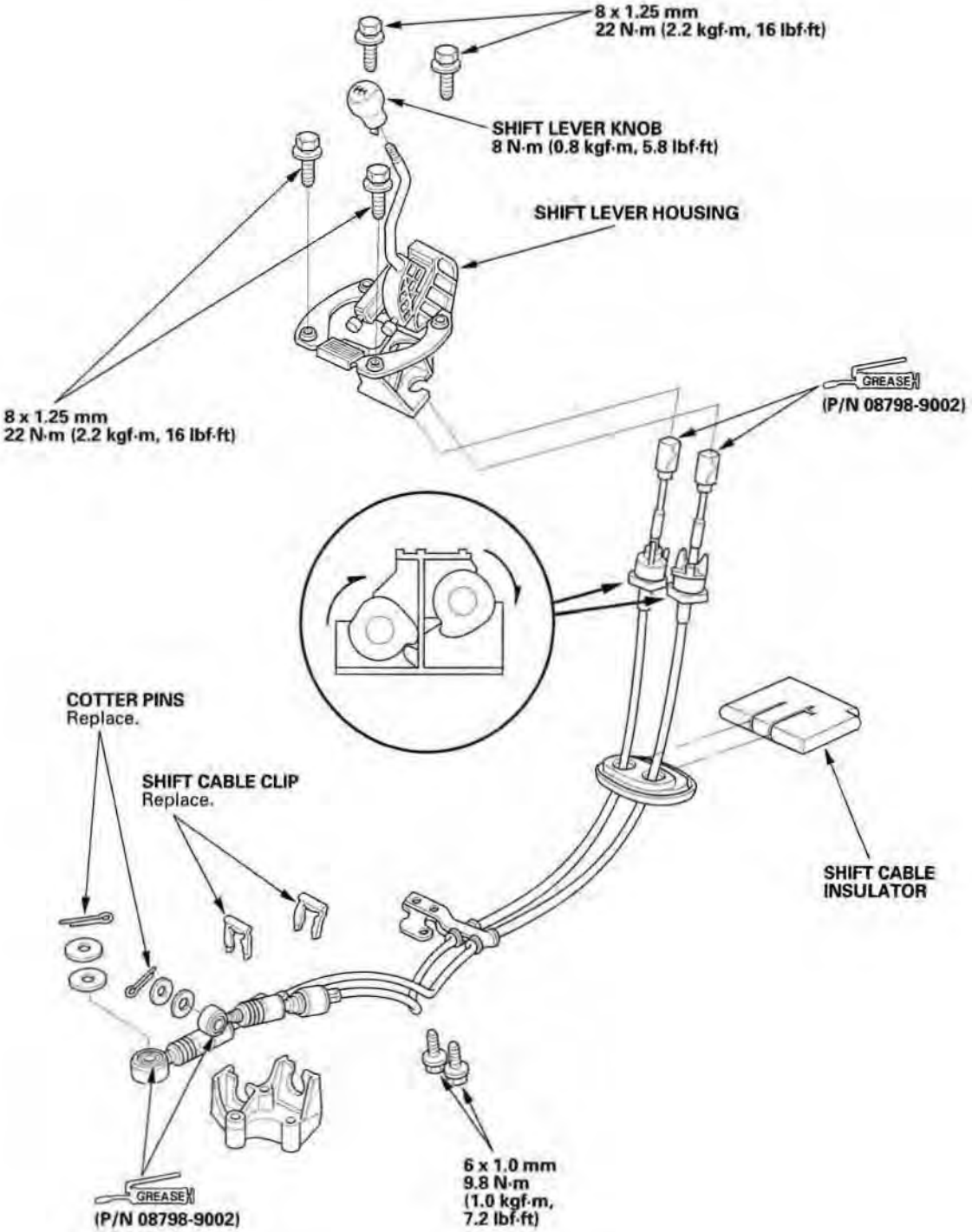
24. Install the 20 mm bolt (A) and 20 mm washer (B).



25. Install the new O-ring (A) and the side cover (B).

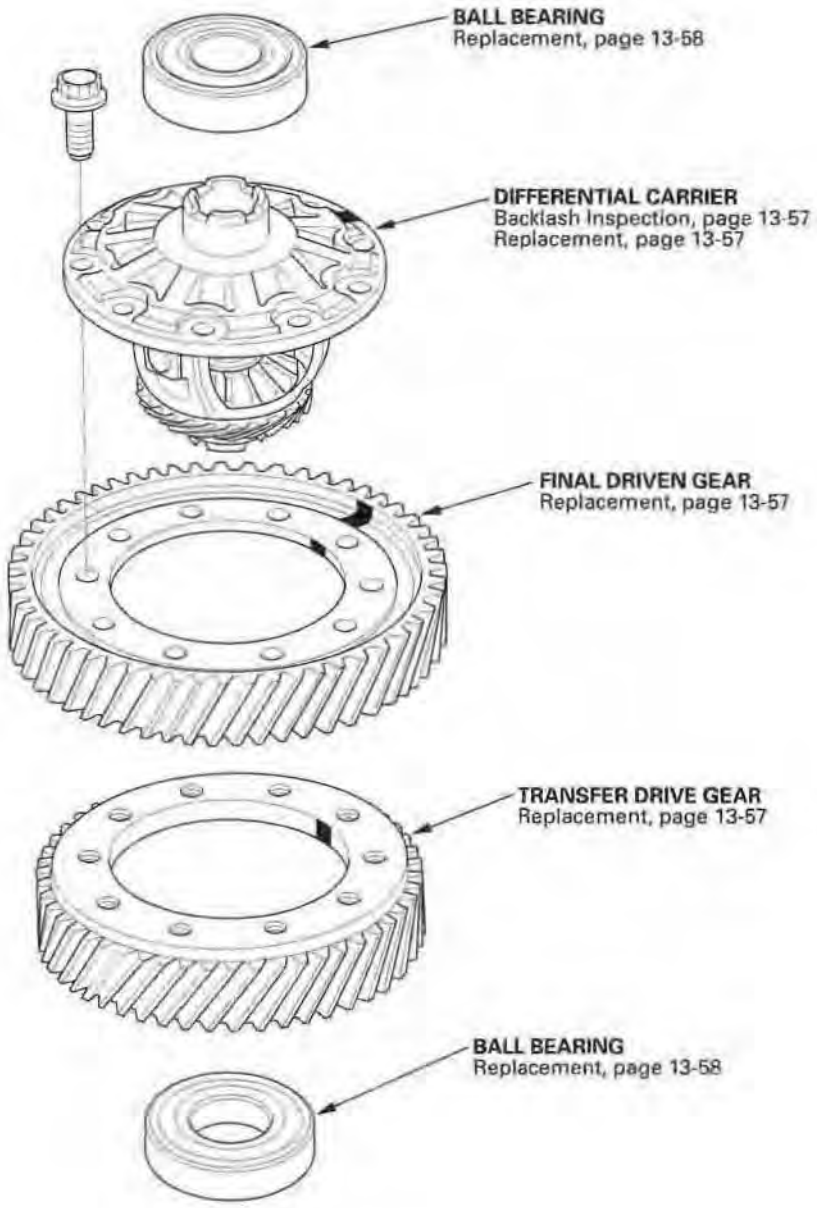


Gearshift Mechanism Replacement



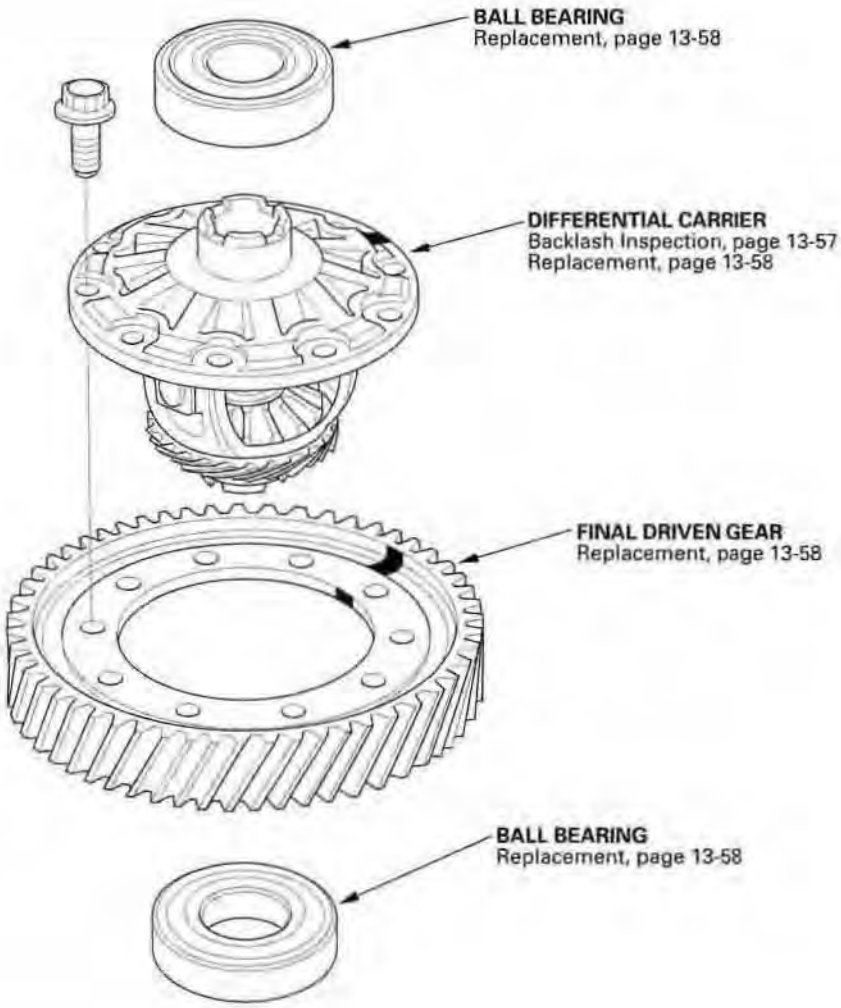
Component Location Index

4WD Model



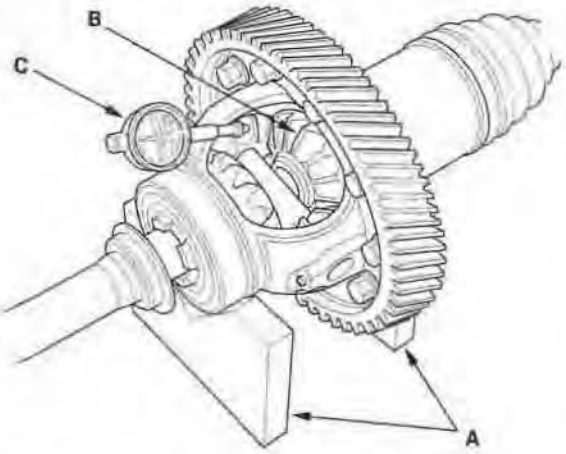
Component Location Index (cont'd)

2WD Model



Backlash Inspection

1. Place the differential assembly on V-blocks (A), and install both axles.



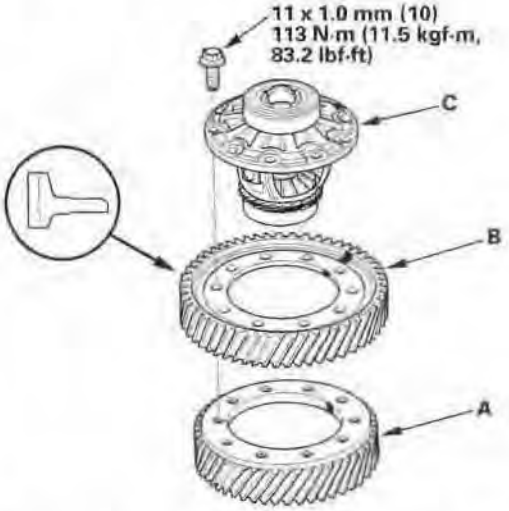
2. Measure the backlash of both pinion gears (B) with a dial indicator (C). If the backlash is not within the standard, replace the differential carrier.

Standard (New): 0.05—0.15 mm (0.002—0.006 in.)

Differential Carrier, Final Driven Gear, Transfer Drive Gear Replacement

4WD Model

1. Remove the bolts (left-hand threads) in a crisscross pattern in several steps, then remove the transfer drive gear (A) and final driven gear (B) from the differential carrier (C).

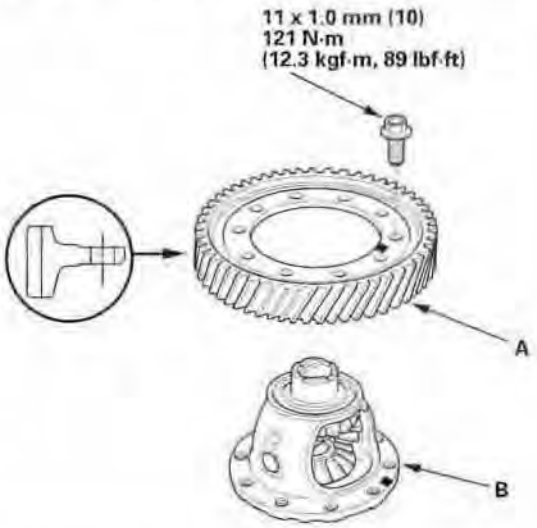


2. Install the driven gear with the chamfer on the inside diameter facing the carrier. Tighten the bolts in a crisscross pattern in several steps.

Differential Carrier, Final Driven Gear Replacement

2WD Model

1. Remove the bolts (left-hand threads) in a crisscross pattern in several steps, then remove the driven gear (A) from the differential carrier (B).



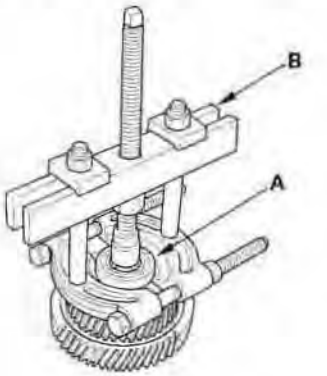
2. Install the driven gear with the chamfer on the inside diameter facing the carrier. Tighten the bolts in a crisscross pattern in several steps.

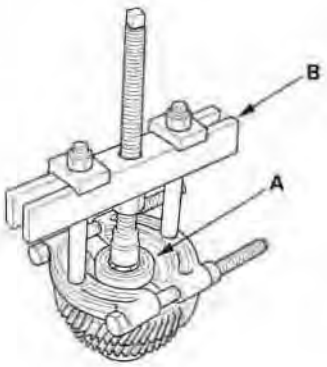
Carrier Bearing Replacement

Special Tools Required
Driver, 40 mm I.D. 07746-0030100

1. Check the carrier bearings for wear and rough rotation. If they rotate smoothly and their rollers show no signs of wear, the bearings are OK.

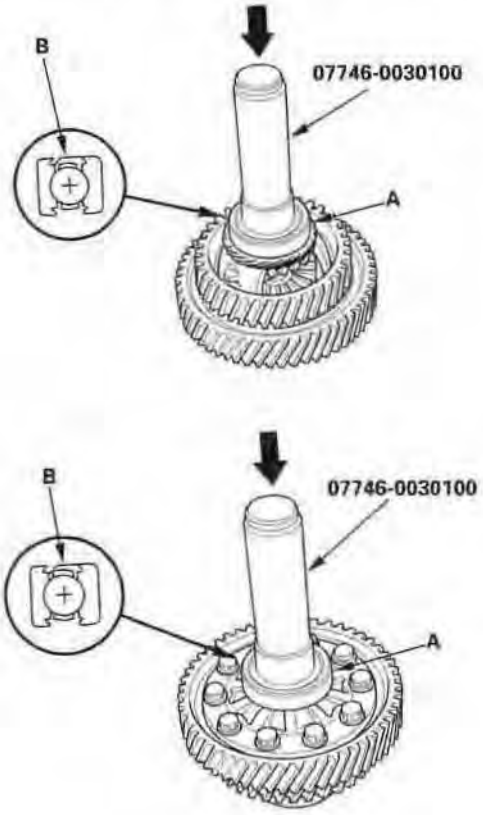
2. Remove the carrier bearing (A) with a commercially available bearing puller (B).





3. Install the new bearings (A) with the special tool and a press. Press each bearing on until it bottoms. There should be no clearance between the bearings and the carrier.

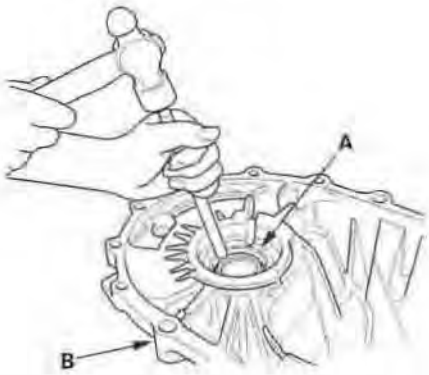
   NOTE: Place the seal part of the bearing (B) toward the outside of the differential, then install it.



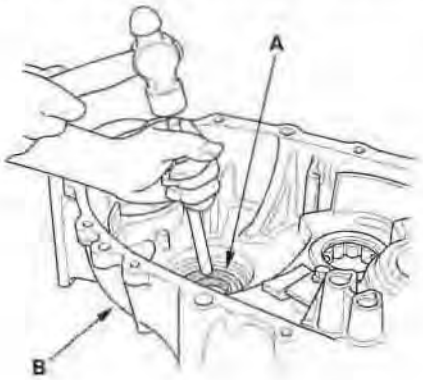
Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment 07NAD-P20A100

1. Remove the differential assembly.
2. Remove the oil seal (A) from the transmission housing (B).



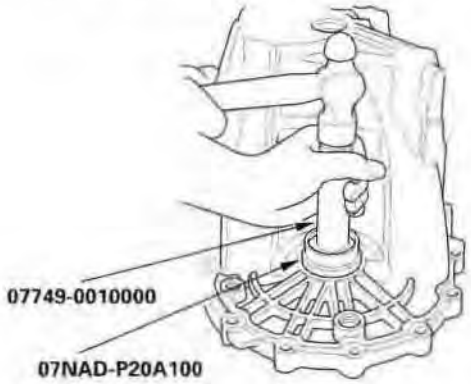
3. Remove the oil seal (A) from the clutch housing (B).



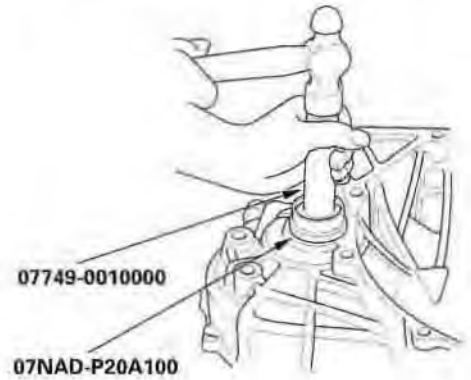
(cont'd)

Oil Seal Replacement (cont'd)

4. Install the new oil seal in the transmission housing with the special tools.



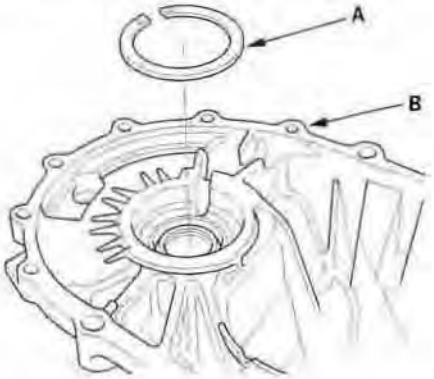
5. Install the new oil seal in the clutch housing with the special tools.



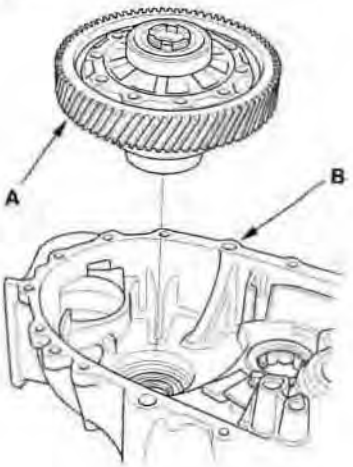
Differential Thrust Clearance Adjustment

Special Tools Required
Driver, 40 mm I.D. 07746-0030100

1. If you removed the 80 mm shim (A) from the clutch housing (B), reinstall the same sized shim.



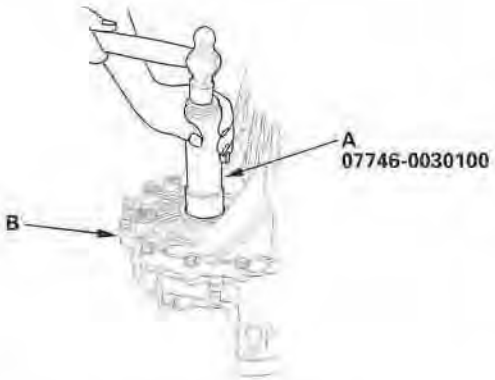
2. Install the differential assembly (A) into the clutch housing (B).



3. Install the transmission housing onto the clutch housing, then tighten the 8 mm flange bolts in a crisscross pattern in several steps (see step 15 on page 13-51).

8 x 1.25 mm
27 N·m (2.8 kgf·m, 20 lbf·ft)

4. Use the special tool (A) to bottom the differential assembly in the clutch housing (B).



5. Measure clearance between the 80 mm shim and the bearing outer race in the transmission housing.

Standard: 0—0.10 mm (0—0.0039 in.)

6. If the clearance is more than the standard, select a new shim from the following table. If the clearance measured in step 5 is within the standard, go to step 9.

80 mm Shim

	Part Number	Thickness
A	41441-PL3-B00	1.0 mm (0.039 in.)
B	41442-PL3-B00	1.1 mm (0.043 in.)
C	41443-PL3-B00	1.2 mm (0.047 in.)
D	41444-PL3-B00	1.3 mm (0.051 in.)
E	41445-PL3-B00	1.4 mm (0.055 in.)
F	41446-PL3-B00	1.5 mm (0.059 in.)
G	41447-PL3-B00	1.6 mm (0.063 in.)
H	41448-PL3-B00	1.7 mm (0.067 in.)
J	41449-PL3-B00	1.8 mm (0.071 in.)
K	41450-PL3-B00	1.05 mm (0.041 in.)
L	41451-PL3-B00	1.15 mm (0.045 in.)
M	41452-PL3-B00	1.25 mm (0.049 in.)
N	41453-PL3-B00	1.35 mm (0.053 in.)
P	41454-PL3-B00	1.45 mm (0.057 in.)
Q	41455-PL3-B00	1.55 mm (0.061 in.)
R	41456-PL3-B00	1.65 mm (0.065 in.)
S	41457-PL3-B00	1.75 mm (0.069 in.)

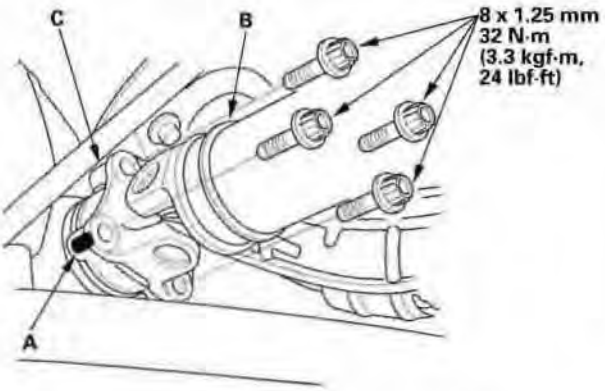
7. Remove the bolts and the transmission housing.

8. Replace the thrust shim selected in step 6, then recheck the clearance.

9. Reinstall the transmission.

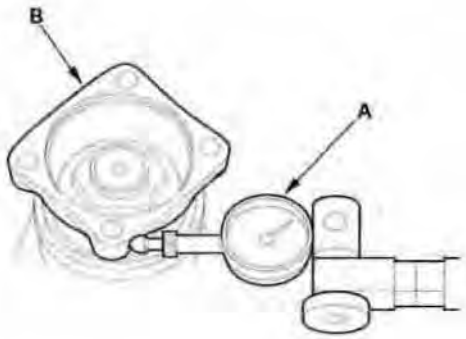
Backlash Inspection on Vehicle

1. Raise the front of the vehicle, and support it with safety stands (see page 1-9).
2. Set the parking brake, and block both rear wheels securely.
3. Shift to Neutral.
4. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flanges (C).



5. Separate the propeller shaft from the transfer assembly.
6. Set a dial indicator (A) on the transfer companion flange (B), then measure the transfer gear backlash.

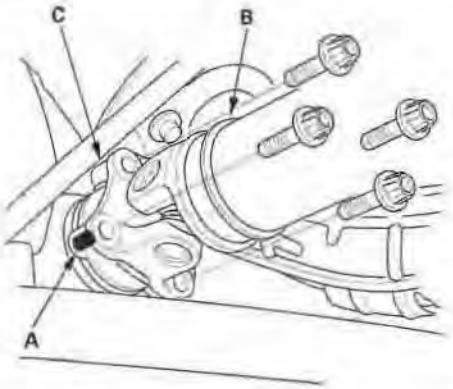
Standard: 0.06—0.16 mm (0.002—0.006 in.)



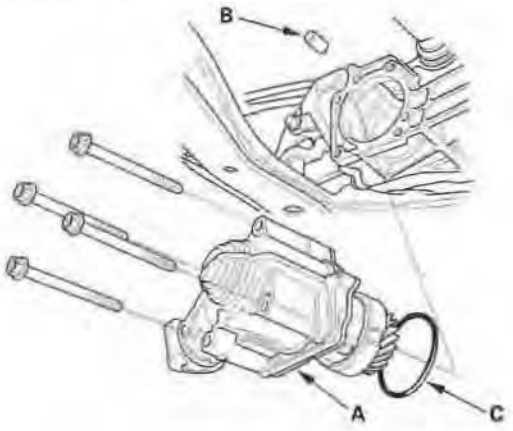
7. If the measurement is out of specification, remove the transfer assembly (see page 13-63) and inspect the transfer assembly (see page 13-64).
8. Before reinstalling the propeller shaft, check the transfer assembly oil seal for damage and fluid leaks.
   - If the seal is leaking, remove the transfer assembly (see page 13-63), replace the oil seal, and adjust the total starting torque (see step 4 on page 13-64). Do not replace the oil seal with the transfer assembly installed on the transmission.
   - If the seal is OK, reinstall the propeller shaft.

Transfer Assembly Removal

1. Raise the front of the vehicle, and support it with safety stands (see page 1-9).
2. Set the parking brake, and block both rear wheels securely.
3. Drain the manual transmission fluid. Reinstall the drain plug with a new sealing washer (see page 13-3).
4. Make reference marks (A) across the propeller shaft (B) and the companion flanges (C).



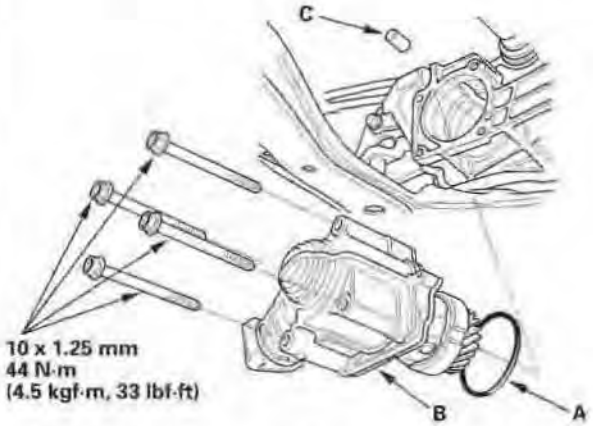
5. Separate the propeller shaft from the transfer assembly.
6. Remove the transfer assembly (A), dowel pin (B), and O-ring (C).



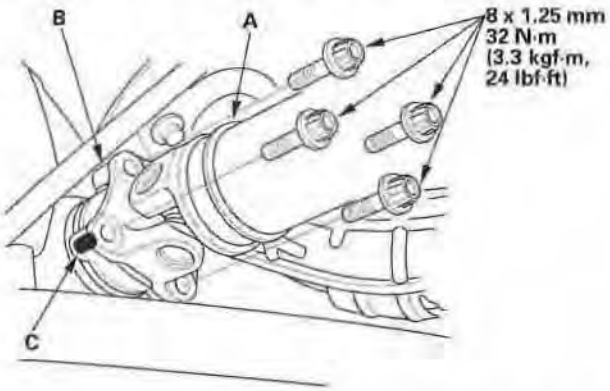
Transfer Assembly Installation

NOTE:
- While installing the transfer assembly on the transmission, do not allow dust or other foreign particles to enter the transmission.
- Be careful not to damage the clutch housing with transfer driven gear.

1. Install a new O-ring (A) on the transfer assembly (B), then install the dowel pin (C) on the transmission.



2. Apply MTF to the transfer driven gear and transmission contact area, then install the transfer assembly on the transmission.
3. Install the propeller shaft (A) on the transfer assembly (B) by aligning the reference marks (C).

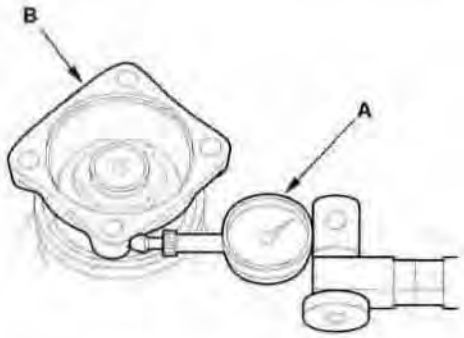


4. Refill the transmission with MTF (see page 13-3).
5. Start the engine, and run it to normal operating temperature (the radiator fan comes on). Turn the engine off, and check the fluid level.

Transfer Assembly Inspection

Transfer Gear (Hypoid Gear) Backlash Measurement

1. Set a dial indicator (A) on the companion flange (B) as shown.



2. Measure the transfer gear backlash.

   Standard: 0.06—0.16 mm (0.002—0.006 in.)

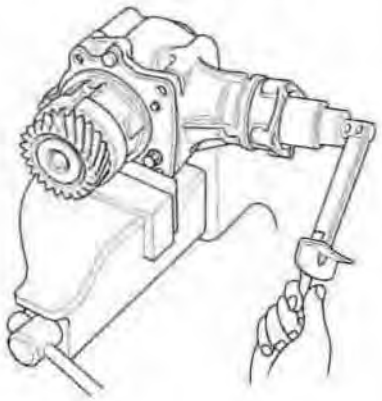
Total Starting Torque Measurement

3. Rotate the companion flange several times to seat the tapered roller bearing.

4. Measure the starting torque (companion flange side) using a torque wrench.

   NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

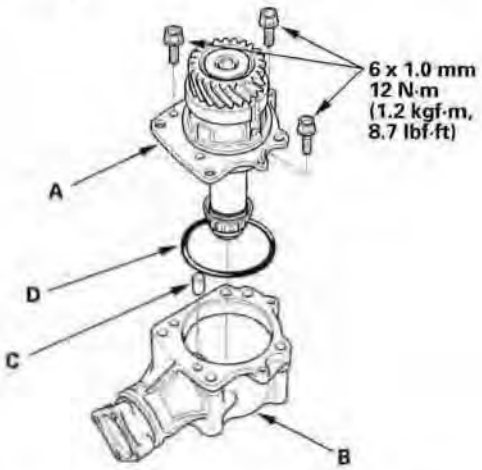
   Standard:
   2.16—3.57 N·m
   (22.0—36.4 kgf·cm, 19.1—31.6 lbf·in)



Transfer Drive Gear Tooth Contact Inspection

5. Remove the transfer from the vise.

6. Remove the transfer holder assembly (A) from the transfer housing (B), then remove the dowel pin (C) and O-ring (D).



7. Apply Prussian Blue to the transfer drive gear teeth lightly and evenly.

8. Install the transfer holder assembly to the transfer housing, then tighten the bolts.

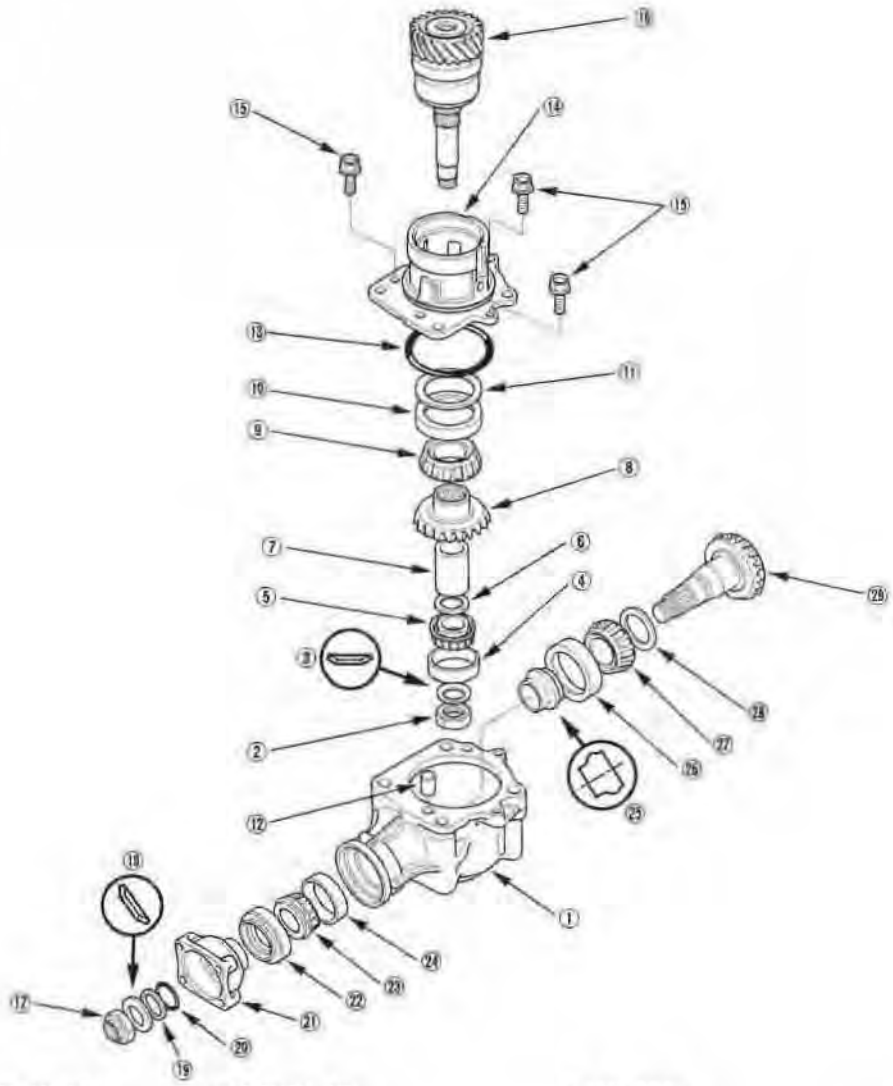
9. Rotate the companion flange in both directions until the transfer gear rotates one full turn in both directions.

10. Check the transfer gear tooth contact pattern.

11. If the measurements or the tooth contact pattern are not within the standard, disassemble the transfer assembly, replace worn or damaged parts, and reassemble it.

Transfer Assembly Disassembly

Exploded View



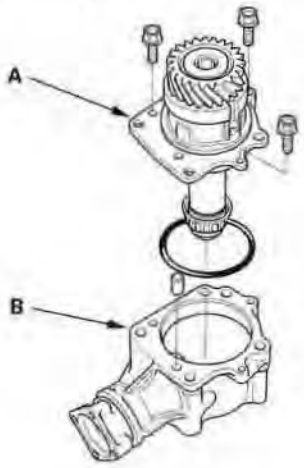
① TRANSFER HOUSING
② 22 mm LOCKNUT
Replace.
③ CONICAL SPRING WASHER
Replace.
④ TAPERED ROLLER BEARING OUTER RACE
⑤ TAPERED ROLLER BEARING
⑥ 25 mm THRUST SHIM
⑦ TRANSFER COLLAR
⑧ TRANSFER DRIVE GEAR
⑨ TAPERED ROLLER BEARING
⑩ TAPERED ROLLER BEARING OUTER RACE
⑪ 76 mm THRUST SHIM
⑫ DOWEL PIN
⑬ O-RING
Replace.
⑭ TRANSFER HOLDER
⑮ 6 mm FRANGE BOLTS
⑯ TRANSFER SHAFT ASSEMBLY
⑰ 22 mm LOCKNUT
Replace.
⑱ CONICAL SPRING WASHER
Replace.
⑲ BACK-UP RING
⑳ O-RING
Replace.
㉑ COMPANION FLANGE
㉒ OIL SEAL
Replace.
㉓ TAPERED ROLLER BEARING
㉔ TAPERED ROLLER BEARING OUTER RACE
㉕ TRANSFER SPACER
Replace.
㉖ TAPERED ROLLER BEARING OUTER RACE
㉗ TAPERED ROLLER BEARING
㉘ 35 mm THRUST SHIM
㉙ TRANSFER DRIVEN GEAR

(cont'd)

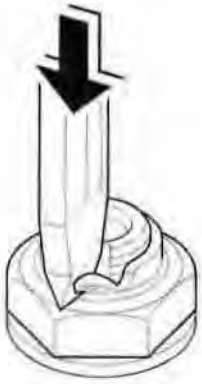
Transfer Assembly Disassembly (cont'd)

Special Tools Required
- Holder handle 07JAB-001020B
- Companion flange holder 07RAB-TB4010A or 07RAB-TB4010B

1. Remove the transfer holder assembly (A) from the transfer housing (B).

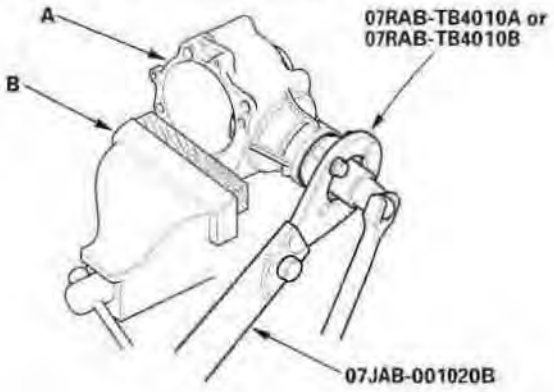


2. Cut the lock tabs of the locknut using a chisel. Keep all of the chiseled particles out of the transfer driven gear.



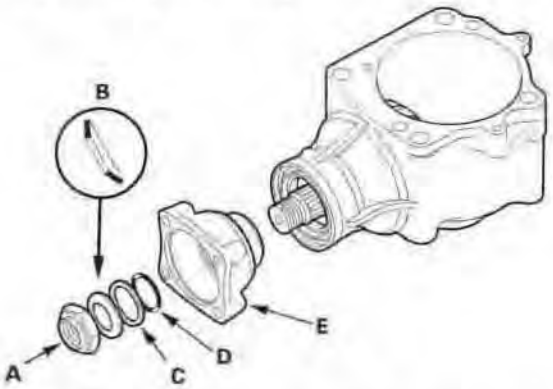
3. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

   NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

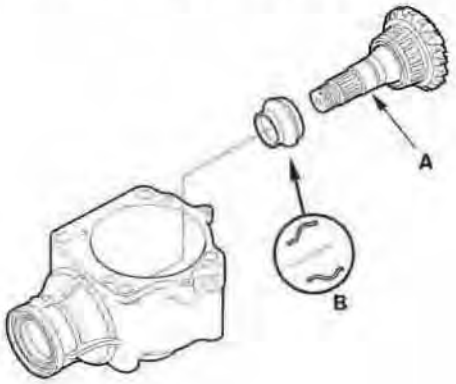


4. Install the special tools on the companion flange, then loosen the transfer driven gear shaft locknut.

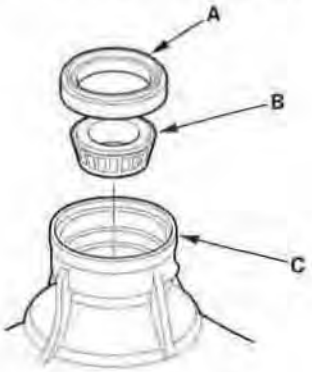
5. Remove the transfer driven gear locknut (A), conical spring washer (B), back-up ring (C), O-ring (D), and companion flange (E).



6. Remove the transfer driven gear (A), then remove the transfer spacer (B) from the transfer driven gear.



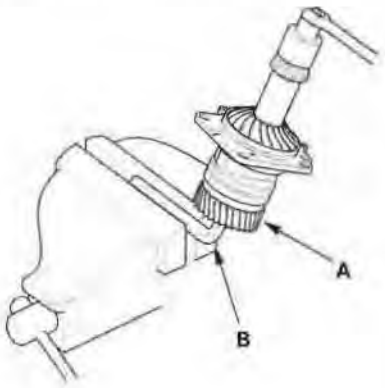
7. Remove the oil seal (A) and the tapered roller bearing (B) from the transfer housing (C).



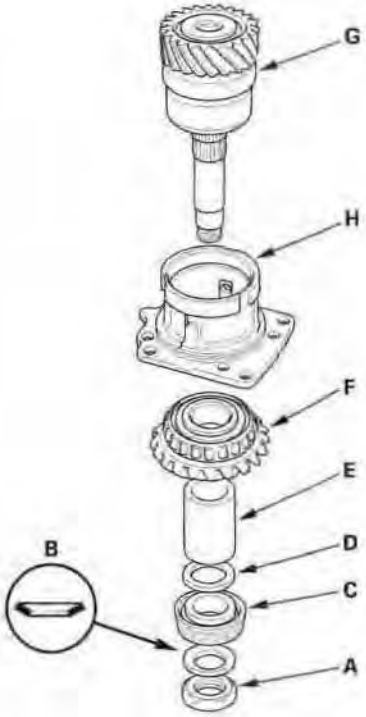
Transfer Holder Disassembly

1. Cut the lock tabs of the locknut using a chisel. Keep all of the chiseled particles out of the transfer shaft.

2. Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise, then loosen the locknut.



3. Remove the locknut (A), conical spring washer (B), tapered roller bearing (C), 25 mm thrust shim (D), transfer shaft collar (E), transfer drive gear (F), and transfer shaft assembly (G) from the transfer holder (H).

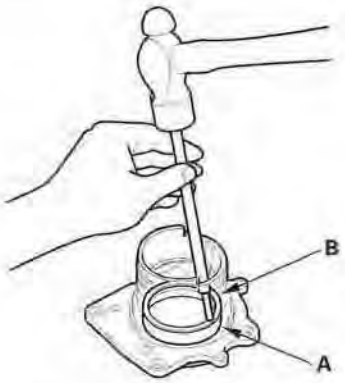


Transfer Holder Bearing Race Replacement

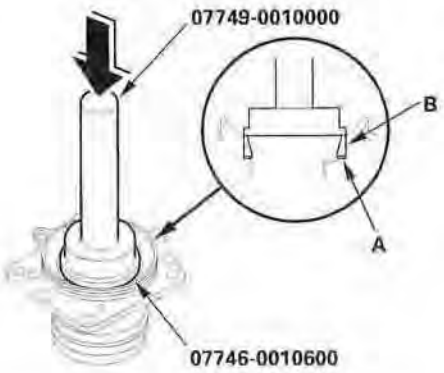
Special Tools Required
- Attachment, 72 x 75 mm 07746-0010600
- Driver 07749-0010000

NOTE: Coat all parts with MTF during reassembly.

1. Remove the tapered roller bearing outer race (A) and 76 mm thrust shim (B) from the transfer holder.



2. Install the 76 mm thrust shim (A) in the transfer holder.



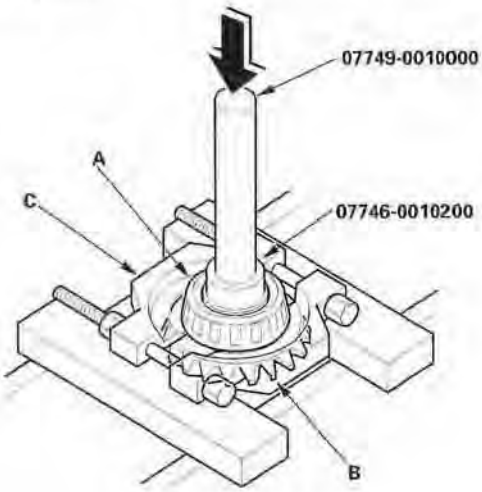
3. Install the tapered roller bearing outer race (B) using the special tools and a press.

Transfer Drive Gear Bearing Replacement

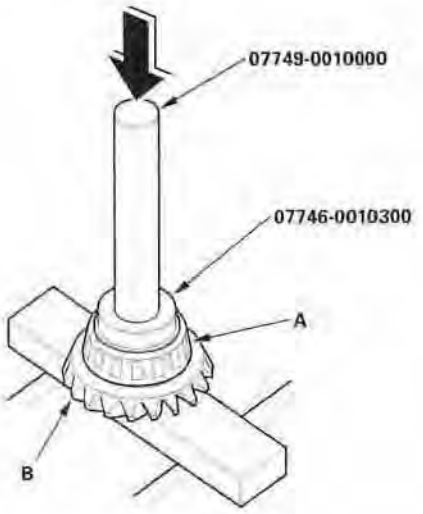
Special Tools Required
- Attachment, 37 x 40 mm 07746-0010200
- Attachment, 42 x 47 mm 07746-0010300
- Driver 07749-0010000

NOTE: Coat all parts with MTF during reassembly.

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) using a commercially available bearing separator (C), the special tools, and a press.



2. Install the new tapered roller bearing (A) on the transfer drive gear (B) using the special tools and a press.

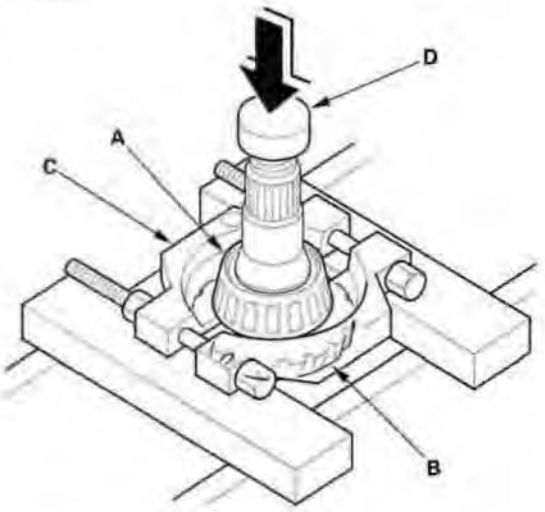


Transfer Driven Gear Bearing Replacement

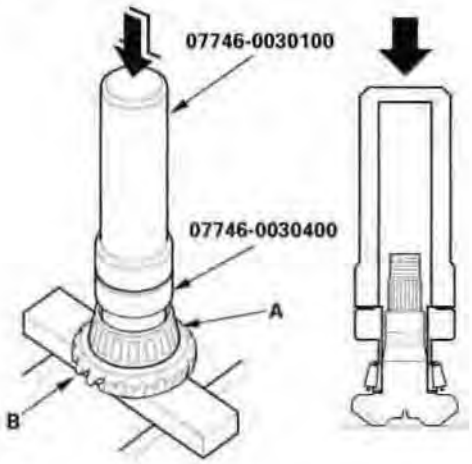
Special Tools Required
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400

NOTE: Coat all parts with MTF during reassembly.

1. Remove the tapered roller bearing (A) from the transfer driven gear (B) using a commercially available bearing separator (C), an adapter (D), and a press.



2. Install the new tapered roller bearing (A) on the transfer driven gear (B) using the special tools and a press.

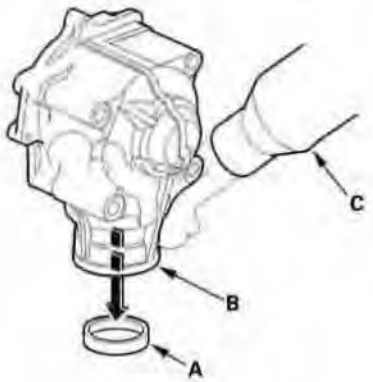


Transfer Housing Bearing Outer Race Replacement

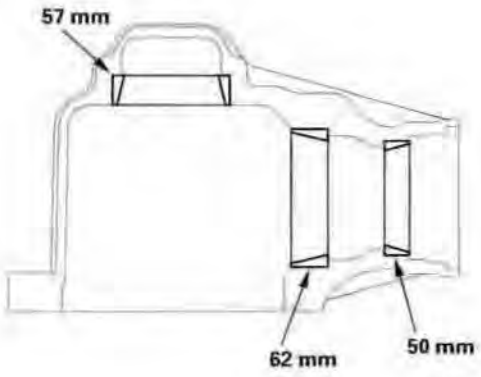
Special Tools Required
- Installer shaft, 14 x 165 mm 07JAF-SJ80110
- Installer nut, 14 mm 07JAF-SJ80120
- Bearing installer attachment 07KAF-PS30120
- Bearing installer attachment 07LAF-PZ70110
- Driver 07749-0010000
- Oil seal driver attachment 07947-SD90101

NOTE:
- Coat all parts with MTF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.

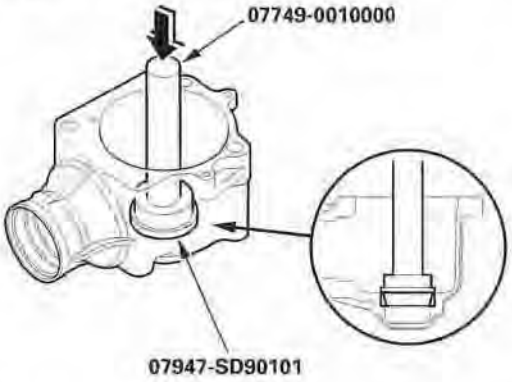
1. Remove the tapered roller bearing outer race (A) from transfer housing (B) by heating the housing to almost 212 °F (100 °C) using a heat gun (C). Do not heat the housing over 212 °F (100 °C).



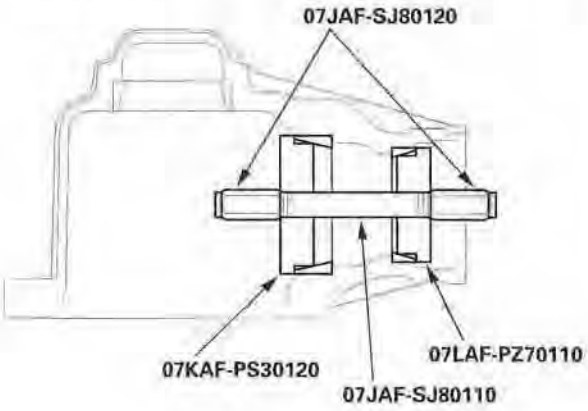
Bearing Outer Race Locations



2. Install the 57 mm tapered roller bearing outer race using the special tools.



3. Install the 62 mm tapered roller bearing outer race and 50 mm tapered roller bearing outer race using the special tools.



Transfer Assembly Reassembly

Special Tools Required
- Holder handle 07JAB-001020B
- Oil seal driver attachment 07JAD-PH80101
- Companion flange holder 07RAB-TB4010A or 07RAB-TB4010B
- Attachment, 72 x 75 mm 07746-0010600
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400
- Driver 07749-0010000

Note these items during reassembly:
- While reassembling the transfer assembly:
  - Check and adjust the transfer gear tooth contact.
  - Measure and adjust the transfer gear backlash.
  - Check and adjust the tapered roller bearing starting torque.
- Coat all parts with MTF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.
- Replace the transfer drive gear and the transfer driven gear shaft as a set if either part is replaced.

Outline of Assembly

1. Select the 35 mm thrust shim. Do this procedure if the transfer driven gear shaft or the tapered roller bearing on the transfer driven gear shaft is replaced.
2. Preassemble the parts to check and adjust transfer gear backlash and transfer gear tooth contact.
3. Disassemble the parts, then assemble the transfer driven gear shaft and its related parts.
4. Measure and adjust the starting torque of the transfer driven gear shaft tapered roller bearing.
5. Assemble the transfer shaft and its related parts.
6. Measure and adjust the total starting torque.

(cont'd)

Transfer Assembly Reassembly (cont'd)

35 mm Thrust Shim Selection

1. Select the 35 mm thrust shim if the transfer driven gear shaft or the tapered roller bearing on the transfer driven gear shaft is replaced.

   Calculate the thickness of the 35 mm thrust shim using the formula.

   Formula: $\frac{A}{100} - \frac{B}{100} + C = X$

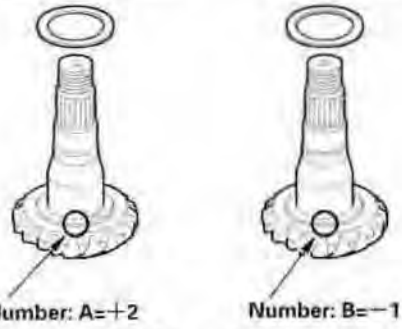
   A: Number on the existing transfer driven gear shaft.
   B: Number on the replacement transfer driven gear shaft.
   C: Thickness of the existing 35 mm thrust shim.
   X: Thickness needed for the replacement 35 mm thrust shim.

   NOTE: The number on the transfer driven gear shaft is shown in 1/100 mm.

Example:

C: EXISTING 35 mm THRUST SHIM
Thickness: C=1.05 mm

X: REPLACEMENT 35 mm THRUST SHIM
Thickness: X= ? ? mm



A: EXISTING TRANSFER DRIVEN GEAR SHAFT

B: REPLACEMENT TRANSFER DRIVEN GEAR SHAFT

$$X = \frac{A}{100} - \frac{B}{100} + C = \frac{2}{100} - \frac{-1}{100} + 1.05$$

$$= 0.02 + 0.01 + 1.05 = 1.08 \text{ (mm)}$$

Select 35 mm thrust shim thickness of 1.08 mm (0.043 in.).
If the tapered roller bearing on the transfer driven gear shaft is replaced.

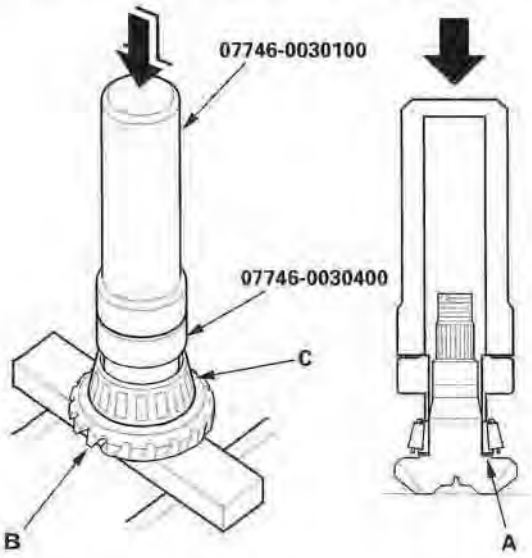
Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 35 mm thrust shim by the amount of difference in bearing thickness, and select the replacement 35 mm thrust shim. Do not use more than one 35 mm thrust shim to adjust the transfer gear backlash.

35 mm Thrust Shim

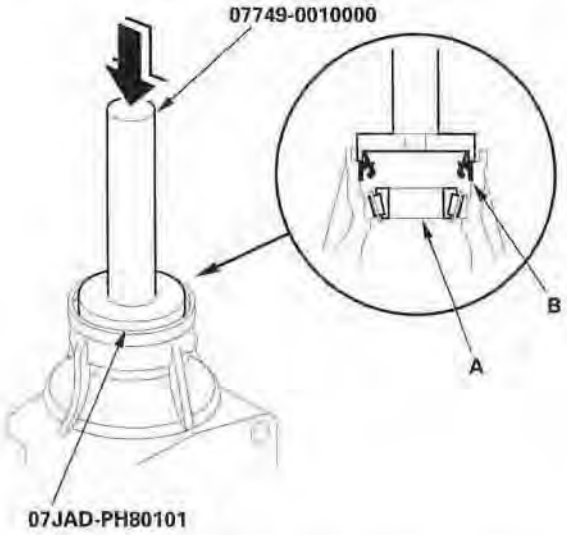
Shim No.	Part Number	Thickness
A	41361-PS3-000	0.72 mm (0.028 in.)
B	41362-PS3-000	0.75 mm (0.030 in.)
C	41363-PS3-000	0.78 mm (0.031 in.)
D	41364-PS3-000	0.81 mm (0.032 in.)
E	41365-PS3-000	0.84 mm (0.033 in.)
F	41366-PS3-000	0.87 mm (0.034 in.)
G	41367-PS3-000	0.90 mm (0.035 in.)
H	41368-PS3-000	0.93 mm (0.037 in.)
I	41369-PS3-000	0.96 mm (0.038 in.)
J	41370-PS3-000	0.99 mm (0.039 in.)
K	41371-PS3-000	1.02 mm (0.040 in.)
L	41372-PS3-000	1.05 mm (0.041 in.)
M	41373-PS3-000	1.08 mm (0.043 in.)
N	41374-PS3-000	1.11 mm (0.044 in.)

Transfer Gear Backlash Inspection and Transfer Gear Tooth Contact Inspection

2. Install the 35 mm thrust shim (A) on the transfer driven gear (B), then install the tapered roller bearing (C) using the special tools and a press.

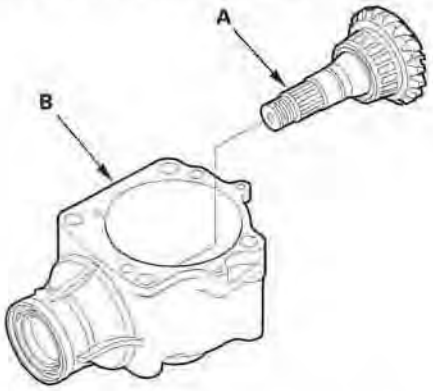


3. Install the bearing outer race, then install the tapered bearing (A) in the companion flange side of the transfer housing.

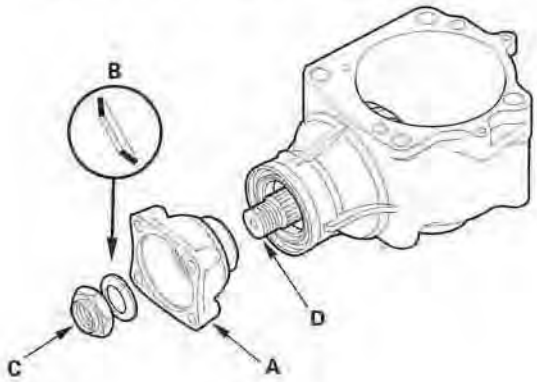


4. Install the new oil seal (B) in the transfer housing using the special tools.

5. Install the transfer driven gear (A) in the transfer housing (B). Do not install the transfer spacer on the transfer driven gear shaft in this step.



6. Install the companion flange (A), conical spring washer (B), and locknut (C) on the transfer driven gear (D). Do not install the O-ring and the back-up ring on the transfer gear shaft in this step.

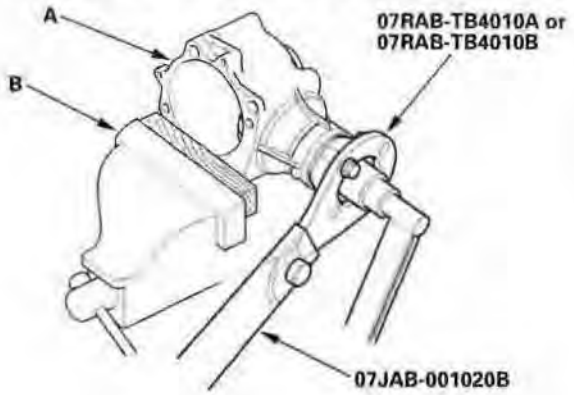


(cont'd)

Transfer Assembly Reassembly (cont'd)

7. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then install the special tools on the companion flange.

   NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



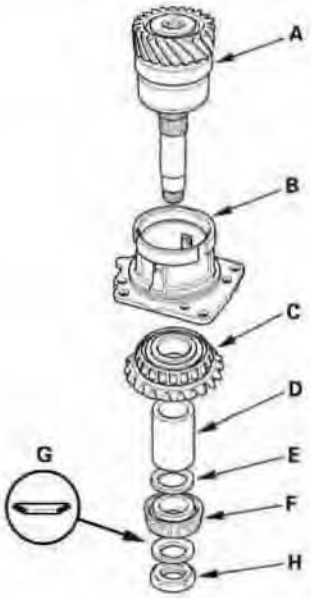
8. Tighten the locknut while measuring the starting torque so the starting torque is within 0.98—1.39 N·m (10.0—14.2 kgf·cm, 8.7—12.3 lbf·in).

   NOTE:
   - Coat the threads of the locknut and the shaft with MTF before installing the locknut.
   - Do not stake the locknut in this step.

   Starting Torque:
   0.98—1.39 N·m
   (10.0—14.2 kgf·cm, 8.7—12.3 lbf·in)

9. Install the transfer shaft assembly (A) in the transfer holder (B), then install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H) on the transfer shaft assembly.

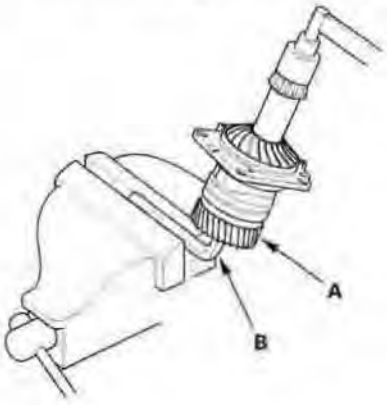
   NOTE:
   - Coat the threads of the locknut and the shaft with MTF before installing the locknut.
   - Do not stake the locknut in this step.



10. Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise, and tighten the locknut.

    NOTE: Do not stake the locknut in this step.

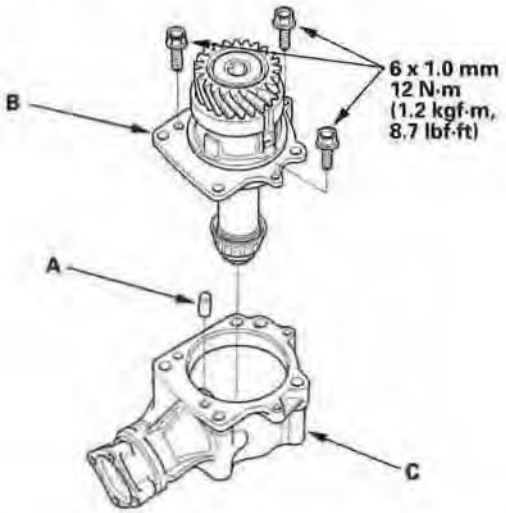
    Torque: 118 N·m (12.0 kgf·m, 86.8 lbf·ft)



11. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

12. Install the dowel pin (A) and transfer holder assembly (B) in the transfer housing (C).

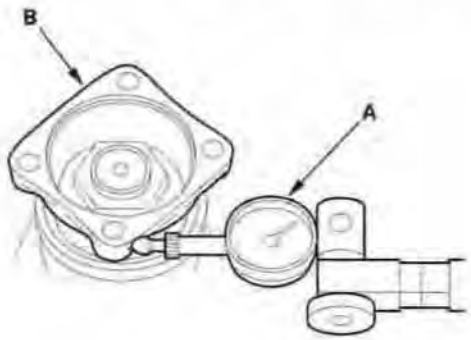
    NOTE: Temporarily install the transfer holder assembly without the O-ring.



13. Rotate the companion flange several times to seat the tapered roller bearing.

14. Set a dial indicator (A) on the companion flange (B), then measure the transfer gear backlash.

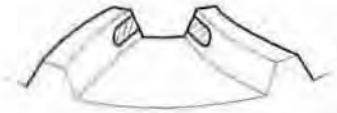
    Standard: 0.06—0.16 mm (0.002—0.006 in.)



15. Check the transfer gear tooth contact pattern.

CORRECT TOOTH CONTACT PATTERN

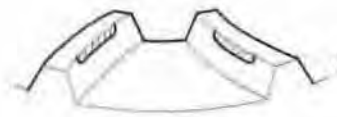
INCORRECT TOOTH CONTACT PATTERN



TOE CONTACT

FLANK CONTACT

HEEL CONTACT



FACE CONTACT

(cont'd)

Transfer Assembly Reassembly (cont'd)

16. If the transfer gear tooth contact is incorrect, adjust the transfer gear tooth contact with a 35 mm or 25 mm thrust shim. If the gear tooth contact is correct, go to step 17.

    NOTE:
    - To select a 35 mm thrust shim.
    - Do not use more than one 35 mm shim to adjust the transfer gear tooth contact.
    - To select the 25 mm thrust shim.
    - Do not use more than one 25 mm shim to adjust the transfer gear tooth contact.

    - **Toe Contact**
      Use a thicker 35 mm thrust shim to move the transfer driven gear shaft toward the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear away from the transfer driven gear shaft to adjust the transfer gear backlash as follows:
      – Increase the thickness of the 25 mm thrust shim.
      – Reduce the thickness of the 76 mm thrust shim by the amount you increased the thickness of the 25 mm thrust shim.

    - **Flank Contact**
      Use a thinner thrust shim to move the transfer drive gear toward the transfer driven gear shaft. Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.

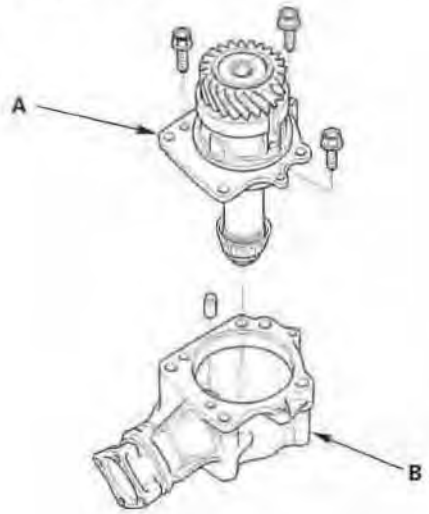
    - **Heel Contact**
      Use a thinner 35 mm thrust shim to move the transfer driven gear shaft away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer driven gear shaft to adjust the transfer gear backlash as follows:
      – Reduce the thickness of the 25 mm thrust shim.
      – Increase the thickness of the 76 mm thrust shim by the amount you reduced the thickness of the 25 mm thrust shim.

    - **Face Contact**
      Use a thicker thrust shim to move the transfer drive gear away from the transfer driven gear shaft. Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.

25 mm Thrust Shim

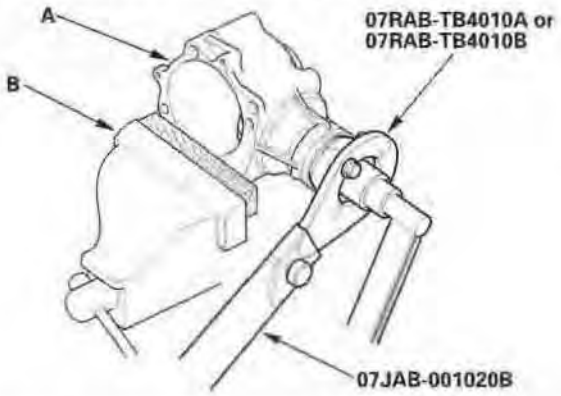
Shim No.	Part Number	Thickness
1.70	29411-P1C-000	1.70 mm (0.067 in.)
1.73	29412-P1C-000	1.73 mm (0.068 in.)
1.76	29413-P1C-000	1.76 mm (0.069 in.)
1.79	29414-P1C-000	1.79 mm (0.070 in.)
1.82	29415-P1C-000	1.82 mm (0.072 in.)
1.85	29416-P1C-000	1.85 mm (0.073 in.)
1.88	29417-P1C-000	1.88 mm (0.074 in.)
1.91	29418-P1C-000	1.91 mm (0.075 in.)
1.94	29419-P1C-000	1.94 mm (0.076 in.)
1.97	29420-P1C-000	1.97 mm (0.078 in.)
2.00	29421-P1C-000	2.00 mm (0.079 in.)
2.03	29422-P1C-000	2.03 mm (0.080 in.)
2.06	29423-P1C-000	2.06 mm (0.081 in.)
2.09	29424-P1C-000	2.09 mm (0.082 in.)
2.12	29425-P1C-000	2.12 mm (0.083 in.)
2.15	29426-P1C-000	2.15 mm (0.085 in.)
2.18	29427-P1C-000	2.18 mm (0.086 in.)
2.21	29428-P1C-000	2.21 mm (0.087 in.)
2.24	29429-P1C-000	2.24 mm (0.088 in.)

17. Remove the transfer holder assembly (A) from the transfer housing (B).



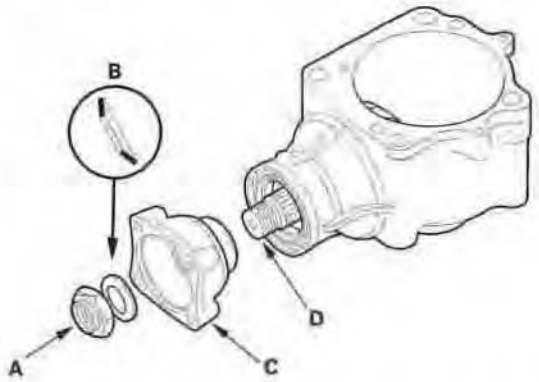
18. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

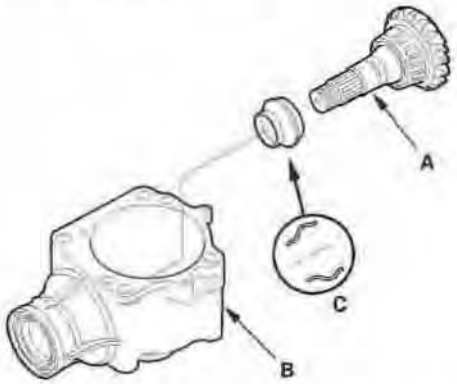


19. Install the special tool on the companion flange, then loosen the locknut.

20. Remove the locknut (A), conical spring washer (B), and companion flange (C) from the transfer driven gear (D).



21. Remove the transfer driven gear (A) from the transfer housing (B).



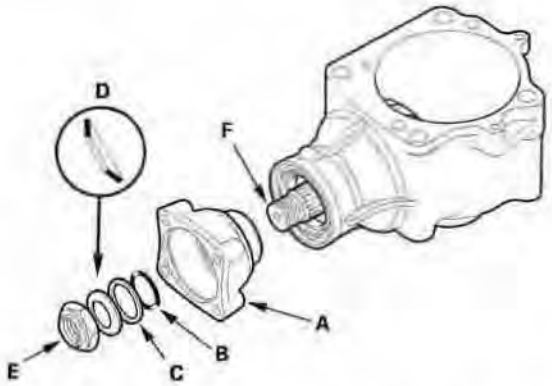
22. Install the new transfer spacer (C) on the transfer driven gear, then install them in the transfer housing.

(cont'd)

Transfer Assembly Reassembly (cont'd)

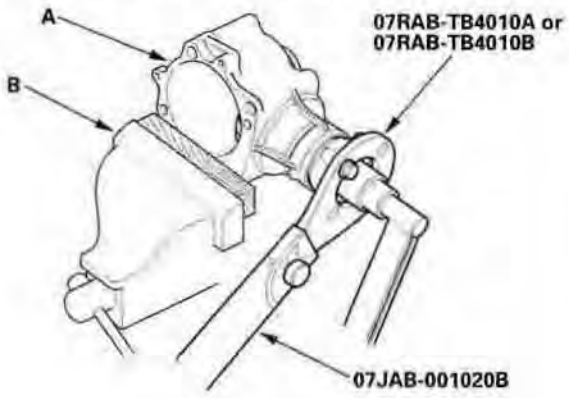
23. Install the companion flange (A), O-ring (B), back-up ring (C), conical spring washer (D), and locknut (E) on the transfer driven gear (F).

    NOTE:
    - Coat the threads of the locknut, O-ring, and transfer shaft with MTF before installing the locknut.
    - Install the conical spring washer in the direction shown.



24. Secure the transfer housing (A) in a bench vise (B) with soft jaws.

    NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



25. Install the special tool on the companion flange, then tighten the transfer driven gear shaft locknut while measuring the starting torque of the transfer driven gear shaft.

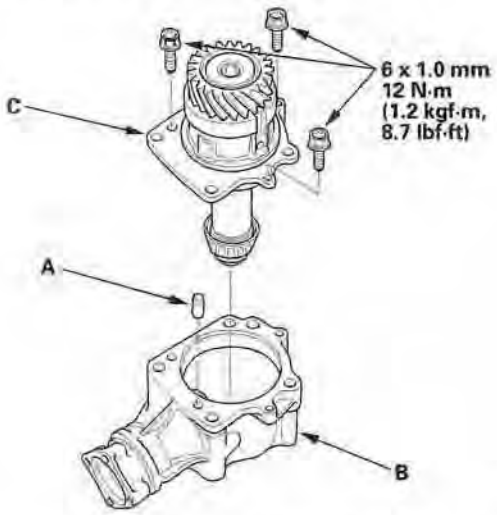
    Starting Torque:
    0.98—1.39 N·m
    (10.0—14.2 kgf·cm, 8.7—12.3 lbf·in)
    Tightening Torque:
    132—260 N·m
    (13.5—26.5 kgf·m, 97.6—192 lbf·ft)

    NOTE:
    - Rotate the companion flange several times to seat the tapered roller bearing, then measure the starting torque.
    - If the starting torque exceeds 1.39 N·m (14.2 kgf·cm, 12.3 lbf·in), replace the transfer spacer and reassemble the parts. Do not adjust the torque with the locknut loose.
    - If the tightening torque exceeds 260 N·m (26.5 kgf·m, 192 lbf·ft), replace the transfer spacer and reassemble the parts.
    - Write down the measurement of the starting torque; it is used to measure the total starting torque.

26. Stake the locknut into the transfer driven gear shaft using a 3.5 mm punch.

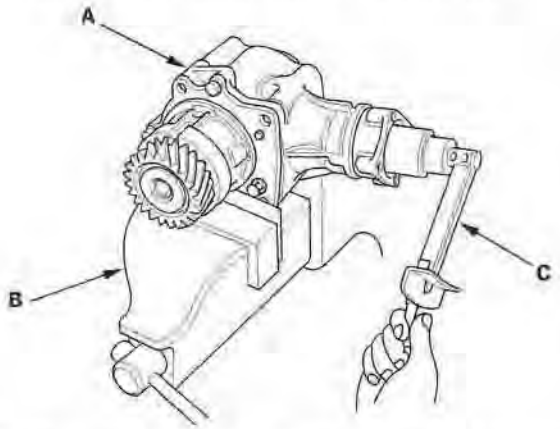
27. Install the dowel pin (A) in the transfer housing (B), then install the transfer holder assembly (C).

NOTE: Temporarily install the transfer holder assembly without the O-ring.



28. Secure the transfer housing (A) in a bench vise (B) with soft jaws, then rotate the companion flange several times to seat the tapered roller bearing.

NOTE: To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



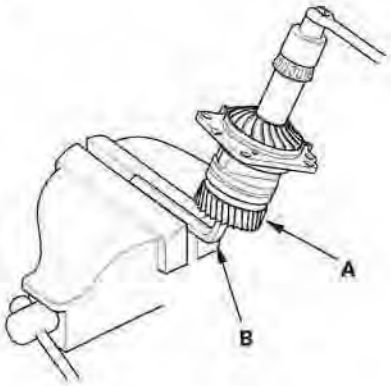
29. Measure the total starting torque using the torque wrench (C).

Total Starting Torque:
1.30—2.47 N·m (13.3—25.2 kgf·cm, 11.5—21.9 lbf·in) + Transfer Driven Gear Shaft Starting Torque Value (written down in step 25).

30. Remove the transfer holder assembly from the transfer housing.

31. If the measurement is not within the specification, go to step 32.
If the measurement is within the specification, go to step 43.

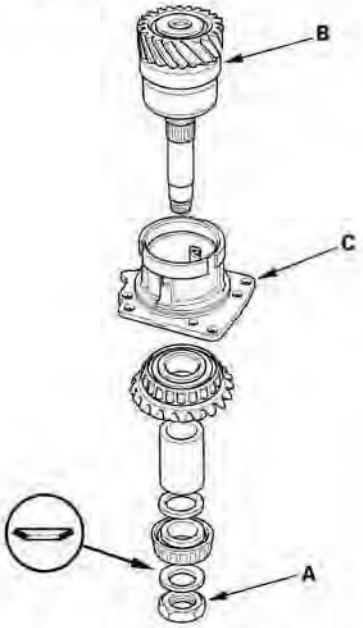
32. Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise then loosen the locknut.



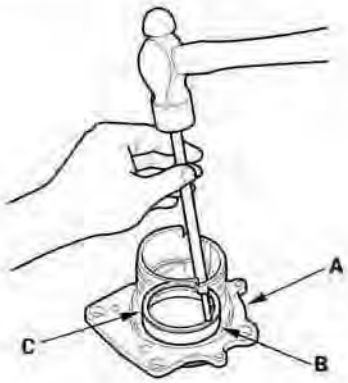
(cont'd)

Transfer Assembly Reassembly (cont'd)

33. Remove the locknut (A) and transfer shaft assembly (B) from the transfer holder (C).



34. Remove the tapered roller bearing outer race (A) and 76 mm thrust shim (B) from the transfer holder (C).

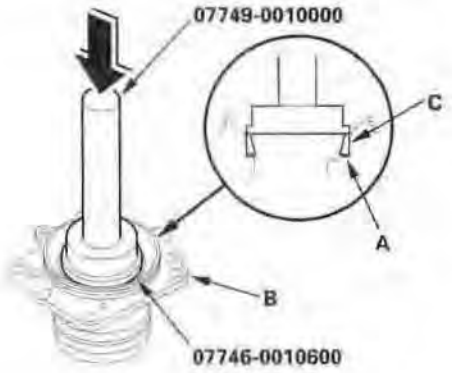


35. Measure the thickness of the removed 76 mm thrust shim, and select a new 76 mm shim.

76 mm Thrust Shim

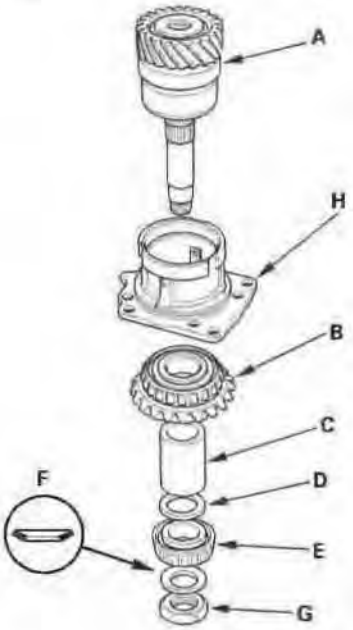
	Part Number	Thickness
A	41361-PPS-000	1.20 mm (0.047 in.)
B	41362-PPS-000	1.23 mm (0.048 in.)
C	41363-PPS-000	1.26 mm (0.049 in.)
D	41364-PPS-000	1.29 mm (0.050 in.)
E	41365-PPS-000	1.32 mm (0.052 in.)
F	41366-PPS-000	1.35 mm (0.053 in.)
G	41367-PPS-000	1.38 mm (0.054 in.)
H	41368-PPS-000	1.41 mm (0.055 in.)
J	41369-PPS-000	1.44 mm (0.057 in.)
K	41370-PPS-000	1.47 mm (0.058 in.)
L	41371-PPS-000	1.50 mm (0.059 in.)
M	41372-PPS-000	1.53 mm (0.060 in.)
N	41373-PPS-000	1.56 mm (0.061 in.)
P	41374-PPS-000	1.59 mm (0.062 in.)
R	41375-PPS-000	1.62 mm (0.064 in.)
S	41376-PPS-000	1.65 mm (0.065 in.)
T	41377-PPS-000	1.68 mm (0.066 in.)
U	41378-PPS-000	1.71 mm (0.067 in.)
W	41379-PPS-000	1.74 mm (0.068 in.)
X	41380-PPS-000	1.77 mm (0.070 in.)
Y	41381-PPS-000	1.80 mm (0.071 in.)
Z	41382-PPS-000	1.83 mm (0.072 in.)
AA	41383-PPS-000	1.86 mm (0.073 in.)
AB	41384-PPS-000	1.89 mm (0.074 in.)
AC	41385-PPS-000	1.92 mm (0.076 in.)
AD	41386-PPS-000	1.95 mm (0.077 in.)
AE	41387-PPS-000	1.98 mm (0.078 in.)
AF	41388-PPS-000	2.01 mm (0.079 in.)
AG	41389-PPS-000	2.04 mm (0.080 in.)
AH	41390-PPS-000	2.07 mm (0.081 in.)
AJ	41391-PPS-000	2.10 mm (0.083 in.)
AK	41392-PPS-000	2.13 mm (0.084 in.)
AL	41393-PPS-000	2.16 mm (0.085 in.)
AM	41394-PPS-000	2.19 mm (0.086 in.)
AN	41395-PPS-000	2.22 mm (0.087 in.)
AP	41396-PPS-000	2.25 mm (0.089 in.)
AR	41397-PPS-000	2.28 mm (0.090 in.)
AS	41398-PPS-000	2.31 mm (0.091 in.)
AT	41399-PPS-000	2.34 mm (0.092 in.)
AU	41400-PPS-000	2.37 mm (0.093 in.)
AW	41401-PPS-000	2.40 mm (0.094 in.)
AX	41402-PPS-000	2.43 mm (0.096 in.)
AY	41403-PPS-000	2.46 mm (0.097 in.)
AZ	41404-PPS-000	2.49 mm (0.098 in.)
BA	41405-PPS-000	2.52 mm (0.099 in.)
BB	41406-PPS-000	2.55 mm (0.100 in.)
BC	41407-PPS-000	2.58 mm (0.102 in.)
BD	41408-PPS-000	2.61 mm (0.103 in.)
BE	41409-PPS-000	2.64 mm (0.104 in.)
BF	41410-PPS-000	2.67 mm (0.105 in.)

36. Install the 76 mm thrust shim (A) in the transfer holder (B).



37. Install the tapered roller bearing outer race (C) using the special tools and a press.

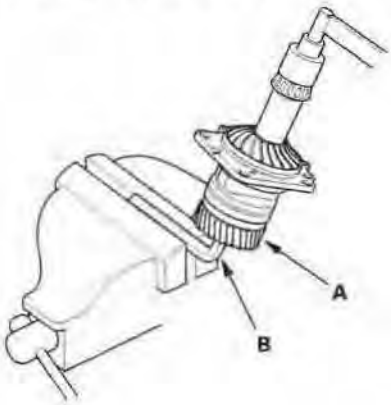
38. Install the transfer shaft assembly (A), transfer drive gear (B), transfer shaft collar (C), 25 mm thrust shim (D), tapered roller bearing (E), conical spring washer (F), and locknut (G) in the transfer holder (H).



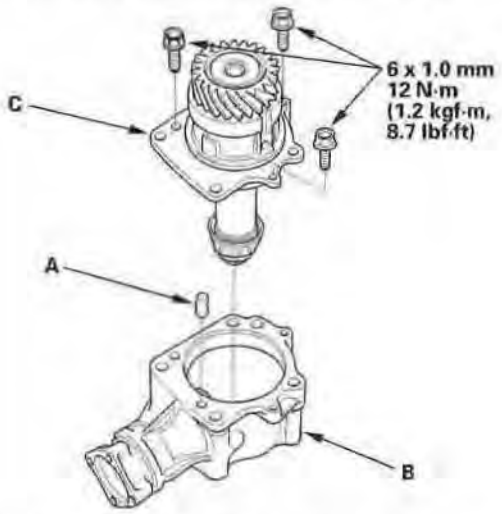
39. Hold the transfer shaft (A) with a 14 mm hex wrench (B) clamped in a bench vise, then tighten the locknut.

NOTE: Do not stake the locknut in this step.

Tightening Torque:
118 N·m (12.0 kgf·m, 86.8 lbf·ft)



40. Install the dowel pin (A) in the transfer housing (B), then install the transfer holder assembly (C).



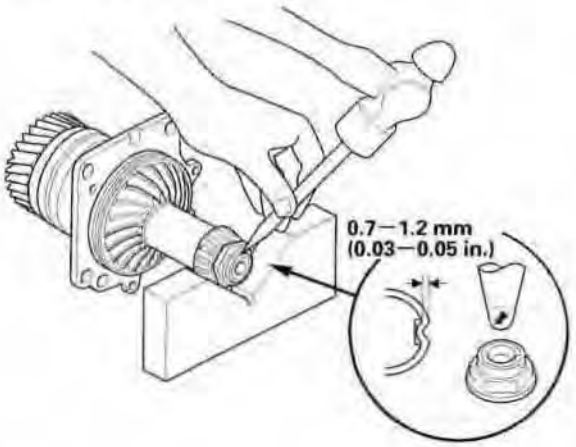
41. Recheck and make sure the total starting torque is within the specification.

(cont'd)

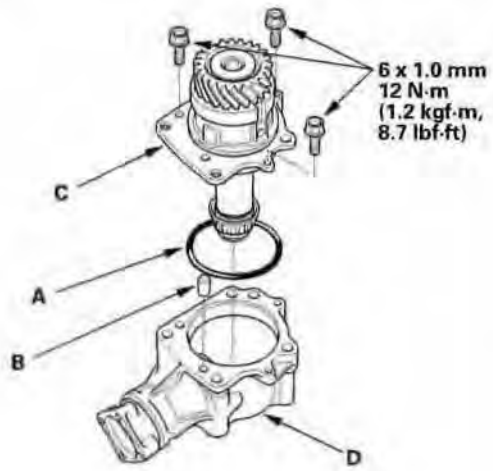
Transfer Assembly Reassembly (cont'd)

42. Remove the transfer holder assembly from the transfer housing.

43. Stake the locknut on the transfer shaft using a 3.5 mm punch.



44. Coat the new O-ring (A) with MTF, install it on the transfer holder, then install the dowel pin (B) and transfer holder assembly (C) in the transfer housing (D).



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If automatic transmission maintenace is required)

The ELEMENT SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items require special precautions and tools, and should be done only by an authorized Honda dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors when the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Automatic Transmission

Automatic Transmission

A/T Gear Position Indicator

A/T Interlock System

Transmission End Cover

Transmission Housing

Valve Body

Torque Converter Housing

Shafts and Clutches

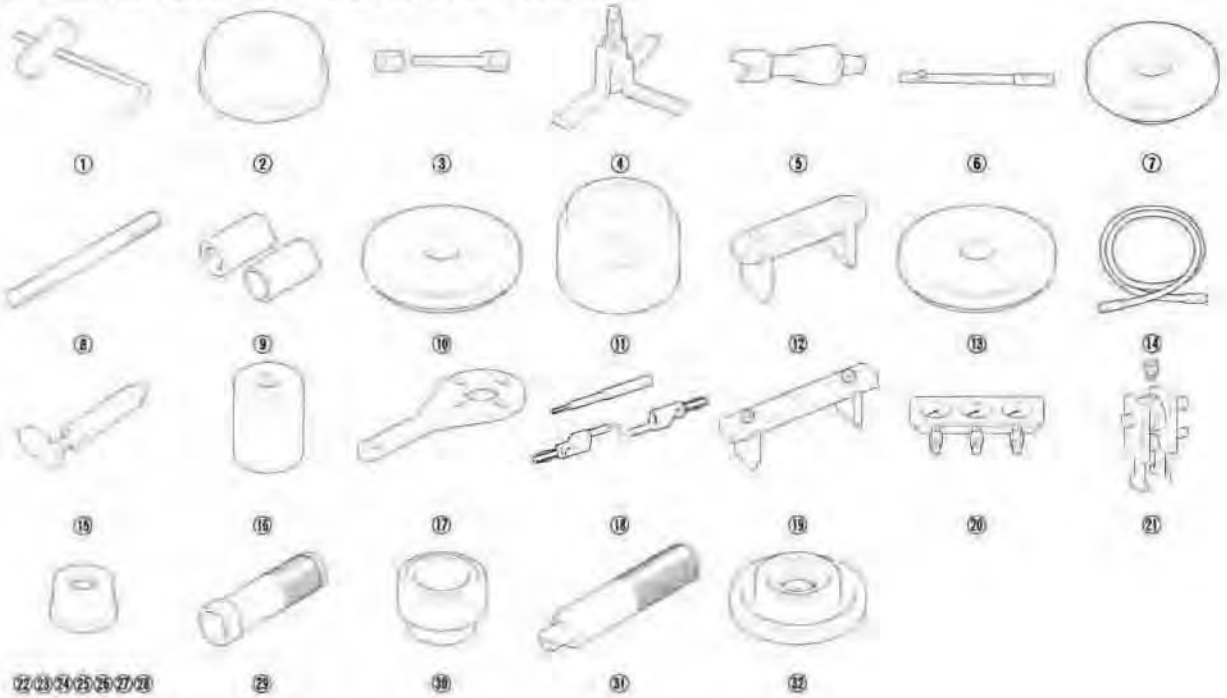
A/T Differential

Transfer Assembly

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07GAB-PF50101 or 07GAB-PF50100	Mainshaft Holder	1
②	07GAD-SD40101	Attachment, 78 x 90 mm	1
③	07GAE-PG40200 or 07GAE-PG4020A	Clutch Spring Compressor Bolt Assembly	1
④	07HAC-PK40102	Housing Puller	1
⑤	07HAJ-PK40201	Preload Inspection Tool	1
⑥	07JAB-001020A	Holder Handle	1
⑦	07JAD-PH80101	Oil Seal Driver Attachment	1
⑧	07JAF-SJ80110	Installer Shaft, 14 x 165 mm	1
⑨	07JAF-SJ80120	Installer Nut, 14 mm	2
⑩	07KAF-PS30120	Bearing Installer Attachment	1
⑪	07LAD-PW50601	Attachment, 40 x 50 mm	1
⑫	07LAE-PX40100	Clutch Spring Compressor Attachment	2
⑬	07LAF-PZ70110	Bearing Installer Attachment	1
⑭	07MAJ-PY4011A	A/T Pressure Hose, 2,210 mm	4
⑮	07MAJ-PY40120	A/T Pressure Hose Adapter	4
⑯	07QAD-P0A0100	Attachment, 42 mm I.D.	1
⑰	07RAB-TB4010A or 07RAB-TB4010B	Companion Flange Holder	1
⑱	07SAZ-001000A	Backprobe Set	2
⑲	07ZAE-PRP0100	Clutch Compressor Attachment	1
⑳	07406-0020400 or 07406-0020401	A/T Oil Pressure Gauge Set w/Panel	1
㉑	07736-A01000B or 07736-A01000A	Adjustable Bearing Puller, 25—40 mm	1
㉒	07746-0010100	Attachment, 32 x 35 mm	1
㉓	07746-0010200	Attachment, 37 x 40 mm	1
㉔	07746-0010300	Attachment, 42 x 47 mm	1
㉕	07746-0010400	Attachment, 52 x 55 mm	1
㉖	07746-0010500	Attachment, 62 x 68 mm	1
㉗	07746-0010600	Attachment, 72 x 75 mm	1
㉘	07746-0010800	Attachment, 22 x 24 mm	1
㉙	07746-0030100	Driver, 40 mm I.D.	1
㉚	07746-0030400	Attachment, 35 mm I.D.	1
㉛	07749-0010000	Driver	1
㉜	07947-SD90101	Oil Seal Driver Attachment	1

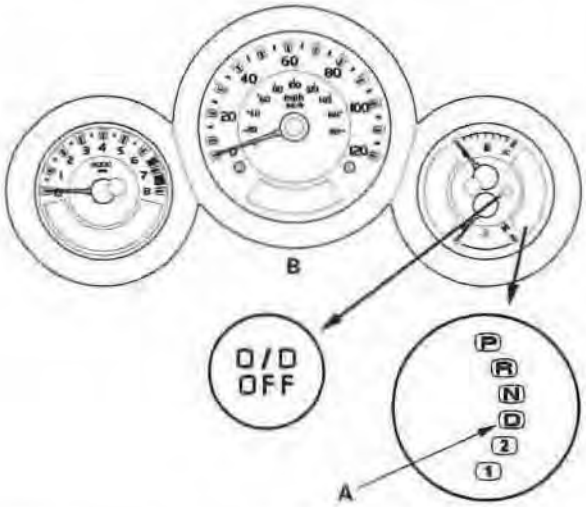
④: If the top arm is too short, replace it with 07SAC-P0Z01001.
⑫: 07HAE-PL50101 may be used to substitute one of these tools.
㉑: Must be used with commercially available 3/8 "-16 " slide hammer.



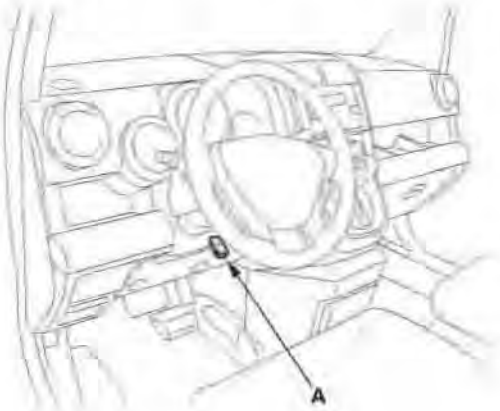
General Troubleshooting Information

How to Check for DTCs with the Honda Diagnostic System

When the powertrain control module (PCM) senses an abnormality in the input or output systems, the D indicator (A) in the gauge assembly (B) will usually blink.



When the data link connector (DLC) (A) (located under the driver's side of the dashboard) is connected to the Honda Diagnostic System (HDS), it will indicate the diagnostic trouble code (DTC) when the ignition switch is turned ON (II).



If the D indicator or malfunction indicator lamp (MIL) has been reported on, or if a driveability problem is suspected, follow this procedure:

1. Connect the HDS to the DLC. (See the HDS Help menu for specific instructions.)
2. Turn the ignition switch ON (II), select A/T system and observe the DTC in the DTCs MENU on the tester screen.
3. Record all fuel and emissions DTCs, A/T DTCs, and freeze data.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except for DTC P0700, DTC P0700 means there is one or more A/T DTCs, and no problems were detected in the fuel and emissions circuit of the PCM).
5. Clear the DTC and data.
6. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for a DTC. If the A/T DTC returns, go to the DTC troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight.

Symptom Troubleshooting Versus DTC Troubleshooting

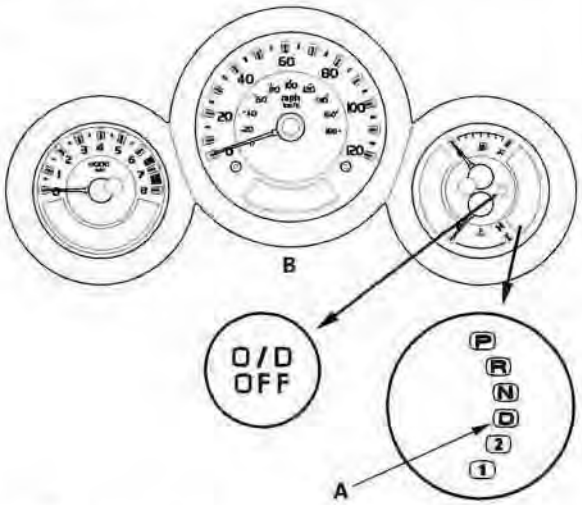
Some symptoms will not trigger diagnostic trouble codes (DTCs) or cause the D indicator to blink. If the malfunction indicator lamp (MIL) was reported ON or the D indicator has been blinking, check for DTCs. If the vehicle has an abnormal symptom, and there are no DTCs stored, go to the Symptom Troubleshooting Index. Check the list of probable cause(s) for the symptom in the sequence listed, until you find the problem.

(cont'd)

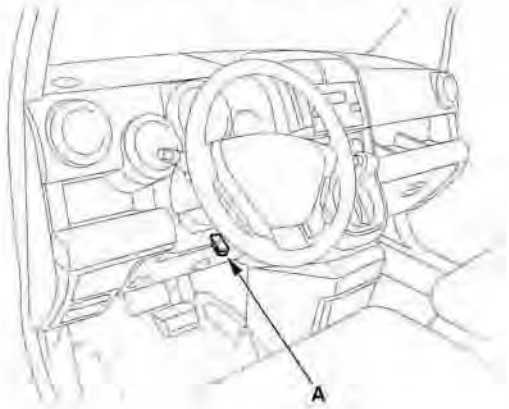
General Troubleshooting Information (cont'd)

How to Check for DTCs with the SCS Mode (retrieving the flash codes)

When the PCM senses an abnormality in the input or output system, the D indicator (A) in the gauge assembly (B) will usually blink.



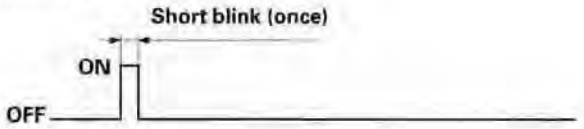
When the D indicator has been reported on, connect the HDS to the DLC (A) (located under the driver's side of the dashboard). Turn the ignition switch ON (II), from the SELECT MODE MENU select SCS mode, then the D indicator will indicate (blink) the DTC.



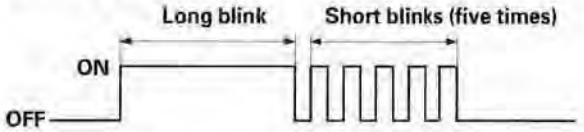
If the D indicator and the MIL come on at the same time, or if a driveability problem is suspected, follow this procedure:

1. Connect the HDS to the DLC. (See the HDS Help menu for specific instructions.)
2. Turn the ignition switch ON (II), from the SELECT MODE MENU select SCS mode, then observe the D indicator in the gauge assembly.
   Codes 1 through 9 are indicated by individual short blinks. Code 10 and above are indicated by a series of long and short blinks. One long blink equals 10 short blinks. Add the long and short blinks together to determine the code.

Example: DTC 1-1



Example: DTC 15-5

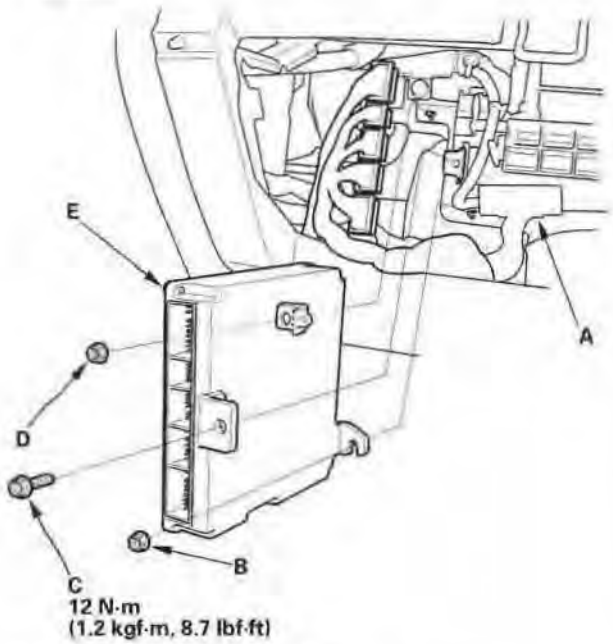


3. Record all fuel and emissions DTCs and A/T DTCs.
4. If there is a fuel and emissions DTC, first check the fuel and emissions system as indicated by the DTC (except DTC 70, DTC 70 means there is one or more A/T DTCs, and no problems were detected in the fuel and emissions circuit of the PCM).
5. Clear the DTC and data.
6. Drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, and then recheck for DTC. If the A/T DTC returns, go to the DTC Troubleshooting Index. If the DTC does not return, there was an intermittent problem within the circuit. Make sure all pins and terminals in the circuit are tight.

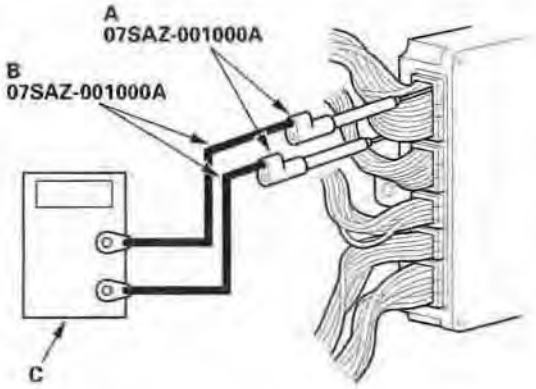
How to Troubleshoot Circuits at the PCM

Special Tools Required
Backprobe set 07SAZ-001000A (two required)

1. Remove the glove box stops, then open the glove box.
2. Jump the SCS line with the HDS.
3. Remove the 20P harness connector (A) from its bracket.



4. Disconnect all PCM connectors.
5. Remove the relays from the glove box frame.
6. Loosen the mounting nut (B) on the lower right of the PCM, and remove the mounting bolt (C) and nut (D) on the left of the PCM.
7. Lift the PCM up to clear the mounting nut on the lower right of the PCM, then pull out the PCM (E).
8. Reconnect all PCM connectors and exit the SCS menu.
9. Connect the backprobe adapters (A) to the stacking patch cords (B), and connect the cords to a multimeter (C).



10. Using the wire insulation as a guide for the contoured tip of the backprobe adapter, gently slide the tip into the connector from the wire side until it touches the end of the wire terminal.
11. If you cannot get to the wire side of the connector or the wire side is sealed, disconnect the connector and use the tester probe to probe the connectors from the terminal side. Do not force the probe into the connector.

(cont'd)

General Troubleshooting Information (cont'd)

Clear A/T DTCs, and PCM Reset Procedures

1. Connect the HDS to the DLC.
2. Turn the ignition switch ON (II).
3. Clear the DTC(s) on the HDS screen.

OBD Status

The OBD Status shows the current system status of each DTC and all of the parameters. This function is used to see if the technician's repair was successfully finished. The results of diagnostic tests for the DTC are displayed as:

- PASS: On Board Diagnosis is successfully finished.
- FAILED: On Board Diagnosis has finished but failed.
- NOT COMPLETED: The On Board diagnosis was running but is out of the Enable conditions of the DTC.

PCM Updating and Substitution for Testing

Special Tools Required
Honda Interface Module (HIM) EQS05A35570

Use this procedure when you have to substitute a known-good PCM in a troubleshooting procedure. Update the PCM only if the PCM does not have the latest software loaded.

Do not turn the ignition switch OFF while updating the PCM. If you turn the ignition switch OFF, the PCM can be damaged.

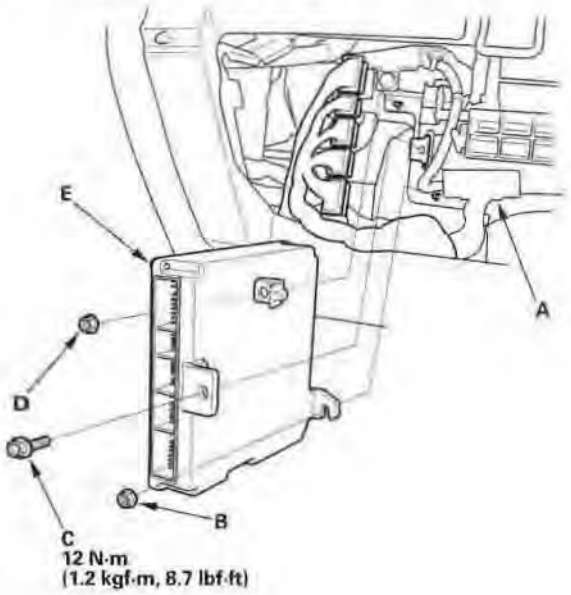
How to Update the PCM

NOTE:
- To ensure the latest program is installed, update a PCM whenever the PCM is substituted or replaced.
- You cannot update a PCM with the program it already has. It will only accept a new program.
- Before you update the PCM, make sure the vehicle's battery is fully charged.
- To prevent PCM damage, do not operate any electrical system; audio system, brakes, air conditioning, power windows, moonroof, and door locks, during the update.
- If you need to diagnose the Honda interface module (HIM) because the HIM's red (#3) light came on or was flashing during the update, leave the ignition switch in the ON (II) position when you disconnect the HIM from the DLC. This will prevent PCM damage.

1. Turn the ignition switch ON (II). Do not start the engine.
2. Connect the Honda interface module (HIM) to the DLC located under the left end of the dash.
3. Update the PCM according to the procedures described on the HIM label. If the software in the PCM is the latest, replace the PCM.

How to Substitute the PCM

1. Connect the HDS to the DLC.
2. Turn the ignition switch OFF.
3. Jump the SCS line with the HDS.
4. Remove the glove box stops, then open the glove box.
5. Remove the 20P harness connector (A) from its bracket, and disconnect PCM connectors.



6. Disconnect all PCM connectors.
7. Remove the relays from the glove box frame.
8. Loosen the PCM mounting nut (B) on the lower right of the PCM, and remove the mounting bolt (C) and nut (D) on the left of the PCM.
9. Lift the PCM up to clear the mounting nut on the lower right of the PCM, then pull out the PCM (E).
10. Install a known-good PCM.
11. Rewrite the immobilizer code with the PCM replacement procedure in the HDS; this will allow you to start the engine.
12. After completing your test, reinstall the original PCM and rewrite the immobilizer code with the PCM replacement procedure in the HDS again.

How to End a Troubleshooting Session

This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.
2. Connect the HDS to the DLC.
3. Turn the ignition switch ON (II).
4. Clear the DTC(s) on the HDS screen.
5. Turn the ignition switch ON (II).
6. Start the engine in the P or N position, and warm it up to normal operating temperature (the radiator fan comes on).
7. To verify that the problem is repaired, test-drive the vehicle for several minutes at speeds over 30 mph (50 km/h) or in freeze data range.

DTC Troubleshooting Index

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

DTC *(1)	D Indicator	MIL	Detection Item	Page
P0705 (5-2) *(1)	Blinks	ON	Transmission range switch (multiple shift-position input)	(see page 14-70)
P0706 (6-2) *(1)	OFF	ON	Transmission range switch (open)	(see page 14-79)
P0711 (28-5) *(2)	Blinks	OFF	ATF temperature sensor (range/performance)	(see page 14-83)
P0712 (28-3) *(2)	Blinks	OFF	ATF temperature sensor (short)	(see page 14-84)
P0713 (28-4) *(2)	Blinks	OFF	ATF temperature sensor (open)	(see page 14-85)
P0716 (15-5) *(2)	Blinks	ON	Input shaft (mainshaft) speed sensor (range/performance)	(see page 14-87)
P0717 (15-3) *(2)	Blinks	ON	Input shaft (mainshaft) speed sensor (no signal input)	(see page 14-91)
P0718 (15-6) *(2)	Blinks	ON	Input shaft (mainshaft) speed sensor (intermittent failure)	(see page 14-95)
P0721 (9-5) *(2)	Blinks	ON	Output shaft (countershaft) speed sensor (range/performance)	(see page 14-97)
P0722 (9-3) *(2)	Blinks	ON	Output shaft (countershaft) speed sensor (no signal input)	(see page 14-101)
P0723 (9-6) *(2)	Blinks	ON	Output shaft (countershaft) speed sensor (intermittent failure)	(see page 14-105)
P0731 (64-1)	Blinks	OFF	1st gear incorrect ratio	(see page 14-107)
P0732 (64-2)	Blinks	OFF	2nd gear incorrect ratio	(see page 14-108)
P0733 (64-3)	Blinks	OFF	3rd gear incorrect ratio	(see page 14-109)
P0734 (64-4)	Blinks	OFF	4th gear incorrect ratio	(see page 14-110)
P0741 (40-3)	Blinks	OFF	Torque converter clutch circuit performance or stuck OFF	(see page 14-111)
P0747 (76-4)	Blinks	ON	A/T clutch pressure control solenoid valve A stuck ON	(see page 14-112)
P0752 (70-4)	Blinks	ON	Shift solenoid valve A stuck ON	(see page 14-113)
P0761 (72-3)	Blinks	ON	Shift solenoid valve C stuck OFF	(see page 14-114)

NOTE:

* (1): The DTC in parentheses is the Honda code that you will see when you use the HDS. The first number(s) before the - (hyphen) is the flash code the D indicator indicates when the data link connector is connected to the HDS, and HDS in SCS mode.
* (2): This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

DTC *(1)	D Indicator	MIL	Detection Item	Page
P0771 (74-3)	Blinks	ON	Shift solenoid valve E stuck OFF	(see page 14-115)
P0776 (77-3)	Blinks	ON	A/T clutch pressure control solenoid valve B stuck OFF	(see page 14-116)
P0777 (77-4)	Blinks	ON	A/T clutch pressure control solenoid valve B stuck ON	(see page 14-117)
P0780 (45-1)	Blinks	ON	Shift control system	(see page 14-118)
P0796 (78-3)	Blinks	ON	A/T clutch pressure control solenoid valve C stuck OFF	(see page 14-119)
P0797 (78-4)	Blinks	ON	A/T clutch pressure control solenoid valve C stuck ON	(see page 14-120)
P0812 (62-2) *(2)	Blinks	OFF	Transmission range switch ATP RVS switch	(see page 14-121)
P0842 (25-3) *(2)	Blinks	ON	2nd clutch transmission fluid pressure switch (short or stuck ON)	(see page 14-123)
P0843 (25-4) *(2)	Blinks	ON	2nd clutch transmission fluid pressure switch (open or stuck OFF)	(see page 14-125)
P0847 (26-3) *(2)	Blinks	OFF	3rd clutch transmission fluid pressure switch (short or stuck ON)	(see page 14-127)
P0848 (26-4) *(2)	Blinks	OFF	3rd clutch transmission fluid pressure switch (open or stuck OFF)	(see page 14-129)
P0962 (16-3) *(2)	Blinks	ON	A/T clutch pressure control solenoid valve A (open/short)	(see page 14-131)
P0963 (16-4) *(2)	Blinks	ON	A/T clutch pressure control solenoid valve A	(see page 14-133)
P0966 (23-3) *(2)	Blinks	ON	A/T clutch pressure control solenoid valve B (open/short)	(see page 14-135)
P0967 (23-4) *(2)	Blinks	ON	A/T clutch pressure control solenoid valve B	(see page 14-137)
P0970 (29-3) *(2)	Blinks	ON	A/T clutch pressure control solenoid valve C (open/short)	(see page 14-139)
P0971 (29-4) *(2)	Blinks	ON	A/T clutch pressure control solenoid valve C	(see page 14-141)
P0973 (7-3) *(2)	Blinks	ON	Shift solenoid valve A (short)	(see page 14-143)

NOTE:

* (1): The DTC in parentheses is the Honda code that you will see when you use the HDS. The first number(s) before the - (hyphen) is the flash code the D indicator indicates when the data link connector is connected to the HDS, and HDS in SCS mode.
* (2): This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

(cont'd)

DTC Troubleshooting Index (cont'd)

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

DTC *(1)	D Indicator	MIL	Detection Item	Page
P0974 (7-4) *(2)	Blinks	ON	Shift solenoid valve A (open)	(see page 14-145)
P0976 (8-3) *(2)	Blinks	ON	Shift solenoid valve B (short)	(see page 14-147)
P0977 (8-4) *(2)	Blinks	ON	Shift solenoid valve B (open)	(see page 14-149)
P0979 (22-3) *(2)	Blinks	ON	Shift solenoid valve C (short)	(see page 14-151)
P0980 (22-4) *(2)	Blinks	ON	Shift solenoid valve C (open)	(see page 14-153)
P0985 (61-3) *(2)	Blinks	ON	Shift solenoid valve E (short)	(see page 14-155)
P0986 (61-4) *(2)	Blinks	ON	Shift solenoid valve E (open)	(see page 14-157)
P1731 (45-3)	Blinks	ON	Shift control system • Shift solenoid valve E stuck ON • Shift valve E stuck • A/T clutch pressure control solenoid valve A stuck OFF • CPC valve A stuck	(see page 14-159)
P1732 (45-4)	Blinks	ON	Shift control system • Shift solenoid valves B or C stuck ON • Shift valves B or C stuck	(see page 14-161)
P1735 (45-7)	Blinks	ON	Shift control system • Shift solenoid valves B or C stuck OFF • Shift solenoid valve E stuck ON • Shift valves B, C, or E stuck • A/T clutch pressure control solenoid valve A stuck OFF • CPC valve A stuck	(see page 14-163)
P1736 (45-8)	Blinks	ON	Shift control system • Shift solenoid valve B stuck OFF • Shift solenoid valve E stuck ON • Shift valve B or E stuck • A/T clutch pressure control solenoid valve A stuck OFF • CPC valve A stuck	(see page 14-165)

NOTE:

* (1): The DTC in parentheses is the Honda code that you will see when you use the HDS. The first number(s) before the - (hyphen) is the flash code the D indicator indicates when the data link connector is connected to the HDS, and HDS in SCS mode.
* (2): This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

Symptom Troubleshooting Index

Symptom	Probable cause(s)	Notes
When you turn the ignition switch ON (II), the D indicator comes on and stays on in all shift lever positions, or it never comes on at all	Communication line between multiplex control unit and gauge assembly defective	Check if the MIL indicates a code for the communication line between the multiplex control unit and gauge assembly (see page 22-149).
D, 2, or 1 indicator does not come on when the shift lever is in that position	Communication line between multiplex control unit and gauge assembly defective	Check if the MIL indicates a code for the communication line between the multiplex control unit and gauge assembly (see page 22-149).
The transmission still shifts into 4th gear in D even though the O/D switch is pushed	A problem in the O/D switch circuit	Check the O/D switch circuit (see page 14-233).
Shift lever cannot be moved from P while you're pressing on the brake pedal	A problem in the shift lock system (interlock system)	Check the interlock system - shift lock system circuit (see page 14-242).
Ignition switch cannot be moved from ACC (I) to LOCK (0) (key is pushed in, shift lever in P)	A problem in the key interlock system (interlock system)	Check the interlock system - key interlock system circuit (see page 14-243).

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Engine runs, but vehicle does not move in any gear	1. Low ATF level 2. Shift cable broken or out of adjustment 3. Joint in shift cable at transmission or body worn 4. ATF pump worn or binding 5. Regulator valve stuck or spring worn 6. ATF strainer clogged 7. Mainshaft worn or damaged 8. Final gears worn or damaged 9. Transmission-to-engine assembly error 10. Axle disengaged	• Check the ATF level, and check the ATF cooler lines for leakage and loose connections. If necessary, clean the ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission selector control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the line pressure. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it tops out, it will block the fluid return passage and result in damage. • Check the ATF strainer for debris. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. • Inspect the differential pinion gears for wear. If the differential pinion gears are worn, replace the differential assembly, replace the ATF strainer, thoroughly clean the transmission, and clean the torque converter, cooler, and lines.
Vehicle moves in 2 and R, but not in D or 1	1. 1st accumulator defective 2. 1st gears worn or damaged 3. 1st clutch defective	• Check the 1st clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace the end cover. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.

Symptom	Probable cause(s)	Notes
Vehicle moves in D, 1, and R, but not in 2	1. 2nd accumulator defective 2. 2nd gears worn or damaged 3. 2nd clutch defective	• Check the 2nd clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate.
Vehicle moves in D, 2, and 1, but not in R	1. Shift solenoid valve E defective 2. Shift fork shaft stuck 3. Shift valve E defective 4. 4th/reverse accumulator defective 5. 4th clutch defective 6. Reverse gears worn or damaged	• Check the D indicator, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-rings for wear and damage. • Check for a missing shift fork bolt on the shift fork shaft. • Check the 4th clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the reverse selector gear teeth chamfers, and inspect the engagement teeth chamfers of the countershaft 4th gear and reverse gear. Replace the reverse gears and the reverse selector if they are worn or damaged. If the transmission makes a clicking, grinding, or whirring noise, also replace the mainshaft 4th gear, reverse idler gear, and countershaft 4th gear.
Poor acceleration; flares on starting off in D; stall speed high in 2 and 1, and in D in 1st and 2nd	1. Low ATF level 2. Shift cable broken or out of adjustment 3. ATF pump worn or binding 4. Regulator valve stuck or spring worn 5. ATF strainer clogged 6. Torque converter check valve defective	• Check the ATF level, and check the ATF cooler lines for leakage and loose connections. If necessary, clean the ATF cooler lines. • Check for a loose shift cable at the shift lever and the transmission selector control shaft. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Check the ATF strainer for debris. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Poor acceleration; flares on starting off in D; stall speed high when starting off in 2	2nd clutch defective	• Check the 2nd clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate.
Poor acceleration; flares on starting off in D; stall speed high in R	1. Shift cable broken or out of adjustment 2. 4th clutch defective	• Check for a loose shift cable at the shift lever and the transmission selector control shaft. • Check the 4th clutch pressure in the D and R positions. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate.
Poor acceleration; stall speed low in 2 and 1, and in D in 1st and 2nd	1. Shift solenoid valve E defective 2. Torque converter one-way clutch defective 3. Engine output low 4. Torque converter clutch piston defective 5. Lock-up shift valve defective	• Check the D indicator, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-ring for wear and damage. • Replace the torque converter.
Poor acceleration; stall speed low in R	1. Engine output low 2. Torque converter clutch piston defective 3. Lock-up shift valve defective	Replace the torque converter.

Symptom	Probable cause(s)	Notes
Engine idle vibration	1. Low ATF level 2. Shift solenoid valve E defective 3. Drive plate defective or transmission misassembled 4. Engine output low 5. Torque converter clutch piston defective 6. ATF pump worn or binding 7. Lock-up shift valve defective 8. Misadjusted engine and transmission mounts	• Check the ATF level, and check the ATF cooler lines for leakage and loose connections. If necessary, clean the ATF cooler lines. • Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Inspect the ATF strainer for clogging with particles of steel or aluminum. If the ATF strainer is clogged, replace it, and clean the torque converter, cooler, and lines. • Check the D indicator, and check for loose connectors. Inspect the shift solenoid valve E for seizure, and O-rings for wear and damage. • Check for a misinstalled/damaged drive plate. • Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts. • Replace the torque converter.
Vehicle moves in N	1. Excessive ATF 2. Foreign material in separator plate orifice 3. Relief valve defective 4. 1st clutch defective 5. 2nd clutch defective 6. 3rd clutch defective 7. 4th clutch defective 8. Clutch end-plate-to-top-disc clearance incorrect 9. Needle bearing seized up, worn, or damaged 10. Thrust washer seized up, worn, or damaged	• Check the ATF level, and drain the ATF if it is over-filled. • Check the 1st, 2nd, 3rd and 4th clutch pressures. • Check the ATF strainer for debris. If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump. If the ATF pump is OK, find the damaged components that caused the debris. If no cause for contamination is found, replace the torque converter. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal (1st and 2nd) for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and the O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and the O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 3rd clutch feed pipe is loose or damaged.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Late shift after shifting from N to D, or excessive shock when shifted into D	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. A/T clutch pressure control solenoid valve B defective 4. A/T clutch pressure control solenoid valve C defective 5. Shift cable broken or out of adjustment 6. Joint in shift cable and transmission or body worn 7. Input shaft (mainshaft) speed sensor defective 8. Output shaft (countershaft) speed sensor defective 9. ATF temperature sensor defective 10. Foreign material in separator plate orifice 11. Servo control valve defective 12. 1st accumulator defective 13. 1st check ball stuck 14. Lock-up shift valve defective 15. 1st clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the input shaft (mainshaft) speed sensor and output shaft (countershaft) speed sensor installation. • Check for a loose shift cable at the shift lever and the transmission selector control shaft. • Check the 1st clutch pressure. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and the O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.
Late shift after shifting from N to R, or excessive shock when shifted into R	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Shift cable broken or out of adjustment 4. Joint in shift cable at transmission or body worn 5. Mainshaft speed sensor defective 6. Countershaft speed sensor defective 7. ATF temperature sensor defective 8. Shift fork shaft stuck 9. Foreign material in separator plate orifice 10. Shift valve E defective 11. 4th/reverse accumulator defective 12. Lock-up shift valve defective 13. 4th clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the input shaft (mainshaft) speed sensor and output shaft (countershaft) speed sensor installation. • Check for a loose shift cable at the shift lever and the transmission selector control shaft. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Check for a missing shift fork bolt on the shift fork shaft. • Check the 4th clutch pressure. • Inspect the servo valve and O-ring.

Symptom	Probable cause(s)	Notes
The A/T does not shift	1. Input shaft (mainshaft) speed sensor defective 2. Output shaft (countershaft) speed sensor defective	Check the D indicator, and check for loose connectors. Check the input shaft (mainshaft) and output shaft (countershaft) speed sensor installation.
Excessive shock or flares on all upshifts and downshifts	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. Input shaft (mainshaft) speed sensor defective 4. Output shaft (countershaft) speed sensor defective 5. ATF temperature sensor defective 6. Foreign material in separator plate orifice	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the input shaft (mainshaft) speed sensor and output shaft (countershaft) speed sensor installation.
Excessive shock or flares on 1-2 upshift or 2-1 downshift	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. A/T clutch pressure control solenoid valve B defective 4. A/T clutch pressure control solenoid valve C defective 5. 2nd clutch transmission fluid pressure switch defective 6. Foreign material in separator plate orifice 7. 1st accumulator defective 8. 2nd accumulator defective 9. 1st check ball stuck 10. 2nd check ball stuck 11. Lock-up shift valve defective 12. 1st clutch defective 13. 2nd clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the 1st and 2nd clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect the clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If the discs and plates are OK, adjust the clearance with the clutch end plate. • Inspect the 1st clutch feed pipe. If the 1st clutch feed pipe is scored, replace it and the O-ring under the feed pipe guide. • Replace the secondary shaft if the bushing for the 1st clutch feed pipe is loose or damaged.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Excessive shock or flares on 2-3 upshift or 3-2 downshift	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. 3rd clutch transmission fluid pressure switch defective 4. Foreign material in separator plate orifice 5. 2nd accumulator defective 6. 3rd accumulator defective 7. 2nd check ball stuck 8. 2nd clutch defective 9. 3rd clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket for wear and damage, and inspect the solenoid valves for seizure. • Check the 2nd and 3rd clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal (2nd) for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and the O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 3rd clutch feed pipe is loose or damaged.
Excessive shock or flares on 3-4 upshift or 4-3 downshift	1. A/T clutch pressure control solenoid valve B defective 2. A/T clutch pressure control solenoid valve C defective 3. Foreign material in separator plate orifice 4. 3rd accumulator defective 5. 4th accumulator defective 6. 3rd clutch defective 7. 4th clutch defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket and O-rings for wear and damage, and inspect the solenoid valves for seizure. • Check the 3rd and 4th clutch pressures. • Inspect the clutch piston, clutch piston check valve, and O-rings. Check the spring retainer and retainer seal for wear and damage. Inspect the clutch end-plate-to-top-disc clearance. If the clearance is out of tolerance, inspect the clutch discs and plates for wear and damage. If the discs are worn or damaged, replace them as a set. Inspect clutch waved-plate height. If the height is out of tolerance, replace the waved-plate. If they are OK, adjust the clearance with the clutch end plate. • Inspect the 3rd clutch feed pipe. If the 3rd clutch feed pipe is scored, replace it and the O-ring under the feed pipe guide. • Replace the mainshaft if the bushing for the 3rd clutch feed pipe is loose or damaged.

Symptom	Probable cause(s)	Notes
Noise from transmission in all shift lever positions	1. ATF pump worn or binding 2. Mainshaft bearing, countershaft bearing, or secondary shaft bearing defective	• Improper alignment of ATF pump and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high pitched squeak. • Be careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools. • Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it tops out, it will block the fluid return passage and result in damage. • Inspect the ATF strainer for clogging with particles of steel or aluminum. If the ATF strainer is clogged, replace it, and clean the torque converter, cooler, and lines. • Inspect the mainshaft, countershaft, and secondary shaft for wear or damage.
Vehicle does not accelerate above 31 mph (50 km/h)	Torque converter one-way clutch defective	Replace the torque converter.
Vibration in all shift lever positions	Drive plate defective or transmission misassembled	• Check for a misinstalled/damaged drive plate. • Set idle rpm in gear to the specified idle speed. If still no good, adjust the engine and transmission mounts.

(cont'd)

Symptom Troubleshooting Index (cont'd)

Symptom	Probable cause(s)	Notes
Shift lever does not operate smoothly	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable at transmission or body worn	• Check the D indicator, and check for loose connectors. Inspect the transmission range switch for operation. • Check for a loose shift cable at the shift lever and the transmission selector control shaft.
Transmission does not shift into P	1. Shift cable broken or out of adjustment 2. Joint in shift cable and transmission or body worn 3. Park mechanism defective	• Check for a loose shift cable at the shift lever and the transmission selector control shaft. • Check the park pawl spring installation and the park lever spring installation. If installation is incorrect, install the spring correctly. Make sure that the park lever stop is not installed upside down. Check the distance between the park pawl shaft and park lever roller pin. If the distance is out of tolerance, adjust the distance with the park lever stop.
Torque converter clutch does not disengage	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Torque converter clutch piston defective 4. Lock-up shift valve defective 5. Lock-up control valve defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter.
Torque converter clutch does not operate smoothly	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Torque converter clutch piston defective 4. Torque converter check valve defective 5. Lock-up shift valve defective 6. Lock-up control valve defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter.

Symptom	Probable cause(s)	Notes
Torque converter clutch does not engage	1. Shift solenoid valve E defective 2. A/T clutch pressure control solenoid valve A defective 3. Input shaft (mainshaft) speed sensor defective 4. Output shaft (countershaft) speed sensor defective 5. Torque converter clutch piston defective 6. Torque converter check valve defective 7. Lock-up shift valve defective 8. Lock-up control valve defective	• Check the D indicator, and check for loose connectors. Inspect the solenoid valve filter/ gasket for wear and damage, and inspect the solenoid valves for seizure. • Replace the torque converter. • Check the input shaft (mainshaft) speed sensor and output shaft (countershaft) speed sensor installation.
A/T gear position indicator does not indicate shift lever positions	1. Transmission range switch defective or out of adjustment 2. Shift cable broken or out of adjustment 3. Joint in shift cable at transmission or body worn	• Check the D indicator, and check for loose connectors. Inspect the transmission range switch operation. • Check for a loose shift cable at the shift lever and the transmission selector control shaft.
Speedometer and odometer do not work	Output shaft (countershaft) speed sensor defective	• Check the D indicator, and check for loose connectors. Inspect the transmission range switch operation. • Check the output shaft (countershaft) speed sensor installation.
The engine does not rev to high rpm, and the transmission upshifts at low rpm	VTEC rocker arms defective	Check the VTEC rocker arms as described.

System Description

General Operation

The automatic transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled unit which provides 4 speeds forward and 1 reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears, and Clutches
The torque converter consists of a pump, turbine, and stator assembly in a single unit. The converter housing (pump) is connected to the engine crankshaft and turns as the engine turns. Around the outside of the torque converter is a ring gear which meshes with the starter pinion when the engine is being started. The entire torque converter assembly serves as a flywheel while transmitting power to the transmission mainshaft, the transmission has three parallel shafts; the mainshaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft, and includes the 3rd and 4th clutches, and gears for 3rd, 4th, reverse, and idler. The mainshaft reverse gear is integral with the mainshaft 4th gear. The countershaft includes the gears for 1st, 2nd, 3rd, 4th, reverse, park, and the final drive. The final drive gear is integral with the countershaft. The countershaft 4th gear and the countershaft reverse gear can be locked to the countershaft providing 4th or reverse gear, depending on which way the selector is moved. The secondary shaft includes the 1st and 2nd clutches, and gears for 1st, 2nd, and idler. The idler shaft is located between the mainshaft and secondary shaft, and the idler gear transmits power between the mainshaft and the secondary shaft. The gears on the mainshaft and the secondary shaft are in constant mesh with those on the countershaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted through the mainshaft, then to the secondary shaft to the countershaft to provide drive.

Electronic Control
The electronic control system consists of the powertrain control module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, behind the left side of the glove box.

Hydraulic Control
The valve bodies include the main valve body, the regulator valve body, and the servo body. They are bolted to the torque converter housing. The main valve body contains the manual valve, the shift valves A, B, C, and E, the relief valve, the lock-up control valve, the cooler check valve, the servo control valve, and the ATF pump gears. The regulator valve body contains the regulator valve, the torque converter check valve, lock-up shift valve, and the 1st accumulator. The servo body contains the servo valve, the CPB valve, accumulators for 2nd, 3rd, and 4th, and shift solenoid valves for A, B, C, and E. Fluid from the regulator passes through the manual valve to the various control valves. The 1st and 3rd clutches receive fluid from their respective feed pipes, and the 2nd and the 4th clutches receive fluid from the internal hydraulic circuit.

Shift Control Mechanism
The PCM controls to the shifting of gears with shift solenoid valves A, B, C, and E, and A/T clutch pressure control solenoid valves A, B, and C, while receiving input signals from various sensors and switches located throughout the vehicle. The shift solenoid valves shift the positions of the shift valves to switch the port leading hydraulic pressure to the clutch. The A/T clutch pressure control solenoid valves A, B, and C regulate their respective pressure, and pressurize the clutches to engage it and its corresponding gear. The pressures from the A/T clutch pressure control solenoid valves also apply to the shift valves to switch the port.

Lock-up Mechanism
The lock-up mechanism operates in D position (2nd, 3rd, and 4th) and D position over drive off mode (3rd). The pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the torque converter clutch piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with the hydraulic control, the PCM optimizes the timing and amount of the lock-up mechanism. When shift solenoid valve E is turned on by the PCM, shift solenoid valve E pressure switches the lock-up shift valve lock-up on and off. The A/T clutch pressure control solenoid valve A and the lock-up control valve controls the amount of lock-up.

Gear Selection
The shift lever has six positions; P: PARK, R: REVERSE, N: NEUTRAL, D: DRIVE 1st through 4th gear range with over drive mode, and 1st through 3rd gear range with over drive OFF mode, 2: 2nd gear, and 1: 1st gear.

Position	Description
P: PARK	Front wheels locked; park pawl engaged with park gear on countershaft. All clutches are released.
R: REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch engaged.
N: NEUTRAL	All clutches are released.
D: DRIVE with over drive mode (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshifts through 3rd, 2nd, and 1st on deceleration to stop. The lock-up mechanism operates in 2nd, 3rd, and 4th gears.
D: DRIVE with over drive OFF mode (1st through 3rd)	For rapid acceleration at highway speeds and general driving, up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism operates in 3rd gear.
2: SECOND	Used for engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up and down.
1: FIRST	Used for engine braking; stays in 1st gear, does not shift up.

Starting is possible only in the P and N positions because of a slide-type neutral-safety switch.

Automatic Transaxle (A/T) Gear Position Indicator
The A/T gear position indicator in the instrument panel shows which shift lever position has been selected.

Transfer Mechanism (4WD)
The transfer mechanism consists of the transfer drive gear on the differential, the transfer shaft, the transfer drive gear (hypoid gear), the transfer output shaft (hypoid gear), and the companion flange. The transfer mechanism assembly is on the rear of the transmission, beside the differential. The transfer drive gear on the differential drives the transfer shaft and transfer drive gear (hypoid gear), and the transfer drive gear (hypoid gear) drives the transfer output shaft (hypoid gear). Power is transmitted from the transfer drive gear on the differential to the rear differential via the transfer shaft and the propeller shaft.

System Description (cont'd)

Clutches and Gears

The 4-speed automatic transmission uses hydraulically-actuated clutches to engage or disengage the transmission gears. When hydraulic pressure is introduced into the clutch drum, the clutch piston moves. This presses the friction discs and steel plates together, locking them so they don't slip. Power is then transmitted through the engaged clutch pack to its hub-mounted gear. Likewise, when the hydraulic pressure is bled from the clutch pack, the piston releases the friction discs and steel plates, and they are free to slide past each other. This allows the gear to spin independently on its shaft, transmitting no power.

1st Clutch
The 1st clutch engages/disengages 1st gear, and is located at the top of the secondary shaft. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the secondary shaft.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the end of the secondary shaft, opposite the end cover. The 2nd clutch is supplied hydraulic pressure by a circuit connected to the internal hydraulic circuit.

3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the top of the mainshaft. The 3rd clutch is joined back-to-back to the 4th clutch. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

4th Clutch
The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the top of the mainshaft. The 4th clutch is joined back-to-back to the 3rd clutch. The 4th clutch is supplied hydraulic pressure by a circuit connected to the internal hydraulic circuit.

Gear Operation

Gears on the mainshaft:

- 4th gear is engaged/disengaged with the mainshaft by the 4th clutch.
- 3rd gear is engaged/disengaged with the mainshaft by the 3rd clutch.
- Reverse gear is engaged/disengaged with the mainshaft by the 4th clutch.
- Idler gear is splined with the mainshaft, and rotates with the mainshaft.

Gears on the countershaft:

- Final drive gear is integral with the countershaft.
- 1st, 2nd, 3rd, and park gears are splined with the countershaft, and rotate with the countershaft.
- 4th gear and reverse gear rotate freely from the countershaft. The reverse selector engages 4th gear and reverse gear with the reverse selector hub. The reverse selector hub is splined to the countershaft so that the 4th gear and reverse gear engage with the countershaft.

Gears on the secondary shaft:

- 1st gear is engaged/disengaged with the secondary shaft by the 1st clutch.
- 2nd gear is engaged/disengaged with the secondary shaft by the 2nd clutch.
- Idler gear is splined with the secondary shaft, and rotates with the secondary shaft.

The idler gear on the idler shaft transmits power between the mainshaft and the secondary shaft.
The reverse idler gear transmits power from the mainshaft reverse gear to the countershaft reverse gear, and changes rotation direction of the countershaft to reverse.

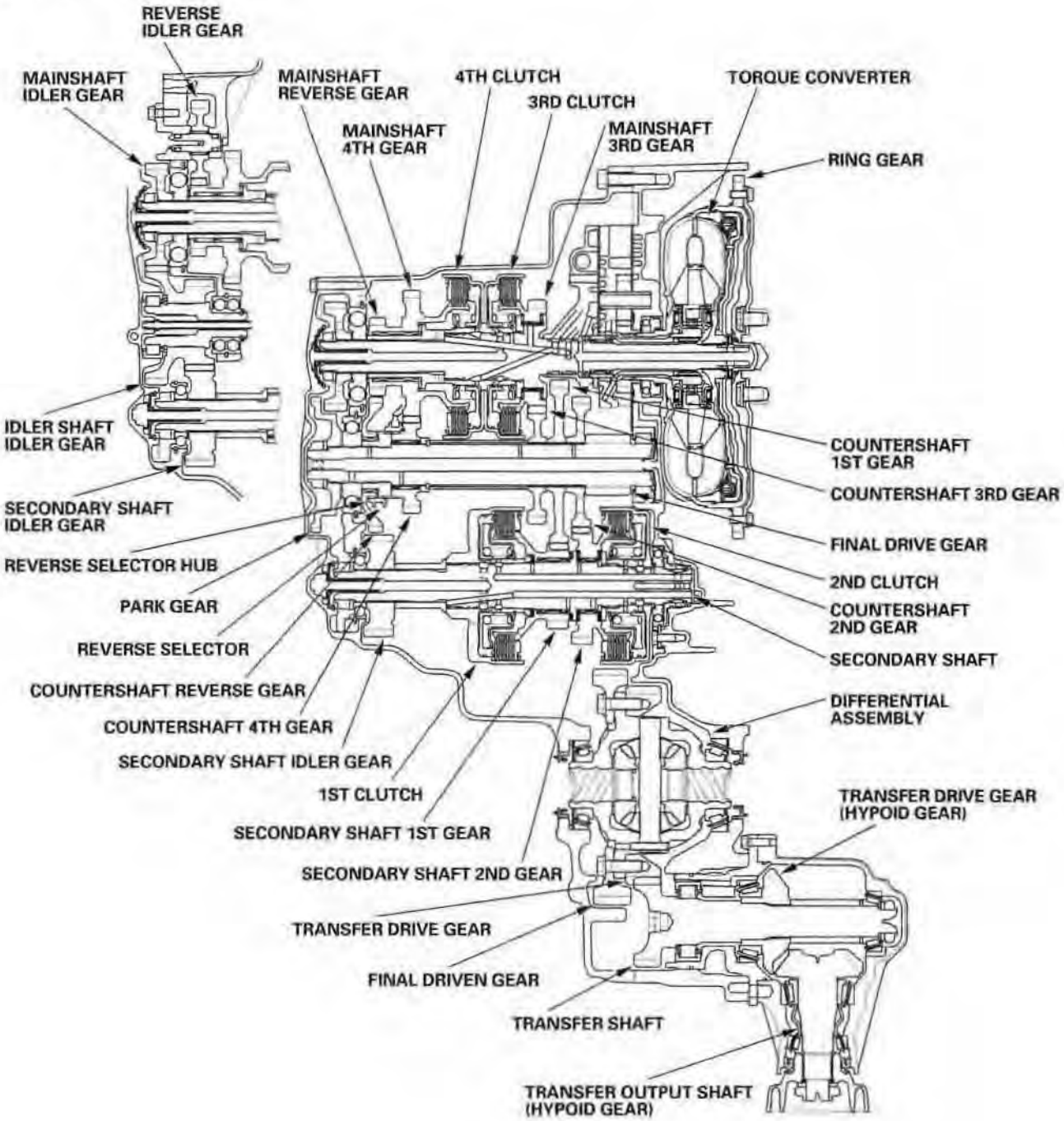
(cont'd)

System Description (cont'd)

Transmission Cutaway View

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.

Idler Gear Section Cutaway View



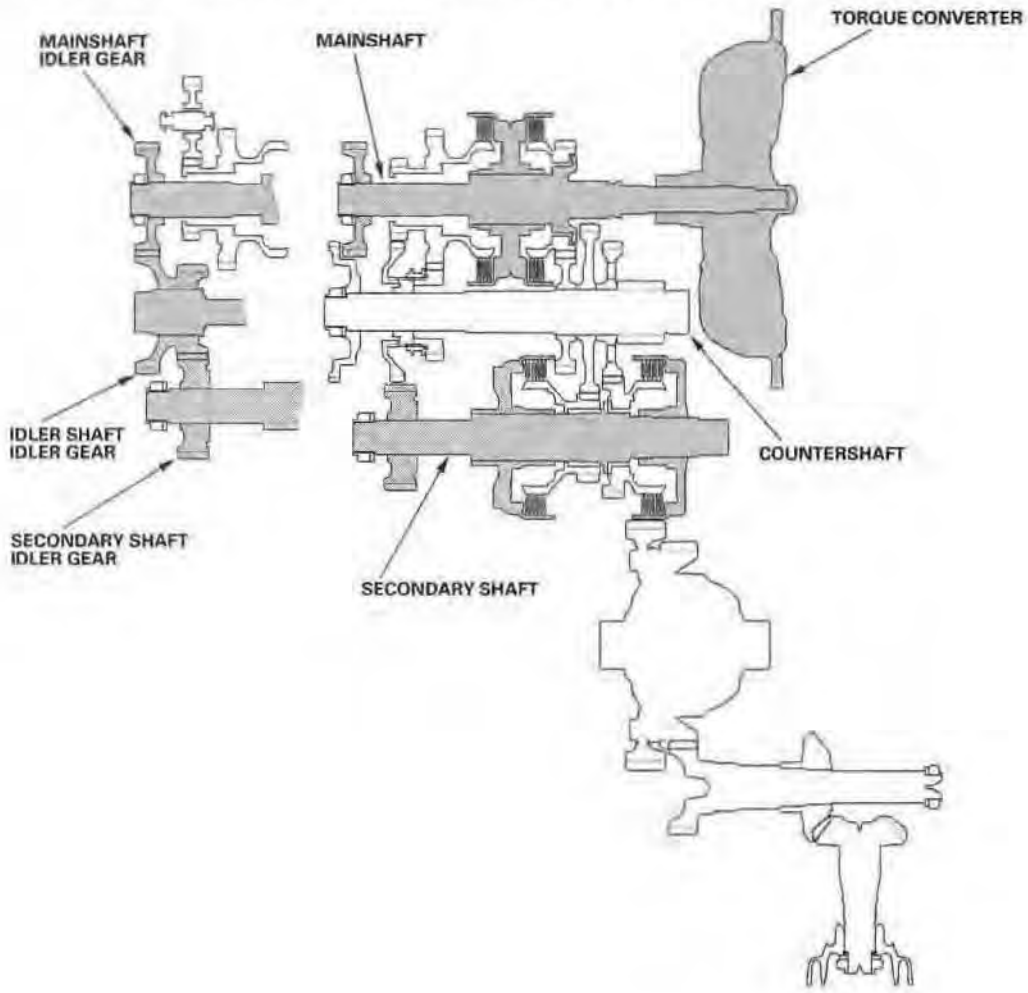
Power Flow

P Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the park pawl interlocking the park gear.

N Position
Engine power transmitted from the torque converter drives the mainshaft idler gear, the idler shaft idler gear, and the secondary shaft idler gear, but hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.
In this position, the position of the reverse selector differs according to whether the shift lever shifted from the D or R position:

- When shifted from the D position, the reverse selector engages with the countershaft 4th gear and the reverse selector hub, and the 4th gear engages with the countershaft.
- When shifted from the R position, the reverse selector engages with the countershaft reverse gear and the reverse selector hub, and the reverse gear engages with the countershaft.

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



(cont'd)

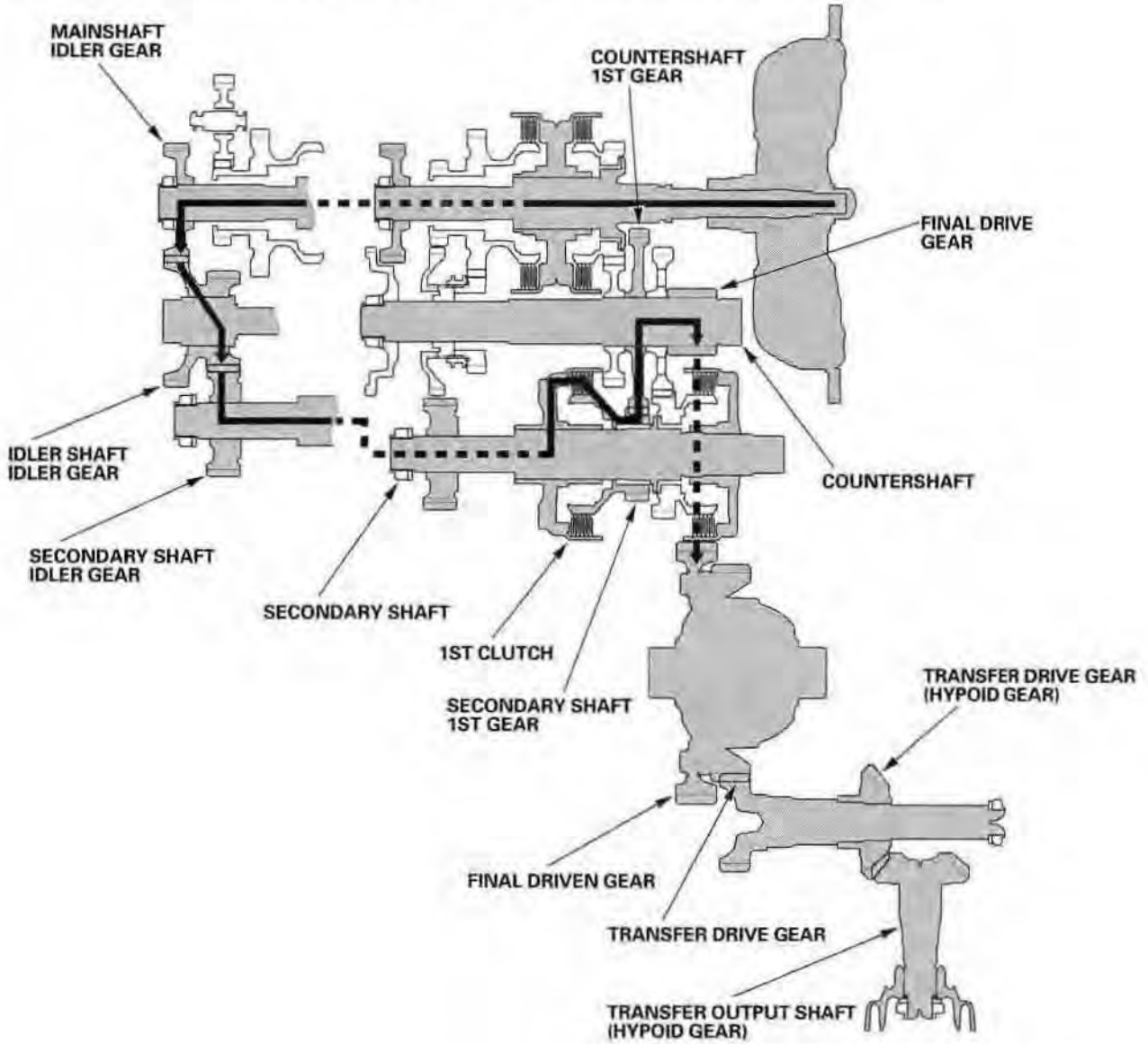
System Description (cont'd)

Power Flow (cont'd)

1st Gear

- Hydraulic pressure is applied to the 1st clutch, then the 1st clutch engages the secondary shaft 1st gear with the secondary shaft.
- The mainshaft idler gear drives the secondary shaft via the idler shaft idler gear and the secondary shaft idler gear.
- The secondary shaft 1st gear drives the countershaft 1st gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer output shaft (hypoid gear).

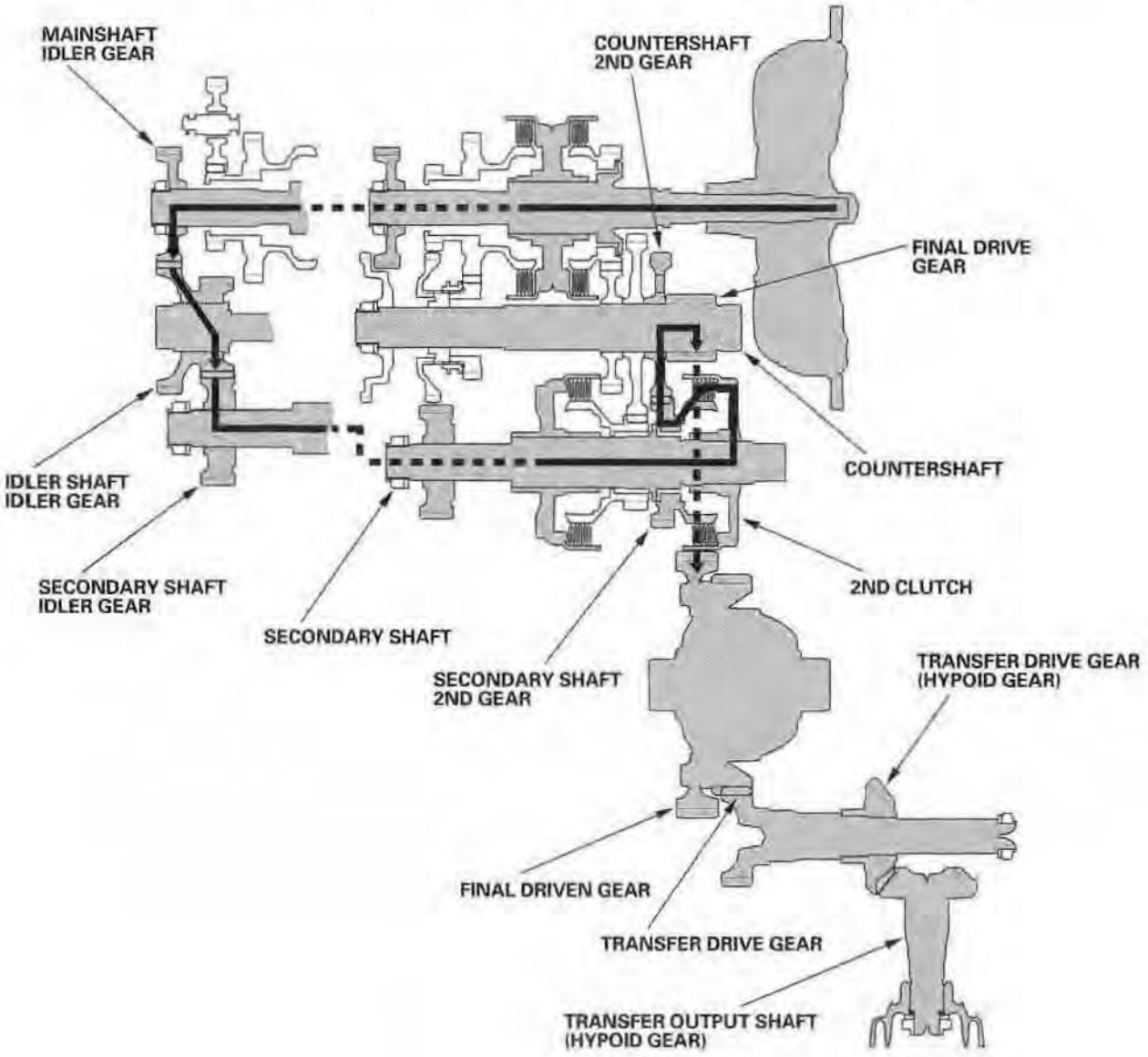
NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



2nd Gear

- Hydraulic pressure is applied to the 2nd clutch, then the 2nd clutch engages the secondary shaft 2nd gear with the secondary shaft.
- The mainshaft idler gear drives the secondary shaft via the idler shaft idler gear and the secondary shaft idler gear.
- The secondary shaft 2nd gear drives the countershaft 2nd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer output shaft (hypoid gear).

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



(cont'd)

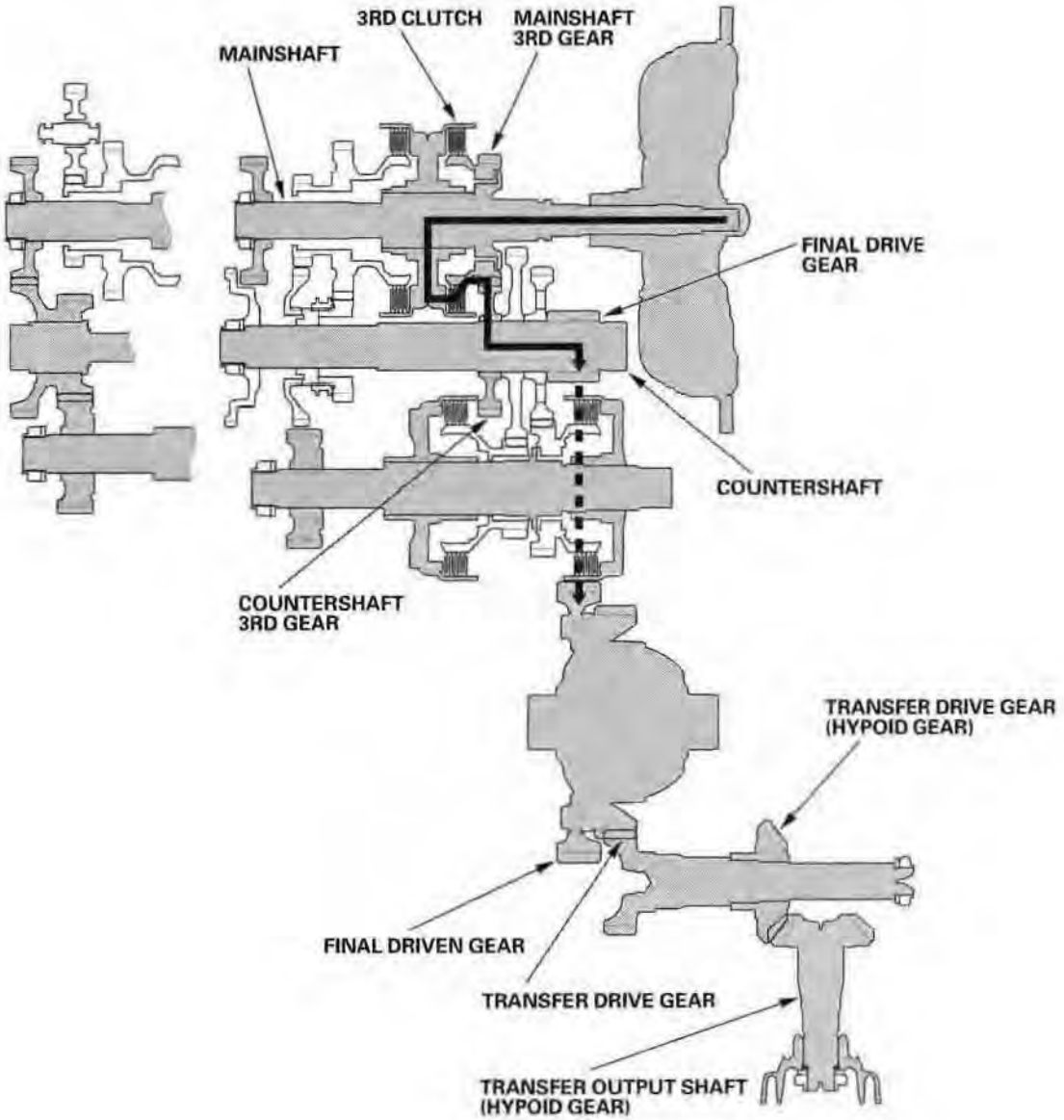
System Description (cont'd)

Power Flow (cont'd)

3rd Gear

- Hydraulic pressure is applied to the 3rd clutch, then the 3rd clutch engages the mainshaft 3rd gear with the mainshaft.
- The mainshaft 3rd gear drives the countershaft 3rd gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer output shaft (hypoid gear).

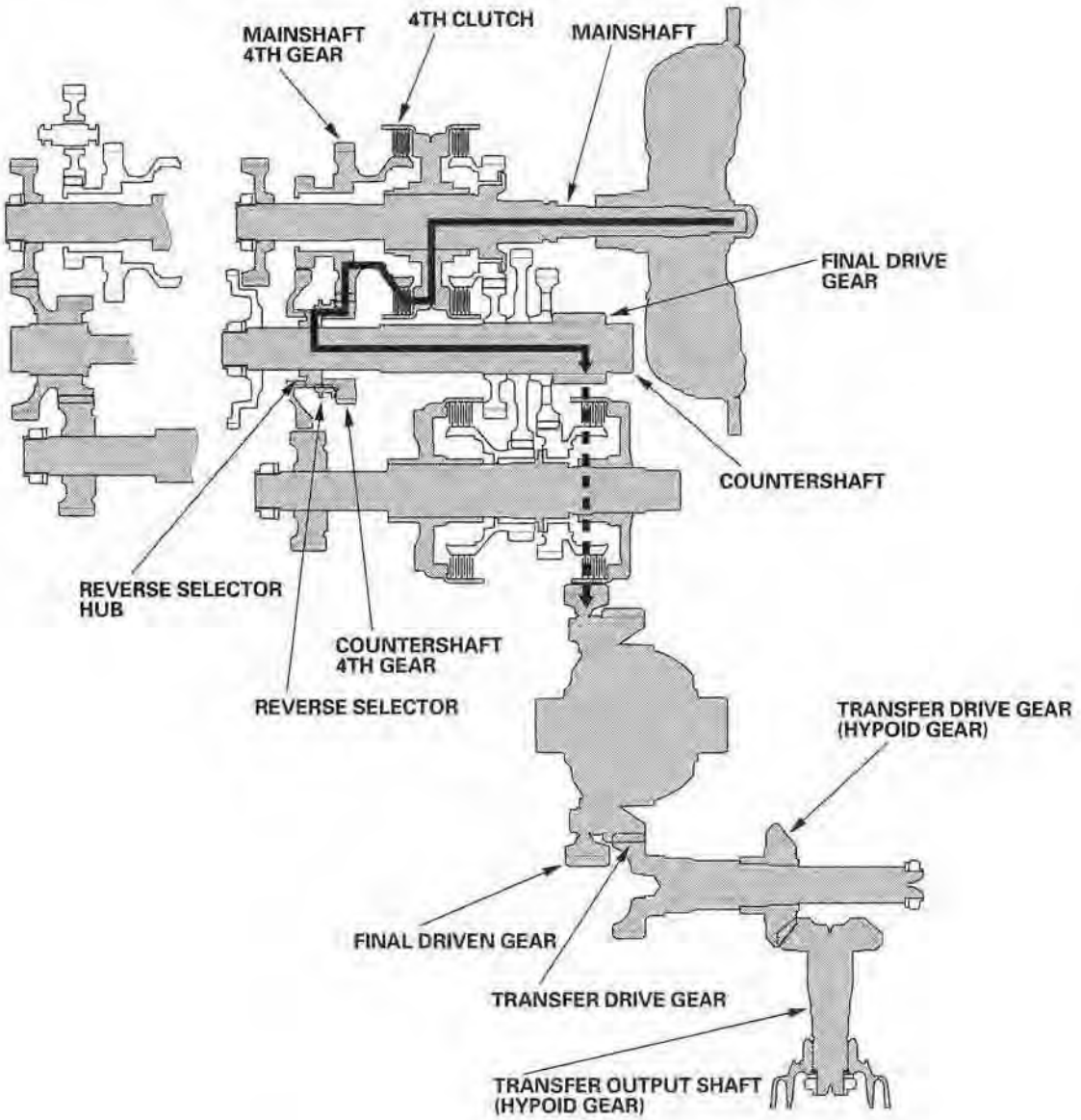
NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



4th Gear

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft 4th gear and reverse selector hub while the shift lever is in the forward range (D, 2, and 1 positions).
- Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft 4th gear with the mainshaft.
- The mainshaft 4th gear drives the countershaft 4th gear and the countershaft.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer output shaft (hypoid gear).

NOTE: The illustration shows the 4WD transmission; 2WD does not have the transfer mechanism.



(cont'd)

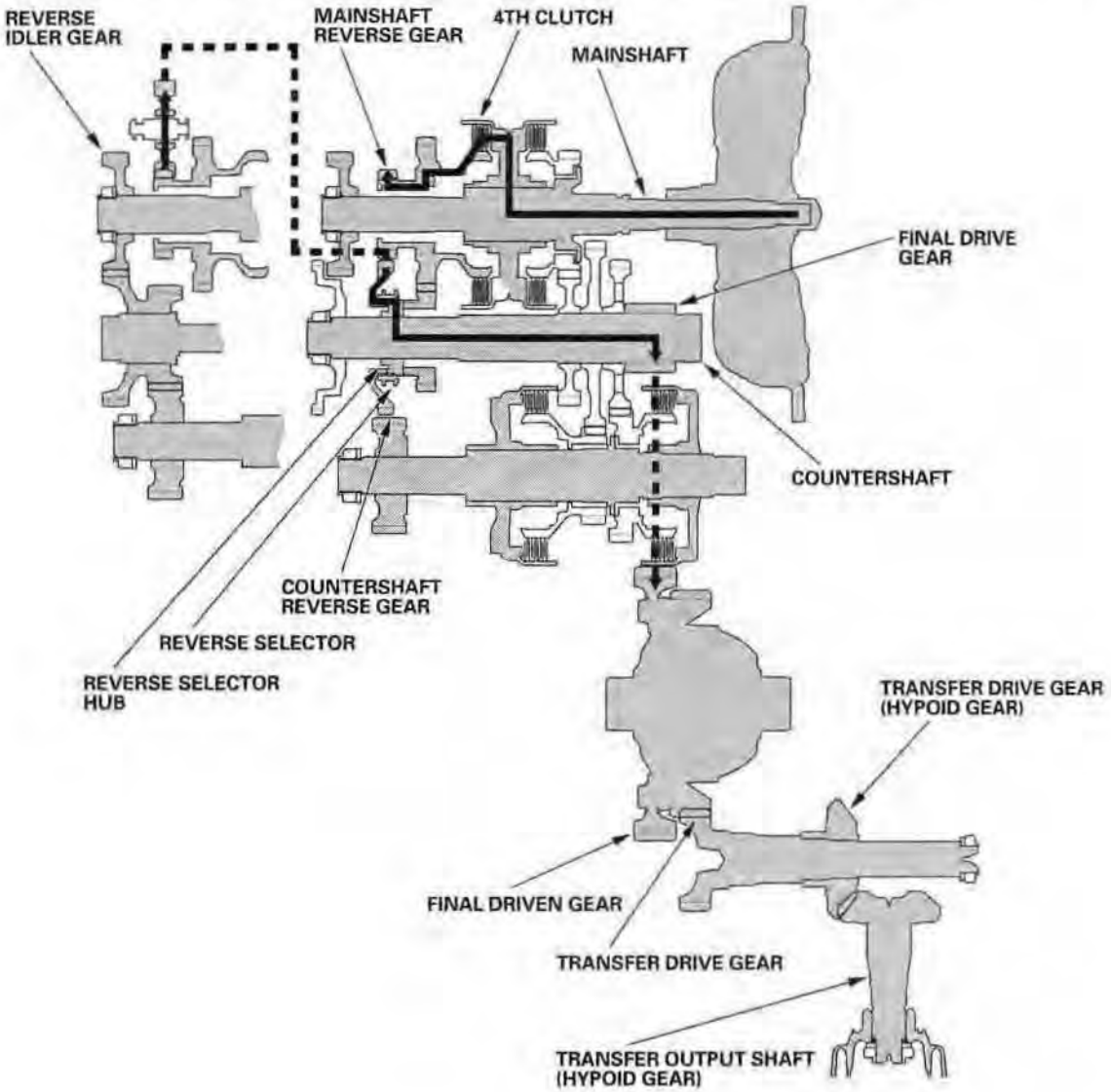
System Description (cont'd)

Power Flow (cont'd)

R Position

- Hydraulic pressure is applied to the servo valve to engage the reverse selector with the countershaft reverse gear and reverse selector hub while the shift lever is in the R position.
- Hydraulic pressure is also applied to the 4th clutch, then the 4th clutch engages the mainshaft reverse gear with the mainshaft.
- The mainshaft reverse gear drives the countershaft reverse gear via the reverse idler gear.
- The rotation direction of the countershaft reverse gear is changed by the reverse idler gear.
- The countershaft reverse gear drives the countershaft via the reverse selector which drives the reverse selector hub.
- Power is transmitted to the final drive gear, which in turn drives the final driven gear and the transfer drive gear.
- The transfer drive gear drives the transfer drive gear (hypoid gear) and the transfer output shaft (hypoid gear).

NOTE: The illustration shows 4WD transmission; 2WD does not have the transfer mechanism.

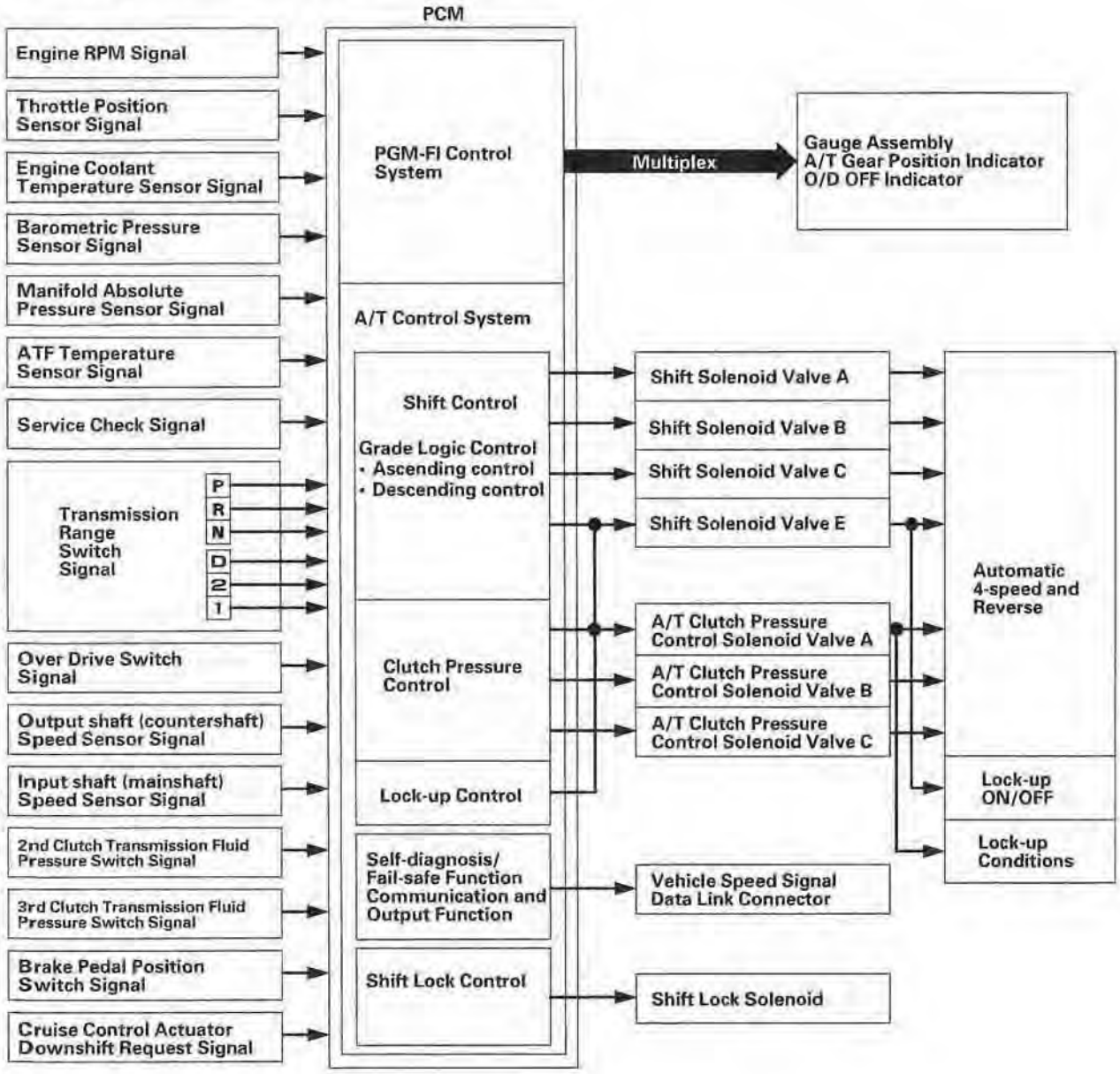


Electronic Control System

Functional Diagram

The electronic control system consists of the powertrain control module (PCM), sensors, and solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The PCM receives input signals from the sensors, switches, and other control units, performs data processing, and output signals for the engine control system and A/T control system. The A/T control system includes shift control, grade logic control, clutch pressure control, and lock-up control, all of which are stored in the PCM.
The PCM switches the shift solenoid valves and the A/T clutch pressure control solenoid valves to control shifting transmission gears and lock-up torque converter clutch.



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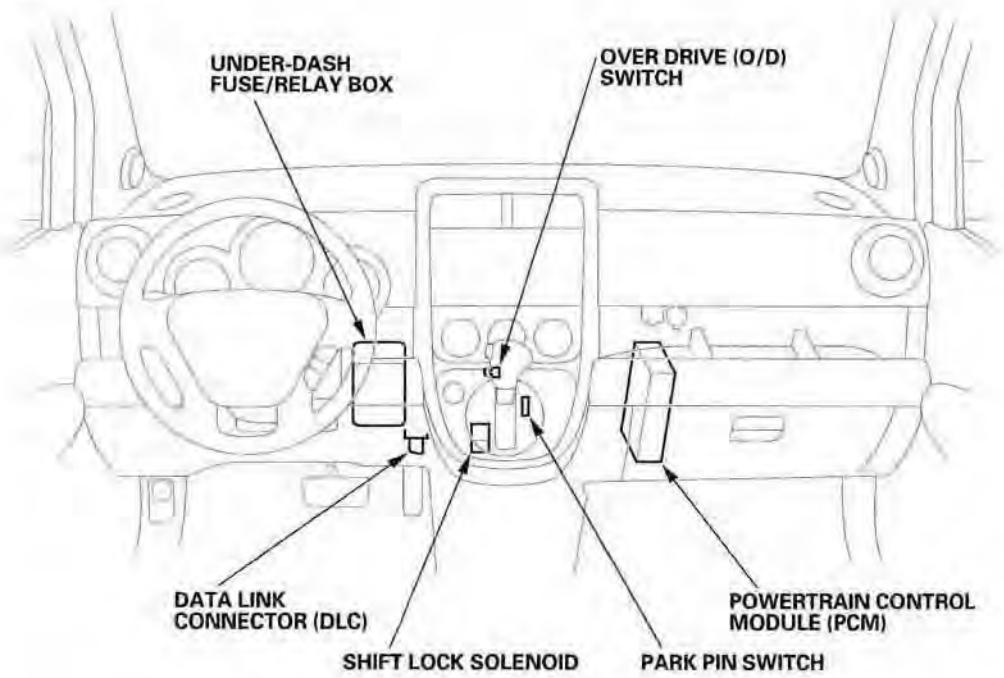
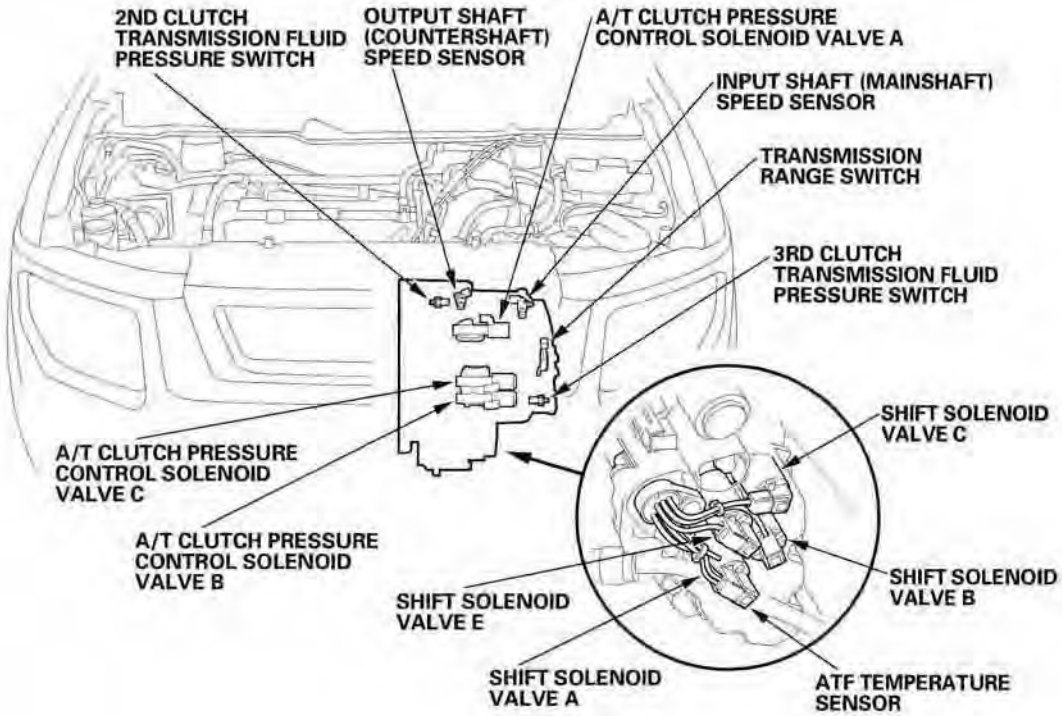
System Description (cont'd)

Electronic Control System (cont'd)

Electronic Controls Location

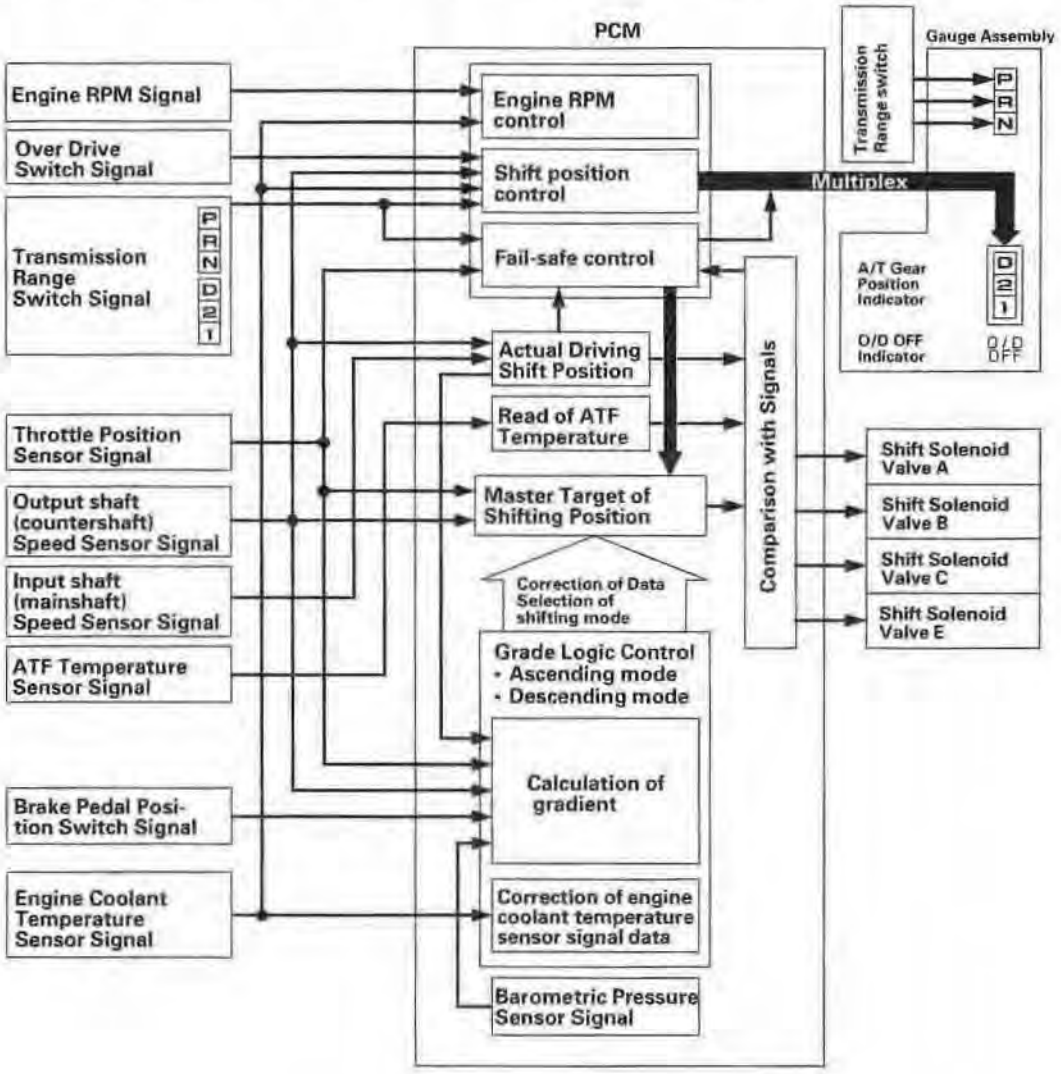




Shift Control

The PCM instantly determines which gear should be selected by various signals sent from sensors and switches, and it actuates the shift solenoid valves A, B, C, and E to control shifting.

Also, a grade logic control system has been adopted to control shifting in the D position. The PCM compares actual driving conditions with memorized driving conditions, based on the input from the throttle position sensor, the engine coolant temperature sensor, the barometric pressure sensor, the brake pedal position switch signal, and the shift lever position signal, to control shifting while the vehicle is ascending or descending a slope.



(cont'd)

System Description (cont'd)

Electronic Control System (cont'd)

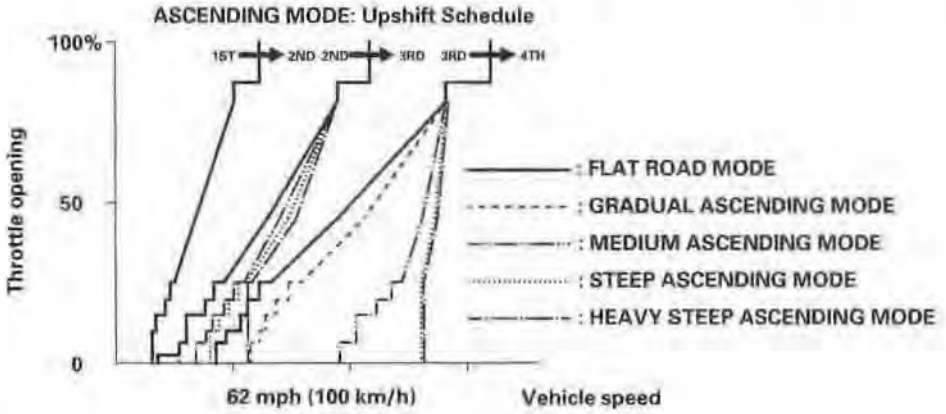
The PCM turns the shift solenoid valves A, B, C, and E ON and OFF to control shifting of the transmission. The combination of driving signals to shift solenoid valves A, B, C, and E are shown in table.

Position	Gear position	Shift solenoid valves			
		A	B	C	E
D	Shifting from N position	OFF	ON	ON	OFF
	Stays in 1st	ON	ON	ON	OFF
	Shifting gears between 1st and 2nd	OFF	ON	ON	OFF
	Stays in 2nd	OFF	ON	OFF	OFF
	Shifting gears between 2nd and 3rd	OFF	ON	ON	OFF
	Stays in 3rd	OFF	OFF	ON	OFF
	Shifting gears between 3rd and 4th	OFF	OFF	OFF	OFF
	Stays in 4th	ON	OFF	OFF	OFF
2	2nd gear	OFF	ON	OFF	OFF
1	1st gear	ON	ON	ON	OFF
R	Shifting from the P and N position	OFF	ON	OFF	ON
	Stays in reverse	ON	ON	OFF	ON
	Reverse inhibitor control	OFF	OFF	ON	OFF
P	Park	OFF	ON	OFF	ON
N	Neutral	OFF	ON	ON	OFF

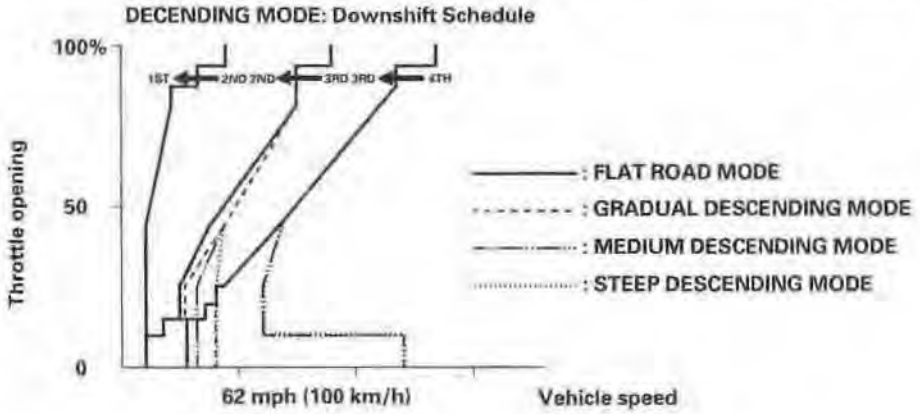
Grade Logic Control

Grade Logic Control: Ascending Control
When the PCM determines that the vehicle is climbing a hill in the D position, the system extends the engagement area of 2nd and 3rd gears to prevent the transmission from frequently shifting between 2nd and 3rd gears, and between 3rd and 4th gears, so the vehicle can run smooth and have more power when needed.

Shift schedules stored in the PCM between 2nd and 3rd gears, and between 3rd and 4th gears, enable it to automatically select the most suitable gear according to the magnitude of a gradient.



Grade Logic Control: Descending Control
When the PCM determines that the vehicle is going down a hill in the D position, the shift-up speed from 3rd to 4th gear, and from 2nd to 3rd gear (when the throttle is closed) becomes higher than the speed for flat road driving to widen the 3rd gear and 2nd gear driving area. This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are three descending modes with different 3rd gear driving areas and 2nd gear driving areas according to the magnitude of a gradient stored in the PCM. When the vehicle is in 4th gear, decelerating, and when you are applying the brakes on a steep hill, the transmission will downshift to a lower gear. When you accelerate, the transmission will then return to a higher gear.



(cont'd)

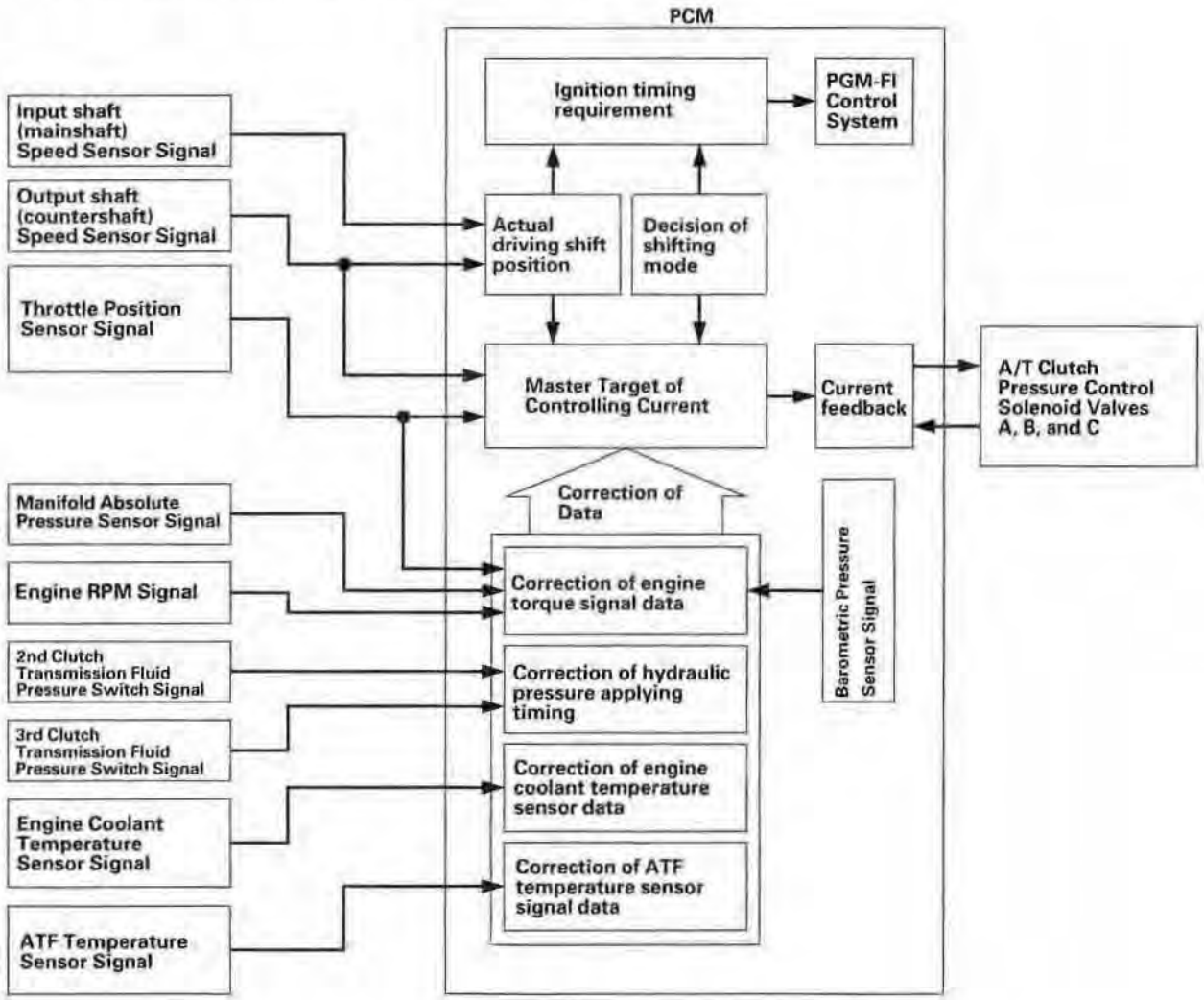
System Description (cont'd)

Electronic Control System (cont'd)

Clutch Pressure Control

The PCM actuates the A/T clutch pressure control solenoid valves A, B, and C to control the clutch pressure. When shifting between lower and higher gears, the clutch pressure regulated by the A/T clutch pressure control solenoid valves A, B, and C engage and disengage the clutch smoothly.

The PCM receives input signals from the various sensors and switches, performs data processing, and outputs a current to the A/T clutch pressure control solenoid valves A, B, and C.

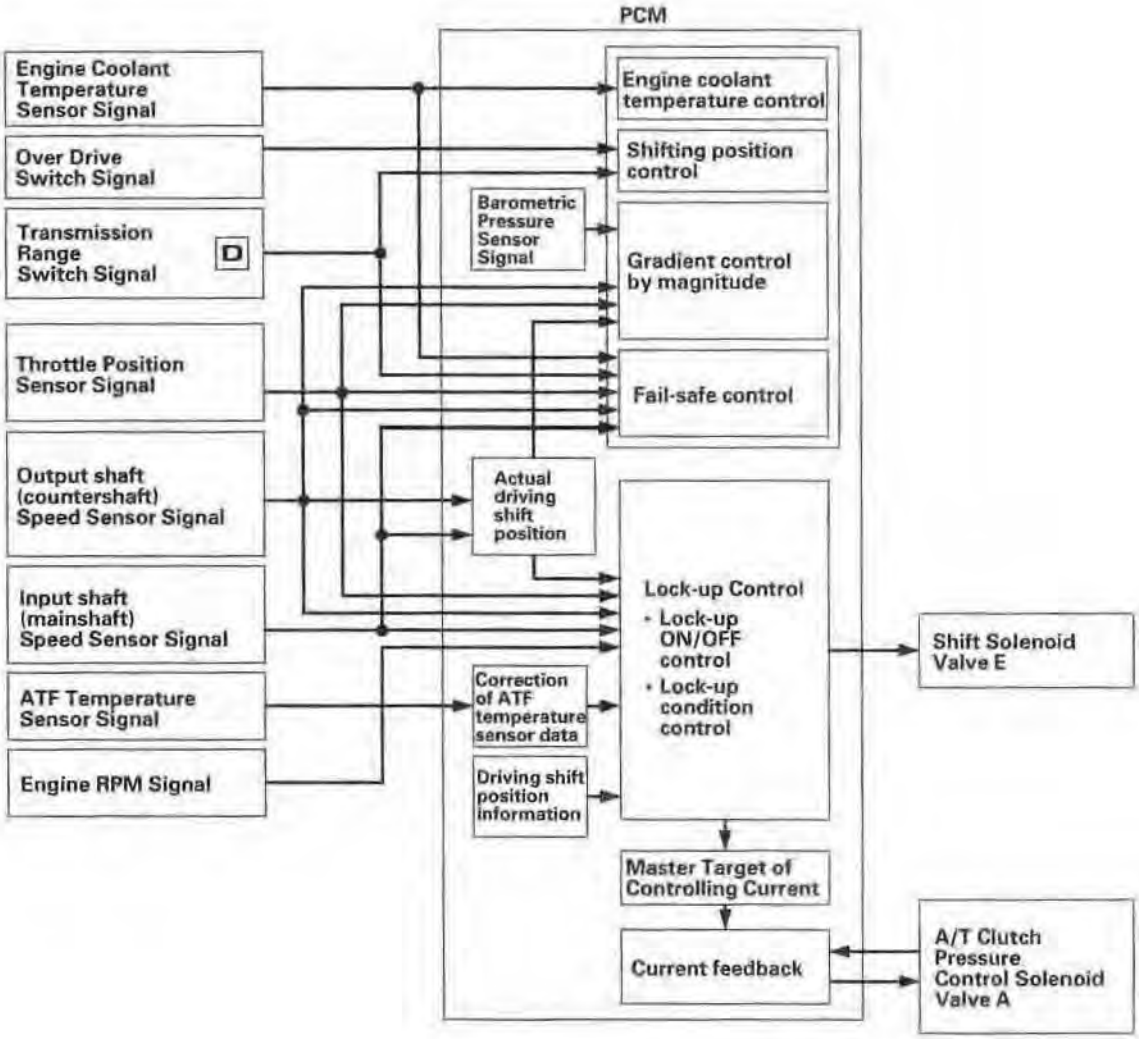


Lock-up Control

The shift solenoid valve E controls the hydraulic pressure to switch the lock-up shift valve and lock-up ON and OFF. The PCM actuates the shift solenoid valve E and the A/T clutch pressure control solenoid valve A to control the torque converter clutch lock-up. When the shift solenoid valve E is turned ON, the condition of lock-up starts.

The A/T clutch pressure control solenoid valve A regulates and applies hydraulic pressure to the lock-up control valve to control the amount of lock-up.

The lock-up mechanism operates in 2nd, 3rd, and 4th gears in the D position, and 3rd gear in the D position over drive off mode.



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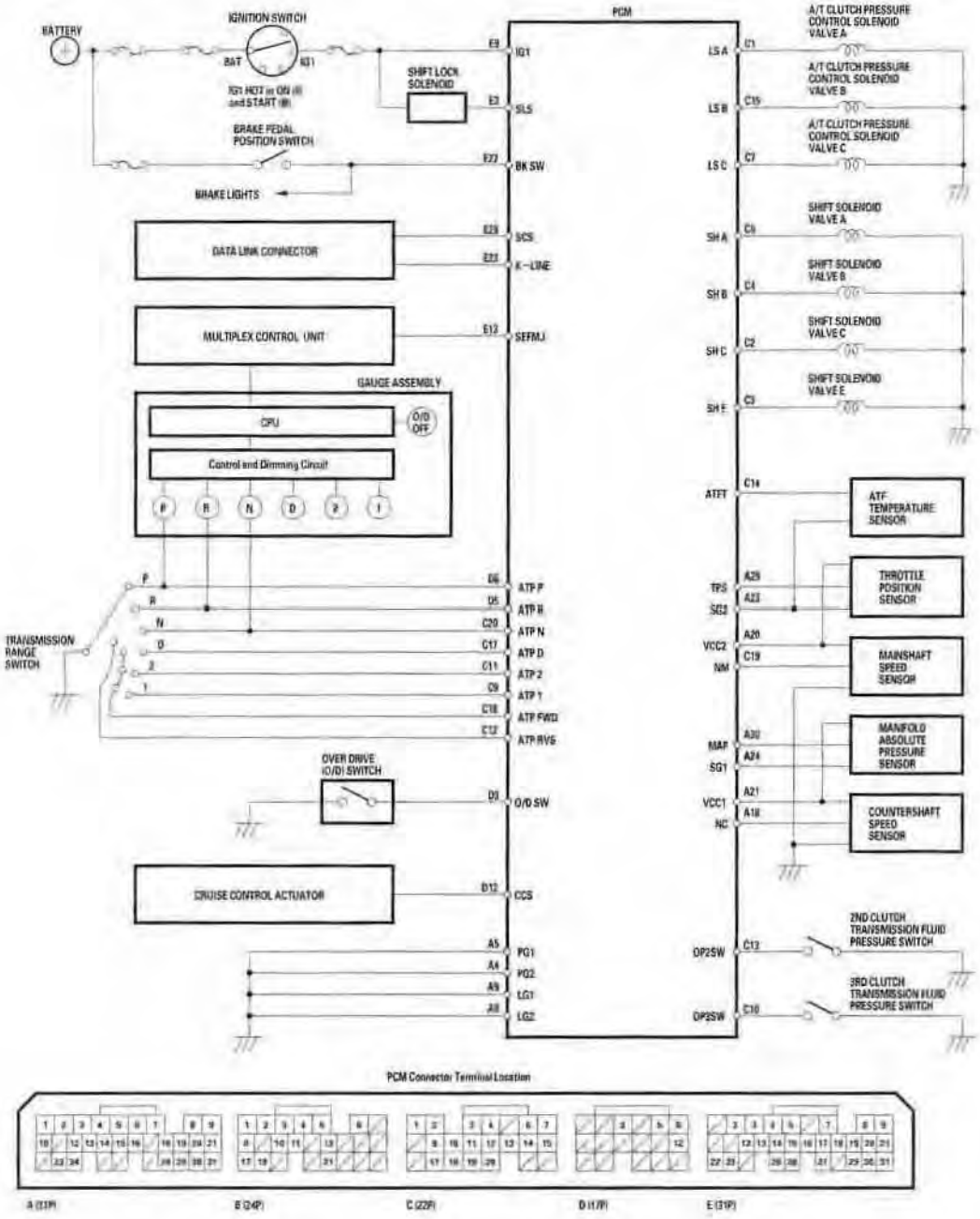
System Description (cont'd)

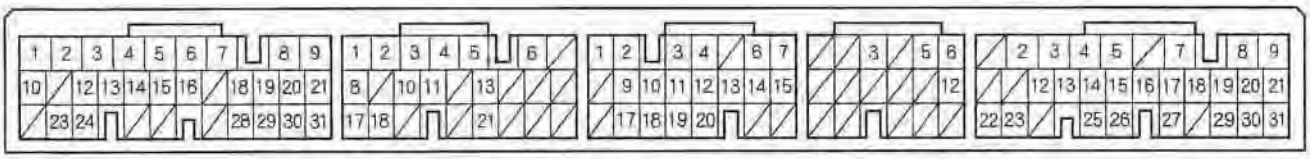
Electronic Control System (cont'd)

PCM Electrical Connections



PCM Inputs and Outputs

PCM Connector Terminal Locations



A (31P) B (24P) C (22P) D (17P) E (31P)

PCM CONNECTOR A (31P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
A4	BLK	PG2	Ground	Less than 1.0 V at all times
A5	BLK	PG1	Ground	Less than 1.0 V at all times
A8	BRN/YEL	LG2	Ground	Less than 1.0 V at all times
A9	BRN/YEL	LG1	Ground	Less than 1.0 V at all times
A18	BLU	NC	Output shaft (countershaft) speed sensor signal input	With ignition switch ON (II): 0 V or about 5 V While driving: About 2.5 V
A20	YEL/BLU	VCC2	Power supply circuit for sensors	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
A21	YEL/RED	VCC1	Power supply circuit for sensors	With ignition switch ON (II): About 5 V With ignition switch OFF: 0 V
A23	GRN/BLK	SG2	Sensor ground	Less than 1.0 V at all times
A24	GRN/WHT	SG1	Sensor ground	Less than 1.0 V at all times
A29	RED/BLK	TPS	TP sensor signal input	With throttle fully open: About 4.5 V With throttle fully closed: About 0.5 V
A30	GRN/RED	MAP	MAP sensor signal input	With ignition switch ON (II): About 3 V At idle: About 1.0 V (depending on engine speed)

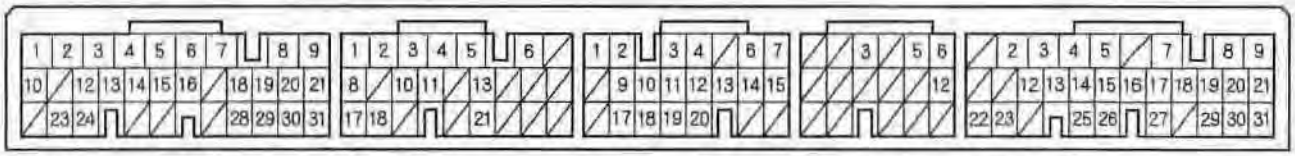
(cont'd)

System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs (cont'd)

PCM Connector Terminal Locations



PCM CONNECTOR C (22P)

Terminal Number	Wire Color	Signal	Description	Measuring Condition/Terminal Voltage
C1	BLK/BLU	LS A	A/T clutch pressure control solenoid valve A control	With ignition switch ON (II): Pulsing signal
C2	GRN	SH C	Shift solenoid valve C control	Battery voltage in these positions: • N and 1 • 1st and 3rd gears in D • Reverse inhibit in R 0 V in these positions: • P, R, and 2 • 2nd and 4th gears in D
C3	YEL	SH E	Shift solenoid valve E control	Battery voltage in these positions: • P and R 0 V in these positions: • Reverse inhibit in R • N, D, 2, and 1
C4	GRN/WHT	SH B	Shift solenoid valve B control	Battery voltage in these positions: • P, R, N, 2, and 1 • 1st and 2nd gears in D 0 V in these positions: • Reverse inhibit in R • 3rd and 4th gears in D
C6	BLU/BLK	SH A	Shift solenoid valve A control	Battery voltage in these positions: • R and 1 • 1st and 4th gears in D 0 V in these positions: • Reverse inhibit in R • P, N, and 2 • 2nd and 3rd gears in D
C7	BLU/YEL	LS C	A/T clutch pressure control solenoid valve C control	With ignition switch ON (II): Pulsing signal

PCM CONNECTOR C (22P)

Terminal Number	Wire Color	Signal	Description	Measuring Condition/Terminal Voltage
C9	BRN	ATP 1	Transmission range switch 1 position signal input	In the 1 position: 0 V In other than the 1 position: Battery voltage
C10	BLU/WHT	OP3SW	3rd clutch transmission fluid pressure switch signal input	With ignition switch ON (II): About 5 V With 3rd clutch pressure: 0 V
C11	BLU	ATP 2	Transmission range switch 2 position signal input	In the 2 position: 0 V In other than the 2 position: Battery voltage
C12	RED/WHT	ATP RVS	Transmission range switch RVS (R position) signal input	In R position: 0 V In other than the R position: Battery voltage
C13	BLU/RED	OP2SW	2nd clutch transmission fluid pressure switch signal input	With ignition switch ON (II): About 5 V With 2nd clutch pressure: 0 V
C14	RED/YEL	ATFT	ATF temperature sensor signal input	With ignition switch ON (II): 0.5—4.8 V (Depending on ATF temperature) With ignition switch OFF: 0 V
C15	BRN/WHT	LS B	A/T clutch pressure control solenoid valve B control	With ignition switch ON (II): Pulsing signal
C17	YEL/GRN	ATP D	Transmission range switch D position signal input	In the D position: 0 V In other than the D position: Battery voltage
C18	YEL/RED	ATP FWD	Transmission range switch D, 2, and 1 position signals input	In the D, 2, and 1 positions: 0 V In other than the D, 2, and 1 positions: Battery voltage
C19	WHT/RED	NM	Input shaft (mainshaft) speed sensor signal input	With ignition switch ON (II): 0 V or about 5 V With engine at idling in the N position: About 2.5 V
C20	RED/BLK	ATP N	Transmission range switch N position signal input	In the N position: 0 V In other than the N position: Battery voltage

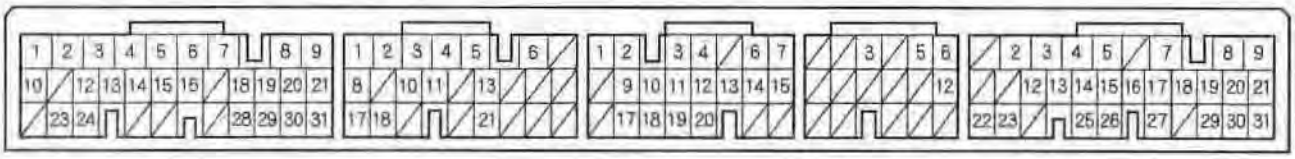
(cont'd)

System Description (cont'd)

Electronic Control System (cont'd)

PCM Inputs and Outputs (cont'd)

PCM Connector Terminal Locations



PCM CONNECTOR D (17P)

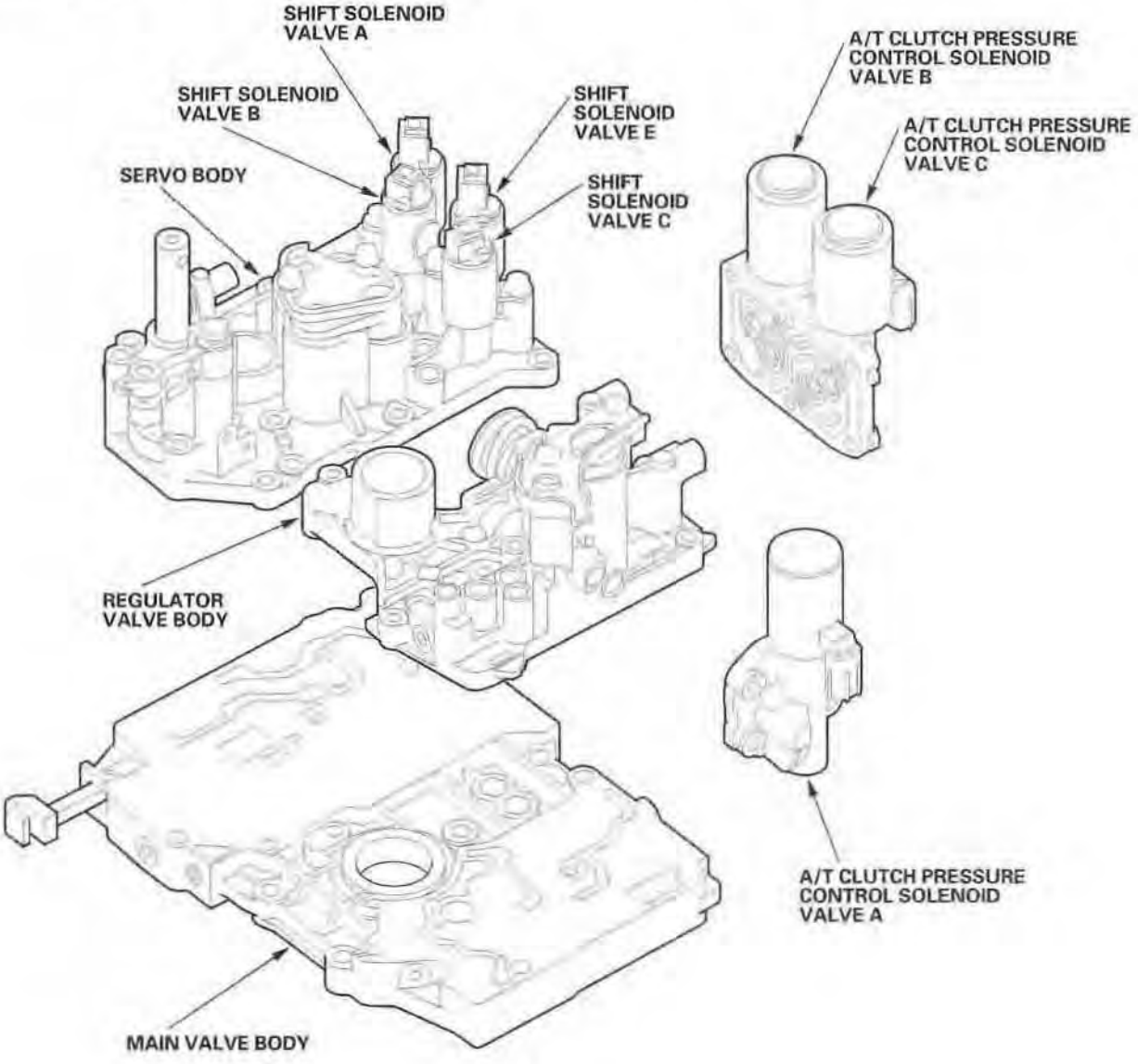
Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
D3	GRN	O/D SW	Over drive (O/D) switch signal input	With over drive ON: 0 V With over drive OFF: Battery voltage
D5	WHT	ATP R	Transmission range switch R position input	In the R position: 0 V In other than the R position: Battery voltage
D6	BLK/BLU	ATP P	Transmission range switch P position input	In the P position: 0 V In other than the P position: Battery voltage
D12	BLU/ORN	CCS	Downshift signal input from cruise control actuator	When cruise control is used: Pulsing signal

PCM CONNECTOR E (31P)

Terminal Number	Wire Color	Signal	Description	Measuring Conditions/Terminal Voltage
E2	WHT/BLU	SLS	Shift lock solenoid	With ignition switch ON (II), in the P position, brake pedal pressed, and accelerator released: 0 V
E9	BLK/YEL	IG1	Power supply circuit for solenoid valves	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
E13	YEL	SEFMJ	Communicates with multiplex control unit	With ignition switch ON (II): About 5 V With engine running under load: Pulsing signal
E22	WHT/BLK	BKSW	Brake pedal position switch signal input	Brake pedal pressed: Battery voltage Brake pedal released: 0 V
E23	LT BLU	K-LINE	Communication line PCM-to-DLC	With ignition switch ON (II): Battery voltage
E29	BRN	SCS	Detects service check signal	With the SCS shorted with the HDS: About 0 V With the SCS open: About 5 V

Hydraulic Controls

The valve body includes the main valve body, the regulator valve body, and the servo body. The ATF pump is driven by splines on the left end of the torque converter, which is attached to the engine. Fluid flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to the shift valves and to each of the clutches via the solenoid valves. The shift solenoid valves A, B, C, and E are bolted on the servo body. The A/T clutch pressure control solenoid valves A, B, and C are mounted on the outside of the transmission housing.



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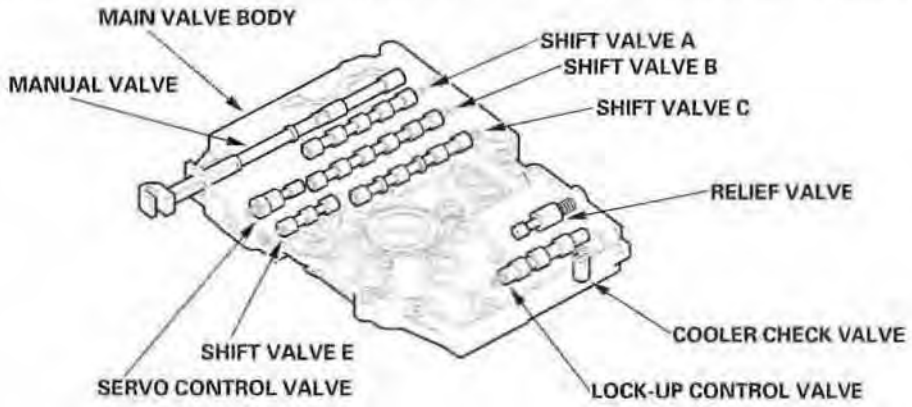
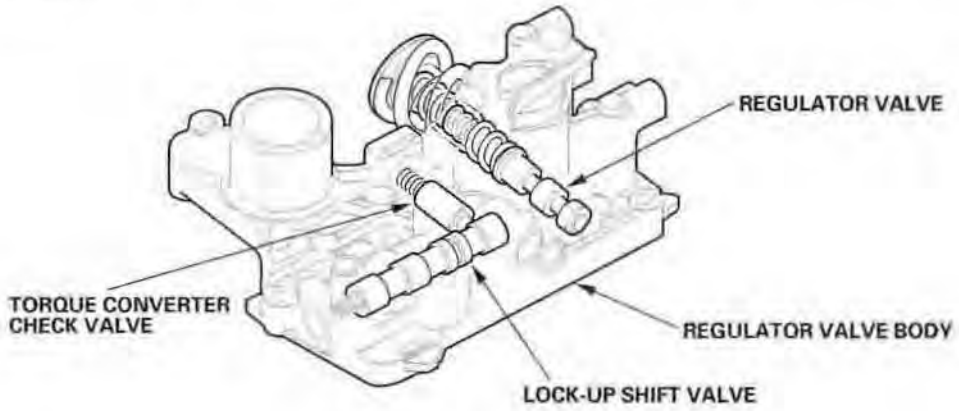
System Description (cont'd)

Hydraulic Controls (cont'd)

Main Valve Body
The main valve body contains the manual valve, the shift valves A, B, C, and E, the relief valve, the lock-up control valve, the cooler check valve, the servo control valve, and the ATF pump gears. The primary function of the main valve body is to switch fluid pressure on and off and to control hydraulic pressure going to the hydraulic control system.



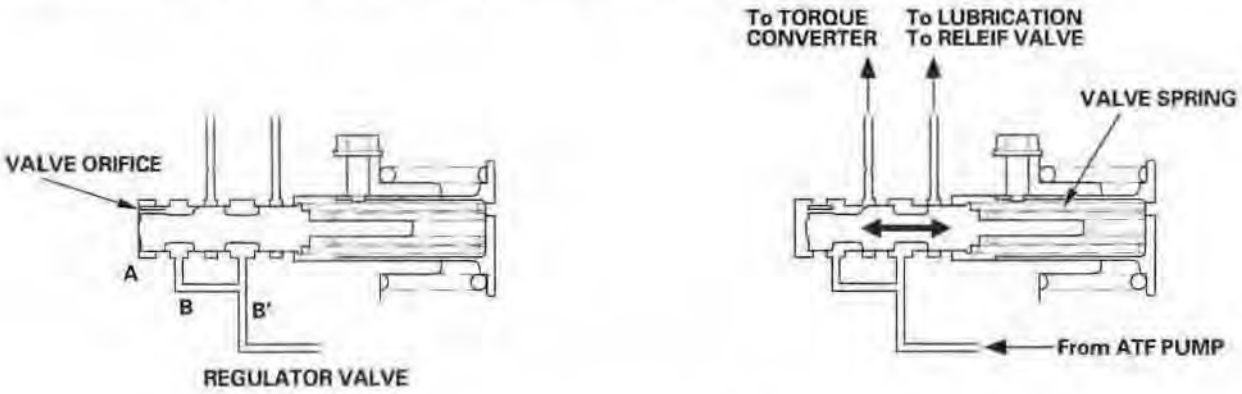
Regulator Valve Body
The regulator valve body contains the regulator valve, the torque converter check valve, lock-up shift valve, and the 1st accumulator.



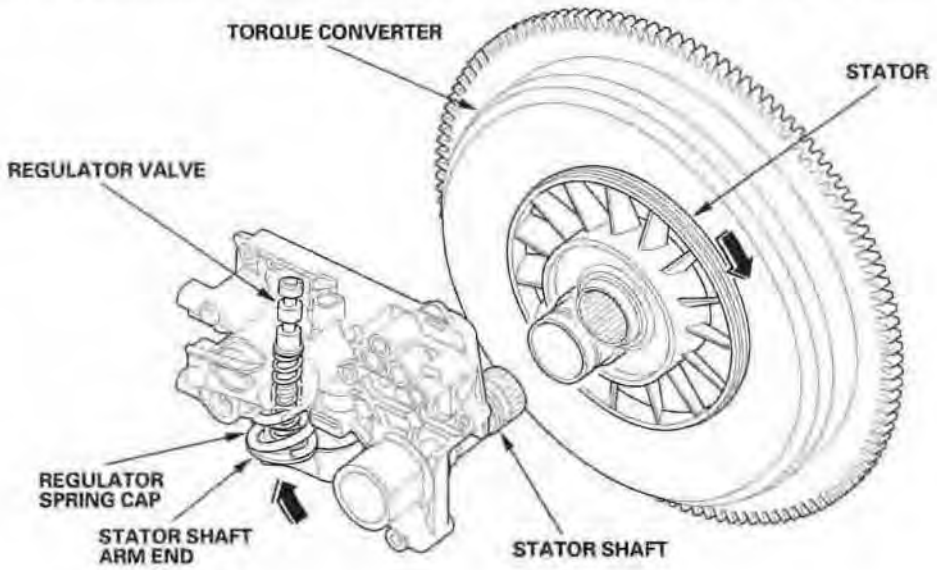
Regulator Valve

The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubrication system and torque converter. The fluid from the ATF pump flows through B and B'. Fluid entering from B flows through the valve orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter and the relief valve, and the regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes, and the amount of fluid from B' through torque converter also changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration.



Increases in hydraulic pressure according to torque are performed by the regulator valve using stator torque reaction. The stator shaft is splined with the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.



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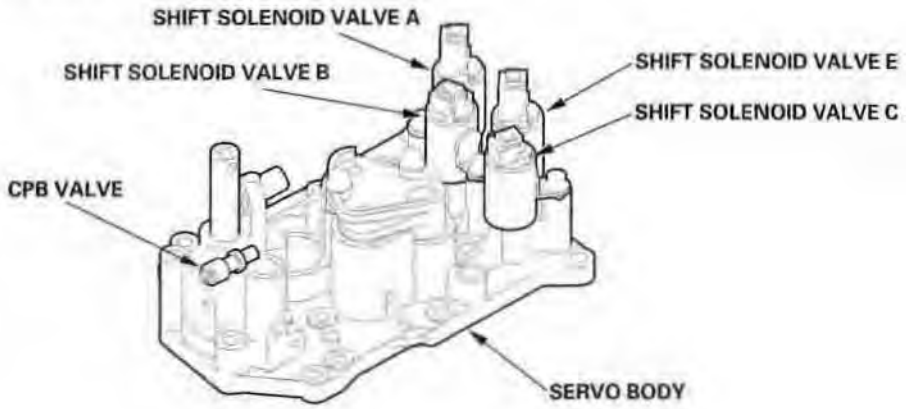
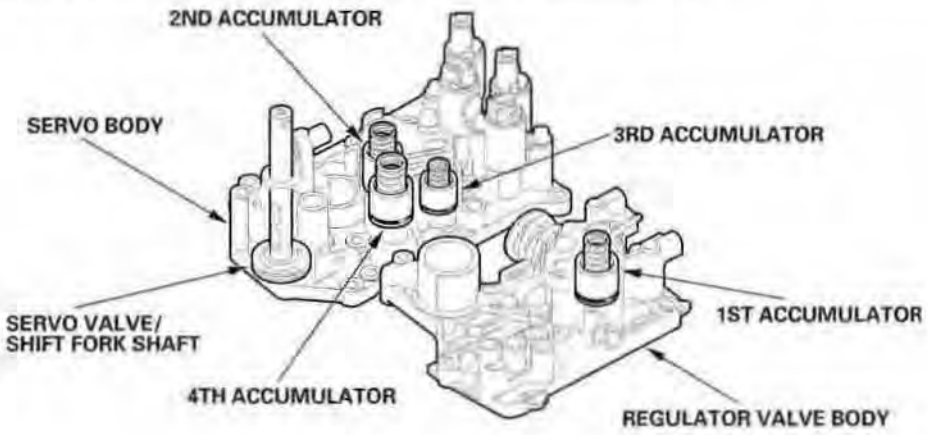
System Description (cont'd)

Hydraulic Controls (cont'd)

Servo Body
The servo body contains the servo valve, the clutch pressure back-up (CPB) valve, accumulators for 2nd, 3rd, and 4th, and shift solenoid valves for A, B, C, and E.



Accumulator
The accumulators are located in the regulator valve body and the servo body. The regulator valve body contains the 1st accumulator, and the servo body contains the 2nd, 3rd, and 4th accumulators.



Hydraulic Flow

Distribution of Hydraulic Pressure

As the engine turns, the ATF pump starts to operate. Automatic transmission fluid (ATF) is drawn through the ATF strainer (filter) and discharged into the hydraulic circuit. Then, ATF flowing from the ATF pump becomes line pressure that's regulated by the regulator valve. Torque converter pressure from the regulator valve enters the torque converter through the lock-up shift valve, and it is discharged from the torque converter. The torque converter check valve prevents torque converter pressure from rising.

The PCM controls the shift solenoid valves ON and OFF. The shift solenoid valve intercepts line pressure from the ATF pump via the manual valve when the shift solenoid valve is OFF. When the shift solenoid valve is turned ON, line pressure changes to shift solenoid valve pressure at the shift solenoid valve, then the solenoid valve pressure flows to the shift valve. Applying shift solenoid pressure to the shift valves moves the position of the shift valve, and switches the port of the hydraulic circuit. The PCM also controls A/T clutch pressure control solenoid valves A, B, and C. The A/T clutch pressure control solenoid valves regulate hydraulic pressure, and apply the pressure to the clutches to engage smoothly. The clutches receive optimum clutch pressure which is regulated by the A/T clutch pressure control solenoid valves for comfortable driving and shifting under all conditions.

Hydraulic pressure at the port is as follows:

PORT NO.	DESCRIPTION OF PRESSURE	PORT NO.	DESCRIPTION OF PRESSURE
1	LINE	SC	SHIFT SOLENOID VALVE C
3	LINE	SE	SHIFT SOLENOID VALVE E
3'	LINE	10	1ST CLUTCH
4	LINE	20	2ND CLUTCH
4'	LINE	30	3RD CLUTCH
4''	LINE	40	4TH CLUTCH
7	LINE	55	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
1A	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A	55'	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
1B	LINE	56	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B
3A	LINE	57	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C
3B	LINE	90	TORQUE CONVERTER
3C	LINE	91	TORQUE CONVERTER
5A	LINE	92	TORQUE CONVERTER
5B	LINE	93	ATF COOLER
5C	LINE	94	TORQUE CONVERTER
5D	LINE	95	LUBRICATION
5E	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B	96	TORQUE CONVERTER
5F	LINE or A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A or B	97	TORQUE CONVERTER
5G	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B	99	SUCTION
5H	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	X	DRAIN
5K	A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C	HX	HIGH POSITION DRAIN
SA	SHIFT SOLENOID VALVE A	AX	AIR DRAIN
SB	SHIFT SOLENOID VALVE B		

(cont'd)

System Description (cont'd)

Hydraulic Flow (cont'd)

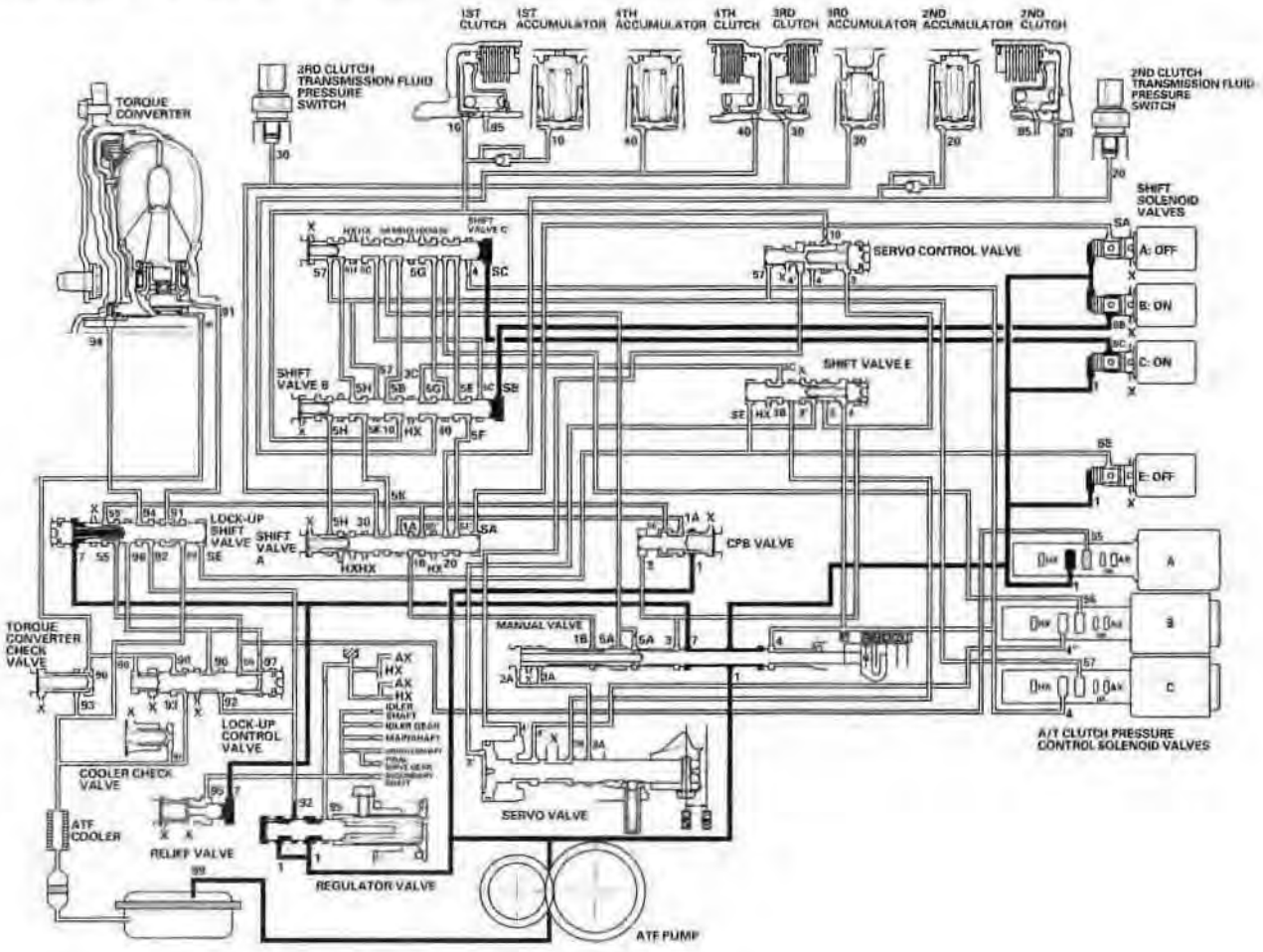
N Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:

- Shift solenoid valve A: OFF Shift valve A stays on in the right side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: ON Shift valve C moves to left side
- Shift solenoid valve E: OFF Shift valve E stays on in the left side

Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A, and changes to A/T clutch pressure control solenoid valve A pressure (55) at the A/T clutch pressure control solenoid valve A. A/T clutch pressure control solenoid valve A pressure (55) becomes line pressure (1B) at the shift valve A, and stops at the manual valve. Under this condition, hydraulic pressure is not applied to the clutches.

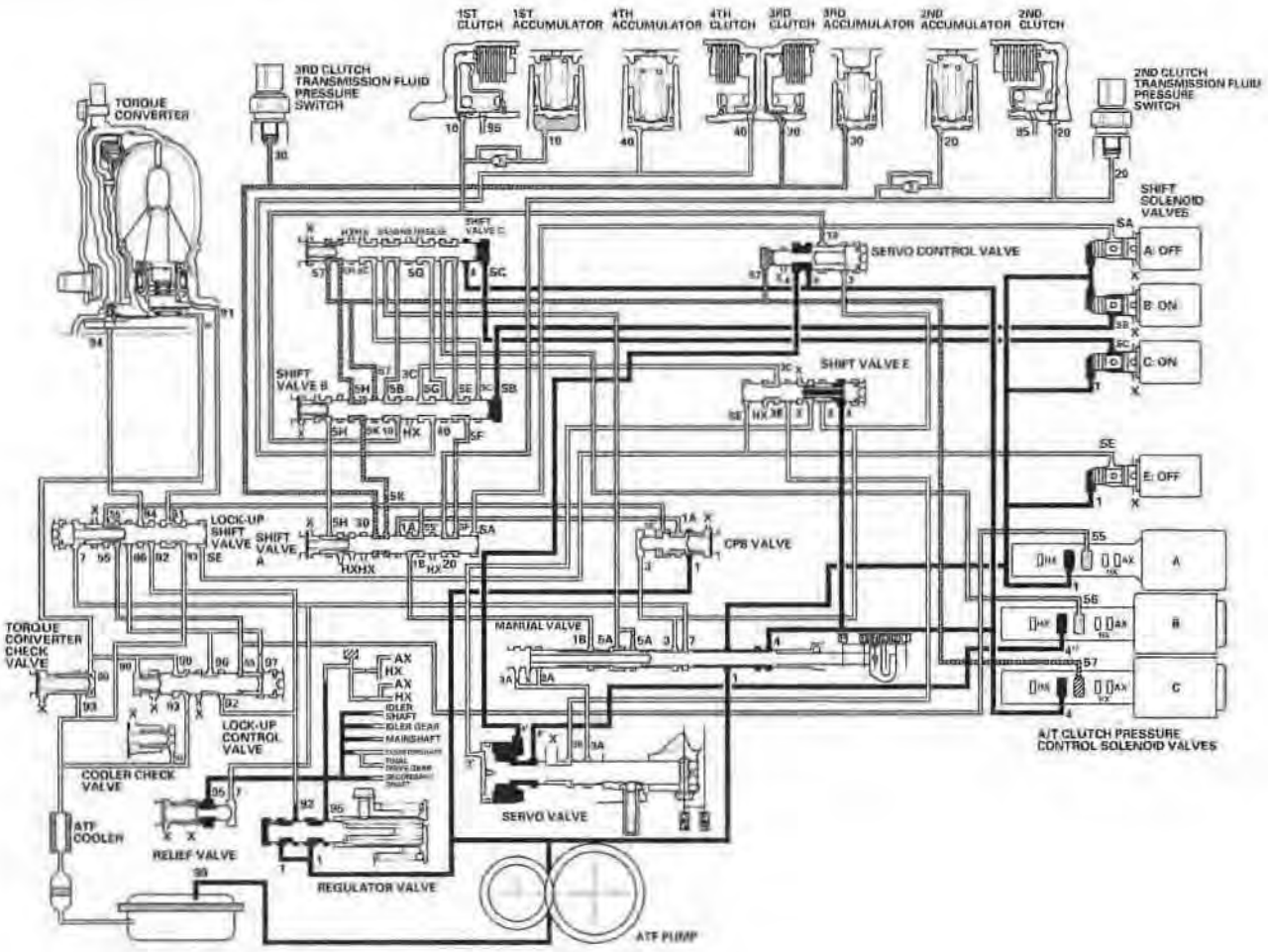
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



D Position: 1st gear shifting from the N position

Shift solenoid valves remain the same as in the N position when shifting to the D position from the N. The manual valve is moved to the D position, and switches the port of line pressure (4) leading to the A/T clutch pressure control solenoid valve C. Hydraulic pressure to the 1st clutch from the A/T clutch pressure control solenoid valve A is created as shift solenoid valve A is OFF, B and C stays ON. A/T clutch pressure control solenoid valve A pressure (55) changes to 1st clutch pressure (10) at the shift valve B, and flows to the 1st clutch. A/T clutch pressure control solenoid valves B and C pressures also flow to the 2nd and 3rd clutches. The 1st clutch is engaged gently when shifting to the D position from the N.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

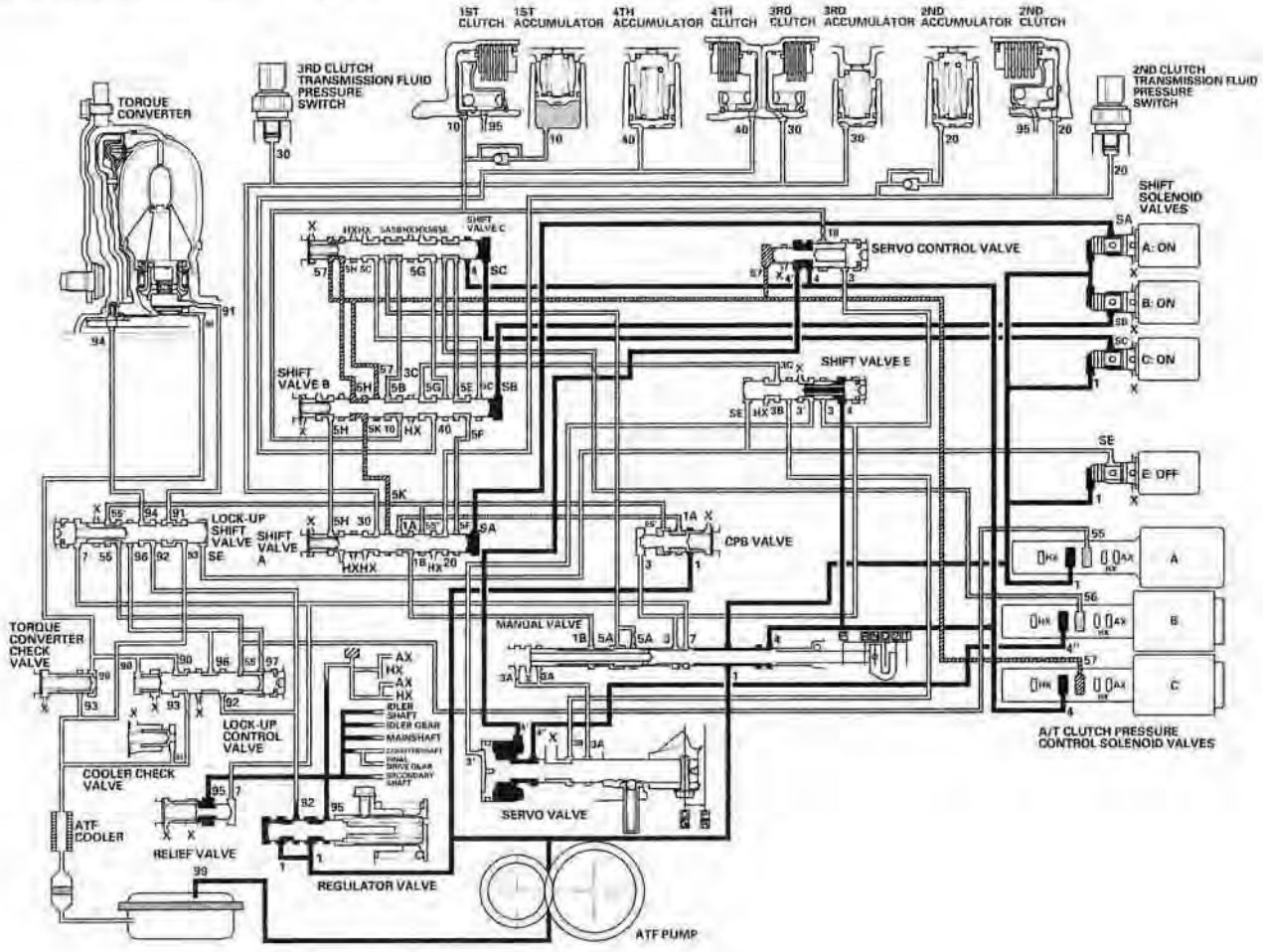
System Description (cont'd)

Hydraulic Flow (cont'd)

D Position: Driving in 1st gear
The PCM turns shift solenoid valves A ON and keeps B and C ON, and E OFF. Shift solenoid valve A pressure (SA) is applied to the right side of the shift valve A. Shift valve A is moved to the left side to uncover the port of line pressure leading to the 1st clutch, and to cover the A/T clutch pressure control solenoid valve pressures port. The A/T clutch pressure control solenoid valves pressures are released at the shift valve A.

Fluid flows to the 1st clutch by way of:
Line pressure (1) → A/T clutch pressure control solenoid valve A—A/T clutch pressure control solenoid valve A pressure (55) → CPB valve—Line pressure (1A) → Shift valve A—Line pressure (1B) → Manual valve—Line pressure (5A) → Shift valve C—Line pressure (5B) → Shift valve B—1st clutch pressure (10) → 1st clutch
The 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch is engaged securely.

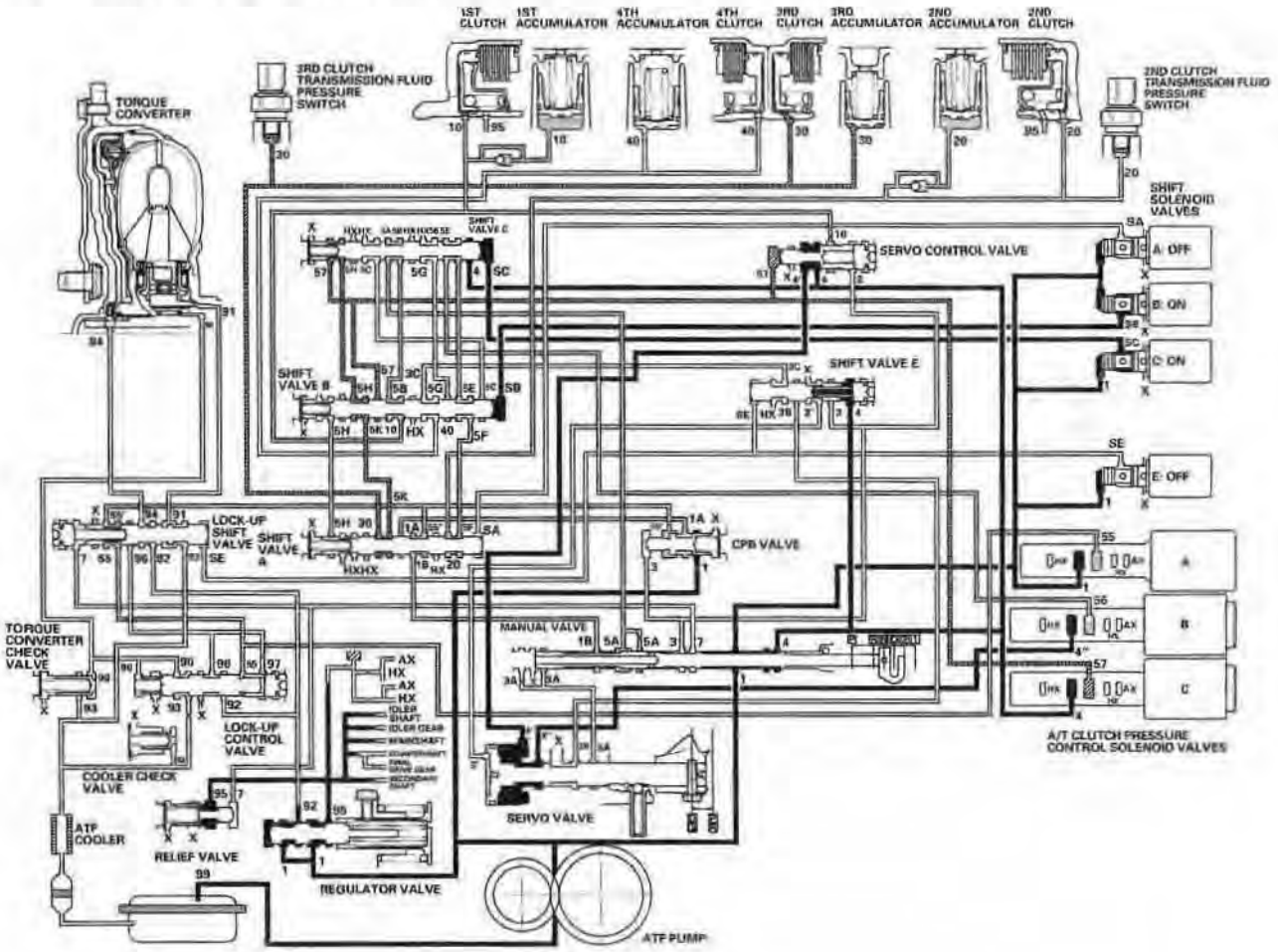
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



D Position: Shifting between 1st gear and 2nd gear

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valves A OFF and keeps B and C ON, and E OFF. Shift solenoid valve A pressure (SA) in the right side of shift valve A is released. Shift valve A is moved to the right side to uncover the A/T clutch pressure control solenoid valves pressures port leading to the 1st, 2 nd, and 3rd clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve B pressure (56) changes to 2nd clutch pressure (20) at the shift valve A, and flows to the 2nd clutch. The 2nd clutch is engaged gently.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

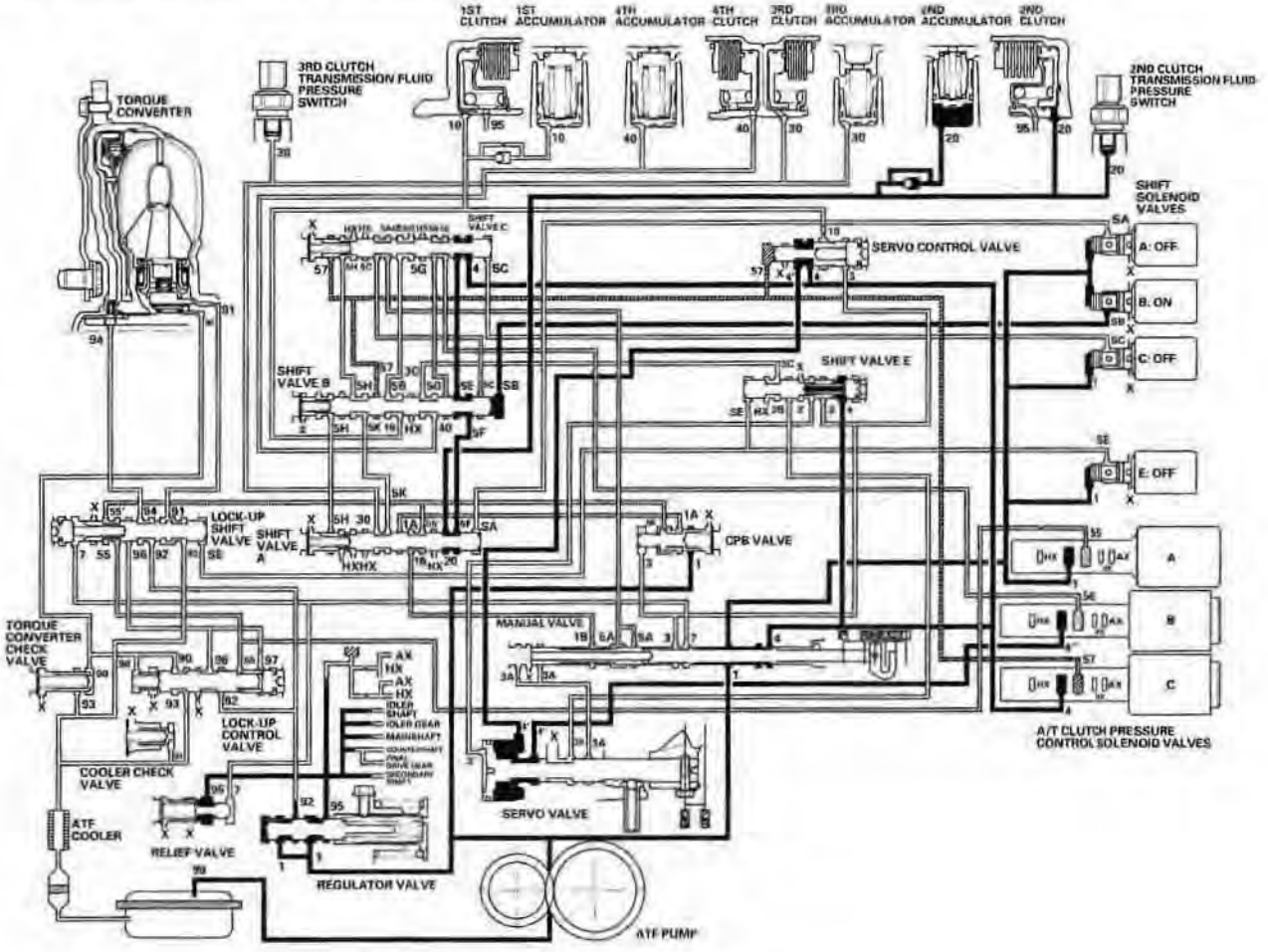
System Description (cont'd)

Hydraulic Flow (cont'd)

D Position: Driving in 2nd gear
The PCM turns shift solenoid valves C OFF and keeps A and E OFF, and B ON. Shift solenoid valve C pressure (SC) in the right side of the shift valve C is released. Shift valve C is moved to the right side to switch the ports. This movement covers the A/T clutch pressure control solenoid valve pressure at shift valve C and B, and uncovers the line pressure port leading to the 2nd clutch.

Fluid flows to 2nd clutch by way of:
Line pressure (1) → Manual valve—Line pressure (4) → Shift valve C—Line pressure (5E) → Shift valve B—Line pressure (5F) → Shift valve A—2nd clutch pressure (20) → 2nd clutch
The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged securely.

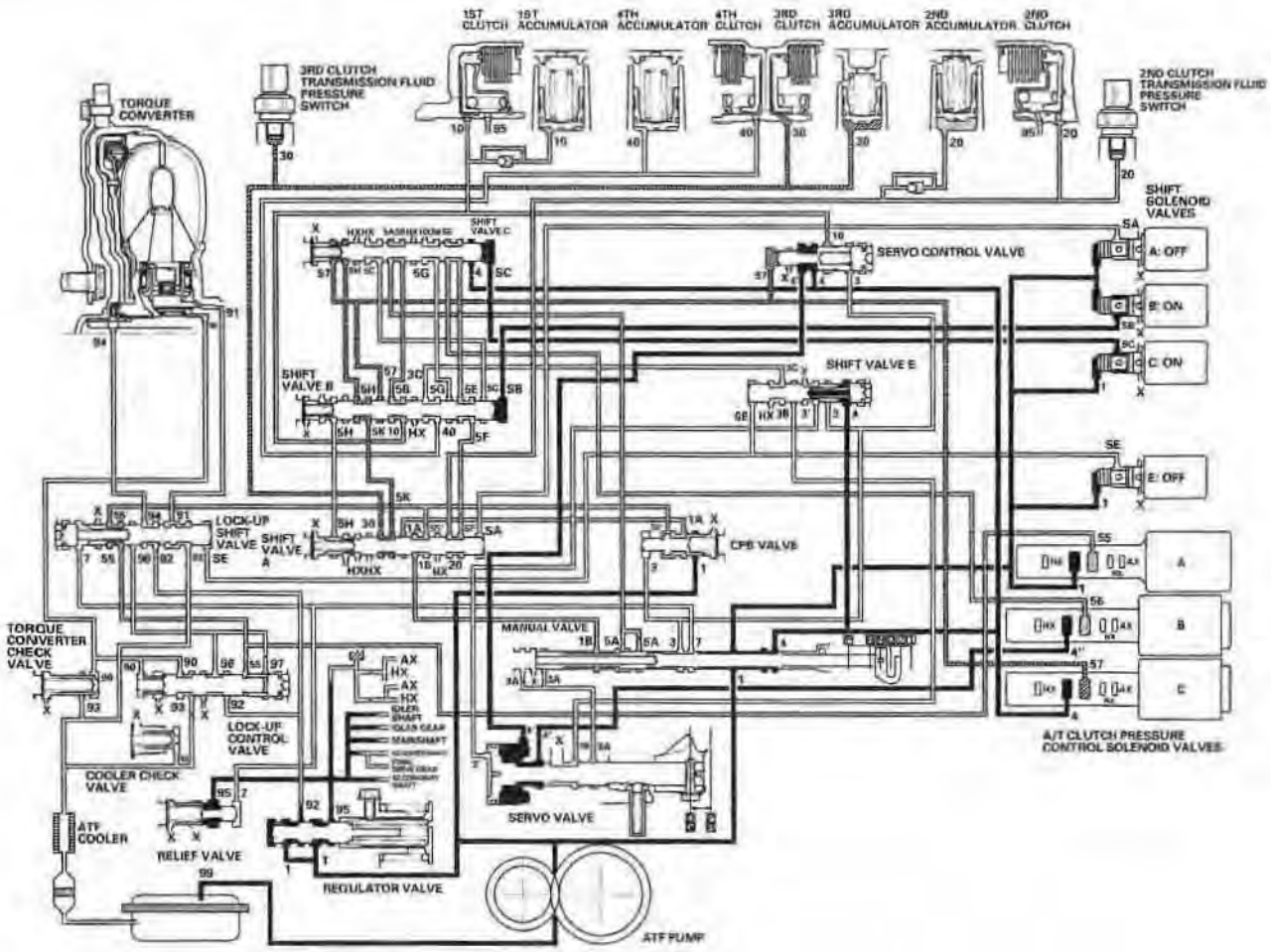
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



D Position: Shifting between 2nd gear and 3rd gear

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valves C ON and keeps A and E OFF, and B ON. Shift solenoid valve C pressure (SC) is applied to the right side of the shift valve C. Shift valve C is moved to the left side to uncover the A/T clutch pressure control solenoid valve pressure ports leading to the 1st, 2nd, and 3rd clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve B pressure (56) changes to 2nd clutch pressure (20) at the shift valve A, and A/T clutch pressure control solenoid valve C pressure (57) changes to 3rd clutch pressure (30) at shift valve A. The 2nd and 3rd clutches are engaged gently.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

System Description (cont'd)

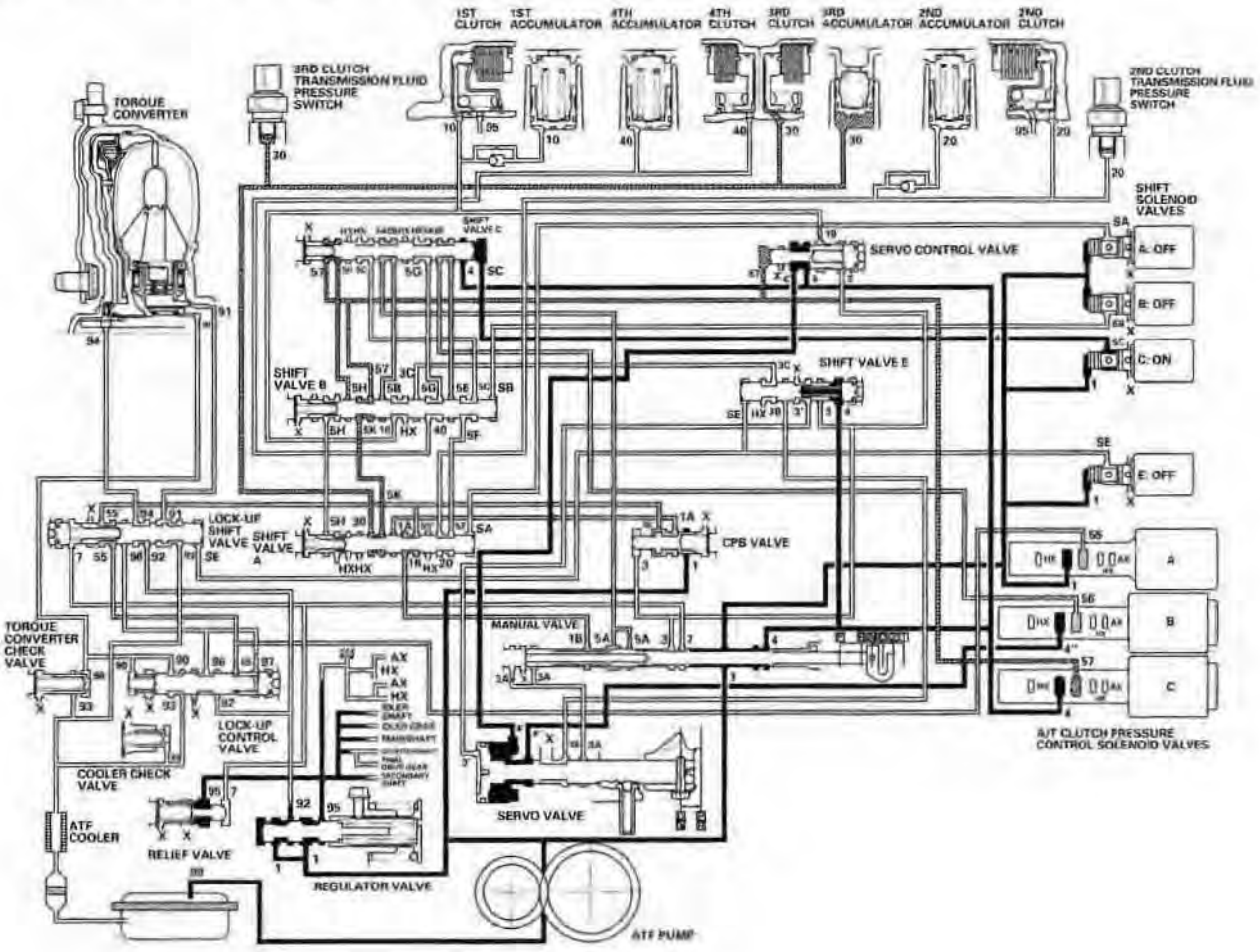
Hydraulic Flow (cont'd)

D Position: Driving in 3rd gear

The PCM turns shift solenoid valves B OFF and keeps A and E OFF, and C ON. Shift solenoid valve B pressure (SB) in the right side of shift valve B is released, and shift valve B is moved to the right side. This movement switches the port of A/T clutch pressure control solenoid valve C pressure leading to the 3rd clutch.

A/T clutch pressure control solenoid valve C pressure (57) changes to (5K) at the shift valve B, and becomes 3rd clutch pressure (30) at the shift valve A. The 3rd clutch pressure (30) is applied to the 3rd clutch, and the 3rd clutch is engaged securely.

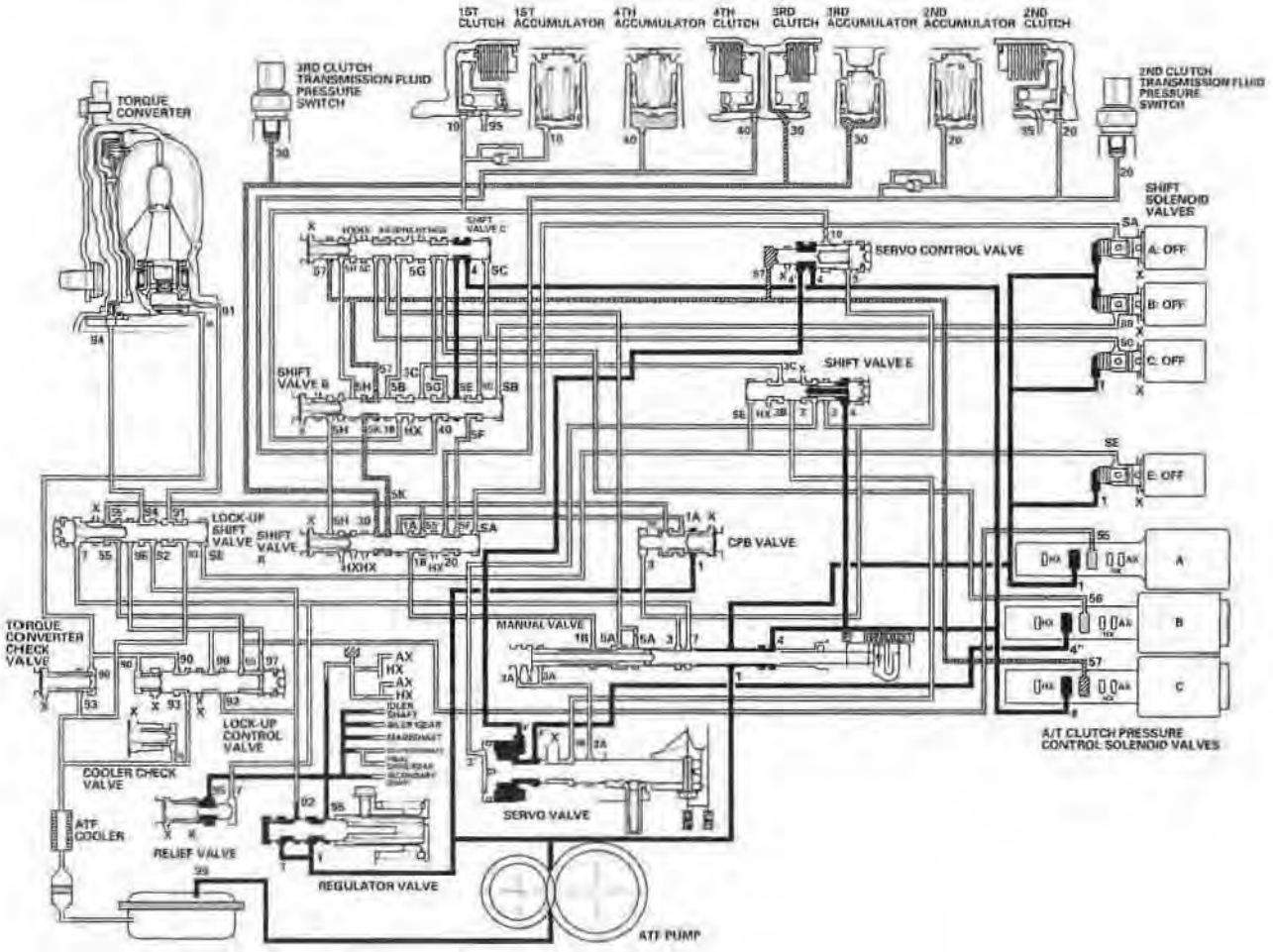
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



D Position: Shifting between 3rd gear and 4th gear

As the speed of the vehicle reaches the programmed value, the PCM turns shift solenoid valves C OFF and keeps A, B, and E OFF. Shift solenoid valve C pressure (SC) in the right side of shift valve C is released. Shift valve C is moved to the right side to uncover the A/T clutch pressure control solenoid valve A and B pressure ports leading to the 2nd and 4th clutches. The PCM controls the A/T clutch pressure control solenoid valves to regulate hydraulic pressure. A/T clutch pressure control solenoid valve A pressure changes to 2nd clutch pressure (20) at shift valve A, and A/T clutch pressure control solenoid valve B pressure changes to 4th clutch pressure (40) at shift valve B. The 3rd clutch pressure is regulated to low by the A/T clutch pressure control solenoid valve C. The 3rd and 4th clutches are engaged gently.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

System Description (cont'd)

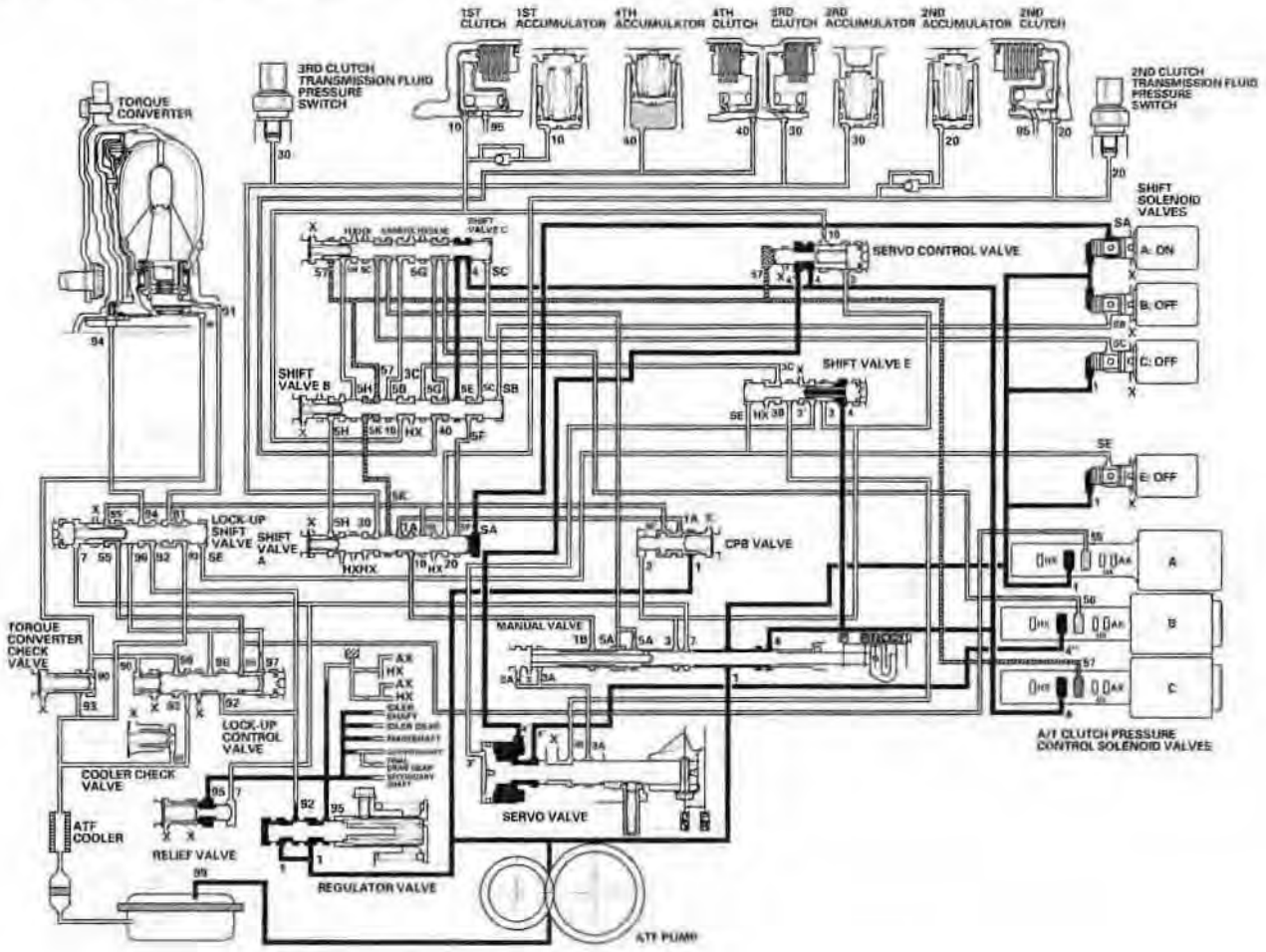
Hydraulic Flow (cont'd)

D Position: Driving in 4th gear

The PCM turns shift solenoid valves A ON and keeps B, C, and E OFF. Shift solenoid valve A pressure (SA) is applied to the right side of shift valve A. Shift valve A is moved to the left side to cover the A/T clutch pressure control solenoid valve A and C pressure ports leading to the 2nd and 3rd clutches.

A/T clutch pressure control solenoid valve B pressure (56) changes to (5G) at shift valve C, and becomes 4th clutch pressure (40) at shift valve B. The 4th clutch pressure (40) is held to high by the A/T clutch pressure control solenoid valve B, and the 4th clutch is engaged securely.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



2 Position

The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:

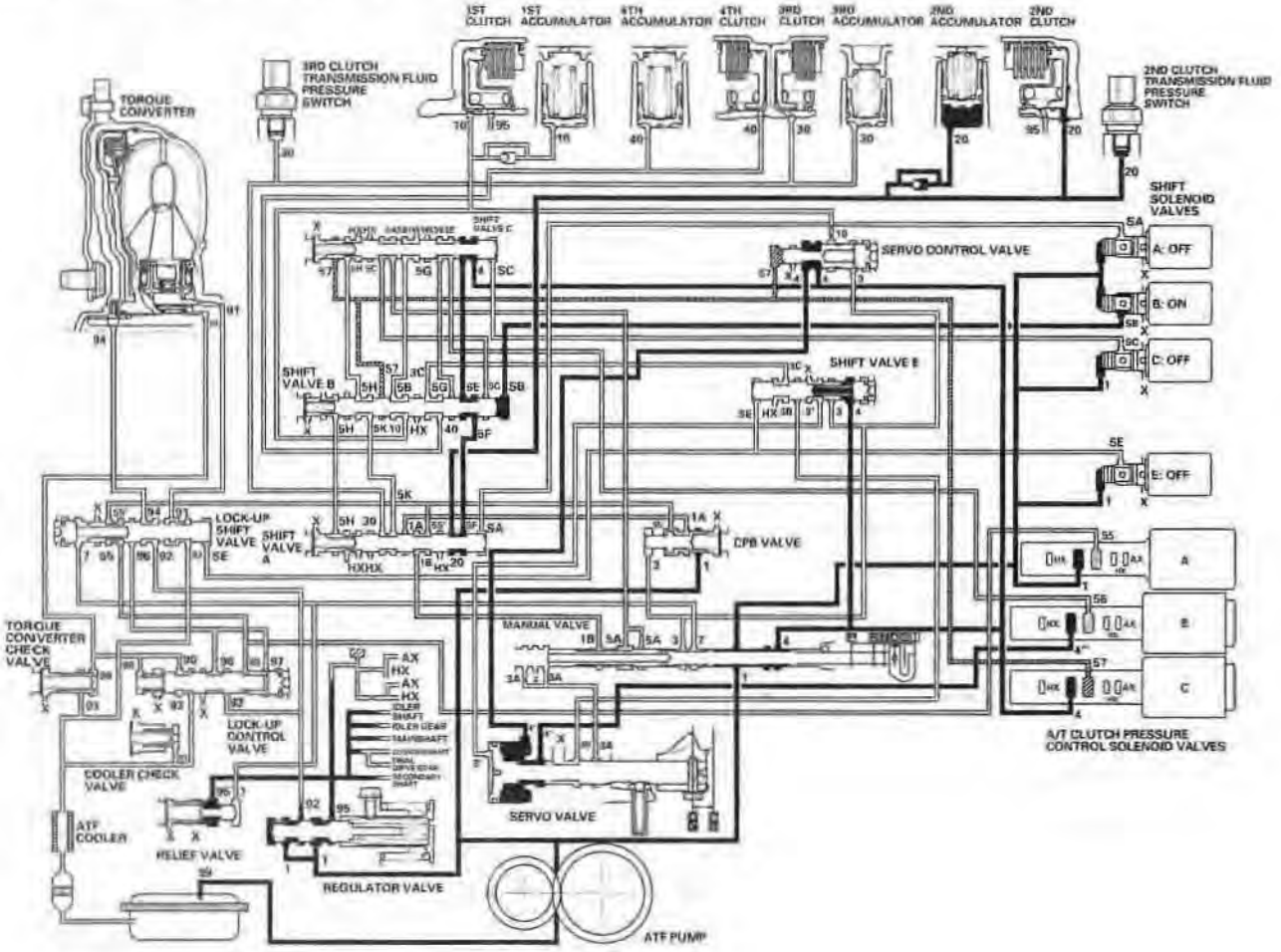
- Shift solenoid valve A: OFF Shift valve A stays on in the right side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: OFF Shift valve C stays on in the right side
- Shift solenoid valve E: OFF Shift valve E stays on in the left side

Line pressure (1) changes (4) at the manual valve, and flows to shift valve C. Line pressure (4) becomes the 2nd clutch pressure (20) at the shift valve A.

Fluid Flows to 2nd clutch by way of:
Line pressure (1) → Manual valve—Line pressure (4) → Shift valve C—Line pressure (5E) → Shift valve B—Line pressure (5F) → Shift valve A—2nd clutch pressure (20) → 2nd clutch

The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

System Description (cont'd)

Hydraulic Flow (cont'd)

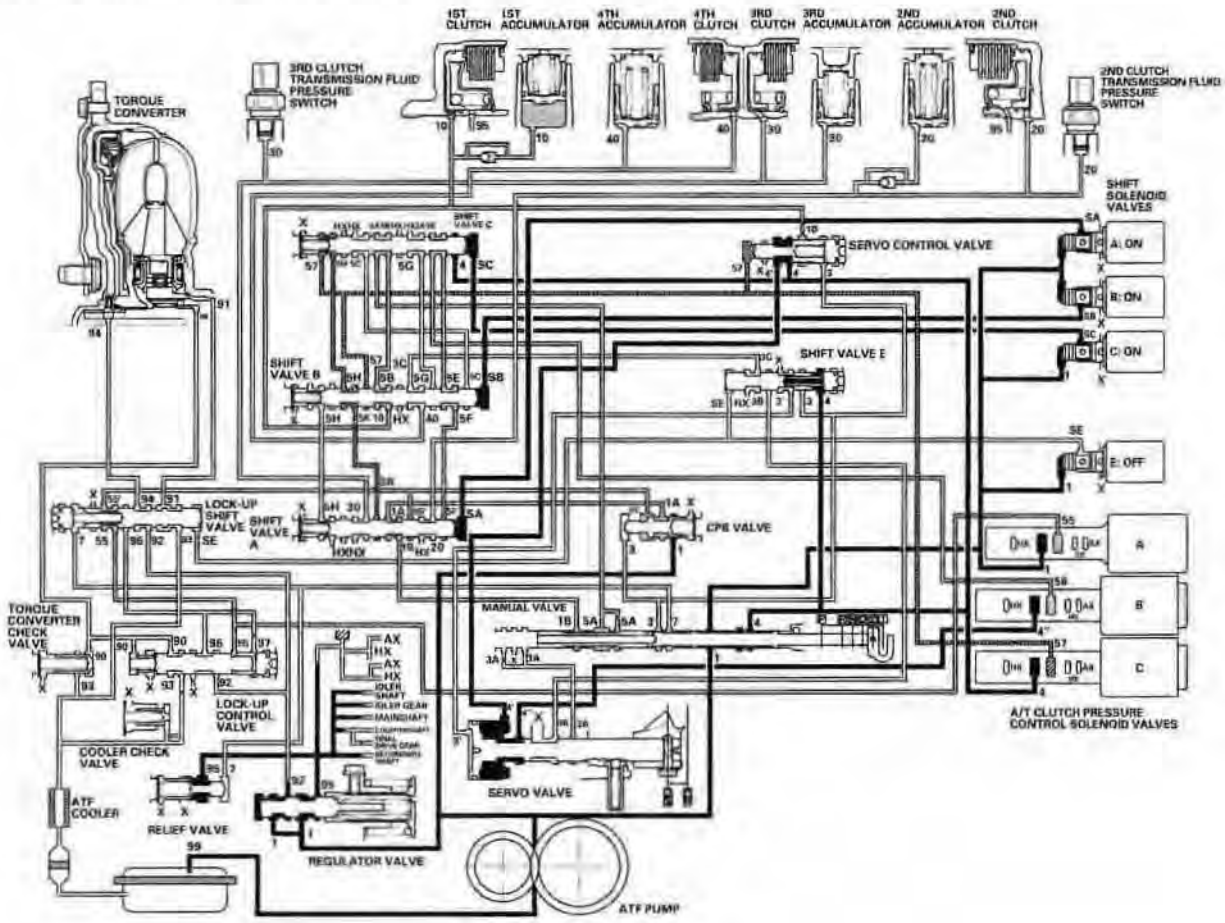
1 Position
The PCM controls the shift solenoid valves. The conditions of the shift solenoid valves and positions of the shift valves are as follows:
- Shift solenoid valve A: ON Shift valve A moves to left side
- Shift solenoid valve B: ON Shift valve B moves to left side
- Shift solenoid valve C: ON Shift valve C moves to left side
- Shift solenoid valve E: OFF Shift valve E stays on in the left side

Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A, and changes to A/T clutch pressure control solenoid pressure (55) at the A/T clutch pressure control solenoid valve A.

Fluid Flows to 1st clutch by way of:
A/T clutch pressure control solenoid pressure (55) → CPB valve—Line pressure (1A) → Shift valve A—Line pressure (1B) → Manual valve—Line pressure (5A) → Shift valve C—Line pressure (5B) → Shift valve B—1st clutch pressure (10) → 1st clutch

The 1st clutch pressure (10) is applied to the 1st clutch, and the 1st clutch is engaged.

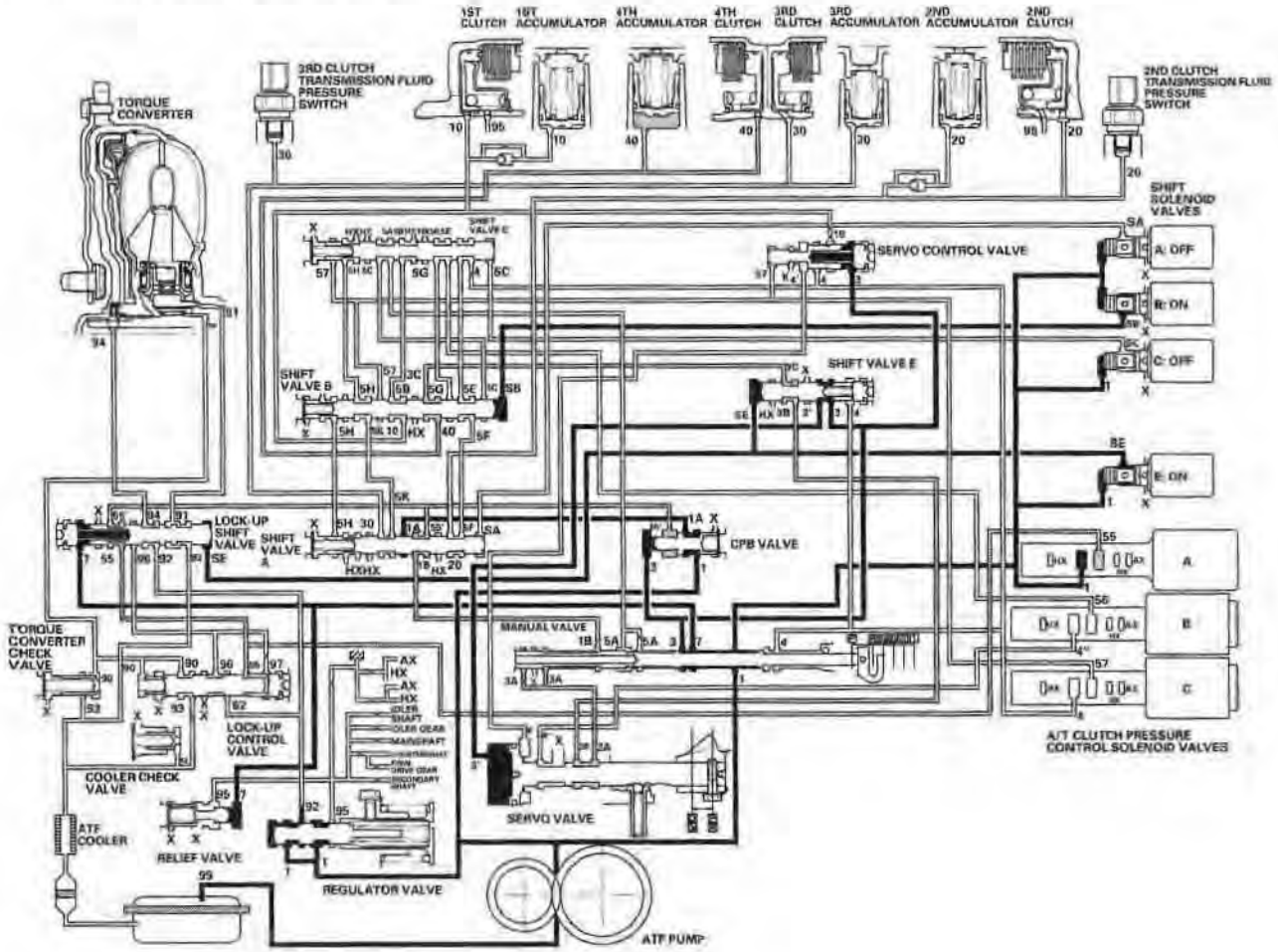
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



R Position: Shifting to the R position from the P or N position

When shifting in the R position, the PCM turns shift solenoid valves B and E ON, and A and C OFF. Shift solenoid valve B pressure (SB) is applied to the right side of shift valve B, and shift valve B is moved to left side. Shift solenoid valve E pressure (SE) is applied to the left side of shift valve E, and shift valve E is moved to the right side. Line pressure (1) changes to (3) at the manual valve, and flows to the servo valve via shift valve E. The servo valve is moved to reverse range position. Movement of shift valves B and E, and servo valve creates 4th clutch pressure line between the 4th clutch and the A/T clutch pressure control solenoid valve A. The 4th clutch pressure (40) is applied to the 4th clutch, and the 4th clutch is engaged gently.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

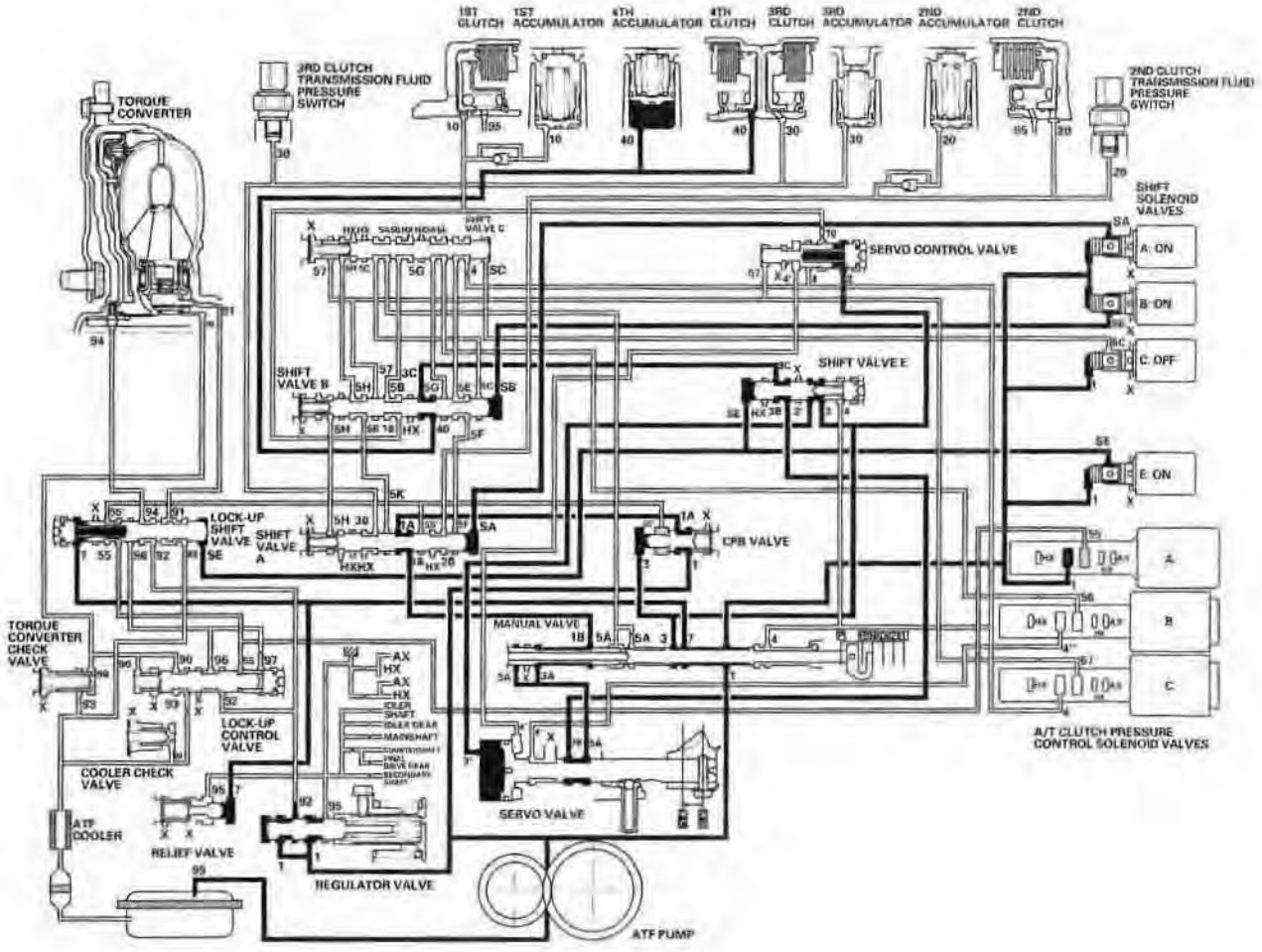
System Description (cont'd)

Hydraulic Flow (cont'd)

R Position: Driving in reverse gear
After starting off in reverse gear, the PCM turns shift solenoid valves A ON and keeps B and E ON, and C OFF. Shift solenoid valve A pressure (SA) is applied to the right side of shift valve A to cover the A/T clutch pressure control solenoid valve A pressure port, and to uncover the line pressure port leading to the 4th clutch creating full line pressure. The 4th clutch is engaged securely with line pressure.

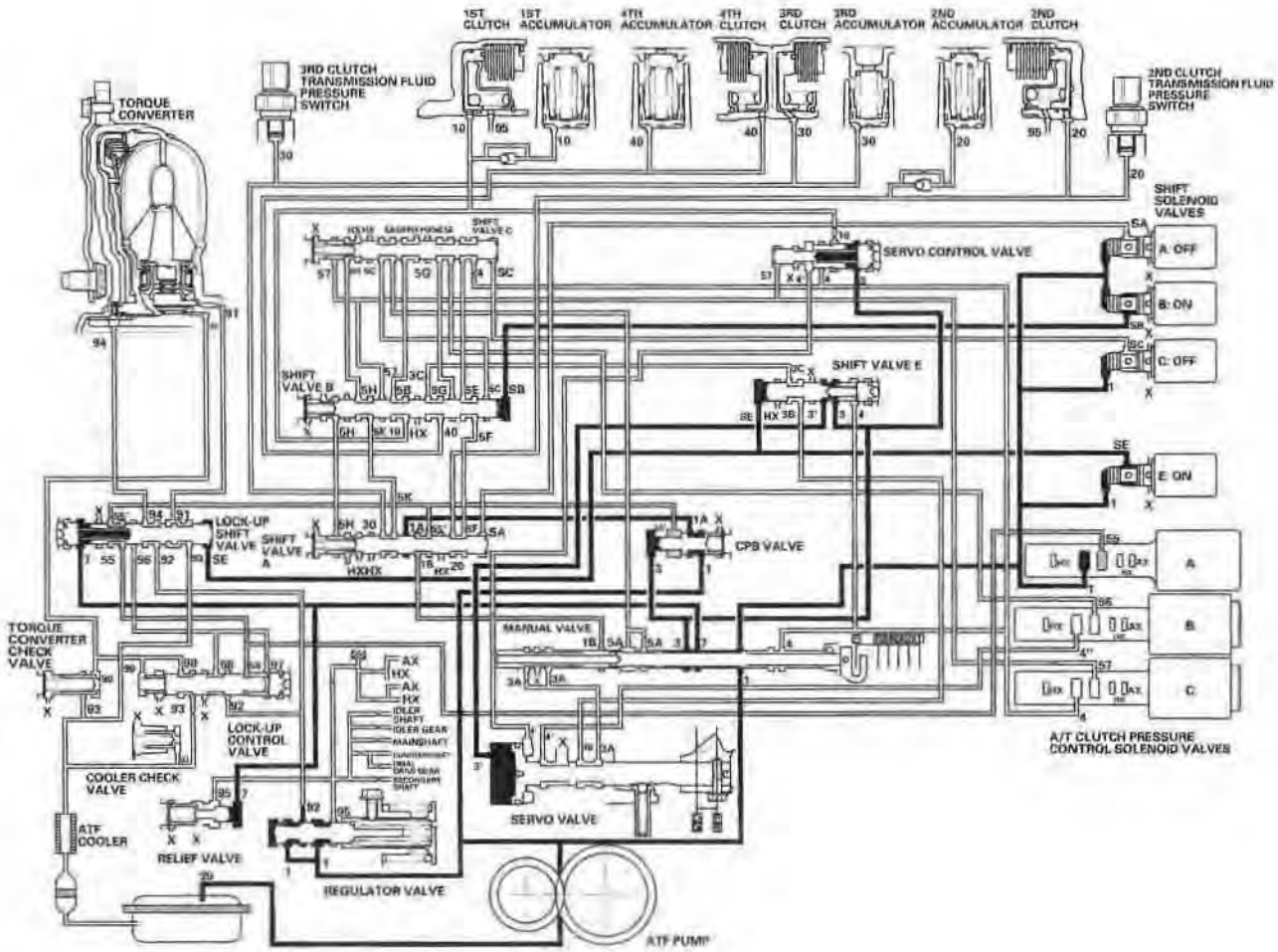
Reverse Inhibitor Control
While the vehicle is moving forward, the PCM keeps shift solenoid valve E OFF. Shift valve E covers the port of line pressure (3') leading to the servo valve reverse position. The servo valve cannot be shifted to reverse position, and hydraulic pressure is not applied to the 4th clutch from servo valve for reverse. As a result, power is not transmitted in the reverse direction.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



P Position

The PCM turns shift solenoid valves B and E ON, and A and C OFF. Line pressure (1) flows to the shift solenoid valves and the A/T clutch pressure control solenoid valve A. Line pressure (3) changes to (3') at shift valve E, and flows to the servo valve. The servo valve is moved to reverse/park position. Hydraulic pressure is not applied to the clutches.



System Description (cont'd)

Lock-up System

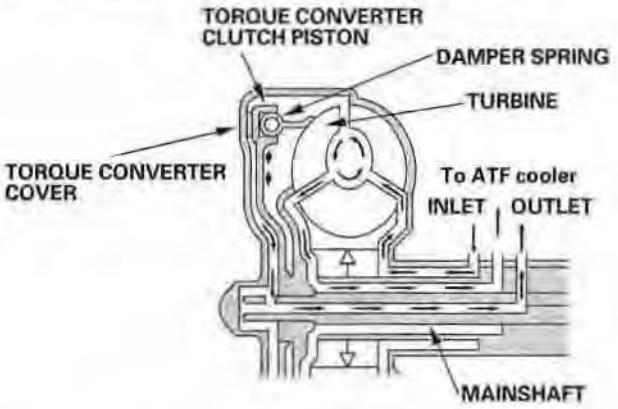
The lock-up mechanism of the torque converter clutch operates in the D position (2nd, 3rd, and 4th) and the D position over drive off mode (3rd). The pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the torque converter clutch piston to be held against the torque converter cover. As this takes place, the mainshaft rotates at the same speed as the engine crankshaft. Together with the hydraulic control, the PCM optimizes the timing and amount of the lock-up mechanism. When shift solenoid valve E is turned on by the PCM, the shift solenoid valve E pressure switches the lock-up shift valve lock-up on and off. A/T clutch pressure control solenoid valve A and the lock-up control valve control the amount of lock-up.

Torque Converter Clutch Lock-up ON (Engaging Torque Converter Clutch)
Fluid in the chamber between the torque converter cover and the torque converter clutch piston is drained off, and fluid entering from the chamber between the pump and stator exerts pressure through the torque converter clutch piston against the torque converter cover. The torque converter clutch piston engages with the torque converter cover; torque converter clutch lock-up ON, and the mainshaft rotates at the same as the engine.

Power flow

The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Torque converter clutch piston
↓
Damper spring
↓
Turbine
↓
Mainshaft

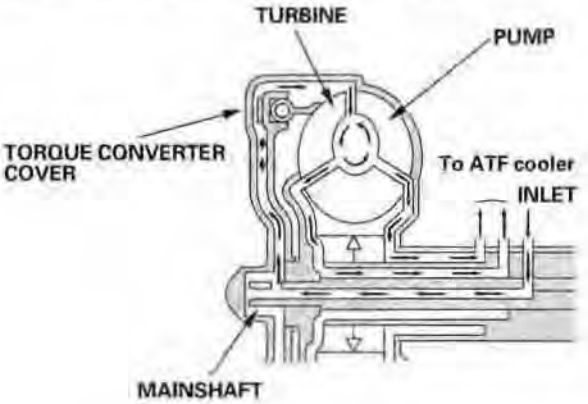


Torque Converter Clutch Lock-up OFF (Disengaging Torque Converter Clutch)
Fluid entered from the chamber between the torque converter cover and the torque converter clutch piston passes through the torque converter and goes out through the chambers between the turbine and the stator, and between the pump and the stator. As a result, the torque converter clutch piston moves away from the torque converter cover, and the torque converter clutch lock-up is released; torque converter clutch lock-up is OFF.

Power flow

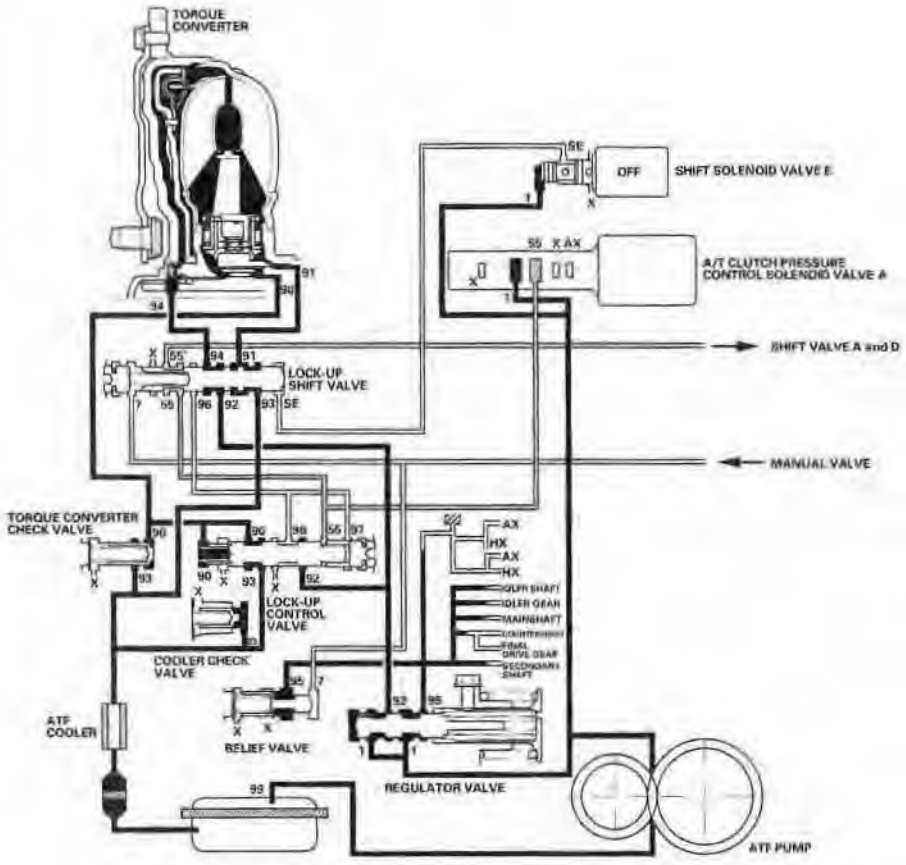
The power flows by way of:

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



No Lock-up
Shift solenoid valve E is turned OFF by the PCM, and shift solenoid valve E pressure (SE) is not applied to the lock-up shift valve. The lock-up shift valve stays to the right to uncover the torque converter pressure ports leading to the left side of the torque converter and releasing pressure from the right side of the torque converter. Torque converter pressure (92) changes to (94) at the lock-up shift valve, and enters into the left side of the torque converter to disengage the torque converter clutch. This keeps the torque converter clutch piston is kept away from the torque converter cover and the torque converter clutch lock-up is OFF.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

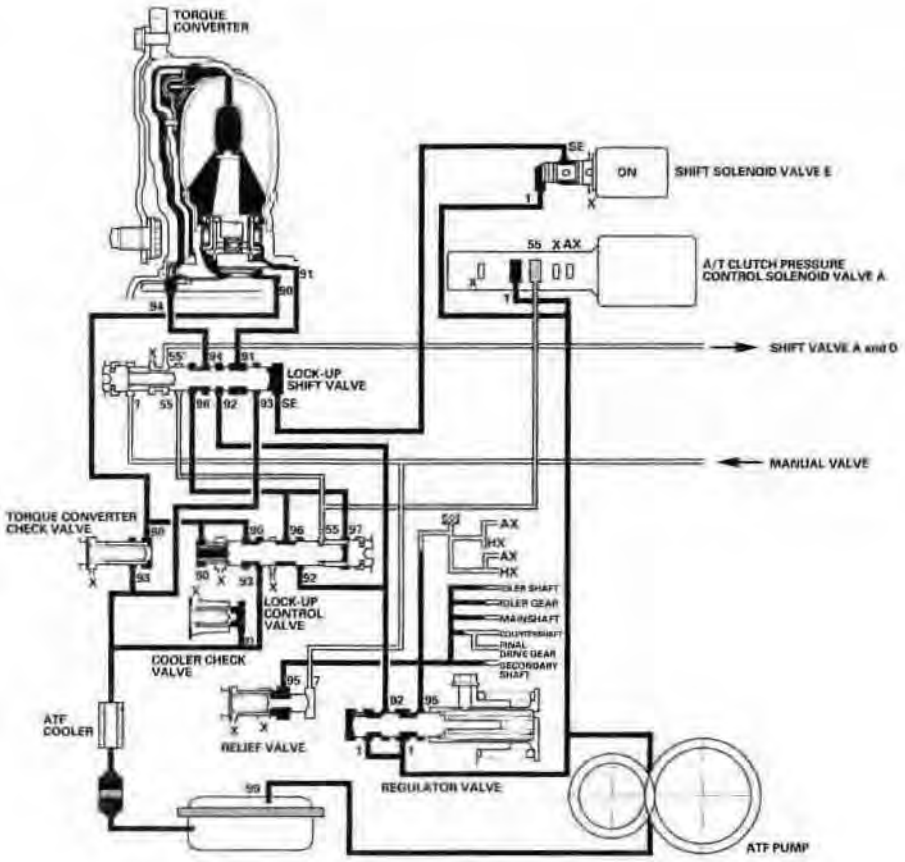
System Description (cont'd)

Lock-up System (cont'd)

Partial Lock-up

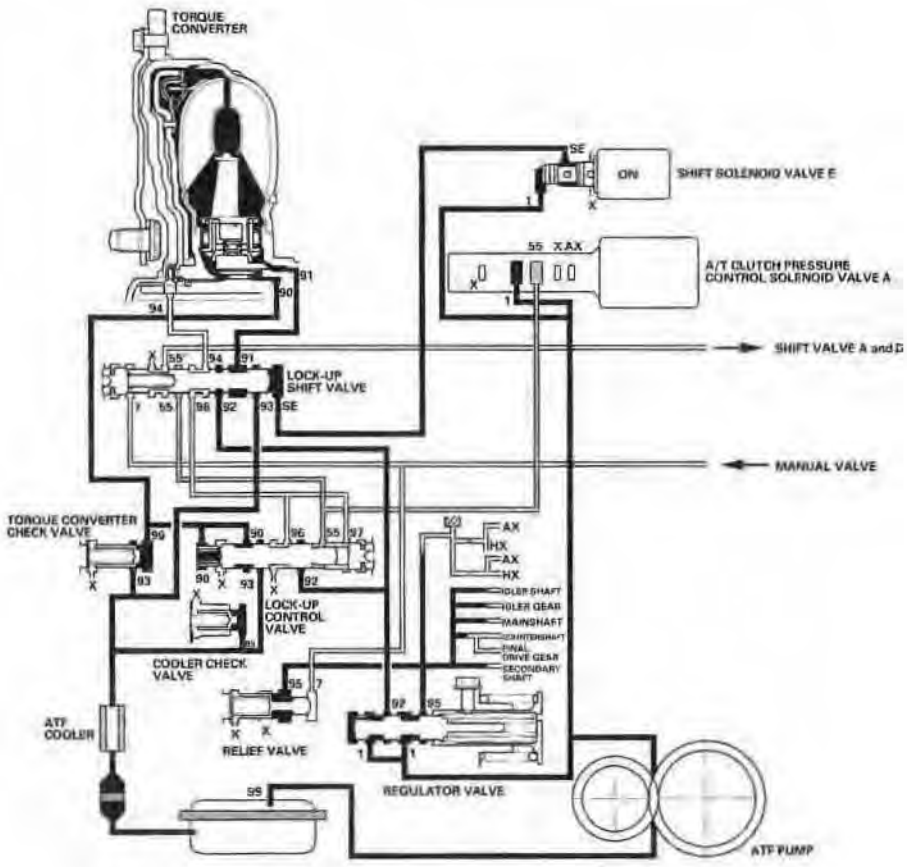
As the speed of the vehicle reaches the programmed value, shift solenoid valve E is turned ON by the PCM, and shift solenoid valve E pressure (SE) is applied to the right side of the lock-up shift valve. The lock-up shift valve is moved to the left side to switch the torque converter pressure (91) port, which goes to the right side of the torque converter, and the port of torque converter pressure (94) is released from the left side of the torque converter. Torque converter pressure (91) flows to the right side of the torque converter to engage the torque converter clutch. The PCM also controls the A/T clutch pressure control solenoid valve A to regulate A/T clutch pressure control solenoid valve A pressure (55) is applies to the lock-up shift valve and lock-up control valve. The position of the lock-up control valve depends on A/T clutch pressure control solenoid valve A pressure (55) and torque converter pressure released from the torque converter. The lock-up control valve controls the amount of torque converter clutch lock-up until fluid between the clutch piston and torque converter cover is fully released; the torque converter clutch is in partial lock-up.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



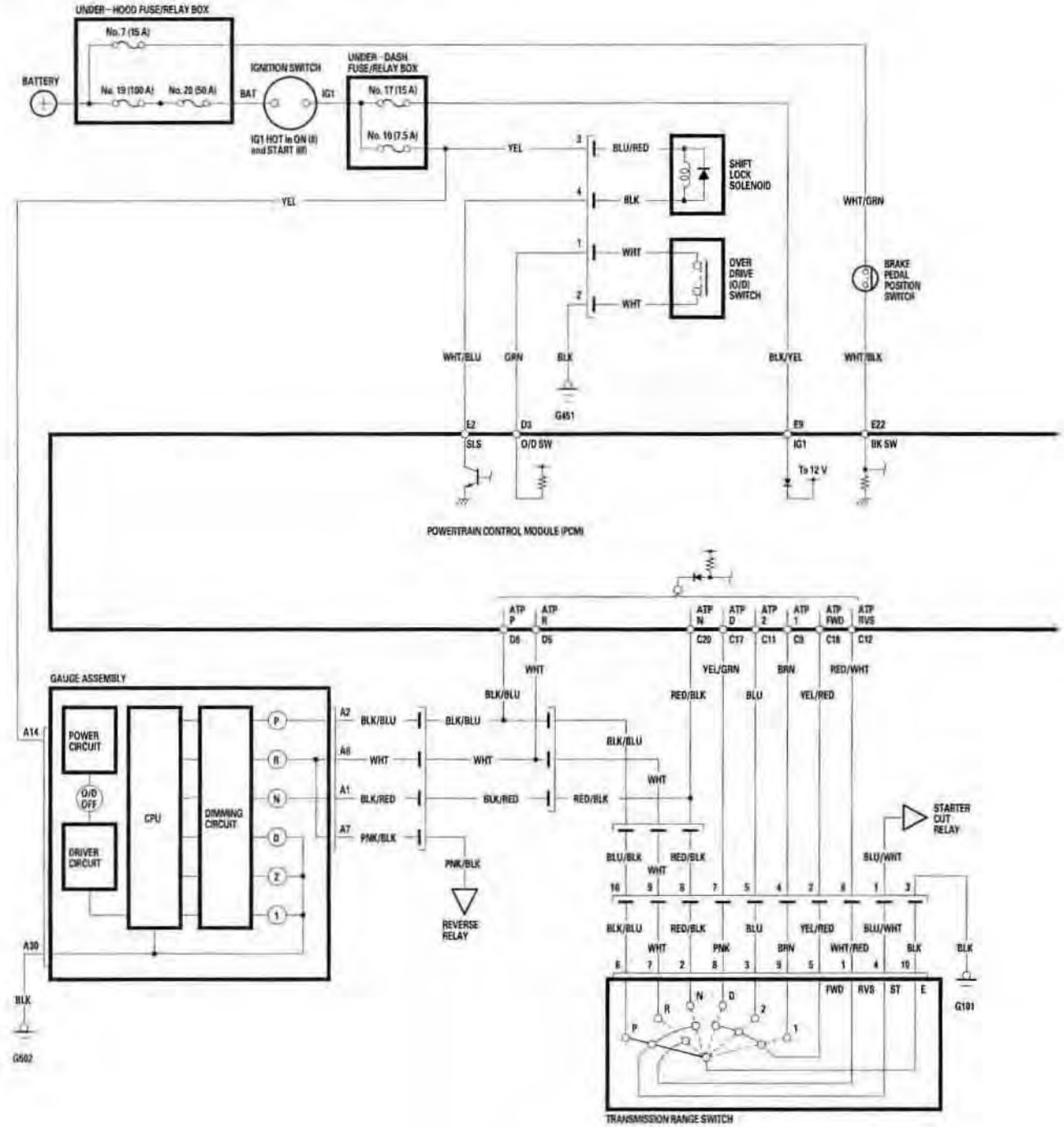
Full Lock-up
When the vehicle speed increases, the PCM sends a signal to the A/T clutch pressure control solenoid valve A to increase A/T clutch pressure control solenoid valve A pressure (55), and the lock-up control valve is moved to the left. Torque converter pressure (94) from the left side of the torque converter is completely released fully at the lock-up control valve, and torque converter pressure (91) engages the torque converter clutch securely; the torque converter clutch is in full lock-up.

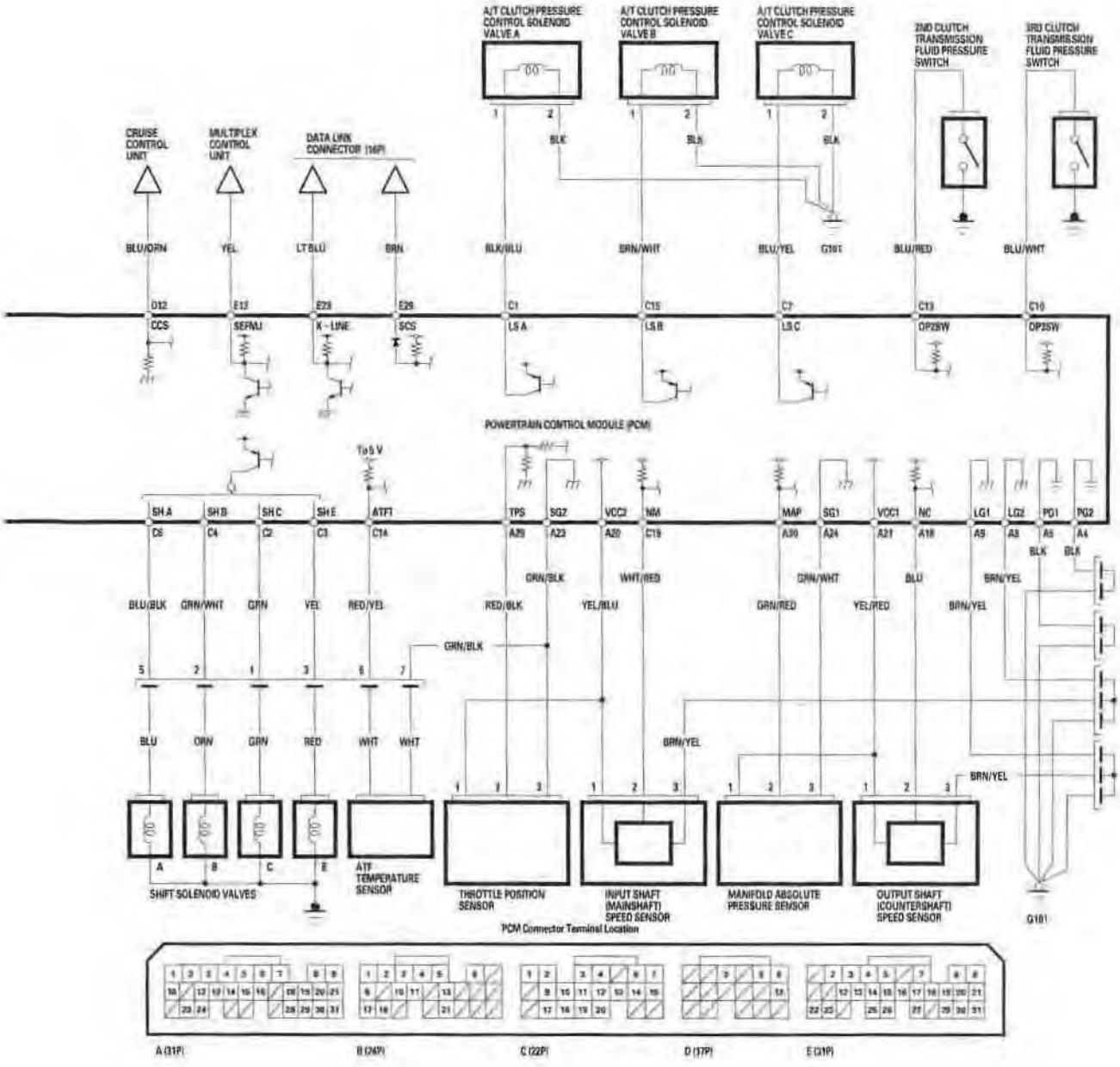
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



System Description (cont'd)

Circuit Diagram - PCM A/T Control System




A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A
A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B
A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C
2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH
3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH
CRUISE CONTROL UNIT
MULTIPLEX CONTROL UNIT
DATA LINK CONNECTOR (16P)
BLK
BLU/ORN
YEL
LT BLU
BRN
BLK/BLU
BRN/WHT
BLU/YEL
G101
BLU/RED
BLU/WHT
D12
E17
E23
E26
C1
C15
C7
C13
C10
CCS
SEFNU
K-LINE
SCS
LS A
LS B
LS C
OP2SW
OP2SW
POWERTRAIN CONTROL MODULE (PCM)
To 5 V
SH A
SH B
SH C
SH E
ATF1
TPS
SG2
VCC2
NM
MAP
SG1
VCC1
NC
LG1
LG2
PG1
PG2
C8
C4
C2
C3
C1A
A29
A23
A20
C19
A30
A24
A21
A18
A9
A8
A5
A4
BLK
BLK
BLU/BLK
GRN/WHT
GRN
YEL
RED/YEL
GRN/BLK
RED/BLK
WHT/RED
YEL/BLU
GRN/WHT
GRN/RED
BLU
YEL/RED
BRN/YEL
BRN/YEL
GRN/BLK
5
2
1
3
6
7
BLU
GRN
GRN
RED
WHT
WHT
BRN/YEL
BRN/YEL
A
B
C
E
SHIFT SOLENOID VALVES
ATF TEMPERATURE SENSOR
THROTTLE POSITION SENSOR
INPUT SHAFT (MAINSHAFT) SPEED SENSOR
MANIFOLD ABSOLUTE PRESSURE SENSOR
OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR
G101
PCM Connector Terminal Location
A (31P)
B (26P)
C (22P)
D (17P)
E (31P)

DTC Troubleshooting

DTC P0705: Short in Transmission Range Switch Circuit (Multiple Shift-position Input)

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine.
3. Move the shift lever to each position, and check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0705.

   Did the result indicate a fail?

   YES—Go to step 4.

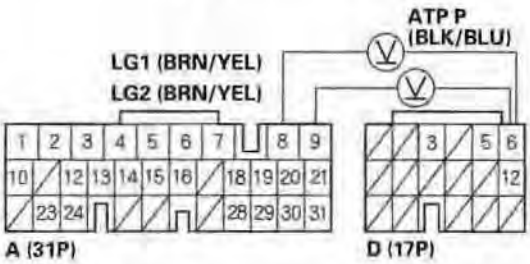
   NO—Intermittent failure, the system is OK at this time. Check for an intermittent short in the wires between the transmission range switch and PCM. If the tester indicates NOT COMPLETE, return to step 1 and recheck. ■
4. Test the transmission range switch (see page 14-229).

   Is the switch OK?

   YES—Go to step 5.

   NO—Replace the transmission range switch, then go to step 55.
5. Turn the ignition switch ON (II).
6. Shift to all positions other than P.
7. Measure the voltage between PCM connector terminals D6 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

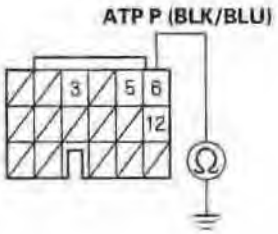
Is there battery voltage?

YES—Go to step 14.

NO—Go to step 8.

8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector D (17P).
11. Check for continuity between PCM connector terminal D6 and body ground.

PCM CONNECTOR D (17P)



Wire side of female terminals

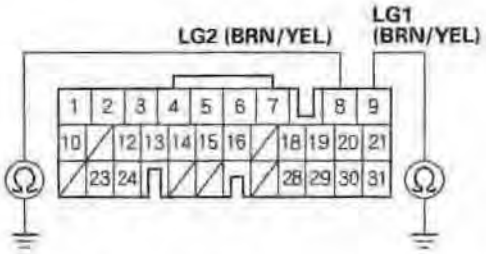
Is there continuity?

YES—Repair short in the wire between PCM connector terminal D6 and the transmission range switch, then go to step 55.

NO—Go to step 12.

12. Disconnect PCM connector A (31P).
13. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open in the wire between PCM connector terminals A8, A9, and ground (G101), or repair poor ground (G101), then go to step 55.

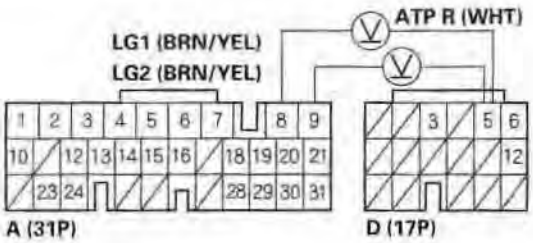
(cont'd)

DTC Troubleshooting (cont'd)

14. Shift to all positions other than R.

15. Measure the voltage between PCM connector terminals D5 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Go to step 20.

NO—Go to step 16.

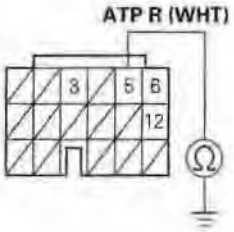
16. Turn the ignition switch OFF.

17. Jump the SCS line with the HDS.

18. Disconnect PCM connector D (17P).

19. Check for continuity between PCM connector terminal D5 and body ground.

PCM CONNECTOR D (17P)



Wire side of female terminals

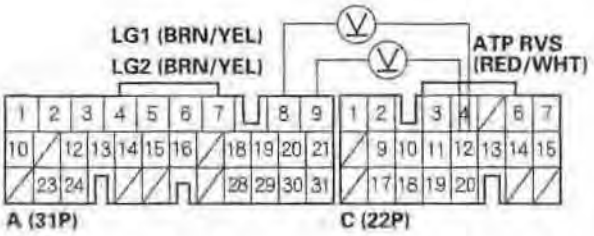
Is there continuity?

YES—Repair short in the wire between PCM connector terminal D5 and the transmission range switch, then go to step 55.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

20. Measure the voltage between PCM connector terminals C12 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Go to step 25.

NO—Go to step 21.

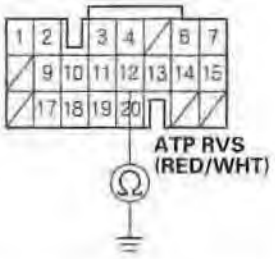
21. Turn the ignition switch OFF.

22. Jump the SCS line with the HDS.

23. Disconnect PCM connector C (22P).

24. Check for continuity between PCM connector terminal C12 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between PCM connector terminal C12 and the transmission range switch, then go to step 55.

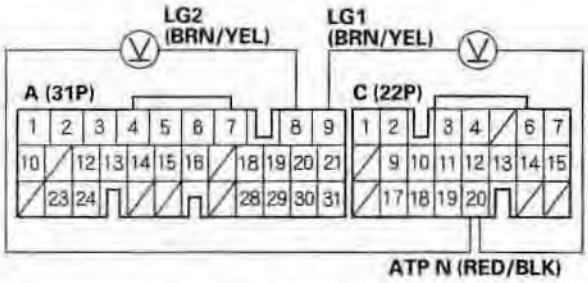
NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

(cont'd)

DTC Troubleshooting (cont'd)

25. Shift to all positions other than N.
26. Measure the voltage between PCM connector terminals C20 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

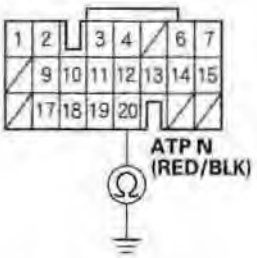
Is there battery voltage?

YES—Go to step 31.

NO—Go to step 27.

27. Turn the ignition switch OFF.
28. Jump the SCS line with the HDS.
29. Disconnect PCM connector C (22P).
30. Check for continuity between PCM connector terminal C20 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

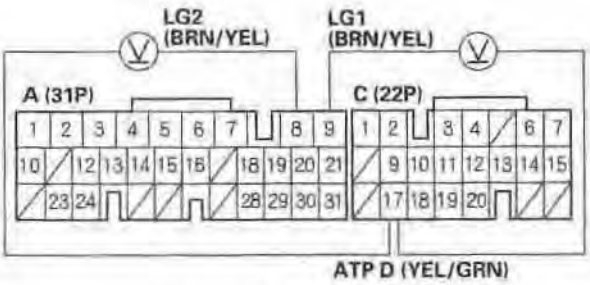
YES—Repair short in the wire between PCM connector terminal C20 and the transmission range switch, then go to step 55.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

31. Shift to all positions other than D.

32. Measure the voltage between PCM connector terminals C17 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Go to step 37.

NO—Go to step 33.

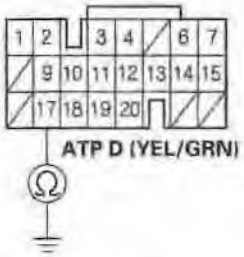
33. Turn the ignition switch OFF.

34. Jump the SCS line with the HDS.

35. Disconnect PCM connector C (22P).

36. Check for continuity between PCM connector terminal C17 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between PCM connector terminal C17 and the transmission range switch, then go to step 55.

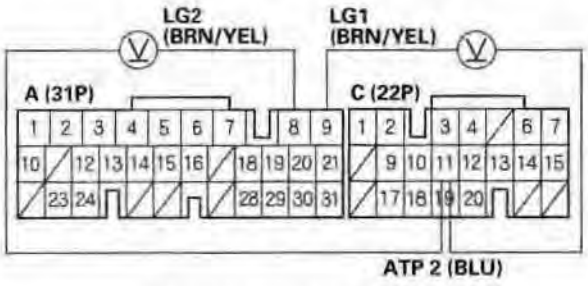
NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

(cont'd)

DTC Troubleshooting (cont'd)

37. Shift to all positions other than 2.
38. Measure the voltage between PCM connector terminals C11 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

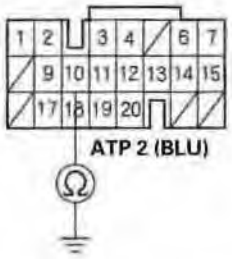
Is there battery voltage?

YES—Go to step 43.

NO—Go to step 39.

39. Turn the ignition switch OFF.
40. Jump the SCS line with the HDS.
41. Disconnect PCM connector C (22P).
42. Check for continuity between PCM connector terminal C11 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

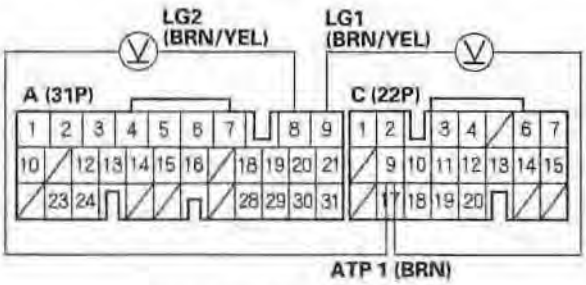
YES—Repair short in the wire between PCM connector terminal C11 and the transmission range switch, then go to step 55.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

43. Shift to all positions other than 1.

44. Measure the voltage between PCM connector terminals C9 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Go to step 49.

NO—Go to step 45.

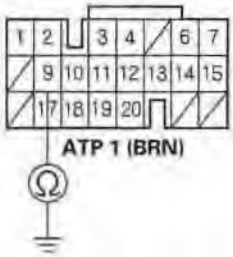
45. Turn the ignition switch OFF.

46. Jump the SCS line with the HDS.

47. Disconnect PCM connector C (22P).

48. Check for continuity between PCM connector terminal C9 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between PCM connector terminal C9 and the transmission range switch, then go to step 55.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

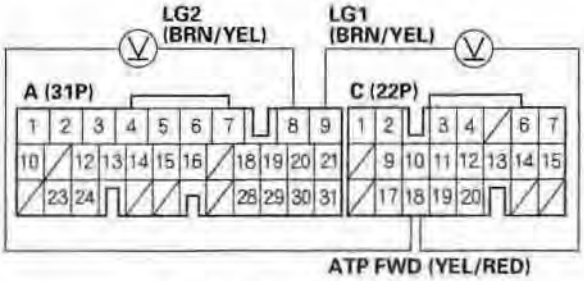
(cont'd)

DTC Troubleshooting (cont'd)

49. Shift to all positions other than D, 2, and 1.

50. Measure the voltage between PCM connector terminals C18 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Go to step 51.

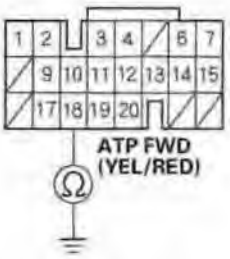
51. Turn the ignition switch OFF.

52. Jump the SCS line with the HDS.

53. Disconnect PCM connector C (22P).

54. Check for continuity between PCM connector terminal C18 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

YES—Repair short in the wire between PCM connector terminal C18 and the transmission range switch, then go to step 55.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

55. Clear the DTC with the HDS.

56. Move the shift lever to each position, and check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0705.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0706: Open in Transmission Range Switch Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
3. Start the engine, drive the vehicle in the D position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.
4. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0706.

   Did the result indicate a fail?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission range switch and PCM. If the tester indicates NOT COMPLETE, return to step 1 and recheck.■
5. Test the transmission range switch (see page 14-229).

   Is the switch OK?

   YES—Inspect the end of the selector control shaft (see step 6 on page 14-230), and go to step 6.

   NO—Replace the transmission range switch, then go to step 24.
6. Install the transmission range switch correctly, and adjust the shift cable (see page 14-223).
7. Clear the DTC with the HDS.
8. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
9. Start the engine, drive the vehicle in the D position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.
10. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0706.

    Did the result indicate a fail?

    YES—Go to step 11.

    NO—The problem has been corrected. If the tester indicates NOT COMPLETE, return to step 7 and recheck.■
11. Shift the shift lever into the D position, and verify the ATP FWD and ATP D inputs with the HDS in the A/T data list.

    Is the ATP FWD and ATP D ON?

    YES—Go to step 12.

    NO—Go to step 18.
12. Shift to the 2 position, and verify the ATP FWD and ATP 2 inputs with the HDS in the A/T date list.

    Is the ATP FWD and ATP 2 ON?

    YES—Go to step 13.

    NO—Go to step 18.
13. Shift to the 1 position, and verify the ATP FWD and ATP 1 signals with the HDS in the A/T data list.

    Is the ATP FWD and ATP 1 ON?

    YES—Go to step 14.

    NO—Go to step 18.

(cont'd)

DTC Troubleshooting (cont'd)

14. Clear the DTC with the HDS, and turn the ignition switch OFF.

15. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.

16. Start the engine, drive the vehicle in the D position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.

17. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0706.

    Did the result indicate a fail?

    YES—Go to step 18.

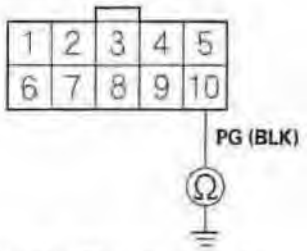
    NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission range switch and PCM. If the tester indicates NOT COMPLETE, return to step 14 and recheck.■

18. Turn the ignition switch OFF.

19. Disconnect the transmission range switch connector.

20. Check for continuity between transmission range switch connector terminal No. 10 and body ground.

TRANSMISSION RANGE SWITCH CONNECTOR



Wire side of female terminals

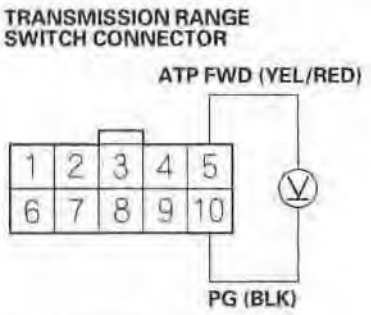
Is there continuity?

YES—Go to step 21.

NO—Repair open in the wire between transmission range switch connector terminal No. 10 and ground (G101), or repair poor ground (G101), then go to step 26.

21. Turn the ignition switch ON (II).

22. Measure the voltage between transmission range switch connector terminals No. 5 and No. 10.



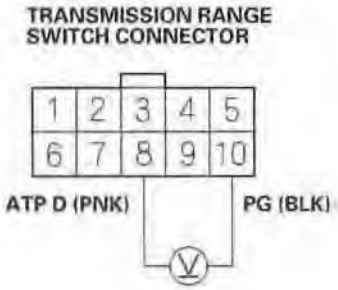
Wire side of female terminals

Is there voltage?

YES—Go to step 23.

NO—Repair open in the wire between the transmission range switch and PCM connector terminal C18, then go to step 26.

23. Measure the voltage between transmission range switch connector terminals No. 8 and No. 10.



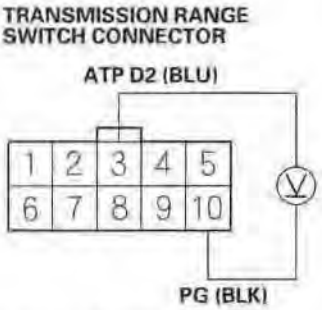
Wire side of female terminals

Is there voltage?

YES—Go to step 24.

NO—Repair open in the wire between the transmission range switch and PCM connector terminal C17, then go to step 26.

24. Measure the voltage between transmission range switch connector terminals No. 3 and No. 10.



Wire side of female terminals

Is there voltage?

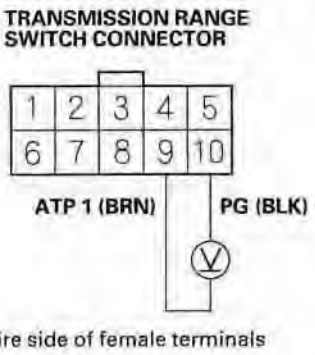
YES—Go to step 25.

NO—Repair open in the wire between the transmission range switch and PCM connector terminal C11, then go to step 26.

(cont'd)

DTC Troubleshooting (cont'd)

25. Measure the voltage between transmission range switch connector terminals No. 9 and No. 10.



Wire side of female terminals

Is there voltage?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open in the wire between the transmission range switch and PCM connector terminal C9, then go to step 26.

26. Clear the DTC with the HDS.
27. Turn the ignition switch OFF.
28. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
29. Start the engine, drive the vehicle in the D position until the vehicle speed reaches 35 mph (56 km/h), then slow down and stop the wheels.
30. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0706.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 1 and recheck. ■

DTC P0711: Problem in ATF Temperature Sensor Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Check the ATF temperature with the HDS.

   Does the ATF temperature exceed the ambient-air temperature?

   YES—Record the ATF temperature. Leave the engine off for more than 30 minutes, and go to step 2.

   NO—Record the ATF temperature. Test the stall speed RPM (see page 14-169) three times. Go to step 2 after stall speed testing.

2. Check the ATF temperature with the HDS.

   Did the ATF temperature change?

   YES—Leave the engine off for at least 30 more minutes, and go to step 3.

   NO—Replace ATF temperature sensor (see page 14-182), then go to step 5.

3. Check the ECT SENSOR with the HDS.

   Is the ECT SENSOR equal to the ambient-air temperature?

   YES—Go to step 4.

   NO—Leave the engine off until ECT sensor equals ambient-air temperature, then go to step 4.

4. Check the ATF temperature with the HDS.

   Is the ATF temperature almost equal to ECT SENSOR?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ATF temperature sensor and PCM.■

   NO—Replace ATF temperature sensor (see page 14-182), then go to step 5.

5. Clear the DTC with the HDS.

6. Test-drive the vehicle for several minutes in the D position through all four gears.

7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0711.

   Did the result indicate a pass?

   YES—The problem has been corrected.■

   NO—Return to step 1 and recheck.■

DTC Troubleshooting (cont'd)

DTC P0712: Short in ATF Temperature Sensor Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Check ATF temperature sensor voltage with the HDS in the A/T data list.

   Is ATF temperature sensor voltage 0.07 V or less?

   YES—Go to step 2.

   NO—Intermittent failure, the system is OK at this time. Check for intermittent short in the wires between the ATF temperature sensor and PCM.■

2. Disconnect the shift solenoid harness connector at the shift solenoid valve cover.

3. Check ATF temperature sensor voltage with the HDS.

   Is ATF temperature sensor voltage 0.07 V or less?

   YES—Go to step 4.

   NO—Check for a short to ground in the shift solenoid harness wire in the transmission (see page 14-182). If the wire is OK, replace ATF temperature sensor (see page 14-182), then go to step 8.

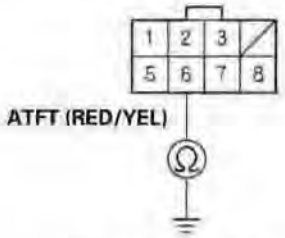
4. Turn the ignition switch OFF.

5. Jump the SCS line with the HDS.

6. Disconnect PCM connector C (22P).

7. Check for continuity between shift solenoid harness connector terminal No. 6 and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C14 and the shift solenoid harness connector, then go to step 8.

NO—Check for a short to ground in the shift solenoid harness wire in the transmission (see page 14-182). If the wire is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

8. Clear the DTC with the HDS.

9. Test-drive the vehicle for several minutes in the D position through all four gears.

10. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0712.

    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 1 and recheck.■

DTC P0713: Open in ATF Temperature Sensor Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Check ATF temperature sensor voltage with the HDS in the A/T data list.

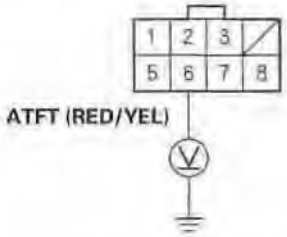
   Does ATF temperature sensor voltage exceed 4.93 V?

   YES—Go to step 2.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the ATF temperature sensor and PCM. ■

2. Turn the ignition switch OFF.
3. Disconnect the shift solenoid harness connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between shift solenoid harness connector terminal No. 6 and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Wire side of female terminals

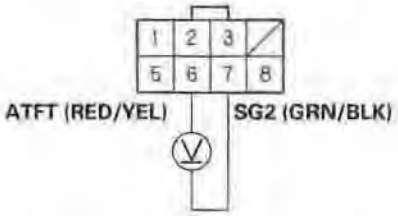
Is there about 5 V?

YES—Go to step 6.

NO—Go to step 7.

6. Measure the voltage between shift solenoid harness connector terminals No. 6 and No. 7.

SHIFT SOLENOID HARNESS CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Check the ATF temperature sensor and shift solenoid harness in the transmission housing (see page 14-182). ■

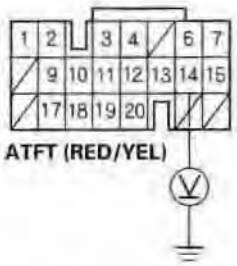
NO—Repair open in the wire between PCM connector terminal A23 and the shift solenoid harness connector, then go to step 8.

(cont'd)

DTC Troubleshooting (cont'd)

7. Measure the voltage between PCM connector terminal C14 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal C14 and the shift solenoid harness connector, then go to step 8.

NO—Check for loose or poor connections at PCM connector terminal C14. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

8. Clear the DTC with the HDS.
9. Test-drive the vehicle for several minutes in the D position in all four gears.
10. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0713.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0716: Problem in Input Shaft (Mainshaft) Speed Sensor Circuit

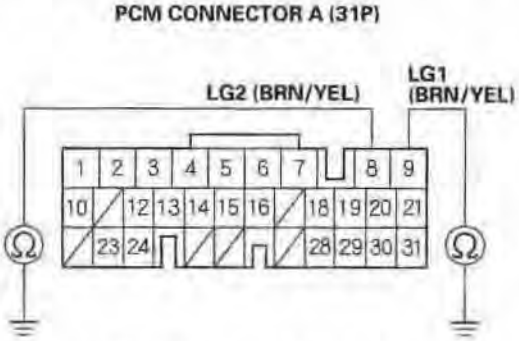
NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Record all freeze data, then clear the DTC with the HDS.
2. Check for proper input shaft (mainshaft) speed sensor installation (see page 14-180).
3. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
4. Start the engine, drive the vehicle in the D position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0716.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for loose or poor connections at the PCM and input shaft (mainshaft) speed sensor connectors. If the tester indicates NOT COMPLETE, return to step 4 and recheck. ■
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector A (31P) and input shaft (mainshaft) speed sensor connector.
9. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.



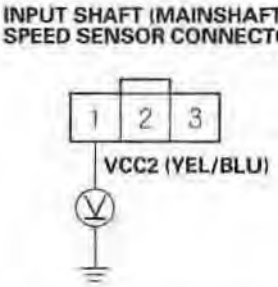
Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wires between PCM connector terminals A8, A9, and ground (G101), or repair poor ground (G101), then go to step 30.

10. Connect PCM connector A (31P).
11. Turn the ignition switch ON (II).
12. Measure the voltage between input shaft (mainshaft) speed sensor connector terminal No. 1 and body ground.



Wire side of female terminals

Is there about 5 V?

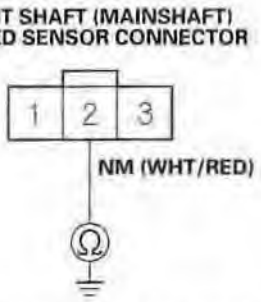
YES—Go to step 13.

NO—Go to step 24.

(cont'd)

DTC Troubleshooting (cont'd)

13. Turn the ignition switch OFF.
14. Disconnect PCM connector C (22P).
15. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 2 and body ground.



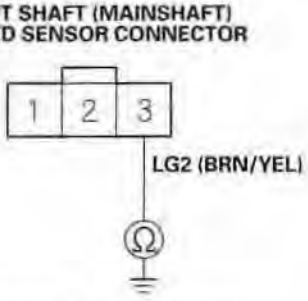
Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C19 and input shaft (mainshaft) speed sensor, then go to step 30.

NO—Go to step 16.

16. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 3 and body ground.



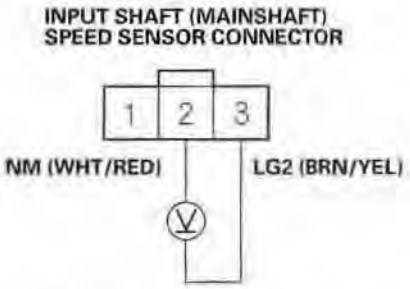
Wire side of female terminals

Is there continuity?

YES—Go to step 17.

NO—Repair open in the wire between the input shaft (mainshaft) speed sensor connector and ground (G101), then go to step 30.

17. Connect PCM connector C (22P).
18. Turn the ignition switch ON (II).
19. Measure the voltage between input shaft (mainshaft) speed sensor connector terminals No. 2 and No. 3.



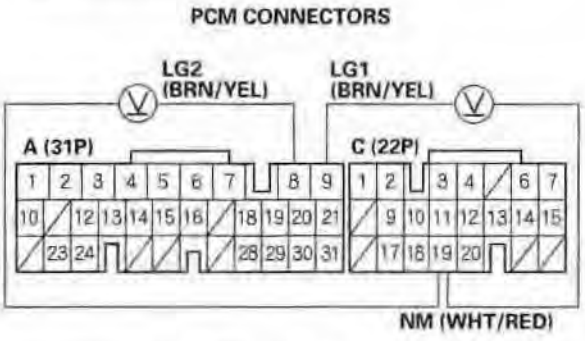
Wire side of female terminals

Is there about 5 V?

YES—Go to step 20.

NO—Go to step 29.

20. Connect the input shaft (mainshaft) speed sensor connector.
21. Measure the voltage between PCM connector terminals C19 and A8 or A9.



Wire side of female terminals

Is the voltage 0 V or about 5 V?

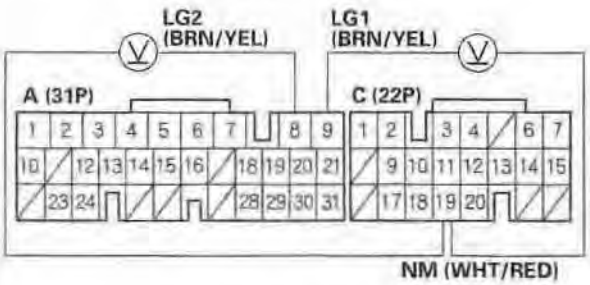
YES—Go to step 22.

NO—Replace the input shaft (mainshaft) speed sensor (see page 14-180), then go to step 30.

22. Shift to the P position. Start the engine, and let it idle.

23. With the engine idling, measure the voltage between PCM connector terminals C19 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

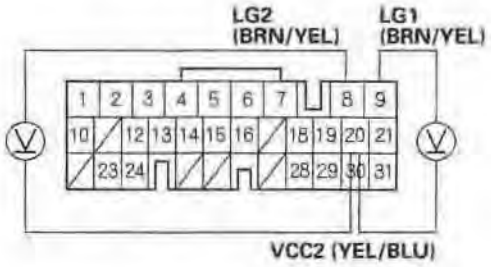
Is there 1.5 - 3.5 V?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Replace the input shaft (mainshaft) speed sensor (see page 14-180), then go to step 30.

24. Measure the voltage between PCM connector terminals A20 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there 4.75 - 5.25 V?

YES—Repair open in the wire between PCM connector terminal A20 and the input shaft (mainshaft) speed sensor connector, then go to step 30.

NO—Go to step 25.

25. Turn the ignition switch OFF.

26. Jump the SCS line with the HDS.

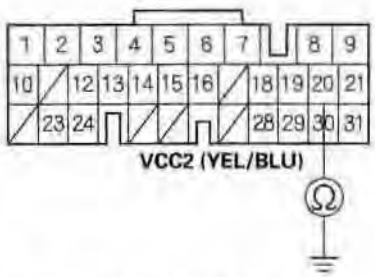
27. Disconnect PCM connector A (31P).

(cont'd)

DTC Troubleshooting (cont'd)

28. Check for continuity between PCM connector terminal A20 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

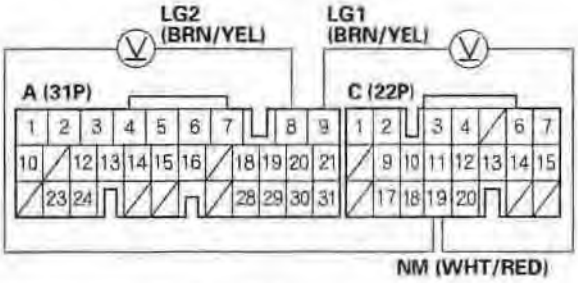
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal A20 and the input shaft (mainshaft) speed sensor connector, then go to step 30.

NO—Check for loose or poor connections at PCM connector terminal A20. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

29. Measure the voltage between PCM connector terminals C19 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal C19 and the input shaft (mainshaft) speed sensor connector, then go to step 30.

NO—Check for loose or poor connections at PCM connector terminal C19. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

30. Clear the DTC with the HDS.

31. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.

32. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0716.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0717: Problem in Input Shaft (Mainshaft) Speed Sensor Circuit (No Signal Input)

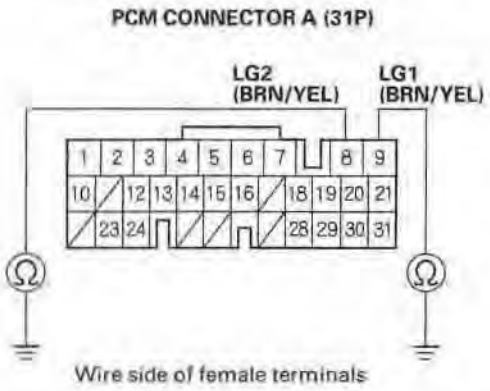
NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Record all freeze data, and clear the DTC with the HDS.
2. Check for proper input shaft (mainshaft) speed sensor installation (see page 14-180).
3. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
4. Start the engine, drive the vehicle in the D position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds. Slow down and stop the wheels.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0717.

   Did the result indicate a fail?

   YES—Go to step 6.

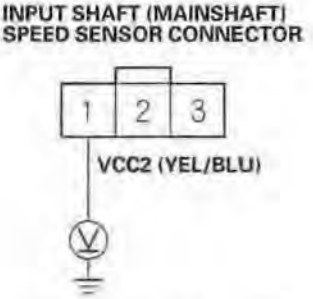
   NO—Intermittent failure, the system is OK at this time. Check for loose or poor connections at the PCM and input shaft (mainshaft) speed sensor connectors. If the tester indicates NOT COMPLETE, return to step 4 and recheck. ■
6. Turn the ignition switch OFF.
7. Jump the SCS line with the HDS.
8. Disconnect PCM connector A (31P) and input shaft (mainshaft) speed sensor connector.
9. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.



   Is there continuity?

   YES—Go to step 10.

   NO—Repair open in the wires between PCM connector terminals A8, A9, and ground (G101), or repair poor ground (G101), then go to step 30.
10. Connect PCM connector A (31P).
11. Turn the ignition switch ON (II).
12. Measure the voltage between input shaft (mainshaft) speed sensor connector terminal No. 1 and body ground.



   Is there about 5 V?

   YES—Go to step 13.

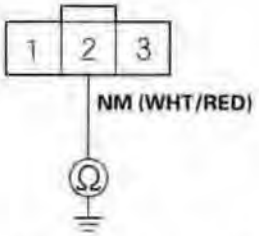
   NO—Go to step 24.

(cont'd)

DTC Troubleshooting (cont'd)

13. Turn the ignition switch OFF.
14. Disconnect PCM connector C (22P).
15. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 2 and body ground.

INPUT SHAFT (MAINSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

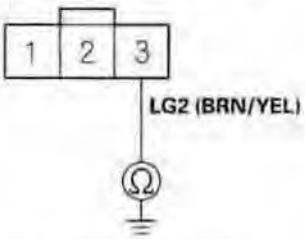
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C19 and input shaft (mainshaft) speed sensor, then go to step 30.

NO—Go to step 16.

16. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 3 and body ground.

INPUT SHAFT (MAINSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

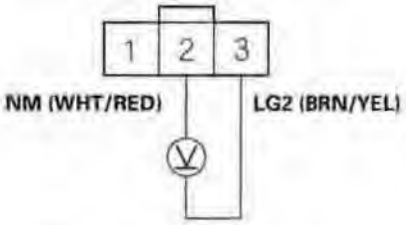
Is there continuity?

YES—Go to step 17.

NO—Repair open in the wire between the input shaft (mainshaft) speed sensor connector and ground (G101), then go to step 30.

17. Connect PCM connector C (22P).
18. Turn the ignition switch ON (II).
19. Measure the voltage between input shaft (mainshaft) speed sensor connector terminals No. 2 and No. 3.

INPUT SHAFT (MAINSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

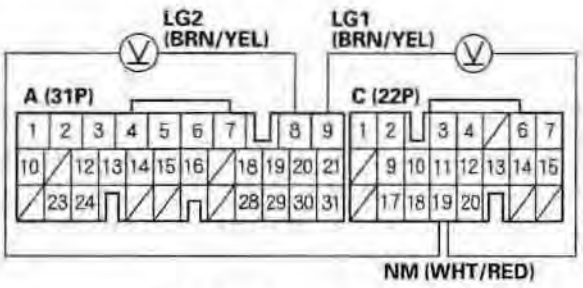
Is there about 5 V?

YES—Go to step 20.

NO—Go to step 29.

20. Connect the input shaft (mainshaft) speed sensor connector.
21. Measure the voltage between PCM connector terminals C19 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there 0 V or about 5 V?

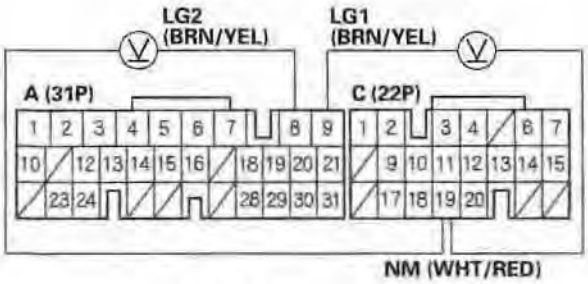
YES—Go to step 22.

NO—Replace the input shaft (mainshaft) speed sensor (see page 14-180), then go to step 30.

22. Shift to the P position. Start the engine, and let it idle.

23. With the engine idling, measure the voltage between PCM connector terminals C19 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

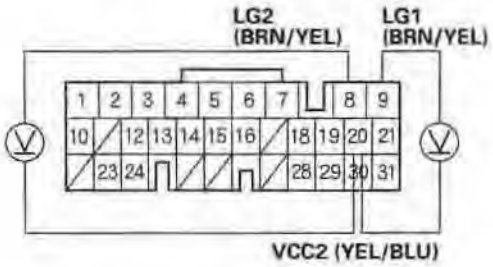
Is there 1.5 – 3.5 V?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Replace the input shaft (mainshaft) speed sensor (see page 14-180), then go to step 30.

24. Measure the voltage between PCM connector terminals A20 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there 4.75 – 5.25 V?

YES—Repair open in the wire between PCM connector terminal A20 and the input shaft (mainshaft) speed sensor connector, then go to step 30.

NO—Go to step 25.

25. Turn the ignition switch OFF.

26. Jump the SCS line with the HDS.

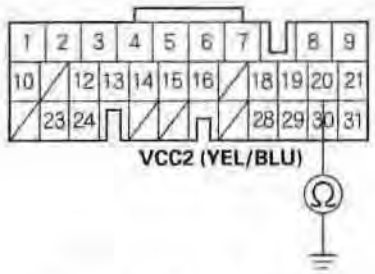
27. Disconnect PCM connector A (31P).

(cont'd)

DTC Troubleshooting (cont'd)

28. Check for continuity between PCM connector terminal A20 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

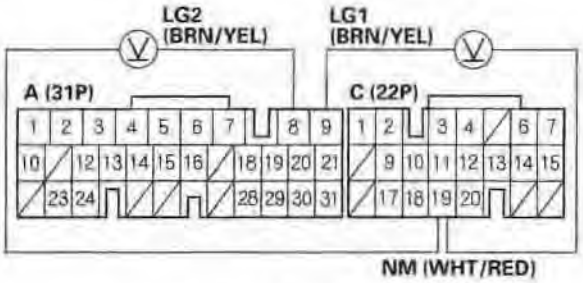
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal A20 and the input shaft (mainshaft) speed sensor connector, then go to step 30.

NO—Check for loose or poor connections at PCM connector terminal A20. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

29. Measure the voltage between PCM connector terminals C19 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal C19 and the input shaft (mainshaft) speed sensor connector, then go to step 30.

NO—Check for loose or poor connections at PCM connector terminal C19. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

30. Clear the DTC with the HDS.

31. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.

32. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0717.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0718: Input Shaft (Mainshaft) Speed Sensor Intermittent Failure

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Test-drive the vehicle for several minutes in the D position through all four gears.
3. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0718.

   Did the result indicate a fail?

   YES—Go to step 4.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the input shaft (mainshaft) speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 2 and recheck.■
4. Turn the ignition switch OFF.
5. Disconnect the input shaft (mainshaft) speed sensor connector, and inspect the connector and connector terminals to be sure they are making good contact.

   Are the connector terminals OK?

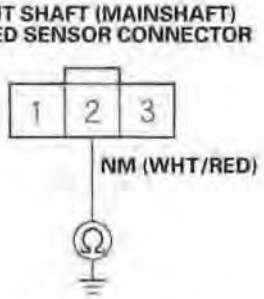
   YES—Go to step 6.

   NO—Repair the connector terminals, then go to step 6.
6. Connect the input shaft (mainshaft) speed sensor connector.
7. Test-drive the vehicle for several minutes, and check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0718.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—The problem has been corrected. If the tester indicates NOT COMPLETE, return to step 7 and recheck.■
8. Turn the ignition switch OFF.
9. Jump the SCS line with the HDS.
10. Disconnect PCM connector C (22P).
11. Disconnect the input shaft (mainshaft) speed sensor connector.
12. Check for continuity between input shaft (mainshaft) speed sensor connector terminal No. 2 and body ground.



Wire side of female terminals

Is there continuity?

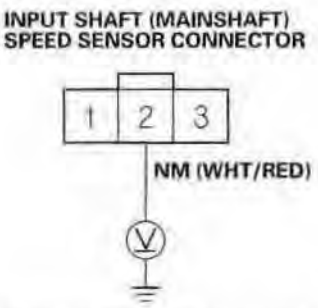
YES—Repair short to ground in the wire between PCM connector terminal C19 and the input shaft (mainshaft) speed sensor connector, then go to step 19.

NO—Go to step 13.

(cont'd)

DTC Troubleshooting (cont'd)

13. Connect PCM connector C (22P).
14. Turn the ignition switch ON (II).
15. Measure the voltage between input shaft (mainshaft) speed sensor connector terminal No. 2 and body ground.



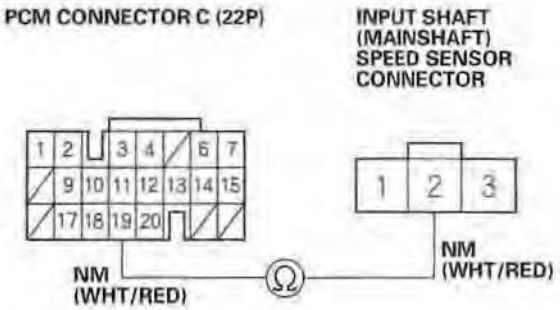
Wire side of female terminals

Is there about 5 V?

YES—Replace the input shaft (mainshaft) speed sensor (see page 14-180), then go to step 19.

NO—Go to step 16.

16. Turn the ignition switch OFF.
17. Disconnect PCM connector C (22P).
18. Check for continuity between PCM connector terminal C19 and input shaft (mainshaft) speed sensor connector terminal No. 2.



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open in the wire between PCM connector terminal C19 and the input shaft (mainshaft) speed sensor, then go to step 19.

19. Clear the DTC with the HDS.
20. Test-drive the vehicle for several minutes in the D position through all four gears.
21. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0718.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0721: Problem in Output Shaft (Countershaft) Speed Sensor Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

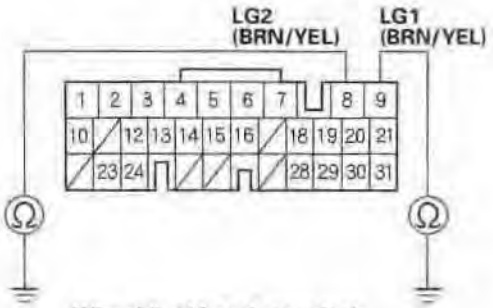
1. Record all freeze data, and clear the DTC with the HDS.
2. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
3. Start the engine, drive the vehicle in the D position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds. Slow down and stop the wheels.
4. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0721.

   Did the result indicate a fail?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect PCM connector A (31P) and output shaft (countershaft) speed sensor connector.
8. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

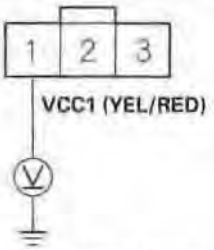
Is there continuity?

YES—Go to step 9.

NO—Repair open in the wire between PCM connector terminals A8, A9, and ground (G101), or repair poor ground (G101), then go to step 29.

9. Connect PCM connector A (31P).
10. Turn the ignition switch ON (II).
11. Measure the voltage between output shaft (countershaft) speed sensor connector terminal No. 1 and body ground.

OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

Is there about 5 V?

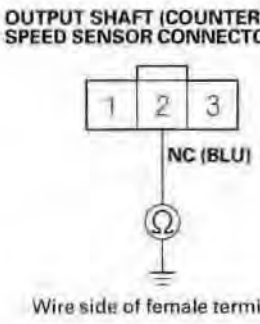
YES—Go to step 12.

NO—Go to step 23.

(cont'd)

DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.
13. Disconnect PCM connector A (31P).
14. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 2 and body ground.

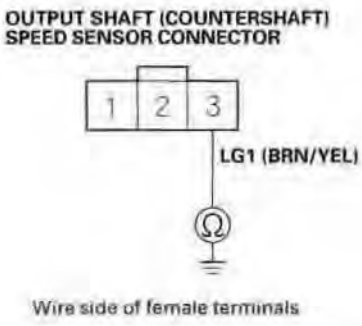


Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal A18 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Go to step 15.

15. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 3 and body ground.

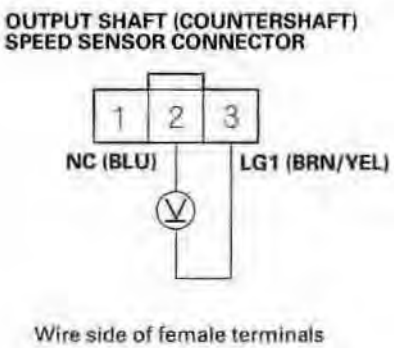


Is there continuity?

YES—Go to step 16.

NO—Repair open in the wire between the output shaft (countershaft) speed sensor and ground (G101), or repair poor ground (G101), then go to step 29.

16. Connect PCM connector A (31P).
17. Turn the ignition switch ON (II).
18. Measure the voltage between output shaft (countershaft) speed sensor connector terminals No. 2 and No. 3.

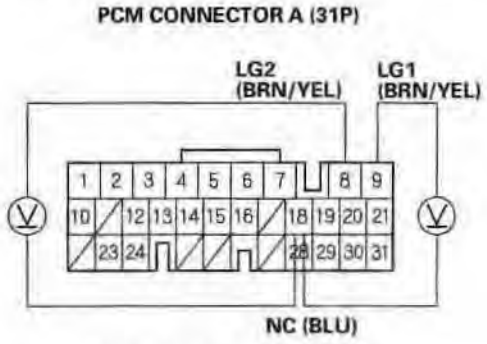


Is there about 5 V?

YES—Go to step 19.

NO—Go to step 28.

19. Connect output shaft (countershaft) speed sensor connector.
20. Measure the voltage between PCM connector terminals A18 and A8 or A9.



Is there 0 V or about 5 V?

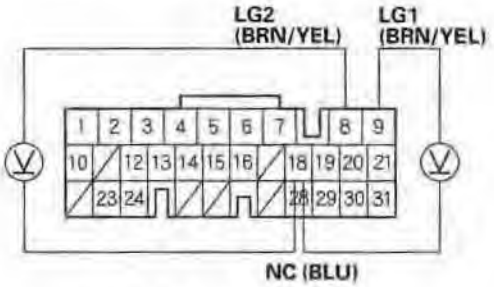
YES—Go to step 21.

NO—Replace the output shaft (countershaft) speed sensor (see page 14-180), then go to step 29.

21. Shift to the P position. Start the engine, and let it idle.

22. Shift to the D position, and measure the voltage between PCM connector terminals A18 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

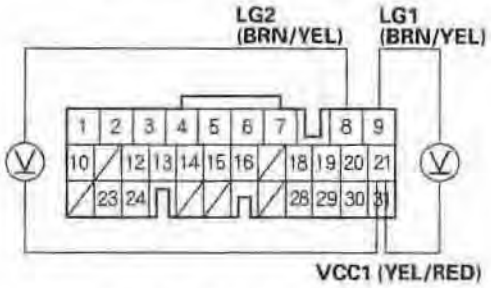
Is there 1.5 – 3.5 V?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Replace the output shaft (countershaft) speed sensor (see page 14-180), then go to step 29.

23. Measure the voltage between PCM connector terminals A21 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there 4.75 – 5.25 V?

YES—Repair open in the wire between PCM connector terminal A21 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Go to step 24.

24. Turn the ignition switch OFF.

25. Jump the SCS line with the HDS.

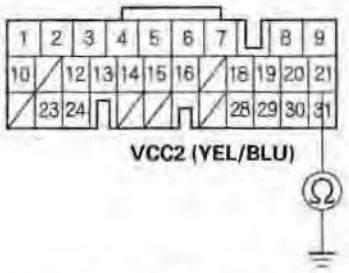
26. Disconnect PCM connector A (31P).

(cont'd)

DTC Troubleshooting (cont'd)

27. Check for continuity between PCM connector terminal A21 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

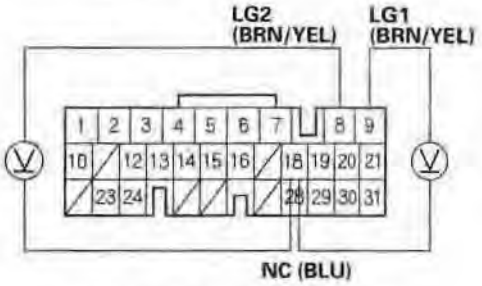
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal A21 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Check for loose or poor connections at PCM connector terminal A21. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

28. Measure the voltage between PCM connector terminals A18 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal A18 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

29. Clear the DTC with the HDS.

30. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.

31. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0721.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0722: Problem in Output Shaft (Countershaft) Speed Sensor Circuit (No Signal Input)

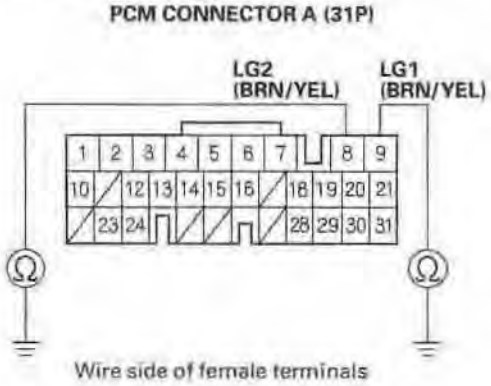
NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Raise the front of the vehicle, make sure it is securely supported, and allow the front wheels to rotate freely.
3. Start the engine, drive the vehicle in the D position, and hold the vehicle at speeds over 30 mph (48 km/h) for more than 10 seconds.
4. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0722.

   Did the result indicate a fail?

   YES—Go to step 5.

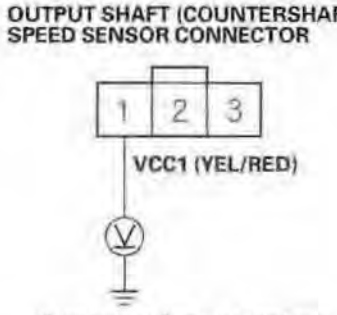
   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
5. Turn the ignition switch OFF.
6. Jump the SCS line with the HDS.
7. Disconnect PCM connector A (31P) and output shaft (countershaft) speed sensor connector.
8. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.



   Is there continuity?

   YES—Go to step 9.

   NO—Repair open in the wires between PCM connector terminals A8, A9, and ground (G101), or repair poor ground (G101), then go to step 29.
9. Connect PCM connector A (31P).
10. Turn the ignition switch ON (II).
11. Measure the voltage between output shaft (countershaft) speed sensor connector terminal No. 1 and body ground.



   Is there about 5 V?

   YES—Go to step 12.

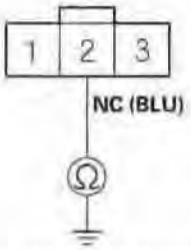
   NO—Go to step 23.

(cont'd)

DTC Troubleshooting (cont'd)

12. Turn the ignition switch OFF.
13. Disconnect PCM connector A (31P).
14. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 2 and body ground.

OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

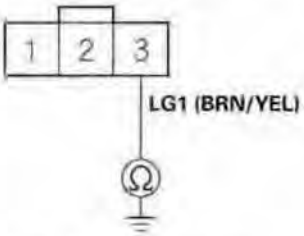
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal A18 and output shaft (countershaft) speed sensor, then go to step 29.

NO—Go to step 15.

15. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 3 and body ground.

OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

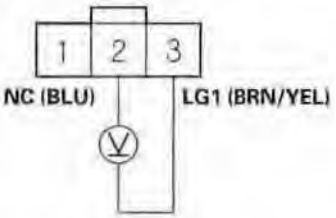
Is there continuity?

YES—Go to step 16.

NO—Repair open in the wire between the output shaft (countershaft) speed sensor connector and ground (G101), then go to step 29.

16. Connect PCM connector A (31P).
17. Turn the ignition switch ON (II).
18. Measure the voltage between output shaft (countershaft) speed sensor connector terminals No. 2 and No. 3.

OUTPUT SHAFT (COUNTERSHAFT) SPEED SENSOR CONNECTOR



Wire side of female terminals

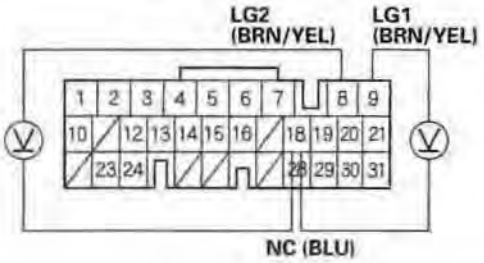
Is there about 5 V?

YES—Go to step 19.

NO—Go to step 28.

19. Connect the output shaft (countershaft) speed sensor connector.
20. Measure the voltage between PCM connector terminals A18 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is the voltage 0 V or about 5 V?

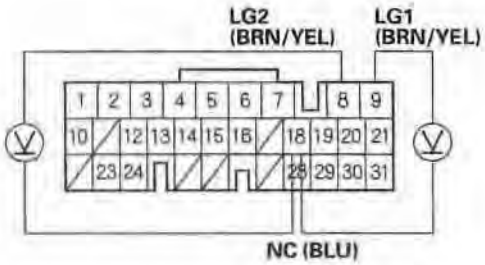
YES—Go to step 21.

NO—Replace the output shaft (countershaft) speed sensor (see page 14-180), then go to step 29.

21. Shift to the P position. Start the engine, and let it idle.

22. Shift to the D position, and measure the voltage between PCM connector terminals A18 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

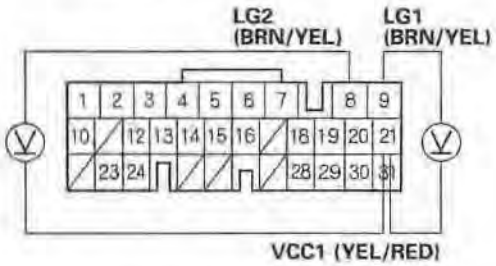
Is there 1.5 – 3.5 V?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Replace the output shaft (countershaft) speed sensor (see page 14-180), then go to step 29.

23. Measure the voltage between PCM connector terminals A21 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal A21 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Go to step 24.

24. Turn the ignition switch OFF.

25. Jump the SCS line with the HDS.

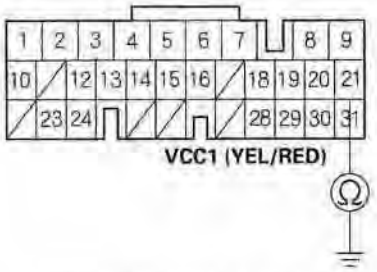
26. Disconnect PCM connector A (31P).

(cont'd)

DTC Troubleshooting (cont'd)

27. Check for continuity between PCM connector terminal A21 and body ground.

PCM CONNECTOR A (31P)



Wire side of female terminals

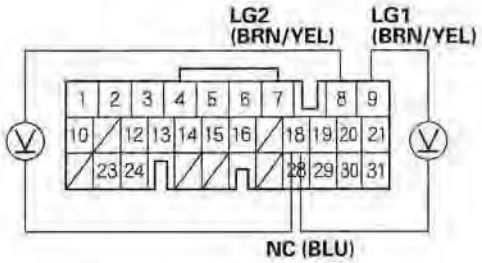
Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal A21 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Check for loose or poor connections at PCM connector terminal A21. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

28. Measure the voltage between PCM connector terminals A18 and A8 or A9.

PCM CONNECTOR A (31P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal A18 and the output shaft (countershaft) speed sensor, then go to step 29.

NO—Check for loose or poor connections at PCM connector terminal A18. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

29. Clear the DTC with the HDS.

30. Test-drive the vehicle for several minutes in the D position through all four gears.

31. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0722.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0723: Output Shaft (Countershaft) Speed Sensor Intermittent Failure

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Record all freeze data, and clear the DTC with the HDS.
2. Test-drive the vehicle for 10 minutes under the same conditions as those indicated by the freeze data, and check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0723.

   Did the result indicate a fail?

   YES—Go to step 3.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the output shaft (countershaft) speed sensor and PCM. If the tester indicates NOT COMPLETE, return to step 2 and recheck. ■
3. Turn the ignition switch OFF.
4. Disconnect the output shaft (countershaft) speed sensor connector, and inspect the connector and connector terminals to be sure they are making good contact.

   Are the connector terminals OK?

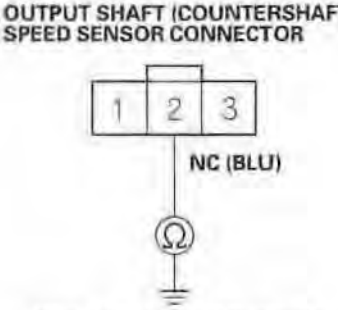
   YES—Go to step 5.

   NO—Repair the connector terminals, then go to step 5.
5. Connect the output shaft (countershaft) speed sensor connector.
6. Test-drive the vehicle for several minutes, and check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0723.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—The problem has been corrected. If the tester indicates NOT COMPLETE, return to step 6 and recheck. ■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connector A (31P).
10. Disconnect the output shaft (countershaft) speed sensor connector.
11. Check for continuity between output shaft (countershaft) speed sensor connector terminal No. 2 and body ground.



Wire side of female terminals

Is there continuity?

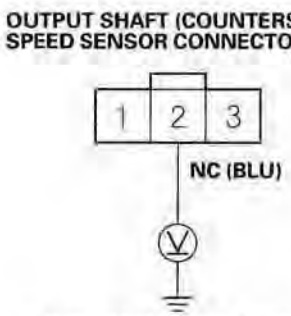
YES—Repair short to ground in the wire between PCM connector terminal A18 and the output shaft (countershaft) speed sensor, then go to step 18.

NO—Go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

12. Connect PCM connector A (31P).
13. Turn the ignition switch ON (II).
14. Measure the voltage between output shaft (countershaft) speed sensor connector terminal No. 2 and body ground.



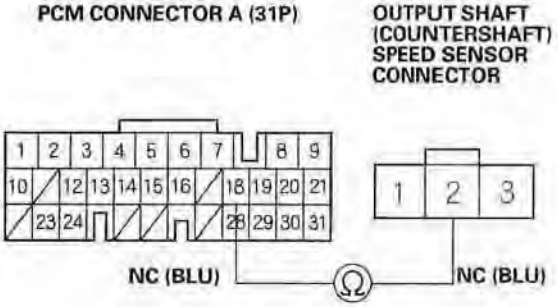
Wire side of female terminals

Is there about 5 V?

YES—Replace the output shaft (countershaft) speed sensor (see page 14-180), then go to step 18.

NO—Go to step 15.

15. Turn the ignition switch OFF.
16. Disconnect PCM connector A (31P).
17. Check for continuity between PCM connector terminal A18 and output shaft (countershaft) speed sensor connector terminal No. 2.



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open in the wire between PCM connector terminal A18 and the output shaft (countershaft) speed sensor, then go to step 18.

18. Clear the DTC with the HDS.
19. Test-drive the vehicle for several minutes in the D position through all four gears.
20. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0723.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0731: Problem in 1st Clutch and 1st Clutch Hydraulic Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Measure the line pressure (see page 14-170).

   Is the line pressure within service limit?

   YES—Go to step 5.

   NO—Repair the ATF pump and regulator valve, or replace the transmission. ■
5. Measure the 1st clutch pressure (see page 14-170).

   Is the 1st clutch pressure within service limits?

   YES—Go to step 6.

   NO—Shift valves B and C are stuck. Repair these valves and hydraulic circuit, or replace the transmission. ■
6. Test stall speed in the 1 position (see page 14-169).

   Is the stall speed test within service limits?

   YES—Go to step 7.

   NO—Shift valves A and D are stuck. Repair these valves and hydraulic circuit, or replace the transmission. ■
7. Clear the DTC with the HDS.
8. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in 1st gear in the D position at 10 mph (16 km/h) for 20 seconds.
9. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0731.

   Did the result indicate a fail?

   YES—Repair the 1st clutch, or replace the transmission. ■

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 8 and recheck. ■

DTC Troubleshooting (cont'd)

DTC P0732: Problem in 2nd Clutch and 2nd Clutch Hydraulic Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Measure the line pressure (see page 14-170).

   Is the line pressure within service limit?

   YES—Go to step 5.

   NO—Repair the ATF pump and regulator valve, or replace the transmission.■
5. Measure the 2nd clutch pressure (see page 14-170).

   Is the 2nd clutch pressure within service limits?

   YES—Go to step 6.

   NO—Shift valves A and B are stuck. Repair these valves and hydraulic circuit, or replace the transmission.■
6. Test stall speed in the 2 position (see page 14-169).

   Is the stall speed test within service limits?

   YES—Go to step 7.

   NO—Shift valve C is stuck. Repair the shift valve C and hydraulic circuit, or replace the transmission.■
7. Clear the DTC with the HDS.
8. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in 2nd gear in the D position at 10 mph (16 km/h) for 20 seconds.
9. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0732.

   Did the result indicate a fail?

   YES—Repair the 2nd clutch, or replace the transmission.■

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 8 and recheck.■

DTC P0733: Problem in 3rd Clutch and 3rd Clutch Hydraulic Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.

4. Measure the line pressure (see page 14-170).

   Is the line pressure within service limits?

   YES—Go to step 5.

   NO—Repair the ATF pump and regulator valve, or replace the transmission.■

5. Measure the 3rd clutch pressure (see page 14-170).

   Is the 3rd clutch pressure within service limits?

   YES—Go to step 6.

   NO—Shift valves A and D are stuck. Repair these valves and hydraulic circuit, or replace the transmission.■

6. Clear the DTC with the HDS.

7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in 3rd gear in the D position at speeds over 10 mph (16 km/h) for 20 seconds.

8. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0733.

   Did the result indicate a fail?

   YES—Repair the 3rd clutch, or replace the transmission.■

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 7 and recheck.■

DTC Troubleshooting (cont'd)

DTC P0734: Problem in 4th Clutch and 4th Clutch Hydraulic Circuit

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Measure the line pressure (see page 14-170).

   Is the line pressure within service limits?

   YES—Go to step 5.

   NO—Repair the ATF pump and regulator valve, or replace the transmission. ■
5. Measure the 4th clutch pressure (see page 14-170).

   Is the 4th clutch pressure within service limits?

   YES—Go to step 6.

   NO—Shift valve B, shift valve C, servo control valve, and servo valve are stuck. Repair these valves and hydraulic circuit, or replace the transmission. ■
6. Clear the DTC with the HDS.
7. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data, or drive in the 4th gear in the D position at speeds over 10 mph (16 km/h) for 20 seconds.
8. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0734.

   Did the result indicate a fail?

   YES—Repair the 4th clutch, or replace the transmission. ■

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 7 and recheck. ■

DTC P0741: Torque Converter Clutch Hydraulic Circuit Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Select Shift Solenoid E in Miscellaneous Test Menu, and check that the shift solenoid valve E operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 6.

   NO—Replace shift solenoid valve E (see page 14-174), then go to step 10.
6. Run the engine until the engine coolant temperature reaches 176 °F (80 °C).
7. Select Clutch Pressure Control (Linear) Solenoid A in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.

   Is the system OK?

   YES—Go to step 8.

   NO—Follow instructions indicated on the HDS by the test result. Go to step 10 if any part was replaced.
8. Test-drive the vehicle at 55 mph (88 km/h) for 2 minutes while monitoring the vehicle speed with the HDS.
9. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0741.

   Did the result indicate a fail?

   YES—Faulty torque converter mechanism, torque converter clutch hydraulic circuit, lock-up shift valve, or lock-up control valve, or replace the transmission. ■

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 8 and recheck. ■
10. Clear the DTC with the HDS.
11. Test-drive the vehicle for several minutes under the same conditions as those indicated by the freeze data.
12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0741.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 5 and recheck. ■

DTC Troubleshooting (cont'd)

DTC P0747: A/T Clutch Pressure Control Solenoid Valve A Stuck ON

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0747.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.■
8. Clear the DTC with the HDS.
9. Select Clutch Pressure Control (Linear) Solenoid A in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.

   Is the system OK?

   YES—Intermittent failure, the system is OK at this time.■

   NO—Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11.
10. Inspect A/T clutch pressure control solenoid valve A (see page 14-176).

    Does the A/T clutch pressure control solenoid valve A work properly?

    YES—Repair hydraulic system related with shift valve B and E, or replace the transmission, then go to step 11.

    NO—Replace A/T clutch pressure control solenoid valve A (see page 14-177), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds. Slow down to a stop.
13. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0747.

    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 8 and recheck.■

DTC P0752: Shift Solenoid Valve A Stuck ON

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0752.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■
8. Clear the DTC with the HDS.
9. Select Shift Solenoid A in Miscellaneous Test Menu, and check that the shift solenoid valve A operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve A (see page 14-174), then go to step 13.
10. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0752.

    Did the result indicate a fail?

    YES—Repair shift valve A, or replace the transmission, then go to step 13.

    NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck. ■
13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down and to a stop.
16. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0752.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC Troubleshooting (cont'd)

DTC P0761: Shift Solenoid Valve C Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0761.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.■
8. Clear the DTC with the HDS.
9. Select Shift Solenoid C in Miscellaneous Test Menu, and check that the shift solenoid valve C operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve C (see page 14-174), then go to step 13.
10. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0761.

    Did the result indicate a fail?

    YES—Repair shift valve C, or replace the transmission, then go to step 13.

    NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.■
13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0761.

    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 8 and recheck.■

DTC P0771: Shift Solenoid Valve E Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0771.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■
8. Clear the DTC with the HDS.
9. Select Shift Solenoid E in Miscellaneous Test Menu, and check that the shift solenoid valve E operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve E (see page 14-174), then go to step 13.
10. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
11. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0771.

    Did the result indicate a fail?

    YES—Repair shift valve E, or replace the transmission, then go to step 13.

    NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck. ■
13. Clear the DTC with the HDS.
14. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0771.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC Troubleshooting (cont'd)

DTC P0776: A/T Clutch Pressure Control Solenoid Valve B Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0776.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■
8. Clear the DTC with the HDS.
9. Select Clutch Pressure Control (Linear) Solenoid B in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve B with the HDS.

   Is the system OK?

   YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck. ■

   NO—Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11.
10. Inspect A/T clutch pressure control solenoid valve B (see page 14-178).

    Does the A/T clutch pressure control solenoid valve B work properly?

    YES—Repair hydraulic system related with shift valve B, or replace the transmission, then go to step 11.

    NO—Replace A/T clutch pressure control solenoid valve B (see page 14-179), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0776.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC P0777: A/T Clutch Pressure Control Solenoid Valve B Stuck ON

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0777.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.■
8. Clear the DTC with the HDS.
9. Select Clutch Pressure Control (Linear) Solenoid B in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve B with the HDS.

   Is the system OK?

   YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck.■

   NO—Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11.
10. Inspect A/T clutch pressure control solenoid valve B (see page 14-178).

    Does the A/T clutch pressure control solenoid valve B work properly?

    YES—Repair hydraulic system related with shift valve B, or replace the transmission, then go to step 11.

    NO—Replace A/T clutch pressure control solenoid valve B (see page 14-179), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0777.

    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 8 and recheck.■

DTC Troubleshooting (cont'd)

DTC P0780: Shift Control System

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Check for other DTCs indicated simultaneous with the code P0780.

   NOTE: P0780 means there is one or more A/T DTCs about the shift control system.

   Are there other DTCs?

   YES—Go to step 2.

   NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

2. Perform the troubleshooting flowchart for the indicated codes:

   - P1731: (see page 14-159)
   - P1732: (see page 14-161)
   - P1735: (see page 14-163)
   - P1736: (see page 14-165)

DTC P0796: A/T Clutch Pressure Control Solenoid Valve C Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0796.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■
8. Clear the DTC with the HDS.
9. Select Clutch Pressure Control (Linear) Solenoid C in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve C with the HDS.

   Is the system OK?

   YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck. ■

   NO—Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11.
10. Inspect A/T clutch pressure control solenoid valve C (see page 14-178).

    Does the A/T clutch pressure control solenoid valve C work properly?

    YES—Repair hydraulic system related with shift valves B and C, or replace the transmission, then go to step 11.

    NO—Replace A/T clutch pressure control solenoid valve C (see page 14-179), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0796.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC Troubleshooting (cont'd)

DTC P0797: A/T Clutch Pressure Control Solenoid Valve C Stuck ON

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0797.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■
8. Clear the DTC with the HDS.
9. Select Clutch Pressure Control (Linear) Solenoid C in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve C with the HDS.

   Is the system OK?

   YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 9 and recheck. ■

   NO—Follow instructions indicated on the HDS by the test result, but the tester has not determined the cause of the failure, go to step 10. If any part was replaced, go to step 11.
10. Inspect A/T clutch pressure control solenoid valve C (see page 14-178).

    Does the A/T clutch pressure control solenoid valve C work properly?

    YES—Repair hydraulic system related with shift valves B and C, or replace the transmission, then go to step 11.

    NO—Replace A/T clutch pressure control solenoid valve C (see page 14-179), then go to step 11.
11. Clear the DTC with the HDS.
12. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0797.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC P0812: Open in Transmission Range Switch ATP RVS Switch Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Turn the ignition switch ON (II).
2. Shift to the R position, and verify the A/T R SWITCH signal with the HDS in the A/T data list.

   Is the A/T R SWITCH ON?

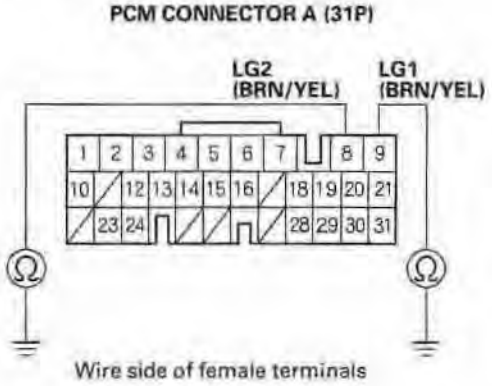
   YES—Go to step 3.

   NO—Inspect the end of the selector control shaft (see step 6 on page 14-230), adjust the shift cable (see page 14-223), then recheck. If problem still exists, go to step 4.
3. Check the REVERSE SWITCH signal with the HDS.

   Is the REVERSE SWITCH ON?

   YES—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the transmission range switch and PCM. ■

   NO—Go to step 4.
4. Turn the ignition switch OFF.
5. Check for continuity between PCM connector terminals A8 and body ground, and between A9 and body ground.



   Is there continuity?

   YES—Go to step 6.

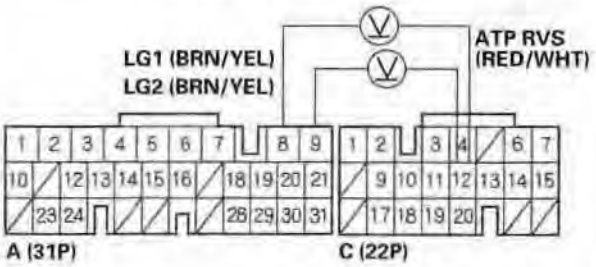
   NO—Repair open in the wires between PCM connector terminals A8, A9, and ground (G101), and repair poor ground (G101), then go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

6. Turn the ignition switch ON (II).
7. Shift to the R position.
8. Measure the voltage between PCM connector terminals C12 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

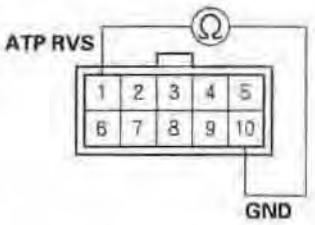
Is there voltage?

YES—Go to step 9.

NO—Check for loose or poor connections at PCM connector terminal C12. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

9. Turn the ignition switch OFF.
10. Disconnect the transmission range switch connector.
11. Check for continuity between the No. 1 and No. 10 terminals at the transmission range switch. The shift position must be R.

TRANSMISSION RANGE SWITCH CONNECTOR



Terminal side of male terminals

Is there continuity?

YES—Check for loose or poor connections at the transmission range switch connector terminal No. 1. If the connection is OK, repair open in the wire between PCM connector terminal C12 and the transmission range switch, then go to step 12.

NO—Replace the transmission range switch, then go to step 12.

12. Clear the DTC with the HDS.
13. Start the engine, and shift the shift lever slowly into the P, R, then N position.
14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0812.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0842: Short in 2nd Clutch Transmission Fluid Pressure Switch Circuit, or 2nd Clutch Transmission Fluid Pressure Switch Stuck ON

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check the 2nd PRES SWITCH signal with the HDS in the A/T data list when not in 2nd gear.

   Is the 2nd PRES SWITCH OFF?

   YES—Go to step 3.

   NO—Go to step 5.
3. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 2nd gear in the 2 position for more than 5 seconds, then shift to the D position, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
4. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0842.

   Did the result indicate a fail?

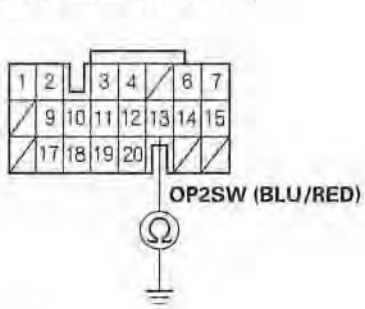
   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. Check the BLU/RED wire for an intermittent short to ground between the 2nd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
5. Turn the ignition switch OFF.
6. Disconnect the 2nd clutch transmission fluid pressure switch connector.
7. Turn the ignition switch ON (II).
8. Check the 2nd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 2nd PRES SWITCH OFF?

   YES—Replace the 2nd clutch transmission fluid pressure switch (see page 14-181), then go to step 13.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (22P).
12. Check for continuity between PCM connector terminal C13 and body ground.



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C13 and the 2nd clutch transmission fluid pressure switch, then go to step 13.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

(cont'd)

DTC Troubleshooting (cont'd)

13. Clear the DTC with the HDS.

14. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 2nd gear in the 2 position for more than 5 seconds, then shift to the D position, and drive in 4th gear for more than 5 seconds. Slow down to a stop.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0842.

    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 1 and recheck.■

DTC P0843: Open in 2nd Clutch Transmission Fluid Pressure Switch Circuit, or 2nd Clutch Transmission Fluid Pressure Switch Stuck OFF

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Shift into the 2 position while pressing the brake pedal, and verify that the SHIFT MAP NUMBER indicates 2nd with the HDS in the A/T data list.
3. Check the 2nd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 2nd PRES SWITCH ON?

   YES—Go to step 4.

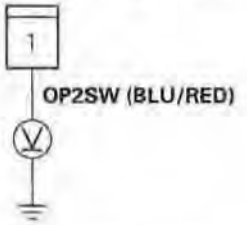
   NO—Go to step 6.
4. Drive the vehicle in 2nd gear in the 2 position for more than 5 seconds, then shift to the D position, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0843.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the 2nd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.■
6. Turn the ignition switch OFF.
7. Disconnect the 2nd clutch transmission fluid pressure switch connector.
8. Turn the ignition switch ON (II).
9. Measure the voltage between the 2nd clutch transmission fluid pressure switch connector terminal and body ground.

2ND CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Replace the 2nd clutch transmission fluid pressure switch (see page 14-181), then go to step 11.

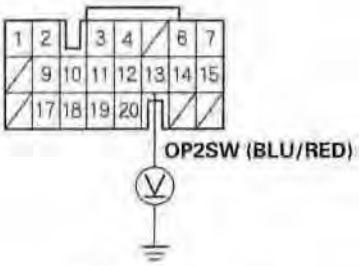
NO—Go to step 10.

(cont'd)

DTC Troubleshooting (cont'd)

10. Measure the voltage between PCM connector terminal C13 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal C13 and the 2nd clutch transmission fluid pressure switch, then go to step 11.

NO—Check for loose or poor connections at PCM connector terminal C13. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

11. Clear the DTC with the HDS.

12. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 2nd gear in the 2 position for more than 5 seconds, then shift to the D position, and drive in 4th gear for more than 5 seconds. Slow down to a stop.

13. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0843.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0847: Short in 3rd Clutch Transmission Fluid Pressure Switch Circuit, or 3rd Clutch Transmission Fluid Pressure Switch Stuck ON

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check the 3rd PRES SWITCH signal with the HDS in the A/T data list when not in 3rd gear.

   Is the 3rd PRES SWITCH ON?

   YES—Go to step 3.

   NO—Go to step 5.
3. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 3rd gear in the D position with overdrive off mode (turned the O/D switch off) for more than 5 seconds, then turn the O/D switch on, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
4. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0847.

   Did the result indicate a fail?

   YES—Go to step 5.

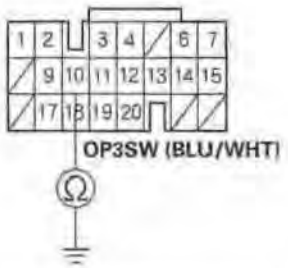
   NO—Intermittent failure, the system is OK at this time. Check the BLU/WHT wire for an intermittent short to ground between the 3rd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.■
5. Turn the ignition switch OFF.
6. Disconnect the 3rd clutch transmission fluid pressure switch connector.
7. Turn the ignition switch ON (II).
8. Check the 3rd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 3rd PRES SWITCH OFF?

   YES—Replace the 3rd clutch transmission fluid pressure switch (see page 14-181), then go to step 13.

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Jump the SCS line with the HDS.
11. Disconnect PCM connector C (22P).
12. Check for continuity between PCM connector terminal C10 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C10 and the 3rd clutch transmission fluid pressure switch, then go to step 13.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

13. Clear the DTC with the HDS.

14. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 3rd gear in the D position (turned the O/D switch off) for more than 5 seconds, then turn the O/D switch on, and drive in 4th gear for more than 5 seconds. Slow down to a stop.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0847.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 1 and recheck. ■

DTC P0848: Open in 3rd Clutch Transmission Fluid Pressure Switch Circuit, or 3rd Clutch Transmission Fluid Pressure Switch Stuck OFF

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in the 3rd gear in the D position with overdrive off mode (turned the O/D switch off), and verify that the SHIFT MAP NUMBER indicates 3rd with the HDS in the A/T data list.
3. Check the 3rd PRES SWITCH signal with the HDS in the A/T data list.

   Is the 3rd PRES SWITCH ON?

   YES—Go to step 4.

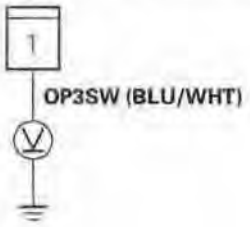
   NO—Go to step 6.
4. Drive the vehicle in 3rd gear in the D position with overdrive off mode (turned the O/D switch off), for more than 5 seconds, then turn the O/D switch on, and drive in 4th gear for more than 5 seconds. Slow down to a stop.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0847.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the 3rd clutch transmission fluid pressure switch and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.■
6. Turn the ignition switch OFF.
7. Disconnect the 3rd clutch transmission fluid pressure switch connector.
8. Turn the ignition switch ON (II).
9. Measure the voltage between the 3rd clutch transmission fluid pressure switch connector terminal and body ground.

3RD CLUTCH TRANSMISSION FLUID PRESSURE SWITCH CONNECTOR



Wire side of female terminals

Is there about 5 V?

YES—Replace the 3rd clutch transmission fluid pressure switch (see page 14-181), then go to step 11.

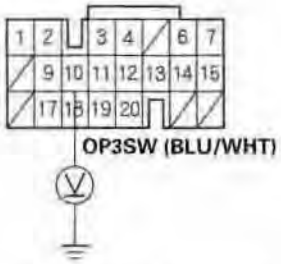
NO—Go to step 10.

(cont'd)

DTC Troubleshooting (cont'd)

10. Measure the voltage between PCM connector terminal C10 and body ground.

PCM CONNECTOR C (22P)



Wire side of female terminals

Is there about 5 V?

YES—Repair open in the wire between PCM connector terminal C10 and the 3rd clutch transmission fluid pressure switch, then go to step 11.

NO—Check for loose or poor connections at PCM connector terminal C10. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

11. Clear the DTC with the HDS.

12. Start the engine, and warm it up to normal operating temperature (the radiator fan comes on). Drive the vehicle in 3rd gear in the D position with overdrive off mode (turned the O/D switch off), for more than 5 seconds, then turn the O/D switch on, and drive in 4th gear for more than 5 seconds. Slow down to a stop.

13. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0848.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0962: Problem in A/T Clutch Pressure Control Solenoid Valve A Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check that DTC P0962 recurs.

   Is DTC P0962 indicated?

   YES—Go to step 6.

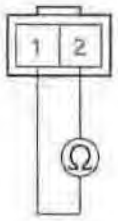
   NO—Go to step 3.
3. Select Clutch Pressure Control Solenoid Control in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve A at 1.0 A in Clutch Pressure Control Solenoid Control Menu.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0962.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve A connector.
8. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid connector.

   A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



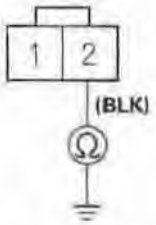
Terminal side of male terminals

   Is there 3 – 10 Ω ?

   YES—Go to step 9.

   NO—Replace the A/T clutch pressure control solenoid valve A (see page 14-177), then go to step 12.
9. Check for continuity between A/T clutch pressure control solenoid valve A connector terminal No. 2 and body ground.

   A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Wire side of female terminals

   Is there continuity?

   YES—Go to step 10.

   NO—Repair open in the wire between the A/T clutch pressure control solenoid valve A and ground (G101), or repair poor ground (G101), then go to step 12.

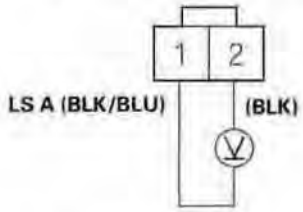
(cont'd)

DTC Troubleshooting (cont'd)

10. Turn the ignition switch ON (II).

11. Measure the voltage between A/T clutch pressure control solenoid valve A connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Wire side of female terminals

Is there about 11 V as the ignition switch is turned to the ON (II) position?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open or short in the wire between PCM connector terminal C1 and A/T clutch pressure control solenoid valve A, then go to step 12.

12. Clear the DTC with the HDS.

13. Test-drive the vehicle for several minutes in the D position through all four gears.

14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0962.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0963: Problem in A/T Clutch Pressure Control Solenoid Valve A

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check that DTC P0963 recurs.

   Is DTC P0963 indicated?

   YES—Go to step 6.

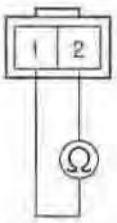
   NO—Go to step 3.
3. Select Clutch Pressure Control Solenoid Control in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve A at 0.2 A in Clutch Pressure Control Solenoid Control Menu.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0963.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve A connector.
8. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Terminal side of male terminals

Is there 3 – 10 Ω ?

YES—Go to step 9.

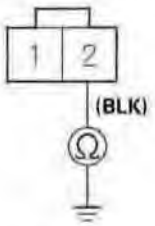
NO—Replace the A/T clutch pressure control solenoid valve A (see page 14-177), then go to step 10.

(cont'd)

DTC Troubleshooting (cont'd)

9. Check for continuity between A/T clutch pressure control solenoid valve A connector terminal No. 2 and body ground.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE A CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Repair open in the wire between the A/T clutch pressure control solenoid valve A and ground (G101), or repair poor ground (G101), then go to step 10.

10. Clear the DTC with the HDS.

11. Test-drive the vehicle for several minutes in the D position through all four gears.

12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0963.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0966: Problem in A/T Clutch Pressure Control Solenoid Valve B Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check that DTC P0966 recurs.

   Is DTC P0966 indicated?

   YES—Go to step 6.

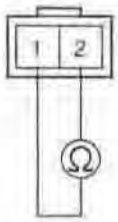
   NO—Go to step 3.
3. Select Clutch Pressure Control Solenoid Control in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve B with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve B at 1.0 A in Clutch Pressure Control Solenoid Control Menu.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0966.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections and loose terminals at the A/T clutch pressure control solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve B connector.
8. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid connector.

   A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



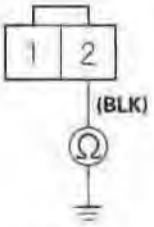
   Terminal side of male terminals

   Is there 3—10 Ω ?

   YES—Go to step 9.

   NO—Replace the A/T clutch pressure control solenoid valve B (see page 14-179), then go to step 12.
9. Check for continuity between A/T clutch pressure control solenoid valve B connector terminal No. 2 and body ground.

   A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



   Wire side of female terminals

   Is there continuity?

   YES—Go to step 10.

   NO—Repair open in the wire between the A/T clutch pressure control solenoid valve B and ground (G101), or repair poor ground (G101), then go to step 12.

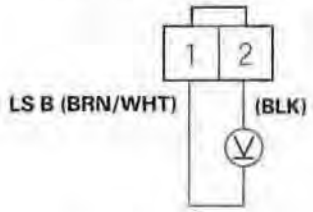
(cont'd)

DTC Troubleshooting (cont'd)

10. Turn the ignition switch ON (II).

11. Measure the voltage between A/T clutch pressure control solenoid valve B connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Wire side of female terminals

Is there about 11 V as the ignition switch is turned to the ON (II) position?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open or short in the wire between PCM connector terminal C15 and A/T clutch pressure control solenoid valve B, then go to step 12.

12. Clear the DTC with the HDS.

13. Test-drive the vehicle for several minutes in the D position through all four gears.

14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0966.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0967: Problem in A/T Clutch Pressure Control Solenoid Valve B

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check that DTC P0967 recurs.

   Is DTC P0967 indicated?

   YES—Go to step 6.

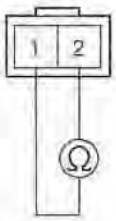
   NO—Go to step 3.
3. Select Clutch Pressure Control Solenoid Control in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve B with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve B at 0.2 A in Clutch Pressure Control Solenoid Control Menu.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0967.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.■
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve B connector.
8. Measure A/T clutch pressure control solenoid valve B resistance at the solenoid connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Terminal side of male terminals

Is there 3– 10 Ω ?

YES—Go to step 9.

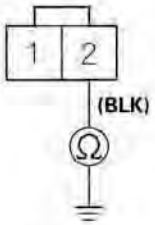
NO—Replace the A/T clutch pressure control solenoid valve B (see page 14-179), then go to step 10.

(cont'd)

DTC Troubleshooting (cont'd)

9. Check for continuity between A/T clutch pressure control solenoid valve B connector terminal No. 2 and body ground.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE B CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Repair open in the wire between the A/T clutch pressure control solenoid valve B and ground (G101), or repair poor ground (G101), then go to step 10.

10. Clear the DTC with the HDS.

11. Test-drive the vehicle for several minutes in the D position through all four gears.

12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0967.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0970: Problem in A/T Clutch Pressure Control Solenoid Valve C Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check that DTC P0970 recurs.

   Is DTC P0970 indicated?

   YES—Go to step 6.

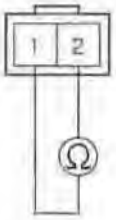
   NO—Go to step 3.
3. Select Clutch Pressure Control Solenoid Control in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve C with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve C at 1.0 A in Clutch Pressure Control Solenoid Control Menu.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0970.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck. ■
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve C connector.
8. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

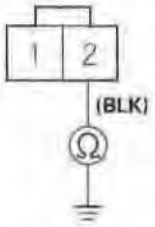
Is there 3 – 10 Ω?

YES—Go to step 9.

NO—Replace the A/T clutch pressure control solenoid valve C (see page 14-179), then go to step 12.

9. Check for continuity between A/T clutch pressure control solenoid valve C connector terminal No. 2 and body ground.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 10.

NO—Repair open in the wire between the A/T clutch pressure control solenoid valve C and ground (G101), or repair poor ground (G101), then go to step 12.

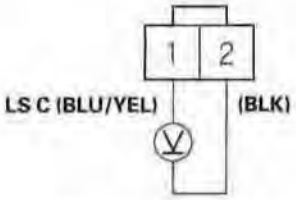
(cont'd)

DTC Troubleshooting (cont'd)

10. Turn the ignition switch ON (II).

11. Measure the voltage between A/T clutch pressure control solenoid valve C connector terminals No. 1 and No. 2.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Wire side of female terminals

Is there about 11 V as the ignition switch is turned to the ON (II) position?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Repair open or short in the wire between PCM connector terminal C7 and A/T clutch pressure control solenoid valve C, then go to step 12.

12. Clear the DTC with the HDS.

13. Test-drive the vehicle for several minutes in the D position through all four gears.

14. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0970.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0971: Problem in A/T Clutch Pressure Control Solenoid Valve C

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Check that DTC P0971 recurs.

   Is DTC P0971 indicated?

   YES—Go to step 6.

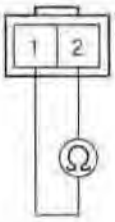
   NO—Go to step 3.
3. Select Clutch Pressure Control Solenoid Control in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve C with the HDS.
4. Drive with the A/T clutch pressure control solenoid valve C at 0.2 A in Clutch Pressure Control Solenoid Control Menu.
5. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0971.

   Did the result indicate a fail?

   YES—Go to step 6.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the A/T clutch pressure control solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 3 and recheck.■
6. Turn the ignition switch OFF.
7. Disconnect the A/T clutch pressure control solenoid valve C connector.
8. Measure A/T clutch pressure control solenoid valve C resistance at the solenoid connector.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Terminal side of male terminals

Is there 3– 10 Ω ?

YES—Go to step 9.

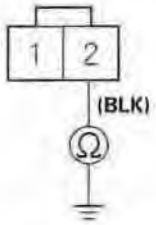
NO—Replace the A/T clutch pressure control solenoid valve C (see page 14-179), then go to step 10.

(cont'd)

DTC Troubleshooting (cont'd)

9. Check for continuity between A/T clutch pressure control solenoid valve C connector terminal No. 2 and body ground.

A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE C CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Repair open in the wire between the A/T clutch pressure control solenoid valve C and ground (G101), or repair poor ground (G101), then go to step 10.

10. Clear the DTC with the HDS.

11. Test-drive the vehicle for several minutes in the D position through all four gears.

12. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0971.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0973: Short in Shift Solenoid Valve A Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine, and shift to the D position.
3. Check that DTC P0973 recurs.

   Is DTC P0973 indicated?

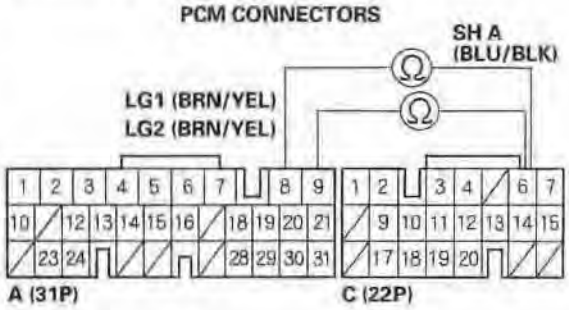
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid A in Miscellaneous Test Menu, and test the shift solenoid valve A with the HDS.
5. Start the engine, and shift to the D position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0973.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check the BLU/BLK wire for an intermittent short to ground between shift solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck. ■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C6 and A8 or A9.



Wire side of female terminals

Is there less than 12 Ω ?

YES—Go to step 11.

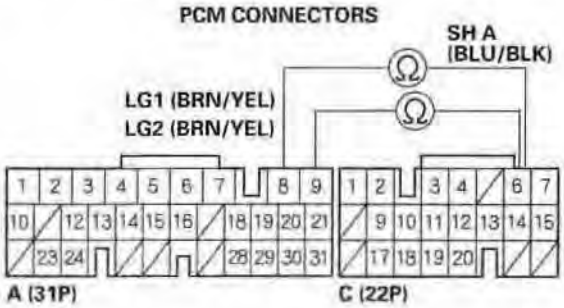
NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Check for continuity between PCM connector terminals C6 and A8 or A9.



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C6 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve A, and check for a short in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve A and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Start the engine, and shift to the D position.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0973.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0974: Open in Shift Solenoid Valve A Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine in the P position.
3. Check that DTC P0974 recurs.

   Is DTC P0974 indicated?

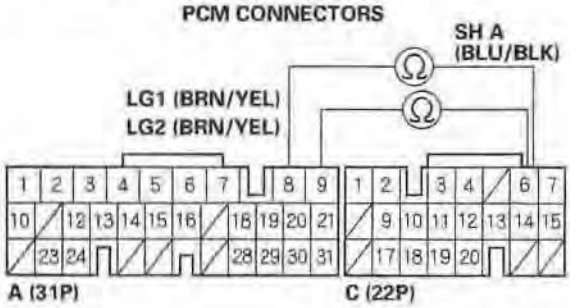
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid A in Miscellaneous Test Menu, and test the shift solenoid valve A with the HDS.
5. Start the engine in the P position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0974.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve A and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck. ■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C6 and A8 or A9.



Wire side of female terminals

Is there 12 – 25 Ω?

YES—Check for loose or poor connections at PCM connector terminal C6. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

NO—Go to step 11.

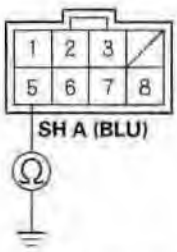
(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Measure the resistance between shift solenoid harness connector terminal No. 5 and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Terminal side of male terminals

Is there 12–25 Ω ?

YES—Repair open in the wire between PCM connector terminal C6 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve A, and check for an open in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve A and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Start the engine in the P position.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0974.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0976: Short in Shift Solenoid Valve B Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine in the P position.
3. Check that DTC P0976 recurs.

   Is DTC P0976 indicated?

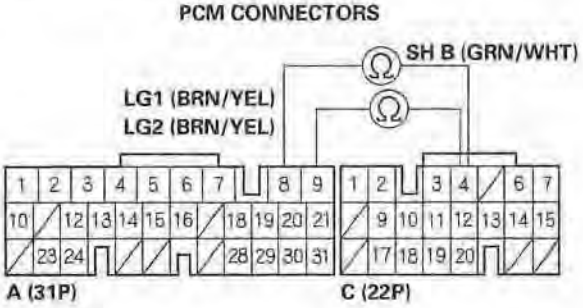
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid B in Miscellaneous Test Menu, and test the shift solenoid valve B with the HDS.
5. Start the engine in the P position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0976.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check the GRN/WHT wire for an intermittent short to ground between the shift solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C4 and A8 or A9.



Wire side of female terminals

Is there less than 12 Ω ?

YES—Go to step 11.

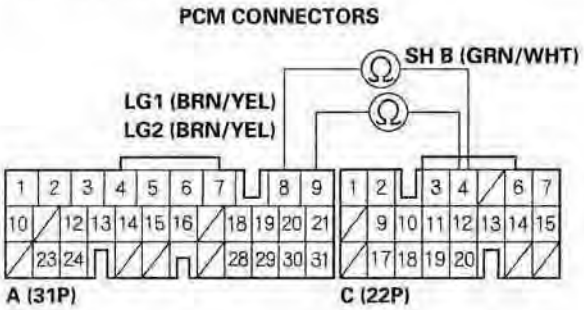
NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Check for continuity between PCM connector terminals C4 and A8 or A9.



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C4 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve B, and check for a short in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve B and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Start the engine in the P position.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0976.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0977: Open in Shift Solenoid Valve B Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Test-drive the vehicle for several minutes in 1st, 2nd, and 3rd gears in the D position with overdrive off mode (turned the O/D switch off).
3. Check that DTC P0977 recurs.

   Is DTC P0977 indicated?

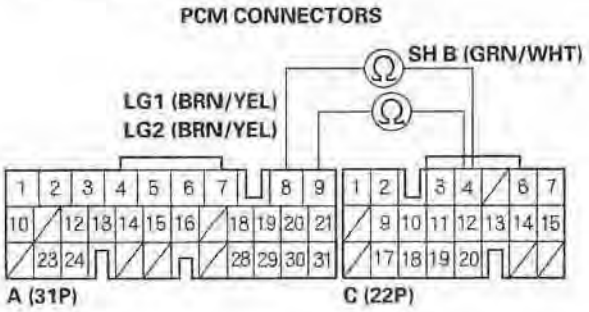
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid B in Miscellaneous Test Menu, and test the shift solenoid valve B with the HDS.
5. Test-drive the vehicle for several minutes in 1st, 2nd and 3rd gears in the D position with overdrive off mode (turned the O/D switch off).
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0977.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve B and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C4 and A8 or A9.



Wire side of female terminals

Is there 12 – 25 Ω ?

YES—Check for loose or poor connections at PCM connector terminal C4. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Go to step 11.

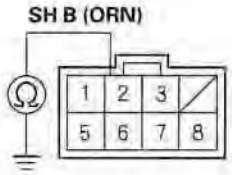
(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Measure the resistance between shift solenoid harness connector terminal No. 2 and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Terminal side of male terminals

Is there 12 – 25 Ω ?

YES—Repair open in the wire between PCM connector terminal C4 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve B, and check for an open in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve B and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Test-drive the vehicle for several minutes in 1st, 2nd, and 3rd gears in the D position with overdrive off mode (turned the O/D switch off).

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0977.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0979: Short in Shift Solenoid Valve C Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine, and shift to the D position.
3. Check that DTC P0979 recurs.

   Is DTC P0979 indicated?

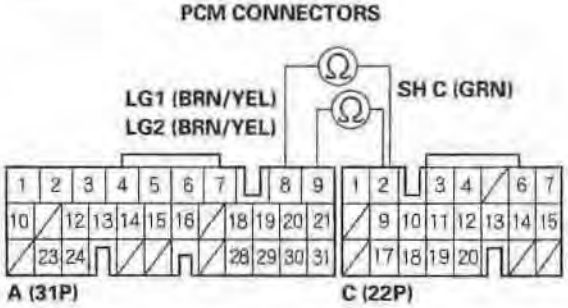
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid C in Miscellaneous Test Menu, and test the shift solenoid valve C with the HDS.
5. Start the engine, and shift to the D position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0979.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check the GRN wire for an intermittent short to ground between the shift solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck. ■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C2 and A8 or A9.



Wire side of female terminals

Is there less than 12 Ω ?

YES—Go to step 11.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

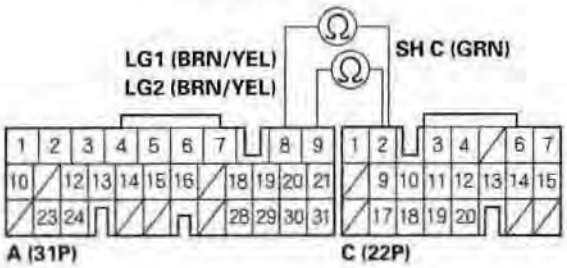
(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Check for continuity between PCM connector terminals C2 and A8 or A9.

PCM CONNECTORS



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C2 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve C, and check for a short in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve C and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Start the engine, and shift to the D position.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0979.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0980: Open in Shift Solenoid Valve C Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine in the P position.
3. Check that DTC P0980 recurs.

   Is DTC P0980 indicated?

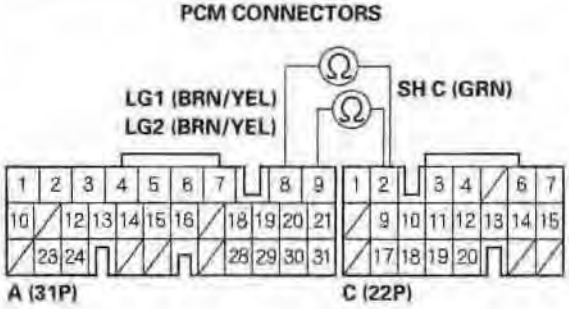
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid C in Miscellaneous Test Menu, and test the shift solenoid valve C with the HDS.
5. Start the engine in the P position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0980.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve C and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C2 and A8 or A9.



Wire side of female terminals

Is there 12—25 Ω?

YES—Check for loose or poor connections at PCM connector terminal C2. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Go to step 11.

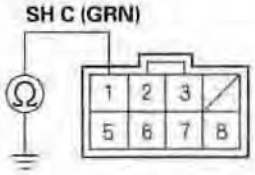
(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Measure the resistance between shift solenoid harness connector terminal No. 1 and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Terminal side of male terminals

Is there 12–25 Ω ?

YES—Repair open in the wire between PCM connector terminal C2 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve C, and check for an open in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve C and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Start the engine in the P position.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0980.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P0985: Short in Shift Solenoid Valve E Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Start the engine in the P position.
3. Check that DTC P0985 recurs.

   Is DTC P0985 indicated?

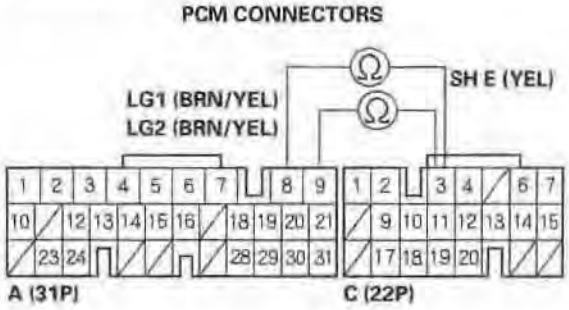
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid E in Miscellaneous Test Menu, and test the shift solenoid valve E with the HDS.
5. Start the engine in the P position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0985.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check the YEL wire for an intermittent short to ground between the shift solenoid valve E and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck. ■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C3 and A8 or A9.



Wire side of female terminals

Is there less than 12 Ω ?

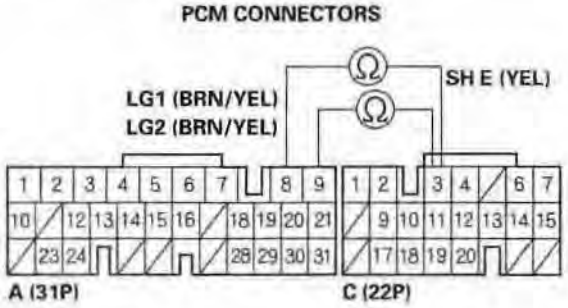
YES—Go to step 11.

NO—Update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM. ■

(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.
12. Check for continuity between PCM connector terminals C3 and A8 or A9.



Wire side of female terminals

Is there continuity?

YES—Repair short to ground in the wire between PCM connector terminal C3 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve E, and check for a short in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve E and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.
14. Start the engine in the P position.
15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0985.

Did the result indicate a pass?

YES—The problem has been corrected.■

NO—Return to step 1 and recheck.■

DTC P0986: Open in Shift Solenoid Valve E Circuit

NOTE:
- Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.
- This code is caused by an electrical circuit problem and cannot be caused by a mechanical problem in the transmission.

1. Clear the DTC with the HDS.
2. Test-drive the vehicle for several minutes in 1st and 2nd gears in the D position.
3. Check that DTC P0986 recurs.

   Is DTC P0986 indicated?

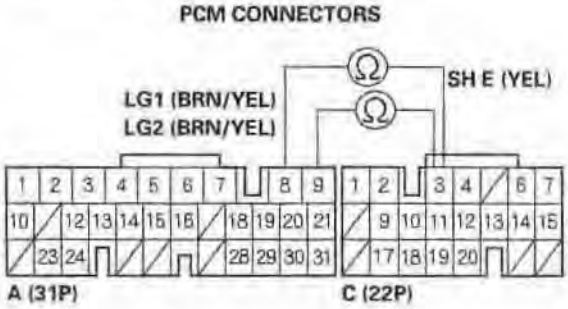
   YES—Go to step 7.

   NO—Go to step 4.
4. Select Shift Solenoid E in Miscellaneous Test Menu, and test the shift solenoid valve E with the HDS.
5. Test-drive the vehicle for several minutes in 1st and 2nd gears in the D position.
6. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0986.

   Did the result indicate a fail?

   YES—Go to step 7.

   NO—Intermittent failure, the system is OK at this time. Check for poor connections or loose terminals at the shift solenoid valve E and PCM. If the tester indicates NOT COMPLETE, return to step 4 and recheck.■
7. Turn the ignition switch OFF.
8. Jump the SCS line with the HDS.
9. Disconnect PCM connectors A (31P) and C (22P).
10. Measure the resistance between PCM connector terminals C3 and A8 or A9.



Wire side of female terminals

Is there 12 – 25 Ω?

YES—Check for loose or poor connections at PCM connector terminal C3. If the connection is OK, update the PCM if it does not have the latest software, or substitute a known-good PCM (see page 14-6), then recheck. If the symptom/indication goes away with a known-good PCM, replace the original PCM.■

NO—Go to step 11.

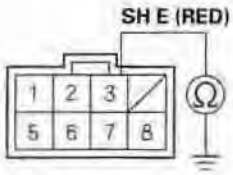
(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect the shift solenoid harness connector at the transmission housing.

12. Check for continuity between shift solenoid harness connector terminal No. 3 and body ground.

SHIFT SOLENOID HARNESS CONNECTOR



Terminal side of male terminals

Is there 12 – 25 Ω ?

YES—Repair open in the wire between PCM connector terminal C3 and the shift solenoid harness connector, then go to step 13.

NO—Check shift solenoid valve E, and check for an open in the shift solenoid harness in the transmission (see page 14-182). Replace shift solenoid valve E and/or shift solenoid harness, then go to step 13.

13. Clear the DTC with the HDS.

14. Test-drive the vehicle for several minutes in 1st and 2nd gears in the D position.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P0986.

Did the result indicate a pass?

YES—The problem has been corrected. ■

NO—Return to step 1 and recheck. ■

DTC P1731: Problem in Shift Control System:

- Shift Solenoid Valve E Stuck ON
- Shift Valve E Stuck
- A/T Clutch Pressure Control Solenoid Valve A Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.

4. Clear the DTC with the HDS.

5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1731.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.■

8. Clear the DTC with the HDS.

9. Select Shift Solenoid E in Miscellaneous Test Menu, and check that the shift solenoid valve E operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve E (see page 14-174), then go to step 12.

10. Select Clutch Pressure Control (Linear) Solenoid A in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.

    Is the system OK?

    YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 10 and recheck.■

    NO—Follow instructions indicated on the HDS by the test result, but if the tester has not determined the cause of the failure, go to step 11. If any part was replaced, go to step 12.

11. Inspect A/T clutch pressure control solenoid valve A (see page 14-176).

    Dose the A/T clutch pressure control solenoid valve A work properly?

    YES—Repair hydraulic system related with shift valve E, or replace the transmission, then go to step 12.

    NO—Replace A/T clutch pressure control solenoid valve A (see page 14-177), then go to step 12.

(cont'd)

DTC Troubleshooting (cont'd)

12. Clear the DTC with the HDS.
13. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
14. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1731.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC P1732: Problem in Shift Control System:

- Shift Solenoid Valves B or C Stuck ON
- Shift Valves B or C Stuck

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.
3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.
4. Clear the DTC with the HDS.
5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1732.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■
8. Clear the DTC with the HDS.
9. Select Shift Solenoid B in Miscellaneous Test Menu, and check that the shift solenoid valve B operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve B (see page 14-174), then go to step 14.
10. Select Shift Solenoid C in Miscellaneous Test Menu, and check that the shift solenoid valve C operates with the HDS.

    Is a clicking sound heard?

    YES—Go to step 11.

    NO—Replace shift solenoid valve C (see page 14-174), then go to step 14.
11. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
12. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
13. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1732.

    Did the result indicate a fail?

    YES—Repair hydraulic system related with shift valves B and C, or replace the transmission, then go to step 14.

    NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 14 and recheck. ■

(cont'd)

DTC Troubleshooting (cont'd)

14. Clear the DTC with the HDS.
15. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
16. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.
17. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1732.

    Did the result indicate a pass?

    YES—The problem has been corrected. ■

    NO—Return to step 8 and recheck. ■

DTC P1735: Problem in Shift Control System:

- Shift Solenoid Valves B and C Stuck OFF
- Shift Solenoid Valve E Stuck ON
- Shift Valves B, C, and E Stuck
- A/T Clutch Pressure Control Solenoid Valve A Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission.■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.

4. Clear the DTC with the HDS.

5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1735

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck.■

8. Clear the DTC with the HDS.

9. Select Shift Solenoid B in Miscellaneous Test Menu, and check that the shift solenoid valve B operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve B (see page 14-174), then go to step 17.

10. Select Clutch Pressure Control (Linear) Solenoid C in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve C with the HDS.

    Is a clicking sound heard?

    YES—Go to step 11.

    NO—Replace shift solenoid valve C (see page 14-174), then go to step 17.

11. Select Shift Solenoid E in Miscellaneous Test Menu, and check that the shift solenoid valve E operates with the HDS.

    Is a clicking sound heard?

    YES—Go to step 12.

    NO—Replace shift solenoid valve E (see page 14-174), then go to step 17.

12. Select Clutch Pressure Control (Linear) Solenoid A in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.

    Is the system OK?

    YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 12 and recheck.■

    NO—Follow instructions indicated on the HDS by the test result, but if the tester has not determined the cause of the failure, go to step 13. If any part was replaced, go to step 17.

(cont'd)

DTC Troubleshooting (cont'd)

13. Inspect A/T clutch pressure control solenoid valve A (see page 14-176).

    Does the A/T clutch pressure control solenoid valve A work properly?

    YES—Repair hydraulic system related with shift valve E, or replace the transmission, then go to step 12.

    NO—Replace A/T clutch pressure control solenoid valve A (see page 14-177), then go to step 12.

14. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

15. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

16. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1735

    Did the result indicate a fail?

    YES—Repair hydraulic system related with shift valves B, C, and E, or replace the transmission, then go to step 17.

    NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 14 and recheck.■

17. Clear the DTC with the HDS.

18. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

19. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

20. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1735

    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 8 and recheck.■

DTC P1736: Problem in Shift Control System:

- Shift Solenoid Valves B Stuck OFF
- Shift Solenoid Valve E Stuck ON
- Shift Valves B and E Stuck
- A/T Clutch Pressure Control Solenoid Valve A Stuck OFF

NOTE: Record all freeze data and review General Troubleshooting Information (see page 14-3) before you troubleshoot.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).

2. Make sure that the transmission is filled to the proper level, and check for fluid leaks.

3. Drain the ATF (see page 14-185) through a strainer. Inspect the strainer for metal debris or excessive clutch material.

   Does the strainer contain metal debris or excessive clutch material?

   YES—Replace the transmission. ■

   NO—Replace the ATF (see step 4 on page 14-185), then go to step 4.

4. Clear the DTC with the HDS.

5. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

6. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

7. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1736.

   Did the result indicate a fail?

   YES—Go to step 8.

   NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 5 and recheck. ■

8. Clear the DTC with the HDS.

9. Select Shift Solenoid B in Miscellaneous Test Menu, and check that the shift solenoid valve B operates with the HDS.

   Is a clicking sound heard?

   YES—Go to step 10.

   NO—Replace shift solenoid valve B (see page 14-174), then go to step 16.

10. Select Shift Solenoid E in Miscellaneous Test Menu, and check that the shift solenoid valve E operates with the HDS.

    Is a clicking sound heard?

    YES—Go to step 11.

    NO—Replace shift solenoid valve E (see page 14-174), then go to step 16.

11. Select Clutch Pressure Control (Linear) Solenoid A in Miscellaneous Test Menu, and test the A/T clutch pressure control solenoid valve A with the HDS.

    Is the system OK?

    YES—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 11 and recheck. ■

    NO—Follow instructions indicated on the HDS by the test result, but if the tester has not determined the cause of the failure, go to step 12. If any part was replaced, go to step 16.

12. Inspect A/T clutch pressure control solenoid valve A (see page 14-176).

    Does the A/T clutch pressure control solenoid valve A work properly?

    YES—Repair hydraulic system related with shift valve E, or replace the transmission, then go to step 16.

    NO—Replace A/T clutch pressure control solenoid valve A (see page 14-177), then go to step 16.

(cont'd)

DTC Troubleshooting (cont'd)

13. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

14. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

15. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1736.

    Did the result indicate a fail?

    YES—Repair hydraulic system related with shift valves B and E, or replace the transmission, then go to step 16.

    NO—Intermittent failure, the system is OK at this time. If the tester indicates NOT COMPLETE, return to step 13 and recheck.■

16. Clear the DTC with the HDS.

17. Test-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

18. Retest-drive the vehicle in the D position through all four gears at speeds over 12 mph (20 km/h) for more than 20 seconds, then slow down to a stop.

19. Check the OBD status in DTC Monitor Tool from DTCs/Freeze Data in A/T Mode Menu for a pass/fail test of code P1736.

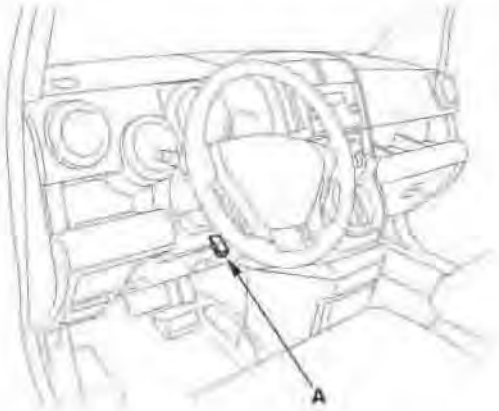
    Did the result indicate a pass?

    YES—The problem has been corrected.■

    NO—Return to step 8 and recheck.■

Road Test

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Apply the parking brake, and block both rear wheels. Start the engine, then shift to the D position while pressing the brake pedal. Press the accelerator pedal, and release it suddenly. The engine should not stall.
3. Repeat step 2 in the 2, 1, and R positions.
4. Connect the HDS to the DLC (A), and go to the A/T data list.



5. Test-drive the vehicle on a flat road in the D position. Check for abnormal noise and clutch slippage. While driving, check that the shift points occur at the proper speeds by monitoring the throttle position sensor voltage with the HDS and comparing your shift point speeds and voltage to those in the table. (The throttle position sensor voltage represents the throttle opening.)

Upshift: D Position

Throttle position sensor voltage: 0.8 V	
1st→2nd	9—12 mph (14—19 km/h)
2nd→3rd	21—24 mph (34—39 km/h)
3rd→4th	28—32 mph (45—52 km/h)
Lock-up ON	48—55 mph (77—89 km/h)
Throttle position sensor voltage: 2.25 V	
1st→2nd	23—27 mph (37—43 km/h)
2nd→3rd	39—44 mph (63—71 km/h)
3rd→4th	61—66 mph (98—107 km/h)
Lock-up ON	73—84 mph (118—135 km/h)
Fully-opened throttle Throttle position sensor voltage: 4.5 V	
1st→2nd	35—40 mph (57—65 km/h)
2nd→3rd	64—72 mph (103—116 km/h)
3rd→4th	106—117 mph (171—188 km/h)
Lock-up ON	94—105 mph (152—169 km/h)

(cont'd)

Road Test (cont'd)

Downshift: D Position

Throttle position sensor voltage: 0.8 V	
Lock-up OFF	47—53 mph (76—85 km/h)
4th→3rd	19—22 mph (31—35 km/h)
3rd→1st	5—8 mph (8—13 km/h)
Throttle position sensor voltage: 2.25 V	
Lock-up OFF	62—70 mph (99—112 km/h)
Fully-opened throttle **Throttle position sensor voltage: 4.5 V**	
Lock-up OFF	91—102 mph (147—164 km/h)
4th→3rd	88—98 mph (141—157 km/h)
3rd→2nd	53—60 mph (85—96 km/h)
2nd→1st	26—31 mph (42—50 km/h)

6. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift from the D position to the 2 position. The vehicle should immediately begin to slow down from engine braking.

7. Check for abnormal noise and clutch slippage in the following positions.

   1 (1st Gear) Position
   Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts should not occur with the shift lever in this position.

   2 (2nd Gear) Position
   Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage. Upshifts and downshifts should not occur with the shift lever in this position.

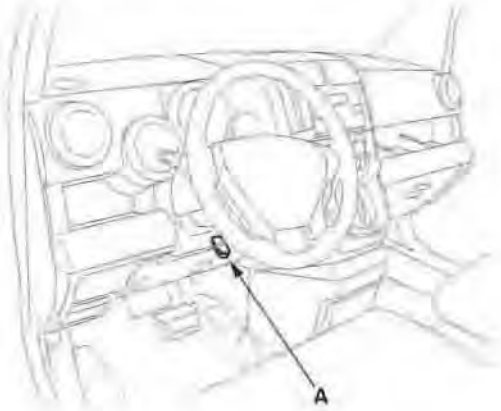
   R (Reverse) Position
   Accelerate from a stop at full throttle for a short period of time, and check for abnormal noise and clutch slippage.

8. Test in P (Park) Position.
   Park the vehicle on a slope (about 16 °), apply the brake, and shift into the P position. Release the brake; the vehicle should not move.

   NOTE: Always use the brake to hold the vehicle, when stopped on an incline in gear. Depending on the grade of the incline, the vehicle could roll backwards if the brake is released.

Stall Speed Test

1. Set the parking brake, and block all four wheels.
2. Connect the HDS to the DLC (A), and go to the A/T data list.



3. Make sure the A/C switch is OFF.
4. After the engine has warmed up to normal operating temperature (the radiator fan comes on), shift to the 2 position.
5. Firmly press the brake pedal and accelerator for 6 to 8 seconds, and note engine speed. Do not move the shift lever while raising engine speed.
6. Allow 2 minutes for cooling, then repeat the test in the D, 1, and R positions.

NOTE:
- Do not test stall speed for more than 10 seconds at a time.
- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in D, 2, 1, and R positions.
- Do not test stall speed with the A/T pressure gauges installed.

Stall Speed rpm:
Specification: 2,100 rpm
Service Limit: 1,950—2,250 rpm

7. If the measurements are out of the service limit, problems and probable causes are listed in the table:

Problem	Probable causes
Stall speed rpm high in the D, 2, 1, and R positions	• Low fluid level • ATF pump output low • ATF pump defective • Clogged ATF strainer • Pressure regulator valve stuck closed
Stall speed high in the R position	Slippage of 4th clutch
Stall speed high in the 2 position	Slippage of 2nd clutch
Stall speed high in the 1 position	Slippage of 1st clutch
Stall speed low in the D, 2, 1, and R positions	• Engine output low • Engine throttle valve closed • Torque converter one-way clutch slipping

Pressure Test

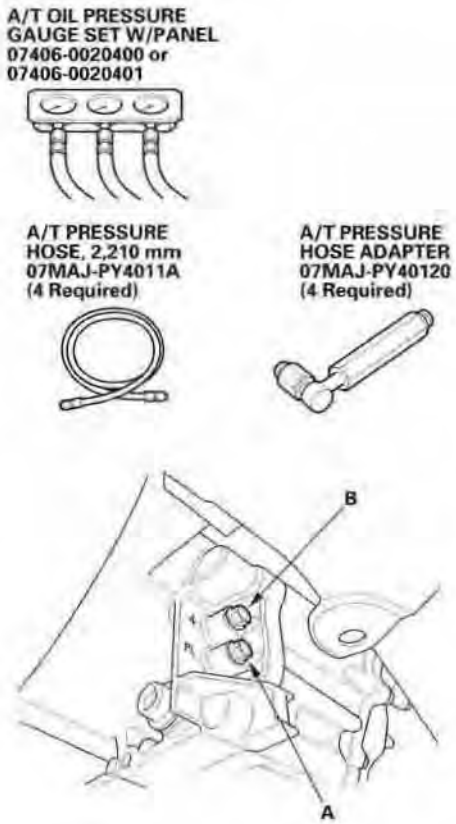
Special Tools Required
- A/T oil pressure gauge set 07406-0020400 or 07406-0020401
- A/T pressure hose, 2,210 mm 07MAJ-PY4011A
- A/T pressure hose adapter 07MAJ-PY40120

1. Before testing, be sure the transmission is filled to the proper level.

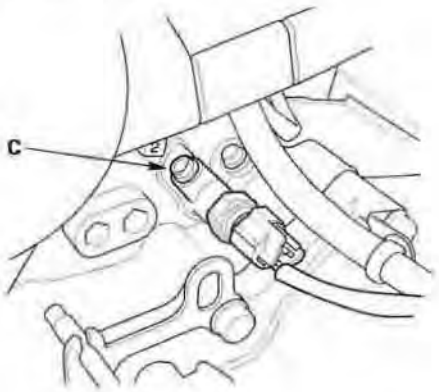
2. 4WD model: Raise the vehicle, make sure it is securely supported, and allow all four wheels to rotate freely.
   2WD model: Raise the front of the vehicle, and make sure it is securely supported. Set the parking brake, block rear wheels securely, and allow the front wheels to rotate freely.

3. Warm up the engine (the radiator fan comes on), then stop it and connect the HDS to the DLC.

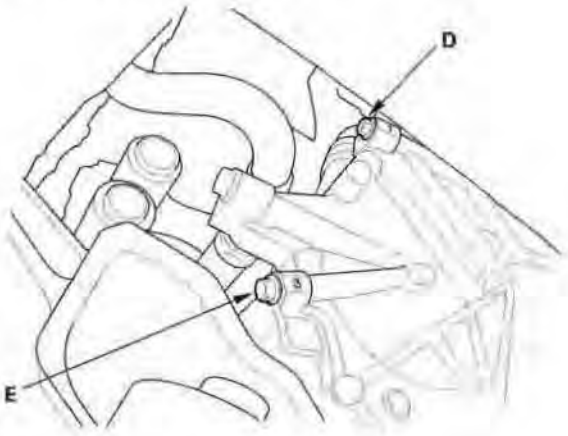
4. Connect the oil pressure gauge to the line pressure inspection hole (A) and 4th clutch pressure inspection hole (B). Do not allow dust or other foreign particles to enter the holes while connecting the gauges.



5. Remove the air cleaner housing, and connect the oil pressure gauge to the 2nd clutch pressure inspection hole (C). Then temporarily reinstall the air cleaner housing.



6. Connect the oil pressure gauges to the 1st clutch pressure inspection hole (D) and 3rd clutch pressure inspection hole (E).



7. Start the engine, and run it at 2,000 rpm.

8. Shift to the N or P position, and measure line pressure at the line pressure inspection hole (A).

   NOTE: Higher pressure may be indicated if measurements are made in shift lever position other than N or P.

Pressure	Fluid Pressure	
	Standard	Service Limit
Line (A)	900—960 kPa (9.2—9.8 kgf/cm², 130—140 psi)	850 kPa (8.7 kgf/cm², 120 psi)

9. Shift to the 1 position, and measure 1st clutch pressure at the 1st clutch pressure inspection hole (D) with holding engine speed at 2,000 rpm.

10. Shift to the 2 position, and measure 2nd clutch pressure at the 2nd clutch pressure inspection hole (C) with holding engine speed at 2,000 rpm.

11. Shift to the P position, then press the brake pedal and hold it.

12. Shift to the 2 position, and release the brake pedal (transmission should be in 2nd gear).

13. Press the accelerator very slowly to increase engine speed to 2,000 rpm gradually over 10 seconds, then hold it at 2,000 rpm.

14. Hold in the 2 position at 2,000 rpm, shift into N for 1 second, then shift to the D position, and turn the overdrive off mode by pushing the O/D switch. Measure 3rd clutch pressure at the 3rd clutch pressure inspection hole (E) with holding engine speed at 2,000 rpm.

15. Measure 4th clutch pressure at the 4th clutch pressure inspection hole (B) with holding engine speed at 2,000 rpm.

16. Shift to the R position, and measure 4th clutch pressure at the 4th clutch pressure inspection hole (B) with holding engine speed at 2,000 rpm.

Pressure	Fluid Pressure	
	Standard	Service Limit
1st clutch (D) 2nd clutch (C) 3rd clutch (E) 4th clutch (B)	890—970 kPa (9.1—9.9 kgf/cm², 130—140 psi)	840 kPa (8.6 kgf/cm², 120 psi)

17. If the measurements are out of service limit, problems and probable causes are listed in the table:

Problem	Probable causes
No or low line pressure	• Torque converter • Regulator valve • Torque converter check valve • ATF pump • Low fluid level • Clogged ATF strainer
No or low 1st clutch pressure	• 1st clutch • O-rings
No or low 2nd clutch pressure	• 2nd clutch • O-rings
No or low 3rd clutch pressure	• 3rd clutch • O-rings
No or low 4th clutch pressure in the D position	• 4th clutch • O-rings
No or low 4th clutch pressure in the R position	• Servo valve • 4th clutch • O-rings

18. Install the sealing bolts with new sealing washers, and tighten the bolts to the specified torque.

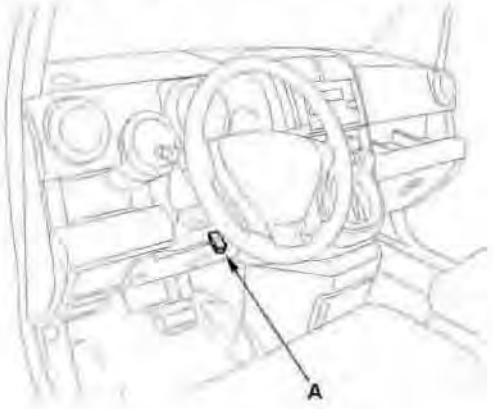
    Torque: 18 N·m (1.8 kgf-m, 13 lbf-ft)

    NOTE: Do not reuse old sealing washers.

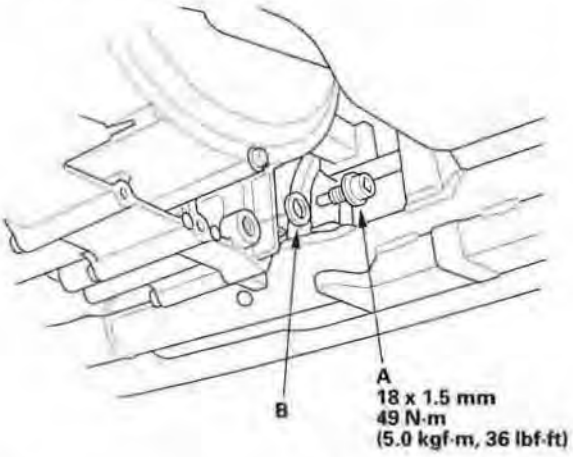
19. Install the air cleaner housing.

Shift Solenoid Valve Test

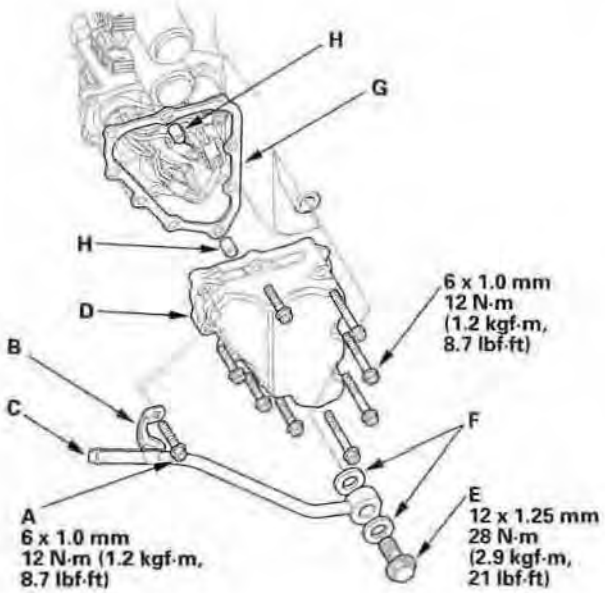
1. Connect the HDS to the DLC (A).



2. Select Shift Solenoid A, B, C, and E in Miscellaneous Test Menu on the HDS.
3. Check that the shift solenoid valve A, B, C, and E operate with the HDS. A clicking sound should be heard.
4. Shift solenoid valves test has finished if the test results are OK.
   If no sound is heard, remove the shift solenoid valves and test.
5. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

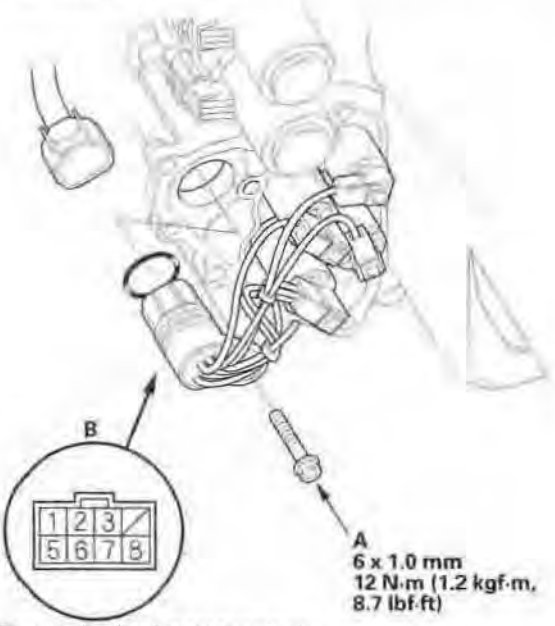


6. Reinstall the drain plug with a new sealing washer (B).
7. Place the transmission jack under the transmission, and lift it up to create clearance between the transmission and front subframe.
8. Disconnect the shift solenoid harness connector.
9. Remove the bolt (A) securing the bracket (B) of the ATF cooler inlet line (C) on the shift solenoid valve cover (D), and remove the line bolt (E) with sealing washers (F).



10. Remove the shift solenoid valve cover (D), gasket (G), and dowel pins (H).

11. Remove the bolt (A), and remove the shift solenoid harness connector (B).



Terminal side of male terminals

12. Measure shift solenoid valves resistance between the shift solenoid harness connector terminals No. 1, No. 2, No. 3, No. 5 and body ground.

- Shift solenoid valve A: No. 5 terminal (BLU)
- Shift solenoid valve B: No. 2 terminal (ORN)
- Shift solenoid valve C: No. 1 terminal (GRN)
- Shift solenoid valve E: No. 3 terminal (RED)

Standard: 12—25 Ω

13. If the resistance is out of standard, disconnect the shift solenoid valve connector, and measure its resistance at the solenoid valve terminal. Replace the shift solenoid valve if the resistance is out of standard.

14. Connect the battery negative terminal to body ground, and connect the battery positive terminal to the shift solenoid harness connector terminals individually. A clicking sound should be heard.

15. If no sound is heard, connect the battery positive terminal to the shift solenoid valve terminal, and check that the clicking sound is heard. Replace the shift solenoid valve if no sound is heard.

16. Replace the solenoid harness if the tests results are OK.

17. Install the new O-ring on the shift solenoid harness connector, and install the connector in the transmission housing.

18. Install the shift solenoid valve cover with the new gasket and dowel pins.

19. Install the ATF cooler inlet line with the line bolt and the new sealing washers. Create clearance with the jack between the transmission and the front subframe to tighten the line bolt with the torque wrench.

20. Install the bracket of the ATF cooler inlet line on the shift solenoid valve cover with the bolt.

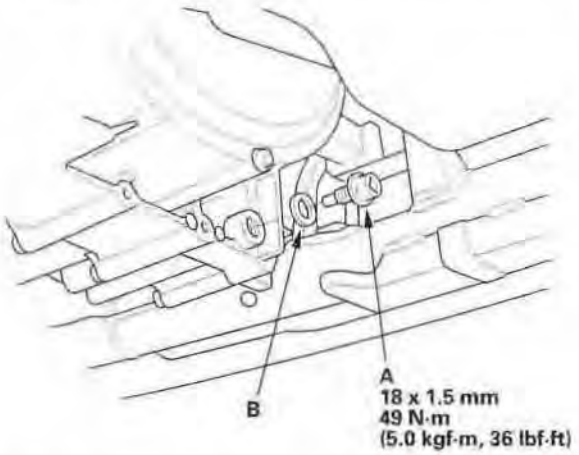
21. Check the connector for rust, dirt, or oil, then connect the connector securely.

22. Remove the transmission jack.

23. Refill the transmission with the recommended fluid (see step 5 on page 14-185).

Shift Solenoid Valve Replacement

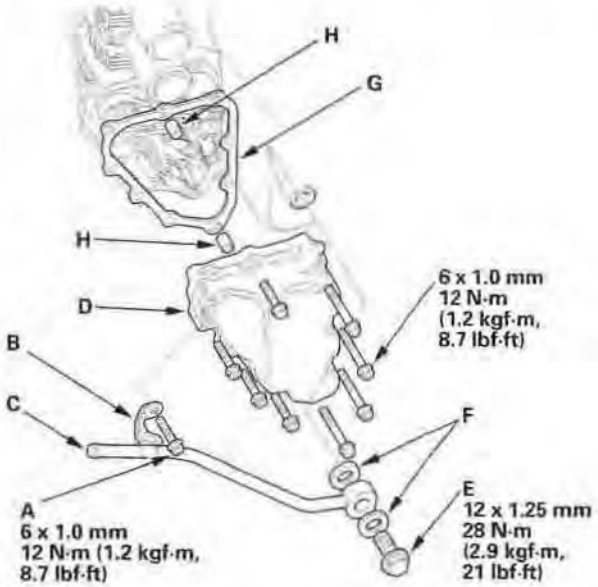
1. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).



2. Reinstall the drain plug with a new sealing washer (B).

3. Place the transmission jack under the transmission, and lift it up to create clearance between the transmission and front subframe.

4. Remove the bolt (A) securing the bracket (B) of the ATF cooler inlet line (C) on the shift solenoid valve cover (D), and remove the line bolt (E) with sealing washers (F).

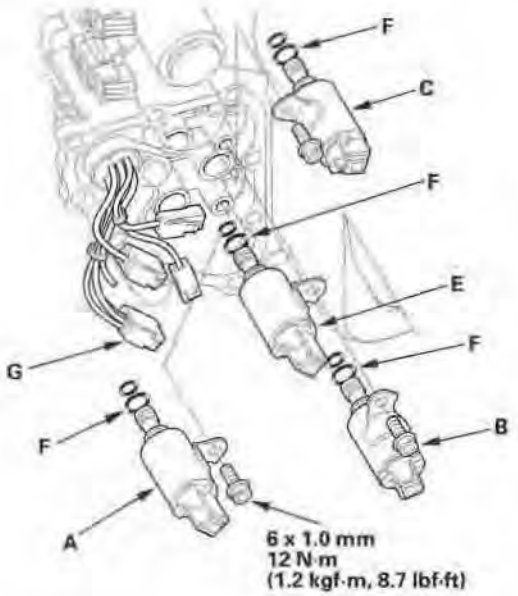


5. Remove the shift solenoid valve cover (D), gasket (G), and dowel pins (H).

6. Disconnect the shift solenoid valve connectors.

7. Remove the bolts, and hold the shift solenoid valve body, then remove them. Do not hold the connector to remove.

8. Install the new O-rings (two O-rings per a solenoid valve) (F) on the good solenoid valve. The replacement solenoid valve comes with new O-rings.



9. Install shift solenoid valves A, C, and E by holding the shift solenoid valve body; be sure to install the solenoid valves until their mounting bolt brackets contact the servo body.

   NOTE: Do not install shift solenoid valve B before installing shift solenoid valve E. If solenoid valve B is installed before solenoid valve E, it may damage the hydraulic control system.

10. Install shift solenoid valve B by holding the shift solenoid valve body; be sure to install the solenoid valve until its mounting bolt bracket contacts the bracket of installed solenoid.

11. Connect shift solenoid valve A connector (G) with the ATF temperature sensor.

12. Connect solenoid valve B connector (ORN wire), solenoid valve C connector (GRN wire), and solenoid valve E connector (RED wire).

13. Install the shift solenoid valve cover with the new gasket and dowel pins.

14. Install the ATF cooler inlet line with the line bolt and the new sealing washers. Create clearance with the jack between the transmission and the front subframe to tighten the line bolt with the torque wrench.

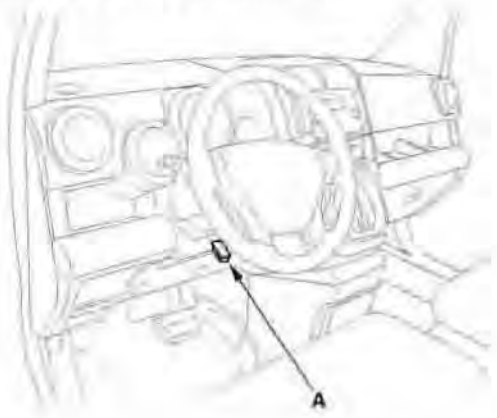
15. Install the bracket of the ATF cooler inlet line on the shift solenoid valve cover with the bolt.

16. Remove the transmission jack.

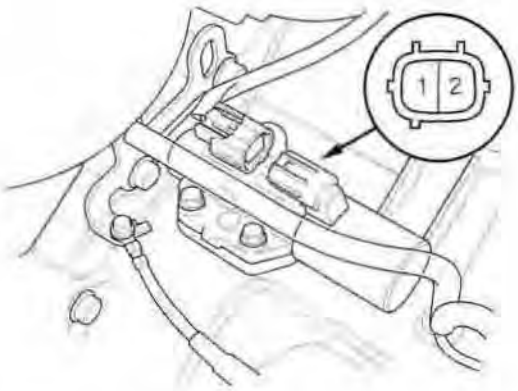
17. Refill the transmission with the recommended fluid (see step 5 on page 14-185).

A/T Clutch Pressure Control Solenoid Valve A Test

1. Connect the HDS to the DLC (A).



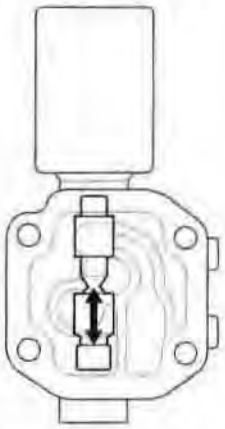
2. Select Clutch Pressure Control (Linear) Solenoid A in Miscellaneous Test Menu on the HDS.
3. Test the A/T clutch pressure control solenoid valve A with the HDS.
4. Follow instructions indicated on the HDS by the test result. If the HDS has not determined the cause of the failure, remove A/T clutch pressure control solenoid valve A and test.
5. Remove the air cleaner housing.
6. Disconnect the A/T clutch pressure control solenoid valve A connector.



7. Measure A/T clutch pressure control solenoid valve A resistance at the solenoid valve A terminal.

   Standard: 3—10 Ω

8. If the resistance is out of standard, replace A/T clutch pressure control solenoid valve A.
9. Connect the battery positive terminal to the No. 1 terminal of the A/T clutch pressure control solenoid valve A connector, and connect the battery negative terminal to the No. 2 terminal. A clicking sound should be heard.
10. If no sound is heard, remove A/T clutch pressure control solenoid valve A.
11. Check the fluid passage of the A/T clutch pressure control solenoid valve for dust or dirt.
12. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valve A to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure the A/T clutch pressure control solenoid valve moves.



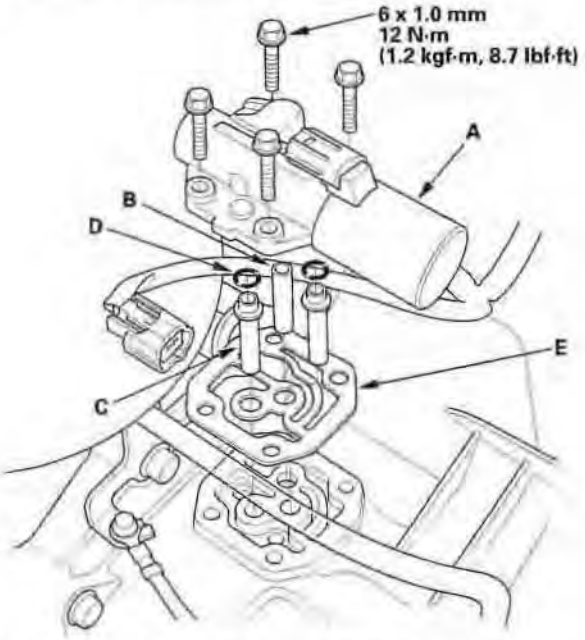
13. Disconnect one of the battery terminals, and check valve movement.

    NOTE: You can see valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valve A body.

14. If the valve binds or moves sluggishly, or if the solenoid valve does not operate, replace A/T clutch pressure control solenoid valve A.

A/T Clutch Pressure Control Solenoid Valve A Replacement

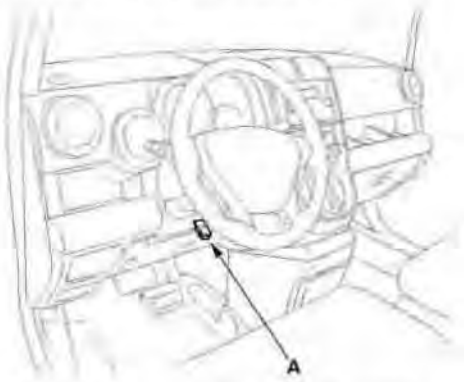
1. Remove the air cleaner housing.
2. Disconnect the A/T clutch pressure control solenoid valve A connector.
3. Remove the mounting bolts and A/T clutch pressure control solenoid valve A.



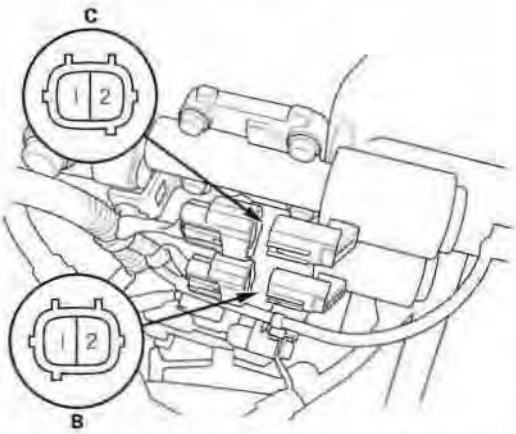
4. Remove the ATF pipe (B), ATF joint pipes (C), O-rings (D), and gasket (E).
5. Clean the mounting surface and fluid passage of the transmission housing.
6. Install the new gasket on the transmission housing, and install the ATF pipe and ATF joint pipes.
7. Install the new O-rings over the ATF joint pipes.
8. Install the new A/T clutch pressure control solenoid valve A.
9. Check the A/T clutch pressure control solenoid valve A connector for rust, dirt, and oil, clean if needed, then connect it securely.
10. Install the air cleaner housing.

A/T Clutch Pressure Control Solenoid Valve B and C Test

1. Connect the HDS to the DLC (A).



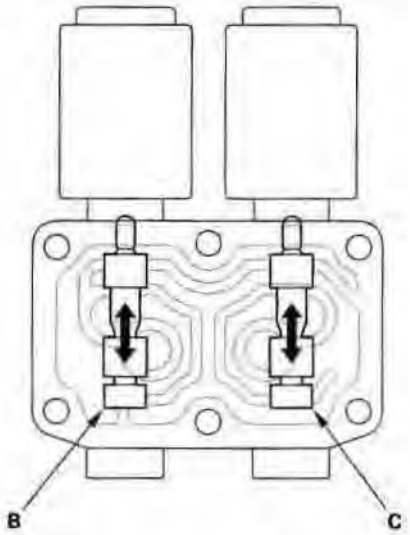
2. Select Clutch Pressure Control (Linear) Solenoid B and C in Miscellaneous Test Menu on the HDS.
3. Test the A/T clutch pressure control solenoid valves B and C with the HDS.
4. Follow instructions indicated on the HDS by the test result. If the HDS has not determined the cause of the failure, remove A/T clutch pressure control solenoid valves B, C and test.
5. Remove the air cleaner housing.
6. Disconnect the A/T clutch pressure control solenoid valves B and C connectors.



7. Measure A/T clutch pressure control solenoid valve B resistance between the solenoid valve B terminals No. 1 and No. 2, and measure A/T clutch pressure control solenoid valve C resistance between the solenoid valve C terminals No. 1 and No. 2.

   Standard: 3—10 Ω

8. If the resistance of either of the A/T clutch pressure control solenoid valves is out of standard, replace A/T clutch pressure control solenoid valves B and C.
9. Connect the battery positive terminal to the No. 1 terminal of the A/T clutch pressure control solenoid valves B and C, and connect the battery negative terminal to the No. 2 terminal. A clicking sound should be heard.
10. If no sound is heard, remove A/T clutch pressure control solenoid valves B and C.
11. Check the fluid passage of the A/T clutch pressure control solenoid valve for dust or dirt.
12. Connect the No. 1 terminal of the A/T clutch pressure control solenoid valves B and C to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal. Make sure A/T clutch pressure control solenoid valves B and C move.



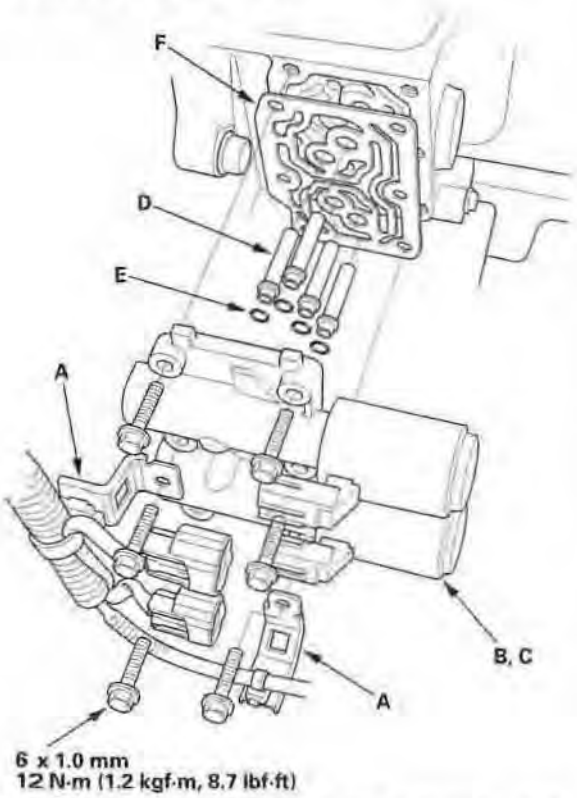
13. Disconnect one of the battery terminals, and check valve movement.

    NOTE: You can see valve movement through the fluid passage in the mounting surface of the A/T clutch pressure control solenoid valves B and C body.

14. If either valve binds or moves sluggishly, or if the solenoid valve does not operate, replace A/T clutch pressure control solenoid valves B and C.

A/T Clutch Pressure Control Solenoid Valve B and C Replacement

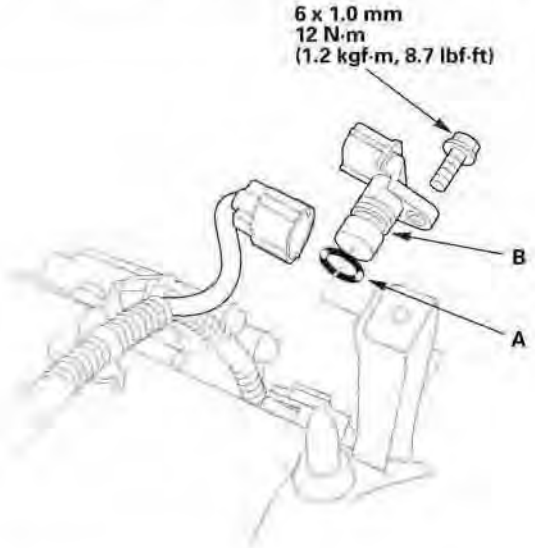
1. Remove the air cleaner housing.
2. Disconnect the A/T clutch pressure control solenoid valves B and C connectors.
3. Remove the mounting bolts, harness clamp brackets (A), and A/T clutch pressure control solenoid valves B and C.



4. Remove the ATF joint pipes (D), O-rings (E), and gasket (F).
5. Clean the mounting surface and fluid passage of the transmission housing.
6. Install the new gasket on the transmission housing, and install the ATF joint pipes.
7. Install the new O-rings over the ATF joint pipes.
8. Install the new A/T clutch pressure control solenoid valves B and C, and harness clamp brackets.
9. Check the A/T clutch pressure control solenoid valves B and C connectors for rust, dirt, and oil, clean if needed, then connect them securely.
10. Install the air cleaner housing.

Input Shaft (Mainshaft) Speed Sensor Replacement

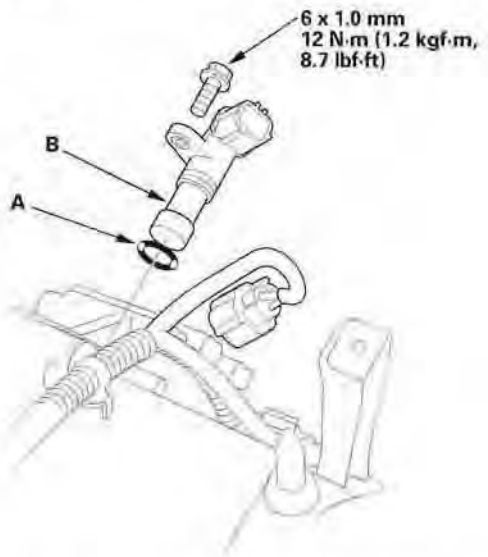
1. Disconnect the input shaft (mainshaft) speed sensor connector.
2. Remove the input shaft (mainshaft) speed sensor.



3. Install the new O-ring (A) on the mainshaft speed sensor, and install the input shaft (mainshaft) speed sensor (B) in the transmission housing.
4. Check the connector for rust, dirt, and oil, clean if needed, then connect the connector securely.

Output Shaft (Countershaft) Speed Sensor Replacement

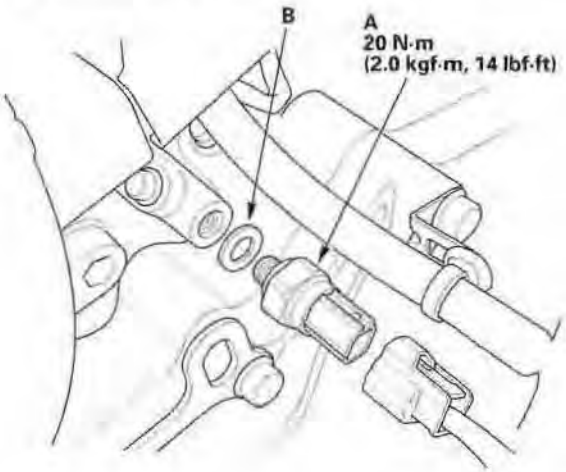
1. Disconnect the output shaft (countershaft) speed sensor connector.
2. Remove the output shaft (countershaft) speed sensor.



3. Install the new O-ring (A) on the countershaft speed sensor, and install the output shaft (countershaft) speed sensor (B) in the transmission housing.
4. Check the connector for rust, dirt, and oil, clean if needed, then connect the connector securely.

2nd Clutch Transmission Fluid Pressure Switch Replacement

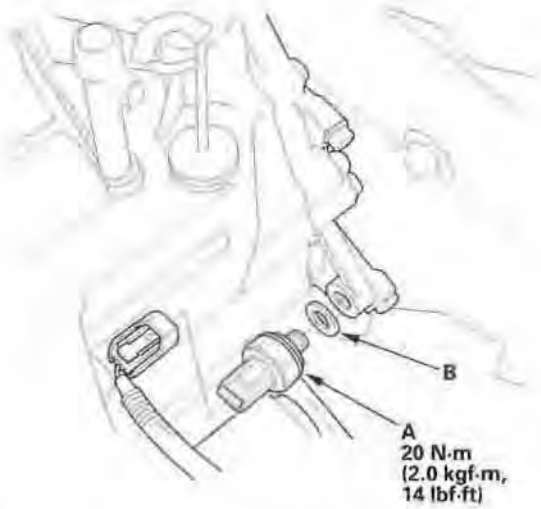
1. Remove the air cleaner housing.
2. Disconnect the connector from the 2nd clutch pressure switch (A).



3. Remove the 2nd clutch pressure switch and use a new sealing washer (B). Tighten the switch on the metal part, not the plastic part.
4. Reconnect the connector, making sure there is no water, oil, dust, or foreign particles inside it.
5. Install the air cleaner housing.

3rd Clutch Transmission Fluid Pressure Switch Replacement

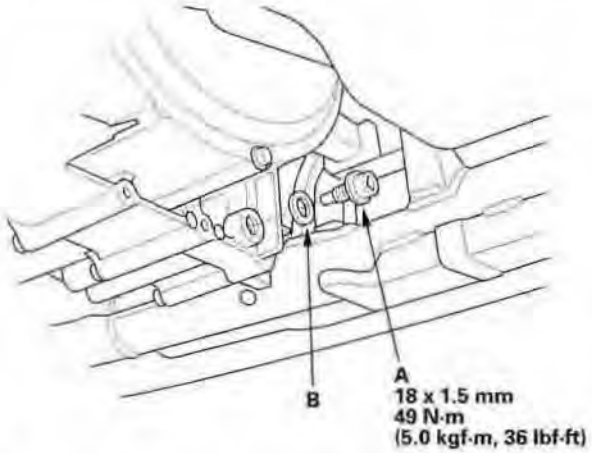
1. Disconnect the connector from the 3rd clutch pressure switch (A).



2. Remove the 3rd clutch pressure switch and use a new sealing washer (B). Tighten the switch on the metal part, not the plastic part.
3. Reconnect the connector, making sure there is no water, oil, dust, or foreign particles inside it.

ATF Temperature Sensor Test/Replacement

1. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

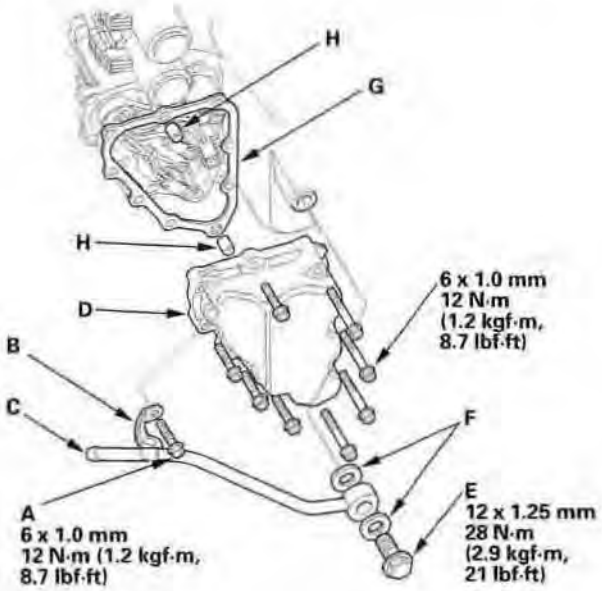


2. Reinstall the drain plug with a new sealing washer (B).

3. Place the transmission jack under the transmission, and lift it up to create clearance between the transmission and front subframe.

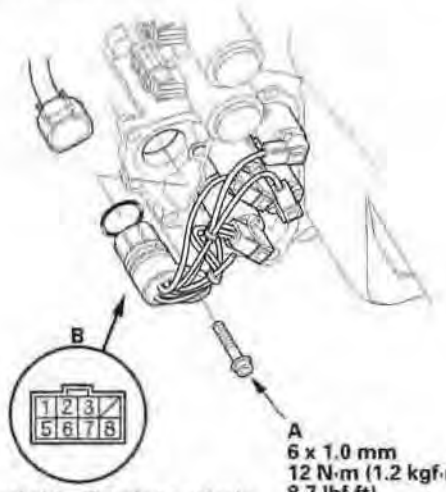
4. Disconnect the shift solenoid harness connector.

5. Remove the bolt (A) securing the bracket (B) of the ATF cooler inlet line (C) on the shift solenoid valve cover (D), and remove the line bolt (E) with sealing washers (F).



6. Remove the shift solenoid valve cover (D), gasket (G), and dowel pins (H).

7. Remove the bolt (A), and remove the shift solenoid harness connector (B).



Terminal side of male terminals

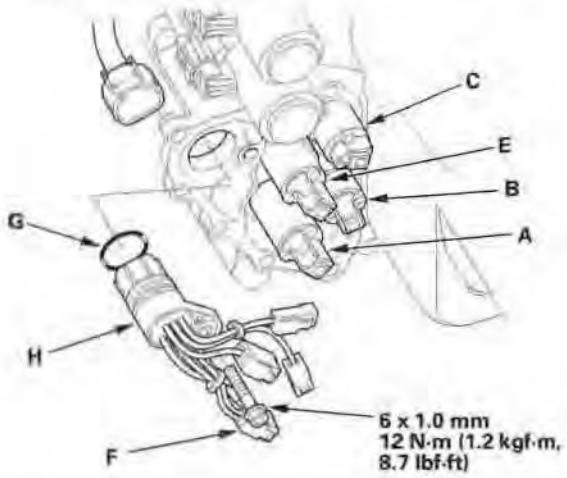
8. Measure ATF temperature sensor resistance between the No. 6 and No. 7 terminals of the shift solenoid harness connector.

   Standard: 50 Ω – 25 kΩ

9. If the resistance is out of standard, replace the shift solenoid harness. The ATF temperature sensor is not available separately from the shift solenoid harness.

10. Disconnect the connectors from the shift solenoid valves.

11. Connect the shift solenoid valve A connector (BLU wire) with the ATF temperature sensor (F) on the new solenoid harness.



12. Connect the solenoid valve B connector (ORN wire), solenoid valve C connector (GRN wire), and solenoid valve E connector (RED wire).

13. Install the new O-ring (G) on the shift solenoid harness connector (H), and install the connector in the transmission housing.

14. Install the shift solenoid valve cover with the new gasket and dowel pins.

15. Install the ATF cooler inlet line with the line bolt and the new sealing washers. Create clearance with the jack between the transmission and the front subframe to tighten the line bolt with the torque wrench.

16. Install the bracket of the ATF cooler inlet line on the shift solenoid valve cover with the bolt.

17. Check the connector for rust, dirt, or oil, clean if needed, then connect the connector securely.

18. Remove the transmission jack.

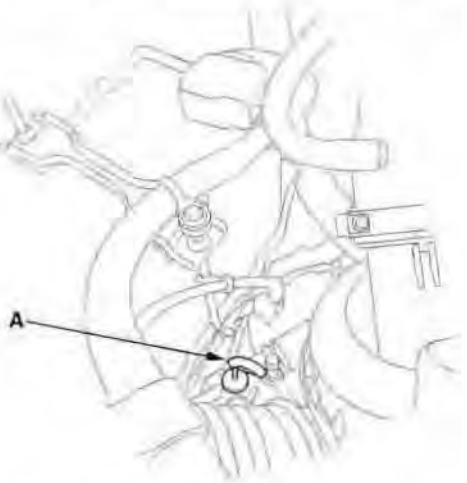
19. Refill the transmission with the recommended fluid (see step 5 on page 14-185).

ATF Level Check

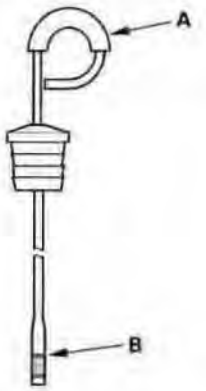
NOTE: Keep all foreign particles out of the transmission.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on level ground, and turn the engine off.

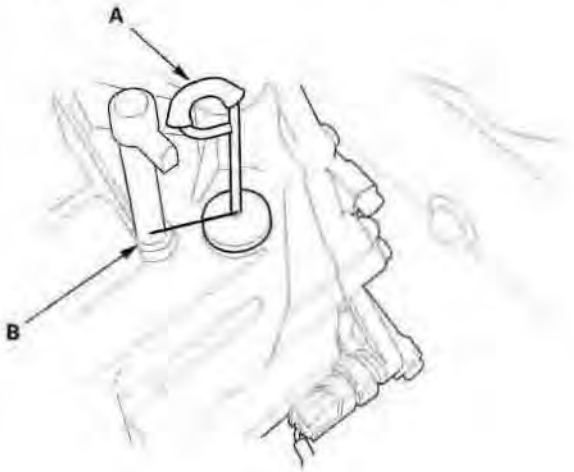
   NOTE: Check the fluid level within 60—90 seconds after turning the engine off.
3. Remove the dipstick (yellow loop) (A) from the transmission, and wipe it with a clean cloth.



4. Insert the dipstick back into the transmission.
5. Remove the dipstick (A), and check the fluid level. It should be at the upper mark (B).



6. If the level is below the upper mark, check for fluid leaks at the transmission, hose and line joints, and cooler lines.
   If a problem is found, fix it before filling the transmission.
   If the level is above the upper mark, drain the ATF to proper level (see step 3 on page 14-185).
7. Pour the recommended fluid amount into the dipstick hole to bring it to the upper mark. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.
8. Insert the dipstick (A) back into the transmission with the handle pointing toward the breather pipe (B).

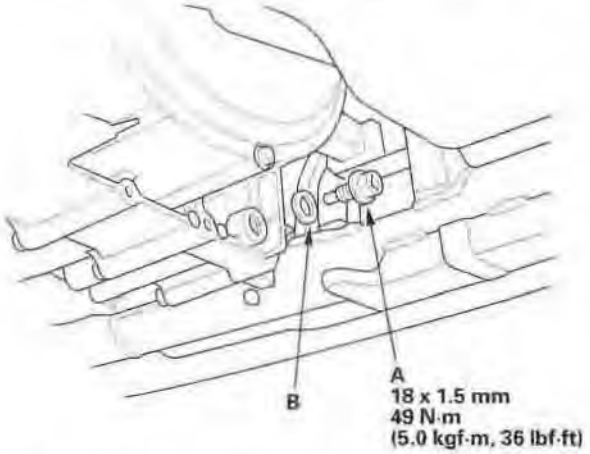


ATF Replacement

NOTE: Keep all foreign particles out of the transmission.

1. Bring the transmission up to normal operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on level ground, and turn the engine off.
3. Remove the drain plug (A), and drain the automatic transmission fluid (ATF).

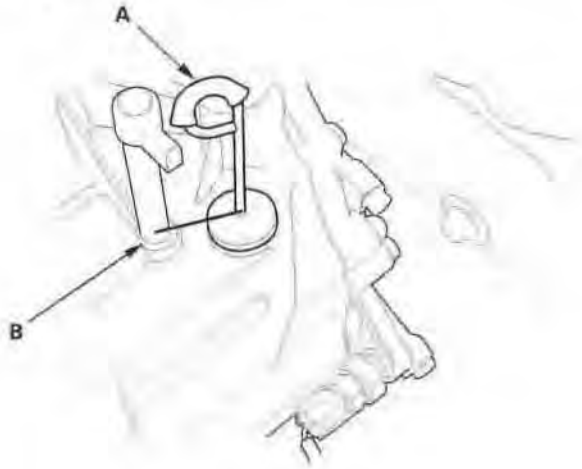
   NOTE: If a cooler cleaner is to be used, refer to ATF cooler cleaning (see page 14-208).



4. Reinstall the drain plug with a new sealing washer (B).
5. Refill the transmission with the recommended fluid amount through the dipstick hole until the level reaches the upper mark on the dipstick. Always use Honda ATF-Z1 Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

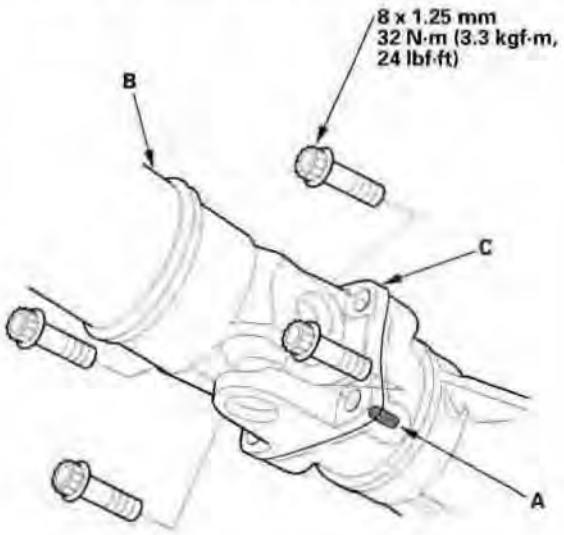
   Automatic Transmission Fluid Capacity:
   4WD:
   3.1 L (3.3 US qt) at change
   7.2 L (7.6 US qt) at overhaul
   2WD:
   3.2 L (3.4 US qt) at change
   6.8 L (7.2 US qt) at overhaul

6. Insert the dipstick (A) back into the transmission with the handle pointing toward the breather pipe (B).



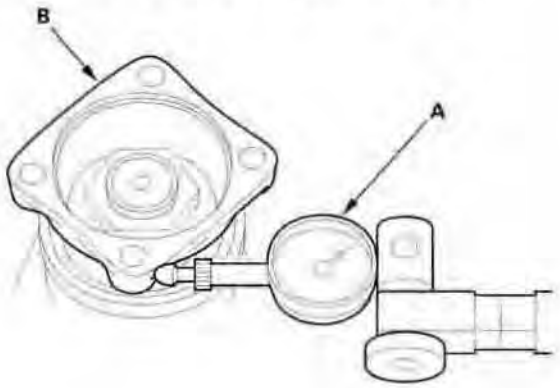
Transfer Assembly Inspection

1. Raise the vehicle, and make sure it is supported securely.
2. Shift the transmission into the N position.
3. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C).



4. Separate the propeller shaft from the transfer assembly.
5. Set a dial indicator (A) on the transfer companion flange (B), and measure the transfer gear backlash.

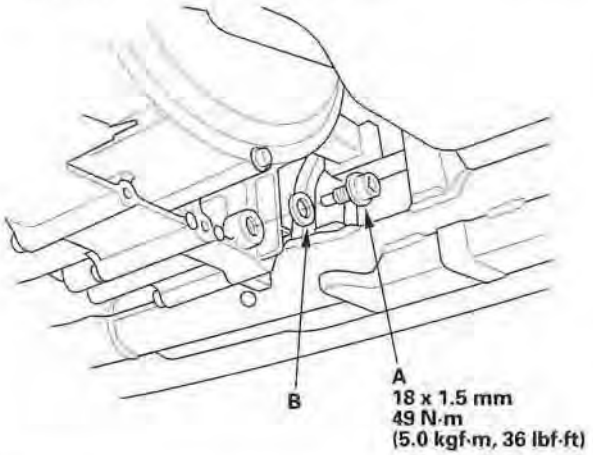
Standard: 0.06—0.16 mm (0.02—0.06 in.)



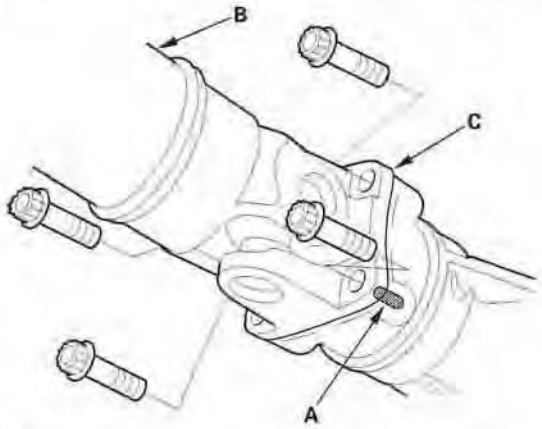
6. If the measurement is out of standard, remove the transfer assembly, and adjust the transfer gear backlash (see page 14-331).
7. Check for fluid leaks between the mating surfaces of the transfer assembly and transmission.
8. If there is a leak, remove the transfer assembly, and replace the O-ring. Also check for fluid leaks between the mating surfaces of the transfer housing and transfer cover. If there is a leak, remove the transfer cover, and replace the O-ring.
9. Check for leaks between the transfer companion flange and transfer oil seal.
10. If there is a leak, remove the transfer assembly from the transmission, and replace the transfer oil seal and O-ring on the transfer output shaft. If oil seal and O-ring replacement is required, you will need to check and adjust the transfer gear tooth contact, transfer gear backlash, the tapered roller bearing starting torque, and the total starting torque (see page 14-341). Do not replace the oil seal with the transfer assembly on the transmission.

Transfer Assembly Removal

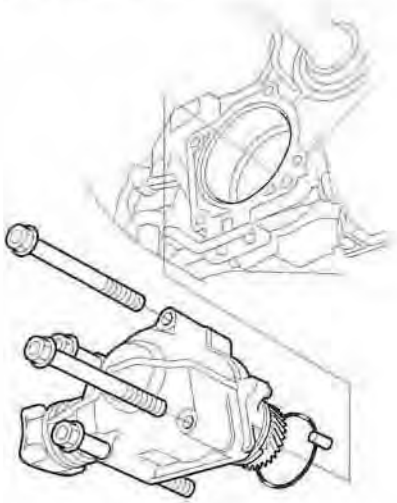
1. Raise the vehicle, and make sure it is supported securely.
2. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



3. Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C).



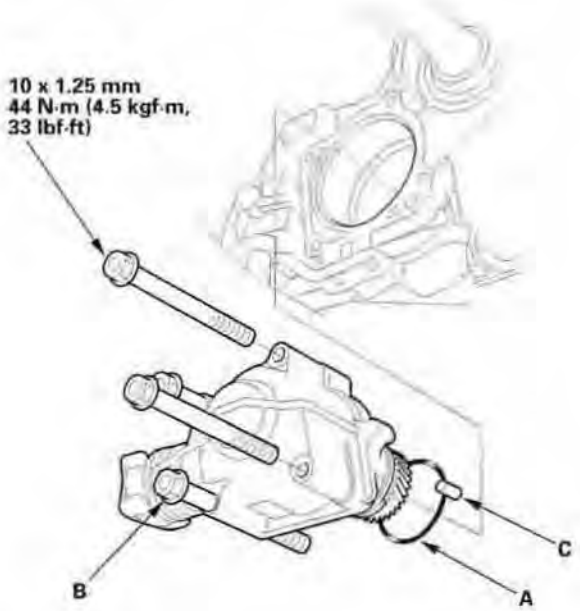
4. Separate the propeller shaft from the transfer assembly.
5. Remove the transfer assembly.



Transfer Assembly Installation

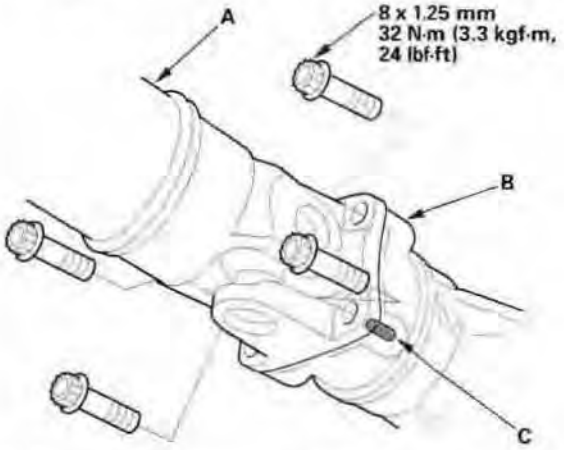
1. Clean the area where the transfer assembly contacts the transmission with solvent or carburetor cleaner, and dry with compressed air. Then apply transmission fluid to the contact areas. When installing the transfer assembly, be sure not to allow dust or other foreign particles to enter the transmission.

2. Install the new O-ring (A) on the transfer.



3. Insert the four bolts (B) in the transfer housing, then install the transfer assembly with the dowel pin (C).

4. Install the propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).



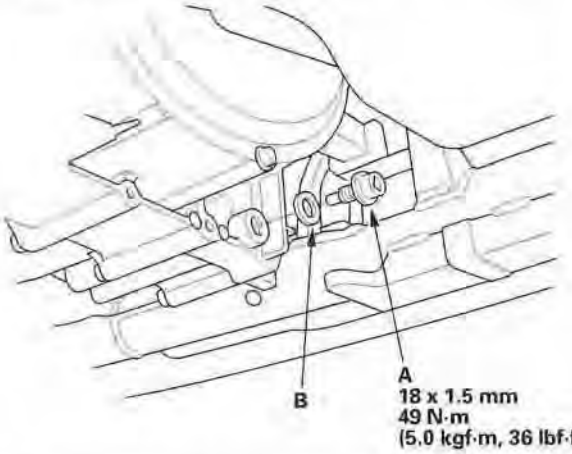
5. Refill the transmission fluid (see step 5 on page 14-185).

6. Start the engine, and run it to normal operating temperature (the radiator fan comes on). Turn the engine off, and check the fluid level (see page 14-184).

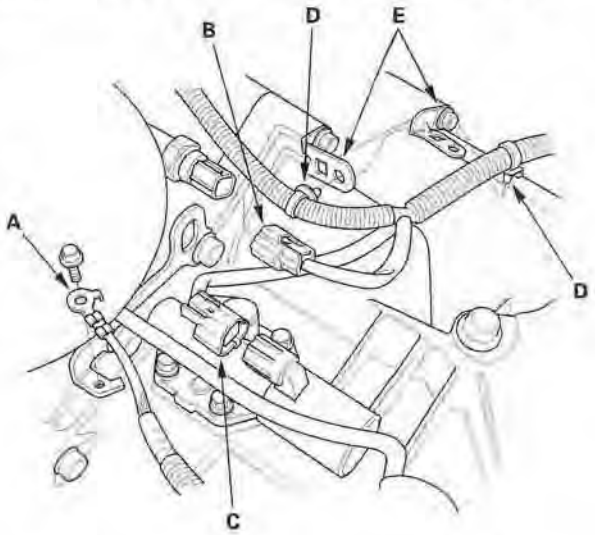
Transmission Removal

Special Tools Required
- Engine hanger adapter VSB02C000015
- Engine support hanger, A and Reds AAR-T-12566 (Available through the Honda Tool and Equipment Program 1-888-424-6857)
- Front subframe adapter EQS02C000011

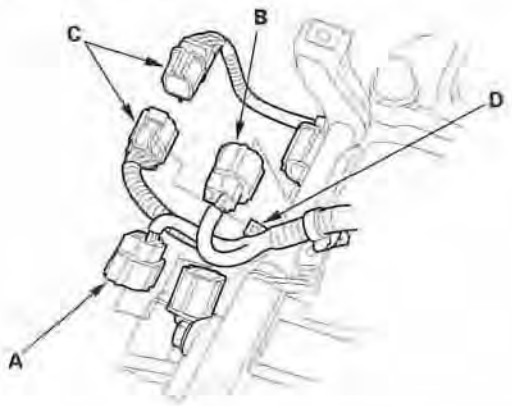
1. Before disconnecting the battery, make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset stations.
2. Raise the vehicle, and make sure it is securely supported.
3. Remove the splash shield.
4. Remove the drain plug (A), and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (B).



5. Disconnect the battery negative terminal, then disconnect the battery positive terminal.
6. Remove the air cleaner housing and the intake air duct.
7. Remove the battery hold-down bracket, then remove the battery and battery tray.
8. Remove the harness clamp from the battery base, then remove the battery base.
9. Remove the transmission ground terminal (A).



10. Disconnect the 2nd clutch transmission fluid pressure switch connector (B) and A/T clutch pressure control solenoid valve A connector (C), and remove the harness clamps (D) from the clamp brackets (E).
11. Disconnect the output shaft (countershaft) speed sensor connector (A) and input shaft (mainshaft) speed sensor (B).



12. Remove the transmission range switch connector (C) from its bracket (D), then disconnect it.

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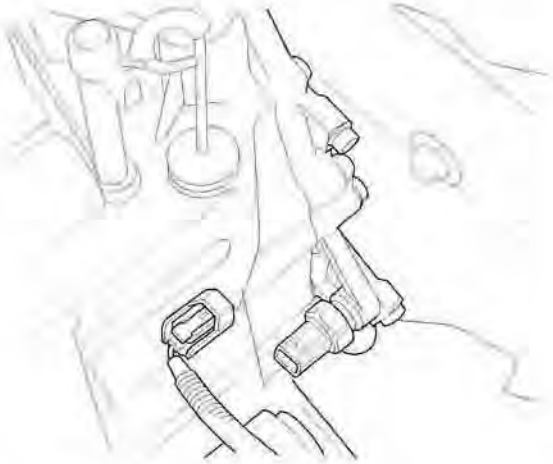
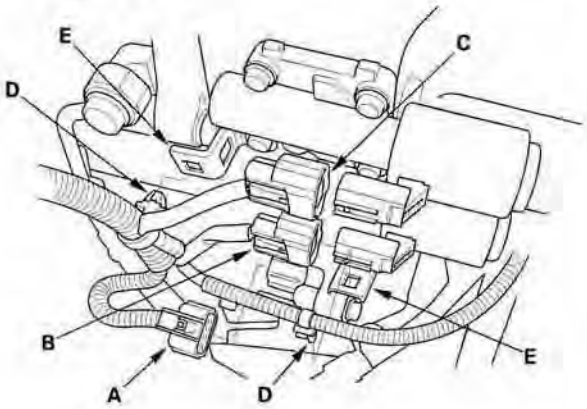
Transmission Removal (cont'd)

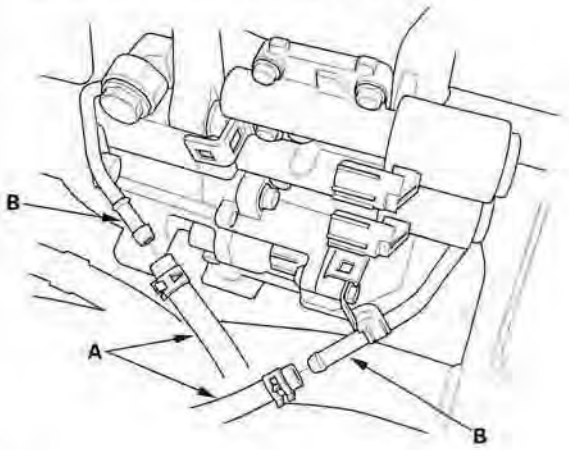
13. Disconnect the 3rd clutch transmission fluid pressure switch connector.



14. Disconnect the shift solenoid harness connector (A), A/T clutch pressure control solenoid valve B connector, and solenoid valve C connector, then remove the harness clamps (D) from the clamp brackets (E).

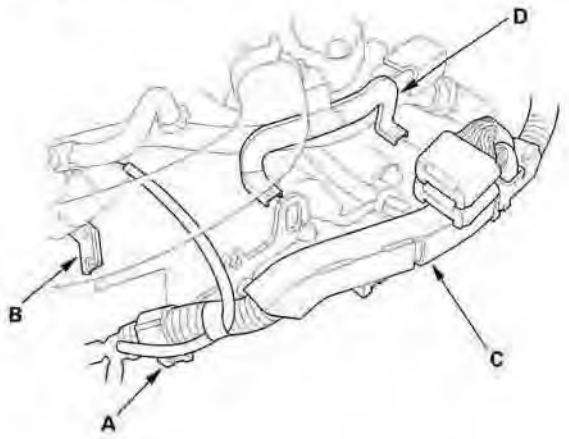


15. Remove the ATF cooler hoses (A) from the ATF cooler lines (B). Turn the ends of the ATF cooler hoses up to prevent ATF from flowing out, then plug the ATF cooler hoses and lines.

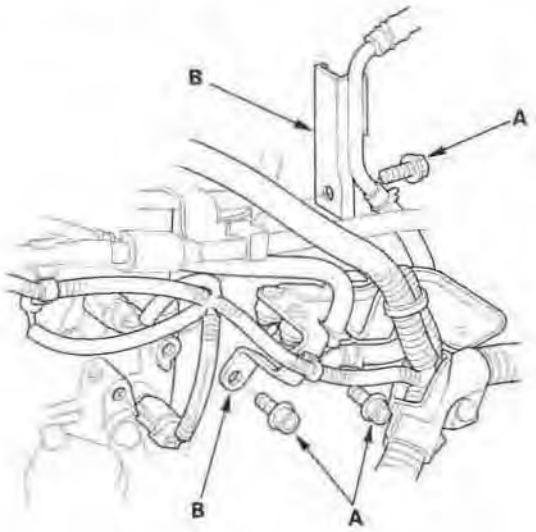


16. Check for any signs of leakage at the hose joints.

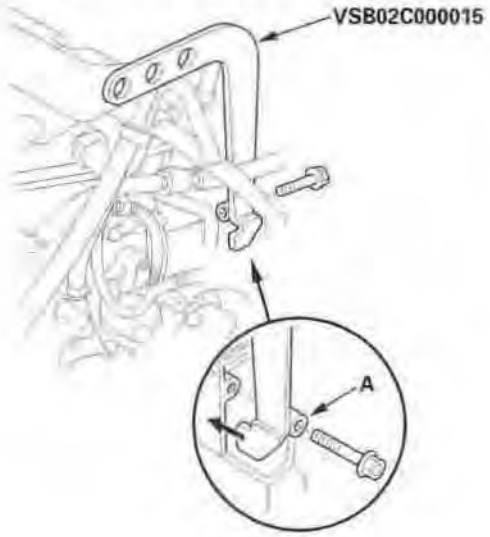
17. Remove the harness clamp (A) from the clamp bracket (B), and remove the harness cover (C) from its bracket (D).



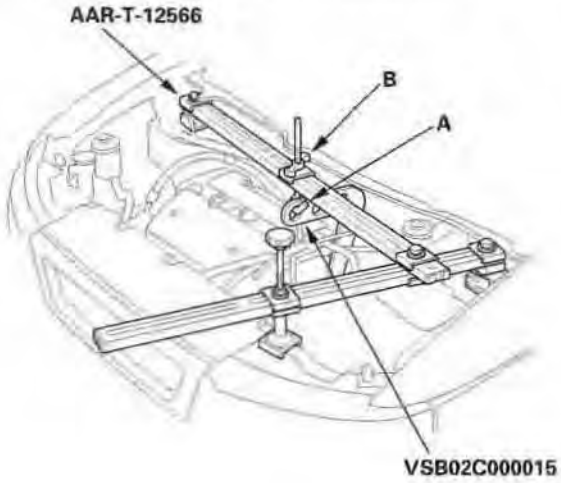
18. Remove the bolts (A) securing the water line and harness brackets (B).



19. Attach the special tool adapter (VSB02C000015) to the threaded hole (A) in the cylinder head.



20. Install the engine support hanger (AAR-T-12566) to the vehicle, and attach the hook (A) to the special tool adapter (VSB02C000015). Tighten the wing nut (B) by hand, and lift and support the engine.



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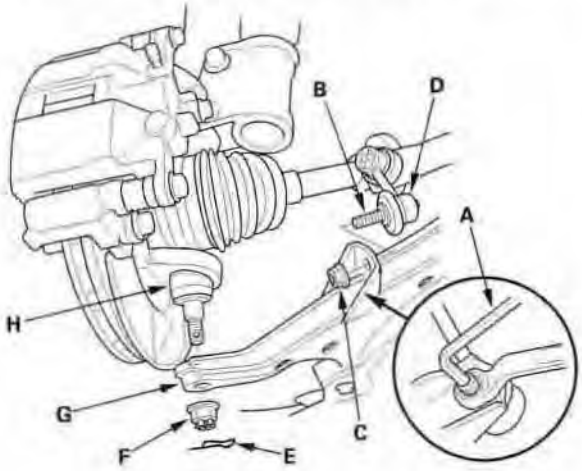
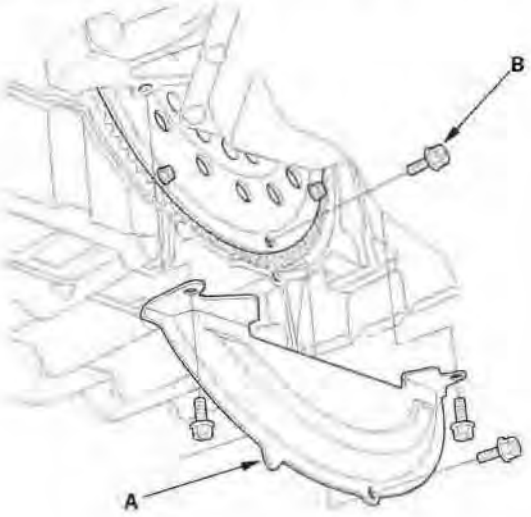
Transmission Removal (cont'd)

21. Insert a 5 mm hex wrench (A) in the top of the ball joint pin (B), and remove the nut (C), then separate the stabilizer link (D) from the lower arm.



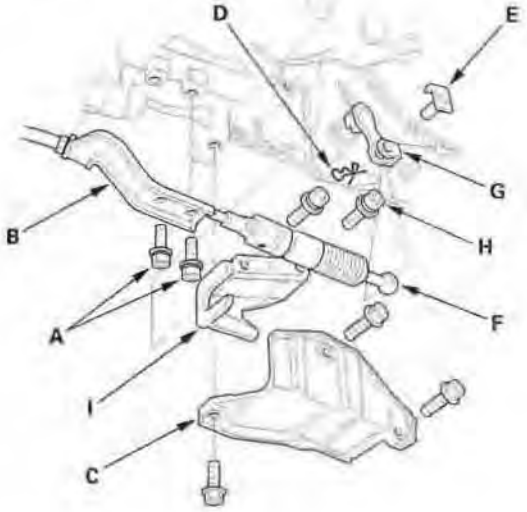
22. Remove the spring clips (E) and castle nuts (F). Install the ball joint thread protector (07AAF-SDAA100) on the ball joint threads, and separate the lower arms (G) from the knuckles (H) (see page 18-11).

23. Remove the torque converter cover (A), and remove the eight drive plate bolts (B) while rotating the crankshaft pulley.



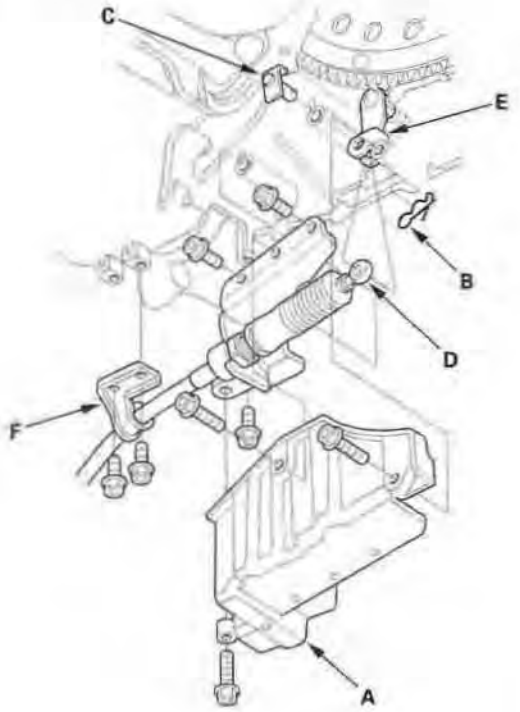
24. 4WD model: Remove the shift cable.

-1 Remove the bolts (A) securing the shift cable bracket (B), then remove the shift cable cover (C).
-2 Remove the spring clip (D) and control pin (E), then separate the shift cable (F) from the selector control lever (G). Do not bend the shift cable excessively.
-3 Remove the bolts (H) securing the shift cable bracket (I), then remove the shift cable bracket (I) from the shift cable.

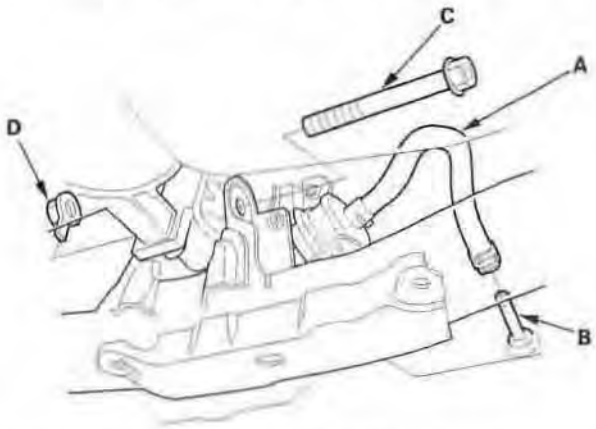


25. 2WD model: Remove the shift cable.

-1 Remove the shift cable cover (A).
-2 Remove the spring clip (B) and control pin (C), then separate the shift cable (D) from the selector control lever (E).
-3 Remove the bolts securing the shift cable bracket (F). Do not bend the shift cable excessively.

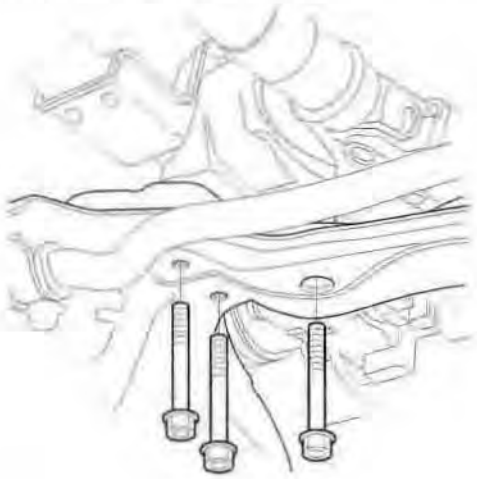


26. Disconnect the ATF cooler hose (A) from the ATF cooler line (B), then plug the end of the hose.



27. Remove the front mount bolt (C) and nut (D).

28. Remove the rear mount bolts.



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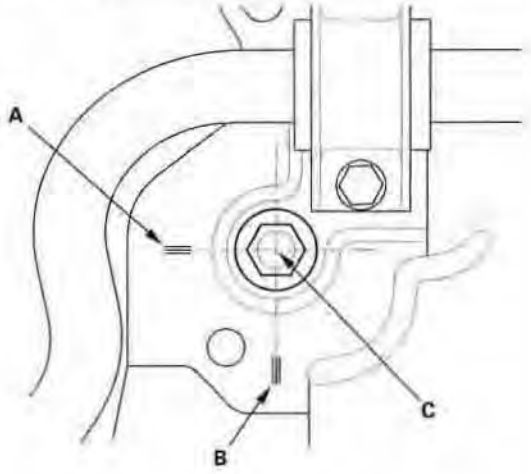
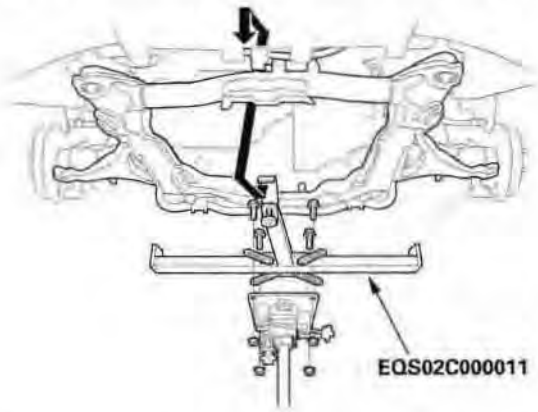
Transmission Removal (cont'd)

29. Make the appropriate reference lines at positions A and B that line up with the center of the subframe mounting bolts (C).

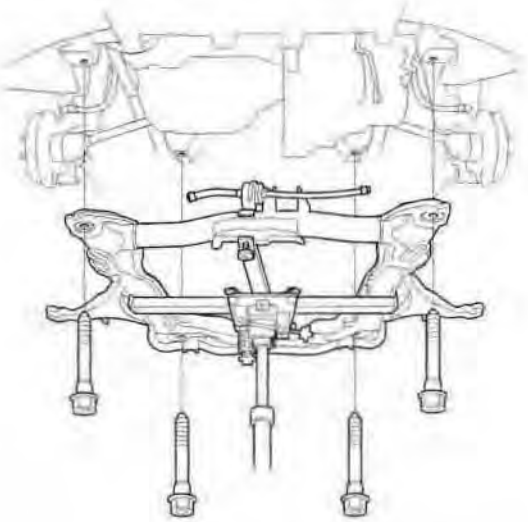


30. Attach the special tool to the subframe with hanging the hook of the special tool over the front of the subframe, then tighten the special tool screw.

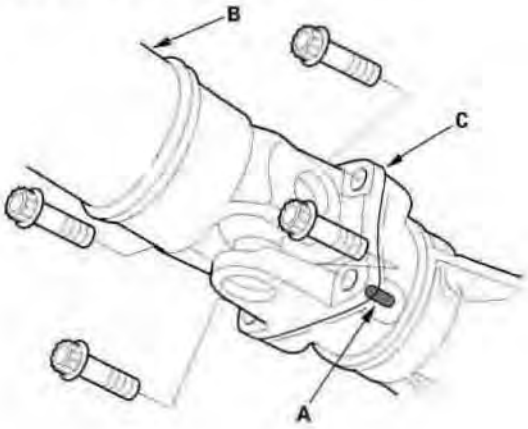


31. Raise the jack and line up the slots in the arms with the bolt holes on the corner of the jack base, then attach them with the bolts securely.

32. Remove the four subframe mounting bolts, then lower the subframe.

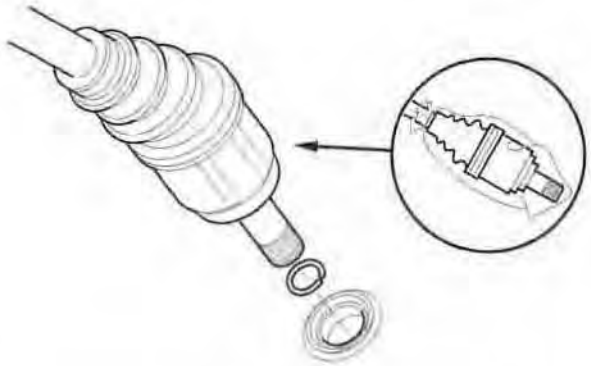


33. 4WD model: Make a reference mark (A) across the propeller shaft (B) and the transfer companion flange (C), then separate the propeller shaft from the transfer assembly.

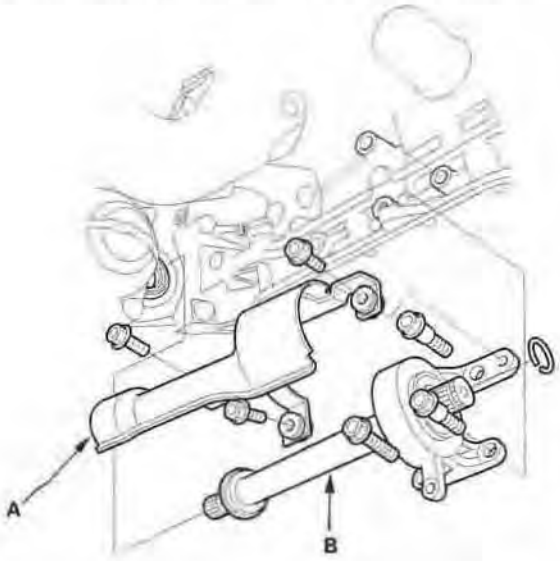


34. Pry the left driveshaft out of the differential (see step 9 on page 16-4).

35. Remove the driveshafts from the differential and intermediate shaft.



36. Remove the intermediate shaft cover (A).

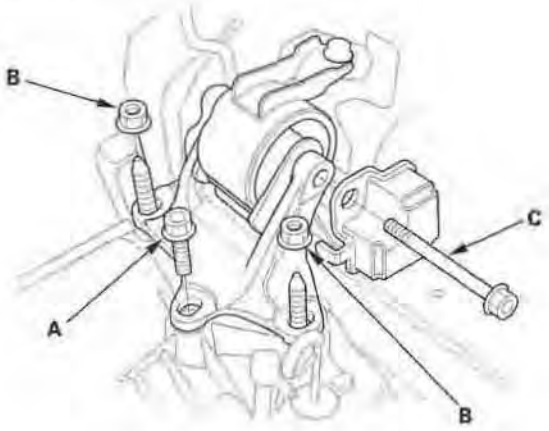


37. Remove the intermediate shaft (B). Coat all precision finished surfaces with clean engine oil, then tie plastic bags over the driveshaft and intermediate shaft ends.

38. Place a jack under the transmission.

39. Remove the transmission housing mounting bolts.

40. Remove the transmission mount bracket bolt (A) and nuts (B), then remove the transmission mount bolt (C).

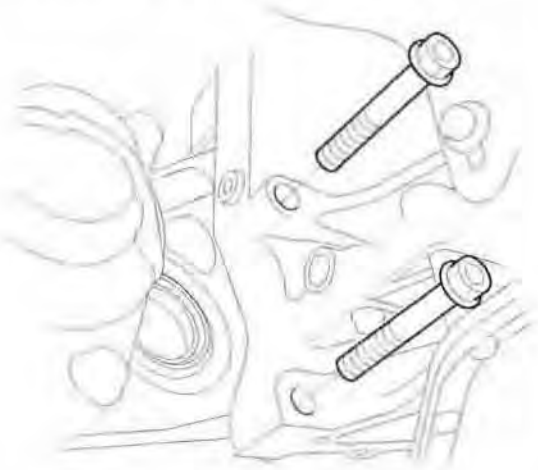


(cont'd)

Transmission Removal (cont'd)

41. Remove the transmission housing mounting bolts located on front lower of the transmission.

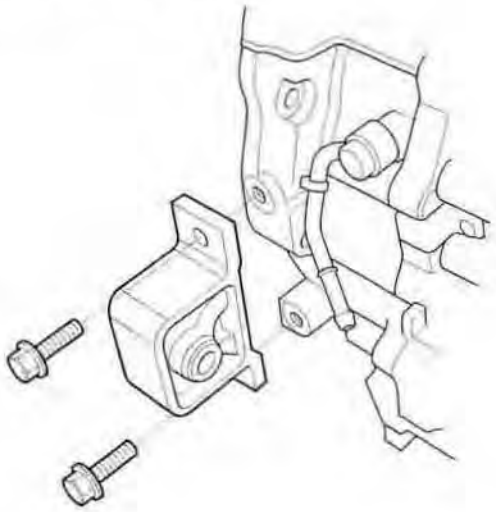
42. Remove the transmission housing mounting bolts located on the rear of the transmission.



43. Slide the transmission away from the engine to remove it from the vehicle.

44. Remove the torque converter assembly.

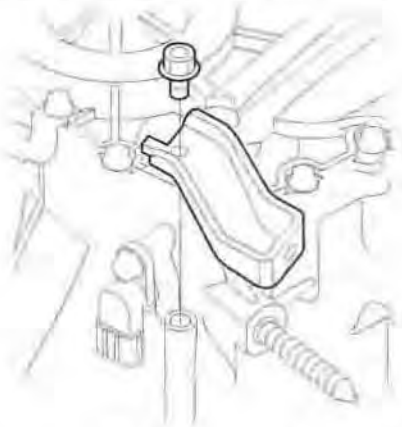
45. Remove the front mount.



46. Remove the rear mount/bracket.

NOTE: The illustration shows the 4WD model; 2WD model is similar.

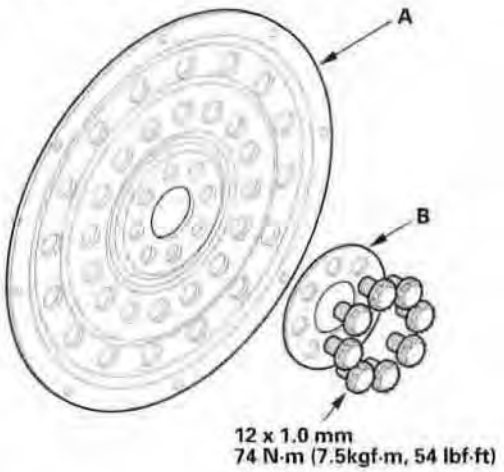
47. Remove the air cleaner housing mounting bracket.



48. Inspect the drive plate, and replace it if it's damaged.

Drive Plate Removal and Installation

1. Remove the drive plate (A) and washer (B) from the engine crankshaft.

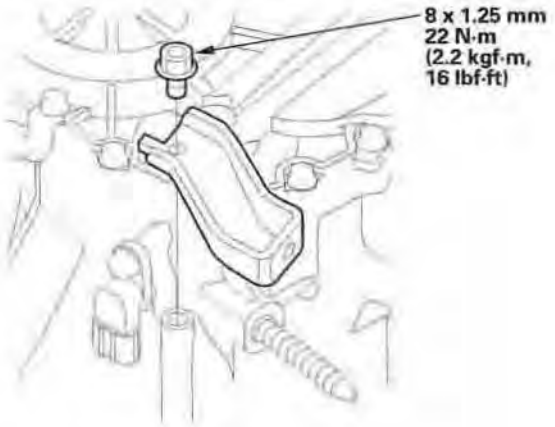


2. Install the drive plate and washer on the engine crankshaft, and tighten the eight bolts in a crisscross pattern in two or more steps.

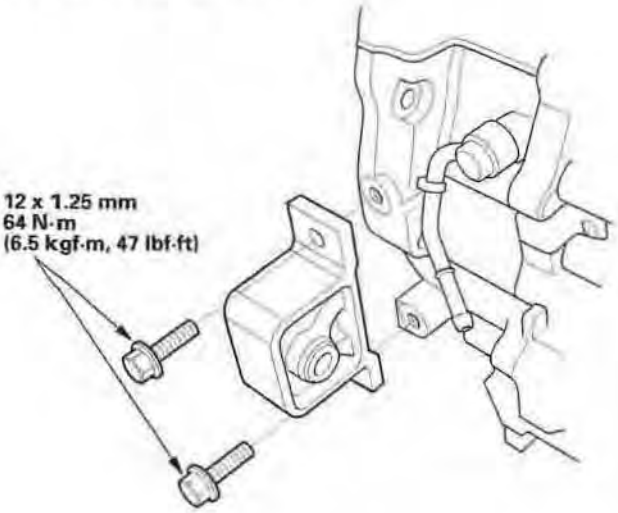
Transmission Installation

1. Clean the ATF cooler (see page 14-208).

2. Install the air cleaner housing mounting bracket.



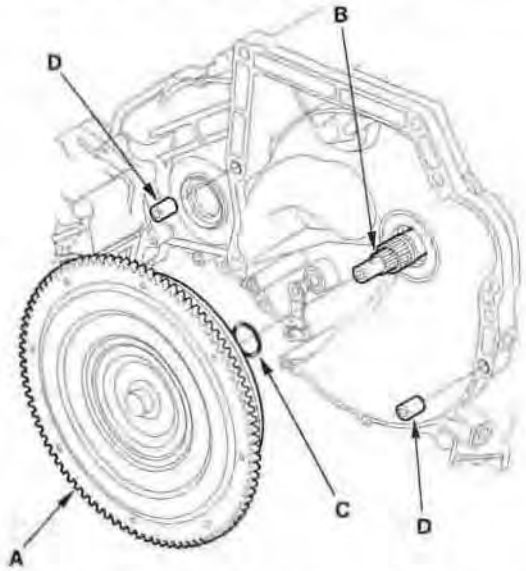
3. Install the front mount.



4. Install the rear mount/bracket.

NOTE: The illustration shows the 4WD model; 2WD model is similar.

5. Install the torque converter assembly (A) on the mainshaft (B) with the new O-ring (C).

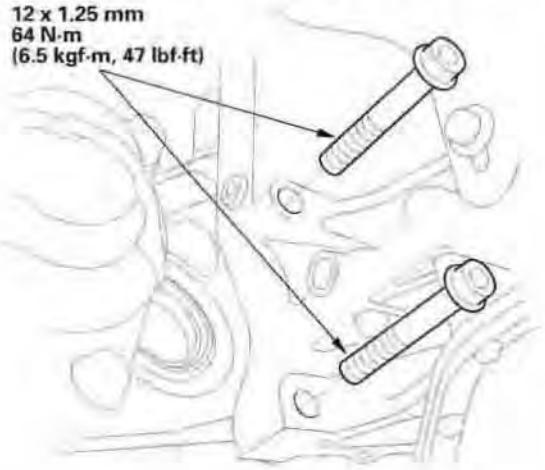


6. Install the 14 x 20 mm dowel pins (D) in the torque converter housing.

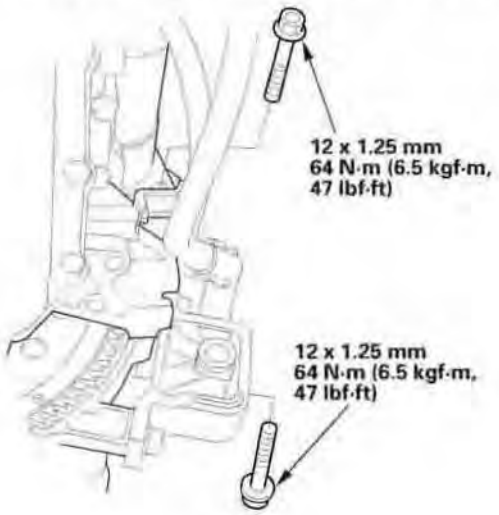
(cont'd)

Transmission Installation (cont'd)

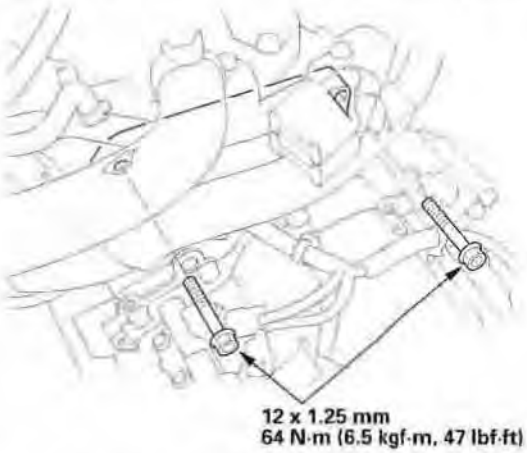
7. Place the transmission on a jack, and raise the transmission to the engine level.
8. Attach the transmission to the engine, then install the transmission housing mounting bolts.



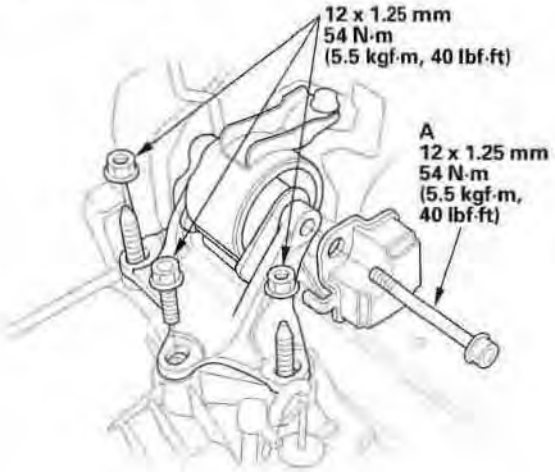
9. Install the transmission housing mounting bolts.



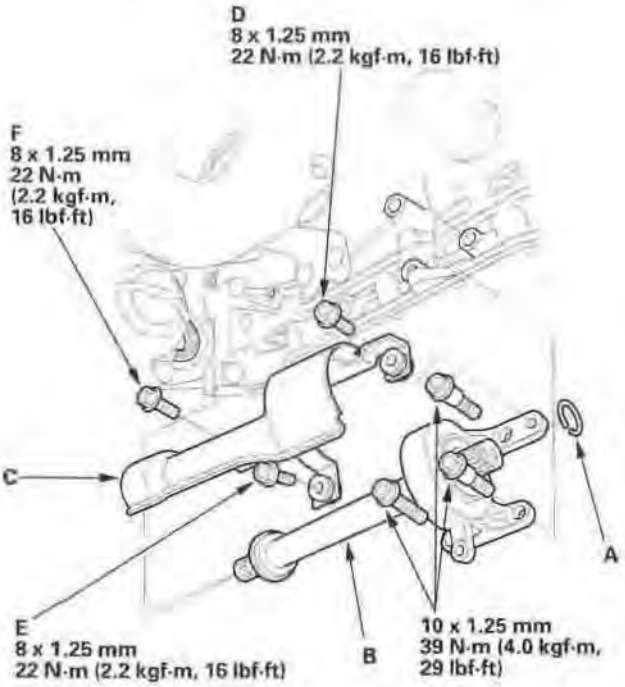
10. Install the transmission housing mounting bolts.



11. Install the transmission mount bracket. Tighten the mount bolt (A) loosely, and tighten the transmission mount bracket bolt and nuts to the specified torque, then tighten the mount bolt to the specified torque.



12. Install the new set ring (A) on the intermediate shaft (B).

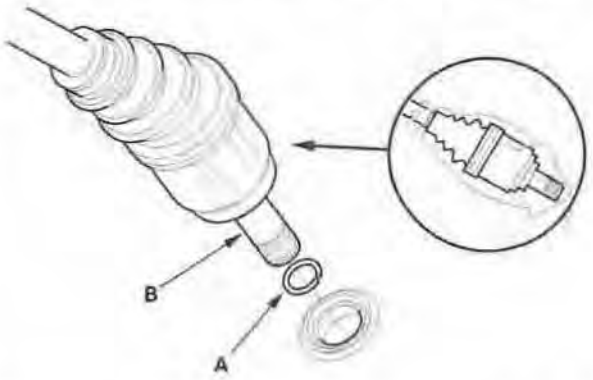


13. Clean the areas where the intermediate shaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air. Then install the intermediate shaft in the differential. While installing the intermediate shaft, be sure not to allow dust or other foreign particles to enter the transmission.

14. Install the intermediate shaft cover (C), but do not tighten the bolts.

15. Tighten the upper right bolt (D) on the cover first, then lower right bolt (E), and lastly the left bolt (F).

16. Install the new set ring (A) on the left driveshaft (B).



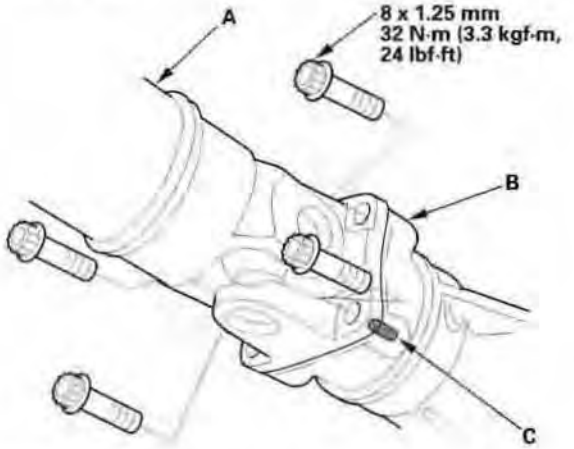
17. Install the right and left driveshaft (see page 16-16). While installing the left driveshaft in the differential, be sure not to allow dust or other foreign particles to enter the transmission.

NOTE:
- Clean the areas where the left driveshaft contacts the transmission (differential) with solvent or carburetor cleaner, and dry with compressed air.
- Turn the right and left steering knuckle fully outward, and slide the left driveshaft into the differential until you feel its set ring engage the side gear. Slide the right driveshaft over the intermediate shaft splines until you feel the driveshaft engage the intermediate shaft set ring.

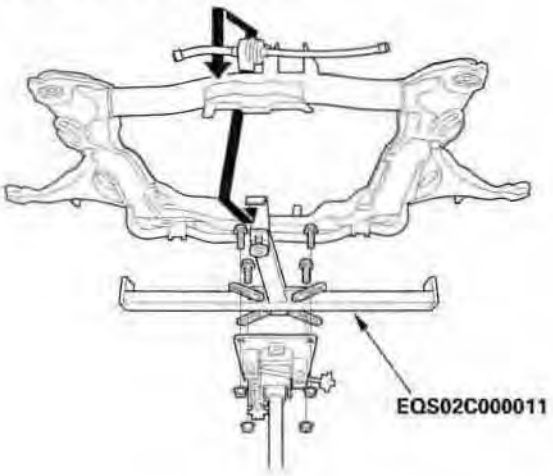
(cont'd)

Transmission Installation (cont'd)

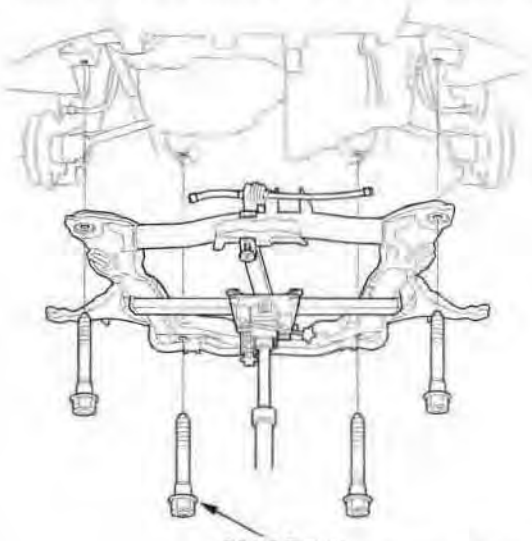
18. Install the propeller shaft (A) to the transfer companion flange (B) by aligning the reference mark (C).



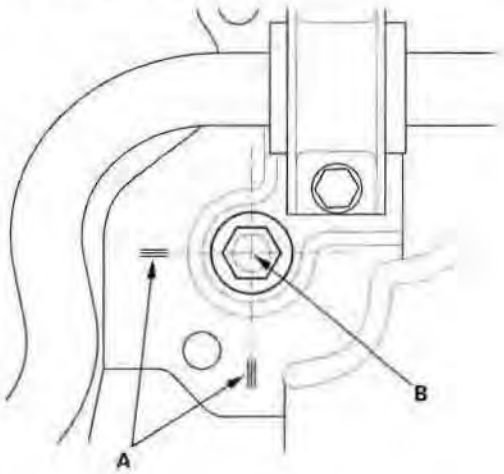
19. Support the subframe with the special tool and a jack, and lift it up to body.



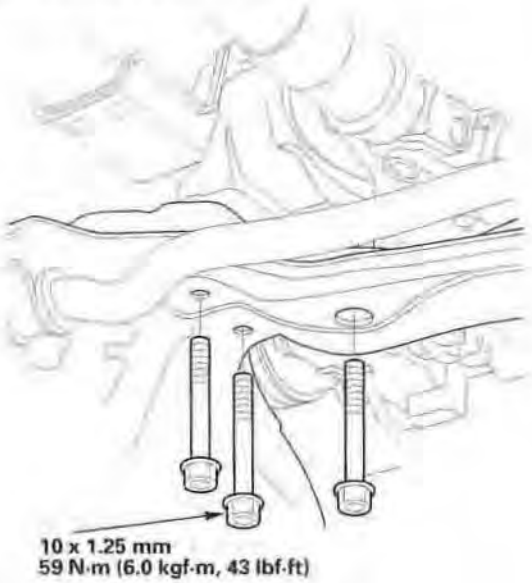
20. Loosely install the new subframe mounting bolts.



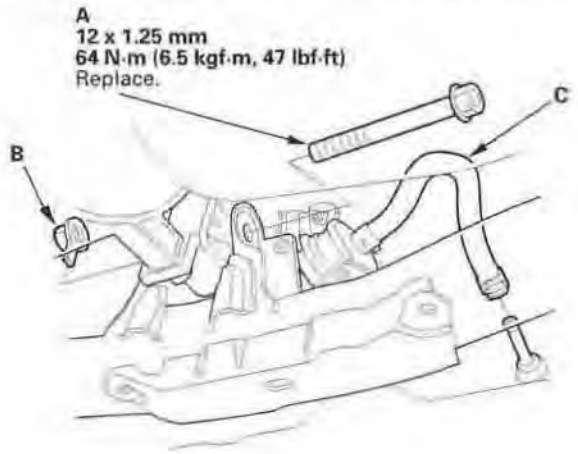
21. Align the reference marks (A) with the center of the subframe mounting bolts (B), then tighten the bolts to the specified torque.



22. Install the rear mount bolts.

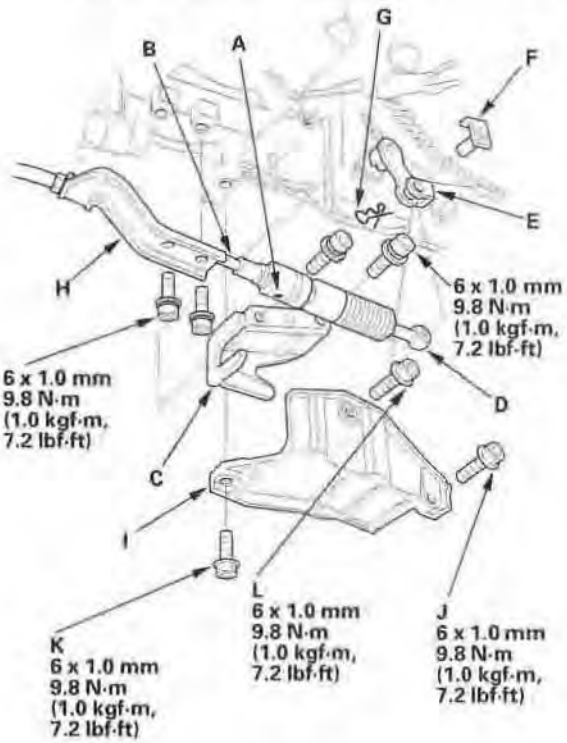


23. Install the front mount bolt (A) and nut (B), connect the ATF cooler hose (C) to the ATF cooler line, then secure the hose with the clip (see page 14-210).



24. 4WD model: Install the shift cable.

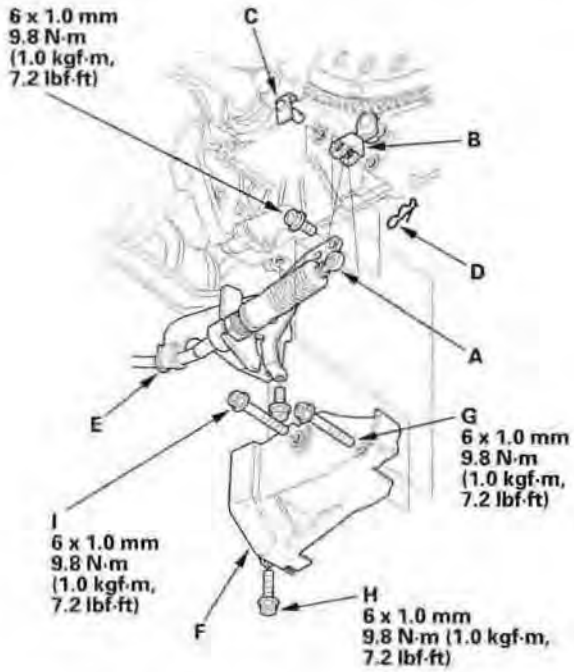
-1 Face the dot (A) on the shift cable (B) down, then install the shift cable bracket (C) on the shift cable.
-2 Attach the shift cable end (D) to the selector control lever (E), then insert the control pin (F) into the selector control lever hole through the shift cable end.
-3 Secure the control pin with the spring clip (G). Do not bend the shift cable excessively.
-4 Secure the shift cable bracket (H) with the bolts, and install the shift cable cover (I), but do not tighten the bolts.
-5 Tighten the front bolt (J) on the cover first, then the lower bolt (K), and lastly the middle bolt (L).



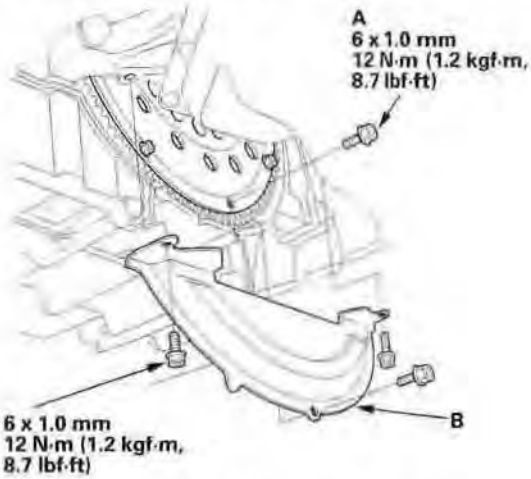
(cont'd)

Transmission Installation (cont'd)

25. 2WD model: Install the shift cable.
    -1 Attach the shift cable end (A) to the selector control lever (B), then insert the control pin (C) into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip (D). Do not bend the shift cable excessively.
    -2 Secure the shift cable bracket (E) with the bolt, and install the shift cable cover (F), but do not tighten the bolts.
    -3 Tighten the front bolt (G) on the cover first, then the lower bolt (H), and lastly the middle bolt (I).

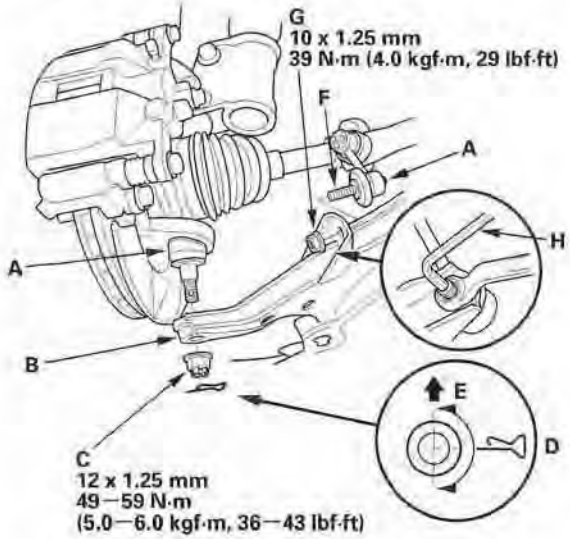


26. Attach the torque converter to the drive plate with eight bolts (A). Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then to the final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.



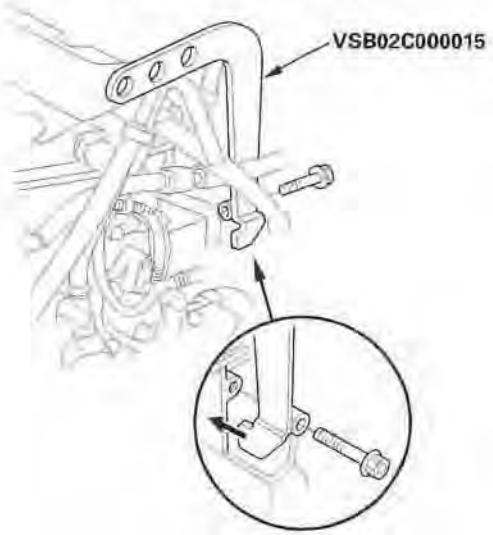
27. Install the torque converter cover (B).

28. Connect the ball joints (A) to the lower arms (B), and install the castle nuts (C) and spring clips (D). Keep the ball joint threads free of grease. Install the spring clips from the inside of the vehicle, with their hooked sides facing the front (E) of the vehicle in the direction shown.

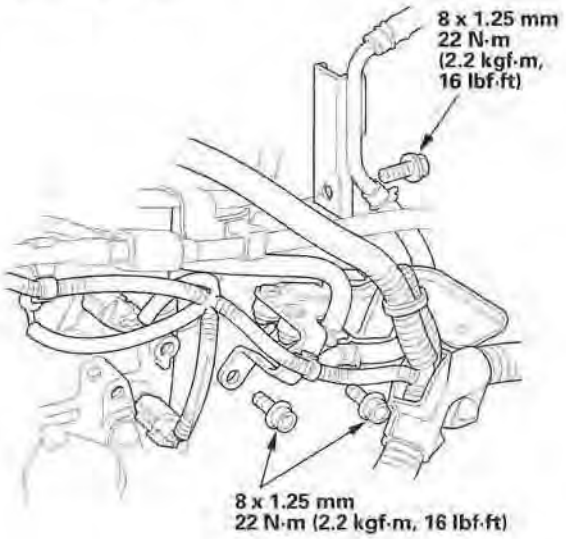


29. Connect the ball joints (F) to the lower arms, and install the nuts (G). Insert a 5 mm hex wrench (H) in the top of the ball joint pins, and tighten the nuts.

30. Remove the engine support hanger, and remove the special tool adapter from the engine.



31. Install the removed bolts and the water line and harness bracket.



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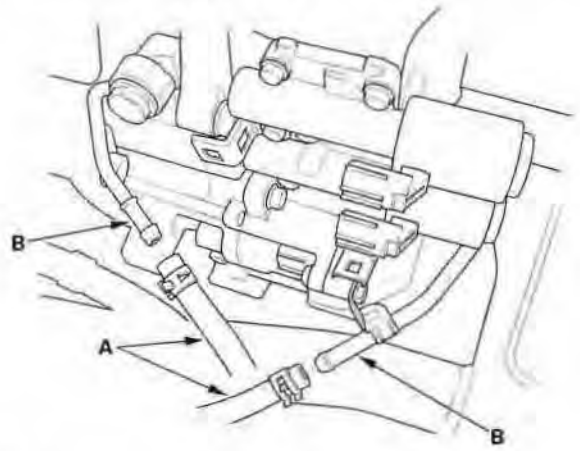
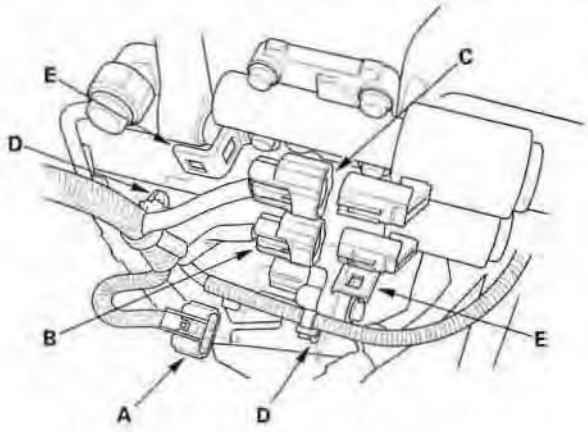
Transmission Installation (cont'd)

32. Connect the ATF cooler hoses (A) to the ATF cooler lines (B) (see page 14-210).

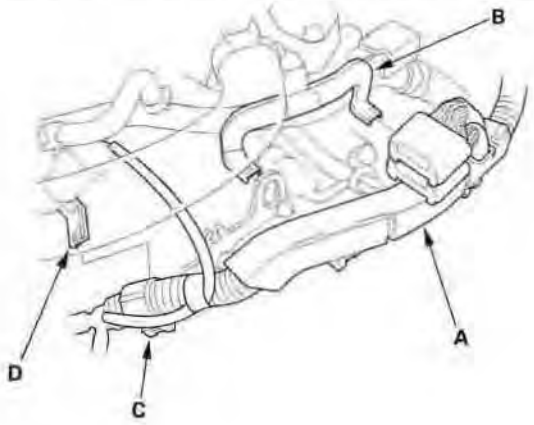


33. Connect the shift solenoid harness connector (A), A/T clutch pressure control solenoid valve B connector, and solenoid valve C connector. Install the harness clamps (D) on the clamp brackets (E).

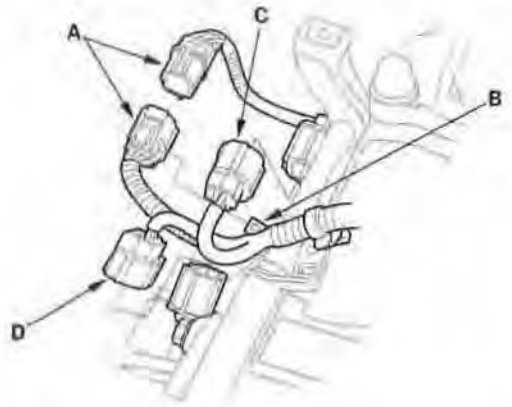


34. Connect the 3rd clutch transmission fluid pressure switch connector.

35. Install the harness cover (A) on its bracket (B), and install the harness clamp (C) on the bracket (D).

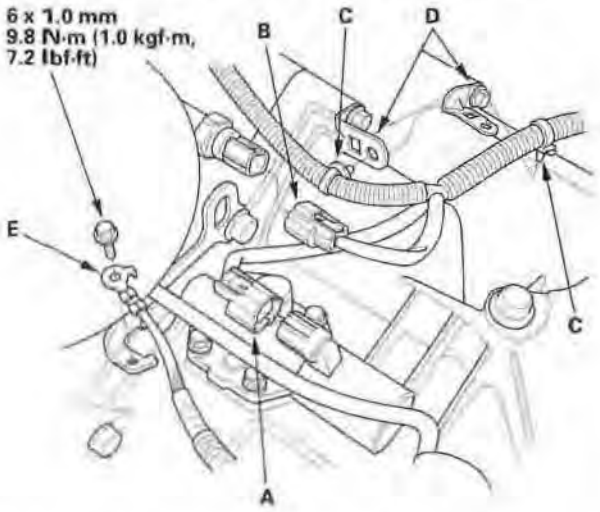


36. Connect the transmission range switch connector (A), and install it on its bracket (B).



37. Connect the connectors to the input shaft (mainshaft) speed sensor (C) and output shaft (countershaft) speed sensor (D).

38. Connect the A/T clutch pressure control solenoid valve A connector and 2nd clutch transmission fluid pressure switch connector (B), and install the harness clamps (C) on the clamp brackets (D).



39. Install the transmission ground terminal (E).

40. Install the battery base, then install the harness clamp on the clamp bracket on the base.

41. Refill the transmission with ATF (see step 5 on page 14-185).

42. Install the intake air duct and air cleaner housing.

43. Install the battery tray and battery, then secure the battery with its hold-down bracket.

44. Connect the battery terminals.

45. Set the parking brake. Start the engine, and shift the transmission through all gears three times.

46. Check the shift lever operation, A/T gear position indicator operation, and shift cable adjustment.

47. Check and adjust the front wheel alignment (see page 18-5).

48. Install the splash shield.

49. Start the engine in the P or N position, and warm it up to normal operating temperature (the radiator fan comes on).

50. Turn off the engine, and check the ATF level (see page 14-184).

51. Do the power window control unit reset procedure (see page 22-115).

52. Perform the road test (see page 14-167).

53. Loosen the bolts of the front mount, rear mount, and transmission mount after the road test.

54. Tighten the transmission mount bolt to 54 N·m (5.5 kgf·m, 40 lbf·ft), tighten the rear mount bolt to 64 N·m (6.5 kgf·m, 47 lbf·ft), and lastly tighten the front mount bolt to 64 N·m (6.5 kgf·m, 47 lbf·ft).

55. Enter the anti-theft code for the radio, then enter the radio station presets, and set the clock.

ATF Cooler Cleaning

Special Tools Required
- ATF Cooler Cleaner GHTTTCF6H
- Magnetic Nonbypass Spin-on Filter GTHGNBP2 (Available through the Honda Tool and Equipment Program 1-888-424-6857)

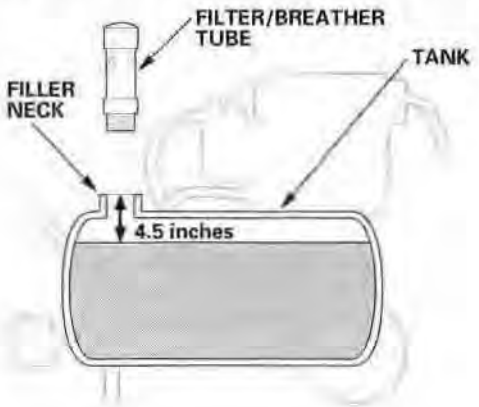
Before installing an overhauled or remanufactured automatic transmission, you must thoroughly clean the ATF cooler to prevent system contamination. Failure to do so could cause a repeat automatic transmission failure.

The cleaning procedure involves heated ATF-Z1 delivered under high pressure (100 psi). Check the security of all hoses and connections. Always wear safety glasses or a face shield, along with gloves and protective clothing. If you get ATF in your eyes or on your skin, rinse with water immediately.

⚠WARNING

- Improper use of the ATF cooler cleaner can result in burns and other serious injuries.
- Always wear eye protection and protective clothing, and follow this procedure.

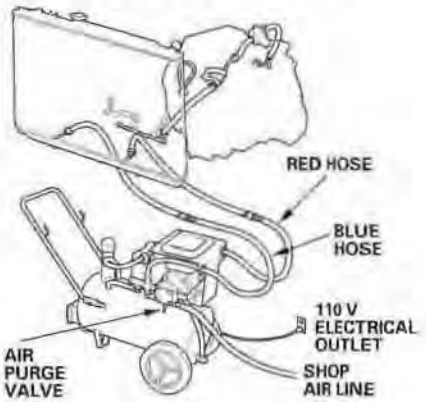
1. Check the fluid in the cooler cleaner tank. (The fluid level should be 4.5 inches from the top of the filler neck.) Adjust the level if needed; do not overfill. Use only Honda ATF-Z1; do not use any additives.



2. Plug the cooler cleaner into a 110 V grounded electrical outlet.

NOTICE

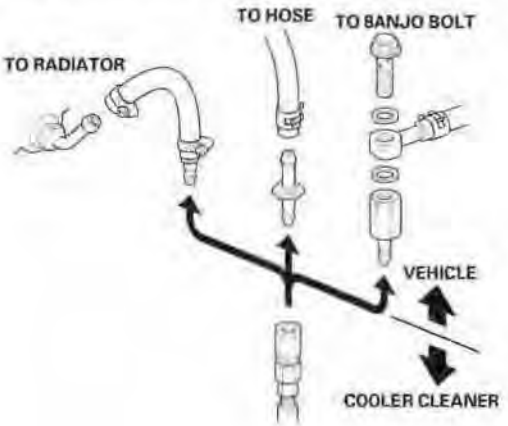
Make sure the outlet has no other appliances (light fixtures, drop lights, extension cords) plugged into it. Also, never plug the cooler cleaner into an extension cord or drop light; you would damage the unit.



3. Flip the HEAT toggle switch to ON; the green indicator above the toggle switch comes on. Wait 1 hour for the cooler cleaner to reach its operating temperature. (The cooler cleaner is ready to use when the temperature gauge reads 140 ° to 150 °F.)

   NOTE: If the red indicator above the HEAT toggle switch comes on, the fluid level in the tank is too low for the tank heater to work (see step 1 of this procedure).

4. Select the appropriate pair of fittings, and attach them to the radiator, to the hoses, or to the banjo bolts for flow through the ATF cooler cleaner.



5. Connect the red hose to the cooler outlet line (the line that normally goes to the external filter on the transmission).

6. Connect the blue hose to the cooler inlet line.

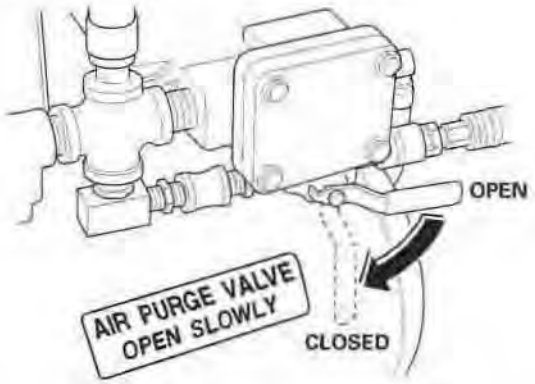
7. Connect a shop air hose (regulated to 100 to 125 psi) to the air purge valve.

   NOTICE

   The quick-connect fitting has a one-way check valve to keep ATF from entering your shop's air system. Do not remove or replace the fitting. Attach the coupler provided with the cooler cleaner to your shop air line if your coupler is not compatible.

8. Flip the MOTOR toggle switch to ON; the green indicator above the toggle switch comes on. Let the pump run for 5 minutes. While the pump is running, open and close the air purge valve periodically to cause agitation and improve the cleaning process. Always open the valve slowly. At the end of the 5-minutes cleaning period, leave the air purge valve open.

   NOTE: While the pump is running with the air purge valve open, it is normal to see vapor coming from the filler/breather tube vents.



9. With the air purge valve open, flip the MOTOR toggle switch to OFF; the green indicator goes off. Leave the air purge valve open for at least 15 seconds to purge the lines and hoses of residual ATF, then close the valve.

10. Disconnect the red and blue hoses from the ATF cooler. Now connect the red hose to the cooler inlet line.

11. Now connect the blue hose to the cooler outlet line.

12. Flip the MOTOR toggle switch to ON, and let the pump run for 5 minutes. While the pump is running, open and close the air purge valve periodically. Always open the valve slowly. At the end of the 5-minutes cleaning period, leave the air purge valve open.

    NOTE: While the pump is running with the air purge valve open, it is normal to see vapor coming from the filler/breather tube vents.

13. With the air purge valve open, flip the MOTOR toggle switch to OFF. Leave the air purge valve open for at least 15 seconds to purge the lines and hoses of residual ATF, then close the valve.

14. Disconnect the red and blue hoses from the ATF cooler lines.

15. Connect the red and blue hoses to each other.

16. Disconnect the shop air from the air purge valve. Disconnect and stow the coupler if used.

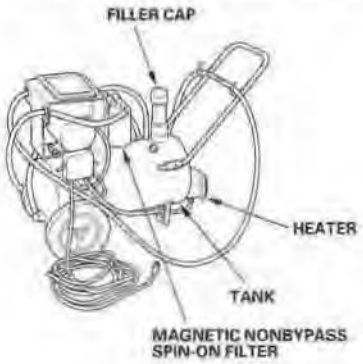
17. Disconnect and stow the fittings from the ATF cooler inlet and outlet lines.

18. Unplug the cooler cleaner from the 110 V outlet.

Tool Maintenance

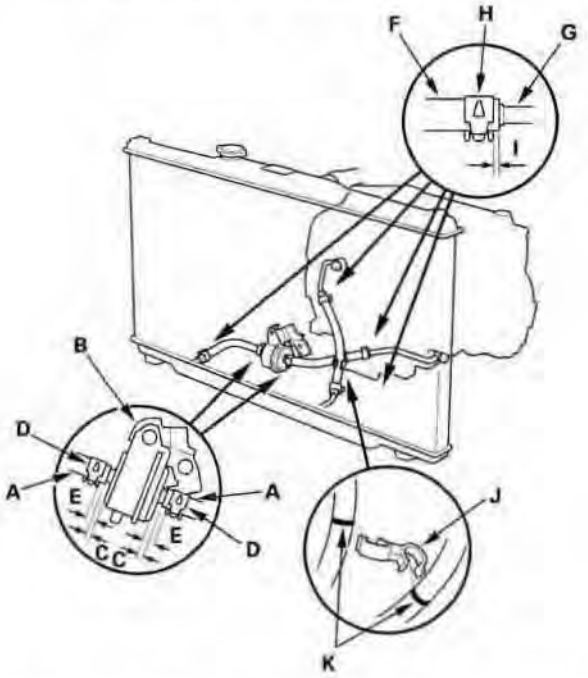
Follow these instructions to keep the ATF cooler cleaner working properly:

- Replace the two magnetic nonbypass spin-on filters once a year or when you notice a restriction in the ATF flow.
- Check the level and condition of the fluid in the tank before each use.
- Replace the ATF in the tank when it looks dark or dirty.



ATF Cooler Hose Replacement

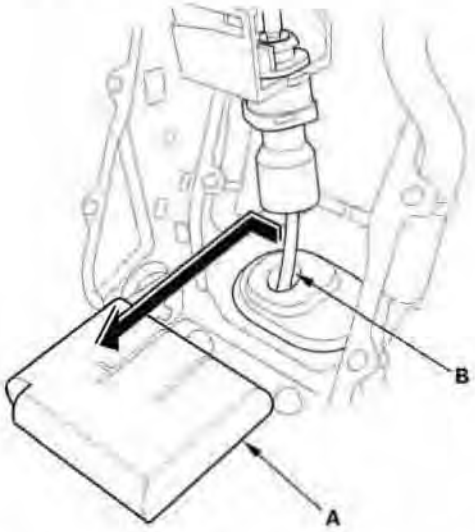
1. Slide the ATF cooler hoses (A) on the ATF filter (B) until they are 5—6 mm (0.20—0.24 in.) (C) away from the filter housing.
2. Secure the hoses with the clips (D) at 10—12 mm (0.4—0.5 in.) (E) from the filter housing.



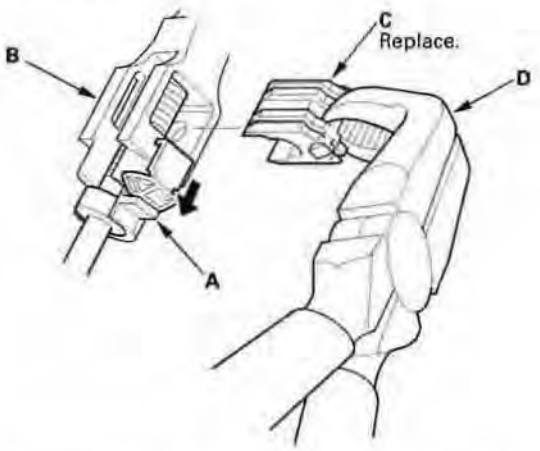
3. Slide the ATF cooler hoses (F) over the ATF cooler lines (G), then secure the hoses with the clips (H) at 2—4 mm (0.1—0.2 in.) (I) from the hose ends.
4. Install the hose clamp (J) at the marks (K) on the ATF cooler hoses.

Shift Lever Removal

1. Remove the center lower cover (see page 20-76).
2. Remove the shift lever console trim (see page 20-76).
3. Shift the shift lever into the R position.
4. Remove the shift cable insulator (A) from the shift cable (B).

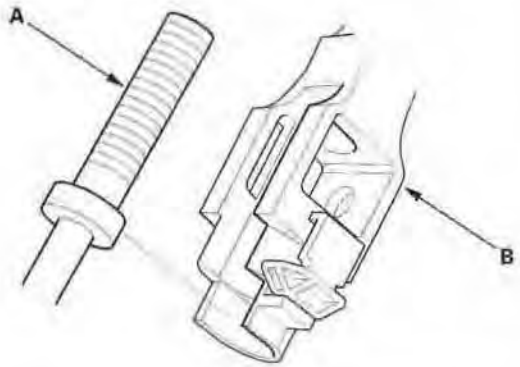


5. Slide the lock tab (A) down on the shift cable end holder (B).

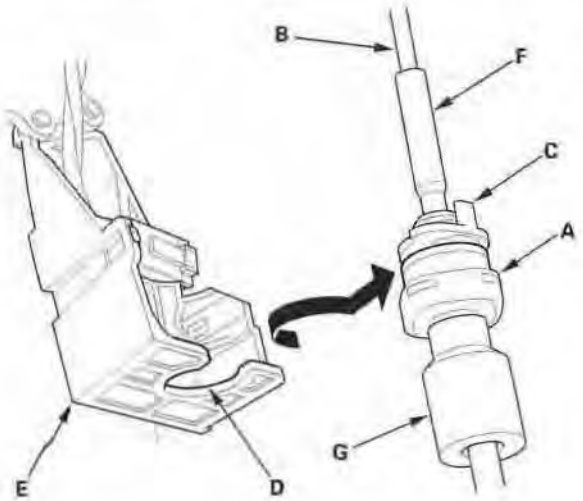


6. Grasp the shift cable lock (C) in the middle with angle-jaw needle-nose pliers (D), and remove it from the shift cable end and shift cable end holder. Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.

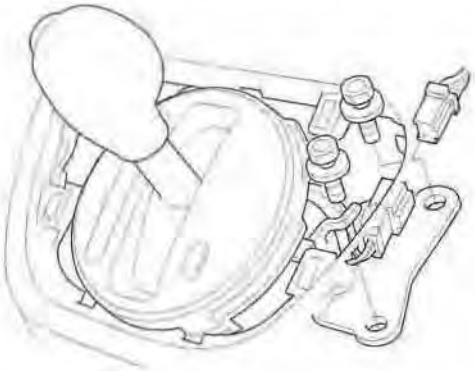
7. Separate the shift cable end (A) from the shift cable, end holder (B).



8. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the shift cable bracket (E). Then slide the holder to remove the shift cable from the shift cable bracket. Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).

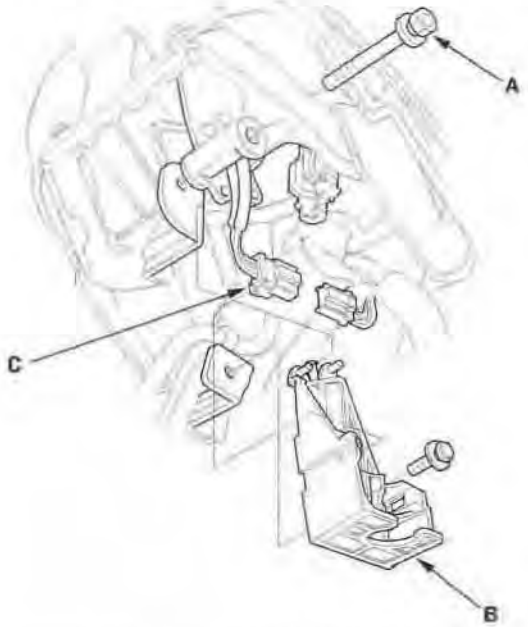


9. Remove the shift lever mounting bolts.



10. Disconnect the park pin switch connector.

11. Remove the shift lever mounting bolt (A), and remove the shift cable bracket (B).



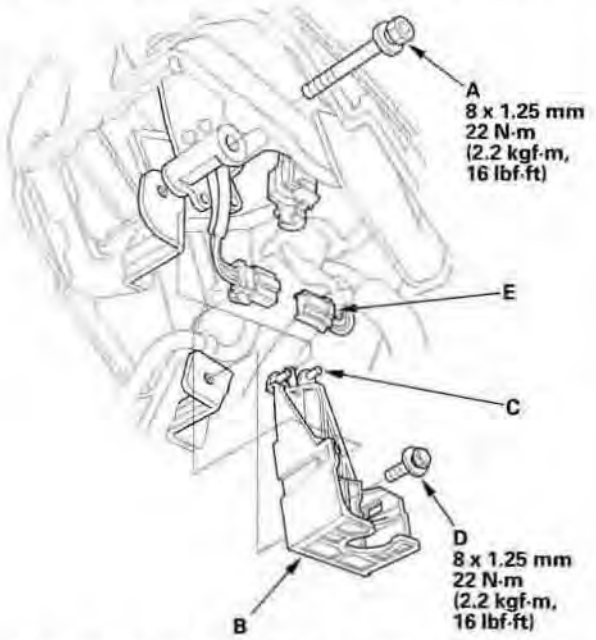
12. Remove the O/D switch/shift lock solenoid connector (C), then disconnect the connector.

13. Cover around the opening of the console with tape to prevent damage to the console.

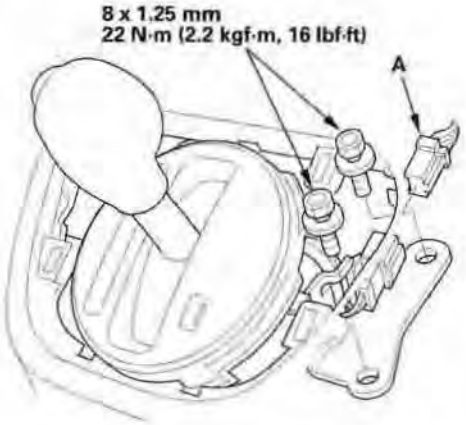
14. Remove the shift lever assembly.

Shift Lever Installation

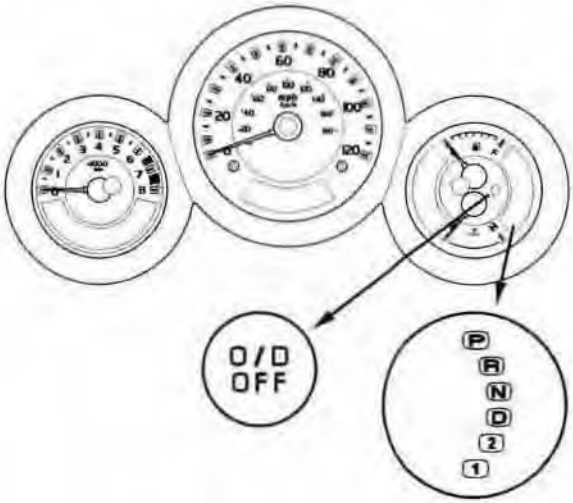
1. Cover around the opening of the console with tape to prevent damage to the console.
2. Position the shift lever in the console.
3. Install the shift lever mounting bolt (A) loosely.



4. Install the shift cable bracket (B) with aligning the projections (C) to the holes of the shift lever bracket, and install the mounting bolt (D).
5. Connect the O/D switch/shift lock solenoid connector (E), and install it on the shift cable bracket.
6. Secure the shift lever assembly with the mounting bolts.

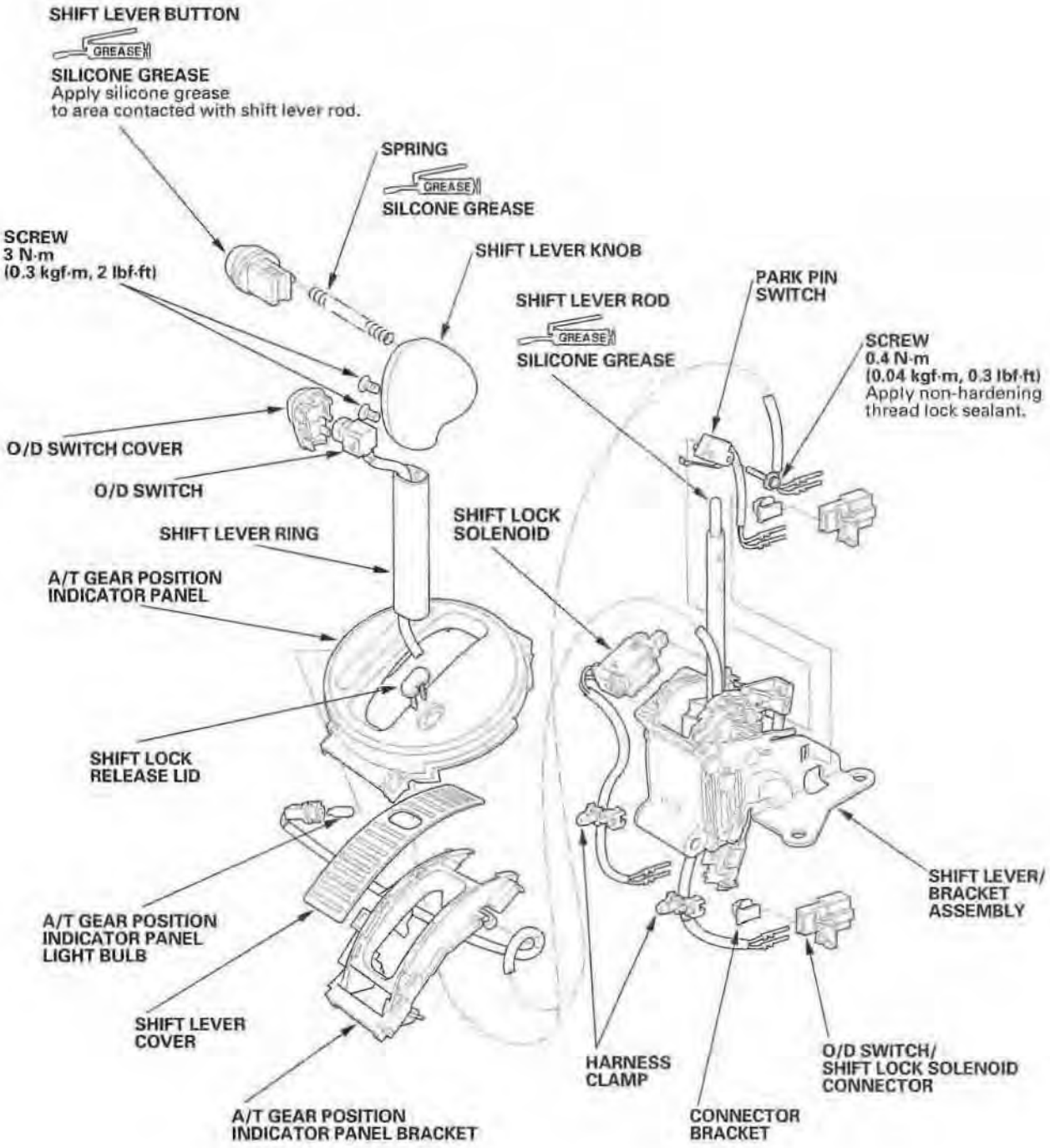


7. Connect the park pin switch connector (A).
8. Tighten the shift lever mounting bolt that was loosely installed in step 3.
9. Turn the ignition switch ON (II), and verify that the R position indicator comes on.



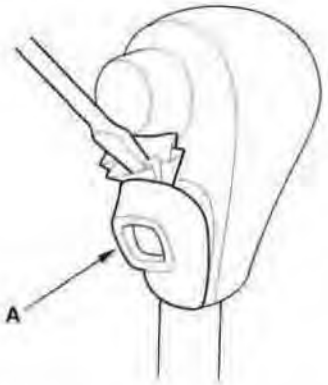
10. Turn the ignition switch OFF.
11. Install the shift cable to the shift lever, refer to shift cable adjustment (see page 14-223).

Shift Lever Disassembly/Reassembly

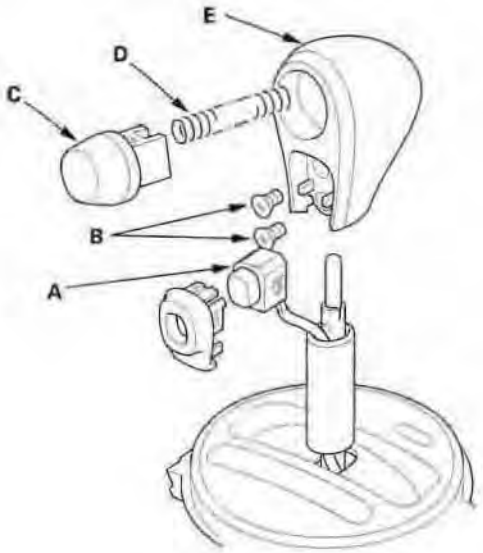


Shift Lever Bracket Assembly Replacement

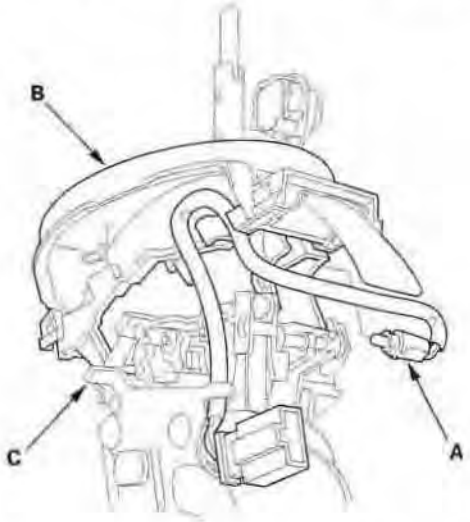
1. Remove the shift lever assembly (see page 14-210).
2. Pry the O/D switch cover (A), and remove it.



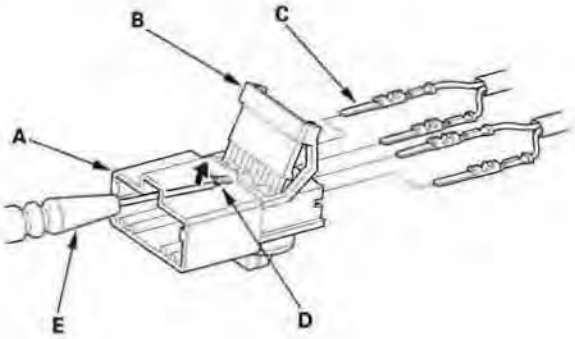
3. Remove the O/D switch (A) by expanding its locks, and remove the screws (B), shift lever button (C), spring (D), and shift lever knob (E).



4. Remove the A/T gear position indicator panel light socket (A), then separate the A/T gear position indicator panel (B) from the shift lever bracket (C).



5. Pry the lock tabs on the back of the O/D switch/shift lock solenoid connector (A), and remove the back cover (B).



6. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all four terminals.

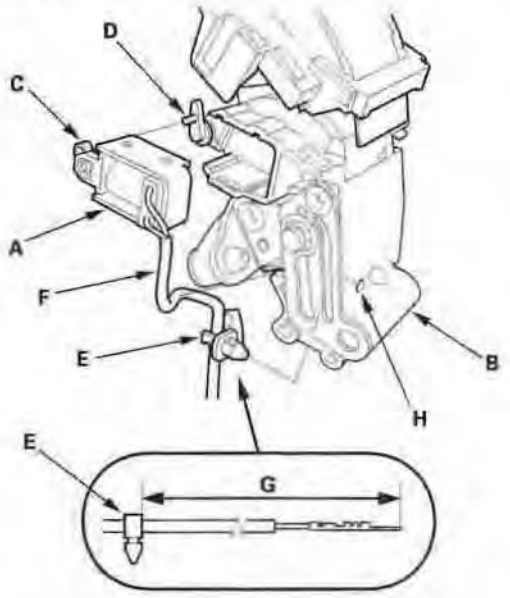
7. Remove the O/D switch harness clamp from the shift lever bracket and from the harness, and pull the O/D switch harness out to remove the shift lever assembly.

8. Remove the shift lock solenoid harness clamp from the shift lever bracket, and remove the shift lock solenoid.

9. Remove the park pin switch from the shift lever bracket.

10. Replace the shift lever/bracket assembly.

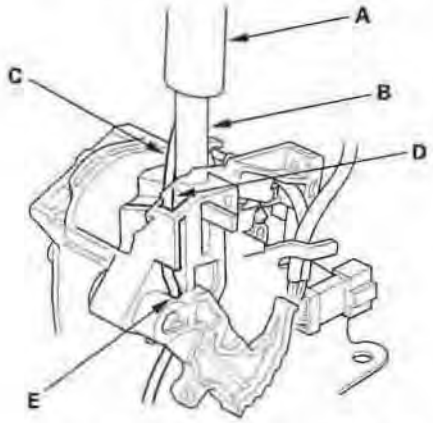
11. Install the shift lock solenoid (A) on the shift lever/bracket assembly (B) with aligning the shift lock solenoid plunger (C) with the tip of the shift lock stop (D).



12. Install the harness clamp (E) on the shift lock solenoid harness (F) at 128—138 mm (5.0—5.4 in.) (G) from the harness terminal end.

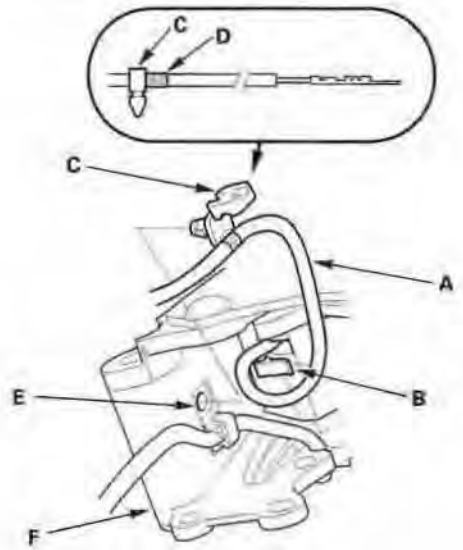
13. Install the clamp in the hole (H) of the shift lever bracket.

14. Install the shift lever ring (A) to the shift lever (B).



15. Insert the O/D switch harness (C) into the shift lever ring, and route the harness through the groove (D) of the shift lever into the hole (E). Do not pinch the harness.

16. Wind the O/D switch harness (A) one turn around the clamp (B) on the bottom of the shift lever.

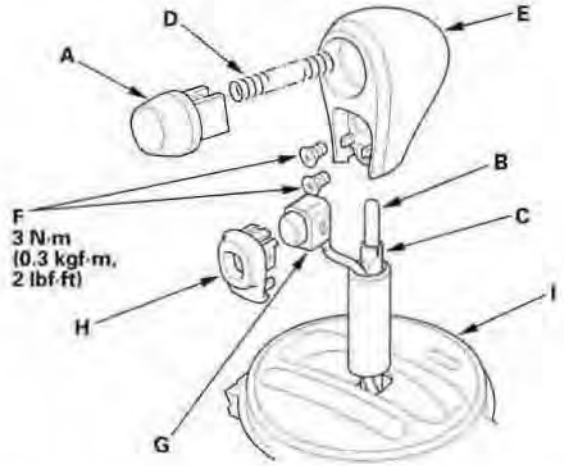


17. Install the harness clamp (C) at the reference tape (D) on the harness, then install the clamp in the hole (E) of the shift lever bracket (F).

(cont'd)

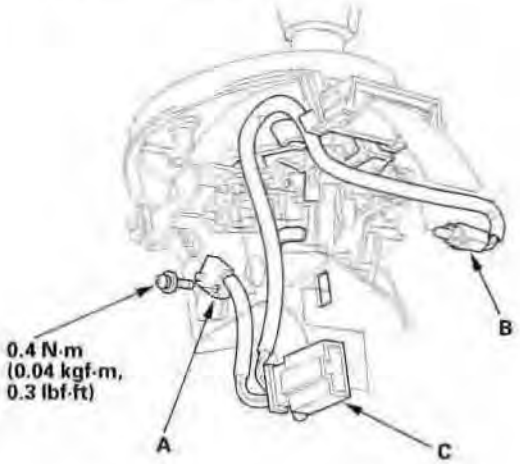
Shift Lever Bracket Assembly Replacement (cont'd)

18. Apply silicone grease to the shift lever button (A) and push rod (B) of the shift lever (C), and install the spring (D), shift lever button, and shift lever knob (E). Install the screws (F) to secure the shift lever knob to the shift lever.



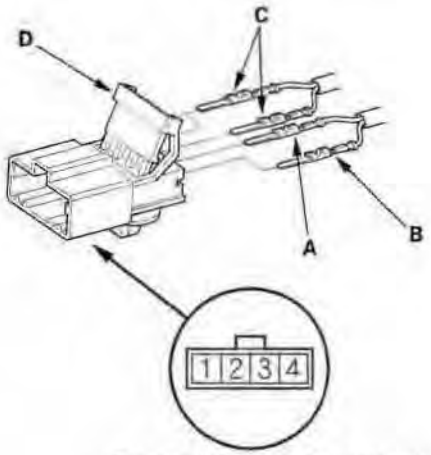
19. Install the O/D switch (G) and the O/D switch cover (H), and install the A/T gear position indicator panel (I) on the shift lever bracket.

20. Install the park pin switch (A). Apply non-hardening thread lock sealant to screw threads, and secure the switch with the screw.



21. Install the A/T gear position indicator panel light socket (B), and install the connector (C).

22. Install BLU/RED harness terminal (A) of the shift lock solenoid in the No. 3 cavity, and BLK harness terminal (B) in the No. 4 cavity.



Terminal side of male terminals

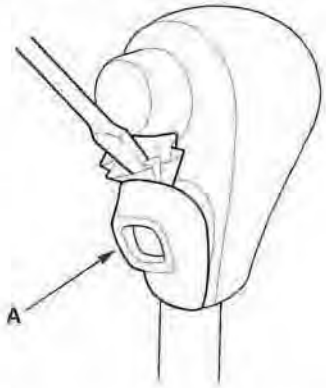
23. Install the O/D switch harness terminals (C) in the No. 3 and No. 4 cavities. Either O/D switch harness terminal can be installed in No. 3 and No. 4 cavities.

24. Make sure that the all four terminals lock securely, then install the back cover (D) securely in place.

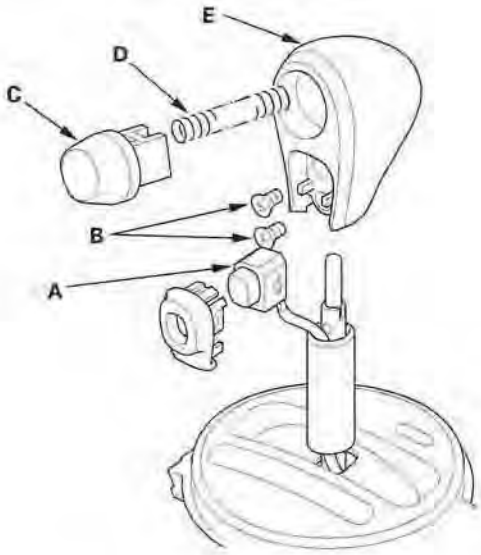
25. Install the shift lever assembly (see page 14-212).

Shift Lever Ring Replacement

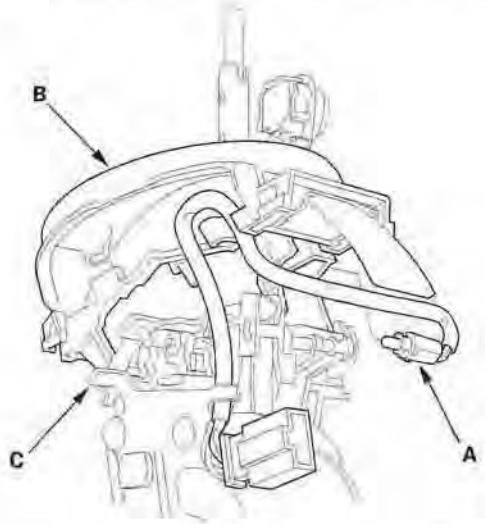
1. Remove the shift lever assembly (see page 14-210).
2. Pry the O/D switch cover (A), and remove it.



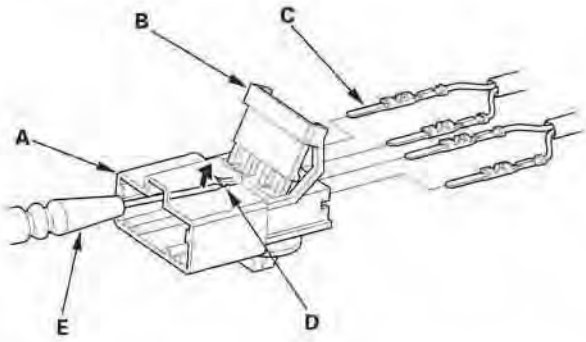
3. Remove the O/D switch (A) by expanding its locks, and remove the screws (B), shift lever button (C), spring (D), and shift lever knob (E).



4. Remove the A/T gear position indicator panel light socket (A), then separate the A/T gear position indicator panel (B) from the shift lever bracket (C).



5. Pry the lock tabs on the back of the O/D switch/shift lock solenoid connector (A), and remove the back cover (B).

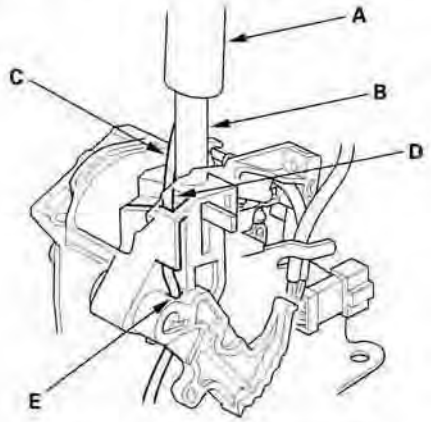


6. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all four terminals.
7. Remove the O/D switch harness clamp from the shift lever bracket and from the harness, and pull the O/D switch harness out to remove the shift lever assembly.

(cont'd)

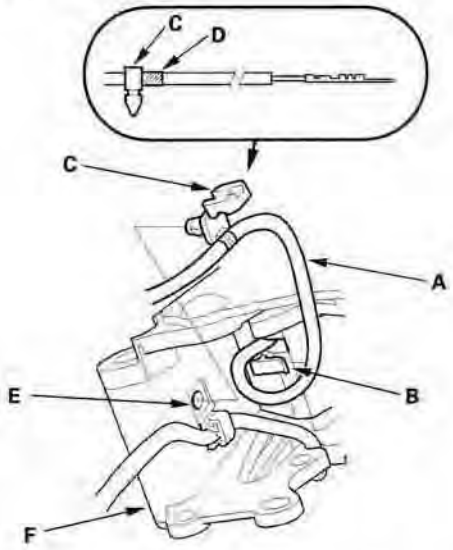
Shift Lever Ring Replacement (cont'd)

8. Replace the shift lever ring, and install the new shift lever ring (A) to the shift lever (B).



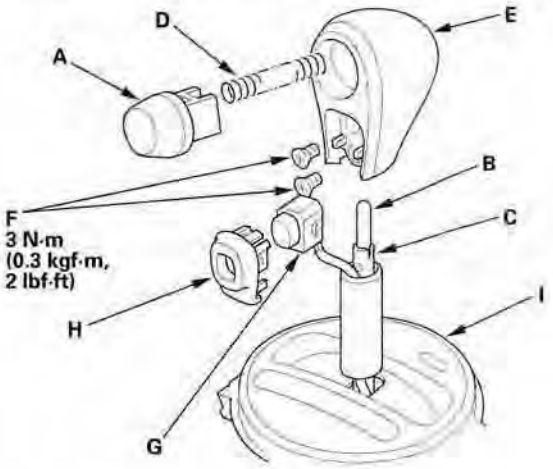
9. Insert the O/D switch harness (C) into the shift lever ring, and route the harness through the groove (D) of the shift lever into the hole (E). Do not pinch the harness.

10. Wind the O/D switch harness (A) one turn around the clamp (B) on the bottom of the shift lever.



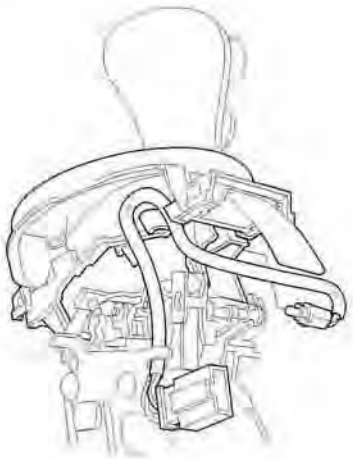
11. Install the harness clamp (C) at the reference tape (D) on the harness, then install the clamp in the hole (E) of the shift lever bracket (F).

12. Apply silicone grease to the shift lever button (A) and push rod (B) of the shift lever (C), and install the spring (D), shift lever button, and shift lever knob (E). Install the screws (F) to secure the shift lever knob to the shift lever.

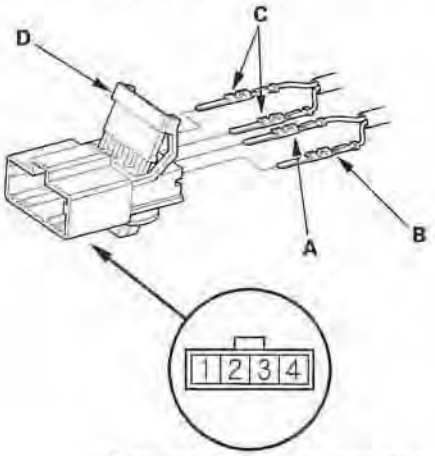


13. Install the O/D switch (G) and the O/D switch cover (H), and install the A/T gear position indicator panel (I) on the shift lever bracket.

14. Install the A/T gear position indicator panel light socket.



15. Install BLU/RED harness terminal (A) of the shift lock solenoid in the No. 3 cavity, and BLK harness terminal (B) in the No. 4 cavity.



Terminal side of male terminals

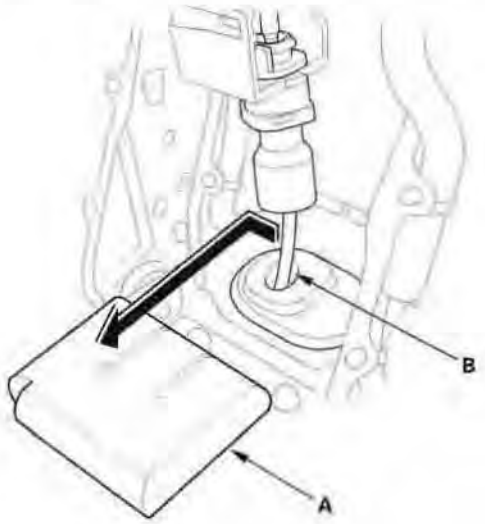
16. Install the O/D switch harness terminals (C) in the No. 3 and No. 4 cavities. Either O/D switch harness terminal can be installed in No. 3 and No. 4 cavities.

17. Make sure that the all four terminals lock securely, then install the back cover (D) securely in place.

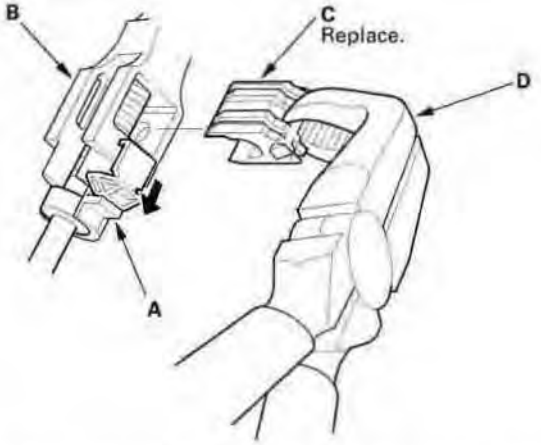
18. Install the shift lever assembly (see page 14-212).

Shift Cable Replacement

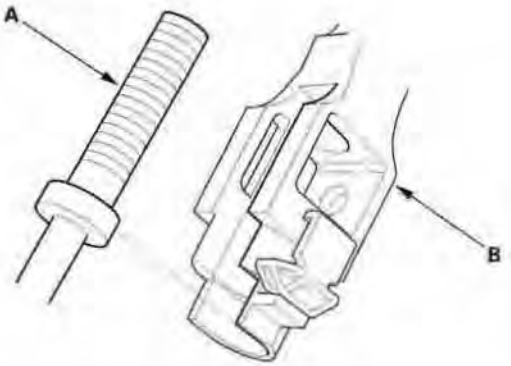
1. Raise the front of the vehicle, or lift the vehicle up, and make sure it is securely supported.
2. Remove the center lower cover (see page 20-76).
3. Shift the shift lever into the R position.
4. Remove the shift cable insulator (A) from the shift cable (B).



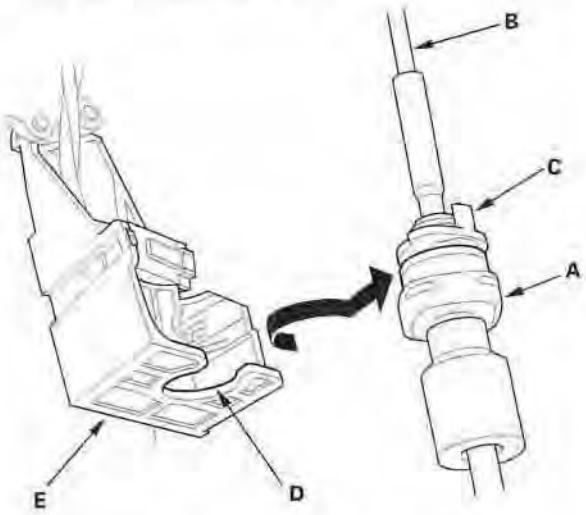
5. Slide the lock tab (A) down on the shift cable end holder (B).



6. Grasp the shift cable lock (C) in the middle with angle-jaw needle-nose pliers (D), and remove it from the shift cable end and shift cable end holder. Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
7. Separate the shift cable end (A) from the shift cable end holder (B).



8. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the shift cable bracket (E). Then slide the holder to remove the shift cable from the shift cable bracket.

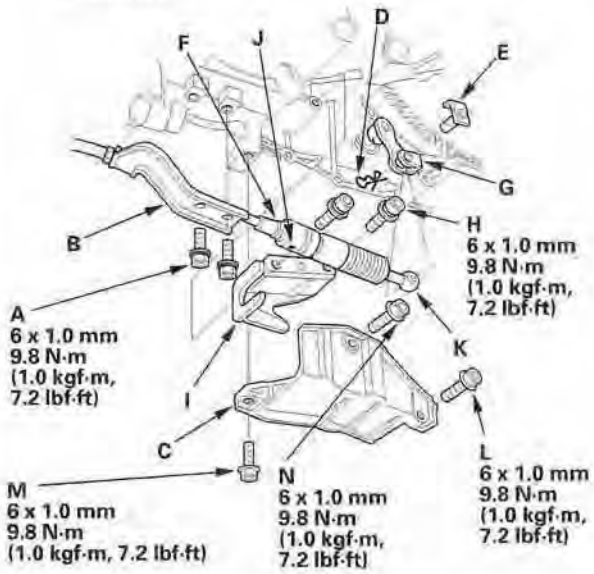


9. Remove the heat shield under the body, and remove the shift cable bracket.

10. Remove the grommet, and pull out the shift cable.

11. 4WD model: Replace the shift cable.

-1 Remove the bolts (A) securing the shift cable bracket (B), then remove the shift cable cover (C).
-2 Remove the spring clip (D) and control pin (E), then separate the shift cable (F) from the selector control lever (G).
-3 Remove the bolts (H) securing the shift cable bracket (I), then remove the shift cable bracket (I) from the shift cable.
-4 Replace the shift cable, and insert it through the grommet hole. Do not bend the shift cable excessively. Face the dot (J) on the shift cable (F) down, then install the shift cable bracket (I) on the shift cable.
-5 Attach the shift cable end (K) to the selector control lever (G), then insert the control pin (E) into the selector control lever hole through the shift cable end. Secure the control pin with the spring clip (D).
-6 Secure the shift cable bracket (B) with the bolts (A), and install the shift cable cover (C), but do not tighten the bolts.
-7 Tighten the front bolt (L) on the cover first, then the lower bolt (M), and lastly the middle bolt (N).

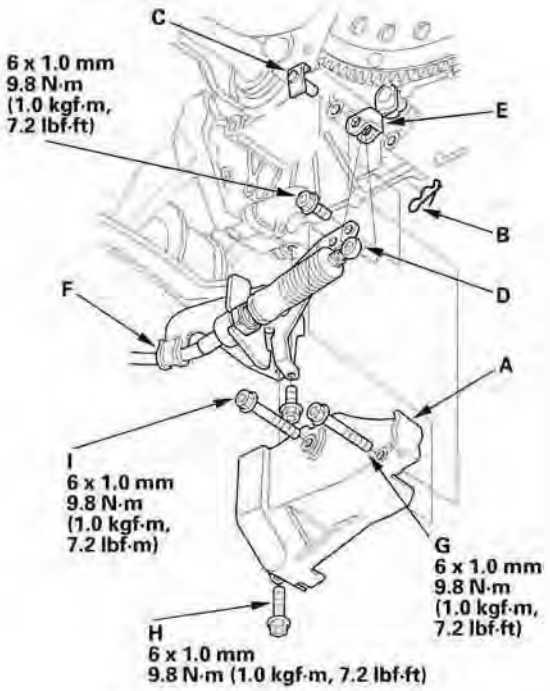


(cont'd)

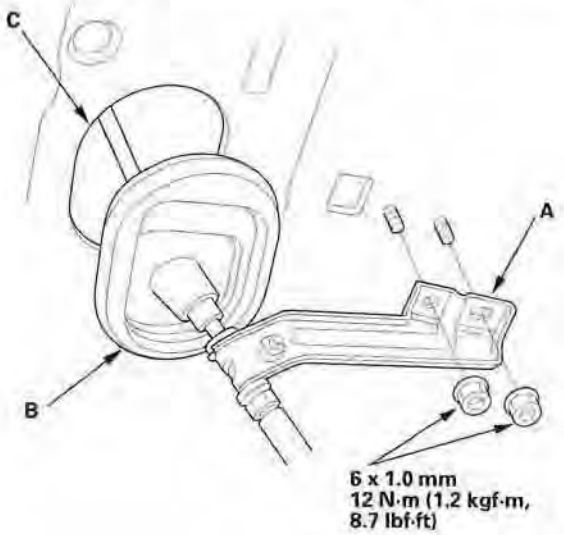
Shift Cable Replacement (cont'd)

12. 2WD model: Replace the shift cable.

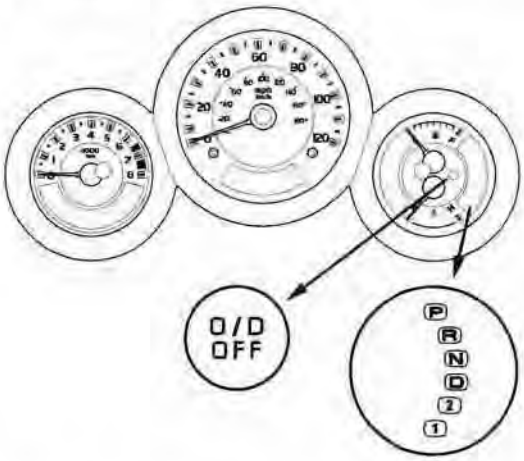
    -1 Remove the shift cable cover (A).
    -2 Remove the spring clip (B) and control pin (C), then separate the shift cable (D) from the selector control lever (E).
    -3 Remove the bolts securing the shift cable bracket (F).
    -4 Replace the shift cable, and insert it through the grommet hole. Do not bend the shift cable excessively.
    -5 Attach the shift cable end (D) to the selector control lever (E), then insert the control pin (C) into the selector control lever hole through the shift cable end, and secure the control pin with the spring clip (B).
    -6 Secure the shift cable bracket (F) with the bolt, and install the shift cable cover (A), but do not tighten the bolts.
    -7 Tighten the front bolt (G) on the cover first, then the lower bolt (H), and lastly the middle bolt (I).



13. Install the shift cable bracket (A) on the body, then install the grommet (B) in its hole (C).



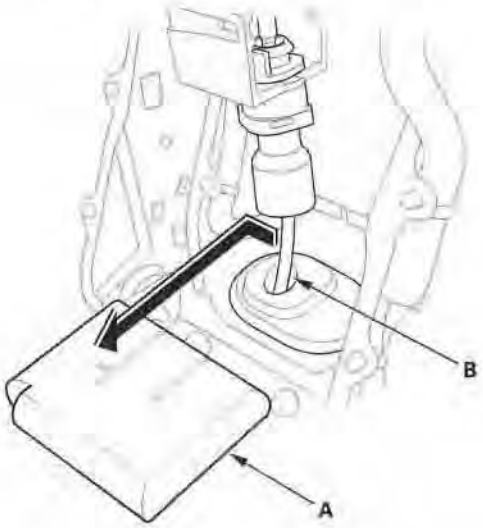
14. Turn the ignition switch ON (II), and verify that the R position indicator comes on.



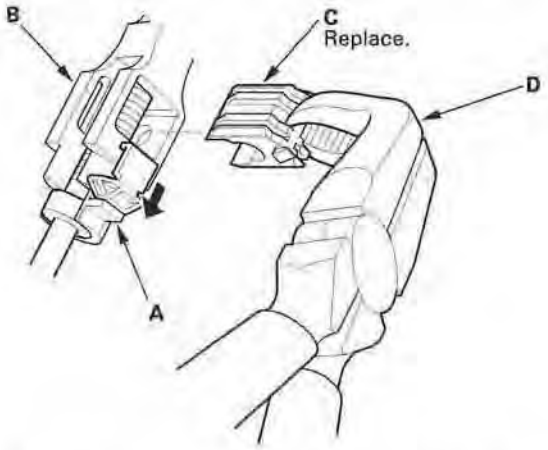
15. Install the shift cable to the shift lever, refer to shift cable adjustment (see page 14-223).

Shift Cable Adjustment

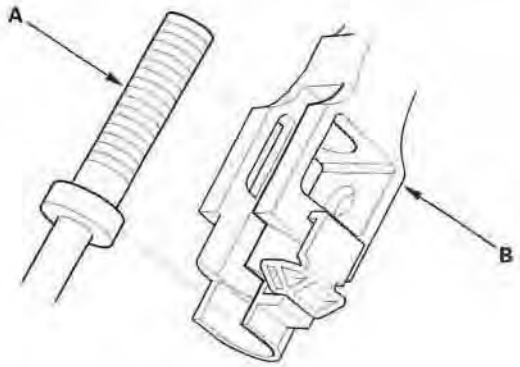
1. Remove the center lower cover (see page 20-76).
2. Shift the shift lever into the R position.
3. Remove the shift cable insulator (A) from the shift cable (B).



4. Slide the lock tab (A) down on the shift cable end holder (B).



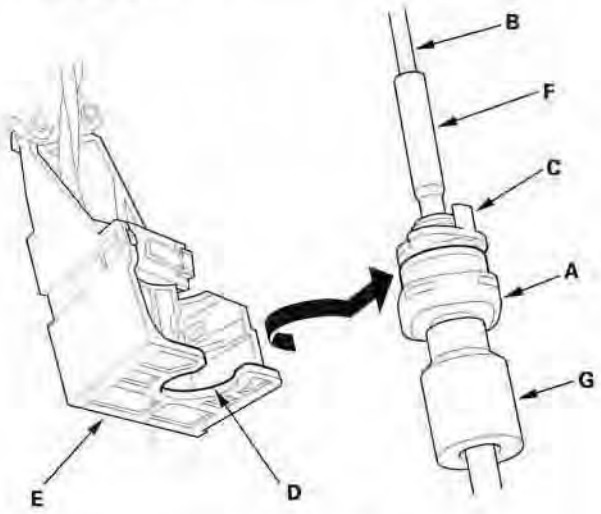
5. Grasp the shift cable lock (C) in the middle with angle-jaw needle-nose pliers (D), and remove it from the shift cable end and shift cable end holder. Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
6. Separate the shift cable end (A) from the shift cable end holder (B).



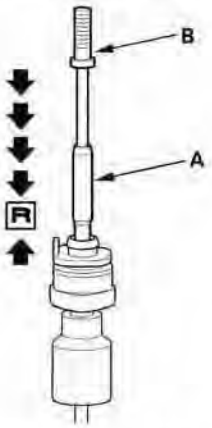
(cont'd)

Shift Cable Adjustment (cont'd)

7. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the shift cable bracket (E). Then slide the holder to remove the shift cable from the shift cable bracket. Do not remove the shift cable by twisting shift cable guide (F) and damper (G).



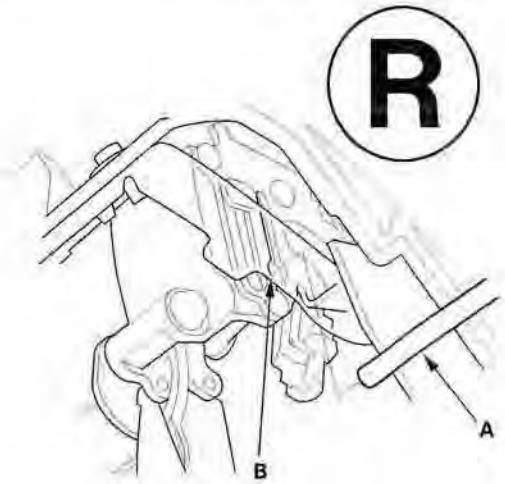
8. Push the shift cable down until it stops, then release it. Pull the shift cable back one step so that the shift cable is in R. Do not hold the shift cable guide (A) to adjust the shift cable (B).



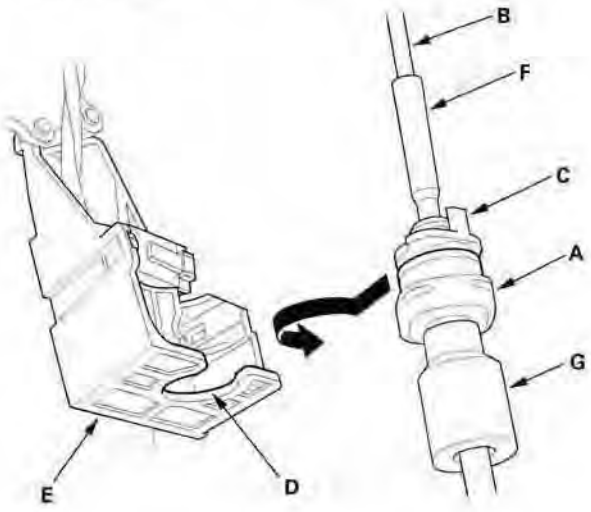
9. Turn the ignition switch ON (II), and verify that the R position indicator comes on.

10. Turn the ignition switch OFF.

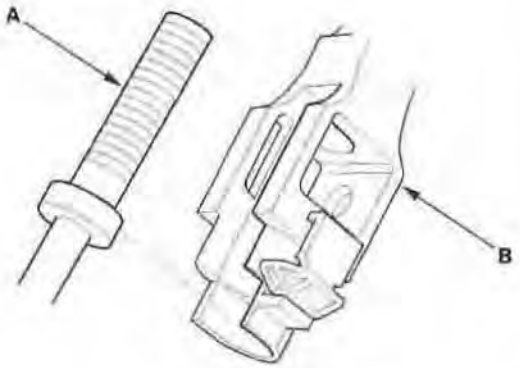
11. Insert a 6.0 mm (0.24 in.) pin (A) into the positioning hole (B) on the shift lever bracket through the positioning hole on the shift lever. The shift lever is secured in R position.



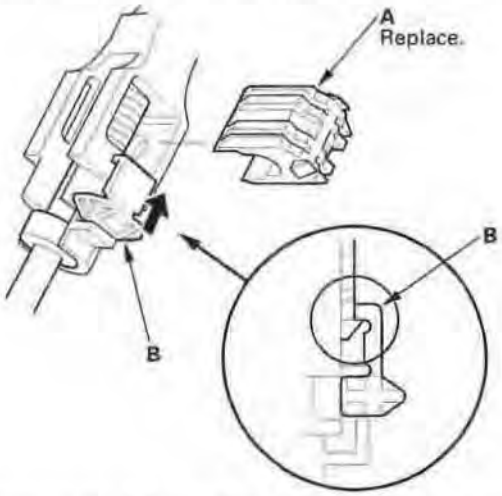
12. Rotate the socket holder (A) on the shift cable (B) to face the tab (C) on the holder opposite the opening (D) in the shift cable bracket (E). Align the holder with the opening in the bracket, then slide the holder into the bracket. Rotate the holder a quarter turn to secure the shift cable. Do not install the shift cable by twisting the shift cable guide (F) and damper (G).



13. Install the shift cable end (A) in the shift cable end holder (B). Keep the shift cable end and end holder free of grease.

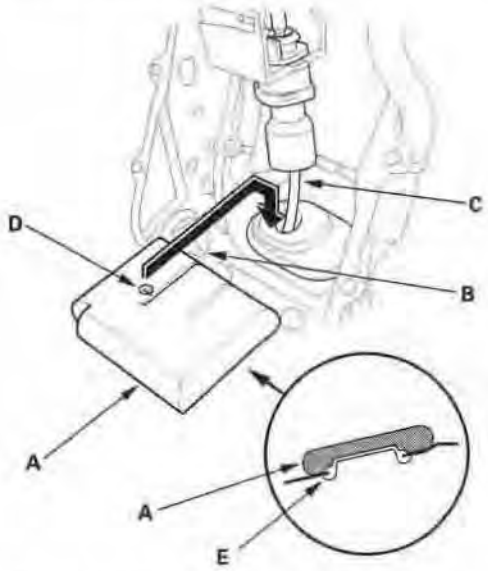


14. Install the new shift cable lock (A) to secure the shift cable end and shift cable end holder, then push the lock tab (B) up until it stops to lock joint.



15. Remove the 6.0 mm (0.24 in.) pin that was installed to hold the shift lever.

16. Install the shift cable insulator (A) along the slot (B) over the shift cable (C), and position the shift cable in the left end (D) of the slot.



17. Push the insulator down so that it covers the shift cable grommet (E).

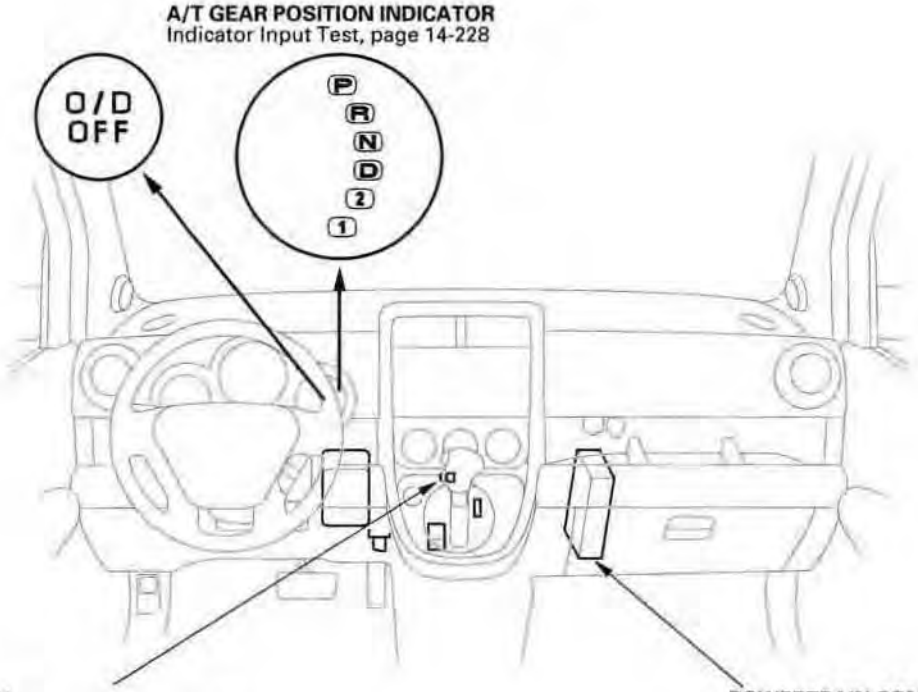
18. Allow the wheels to rotate freely.

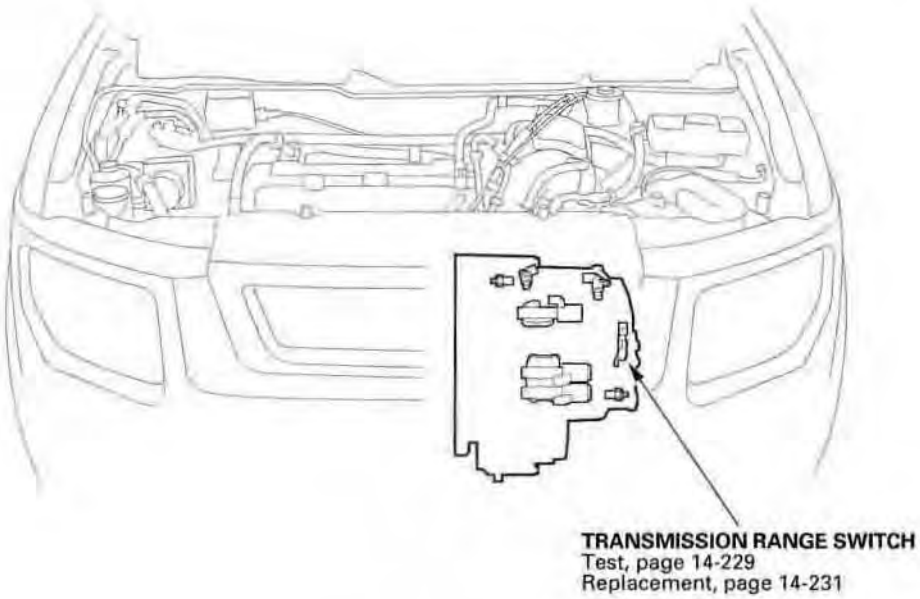
19. Start the engine, and move the shift lever to each position. Verify that the A/T gear position indicator follows the transmission range switch, and check the shift lever operation in all gear.

20. Install the center lower cover (see page 20-76).

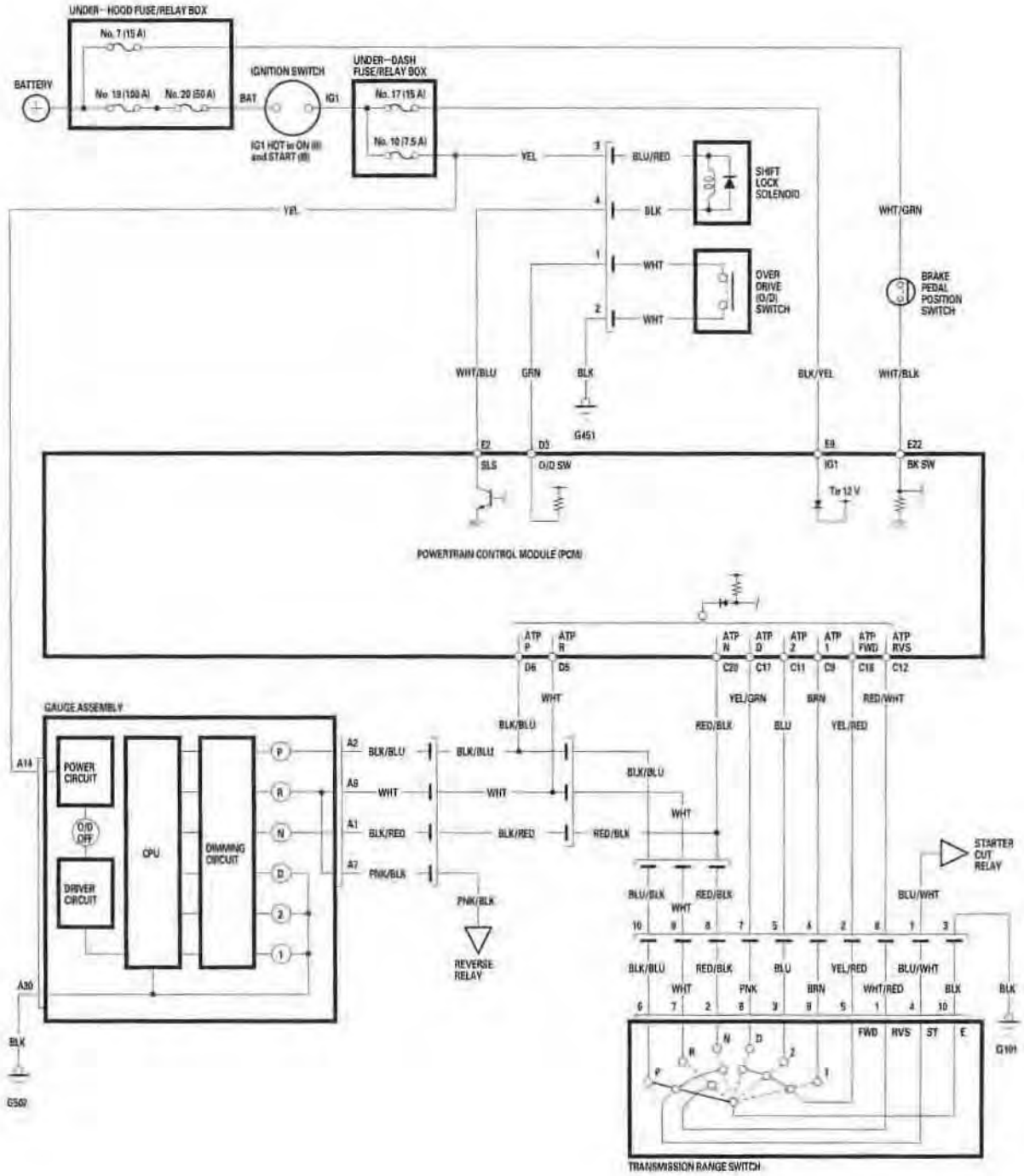
A/T Gear Position Indicator

Component Location Index





Circuit Diagram

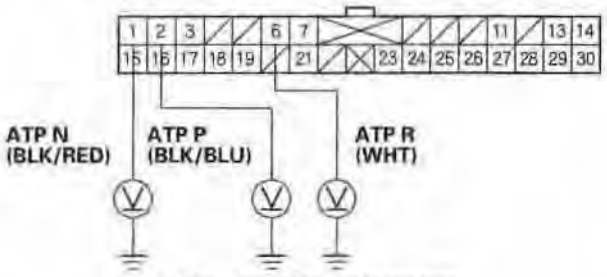


Indicator Input Test

SRS components are located in this area. Review the SRS component locations (see page 23-10), and the precautions and procedures (see page 23-11) before performing repairs or service.

1. If the MIL has been reported, check for a DTC, and repair the system as indicated by DTC.
2. If the MIL does not come on, and the A/T gear position indicator P, N, or R does not come on, remove the gauge assembly from the dashboard, then disconnect gauge assembly connector A (30P).
3. Inspect the connectors and connector terminals to be sure they are making good contact.
4. If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
5. Turn the ignition switch ON (II).
6. Shift to the P position, and check for voltage between A2 terminal (BLK/BLU) and ground.
   There should be 0 V in the P position. There should be battery voltage in any other shift lever position.
   If the test results are different, check for a faulty transmission range switch or an open in the wire.

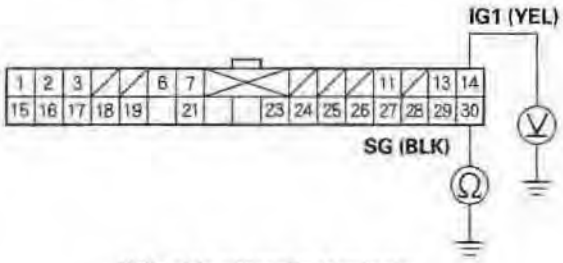
GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

7. Shift to the R position, and check for voltage between A6 terminal (WHT) and ground.
   There should be 0 V in the R position. There should be battery voltage in any other shift lever position.
   If the test results are different, check for a faulty transmission range switch or an open in the wire.
8. Shift to the N position, and check for voltage between A1 terminal (BLK/RED) and ground.
   There should be 0 V in the N position. There should be battery voltage in any other shift lever position.
   If the test results are different, check for faulty transmission range switch or an open in the wire.
9. Check for voltage A14 terminal (YEL) and ground with the ignition in switch ON (II).
   There should be battery voltage. If the test result is different, check for a blown No. 10 (7.5 A) fuse in the under-dash fuse/relay box or an open in the wire.

GAUGE ASSEMBLY CONNECTOR A (30P)

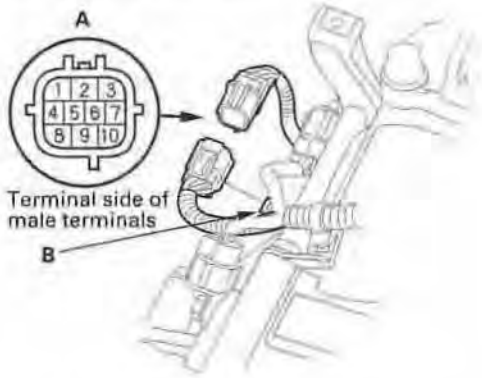


Wire side of female terminals

10. Turn the ignition switch OFF, and check for continuity between A30 terminal (BLK) and ground under all conditions.
    There should be continuity. If the test result is different, check for a poor ground (G502) or an open in the wire.
11. If all input tests prove OK, but the indicator is faulty, replace the printed circuit board.

Transmission Range Switch Test

1. Remove the transmission range switch harness connector (A) from the connector bracket (B), then disconnect the connector.



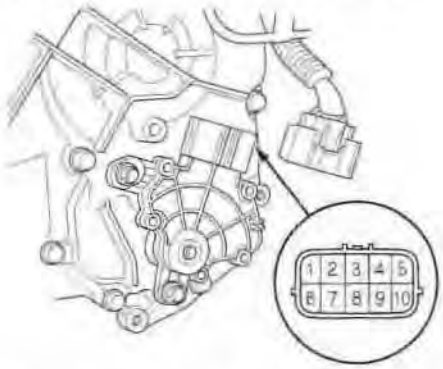
Connector Terminal Specification

Terminal	Signal	Terminal	Signal
1	ATP NP (ST)	6	ATP RVS
2	ATP FWD	7	D
3	Ground (E)	8	N
4	1	9	R
5	2	10	P

2. Check for continuity between terminals at the harness connector. There should be continuity between the terminals in the following table for each switch position.

Position	Connector Terminal									
	1	2	3	4	5	6	7	8	9	10
P	○		○							○
R			○			○			○	
N	○		○					○		
D		○	○				○			
2		○	○		○					
1		○	○	○						

3. If there is no continuity between any terminals, remove the transmission range switch cover, and disconnect the connector at the switch.



Connector Terminal Specification

Terminal	Signal	Terminal	Signal
1	ATP RVS	6	P
2	N	7	R
3	2	8	D
4	ATP NP (ST)	9	1
5	ATP FWD	10	Ground (E)

4. Check for continuity between terminals at the switch connector. There should be continuity between the terminals in the following table for each switch position.

Position	Connector Terminal									
	1	2	3	4	5	6	7	8	9	10
P				○		○				○
R	○						○			○
N		○		○						○
D					○			○		○
2			○		○					○
1					○				○	○

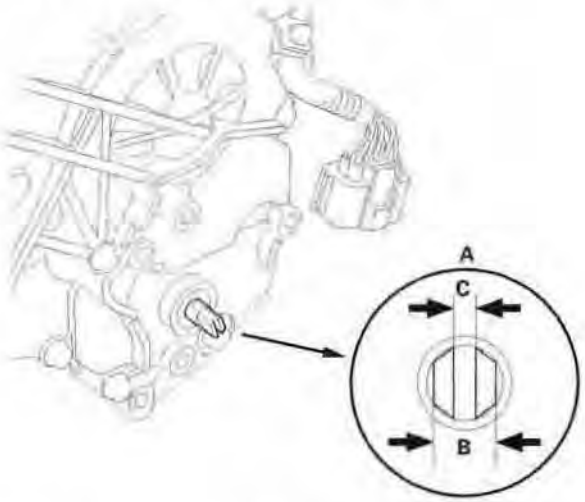
(cont'd)

Transmission Range Switch Test (cont'd)

5. If the transmission range switch continuity check is OK, replace the faulty transmission range switch harness.

6. If there is no continuity between any terminals, remove the transmission range switch, and check the end of the selector control shaft (A).

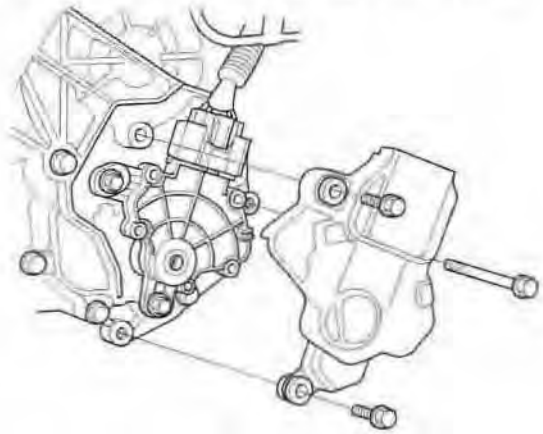
   Standard
   Selector Control Shaft Width (B):
   6.1—6.2 mm (0.240—0.244 in.)
   Selector Control Shaft End Gap (C):
   1.8—2.0 mm (0.07—0.08 in.)



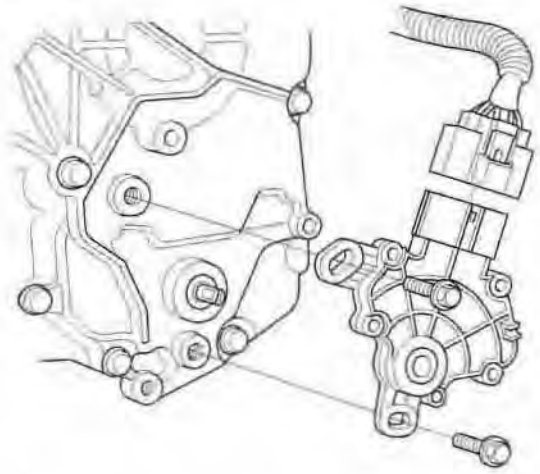
7. The measurement of the selector control shaft end is within the standard, replace the transmission range switch. If the measurement is out of the standard, repair the selector control shaft end, and recheck the transmission range switch continuity.

Transmission Range Switch Replacement

1. Raise the vehicle, and make sure it is securely supported.
2. Shift to the N position.
3. Remove the transmission range switch cover.



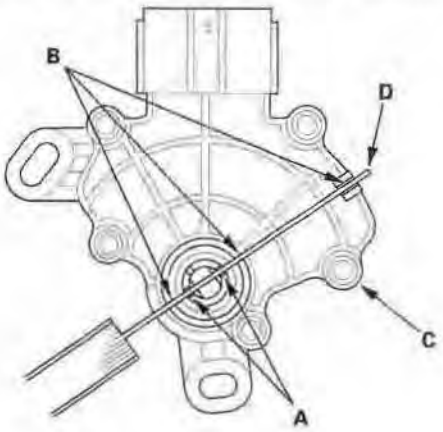
4. Disconnect the transmission range switch connector.



5. Remove the old transmission range switch, and install the new switch.
6. Make sure that the selector control shaft (A) is in the N position. If necessary, move the shift lever to the N position.

7. Align the cutout (A) on the rotary-frame with the neutral positioning cutouts (B) on the transmission range switch (C), then put a 2.0 mm (0.08 in.) feeler gauge blade (D) in the cutouts to hold it in the N position.

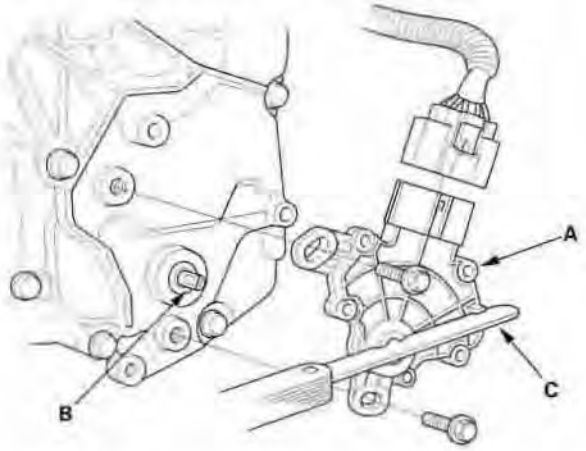
   NOTE: Be sure to use a 2.0 mm (0.08 in.) blade or equivalent to hold the switch in the N position.



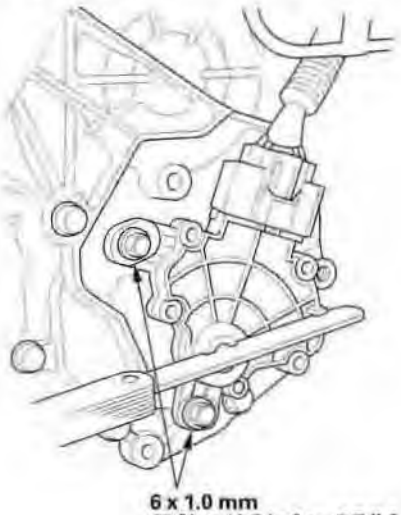
(cont'd)

Transmission Range Switch Replacement (cont'd)

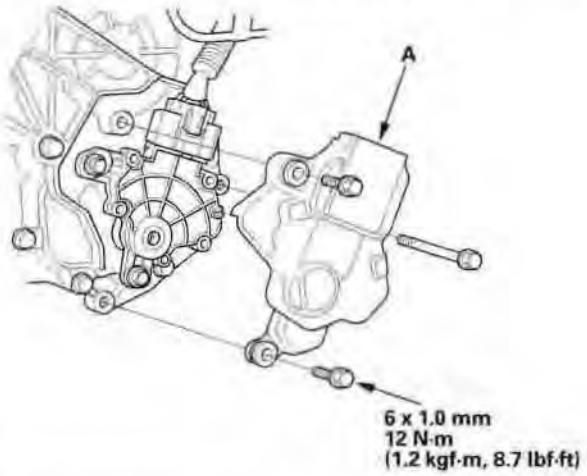
8. Install the transmission range switch (A) gently on the selector control shaft (B) while holding the N position with the 2.0 mm (0.08 in.) blade (C).



9. Tighten the bolts on the transmission range switch while you continue to hold the N position. Do not move the transmission range switch when tightening the bolts. Remove the feeler gauge.



10. Connect the connector securely, then install the transmission range switch cover (A).



11. Turn the ignition switch ON (II). Move the shift lever through all gear positions, and check the transmission range switch synchronization with the A/T gear position indicator.

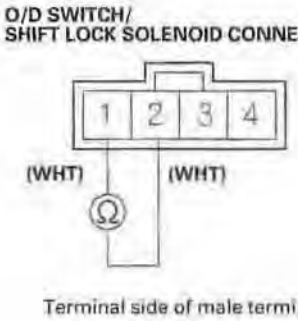
12. Check that the engine can start in the P and N positions, and cannot start in any other shift lever position.

13. Check that the back-up lights come on when the shift lever is in the R position.

14. Allow the wheels to rotate freely, then start the engine, and check the shift lever operation.

O/D Switch Circuit Troubleshooting

1. Turn the ignition switch OFF.
2. Disconnect the O/D switch/shift lock solenoid connector.
3. Check for continuity between O/D switch/shift lock solenoid terminals No. 1 and No. 2 while pressing the O/D switch and when the switch is released.



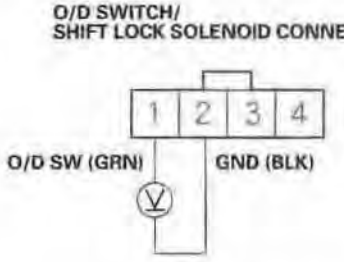
Terminal side of male terminals

Is there continuity while pressing the O/D switch, and no continuity when the switch released?

YES—Go to step 4.

NO—Replace the O/D switch (see page 14-234). ■

4. Turn the ignition switch ON (II).
5. Shift the shift lever to the D position.
6. Measure the voltage between O/D switch/shift lock solenoid connector terminals No. 1 and No. 2.



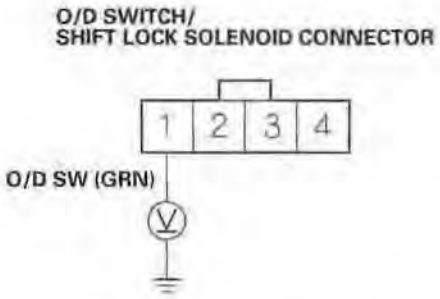
Wire side of female terminals

Is there battery voltage?

YES—O/D switch circuit is OK. Check for loose terminals. ■

NO—Go to step 7.

7. Measure the voltage between O/D switch/shift lock solenoid connector terminal No. 1 and body ground.



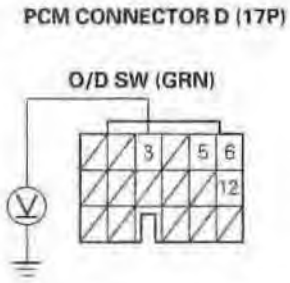
Wire side of female terminals

Is there battery voltage?

YES—Repair open in the wire between O/D switch/shift lock solenoid connector terminal No. 2 and ground (G451), or repair poor ground (G451). ■

NO—Go to step 8.

8. Measure the voltage between PCM connector terminal D3 and body ground.



Wire side of female terminals

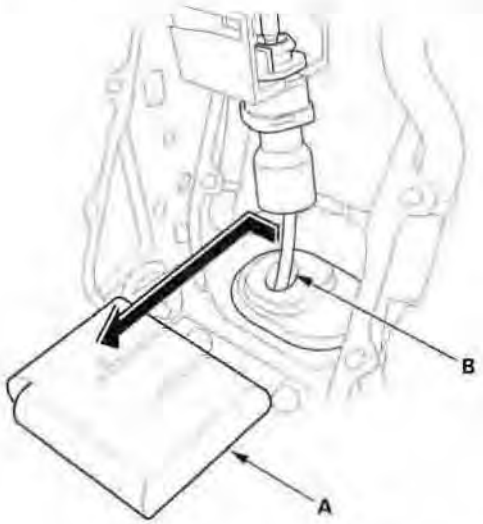
Is there battery voltage?

YES—Repair open or short in the wire between PCM connector terminal D3 and O/D switch/shift lock solenoid connector. ■

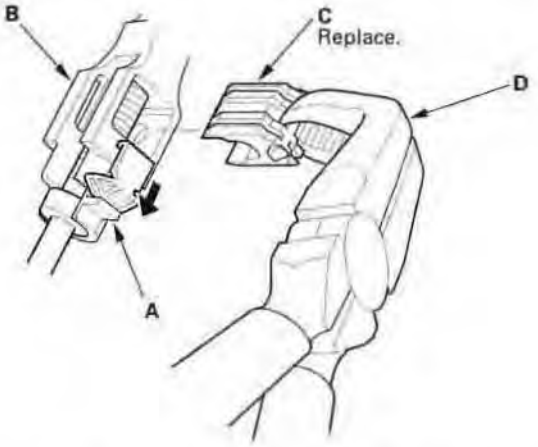
NO—Check for a short in the wire between PCM terminal D3 and O/D switch/shift lock solenoid connector. Check for loose or poor connections at PCM connector terminal D3. If the wire and connections are OK, substitute a known-good PCM and recheck. ■

O/D Switch Test/Replacement

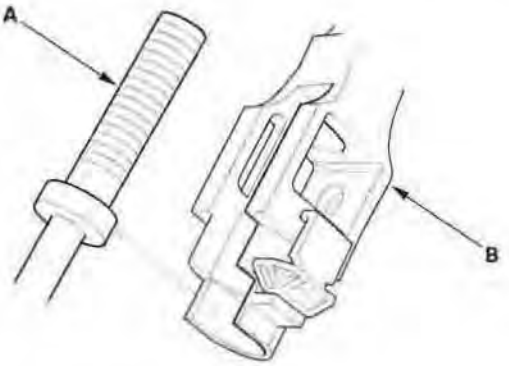
1. Remove the center lower cover (see page 20-76).
2. Remove the shift lever console trim (see page 20-76).
3. Shift the shift lever into the R position.
4. Remove the shift cable insulator (A) from the shift cable (B).



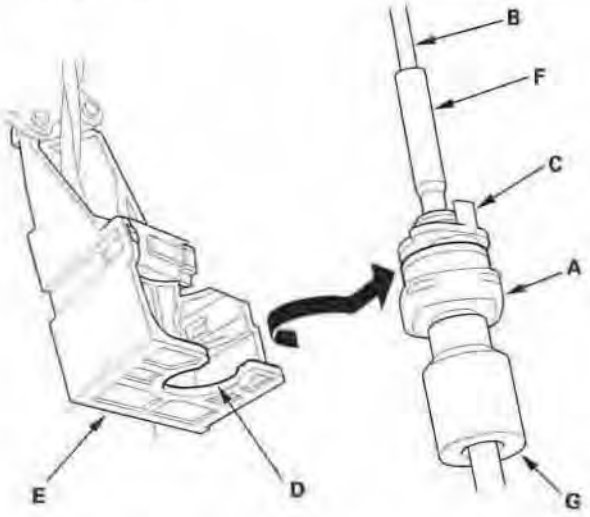
5. Slide the lock tab (A) down on the shift cable end holder (B).



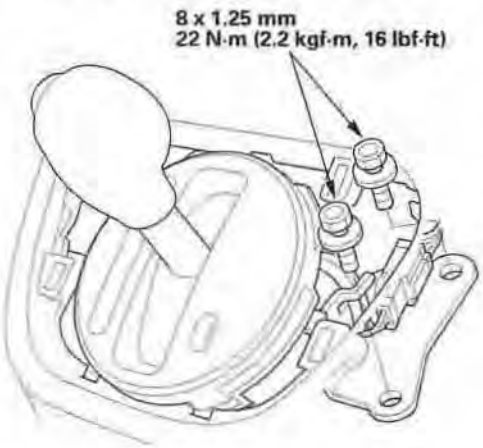
6. Grasp the shift cable lock (C) in the middle with angle-jaw needle-nose pliers (D), and remove it from the shift cable end and shift cable end holder. Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
7. Separate the shift cable end (A) from the shift cable end holder (B).



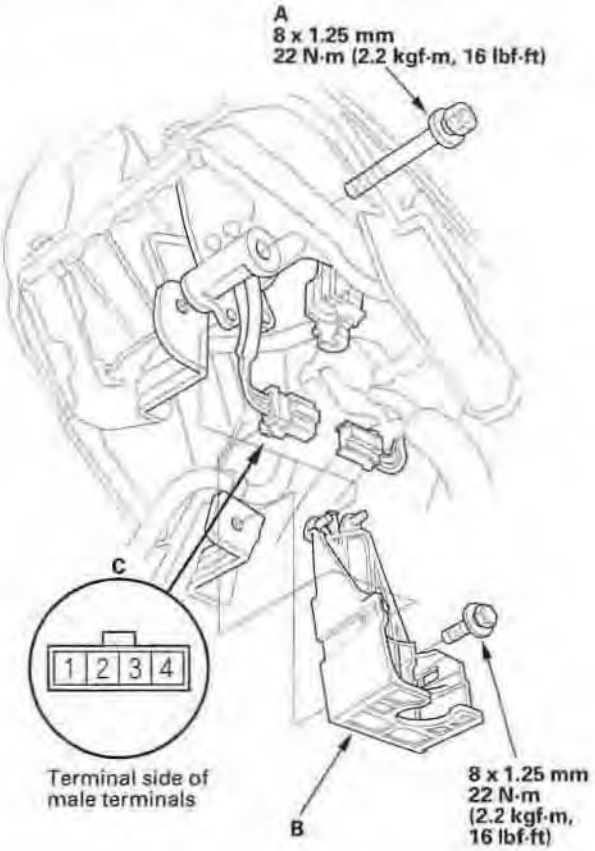
8. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the shift cable bracket (E). Then slide the holder to remove the shift cable from the shift cable bracket. Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).



9. Remove the shift lever mounting bolts.



10. Remove the shift lever mounting bolt (A), and remove the shift cable bracket (B).



11. Remove the O/D switch/shift lock solenoid connector (C), then disconnect the connector.

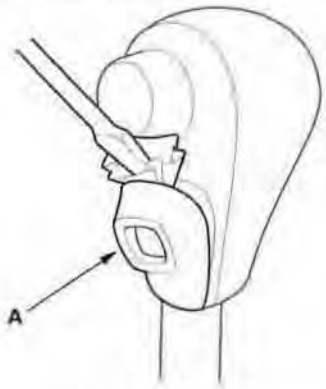
12. Check for continuity between O/D switch/shift lock solenoid connector terminals No. 1 and No. 2 while pushing the O/D switch toggle. The O/D switch terminals continuity is toggled by pushing the O/D switch ON and OFF.

13. If the O/D switch works properly, connect the connector and install the removed parts. If the switch is faulty, go to step 14, and replace the switch.

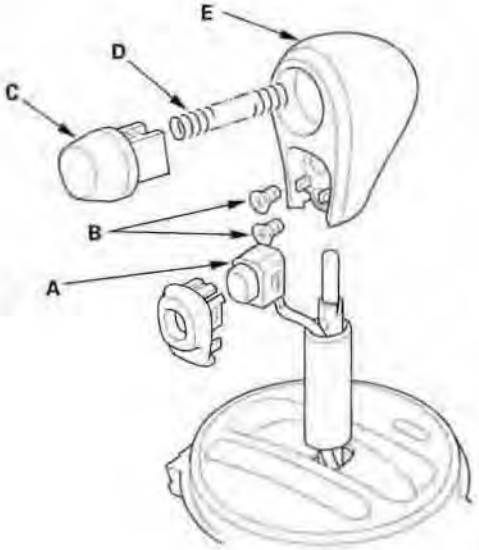
(cont'd)

O/D Switch Test/Replacement (cont'd)

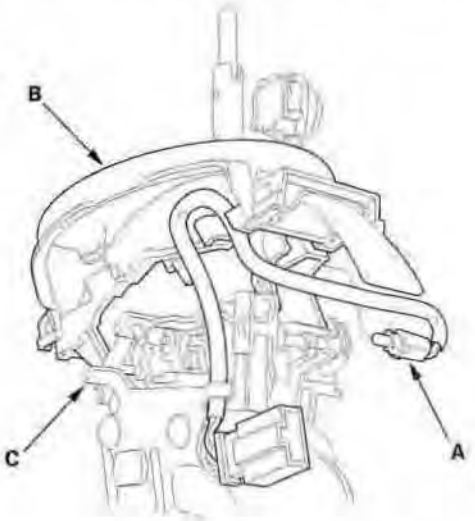
14. Remove the shift lever assembly.
15. Pry the O/D switch cover (A), and remove it.



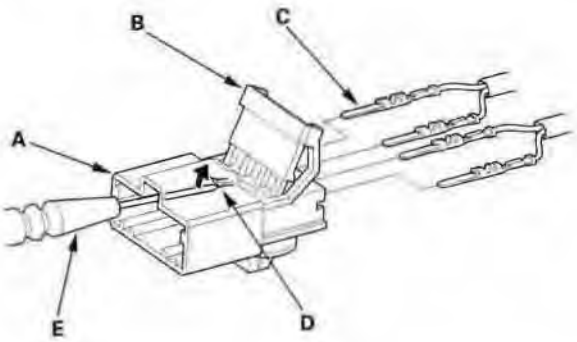
16. Remove the O/D switch (A) by expanding its locks, and remove the screws (B), shift lever button (C), spring (D), and shift lever knob (E).



17. Remove the A/T gear position indicator panel light socket (A), then separate the A/T gear position indicator panel (B) from the shift lever bracket (C).

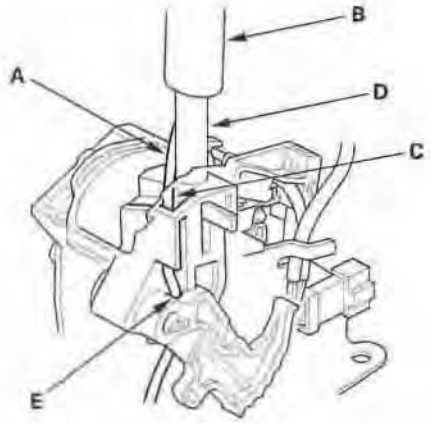


18. Pry the lock tabs on the back of the O/D switch/shift lock solenoid connector (A), and remove the back cover (B).

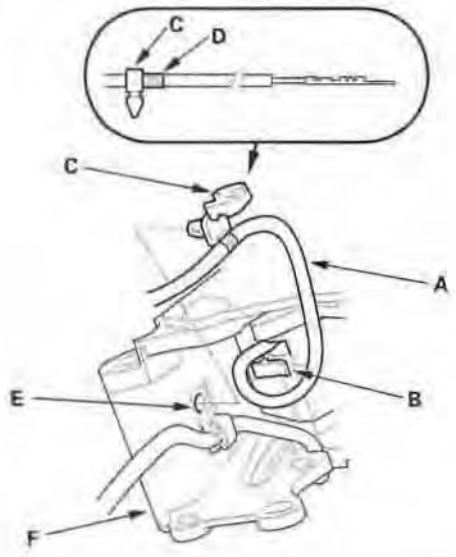


19. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all four terminals.
20. Remove the O/D switch harness clamp from the shift lever bracket and from the harness, and pull the O/D switch harness out to remove the shift lever assembly.

21. Insert the new O/D switch harness (A) into the shift lever ring (B), and route the harness through the groove (C) of the shift lever (D) into the hole (E). Do not pinch the harness.

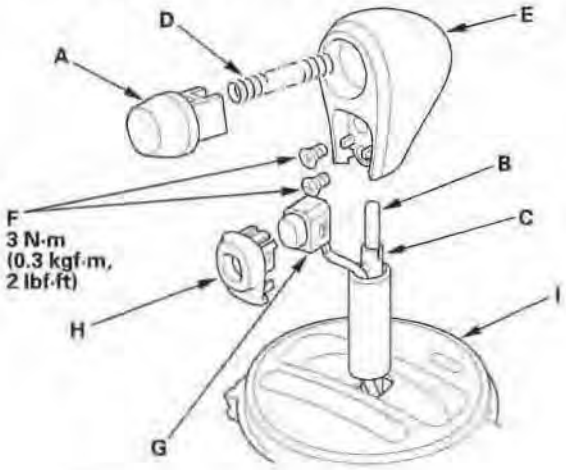


22. Wind the O/D switch harness (A) one turn around the clamp (B) on the bottom of the shift lever.



23. Install the harness clamp (C) at the reference tape (D) on the harness, then install the clamp in the hole (E) of the shift lever bracket (F).

24. Apply silicone grease to the shift lever button (A) and push rod (B) of the shift lever (C), and install the spring (D), shift lever button, and shift lever knob (E). Install the screws (F) to secure the shift lever knob to the shift lever.



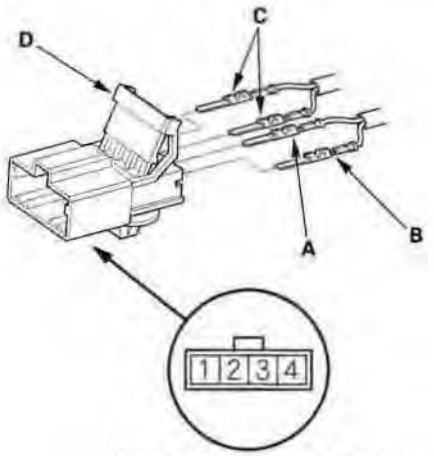
25. Install the O/D switch (G) and the O/D switch cover (H), and install the A/T gear position indicator panel (I) on the shift lever bracket.

26. Install the A/T gear position indicator panel light socket.

(cont'd)

O/D Switch Test/Replacement (cont'd)

27. Install BLU/RED harness terminal (A) of the shift lock solenoid in the No. 3 cavity, and BLK harness terminal (B) in the No. 4 cavity.



Terminal side of male terminals

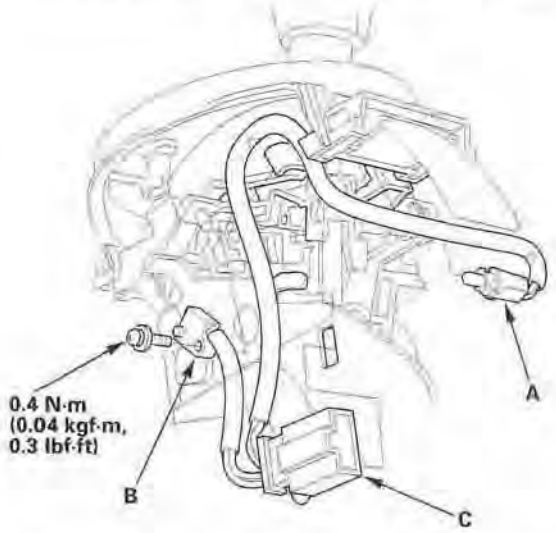
28. Install the O/D switch harness terminals (C) in the No. 1 and No. 2 cavities. Either O/D switch harness terminal can be installed in No. 1 and No. 2 cavities.

29. Make sure that the all four terminals lock securely, then install the back cover (D) securely in place.

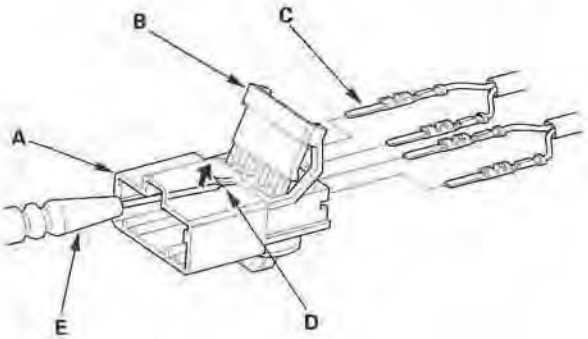
30. Install the shift lever assembly (see page 14-212).

A/T Gear Position Indicator Panel Light Harness Replacement

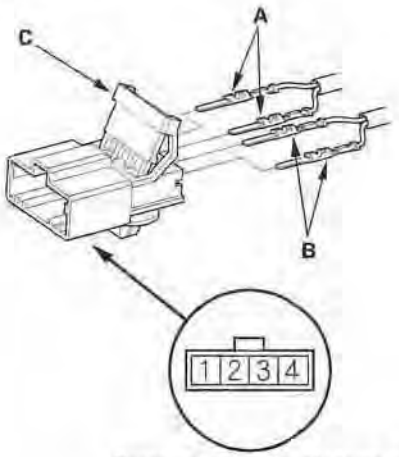
1. Remove the shift lever assembly (see page 14-210).
2. Remove the A/T gear position indicator panel light socket (A), and remove the bulb from the socket.



3. Remove the park pin switch (B) and the switch connector (C).
4. Pry the lock tabs on the back of the park pin switch connector (A), and remove the back cover (B).



5. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all four terminals.
6. Replace the A/T gear position indicator panel light harness with the new one.
7. Install GRN harness terminals (A) of the park pin switch in the No. 1 and No. 2 cavities. Either park pin switch harness terminal can be installed in No. 1 and No. 2.

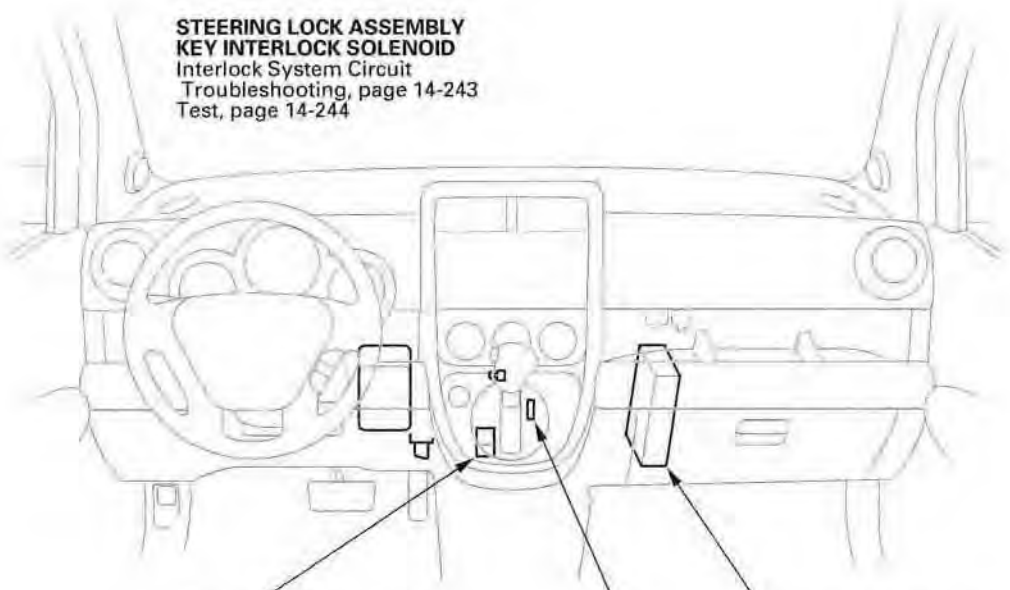


Terminal side of male terminals

8. Install the RED/BLK harness terminals (B) in the No. 3 and No. 4 cavities. Either A/T gear position indicator panel light harness terminal can be installed in No. 3 and No. 4 cavities.
9. Make sure that the all four terminals lock securely, then install the back cover (C) securely in place.
10. Install the park pin switch. Apply non-hardening thread lock sealant to screw threads, and secure the switch with the screw.
11. Install the A/T gear position indicator panel light bulb in the socket.
12. Install the A/T gear position indicator panel light socket, and install the connector.
13. Install the shift lever assembly (see page 14-212).

A/T Interlock System

Component Location Index



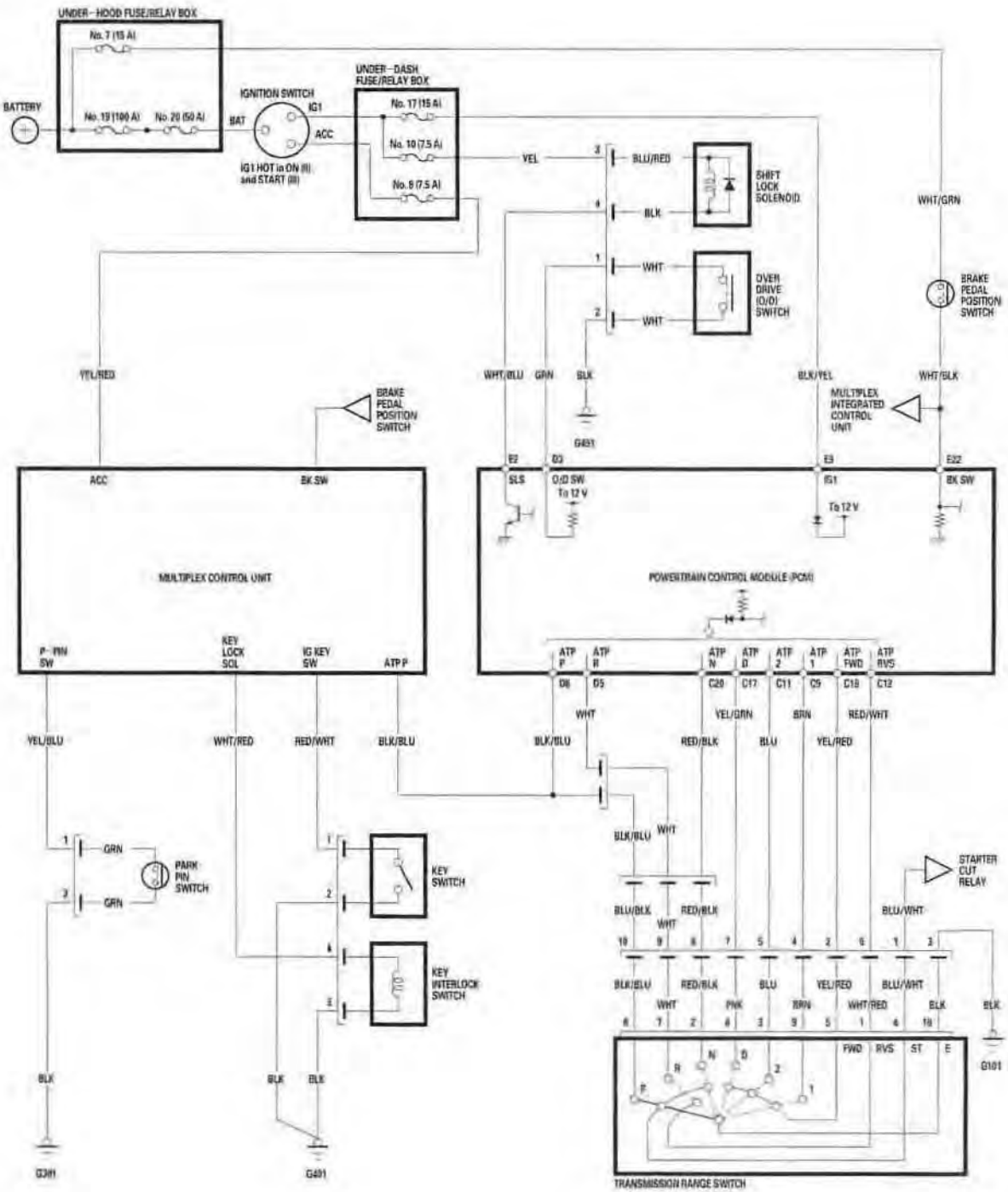
STEERING LOCK ASSEMBLY
KEY INTERLOCK SOLENOID
Interlock System Circuit
Troubleshooting, page 14-243
Test, page 14-244

SHIFT LOCK SOLENOID
Shift Lock System Circuit
Troubleshooting, page 14-242
Test, page 14-245
Replacement, page 14-245

POWERTRAIN CONTROL MODULE (PCM)

PARK PIN SWITCH
Interlock System Circuit
Troubleshooting, page 14-243
Test, page 14-250
Replacement, page 14-251

Circuit Diagram



Shift Lock System Circuit Troubleshooting

1. Press the brake pedal.

   NOTE: Use the HDS to verify brake switch input.

   Are the brake lights ON?

   YES—Go to step 2.

   NO—Repair faulty brake light circuit. ■

2. Connect the HDS. Check engine speed and throttle position in the A/T data list.

   Is the engine speed at idle, and TPS about 0.5 V?

   YES—Go to step 3.

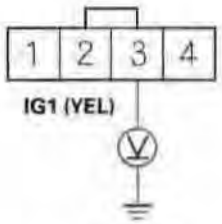
   NO—Repair engine speed or throttle position input. ■

3. Disconnect the O/D switch/shift lock solenoid connector (see page 14-245).

4. Turn the ignition switch ON (II).

5. Measure the voltage between O/D switch/shift lock solenoid connector terminal No. 3 and body ground.

   O/D SWITCH/
   SHIFT LOCK SOLENOID CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

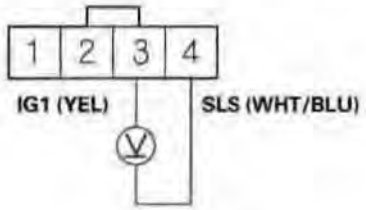
   YES—Go to step 6.

   NO—Check for blown No. 10 fuse in the under-dash fuse/relay box. If the fuse is OK, repair open in the wire between the O/D switch/shift lock solenoid connector and the under-dash fuse/relay box. ■

6. Shift the shift lever into the P position, and press the brake pedal.

7. Measure the voltage between O/D switch/shift lock solenoid connector terminals No. 3 and No. 4 while pressing the brake pedal.

   O/D SWITCH/
   SHIFT LOCK SOLENOID CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES—Check the shift lock mechanism. If the mechanism is OK, replace the shift lock solenoid (see page 14-245). ■

   NO—Check for an open in the wire between PCM connector terminal E2 and shift lock solenoid connector. If the wire is OK, substitute a known-good PCM and recheck. ■

Key Interlock System Circuit Troubleshooting

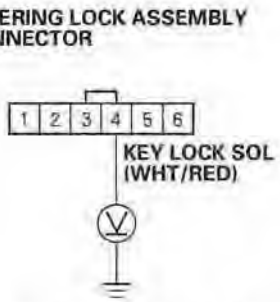
SRS components are located in this area. Review the SRS component locations (see page 23-10), and the precautions and procedures (see page 23-11) before performing repairs or service.

1. Turn the ignition switch to ACC (I). The shift lever must be in the P position.
2. Disconnect the steering lock assembly connector.
3. Check if the ignition key can be moved to LOCK (0) position, and remove the key from the cylinder.

   Is the ignition key able to move to the LOCK (0) position, and then removed?

   YES—Go to step 4.

   NO—Replace the ignition key cylinder/steering lock assembly (see page 17-29). ■
4. Turn the ignition switch to ACC (I) or ON (II), and shift to the N position.
5. Check for the voltage between the No. 4 terminal of the steering lock assembly connector and body ground.

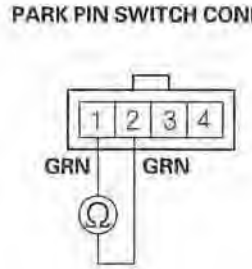


Wire side of female terminals

   Is there battery voltage?

   YES—Go to step 6.

   NO—Check for an open in with WHT/RED wire between the MICU and the steering lock assembly connector. If the wire is OK, substitute a known-good multiplex integrated control unit and recheck. ■
6. Turn the ignition switch to ACC (I), and shift to the P position.
7. Remove the shift lever console trim (see page 20-76).
8. Disconnect the park pin switch connector (see page 14-250).
9. Check for continuity between park pin switch connector terminals No. 1 and No. 2 while pushing the button of the shift lever in, and when released.



Terminal side of male terminals

   Is there continuity when pushing the button in, and no continuity when it's released?

   YES—Check for an open in the wire between the multiplex integrated control unit and the park pin switch connector. If the wire is OK, replace the multiplex integrated control unit. ■

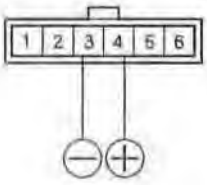
   NO—Replace the park pin switch (see page 14-251). ■

Key Interlock Solenoid Test

SRS components are located in this area. Review the SRS component locations (see page 23-10), and the precautions and procedures (see page 23-11) before performing repairs or service.

1. Remove the driver's dashboard lower cover (see page 20-73), and lower steering column cover (see page 17-25).
2. Disconnect steering lock assembly connector.
3. Insert the ignition key in the key cylinder, then turn the ignition key to ACC (I).
4. Connect the battery positive terminal to steering lock assembly connector terminal No. 4, and connect the battery negative terminal to No. 3 terminal. Make sure that the ignition key cannot be turned to LOCK (0) position. Release the battery terminals, and make sure that the key can be turned to LOCK (0) position and removed from the cylinder.
5. If the key interlock solenoid works improperly, replace the ignition key cylinder/steering lock assembly (see page 17-29).

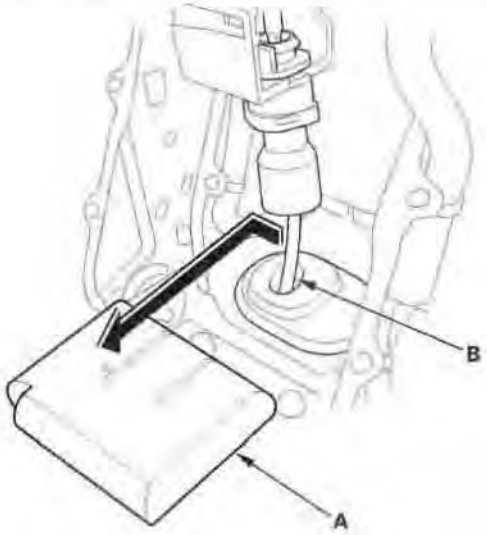
STEERING LOCK ASSEMBLY CONNECTOR



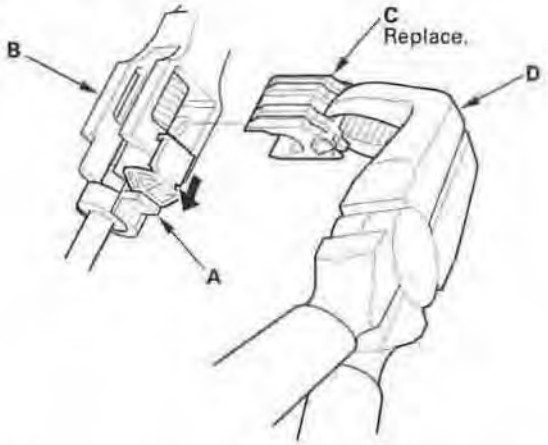
Terminal side of male terminals

Shift Lock Solenoid Test/Replacement

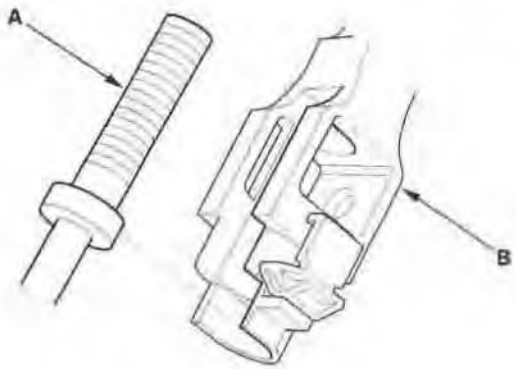
1. Remove the center lower cover (see page 20-76).
2. Remove the shift lever console trim (see page 20-76).
3. Shift the shift lever into the R position.
4. Remove the shift cable insulator (A) from the shift cable (B).



5. Slide the lock tab (A) down on the shift cable end holder (B).



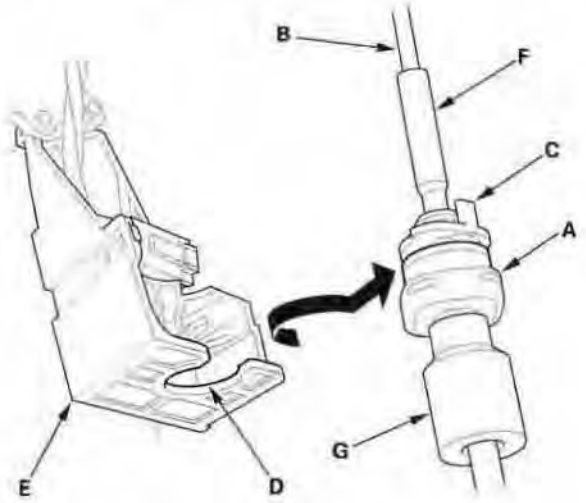
6. Grasp the shift cable lock (C) in the middle with angle-jaw needle-nose pliers (D), and remove it from the shift cable end and shift cable end holder. Do not pry the shift cable lock with a screwdriver, it may damage the shift cable end holder.
7. Separate the shift cable end (A) from the shift cable end holder (B).



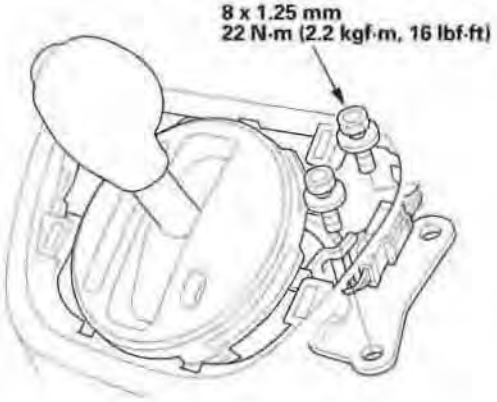
(cont'd)

Shift Lock Solenoid Test/Replacement (cont'd)

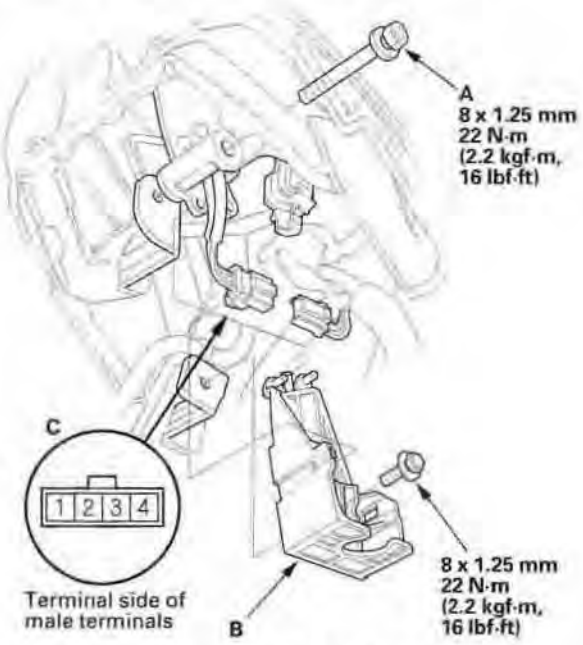
8. Rotate the socket holder (A) on the shift cable (B) a quarter turn; the tab (C) on the socket holder will be in the opening (D) of the shift cable bracket (E). Then slide the holder to remove the shift cable from the shift cable bracket. Do not remove the shift cable by twisting the shift cable guide (F) and damper (G).



9. Remove the shift lever mounting bolts.



10. Remove the shift lever mounting bolt (A), and remove the shift cable bracket (B).



11. Remove the O/D switch/shift lock solenoid connector (C), then disconnect the connector.

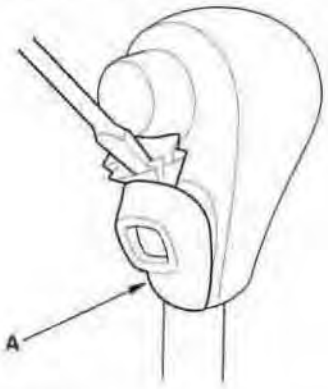
12. Connect the battery positive terminal to O/D switch/shift lock solenoid connector terminal No. 3, and connect the battery negative terminal to connector terminal No. 4. Do not connect the battery positive terminal to the terminal No. 4 or you will damage the diode inside the solenoid.

13. Check that the shift lever can be moved from the P position. Release the battery terminals, move the shift lever back to the P, and make sure it locks.

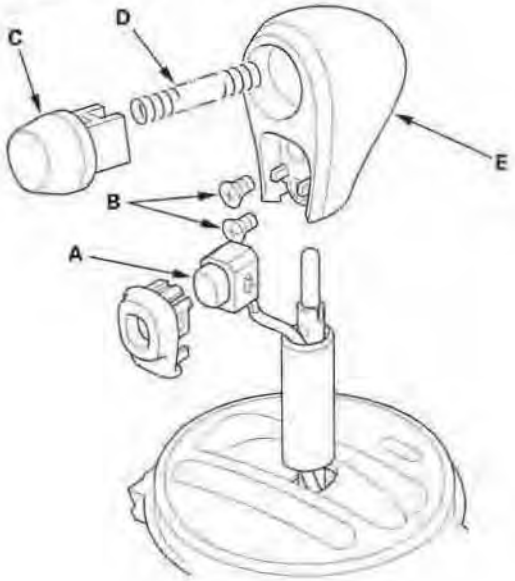
14. If the shift lock solenoid works properly, connect the connector, and install the removed parts. If the shift lock solenoid is faulty, go to step 15, and replace the shift lock solenoid.

15. Remove the shift lever assembly.

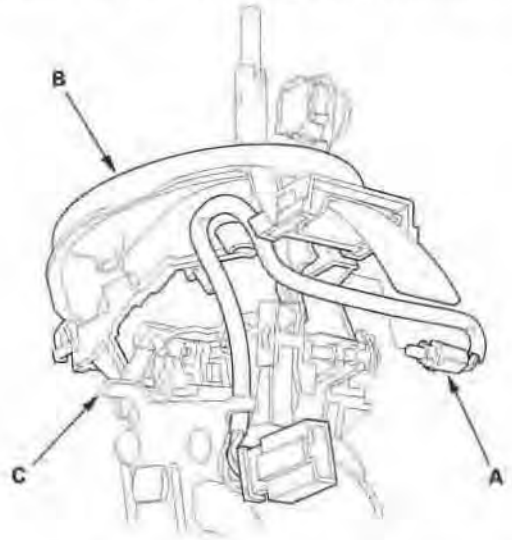
16. Pry the O/D switch cover (A), and remove it.



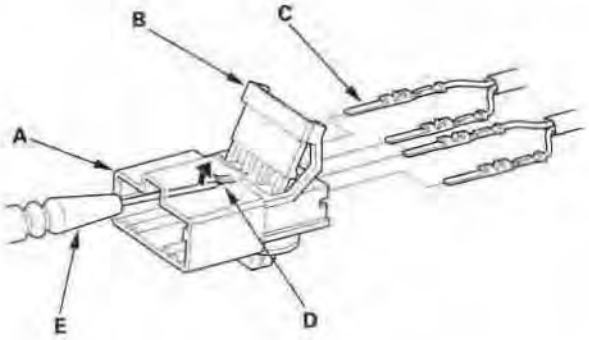
17. Remove the O/D switch (A) by expanding its locks, and remove the screws (B), shift lever button (C), spring (D), and shift lever knob (E).



18. Remove the A/T gear position indicator panel light socket (A), then separate the A/T gear position indicator panel (B) from the shift lever bracket (C).



19. Pry the lock tabs on the back of the O/D switch/shift lock solenoid connector (A), and remove the back cover (B).



20. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all four terminals.

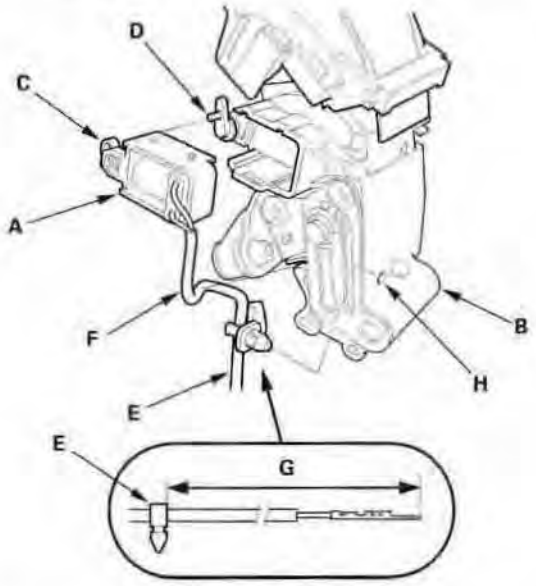
21. Remove the shift lock solenoid harness clamp from the shift lever bracket, and remove the shift lock solenoid.

22. Replace the shift lock solenoid.

(cont'd)

Shift Lock Solenoid Test/Replacement (cont'd)

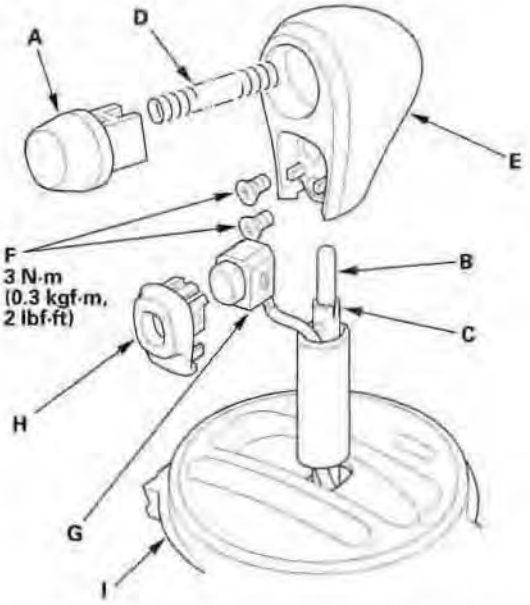
23. Install the new shift lock solenoid (A) on the shift lever/bracket assembly (B) with aligning the shift lock solenoid plunger (C) with the tip of the shift lock stop (D).



24. Install the harness clamp (E) on the shift lock solenoid harness (F) at 128—138 mm (5.0—5.4 in.) (G) from the harness terminal end.

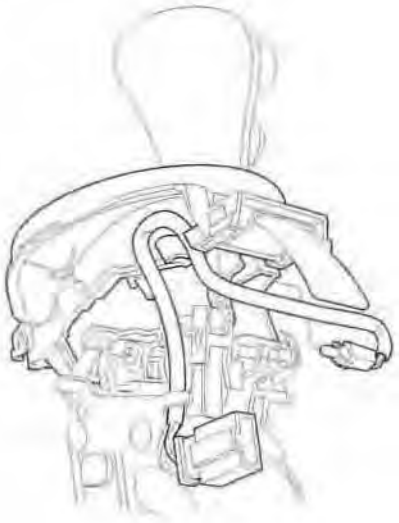
25. Install the clamp in the hole (H) of the shift lever bracket.

26. Apply silicone grease to the shift lever button (A) and push rod (B) of the shift lever (C), and install the spring (D), shift lever button, and shift lever knob (E). Install the screws (F) to secure the shift lever knob to the shift lever.

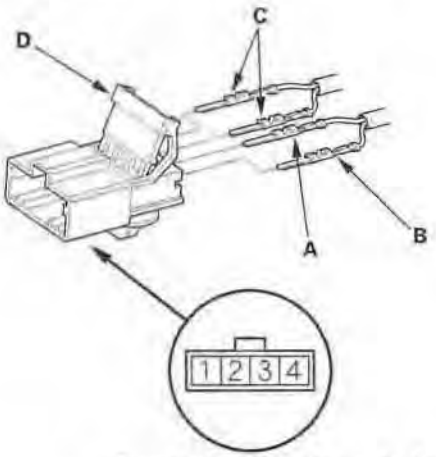


27. Install the O/D switch (G) and the O/D switch cover (H), and install the A/T gear position indicator panel (I) on the shift lever bracket.

28. Install the A/T gear position indicator panel light socket.



29. Install BLU/RED harness terminal (A) of the shift lock solenoid in the No. 3 cavity, and BLK harness terminal (B) in the No. 4 cavity.



Terminal side of male terminals

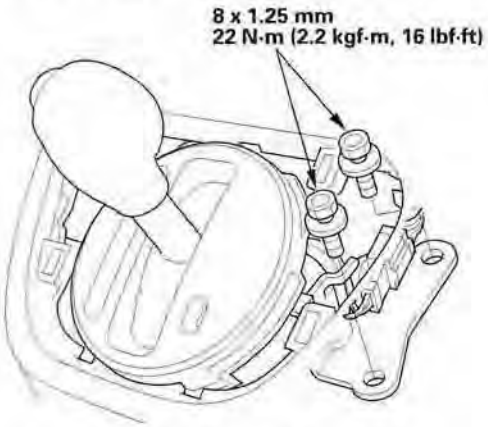
30. Install the O/D switch harness terminals (C) in the No. 1 and No. 2 cavities. Either O/D switch harness terminal can be installed in No. 1 and No. 2 cavities.

31. Make sure that the all four terminals lock securely, then install the back cover (D) securely in place.

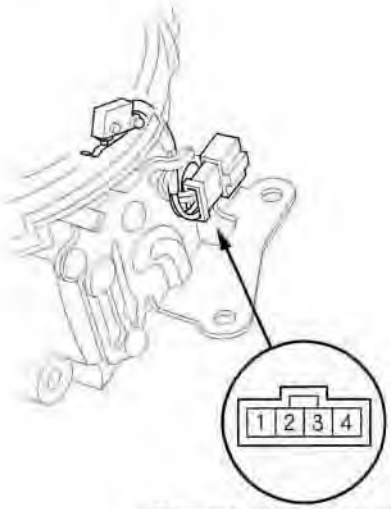
32. Install the shift lever assembly (see page 14-212).

Park Pin Switch Test

1. Remove the shift lever console trim (see page 20-76).
2. Remove the shift lever mounting bolts.



3. Disconnect the park pin switch connector.

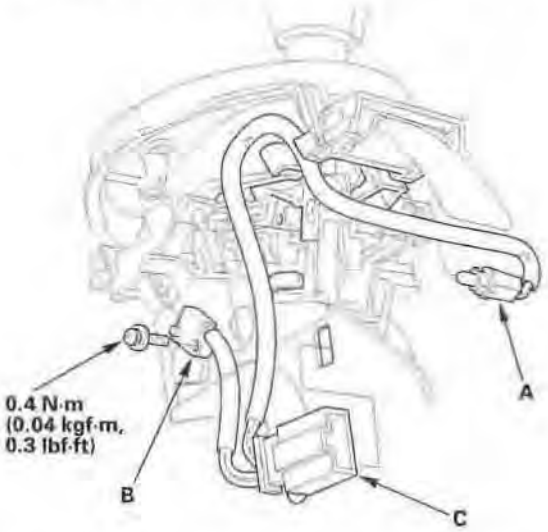


Terminal side of male terminals

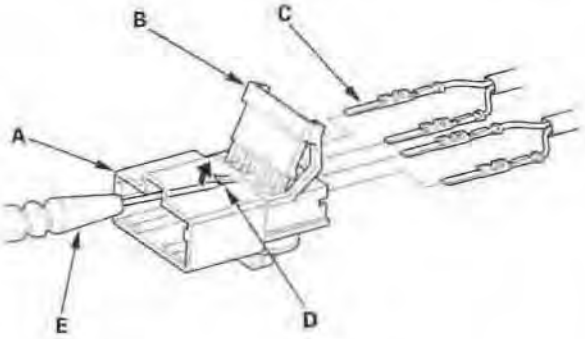
4. Shift the shift lever into the P position and release the shift lever button, then check for continuity between connector terminals No. 1 and No. 2. There should be no continuity.
5. Shift out of the P position or press the shift lever button while in the P position, and check for continuity between connector terminals No. 1 and No. 2. There should be continuity.
6. If the park pin switch is faulty, replace it.

Park Pin Switch Replacement

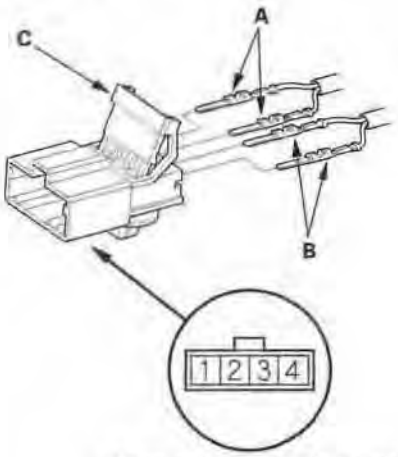
1. Remove the shift lever assembly (see page 14-210).
2. Remove the A/T gear position indicator panel light socket (A).



3. Remove the park pin switch (B) and the switch connector (C).
4. Pry the lock tabs on the back of the park pin switch connector (A), and remove the back cover (B).



5. Remove the terminal (C) from the connector by pushing the lock tab (D) up in the connector using a thin blade screwdriver (E). Remove all four terminals.
6. Replace the park pin switch with the new one.
7. Install GRN harness terminals (A) of the park pin switch in the No. 1 and No. 2 cavities. Either park pin switch harness terminal can be installed in No. 1 and No.2.



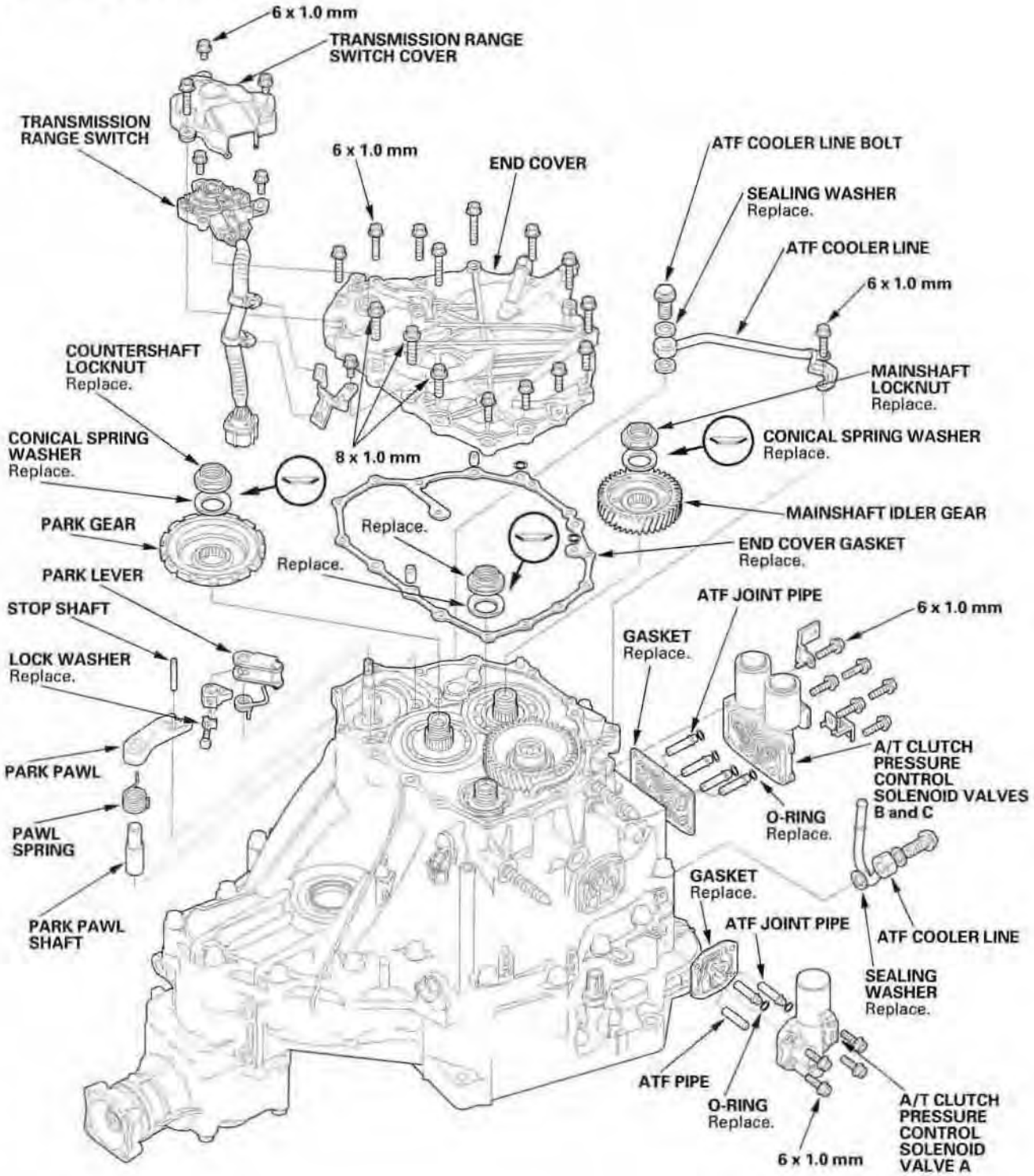
Terminal side of male terminals

8. Install the RED/BLK harness terminals (B) in the No. 3 and No. 4 cavities. Either A/T gear position indicator panel light harness terminal can be installed in No. 3 and No. 4 cavities.
9. Make sure that the all four terminals lock securely, then install the back cover (C) securely in place.
10. Install the park pin switch. Apply non-hardening thread lock sealant to screw threads, and secure the switch with the screw.
11. Install the A/T gear position indicator panel light socket, and install the connector.
12. Install the shift lever assembly (see page 14-212).

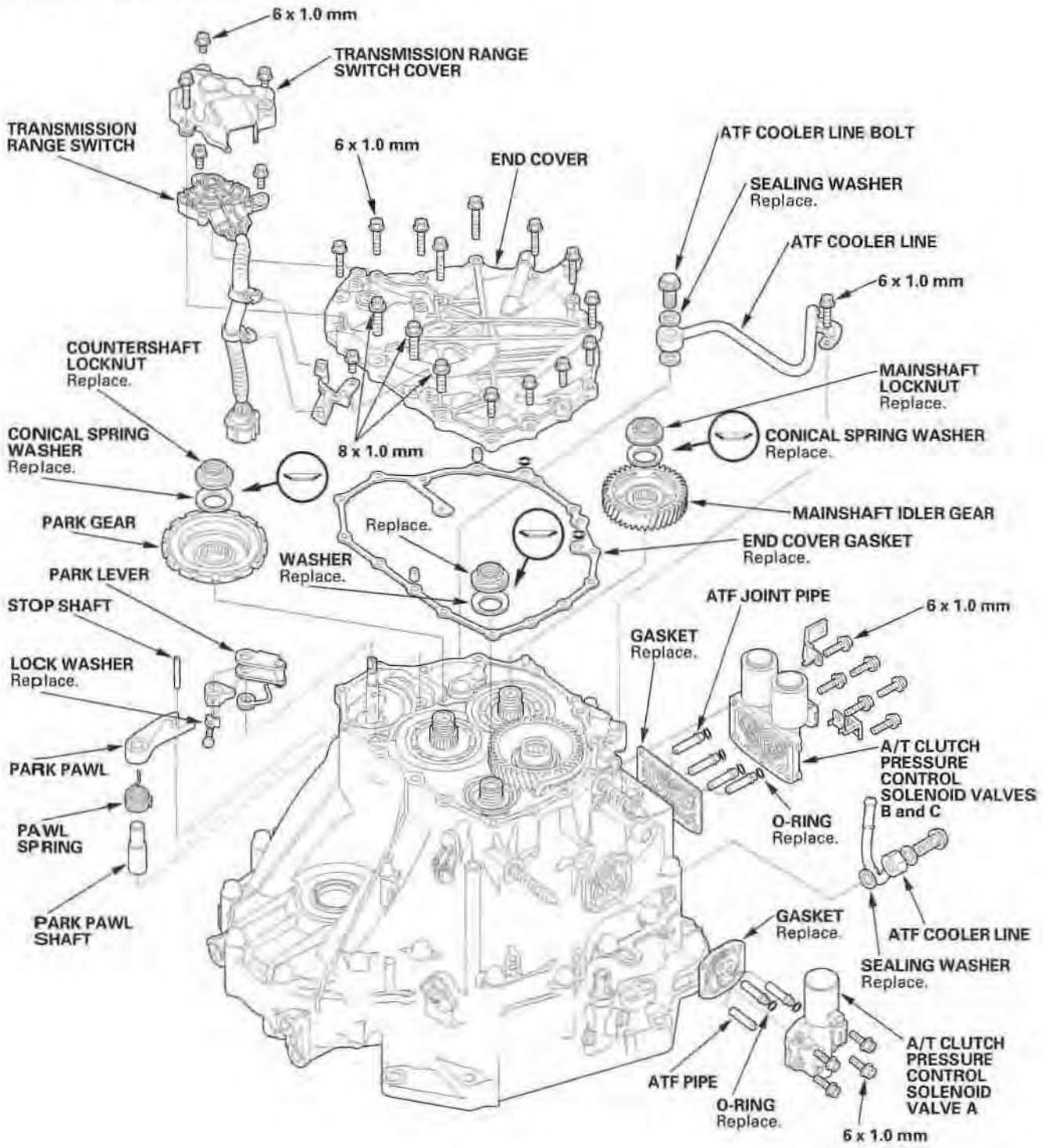
Transmission End Cover

End Cover Removal

Exploded View - 4WD



Exploded View - 2WD



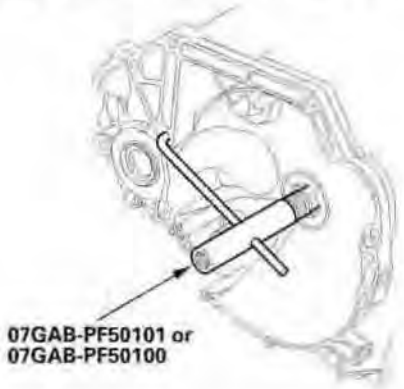
(cont'd)

End Cover Removal (cont'd)

Special Tools Required
Mainshaft holder 07GAB-PF50101 or 07GAB-PF50100

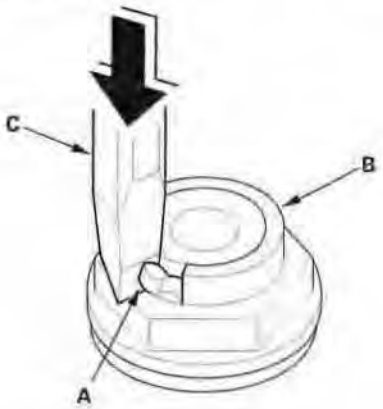
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF cooler lines.
2. Remove the A/T clutch pressure control solenoid valve A, then remove the ATF pipe, ATF joint pipes, and gasket.
3. Remove A/T clutch pressure control solenoid valves B and C, then remove the ATF joint pipes and gasket.
4. Remove the transmission range switch cover.
5. Remove the transmission range switch harness clamps from the clamp brackets, then remove the transmission range switch.
6. Remove the end cover.
7. Slip the special tool onto the mainshaft.



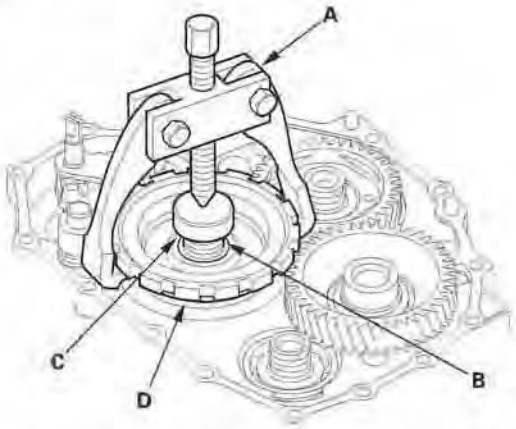
8. Engage the park pawl with the park gear.
9. Cut the lock tab (A) of each shaft locknut (B) using a chisel (C). Then remove the locknuts and conical spring washers from each shaft.

   NOTE:
   - Countershaft and secondary shaft locknuts have left-hand threads.
   - Keep all of the chiseled particles out of the transmission.
   - Clean the old mainshaft and countershaft locknuts; they are used to install the press fit idler gear on the mainshaft, and park gear on the countershaft.

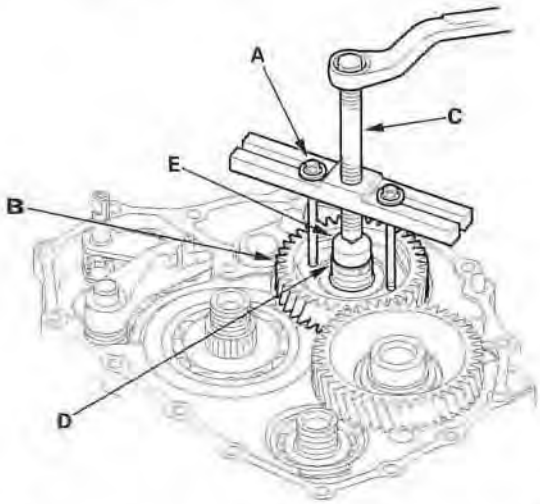


10. Remove the special tool from the mainshaft.

11. Set a two-jaw (or three-jaw) puller (A) on the countershaft (B) by putting a spacer (C) between the puller and countershaft, then remove the park gear (D).



12. Install 6 x 1.0 mm bolts (A) on the mainshaft idler gear (B). Set a puller (C) on the mainshaft (D) by putting a spacer (E) between the puller and mainshaft, then remove the mainshaft idler gear.



13. Remove the park pawl, park pawl spring, park pawl shaft, and stop shaft.

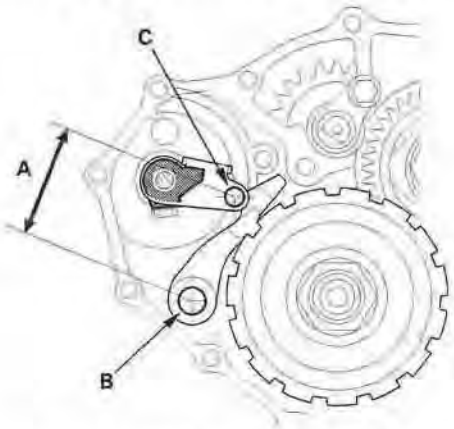
14. Remove the park lever from the selector control shaft.

Park Lever Stop Inspection and Adjustment

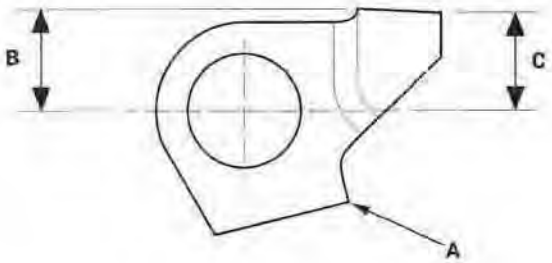
1. Set the park lever in the P position.

2. Measure the distance (A) between the park pawl shaft (B) and the park lever roller pin (C).

Standard: 57.7—58.7 mm (2.27—2.31 in.)



3. If the measurement is out of standard, select and install the appropriate park lever stop (A) from the table.



PARK LEVER STOP

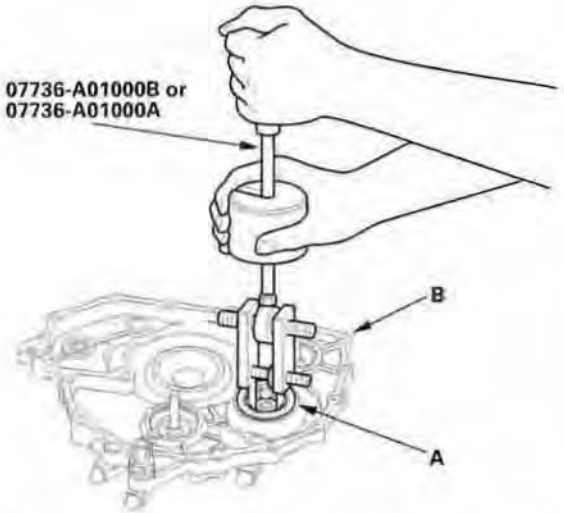
Mark	Part Number	B	C
1	24537-PA9-003	11.00 mm (0.433 in.)	11.00 mm (0.433 in.)
2	24538-PA9-003	10.80 mm (0.425 in.)	10.65 mm (0.419 in.)
3	24539-PA9-003	10.60 mm (0.417 in.)	10.30 mm (0.406 in.)

4. After replacing the park lever stop, make sure the distance is within tolerance.

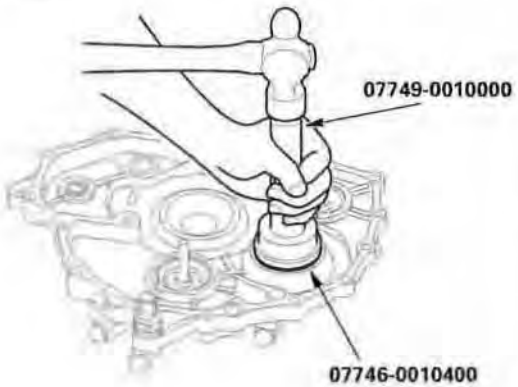
Idler Gear Shaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400

1. Remove the idler gear shaft bearing (A) from the end cover (B) with the special tool.



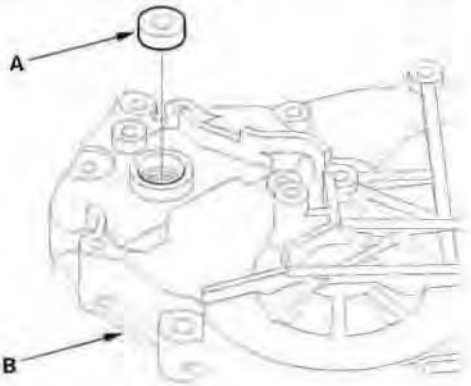
2. Install the new bearing in the end cover with the special tools.



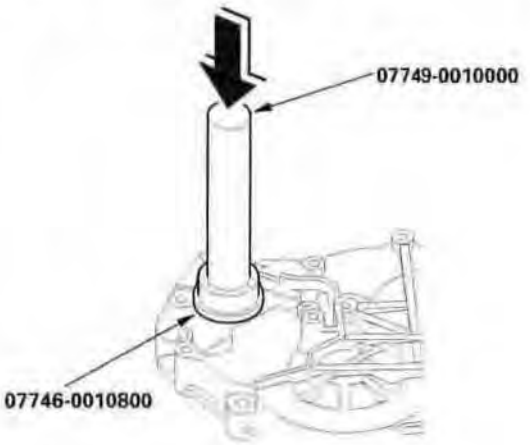
Selector Control Shaft Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the end cover (B).



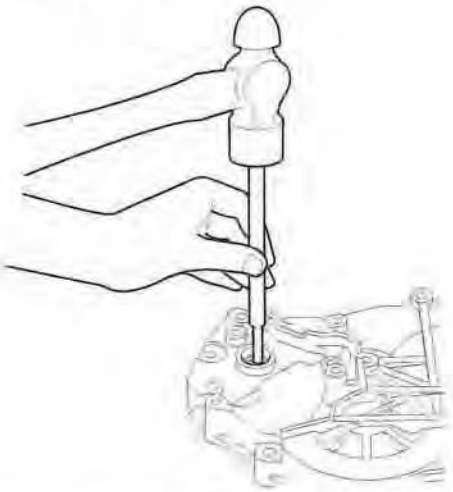
2. Install the new oil seal flush to the end cover with the special tools.



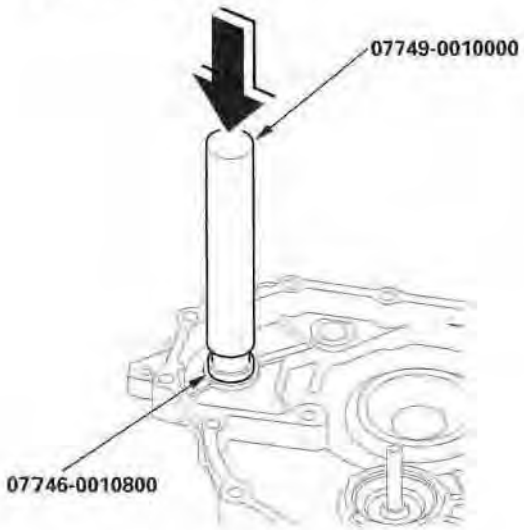
Selector Control Shaft Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal from the end cover, then remove the bearing.



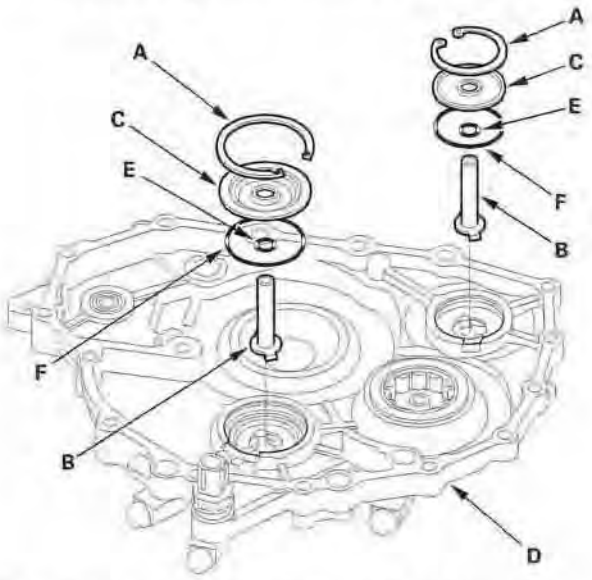
2. Install the new bearing flush to the end cover with the special tools.



3. Install the new oil seal (see page 14-256)

ATF Feed Pipe Replacement

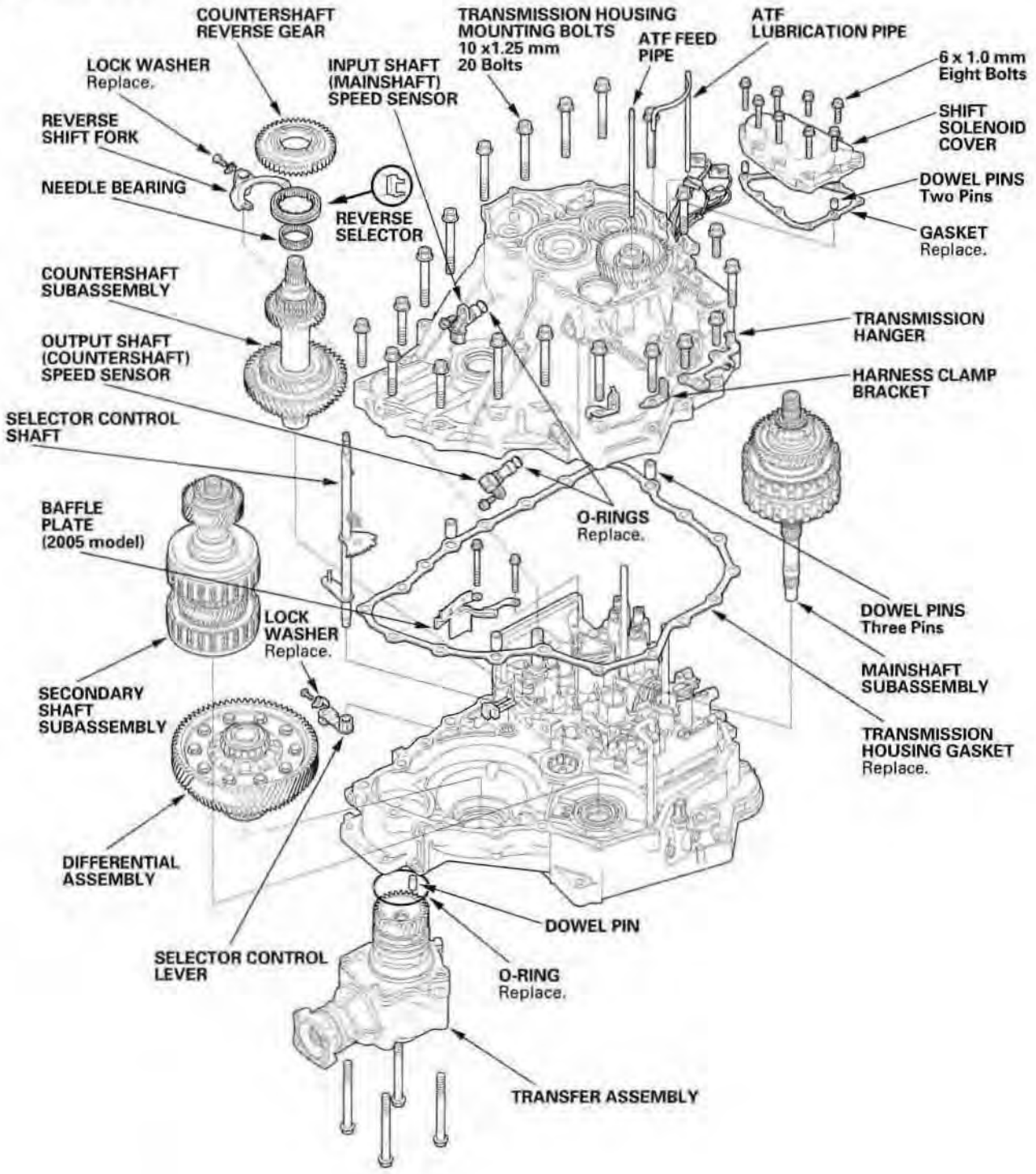
1. Remove the snap rings (A), ATF feed pipes (B), and feed pipe flanges (C) from the end cover (D).



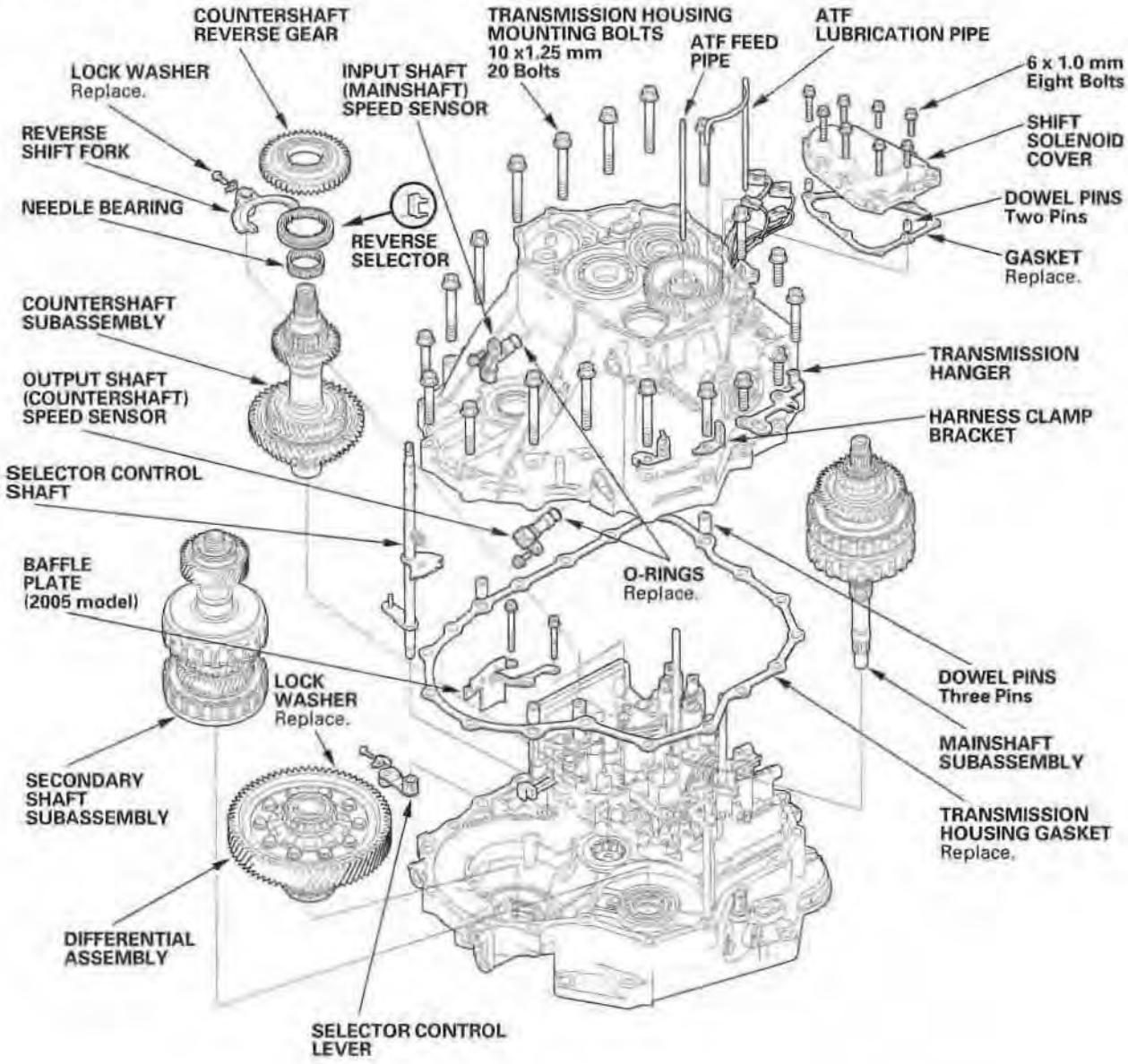
2. Install the new O-ring (E) over the ATF feed pipe.
3. Install the ATF feed pipe in the end cover by aligning the feed pipe tabs with the indentations in the end cover.
4. Install the new O-ring (F) in the end cover, then install the feed pipe flange over the ATF feed pipe and O-ring.
5. Secure the ATF feed pipe and feed pipe flange with the snap ring.

Housing and Shaft Assembly Removal

Exploded View - 4WD



Exploded View - 2WD



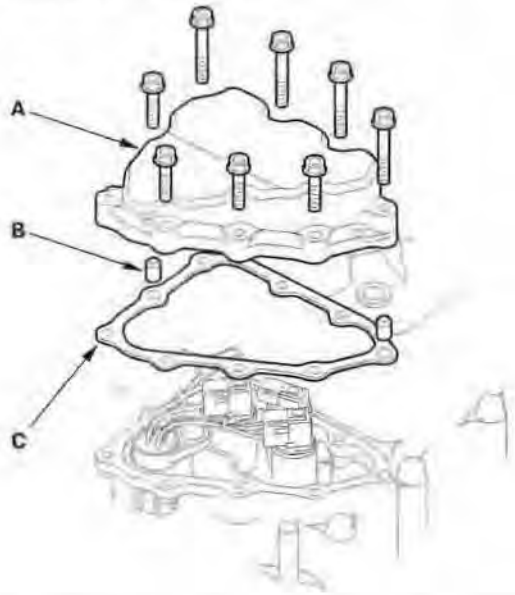
(cont'd)

Housing and Shaft Assembly Removal (cont'd)

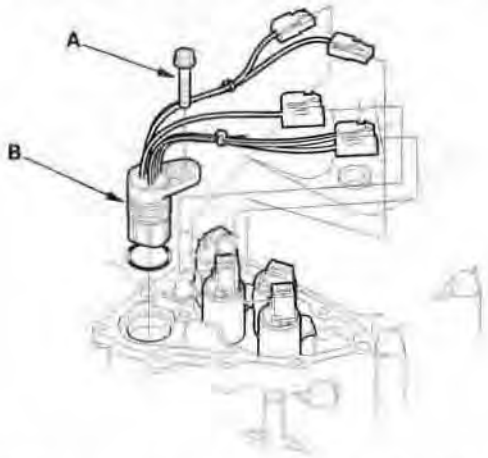
Special Tools Required
Housing puller 07HAC-PK40102

NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipe from the idler gear shaft, and the ATF lubrication pipe from the transmission housing.
2. Remove the shift solenoid valve cover (A), dowel pins (B), and gasket (C).

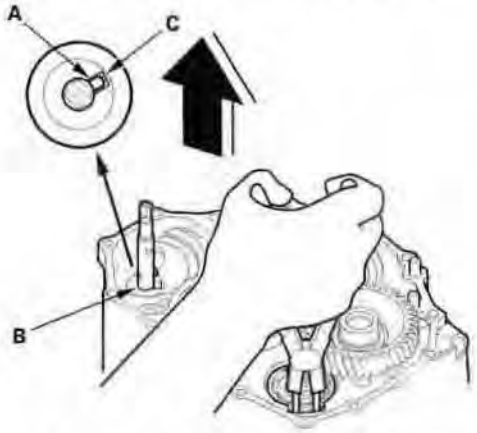


3. Remove the bolt (A) securing the solenoid harness connector (B), and remove the connector.



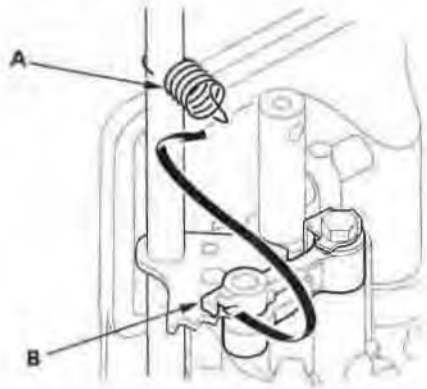
4. Disconnect the connectors from the shift solenoid valves.
5. Remove the mainshaft and countershaft speed sensors.
6. Remove the transmission housing mounting bolts, hanger, and harness clamp brackets.
7. Align the spring pin (A) on the selector control shaft (B) with the transmission housing groove (C) by turning the selector control shaft.

   NOTE: Do not squeeze the end of the selector control shaft tips together when turning the shaft. If the tips are squeezed together it could cause a faulty signal or position due to the play between the selector control shaft and the switch.

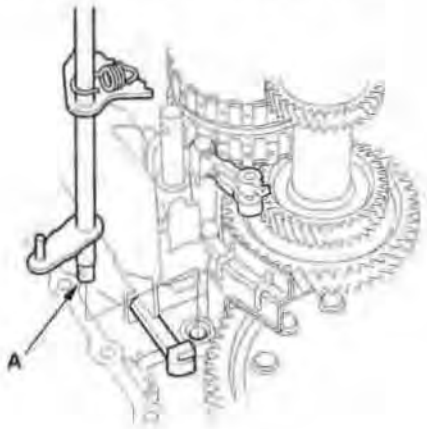


8. While expanding the snap ring of the secondary shaft bearing using the snap ring pliers, lift the transmission housing. Release the snap ring pliers, and remove the transmission housing.
9. Remove the countershaft reverse gear and needle bearing.
10. Remove the lock bolt securing the shift fork, then remove the shift fork with the reverse selector together.
11. Remove the selector control lever from the selector control shaft.

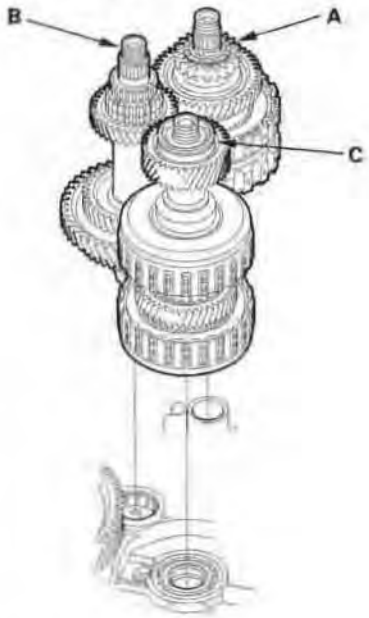
12. Unhook the detent spring (A) from the detent arm (B).



13. Remove the selector control shaft (A).



14. Remove the mainshaft subassembly (A), countershaft subassembly (B), and secondary shaft subassembly (C) together.



15. Remove the differential assembly.
16. 2005 model: Remove the baffle plate.
17. 4WD model: Remove the transfer assembly.

Bearing Removal

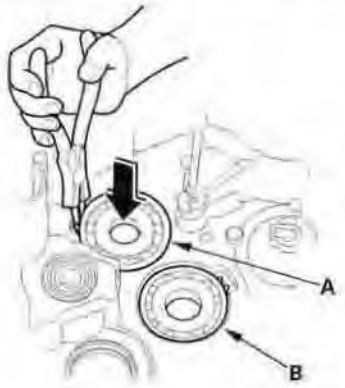
Special Tools Required
- Attachment, 78 x 90 mm 07GAD-SD40101
- Driver 07749-0010000
- Attachment, 42 x 47 mm 07746-0010300

1. Remove the idler gear shaft when removing the mainshaft bearing and idler gear shaft bearing.

   NOTE: If you are only removing the countershaft bearing, idler gear shaft removal is not needed.

2. To remove the mainshaft bearing (A) and countershaft bearing (B) from the transmission housing, expand each snap ring with the snap ring pliers, then push the bearing out.

   NOTE: Do not remove the snap ring unless it's necessary to clean the grooves in the housing.



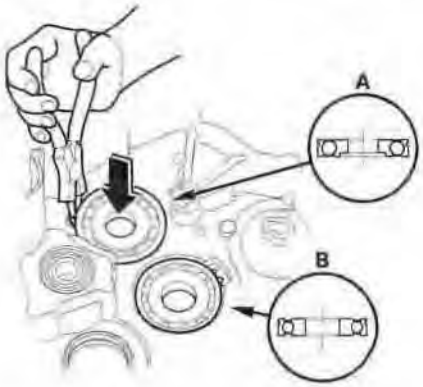
3. Expand the snap ring of the idler gear shaft bearing with the snap ring pliers, then push the bearing out.

Bearing Installation

Special Tools Required
- Attachment, 78 x 90 mm 07GAD-SD40101
- Driver 07749-0010000
- Attachment, 42 x 47 mm 07746-0010300

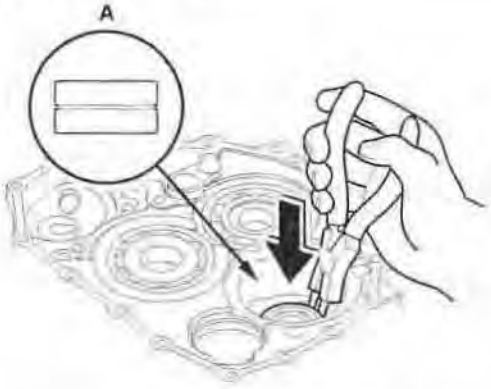
1. Install the bearings in the direction shown.

2. Expand each snap ring with the snap ring pliers, and install the mainshaft bearing (A) and countershaft bearing (B) part-way into the housing.



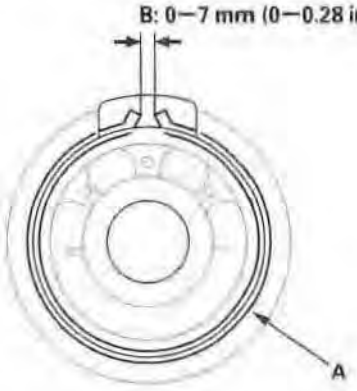
3. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.

4. Expand the snap ring of the idler gear shaft (A) with the snap ring pliers, and install the bearing part-way into the housing.



5. Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.

6. After installing the bearings verify that the snap rings (A) are seated in the bearing and housing grooves, and that the ring end gaps (B) are correct.

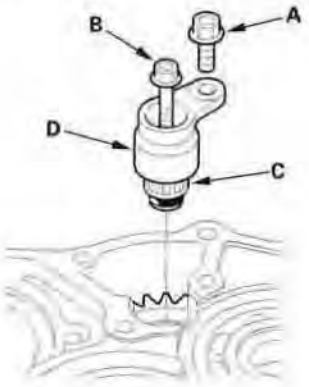


7. Install the idler shaft.

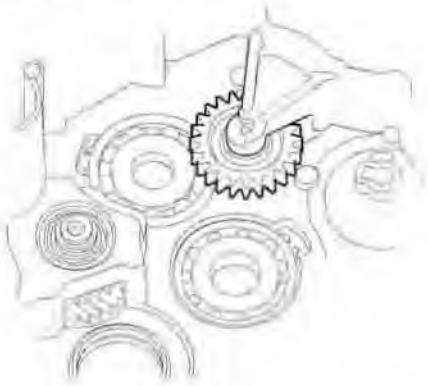
Reverse Idler Gear Removal and Installation

Removal

1. Remove the bolt (A) securing the reverse idler gear shaft holder.

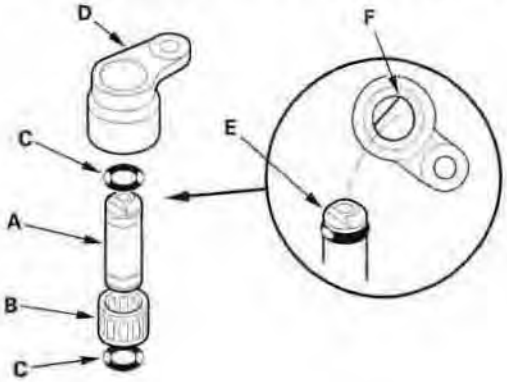


2. Install a 5 x 0.8 mm bolt (B) in the reverse idler gear shaft, and pull it to remove the reverse idler gear shaft (C) and gear shaft holder (D) together.
3. Remove the reverse idler gear.

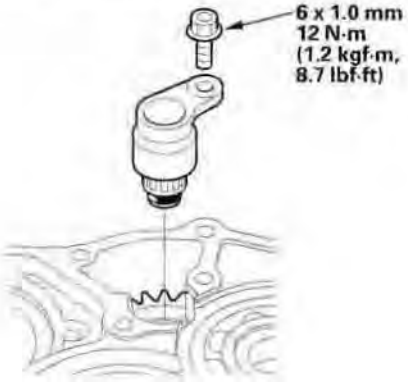


Installation

1. Install the reverse idler gear in the transmission housing.
2. Coat the reverse idler gear shaft (A), needle bearing (B), and new O-rings (C) with lithium grease lightly.



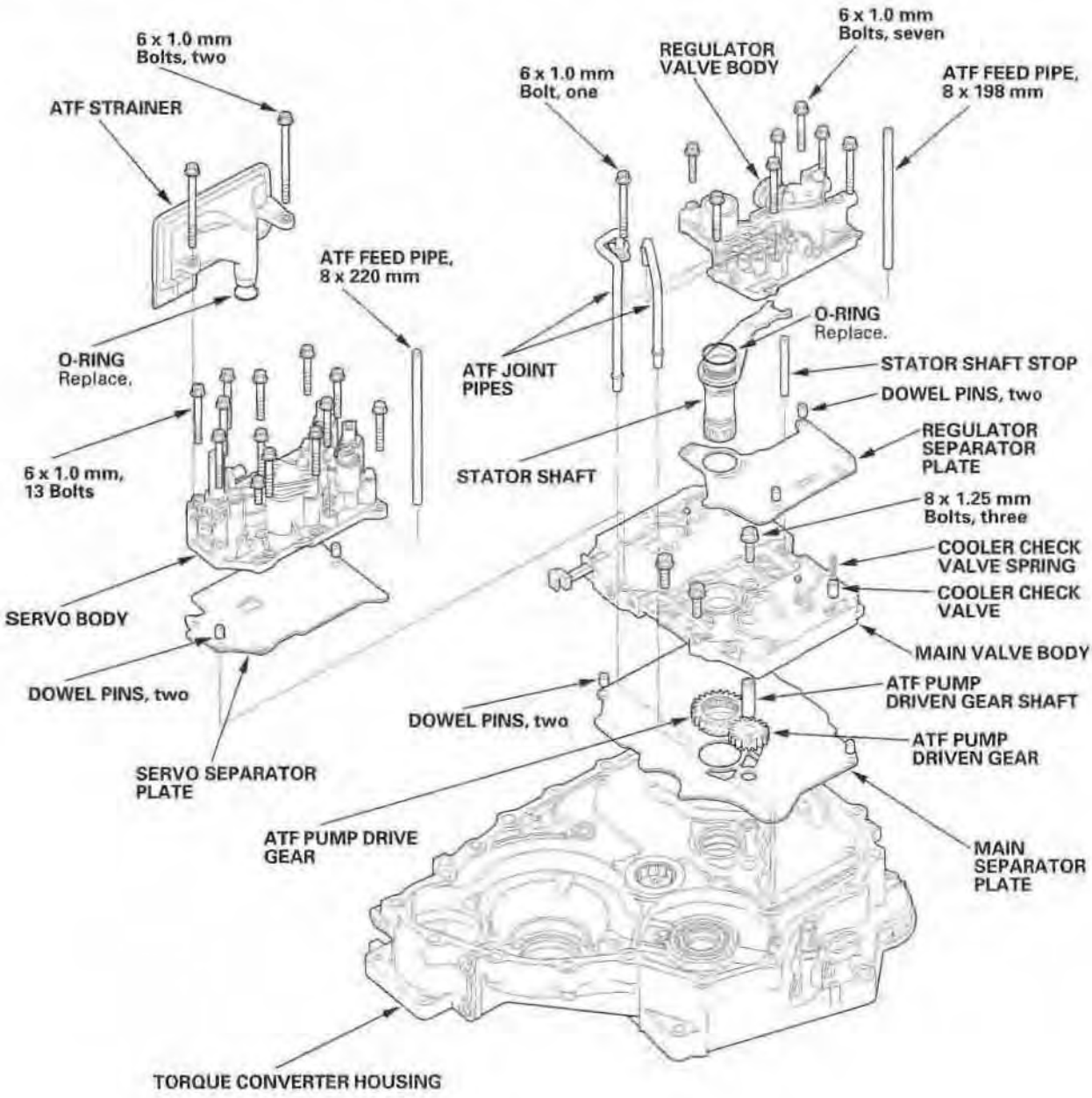
3. Assemble the new O-rings and needle bearing on the reverse idler gear shaft, then install the reverse idler gear shaft in the reverse idler gear shaft holder (D). Align the D-shaped cut out (E) of the shaft with the D-shaped area (F) of the holder.
4. Install the reverse idler gear shaft/holder assembly on the transmission housing.



Valve Body and ATF Strainer Removal

Exploded View - 2003-2004 Models

NOTE: The illustration shows the 4WD transmission; the 2WD is similar.

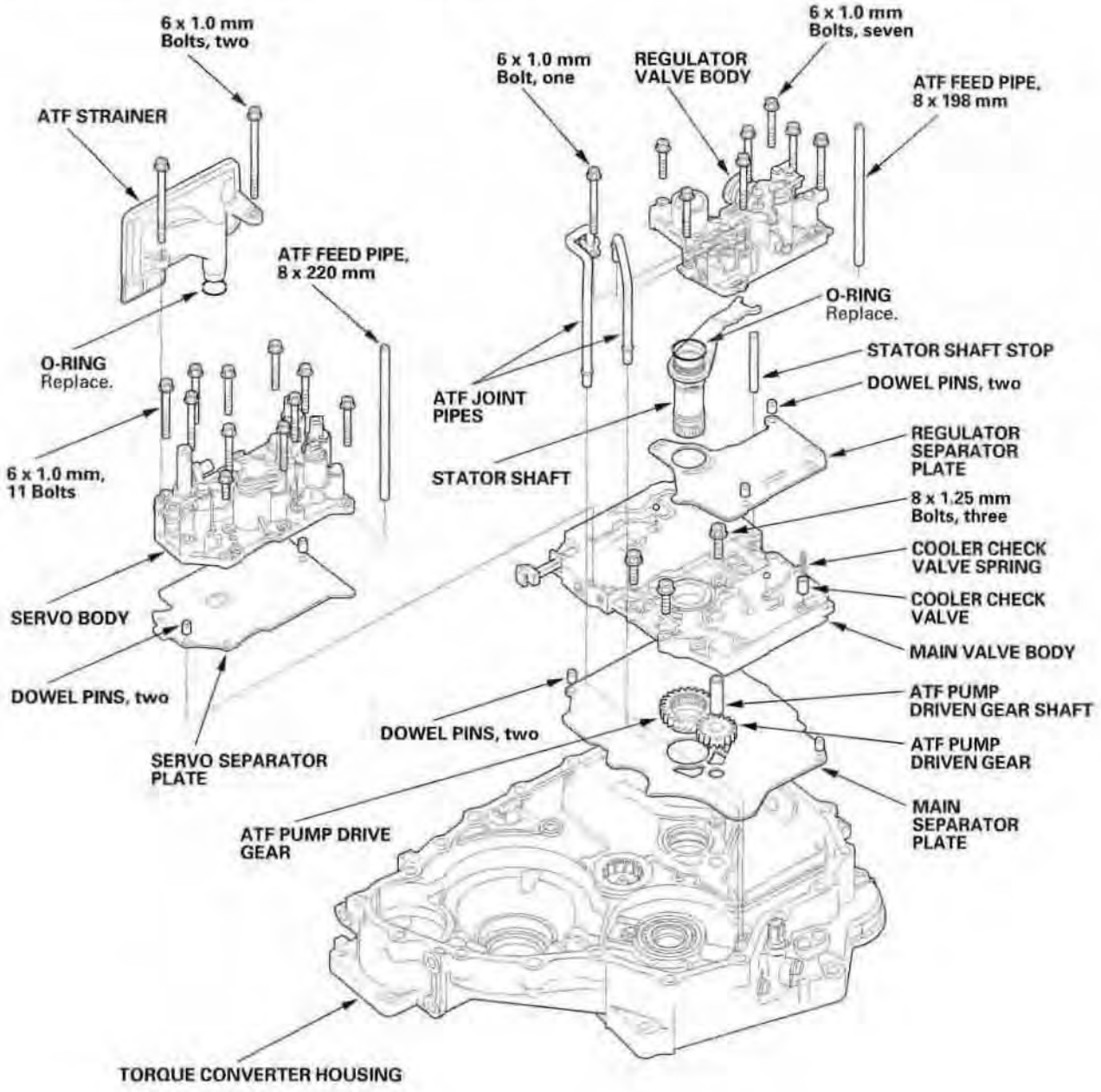


(cont'd)

Valve Body and ATF Strainer Removal (cont'd)

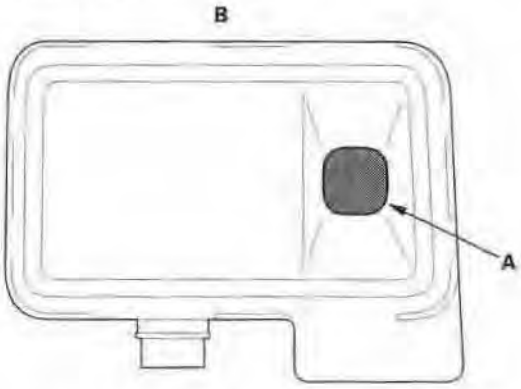
Exploded View - 2005 Model

NOTE: The illustration shows the 4WD transmission; the 2WD is similar.



NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the ATF feed pipes from the regulator valve body and the servo body.
2. Remove the ATF strainer (two bolts).
3. 2003-2004 models: Remove the servo body (13 bolts), then remove the separator plate and dowel pins (two).
4. 2005 model: Remove the servo body (11 bolts), then remove the separator plate and dowel pins (two).
5. Remove the ATF joint pipes (one bolt) from the regulator valve body.
6. Remove the regulator valve body (seven bolts).
7. Remove the stator shaft and stator shaft stop.
8. Remove the regulator separator plate and dowel pins (two).
9. Remove the cooler check valve spring and valve from the main valve body, then remove the main valve body (three bolts). Do not let the check balls fall out.
10. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
11. Remove the main separator plate and dowel pins (two).
12. Clean the inlet opening (A) of the ATF strainer (B) thoroughly with compressed air, then check that it is in good condition and that the inlet opening is not clogged.



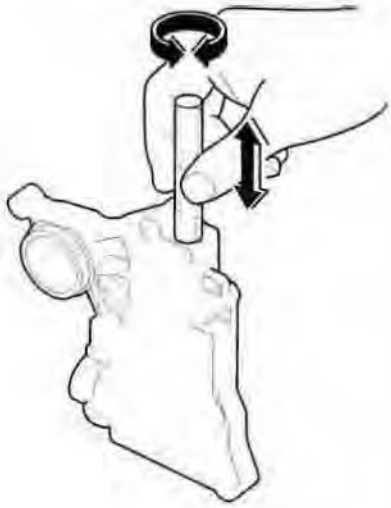
13. Test the ATF strainer by pouring clean ATF through the inlet opening, and replace it if it is clogged or damaged.

Valve Body Repair

NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. Use this procedure to free the valves.

1. Soak a sheet of #600 abrasive paper in ATF for about 30 minutes.
2. Carefully tap the valve body so the sticking valve drops out of its bore. It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.
3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked #600 paper and insert it in the valve bore of the sticking valve. Twist the paper slightly, so that it unrolls and fits the bore tightly, then polish the bore by twisting the paper as you push it in and out.

   NOTE: The valve body is aluminum and doesn't require much polishing to remove any burrs.



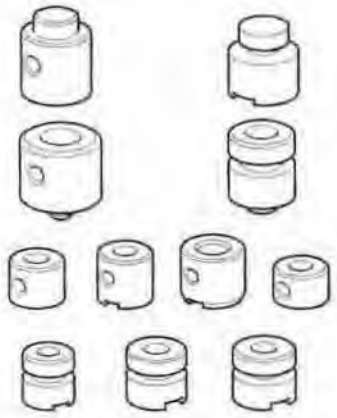
5. Remove the #600 paper. Thoroughly wash the entire valve body in solvent, then dry it with compressed air.
6. Coat the valve with ATF, then drop it into its bore. It should drop to the bottom of the bore under its own weight. If not, repeat step 4, then retest. If the valve still sticks, replace the valve body.

7. Remove the valve, and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

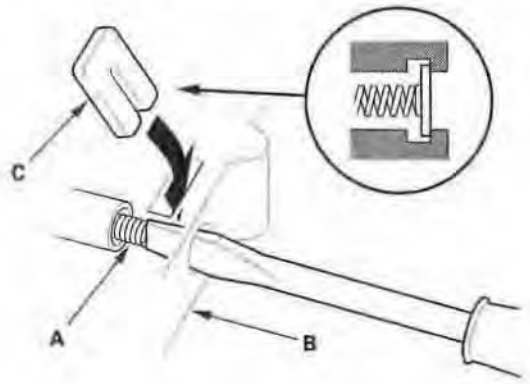
Valve Body Valve Installation

1. Coat all parts with ATF before assembly.

2. Install the valves and springs in the sequence shown for the main valve body (see page 14-270), regulator valve body (2003-2004 models) (see page 14-272), (2005 model) (see page 14-273), and servo body (see page 14-274). Refer to the following valve cap illustrations, and install each valve cap so the end shown facing up will be facing the outside of the valve body.

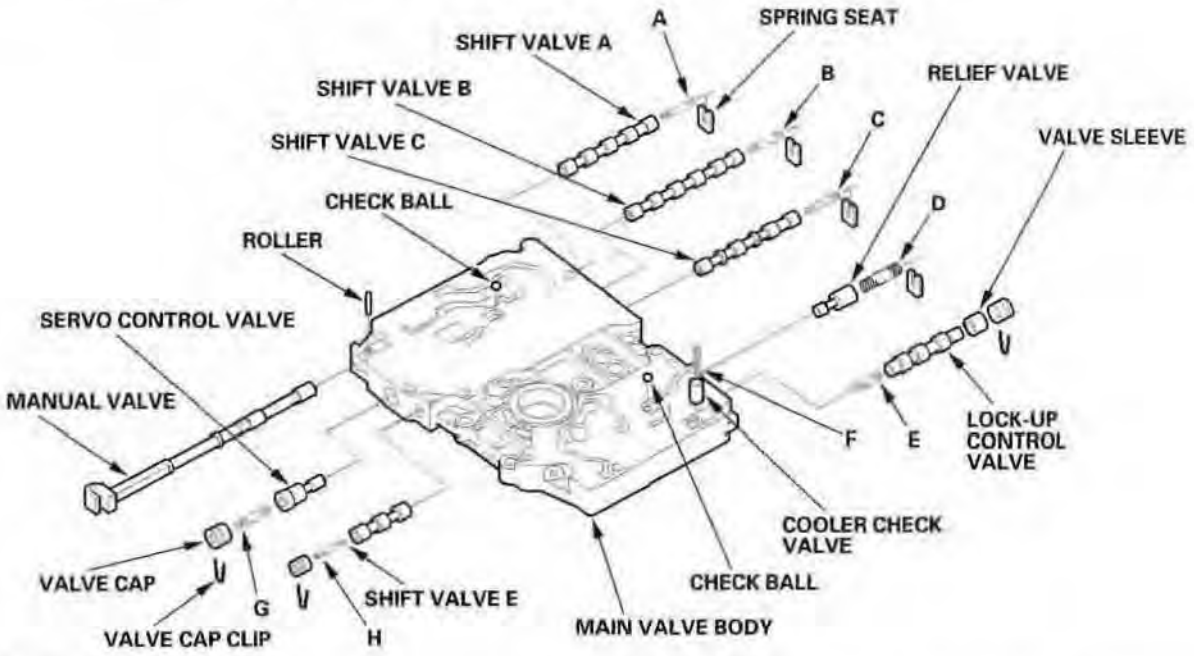


3. Install all the springs and seats. Insert the spring (A) in the valve, then install the valve in the valve body (B). Push the spring in with a screwdriver, then install the spring seat (C).



Main Valve Body Disassembly, Inspection, and Reassembly

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Do not use a magnet to remove the check balls, it may magnetize the balls.
3. Inspect the valve body for scoring and damage.
4. Check all valves for free movement. If any fail to slide freely, refer to valve body repair (see page 14-268).
5. Coat all parts with ATF during assembly.

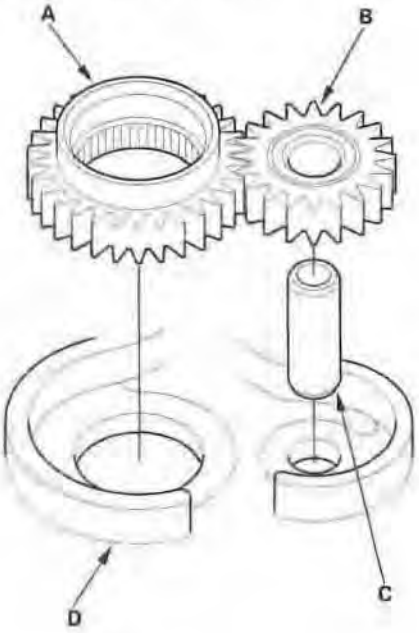


SPRING SPECIFICATIONS

Springs		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Shift valve A spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
B	Shift valve B spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
C	Shift valve C spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9
D	Relief valve spring	1.0 (0.039)	9.6 (0.378)	34.1 (1.343)	10.2
E	Lock-up control valve spring	0.65 (0.026)	7.1 (0.280)	23.1 (0.909)	12.7
F	Cooler check valve spring	0.9 (0.035)	6.6 (0.260)	26.5 (1.043)	12.6
G	Servo control valve spring	0.7 (0.028)	6.6 (0.260)	35.7 (1.406)	17.2
H	Shift valve E spring	0.8 (0.031)	5.6 (0.220)	28.1 (1.106)	15.9

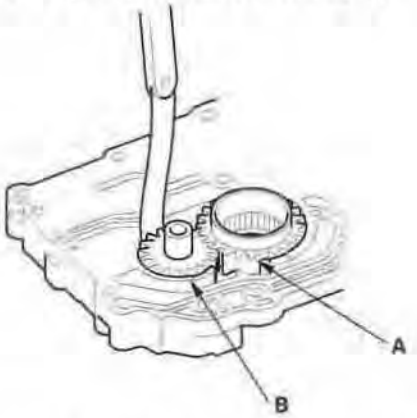
ATF Pump Inspection

1. Install the ATF pump drive gear (A), driven gear (B), and ATF pump driven gear shaft (C) in the main valve body (D). Lubricate all parts with ATF, and install the ATF pump driven gear with its grooved and chamfered side facing up.



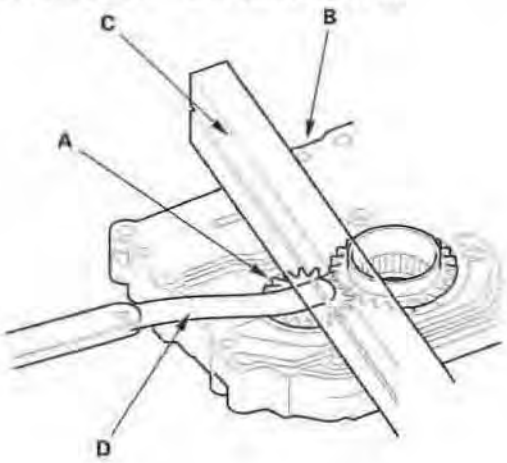
2. Measure the side clearance of the ATF pump drive gear (A) and driven gear (B).

ATF Pump Gears Side (Radial) Clearance:
Standard (New):
ATF Pump Drive Gear
0.210—0.265 mm (0.0083—0.0104 in.)
ATF Pump Driven Gear
0.070—0.125 mm (0.0028—0.0049 in.)



3. Remove the ATF pump driven gear shaft. Measure the thrust clearance between the ATF pump driven gear (A) and the valve body (B) with a straight edge (C) and a feeler gauge (D).

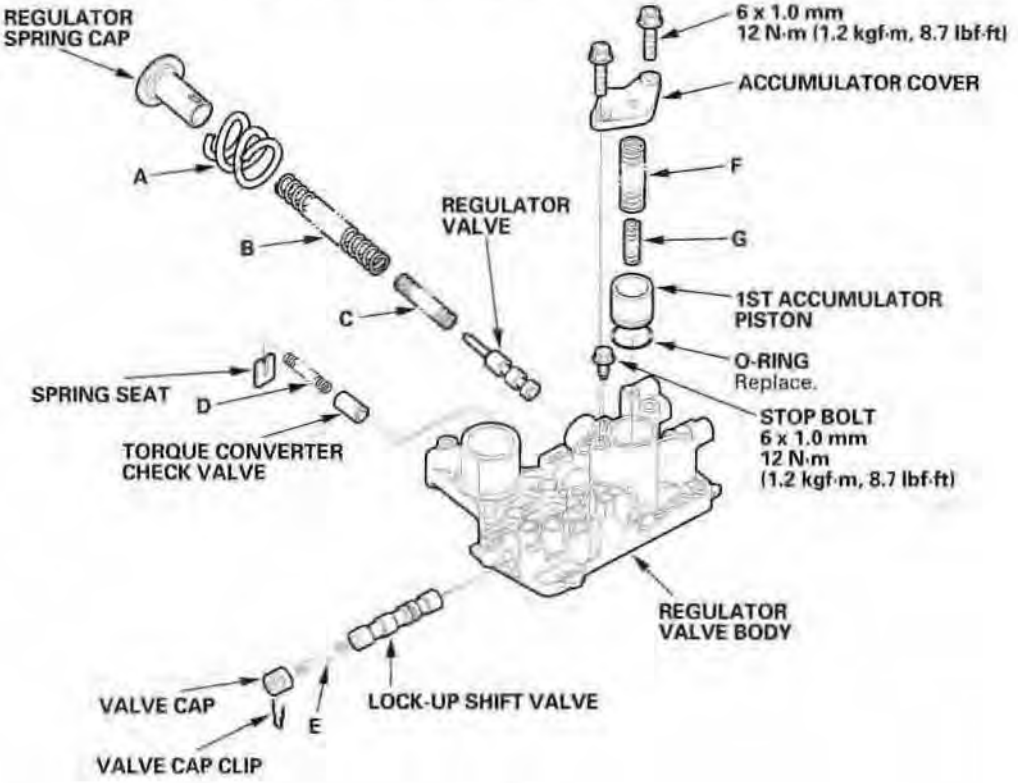
ATF Pump Drive/Driven Gear Thrust (Axial) Clearance:
Standard (New): 0.03—0.05 mm (0.001—0.002 in.)
Service Limit: 0.07 mm (0.003 in.)



Regulator Valve Body Disassembly, Inspection, and Reassembly

2003-2004 Models

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Inspect the valve body for scoring and damage.
3. Check all valves for free movement. If any fail to slide freely, refer to valve body repair (see page 14-268).
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
5. Coat all parts with ATF during assembly.
6. When reassembling the valve body, align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.

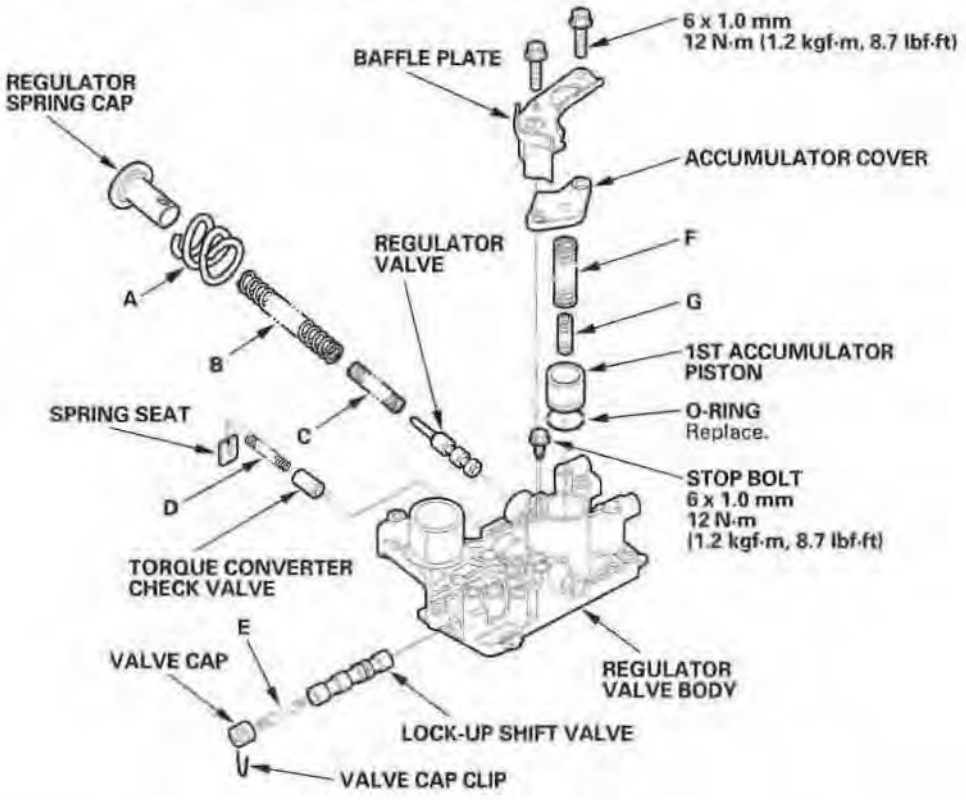


SPRING SPECIFICATIONS

Spring		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
B	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	80.6 (3.173)	16.1
C	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
D	Torque converter check valve spring	1.2 (0.047)	8.6 (0.339)	33.8 (1.331)	12.2
E	Lock-up shift valve spring	1.0 (0.039)	6.6 (0.260)	35.5 (1.398)	18.2
F	1st accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
G	1st accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6

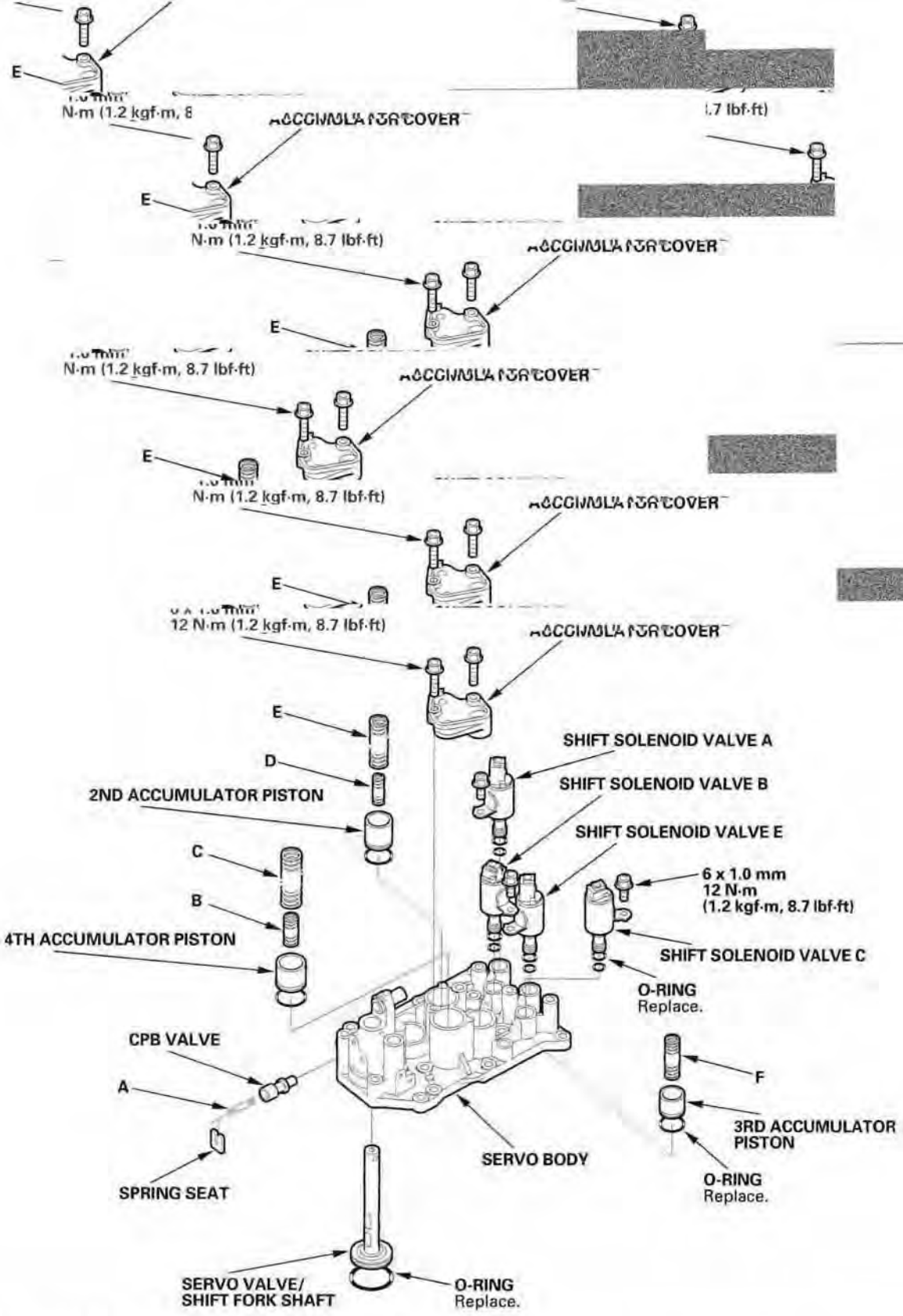
2005 Model

1. Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air. Blow out all passages.
2. Inspect the valve body for scoring and damage.
3. Check all valves for free movement. If any fail to slide freely, refer to valve body repair (see page 14-268).
4. Hold the regulator spring cap in place while removing the stop bolt. The regulator spring cap is spring loaded. Once the stop bolt is removed, release the spring cap slowly so it does not pop out.
5. Coat all parts with ATF during assembly.
6. When reassembling the valve body, align the hole in the regulator spring cap with the hole in the valve body, then press the spring cap into the valve body, and tighten the stop bolt.



SPRING SPECIFICATIONS

	Spring	Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92
B	Regulator valve spring A	1.9 (0.075)	14.7 (0.579)	80.6 (3.173)	16.1
C	Regulator valve spring B	1.6 (0.063)	9.2 (0.362)	44.0 (1.732)	12.5
D	Torque converter check valve spring	1.2 (0.047)	8.6 (0.339)	33.8 (1.331)	12.2
E	Lock-up shift valve spring	1.0 (0.039)	6.6 (0.260)	35.5 (1.398)	18.2
F	1st accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
G	1st accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6



SPRING SPECIFICATIONS

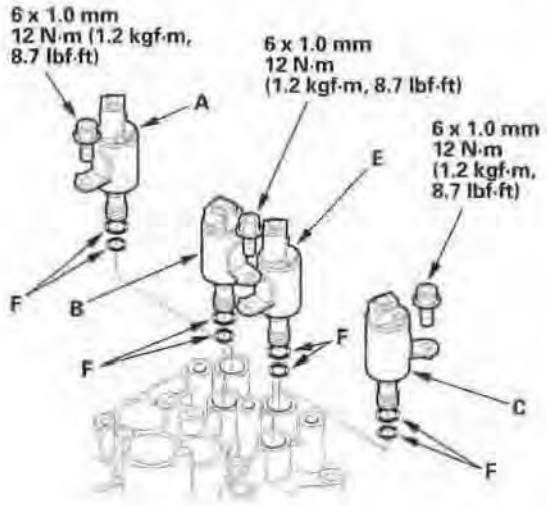
Springs		Standard (New)-Unit: mm (in.)			
		Wire Diameter	O.D.	Free Length	No. of Coils
A	CPB valve spring	0.7 (0.028)	9.1 (0.358)	32.3 (1.272)	8.6
B	4th accumulator spring B	2.3 (0.091)	12.2 (0.480)	31.5 (1.240)	6.6
C	4th accumulator spring A	2.4 (0.094)	18.6 (0.732)	49.0 (1.929)	7.1
D	2nd accumulator spring B	2.0 (0.079)	10.6 (0.417)	34.0 (1.339)	8.0
E	2nd accumulator spring A	2.2 (0.087)	16.6 (0.654)	48.2 (1.898)	8.5
F	3rd accumulator spring	2.5 (0.098)	14.6 (0.575)	29.9 (1.177)	4.9

Shift Solenoid Valve Installation

NOTE:
- Do not install the shift solenoid valve B before installing the shift solenoid valve E. If solenoid valve B is installed before solenoid valve E, it may damage the hydraulic control system.
- Do not hold the shift solenoid valve connector to install it. Be sure to hold the shift solenoid valve body.

1. Install new O-rings (F) on each shift solenoid valve.

   NOTE: The new shift solenoid valve is equipped with new O-rings. If you install a new shift solenoid valve, there is no need to replace its O-rings.



2. Install shift solenoid valve A by holding the shift solenoid valve body; be sure the mounting bracket contacts the servo body.

3. Install shift solenoid valve E by holding the shift solenoid valve body; be sure the mounting bracket contacts the servo body.

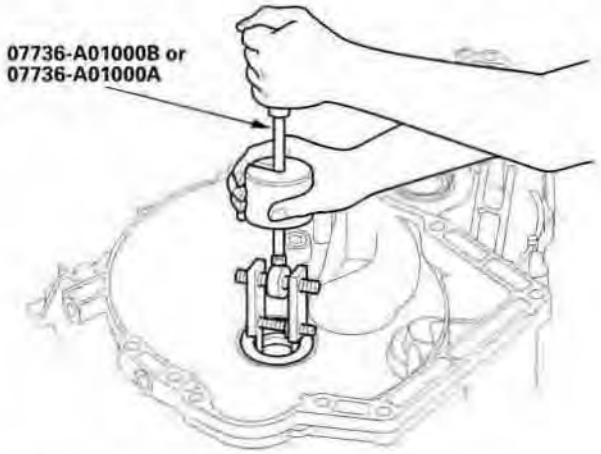
4. Install shift solenoid valve B by holding the shift solenoid valve body; be sure the mounting bracket contacts the bracket on shift solenoid valve E.

5. Install the shift solenoid valve C by holding the shift solenoid valve body; be sure the mounting bracket contacts the servo body.

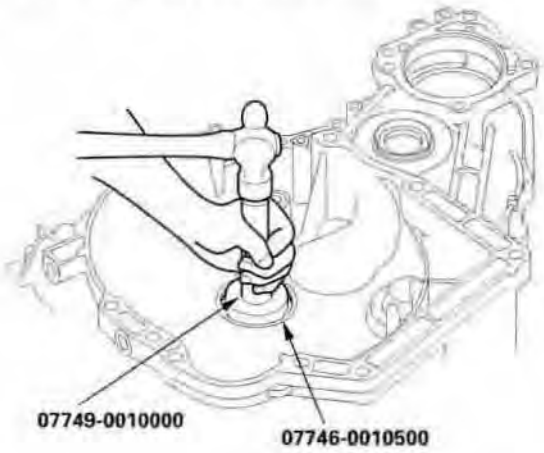
Mainshaft Bearing and Oil Seal Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500
- Attachment, 72 x 75 mm 07746-0010600

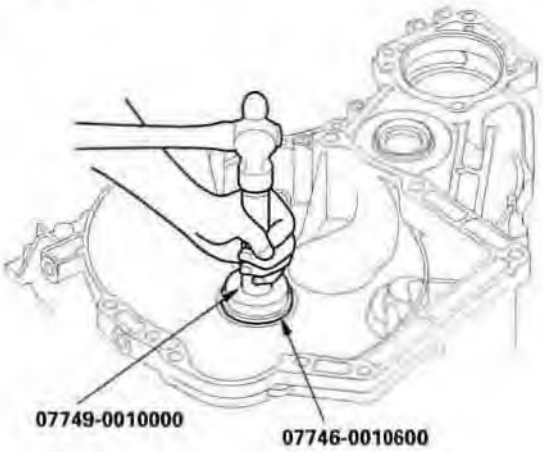
1. Remove the mainshaft bearing and oil seal with the special tool.



2. Install the new mainshaft bearing until it bottoms in the housing with the special tools.



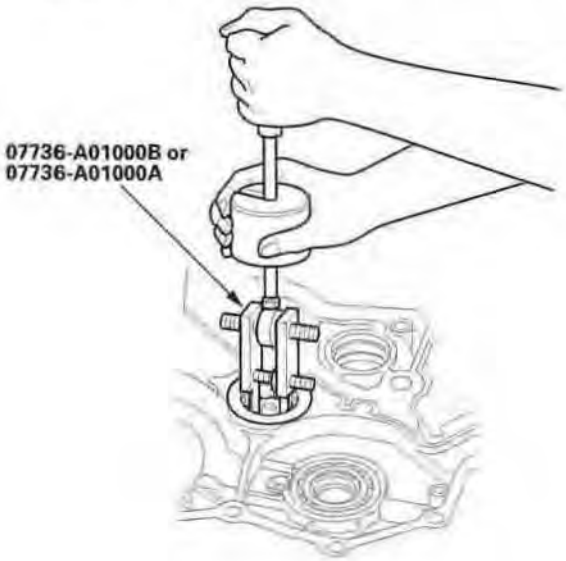
3. Install the new oil seal flush in the housing with the special tools.



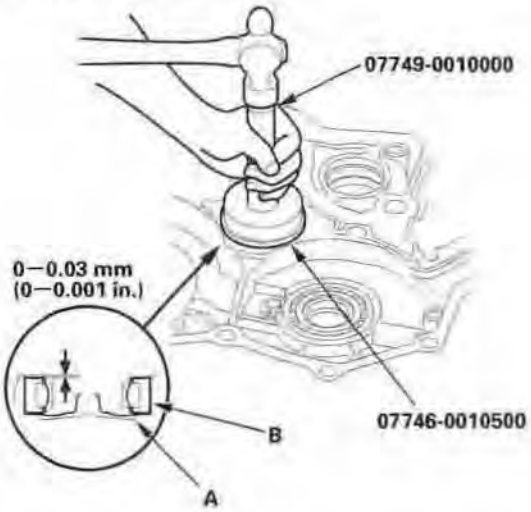
Countershaft Bearing Replacement

Special Tools Required
- Adjustable bearing puller, 25—40 mm 07736-A01000B or 07736-A01000A
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the countershaft bearing with the special tool.



2. Install the ATF guide plate (A).

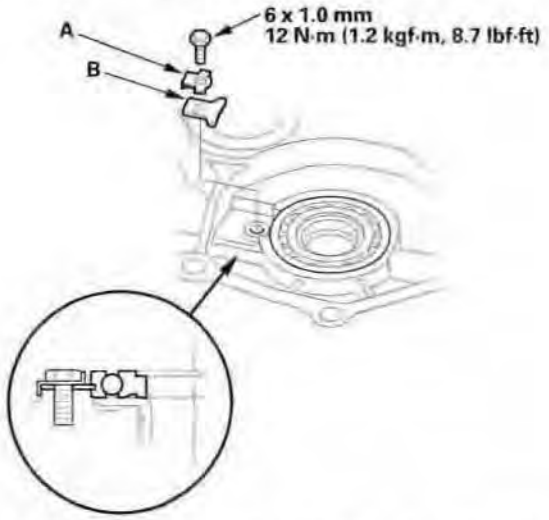


3. Install the new countershaft bearing (B) in the housing with the special tools.

Secondary Shaft Bearing Replacement

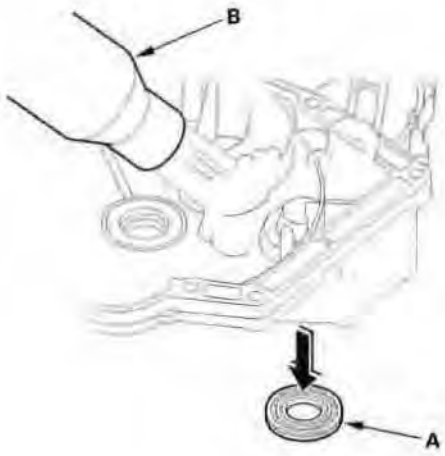
Special Tools Required
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the bolt, then remove the lock washer (A) and bearing set plate (B).

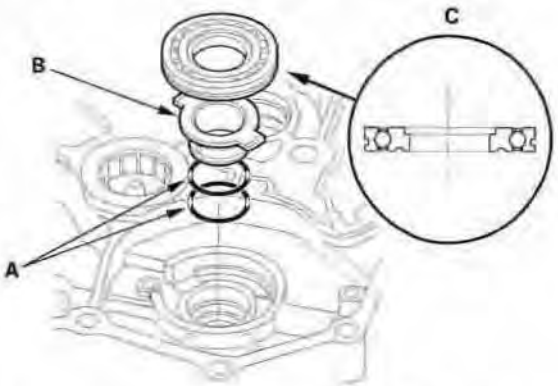


2. Remove the secondary shaft bearing (A) by heating the housing to about 212 °F (100 °C) with a heat gun (B). Do not heat the housing in excess of 212 °F (100 °C).

   NOTE: Let the housing cool to normal temperature before installing the bearing.



3. Install the new O-rings (A) on the ATF guide collar (B), then install the ATF guide collar in the housing.



4. Install the new secondary shaft bearing (C) in the direction shown.

5. Drive the secondary shaft bearing with the special tools, and install it securely in the housing.

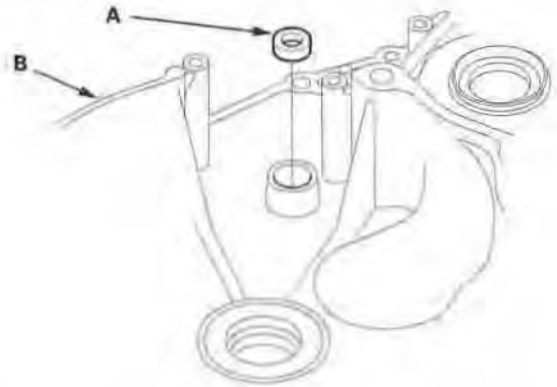
6. Check that the bearing groove aligns with the housing surface, then install the bearing set plate with aligning the bearing groove.

7. Install the new lock washer and bolt, then bend the lock tab of the lock washer against the bolt head.

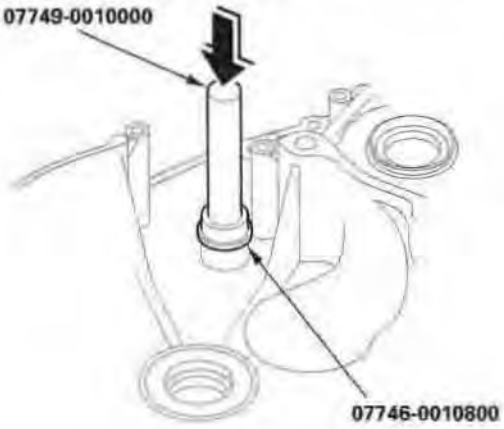
Selector Control Shaft Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 22 x 24 mm 07746-0010800

1. Remove the oil seal (A) from the torque converter housing (B).

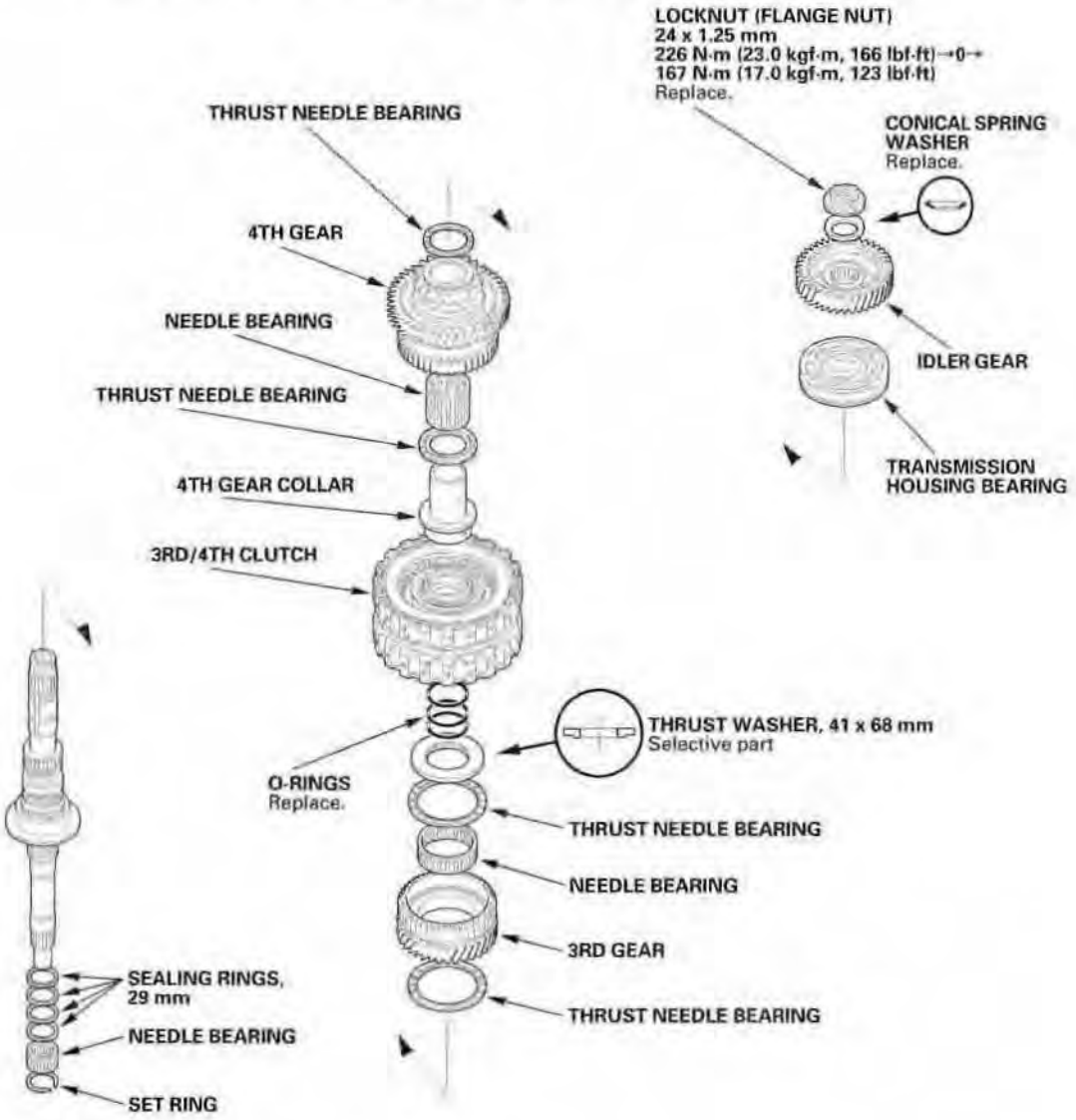


2. Install the new oil seal flush to the torque converter housing with the special tools.



Mainshaft Disassembly, Inspection, and Reassembly

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.

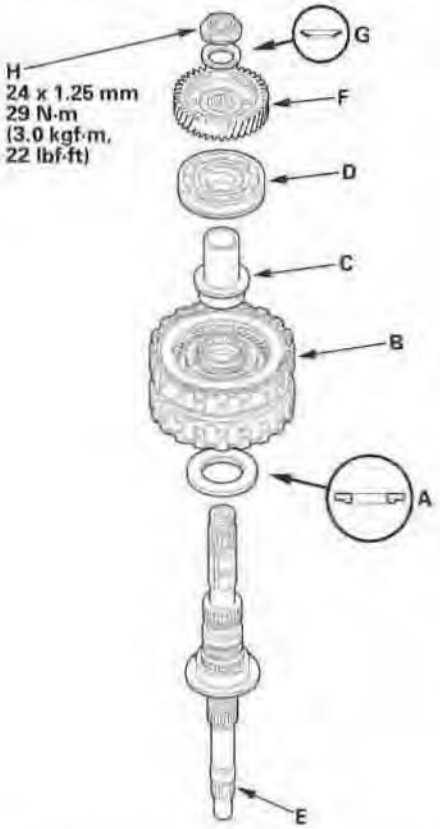


2. Inspect the splines for excessive wear and damage.
3. Check shaft bearing surface for scoring and excessive wear.
4. Before installing the O-rings, wrap the shaft splines with tape to prevent O-ring damage.
5. Lubricate all parts with ATF during assembly.
6. Install the conical spring washer and 41 x 68 mm thrust washer in the direction shown.
7. Replace the locknut and conical spring washer with new ones when assembling the transmission.
8. Check the clearance of the 3rd gear.

Mainshaft 3rd Gear Clearance Inspection

1. Remove the mainshaft transmission housing bearing (see page 14-262).

2. Assemble the 41 x 68 mm thrust washer (A), 3rd/4th clutch (B), 4th gear collar (C), and the transmission housing bearing (D) on the mainshaft (E). Do not install the O-rings during inspection.

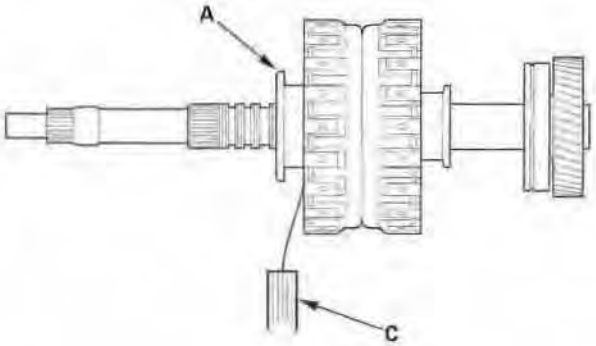


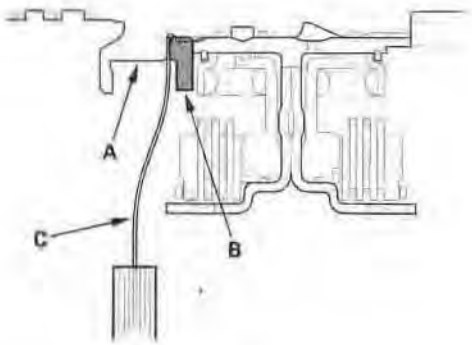
3. Install the idler gear (F) on the mainshaft with a press, then install the conical spring washer (G) and locknut (H).

4. Tighten the locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

5. Measure the clearance between the mainshaft flange (A) and 41 x 68 mm thrust washer (B) with a feeler gauge (C) in at least three places. Use the average as the actual clearance.

Standard
2003-2004 models: 0.03—0.31 mm (0.001—0.012 in.)
2005 model: 0.03—0.11 mm (0.001—0.004 in.)

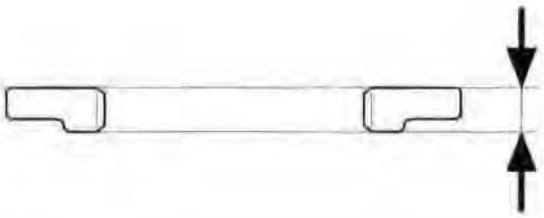




(cont'd)

Mainshaft 3rd Gear Clearance Inspection (cont'd)

6. If the clearance is out of standard, remove the 41 x 68 mm thrust washer and measure its thickness.



7. Select and install a new thrust washer, then recheck.

THRUST WASHER, 41 x 68 mm

No.	Part Number	Thickness
1	90414-PRP-000	6.35 mm (0.250 in.)
2	90415-PRP-000	6.40 mm (0.252 in.)
3	90416-PRP-000	6.45 mm (0.254 in.)
4	90417-PRP-000	6.50 mm (0.256 in.)
5	90418-PRP-000	6.55 mm (0.258 in.)
6	90419-PRP-000	6.60 mm (0.260 in.)

8. After replacing the thrust washer, make sure the clearance is within standard.

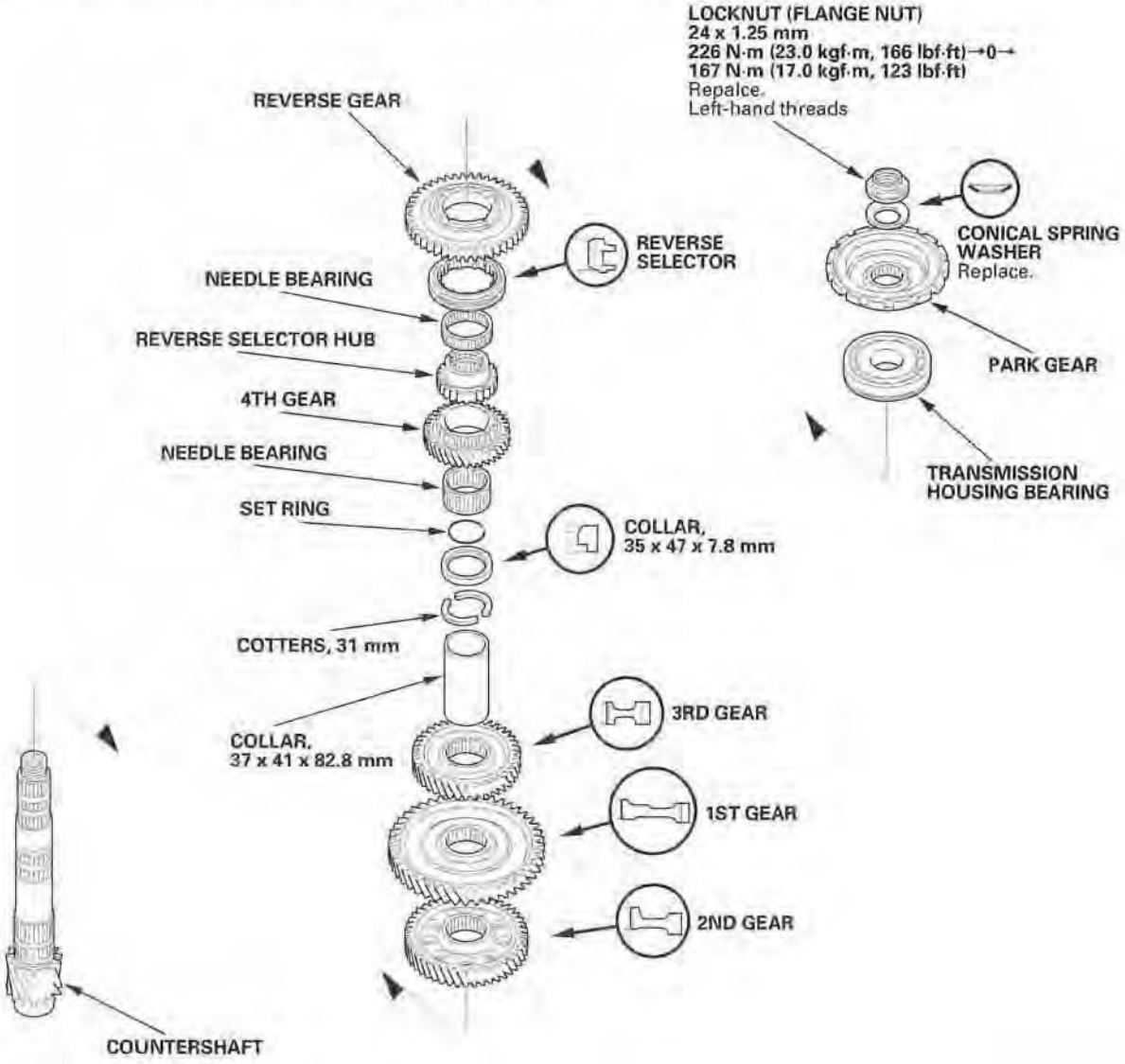
9. Disassemble the shaft and gears.

10. Reinstall the bearing in the transmission housing (see page 14-263).

Countershaft Disassembly, Inspection, and Reassembly

NOTE: Some reverse selector hubs are press-fitted to the countershaft; special tools are needed to remove them (see page 14-284) and to install them (see page 14-285).

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.

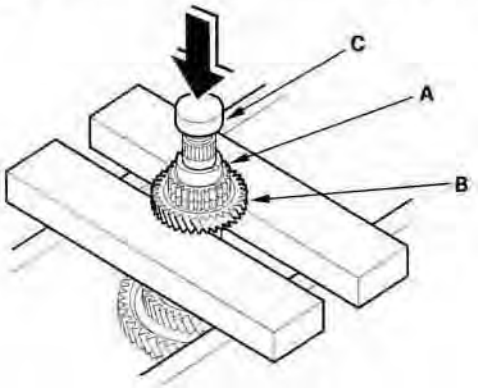


2. Inspect the splines for excessive wear and damage.
3. Check shaft bearing surface for scoring and excessive wear.
4. Lubricate all parts with ATF during assembly.
5. Install the conical spring washer, reverse selector, 35 x 47 x 7.8 mm collar, 3rd gear, 1st gear, and 2nd gear in the direction shown.
6. Replace the locknut and conical spring washer with new ones when assembling the transmission. The countershaft locknut has left-hand threads.

Countershaft Reverse Selector Hub Removal

1. Remove the reverse selector hub (A) and the 4th gear (B) from the countershaft with a press. Place a shaft protector (C) between the countershaft and press to prevent damaging the countershaft.

   NOTE: Some reverse selector hubs are not press-fitted and can be removed without using a press.



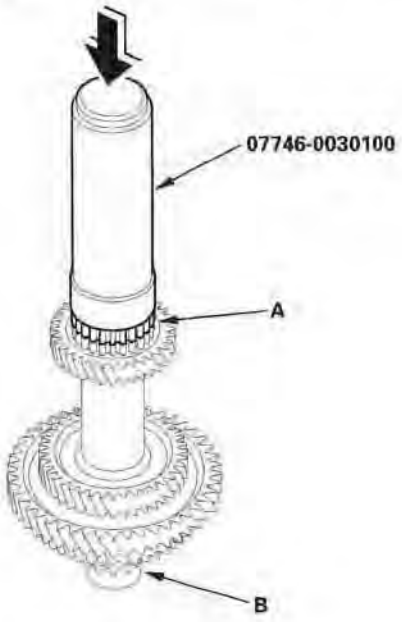
2. Remove the needle bearing, set ring, 35 x 47 x 7.8 mm collar, 31 mm cotters, and 37 x 41 x 82.8 mm collar from the countershaft.
3. Remove 1st, 3rd, and 2nd gears from the countershaft by hand.

Countershaft Reverse Selector Hub Installation

Special Tools Required
Driver, 40 mm I.D. 07746-0030100

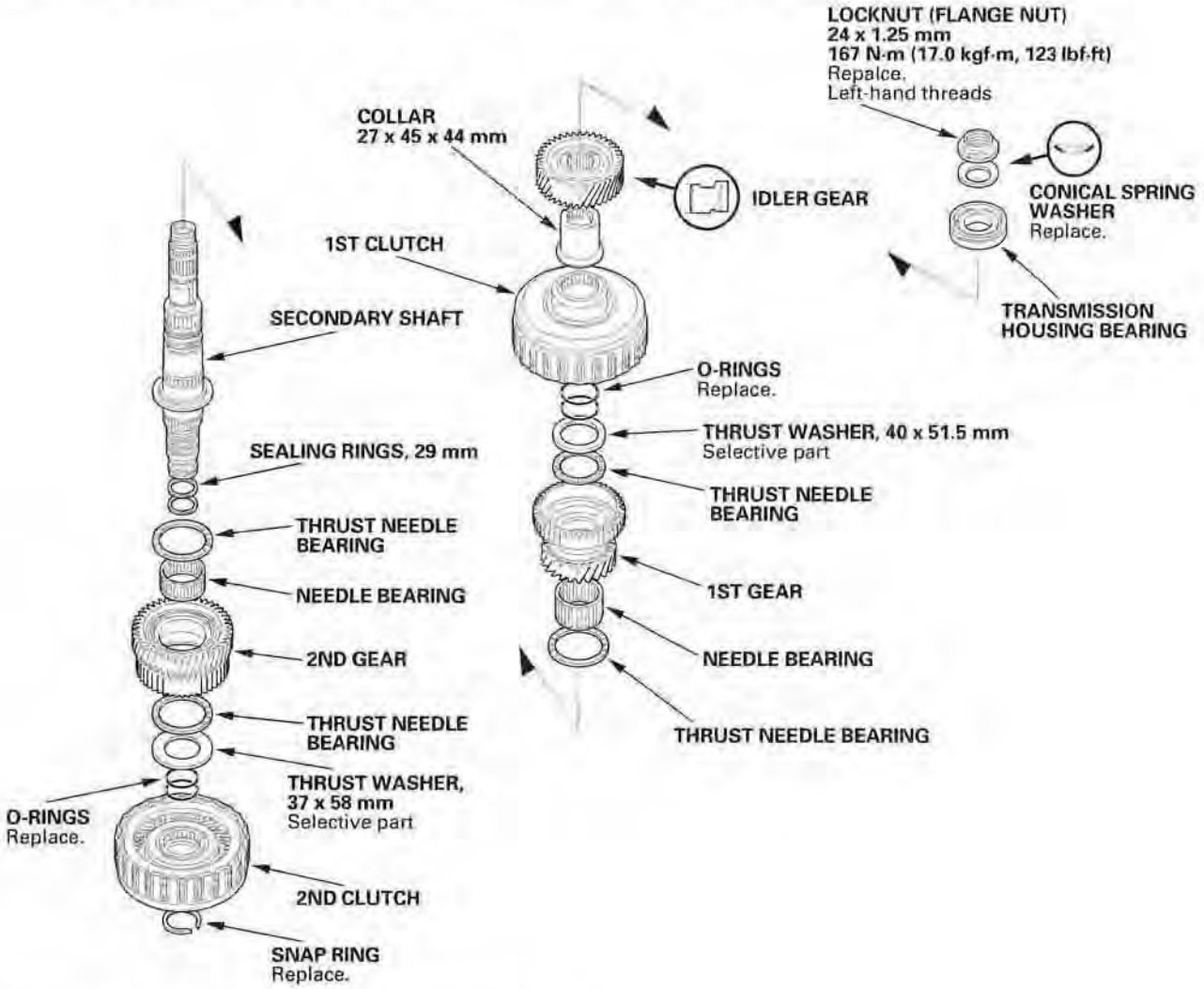
1. Apply ATF to the parts.
2. Install 2nd, 1st, and 3rd gears on the countershaft by hand.
3. Install the 37 x 41 x 82.8 mm collar, 31 mm cotters, 35 x 47 x 7.8 mm collar, set ring needle bearing, and 4th gear on the countershaft.
4. Slide the reverse selector hub (A) over the countershaft (B), then press it in place with the special tool and a press.

   NOTE: Some reverse selector hubs are not press-fitted and can be installed without using the special tool and a press.



Secondary Shaft Disassembly, Inspection, and Reassembly

1. Inspect the thrust needle bearing and the needle bearing for galling and rough movement.



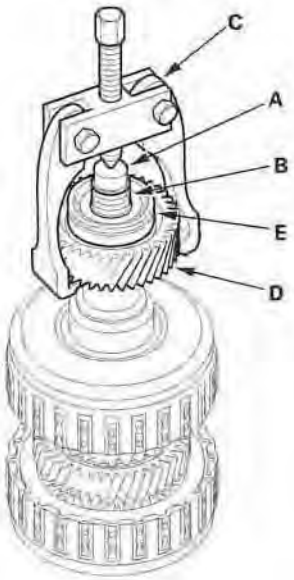
2. Inspect the splines for excessive wear and damage.
3. Check the shaft bearing surfaces for scoring and excessive wear.
4. Before installing the O-rings, wrap the shaft splines with tape to prevent O-ring damage.
5. Lubricate all parts with ATF during assembly.
6. Install the conical spring washer and idler gear in the direction shown.
7. Replace the locknut and conical spring washer with new ones when assembling the transmission. The secondary shaft locknut has left-hand threads.
8. Check the clearance of 2nd and 1st gears.

Secondary Shaft Ball Bearing, Idler Gear Removal and Installation

Special Tools Required
Attachment, 42 mm I.D. 07QAD-P0A0100

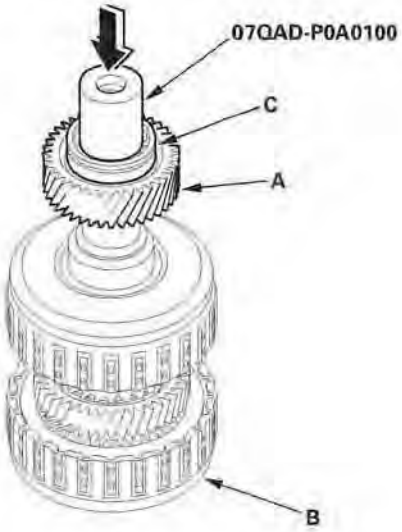
Removal

Place a shaft protector (A) on the secondary shaft (B), place the puller (C) on the idler gear (D), then remove the idler gear and ball bearing (E).



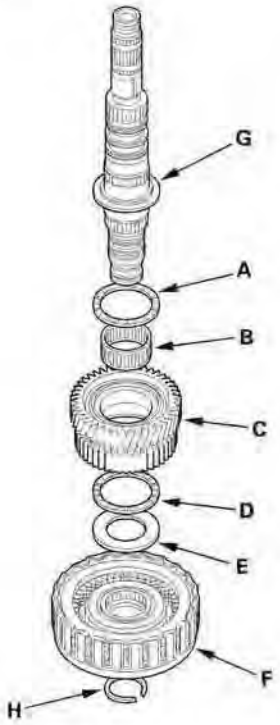
Installation

Install the idler gear (A) on the secondary shaft (B), and install the ball bearing (C) on the shaft with the special tool and a press.



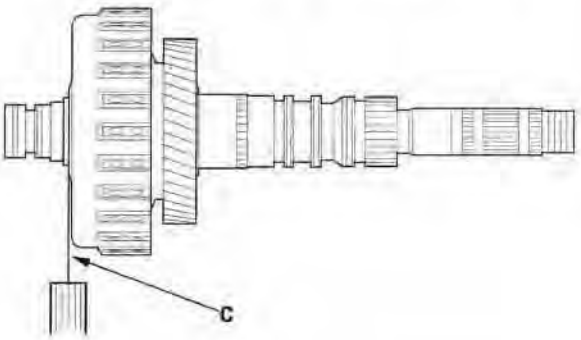
Secondary Shaft 2nd Gear Clearance Inspection

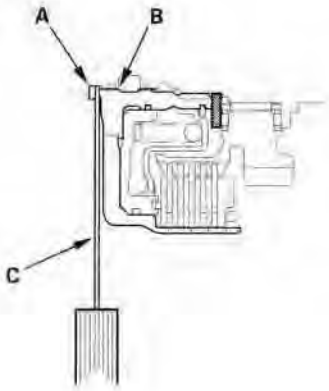
1. Install the thrust needle bearing (A), needle bearing (B), 2nd gear (C), thrust needle bearing (D), 37 x 58 mm thrust washer (E), and 2nd clutch (F) on the secondary shaft (G), then secure them with the snap ring (H).



2. Measure the clearance between the snap ring (A) and the 2nd clutch guide (B) with a feeler gauge (C), in at least three places. Use the average as the actual clearance.

Standard: 0.04—0.12 mm (0.002—0.005 in.)





3. If the clearance is out of standard, remove the 37 x 58 mm thrust washer and measure its thickness.

4. Select and install a new thrust washer, then recheck.

THRUST WASHER, 37 x 58 mm

No.	Part Number	Thickness
1	90511-PRP-010	3.900 mm (0.154 in.)
2	90512-PRP-010	3.925 mm (0.155 in.)
3	90513-PRP-010	3.950 mm (0.156 in.)
4	90514-PRP-010	3.975 mm (0.156 in.)
5	90515-PRP-010	4.000 mm (0.157 in.)
6	90516-PRP-010	4.025 mm (0.158 in.)
7	90517-PRP-010	4.050 mm (0.159 in.)
8	90518-PRP-010	4.075 mm (0.160 in.)
9	90519-PRP-010	4.100 mm (0.161 in.)
10	90520-PRP-010	4.125 mm (0.162 in.)
11	90521-PRP-010	4.150 mm (0.163 in.)
12	90522-PRP-010	4.175 mm (0.164 in.)
13	90523-PRP-000	4.200 mm (0.165 in.)
14	90524-PRP-000	4.225 mm (0.166 in.)
15	90525-PRP-000	4.250 mm (0.167 in.)
16	90526-PRP-000	4.275 mm (0.168 in.)
17	90527-PRP-000	4.300 mm (0.169 in.)
18	90528-PRP-000	4.325 mm (0.170 in.)
19	90529-PRP-000	4.350 mm (0.171 in.)
20	90530-PRP-000	4.375 mm (0.172 in.)

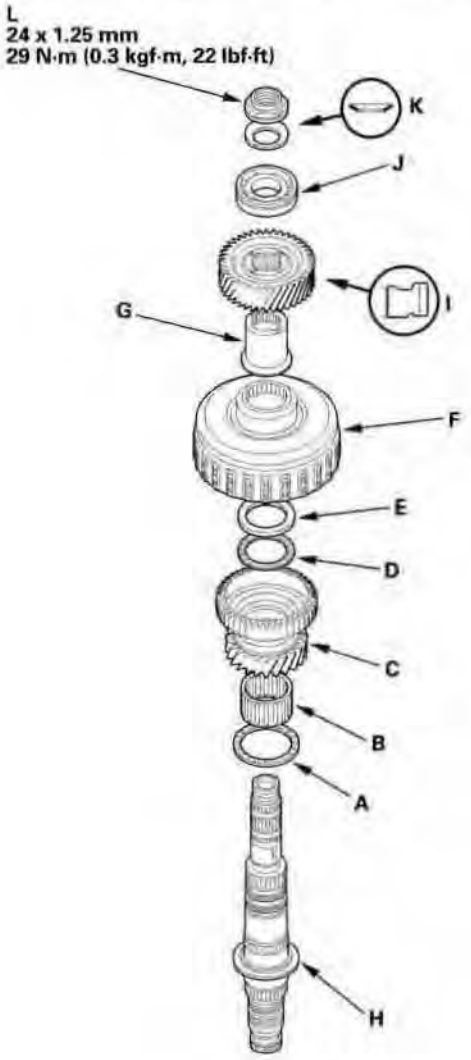
5. After replacing the thrust washer, make sure the clearance is within standard.

6. Disassemble the shaft and gears.

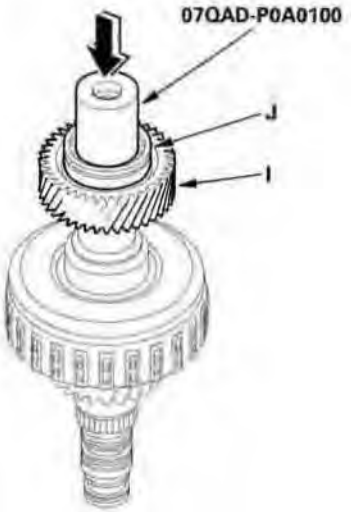
Secondary Shaft 1st Gear Clearance Inspection

Special Tools Required
Attachment, 42 mm I.D. 07QAD-P0A0100

1. Install the thrust needle bearing (A), needle bearing (B), 1st gear (C), thrust needle bearing (D), 40 x 51.5 mm thrust washer (E), 1st clutch (F), and 27 x 45 x 44 mm collar (G) on the secondary shaft (H).

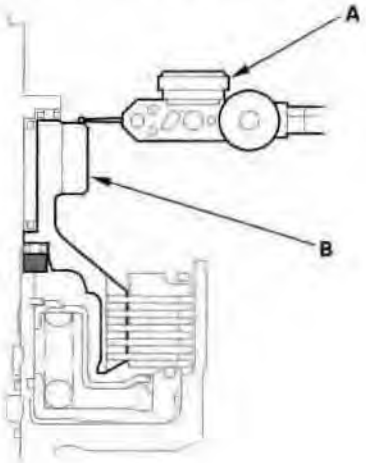


2. Install the idler gear (I), then install the ball bearing (J) on the idler gear with the special tool and a press.



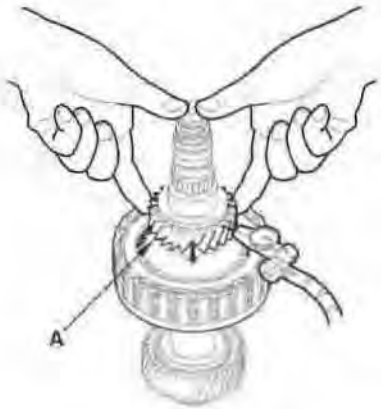
3. Install the conical spring washer (K) and locknut (L), then tighten the locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

4. Turn the secondary shaft assembly upside down, and set the dial indicator (A) on the 1st gear (B).



5. Hold the secondary shaft, and measure the 1st gear axial clearance in at least three places while moving the 1st gear (A). Use the average as the actual clearance.

Standard: 0.04—0.12 mm (0.002—0.005 in.)



6. If the clearance is out of standard, remove the 40 x 51.5 mm thrust washer and measure its thickness.

7. Select and install a new thrust washer, then recheck.

THRUST WASHER, 40 x 51.5 mm

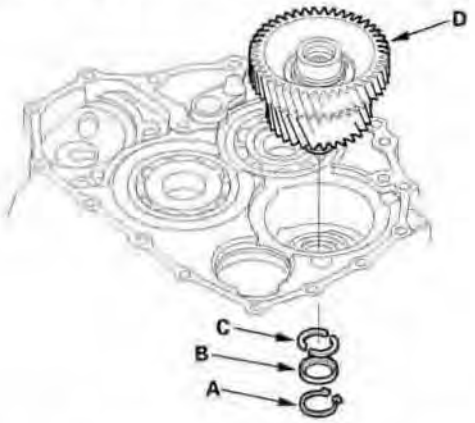
No.	Part Number	Thickness
1	90503-PRP-000	4.80 mm (0.189 in.)
2	90504-PRP-000	4.85 mm (0.191 in.)
3	90505-PRP-000	4.90 mm (0.193 in.)
4	90506-PRP-000	4.95 mm (0.195 in.)
5	90507-PRP-000	5.00 mm (0.197 in.)
6	90508-PRP-000	5.05 mm (0.199 in.)

8. After replacing the thrust washer, make sure the clearance is within standard.

9. Disassemble the shaft and gears.

Idler Gear Shaft Removal and Installation

1. Remove the snap ring (A), cotter retainer (B), and cotters (C). Do not distort the snap ring.



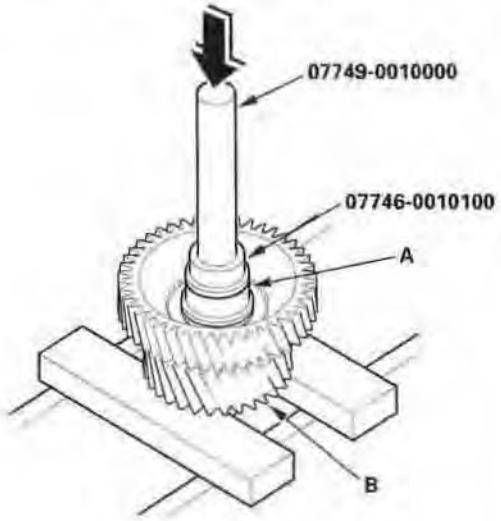
2. Remove the idler gear shaft/idler gear assembly (D) from the transmission housing.
3. Check the snap rings and cotter retainer for wear and damage. Replace them if they are worn, distorted, or damaged.
4. Install the idler gear and shaft in the reverse order of removal.

Idler Gear/Idler Gear Shaft Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 32 x 35 mm 07746-0010100

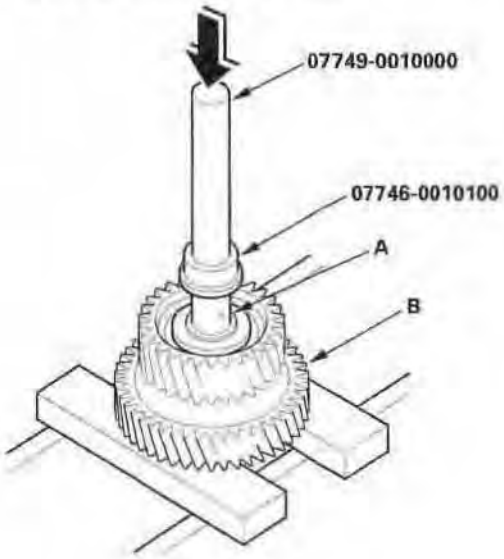
1. Remove the snap ring from the idler gear/idler shaft assembly.

2. Remove the idler gear shaft (A) from the idler gear (B) with the special tools and a press.



3. Replace the idler gear or idler gear shaft, and attach the idler gear shaft to the idler gear.

4. Install the idler gear shaft (A) in the idler gear (B) with the special tools and a press.

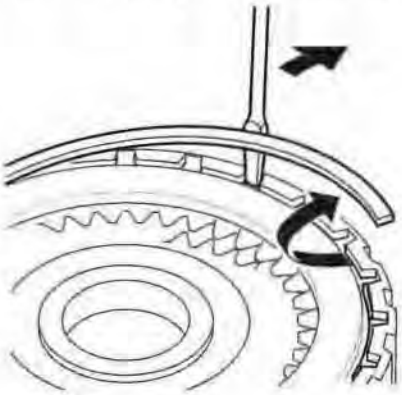


5. Install the snap ring.

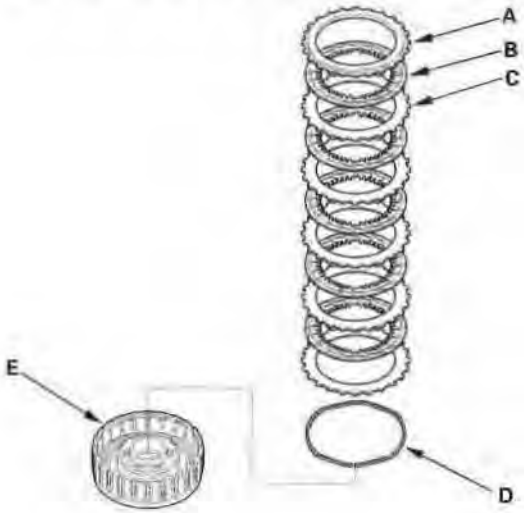
Clutch Disassembly

Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100 or 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A

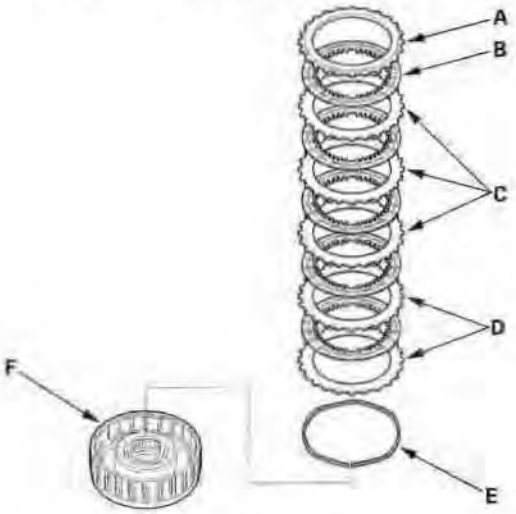
1. Remove the snap ring with a screwdriver.



2. Remove the clutch end plate (A), clutch discs (B) (5), clutch waved-plates (C) (5), and waved spring (D) from the 1st clutch drum (E).

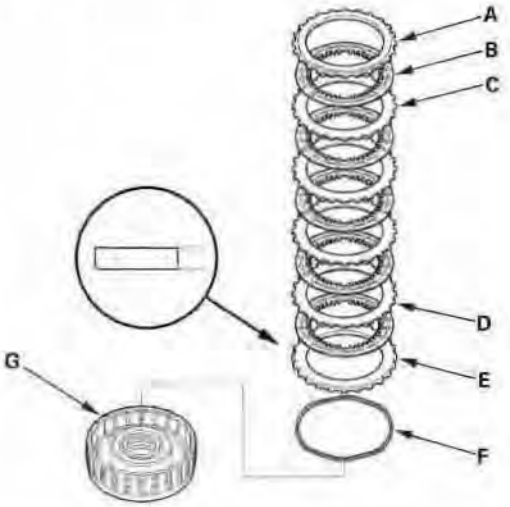


3. 2003-2004 models 2nd clutch: Remove the clutch end plate (A), clutch discs (B) (5), clutch waved-plates (C) (3), clutch flat-plates (D) (2), and waved spring (E) from the 2nd clutch drum (F).



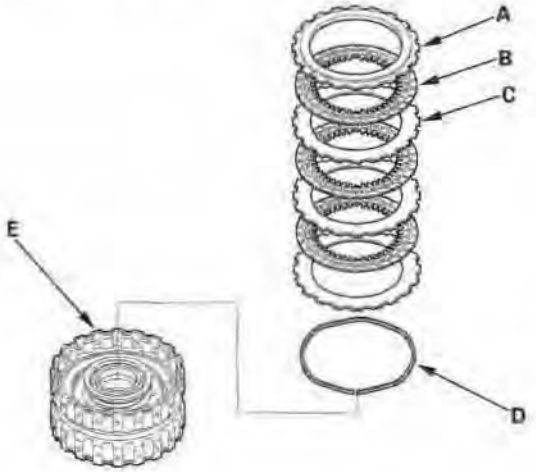
4. 2003-2004 models 2nd clutch: Make reference marks on the clutch flat-plates (D).

5. 2005 model 2nd clutch: Remove the clutch end plate (A), clutch discs (B) (5), clutch waved-plates (C) (3), 2.0 mm-thick flat-plate (D), 4.0 mm-thick plate (E), and waved spring (F) from the 2nd clutch drum (G).

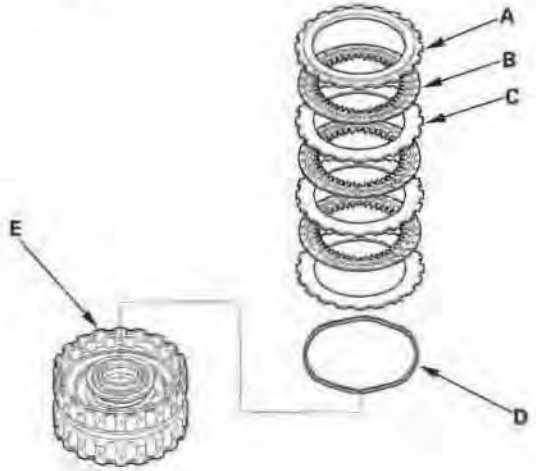


6. 2005 model 2nd clutch: Make reference mark on 2.0 mm-thick flat-plate (D).

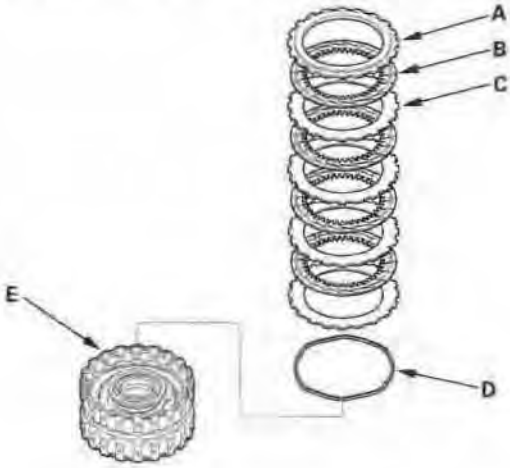
7. 2003-2004 models 3rd clutch: Remove the clutch end plate (A), clutch discs (B) (3), clutch waved-plates (C) (3), and waved spring (D) from the 3rd clutch drum (E).



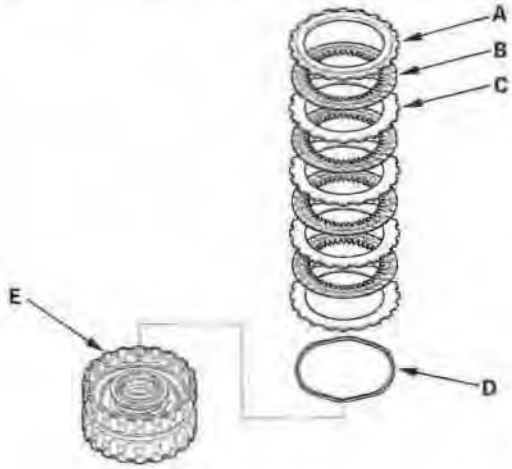
8. 2003-2004 models 4th clutch: Remove the clutch end plate (A), clutch discs (B) (3), clutch waved-plates (C) (3), and waved spring (D) from the 4th clutch drum (E).



9. 2005 model 3rd clutch: Remove the clutch end plate (A), clutch discs (B) (4), clutch waved-plates (C) (4), and waved spring (D) from the 3rd clutch drum (E).



10. 2005 model 4th clutch: Remove the clutch end plate (A), clutch discs (B) (4), clutch waved-plates (C) (4), and waved spring (D) from the 4th clutch drum (E).

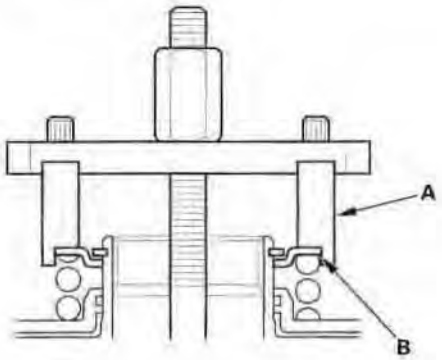


(cont'd)

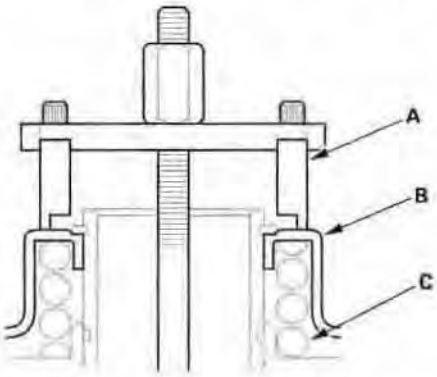
Clutch Disassembly (cont'd)

11. Install the special tools.

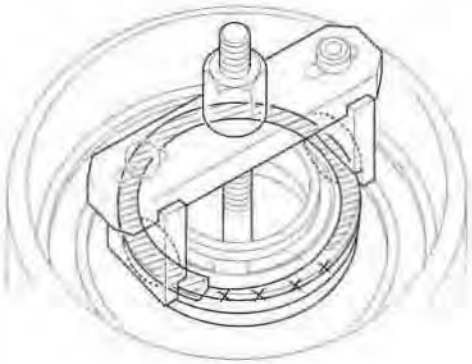
12. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 3rd and 4th clutches.



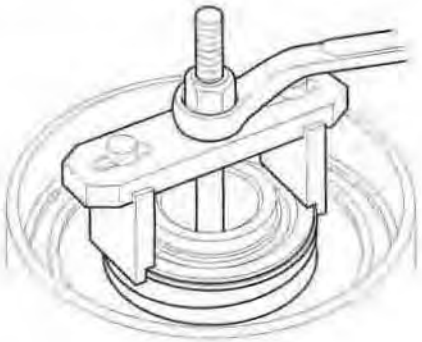
13. Set the special tool (A) on the spring retainer (B) of the 1st and 2nd clutches in such a way that the special tool works on the clutch return spring (C).



14. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



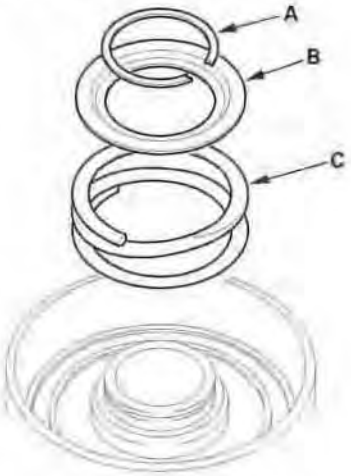
15. Compress the return spring until the snap ring can be removed.



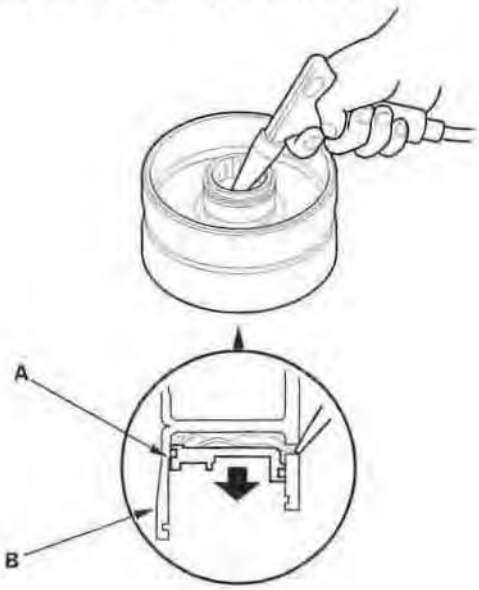
16. Remove the snap ring with snap ring pliers.

17. Remove the special tools.

18. Remove the snap ring (A), spring retainer (B), and return spring (C).



19. Wrap a shop rag around the clutch drum (A), and apply air pressure to the fluid passage to remove the piston (B). Place a finger tip on the other passage while applying air pressure.

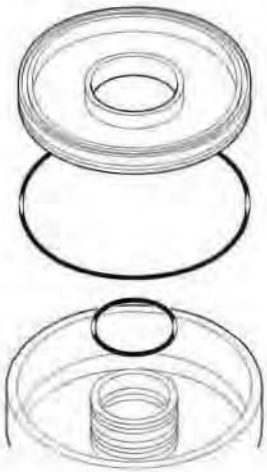


(cont'd)

Clutch Disassembly (cont'd)

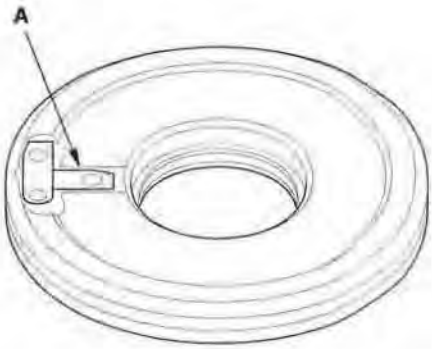
20. Remove the piston, then remove the O-rings from the 3rd and 4th clutch pistons.

21. Remove the piston, then remove the O-ring from the 1st and 2nd clutch drum, and remove the O-ring from each clutch piston.

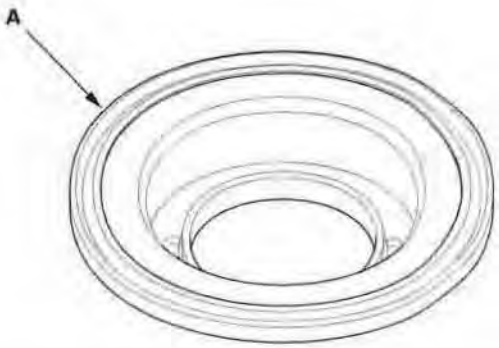


Clutch Inspection

1. Inspect the 3rd and 4th clutch pistons and clutch piston check valves (A).



2. If the clutch piston check valve is loose or damaged, replace the clutch piston.
3. Check the spring retainer for wear and damage.
4. Check the oil seal (A) on the spring retainer of the 1st and 2nd clutches for wear, damage, and peeling.



5. If the oil seal is worn, damaged, or peeling, replace the spring retainer.

6. Inspect the clutch discs, clutch plates, and clutch end plate for wear, damage, and discoloration.

Standard Thickness	
Clutch Discs:	**1.94 mm (0.076 in.)**
Clutch Plates:	
1st clutch plates:	**1.6 mm (0.063 in.)**
2nd clutch plates:	**2.0 mm (0.079 in.)**
3rd and 4th clutch plates:	**2.0 mm (0.079 in.)**

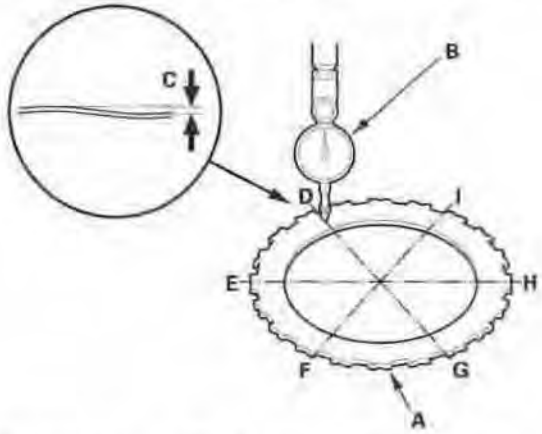
7. If the clutch discs are worn or damaged, replace them as a set. If the clutch discs are replaced, inspect the clutch end-plate-to-top-disc clearance.

8. If any plate is worn, damaged, or discolored, replace the damaged plate with the new plate, and inspect the other waved-plates for a phase difference. If the clutch plate is replaced, inspect the clutch end-plate-to-top-disc clearance.

9. If the clutch end plate is worn, damaged, or discolored, inspect the clutch end-plate-to-top-disc clearance, then replace the clutch end plate.

Clutch Waved-plate Phase Difference Inspection

1. Place the clutch waved-plate (A) on a surface plate, and set a dial indicator (B) on the waved-plate.



2. Find the bottom (D) of a phase difference of the waved-plate, zero the dial indicator and make a reference mark on the bottom of the waved-plate.

3. Rotate the 1st and 2nd clutch waved-plate about 60 degrees by holding it by its circumference, and rotate the 3rd and 4th clutch waved-plate about 72 degrees or 54-degrees apart from the bottom. The dial indicator should be at a top (E) of a phase difference. Do not rotate the waved-plate by holding its surface, always rotate it holding its circumference.

4. Read the dial indicator. The dial indicator reads the phase difference (C) of the waved-plate between bottom and top.

Standard: 0.07—0.20 mm (0.003—0.008 in.)
Minimum: 0.05 mm (0.002 in.)

5. Rotate the 1st and 2nd clutch waved-plate about 60-degrees from the top position, and rotate the 3rd and 4th clutch waved-plate 54-degrees or 72-degrees apart from the top. The dial indicator should be at the bottom of a phase difference (F and H). Zero the dial indicator.

6. Measure the phase difference at the other two tops (G and I) of the waved-plate by following steps 3 thru 5.

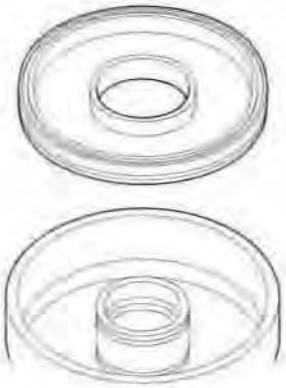
7. If the two values of the three measurements are within the standard, the waved-plate is OK. If the two values of the three measurements are out of the standard, replace the waved-plate.

Clutch Clearance Inspection

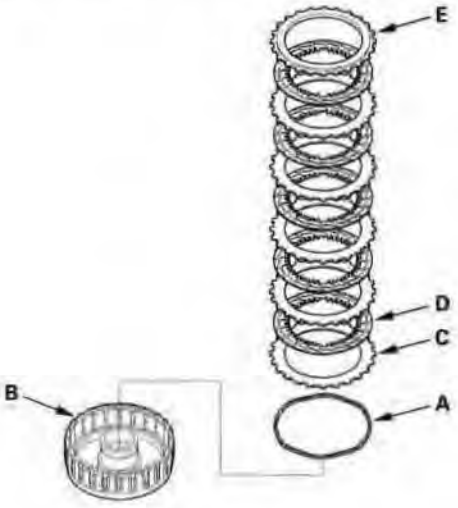
Special Tools Required
Clutch compressor attachment 07ZAE-PRP0100

1. Inspect the clutch piston, discs, plates, and end plate for wear and damage (see page 14-298), and inspect clutch waved-plate phase difference (see page 14-299), if necessary.

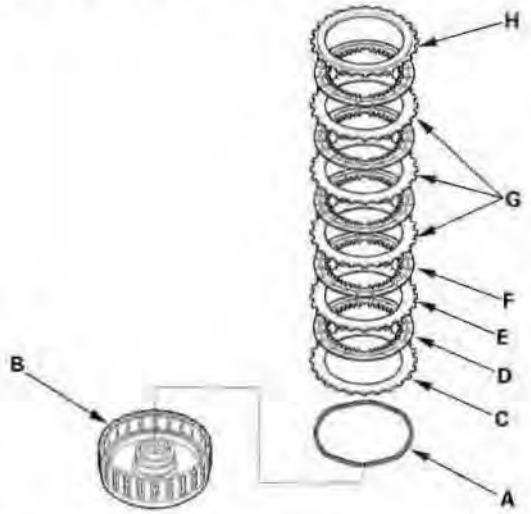
2. Install the clutch piston in the clutch drum. Do not install the O-rings during inspection.



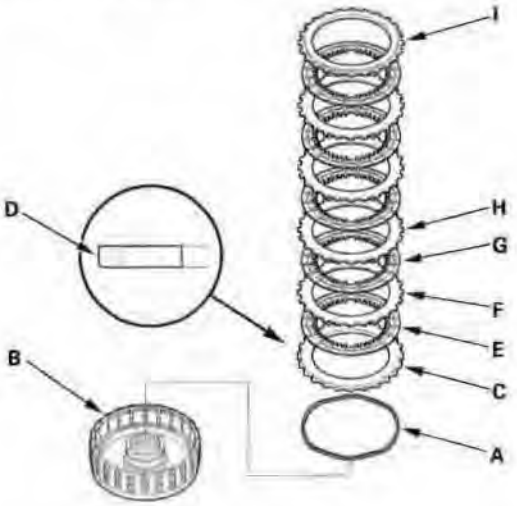
3. Install the waved spring (A) in the 1st clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (5) and discs (D) (5), then install the clutch end-plate (E) with the flat side toward the disc.



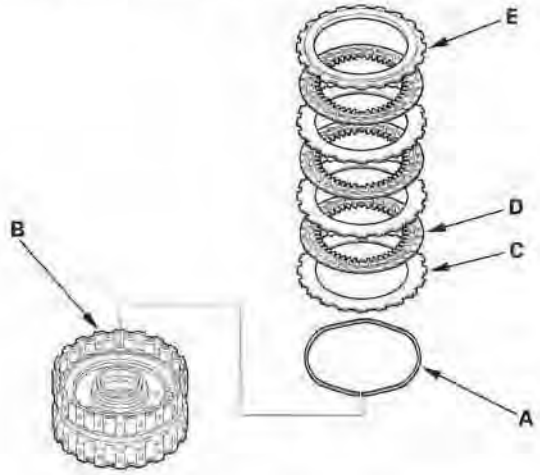
4. 2003-2004 models 2nd clutch: Install the waved spring (A) in the 2nd clutch drum (B). Install the clutch flat-plate (C), clutch disc (D), and clutch flat-plate (E). Starting with the clutch disc, alternately install the clutch discs (F) (4) and clutch waved-plates (G) (3), then install the clutch end plate (H) with the flat side toward the disc.



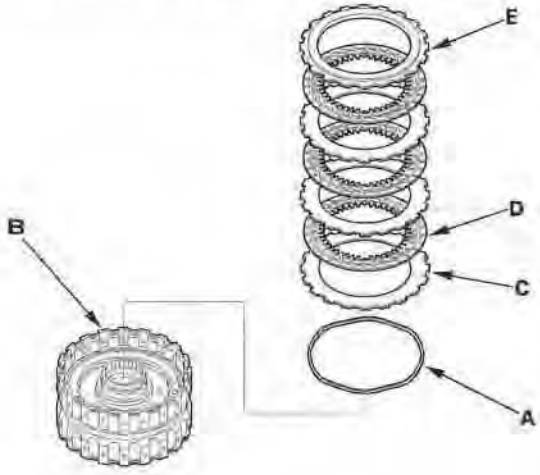
5. 2005 model 2nd clutch: Install the waved spring (A) in the 2nd clutch drum (B). Install the 4.0 mm-thick plate (C) with the shear droop side (D) toward the inside of the drum, clutch disc (E), and 2.0 mm-thick flat-plate (F), then starting with the disc, alternately install the discs (G) (4) and waved-plates (H) (3), then install the clutch-end-plate (I) with the flat side toward the disc.



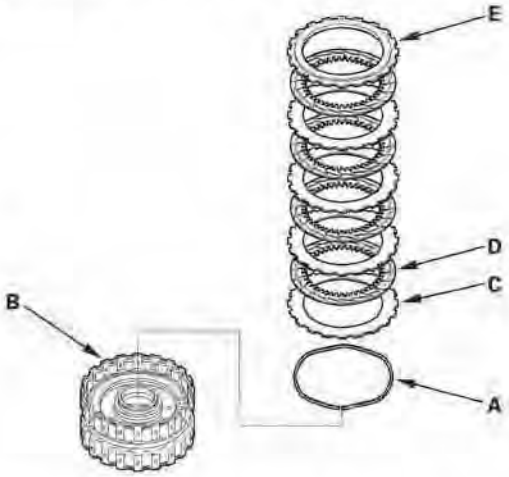
6. 2003-2004 models 3rd clutch: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (3) and discs (D) (3), then install the clutch end plate (E) with the flat side toward the disc.



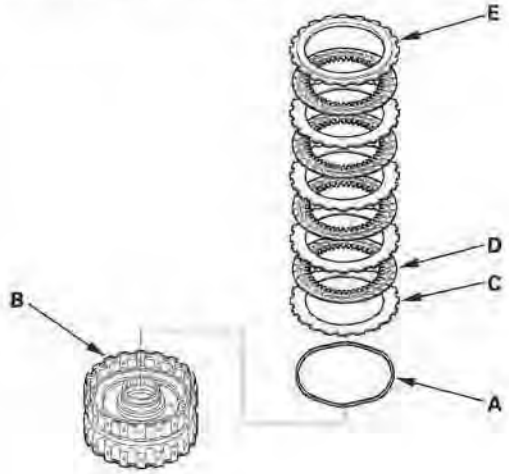
7. 2003-2004 models 4th clutch: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (3) and discs (D) (3), then install the clutch end plate (E) with the flat side toward the disc.



8. 2005 model 3rd clutch: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (4) and discs (D) (4), then install the clutch end plate (E) with the flat side toward the disc.



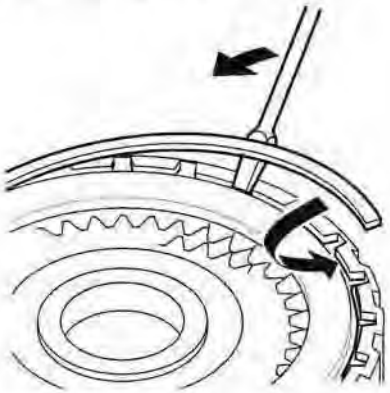
9. 2005 model 4th clutch: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (4) and discs (D) (4), then install the clutch end plate (E) with the flat side toward the disc.



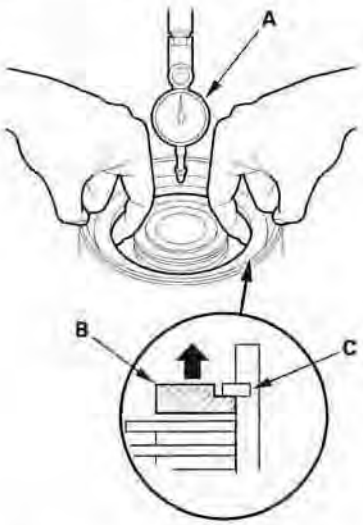
(cont'd)

Clutch Clearance Inspection (cont'd)

10. Install the snap ring with a screwdriver.

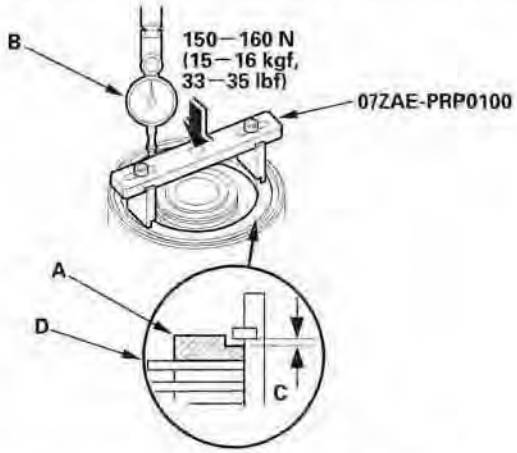


11. Set a dial indicator (A) on the clutch end plate (B).



12. Zero the dial indicator with the clutch end plate lifted up to the snap ring (C).

13. Release the clutch end plate to lower the clutch end plate, then put the special tool on the end plate (A).

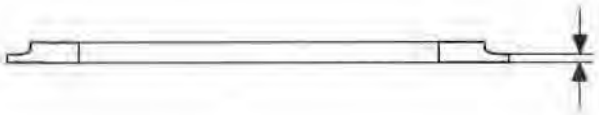


14. Press the special tool down with 150–160 N (15–16 kgf, 33–35 lbf) using a force gauge, and read the dial indicator (B). The dial indicator reads the clearance (C) between the clutch end plate and top disc (D). Take measurements in at least three places, and use the average as the actual clearance.

Clutch End Plate-to-Top Disc Clearance
Service Limit:

1st Clutch:	**1.28–1.48 mm (0.050–0.058 in.)**
2nd Clutch:	
2003-2004 models:	**0.85–1.05 mm (0.033–0.041 in.)**
2005 model:	**0.88–1.08 mm (0.035–0.043 in.)**
3rd Clutch:	
2003-2004 models:	**0.73–0.93 mm (0.029–0.037 in.)**
2005 model:	**0.93–1.13 mm (0.037–0.044 in.)**
4th Clutch:	
2003-2004 models:	**0.73–0.93 mm (0.029–0.037 in.)**
2005 model:	**0.93–1.13 mm (0.037–0.044 in.)**

15. If the clearance is out of the service limit, select a new clutch end plate from the following table.



1ST and 2ND CLUTCH END PLATES

Plate No.	Part Number	Thickness
1	22551-RCL-003	2.6 mm (0.102 in.)
2	22552-RCL-003	2.7 mm (0.106 in.)
3	22553-RCL-003	2.8 mm (0.110 in.)
4	22554-RCL-003	2.9 mm (0.114 in.)
5	22555-RCL-003	3.0 mm (0.118 in.)
6	22556-RCL-003	3.1 mm (0.122 in.)
7	22557-RCL-003	3.2 mm (0.126 in.)
8	22558-RCL-003	3.3 mm (0.130 in.)
9	22559-RCL-003	3.4 mm (0.134 in.)

3RD and 4TH CLUTCH END PLATES

Plate No.	Part Number	Thickness
1	22581-RCL-003	2.1 mm (0.083 in.)
2	22582-RCL-003	2.2 mm (0.087 in.)
3	22583-RCL-003	2.3 mm (0.091 in.)
4	22584-RCL-003	2.4 mm (0.095 in.)
5	22585-RCL-003	2.5 mm (0.098 in.)
6	22586-RCL-003	2.6 mm (0.102 in.)
7	22587-RCL-003	2.7 mm (0.106 in.)
8	22588-RCL-003	2.8 mm (0.110 in.)
9	22589-RCL-003	2.9 mm (0.114 in.)

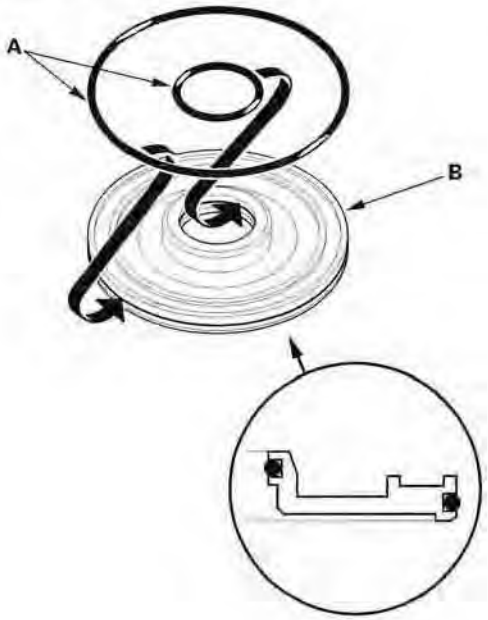
16. Install the new clutch end plate, then recheck the clearance.

    NOTE: If the thickest clutch end plate is installed, but the clearance is still over the service limit, replace the clutch discs and plates.

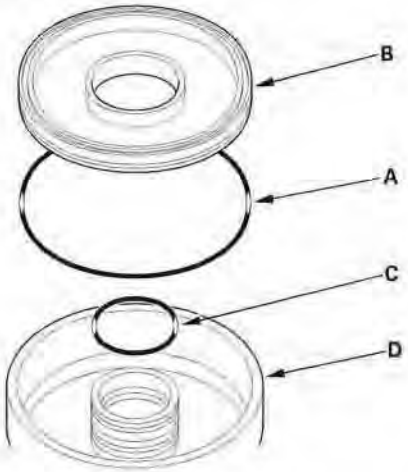
Clutch Reassembly

Special Tools Required
- Clutch spring compressor attachment 07LAE-PX40100 or 07HAE-PL50101
- Clutch spring compressor bolt assembly 07GAE-PG40200 or 07GAE-PG4020A

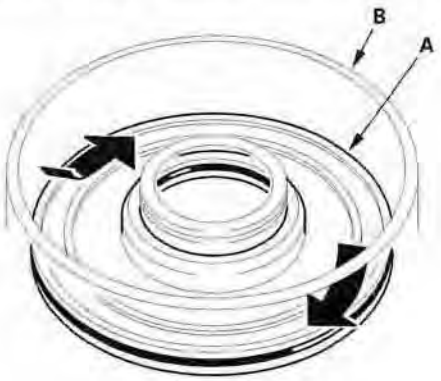
1. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.
2. Install the new O-rings (A) on the 3rd and 4th clutch pistons (B).



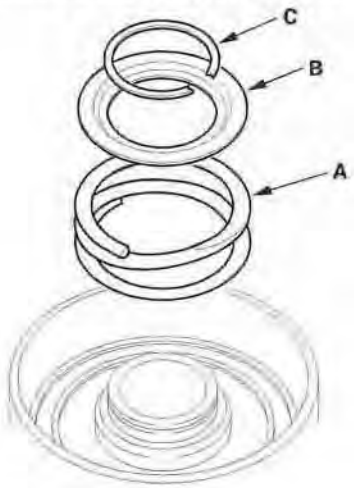
3. Install the new O-ring (A) in the 1st and 2nd clutch pistons (B), and install the new O-ring (C) on the clutch drums (D).



4. Install the clutch piston (A) in the clutch drum (B). Apply pressure and rotate it to ensure proper seating. Lubricate the piston O-ring with ATF before installing. Do not pinch the O-ring by installing the piston with too much force.

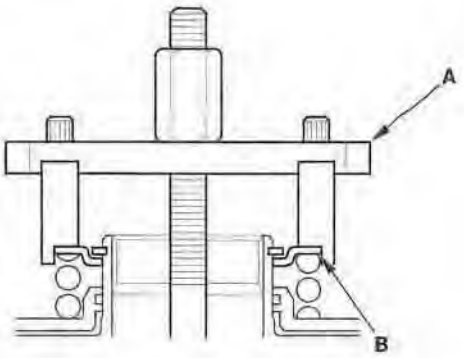


5. Install the return spring (A) and spring retainer (B), and position the snap ring (C) on the retainer.

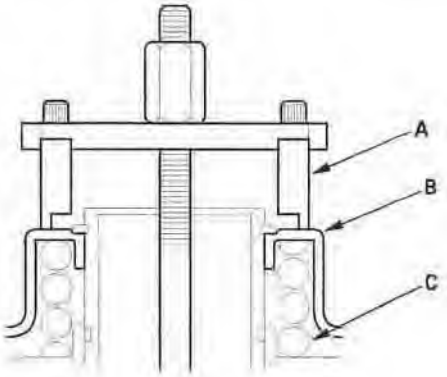


6. Install the special tools.

7. Be sure the special tool (A) is adjusted to have full contact with the spring retainer (B) on the 3rd and 4th clutches.



8. Set the special tool (A) on the spring retainer (B) of the 1st and 2nd clutches in such a way that the special tool works on the clutch return spring (C).



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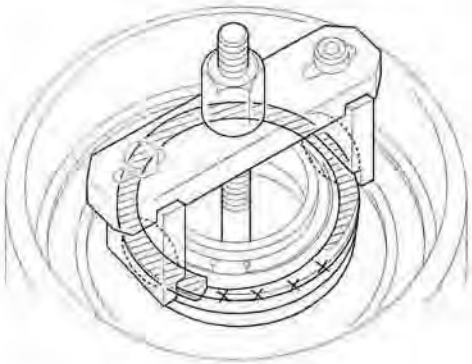
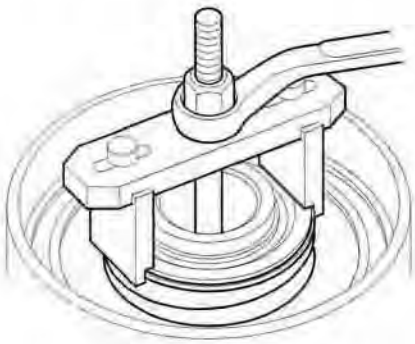
Clutch Reassembly (cont'd)

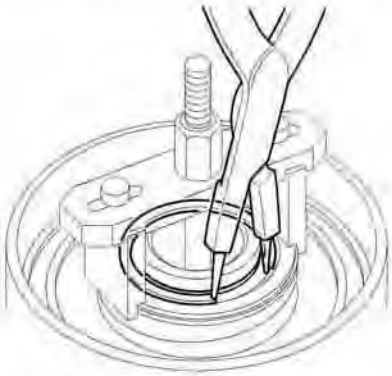
9. If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



10. Compress the return spring.

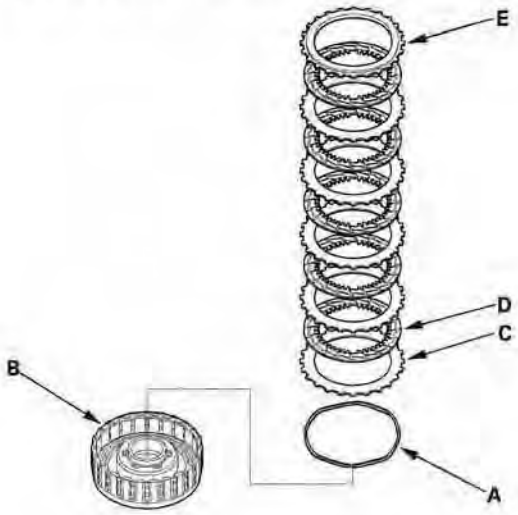


11. Install the snap ring with snap ring pliers.

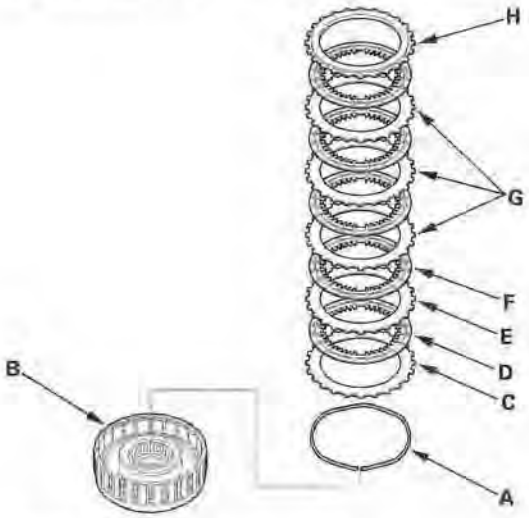


12. Remove the special tools.

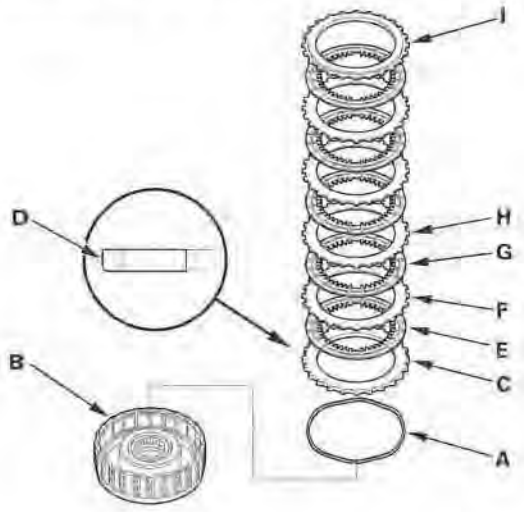
13. Install the waved spring (A) in the 1st clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (5) and discs (D) (5), then install the clutch end plate (E) with the flat side toward the disc.



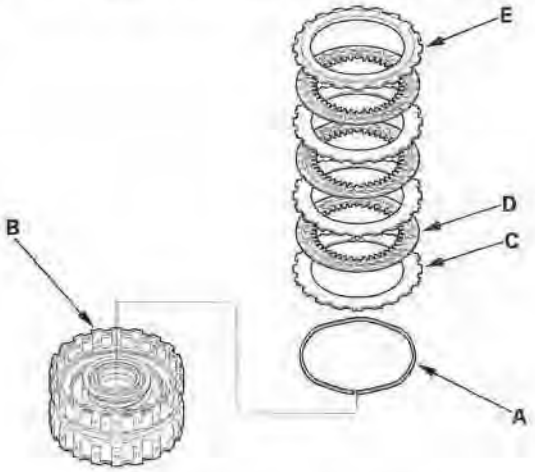
14. 2003-2004 models 2nd clutch: Install the waved spring (A) in the 2nd clutch drum (B). Install the clutch flat-plate (C), clutch disc (D), and clutch flat-plate (E). Starting with the clutch disc, alternately install the clutch discs (F) (4) and clutch waved-plates (G) (3), then install the clutch end-plate (H) with the flat side toward the disc.



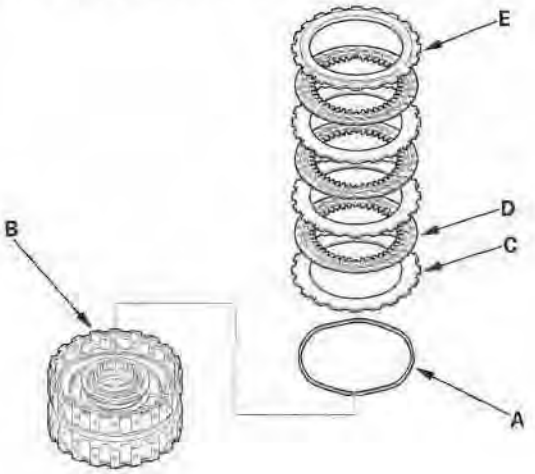
15. 2005 model 2nd clutch: Install the waved spring (A) in the 2nd clutch drum (B). Install the 4.0 mm-thick plate (C) with the shear droop side (D) toward the inside of the drum, clutch disc (E), and 2.0 mm-thick flat-plate (F), then starting with the clutch disc, alternately install the clutch discs (G) (4) and clutch waved-plates (H) (3), then install the clutch end-plate (I) with the flat side toward the disc.



16. 2003-2004 models 3rd clutch: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (3) and discs (D) (3), then install the clutch end-plate (E) with the flat side toward the disc.



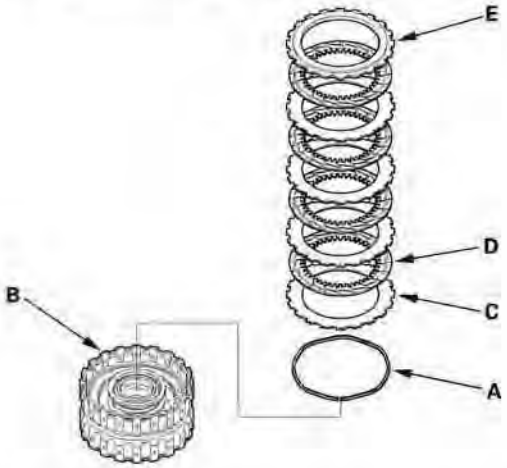
17. 2003-2004 models 4th clutch: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (3) and discs (D) (3), then install the clutch end-plate (E) with the flat side toward the disc.



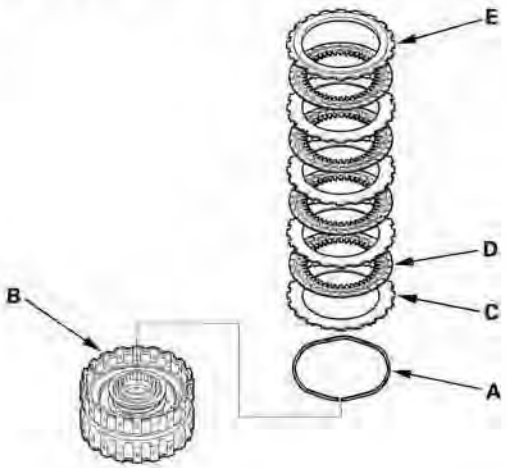
(cont'd)

Clutch Reassembly (cont'd)

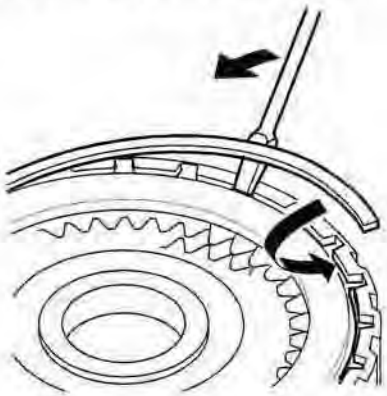
18. 2005 model 3rd clutch: Install the waved spring (A) in the 3rd clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (4) and discs (D) (4), then install the clutch end-plate (E) with the flat side toward the disc.



19. 2005 model 4th clutch: Install the waved spring (A) in the 4th clutch drum (B). Starting with the clutch waved-plate, alternately install the clutch plates (C) (4) and discs (D) (4), then install the clutch end-plate (E) with the flat side toward the disc.



20. Install the snap ring with a screwdriver.

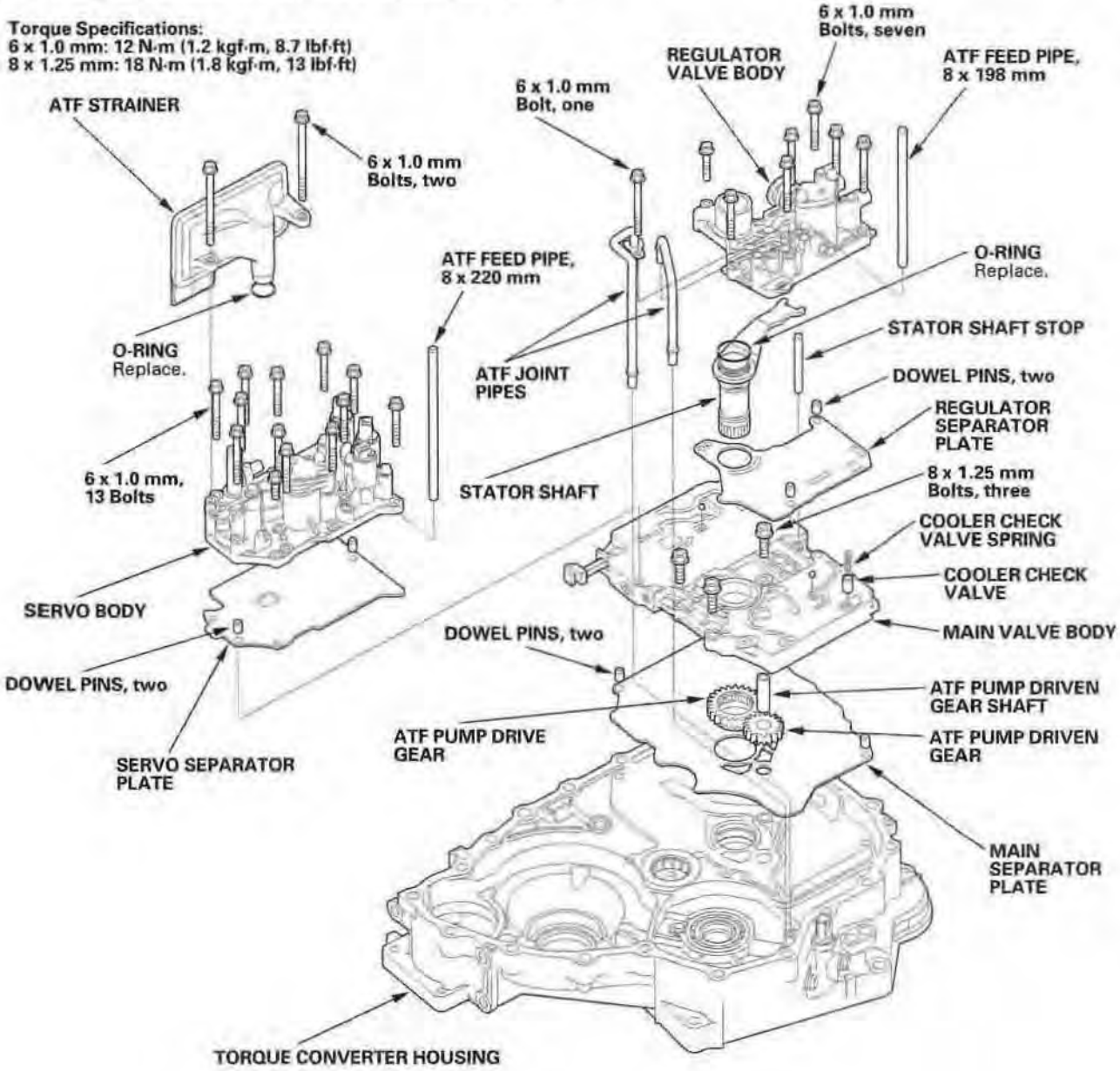


21. Check that the clutch piston moves by applying air pressure into fluid passage.

Valve Body and ATF Strainer Installation

Exploded View - 2003-2004 Models

NOTE: The illustration shows the 4WD transmission; 2WD is similar.



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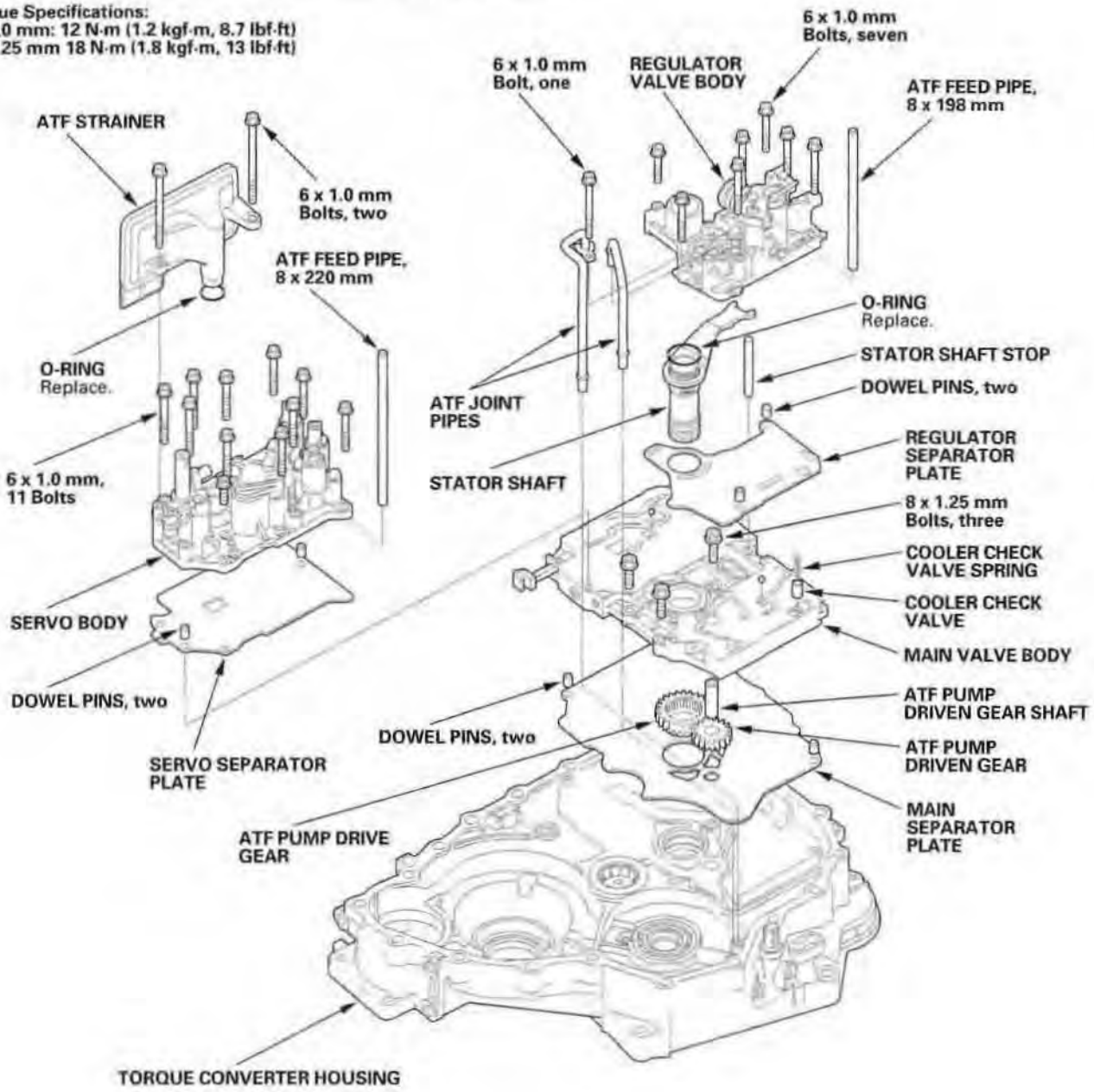
Valve Body and ATF Strainer Installation (cont'd)

Exploded View - 2005 Model

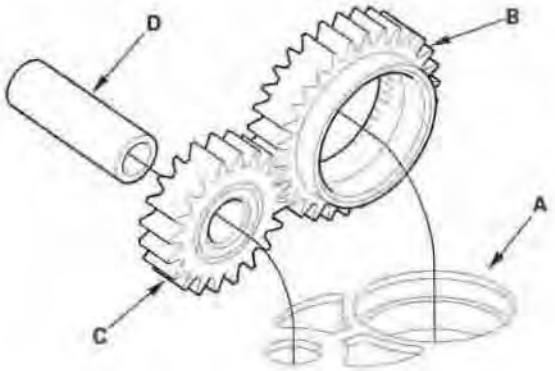
NOTE: The illustration shows the 4WD transmission; the 2WD is similar.

Torque Specifications:
6 x 1.0 mm: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
8 x 1.25 mm 18 N·m (1.8 kgf·m, 13 lbf·ft)

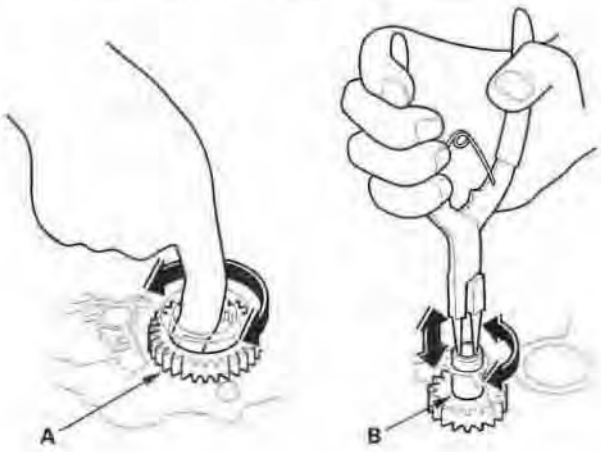


NOTE: Refer to the Exploded View as needed during the following procedure.

1. Install the main separator plate (A) and two dowel pins on the torque converter housing. Then install the ATF pump drive gear (B), driven gear (C), and ATF pump driven gear shaft (D). Install the ATF pump driven gear with its grooved and chamfered side facing down.



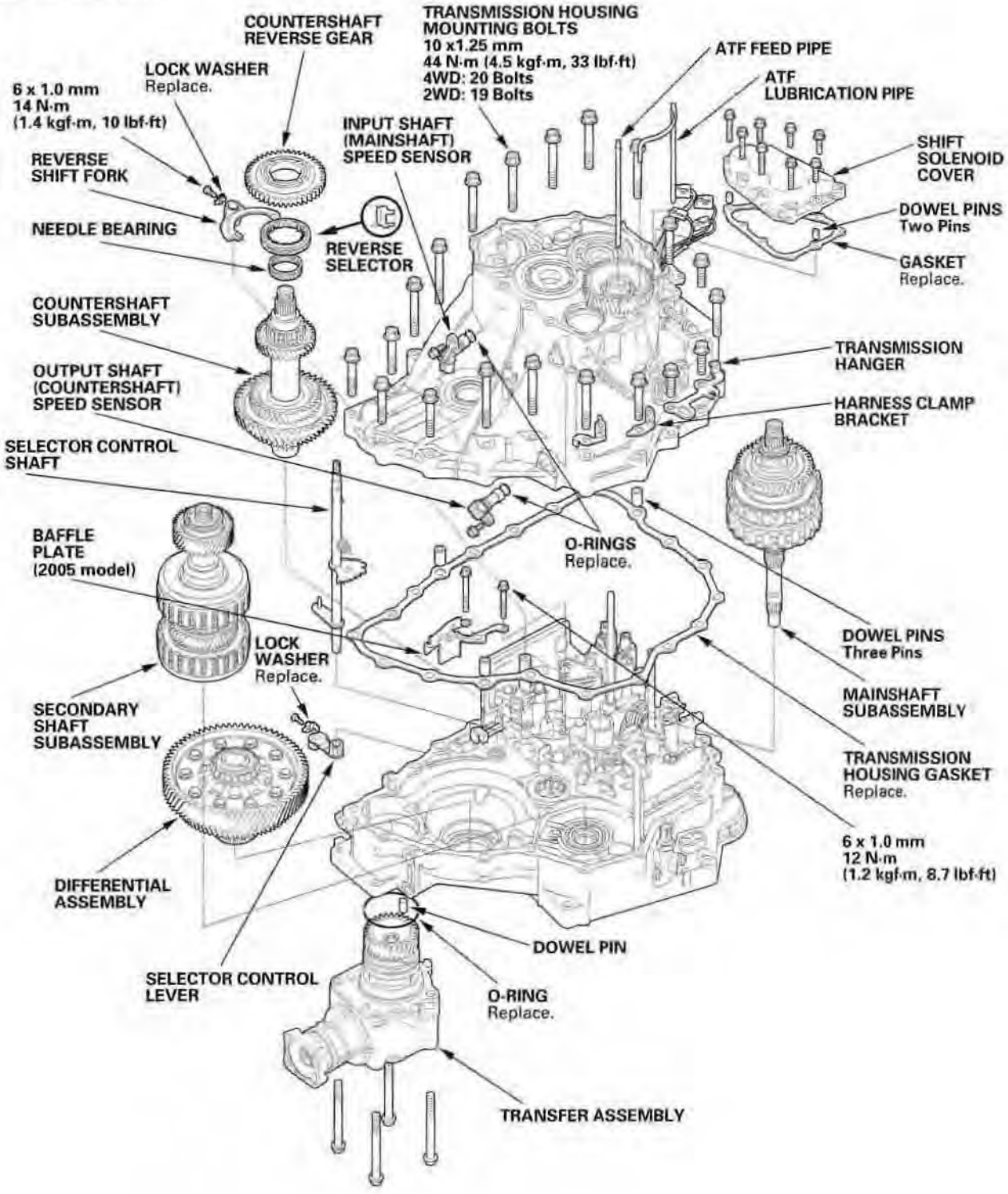
2. Install the main valve body.
3. Make sure the ATF pump drive gear (A) rotates smoothly in the normal operating direction, and the ATF pump driven gear shaft (B) moves smoothly in the axial and normal operating direction.



4. If the ATF pump drive gear and ATF pump driven gear shaft do not move smoothly, loosen the main valve body bolts. Realign the ATF pump driven gear shaft, and retighten the bolts to the specified torque, then recheck. Failure to align the ATF pump driven gear shaft correctly will result in a seized ATF pump drive gear or ATF pump driven gear shaft.
5. Make sure that the check balls (two) are in the main valve body, and install the cooler check valve and the cooler check valve spring.
6. Install the regulator separator plate and dowel pins (two) on the main valve body.
7. Install the stator shaft and stator shaft stop.
8. Install the regulator valve body (seven bolts).
9. Install the servo separator plate and dowel pins (two) on the main valve body.
10. 2003-2004 models: Install the servo body (13 bolts).
11. 2005 model: Install the servo body (11 bolts).
12. Install the ATF strainer (two bolts).
13. Install the ATF joint pipes (one bolt).
14. Install the ATF feed pipes in the regulator valve body and servo body.

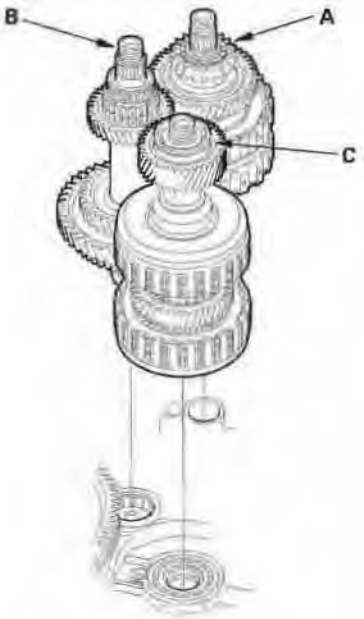
Shaft Assembly and Housing Installation

Exploded View

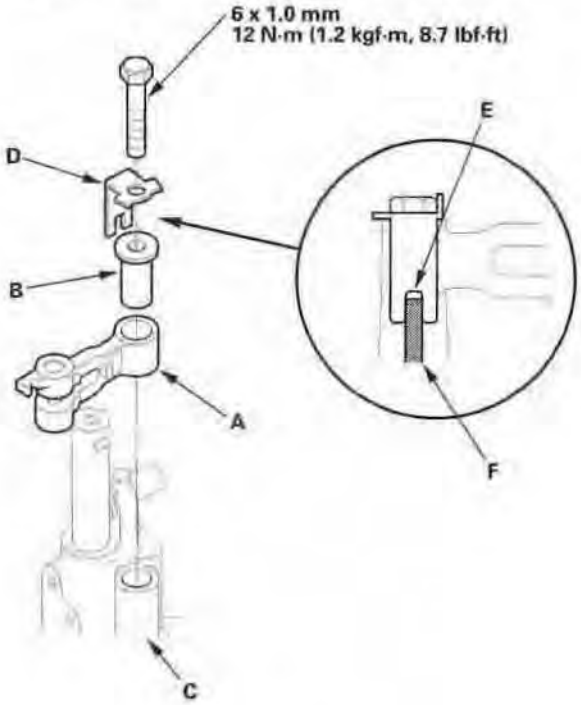


NOTE: Refer to the Exploded View as needed during the following procedure. The Exploded View shows the 4WD transmission model; the 2WD transmission is similar.

1. Install the differential assembly in the torque converter housing.
2. 2005 model: Install the baffle plate on the servo body.
3. Assemble the mainshaft, countershaft, and secondary shaft.
4. Join the mainshaft subassembly (A), countershaft subassembly (B), and secondary shaft subassembly (C) together, and install them in the torque converter housing.



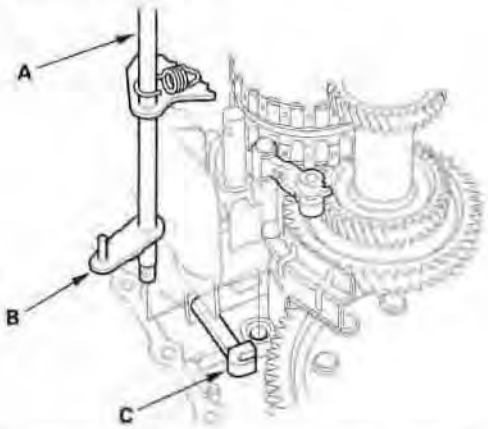
5. If the detent arm was removed, install the detent arm (A) with arm collar (B) on the servo body (C), and install the new lock washer (D) by aligning its cutout (E) with the projection (F) of the servo body. Install and tighten the bolt, then bend the lock tab of the lock washer against the bolt head.



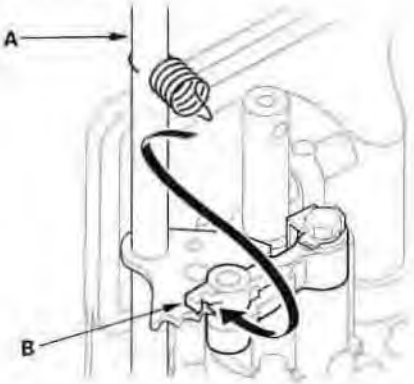
(cont'd)

Shaft Assembly and Housing Installation (cont'd)

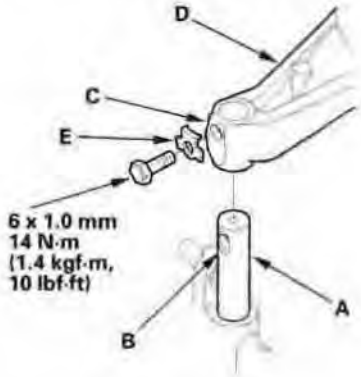
6. Install the selector control shaft (A) in the torque converter housing aligning the manual valve lever pin (B) on the selector control shaft with the guide of the manual valve (C). Pull the manual valve gently when aligning the manual valve with the selector control shaft.



7. Hook the detent arm spring (A) to the detent arm (B).



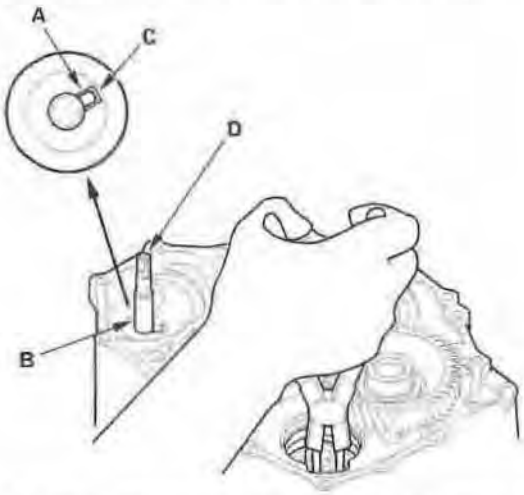
8. Turn the shift fork shaft (A) so the large chamfered hole (B) is facing the fork bolt hole (C) of the shift fork (D).



9. Install the shift fork and reverse selector together on the shift fork shaft and countershaft. Secure the shift fork to the shift fork shaft with the lock bolt and a new lock washer (E), then bend the lock tab of the lock washer against the bolt head.
10. Install the needle bearing and countershaft reverse gear on the countershaft.
11. Install the reverse idler gear in the transmission housing (see page 14-264).
12. Install the idler gear shaft (see page 14-292), if it was removed.
13. Install the three dowel pins and a new gasket on the torque converter housing.

14. Align the spring pin (A) on the selector control shaft (B) with the transmission housing groove (C) by turning the selector control shaft.

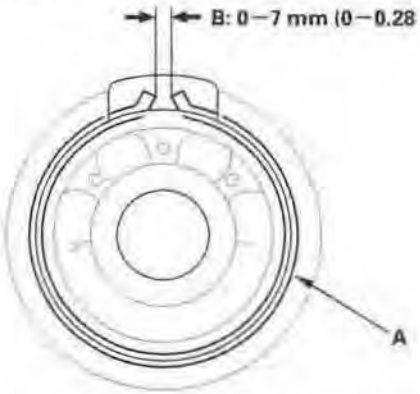
    NOTE: Do not squeeze the end (D) of the selector control shaft tips together when turning the shaft. If the tips are squeezed together it could cause a faulty signal or position due to the play between the selector control shaft and the switch.



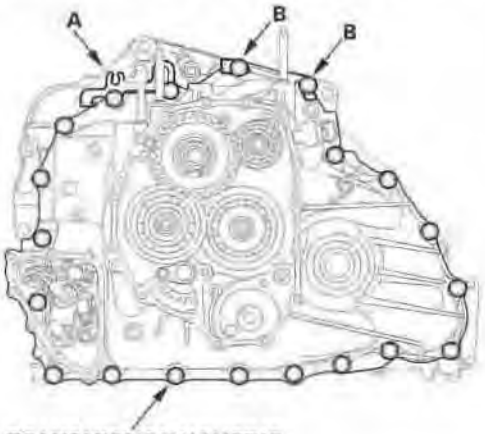
15. Place the transmission housing on the torque converter housing. Do not install the mainshaft and countershaft speed sensors before installing the transmission housing on the torque converter housing.

16. While expanding the snap ring of the secondary shaft bearing using snap ring pliers, install the transmission housing onto the bearing part-way. Then release the pliers, and push down on the housing until it bottoms and the snap ring snaps into place in the transmission housing snap-ring groove.

17. Verify that the secondary shaft bearing snap ring (A) is seated in the bearing and housing groove, and that the ring end gap (B) is correct.



18. Install the transmission housing mounting bolts along with the transmission hanger (A) and harness clamp brackets (B), and tighten the bolts in two or three steps in a crisscross pattern.

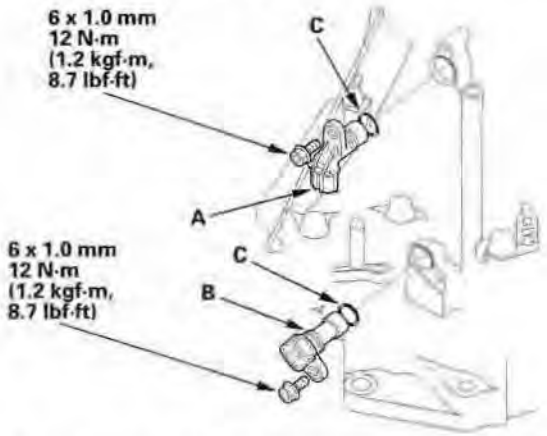


TRANSMISSION HOUSING MOUNTING BOLTS
10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)
4WD: 20 Bolts
2WD: 19 Bolts

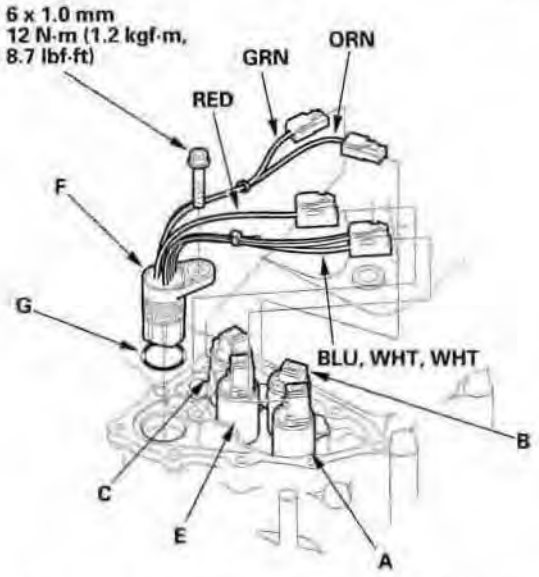
(cont'd)

Shaft Assembly and Housing Installation (cont'd)

19. Install the input shaft (mainshaft) speed sensor (A) and output shaft (countershaft) speed sensor (B) with new O-rings (C).



20. Install the shift solenoid harness connector (F) in the transmission housing with the new O-ring (G).

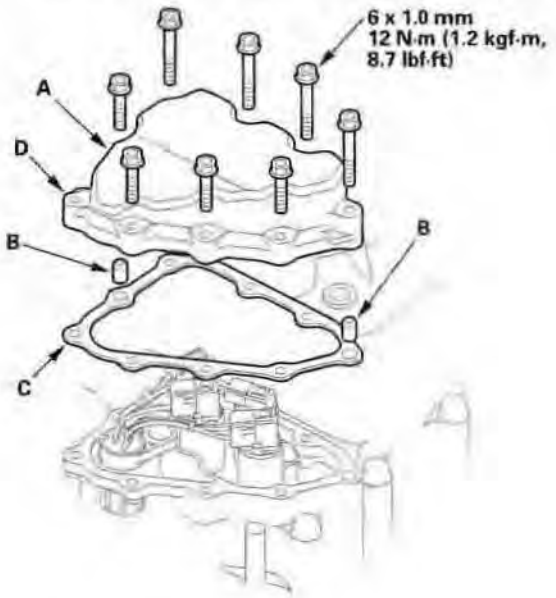


21. Connect the connector (BLU, WHT and WHT wires) to the shift solenoid valve A.

22. Connect the connectors to the respective solenoid valves:

- ORN wire to shift solenoid valve B.
- GRN wire to shift solenoid valve C.
- RED wire to shift solenoid valve E.

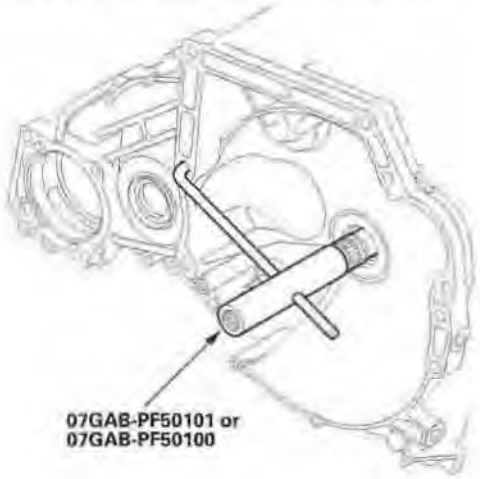
23. Install the shift solenoid valve cover (A) with the two dowel pins (B) and the new gasket (C), and tighten the bolts (eight). Install the one bolt with the bracket for the ATF cooler line in the bolt hole (D).



End Cover Installation

Special Tools Required
Mainshaft holder 07GAB-PF50101 or 07GAB-PF50100

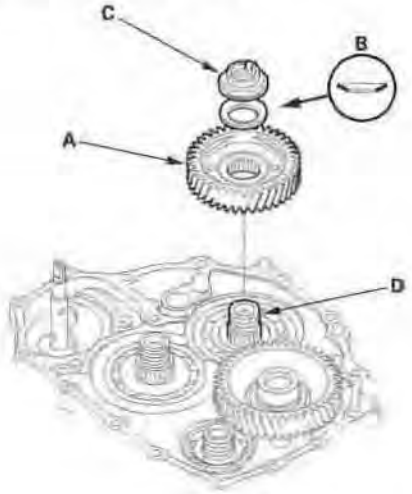
1. Install the special tool onto the mainshaft.



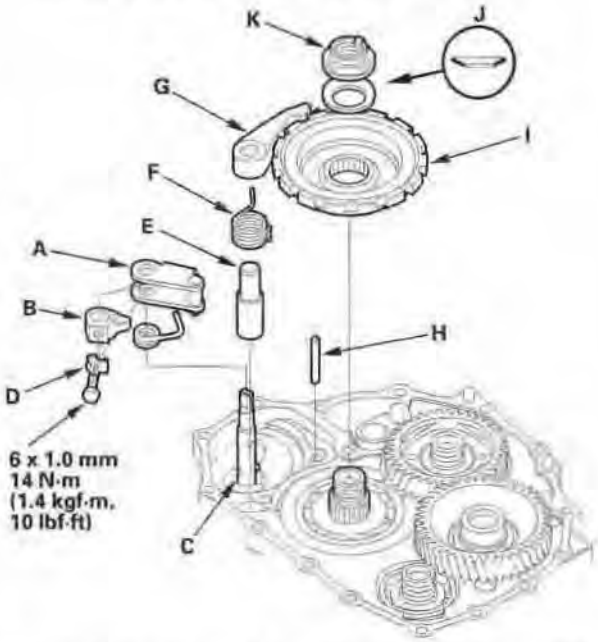
2. Lubricate the following parts with ATF:
   - Splines and threads of the mainshaft.
   - Splines of the mainshaft idler gear.
   - Old conical spring washer and old locknut.

3. Install the mainshaft idler gear (A), old conical spring washer (B), and old locknut (C) on the mainshaft (D), and tighten the locknut to 226 N·m (23.0 kgf·m, 166 lbf·ft).

   NOTE:
   - Do not tap the idler gear to install.
   - Use a torque wrench to tighten the locknut. Do not use an impact wrench.



4. Install the park lever (A) and park lever stop (B) on the selector control shaft (C), then install the lock bolt with the new lock washer (D). Do not bend the lock tab of the lock washer until step 18.



5. Install the park pawl shaft (E), park pawl spring (F), park pawl (G), and stop shaft (H) on the transmission housing.

6. Lubricate the following parts with ATF:
   - Threads and splines of the countershaft.
   - Old conical spring washer and old locknut.
   - Areas where the park gear contacts the conical spring washer.

7. Install the park gear (I), old conical spring washer (J), and old locknut (K) on the countershaft.

8. Lift the park pawl up, and engage it with the park gear, then tighten the locknut to 226 N·m (23.0 kgf·m, 166 lbf·ft).

   NOTE:
   - Do not tap the park gear to install.
   - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
   - Countershaft locknut has left-hand threads.

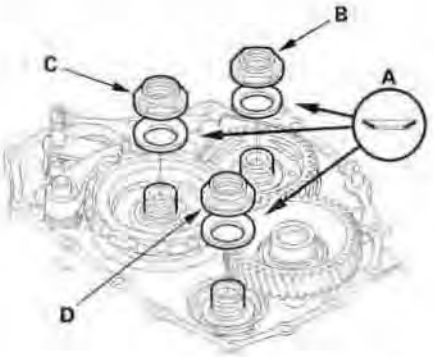
9. Remove the locknuts and conical spring washers from the mainshaft and countershaft.

(cont'd)

End Cover Installation (cont'd)

10. Lubricate the threads of the shafts, the new locknuts, and the new conical spring washers with ATF.

11. Install the new conical spring washers (A) in the direction shown, and install the new mainshaft locknut (B), the new countershaft locknut (C), and the new secondary shaft locknut (D).

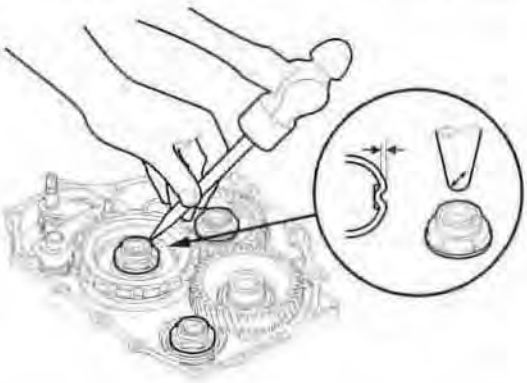


12. Tighten the locknuts to 167 N·m (17.0 kgf·m, 123 lbf·ft).

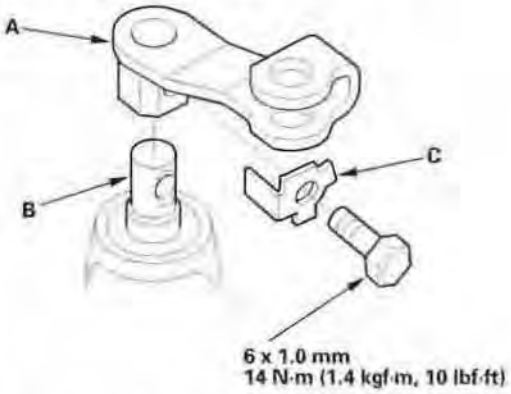
    NOTE:
    - Be sure to install the conical spring washers in the direction shown.
    - Use a torque wrench to tighten the locknut. Do not use an impact wrench.
    - Countershaft and secondary shaft locknuts have left-hand threads.

13. Remove the special tool from the mainshaft.

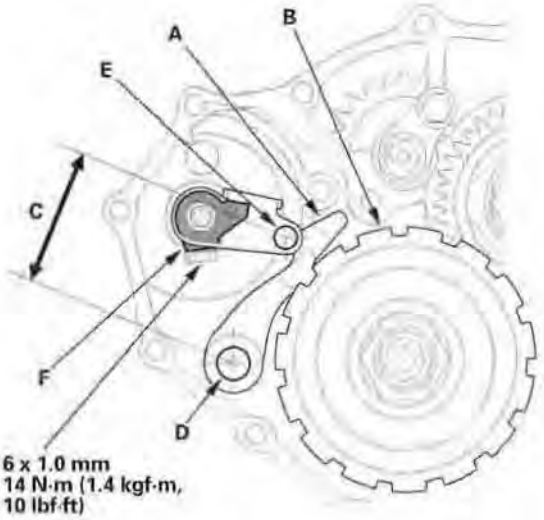
14. Stake the locknuts into the shafts with a punch.



15. Install the selector control lever (A) on the selector control shaft (B), and install the bolt with the new lock washer (C), then bend the lock tab of the lock washer against the bolt head.



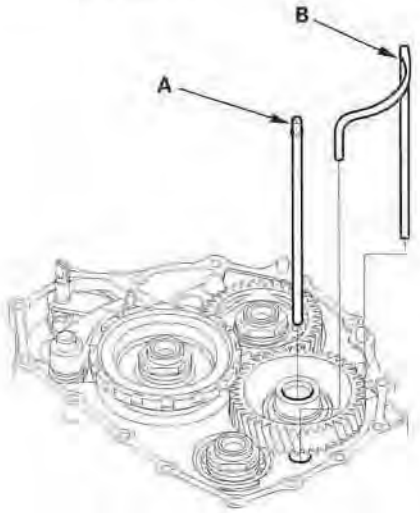
16. Set the park lever in the P position, then verify that the park pawl (A) engages the park gear (B).



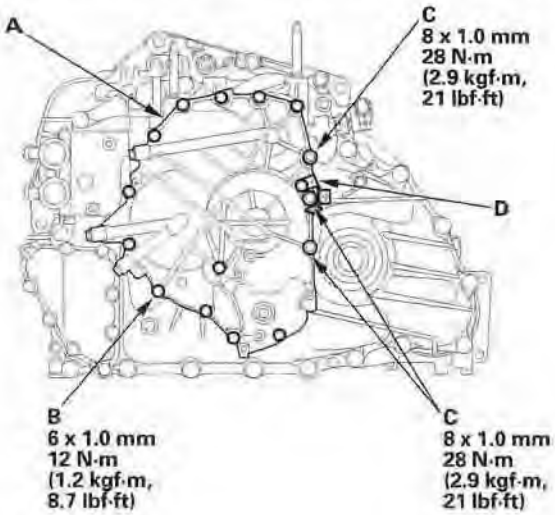
17. If the park pawl does not engage fully, check the distance (C) between the pawl shaft (D) and the park lever roller pin (E) (see page 14-255).

18. Tighten the lock bolt, and bend the lock tab of the lock washer (F) against the bolt head.

19. Install the ATF feed pipe (A) into the idler gear shaft, and install the ATF lubrication pipe (B) into the transmission housing.



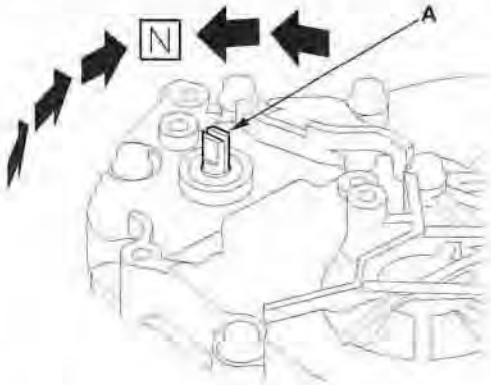
20. Install the end cover (A) with the two dowel pins, new O-rings, and new gasket. Tighten the 6 x 1.0 mm bolts (12) (B) and 8 x 1.0 mm bolts (3) (C).



21. Install the harness clamp bracket (D) on the end cover.

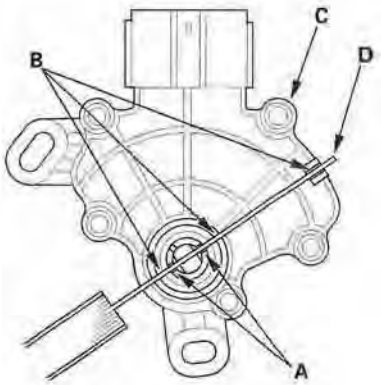
22. Set the selector control shaft (A) to the N position by turning the selector control lever on the torque converter side.

NOTE: Do not squeeze the end of the selector control shaft tips together when turning the shaft. If the tips are squeezed together it could cause a faulty signal or position due to the play between the selector control shaft and the switch.



23. Align the cutouts (A) on the rotary-frame with the neutral positioning cutouts (B) on the transmission range switch (C), then put a 2.0 mm (0.08 in.) feeler gauge blade (D) in the cutouts to hold in the N position.

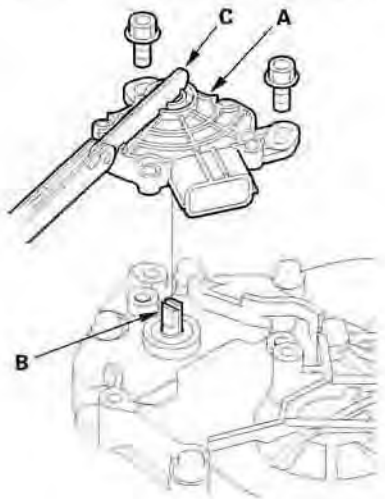
NOTE: Be sure to use a 2.0 mm (0.08 in.) blade or equivalent to hold the switch in the N position.



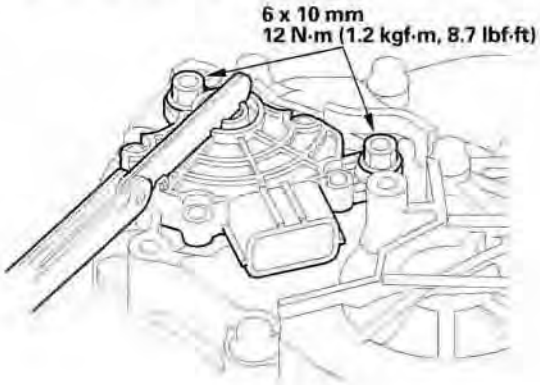
(cont'd)

End Cover Installation (cont'd)

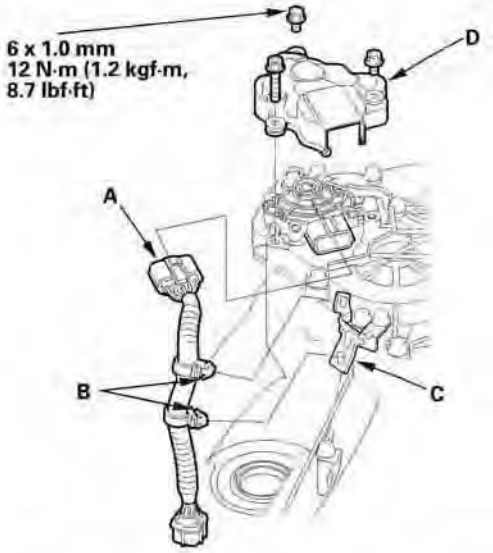
24. Install the transmission range switch (A) gently on the selector control shaft (B) while holding the N position with the 2.0 mm (0.08 in.) blade (C).



25. Tighten the bolts on the transmission range switch while you continue to hold the N position. Do not move the transmission range switch when tightening the bolts. Remove the feeler gauge.

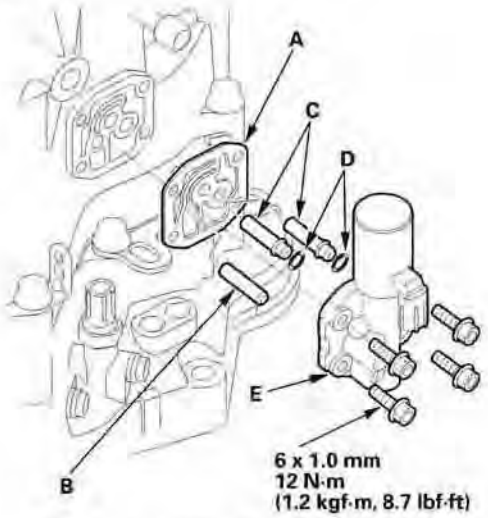


26. Connect the transmission range switch connector (A) securely, then install the harness clamps (B) on the clamp bracket (C).



27. Install the transmission range switch cover (D).

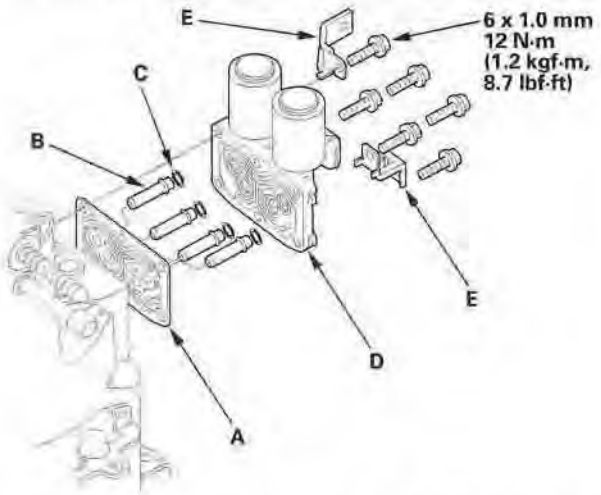
28. Install the new gasket (A) on the transmission housing, and install the ATF pipe (B) and ATF joint pipes (C).



29. Install the new O-rings (D) over the ATF joint pipes.

30. Install the A/T clutch pressure control solenoid valve A (E).

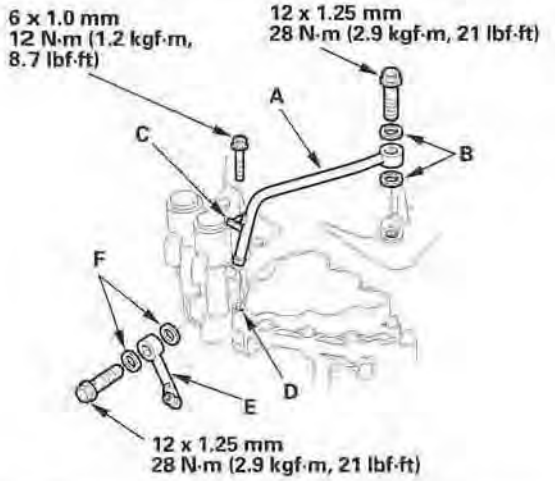
31. Install the new gasket (A) on the transmission housing, and install the ATF joint pipes (B).



32. Install the new O-rings (C) over the ATF joint pipes.

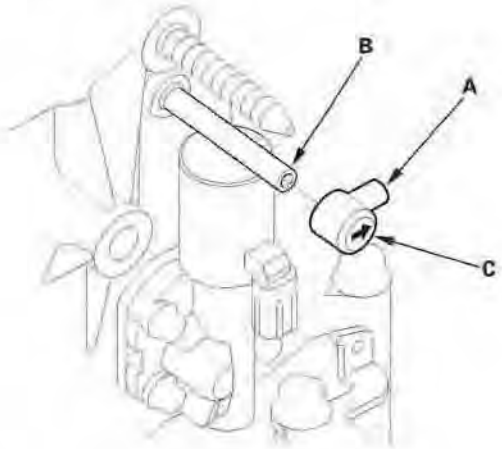
33. Install the A/T clutch pressure control solenoid valves B and C (D) and harness clamp brackets (E).

34. Install the ATF cooler inlet line (A) with the new sealing washers (B), and install the bracket (C) of the ATF cooler inlet line on the shift solenoid valve cover hole (D) (see step 23 on page 14-316).

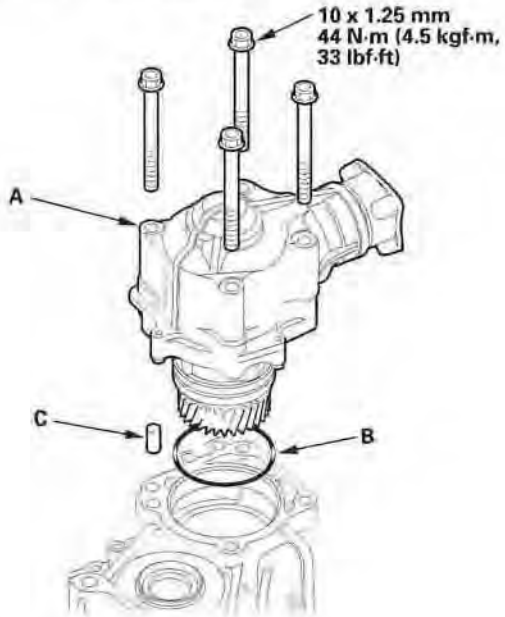


35. Install the ATF cooler outlet line (E) with the new sealing washers (F).

36. Install the breather cap (A) securely on the breather pipe (B) so its arrow (C) points to the front of the transmission (A/T clutch pressure control solenoid valves B and C side).



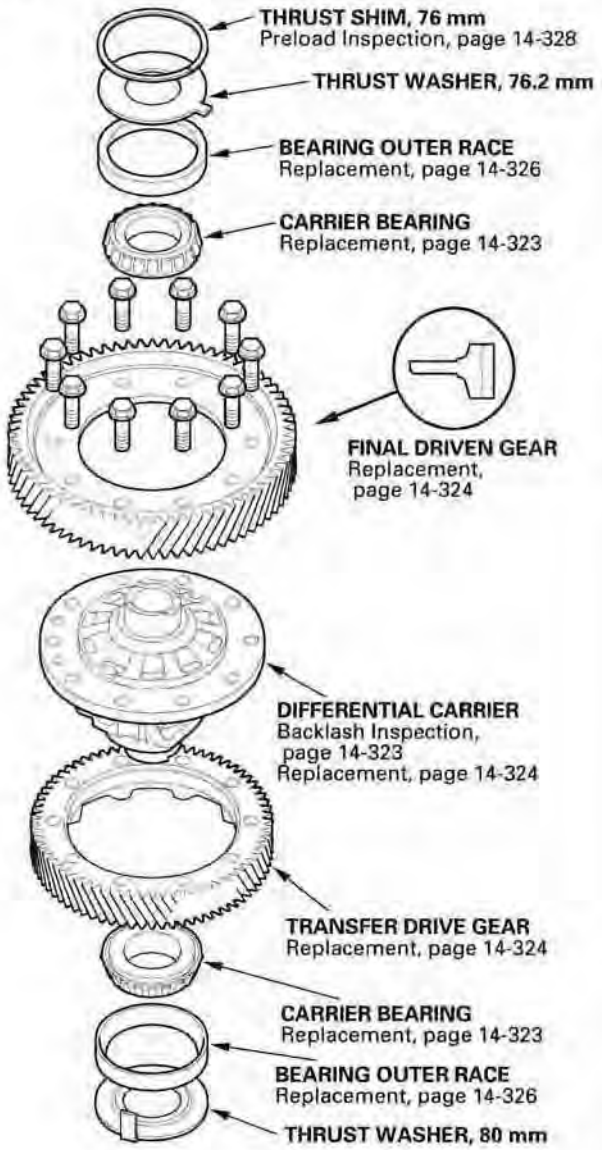
37. 4WD model: Install the transfer assembly (A) with the new O-ring (B) and dowel pin (C).



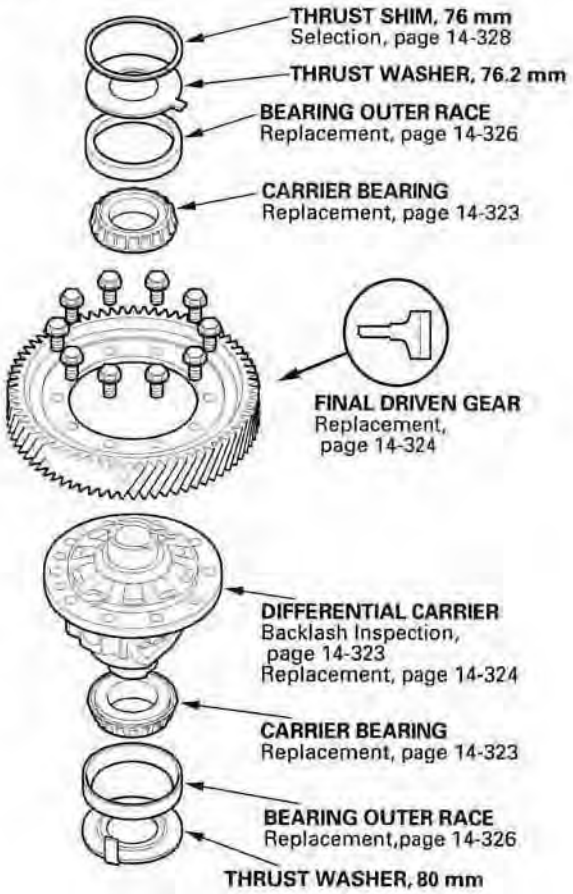
38. Install the ATF dipstick.

Component Location Index

4WD



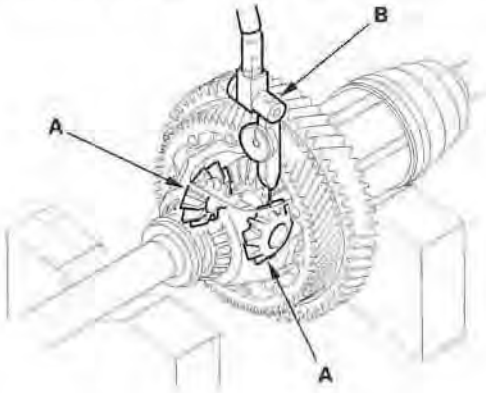
2WD



Backlash Inspection

NOTE: The illustration shows the 4WD; 2WD model is similar.

1. Install the driveshaft and intermediate shaft on the differential, then place the axles on V-blocks.



2. Check the backlash of the pinion gears (A) with a dial indicator (B).

   Standard: 0.05—0.15 mm (0.002—0.006 in.)

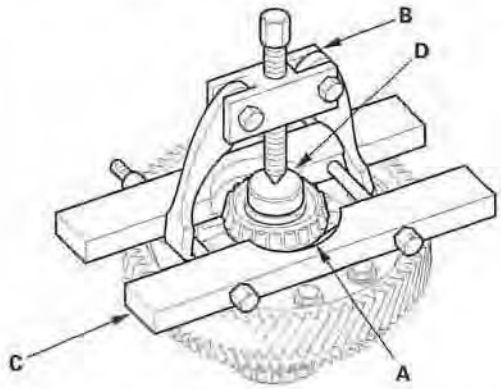
3. If the backlash is out of standard, replace the differential carrier.

Carrier Bearing Replacement

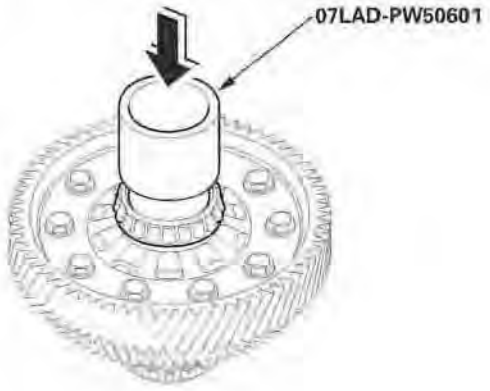
Special Tools Required
Attachment, 40 x 50 mm 07LAD-PW50601

NOTE:
- The bearing and bearing outer race should be replaced as a set.
- Inspect and adjust the carrier bearing preload whenever bearing is replaced.
- Check the bearing for wear and rough rotation. If the bearing is OK, removal is not necessary.
- The illustration shows the 4WD model; 2WD is similar.

1. Remove the carrier bearing (A) with a commercially available puller (B), bearing separator (C), and stepper adapter (D).



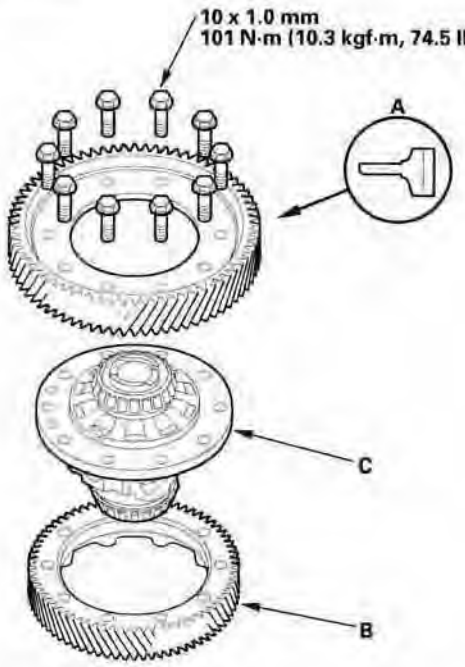
2. Install the new bearings with the special tool and a press. Press the bearing on securely so there is no clearance between the bearing and the differential carrier.



Differential Carrier, Final Driven Gear, and Transfer Drive Gear Replacement

1. Remove the final driven gear (A) and transfer drive gear (B) from the differential carrier (C).

   NOTE: The final driven gear bolts have left-hand threads.

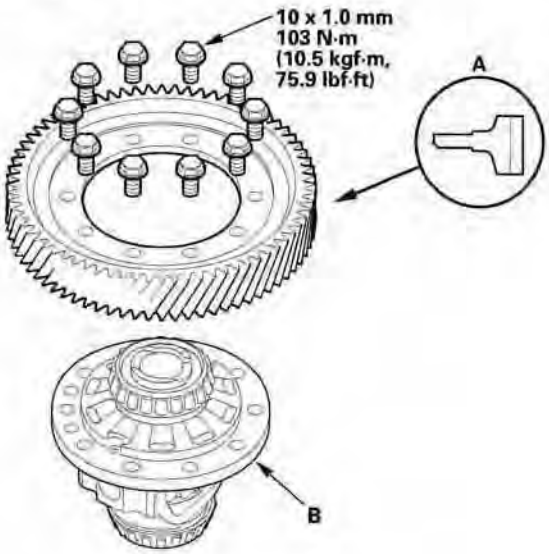


2. Install the final driven gear with the chamfered side on the inner bore facing the differential carrier.
3. Tighten the bolts to the specified torque in a crisscross pattern.

Differential Carrier, Final Driven Gear Replacement

1. Remove the final driven gear from the differential carrier, and replace the differential carrier or final driven gear.
2. Install the final driven gear (A) in the direction shown on the differential carrier (B).

   NOTE: Differential carrier bolts have left-hand threads.



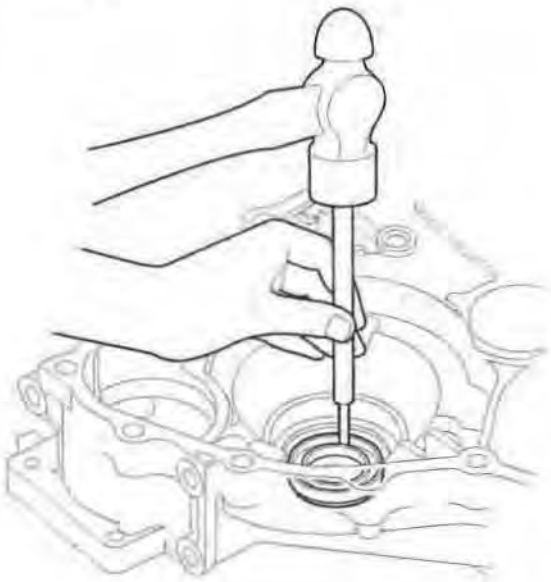
Oil Seal Replacement

Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment 07947-SD90101
- Oil seal driver attachment 07JAD-PH80101

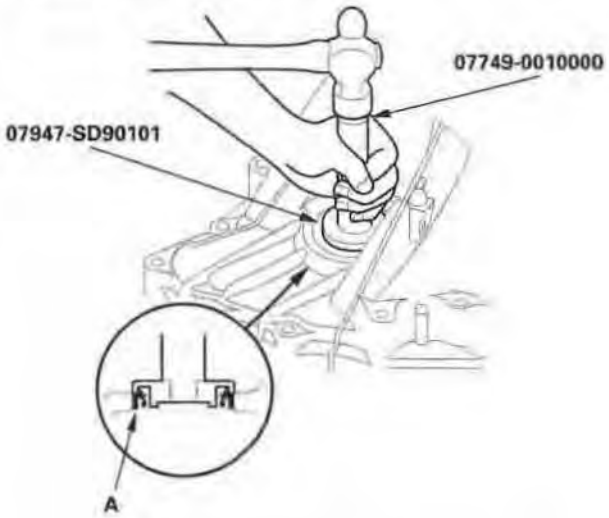
NOTE: The illustration shows the 4WD model; 2WD is similar.

1. Remove the oil seal from the transmission housing.

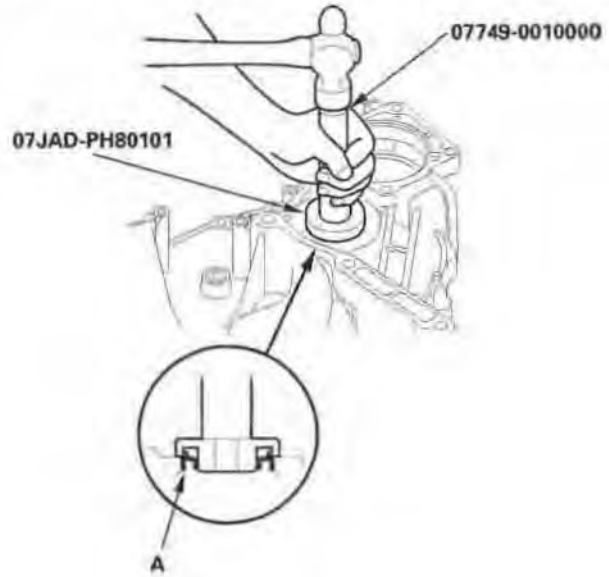
2. Remove the oil seal from the torque converter housing.



3. Install the new oil seal (A) in the transmission housing with the special tools.



4. Install the new oil seal (A) in the torque converter housing with the special tools.



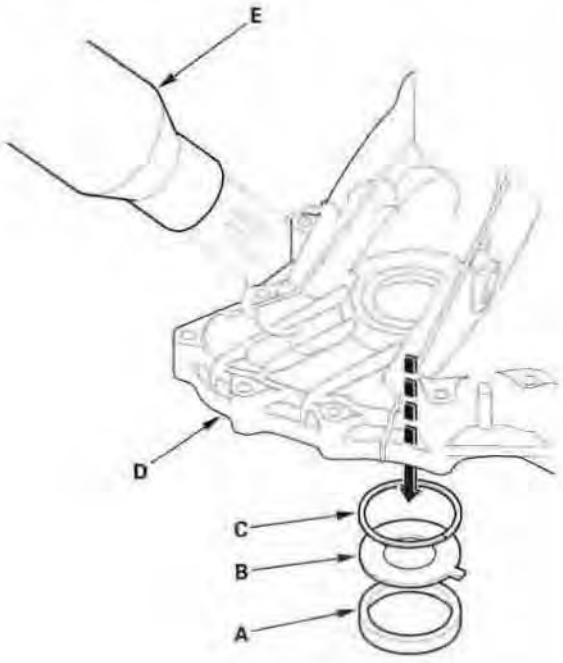
Carrier Bearing Outer Race Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 78 x 90 mm 07GAD-SD40101
- Attachment, 72 x 75 mm 07746-0010600

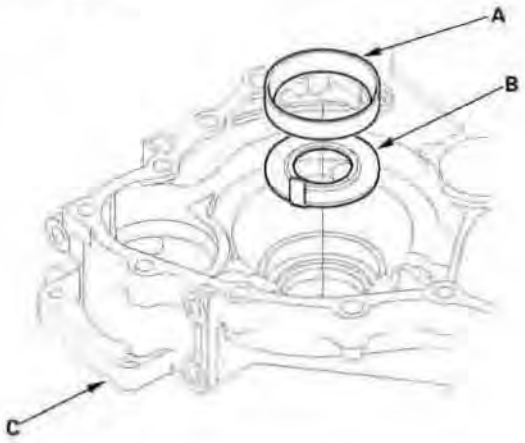
NOTE:
- The bearing and bearing outer race should be replaced as a set.
- Replace the bearing with a new one whenever the outer race is replaced.
- Do not use the thrust shim on the torque converter housing.
- Adjust bearing preload after replacing the bearing and outer race.
- Coat all parts with ATF during installation.
- The illustration shows the 4WD model; 2WD is similar.

1. Remove the bearing outer race (A), 76.2 mm thrust washer (B), and 76 mm thrust shim (C) from the transmission housing (D) by heating the housing to about 212 °F (100 °C) with heat gun (E). Do not heat the housing in excess of 212 °F (100 °C).

   NOTE: Let the transmission housing cool to room temperature before installing the bearing outer race.



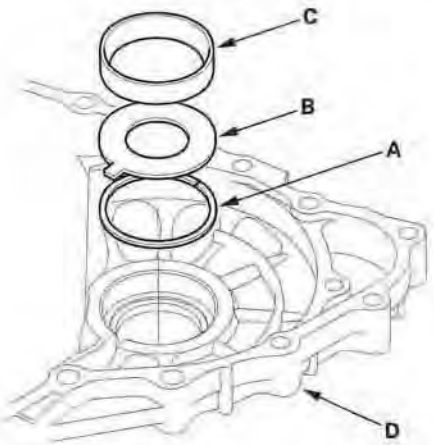
2. Remove the bearing outer race (A) and 80 mm thrust washer (B) from the torque converter housing (C).



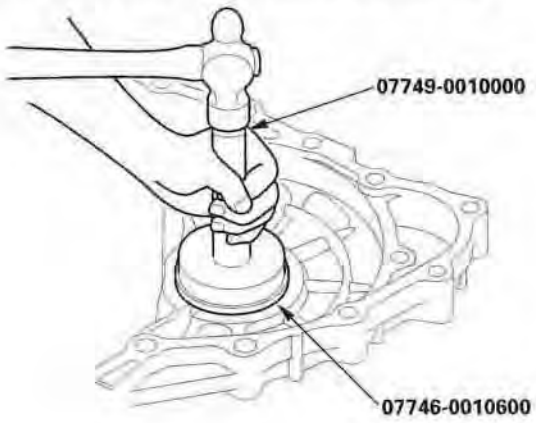
3. Install the 80 mm thrust washer and the new bearing outer race in the torque converter housing.

4. Drive the bearing outer race securely in the housing with the special tools.

5. Install the 76 mm thrust shim (A), 76.2 mm thrust washer (B), and the new bearing outer race (C) in the transmission housing (D).



6. With the special tools, drive the bearing outer race in securely so there is no clearance between the outer race, thrust washer, shim, and housing.



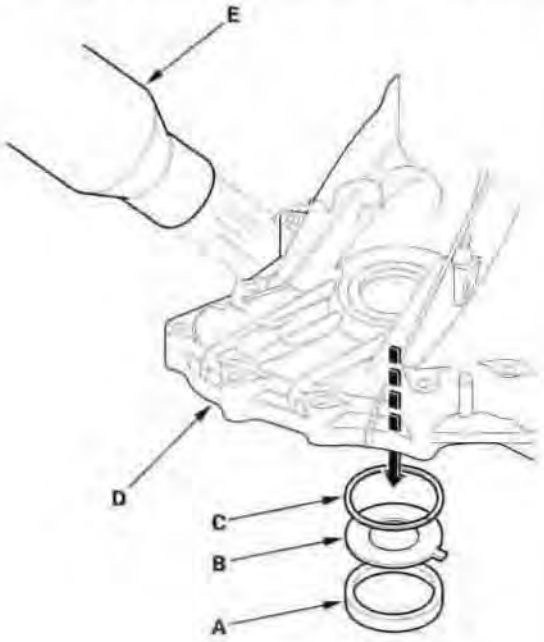
Carrier Bearing Preload Inspection

Special Tools Required
- Driver 07749-0010000
- Attachment, 72 x 75 mm 07746-0010600
- Preload inspection tool 07HAJ-PK40201

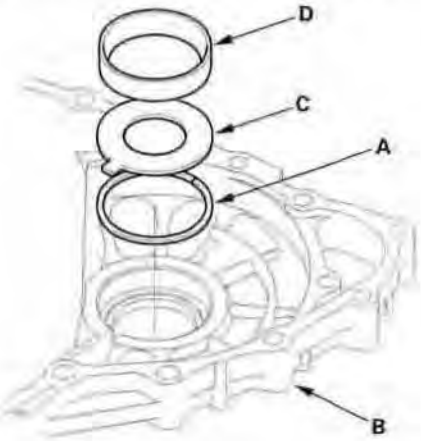
NOTE:
- If the transmission housing, torque converter housing, differential carrier, carrier bearing and outer race, or thrust shim were replaced, the bearing preload must be adjusted.
- Coat all parts with ATF during installation.
- Do not use the thrust shim in the torque converter housing.
- The illustration shows the 4WD model; 2WD is similar.

1. Remove the bearing outer race (A), 76.2 mm thrust washer (B), and 76 mm thrust shim (C) from the transmission housing (D) by heating the housing to about 212 °F (100 °C) with heat gun (E). Do not heat the housing in excess of 212 °F (100 °C).

   NOTE: Let the transmission housing cool to room temperature before adjusting the bearing preload.

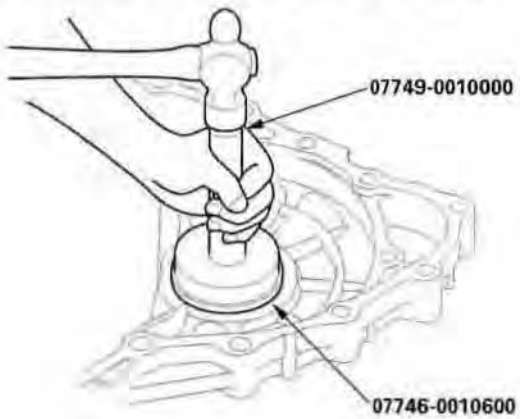


2. Install the 76 mm thrust shim (A) in the transmission housing (B).
   If you replace the 76 mm thrust shim with a new one, use the same thickness shim as the old one.

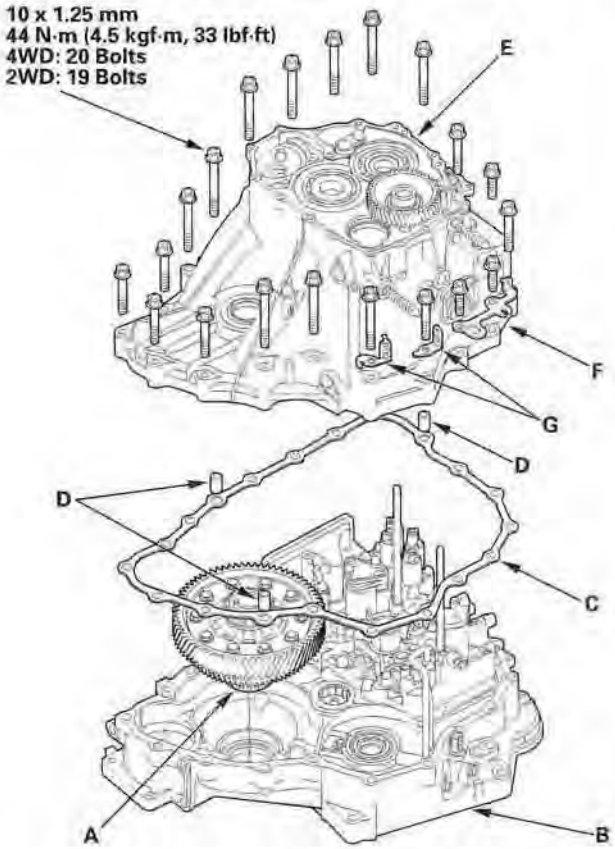


3. Install the 76.2 mm thrust washer (C) and the bearing outer race (D) in the transmission housing.

4. With the special tools, drive the bearing outer race in securely so there is no clearance between the outer race, thrust washer, shim, and housing.



5. Install the differential assembly (A) in the torque converter housing (B), and install the gasket (C) and dowel pins (D) on the housing.

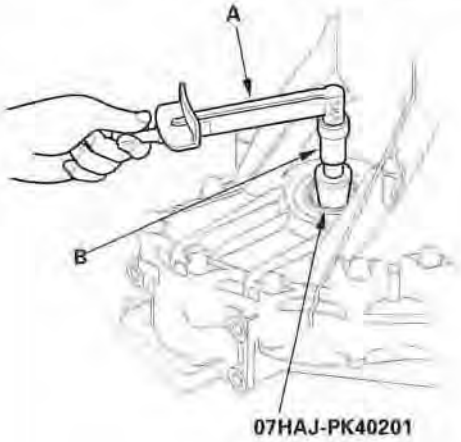


6. Install the transmission housing (E) with the transmission hanger (F) and harness clamp brackets (G), then tighten the bolts.

7. Rotate the differential assembly in both directions to seat the bearings.

8. Measure the starting torque of the differential assembly with the special tool, a torque wrench (A), and a socket (B). Measure the starting torque at normal room temperature in both directions.

Standard
New Bearing: **2.7—3.9 N·m (28—40 kgf·cm, 24—35 lbf·in.)**
Reused Bearing: **2.5—3.6 N·m (25—37 kgf·cm, 22—32 lbf·in.)**



(cont'd)

Carrier Bearing Preload Inspection (cont'd)

9. If the measurement is out of standard, remove the thrust shim and select the thrust shim from table. Install the new thrust shim and recheck. To increase the starting torque, increase the thickness of the thrust shim. To decrease the starting torque, decrease the thickness of the shim. Changing the shim to the next size will increase or decrease starting torque about 0.3—0.4 N·m (3—4 kgf·cm, 2.7—3.5 lbf·in.).

THRUST SHIM, 76 mm

No.	Part Number	Thickness
S	41438-PX4-700	2.05 mm (0.081 in.)
T	41439-PX4-700	2.10 mm (0.083 in.)
U	41440-PX4-700	2.15 mm (0.085 in.)
A	41441-PK4-000	2.20 mm (0.087 in.)
B	41442-PK4-000	2.25 mm (0.089 in.)
C	41443-PK4-000	2.30 mm (0.091 in.)
D	41444-PK4-000	2.35 mm (0.093 in.)
E	41445-PK4-000	2.40 mm (0.094 in.)
F	41446-PK4-000	2.45 mm (0.096 in.)
G	41447-PK4-000	2.50 mm (0.098 in.)
H	41448-PK4-000	2.55 mm (0.100 in.)
I	41449-PK4-000	2.60 mm (0.101 in.)
J	41450-PK4-000	2.65 mm (0.103 in.)
K	41451-PK4-000	2.70 mm (0.105 in.)
L	41452-PK4-000	2.75 mm (0.107 in.)
M	41453-PK4-000	2.80 mm (0.110 in.)
N	41454-PK4-000	2.85 mm (0.112 in.)
O	41455-PK4-000	2.90 mm (0.114 in.)
P	41456-PK4-000	2.95 mm (0.116 in.)
Q	41457-PK4-000	3.00 mm (0.118 in.)
R	41458-PK4-000	3.05 mm (0.120 in.)
0A	41428-PRP-000	1.55 mm (0.061 in.)
0B	41429-PRP-000	1.60 mm (0.063 in.)
0C	41430-PRP-000	1.65 mm (0.065 in.)
0D	41431-PRP-000	1.70 mm (0.067 in.)
0E	41432-PRP-000	1.75 mm (0.069 in.)
0F	41433-PRP-000	1.80 mm (0.071 in.)
0G	41434-PRP-000	1.85 mm (0.073 in.)
0H	41435-PRP-000	1.90 mm (0.075 in.)
0I	41436-PRP-000	1.95 mm (0.077 in.)
0J	41437-PRP-000	2.00 mm (0.079 in.)

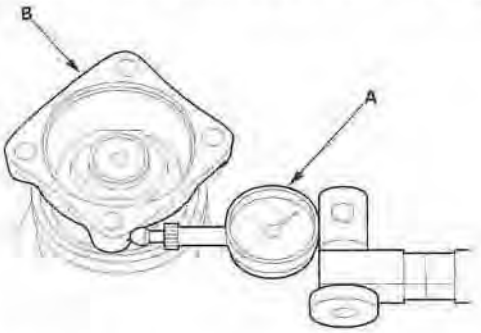
(cont'd)

THRUST SHIM, 76 mm (cont'd)

No.	Part Number	Thickness
A	41428-PAX-000	1.575 mm (0.062 in.)
B	41429-PAX-000	1.625 mm (0.064 in.)
C	41430-PAX-000	1.675 mm (0.066 in.)
D	41431-PAX-000	1.725 mm (0.068 in.)
E	41432-PAX-000	1.775 mm (0.070 in.)
F	41433-PAX-000	1.825 mm (0.072 in.)
G	41434-PAX-000	1.875 mm (0.074 in.)
H	41435-PAX-000	1.925 mm (0.076 in.)
I	41436-PAX-000	1.975 mm (0.078 in.)
J	41437-PAX-000	2.025 mm (0.080 in.)
K	41438-PAX-000	2.075 mm (0.082 in.)
L	41439-PAX-000	2.125 mm (0.084 in.)
M	41440-PAX-000	2.175 mm (0.086 in.)
N	41441-PAX-000	2.225 mm (0.088 in.)
O	41442-PAX-000	2.275 mm (0.090 in.)
P	41443-PAX-000	2.325 mm (0.092 in.)
Q	41444-PAX-000	2.375 mm (0.094 in.)
R	41445-PAX-000	2.425 mm (0.095 in.)
S	41446-PAX-000	2.475 mm (0.097 in.)
T	41447-PAX-000	2.525 mm (0.099 in.)
U	41448-PAX-000	2.575 mm (0.101 in.)
V	41449-PAX-000	2.625 mm (0.103 in.)
W	41450-PAX-000	2.675 mm (0.105 in.)
X	41451-PAX-000	2.725 mm (0.107 in.)
Y	41452-PAX-000	2.775 mm (0.109 in.)
Z	41453-PAX-000	2.825 mm (0.111 in.)
0A	41454-PAX-000	2.875 mm (0.113 in.)
0B	41455-PAX-000	2.925 mm (0.115 in.)
0C	41456-PAX-000	2.975 mm (0.117 in.)
0D	41457-PAX-000	3.025 mm (0.119 in.)

Inspection

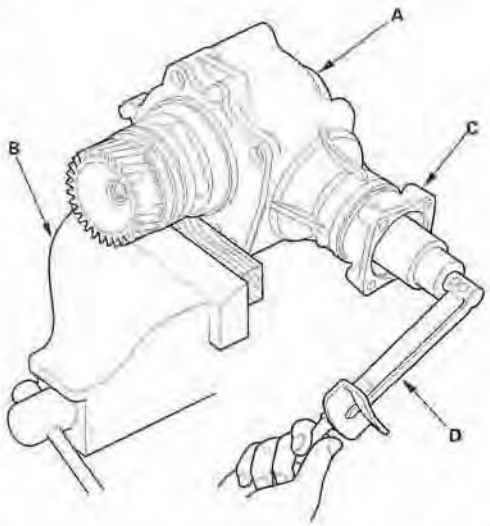
1. Set a dial indicator (A) on the companion flange (B).



2. Measure the transfer gear backlash.

   Standard: 0.06—0.16 mm (0.02—0.06 in.)

3. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



4. Rotate the companion flange several times to seat the tapered roller bearings.

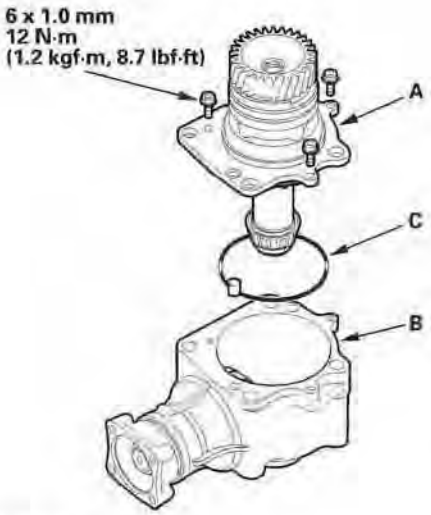
5. Measure the starting torque at the companion flange (C) using a torque wrench (D).

Standard	
2003-2004 models:	2.16—3.57 N·m (22.0—36.4 kgf·cm, 19.1—31.6 lbf·in.)
2005 model:	2.75—4.22 N·m (28.1—43.15 kgf·cm, 24.5—37.5 lbf·in.)

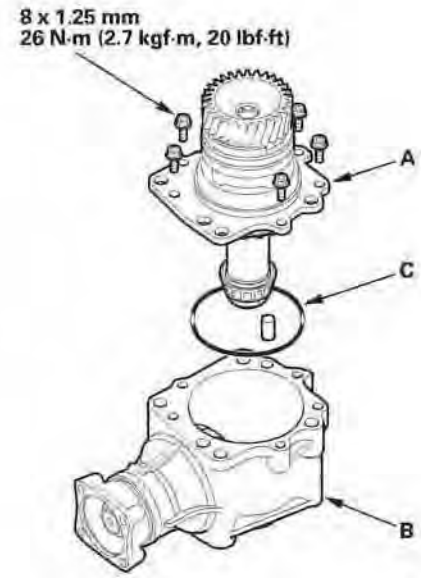
6. Remove the transfer assembly from the vise.

7. Remove the transfer holder (A) from the transfer housing (B), then remove the O-ring (C) from the transfer holder.

2003-2004 models:



2005 model:



(cont'd)

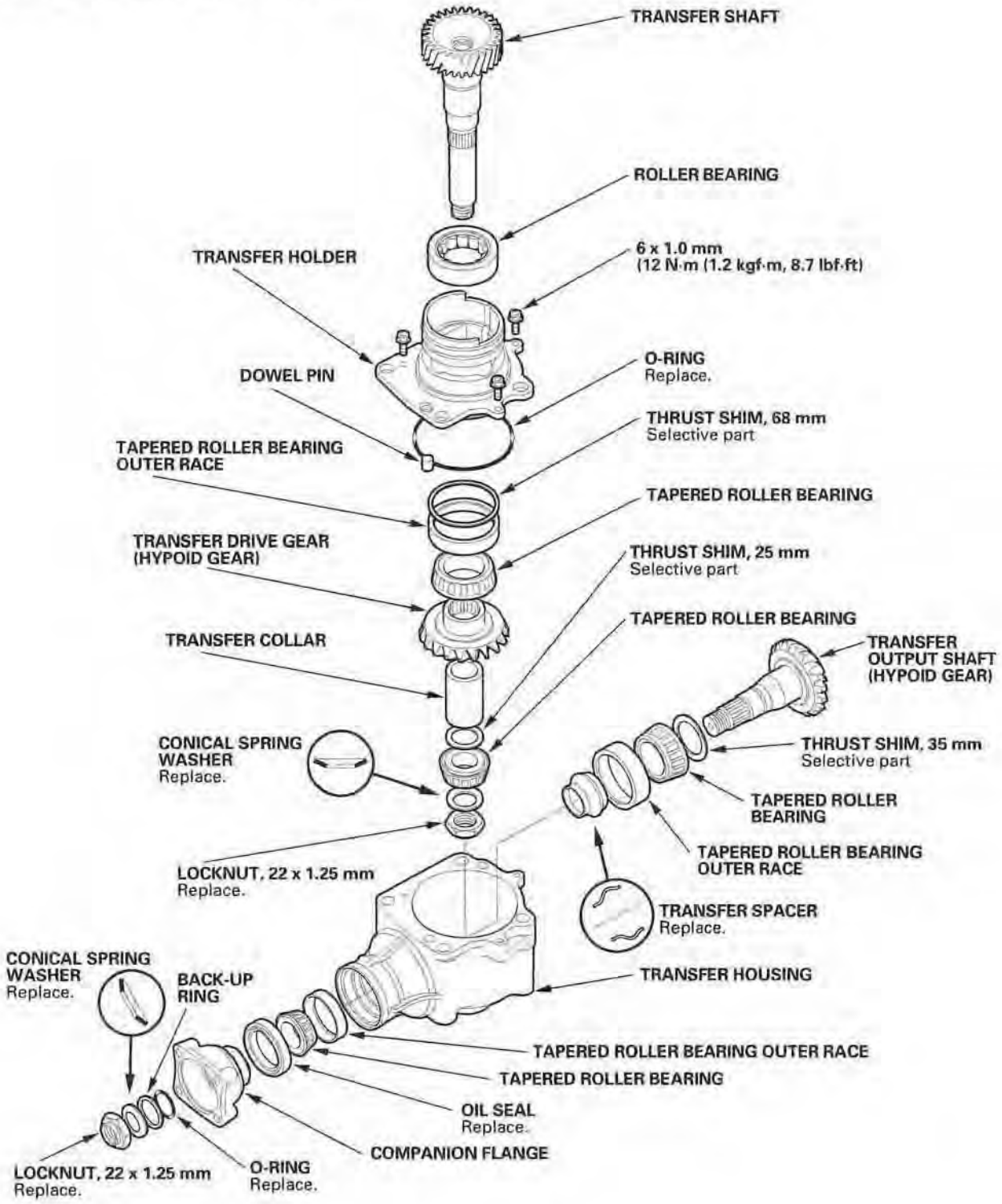
Inspection (cont'd)

8. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.
9. Install the transfer holder, and tighten the bolts. Do not install the O-ring on the transfer holder.
10. Rotate the companion flange in both directions until the transfer gears rotate one full turn in both directions.
11. Remove the transfer holder, and check the transfer drive gear tooth contact pattern. The pattern should be centered on the gear teeth as shown.

12. If the measurements are out of standard or the tooth contact pattern are incorrect, disassemble the transfer assembly and repair it.

Disassembly

Exploded View - 2003-2004 Models



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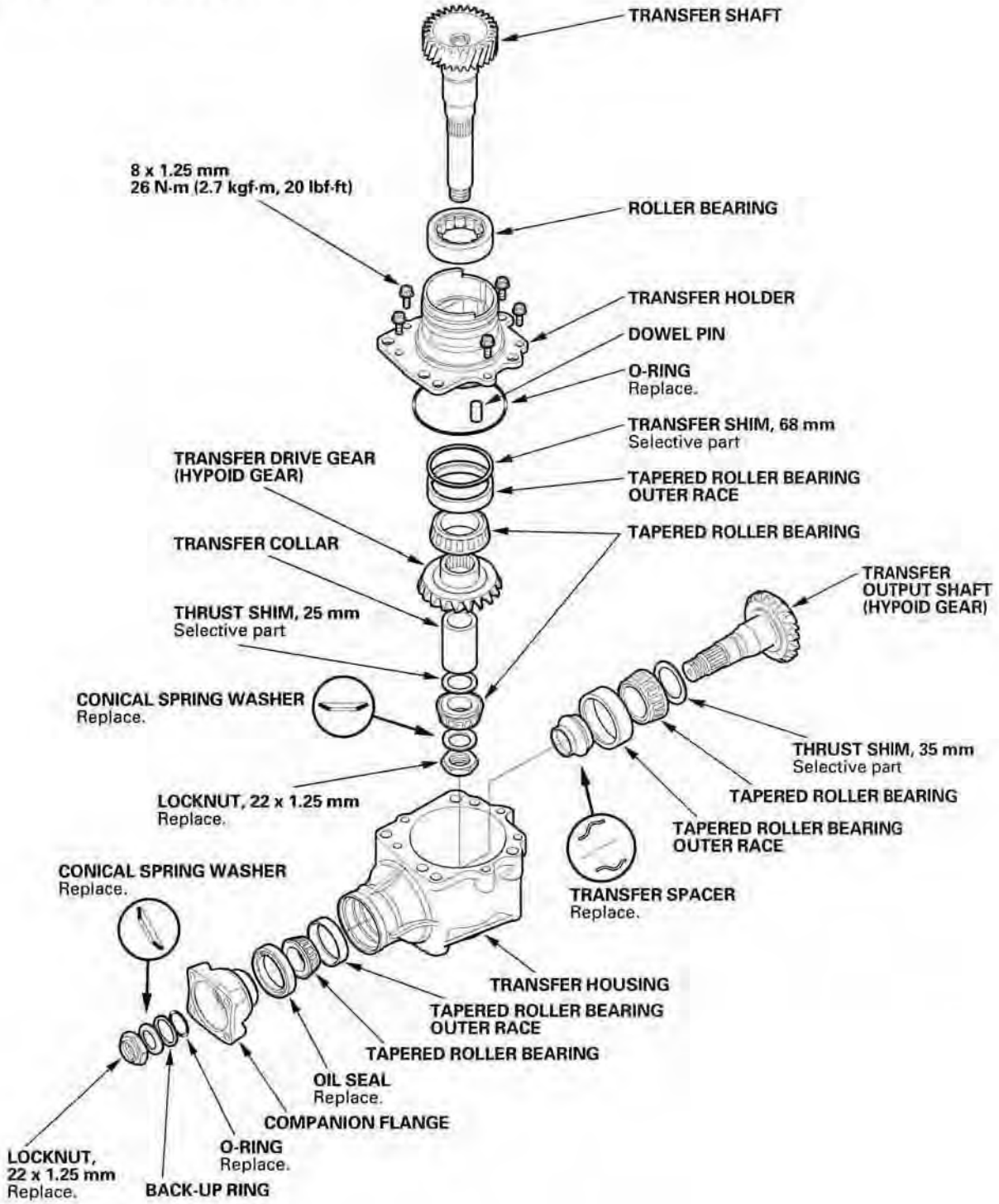
Transfer Assembly

Disassembly (cont'd)

Exploded View - 2005 Model

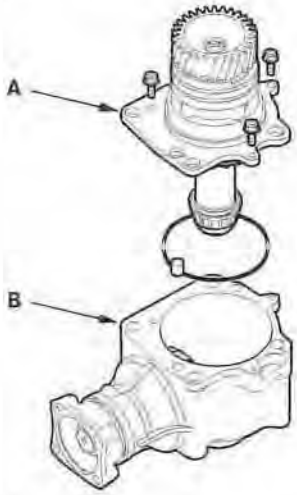


Special Tools Required
- Companion flange holder 07RAB-TB4010A or 07RAB-TB4010B
- Holder handle 07JAB-001020A

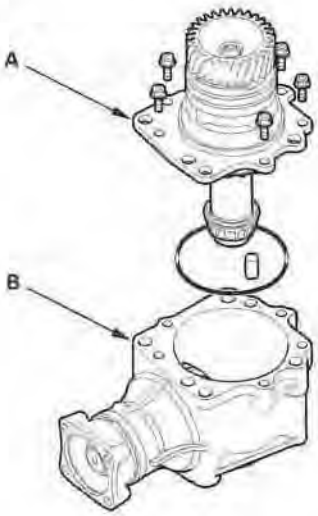
NOTE: Refer to the Exploded View as needed during the following procedure.

1. Remove the transfer holder (A) from the transfer housing (B).

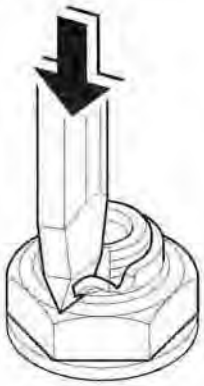
2003-2004 models:



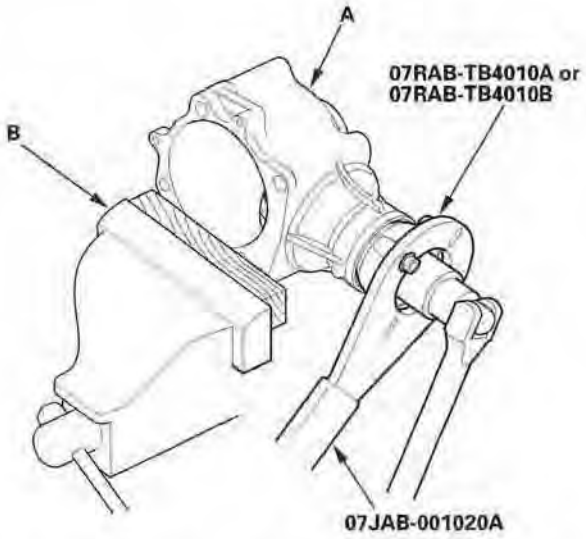
2005 model:



2. Cut the lock tab on the locknut using a chisel.



3. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



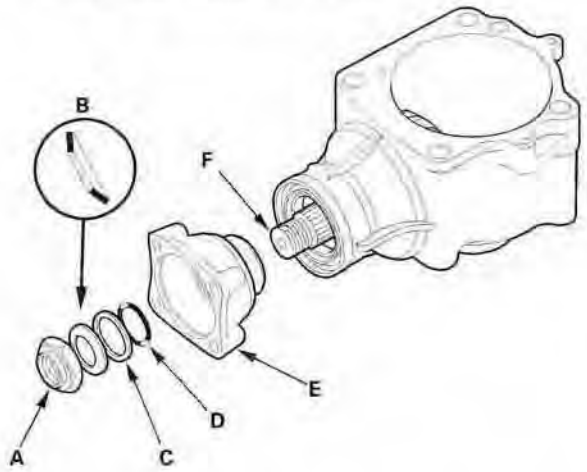
4. Install the special tool on the companion flange, then loosen the locknut.

5. Remove the special tool.

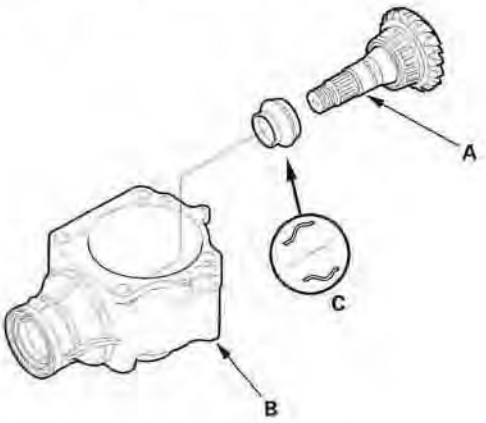
(cont'd)

Disassembly (cont'd)

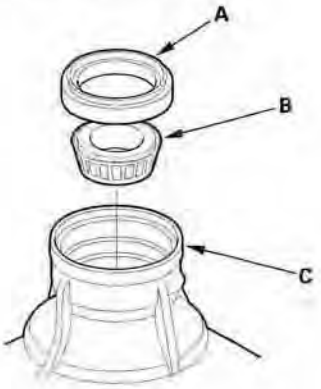
6. Remove the locknut (A), conical spring washer (B), back-up ring (C), O-ring (D), and companion flange (E) from the transfer output shaft (F).



7. Remove the transfer output shaft (A) from the transfer housing (B), then remove the transfer spacer (C) from the transfer output shaft.

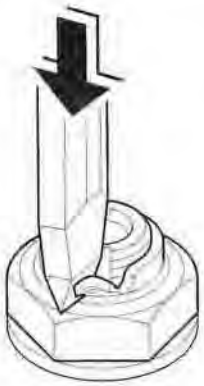


8. Remove the oil seal (A) and tapered roller bearing (B) from the transfer housing (C).

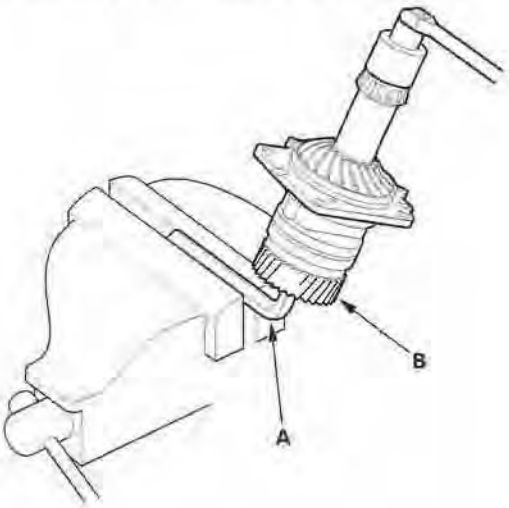


Transfer Holder Disassembly

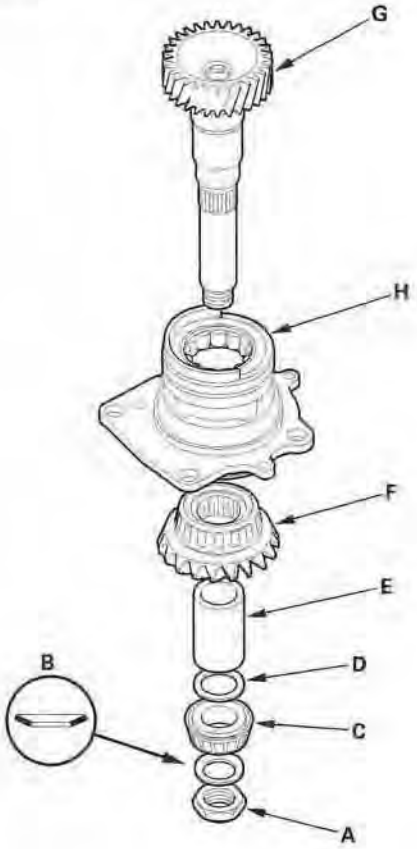
1. Cut the lock tab on the locknut of the transfer shaft using a chisel.



2. Put a 14 mm hex wrench (A) in the transfer shaft (B), then secure the hex wrench in a bench vise.



3. Remove the locknut (A) and conical spring washer (B).

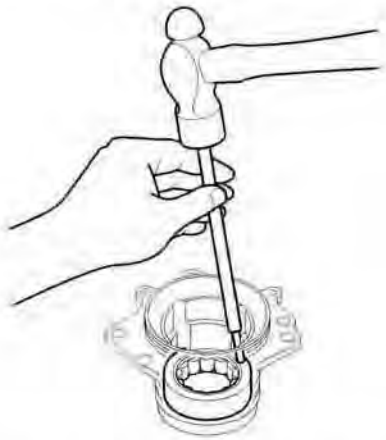


4. Remove the tapered roller bearing (C), 25 mm thrust shim (D), transfer collar (E), transfer drive gear (F), and transfer shaft (G) from the transfer holder (H).

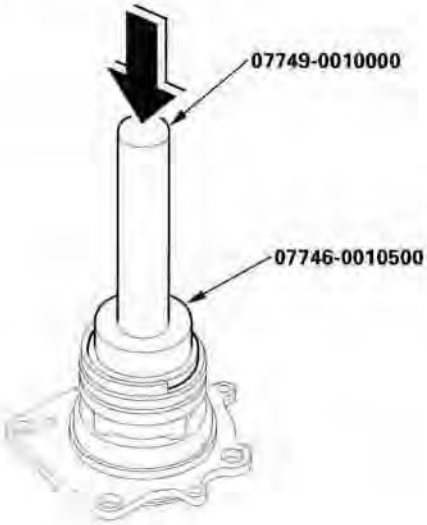
Transfer Holder Roller Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the roller bearing from the transfer holder.



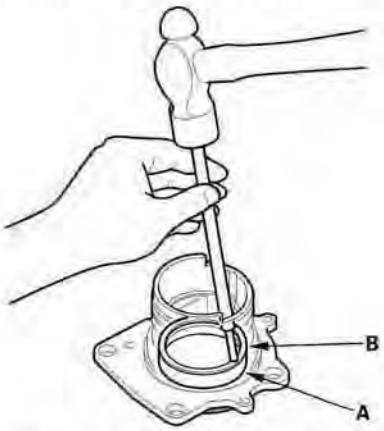
2. Install the new roller bearing in the transfer holder with the special tools.



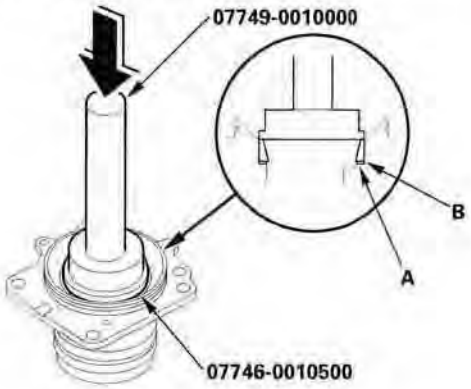
Transfer Holder Tapered Roller Bearing Outer Race Removal/ Installation

Special Tools Required
- Driver 07749-0010000
- Attachment, 62 x 68 mm 07746-0010500

1. Remove the tapered roller bearing outer race (A) and 68 mm thrust shim (B) from the transfer holder.



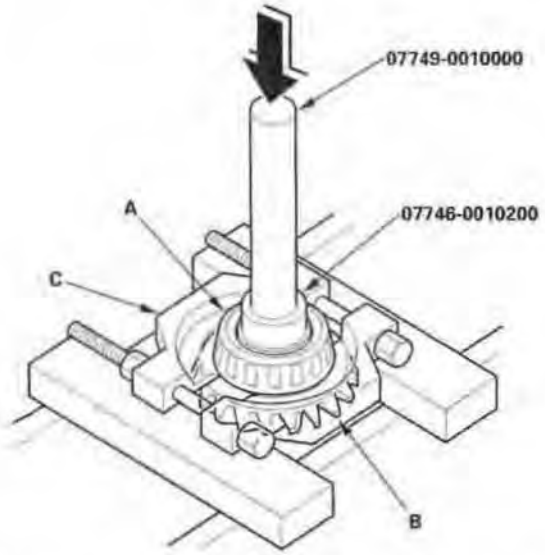
2. Install the 68 mm thrust shim (A) in the transfer holder, then install the tapered roller bearing outer race (B) with the special tools.



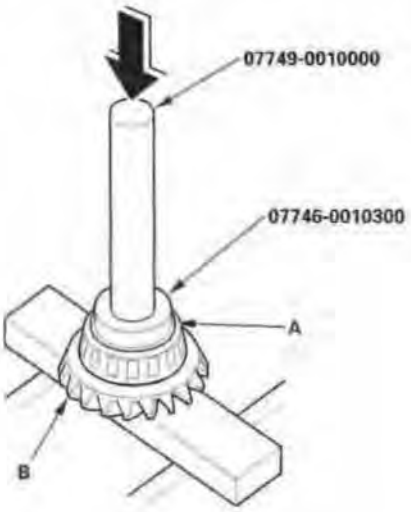
Transfer Drive Gear Bearing Replacement

Special Tools Required
- Driver 07749-0010000
- Attachment, 37 x 40 mm 07746-0010200
- Attachment, 42 x 47 mm 07746-0010300

1. Remove the tapered roller bearing (A) from the transfer drive gear (B) with the special tools, bearing separator (C) and a press.



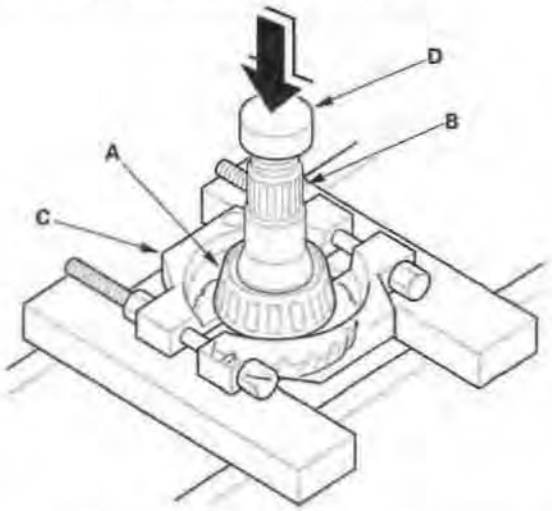
2. Install the new tapered roller bearing (A) on the transfer drive gear (B) with the special tools and a press.



Transfer Output Shaft Bearing Removal/Installation

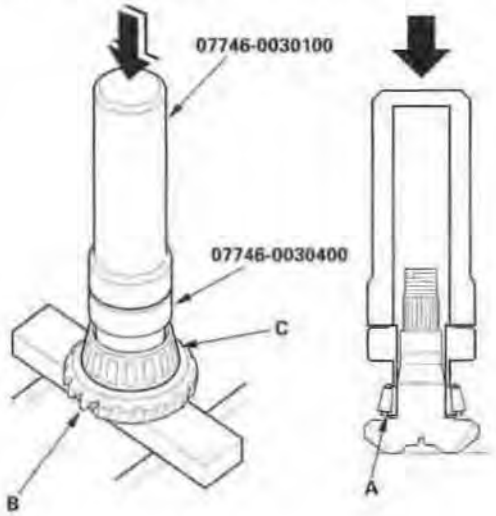
Special Tools Required
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400

1. Remove the tapered roller bearing (A) from the transfer output shaft (B) with a bearing separator (C) and a press. Place a shaft protector (D) between the transfer output shaft and the press to prevent damaging the transfer output shaft.



2. Install the 35 mm thrust shim (A) on the transfer output shaft (B).

3. Install the tapered roller bearing (C) on the transfer output shaft with the special tools and a press.



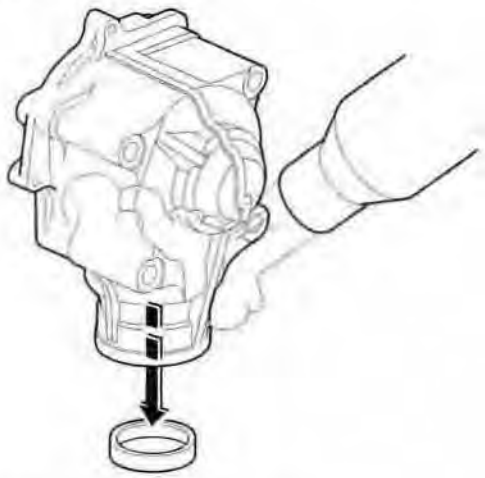
Transfer Housing Tapered Roller Bearing Outer Race Replacement

Special Tools Required
- Driver 07749-0010000
- Oil seal driver attachment 07947-SD90101
- Bearing installer attachment 07KAF-PS30120
- Bearing installer attachment 07LAF-PZ70110
- Installer shaft 14 x 165 mm 07JAF-SJ80110
- Installer nut 14 mm 07JAF-SJ80120

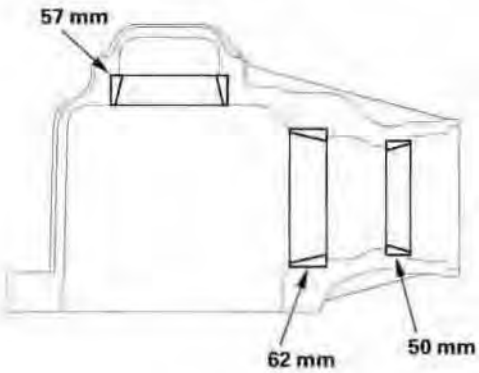
NOTE: Replace the bearing with a new one whenever the outer race is replaced.

1. Remove the bearing outer races from the transfer housing by heating the housing to about 212 °F (100 °C) with a heat gun. Do not heat the housing more than 212 °F (100 °C).

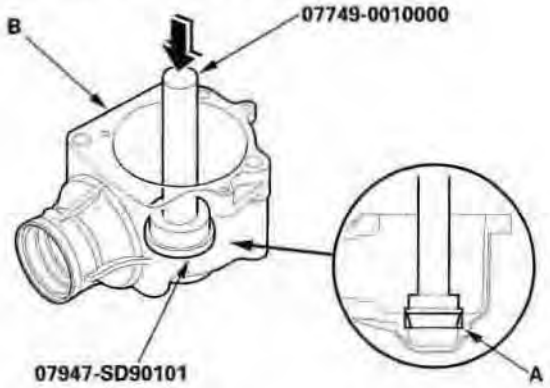
   NOTE: Some 57 mm bearing outer races are not press-fitted, and can be removed without heating the housing.



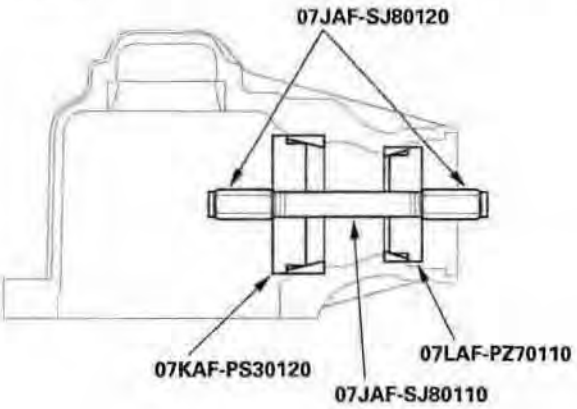
Bearing Outer Race Locations



2. Install the 57 mm bearing outer race (A) in the housing (B) with the special tools.



3. Install the 62 mm bearing outer race and 50 mm bearing outer race in the housing with the special tools.



Reassembly

Special Tools Required
- Driver, 40 mm I.D. 07746-0030100
- Attachment, 35 mm I.D. 07746-0030400
- Driver 07749-0010000
- Oil seal driver attachment 07JAD-PH80101
- Companion flange holder 07RAB-TB4010A or 07RAB-TB4010B
- Holder handle 07JAB-001020A
- Attachment, 62 x 68 mm 07746-0010500

NOTE:
- While reassembling the transfer assembly:
  - Check and adjust the transfer gear tooth contact.
  - Measure and adjust the transfer gear backlash.
  - Check and adjust the tapered roller bearing starting torque.
- Coat all parts with ATF during reassembly.
- Replace the tapered roller bearing and the bearing outer race as a set if either part is replaced.
- Replace the transfer drive gear and the transfer output shaft as a set if either part is replaced.

1. Select the 35 mm thrust shim if the transfer output shaft is replaced. Calculate the thickness of the 35 mm thrust shim using the formula, and select the shim from the table.

   NOTE: The number on the transfer output shaft is shown in 1/100 mm.

   Formula: $X = \frac{A}{100} - \frac{B}{100} + C$

   A: Number on the existing transfer output shaft

   B: Number on the replacement transfer output shaft

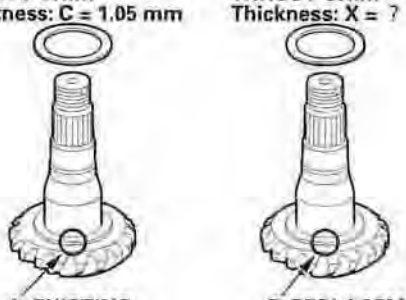
   C: Thickness of the existing 35 mm thrust shim

   X: Thickness needed for the replacement 35 mm thrust shim

Example:

C: EXISTING 35 mm THRUST SHIM Thickness: C = 1.05 mm

X: REPLACEMENT 35 mm THRUST SHIM Thickness: X = ? ? mm



A: EXISTING TRANSFER OUTPUT SHAFT Number: A = + 2

B: REPLACEMENT TRANSFER OUTPUT SHAFT Number: B = − 1

$$X = \frac{A}{100} - \frac{B}{100} + C = \frac{2}{100} - \frac{-1}{100} + 1.05$$

$$= 0.02 + 0.01 + 1.05 = 1.08 \text{ mm}$$

Select No. M 35 mm thrust shim of 1.08 mm in this cause.

THRUST SHIM, 35 mm

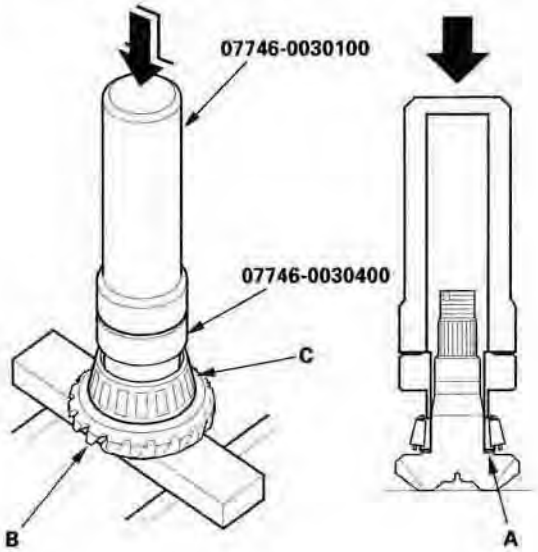
Shim No.	Part Number	Thickness
A	41361-PS3-000	0.72 mm (0.028 in.)
B	41362-PS3-000	0.75 mm (0.030 in.)
C	41363-PS3-000	0.78 mm (0.031 in.)
D	41364-PS3-000	0.81 mm (0.032 in.)
E	41365-PS3-000	0.84 mm (0.033 in.)
F	41366-PS3-000	0.87 mm (0.034 in.)
G	41367-PS3-000	0.90 mm (0.035 in.)
H	41368-PS3-000	0.93 mm (0.037 in.)
I	41369-PS3-000	0.96 mm (0.038 in.)
J	41370-PS3-000	0.99 mm (0.039 in.)
K	41371-PS3-000	1.02 mm (0.040 in.)
L	41372-PS3-000	1.05 mm (0.041 in.)
M	41373-PS3-000	1.08 mm (0.043 in.)
N	41374-PS3-000	1.11 mm (0.044 in.)

2. Select the 35 mm thrust shim if the tapered roller bearing on the transfer output shaft is replaced. Measure the thickness of the replacement bearing and the existing bearing, and calculate the difference of the bearing thickness. Adjust the thickness of the existing 35 mm thrust shim by the amount of the difference in bearing thickness, and select the replacement 35 mm thrust shim.

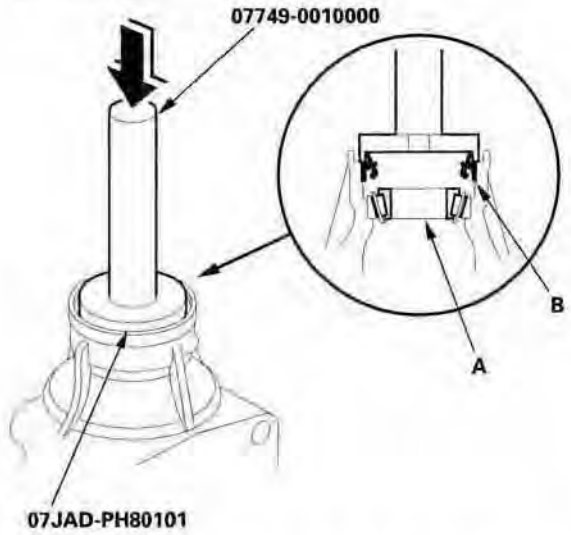
(cont'd)

Reassembly (cont'd)

3. Install the 35 mm thrust shim (A) on the transfer output shaft (B), then install the tapered roller bearing (C) with the special tools and a press.

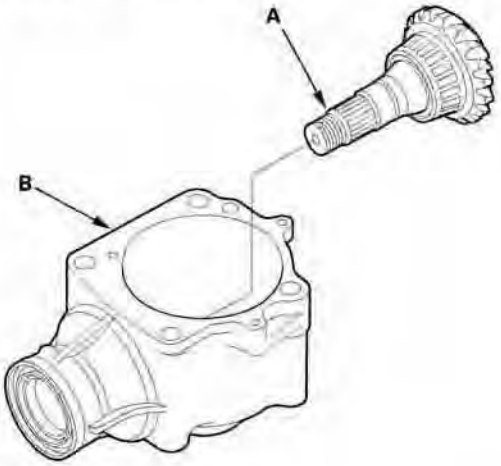


4. Place the tapered roller bearing (A) on the bearing outer race of the companion flange side of the transfer housing.

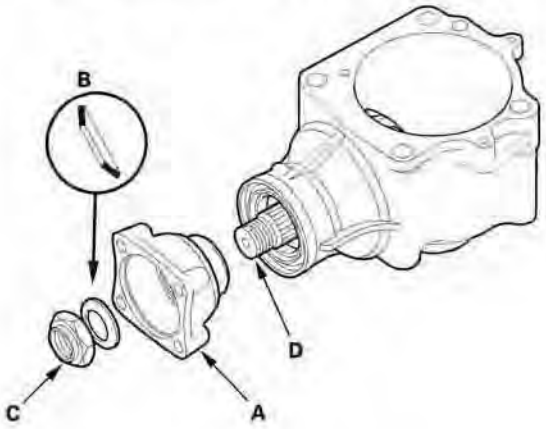


5. Install the new oil seal (B) on the transfer housing with the special tools and a press.

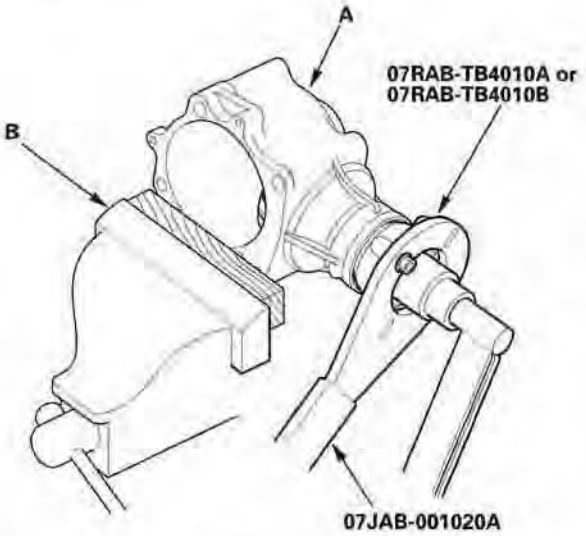
6. Install the transfer output shaft (A) in the transfer housing (B). Do not install the transfer spacer on the transfer output shaft.



7. Install the companion flange (A), conical spring washer (B), and locknut (C) on the transfer output shaft (D). Do not install the O-ring and back-up ring.



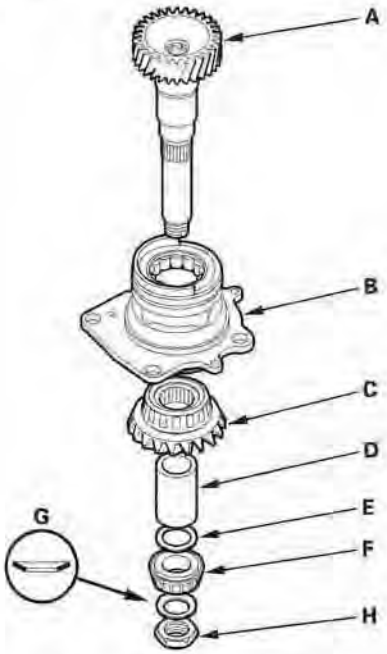
8. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



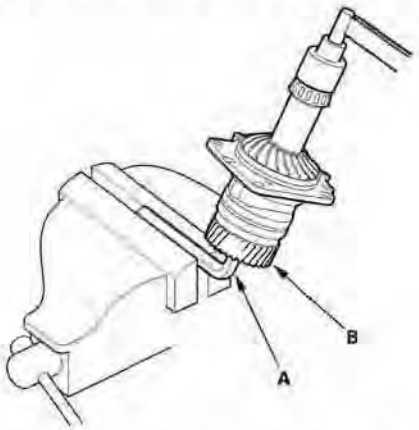
9. Install the special tool on the companion flange.

10. Tighten the locknut while measuring the starting torque so the starting torque is within 0.98—1.39 N·m (10.0—14.2 kgf·cm, 8.7—12.3 lbf·in.). Do not stake the locknut in this step.

11. Install the transfer shaft (A) in the transfer holder (B), and install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H).



12. Put a 14 mm hex wrench (A) in the transfer shaft (B), then secure the hex wrench in a bench vise.



13. Tighten the locknut 118 N·m (12.0 kgf·m, 86.8 lbf·ft). Do not stake the locknut in this step.

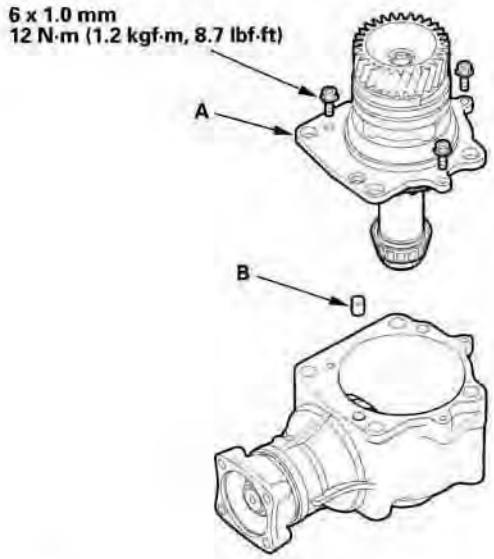
(cont'd)

Reassembly (cont'd)

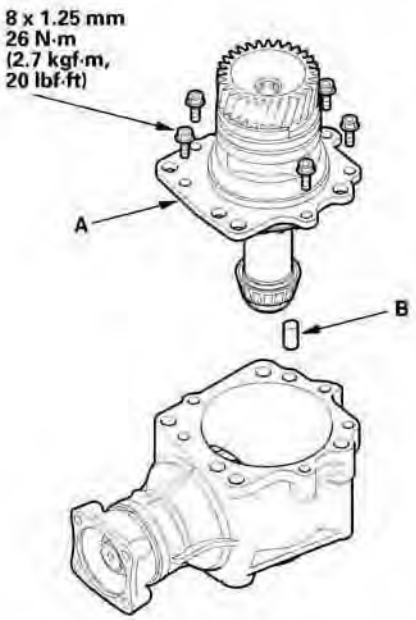
14. Apply Prussian Blue to both sides of the transfer drive gear teeth lightly and evenly.

15. Temporarily install the transfer holder (A) and dowel pin (B) without O-ring, and tighten the bolts.

2003-2004 models:

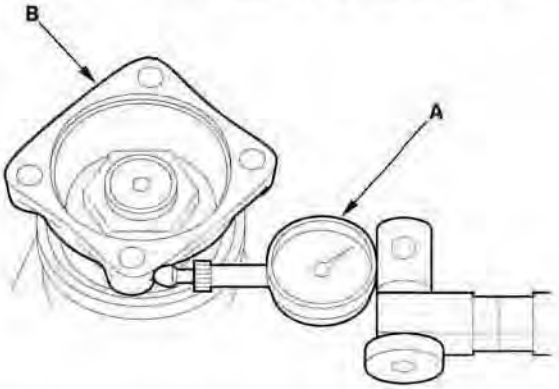


2005 model:



16. Rotate the companion flange in both directions until the transfer gears rotate one full turn in both directions.

17. Set a dial indicator (A) on the companion flange (B).



18. Measure the transfer gear backlash.

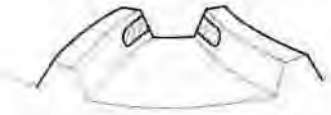
Standard: 0.06—0.16 mm (0.02—0.06 in.)

19. Remove the transfer holder, and check the transfer drive gear tooth contact pattern.

CORRECT TOOTH CONTACT PATTERN

INCORRECT TOOTH CONTACT PATTERNS

TOE CONTACT



HEEL CONTACT

FLANK CONTACT

FACE CONTACT

20. If the backlash measurement is out of standard, adjust the backlash with the 35 mm thrust shim and recheck. Do not use more than two 35 mm thrust shims to adjust the backlash.

21. If the transfer gear tooth contact is incorrect, adjust the tooth contact with the 25 mm or 35 mm thrust shim. Do not use more than two of each thrust shim to adjust the tooth contact.

- Toe Contact
  Use a thicker 35 mm thrust shim to move the transfer output shaft toward the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear away from the transfer output shaft to adjust the transfer gear backlash as follows:
  - Increase the thickness of the 25 mm thrust shim.
  - Reduce the thickness of the 68 mm thrust shim by the amount you increased the 25 mm thrust shim.
- Heel Contact
  Use a thinner 35 mm thrust shim to move the transfer output shaft away from the transfer drive gear. Because this movement causes the transfer gear backlash to change, move the transfer drive gear toward the transfer output shaft to adjust the transfer gear backlash as follows:
  - Reduce the thickness of the 25 mm thrust shim.
  - Increase the thickness of the 68 mm thrust shim by amount you reduced the thickness of the 25 mm thrust shim.
- Flank Contact
  Use a thinner thrust shim to move the transfer drive gear toward the transfer output shaft. Flank contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Heel Contact.
- Face Contact
  Use a thicker thrust shim to move the transfer drive gear away from the transfer output shaft. Face contact must be adjusted within the limits of the transfer gear backlash. If the backlash exceeds the limits, adjust as described under Toe Contact.

(cont'd)

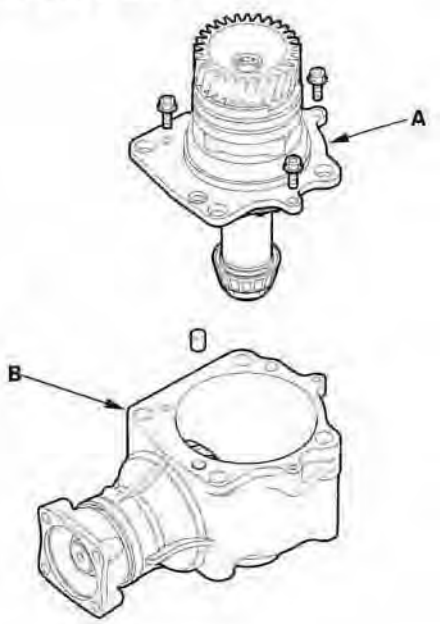
Reassembly (cont'd)

THRUST SHIM, 25 mm

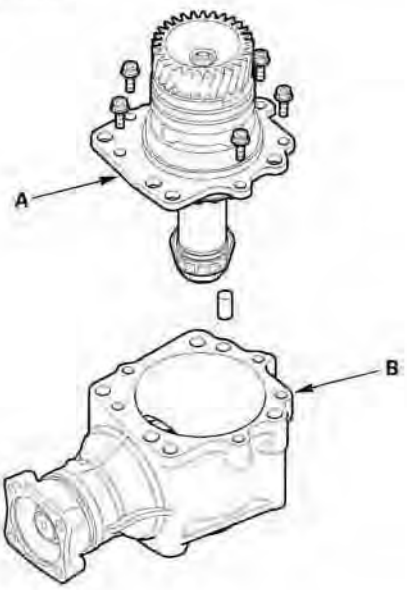
Shim No.	Part Number	Thickness
1.70	29411-P1C-000	1.70 mm (0.067 in.)
1.73	29412-P1C-000	1.73 mm (0.068 in.)
1.76	29413-P1C-000	1.76 mm (0.069 in.)
1.79	29414-P1C-000	1.79 mm (0.070 in.)
1.82	29415-P1C-000	1.82 mm (0.072 in.)
1.85	29416-P1C-000	1.85 mm (0.073 in.)
1.88	29417-P1C-000	1.88 mm (0.074 in.)
1.91	29418-P1C-000	1.91 mm (0.075 in.)
1.94	29419-P1C-000	1.94 mm (0.076 in.)
1.97	29420-P1C-000	1.97 mm (0.078 in.)
2.00	29421-P1C-000	2.00 mm (0.079 in.)
2.03	29422-P1C-000	2.03 mm (0.080 in.)
2.06	29423-P1C-000	2.06 mm (0.081 in.)
2.09	29424-P1C-000	2.09 mm (0.082 in.)
2.12	29425-P1C-000	2.12 mm (0.083 in.)
2.15	29426-P1C-000	2.15 mm (0.085 in.)
2.18	29427-P1C-000	2.18 mm (0.086 in.)
2.21	29428-P1C-000	2.21 mm (0.087 in.)
2.24	29429-P1C-000	2.24 mm (0.088 in.)

22. Remove the transfer holder (A) from the transfer housing (B) after adjusting the transfer gear backlash or transfer gear tooth contact.

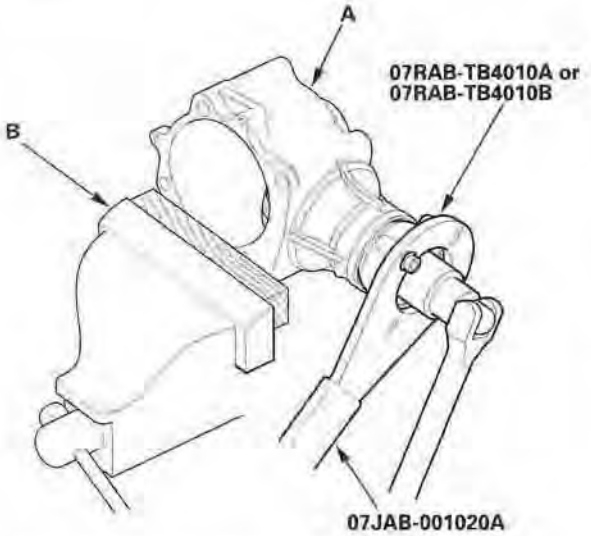
2003-2004 models:



2005 model:

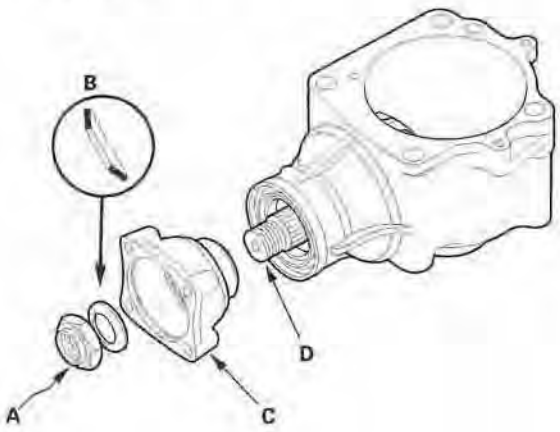


23. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.

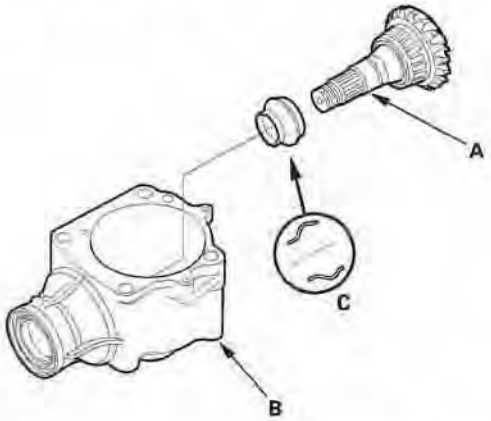


24. Install the special tool on the companion flange, then loosen the locknut.

25. Remove the locknut (A), conical spring washer (B), and companion flange (C) from the transfer output shaft (D).



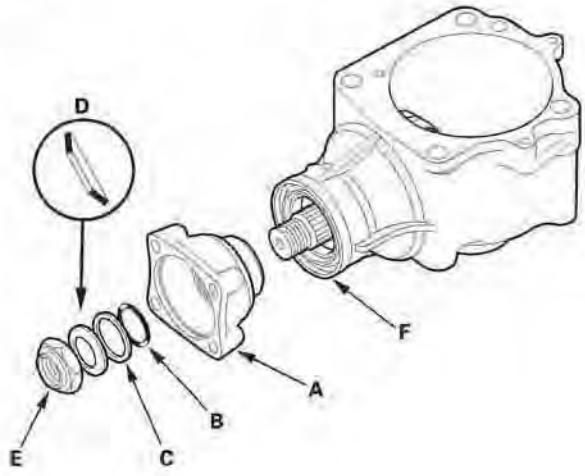
26. Remove the transfer output shaft (A) from the transfer housing (B).



27. Install the new transfer spacer (C) on the transfer output shaft in the direction shown, and install them in the transfer housing.

28. Coat the threads of the locknut and transfer output shaft with ATF.

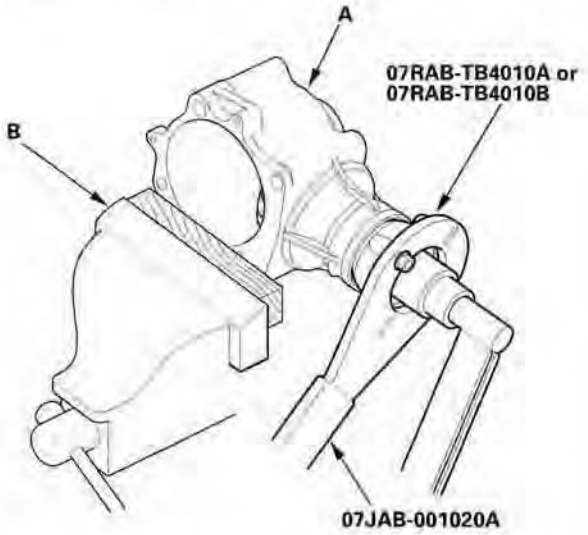
29. Install the companion flange (A), new O-ring (B), back-up ring (C), new conical spring washer (D), and new locknut (E) on the transfer output shaft (F). Install the conical spring washer in the direction shown.



(cont'd)

Reassembly (cont'd)

30. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



31. Install the special tool on the companion flange.

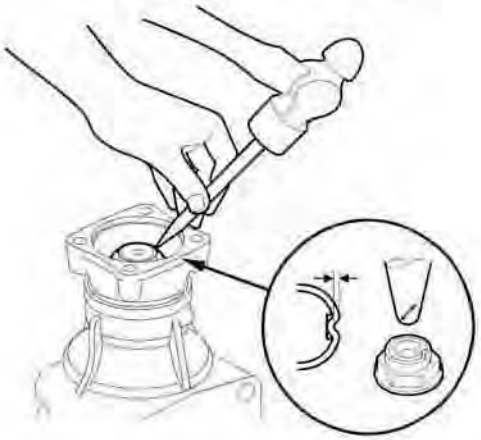
32. Tighten the locknut while measuring the starting torque of the transfer output shaft.

    Starting Torque:
    0.98—1.39 N·m (10.0—14.2 kgf·cm, 8.7—12.3 lbf·in.)
    Tightening Torque:
    132—260 N·m (13.5—26.5 kgf·m, 97.6—192 lbf·ft)

    NOTE:
    - Rotate the companion flange several turns to seat the tapered roller bearings, then measure the starting torque.
    - If the starting torque exceeds 1.39 N·m (14.2 kgf·cm, 12.3 lbf·in.), replace the transfer spacer and reassemble the parts. Do not adjust the starting torque with the locknut loose.
    - If the tightening torque exceeds 260 N·m (26.5 kgf·m, 192 lbf·ft), replace the transfer spacer and reassemble the parts.

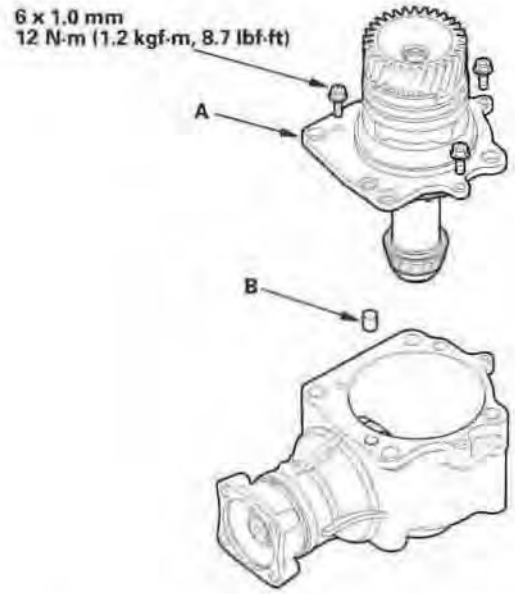
33. Remove the special tool.

34. Stake the locknut using a 3.5 mm punch.

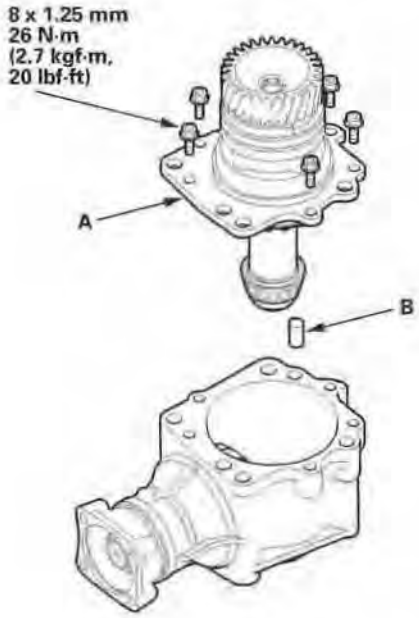


35. Temporarily install the transfer holder (A) and dowel pin (B) without the O-ring, and tighten the bolts.

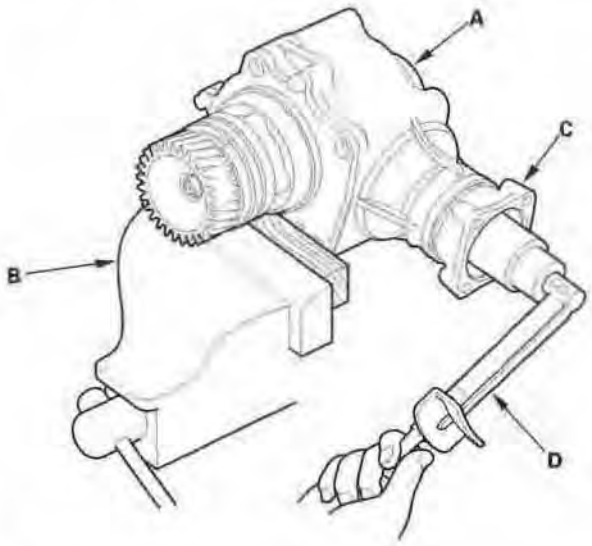
2003-2004 models:



2005 model:



36. Secure the transfer housing (A) in a bench vise (B) with soft jaws. To prevent damage to the transfer housing, always use soft jaws or equivalent materials between the transfer housing and the vise.



37. Rotate the companion flange several times to seat the tapered roller bearings.

38. Measure the starting torque at the companion flange (C) using a torque wrench (D).

Standard
2003-2004 models:
2.16—3.57 N·m
(22.0—36.4 kgf·cm, 19.1—31.6 lbf·in.)
2005 model:
2.75—4.22 N·m
(28.1—43.15 kgf·cm, 24.5—37.5 lbf·in.)

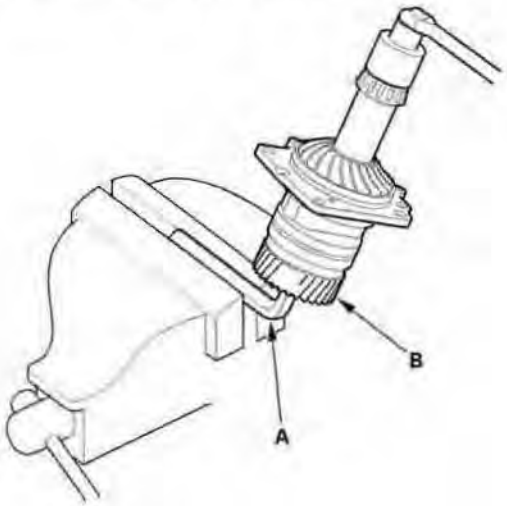
39. Remove the transfer holder from the transfer housing.

40. If the measurement is within the standard, go to step 53.

(cont'd)

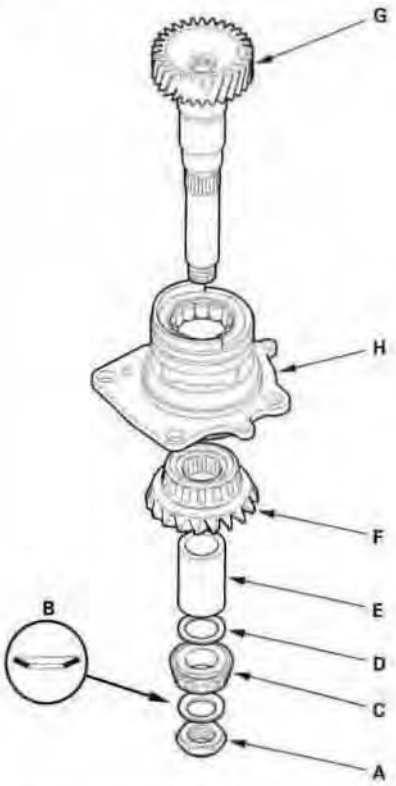
Reassembly (cont'd)

41. If the measurement is out of standard, put a 14 mm hex wrench (A) in the transfer shaft (B), then secure the hex wrench in a bench vise.



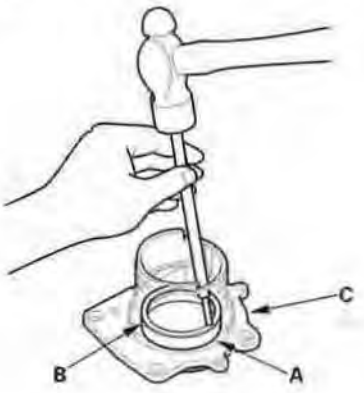
42. Loosen the locknut.

43. Remove the locknut (A) and conical spring washer (B).



44. Remove the tapered roller bearing (C), 25 mm thrust shim (D), transfer collar (E), transfer drive gear (F), and transfer shaft (G) from the transfer holder (H).

45. Remove the tapered roller bearing outer race (A) and the 68 mm thrust shim (B) from the transfer holder (C).

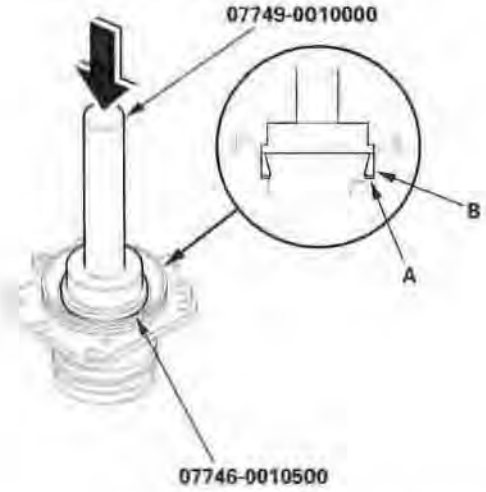


46. Measure the thickness of the 68 mm thrust shim, and select the new 68 mm thrust shim.

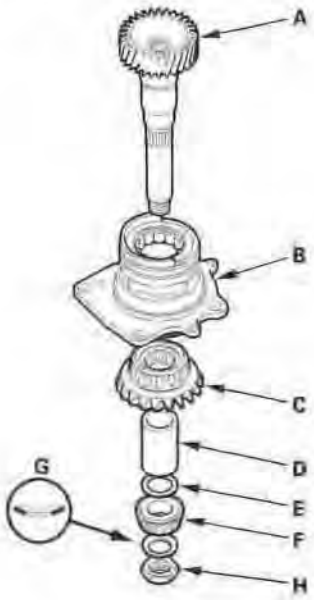
THRUST SHIM, 68 mm

Shim No.	Part Number	Thickness
ZV	23974-P1C-020	1.41 mm (0.056 in.)
ZW	23975-P1C-020	1.44 mm (0.057 in.)
ZX	23976-P1C-020	1.47 mm (0.058 in.)
ZY	23977-P1C-020	1.50 mm (0.060 in.)
ZZ	23978-P1C-020	1.53 mm (0.060 in.)
A	23941-PW5-000	1.56 mm (0.061 in.)
B	23942-PW5-000	1.59 mm (0.063 in.)
C	23943-PW5-000	1.62 mm (0.064 in.)
D	23944-PW5-000	1.65 mm (0.065 in.)
E	23945-PW5-000	1.68 mm (0.066 in.)
F	23946-PW5-000	1.71 mm (0.067 in.)
G	23947-PW5-000	1.74 mm (0.069 in.)
H	23948-PW5-000	1.77 mm (0.070 in.)
I	23949-PW5-000	1.80 mm (0.071 in.)
J	23950-PW5-000	1.83 mm (0.072 in.)
K	23951-PW5-000	1.86 mm (0.073 in.)
L	23952-PW5-000	1.89 mm (0.074 in.)
M	23953-PW5-000	1.92 mm (0.076 in.)
N	23954-PW5-000	1.95 mm (0.077 in.)
O	23955-PW5-000	1.98 mm (0.078 in.)
P	23956-PW5-000	2.01 mm (0.079 in.)
Q	23957-PW5-000	2.04 mm (0.080 in.)
R	23958-PW5-000	2.07 mm (0.081 in.)
S	23959-PW5-000	2.10 mm (0.083 in.)
T	23960-PW5-000	2.13 mm (0.084 in.)
U	23961-PW5-000	2.16 mm (0.085 in.)
V	23962-PW5-000	2.19 mm (0.086 in.)
W	23963-PW5-000	2.22 mm (0.087 in.)
X	23964-PW5-000	2.25 mm (0.089 in.)
Y	23965-PW5-000	2.28 mm (0.090 in.)
Z	23966-PW5-000	2.31 mm (0.091 in.)
AA	23967-PW5-000	2.34 mm (0.092 in.)
AB	23968-PW5-000	2.37 mm (0.093 in.)
AC	23969-PW5-000	2.40 mm (0.094 in.)
AD	23970-PW5-000	2.43 mm (0.096 in.)
AZ	23941-PW8-000	2.46 mm (0.097 in.)
BZ	23942-PW8-000	2.49 mm (0.098 in.)
CZ	23943-PW8-000	2.52 mm (0.099 in.)
DZ	23944-PW8-000	2.55 mm (0.100 in.)
EZ	23945-PW8-000	2.58 mm (0.102 in.)

47. Install the new 68 mm thrust shim (A) in the transfer holder, then install the tapered roller bearing outer race (B) with the special tools.



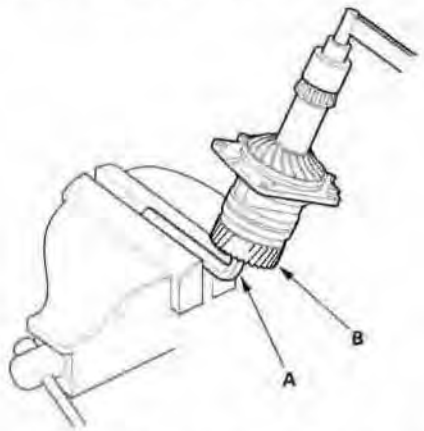
48. Install the transfer shaft (A) in the transfer holder (B), and install the transfer drive gear (C), transfer collar (D), 25 mm thrust shim (E), tapered roller bearing (F), conical spring washer (G), and locknut (H). Install the conical spring washer in the direction shown.



(cont'd)

Reassembly (cont'd)

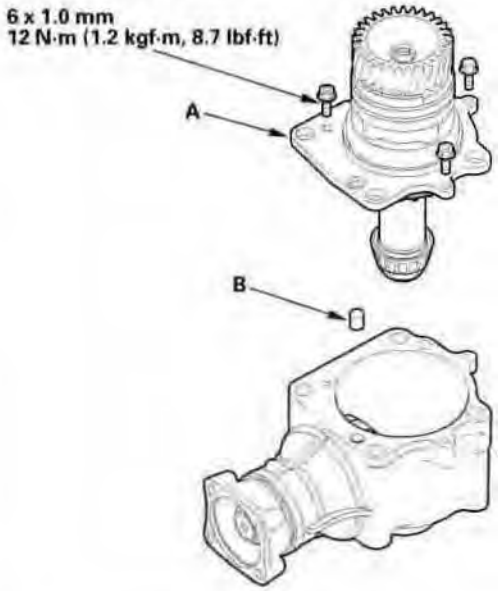
49. Put a 14 mm hex wrench (A) in the transfer shaft (B), then secure the hex wrench in a bench vise.



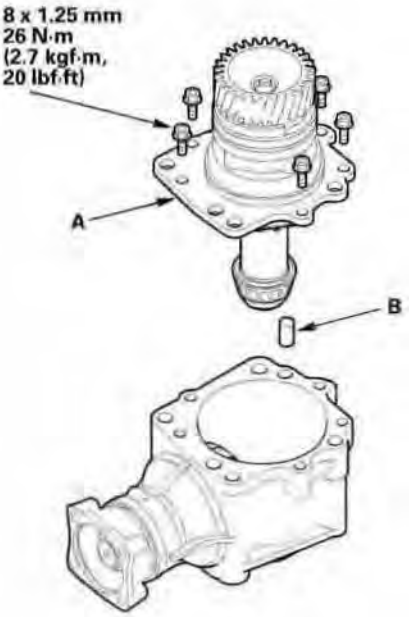
50. Tighten the locknut 118 N·m (12.0 kgf·m, 86.8 lbf·ft). Do not stake the locknut in this step.

51. Temporarily install the transfer holder (A) and dowel pin (B) without the O-ring, and tighten the bolts.

2003-2004 models:

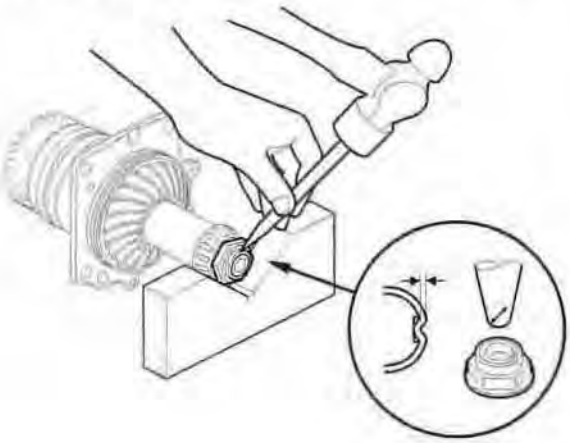


2005 model:



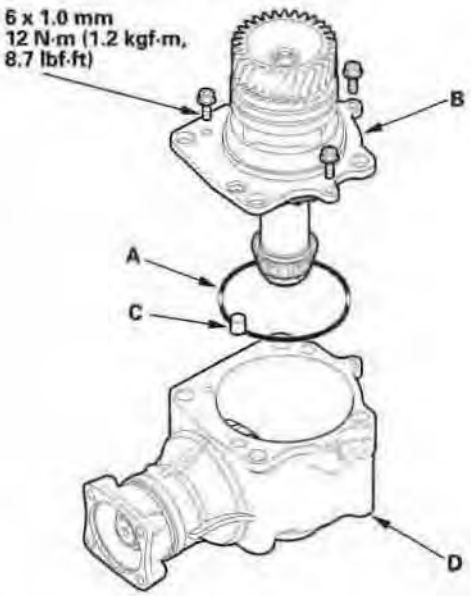
52. Rotate the companion flange several turns to seat the tapered roller bearings, and recheck the starting torque. Remove the transfer holder after adjusting the starting torque.

53. Stake the locknut of the transfer shaft using a 3.5 mm punch.

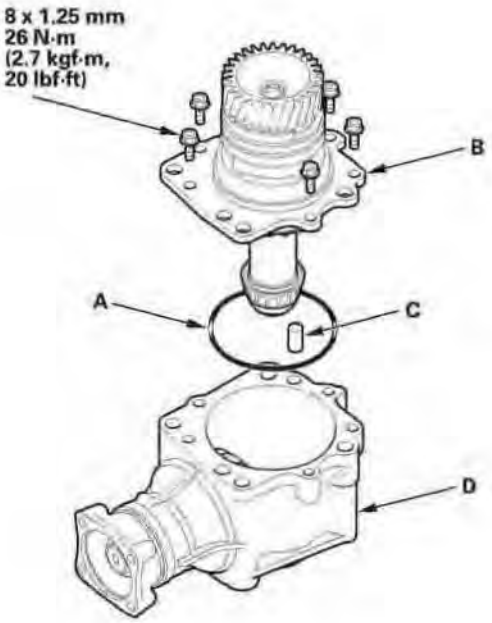


54. Install the new O-ring (A) on the transfer holder (B), then install the transfer holder with the dowel pin (C) on the transfer housing (D).

2003-2004 models:



2005 model:



Rear Differential

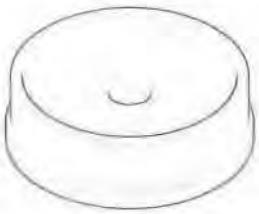
Special Tools

Ref. No.	Tool Number	Description	Qty
①	07GAD-PH70201	Oil Seal Driver	1
②	07JAB-001020A	Holder Handle	1
③	07JAD-PL90100	Oil Seal Driver	1
④	07NAD-PX40100	Attachment, 78 x 80 mm	1
⑤	07RAB-TB4010B	Companion Flange Holder	1
⑥	07749-0010000	Driver	1


①


②


③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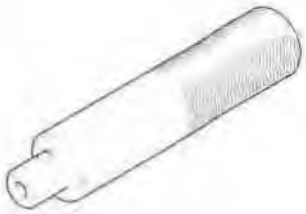
⑤


⑥

System Description

Outline
The Real-time 4WD-Dual Pump System model has a hydraulic clutch and a differential mechanism in the rear differential assembly. Under normal conditions, the vehicle is driven by the front wheels. However, depending on to the driving force of the front wheels and the road conditions, the system instantly transmits appropriate driving force to the rear wheels without requiring the driver to switch between 2WD (front wheel drive) and 4WD (four wheel drive). The switching mechanism between 2WD and 4WD is integrated into the rear differential assembly to make the system light and compact.
In addition, the dual pump system switches off the rear-wheel-drive force when braking in a forward gear. This allows the braking system to work properly on models equipped with an Anti-lock Brake System (ABS).

Construction
The rear differential assembly consists of the torque control differential case assembly and the rear differential carrier assembly. The torque control differential case assembly consists of the differential clutch assembly, the companion flange, and the oil pump body assembly. The rear differential carrier assembly consists of the differential mechanism. The differential drive and driven gears are hypoid gears.
The oil pump body assembly consists of the front oil pump, the rear oil pump, the hydraulic control mechanism, and the clutch piston. The clutch piston has a disc spring that constantly provides the differential clutch assembly with a preset torque to prevent abnormal sound.
The clutch guide in the differential clutch assembly is connected to the propeller shaft via the companion flange, and it receives the driving force from the transfer assembly. The clutch guide rotates the clutch plate and the front oil pump in the oil pump body.
The clutch hub in the differential clutch assembly has a clutch disc that is splined with the hypoid drive pinion gear. The hypoid drive gear drives the rear oil pump.
The front and rear oil pumps are trochoidal pumps. The rear oil pump capacity is 2.5 percent larger than the front oil pump to handle the rotation difference between the front and rear wheels caused by worn front tires and tight corner braking. The oil pumps are designed so the fluid intake works as a fluid discharge when the oil pumps rotate in reverse. Honda Dual Pump Fluid is used instead of differential fluid.

Operation
When there is a difference in rotation speed between the front wheels (clutch guide) and rear wheels (hypoid driven gear), hydraulic pressure from the front and rear oil pumps engages the differential clutch, and drive force from the transfer assembly is applied to the rear wheels.
The hydraulic pressure control mechanism in the oil pump body selects 4WD mode when the vehicle is started abruptly, or when accelerating in a forward or reverse gear (causing rotation difference between the front and rear wheels), or when braking in reverse gear (when decelerating). It switches to 2WD mode when the vehicle is driven at a constant speed in forward or reverse gear (when there is no rotation difference between the front and rear wheels), or when braking in a forward gear (when decelerating).
To protect the system, the differential clutch assembly is lubricated by hydraulic pressure generated by the oil pumps in both 4WD and 2WD modes. Also, the thermal switch relieves the hydraulic pressure on the clutch piston and cancels 4WD mode if the temperature of the differential fluid rises above normal.

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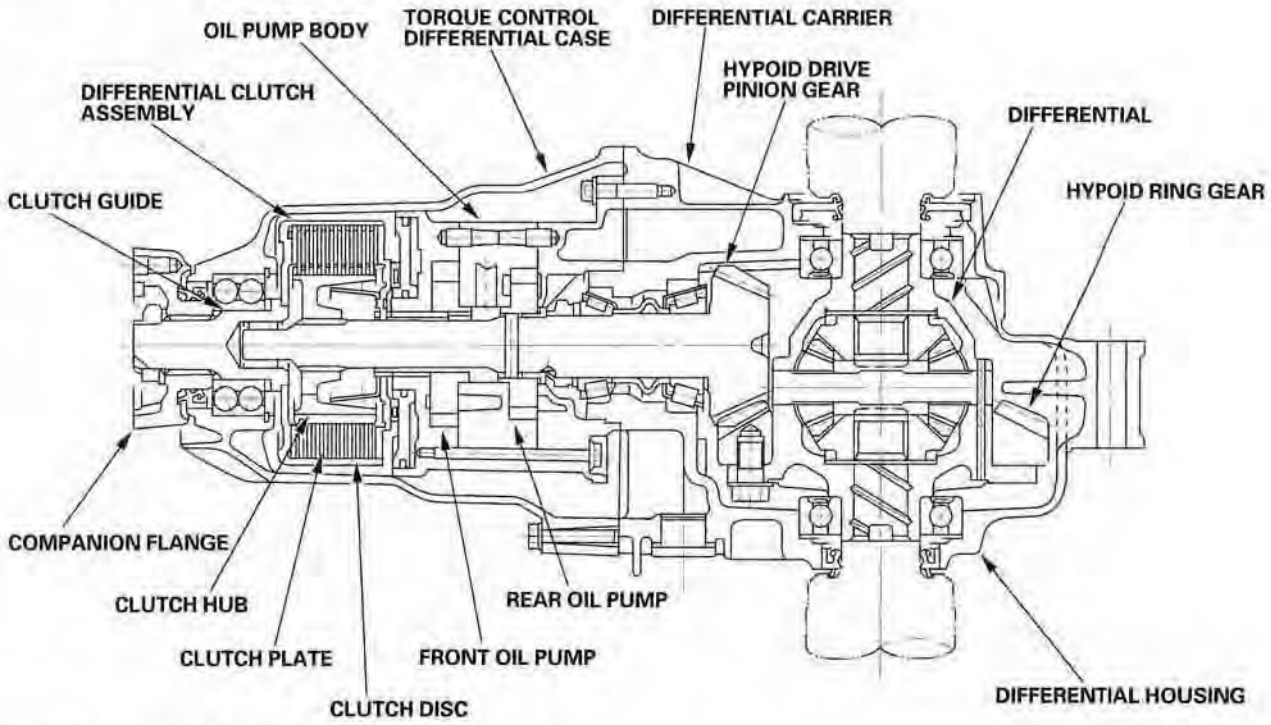
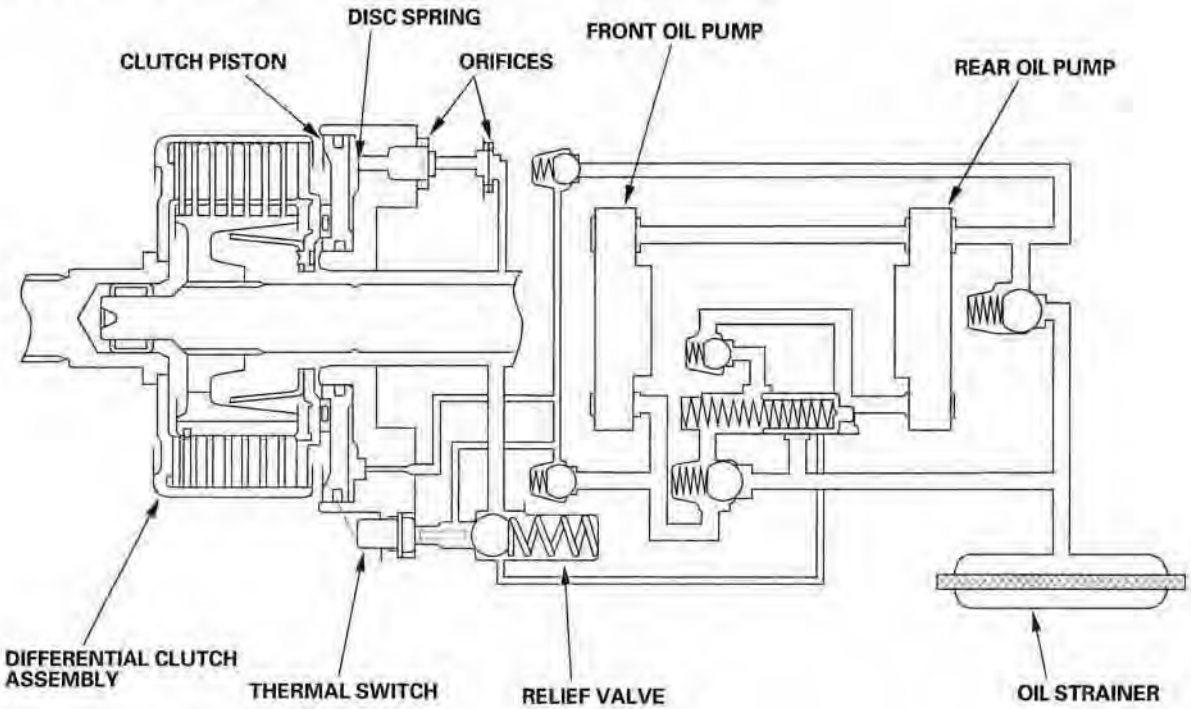
System Description (cont'd)

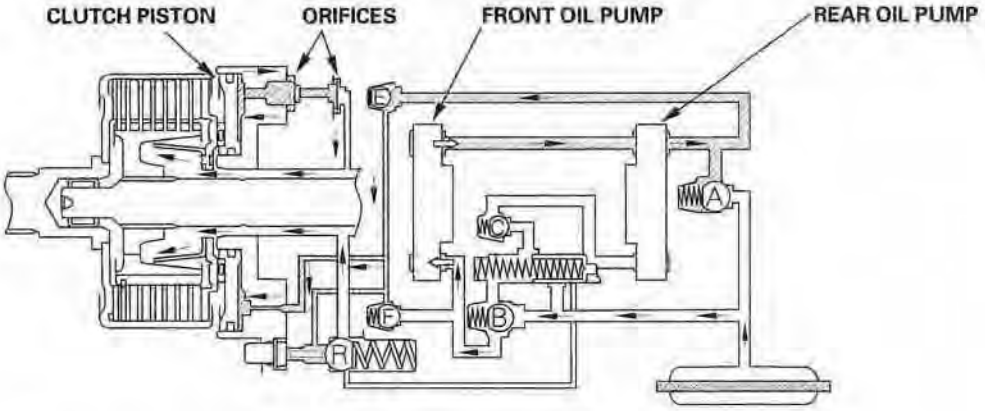
REAR DIFFERENTIAL ASSEMBLY



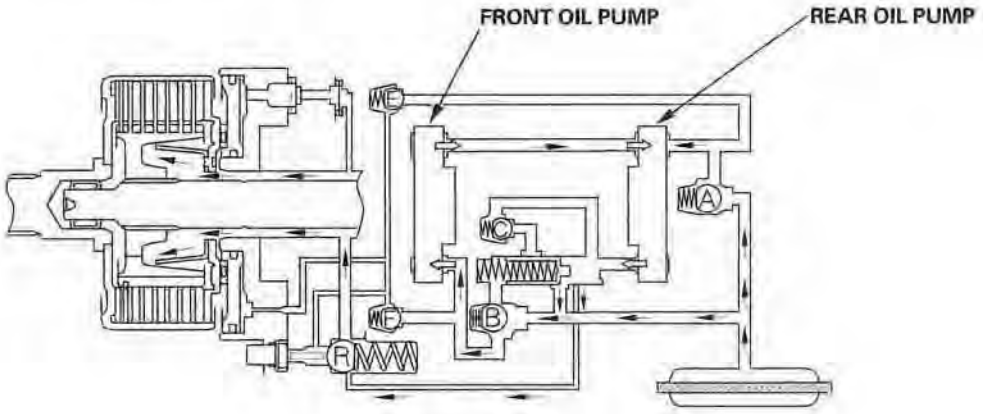
HYDRAULIC CONTROL SYSTEM



Forward Start and Acceleration (4WD)
During a forward start and forward acceleration, the dual pump system can engage four wheel drive.
If the front wheels spin faster than the rear wheels, the front oil pump spins faster than the rear oil pump. The front pump draws fluid through check valve B and discharges it. Some of the discharged fluid is drawn in by the rear oil pump. The remaining fluid will pass through check valve E into the clutch piston. There, hydraulic pressure is regulated by two orifices.
The regulated hydraulic pressure at the clutch piston pushes the plates and discs of the clutch together to form a connection. The engaged clutch then passes driving force from the transfer assembly to the rear wheels, producing 4WD.



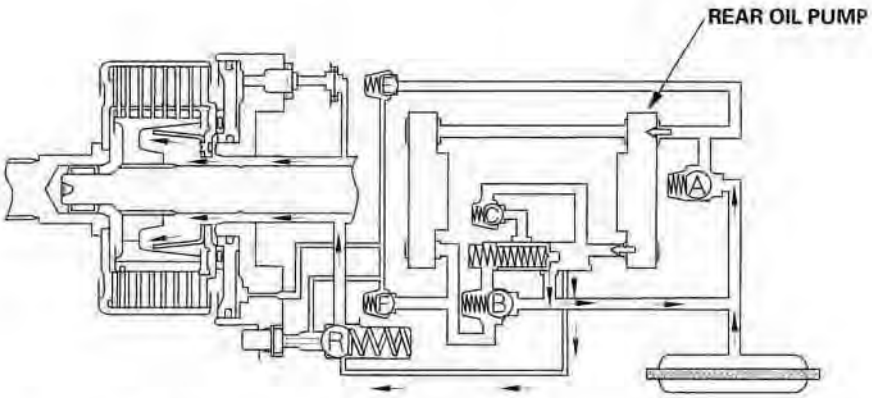
Forward Driving at Constant Speed (2WD)
When driving forward at a constant speed (cruising), the dual pump system functions in two wheel drive mode.
The rotation speed of the front and rear wheels is the same, so the speed of the front and rear pumps is also the same. Fluid discharged by the front oil pump is drawn in by the rear oil pump and is circulated through the system. Because there is no pressure built up at the clutch piston, the clutch does not engage, and the vehicle remains in 2WD (front wheel drive).



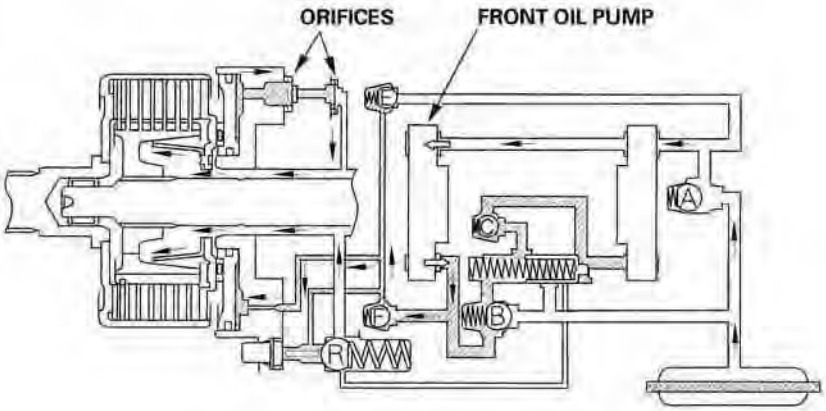
(cont'd)

System Description (cont'd)

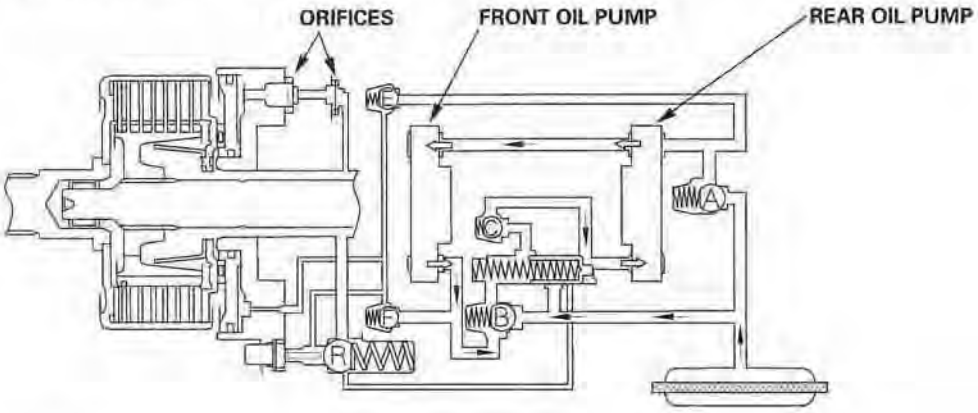
Forward Deceleration (2WD)
During forward deceleration, the dual pump system functions in two wheel drive mode.
Because of braking characteristics, the speed of the rear wheels may exceed the speed of the front wheels during deceleration. If so, the rear oil pump spins faster than the front oil pump.
Fluid discharged by the rear oil pump is simply drawn in again by the rear pump and recirculated. Because there is no pressure built up at the clutch piston, the clutch piston does not engage, and the vehicle remains in 2WD (front wheel drive).



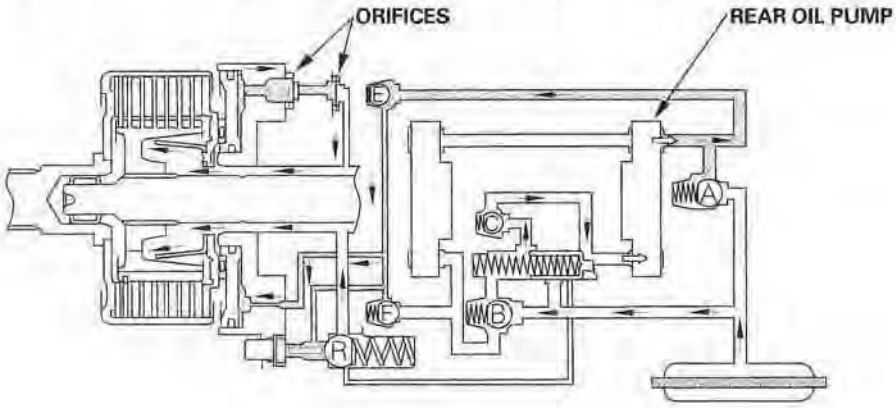
Reverse Start and Acceleration (4WD)
During reverse start and reverse acceleration, the dual pump system can engage four wheel drive.
If the front wheels spin faster than the rear wheels, the front oil pump spins faster than the rear oil pump. The front oil pump draws in fluid through check valve A and discharges it. (Note that in reverse, the direction of the pumps is the opposite of that during forward driving.)
Some of the fluid that is discharged by the front oil pump is drawn in by the rear oil pump. The remaining fluid passes through check valve F into the cylinder of the clutch piston, where it is regulated by two orifices.
The regulated hydraulic pressure at the clutch piston may force the plates and discs of the clutch together to form a connection. The engaged clutch passes driving force from the transfer assembly to the rear wheels, producing 4WD.



Reverse Driving at Constant Speed (2WD)
When driving in reverse at a constant speed, the dual pump system functions in two wheels drive mode.
The rotation speed of the front and rear wheels is the same, so the speed of the front and rear pumps is also the same. Fluid discharged by the front oil pump is drawn in by the rear oil pump and is circulated through the system. But, because there is a difference in the capacity between the two pumps, fluid flows through check valve E, and then through orifices. This fluid lubricates and cools the clutch assembly and bearings.
In this condition, only a low pressure is built up at the clutch piston. Therefore the clutch does not engage, and the vehicle remains in 2WD (front wheel drive).



Reverse Deceleration (4WD)
During reverse deceleration, the dual pump system can engage four wheel drive.
When decelerating in reverse direction, the speed of the rear wheels may exceed the speed of the front wheels (due to engine braking). In this condition, the rear oil pump draws fluid through check valves B and C. Fluid discharged from the rear oil pump then flows through check valve E to the clutch piston. There, pressure is regulated by two orifices. The regulated hydraulic pressure at the clutch piston may force the plates and discs of the clutch together to form a connection. The engaged clutch passes driving force from the transfer assembly to the rear wheels, producing 4WD.



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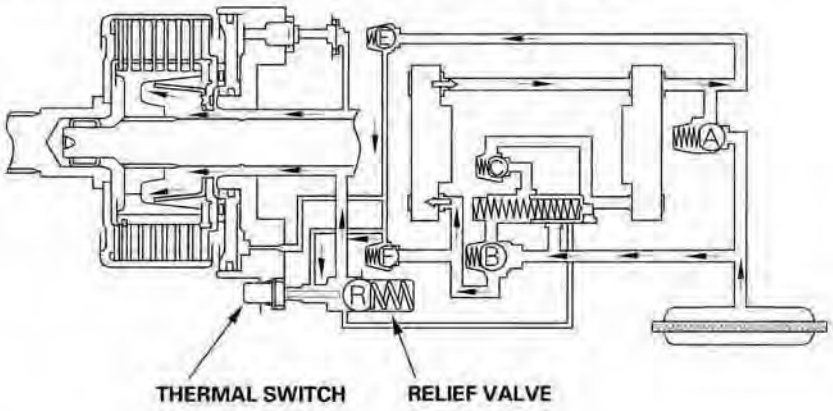
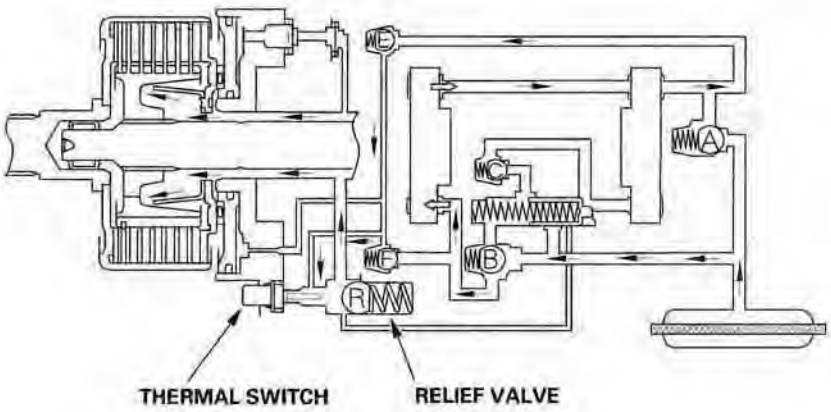
System Description (cont'd)

Thermal Switch Operation (2WD)
During 4WD operation, pressure-regulated fluid is in contact with the clutch piston and the thermal switch.
If the temperature of the fluid in the differential goes too high, the thermal switch pushes open the relief valve R. This causes the pressure in the clutch piston to drop, and 4WD mode is disengaged.



Relief Valve Operation
When the fluid pressure goes higher than the relief valve spring force, check valve R opens. Pressure applied at the clutch piston is held constant. This feature adds stability by preventing the rear wheel drive system from experiencing excessive torque.



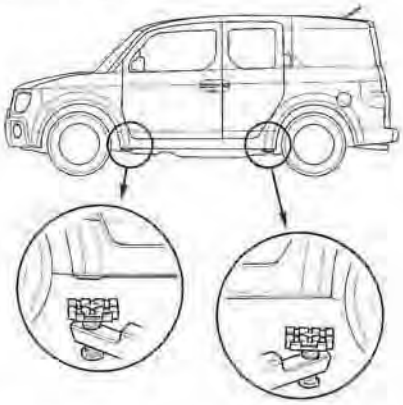
Dual Pump System Function Test

Automatic Transmission

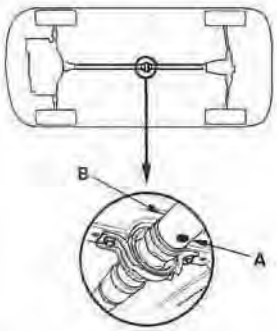
Starting and accelerating in forward gears (4WD mode)

NOTE: Do not test repeatedly or the fluid will overheat.

1. Lift up the vehicle so all four wheels are off the ground (see page 1-9).



2. Make a mark (A) on either No. 1 or No. 2 propeller shaft (B).

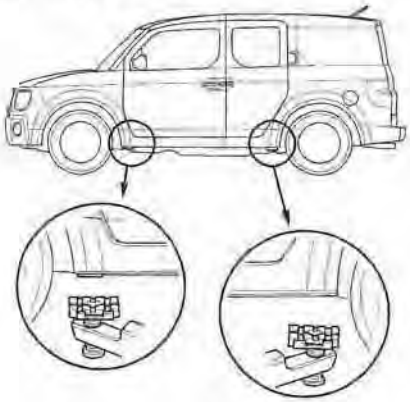


3. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
4. With the engine at idle, shift to the 1st gear.
5. Apply the parking brake firmly to lock the rear wheels, and measure the time it takes the propeller shaft to rotate 10 times.
   - If the measured time is more than 10 seconds, the 4WD system is normal.
   - If the time is less than 10 seconds, there is a problem in the 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit (front pump portion).

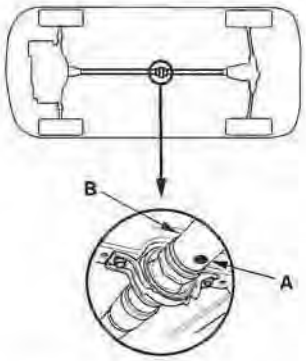
Starting and accelerating in reverse gear (4WD mode)

NOTE: Do not test repeatedly or the fluid will overheat.

1. Lift up the vehicle so all four wheels are off the ground (see page 1-9).



2. Make a mark (A) on either No. 1 or No. 2 propeller shaft (B).



3. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
4. With the engine at idle, shift to Reverse.
5. Apply the parking brake firmly to lock the rear wheels, and measure the time it takes the propeller shaft to rotate 10 times.
   - If the measured time is more than 10 seconds, the 4WD system is normal.
   - If the time is less than 10 seconds, there is a problem in the 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit (front pump portion).

(cont'd)

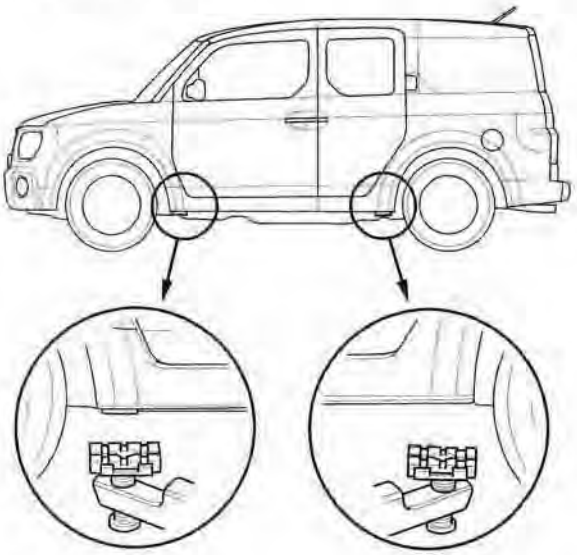
Dual Pump System Function Test (cont'd)

Manual Transmission

Starting and accelerating in forward gears (4WD mode)

NOTE: Do not test repeatedly or the fluid will overheat.

1. Lift up the vehicle so all four wheels are off the ground (see page 1-9).

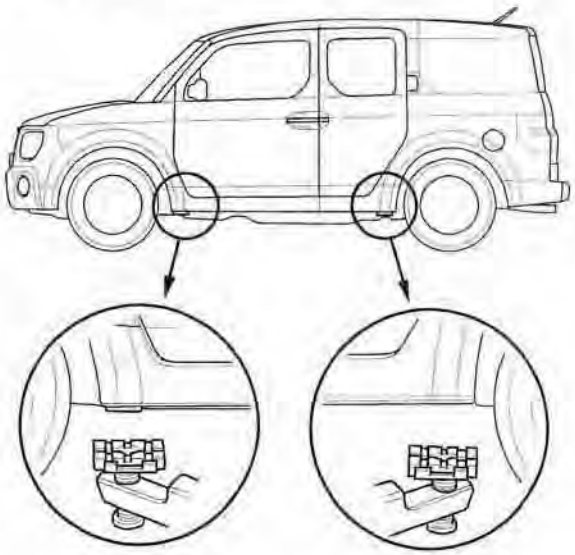


2. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
3. With the engine at idle, shift into 1st gear, and release the clutch.
4. Apply the parking brake firmly.
   - If the engine stalls, the 4WD system is normal.
   - If the engine continues running, there is a problem in the 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit (front pump portion).

Starting and accelerating in reverse gears (4WD mode)

NOTE: Do not test repeatedly or the fluid will overheat.

1. Lift up the vehicle so all four wheels are off the ground (see page 1-9).

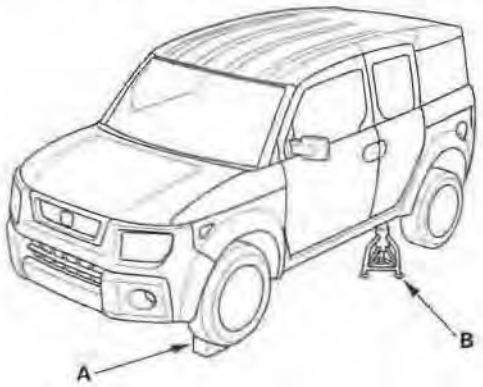


2. Start the engine, and let it run until it warms up (the radiator fan comes on at least twice).
3. With the engine at idle, shift into reverse gear, and release the clutch.
4. Apply the parking brake firmly.
   - If the engine stalls, the 4WD system is normal.
   - If the engine continues running, there is a problem in the 4WD system. Check the differential fluid. If the differential fluid is normal, replace the torque control differential (TCD) case kit (front pump portion).

Automatic Transmission/Manual Transmission

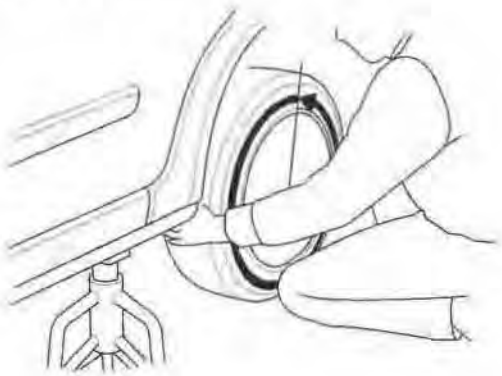
Decelerating in a forward gears (2WD mode)

1. Block the front wheels (A), raise the left rear wheel, and support it with a safety stand (B) as shown.



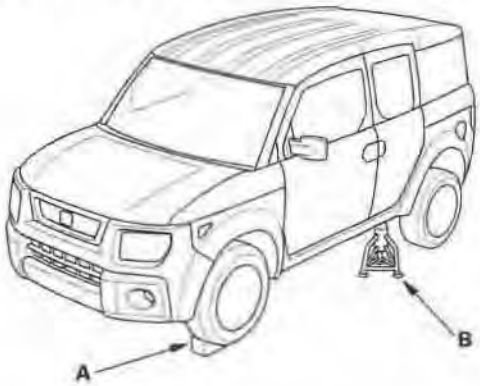
2. Hold the tire, and turn it counterclockwise continuously for more than one rotation.

   - If the rotation of the wheel does not gradually feel heavy while rotating, the 2WD system when decelerating in a forward gear is normal.
   - If the rotation of the wheel gradually feels heavy, there is a problem in the system. Check the differential fluid. If the fluid is normal, replace the torque control differential (TCD) case kit (front pump portion).



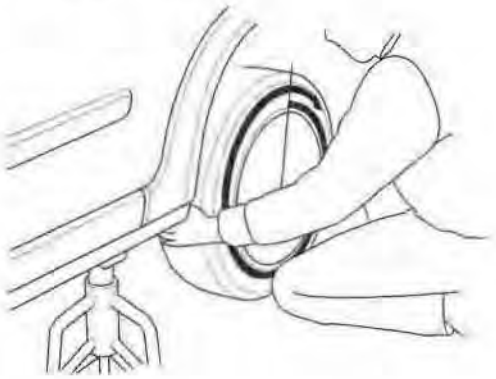
Decelerating in reverse gears (4WD mode)

1. Block the front wheels (A), raise the left rear wheel, and support it with a safety stand (B) as shown.



2. Hold the tire, and turn it clockwise continuously for more than one rotation.

   - If the rotation of the wheel gradually feels heavy, the 4WD system when decelerating in reverse gear is normal.
   - If the rotation of the wheel does not gradually feel heavy, there is a problem in the system. Check the differential fluid. If the fluid is normal, replace the torque control differential (TCD) case kit (front pump portion).



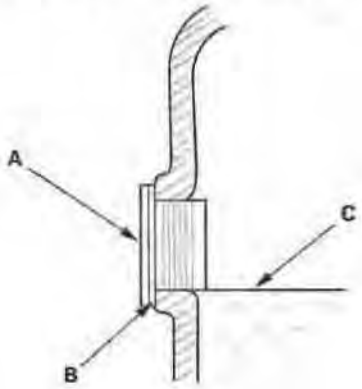
Symptom Troubleshooting Index

Symptom	Diagnostic Procedure	Also check for
Will not go into 4WD mode	• Fluid level too low. Add fluid. • Incorrect fluid type. Replace.	Most problems in the unit are to be diagnosed by identifying noises from the gears or bearings. Care should be taken during diagnosis not to confuse differential noises with those from other drivetrain components.
Will not return to 2WD mode	Incorrect fluid type. Drain and fill the differential with the recommended fluid.	
Gear or bearing noises	• Fluid level too low. Add fluid. • Incorrect or worn out fluid. Drain and fill the differential with the recommended fluid. • Damaged or chipped gears. Replace the differential carrier assembly.	
Rear differential overheats	• Fluid level too low. Add fluid. • Incorrect fluid type. Drain and fill the differential with the recommended fluid.	
Rear differential leaks fluid	• Fluid level too high. Lower to proper level. • Clogged breather hose. Clean or replace. • Worn or damaged oil seal. Replace. • Damaged sealing washer. Replace. • Loose mounting bolts or inadequate sealing. Recheck torque or apply sealant.	
Rear differential screeches, whines, moans, or squeaks	• Fluid level too low. Add fluid. • Incorrect or worn out fluid. Replace fluid. • Incorrect tire rolling circumference. Adjust tire pressure or replace tires. • Damaged pump. Replace torque control differential (TCD) front pump.	

Differential Fluid Inspection and Replacement

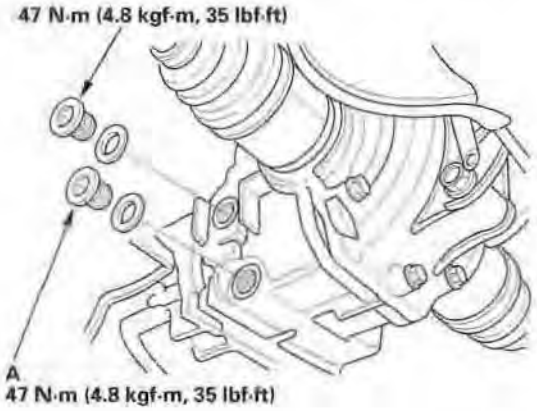
1. With the vehicle on level ground, inspect the differential fluid with the ignition switch turned to LOCK (0).

2. Remove the oil filler plug (A) and sealing washer (B), then check the condition of the fluid, and make sure the fluid is at the proper level (C).



3. The fluid level must be up to the fill hole. If it is below the hole, add the recommended fluid until it runs out, then reinstall the oil filler plug with a new sealing washer.

4. If the fluid is dirty, remove the drain plug (A), and drain the fluid.



5. Clean the drain plug, then reinstall it with a new sealing washer, and refill the differential with the recommended fluid to the proper level.

   NOTE: If you disassemble the differential, check the fluid level again after the 4WD system check is finished. Add fluid if necessary.

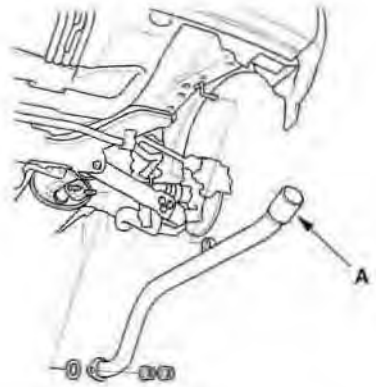
   Fluid Capacity
   1.0 L (1.1 US qt) at fluid change
   1.2 L (1.3 US qt) at overhaul

   Recommended fluid: Honda Dual Pump Fluid

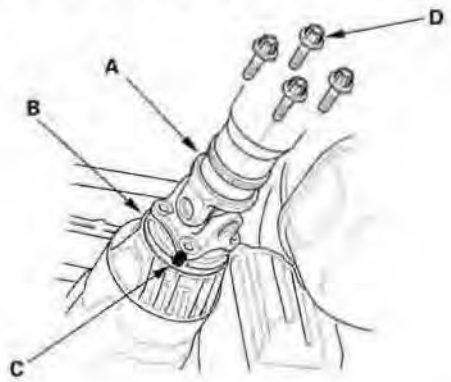
6. Reinstall the oil filler plug with a new sealing washer.

Differential Removal

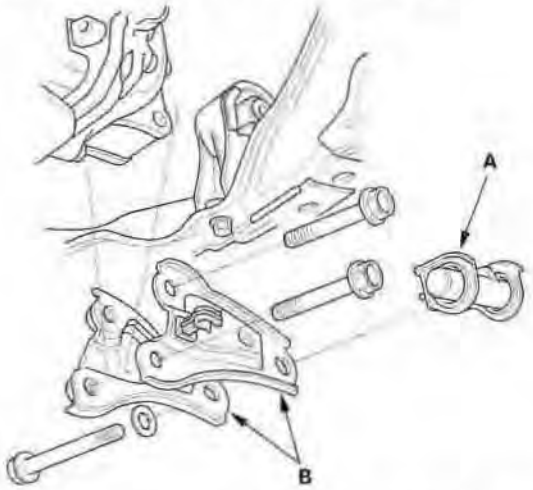
1. Drain the differential fluid (see page 15-13).
2. Remove the tail pipe (A).



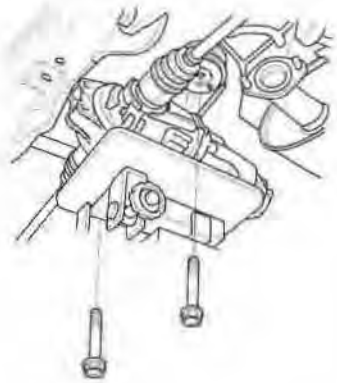
3. Mark the propeller shaft (A) and companion flange of the rear differential assembly (B) so they can be reinstalled in their original positions (C).



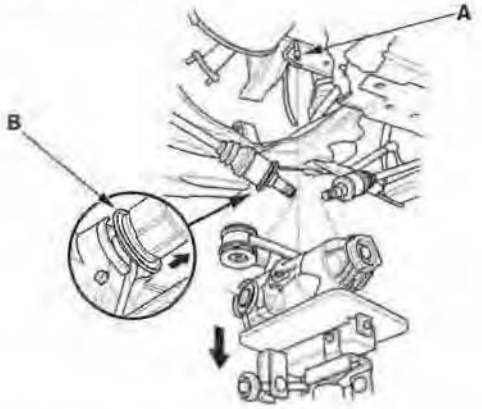
4. Remove and discard the propeller shaft mounting bolts (D), then separate the propeller shaft from the rear differential assembly.
5. Remove the rear differential damper (A).



6. Place a transmission jack under the rear differential assembly, then remove the right and left mounting brackets B.
7. Remove the mounting bolts.



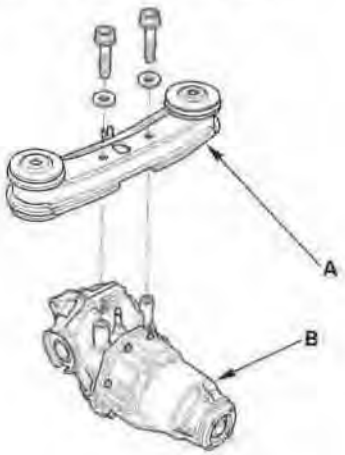
8. Remove the breather tube (A) from the breather tube fitting.



9. Lower the rear differential assembly while pulling both driveshaft inner joints out of the rear differential assembly.

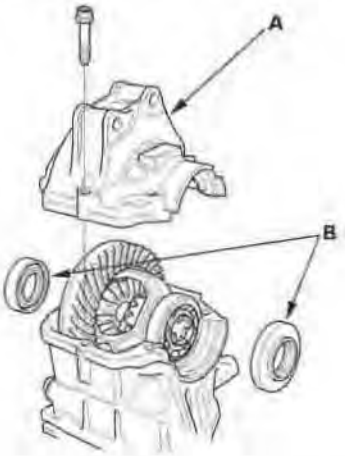
   NOTE: Be careful not to damage the driveshaft ring (B) when prying out the differential inboard joints.

10. Remove the rear differential mount assembly (A) from the rear differential assembly (B).



Differential Housing Assembly Removal and Installation

1. Remove the six mounting bolts in a crisscross pattern in several steps, then remove the differential housing assembly (A) and oil seals (B).



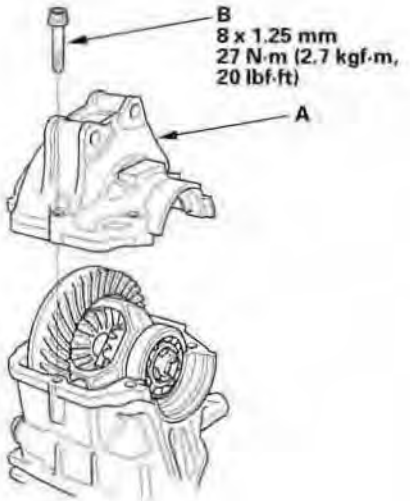
2. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N 08718-0001) to the sealing surface. Make sure you seal the entire circumference of the bolt holes to prevent oil leakage.

   NOTE:
   - You must assemble the housings within 5 minutes after applying the liquid gasket. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
   - Allow it to cure at least 20 minutes after assembly before filling the differential with fluid.

(cont'd)

Differential Housing Assembly Removal and Installation (cont'd)

3. Install the differential housing assembly (A), then torque the six mounting bolts (B) in a crisscross pattern in several steps.



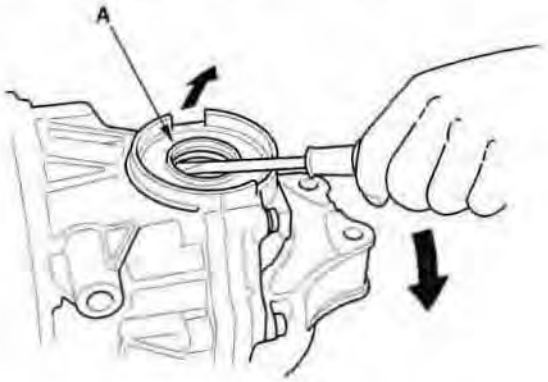
4. Install the oil seals.

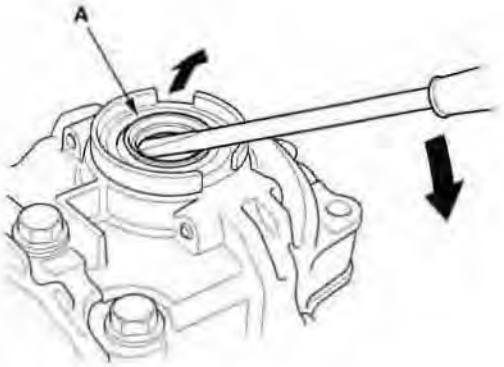
Oil Seal Replacement

Special Tools Required
- Oil seal driver 07GAD-PH70201
- Driver 07749-0010000
- Attachment, 78 x 80 mm 07NAD-PX40100
- Oil seal driver 07JAD-PL90100

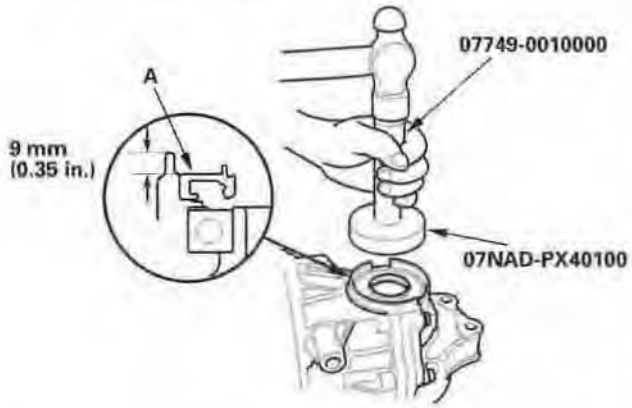
1. Remove the oil seals (A) from the differential housing.

   NOTE: Be careful not to damage the differential carrier while prying out the seals.

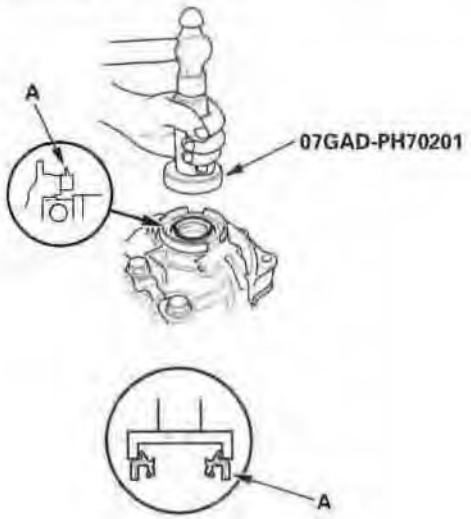




2. Install the right side oil seal (A) squarely using the special tools. Installation depth of the oil seal is 9 mm (0.35 in.) below the machined edge of the differential carrier assembly. Be careful not to damage the lip of the oil seals.

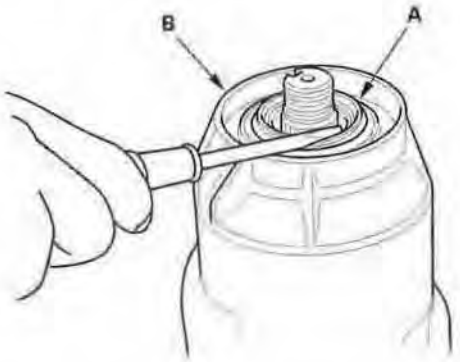


3. Install the left side oil seal (A) squarely and flush with the machined edge of the differential carrier assembly using the special tools. Be careful not to damage the lip of the oil seal.

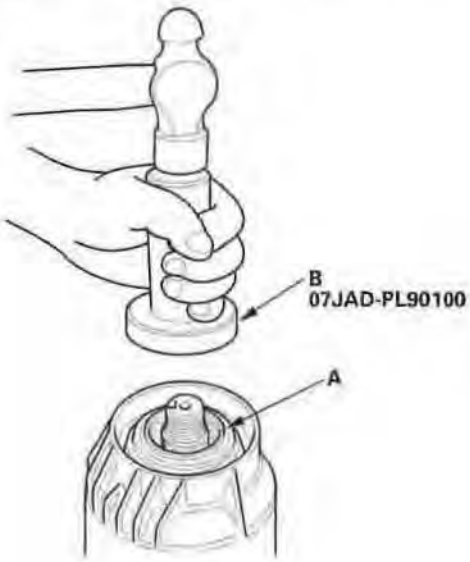


4. Remove the oil seal (A) from the torque control differential case (B).

NOTE: Be careful not to damage the shaft or case while prying out the seal.



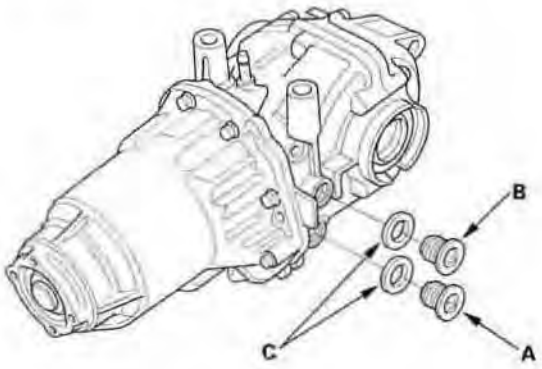
5. Install the oil seal (A) squarely using the special tool (B). Be careful not to damage the lip of the oil seal.



Differential Disassembly

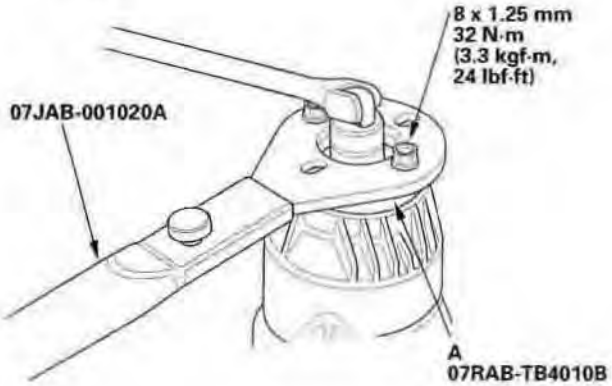
Special Tools Required
- Holder handle 07JAB-001020A
- Companion flange holder 07RAB-TB4010B

1. Remove the drain plug (A) and the oil filler plug (B) with sealing washers (C).

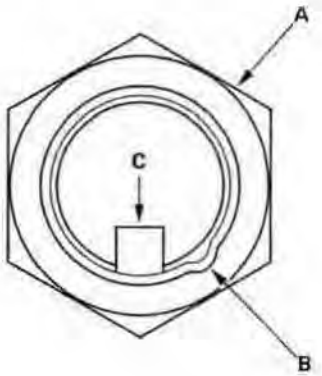


2. Raise the locknut tab (A) from the groove of the clutch guide, making sure that the tab completely clears the groove to prevent damaging the clutch guide.

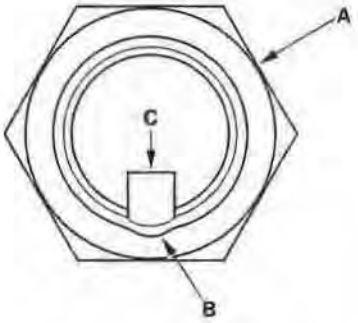
3. Install the special tools (A) on the companion flange.



4. Loosen the locknut (A) counterclockwise so that its tab (B) comes out from the groove (C) in the clutch guide.

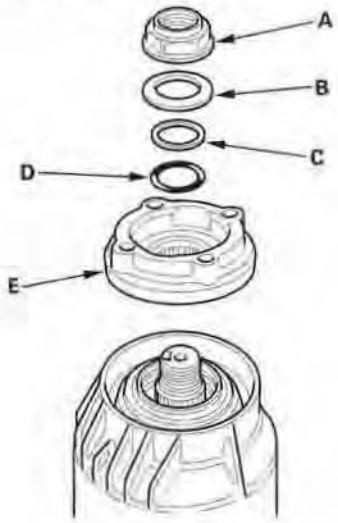


5. Tighten the locknut (A) until its tab (B) aligns with the groove (C).

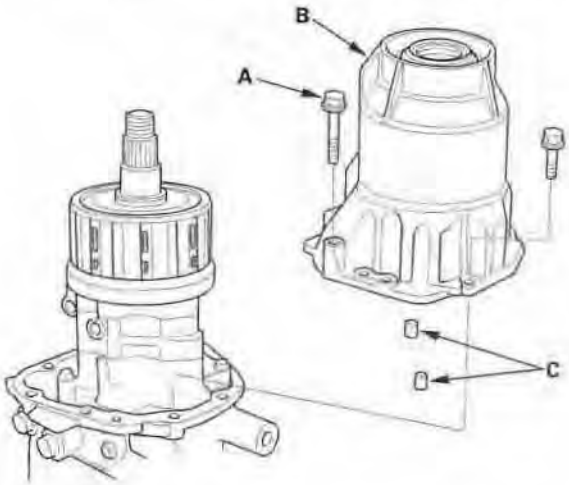


6. Remove any dirt from inside of the groove in the clutch guide, then loosen the locknut.

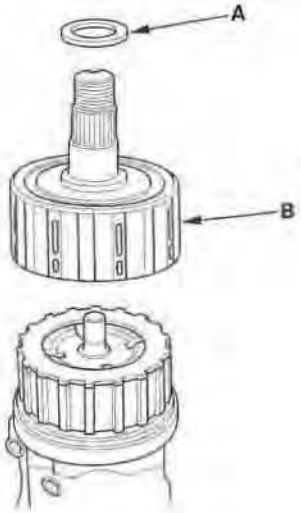
7. Remove the locknut (A), the disc spring washer (B), the back-up ring (C), the O-ring (D), and the companion flange (E).



8. Remove the eight mounting bolts (A) in a crisscross pattern in several steps, then remove the torque control differential case (B) and the dowel pins (C).



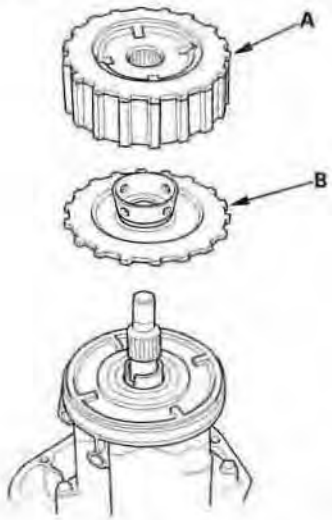
9. Remove the shim (A) and the clutch guide (B).



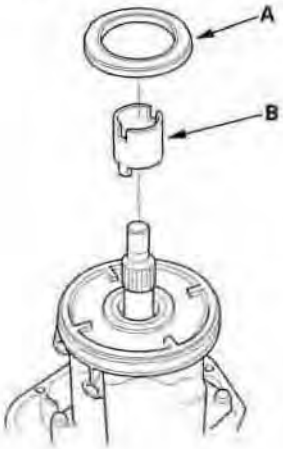
(cont'd)

Differential Disassembly (cont'd)

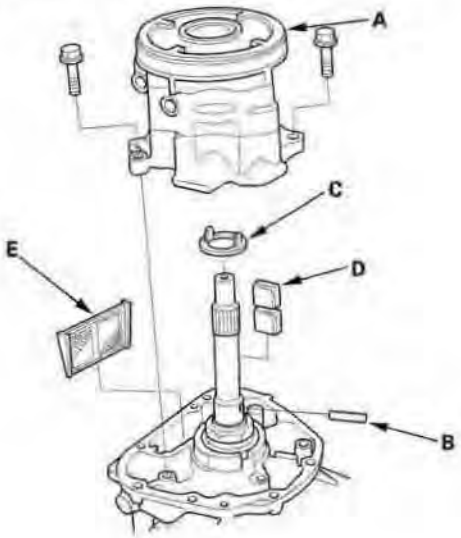
10. Remove the clutch hub/plates/discs (A) and the pressure plate (B).



11. Remove the thrust needle bearing (A) and the oil pump driveshaft (B).

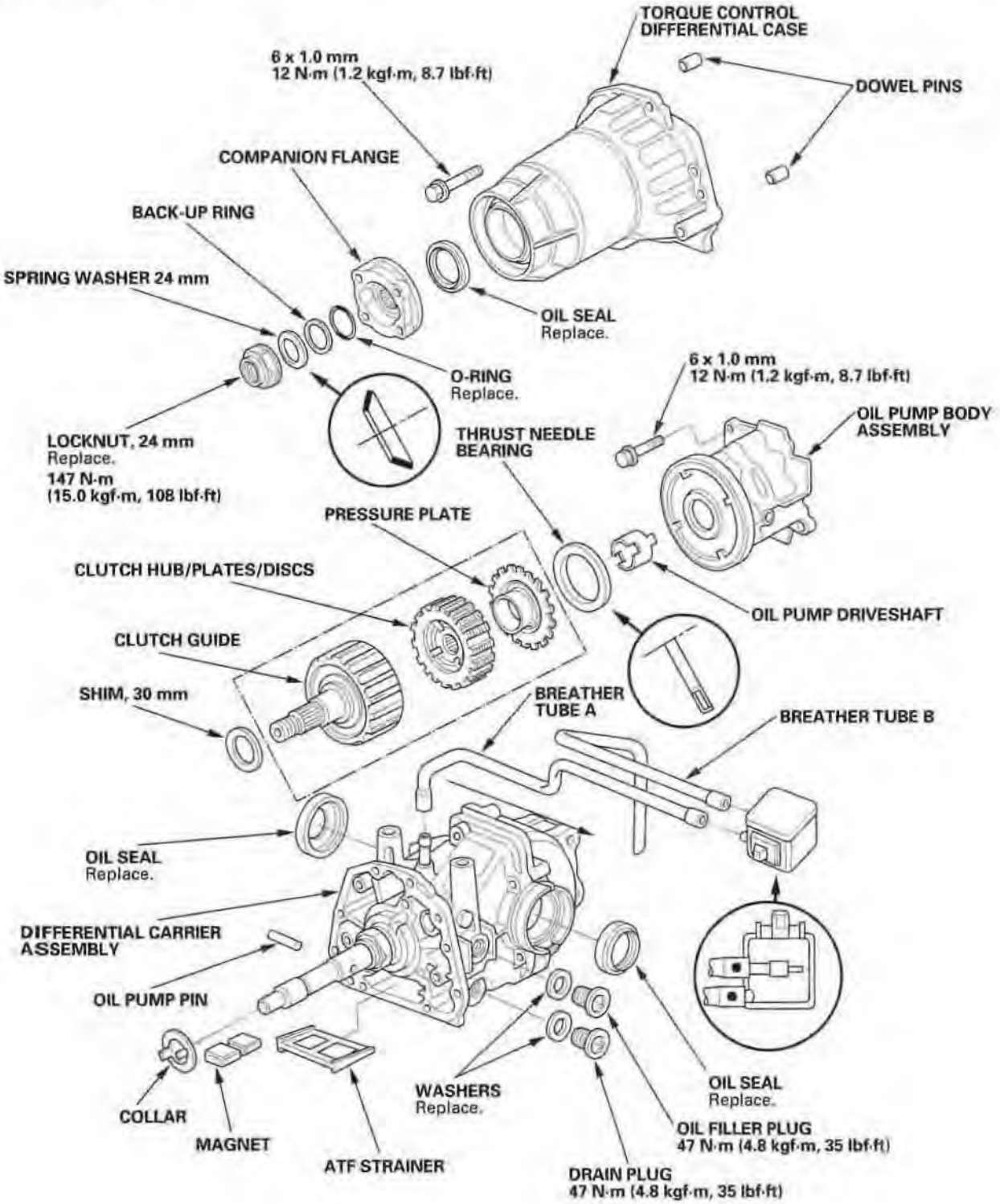


12. Remove the oil pump body assembly (A), the oil pump pin (B), the collar (C), the magnet (D), and the ATF strainer (E).



Differential Reassembly

Exploded View

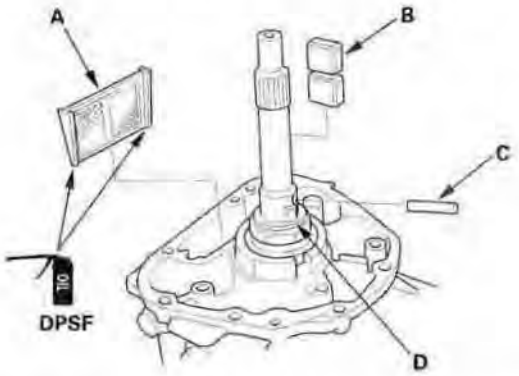


(cont'd)

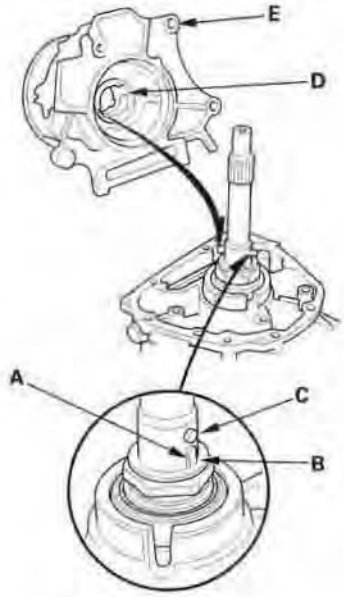
Differential Reassembly (cont'd)

Special Tools Required
- Holder handle 07JAB-001020A
- Companion flange holder 07RAB-TB4010B

1. Apply Dual Pump Fluid to the rubber of the ATF strainer (A), then install the ATF strainer, the magnet (B), the oil pump pin (C), and the collar (D) in the differential carrier assembly.

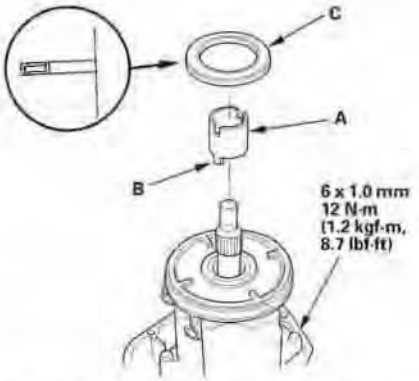


2. Align the tabs (A) of the collar (B) with the oil pump pin (C). Align the grooves (D) of the rear oil pump with the oil pump pin and collar tabs, then install the oil pump body assembly (E) on the differential carrier assembly.



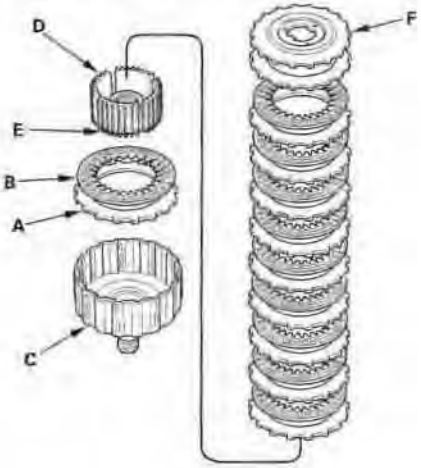
3. Tighten the oil pump body assembly mounting bolts.

4. Install the oil pump driveshaft (A) by aligning the projection (B) of the oil pump driveshaft with the groove of the front oil pump in the oil pump body assembly.

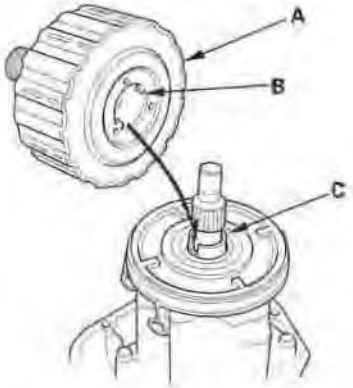


5. Install the thrust needle bearing (C).

6. If necessary, reassemble the differential clutch, and note these items:
   - Install one metal clutch plate (A) and one fiber clutch disc (B) in the clutch guide (C), then install the clutch hub with snap ring (D) into the clutch guide.
   - Make sure the splines of the clutch hub and fiber clutch disc line up below the snap ring (E).
   - Install the remaining metal clutch plates and fiber clutch discs alternately until you have installed a total of eleven plates and ten discs, then install the pressure plate (F).
   - Make sure the differential clutch is assembled correctly. The pressure plate should be flush with the top of the clutch guide.

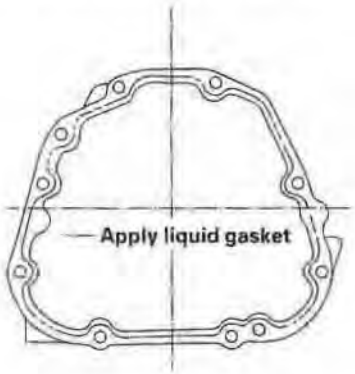


7. Install the differential clutch assembly (A) by aligning the tabs of the pressure plate (B) with the grooves in the oil pump driveshaft (C). Be careful not to let the pressure plate fall out of the clutch guide during assembly.

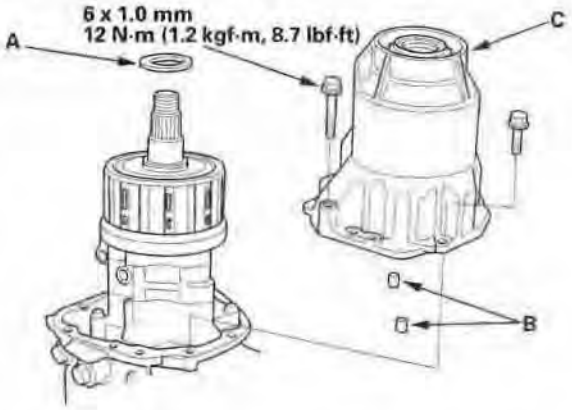


8. Remove the dirt and oil from the sealing surfaces. Apply liquid gasket (P/N 08718-0001) to the sealing surface. Make sure you seal the entire circumference of the bolt holes to prevent oil leakage.

NOTE:
- You must assemble the housings within 5 mintues after applying the liquid gasket. If not, the sealing surface must be cleaned, and the liquid gasket reapplied.
- Allow it to cure at least 20 minutes after assembly before filling the differential with oil.

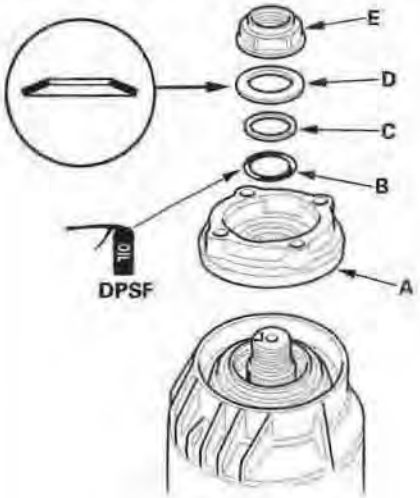


9. Install the 30 mm shim (A), the 6 x 1.0 mm dowel pins (B), and the torque control differential case (C). Torque the eight mounting bolts in a crisscross pattern in several steps.



10. Install the companion flange (A), a new O-ring (B), back-up ring (C), disc spring washer (D), and a new locknut (E).

NOTE: Apply Dual Pump Fluid to the O-ring.

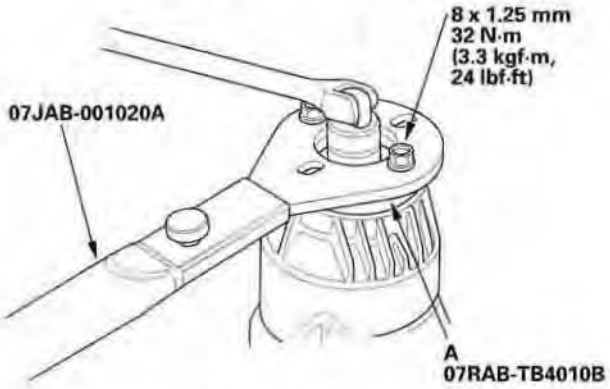


(cont'd)

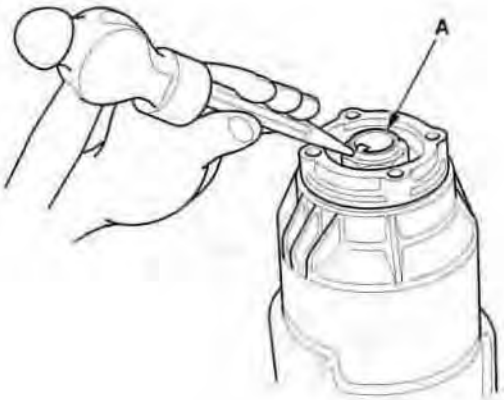
Differential Reassembly (cont'd)

11. Install the special tools (A) to the companion flange, then tighten the new locknut to the specified torque.

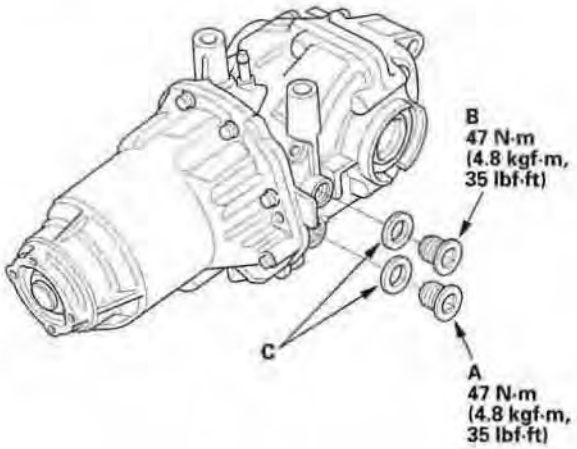
TORQUE: 147 N·m (15.0 kgf·m, 108 lbf·ft)



12. Stake the locknut tab (A) into the groove in the clutch guide.

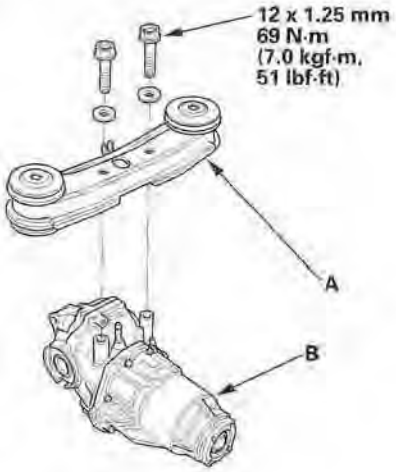


13. Install the drain plug (A) and the oil filler plug (B) with new washers (C).



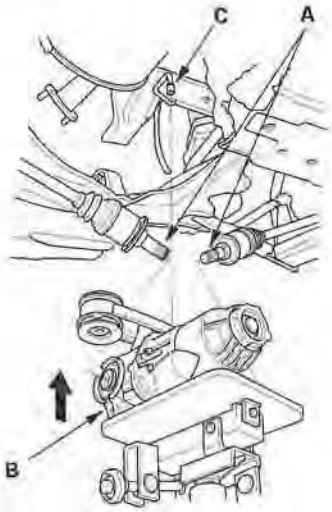
Differential Installation

1. Install the rear differential mount assembly A to the rear differential assembly (B).



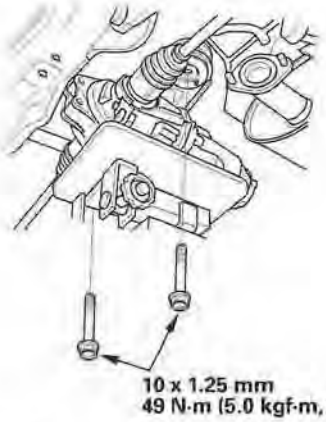
2. Jack up the rear differential.

3. Install the new set rings (A) to on the driveshafts, then insert the driveshafts into the rear differential (B).

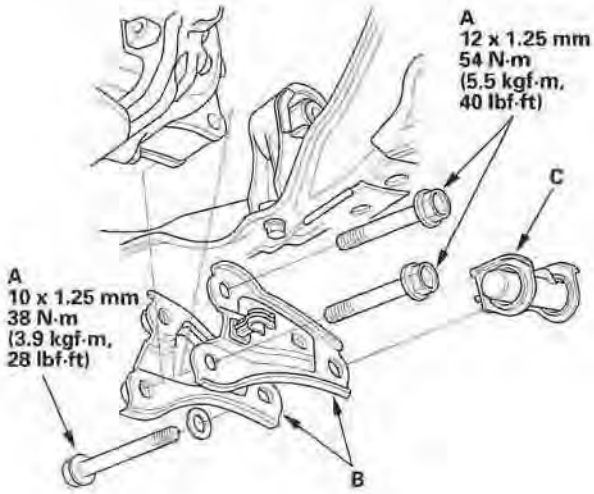


4. Lift the rear differential up into position, then push on both driveshafts to lock the set rings into place. Connect the breather tube (C).

5. Install the rear differential mount assembly mounting bolts.



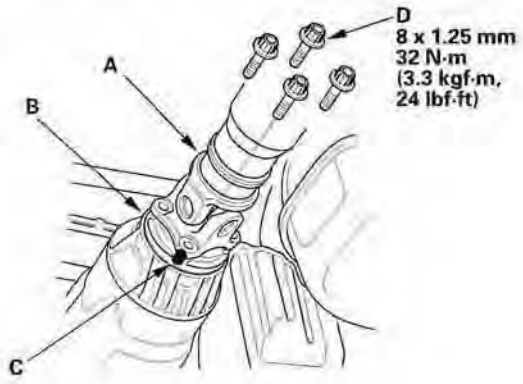
6. Install the right and left rear differential mount brackets B, then torque the bolts (A) and rear differential damper (C).



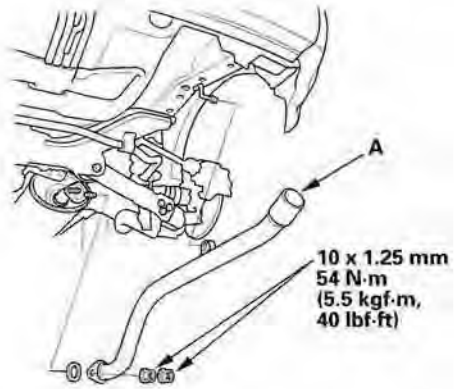
(cont'd)

Differential Installation (cont'd)

7. Install the No. 2 propeller shaft (A) onto the rear differential (B) by aligning the reference marks (C) made during removal. Make sure you use new mounting bolts (D).



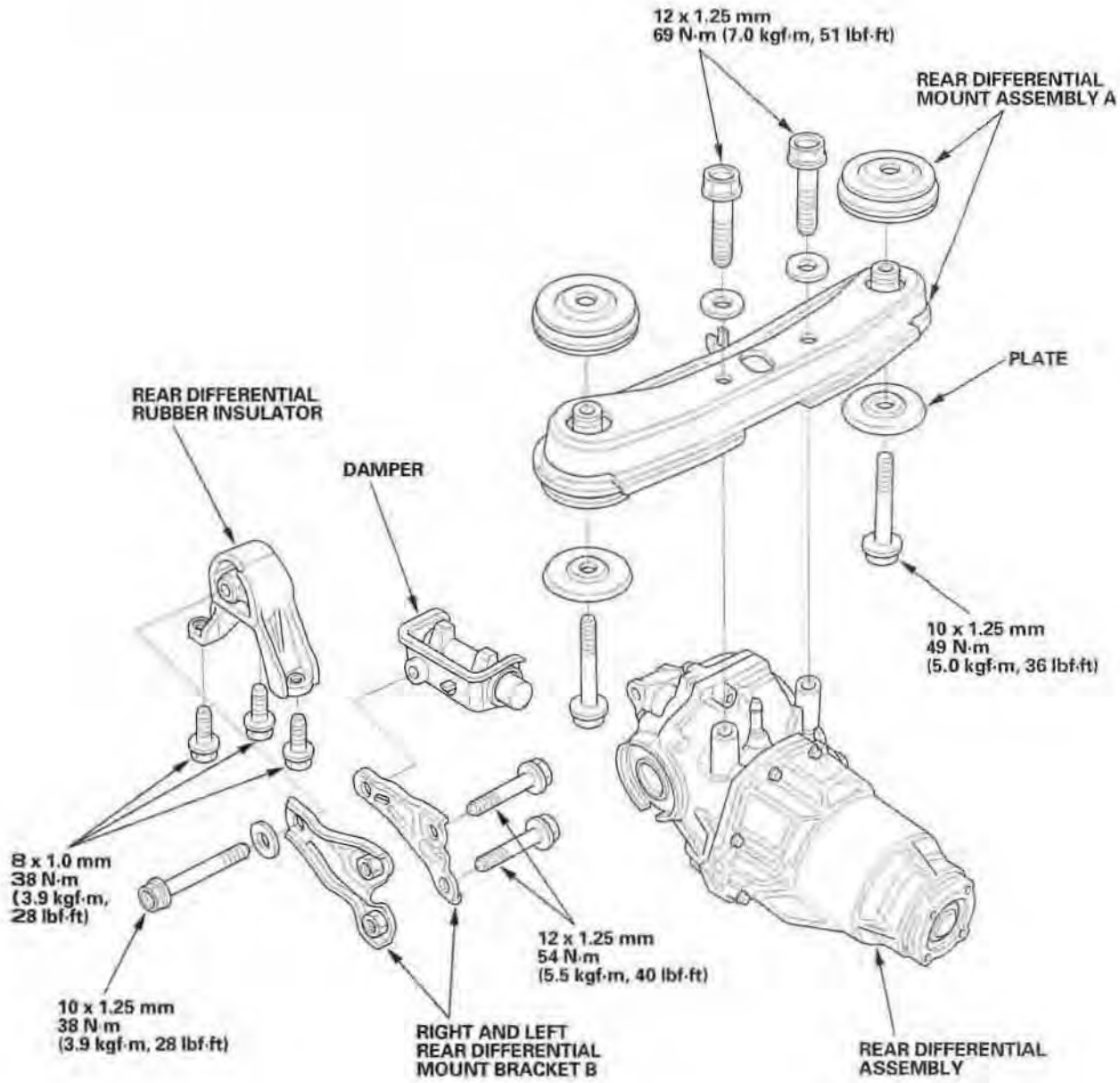
8. Install the tail pipe (A).



9. Fill the rear differential with the specified amount of Dual Pump Fluid (see page 15-13).

Differential Mount Replacement

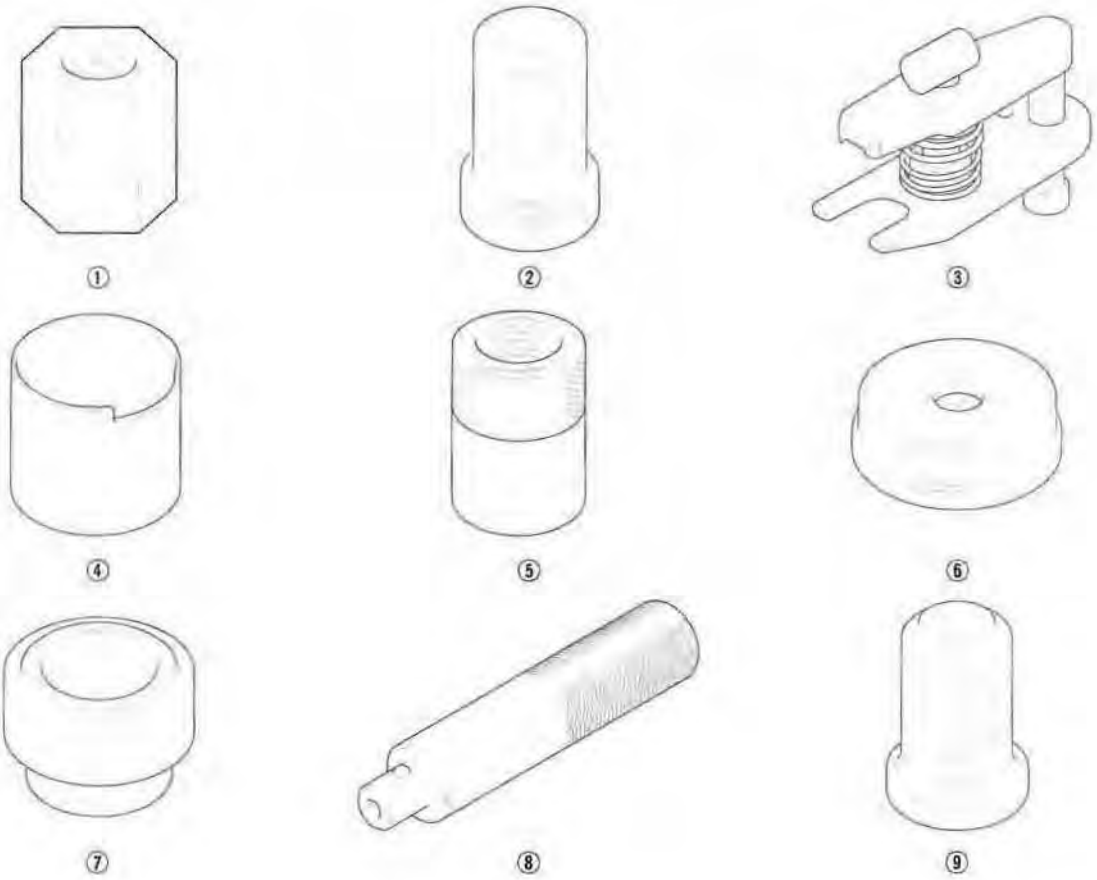
Exploded View



Driveline/Axle

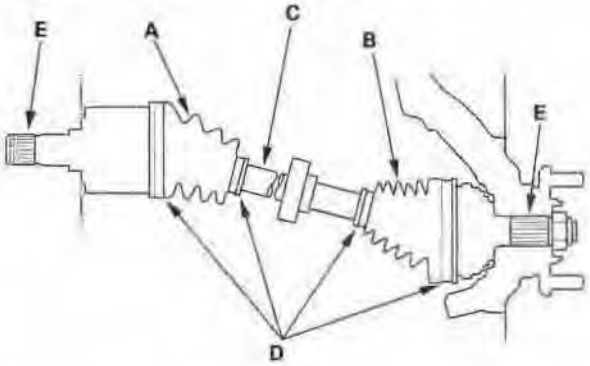
Special Tools

Ref. No.	Tool Number	Description	Qty
①	07AAF-SDAA100	Ball Joint Thread Protector	1
②	07GAD-PH70201	Oil Seal Driver	1
③	07MAC-SL00200	Ball Joint Remover, 28 mm	1
④	07NAF-SR30101	Half Shaft Base	1
⑤	07XAC-001020A	Threaded Adapter, 24 x 1.5 mm	1
⑥	07746-0010400	Attachment, 52 x 55 mm	1
⑦	07746-0030400	Attachment, 35 mm I.D.	1
⑧	07749-0010000	Driver	1
⑨	07947-SB00100	Oil Seal Driver	1



Driveshaft Inspection

1. Check the inboard boot (A) and the outboard boot (B) on the driveshaft (C) for cracks, damage, leaking grease, and loose boot bands (D). If any damage is found, replace the boot and boot bands.



2. Turn the driveshaft by hand, and make sure the splines (E) and joint are not excessively loose.

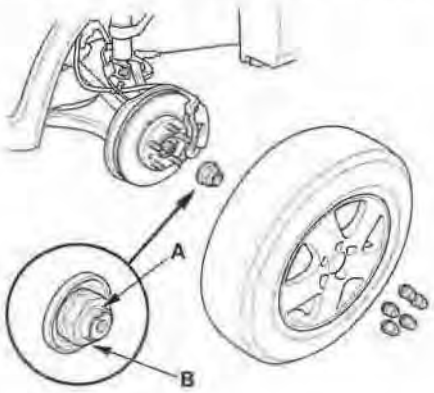
3. Make sure the driveshaft is not twisted, bent, or cracked; if it is, replace it.

Front Driveshaft Removal

Special Tools Required
- Ball joint remover, 28 mm 07MAC-SL00200
- Ball joint thread protector 07AAF-SDAA100

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9).

2. Remove the wheel nuts and front wheels.

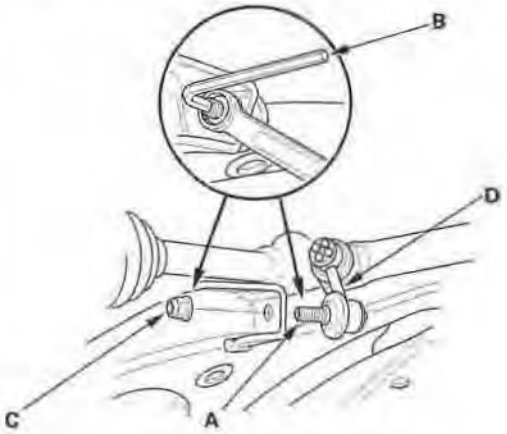


3. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.

4. Drain the transmission fluid. Reinstall the drain plug using a new washer:

   - Manual transmission (see page 13-3)
   - Automatic transmission (see page 14-185)

5. Hold the stabilizer ball joint pin (A) with a hex wrench (B), and remove the flange nut (C). Separate the front stabilizer link (D) from the lower arm.

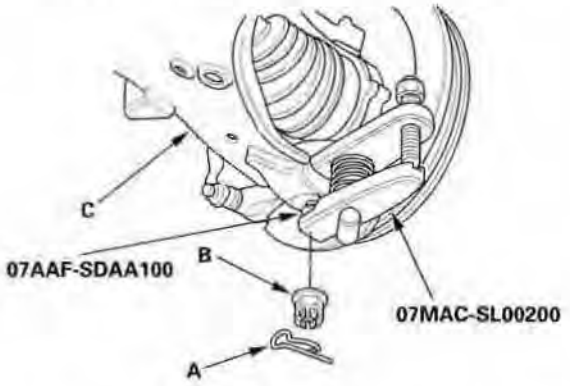


(cont'd)

Front Driveshaft Removal (cont'd)

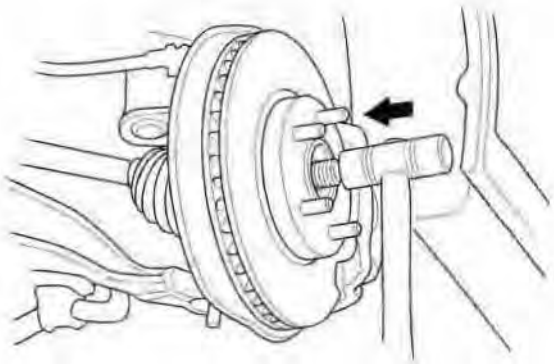
6. Remove the lock pin (A) from the lower arm ball joint castle nut (B), and remove the nut.

   NOTE:
   - To avoid damaging the ball joint, install the ball joint thread protector onto the threads of the ball joint.
   - Be careful not to damage the ball joint boot when installing the remover.



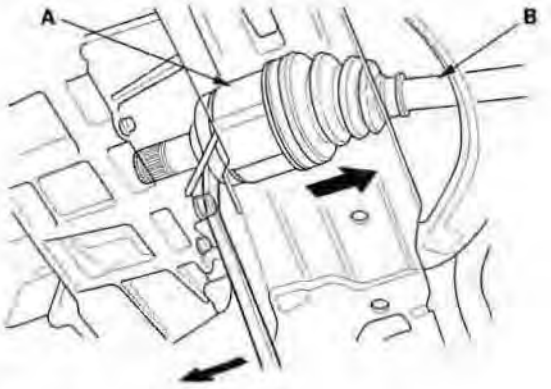
7. Separate the ball joint from the lower arm (C) with the special tool (see page 18-10).

8. Pull the knuckle outward, and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.

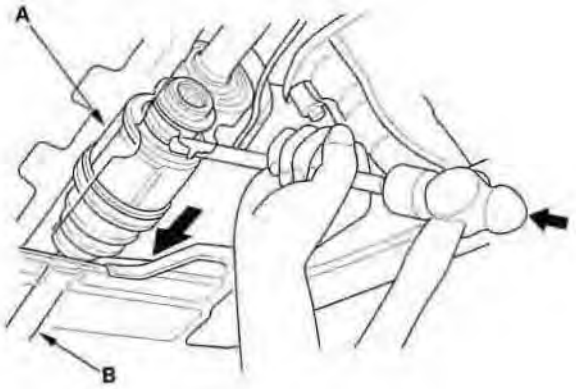


9. Left driveshaft: Pry the inboard joint from the differential case with a prybar.
   Right driveshaft: Drive the inboard joint off of the intermediate shaft with a drift and hammer.
   Remove the driveshaft as an assembly. Do not pull on the driveshaft (B), because the inboard joint may come apart. Pull the driveshaft straight out to avoid damaging the oil seal.

Left driveshaft



Right driveshaft

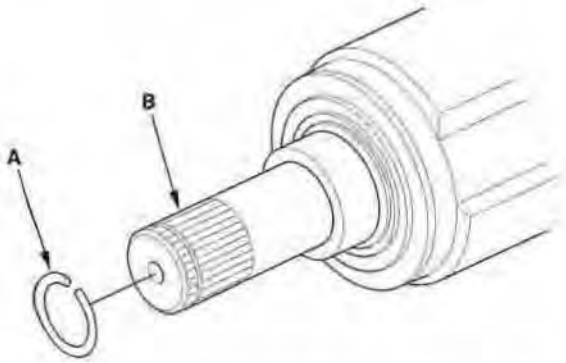


Front Driveshaft Disassembly

Special Tools Required
- Threaded adapter, 24 x 1.5 mm 07XAC-001020A
- Slide hammer, 5/8" x 18 UNF, commercially available
- Boot band pincers Kent-Moore J-35910 or equivalent, commercially available

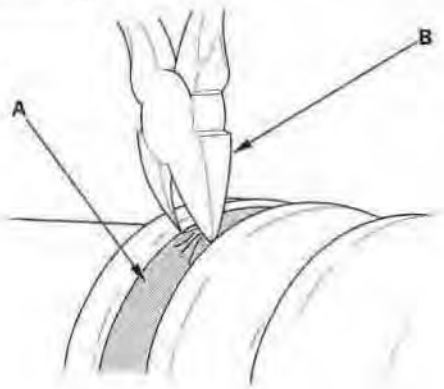
Inboard Joint Side

1. Remove the set ring (A) from the inboard joint (B).

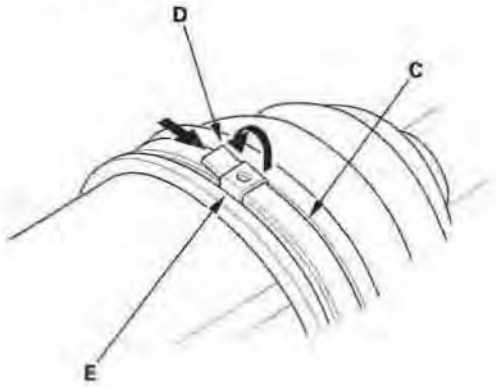


2. Remove the boot bands. Be careful not to damage the boot.
   - If the boot band is a welded type (A), cut the boot band (B).
   - If the boot band is a double loop type (C), lift up the band end (D), and push it into the clip (E).
   - If the boot band is a low profile type (F), pinch the boot band using commercially available boot band pincers (G).

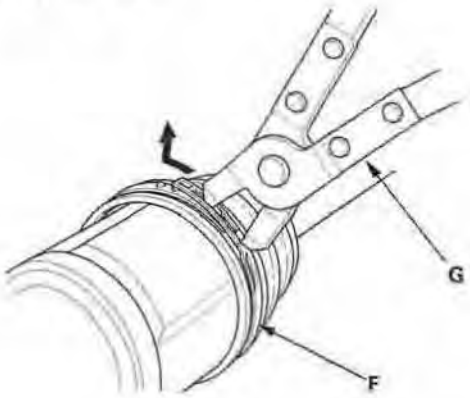
Welded type



Double loop type



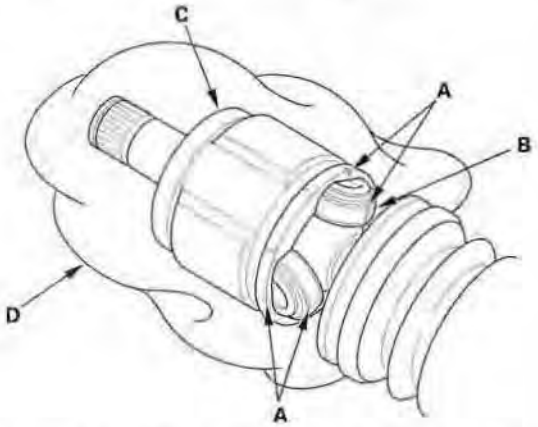
Low profile type



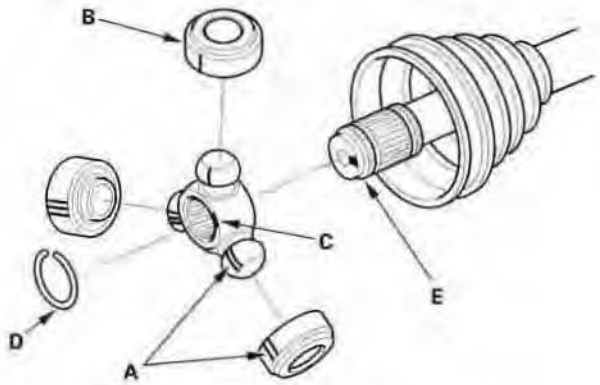
(cont'd)

Front Driveshaft Disassembly (cont'd)

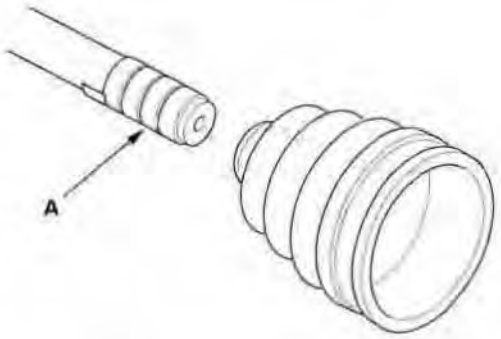
3. Make a mark (A) on each roller (B) and inboard joint (C) to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel (D). Be careful not to drop the rollers when separating them from the inboard joint.



4. Make a mark (A) on the rollers (B) and spider (C) to identify the locations of the rollers on the spider, then remove the rollers.



5. Remove the circlip (D).
6. Mark the spider and driveshaft (E) to identify the position of the spider on the shaft.
7. Remove the spider.
8. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



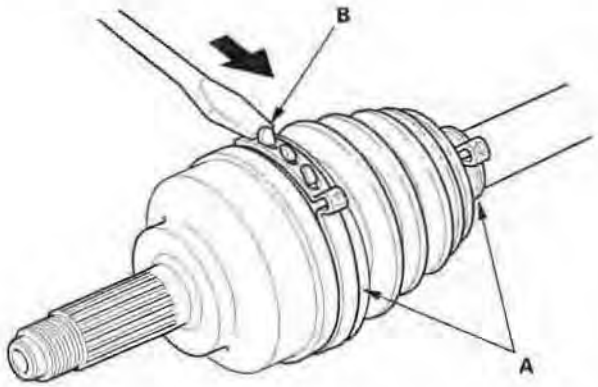
9. Remove the inboard boot. Be careful not to damage the boot.
10. Remove the vinyl tape.

Outboard Joint Side

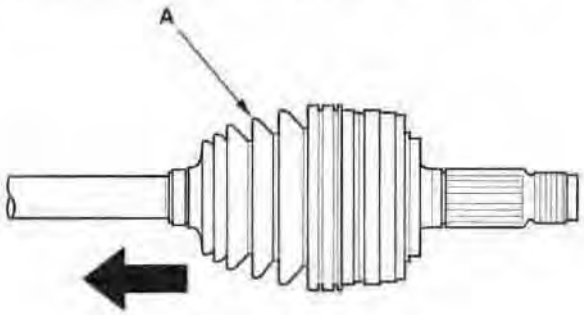
1. Remove the boot bands. Be careful not to damage the boot and dynamic damper.

   If the boot band is an ear clamp type (A), lift up the three tabs (B) with a screwdriver.

   Ear clamp type

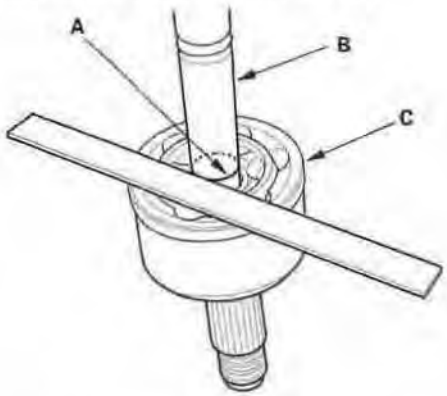


2. Slide the outboard boot (A) partially to the inboard joint side. Be careful not to damage the boot.



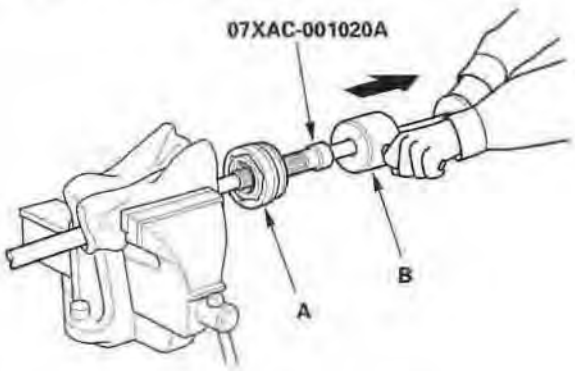
3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.

4. Make a mark (A) on the driveshaft (B) at the same position of the outboard joint end (C).



5. Carefully clamp the driveshaft in a vise.

6. Remove the outboard joint (A) using the special tool and a commercially available 5/8" x 18 UNF slidehammer (B).

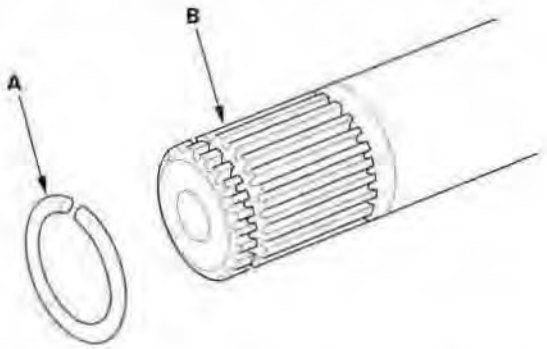


7. Remove the driveshaft from the vise.

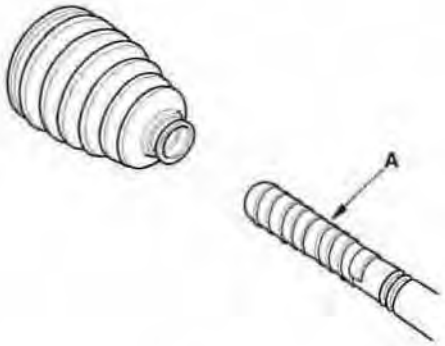
(cont'd)

Front Driveshaft Disassembly (cont'd)

8. Remove the stop ring (A) from the driveshaft (B).



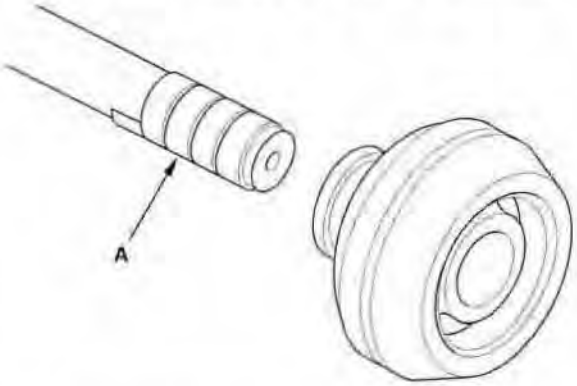
9. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



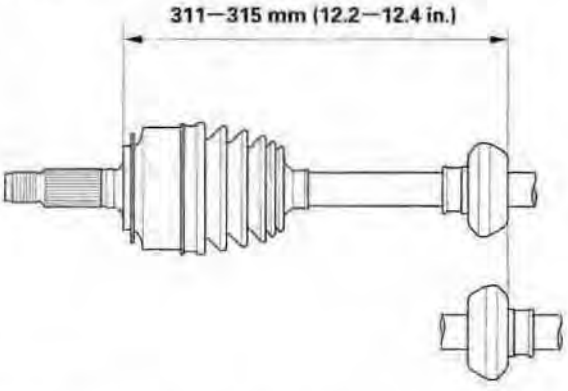
10. Remove the outboard boot. Be careful not to damage the boot.
11. Remove the vinyl tape.

Dynamic Damper Replacement

1. Remove the inboard joint (see page 16-5).
2. Remove the dynamic damper bands. Be careful not to damage the dynamic damper (see page 16-5).
   - If the band is a welded type, cut the band.
   - If the band is a double loop type, lift up the band end, and push it into the clip.
   - If the band is a low profile type, pinch the band using commercially available boot band pincers.
3. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the dynamic damper.



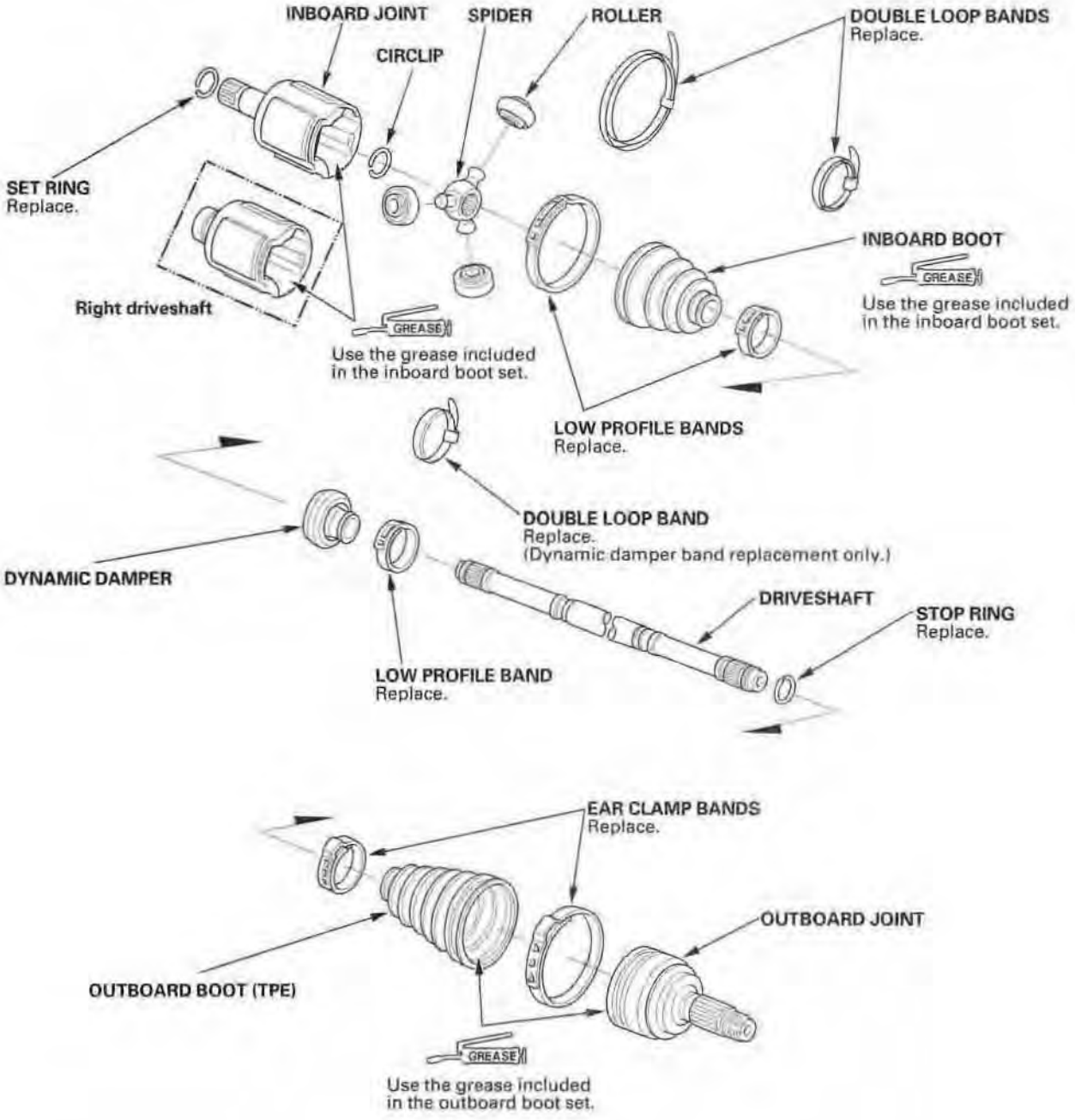
4. Remove the dynamic damper. Be careful not to damage the dynamic damper.
5. Adjust the position of the new dynamic damper to the figure follow. (The dynamic damper can be installed in either direction.)



6. Install the dynamic damper band (see step 9 on page 16-11).
7. Install the inboard joint (see page 16-10).

Front Driveshaft Reassembly

Exploded View



(cont'd)

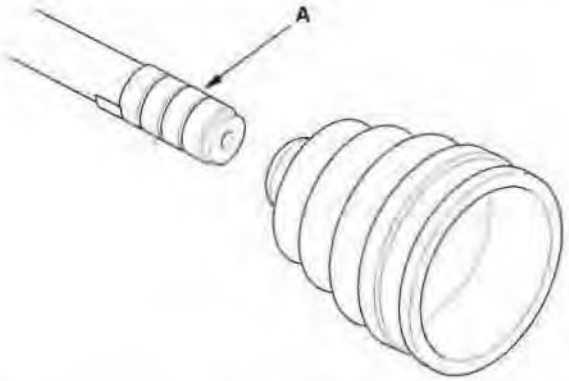
Front Driveshaft Reassembly (cont'd)

Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available
- Boot band pincers, Kent-Moore J-35910 or equivalent, commercially available

NOTE: Refer to the Exploded View as needed during this procedure.

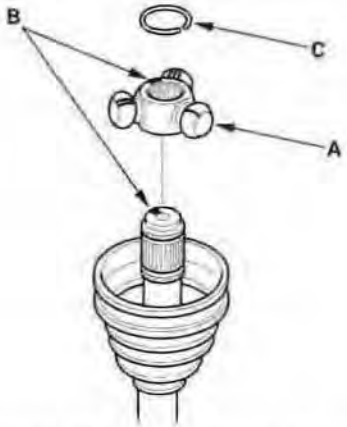
Inboard Joint Side

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



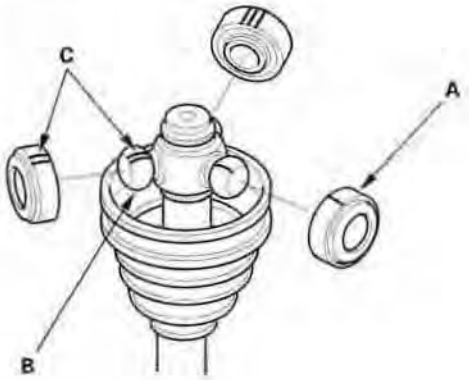
2. Install the inboard boot onto the driveshaft, then remove the vinyl tape. Be careful not to damage the inboard boot.

3. Install the spider (A) onto the driveshaft by aligning the marks (B) on the spider and the end of the driveshaft.



4. Fit the circlip (C) into the driveshaft groove. Rotate the circlip in its groove to make sure it is fully seated.

5. Fit the rollers (A) onto the spider (B) with their high shoulders facing outward, and note these items:
   - Reinstall the rollers in their original positions on the spider by aligning the marks (C).
   - Hold the driveshaft pointed up to prevent the rollers from falling off.

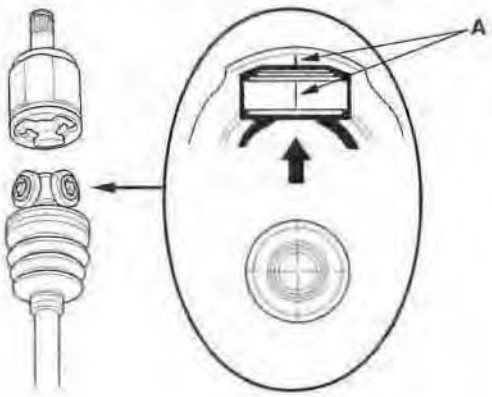


6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity
Inboard joint: 150—160 g (5.3—5.6 oz)

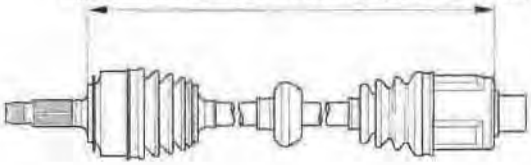
7. Fit the inboard joint onto the driveshaft, and note these items:

- Reinstall the inboard joint onto the driveshaft by aligning the marks (A) on the inboard joint and the rollers.
- Hold the driveshaft so the inboard joint is pointing up to prevent it from falling off.

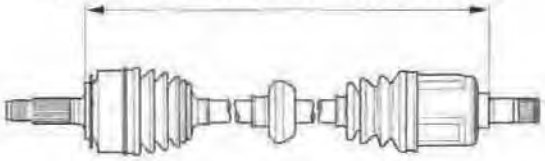


8. Adjust the inboard joint so the rollers are in the middle of the joint, then check the driveshaft length measurement to the figure.

Right driveshaft: 532—537 mm (20.9—21.1 in.)



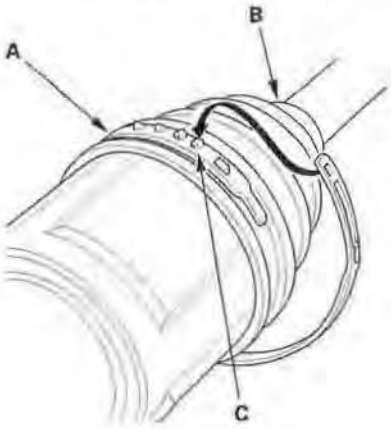
Left driveshaft: 554—559 mm (21.8—22.0 in.)



9. Install the boot bands.

- For the double loop type, go to step 13. (Boot band replacement only)
- For the low profile type, go to step 10.

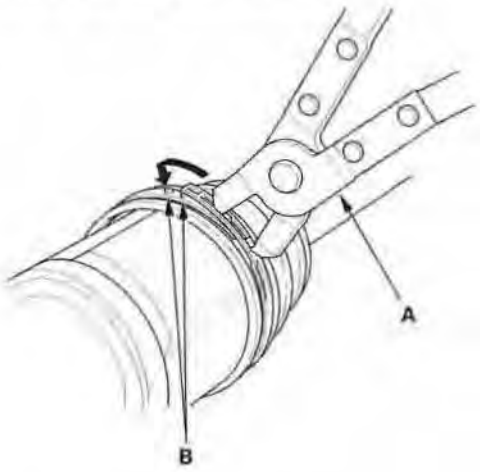
10. Install the new low profile band (A) onto the boot (B), then hook the tab (C) of the band.



(cont'd)

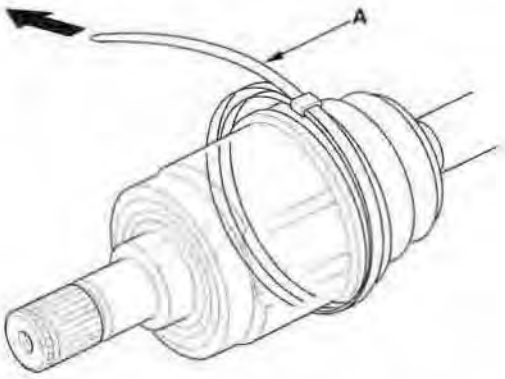
Front Driveshaft Reassembly (cont'd)

11. Close the hook portion of the band with a commercially available boot band pincers (A), then hook the tabs (B) of the band.



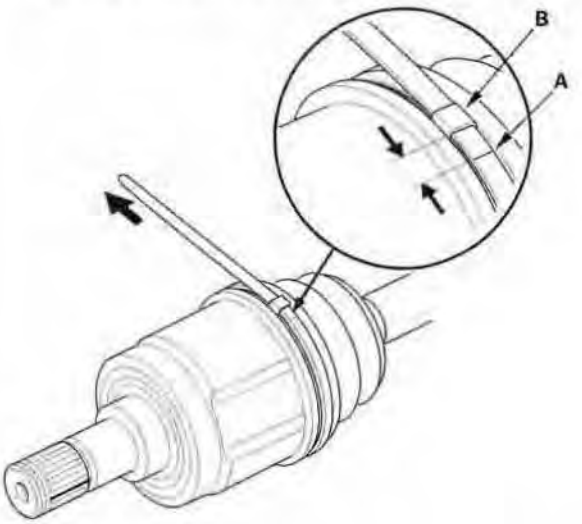
12. Install the boot band on the other end of the boot, and repeat steps 10 through 11, then go to step 22.

13. Fit the boot ends onto the driveshaft and the inboard joint, then install the new double loop band (A) onto the boot.

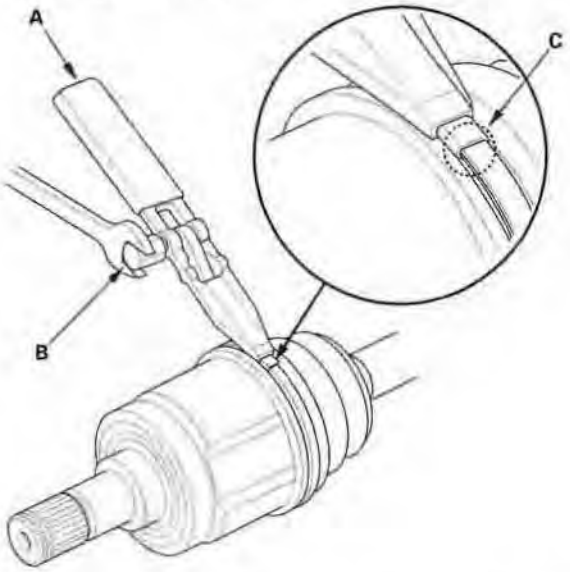


14. Pull up the slack in the band by hand.

15. Mark a position (A) on the band 10—14 mm (0.4—0.6 in.) from the clip (B).

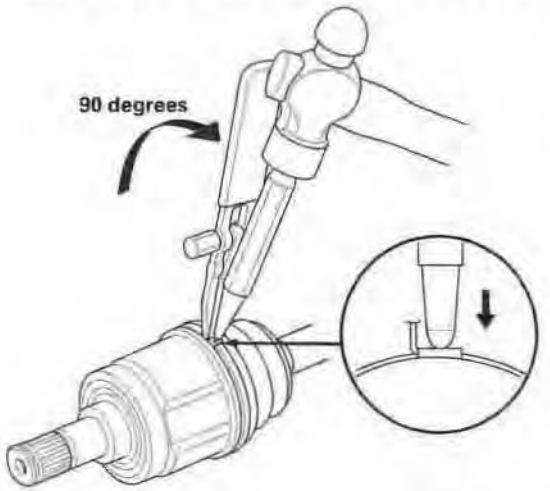


16. Thread the free end of the band through the nose section of a commercially available boot band tool KD-3191 or equivalent (A), and into the slot on the winding mandrel (B).

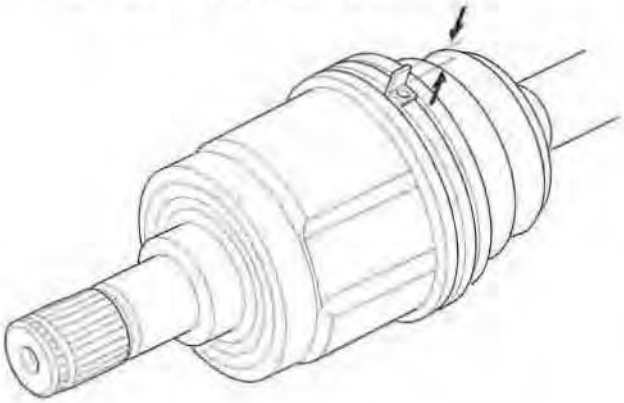


17. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

18. Lift up the boot band tool to bend the free end of the band 90 degrees to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.

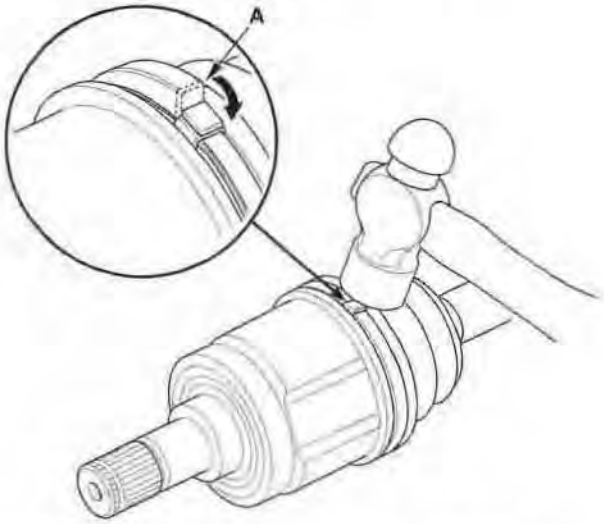


19. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5—10 mm (0.2—0.4 in.) tail protruding from the clip.



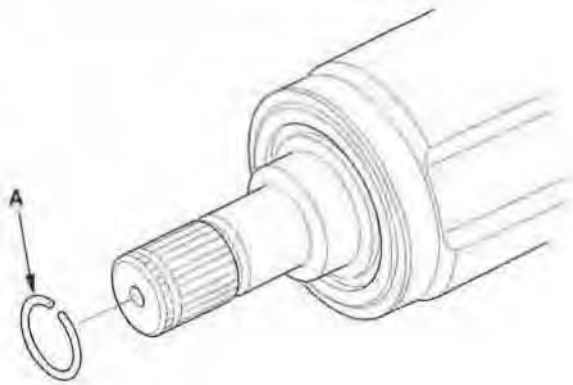
20. Bend the band end (A) by tapping it down with a hammer.

NOTE:
- Make sure the band and clip do not interfere with anything on the vehicle and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



21. Repeat steps 13 through 20 for the band on the other end of the boot, then go to step 22.

22. Install the new set ring (A).

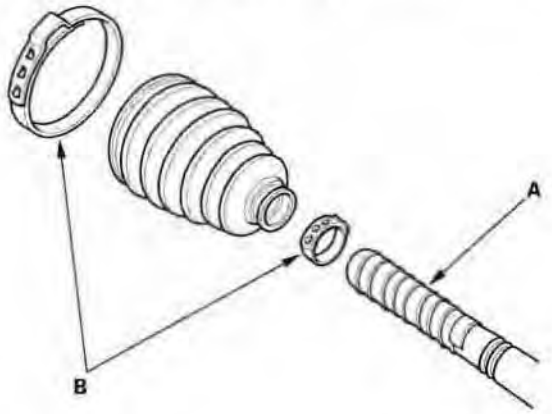


(cont'd)

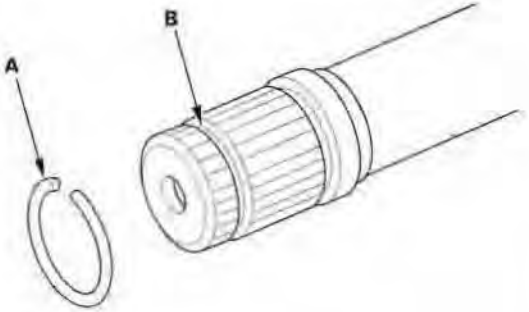
Front Driveshaft Reassembly (cont'd)

Outboard Joint Side

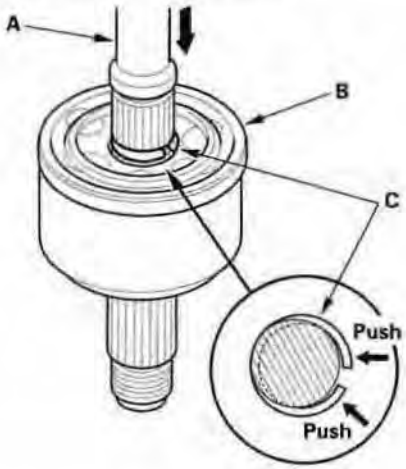
1. Wrap the splines with vinyl tape (A) to prevent damage to the outboard boot.



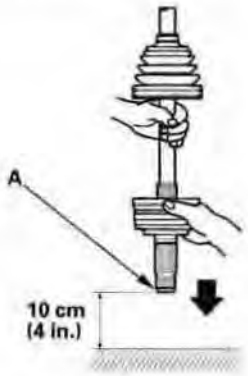
2. Install the new ear clamp bands (B) and outboard boot, then remove the vinyl tape. Be careful not to damage the outboard boot.
3. Install the new stop ring (A) in the driveshaft groove (B).



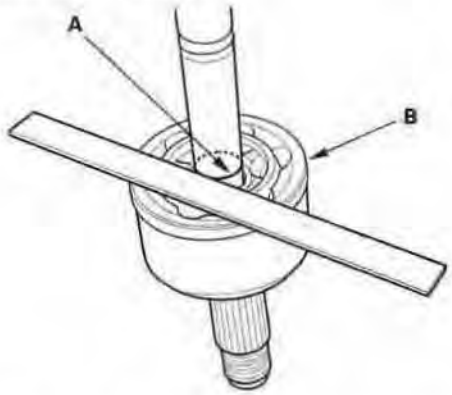
4. Insert the driveshaft (A) into the outboard joint (B) until the stop ring (C) is closed.



5. To completely seat the outboard joint, pick up the driveshaft and joint, and tap them from about 10 cm (4 in.) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft. Be careful not to damage the threaded section (A) of the outboard joint.

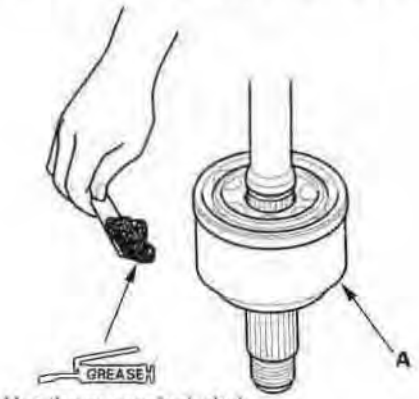


6. Check the alignment of the paint mark (A) with the outboard joint end (B).



7. Pack the outboard joint (A) with the joint grease included in the new joint boot set.

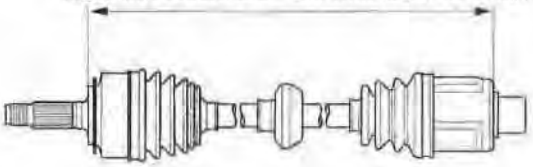
Grease quantity
Outboard joint: 140—150 g (4.9—5.3 oz)



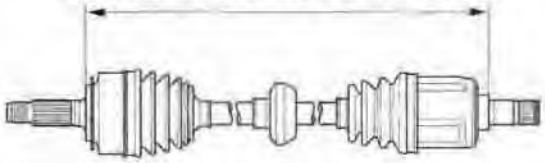
Use the grease included in the outboard boot set.

8. Adjust the length of the driveshafts as shown in the figure, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the groove of the driveshaft and joint.

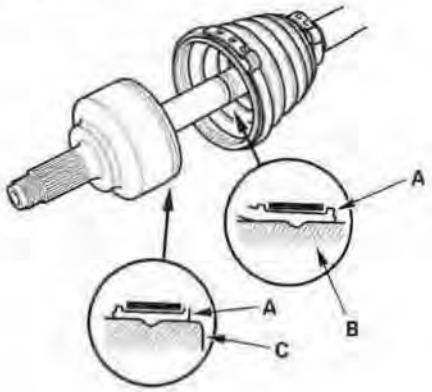
Right driveshaft: 532—537 mm (20.9—21.1 in.)



Left driveshaft: 554—559 mm (21.8—22.0 in.)



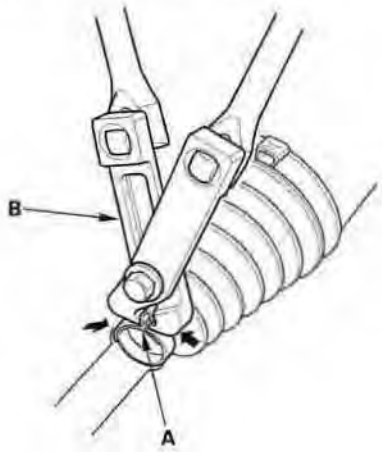
9. Fit the boot (A) ends onto the driveshaft (B) and outboard joint (C).



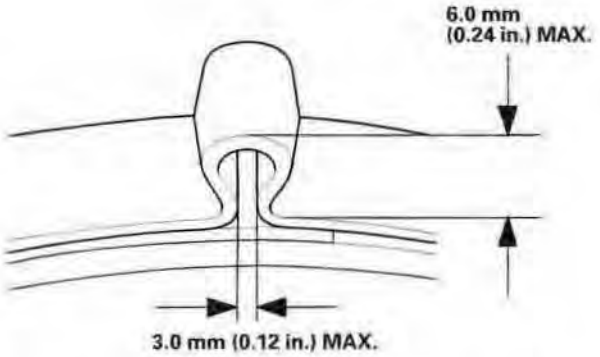
(cont'd)

Front Driveshaft Reassembly (cont'd)

10. Close the ear portion (A) of the band with commercially available boot band pincers Kent-Moore J-35910 or equivalent (B).



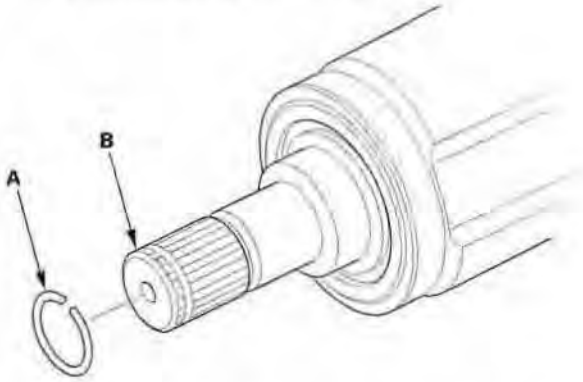
11. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band farther.



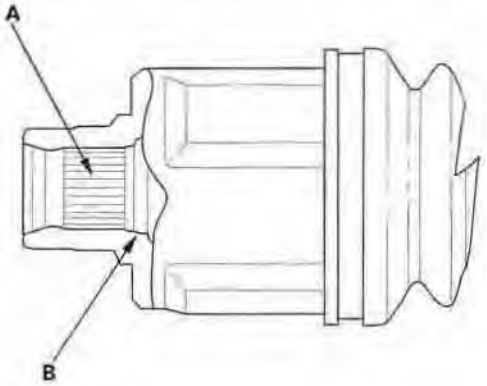
12. Repeat steps 10 and 11 for the band on the other end of the boot.

Front Driveshaft Installation

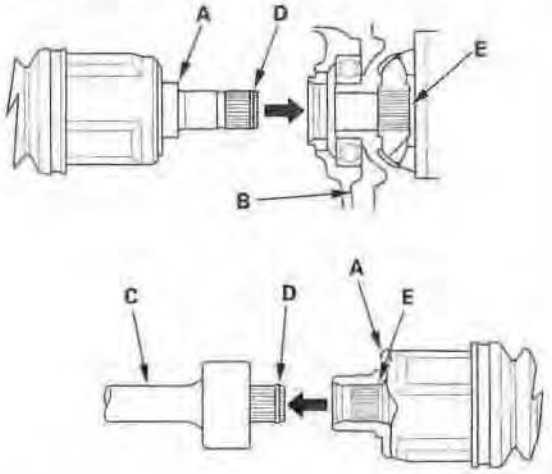
1. Install a new set ring (A) in the set ring groove of the driveshaft (left driveshaft) (B).



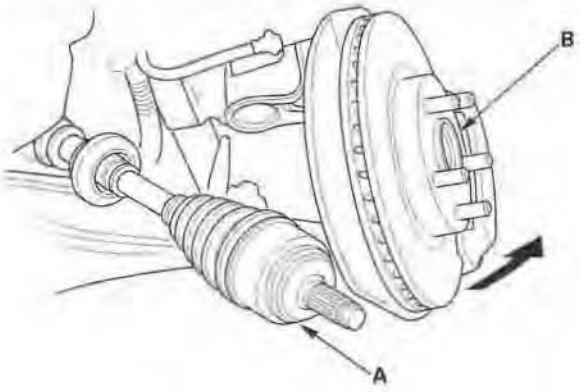
2. Apply 0.5—1.0 g (0.02—0.04 oz) of grease to the whole splined surface (A) of the right driveshaft. After applying grease, remove the grease from the splined grooves at intervals of 2—3 splines and from the set ring groove (B) so that air can bleed from the intermediate shaft.



3. Clean the areas where the driveshaft contacts the differential thoroughly with solvent or brake cleaner, and dry with compressed air. Insert the inboard end (A) of the driveshaft into the differential (B) or intermediate shaft (C) until the new set ring (D) locks in the groove (E).

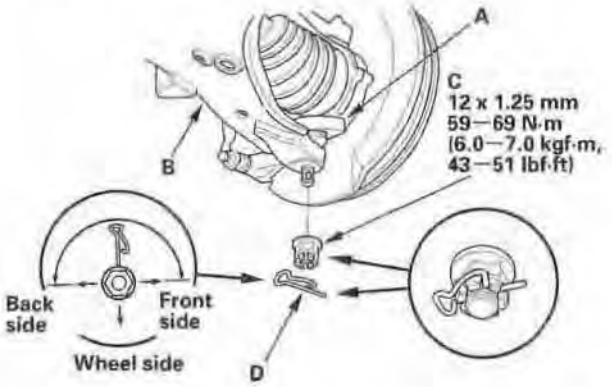


4. Install the outboard joint (A) into the front hub (B).



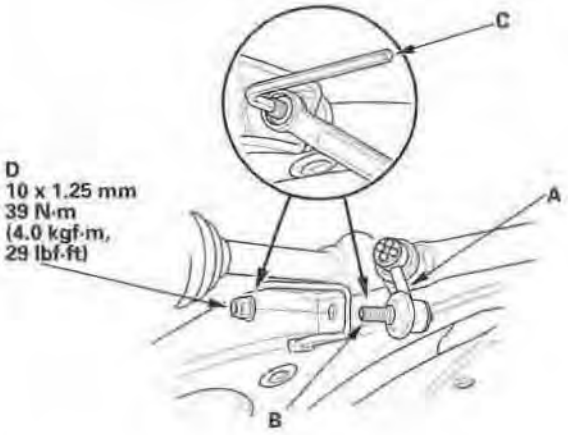
5. Clean off any grease contamination from the ball joint threads, then install the knuckle (A) onto the lower arm (B). Wipe off the grease before tightening the nut at the ball joint. Torque the new castle nut (C) to the lower torque specification, then tighten it only far enough to align the slot with the ball joint pin hole. Do not align the nut by loosening it.

NOTE: Make sure the ball joint boot is not damaged or cracked.



6. Install the new lock pin (D) into the ball joint pin hole as shown.

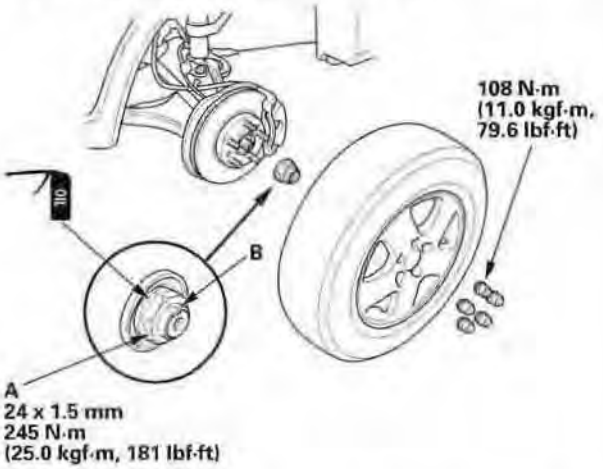
7. Connect the front stabilizer link (A) to the lower arm. Hold the stabilizer link ball joint pin (B) with a hex wrench (C), and tighten the new flange nut (D).



(cont'd)

Front Driveshaft Installation (cont'd)

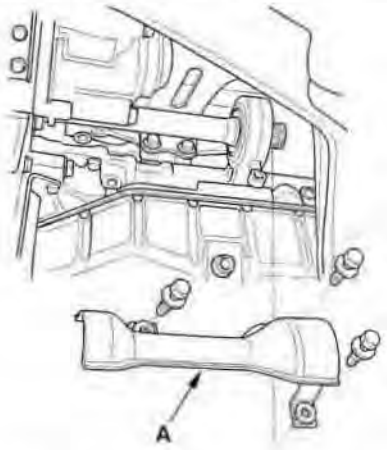
8. Install a new spindle nut (A), then tighten the nut. After tightening, use a drift to stake the spindle nut shoulder (B) against the driveshaft.



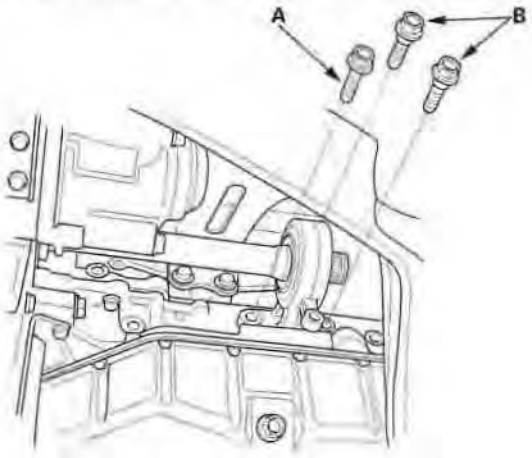
9. Clean the mating surfaces of the brake disc and the front wheel, then install the front wheel with the wheel nuts.
10. Turn the front wheel by hand, and make sure there is no interference between the driveshaft and surrounding parts.
11. Refill the transmission with recommended transmission fluid:
    - Manual transmission (see page 13-3)
    - Automatic transmission (see page 14-185)
12. Check the front wheel alignment, and adjust it if necessary (see page 18-5).

Intermediate Shaft Removal

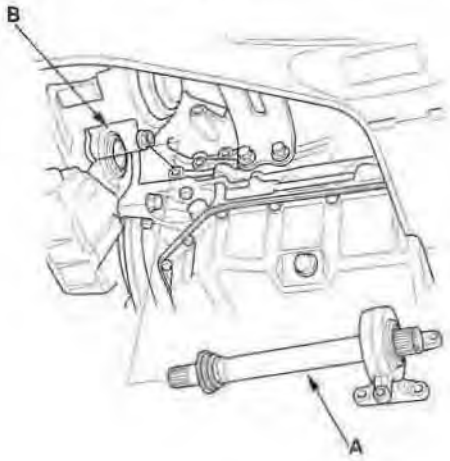
1. Drain the transmission fluid. Reinstall the drain plug using a new washer:
    - Manual transmission (see page 13-3)
    - Automatic transmission (see page 14-185)
2. Remove the right driveshaft (see page 16-3).
3. Remove the heat shield (A).



4. Remove the flange bolt (A) and two dowel bolts (B).



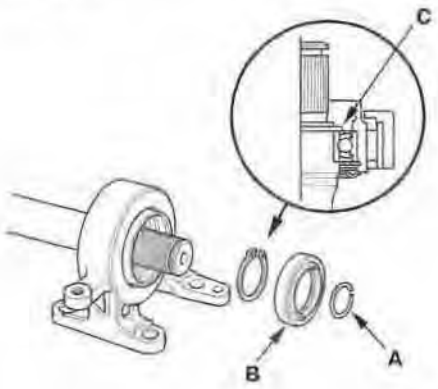
5. Remove the intermediate shaft (A) from the differential. Hold the intermediate shaft horizontally until it is clear of the differential to prevent damage to the differential oil seal (B).



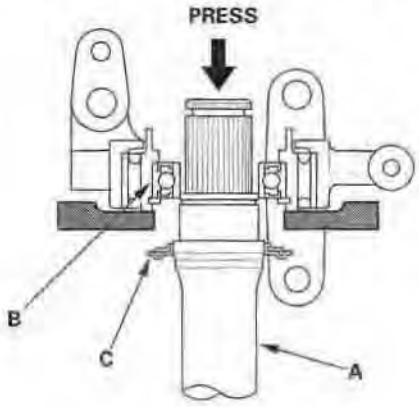
Intermediate Shaft Disassembly

Special Tools Required
- Oil seal driver 07947-SB00100
- Half shaft base 07NAF-SR30101

1. Remove the set ring (A), outer seal (B), and external snap ring (C).



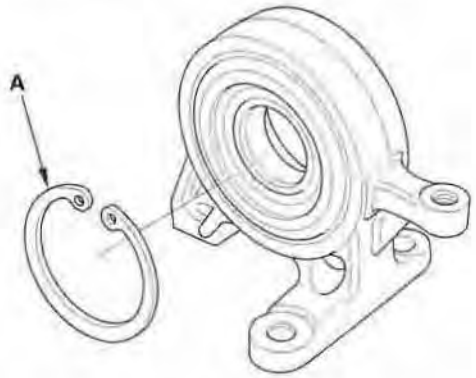
2. Press the intermediate shaft (A) out of the intermediate shaft bearing (B) using a press. Be careful not to damage the metal rings (C) on the intermediate shaft during disassembly.



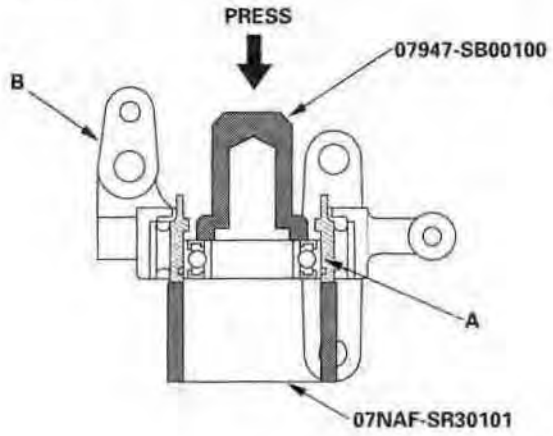
(cont'd)

Intermediate Shaft Disassembly (cont'd)

3. Remove the internal snap ring (A).

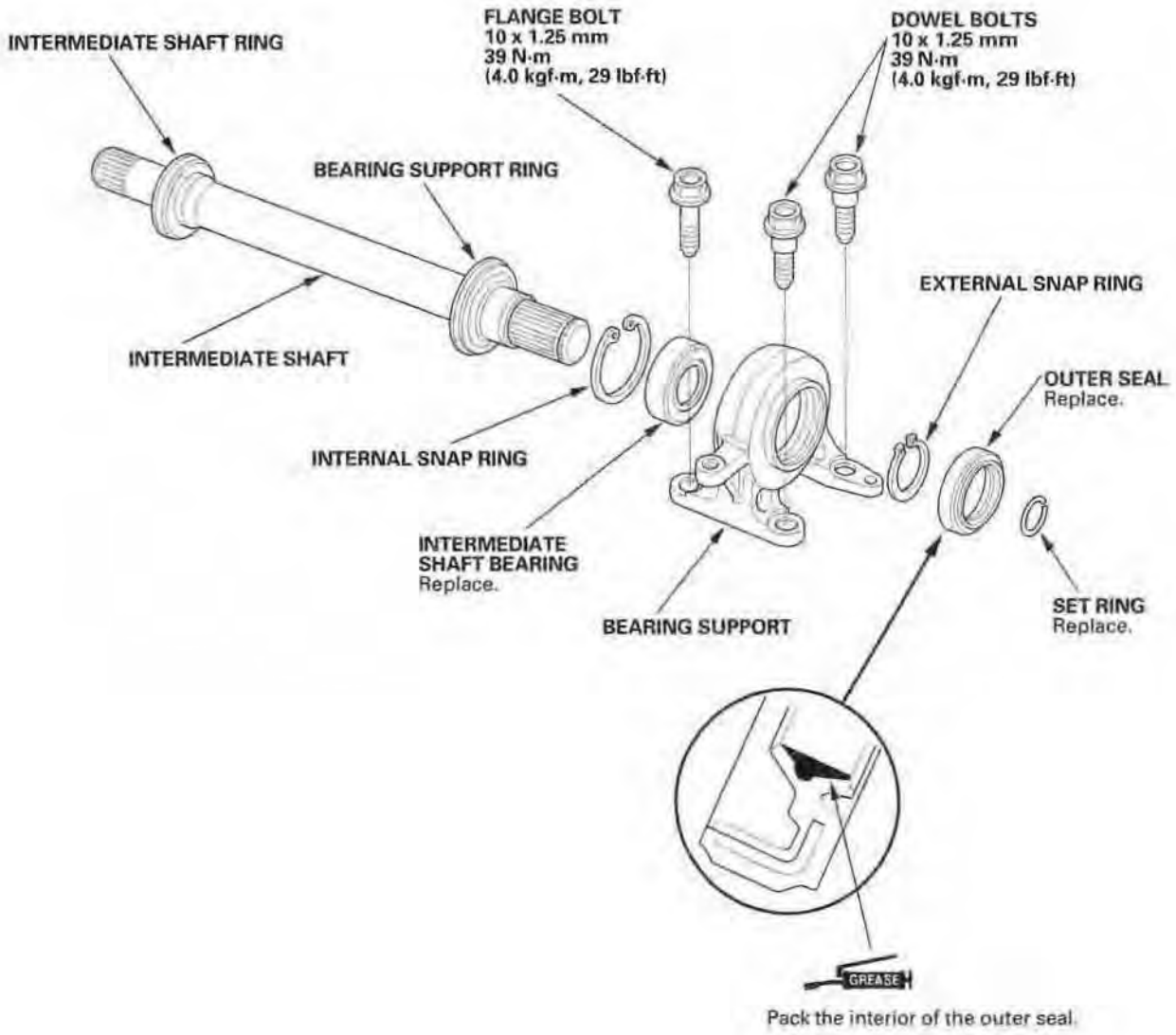


4. Press the intermediate shaft bearing (A) out of the bearing support (B) using the special tools and a press.



Intermediate Shaft Reassembly

Exploded View



Pack the interior of the outer seal.

(cont'd)

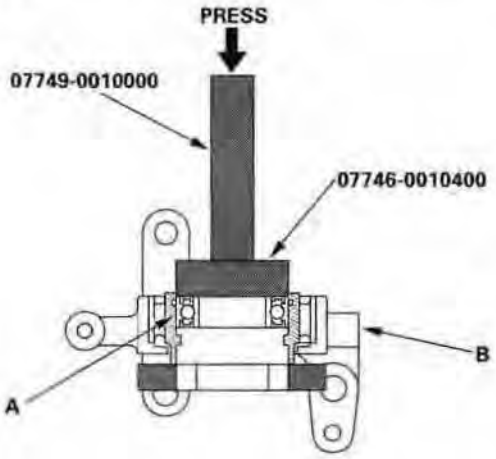
Intermediate Shaft Reassembly (cont'd)

Special Tools Required
- Driver 07749-0010000
- Attachment, 52 x 55 mm 07746-0010400
- Attachment, 35 mm I.D. 07746-0030400
- Oil seal driver 07GAD-PH70201

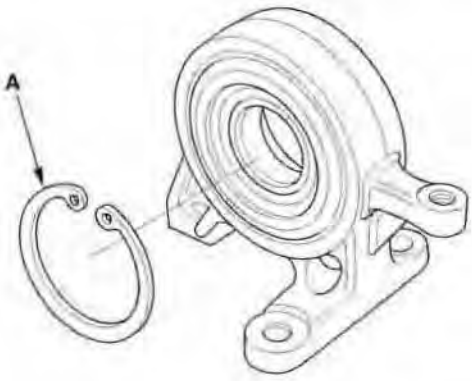
NOTE: Refer to the Exploded View as needed during this procedure.

1. Clean the disassembled parts with solvent, and dry them with compressed air. Do not wash the rubber parts with solvent.

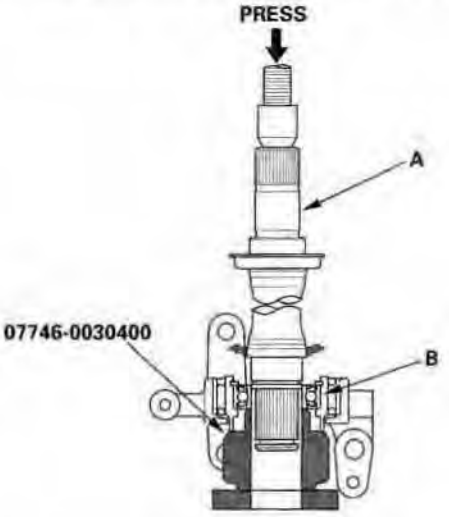
2. Press the intermediate shaft bearing (A) into the bearing support (B) using the special tools and a press.



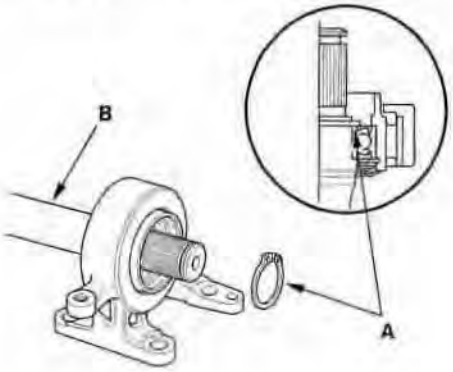
3. Install, then seat the internal snap ring (A) into the groove of the bearing support.



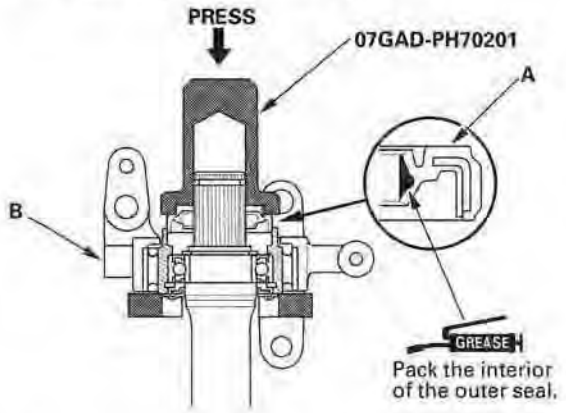
4. Press the intermediate shaft (A) into the shaft bearing (B) using the special tool and a press.



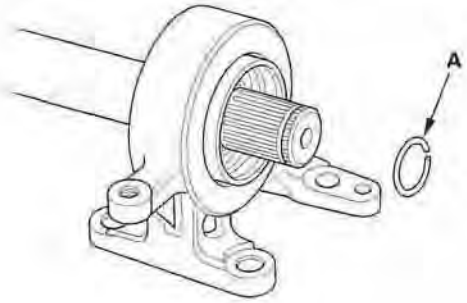
5. Install, then seat the external snap ring (A) into the groove of the intermediate shaft (B).



6. Install the outer seal (A) into the bearing support (B) using the special tool and a press.

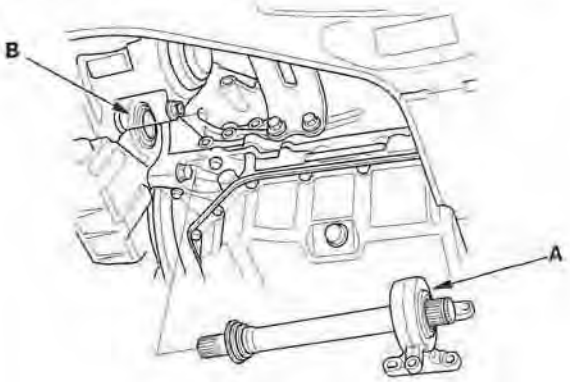


7. Install the set ring (A).

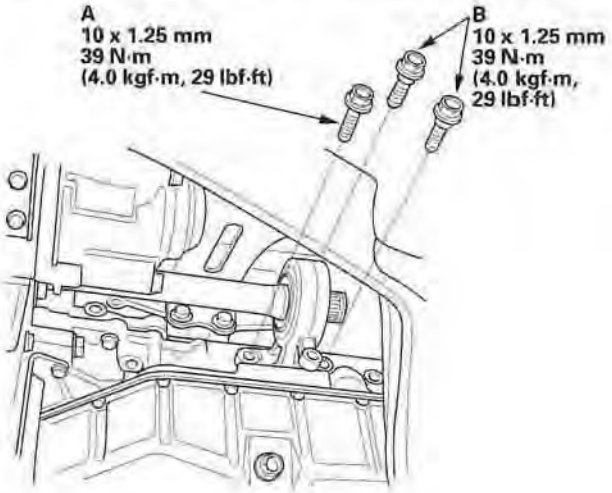


Intermediate Shaft Installation

1. Use solvent or brake cleaner to thoroughly clean the areas where the intermediate shaft (A) contacts the transmission (differential), and dry with compressed air. Insert the intermediate shaft assembly into the differential. Hold the intermediate shaft horizontally to prevent damage to the differential oil seal (B).



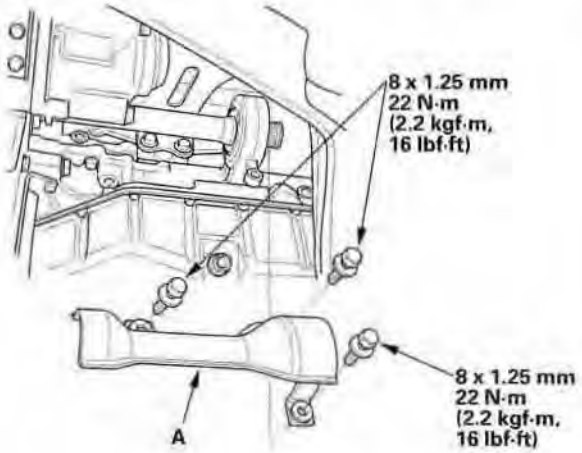
2. Install the flange bolt (A) and two dowel bolts (B).



(cont'd)

Intermediate Shaft Installation (cont'd)

3. Install the heat shield (A), and tighten the three bolts.



4. Install the right driveshaft (see page 16-16).

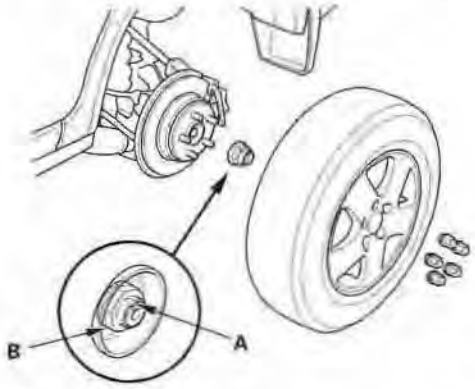
5. Refill the transmission fluid:

   - Manual transmission (see page 13-3)
   - Automatic transmission (see page 14-185)

Rear Driveshaft Removal

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9).

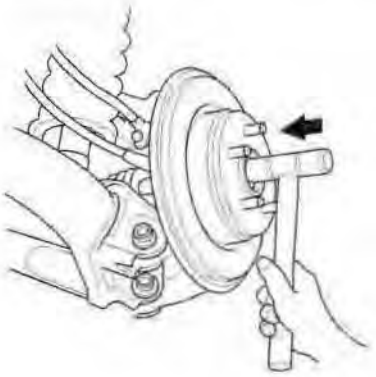
2. Remove the wheel nuts and rear wheels.



3. Lift up the locking tab (A) on the spindle nut (B), then remove the nut.

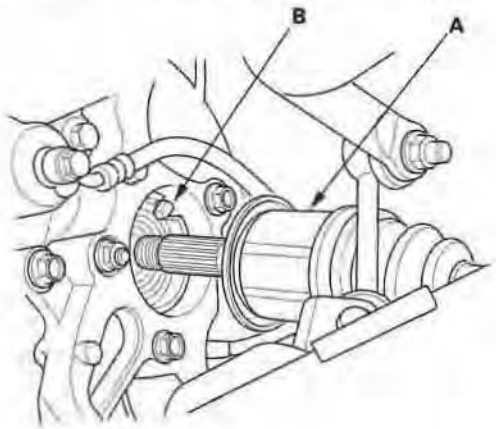
4. Remove the rear driveshafts from the rear differential assembly (see step 9 on page 15-15).

5. Remove the rear driveshaft outboard joint from the trailing arm and rear hub using a plastic hammer or a puller if necessary.



6. Remove the rear driveshaft (A).

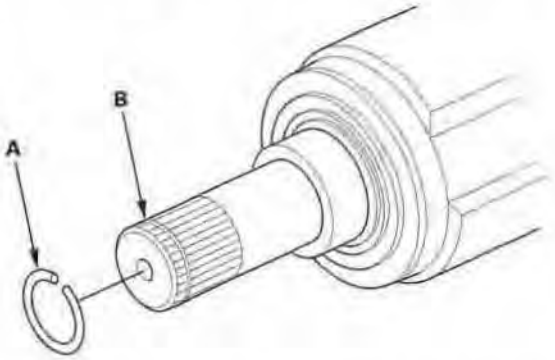
NOTE:
- Be careful not to damage the ABS wheel sensor (B).
- Pull on the outer joint. Do not pull on the driveshaft because the joint may come apart.



Rear Driveshaft Disassembly

NOTE:
- Due to the amount of work required to replace one damaged boot, it is best to replace both boots at the same time.
- These instructions are for the inboard joint. The same procedure applies to the outboard joint.

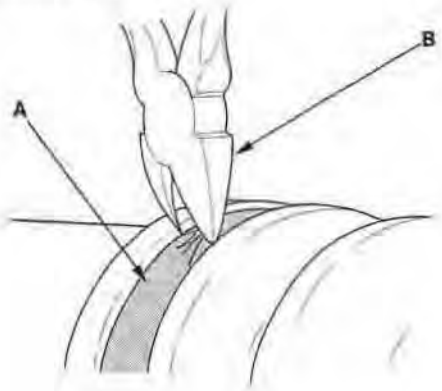
1. Remove the set ring (A) from the inboard joint (B).



2. Remove the boot bands. Be careful not to damage the boot.

- If the boot band is a welded type (A), cut the boot band (B).
- If the boot band is a double loop type (C), lift up the band bend (D), and push it into the clip (E).
- If the boot band is a low profile type (F), pinch the boot band using commercially available boot band pincers (G).

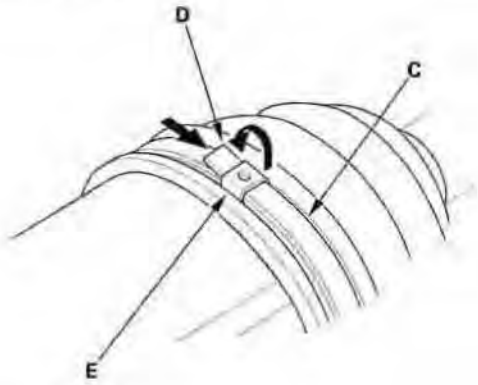
Welded type



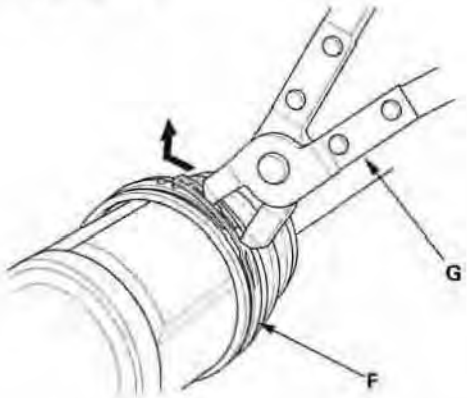
(cont'd)

Rear Driveshaft Disassembly (cont'd)

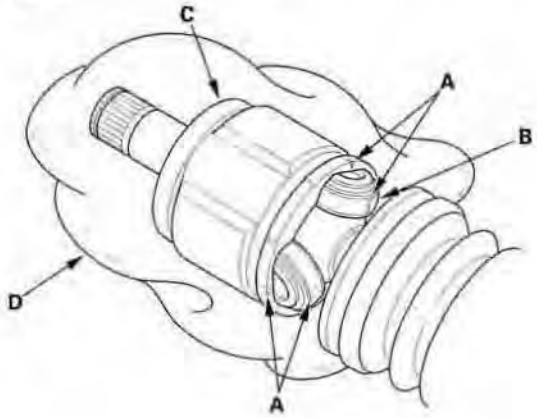
Double loop type



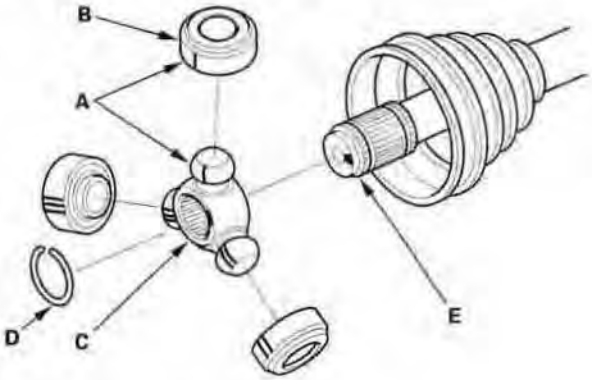
Low profile type



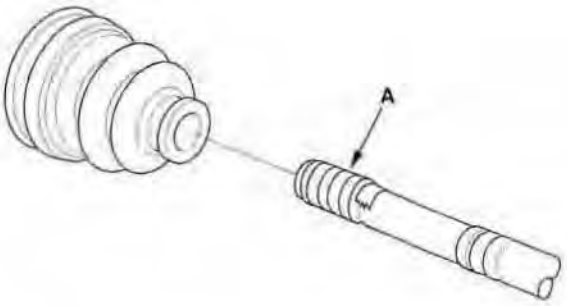
3. Make a mark (A) on each roller (B) and inboard joint (C) to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel (D). Be careful not to drop the rollers when separating them from the inboard joint.



4. Make a mark (A) on the rollers (B) and spider (C) to identify the locations of the rollers on the spider, them remove the rollers.



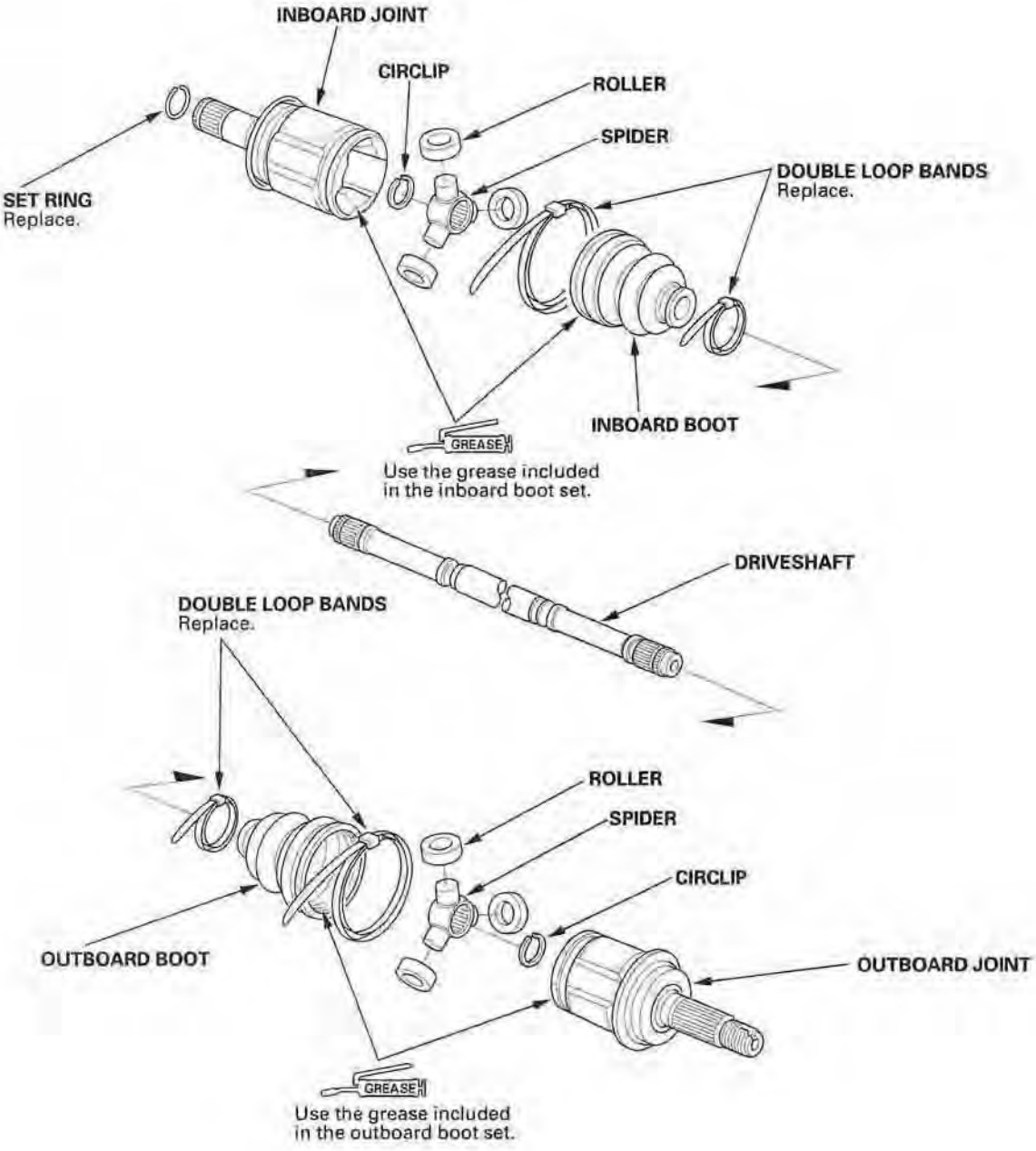
5. Remove the circlip (D).
6. Mark the spider and driveshaft (E) to identify the position of the spider on the shaft.
7. Remove the spider.
8. Wrap the splines on the driveshaft with vinyl tape (A) to prevent damage to the boot.



9. Remove the inboard boot. Be careful not to damage the boot.
10. Remove the vinyl tape.

Rear Driveshaft Reassembly

Exploded View



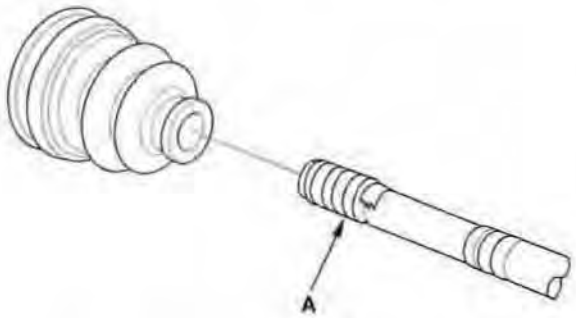
(cont'd)

Rear Driveshaft Reassembly (cont'd)

Special Tools Required
- Boot band tool, KD-3191 or equivalent, commercially available

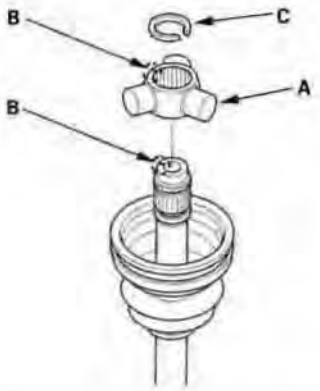
NOTE:
- Refer to the Exploded View as needed during this procedure.
- These instructions are for the inboard joint. The same procedure applies to the outboard joint.

1. Wrap the splines with vinyl tape (A) to prevent damage to the inboard boot.



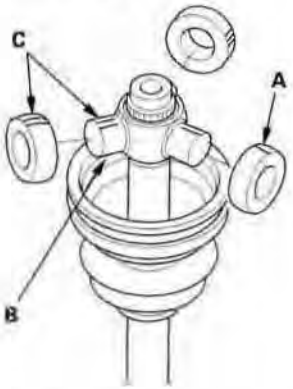
2. Install the inboard boot onto the driveshaft, then remove the vinyl tape. Be careful not to damage the inboard boot.

3. Install the spider (A) onto the driveshaft by aligning the marks (B) on the spider and the end of the driveshaft.



4. Fit the circlip (C) into the driveshaft groove. Always rotate the circlip in its groove to make sure it is fully seated.

5. Fit the rollers (A) onto the spider (B) with their high shoulders facing outward, and note these items:
   - Reinstall the rollers in their original positions on the spider by aligning the marks (C).
   - Hold the driveshaft pointed up to prevent the rollers from falling off.



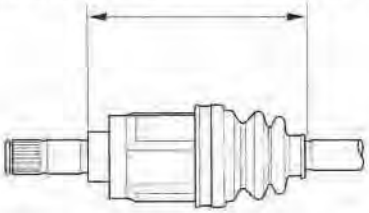
6. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity
Inboard joint: 80—90 g (2.8—3.2 oz)

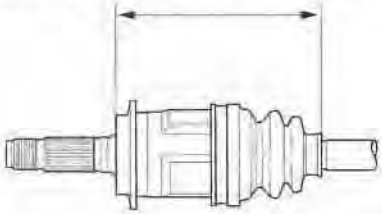
7. Fit the inboard joint onto the driveshaft, and note these items:
   - Reinstall the inboard joint onto the driveshaft by aligning the marks (A) on the inboard joint and the rollers.
   - Hold the driveshaft so the inboard joint points up to prevent it from falling off.

8. Adjust the length of the driveshafts as shown in the figure, then adjust the boots to halfway between full compression and full extension. Make sure the ends of the boots seat in the grooves of the driveshaft and joint.

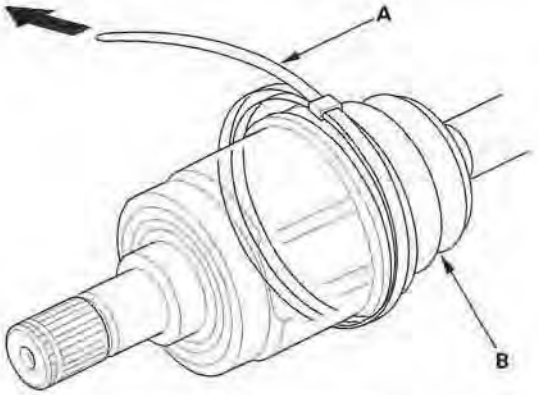
Inboard boot: 153—157 mm (6.02—6.18 in.)



Outboard boot: 143—147 mm (5.63—5.79 in.)

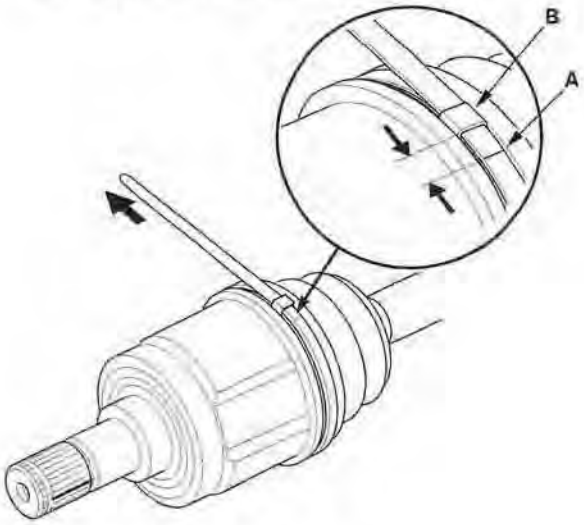


9. Fit the boot ends onto the driveshaft and the inboard joint, then install the new double loop band (A) onto the boot.



10. Pull up the slack in the band by hand.

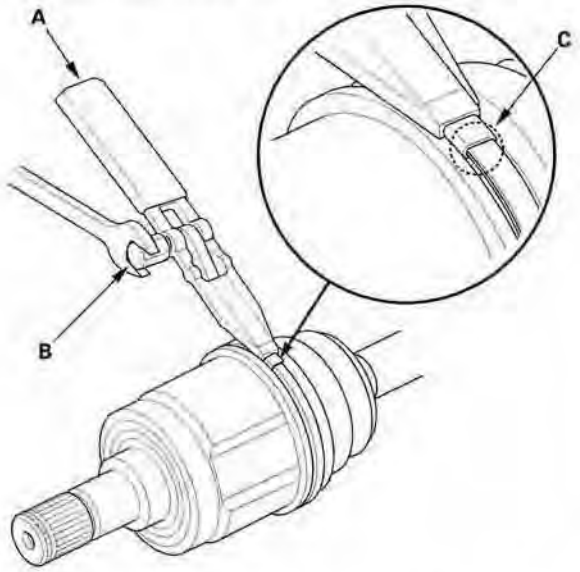
11. Mark a position (A) on the band 10—14 mm (0.4—0.6 in.) from the clip (B).



(cont'd)

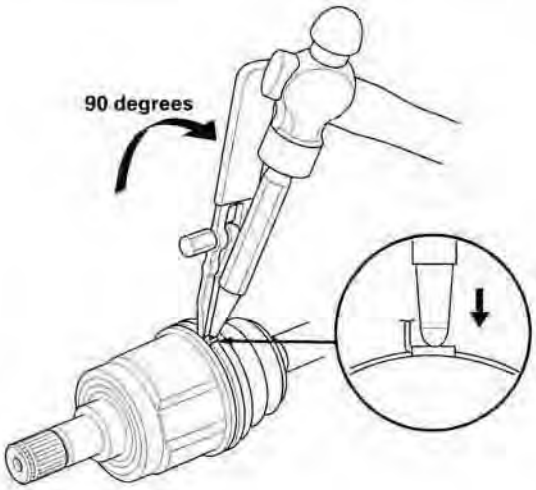
Rear Driveshaft Reassembly (cont'd)

12. Thread the free end of the band through the nose section of the commercially available boot band tool KD-3191 or equivalent (A), and into the slot on the winding mandrel (B).

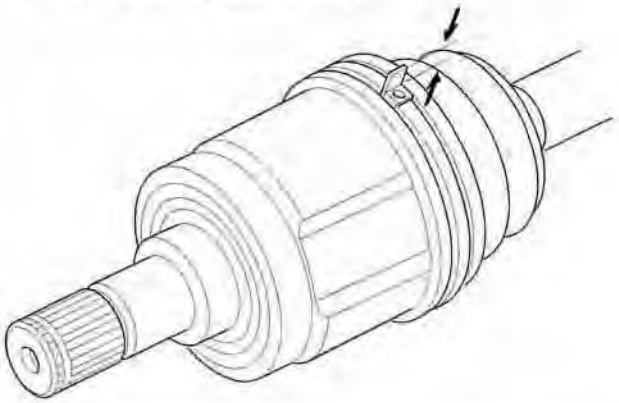


13. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot (C) on the band meets the edge of the clip.

14. Lift up the boot band tool to bend the free end of the band 90 degrees to the clip. Center-punch the clip, then fold over the remaining tail onto the clip.

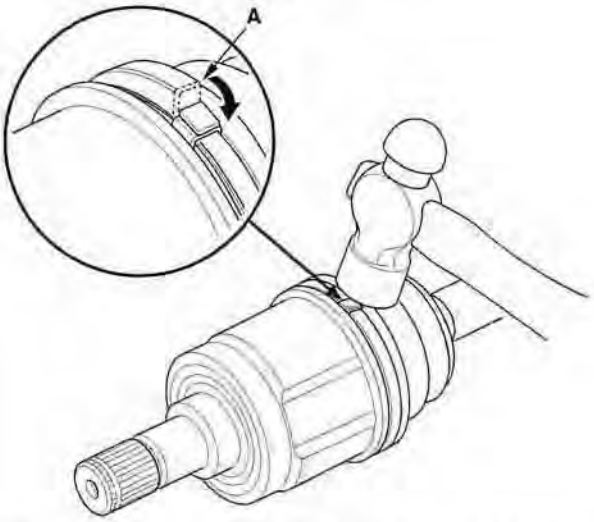


15. Unwind the boot band tool, and cut off the excess free end of the band to leave 5—10 mm (0.2—0.4 in.) tail protruding from the clip.



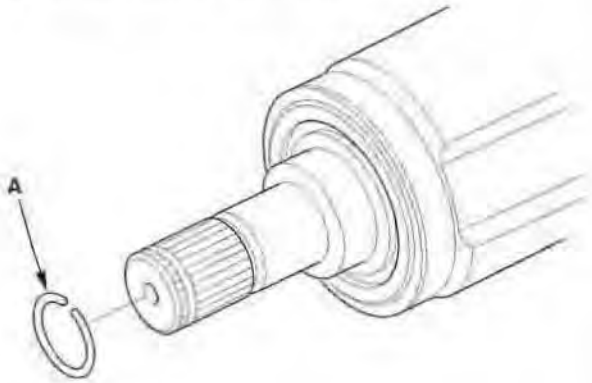
16. Bend the band end (A) by tapping it down with a hammer.

NOTE:
- Make sure the band and clip do not interfere with anything, and the band does not move.
- Remove any grease remaining on the surrounding surfaces.



17. Install the boot band on the other end of the boot, and repeat steps 9 through 16.

18. Install the new set ring (A).

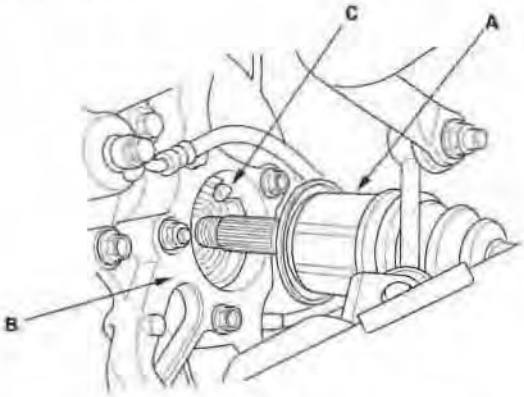


Rear Driveshaft Installation

NOTE: Before starting installation, make sure the mating surfaces of the joint and the splined section are free from dirt or dust.

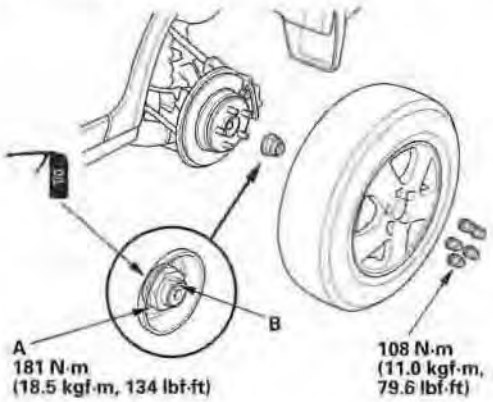
1. Install the outboard joint (A) into the rear hub (B).

   NOTE: Be careful not to damage the ABS wheel sensor (C).



2. Install the rear driveshafts into the rear differential assembly (see step 3 on page 15-25).

3. Apply a small amount of engine oil to the seating surface of the new spindle nut (A).



4. Install a new spindle nut, then torque the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft (B).

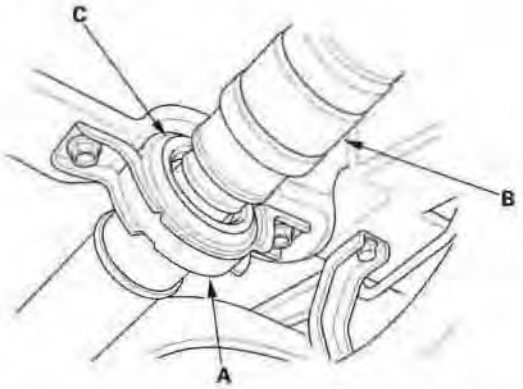
5. Clean the mating surfaces of the brake disc and the wheel, then install the rear wheel and torque the wheel nuts.

6. Turn the rear wheel by hand, and make sure there is no interference between the driveshaft and surrounding parts.

Propeller Shaft Inspection

Universal Joint and Boots

1. Shift the transmission to Neutral.
2. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see page 1-9).
3. Check the center support bearing (A) for excessive play or rattle. If the center support has excessive play or rattle, replace the propeller shaft assembly (B).

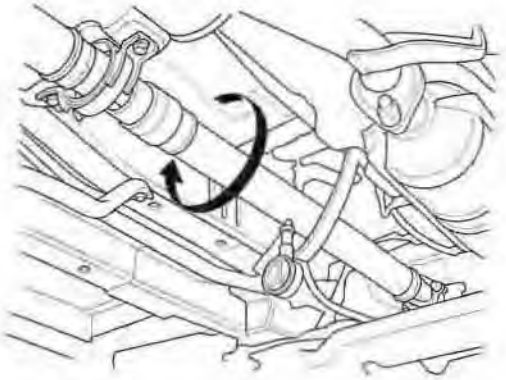


4. Check the universal joint boots (C) for damage and deterioration. If the boots are damaged or deteriorated, replace the propeller shaft assembly.
5. Check the universal joints for excessive play or rattle. If the universal joints have excessive play or rattle, replace the propeller shaft assembly.

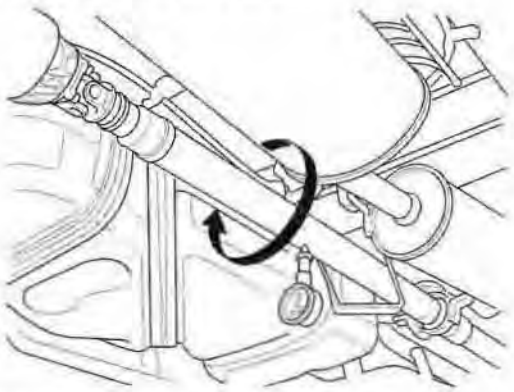
Propeller Shaft Runout

6. Install a dial indicator with its needle on the center of the No. 1 or No. 2 propeller shaft.
7. Turn the other propeller shaft slowly, and check the runout. Repeat this procedure for the other propeller shaft.

No. 1 Propeller Shaft Runout
Service Limit: 1.5 mm (0.06 in.)



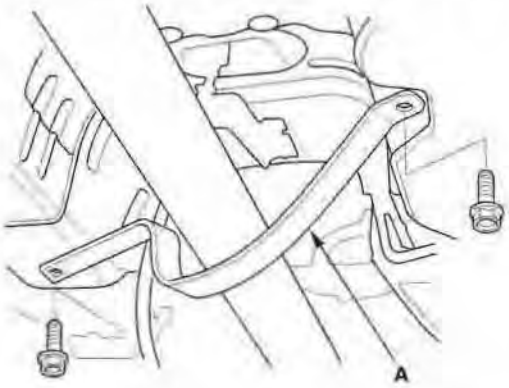
No. 2 Propeller Shaft Runout
Service Limit: 1.5 mm (0.06 in.)



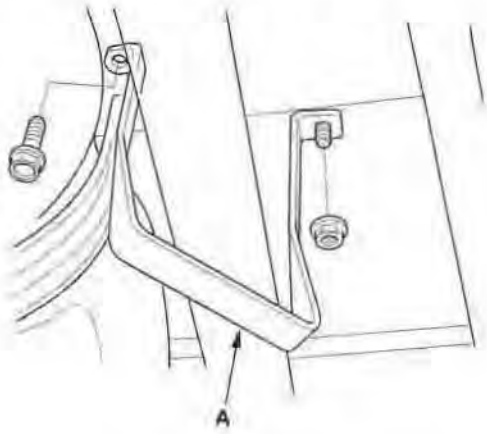
8. If the runout on either propeller shaft exceeds the service limit, replace the propeller shaft assembly.

Propeller Shaft Removal

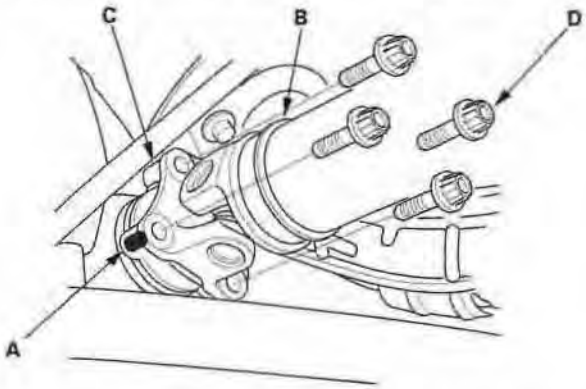
1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see page 1-9).
2. Remove the No. 1 propeller shaft protector (A).



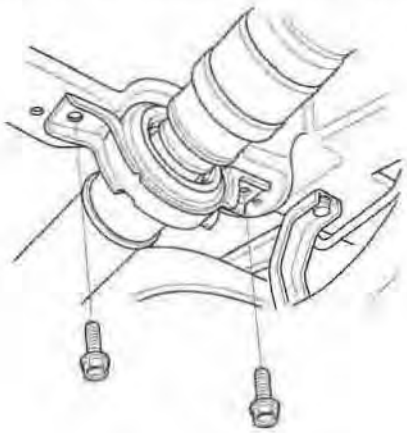
3. Remove the No. 2 propeller shaft protector (A).



4. Make a reference mark (A) across the propeller shaft (B) and transfer companion flange (C).



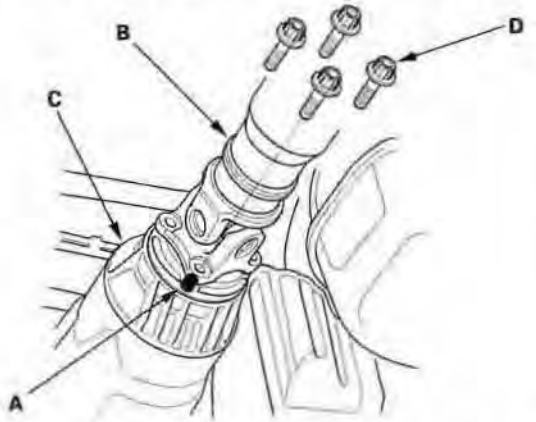
5. Remove and discard the propeller shaft mounting bolts (D), then separate the propeller shaft from the transfer assembly.
6. Remove the center support bearing mounting bolts.



(cont'd)

Propeller Shaft Removal (cont'd)

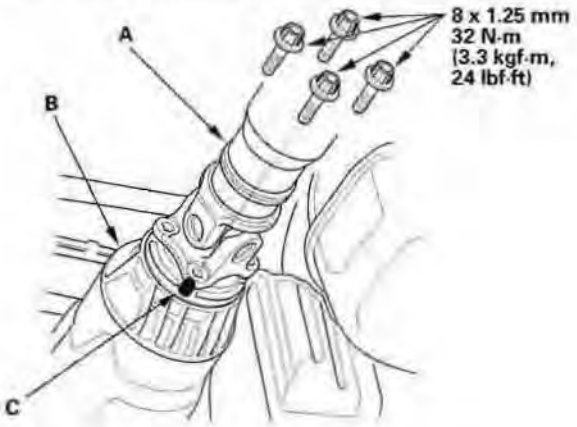
7. Make a reference mark (A) across the propeller shaft (B) and rear differential companion flange (C).



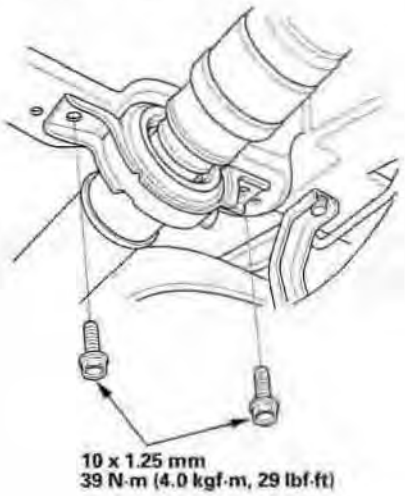
8. Remove and discard the propeller shaft mounting bolts (D). Separate the propeller shaft from the rear differential, then remove the propeller shaft.

Propeller Shaft Installation

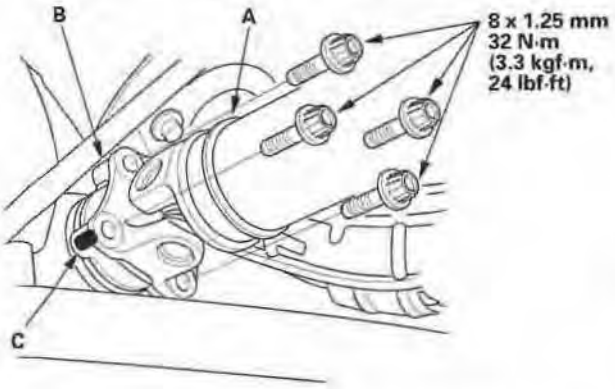
1. Install the propeller shaft (A) onto the rear differential (B) by aligning the reference mark (C), then install new propeller shaft mounting bolts.



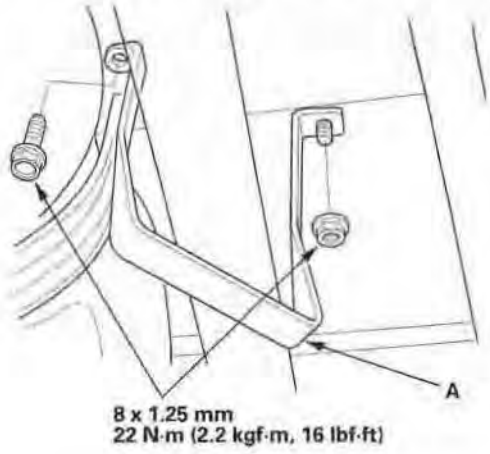
2. Install the center support bearing mounting bolts. Make sure you use new bolts.



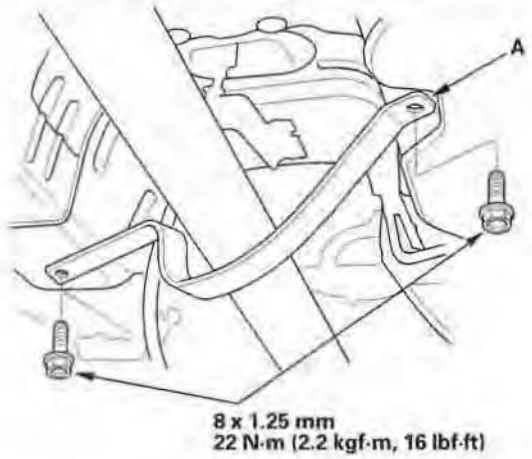
3. Install the propeller shaft (A) onto the transfer assembly (B) by aligning the reference mark (C), then install new propeller shaft mounting bolts.



4. Install the No. 2 propeller shaft protector (A).



5. Install the No. 1 propeller shaft protector (A).



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If steering maintenance is required)

The ELEMENT SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items require special precautions and tools, and should be done only by an authorized Honda dealer.

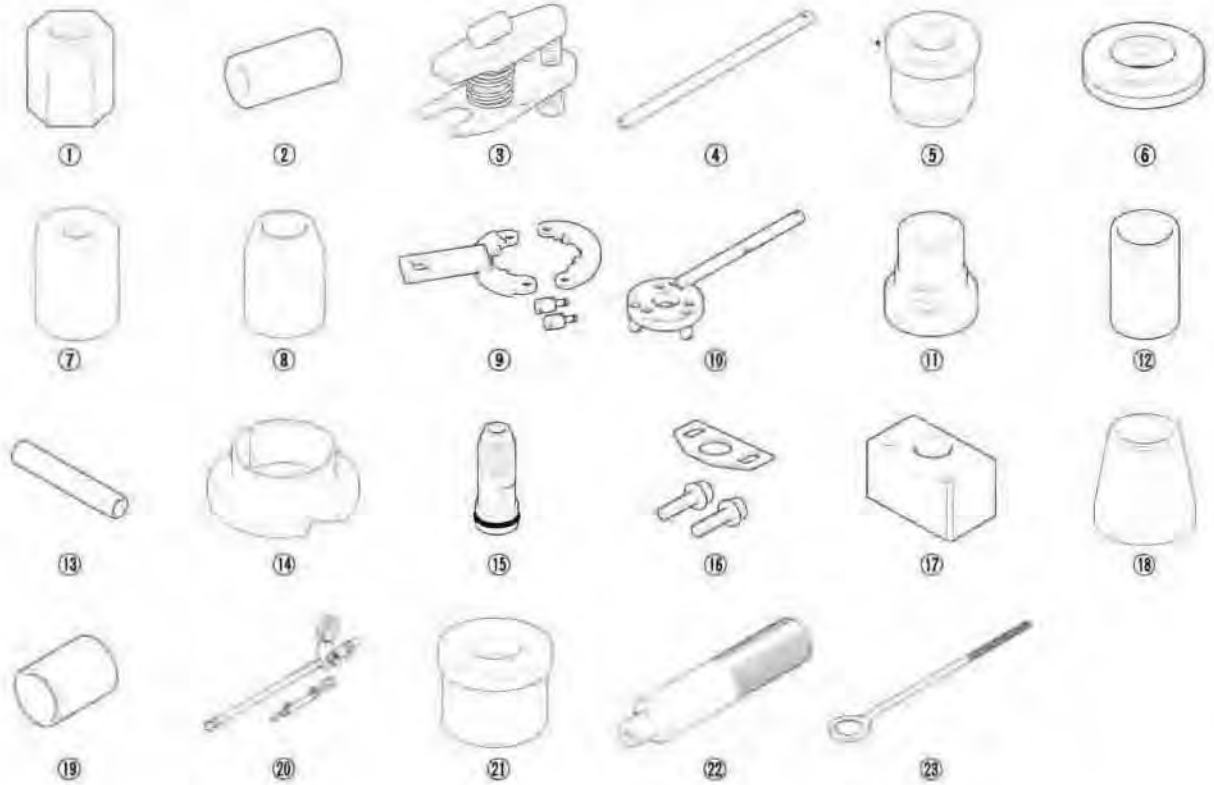
- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors when the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Steering

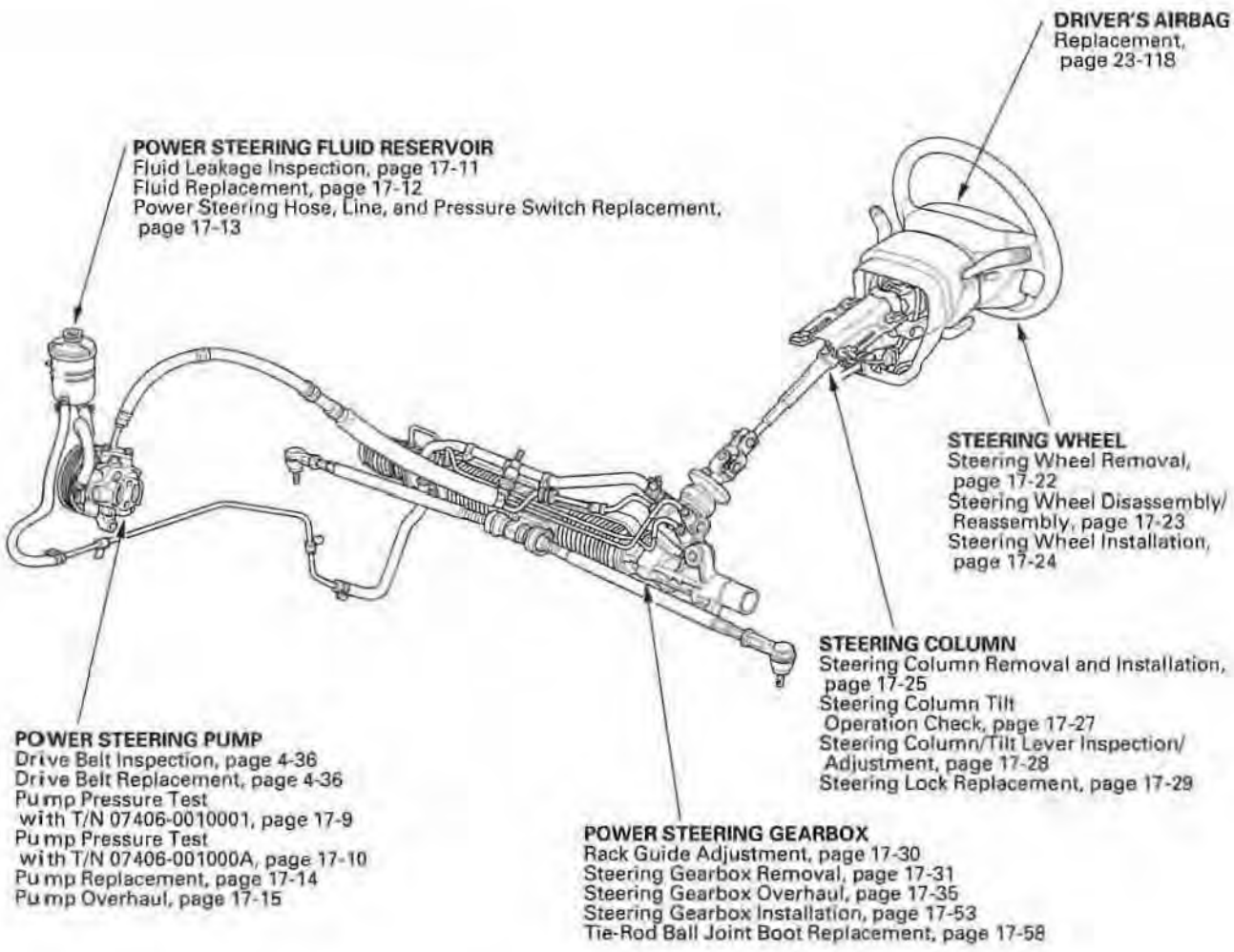
Power Steering

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07AAF-SDAA100	Ball Joint Thread Protector, 12 mm	1
②	07GAF-PH70100	Pilot Collar	1
③	07MAC-SL00200	Ball Joint Remover, 28 mm	1
④	07NAD-SR30101	Driver Handle	1
⑤	07NAD-SR30200 or 07NAD-SR3020A	Cylinder End Seal Remover Attachment	1
⑥	07NAG-SR30900 or 07NAG-SR3090A	Valve Seal Ring Sizing Tool	1
⑦	07QAD-P0A0100	Attachment, 42 mm	1
⑧	07YAG-S2X0100	Sleeve Seal Ring Guide	1
⑨	07ZAA-S5A0100	Locknut Wrench	1
⑩	07ZAB-S5A0100	Pulley Holder	1
⑪	07ZAF-S5A0100	Driver, 27 mm	1
⑫	07ZAG-S5A0100	Sleeve Seal Ring Sizing Tool, 36 mm	1
⑬	07ZAG-S5A0200	Valve Seal Ring Guide	1
⑭	07974-6890801 or 07974-689080A	Cylinder End Seal Slider, 23 mm	1
⑮	07VAK-P8A011A	P/S Joint Adapter (Pump)	1
⑯	07ZAK-S7CA100	P/S Joint Adapter Plate (Pump)	1
⑰	07ZAK-S7C0200	P/S Joint Adapter (Hose)	1
⑱	07ZAG-S7A0100	Piston Seal Ring Guide, 42 mm	1
⑲	07ZAG-S7A0200	Piston Seal Ring Sizing Tool, 42 mm	1
⑳	07406-0010001 or 07406-001000A	P/S Pressure Gauge	1
㉑	07746-0010100	Attachment, 32 x 35 mm	1
㉒	07749-0010000	Driver	1
㉓	07916-SA50001	Locknut Wrench, 40 mm	1



Component Location Index



Symptom Troubleshooting Index

Find the symptom in the chart below, and do the related procedures in the order listed until you find the cause.

Symptom	Procedure(s)	Also check for:
Hard steering	Troubleshoot the system (see page 17-6).	• Modified suspension • Damaged suspension • Tire sizes, tire varieties, and air pressure
Assist (excessively light steering at high speed)	Check the rack guide adjustment (see page 17-30).	• Front wheel alignment (see page 18-5) • Tire size, tire varieties, and air pressure
Shock or vibration when the steering wheel is turned to full lock	1. Check the rack guide adjustment (see page 17-30). 2. Check the drive belt for slippage (see page 4-36). 3. Check the power seering pump fluid pressure with T/N 07406-0010001 (see page 17-9) or T/N 07406-001000A (see page 17-10). 4. Overhaul the steering gearbox (see page 17-35).	
Steering wheel will not return smoothly	1. Check cylinder lines for deformation. 2. Check wheel alignment (see page 18-5). 3. Overhaul the steering gearbox (see page 17-35).	
Uneven or rough steering	1. Check the rack guide adjustment (see page 17-30). 2. Check the drive belt (see page 4-36). 3. Check low or erratic engine idle speed (see page 11-206). 4. Check for air in the power steering system due to low fluid level or an air leak at the pump inlet hose. 5. Check for low fluid level in the power steering reservoir due to possible leaks in the system. 6. Overhaul the steering gearbox (see page 17-35).	
Steering wheel kicks back during wide turns	1. Check the drive belt (see page 4-36). 2. Check the power steering pump fluid pressure with T/N 07406-0010001 (see page 17-9) or T/N 07406-001000A (see page 17-10).	
Humming noise from the power steering system	1. Check when the noise occurs: • If the noise is heard for about 2—3 minutes after starting the engine in cold weather, this is normal. • If the noise is heard when the wheel is turned with the vehicle stopped, this is normal due to the fluid pulsation. 2. Check for the high-pressure hose touching the subframe or body. 3. Check for air bubbles in the power steering fluid. 4. Damaged or kinked power steering line. 5. Plugged power steering reservoir filter (built into reservoir).	Pump pressure

Symptom	Procedure(s)	Also check for:
Power steering rack rattle or chattering	1. Check for loose steering components (tie-rod and ball joints). Tighten or replace as necessary. 2. Check the steering column shaft for wobbling. If the steering column wobbles, replace the steering column assembly (see page 17-25). 3. Check the rack guide adjustment (see page 17-30). 4. Check the power steering pump pulley: • If the pulley is loose, tighten it (see step 47 on page 17-21). • If the pump shaft is loose, replace the pump (see page 17-14).	
Hissing from the power steering system	• Check the fluid level. If low, fill the reservoir to the proper level and check for leaks. • Check the reservoir for leaks. • Check for crushed inlet hose or loose hose clamp allowing air into the suction side of the system. • Check the power steering pump shaft oil seal for leaks.	Air in the P/S fluid
Noise from the power steering pump	• Compare the pump noise at normal operating temperature to another like vehicle (pump noise up to 2—3 minutes after starting the engine in cold weather is normal). • Remove and inspect the pump for wear and damage (see page 17-15).	• P/S pump pressure • Air in the P/S fluid
Squeaking	Check the drive belt (see page 4-36).	
Fluid leaks from the steering gearbox	• Fluid leaks from the top of the valve body unit: Overhaul the steering gearbox (see page 17-35). • Fluid leaks from boot A: Replace the valve oil seal on the pinion shaft. Replace the cylinder end seal on the gearbox side. • Fluid leaks from boot B: Replace the left cylinder end seal. • Fluid leaks from pinion shaft near the lower steering joint bolt: Overhaul the valve body unit.	
Fluid leaks from the power steering line	• Fluid leaks from the cylinder line connections (flare nuts): Tighten the connection and retest. • Fluid leaks from a damaged cylinder lines: Replace the cylinder line. • Fluid leaks from the pump outlet hose or return line fitting on the valve body unit (flare nuts): Tighten the fitting and retest. If it still leaks, replace the hose, the line, or valve body unit as necessary.	
Fluid leaks from the power steering pump	• Fluid leaks from the front oil seal: Replace the front oil seal. • Fluid leaks from the power steering pump housing: Replace the leaking O-rings or seals (see page 17-15), and if necessary replace the power steering pump (see page 17-14).	
Fluid leaks from the power steering reservoir	• Fluid leaks from around the reservoir cap: Fluid level is too high, drain the reservoir to the proper level. • Aerated fluid: Check for an air leak on the inlet side of pump. • Fluid leaks from reservoir: Check for the reservoir for cracks and replace as necessary.	
Fluid leaks from the power steering pump outlet hose (high-pressure)	• Check the fitting for loose bolts. If the bolts are tight, replace the fitting O-ring. • Fluid leaks at the swagged joint: Replace the outlet hose.	
Fluid leaks from the power steering pump inlet hose (low-pressure)	Check the hose for damage, deterioration, or improper assembly. Replace or repair as necessary.	

Symptom Troubleshooting

Hard Steering

1. Check the power assist (see page 17-7).

   Is the starting load more than 29 N (3.0 kgf, 6.6 lbf)?

   YES—Go to step 2.

   NO—Power assist is OK. ■

2. Measure steady-state fluid pressure from the pump at idle with T/N 07406-0010001 (see page 17-9) or T/N 07406-001000A (see page 17-10).

   Is the pressure 1,470 kPa (15.0 kgf/cm², 213 psi) or less?

   YES—Go to step 3.

   NO—Go to step 7.

3. Measure the pump relief pressure at idle with T/N 07406-0010001 (see page 17-9) or T/N 07406-001000A (see page 17-10).

   Is the pressure 7,460 – 8,140 kPa (76 – 83 kgf/cm², 1,080 – 1,180 psi) or less?

   YES—Go to step 4.

   NO—Faulty pump assembly. ■

4. With a spring scale, measure the power assist in both directions, to the left and to the right.

   Are the two measurements within 2.9 N (0.3 kgf, 0.66 lbf) of each other?

   YES—Go to step 5.

   NO—Go to step 8.

5. Measure the fluid pressure with both pressure gauge valves open (if so equipped), while turning the steering wheel fully to the left and fully to the right.

   Is the pressure 7,460 – 8,140 kPa (76 – 83 kgf/cm², 1,080 – 1,180 psi) or less?

   YES—Go to step 6.

   NO—Faulty gearbox. ■

6. Adjust the rack guide (see page 17-30), and retest.

   Is the steering OK?

   YES—Repair is completed. ■

   NO—Faulty gearbox. ■

7. Check the feed and return lines between the pump and the gearbox for clogging and deformation.

   Are the lines clogged or deformed?

   YES—Repair or replace the lines. ■

   NO—Faulty valve body unit. ■

8. Check the cylinder lines for deformation (see page 17-11).

   Are the lines deformed?

   YES—Replace the lines. ■

   NO—Go to step 9.

9. Check for a bent rack shaft or misadjusted rack guide (too tight).

   Is the rack shaft bent or the rack guide adjusted too tight?

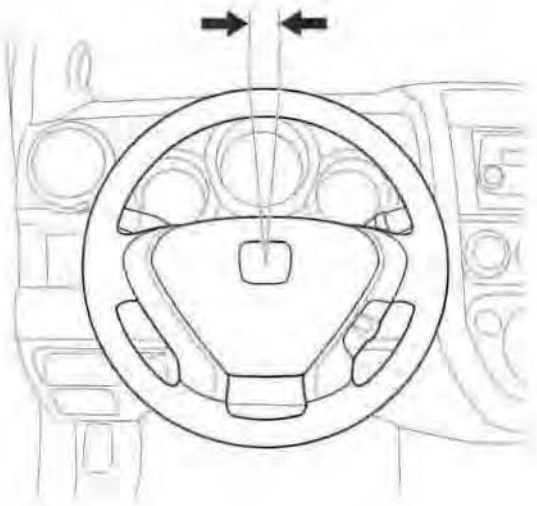
   YES—Replace the rack shaft or readjust the rack guide. ■

   NO—Faulty valve body unit. ■

Steering Wheel Rotational Play Check

1. Turn the front wheels to the straight ahead position.
2. Measure how far you can turn the steering wheel left and right without moving the front wheels.
   - If the play is within the limit, the gearbox and linkages are OK.
   - If the play exceeds the limit, adjust the rack guide (see page 17-30). If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox (see page 17-8).

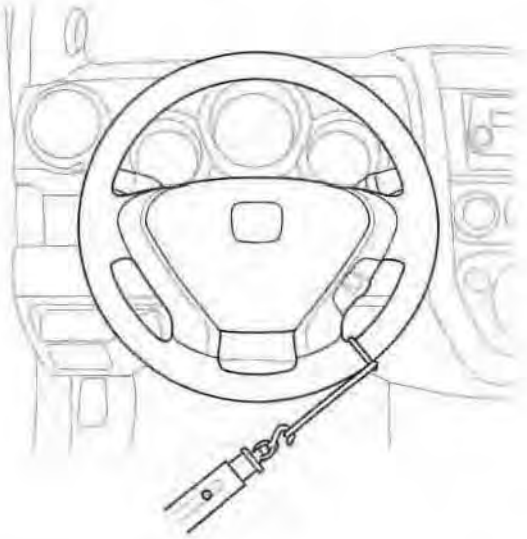
Rotational play: 0—10 mm (0—0.39 in.)



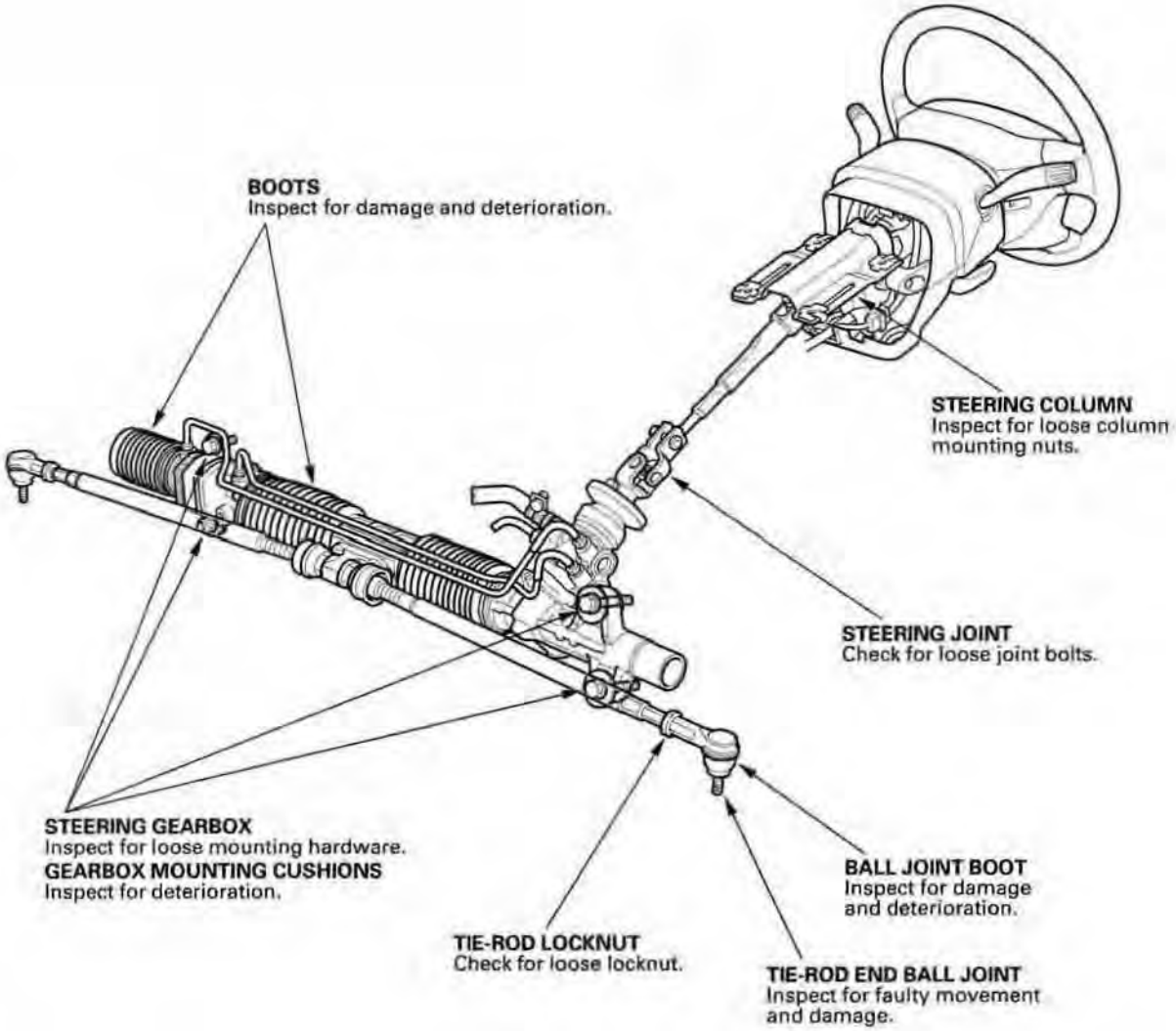
Power Assist Check

1. Check the power steering fluid level (see page 17-12).
2. Start the engine, let it idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a commercially available spring scale to the steering wheel. With the engine idling and the vehicle on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.
   - If the scale reads no more than specifications, the gearbox and pump are OK.
   - If the scale reads more than specifications, troubleshoot the steering system (see page 17-6).

Initial turning load: 29 N (3.0 kgf, 6.6 lbf)



Steering Linkage and Gearbox Inspection



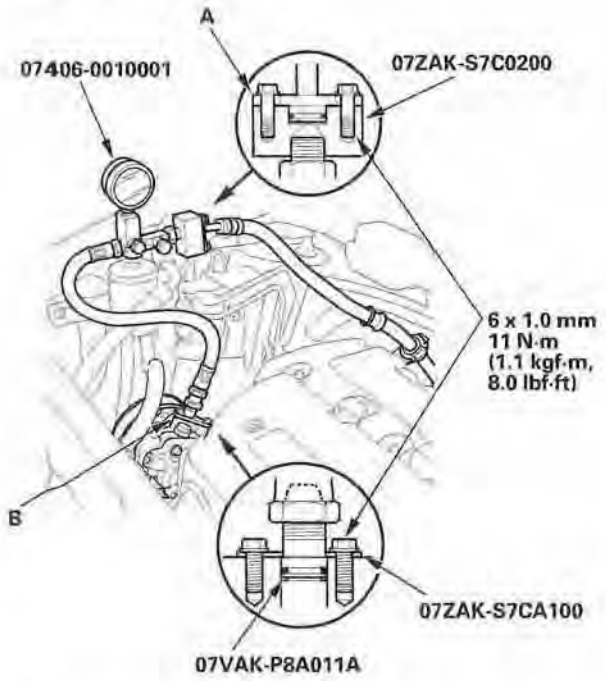
Pump Pressure Test with T/N 07406-0010001

Special Tools Required
- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07ZAK-S7CA100
- P/S joint adapter (hose) 07ZAK-S7C0200
- P/S pressure gauge 07406-0010001

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-12).

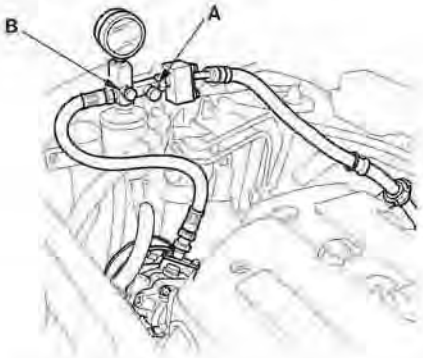
2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the alternator, frame and other parts. Install the P/S joint adapter (pump) on the pump outlet (B).



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose to the P/S joint adapter (hose).

4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Fully open the shut-off valve (A).



6. Fully open the pressure control valve (B).

7. Start the engine, and let it idle.

8. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature at 158 °F (70 °C).

9. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the pressure should be no more than 1,470 kPa (15.0 kgf/cm², 213 psi). If the pressure is too high, check the outlet hose or valve body unit (see Steering System Troubleshooting).
   Raise the engine speed to 3,000 rpm, and measure the fluid pressure. If the pump is in good condition, the pressure should be at least 1,470 kPa (15.0 kgf/cm², 213 psi). If the pressure is too high, repair or replace the pump.

10. Lower the engine speed and let it idle. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.

    NOTICE
    Do not keep the shut-off valve closed more than 5 seconds, or the pump could be damaged by over-heating.

11. Immediately open the shut-off valve fully. If the pump is in good condition, the gauge should read at least this specification:

    7,460—8,140 kPa (76—83 kgf/cm², 1,080—1,180 psi)

    A low reading means pump output is too low for full assist. Repair or replace the pump.

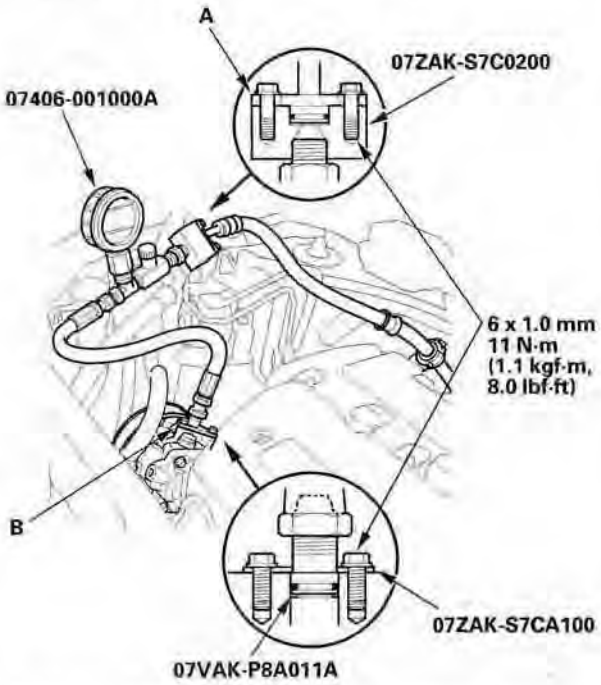
Pump Pressure Test with T/N 07406-001000A

Special Tools Required
- P/S joint adapter (pump) 07VAK-P8A011A
- P/S joint adapter plate (pump) 07ZAK-S7CA100
- P/S joint adapter (hose) 07ZAK-S7C0200
- P/S pressure gauge 07406-001000A

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

1. Check the power steering fluid level (see page 17-12).

2. Disconnect the pump outlet hose (A) from the pump outlet with care so as not to spill the power steering fluid on the alternator, frame and other parts. Install the P/S joint adapter (pump) on the pump outlet (B).



3. Connect the P/S joint adapter (hose) to the P/S pressure gauge, then connect the pump outlet hose to the P/S joint adapter (hose).

4. Install the P/S pressure gauge to the P/S joint adapter (pump).

5. Open the pressure control valve (A) fully.

6. Start the engine, and let it idle.

7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature at 158 °F (70 °C).

8. Measure steady-state fluid pressure while the engine is idling. If the pump is in good condition, the pressure should be no more than 1,470 kPa (15.0 kgf/cm², 213 psi). If the pressure is too high, check the outlet hose or valve body unit (see Steering System Troubleshooting).
   Raise the engine speed to 3,000 rpm, and measure the fluid pressure. If the pump is in good condition, the pressure should be at least 1,470 kPa (15.0 kgf/cm², 213 psi). If the pressure is too high, repair or replace the pump.

9. Lower the engine speed and let it idle. Close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.

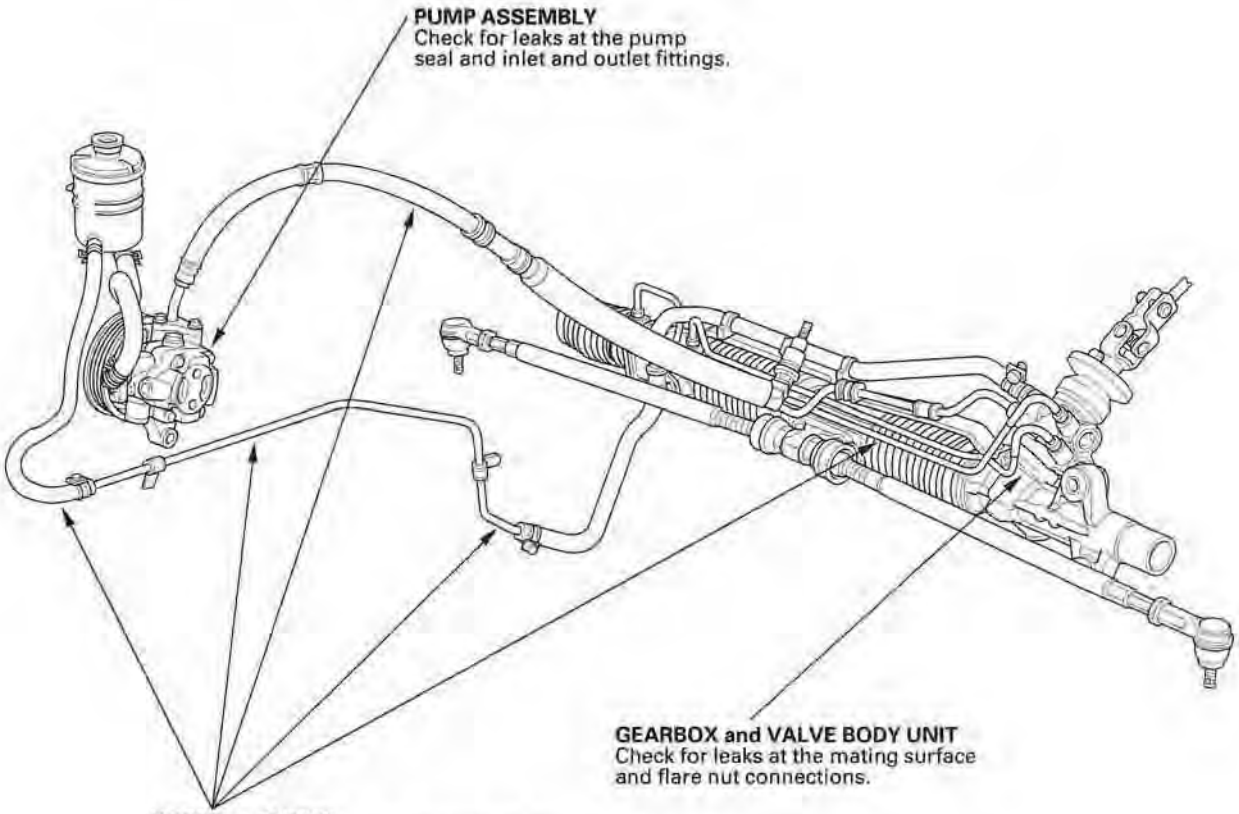
   NOTICE
   Do not keep the shut-off valve closed more than 5 seconds, or the pump could be damaged by over-heating.

10. Immediately open the shut-off valve fully. If the pump is in good condition, the gauge should read at least this specification:

    7,460—8,140 kPa (76—83 kgf/cm², 1,080—1,180 psi)

    A low reading means pump output is too low for full assist. Repair or replace the pump.

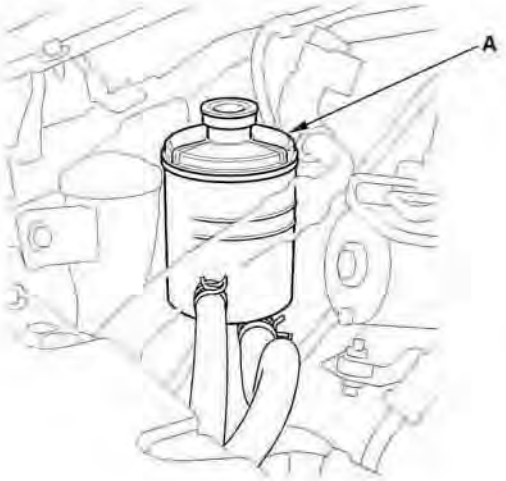
Fluid Leakage Inspection



Fluid Replacement

Check the reservoir (A) at regular intervals, and add the recommended fluid as necessary. Always use Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

SYSTEM CAPACITY:
0.83 L (0.87 US. qt) at disassembly
RESERVOIR CAPACITY:
0.27 L (0.28 US. qt)



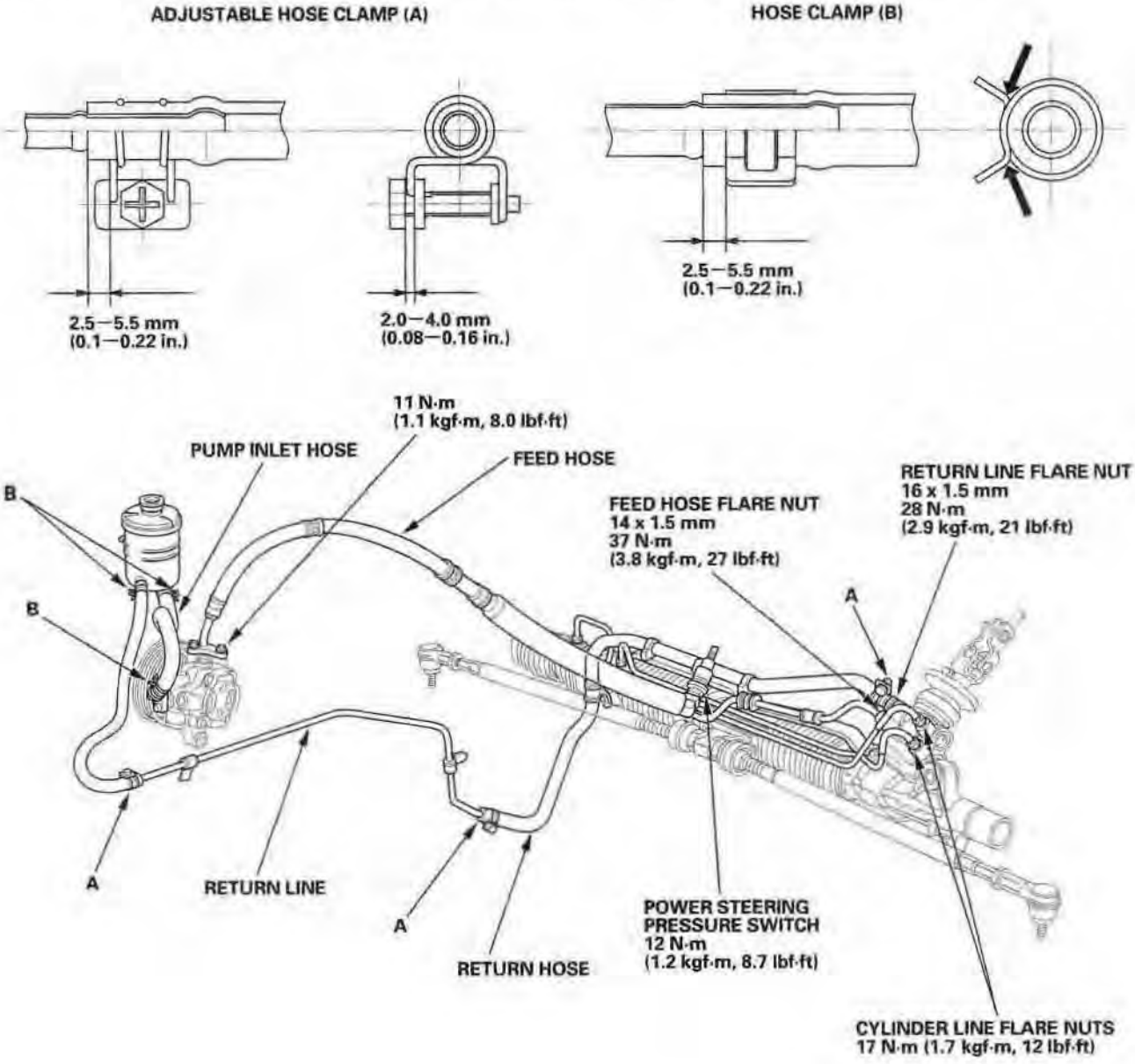
1. Raise the reservoir, then disconnect the return hose (A) to drain the reservoir. Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.

2. Connect a hose (B) of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.
3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut-off the engine. Discard the fluid.
4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line (C).
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add more if necessary. Do not fill the reservoir beyond the upper level line.

Power Steering Hose, Line, and Pressure Switch Replacement

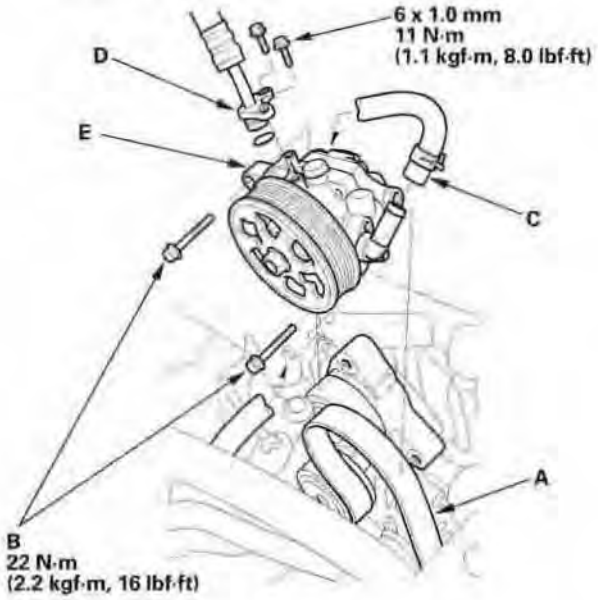
Note these items during installation:

- Connect each hose to the corresponding line securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Check all clamps for deterioration or deformation; replace with new clamps.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.



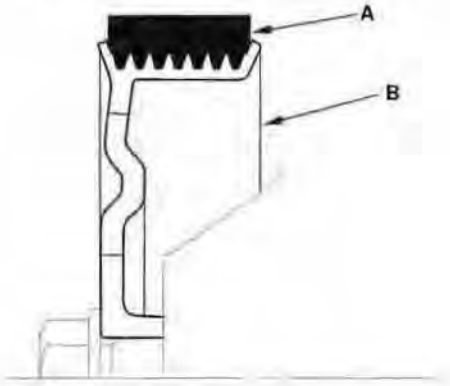
Pump Replacement

1. Place a suitable container under the vehicle.
2. Drain the power steering fluid from the reservoir.
3. Remove the drive belt (A) from the pump pulley (see page 4-36).



4. Remove the pump mounting bolts (B).
5. Cover the auto-tensioner, alternator, and A/C compressor with several shop towels to protect them from spilled power steering fluid. Disconnect the pump inlet hose (C) and pump outlet hose (D) from the pump (E), and plug them. Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once. Do not turn the steering wheel with the pump removed.
6. Cover the opening of the pump with a piece of tape to prevent foreign material from entering the pump.
7. Connect the pump inlet hose and pump outlet hose.
8. Loosely install the pump in the pump bracket with the mounting bolts, then tighten the pump fittings securely.
9. Install the drive belt (A).

   Note these items during belt installation:
   - Make sure that the belt is properly positioned on the pulleys (B).
   - Do not get power steering fluid or grease on the auto-tensioner, alternator, A/C compressor, and drive belt or pulley faces. Clean off any fluid or grease before installation.

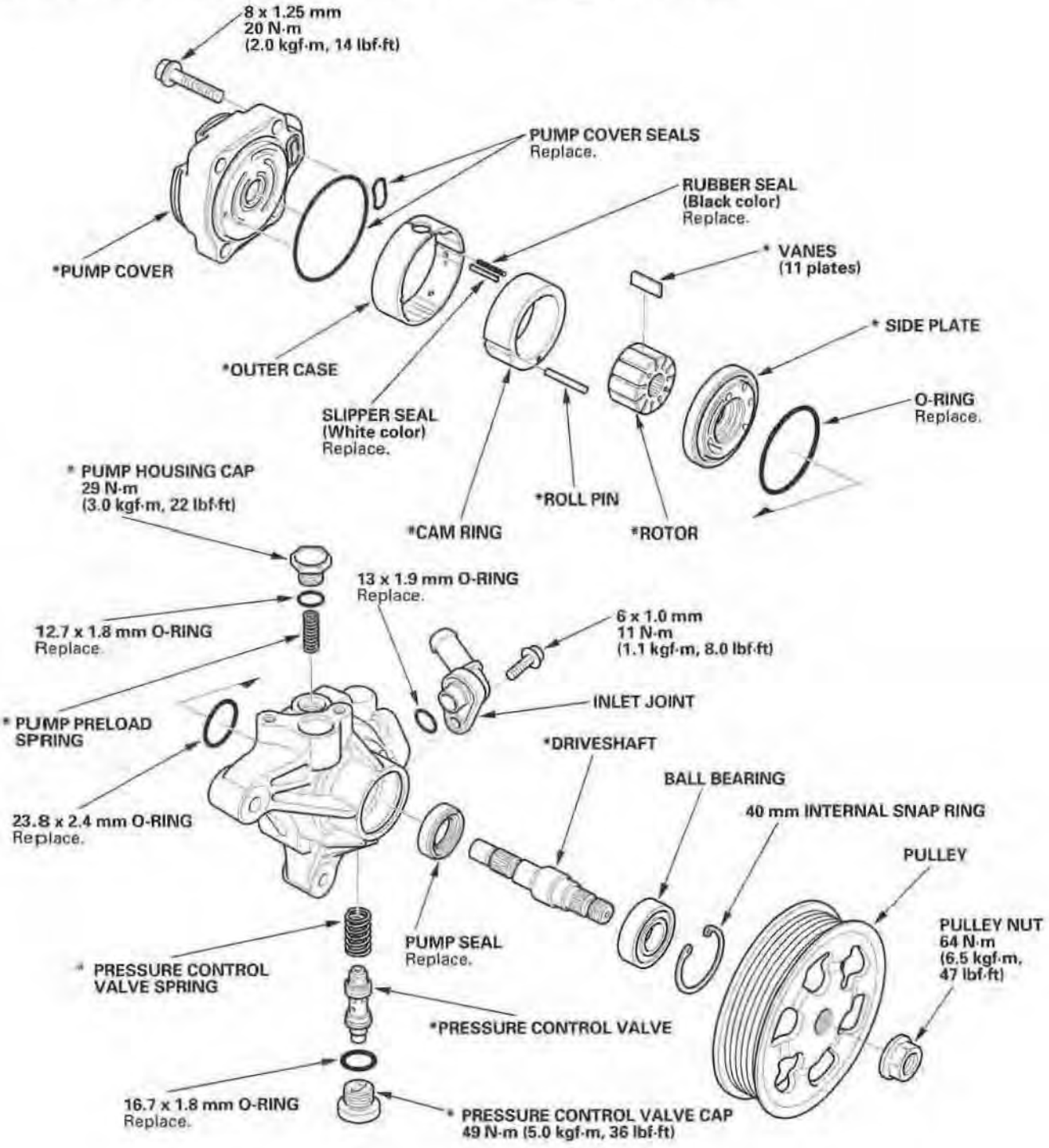


10. Tighten the pump mounting bolts to the specified torque.
11. Fill the reservoir to the upper level line (see page 17-12).

Pump Overhaul

Exploded View

Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.



(cont'd)

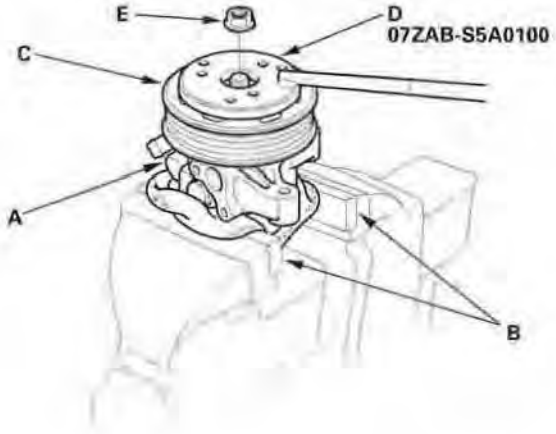
Pump Overhaul (cont'd)

Special Tools Required
- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Pulley holder 07ZAB-S5A0100

Disassembly

NOTE: Refer to the Exploded View as needed during the following procedure.

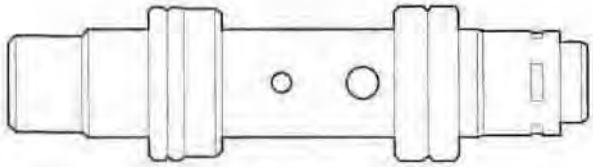
1. Drain the fluid from the pump (see page 17-12).
2. Remove the power steering pump (see page 17-14).
3. Hold the steering pump (A) in a vise with soft jaws (B), hold the pulley (C) with the special tool (D), and remove the pulley nut (E) and pulley. Be careful not to damage the pump housing with the jaws of the vise.



4. Remove the inlet joint and O-ring.
5. Remove the pressure control valve cap, O-ring, valve spring, and pressure control valve.
6. Remove the pump housing cap, O-ring, and pump preload spring.
7. Remove the pump cover and pump cover seals.
8. Pull out the roll pin.
9. Remove the outer case, cam ring, rotor, vanes, and side plate.
10. Remove the rubber seal and slipper seal from the outer case.
11. Remove the O-rings from the bottom of the housing.
12. Remove the 40 mm internal snap ring, then remove the driveshaft by tapping the shaft end with the plastic hammer.
13. Remove the seal from the pump housing.

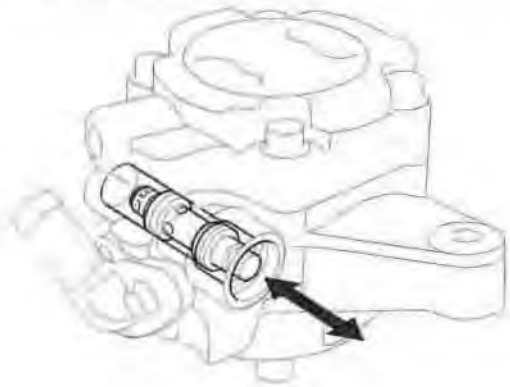
Inspection

14. Check the pressure control valve for wear, burrs, and other damage to the edges of the grooves in the valve.



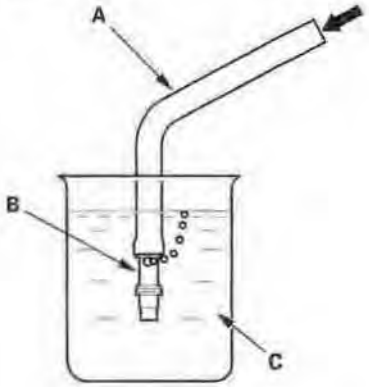
15. Inspect the bore of the pressure control valve on the pump housing for scratches and wear.

16. Slip the pressure control valve back in the pump housing, and check that it moves in and out smoothly. If OK, go to step 17; if not, replace the pump as an assembly. The pressure control valve is not available separately.

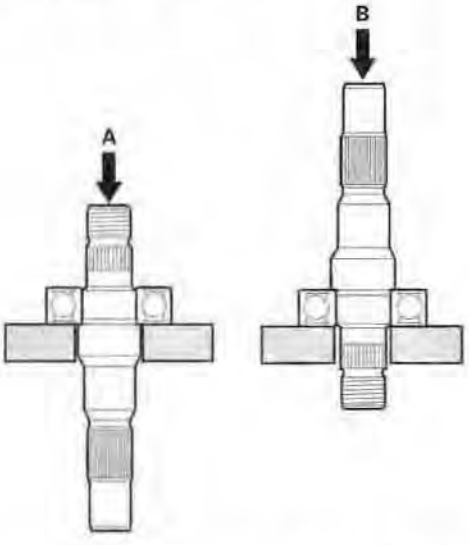


17. Attach a hose (A) to the end of the pressure control valve (B) as shown. Then submerge the pressure control valve in a container of power steering fluid or solvent (C), and blow in the hose.

    - If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm², 14.2 psi), replace the pump as an assembly. The pressure control valve is not available separately.
    - If the pressure control valve is OK, set it aside for reassembly later.



18. Inspect the ball bearing by rotating the outer race slowly. If you feel any play (axial or radial) or roughness, remove the faulty ball bearing (A), and install a new one (B).



19. Inspect each part shown with an asterisk in the Exploded View; if any of them are worn or damaged, replace the pump as an assembly.

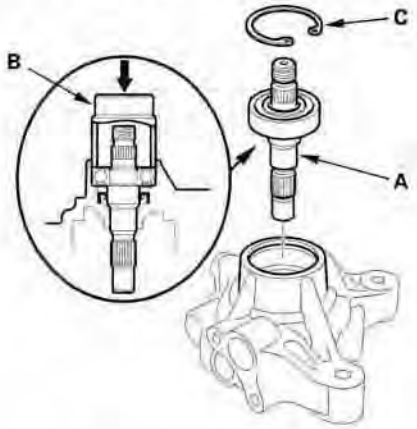
(cont'd)

Pump Overhaul (cont'd)

Reassembly

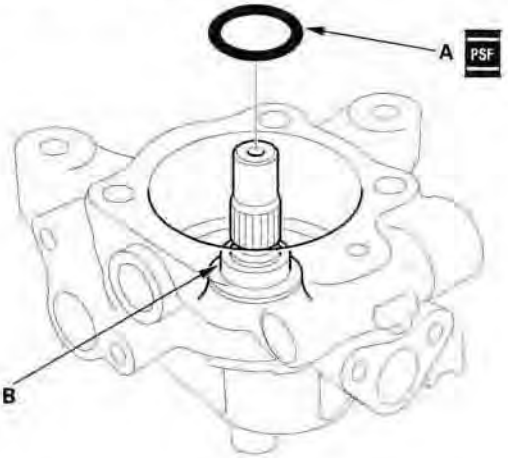
20. Install the new pump seal (A) (with its grooved side facing in) into the pump housing (B) by hand first, then drive it in using the special tools until there is no step at the top of the pump seal, and the seal is fully seated in the pump housing.

21. Position the pump driveshaft (A) in the pump housing, then press it in with the appropriate size socket wrench (B) as shown. Do not apply more than 1,370 N (140 kgf, 308 lbf) of pressure.

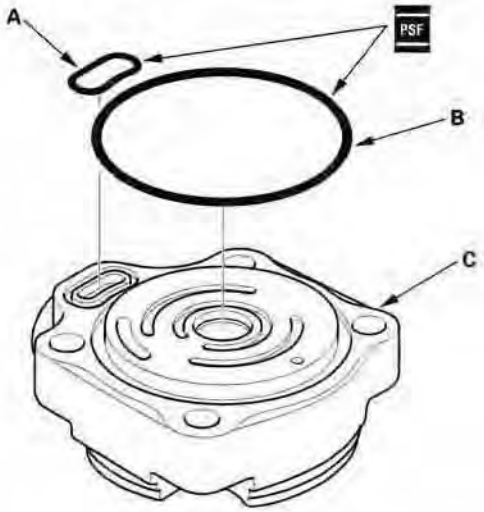


22. Install the 40 mm internal snap ring (C) with its radiused edge facing out.

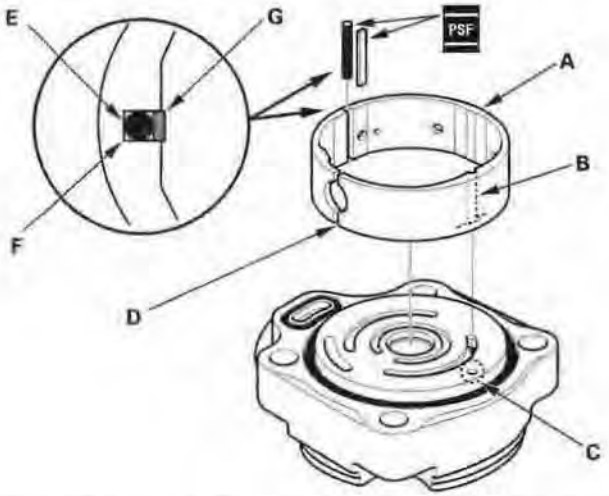
23. Coat the new 23.8 mm O-ring (A) with power steering fluid, then position it on the bottom (B) of the pump housing.



24. Coat the new cover seals (A) and (B) with power steering fluid, then position them into the grooves on the cover (C).



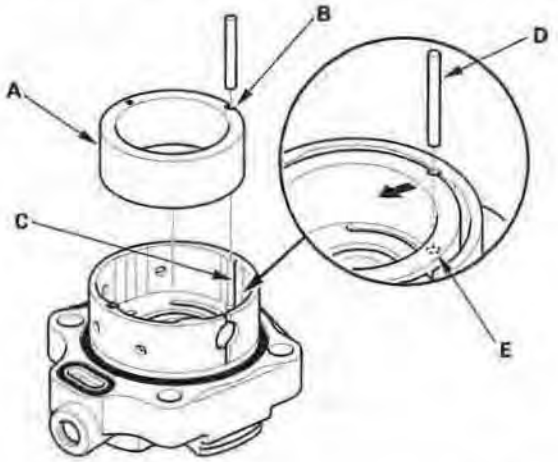
25. Install the outer case (A) by aligning the slot (B) inside the outer case with the cover roll pin hole (C). Be sure that the slit (D) on the outer case is in the direction shown.



26. Apply power steering fluid to the rubber seal (E) (black), and install it in the slot (F) of the outer case.

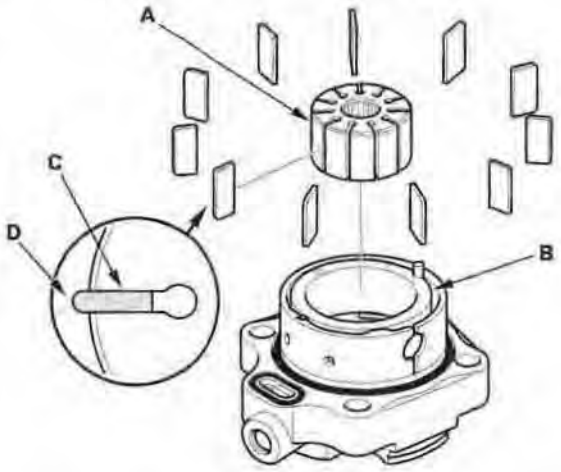
27. Apply power steering fluid to the slipper seal (G) (white), and install it on top of the rubber seal you just installed.

28. Install the cam ring (A) by aligning the slot (B) with the slot (C) in the outer case.



29. Insert the roll pin (D) into the slots between the cam ring and outer case, then push the roll pin into the set hole (E).

30. Install the rotor (A) in the cam ring (B).

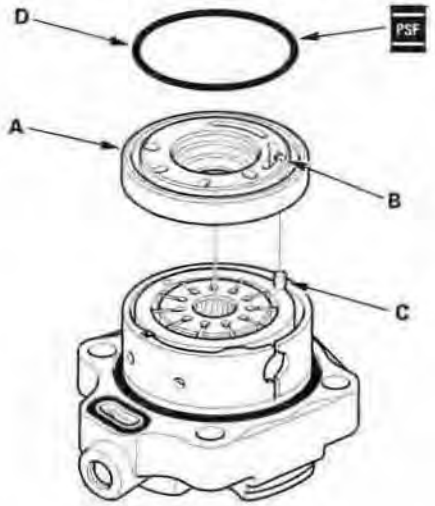


31. Set the 11 vanes (C) in the grooves in the rotor. Make sure that the round ends (D) of the vanes are in contact with the sliding surface of the cam ring.

(cont'd)

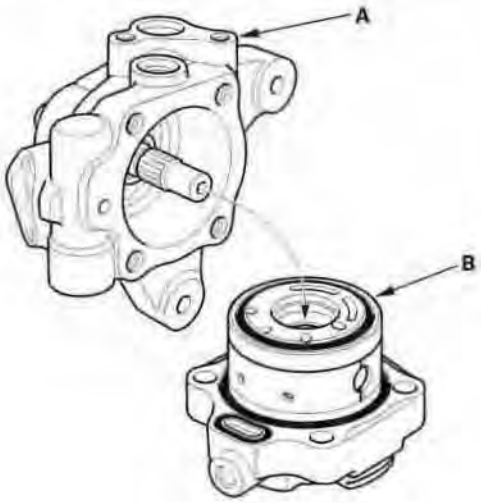
Pump Overhaul (cont'd)

32. Place the side plate (A) on the cam ring, and align the roll pin set hole (B) with the roll pin (C).

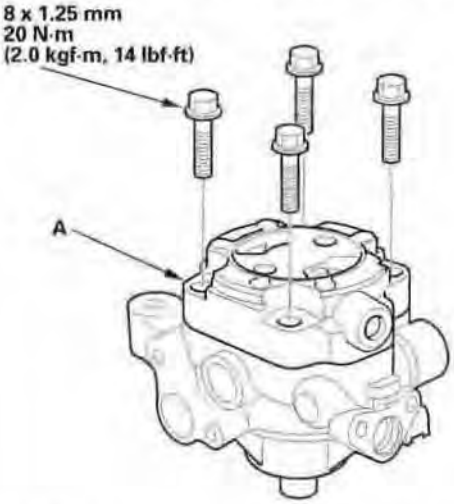


33. Coat the new O-ring (D) with power steering fluid, then position it into the groove on the side plate.

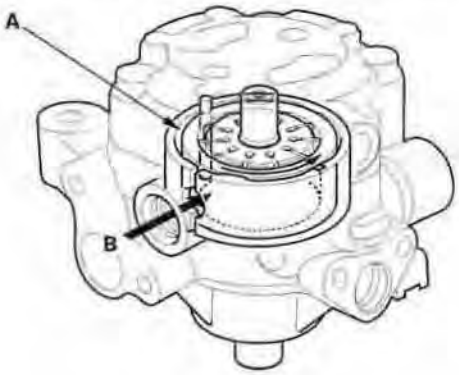
34. Install the pump housing (A) over the cover assembly (B).



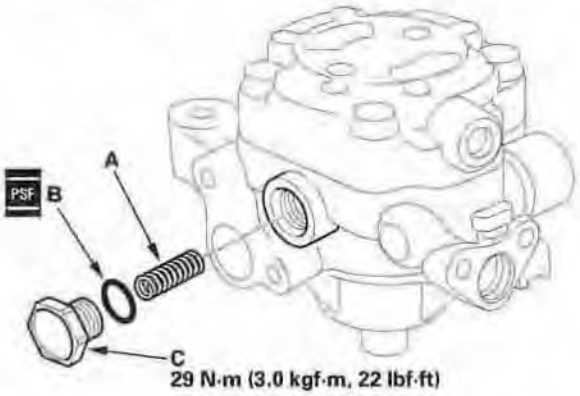
35. Align the bolt holes in the cover (A) with the threaded holes in the pump housing. Install the flange bolts loosely first, then torque the flange bolts in a criss-cross pattern in two or more steps.



36. Push in the cam ring (A) from the pump housing cap hole (B) with a flat-tip screwdriver to make sure the cam ring is fully seated against the outer case.



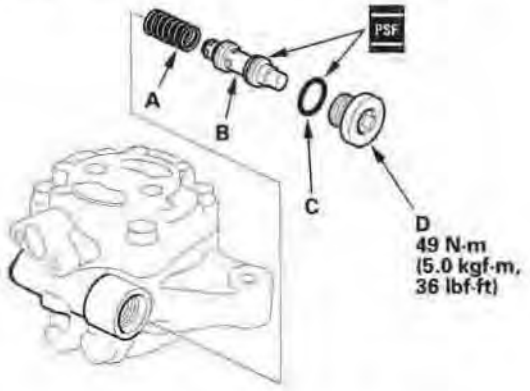
37. Install the pump preload spring (A) in the pump housing.



38. Coat the new 12.7 mm O-ring (B) with power steering fluid, and install it on the pump housing cap (C).

39. Install the pump housing cap on the pump housing, and tighten it to the specified torque.

40. Install the pressure control valve spring (A) in the pump housing.

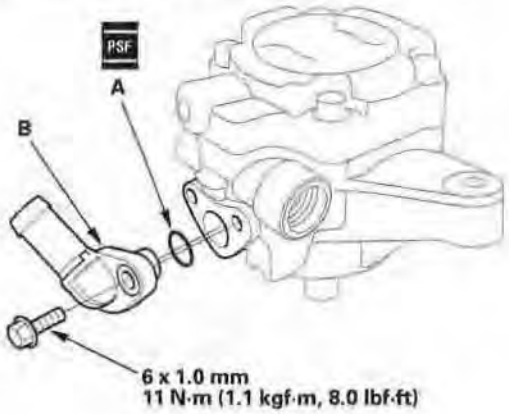


41. Coat the pressure control valve (B) with power steering fluid, and install it in the pump housing.

42. Coat the new 16.7 mm O-ring (C) with power steering fluid, and install it on the pressure control valve cap (D).

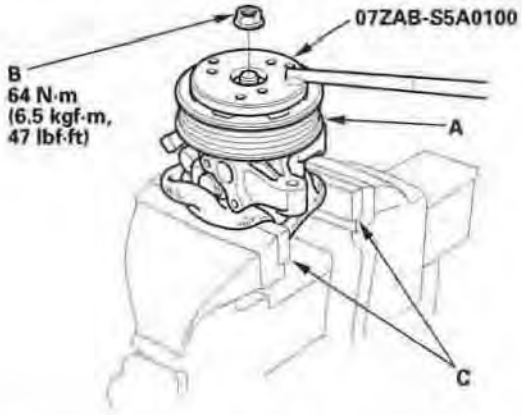
43. Install the pressure control valve cap on the pump housing, and tighten it to the specified torque.

44. Coat the new O-ring (A) with power steering fluid, and install it on the inlet joint (B).



45. Install the inlet joint on the pump housing.

46. Install the pulley (A), then loosely install the pulley nut (B). Hold the steering pump in a vise with soft jaws (C). Be careful not to damage the pump housing with the jaws of the vise.



47. Hold the pulley with the special tool, and tighten the pulley nut to the specified torque.

48. Check that the pump turns smoothly by turning the pulley. If it turns hard, loosen the four flange bolts on the cover, then retighten them as in step 35, and check the pump again.

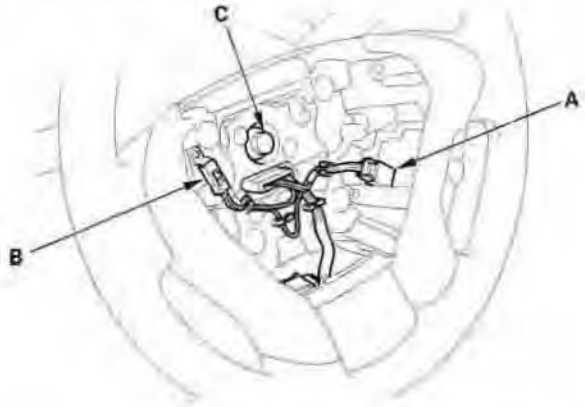
Steering Wheel Removal

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

1. Make sure you have the anti-theft codes for the audio, then write down the customer's radio and XM presets.

2. Align the front wheels straight ahead, then remove the driver's airbag from the steering wheel (see page 23-118).

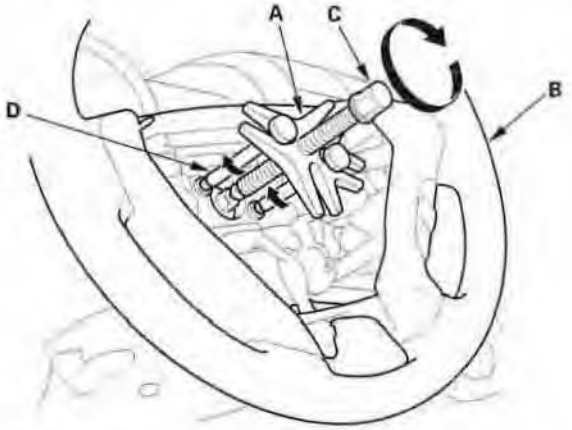
3. Disconnect the cruise control Set/decel, Resume/accel, Cancel switch connector (A) and horn switch connector (B).



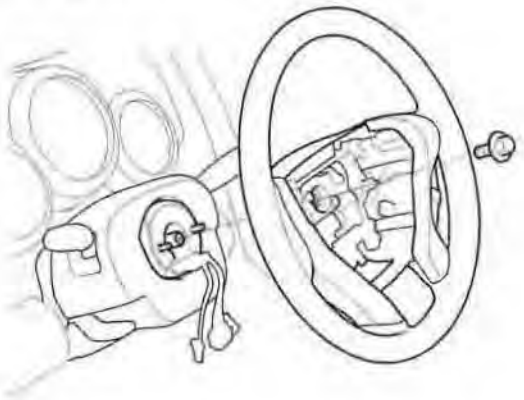
4. Loosen the steering wheel bolt (C).

5. Install a commercially available steering wheel puller (A) on the steering wheel (B). Free the steering wheel from the steering column shaft by turning the pressure bolt (C) of the puller.

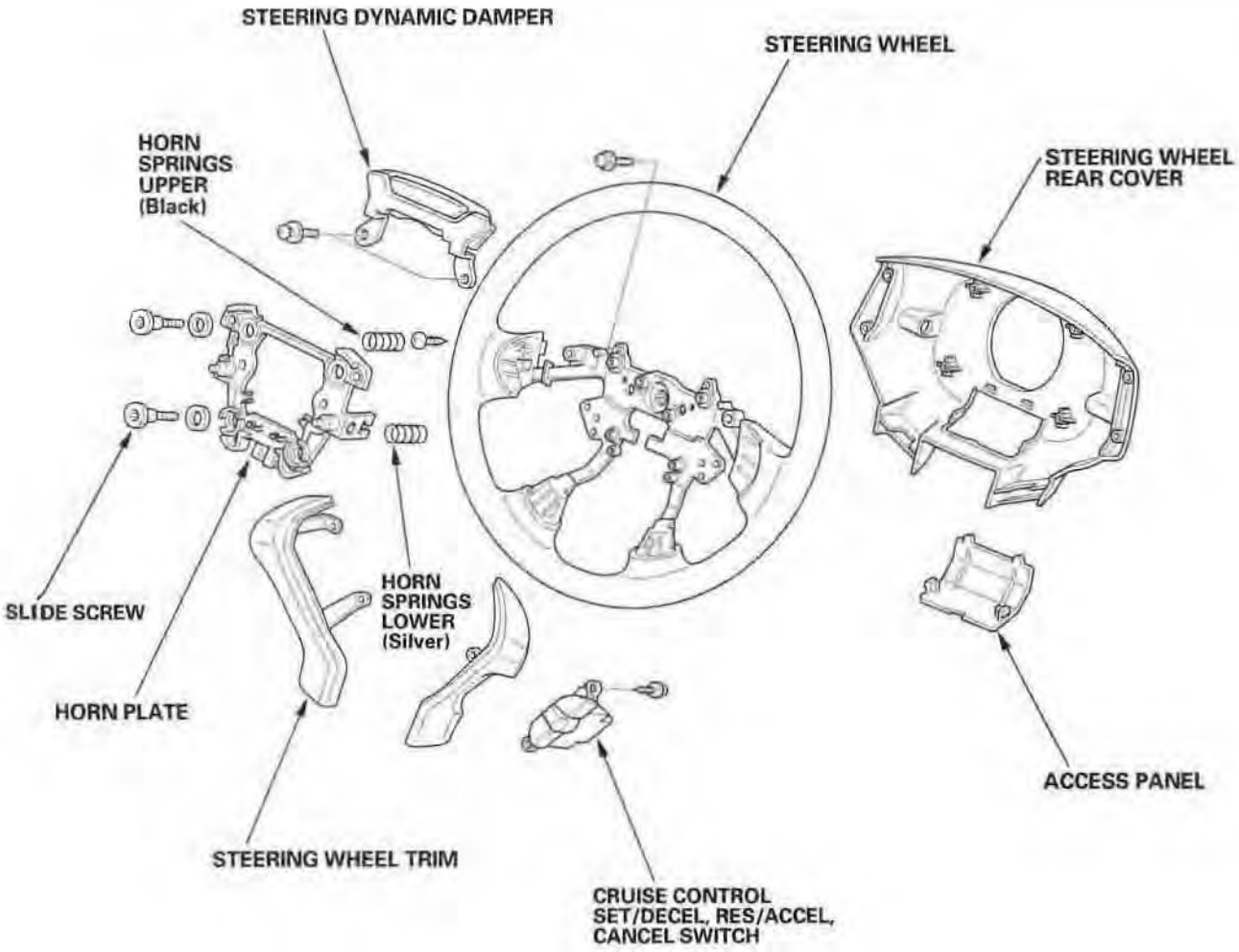
   Note these items when removing the steering wheel:
   - Do not tap on the steering wheel or the steering column shaft when removing the steering wheel.
   - If you thread the puller bolts (D) into the wheel hub more than five threads, the bolts will hit the cable reel and damage it. To prevent this, install a pair of jam nuts five threads up on each puller bolt.



6. Remove the steering wheel puller, then remove the steering wheel bolt and steering wheel from the steering column.

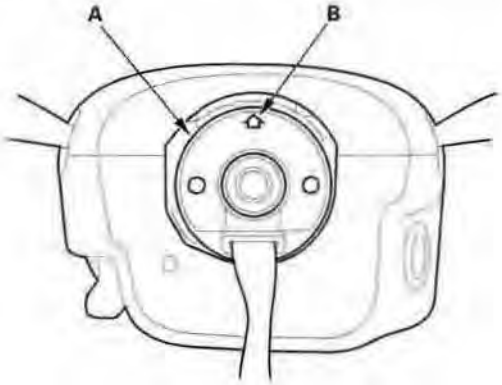


Steering Wheel Disassembly/Reassembly

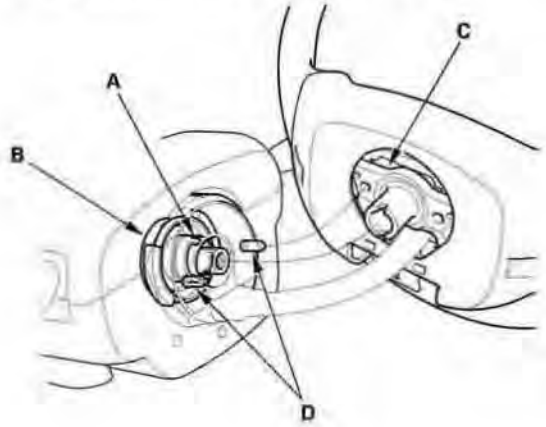


Steering Wheel Installation

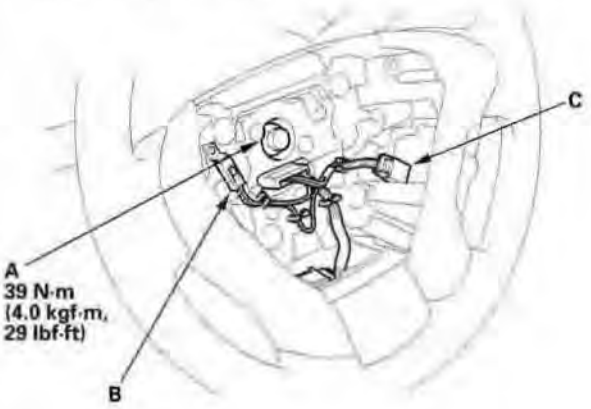
1. Before installing the steering wheel, make sure the front wheels are aligned straight ahead, then center the cable reel (A). Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about two and a half turns. The arrow mark (B) on the cable reel label should point straight up.



2. Position the two tabs (A) of the turn signal cancelling sleeve (B) as shown. Install the steering wheel on to the steering column shaft, making sure the steering wheel hub (C) engages the pins (D) of the cable reel and tabs of the canceling sleeve. Do not tap on the steering wheel or steering column shaft when installing the steering wheel.



3. Install the steering wheel bolt (A), and tighten it to the specified torque. Connect the horn switch connector (B) and Set/decel, Resume/accel, Cancel switch connector (C). Make sure the wire harness is routed and fastened properly.



4. Install the driver's airbag, and confirm that the system is operating properly (see page 23-118).

5. Do the ECM/PCM idle learn procedure (see page 11-207).

6. Perform the power window control unit reset procedure (see page 22-115).

7. Enter the anti-theft codes for the audio, then enter the customer's radio and XM presets. Reset the clock.

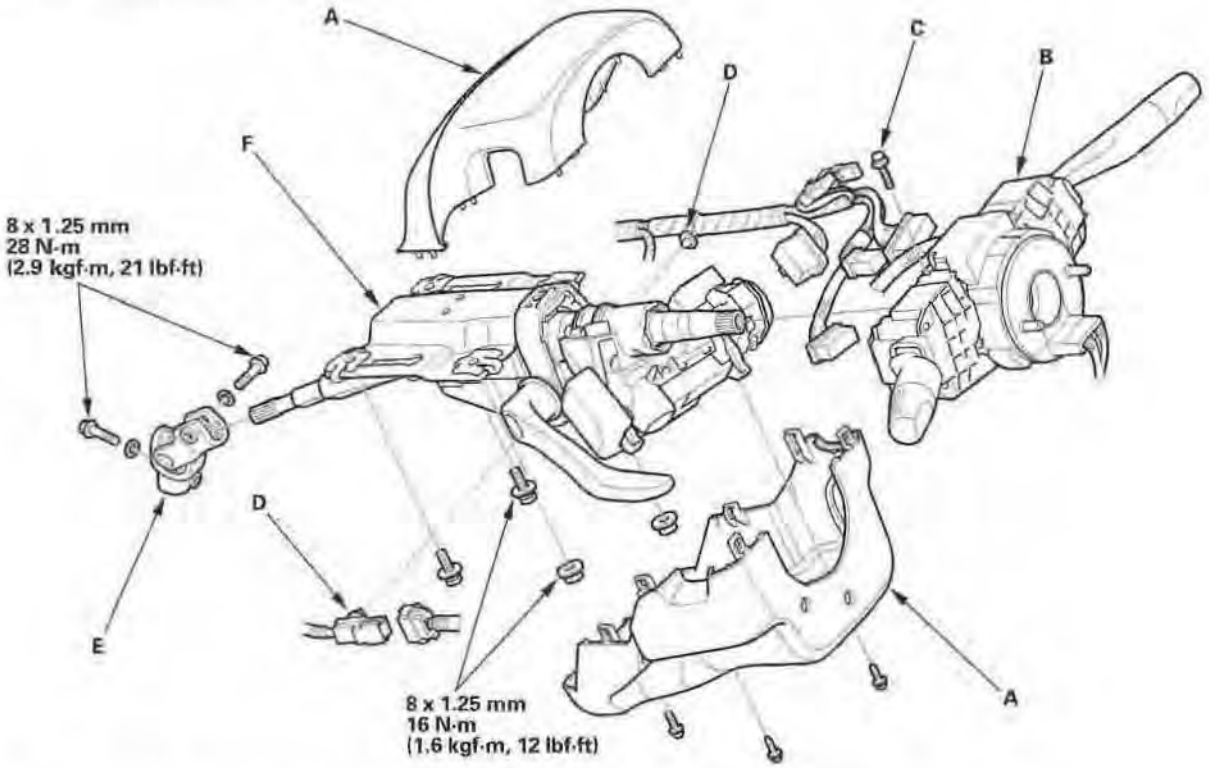
8. Check the horn and turn signal cancelling for proper operation.

Steering Column Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

Removal

1. Make sure you have the anti-theft codes for the audio, then write down the customer's radio and XM presets.
2. Disconnect the battery.
3. Remove the steering wheel (see page 17-22).
4. Remove the driver's dashboard lower cover (see page 20-73).
5. Remove the column covers (A).



6. Disconnect the wire harness connectors from the combination switch assembly (B).
7. Remove the combination switch assembly from the steering column shaft by removing the screw (C) on the top of the combination switch.
8. Disconnect the connectors from the ignition switch, and release the wire harness clips (D) from the steering column.
9. Disconnect the steering joint (E), and remove it from the column shaft.
10. Remove the steering column (F) by removing the attaching nuts and bolts.

(cont'd)

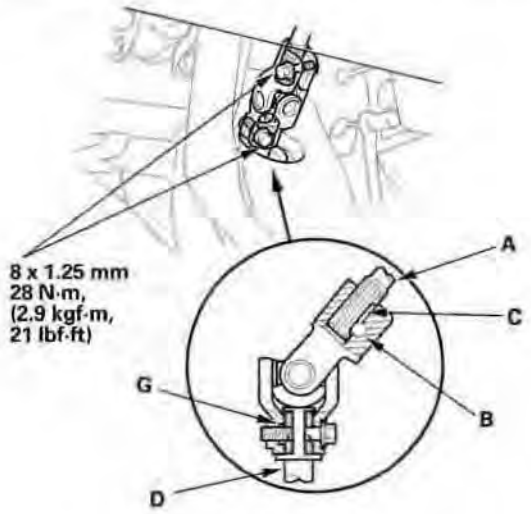
Steering Column Removal and Installation (cont'd)

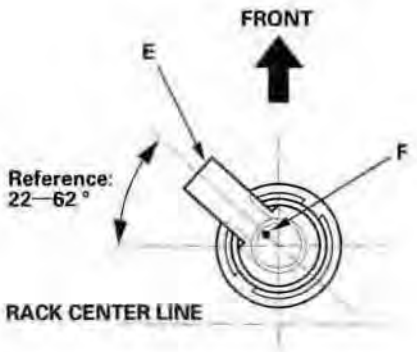
Installation

1. Install the steering column in the reverse order of removal, and note these items:

   - Take care not to let the sliding capsules fall out of position during column installation.
   - Make sure the wires are not caught or pinched by any parts.

2. Insert the upper end of the steering joint onto the steering shaft (A) (line up the bolt hole (B) with the flat portion (C) on the shaft).





3. Slip the lower end of the steering joint onto the pinion shaft (D) taking care to align gap it lower end of steering joint with the tab (E) of the center guide and punch mark (F) on the pinion shaft (line up the bolt hole with the groove (G) around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.

4. Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it to the specified torque. Tighten the lower joint bolt to the specified torque.

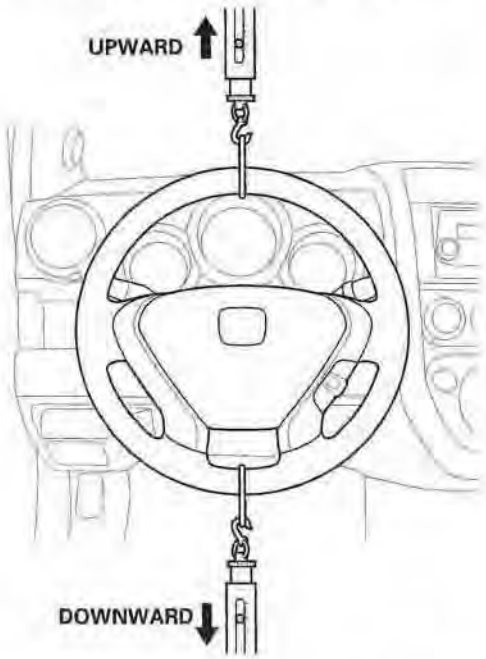
5. Finish the installation, and note these items:

   - Make sure the wire harness is routed and fastened properly.
   - Make sure the connectors are properly connected.
   - Reinstall the steering wheel (see page 17-24).
   - Reconnect the battery.
     - Do the power window control unit reset procedure (see page 22-115).
     - Enter the anti-theft codes for the audio, then the customer's radio and XM presets. Reset the clock.
   - Verify horn and turn signal switch operation.
   - Check wheel alignment, and adjust it if necessary (see page 18-5).

Steering Column Tilt Operation Check

1. Set the steering wheel in the straight driving position, and loosen the tilt lever fully.
2. Attach the spring scale to the highest point of the steering wheel, and set the tilting position at the lowest.
3. Pull the spring scale straight up, and read the operation load during tilting.
4. Attach the spring scale to the lowest point of the steering wheel.
5. Pull the spring scale straight down, and read the operation load during tilting.

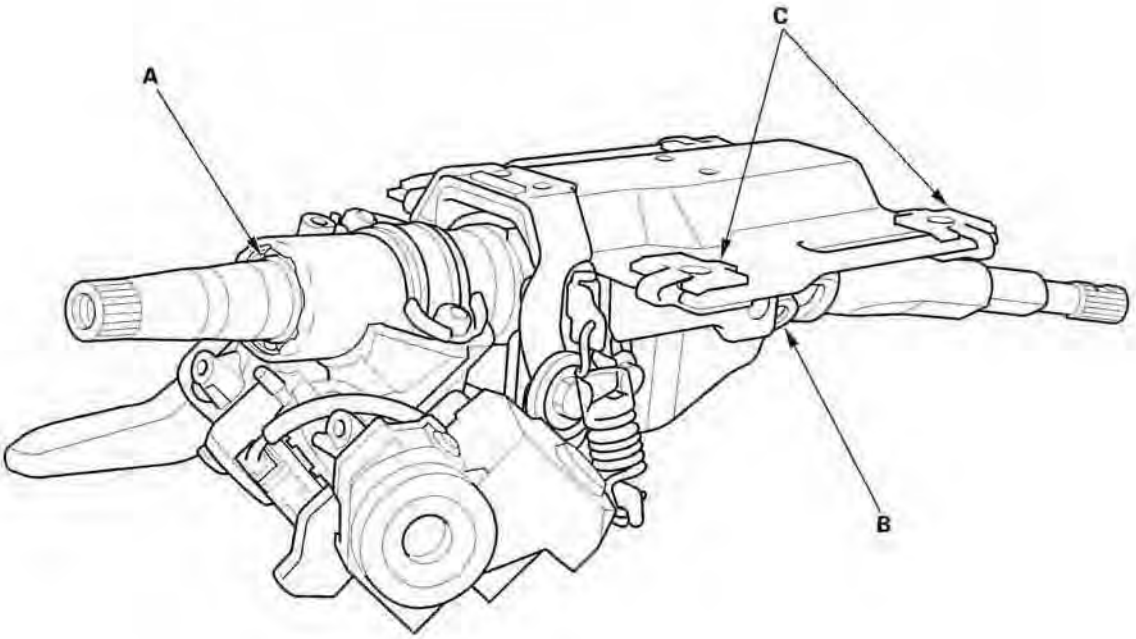
   Tilting load (Upward/Downward):
   Standard: 68 N (7.0 kgf, 15 lbf) or below



6. If the measurement is more than the specification, adjust the tilt lever preload (see step 1 on page 17-29).

Steering Column/Tilt Lever Inspection/Adjustment

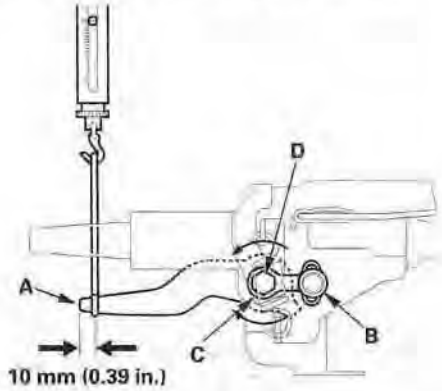
- Check the steering column ball bearing (A) and the steering joint bearings (B) for play and proper movement. If any bearing is noisy or has excessive play, replace the steering column as an assembly.
- Check the sliding capsules (C) for distortion and breakage. If there is distortion or breakage, replace the steering column as an assembly.



Tilt Lever Preload Inspection

1. Move the tilt lever (A) from the loose position to the lock position three to five times; then measure the tilt lever preload 10 mm (0.39 in.) from the end of the tilt lever.

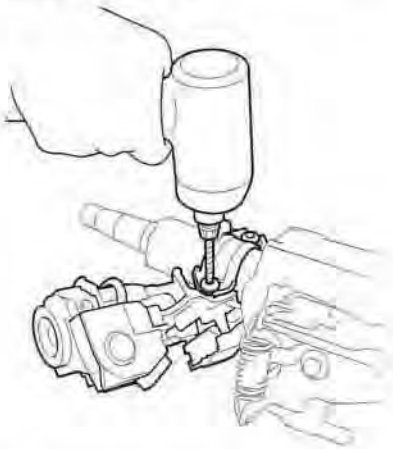
Preload: 70—90 N (7—9 kgf, 15—20 lbf)



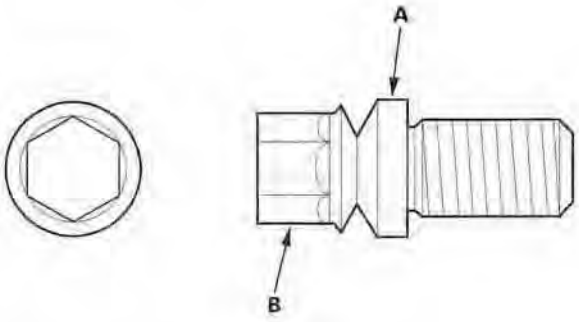
2. If the measurement is out of the specification, adjust the preload using the following procedures.
   - Loosen the tilt lever, and set the steering column in the neutral position.
   - Remove the 6 mm lock bolt (B), and remove the stop (C). Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.
   - Adjust the preload by turning the tilt lock bolt (D) left or right.
   - Pull up the tilt lever to the uppermost position, and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures to adjust.

Steering Lock Replacement

1. Remove the steering column (see page 17-25).
2. Center punch each of the two shear bolts, and drill their heads off with a 5 mm (3/16 in.) drill bit. Be careful not to damage the switch body when removing the shear bolts.



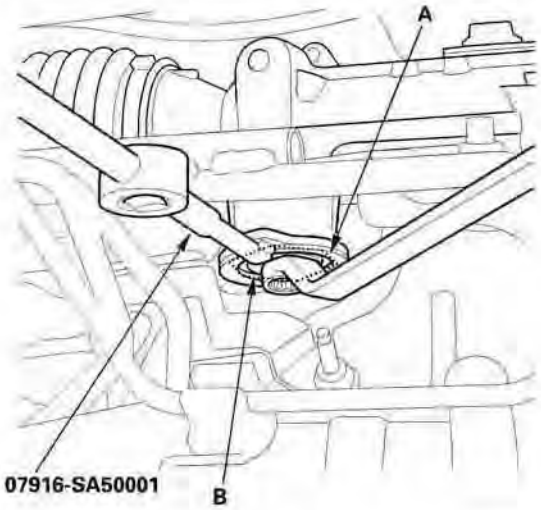
3. Remove the shear bolts from the switch body.
4. Install the switch body without the key inserted.
5. Loosely tighten the new shear bolts.
6. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.
7. Tighten the shear bolts (A) until the hex heads (B) twist off.



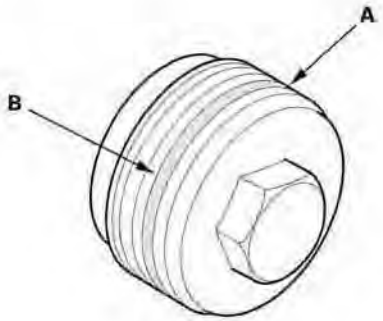
Rack Guide Adjustment

Special Tools Required
Locknut wrench, 40 mm 07916-SA50001

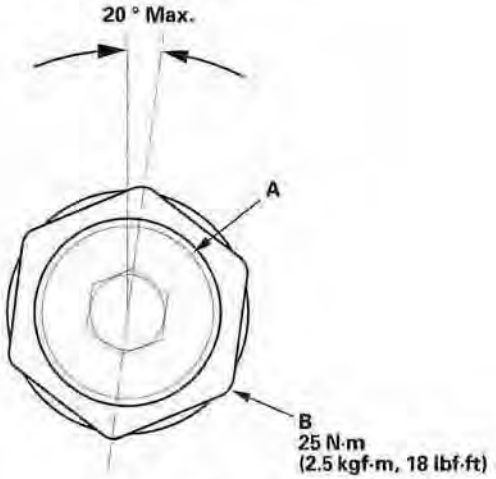
1. Set the wheels in the straight ahead position.
2. Loosen the rack guide screw locknut (A) with the special tool, then remove the rack guide screw (B).



3. Remove the old sealant from rack guide screw (A), and apply new sealant (Three Bond 1215 or Loctite 5699) to the middle of the threads (B). Loosely install the rack guide screw in the steering gearbox.



4. Tighten the rack guide screw (A) to 25 N·m (2.5 kgf·m, 18 lbf·ft), then loosen it.



5. Retighten the rack guide screw to 6 N·m (0.6 kgf·m, 4 lbf·ft), then back it off to specified angle.

   Specified return angle: 20 ° Max.

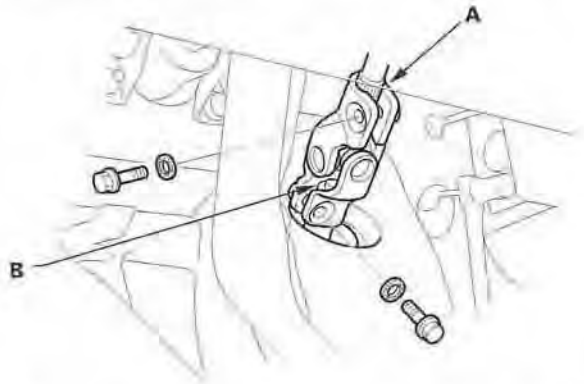
6. Hold the rack guide screw stationary with a wrench, and tighten the locknut by hand until it's fully seated.
7. Install the special tool on the locknut (B), and hold the rack guide screw stationary with a wrench. Tighten the locknut an additional 30 ° with the special tool.
8. Check for unusual steering effort through the complete turning travel.
9. Check the steering wheel rotational play and the power assist (see page 17-7).

Steering Gearbox Removal

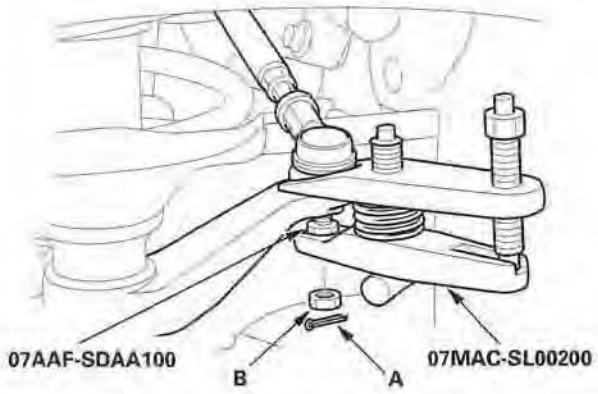
Special Tools Required
- Ball joint thread protector, 12 mm 07AAF-SDAA100
- Ball joint remover, 28 mm 07MAC-SL00200

Note these items during removal:
- Using solvent and a brush, wash any oil and dirt off the valve body unit, its lines, and the end of the gearbox. Blow dry with compressed air.
- Be sure to remove the steering wheel before disconnecting the steering joint. Damage to the cable reel can occur.

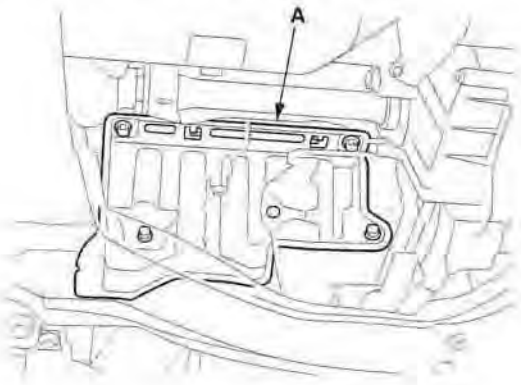
1. Raise the front of vehicle, and support it with safety stands in the proper locations (see page 1-9).
2. Remove the front wheels.
3. Remove the steering wheel (see page 17-22).
4. Remove the driver's dashboard lower cover (see page 20-73).
5. Remove the steering joint bolts, and disconnect the steering joint by moving the steering joint (A) toward the column.



6. Remove the center guide from the top of the pinion shaft (B) (if equipped), and discard it.
7. Remove the cotter pin (A) from the tie-rod ball joint nut (B), and loosen the nut.



8. Separate the tie-rod ball joint and damper steering arm using the special tools (see page 18-10). Repeat on the other side of the vehicle.
9. Remove the P/S heat baffle plate (A).



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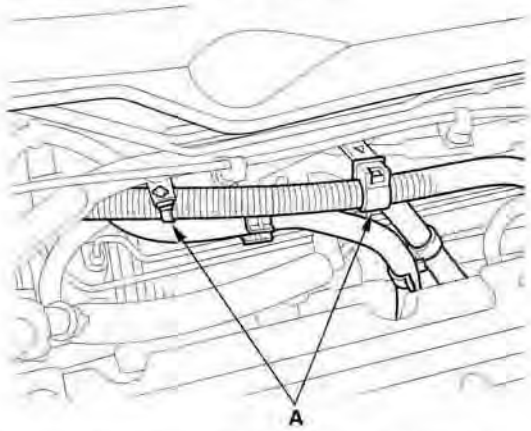
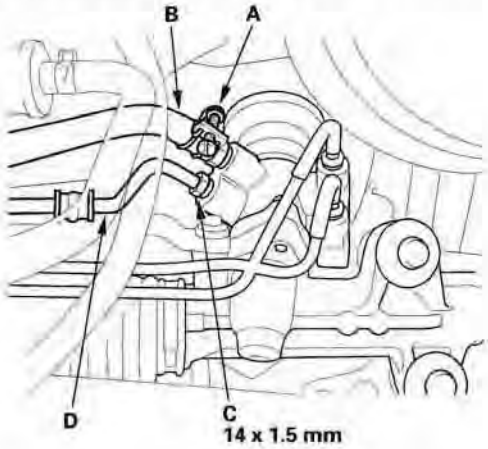
Steering Gearbox Removal (cont'd)

10. Remove the engine wire harness clamp and clip (A) from the two mounting brackets.

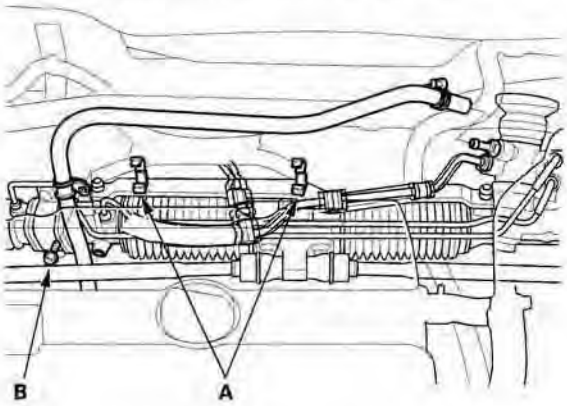


11. Loosen the adjustable hose clamp (A) and disconnect the return hose (B).

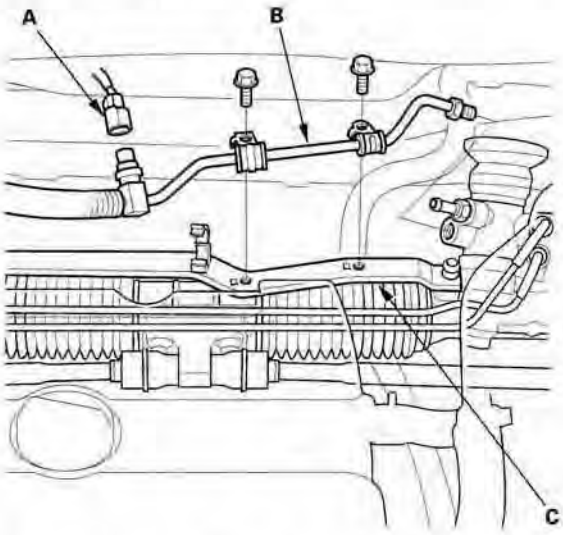


12. Loosen the 14 mm flare nut (C) and disconnect the feed line (D).

13. Open the hose holders (A) on the return hose, and remove the return hose clamp bolt (B).

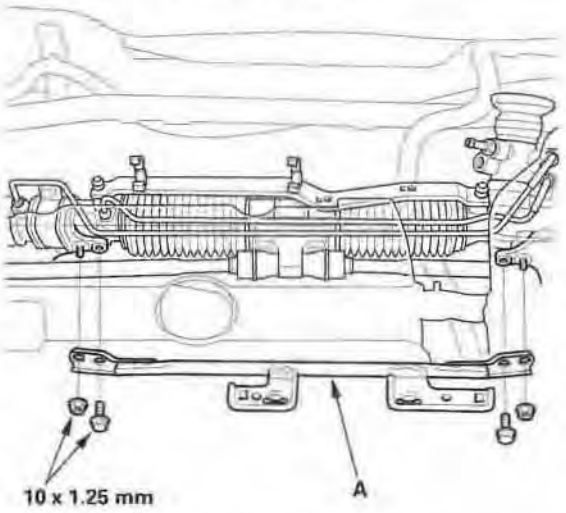


14. Disconnect the power steering pressure switch connector (A).

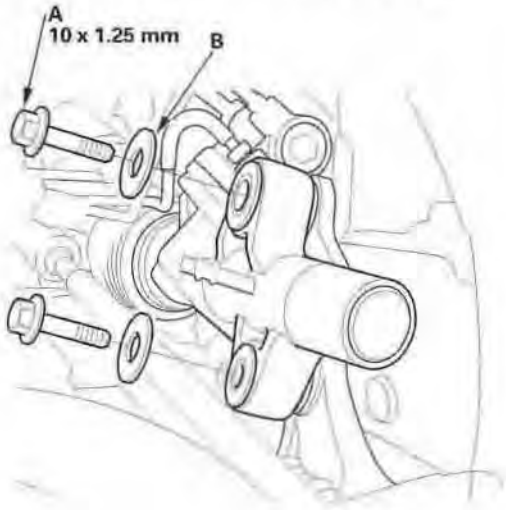


15. Remove the feed line (B) on the P/S line mounting bracket (C), and move it aside.

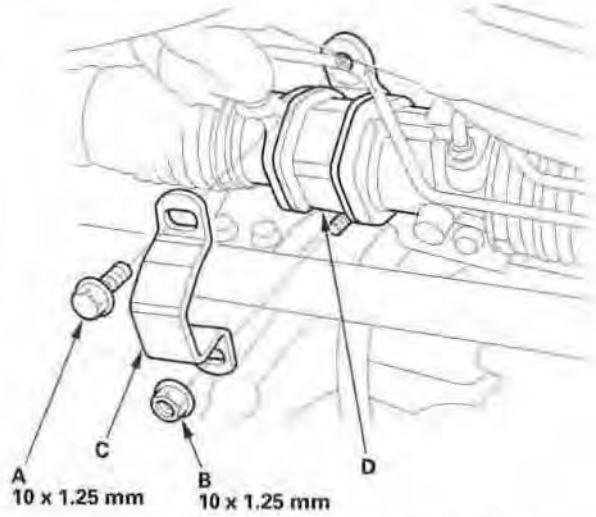
16. Remove the body stiffener (A).



17. Remove the two 10 mm flange bolts (A) and washers (B) from the left side of gearbox.

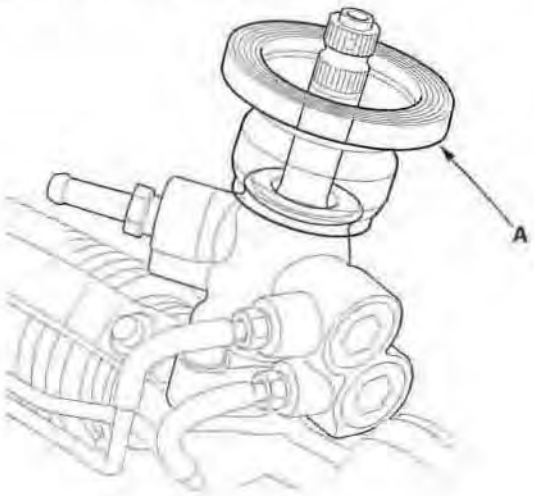


18. Remove the 10 mm flange bolt (A) and nut (B) from the right side of gearbox, and remove the mounting bracket (C).



19. Lower the steering gearbox, and rotate it so the pinion shaft points upward, and remove the mounting cushion (D).

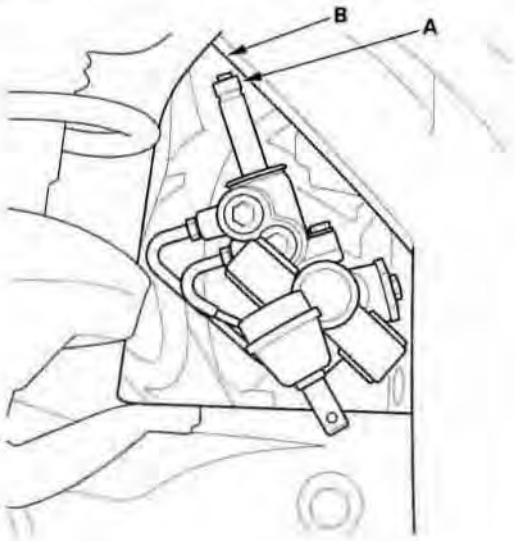
20. Remove the pinion shaft grommet (A) from the top of the valve body unit.



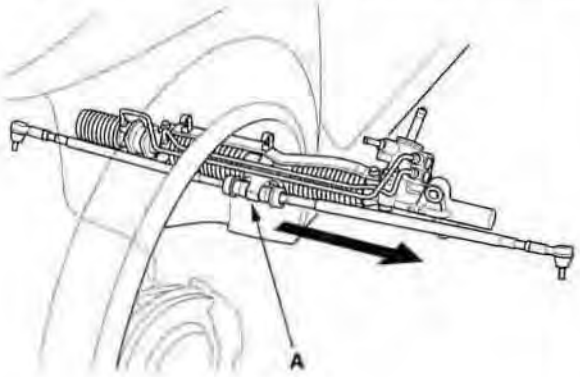
(cont'd)

Steering Gearbox Removal (cont'd)

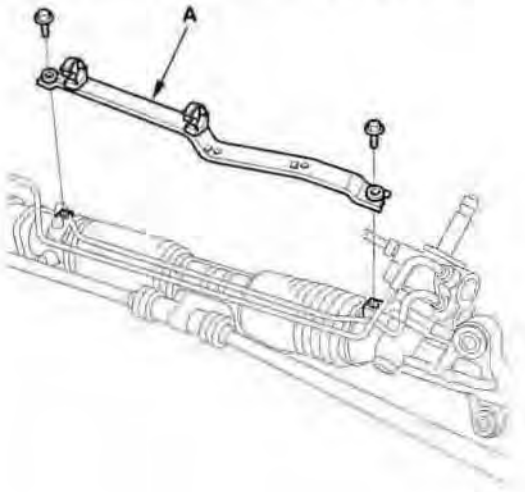
21. Carefully move the steering gearbox and tie-rods as an assembly toward the driver's side until the pinion shaft (A) clears the wheelwell opening (B) on the frame.



22. Remove the steering gearbox (A) through the wheelwell opening on the driver's side. Be careful not to damage the hoses, lines, and wire harnesses.

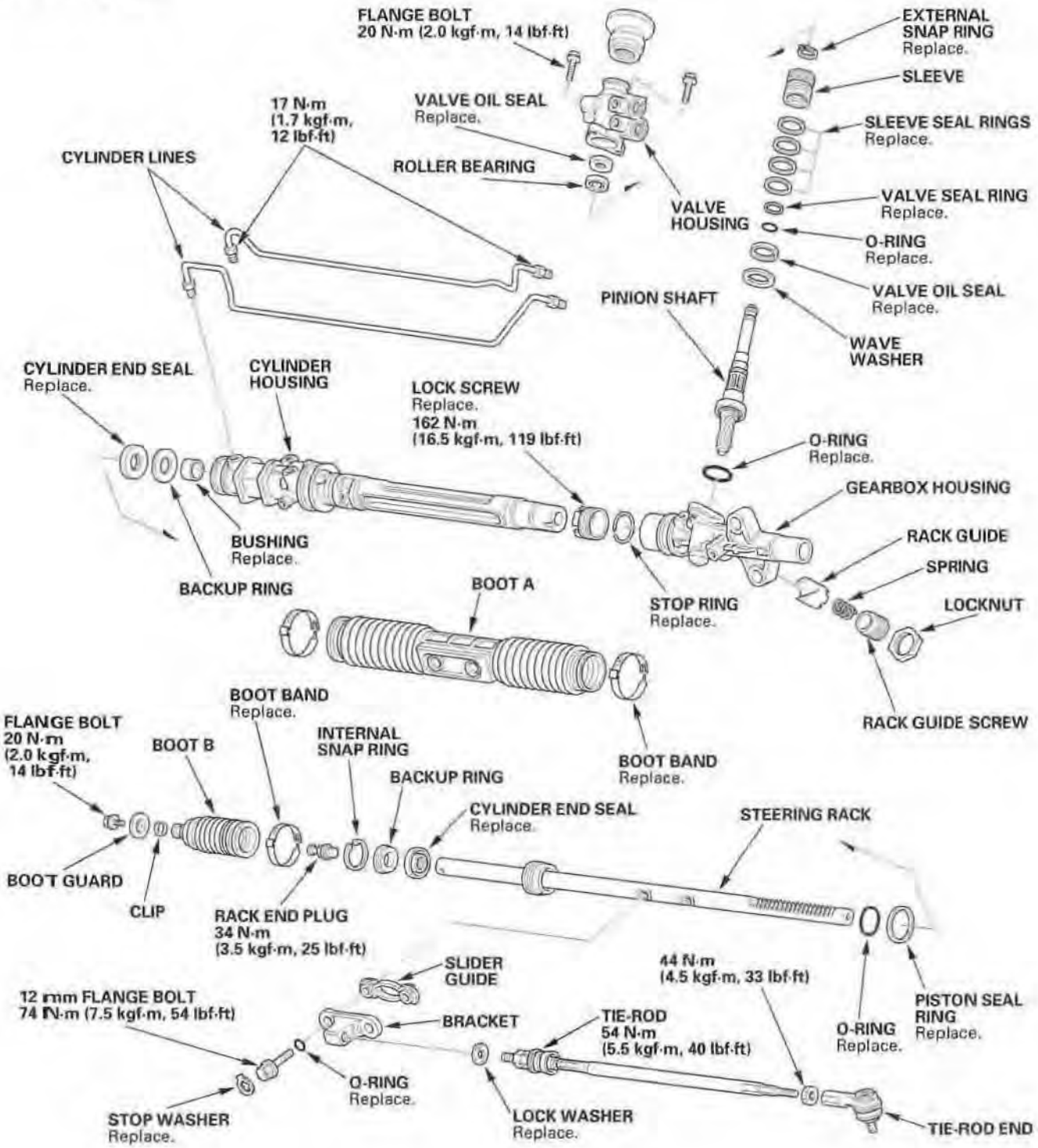


23. Remove the P/S line mounting bracket (A).



Steering Gearbox Overhaul

Exploded View



(cont'd)

Steering Gearbox Overhaul (cont'd)

Special Tools Required
- Cylinder end seal remover attachment 07NAD-SR30200 or 07NAD-SR3020A
- Driver, 27 mm 07ZAF-S5A0100
- Valve seal ring sizing tool 07NAG-SR30900 or 07NAG-SR3090A
- Sleeve seal ring guide 07YAG-S2X0100
- Sleeve seal ring sizing tool, 36 mm 07ZAG-S5A0100
- Attachment, 32 x 35 mm 07746-0010100
- Driver 07749-0010000
- Piston seal ring guide, 42 mm 07ZAG-S7A0100
- Piston seal ring sizing tool, 42 mm 07ZAG-S7A0200
- Pilot collar 07GAF-PH70100
- Locknut wrench 07ZAA-S5A0100
- Driver handle 07NAD-SR30101
- Cylinder end seal slider, 23 mm 07974-6890801 or 07974-689080A
- Valve seal ring guide 07ZAG-S5A0200
- Pincers, Oetiker 1098 or equivalent, commercially available

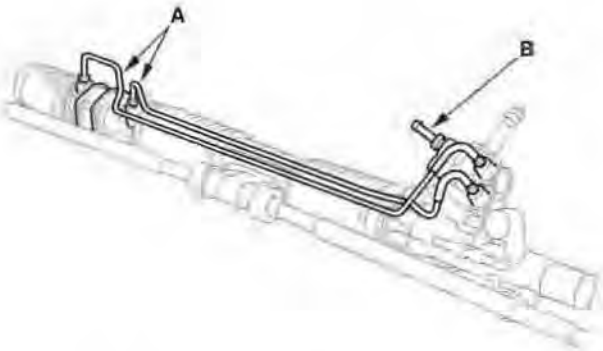
NOTE: Refer to the Exploded View as needed during this procedure.

Removal

1. Remove the steering gearbox (see page 17-31).

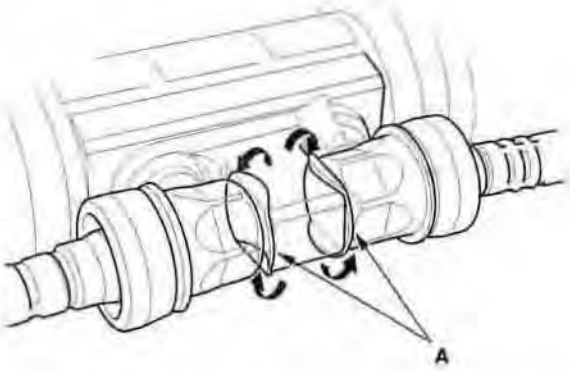
Disassembly

2. Remove cylinder lines (A) and return line joint (B) from the gearbox.

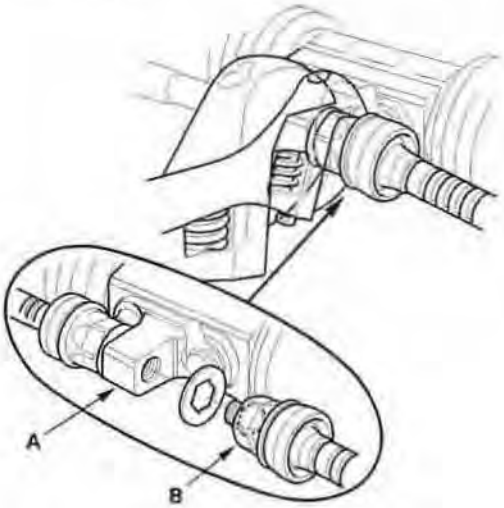


3. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

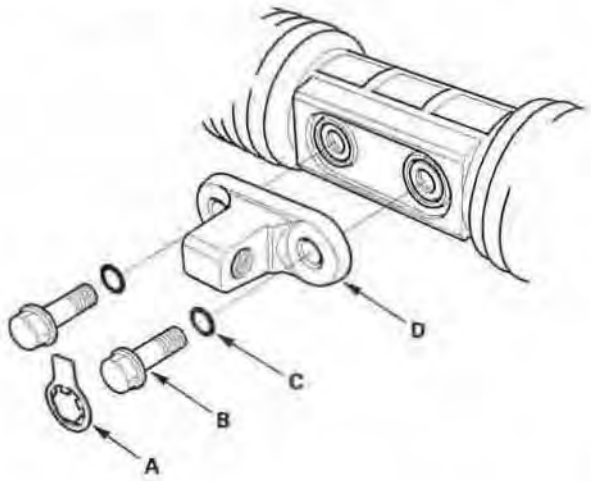
4. Unbend the lock washers (A).



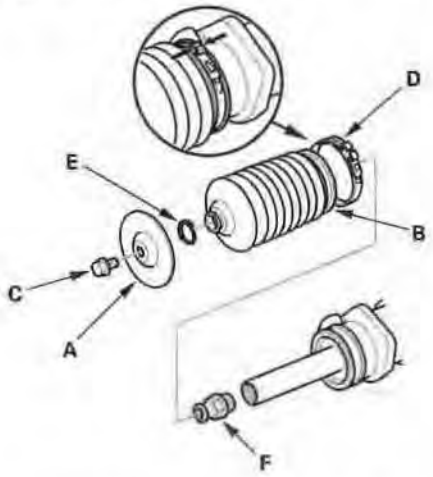
5. Hold the bracket (A) with one wrench, and unscrew both tie-rods (B) with another wrench. Remove the lock washers.



6. Remove the stop washer (A), the 12 mm flange bolts (B), O-rings (C), and bracket (D) from the steering gearbox.

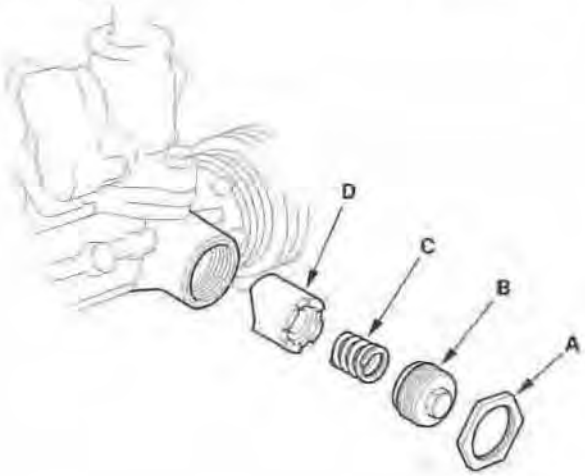


7. Remove the boot guard (A) by removing the 8 mm flange bolt (C) on the rack end.

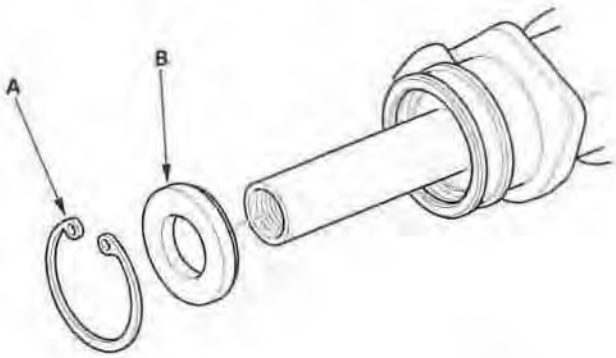


8. Remove the boot band (D) and clip (E). Pull the boot B away from the end of the steering gearbox. Remove the rack end plug (F).

9. Loosen the locknut (A), then remove the rack guide screw (B), spring (C), and rack guide (D) from the steering gearbox.



10. Remove the internal snap ring (A) and backup ring (B) from the cylinder housing.

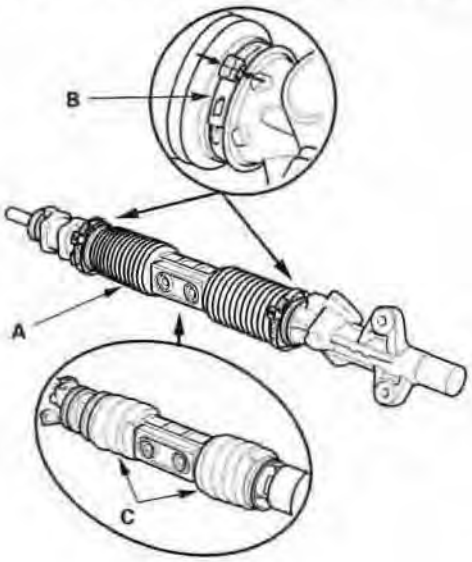


(cont'd)

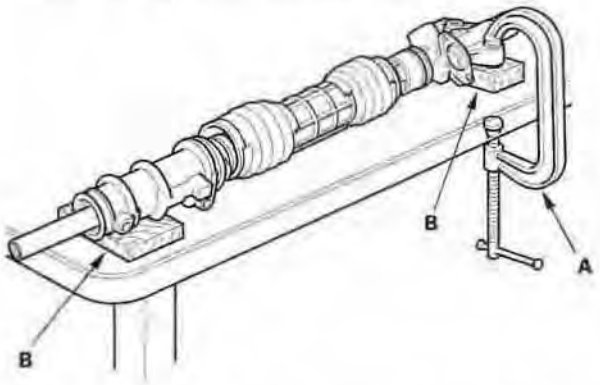
Steering Gearbox Overhaul (cont'd)

11. Remove the valve body unit (A) from the steering gearbox. Remove the O-ring (B) and discard it.

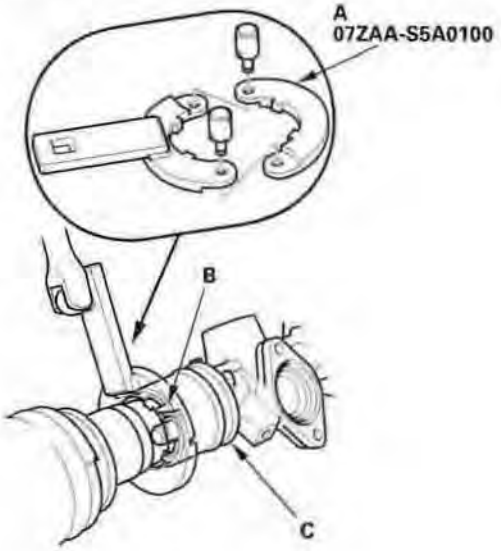
12. Remove the two boot bands (B) from boot A. Compress boot A by hand, and apply vinyl tape (C) so the boots stay collapsed and pulled back.



13. Hold the gearbox housing using a C-clamp (commercially available) (A) and the wooden blocks (B) as shown. Do not clamp the cylinder housing or gearbox housing in the vise.

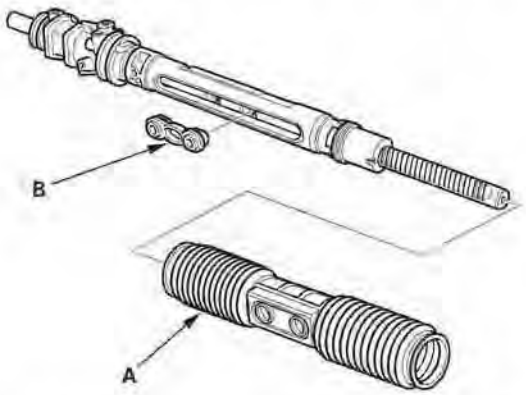


14. Install the special tool (A) on the lock screw (B), then loosen and remove the lock screw from inside of the gearbox housing (C).

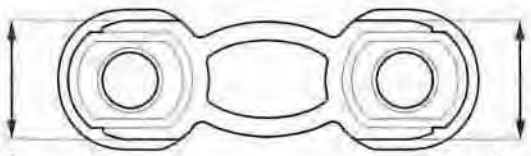


15. Remove the special tool.

16. Pull on the cylinder to remove it from the gearbox housing. Remove boot A and the slider guide (B) from the cylinder.



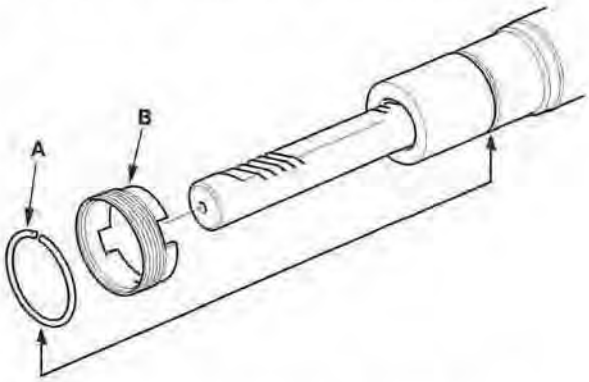
17. Check the slider guide for damage and cracks. Use vernier calipers to measure the thickness of the slider guide. If the thickness is less than the service limit (A), replace the slider guide.



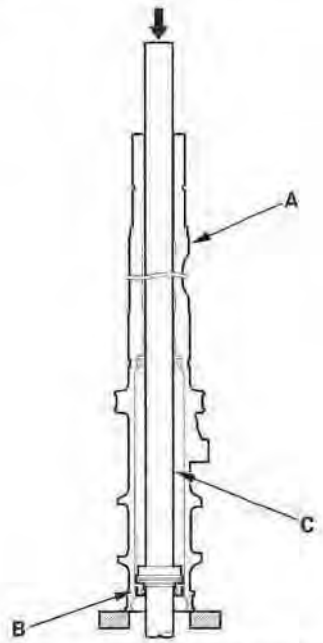
A
25.3 mm
(0.925 in.)

A
25.3 mm
(0.925 in.)

18. Remove and discard the stop ring (A) on the cylinder by expanding it with snap ring pliers. Remove and discard the lock screw (B).



19. Set the cylinder housing (A) in a press so the cylinder side points downward, then press the cylinder end seal (B) and steering rack (C) out of the cylinder. Hold the rack to keep it from falling when pressed clear.

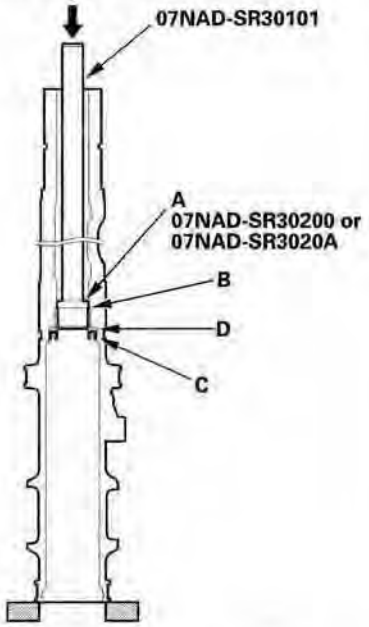


20. Remove the cylinder end seal from the steering rack.

(cont'd)

Steering Gearbox Overhaul (cont'd)

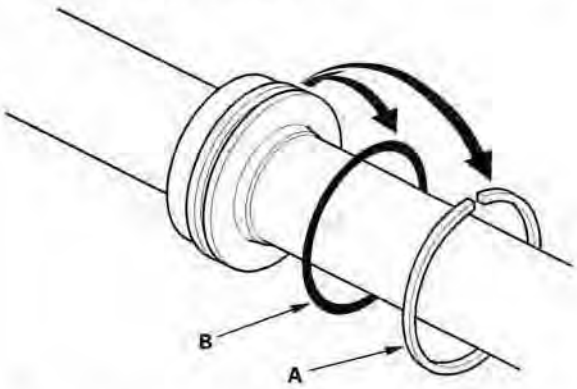
21. Insert the special tools into the cylinder. Make sure the attachment (A) of the special tools is securely positioned on the bushing edges (B).



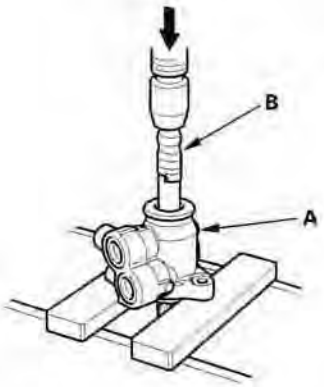
22. Place the cylinder in a press, then remove the cylinder end seal (C), backup ring (D), and bushing from the cylinder by pressing on the special tool end.

    Note the items when pressing the cylinder end seal:
    - Keep tool straight to avoid damaging the cylinder wall. Check the tool angle, and correct it if necessary, when removing the cylinder end seal.
    - Use a press to remove the cylinder end seal. Do not try to remove the seal by striking the tool; striking the tool would break the cylinder end seal, and the seal would remain in the cylinder.

23. Carefully pry the piston seal ring (A) and O-ring (B) off the rack piston. Be careful not to damage the inside of the seal ring groove and piston edges when removing the seal ring.



24. Before removing the valve housing (A), apply vinyl tape (B) to the splines on the pinion shaft.



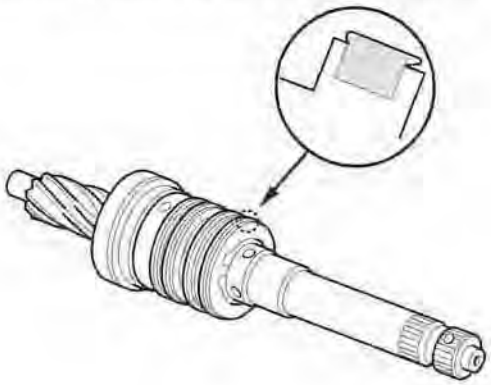
25. Separate the valve housing from the pinion shaft/ valve using a press.

26. With your finger, check the inner wall of the valve housing where the seal ring slides. If there is a step in the wall, the housing is worn. Replace it.

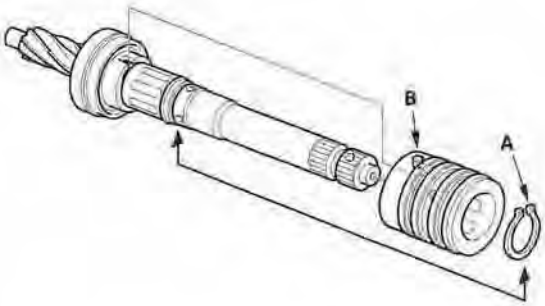
    NOTE: There may be sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.

27. Check for wear, burrs, and other damage to the edges of the grooves in the sleeve.

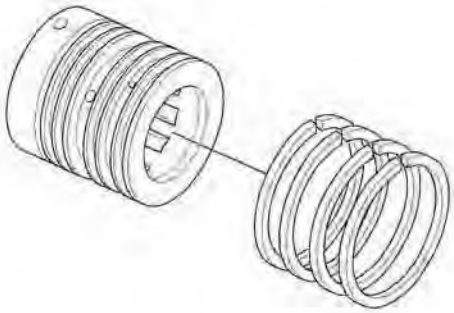
    NOTE: The pinion shaft and sleeve are a precision matched set. If either the pinion shaft or sleeve must be replaced, replace both parts as a set.



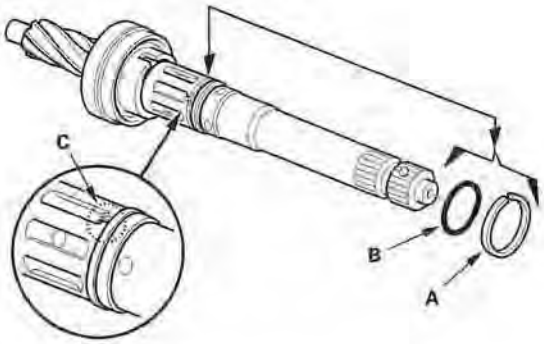
28. Remove the external snap ring (A) and sleeve (B) from the pinion shaft.



29. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve. Be careful not to damage the edges of the sleeve grooves and the outer surface when removing the seal rings.



30. Using a cutter or an equivalent tool, cut the valve seal ring (A) and O-ring (B) at the groove (C) in the pinion shaft. Remove the valve seal ring and O-ring. Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.

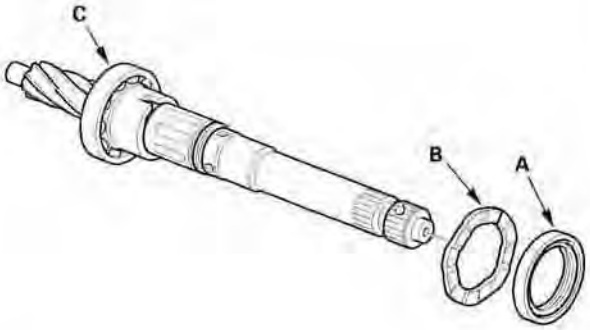


(cont'd)

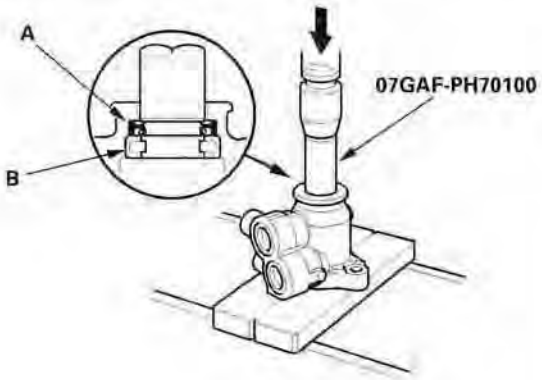
Steering Gearbox Overhaul (cont'd)

31. Remove the valve oil seal (A) and wave washer (B) from the pinion shaft.

    Note these items during disassembly:
    - Inspect the ball bearing (C) by rotating the outer race slowly. If there is any excessive play, replace the pinion shaft and sleeve as an assembly.
    - The pinion shaft and sleeve are a precise fit; do not intermix old and new pinion shafts and sleeves.

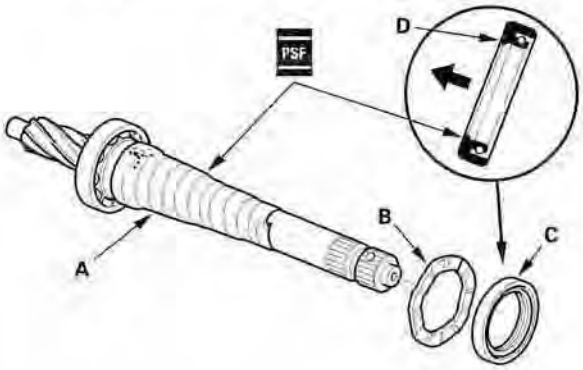


32. Press the valve oil seal (A) and roller bearing (B) out of the valve housing using a hydraulic press and special tool.



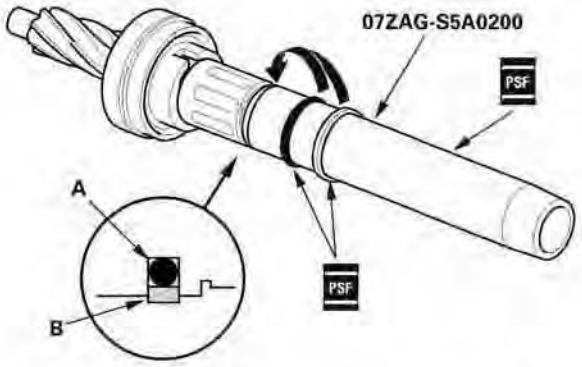
Reassembly

33. Apply vinyl tape (A) to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.



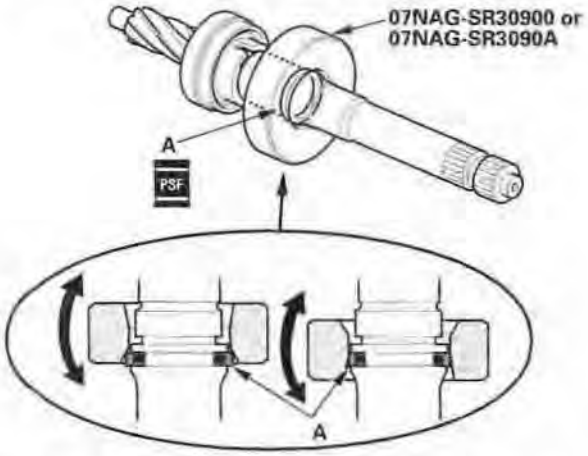
34. Install the wave washer (B). Coat the inside surface of the new valve oil seal (C) with power steering fluid, and install the seal with its grooved side facing opposite the bearing, then slide it over the pinion shaft, being careful not to damage its sealing lip (D). Remove the vinyl tape.

35. Install the special tool over the pinion, and coat the surface of the tool with power steering fluid. Slip the new O-ring (A) and new valve seal ring (B) over the special tool, and expand them.



36. Fit the O-ring in the groove of the pinion shaft. Then slide the valve seal ring over the shaft and in the groove on the pinion shaft.

37. Remove the special tool, and apply power steering fluid to the surface of the valve seal ring (A).

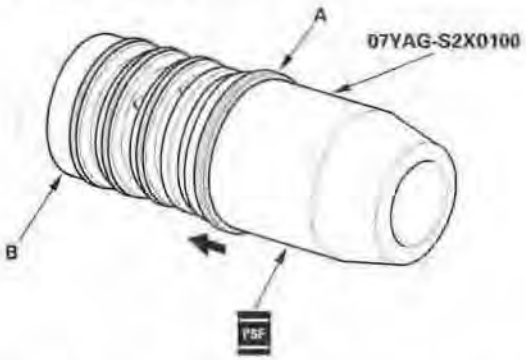


38. Apply power steering fluid to the inside of the special tool. Set the larger diameter end of the special tool over the valve seal ring, and move the special tool up and down several times to make the valve seal ring fit in the pinion shaft groove.

39. Remove the special tool, turn it over, and slide the smaller diameter end over the valve seal ring. Move it up and down several times to make the valve seal ring fit snugly in the pinion shaft groove.

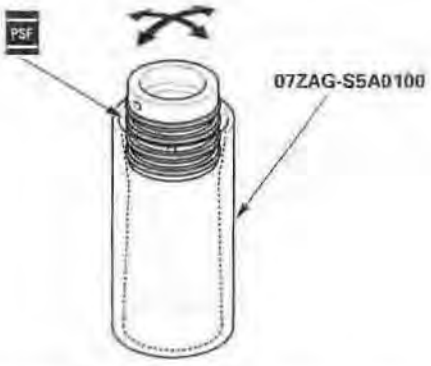
40. Apply power steering fluid to the surface of the special tool. Slip two new seal rings (A) over the special tool from the smaller diameter end, and expand them. Install only two rings at a time from each end of the pinion shaft sleeve (B).

    Note these items when installing the seal rings:
    - Do not over-expand the seal rings. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal rings using the special tool (sizing tool).
    - There are two types of sleeve seal rings; black and brown. Do not mix the different types of rings as they are not compatible.



41. Align the special tool with each groove in the sleeve, and slide a sleeve seal ring into each groove. After installation, compress the seal rings with your fingers temporarily.

42. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the special tool, then slowly insert the sleeve into the special tool.



43. Move the sleeve back and forth several times to make the seal rings fit snugly in the sleeve. Be sure that the seal rings are not twisted.

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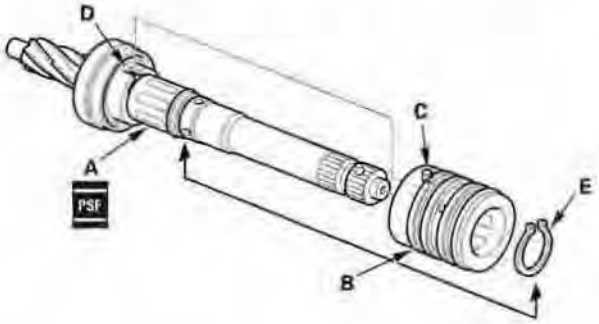
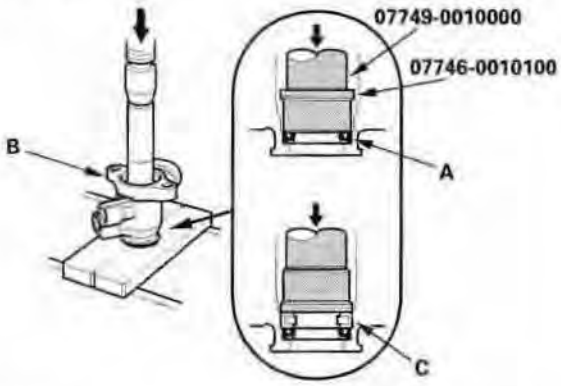
Steering Gearbox Overhaul (cont'd)

44. Apply power steering fluid to the surface of the pinion shaft (A). Slide the sleeve (B) onto the pinion shaft by aligning the locating pin (C) on the inside of the sleeve with the cutout (D) in the shaft. Then install the new external snap ring (E) securely in the pinion shaft groove. Be careful not to damage the valve seal ring when inserting the sleeve.

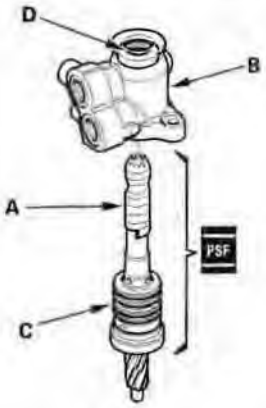


45. Apply power steering fluid to the seal ring lip of the new valve oil seal (A), then install the seal in the valve housing (B) using a hydraulic press and special tools. Install the seal with its grooved side facing the tool.



46. Press the roller bearing (C) into the valve housing with a hydraulic press and special tools.

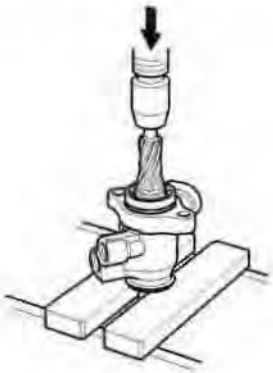
47. Apply vinyl tape (A) to the pinion shaft, then coat the vinyl tape with power steering fluid.



48. Insert the pinion shaft into the valve housing (B). Be careful not to damage the valve seal rings (C) and valve oil seal sealing lip (D).

49. Remove the vinyl tape from the pinion shaft, then remove any residue from the tape adhesive.

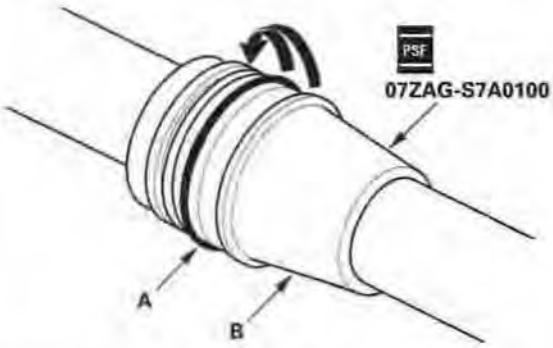
50. Press the pinion shaft/sleeve into the valve housing with a hydraulic press. Check that the pinion shaft/sleeve turns smoothly by hand after installing it.



51. Coat the special tool with power steering fluid, then slide it onto the rack, big end first.

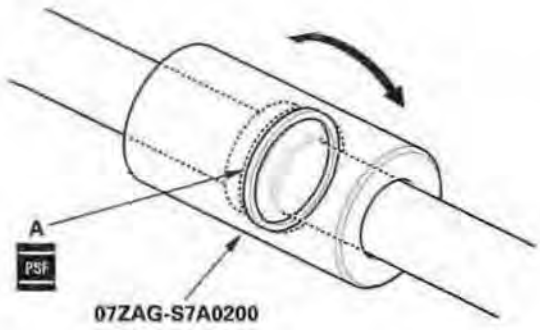
52. Position the new O-ring (A) and new piston seal ring (B) on the special tool, then slide them down toward the big end of the tool.

    Note these items during reassembly:
    - Do not over expand the resin seal ring. Install the resin seal ring with care so as not to damage it. After installation, be sure to contract the seal ring using the special tool (sizing tool).
    - Replace piston's O-ring and seal ring as a set.



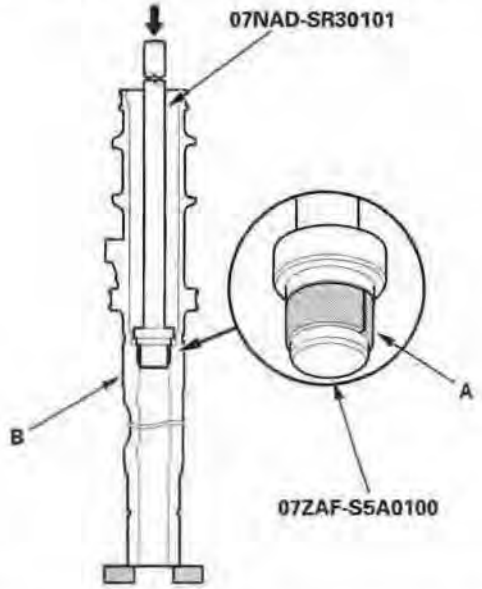
53. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.

54. Coat the piston seal ring (A) and the inside of the special tool with power steering fluid, then carefully slide the tool onto the rack and over the piston seal ring.



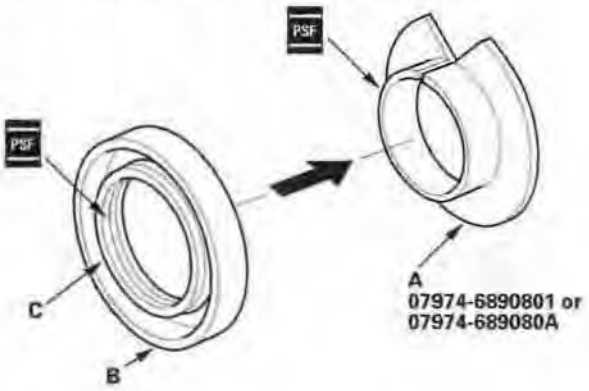
55. Move the special tool back and forth several times to make the piston seal ring fits snugly in the piston.

56. Set the new bushing (A) on the special tool, and insert the special tools into the cylinder housing (B).



57. Set the cylinder in a press, and install the bushing into the bottom of the cylinder by pressing on the tool with a press. Do not push on the tool with excessive force as it may damage the new bushing.

58. Coat the sliding surface of the special tool (A) and new cylinder end seal (B) with power steering fluid. Place the seal on the special tool with its grooved side (C) facing opposite the special tool.

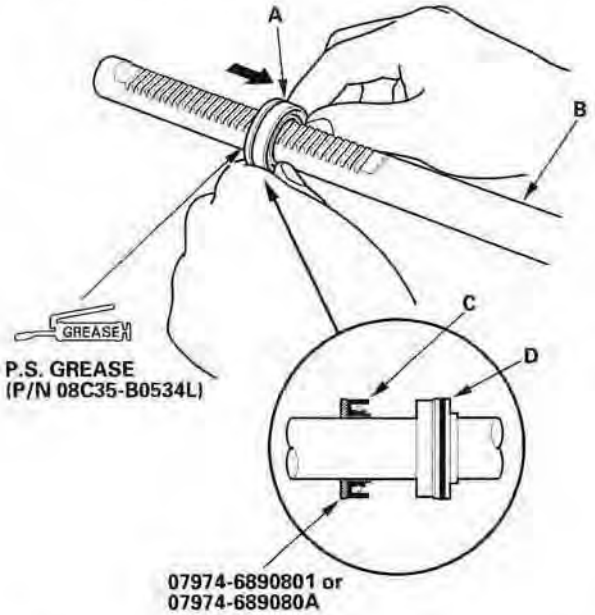


(cont'd)

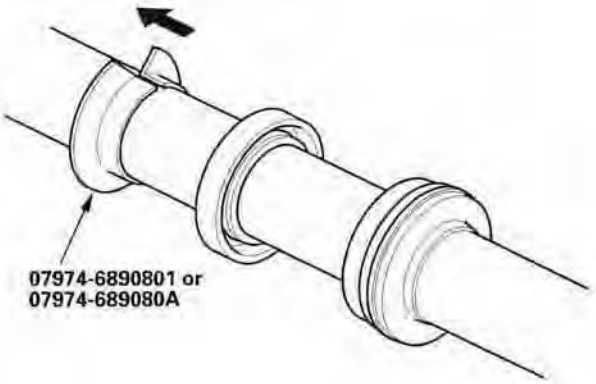
Steering Gearbox Overhaul (cont'd)

59. Apply a thin coat of power steering grease to the inside of the special tool.

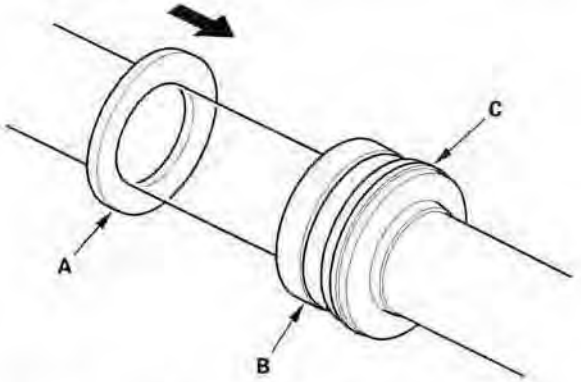
60. Install the cylinder end seal (A) onto the steering rack (B) with its grooved side (C) toward the piston (D). Make sure the gap in the special tool is opposite of rack teeth.



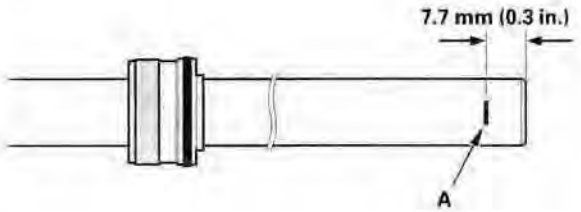
61. Separate the cylinder end seal from the special tool, then remove the special tool.



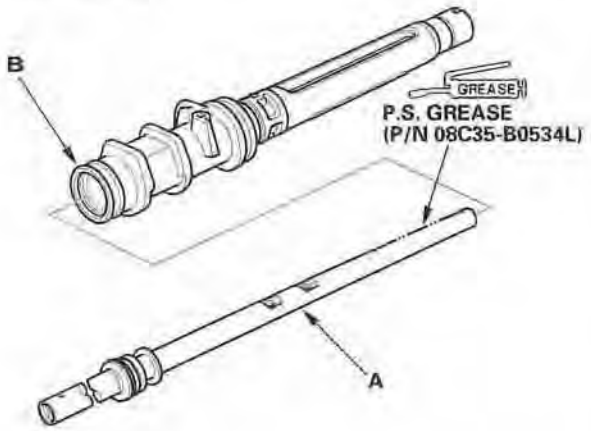
62. Install the new backup ring (A) on the steering rack, then place the backup ring and cylinder end seal (B) against the piston (C).



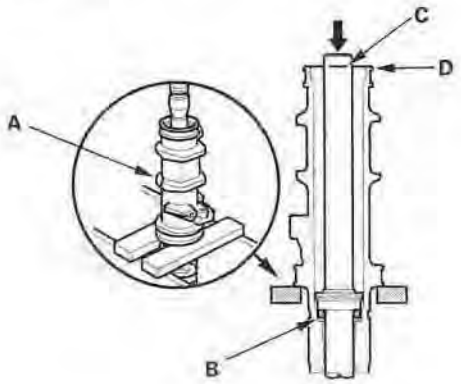
63. Mark (A) a position on the steering rack surface with a felt-tip marker, 7.7 mm (0.3 in.) from the rack end.



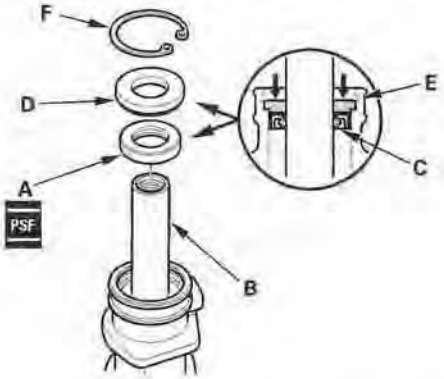
64. Apply power steering grease to the steering rack teeth, then insert the steering rack (A) into the cylinder (B). Be careful not to damage the inner surface of the cylinder wall and bushing with the rack edges.



65. Set the cylinder (A) in a press, then press the cylinder end seal (B) into the bottom of the cylinder until the mark (C) on the rack meets the edges (D) of the cylinder.



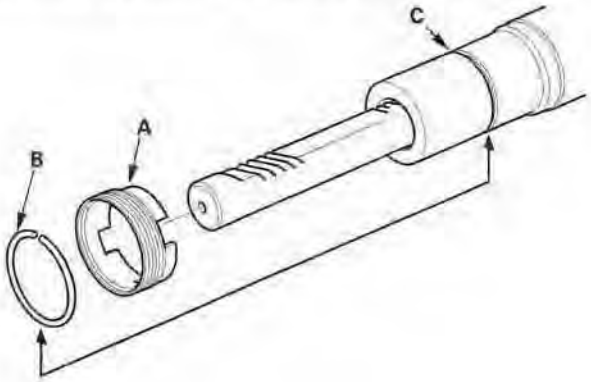
66. Coat the inside and outside surfaces of the new cylinder end seal (A) with power steering fluid.



67. Install the cylinder end seal onto the steering rack (B) with its grooved side (C) toward the piston. Push in the cylinder end seal with your finger.

68. Place the backup ring (D) on the cylinder end seal with its flat side facing upward. Then drive the backup ring in with the appropriate size socket wrench until the its surface is below the internal snap ring groove (E). Install the snap ring (F) in the groove.

69. Install the new lock screw (A) on the cylinder.

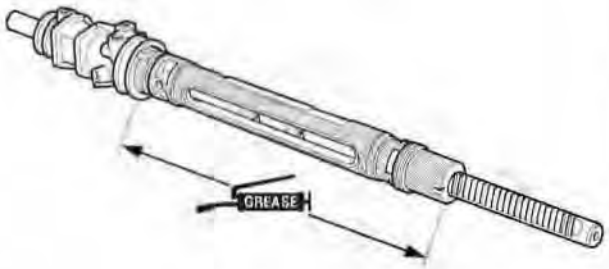


70. Install the new stop ring (B) in the groove (C) on the cylinder by expanding it with snap ring pliers. Be careful not to scratch or damage the cylinder surface with the stop ring edges.

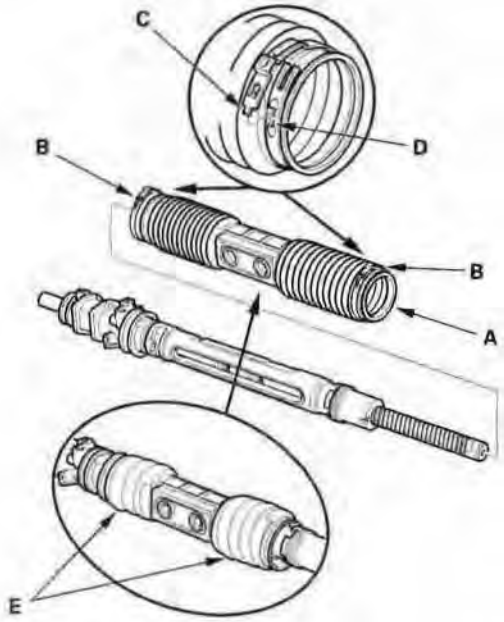
(cont'd)

Steering Gearbox Overhaul (cont'd)

71. Coat the housing surface with multipurpose grease as shown.

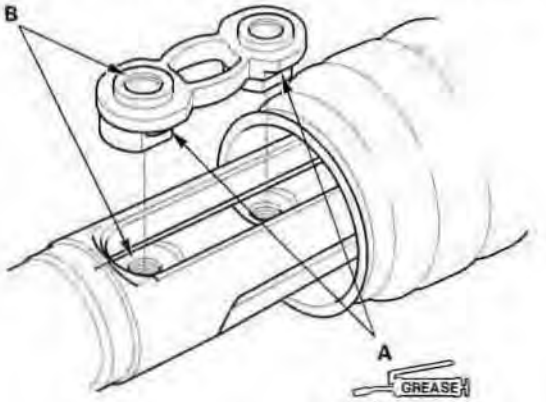


72. Set the new boot bands (B) on the band installation grooves of boot A by aligning the tabs (C) with the holes (D) of the band. Do not close the ear portion of the boot band yet.



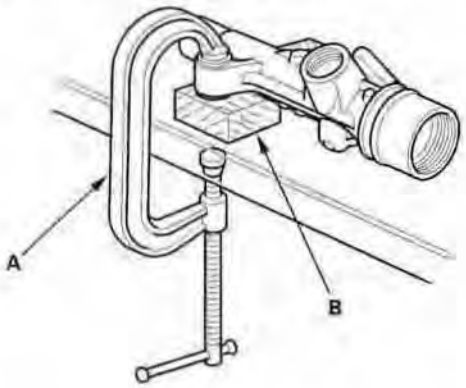
73. Compress boot A by hand, and apply vinyl tape (E) to the bellows so the boots stay collapsed and pulled back. Slide boot A over the cylinder so the smaller diameter end of the boot faces the gearbox housing.

74. Apply power steering grease to the sliding surface of the slider guide (A). Keep grease off of the rack-to-slider guide matching surfaces and the boot-to-slider guide matching surfaces. Slide the steering rack all the way to left, and place the slider guide on the steering rack by aligning the bolt holes (B).

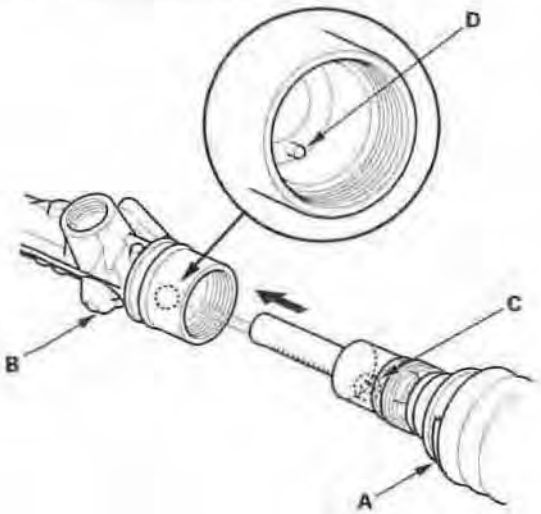


P.S. GREASE (P/N 08C35-B0534L)

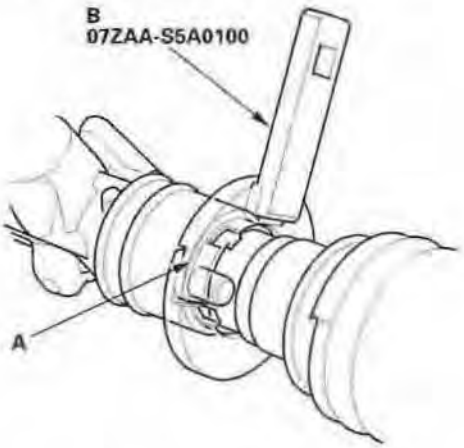
75. Hold the gearbox housing using a C-clamp (A) and the wooden block (B) as shown.



76. Push the cylinder (A) into the gearbox housing (B) so the notch (C) is aligned with the pin (D) inside of the gearbox housing.

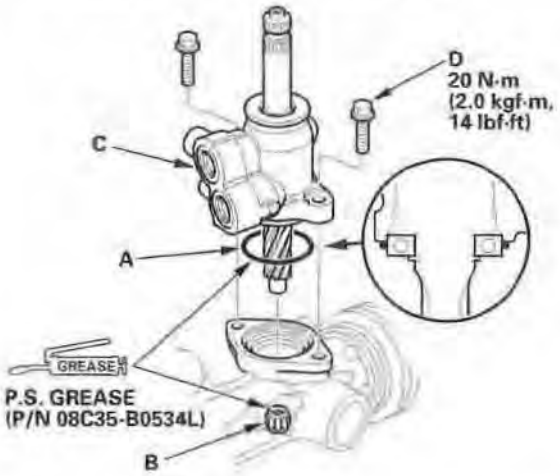


77. Tighten the lock screw (A) by hand first, then install the special tool (B) on the lock screw. Lightly tighten the lock screw. Do not tighten the lock screw to the specified torque yet.



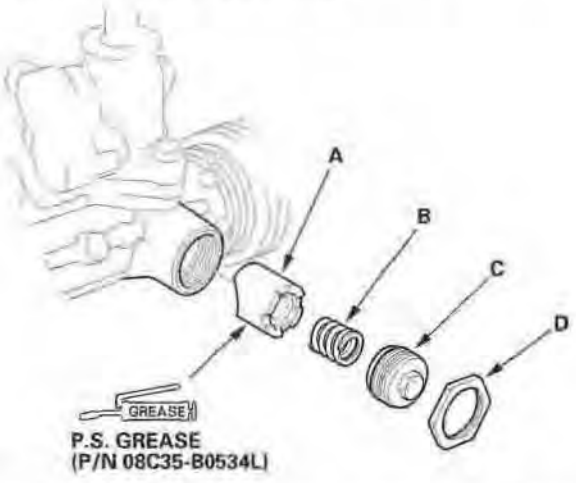
78. Remove the special tool.

79. Coat the new O-ring (A) with power steering grease, and carefully fit it on the valve housing.



80. Apply power steering grease to the needle bearing (B) in the gearbox housing, then install the valve body unit (C) by engaging the gears. Note the valve body unit installation position (direction of the line connections). Tighten the flange bolts (D) to the specified torque.

81. Apply power steering grease to the sliding surface and circumference of the rack guide (A), and install it into the gearbox housing. Wipe the grease off the threaded section of the housing.

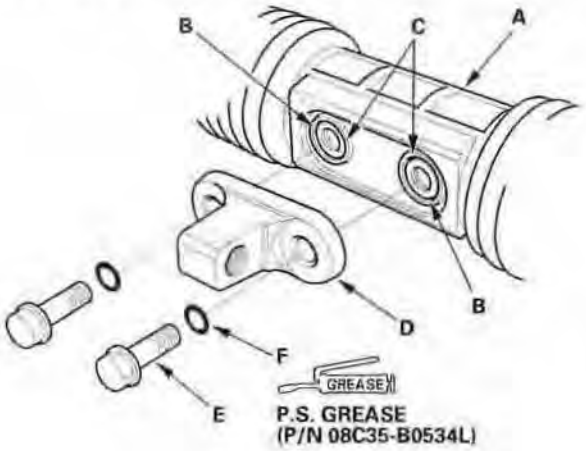


82. Install the spring (B), and rack guide screw (C), then install and tighten it to 25 N·m (2.5 kgf·m, 18 lbf·ft). Loosely install the locknut (D).

(cont'd)

Steering Gearbox Overhaul (cont'd)

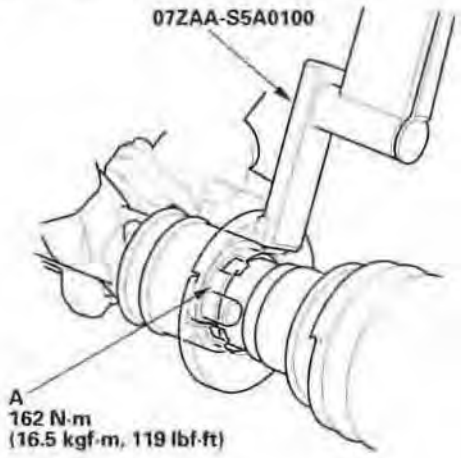
83. Center the steering rack within its stroke, and align the slider guide (B) with the holes (C) in boot A. Fit the slider guide to boot A by pressing around the edges of the holes securely.



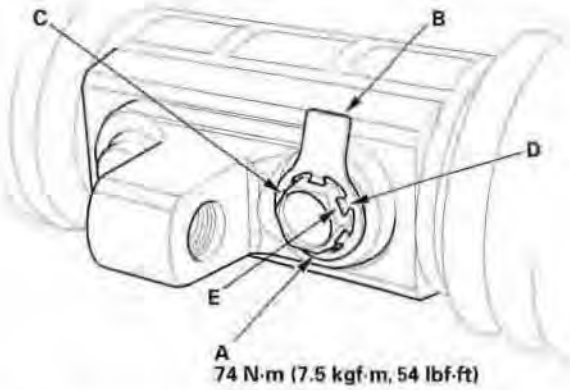
84. Before installing the bracket (D), clean the mating surface of the 12 mm flange bolts (E) and bracket. Coat the new O-rings (F) with power steering grease, and install them on the 12 mm flange bolts.

85. Loosely install the bracket on the steering rack by tightening the 12 mm flange bolts to 25 N·m (2.5 kgf·m, 18 lbf·ft).

86. Hold the gearbox housing using a C-clamp, then install the special tool on the lock screw (A). Retighten the lock screw to the specified torque values. Remove the special tool.



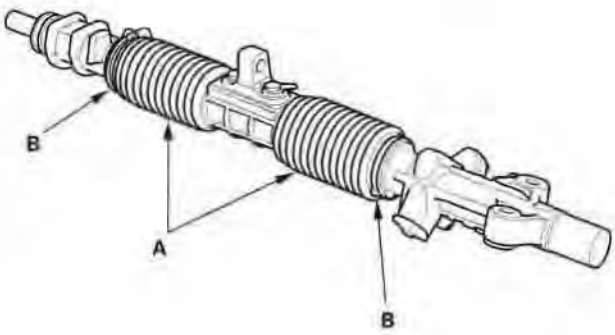
87. Retighten the 12 mm flange bolts (A) to the specified torque values.



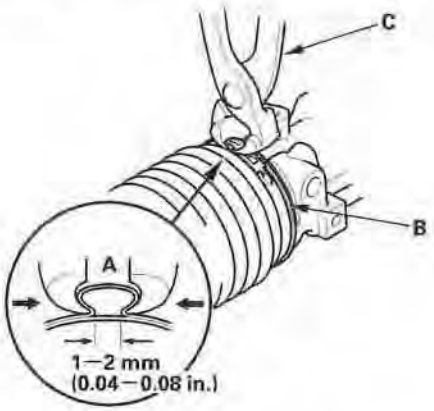
88. After tightening the 12 mm flange bolts, install a new stop washer (B) over one of the bolt heads (C). Be sure the tabs (D) of the stop washer are aligned with the flat surfaces (E) of the bolt head.

89. Clean off any grease or contamination from the boot installation grooves around the housing.

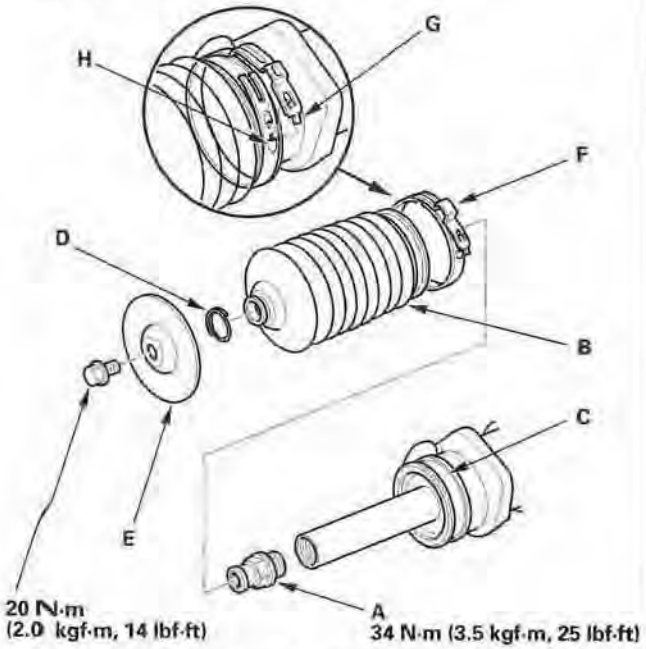
90. Expand boot A by removing the vinyl tape, and fit the boot ends (B) in the installation grooves on the cylinder housing.



91. Close the ear portion (A) of the bands (B) with a commercially available pincers, Oetiker 1098 or equivalent (C).

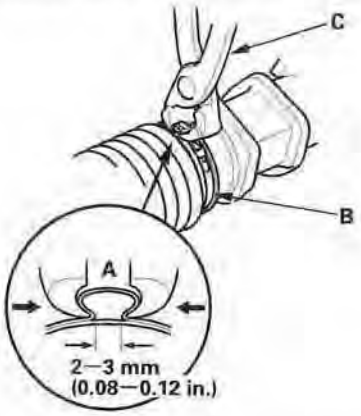


92. Install the rack end plug (A). Clean off any grease or contamination from the boot installation grooves (C) around the housing.

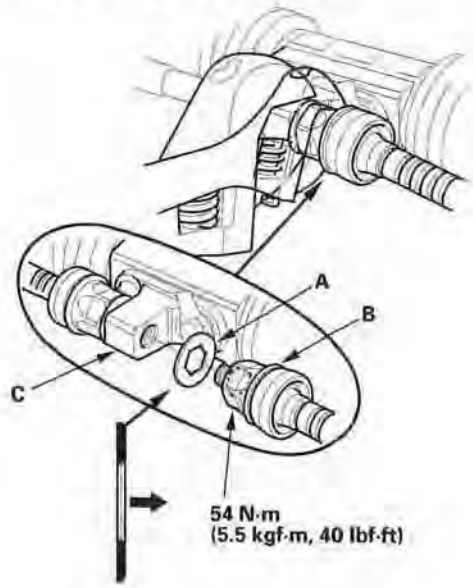


93. Slide the steering rack, and adjust the distance between the cylinder housing end and the end of the rack end plug to 70.5 mm (2.8 in.). Install boot B, and set the boot end in the installation grooves in the cylinder housing and rack end plug properly. Install the clip (D) and boot guard (E). Install the new boot band (F) in the band grooves of boot B by aligning the tabs (G) with the holes (H) in the band.

94. Close the ear portion (A) of the band (B) with a commercially available pincers, Oetiker 1098 or equivalent (C). Slide the rack right and left to be certain that the boots are not deformed or twisted.



95. Install a new lock washer (A) on the tie-rod (B) with the radiused side of the washer toward the tie-rod, and screw the tie-rod into the bracket (C). Repeat this step for the other tie-rod. Hold the bracket with one wrench, and tighten both tie-rods to the specified torque with another wrench.



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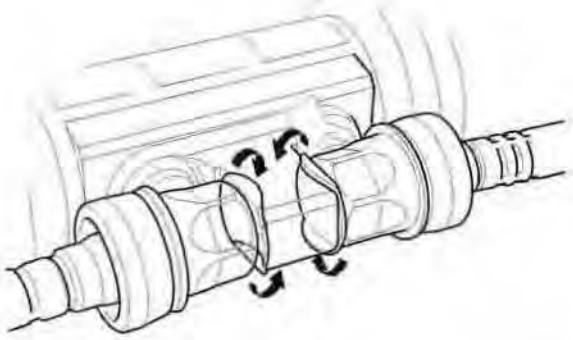
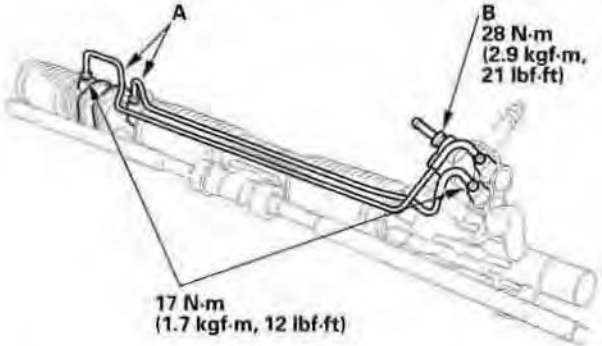
Steering Gearbox Overhaul (cont'd)

96. Bend the lock washers against the flat spots on the bracket with a large pair of pliers.



97. Install the cylinder lines (A) and return line joint (B).

Note these items during reassembly:
- Thoroughly clean the joints of the cylinder lines. The joints must be free of foreign material.
- Install the cylinder lines by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.

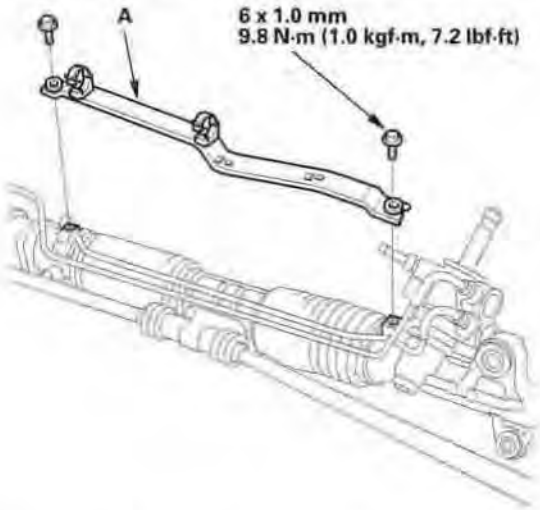


98. Adjust the rack guide screw (see page 17-30). After adjusting, check that the rack moves smoothly by sliding it right and left.

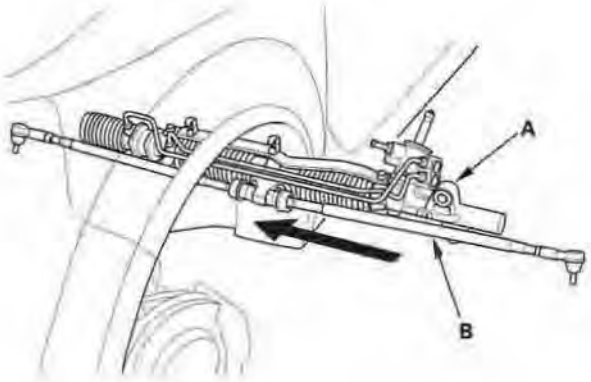
99. Install the steering gearbox (see page 17-53).

Steering Gearbox Installation

1. Install the P/S line mounting bracket (A).

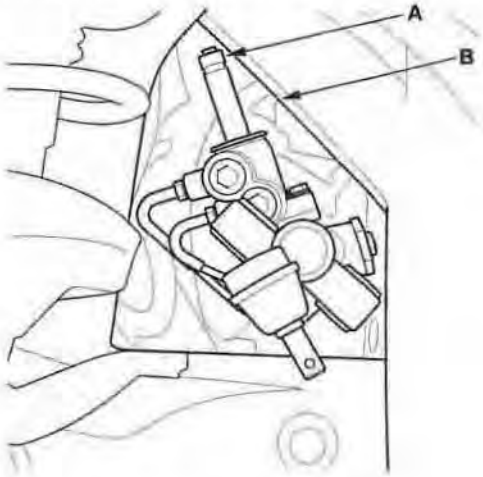


2. Pass the cylinder of the steering gearbox (A) together with the tie-rods (B) through the wheelwell opening on the driver's side.

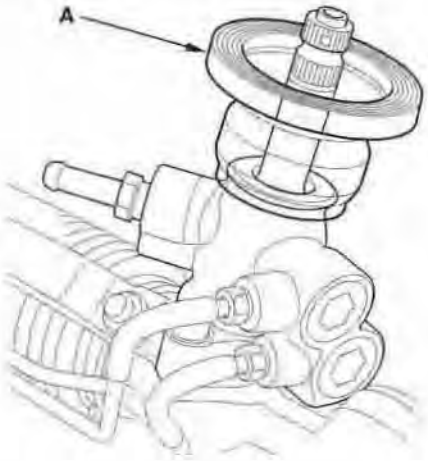


3. Carefully move the steering gearbox toward the passenger's side until the pinion shaft (A) clears the wheelwell opening (B) on the frame. Continue moving the gearbox toward the passenger's side until the steering gearbox is in position.

NOTE: Make sure the power steering return hose is routed between the gearbox and right tie-rod.



4. Install the pinion shaft grommet (A).



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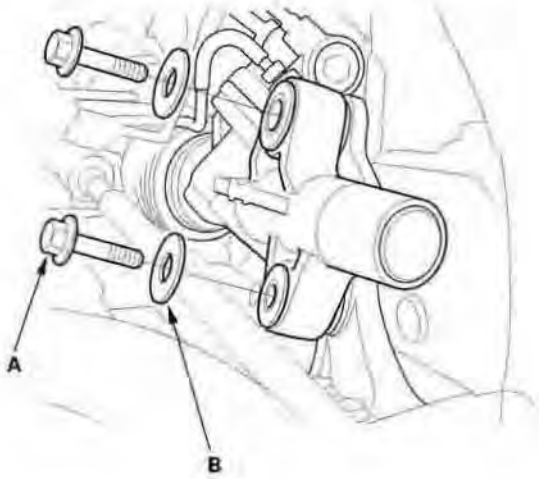
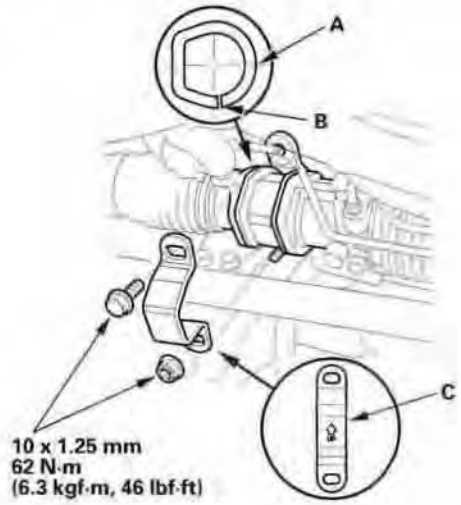
Steering Gearbox Installation (cont'd)

5. Insert the pinion shaft up through the bulkhead, and place the steering gearbox on the mounting brackets. Be sure that the pinion shaft grommet is in place securely.

6. Loosely install the two 10 mm flange bolts (A) and washers (B) on the left side of the gearbox.



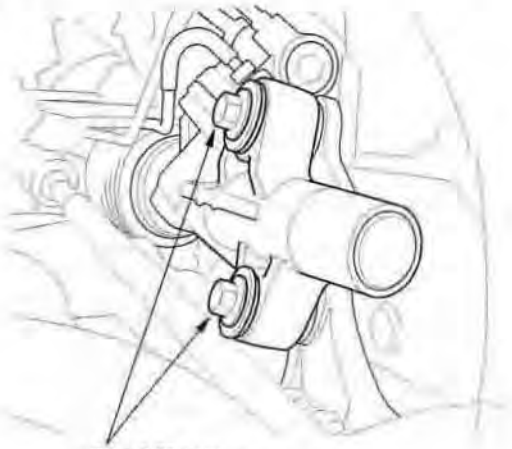
7. Install the mounting cushion (A) on the right side of the gearbox. Position the cutout (B) on the mounting cushion as shown.



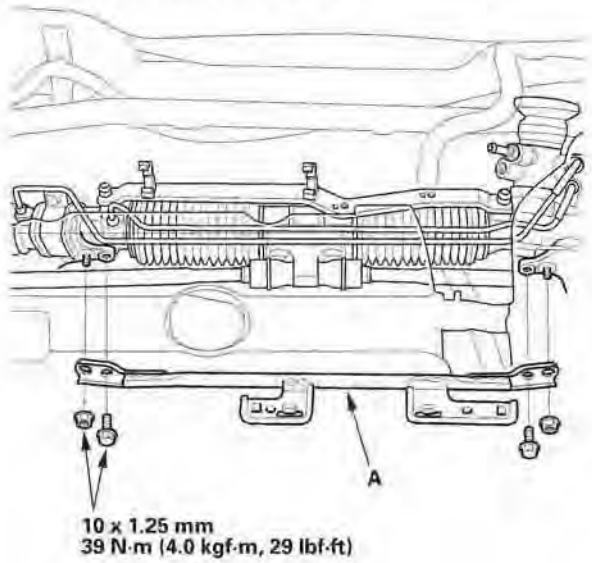
8. Install the mounting bracket (C) over the mounting cushion.

9. Install the 10 mm flange bolt and nut loosely first, then torque the flange bolt and nut alternately in two or more steps.

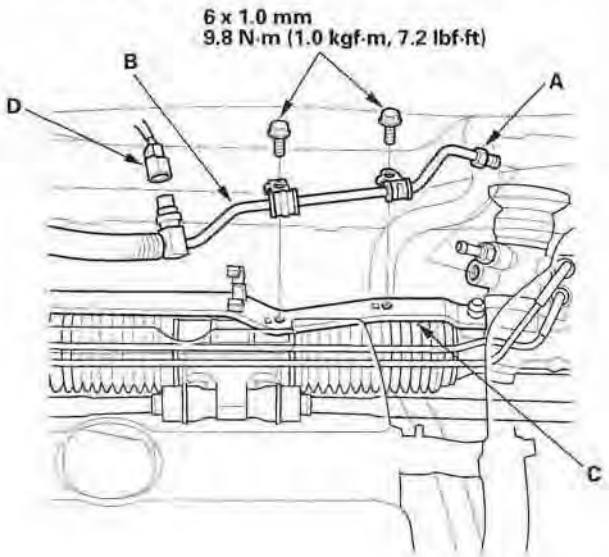
10. Tighten the left side flange bolts to the specified torque value.



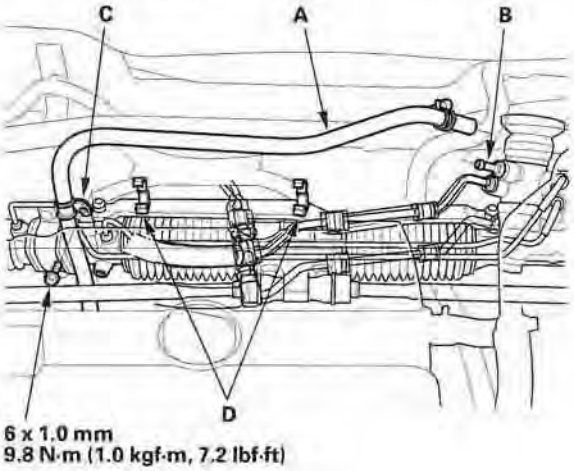
11. Install the body stiffener (A).



12. Loosely connect the 14 mm flare nut (A) to the valve body unit, and install the feed line (B) on the P/S line mounting bracket (C). Connect the power steering pressure switch connector (D).

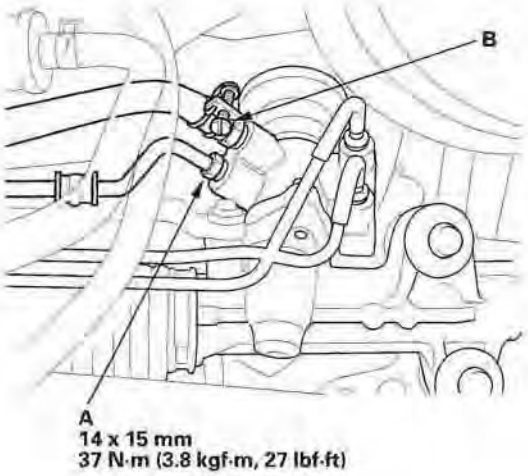


13. Connect the return hose (A) to the return line joint (B) securely. Install the return hose clamp (C) on the steering gearbox.



14. Install the return hose on the hose holders (D) securely.

15. Tighten the 14 mm flare nut (A) to the specified torque and the adjustable hose clamp (B) (see page 17-13).



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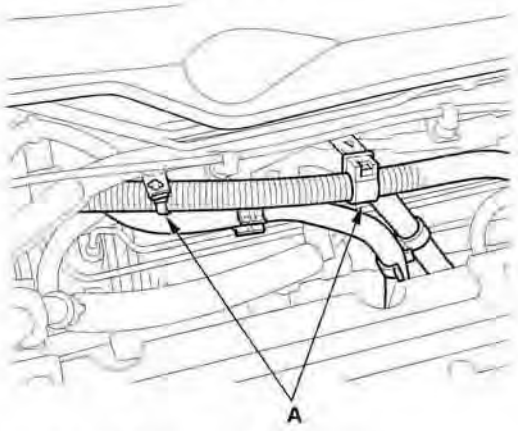
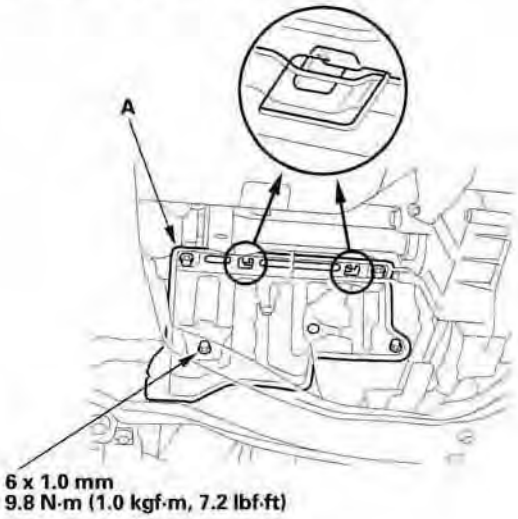
Steering Gearbox Installation (cont'd)

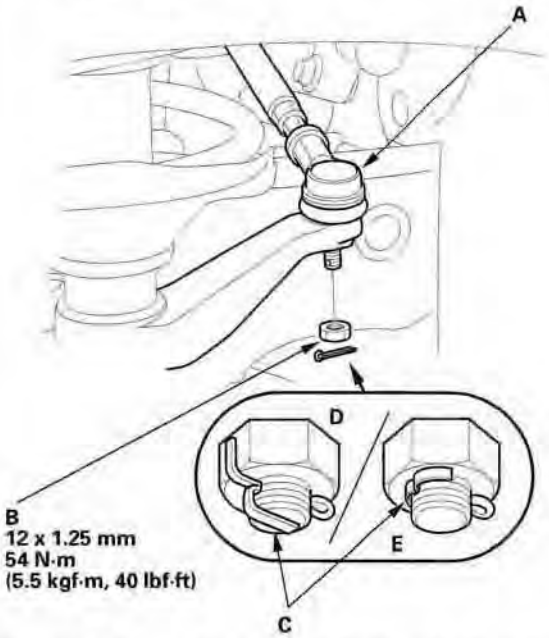
16. Reinstall the engine wire harness clamp and clip (A) to the mounting brackets.



17. Install the P/S heat baffle plate (A).



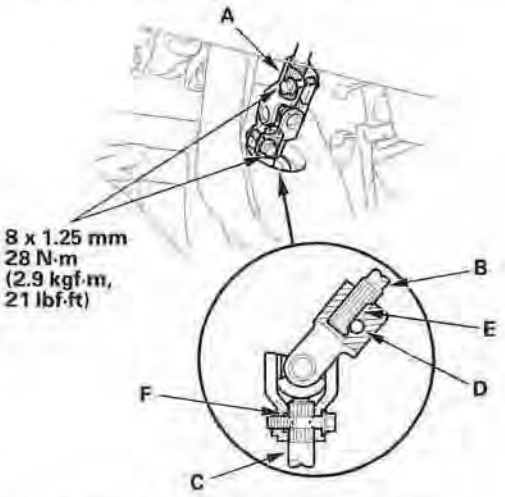
18. Clean off any grease or contamination from the ball joint tapered section and threads. Then reconnect the tie-rod end (A) to the damper steering arms. Install the 12 mm nut (B), and tighten it to the specified torque.



19. Install a new cotter pin (C), and bend it as shown (D) or (E).

20. Install the steering joint (A), and reconnect the steering shaft (B) and pinion shaft (C). Make sure the steering joint is connected as follows:

    - Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole (D) with the flat portion (E) on the shaft).
    - Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove (F) around the shaft), and loosely install the lower joint bolt. Be sure that the lower joint bolt is securely in the groove in the pinion shaft.
    - Pull on the steering joint to make sure that the steering joint is fully seated. Then install the upper joint bolt and tighten it. Tighten the lower joint bolt to the specified torque.



21. Install the driver's dashboard lower cover (see page 20-73).

22. Install the front wheel, then set the wheels in the straight ahead position.

23. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (about two and a half turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see page 17-24).

24. Fill the system with power steering fluid, and bleed air from the system (see page 17-12).

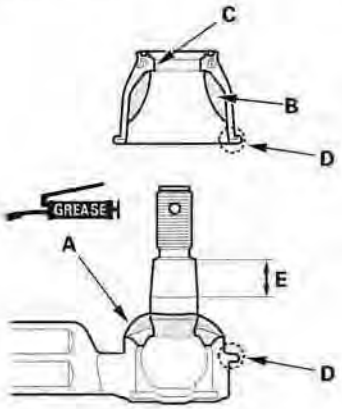
25. After installation, perform the following checks.

    - Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid. Check the gearbox for leaks (see page 17-11).
    - Perform the front toe inspection (see page 18-7).
    - Check the steering wheel spoke angle.
      If steering spoke angles to the right and left are not equal (steering wheel and rack are not centered), correct the engagement of the joint/pinion shaft serrations, then adjust the front toe by turning the tie-rods, if necessary.

Tie-rod Ball Joint Boot Replacement

Special Tools Required
Attachment, 42 mm 07QAD-P0A0100

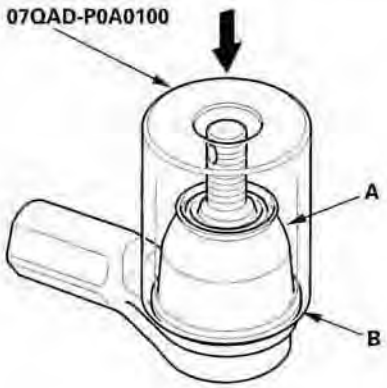
1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.
2. Pack the lower area of the ball pin (A) with fresh multipurpose grease.



3. Pack the interior of the new boot (B) and lip (C) with multipurpose grease.

   Note these items when installing new grease:
   - Keep grease off the boot mounting area (D) and the tapered section (E) of the ball pin.
   - Do not allow dust, dirt, or other foreign materials to enter the boot.

4. Install the new boot (A) using the special tool. The boot must not have a gap at the boot installation sections (B). After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.



Suspension

Front and Rear Suspension

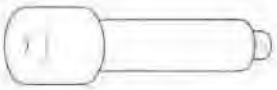
Front Suspension

Rear Suspension

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07AAF-SDAA100	Ball Joint Thread Protector, 12 mm	1
②	07GAF-SD40100	Hub Dis/Assembly Tool	1
③	07MAC-SL00200	Ball Joint Remover, 28 mm	1
④	07965-SA50500	Front Hub Dis/Assembly Tool	1
⑤	07746-0010500	Attachment, 62 x 68 mm	1
⑥	07749-0010000	Driver	1
⑦	07965-SD90100	Support Base	1
⑧	07965-SA70100	Hub Dis/Assembly Tool	1

①



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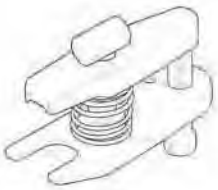

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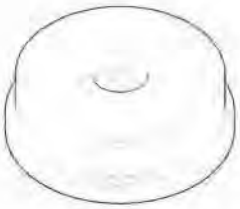
④



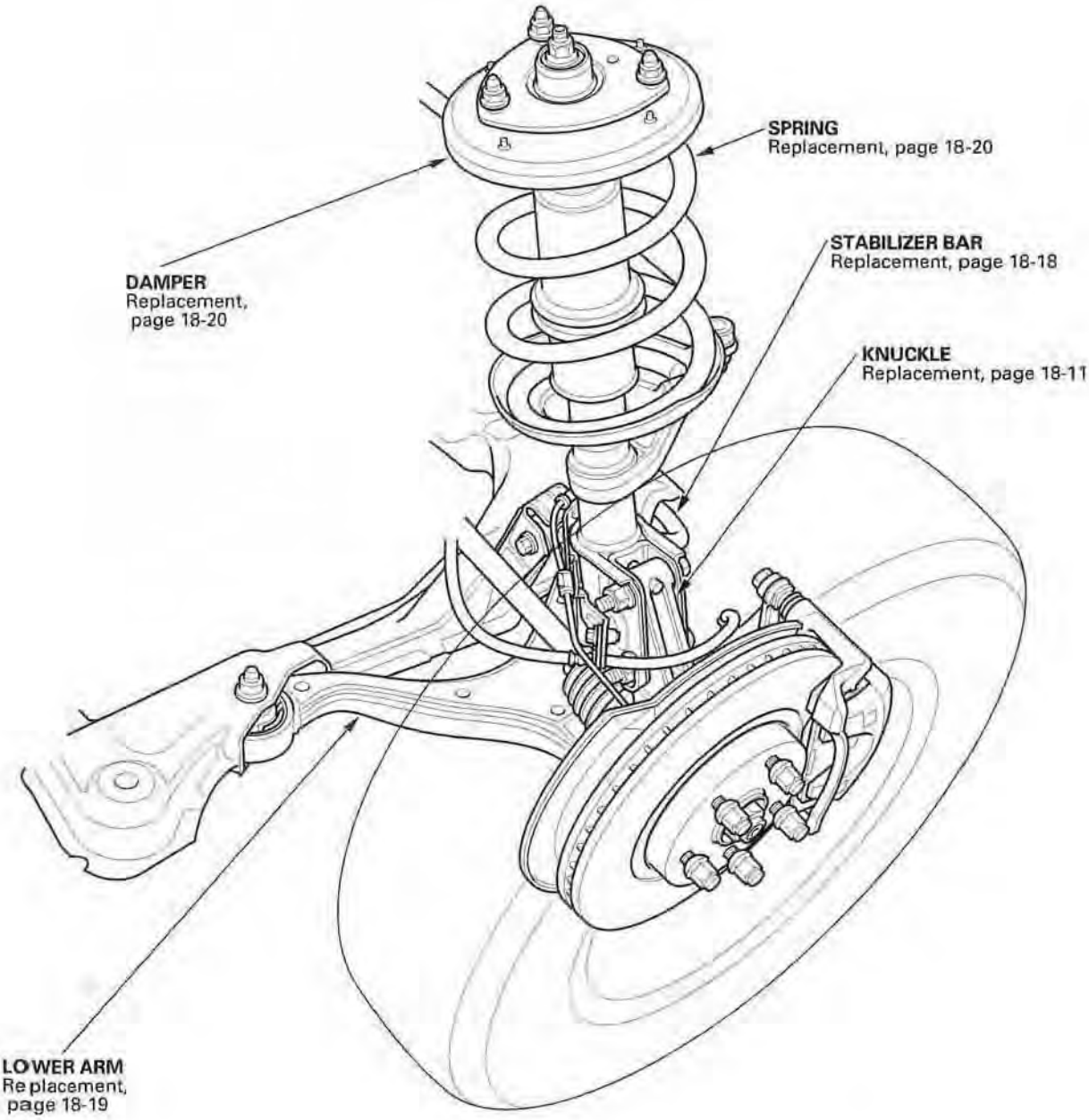
⑤

⑥

⑦

Component Location Index

Front Suspension



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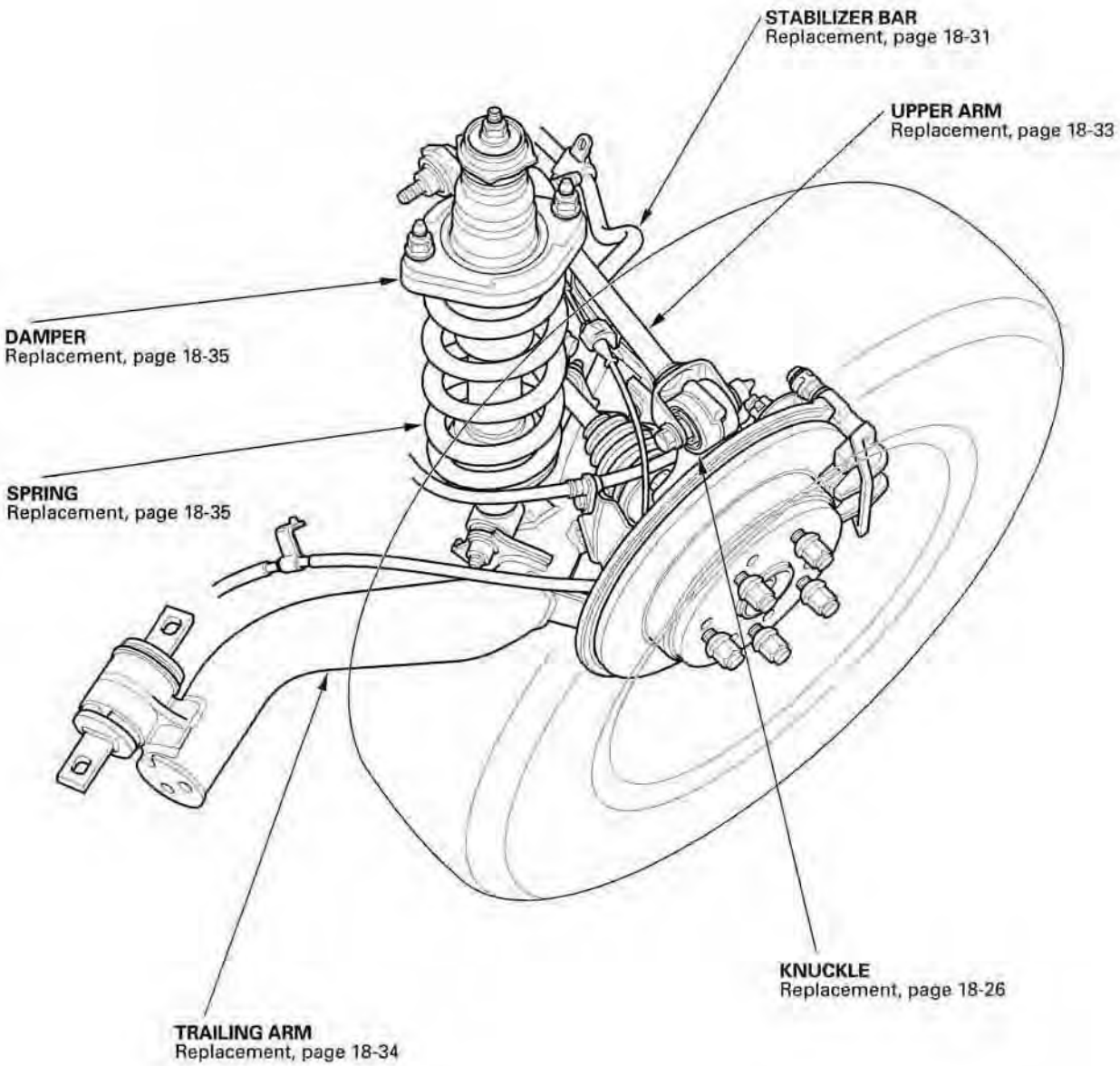
Component Location Index (cont'd)

Rear Suspension



Wheel Alignment

The suspension can be adjusted for front camber, front toe, and rear toe. However, each of these adjustments are interrelated to each other. For example, when you adjust toe, the camber changes. Therefore, you must adjust the front wheel alignment whenever you adjust camber or toe.

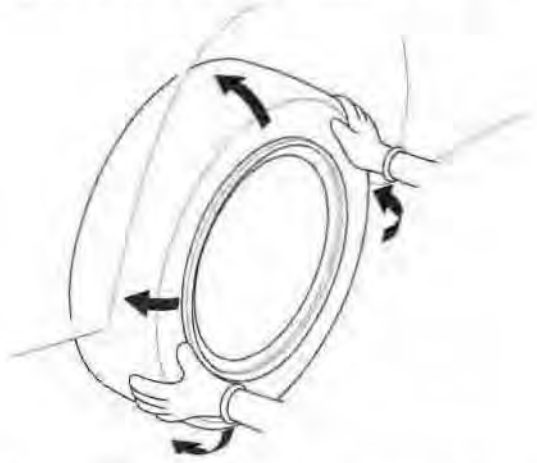
Pre-Alignment Checks

For proper inspection and adjustment of the wheel alignment, do these checks:

1. Release the parking brake to avoid an incorrect measurement.
2. Make sure the suspension is not modified.
3. Check the tire size and tire pressure.

   Tire size:
   Front/Rear: P215/70R16 99S

   Tire pressure:
   Front: 220 kPa (2.2 kgf/cm², 32 psi)
   Rear: 235 kPa (2.4 kgf/cm², 34 psi)
4. Check the runout of the wheels and tires.
5. Check the suspension ball joints. (Hold a wheel with your hands, and move it up and down and right and left to check for wobbling.)



6. Bounce the vehicle up and down several times to stabilize the suspension.

Caster Inspection

Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacture's instructions.

Check the caster angle.

Caster angle: 1 ° 50 ′±1 °

- If the measurement is within specifications, measure the camber angle.
- If the measurement is not within specifications, check for bent or damaged suspension components.

(cont'd)

Wheel Alignment (cont'd)

Camber Inspection

Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

Check the camber angle.

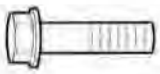
Camber angle:
Front: −0 ° 13 ′±45 ′
Rear: −1 ° 00 ′±45 ′

- If the measurement for the front camber is outside the specification, go to front camber adjustment.
- If the measurement for the rear camber is outside the specification, check for bent or damaged suspension components.

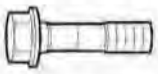
Front Camber Adjustment

The front camber can be adjusted by exchanging one or both of the damper pinch bolts with the smaller diameter adjusting bolt(s). The difference between the adjusting bolt diameter and the pinch bolt hole diameter allows a small range of adjustment.

Damper Pinch Bolt:



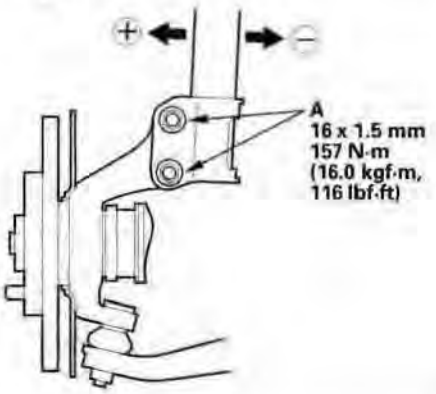
Adjusting Bolt:
P/N 90188-S6M-Z01



1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9).

2. Loosen the flange nuts (A) and bolts, and adjust the camber by moving the bottom of the damper within the range of the damper pinch bolt free play. Tighten the flange nuts to the specified torque.

   NOTE: The camber angle can be adjusted up to ±15 ′ (center of tolerance) by replacing one damper pinch bolt with the adjusting bolt. The camber angle can be adjusted up to ±30 ′ by replacing both damper pinch bolts with the adjusting bolts.



3. Reinstall the front wheels, lower the front of the vehicle to the ground, and bounce the front of the vehicle several times to stabilize the suspension.

4. Measure the camber angle.

   - If the measurement is within specification, measure the toe-in.
   - If the measurement is not within specification, check for bent or damaged suspension components.

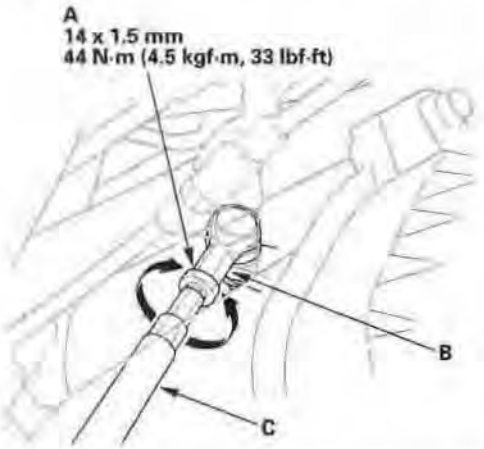
Front Toe Inspection/Adjustment

Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Center the steering wheel spokes.
2. Check the toe with the wheels pointed straight ahead.

   Front toe-in: 0±3 mm (0±1/8 in.)

   - If no adjustment is required, remove the alignment equipment.
   - If adjustment is required, go to step 3.
3. Loosen the tie-rod locknuts (A) while holding the tie-rod end (B).



4. Turn the tie-rod arm (C) until the front toe is within specifications.
5. After adjusting, tighten the locknut while holding the tie-rod arm. Make sure the toe setting does not change.

Rear Toe Inspection/Adjustment

Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

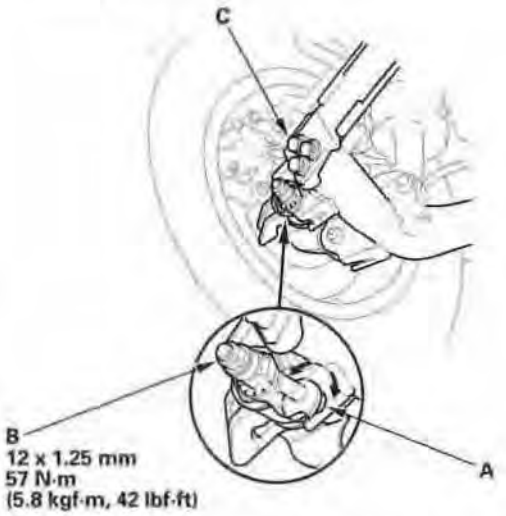
1. Release the parking brake to avoid an incorrect measurement.
2. Check the toe.

   Rear toe-in: 2^{+2}_{-1} mm ($1/16^{+1/16}_{-1/32}$ in.)

   - If no adjustment is required, remove the alignment equipment.
   - If adjustment is required, go to step 3.
3. Hold the adjusting bolt (A) on the rear trailing arm, and loosen the self-locking nut (B).

   NOTICE

   Do not loosen the special bolts (C) on the trailing arm.



4. Adjust the rear toe by turning the adjusting bolt until the toe is correct.
5. Tighten the self-locking nut while holding the adjusting bolt.

(cont'd)

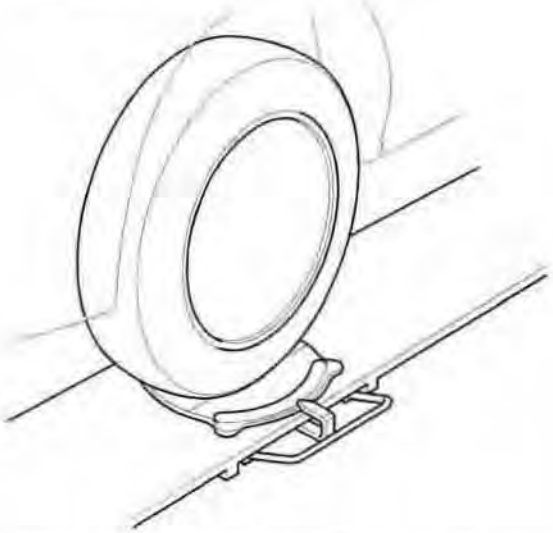
Wheel Alignment (cont'd)

Turning Angle Inspection

Use commercially available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

   Turning angle:
   Inward: 40 ° 05 ' ±2 °
   Outward: 32 ° 16 ' (reference)



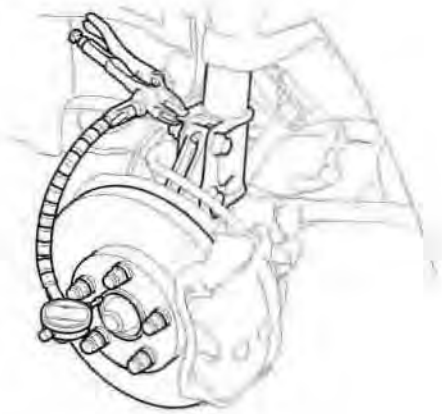
2. If the turning angle is not within the specifications, check for bent or damaged suspension components.

Wheel Bearing End Play Inspection

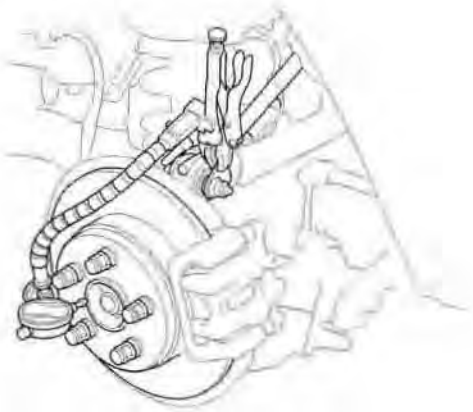
1. Raise the vehicle, and support it with safety stands in the proper locations (see page 1-9).
2. Remove the wheels, then reinstall the wheel nuts.
3. Attach the dial gauge. Place the dial gauge against the hub flange.

   Front/Rear:
   Standard: 0—0.05 mm (0—0.002 in.)

   Front



   Rear



4. Measure the bearing end play moving the brake disc inward or outward.
5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

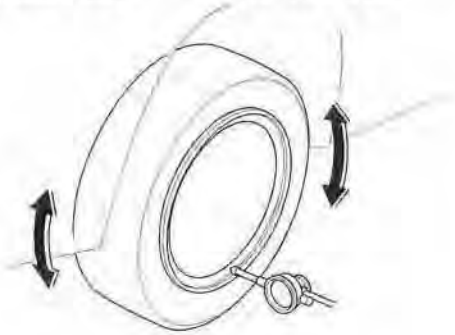
Wheel Runout Inspection

1. Raise the vehicle, and support it with safety stands in the proper locations (see page 1-9).

2. Check for bent or deformed wheels.

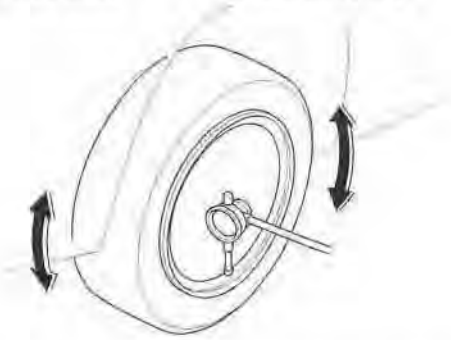
3. Set up the dial gauge as shown, and measure axial runout by turning the wheel.

Front and rear wheel axial runout:
Standard:
Aluminum wheel: 0—0.6 mm (0—0.02 in.)
Steel wheel: 0—1.4 mm (0—0.06 in.)
Service limit: 2.0 mm (0.08 in.)



4. Reset the dial gauge to the position shown, and measure the radial runout.

Front and rear wheel radial runout:
Standard:
Aluminum wheel: 0—0.6 mm (0—0.02 in.)
Steel wheel: 0—1.4 mm (0—0.06 in.)
Service limit: 1.5 mm (0.06 in.)



5. If the wheel runout is not within the specification, check the wheel bearing end play (see page 18-8), and make sure the mating surfaces on the brake disc and the inside of the wheel are clean.

6. If the bearing end play is within the specification but the wheel runout is more than the service limit, replace the wheel.

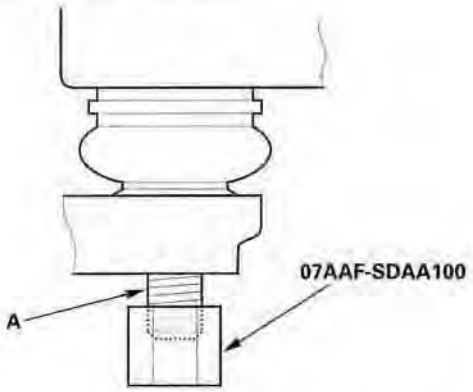
Ball Joint Removal

Special Tools Required
- Ball joint thread protector, 12 mm 07AAF-SDAA100
- Ball joint remover, 28 mm 07MAC-SL00200

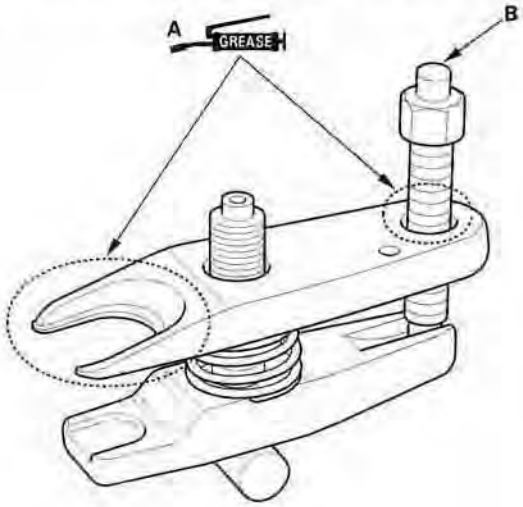
NOTICE

Always use a ball joint remover to disconnect a ball joint. Do not strike the housing or any other part of the ball joint connection to disconnect it.

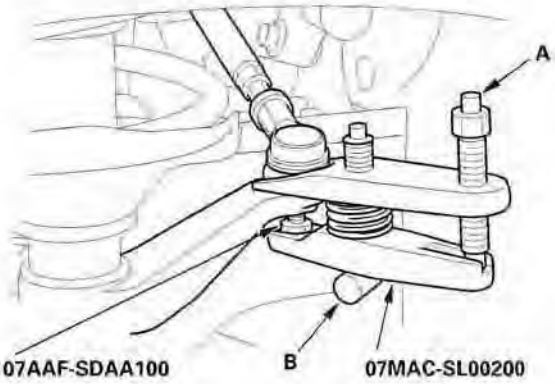
1. Install the ball joint thread special tool onto the threads of the ball joint (A).



2. Apply grease to the special tool on the areas shown (A). This will ease installation of the tool and prevent damage to the pressure bolt (B) threads.



3. Loosen the pressure bolt (A), and install the special tools as shown. Insert the jaws carefully, making sure not to damage the ball joint boot. Adjust the jaw spacing by turning the head (B) of the adjusting bolt.



4. After adjusting the adjusting bolt, make sure the head of the adjusting bolt is in the position shown to allow the jaw to pivot.

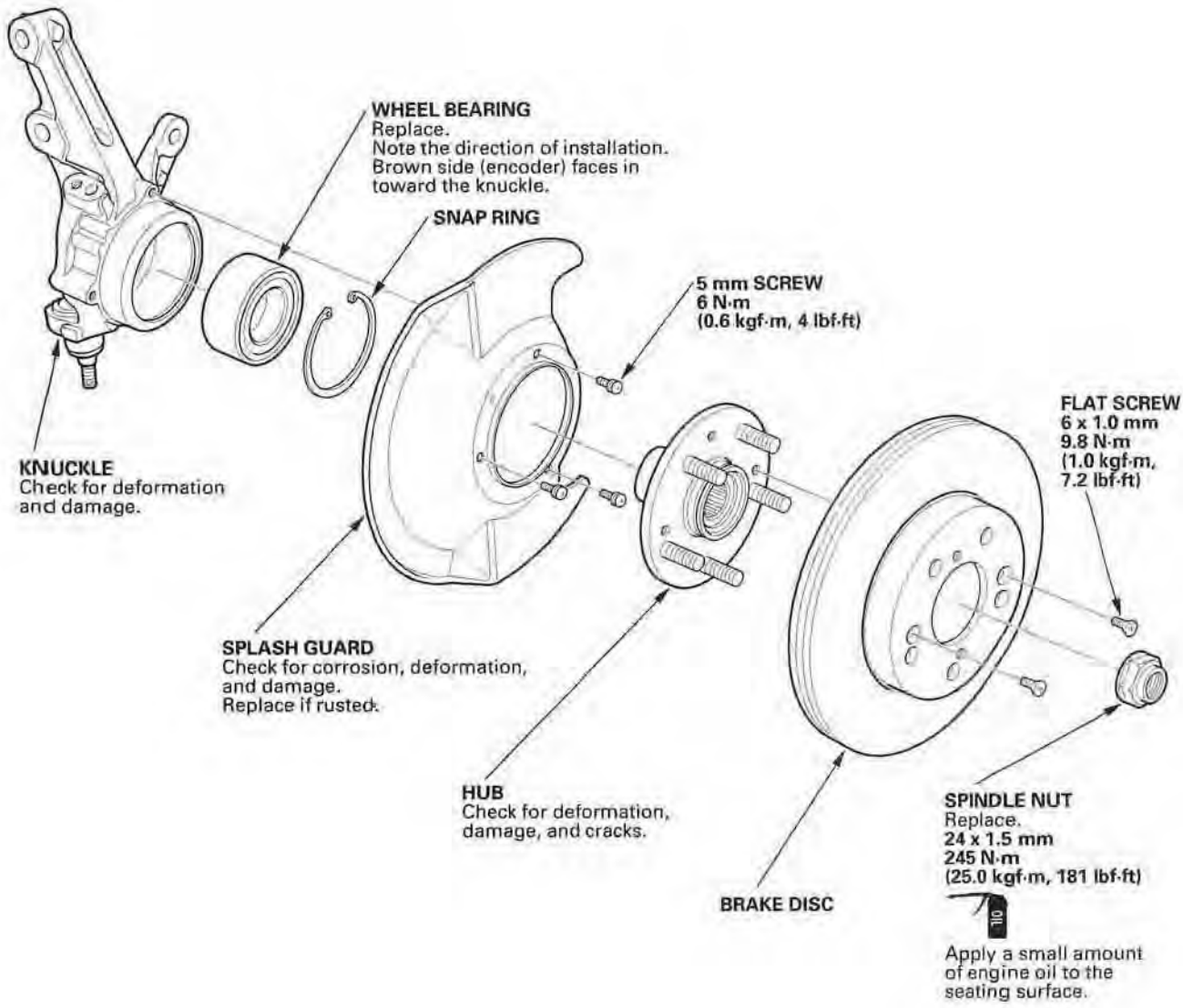
5. With a wrench, tighten the pressure bolt until the ball joint pin pops loose from the steering arm or knuckle. If necessary, apply penetrating type lubricant to loosen the ball joint pin.

   NOTE: Do not use pneumatic or electric tools on the pressure bolt.

6. Remove the tools, and pull the ball joint out of the steering arm or knuckle. Inspect the ball joint boot, and replace it if damaged.

Knuckle/Hub/Wheel Bearing Replacement

Exploded View



(cont'd)

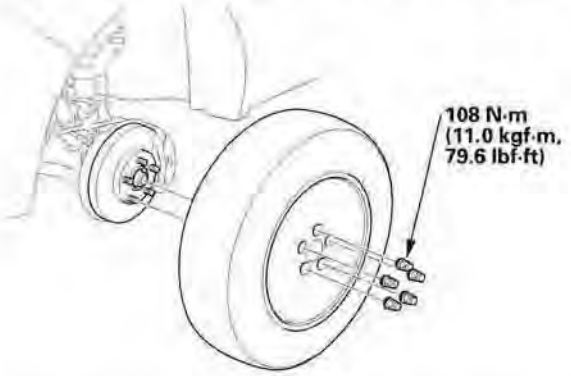
Knuckle/Hub/Wheel Bearing Replacement (cont'd)

Special Tools Required
- Hub dis/assembly tool 07GAF-SD40100
- Ball joint remover, 28 mm 07MAC-SL00200
- Attachment, 62 x 68 mm 07746-0010500
- Driver 07749-0010000
- Support base 07965-SD90100
- Ball joint thread protector, 12 mm 07AAF-SDAA100

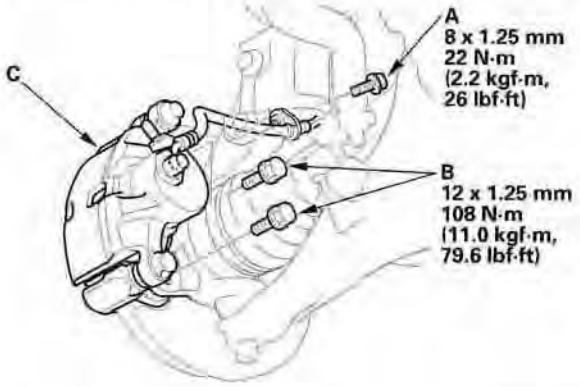
Knuckle and Hub Replacement

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9).

2. Remove the wheel cap, wheel nuts, and front wheel.

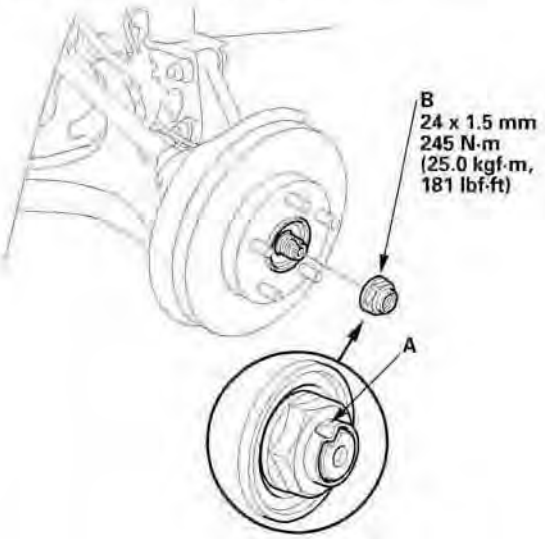


3. Remove the brake hose bracket mounting bolt (A).

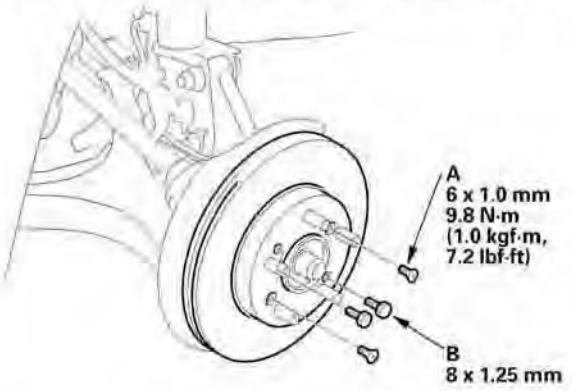


4. Remove the caliper bracket mounting bolts (B), and remove the caliper assembly (C) from the knuckle. To prevent damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper assembly from the undercarriage. Do not twist the brake hose with force.

5. Raise the stake (A) of the spindle nut (B), then remove and discard the nut.

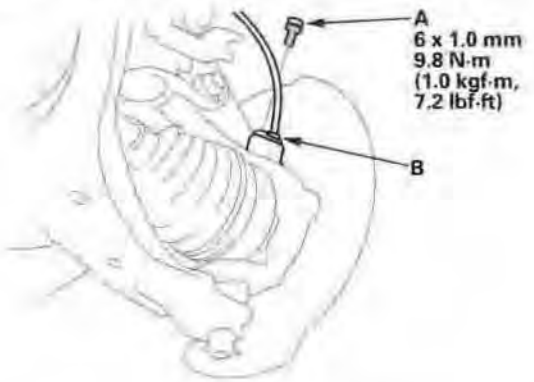


6. Remove the brake disc retaining flat screws (A).

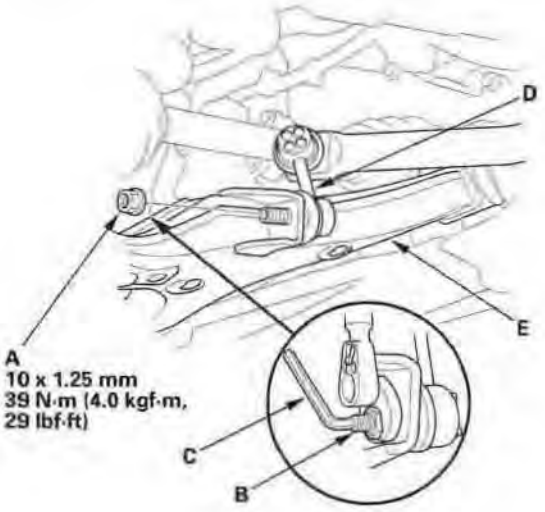


7. Screw two 8 x 1.25 mm bolts (B) into the disc to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the disc excessively.

8. With ABS: Remove the flange bolt (A) and wheel sensor (B) from the knuckle. Do not disconnect the wheel sensor connector.

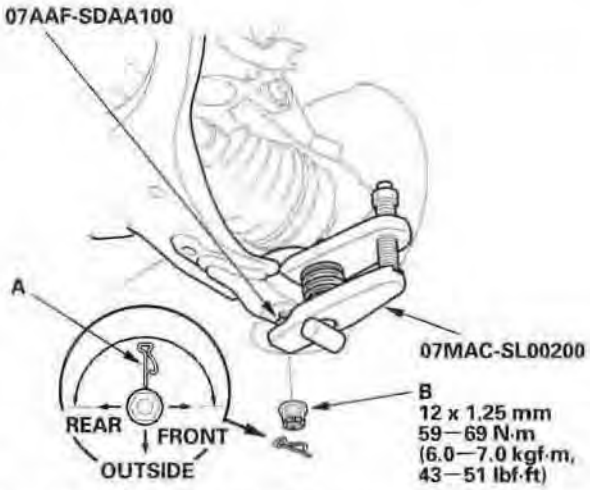


9. Remove the flange nut (A) while holding the joint pin (B) with a hex wrench (C), and disconnect the stabilizer link (D) from the lower arm (E).



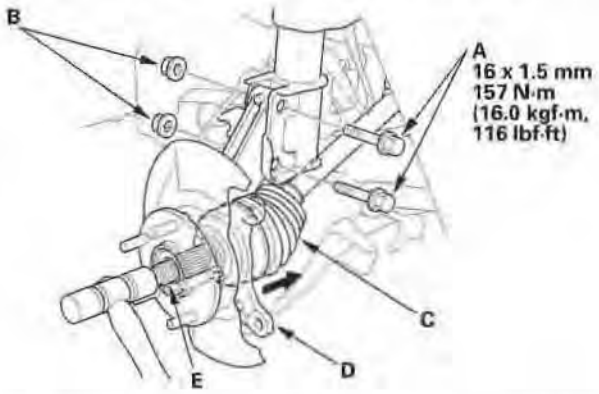
10. Remove the lock pin (A) from the lower arm ball joint, and remove the castle nut (B).

NOTE: During installation, insert the lock pin into the ball joint pin from the inside to the outside of the vehicle. The closed end of the lock pin must be in the range shown.



11. Disconnect the lower arm from the knuckle using the special tools (see page 18-10).

12. Loosen the damper pinch bolts (A) while holding the nuts (B), and remove the bolts and nuts.



13. Remove the driveshaft outboard joint (C) from the knuckle (D) by tapping the driveshaft end (E) with a plastic hammer while drawing the knuckle outward, then remove the knuckle.

NOTE: Do not pull the driveshaft end outward. The driveshaft joint may come off.

(cont'd)

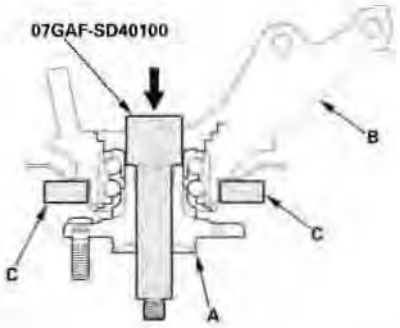
Knuckle/Hub/Wheel Bearing Replacement (cont'd)

14. Install the knuckle/hub/hub bearing unit in the reverse order of removal, and note these items:

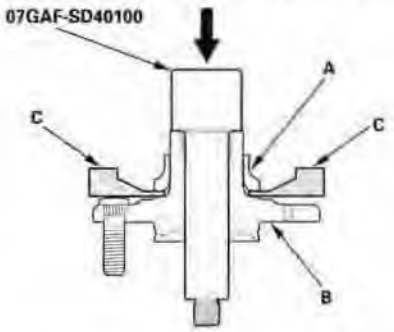
- Be careful not to damage the ball joint boot when installing the knuckle.
- Tighten all mounting hardware to the specified torque values.
- First install all the components and lightly tighten the bolts and nuts, then raise the suspension with a floor jack to load it with the vehicle's weight before fully tightening to the specified torque values. Do not place the jack against the ball joint pin of the lower arm.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the ball joint pin hole. Do not align the castle nut by loosening it.
- Install a new lock pin on the castle nut after torquing.
- Use a new spindle nut on reassembly.
- Before installing the new spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.
- Replace the self-locking nuts, damper pinch bolts and nuts with new ones.
- Before installing the brake disc, clean the mating surface of the front hub and the inside of the brake disc.
- Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
- Check the front wheel alignment, and adjust it if necessary (see page 18-5).

Wheel Bearing Replacement

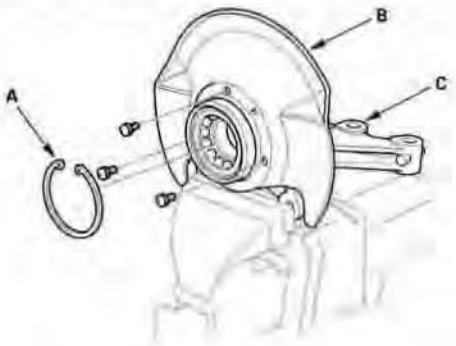
1. Separate the hub (A) from the knuckle (B) using the special tool and a hydraulic press. Hold the knuckle with the attachment (C) of the hydraulic press or equivalent tool. Be careful not to deform the splash guard. Hold onto the hub to keep it from falling when pressed clear.



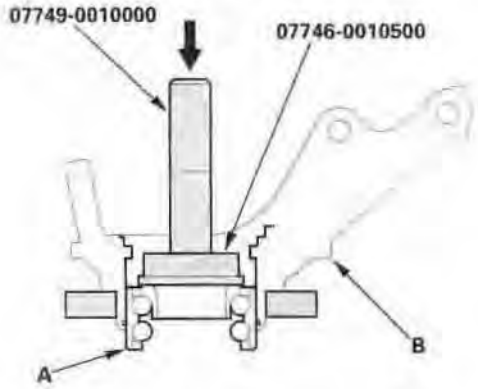
2. Press the wheel bearing inner race (A) out of the hub (B) using the special tool, a commercially available bearing separator (C), and a press.



3. Remove the snap ring (A) and the splash guard (B) from the knuckle (C).



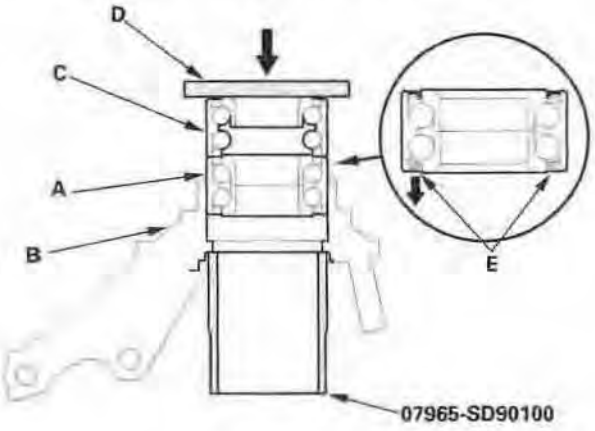
4. Press the wheel bearing (A) out of the knuckle (B) using the special tools, and a press.



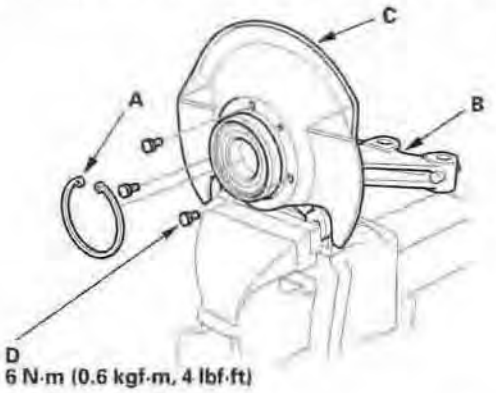
5. Wash the knuckle and hub thoroughly in a high flash point solvent before reassembly.

6. Press a new wheel bearing (A) into the knuckle (B) using the old bearing (C), a steel plate (D), the special tool, and a press.

   NOTE (with ABS):
   - Install the wheel bearing with the magnetic encoder (E) (brown color) toward the inside of the knuckle.
   - Remove any oil, grease, dust, metal debris, or other foreign material from the encoder surface.
   - Keep magnetic tools away from the encoder surface.
   - Be careful not to damage the encoder surface when you insert the wheel bearing.

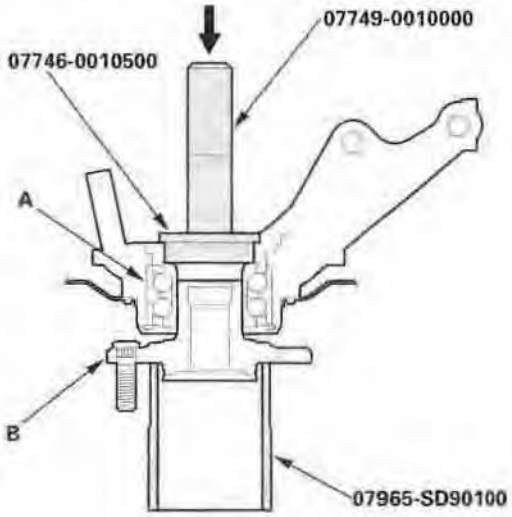


7. Install the snap ring (A) securely in the knuckle (B).



8. Install the splash guard (C), and tighten the screws (D) to the specified torque value.

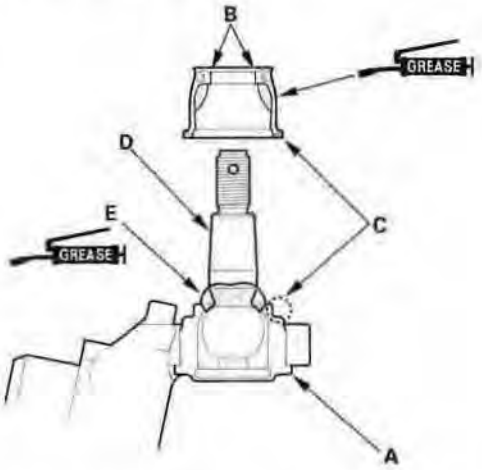
9. Press a wheel bearing (A) onto the hub (B) using the special tools, and a press.



Ball Joint Boot Replacement

Special Tools Required
Front hub dis/assembly tool 07965-SA50500

1. Remove the boot. Check for a gap between the ball joint (A) and the knuckle. If there is a gap, replace the knuckle assembly. Do not press the ball joint back into the knuckle.

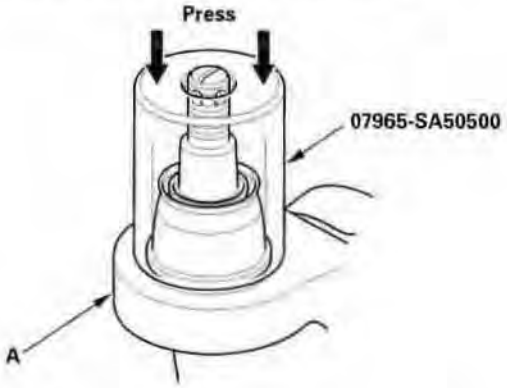


2. Pack the interior and lip (B) of a new boot with fresh grease. Keep the grease off of the boot-to-knuckle mating surfaces (C).

3. Wipe the grease off the tapered section of the pin (D), and pack fresh grease onto the base (E).

4. Install the boot onto the ball joint pin, then squeeze it gently to force out any air. Do not let dirt or other foreign materials get into the boot.

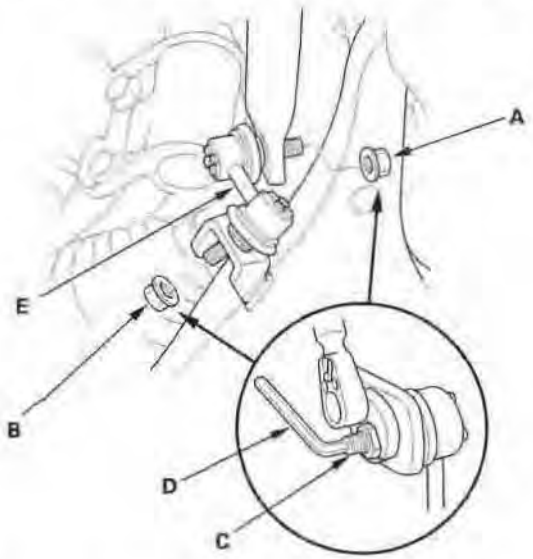
5. Press the boot with the special tool until the bottom seats on the knuckle (A) evenly around.



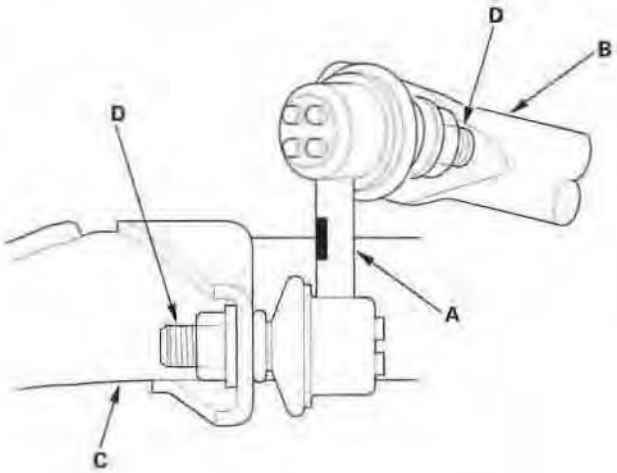
6. After installing a boot, wipe any grease off the exposed portion of the ball joint pin.

Stabilizer Link Removal/Installation

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9).
2. Remove the front wheels.
3. Remove the self-locking nut (A) and flange nut (B) while holding the respective joint pin (C) with a hex wrench (D), and remove the stabilizer link (E).



4. Install the stabilizer link (A) on the stabilizer bar (B) and lower arm (C) with the joint pins (D) set at the center of their range of movement.

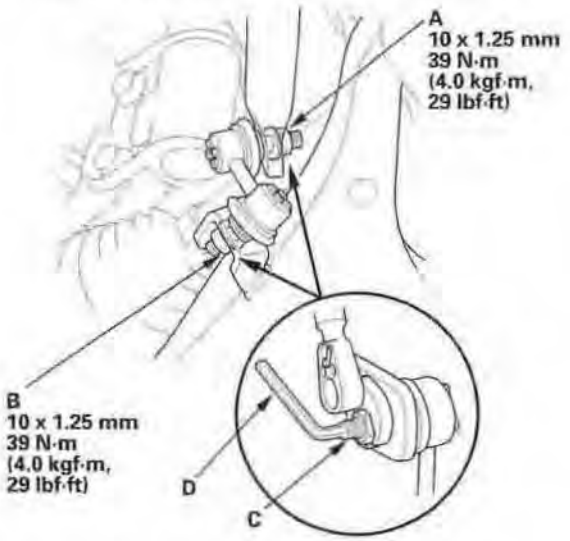


5. Install the self-locking nut and flange nut, and lightly tighten them.

   NOTE: Use a new self-locking nut on reassembly.

   NOTICE
   Do not place the jack against the ball joint pin.

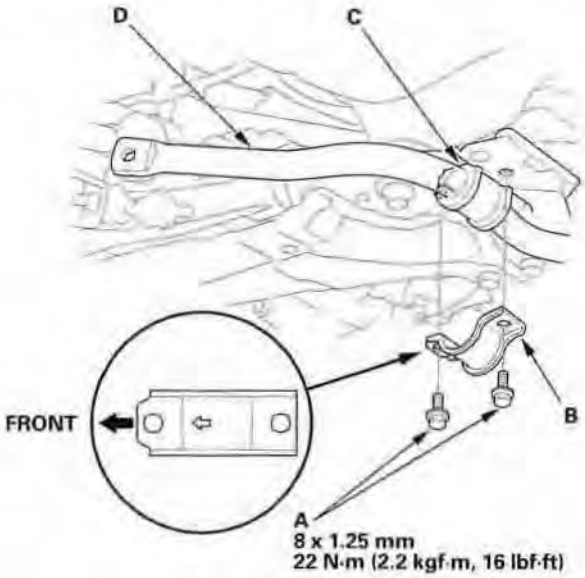
6. Tighten the new self-locking nut (A) and flange nut (B) to the specified torque values while holding the respective joint pins (C) with a hex wrench (D).



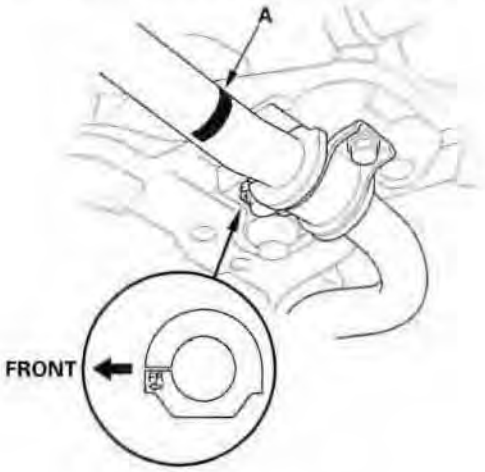
7. Reinstall the front wheels.
8. After 5 minutes of driving, torque the self-locking nut again.

Stabilizer Bar Replacement

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9).
2. Remove the front wheels.
3. Disconnect the stabilizer links from the stabilizer bar on the right and left (see page 18-17).
4. Remove the flange bolts (A) and bushing holders (B), then remove the bushings (C) and the stabilizer bar (D).



5. Install the stabilizer bar in the reverse order of removal, and note these items:
   - Use new self-locking nuts on reassembly.
   - Note the right and left direction of the stabilizer bar. The paint mark (A) on the stabilizer bar shows the right side.
   - Do not set the bushings on the bent or curved part of the stabilizer bar.
   - Note the fore/aft direction of the bushing holders.
   - Refer to Stabilizer Link Replacement to connect the stabilizer bar to the links (see page 18-17).



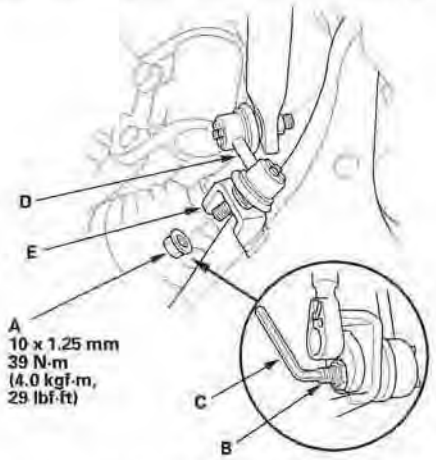
Lower Arm Replacement

Special Tools Required
- Ball joint thread protector, 12mm 07AAF-SDAA100
- Ball joint remover, 28 mm 07MAC-SL00200

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9).

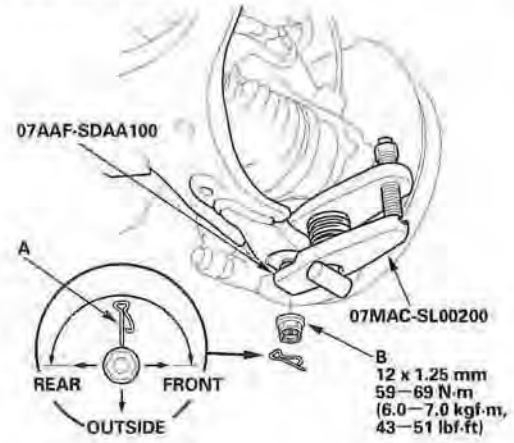
2. Remove the front wheel.

3. Remove the flange nut (A) while holding the joint pin (B) with a hex wrench (C), and disconnect the stabilizer link (D) from the lower arm (E).



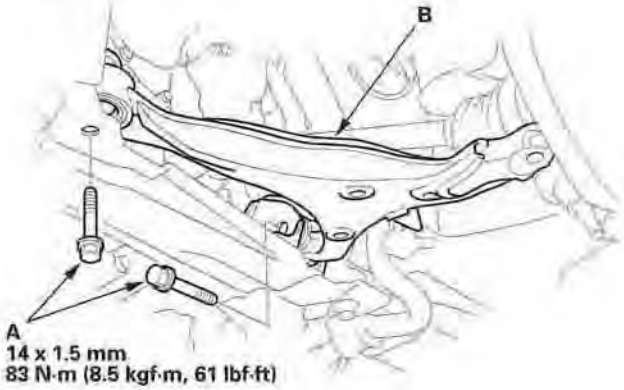
4. Remove the lock pin (A) from the lower arm ball joint, and remove the castle nut (B).

   NOTE: During installation, insert the lock pin into the ball joint pin from the inside to the outside of the vehicle. The closed end of the lock pin must be in the range shown.



5. Disconnect the lower arm from the knuckle using the special tools (see page 18-10).

6. Remove the flange bolts (A), and remove the lower arm (B).

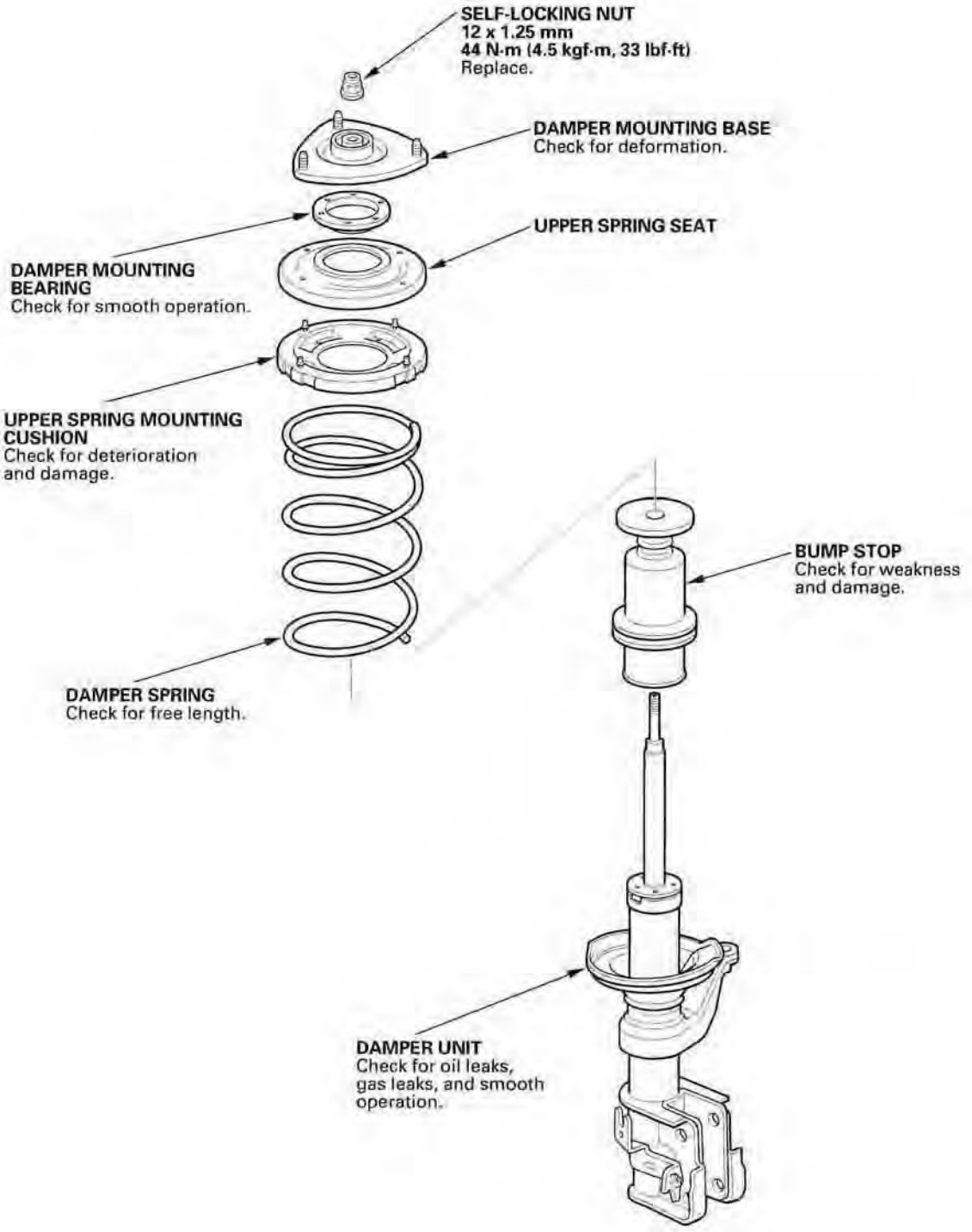


7. Install the lower arm in the reverse order of removal, and note these items:

   - Be careful not to damage the ball joint boot when connecting the lower arm to the knuckle.
   - Tighten all mounting hardware to the specified torque values.
   - First install all the components and lightly tighten the bolts and nuts, then raise the suspension with a floor jack to load it with the vehicle's weight before fully tightening it to the specified torque values. Do not place the jack on the lower arm ball joint.
   - Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the ball joint pin hole. Do not align the castle nut by loosening it.
   - Install a new lock pin on the castle nut after torquing.
   - Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
   - Check the wheel alignment, and adjust it if necessary (see page 18-5).

Damper/Spring Replacement

Exploded View

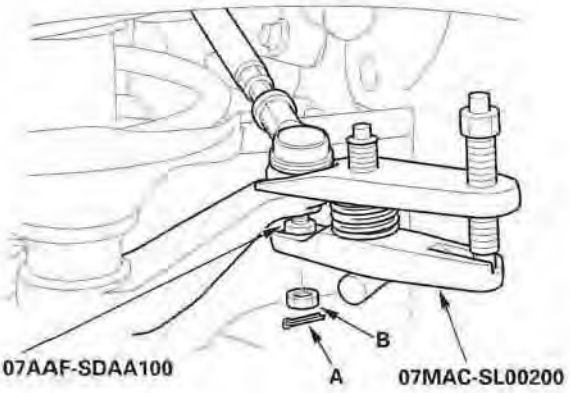


Special Tools Required
- Ball joint thread protector, 12mm 07AAF-SDAA100
- Ball joint remover, 28 mm 07MAC-SL00200

Removal

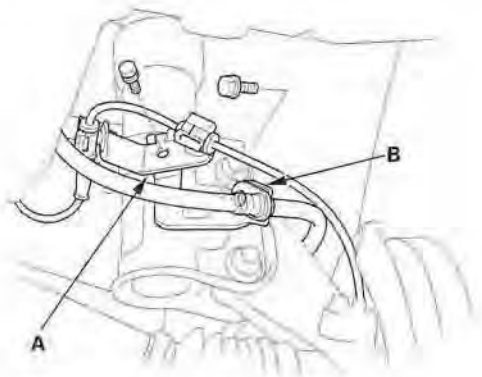
1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the front wheels.

2. Remove the cotter pin (A) from the tie-rod end ball joint, and remove the nut (B).

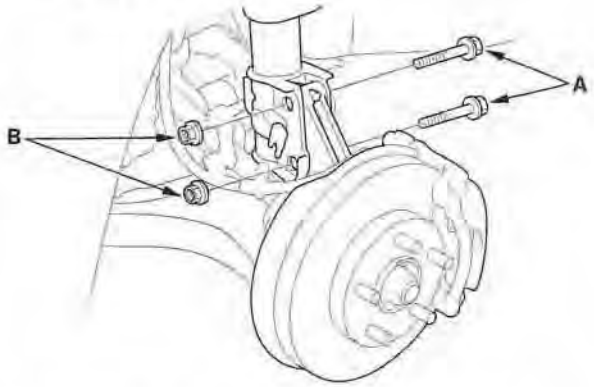


3. Disconnect the tie-rod end from the steering arm on the damper using the special tools (see page 18-10).

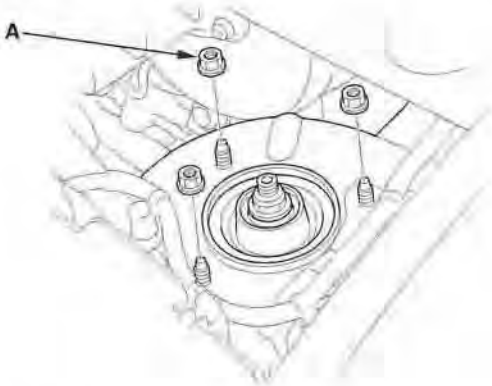
4. Remove the bolts, and remove the wheel sensor harness bracket (A) (with ABS) and brake hose bracket (B) from the damper. Do not disconnect the wheel sensor connector.



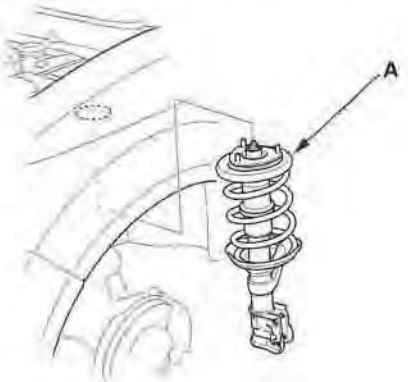
5. Remove the damper pinch bolts (A) while holding the nuts (B).



6. Remove the flange nuts (A) from the top of the damper.



7. Lower the lower arm, and remove the damper assembly (A).

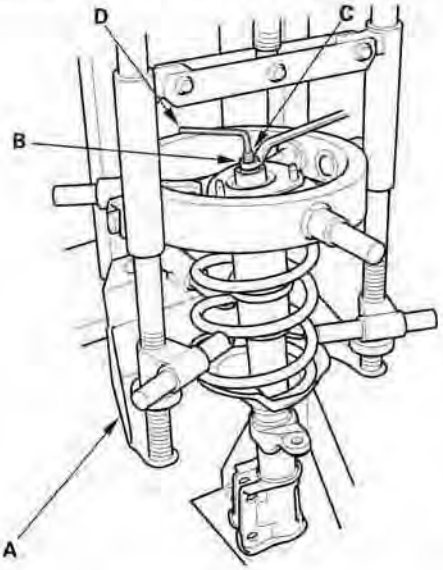


(cont'd)

Damper/Spring Replacement (cont'd)

Disassembly/Inspection

1. Compress the damper spring with a commercially available strut spring compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B) while holding the damper shaft (C) with a hex wrench (D). Do not compress the spring more than necessary to remove the nut.



2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.

3. Reassemble all the parts, except for the upper spring seat and spring.

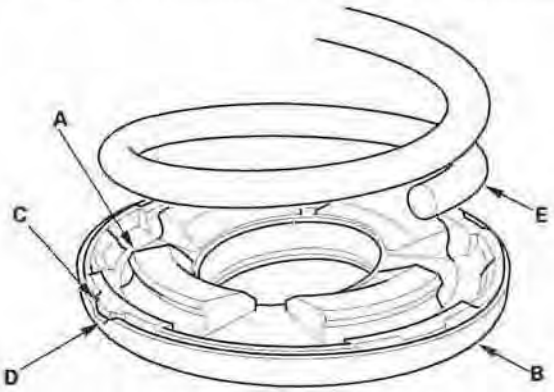
4. Compress the damper assembly by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should extend smoothly and constantly when compression is released. If it does not, the gas is leaking and the damper should be replaced.

5. Check for oil leaks, abnormal noises, and binding during these tests.

Reassembly

NOTE: Refer to the Exploded View as needed.

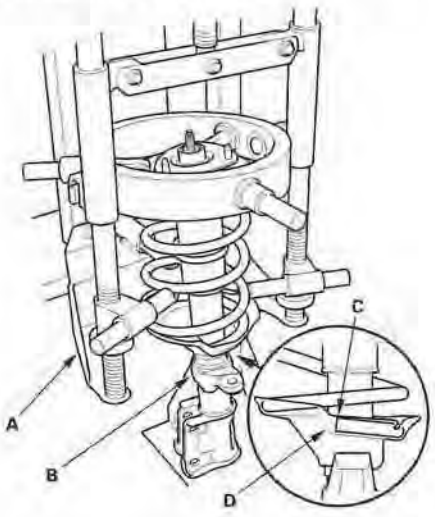
1. Install the upper spring mounting cushion (A) on the upper spring seat (B) by aligning the tab portion (C) on the cushion with the cutout (D) in the seat.



2. Install the damper spring (E) in the groove of the cushion securely.

3. Install the damper mounting bearing and damper mounting base on the upper spring seat.

4. Install the upper spring seat and the spring on a commercially available strut spring compressor (A), and compress the spring lightly.

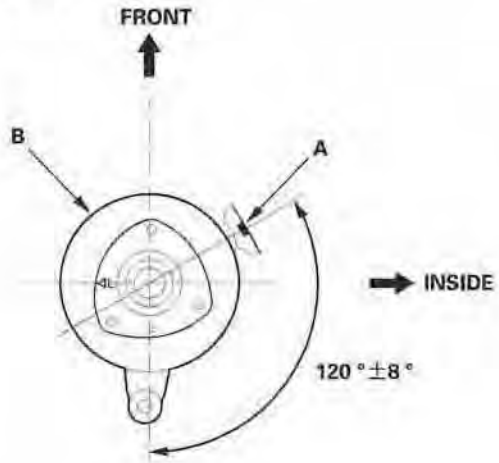


5. Insert the damper unit (B) up through the compressed spring.

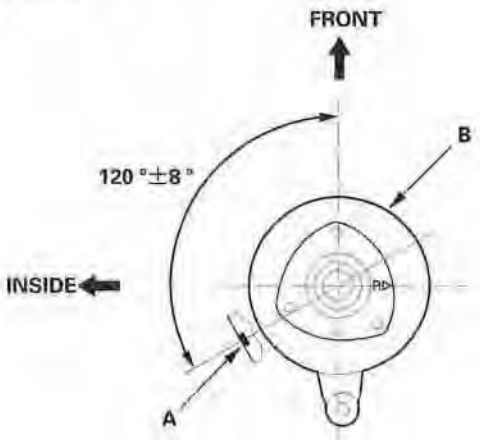
6. Align the bottom of the spring (C) and the stepped part (D) of the lower spring seat.

7. Check that the cutout (A) in the side of the upper spring seat (B) is in the position shown. If the cutout is out of position, remove all the components from the strut spring compressor. Go to step 2, and reassemble the spring and upper spring seat accordingly.

Left side



Right side

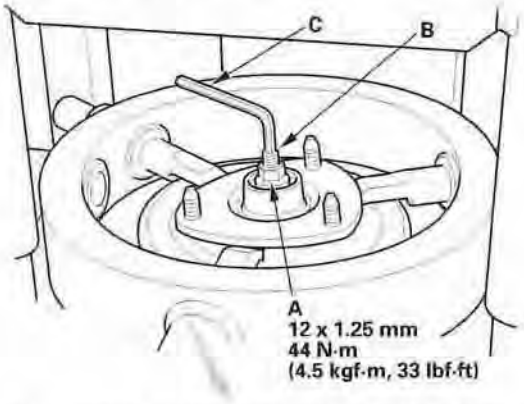


(cont'd)

Damper/Spring Replacement (cont'd)

8. Hold the bottom of the damper with your hand, and compress the spring. Do not compress the spring excessively.

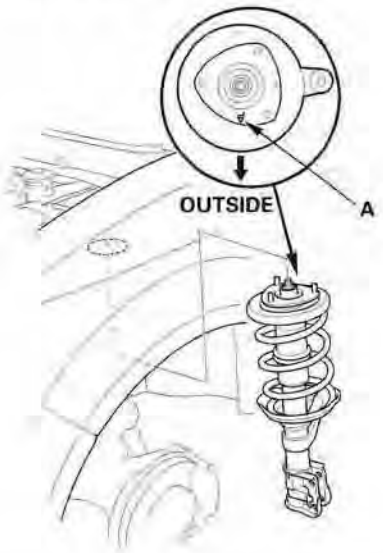
9. Install the 12 mm self-locking nut (A) on the damper shaft (B). Hold the damper shaft with a hex wrench (C), and tighten the 12 mm self-locking nut to the specified torque value.



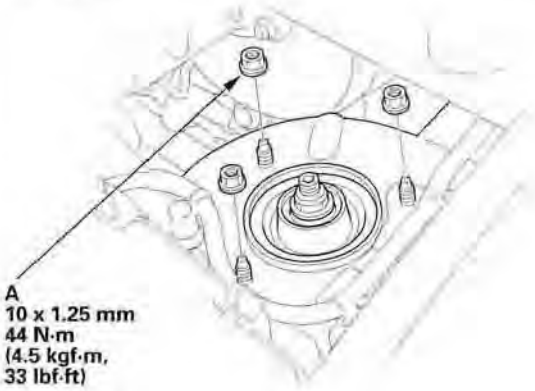
10. Remove the damper assembly from the strut spring compressor.

Installation

1. Lower the lower arm, and position the damper assembly in the body. Turn the damper mounting base so the "△L" or "△R" mark (A) faces toward the outside of the vehicle.



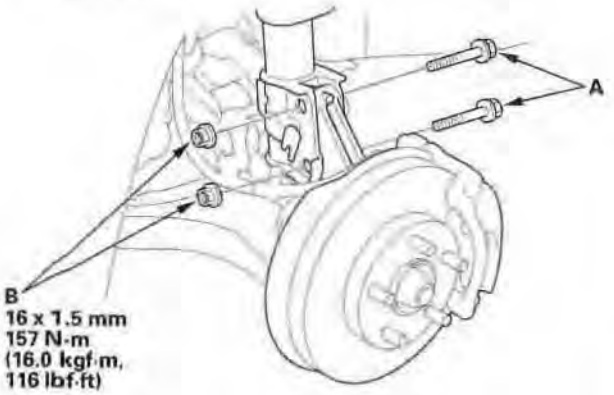
2. Loosely install flange nuts (A) onto the top of the damper.



3. Position the damper on the knuckle, and install the new damper pinch bolts (A) and nuts (B), and lightly tighten the nuts.

NOTICE

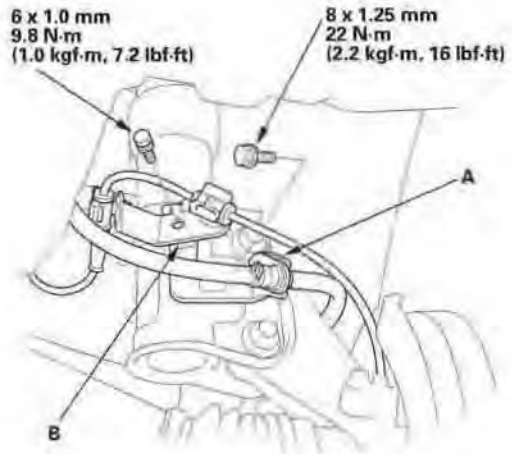
Do not place the jack against the lower arm ball joint.



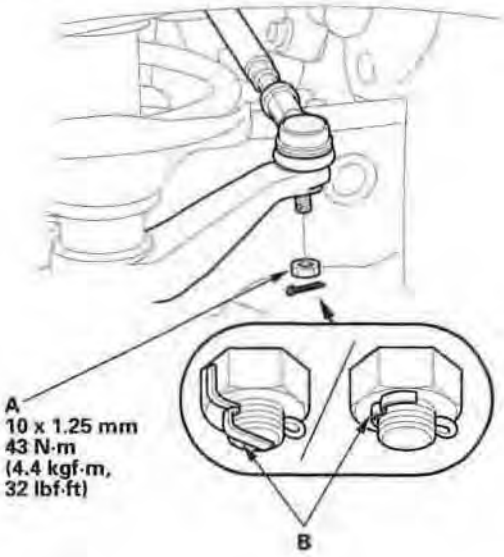
4. Tighten the flange nuts on the top of the damper to the specified torque value.

5. Tighten the damper pinch nuts to the specified torque value.

6. Install the brake hose bracket (A) and the wheel sensor harness bracket (B) (with ABS) onto the damper, and tighten the bolt to the specified torque value.



7. Clean off any grease contamination from the ball joint tapered section and threads, then connect the tie-rod end to the steering arm. Tighten the nut (A) to the specified torque value. Install the cotter pin (B) after tightening, and bend its end as shown.

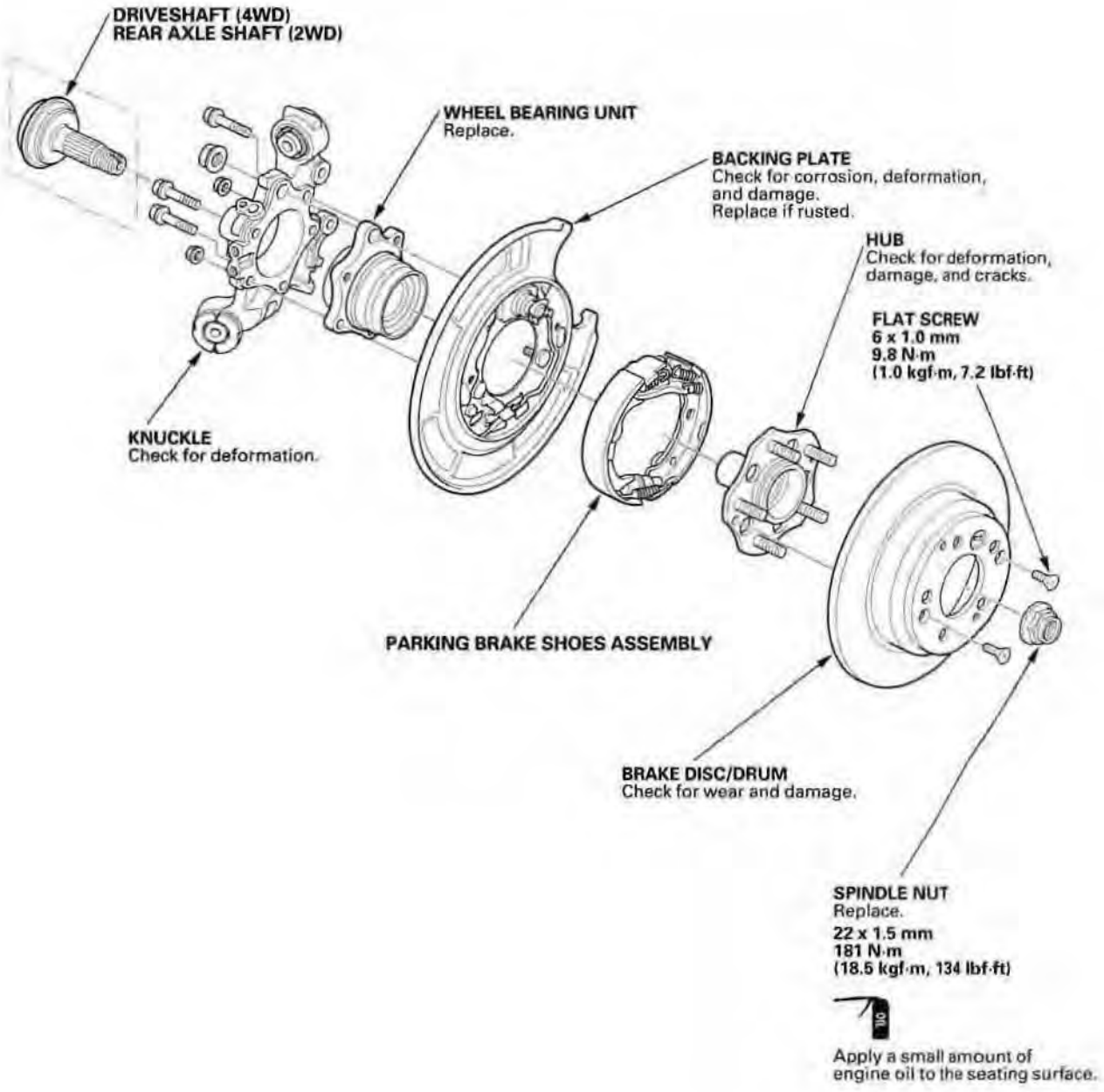


8. Clean the mating surface of the brake disc and the inside of the wheel, then install the front wheels.

9. Check the wheel alignment, and adjust it if necessary (see page 18-5).

Knuckle/Hub/Wheel Bearing Replacement

Exploded View

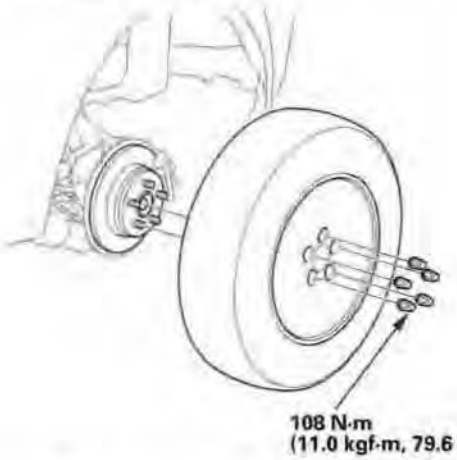


Special Tools Required
- Hub dis/assembly tool 07965-SA70100
- Attachment, 62 x 68 mm 07746-0010500
- Driver 07749-0010000
- Support base 07965-SD90100

Knuckle Replacement

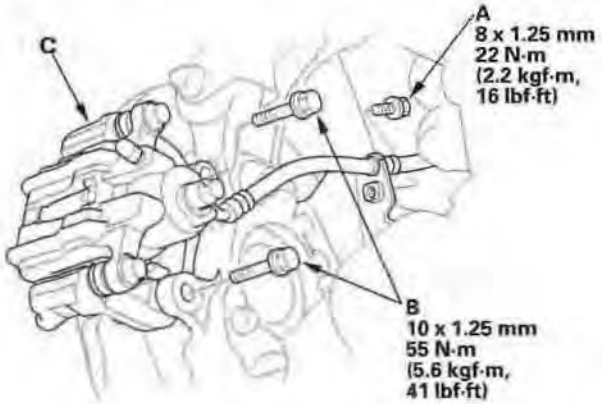
1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9).

2. Remove the rear wheels.



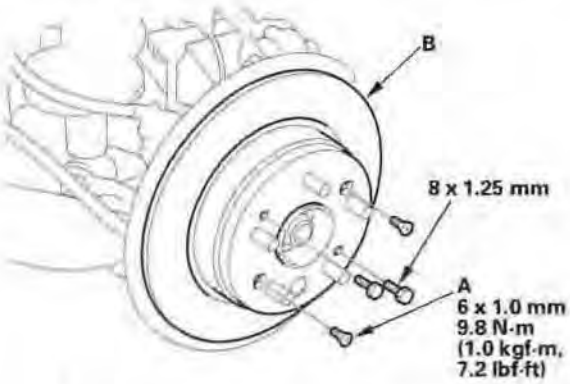
3. Release the parking brake lever.

4. Remove the brake hose mounting bolt (A).

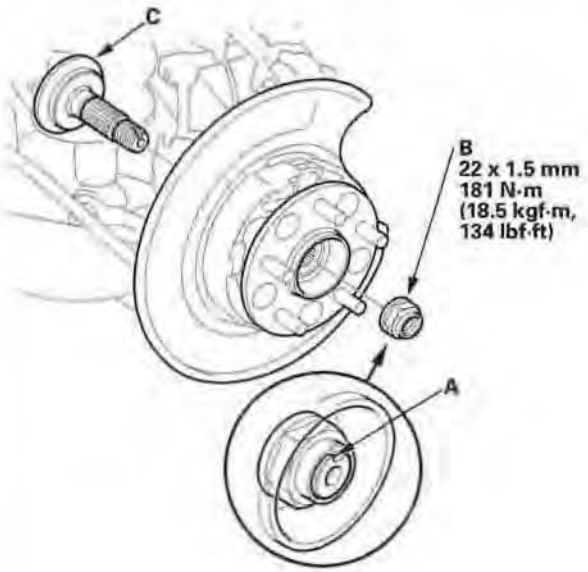


5. Remove the caliper bracket mounting bolts (B), and hang the caliper (C) to one side. To prevent damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

6. Remove the brake disc retaining flat screw (A), and screw two 8 x 1.25 mm bolts into the brake disc/drum (B) to push it away from the hub. Turn each bolt two turns at a time to prevent cocking the brake disc/drum excessively. Remove the brake disc/drum.



7. Raise the stake (A) of the spindle nut (B), then remove and discard the nut. Remove the rear axle shaft (C) from vehicles with 4WD.



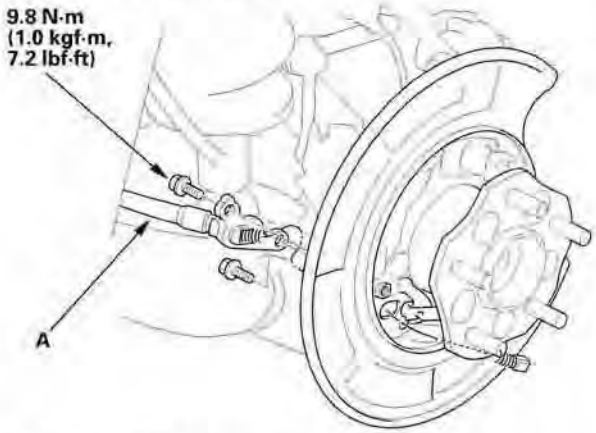
(cont'd)

Knuckle/Hub/Wheel Bearing Replacement (cont'd)

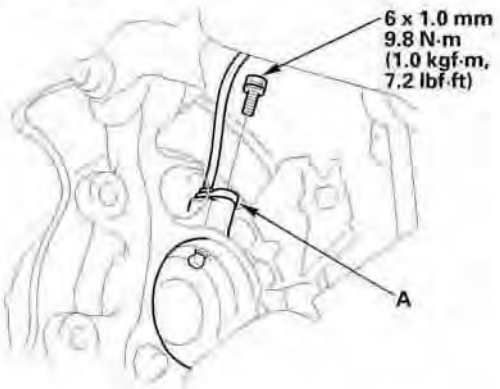
8. Remove the parking brake shoes (see page 19-28).

9. Remove the parking brake cable (A) from the backing plate.

   NOTE: The parking brake cable must not be bent or distorted. This will lead to stiff operation and premature cable failure.

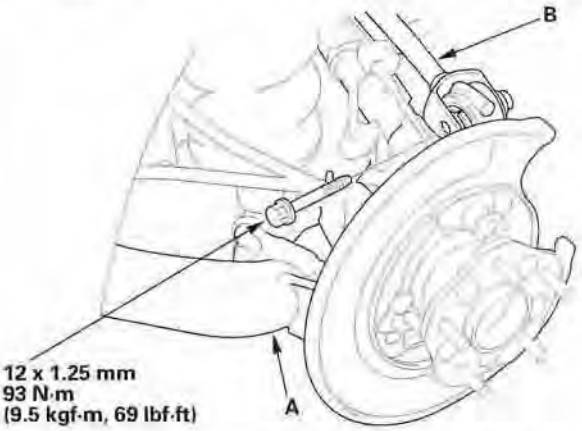


10. Remove the wheel sensor (A) from the knuckle (if equipped with ABS).



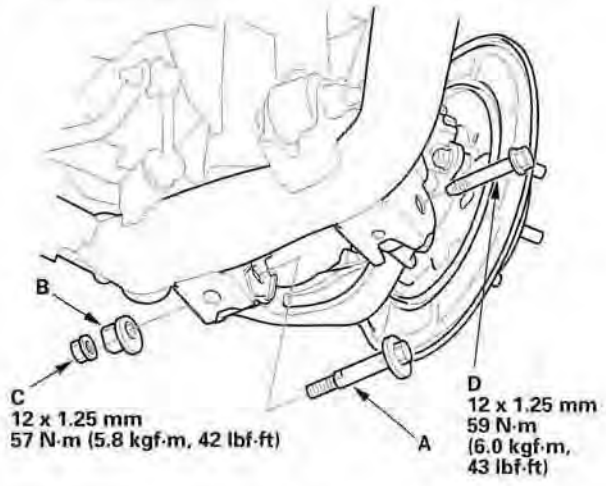
11. Place a floor jack under the trailing arm (A) to support it.

    NOTE: Do not place the jack against the plate section of the lower arm. Be careful not to damage any suspension components.



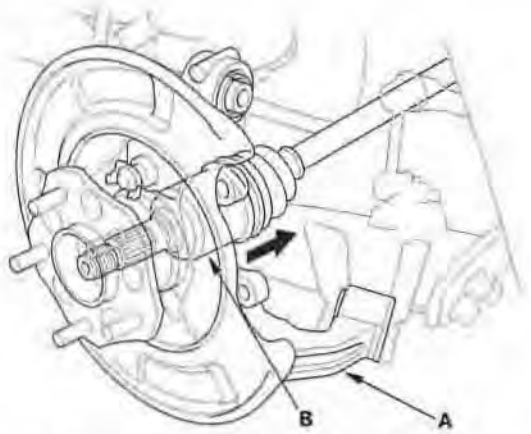
12. Remove the flange bolt, and disconnect the upper arm (B) from the knuckle.

13. Mark the cam positions of the adjusting bolt (A) and adjusting cam (B), then remove the self-locking nut (C), adjusting cam, and adjusting bolt. Discard the self-locking nut.



14. Remove the flange bolt (D).

15. Remove the knuckle (A) while pushing in the driveshaft and holding the driveshaft outboard joint (B) (4WD only).



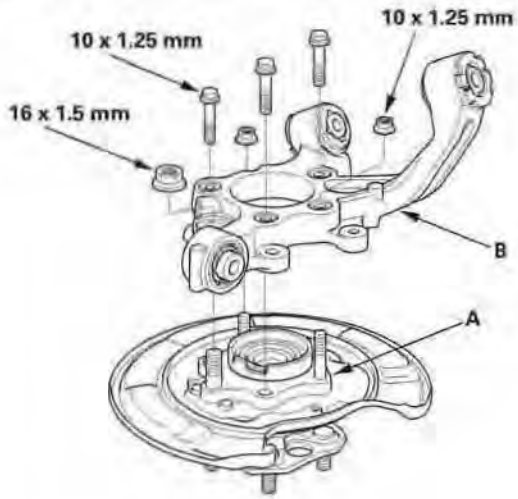
16. Install the knuckle in the reverse order of removal, and note these items:

- First install all the suspension components, and lightly tighten the bolts and nuts, then place a floor jack under the trailing arm, and raise the suspension to load it with the vehicle's weight before fully tightening the bolts and nuts to the specified torque values.
- Align the cam positions of the adjusting bolt and adjusting cam with the marked positions when tightening.
- Use a new self-locking nut on reassembly.
- Use a new spindle nut on reassembly.
- Before installing the spindle nut, apply a small amount of engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft or axle shaft.
- Before installing the brake disc/drum, clean the mating surfaces of the rear hub and the inside of the brake disc/drum.
- Before installing the wheel, clean the mating surfaces of the brake disc/drum and the inside of the wheel.
- Check the rear wheel alignment, and adjust it if necessary (see page 18-5).

Wheel Bearing Unit Replacement

1. Remove the brake hose mounting bracket (A).

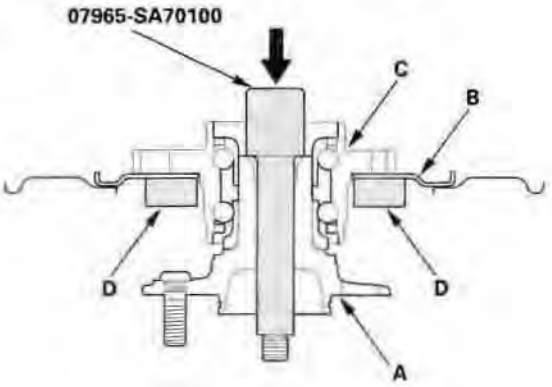
2. Separate the bearing unit (A) from the knuckle (B).



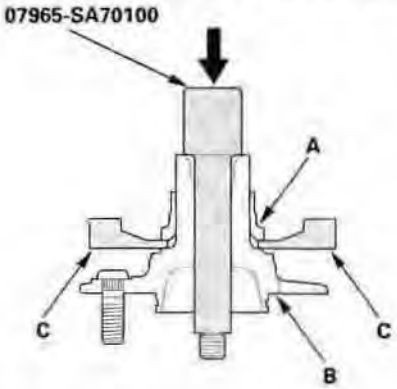
(cont'd)

Knuckle/Hub/Wheel Bearing Replacement (cont'd)

3. Separate the hub (A) and backing plate (B) from bearing unit (C) using the special tool and a hydraulic press. Hold the bearing unit with a press attachment (D) or equivalent tool. Be careful not to deform the backing plate. Hold onto the hub to keep it from falling when pressed clear.



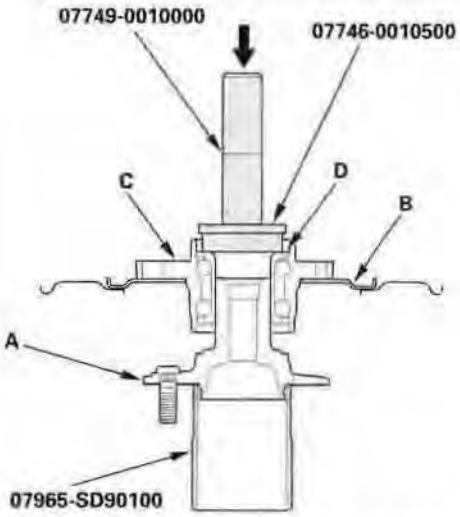
4. Press the wheel bearing inner race (A) out of the hub (B) using the special tool, a commercially available bearing separator (C), and a press.



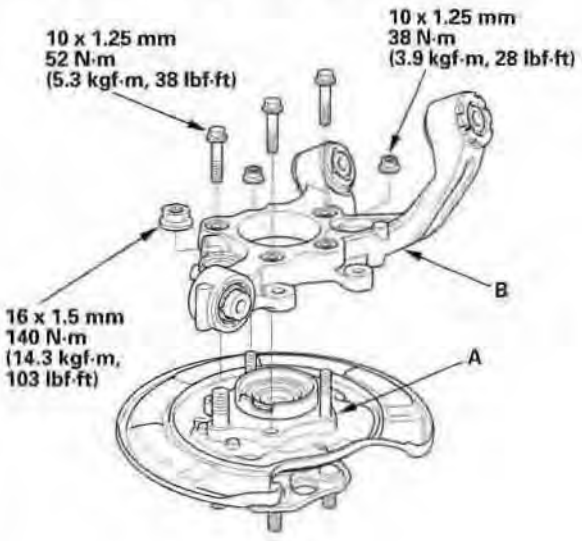
5. Wash the knuckle and hub throughly in a high flash point solvent before reassembly.

6. Install the hub (A) and backing plate (B) on the new bearing unit (C) using the special tools and a hydraulic press. Be careful not to deform the backing plate.

   NOTE (with ABS):
   - Remove any oil, grease, dust, or other foreign material from the encoder surface (D).
   - Keep magnetic tools away from the encoder surface.
   - Be careful not to damage the encoder surface.



7. Install the bearing unit (A) and knuckle (B).

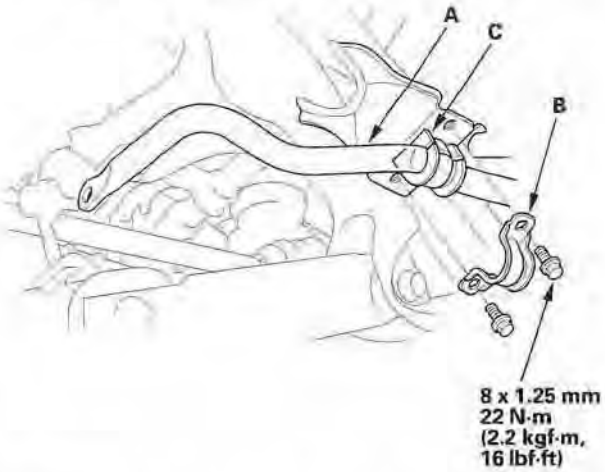


8. Install the brake hose mounting bracket (A).

Stabilizer Bar Replacement

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.

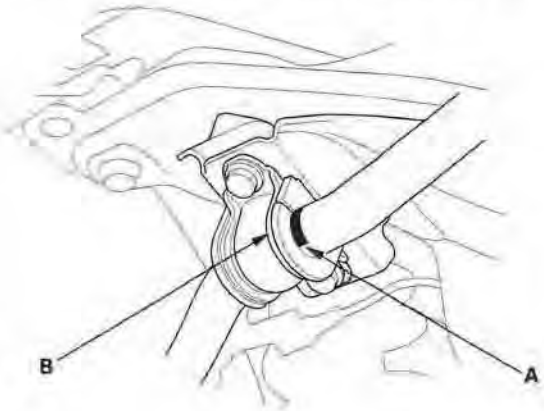
2. Disconnect the stabilizer links from the stabilizer bar (A) on the right and left (see page 18-32).



3. Remove the flange bolts and bushing holders (B), then remove the bushings (C) and the stabilizer bar.

4. Install the stabilizer bar in the reverse order of removal, and note these items:

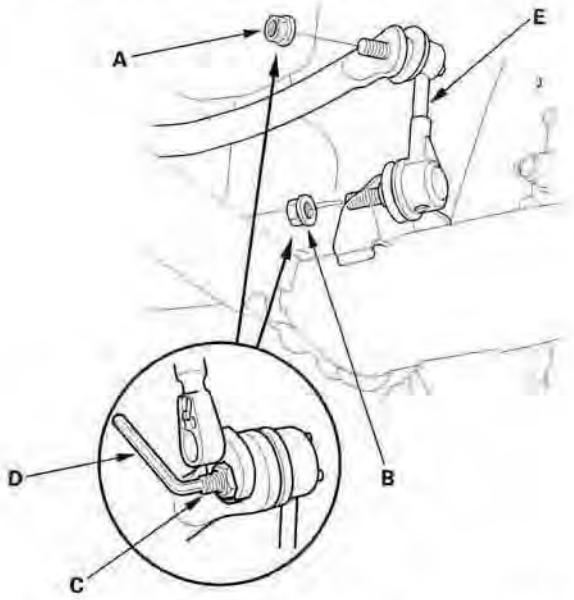
   - Use new self-locking nuts on reassembly.
   - Make sure the right and left ends of the stabilizer bar are installed on their respective sides of the vehicle.
   - Align the ends of the paint marks (A) on the stabilizer bar with the bushings (B).
   - Refer to Stabilizer Link Replacement to connect the stabilizer bar to the links (see page 18-32).



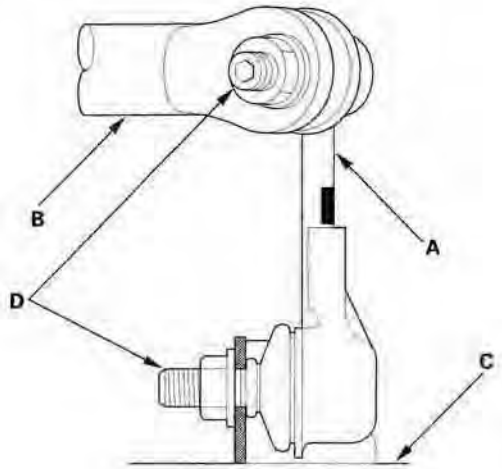
Stabilizer Link Removal/Installation

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.

2. Remove the self-locking nut (A) and flange nut (B) while holding the respective joint pin (C) with a hex wrench (D), and remove the stabilizer link (E).



3. Install the stabilizer link (A) on the stabilizer bar (B) and trailing arm (C) with the joint pins (D) set at the center of their range of movement.

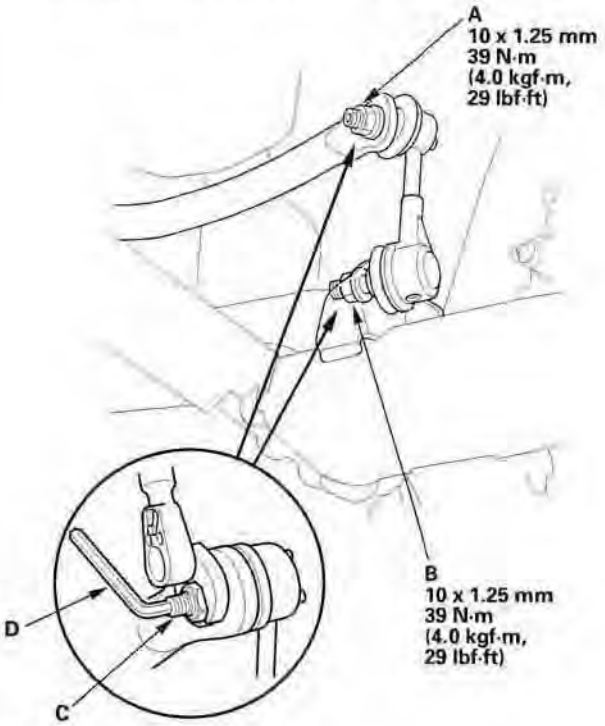


4. Install the self-locking nut and flange nut, and lightly tighten them.

   NOTE: Use a new self-locking nut on reassembly.

5. Place a jack under the trailing arm at the knuckle-side end, and raise the suspension to load it with the vehicle's weight.

6. Tighten the new self-locking nut (A) and flange nut (B) to the specified torque values while holding the respective joint pins (C) with a hex wrench (D).



7. Reinstall the rear wheels.

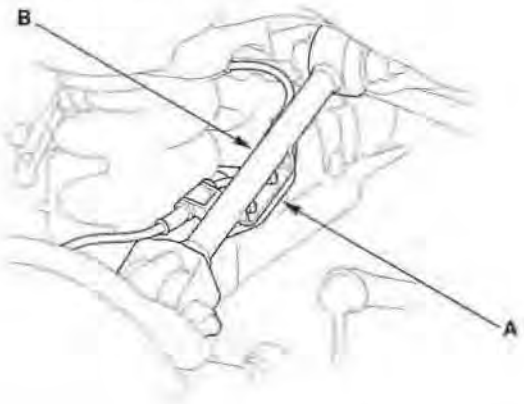
8. After 5 minutes of driving, torque the self-locking nut again.

Upper Arm Replacement

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.

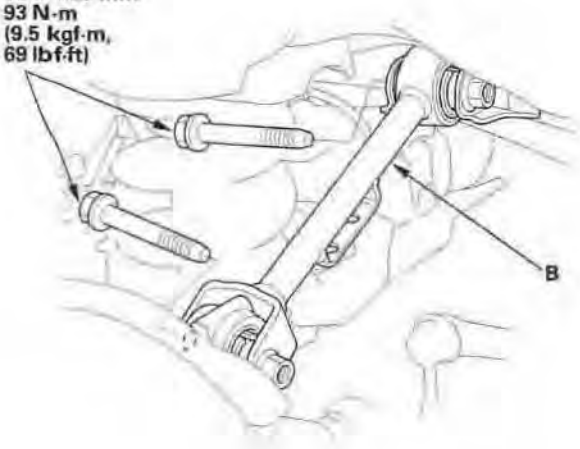
2. Place a floor jack under the trailing arm, and support the suspension.

3. Remove the wheel sensor harness bracket (A) (with ABS) from the upper arm (B).



4. Remove the flange bolts (A), and remove the upper arm (B).

A
12 x 1.25 mm
93 N·m
(9.5 kgf·m,
69 lbf·ft)

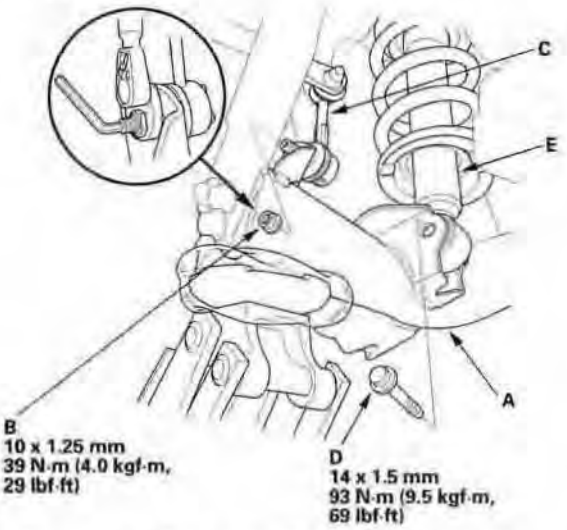


5. Install the upper arm in the reverse order of removal, and note these items:

   - First install all the suspension components and lightly tighten the bolts and nuts, then place a jack under the trailing arm. Raise the suspension with a floor jack to load it with the vehicle's weight before fully tightening the bolts and nuts to the specified torque values.
   - Tighten all the mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surface of the brake disc/drum and the inside of the wheel.
   - Check the wheel alignment, and adjust it if necessary (see page 18-5).

Trailing Arm Replacement

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.
2. Remove the knuckle (see page 18-27).
3. Place the floor jack under the trailing arm (A) to support it.

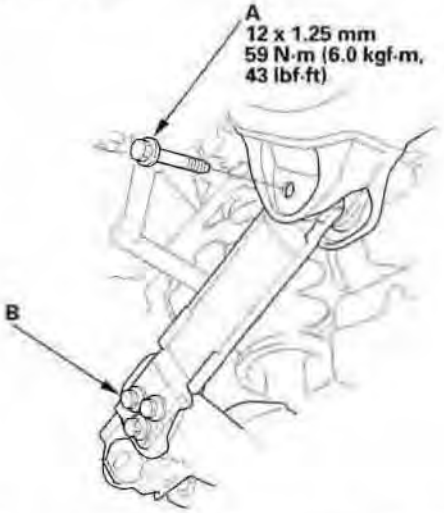


4. Remove the flange nut (B), and disconnect the stabilizer link (C) from the trailing arm.
5. Remove the flange bolt (D), and disconnect the damper (E) from the trailing arm.
6. Remove the trailing arm front mounting bolts (A).

7. Remove the trailing arm rear mounting bolt (A).

NOTICE

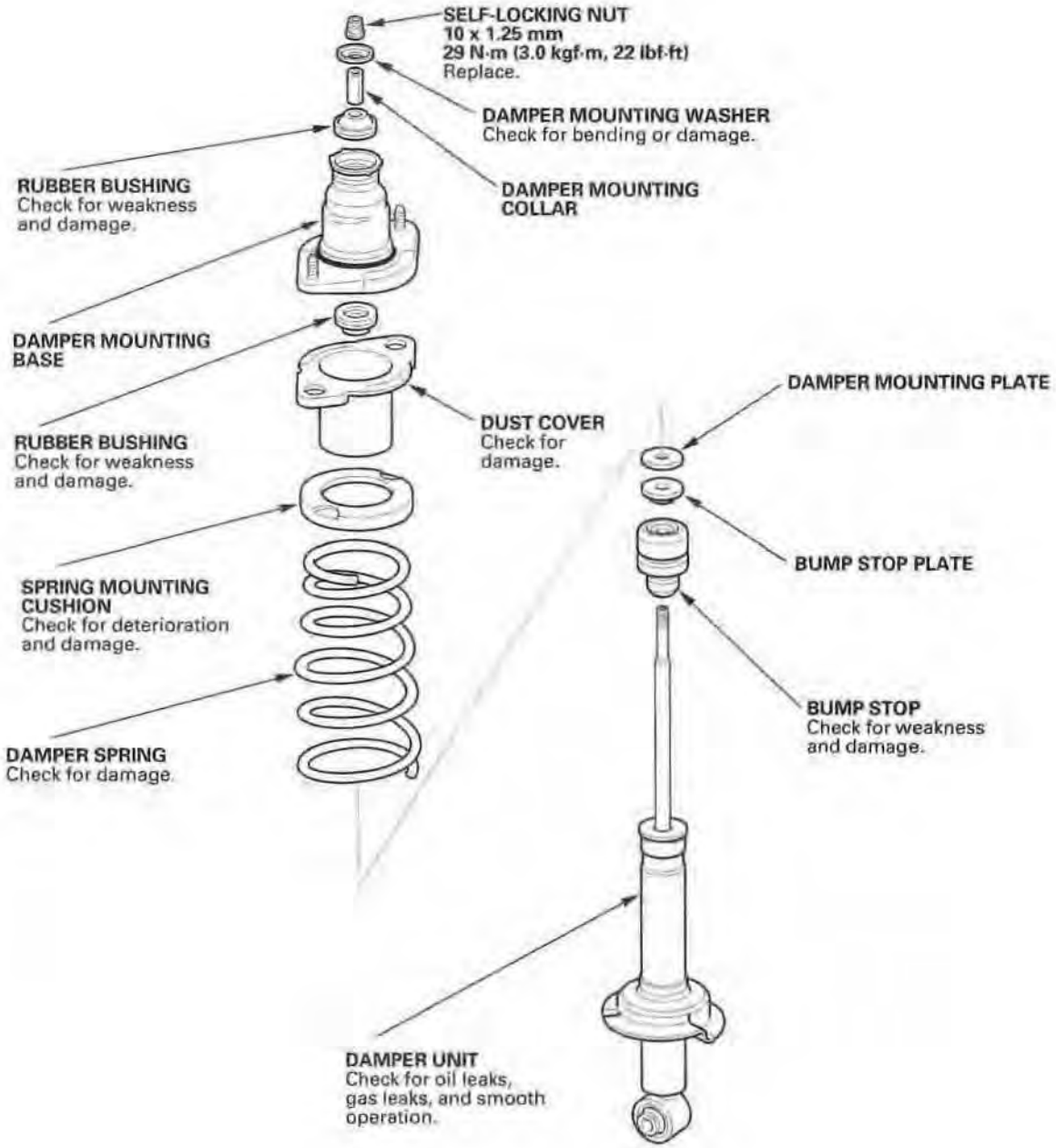
Do not loosen the special bolts (B) on the trailing arm.



8. Lower the jack, and remove the trailing arm.
9. Install the trailing arm in the reverse order of removal, and note these items:
   - First install all the suspension components and lightly tighten the bolts and nuts, then place a jack under the trailing arm. Raise the suspension to load it with the vehicle's weight before fully tightening the bolts and nuts to the specified torque values.
   - Tighten all the mounting hardware to the specified torque values.
   - Before installing the wheel, clean the mating surface of the brake disc/drum and the inside of the wheel.
   - Check the wheel alignment, and adjust it if necessary (see page 18-5).

Damper/Spring Replacement

Exploded View



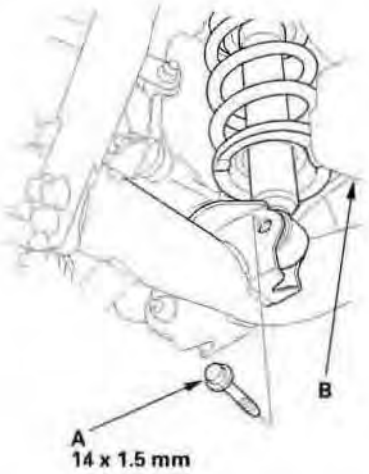
(cont'd)

Damper/Spring Replacement (cont'd)

Removal

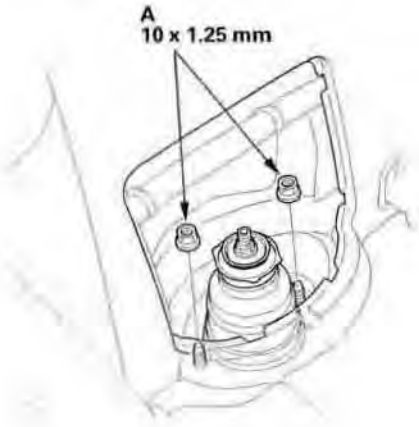
1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.

2. Remove the flange bolt (A) from the bottom of the damper.

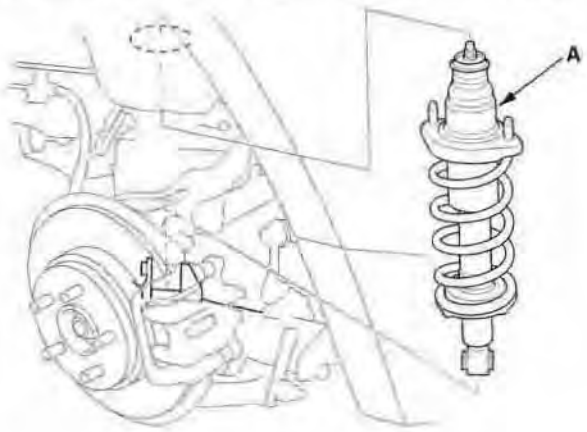


3. Remove the canister mounting bolts, and loosen the EVAP canister (B) mounting (only left side) (see page 11-271).

4. Remove the flange nuts (A) from the top of the damper in the cargo area.

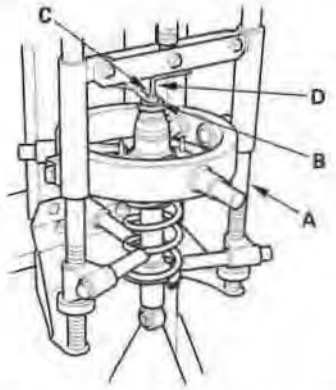


5. Remove the damper assembly (A) from the body.



Disassembly/Inspection

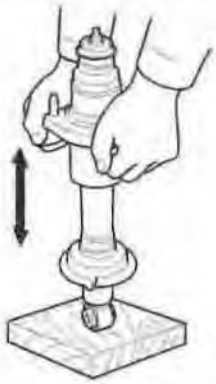
1. Compress the damper spring with a commercially available strut spring compressor (A) according to the manufacturer's instructions, then remove the self-locking nut (B) while holding the damper shaft (C) with a hex wrench (D). Do not compress the spring more than necessary to remove the nut.



2. Release the pressure from the strut spring compressor, then disassemble the damper as shown in the Exploded View.

3. Reassemble all the parts, except for the spring.

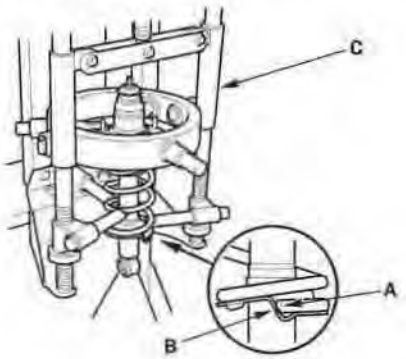
4. Compress the damper assembly by hand, and check for smooth operation through a full stroke, both compression and extension. The damper should extend smoothly and constantly when compression is released. If it does not, the gas is leaking and the damper should be replaced.



5. Check for oil leaks, abnormal noises, or binding during these tests.

Reassembly

1. Install all the parts except the damper mounting washer and self-locking nut onto the damper unit by referring to the Exploded View. Align the bottom of the spring (A) and the stepped part of the lower spring seat (B), and align the damper mounting base as shown.



Left side

Right side

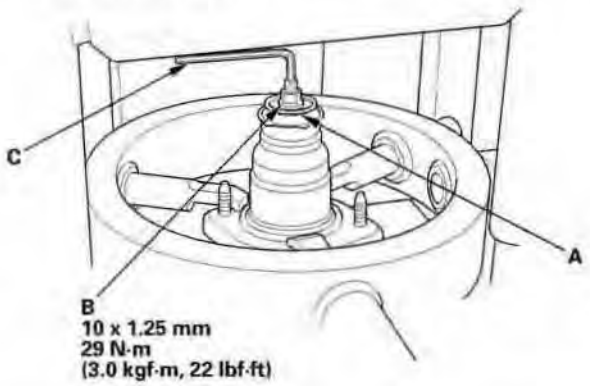
2. Install the damper assembly on a commercially available strut spring compressor (C).

(cont'd)

Damper/Spring Replacement (cont'd)

3. Compress the damper spring with the strut spring compressor.

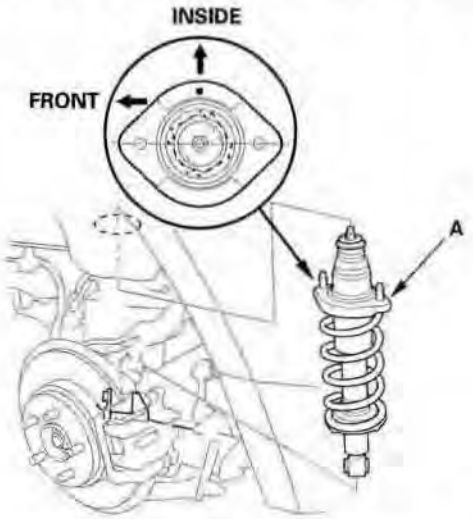
4. Install the washer (A) and a new self-locking nut (B) on the damper shaft.



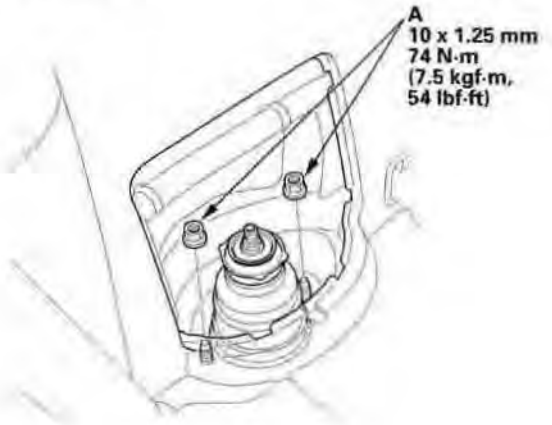
5. Hold the damper shaft with a hex wrench (C), and tighten the self-locking nut to the specified torque value.

Installation

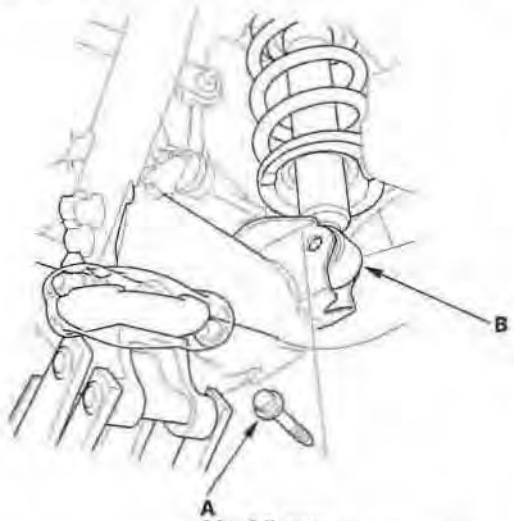
1. Position the damper (A) assembly in the body. Note the direction of the damper mounting base so the indent mark on it is toward the inside of the vehicle.



2. Loosely install the flange nuts (A) onto the top of the damper.



3. Loosely install the flange bolt (A) on the bottom of the damper (B).



4. Raise the suspension with a floor jack to load it with the vehicle's weight, and tighten the nuts and bolt to the specified torque values.

5. Install the EVAP canister mounting bolts (only left side) (see page 11-271).

6. Clean the mating surface of the brake disc/drum and the inside of the wheel, then install the rear wheel.

7. Check the wheel alignment, and adjust it if necessary (see page 18-5).

Brakes

Conventional Brake Components

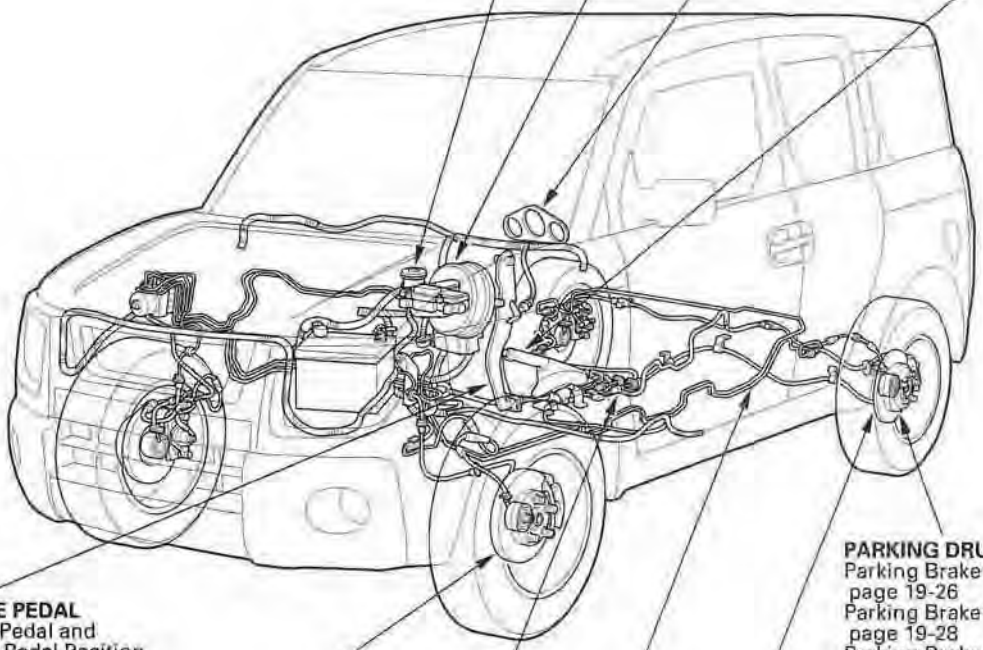
Conventional Brake Components

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07JAG-SD40100	Pushrod Adjustment Gauge	1

①

Component Location Index



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Brake System Inspection and Test

Component Inspections:

Component	Procedure	Also check for:
Master Cylinder	Look for damage or signs of fluid leakage at: • Reservoir or reservoir grommets • Line joints • Between master cylinder and booster	Bulging seal at reservoir cap. This is a sign of fluid contamination.
Brake Hoses	Look for damage or signs of fluid leakage at: • Line joints and banjo bolt connections • Hoses and lines, also inspect for twisting or damage	Bulging, twisted, or bent lines.
Caliper	Look for damage or signs of fluid leakage at: • Piston seal • Banjo bolt connections • Bleeder screw	Seized or sticking caliper pins.
ABS Modulator	Look for damage or signs of fluid leakage at: • Line joints • Modulator	

Brake System Test

Brake pedal sinks/fades when braking

1. Start the engine, and let it warm up to operating temperature.
2. Attach a 50 mm (2 in.) piece of masking tape along the bottom of the steering wheel, and draw a horizontal reference mark across it.
3. With the transmission in Neutral, press and hold the brake pedal lightly (about the same pressure needed to keep an A/T-equipped vehicle from creeping), then release the parking brake.
4. While still holding the brake pedal, hook the end of the tape measure behind it. Then pull the tape up to the steering wheel, noting where the tape measure lines up with the reference mark you made on the masking tape.
5. Apply steady pressure to the brake pedal for 3 minutes.
6. Watch the tape measure.
   - If it moves less than 10 mm (3/8 in.), the master cylinder is OK.
   - If it moves more than 10 mm (3/8 in.), replace the master cylinder.

Symptom Troubleshooting

Rapid brake pad wear, vehicle vibration (after a long drive), or hard brake pedal

1. Drive the vehicle until the brakes drag or until the pedal is high and hard. This can take 20 or more brake pedal applications during an extended test-drive.

2. With the engine running, raise the vehicle on a lift, and spin all four wheels by hand.

   Is there brake drag at any of the wheels?

   YES—Go to step 3.

   NO—Look for other causes of the pad wear, high pedal, or vehicle vibration. ■

3. Turn the engine off, pump the brake pedal to deplete the vacuum in the brake booster, and then spin the wheels again to check for brake drag.

   Is there brake drag at any of the wheels?

   YES—Go to step 4.

   NO—Replace the brake booster. ■

4. Without removing the brake lines, unbolt and separate the master cylinder from the booster, then spin the wheels to check for brake drag.

   Is there brake drag at any of the wheels?

   YES—Go to step 5.

   NO—Check the brake pedal position switch adjustment and pedal free play. ■

5. Loosen the hydraulic lines at the master cylinder, then spin the wheels to check for brake drag.

   Is there brake drag at any of the wheels?

   YES—Go to step 6.

   NO—Replace the master cylinder. ■

6. Loosen the bleeder screws at each caliper, then spin the wheels to check for brake drag.

   Is there brake drag at any of the wheels?

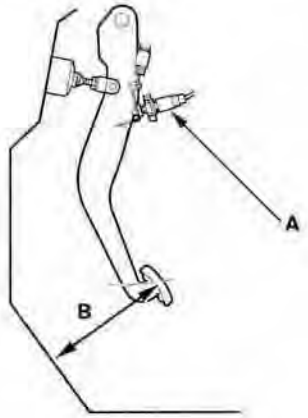
   YES—Disassemble and repair the caliper on the wheel(s) with brake drag. ■

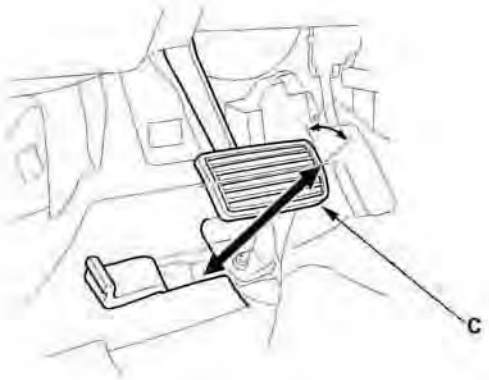
   NO—Look for a bulging master cylinder cap seal, discolored or contaminated brake fluid in the master cylinder, or damaged brake lines. If any of these items are damaged, replace them. If all of these items are OK, replace the ABS modulator-control unit. ■

Brake Pedal and Brake Pedal Position Switch Adjustment

Pedal Height

1. Turn the brake pedal position switch (A) counterclockwise, and pull it back until it is no longer touching the brake pedal.

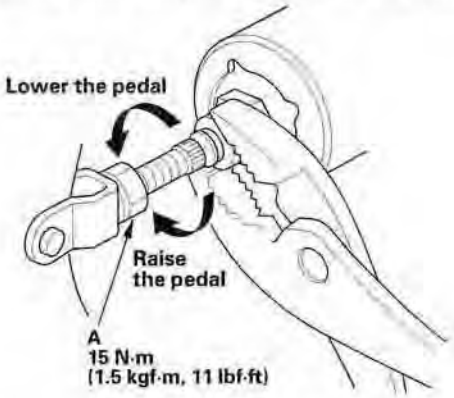




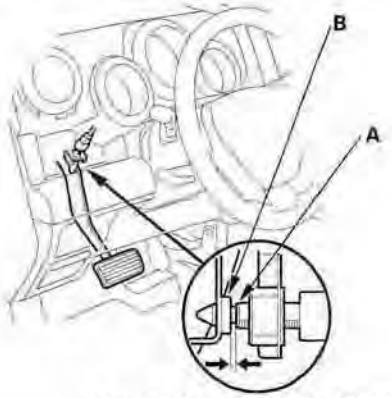
2. Lift up the carpet. At the insulator cutout, measure the pedal height (B) from the middle of the pedal pad (C).

Standard pedal height (with carpet removed):
M/T: 178 mm (7 in.)
A/T: 180 mm (7 3/32 in.)

3. Loosen the pushrod locknut (A), and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly. Do not adjust the pedal height with the pushrod pressed.



4. Push in the brake pedal position switch until its plunger is fully pressed (threaded end (A) touching the pad (B) on the pedal arm). Then, turn the switch 45 ° clockwise to lock it. The gap between the brake pedal position switch and the pad is automatically adjusted to 0.4 to 3.0 mm (0.016 to 0.118 in.) by locking the switch. Make sure the brake lights go off when the pedal is released.

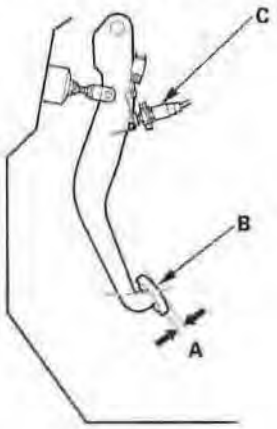


5. Check the brake pedal free play.

Pedal Free Play

1. With the engine off, inspect the play (A) on the brake pedal pad (B) by pushing the brake pedal by hand.

   Free play: 1—5 mm (1/16—3/16 in.)



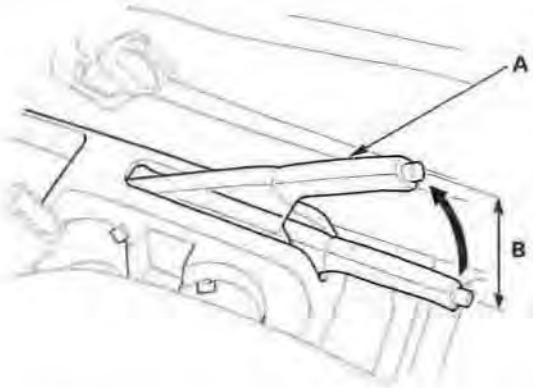
2. If the brake pedal free play is out of specification, adjust the brake pedal position switch (C). If the brake pedal free play is insufficient, it may result in brake drag.

Parking Brake Check and Adjustment

Check

1. Pull the parking brake lever (A) with 196 N (20 kgf, 44 lbf) of force to fully apply the parking brake. The parking brake lever should be locked within the specified number of clicks (B).

   Lever locked clicks: 4 to 7



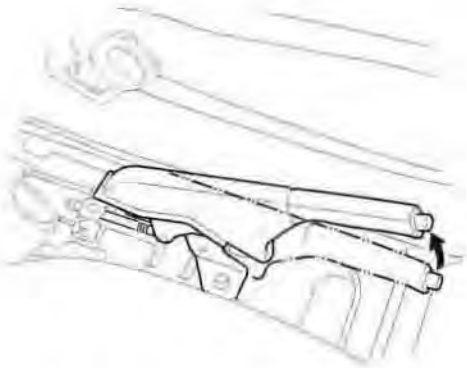
2. Adjust the parking brake if the lever clicks are not within the specification.

(cont'd)

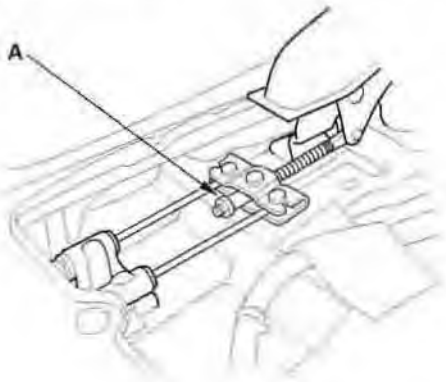
Parking Brake Check and Adjustment (cont'd)

Minor Adjustment

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9).
2. Release the parking brake lever fully.
3. Remove the center console (see page 20-71).
4. Pull the parking brake lever 1 click.



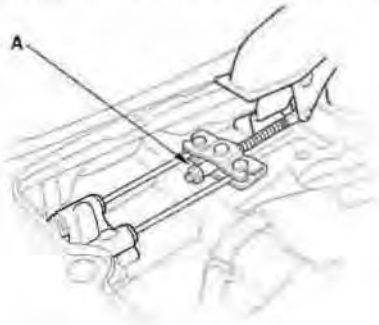
5. Tighten the adjusting nut (A) until the parking brakes drag slightly when the rear wheels are turned.



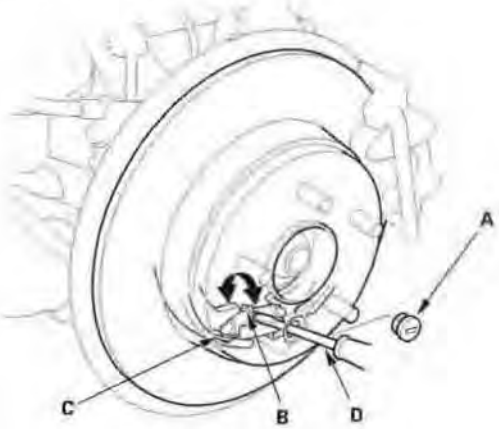
6. Release the parking brake lever fully, and check that the parking brakes do not drag when the rear wheels are turned. Readjust if necessary.
7. Make sure the parking brakes are fully applied when the parking brake lever is pulled all the way.
8. Install the center console (see page 20-71).

Major Adjustment (to be done when replacing parking brake shoes and after lining surface break-in)

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9).
2. Release the parking brake lever fully.
3. Remove the center console (see page 20-71).
4. Back off the adjusting nut (A) in the equalizer.



5. Remove the rear wheels.
6. Remove the access plug (A).

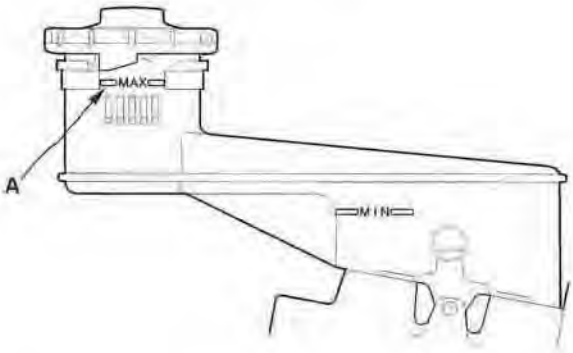


7. Turn the ratchet teeth (B) on the adjuster assembly (C) with a flat-tip screwdriver (D) until the shoes lock against the drum. Then back off the adjuster 8 clicks, and install the access plug.
8. Do the minor adjustment procedure.
9. Install the rear wheels.
10. Install the center console (see page 20-71).

Brake System Bleeding

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of the bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.
- Do not reuse the drained fluid.
- Always use Honda DOT 3 Brake Fluid from an unopened container. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line (A).



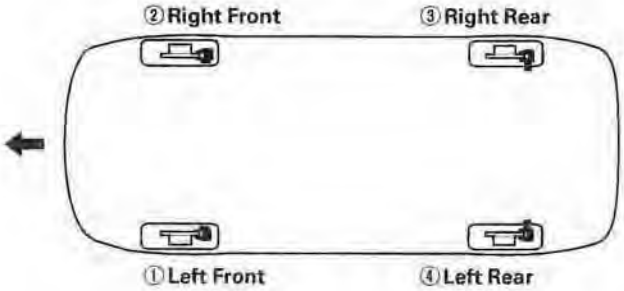
2. Slide a piece of clear plastic hose over the bleed screw, and submerge the other end in a container of new brake fluid.

3. Have someone slowly pump the brake pedal several times, then apply steady pressure.

4. Loosen the left-front brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.

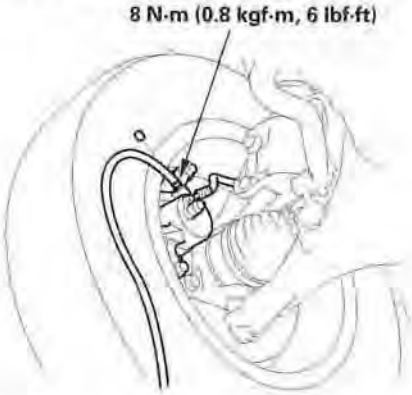
5. Repeat the procedure for each wheel in the sequence shown following until air bubbles no longer appear in the fluid.

BLEEDING SEQUENCE:

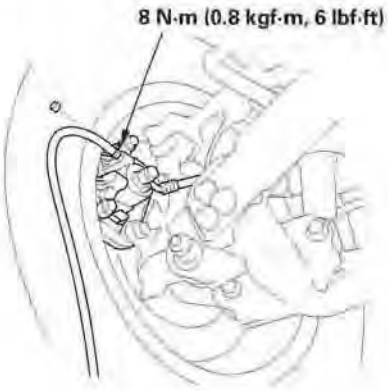


6. Refill the master cylinder reservoir to the MAX (upper) level line.

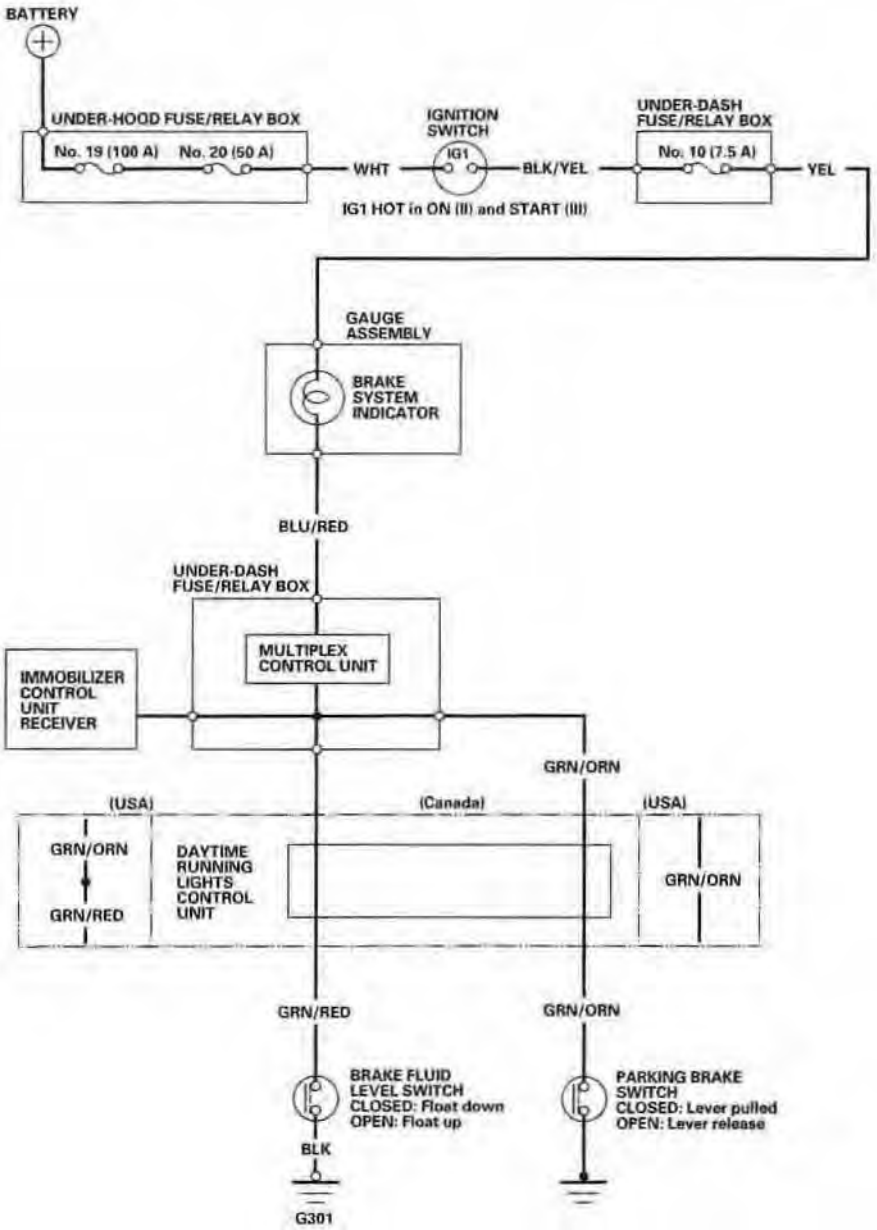
Front brake



Rear brake

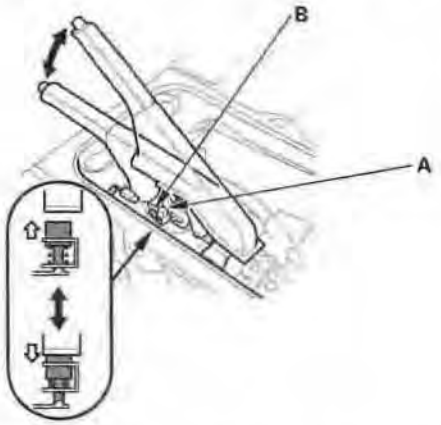


Brake System Indicator Circuit Diagram



Parking Brake Switch Test

1. Remove the center console (see page 20-71).
2. Disconnect the connector from the parking brake switch (A).



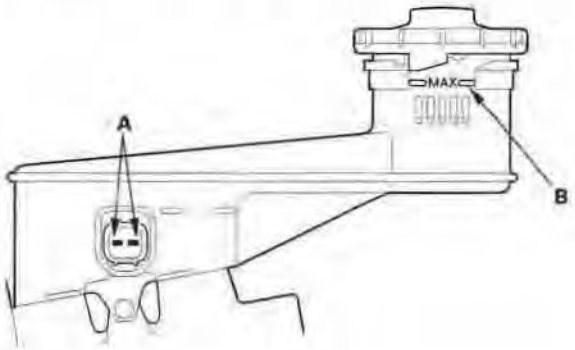
3. Check for continuity between the switch terminal (B) and body ground.
   - With the parking brake lever pulled, there should be continuity.
   - With the parking brake lever released, there should be no continuity.

   NOTE:
   - If both the ABS indicator and the brake system indicator come on at the same time, check the ABS (see page 19-39).
   - If the parking brake switch and brake fluid level switch are OK, but the brake system indicator does not work, check the ABS (see page 19-39).

Brake Fluid Level Switch Test

Check for continuity between the terminals (A) with the float in the down position and the up position.

- Remove the brake fluid completely from the reservoir. With the float down, there should be continuity.
- Fill the reservoir with brake fluid to the MAX (upper) level (B). With the float up, there should be no continuity.



Front Brake Pad Inspection and Replacement

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

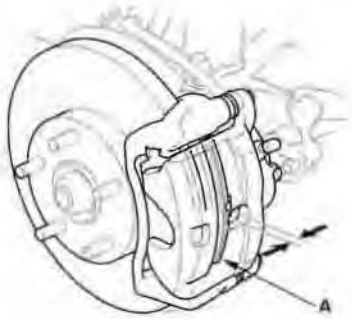
Inspection

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the front wheels.

2. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the brake pad backing plate.

Brake pad thickness:
Standard: 10.6—11.2 mm (0.42—0.44 in.)
Service limit: 1.6 mm (0.06 in.)

Inner pad



Outer pad

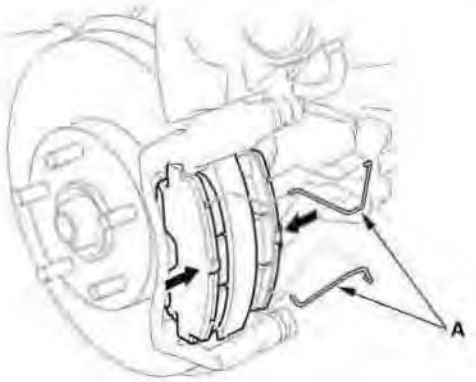
3. If the brake pad thickness is less than the service limit, replace all the pads as a set.

Replacement

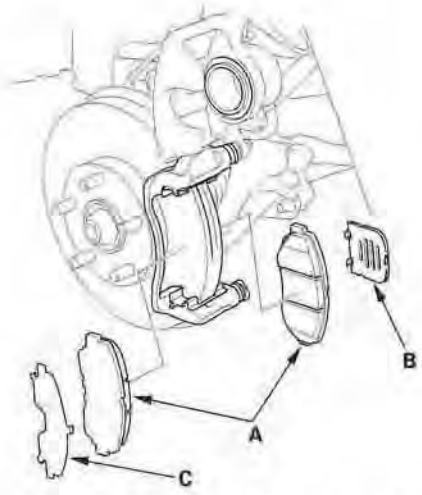
1. Remove the flange bolt (A).

NOTE: The pad springs are installed on the brake pads to prevent brake drag. Be careful when pivoting up the caliper body fully, or the spring could be flipped out of position.

2. Pivot the caliper slightly so the brake pads do not come out of position, and hold the brake pads on both sides firmly with your fingers. Remove the pad springs (A) from the brake pads.



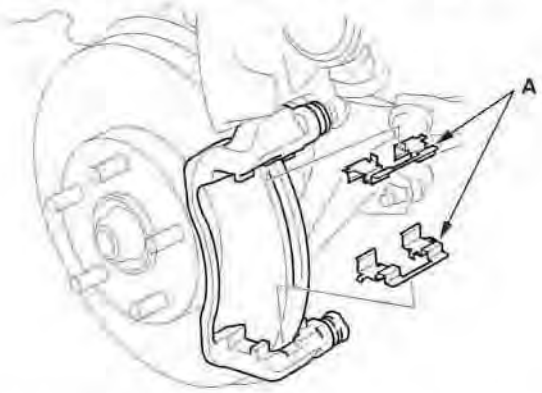
3. Pivot the caliper up out of the way, and remove the pads (A).



4. Remove the inner pad shim (B), and outer pad shim (C).

5. Check the hose and pin boots for damage and deterioration.

6. Remove the pad retainers (A). Clean the upper and lower pad retainers; remove any corrosion.

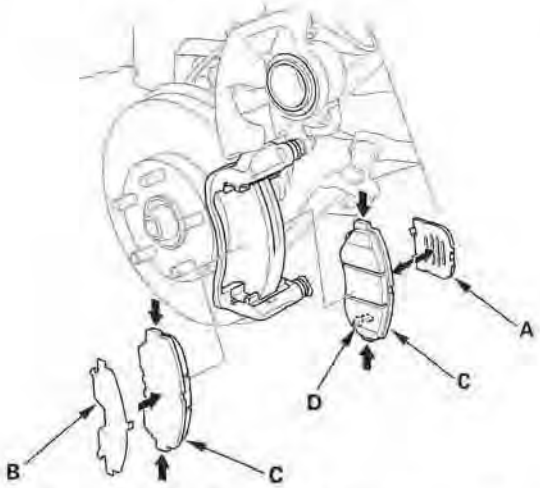


7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.

8. Check the brake disc for damage and cracks.

9. Install the pad retainers.

10. Apply a thin coat of M-77 assembly paste (P/N 08798-9010) to both sides of the inner pad shim (A), and outer pad shim (B), the back of the brake pads (C), and the other areas indicated by the arrows. Wipe excess assembly paste off the shim. Contaminated brake discs and brake pads reduce stopping ability. Keep assembly paste off the brake discs and brake pad material.

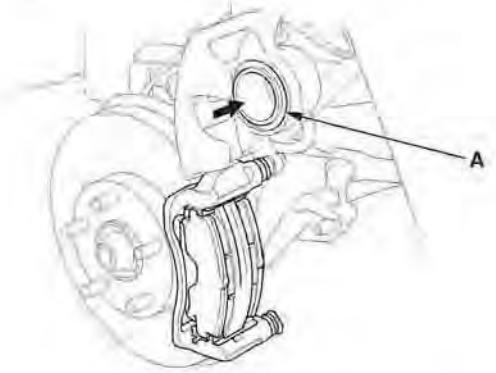


11. Install the brake pads and pad shims correctly. Install the brake pads with the wear indicator (D) on the bottom inside.
If you are reusing the brake pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

(cont'd)

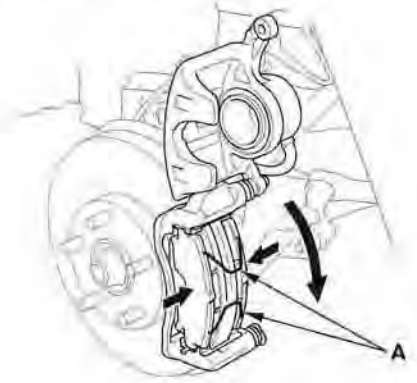
Front Brake Pad Inspection and Replacement (cont'd)

12. Push in the piston (A) so the caliper will fit over the brake pads. Check the brake fluid level. The brake fluid may overflow if the reservoir is too full. Make sure the piston boot is in position to prevent damaging it when pivoting the caliper down.

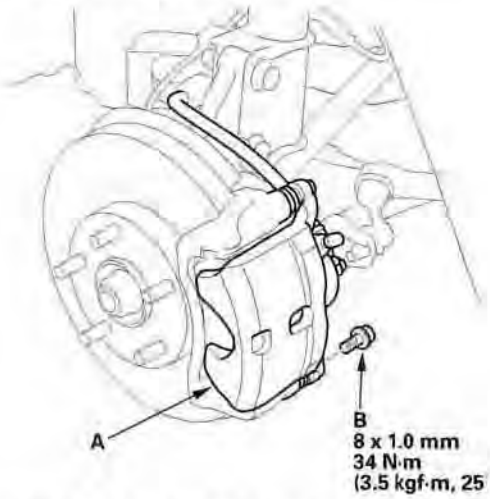


13. Hold the brake pads on both sides firmly with your fingers, and install the new pad springs (A) on the brake pads. Holding the brake pads, set the caliper over the brake pads by pivoting it down slowly.

    NOTE: Insert the pad spring ends into the pad installation holes securely.



14. Pivot the caliper (A) down into position. Be careful not to damage the pin boots.



15. Install the flange bolt (B), and tighten it to the specified torque.

16. After installation, press the brake pedal several times to make sure the brakes work.

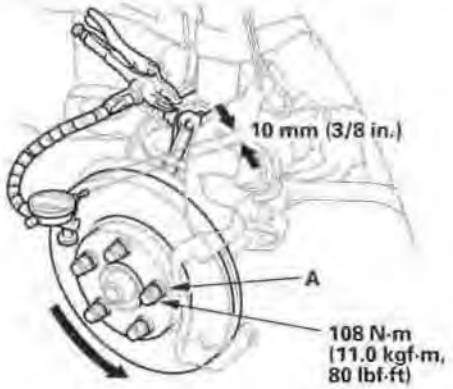
    NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

17. Check for leaks at the hose and line joints or connections, if necessary repair the cause of the leak, then test-drive.

Front Brake Disc Inspection

Runout

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the front wheels.
2. Remove the brake pads (see page 19-12).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly, and remove all rust.
4. Install suitable flat washers (A) and wheel nuts, and tighten the nuts to the specified torque to hold the brake disc securely against the hub.



5. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (3/8 in.) from the outer edge of the disc.

Brake disc runout:
Service limit: 0.10 mm (0.004 in.)

6. If the disc is beyond the service limit, refinish the brake disc.

Max. refinish limit: 21.0 mm (0.83 in.)

NOTE:
- If the brake disc is beyond the service limit for refinishing, replace it (see step 3 on page 18-12).
- A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and Parallelism

1. Raise the front of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the front wheels.
2. Remove the brake pads (see page 19-12).
3. Using a micrometer, measure disc thickness at eight points, approximately 45 ° apart and 10 mm (3/8 in.) in from the outer edge of the disc.

Brake disc thickness:
Standard: 23.0 mm (0.91 in.)
Max. refinishing limit: 21.0 mm (0.83 in.)
Brake disc parallelism: 0.015 mm (0.0006 in.) max.

NOTE: This is the maximum allowable difference between the thickness measurements.

4. If the smallest measurement is less than the maximum refinishing limit, replace the brake disc (see step 3 on page 18-12).
5. If the disc is beyond the service limit for parallelism, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way Manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

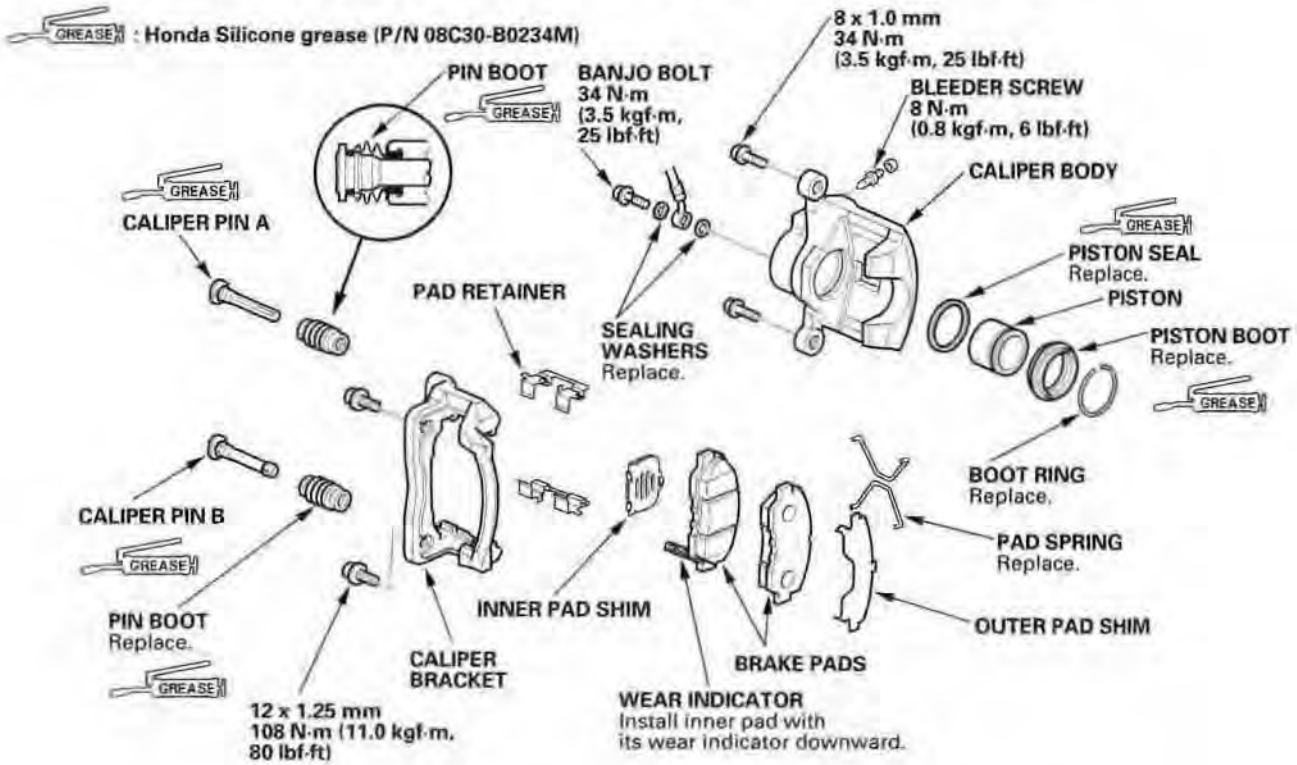
Front Brake Caliper Overhaul

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

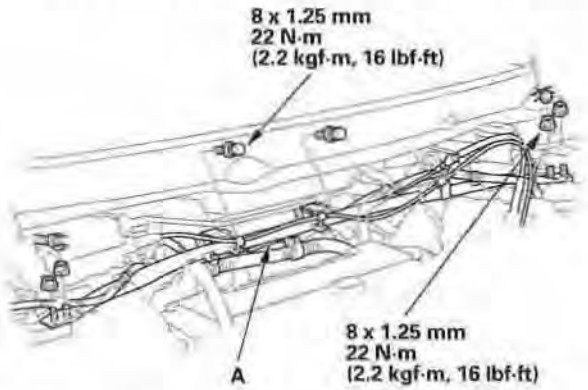
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping brake fluid, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter get in the brake fluid.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid.
- Always use Honda DOT 3 Brake Fluid from an unopened container. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Do not mix different brands of brake fluid as they may not be compatible.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- Replace all rubber parts with new ones whenever disassembled.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.



Master Cylinder Replacement

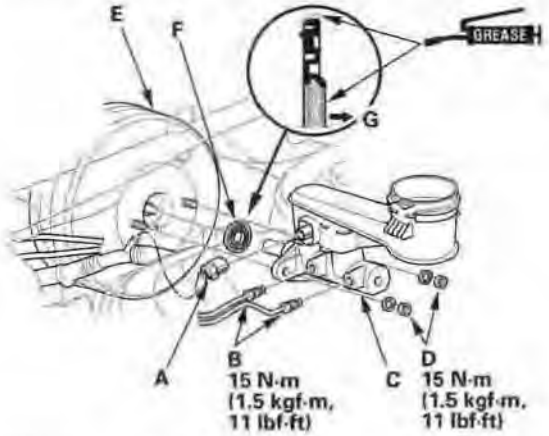
NOTE: Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

1. Release the engine wire harness clips on the strut brace (A), and remove the strut brace.
   With M/T: Remove the clutch reservoir bracket from the vehicle, and move it aside. Do not disconnect the clutch hose from the reservoir.



2. Remove the reservoir cap and brake fluid from the master cylinder reservoir.

3. Remove the brake fluid level sensor connector (A).



4. Disconnect the brake lines (B) from the master cylinder (C). To prevent spills, cover the hose joints with rags or shop towels.

5. Remove the master cylinder mounting nuts (D) and washers.

6. Remove the master cylinder from the brake booster (E). Be careful not to bend or damage the brake lines when removing the master cylinder.

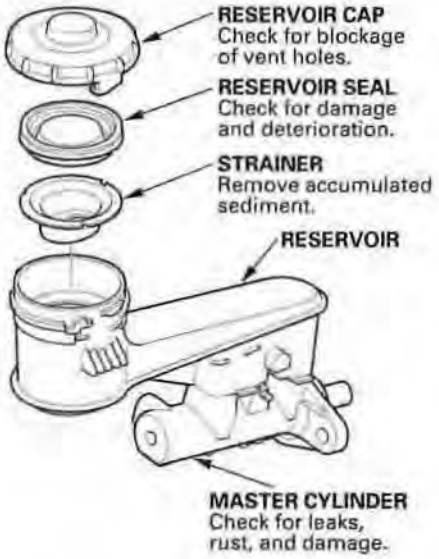
7. Remove the rod seal (F) from the master cylinder.

8. Install the master cylinder in the reverse order of removal, and note these items:

   - Replace all the rubber parts with new ones whenever the master cylinder is removed.
   - Check the pushrod clearance before installing the master cylinder, and adjust it if necessary (see page 19-18).
   - Use a new rod seal on reassembly.
   - Coat the inner bore lip and outer circumference of the new rod seal with the recommended seal grease in the master cylinder set.
   - Install the rod seal onto the master cylinder with its grooved side (G) toward the master cylinder.
   - Check the brake pedal height and free play after installing the master cylinder, and adjust it if necessary (see page 19-6).
   - Bleed brake system (see page 19-9).

Master Cylinder Inspection

NOTE:
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not try to disassemble the master cylinder assembly. Replace the master cylinder assembly with a new part if necessary.
- Do not allow dirt or foreign matter to contaminate the brake fluid.

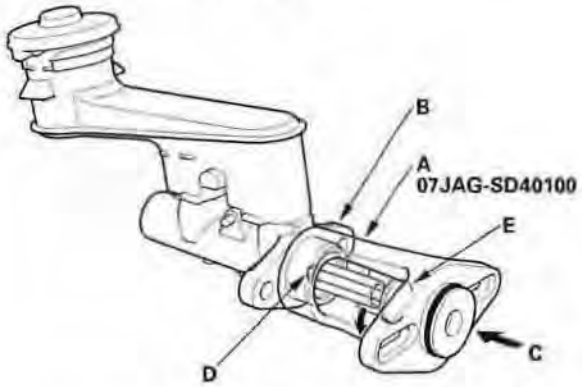


Brake Booster Pushrod Clearance Adjustment

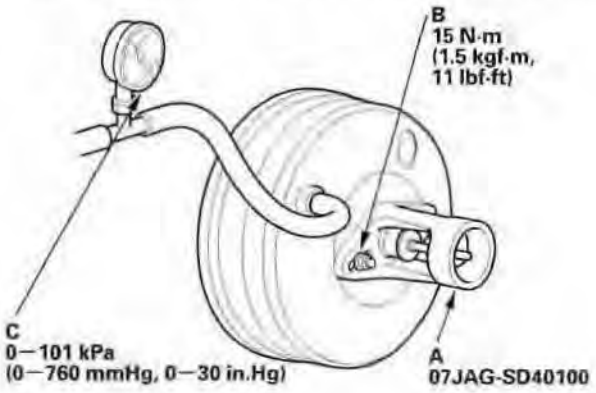
Special Tools Required
Pushrod adjustment gauge 07JAG-SD40100

NOTE: Brake booster pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing the master cylinder.

1. Set the special tool (A) on the master cylinder body (B), push in the center shaft (C) until the top of it contacts the end of the secondary piston (D) by turning the adjusting nut (E).



2. Without disturbing the center shaft's position, install the special tool (A) backwards on the booster.

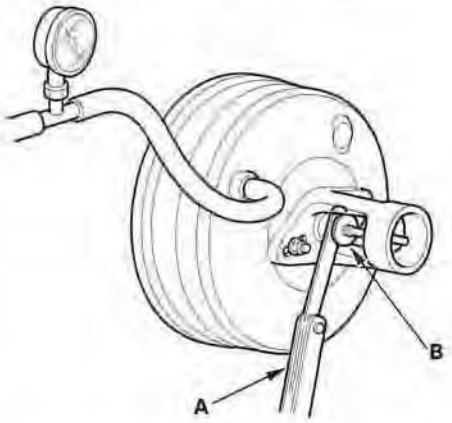


3. Install the master cylinder nuts (B), and tighten them to the specified torque.

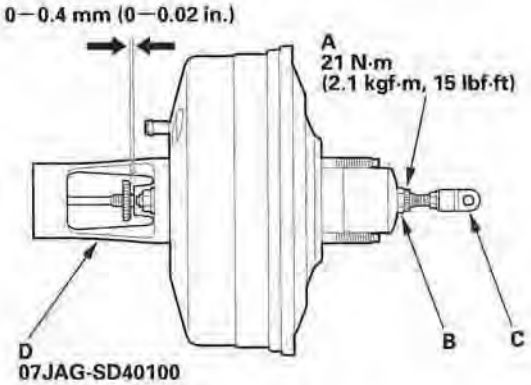
4. Connect the booster in-line with a vacuum gauge (C) 0—101 kPa (0—760 mmHg, 0—30 in.Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 66 kPa (500 mmHg, 20 in.Hg) vacuum.

5. With a feeler gauge (A), measure the clearance between the gauge body and the adjusting nut (B) as shown.
   If the clearance between the gauge body and the adjusting nut is 0.4 mm (0.02 in.), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body and the adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in.) or more. Therefore it must be adjusted and rechecked.

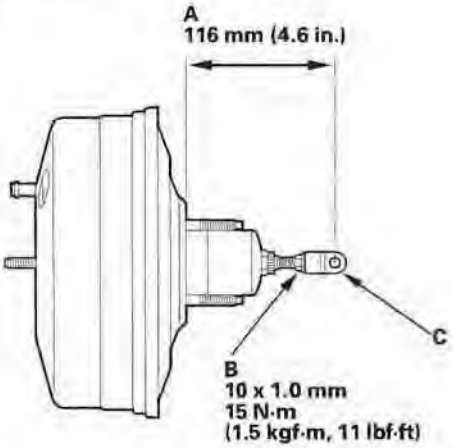
   Clearance: 0—0.4 mm (0—0.02 in.)



6. If the clearance is incorrect, loosen the star locknut (A), and turn the adjuster (B) in or out to adjust.
   - Adjust the clearance while the specified vacuum is applied to the booster.
   - Hold the yoke (C) while adjusting.



7. Tighten the star locknut securely.
8. Remove the special tool (D).
9. Check the pushrod length (A) as shown if the booster is removed. If the length is incorrect, loosen the pushrod locknut (B), and turn the yoke (C) in or out to adjust.



10. Install the master cylinder (see page 19-17).

Brake Booster Test

Functional Test

1. With the engine stopped, press the brake pedal several times to deplete the vacuum reservoir, then press the pedal hard, and hold it for 15 seconds. If the pedal sinks, either the master cylinder is bypassing internally, or the brake system (master cylinder, lines, modulator, or caliper) is leaking.

2. Start the engine with the brake pedal pressed. If the pedal sinks slightly, the vacuum booster is operating normally. If the pedal height does not vary, the booster or check valve is faulty.

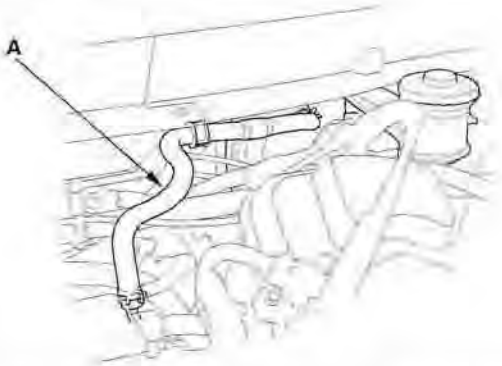
3. With the engine running, press the brake pedal lightly and shift the transmission to the D position. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 10 mm (3/8 in.) in 3 minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the booster.)

Leak Test

1. Press the brake pedal with the engine running, then stop the engine. If the pedal height does not vary while pressed for 30 seconds, the vacuum booster is OK. If the pedal rises, the booster is faulty.

2. Turn the engine off, and wait 30 seconds. Press the brake pedal several times using normal pressure. When the pedal is first pressed, it should be low. On consecutive applications, the pedal height should gradually rise. If the pedal position does not vary, check the booster check valve.

3. Disconnect the brake booster vacuum hose (check valve built-in) (A) at the booster side.



4. Start the engine, and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.

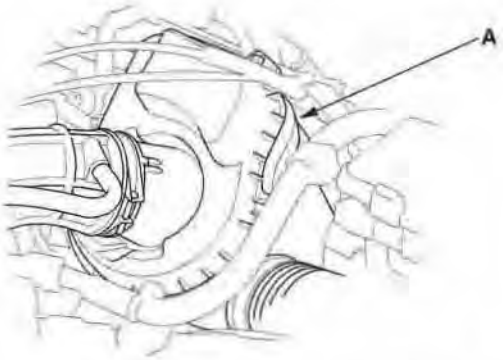
5. Start the engine, and then pinch the brake booster vacuum hose between the check valve and the booster.

6. Turn the engine off, and wait 30 seconds. Press the brake pedal several times using normal pressure. When the pedal is first pressed, it should be low. On consecutive applications, the pedal height should gradually rise.

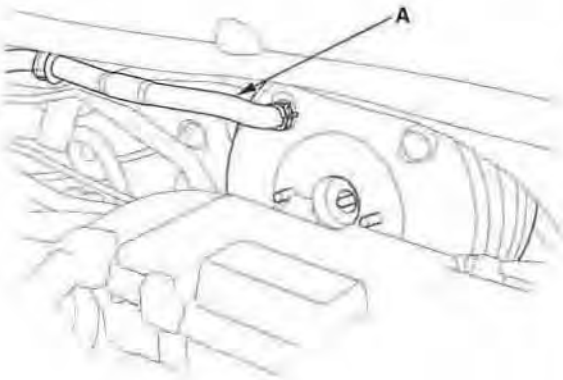
   - If the pedal position does not vary, replace the brake booster.
   - If the pedal position varies, replace the brake booster vacuum hose/check valve assembly.

Brake Booster Replacement

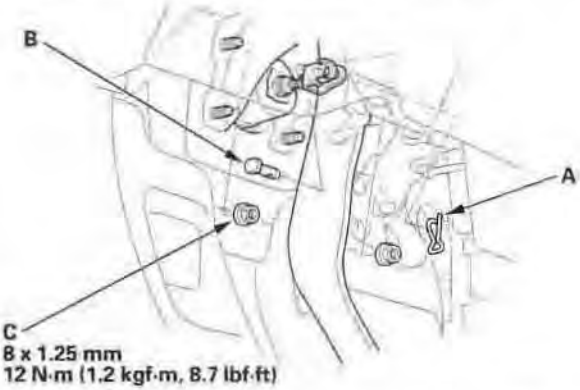
1. Remove the master cylinder (see page 19-17).
2. Remove the air cleaner assembly (A).



3. Disconnect the vacuum hose (A) from the brake booster.



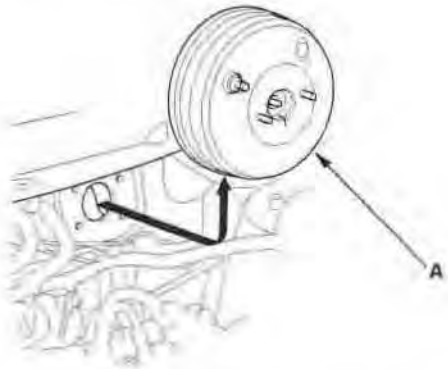
4. Remove the clip (A) and the joint pin (B), and disconnect the yoke from the brake pedal.



5. Remove the brake booster mounting nuts (C).
6. Remove the brake booster (A) from the engine compartment.

NOTICE

- Be careful not to damage the booster surfaces and threads of the booster stud bolts.
- Be careful not to bend or damage the brake lines.



7. Install the brake booster in the reverse order of removal, and note these items:

- Adjust the pushrod clearance before installing the brake booster (see page 19-18).
- Use a new clip whenever installing.
- After installing the brake booster and master cylinder, fill the reservoir with new brake fluid, bleed the brake system (see page 19-9), and adjust the brake pedal height and free play (see page 19-6).

Rear Brake Pad Inspection and Replacement

⚠CAUTION

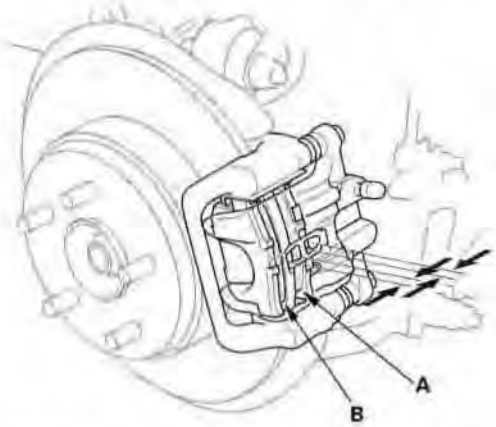
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Inspection

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.

2. Check the thickness of the inner pad (A) and outer pad (B). Do not include the thickness of the brake pad backing plate.

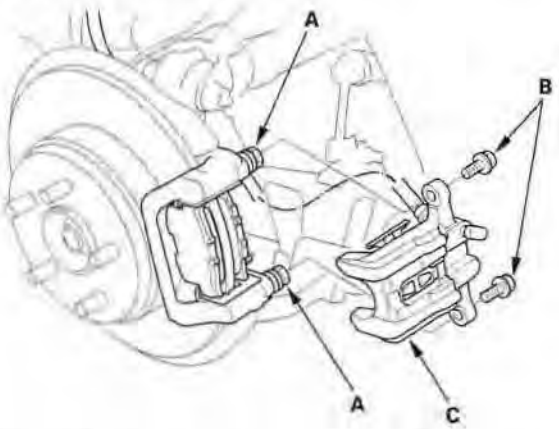
Brake pad thickness:
Standard: 8.6—9.7 mm (0.34—0.38 in.)
Service limit: 1.6 mm (0.06 in.)



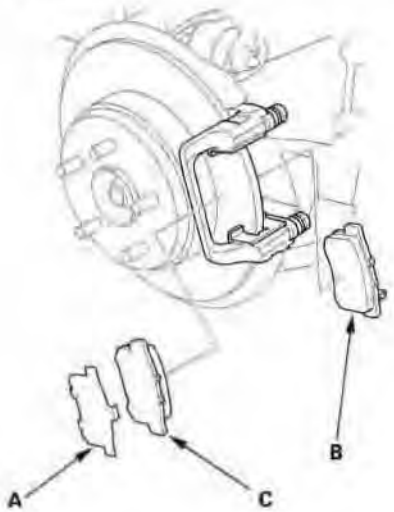
3. If the brake pad thickness is less than the service limit, replace all the brake pads as a set.

Replacement

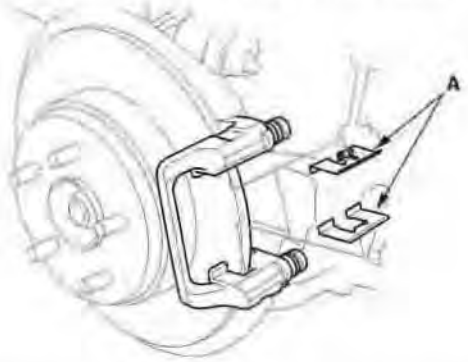
1. Hold the pins (A) with a wrench, being careful not to damage the pin boots. Remove the caliper bolts (B), and remove the caliper (C) with inner pad from the caliper bracket.



2. Remove the pad shim (A) and inner pad (B), and outer pad (C).



3. Remove the pad retainers (A). Clean the upper and lower pad retainers; remove any corrosion.

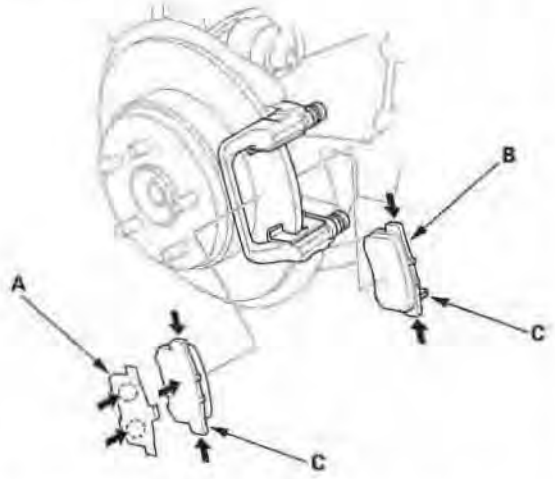


4. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.

5. Check the brake disc for damage and cracks.

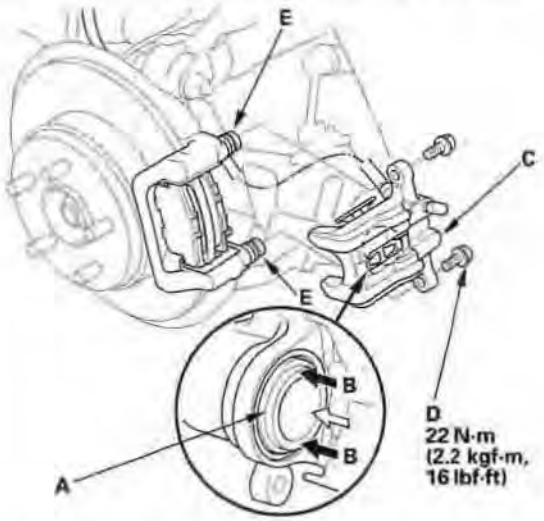
6. Install the pad retainers.

7. Apply a thin coat of M-77 assembly paste (P/N 08798-9010) to both sides of the pad shim (A), the back of the inner pad (B) and outer pad (C), and the other areas indicated by the arrows. Wipe excess assembly paste off the shim. Contaminated brake discs and brake pads reduce stopping ability. Keep assembly paste off the brake discs and brake pad material.



8. Install the brake pads and pad shims correctly. Install the brake pads with the wear indicators (D) on the bottom inside.
If you are reusing the brake pads, always reinstall the brake pads in their original positions to prevent a momentary loss of braking efficiency.

9. Push in the piston (A) so that the caliper will fit over the brake pads. Check the brake fluid level. The brake fluid may overflow if the reservoir is too full. Make sure that the piston boot is in position to prevent damaging it when installing the caliper.



10. Apply a thin coat of M-77 assembly paste (P/N 08798-9010) to the piston edges (B) on their mating surfaces against the inner pad.

11. Install the brake caliper (C) and caliper bolts (D), and torque them to the specified torque while holding the pin (E). Be careful not to damage the pin boots.

12. Press the brake pedal several times to make sure the brakes work, then test-drive.

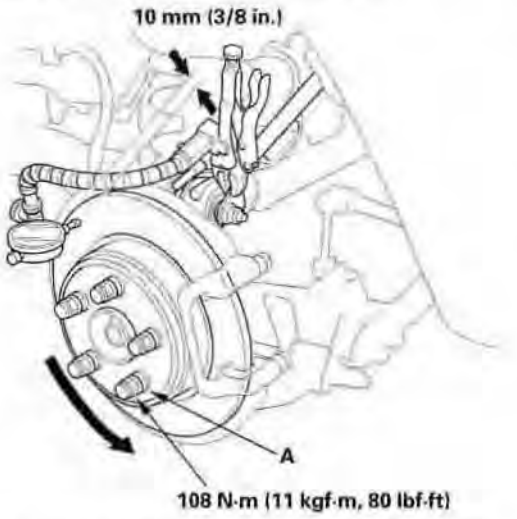
    NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

13. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

Rear Brake Disc Inspection

Runout

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.
2. Remove the brake pads (see page 19-22).
3. Inspect the brake disc surface for damage and cracks. Clean the disc thoroughly and remove all rust.
4. Install suitable flat washers (A) and wheel nuts, and tighten the nuts to the specified torque to hold the brake disc securely against the hub.



5. Set up the dial gauge against the brake disc as shown, and measure the runout at 10 mm (3/8 in.) from the outer edge of the disc.

   Brake disc runout:
   Service limit: 0.10 mm (0.004 in.)

6. If the brake disc is beyond the service limit, refinish the disc.

   Max. refinishing limit: 7.5 mm (0.30 in.)

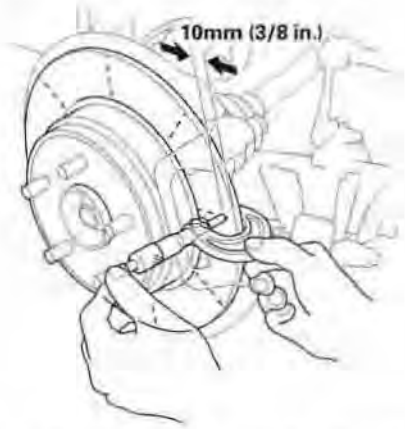
   NOTE:
   - If the brake disc is beyond the service limit for refinishing, replace it (see step 4 on page 18-27).
   - A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in.).

Thickness and Parallelism

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.
2. Remove the brake pads (see page 19-22).
3. Using a micrometer, measure disc thickness at eight points, approximately 45 ° apart and 10 mm (3/8 in.) in from the outer edge of the disc.

   Brake disc thickness:
   Standard: 8.9—9.1 mm (0.350—0.358 in.)
   Max. refinishing limit: 7.5 mm (0.30 in.)
   Brake disc parallelism: 0.015 mm (0.0006 in.) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.



4. If the smallest measurement is less than the maximum refinishing limit, replace the brake disc (see step 4 on page 18-27).
5. If the brake disc is beyond the service limit for parallelism, refinish the disc with an on-car brake lathe.

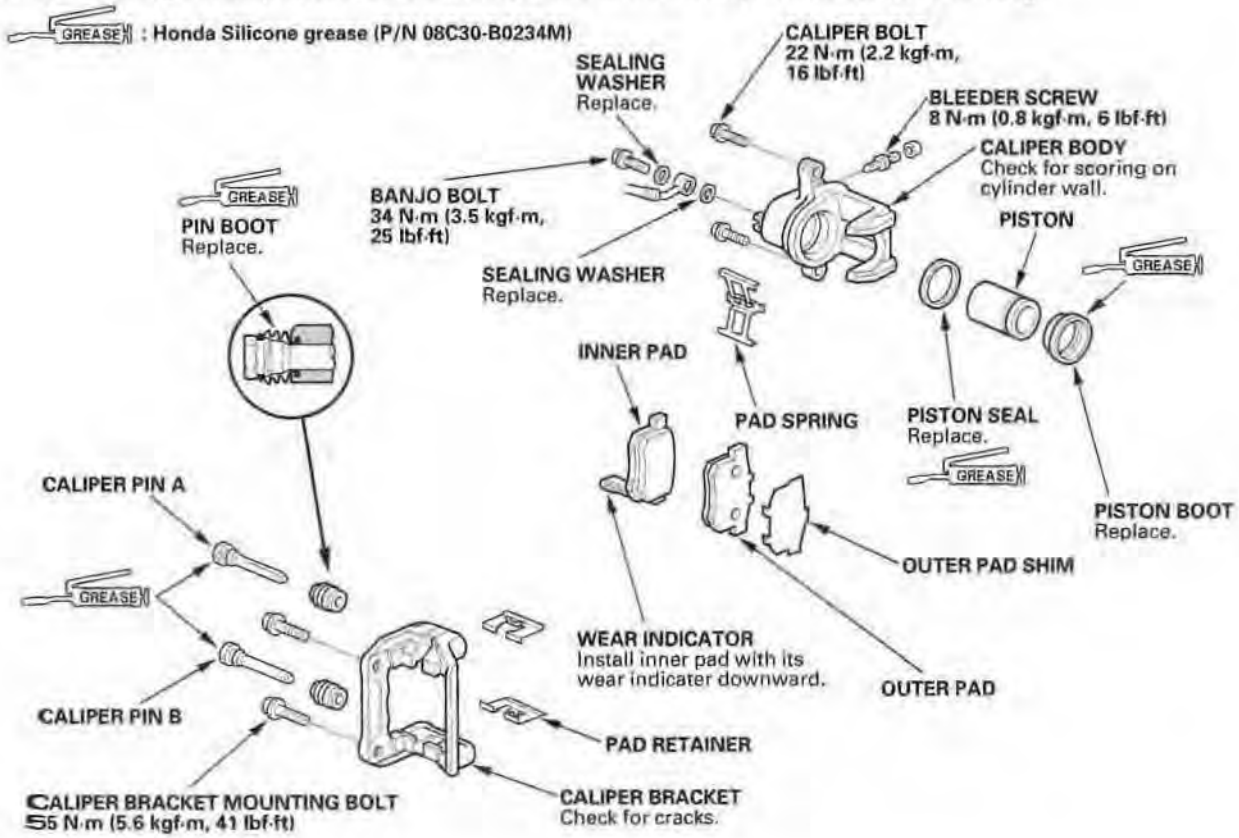
Rear Brake Caliper Overhaul

⚠CAUTION

Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Remove, disassemble, inspect, reassemble, and install the caliper, and note these items:

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping, cover disconnected hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dirt and other foreign particles.
- Replace parts with new ones as specified in the illustration.
- Make sure no dirt or other foreign matter gets in the brake fluid.
- Make sure no grease or oil gets on the brake discs or pads.
- When reusing pads, always reinstall them in their original positions to prevent loss of braking efficiency.
- Do not reuse drained brake fluid.
- Always use Honda DOT 3 Brake Fluid from an unopened container. Non-Honda brake fluid can cause corrosion and shorten the life of the system.
- Do not mix different brands of brake fluid as they may not be compatible.
- Coat the piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones.
- After installing the caliper, check the brake hose and line for leaks, interference, and twisting.



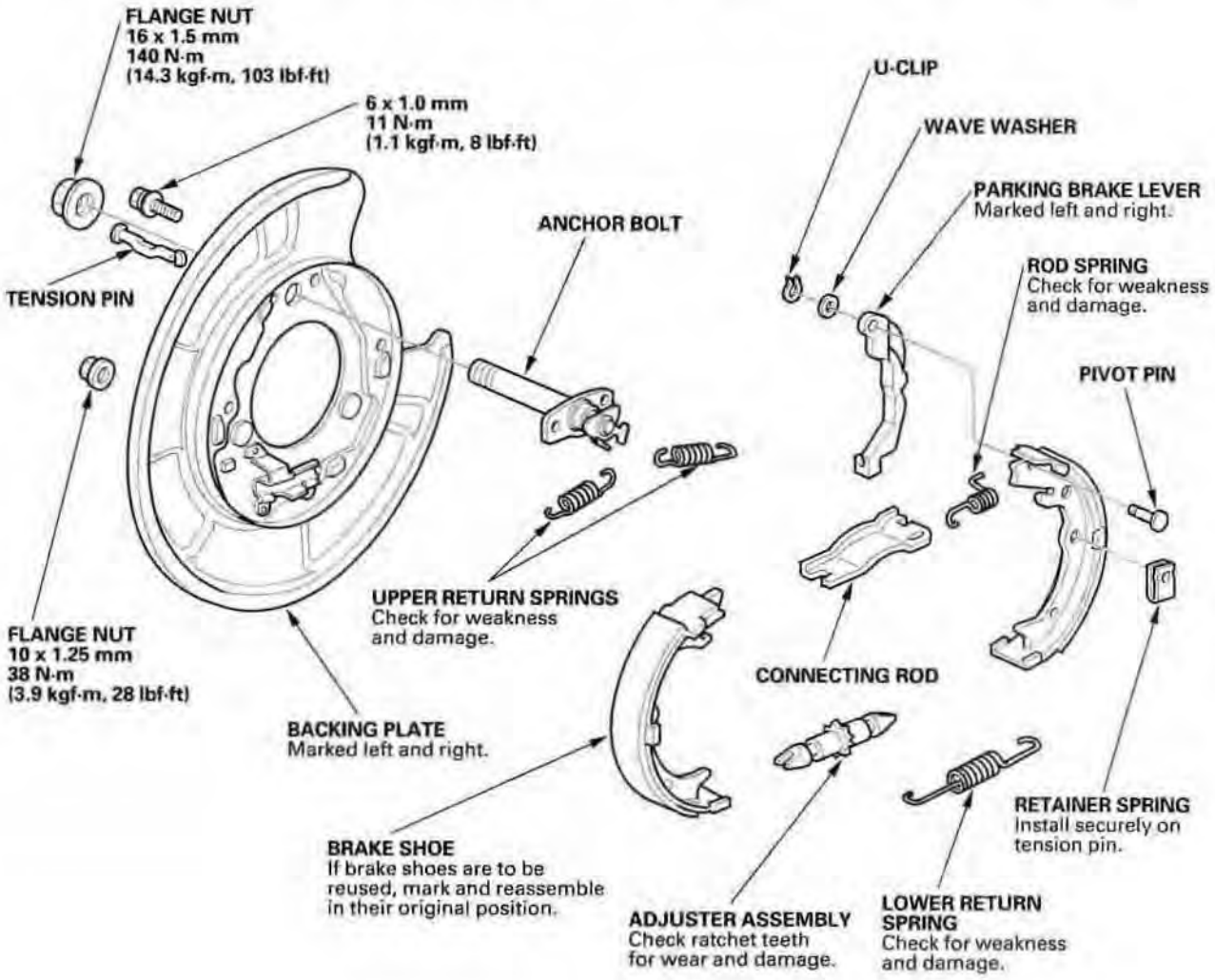
Parking Brake Inspection

⚠CAUTION

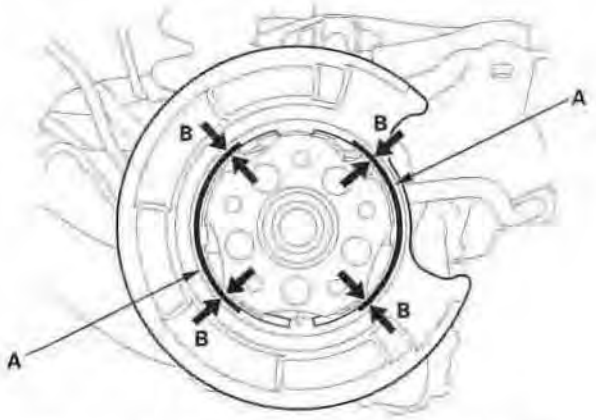
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.

2. Release the parking brake, and remove the rear brake caliper and disc/drum (see step 4 on page 18-27).



3. Check the parking brake linings (A) for cracking, glazing, wear, and contamination.



4. Measure the parking brake lining thickness (B). Measurement does not include brake shoe thickness.

Parking brake lining thickness:
Standard: 2.5 mm (0.098 in.)
Service limit: 1.0 mm (0.04 in.)

5. If the brake lining thickness is less than the service limit, replace all the parking brake shoes as a set.

6. Check the bearings in the hub unit for smooth operation.

7. Measure the inside diameter of the parking brake drum with inside vernier calipers.

Parking brake drum inside diameter:
Standard: 169.9—170.0 mm (6.689—6.693 in.)
Service limit: 171.0 mm (6.732 in.)

8. If the inside diameter of the parking brake drum is more than the service limit, replace the rear brake disc/drum.

9. Check the parking brake drum for scoring, grooves, and cracks.

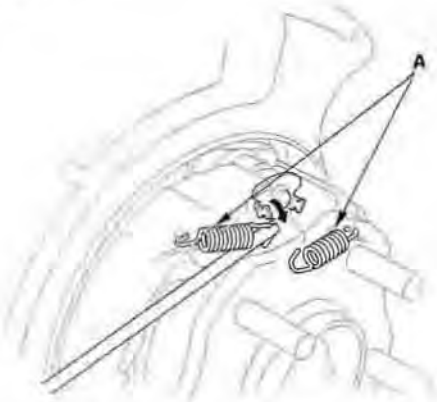
Parking Brake Shoe Replacement

⚠CAUTION

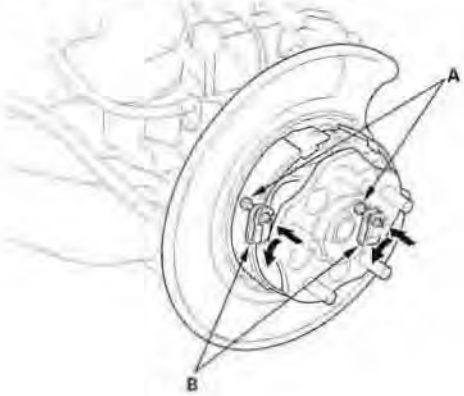
Frequent inhalation of brake pad dust, regardless of material composition, could be hazardous to your health.
- Avoid breathing dust particles.
- Never use an air hose or brush to clean brake assemblies. Use an OSHA-approved vacuum cleaner.

Disassembly

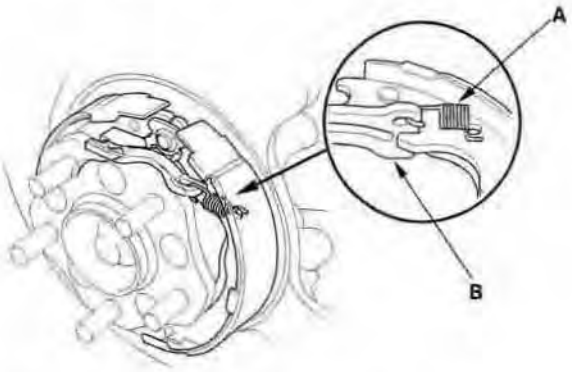
1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.
2. Release the parking brake, and remove the rear brake caliper and brake disc/drum (see step 4 on page 18-27).
3. Disconnect and remove the upper return springs (A).



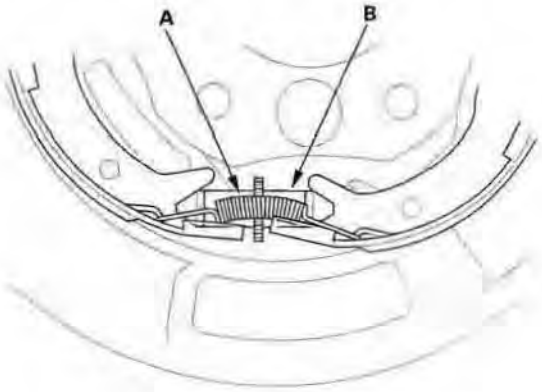
4. Remove the tension pins (A) by pushing the retainer springs (B) and turning the pins.



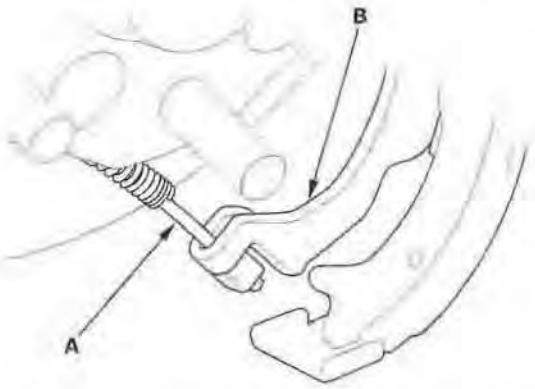
5. Disconnect the rod spring (A), and remove the connecting rod (B).



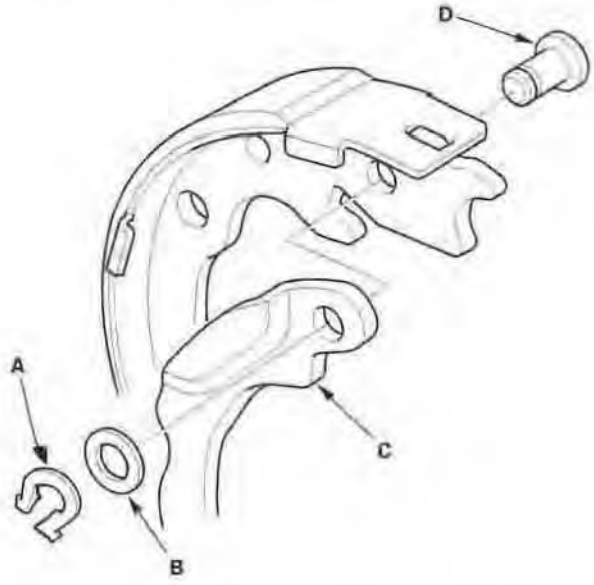
6. Lower the parking brake shoe assembly.
7. Remove the forward brake shoe by removing the lower return spring (A) and adjuster assembly (B).



8. Remove the rearward brake shoe by disconnecting the parking brake cable (A) from the parking brake lever (B).

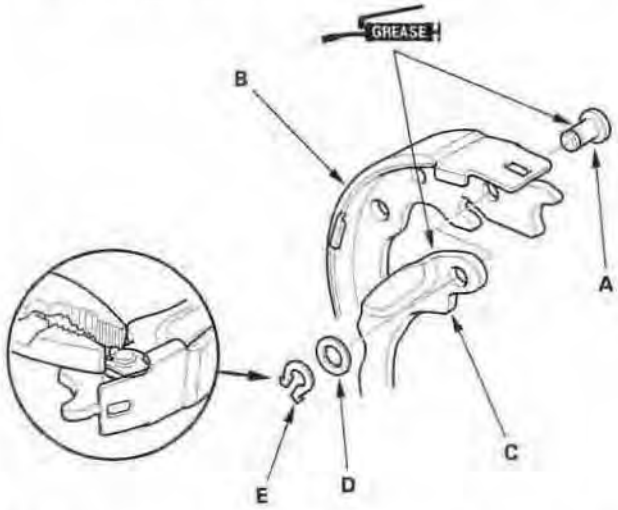


9. Remove the U-clip (A), wave washer (B), parking brake lever (C), and pivot pin (D) from the brake shoe.



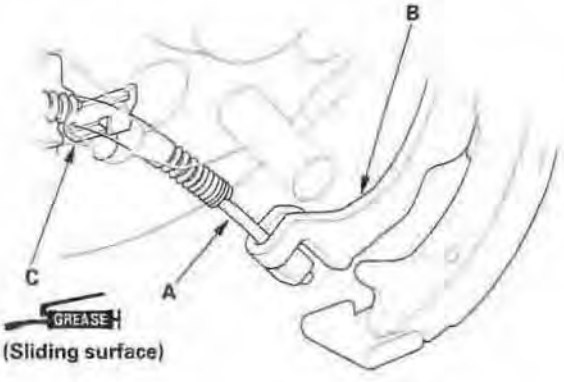
Reassembly

1. Apply a thin coat of 44 MA assembly paste to the sliding surface of the pivot pin (A), and insert the pin into the rearward brake shoe (B).



2. Install the parking brake lever (C) and wave washer (D) on the pivot pin, and secure with a new U-clip (E).
   - Install the wave washer with its convex side facing out.
   - Pinch the U-clip securely to prevent the pivot pin from coming out of the brake shoe.

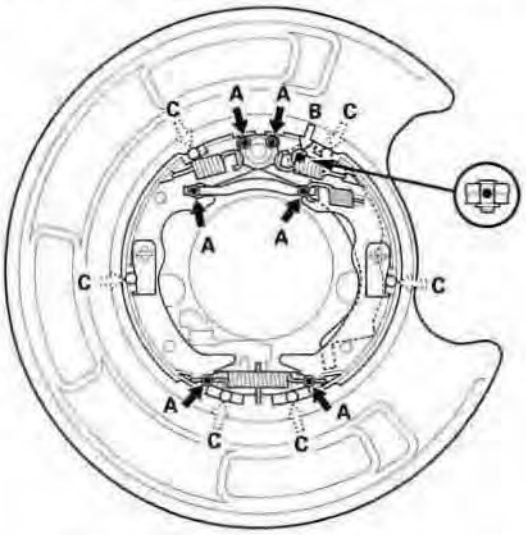
3. Connect the parking brake cable (A) to the parking brake lever (B). Apply silicone grease to the cable contact surface (C) on the backing plate.



(cont'd)

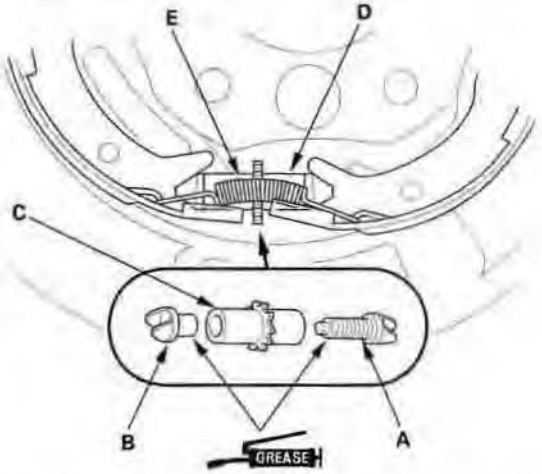
Parking Brake Shoe Replacement (cont'd)

4. Apply a thin coat of 44 MA assembly paste to the shoe ends and connecting rod ends (A), sliding surfaces (B), and opposite edges of the parking brake shoe (C) as illustrated. Wipe off any excess assembly paste. Do not get assembly paste on the brake lining material.



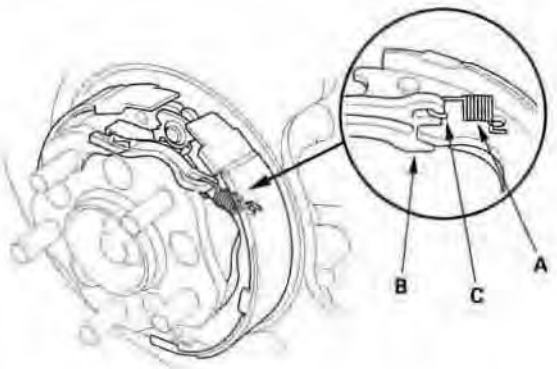
Greasing symbols:
- **Brake shoe ends and connecting rod ends**
- **Opposite edge of the shoe**
- **Sliding surface**

5. Clean the threaded portions of clevis A, and coat the threads of the clevis with grease. Clean the sliding surface of clevis B, and coat the sliding surface of clevis B with grease. Install clevises A and B on the adjuster (C), and shorten clevis A by turning the adjuster.

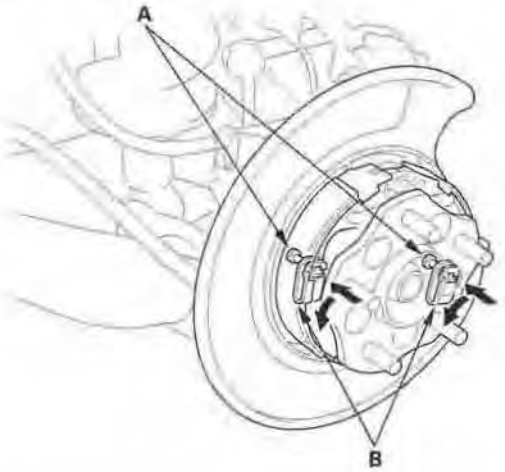


6. Reinstall the brake shoe adjuster assembly (D), and hook the lower return spring (E) on the parking brake shoes.

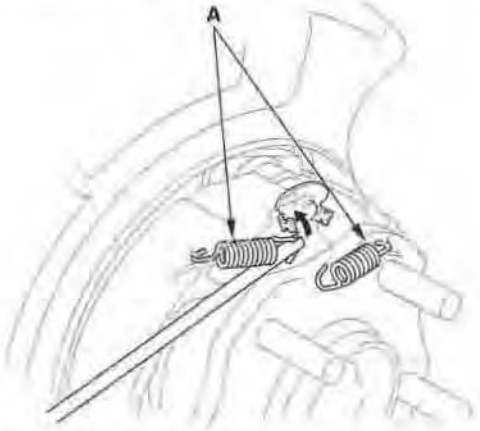
7. Hook the rod spring (A) to the connecting rod (B) first with the spring end (C) pointing downward. Then hook the rod spring to the parking brake shoe, and install the connecting rod on the parking brake shoes.



8. Reinstall the tension pins (A) and retainer springs (B). Make sure the tension pin does not contact the parking brake lever.



9. Reinstall the upper return springs (A).



10. Install the rear brake disc/drum and rear brake caliper (see page 18-26).

11. Do the major adjustment for the parking brake (see page 19-8).

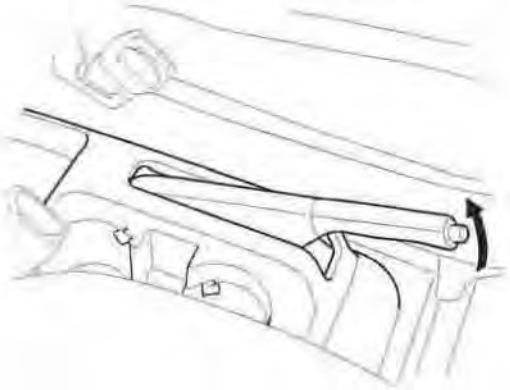
Parking Brake Shoe Lining Break-in

NOTE: Do the brake linings surface brake-in when replacing shoes with new linings and/or new rear brake disc/drum.

⚠ WARNING

Do this operation in a safe area.

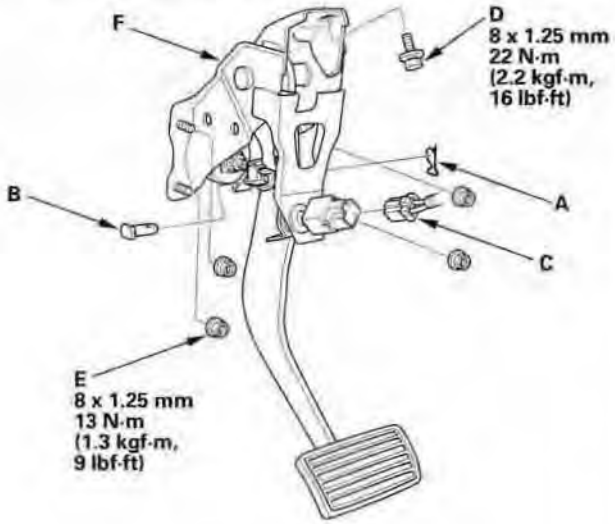
1. Park the vehicle on a firm, level surface.
2. Do the major parking brake adjustment.
3. Do the minor parking brake adjustment.
4. Drive the vehicle at 31 mph (50 km/h).
5. Pull the parking brake lever two to four clicks while driving the vehicle for 400 m (1/4 mile).



6. Stop the vehicle, and release the parking brake lever for 5—10 minutes to allow the rear brake disc/drum to cool. Repeat steps 4 through 6 three more times.
7. Check the parking brake lever adjustment (see page 19-7).

Brake Pedal Replacement

1. Remove the clip (A) and pin (B).

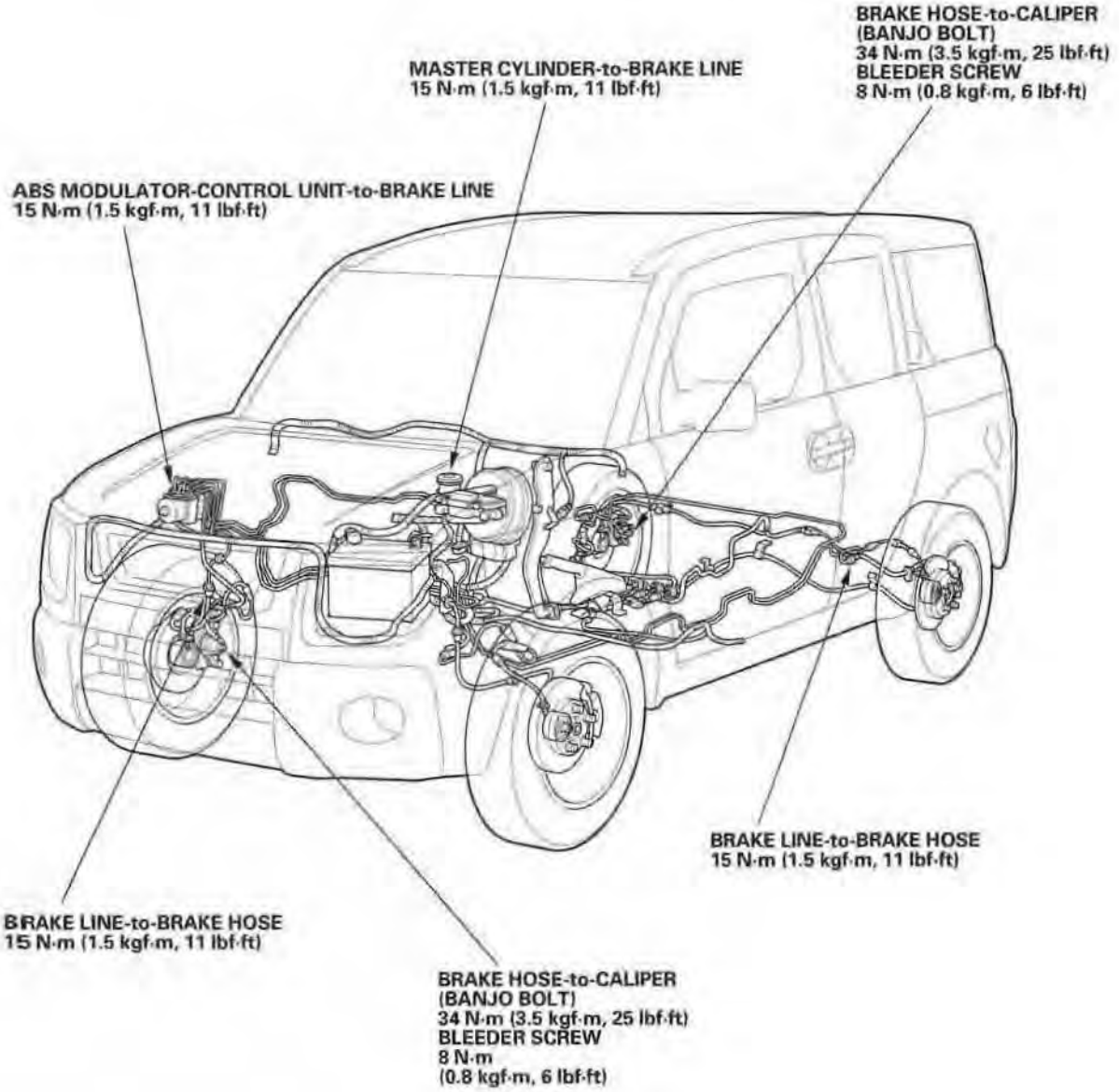


2. Disconnect the brake pedal position switch connector (C).
3. Remove the brake pedal braket mounting bolt (D) and brake booster mounting nuts (E).
4. Remove the brake pedal with bracket (F).
5. Install in the reverse order of removal.
6. Do the brake pedal and brake pedal position switch adjustment (see page 19-6).

Brake Hose and Line Inspection

1. Inspect the brake hoses for damage, deterioration, leaks, interference, and twisting.
2. Check the brake lines for damage, rusting, and leaks. Also check for bent brake lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.
4. Check the master cylinder and ABS modulator-control unit (if equipped) for damage and leaks.

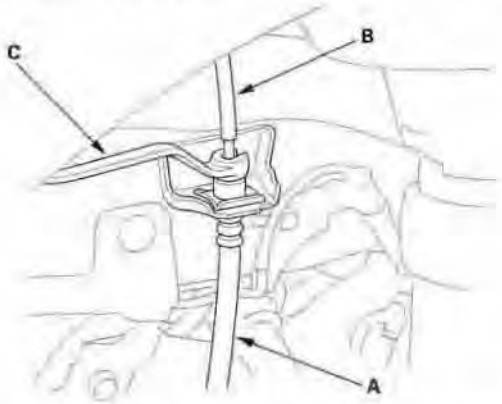
   NOTE: Replace the brake hose clip whenever the brake hose is serviced.



Brake Hose Replacement

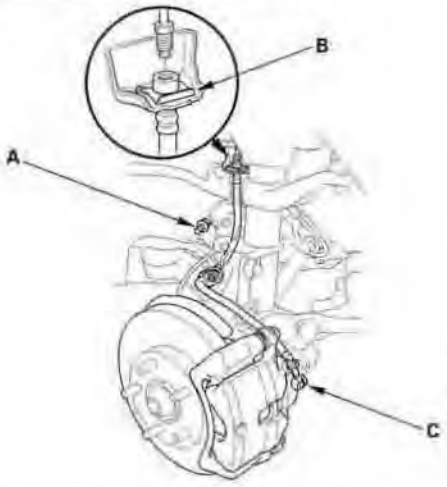
NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- To prevent dripping, cover disconnected line joints with rags or shop towels.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.

1. Replace the brake hose (A) if the hose is twisted, cracked, or if it leaks.



2. Disconnect the brake hose from the brake line (B) using a 10 mm flare nut wrench (C).

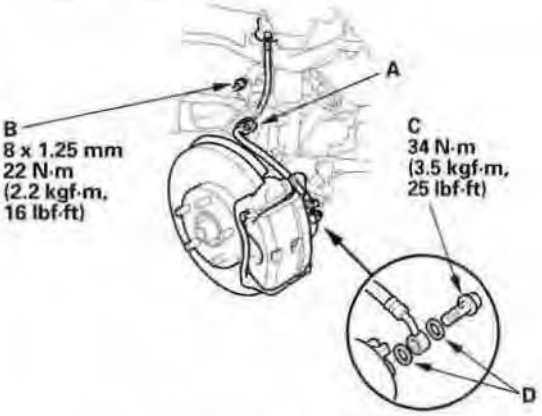
3. Remove the flange bolt (A), and remove the brake hose brackets from the damper.



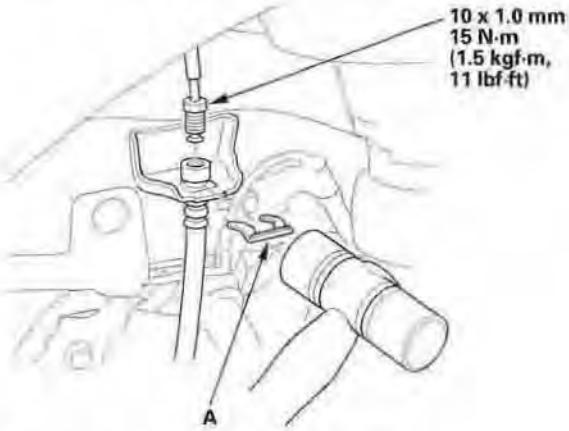
4. Remove and discard the hose clip (B).

5. Remove the banjo bolt (C), and remove the brake hose from the caliper.

6. Install the brake hose bracket (A) on the damper with the flange bolt (B) first, then connect the brake hose to the caliper with the banjo bolt (C) and new sealing washers (D).



7. Install the brake hose onto the brake hose bracket on the body with a new hose clip (A).



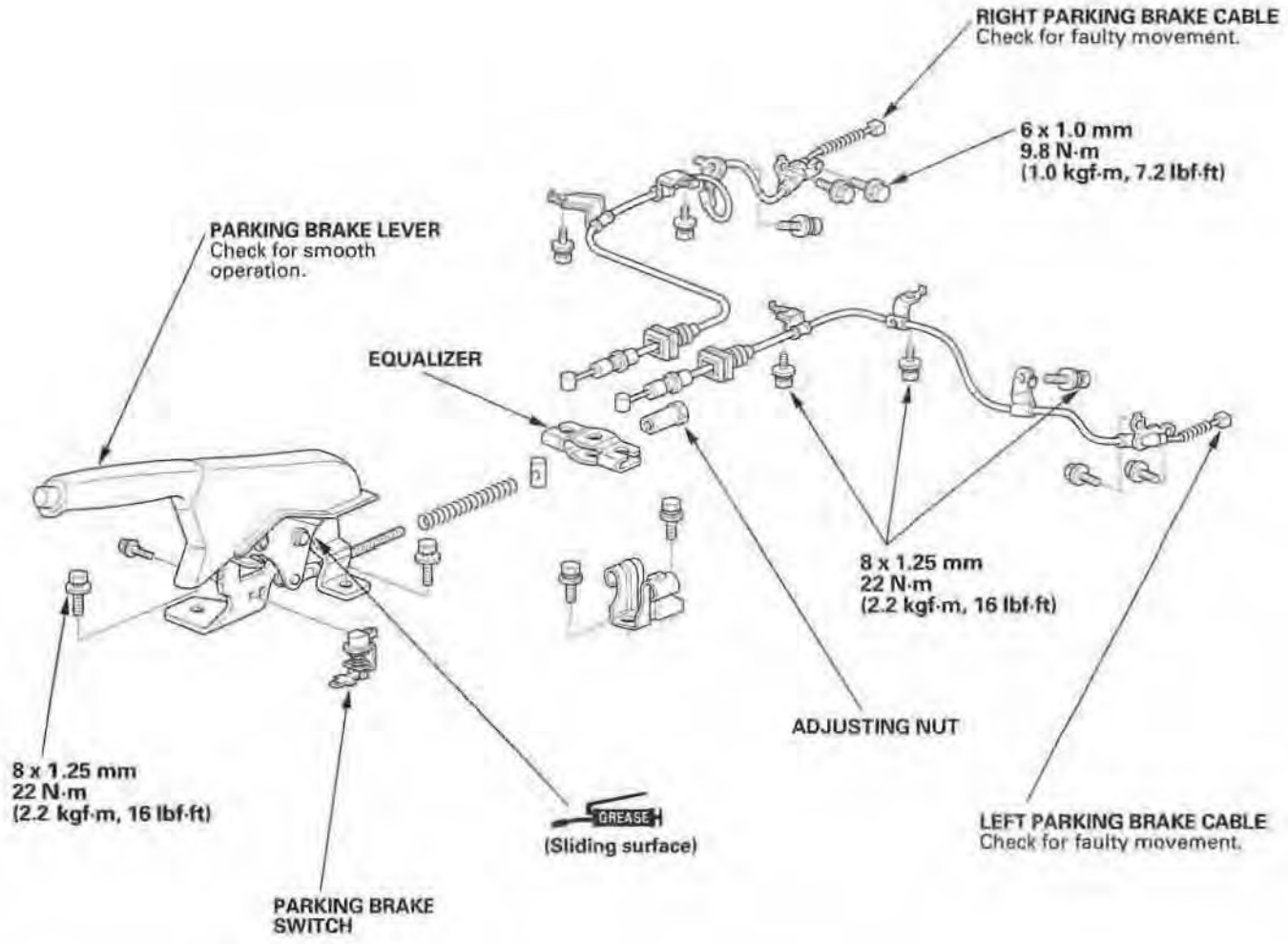
8. Connect the brake line to the brake hose.

9. After installing the brake hose, bleed the brake system (see page 19-9).

10. Do the following checks:
    - Check the brake hose and line joint for leaks, and tighten if necessary.
    - Check the brake hoses for interference and twisting.

Parking Brake Cable Replacement

Exploded View

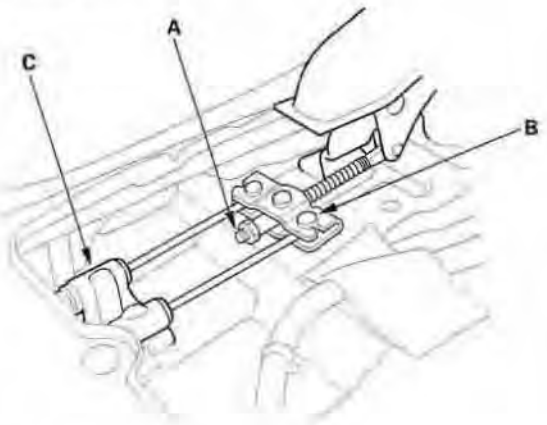


(cont'd)

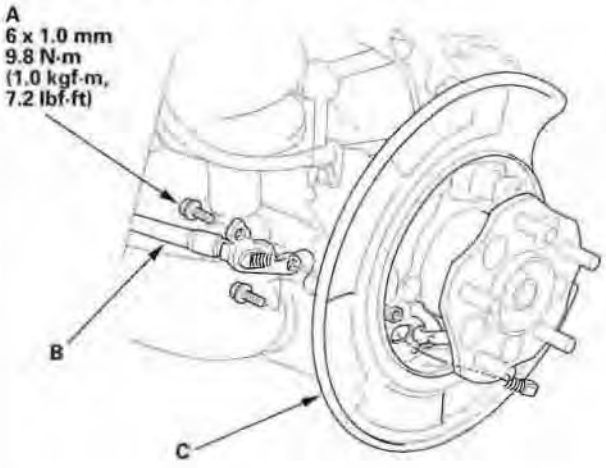
Parking Brake Cable Replacement (cont'd)

NOTE:
- The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature failure.
- Refer to the Exploded View as needed during this procedure.

1. Raise the rear of the vehicle, and support it with safety stands in the proper locations (see page 1-9). Remove the rear wheels.
2. Release the parking brake lever fully.
3. Remove the center console (see page 20-71).
4. Back off the adjusting nut (A) in the equalizer, and disconnect the parking brake cable ends (B) from the equalizer.



5. Remove the cable guide base (C).
6. Remove the rear brake shoe (see page 19-28), and disconnect the parking brake cable from the shoe.
7. Remove the flange bolts (A) and parking brake cable (B) from the backing plate (C).

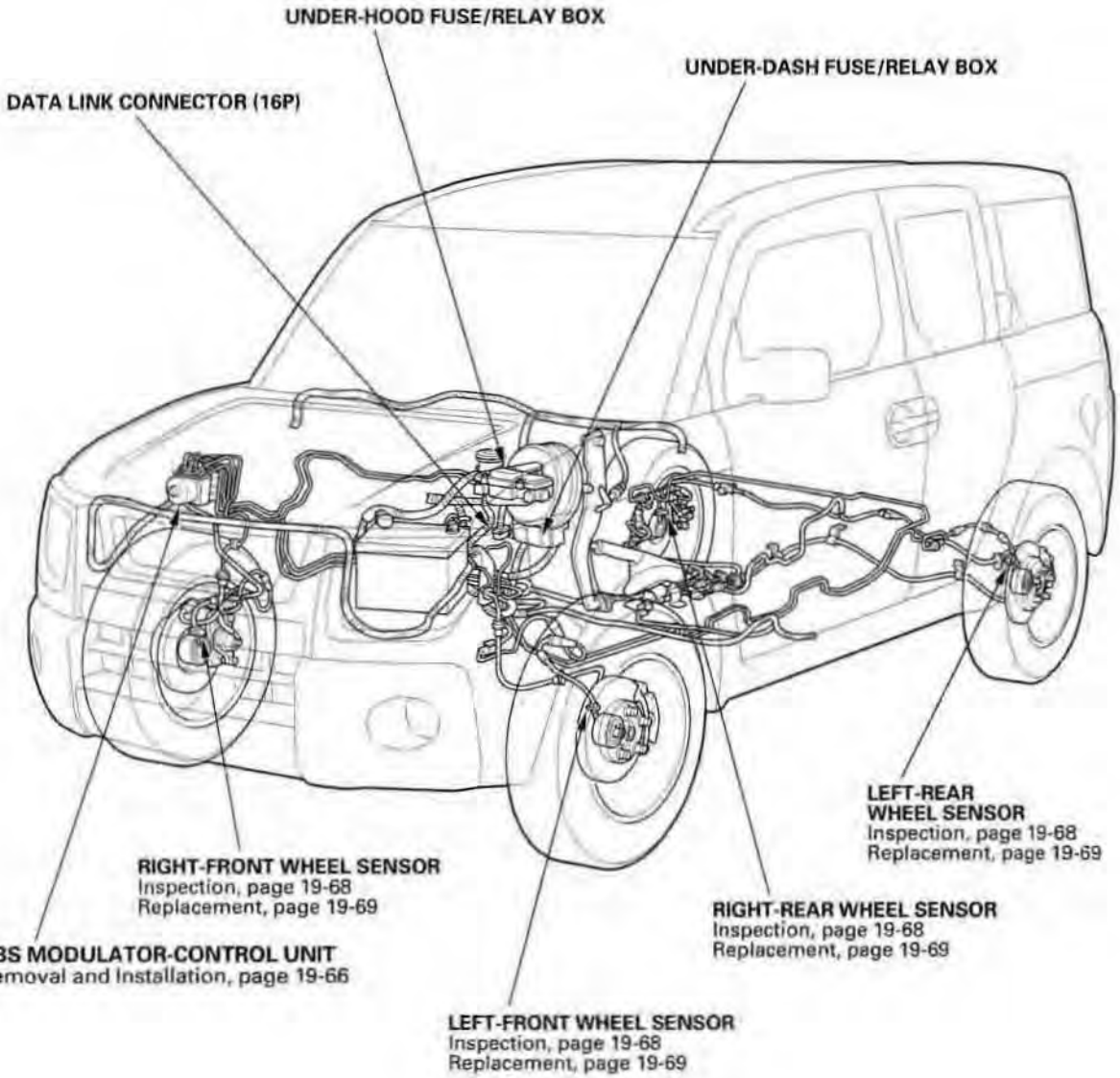


8. Reinstall the parking brake cable in the reverse order of removal, and note these items:
   - Be careful not to bend or distort the cable.
   - Tighten adjusting nut in the equalizer until there is tension in the wires.
   - Apply hand brake lever full stroke and release 10 times.
   - Do the major parking brake adjustment (see page 19-8).

Brakes

ABS Components

Component Location Index



General Troubleshooting Information

ABS Indicator

- If the system is OK, the ABS indicator comes on, then goes off 2 seconds after turning the ignition switch ON (II).
- The ABS indicator comes on when the ABS control unit detects a problem in the system. However, even though the system is operating properly, the indicator can come on under these conditions:
  - Only the drive wheels rotate.
  - One drive wheel is stuck.
  - The vehicle goes into a spin.
  - The ABS continues to operate for a long time.
  - The vehicle is subjected to an electrical signal disturbance.

To determine the actual cause of the problem, question the customer about the problem, taking these conditions into consideration.

- When a problem is detected and the ABS indicator comes on, there are cases when the indicator stays on until the ignition switch is turned OFF, and cases when the indicator goes off automatically when the system returns to normal.
  - DTC 61 or 62: The ABS indicator goes off automatically when the system returns to normal.
  - DTC 11, 13, 15, 17, 31, 32, 33, 34, 35, 36, 37, 38, 54, or 81: The ABS indicator stays on until the ignition switch is turned OFF whether or not the system returns to normal.
  - DTC 12, 14, 16, 18, 21, 22, 23, 24, 51, 52, or 53: The ABS indicator goes off after the ignition switch is turned OFF and then back ON (II), the vehicle is driven, and the system is OK.

Brake System Indicator

The brake indicator in the gauge assembly will come on under these conditions:

- Parking brake lever is pulled up.
- Low brake fluid in the brake master cylinder reservoir.
- ABS control unit detects a problem that affects the EBD.

Diagnostic Trouble Code (DTC)

- The memory can hold any number of DTCs. However, when the same DTC is detected more than once, the more recent DTC is written over the earlier one. Therefore, when the same problem is detected repeatedly, it is memorized as a single DTC.
- The DTCs are indicated in the order they occurred, beginning with the most recent.
- The DTCs are memorized in the EEPROM (non-volatile memory). Therefore, the memorized DTCs are not cleared when the battery is disconnected, the ignition switch is turned OFF, or the system returns to normal. Do the specified procedures to clear the DTCs.

Self-diagnosis

- Self-diagnosis can be classified into two categories:
  - Initial diagnosis:
    Done right after the ignition switch is turned ON (II) and until the ABS indicator goes off.
  - Regular diagnosis:
    Done right after the initial diagnosis until the ignition switch is turned OFF.
- When a problem is detected by self-diagnosis, the system does the following:
  - Turns the ABS indicator and possibly the brake system indicator on.
  - Memorizes the DTC.
  - Stops ABS operation.

Kickback

The pump motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder, causing kickback at the brake pedal.

Pump Motor

- The pump motor operates when the ABS is functioning.
- The ABS control unit checks the pump motor operation when the vehicle is driven the first time after the ignition switch is turned ON (II). You may hear the motor operate at this time, but it is normal.

(cont'd)

General Troubleshooting Information (cont'd)

How to Troubleshoot DTCs

The troubleshooting flowchart procedures assume that the cause of the problem is still present, and the ABS indicator and possibly the brake system indicator are still on. Following the flowchart when the ABS indicator does not come on can result in incorrect diagnosis. The connector illustrations show the female terminal connectors with a single outline and the male terminal connectors with a double outline.

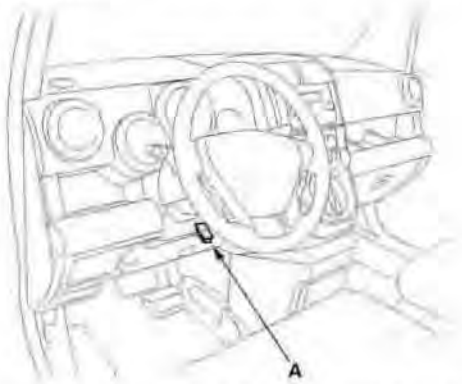
1. Question the customer about the conditions when the problem occured, and try to reproduce the same conditions for troubleshooting. Find out when the ABS indicator and possibly the brake system indicator came on, such as during ABS control, after ABS control, when the vehicle was at a certain speed, etc.

2. When the ABS indicator and possibly the brake system indicator does not come on during the test-drive, but troubleshooting is done based on the DTC, check for loose connectors, poor terminal contact, etc., before you start troubleshooting.

3. After troubleshooting, clear the DTC, and test-drive the vehicle. Make sure the ABS indicator and possibly the brake system indicator does not come on.

How to Retrieve DTCs

1. With the ignition switch OFF, connect the Honda Diagnostic System (HDS) to the 16P data link connector (DLC) (A) under the driver's side of the dashboard.

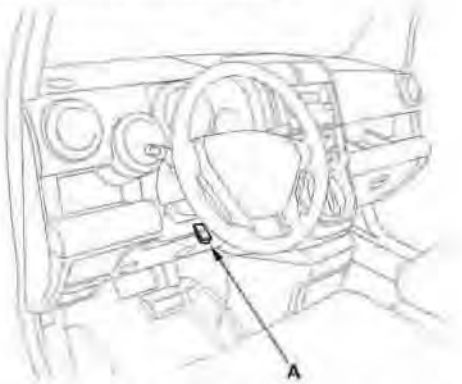


2. Turn the ignition switch ON (II), and follow the prompts on the HDS to display the ABS DTC(s) on the screen. After determining the DTC, refer to the ABS DTC Troubleshooting.

   NOTE: See the HDS Help menu for specific instructions.

How to Clear DTCs

1. With the ignition switch OFF, connect the HDS to the 16P data link connector (DLC) (A) under the driver's side of the dashboard.



2. Turn the ignition switch ON (II), and clear the DTC(s) by following the screen prompts on the HDS.

   NOTE: See the HDS Help menu for specific instructions.

DTC Troubleshooting Index

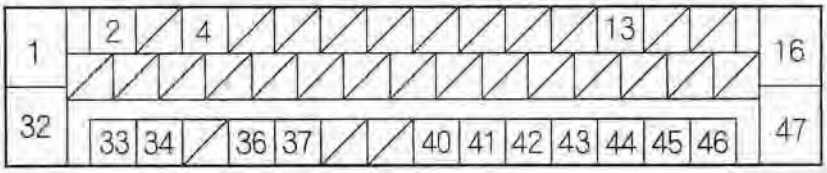
DTC	ABS indicator	Brake system indicator	Detection Item	Troubleshooting
11	ON	ON or OFF	Right-front wheel sensor (open/short to body ground/ short to power)	(see page 19-53)
12	ON	ON or OFF	Right-front wheel sensor (electrical noise/intermittent interruption)	(see page 19-56)
13	ON	ON or OFF	Left-front wheel sensor (open/short to body ground/short to power)	(see page 19-53)
14	ON	ON or OFF	Left-front wheel sensor (electrical noise/intermittent interruption)	(see page 19-56)
15	ON	ON or OFF	Right-rear wheel sensor (open/short to body ground/short to power)	(see page 19-53)
16	ON	ON or OFF	Right-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19-56)
17	ON	ON or OFF	Left-rear wheel sensor (open/short to body ground/short to power)	(see page 19-53)
18	ON	ON or OFF	Left-rear wheel sensor (electrical noise/intermittent interruption)	(see page 19-56)
21	ON	ON or OFF	Right-front magnetic encoder	(see page 19-57)
22	ON	ON or OFF	Left-front magnetic encoder	(see page 19-57)
23	ON	ON or OFF	Right-rear magnetic encoder	(see page 19-57)
24	ON	ON or OFF	Left-rear magnetic encoder	(see page 19-57)
31	ON	ON	Solenoid	(see page 19-57)
32	ON	ON	Solenoid	(see page 19-57)
33	ON	ON	Solenoid	(see page 19-57)
34	ON	ON	Solenoid	(see page 19-57)
35	ON	ON	Solenoid	(see page 19-57)
36	ON	ON	Solenoid	(see page 19-57)
37	ON	ON	Solenoid	(see page 19-57)
38	ON	ON	Solenoid	(see page 19-57)
51	ON	OFF	Motor lock	(see page 19-58)
52	ON	OFF	Motor stuck OFF	(see page 19-58)
53	ON	OFF	Motor stuck ON	(see page 19-59)
54	ON	ON	ABS fail-safe relay	(see page 19-59)
61	ON	ON or OFF	IG2 voltage low	(see page 19-60)
62	ON	ON	IG2 voltage high	(see page 19-60)
81	ON	ON or OFF	Central Processing Unit (CPU) diagnosis, and ROM/RAM diagnosis	(see page 19-61)

Symptom Troubleshooting Index

Symptom	Diagnostic procedure
ABS indicator does not come on	ABS Indicator Circuit Troubleshooting (see page 19-61)
ABS indicator does not go off, and no DTCs are stored	ABS Indicator Circuit Troubleshooting (see page 19-61)
Brake system indicator does not come on for the bulb check after the ignition switch is turned ON (II), and the parking brake switch and brake fluid reservoir switch are open	Brake System Indicator Circuit Troubleshooting (see page 19-64)
Brake system indicator does not go off, and no DTCs are stored	Brake System Indicator Circuit Troubleshooting (see page 19-64)
Both ABS and brake system indicator do not go off, and no DTCs are stored	ABS Indicator Circuit Troubleshooting (see page 19-61)

System Description

ABS Control Unit Inputs and Outputs for 47P Connector



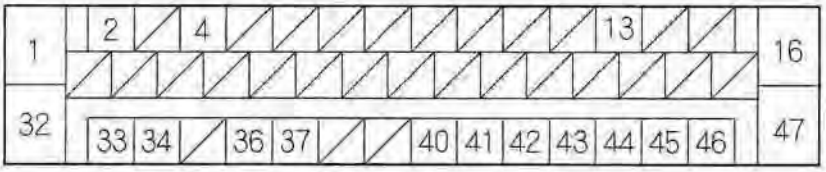
Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Measurement (Disconnect the ABS control unit 47P connector)		
				Terminal	Conditions	Voltage
1	WHT/RED	+B-P	Power source for the pump motor relay	1—GND	At all times	Battery Voltage
2	GRY	DIAG-H	Communicates with HDS	——	——	——
4	BLK/ORN	IG2	Power source for activating the system	4—GND	Ignition switch ON (II)	Battery Voltage
13	BRN/YEL	EBD	Drives brake system indicator	13—GND	Parking brake released, ignition switch turned from OFF to ON — During bulb check (light ON)	About 10 V
					Parking brake released, ignition switch turned from OFF to ON — After bulb check (light OFF)	Below 1 V
16	BLK	GND-V	Ground for the system/solenoid valve	16—1	At all times	Battery Voltage

(cont'd)

System Description (cont'd)

ABS Control Unit Inputs and Outputs for 47P Connector (cont'd)



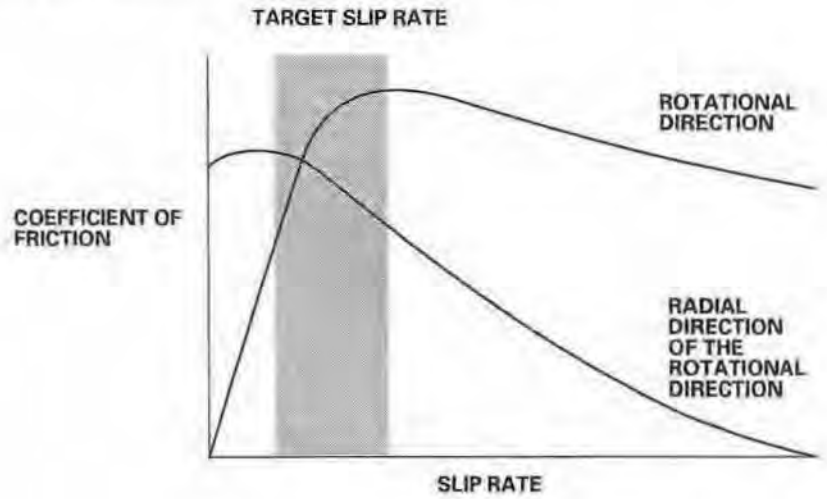
Wire side of female terminals

Terminal number	Wire color	Terminal sign	Description	Measurement (Disconnect the ABS control unit 47P connector)		
				Terminal	Conditions	Voltage
32	WHT/GRN	+B-V	Power source for the system/solenoid valve	32—GND	At all times	Battery Voltage
33	BLU	FR-GND	Detects right-front wheel sensor signal	——	——	——
34	GRN/BLK	FR +B				
36	YEL/RED	RL +B	Detects left-rear wheel sensor signal	——	——	——
37	GRY/RED	RL-GND				
40	BRN	SCS	Use for DTC indication or clearing	40—GND	Ignition switch ON (II)	About 5 V
41	WHT/BLK	STOP	Detects brake switch signal	41—GND	Brake pedal: Pressed	Battery Voltage
					Brake pedal: Released	Below 0.3 V
42	BLU/YEL	RR-GND	Detects right-rear wheel sensor signal	——	——	——
43	GRN/YEL	RR +B				
44	BLU/RED	ABS	Drive ABS indicator	44—GND	Ignition switch ON (II)	About 6 V
45	BLU/ORN	FL +B	Detects left-front wheel sensor signal	——	——	——
46	BRN/WHT	FL-GND				
47	BLK	GND-P	Ground for the pump motor	47—1	At all times	Battery Voltage

Features

When the brake pedal is pressed during driving, the wheels can lock before the vehicle comes to a stop. In such an event, the maneuverability of the vehicle is reduced if the front wheels are locked, and the stability of the vehicle is reduced if the rear wheels are locked, creating an extremely unstable condition. The ABS precisely controls the slip rate of the wheels to ensure maximum grip force from the tires, thereby ensuring the maneuverability and stability of the vehicle.
The ABS calculates the slip rate of the wheels based on the vehicle speed and the wheel speed, then it controls the brake fluid pressure to reach the target slip rate.

Grip force of tire and road surface

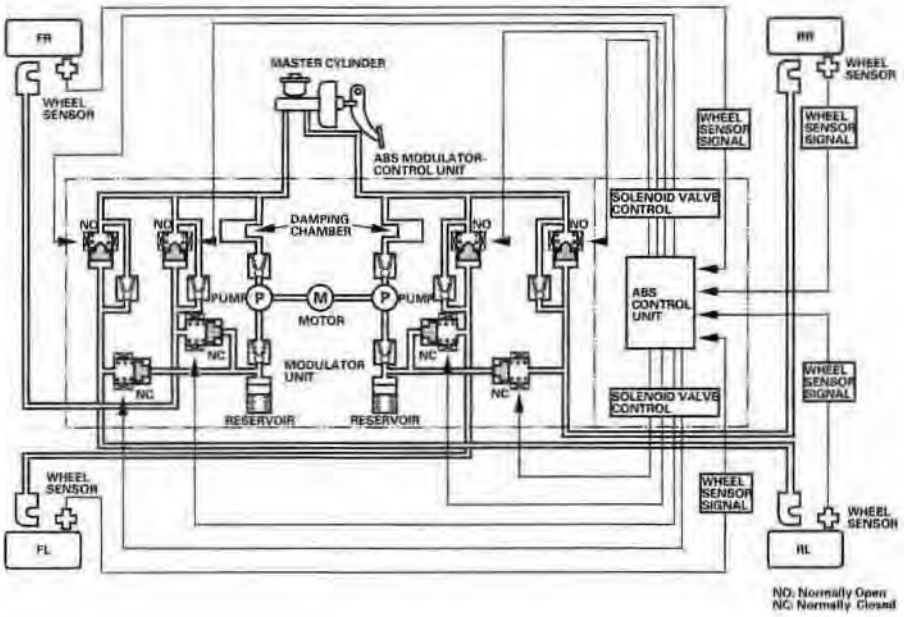


(cont'd)

ABS Components

System Description (cont'd)

COMPONENTS		MAIN FUNCTION
Wheel sensor		The wheel sensor outputs the speed signal to the ABS control unit according to the magnetic encoder's rotation speed.
ABS modulator-control unit	ABS control unit	The ABS control unit processes the signal from the wheel sensor, then outputs the ABS control signal to the modulator unit.
	Modulator unit	The modulator unit receives the control signal, then controls brake fluid pressure for each wheel.
Motor relay (inside of the ABS control unit)		The motor relay drives the ABS pump motor.
ABS fail-safe relay (inside of the ABS control unit)		The ABS fail-safe relay cuts the power to the solenoid valve when a problem is detected.



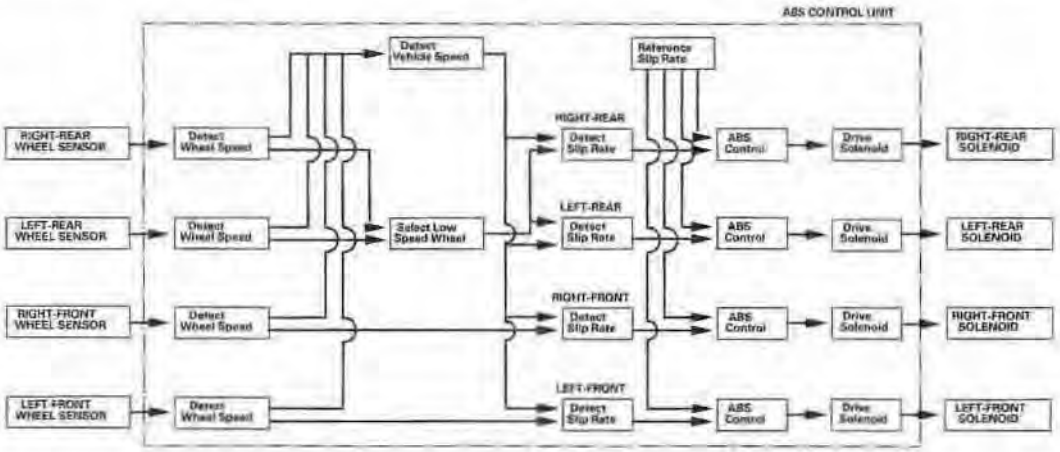
ABS Control Unit

Main Control

The ABS control unit detects the wheel speed based on the wheel sensor signal it received, then it calculates the vehicle speed based on the detected wheel speed. The control unit detects the vehicle speed during deceleration based on the rate of deceleration.

The ABS control unit calculates the slip rate of each wheel, and transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The hydraulic control has three modes: Pressure reducing, pressure retaining, and pressure intensifying.



Electronic Brake Distribution (EBD) Control

The electronic brake distribution (EBD) function helps control vehicle braking by adjusting the rear brake force before the ABS operates. Based on wheel sensor signals, the ABS control unit uses the modulator to control the rear brakes individually. When the rear wheel speed is less than the front wheel speed, the ABS control unit retains the current rear brake fluid pressure by closing the inlet valve in the modulator. As the rear wheel speed increases and approaches the front wheel speed, the control unit increases the rear brake fluid pressure by momentarily opening the inlet valve. This whole process is repeated very rapidly. While this is happening, there may be kickback at the brake pedal.

During self-diagnosis, if the ABS control unit detects a problem that affects the EBD, it turns on the brake system indicator and the ABS indicator.

Self-diagnosis Function

1. The ABS control unit is equipped with a CPU and a monitor IC. They check each other for problems.
2. The CPU checks the system circuits.
3. The ABS control unit turns on the ABS and possibly the brake system indicator when the unit detects a problem, and the unit stops ABS operation.
4. The self-diagnosis can be classified into these two categories:
   - Initial diagnosis
   - Regular diagnosis

On-board Diagnosis Function

The ABS can be diagnosed with the HDS.
The ALB Checker cannot be used with this system. For air bleeding, and checking wheel sensor signals, use the HDS. See the HDS Help menu for specific operating instructions.

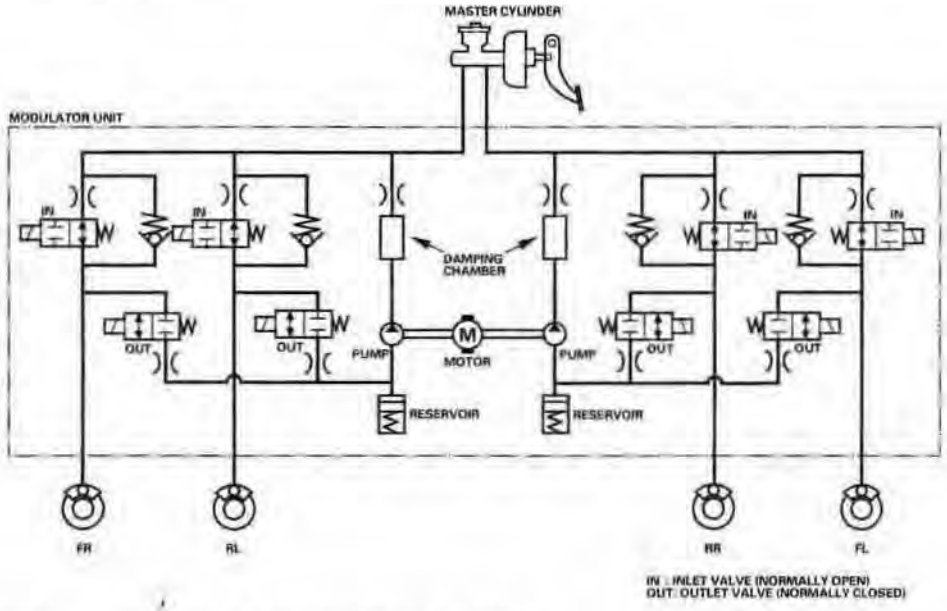
(cont'd)

System Description (cont'd)

ABS Modulator

The ABS modulator consists of inlet solenoid valves, outlet solenoid valves, reservoir, pump, and the pump motor. The modulator reduces the caliper fluid pressure directly. It is a circulating-type modulator because the brake fluid circulates through the caliper, reservoir, and the master cylinder. The hydraulic control has three modes: Normal braking, pressure retaining, and pressure reducing. The hydraulic circuit is an independent four channel type, one channel for each wheel.

Shown in normal braking mode



Normal braking mode: Inlet valve open, outlet valve closed:
Master cylinder fluid is pumped out to the caliper.

Pressure retaining mode: Inlet valve closed, outlet valve closed:
Caliper fluid is retained by the inlet valve and outlet valve.

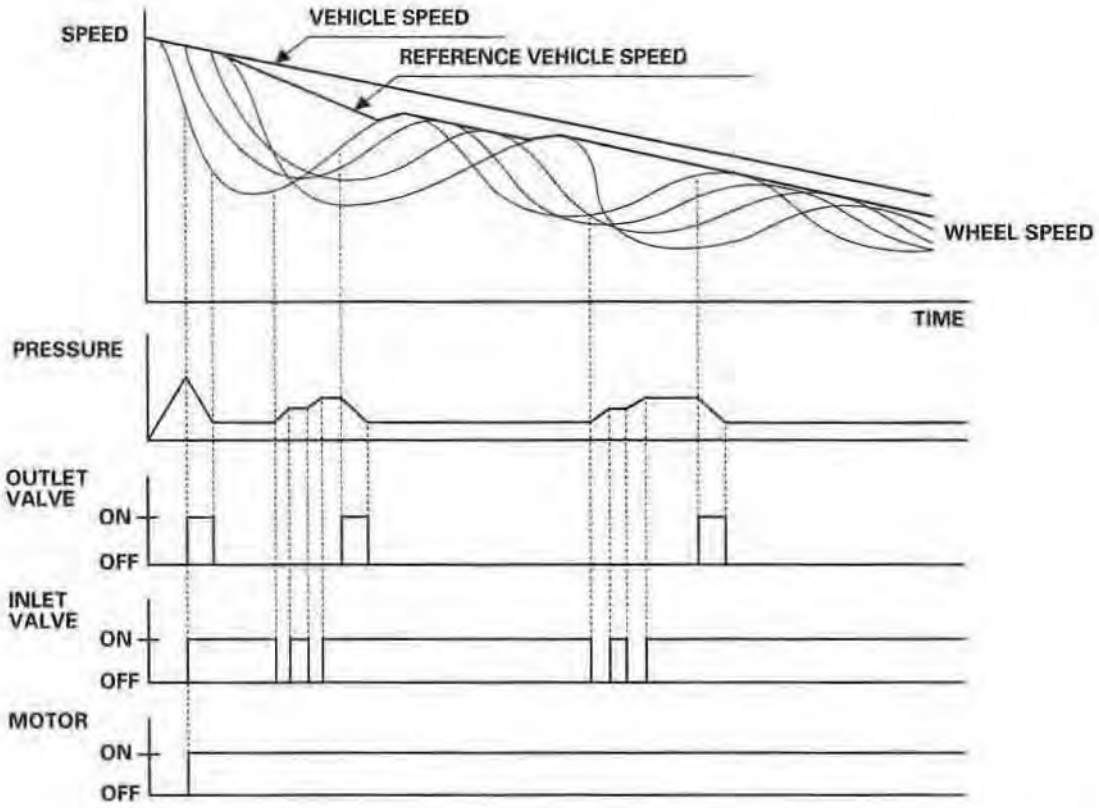
Pressure reducing mode: Inlet valve closed, outlet valve open:
Caliper fluid flows through the outlet valve to the reservoir.
When in pressure reducing mode, the pump motor is ON.
The reservoir fluid is pumped out by the pump, through the damping chamber, to the master cylinder.
When stopping ABS operation, the pump motor is OFF.

Wheel Sensors

The wheel sensors are the magnetic contactless type. The wheel sensors detect changing of magnetic polarity on the magnetic encoder contained inside the wheel bearings. The ABS control unit calculates the wheel speed based on signals received from the wheel sensor.

NOTE: The wheel bearings are directional.

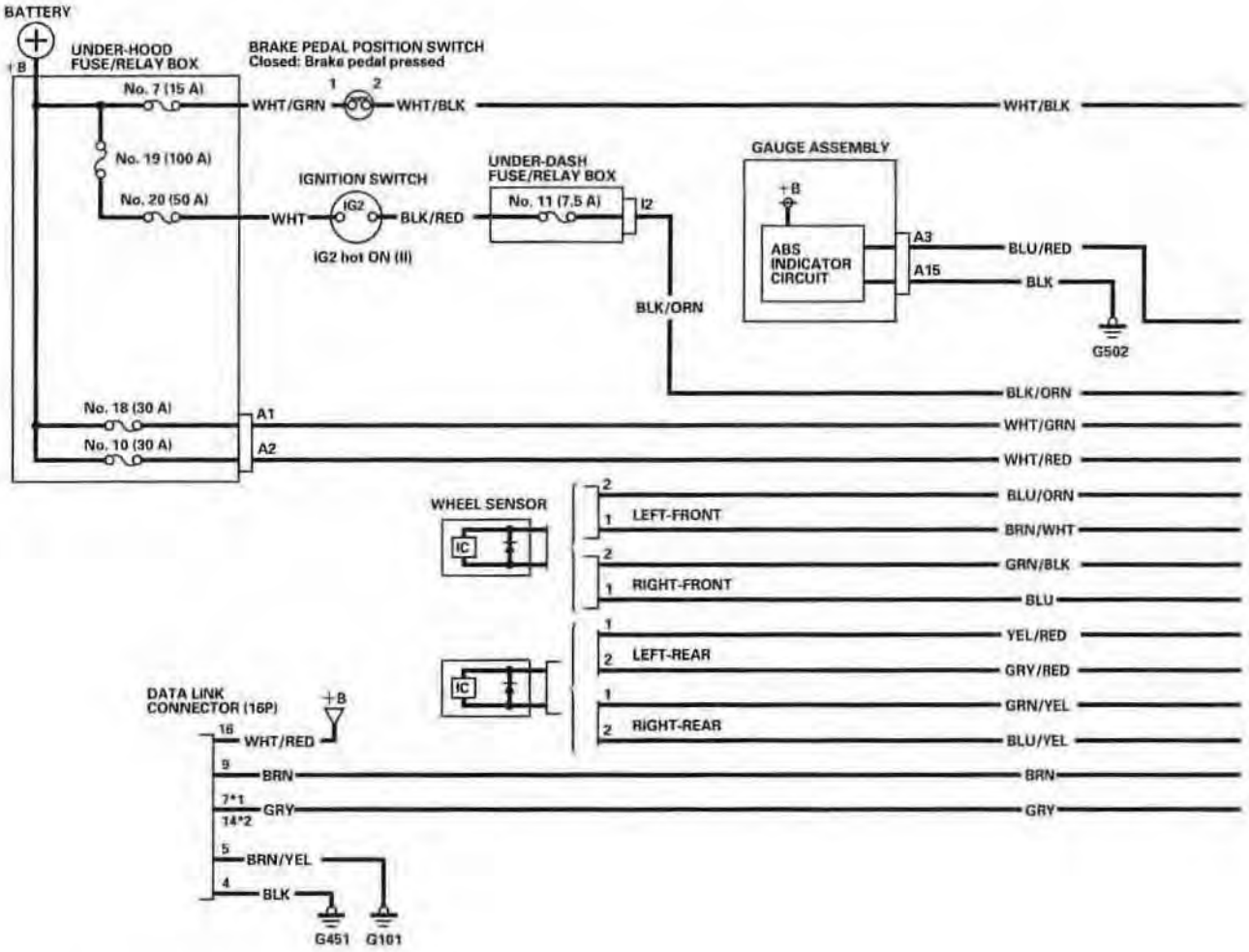
Wheel speed and modulator control



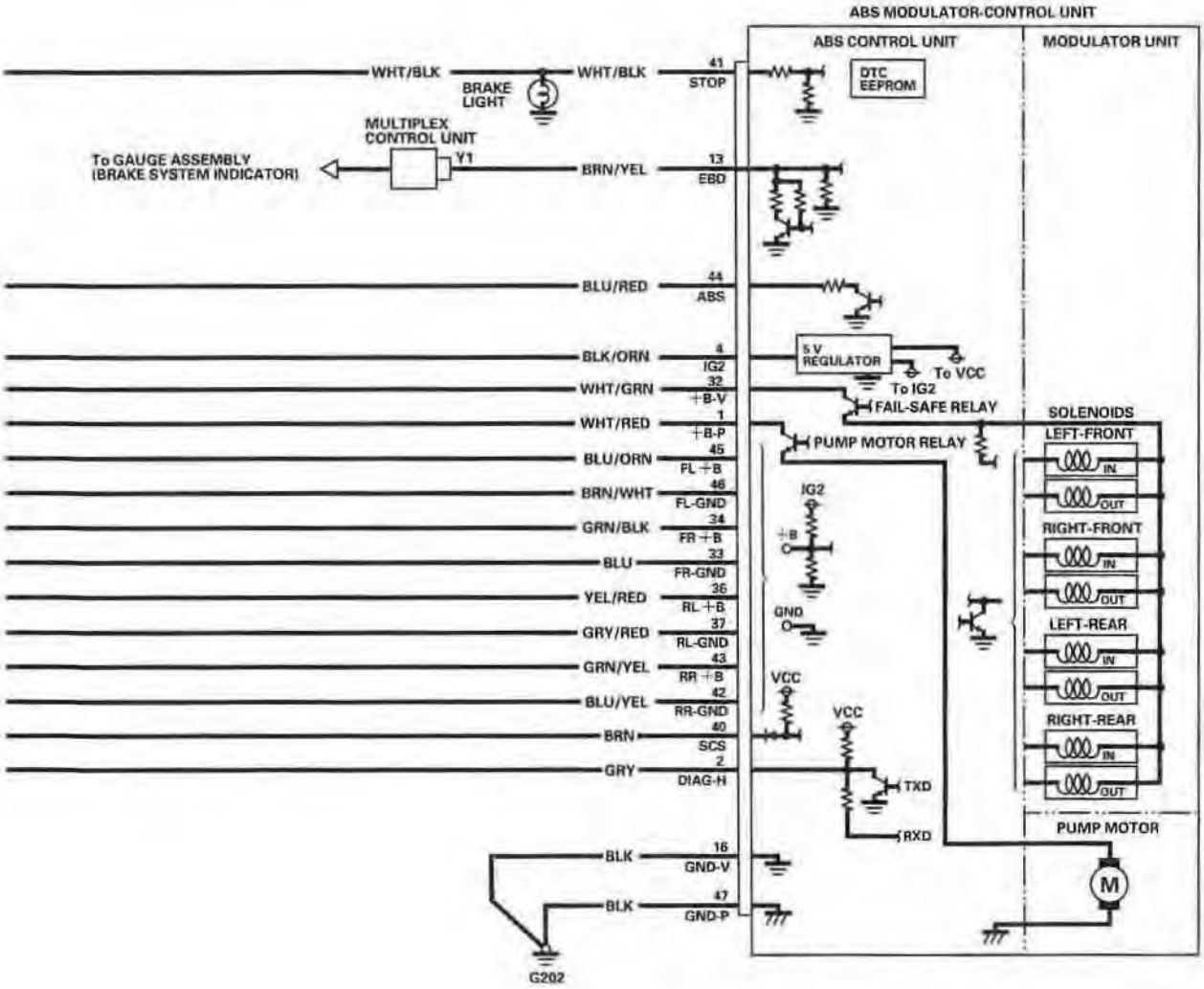
When the wheel speed drops sharply below the vehicle speed, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time. As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

ABS Components

Circuit Diagram



*1: '03-04 models
*2: '05 model

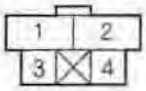

ABS MODULATOR-CONTROL UNIT
ABS CONTROL UNIT
MODULATOR UNIT
DTC EEPROM
WHT/BLK
BRAKE LIGHT
WHT/BLK
41
STOP
MULTIPLEX CONTROL UNIT
To GAUGE ASSEMBLY (BRAKE SYSTEM INDICATOR)
Y1
BRN/YEL
13
EBD
BLU/RED
44
ABS
BLK/ORN
4
IG2
5 V REGULATOR
To VCC
To IG2
WHT/GRN
32
+B-V
FAIL-SAFE RELAY
WHT/RED
1
+B-P
PUMP MOTOR RELAY
SOLENOIDS
LEFT-FRONT
BLU/ORN
45
FL +B
IN
OUT
BRN/WHT
46
FL-GND
IG2
+B
RIGHT-FRONT
GRN/BLK
34
FR +B
BLU
33
FR-GND
GND
YEL/RED
36
RL +B
LEFT-REAR
GRY/RED
37
RL-GND
GRN/YEL
43
RR +B
VCC
BLU/YEL
42
RR-GND
VCC
RIGHT-REAR
BRN
40
SCS
GRY
2
DIAG-H
TXD
RXD
PUMP MOTOR
BLK
16
GND-V
M
BLK
47
GND-P
G202

(cont'd)

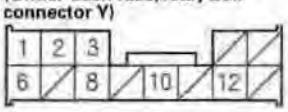
Circuit Diagram (cont'd)

UNDER-HOOD FUSE/RELAY BOX CONNECTOR A (2P)

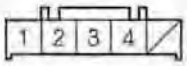
BRAKE PEDAL POSITION SWITCH 4P CONNECTOR



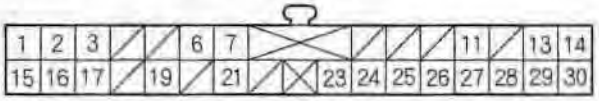
MULTIPLEX CONTROL UNIT 13P CONNECTOR (Under-dash fuse/relay box connector Y)



UNDER-DASH FUSE/RELAY BOX CONNECTOR I (5P)



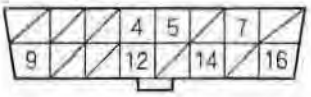
GAUGE ASSEMBLY CONNECTOR A (30P)



ABS CONTROL UNIT 47P CONNECTOR

Wire side of female terminals

DATA LINK CONNECTOR (16P)



Terminal side of female terminals

WHEEL SENSOR 2P CONNECTORS

FRONT

Wire side of female terminals

REAR

Terminal side of male terminals

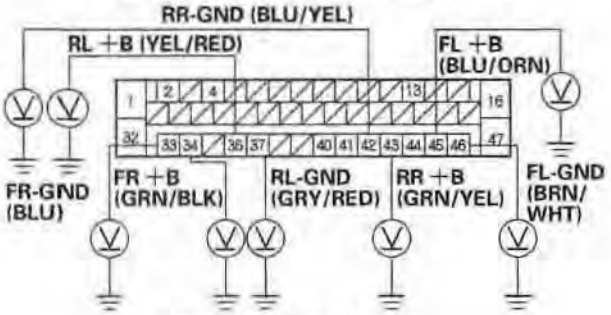
DTC Troubleshooting

DTC 11, 13, 15, 17: Wheel Sensor (Open/Short to Body Ground/Short to Power)

1. Disconnect the ABS control unit 47P connector.
2. Start the engine.
3. Measure the voltage between body ground and the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector individually (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR-GND: No. 33
13 (Left-front)	FL +B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL-GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there battery voltage?

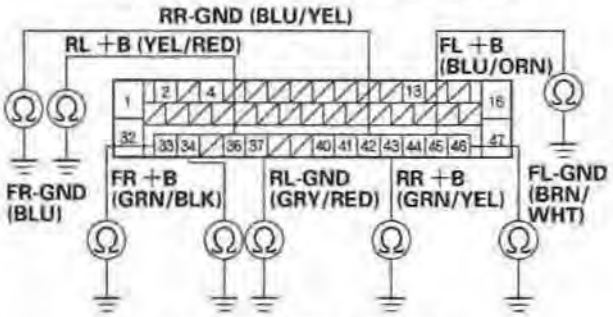
YES—Repair short to power in the wire between the ABS modulator-control unit and the appropriate wheel sensor. ■

NO—Go to step 4.

4. Turn the ignition switch OFF.
5. Check for continuity between body ground and the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector individually (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR-GND: No. 33
13 (Left-front)	FL +B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL-GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Go to step 6.

NO—Go to step 8.

(cont'd)

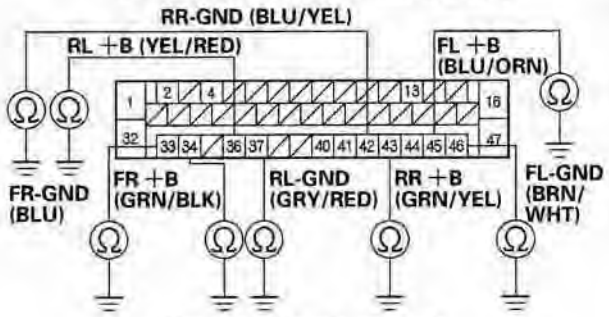
DTC Troubleshooting (cont'd)

6. Disconnect the appropriate wheel sensor 2P connector.

7. Check for continuity between body ground and the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector individually (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR-GND: No. 33
13 (Left-front)	FL +B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL-GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

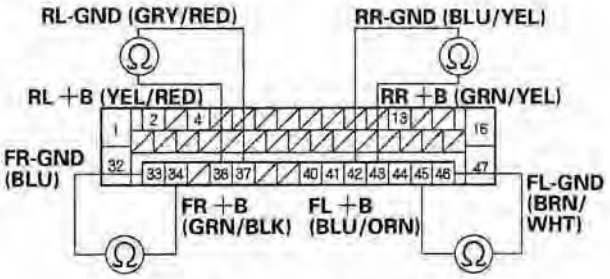
YES—Repair short to body ground in the wire between the ABS modulator-control unit and the wheel sensor. ■

NO—Replace the wheel sensor (see page 19-69). ■

8. Measure the resistance between the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector (see table), then measure the resistance between the same terminals and reverse the positive and negative tester probes.

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR-GND: No. 33
13 (Left-front)	FL +B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL-GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is the resistance infinity (open circuit) in both directions?

YES—Go to step 9.

NO—Go to step 11.

9. Disconnect the appropriate wheel sensor 2P connector.

10. Measure the resistance between the appropriate wheel sensor 2P connector terminals, then measure the resistance between the same terminals and reverse the positive and negative tester probes.

WHEEL SENSOR 2P CONNECTOR

Wire side of female terminals

Terminal side of male terminals

Is the resistance infinity (open circuit) in both directions?

YES—Replace the wheel sensor (see page 19-69). ■

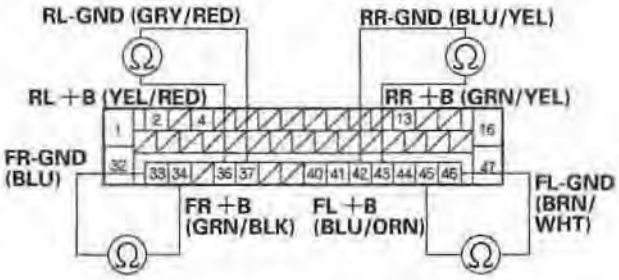
NO—Repair open in the wire between the ABS modulator-control unit and the wheel sensor. ■

11. Disconnect the appropriate wheel sensor 2P connector.

12. Check for continuity between the appropriate wheel sensor +B and GND terminals of the ABS control unit 47P connector (see table).

DTC	Appropriate Terminal	
	+B	GND
11 (Right-front)	FR +B: No. 34	FR-GND: No. 33
13 (Left-front)	FL +B: No. 45	FL-GND: No. 46
15 (Right-rear)	RR +B: No. 43	RR-GND: No. 42
17 (Left-rear)	RL +B: No. 36	RL-GND: No. 37

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair the wires between the ABS modulator-control unit and the wheel sensor that are shorted to each other. ■

NO—Go to step 13.

13. Replace the appropriate wheel sensor, then test-drive the vehicle.

Does the ABS indicator come on?

YES—Check for loose or poor connections at the ABS control unit 47P connector and the appropriate wheel sensor 2P connector. If the connectors are good, clear the DTC, and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, replace the ABS modulator-control unit (see page 19-66). ■

NO—Troubleshooting is complete. ■

DTC Troubleshooting (cont'd)

DTC 12, 14, 16, 18: Wheel Sensor (Electrical Noise/Intermittent Interruption)

NOTE: If the ABS indicator comes on because of electrical noise, the indicator will go off when you test-drive the vehicle at 19 mph (30 km/h).

1. Clear the DTC using the HDS (see page 19-40).
2. Disconnect the HDS.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle.

   Does the ABS indicator come on?

   YES—Go to step 5.

   NO—Intermittent failure, the system is OK at this time. ■
5. Check the appropriate wheel sensor and magnetic encoder (see page 19-68).

DTC	Appropriate Wheel Sensor
12	Right-front
14	Left-front
16	Right-rear
18	Left-rear

   Are they OK?

   YES—Go to step 6.

   NO—Reinstall or replace the appropriate wheel sensor and magnetic encoder (see page 19-69). ■
6. Disconnect the ABS control unit 47P connector.
7. Check for continuity between the appropriate wheel sensor GND terminal and all other wheel sensor GND terminals (see table).

DTC	Appropriate Terminal	Other Terminals		
12	FR-GND: No. 33	No. 46	No. 42	No. 37
14	FL-GND: No. 46	No. 33	No. 42	No. 37
16	RR-GND: No. 42	No. 33	No. 46	No. 37
18	RL-GND: No. 37	No. 33	No. 46	No. 42

ABS CONTROL UNIT 47P CONNECTOR

Wire side of female terminals

   Is there continuity?

   YES—Repair short in the wires between the appropriate wheel sensor and the other wheel sensor. ■

   NO—Go to step 8.
8. Replace the appropriate wheel sensor and test-drive the vehicle.

   Does the ABS indicator come ON?

   YES—Clear the DTC, and test-drive the vehicle. If the ABS indicator comes on and the same DTC is indicated, replace the ABS modulator-control unit (see page 19-66). ■

   NO—The sensor was faulty. Troubleshooting is complete. ■

DTC 21, 22, 23, 24: Magnetic Encoder

1. Clear the DTC using the HDS (see page 19-40).
2. Disconnect the HDS from the 16P DLC.
3. Test-drive the vehicle at 19 mph (30 km/h) or more.

   Does the ABS indicator come on, and are DTCs 21, 22, 23, and/or 24 indicated?

   YES—Go to step 4.

   NO—The system is OK at this time. ■
4. Check the appropriate wheel sensor (see table) (see page 19-68).

DTC	Appropriate Wheel Sensor
21	Right-front
22	Left-front
23	Right-rear
24	Left-rear

   Is the encoder OK?

   YES—Go to step 5.

   NO—Replace the wheel sensor (see page 19-69). ■
5. Check that the encoders are installed correctly, and free from debris:

   - Front encoder (see page 18-11)
   - Rear encoder (see page 18-26)

   Are they clean and installed correctly?

   YES—Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. ■

   NO—Clean and reinstall or replace the appropriate encoder. ■

DTC 31, 32, 33, 34, 35, 36, 37, 38: Solenoid

1. Clear the DTC using the HDS (see page 19-40).
2. Turn the ignition switch ON (II).
3. Verify the DTC.

   Does the ABS indicator come on, and are DTCs 31, 32, 33, 34, 35, 36, 37, and/or 38 indicated?

   YES—Replace the ABS modulator-control unit (see page 19-66). ■

   NO—The system is OK at this time. ■

DTC Troubleshooting (cont'd)

DTC 51: Motor Lock

DTC 52: Motor Stuck OFF

1. Check the No. 10 (30 A) fuse in the under-hood fuse/relay box.

   Is the fuse OK?

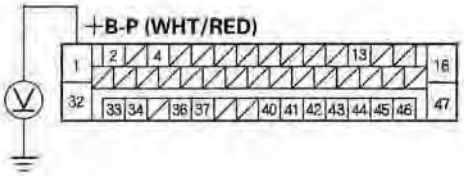
   YES—Reinstall the fuse, and go to step 2.

   NO—Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in this fuse circuit. If the circuit is OK, replace the ABS modulator-control unit (see page 19-66).■

2. Disconnect the ABS control unit 47P connector.

3. Measure the voltage between the ABS control unit 47P connector terminal No. 1 and body ground.

   ABS CONTROL UNIT 47P CONNECTOR



   Wire side of female terminals

   Is there battery voltage?

   YES—Go to step 4.

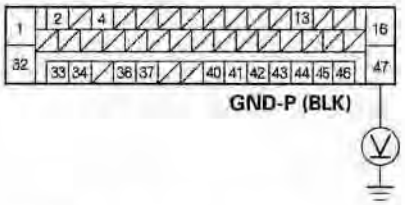
   NO—Repair open in the wire between the No. 10 (30 A) fuse and the ABS modulator-control unit.■

4. Reconnect the ABS control unit 47P connector.

5. Turn the ignition switch ON (II).

6. Measure the voltage between the ABS control unit 47P connector terminal No. 47 and body ground.

   ABS CONTROL UNIT 47P CONNECTOR



   Wire side of female terminals

   Is there less than 0.1 V?

   YES—Go to step 7.

   NO—Repair open in the wire between the ABS modulator-control unit and body ground (G202). If the wire is OK, repair G202.■

7. Clear the DTC using the HDS (see page 19-40).

8. Disconnect the HDS from the 16P DLC.

9. Test-drive the vehicle at 6 mph (10 km/h) or more.

   Does the ABS indicator come on, and are DTC 51 or 52 indicated?

   YES—Check for loose or poor connections in the ABS control unit 47P connector. If the connections are good, replace the ABS modulator-control unit (see page 19-66).■

   NO—The system is OK at this time.■

DTC 53: Motor Stuck ON

1. Clear the DTC using the HDS (see page 19-40).
2. Disconnect the HDS from the 16P DLC.
3. Test-drive the vehicle.

   Does the ABS indicator come on, and is DTC 53 indicated?

   YES—Replace the ABS modulator-control unit (see page 19-66).■

   NO—The system is OK at this time.■

DTC 54: ABS Fail-safe Relay

1. Clear the DTC using the HDS (see page 19-40).
2. Disconnect the HDS.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle.

   Does the ABS indicator come on, and is DTC 54 indicated?

   YES—Go to step 5.

   NO—Intermittent failure; the vehicle is OK at this time. Check for lose terminals at the ABS modulator-control unit.■

5. Check the No. 18 (30 A) fuse in the under-hood fuse/relay box.

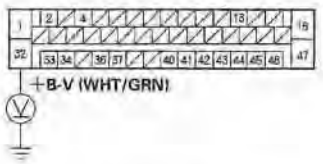
   Is the fuse OK?

   YES—Reinstall the fuse, and go to step 6.

   NO—Replace the fuse, and recheck. If the fuse is blown, check for a short to body ground in the +B-V circuit. If the circuit is OK, replace ABS modulator-control unit (see page 19-66).■

6. Disconnect the ABS control unit 47P connector.
7. Measure the voltage between the ABS control unit 47P connector terminal No. 32 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 8.

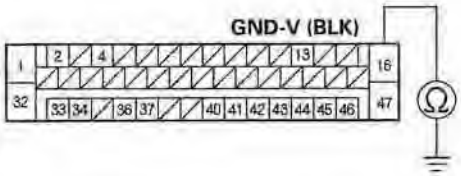
NO—Repair open in the wire between the No. 18 (30 A) fuse and the ABS modulator-control unit.■

(cont'd)

DTC Troubleshooting (cont'd)

8. Check for continuity between the ABS control unit 47P connector terminal No. 16 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Check for loose terminals in the ABS control unit 47P connector. If the terminals are OK, replace the ABS modulator-control unit (see page 19-66).■

NO—Repair open in the wire between the ABS modulator-control unit and body ground (G202). If the wire is OK, repair G202.■

DTC 61, 62: IG2 Voltage

1. Clear the DTC using the HDS (see page 19-40).
2. Disconnect the HDS.
3. Turn the ignition switch OFF, then turn it ON (II) again.
4. Test-drive the vehicle at 6 mph (10 km/h) or more.

   Does the ABS indicator come on?

   YES—Go to step 5.

   NO—The system is OK at this time.■
5. Verify the DTC.

   Is DTC 61 or 62 indicated?

   YES—Go to step 6.

   NO—Do the appropriate troubleshooting for the DTC.■
6. Check the charging system.

   Is charging system OK?

   YES—Check for loose terminals at the ABS control unit 47P connector and G202. If the terminals and ground are OK, replace the ABS modulator-control unit (see page 19-66).■

   NO—Troubleshoot and repair the charging system.■

DTC 81: Central Processing Unit (CPU) Diagnosis, and ROM/RAM Diagnosis

1. Check for other DTCs.

   Is another DTC present?

   YES—Do the appropriate troubleshooting for the other DTC. ■

   NO—Go to step 2.

2. Clear the DTC using the HDS (see page 19-40).
3. Disconnect the HDS from the 16P DLC.
4. Turn the ignition switch OFF, then turn it ON (II) again.
5. Test-drive the vehicle.

   Does the ABS indicator come on, and is DTC 81 indicated?

   YES—Replace the ABS modulator-control unit (see page 19-66). ■

   NO—Intermittent failure; the vehicle is OK at this time. ■

ABS Indicator Circuit Troubleshooting

ABS indicator does not come on

1. Turn the ignition switch ON (II), and watch the ABS indicator.

   Does the ABS indicator come on?

   YES—The system is OK at this time. ■

   NO—Go to step 2.

2. Do the gauge assembly self-diagnosis function procedure (see page 22-62).

   Is the gauge assembly OK?

   YES—Go to step 3.

   NO—Replace the gauge assembly (see page 22-69). ■

3. Turn the ignition switch OFF.
4. Disconnect the ABS control unit 47P connector.
5. Turn the ignition switch ON (II).

   Does the ABS indicator come on?

   YES—Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. ■

   NO—Go to step 6.

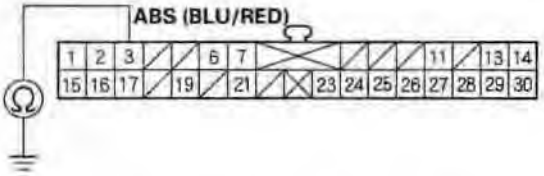
6. Turn the ignition switch OFF.
7. Remove the gauge assembly (see page 22-69).
8. Disconnect gauge assembly connector A (30P).

(cont'd)

ABS Indicator Circuit Troubleshooting (cont'd)

9. Check for continuity between gauge assembly connector A (30P) terminal No. 3 and body ground.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

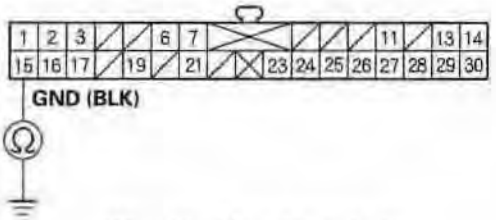
Is there continuity?

YES—Repair short to body ground in the wire between the gauge assembly and the ABS modulator-conrol unit.■

NO—Go to step 10.

10. Cheek for continuity between gauge assembly connector A (30P) terminal No. 15 and body ground.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Is there continuity?

YES—Check for loose terminals in the gauge assembly connectors. If the terminals are OK, replace the gauge assembly (see page 22-69).■

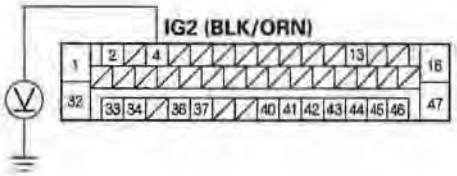
NO—Repair open in the wire between the gauge assembly and body ground (G502). If the wire is OK, repair G502.■

ABS indicator does not go off, and no DTCs are stored

NOTE: The ABS indicator will stay ON any time the HDS is connected to the DLC and in an ABS-related menu or function. Make sure you check the ABS indicator function after disconnecting the HDS.

1. Disconnect the ABS control unit 47P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the ABS control unit 47P connector terminal No. 4 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there battery voltage?

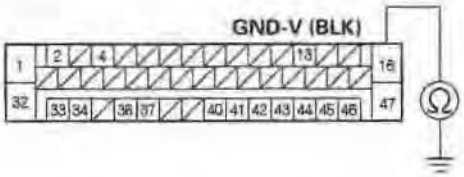
YES—Go to step 4.

NO—Repair open in the wire between the No. 11 (7.5 A) fuse and the ABS modulator-control unit.■

4. Turn the ignition switch OFF.

5. Check for continuity between the ABS control unit 47P connector terminal No. 16 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

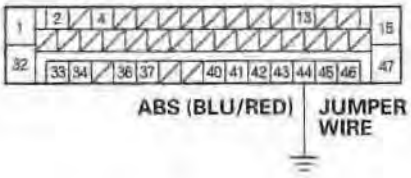
YES—Go to step 6.

NO—Repair open in the wire between the ABS modulator-control unit and body ground (G202). If the wire is OK, repair G202. ■

6. Turn the ignition switch ON (II).

7. Connect the ABS control unit 47P connector terminal No. 44 and body ground with a jumper wire.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Does the ABS indicator go off?

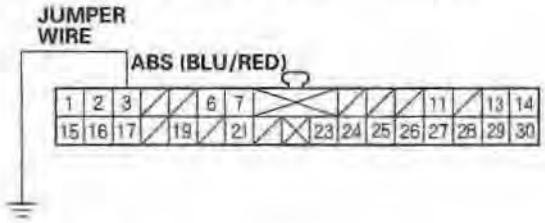
YES—Check for loose terminals in the ABS control unit 47P connector. If necessary, substitute a known-good ABS modulator-control unit, and recheck. ■

NO—Go to step 8.

8. Remove the gauge assembly, and leave the connector connected.

9. Connect gauge assembly connector A (30P) terminal No. 3 and body ground with a jumper wire.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Does the ABS indicator go off?

YES—Repair open in the wire between the ABS modulator-control unit and the gauge assembly. ■

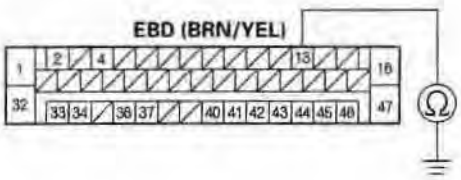
NO—Check for loose gauge assembly connectors. If the connectors are OK, replace the gauge assembly (see page 22-69). ■

Brake System Indicator Circuit Troubleshooting

Brake system indicator does not come on

1. Disconnect the multiplex control unit 13P (under-dash fuse/relay box Y) connector and the ABS control unit 47P connector.
2. Check for continuity between the ABS control unit 47P connector terminal No. 13 and body ground.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the multiplex control unit and the ABS modulator-control unit. ■

NO—Do the multiplex control system troubleshooting (see page 22-149). ■

Brake system indicator does not go off, and no DTCs are stored

1. Release the parking brake.
2. Turn the ignition switch ON (II).

   Does the brake system indicator go off after several seconds?

   YES—The system is OK at this time. ■

   NO—Go to step 3.
3. Check the brake fluid level (see page 19-9).

   Is the level OK?

   YES—Go to step 4.

   NO—Refill the brake fluid, and recheck. ■
4. Check the ABS indicator.

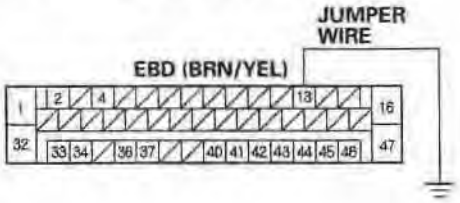
   Does the ABS indicator stay on?

   YES—Read the ABS DTC (see page 19-40), and do the applicable troubleshooting for the DTC. ■

   NO—Go to step 5.
5. Turn the ignition switch OFF.
6. Disconnect the ABS control unit 47P connector.
7. Turn the ignition switch ON (II).

8. Connect the ABS control unit 47P connector terminal No. 13 and body ground with a jumper wire.

ABS CONTROL UNIT 47P CONNECTOR



Wire side of female terminals

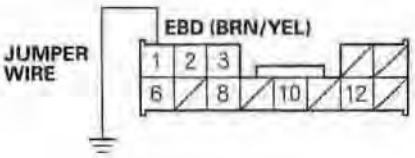
Does the brake system indicator go off?

YES—Check for loose terminal at the ABS control unit 47P connector and G202. If the terminals and ground are OK, replace the ABS modulator-control unit (see page 19-66). ■

NO—Go to step 9.

9. Connect multiplex control unit 13P (under-dash fuse/relay box Y) connector terminal No. 1 and body ground with a jumper wire.

MULTIPLEX CONTROL UNIT 13P CONNECTOR



Wire side of female terminals

Does the brake system indicator go off?

YES—Repair open in the wire between the multiplex control unit and the ABS modulator-control unit. ■

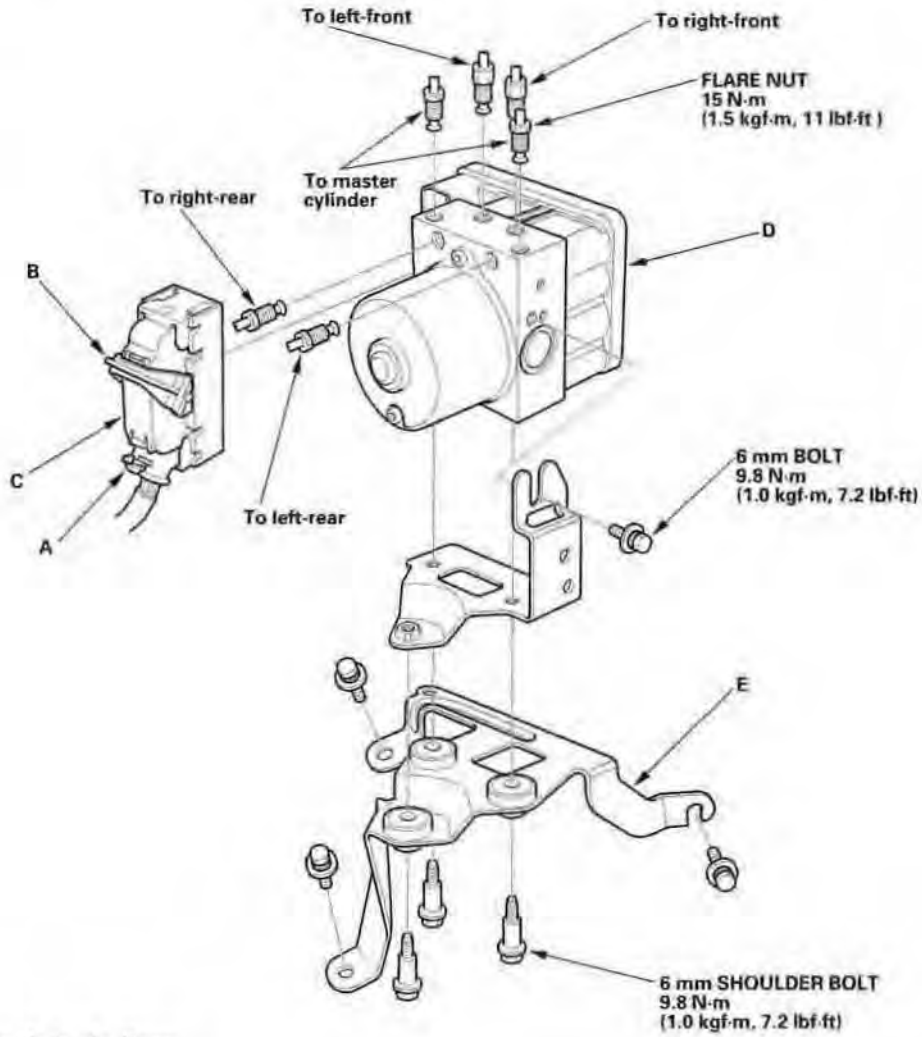
NO—Do the multiplex control system troubleshooting (see page 22-149). ■

ABS Modulator-Control Unit Removal and Installation

NOTE:
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid gets on the paint, wash it off immediately with water.
- Be careful not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

Removal

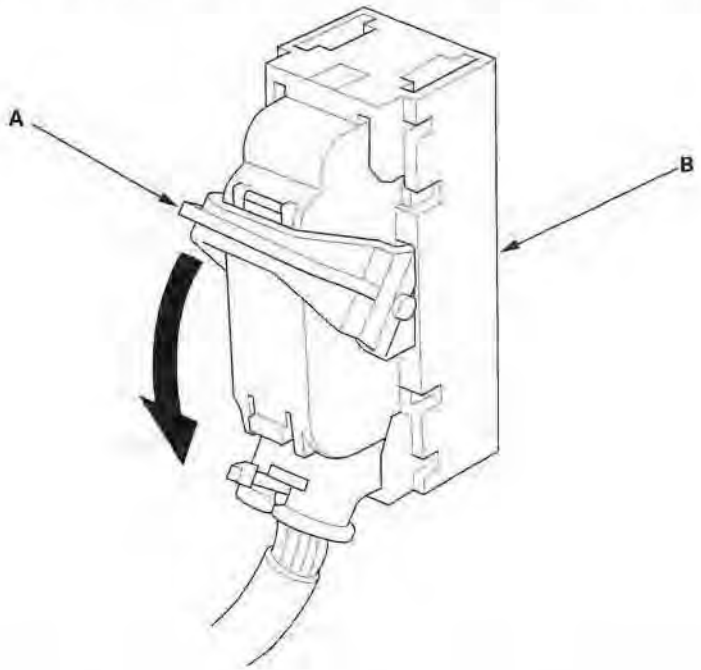
1. Push in the locking tab (A) and pull up the lock (B) of the ABS control unit 47P connector (C), and the connector disconnects itself.



2. Disconnect the six brake lines.
3. Remove the ABS modulator-control unit (D)/bracket (E) from the body.
4. Remove the two 6 mm shoulder bolts and 6 mm bolt from the bracket, then remove the ABS modulator-control unit from the bracket.

Installation

1. Install the ABS modulator-control unit on the bracket, then tighten the two 6 mm shoulder bolts and 6 mm bolt.
2. Install the ABS modulator-control unit/bracket on the body.
3. Align the connecting surface of the ABS control unit 47P connector.
4. Push in the lock (A) of the ABS control unit 47P connector (B), then connect the connector.



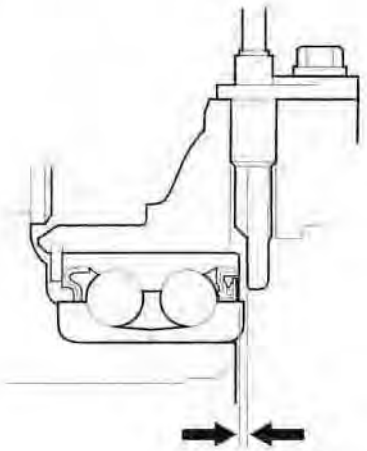
5. Connect the six brake lines.
6. Bleed the brake system, starting with the front wheels (see page 19-9).
7. Start the engine, and check that the ABS indicator and brake system indicator go off.
8. Test-drive the vehicle, and check that the ABS indicator and brake system indicator do not come on.

Wheel Sensor Inspection

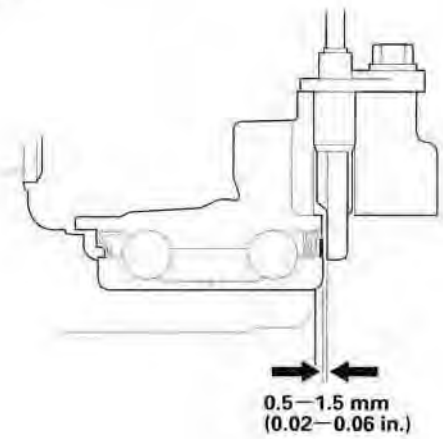
1. Remove the appropriate front driveshaft (see page 16-3) or rear driveshaft (see page 16-24).

2. Check the magnetic encoder after cleaning the encoder. If necessary, replace the front wheel bearing (see page 18-11) or rear wheel bearing unit (see page 18-26).

Front



Rear



3. Measure the air gap between the wheel sensor and the magnetic encoder all the way around while rotating the encoder.

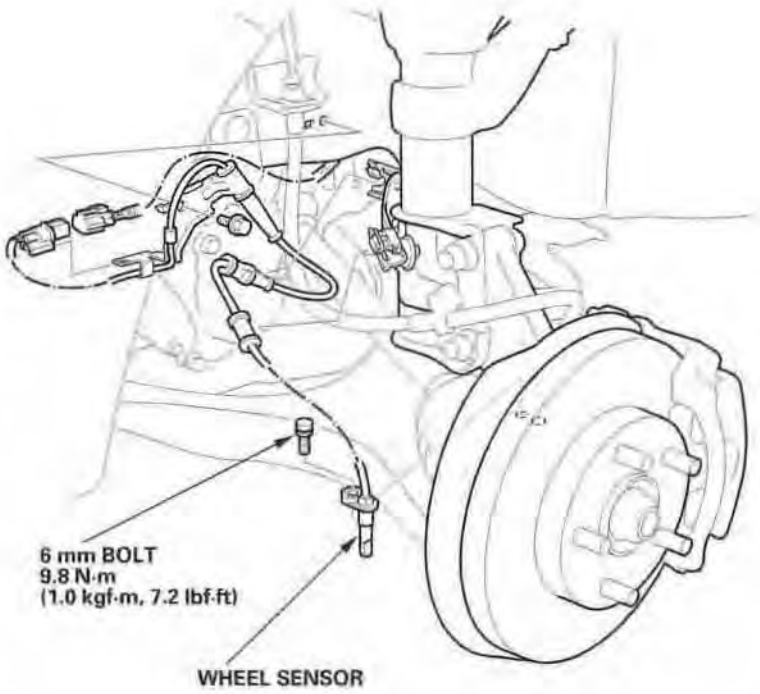
Standard:
Front/Rear: 0.5—1.5 mm (0.02—0.06 in.)

NOTE:
- Install the wheel bearing with the magnetic encoder (brown color) toward the inside of the knuckle.
- Remove any oil, grease, dust, or other foreign material from the encoder surface.
- Keep magnetic tools away from the encoder surface.
- Be careful not to damage the encoder surface when you insert the wheel bearing.

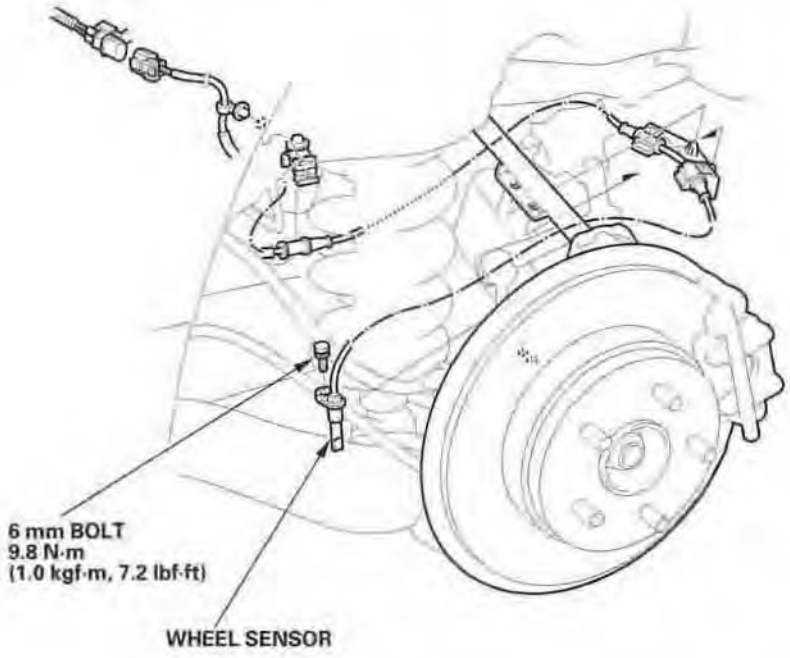
Wheel Sensor Replacement

NOTE: Install the sensors carefully to avoid twisting the wires.

Front



Rear



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If body maintenance is required)

The ELEMENT SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items require special precautions and tools, and should be done only by an authorized Honda dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors when the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Body

Seats

Bumpers

Hood

Hatch

Tailgate

Fuel Fill Door

Exterior Trim

Fenderwell

Openers

Frame

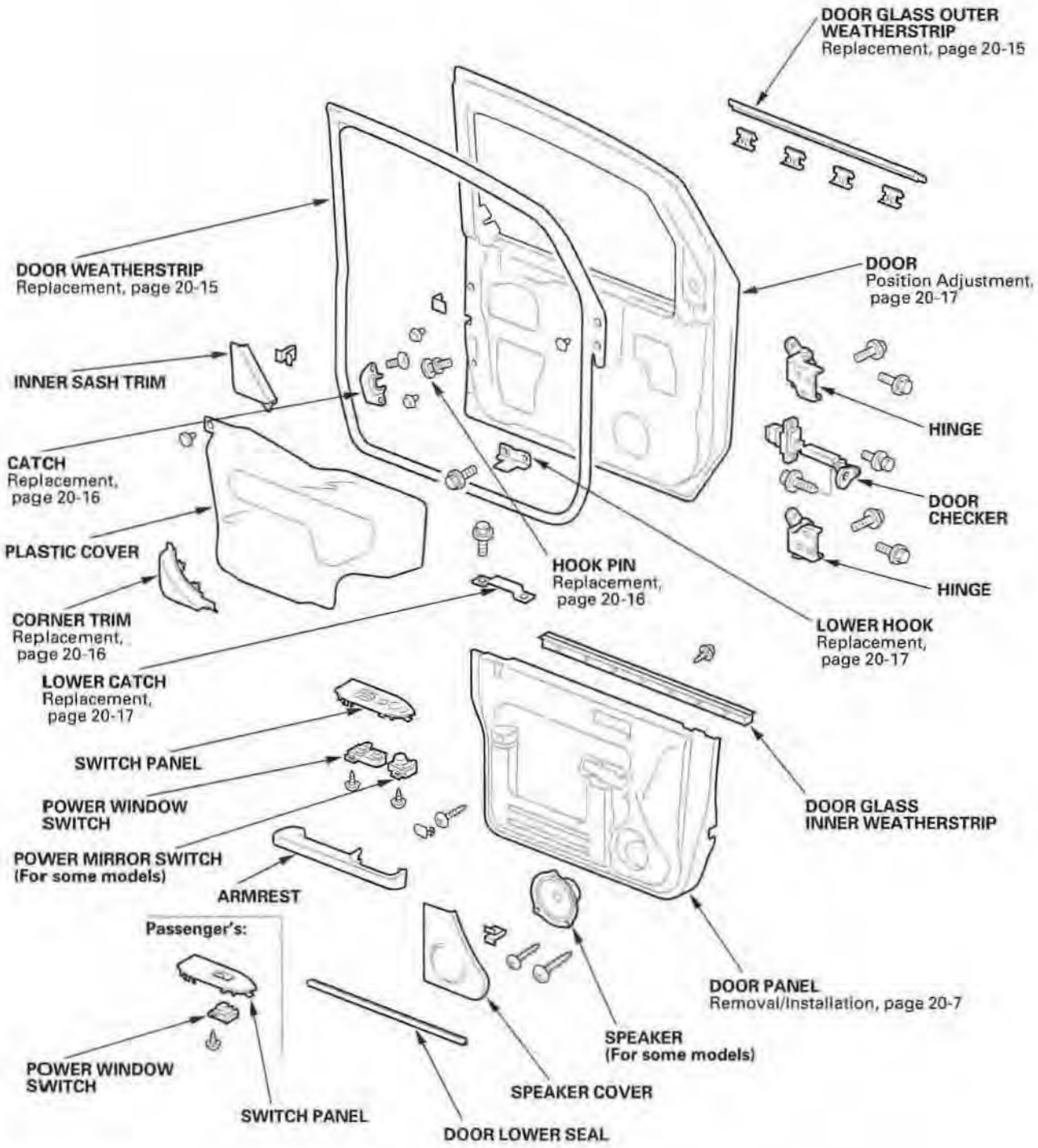
Special Tools

Ref. No.	Tool Number	Description	Qty
①	SOJATP2014	KTC Trim Tool Set	1

①: Available through the American Honda Tool and Equipment Program; call 888-424-6857.

①

Component Location Index - Front Door



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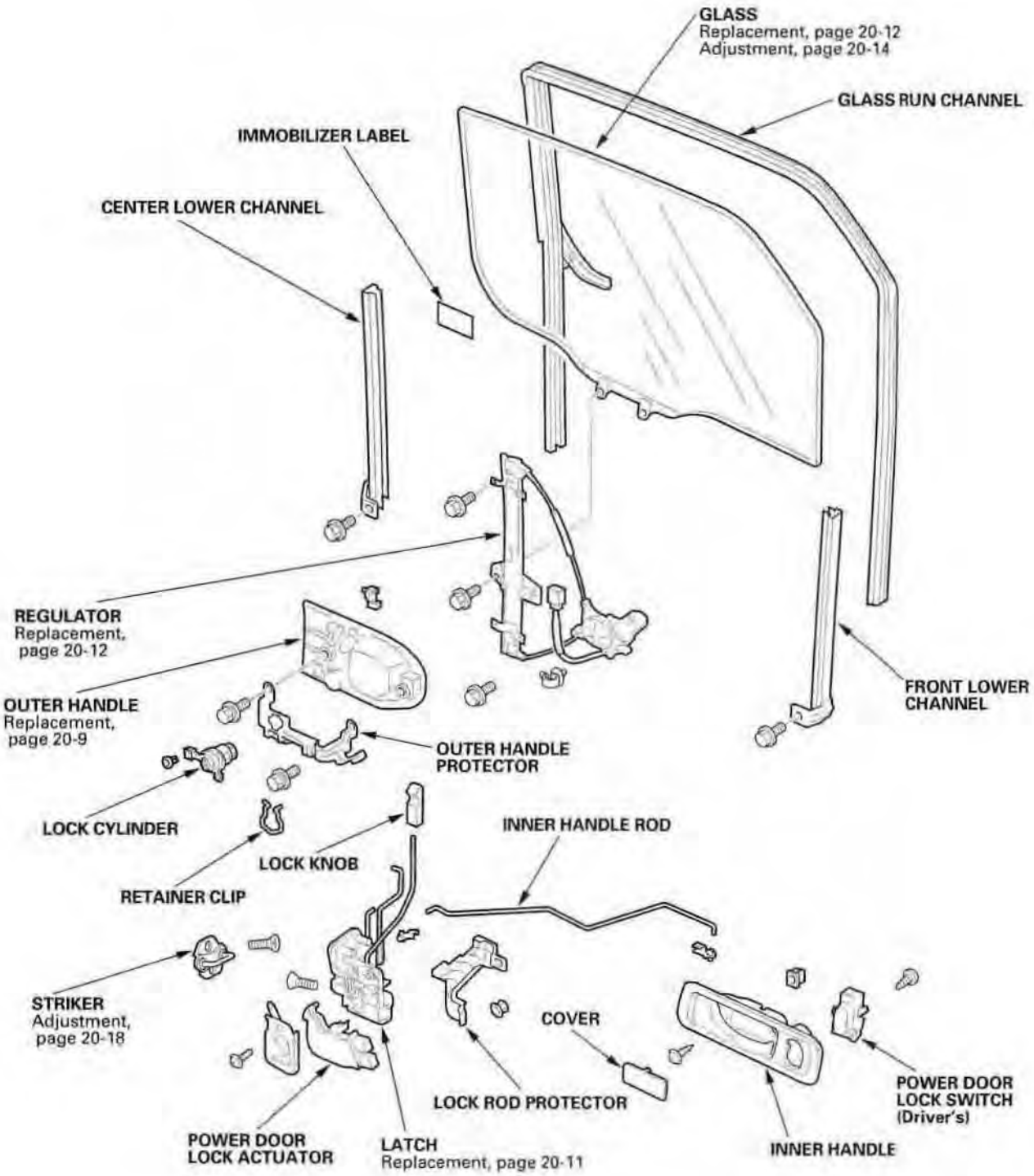
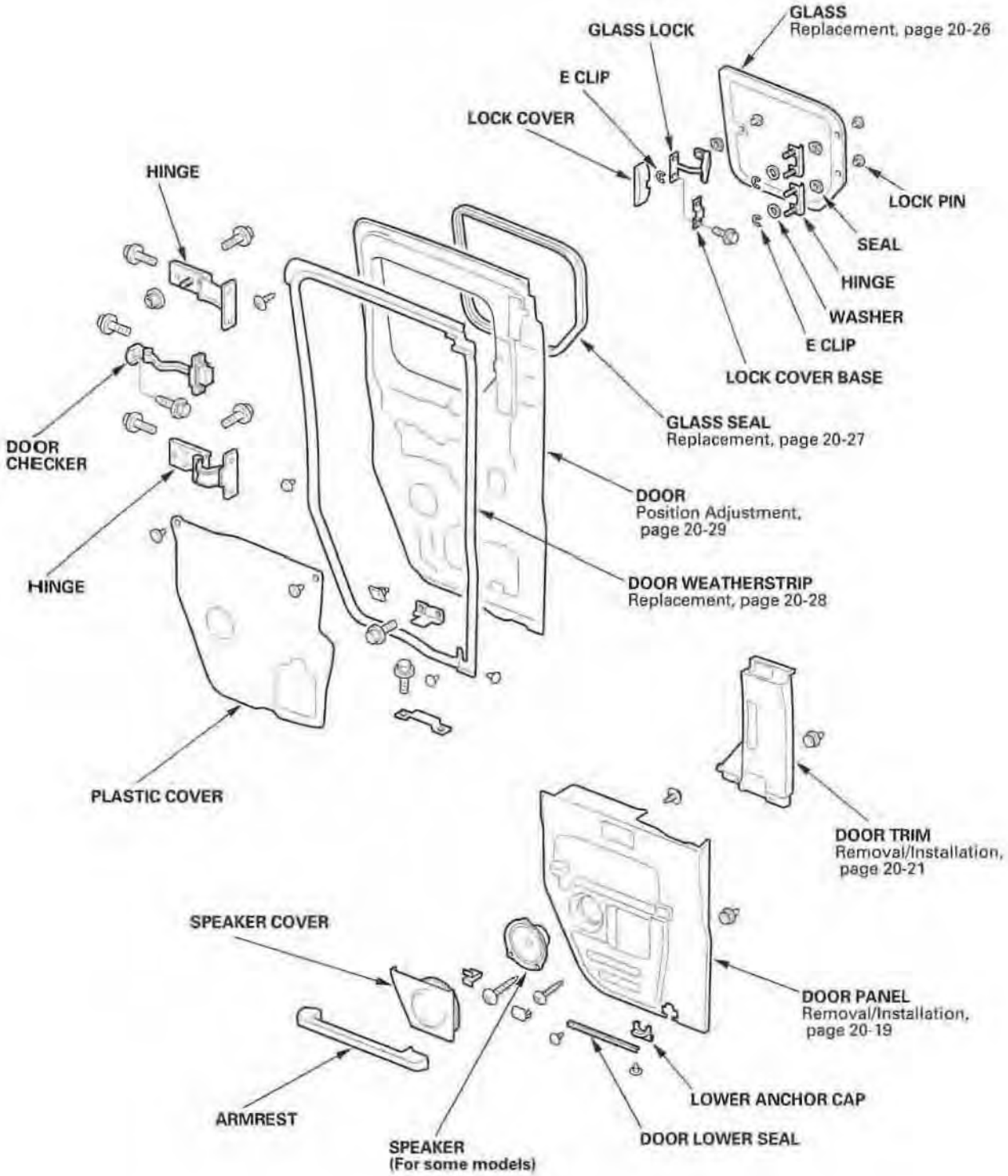
Component Location Index - Front Door (cont'd)



Component Location Index - Rear Door



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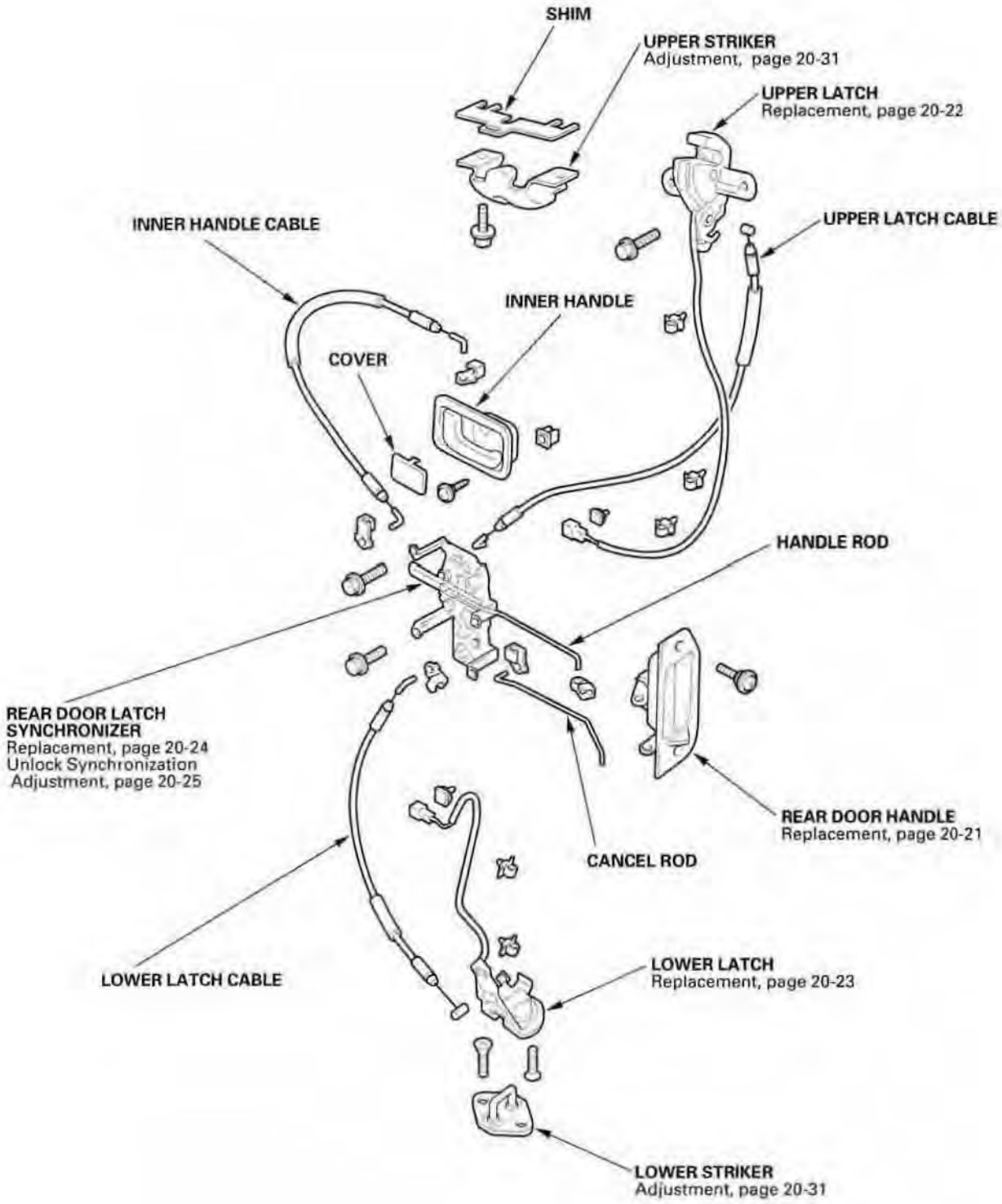
Component Location Index - Rear Door (cont'd)



Front Door Panel Removal/Installation

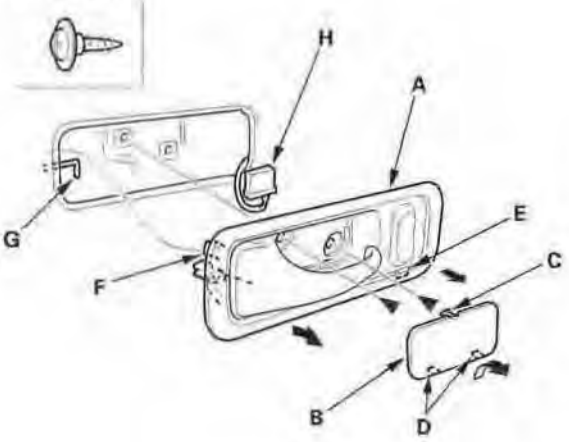
Special Tools Required
- KTC trim tool set SOJATP2014
- Trim pad remover, Snap-on A 177A or equivalent, commercially available

NOTE: Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

1. Remove the inner handle (A).
   - -1 Using the appropriate tool from the KTC trim tool set, pry out on the upper portion of the cover (B) to release the upper hook (C), and pull up the cover to release the lower hooks (D), then remove the cover.
   - -2 Remove the screws.
   - -3 Release the hook (E), and pull the inner handle forward and out half-way to release the hook (F).
   - -4 Disconnect the inner handle rod (G).
   - -5 Disconnect the power door lock switch connector (H).

Fastener Locations

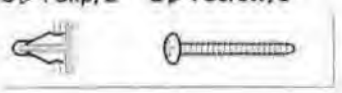
▶: Screw, 2

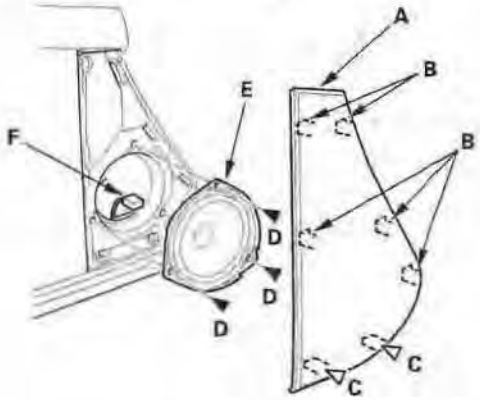


2. Pull out on the speaker cover (A) to detach the hooks (B) and clips (C), then remove the cover.

Fastener Locations

C▷: Clip, 2 D▶: Screw, 3



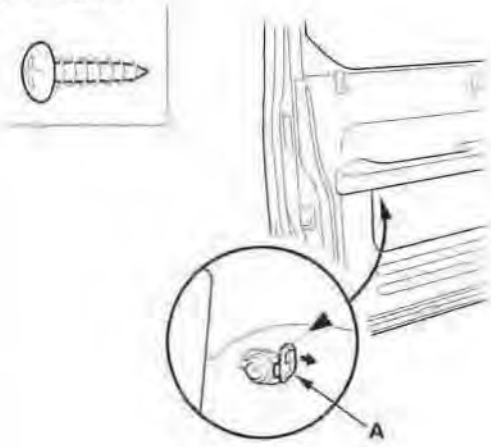


3. Remove the screws (D), then remove the speaker (E) (for some models), and disconnect its connector (F).

4. From under the armrest, using the appropriate tool from the KTC trim tool set, pry out the lid (A), and remove the screw.

Fastener Location

▶: Screw, 1



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Front Door Panel Removal/Installation (cont'd)

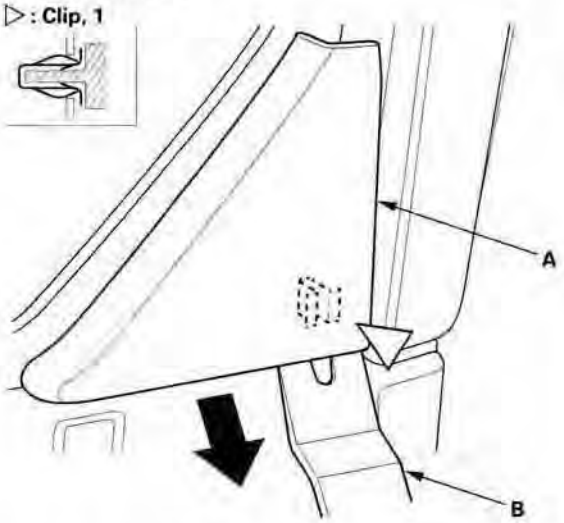
5. Lower the glass fully.

6. Remove the mirror mount cover (see step 2 on page 20-33).

7. Lower the front window so you can access the inner sash trim (A).

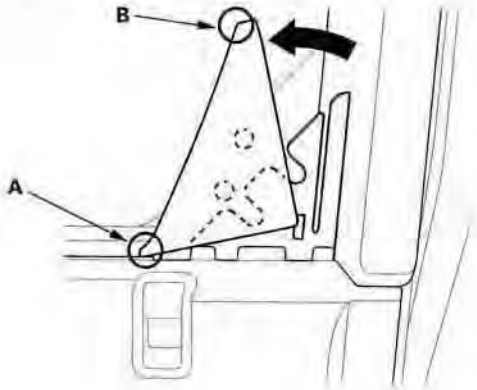
Fastener Location

▷: Clip, 1



8. Use a trim tool (B) to release the clip at the lower rear corner of the sash trim. Pry out from the edge of the sash trim until the clip releases.

9. While pressing down the front corner (A) of the sash trim, pull the top corner (B) forward until the sash trim releases.

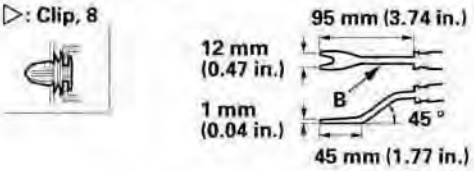


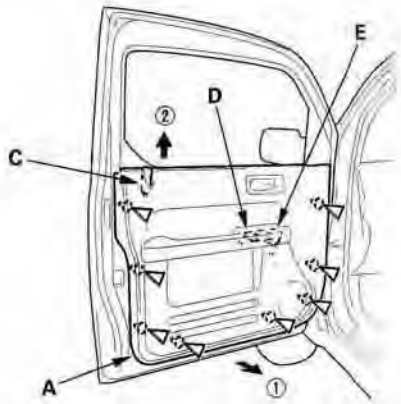
10. Remove the door panel (A) with as little bending as possible to avoid creasing or breaking it.

–1 Release the clips that hold the door panel with a commercially available trim pad remover (B).
–2 Starting at the rear, pull the door panel upward, then release the lock knob (C).
–3 Disconnect the power window switch connector (D), power mirror switch connector (on the driver's door) (E).

Fastener Locations

▷: Clip, 8





11. Install the panel in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the connectors are plugged in properly, and the rod is connected properly.
- Push the clips portion into place securely.
- Check the window and power door lock operations.

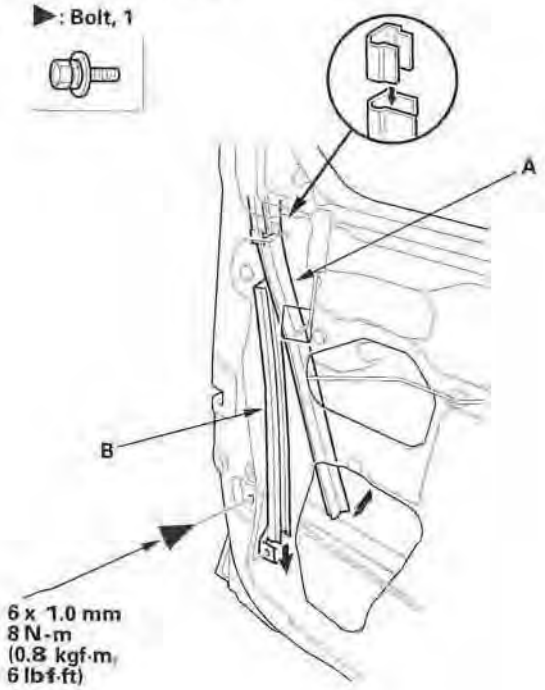
Front Door Outer Handle Replacement

NOTE: Put on gloves to protect your hands.

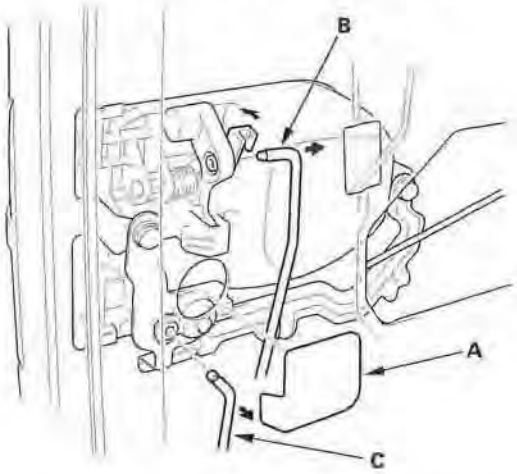
1. Remove these items:
   - Door panel (see page 20-7)
   - Plastic cover, as necessary (see page 20-3)
2. Raise the glass fully.
3. Pull the glass run channel (A) away as necessary, and remove the bolt, then remove the center lower channel (B) by pulling it downward.

Fastener Location

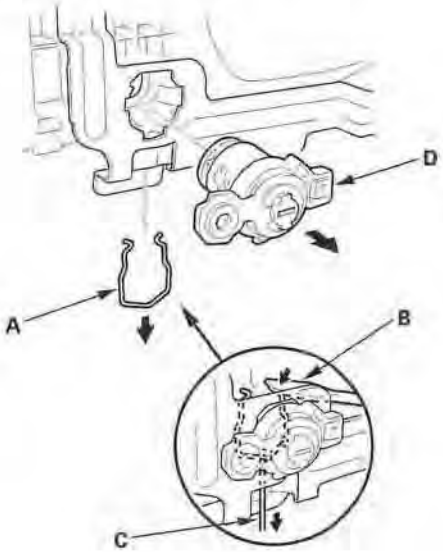
▶: Bolt, 1



4. Remove the access seal (A), and disconnect the outer handle rod (B) and cylinder rod (C).



5. Push the top of the retainer clip (A) with a flat-tip screwdriver (B), and hold it. Release the retainer clip with a hook-shaped tool (C), then remove the lock cylinder (D).



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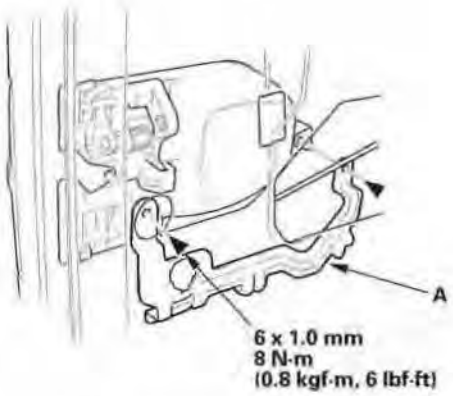
Front Door Outer Handle Replacement (cont'd)

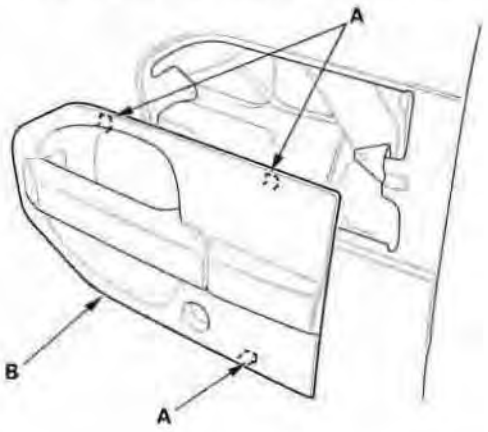
6. Remove the bolts, then remove the outer handle protector (A).

Fastener Locations

▶: Bolt, 2



7. Release the hooks (A), then remove the outer handle (B). Take care not to scratch the door.



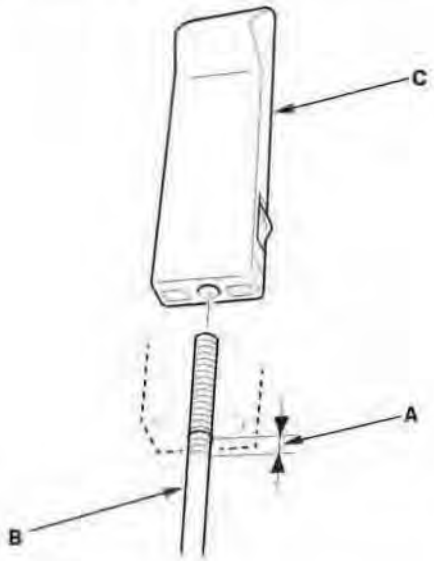
8. Install the outer handle in the reverse order of removal, and note these items:

- Make sure each rod is connected securely.
- Make sure the door locks and opens properly.
- When installing the lock cylinder, leave the outer door handle bolts loose so the inner protector does not interfere with the lock cylinder installation, then tighten the handle bolts.
- Install the lock cylinder retaining clip on the handle, then install the lock cylinder. Be sure the clip is fully seated in the slot on the lock cylinder.
- When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

Front Door Latch Replacement

NOTE: Put on gloves to protect your hands.

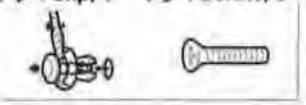
1. Remove these items:
   - Door panel (see page 20-7)
   - Plastic cover, as necessary (see page 20-3)
2. Raise the glass fully.
3. Remove the center lower channel (see step 3 on page 20-9).
4. Remove the access seal, and disconnect the outer handle rod and cylinder rod (see step 4 on page 20-9).
5. To ease reassembly, note the distance (A) of the lock rod (B) on the lock knob (C) before disconnecting it.

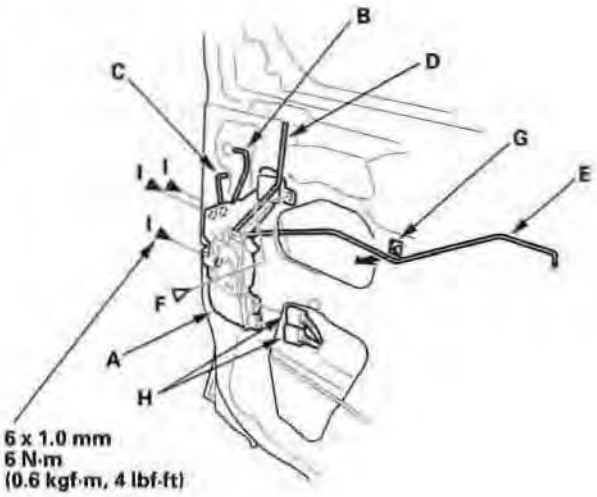


6. Remove the latch (A). Take care not to bend the outer handle rod (B), cylinder rod (C), lock rod (D), and inner handle rod (E).
   -1 Remove the clip (F).
   -2 Release the inner handle rod from the rod holder (G).
   -3 Disconnect the connectors (H).
   -4 Remove the screws (I).

Fastener Locations

F ▷: Clip, 1 I ▶: Screw, 3





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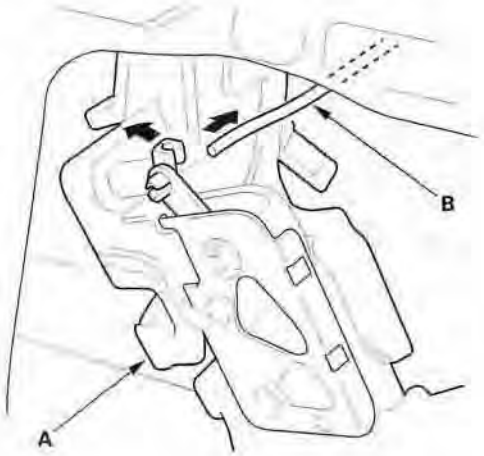
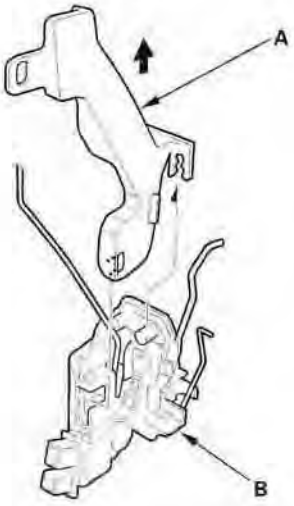
Front Door Latch Replacement (cont'd)

7. Pull the latch (A) out until you can disconnect the inner handle rod (B), then disconnect the rod.



8. Remove the latch from the hole in the door. Take care not to bend the rods.

9. Pull the lock rod protector (A) upward, then remove the protector from the latch (B).



10. Install the latch in the reverse order of removal, and note these items:

- Make sure the actuator connectors are plugged in properly, and each rod is connected securely.
- Make sure the door locks and opens properly.
- When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

Front Door Glass and Regulator Replacement

NOTE: Put on gloves to protect your hands.

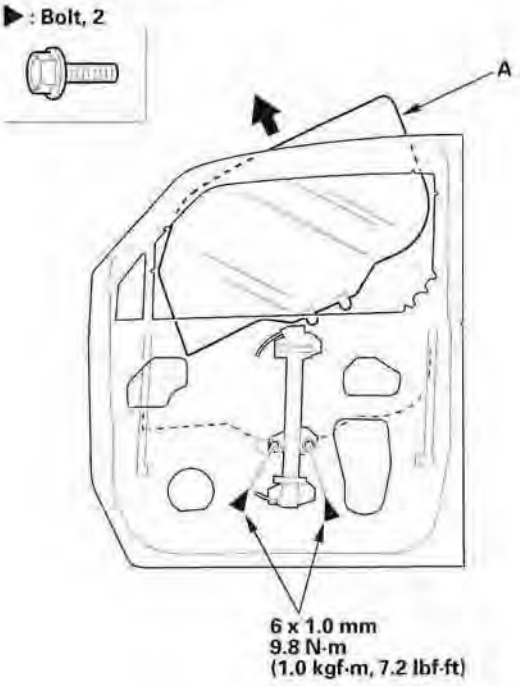
1. Remove these items:

- Door panel (see page 20-7)
- Plastic cover, as necessary (see page 20-3)

2. Carefully lower the glass (A) until you can see the bolts, then remove them. Carefully pull the glass out through the window slot. Take care not to drop the glass inside the door.

Fastener Locations

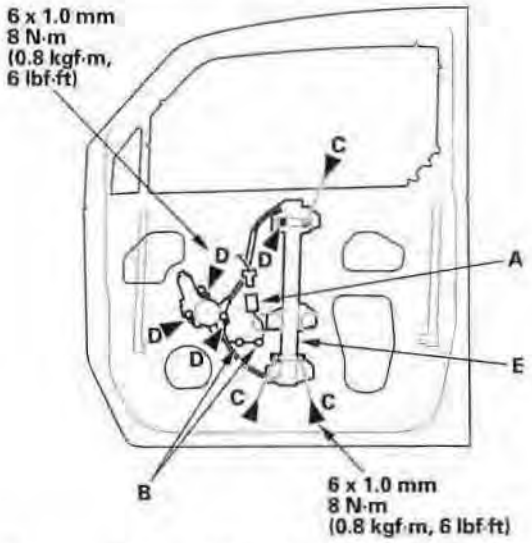
▶ : Bolt, 2



3. Disconnect and detach the connector (A) and harness clips (B) from the door.

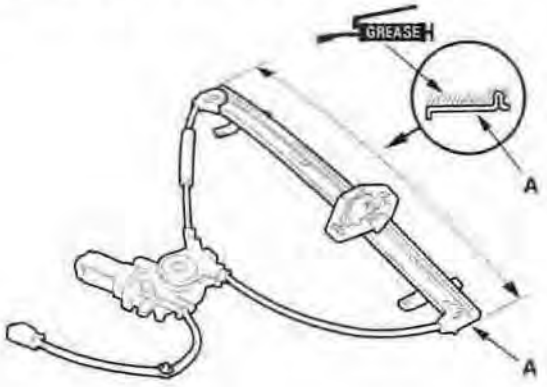
Fastener Locations

C ▶ : Bolt, 3 D ▶ : Bolt, 4



4. Remove the bolts (C), and loosen the bolts (D), then remove the regulator (E) through the hole in the door.

5. Apply multipurpose grease to all the sliding surfaces of the regulator (A) where shown.



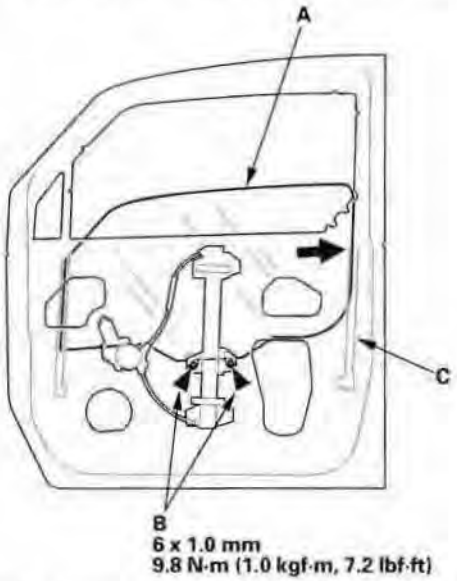
6. Install the glass and regulator in the reverse order of removal, and note these items:

- Roll the glass up and down to see if it moves freely without binding.
- Make sure that there is no clearance between the glass and glass run channel when the glass is closed.
- Adjust the position of the glass as necessary (see page 20-14).
- Check for water leaks (see step 7 on page 20-14).
- Test-drive and check for wind noise and rattles.
- When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

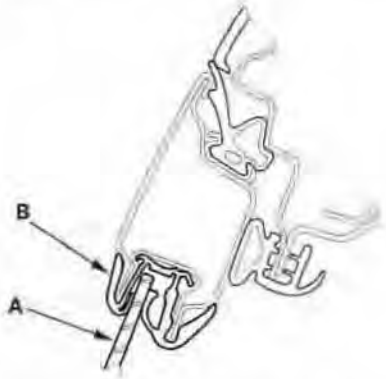
Front Door Glass Adjustment

NOTE:
- Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.
- Wipe the run channel clean with a shop towel.
- Lubricate the run channel with Shin-Etsu grease P/N 08798-9013.

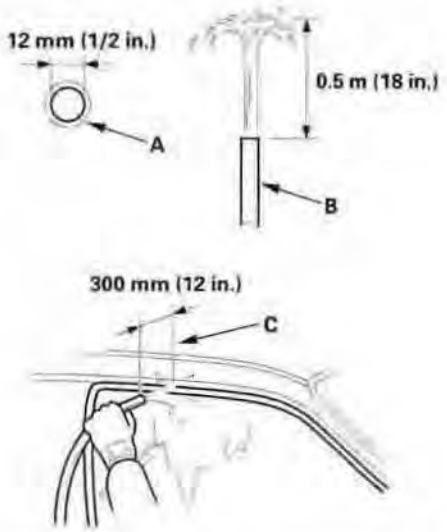
1. Place the vehicle on a firm, level surface.
2. Remove these items:
   - Door panel (see page 20-7)
   - Plastic cover (see page 20-3)
3. Carefully move the glass (A) until you can see the glass mounting bolts (B), then loosen them.



4. Push the glass against the channel (C), then tighten the glass mounting bolts.
5. Check that the glass moves smoothly.
6. Raise the glass fully, and check for gaps. Also check that the glass (A) contacts the glass run channel (B) evenly.



7. Check for water leaks. Run water over the roof and on the sealing area as shown, and note these items:
   - Use a 12 mm (1/2 in.) diameter hose (A).
   - Adjust the rate of water flow as shown (B).
   - Do not use a nozzle.
   - Hold the hose about 300 mm (12 in.) away from the door (C).



8. Attach the plastic cover, and install the door panel (see page 20-7).
9. Test-drive and check for wind noise.

Front Door Glass Outer Weatherstrip Replacement

Special Tools Required
KTC trim tool set SOJATP2014

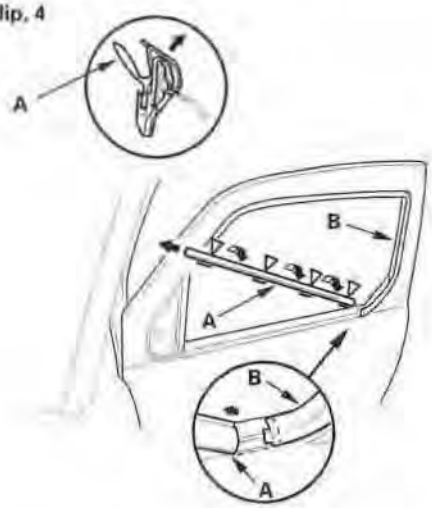
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the door.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

1. Remove the power/manual mirror (see page 20-33).

2. Starting at the rear, pry the door glass outer weatherstrip (A) up to detach the clips, and release the weatherstrip from the glass run channel (B), then remove the weatherstrip.

Fastener Locations

▷: Clip, 4



3. Install the weatherstrip in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Push the clips into place securely.

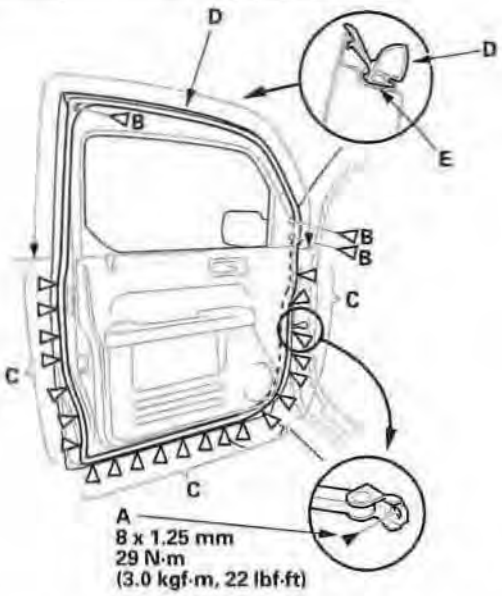
Front Door Weatherstrip Replacement

NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. At the A-pillar, remove the door checker mounting bolt (A).

Fastener Locations

A▶: Bolt, 1 B▷: Clip, 3 C▷: Clip, 22



2. Detach the clips (B, C), then remove the door weatherstrip (D).

3. Install the weatherstrip in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Push the clips into place securely.
   - Make sure the weatherstrip is installed in the holder (E) securely.
   - Apply liquid thread lock to the door checker mounting bolt before installation.
   - Check for water leaks (see step 7 on page 20-14).
   - Test-drive and check for wind noise.

Front Door Inner Corner Trim Replacement

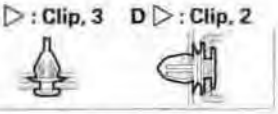
Special Tools Required
KTC trim tool set SOJATP2014

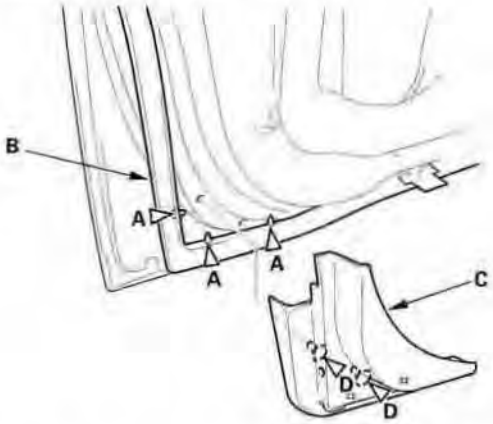
NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

1. Detach the clips (A), then remove the weatherstrip (B) pull out on the inner corner trim (C) to release the clips (D).

Fastener Locations

A ▷ : Clip, 3 D ▷ : Clip, 2

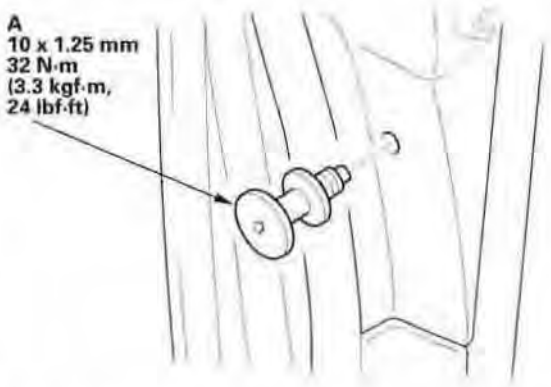




2. Install the inner corner trim in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Push the clips into place securely.

Front Door Hook Pin and Catch Replacement

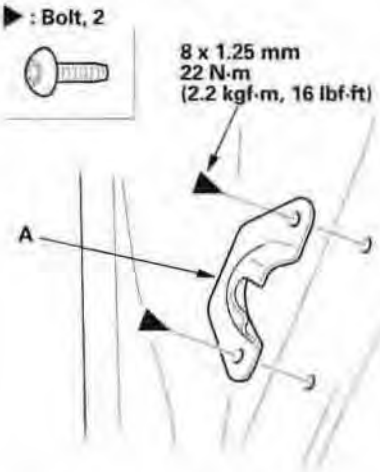
1. With a T40 Torx bit, remove the door hook pin (A) from the front door.



2. With a T40 Torx bit, remove the bolts, then remove the catch (A) from the rear door.

Fastener Locations

▶ : Bolt, 2



3. Install the hook pin and catch in the reverse order of removal, and apply liquid thread lock to the threads of the door hook pin.

4. Apply touch-up paint to the catch mounting bolts and around the catch.

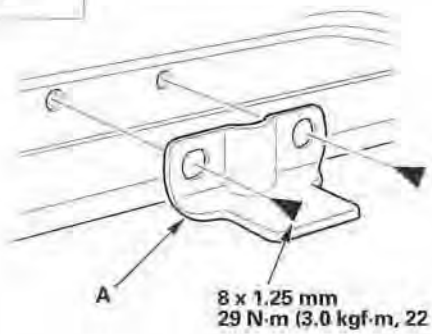
Front Door Lower Hook and Lower Catch Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the bolts, then remove the lower hook (A).

Fastener Locations

▶ : Bolt, 2

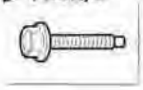


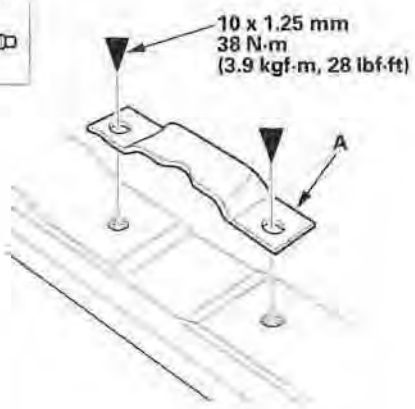
2. Remove the door sill trim (see page 20-58).

3. Remove the bolts, then remove the lower catch (A).

Fastener Locations

▶ : Bolt, 2





4. Install the lower hook and lower catch in the reverse order of removal, and apply touch-up paint to the lower hook mounting bolts and around the lower hook.

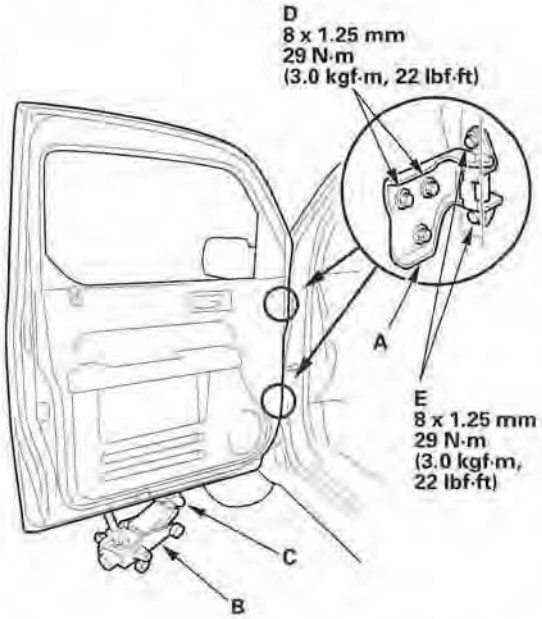
Front Door Position Adjustment

NOTE: Check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body. Check that the door and body edges are parallel.

1. Place the vehicle on a firm, level surface when adjusting the doors.

2. Adjust at the hinges (A):

   - Remove the front fender cladding (see page 20-131) and front inner fender (see page 20-138).
   - Pad a floor jack (B) with a shop towel (C) and use the jack to support the door during the adjustment procedure.
   - Loosen the hinge mounting bolts (D) slightly, and move the door backward or forward, up or down as necessary to equalize the gaps.

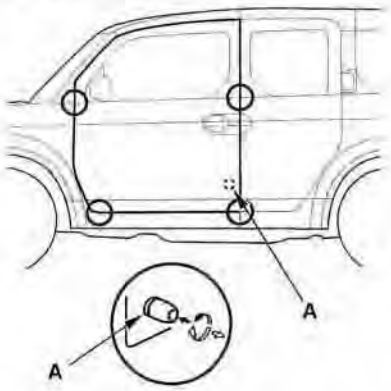


3. If necessary, replace the door mounting bolts (E) with the adjusting bolts (P/N 90102-SFA-305) made specifically for door adjustment, then adjust at the door: Loosen the door mounting bolts slightly, and move the door up or down as necessary to equalize the gaps, and in or out until it's flush with the body.

(cont'd)

Front Door Position Adjustment (cont'd)

4. Check that the door and body edges are parallel. If necessary, adjust the door cushion (A) to make the rear of the door flush with the body.



5. Apply touch-up paint to the hinge mounting bolts, and around the hinges.

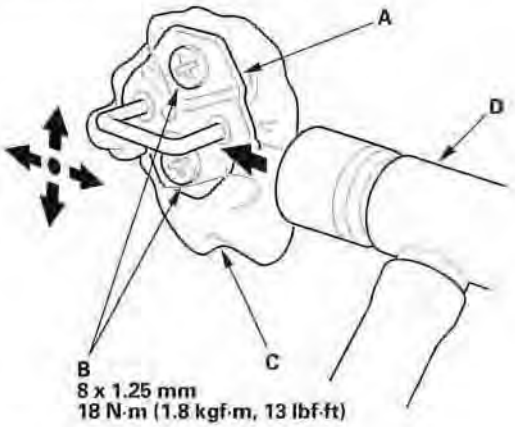
6. Check for water leaks (see step 7 on page 20-14).

7. Test-drive and check for wind noise.

Front Door Striker Adjustment

Make sure the door latches securely without slamming it. If necessary, adjust the striker (A): The striker nuts are fixed, but the striker can be adjusted slightly up or down, and in or out.

1. Loosen the screws (B), then insert a shop towel (C) between the body and striker.



2. Lightly tighten the screws.

3. Wrap the striker with a shop towel, then adjust the striker by tapping it with a plastic hammer (D). Do not tap the striker too hard.

4. Loosen the screws, and remove the shop towel.

5. Lightly tighten the screws.

6. Hold the outer handle out, and push the door against the body to be sure the striker allows a flush fit. If the door latches properly, tighten the screws and recheck.

Rear Door Panel Removal/Installation

Special Tools Required
- KTC trim tool set SOJATP2014
- Trim pad remover, Snap-on A 177A or equivalent, commercially available

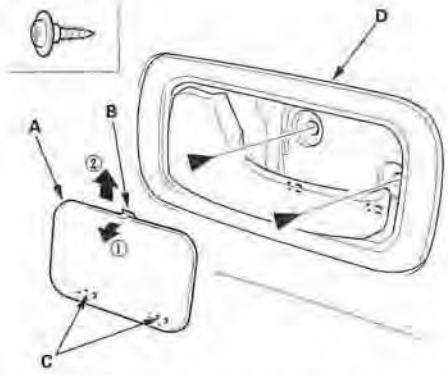
NOTE: Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

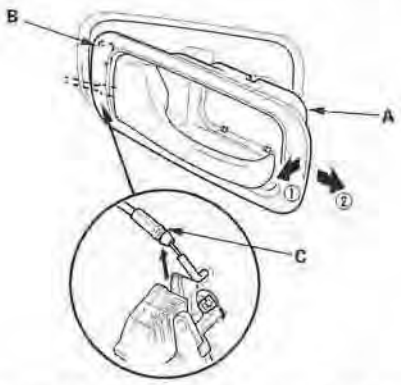
1. Using the appropriate tool from the KTC trim tool set, pry out on the upper portion of the cover (A) to release the upper hook (B), and pull up the cover to release the lower hooks (C), then remove the cover, and remove the screws securing the inner handle (D).

Fastener Locations

▶ : Screw, 2



2. Pull out on the front edge of the inner handle (A), and pull the inner handle forward to release the hook (B).

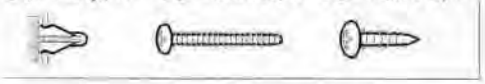


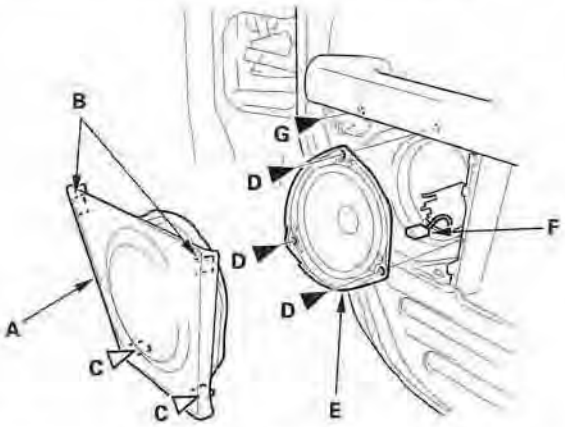
3. Disconnect the inner handle cable (C), then remove the inner handle.

4. Pull out on the speaker cover (A) to detach the hooks (B) and clips (C), then remove the cover.

Fastener Locations

C ▷ : Clip, 2 D ▶ : Screw, 3 G ▶ : Screw, 1





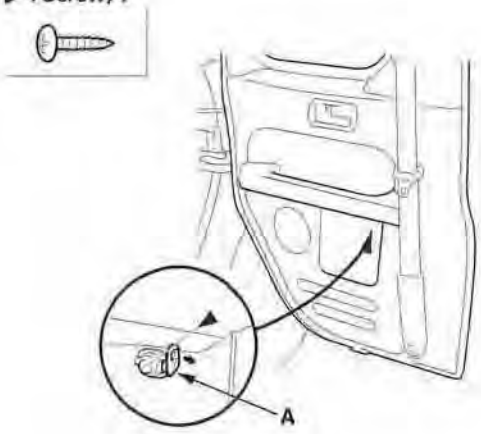
5. Remove the screws (D), then remove the speaker (E) (for some models), and disconnect its connector (F).

6. Remove the screw (G).

7. From under the armrest, using the appropriate tool from the KTC trim tool set, pry out the lid (A), and remove the screw.

Fastener Location

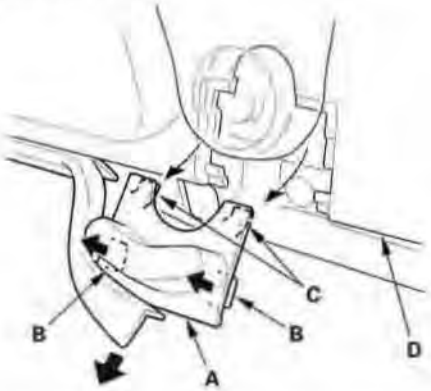
▶ : Screw, 1



(cont'd)

Rear Door Panel Removal/Installation (cont'd)

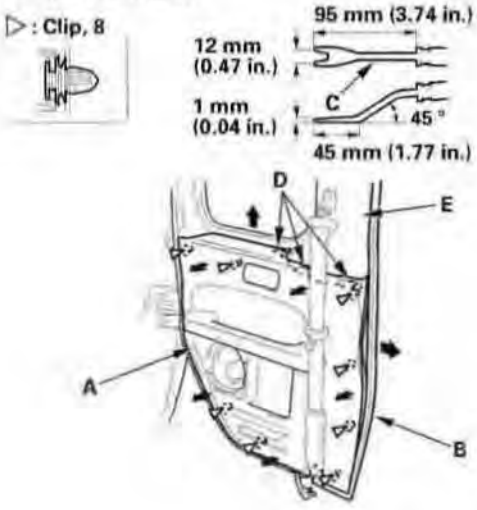
8. Pull out on the bottom of the lower anchor cap (A) to release the hooks (B), and pull down on the cap to release the hooks (C), then remove the cap from the door panel (D).



9. Remove the door panel (A) with as little bending as possible to avoid creasing or breaking it.

   -1 Pull the door weatherstrip (B) out as necessary.
   -2 Release the clips that hold the door panel with a commercially available trim pad remover (C).
   -3 Pull out on the top of the door panel to release the hooks (D) from the rear door trim (E).
   -4 Pull the door panel upward.

Fastener Locations



10. Install the panel in the reverse order of removal, and note these items:

    - Make sure the inner handle cable is connected properly.
    - Replace any damaged clips.
    - Push the clips and hooks into place securely.

Rear Door Trim Removal/ Installation

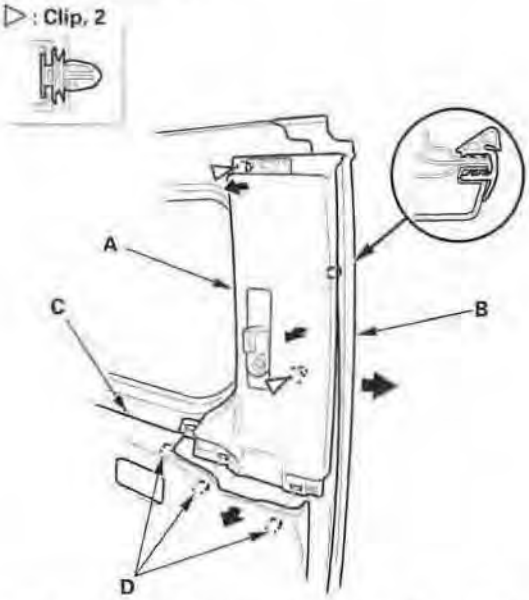
1. Remove the front seat belt upper anchor bolt (see step 5 on page 23-4).

2. Remove the rear door trim (A).

   -1 Pull the door weatherstrip (B) out as necessary.
   -2 Pull out on the top of the rear door panel (C) to release the hooks (D).
   -3 Pull out on the rear door trim to detach the clips.

Fastener Locations

▷: Clip, 2



3. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Push the clips and hooks into place securely.
   - Apply liquid thread lock to the anchor bolt before reinstallation.
   - Before installing the anchor bolt, make sure there are no twists or kinks in the seat belt.

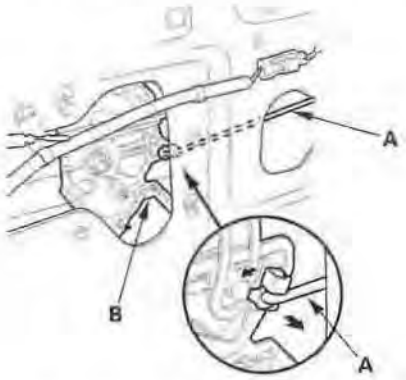
Rear Door Handle Replacement

NOTE: Put on gloves to protect your hands.

1. Remove these items:

   - Door panel (see page 20-19)
   - Plastic cover, as necessary (see page 20-5)

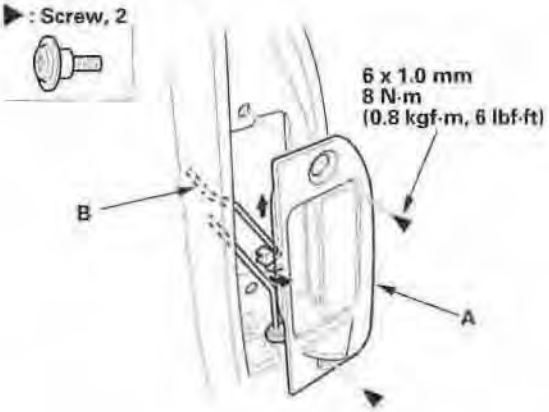
2. Disconnect the cancel rod (A) from the rear door latch synchronizer (B).



3. Remove the screws, then pull the rear door handle (A) out. Disconnect the handle rod (B), then remove the handle.

Fastener Locations

▶: Screw, 2



4. Install the handle in the reverse order of removal, and note these items:

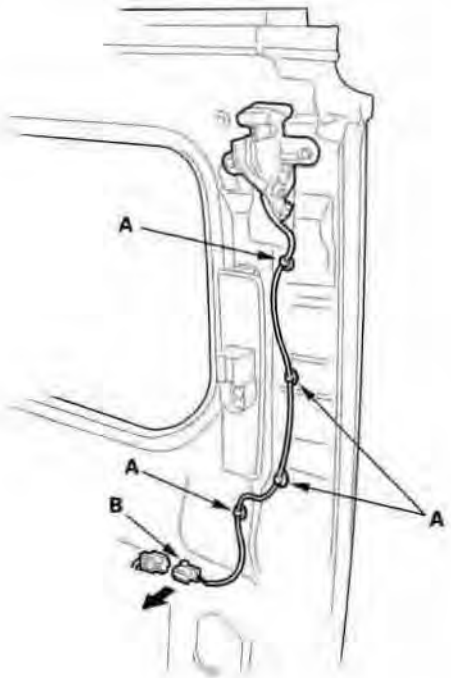
   - Make sure each rod is connected securely.
   - Make sure the door locks and opens properly.
   - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

Rear Door Upper Latch Replacement

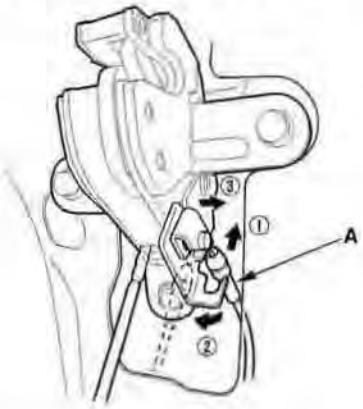
NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-19)
   - Plastic cover, as necessary (see page 20-5)
   - Door trim (see page 20-21)

2. Detach the harness clips (A). Disconnect the upper latch switch connector (B), and detach it.



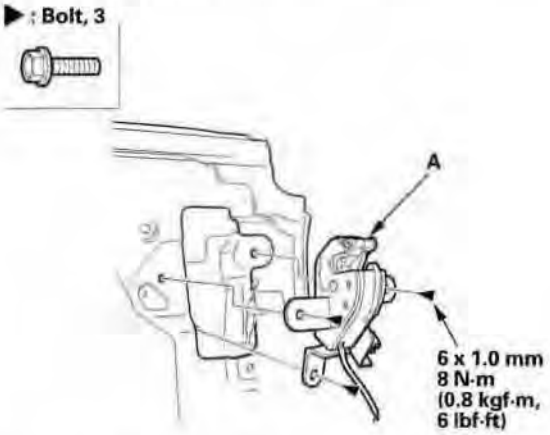
3. Disconnect the upper latch cable (A) in the sequence shown. Take care not to bend the cable.



4. Remove the bolts, then remove the upper latch (A).

Fastener Locations

▶ : Bolt, 3



5. Install the latch in the reverse order of removal, and note these items:
   - Make sure the connector is plugged in properly, and cable is connected securely.
   - Make sure the door locks and opens properly.
   - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

Rear Door Lower Latch Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE: Put on gloves to protect your hands.

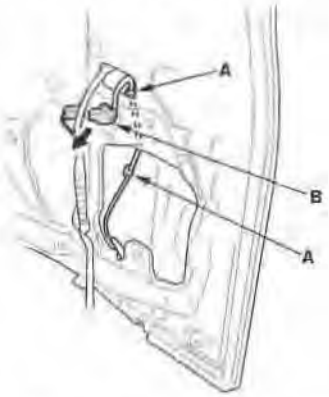
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.

2. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.

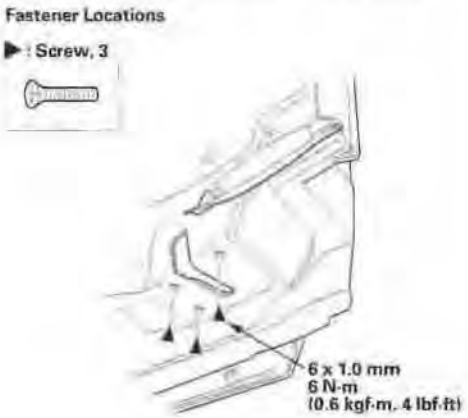
3. Remove these items:

   - Door panel (see page 20-19)
   - Front seat belt, retractor, and seat belt protector (see page 23-4)
   - Plastic cover, as necessary (see page 20-5)

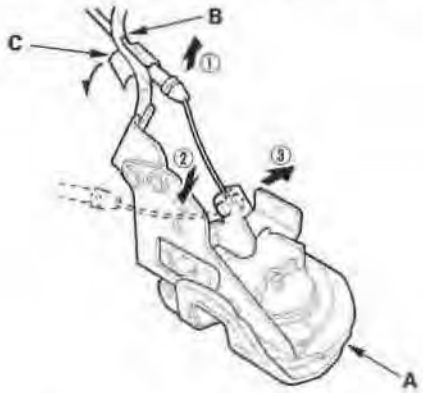
4. Detach the harness clips (A). Disconnect the lower latch switch connector (B), and detach it.



5. Remove the screws from under the door.



6. Pull the lower latch (A) up, and disconnect the lower latch cable (B) in the sequence shown. Remove the vinyl tape (C) from the cable and wire harness. Take care not to kink the cable.



7. Remove the lower latch.

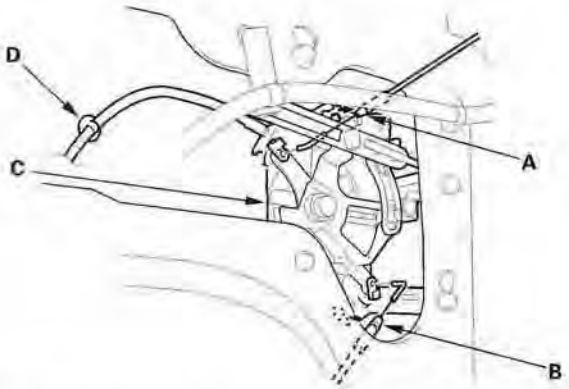
8. Install the latch in the reverse order of removal, and note these items:

   - Make sure the connector is plugged in properly, and cable is connected securely.
   - Make sure the door locks and opens properly.
   - Apply liquid thread lock to the anchor bolts before reinstallation.
   - Before installing the anchor bolts, make sure there are no twists or kinks in the seat belt.
   - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.
   - Reconnect the negative cable to the battery.
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.
   - Reset the clock.
   - Do the ECM/PCM idle learn procedure (see page 11-207).
   - Do the power window control unit reset procedure (see page 22-115).

Rear Door Latch Synchronizer Replacement

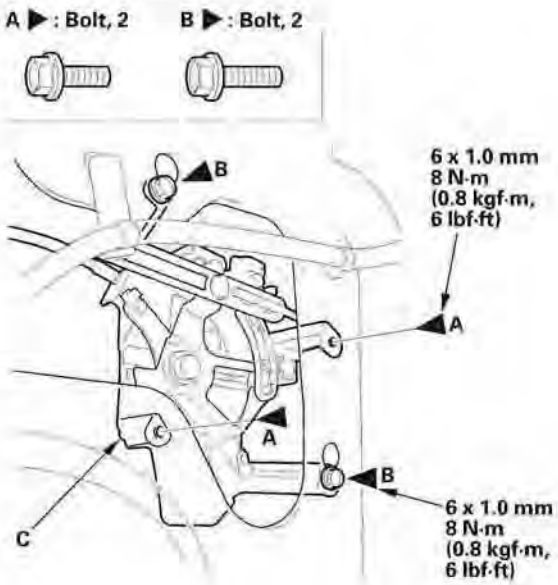
NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Door panel (see page 20-19)
   - Plastic cover, as necessary (see page 20-5)
   - Door handle (see page 20-21)
2. Disconnect the upper latch cable (A) and lower latch cable (B) from the latch synchronizer (C).



3. Detach the inner handle cable clip (D).
4. Remove the bolts (A), and loosen the bolts (B), then remove the latch synchronizer (C) through the hole in the door.

Fastener Locations



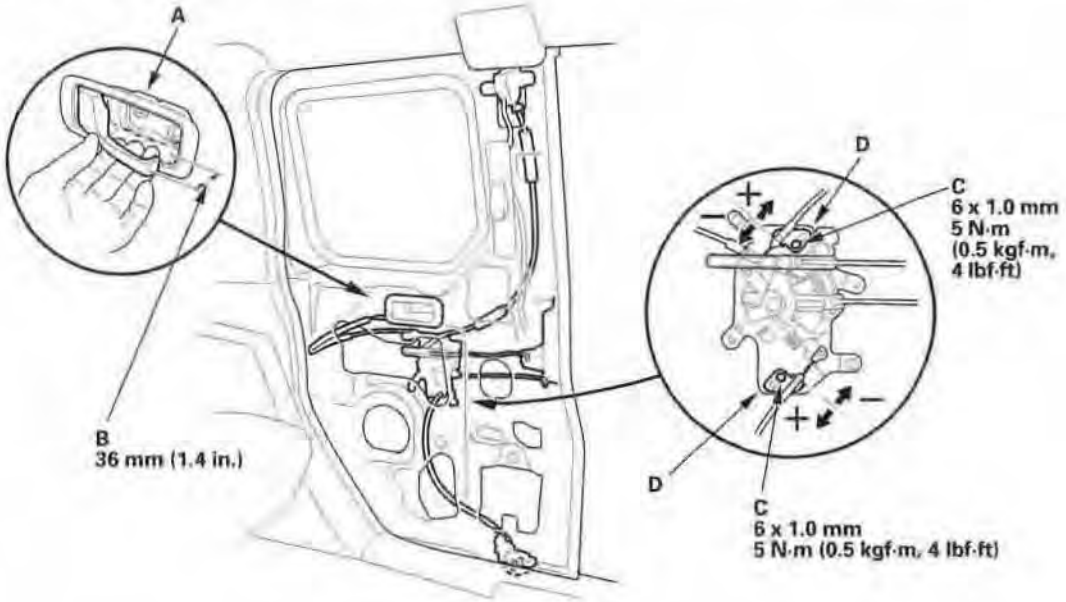
5. Install the latch synchronizer in the reverse order of removal, and note these items:
   - Make sure each cable and rod is connected securely.
   - Make sure the door locks and opens properly. If necessary, adjust the upper latch cable and lower latch cable (see page 20-25).
   - When reinstalling the door panel, make sure the plastic cover is installed properly and sealed around its perimeter.

Rear Door Unlock Synchronization Adjustment

1. Remove these items:
   - Door panel (see page 20-19)
   - Plastic cover (see page 20-5)
2. Install the inner handle by securing the screws.
3. Close the door securely.
4. Pull the inner handle (A), and measure the inner handle stroke (B) when unlocking the door.

   Inner handle stroke: 36 mm (1.4 in.)

   - If the inner handle stroke is less than the specification, loosen the bolts (C) slightly, and move the plates (D) in the direction shown by the minus arrow.
   - If the inner handle stroke is more than the specification, loosen the bolts (C) slightly, and move the plates (D) in the direction shown by the plus arrow.

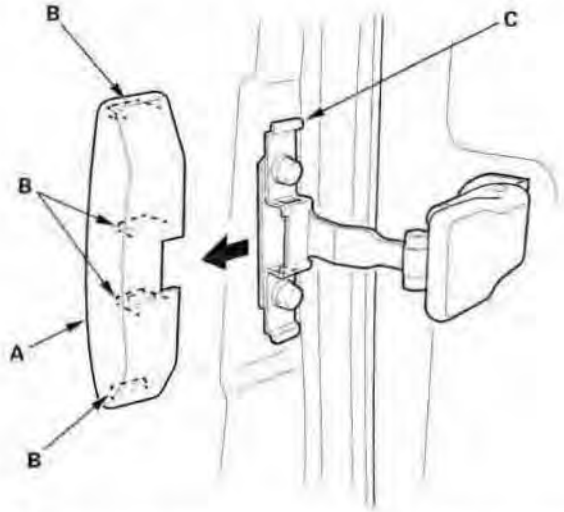


5. Tighten the bolts, and recheck the inner handle stroke.
6. Remove the inner handle, and reinstall the plastic cover and door panel.

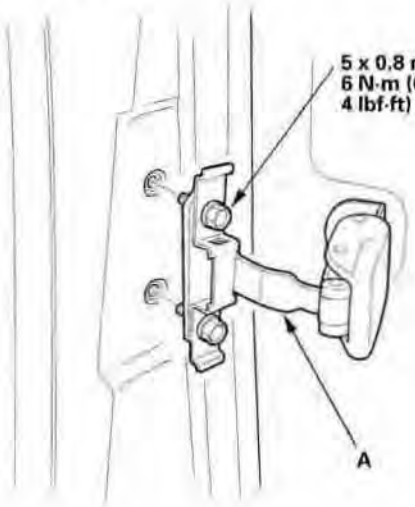
Rear Door Glass Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the door trim (see page 20-21).
2. Pull out on the glass lock cover (A) to release the hooks (B) from the lock cover base (C), then remove the cover.



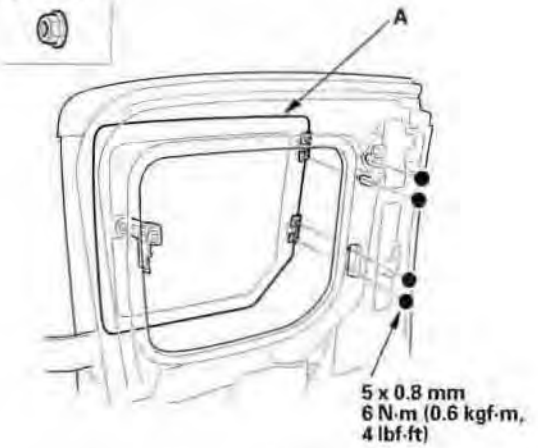
3. Remove the bolts, then remove the glass lock (A) from the door.



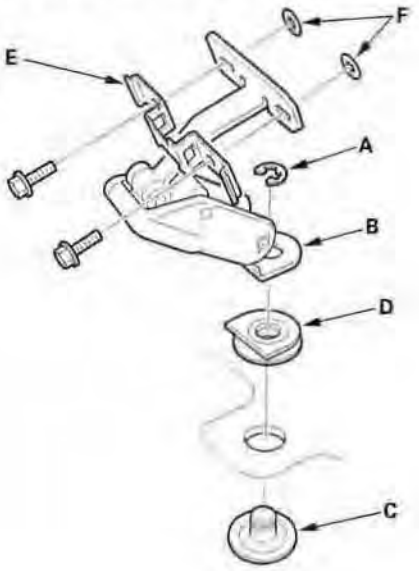
4. While holding the glass (A), remove the nuts, then remove the glass.

Fastener Locations

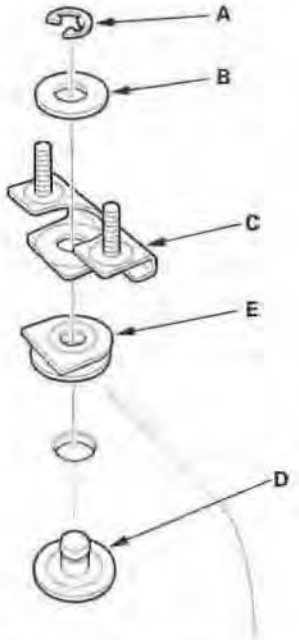
●: Nut, 4



5. If necessary, release the E clip (A), and remove the glass lock (B), lock pin (C) and rubber seal (D) from the glass. Remove the lock cover base (E) by removing the lock washers (F).



6. If necessary, release the E clip (A), and remove the washer (B), hinge (C), lock pin (D) and rubber seal (E) from the glass.



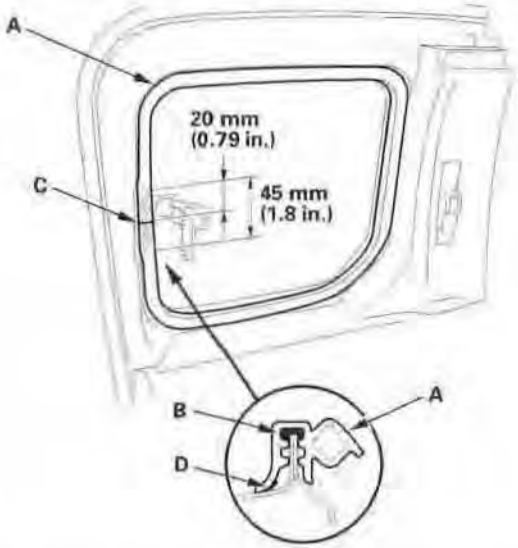
7. Install the glass in the reverse order of removal, and note these items:

   - The glass and rear door edges should be parallel.
   - Make sure the glass locks properly.
   - Check that the glass contacts the glass seal evenly.
   - Check for water leaks.
   - Test-drive and check for wind noise.

Rear Door Glass Seal Replacement

1. Remove the bolts securing the glass lock (see step 3 on page 20-26).

2. Remove the glass seal (A) by pulling out on it.



3. Apply clear sealant (B) into the channel of the joint (C).

   Sealant: Cemedine P/N 08712-0004, or equivalent

4. Locate the painted alignment mark (D) on the joint. Align the painted mark with the center of the glass opening, and install the glass seal all the way around.

5. Check for water leaks.

6. Test-drive and check for wind noise.

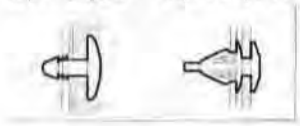
Rear Door Weatherstrip Replacement

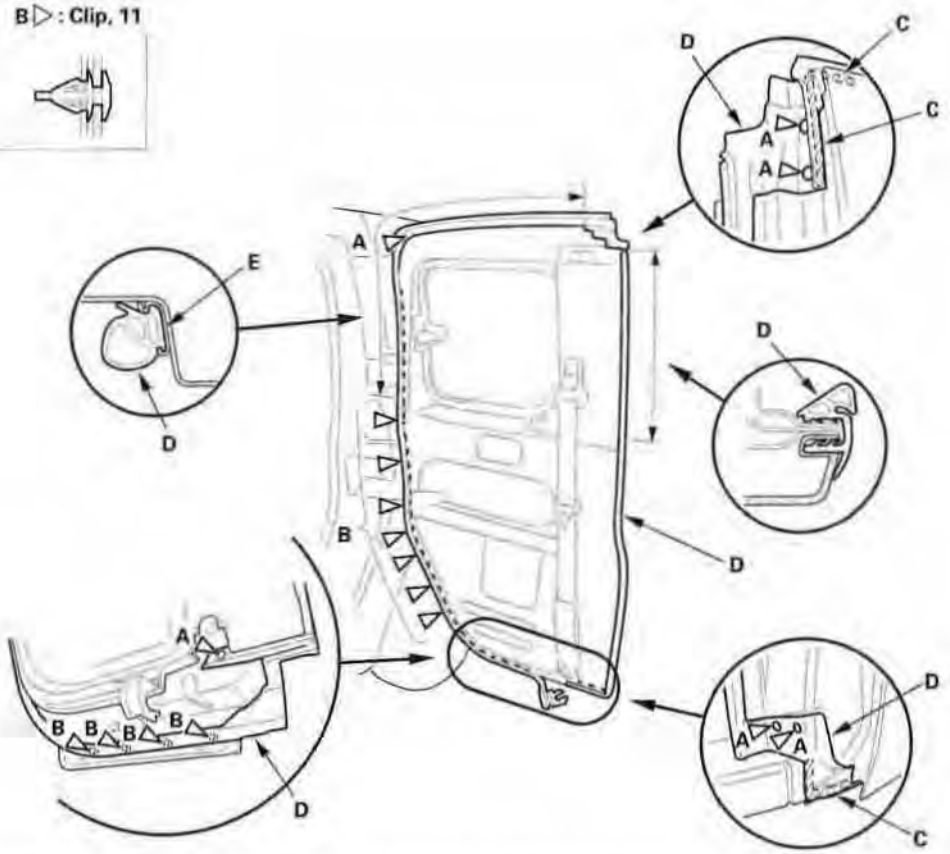
NOTE:
- Take care not to scratch the door.
- Use a clip remover to remove the clips.

1. Detach the clips (A, B), release the double-sided adhesive tape (C), then remove the door weatherstrip (D).

Fastener Locations

A▷: Clip, 6 B▷: Clip, 11





2. Install the weatherstrip in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Scrape off the remaining double-sided adhesive tape from the weatherstrip and rear door, and clean the weatherstrip and rear door with alcohol. Attach new double-sided adhesive tape (3M 4213, or equivalent) to the weatherstrip.
- Make sure the weatherstrip is installed in the holder (E) securely.
- Check for water leaks (see step 7 on page 20-14).
- Test-drive and check for wind noise.

Rear Door Position Adjustment

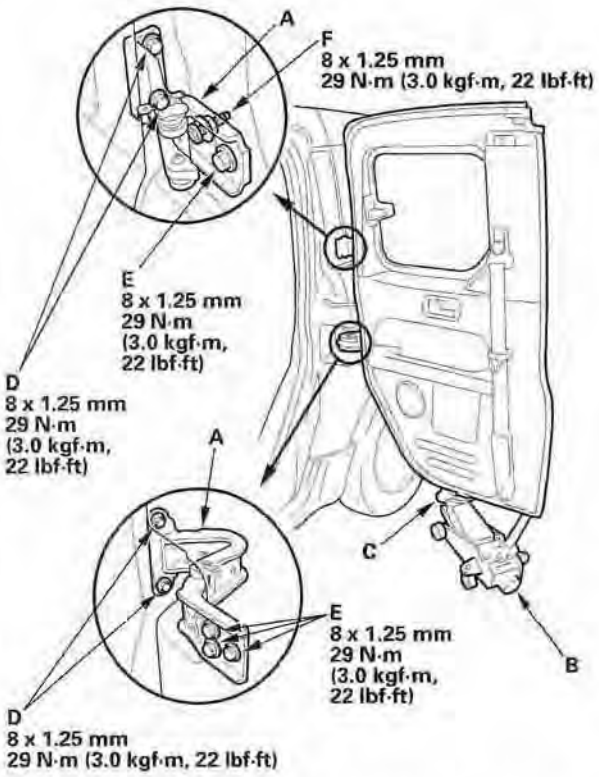
SRS components are located in the lower B-pillar area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE: Check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body. Check that the door and body edges are parallel.

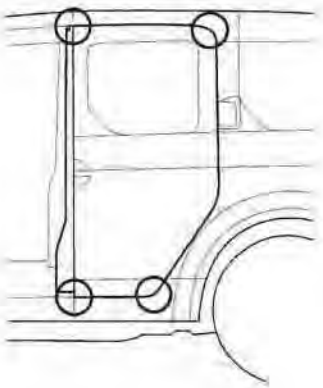
1. Place the vehicle on a firm, level surface when adjusting the doors.

2. Adjust at the hinges (A):

   - Pad a floor jack (B) with a shop towel (C) and use the jack to support the door during adjustment.
   - Loosen the door mounting bolts (D) slightly, and move the door in or out until it's flush with the body.
   - Remove these items:
     - C-pillar outer trim (see page 20-122)
     - Rear cladding (see page 20-132)
     - Quarter pillar trim (see page 20-61)
   - Loosen the hinge mounting bolts (E) and nut (F) slightly, and move the door backward or forward, up or down as necessary to equalize the gaps.



3. Close the rear door, and check that it latches securely without slamming it, and the rear door and body edges are parallel. If necessary, adjust the upper and lower striker at the same time (see page 20-31).



(cont'd)

Rear Door Position Adjustment (cont'd)

4. Close the front door, and make sure it latches securely without slamming it, and the front door, rear door, and body edges are parallel.

5. After adjusting the upper and lower strikers (see page 20-31), check the rear door unlock synchronization. If necessary, adjust the upper and lower latch cables (see page 20-25).

6. Apply touch-up paint to the hinge mounting bolts, and around the hinges.

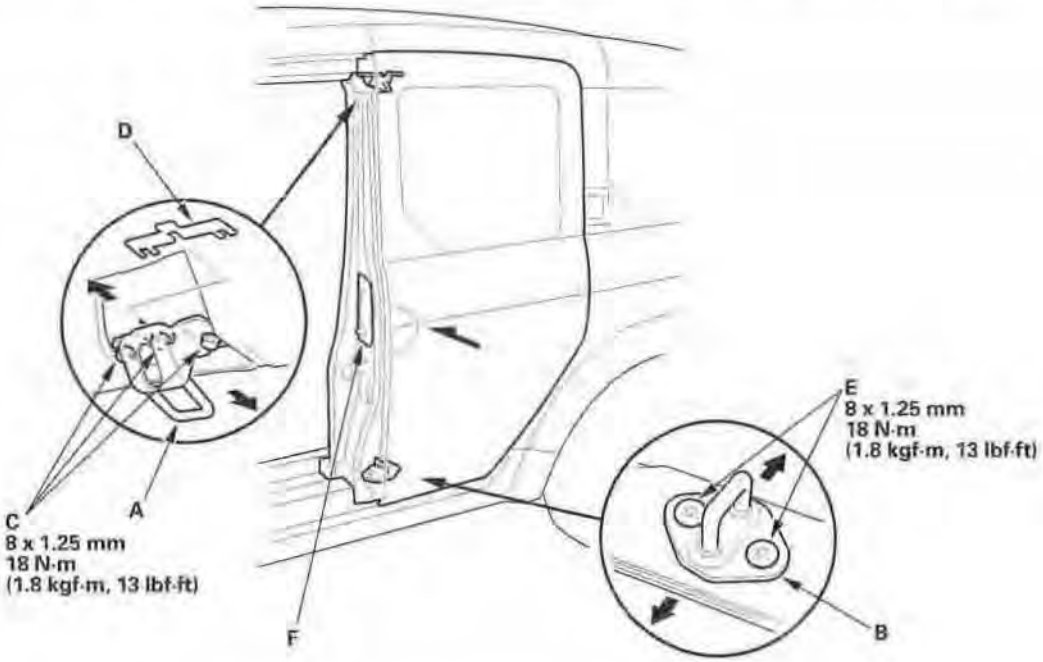
7. Check for water leaks (see step 7 on page 20-14).

8. Test-drive and check for wind noise.

Rear Door Striker Adjustment

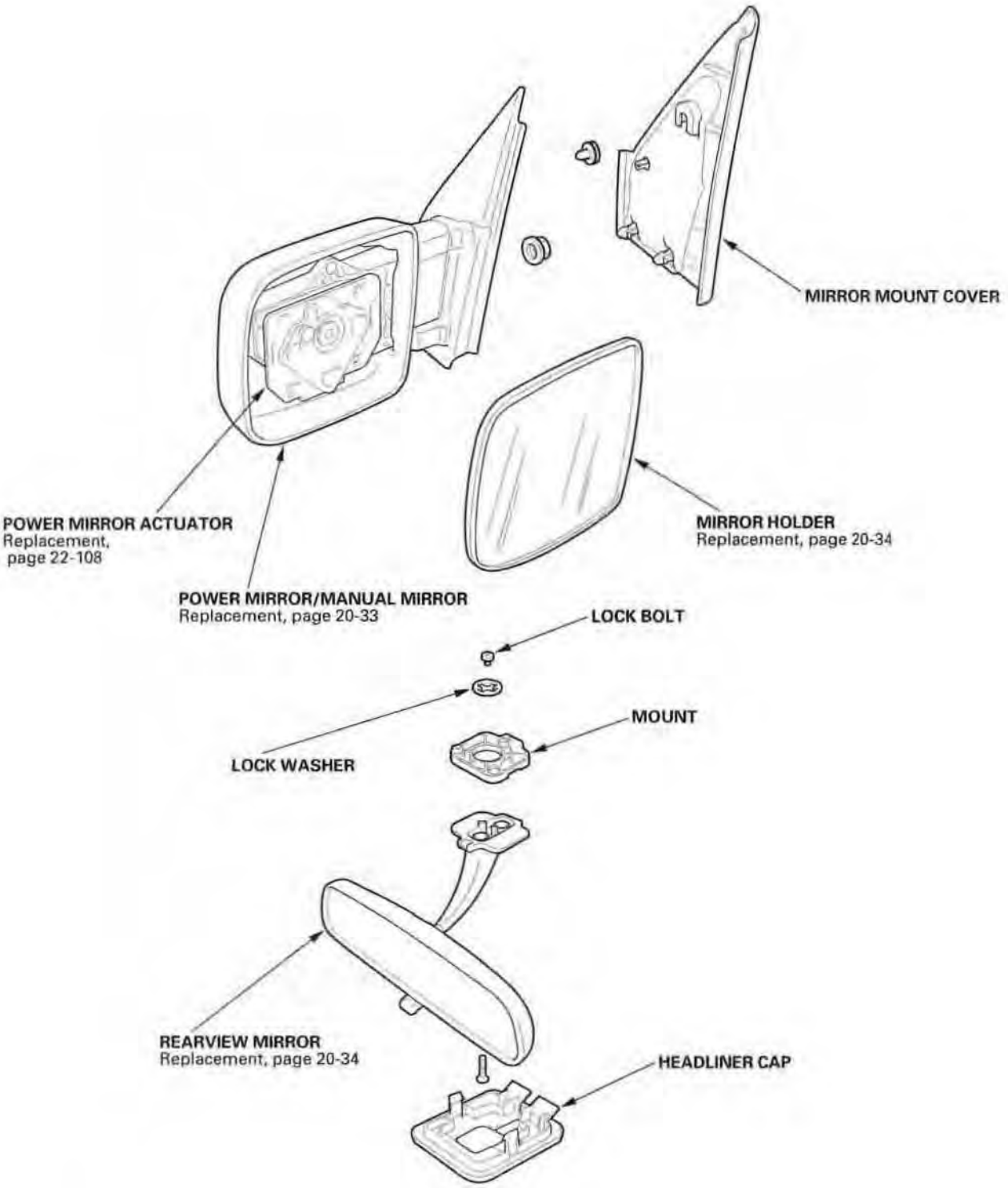
Make sure the door latches securely without slamming it. If necessary, adjust the upper and lower strikers at the same time.

1. Remove these items:
   - Upper striker cover (see step 5 on page 20-66)
   - Door sill trim (see page 20-58)
2. Adjust the upper striker (A) and lower striker (B):
   - Loosen the upper striker mounting bolts (C) slightly, and move the striker in or out until the upper edge of the door is flush with the body. Install and/or remove shims (D) until the striker is centered in the upper latch.
   - Loosen the lower striker mounting screws (E) slightly, and move the striker in or out until the bottom edge of the door is flush with the body. Move the striker forward or rearward until the striker is centered in the lower latch.



3. Lightly tighten the bolts and screws.
4. Hold the door handle (F) out, and push the door against the body to be sure the strikers allow a flush fit. If the door latches properly, tighten the bolts and screws and recheck.
5. Check the door unlock synchronization. If necessary, adjust the upper and lower latch cables (see page 20-25).

Component Location Index

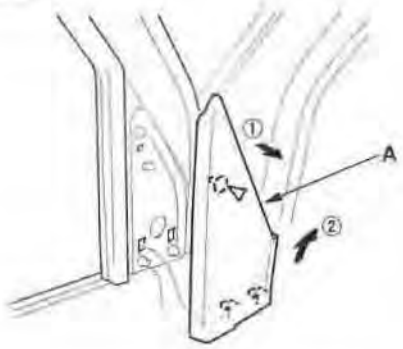


Power Mirror/Manual Mirror Replacement

1. Lower the door glass fully.
2. Carefully pry out the mirror mount cover (A) by hand in the sequence shown.

Fastener Location

▷: Clip, 1

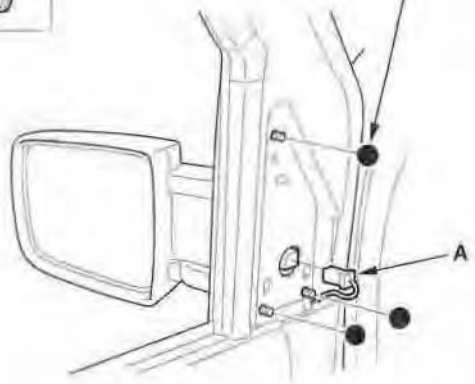


3. On power mirror model: Disconnect the connector (A).

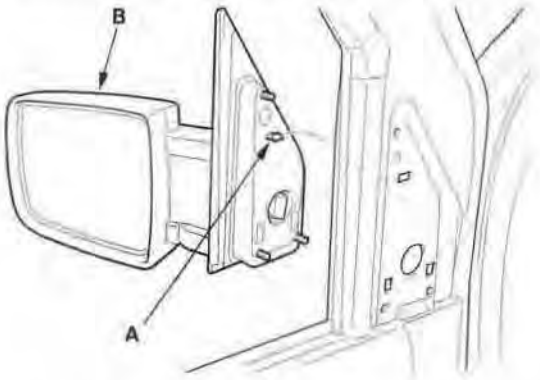
Fastener Locations

●: Nut, 3

5 x 0.8 mm
5 N·m
(0.5 kgf·m, 4 lbf·ft)



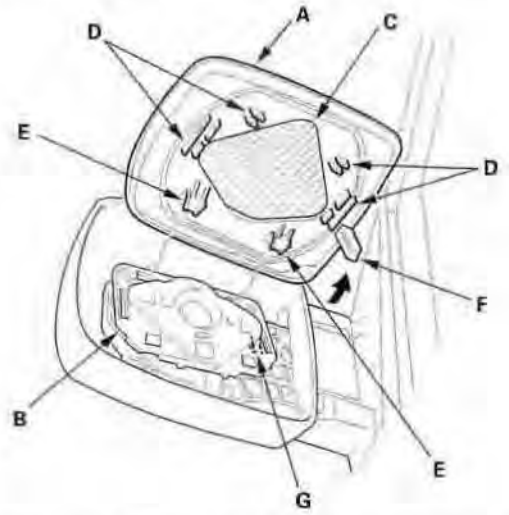
4. While holding the mirror, remove the nuts securing the mirror.
5. Release the hook (A), then remove the mirror (B).



6. Install the mirror in the reverse order of removal, and note these items:
   - Make sure the connector is plugged in properly (power mirror model).
   - Replace the cover clip if it's damaged.
   - Push the cover clip portion into place securely.

Mirror Holder Replacement

1. Carefully pull out the bottom edge of the mirror holder (A) by hand. Take care not to scratch the mirror.



2. Separate the mirror holder from the actuator (B) by slowly pulling them apart while separating the adhesive (C), detaching the clips (D), and releasing the hooks (E). Manual mirror: Release the pin (F) from the pin spring (G).

3. Reattach the hooks of the mirror holder to the actuator, and on the manual mirror, reattach the pin of the mirror holder to the pin spring of the mirror bracket, then position the mirror holder on the actuator. Carefully push on the clip portions of the mirror holder until the mirror holder locks into place.

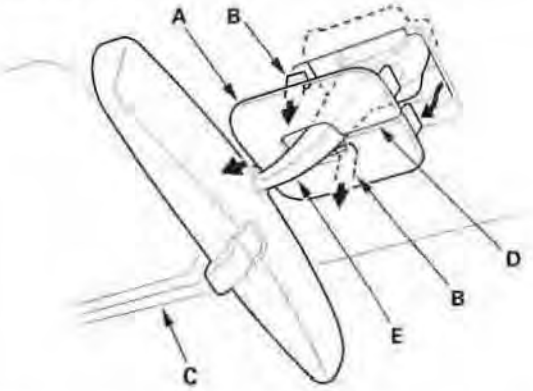
4. Check the operation of the actuator.

Rearview Mirror Replacement

Special Tools Required
KTC trim tool set SOJATP2014

NOTE: Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

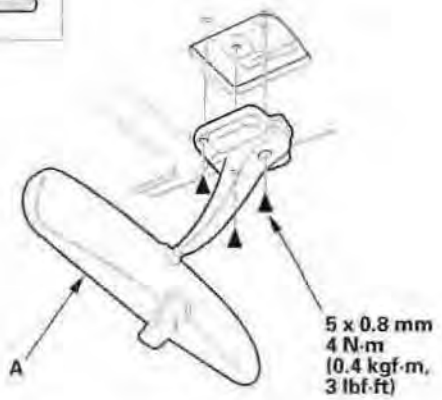
1. Using the appropriate tool from the KTC trim tool set, carefully remove the headliner cap (A) by releasing the hooks (B) from the headliner (C), and remove the cap through the slit (D) on it from the rearview mirror stay (E). Take care not to scratch the cap and headliner.



2. Remove the screws, then remove the rearview mirror (A).

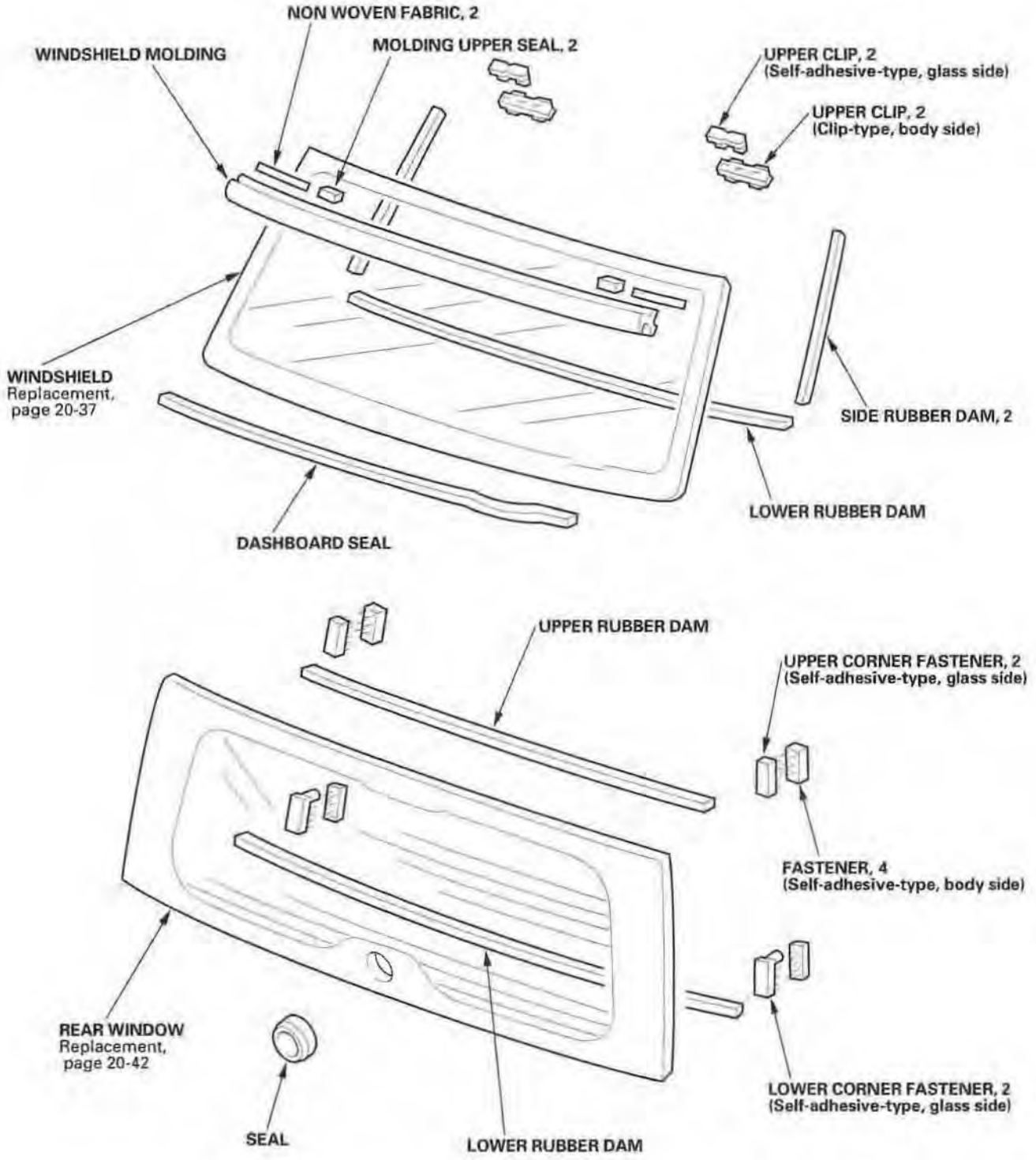
Fastener Locations

▶: Screw, 3



3. Install the rearview mirror in the reverse order of removal.

Component Location Index



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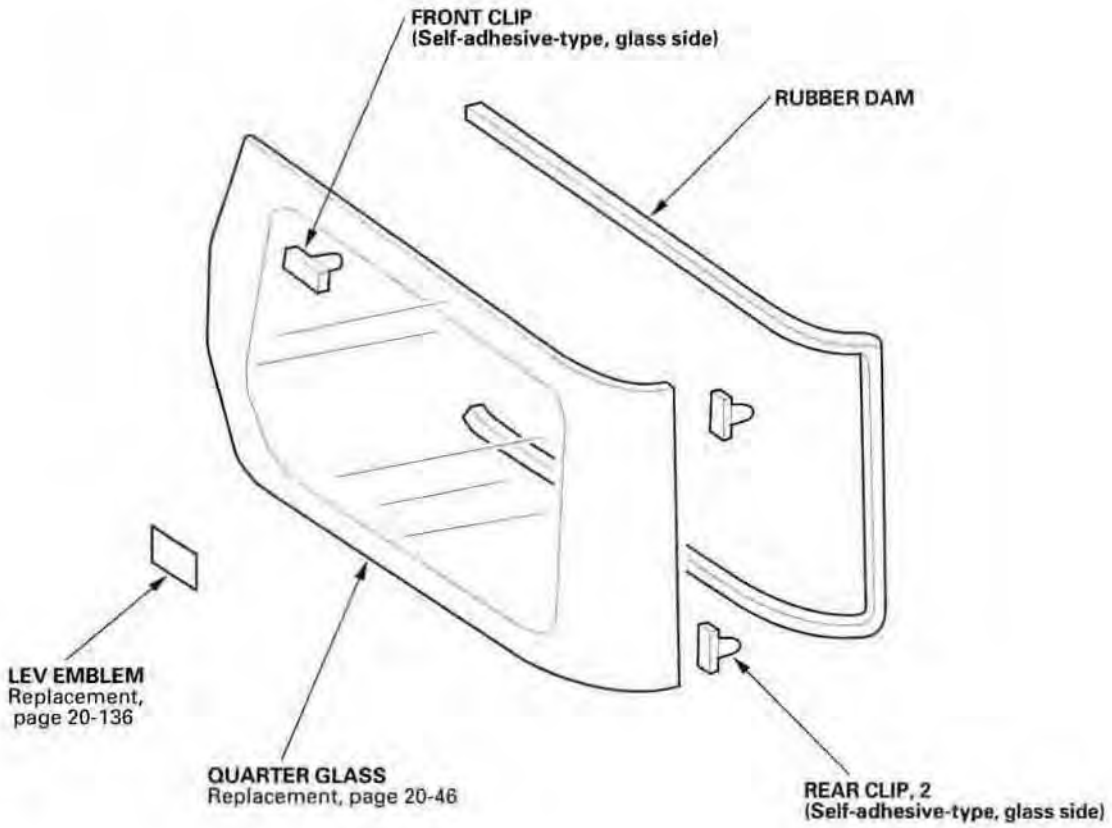
Component Location Index (cont'd)

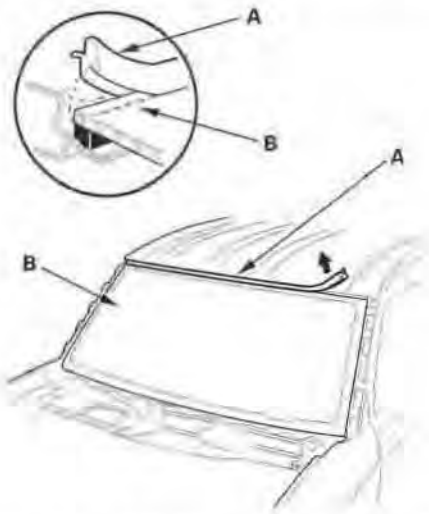


Windshield Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection while cutting the glass adhesive with piano wire.
- Use seat covers to avoid damaging any surfaces.

1. Remove these items:
   - Rearview mirror (see page 20-34)
   - A-pillar trim, both sides (see page 20-58)
   - Windshield wiper arms (see page 22-171)
   - Windshield side trim, both sides (see page 20-124)
   - Cowl covers (see page 20-120)

2. Remove the molding (A) from the edge of the windshield (B). If necessary, cut the molding with a utility knife.

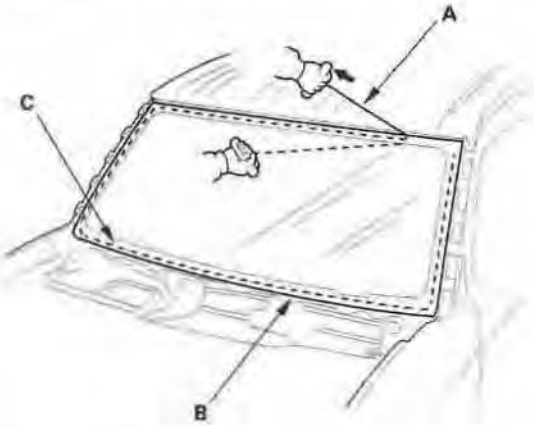


3. If the old glass is to be reinstalled, make alignment marks across the glass and body with a grease pencil.

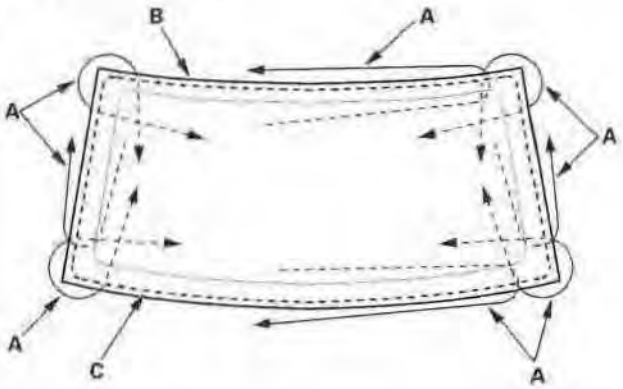
4. Pull down the front portion of the headliner (see page 20-65). Take care not to bend the headliner excessively, or you may crease or break it.

5. Apply protective tape along the edge of the dashboard and body. Using an awl, make a hole through the rubber dam, adhesive, and dashboard seal from inside the vehicle at the corner portion of the glass. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.

6. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the windshield (B) as possible to prevent damage to the body and dashboard. Carefully cut through the rubber dam and adhesive (C) around the entire windshield.



Cutting positions



7. Carefully remove the windshield.

(cont'd)

Windshield Replacement (cont'd)

8. With a knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire windshield opening flange:

   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the rubber dam and fasteners from the body.

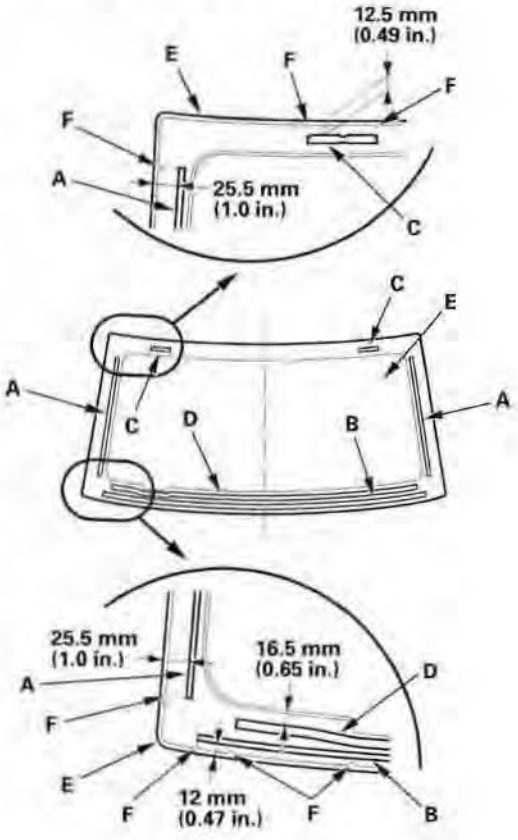
9. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease and water from getting on the clean surface.

10. If the old windshield is to be reinstalled, use a putty knife to scrape off all of the old adhesive, the rubber dam, and the dashboard seal from the windshield. Clean the inside face and the edge of the windshield with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

11. Attach the side rubber dam (A), lower rubber dam (B) with adhesive tape. Attach the clips (C) with adhesive tape and dashboard seal (D) to the inside face of the windshield (E) as shown:

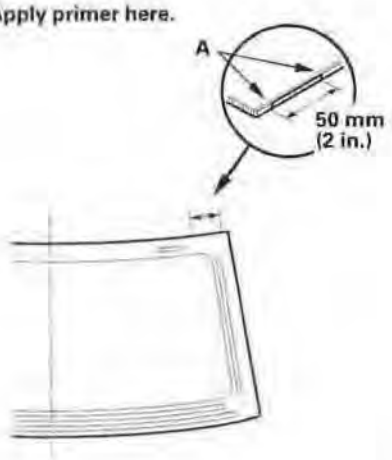
    - Be sure the side rubber dam, lower rubber dam, and dashboard seal line up with the alignment marks (F).
    - Be careful not to touch the windshield where adhesive will be applied.

    Side rubber dam adhesive tape:
    Thickness 0.16 mm (0.006 in.)
    Width 3.5 mm (0.14 in.)
    Lower rubber dam adhesive tape:
    Thickness 0.16 mm (0.006 in.)
    Width 4 mm (0.16 in.)
    Clips adhesive tape:
    Thickness 0.2 mm (0.008 in.)
    Width 7.5 mm (0.3 in.)



12. Apply primer to the edge of the windshield between the alignment marks (A). Be careful not to touch the windshield where adhesive will be applied.

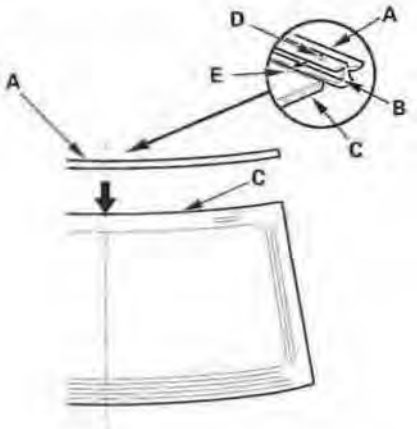
: **Apply primer here.**



13. Attach the molding (A) with adhesive tape (B) to the edge of the windshield (C):

- Be sure the alignment mark (D) of the molding lines up with the alignment mark (E) of the windshield.
- Be careful not to touch the windshield where adhesive will be applied.

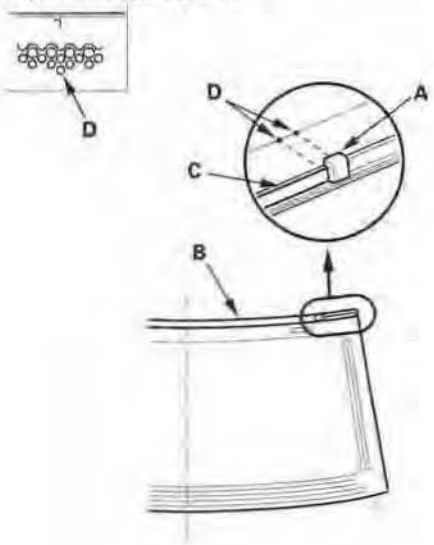
Molding adhesive tape:
Thickness 0.8 mm (0.031 in.)
Width 4 mm (0.16 in.)



14. Attach the molding upper seal (A) to the inside surface of the molding (B), and attach the non-woven fabric (C) as shown:

- Be sure the molding upper seal and non-woven fabric line up with the alignment dots (D).
- Be careful not to touch the windshield where adhesive will be applied.

Alignment dot location:



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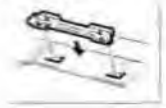
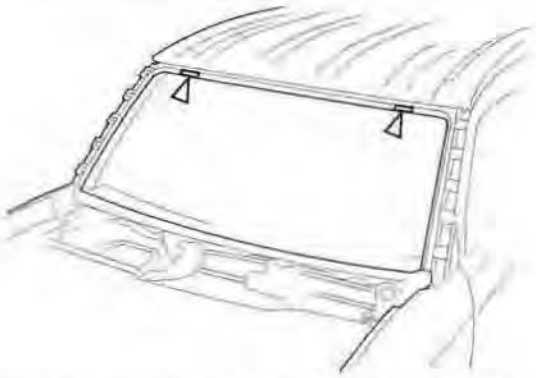
Windshield Replacement (cont'd)

15. Install the clips to the body.

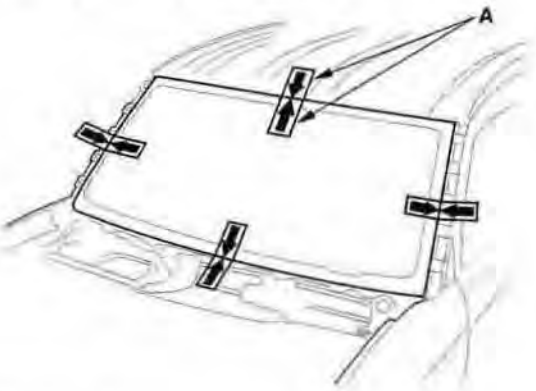
Fastener Locations

▷: **Clip, 2**





16. Set the windshield in the opening, and center it. Make alignment marks (A) across the windshield and body with a grease pencil at the four points shown. Be careful not to touch the windshield where adhesive will be applied.

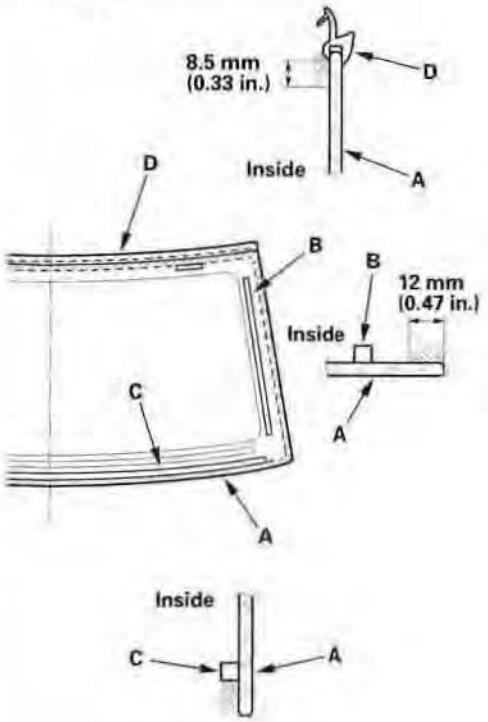


17. Remove the windshield.

18. With a sponge, apply a light coat of glass primer around the edge of the windshield (A) between the side rubber dam (B), lower rubber dam (C), and molding (D) as shown, then lightly wipe it off with gauze or cheesecloth:

- Apply glass primer to the molding.
- Do not apply body primer to the windshield, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the windshield properly, causing a leak after the windshield is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

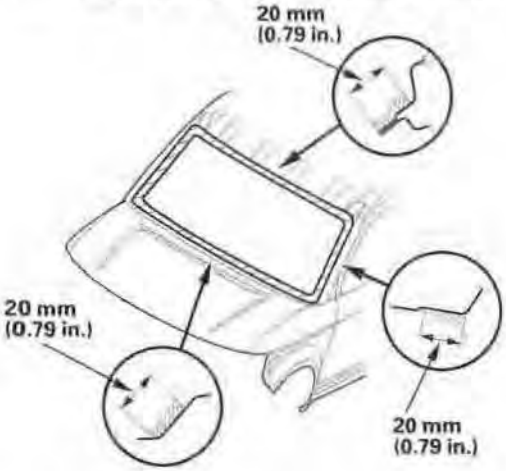
: **Apply glass primer here.**



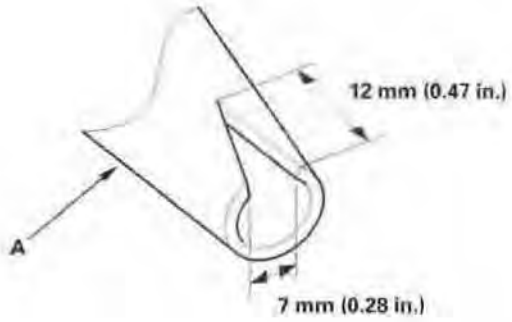
19. With a sponge, carefully apply a light coat of body primer to any exposed paint around the flange where new adhesive will be applied. Let the primer dry for at least 10 minutes.

- Do NOT apply body primer to any remaining original adhesive on the flange.
- Be careful not to mix up the body and glass primer sponges.
- Never touch the primed surfaces with your hands.

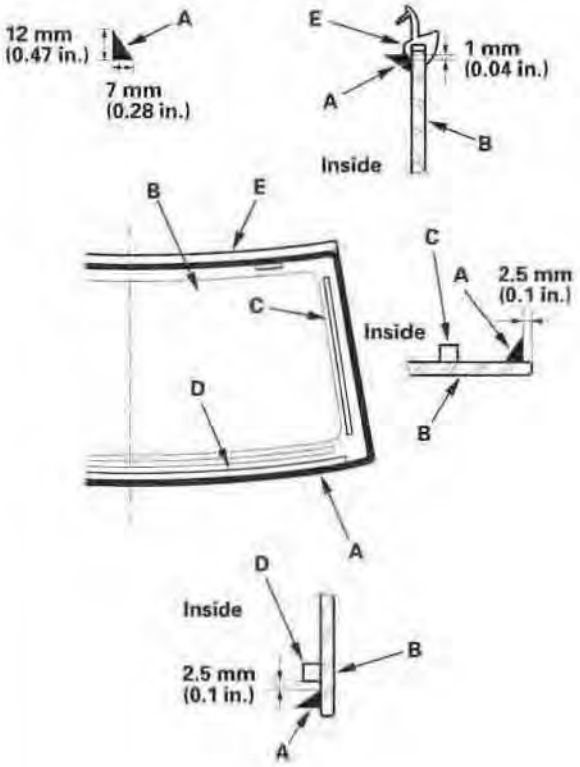
: Apply body primer to exposed point here.



20. Cut a "V" in the end of the nozzle (A) on the adhesive cartridge as shown.



21. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the windshield (B) between the side rubber dam (C), lower rubber dam (D), and molding (E) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



(cont'd)

Windshield Replacement (cont'd)

22. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 16, and set it down on the adhesive. Lightly push on the windshield until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.

23. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.

24. Let the adhesive dry for at least 1 hour, then spray water over the windshield and check for leaks. Mark leaking areas, and let the windshield dry, then seal with sealant:

    - Let the vehicle stand for at least 4 hours after windshield installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.
    - Keep the windshield dry for the first hour after installation.

25. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for 2 to 3 days:
    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

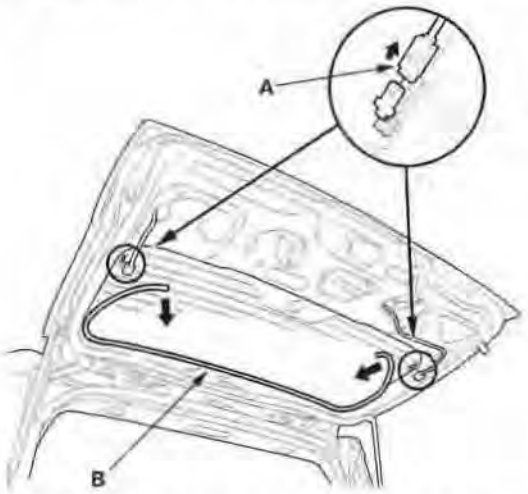
Rear Window Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection while cutting the glass adhesive with piano wire.
- Use seat covers to avoid damaging any surfaces.
- Do not damage the rear window defogger grid lines and terminals.

1. Remove these items:

    - Hatch trim panel (see page 20-63)
    - Rear window wiper motor (see page 22-172)
    - High mount brake light (see page 22-86)

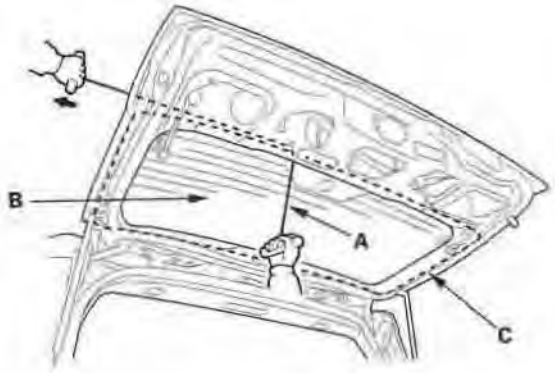
2. Disconnect the rear window defogger connectors (A), and remove the rear window trim (B).



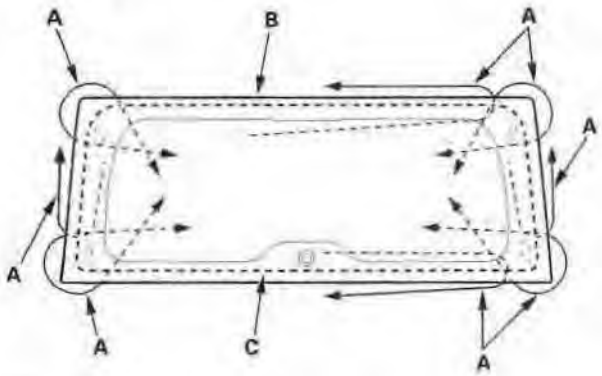
3. If the old glass is to be reinstalled, make alignment marks across the glass and body with a grease pencil.

4. Apply protective tape along the inside and outside edges of the tailgate. Using an awl, make a hole through the adhesive from inside the vehicle at the corner portion of the glass. Push the piano wire through the hole, and wrap each end around a piece of wood.

5. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the rear window (B) as possible to prevent damage to the tailgate, and carefully cut through the adhesive (C) around the entire rear window.



Cutting positions



6. Carefully remove the rear window.

7. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire rear window opening flange:

   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the fasteners from the tailgate.

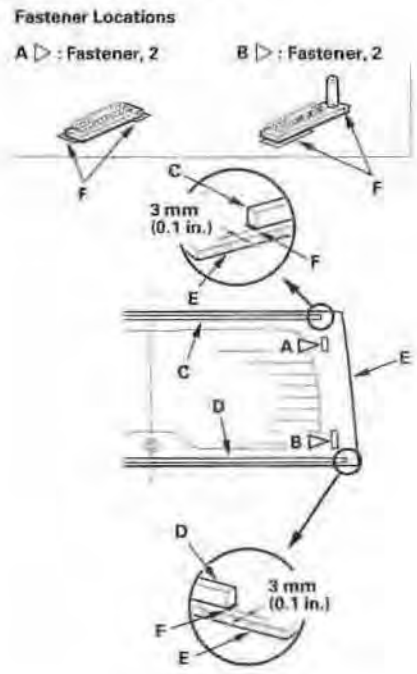
8. Clean the tailgate bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.

9. If the old rear window is to be reinstalled, use a putty knife to scrape off all of the old adhesive and rubber dam from the rear window. Clean the inside face and the edge of the rear window with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

10. Attach the upper corner fasteners (A) and lower corner fasteners (B) with adhesive tape. Attach the upper rubber dam (C) and lower rubber dam (D) with adhesive tape to the inside surface of the rear window (E) as shown:

    - Be sure the fasteners and rubber dams line up with alignment marks (F).
    - Be careful not to touch the rear window where adhesive will be applied.

    Corner fasteners adhesive tape:
    Thickness 0.6 mm (0.024 in.)
    Width 7.5 mm (0.3 in.)
    Rubber dam adhesive tape:
    Thickness 0.16 mm (0.006 in.)
    Width 3.5 mm (0.14 in.)



(cont'd)

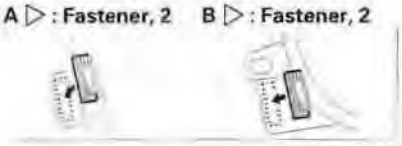
Rear Window Replacement (cont'd)

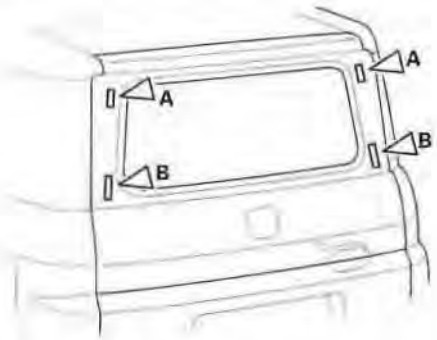
11. Attach the corner fasteners (A, B) with adhesive tape to the tailgate as shown.

Fastener adhesive tape:
Thickness 0.6 mm (0.024 in.)
Width 9.5 mm (0.37 in.)

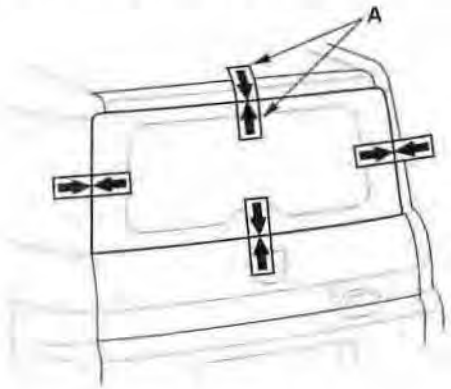
Fastener Locations

A ▷: Fastener, 2 B ▷: Fastener, 2





12. Set the rear window in the opening, and center it. Make alignment marks (A) across the rear window, tailgate, and body with a grease pencil at the four points shown. Be careful not to touch the rear window where adhesive will be applied.

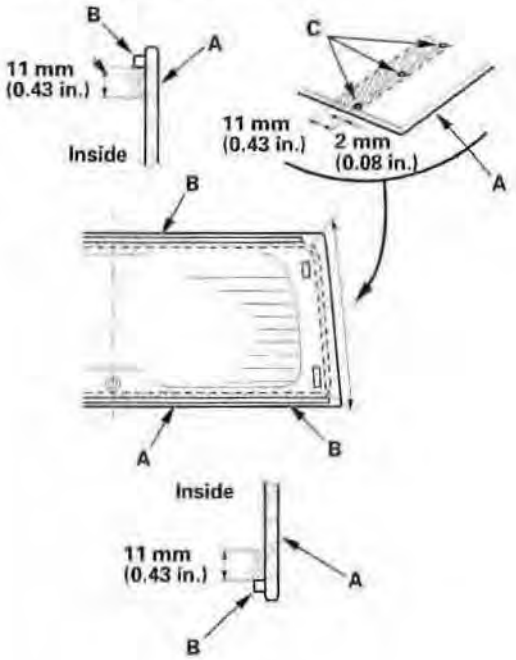


13. Remove the rear window.

14. With a sponge, apply a light coat of glass primer to the edge of the rear window (A) along the rubber dam (B) as shown, then lightly wipe it off with gauze or cheesecloth:

- With the printed dots (C) on the rear window as a guide, apply the glass primer to both side portions of the rear window.
- Do not apply body primer to the rear window, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the rear window properly, causing a leak after the rear window is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

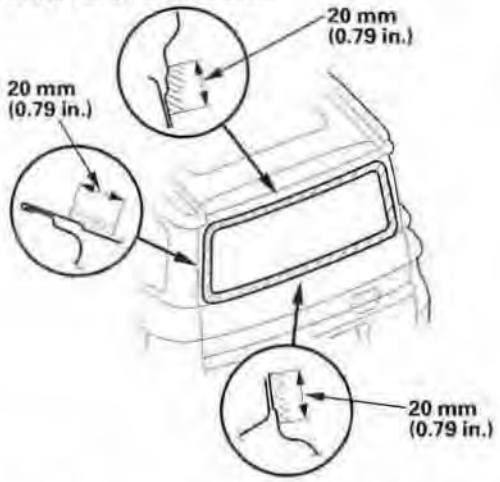
: Apply glass primer here.



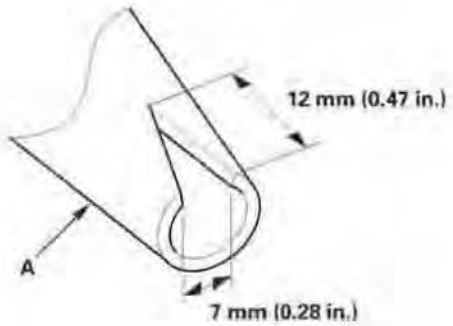
15. With a sponge, carefully apply a light coat of body primer to any exposed paint around the flange where new adhesive will be applied. Let the primer dry for at least 10 minutes.

    - Do NOT apply body primer to any remaining original adhesive on the flange.
    - Be careful not to mix up the body and glass primer sponges.
    - Never touch the primed surfaces with your hands.

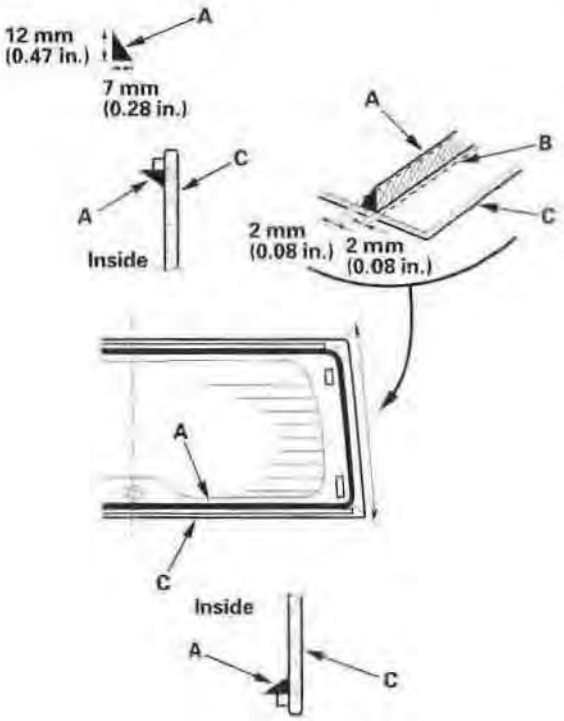
    : Apply body primer here.



16. Cut a "V" in the end of nozzle (A) on the adhesive cartridge as shown.



17. Put the cartridge in a caulking gun, and run a bead of adhesive (A) on the glass primer trace (B) you applied on step 14, and around the edge of the rear window (C) as shown.
    Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



(cont'd)

Rear Window Replacement (cont'd)

18. Use suction cups to hold the rear window over the opening, align it with the alignment marks you made in step 12, and set it down on the adhesive. Lightly push on the rear window until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.

19. Scrape or wipe any excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

20. Let the adhesive dry for at least 1 hour, then spray water over the rear window and check for leaks. Mark the leaking areas, let the rear window dry, then seal with sealant. Let the vehicle stand for at least 4 hours after rear window installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.

21. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for 2 to 3 days:
    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Quarter Glass Replacement

NOTE:
- Put on gloves to protect your hands.
- Wear eye protection while cutting the glass adhesive with piano wire.
- Use seat covers to avoid damaging any surfaces.
- Do not damage the glass antenna grid lines and terminals.

1. Remove these items:

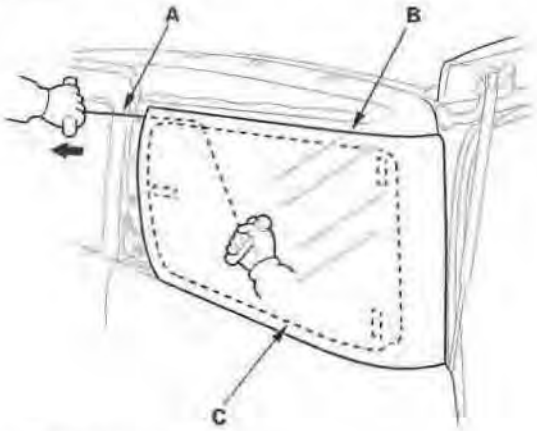
    - Rear side trim panel, upper portion as necessary (see page 20-60)
    - Quarter pillar trim (see page 20-61)
    - D-pillar trim (see step 1 on page 20-62)
    - Roof side center trim (see step 1 on page 20-126)
    - Roof side rear trim (see step 1 on page 20-128)
    - C-pillar outer trim (see page 20-122)

2. If the old quarter glass is to be reinstalled, make alignment marks across the glass and body with a grease pencil.

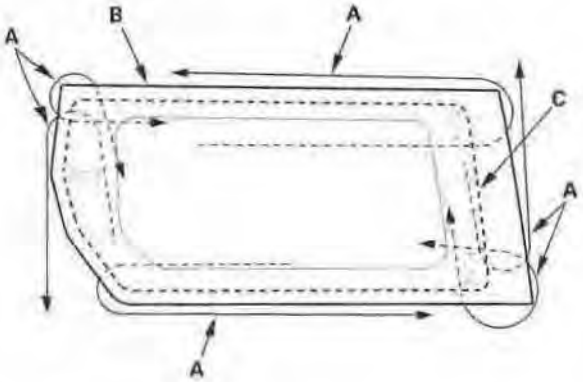
3. Pull down the rear side portion of the headliner as necessary (see page 20-65).

4. Apply protective tape along the inside and outside edges of the body. Using an awl, make a hole through the adhesive from inside the vehicle. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.

5. With a helper on the outside, pull the piano wire (A) back and forth in a sawing motion. Hold the piano wire as close to the quarter glass (B) as possible to prevent damage to the body, and carefully cut through the adhesive (C) around the entire quarter glass.



Cutting positions



6. Carefully remove the quarter glass.

7. With a putty knife, scrape the old adhesive smooth to a thickness of about 2 mm (0.08 in.) on the bonding surface around the entire quarter glass opening flange:

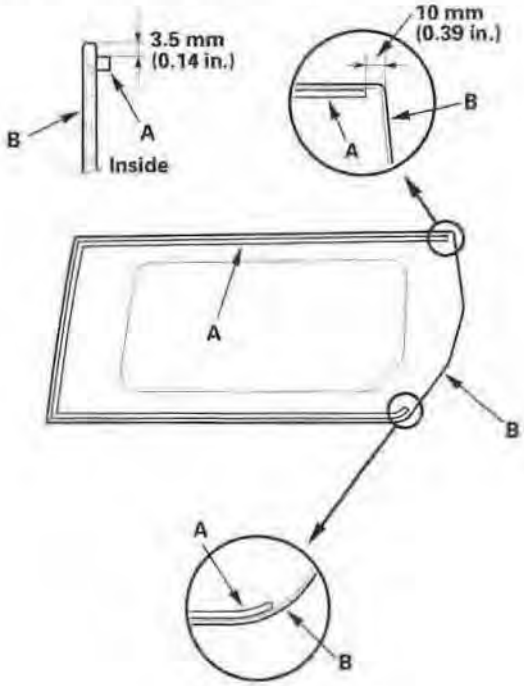
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the fasteners from the body.

8. Clean the body bonding surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.

9. If the old quarter glass is to be reinstalled, use a putty knife to scrape off all of the old adhesive and the rubber dam from the glass. Clean the inside face and the edge of the glass with alcohol where new adhesive is to be applied. Make sure the bonding surface is kept free of water, oil, and grease.

10. Attach the rubber dam (A) with adhesive tape to the inside surface of the glass (B) as shown. Be careful not to touch the glass where adhesive will be applied.

    Rubber dam adhesive tape:
    Thickness 0.16 mm (0.006 in.)
    Width 3.5 mm (0.14 in.)

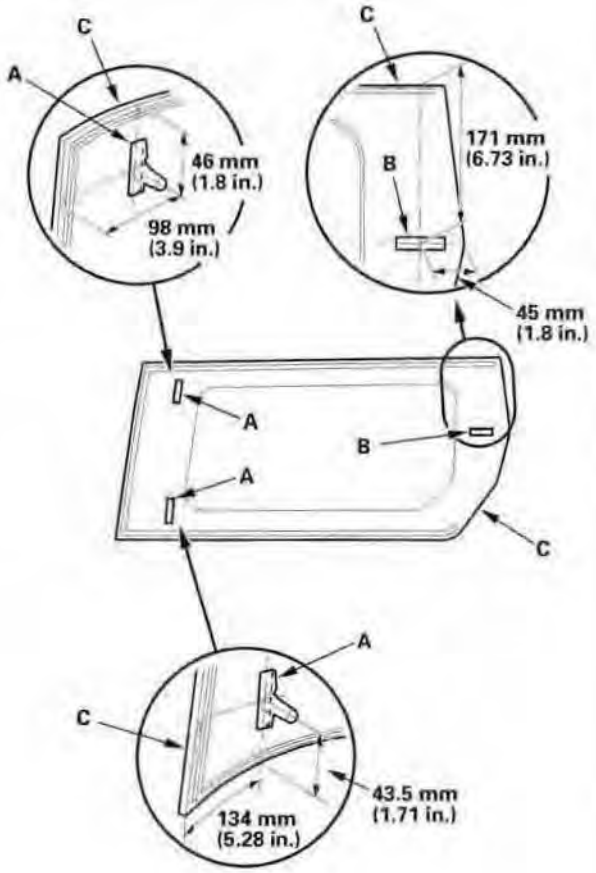


(cont'd)

Quarter Glass Replacement (cont'd)

11. Before installing the clips (A, B), apply primer to the inside face of the quarter glass (C) where clips will be installed, and apply the clips with adhesive tape. Be careful not to touch the quarter glass where adhesive will be applied.

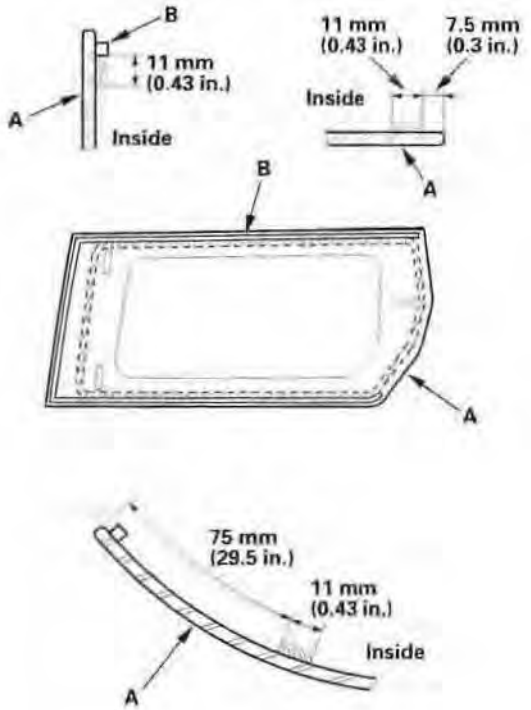
Clip adhesive tape:
Thickness 0.4 mm (0.015 in.)
Width 7.5 mm (0.3 in.)



12. With a sponge, apply a light coat of glass primer to the edge of the glass (A) and along the rubber dam (B) as shown, then lightly wipe it off with gauze or cheesecloth:

- Do not apply body primer to the quarter glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the quarter glass properly, causing a leak after the quarter glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.

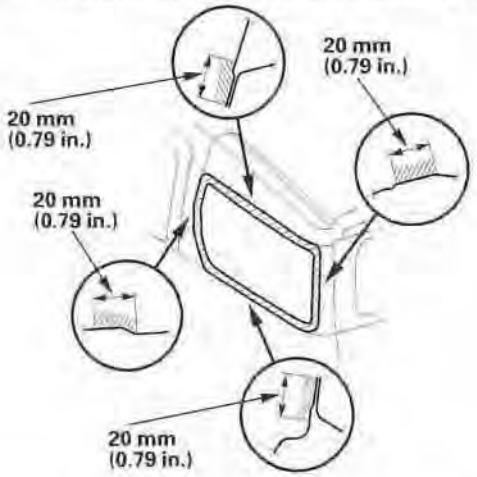
: **Apply glass primer here.**



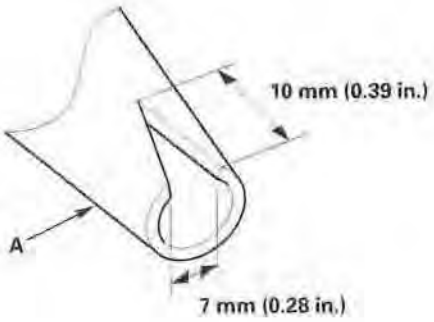
13. With a sponge, carefully apply a light coat of body primer to any exposed paint around the flange where new adhesive will be applied. Let the primer dry for at least 10 minutes.

- Do NOT apply body primer to any remaining original adhesive on the flange.
- Be careful not to mix up the body and glass primer sponges.
- Never touch the primed surfaces with your hands.

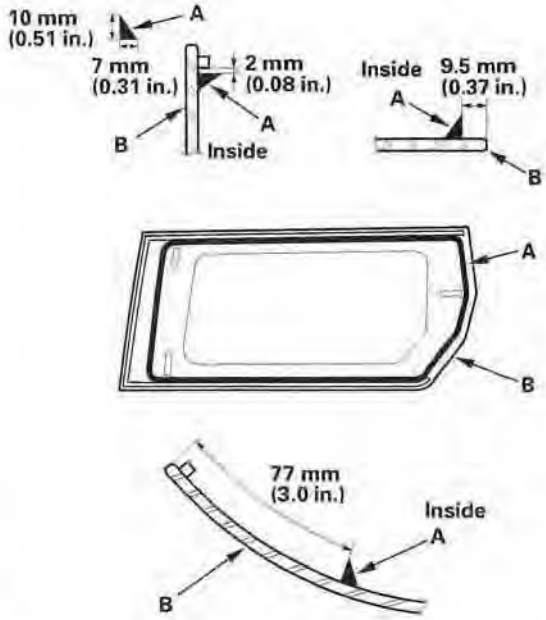
: Apply body primer to exposed paint here.



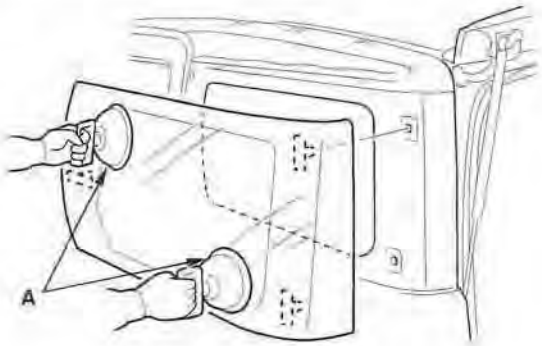
14. Cut a "V" in the end of the nozzle (A) on the adhesive cartridge as shown.



15. Put the cartridge in a caulking gun, and run a bead of adhesive (A) around the edge of the glass (B) as shown. Apply the adhesive within 30 minutes after applying the glass primer. Make a slightly thicker bead at each corner.



16. Use suction cups (A) to hold the quarter glass over the opening, align it and set it down on the adhesive. Lightly push on the quarter glass until its edges are fully seated on the adhesive all the way around. Do not open or close the doors until the adhesive is dry.



(cont'd)

Quarter Glass Replacement (cont'd)

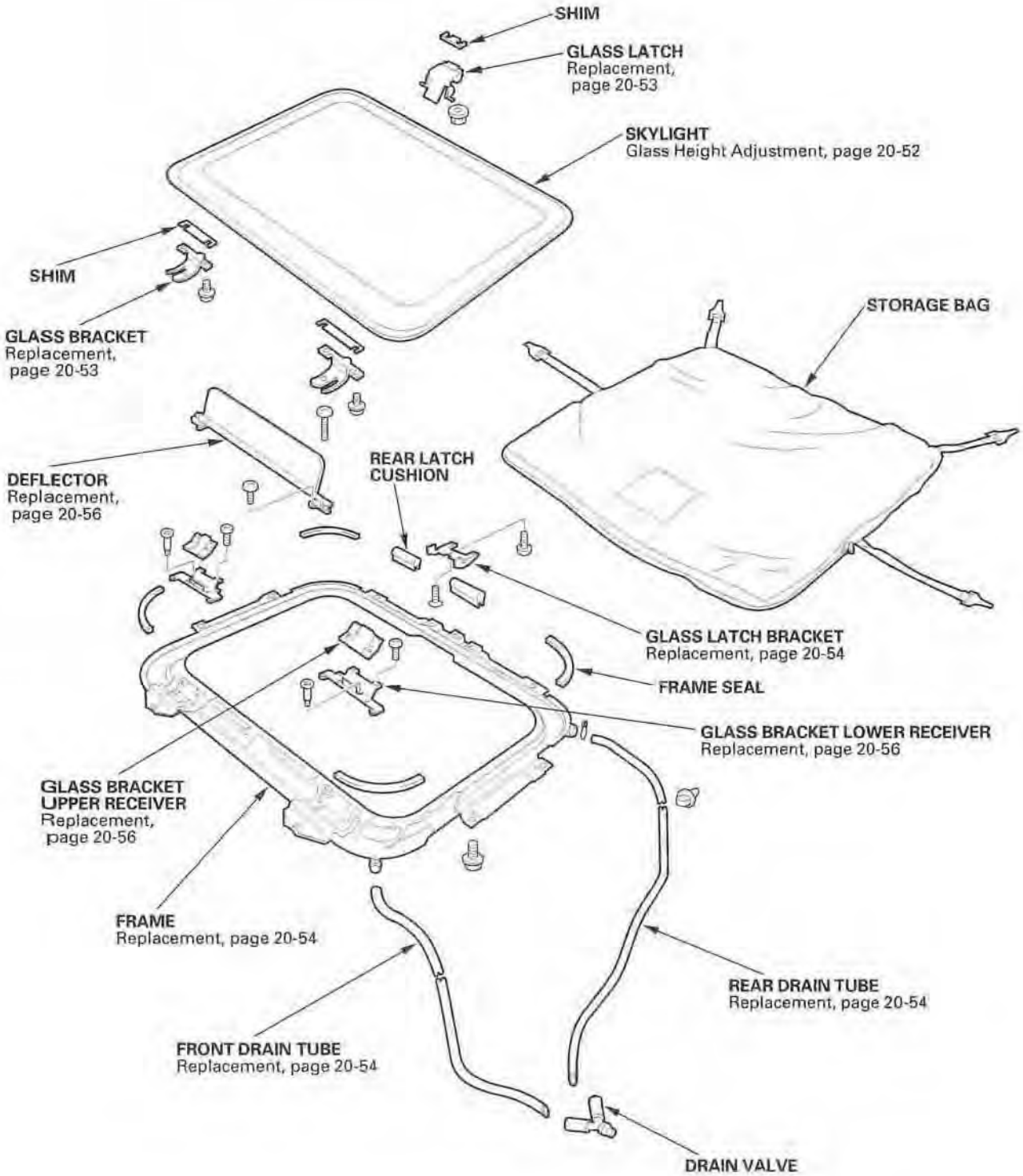
17. Scrape or wipe the excess adhesive off with a putty knife or towel. To remove adhesive from a painted surface or the quarter glass, use a soft shop towel dampened with alcohol.

18. Let the adhesive dry for at least 1 hour, then spray water over the quarter glass and check for leaks. Mark the leaking areas, let the quarter glass dry, then seal with sealant. Let the vehicle stand for at least 4 hours after quarter glass installation. If the vehicle has to be used within the first 4 hours, it must be driven slowly.

19. Reinstall all remaining removed parts.

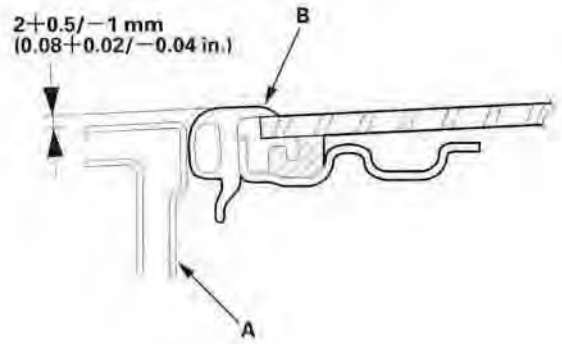
    NOTE: Advise the customer not to do the following things for 2 to 3 days:
    - Slam the doors with all the windows rolled up.
    - Twist the body excessively (such as when going in and out of driveways at an angle or driving over rough, uneven roads).

Component Location Index



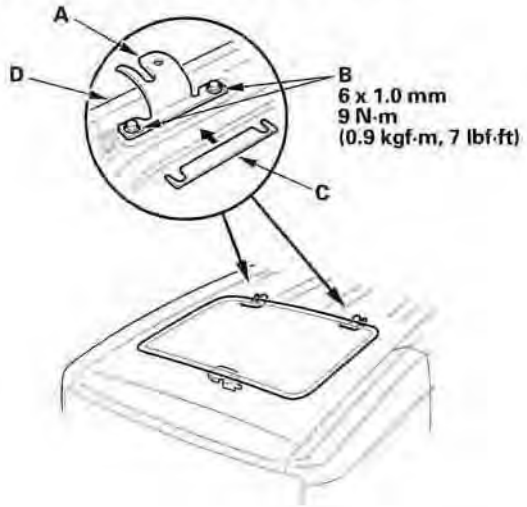
Glass Height Adjustment

The roof panel (A) should be even with the glass weatherstrip (B), to within 2+0.5/−1 mm (0.08+0.02/−0.04 in.) at the center of the glass opening. If not, make the following adjustment:



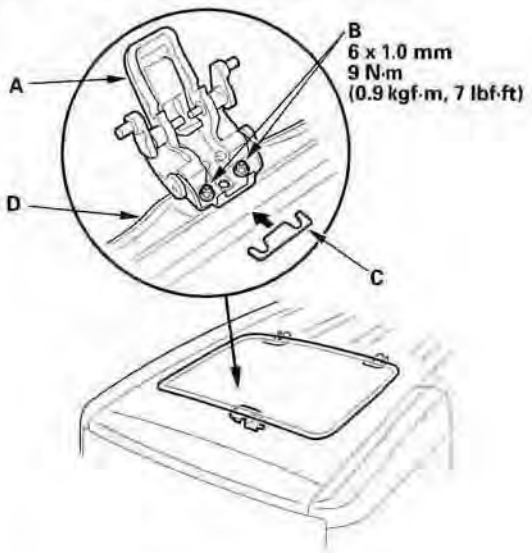
1. Remove the skylight.
2. For front height: On both glass brackets (A), using a T30 Torx bit, loosen the bolts (B), and install a shim (C) between the glass frame (D) and glass bracket.

   Shim Thickness: 2 mm (0.08 in.) max.



3. For rear height: On the glass latch (A), loosen the nuts (B), and install a shim (C) between the glass frame (D) and glass latch.

   Shim Thickness: 1 mm (0.04 in.) max.



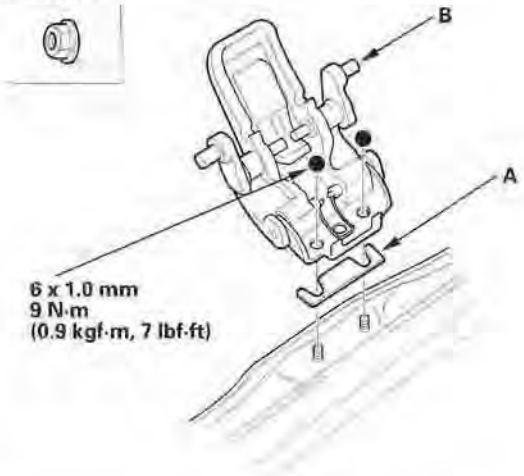
4. Install the skylight.
5. Check that the latch handle works smoothly.
6. Lock the skylight securely, and recheck the glass height alignment.

Glass Latch Replacement

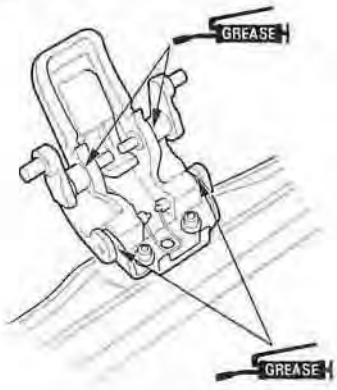
1. Remove the skylight.
2. To prevent damage to the skylight, place it on a work area with a protective covering.
3. Remove the nuts and shim (A), then remove the glass latch (B).

Fastener Locations

●: Nut, 2



4. Install the latch in the reverse order of removal, and note these items:
   - Apply multipurpose grease to the handle pivot portions and latch arm moving portion as indicated by the arrows.
   - Check the glass latch operation.

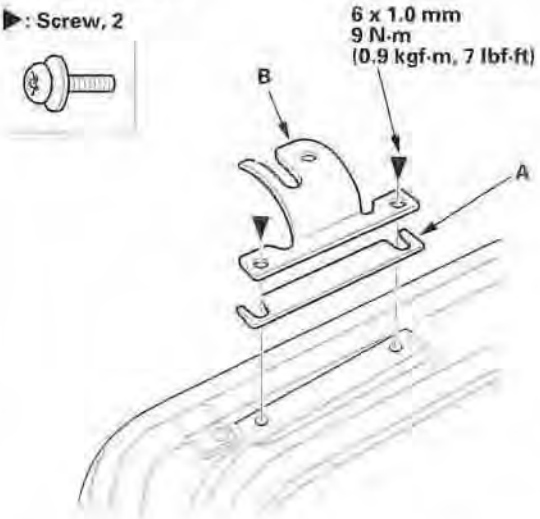


Glass Bracket Replacement

1. Remove the skylight.
2. To prevent damage to the skylight, place it on a work area with a protective covering.
3. Using a T30 Torx bit, remove the screws and shim (A), then remove the glass bracket (B).

Fastener Locations

▶: Screw, 2



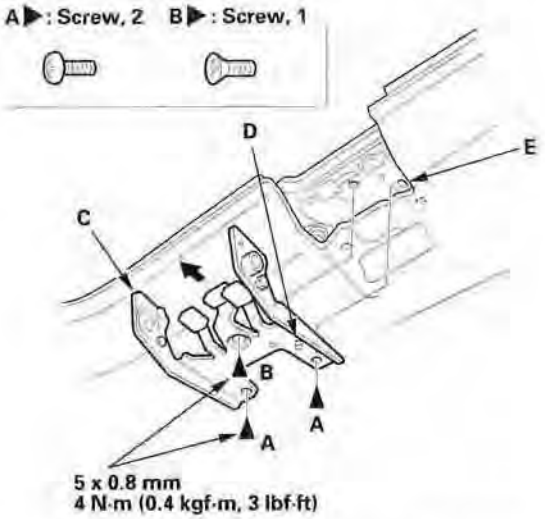
4. Install the bracket in the reverse order of removal.

Glass Latch Bracket Replacement

1. Remove these items:
   - Skylight
   - Rear roof trim (see page 20-62)
   - Roof trim (see step 8 on page 20-67)
   - Glass latch handle trim (see step 7 on page 20-67)
2. Pull down the headliner as necessary. Take care not to bend the headliner excessively, or you may crease or break it.
3. Remove the screws (A, B), then remove the latch bracket (C).

Fastener Locations

A▶: Screw, 2 B▶: Screw, 1



4. Install the bracket in the reverse order of removal, and make sure the guide projection (D) is installed into the elongated hole (E) properly.

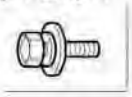
Frame and Drain Tube Replacement

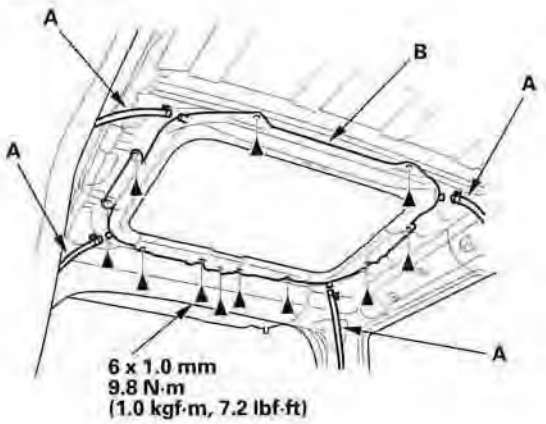
NOTE: Put on gloves to protect your hands.

1. Remove these items:
   - Skylight
   - Headliner (see page 20-65)
2. Disconnect the drain tubes (A).

Fastener Locations

▶: Bolt, 11



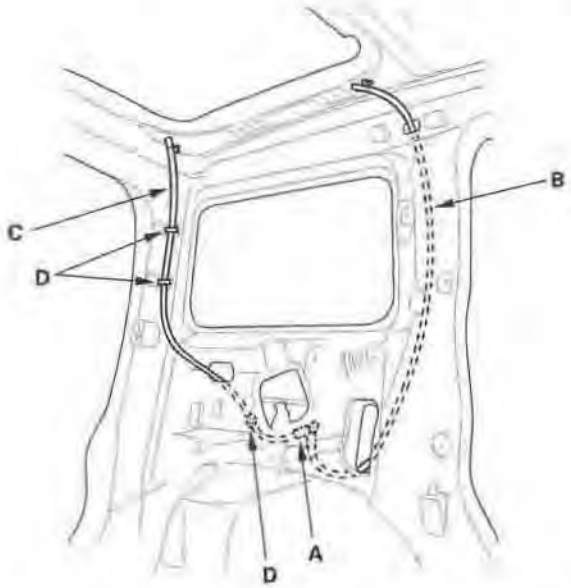


3. With an assistant holding the frame (B), remove the bolts, then remove the frame.
4. Carefully remove the frame through the hatch opening. Take care not to scratch the interior trim and body, or tear the seat cover.

5. Remove these items:

   - Rear side trim panel (see page 20-60)
   - Rear seat belt retractor and seat belt protector (see page 23-7)

6. Remove the drain valve (A) from the body, and disconnect the front drain tube (B) and rear drain tube (C).

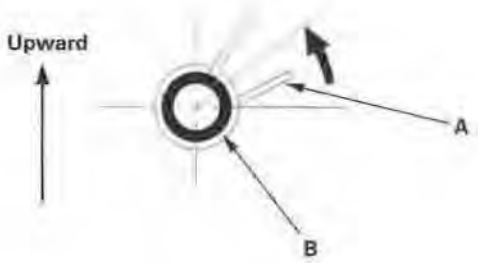


7. Detach the clips (D) securing the rear drain tube, then pull the tube out.

8. Tie a string to the end of the front drain tube, then pull the tube down out of the C-pillar.

9. Install the frame and drain tube in the reverse order of removal, and note these items:

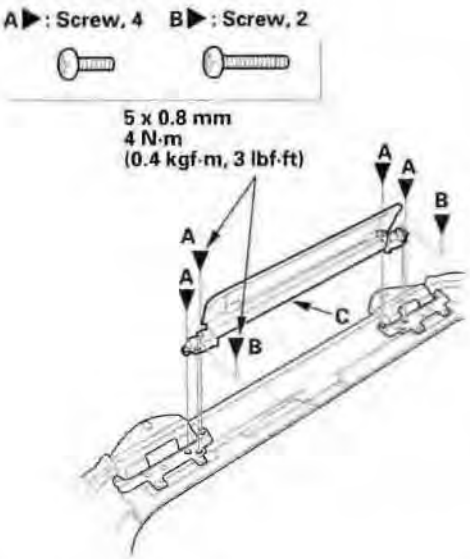
   - Before installing the frame, clear the drain tubes and drain valves using compressed air.
   - Check the frame seal.
   - Clean the surface of the frame.
   - When connecting the drain tube, slide it over the frame nozzle at least 10 mm (0.39 in.).
   - Install the tube clip (A) on the drain tube (B) as shown.



10. Check for water leaks. Let the water run freely from a hose without a nozzle. Do not use a high-pressure spray.

Deflector Replacement

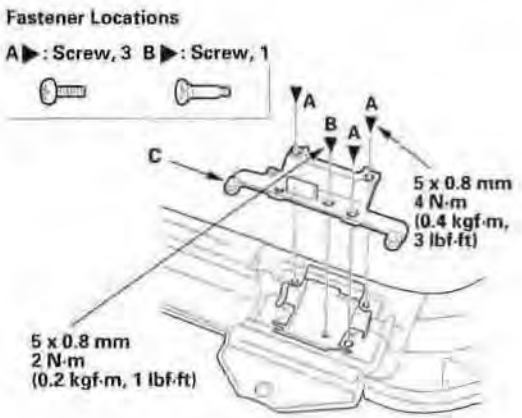
1. Remove the frame (see page 20-54).
2. Remove the screws (A, B), then remove the deflector (C). Take care not to scratch the frame.



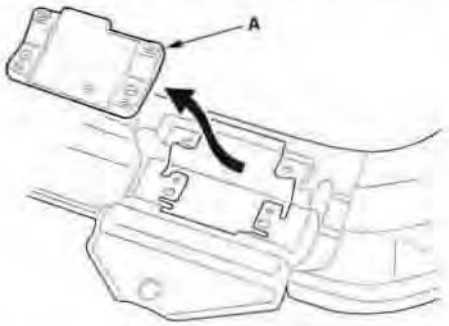
3. Install the deflector in the reverse order of removal.

Glass Bracket Receiver Replacement

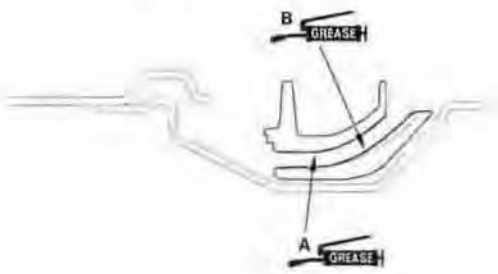
1. Remove the frame (see page 20-54).
2. Remove the deflector (see page 20-56).
3. Remove the screws (A, B), then remove the upper receiver (C).



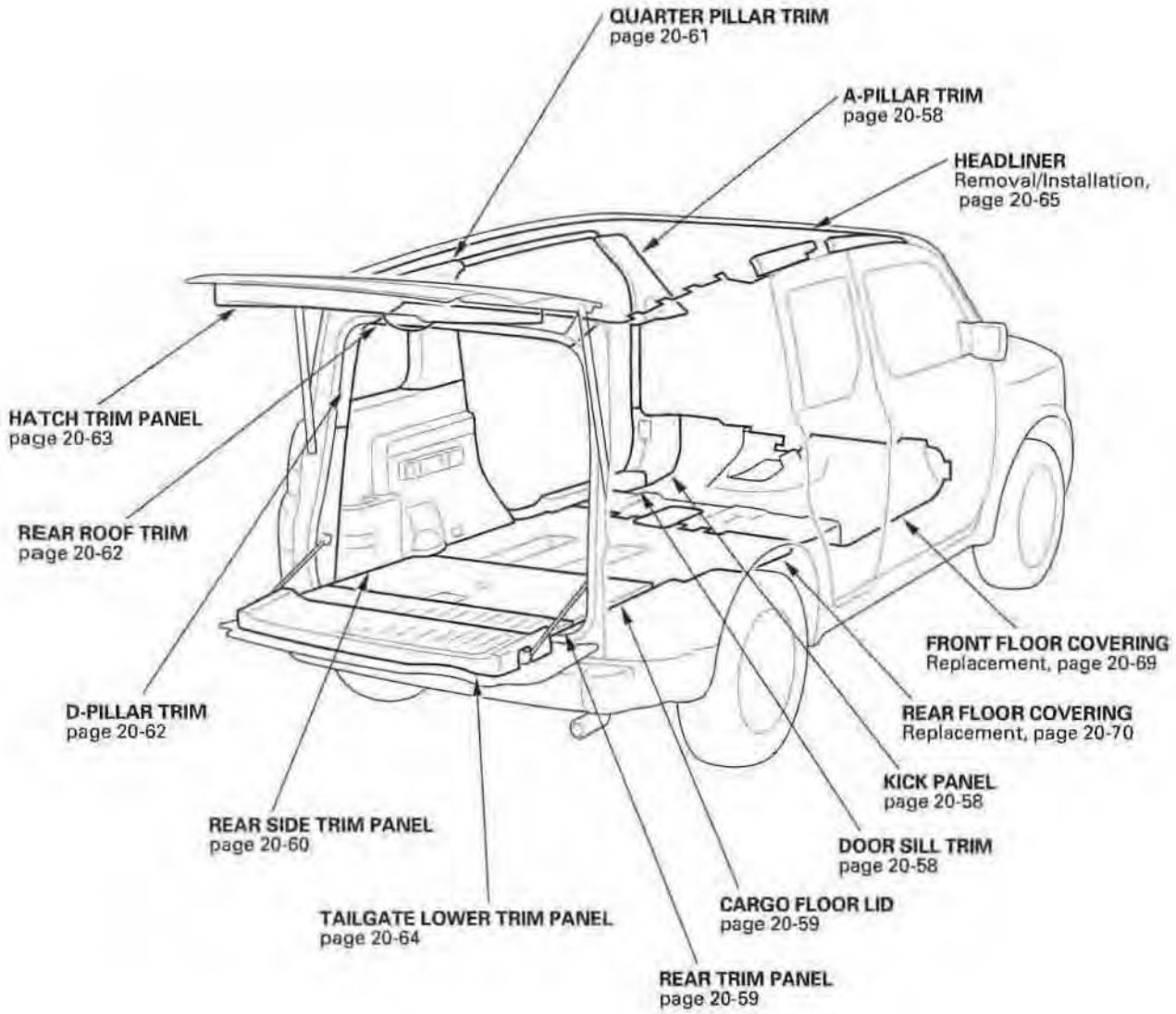
4. Remove the lower receiver (A) from the frame.



5. Install the receivers in the reverse order of removal, and apply multipurpose grease to the upper receiver surface (A) and lower receiver surface (B) as indicated by the arrows.



Component Location Index



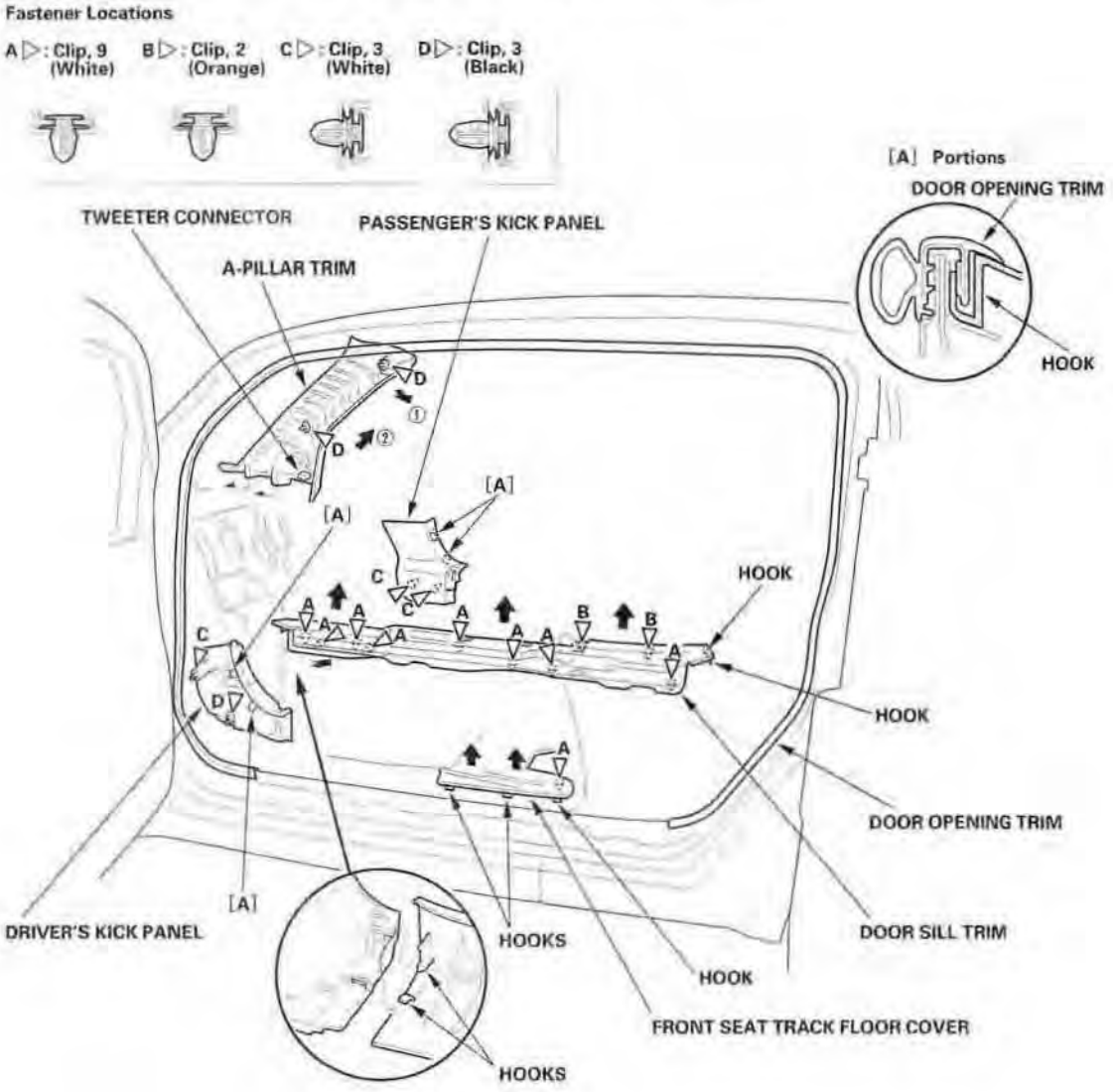
Trim Removal/Installation - Door Areas

Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend or scratch the trim and panels.

1. Remove the trim as shown.

2. Install the trim in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Push the clips and hooks into place securely.
   - Make sure the tweeter connector is plugged in properly (for some models).



Trim Removal/Installation - Cargo Area

Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend or scratch the trim and panels.

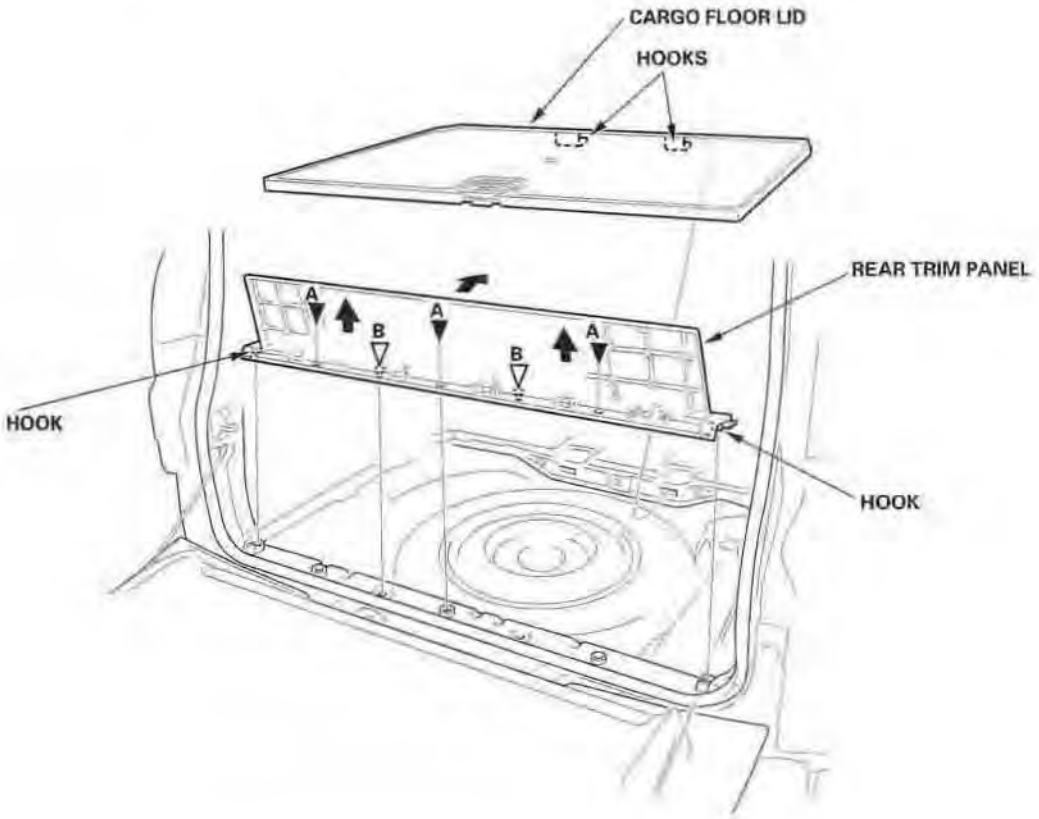
1. Remove the cargo area trim as shown. To remove the rear trim panel, lift up on the hinged section and hold it, then remove the screws and release the clips.

2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Push the clips into place securely.

Fastener Locations

A ▶: Screw, 3 **B ▷: Clip, 2 (White)**



Trim Removal/Installation - Rear Side Area

Special Tools Required
KTC trim tool set SOJATP2014

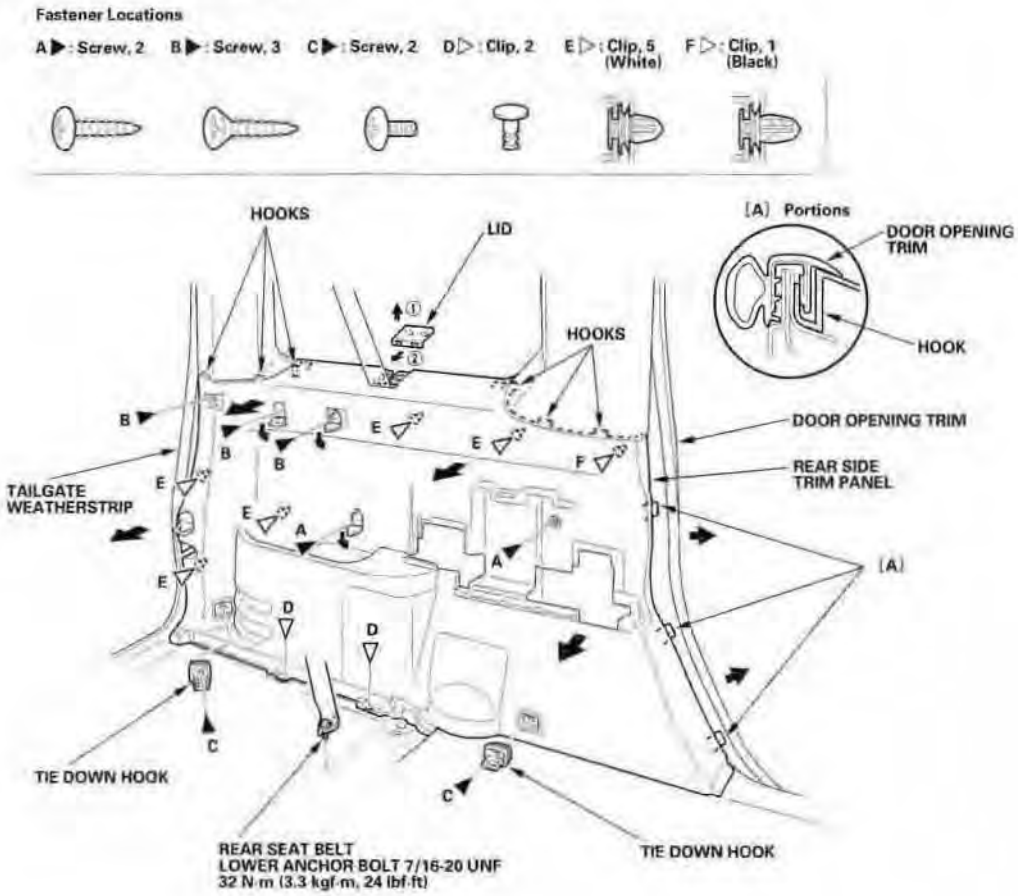
NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend or scratch the trim and panels.

1. Remove these items, then remove the trim as shown:

   - Rear trim panel (see page 20-59)
   - Door sill trim (see page 20-58)
   - Rear seat
   - Rear seat striker (see page 20-104)

2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the seat belt is not pinched.
   - Apply liquid thread lock to the rear seat belt lower anchor bolt before installation.
   - Before installing the anchor bolt, make sure there are no twists or kinks in the seat belt.
   - Push the clips into place securely.



Trim Removal/Installation - Rear Side Pillar Area

Special Tools Required
KTC trim tool set SOJATP2014

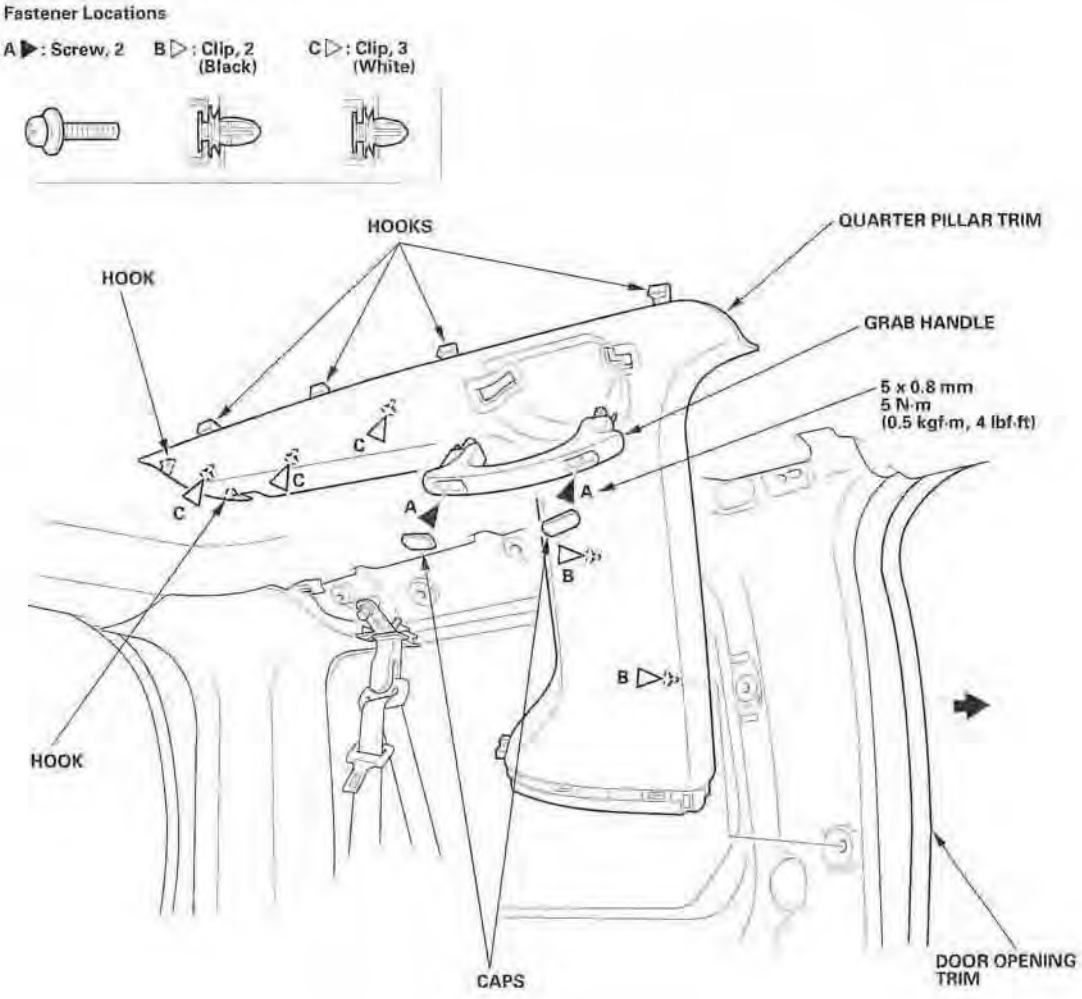
NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend or scratch the trim and panels.

Quarter Pillar Trim

1. Remove the quarter pillar trim as shown. To remove the trim, remove the upper portion of the rear side trim panel as needed (see page 20-60).

2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - When installing the rear side trim panel, make sure the seat belt is not pinched.
   - Push the clips into place securely.



(cont'd)

Trim Removal/Installation - Rear Side Pillar Area (cont'd)

D-Pillar Trim/Rear Roof Trim

1. Remove these items, then remove the trim as shown:

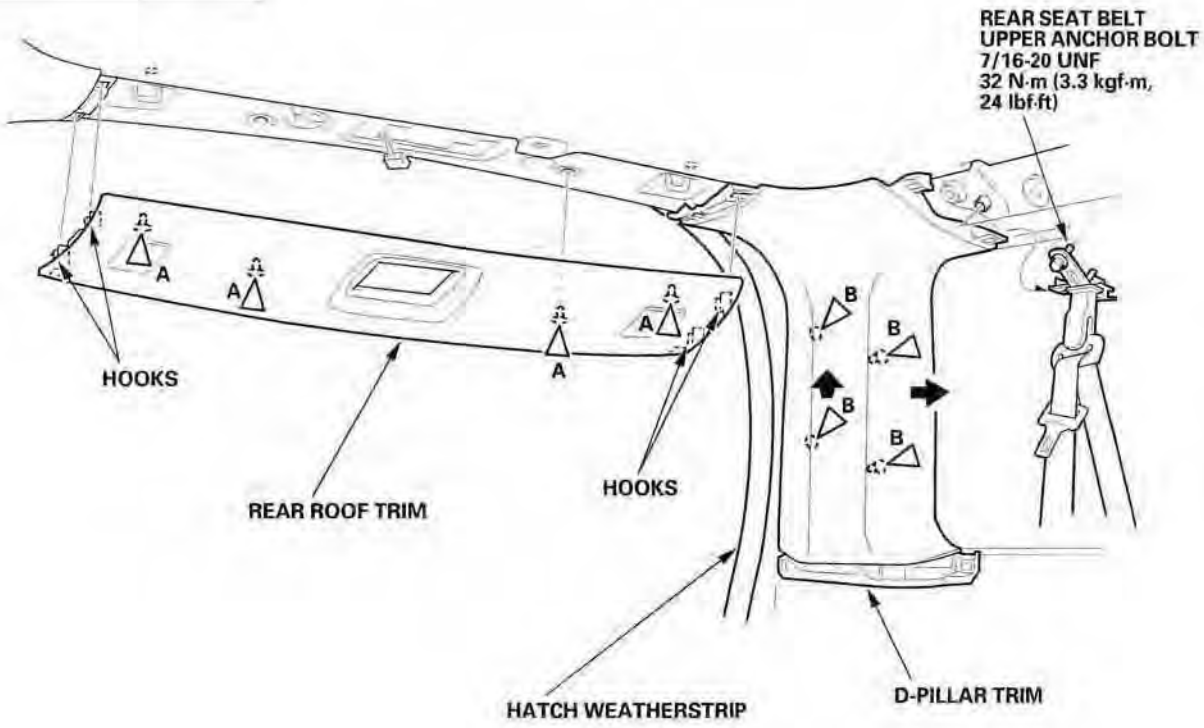
   - Quarter pillar trim
   - Upper portion of the rear side trim panel as needed (see page 20-60)
   - Rear ceiling light (see page 22-94)

2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Apply liquid thread lock to the upper anchor bolt before installation.
   - Push the clips into place securely.
   - When installing the rear side trim panel, make sure the seat belt is not pinched.
   - Before installing the upper anchor bolt, make sure there are no twists or kinks in the seat belt.

Fastener Locations

A▷: Clip, 4 (White) B▷: Clip, 4 (Black)



Trim Removal/Installation - Hatch Area

Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend or scratch the trim and panels.

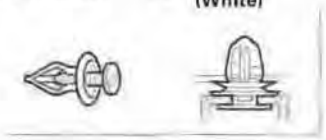
1. Remove the trim as shown.

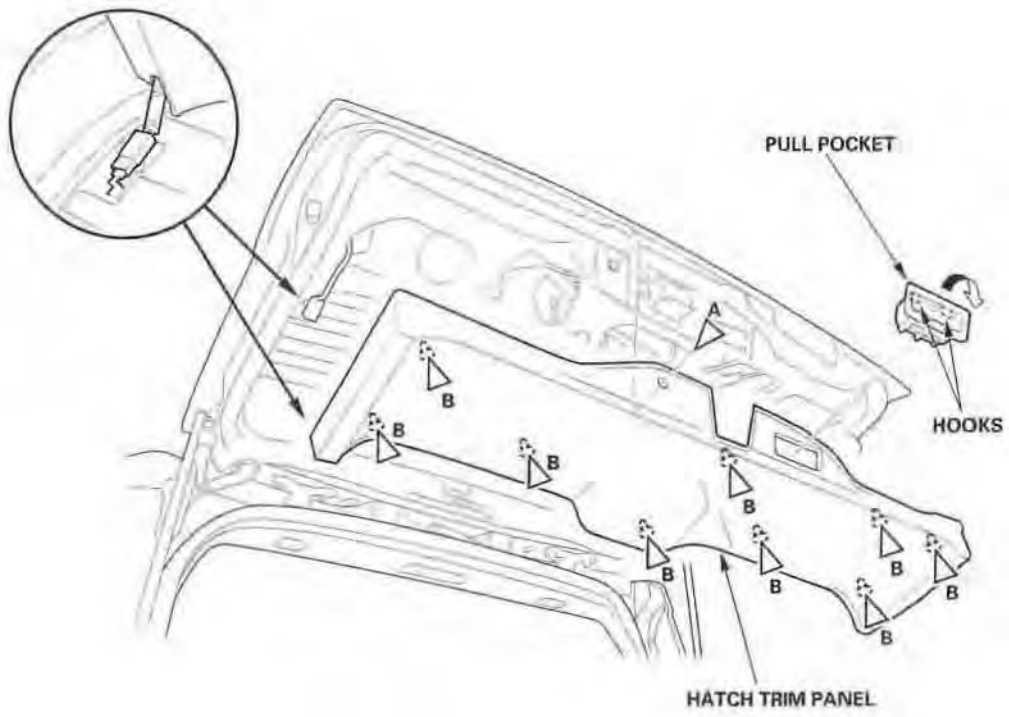
2. Install the trim in the reverse order of removal, and note these items:

   - Replace any damaged clips.
   - Make sure the rear window defogger wire harness on each side is not pinched.
   - Push the clips into place securely.

Fastener Locations

A▷: Clip, 1 **B▷: Clip, 9 (White)**





Trim Removal/Installation - Tailgate Area

Special Tools Required
KTC trim tool set SOJATP2014

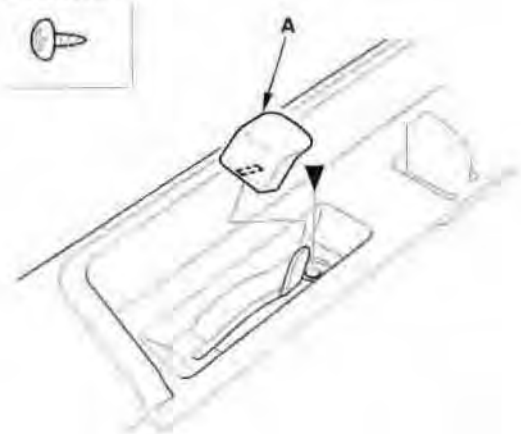
NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend or scratch the trim and panels.

1. Remove the tailgate weatherstrip as needed (see page 20-117).

2. Remove the tailgate handle knob (A), and remove the screw.

Fastener Location

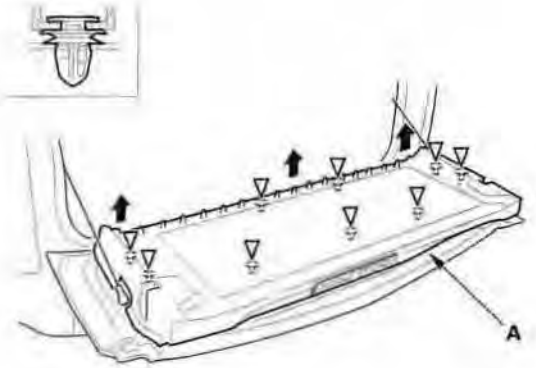
▶: Screw, 1



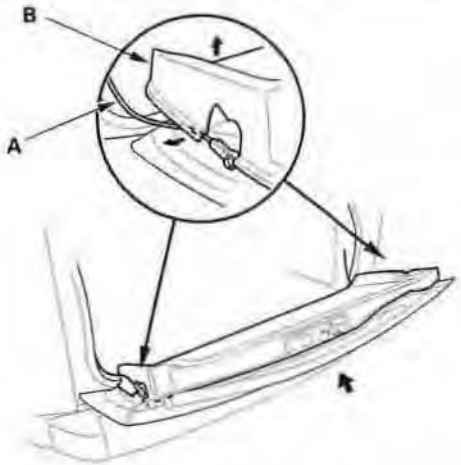
3. Open the tailgate. Starting at the bottom edge on the tailgate lower trim panel (A), pull the trim panel up to detach the clips.

Fastener Locations

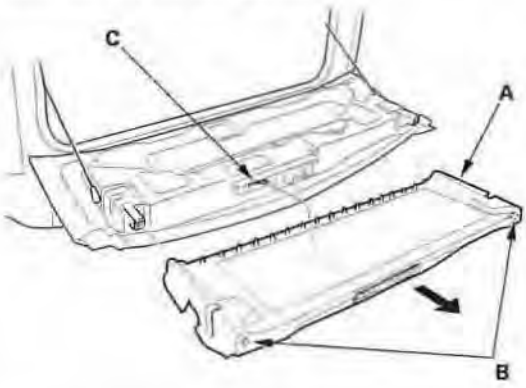
▷: Clip, 9 (White)



4. Close the tailgate half-way and hold it there to loosen the tailgate support cables (A) on both sides. Pull up on the bottom edge of the trim panel (B) and pass the cables under the trim panel on each side.



5. Pull the trim panel (A) out to release the pins (B) of the trim panel and the tailgate handle lever (C), then remove the trim panel.



6. Install the trim panel in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the tailgate handle lever is slipped through the slit of the trim panel properly.
- Push the clips into place securely.

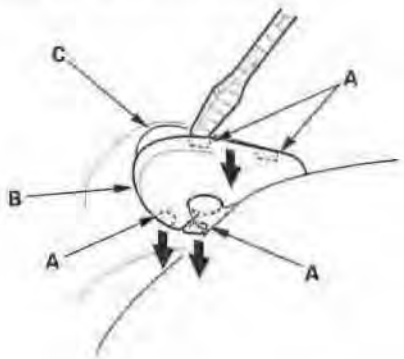
Headliner Removal/Installation

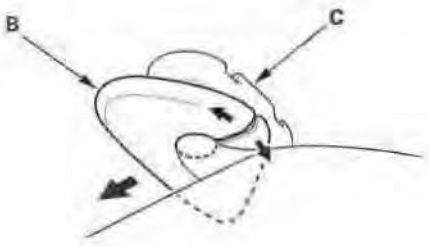
Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to bend and scratch the headliner.
- Be careful not to damage the dashboard and other interior trim.

1. Remove these items:
   - Ceiling light (see page 22-94)
   - A-pillar trim, both sides (see page 20-58)
   - Quarter pillar trim, both sides (see page 20-61)
   - Rear roof trim (see page 20-62)
   - D-pillar trim, both sides (see page 20-62)
   - Rearview mirror (see page 20-34)
   - Skylight (for some models)

2. Release the tabs (A) on both sides with the appropriate tool from the KTC trim tool set, then remove the sunvisor cap (B) from the bracket (C). Turn the cap, and remove it.

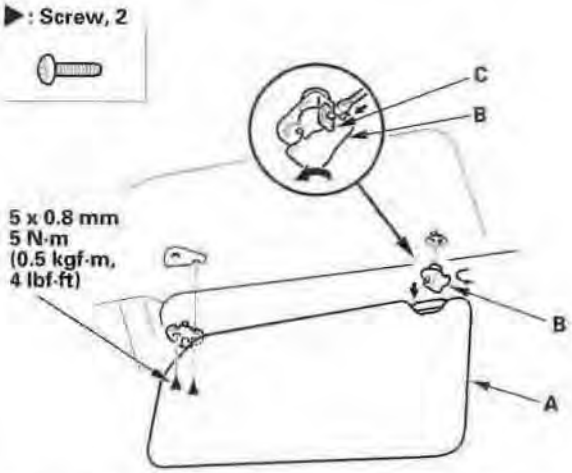




3. Remove the sunvisor (A) and holder (B) from both sides.
   -1 Using a T25 Torx bit, remove the screws.
   -2 Remove the sunvisor from the body and holder.
   -3 Using the appropriate tool from the KTC trim tool set, push the hook (C), and turn the holder 90 °, then pull it out.

Fastener Locations

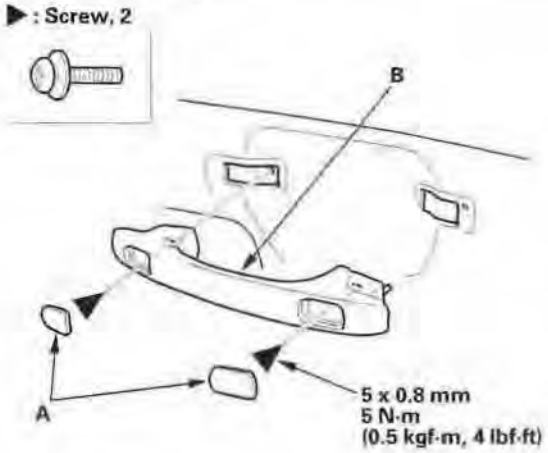
▶: Screw, 2



4. On the front passenger's side: Remove the caps (A), and remove the screws, then remove the grab handle (B).

Fastener Locations

▶: Screw, 2



(cont'd)

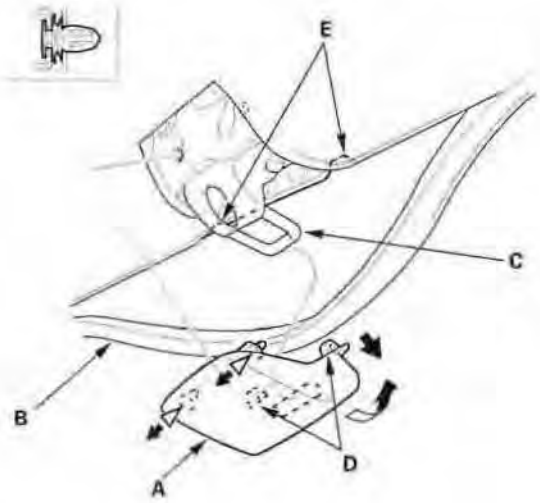
Headliner Removal/Installation (cont'd)

5. Remove the upper striker covers (A) from both side.

   –1 Pull the door opening seal (B) away as needed.
   –2 Pull out on the inside edge of the cover to release the clips.
   –3 Pull the cover to the rear to release it from the rear access panel upper striker (C). The hooks (D) on the cover must pass through the notches (E) in the door opening flange.

Fastener Locations

▷: Clip, 2 (Black)

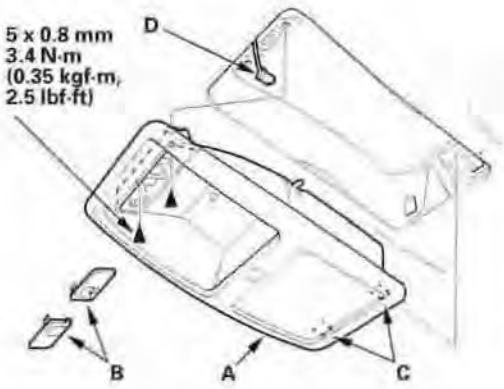


6. If equipped, remove the roof console (A).

   –1 Remove the lens (B).
   –2 Remove the self-tapping screws.
   –3 Pull the console down, and slide it rearward to release the hooks (C). Take care not to damage the interior wire harness.
   –4 Disconnect the front individual map light connector (D).

Fastener Locations

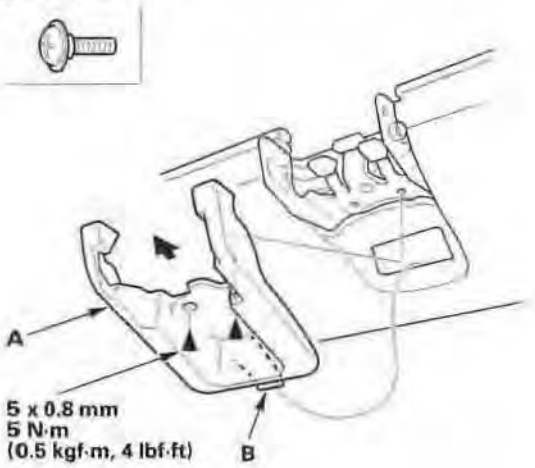
▶: Screw, 2



7. If equipped with a skylight, remove the screws, and slide the glass latch handle trim (A) forward to release the hook (B), then remove the trim.

Fastener Locations

▶: Screw, 2

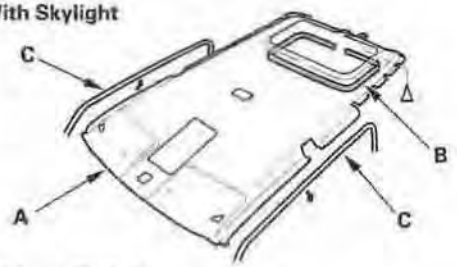


8. With the help of an assistant, remove the headliner (A).
   - -1 If equipped with a skylight, remove the roof trim (B).
   - -2 Remove the clip from the rear edge of the headliner.
   - -3 Remove the remaining door opening seal (C) from each opening.
   - -4 Lower the headliner.

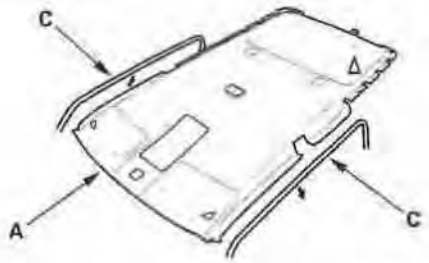
Fastener Location

▷: Clip, 1

With Skylight



Without Skylight



9. Remove the headliner through the hatch opening. Take care not to damage the headliner.

(cont'd)

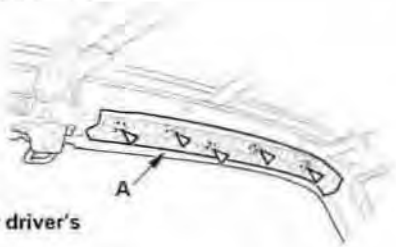
Headliner Removal/Installation (cont'd)

10. Detach the hooks, then remove the front roof side pads (A) and rear roof side pads (B) from both sides.

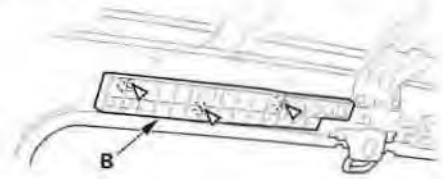
Fastener Locations

▷: **Hook, 15 (Both sides)**

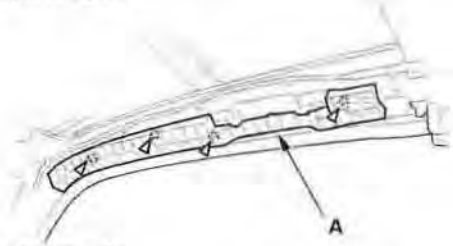
Front driver's



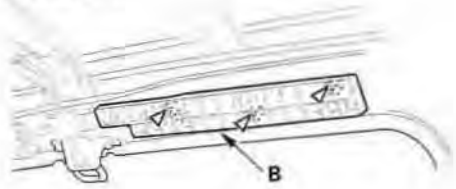
Rear driver's



Front passenger's

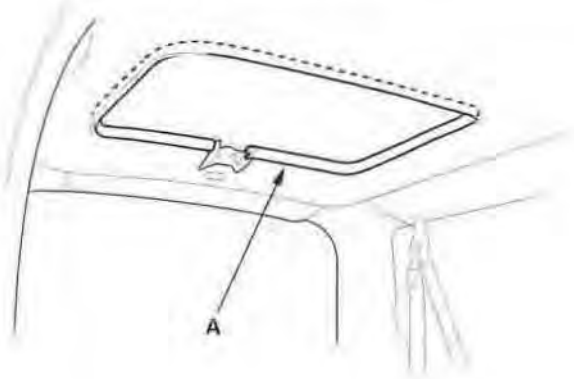


Rear passenger's



11. Install the headliner in the reverse order of removal, and note these items:

- Replace the clip if it's damaged.
- When reinstalling the headliner through the tailgate opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
- Check that both sides of the headliner are securely attached to the trim.
- With skylight: When installing the roof trim (A), align the roof trim ends with the opening flange of the skylight frame as shown.



Floor Covering Replacement

Special Tools Required
KTC trim tool set SOJATP2014

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to damage, wrinkle or twist the floor covering.
- Be careful not to damage the dashboard or other interior trim pieces.

Front Floor Covering

1. Remove these items:

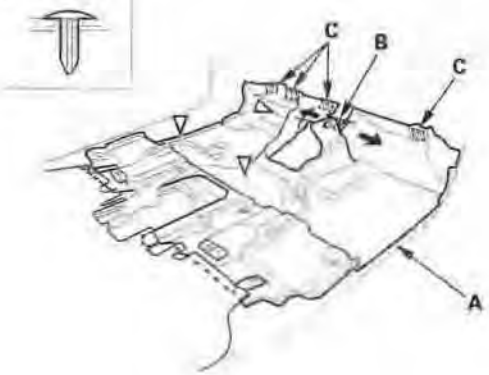
   - Front seats, both sides (see page 20-86)
   - Door sill trim, both sides (see page 20-58)
   - Kick panels, both sides (see page 20-58)
   - Passenger's dashboard under cover (see page 20-78)
   - Center lower cover (see page 20-76)
   - Center console (see page 20-71)
   - Subwoofer (see page 22-191)

2. Remove the front floor covering (A).

   –1 Remove the clips.
   –2 Release the fastener (B), then pull back the floor covering from under the heater unit.
   –3 Release the fasteners (C) on the front edge of the floor covering, then pull back the floor covering from under the dashboard.

Fastener Locations

▷ : **Clip, 3**



3. Remove the front floor covering.

4. Install the floor covering in the reverse order of removal, and note these items:

   - Take care not to damage, wrinkle or twist the floor covering.
   - Make sure the seat harnesses are routed correctly.
   - Replace any damaged clips.
   - Push the clips into place securely.

(cont'd)

Floor Covering Replacement (cont'd)

Rear Floor Covering

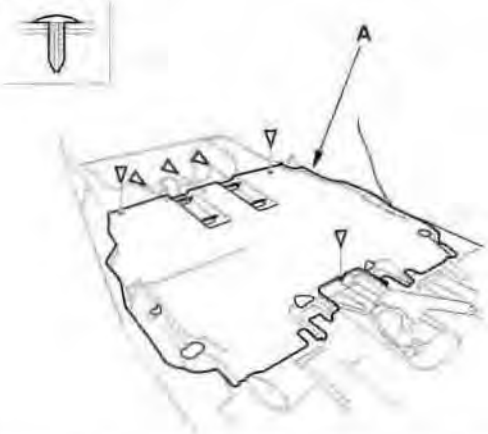
1. Remove these items:

   - Front seats, both sides (see page 20-86)
   - Door sill trim, both sides (see page 20-58)
   - Rear side trim panel, both sides (see page 20-60)
   - Center console (see page 20-71)

2. Remove the clips, then remove the rear floor covering (A).

Fastener Locations

▷: **Clip, 6**



3. Install the floor covering in the reverse order of removal, and note these items:

   - Take care not to damage, wrinkle or twist the floor covering.
   - Replace any damaged clips.
   - Push the clips into place securely.

Center Console Removal/Installation

NOTE: Take care not to scratch the front seat and related parts.

1. Pull the front edge of the center console (A) to release the clips, and remove the console by releasing the hooks (B).

Fastener Locations

▷: **Clip, 2**

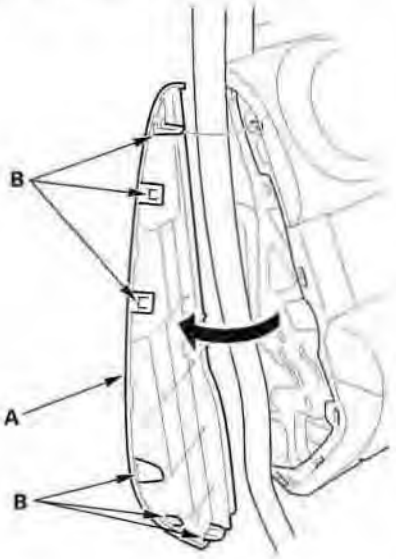
2. Install the console in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Push the clip portions into place securely.

Driver's Dashboard Panel Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

1. Open the driver's door, and gently pull out on the front of the dashboard side lid (A) to release the hooks (B), then remove the lid.



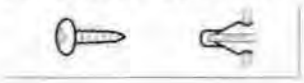
2. Tilt the steering column down.

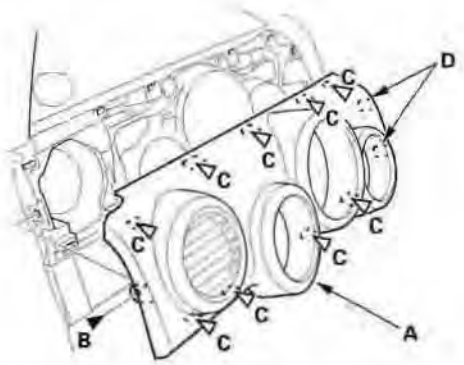
3. Remove the driver's dashboard panel (A).

   -1 Open the driver's door, and remove the screw (B).
   -2 Gently pull out the panel along the bottom to detach the clips (C).
   -3 Gently pull out the panel along the top to detach the clips.
   -4 Gently release the hooks (D) on the inside edge of the panel.

Fastener Locations

B▶: Screw, 1 C▷: Clip, 9





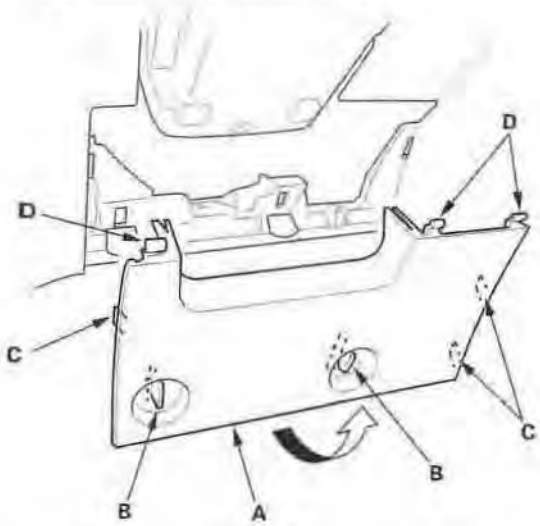
4. Install the panel in the reverse order of removal, and note these items:

   • Replace any damaged clips.
   • Push the clips and hooks into place securely.

Driver's Dashboard Lower Cover Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

1. Remove the driver's dashboard lower cover (A).
   - -1 Turn the lock knobs (B) 90 °.
   - -2 Gently pull out on the bottom edge to release the side hooks (C).
   - -3 Release the upper hooks (D).

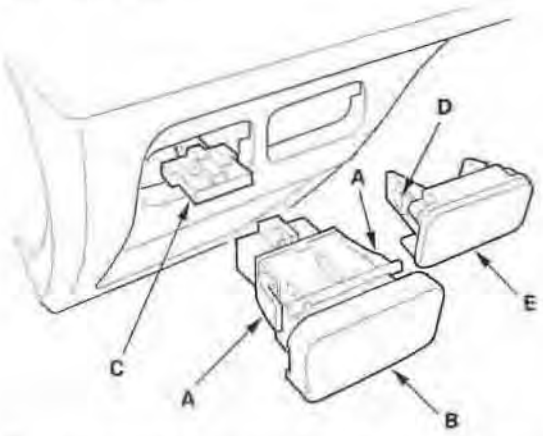


2. Install the cover in the reverse order of removal, and push the side hooks into place securely.

Driver's Pocket Removal/ Installation

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

1. Reach under the dashboard, and push on lock tabs (A) to release the cruise control main switch (B), then remove the switch and disconnect the connector (C).



2. Reach through the cruise control switch hole and push on lock tab (D) and remove the switch lid (E).

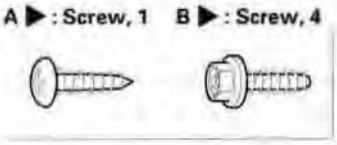
(cont'd)

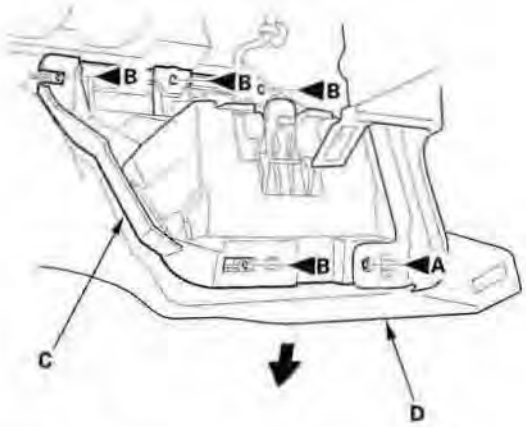
Driver's Pocket Removal/ Installation (cont'd)

3. From under the dash, remove the screws (A, B) securing the driver's pocket (C).

Fastener Locations

A ▶: Screw, 1 B ▶: Screw, 4





4. While pulling out on the bottom edge of the dashboard (D), remove the pocket.

5. Install the pocket in the reverse order of removal, and make sure the switch connector is plugged in properly.

Driver's Vent Removal/Installation

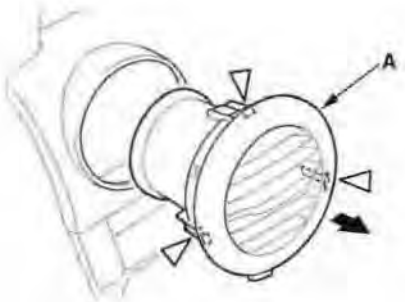
Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- The passenger's vent is similar.

1. Apply protective tape around the related parts to prevent damage. Carefully insert the appropriate tool from the KTC trim tool set next to the clips, and detach the clips by prying on the driver's vent (A). Take care not to scratch the dashboard and related parts.

Fastener Locations

▷: Clip, 3



2. Pull out on the driver's vent, then remove it.

3. Install the driver's vent by pushing the clips into place securely.

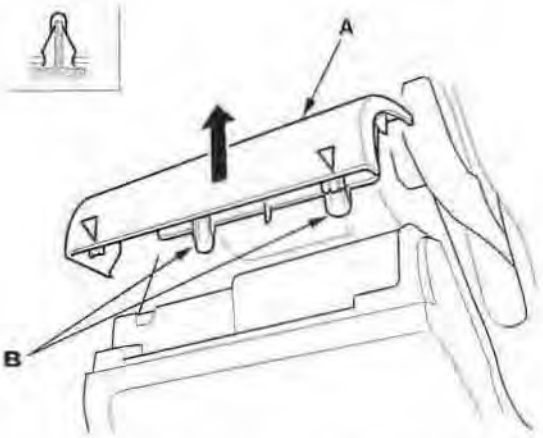
Driver's Outer Dashboard Trim Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

1. Pull out on the driver's outer dashboard trim (A) to release the clips and hooks (B) from the dashboard.

Fastener Locations

▷: Clip, 2



2. Install the dashboard trim in the reverse order of removal, and push the clip and hook portions into place securely.

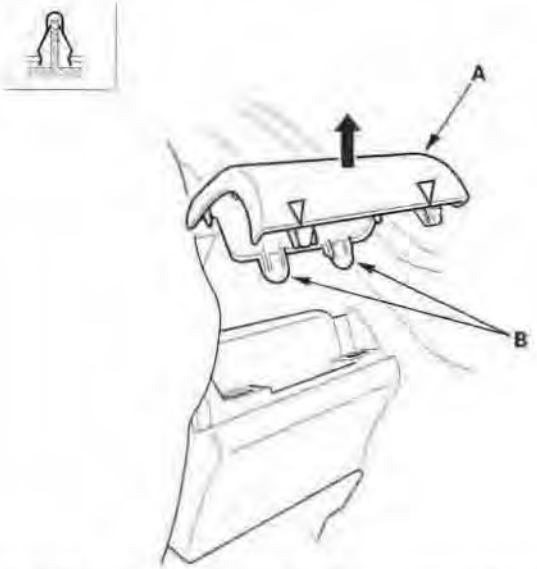
Driver's Inner Dashboard Trim Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

1. Pull out on the driver's inner dashboard trim (A) to release the clips and hooks (B) from the dashboard.

Fastener Locations

▷: Clip, 2



2. Install the dashboard trim in the reverse order of removal, and push the clip and hook portions into place securely.

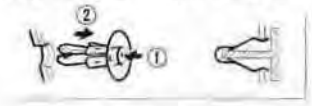
Center Lower Cover Removal/ Installation

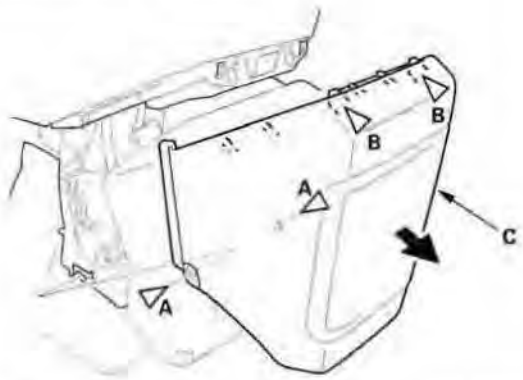
Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to scratch the dashboard and related parts.

1. Remove the clips (A) and detach the clips (B) then remove the center rear cover (C).

Fastener Locations
A▷: Clip, 2 B▷: Clip, 2





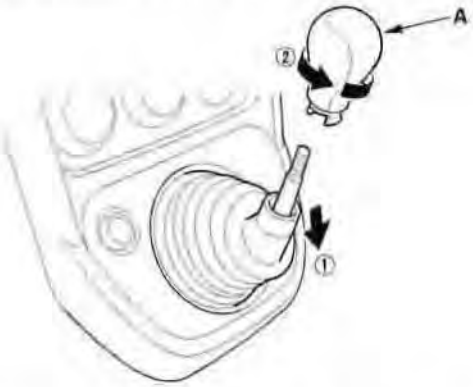
2. Install the cover the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Push the clips into place securely.

Shift Lever Trim Removal/ Installation

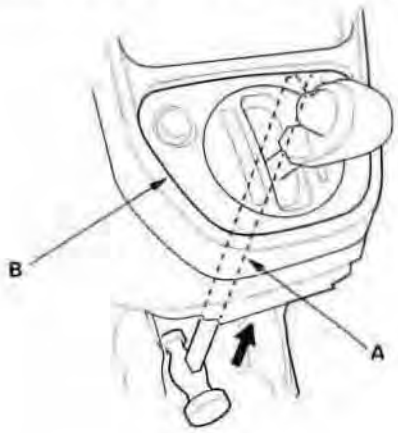
NOTE:
- Put on gloves to protect your hands.
- Do not pry the panel surface with a flat-tip screwdriver, to prevent damage.
- Take care not to scratch the dashboard and related parts.

1. Remove these items:
   - Center lower cover (see page 20-76)
   - Woofer, for some models (see page 22-191)

2. M/T model: Remove the shift knob (A).



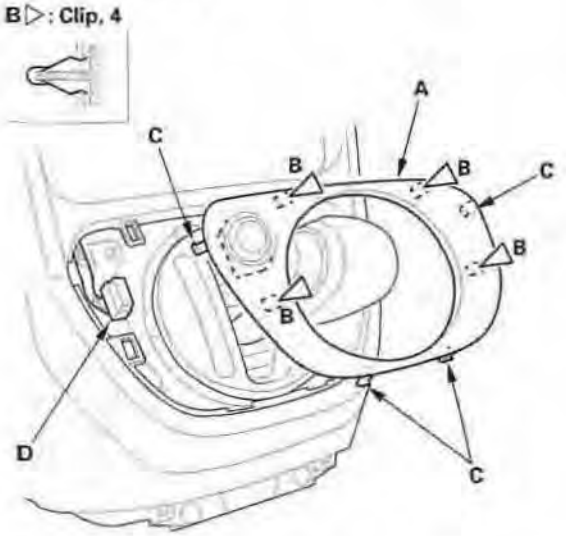
3. Using the handle end of a hammer (A), carefully insert the handle through the center lower cover opening, and push on the back side of the shift lever trim (B) to start to release the clips.



4. Pull out the shift lever trim (A) to release the remaining clips (B), hooks (C), and disconnect hazard warning switch connector (D).

Fastener Locations

B▷: Clip, 4



5. Install the panel in the reverse order of removal, and note these items:

   - Make sure each connector is plugged in properly.
   - Push the clip and hook portions into place securely.

Center Panel Removal/Installation

Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to scratch the dashboard and related parts.

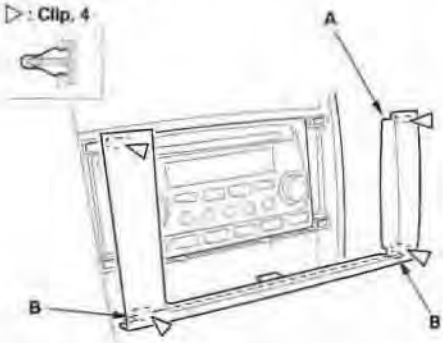
1. Remove these items:

   - Center lower cover (see page 20-76)
   - Shift lever trim (see page 20-76)

2. Release the lower clips in the radio panel (A) by putting a hook-snaped tool into the notches (B) and pulling out carefully. Pull out on the radio panel to release the upper clips.

Fastener Locations

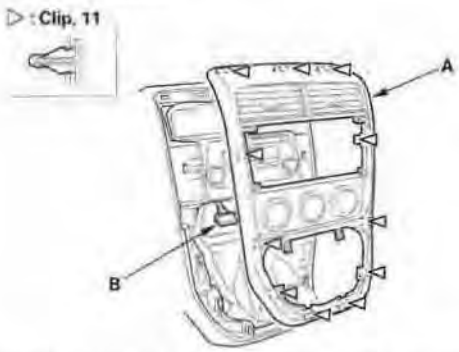
▷: Clip, 4



3. Pull on the center panel (A) to release the clips, then disconnect the heater control unit connector (B).

Fastener Locations

▷: Clip, 11



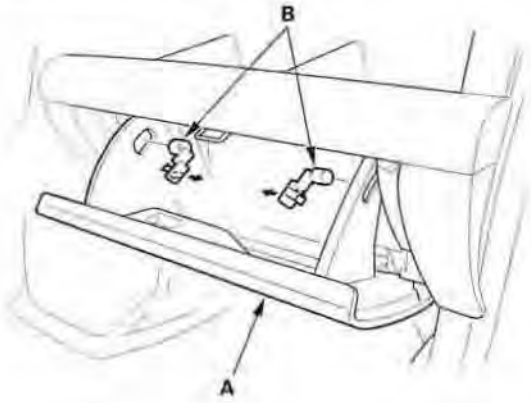
4. Install the panel in the reverse order of removal, and note these items:

   - Make sure the heater control unit connector is plugged in properly.
   - Push the clips into place securely.

Glove Box Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

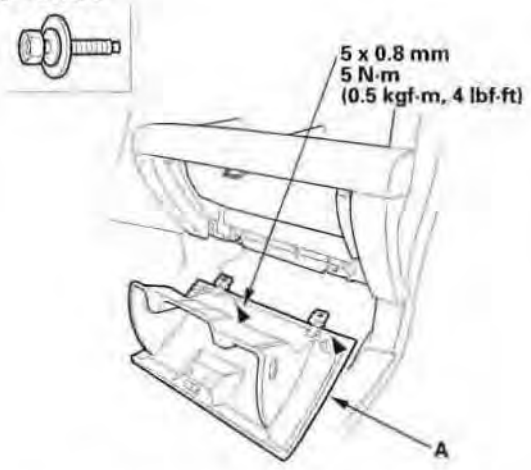
1. While holding the glove box (A), remove the glove box stop (B) on each side.



2. Remove the bolts, then remove the glove box (A).

Fastener Locations

▶: Bolt, 2



3. Install the glove box in the reverse order of removal.

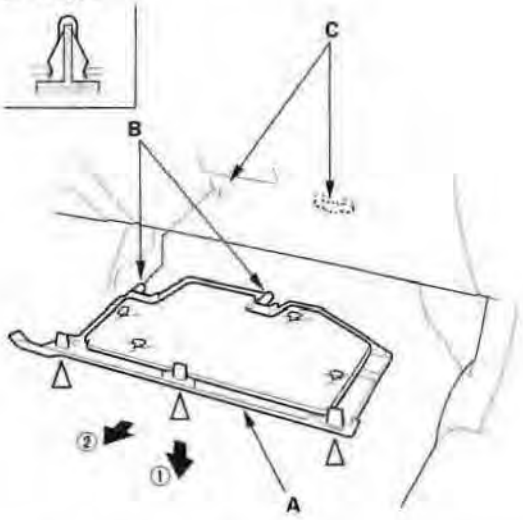
Passenger's Dashboard Under Cover Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

1. Remove the passenger's dashboard under cover (A).
   - –1 Gently pull down the rear edge to release the clips.
   - –2 Pull the cover away to release the pins (B) from the holders (C).

Fastener Locations

▷: Clip, 3

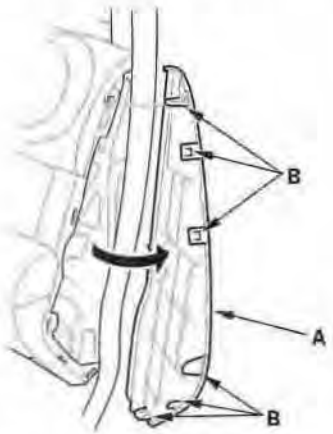


2. Install the cover in the reverse order of removal, and push the clip portions into place securely.

Passenger's Dashboard Upper Panel and Dashboard Tray Cover Removal/ Installation

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

1. Open the passenger's door, and gently pull out on the front of the dashboard side lid (A) to release the hooks (B), then remove the lid.

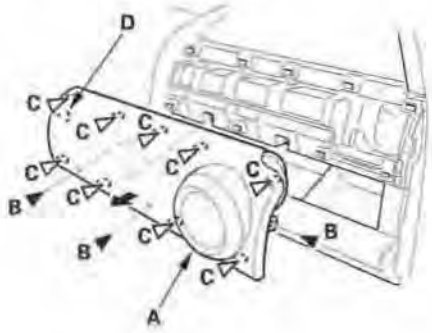


2. Remove the dashboard upper panel (A).

   –1 Remove the screws (B).
   –2 Gently pull out on the panel to release the clips (C) and hook (D).

Fastener Locations

B ▶ : Screw, 3 C ▷ : Clip, 9

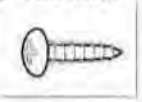


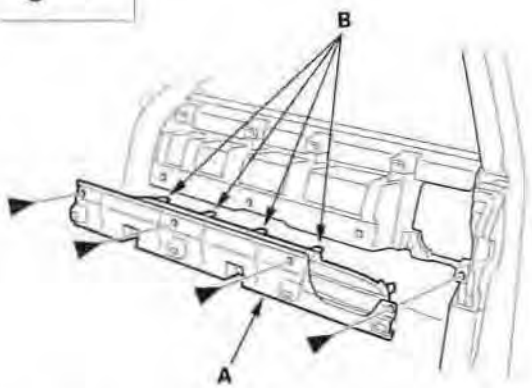
3. Remove the dashboard tray cover (A).

   –1 Remove the screws.
   –2 Gently pull out on the cover to release the hooks (B).

Fastener Locations

▶ : Screw, 4





4. Install the cover and panel in the reverse order of removal, and push the clips and hooks into place securely.

Passenger's Dashboard Lower Panel Removal/Installation

NOTE: Take care not to scratch the dashboard and related parts.

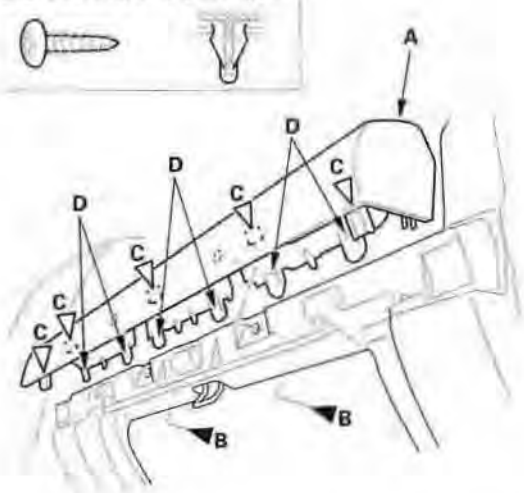
1. Remove the glove box stop on each side, then lower the glove box (see step 1 on page 20-78).

2. Remove the dashboard lower panel (A).

   -1 Remove the screw (B).
   -2 Gently pull out the panel to release the clips (C) and hooks (D).

Fastener Locations

B ▶: Screw, 2 C ▷: Clip, 5



3. Install the panel in the reverse order of removal, and push the clips into place securely.

Dashboard Removal/Installation

Special Tools Required
KTC trim tool set SOJATP2014

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Have an assistant help you when removing and installing the dashboard.
- Take care not to scratch the dashboard, body, and other related parts.
- Put on gloves to protect your hands.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.

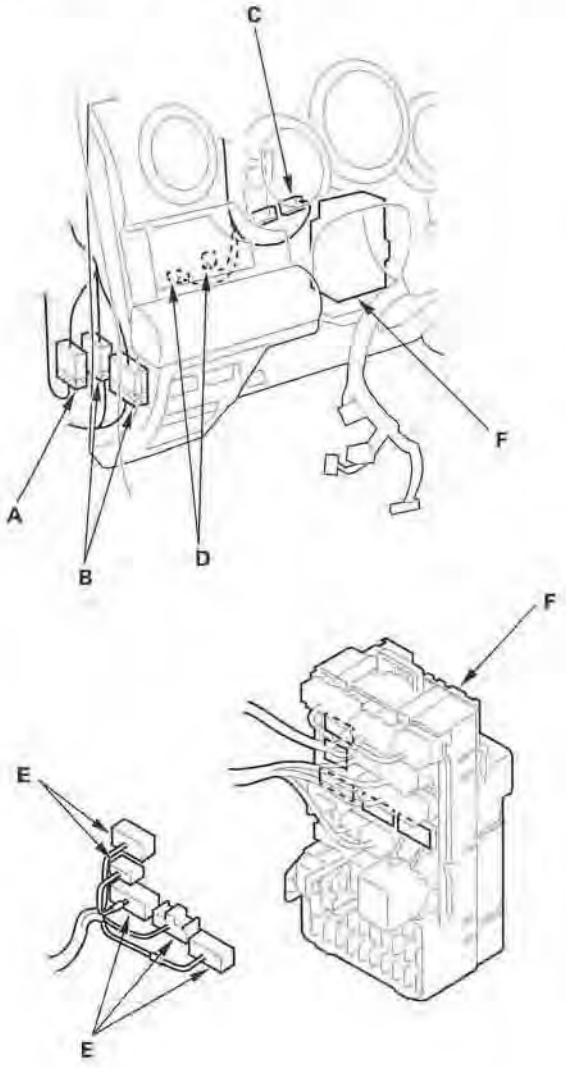
2. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.

3. Remove these items:

   - Driver's dashboard lower cover (see page 20-73)
   - Glove box (see page 20-78)
   - Passenger's dashboard under cover (see page 20-78)
   - Center lower cover (see page 20-76)
   - Passenger's vent (see page 20-74)
   - A-pillar trim, both sides (see page 20-58)
   - Kick panel, passenger's side (see page 20-58)
   - Steering column (see page 17-25)
   - A/T model: Disconnect the A/T control cable (see page 14-210)
   - M/T model: Disconnect shift cable (see page 13-54)
   - Woofer, for some models (see page 22-191)

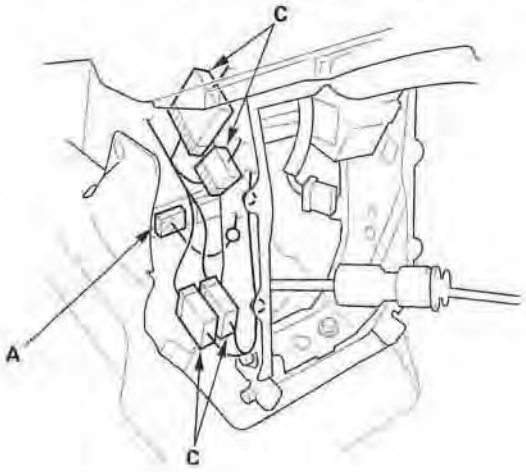
Driver's side

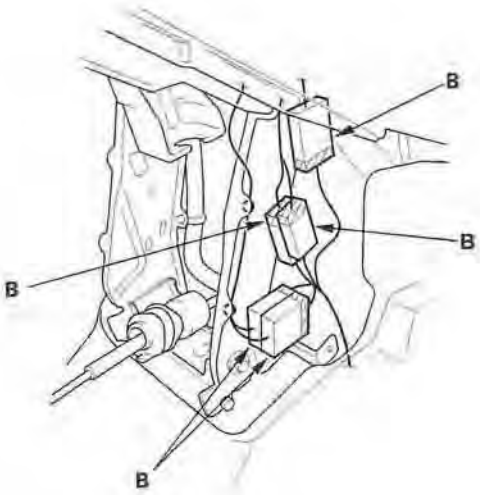
4. From under the dash, disconnect the tweeter harness connector (A) (on some models), driver's door wire harness connectors (B), brake switch connector (C), and clutch switch connector (D) (on M/T model). Disconnect the engine compartment wire harness connectors (E) from the under-dash fuse/relay box (F).



Middle portion

5. Disconnect the SRS control unit connector (A), floor wire harness connectors (B), and engine compartment wire harness connectors (C).



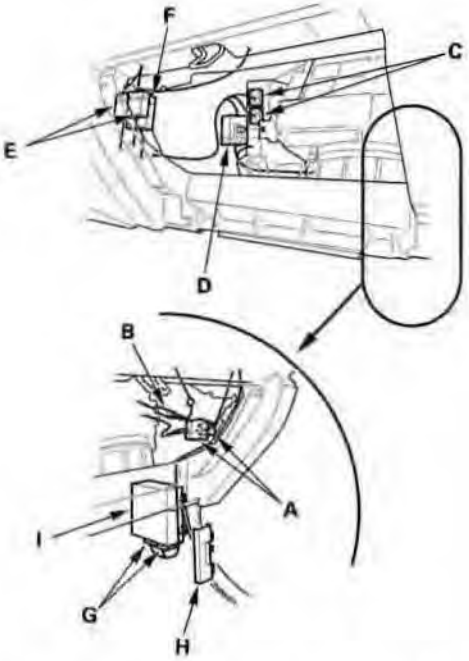


(cont'd)

Dashboard Removal/Installation (cont'd)

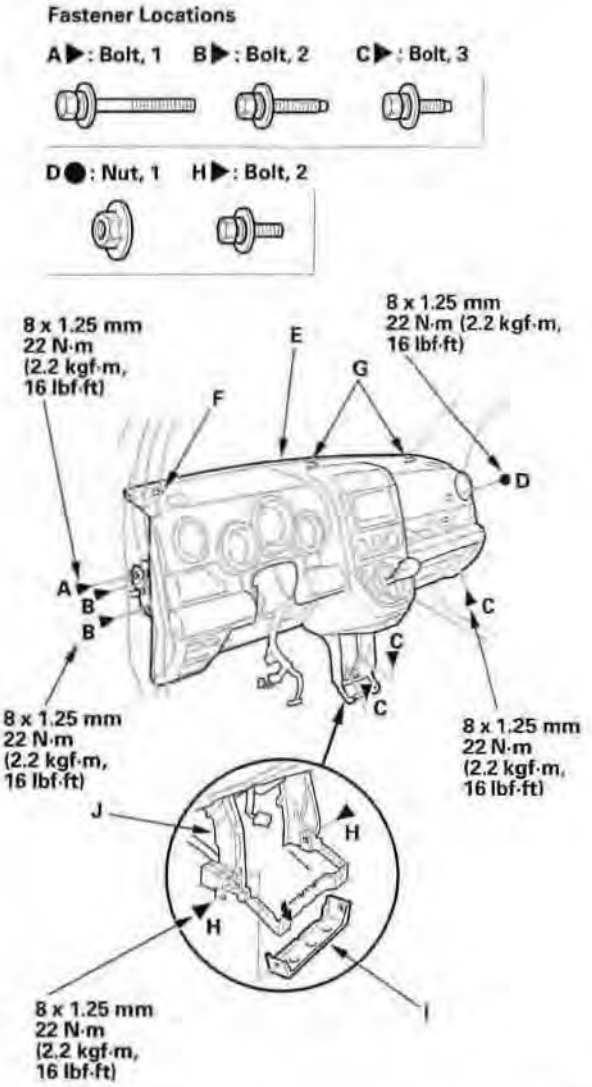
Passenger's side

6. From under the dash, disconnect the passenger's door wire harness connectors (A), antenna lead (B), ECM/PCM connectors (C), engine wire harness connector (D), heater subharness connectors (E), and passenger's airbag connector (F). Disconnect the amplifier connectors (G), and release the wire harness protector (H) from the amplifier (I) (on some models).



7. Detach all of the harness and connector clips.

8. Remove the bolts (A, B, C) and nut (D), then lift up on the dashboard (E) to release it from the guide pins (F, G) on the body.



9. Carefully remove the dashboard through the front door opening.

10. Remove the center frame mounting bolts (H), then remove the center bracket (I) from the center frame (J).

11. Install the dashboard in the reverse order of removal, and note these items:

- Make sure the dashboard fits onto the guide pins correctly.
- Apply liquid thread lock to the center frame mounting bolts before reinstallation.
- Reinstall the center bracket on the center frame, and slightly tighten the mounting bolts. Reinstall the dashboard on the body. After tightening both dashboard mounting bolts and nut, tighten the center bracket mounting bolts and center frame mounting bolts.
- Before tightening the bolts, make sure each wire harness is not pinched.
- Make sure the connectors are plugged in properly, and the antenna lead is connected properly.
- Reconnect the negative cable to battery.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.
- Reset the clock.
- Do the ECM/PCM idle learn procedure (see page 11-207).
- Do the power window control unit reset procedure (see page 22-115).

Steering Hanger Beam Replacement

NOTE:
- Have an assistant help you when removing and installing the steering hanger beam.
- Take care not to scratch the dashboard.
- Put on gloves to protect your hands.

1. Remove the dashboard (see page 20-80)

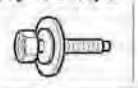
2. Remove these items from the dashboard:

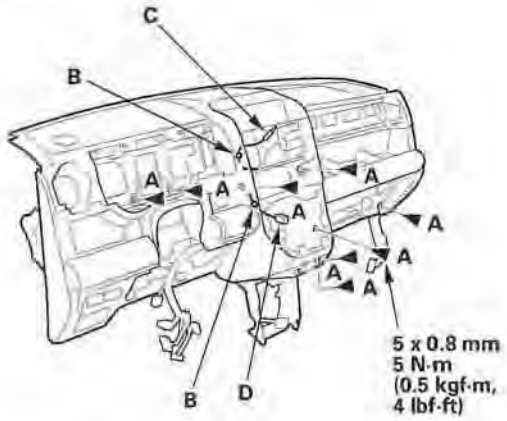
- Driver's dashboard panel (see page 20-72)
- Gauge assembly (see page 22-69)
- Shift lever, A/T model (see page 14-210), M/T model (see page 13-54)
- Audio unit (see page 22-189)
- Passenger's airbag (see page 23-119)

3. Remove the bolts (A) from the dashboard.

Fastener Locations

A▶ : Bolt, 8





4. Detach the harness clips (B) securing the antenna lead (C) and hazard warning switch wire harness (D).

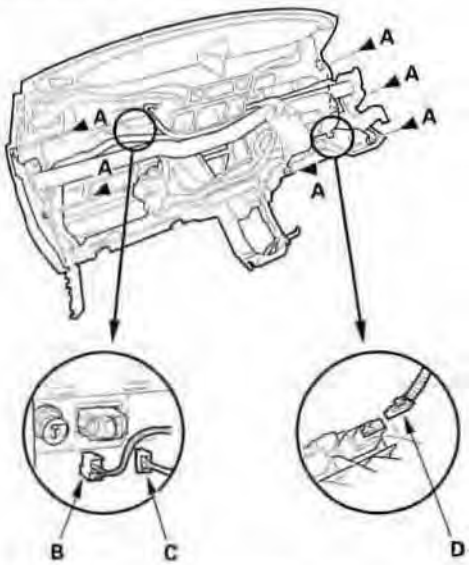
(cont'd)

Steering Hanger Beam Replacement (cont'd)

5. From the back of the dashboard, remove the screws (A).

Fastener Locations

A▶ : Screw, 6



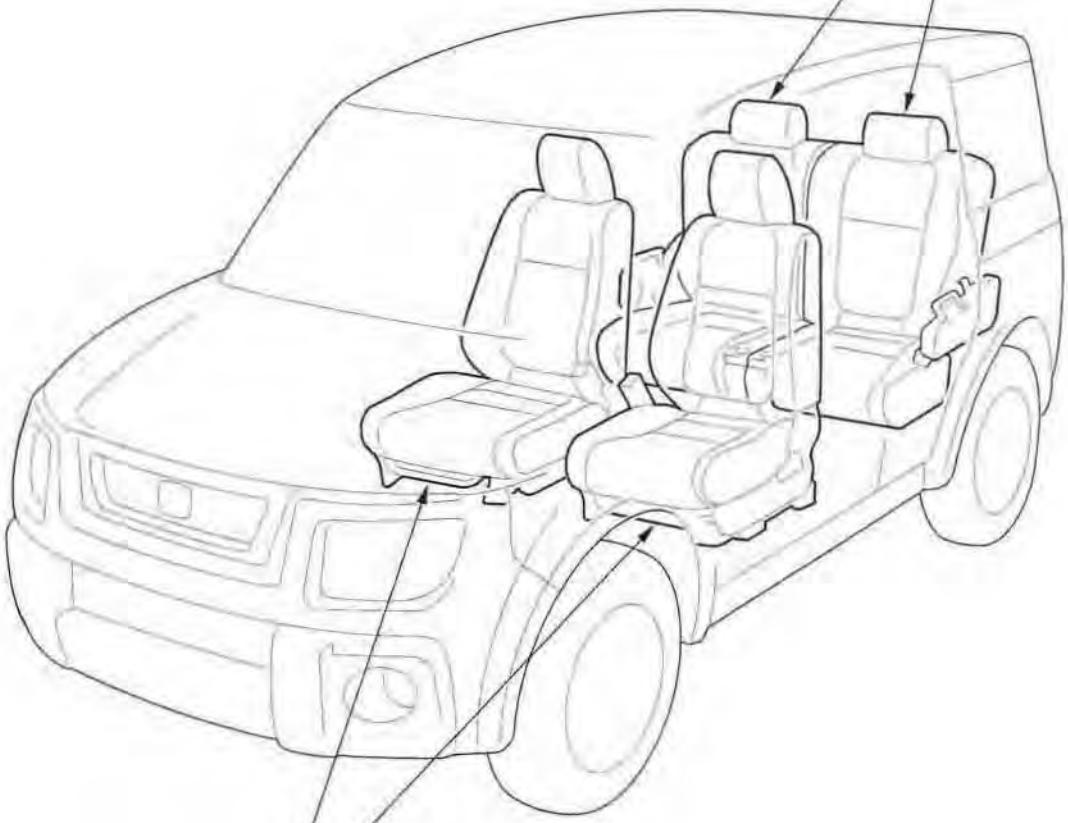
6. Disconnect the accessory power socket connector (B), auxiliary jack connector (C), cruise control main switch connector (D).

7. With the help of an assistant, separate the dashboard and steering hanger beam.

8. Install the beam in the reverse order of removal, and note these items:

   - Make sure the dashboard wire harness is not pinched.
   - Make sure the connectors are plugged in properly.

Component Location Index



REAR SEATS
Disassembly/Reassembly, page 20-96
Seat Cover Replacement, page 20-100
Seat Striker Replacement, page 20-104

FRONT SEATS
Removal/Installation, page 20-86
Disassembly/Reassembly-Driver's Seat, page 20-88
Disassembly/Reassembly-Passenger's Seat, page 20-89
Armrest Replacement
* '03 model page 20-90
* '04--05 models page 20-91
Seat Cover Replacement, page 20-92

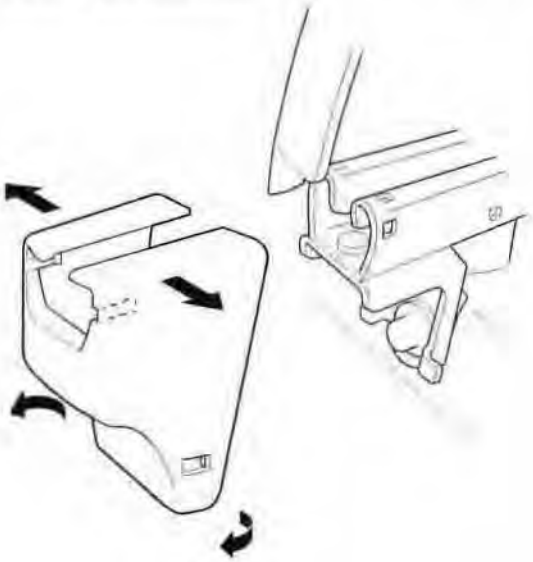
Front Seat Removal/Installation

Special Tools Required
KTC trim tool set SOJATP2014

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Take care not to scratch the body or tear the seat covers.
- Put on gloves to protect your hands.

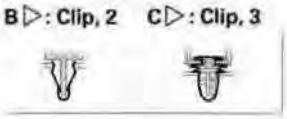
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the preset buttons.
2. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.
3. Remove the front seat track end covers from the front of both seat tracks.

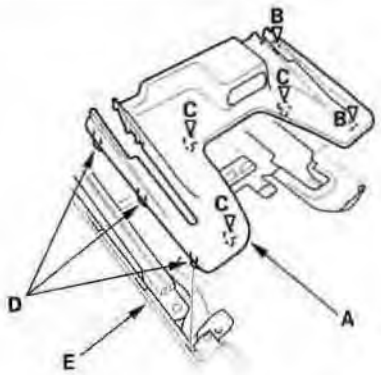


4. Slide the front seat forward fully.
5. Pull the front seat track floor cover (A) up to detach the clips (B, C) and to detach the hooks (D) from the door sill trim (E).

Fastener Locations

B▷: Clip, 2 C▷: Clip, 3





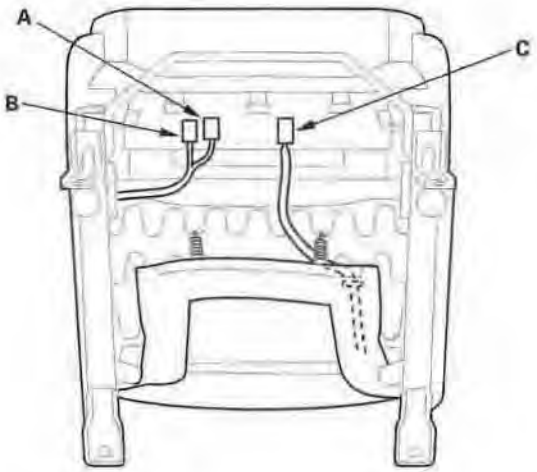
6. Remove the bolts securing the front seat.

Fastener Locations

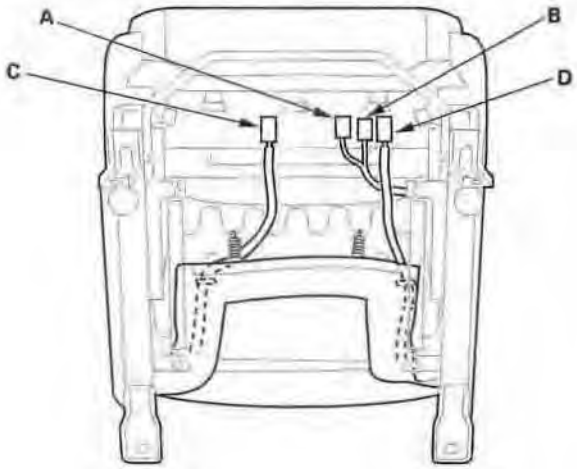
▶: Bolt, 4

7. Lift up the front seat, then disconnect the seat belt buckle switch connector (A), the seat belt buckle tensioner connector (B), the side airbag connector (C) on some driver's and passenger's seats, and the OPDS unit harness connector (D) on some passenger's seats.

Driver's seat



Passenger's seat



8. Remove the headrest.

9. With the help of an assistant, carefully remove the front seat through the door opening.

10. Install the seat in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure each connector is plugged in properly.
- Apply liquid thread lock to the seat mounting bolts before reinstallation.
- Tighten the seat mounting bolts to the specified torque in the sequence shown. Slide the seat all the way back and tighten ① and ②, then slide it forward and tighten ③ and ④.
- Reconnect the negative cable to the battery.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.
- Reset the clock.
- Do the ECM/PCM idle learn procedure (see page 11-207).
- Do the power window control unit reset procedure (see page 22-115).

Fastener Locations

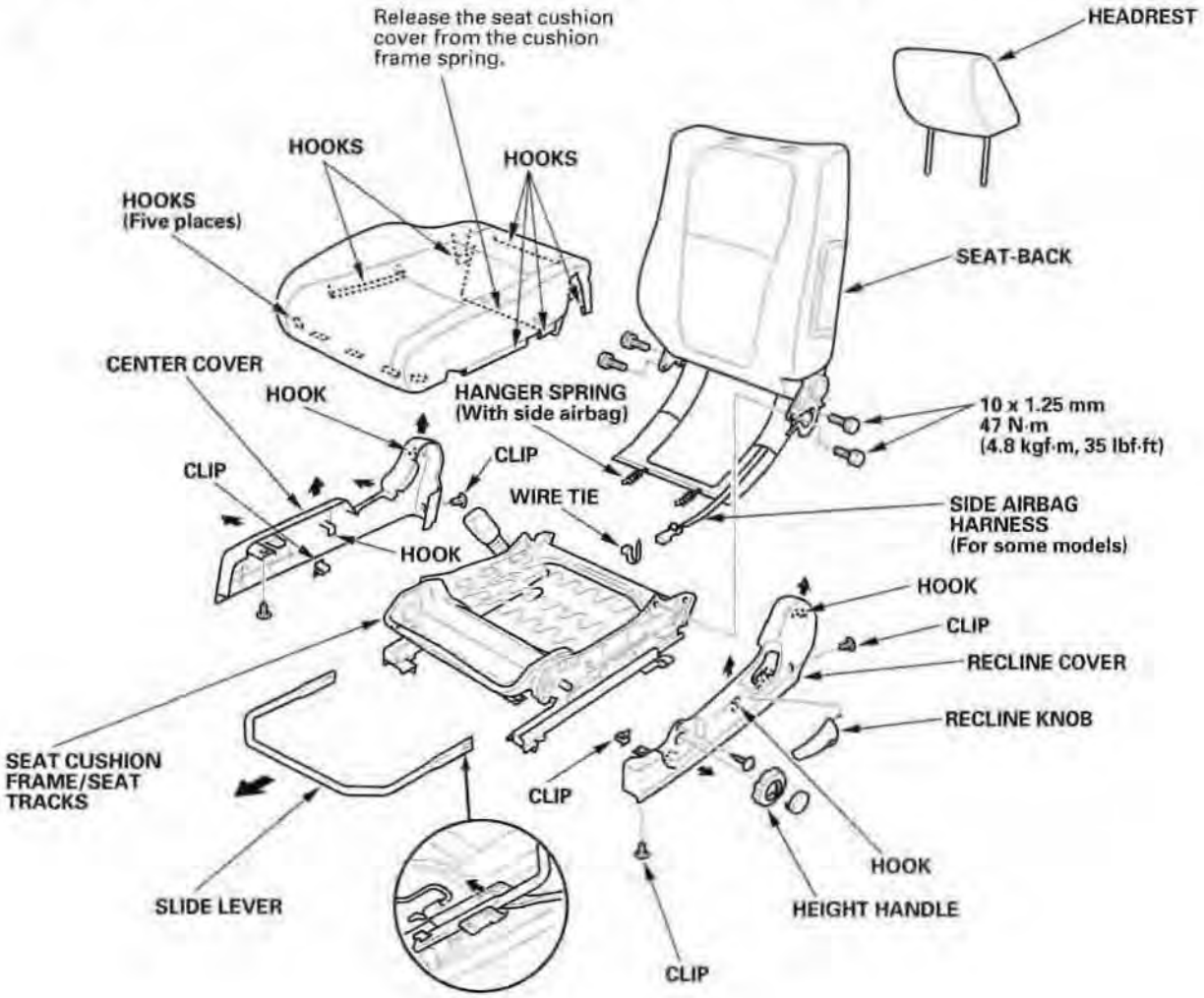
▶: Bolt, 4

Front Seat Disassembly/Reassembly - Driver's Seat

Special Tools Required
KTC trim tool set SOJATP2014

For some models: SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- For seat cushion removal and installation procedures, refer to Front Seat Cover Replacement (see page 20-92).
- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat cushion cover, stretch the material evenly over the pad.

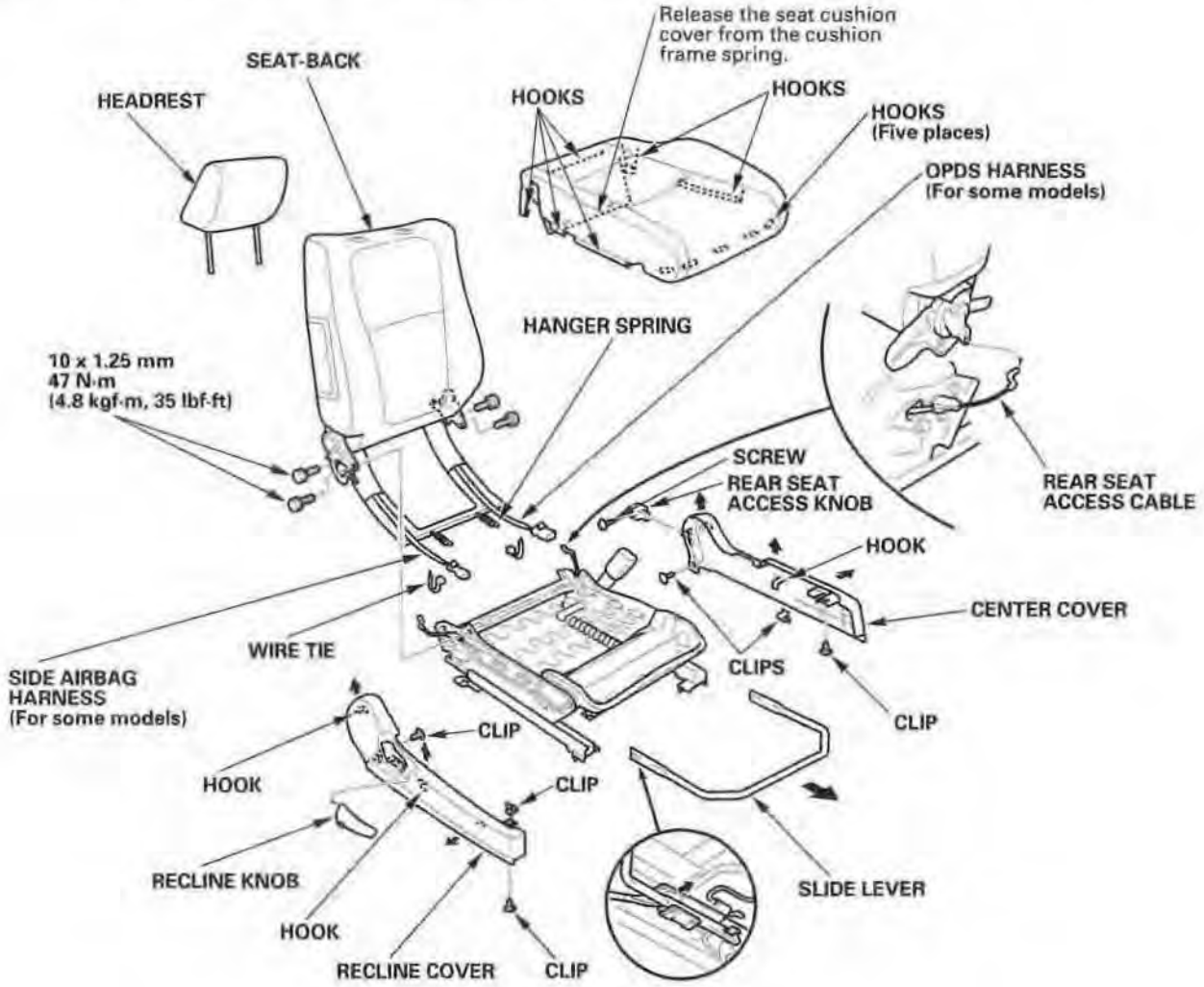


Front Seat Disassembly/Reassembly - Passenger's Seat

Special Tools Required
KTC trim tool set SOJATP2014

For some models: SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- For seat cushion removal and installation procedures, refer to Front Seat Cover Replacement (see page 20-92).
- Apply multipurpose grease to the moving portion of the seat track.
- To prevent wrinkles in the seat cushion cover, stretch the material evenly over the pad.



Front Seat Armrest Replacement - Driver's Seat

'03 Model

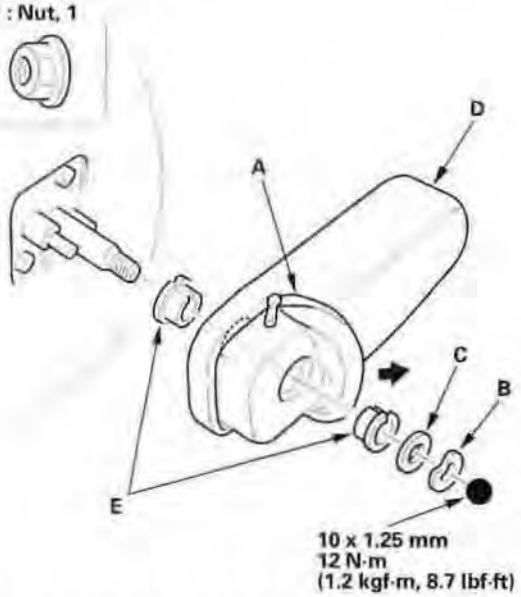
NOTE: Take care not to tear the seams or damage the seat covers.

For Some Models

1. Unzip the armrest cover (A), and pull back the armrest cover.

Fastener Location

● : Nut, 1

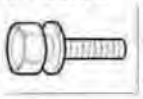


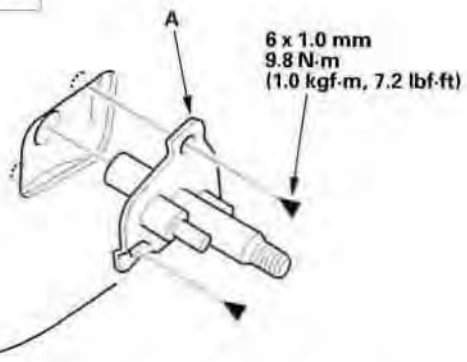
2. Remove the nut, the wave washer (B), and the washer (C), then remove the armrest (D). If necessary, remove the bushings (E) from the armrest.

3. Remove the bolts, then remove the armrest bracket (A).

Fastener Locations

▶ : Bolt, 2





4. Install the armrest in the reverse order of removal, and note these items:

- Apply liquid thread lock to the threads on the armrest bracket.
- Install the armrest cover so that when the zipper is closed, the zipper pull is under the armrest.

Front Seat Armrest Replacement - Driver's Seat/Passenger's Seat

'04-05 Models

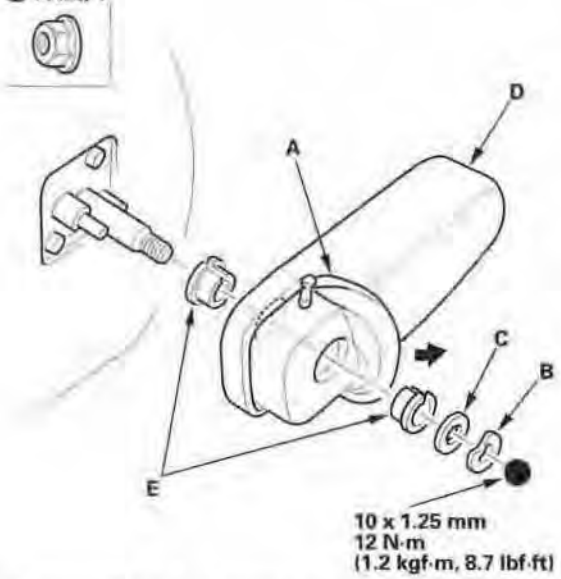
NOTE: Take care not to tear the seams or damage the seat covers.

For Some Models

1. Unzip the armrest cover (A), and pull back the armrest cover.

Fastener Location

● : Nut, 1

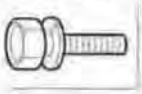


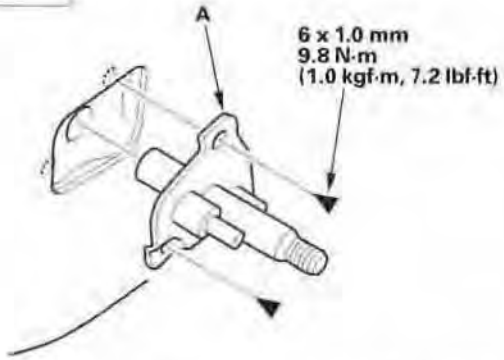
2. Remove the nut, the wave washer (B), and the washer (C), then remove the armrest (D). If necessary, remove the bushings (E) from the armrest.

3. Remove the bolts, then remove the armrest bracket (A).

Fastener Locations

▶ : Bolt, 2





4. Install the armrest in the reverse order of removal.

Front Seat Cover Replacement

For some models: SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

NOTE:
- Take care not to tear the seams or damage the seat covers.
- On the passenger's seat with side airbag, do not touch the OPDS sensor in the seat-back pad, and keep it away from oil. Oil can corrode the sensor causing it to fail.
- Put on gloves to protect your hands.

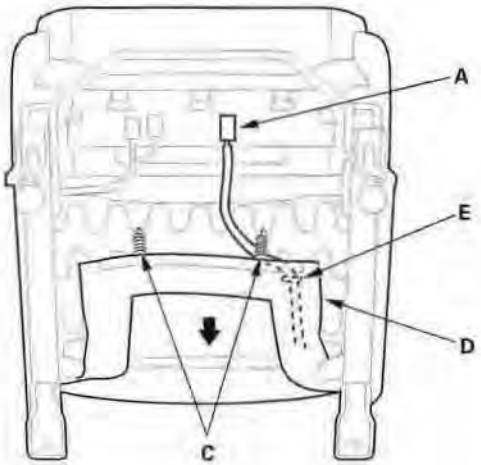
Seat-back Cover

1. Remove the front seat (see page 20-86).

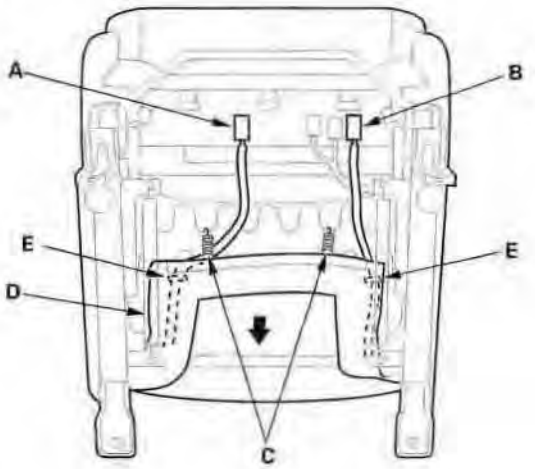
2. Remove the armrest.
   - '03 model (see page 20-90)
   - '04-05 models (see page 20-91)

3. With side airbag: From under the seat cushion, detach the side airbag connector clip (A), and from under the passenger's seat cushion, then detach the OPDS unit connector clip (B). Release the hook springs (C), pull the seat cushion cover (D) back, then remove the harness bands (E).

Driver's



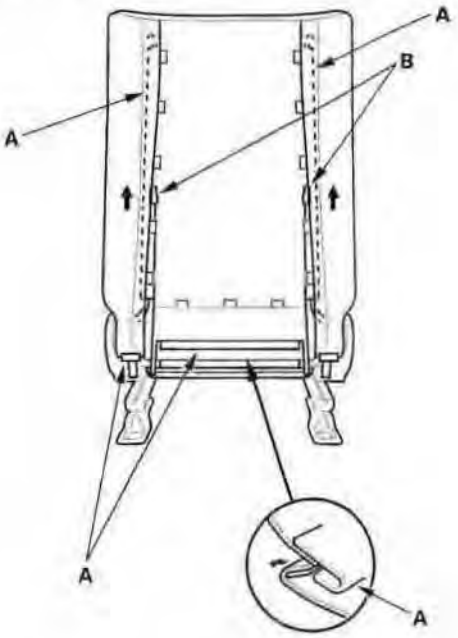
Passenger's



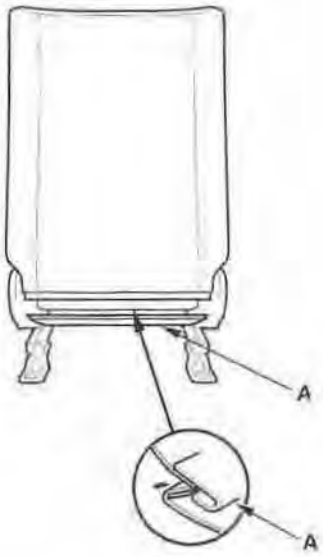
4. Fold the seat-back forward.

5. Release the hooks (A), and with seat-back loops, unzip the seat-back cover (B). It is not necessary to remove a seat-back bungee cord from the loops if the cover will be reinstalled.

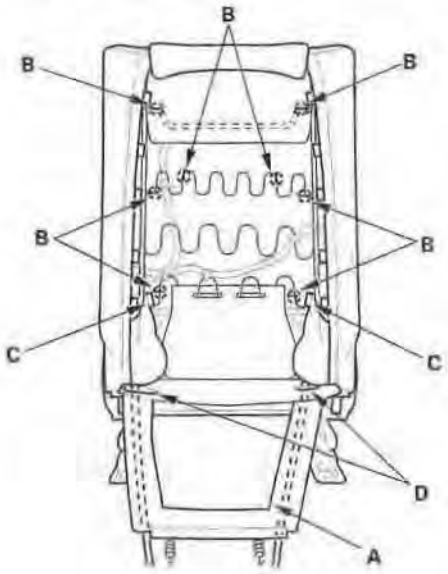
With seat-back loops



Without seat-back loops

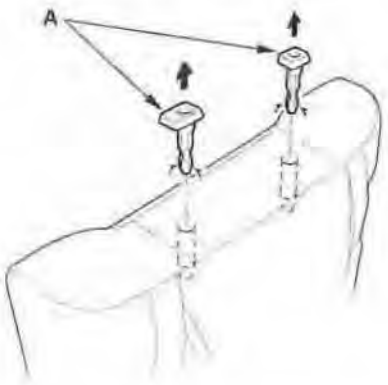


6. Turn over the seat back cover (A), release the inside springs (B) and hooks (C). With side airbag: Pull the side airbag harness and the OPDS harness (passenger's seat) out through a holes (D) in the seat-back cover.



7. With side airbag: Remove the side airbag (see step 4 on page 23-120).

8. Pull out the headrest guides (A) while pinching the end of the guides, and remove them.



9. Pull back the seat-back cover all the way around, then remove it.

10. Install the cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the clips, hooks, and inside springs.
- Make sure the side airbag harness and seat subharness (passenger's seat) are routed properly.
- For some models: reinitialize the OPDS control unit (see page 23-24).

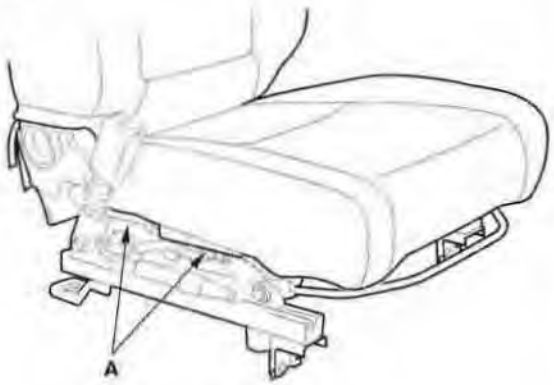
(cont'd)

Front Seat Cover Replacement (cont'd)

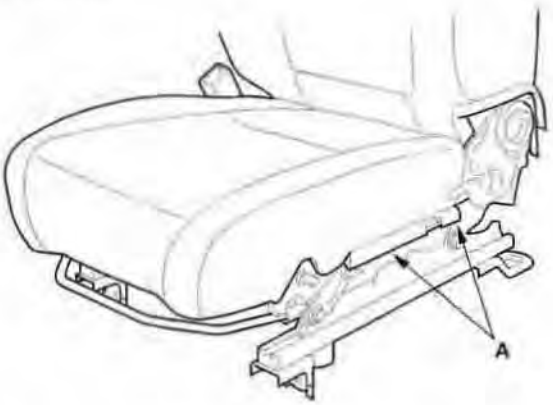
Seat Cushion Cover

1. Remove the front seat (see page 20-86).
2. Remove these items from the front seat:
   - Recline cover, driver's seat (see page 20-88), passenger's seat (see page 20-89)
   - Center cover, driver's seat (see page 20-88), passenger's seat (see page 20-89)
3. With side airbag: From under the seat cushion, detach the side airbag connector clip, and from under the passenger's seat, disconnect the OPDS harness connector, and detach the clips. Release the hook springs from the seat cushion frame spring, then pull the cover back, and remove the harness bands.
4. Release the hooks (A).

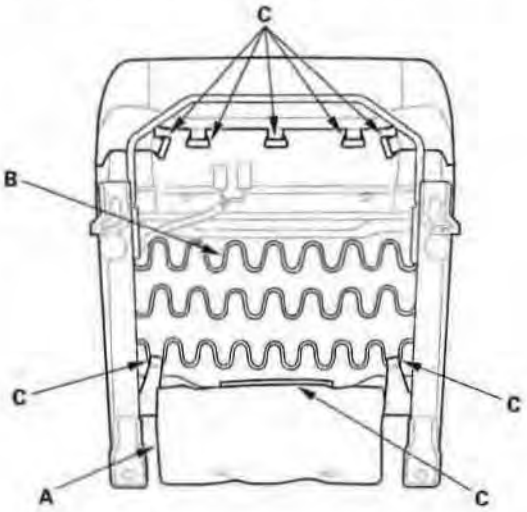
Inside



Outside

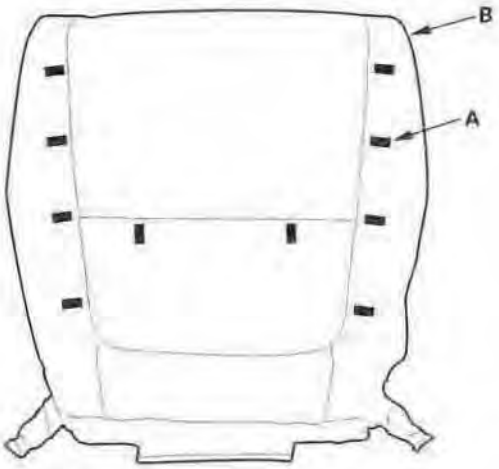


5. From under the seat cushion, release the seat cushion cover (A) from the seat cushion frame spring (B), and release the hooks (C).



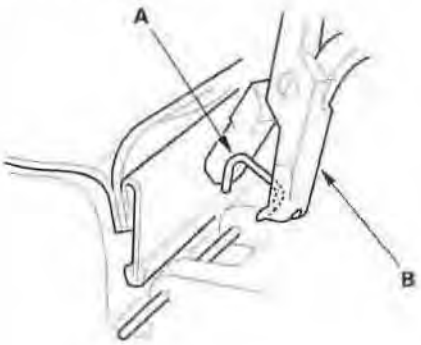
6. Remove the seat cushion cover (A) with the seat cushion pad from the seat cushion frame.

7. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover (B).



8. Install the cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
- Make sure the side airbag harness and seat subharness (passenger's seat) are routed properly.
- Replace any clips you removed with new ones (A). Install them with commercially available upholstery ring pliers (B).

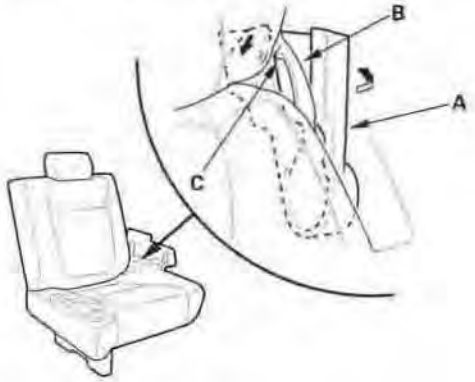


Rear Seat Disassembly/Reassembly

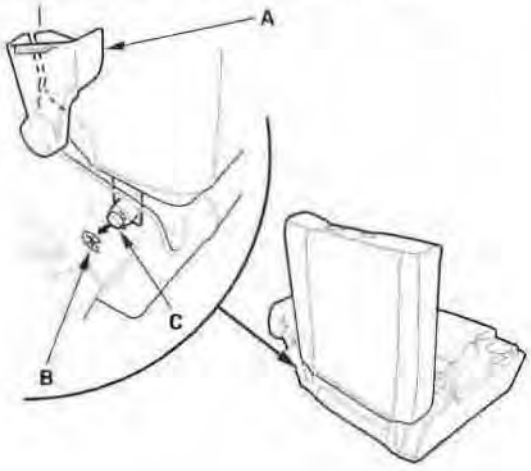
NOTE:
- Put on gloves to protect your hands.
- Take care not to tear the seams or damage the seat covers.

Seat-back Removal/Installation

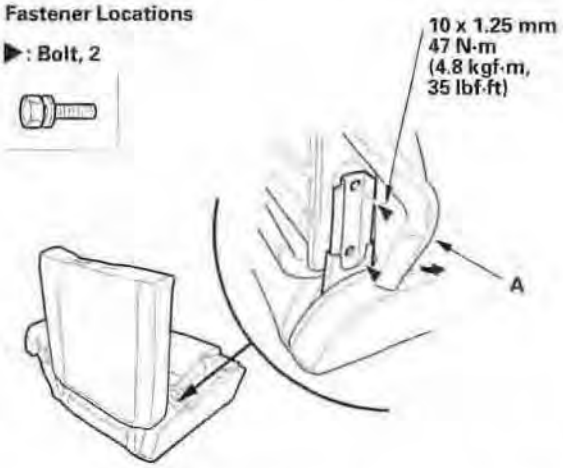
1. Fold the seat-back rearward.
2. Pull the pivot bracket cover (A) away from the pivot bracket (B), and release the hooks (C).



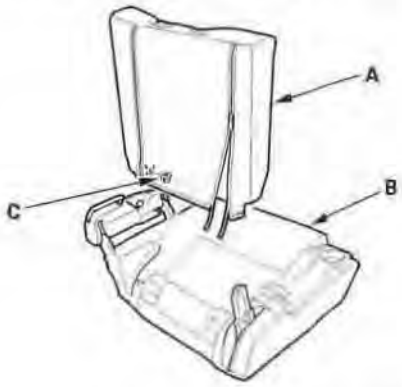
3. Fold the seat-back forward.
4. Remove the pivot bracket cover (A), and remove the E clip (B) from the center pivot (C).



5. Release the hook strip, and with seat-back loops, unzip the seat-back cover (see step 3 on page 20-100), then pull back the cover.
6. Pull back the seat-back pad (A), and remove the bolts.



7. Remove the seat-back (A) from the seat cushion (B). If necessary, remove the bushing (C).



8. Install the seat-back in the reverse order of removal, and note these items:
   - To prevent wrinkles in the seat-back cover, make sure the material is stretched evenly over the pad before securing the hook strips.
   - Replace the bushing and E clip.

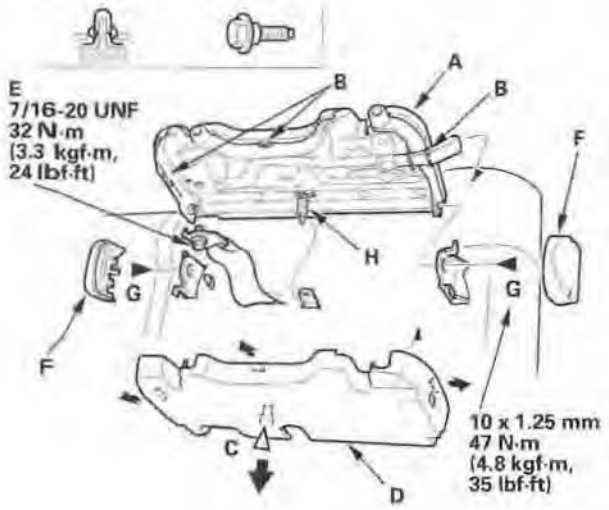
Seat Support Removal/Installation

1. Remove the seat support (A).

   -1 Release the hooks (B), and detach the clip (C), then remove the inner support cover (D).
   -2 Remove the rear seat belt buckle center anchor bolt (E).
   -3 Remove the support bracket covers (F) from both sides.
   -4 Remove the bolts (G).
   -5 Release the support spring (H).

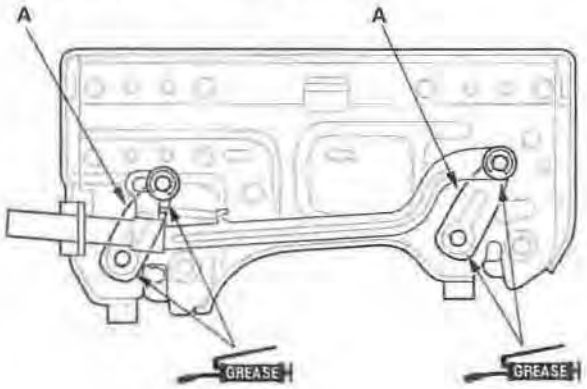
Fastener Locations

C▷: Clip, 1 G▶: Bolt, 2



2. Install the seat support in the reverse order of removal, and note these items:

   - Apply multipurpose grease to the moving portions of the link (A) as indicated by the arrows.
   - Apply liquid thread lock to the center anchor bolt before reinstallation.
   - Make sure there are no twists or kinks in the seat belt buckle before reinstallation.
   - When installing the inner support cover, slip the strap through the hole in the cover.



(cont'd)

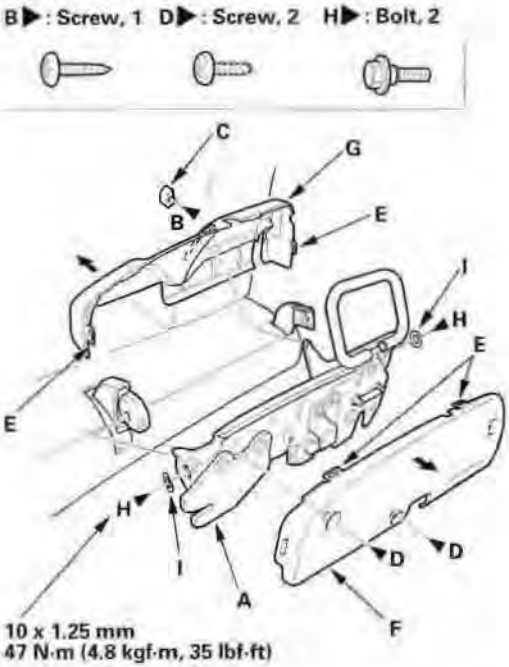
Rear Seat Disassembly/Reassembly (cont'd)

Hinge Lock Removal/Installation

1. Remove the rear seat.
2. Remove the hinge lock (A).
   -1 Remove the screw (B), then remove the knob (C).
   -2 Remove the screws (D), and detach the hooks (E), then remove the outer hinge lock cover (F) and inner hinge lock cover (G).
   -3 Remove the bolts (H) and wave washer (I).

Fastener Locations

B▶: Screw, 1 D▶: Screw, 2 H▶: Bolt, 2



3. Install the hinge lock in the reverse order of removal.

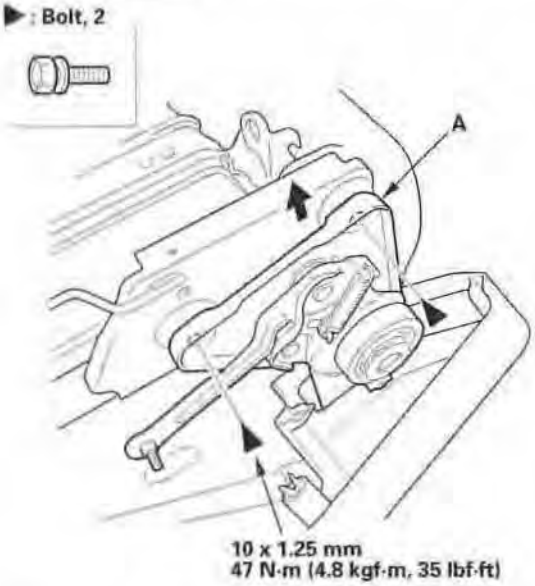
Recline Adjuster Removal/Installation

1. Remove the rear seat.
2. Remove these items from the rear seat:
   - Seat-back
   - Seat support
   - Hinge lock
   - (Latch Child Seat Anchor) cover
3. From under the seat cushion, release the hooks, and pull back the seat cushion cover (see step 3 on page 20-101).
4. Release the hooks from the seat cushion frame (see step 4 on page 20-101).
5. Remove the hook from the hook strap, and pull the hook strap out through the slit in the seat cushion cover (see step 5 on page 20-102).
6. Remove the screw, and pull the strap out (see step 6 on page 20-102).
7. Release the hooks securing the seat cushion cover from the recline cover (see step 7 on page 20-102).
8. Pull back the seat cushion cover. Remove the screw, and pull the recline cover down to release the hook (see step 8 on page 20-102).
9. Remove the nut, then remove the recline strap from the recline adjuster lever (see step 9 on page 20-102).

10. Remove the bolts, then remove the recline adjuster (A).

Fastener Locations

▶: Bolt, 2



11. Install the recline adjuster in the reverse order of removal, and note these items:

- Apply multipurpose grease to the moving portions of the recline adjuster.
- To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hooks.

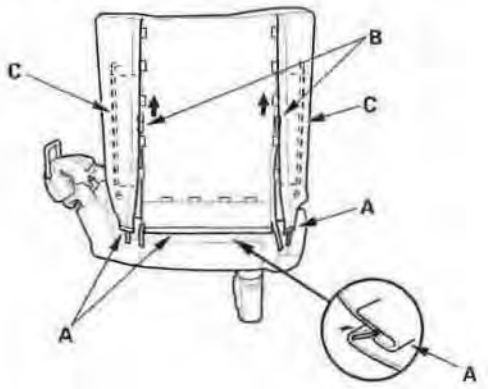
Rear Seat Cover Replacement

NOTE:
- Take care not to tear the seams or damage the seat covers.
- Put on gloves to protect your hands.

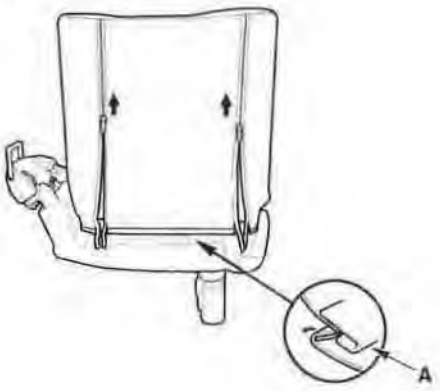
Seat-back Cover

1. Remove the headrest.
2. Fold the seat-back forward.
3. Release the hooks (A), and with seat-back loops, unzip the seat-back cover (B) and release the hooks (C). It is not necessary to remove a seat-back bungee cord from the loops if the cover will be reinstalled.

With seat-back loops

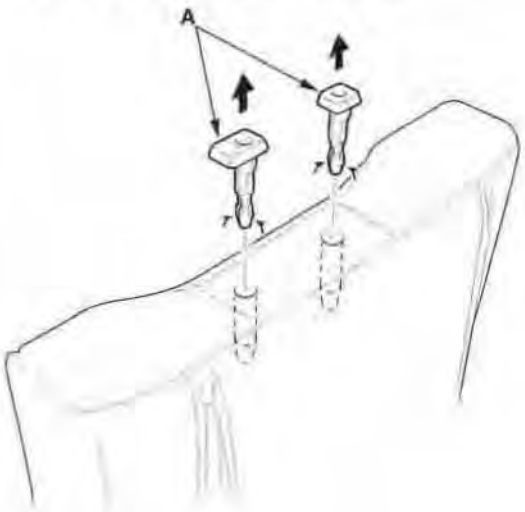


Without seat-back loops



4. Pull back the seat-back cover (A), and release the inside springs (B).

5. Pull out the headrest guides (A) while pinching the end of the guides, and remove them.



6. Pull back the edge of the seat-back cover (A) all the way around, then release all of the clips (B).

7. Remove the seat-back cover.

8. Install the seat-back cover in the reverse order of removal, and note these items:

   - To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the hook, inside spring, and clips.
   - Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).

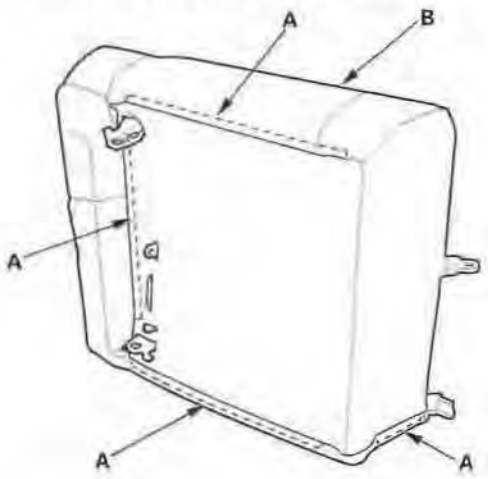
Seat Cushion Cover

1. Remove the rear seat.

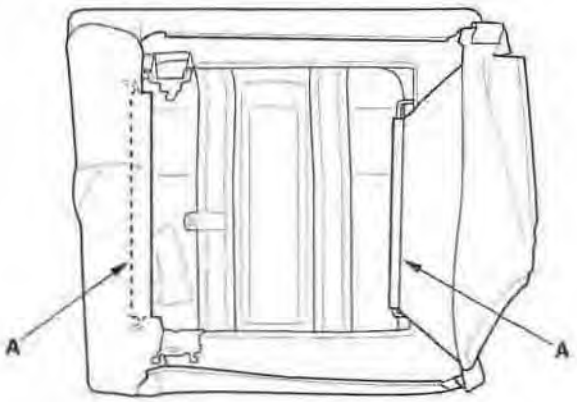
2. Remove these items from the rear seat:

   - Seat-back (see step 1 on page 20-96)
   - Seat support (see step 1 on page 20-97)
   - Hinge lock (see step 2 on page 20-98)
   - (Latch Child Seat Anchor) cover, both sides

3. From under the seat cushion, release the hooks (A), and pull back the seat cushion cover (B).



4. Release the hooks (A) from the seat cushion frame.



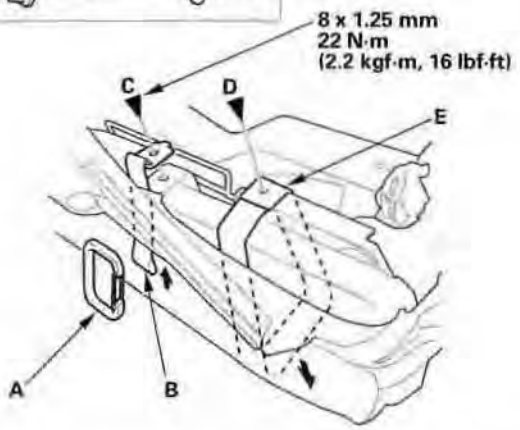
(cont'd)

Rear Seat Cover Replacement (cont'd)

5. Remove the hook (A) from the hook strap (B), and pull the hook strap out through the slit in the seat cushion cover. If necessary, remove the bolt (C), then remove the hook strap.

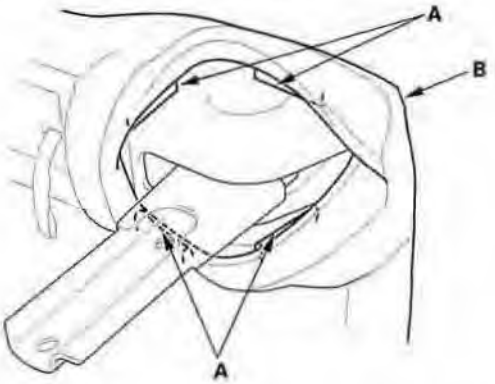
Fastener Locations

C▶: Bolt, 1 D▶: Screw, 1



6. Remove the screw (D), and pull the strap (E) out.

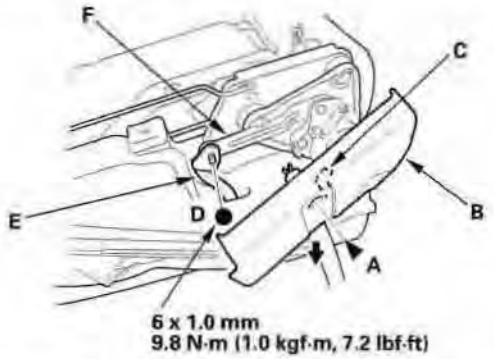
7. Release the hooks (A) securing the seat cushion cover (B) from the recline cover.



8. Pull back the seat cushion cover. Remove the screw (A), and pull the recline cover (B) down to release the hook (C).

Fastener Locations

A▶: Screw, 1 D●: Nut, 1

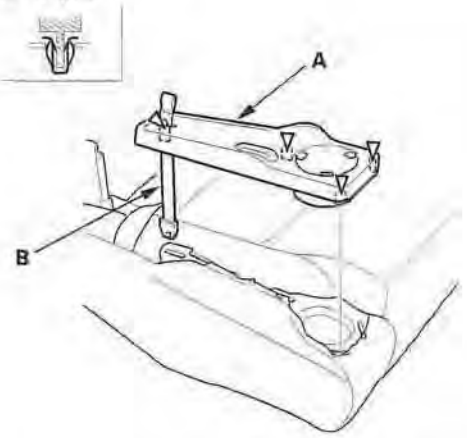


9. Remove the nut (D), then remove the recline strap (E) from the recline adjuster lever (F).

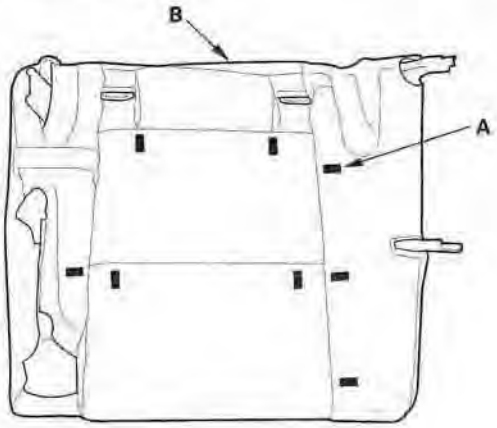
10. Pull up on the center tray (A) to detach the clips, then remove the tray with the recline strap (B).

Fastener Locations

▷: Clip, 4

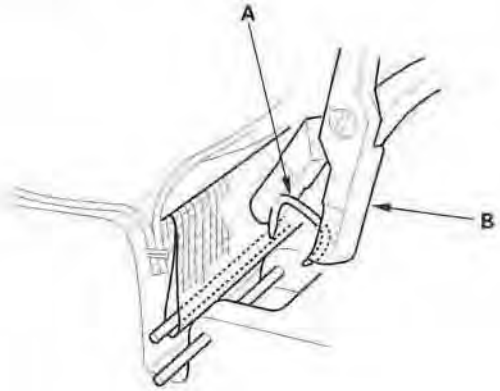


11. Pull back the edge of the seat cushion cover all the way around, and release the clips (A), then remove the seat cushion cover (B).



12. Install the seat cushion cover in the reverse order of removal, and note these items:

- To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips and hooks.
- Replace any clips (A) you removed with new ones using commercially available upholstery ring pliers (B).

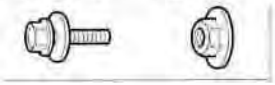


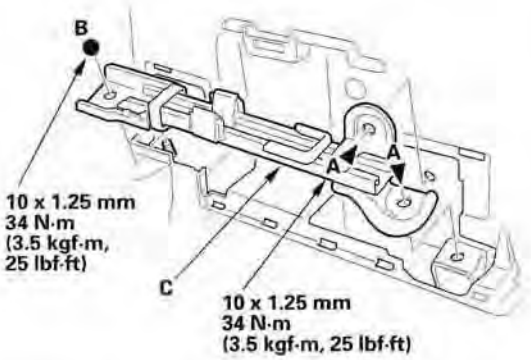
Rear Seat Striker Replacement

1. Remove the rear seat.
2. Remove the bolts (A) and nut (B), then remove the seat striker (C).

Fastener Locations

A▶ : Bolt, 2 B● : Nut, 1





3. Install the seat striker in the reverse order of removal.

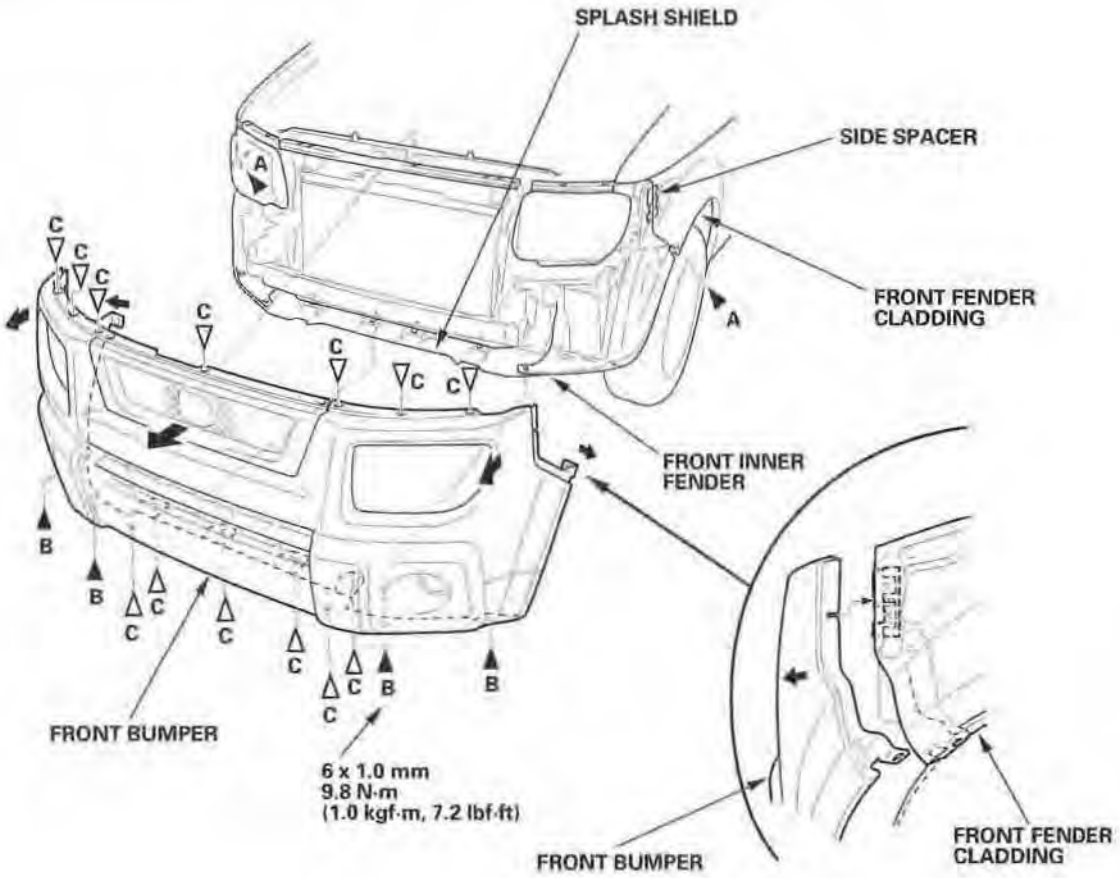
Front Bumper Removal/Installation

NOTE:
- Have an assistant help you when removing and installing the front bumper.
- Take care not to scratch the front bumper and body.
- Put on gloves to protect your hands.

1. Remove the front grille cover (see page 20-119).
2. Remove the front bumper as shown.
3. Install the bumper in the reverse order of removal, and note these items:
   - Make sure the front bumper engages the hooks of the side spacers and the front claddings on both sides securely.
   - Replace any damaged clips.

Fastener Locations

A ▶ : Screw, 2 B ▶ : Bolt, 4 C ▷ : Clip, 13

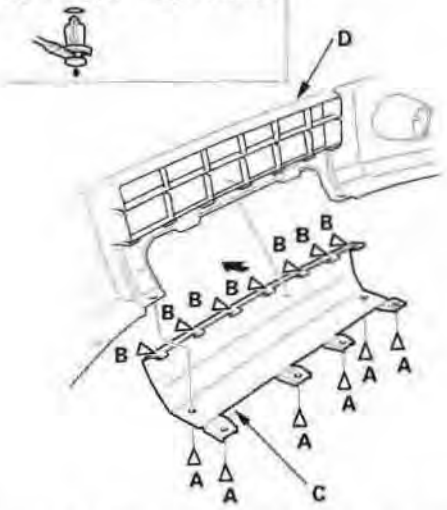


Front Bumper Trim Replacement

1. Remove the clips (A), and release the hooks (B), then remove the front bumper trim (C) from the front bumper (D) by pulling it out. Take care not to scratch the front bumper.

Fastener Locations

A▷: Clip, 6 B▷: Hook, 7



2. Install the trim in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Push the hook portions into place securely.

Rear Bumper Removal/Installation

NOTE:
- Have an assistant help you when removing and installing the rear bumper.
- Take care not to scratch the rear bumper and body.
- Put on gloves to protect your hands.

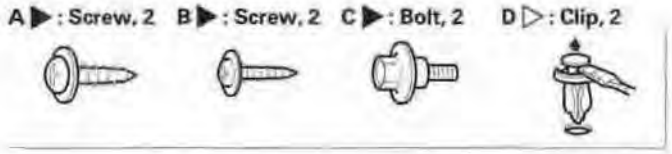
1. Remove the rear bumper as shown.

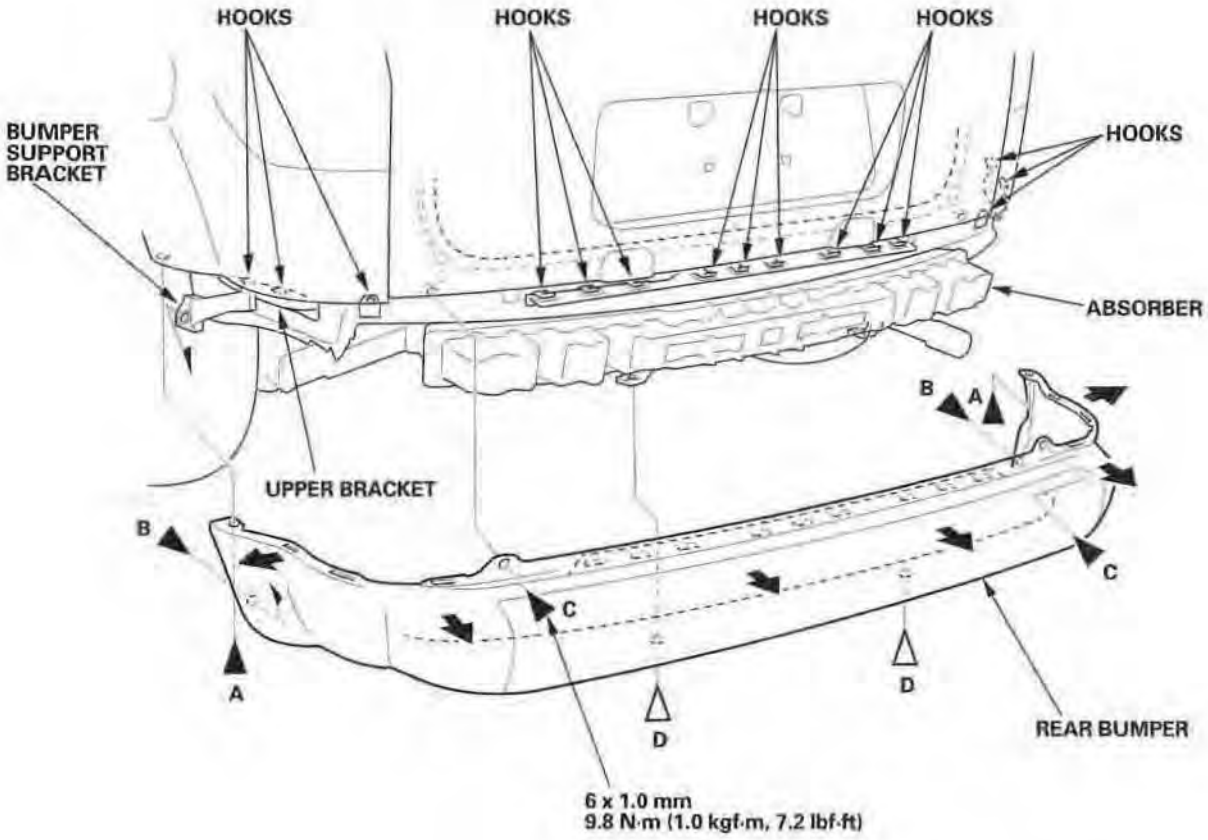
2. Install the bumper in the reverse order of removal, and note these items:

   - Make sure the rear bumper engages the hooks of the side spacers and upper brackets on both sides securely.
   - Replace any damaged clips.

Fastener Locations

A ▶ : Screw, 2 B ▶ : Screw, 2 C ▶ : Bolt, 2 D ▷ : Clip, 2





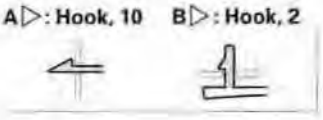
(cont'd)

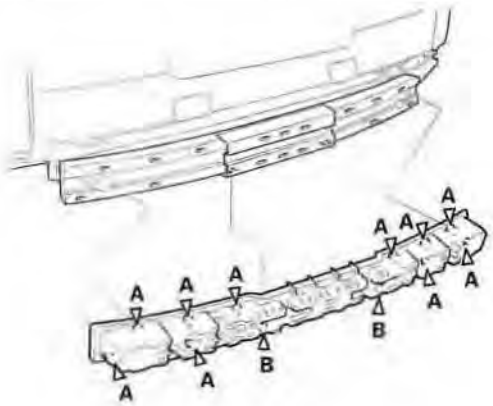
Rear Bumper Removal/Installation (cont'd)

Rear bumper absorber

Fastener Locations

A▷: Hook, 10 B▷: Hook, 2



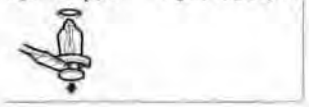


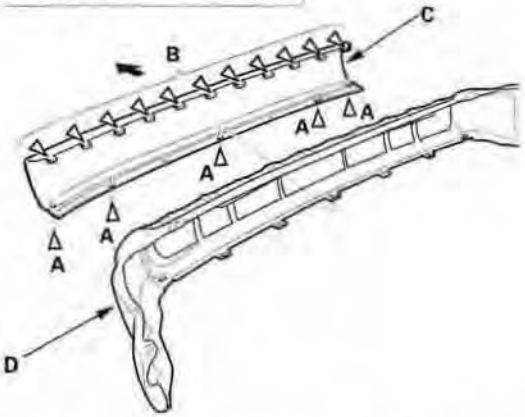
Rear Bumper Trim Replacement

1. Remove the rear bumper (see page 20-107).
2. Remove the clips (A), and release the hooks (B), then remove the rear bumper trim (C) from the rear bumper (D) by pulling it out. Take care not to scratch the rear bumper.

Fastener Locations

A▶: Clip, 5 B▷: Hook, 11

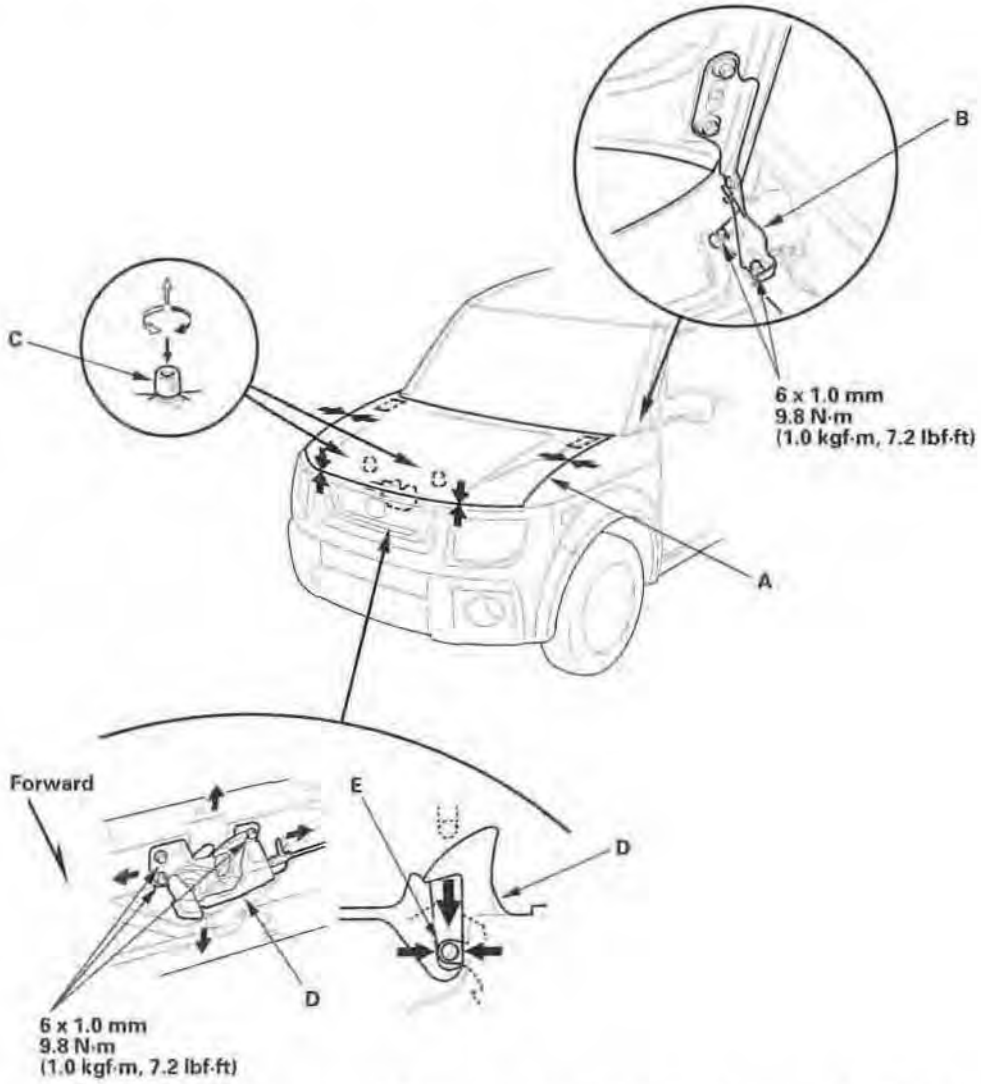




3. Install the trim in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Push the hook portions into place securely.

Adjustment

1. Remove the front grille cover (see page 20-119).
2. Loosen each bolt slightly.
3. Adjust the hood (A) alignment in this sequence:
   - Adjust the hood right and left, as well as forward and rearward, by using the elongated holes on the hood hinge (B).
   - Turn the hood edge cushions (C), as necessary, to make the hood fit flush with the body at the front and side edges.

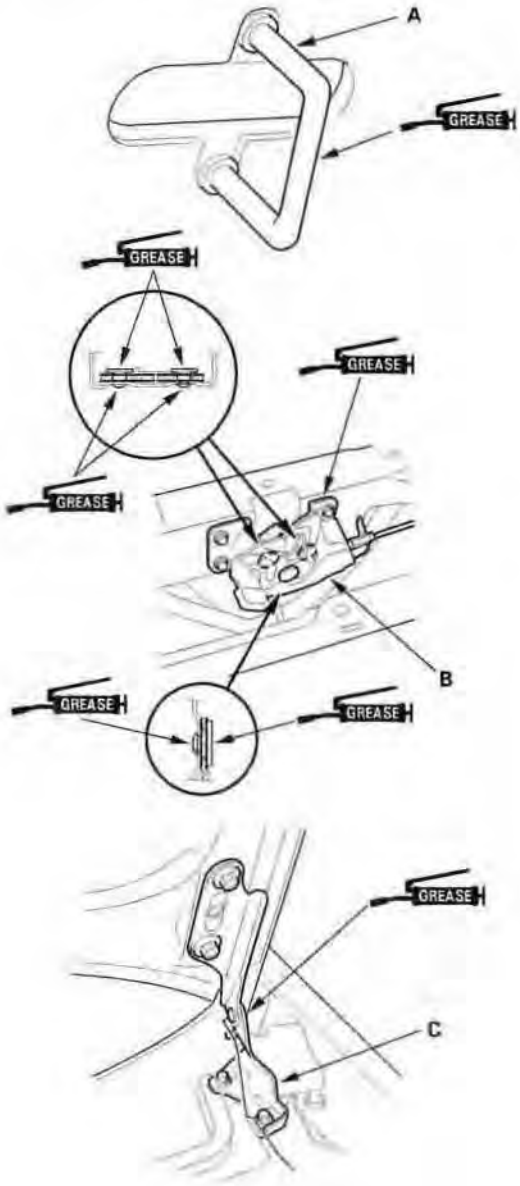


4. Adjust the hood latch (D) to obtain the proper height at the forward edge, and move the hood latch right or left until the striker (E) is centered in the hood latch.
5. Tighten each bolt securely.

(cont'd)

Adjustment (cont'd)

6. Check that the hood opens properly and locks securely.
7. Apply touch-up paint to the hinge mounting bolts and around the hinges.
8. Apply multipurpose grease to the hood striker (A), hood latch (B), and hood hinge (C) as indicated by the arrows.

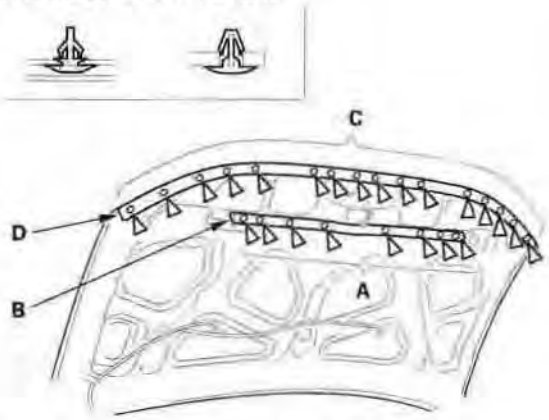


Hood Seal Replacement

1. Using a clip remover, detach the clips (A), then remove the hood seal (B). Detach the clips (C), then remove the hood front seal (D). Take care not to scratch the hood.

Fastener Locations

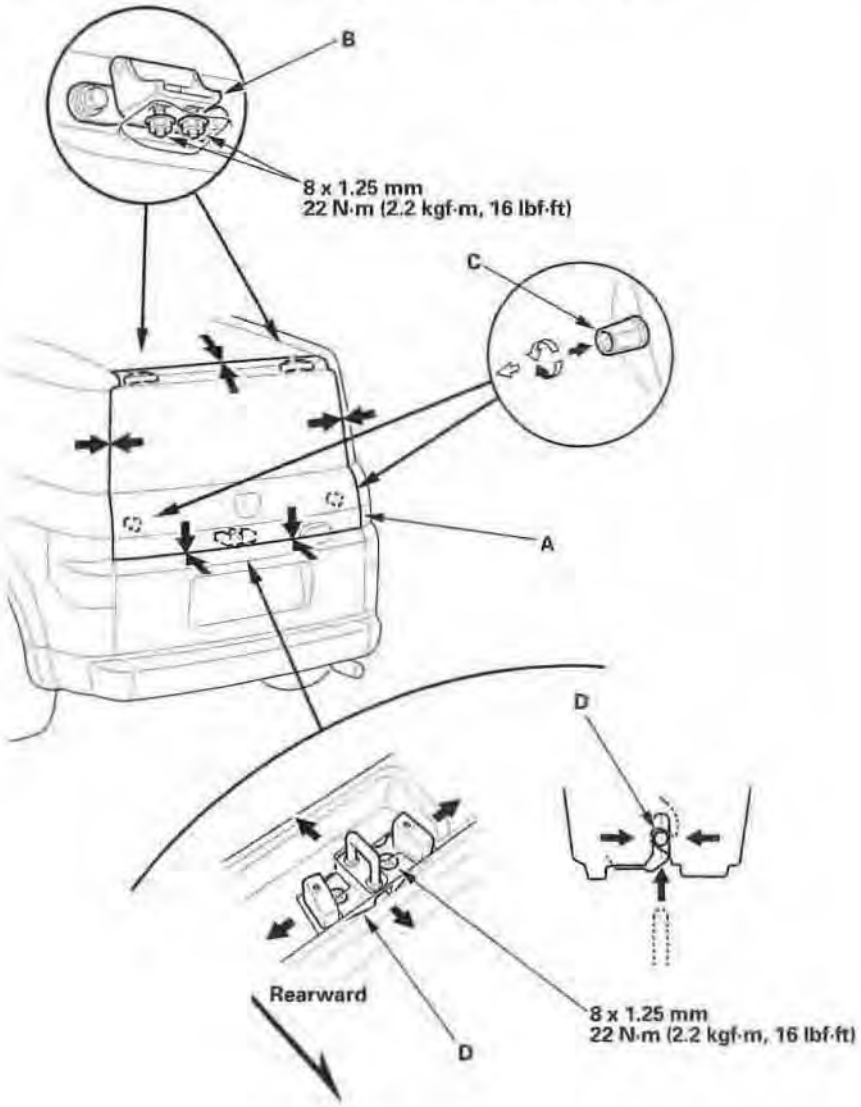
A ▷ : Clip, 8 C ▷ : Clip, 16



2. Install the hood seal and hood molding in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Push the clips into place securely.

Adjustment

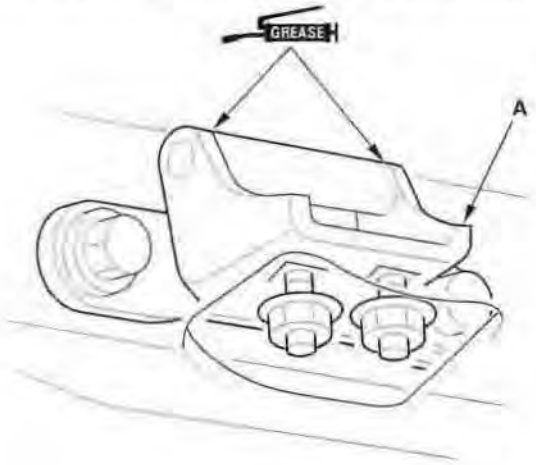
1. Close the tailgate securely.
2. Remove the support strut from each side (see page 20-112).
3. Loosen each bolt slightly.
4. Adjust the hatch (A) alignment in the following sequence:
   - Pull down the rear portion of the headliner (see page 20-65). Take care not to bend the headliner excessively. Adjust the hatch hinges (B) right and left, as well as forward and rearward, using the elongated holes.
   - Turn the hatch edge cushions (C), in or out as necessary, to make the hatch fit flush with the body at the side edges.
   - Adjust the fit between the hatch and hatch opening by moving the striker (D).



(cont'd)

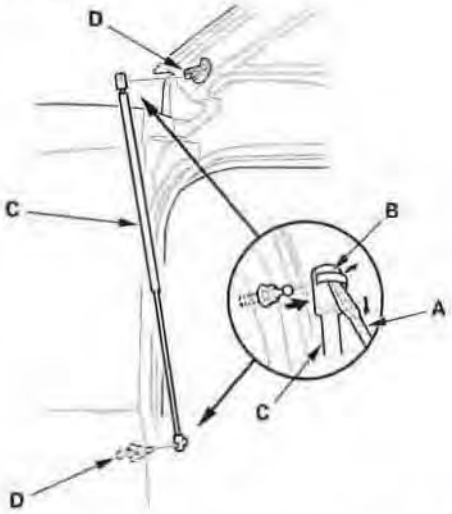
Adjustment (cont'd)

5. Tighten each bolt securely.
6. Check that the hatch opens properly and locks securely.
7. Reinstall the support struts securely.
8. Apply body paint to the hinge mounting nuts and around the hinges.
9. Apply multipurpose grease to the pivot portion of the hatch hinges (A) as indicated by the arrows.



Hatch Support Strut Replacement

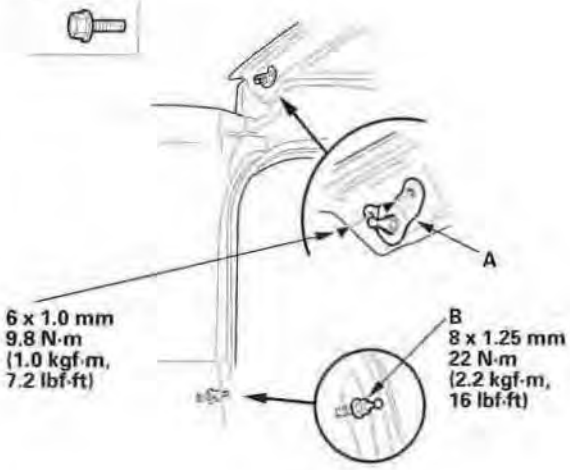
1. With the help of an assistant, use a flat-tip screwdriver (A) to pry the support strut clips (B) from each end of the support strut (C) at the hatch and body, then release the support strut from the pivot bolts (D). Do not remove the clips from the support strut.



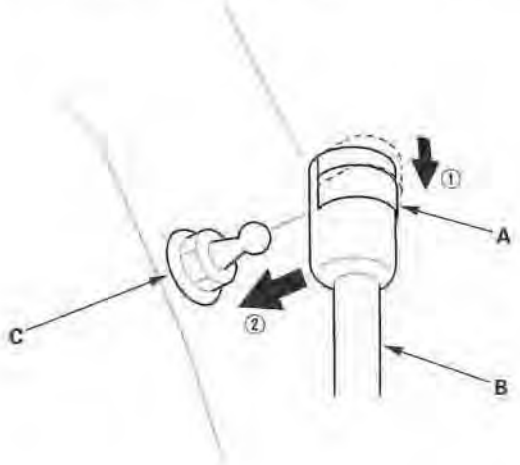
2. Remove the bolts, then remove the bracket (A) from the hatch, and remove the pivot bolt (B).

Fastener Locations

▶: Bolt, 2



3. Set the clips (A) to the original position, then reattach the support strut (B) on the pivot bolts (C) by pushing on the support strut.

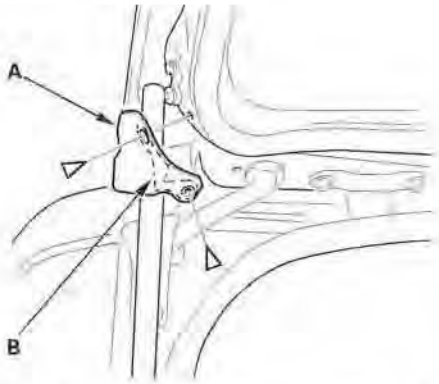


Hatch Upper Molding Replacement

1. Using a clip remover, detach the clips, and pull the hatch upper molding (A) away to release the double-sided adhesive tape (B).

Fastener Locations

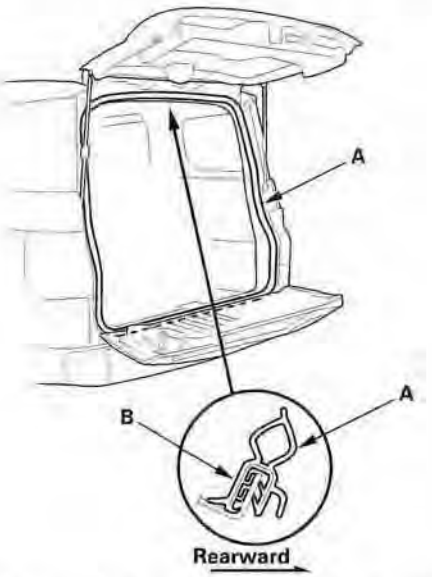
▷: **Clip, 2**



2. Scrape off the remaining double-sided adhesive tape from the hatch, then clean the hatch surface with a sponge dampened in alcohol.
3. Peel off the adhesive backing from the double-sided adhesive tape.
4. Hold the molding up, and align the clip holes in the molding with the mounting holes in the hatch, then install the molding.
5. Install the clips, and push on the adhesive tape portion of the molding securely.

Hatch Weatherstrip Replacement

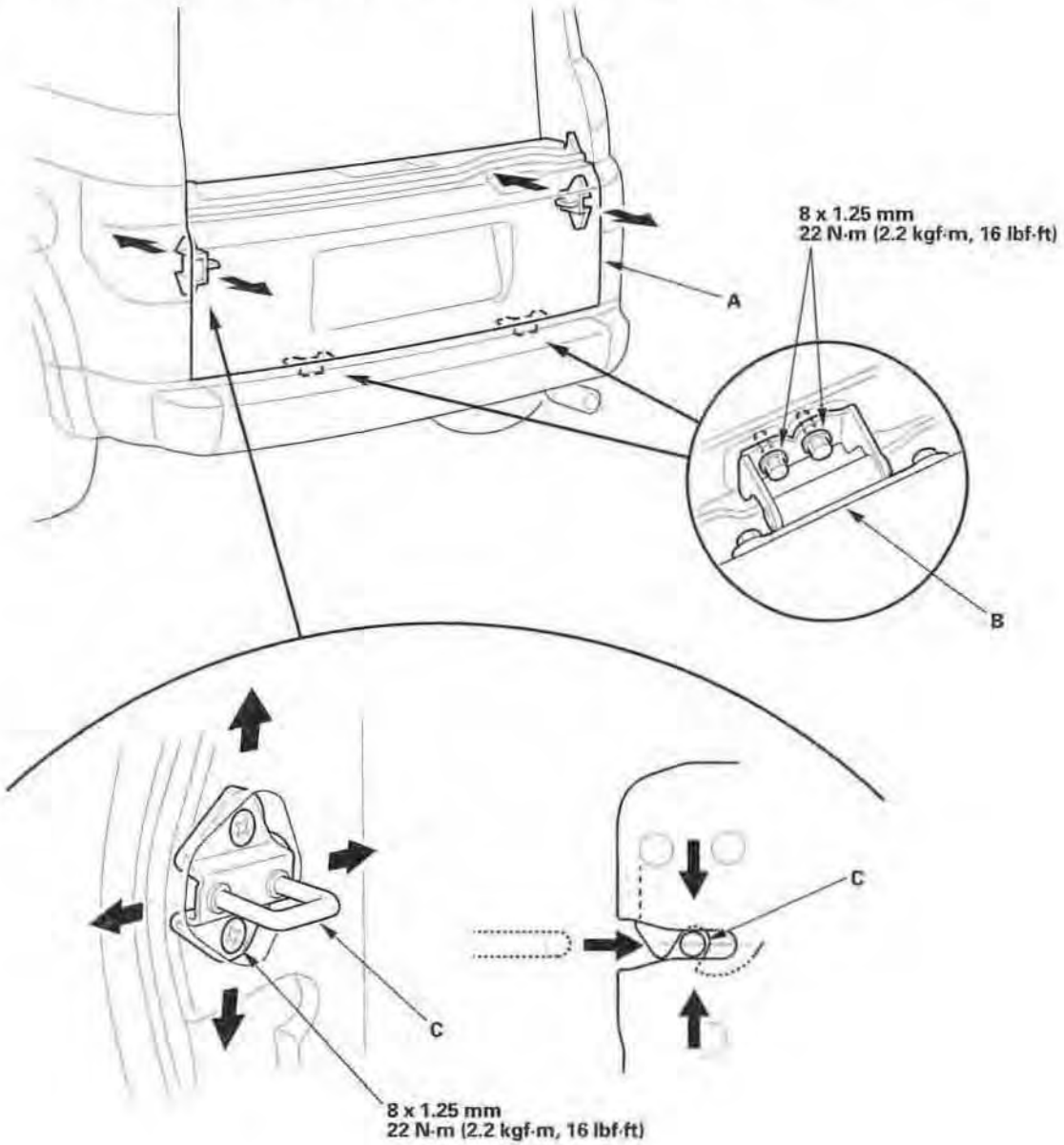
1. Remove the cargo floor lid and trim panel (see page 20-59).
2. Have an assistant help you, remove the tailgate support cables from both sides, and hold the tailgate. Take care not to damage the exterior parts.
3. Remove the hatch weatherstrip (A) by pulling out on it.



4. Locate the painted alignment mark (B) on the hatch weatherstrip. Align the painted mark with the alignment tab in the center of the hatch opening, and install the hatch weatherstrip all the way around in the direction shown. Make sure there are no wrinkles in the weatherstrip.
5. Reinstall the removed parts in reverse order of removal.
6. Check for water leaks.

Adjustment

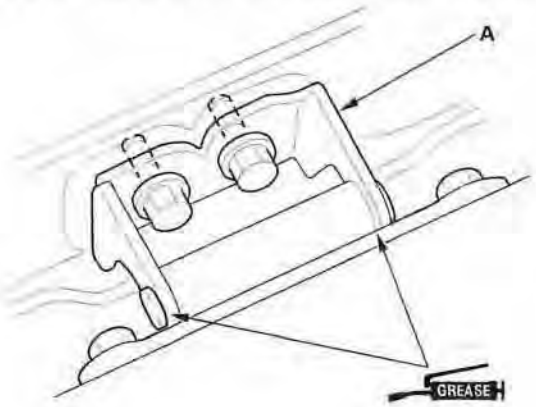
1. Loosen each bolt slightly.
2. Adjust the tailgate (A) alignment in the following sequence:
   - Adjust the tailgate hinges (B) right and left, as well as up and down, using the elongated holes.
   - Adjust the fit between the tailgate and tailgate opening by moving both strikers (C).



(cont'd)

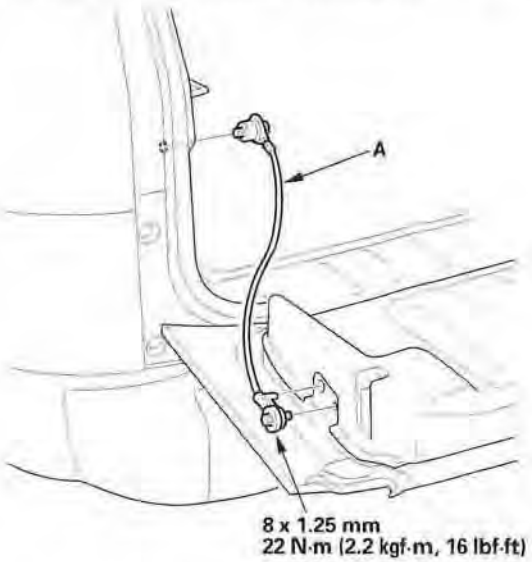
Adjustment (cont'd)

3. Tighten each bolt securely.
4. Check that the tailgate opens properly and locks securely.
5. Check that the tailgate weatherstrip contacts the hatch weatherstrip properly on each side.
6. Apply touch-up paint to the hinge mounting bolts and around the hinges.
7. Apply multipurpose grease to the pivot portion of the tailgate hinges (A) as indicated by the arrows.



Tailgate Support Cable Replacement

1. Close the tailgate half-way, and hold it.
2. Remove the bolts from the body and tailgate, then remove the tailgate support cable (A).

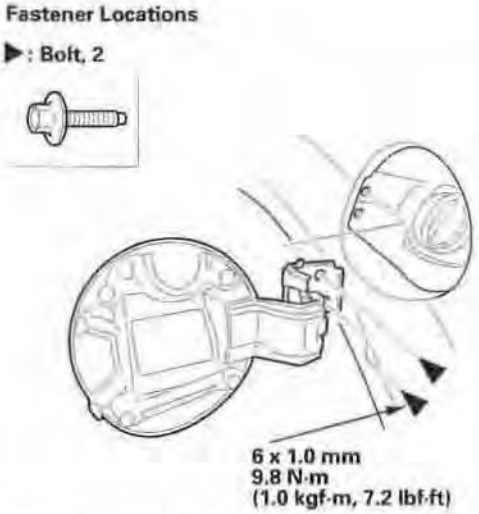


3. Install the support cable in the reverse order of removal.

Fuel Fill Door Removal/Installation

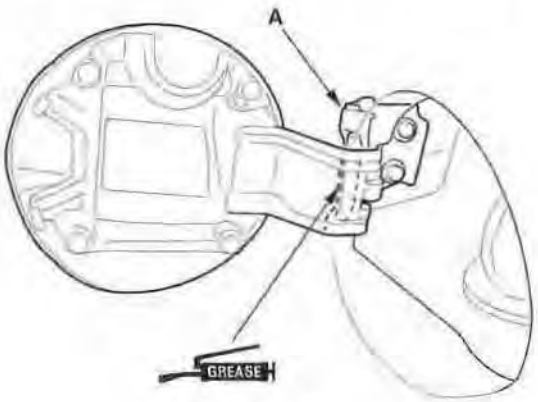
Removal/Installation

1. Remove the bolts, then remove the fuel fill door. Take care not to scratch the rear quarter panel cladding.



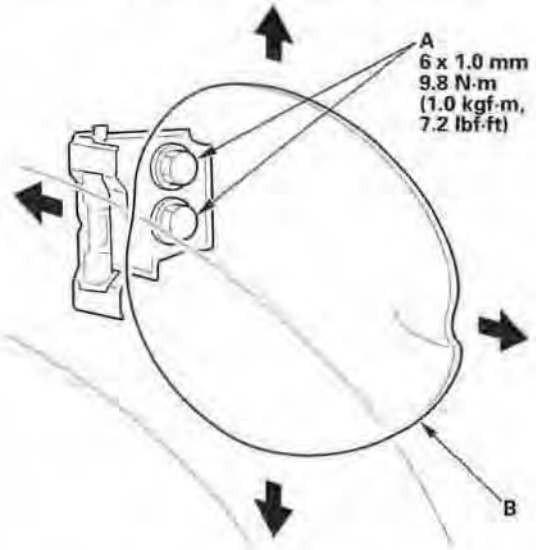
2. Install the fuel fill door in the reverse order of removal, and note these items:

   - Adjust the fuel fill door position alignment.
   - Apply multipurpose grease to the pivot portion of the fuel fill door hinge (A) as indicated by the arrow.



Adjustment

1. Loosen the hinge mounting bolts (A) slightly.



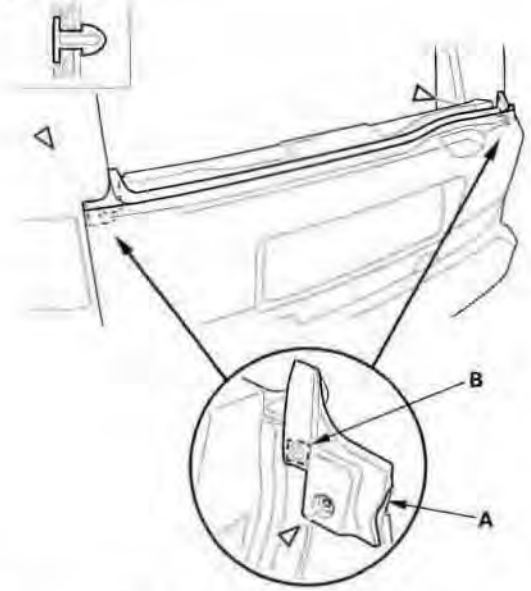
2. Adjust the fuel fill door (B) in or out until it's flush with the body, and up or down as necessary to equalize the gaps.
3. Tighten the hinge mounting bolts.
4. Check that the fuel fill door opens properly and locks securely.

Tailgate Weatherstrip Replacement

1. Open the tailgate half-way, and hold it.
2. On both sides of the tailgate weatherstrip (A), detach the clips with a clip remover, and release the double-sided adhesive tape (B).

Fastener Locations

▷ : **Clip, 2**



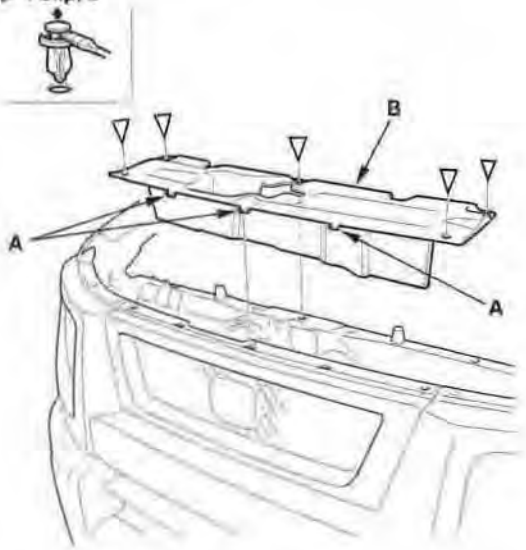
3. Remove the tailgate weatherstrip by pulling out on it.
4. Scrape off the remaining double-sided adhesive tape from the weatherstrip and tailgate, and clean the weatherstrip and tailgate surface with alcohol. Attach the new double-sided adhesive tape (3M 4213, or equivalent) to the weatherstrip.
5. Align the weatherstrip with both edges of the tailgate, and install the weatherstrip along the edge of the tailgate. Make sure there are no wrinkles in the weatherstrip.
6. Install the clips in both sides.
7. Check for water leaks.

Front Grille Cover Replacement

1. Remove the clips, and release the hooks (A), then remove the front grille cover (B). Take care not to scratch the front bumper.

Fastener Locations

▷: Clip, 5



2. Install the grille cover in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Push the hook portions and clips into place securely.

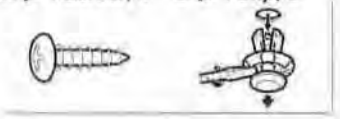
Front Grille Replacement

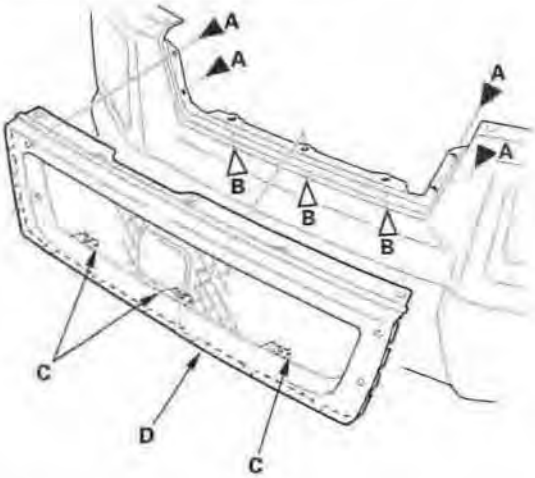
1. Remove the front bumper (see page 20-105).

2. Remove the screws (A), and detach the clips (B), and release the hooks (C), then remove the front grille (D) from the front bumper by pulling it out. Take care not to scratch the front bumper.

Fastener Locations

A ▶: Screw, 4 B ▷: Clip, 3





3. Install the grille in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Make sure the hooks of the grille engage the bumper securely.
- Push the clips into place securely.

Cowl Cover Replacement

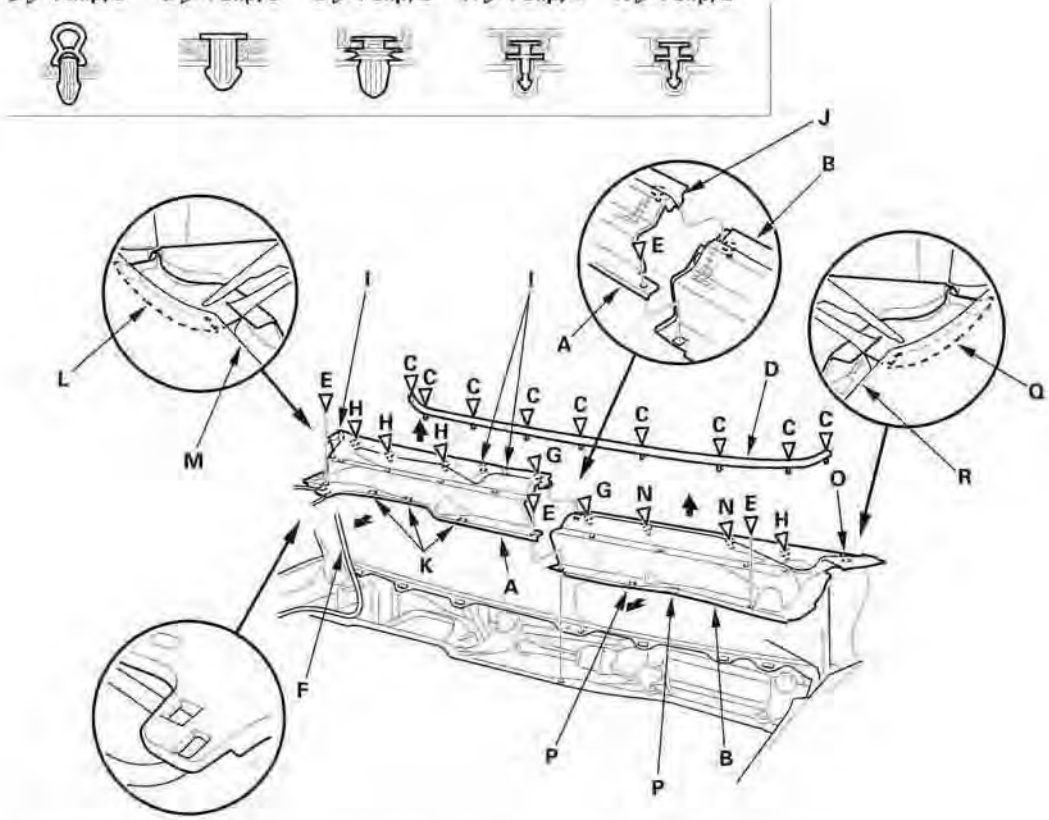
1. Remove the windshield wiper arms (see page 22-171).

2. Remove the passenger's cowl cover (A) and the driver's cowl cover (B). Take care not to scratch the body.

   -1 Using a clip remover, detach the clips (C), then remove the hood rear seal (D).
   -2 Using a clip remover, remove the clips (E) from the cowl covers.
   -3 Release the windshield washer tube (F).
   -4 Detach the clips (G, H) and release the hooks (I, J) by carefully pulling the passenger's cowl cover upward.
   -5 Pull the cover forward to release the hooks (K), and pull the hinge cover (L) out from the front fender (M), then remove the passenger's cowl cover.
   -6 Detach the clips (G, H, N), and release the hook (O) by carefully pulling the driver's cowl cover upward.
   -7 Pull the cover forward to release the hooks (P), and pull the hinge cover (Q) out from the front fender (R), then remove the driver's cowl cover.

Fastener Locations

C ▷ : Clip, 9 E ▷ : Clip, 3 G ▷ : Clip, 2 H ▷ : Clip, 4 N ▷ : Clip, 2



3. Install the cowl covers in the reverse order of removal, and note these items:

   • Replace any damaged clips.
   • Push the clips and hooks into place securely.

A-Pillar Corner Trim Replacement

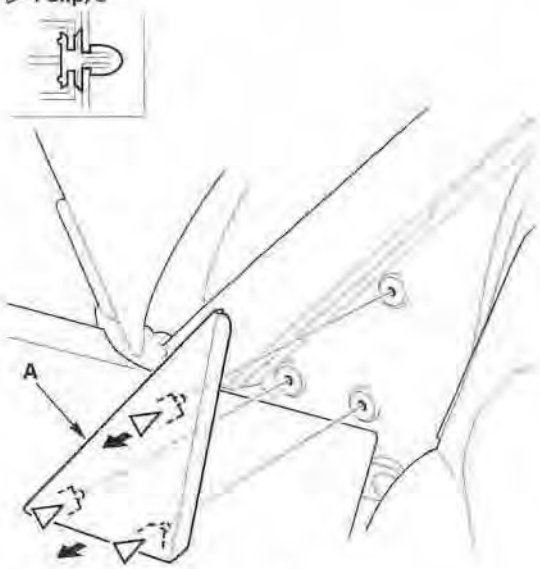
Special Tools Required
KTC trim tool set SOJATP2014

NOTE: Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

1. Open the door.
2. Apply protective tape around the body to prevent damage. Carefully insert the appropriate tool from the KTC trim tool set next to the clips, and detach the clips by prying on the A-pillar corner trim (A). Take care not to scratch the body and related parts.

Fastener Locations

▷: Clip, 3



3. Replace any damaged clips.
4. Hold the trim up, and fit the clips into the holes in the body, then push on the trim until the clips snap into place.

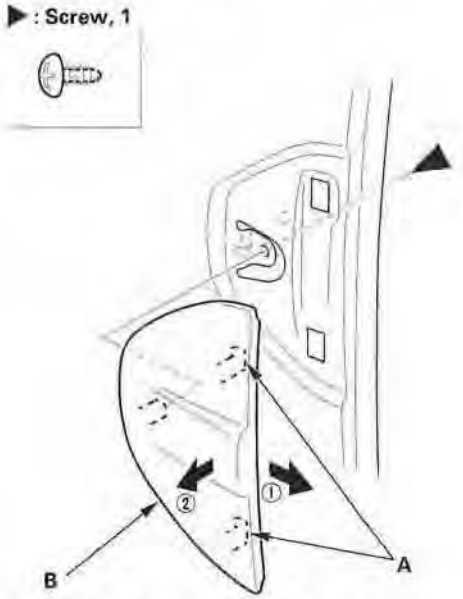
Rear Door Outer Trim Replacement

NOTE:
- Take care not to scratch the body.
- Put on gloves to protect your hands.

1. Remove the rear door panel (see page 20-19).
2. Remove the plastic cover as needed (see page 20-5).
3. Remove the screw, and release the hooks (A) by sliding the rear door outer trim (B) forward, then remove the trim.

Fastener Location

▶: Screw, 1



4. Install the rear door outer trim in the reverse order of removal.

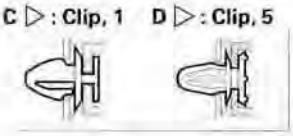
C-Pillar Outer Trim Replacement

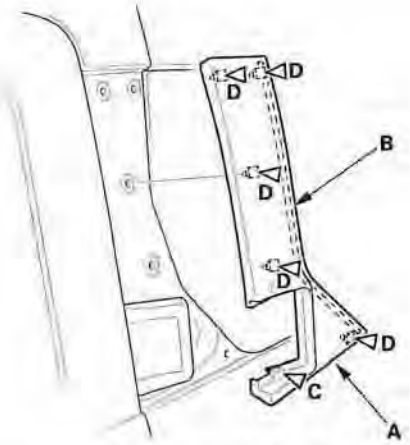
NOTE: Put on gloves to protect your hands.

1. While gently pulling out on the C-pillar outer trim (A), cut the double-sided adhesive tape (B) in the rear edge of the trim.

Fastener Locations

C ▷: Clip, 1 D ▷: Clip, 5





2. Open the rear door. From inside the door, detach the clip (C) with a clip remover.
3. Close the rear door. Detach the clips (D) with a clip remover, then remove the C-pillar outer trim. Take care not to scratch the body and related parts.
4. Scrape off the remaining double-sided adhesive tape from the trim and quarter glass, and clean the trim and quarter glass surface with alcohol. Attach the new double-sided adhesive tape (3M 5392FLR, or equivalent) to the trim.
5. Replace any damaged clips.
6. Hold the trim up, and fit the clips into the holes in the body, then push on the trim until the clips snap into place, and on the double-sided adhesive tape portion to make the adhesive stick securely.

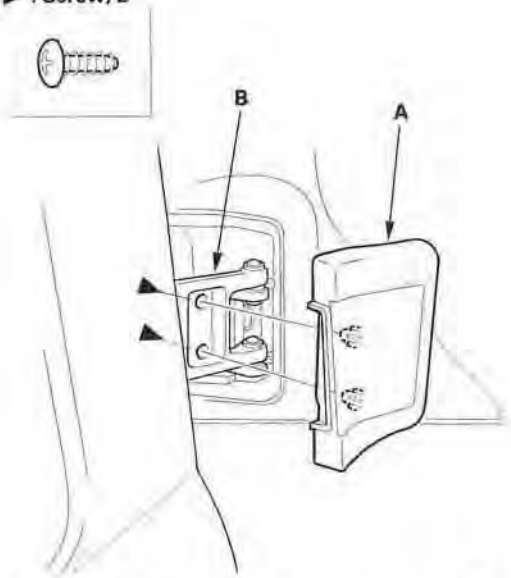
Rear Door Hinge Trim Replacement

NOTE: Take care not to scratch the body.

1. Open the rear door, and remove the screws.
2. Close the rear door half-way, then remove the rear door hinge trim (A) from the rear door upper hinge (B).

Fastener Locations

▶: Screw, 2



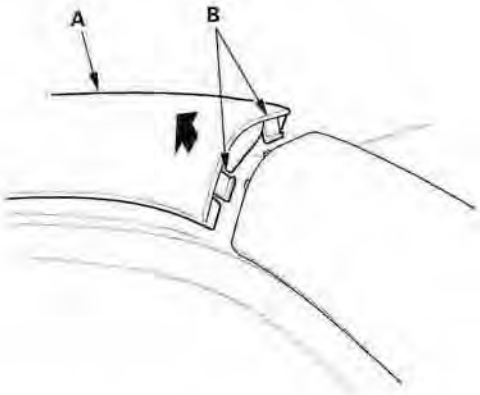
3. Install the hinge trim in the reverse order of removal.

Windshield Side Trim Replacement

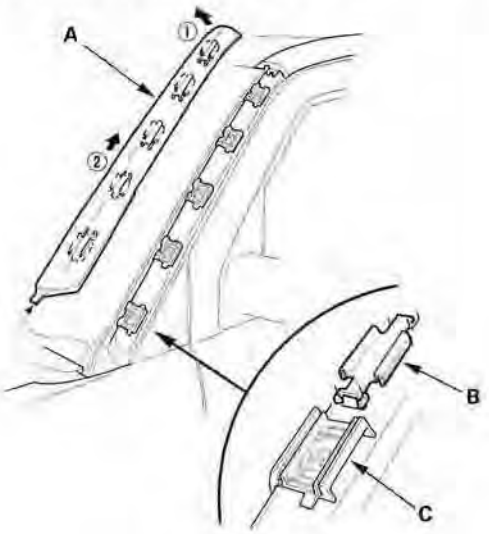
Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.
- Put on gloves to protect your hands.

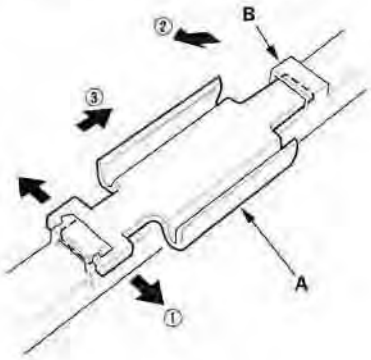
1. Pull the top edge on the windshield side trim (A) up to detach the hooks (B).

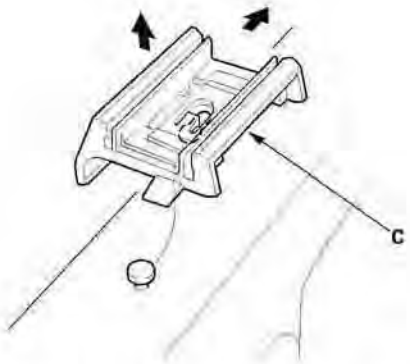


2. Pull the top edge of the trim (A) up, and hold it, then slide the trim rearward along the A-pillar to release the clips (B) in the trim from the retainers (C) on the body. The retainers will stay in the body. Take care not to scratch the other trim and body.

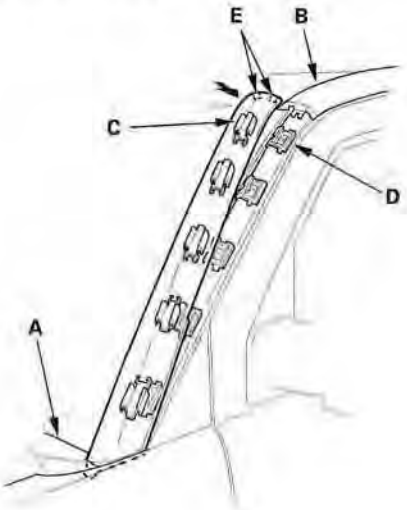


3. Replace the any damaged clips (A) on the trim (B) and the retainers (C) on the body.





4. Hold the trim up, and insert the bottom edge of the trim into the hood hinge cover (A). Align the top edge of the trim with the front edge of the roof side front trim (B), and fit the clips (C) into the retainers (D), then push on the trim until the hooks (E) and clips snap into place.



Roof Side Trim Replacement

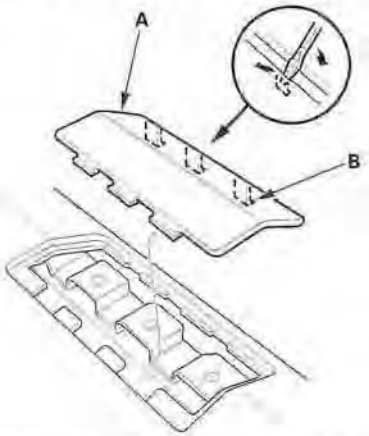
Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

Front Trim

1. Remove these items:
   - Windshield side trim (see page 20-124)
   - Roof side center trim

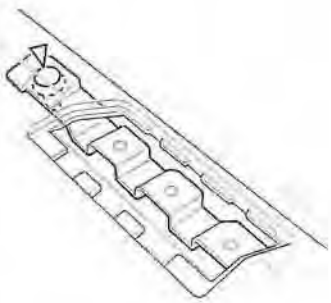
2. Use the appropriate tool from the KTC trim tool set, pry up on the front edge (A) of the roof side front trim to detach the hooks (B).



3. From the front trim lid opening, use a clip remover to detach the clip.

Fastener Location

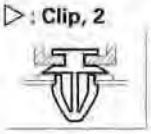
▷: **Clip, 1**

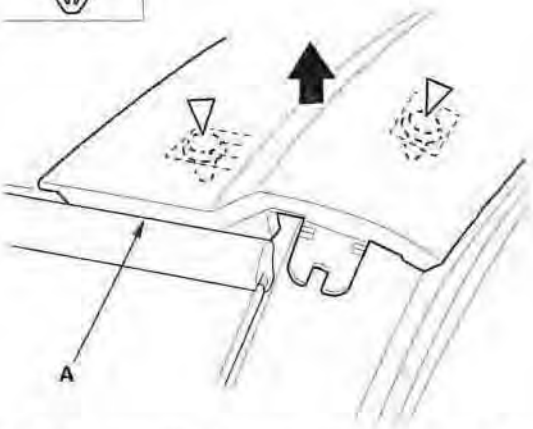


4. Pull the front edge of the roof side front trim (A) up to detach the clips.

Fastener Locations

▷: **Clip, 2**

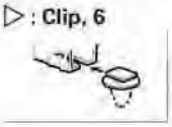


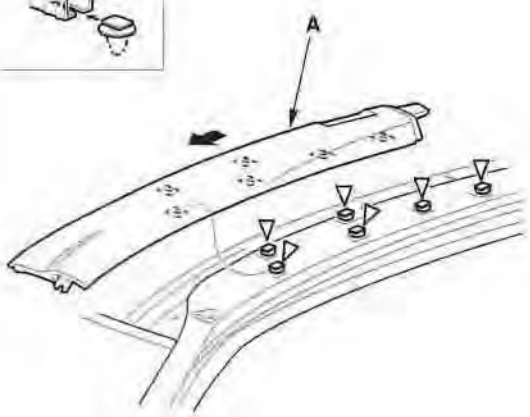


5. Slide the trim (A) forward to release it from the clips, then remove the trim. The clips will stay in the body. Take care not to scratch the body.

Fastener Locations

▷: **Clip, 6**

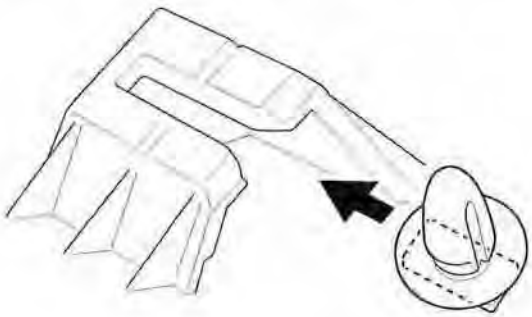




(cont'd)

Roof Side Trim Replacement (cont'd)

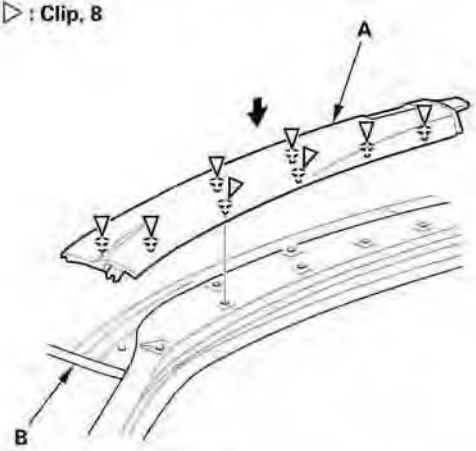
6. Using a clip remover, remove the clips from the body.
7. Replace any damaged clips from the trim and body, then install the clips on the trim.



8. Hold the trim (A) up, and fit the clips into the holes in the body, then push on the trim until the clips snap into place. Take care not to pinch the windshield molding (B).

Fastener Locations

▷ : **Clip, 8**



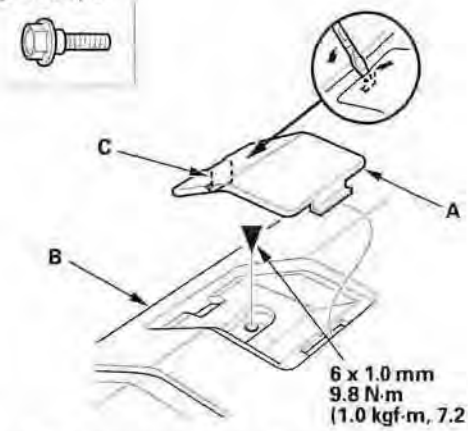
9. Install the front trim lid.

Center Trim

1. Use the appropriate tool from the KTC trim tool set, pry up on the center trim front lid (A) of the roof side center trim (B) to detach the hook (C), and then remove the bolt.

Fastener Location

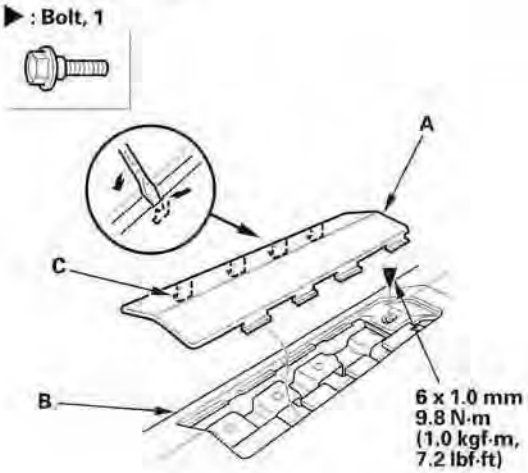
▶ : **Bolt, 1**



2. Use the appropriate tool from the KTC trim tool set, pry up on the center trim rear lid (A) of the roof side center trim (B) to detach the hooks (C), and then remove the bolt.

Fastener Location

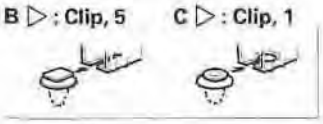
▶ : **Bolt, 1**

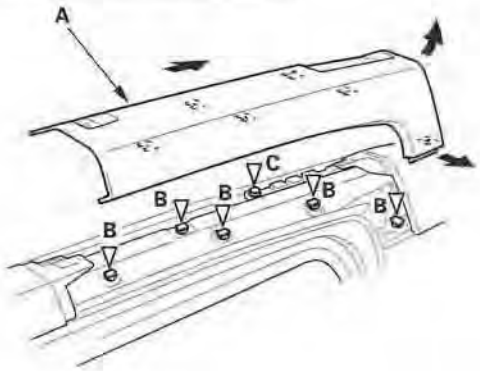


3. Pull the lower rear portion on the roof side center trim (A) out to release it from the clip (B).

Fastener Locations

B ▷: Clip, 5 **C ▷: Clip, 1**

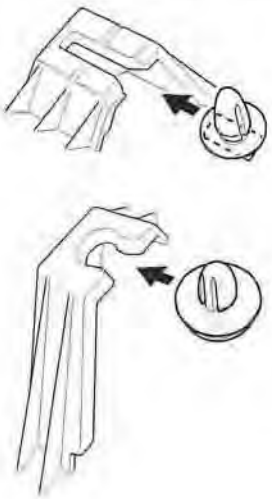




4. Pull the rear edge of the trim up, and hold it. Slide the trim rearward to release it from the clips (B, C). The clips will stay in the body. Take care not to scratch the other trim and body.

5. Using a clip remover, remove the clips from the body.

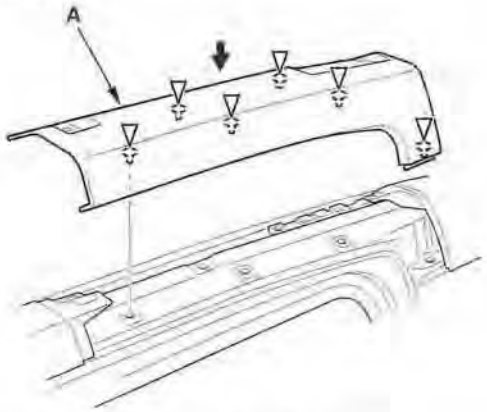
6. Replace any damaged clips, and install them on the trim.



7. Hold the trim (A) up, and fit the clips into the holes in the body, then push on the trim until the clips snap into place.

Fastener Locations

▷: Clip, 6



8. Install the bolts, and install the lids.

(cont'd)

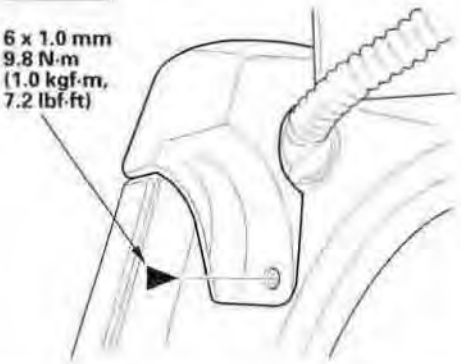
Roof Side Trim Replacement (cont'd)

Rear Trim

1. Remove the center trim rear lid from the roof side center trim, and remove the bolt.
2. Open the hatch, and remove the bolt from the rear portion of the roof side rear trim.

Fastener Location

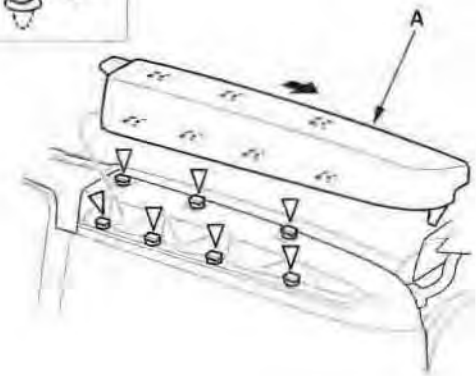
▶: Bolt, 1



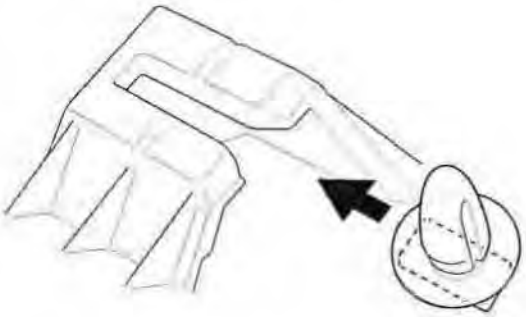
3. Slide the trim (A) rearward to release it from the clips, then remove the trim. The clips will stay in the body. Take care not to scratch the body.

Fastener Locations

▷: Clip, 7



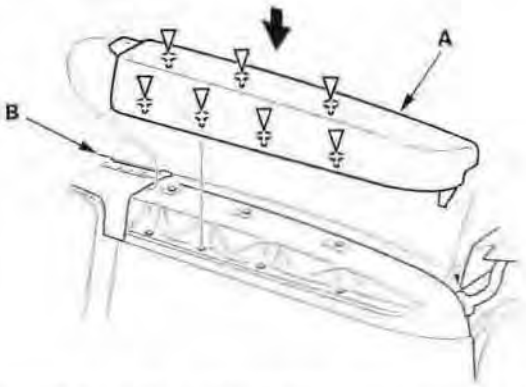
4. Using a clip remover, remove the clips from the body.
5. Replace any damaged clips, and install them on the trim.



6. Insert the front edge of the trim (A) between the roof side center trim (B) and body, and fit the clips into the holes in the body, then push on the trim until the clips snap into place.

Fastener Locations

▷: Clip, 7



7. Install the bolts, and install the center trim rear lid.

Side Sill Panel Replacement

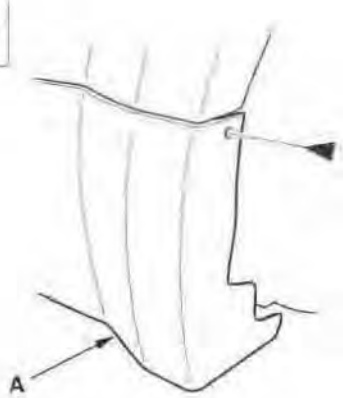
NOTE: Put on gloves to protect your hands.

Removal

1. On the front of the rear wheel arch, remove the screw securing the rear side sill panel (A).

Fastener Location

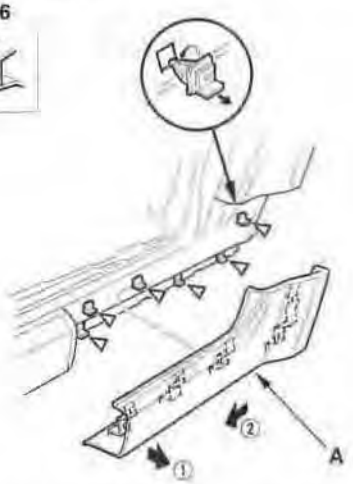
▶: Screw, 1



2. Pull the front edge of the rear side sill panel (A) out, and hold it. Slide the panel forward to release it from the clips, then remove the panel. The clips will stay in the body.

Fastener Locations

▷: Clip, 6

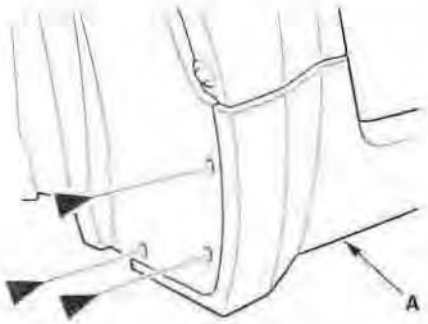


3. Remove the clips from the body by turning them 45 °.

4. On the back of the front wheel arch, remove the screws securing the front side sill panel (A).

Fastener Locations

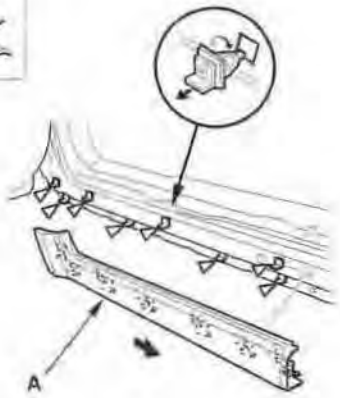
▶: Screw, 3



5. Slide the front side sill panel (A) rearward to release it from the clips, then remove the panel. The clips will stay in the body.

Fastener Locations

▷: Clip, 8



6. Remove the clips by turning them 45 ° from the body.

(cont'd)

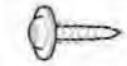
Side Sill Panel Replacement (cont'd)

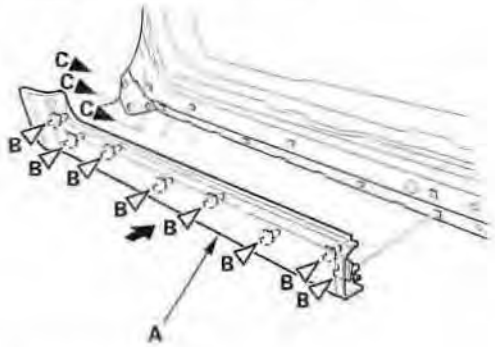
Installation

7. Replace any damaged clips.
8. Install the clips on the side sill panels.
9. Hold the front side sill panel (A) up, and fit all the clips (B) into the holes in the body, then push on the panel until the clips snap into place.

Fastener Locations

B ▷: Clip, 8 C ▶: Screw, 3

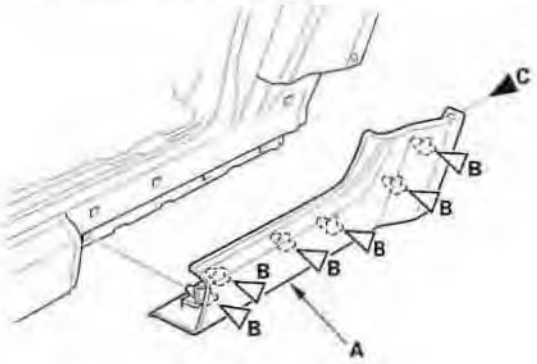




10. Install the screws (C).
11. Hold the rear side sill panel (A) up, and fit all the clips (B) into the holes in the body, then push on the panel until the clips snap into place.

Fastener Locations

B ▷: Clip, 6 C ▶: Screw, 1



12. Install the screw (C).

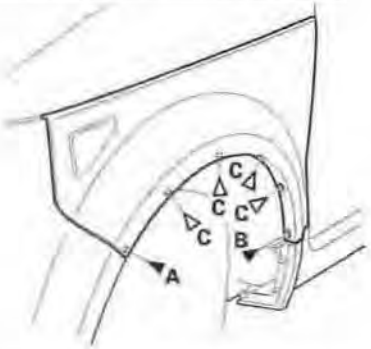
Front Fender Cladding Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body.

1. From the wheel arch, remove the screws (A, B) and clips (C).

Fastener Locations

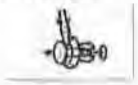
A▶: Screw, 1 B▶: Screw, 1 C▷: Clip, 4

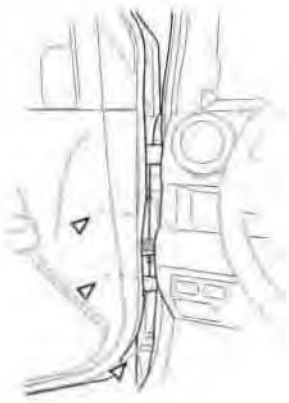


2. Open the door. From outside the door, remove the upper and middle clips, and from inside the door, remove the lower clip securing the front fender cladding and front fender.

Fastener Locations

▷: Clip, 3

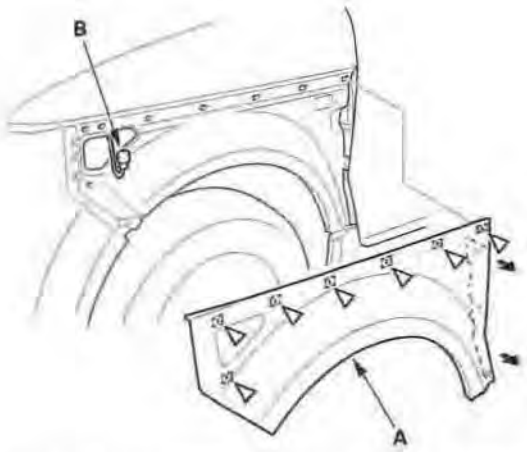




3. Pull out along the upper edge on the front fender cladding (A) to release clips, then remove the cladding from the body, and disconnect the front turn signal light connector (B).

Fastener Locations

▷: Clip, 7



4. Install the cladding in the reverse order of removal, and note these items:

- When removing the remaining clips from the body, turn the clip 90 °, and pull it out.
- Replace any damaged clips.
- Make sure the front turn signal light connector is plugged in properly.
- Push the clip portions into place securely.

Rear Quarter Panel Cladding Replacement

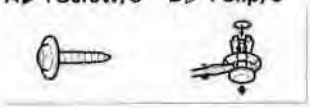
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body.

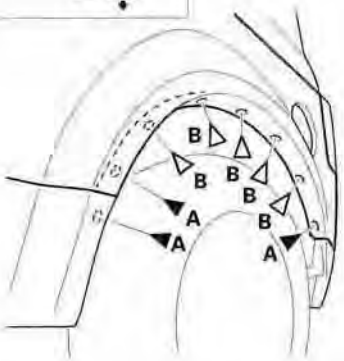
Removal

1. Remove the fuel fill door (see page 20-118).
2. From the rear wheel arch, remove the screws (A) and clips (B).

Fastener Locations

A▶: Screw, 3 B▷: Clip, 5

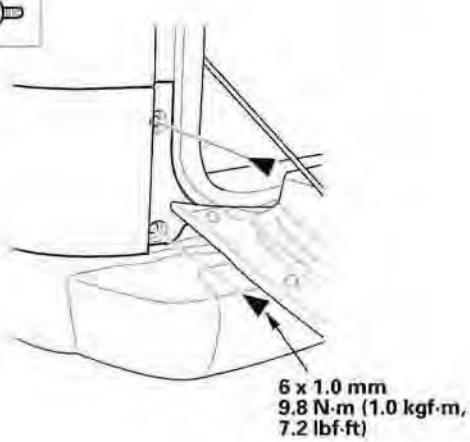




3. Open the tailgate, then remove the bolts.

Fastener Locations

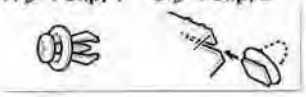
▶: Bolt, 2

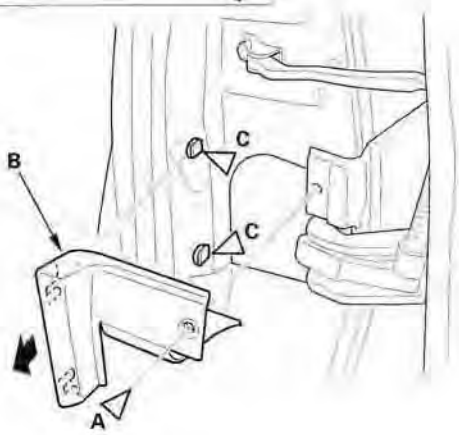


4. Open the rear door. Remove the clip (A), and pull out on the rear door hinge lower cover (B) to release it from the clips (C). Using a clip remover, remove the clips (C) from the body.

Fastener Locations

A ▷: Clip, 1 C ▷: Clip, 2

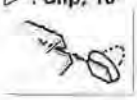


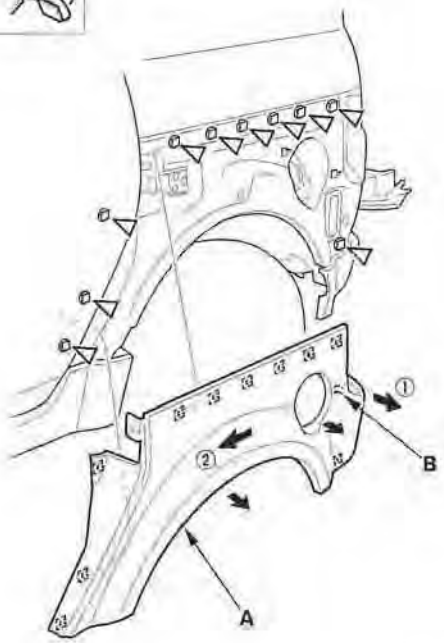


5. Close the rear door halfway. Pull out on the rear bumper, fuel fill door, and rear wheel arch portions of the rear quarter panel cladding (A), and slide the cladding forward to release it from the clips, and to release the hook (B) from the body, then remove the cladding. The clips will stay in the body.

Fastener Locations

▷: **Clip, 10**





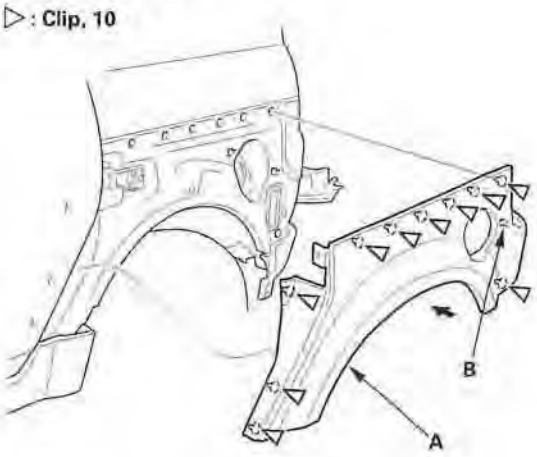
6. Remove the clips from the body by turning them 90 °.

Installation

7. Replace any damaged clips.
8. Install the clips on the rear quarter panel cladding.
9. Open the rear door half-way, and install the front of the rear quarter panel cladding (A). Fit all the clips and hook (B) into the holes in the body, then push on the cladding until the clips and hook snap into place.

Fastener Locations

▷: **Clip, 10**



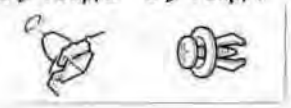
(cont'd)

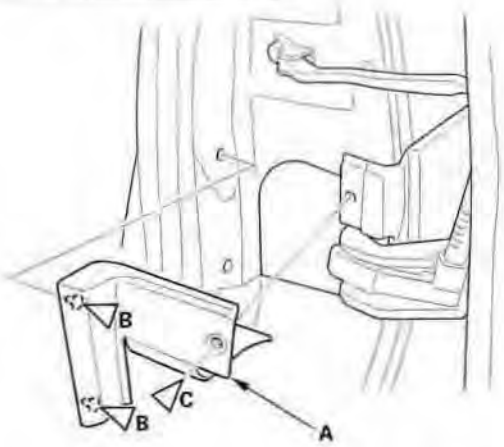
Rear Quarter Panel Cladding Replacement (cont'd)

10. Install the clips on the rear door hinge lower cover.
11. Hold the cover (A) up, and fit the clips (B) into the holes in the body, then push on the cover until the clips snap into place. Install the clip (C).

Fastener Locations

B ▷: Clip, 2 C ▷: Clip, 1





12. Install the bolts, screws, and clips to the rear cladding.
13. Install the fuel fill door.
14. Adjust the fuel fill door position alignment (see page 20-118).

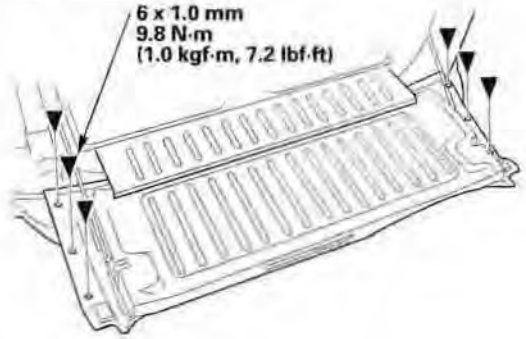
Tailgate Cladding Replacement

NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body.

1. Remove the tailgate weatherstrip as needed (see page 20-117).
2. Open the tailgate.
3. Remove the bolts securing the tailgate cladding.

Fastener Locations

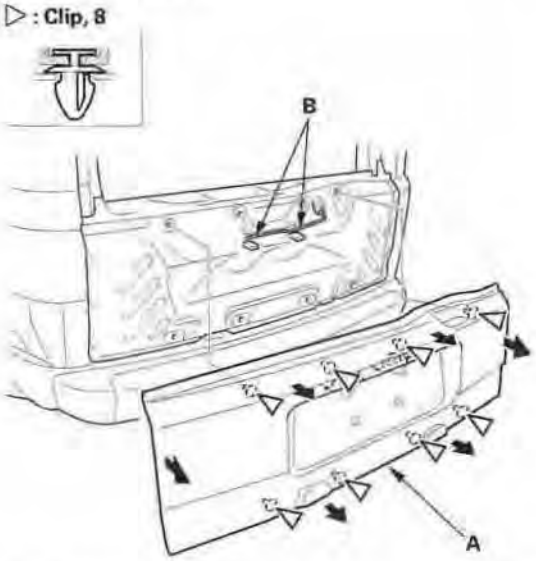
▶: Bolt, 6



4. Pull out along the upper and lower edges on the tailgate cladding (A) to release the clips, then remove the cladding from the tailgate, and disconnect the rear license light connectors (B).

Fastener Locations

▷: Clip, 8



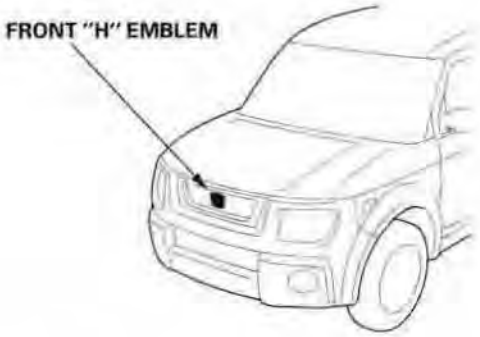
5. Install the cladding in the reverse order of removal, and note these items:

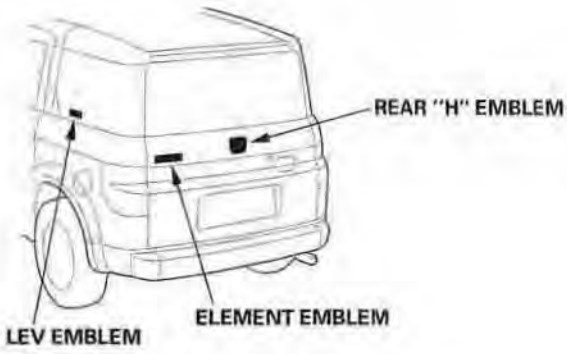
- Replace any damaged clips.
- Make sure the rear license light connectors are plugged in properly.
- Push the clip portions into place securely.
- Reinstall tailgate weatherstrip.

Emblem Replacement

NOTE: When removing the emblems, take care not to scratch the body. Use dental floss to cut double-sided type.

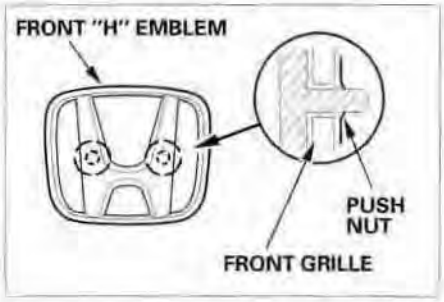
1. To remove the front "H" emblem, remove the front bumper (see page 20-105).
2. Clean the body surface with a sponge dampened in alcohol. After cleaning, keep oil, grease, and water from getting on the surface.
3. Apply the emblems where shown. When installing the LEV emblem on the inside surface of the quarter glass, align the bottom of the application tape with the black ceramic, then press the emblem into place, and remove the application tape.

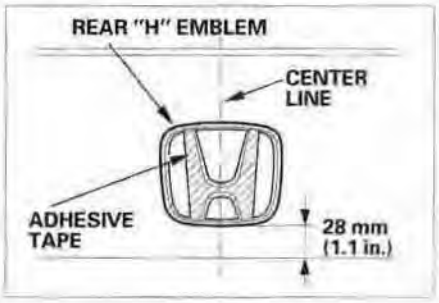


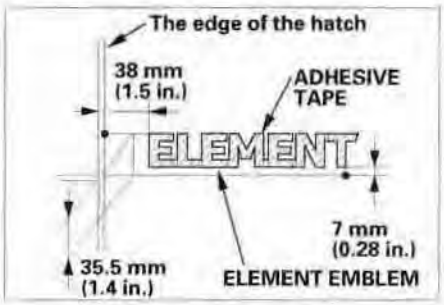


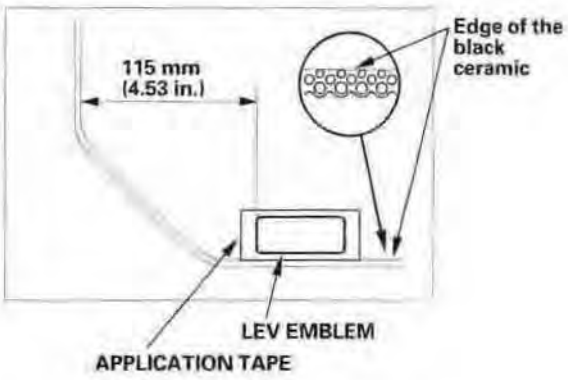
Unit: mm (in.)

Adhesive tape: Thickness 0.8 mm (0.031 in.)









4. Reinstall the front bumper.

Splash Shield Replacement

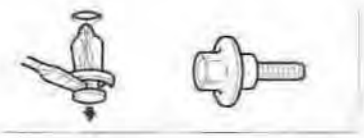
NOTE: Take care not to scratch the body.

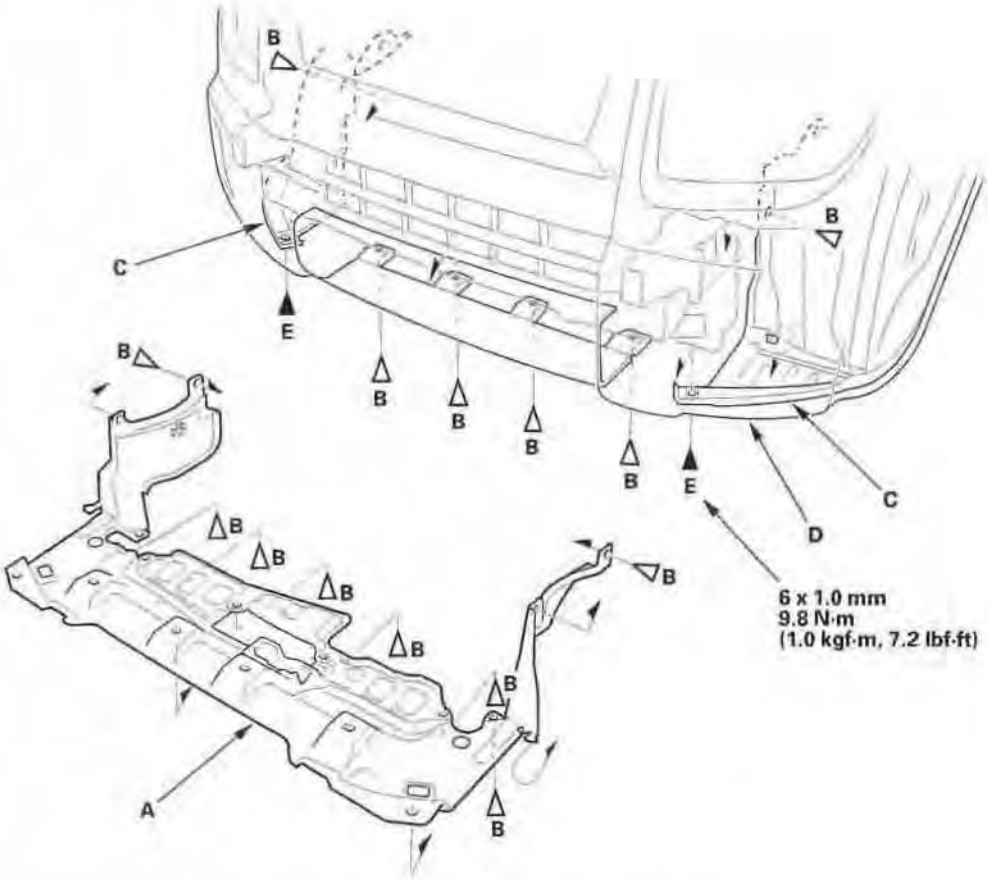
1. Remove the splash shield (A).

   –1 From both wheel arches, remove the clips (B) securing the front inner fender (C) and splash shield to the body.
   –2 From under the front bumper (D), remove the clips (B) and bolts (E).
   –3 Pull the splash shield out.

Fastener Locations

B ▷ : Clip, 14 **E ▶ : Bolt, 2**





2. Install the splash shield in the reverse order of removal, and note these items:

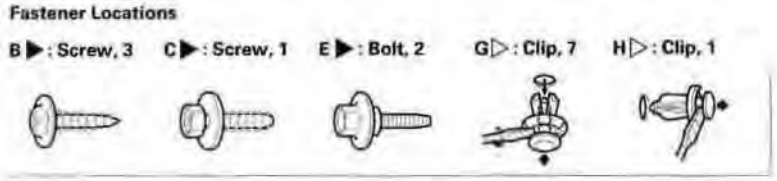
   - Replace any damaged clip.
   - Push the clips into place securely.

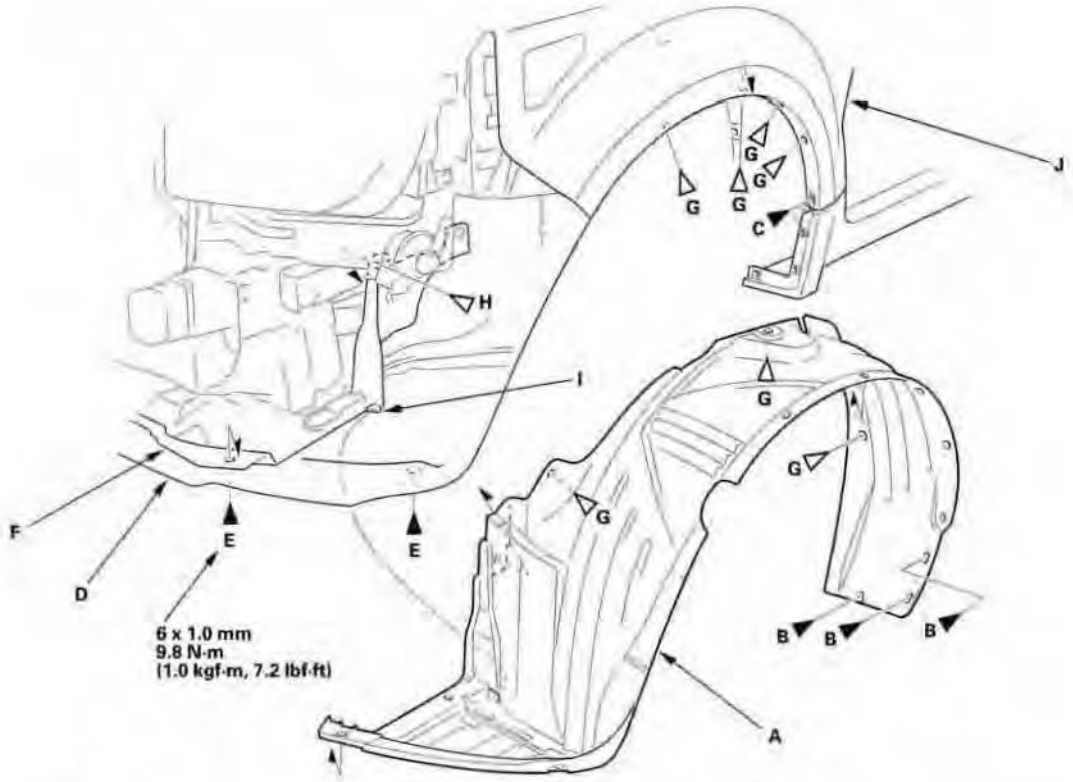
Front Inner Fender Replacement

NOTE: Take care not to scratch the body.

1. Remove the front inner fender (A).

–1 On the back of the wheel arch, remove the screws (B, C).
–2 From under the front bumper (D), remove the bolts (E) securing the front bumper, splash shield (F), and front inner fender.
–3 From the wheel arch, remove the clips (G, H) securing the front inner fender, front cladding (J) (and splash shield) on the body.
–4 Release the hook (I) of the splash shield from the front inner fender.
–5 From the wheel arch, pull the front inner fender out from between the body and front cladding, then remove the front inner fender.





2. Install the inner fender in the reverse order of removal, and note these items:

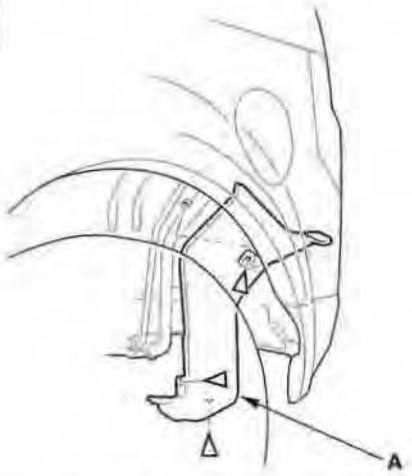
- Replace any damaged clips.
- Push the clips into place securely.

Fuel Pipe Protector Replacement

1. Remove the clips, then remove the fuel pipe protector (A). Take care not to scratch the body.

Fastener Locations

▷: **Clip, 3**



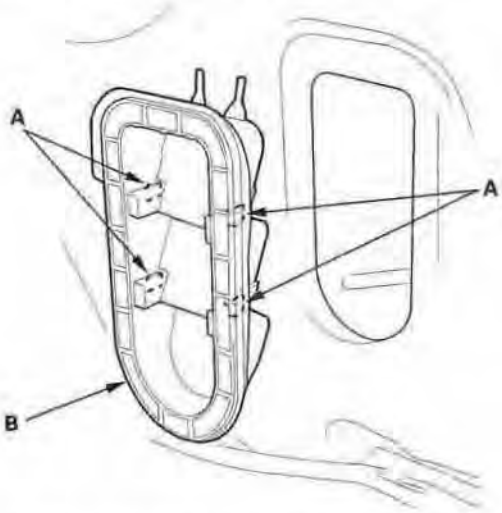
2. Install the protector in the reverse order of removal, and note these items:

- Replace any damaged clips.
- Push the clips into place securely.

Rear Air Outlet Replacement

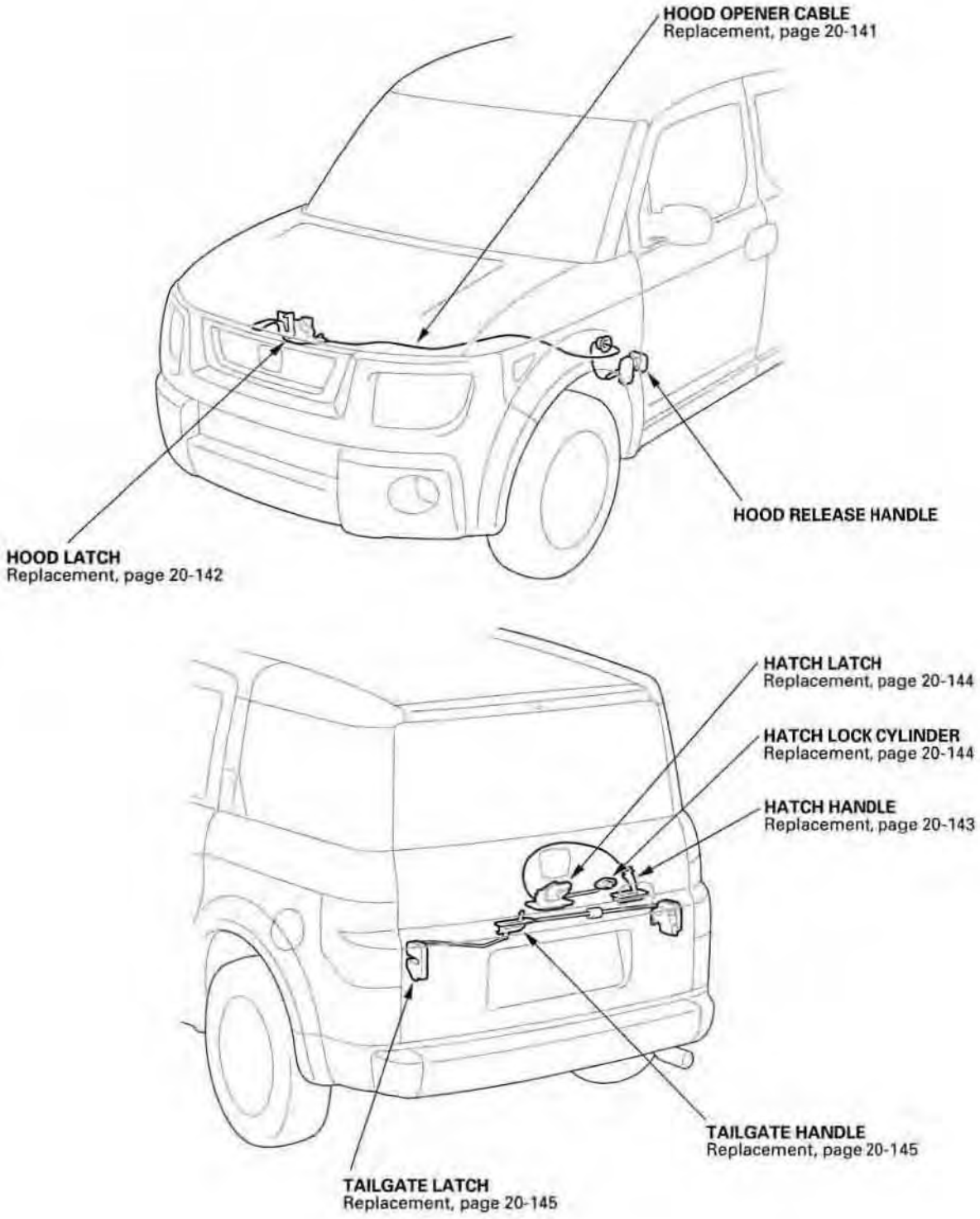
1. Remove the rear bumper (see page 20-107).

2. Detach the hooks (A), then remove the rear air outlet (B). Take care not to scratch the body.



3. Install the air outlet by pushing on the hook portions until the hooks snap into place.

Component Location Index



Hood Opener Cable Replacement

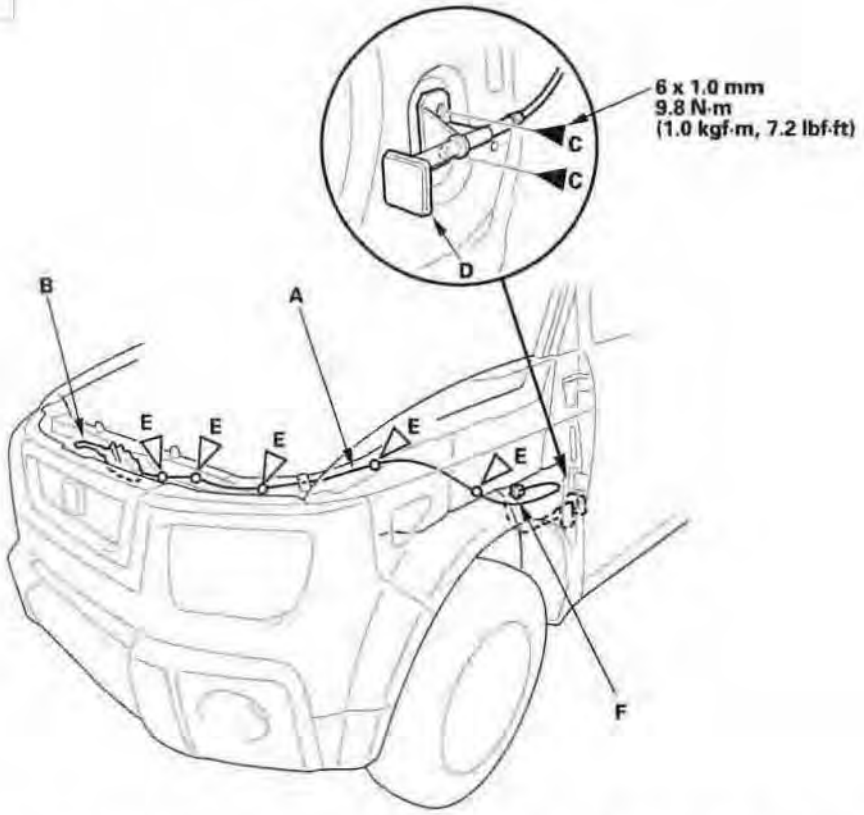
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body and related parts.

1. Remove these items:
   - Front grille cover (see page 20-119)
   - Left front inner fender (see page 20-138)
   - Left kick panel (see page 20-58)

2. Disconnect the hood opener cable (A) from the hood latch (B) (see page 20-142), and remove the bolts (C), then remove the hood release handle (D).

Fastener Locations

C ▶: Bolt, 2 E ▷: Clip, 5



3. Using a clip remover, detach the clips (E). Remove the grommet (F) from the body, then remove the hood opener cable from the vehicle. Take care not to bend the cable.

4. Install the cable in the reverse order of removal, and note these items:
   - Replace any damaged clips.
   - Make sure the hood opens properly and locks securely.

Hood Latch Replacement

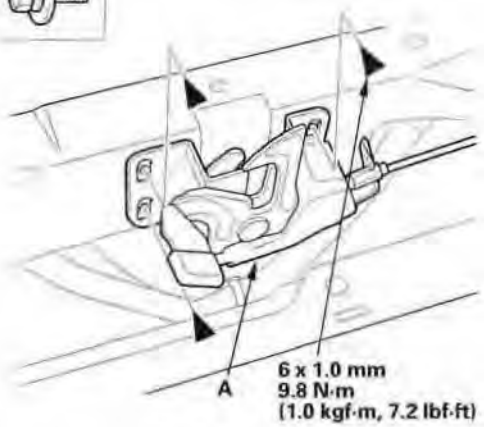
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the body.

1. Remove the front grille cover (see page 20-119).

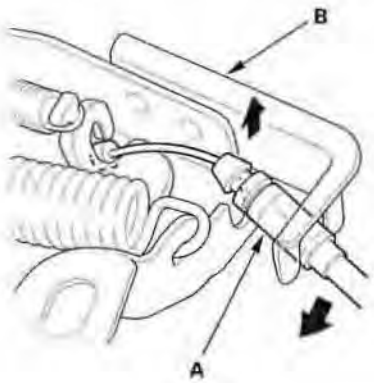
2. Remove the bolts, then remove the hood latch (A) from the body.

Fastener Locations

▶: Bolt, 3

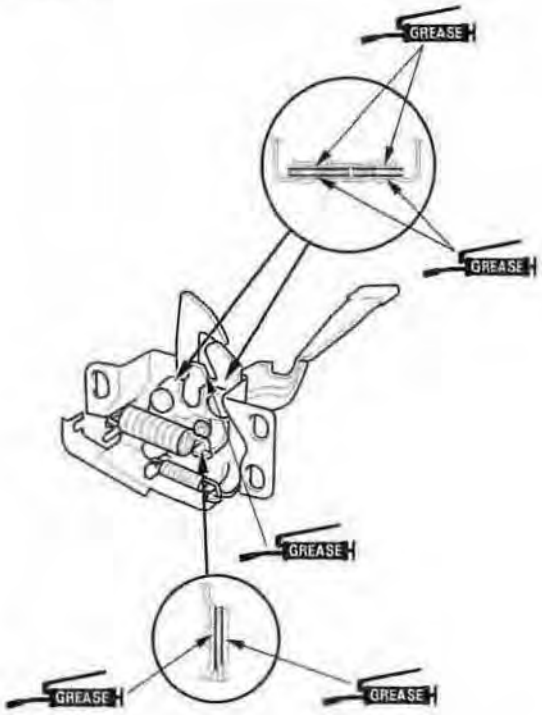


3. Disconnect the hood opener cable (A) from the hood latch (B). Take care not to bend the cable.



4. Install the hood latch in the reverse order of removal, and note these items:

- Apply multipurpose grease to the location of the hood latch indicated by the arrows.
- Make sure the hood opener cable is connected properly.
- Make sure the cable actuates the latch before you close the hood.
- Adjust the hood latch alignment (see step 4 on page 20-109).
- Make sure the hood opens properly and locks securely.



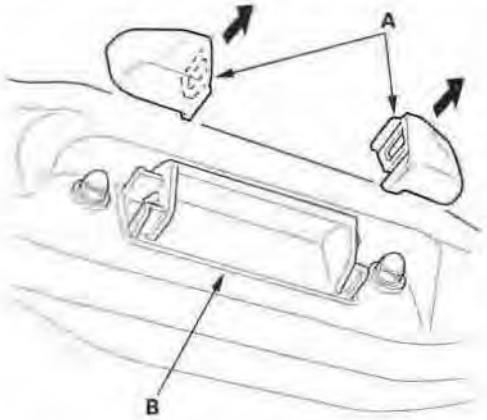
Hatch Handle Replacement

Special Tools Required
KTC trim tool set SOJATP2014

NOTE:
- Put on gloves to protect your hands.
- Use the appropriate tool from the KTC trim tool set to avoid damage when prying components.

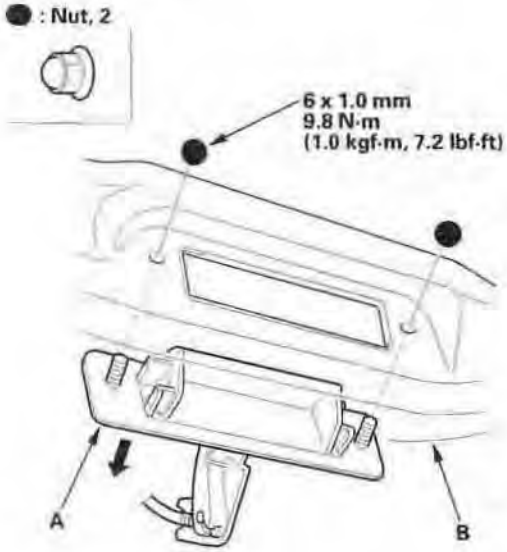
1. Remove the hatch trim panel (see page 20-63).

2. Pry the hatch handle covers (A) out from both sides using the appropriate tool from the KTC trim tool set, then remove them from the hatch handle (B).

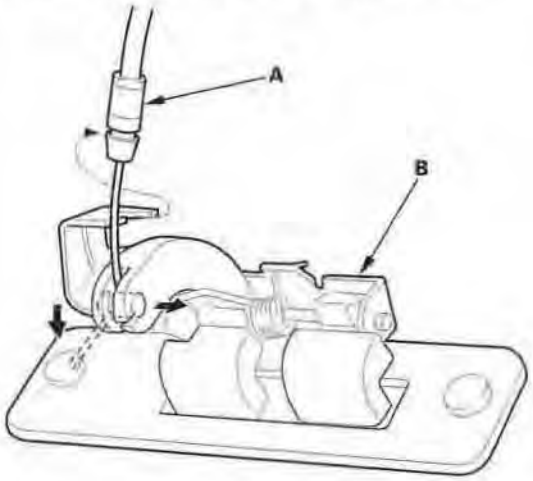


3. Remove the nuts, then remove the hatch handle (A) from the hatch (B).

Fastener Locations



4. Disconnect the hatch opener cable (A) from the handle (B). Take care not to kink the cable.



5. Install the hatch handle in the reverse order of removal, and note these items:

   - Make sure the hatch opener cable is connected securely.
   - Make sure the hatch opens properly.

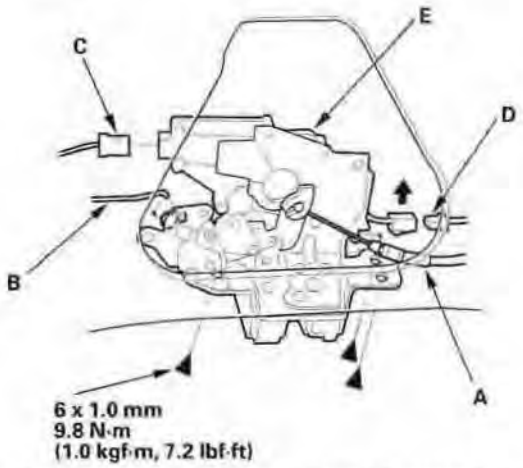
Hatch Latch Replacement

NOTE: Put on gloves to protect your hands.

1. Remove the hatch trim panel (see page 20-63).
2. Disconnect the hatch opener cable (A), cylinder rod (B), hatch latch actuator connector (C), and hatch latch switch connector (D), and detach the connector.

Fastener Locations

▶: Bolt, 3



3. Remove the bolts, then remove the hatch latch (E).
4. Install the hatch latch in the reverse order of removal, and note these items:
   - Make sure the connectors are plugged in properly and the opener cable is connected properly.
   - Make sure the opener cable actuates the latch before you close the hatch.
   - Make sure the hatch opens properly and locks securely.

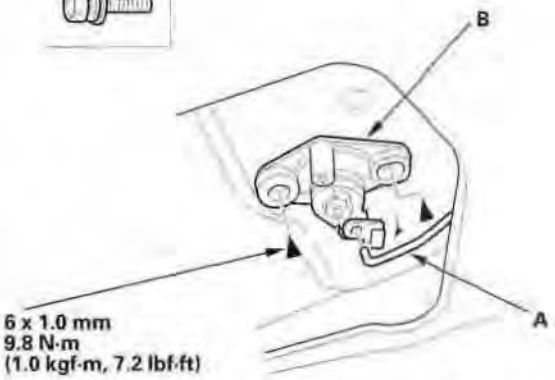
Hatch Lock Cylinder Replacement

NOTE: Put on gloves to protect your hands.

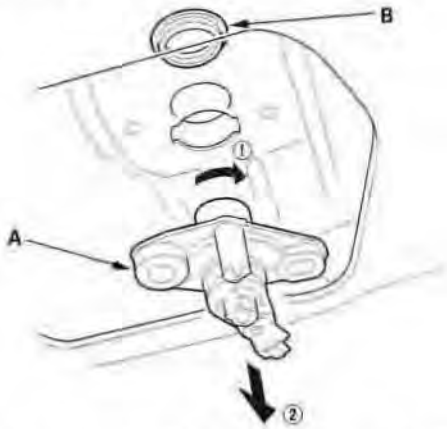
1. Remove the hatch trim panel (see page 20-63).
2. Disconnect the cylinder rod (A), and remove the bolts securing the hatch lock cylinder (B).

Fastener Locations

▶: Bolt, 2



3. Turn the lock cylinder (A) 45 °, and pull it out.



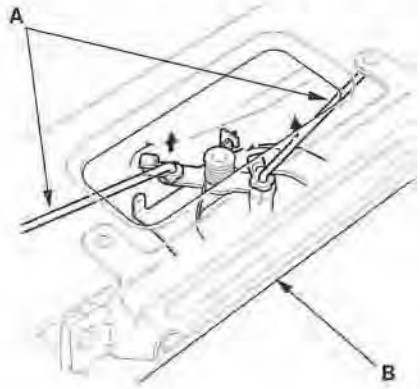
4. If necessary, on the outside of the hatch, remove the lock cylinder seal (B).
5. Install the lock cylinder in the reverse order of removal, and note these items:
   - Make sure the cylinder rod is connected properly.
   - Make sure the hatch opens properly and locks securely.

Tailgate Handle Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.

1. Remove the tailgate lower trim panel (see page 20-64).

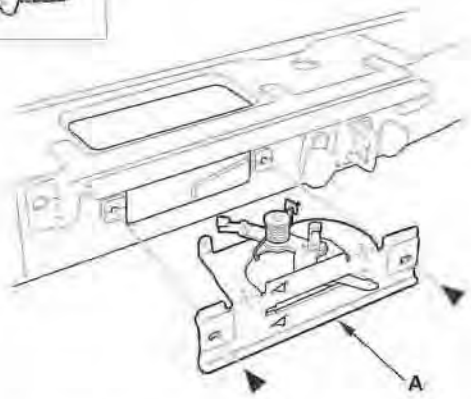
2. Disconnect the tailgate opener rods (A) on both sides from the tailgate handle (B).



3. Remove the screws, then remove the tailgate handle (A).

Fastener Locations

▶: Screw, 2



4. Install the tailgate handle in the reverse order of removal, and note these items:

   - Make sure opener rod is connected securely.
   - Make sure the tailgate locks and opens properly.

Tailgate Latch Replacement

NOTE:
- Take care not to scratch the tailgate.
- Put on gloves to protect your hands.
- The left side is shown; the right side is similar.

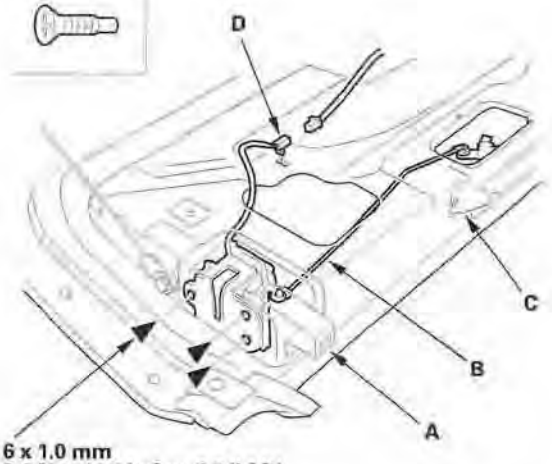
1. Remove the tailgate lower trim panel (see page 20-64).

2. Remove the tailgate latch (A).

   -1 Disconnect the tailgate opener rod (B) from the tailgate handle (C).
   -2 Disconnect the latch switch connector (D), and detach it.
   -3 Remove the screws securing the latch.
   -4 Remove the latch through the hole in the tailgate. Take care not to bend the tailgate opener rod.

Fastener Locations

▶: Screw, 3



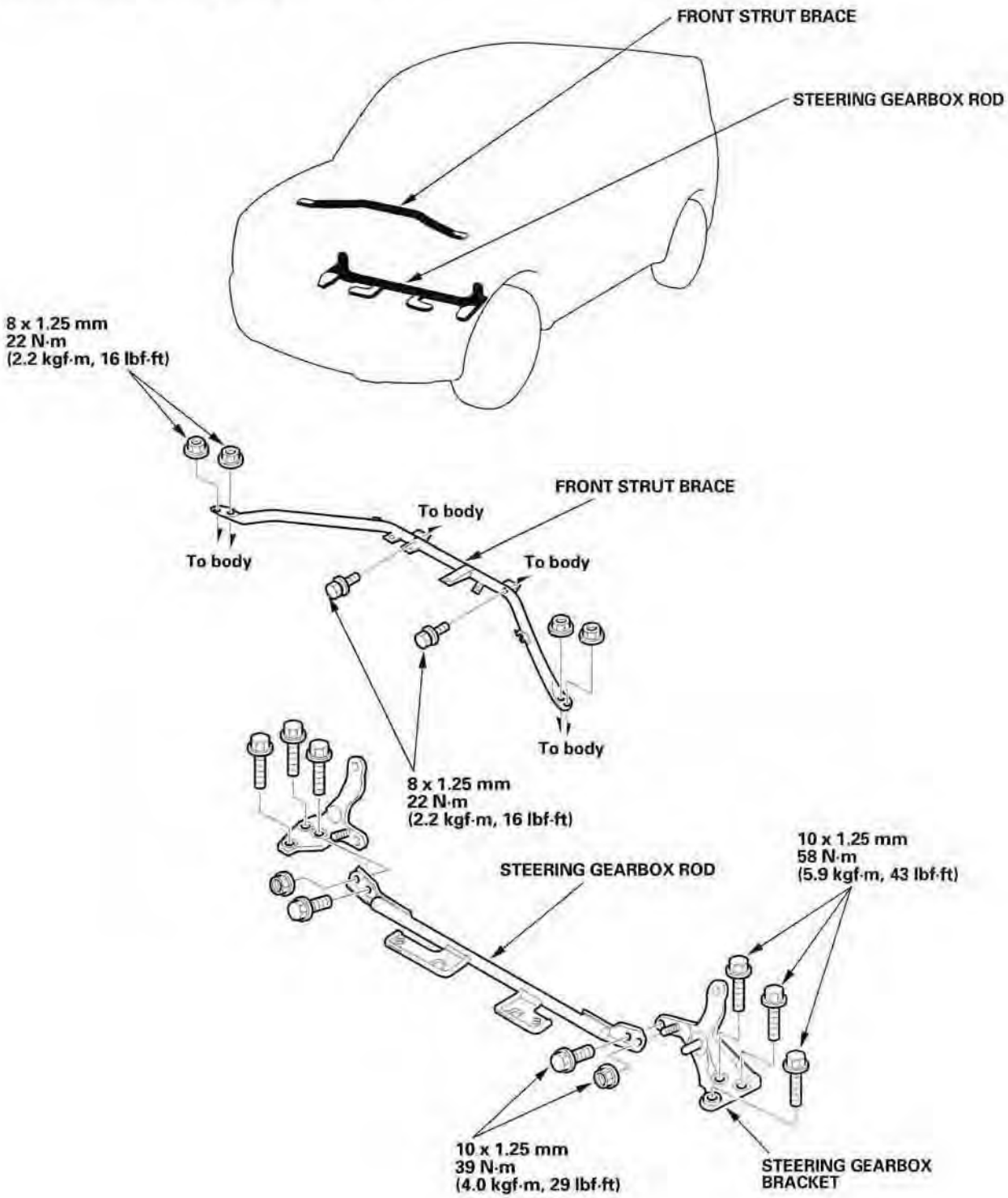
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

3. Install the latch in the reverse order of removal, and note these items:

   - Make sure the latch switch connector is plugged in properly, and opener rod is connected securely.
   - Make sure the opener rod actuates the latch before you close the tailgate.
   - Make sure the tailgate locks and opens properly.

Frame Brace Replacement

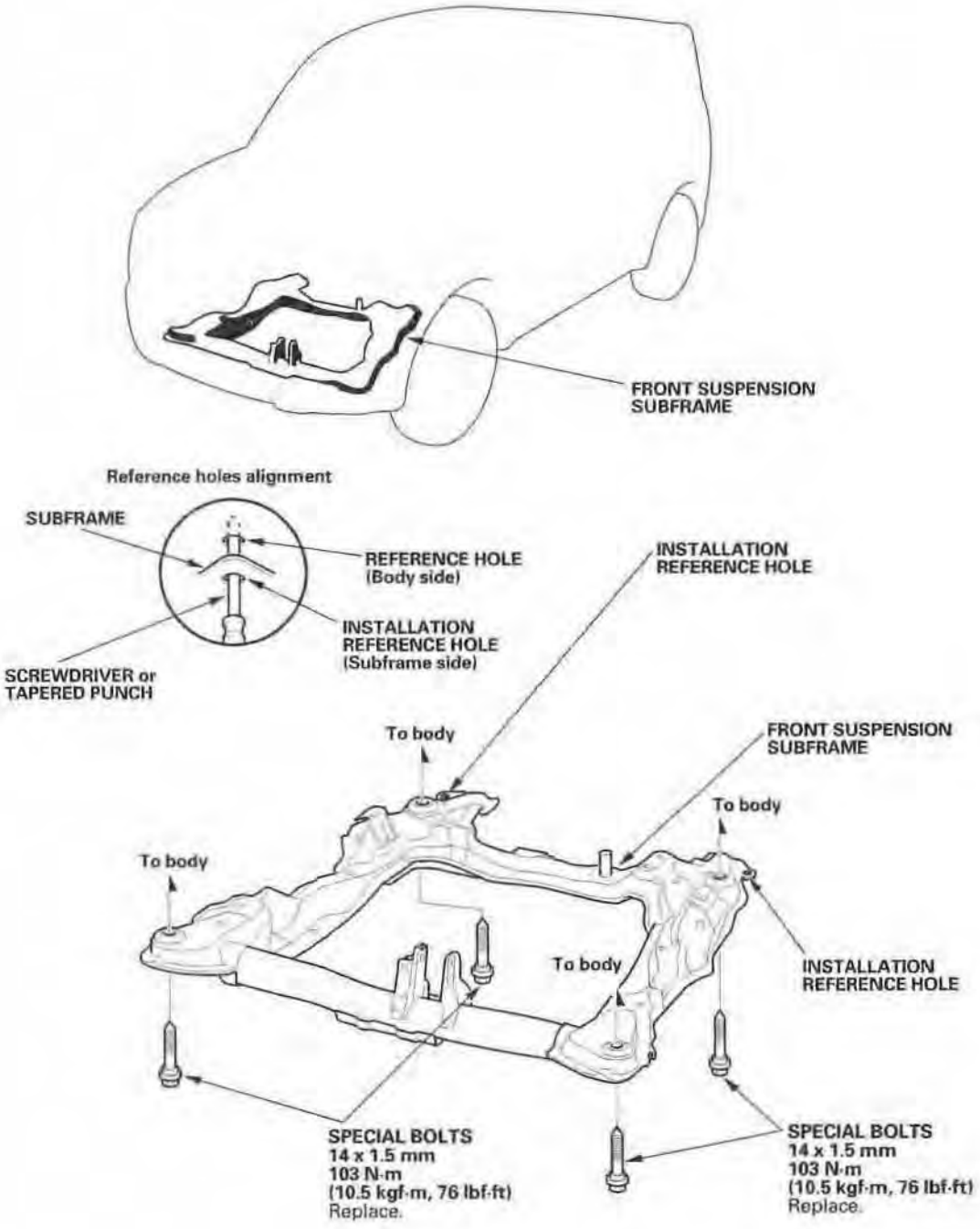
Front Strut Brace and Steering Gearbox Rod Torque



Subframe Replacement

Front Subframe Torque

NOTE: After loosening the subframe mounting bolts, be sure to replace them with new ones.

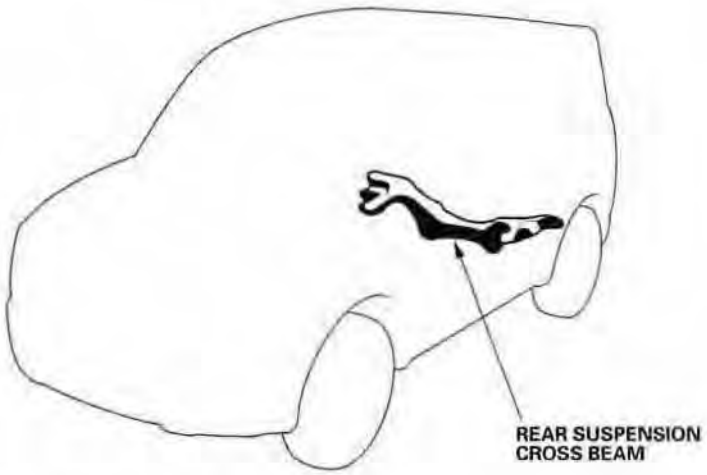


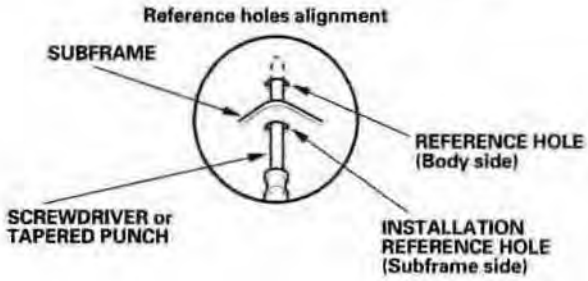
(cont'd)

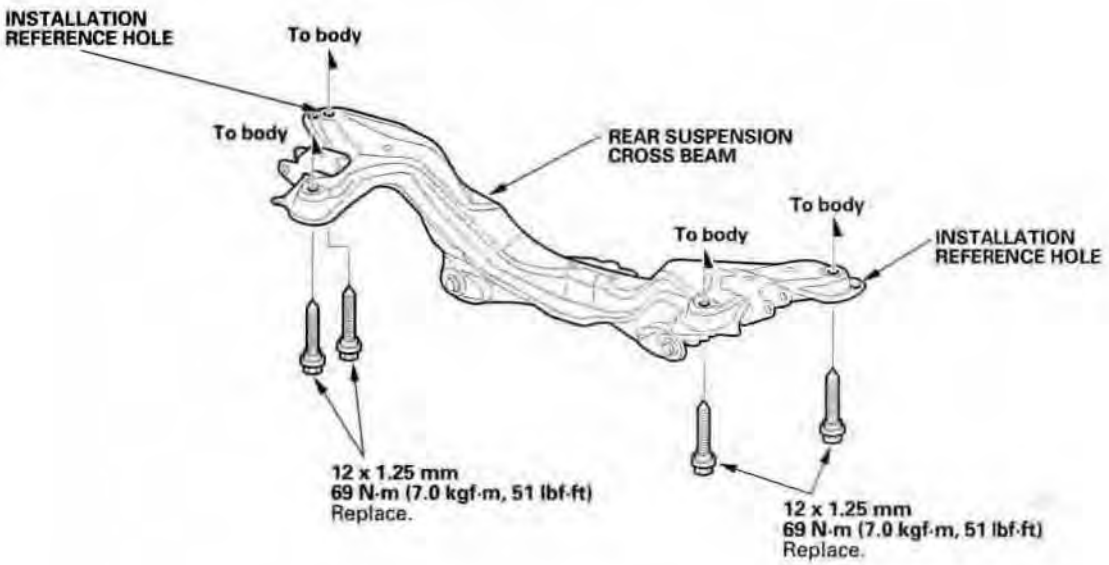
Subframe Replacement (cont'd)

Rear Subframe Torque

NOTE: After loosening the subframe mounting bolts, be sure to replace them with new ones.





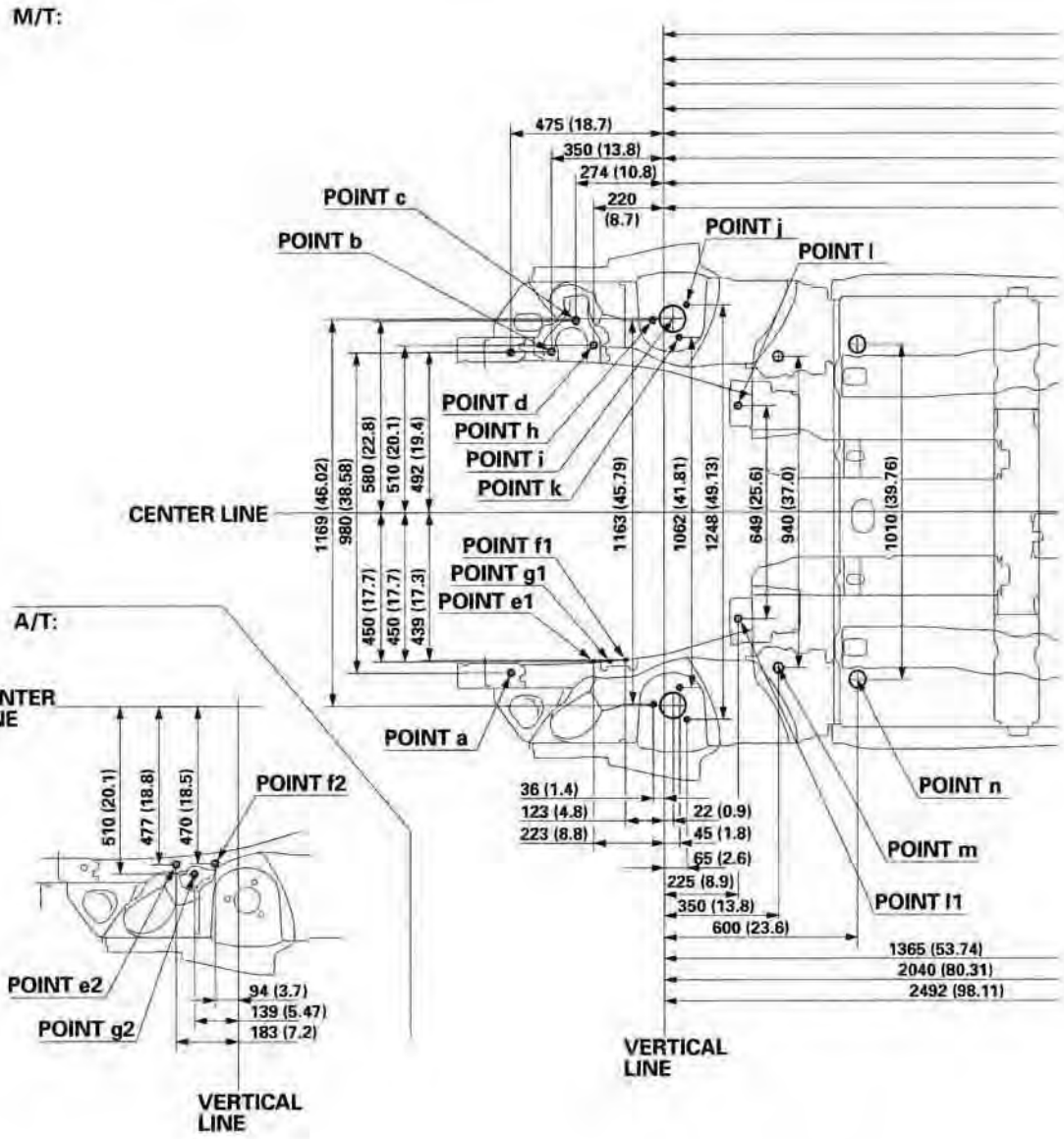


Frame Repair Chart

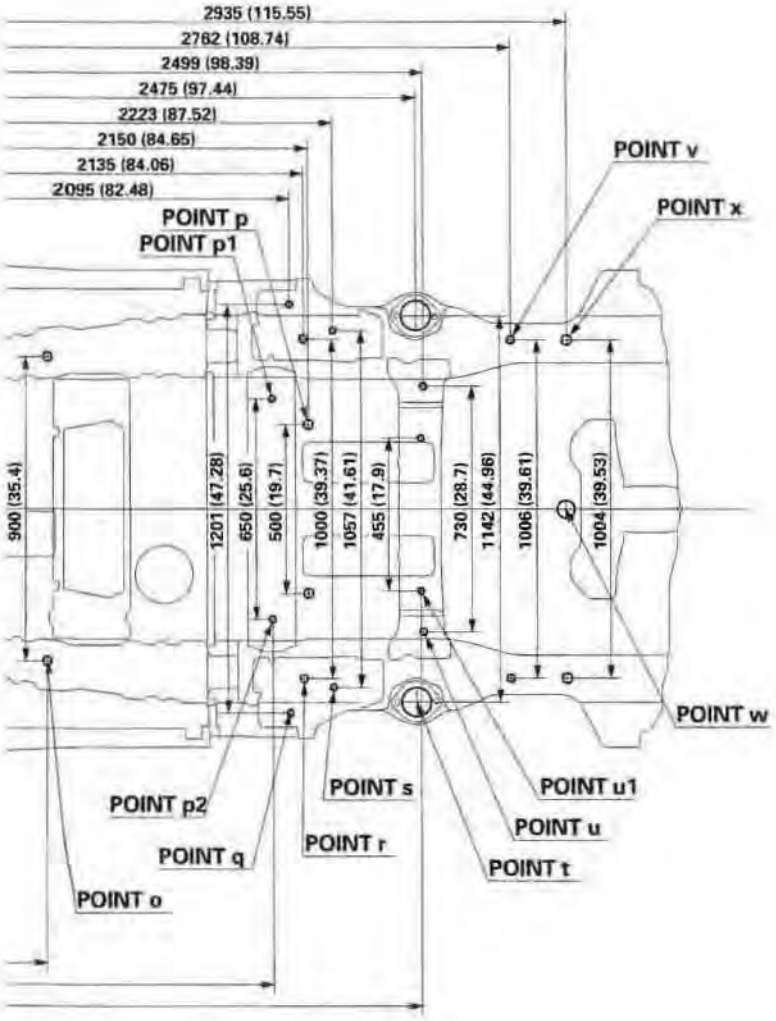
Top View

Unit: mm (in.)
ø: Inner diameter

a	For front subframe ø16 (0.63)	g1	For M/T transmission mount ø13 (0.51)
b	For engine mount ø13 (0.51)	g2	For A/T transmission mount ø13 (0.51)
c	For engine mount ø13 (0.51)	h	For damper mount ø11.5 (0.45)
d	For engine mount ø13 (0.51)	i	Front damper center ø78 (3.07)
e1	For M/T transmission mount ø13 (0.51)	j	For damper mount ø11.5 (0.45)
e2	For A/T transmission mount ø13 (0.51)	k	For damper mount ø11.5 (0.45)
f1	For M/T transmission mount ø13 (0.51)	l	For front subframe ø16 (0.63)
f2	For A/T transmission mount ø13 (0.51)	l1	For front subframe ø16 (0.63)



m Locating hole ø27.4 (1.08)
n Locating hole ø50 (1.97)
o Locating hole ø25 (0.98)
p Locating hole ø25 (0.98)
p1 Locating hole ø13 (0.51) Right side
p2 Locating hole ø15 (0.59) Left side
q For trailing arm ø14 (0.55)
r Locating hole ø15 (0.59)
s For trailing arm ø14 (0.55)
t Rear damper center ø78.6 (3.09)
u For rear cross beam ø15 (0.59)
u1 Locating hole ø15 (0.59)
v For rear cross beam ø15 (0.59)
w Locating hole ø50 (1.97)
x Locating hole ø25 (0.98)



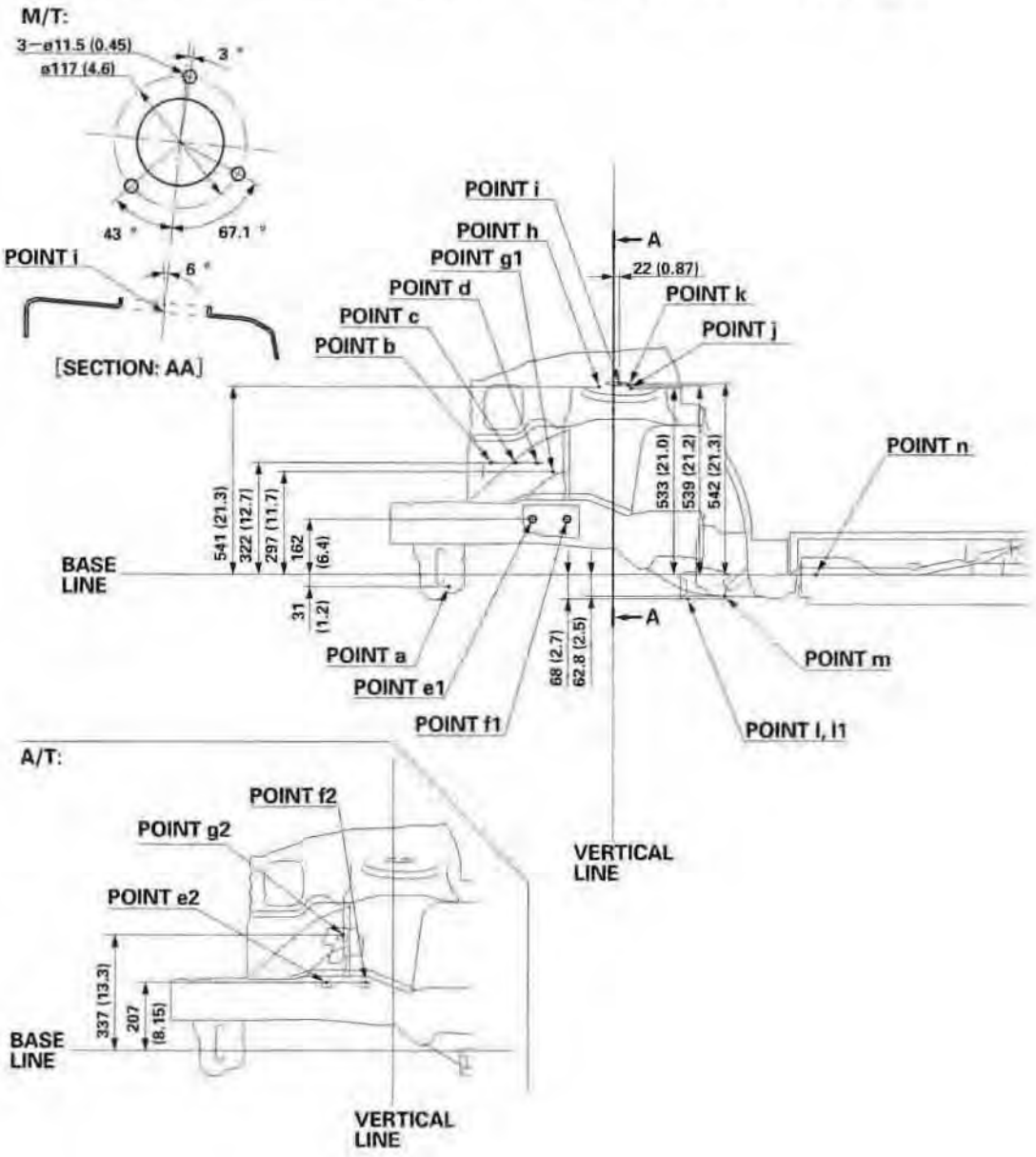
(cont'd)

Frame Repair Chart (cont'd)

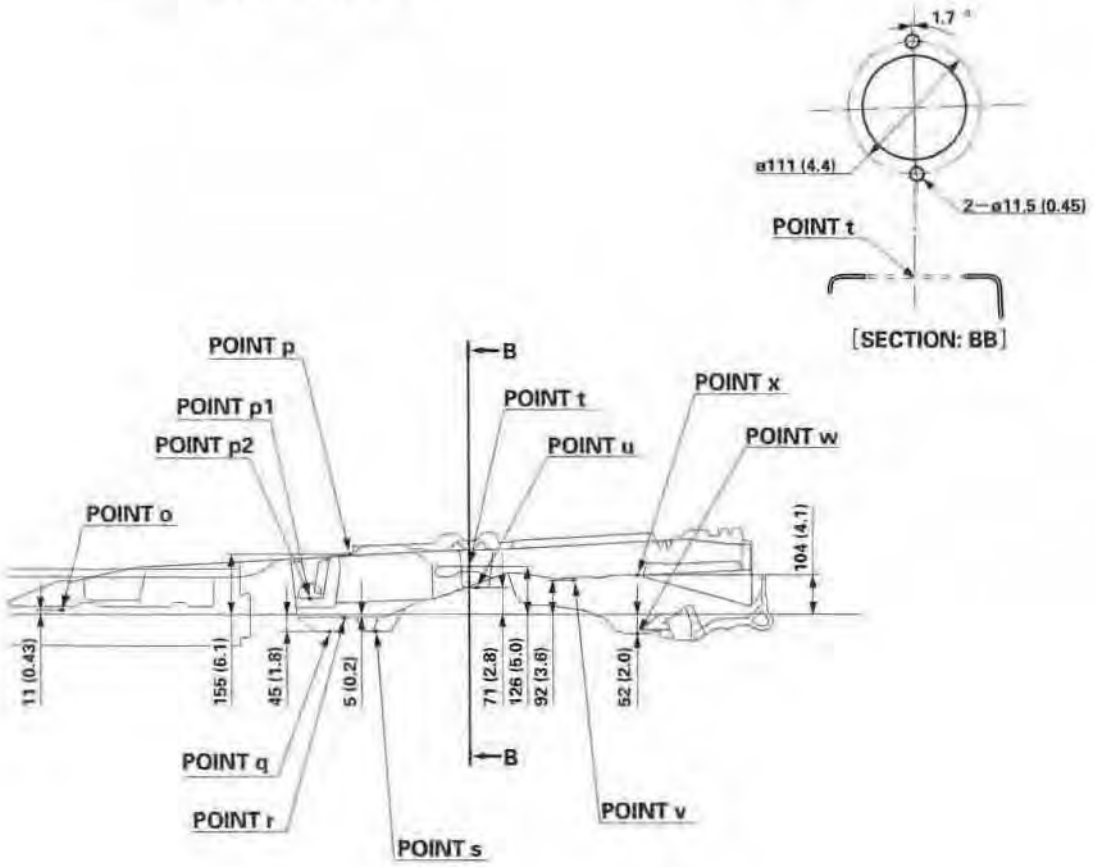
Side View

Unit: mm (in.)
ø: Inner diameter

a	For front subframe ø16 (0.63)	g1	For M/T transmission mount ø13 (0.51)
b	For engine mount ø13 (0.51)	g2	For A/T transmission mount ø13 (0.51)
c	For engine mount ø13 (0.51)	h	For damper mount ø11.5 (0.45)
d	For engine mount ø13 (0.51)	i	Front damper center ø78 (3.07)
e1	For M/T transmission mount ø13 (0.51)	j	For damper mount ø11.5 (0.45)
e2	For A/T transmission mount ø13 (0.51)	k	For damper mount ø11.5 (0.45)
f1	For M/T transmission mount ø13 (0.51)	l	For front subframe ø16 (0.63)
f2	For A/T transmission mount ø13 (0.51)	l1	For front subframe ø16 (0.63)



m Locating hole ø27.4 (1.08)
n Locating hole ø50 (1.97)
o Locating hole ø25 (0.98)
p Locating hole ø25 (0.98)
p1 Locating hole ø13 (0.51) Right side
p2 Locating hole ø15 (0.59) Left side
q For trailing arm ø14 (0.55)
r Locating hole ø15 (0.59)
s For trailing arm ø14 (0.55)
t Rear damper center ø78.6 (3.09)
u For rear cross beam ø15 (0.59)
u1 Locating hole ø15 (0.59)
v For rear cross beam ø15 (0.59)
w Locating hole ø50 (1.97)
x Locating hole ø25 (0.98)



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If HVAC maintenance is required)

The ELEMENT SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items require special precautions and tools, and should be done only by an authorized Honda dealer.

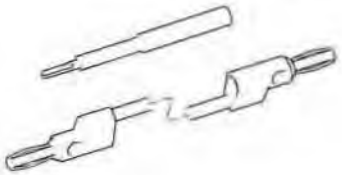
- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors when the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

HVAC (Heating, Ventilation, and Air Conditioning)

Heating/Air Conditioning

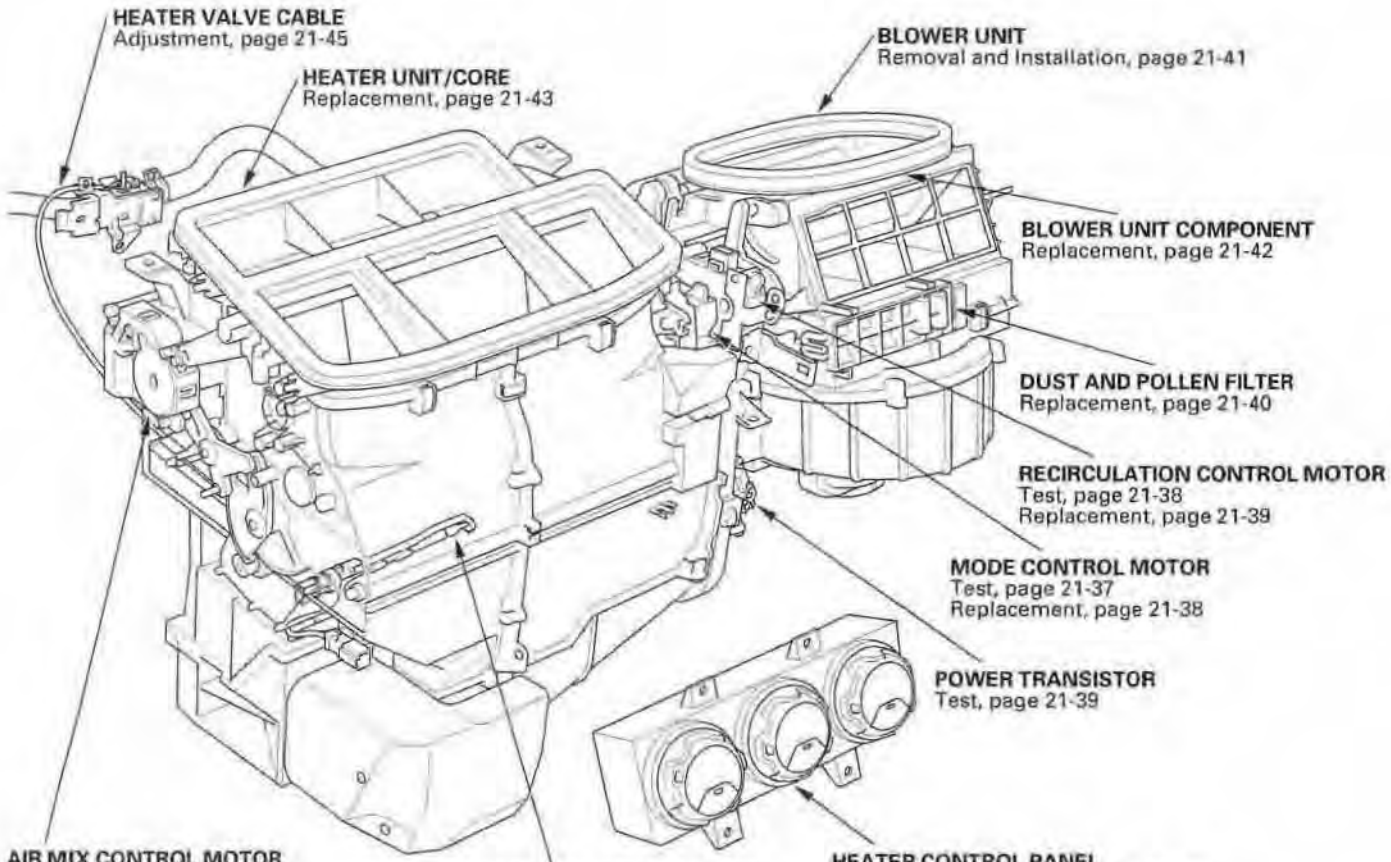
Special Tools

Ref. No.	Tool Number	Description	Qty
①	07SAZ-001000A	Backprobe Set	2



①

Component Location Index



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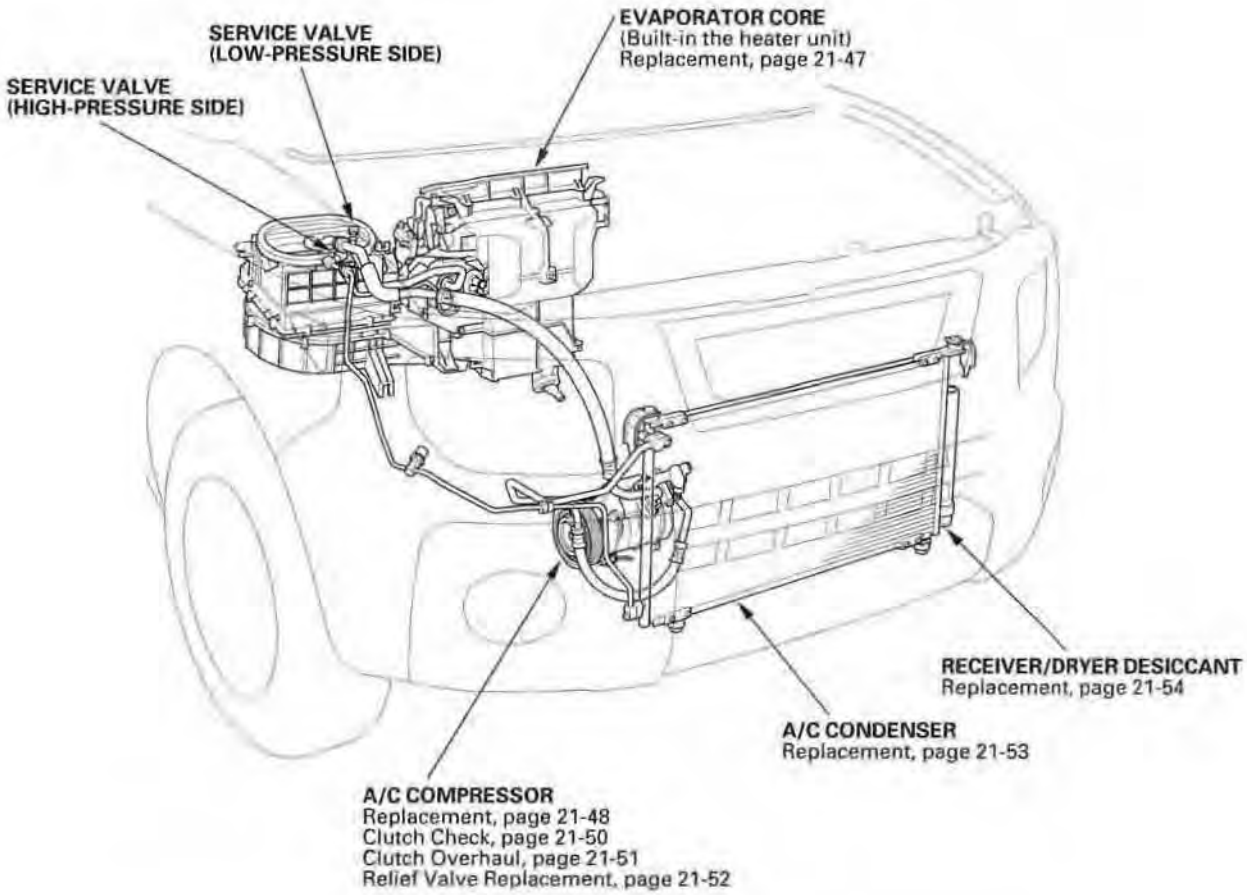
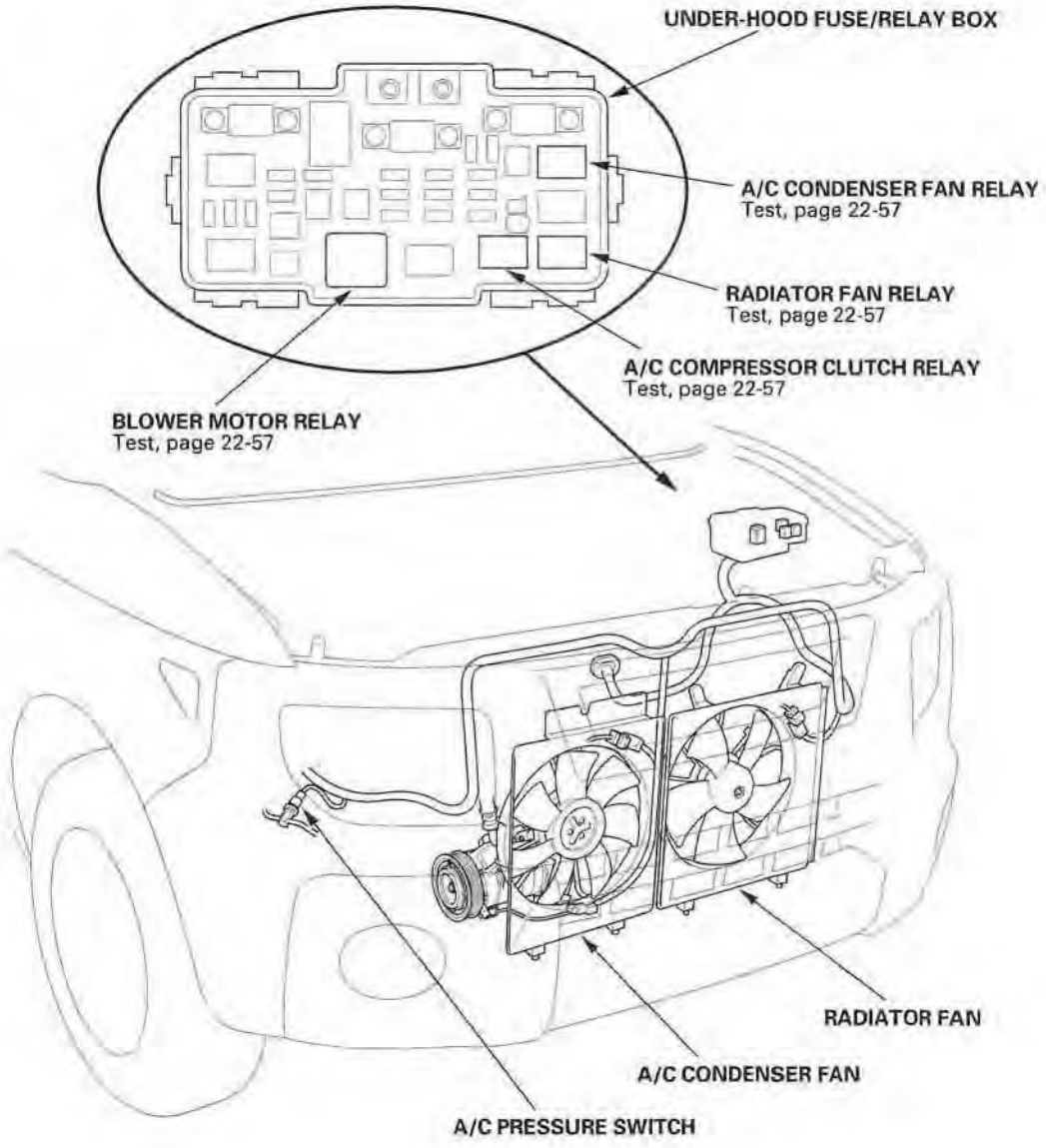
Component Location Index (cont'd)




UNDER-HOOD FUSE/RELAY BOX
A/C CONDENSER FAN RELAY
Test, page 22-57
RADIATOR FAN RELAY
Test, page 22-57
A/C COMPRESSOR CLUTCH RELAY
Test, page 22-57
BLOWER MOTOR RELAY
Test, page 22-57
RADIATOR FAN
A/C CONDENSER FAN
A/C PRESSURE SWITCH

A/C Service Tips and Precautions

⚠ WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134 a service equipment or vehicle air conditioning systems.

⚠ CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

The air conditioning system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result.
Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove R-134a from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

- Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
- Keep moisture and dirt out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
- Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
- When tightening or loosening a fitting, use a second wrench to support the matching fitting.
- When discharging the system, use an R-134a refrigerant recovery/recycling/charging station; don't release refrigerant into the atmosphere.

A/C Refrigerant Oil Replacement

Recommended PAG oil: DENSO ND-OIL 8:

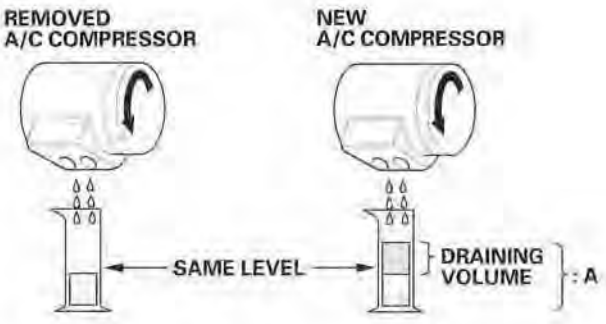
- P/N 38897-PR7-A01AH: 120 mL (4 fl·oz)
- P/N 38899-PR7-A01: 40 mL (1 1/3 fl·oz)

Add the recommended refrigerant oil in the amount listed if you replace any of the following parts.

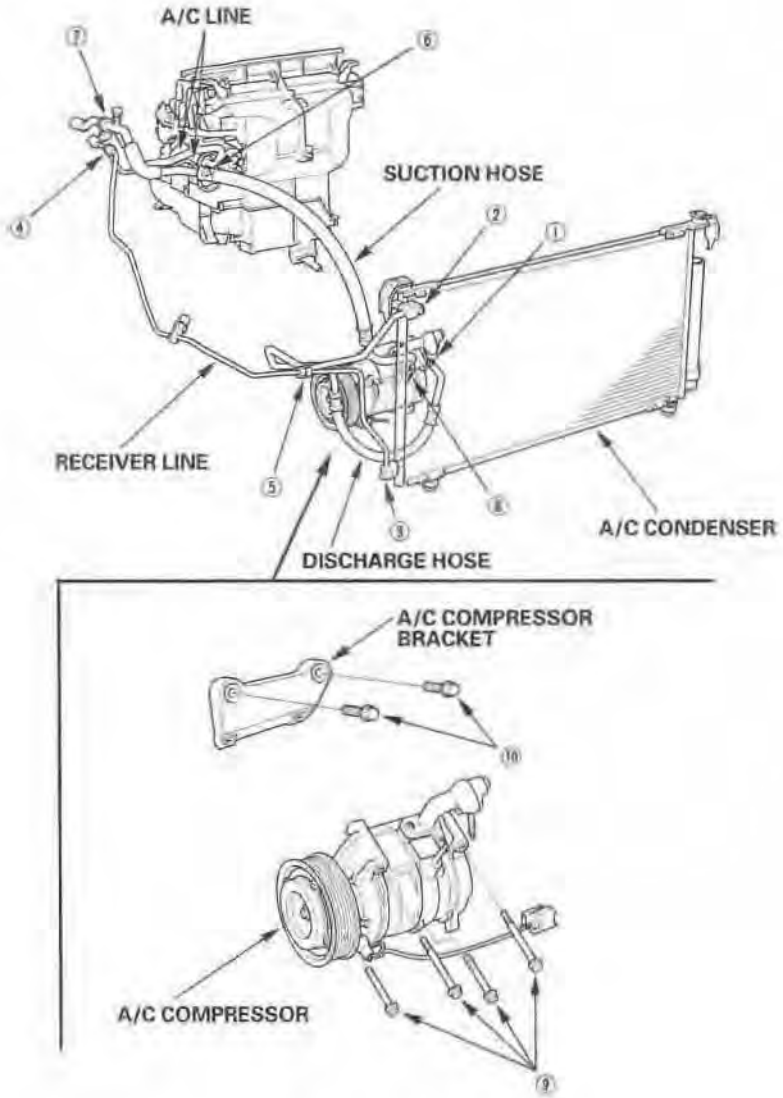
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if it gets on the paint, wash it off immediately.

A/C condenser ..... 25 mL (5/6 fl·oz)
Evaporator ..... 45 mL (1 1/2 fl·oz)
Line or hose ..... 10 mL (1/3 fl·oz)
Receiver/Dryer .... 10 mL (1/3 fl·oz)
Leakage repair .... 25 mL (5/6 fl·oz)
A/C compressor .. For A/C compressor replacement, subtract the volume of oil drained from the removed A/C compressor from 160 mL (5 1/3 fl·oz), and drain the calculated volume of oil from the new A/C compressor: 160 mL (5 1/3 fl·oz) — Volume of removed A/C compressor = Volume to drain from new A/C compressor.

NOTE: Even if no oil is drained from the removed A/C compressor, don't drain more than 50 mL (1 2/3 fl·oz) from the new A/C compressor.



A: 160 mL (5 1/3 fl·oz)



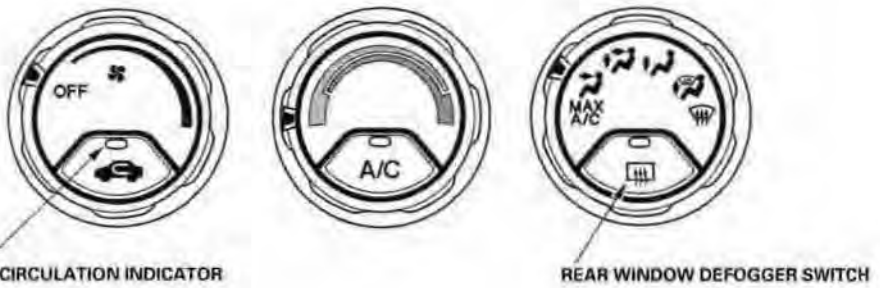
① Discharge hose to the A/C compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
② Discharge hose to the A/C condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
③ Receiver line to the A/C condenser (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
④ Receiver line to the A/C line : 13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑤ Receiver line A to the receiver line B (16 x 1.5 mm) : 13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑥ A/C line to the evaporator (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑦ Suction hose to the A/C line : 31 N·m (3.2 kgf·m, 23 lbf·ft)
⑧ Suction hose to the A/C compressor (6 x 1.0 mm) : 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑨ A/C compressor to the A/C compressor bracket (8 x 1.25 mm) : 22 N·m (2.2 kgf·m, 16 lbf·ft)
⑩ A/C compressor bracket to the engine block (10 x 1.25 mm) : 44 N·m (4.5 kgf·m, 33 lbf·ft)

General Troubleshooting Information

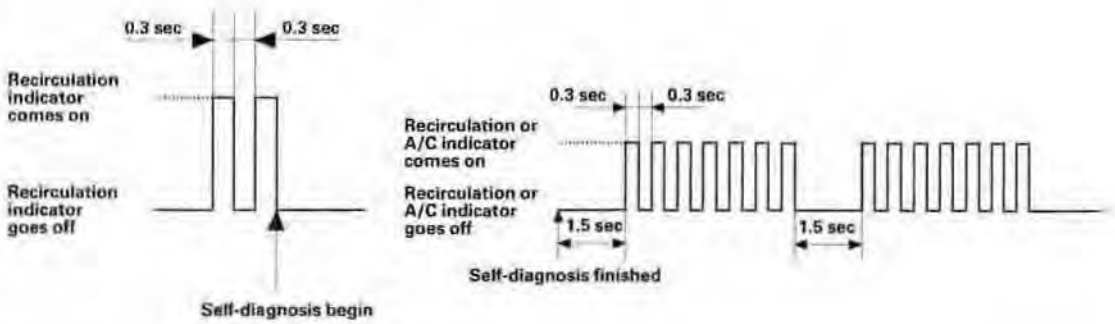
How to Retrieve a DTC

The Heater Control Panel has a self-diagnostic function for heating, ventilation, and air conditioning system. To run the self-diagnostic function, do the following:

1. Turn the ignition switch OFF.
2. Press the recirculation control switch and the rear window defogger switch.
3. While holding the both switches down, turn the ignition switch ON (II).
4. The self-diagnosis will begin, and run for about 15 seconds.
   - If there is any problem in the system after self-diagnosis is finished, the recirculation indicator will blink the Diagnostic Trouble Code (DTC) 7 through 15.
   - If no DTC's are found, the indicator will not blink.



Example of DTC indication Pattern (DTC 7)



Resetting the self-diagnostic Function

Turn the ignition switch OFF to cancel the self-diagnostic function. After completing repair work, run the self-diagnostic function again to make sure that there are no other malfunctions.

Max Cool Position Function

When the mode control dial is in the MAX A/C position, the heater control panel will automatically select the Recirculation mode and turn the A/C on. The recirculation switch and A/C switch are disabled and cannot be turned off in this mode. If the control panel fails to function as described, replace it.

DTC Troubleshooting Index

DTC (Recirculation Indicator Blinks)	Detection Item	Page
7	An open in the air mix control motor circuit	(see page 21-18)
8	A short in the air mix control motor circuit	(see page 21-18)
9	A problem in the air mix control linkage, door, or motor	(see page 21-19)
10	A short or open in the mode control motor circuit	(see page 21-20)
11	A problem in the mode control linkage, doors, or motor	(see page 21-21)
12	A problem in the blower motor circuit	(see page 21-22)
13	A problem in the EEPROM in the heater control panel; the control panel must be replaced	(see page 21-40)
14 (With A/C)	An open in the evaporator temperature sensor circuit	(see page 21-25)
15 (With A/C)	A short in the evaporator temperature sensor circuit	(see page 21-26)

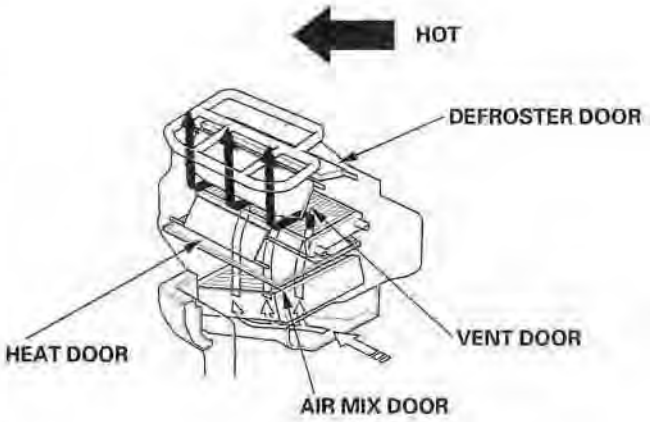
In case of multiple problems, the recirculation indicator will indicate only the DTC with the least number of blinks.

Symptom Troubleshooting Index

Symptom	Diagnostic procedure	Also check for
Recirculation control doors do not change between Fresh and Recirculate	Recirculation control motor circuit troubleshooting (see page 21-27)	• Blown fuse No. 14 (10 A) in the under-dash fuse/relay box • Cleanliness and tightness of all connectors
Blower, heater controls, and A/C do not work	Heater control power and ground circuit troubleshooting (see page 21-29)	• Blown fuse No. 14 (10 A) in the under-dash fuse/relay box • Poor ground at G501 • Cleanliness and tightness of all connectors
The A/C condenser fan does not run at all (but radiator fan runs with the A/C on)	A/C condenser fan circuit troubleshooting (see page 21-30)	• Blown fuse No. 1 (30 A) in the under-hood fuse/relay box, and No. 14 (10 A) in the under-dash fuse/relay box • Poor ground at G201 • Cleanliness and tightness of all connectors
Both fans do not run with the A/C on (but the A/C compressor runs with the A/C on)	Radiator and A/C condenser fans common circuit troubleshooting (see page 21-31)	• Blown fuse No. 1 (30 A) and No. 4 (20 A) in the under-hood fuse/relay box, and No. 14 (10 A) in the under-dash fuse/relay box • Poor ground at G201 • Cleanliness and tightness of all connectors
The A/C compressor clutch does not engage (but both fans run with the A/C on)	A/C compressor clutch circuit troubleshooting (see page 21-32)	• Blown fuse No. 1 (30 A) in the under-hood fuse/relay box, and No. 14 (10 A) in the under-dash fuse/relay box • Cleanliness and tightness of all connectors • Blower motor operation
A/C system does not come on (both fans and the A/C compressor do not work); heater is OK	A/C pressure switch circuit troubleshooting (see page 21-34)	• Cleanliness and tightness of all connectors • Faulty evaporator temperature sensor

System Description

(VENT)



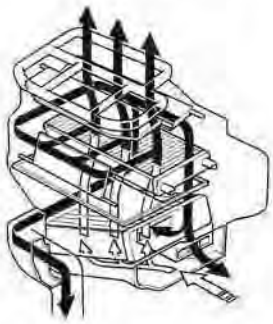
(HEAT/VENT)

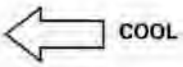
(HEAT)

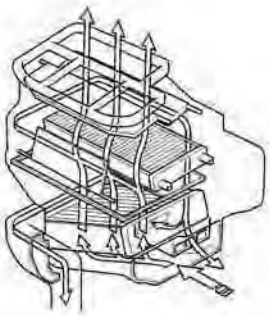
(cont'd)

System Description (cont'd)

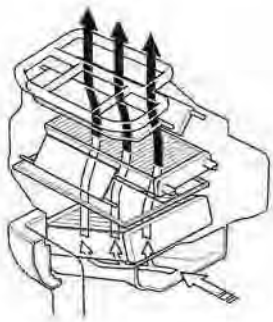
(HEAT/DEF)

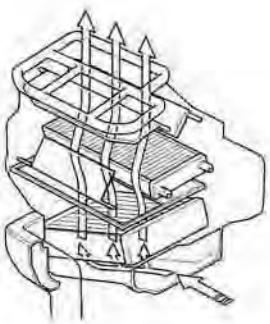




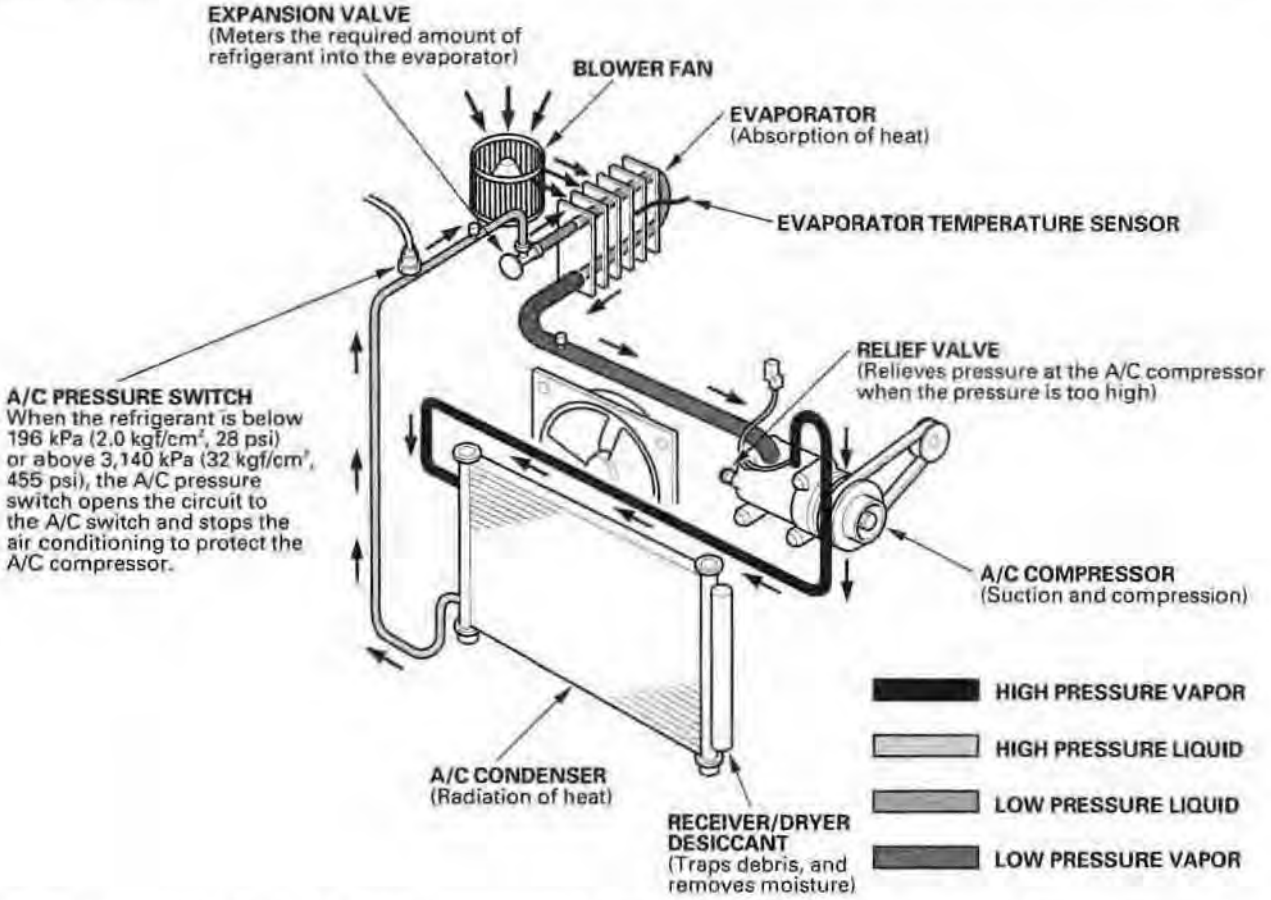


(DEF)





The air conditioning system removes heat from the passenger compartment by circulating refrigerant through the system as shown.



This vehicle uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

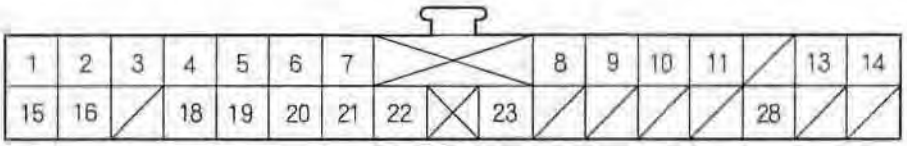
- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil (DENSO ND-OIL 8) designed for the R-134a A/C compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in A/C compressor failure.
- All A/C system parts (A/C compressor, discharge line, suction line, evaporator, A/C condenser, receiver/dryer, expansion valve, O-rings for joints) are designed for refrigerant R-134a. Do not exchange with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
- Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.

(cont'd)

System Description (cont'd)

Heater Control Panel Inputs and Outputs

HEATER CONTROL PANEL 30P CONNECTOR



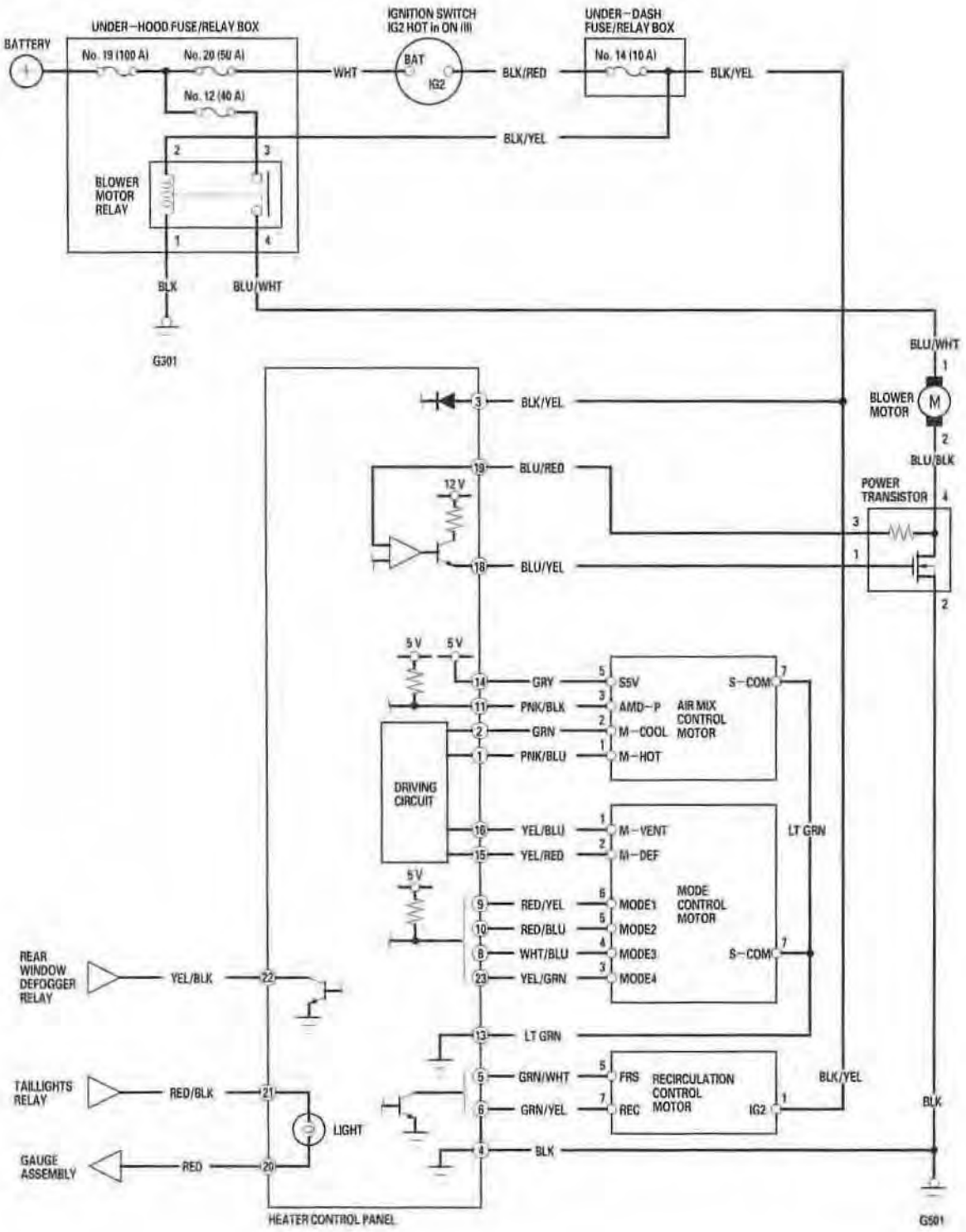
Wire side of female terminals

Cavity	Wire color	Signal	
1	PNK/BLU	AIR MIX HOT	OUTPUT
2	GRN	AIR MIX COOL	OUTPUT
3	BLK/YEL	IG2 (Power)	INPUT
4	BLK	GROUND	INPUT
5	GRN/WHT	FRESH	OUTPUT
6	GRN/YEL	RECIRCULATE	OUTPUT
7*	BLU	A/C PRESSURE SWITCH	OUTPUT
8	WHT/BLU	MODE 3	INPUT
9	RED/YEL	MODE 1	INPUT
10	RED/BLU	MODE 2	INPUT
11	PNK/BLK	AIR MIX POTENTIAL	INPUT
12	———	———	———
13	LT GRN	SENSOR COMMON GROUND	OUTPUT
14	GRY	AIR MIX POTENTIAL 5 V	OUTPUT
15	YEL/RED	MODE DEF	OUTPUT
16	YEL/BLU	MODE VENT	OUTPUT
17	———	———	———
18	BLU/YEL	POWER TRANSISTOR	OUTPUT
19	BLU/RED	BLOWER FEED BACK	INPUT
20	RED	GAUGE ASSEMBLY	INPUT
21	RED/BLK	TAILLIGHTS RELAY	INPUT
22	YEL/BLK	REAR WINDOW DEFOGGER RELAY	OUTPUT
23	YEL/GRN	MODE 4	INPUT
24	———	———	———
25	———	———	———
26	———	———	———
27	———	———	———
28*	BRN	EVAPORATOR TEMPERATURE SENSOR	INPUT
29	———	———	———
30	———	———	———

*: With Air Conditioning

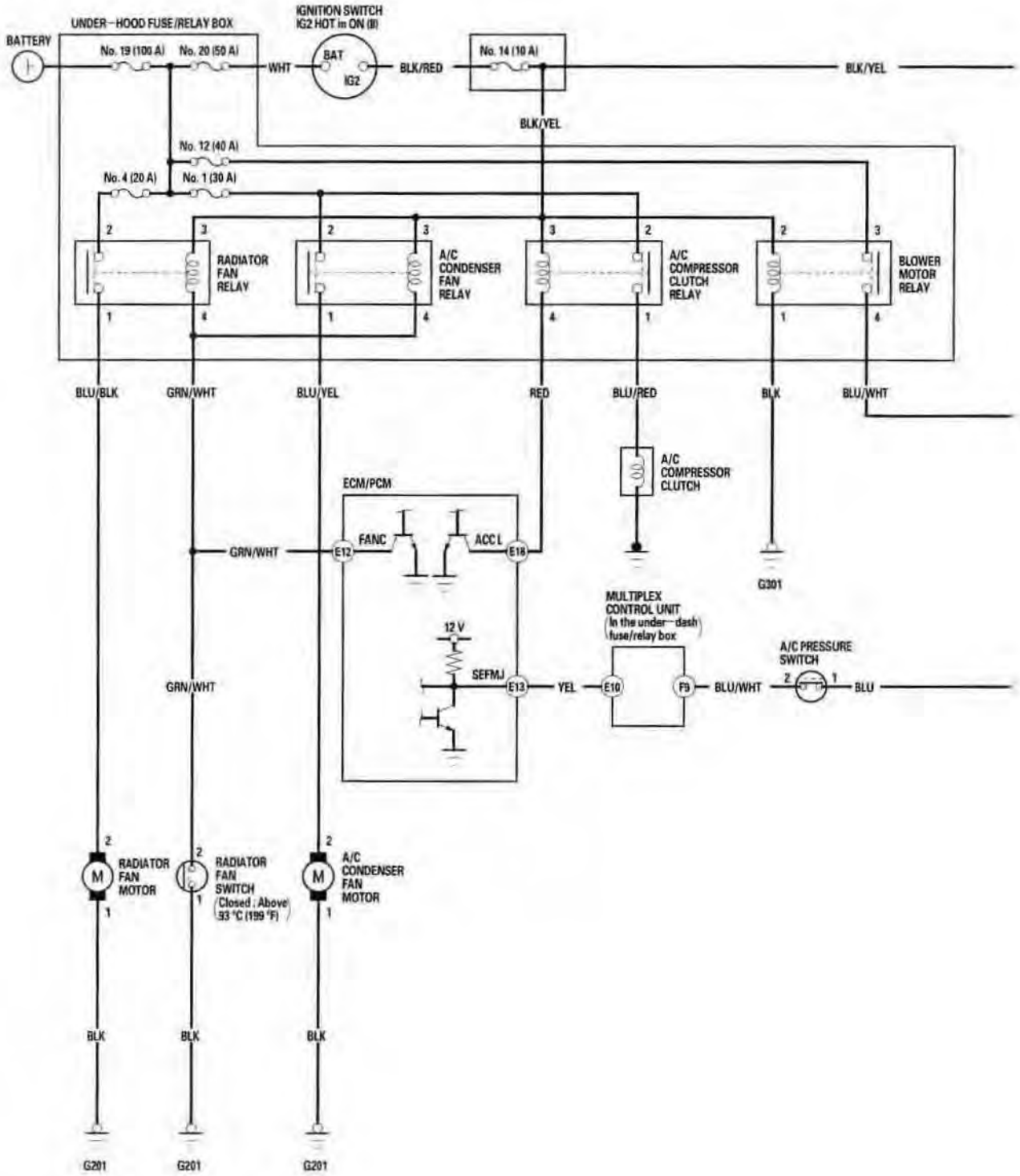
Circuit Diagram

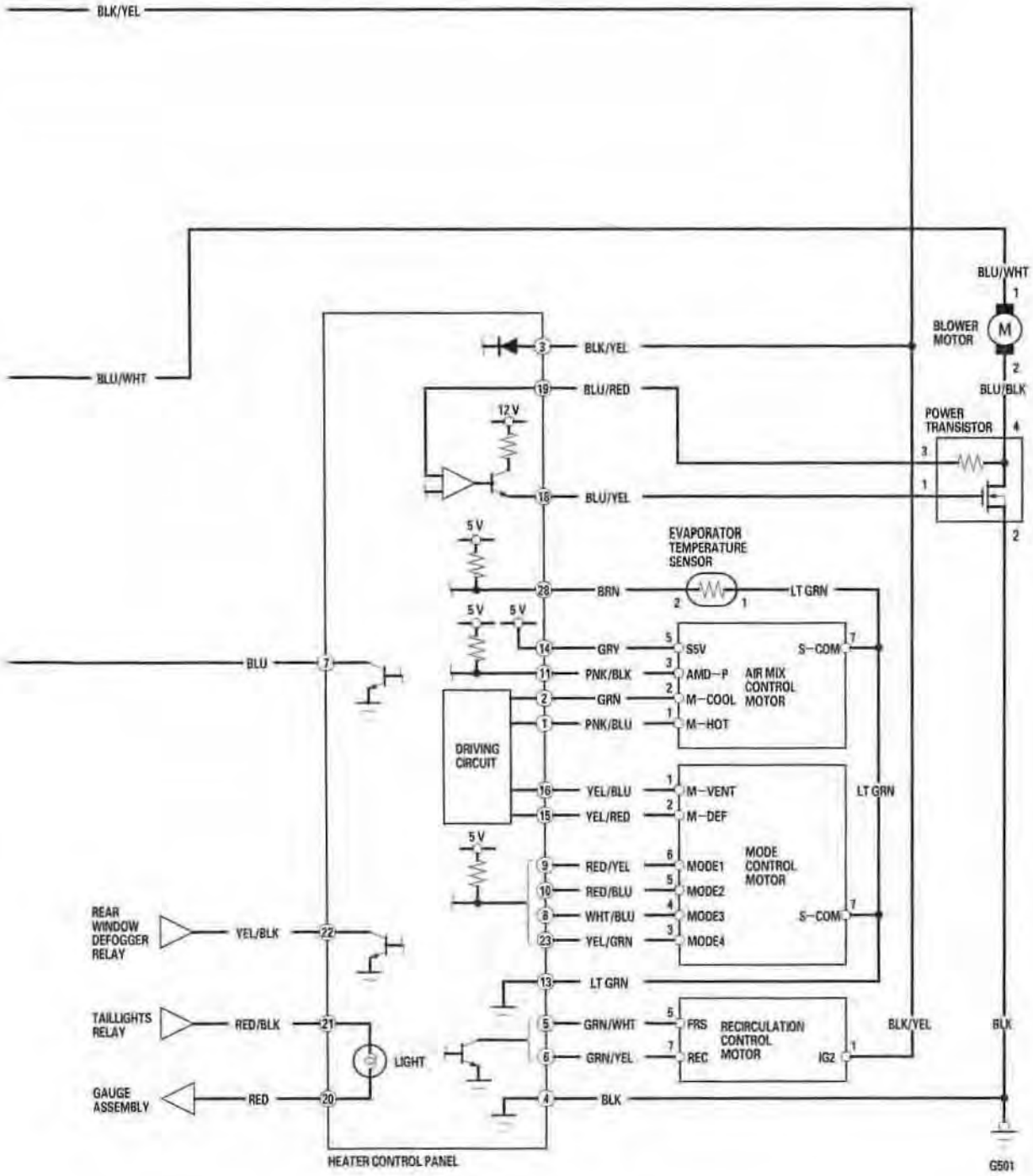
(Without A/C)



Circuit Diagram (cont'd)

(With A/C)




BLK/YEL
BLU/WHT
BLU/WHT
BLOWER MOTOR
BLU/BLK
POWER TRANSISTOR
BLK/YEL
BLU/RED
12 V
BLU/YEL
5 V
EVAPORATOR TEMPERATURE SENSOR
BRN
LT GRN
5 V
5 V
GRY
S5V
S-COM
PNK/BLK
AMD-P
AIR MIX CONTROL MOTOR
GRN
M-COOL
PNK/BLU
M-HOT
BLU
DRIVING CIRCUIT
YEL/BLU
M-VENT
LT GRN
YEL/RED
M-DEF
5 V
RED/YEL
MODE1
MODE CONTROL MOTOR
RED/BLU
MODE2
WHT/BLU
MODE3
S-COM
YEL/GRN
MODE4
REAR WINDOW DEFOGGER RELAY
YEL/BLK
LT GRN
TAILLIGHTS RELAY
RED/BLK
GRN/WHT
FRS
RECIRCULATION CONTROL MOTOR
BLK/YEL
BLK
LIGHT
GRN/YEL
REC
IG2
GAUGE ASSEMBLY
RED
BLK
HEATER CONTROL PANEL
G501

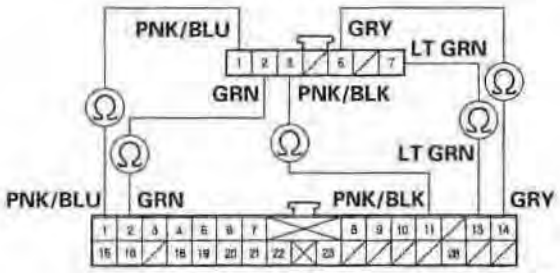
DTC Troubleshooting

DTC 7: An Open in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the heater control panel 30P connector.
3. Check for continuity between the following terminals of the heater control panel 30P connector and the air mix control motor 7P connector.

30P:	7P:
No. 1	No. 1
No. 2	No. 2
No. 11	No. 3
No. 13	No. 7
No. 14	No. 5

AIR MIX CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals



HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Go to step 4.

NO—Repair any open in the wire(s) between the heater control panel and the air mix control motor.■

4. Check for loose wires or poor connections at the heater control panel 30P connector and at the air mix control motor 7P connector. If the connections are good, substitute a known-good air mix control motor and retest.

Did the symptom/indication go away?

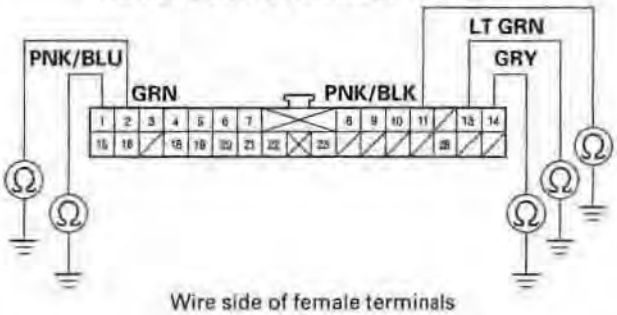
YES—The original air mix control motor is faulty, replace it.■

NO—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

DTC 8: A Short in the Air Mix Control Motor Circuit

1. Disconnect the air mix control motor 7P connector.
2. Disconnect the heater control panel 30P connector.
3. Check for continuity between body ground and heater control panel 30P connector terminals No. 1, 2, 11, 13, and 14 individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

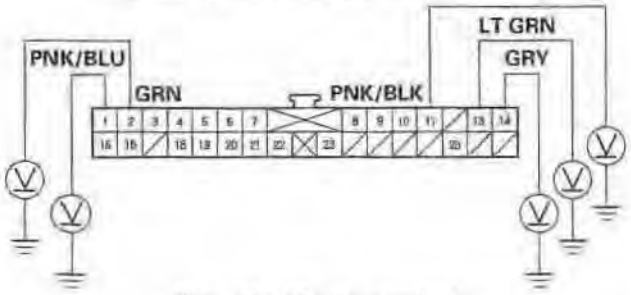
Is there continuity?

YES—Repair any short to body ground in the wire(s) between the heater control panel and the air mix control motor.■

NO—Go to step 4.

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

YES—Repair any short to power in the wire(s) between the heater control panel and the air mix control motor. This short also may damage the heater control panel. Repair the short to power before replacing the heater control panel. ■

NO—Go to step 5.

5. Substitute a known-good air mix control motor and retest.

Did the symptom/indication go away?

YES—The original air mix control motor is faulty, replace it. ■

NO—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

DTC 9: A Problem in the Air Mix Control Linkage, Door, or Motor

1. Test the air mix control motor (see page 21-36).

Is the air mix control motor OK?

YES—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

NO—Go to step 2.

2. Remove the air mix control motor (see page 21-37).

3. Check the air mix control linkage and door for smooth movement.

Do the air mix control linkage and door move smoothly?

YES—Replace the air mix control motor. ■

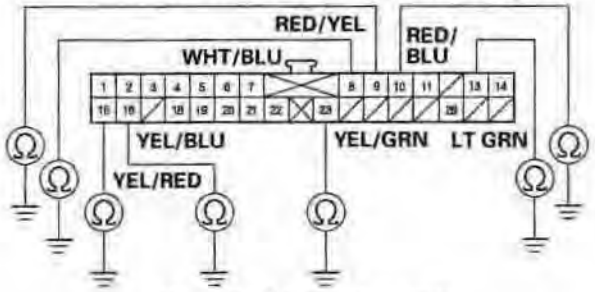
NO—Repair the air mix control linkage or door. ■

DTC Troubleshooting (cont'd)

DTC 10: A Short or Open in the Mode Control Motor Circuit

1. Disconnect the mode control motor 7P connector.
2. Disconnect the heater control panel 30P connector.
3. Check for continuity between body ground and the heater control panel 30P connector terminals No. 8, 9, 10, 13, 15, 16, and 23 individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

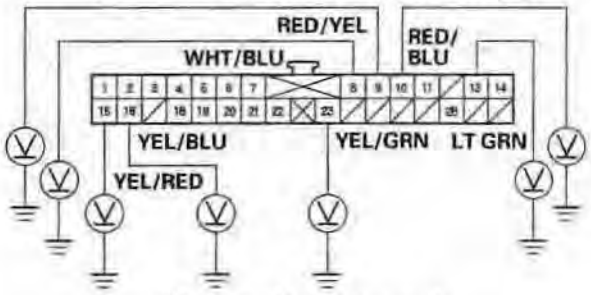
Is there continuity?

YES—Repair any short to body ground in the wire(s) between the heater control panel and the mode control motor.■

NO—Go to step 4.

4. Turn the ignition switch ON (II), and check the same terminals for voltage.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

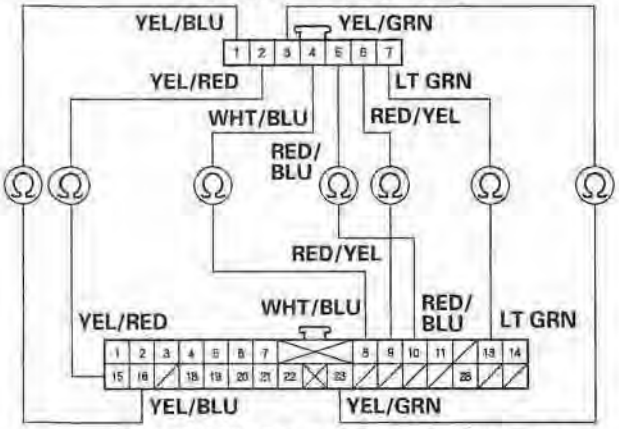
YES—Repair any short to power in the wire(s) between the heater control panel and the mode control motor. This short also may damage the heater control panel. Repair the short to power, then retest before replacing the heater control panel.■

NO—Go to step 5.

5. Turn the ignition switch OFF, and check for continuity between the following terminals of the heater control panel 30P connector and the mode control motor 7P connector.

30P:	7P:
No. 8	No. 4
No. 9	No. 6
No. 10	No. 5
No. 13	No. 7
No. 15	No. 2
No. 16	No. 1
No. 23	No. 3

MODE CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals



HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Go to step 6.

NO—Repair any open in the wire(s) between the heater control panel and the mode control motor. ■

6. Check for loose wires or poor connections at the heater control panel 30P connector and at the mode control motor 7P connector. If the connections are good, substitute a known-good mode control motor and retest.

Did the symptom/indication go away?

YES—The original mode control motor is faulty, replace it. ■

NO—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

DTC 11: A Problem in the Mode Control Linkage, Doors, or Motor

1. Test the mode control motor (see page 21-37).

Is the mode control motor OK?

YES—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

NO—Go to step 2.

2. Remove the mode control motor (see page 21-38).

3. Check the mode control linkage and doors for smooth movement.

Do the mode control linkage and doors move smoothly?

YES—Replace the mode control motor. ■

NO—Repair the mode control linkage or doors. ■

DTC Troubleshooting (cont'd)

DTC 12: A Problem in the Blower Motor Circuit

1. Check the No. 12 (40 A) fuse in the under-hood fuse/relay box, and the No. 14 (10 A) fuse in the under-dash fuse/relay box.

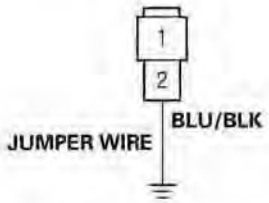
   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse(s), and recheck. ■

2. Connect the No. 2 terminal of the blower motor 2P connector to body ground with a jumper wire.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

3. Turn the ignition switch ON (II).

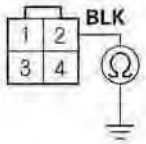
   Does the blower motor run?

   YES—Go to step 4.

   NO—Go to step 17.

4. Turn the ignition switch OFF.
5. Disconnect the jumper wire.
6. Disconnect the power transistor 4P connector.
7. Check for continuity between the No. 2 terminal of the power transistor 4P connector and body ground.

POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

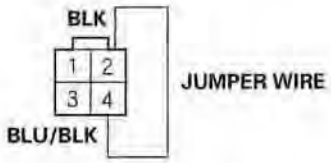
Is there continuity?

YES—Go to step 8.

NO—Check for an open in the wire between the power transistor and body ground. If the wire is OK, check for poor ground at G501. ■

8. Connect the No. 2 and No. 4 terminals of the power transistor 4P connector with a jumper wire.

POWER TRANSISTOR 4P CONNECTOR



Wire side of female terminals

9. Turn the ignition switch ON (II).

   Does the blower motor run at high speed?

   YES—Go to step 10.

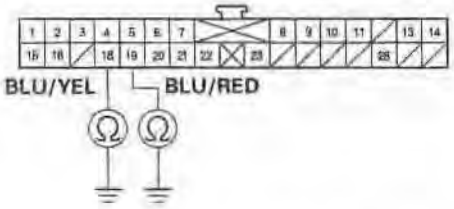
   NO—Repair open in the BLU/BLK wire between the power transistor and the blower motor. ■

10. Turn the ignition switch OFF.
11. Disconnect the jumper wire.

12. Disconnect the heater control panel 30P connector.

13. Check for continuity between the No. 18 and No. 19 terminals of the heater control panel 30P connector and body ground individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

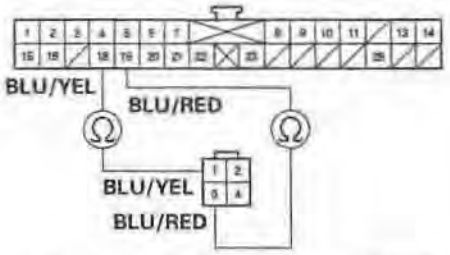
YES—Repair any short to body ground in the wire(s) between the heater control panel and the power transistor. ■

NO—Go to step 14.

14. Check for continuity between the following terminals of the heater control panel 30P connector and the power transistor 4P connector.

30P:	4P:
No. 18	No. 1
No. 19	No. 3

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



POWER TRANSISTOR 4P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Go to step 15.

NO—Repair any open in the wire(s) between the heater control panel and the power transistor. ■

15. Reconnect the heater control panel 30P connector.

16. Test the power transistor (see page 21-39).

Is the power transistor OK?

YES—Check for loose wires or poor connections at the heater control panel 30P connector and at the power transistor 4P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

NO—Replace the power transistor. ■

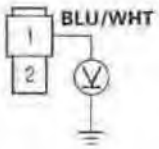
17. Disconnect the jumper wire.

18. Disconnect the blower motor 2P connector.

19. Turn the ignition switch ON (II).

20. Measure the voltage between the No. 1 terminal of the blower motor 2P connector and body ground.

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Replace the blower motor. ■

NO—Go to step 21.

21. Turn the ignition switch OFF.

22. Remove the blower motor relay from the under-hood fuse/relay box, and test it (see page 22-57).

Is the relay OK?

YES—Go to step 23.

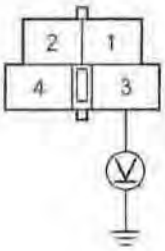
NO—Replace the blower motor relay. ■

(cont'd)

DTC Troubleshooting (cont'd)

23. Measure the voltage between the No. 3 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

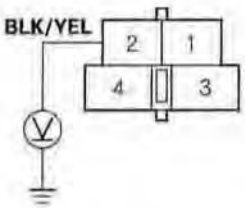
YES—Go to step 24.

NO—Replace the under-hood fuse/relay box. ■

24. Turn the ignition switch ON (II).

25. Measure the voltage between the No. 2 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there battery voltage?

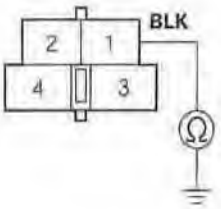
YES—Go to step 26.

NO—Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the blower motor relay. ■

26. Turn the ignition switch OFF.

27. Check for continuity between the No. 1 terminal of the blower motor relay 4P socket and body ground.

BLOWER MOTOR RELAY 4P SOCKET



Is there continuity?

YES—Repair open in the BLU/WHT wire between the blower motor relay and the blower motor. ■

NO—Check for an open in the wire between the blower motor relay and body ground. If the wire is OK, check for poor ground at G301. ■

DTC 14: An Open in the Evaporator Temperature Sensor Circuit

1. Remove the evaporator temperature sensor (see page 21-46).

2. Test the evaporator temperature sensor (see page 21-46).

   Is the resistance within the specifications shown on the graph?

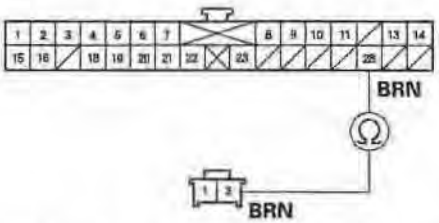
   YES—Go to step 3.

   NO—Replace the evaporator temperature sensor. ■

3. Disconnect the heater control panel 30P connector.

4. Check for continuity between the No. 28 terminal of the heater control panel 30P connector and the No. 2 terminal of the evaporator temperature sensor 2P connector.

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Go to step 5.

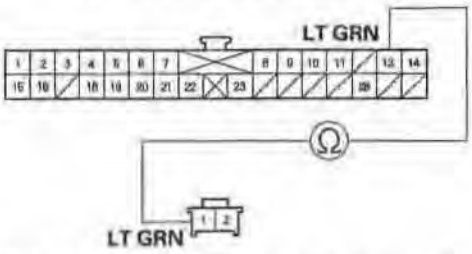
NO—Repair open in the wire between the heater control panel and the evaporator temperature sensor. ■

(cont'd)

DTC Troubleshooting (cont'd)

5. Check for continuity between the No. 13 terminal of the heater control panel 30P connector and the No. 1 terminal of the evaporator temperature sensor 2P connector.

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



EVAPORATOR TEMPERATURE SENSOR 2P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at the heater control panel 30P connector and at the evaporator temperature sensor 2P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

NO—Repair open in the wire between the heater control panel and the evaporator temperature sensor. ■

DTC 15: A Short in the Evaporator Temperature Sensor Circuit

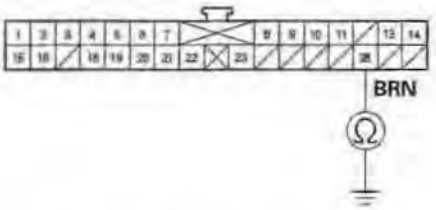
1. Remove the evaporator temperature sensor (see page 21-46).
2. Test the evaporator temperature sensor (see page 21-46).

   Is the resistance within the specifications shown on the graph?

   YES—Go to step 3.

   NO—Replace the evaporator temperature sensor. ■
3. Disconnect the heater control panel 30P connector.
4. Check for continuity between the No. 28 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair short to body ground in the wire between the heater control panel and the evaporator temperature sensor. ■

NO—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

Recirculation Control Motor Circuit Troubleshooting

1. Check the No. 14 (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 2.

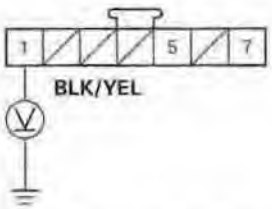
   NO—Replace the fuse, and recheck.■

2. Disconnect the recirculation control motor 7P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 1 terminal of the recirculation control motor 7P connector and body ground.

RECIRCULATION CONTROL MOTOR 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

YES—Go to step 5.

NO—Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the recirculation control motor.■

5. Turn the ignition switch OFF.

6. Test the recirculation control motor (see page 21-38).

   Is the recirculation control motor OK?

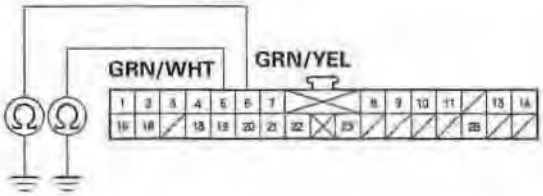
   YES—Go to step 7.

   NO—Go to step 13.

7. Disconnect the heater control panel 30P connector.

8. Check for continuity between the No. 5 and No. 6 terminals of the heater control panel 30P connector and body ground individually.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

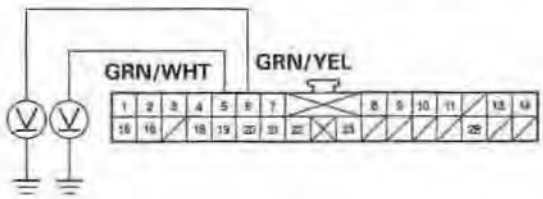
Is there continuity?

YES—Repair any short to body ground in the wire(s) between the heater control panel and the recirculation control motor.■

NO—Go to step 9.

9. Turn the ignition switch ON (II), and check the same wires for voltage.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there any voltage?

YES—Repair any short to power in the wire(s) between the heater control panel and the recirculation control motor. This short also may damage the heater control panel. Repair the short to power and retest before replacing the heater control panel.■

NO—Go to step 10.

(cont'd)

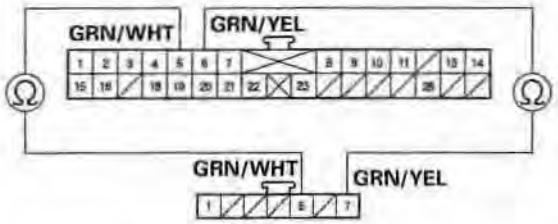
Recirculation Control Motor Circuit Troubleshooting (cont'd)

10. Turn the ignition switch OFF.

11. Check for continuity between the following terminals of the heater control panel 30P connector and the recirculation control motor 7P connector.

30P:	7P:
No. 5	No. 5
No. 6	No. 7

HEATER CONTROL PANEL 30P CONNECTOR
Wire side of female terminals



RECIRCULATION CONTROL MOTOR 7P CONNECTOR
Wire side of female terminals

Is there continuity?

YES—Go to step 12.

NO—Repair any open in the wire(s) between the heater control panel and the recirculation control motor.■

12. Check for loose wires or poor connections at the heater control panel 30P connector and at the recirculation control motor 7P connector. If the connections are good, substitute a known-good recirculation control motor and retest.

Did the symptom/indication go away?

YES—The original recirculation control motor is faulty, replace it.■

NO—Substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

13. Remove the recirculation contol motor (see page 21-38).

14. Check the recirculation control linkage and doors for smooth movement.

Do the recirculation control linkage and doors move smoothly?

YES—Replace the recirculation control motor.■

NO—Repair the recirculation control linkage or doors.■

Heater Control Power and Ground Circuit Troubleshooting

1. Check the No.14 (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 2.

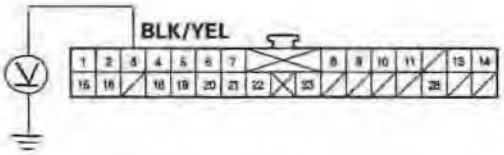
   NO—Replace the fuse, and recheck.■

2. Disconnect the heater control panel 30P connector.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 3 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there battery voltage?

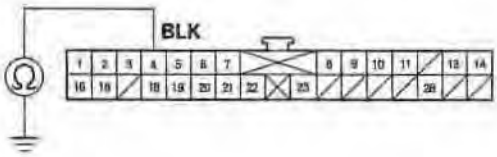
YES—Go to step 5.

NO—Repair open in the wire between the No. 14 fuse in the under-dash fuse/relay box and the heater control panel.■

5. Turn the ignition switch OFF.

6. Check for continuity between the No. 4 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Check for loose wires or poor connections at the heater control panel 30P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel.■

NO—Check for an open in the wire between the heater control panel and body ground. If the wire is OK, check for poor ground at G501.■

A/C Condenser Fan Circuit Troubleshooting

NOTE: Do not use this troubleshooting procedure if the radiator fan and/or the A/C compressor is inoperative. Refer to the symptom troubleshooting index.

1. Check the No. 1 (30 A) fuse in the under-hood fuse/relay box, and the No. 14 (10 A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse(s), and recheck. ■

2. Remove the A/C condenser fan relay from the under-hood fuse/relay box, and test it (see page 22-57).

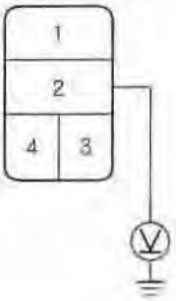
   Is the relay OK?

   YES—Go to step 3.

   NO—Replace the A/C condenser fan relay. ■

3. Measure the voltage between the No. 2 terminal of the A/C condenser fan relay 4P socket and body ground.

   A/C CONDENSER FAN RELAY 4P SOCKET

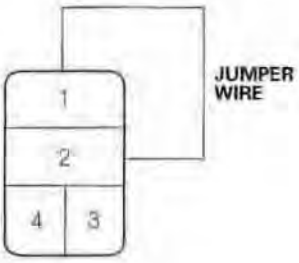
   Is there battery voltage?

   YES—Go to step 4.

   NO—Replace the under-hood fuse/relay box. ■

4. Connect the No. 1 and No. 2 terminals of the A/C condenser fan relay 4P socket with a jumper wire.

   A/C CONDENSER FAN RELAY 4P SOCKET

   Does the A/C condenser fan run?

   YES—Go to step 5.

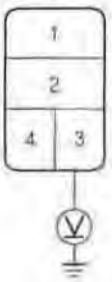
   NO—Go to step 8.

5. Disconnect the jumper wire.

6. Turn the ignition switch ON (II).

7. Measure the voltage between the No. 3 terminal of the A/C condenser fan relay 4P socket and body ground.

   A/C CONDENSER FAN RELAY 4P SOCKET

   Is there battery voltage?

   YES—Replace the under-hood fuse/relay box. ■

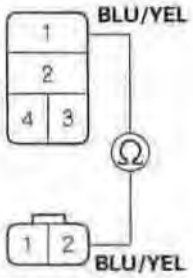
   NO—Repair open in the BLK/YEL wire between the BLK/YEL No. 14 fuse in the under-dash fuse/relay box and the A/C condenser fan relay socket in the under-hood fuse/relay box. ■

8. Disconnect the jumper wire.

9. Disconnect the A/C condenser fan 2P connector.

10. Check for continuity between the No. 1 terminal of the A/C condenser fan relay 4P socket and the No. 2 terminal of the A/C condenser fan 2P connector.

A/C CONDENSER FAN RELAY 4P SOCKET



A/C CONDENSER FAN 2P CONNECTOR
Wire side of female terminals

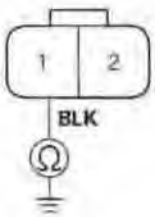
Is there continuity?

YES—Go to step 11.

NO—Repair open in the wire between the A/C condenser fan relay socket in the under-hood fuse/relay box and the A/C condenser fan.■

11. Check for continuity between the No. 1 terminal of the A/C condenser fan 2P connector and body ground.

A/C CONDENSER FAN 2P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Replace the A/C condenser fan motor.■

NO—Check for an open in the wire between the A/C condenser fan and body ground. If the wire is OK, check for poor ground at G201.■

Radiator and A/C Condenser Fan Common Circuit Troubleshooting

NOTE: Do not use this troubleshooting procedure if only one fan is inoperative, or the A/C compressor is inoperative. Refer to the symptom troubleshooting index.

1. Check the No. 1 (30 A) and No. 4 (20 A) fuses in the under-hood fuse/relay box, and the No. 14 (10 A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   YES—Go to step 2.

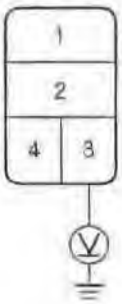
   NO—Replace the fuse(s), and recheck.■

2. Remove the A/C condenser fan relay from the under-hood fuse/relay box.

3. Turn the ignition switch ON (II).

4. Measure the voltage between the No. 3 terminal of the A/C condenser fan relay 4P socket and body ground.

A/C CONDENSER FAN RELAY 4P SOCKET



Is there battery voltage?

YES—Go to step 5.

NO—Repair open in the BLK/YEL wire between the No. 14 fuse in the under-dash fuse/relay box and the radiator fan relay socket, and the A/C condenser fan relay socket.■

5. Turn the ignition switch OFF.

6. Reinstall the A/C condenser fan relay.

7. Make sure the A/C switch is OFF.

(cont'd)

Radiator and A/C Condenser Fan Common Circuit Troubleshooting (cont'd)

8. Turn the ignition switch ON (II).
9. Using the backprobe set, measure the voltage between the No. 12 terminal of ECM/PCM connector E (31P) and body ground with the ECM/PCM connectors connected.

ECM/PCM CONNECTOR E (31P)

Wire side of female terminals

Is there battery voltage?

YES—Check for loose wires or poor connections at ECM/PCM connector E (31P). If the connections are good, substitute a known-good ECM/PCM, and recheck. If the symptom/indication goes away, replace the original ECM/PCM. ■

NO—Repair open in the wire between the radiator fan relay socket, the A/C condenser fan relay socket and the ECM/PCM. ■

A/C Compressor Clutch Circuit Troubleshooting

NOTE: Do not use this troubleshooting procedure if the fans are also inoperative. Refer to the symptom troubleshooting index.

1. Check the No. 1 (30 A) fuse in the under-hood fuse/relay box, and the No. 14 (10 A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   YES—Go to step 2.

   NO—Replace the fuse(s), and recheck. ■

2. Check the engine coolant temperature, throttle position, and idle speed (use the Honda PGM Tester or HDS PGM-FI data list if possible).

   Is the coolant temperature, throttle position, or idle speed out of nomal range?

   YES—Troubleshoot and repair the cause of the high engine coolant temperature, low idle, or excessively high throttle position. ■

   NO—Go to step 3.

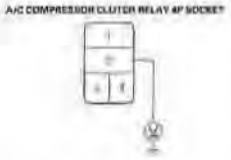
3. Remove the A/C compressor clutch relay from the under-hood fuse/relay box, and test it (see page 22-57).

   Is the relay OK?

   YES—Go to step 4.

   NO—Replace the A/C compressor clutch relay. ■

4. Measure the voltage between the No. 2 terminal of the A/C compressor clutch relay 4P socket and body ground.



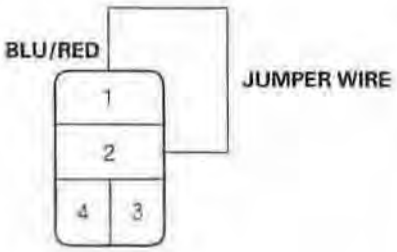
   Is there battery voltage?

   YES—Go to step 5.

   NO—Replace the under-hood fuse/relay box. ■

5. Connect the No. 1 and No. 2 terminals of the A/C compressor clutch relay 4P socket with a jumper wire.

A/C COMPRESSOR CLUTCH RELAY 4P SOCKET



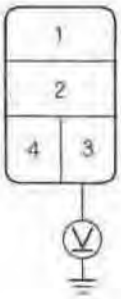
Does the A/C compressor clutch click?

YES—Go to step 6.

NO—Go to step 14.

6. Disconnect the jumper wire.
7. Turn the ignition switch ON (II).
8. Measure the voltage between the No. 3 terminal of the A/C compressor clutch relay 4P socket and body ground.

A/C COMPRESSOR CLUTCH RELAY 4P SOCKET



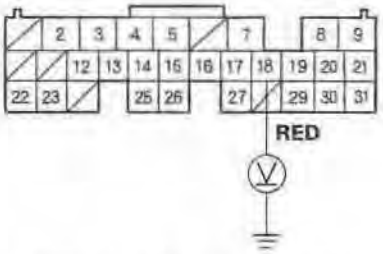
Is there battery voltage?

YES—Go to step 9.

NO—Repair open in the BLK/YEL wire between the No. 14 fuse in the under-dash fuse/relay box and the A/C compressor clutch relay socket. ■

9. Turn the ignition switch OFF.
10. Reinstall the A/C compressor clutch relay.
11. Make sure the A/C switch is OFF.
12. Turn the ignition switch ON (II).
13. Using the backprobe set, measure the voltage between the No. 18 terminal of ECM/PCM connector E (31P) and body ground with the ECM/PCM connectors connected.

ECM/PCM CONNECTOR E (31P)



Wire side of female terminals

Is there battery voltage?

YES—Check for loose wires or poor connections at ECM/PCM connector E (31P). If the connections are good, substitute a known-good ECM/PCM, and recheck. If the symptom/indication goes away, replace the original ECM/PCM. ■

NO—Repair open in the wire between the A/C compressor clutch relay and the ECM/PCM. ■

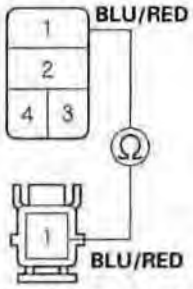
14. Disconnect the jumper wire.
15. Disconnect the A/C compressor clutch 1P connector.

(cont'd)

A/C Compressor Clutch Circuit Troubleshooting (cont'd)

16. Check for continuity between the No. 1 terminal of the A/C compressor clutch relay 4P socket and the No. 1 terminal of the A/C compressor clutch 1P connector.

A/C COMPRESSOR CLUTCH RELAY 4P SOCKET



A/C COMPRESSOR CLUTCH 1P CONNECTOR
Terminal side of male terminals

Is there continuity?

YES—Check the A/C compressor clutch clearance, and the A/C compressor clutch field coil (see page 21-50). ■

NO—Repair open in the wire between the A/C compressor clutch relay socket and the A/C compressor clutch. ■

A/C Pressure Switch Circuit Troubleshooting

NOTE: Do not use this troubleshooting procedure if any of these items are working properly with the A/C switch ON; A/C condenser fan, radiator fan and A/C compressor, or the heater does not work. Refer to the symptom troubleshooting index.

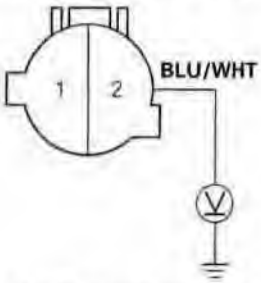
1. Turn the ignition switch ON (II).
2. Turn the blower switch on, and check for blower motor operation.

   Does the blower motor run correctly on all speeds?

   YES—Go to step 3.

   NO—Troubleshoot the blower motor circuit (see page 21-22).
3. Disconnect the A/C pressure switch 2P connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the No. 2 terminal of the A/C pressure switch 2P connector and body ground.

A/C PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

Is there 5 V or more?

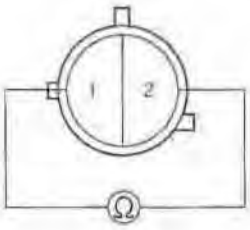
YES—Go to step 6.

NO—Go to step 14.

6. Turn the ignition switch OFF.

7. Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

A/C PRESSURE SWITCH



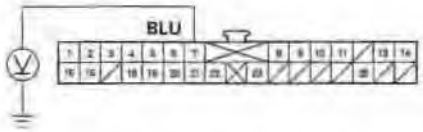
Is there continuity?

YES—Go to step 8.

NO—Go to step 16.

8. Reconnect the A/C pressure switch 2P connector.
9. Disconnect the heater control panel 30P connector.
10. Turn the ignition switch ON (II).
11. Measure the voltage between the No. 7 terminal of the heater control panel 30P connector and body ground.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

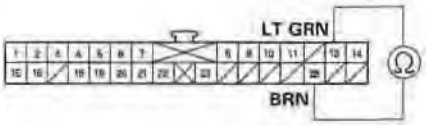
Is there battery voltage?

YES—Go to step 12.

NO—Repair open in the wire between the heater control panel and the A/C pressure switch. ■

12. Turn the ignition switch OFF.
13. Measure the resistance between the No. 13 and the No. 28 terminals of the heater control panel 30P connector.

HEATER CONTROL PANEL 30P CONNECTOR



Wire side of female terminals

Is the resistance less than 24 kΩ ?

YES—Check for loose wires or poor connections at the heater control panel 30P connector and at the A/C pressure switch 2P connector. If the connections are good, substitute a known-good heater control panel, and recheck. If the symptom/indication goes away, replace the original heater control panel. ■

NO—Test the evaporator temperature sensor (see page 21-46). ■

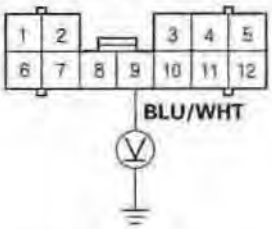
(cont'd)

A/C Pressure Switch Circuit Troubleshooting (cont'd)

14. Make sure the A/C switch is OFF.

15. Using the backprobe set, measure the voltage between the No. 9 terminal of under-dash fuse/relay box connector F (12P) and body ground with the under-dash fuse/relay box connectors connected.

UNDER-DASH FUSE/RELAY BOX CONNECTOR F (12P)



Wire side of female terminals

Is there 5 V or more?

YES—Repair open in the wire between the under-dash fuse/relay box and the A/C pressure switch. ■

NO—Refer to the multiplex control system (see page 22-149). ■

NOTE: Check for multiplex codes in mode 1. Follow the troubleshooting for any codes found. If no codes are found, substitute a known-good multiplex control unit and a ECM/PCM one at a time.

16. Check for proper A/C system pressure.

Is the pressure within specifications?

YES—Replace the A/C pressure switch. ■

NO—Repair the A/C pressure problem. ■

Air Mix Control Motor Test

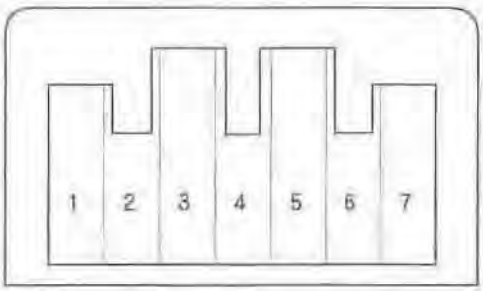
1. Disconnect the 7P connector from the air mix control motor.

NOTICE

Incorrectly applying power and ground to the air mix control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 1 terminal of the air mix control motor, and ground the No. 2 terminal; the air mix control motor should run smoothly, and stop at Max Hot. If it doesn't, reverse the connections; the air mix control motor should run smoothly, and stop at Max Cool.

AIR MIX CONTROL MOTOR



3. If the air mix control motor did not run in step 2, remove it, then check the air mix control linkage and door for smooth movement.

- If the linkage and door move smoothly, replace the air mix control motor.
- If the linkage or door sticks or binds, repair them as needed.
- If the air mix control motor runs smoothly, go to step 4.

4. Measure the resistance between the No. 5 and No. 7 terminals. It should be between 4.2 to 7.8 kΩ.

5. Reconnect the air mix control motor 7P connector, then turn the ignition switch ON (II).

6. Using the backprobe set, measure the voltage between the No. 3 and No. 7 terminals.

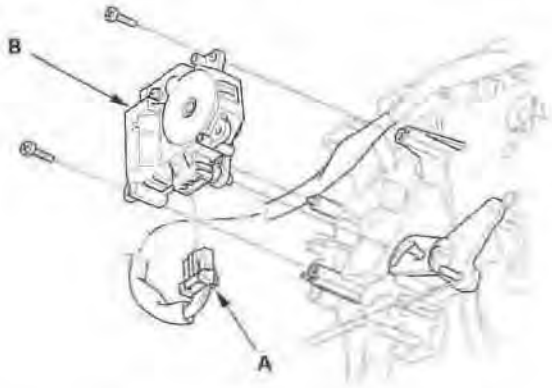
Max Cool—about 1 V
Max Hot—about 4 V

7. If either the resistance or voltage readings are not as specified, replace the air mix control motor.

Air Mix Control Motor Replacement

1. Remove the under-dash fuse/relay box (see page 22-55).

2. Disconnect the 7P connector (A) from the air mix control motor (B). Remove the self-tapping screws and the air mix control motor from the heater unit.



3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

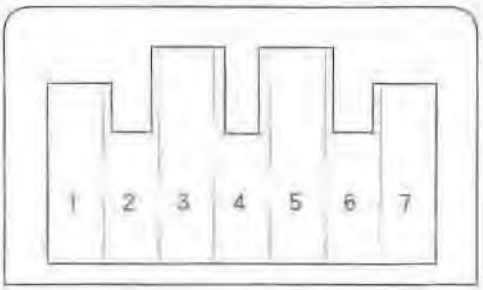
Mode Control Motor Test

1. Disconnect the 7P connector from the mode control motor.

NOTICE
Incorrectly applying power and ground to the mode control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 1 terminal of the mode control motor, and ground the No. 2 terminal; the mode control motor should run smoothly, and stop at Vent. If it doesn't, reverse the connections; the mode control motor should run smoothly, and stop at Defrost. When the mode control motor stops running, disconnect battery power immediately.

MODE CONTROL MOTOR



3. If the mode control motor did not run in step 2, remove it, then check the mode control linkage and doors for smooth movement.

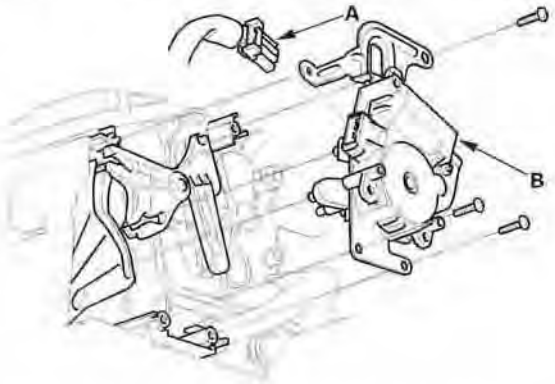
   - If the linkage and doors move smoothly, replace the mode control motor.
   - If the linkage or doors stick or bind, repair them as needed.
   - If the mode control motor runs smoothly, go to step 4.

4. Use a digital multimeter with an output of 1 mA or less at the 20 kΩ range. With the mode control motor running as in step 2, check for continuity between the No. 3, 4, 5, 6 terminals and the No. 7 terminal individually. There should be continuity for a moment at each terminal as the motor moves past the switch's terminal.

5. If there is no continuity for a moment at each terminal, replace the mode control motor.

Mode Control Motor Replacement

1. Remove the ECM/PCM (see page 11-5).
2. Disconnect the 7P connector (A) from the mode control motor (B). Remove the self-tapping screws and the mode control motor from the heater unit.



3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

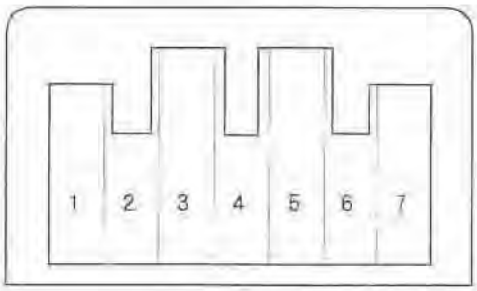
Recirculation Control Motor Test

1. Disconnect the 7P connector from the recirculation control motor.

NOTICE
Incorrectly applying power and ground to the recirculation control motor will damage it. Follow the instructions carefully.

2. Connect battery power to the No. 1 terminal of the recirculation control motor, and ground the No. 5 and No. 7 terminals; the recirculation control motor should run smoothly. To avoid damaging the recirculation control motor, do not reverse power and ground. Disconnect the No. 5 or No. 7 terminals from ground; the recirculation control motor should stop at Fresh or Recirculate. Don't cycle the recirculation control motor for a long time.

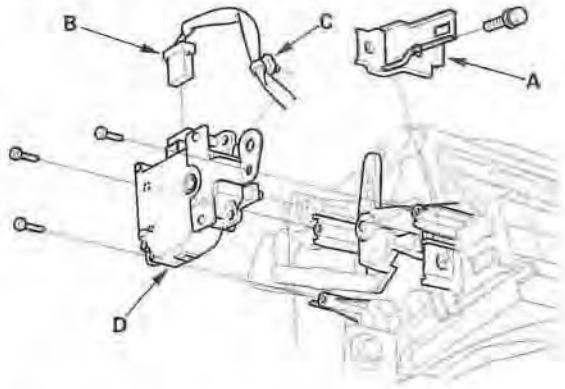
RECIRCULATION CONTROL MOTOR



3. If the recirculation control motor did not run in step 2, remove it, then check the recirculation control linkage and doors for smooth movement.
   - If the linkage and doors move smoothly, replace the recirculation control motor.
   - If the linkage or doors stick or bind, repair them as needed.

Recirculation Control Motor Replacement

1. Remove the ECM/PCM (see page 11-5).
2. Remove the bolt and the bracket (A). Disconnect the 7P connector (B) and the harness clip (C) from the recirculation control motor (D). Remove the self-tapping screws and the recirculation control motor from the blower unit.

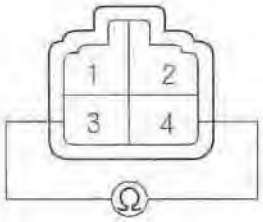


3. Install the motor in the reverse order of removal. After installation, make sure the motor runs smoothly.

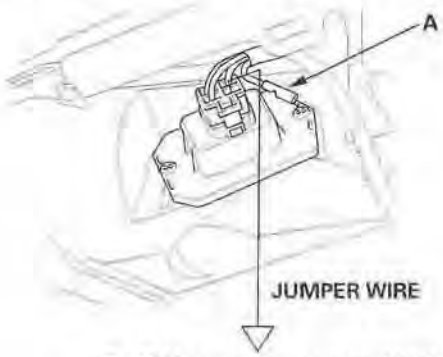
Power Transistor Test

1. Disconnect the 4P connector from the power transistor.
2. Measure the resistance between the No. 3 and No. 4 terminals of the power transistor. It should be about 1.4—1.5 kΩ.
   - If the resistance is within the specifications, go to step 3.
   - If the resistance is not within the specifications, replace the power transistor.

POWER TRANSISTOR



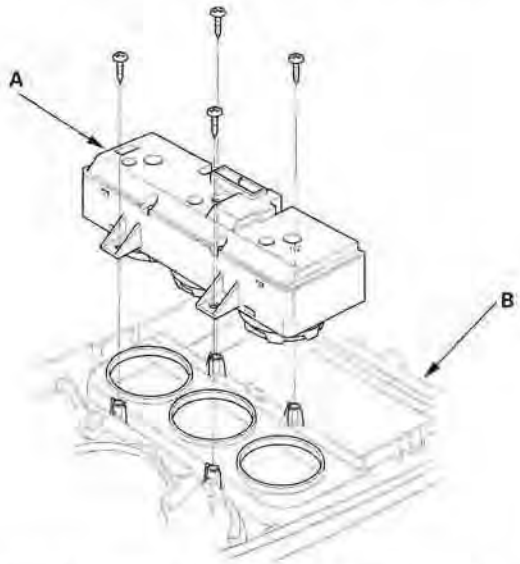
3. Carefully release the lock tab on the No. 1 terminal (BLU/YEL) (A) in the 4P connector, then remove the terminal and insulate it from body ground.



4. Reconnect the 4P connector to the power transistor.
5. Supply 12 V to the No. 1 cavity with a jumper wire.
6. Turn the ignition switch ON (II), and check that the blower motor runs.
   - If the blower motor does not run, replace the power transistor.
   - If the blower motor runs, the power transistor is OK.

Heater Control Panel Removal and Installation

1. Remove the center panel (see page 20-77).
2. Remove the self-tapping screws and the heater control panel (A) from the center panel (B).



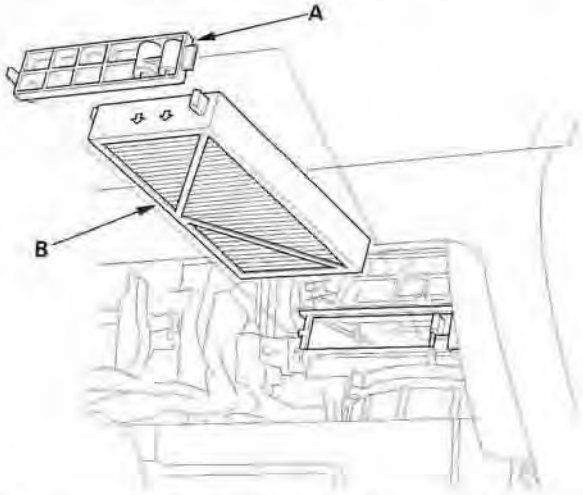
3. Install the control panel in the reverse order of removal. After installation, operate the various functions to see whether they works properly.
4. Run the self-diagnostic function to confirm that there are no problems in the system (see page 21-8).

Dust and Pollen Filter Replacement

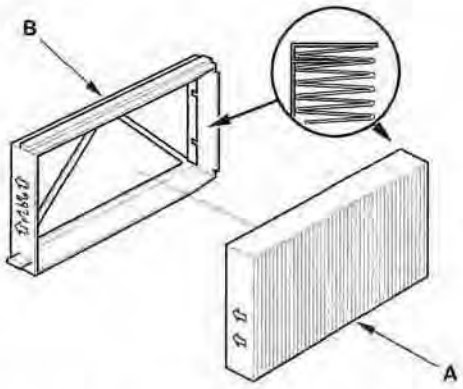
With Air Conditioning

The dust and pollen filters should be replaced every 30,000 miles (48,000 km) or 2 years whichever comes first. Replace the filters more often if the airflow is less than usual, or if the vehicle is driven in areas that have high concentrations of soot from industry or diesel powered vehicles.

1. Open the glove box. Remove the glove box stop on each side, then hang the glove box down (see page 20-78).
2. Remove the filter lid (A) from the blower unit, then pull out the first dust and pollen filter (B). Slide the second filter to the left, and pull it out.



3. Remove the filter (A) from the housing (B), and replace the filter.

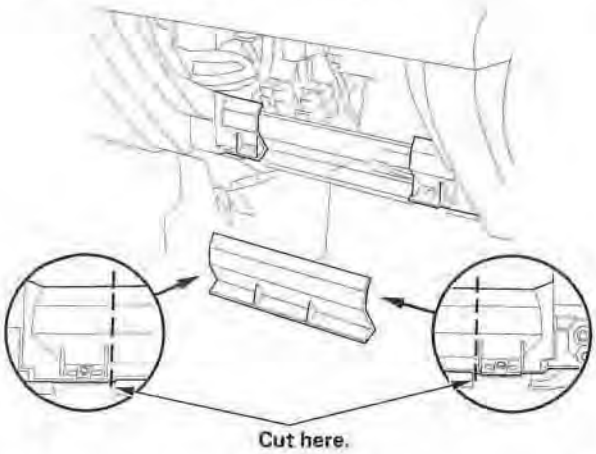


4. Install the filters in the reverse order of removal.

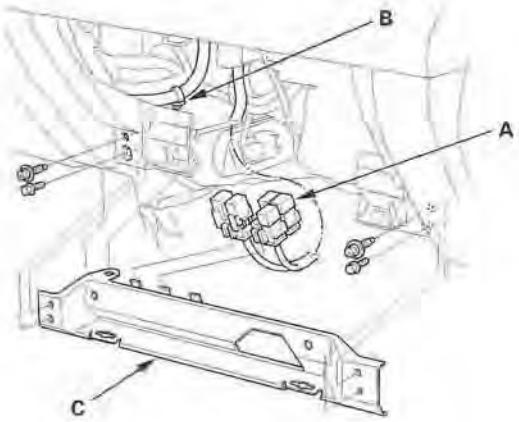
Blower Unit Removal and Installation

1. Remove the passenger's dashboard under cover (see page 20-78), the passenger's kick panel (see page 20-58), and the glove box (see page 20-78).

2. Cut the plastic cross brace in the glove box opening with diagonal cutters in the area shown. Remove and discard the plastic cross brace.

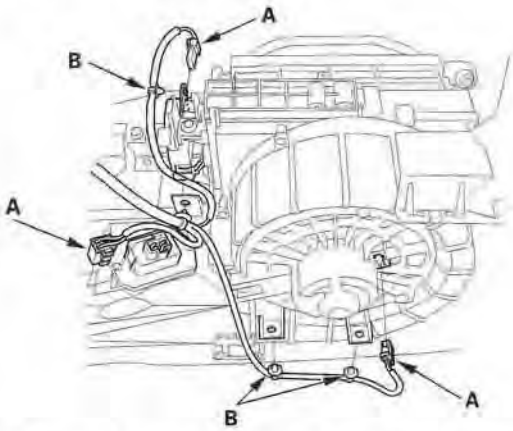


3. Remove the relays (A) and the wire harness clip (B), then remove the bolts and the glove box frame (C).

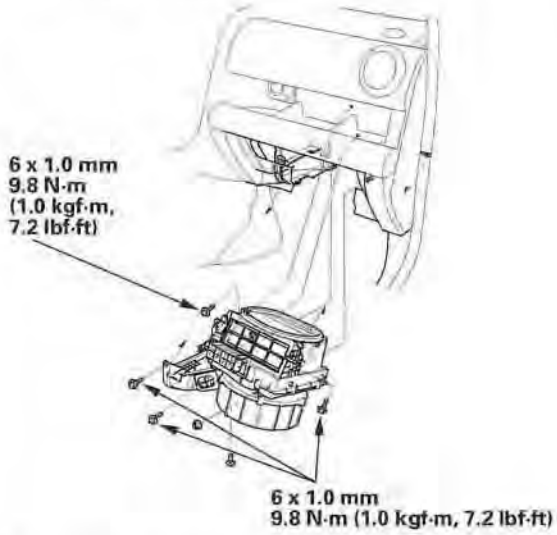


4. Remove the ECM/PCM (see page 11-5).

5. Disconnect the connectors (A) from the blower motor, the power transistor, and the recirculation control motor, then remove the wire harness clips (B).



6. Fold the floor covering and pad back toward you. Remove the mounting bolts, the mounting nut, and the blower unit.

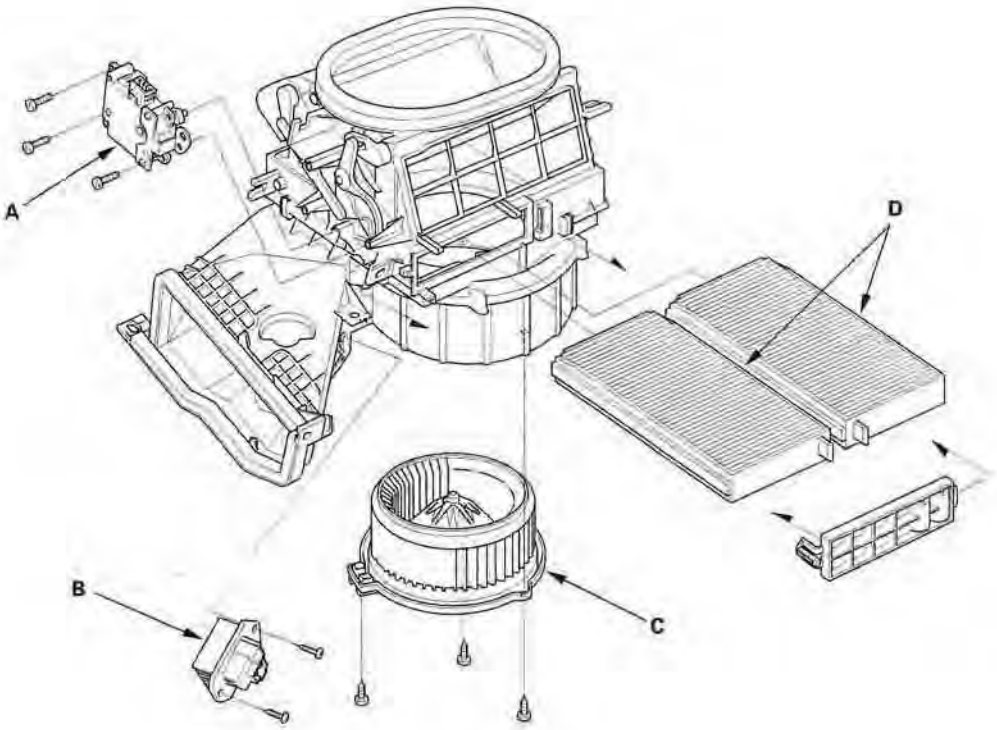


7. Install the unit in the reverse order of removal. Make sure that there is no air leakage.

Blower Unit Component Replacement

Note these items when overhauling the blower unit:

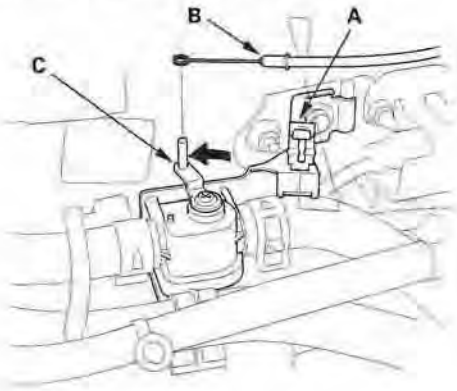
- The recirculation control motor (A), the power transistor (B), the blower motor (C), and the dust and pollen filters (with A/C) (D) can be replaced without removing the blower unit.
- Before reassembly, make sure that the recirculation control linkage and doors move smoothly.
- After reassembly, make sure the recirculation control motor runs smoothly (see page 21-38).



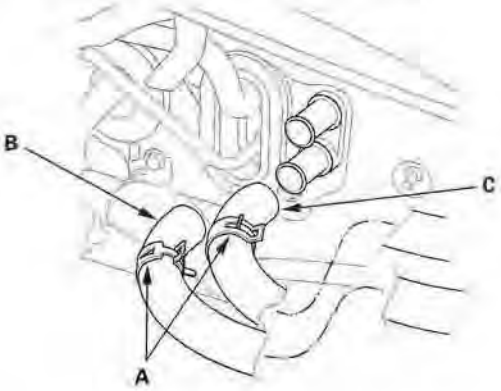
Heater Unit/Core Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-10), and precautions and procedures (see page 23-11) in the SRS section before performing repairs or service.

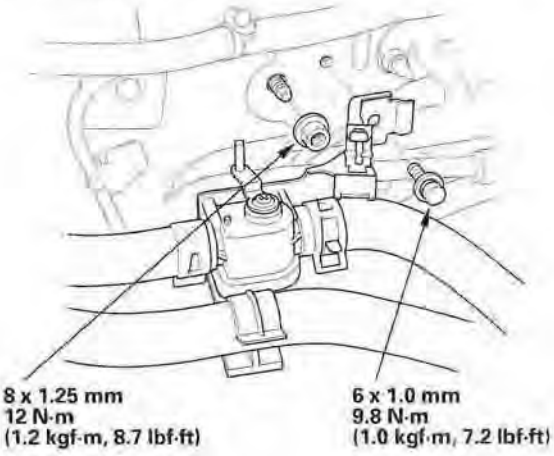
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative cable from the battery.
3. With air conditioning; disconnect the A/C lines from the evaporator core (see page 21-47).
4. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C). Turn the heater valve arm to the fully opened position as shown.



5. When the engine is cool, drain the engine coolant from the radiator (see page 10-6).
6. Slide the hose clamps (A) back, then disconnect the inlet heater hose (B) and the outlet heater hose (C) from the heater core. Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan. Be sure not to let coolant spill on the electrical parts or the painted surfaces. If any coolant spills, rinse it off immediately.



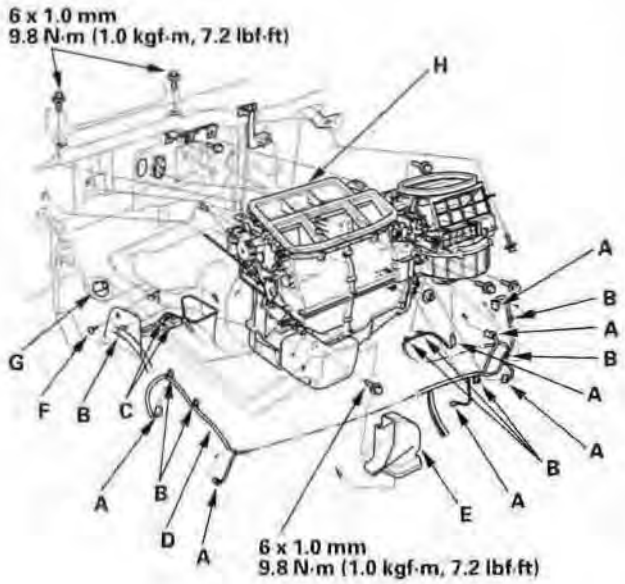
7. Remove the mounting bolt and the heater valve as shown. Remove the mounting nut from the heater unit. Take care not to damage or bend the fuel lines and the brake lines, etc.



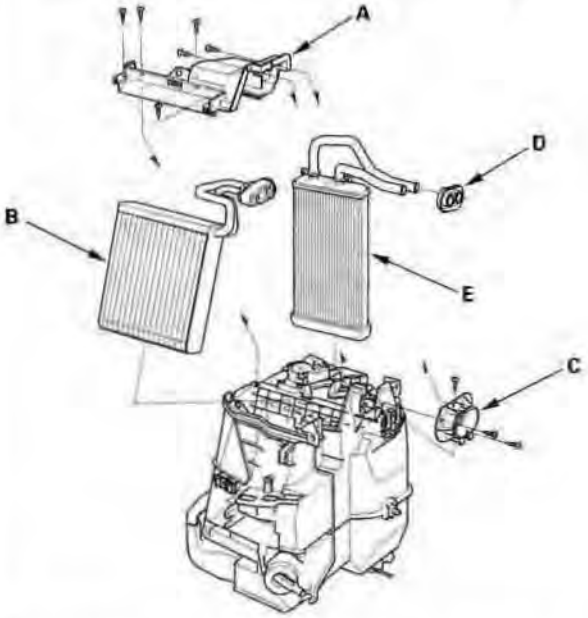
(cont'd)

Heater Unit/Core Replacement (cont'd)

8. Remove the dashboard (see page 20-80).
9. Remove the ECM/PCM (see page 11-5).
10. Disconnect the connectors (A) from the dashboard wire harness, the air mix control motor, the evaporator temperature sensor, the power transistor, the mode control motor, the blower motor, and the recirculation control motor, then remove the wire harness clips (B), the connector clips (C), the wire harness (D), the heater duct (E), and the clip (F). Disconnect the drain hose (G), then remove the mounting nuts and the blower-heater unit (H).



11. Remove the self-tapping screws and the expansion valve cover (A). With air conditioning; carefully pull out the evaporator core (B) so you don't bend the inlet and outlet pipes. Remove the self-tapping screws and the flange cover (C), then remove the grommet (D), and carefully pull out the heater core (E) so you don't bend the inlet and outlet pipes.

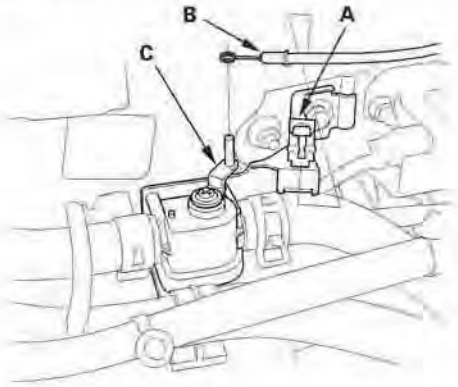


12. Install the heater core and the evaporator core (with A/C) in the reverse order of removal.
13. Install the heater unit in the reverse order of removal, and note these items:

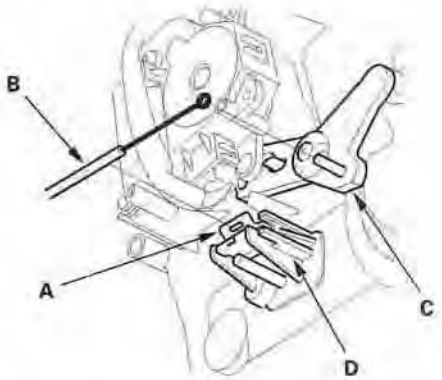
- Do not interchange the inlet and outlet heater hoses, and install the hose clamps securely.
- Refill the cooling system with engine coolant (see page 10-6).
- Be sure to connect the drain hose securely.
- Adjust the heater valve cable (see page 21-45).
- Make sure that there is no coolant leakage.
- Make sure that there is no air leakage.
- With air conditioning, refer to evaporator core replacement (see page 21-47).

Heater Valve Cable Adjustment

1. From under the hood, open the cable clamp (A), then disconnect the heater valve cable (B) from the heater valve arm (C).



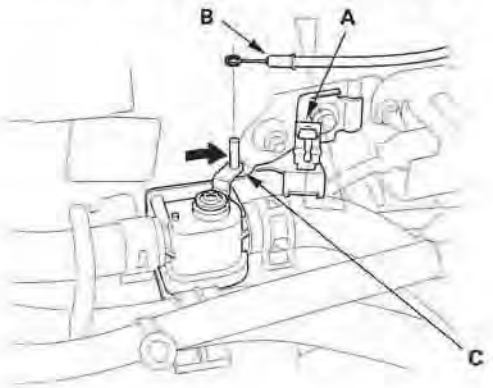
2. From under the dash, disconnect the heater valve cable housing from the cable clamp (A), and disconnect the heater valve cable (B) from the air mix control linkage (C).



3. Set the temperature control dial on Max Cool with the ignition switch ON (II).

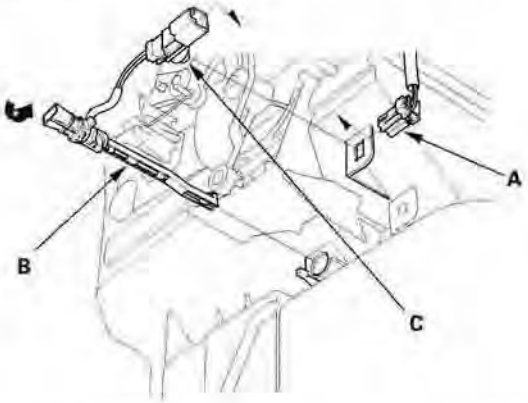
4. Attach the heater valve cable (B) to the air mix control linkage (C) as shown in step 2. Hold the end of the heater valve cable housing against the stop (D), then snap the heater valve cable housing into the cable clamp (A).

5. From under the hood, turn the heater valve arm (C) to the fully closed position as shown, and hold it. Attach the heater valve cable (B) to the heater valve arm, and gently pull on the heater valve cable housing to take up any slack, then install the heater valve cable housing into the cable clamp (A).



Evaporator Temperature Sensor Replacement

1. Disconnect the 2P connector (A) from the evaporator temperature sensor (B), then remove the connector clip (C). Turn the evaporator temperature sensor clockwise to the stop, and carefully pull it out.

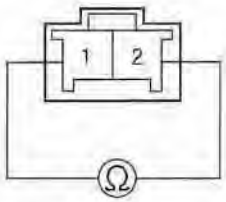


2. Install the sensor in the reverse order of removal.

Evaporator Temperature Sensor Test

1. Dip the sensor in ice water, and measure the resistance between its terminals.

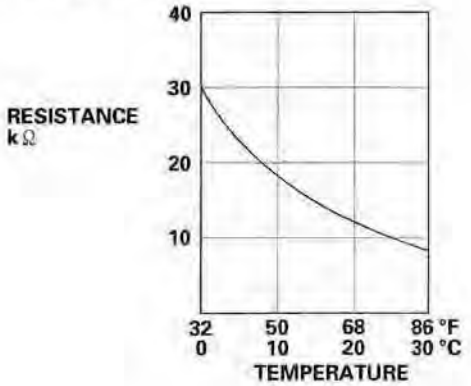
EVAPORATOR TEMPERATURE SENSOR



Terminal side of male terminals

2. Then pour warm water on the sensor, and check for a change in resistance.

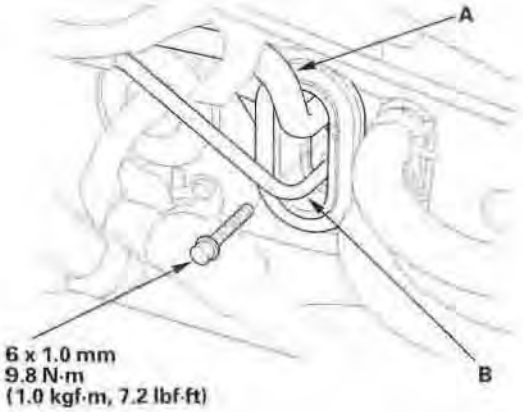
3. Compare the resistance readings with the specifications shown in the graph; the resistance should be within the specifications.



Evaporator Core Replacement

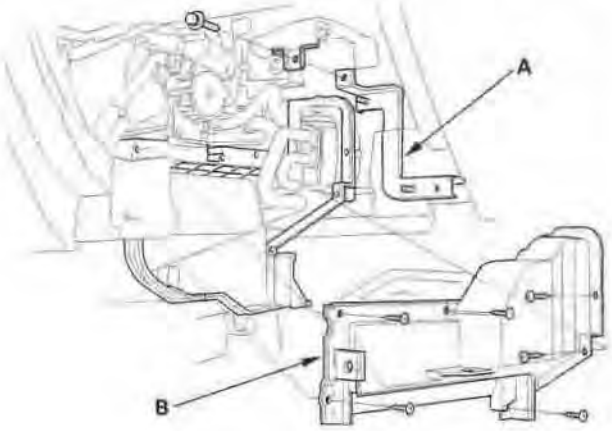
1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-55).

2. Remove the bolt, then disconnect the suction line (A) and the receiver line (B) from the evaporator core.



3. Remove the blower unit (see page 21-41).

4. Remove the bolt and the ECM/PCM bracket (A). Remove the self-tapping screws and the expansion valve cover (B).



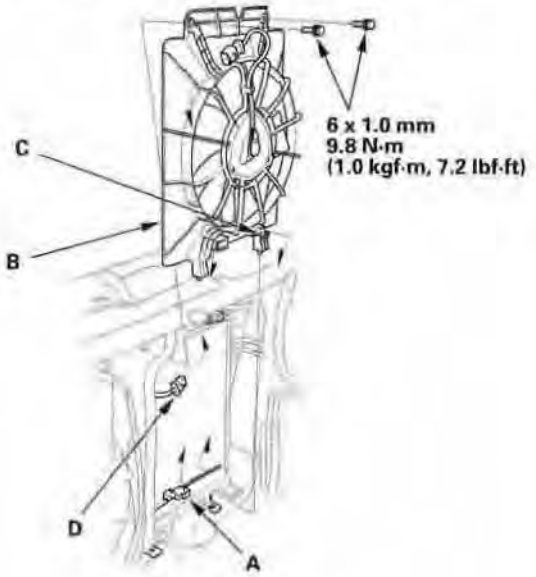
5. Carefully pull out the evaporator core without bending the pipes.

6. Install the core in the reverse order of removal, and note these items:

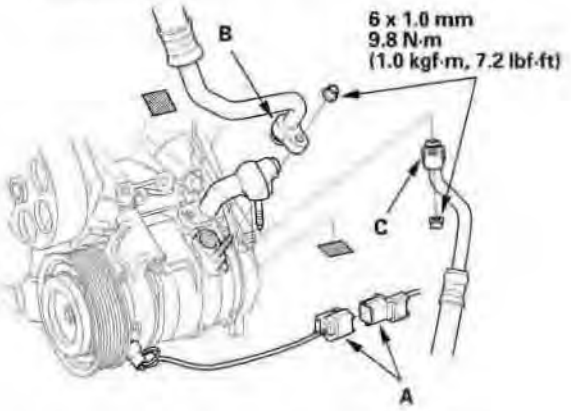
- If you're installing a new evaporator core, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the correct O-rings for HFC-134a (R-134a) to avoid leakage.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Make sure that there is no air leakage.
- Charge the system (see page 21-57).

A/C Compressor Replacement

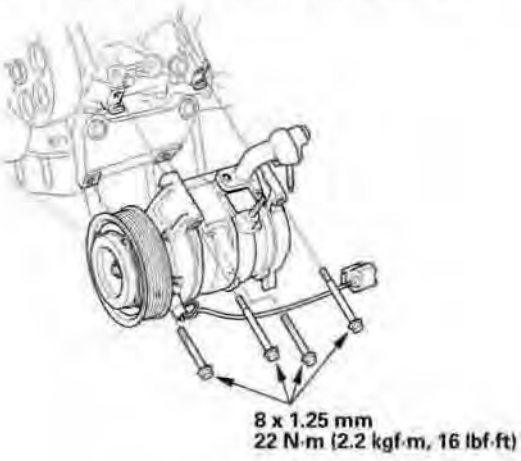
1. If the A/C compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
3. Disconnect the negative cable from the battery.
4. Recover the refrigerant with a recovery/recycling/charging station (see page 21-55).
5. Remove the radiator reservoir tank.
6. Remove the power steering pump (see page 17-14).
7. Remove the alternator (see page 4-39).
8. Remove the bulkhead cover and bulkhead (see page 10-13).
9. Remove the A/C compressor clutch connector (A) from the A/C condenser fan shroud (B), then open the wire harness clip. Disconnect the A/C condenser fan connector (D). Remove the upper mounting bolts and the A/C condenser fan shroud. Be careful not to damage the radiator fins when removing the A/C condenser fan shroud.



10. Disconnect the A/C compressor clutch connector (A), remove the nuts, then disconnect the suction line (B) and the discharge line (C) from the A/C compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



11. Remove the mounting bolts and the A/C compressor. Be careful not to damage the radiator fins when removing the A/C compressor.



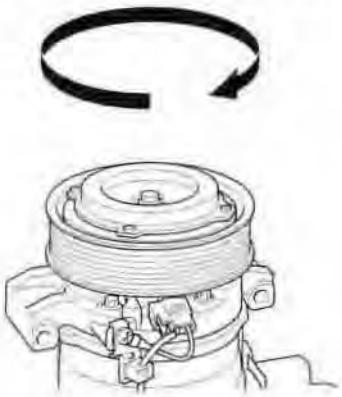
12. Install the A/C compressor in the reverse order of removal, and note these items:

- If you're installing a new A/C compressor, you must calculate the amount of refrigerant oil to be removed from it (see page 21-6).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the correct O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (DENSO ND-OIL 8) for HFC-134a DENSO piston type A/C compressor only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Be careful not to damage the radiator fins when installing the A/C compressor and the A/C condenser fan shroud.
- Charge the system (see page 21-57).
- Do the ECM/PCM idle learn procedure (see page 11-207).
- Perform the power window control unit reset procedure (see page 22-115).
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.
- Reset the clock.

A/C Compressor Clutch Check

1. Check the armature plate for discoloration, peeling, or other damage. If there is damage, replace the clutch set (see page 21-51).

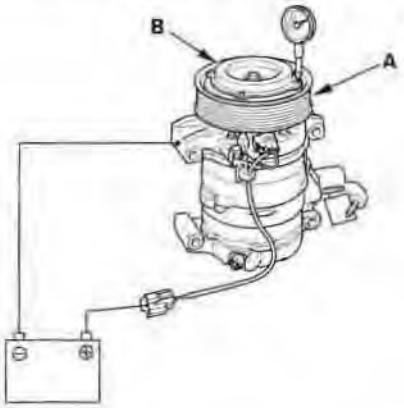
2. Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag (see page 21-51).



3. Measure the clearance between the pulley (A) and the pressure plate (B) with a dial indicator. Zero out the indicator, then apply battery voltage to the A/C compressor clutch. Measure the movement of the pressure plate when the voltage is applied. If the clearance is not within the specified limits, the pressure plate must be reshimmed (see page 21-51).

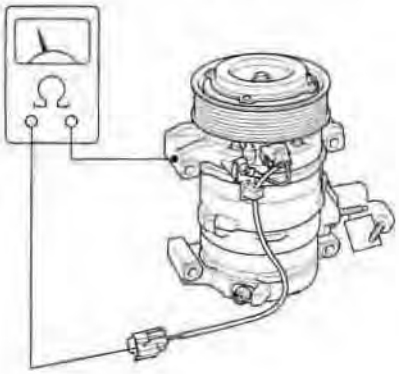
Clearance: 0.35—0.6 mm (0.014—0.024 in.)

NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm, and 0.5 mm.



4. Check resistance of the field coil. If resistance is not within specifications, replace the field coil (see page 21-51).

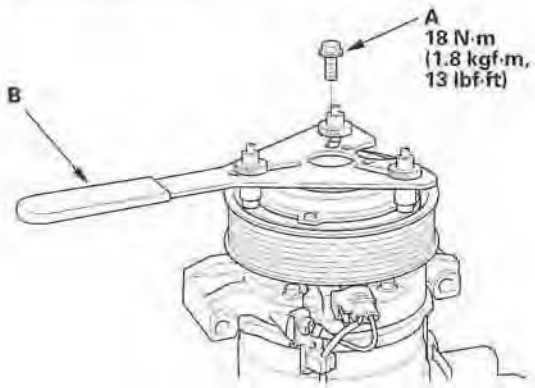
Field Coil Resistance: 3.9—4.3 Ω at 68 °F (20 °C)



A/C Compressor Clutch Overhaul

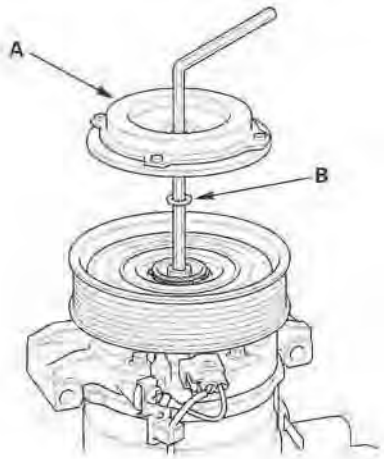
Special Tools Required
A/C clutch holder, Robinair 10204, Kent-Moore J37872, or Honda Tool and Equipment KMT-J33939, commercially available

1. Remove the center bolt (A) while holding the armature plate with a commercially available A/C clutch holder (B).

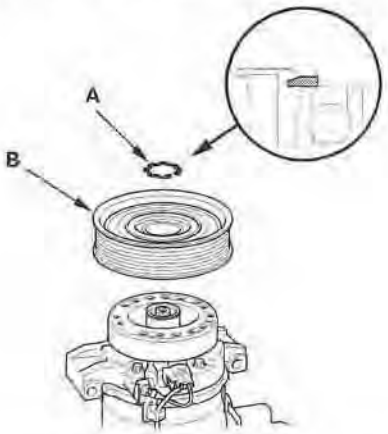


2. Remove the pressure plate (A) and shim(s) (B), taking care not to lose the shim(s). If the clutch needs adjustment, increase or decrease the number and thickness of shims as necessary, then reinstall the armature plate, and recheck its clearance (see page 21-50).

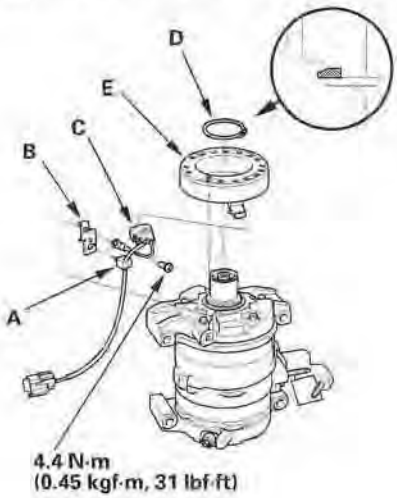
   NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm, and 0.5 mm.



3. If you are replacing the field coil, remove the snap ring (A) with snap ring pliers, then remove the rotor pulley (B). Be careful not to damage the rotor pulley and A/C compressor.



4. Remove the screw, the wire harness clip (A), and holder (B), then disconnect the field coil connector (C). Remove the snap ring (D) with snap ring pliers, then remove the field coil (E). Be careful not to damage the field coil and A/C compressor.



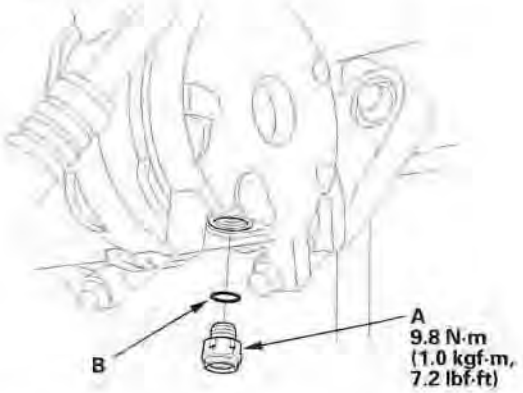
(cont'd)

A/C Compressor Clutch Overhaul (cont'd)

5. Reassemble the clutch in the reverse order of disassembly, and note these items:
   - Install the field coil with the wire side facing down, and align the boss on the field coil with the hole in the A/C compressor.
   - Clean the rotor pulley and A/C compressor sliding surfaces with contact cleaner or other non-petroleum solvent.
   - Install new snap rings, note the installation direction, and make sure they are fully seated in the groove.
   - Make sure that the rotor pulley turns smoothly after it's reassembled.
   - Route and clamp the wires properly or they can be damaged by the rotor pulley.

A/C Compressor Relief Valve Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-55).
2. Remove the relief valve (A), and the O-ring (B). Plug the opening to keep foreign matter from entering the system and the A/C compressor oil from running out.



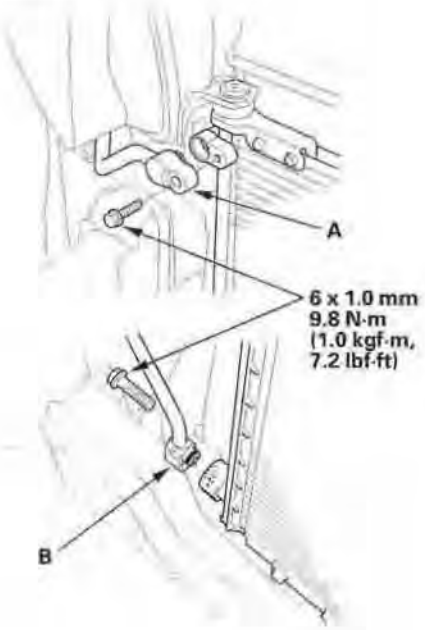
3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.
5. Remove the plug, and install and tighten the relief valve.
6. Charge the system (see page 21-57).

A/C Condenser Replacement

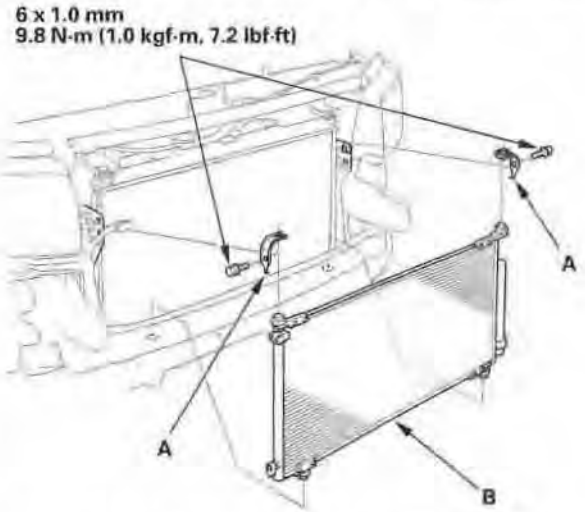
1. Recover the refrigerant with a recovery/recycling/charging station (see page 21-55).

2. Remove the front bumper (see page 20-105).

3. Remove the bolts, then disconnect the discharge line (A) and the A/C condenser line (B) from the A/C condenser. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



4. Remove the bolts and mounting brackets (A), then remove the A/C condenser (B) by lifting it up. Be careful not to damage the radiator and A/C condenser fins when removing the A/C condenser.

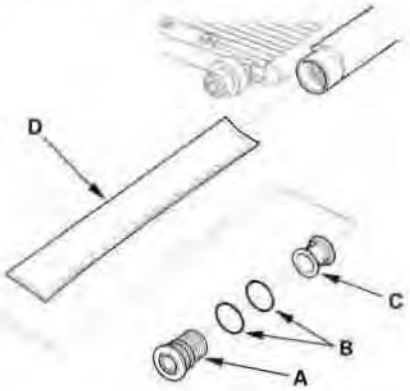


5. Install the A/C condenser in the reverse order of removal, and note these items:

   - If you're installing a new A/C condenser, add refrigerant oil (DENSO ND-OIL 8) (see page 21-6).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them. Be sure to use the correct O-rings for HFC-134a (R-134a) to avoid leakage.
   - Immediately after using the oil, reinstall the cap on the container, and seal it to avoid moisture absorption.
   - Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
   - Be careful not to damage the radiator or the A/C condenser fins when installing the A/C condenser.
   - Charge the system (see page 21-57).

Receiver/Dryer Desiccant Replacement

1. Remove the A/C condenser (see page 21-53).
2. Remove the cap (A) from the bottom of the A/C condenser, then remove the O-rings (B), the filter (C) and the desiccant (D).



3. Install the desiccant in the reverse order of removal, and note these items:
   - Replace the O-rings with new ones, and apply a thin coat of refrigerant oil (DENSO ND-OIL 8) before installing them.
   - Be sure to use the correct O-rings for HFC-134a (R-134a) to avoid leakage.

Refrigerant Recovery

⚠CAUTION

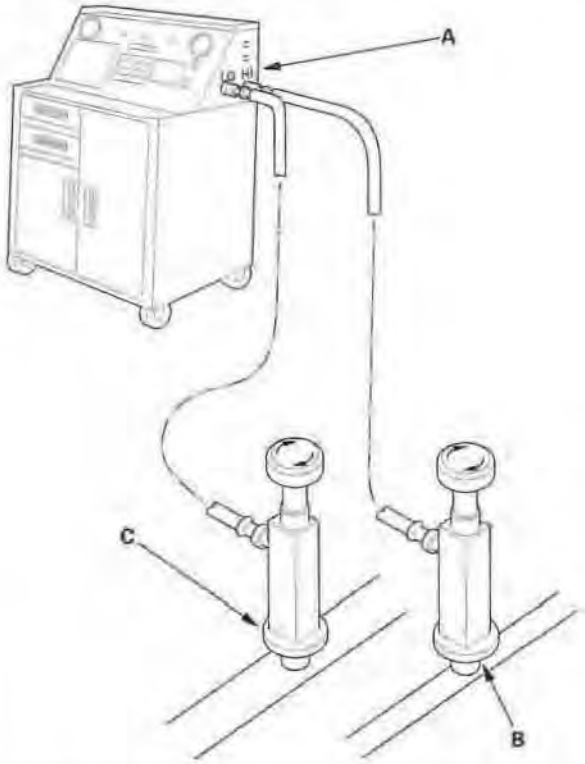
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect an R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed. Be sure to put the same amount of new refrigerant oil back into the A/C system before charging.

System Evacuation

⚠CAUTION

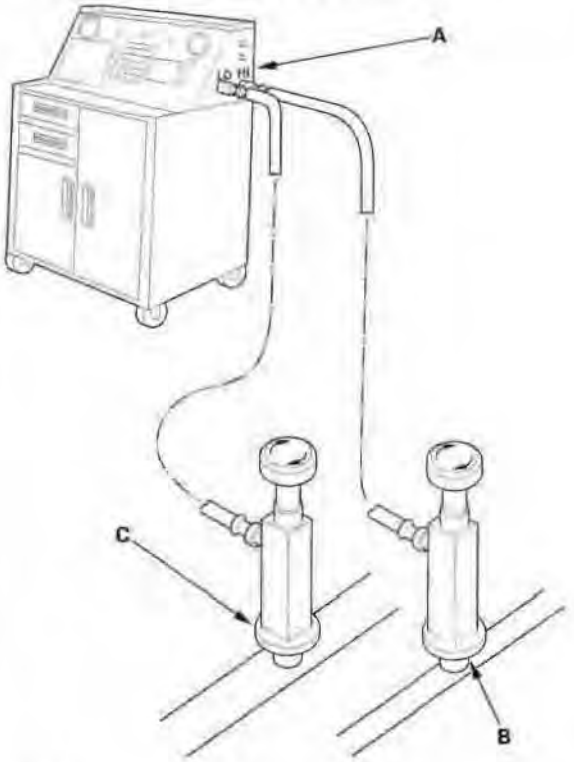
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C system has been opened to the atmosphere, such as during installation or repair, it must be evacuated using an R-134a refrigerant recovery/recycling/charging station. (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect an R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions. Evacuate the system.



3. If the low-pressure does not reach more than 93.3 kPa (700 mmHg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see step 3 on page 21-58).

System Charging

⚠CAUTION

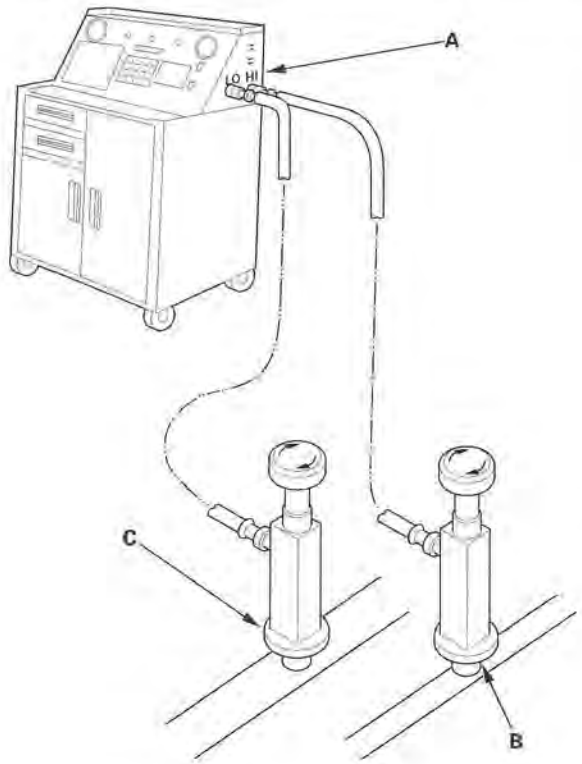
- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect an R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Evacuate the system (see page 21-56).
3. Add the same amount of new refrigerant oil to the system that was removed during recovery. Use only DENSO ND-OIL 8 refrigerant oil.
4. Charge the system with the specified amount of R-134a refrigerant. Do not overcharge the system; the A/C compressor will be damaged.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   500 to 550 g
   0.50 to 0.55 kg
   1.10 to 1.21 lbs
   17.6 to 19.4 oz
5. Check for refrigerant leaks (see page 21-58).
6. Check for system performance (see page 21-59).

Refrigerant Leak Test

Special Tool Required
Leak detector, Honda Tool and Equipment YGK-H-10PM, commercially available

⚠ WARNING

- Compressed air mixed with R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134a service equipment or vehicle air conditioning systems.

⚠ CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

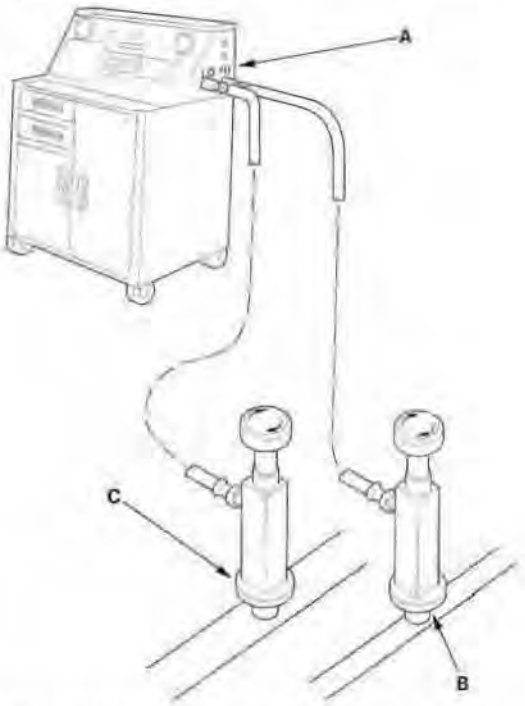
Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect an R-134a refrigerant recovery/recycling/charging station (A) to the high-pressure service port (B) and the low-pressure service port (C), as shown, following the equipment manufacturer's instructions.



2. Open high pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

   Select the appropriate units of measure for your refrigerant charging station.

   Refrigerant capacity:
   500 to 550 g
   0.50 to 0.55 kg
   1.10 to 1.21 lbs
   17.6 to 19.4 oz

3. Check the system for leaks using an R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.

4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), recover the system.

5. After checking and repairing leaks, the system must be evacuated.

A/C System Test

Performance Test

⚠CAUTION

- Air conditioning refrigerant or lubricant vapor can irritate your eyes, nose, or throat.
- Be careful when connecting service equipment.
- Do not breathe refrigerant or vapor.

⚠WARNING

- Compressed air mixed R-134a forms a combustible vapor.
- The vapor can burn or explode causing serious injury.
- Never use compressed air to pressure test R-134 a service equipment or vehicle air conditioning systems.

The performance test will help determine if the air conditioner system is operating within specifications.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioning system.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioning systems should not be pressure tested or leak tested with compressed air.

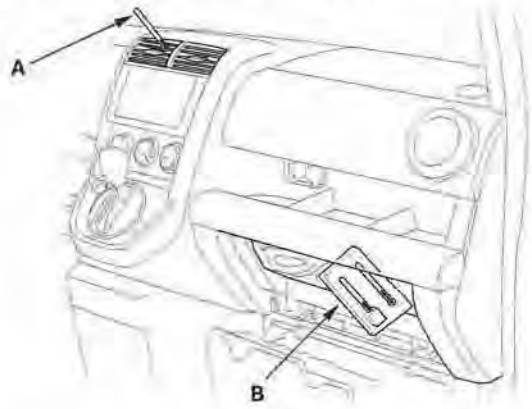
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect an R-134a refrigerant recover/recycling/charging station to the high-pressure service port and the low-pressure service port, following the equipment manufacturer's instructions.

2. Determine the relative humidity and air temperature.

3. Open the glove box, then let the glove box hang down (see page 20-78).

4. Insert a thermometer (A) in the center air vent.



5. Place a thermometer (B) near the blower unit.

6. Test conditions:

   - Avoid direct sunlight.
   - Open the hood.
   - Open the front doors.
   - Set the temperature control dial on Max Cool, the mode control dial on Vent and the recirculation control switch on Recirculate.
   - Turn the A/C switch on and the fan switch on Max.
   - Run the engine at 1,500 rpm.
   - No driver or passengers in vehicle.

7. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the center vent, the intake temperature near the blower unit and the high and low system pressure from the A/C gauges.

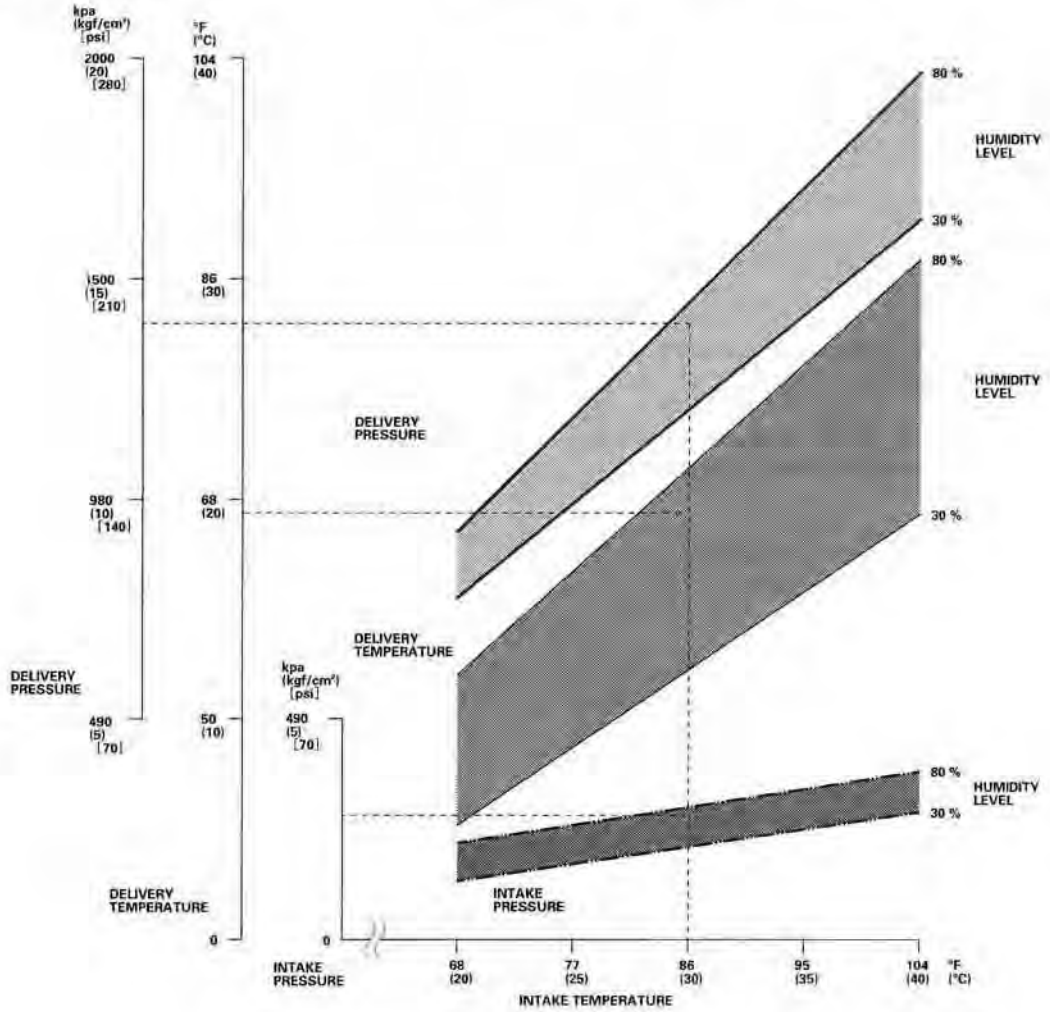
(cont'd)

A/C System Test (cont'd)

8. To complete the charts:

- Mark the delivery temperature along the vertical line.
- Mark the intake temperature (ambient air temperature) along the bottom line.
- Draw a line straight up from the air temperature to the humidity.
- Mark a point 10 % above and 10 % below the humidity level.
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low-side pressure test and high-side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.

Example	**Intake temperature (dry):**	**86 °F (30 °C)**	**Humidity level 70 %**
	Intake temperature (wet):	**77.9 °F (25.5 °C)**	
	Intake pressure:	**275 kPa (2.8 kgf/cm²)**	**[39.8 psi]**
	Delivery temperature:	**67.6 °F (19.8 °C)**	
	Delivery pressure:	**1363 kPa (13.9 kgf/cm²)**	**[197.8 psi]**
Judge:	**Normal**		



Pressure Test

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping A/C compressor, pressure drops about 196 kPa (2.0 kgf/cm², 28 psi) quickly, and then falls gradually.	Air in system	Recover, evacuate (see page 21-56), and recharge with specified amount (see page 21-57).
	Reduced or no airflow through A/C condenser.	• Clogged A/C condenser or radiator fins • A/C condenser or radiator fan not working properly	• Clean. • Check voltage and fan rpm. • Check fan direction.
	Line to A/C condenser is excessively hot.	Restricted flow of refrigerant in system	Restricted lines
Discharge pressure abnormally low	High and low-pressures are balanced soon after stopping A/C compressor. Low side is higher than normal.	• Faulty A/C compressor discharge valve • Faulty A/C compressor seal	Replace the A/C compressor.
	Outlet of expansion valve is not frosted, low-pressure gauge indicates vacuum.	• Faulty expansion valve • Moisture in system	• Replace. • Recover, evacuate, and recharge with specified amount.
Suction (low) pressure abnormally low	Expansion valve is not frosted, and low-pressure line is not cold. Low-pressure gauge indicates vacuum.	• Frozen expansion valve (Moisture in system) • Faulty expansion valve	• Recover, evacuate, and recharge with specified amount. • Replace the expansion valve.
	Discharge temperature is low, and the airflow from vents is restricted.	Frozen evaporator	Run the fan with A/C compressor off, then check evaporator temperature sensor.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
Suction pressure abnormally high	Low-pressure hose and check joint are cooler than the temperature around evaporator.	Expansion valve open too long	Repair or replace.
	Suction pressure is lowered when A/C condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate, and recharge with specified amount.
	High and low-pressures are equalized as soon as the A/C compressor is stopped, and both gauges fluctuate while running.	• Faulty gasket • Faulty high-pressure valve • Foreign particle stuck in high-pressure valve	Replace the A/C compressor.
Suction and discharge pressures abnormally high	Reduced airflow through A/C condenser.	• Clogged A/C condenser or radiator fins • A/C condenser or radiator fan not working properly	• Clean. • Check voltage and fan rpm. • Check fan direction.
Suction and discharge pressures abnormally low	Low-pressure hose and metal end areas are cooler than evaporator.	Clogged or kinked low-pressure hose parts	Repair or replace.
	Temperature around expansion valve is too low compared with that around receiver/dryer.	Clogged high-pressure line	Repair or replace.
Refrigerant leaks	A/C compressor clutch is dirty.	A/C compressor shaft seal leaking	Replace the A/C compressor.
	A/C compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace A/C compressor.
	A/C compressor gasket is wet with oil.	Gasket leaking	Replace the A/C compressor.

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If electrical maintenance is required)

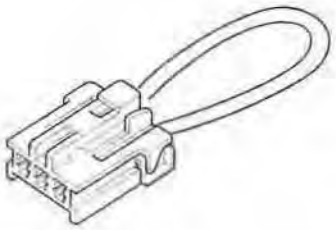
The ELEMENT SRS includes a driver's airbag in the steering wheel hub, a passenger's airbag in the dashboard above the glove box, seat belt tensioners in the front seat belt retractors, seat belt buckle tensioners in the front seat belt buckles, and side airbags in the front seat-backs. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include or are located near SRS components. Servicing, disassembling, or replacing these items require special precautions and tools, and should be done only by an authorized Honda dealer.

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal or side collision, all SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags and/or side airbags.
- Do not bump or impact the SRS unit, front impact sensors, side impact sensors when the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF; otherwise, the system may fail in a collision, or the airbags may deploy.
- SRS electrical connectors are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, in the dashboard above the glove box, in the front seats, and around the floor. Do not use electrical test equipment on these circuits.

Body Electrical

Special Tools

Ref. No.	Tool Number	Description	Qty
①	07WAZ-001010A	MPCS Service Connector	1
②	07XAJ-001000A	Terminal Inspection Feeler Tool Set	1
③	07TAZ-001020A	Back Probe Adapter	1



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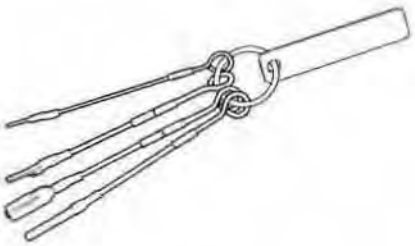

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General Troubleshooting Information

Tips and Precautions

Before Troubleshooting

1. Check applicable fuses in the appropriate fuse/relay box.

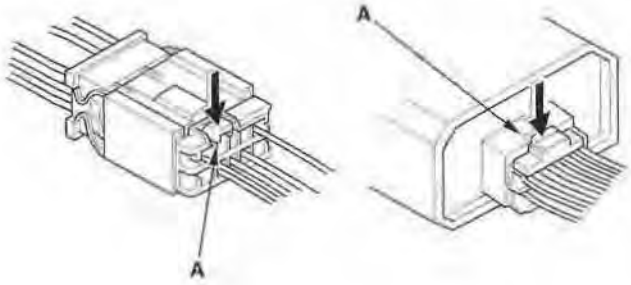
2. Check the battery for damage, state of charge, and clean and tight connections.

NOTICE

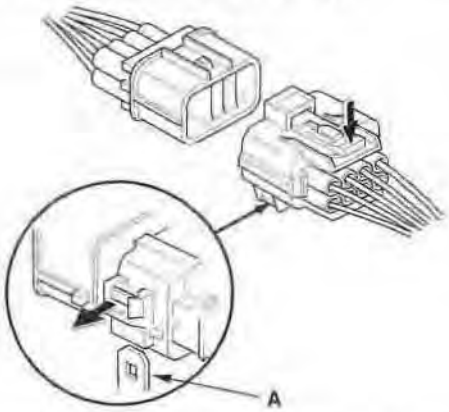
- Do not quick-charge a battery unless the battery ground cable has been disconnected, otherwise you will damage the alternator diodes.
- Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

Handling Connectors

- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with dielectric grease (except watertight connectors).
- All connectors have push-down release type locks (A).

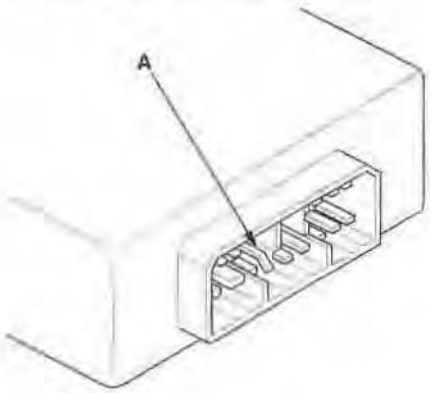


- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket (A).



- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.

- Before connecting connectors, make sure the terminals (A) are in place and not bent.



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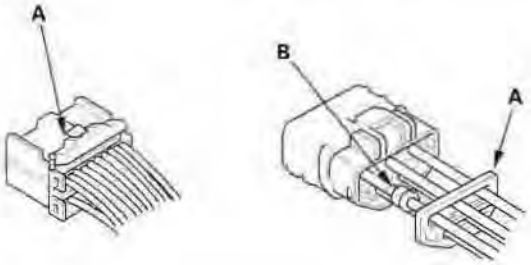
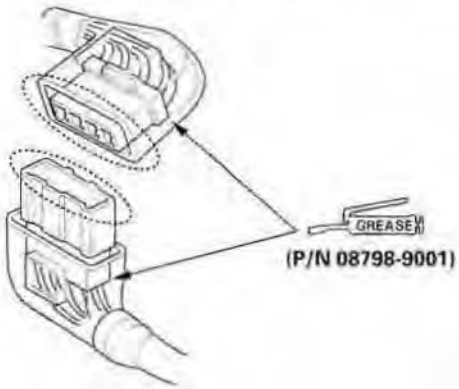
General Troubleshooting Information (cont'd)

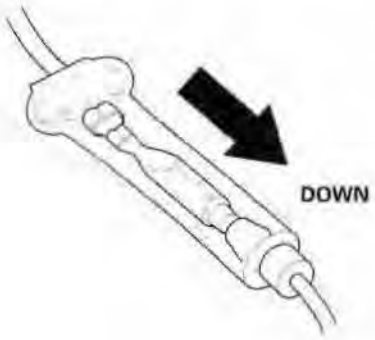
- Check for loose retainer (A) and rubber seals (B).



- The backs of some connectors are packed with dielectric grease. Add grease if necessary. If the grease is contaminated, replace it.

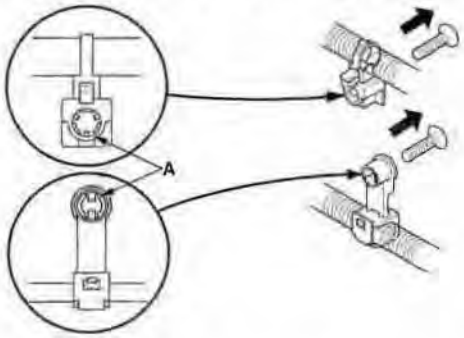


- Insert the connector all the way and make sure it is securely locked.
- Position wires so that the open end of the cover faces down.

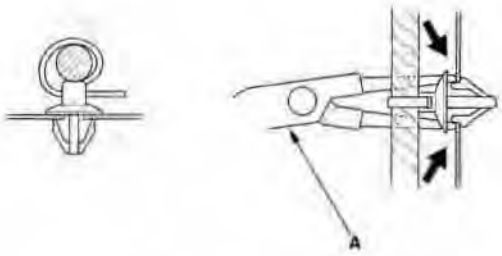


Handling Wires and Harnesses

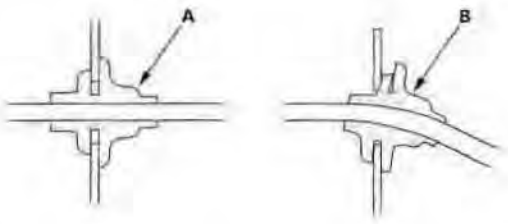
- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks (A).



- Slip pliers (A) under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.

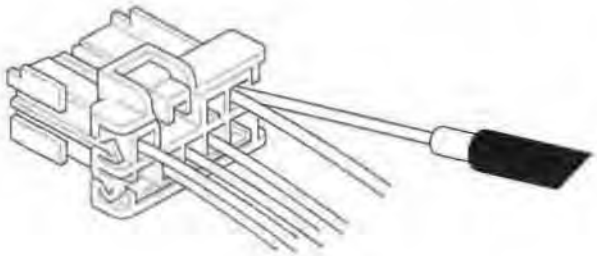


- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
- Seat grommets in their grooves properly (A). Do not leave grommets distorted (B).

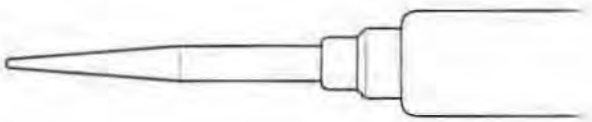


Testing and Repairs

- Do not use wires or harnesses with broken insulation. Replace them or repair them by wrapping the break with electrical tape.
- After installing parts, make sure that no wires are pinched under them.
- When using electrical test equipment, follow the manufacturer's instructions and those described in this manual.
- If possible, insert the probe of the tester from the wire side (except waterproof connector).



- Use a probe with a tapered tip.



- Refer to the instructions in the Honda Terminal Kit for identification and replacement of connector terminals.

(cont'd)

General Troubleshooting Information (cont'd)

Five-step Troubleshooting

1. Verify The Complaint
   Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.

2. Analyze The Schematic
   Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

   Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

3. Isolate The Problem By Testing The Circuit
   Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.

4. Fix The Problem
   Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

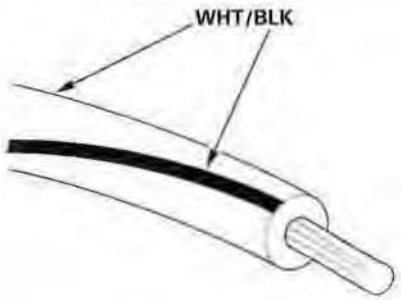
5. Make Sure The Circuit Works
   Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

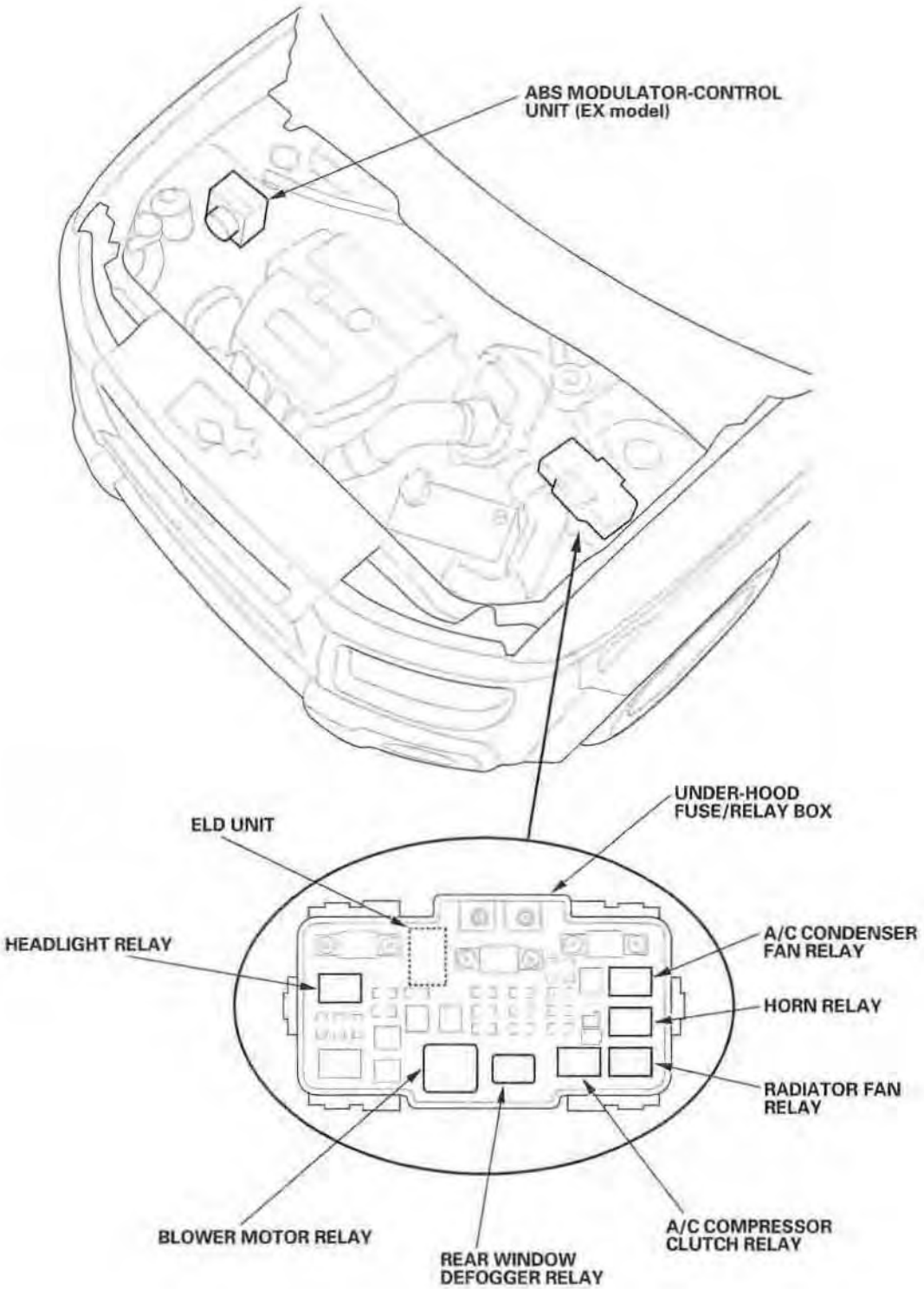
WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Gray
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.



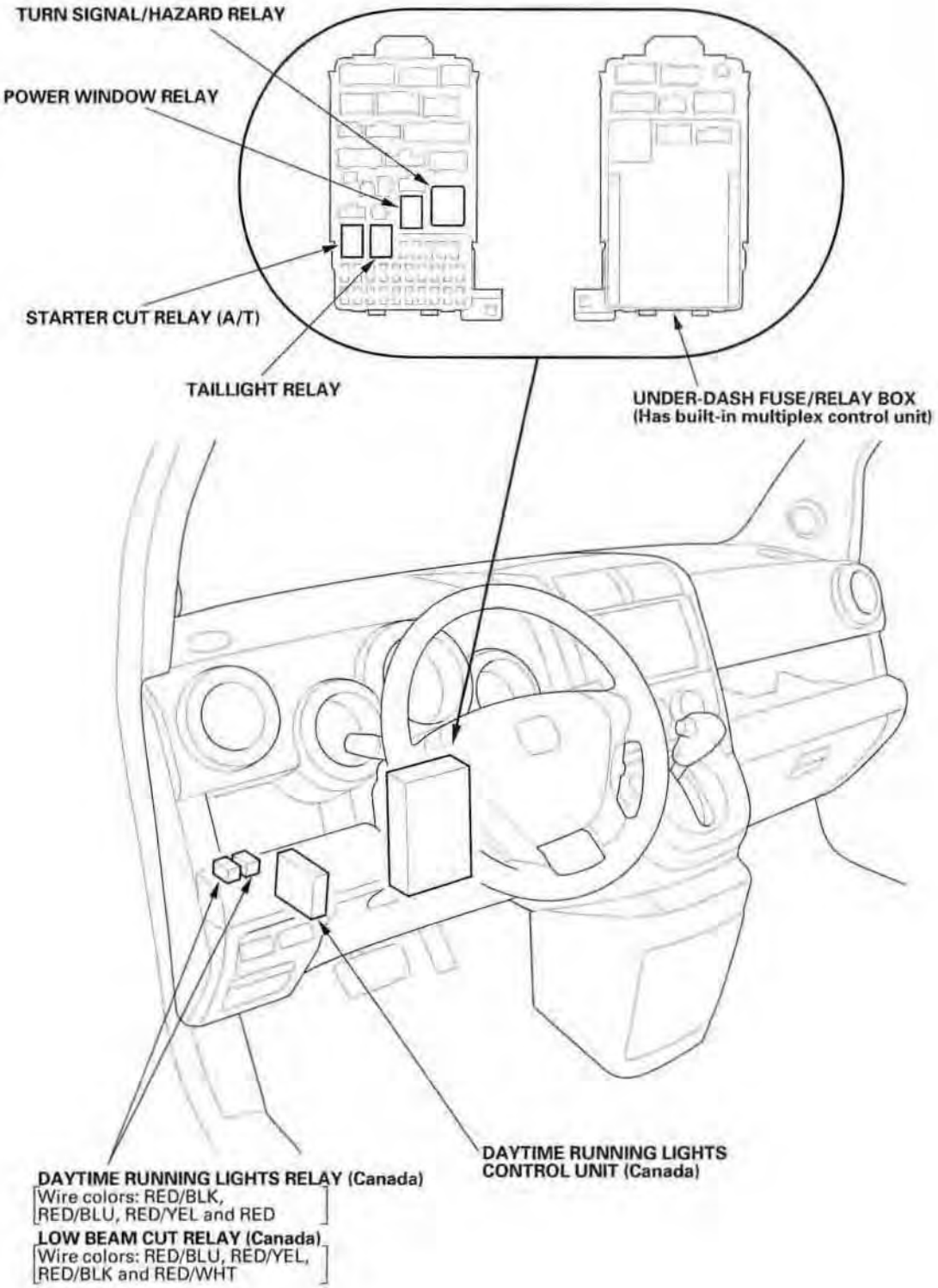
Relay and Control Unit Locations

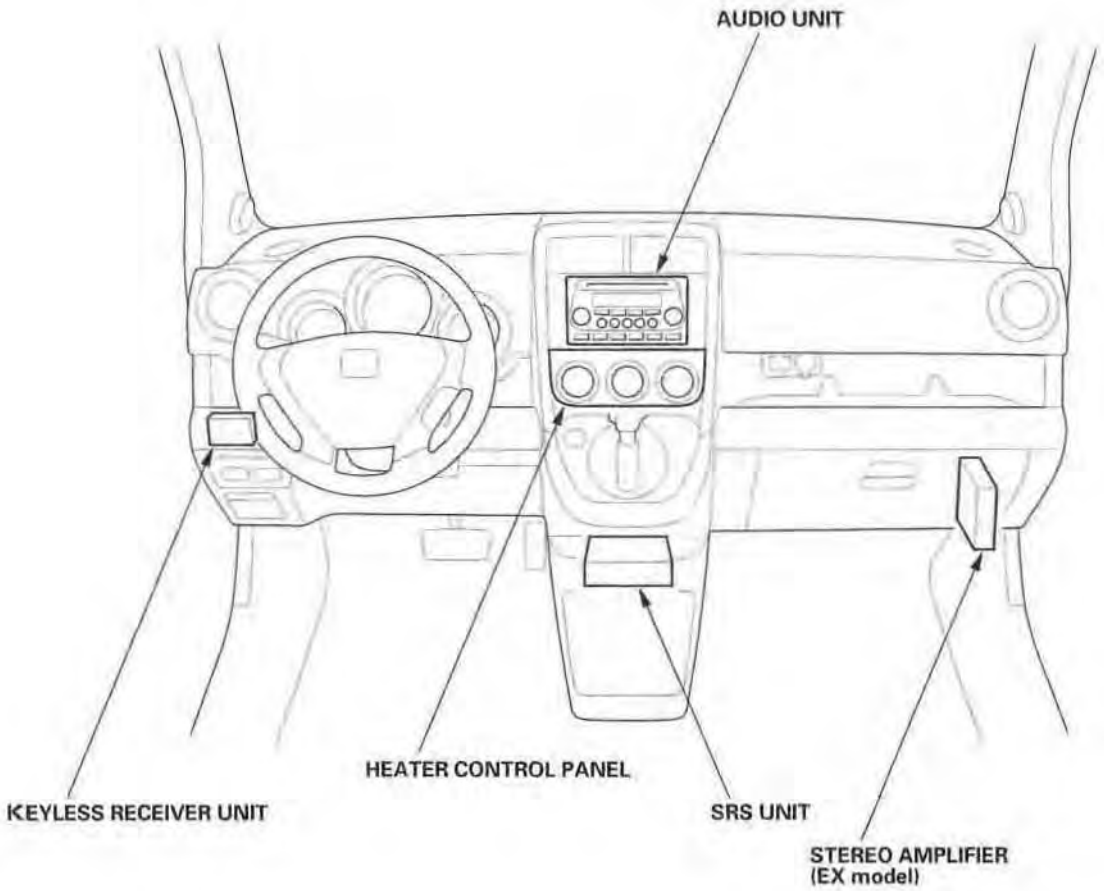
Engine Compartment



Relay and Control Unit Locations

Dashboard

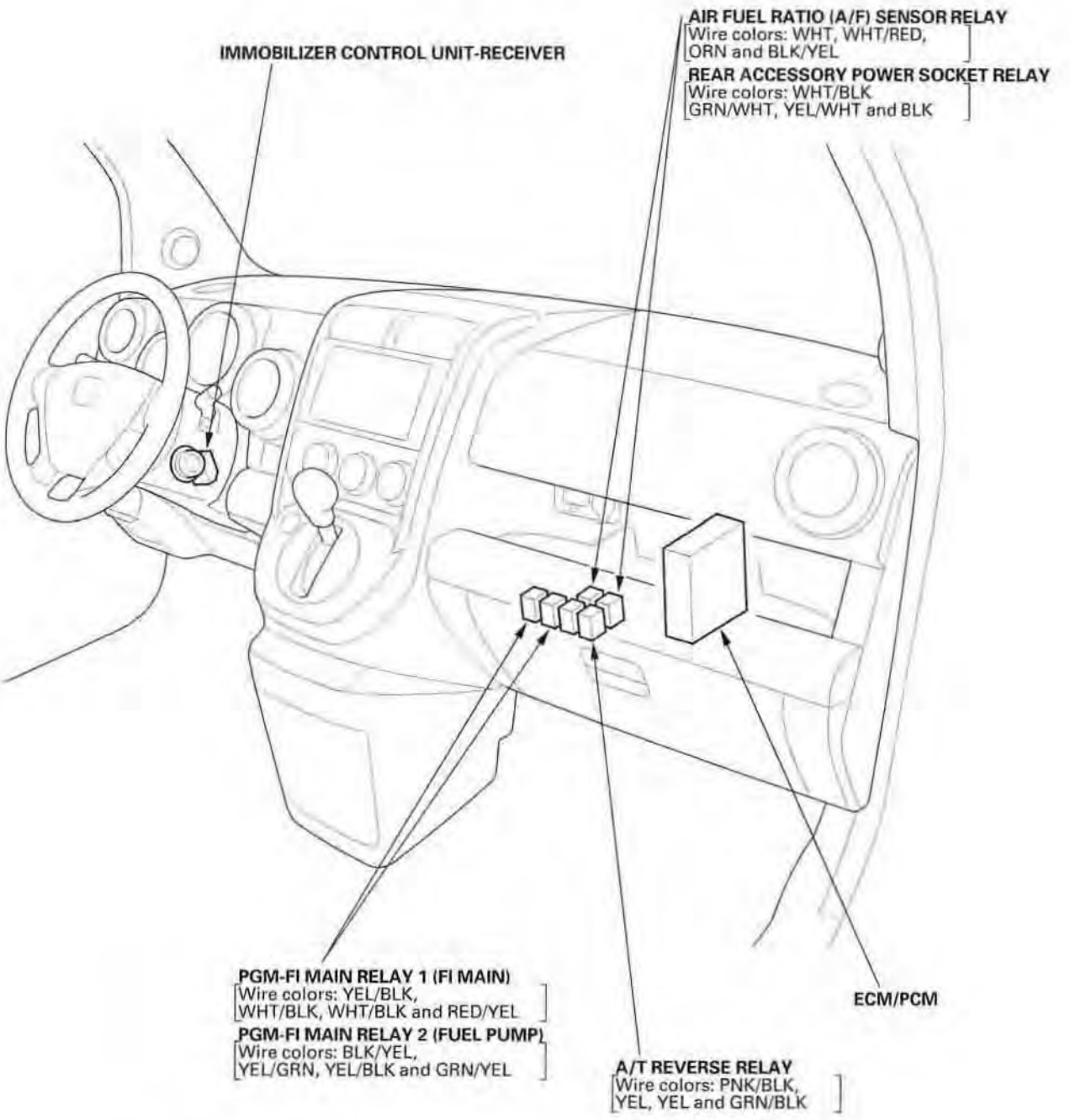



AUDIO UNIT
HEATER CONTROL PANEL
KEYLESS RECEIVER UNIT
SRS UNIT
STEREO AMPLIFIER
(EX model)

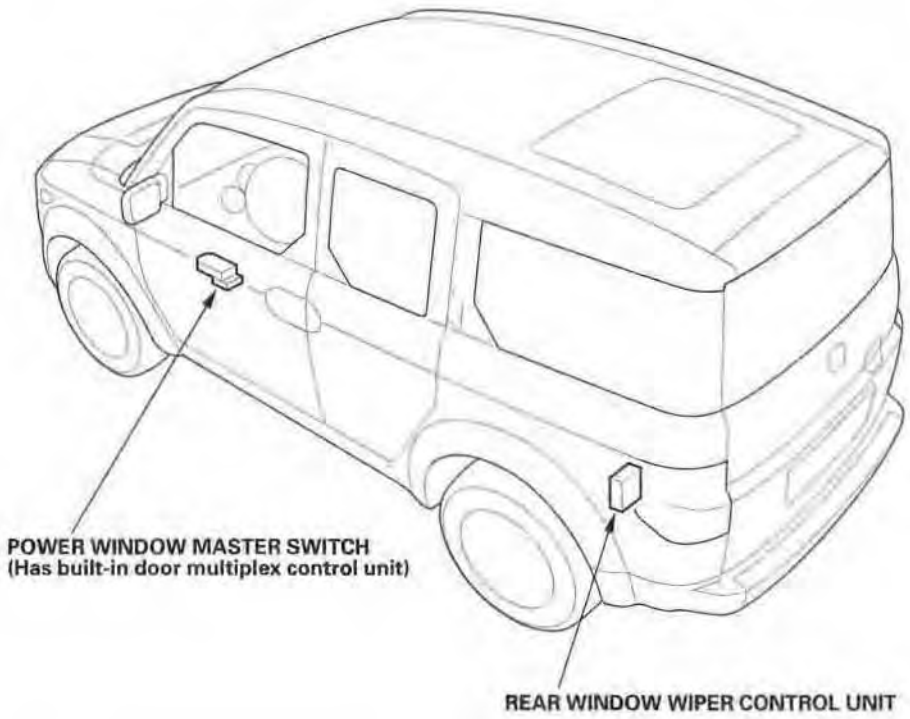
(cont'd)

Relay and Control Unit Locations

Dashboard (cont'd)



Door, Roof, and Seat



Passenger's seat:

Connectors and Harnesses

Connector Index

Identification numbers have been assigned to in-line connectors. The number is preceded by the letter "C" for connectors, "G" for ground terminals or "T" for non-ground terminals.

Harness	Location			
	Engine Compartment	Dashboard	Others (Floor, Door, Tailgate, and Roof)	Notes
Battery ground cable	T3, (−) G1			(see page 22-13)
Engine ground cable	T4 G2			(see page 22-13)
Starter subharness	C102, C103 (+) T101 through T104			(see page 22-14)
Engine wire harness	C102 through C106 G101, G102	C101, C107		(see page 22-16)
Transmission range switch subharness (A/T)	C104			(see page 22-16)
Engine compartment wire harness (Right branch)	G201 and G202			(see page 22-20)
Engine compartment wire harness (Left branch)	G301			(see page 22-22)
Engine compartment wire harness (Dashboard)		C401, C451, C452, C501 through C503, C553, C853	G402	(see page 22-24)
Dashboard wire harness B		C401 through C404 G401		(see page 22-26)
Dashboard wire harness A (Left branch)		C402, C453, C501 through C504, C751 and C752 G501		(see page 22-28)
Tweeter subharness		C504		(see page 22-28)
Dashboard wire harness A (Right branch)		C551 and C552, C561, C651 C781, C851 and C852 G502 and G503		(see page 22-30)
ECM/PCM wire harness		C101, C451 through C456 G451		(see page 22-32)
Floor wire harness (Left side)			C554 and C555, C601, C681 G553	(see page 22-34)
Floor wire harness (Right side)		C403, C404, C454, C455, C551, C552, C553, C559, C561	C556, C557, C558, C560 G551, G552	(see page 22-36)
Roof wire harness		C651		(see page 22-40)
Hatch wire harness			C601	(see page 22-38)
Tailgate wire harness			C681	(see page 22-38)
ABS/Fuel pump wire harness			C558	(see page 22-41)
Driver's door wire harness		C751, C752		(see page 22-42)
Front passenger's door wire harness		C781		(see page 22-43)
Left rear door wire harness			C771, C772 G771	(see page 22-44)
Right rear door wire harness			C761, C762 G751	(see page 22-46)
Left rear door subharness			C554, C555, C771, C772	(see page 22-44)
Right rear door subharness			C556, C557, C761, C762	(see page 22-46)
A/C wire harness		C851 through C853		(see page 22-48)
OPDS unit harness			C560	(see page 22-49)

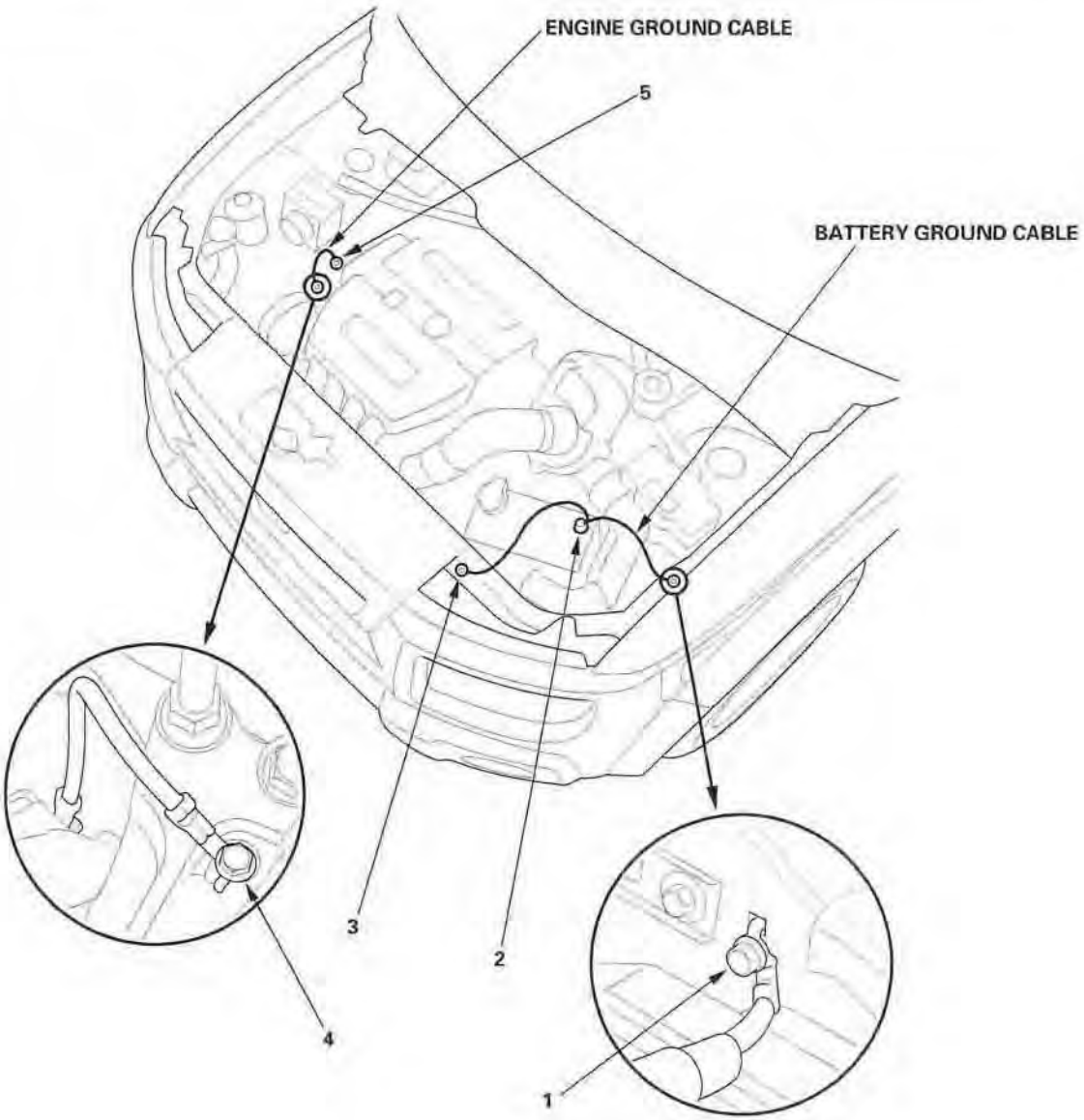
Connector to Harness Index

Battery Ground Cable

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T3	3		Left side of engine compartment	Transmission hanger bracket	
G1	1		Left side of engine compartment	Body ground via battery ground cable	
(—)	2		Battery	Battery negative terminal	

Engine Ground Cable

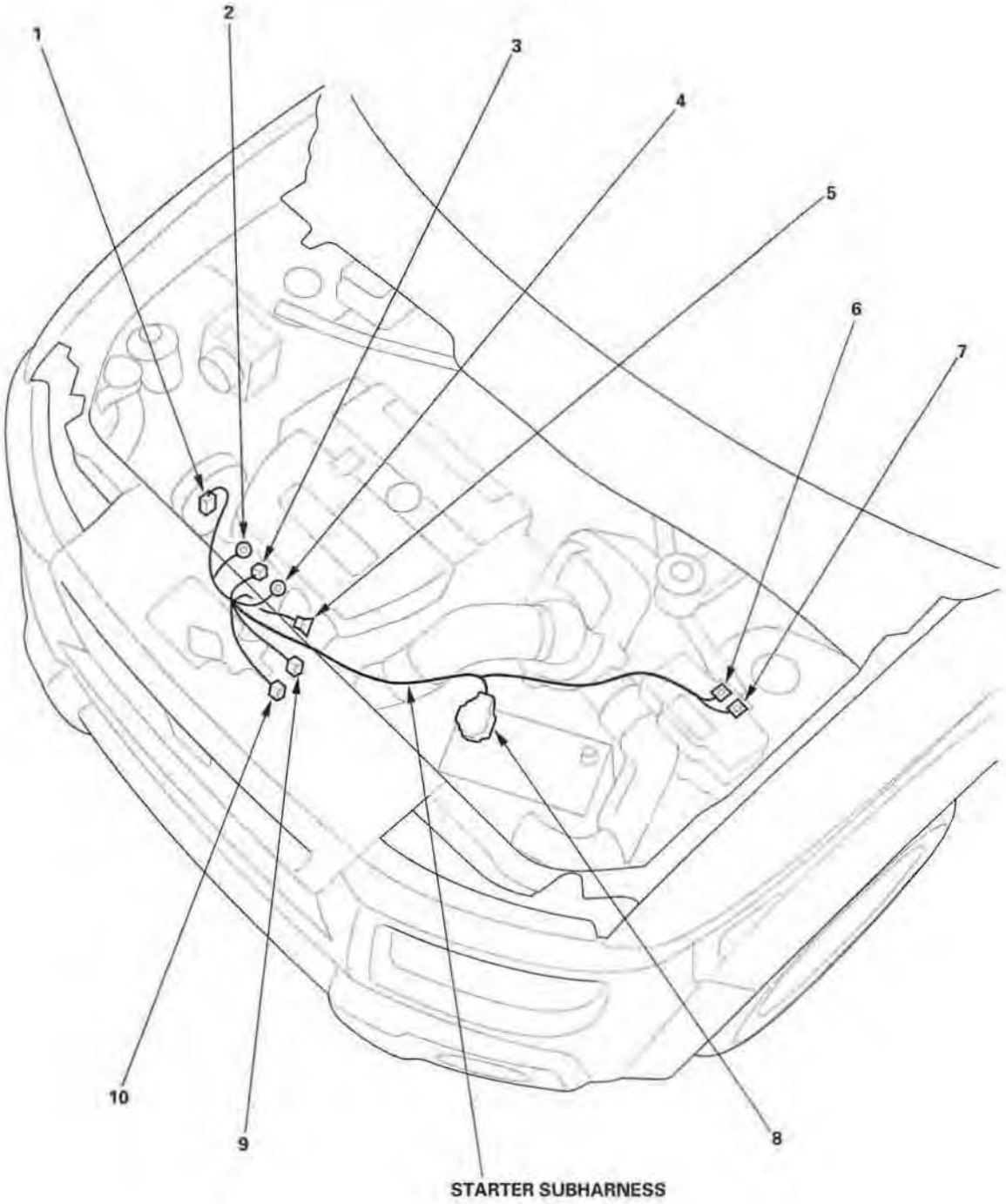
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
T4	5		Right side of engine compartment		
G2	4		Right side of engine compartment	Body ground, via engine ground cable	



Connector to Harness Index (cont'd)

Starter Subharness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Alternator	1	4	Middle of engine compartment		
Knock sensor	3	1	Middle of engine compartment		
Starter solenoid	5	1	Middle of engine compartment		
C102	9	6	Left side of engine compartment	Engine wire harness (see page 22-16)	
C103	10	1	Left side of engine compartment	Engine wire harness (see page 22-16)	
T101	7		Left side of engine compartment	Under-hood fuse/relay box	
T102	6		Left side of engine compartment	Under-hood fuse/relay box	
T103	2		Alternator	Alternator	
T104	4		Middle of engine compartment	Starter motor	
(+)	8		Battery	Battery positive terminal	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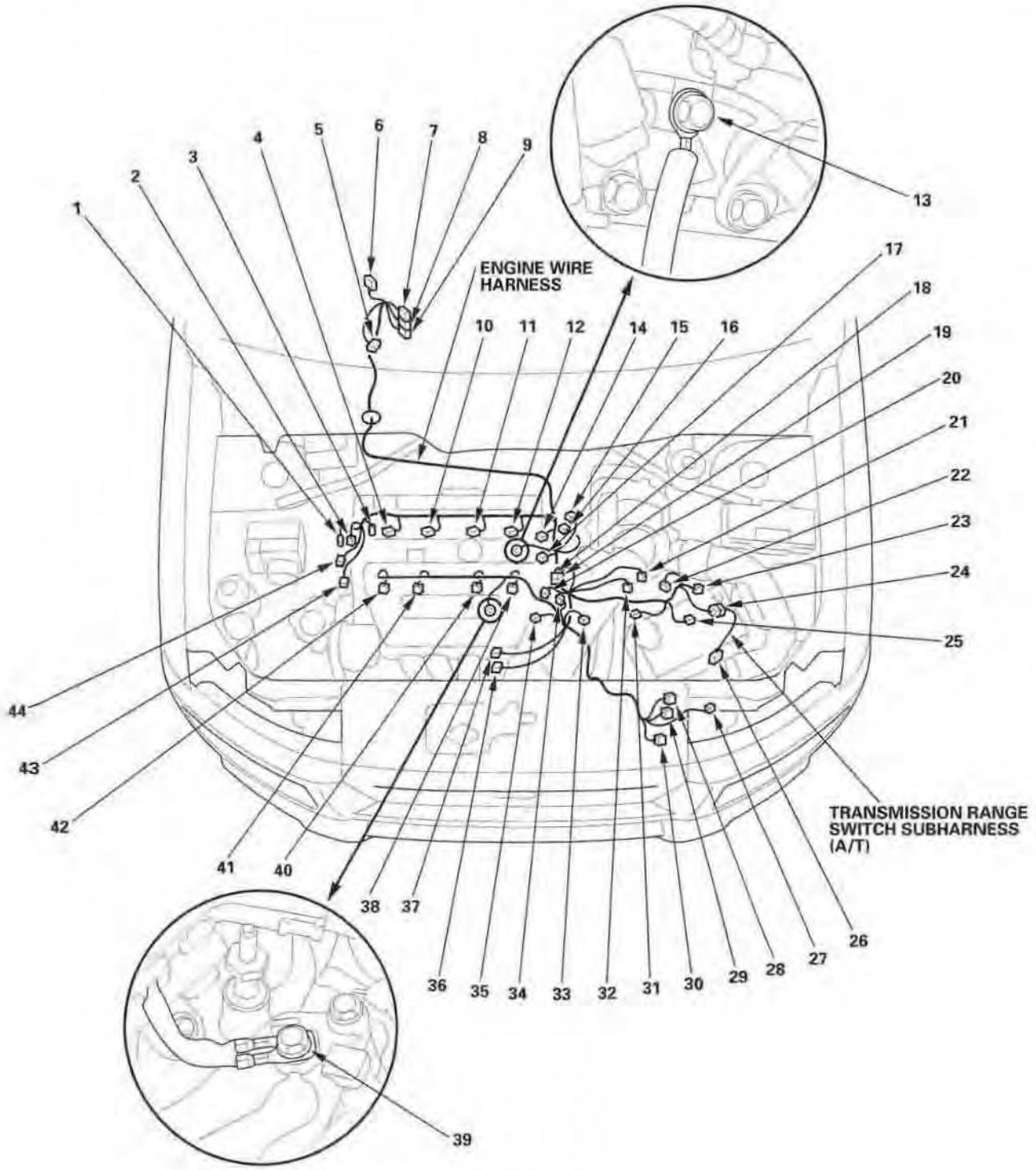
STARTER SUBHARNESS

Connector to Harness Index (cont'd)

Engine Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
A/T clutch pressure control solenoid valve A	25	2	Transmission housing		A/T
A/T clutch pressure control solenoid valve B	29	2	Transmission housing		A/T
A/T clutch pressure control solenoid valve C	28	2	Transmission housing		A/T
Back-up light switch	32	2	Transmission housing		M/T
Camshaft position (CMP) sensor A	17	3	Left side of engine		
Camshaft position (CMP) sensor B	14	3	Left side of engine		
CKP sensor	43	3	Right side of engine		
Output shaft (Countershaft) speed sensor	22	3	Transmission housing		A/T
ECM/PCM connector A	9	31	Under glove box		
ECM/PCM connector B	8	24	Under glove box		
Engine coolant temperature (ECT) sensor	15	2	Left side of engine		
Engine oil pressure switch	1	1	Right side of engine		
EVAP canister purge valve	16	2	Left side of intake manifold		
Idle air control (IAC) valve	20	3	Left side of intake manifold		
Ignition coil No. 1	4	3	Middle of engine compartment		
Ignition coil No. 2	10	3	Middle of engine compartment		
Ignition coil No. 3	11	3	Middle of engine compartment		
Ignition coil No. 4	12	3	Middle of engine compartment		
Injector No. 1	42	2	Middle of engine compartment		
Injector No. 2	41	2	Middle of engine compartment		
Injector No. 3	40	2	Middle of engine compartment		
Injector No. 4	38	2	Middle of engine compartment		
Intake air temperature (IAT) sensor	33	2	Intake air duct		
MAP sensor	35	3	Left side of intake manifold		
Input shaft (Mainshaft) speed sensor	23	3	Transmission housing		A/T
PCM connector C	7	22	Under glove box		A/T
Shift control solenoid valves/ATF temperature sensor	30	8	Left side of engine compartment		A/T
Throttle position (TP) sensor	34	3	Left side of intake manifold		
Vehicle speed sensor (VSS)	21	3	Transmission housing		M/T
VTC oil control solenoid valve	44	2	Right side of engine		
VTEC oil pressure switch	3	2	Right side of engine		
VTEC solenoid valve	2	2	Right side of engine		
2nd clutch transmission fluid pressure switch	31	1	Transmission housing		A/T
3rd clutch transmission fluid pressure switch	27	1	Transmission housing		A/T


ENGINE WIRE HARNESS
TRANSMISSION RANGE SWITCH SUBHARNESS (A/T)
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(cont'd)

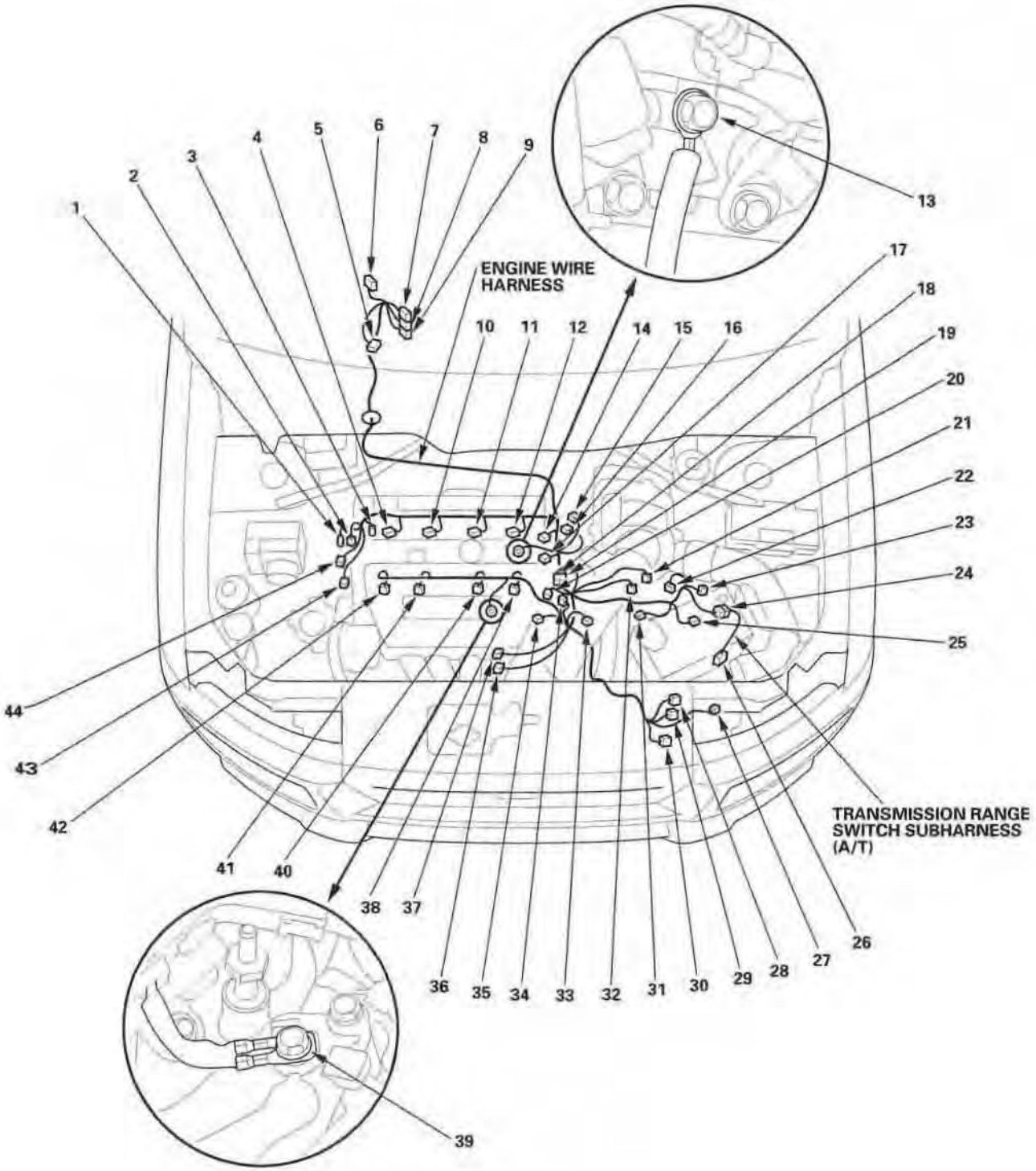
Connector to Harness Index (cont'd)

Engine Wire Harness (cont'd)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
C101	6	20	Behind glove box	ECM/PCM wire harness (see page 22-32)	
C102	36	6	Front of engine compartment	Starter subharness (see page 22-14)	
C103	37	1	Front of engine compartment	Starter subharness (see page 22-14)	
C104	24	10	Transmission housing	Transmission range switch subharness	A/T
C105 (Junction connector)	18	24	Left side of intake manifold		
C106 (Junction connector)	19	24	Left side of intake manifold		
C107 (Junction connector)	5	20	Under glove box		
G101	39		Top of intake manifold	Engine ground, via engine wire harness	
G102	13		Left side of cylinder head	Engine ground, via engine wire harness	

Transmission Range Switch Subharness (A/T)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Transmission range switch	26	10	Transmission housing		
C104	24	10	Transmission housing	Engine wire harness	


ENGINE WIRE HARNESS
TRANSMISSION RANGE SWITCH SUBHARNESS (A/T)
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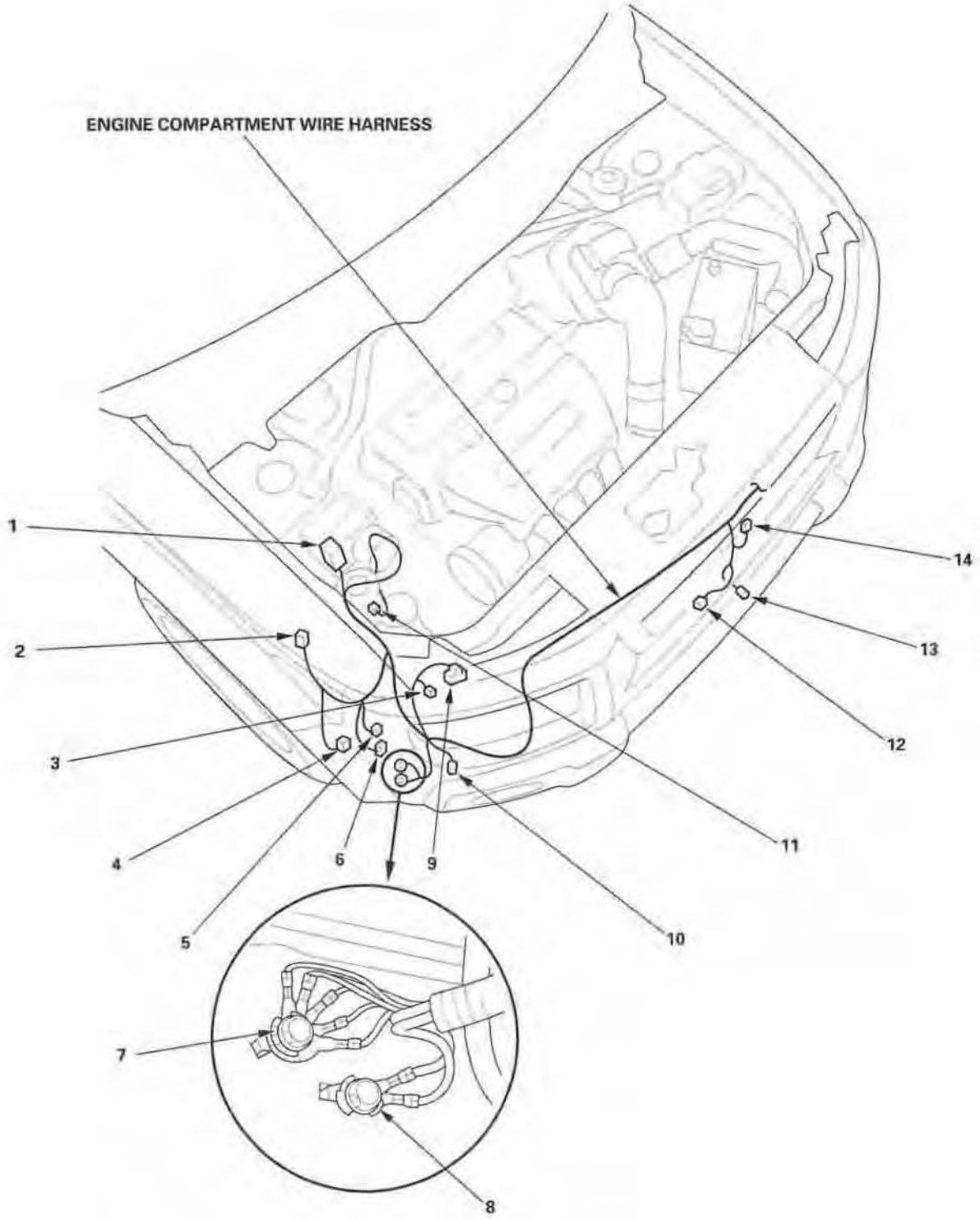
Connector to Harness Index (cont'd)

Engine Compartment Wire Harness (Right branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
ABS modulator-control unit	1	47	Right side of engine compartment		
A/C compressor clutch	12	1	Front of engine compartment		
A/C pressure switch	10	2	Right side of engine compartment		
Condenser fan motor	14	2	Front of engine compartment		
Radiator fan switch	13	2	Front of engine compartment		
Rear window washer motor	5	2	Behind right side of front bumper		
Right front wheel sensor	11	2	Right side of engine compartment		
Right side marker light	2	2	Behind right headlight		
Right front turn signal/parking light	3	3	Behind right headlight		
Right headlight	9	3	Behind right headlight		
Washer fluid level switch	6	2	Behind right side of front bumper		Canada
Windshield washer motor	4	2	Behind right side of front bumper		
G201	7		Behind right side of front bumper	Body ground, via engine compartment wire harness	
G202	8		Behind right side of front bumper	Body ground, via engine compartment wire harness	


ENGINE COMPARTMENT WIRE HARNESS
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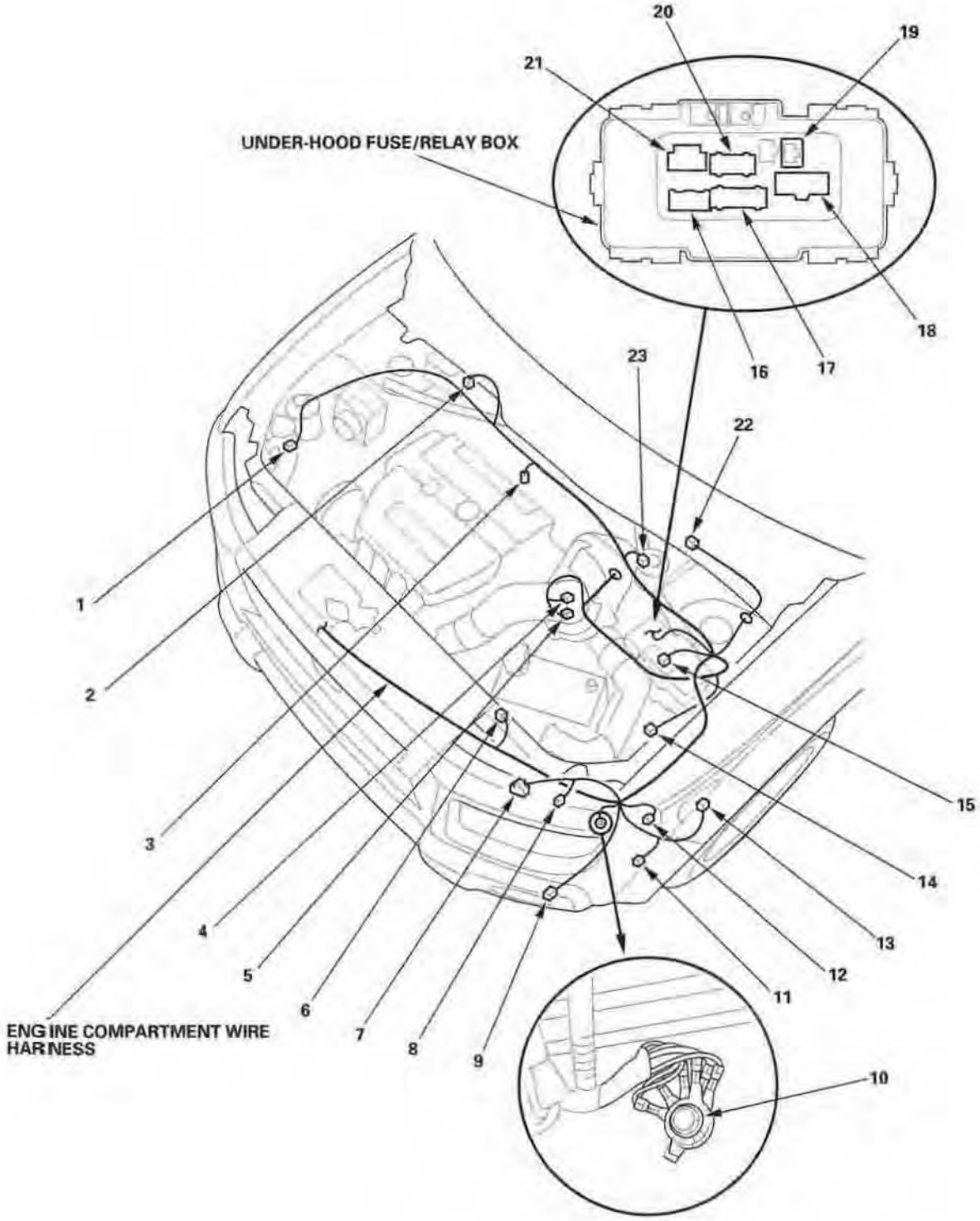
Connector to Harness Index (cont'd)

Engine Compartment Wire Harness (Left branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Air fuel ratio (A/F) sensor	5	4	Below the rear of the engine		
Brake fluid level switch	23	2	Left side of engine compartment		
Cruise control actuator	2	12	Under-hood fuse/relay box		
ELD unit (see page 22-50)	19	3	Under-hood fuse/relay box		
Fog light connector	9	1	Left side of engine compartment		
Horn	11	1	Behind front bumper		
Left front wheel sensor	14	2	Left side of engine compartment		
Left front impact sensor	12	2	Left side of engine compartment		
Left side marker light	13	2	Behind left headlight		
Left front turn signal/parking light	8	3	Behind left headlight		
Left headlight	7	3	Behind left headlight		
Power steering pressure (PSP) switch	3	2	Left side of engine compartment		
Radiator fan motor	6	2	Front of engine compartment		
Right front impact sensor	1	2	Behind front bumper		
Secondary heated oxygen sensor (SHO2S)	4	4	Below the rear of engine		
Test tachometer connector	15	2	Left side of engine compartment		'03 model
Under-hood fuse/relay box connector A (see page 22-50)	21	2	Under-hood fuse/relay box		
Under-hood fuse/relay box connector B (see page 22-50)	16	5	Under-hood fuse/relay box		
Under-hood fuse/relay box connector C (see page 22-50)	20	12	Under-hood fuse/relay box		
Under-hood fuse/relay box connector D (see page 22-50)	17	14	Under-hood fuse/relay box		
Under-hood fuse/relay box connector E (see page 22-50)	18	7	Under-hood fuse/relay box		
Windshield wiper motor	22	5	Under left side of cowl cover		
G301	10		Left side of engine compartment	Body ground, via engine compartment wire harness	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UNDER-HOOD FUSE/RELAY BOX
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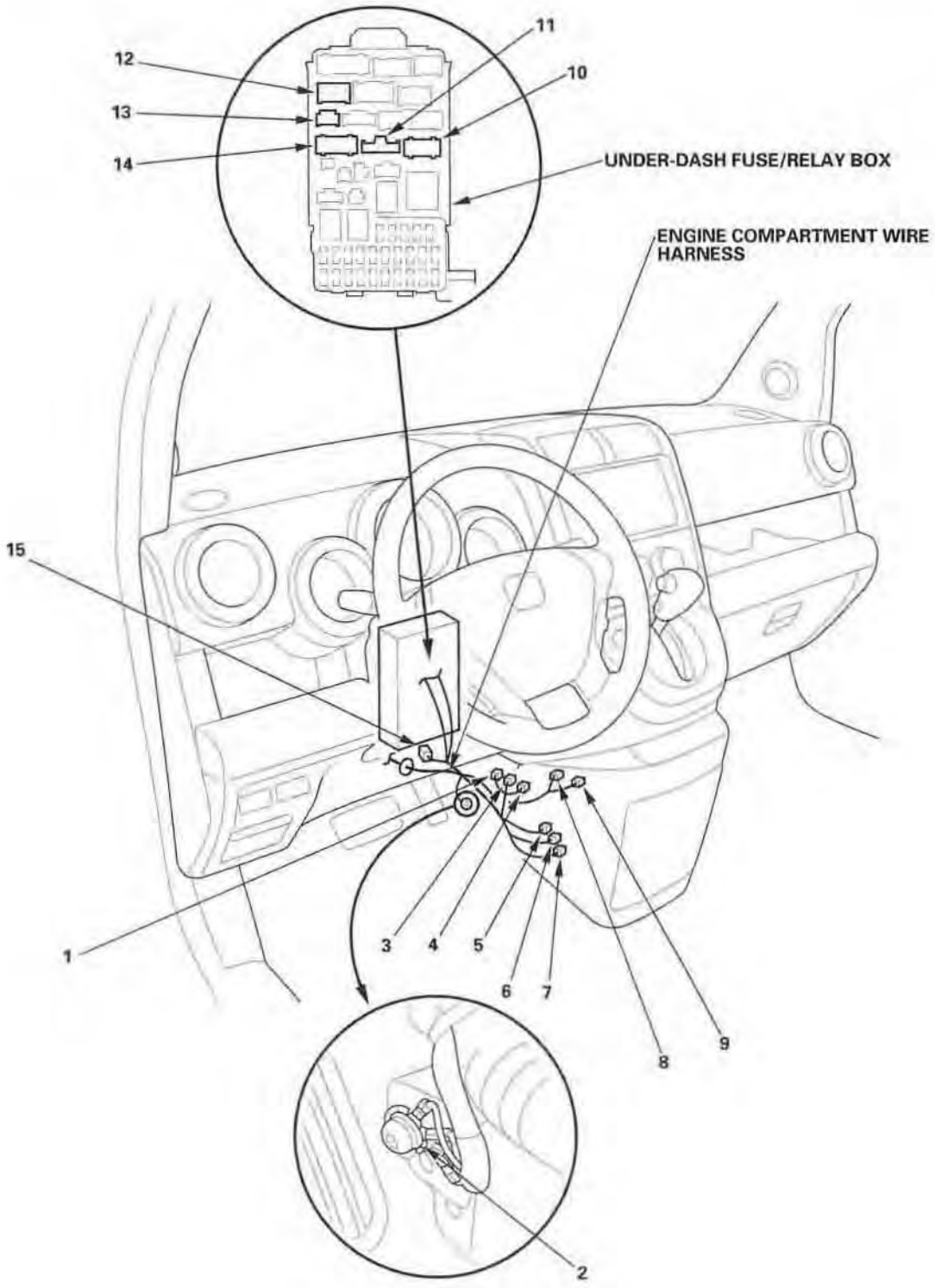
ENGINE COMPARTMENT WIRE HARNESS

Connector to Harness Index (cont'd)

Engine Compartment Wire Harness (Dashboard)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Fog light connector	15	1	Under left side of dash		Option
Under-dash fuse/relay box connector F (see page 22-51)	14	12	Under left side of dash		
Under-dash fuse/relay box connector G (see page 22-51)	10	10	Under left side of dash		
Under-dash fuse/relay box connector H (see page 22-51)	11	3	Under left side of dash		
Under-dash fuse/relay box connector I (see page 22-51)	13	5	Under left side of dash		
Under-dash fuse/relay box connector J (see page 22-51)	12	8	Under left side of dash		
C401	7	4	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C451	6	10	Under middle of dash	ECM/PCM wire harness (see page 22-32)	
C452	5	8	Under middle of dash	ECM/PCM wire harness (see page 22-32)	Canada
C501	4	8	Under middle of dash	Dashboard wire harness A (see page 22-28)	
C502	3	13	Under middle of dash	Dashboard wire harness A (see page 22-28)	Cruise
C503	1	10	Under middle of dash	Dashboard wire harness A (see page 22-28)	Canada
C553	9	10	Under middle of dash	Floor wire harness (see page 22-36)	
C853	8	1	Under middle of dash	A/C wire harness (see page 22-48)	
G402	2		Under middle of dash	Body ground, via engine compartment wire harness	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UNDER-DASH FUSE/RELAY BOX
ENGINE COMPARTMENT WIRE HARNESS
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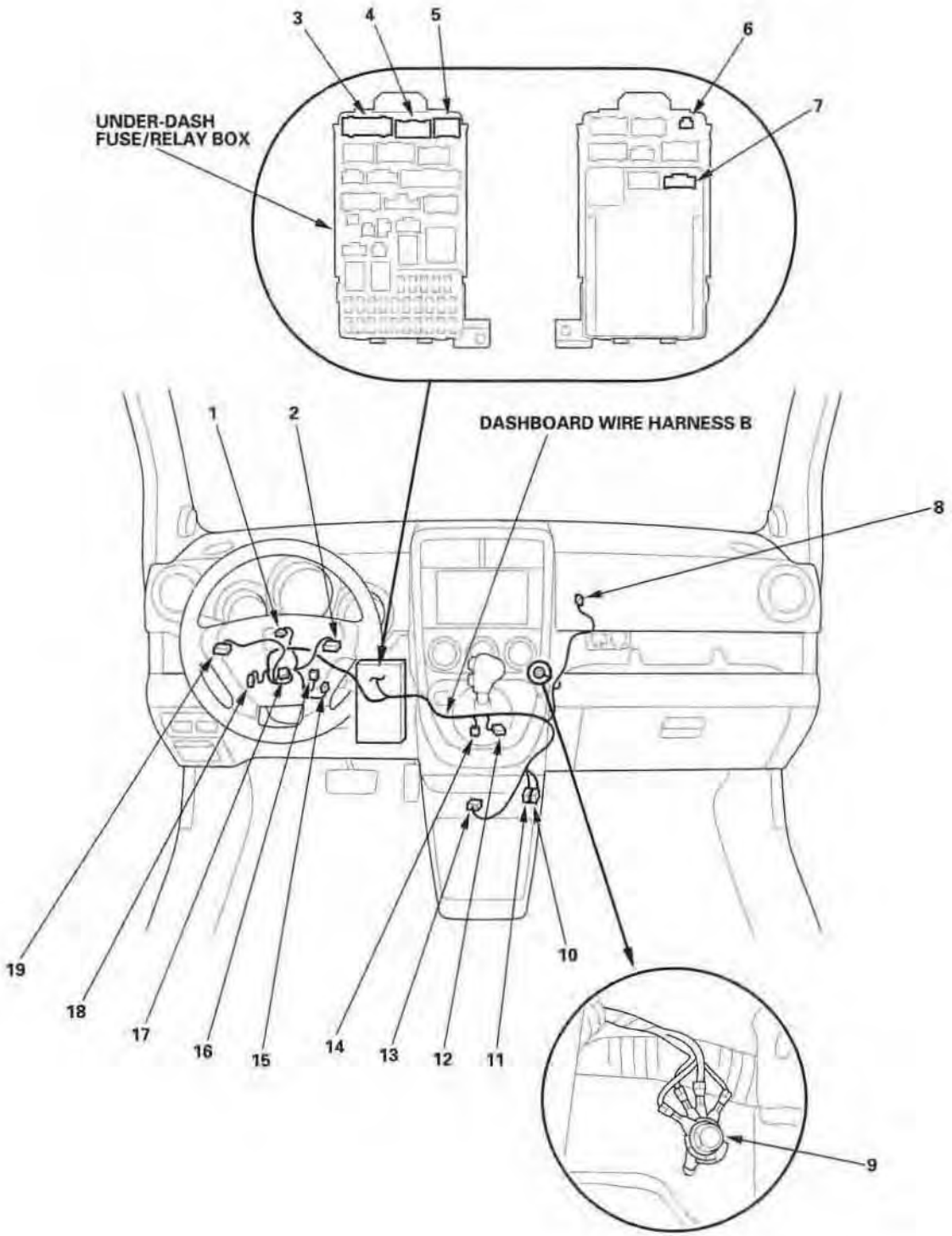
Connector to Harness Index (cont'd)

Dashboard Wire Harness B

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Cable reel connector A	18	4	In steering column cover	Driver's airbag inflator	
Cable reel connector B	1	5	In steering column cover		
Combination light switch	19	16	In steering column cover		
Front passenger's airbag inflator	8	4	Under right side of dash		
Ignition key switch/key light	16	6	In steering column cover		
Ignition switch	17	7	In steering column cover		
Immobilizer control unit-receiver	15	7	In steering column cover		
Multiplex control unit (Fuse/relay box connector X)	7	8	In the under-dash fuse/relay box		
SRS unit connector A	13	18	Under middle of dash		
Under-dash fuse/relay box connector A (see page 22-51)	4	5	Under left side of dash		
Under-dash fuse/relay box connector B (see page 22-51)	5	6	Under left side of dash		
Under-dash fuse/relay box connector C (see page 22-51)	3	14	Under left side of dash		
Under-dash fuse/relay box connector S (see page 22-51)	6	2	Under left side of dash		
Wiper/washer switch	2	14	In the steering column cover		
C401	14	4	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C402	12	14	Under middle of dash	Dashboard wire harness A (see page 22-28)	
C403	11	6	Under middle of dash	Floor wire harness (see page 22-36)	
C404	10	4	Under middle of dash	Floor wire harness (see page 22-36)	
G401	9		Under middle of dash	Body ground, via dashboard wire harness B	


UNDER-DASH
FUSE/RELAY BOX
DASHBOARD WIRE HARNESS B
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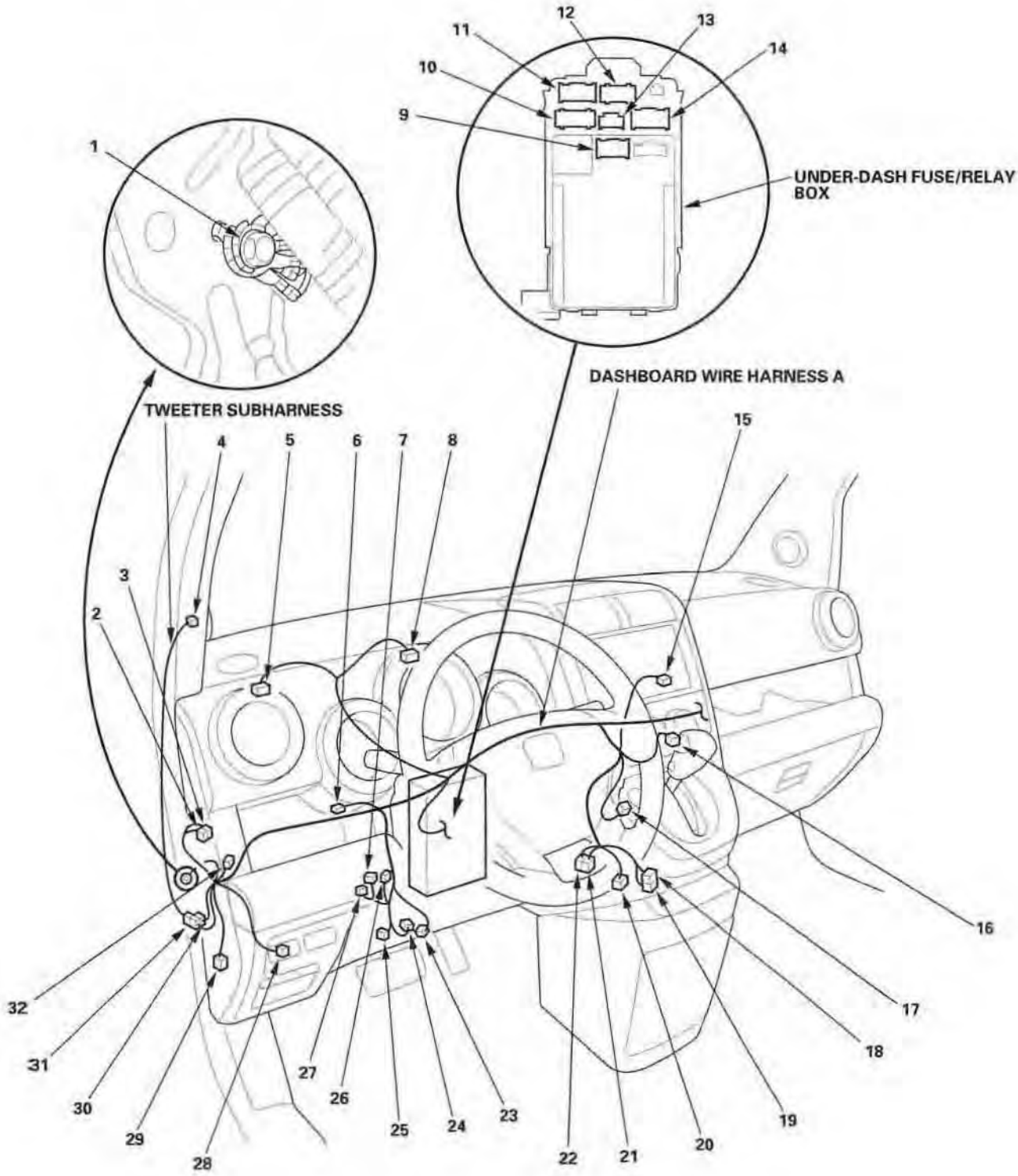
Connector to Harness Index (cont'd)

Dashboard Wire Harness A (Left branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Brake pedal position switch	23	4	Under left side of dash		
Clutch pedal position switch	24	2	Under left side of dash		M/T-Cruise
Clutch interlock switch	25	2	Under left side of dash		M/T
Cruise control main switch	28	5	Under left side of dash		
Daytime running lights control unit	27	14	Under left side of dash		Canada
Daytime running lights relay	2	4	Under left side of dash		Canada
Gauge assembly connector A	8	30	Behind gauge assembly		
Gauge assembly connector B	5	16	Behind gauge assembly		
Diode, rear ceiling light	6	2	Under left side of dash		
Hazard warning switch	17	10	Under middle of dash		
Heater control panel	16	30	Behind heater control panel		
Keyless receiver unit	26	5	Under left side of dash		
Low beam cut relay	3	5	Under left side of dash		Canada
Multiplex control unit (Fuse/relay box connector Y)	9	13	In the under-dash fuse/relay box		
Security control unit connector (optional)	7	22	Under left side of dash		
Trailer lighting connector (optional)	32	6	Under left side of dash		
Under-dash fuse/relay box connector K (see page 22-51)	11	17	In the under-dash fuse/relay box		
Under-dash fuse/relay box connector L (see page 22-51)	12	10	In the under-dash fuse/relay box		
Under-dash fuse/relay box connector M (see page 22-51)	10	12	In the under-dash fuse/relay box		
Under-dash fuse/relay box connector N (see page 22-51)	13	6	In the under-dash fuse/relay box		
Under-dash fuse/relay box connector O (see page 22-51)	14	12	In the under-dash fuse/relay box		
Woofer speaker	15	4	Under middle of dash		
C402	18	14	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C453	19	17	Under middle of dash	ECM/PCM wire harness (see page 22-32)	
C501	21	8	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C502	22	13	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C503	20	10	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C504	31	3	Under left side of dash	Tweeter subharness	
C751	29	20	Under left side of dash	Driver's door wire harness (see page 22-42)	
C752	30	6	Under left side of dash	Driver's door wire harness (see page 22-42)	
G501	1		Under left side of dash	Body ground, via dashboard wire harness A	

Tweeter Subharness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Left tweeter	4	2	Left side of dash	Left A-pillar	
C504	31	3	Under left side of dash	Dashboard wire harness A	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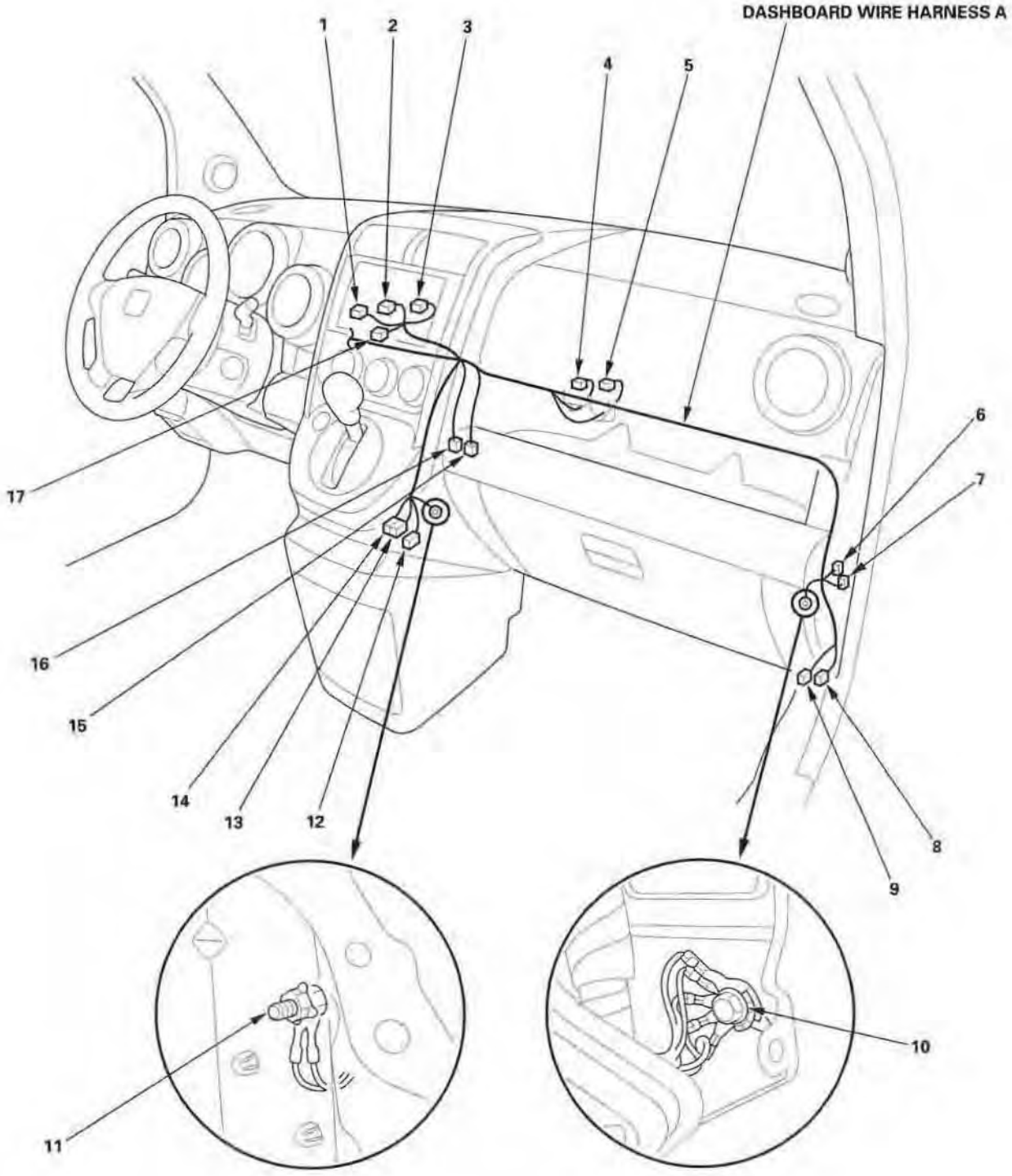
UNDER-DASH FUSE/RELAY BOX
DASHBOARD WIRE HARNESS A
TWEETER SUBHARNESS

Connector to Harness Index (cont'd)

Dashboard Wire Harness A (Right branch)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Audio unit connector A	2	20	Behind audio unit		
Audio unit connector B	3	8	Behind audio unit		
Audio unit connector C	1	6	Behind audio unit		
Audio unit connector D	17	14	Behind audio unit		With XM radio
Auxiliary jack	4	5	Under right side of dash		
Front accessory power socket	5	2	Under right side of dash		
Stereo amplifier connector A	9	14	Under right side of dash		
Stereo amplifier connector B	8	16	Under right side of dash		
C551	14	4	Under middle of dash	Floor wire harness (see page 22-36)	Without XM radio
C552	13	4	Under middle of dash	Floor wire harness (see page 22-36)	Without XM radio
C561	12	23	Under middle of dash	Floor wire harness (see page 22-36)	With XM radio
C651	7	6	Under right side of dash	Roof wire harness (see page 22-40)	
C781	6	12	Under right side of dash	Front passenger's door wire harness (see page 22-43)	*1, *2
C781	6	8	Under right side of dash	Front passenger's door wire harness (see page 22-43)	*3
C851	15	21	Under middle of dash	A/C wire harness (see page 22-48)	
C852	16	1	Under middle of dash	A/C wire harness (see page 22-48)	
G502	10		Under right side of dash	Body ground, via dashboard wire harness A	
G503	11		Under right side of dash	Body ground, via dashboard wire harness A	

* 1: '03-04 EX model
* 2: '05 all models
* 3: '03-04 DX and LX models


DASHBOARD WIRE HARNESS A
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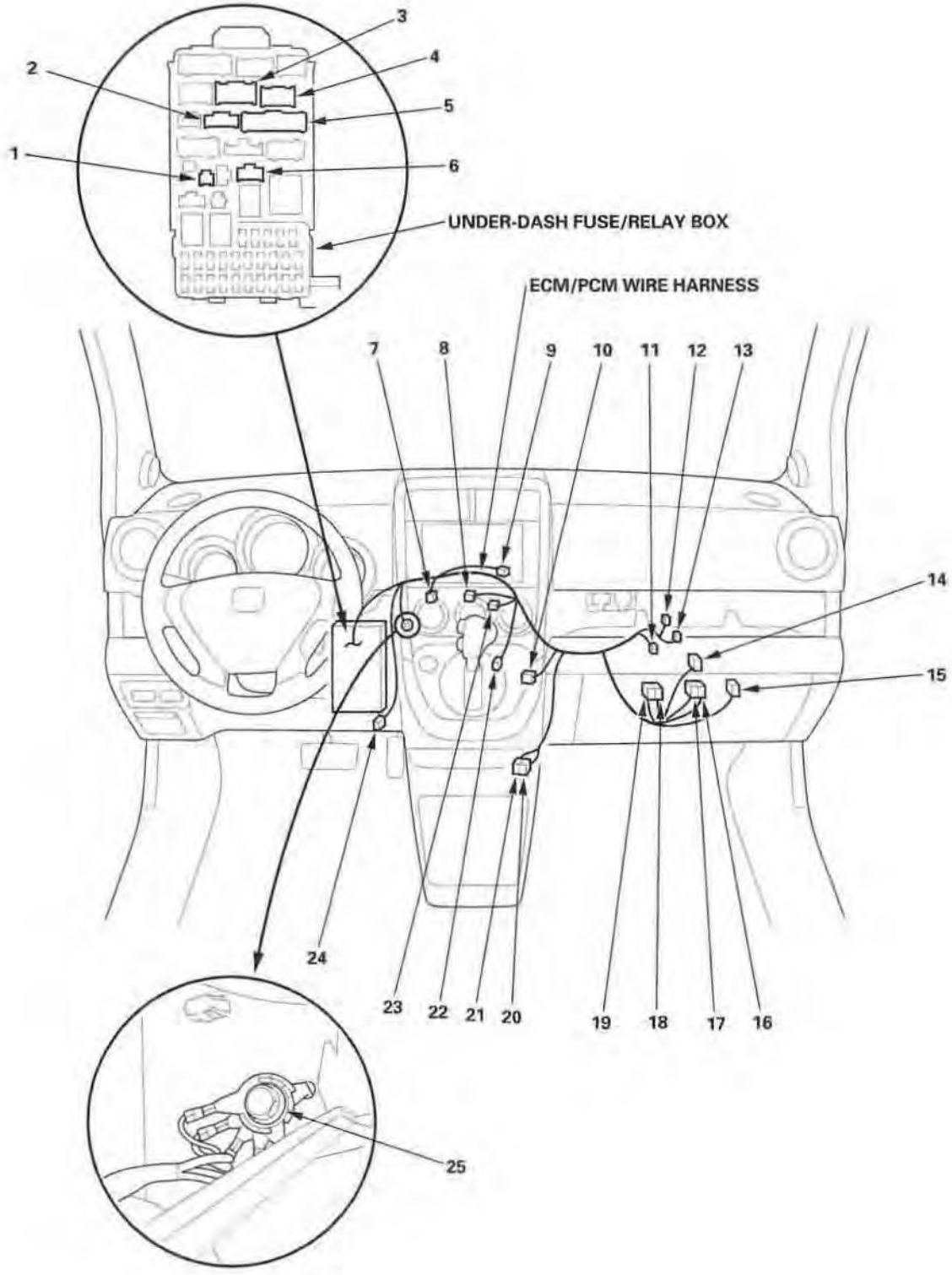
Connector to Harness Index (cont'd)

ECM/PCM Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
A/T reverse relay	17	4	Behind glove box		
Air fuel ratio (A/F) sensor relay	14	4	Behind glove box		
Data link connector (DLC)	24	16	Under middle of dash		
ECM/PCM connector E	12	31	Under right side of dash		
Memory erase signal (MES) connector (see page 22-51)	1	2	Under left side of dash		
PCM connector D	13	17	Under right side of dash		A/T
PGM-FI main relay 1 (FI MAIN)	18	4	Behind glove box		
PGM-FI main relay 2 (FUEL PUMP)	19	5	Behind glove box		
Rear accessory power socket relay	16	4	Behind glove box		
A/T gear position indicator panel light/park pin switch	10	4	Under middle of dash		A/T
Shift lock relay	15	5	Behind glove box		A/T
Shift lock solenoid/over drive switch	22	4	Under middle of dash		A/T
Under-dash fuse/relay box connector D (see page 22-51)	3	12	Under left side of dash		
Under-dash fuse/relay box connector E (see page 22-51)	4	13	Under left side of dash		
Under-dash fuse/relay box connector P (see page 22-51)	5	18	Under left side of dash		
Under-dash fuse/relay box connector Q (see page 22-51)	2	8	Under left side of dash		
Under-dash fuse/relay box connector R (see page 22-51)	6	6	Under left side of dash		
C101	11	20	Under right side of dash	Engine wire harness (see page 22-16)	
C451	7	10	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C452	8	8	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C453	23	17	Under middle of dash	Dashboard wire harness A (see page 22-28)	
C454	20	17	Under middle of dash	Floor wire harness (see page 22-36)	
C455	21	10	Under middle of dash	Floor wire harness (see page 22-36)	
C456 (Junction connector)	9	20	Under middle of dash		
G451	25		Under middle of dash	Body ground, via ECM/PCM wire harness	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UNDER-DASH FUSE/RELAY BOX
ECM/PCM WIRE HARNESS
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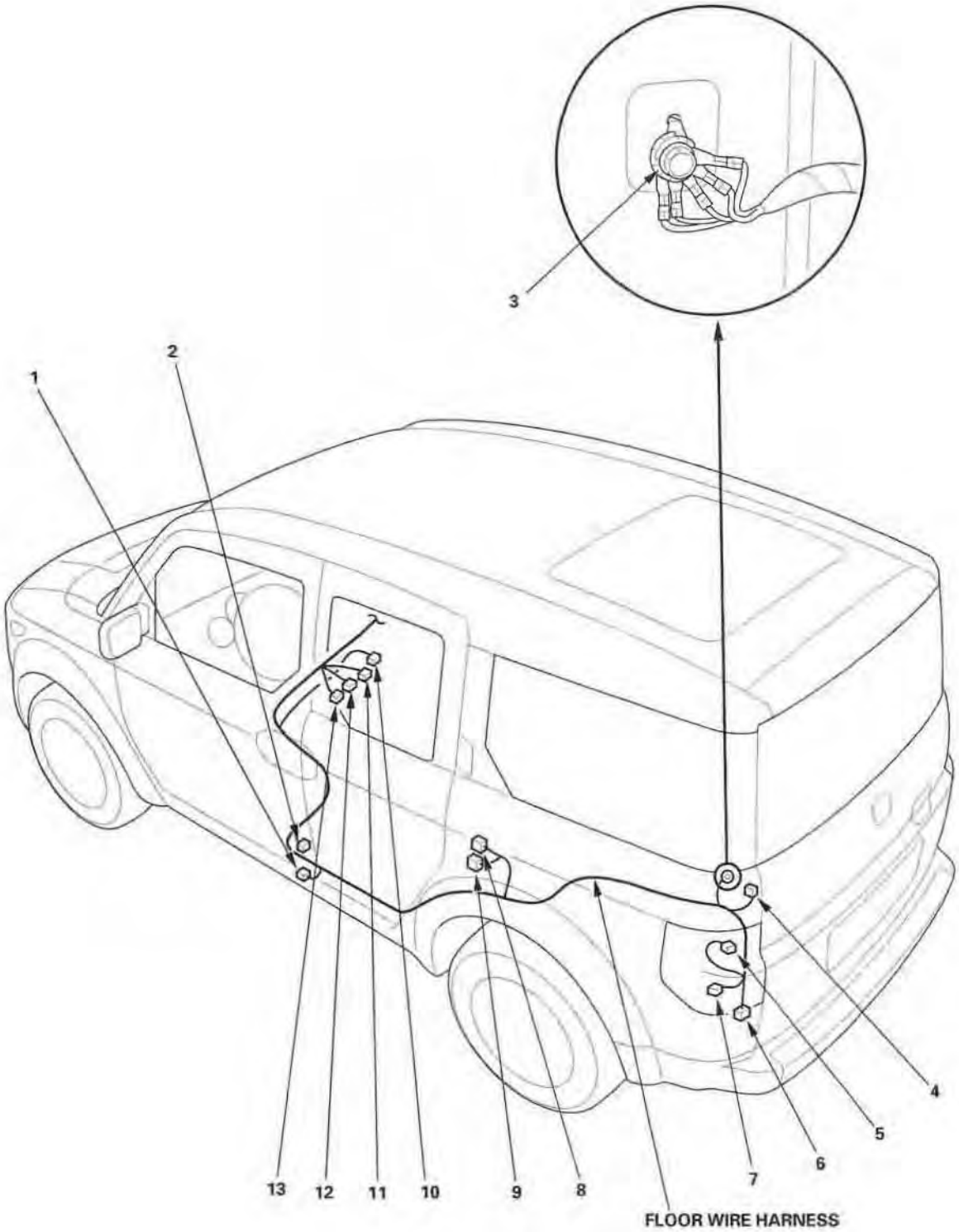
Connector to Harness Index (cont'd)

Floor Wire Harness (Left side)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's seat belt switch	12	3	Under driver's seat		
Driver's side airbag inflator	13	2	Under driver's seat		
Driver's side impact sensor	1	2	Left side of floor		
Driver's seat belt buckle tensioner	11	4	Under driver's seat		
Left taillight	5	5	Behind left taillight		
Parking brake switch	10	1	Middle of floor		
Rear window wiper intermittent control unit	7	8	Left quarter panel		
Trailer lighting connector	2	3	Left side of floor		'05 model
C554	9	6	Left B-pillar	Left rear door subharness (see page 22-44)	
C555	8	4	Left B-pillar	Left rear door subharness (see page 22-44)	
C601	4	10	Left C-pillar	Hatch wire harness (see page 22-38)	
C681	6	3	Left C-pillar	Tailgate wire harness (see page 22-38)	'03-04 models
C681	6	8	Left C-pillar	Tailgate wire harness (see page 22-38)	'05 model
G553	3		Left C-pillar	Body ground, via floor wire harness	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FLOOR WIRE HARNESS
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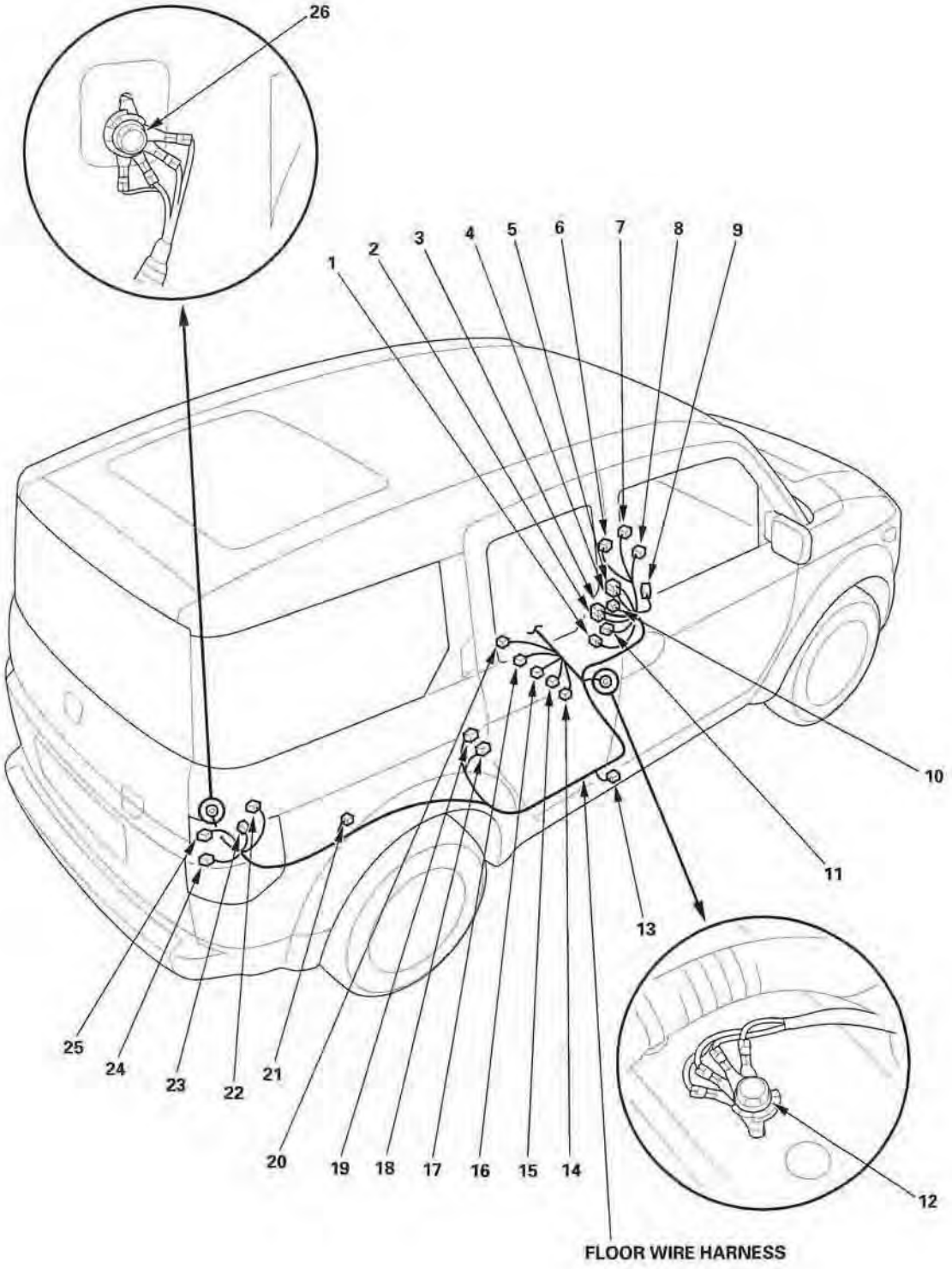
Connector to Harness Index (cont'd)

Floor Wire Harness (Right side)

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's seat belt switch	16	3	Under front passenger's seat		
Front passenger's seat belt buckle tensioner	15	4	Under front passenger's seat		
Front passenger's side airbag inflator	17	2	Under front passenger's seat		
Front passenger's side impact sensor	13	2	Right side of floor		
Rear accessory power socket	22	2	Right quarter panel		
Right taillight	25	5	Behind right taillight		
SRS unit connector B	7	18	Under middle of dash		
SRS unit connector C	8	8	Under middle of dash		
Trailer lighting connector 1	23	6	Behind right taillight		'03-04 models
Trailer lighting connector 2	24	2	Behind right taillight		'03-04 models
XM receiver	21	14	Under right quarter panel		With XM radio
C403	4	6	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C404	5	4	Under middle of dash	Dashboard wire harness B (see page 22-26)	
C454	11	17	Under middle of dash	ECM/PCM wire harness (see page 22-32)	
C455	1	10	Under middle of dash	ECM/PCM wire harness (see page 22-32)	
C551	3	4	Under middle of dash	Dashboard wire harness A (see page 22-30)	Without XM radio
C552	2	4	Under middle of dash	Dashboard wire harness A (see page 22-30)	Without XM radio
C553	6	10	Under middle of dash	Engine compartment wire harness (see page 22-24)	
C556	18	6	Right B-pillar	Right rear door subharness (see page 22-46)	
C557	19	4	Right B-pillar	Right rear door subharness (see page 22-46)	
C558	20	14	Middle of floor	ABS/Fuel pump wire harness (see page 22-41)	With ABS
C558	20	10	Middle of floor	ABS/Fuel pump wire harness (see page 22-41)	Without ABS
C559 (Junction connector)	9	20	Under middle of dash		
C560	14	4	Under front passenger's seat	OPDS unit harness (see page 22-49)	
C561	10	23	Under middle of dash	Dashboard wire harness A (see page 22-30)	With XM radio
G551	26		Right C-pillar	Body ground, via floor wire harness	
G552	12		Under front passenger's seat	Body ground, via floor wire harness	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FLOOR WIRE HARNESS

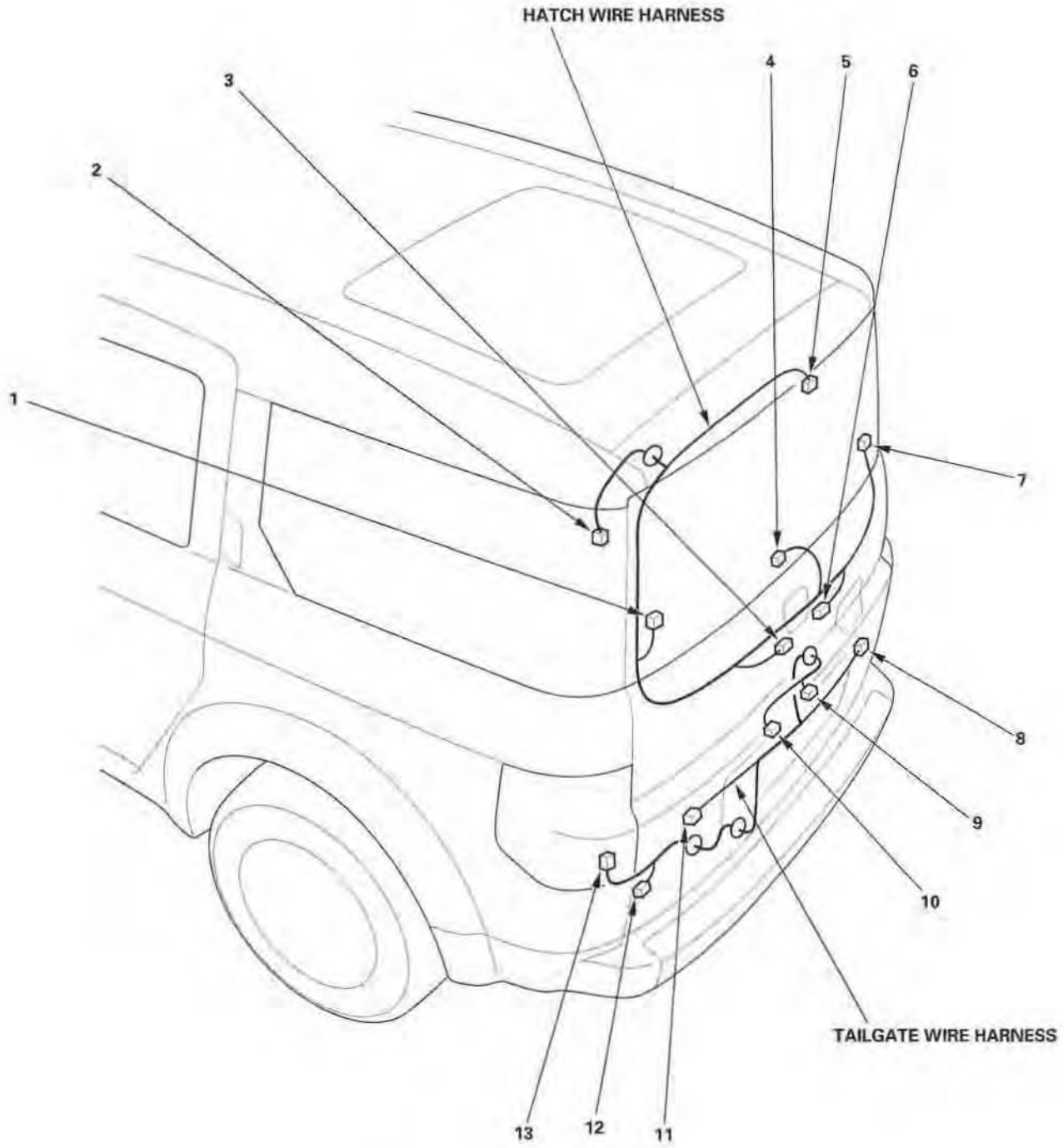
Connector to Harness Index (cont'd)

Hatch Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Hatch latch switch	3	2	Middle of hatch		
Hatch lock actuator	6	2	Middle of hatch		
High mount brake light	5	2	Middle of hatch		
Rear window defogger connector (+)	1	1	Left side of hatch		
Rear window defogger connector (−)	7	1	Right side of hatch		
Rear window wiper motor	4	4	Middle of hatch		
C601	2	10	Left C-pillar	Floor wire harness (see page 22-34)	

Tailgate Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
License plate light connector A	9	2	Middle of tailgate		
License plate light connector B	10	2	Middle of tailgate		
Tailgate left switch	11	2	Left side of tailgate		
Tailgate right switch	8	2	Right side of tailgate		
Trailer lighting connector	12	4	Left side of tailgate		'05 model
C681	13	3	Left C-pillar	Floor wire harness (see page 22-34)	'03-04 models
C681	13	8	Left C-pillar	Floor wire harness (see page 22-34)	'05 model


HATCH WIRE HARNESS
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TAILGATE WIRE HARNESS
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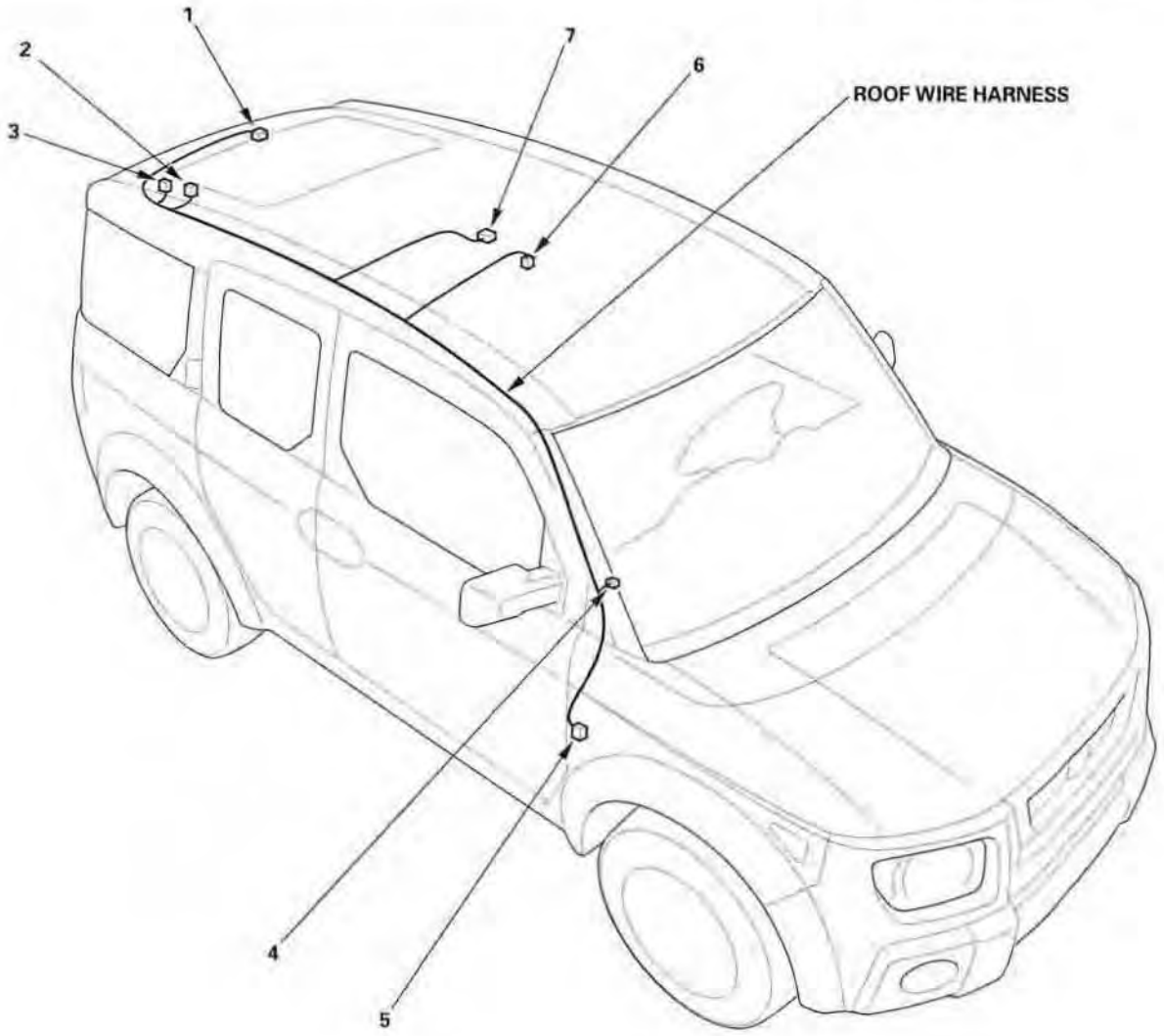
Connector to Harness Index (cont'd)

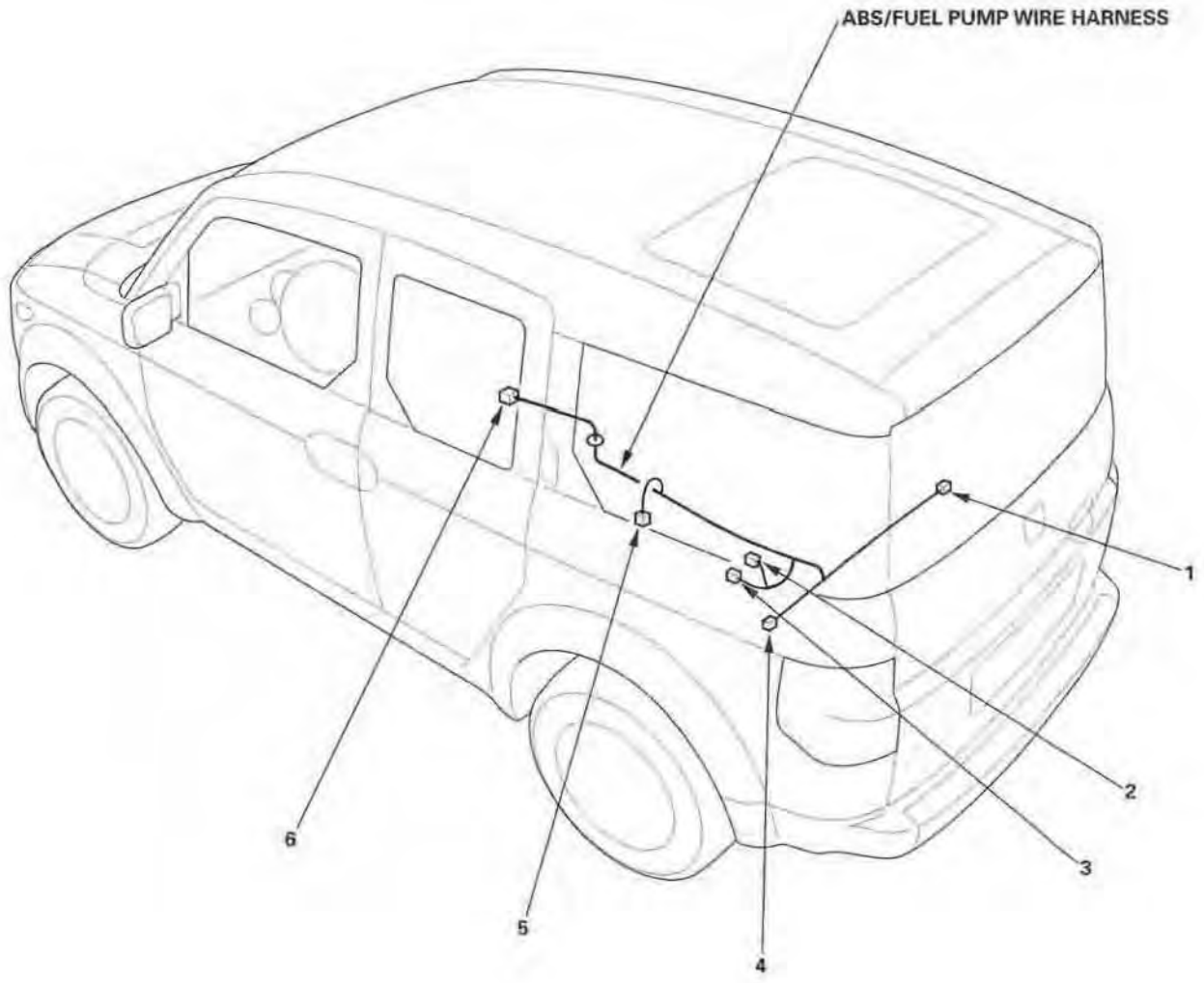
Roof Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Ceiling light (front)	7	3	Rear of roof		
Ceiling light (rear)	1	3	Middle of roof		
Right tweeter	4	2	Right A-pillar		
Roof antenna	2	1	Rear of roof		
Spotlight	6	2	Middle of roof		
XM antenna	3	2	Rear of roof		With XM radio
C651	5	6	Right side of dash	Dashboard wire harness A (see page 22-30)	



ABS/Fuel Pump Wire Harness

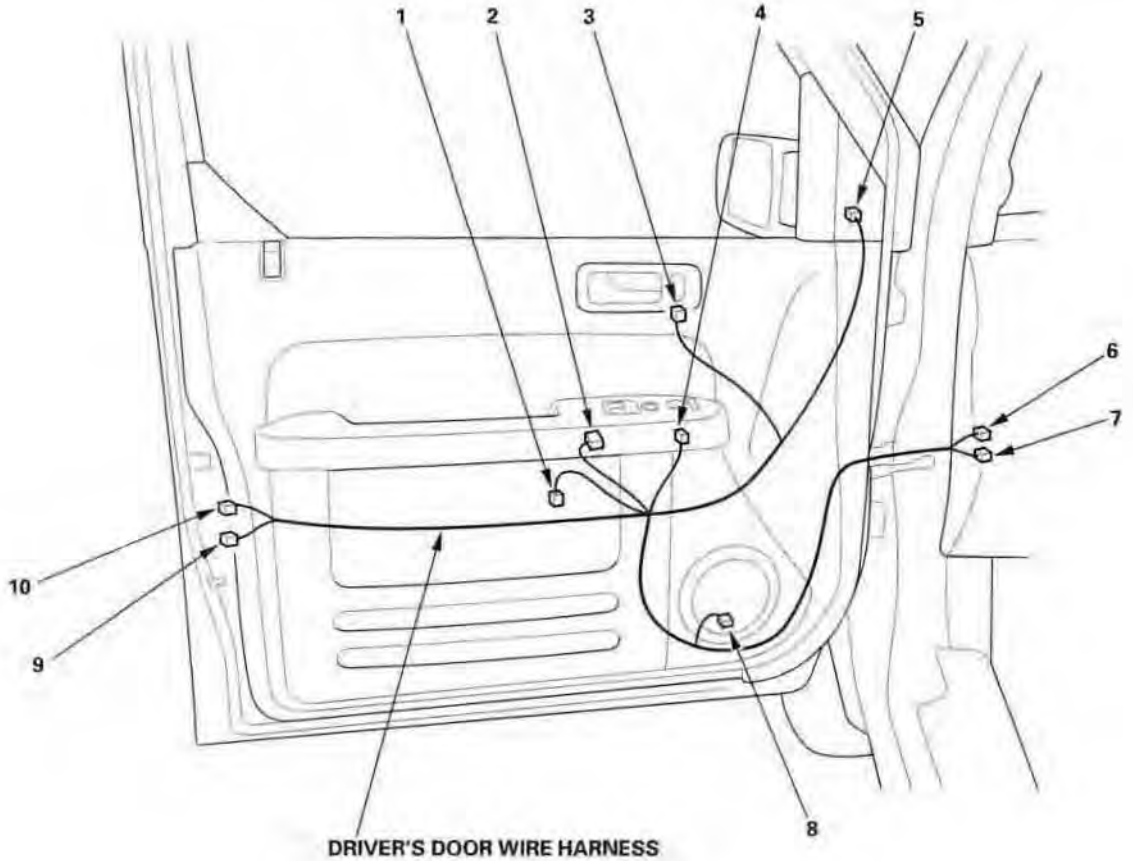
Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
EVAP canister vent shut valve	2	2	Fuel tank		
Fuel tank unit	5	5	Fuel tank		
Fuel tank pressure (FTP) sensor	3	3	Fuel tank		
Left rear wheel sensor	4	2	Under left side of floor		
Right rear wheel sensor	1	2	Under right side of floor		
C558	6	14	Middle of floor	Floor wire harness (see page 22-36)	With ABS
C558	6	10	Middle of floor	Floor wire harness (see page 22-36)	Without ABS



Connector to Harness Index (cont'd)

Driver's Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's door lock actuator	9	2	Driver's door		
Driver's door lock knob switch	10	3	Driver's door		
Driver's door lock switch	3	5	Driver's door		
Driver's door speaker	8	2	Driver's door		
Driver's power window motor	1	6	Driver's door		
Left power mirror	5	8	Driver's door		
Power mirror switch	4	13	Driver's door		
Power window master switch	2	14	Driver's door		
C751	7	20	Under left side of dash	Dashboard wire harness A (see page 22-28)	
C752	6	6	Under left side of dash	Dashboard wire harness A (see page 22-28)	

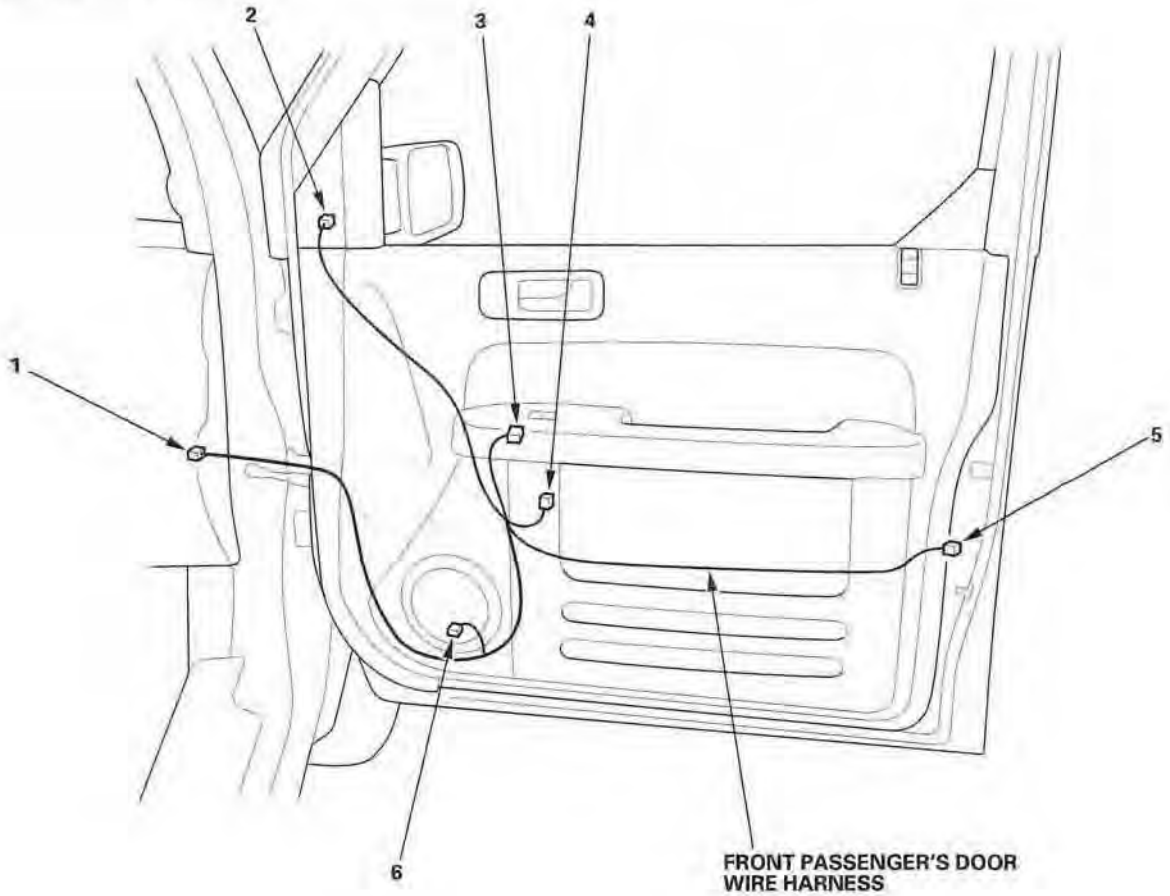


DRIVER'S DOOR WIRE HARNESS

Front Passenger's Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's door lock actuator	5	2	Front passenger's door		
Front passenger's door speaker	6	2	Front passenger's door		
Front passenger's power window motor	4	2	Front passenger's door		
Front passenger's power window switch	3	5	Front passenger's door		
Right power mirror	2	8	Front passenger's door		
C781	1	12	Under right side of dash	Dashboard wire harness A (see page 22-30)	* 1, * 2
C781	1	8	Under right side of dash	Dashboard wire harness A (see page 22-30)	* 3

* 1: '03-04 EX model
* 2: '05 all models
* 3: '03-04 DX and LX models



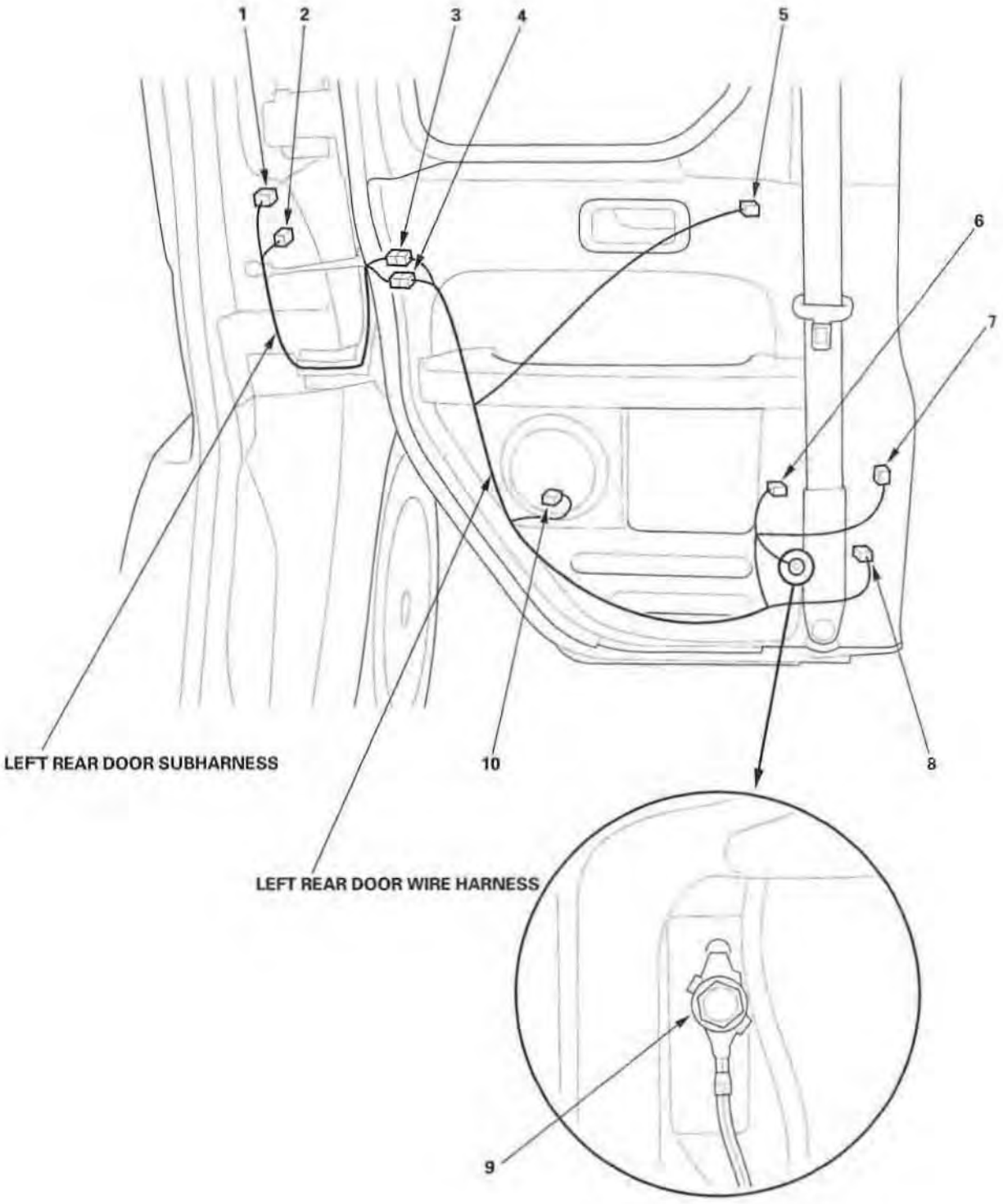
Connector to Harness Index (cont'd)

Left Rear Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Driver's seat belt tensioner	8	2	Left rear door		
Left front door switch	7	1	Left rear door		
Left rear door lower switch	6	2	Left rear door		
Left rear door speaker	10	2	Left rear door		
Left rear door upper switch	5	2	Left rear door		
C771	4	4	Left rear door	Left rear door subharness	
C772	3	6	Left rear door	Left rear door subharness	
G771	9		Left rear door	Body ground, via left rear door wire harness	

Left Rear Door Subharness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
C554	2	6	Left B-pillar	Floor wire harness (see page 22-34)	
C555	1	4	Left B-pillar	Floor wire harness (see page 22-34)	
C771	4	4	Left rear door	Left rear door wire harness	
C772	3	6	Left rear door	Left rear door wire harness	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LEFT REAR DOOR SUBHARNESS
LEFT REAR DOOR WIRE HARNESS

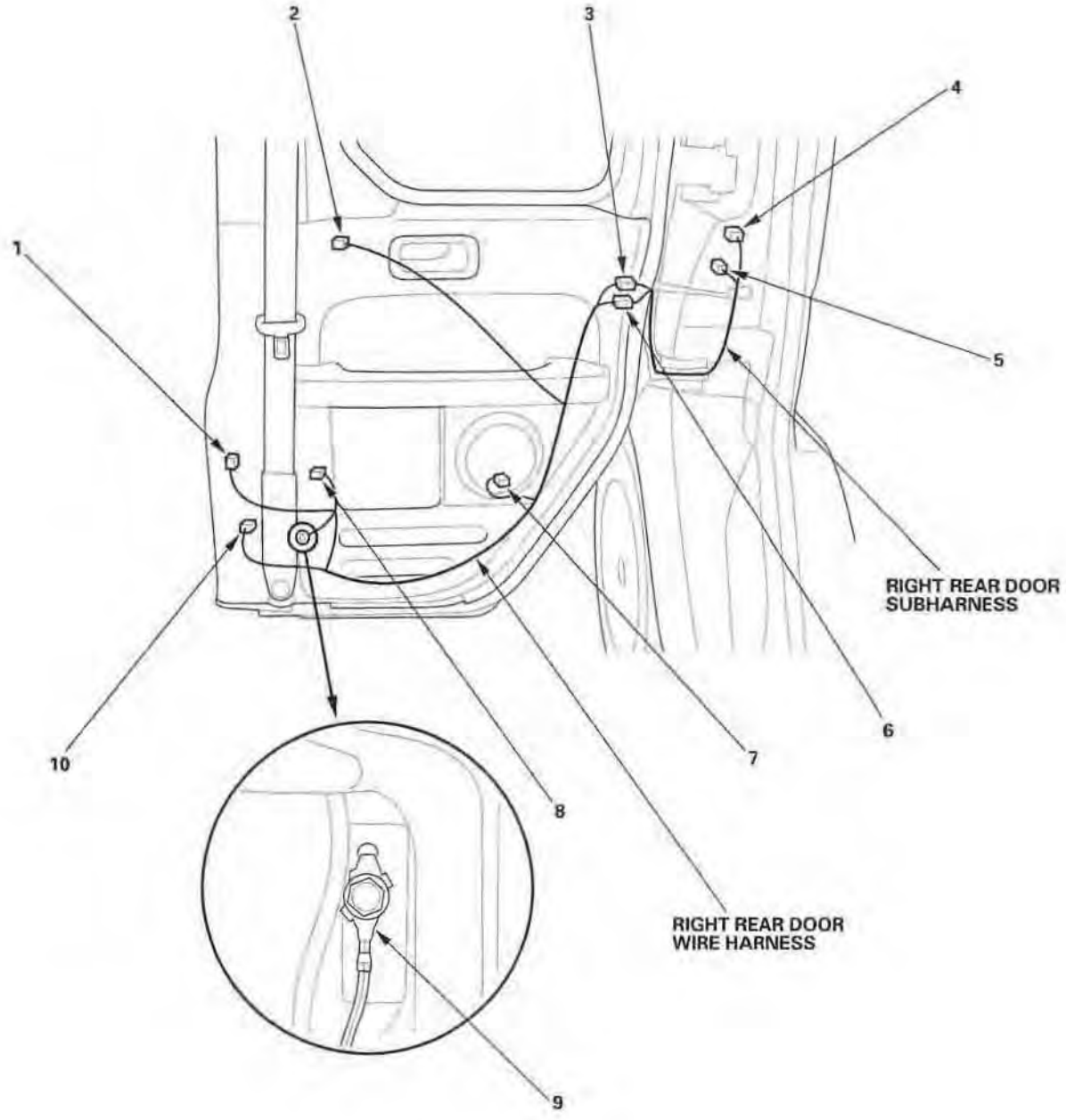
Connector to Harness Index (cont'd)

Right Rear Door Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Front passenger's seat belt tensioner	10	2	Right rear door		
Right front door switch	1	1	Right rear door		
Right rear door lower switch	8	2	Right rear door		
Right rear door speaker	7	2	Right rear door		
Right rear door upper switch	2	2	Right rear door		
C761	6	4	Right rear door	Right rear door subharness	
C762	3	6	Right rear door	Right rear door subharness	
G751	9		Right rear door	Body ground, via right rear door wire harness	

Right Rear Door Subharness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
C556	4	6	Right B-pillar	Floor wire harness (see page 22-36)	
C557	5	4	Right B-pillar	Floor wire harness (see page 22-36)	
C761	6	4	Right rear door	Right rear door wire harness	
C762	3	6	Right rear door	Right rear door wire harness	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RIGHT REAR DOOR
SUBHARNESS
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WIRE HARNESS
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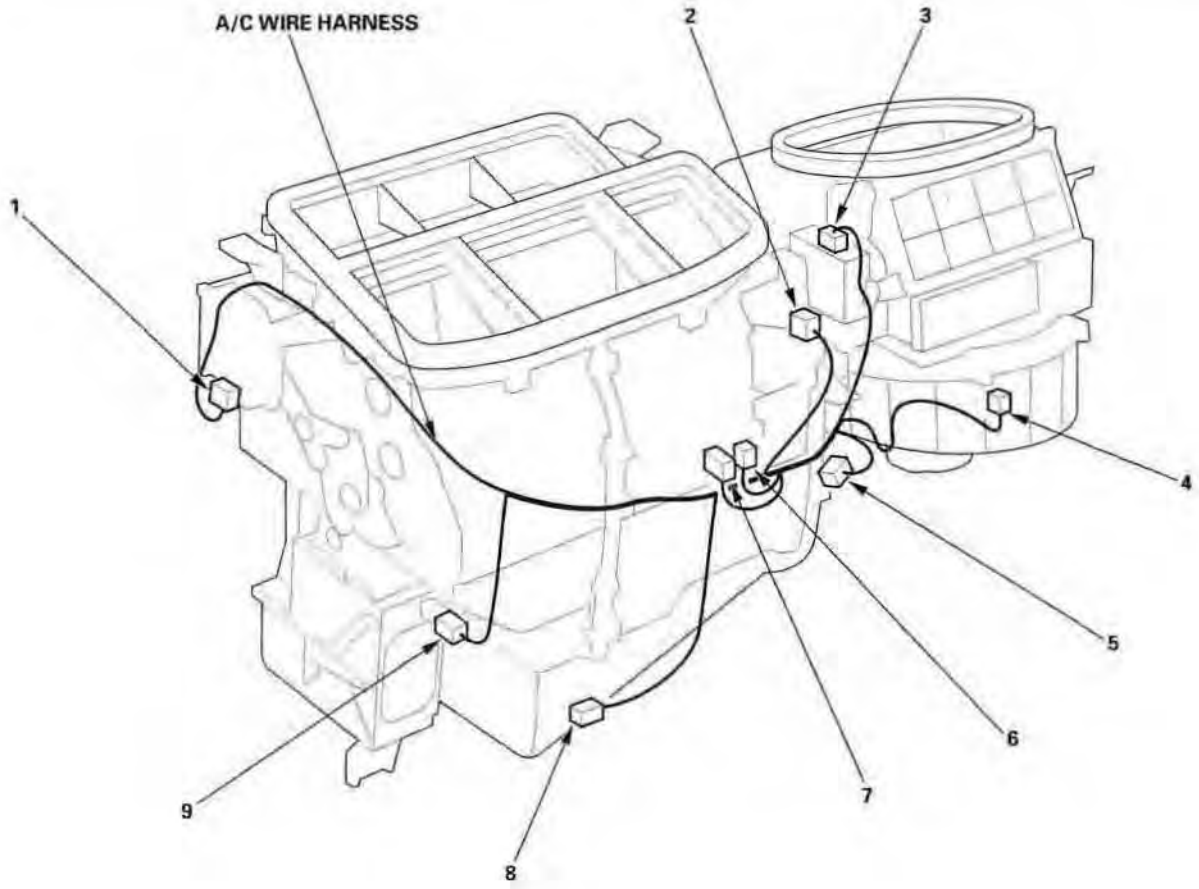
Connector to Harness Index (cont'd)

A/C Wire Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
Air mix control motor	1	7	Under top of dash		
Blower motor	4	2	Under right side of dash		
Blower power transistor	5	4	Under right side of dash		
Evaporator temperature sensor	9	2	Under top of dash		
Mode control motor	2	7	Under right side of dash		
Recirculation control motor	3	7	Under right side of dash		
C851	7	21	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C852	6	1	Under middle of dash	Dashboard wire harness A (see page 22-30)	
C853	8	1	Under middle of dash	Engine compartment wire harness (see page 22-24)	



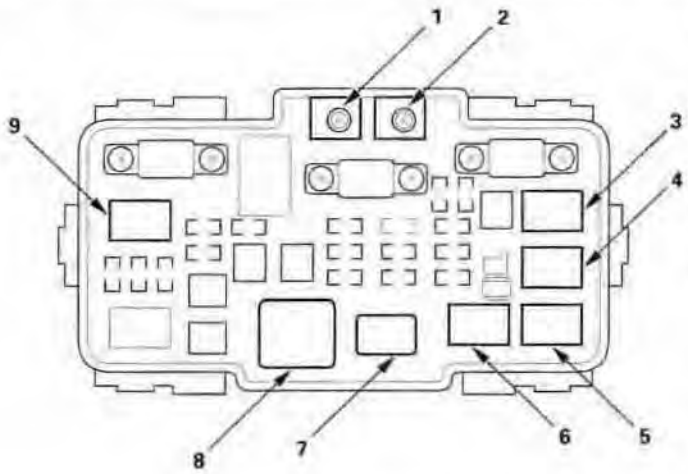
OPDS Unit Harness

Connector or Terminal	Ref	Cavities	Location	Connects to	Notes
OPDS unit connector C560	1 2	8 4	In front passenger's seat Under front passenger's seat	Floor wire harness (see page 22-36)	

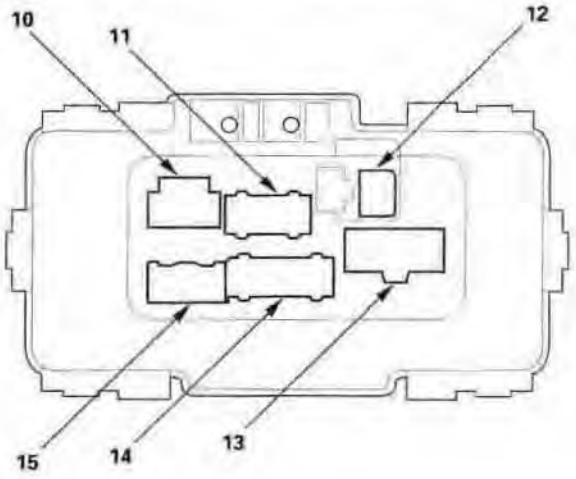
Connector to Fuse/Relay Box Index

Under-hood Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	10	2	Engine compartment wire harness (see page 22-22)
A/C compressor clutch relay	6	4	
A/C condenser fan relay	3	4	
B	15	5	Engine compartment wire harness (see page 22-22)
Blower motor relay	8	4	
C	11	12	Engine compartment wire harness (see page 22-22)
D	14	14	Engine compartment wire harness (see page 22-22)
E	13	7	Engine compartment wire harness (see page 22-22)
ELD unit	12	3	Engine compartment wire harness (see page 22-22)
Horn relay	4	4	
Headlight relay	9	4	
Radiator fan relay	5	4	
Rear window defogger relay	7	4	
T101 (Battery)	2		Starter subharness (see page 22-14)
T102 (Alternator)	1		Starter subharness (see page 22-14)



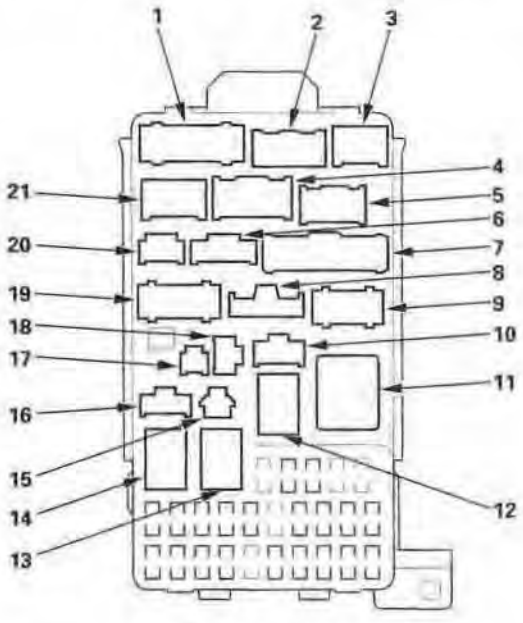
(View of front side)



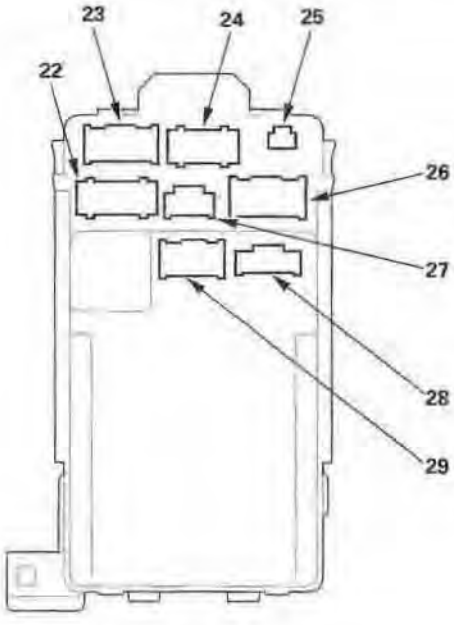
(View of back side)

Under-dash Fuse/Relay Box

Socket	Ref	Terminal	Connects to
A	2	5	Dashboard wire harness B (see page 22-26)
B	3	6	Dashboard wire harness B (see page 22-26)
C	1	14	Dashboard wire harness B (see page 22-26)
D	4	12	ECM/PCM wire harness (see page 22-32)
E	5	13	ECM/PCM wire harness (see page 22-32)
F	19	12	Engine compartment wire harness (see page 22-24)
G	9	10	Engine compartment wire harness (see page 22-24)
H	8	3	Engine compartment wire harness (see page 22-24)
I	20	5	Engine compartment wire harness (see page 22-24)
J	21	8	Engine compartment wire harness (see page 22-24)
K	23	17	Dashboard wire harness A (see page 22-28)
L	24	10	Dashboard wire harness A (see page 22-28)
M	22	12	Dashboard wire harness A (see page 22-28)
N	27	6	Dashboard wire harness A (see page 22-28)
O	26	12	Dashboard wire harness A (see page 22-28)
P	7	18	ECM/PCM wire harness (see page 22-32)
Power window relay	12	4	
Q	6	8	ECM/PCM wire harness (see page 22-32)
R	10	6	ECM/PCM wire harness (see page 22-32)
S	25	2	Dashboard wire harness B (see page 22-26)
Starter cut relay	14	4	
T	18	3	Multiplex control unit service check connector
Taillight relay	13	4	
Turn signal/hazard relay	11	3	
U	15	1	Optional connector
V	16	4	Optional connector
W (Memory erase signal (MES) connector)	17	2	ECM/PCM wire harness (see page 22-32)
X (plugs directly into the multiplex control unit)	28	8	Dashboard wire harness B (see page 22-26)
Y (plugs directly into the multiplex control unit)	29	13	Dashboard wire harness A (see page 22-28)



(View of front side)



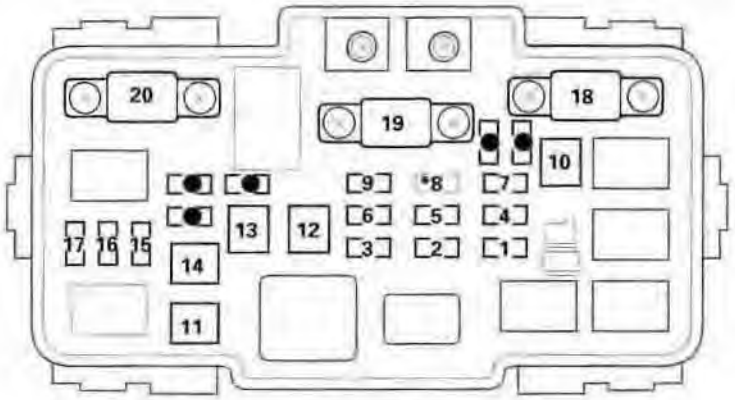
(View of back side)

Power Distribution

Fuse to Components Index

Under-hood Fuse/Relay Box

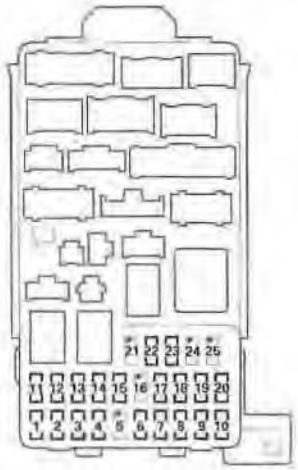
Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	30 A	BLU/YEL	A/C condenser fan motor
		BLU/RED	A/C compressor clutch
2	15 A	WHT/GRN	Dash lights, Front side marker lights, Front parking lights, License plate light, Taillights, Trailer lighting connector, (via taillight relay)
3	7.5 A	WHT/BLU	Front ceiling light, Ignition key light, Rear ceiling light, Spotlights
4	20 A	BLU/BLK	Radiator fan motor
5	15 A	WHT/BLK	Turn signal/hazard relay, Turn signal lights
6	15 A	WHT/BLK	CKP sensor, CMP sensor A/B, ECM/PCM, IAC valve, Injectors, PGM-FI main relay 1 and 2
7	15 A	WHT/GRN	Brake lights, Brake signal to ABS modulator-control unit, Cruise control actuator, ECM/PCM, Horn relay, Trailer lighting connector
8	——	——	Not used
9	10 A	WHT/RED	Audio unit, Data link connector (DLC), Gauge assembly, Immobilizer control unit-receiver, Immobilizer indicator, Keyless receiver unit, Multiplex control unit, XM receiver
10	30 A	WHT/RED	ABS modulator-control unit
11	20 A	BLK/GRN	Rear window defogger
12	40 A	BLU/WHT	Blower motor
13	40 A	WHT/BLK	No. 7, 22, and No. 23 fuses (in the under-dash fuse/relay box), Power window relay
14	40 A	WHT/RED	No. 2, 3, and No. 15 fuses (in the under-dash fuse/relay box)
15	15 A	RED/YEL	Daytime running lights control unit (Canada), High beam indicator, Left headlight
16	15 A	WHT	Multiplex control unit
17	15 A	RED	Daytime running lights control unit (Canada), Right headlight
18	30 A	WHT/GRN	ABS modulator-control unit
19	100 A	——	Battery, Power distribution
20	50 A	WHT	Ignition switch (BAT)



●: Spare fuse
*: Not used

Under-dash Fuse/Relay Box

Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	15 A	BLK/ORN	Ignition coils
2	15 A	GRN/WHT	Rear accessory power socket
3	10 A	RED/BLU	Daytime running lights control unit (Canada)
4	10 A	BLK/YEL	Alternator, Air fuel ratio (A/F) sensor relay, CMP sensor, Cruise control actuator, ELD unit, Evaporative emission (EVAP) canister vent shut valve, Evaporative emission (EVAP) canister purge valve, Secondary HO2S
5	———	———	Not used
6	7.5 A	YEL/GRN	Power window relay
7	20 A	BLU/ORN	Stereo amplifier
8	7.5 A	YEL/RED	Audio unit
9	10 A	GRN	OPDS unit, Rear window washer motor, Rear window wiper control unit
10	7.5 A	YEL	A/T reverse relay, Back-up lights, Gauge assembly, Keyless receiver unit, Multiplex control unit, Shift lock relay
11	7.5 A	BLK/ORN	ABS modulator-control unit
12	7.5 A	YEL/RED	Daytime running lights control unit (Canada)
13	10 A	PNK	SRS unit
14	10 A	BLK/YEL	A/C compressor clutch relay, A/C condenser fan relay, Blower motor relay, Power mirror actuator, Radiator fan relay, Recirculation control motor, Rear window defogger relay
15	20 A	WHT/RED	Air fuel ratio (A/F) sensor
16	———	———	Not used
17	15 A	BLK/YEL	ECM/PCM, Fuel pump, SRS unit
18	15 A	YEL/WHT	Front accessory power socket, Rear accessory power socket relay
19	7.5 A	YEL/BLK	Turn signal/hazard relay
20	20 A	GRN/BLK	Multiplex control unit, Windshield wiper motor, Windshield washer motor
21	———	———	Not used
22	20 A	GRN/BLK	Front passenger's window motor
23	20 A	GRN/WHT	Driver's window motor, Power window control unit (in the power window master switch)
24	———	———	Not used
25	———	———	Not used



*: Not used

Ground Distribution

Ground to Components Index

Ground	Component or circuit grounded
G1	Battery, Transmission housing
G2	Engine mount bracket
G101	A/T clutch pressure control solenoid valves, CMP sensor A/B, CKP sensor, Countershaft speed sensor (A/T), ECM/PCM (LG1 is BRN/YEL, PG2 and PG3 are BLK), EVAP canister purge valve, Idle air control (IAC) valve, Mainshaft speed sensor (A/T), Transmission range switch (A/T), VTC oil control solenoid valve, VTEC oil pressure switch, VTEC solenoid valve
	Shielding between the ECM/PCM and Knock sensor has BRN/YEL wire
G102	Ignition coils
G201	Condenser fan motor, Radiator fan motor, Rear window washer motor, Right front parking light, Right front turn signal/side marker light, Washer fluid level switch (Canada), Windshield washer motor
G202	ABS modulator-control unit (2 wires)
G301	Blower motor relay, Brake fluid level switch, Cruise control actuator, ELD unit, Left front parking light, Left front turn signal/ side marker light, MPCS service check connector, Multiplex control unit (MPCS) (3 wires), Power steering pressure (PSP) switch, Power window relay, Radiator fan switch, Shift lever illumination/park pin switch, Turn signal/hazard relay, Windshield wiper motor
G401	Combination switch (Ignition and wiper), Ignition key switch (2 wires), Wiper/washer switch
G402	Left front airbag sensor, Right front airbag sensor, SRS unit (2 wires)
G501	Cruise control main switch, Daytime running lights control unit (2 wires) (Canada), Door multiplex control unit (2 wires), Driver's door lock knob switch, Heater control panel, Power mirror switch, Power transistor, Power window master switch, Security control unit (option)
G502	Clutch interlock switch (M/T), Clutch pedal position switch (M/T), Front accessory power socket, Gauge assembly (2 wires), Keyless receiver, Multiplex control unit (MPCS) (2 wires)
G503	Audio unit, Stereo amplifier
G451	Data link connector (DLC), Memory erase signal (MES) connector, Multiplex control unit (MPCS), Rear accessory power socket relay, Shift lock solenoid/over-drive switch (A/T)
G551	Rear accessory power socket, Right taillight, Trailer lighting connector, XM receiver, (G551 connects to G751)
G552	OPDS unit, Front passenger's seat belt switch, Driver's seat belt switch, fuel tank unit
G553	Hatch latch switch, High mount brake light, Left taillight, License plate lights, Rear window defogger connector (—), Rear window wiper intermittent control unit, Rear window wiper motor, Tailgate left switch, Tailgate right switch, (G553 connects to G711)
G751	Right rear door lower switch, Right rear door upper switch, (G751 connects to G551)
G771	Left rear door lower switch, Left rear door upper switch, (G771 connects to G553)

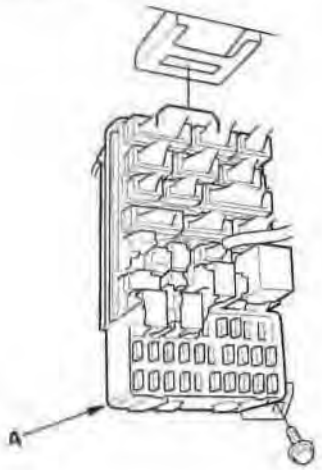
Under-dash Fuse/Relay Box

Removal and Installation

SRS components are located in this area. Review the SRS component locations (see page 23-10) and precautions and procedures (see page 23-11) in the SRS before performing repairs or service.

Removal

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the negative battery cable, then disconnect the positive cable, and wait at least 3 minutes.
3. Remove the dashboard lower cover (see page 20-73).
4. Disconnect the connectors from the fuse side of the under-dash fuse/relay box.
5. Remove the mounting bolt and the under-dash fuse/relay box (A).



6. Disconnect the connectors from the back of the under-dash fuse/relay box, and remove the fuse/relay box.

   NOTE: The SRS connector is a spring-loaded lock type (see page 23-15).

Installation

1. Install the under-dash fuse/relay box in the reverse order of removal, and connect all connectors to the under-dash fuse/relay box.
2. Install the dashboard lower cover.
3. Connect both the negative cable and positive cable to the battery.
4. Do the ECM/PCM idle learn procedure (see page 11-207).
5. Reset the power window control (see page 22-115).
6. Enter the anti-theft codes for the radio, then enter the customer's radio station presets.
7. Confirm that all systems work properly.

Battery Test

⚠ WARNING

A battery can explode if you do not follow the proper procedure, causing serious injury to anyone nearby. Follow all procedures carefully and keep sparks and open flames away from the battery.

Use either a JCI or Bear ARBST tester, and follow the manufacturer's procedures. If you don't have one of these computerized testers, follow this conventional test procedure:

1. Be sure the temperature of the electrolyte is between 70 °F (21 °C) and 100 °F (38 °C).
2. Inspect the battery case for cracks or leaks.
   - If the case is damaged, replace the battery. ■
   - If the case looks OK, go to step 3.
3. Check the indicator EYE.
   - If the EYE indicates the battery is charged, go to step 4.
   - If the EYE indicates a low charge, go to step 7.
4. Apply a 300 A load for 15 seconds to remove the surface charge.
5. Wait 15 seconds, then apply a test load of 280 A for 15 seconds.
6. Record battery voltage during the load test.
   - If voltage is above 9.6 V, the battery is OK. ■
   - If voltage is below 9.6 V, go to step 7.
7. Charge the battery on High (40 A) until the EYE shows the battery is charged, plus an additional 30 minutes. If the battery charge is very low, it may be necessary to bypass the charger's polarity protection circuitry.
   - If the EYE indicates the battery is charged within 3 hours, the battery is OK. ■
   - If the EYE indicates the battery is not charged within 3 hours, replace the battery. ■

Power Relay Test

Use this chart to identify the type of relay, then do the test listed for it.

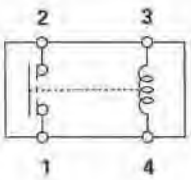
NOTE: The turn signal/hazard relay input test (see page 22-90).

Relay	Test
A/C compressor clutch relay	Normally-open type A
Air fuel ratio (A/F) sensor relay	
A/C condenser fan relay	
Headlight relay	
Horn relay	
Power window relay	
Radiator fan relay	
Reverse relay (A/T)	
Rear accessory power socket relay	
Starter cut relay	
Taillight relay	
Daytime running lights relay (Canada)	
PGM-FI main relay 1	
Blower motor relay	Normally-open type B
Rear window defogger relay	
PGM-FI main relay 2	Five terminal type
Low beam cut relay (Canada)	

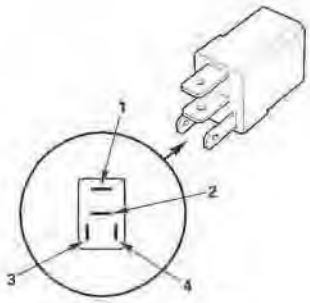
Normally-open type A

Check for continuity between the terminals.

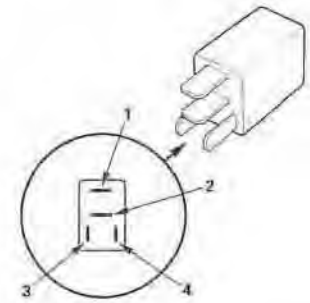
- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 2 terminals when power is disconnected.



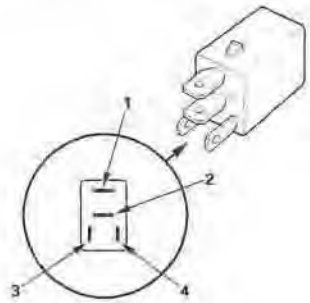
type 1:



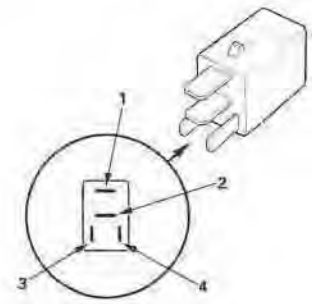
type 2:



PGM-FI main relay 1
type 1:



type 2:



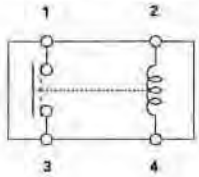
(cont'd)

Power Relay Test (cont'd)

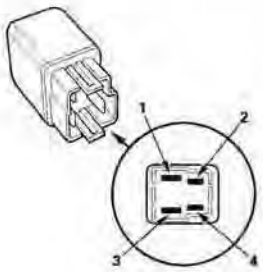
Normally-open type B

Check for continuity between the terminals.

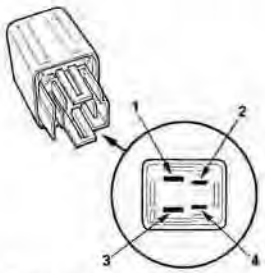
- There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 3 terminals when power is disconnected.



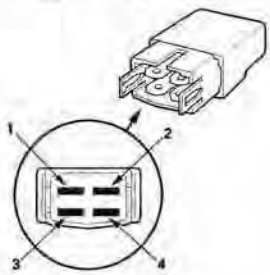
Blower motor relay
type 1:



type 2:



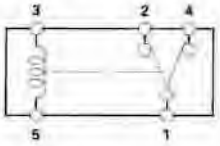
Rear window defogger relay



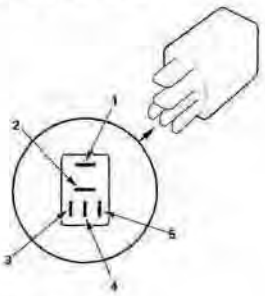
Five-terminal type

Check for continuity between the terminals.

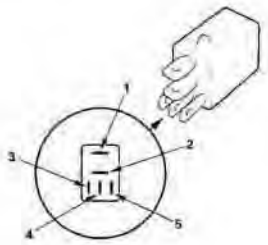
- There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
- There should be no continuity between the No. 1 and No. 4 terminals when power is disconnected.



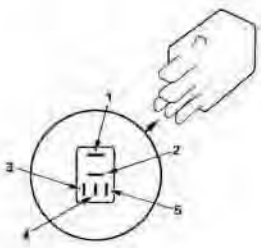
Low beam cut relay (Canada)



PGM-FI main relay 2
type 1:



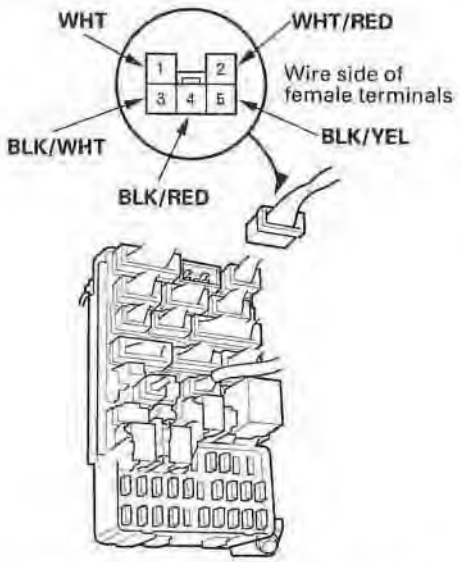
type 2:



Test

SRS components are located in this area. Review the SRS component locations (see page 23-10) and precautions and procedures (see page 23-11) in the SRS before performing repairs or servicing.

1. Remove the dashboard lower cover (see page 20-73).
2. Disconnect connector A (5P) from the under-dash fuse/relay box.

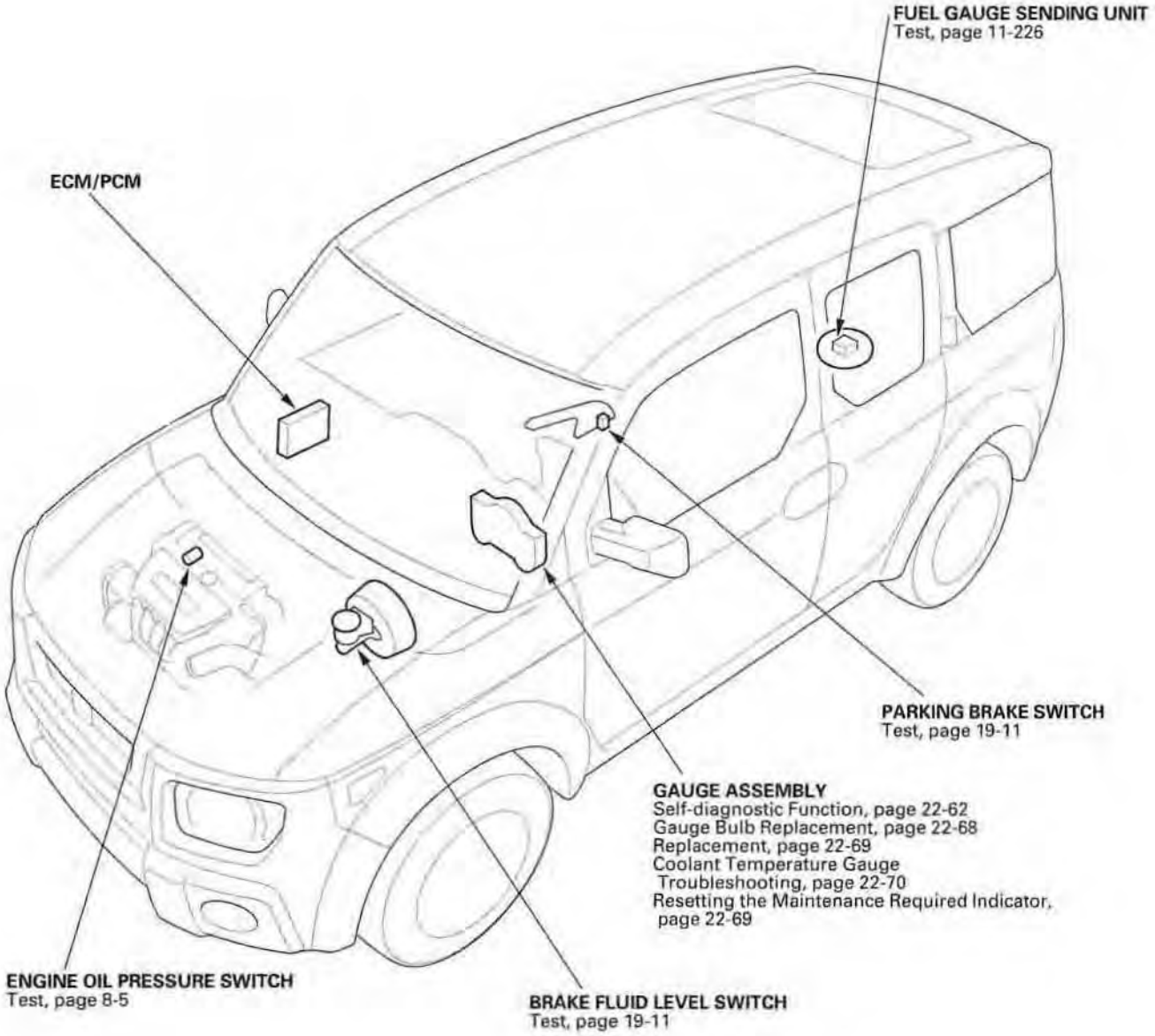


3. Check for continuity between the terminals in each switch position according to the table.

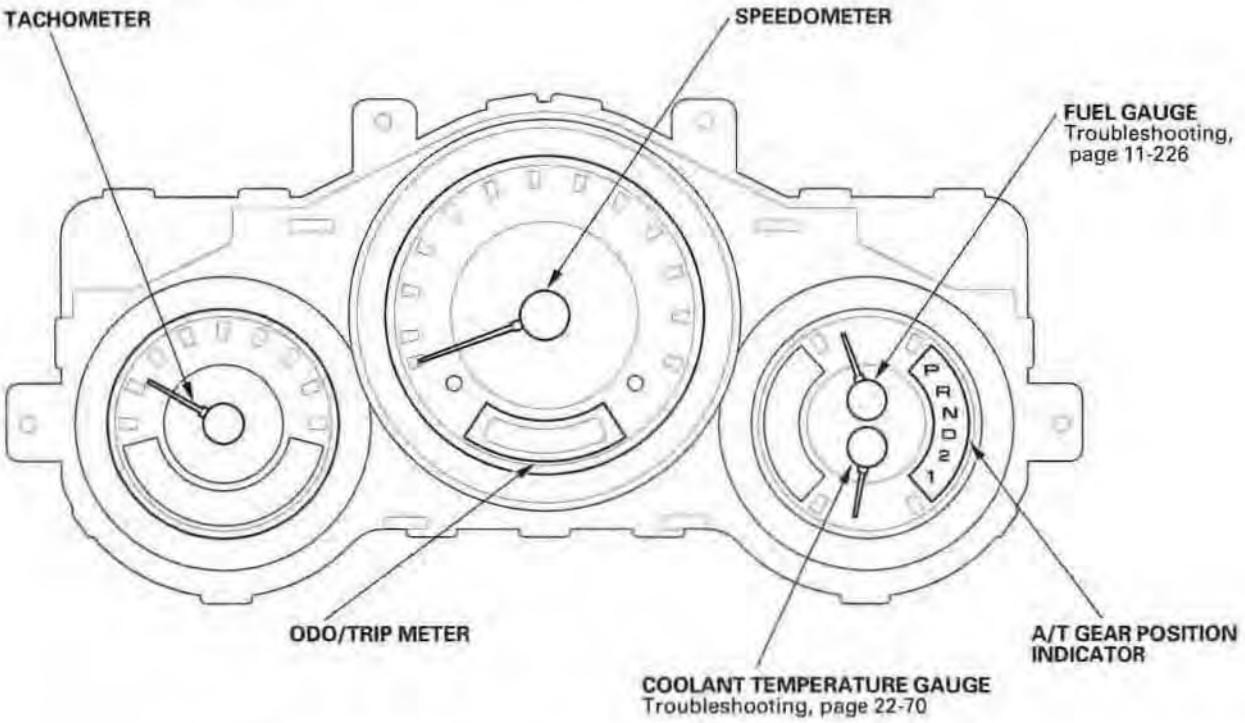
Terminal / Position	WHT/ RED (ACC)	WHT (BAT)	BLK/ YEL (IG1)	BLK/ RED (IG2)	BLK/ WHT (ST)
0 (LOCK)					
I (ACC)	○	○			
II (ON)	○	○			
		○	○		
		○		○	
III (START)		○	○		
		○			○

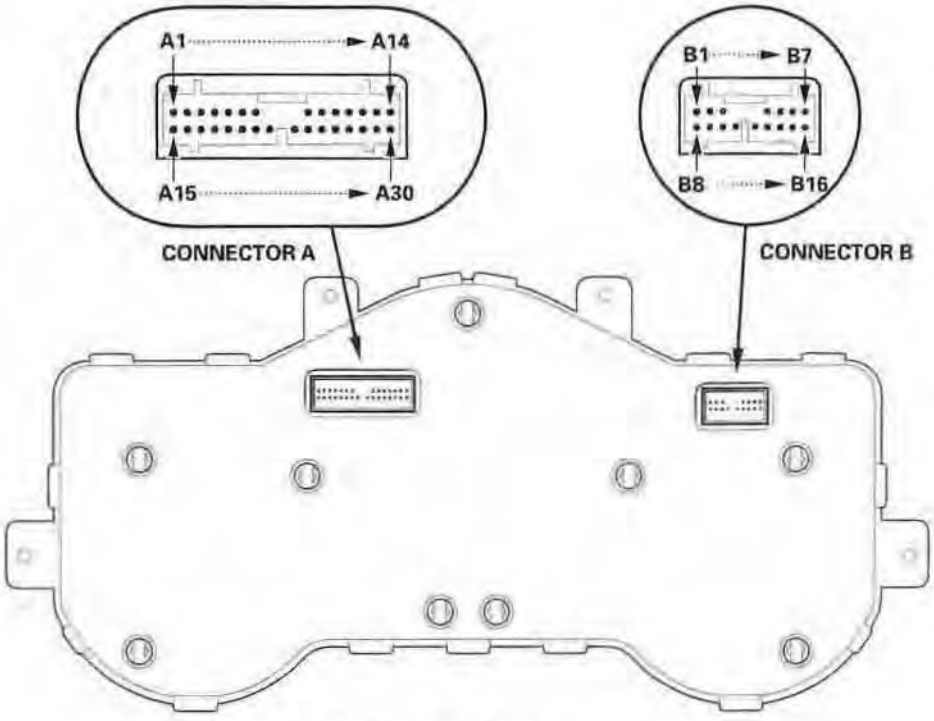
4. If the continuity checks do not agree with the table, replace the steering lock (ignition) switch (see page 17-29).

Component Location Index



Gauge/Terminal Location Index:





(Viewed from back)

Self-diagnostic Function

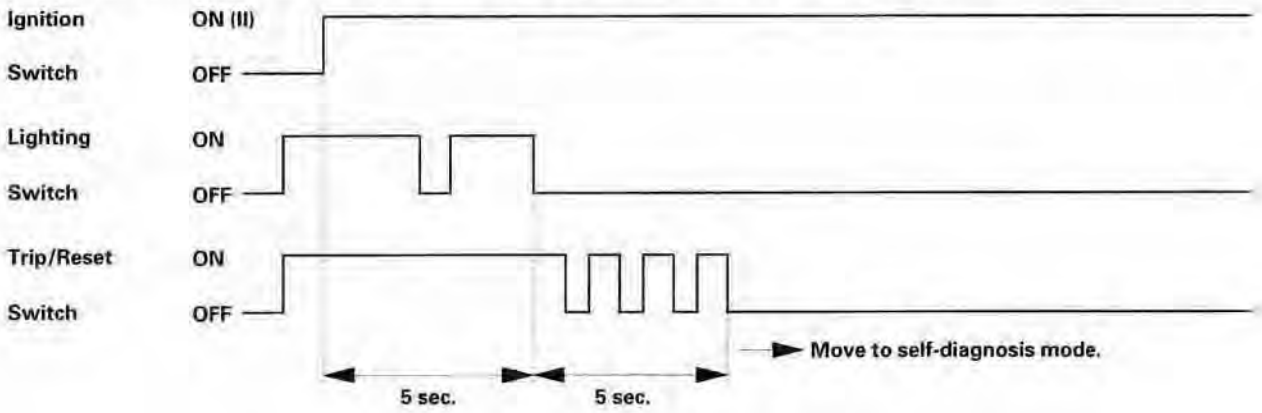
The gauge assembly has a self-diagnostic function that checks these circuits:
- The beeper drive circuit.
- The indicator drive circuit.
- The LCD segments.
- The gauges drive circuit (Speedometer, Tachometer, Fuel gauge, Coolant temperature gauge).
- The communication line (the coolant temperature signal and vehicle speed signal line between the gauge and the ECM/PCM).

Entering the self-diagnostic function

Before entering the self-diagnostic function, check the No. 9 (10 A) fuse in the under-hood fuse/relay box and the No. 10 (7.5 A) fuse in the under-dash fuse/relay box.

1. Press and hold the TRIP/RESET button.
2. Turn the headlights ON.
3. Turn the ignition switch ON (II).
4. Within 5 sec., turn the headlights OFF, then ON and OFF again.
5. Within the next 5 sec., release the TRIP/RESET button, then press and release the button three times.

NOTE:
- While in the self-diagnostic function, the dash lights brightness controller does not operate.
- While in the self-diagnostic function, the TRIP/RESET button is used to start the Beeper Drive Circuit Test and the Gauge Drive Cicuit Check.
- If the vehicle speed exceeds 1.2 mph (2 km/h) or the ignition switch is turned OFF, the self-diagnostic function ends.



The Beeper Drive Circuit Check

When entering the self-diagnostic function, the beeper sounds five times.

The Indicator Drive Circuit Check

When entering the self-diagnostic function, these indicator lights blink:
Seat belt indicator, Door indicator, Brake system light, Charging system light, Cruise indicator, Low engine oil pressure indicator, Low fuel indicator, Maintenance required indicator, Washer fluid level indicator (Canada), A/T gear position indicator (1, 2, D), Over drive indicator (A/T).

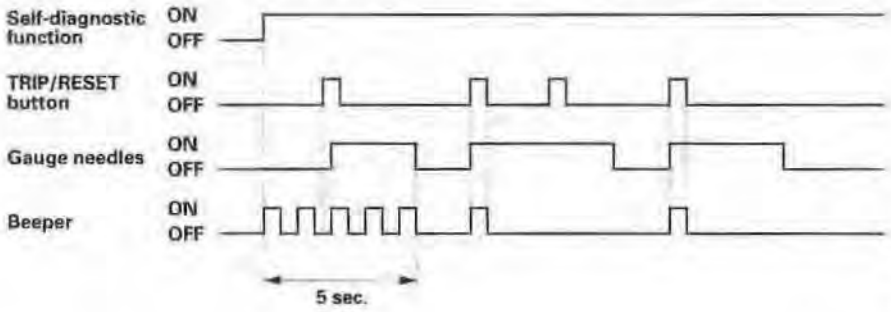
The LCD Segments Check

When entering the self-diagnostic function, the odo/trip meter segments blink five times.

The Gauge Drive Circuit Check

When entering the self-diagnostic function, the speedometer, the tachometer, the fuel gauge, and the coolant temperature gauge needles move from the minimum position to the maximum position, then return to the minimum position.

NOTE:
After the beeper stops sounding and the gauge needles return to the minimum position, pressing the TRIP/RESET button starts the Beeper Drive Circuit Check (one beep), and the Gauge Drive Circuit Check again.
The check cannot be started until the gauge needles return the minimum position.



The needles sweep from the minimum position to the maximum position, then return to the minimum position.

The Communication Line Check

In the self-diagnostic function, and after the odo/trip meter LCD Segments Check, the self-diagnostic function starts the Communication Line Check.
If all segments come on, the communication line is OK.
If the word "Error" is indicated, there is a malfunction in the communication line between the gauge assembly, the multiplex control unit, the keyless receiver unit ('04-05 EX model), and the ECM/PCM. Go to Multiplex System Troubleshooting (see page 22-149).

Normal:

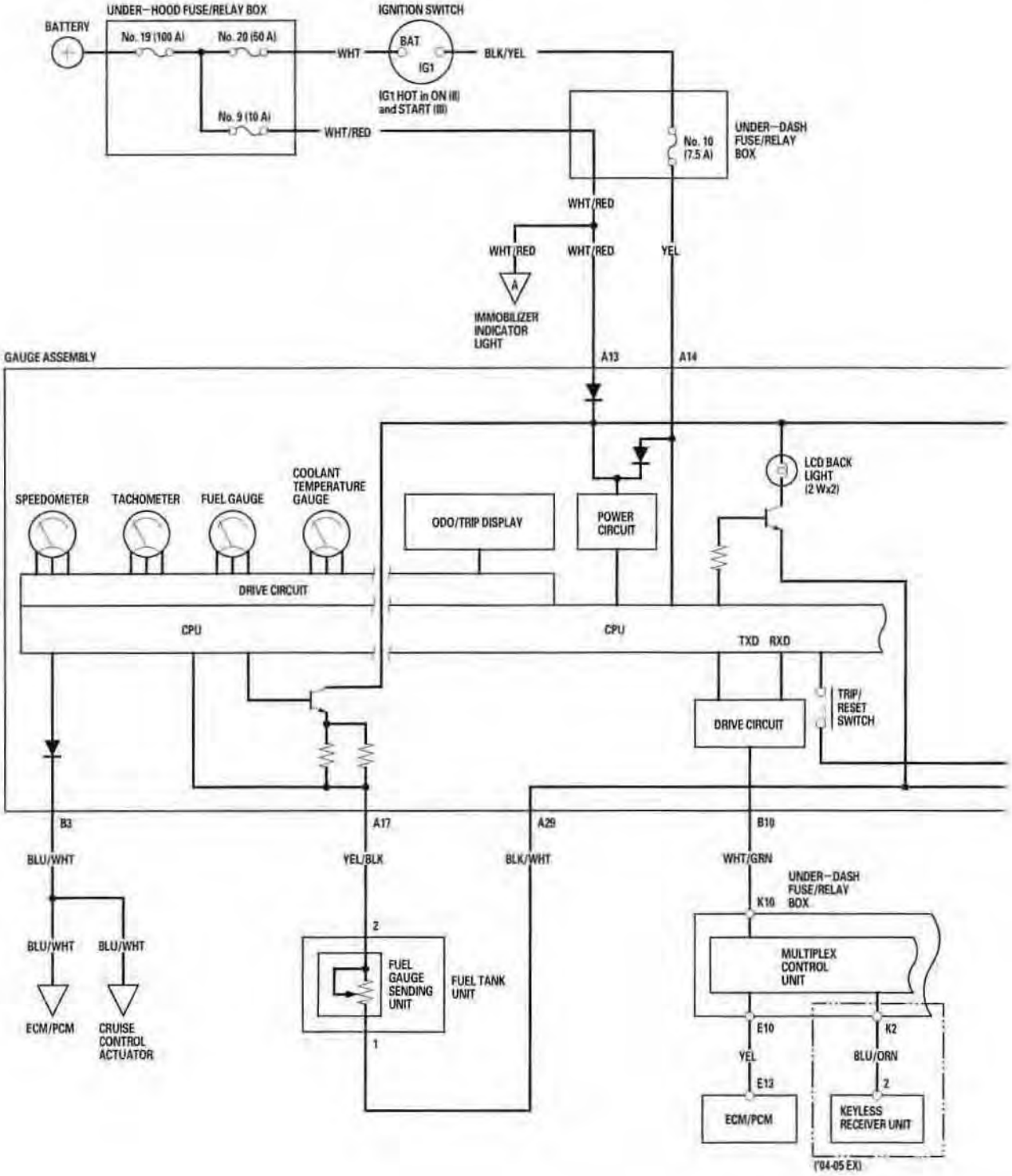
Faulty:

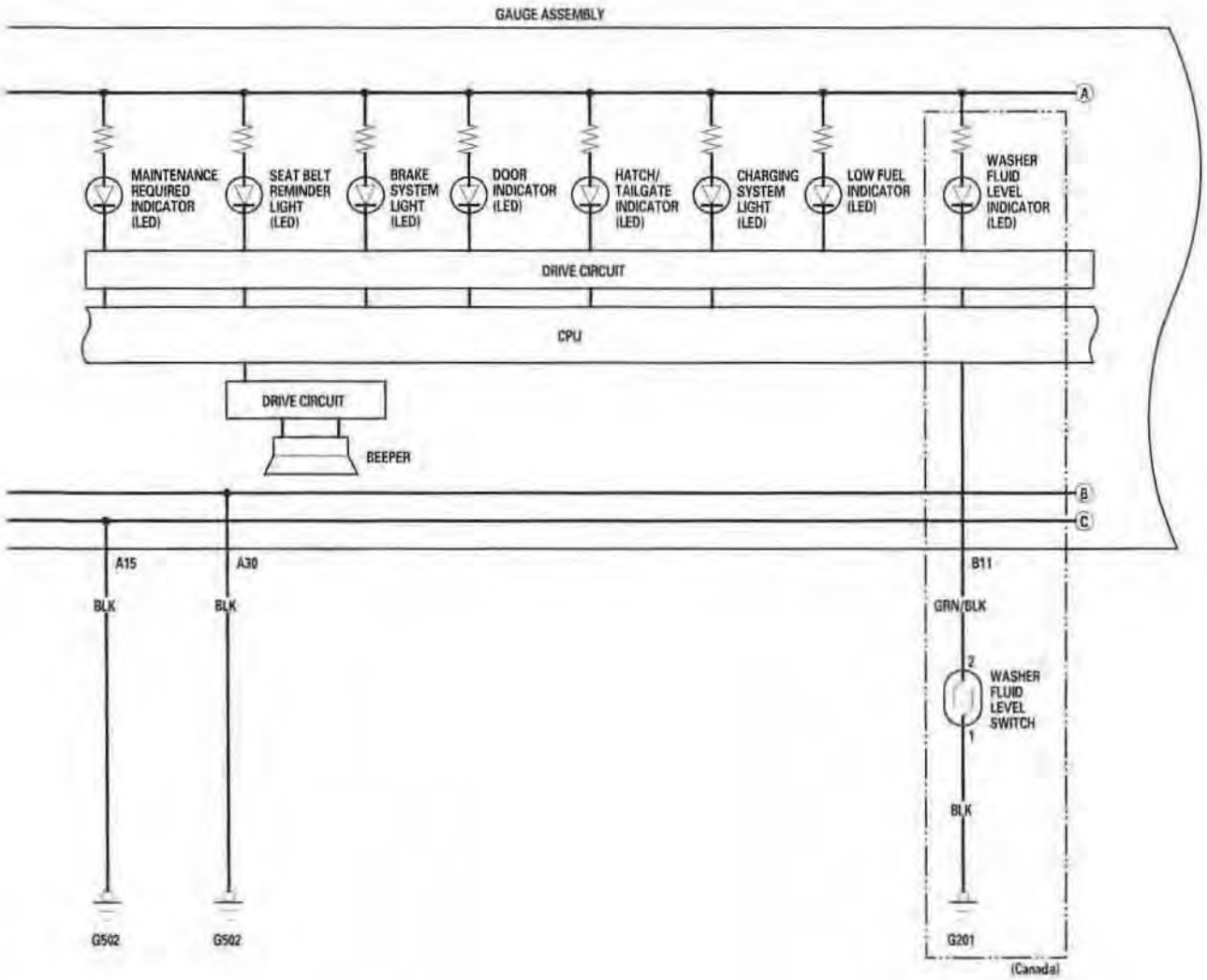
Ending the Self-diagnostic Function

Turn the ignition switch OFF.

NOTE: If the vehicle speed exceeds 1.2 mph (2 km/h), the self-diagnostic function ends.

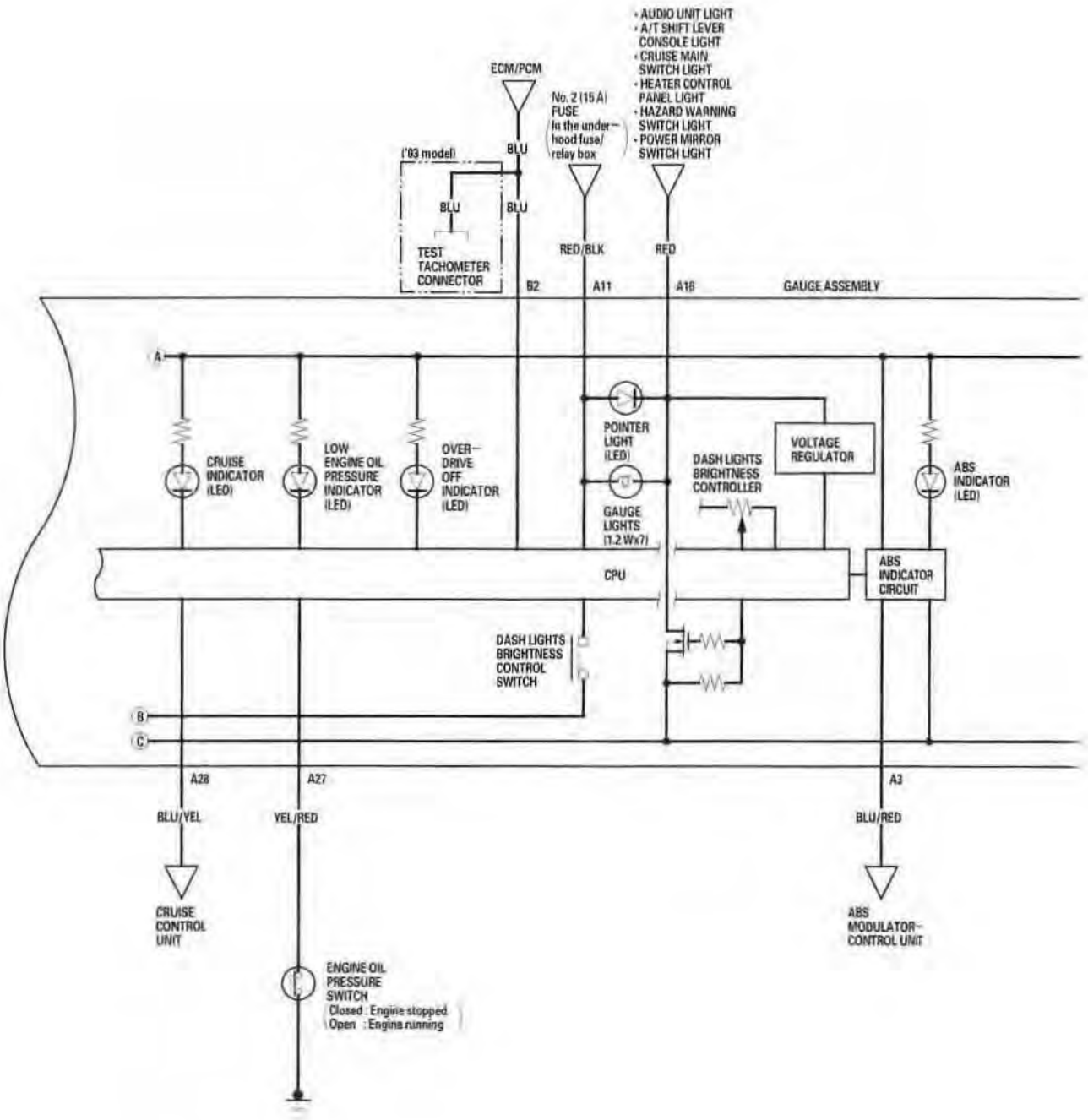
Circuit Diagram

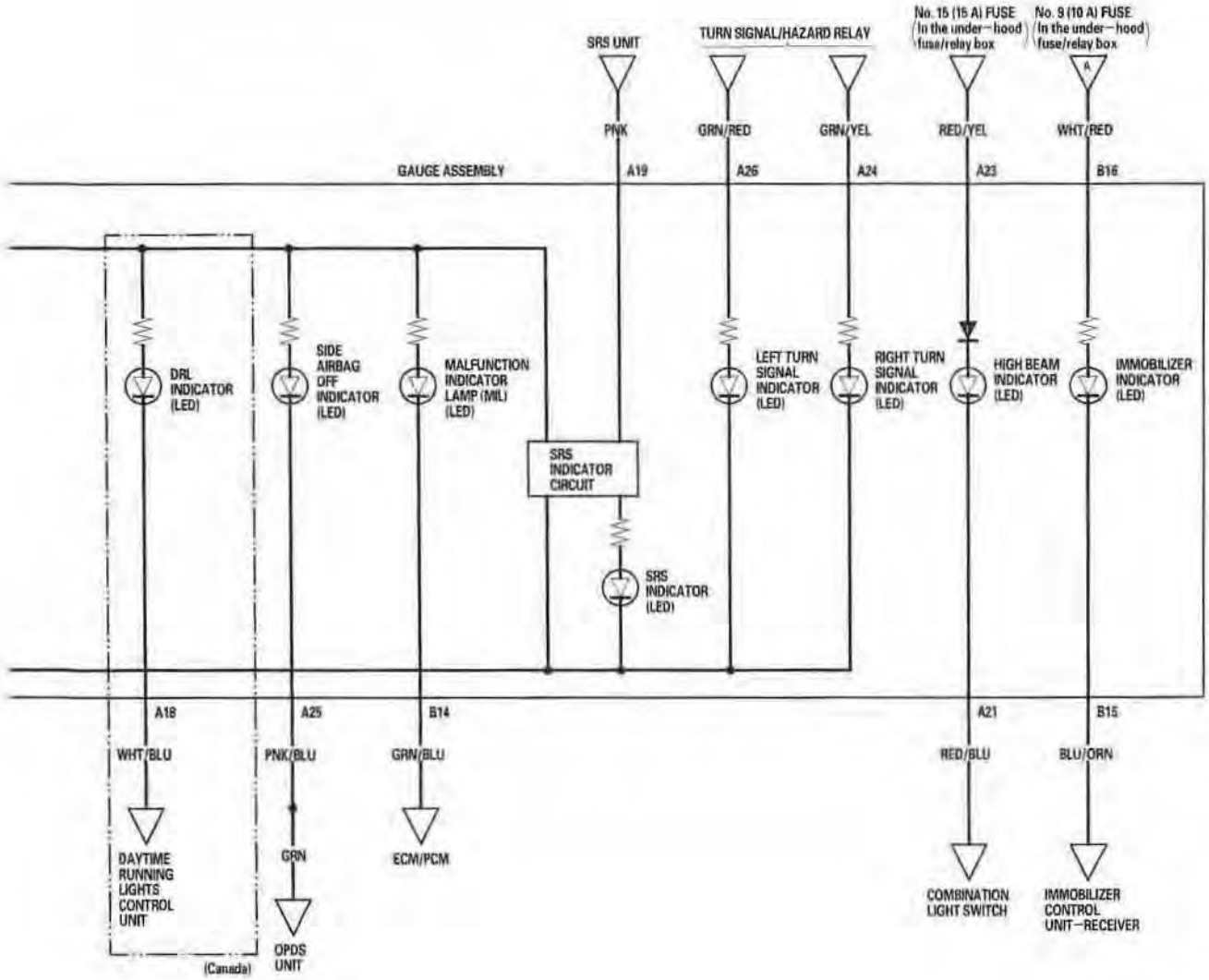



GAUGE ASSEMBLY
A
MAINTENANCE REQUIRED INDICATOR (LED)
SEAT BELT REMINDER LIGHT (LED)
BRAKE SYSTEM LIGHT (LED)
DOOR INDICATOR (LED)
HATCH/ TAILGATE INDICATOR (LED)
CHARGING SYSTEM LIGHT (LED)
LOW FUEL INDICATOR (LED)
WASHER FLUID LEVEL INDICATOR (LED)
DRIVE CIRCUIT
CPU
DRIVE CIRCUIT
BEEPER
B
C
A15
A30
B11
BLK
BLK
GRN/BLK
2
WASHER FLUID LEVEL SWITCH
1
BLK
G502
G502
G201
(Canada)

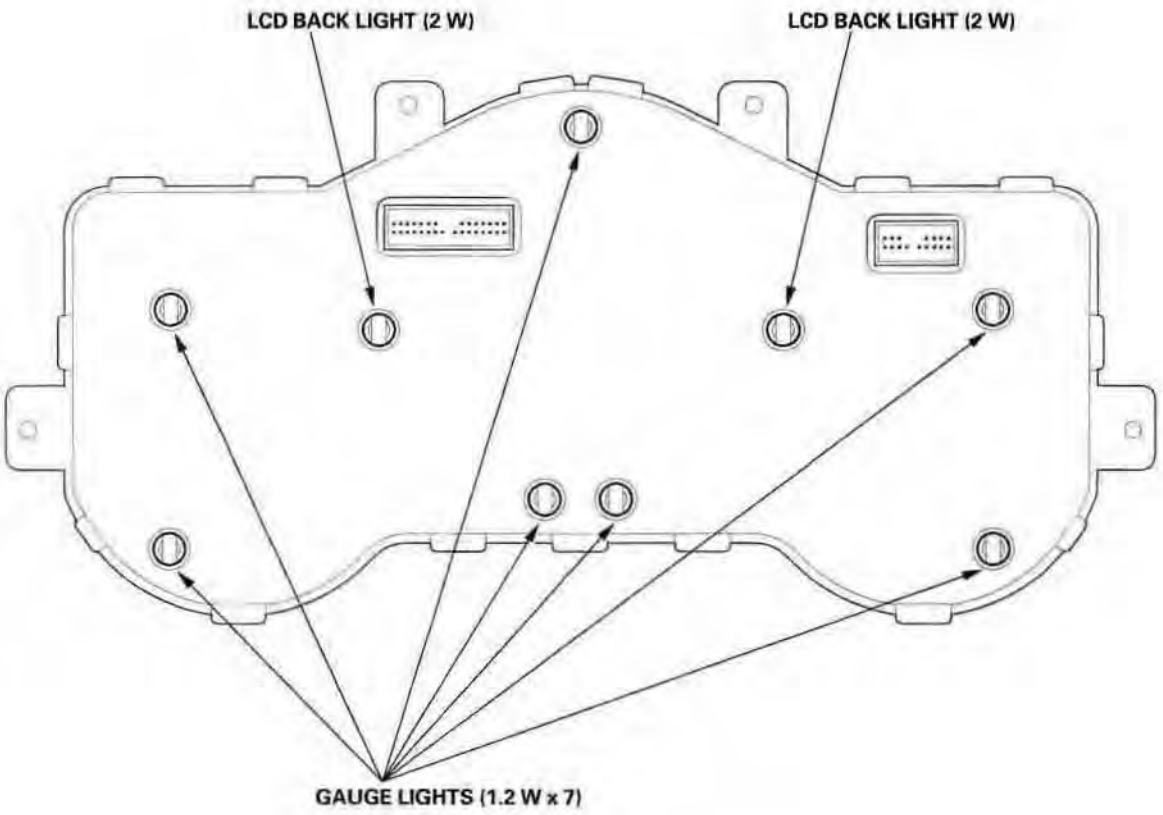
(cont'd)

Circuit Diagram (cont'd)



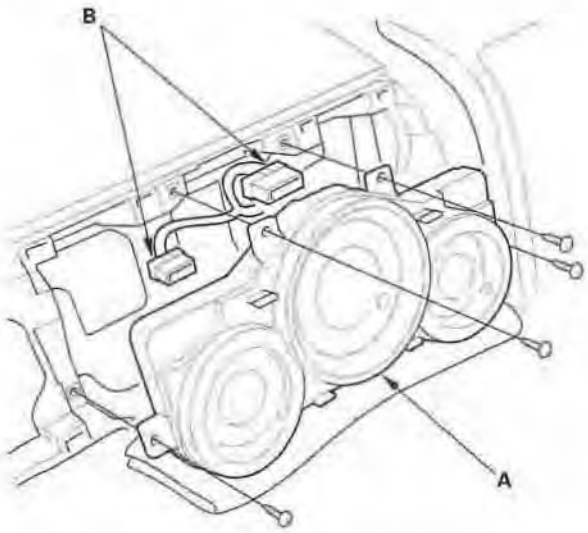

SRS UNIT
TURN SIGNAL/HAZARD RELAY
No. 15 (15 A) FUSE (In the under-hood fuse/relay box)
No. 9 (10 A) FUSE (In the under-hood fuse/relay box)
PNK
GRN/RED
GRN/YEL
RED/YEL
WHT/RED
GAUGE ASSEMBLY
A19
A26
A24
A23
B16
DRL INDICATOR (LED)
SIDE AIRBAG OFF INDICATOR (LED)
MALFUNCTION INDICATOR LAMP (MIL) (LED)
SRS INDICATOR CIRCUIT
SRS INDICATOR (LED)
LEFT TURN SIGNAL INDICATOR (LED)
RIGHT TURN SIGNAL INDICATOR (LED)
HIGH BEAM INDICATOR (LED)
IMMOBILIZER INDICATOR (LED)
A18
A25
B14
A21
B15
WHT/BLU
PNK/BLU
GRN/BLU
RED/BLU
BLU/ORN
DAYTIME RUNNING LIGHTS CONTROL UNIT
(Canada)
GRN
OPDS UNIT
ECM/PCM
COMBINATION LIGHT SWITCH
IMMOBILIZER CONTROL UNIT—RECEIVER

Gauge Bulb Replacement



Gauge Assembly Replacement

1. Remove the driver's dashboard panel (see page 20-72).
2. Place a clean shop towel under the gauge assembly to prevent scratching the steering column or dashboard.
3. Remove the four mounting screws from the gauge assembly (A).



4. Disconnect the connectors (B), and remove the gauge assembly.
5. Install the gauge assembly in the reverse order of removal.

Resetting the Maintenance Required Indicator

Blinking Pattern:

Miles (km)	Maintenance Reminder Light
At 7,900 (12,640) to 8,100 (12,960)	Blinks for 10 seconds when the ignition switch is turned ON (II).
At 9,900 (15,840) to 10,000 (16,160)	Comes on and stays on while the ignition switch is ON (II).

How to Reset

Press and hold the trip/reset button, turn the ignition switch ON (II), and continue to hold the button for more than 10 seconds.

Coolant Temperature Gauge Troubleshooting

Before testing, check the No. 9 (10 A) fuse in the under-hood fuse/relay box and the No. 10 (7.5 A) fuse in the under-dash fuse/relay box.

1. Start the engine, and check the malfunction indicator lamp (MIL).

   Does the MIL come on and stay on?

   YES—Troubleshoot the cause of the ECM/PCM DTC (see page 11-6), and recheck.

   NO—Go to step 2.

2. Check for a multiplex control unit DTC (see page 22-149).

   Is a DTC indicated?

   YES—Troubleshoot the cause of the multiplex control unit DTC (see page 22-149), and recheck.

   NO—Go to step 3.

3. Do the communication line check with the self-diagnosis procedure (see page 22-62).

   Is the word "Error" indicated on the odo/trip meter display?

   YES—The gauge cannot receive the signal from the multiplex control unit and the ECM/PCM. Check for an open in the WHT/GRN wire (gauge connector terminal B10).

   NO—Go to step 4.

4. Do the gauge drive circuit check with the self-diagnosis procedure (see page 22-62).

   Does the temperature gauge needle sweep from the minimum position to the maximum, then return to the minimum position?

   YES—Go to step 5.

   NO—Replace the gauge assembly.■

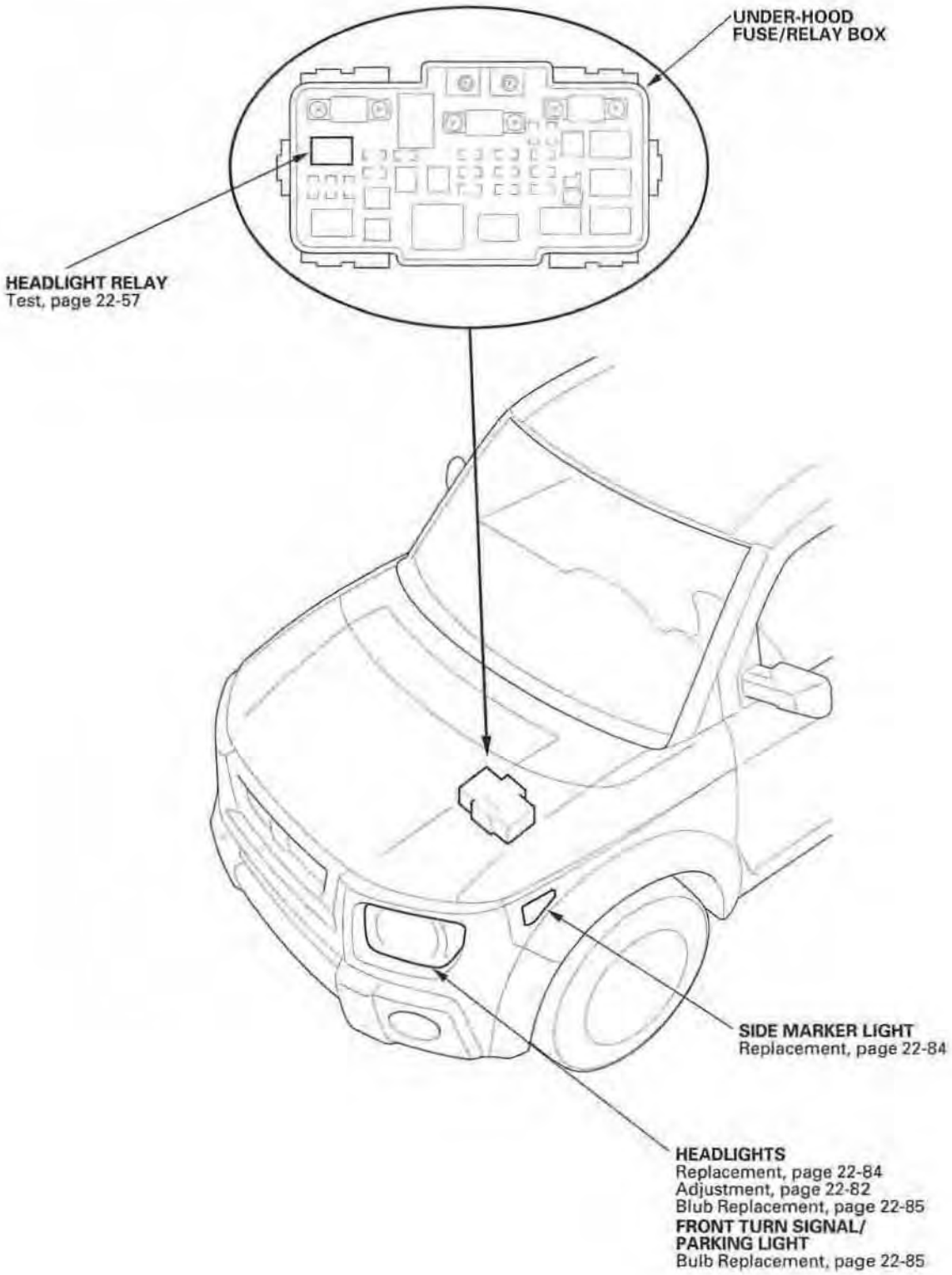
5. Substitute a known-good ECM/PCM (see page 11-6), and recheck.

   Does the symptom/indication go away?

   YES—Replace the ECM/PCM.■

   NO—Substitute a known-good gauge assembly. If the symptom/indication goes away, replace the gauge assembly.■

Component Location Index



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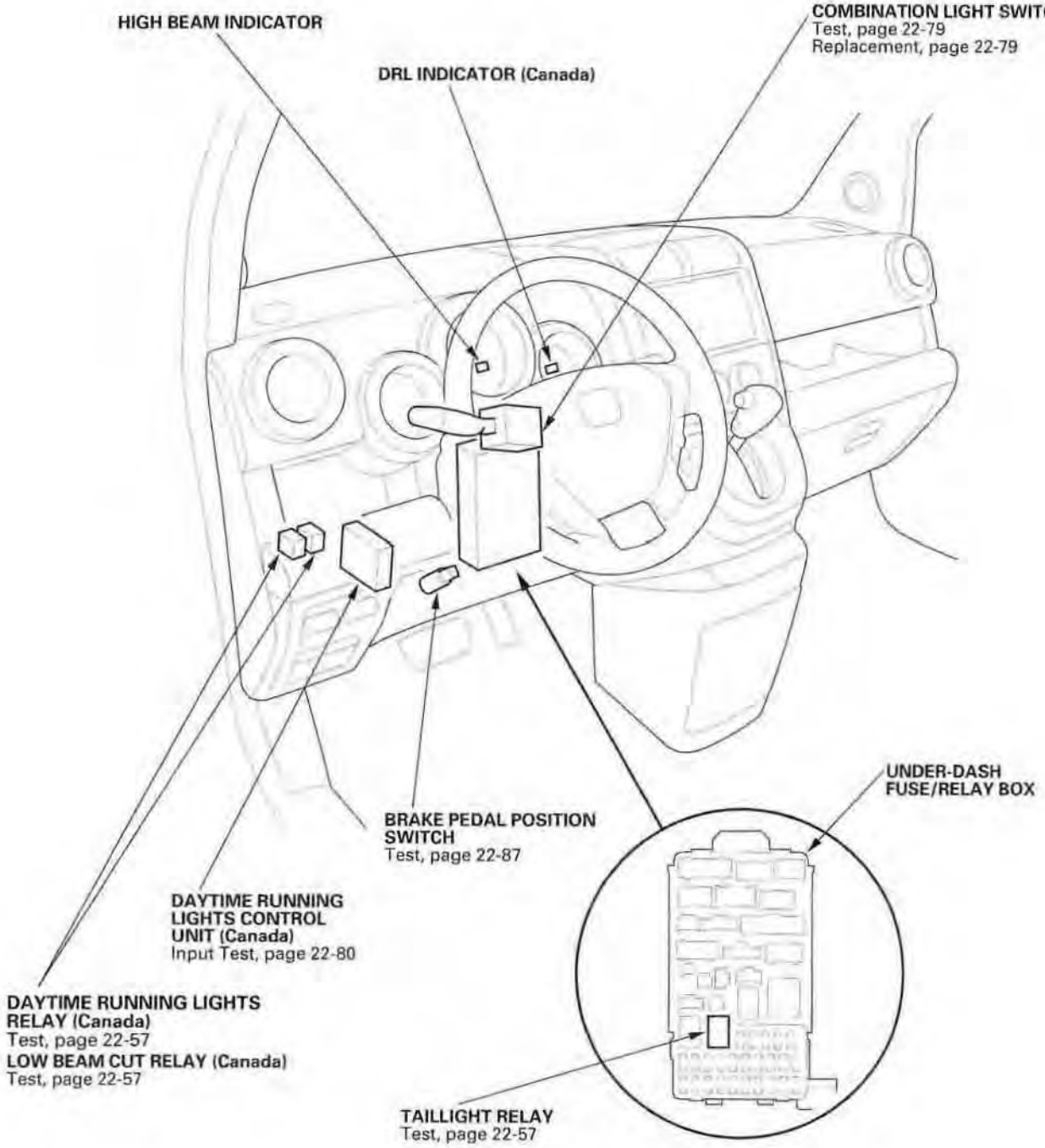
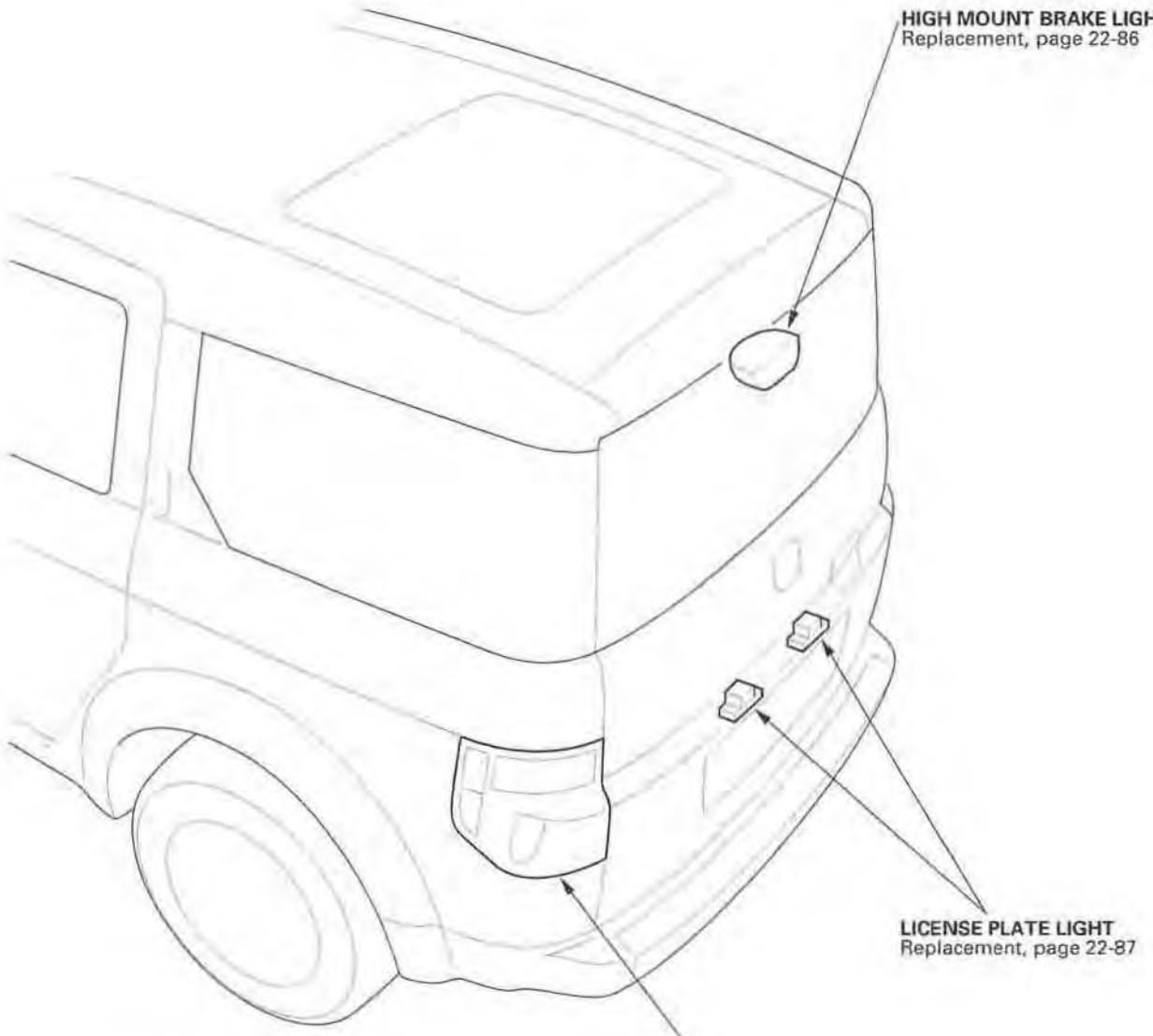
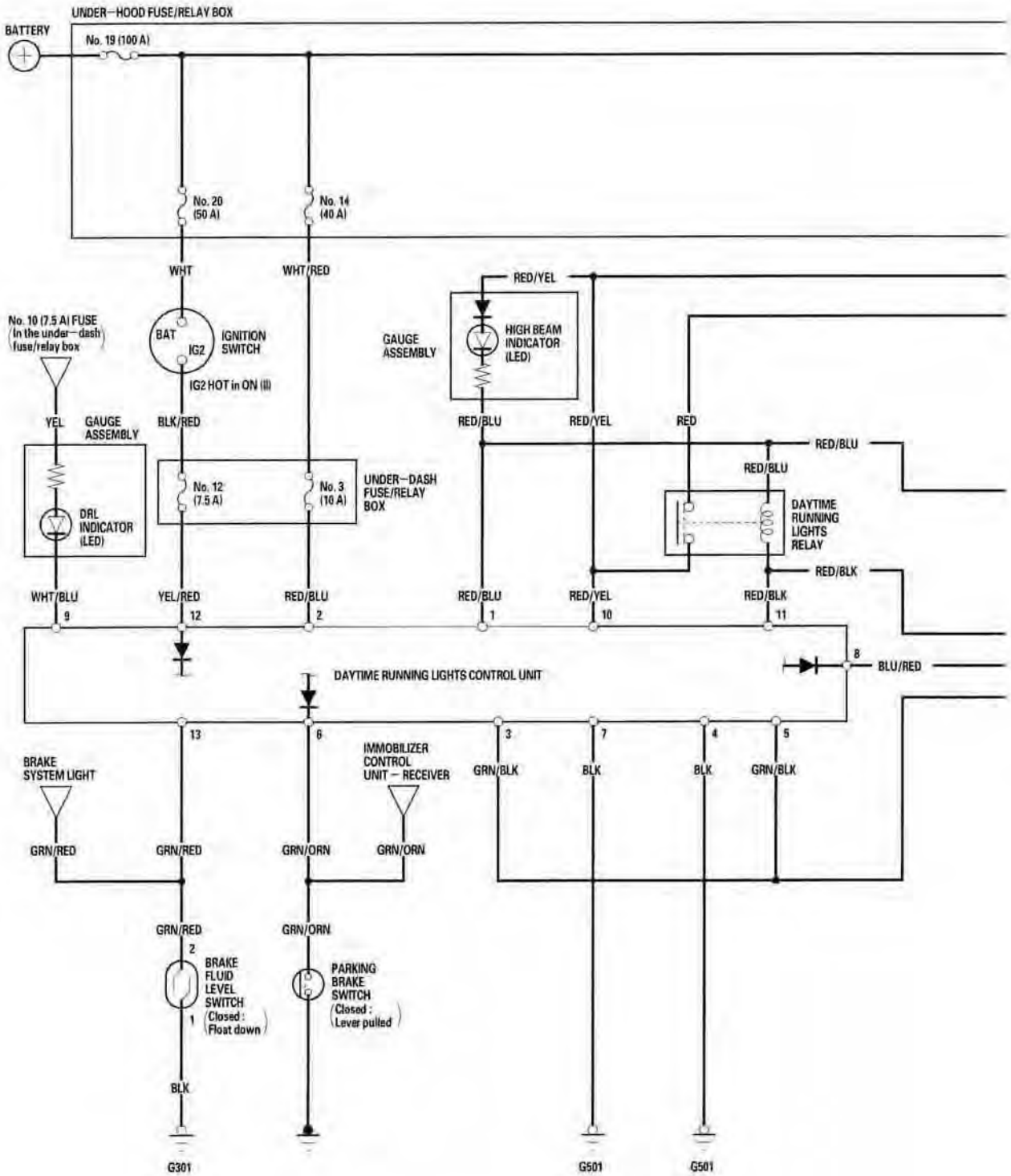
Component Location Index (cont'd)

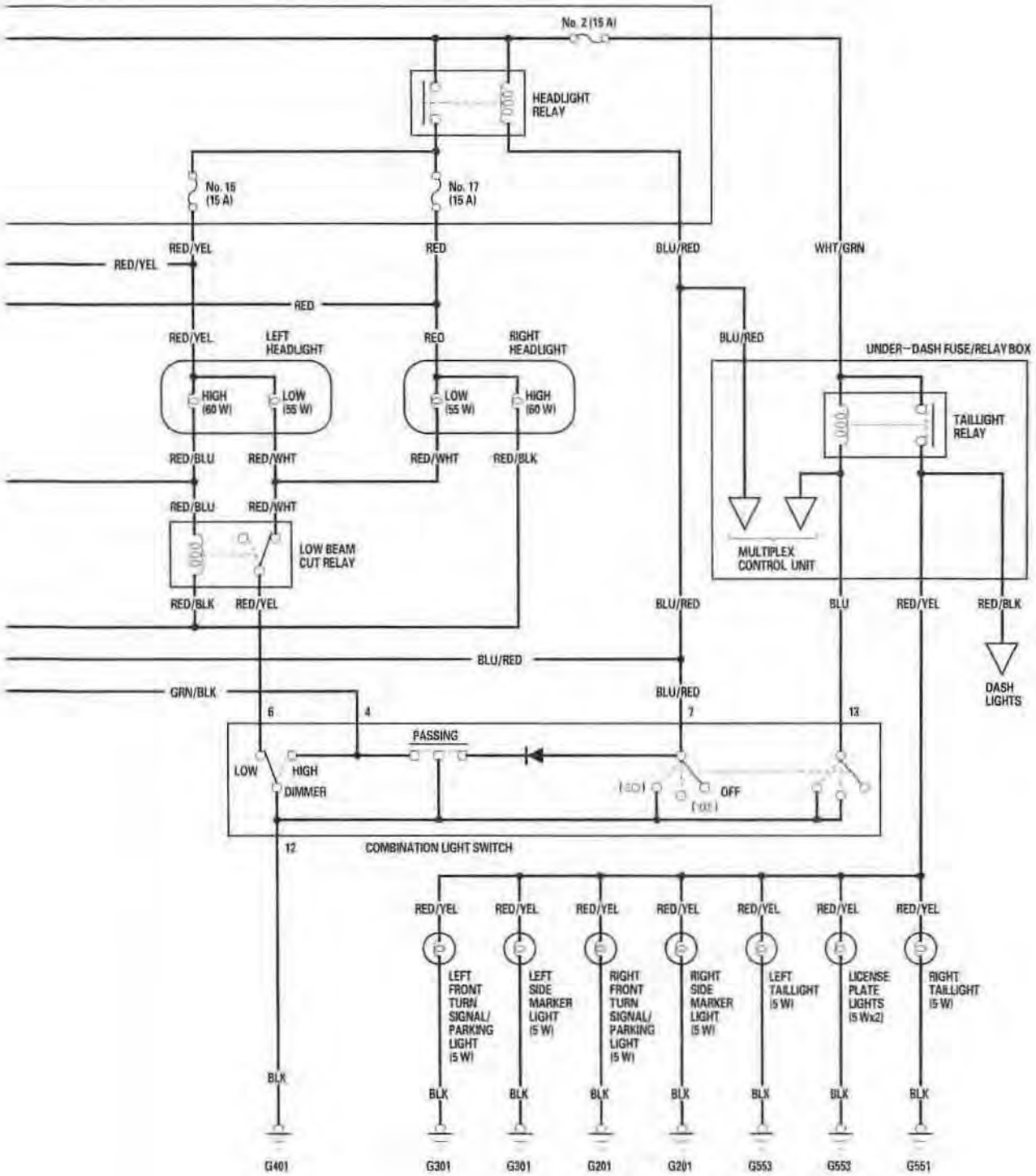



HIGH MOUNT BRAKE LIGHT
Replacement, page 22-86
LICENSE PLATE LIGHT
Replacement, page 22-87
TAILLIGHT/BRAKE LIGHT
Replacement, page 22-86
REAR TURN SIGNAL LIGHT
Replacement, page 22-86
BACK-UP LIGHT
Replacement, page 22-86

Circuit Diagram

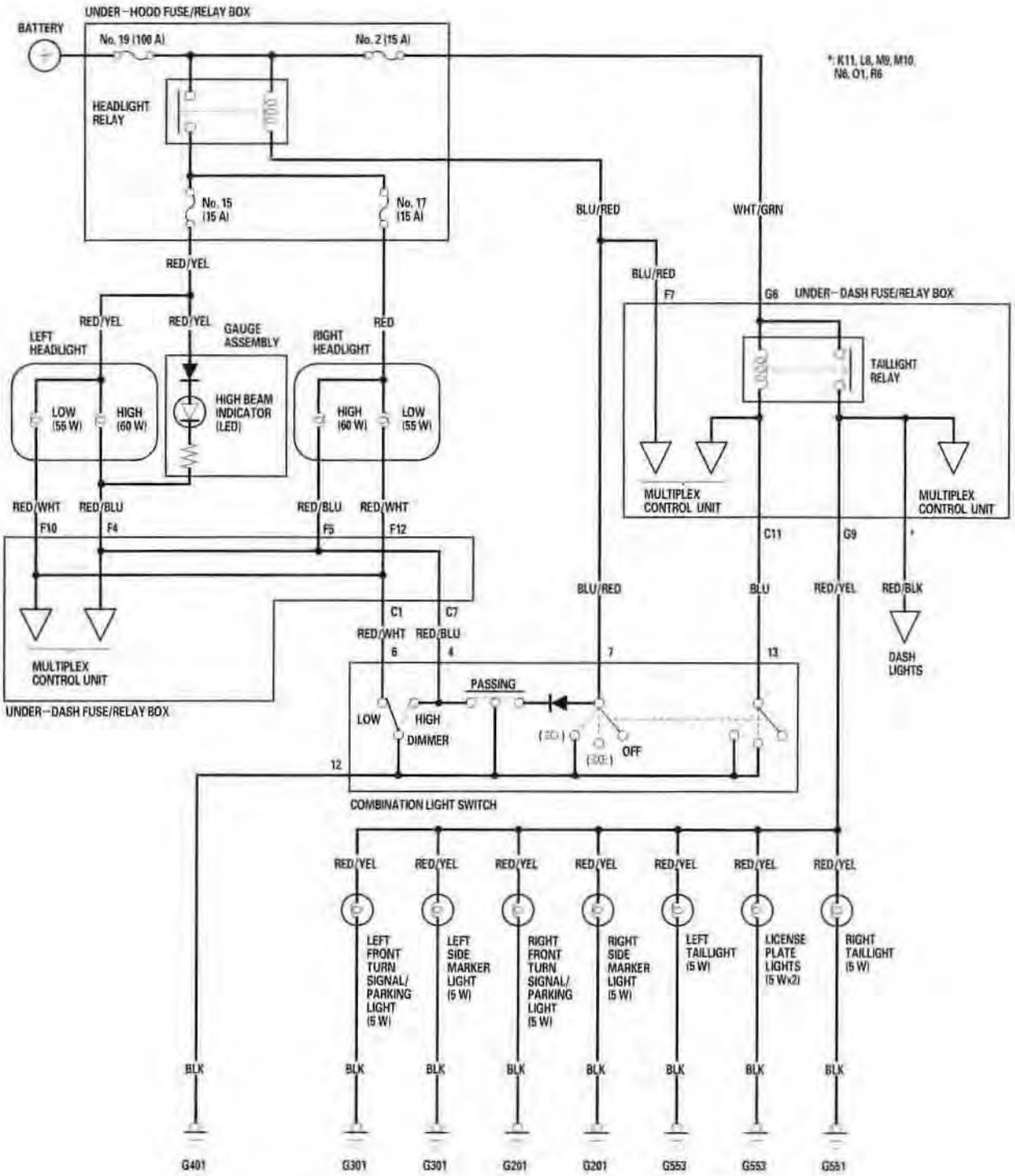
Canada



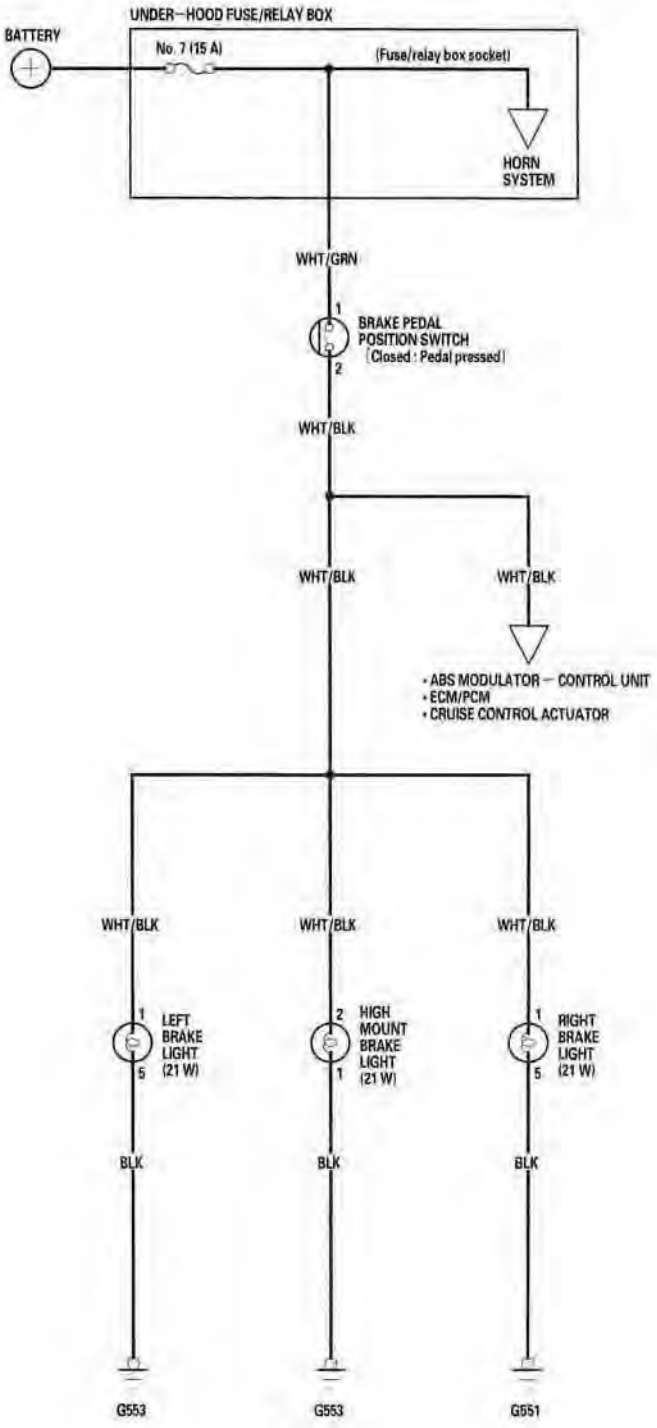

No. 2 (15 A)
HEADLIGHT RELAY
No. 16 (15 A)
No. 17 (15 A)
RED/YEL
RED
BLU/RED
WHT/GRN
LEFT HEADLIGHT
RIGHT HEADLIGHT
HIGH (60 W)
LOW (55 W)
LOW (55 W)
HIGH (60 W)
UNDER-DASH FUSE/RELAY BOX
TAILLIGHT RELAY
MULTIPLEX CONTROL UNIT
RED/BLU
RED/WHT
RED/BLK
LOW BEAM CUT RELAY
BLU
DASH LIGHTS
GRN/BLK
PASSING
LOW
HIGH
DIMMER
OFF
COMBINATION LIGHT SWITCH
LEFT FRONT TURN SIGNAL/ PARKING LIGHT (5 W)
LEFT SIDE MARKER LIGHT (5 W)
RIGHT FRONT TURN SIGNAL/ PARKING LIGHT (5 W)
RIGHT SIDE MARKER LIGHT (5 W)
LEFT TAILLIGHT (5 W)
LICENSE PLATE LIGHTS (5 Wx2)
RIGHT TAILLIGHT (5 W)
BLK
G401
G301
G301
G201
G201
G553
G553
G551

Circuit Diagram (cont'd)

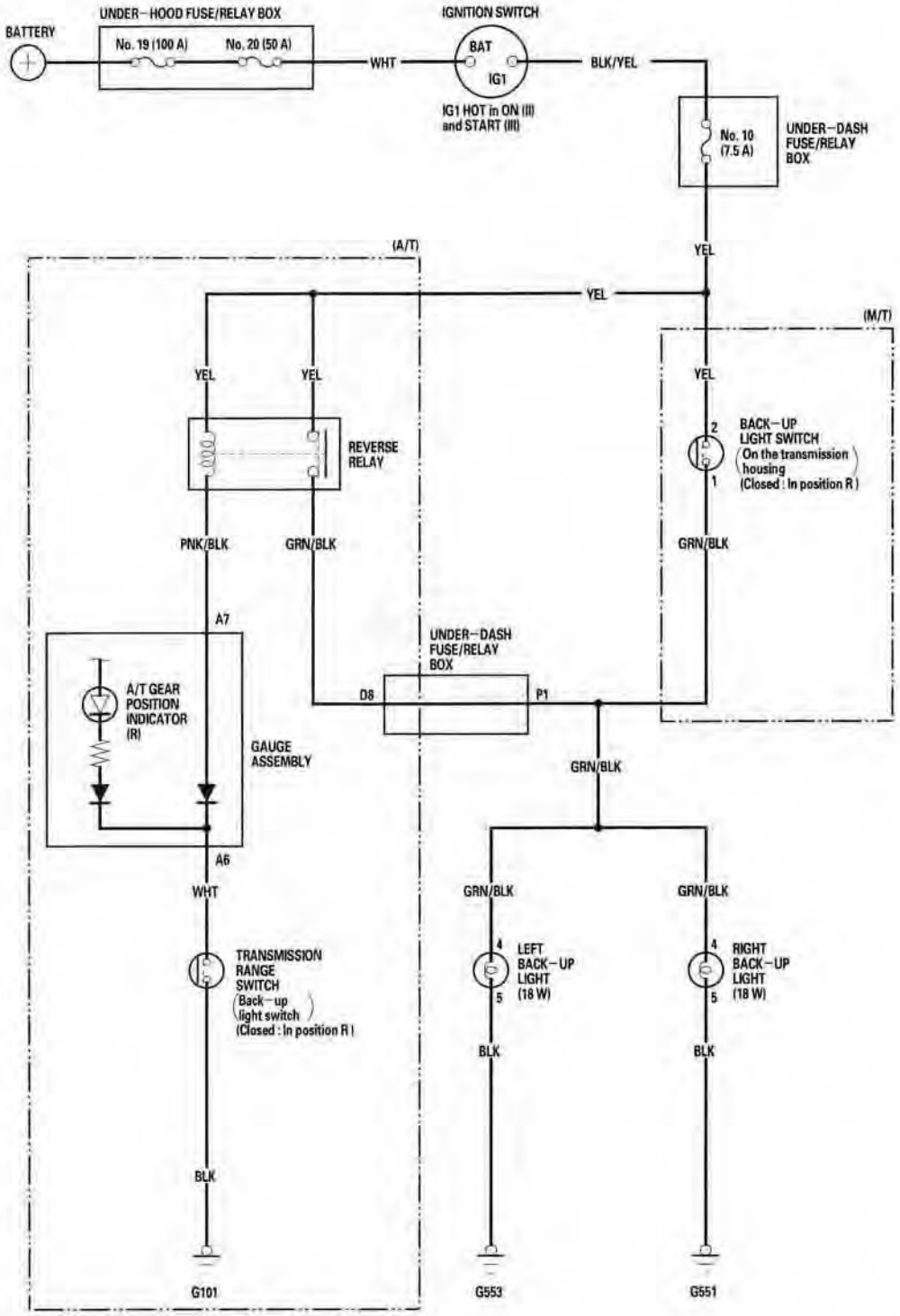
USA



Circuit Diagram - Brake Lights

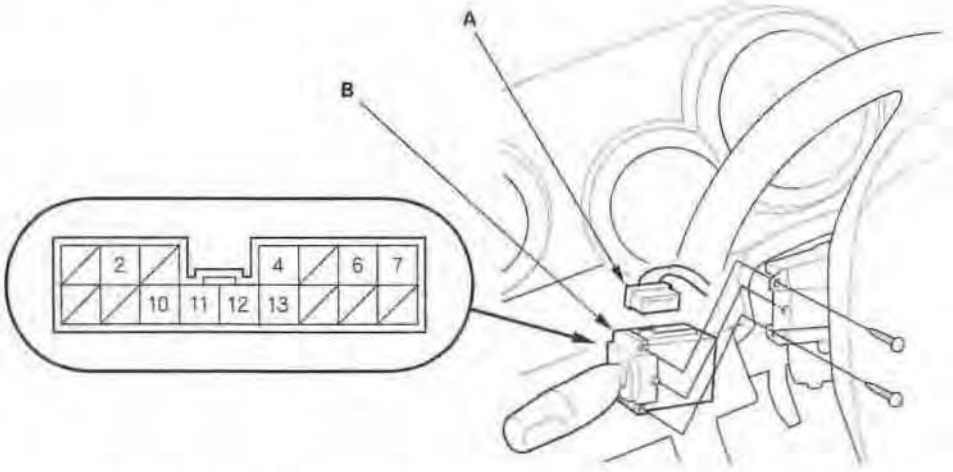


Circuit Diagram - Back-up Lights



Combination Light Switch Test/Replacement

1. Remove the dashboard lower cover (see page 20-73).
2. Remove the steering column covers (see page 17-25).
3. Disconnect the 16P connector (A) from the combination light switch (B).



4. Remove the two screws, then slide out the combination light switch.
5. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, check for continuity between the terminals in each switch position according to the tables.
     – If the continuity is not as specified, replace the switch.

Light switch:

Position \ Terminal			4	6	7		12	13
Headlight switch	OFF			○			○	
	≡D						○	○
	≡D	LOW		○	○		○	○
	≡D	HIGH	○		○		○	○
Passing switch	OFF							
	ON		○		○	▶	○	
			○				○	

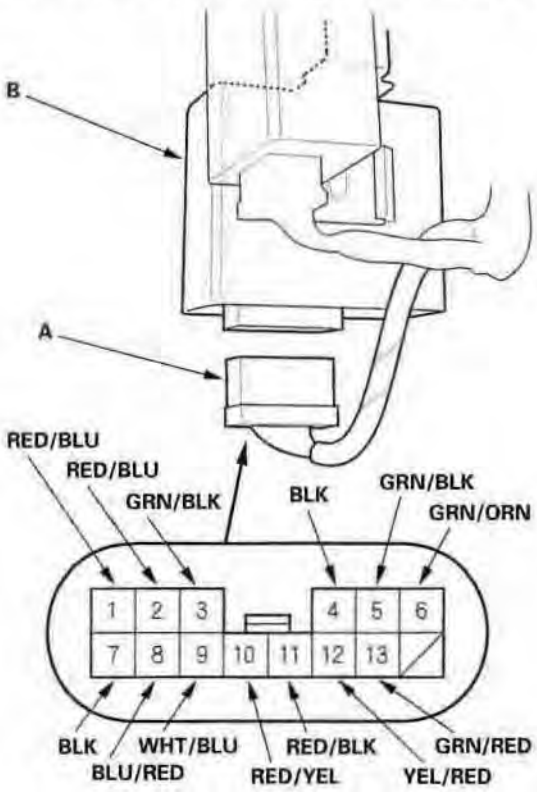
Turn signal switch:

Position \ Terminal	2	10	11
LEFT	○	○	
Neutral			
RIGHT		○	○

Daytime Running Lights Control Unit Input Test

Canada

1. Remove the driver's dashboard lower cover (see page 20-73).
2. Disconnect the 14P connector (A) from the daytime running lights control unit (B).



Wire side of female terminals

3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

4. Make these input tests at the connector.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	RED/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (40 A) fuse in the under-hood fuse/relay box • Blown No. 3 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
12	YEL/RED	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 12 (7.5 A) fuse in the under-dash fuse/relay box • Faulty ignition switch • An open in the wire
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
7	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G501) • An open in the wire
10	RED/YEL	Combination light switch ON (≣D)	Check for voltage to ground: There should be battery voltage.	• Blown No. 15 (15 A) fuse in the under-hood fuse/relay box • Faulty headlight relay • Faulty combination light switch • An open in the wire
1	RED/BLU	Combination light switch ON (≣D), and dimmer switch in HIGH	Connect a jumper wire between No. 3 and No. 1 terminals Left headlight (HIGH) and high beam indicator light should come on.	• Blown bulb • Faulty headlight relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
11	RED/BLK	Combination light switch ON (≣D), and dimmer switch in HIGH	Connect a jumper wire between No. 5 and No. 11 terminals: Right headlight (HIGH) should come on.	• Blown bulb • Faulty headlight relay • Faulty combination light switch • Poor ground (G401) • An open in the wire
3 5	GRN/BLK	Combination light switch ON (≣D), and dimmer switch in HIGH	Check for continuity to ground: There should be continuity.	• Faulty combination light switch • Poor ground (G401) • An open in the wire
6	GRN/ORN	Parking brake lever pulled	Check for continuity to ground: There should be continuity.	• Faulty parking brake switch • An open in the wire
8	BLU/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Faulty headlight relay • Faulty combination light switch • An open in the wire
9	WHT/BLU	Ignition switch ON (II)	Attach to ground: The DRL indicator light should come on.	• Faulty LED • Blown No. 10 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
13	GRN/RED	Ignition switch ON (II)	Attach to ground: The brake system light should come on.	• Faulty LED • An open in the wire

Headlight Adjustment

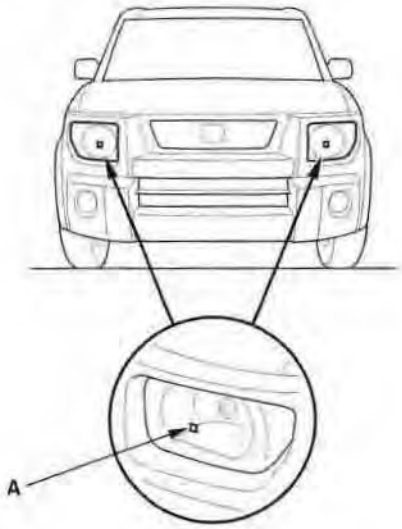
⚠CAUTION

Headlights become very hot during use; do not touch them or any attaching hardware immediately after they have been turned off.

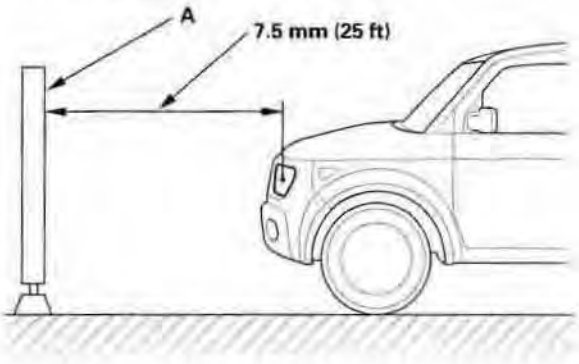
Before adjusting the headlights:

- Park the vehicle on a level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weighs the same should sit in the driver's seat.

1. Clean the outer lens so that you can see the center of the headlights (A).



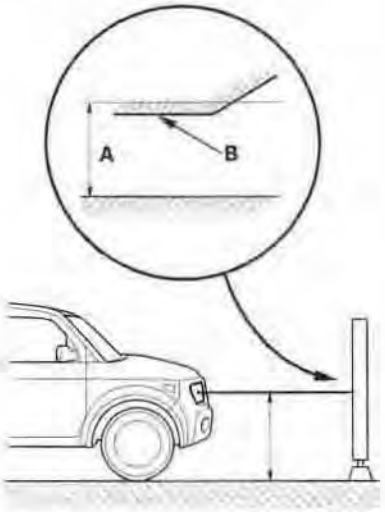
2. Park the vehicle 7.5 m (25 ft) away from a wall or a screen (A).



3. Turn the low beams on.

4. Determine if the headlights are aimed properly.

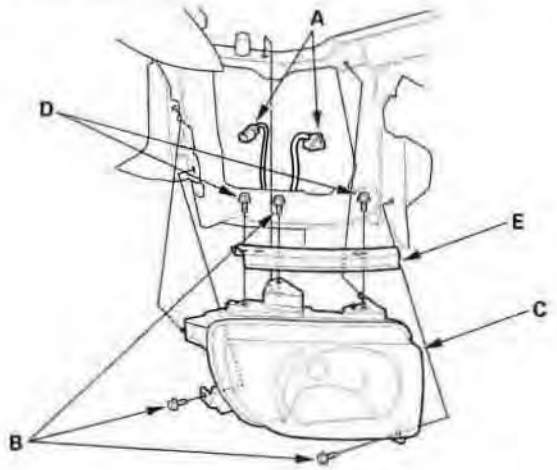
   Vertical adjustment:
   Measure the height of the headlights (A). The lights should reflect 52 mm (2.1 in.) below headlight height (B).



5. If necessary, adjust the headlights to local requirements by turning the vertical adjuster.

Headlight Replacement

1. Remove the front bumper (see page 20-105).
2. Disconnect the connectors (A) from the headlight (C).

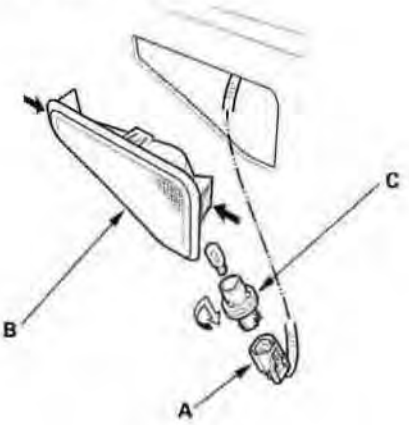


3. Remove the three mounting bolts (B) and headlight assembly (C).
4. Remove the two bolts (D) and corner upper beam (E).
5. Install in the reverse order of removal.
6. After replacement, adjust the headlights (see page 22-82).

Side Marker Light Replacement

1. Remove the inner fender (see page 20-138).
2. Disconnect the 2P connector (A) from the side marker light (B).

Side Marker Light: 5 W



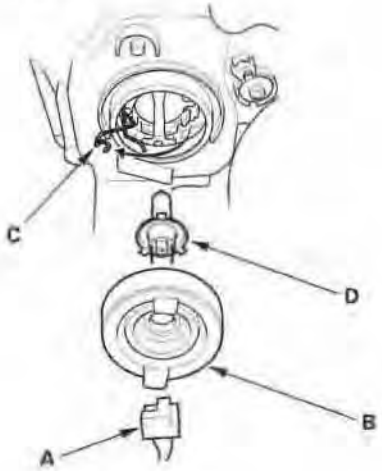
3. Turn the bulb socket (C) 45 ° counterclockwise to remove it from the light.
4. Push the light out from inside of the front fender, and remove the light.
5. Install the light in the reverse order of removal.

Bulb Replacement

Headlight

1. Disconnect the 3P connector (A) from the headlight.

   Headlight (high/low): 60/55 W

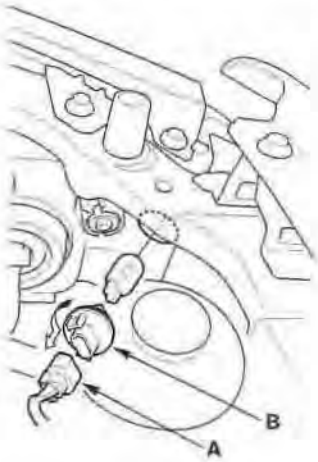


2. Remove the rubber cover (B).
3. Pull the retaining spring (C) away from the bulb (D), then remove the bulb.
4. Install a new bulb in the reverse order of removal. Make sure the tabs on the bulb align with the notches in the headlight.

Front Turn Signal/Parking Light

1. Disconnect the connector (A) from the light.

   Front Turn Signal/Parking Light: 21/5 W

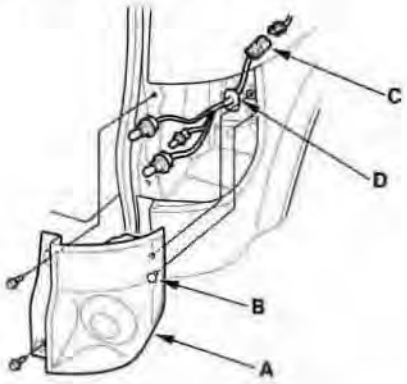


2. Turn the bulb socket (B) 45 ° counterclockwise to remove it from the headlight housing.
3. Install the new bulb in the reverse order of removal.

Taillight Replacement

1. Open the hatch and the tailgate.
2. Remove the two mounting bolts from the taillight (A).

Brake/Taillight: 21/5 W
Back-up Light: 18 W
Rear Turn Signal Light: 21 W

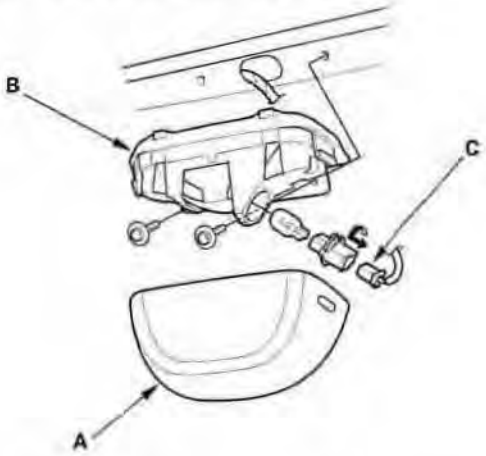


3. Pull the taillight away from the body to disengage the clip (B).
4. Turn the bulb socket 45 ° counterclockwise to remove the bulb socket.
5. If necessary, disconnect the 5P connector (C), and remove the taillight harness grommet (D) from the body.
6. Install the taillight in the reverse order of removal, and run water over it to make sure it does not leak.

High Mount Brake Light Replacement

1. Push in the clips, and remove the cover (A) from the housing (B).

High Mount Brake Light Bulb: 21 W

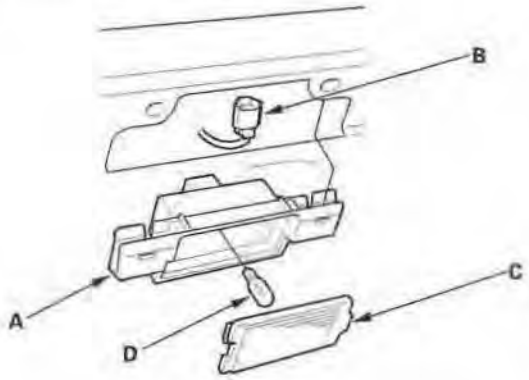


2. Disconnect the 2P connector (C).
3. Remove the mounting nuts and the housing.
4. Install the high mount brake light in the reverse order of removal.

License Plate Light Replacement

1. Remove the license plate light (A) from the tailgate lower cladding.

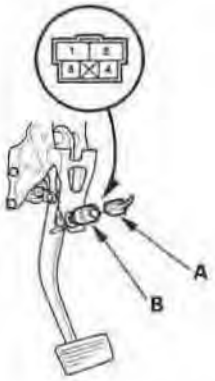
   License Plate Bulb: 5 W



2. Disconnect the 2P connector (B) from the light.
3. Take the lens (C) off, then remove the bulb (D).
4. Install the light in the reverse order of removal.

Brake Pedal Position Switch Test

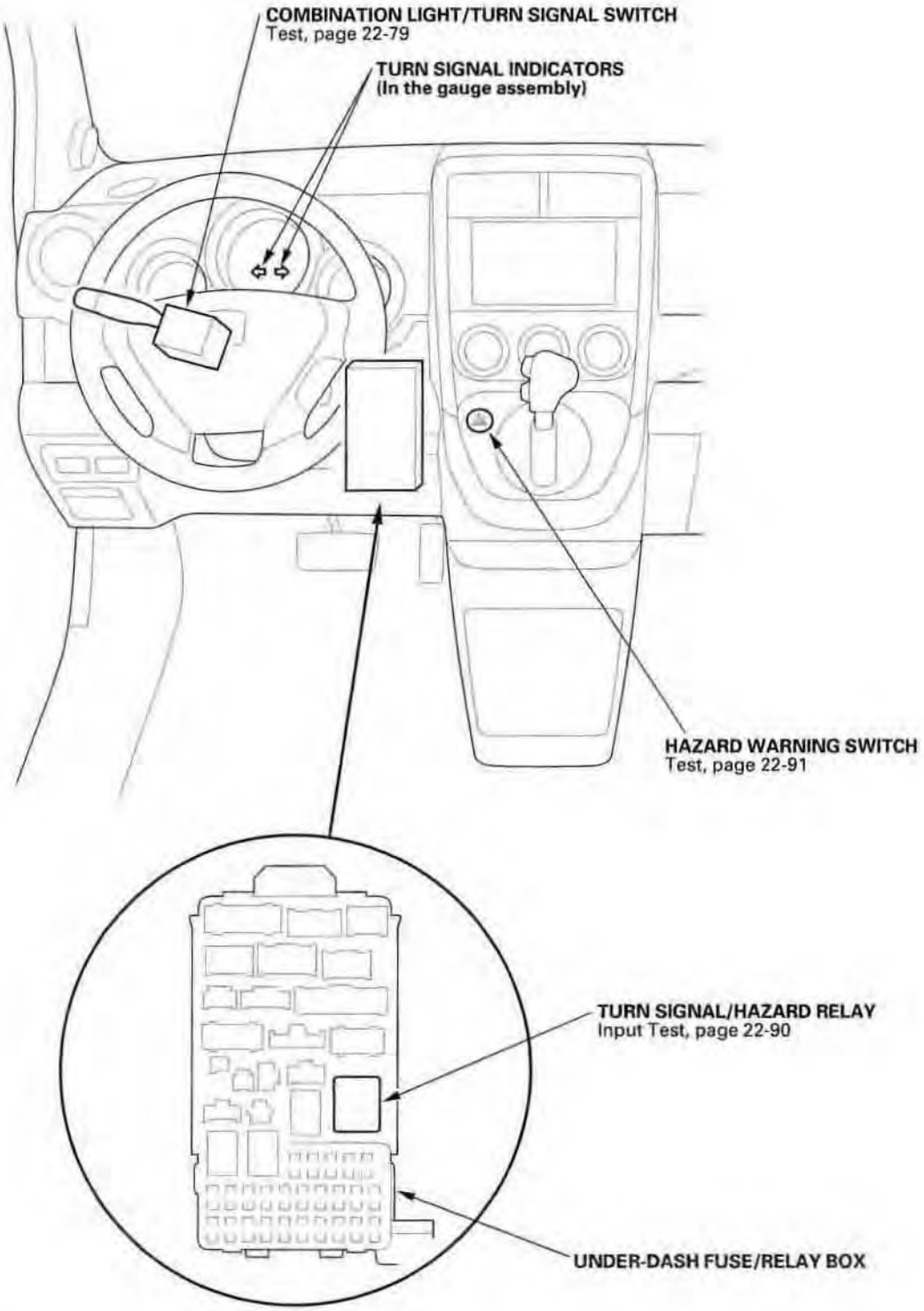
1. Remove the driver's dashboard lower cover (see page 20-73).
2. Disconnect the 4P connector (A) from the brake pedal position switch (B).



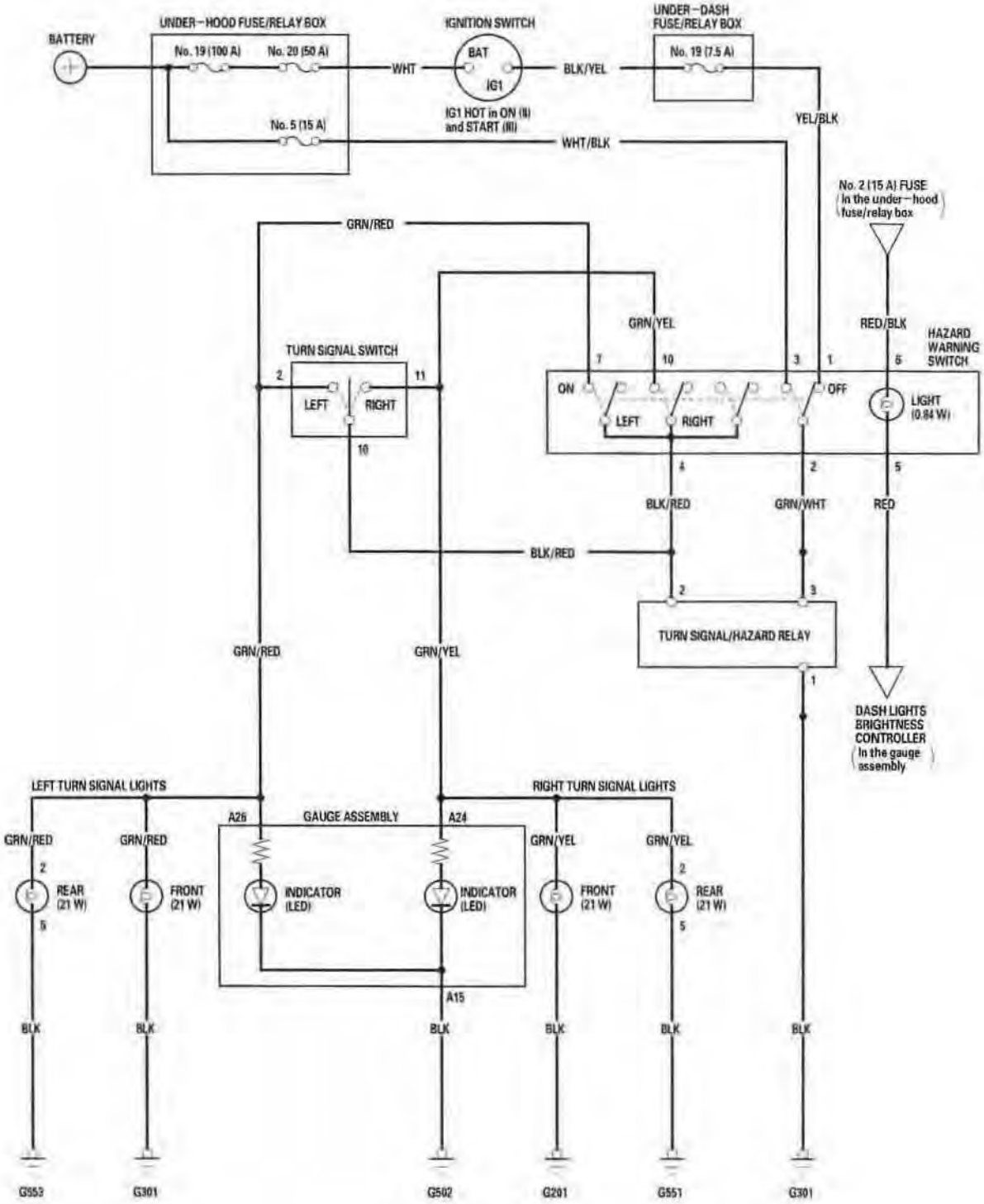
3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity when the brake pedal is pressed.
   - There should be no continuity when the brake pedal is released.
4. Check for continuity between the No. 3 and No. 4 terminals (with cruise control).
   - There should be no continuity when the brake pedal is pressed.
   - There should be continuity when the brake pedal is released.
5. If necessary, adjust the pedal height (see page 19-6), or replace the switch.

Turn Signal/Hazard Flasher

Component Location Index

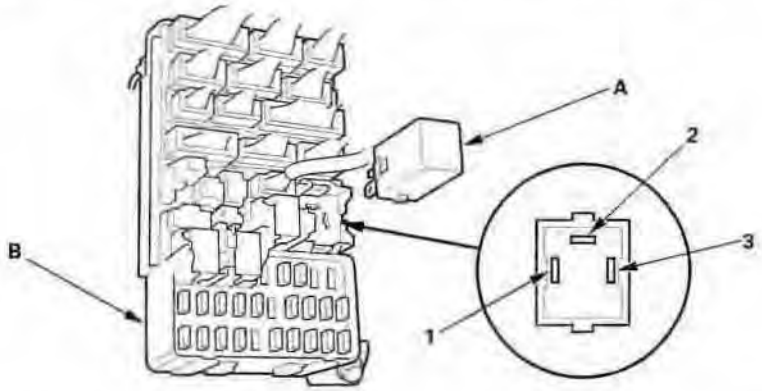


Circuit Diagram



Turn Signal/Hazard Relay Input Test

1. Remove the turn signal/hazard relay (A) from the under-dash fuse/relay box (B).



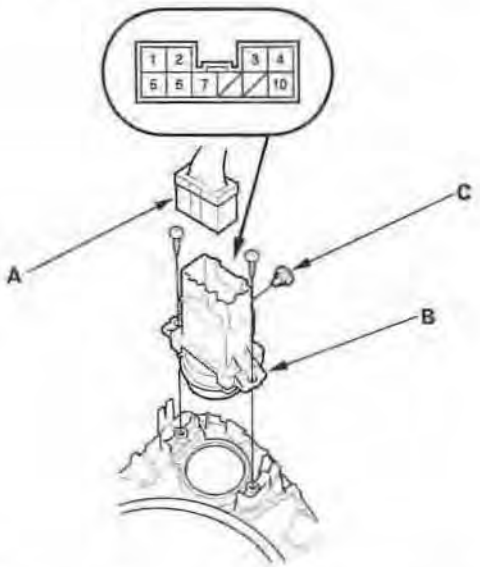
2. Inspect the relay and fuse/relay box socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 3.

3. Make these input tests at the fuse/relay box.
   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.

Cavity	Test condition	Test: Desired result	Possible cause if result is not obtained
1	Under all conditions	Check for continunity to ground: There should be continuity.	• Poor ground (G301) • An open in the wire
3	Ignition switch ON (II), hazard warning switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 19 (7.5 A) fuse in the under-dash fuse/relay box • Faulty hazard warning switch • An open in the wire
	Hazard warning switch ON, ignition switch OFF	Check for voltage to ground: There should be battery voltage.	• Blown No. 5 (15 A) fuse in the under-hood fuse/relay box • Faulty hazard warning switch • An open in the wire
2	Ignition switch ON (II) and turn signal switch in right or left position	Connect No. 2 terminal to No. 3 terminal: Right or left turn signal lights should come on.	• Poor ground (G201, G301, G502, G551, G553) • Faulty turn signal switch • An open in the wire
	Hazard warning switch ON	Connect No. 2 terminal to No. 3 terminal: Hazard warning lights should come on.	• Poor ground (G201, G301, G502, G551, G553) • Faulty hazard warning switch • An open in the wire

Hazard Warning Switch Test

1. Remove the center panel (see page 20-77).
2. Disconnect the 10P connector (A) from the hazard warning switch (B).



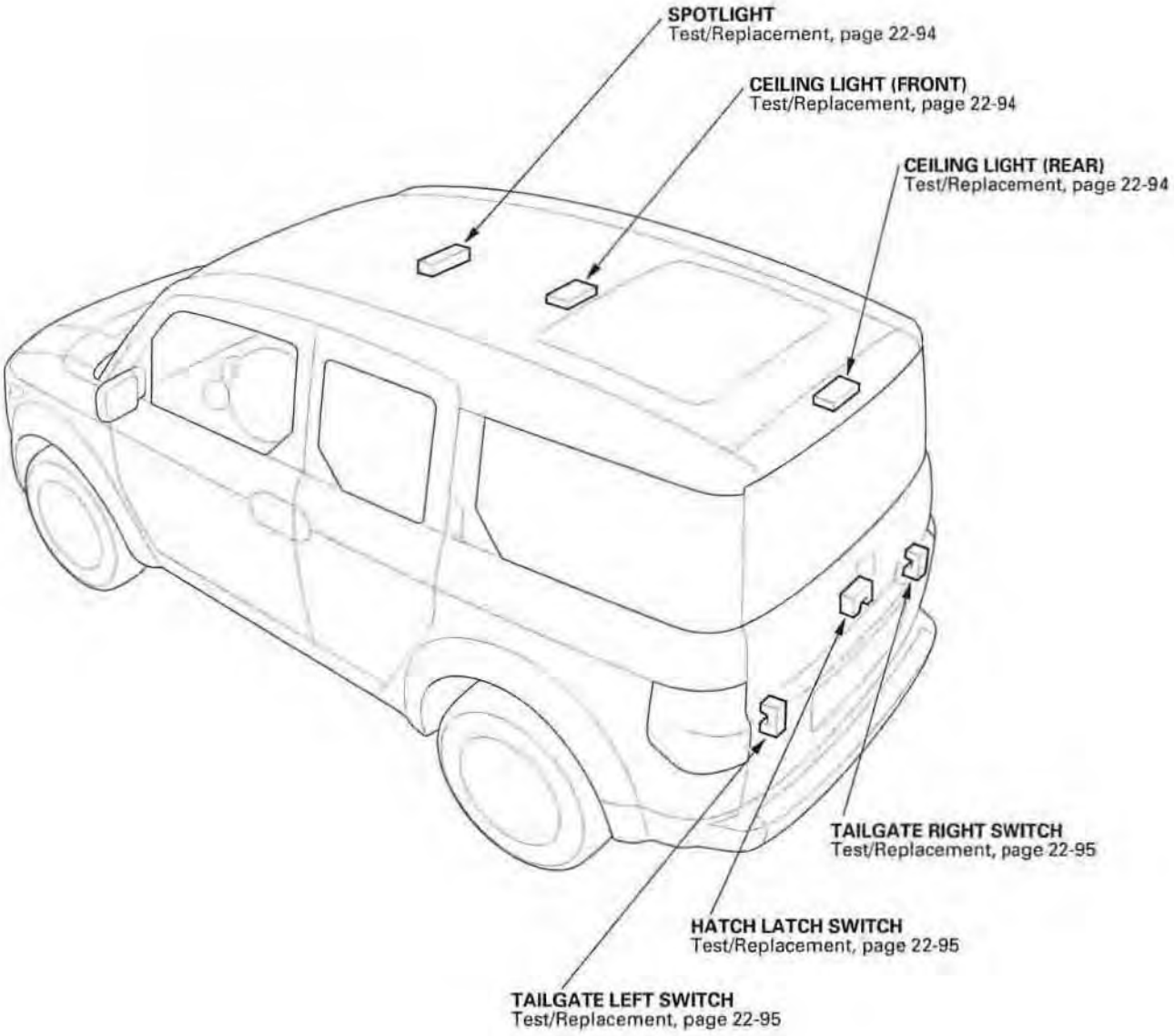
3. Remove the two screws and the hazard warning switch.
4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	5		6	1	2	3	4	7	10
OFF	○	⊗	○	○	○				
ON	○	⊗	○		○	○	○	○	○

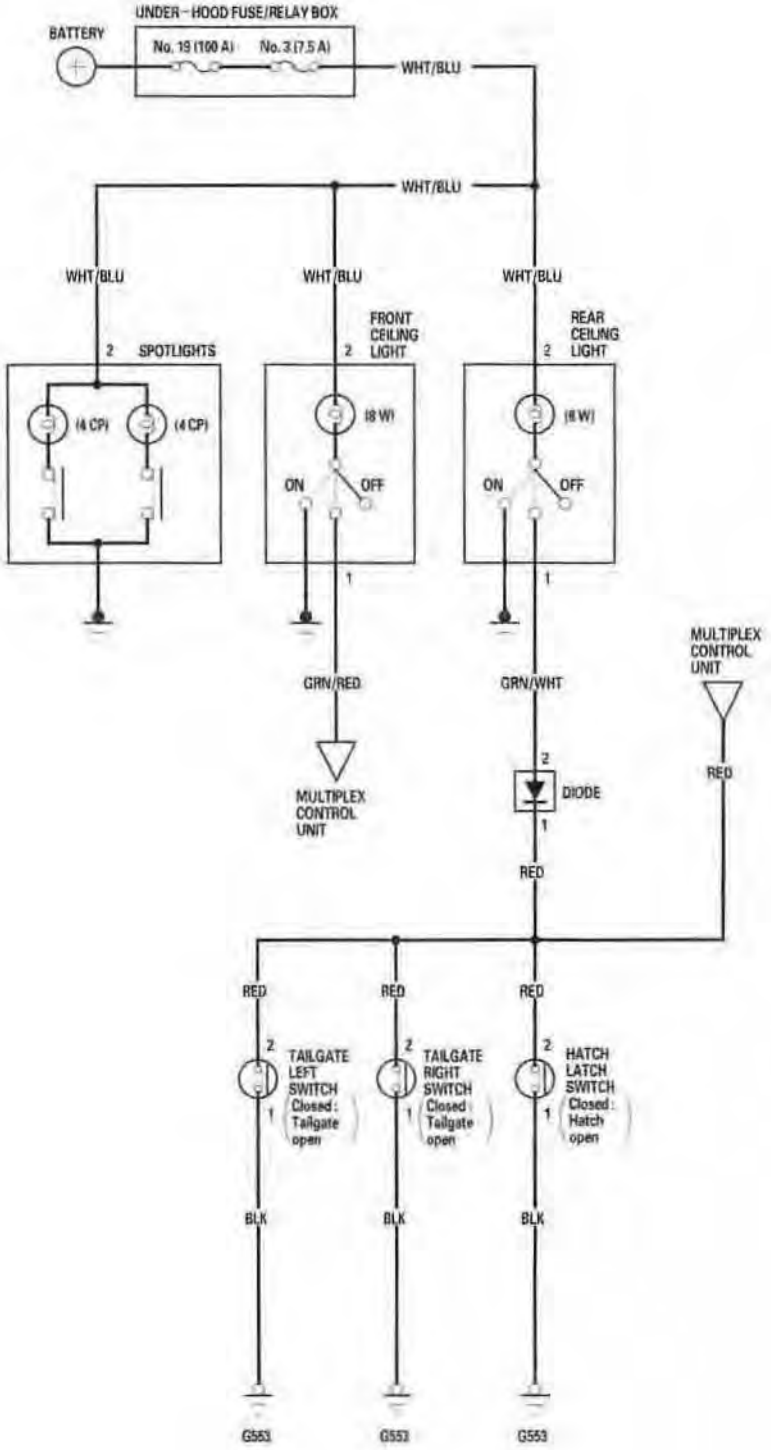
5. If the continuity is not as specified, replace the illumination bulb (C) or the switch.
6. Install the switch in the reverse order of removal.

Interior Lights

Component Location Index



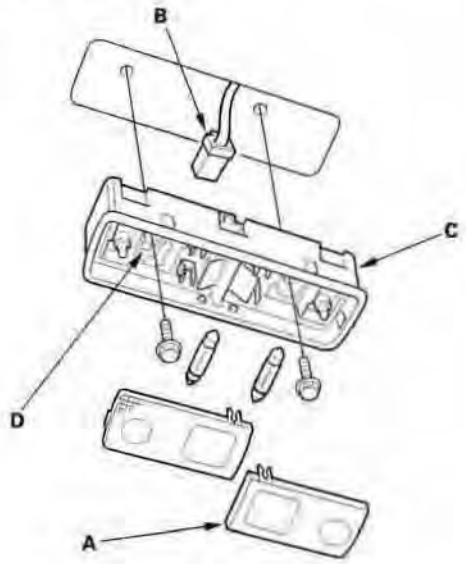
Circuit Diagram



Spotlight Test/Replacement

1. Turn the light switch OFF.
2. Carefully pry off the lenses (A) with a small screwdriver.

Spotlight: 4 CP x 2



3. Remove the two mounting screws.
4. Disconnect the 2P connector (B) from the housing (C).
5. Check for continuity between the terminals in each switch position according to the table and the left mounting screw eyelet (D).

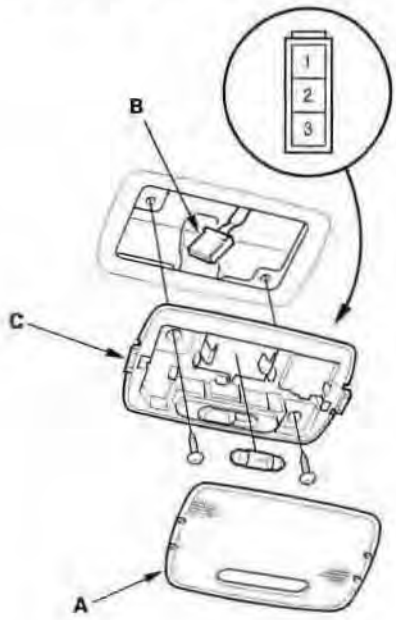
Position \ Terminal		2		Body ground (Eyelet)
LEFT	ON	○	⊖	○
	OFF			
RIGHT	ON	○	⊖	○
	OFF			

6. If the continuity is not as specified, check the bulb. If the bulb is OK, replace the spotlight assembly.

Ceiling Light Test/Replacement

1. Turn the light switch OFF.
2. Carefully pry off the lens (A) with a small screwdriver.

Ceiling Light: 8 W



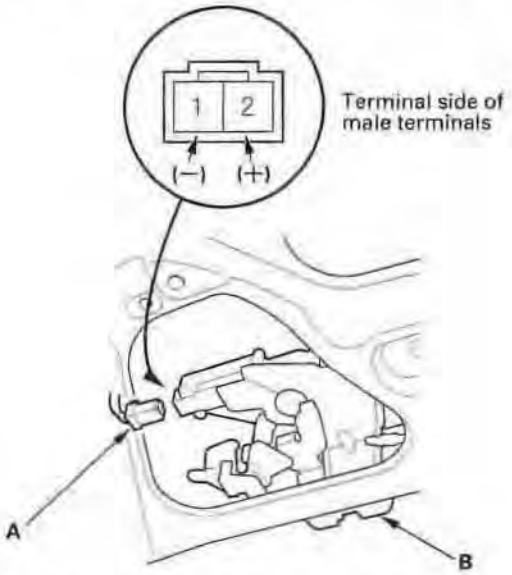
3. Remove the two mounting screws.
4. Disconnect the 3P connector (B) from the housing (C).
5. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1		2		3
OFF					
MIDDLE	○	⊖	○		
ON			○	⊖	○

6. If the continuity is not as specified, check the bulb. If the bulb is OK, replace the ceiling light assembly.

Hatch Latch Switch Test

1. Open the hatch and remove the hatch trim panel (see page 20-63).
2. Disconnect the 2P connector (A) from the hatch latch switch (B).

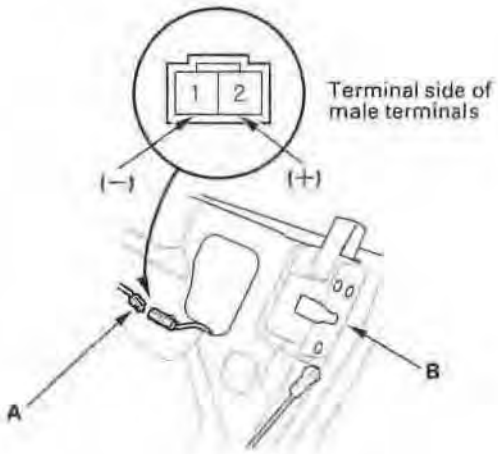


3. Check for continuity between the hatch latch switch 2P connector terminals No. 1 and No. 2.
   - There should be continuity with the hatch open.
   - There should be no continuity with the hatch closed.
4. If the continuity is not as specified, replace the switch.

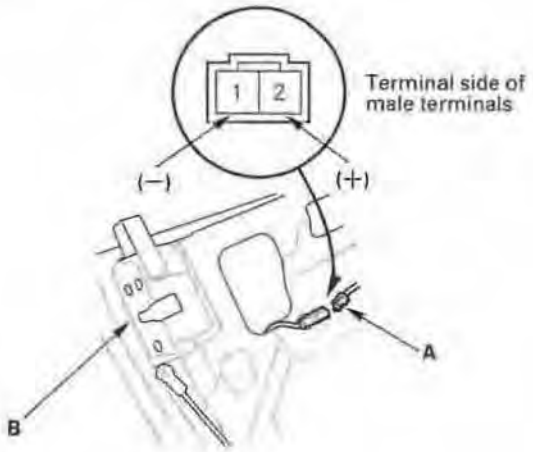
Tailgate Latch Switch Test

1. Open the tailgate and remove the tailgate trim panel (see page 20-64).
2. Disconnect the 2P connector (A) from each tailgate latch switch (B).

Left:



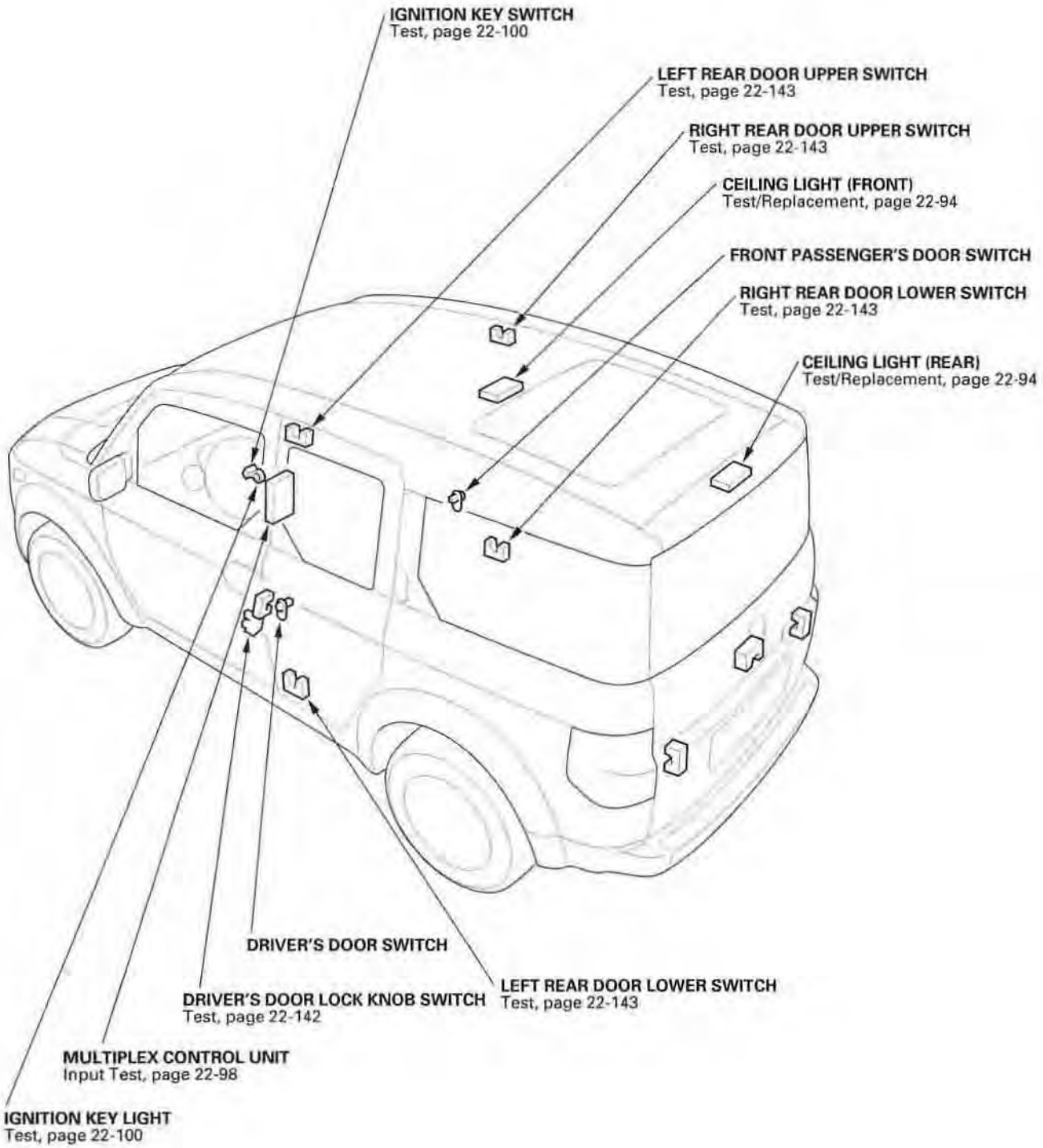
Right:



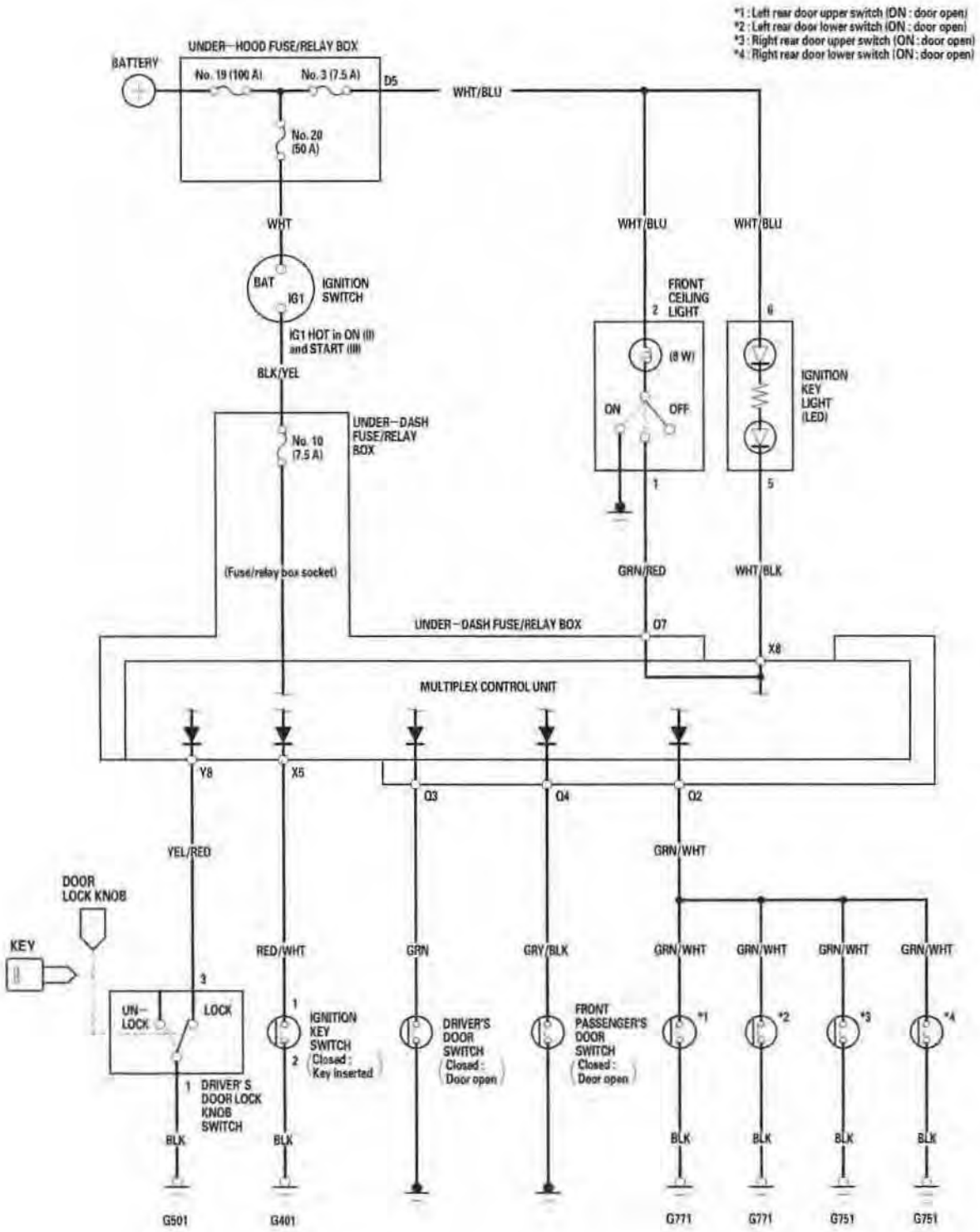
3. Check for continuity between each tailgate latch switch 2P connector terminals No. 1 and No. 2.
   - There should be continuity with the tailgate open.
   - There should be no continuity with the tailgate closed.
4. If the continuity is not as specified, replace the switch.

Entry Lights Control System

Component Location Index



Circuit Diagram



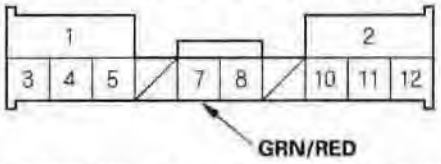
Entry Lights Control System

Control Unit Input Test

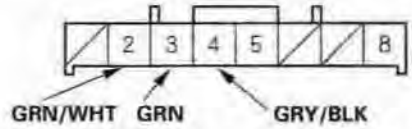
1. Before testing, troubleshoot the multiplex control system (see page 22-149).
2. Remove the driver's dashboard lower cover (see page 20-73).
3. Disconnect the under-dash fuse/relay box connectors O, Q, X and Y.

   NOTE: All connectors are wire side of female terminals.

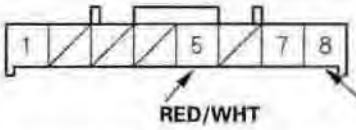
UNDER-DASH FUSE/RELAY BOX CONNECTOR O (12P)



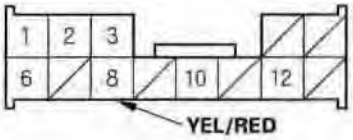
UNDER-DASH FUSE/RELAY BOX CONNECTOR Q (8P)



UNDER-DASH FUSE/RELAY BOX CONNECTOR X (8P)



UNDER-DASH FUSE/RELAY BOX CONNECTOR Y (13P)



4. Inspect the connector and socket terminals to be sure they are all making good contact.

   • If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   • If the terminals look OK, go to step 5.

5. With the connectors still disconnected, make these input tests at the connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
O7	GRN/RED	Ceiling light switch in middle position, all doors closed	Attach to ground: Ceiling light(s) should come on.	• Blown No. 3 (7.5 A) fuse in the under-hood fuse/relay box • Blown bulb • Faulty ceiling light • An open in the wire
X8	WHT/BLK	Under all conditions	Attach to ground: Ignition key light should come on.	• Blown No. 3 (7.5 A) fuse in the under-hood fuse/relay box • Faulty ignition key light (LED) • An open in the wire

6. Reconnect the connectors to the under-dash fuse/relay box, and make these input tests at the appropriate connectors on the under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

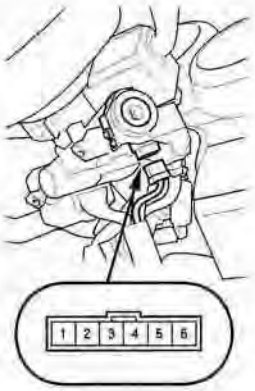
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
Q3	GRN	Driver's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
Q4	GRY/BLK	Front passenger's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door switch • Short to ground
Q2	GRN/WHT	Any rear door open	Check for voltage to ground: There should be less than 1 V.	• Faulty left (right) rear door switch • An open in the wire
		Both rear doors closed	Check for voltage to ground: There should be 5 V or more.	• Faulty left (right) rear door switch • Short to ground
X5	RED/WHT	Ignition key inserted into the ignition switch	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key removed from the ignition switch	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition key switch • Short to ground
Y8	YEL/RED	Driver's door lock knob switch locked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground

Ignition Key Switch Test

NOTE: For more key-in beeper information, refer to the circuit diagram (see page 22-97) and input test (see page 22-98).

When the ignition key is in the ignition switch, the key-in beeper circuit of the multiplex control unit senses ground through the closed ignition key switch. When you open the driver's door, the beeper circuit senses ground through the closed door switch. When both switches are closed (driver's door and ignition), the key-in beeper in the gauge assembly is activated.

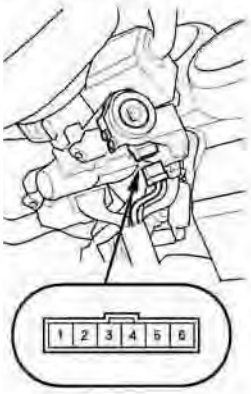
1. Remove the steering column upper and lower covers (see page 17-25).
2. Disconnect the 6P connector.



3. Check for continuity between the No. 1 and No. 2 terminals.
   - There should be continuity with the key in the ignition switch.
   - There should be no continuity with the key removed.
4. If the continuity is not as specified, replace the steering lock assembly.

Ignition Key Light Test

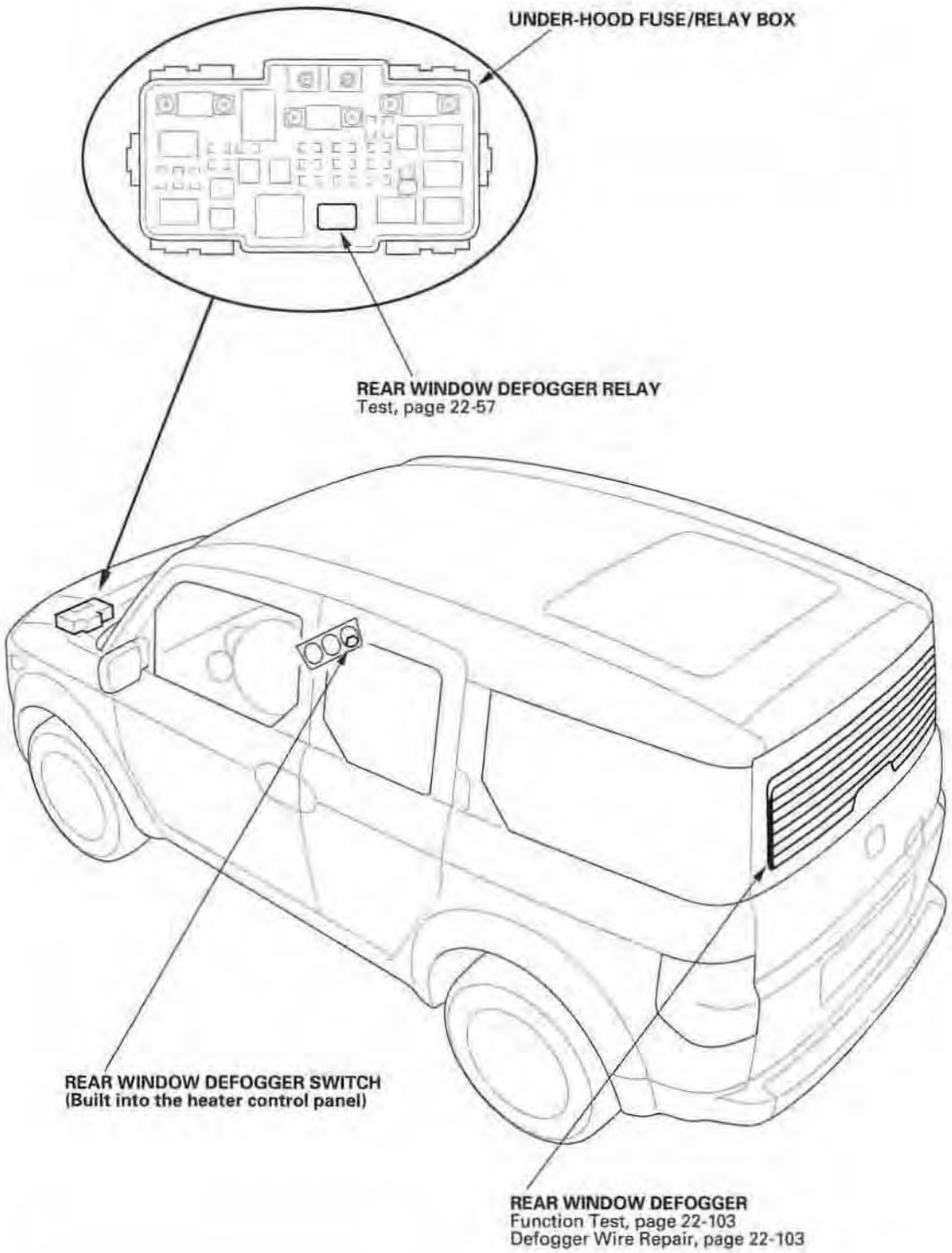
1. Remove the steering column upper and lower covers (see page 17-25).
2. Disconnect the 6P connector.



3. The LED should come on when power is connected to the No. 6 terminal and ground is connected to the No. 5 terminal.
4. If the LED does not come on, replace the steering lock assembly.

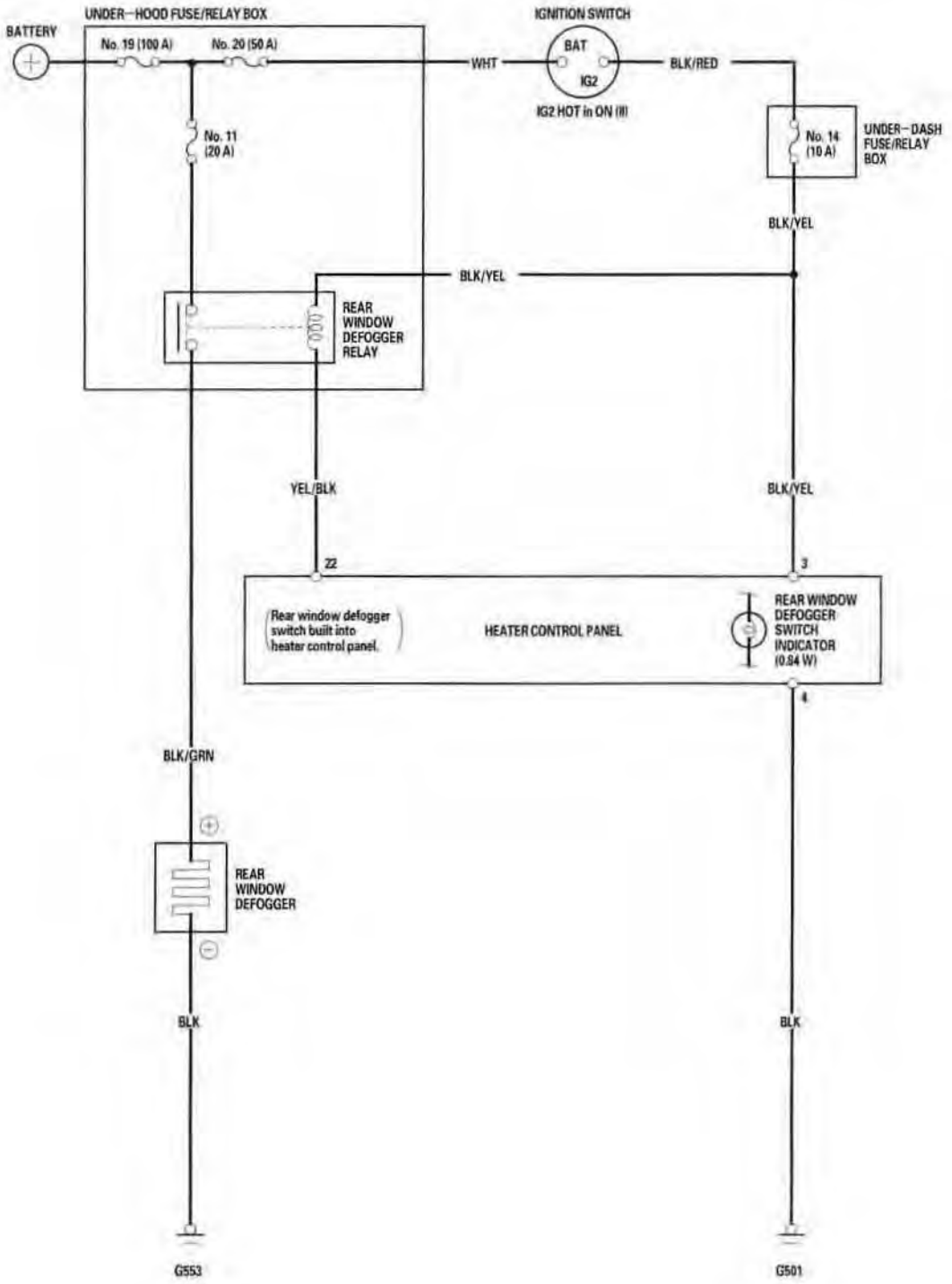
Rear Window Defogger

Component Location Index



Rear Window Defogger

Circuit Diagram

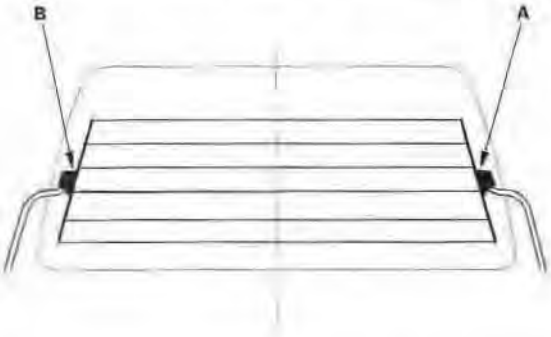


Function Test

NOTE:
- Be careful not to scratch or damage the defogger wires with the tester probe.
- Before testing, check the No. 11 (20 A) fuse in the under-hood fuse/relay box and No. 14 (10 A) fuse in the under-dash fuse/relay box.

1. Check for voltage between the positive terminal (A) on the right side of the glass and body ground with the ignition switch and defogger switch ON.
   There should be battery voltage.

   - If there is no voltage, check for:
     - Faulty defogger relay.
     - An open in the BLK, BLK/GRN, BLK/YEL, or YEL/BLK wire.
     - Faulty heater control panel.
   - If there is battery voltage, go to step 2.



2. Disconnect the negative terminal (B), then check for continuity between the negative terminal (B) and body ground.
   If there is no continuity, check for:

   - An open in the BLK wire.
   - Poor ground (G553).

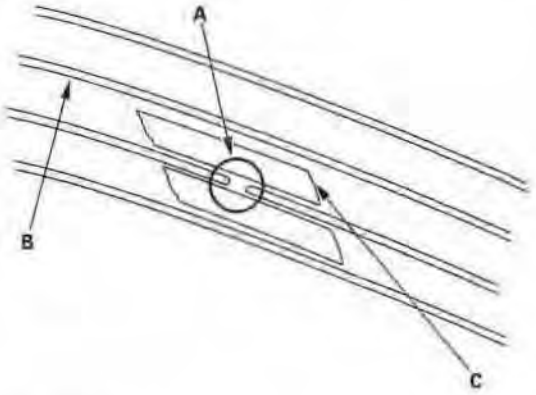
3. Reconnect the negative terminal, then touch the voltmeter positive probe to the halfway point of each defogger wire, and the negative probe to the negative terminal.
   There should be about 6 V with the ignition switch and the defogger switch ON.

   - If the voltage is as specified, the defogger wire is OK.
   - If the voltage is not as specified, repair the defogger wire.
     - If there is battery voltage, there is a break in the negative half of the grid.
     - If there is 0 V, there is a break in the positive half of the grid.

Defogger Wire Repair

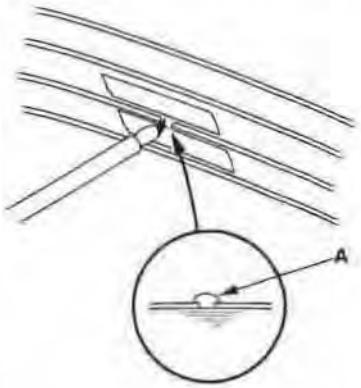
NOTE: To make an effective repair, the broken section must be no longer than one inch.

1. Lightly rub the area around the broken section (A) with fine steel wool, then clean it with isopropyl alcohol.



2. Carefully mask above and below the broken portion of the defogger wire (B) with transparent tape (C).

3. Using a small brush, apply a heavy coat of silver conductive paint (commercially available defogger grid repair material) extending about 1/8" on both sides of the break. Thoroughly mix the paint before use. Allow 30 minutes to dry.

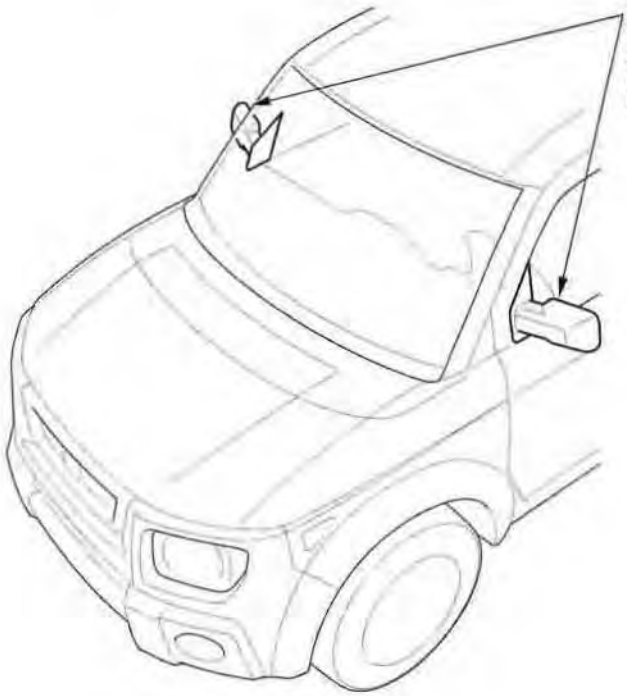


4. Check for continuity in the repaired wire.

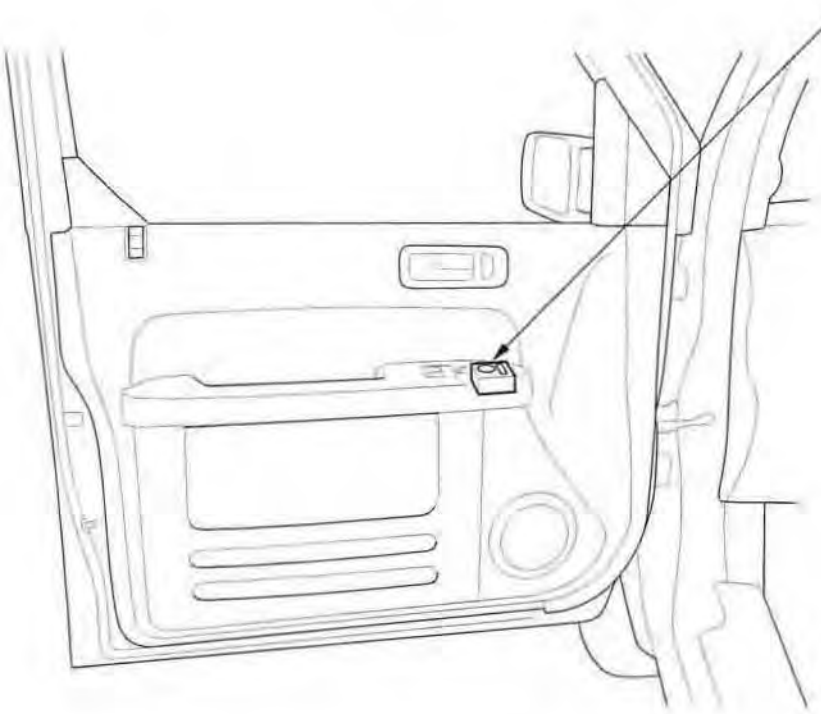
5. Apply a second coat of paint in the same way. Let it dry 3 hours before removing the tape.

Power Mirrors

Component Location Index

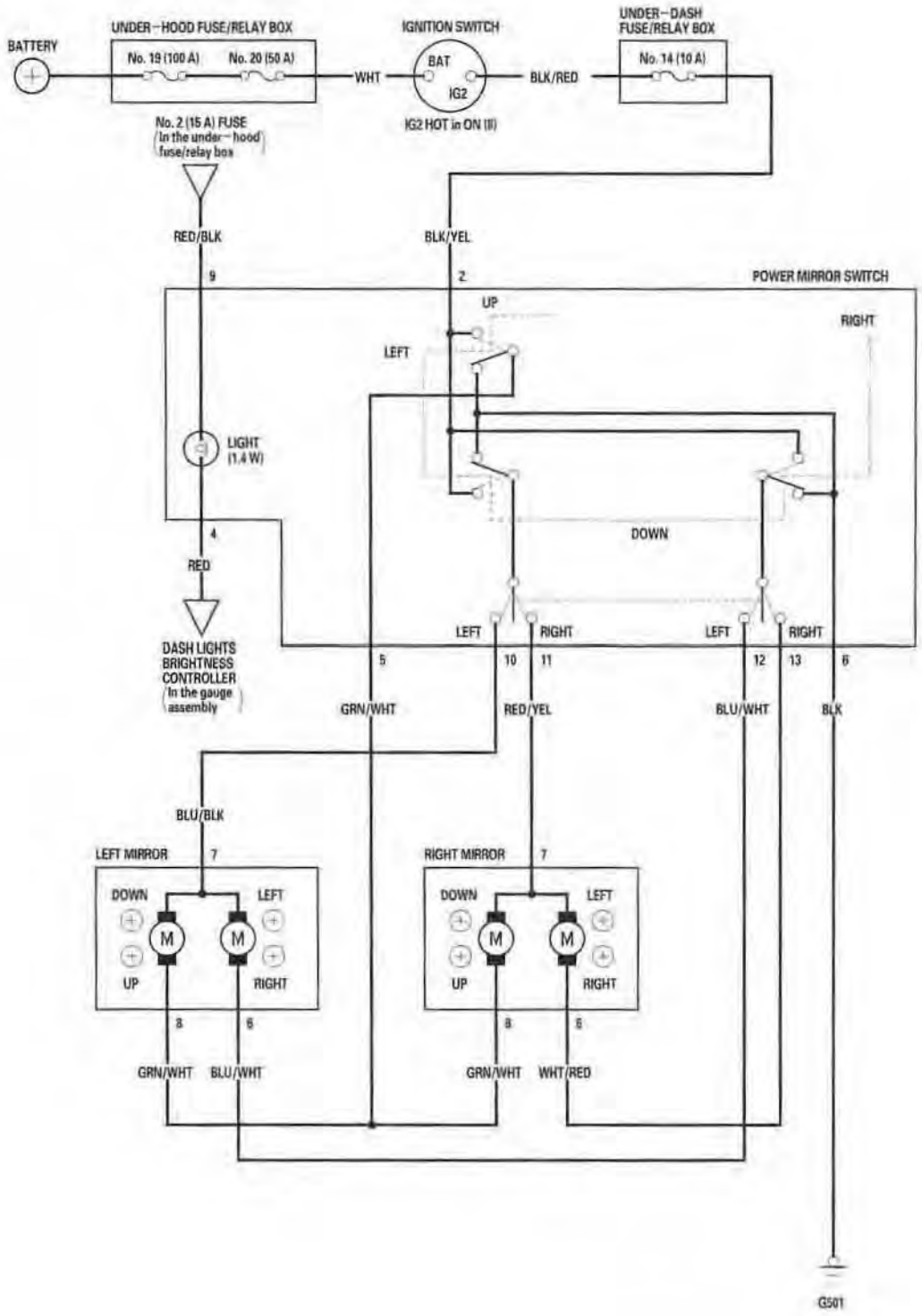


POWER MIRRORS
Function Test, page 22-106
Replacement, page 20-33
Mirror Actuator Test, page 22-107
Mirror Actuator Replacement, page 22-108



POWER MIRROR SWITCH
Test/Replacement, page 22-107

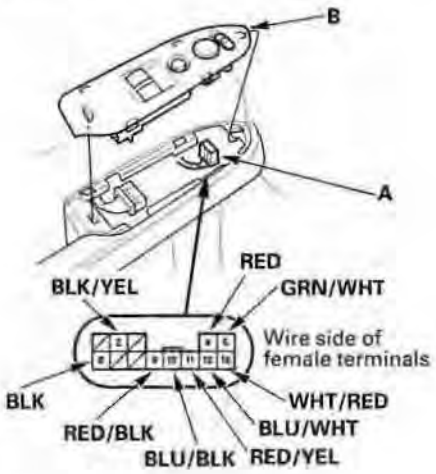
Circuit Diagram



Function Test

1. Remove the driver's door panel (see page 20-7).

2. Disconnect the 13P connector (A) from the power mirror switch (B).



3. Choose the appropriate test based on the symptom:

   - Both mirrors don't work, go to step 4.
   - Left mirror doesn't work, go to step 6.
   - Right mirror doesn't work, go to step 7.

Both mirrors

4. Check for voltage between the No. 2 terminal and body ground with the ignition switch ON (II).
   There should be battery voltage.

   - If there is no battery voltage, check for:
     - Blown No. 14 (10 A) fuse in the under-dash fuse/relay box.
     - An open in the BLK/YEL wire.
   - If there is battery voltage, go to step 5.

5. Check for continuity between the No. 6 terminal and body ground.
   There should be continuity.

   - If there is no continuity, check for:
     - An open in the BLK wire.
     - Poor ground (G501).
   - If there is continuity, check both mirrors individually as described in step 6 and step 7.

Left mirror

6. Connect the No. 2 terminal to the No. 10 terminal, and the No. 5 (then No. 12) terminal to No. 6 terminal with jumper wires. The left mirror should tilt down (then swing left) with the ignition switch ON (II).

   - If the mirror does not tilt down (or does not swing left), check for an open in the GRN/WHT (or BLU/WHT) wire between the left mirror and the 13P connector. If the wire is OK, check the left mirror actuator (see page 22-107).
   - If the mirror neither tilts down nor swings left, repair the BLU/BLK wire.
   - If the mirror works properly, check the mirror switch (see page 22-107).

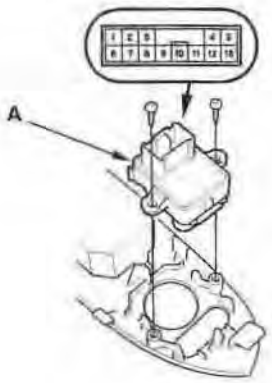
Right mirror

7. Connect the No. 2 terminal to the No. 11 terminal, and the No. 5 (then No. 13) terminal to No. 6 terminal with jumper wires. The right mirror should tilt down (then swing left) with the ignition switch ON (II).

   - If the mirror does not tilt down (or does not swing left), check for an open in the GRN/WHT (or WHT/RED) wire between the right mirror and the 13P connector. If the wire is OK, check the right mirror actuator (see page 22-107).
   - If the mirror neither tilts down nor swings left, repair the RED/YEL wire.
   - If the mirror works properly, check the mirror switch (see page 22-107).

Power Mirror Switch Test/ Replacement

1. Remove the driver's door panel (see page 20-7).
2. Disconnect the 13P connector from the power mirror switch (A).



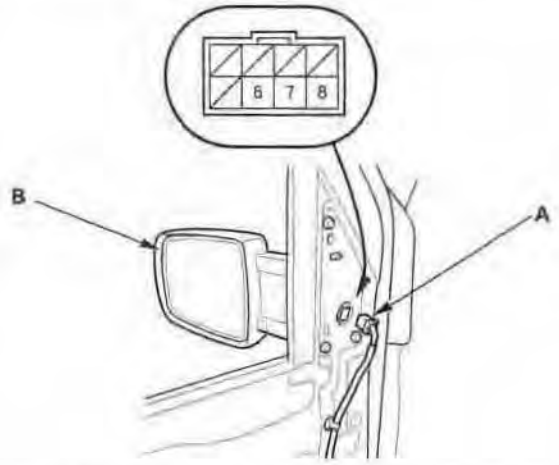
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal		2	5	6	10	11	12	13
L	UP	○	○		○			
	DOWN	○		○	○			
	LEFT	○			○		○	
	RIGHT	○					○	
R	UP	○	○			○		
	DOWN	○		○		○		
	LEFT	○				○		○
	RIGHT	○						○

4. If the continuity is not as specified, remove the screws and replace the switch.

Power Mirror Actuator Test

1. Remove the door panel (see page 20-7).
2. Disconnect the 8P connector (A) from the power mirror actuator (B).



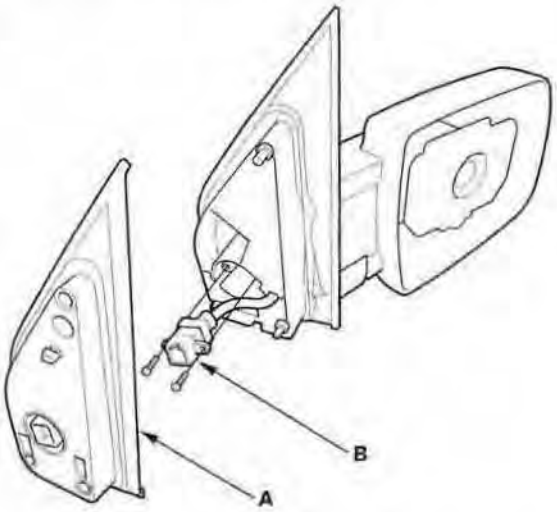
3. Check actuator operation by connecting power and ground according to the table.

Position \ Terminal	6	7	8
TILT UP		⊖	⊕
TILT DOWN		⊕	⊖
SWING LEFT	⊖	⊕	
SWING RIGHT	⊕	⊖	

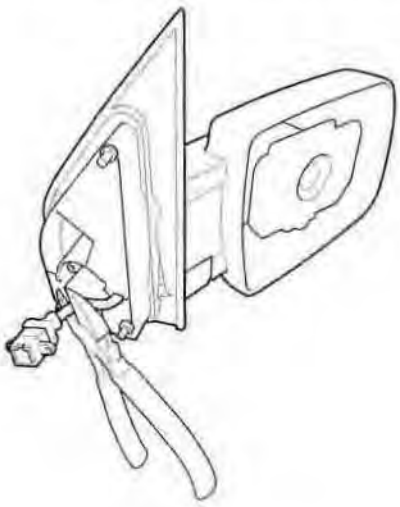
4. If the mirror fails to work properly, replace the mirror actuator.

Power Mirror Actuator Replacement

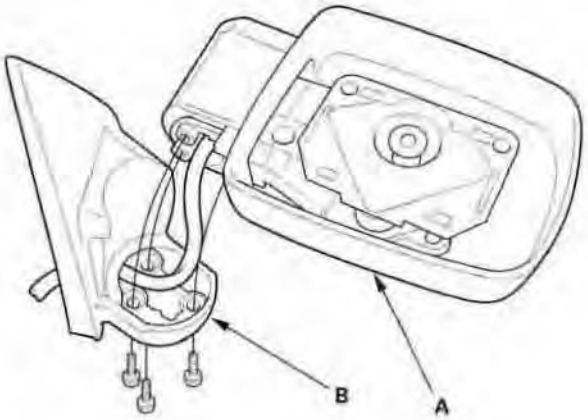
1. Remove the mirror holder (see page 20-34).
2. Disconnect the 6P connector from the mirror, and remove the power mirror (see page 20-33).
3. Remove the cover (A), then remove the two screws from the mirror connector (B).



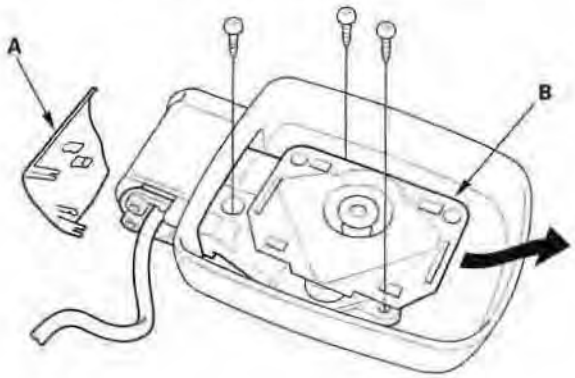
4. Record the terminal locations and wire colors.
5. Cut the wire harness with the wire cutter.



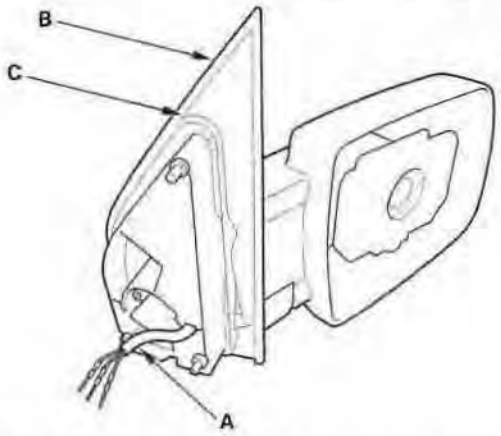
6. Remove the three screws, and separate the mirror housing (A) from the bracket (B).



7. Remove the cover (A), then remove the three screws and the actuator (B).

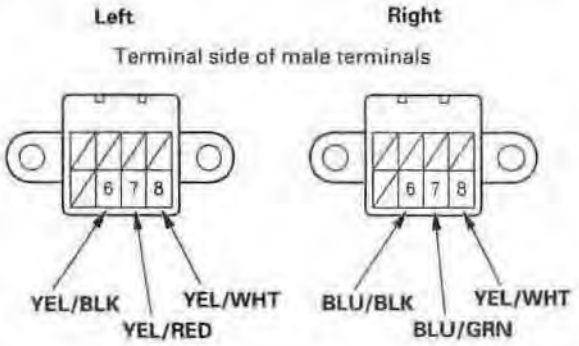


8. Route the wire harness (A) of the new actuator through the hole in the bracket (B) and gasket (C).



9. Install the actuator, bracket, and cover in the reverse order of removal.

10. Insert the new actuator terminals into the connector in the original arrangement as shown.

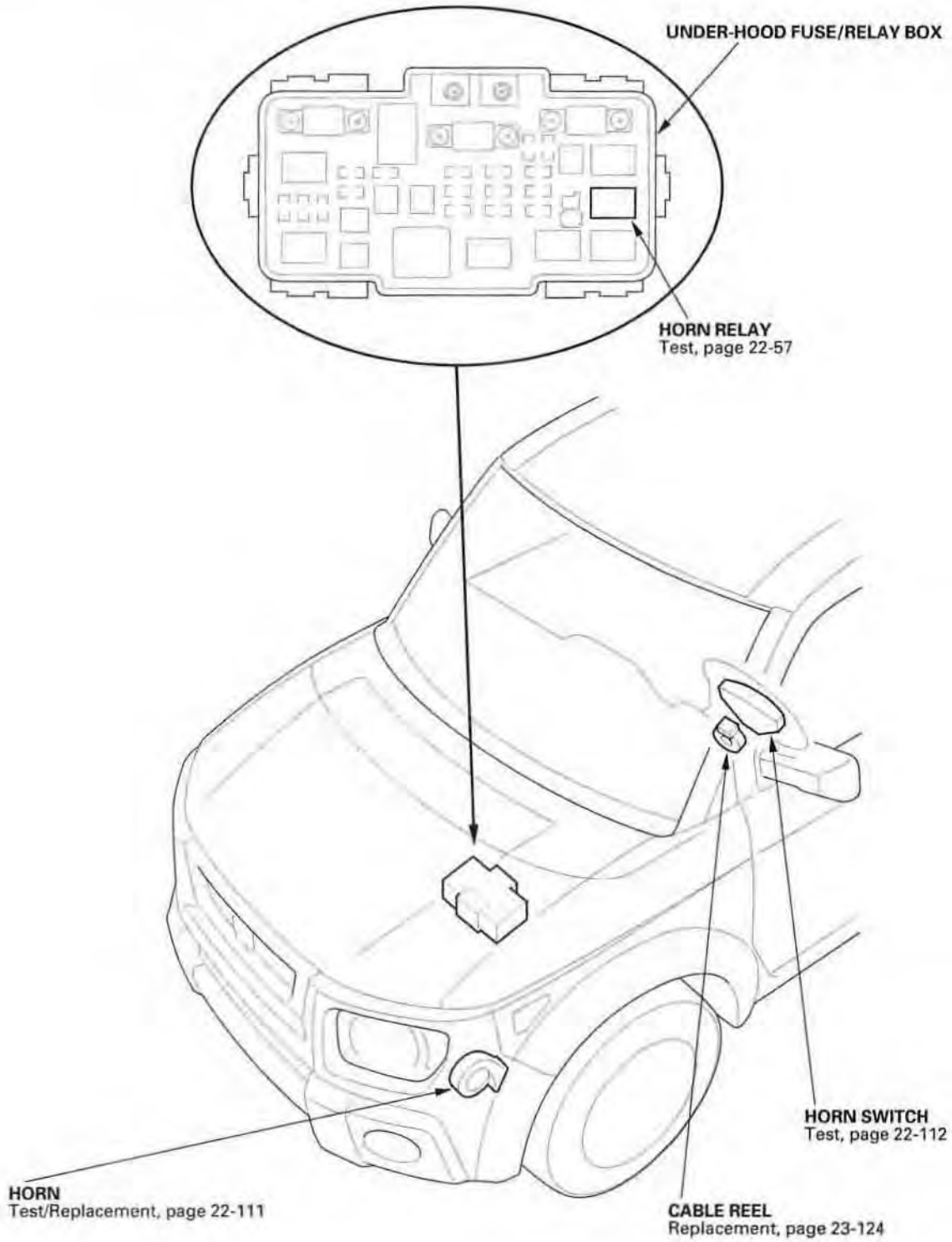


11. Reassemble in the reverse order of disassembly. Be careful not to break the mirror holder when reinstalling it to the actuator.

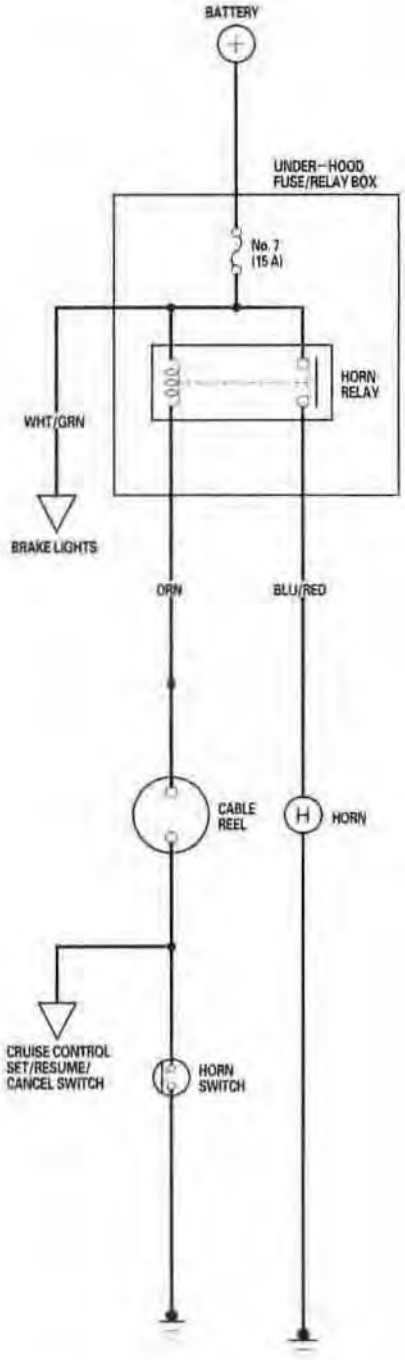
12. Reinstall the mirror assembly to the door.

13. Operate the power mirror to ensure smooth operation.

Component Location Index



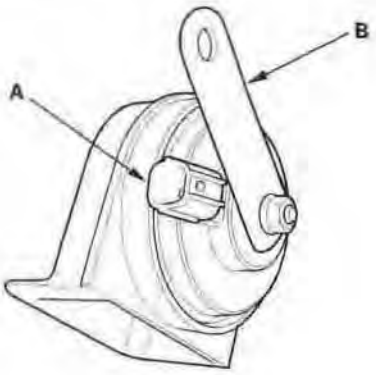
Circuit Diagram



Horn Test/Replacement

1. Remove the left inner fender (see page 20-138).
2. Disconnect the 1P connector (A), and remove the horn (B).

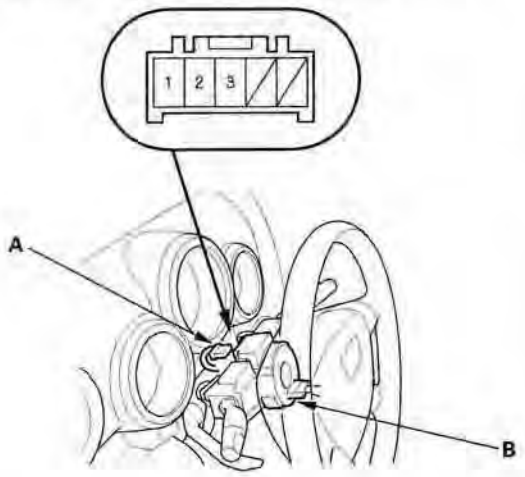
3. Test the horn by connecting battery power to the terminal (A) and ground to the bracket (B). The horn should sound.



Horn Switch Test

1. Remove the steering column covers (see page 17-25).

2. Disconnect the dashboard wire harness B 5P connector (A) from the cable reel (B).



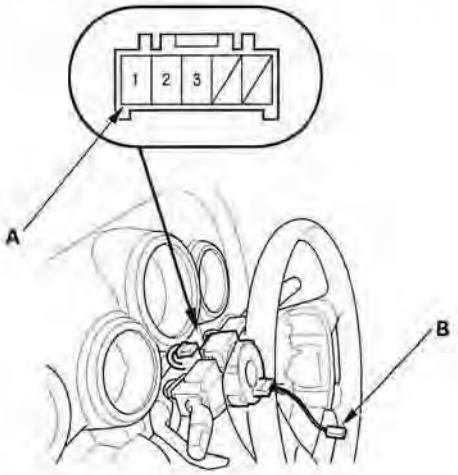
3. Using a jumper wire, connect the dashboard wire harness B 5P connector (A) No. 1 terminal to body ground.

   - If the horn sounds, go to step 4.
   - If the horn doesn't sound, check these items:
     - Horn relay.
     - No. 7 (15 A) fuse in the under-hood fuse/relay box.
     - Horn (see page 22-111).
     - An open in the wire.

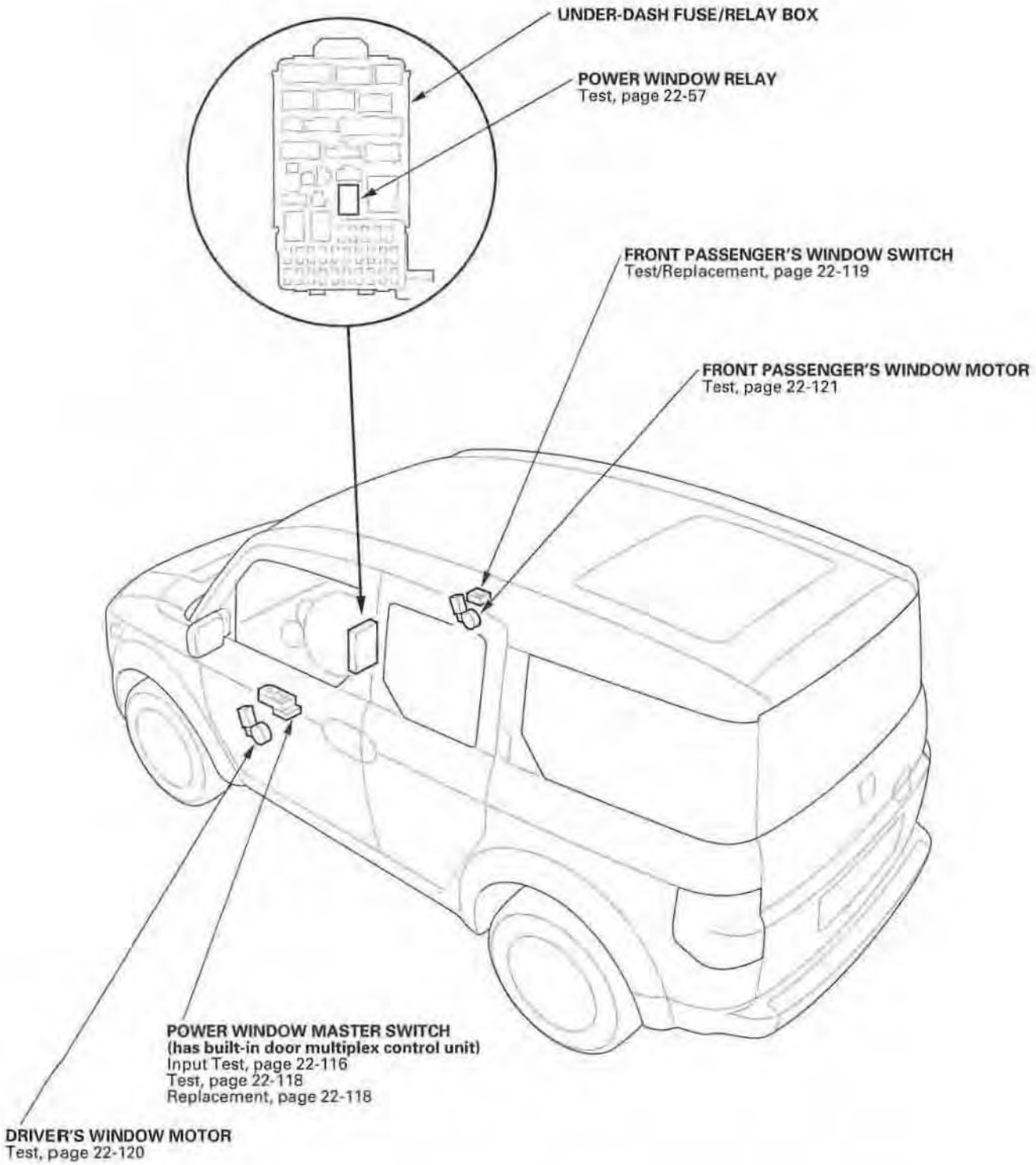
4. Reconnect the dashboard wire harness B 5P connector (A), and disconnect the horn switch positive 1P connector (B).

5. Using a jumper wire, connect the horn switch positive 1P connector (B) to ground.

   - If the horn sounds, replace the horn switch plate.
   - If the horn does not sound, replace the cable reel.

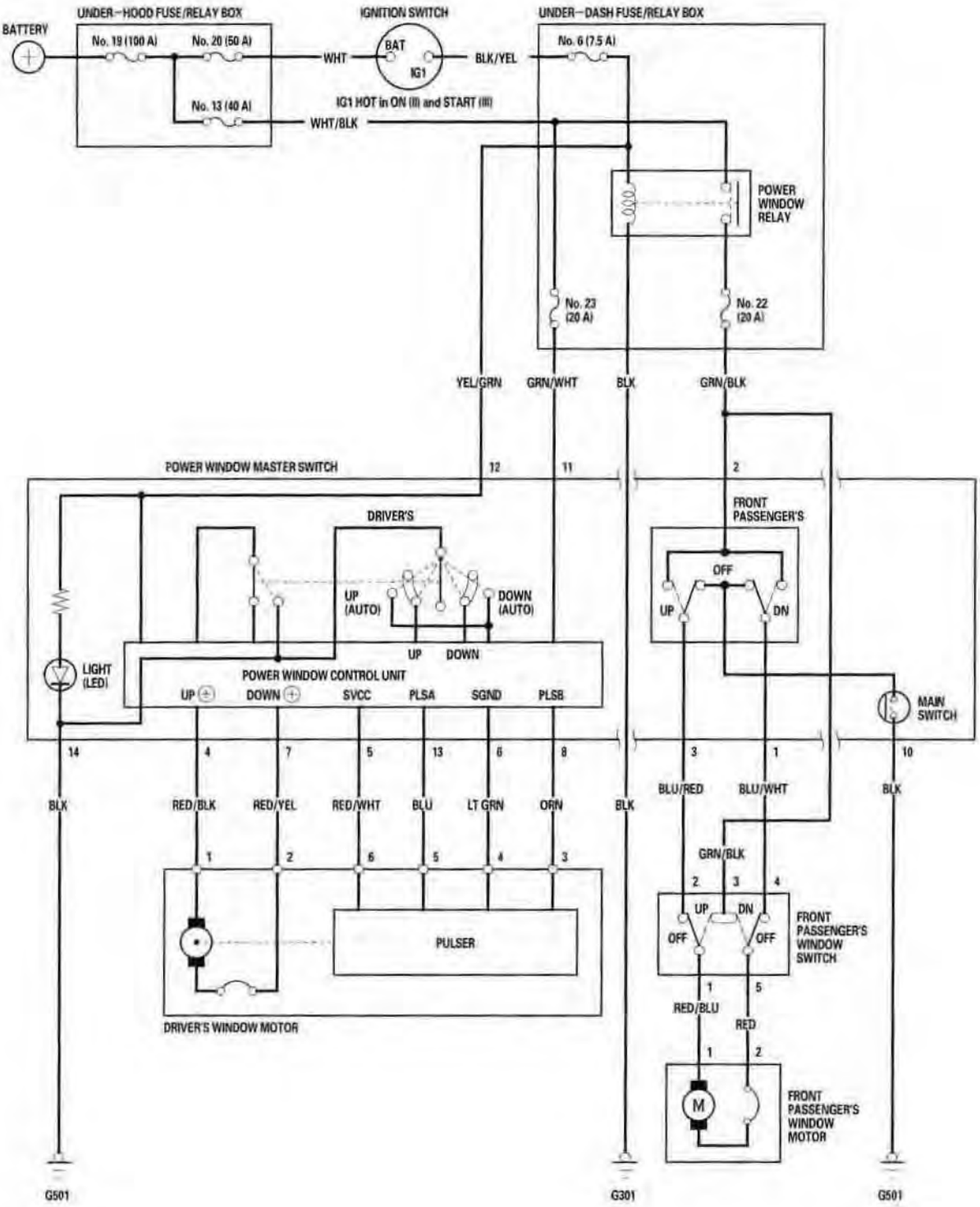


Component Location Index



Power Windows

Circuit Diagram



Resetting the Power Window Control Unit

Resetting the power window control unit is required after performing the following procedures:

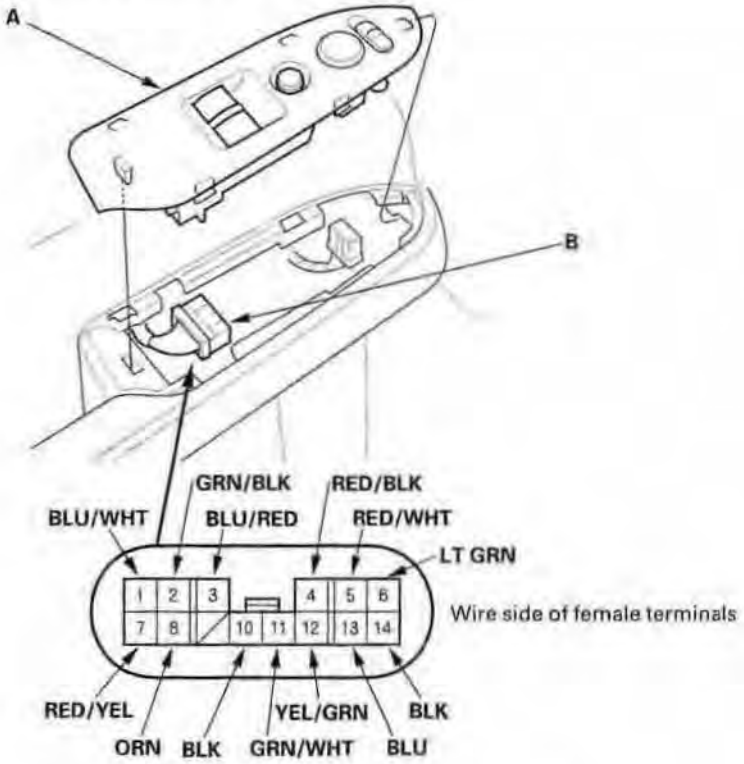
- Loss of battery power
- Loss of power from the No. 23 (20 A) fuse in the under-dash fuse/relay box
- Open circuit caused by disconnecting the 14P connector from the power window master switch

1. Make sure the driver's window does not work in AUTO with the ignition switch ON (II).
2. Start the engine.
3. Lower the driver's window all the way down by pushing the driver's power window switch to the second detent (AUTO DOWN); when the window reaches the bottom, hold the switch in the AUTO DOWN position for 2 seconds.
4. Raise the driver's window all the way up without stopping by pulling the driver's power window switch to the UP position; when the window reaches the top, hold the switch in the UP position for 2 seconds.
5. If the window does not work in AUTO, repeat steps 2 through 5.

Master Switch Input Test

NOTE: The power window control unit is built into the power window master switch, and it only controls the driver's window operations.

1. Remove the driver's door panel (see page 20-7).
2. Remove the power window master switch (A).
3. Disconnect the 14P connector (B) from the master switch.



4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 5.

5. With the 14P connector still disconnected from the switch connector, make these input tests at the connector.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, go to step 6.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
7 4	RED/YEL RED/BLK	Connect the No. 11 and No. 7 terminals, and the No. 4 and No. 14 terminals.	Check for driver's window motor operation: It should run (the driver's window moves down).	• Faulty driver's window motor • An open in the wire
3 1	BLU/RED BLU/WHT	Connect the No. 1 and No. 2 terminals, and the No. 3 and No. 10 terminals, then turn the ignition switch ON (II).	Check for front passenger's window motor operation: It should run (the front passenger's window moves down).	• Faulty front passenger's window motor • Faulty front passenger's window switch • An open in the wire

6. Reconnect the 14P connector to the switch, and perform the following input tests.

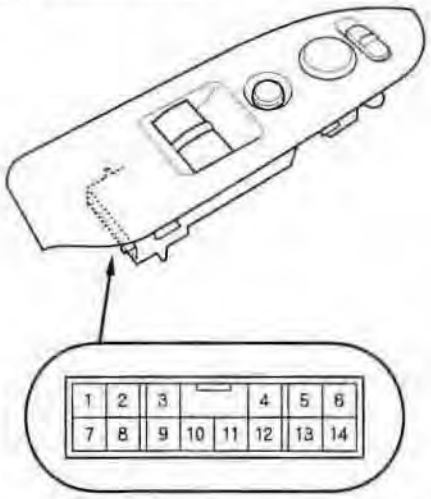
- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the control unit must be faulty; replace the power window master switch.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
10 14	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • An open in the wire
2 11	GRN/BLK GRN/WHT	Ignition switch ON (II) Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (7.5 A), No. 22 (20 A), or No. 23 (20 A) fuse in the under-dash fuse/relay box • Faulty power window relay • Poor ground (G301) • An open in the wire
12	YEL/GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 6 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
5	RED/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Faulty power window master switch • Short to ground in the wire
6	LT GRN	Under all conditions	Check for voltage to ground: There should be less than 1 V.	An open in the wire
13	BLU	Ignition switch ON (II), and the driver's window switch in AUTO DOWN	Check for voltage between the No. 13 and No. 14 terminals: There should be 0 V—about 5 V—0 V—about 5 V repeatedly (a digital voltmeter reads about 2.5 V while the window moves).	• Faulty power window master switch • Short to ground in the wire
8	ORN	Ignition switch ON (II), and the driver's window switch in AUTO DOWN	Check for voltage between the No. 8 and No. 14 terminals: There should be 0 V—about 5 V—0 V—about 5 V repeatedly (a digital voltmeter reads about 2.5 V while the window moves).	

NOTE: Do the power window control unit reset procedure (see page 22-115).

Master Switch Test/Replacement

1. Remove the switch panel (see page 20-7).
2. Remove the door handle (see page 20-7).
3. Disconnect the 20P connector from the power window master switch.



4. Check for continuity between the terminals in each switch position according to the tables.

Driver's Switch:

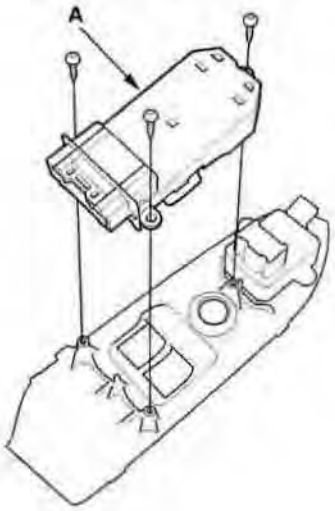
The driver's switch is combined with the control unit so you cannot isolate the switch to test it. Instead, do the master switch input test (see page 22-116). If the tests are normal, the driver's switch must be faulty.

NOTE: Reset the power window control unit (see page 22-115) if you disconnect the switch or replace it.

Front Passenger's Switch:

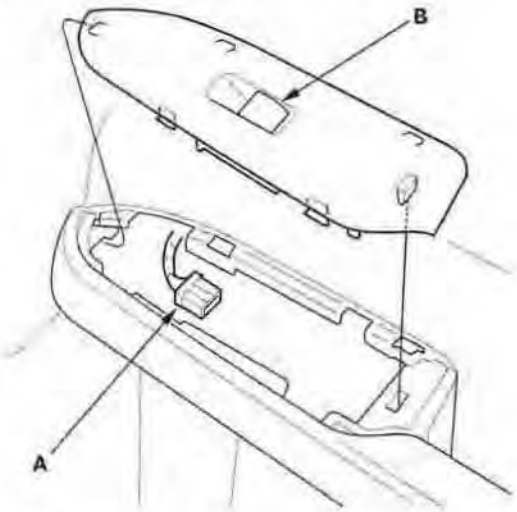
Position	Terminal / Main Switch	1	2	3	10
OFF	ON	○		○	○
	OFF	○		○	
UP	ON	○	○		
	OFF	○	○		
DOWN	ON	○			○
	OFF		○	○	

5. If the continuity is not as specified, remove the three screws and replace the switch (A).

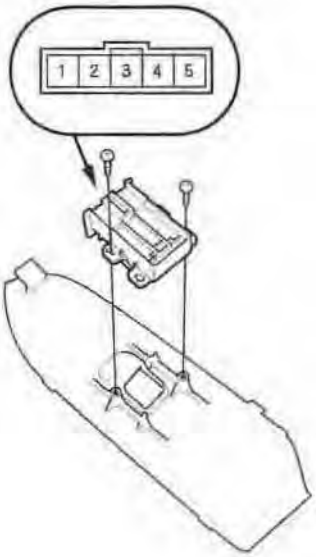


Passenger's Window Switch Test/Replacement

1. Remove the passenger's door panel (see page 20-7).
2. Remove the switch panel (see page 20-7).
3. Disconnect the 5P connector (A) from the front passenger's power window switch (B).



4. Remove the two screws and the passenger's power window switch.



5. Check for continuity between the terminals in each switch position according to the table.

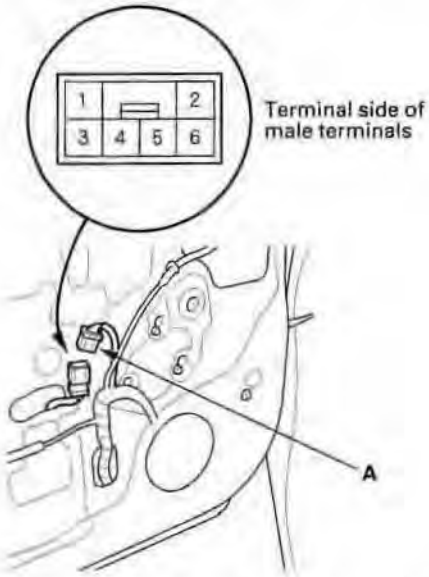
Position \ Terminal	1	2	3	4	5
UP	○		○	○	○
OFF	○	○		○	○
DOWN	○	○	○		○

6. If the continuity is not as specified, replace the switch.

Driver's Window Motor Test

Motor Test

1. Remove the driver's door panel (see page 20-7).
2. Disconnect the 6P connector (A) from the driver's window motor.



3. Test the motor in each direction by connecting battery power and ground according to the table.

NOTICE

To prevent damage to the motor, disconnect one lead as soon as the motor stops running.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

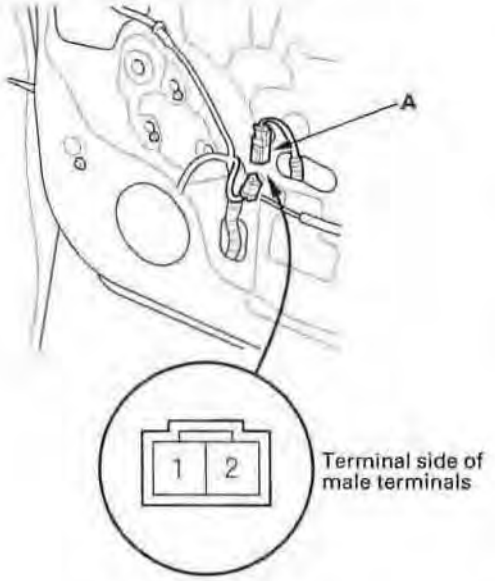
Pulser Test

1. Reconnect the 6P connector to the window motor, and reconnect the 20P connector to the power window master switch.
2. Check for voltage between the terminals at the driver's power window motor.
   - There should be battery voltage between the No. 6 (+) and No. 4 (−) terminals when the ignition switch is turned ON (II).
   - Connect an analog voltmeter between the No. 5 (+) and No. 4 (−) terminals, and run the window motor down or up. The voltmeter needle should move back and forth alternately between 0 V and about 5 V (a digital voltmeter should show about 2.5 V).
   - Connect an analog voltmeter between the No. 3 (+) and No. 4 (−) terminals, and run the window motor down or up. The voltmeter needle should move back and forth alternately between 0 V and about 5 V (a digital voltmeter should show about 2.5 V).

Passenger's Window Motor Test

1. Remove the passenger's door panel (see page 20-7).

2. Disconnect the 2P connector (A) from the passenger's power window motor.



3. Test the motor in each direction by connecting battery power and ground according to the table.

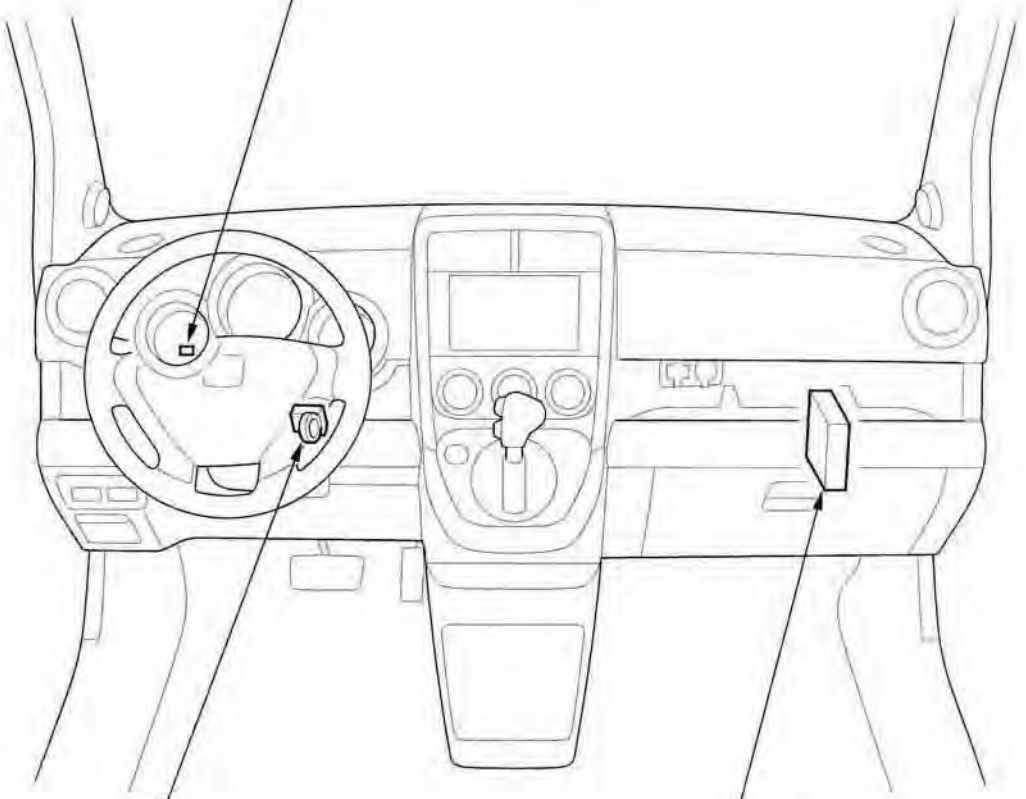
NOTICE

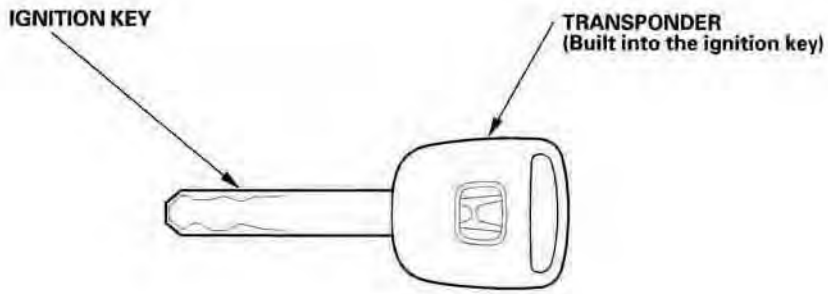
To prevent damage to the motor, disconnect one lead as soon as the motor stops running.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

4. If the motor does not run or fails to run smoothly, replace it.

Component Location Index

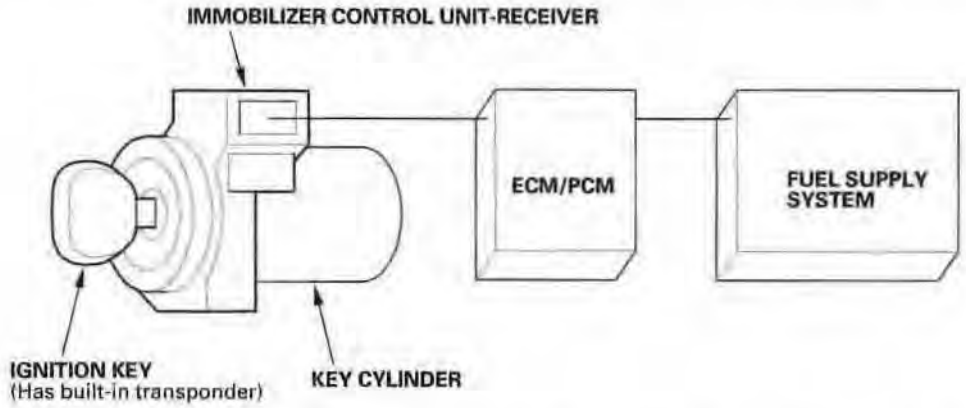




System Description

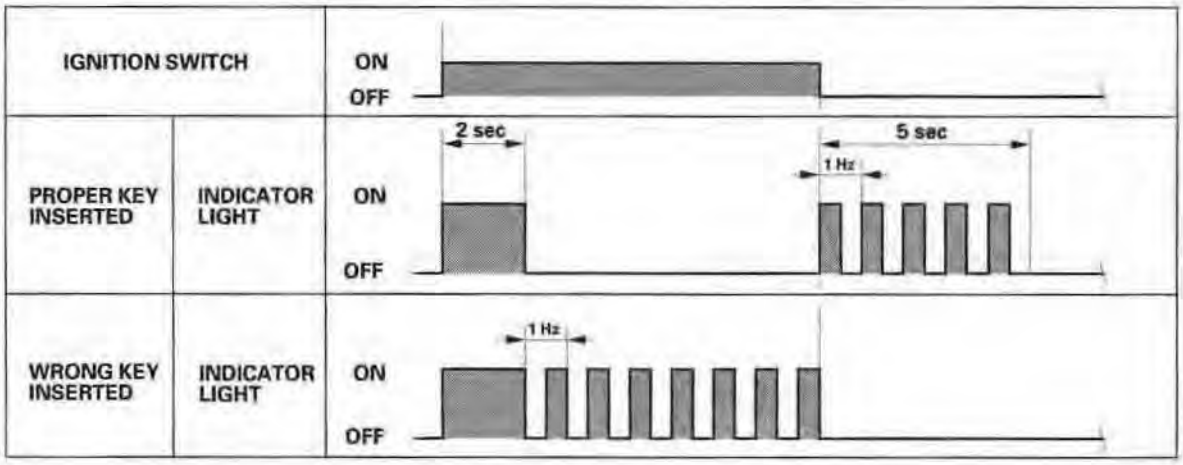
The vehicle is equipped with an immobilizer system that will disable the vehicle unless the proper ignition key is used. This system consists of a transponder located in the ignition key, an immobilizer control unit-receiver, an indicator, and the ECM/PCM.

When the key is inserted in the ignition switch and turned to the ON (II) position, the immobilizer control unit-receiver sends power to the transponder in the ignition key. The transponder then sends a coded signal back to the immobilizer control unit-receiver which then sends a coded signal to the ECM/PCM. The ECM/PCM then energizes the fuel supply system.



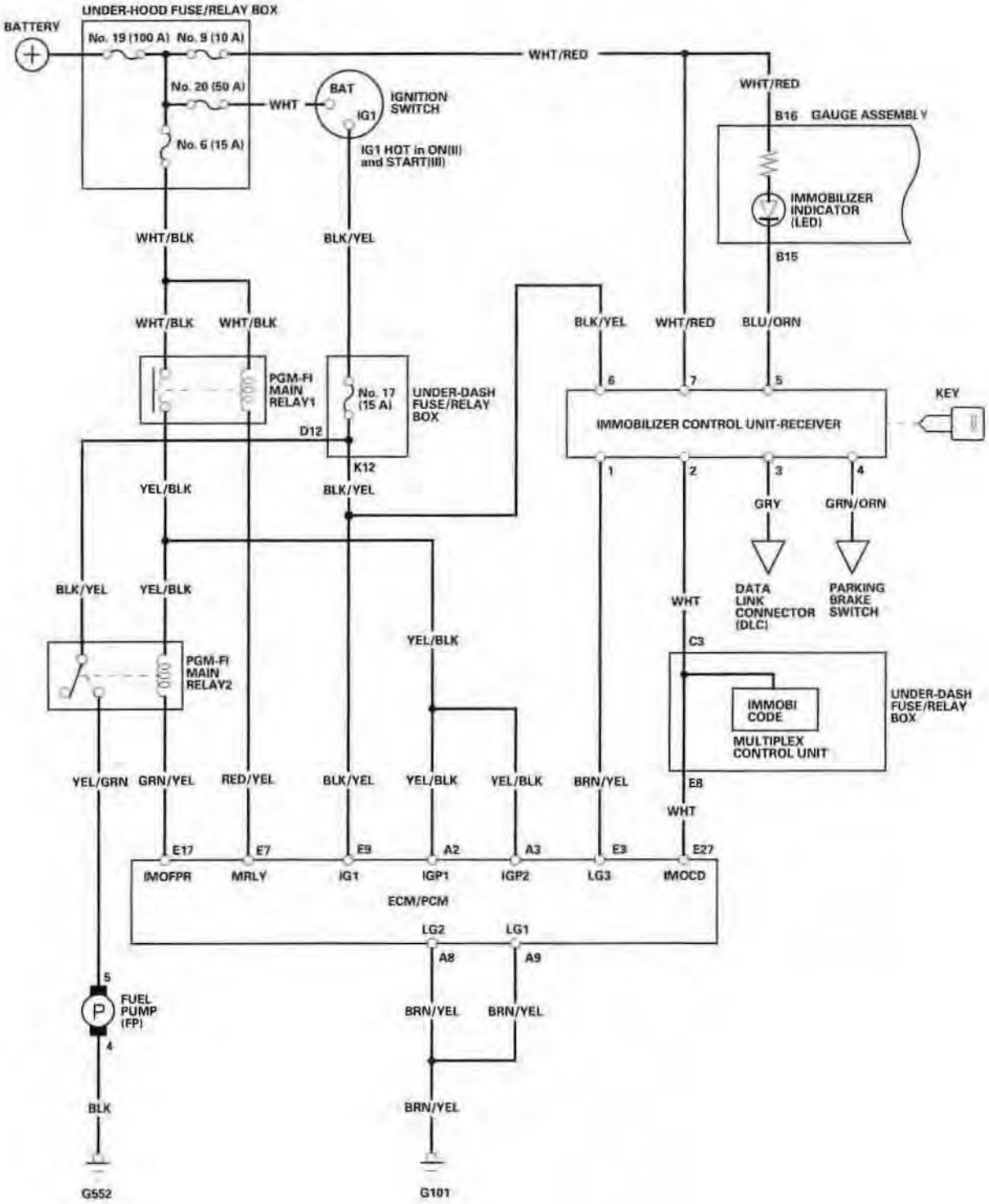
- If the proper key has been used, the immobilizer indicator will come on for about 2 seconds, then go off.
- If the wrong key has been used or the code was not received or recognized by the unit, the indicator will come on for about 2 seconds, then it will blink until the ignition switch is turned OFF. The engine will crank but not start.
- If the ignition switch is turned OFF, the indicator will blink for about 5 seconds to signal that the unit has reset correctly, then the indicator will go off.
- If the customer has lost his key, and cannot start the engine, contact Honda Customer Relations.

IMMOBILIZER INDICATOR LIGHT BLINKING PATTERN:



Immobilizer System

Circuit Diagram



Troubleshooting

1. Turn the ignition switch ON (II) with a programmed key.
2. Check to see if the immobilizer indicator comes on.

   Does the indicator come on?

   YES—Go to step 3.

   NO—Go to step 12.
3. Check the immobilizer indicator operation.

   Does the indicator come on for 2 seconds, then go off?

   YES—Go to step 4.

   NO—Go to step 6.
4. Try to crank the engine.

   Does the starter motor operate?

   YES—Go to step 5.

   NO—Check the starter motor.■
5. Try to start the engine.

   Does the engine start?

   YES—If available, check the Status Log in the immobilizer info with the HDS (see page 22-131). If the Status Log is not available, the immobilizer system is OK at this time.

   NO—Go to step 26.
6. Check to see if the immobilizer indicator comes on and blinks.

   Does the indicator blink?

   YES—Go to step 26.

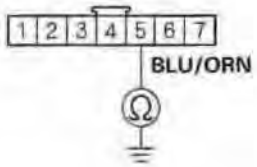
   NO—Go to step 7.
7. Disconnect the 7P connector from the immobilizer control unit-receiver.
8. Check to see if the immobilizer indicator goes off.

   Does the indicator go off?

   YES—Substitute a known-good immobilizer control unit-receiver and/or ECM/PCM.■

   NO—Go to step 9.
9. Turn the ignition switch OFF.
10. Remove the gauge assembly, and disconnect gauge assembly connector B (16P) (see page 22-69).
11. Check for continuity between the immobilizer control unit-receiver 7P connector No. 5 (IMOARM) terminal and body ground.

IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR



Wire side of female terminals

Is there continuity?

YES—Repair a short in the wire.■

NO—Faulty immobilizer indicator, replace the gauge assembly.■

(cont'd)

Troubleshooting (cont'd)

12. Try to start the engine.

    Does the engine start?

    YES—Go to step 13.

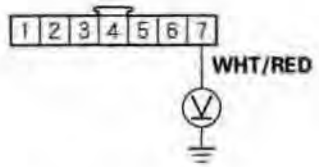
    NO—Go to step 18.

13. Turn the ignition switch OFF.

14. Disconnect the 7P connector from the immobilizer control unit-receiver.

15. Check for voltage between the immobilizer control unit-receiver 7P connector No. 7 (+B) terminal and body ground.

IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

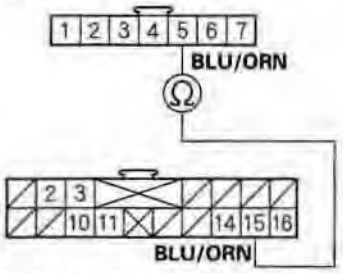
YES—Go to step 16.

NO—Faulty No. 9 (10 A) fuse in the under-hood fuse/relay box. If the fuse is OK, check for an open in the wire between the immobilizer control unit-receiver and under-hood fuse/relay box.■

16. Remove the gauge assembly, and disconnect gauge assembly connector B (16P) (see page 22-69).

17. Check for continuity between the immobilizer control unit-receiver 7P connector No. 5 (IMOARM) terminal and gauge assembly 16P connector No. 15 terminal.

IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR
Wire side of female terminals



GAUGE ASSEMBLY CONNECTOR B (16P)
Wire side of female terminals

Is there continuity?

YES—Faulty immobilizer indicator, replace the gauge assembly.■

NO—Repair an open in the wire.■

18. Turn the ignition switch OFF.

19. Disconnect the 7P connector from the immobilizer control unit-receiver.

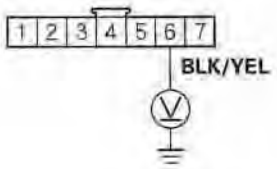
20. Disconnect the ECM/PCM connector E (31P).

21. Attatch the ECM/PCM connector E (31P) No. 7 terminal to body ground with a jumper wire.

22. Turn the ignition switch ON (II).

23. Check for voltage between the immobilizer control unit-receiver 7P connector No. 6 (IG1) terminal and body ground.

IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR



Wire side of female terminals

Is there battery voltage?

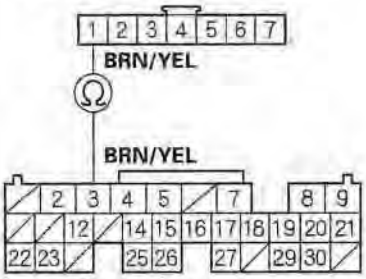
YES—Go to step 24.

NO—Faulty No. 17 (15 A) fuse in the under-dash fuse/relay box. If the fuse is OK, check for an open in the wire between the immobilizer control unit-receiver and under-dash fuse/relay box.■

24. Turn the ignition switch OFF.

25. Check for continuity between the immobilizer control unit-receiver 7P connector No. 1 (LG3) terminal and ECM/PCM connector E (31P) No. 3 terminal.

IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR
Wire side of female terminals



ECM/PCM CONNECTOR E (31P)
Wire side of female terminals

Is there continuity?

YES—Substitute a known-good immobilizer control unit-receiver and/or ECM/PCM.■

NO—Repair an open in the wire. If the wire is OK, repair G101.■

(cont'd)

Troubleshooting (cont'd)

26. Turn the ignition switch OFF.
27. Connect the HDS to the data link connector.
28. Turn the ignition switch ON (II).
29. Look at the System Check in the immobilizer Info with the HDS (see page 22-130).

    Is the immobilizer system normal?

    YES—Go back to step 1.

    NO—Go to step 30.
30. Verify the System Check display on the HDS.

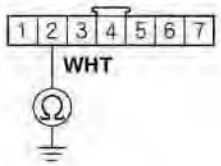
    Does the HDS display the following information?

    - Harness short from the ECM/PCM to the immobilizer unit. (S-net line short)
    - The communication was not good between the ECM/PCM and the immobilizer unit by the battery voltage low.
    - The communication was not good between the immobilizer unit and the ECM/PCM by influence of some noise.
    - Immobilizer unit failure.
    - ECM/PCM failure.

    YES—Go to step 31.

    NO—Go to step 35.
31. Turn the ignition switch OFF.
32. Disconnect the 7P connector from the immobilizer control unit-receiver.
33. Disconnect connector E (31P) from the ECM/PCM.
34. Check for continuity between the immobilizer control unit-receiver 7P connector No. 2 (IMOCD) terminal and body ground.

    IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR

    Wire side of female terminals

    Is there continuity?

    YES—Repair a short in the wire.■

    NO—Substitute a known-good immobilizer control unit-receiver and/or ECM/PCM.■
35. Verify the System Check display on the HDS.

    Does the HDS display the following information?

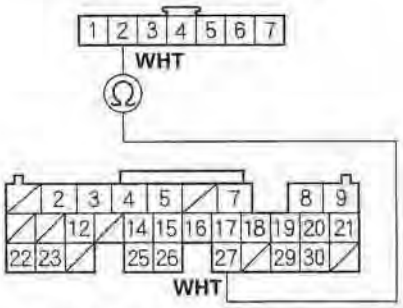
    - Blown fuse
    - Harness open from the ECM/PCM and the immobilizer unit.
    - The communication was not good between the ECM/PCM and the immobilizer unit by battery voltage low.
    - The communication was not good between the immobilizer unit and the ECM/PCM by influence of some noise.
    - Immobilizer unit failure.
    - ECM/PCM failure.

    YES—Go to step 36.

    NO—Check the Possible Failures shown or the System Check display (see page 22-130).
36. Turn the ignition switch OFF.
37. Disconnect the 7P connector from the immobilizer control unit-receiver.
38. Disconnect connector E (31P) from the ECM/PCM.

39. Check for continuity between the immobilizer control unit-receiver 7P connector No. 2 (IMOCD) terminal and ECM/PCM connector E (31P) No. 27 terminal.

IMMOBILIZER CONTROL UNIT-RECEIVER 7P CONNECTOR
Wire side of female terminals



ECM/PCM CONNECTOR E (31P)
Wire side of female terminals

Is there continuity?

YES—Substitute a known-good the immobilizer control unit-receiver and/or ECM/PCM.■

NO—Repair an open in the wire.■

System Check

1. Connect the HDS to the data link connector.
2. Turn the ignition switch ON (II).
3. Monitor the System Check in the Immobilizer Info with the HDS.
4. If the HDS displays the "Immobilizer system is normal", the immobilizer system is OK. If the HDS displays any other messages, check as follows:

Status Log No.	System Check	Possible Failures
A-1	Immobilizer system is not normal	• This key is not registered in the immobilizer unit. Try to register keys by using "KEYS". • The communication was not good between the antenna and the immobilizer key by influence of metal such as key chains. • The communication was not good between the antenna and the immobilizer key by battery voltage low.
A-2	Immobilizer system is not normal	• Intermittent interruption between transponder and immobilizer unit. • The immobilizer key type is different. It is not for this vehicle but for another one or for other company's one. • Key failure (transponder failure) • The communication was not good between the antenna and the immobilizer key by influence of metal such as key chains. • The communication was not good between the antenna and the immobilizer key by battery voltage low.
A-3	Immobilizer system is not normal	• The ignition switch was turned on with a non-immobilizer key. • The immobilizer key type is different. It is not for this vehicle but for another one or for other company's one. • Key failure (transponder failure) • The communication was not good between the antenna and the immobilizer key by influence of metal such as key chains. • The communication was not good between the antenna and the immobilizer key by battery voltage low. • Immobilizer unit failure
B-1	Immobilizer system is not normal	• The ECM/PCM was not registered. Try to register the ECM/PCM by using "REPLACE ECM/PCM". • The communication was not good between the ECM/PCM and the immobilizer unit by battery voltage low. • The communication was not good between the immobilizer unit and the ECM/PCM by influence of some noise.
B-2	Immobilizer system is not normal	• The ECM/PCM was not registered. Try to register the ECM/PCM by using "REPLACE ECM/PCM". • The communication was not good between the ECM/PCM and the immobilizer unit by battery voltage low. • The communication was not good between the immobilizer unit and the ECM/PCM by influence of some noise.
D-1	Immobilizer system is not normal	• Harness short from the ECM/PCM to the immobilizer unit. (S-net line short) • The communication was not good between the ECM/PCM and the immobilizer unit by battery voltage low. • The communication was not good between the immobilizer unit and the ECM/PCM by influence of some noise. • Immobilizer unit failure • ECM/PCM failure
D-3	Immobilizer system is not normal	• Blown fuse • Harness open from the ECM/PCM to the immobilizer unit. • The communication was not good between the ECM/PCM and the immobilizer unit by battery voltage low. • The communication was not good between the immobilizer unit and the ECM/PCM by influence of some noise. • Immobilizer unit failure • ECM/PCM failuer

Status Log

If you suspect there is a immobilizer system problem, check the status log.

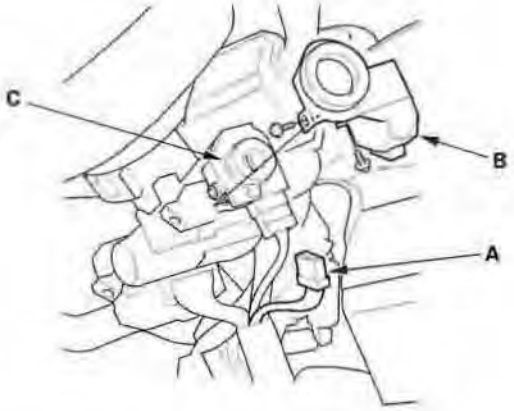
NOTE: Status log may not be available for all models. If you have an updated immobilizer control unit-receiver ('03-04 models) or a '05 model, status log should be available.

1. Connect the HDS to the data link connector.
2. Turn the ignition switch ON (II).
3. On the HDS screen, select Honda systems, select immobilizer set-up, select immobilizer information, then select status log.
4. Check the status log count. Troubleshoot the status with the highest count first. If no counts are listed, the immobilizer system is OK. Continue with normal symptom troubleshooting.

Status Log No.	Detected Item	Probable Cause
A-1	KEY CODE MISMATCH (Code format normal, but code data is mismatch)	1. The key was not registered 2. Interference from metal such as key chains 3. Low battery voltage
A-2	KEY CODE MISMATCH (Code format failure)	1. Ignition switch was turned on with another type of immobilizer key or aftermarket key 2. Interference from metal such as key chains 3. Low battery voltage
A-3	KEY CODE MISMATCH (No key code or non-immobilizer key)	1. Ignition switch was turned on with another type of immobilizer key or aftermarket key 2. Interference from metal such as key chains 3. Low battery voltage 4. Key failure 5. Immobilizer control unit-receiver failure
B-1	ECM/PCM CODE MISMATCH (Code format normal, but code data is mismatch)	1. ECM/PCM was not registered correctly 2. Low battery voltage 3. Poor or loose terminal connections at the immobilizer control unit-receiver 4. Communication line electrical noise
B-2	ECM/PCM MISMATCH (Code format failure)	1. ECM/PCM was not registered correctly 2. Low battery voltage 3. Poor or loose terminal connections at the immobilizer control unit-receiver 4. Communication line electrical noise
D-1	SECURITY-NET LINE PROBLEM (Short to ground)	1. Low battery voltage 2. Poor or loose terminal connections at the immobilizer control unit-receiver and the ECM/PCM 3. Communication line electrical noise
D-3	SECURITY-NET LINE PROBLEM (Open line or ECM/PCM failure)	1. Open or short in the harness from the ECM/PCM to the immobilizer control unit-receiver 2 Low battery voltage 3 Poor or loose terminal connections at the immobilizer control unit-receiver and the ECM/PCM 4 Communication line electrical noise

Immobilizer Control Unit-Receiver Replacement

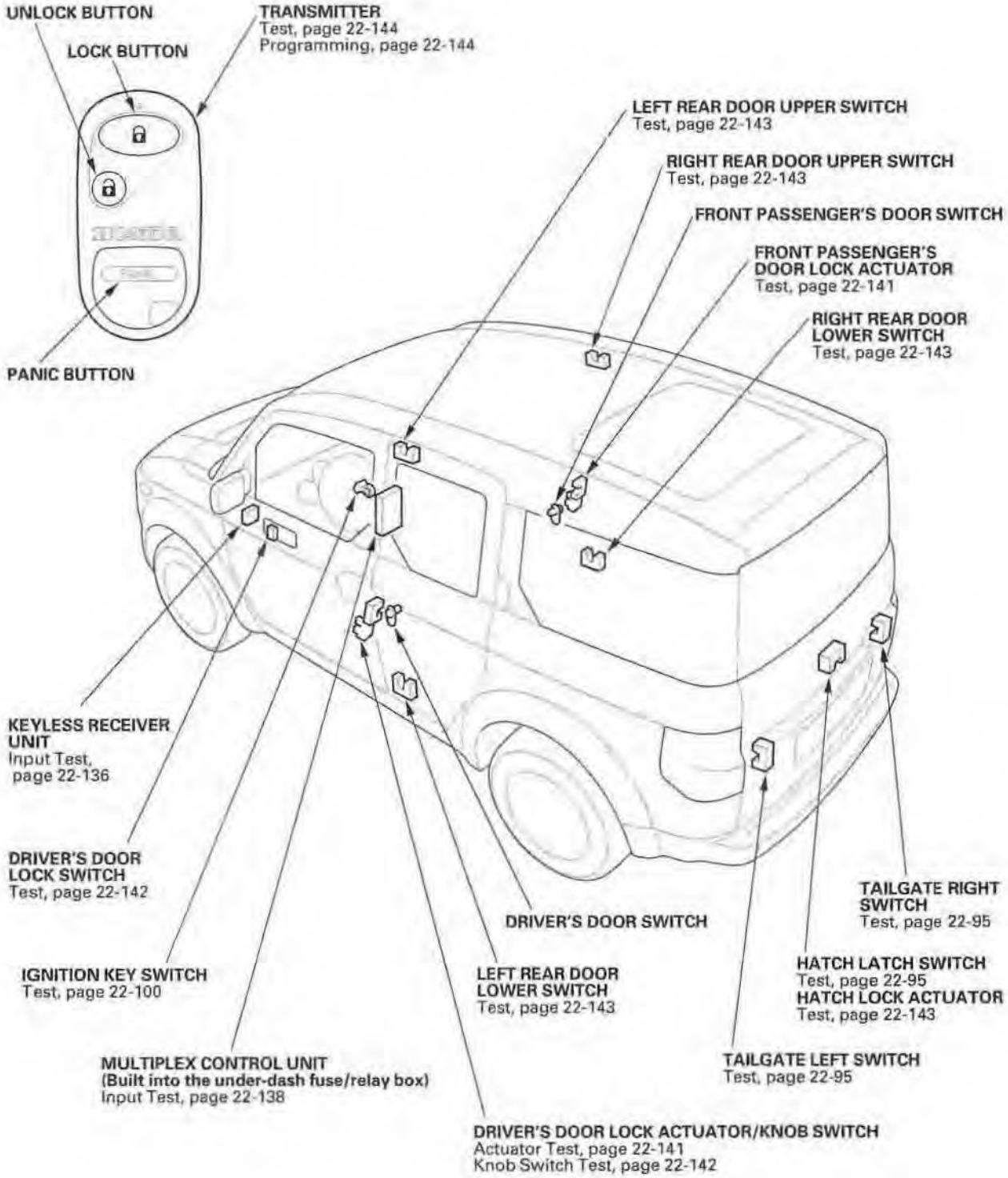
1. Remove the dashboard lower cover (see page 20-73).
2. Remove the steering column covers (see page 17-25).
3. Disconnect the 7P connector (A) from the immobilizer control unit-receiver (B).



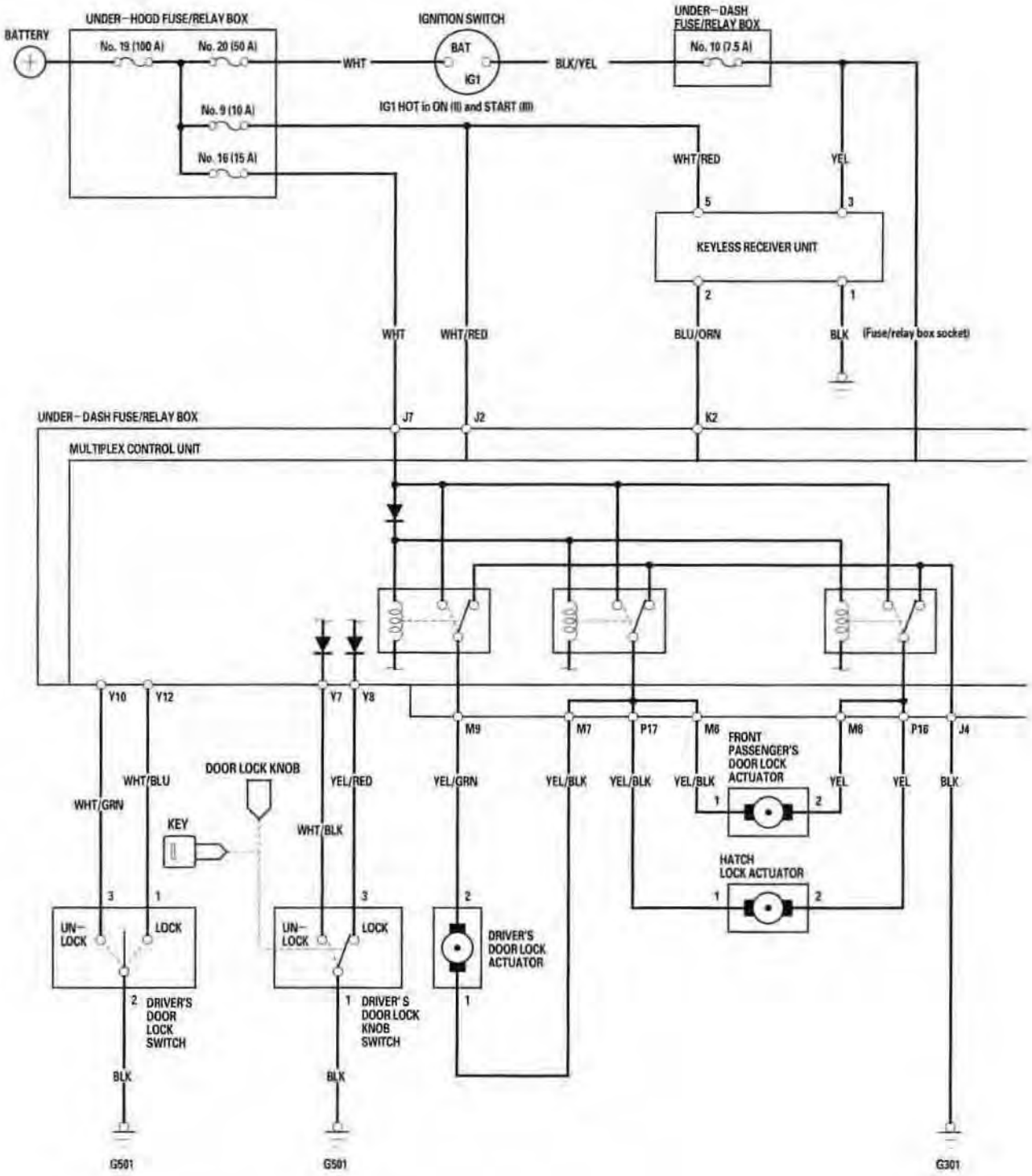
4. Remove the two screws and the immobilizer control unit-receiver from the ignition key cylinder (C).
5. Install the immobilizer control unit-receiver in the reverse order of removal.
6. After replacement, rewrite the unit with the HDS, then check the immobilizer system.

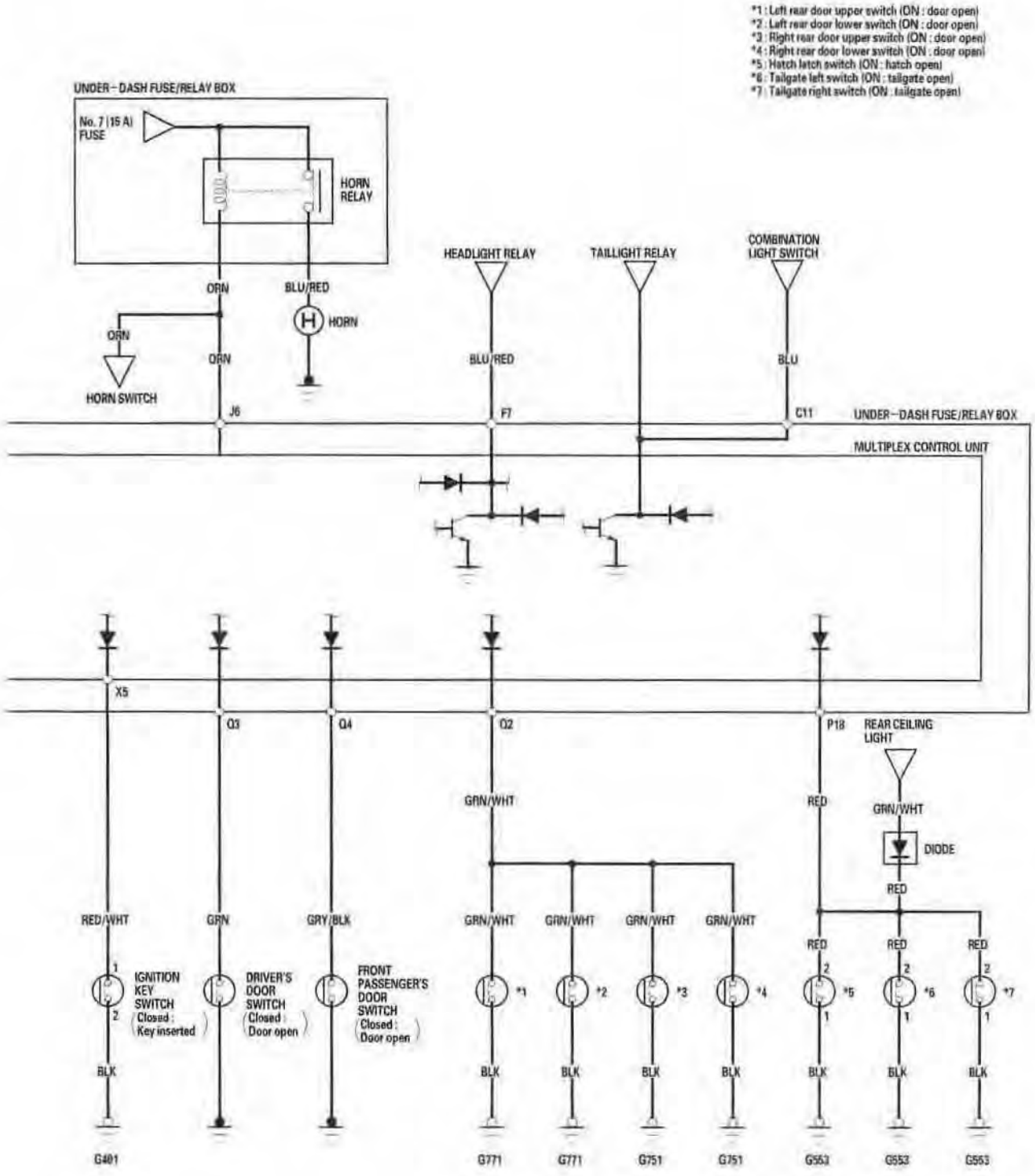
Keyless/Power Door Lock System

Component Location Index



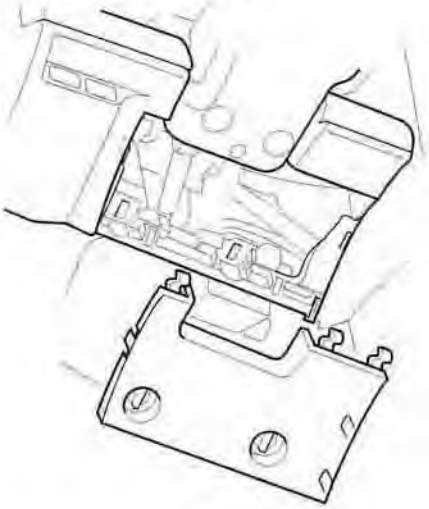
Circuit Diagram



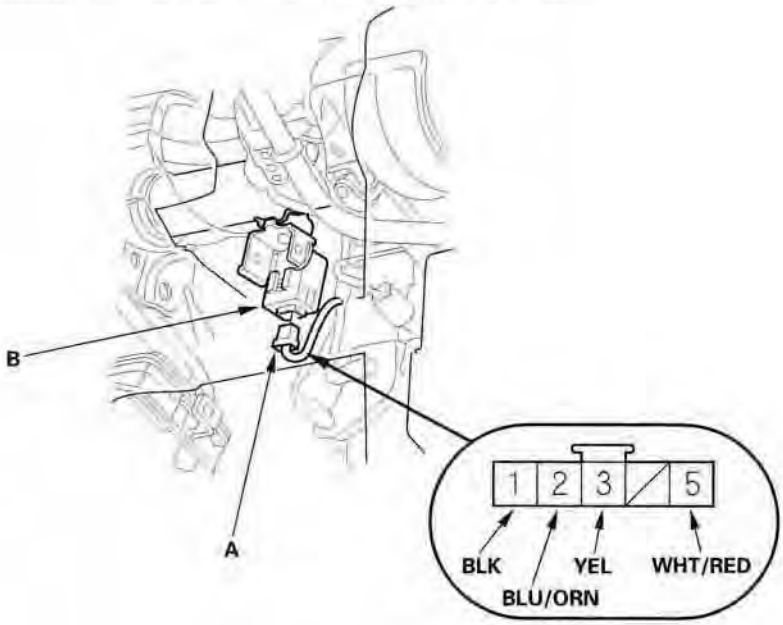

*1 : Left rear door upper switch (ON : door open)
*2 : Left rear door lower switch (ON : door open)
*3 : Right rear door upper switch (ON : door open)
*4 : Right rear door lower switch (ON : door open)
*5 : Hatch latch switch (ON : hatch open)
*6 : Tailgate left switch (ON : tailgate open)
*7 : Tailgate right switch (ON : tailgate open)
UNDER-DASH FUSE/RELAY BOX
No. 7 (15 A) FUSE
HORN RELAY
ORN
BLU/RED
HORN
ORN
ORN
HORN SWITCH
J6
HEADLIGHT RELAY
TAILLIGHT RELAY
COMBINATION LIGHT SWITCH
BLU/RED
BLU
F7
C11
UNDER-DASH FUSE/RELAY BOX
MULTIPLEX CONTROL UNIT
X5
Q3
Q4
Q2
P18
REAR CEILING LIGHT
GRN/WHT
RED
GRN/WHT
DIODE
RED
RED/WHT
GRN
GRY/BLK
GRN/WHT
GRN/WHT
GRN/WHT
GRN/WHT
RED
RED
RED
IGNITION KEY SWITCH (Closed : Key inserted)
DRIVER'S DOOR SWITCH (Closed : Door open)
FRONT PASSENGER'S DOOR SWITCH (Closed : Door open)
*1
*2
*3
*4
*5
*6
*7
BLK
BLK
BLK
BLK
BLK
BLK
BLK
BLK
BLK
G401
G771
G771
G751
G751
G553
G553
G553

Keyless Receiver Unit Input Test

1. Remove the driver's dashboard lower cover (see page 20-73).



2. Disconnect the 5P connector (A) from the Keyless receiver unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.

- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, go to step 4.

4. Reconnect the connector, and make these input tests at the connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G502) • An open in the wire
3	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 10 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
		Ignition switch OFF	Check for voltage to ground: There should be no voltage.	Short to power on No.10 (7.5 A) fuse circuit
5	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10 A) fuse in the under-hood fuse/relay box • An open in the wire

5. Disconnect the connector, and make this input test at the connector.

   - If the test indicates a problem, find and correct the cause, then recheck the system.
   - If the input test proves OK, replace the keyless receiver unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	BLU/ORN	Ignition switch OFF, under-dash fuse/ relay box connector K (17P) disconnected	Check for continuity between the No. 2 terminal and the No. 2 terminal of the under-dash fuse/relay box connector K (17P): There should be continuity. Check for continuity between the No. 2 terminal and body ground: There should be no continuity.	• An open in the wire • A short to ground in the wire

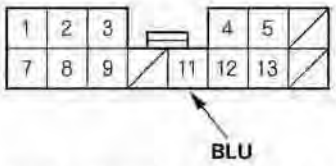
Control Unit Input Test

NOTE: Before testing, troubleshoot the multiplex control system (see page 22-149).

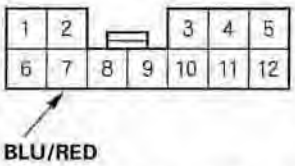
1. Remove the driver's dashboard lower cover (see page 20-73).
2. Disconnect the under-dash fuse/relay box connectors J, M, P, Q, X and Y.

   NOTE: All connectors are wire side of female terminals.

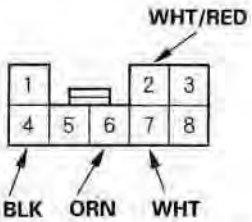
UNDER-DASH FUSE/RELAY BOX CONNECTOR C (14P)



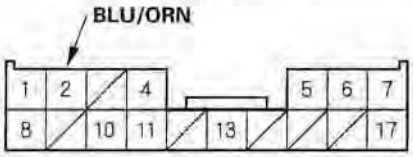
UNDER-DASH FUSE/RELAY BOX CONNECTOR F (12P)



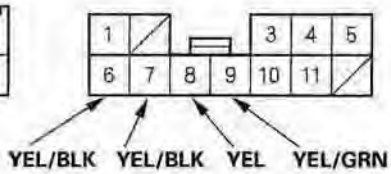
UNDER-DASH FUSE/RELAY BOX CONNECTOR J (8P)



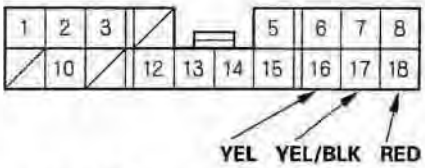
UNDER-DASH FUSE/RELAY BOX CONNECTOR K (17P)



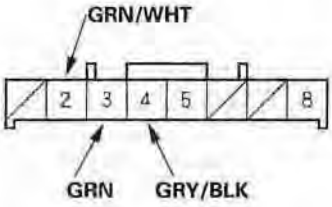
UNDER-DASH FUSE/RELAY BOX CONNECTOR M (12P)



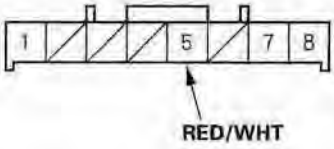
UNDER-DASH FUSE/RELAY BOX CONNECTOR P (18P)



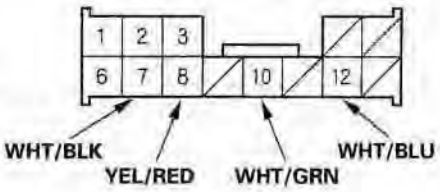
UNDER-DASH FUSE/RELAY BOX CONNECTOR Q (8P)



UNDER-DASH FUSE/RELAY BOX CONNECTOR X (8P)



UNDER-DASH FUSE/RELAY BOX CONNECTOR Y (13P)



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

4. Reconnect all connections to the under-dash fuse/relay box, and make these input tests at the appropriate connectors on the under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
C11	BLU	Under all conditions	Attach to ground: Parking, side marker, license plate lights and taillights should come on.	• Blown No. 2 (15 A) fuse in the under-hood fuse/relay box • Faulty taillight relay • Faulty under-dash fuse/relay box • An open in the wire
F7	BLU/RED	Under all conditions	Attach to ground: Headlights should come on.	• Blown No. 15 or 17 (15 A) fuse in the under-hood fuse/relay box • Faulty headlight relay 1 or 2 • An open in the wire
J2	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (15 A) fuse in the under-hood fuse/relay box • An open in the wire
J4	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G301) • An open in the wire

5. Disconnect the connectors, and make these input tests at the connectors.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
M6 M9	YEL/BLK YEL/GRN	Connect J7 terminal to M6 [M9] terminal, and M9 [M6] terminal to J4 terminal.	Check actuator operation: The driver's door lock actuator should lock [unlock].	• Blown No. 16 (20 A) fuse in the under-hood fuse/relay box • Faulty driver's door lock actuator • An open in the wire
M7 M8	YEL/BLK YEL	Connect J7 terminal to M7 [M8] terminal, and M8 [M7] terminal to J4 terminal.	Check actuator operation: The front passenger's door lock actuator should lock [unlock].	• Blown No. 16 (20 A) fuse in the under-hood fuse/relay box • Faulty front passenger's door lock actuator • An open in the wire
P16 P17	YEL YEL/BLK	Connect J7 terminal to P17 [P16] terminal, and P16 [P17] terminal to J4 terminal.	Check actuator operation: Both rear door lock actuators and the tialgate lock actuator should lock [unlock].	• Blown No. 16 (20 A) fuse in the under-hood fuse/relay box • Faulty left or right door lock actuator • Faulty tailgate lock actuator • An open in the wire

(cont'd)

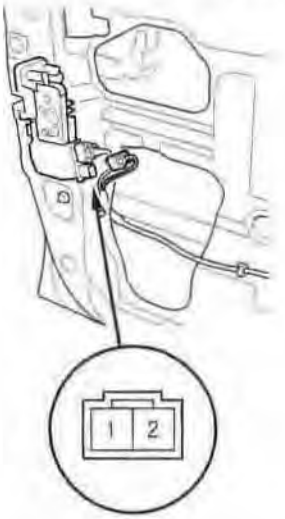
Control Unit Input Test (cont'd)

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J6	ORN	Under all conditions	Attach to ground: The horn should sound.	• Blown No. 7 (15 A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty horn • An open in the wire
J7	WHT	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 16 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
K2	BLU/ORN	Under all conditions	Check for continuity between the K2 terminal and the keyless receiver unit 5P connector No. 2 terminal with the 5P connector disconnected: There should be continuity.	An open in the wire
P18	RED	Tailgate open	Check for voltage to ground: There should be less than 1 V.	• Faulty tailgate switch • An open in the wire
		Tailgate closed	Check for voltage to ground: There should be 5 V or more.	• Faulty tailgate switch • Short to ground
Q3	GRN	Driver's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground
Q4	LT GRN/RED	Passenger's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty passenger's door switch • An open in the wire
		Passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty passenger's door switch • Short to ground
X5	RED/WHT	Ignition key inserted into the ignition switch	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G401) • Faulty ignition key switch • An open in the wire
		Ignition key removed from the ignition switch	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition key switch • Short to ground
Y7	WHT/BLK	Driver's door lock knob switch unlocked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch locked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
Y8	YEL/RED	Driver's door lock knob switch locked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock knob switch • An open in the wire
		Driver's door lock knob switch unlocked	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock knob switch • Short to ground
Y10	WHT/GRN	Driver's door lock switch unlocked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock switch • An open in the wire
		Driver's door lock switch in neutral or LOCK position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground
Y12	WHT/BLU	Driver's door lock switch locked	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G501) • Faulty driver's door lock switch • An open in the wire
		Driver's door lock switch in neutral or UNLOCK position	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door lock switch • Short to ground
P2	BLK/YEL	Press the remote transmitter hatch glass UNLOCK button.	Check for voltage to ground: There should be battery voltage for a moment.	• Poor ground (G601, G701) • Faulty hatch glass opener actuator • An open in a wire

Door Lock Actuator Test

Driver's door

1. Remove the driver's door panel (see page 20-7).
2. Disconnect the 2P connector from the actuator.



3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not work as specified, replace it.

Passenger's door

1. Remove the passenger's door panel (see page 20-7).
2. Disconnect the 2P connector from the actuator.

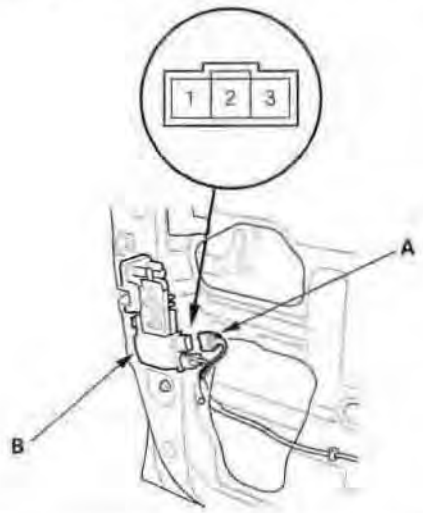
3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not work as specified, replace it.

Door Lock Knob Switch Test

1. Remove the driver's door panel (see page 20-7).
2. Disconnect the 3P connector (A) from the actuator (B).



3. Check for continuity between the No. 1 and No. 3 terminals:
   - There should be continuity when the door lock knob switch is in the LOCKED position.
   - There should be no continuity when the door lock knob switch is in the UNLOCKED position.
4. If the continuity is not as specified, replace the driver's door lock actuator.

Door Lock Switch Test

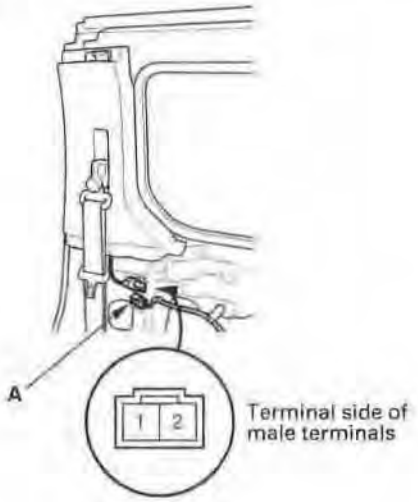
1. Remove the door panel (see page 20-7).
2. Remove the two mounting screws and the door lock switch.

3. Check for continuity between the No. 1 and No. 2 terminals:
   - There should be continuity when the door lock switch is in the LOCKED position.
   - There should be no continuity when the door lock switch is in the neutral or UNLOCKED position.
4. Check for continuity between the No. 2 and No. 3 terminals:
   - There should be continuity when the door lock switch is in the UNLOCKED position.
   - There should be no continuity when the door lock switch is in the neutral or LOCKED position.
5. If the continuity is not as specified, replace the door lock switch.

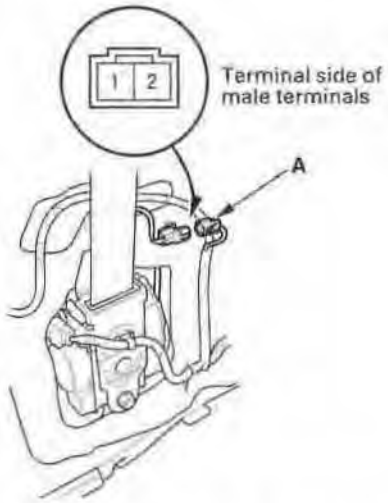
Rear Door Switch Test

1. Remove the rear door panel (see page 20-19).
2. Disconnect the 2P connector (A) from the rear door upper and rear door lower switch.

UPPER:



LOWER:



3. Check for continuity between the 2P connector terminals No. 1 and No. 2.
   - There should be continuity with the rear door open.
   - There should be no continuity with the rear door closed.
4. If the continuity is not as specified, replace the faulty switch.

Hatch Lock Actuator Test

1. Remove the hatch trim panel (see page 20-63).
2. Disconnect the 2P connector from the actuator.

3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

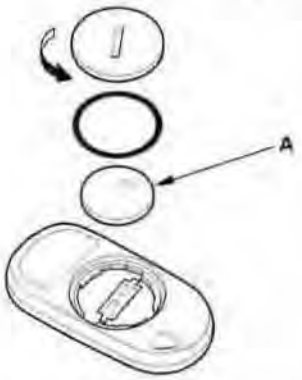
Terminal / Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

4. If the actuator does not operate as specified, replace it.

Transmitter Test

NOTE:
- If the doors unlock or lock with the transmitter, but the LED on the transmitter does not come on, the LED is faulty; replace the transmitter.
- If any door is open, you cannot lock the door with the transmitter.
- If you unlocked the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors relock automatically.
- The doors do not lock or unlock with the transmitter if the ignition key is in the ignition switch.

1. Press the lock or unlock button five or six times to reset the transmitter.
   - If the locks work, the transmitter is OK.
   - If the locks don't work, go to step 2.
2. Open the transmitter, and check for water damage.
   - If you find any water damage, replace the transmitter.
   - If there is no water damage, go to step 3.
3. Replace the transmitter battery (A) with a new one, and try to lock and unlock the doors with the transmitter by pressing the lock or unlock button five or six times.
   - If the doors lock and unlock, the transmitter is OK.
   - If the doors don't lock and unlock, go to step 4.



4. Reprogram the transmitter, then try to lock and unlock the doors with the transmitter.
   - If the doors lock and unlock, the transmitter is OK.
   - If the doors don't lock and unlock, replace the transmitter. If the new transmitter won't lock and unlock the doors, test the keyless receiver unit (see page 22-136).

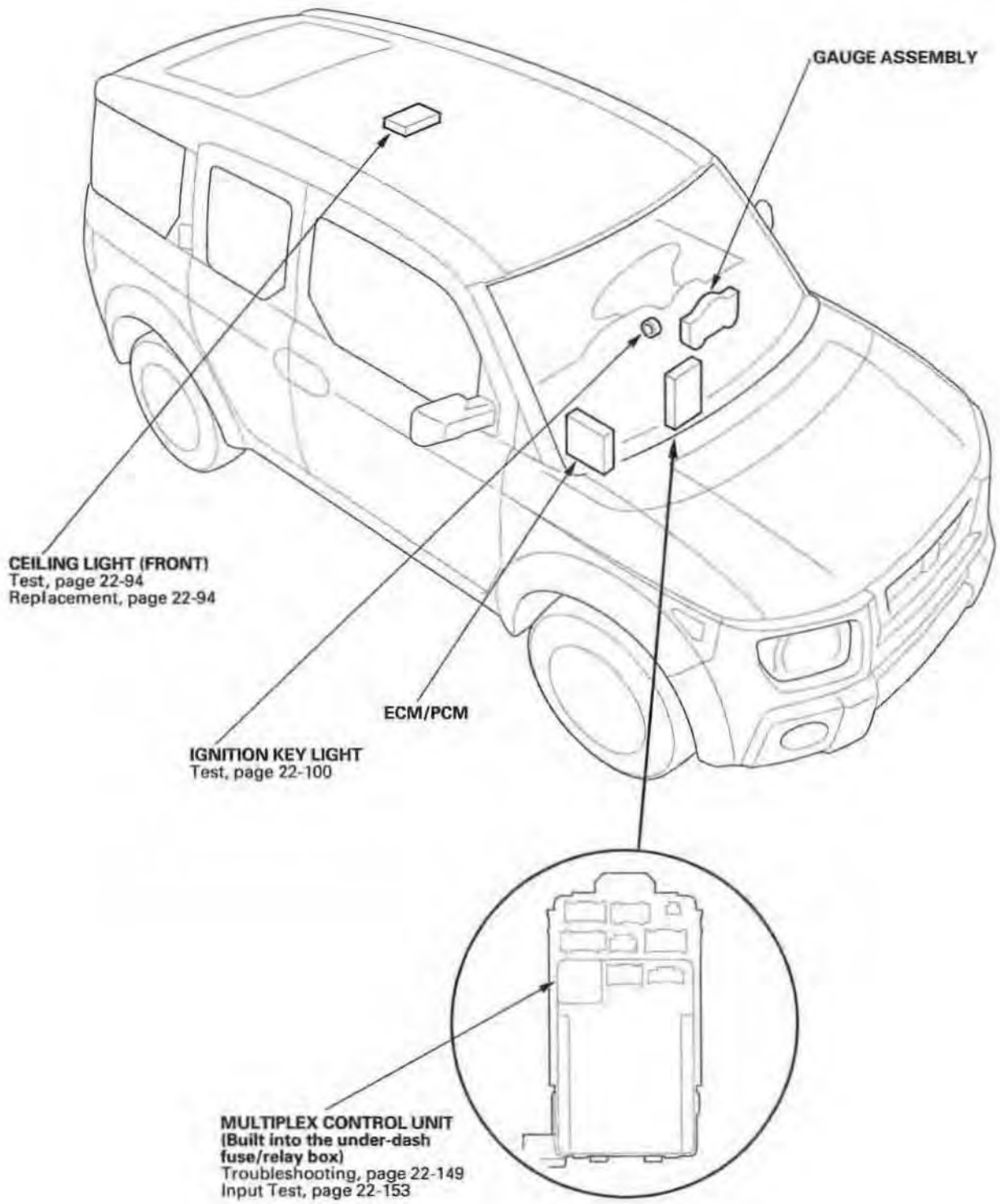
Transmitter Programming

Storing transmitter codes:
The codes of up to three transmitters can be stored into the keyless receiver unit memory. (If a fourth code is stored, the code that was programmed first will be erased.)

NOTE: It is important to maintain the time limits between the steps. Make sure the doors and the tailgate are closed.

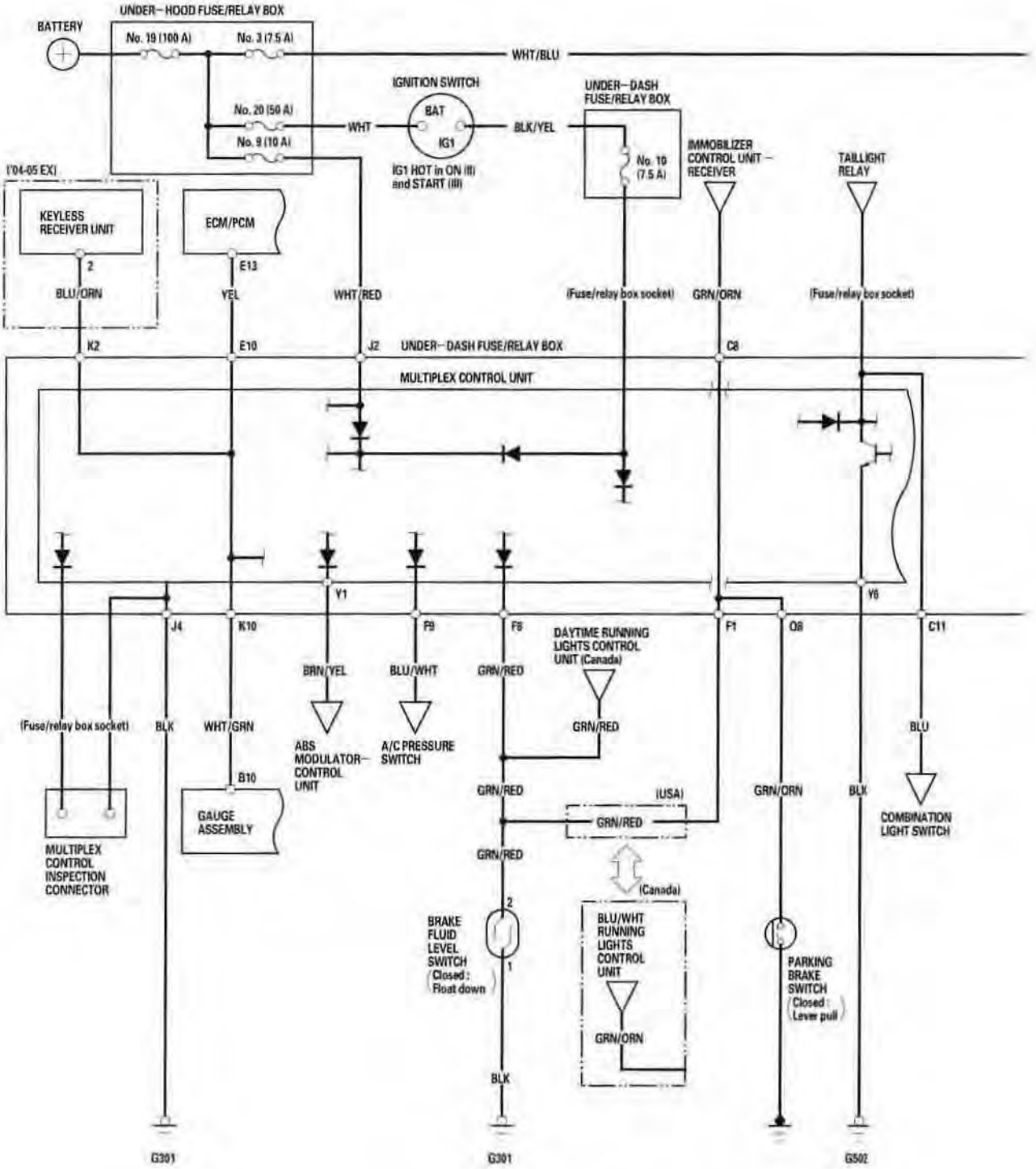
1. Turn the ignition switch ON (II).
2. Within 1 to 4 seconds, push the transmitter lock or unlock button.
3. Within 1 to 4 seconds, turn the ignition switch OFF.
4. Within 1 to 4 seconds, turn the ignition switch ON (II).
5. Within 1 to 4 seconds, push the transmitter lock or unlock button.
6. Within 1 to 4 seconds, turn the ignition switch OFF.
7. Within 4 seconds, turn the ignition switch ON (II).
8. Within 1 to 4 seconds, push the transmitter lock or unlock button.
9. Within 1 to 4 seconds, turn the ignition switch OFF.
10. Within 4 seconds, turn the ignition switch ON (II).
11. Within 1 to 4 seconds, push the transmitter lock or unlock button.
12. Confirm you can hear the sound of the door lock actuators. Within 1 to 4 seconds, push the transmitter lock or unlock button again.
13. Within 10 seconds, press the transmitter lock or unlock buttons on the two additional transmitters. Confirm that you can hear the sound of the door lock actuators after each transmitter code is stored.
14. Turn the ignition switch OFF, and remove the key.
15. Confirm proper operation of the transmitters.

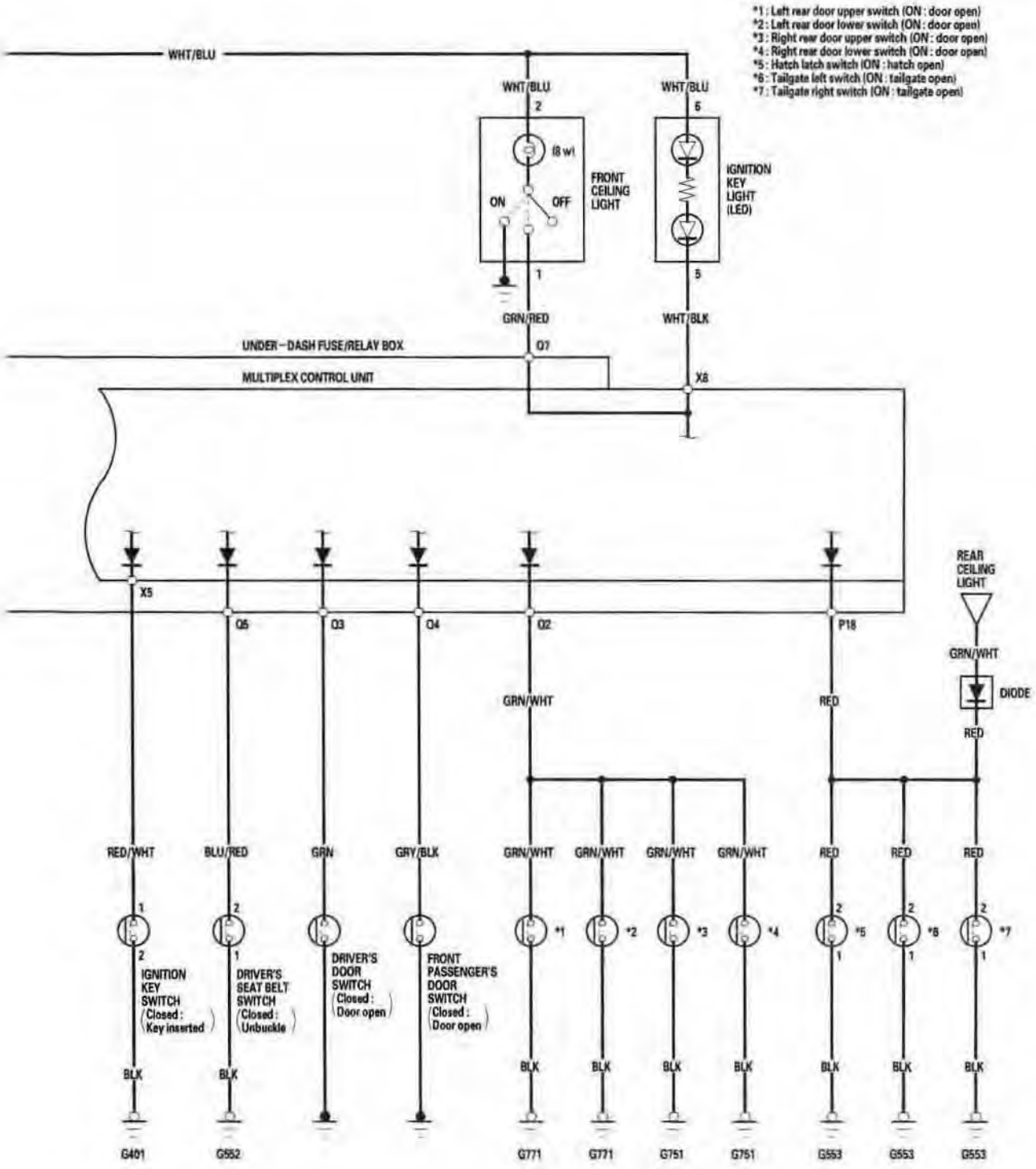
Component Location Index



Multiplex Control System

Circuit Diagram




*1 : Left rear door upper switch (ON : door open)
*2 : Left rear door lower switch (ON : door open)
*3 : Right rear door upper switch (ON : door open)
*4 : Right rear door lower switch (ON : door open)
*5 : Hatch latch switch (ON : hatch open)
*6 : Tailgate left switch (ON : tailgate open)
*7 : Tailgate right switch (ON : tailgate open)
WHT/BLU
WHT/BLU
2
WHT/BLU
6
(8 W)
FRONT CEILING LIGHT
ON
OFF
IGNITION KEY LIGHT (LED)
1
5
GRN/RED
WHT/BLK
UNDER – DASH FUSE/RELAY BOX
Q7
MULTIPLEX CONTROL UNIT
X8
X5
Q5
Q3
Q4
Q2
P18
REAR CEILING LIGHT
GRN/WHT
DIODE
RED
GRN/WHT
RED
RED/WHT
BLU/RED
GRN
GRY/BLK
GRN/WHT
GRN/WHT
GRN/WHT
GRN/WHT
RED
RED
RED
IGNITION KEY SWITCH (Closed : Key inserted)
DRIVER'S SEAT BELT SWITCH (Closed : Unbuckle)
DRIVER'S DOOR SWITCH (Closed : Door open)
FRONT PASSENGER'S DOOR SWITCH (Closed : Door open)
*1
*2
*3
*4
*5
*6
*7
BLK
BLK
BLK
BLK
BLK
BLK
BLK
BLK
BLK
BLK
G401
G552
G771
G771
G751
G751
G553
G553
G553

Multiplex Control System

System Description

The multiplex control system has four internal functions:

- Multiplexing (send multiple signals over shared wires)
- Wake up/sleep (runs at full power only on demand to reduce battery draw)
- Fail-safe (fixes or ignores faulty signals)
- Self-diagnosis (Mode 1 for system DTCs, Mode 2 for input lines)

The system controls the function of these circuits:

- Entry light control (ignition key light and ceiling light)
- Wiper/washer (intermittent wipe and park functions)
- Interlock system
- Power Door Lock
- Gauge assembly (temperature gauge and indicators)
- HVAC (Compressor and fan control)
- Key-in reminder
- Lights-on reminder
- Seat belt reminder
- Keyless entry ('04-05 EX model)

Multiplex Communication

To reduce the number of wire harnesses, digital signals are sent via shared multiplex communication lines rather than sending normal electrical signals through individual wires.

- The input signals from each switch are converted to digital signals at the central processing unit (CPU).
- The digital signals are sent from the transmitting unit to the receiving unit as serial data signals.
- The transmitted signal is converted to a switch signal at the receiving unit, and it operates the related component or performs a function.
- There are exclusive communication lines between the ECM/PCM, the gauge assembly, the keyless receiver unit ('04-05 EX model), and the under-dash fuse/relay box.

Wake-up and Sleep

The multiplex control system has "wake-up" and "sleep" functions to decrease parasitic draw on the battery when the ignition switch is OFF.

- In the sleep mode, the multiplex control unit stops functioning (communication and CPU control) when it is not necessary for the system to operate.
- As soon as any operation is requested (for example, a door is unlocked), the related control unit in the sleep mode immediately wakes up and begins to function.
- When the ignition switch is turned OFF, and the driver's or front passenger's door is opened, then closed, there is about a 40 second delay before the control unit goes from the wake-up mode to the sleep mode.
- If any door is open, the sleep mode will not function.
- If a key is in the ignition switch, the sleep mode will not function.
- When in sleep mode, the draw is reduced from 200 mA to less than 35 mA.

Fail-safe

To prevent improper operation, the multiplex control system has a fail-safe function. In the fail-safe mode, the output signal is fixed when any part of the system malfunctions (for example, a faulty control unit or communication line).
Each control unit has a hardware fail-safe function that fixes the output signal when there is any CPU malfunction, and a software fail-safe function that ignores the signal from the malfunctioning control unit and allows the system to operate normally.

Troubleshooting

Special Tools Required
MPCS Service Connector 07WAZ-001010A

1. Check the No. 9 (10 A) fuse in the under-hood fuse/relay box and the No. 10 (7.5 A) fuse in the under-dash fuse/relay box.

   Are the fuses OK?

   YES—Go to step 2.

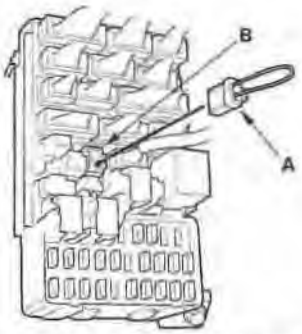
   NO—Find and repair the cause of the blown fuse. ■

2. Remove the driver's dashboard lower cover (see page 20-73).

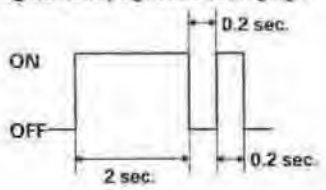
3. Switch the ceiling light to the middle position. Close all doors. Turn the ignition switch ON (II). If the driver's seat belt is unbuckled, the beeper will beep five times.

4. Check self-diagnosis function Mode 1 for a diagnostic trouble code (DTC) by connecting the special tool (A) to the multiplex control inspection connector (B). After about 5 seconds, the ignition key light and ceiling light should come on for 2 seconds, go out, then blink once for 0.2 second. This means that you are in Mode 1 of the self-diagnosis function.

   NOTE: To cancel Mode 1, disconnect the MPCS service connector from the multiplex control inspection connector for more than 10 seconds or turn the ignition switch OFF.



MODE 1: Ignition key light and ceiling light



   Did the blinking lights confirm that you are in Mode 1?

   YES—Count the blinks, then go to step 5.

   NO—See if the SCS circuit is working properly, then go to step 6.

5. Check for continuity between the connector J of under-dash fuse/relay box No. 4 terminal and body ground.

   Is there continuity?

   YES—Faulty under-dash fuse/relay box. Replace and check for DTCs.

   NO—Repair the open in the wire or poor ground (G301), and recheck for DTCs. ■

6. If there is a DTC, it will blink, pause, then repeat the DTC as long as the ignition switch is ON (II).

   Is there a repeating DTC?

   YES—Count the blinks, then go to step 7.

   NO—Go to step 8.

(cont'd)

Troubleshooting (cont'd)

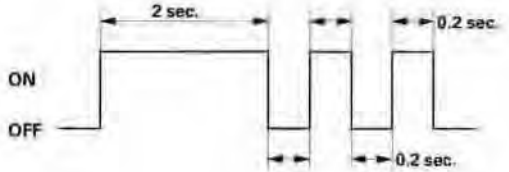
7. About 1 second after you go into self-diagnosis Mode 1, the ceiling light will indicate the DTC, and repeat it every 3 seconds. If there is more than one DTC, the system will indicate them in ascending order, beginning from the DTC with the lowest numerical value. Troubleshoot the DTCs as indicated:

   - DTC 1, 2, and 3 (ECM/PCM P0600) simultaneously: Check for a short to body ground in the YEL wire between multiplex control unit terminal E10 and ECM/PCM terminal E13, in the WHT/GRN wire between multiplex control unit terminal K10 and gauge assembly terminal B10. If both wires are OK, substitute a known-good multiplex control unit, gauge assembly, and ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
   - DTC 2 and 5 simultaneously: Check for an open in the YEL wire between multiplex control unit terminal E10 and ECM/PCM terminal E13. If the wire is OK, substitute a known-good multiplex control unit, gauge assembly, and ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
   - DTC 1 and 6 simultaneously: Check for an open in the WHT/GRN wire between multiplex control unit terminal K10 and gauge assembly terminal B10, and (on '04-05 EX model) in the BLU/ORN wire between the keyless receiver unit terminal No. 2 and the multiplex control unit terminal K2. If the wire is OK, substitute a known-good multiplex control unit, gauge assembly, and ECM/PCM one at a time, in that order, and recheck for the DTCs after each substitution.
   - DTC 1 only (no other DTCs present): Substitute a known-good gauge assembly and a multiplex control unit one at a time, in that order, and recheck for the DTC after each substitution.
   - DTC 2 only (no other DTCs present): Substitute a known-good multiplex control unit and a ECM/PCM one at a time, in that order, and recheck for the DTC after each substitution.
   - DTC 3 only (no other DTCs present): Substitute a known-good multiplex control unit, and recheck for the DTC.
   - DTC 5 only (no other DTCs present): Substitute a known-good gauge assembly, and recheck for the DTC.
   - DTC 6 only (no other DTCs present): Update the ECM/PCM if it does not have the latest software, or substitute a known-good ECM/PCM, then recheck (see page 11-6). If the symptom/indication goes away with a known-good ECM/PCM, replace the original ECM/PCM. ■

DTC	Cause
1	The multiplex control unit cannot receive signals from the gauge assembly.
2	The multiplex control unit cannot receive signals from the ECM/PCM.
3	The multiplex control unit cannot receive signals from itself.
5	The gauge assembly cannot receive signals from multiplex control unit and the ECM/PCM.
6	The ECM/PCM cannot receive signals from multiplex control unit and the gauge assembly.

8. From Mode 1, disconnect the special tool from the multiplex control inspection connector for about 5 to 10 seconds, then reconnect it. The ceiling light should come on for 2 seconds, go out, then blink twice more at 0.2 second intervals. This means the system has gone from Mode 1 to Mode 2.

MODE 2:



NOTE: To cancel Mode 2, disconnect the SCS service connector from the multiplex control inspection connector for more than 10 seconds or turn the ignition switch OFF.

9. Look in the following table for the switches most closely related to the problem. While still in Mode 2, operate the switches. If the circuit is OK, the ceiling light should blink once. If the circuit is faulty, there will be no indication.
In the table below is a list of circuits that can be checked in Mode 2.

Windshield washer switch (ON)
Windshield wiper switch (INT)
Windshield wiper moter (Auto stop)
Driver's door switches (doors open, one at a time)
Driver's rear door switches
Passenger's door switches (doors open, one at a time)
Passenger's rear door switches
Hatch latch switch (hatch open)
Tailgate latch switches (tailgate open)
NOTE: For tailgate switches to work, hatch latch must be manually latched.
Parking brake switch (ON)
Driver's door lock switch (LOCK/UNLOCK)
Driver's door lock knob switch (LOCK)
Driver's seat belt switch (UNLATCH)
A/C switch (ON, with fan switch ON)
Combination light switch (parking lights ON)
ECM/PCM communication line (disconnect and reconnect)
Gauge assembly communication line (disconnect and reconnect)
Brake pedal position switch (pedal pressed)
Transmission range switch (P, R, D, 2, 1)

NOTE: You can check the rear door switches individually if the others are latched.

Does the ceiling light blink?

YES—Go to Sleep and Wake-up Mode Test (see page 22-152).■

NO—Go to step 10.

10. Check two or three other circuits listed in the chart.

Does the ceiling light blink for each circuit?

YES—The additional circuits are OK. Repair the short or open in the circuit that failed the test in step 9.■

NO—Multiple failed circuits can mean that the control unit has failed without triggering a DTC. Test a few more circuits. If they also fail, test the multiplex control unit inputs (see page 22-153). If all the input test are OK, substitute a known-good multiplex control unit, gauge assembly, or ECM/PCM, one at a time, then recheck. If the system works properly, the part that was substituted is faulty; replace it. If there is still a malfunction, substitute a known-good control unit for the next most likely faulty control unit, then recheck. If the system works properly, that control unit is faulty; replace it.■

Sleep and Wake-up Mode Test

1. Shift to the sleep mode:
   Turn the ignition switch OFF, and remove the key. If the control unit receives no signals from the inputs listed, it will go into sleep mode in less than 40 seconds.

Multiplex Control Unit No. 10 (7.5 A) under-dash fuse
Headlight switch (parking lights position OFF) Driver's door switch (door closed) Passenger's door switches (doors closed) Hatch latch switch (hatch closed) Tailgate latch switch (tailgate closed)

2. Confirm the sleep mode:

   - Check for voltage on the YEL or WHT/GRN wires.
   - There should be battery voltage in the sleep mode. Check the parasitic draw at the battery while shifting into the sleep mode. Amperage should change from about 200 mA to less than 35 mA.

3. Shift to the wake up mode:
   When the ignition switch is turned ON (II), the multiplex control unit, gauge assembly, and ECM/PCM wake up at the same time without "talking" to each other through the communication lines. When any switch in the multiplex system is turned on, it wakes up its related control unit which, in turn, wakes up the other units.

   After confirming the sleep mode, look in the following table for the switch most closely related to the problem. Operate that switch and see if its control unit wakes up.

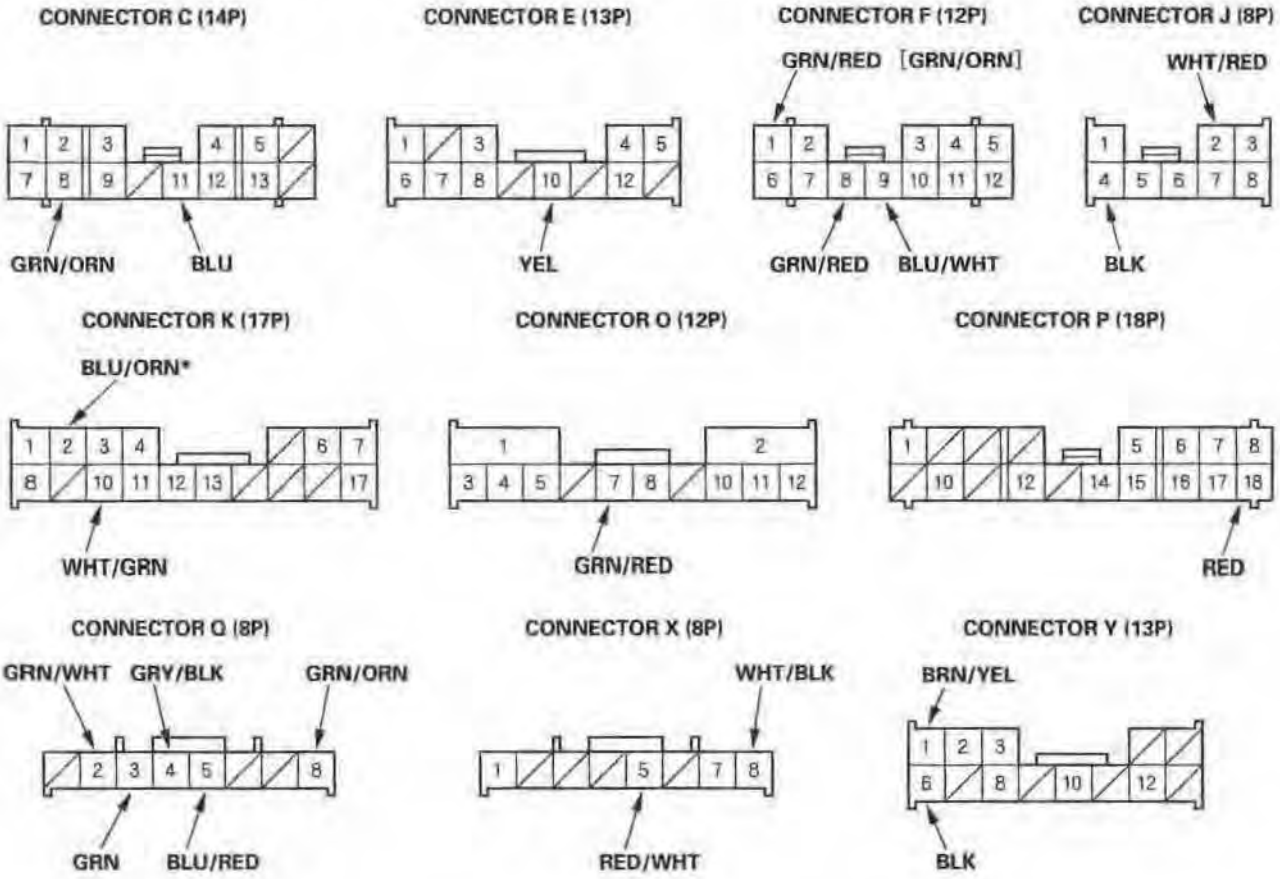
   NOTE: If any control unit is faulty and will not wake up, several circuits in the system will malfunction at the same time.
   In the table, the control unit is followed by a list of the switches and input signals that can wake it up.

Multiplex Control Unit No. 10 (7.5 A) under-dash fuse
Communication lines (ECM/PCM, keyless receiver unit ('04-05 EX model), and gauge assembly)
Headlight switch (parking lights position ON) Driver's door switch (door open) Ignition key cylinder switch (key inserted or removed) Ignition switch (ON position)

Multiplex Control Unit Input Test

NOTE: Before continuing with the multiplex control unit input test, do the multiplex troubleshooting (see page 22-149).

1. Remove the driver's dashboard lower cover (see page 20-73).
2. Disconnect the under-dash fuse/relay box connectors C, E, F, J, K, O, P, Q, X and Y.
   NOTE: All connectors are wire side of female terminals.



[ ] : Canada
*: '04-05 EX model

3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

(cont'd)

Multiplex Control Unit Input Test (cont'd)

4. Reconnect the connectors to the under-dash fuse/relay box, and make these input tests at the appropriate connectors on the under-dash fuse/relay box.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, the multiplex control unit must be faulty, replace the under-dash fuse/relay box assembly.

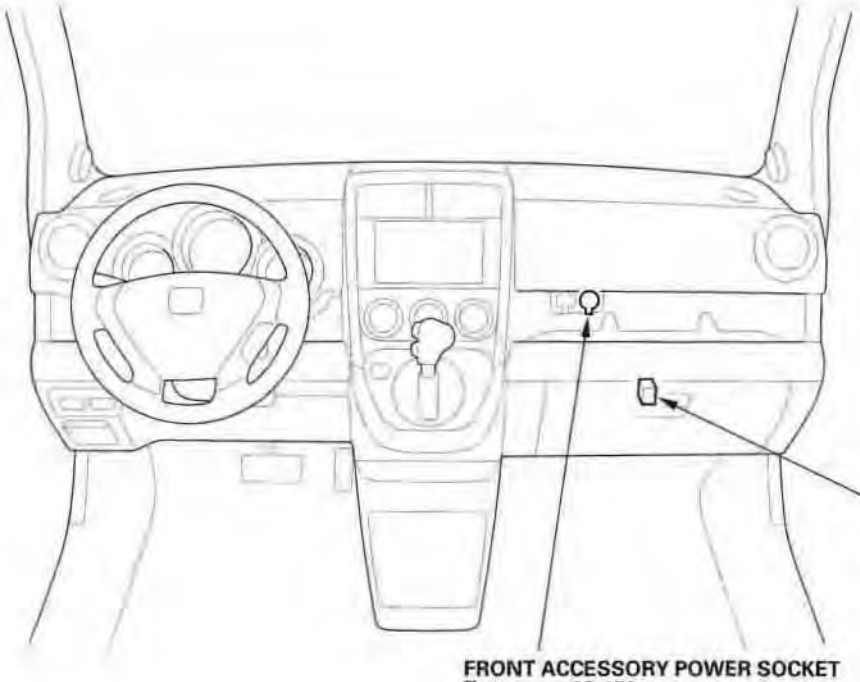
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J4	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G301) • An open in the wire
Y6	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G502) • An open in the wire
J2	WHT/RED	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10 A) fuse in the under-hood fuse/relay box • An open in the wire
Q3	GRN	Driver's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's door switch • An open in the wire
		Driver's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's door switch • Short to ground • Faulty multiplex control unit
Q4	GRY/BLK	Front passenger's door open	Check for voltage to ground: There should be less than 1 V.	• Faulty front passenger's door switch • An open in the wire
		Front passenger's door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty front passenger's door switch • Short to ground • Faulty multiplex control unit
Q2	GRN/WHT	Rear door open	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G751, G771) • Faulty rear door switch • An open in the wire
		Rear door closed	Check for voltage to ground: There should be 5 V or more.	• Faulty rear door switch • Short to ground • Faulty multiplex control unit
Q8 + C8 + F1	GRN/ORN - GRN/RED	Parking brake lever pulled	Check for voltage to ground: There should be less than 1 V.	• Faulty parking brake switch • An open in the wire
		Parking brake lever released	Check for voltage to ground: There should be about 5 V or more.	• Faulty parking brake switch • Short to ground • Faulty multiplex control unit
Q5	BLU/RED	Ignition switch ON (II), driver's seat belt is unbuckled.	Check for voltage to ground: There should be less than 1 V.	• Faulty driver's seat belt switch • Poor ground (G551) • An open in the wire
		Ignition switch ON (II), driver's seat belt is buckled.	Check for voltage to ground: There should be 5 V or more.	• Faulty driver's seat belt switch • Short to ground • Faulty multiplex control unit
P18	RED	Hatch or tailgate open	Check for voltage to ground: There should be less than 1 V.	• Faulty hatch or tailgate latch switch • An open in the wire
		Hatch or tailgate closed	Check for voltage to ground: There should be 5 V or more.	• Faulty hatch or tailgate latch switch • Short to ground • Faulty multiplex control unit

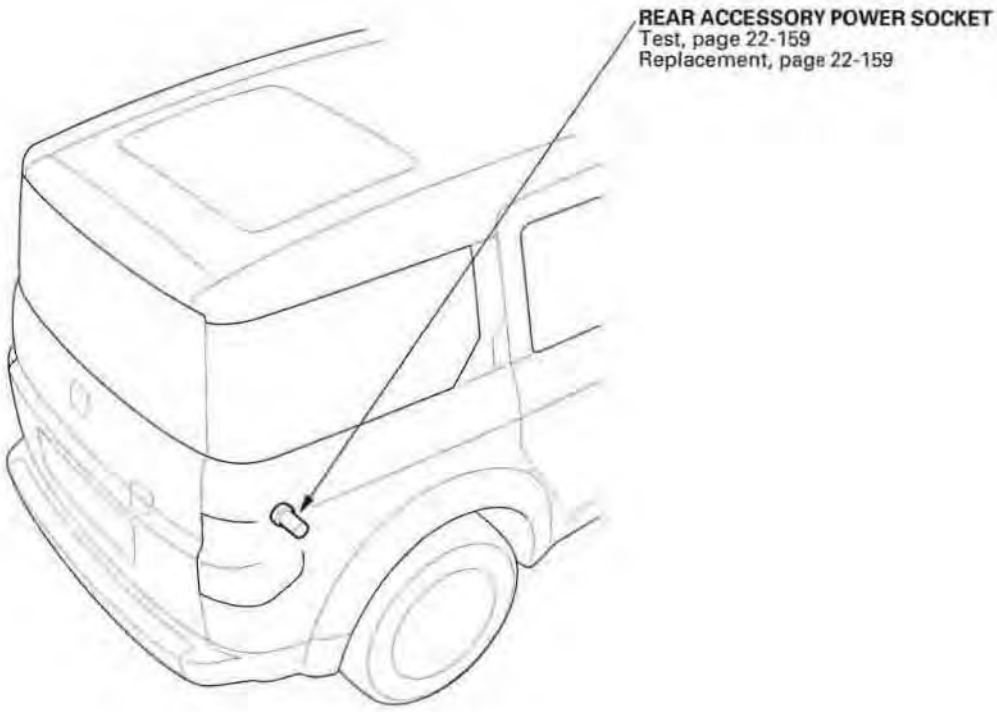
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
X5	RED/WHT	Ignition key is in the ignition switch.	Check for voltage to ground: There should be less than 1 V.	• Faulty ignition key switch • Poor ground (G401) • An open in the wire
		Ignition key is out of the ignition switch.	Check for voltage to ground: There should be 5 V or more.	• Faulty ignition key switch • Short to ground • Faulty multiplex control unit
X8	WHT/BLK	With all doors closed	Attach to ground: The ignition key light should come on.	• Blown No. 3 (7.5 A) fuse in the under-hood fuse/relay box • Blown LED • An open in the wire
O7	GRN/RED	Ceiling light switch in the top position, all doors closed	Attach to ground: The ceiling light, spotlights should come on.	• Blown No. 3 (7.5 A) fuse in the under-hood fuse/relay box • Faulty ceiling light or spotlights • An open in the wire
C11	BLU	Under all conditions	Attach to ground: Dash lights should come on.	• Blown No. 2 (15 A) fuse in the under-hood fuse/relay box • Faulty taillight relay • An open in the wire
F8	GRN/RED	Parking brake released, disconnect the brake fluid level switch 2P connector, and jump the GRN/RED and BLK wires.	Check for voltage to ground: There should be less than 1 V.	• Faulty brake fluid level switch • An open in the wire
		Parking brake released, brake level switch connector disconnected, jumper wire removed.	Check for voltage to ground: There should be 5 V or more.	• Faulty brake fluid level switch • Short to ground • Faulty multiplex control unit
E10	YEL	All doors and tailgate closed, ignition key removed	Check for voltage to ground: There should be battery voltage in the sleep mode and 3—7 volts when awake.	• An open or short in the wire • Faulty multiplex control unit
K10	WHT/GRN	All doors and tailgate closed, ignition key removed	Check for voltage to ground: There should be battery voltage in the sleep mode and 3—7 volts when awake.	• An open or short in the wire • Faulty multiplex control unit
K2*	BLU/ORN			
Y1	BRN/YEL	ABS control unit-modulator disconnected	Check for continuity between the Y1 terminal and the No. 13 terminal of the ABS modulator-control unit: There should be continuity.	An open in the wire
F9	BLU/WHT	Air conditioning switch OFF	Check for voltage to ground: There should be about 5 V or more.	An open or short in the wire

*: '04-05 EX model

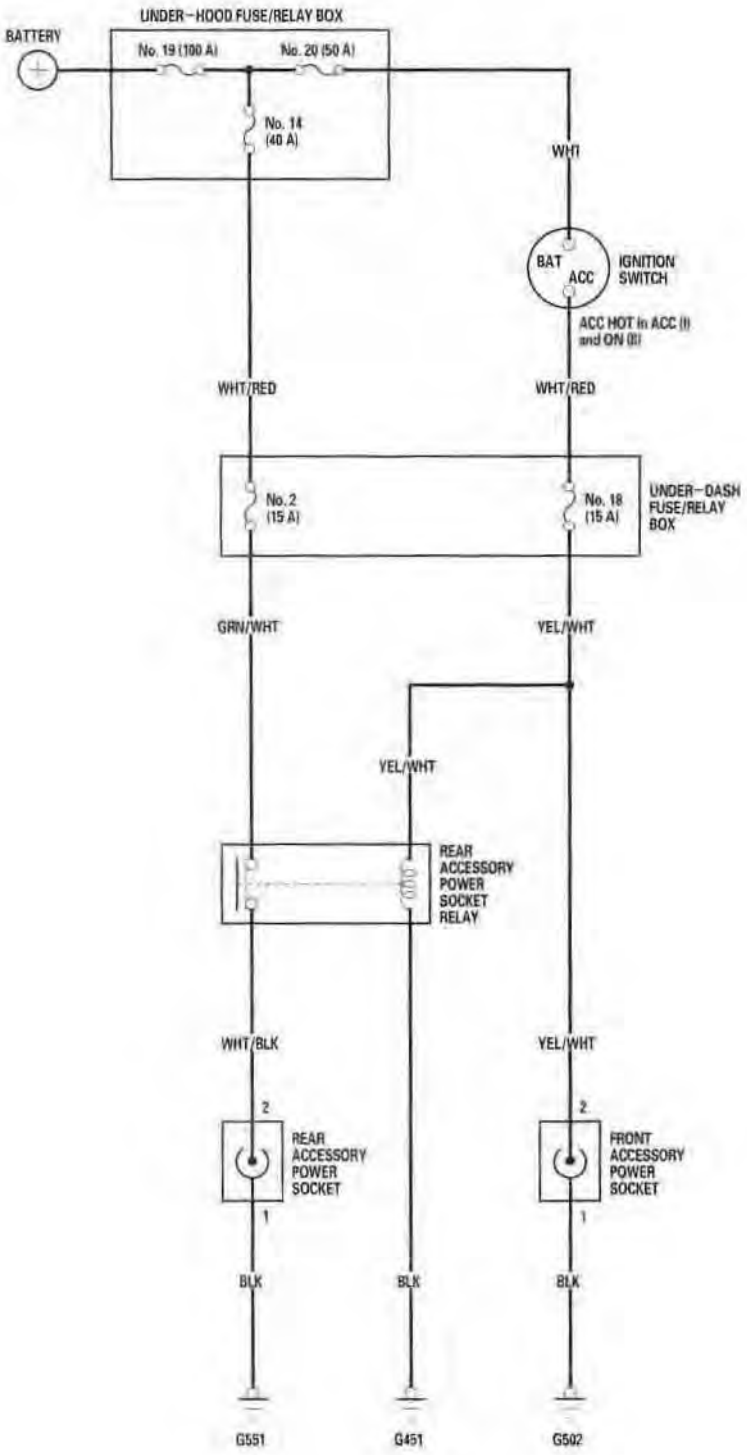
Accessory Power Sockets

Component Location Index





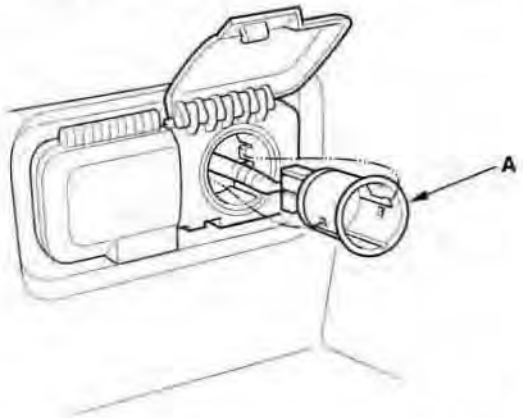
Circuit Diagram



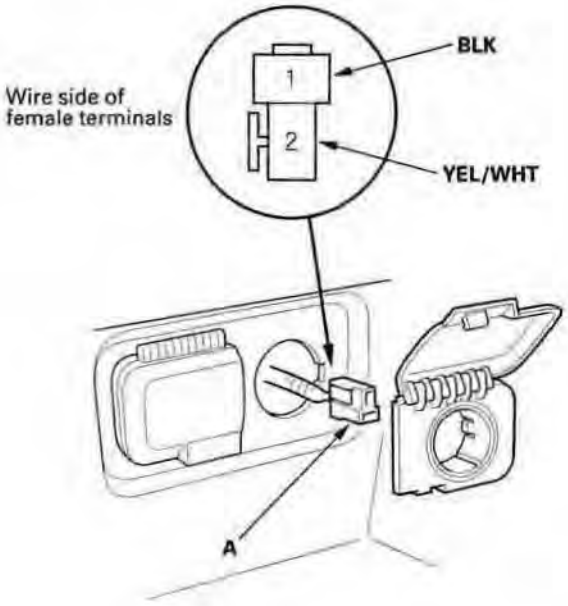
Accessory Power Socket Test/Replacement

Front

1. Carefully pry the accessory power socket and housing (A) out from the dashboard.



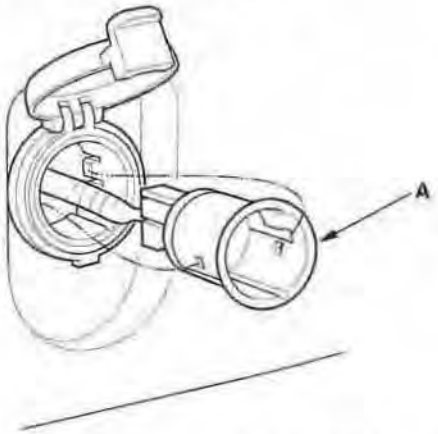
2. Disconnect the 2P connector (A) from the socket.



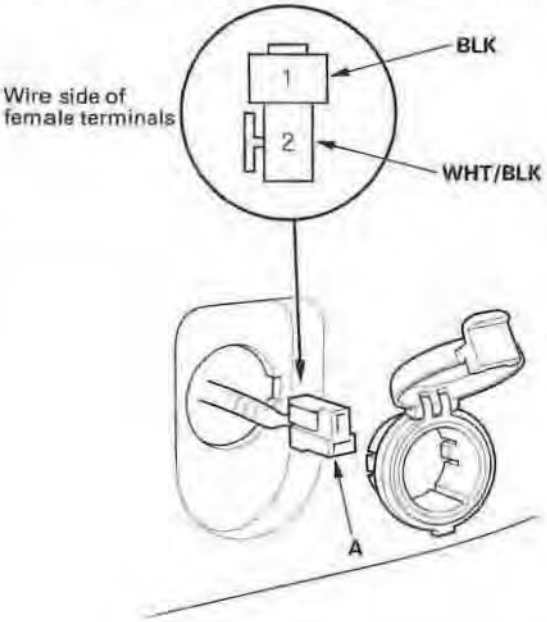
3. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.
4. Turn the ignition switch to ACC (I), and check for voltage between the No. 1 and No. 2 terminals.
   - There should be battery voltage.
   - If there is no battery voltage, check for:
     - Poor ground (G502).
     - An open in the wire.
     - Blown No. 18 (15 A) fuse in the under-dash fuse/relay box.

Rear

1. Carefully pry the accessory power socket (A) out from the right rear side trim panel.

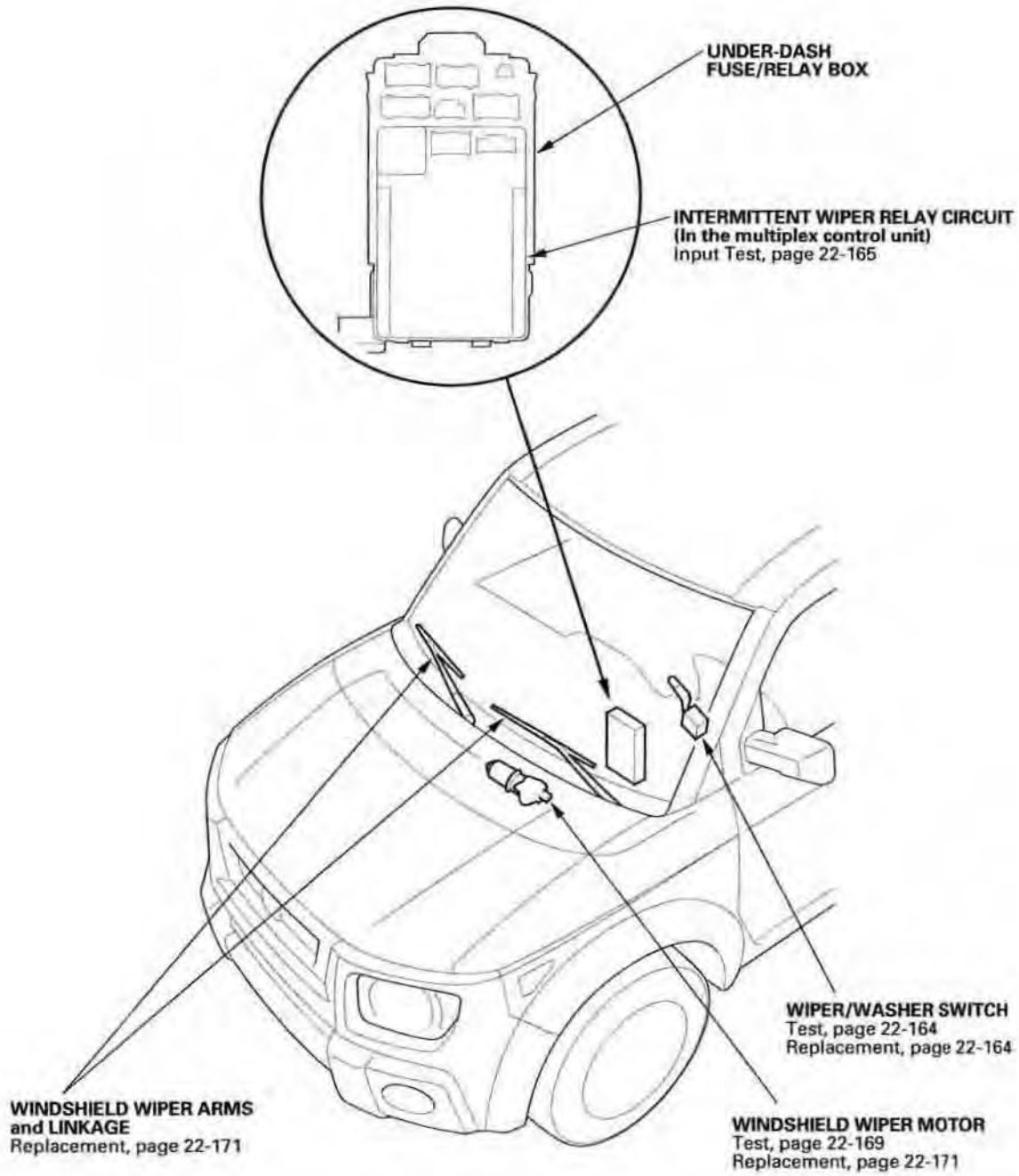


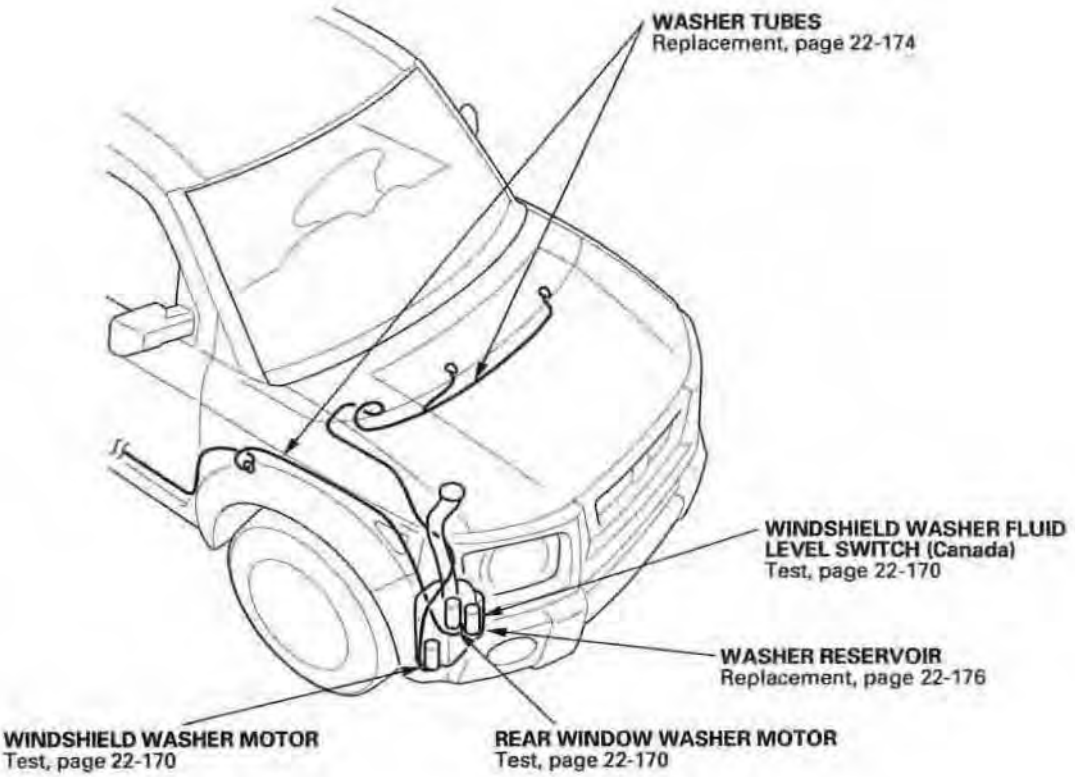
2. Disconnect the 2P connector (A) from the socket.



3. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.
4. Turn the ignition switch to ACC (I), and check for voltage between the No. 1 and No. 2 terminals.
   - There should be battery voltage.
   - If there is no battery voltage, check for:
     - Poor ground (G451, G551).
     - An open in the wire.
     - Blown No. 18 (15 A) fuse in the under-dash fuse/relay box.
     - Blown No. 2 (15 A) fuse in the under-dash fuse/relay box.
     - Faulty rear accessory power socket relay.

Component Location Index

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WINDSHIELD WASHER FLUID LEVEL SWITCH (Canada)
Test, page 22-170
WASHER RESERVOIR
Replacement, page 22-176
WINDSHIELD WASHER MOTOR
Test, page 22-170
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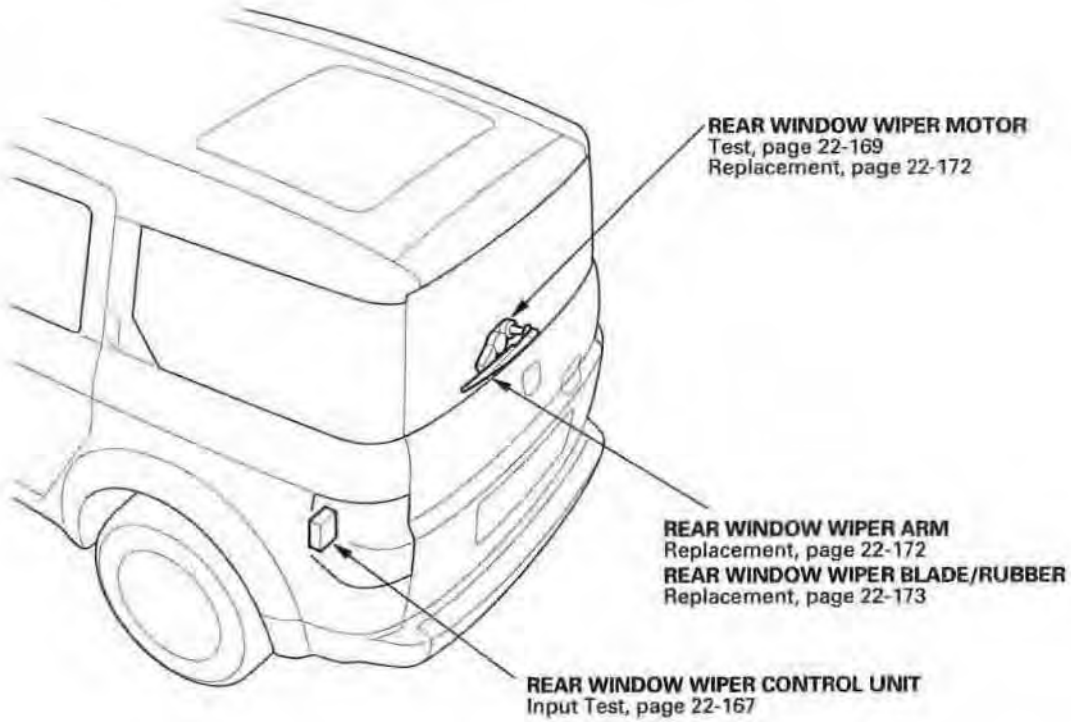
REAR WINDOW WIPER MOTOR
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REAR WINDOW WIPER ARM
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REAR WINDOW WIPER BLADE/RUBBER
Replacement, page 22-173
REAR WINDOW WIPER CONTROL UNIT
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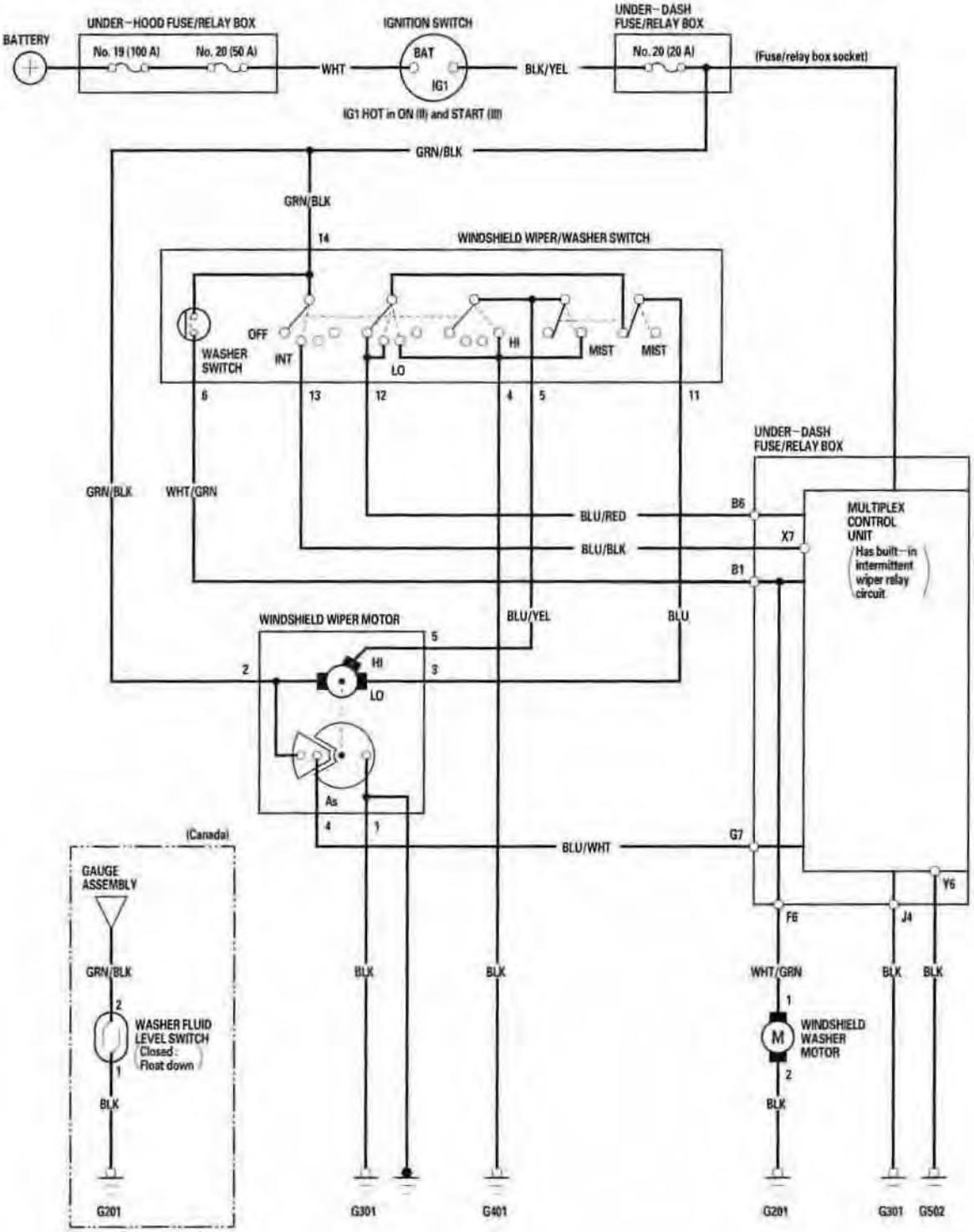
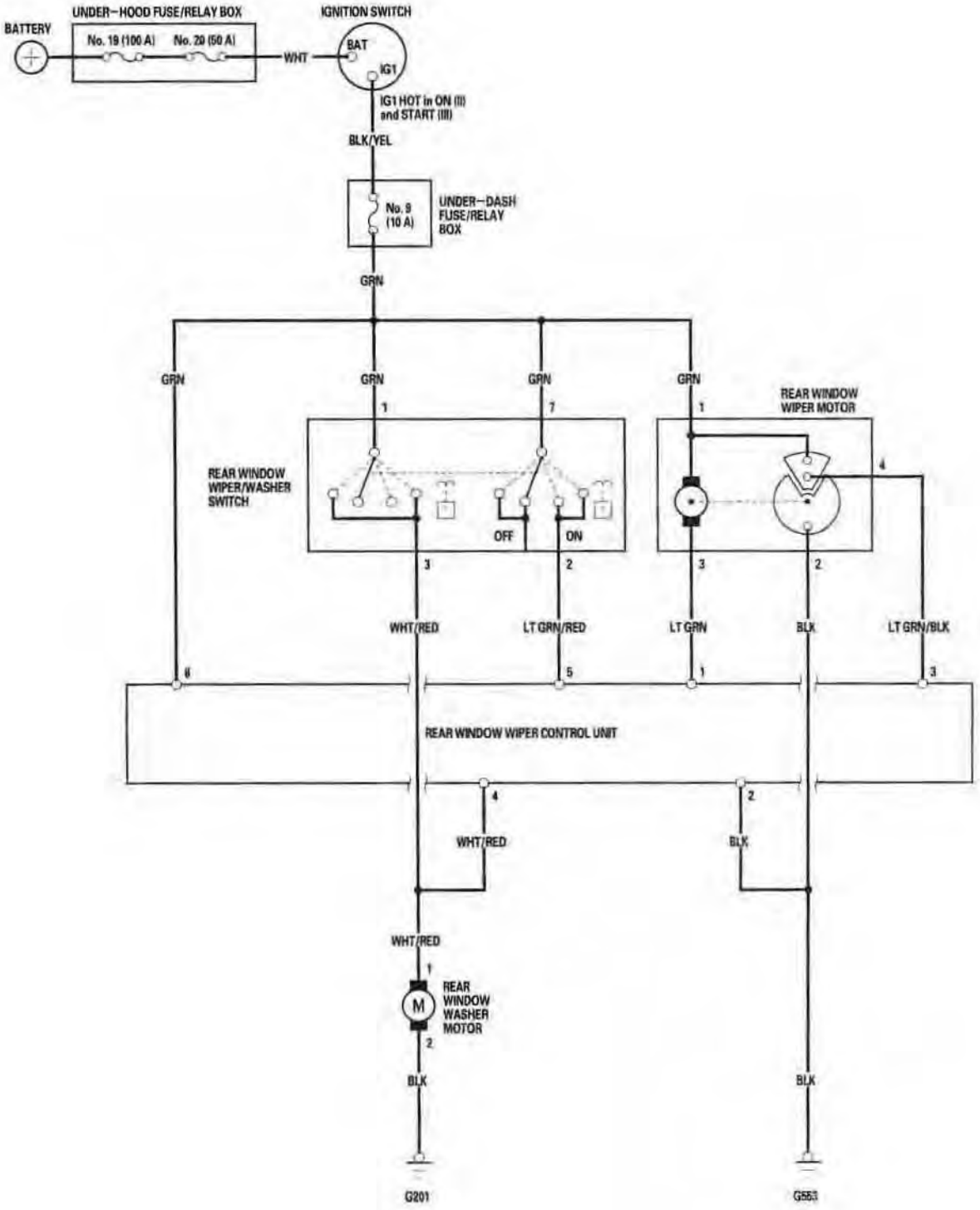
Circuit Diagram - Windshield

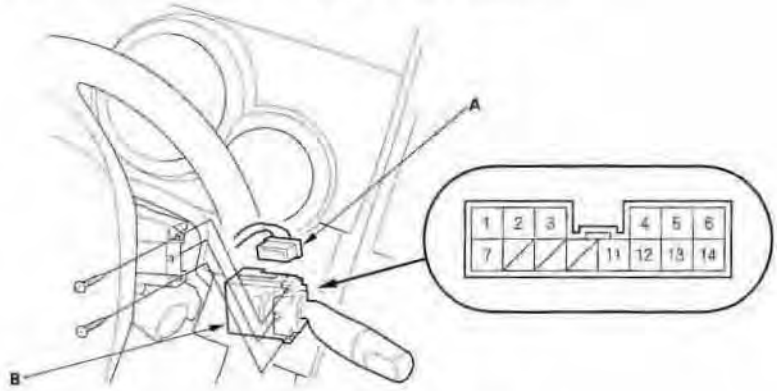


Circuit Diagram - Rear Window



Wiper/Washer Switch Test/Replacement

1. Remove the driver's dashboard lower cover (see page 20-73).
2. Remove the steering column covers (see page 17-25).
3. Disconnect the 14P connector (A) from the wiper/washer switch (B).



4. Remove the two screws, then pull out the wiper/washer switch.
5. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, check for continuity between the terminals in each switch position according to the tables. If the continuity is not as specified, replace the switch.

Windshield:

Terminal / Position	4	5	6	11	12	13	14
OFF				○	○		
INT				○	○	○	○
LO	○			○			
HI	○	○					
Mist switch ON	○	○					
Washer switch ON			○				○

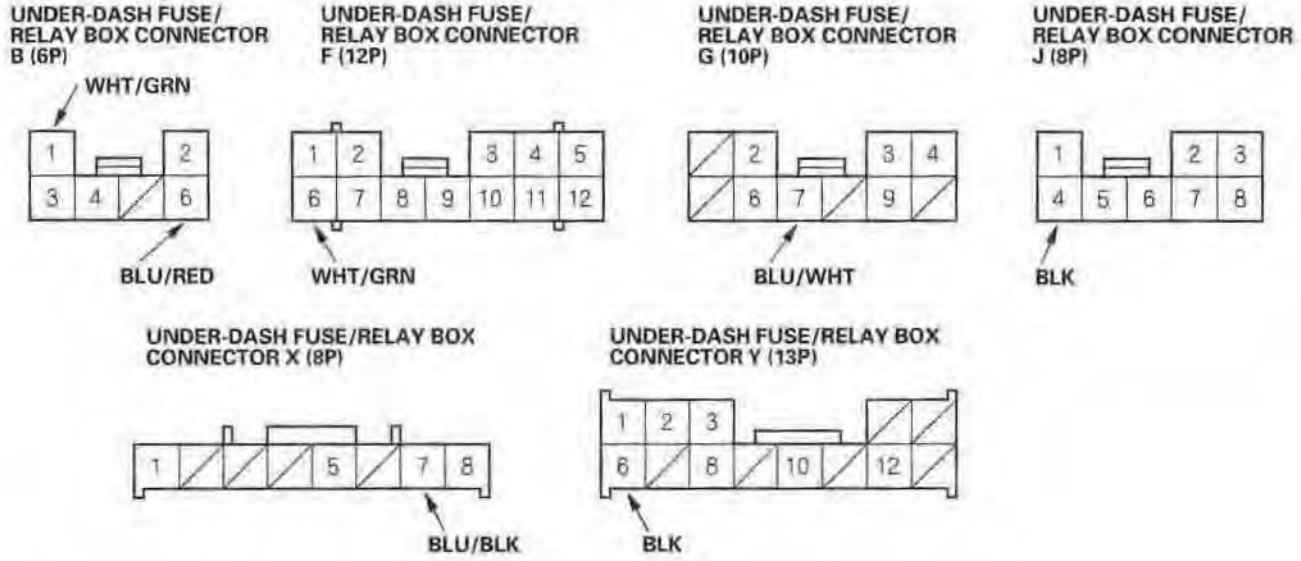
Rear Window:

Terminal / Position	1	2	3	7
Washer switch ON and wiper switch OFF	○		○	
OFF				
ON		○		○
Wiper and Washer switch ON	○	○	○	○

Control Unit Input Test

1. Before testing, troubleshoot the multiplex control system (see page 22-149).
2. Remove the dashboard lower cover (see page 20-73).
3. Disconnect the under-dash fuse/relay box connectors B, F, G, J, X and Y.

   NOTE: All connectors are wire side of female terminals.



4. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals are OK, go to step 5.

(cont'd)

Control Unit Input Test (cont'd)

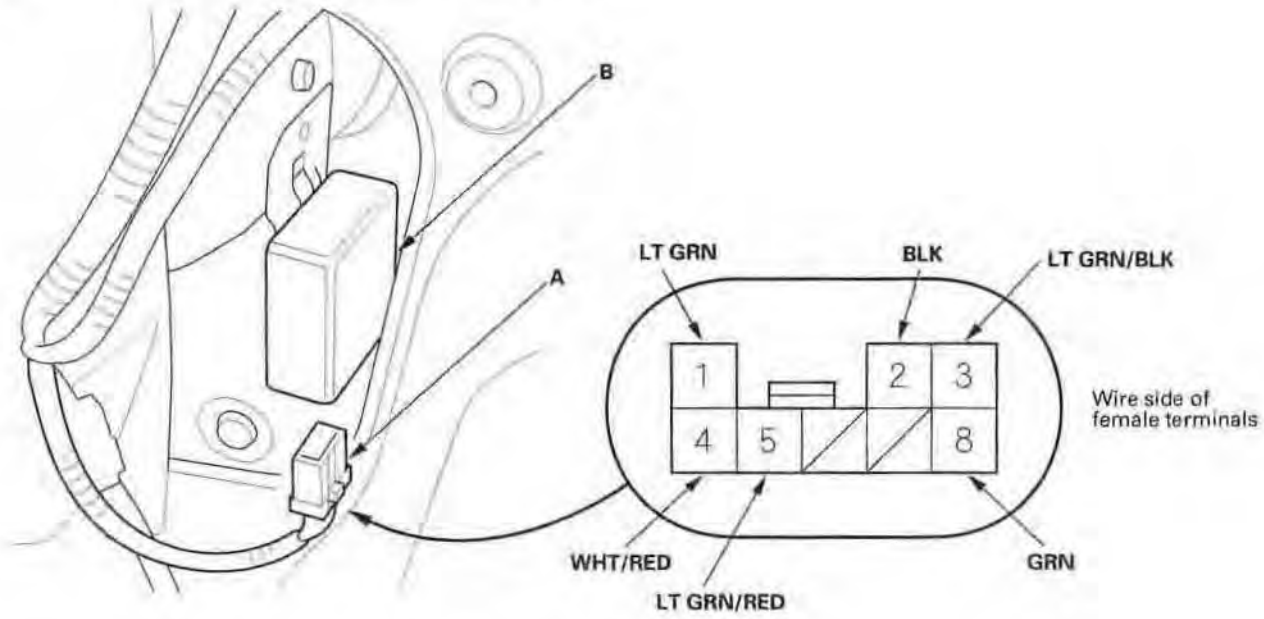
5. Reconnect the connectors, and make these input tests at the connector.

- If any test indicates a problem, find and correct the cause, then recheck the system.
- If all the input tests prove OK, the multiplex control unit must be faulty; replace the under-dash fuse/relay box assembly.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
J4	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G301) • An open in the wire
Y6	BLK	Under all conditions	Check for voltage to ground: There should be less than 1 V.	• Poor ground (G502) • An open in the wire
B1	WHT/GRN	Ignition switch ON (II) and washer switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • An open in the wire
X7	BLU/BLK	Ignition switch ON (II) and wiper switch in INT	Check for voltage to ground: There should be battery voltage.	
B6	BLU/RED	Ignition switch ON (II), wiper switch in OFF or INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • Faulty windshield wiper motor • An open in the wire
G7	BLU/WHT	Ignition switch ON (II) and wipers in park position	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty windshield wiper motor • An open in the wire
B1 - F6	WHT/GRN	Jump B1 to F6 terminals, then ignition switch ON (II) and washer switch ON	Check windshield washer motor operation: The washer motor should run.	• Poor ground (G201) • Blown No. 20 (20 A) fuse in the under-dash fuse/relay box • Faulty wiper/washer switch • Faulty windshield washer motor • Faulty under-dash fuse/relay box • An open in the wire

Rear Window Wiper Control Unit Input Test

1. Remove the left rear side trim panel (see page 20-60).
2. Disconnect the 8P connector (A) from the control unit (B).



3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, go to step 4.

(cont'd)

Rear Window Wiper Control Unit Input Test (cont'd)

4. Reconnect the connector to the control unit, and make these input tests at the connector.

   - If any test indicates a problem, find and correct the cause, then recheck the system.
   - If all the input tests prove OK, go to step 5.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
8	GRN	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
2	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G553) • An open in the wire
4	WHT/RED	Ignition switch ON (II) and rear window washer switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10 A) fuse in the under-dash fuse/relay box • Faulty rear window wiper/ washer switch • An open in the wire
5	LT GRN/ RED	Ignition switch ON (II) and rear window wiper switch ON	Check for voltage to ground: There should be battery voltage.	
3	LT GRN/ BLK	Ignition switch ON (II), rear wiper switch OFF, and wiper in park position	Check for voltage to ground: There should be battery voltage.	• Blown No. 9 (10 A) fuse in the under-dash fuse/relay box • Faulty rear window wiper motor • An open in the wire

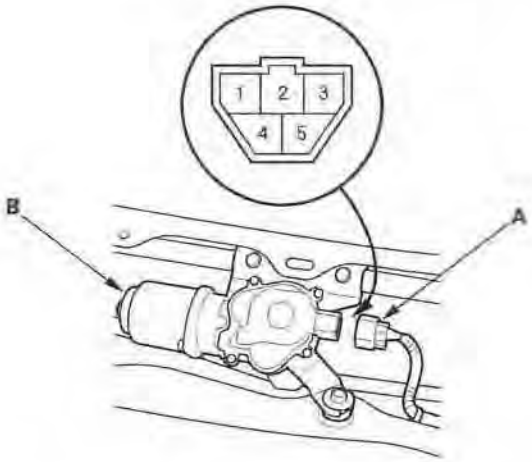
5. Disconnect the 8P connector from the control unit, and make the following test at the connector.

   - If the test indicates a problem, find and correct the cause, then recheck the system.
   - If the input test proves OK, the control unit must be faulty; replace it.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	LT GRN	Ignition switch ON (II).	Attach to ground: The rear window wiper motor should run.	• Blown No. 9 (10 A) fuse in the under-dash fuse/relay box • Faulty rear window wiper motor • An open in the wire

Windshield Wiper Motor Test

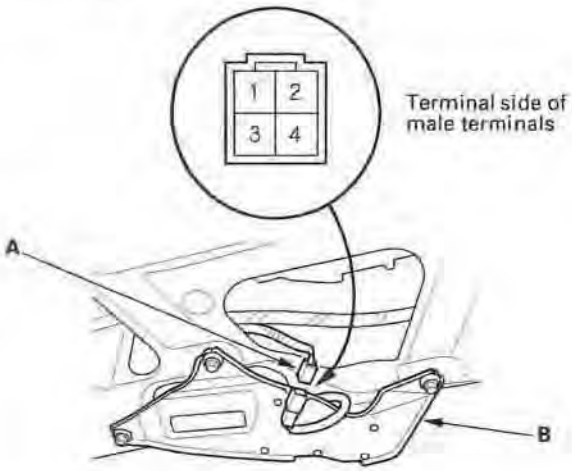
1. Remove the wiper arms, hood seals, and cowl covers (see page 22-171).
2. Disconnect the 5P connector (A) from the wiper motor (B).



3. Test the motor by connecting battery power to the No. 2 terminal and ground the No. 3 (No. 5) terminal of the wiper motor 5P connector. The motor should run at low (high) speed. If the motor does not run or fails to run smoothly, replace the motor.
4. Connect an analog voltmeter between the No. 4 (+) and No. 1 (−) terminals, and run the motor at low or high speed. The voltmeter should indicate 12 V and 4 V or less alternately. If the voltmeter does not indicate as specified, replace the motor.

Rear Window Wiper Motor Test

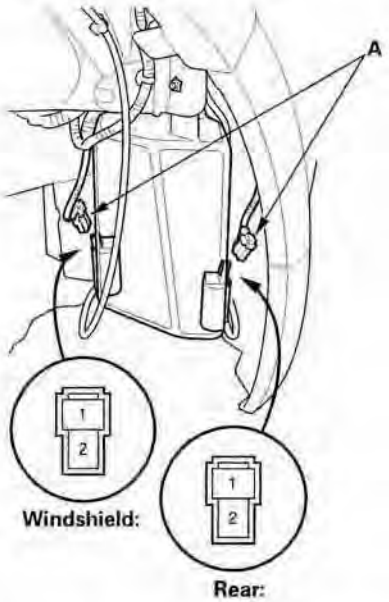
1. Open the hatch, and remove the hatch trim panel (see page 20-63).
2. Disconnect the 4P connector (A) from the wiper motor (B).



3. Test the motor by connecting battery power to the No. 1 terminal and ground the No. 3 terminal of the wiper motor. The motor should run. If the motor does not run or fails to run smoothly, replace the motor.
4. Reconnect the 4P connector to the wiper motor.
5. Connect an analog voltmeter between the No. 4 (+) and No. 2 (−) terminals, and run the motor. The motor should indicate 12 V and 4 V or less alternately. If the voltmeter does not indicate as specified, replace the motor.

Washer Motor Test

1. Remove the right inner fender (see page 20-138).
2. Disconnect the 2P connectors (A) from the washer motors.

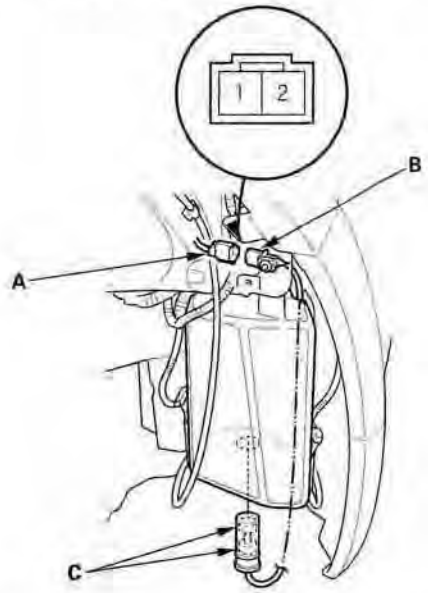


3. Test the motor by connecting battery power to the No. 1 terminal and ground the No. 2 terminal of the washer motor. The motor should run.
   - If the motor does not run or fails to run smoothly, replace it.
   - If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.

Washer Fluid Level Switch Test/ Replacement

Canada

1. Remove the right inner fender (see page 20-138).
2. Disconnect the 2P connector (A) from the washer fluid level switch (B).



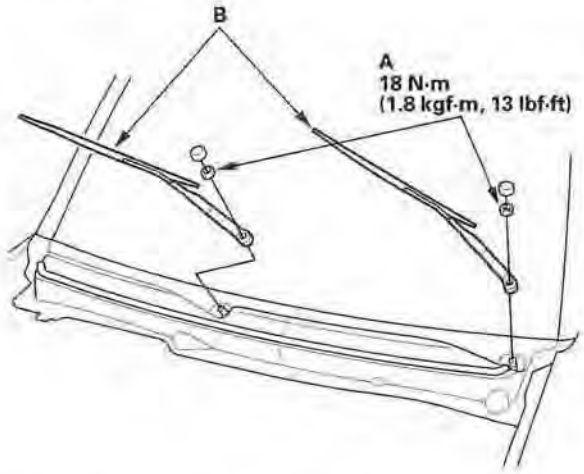
3. Remove the washer fluid level switch from the washer reservoir.

   NOTE: Fluid may flow out of the opening.

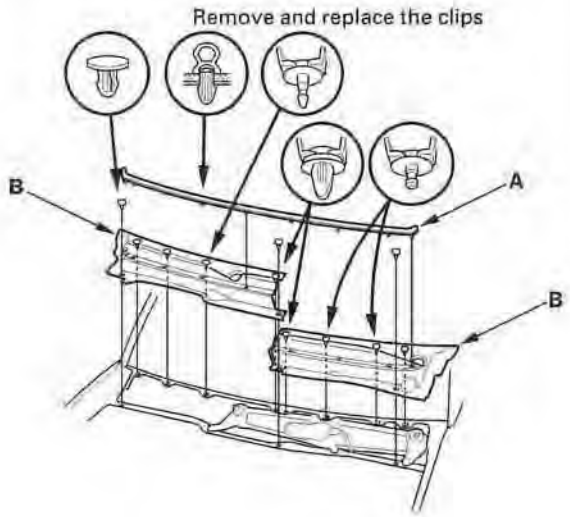
4. Check for continuity between the No. 1 and No. 2 terminals in each float position (C).
   - There should be continuity when the float is down.
   - There should be no continuity when the float is up.
5. If the continuity is not as specified, replace the switch.

Windshield Wiper Motor Replacement

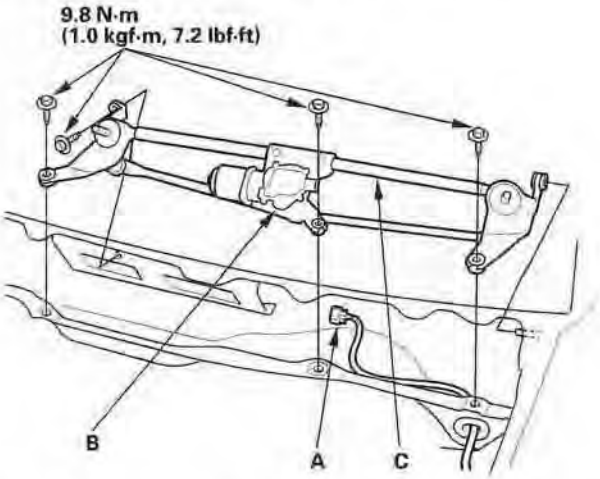
1. Remove the nuts (A) and the windshield wiper arms (B).



2. Remove the hood seal (A) and cowl covers (B).



3. Disconnect the 5P connector (A) from the windshield wiper motor (B).

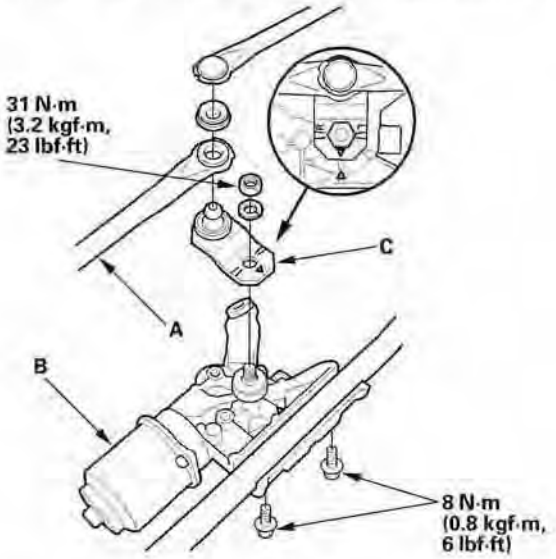


4. Remove the mounting bolts and the wiper linkage assembly (C).

(cont'd)

Windshield Wiper Motor Replacement (cont'd)

5. Remove the two mounting bolts and nut from the wiper linkage (A) to remove the wiper motor (B).



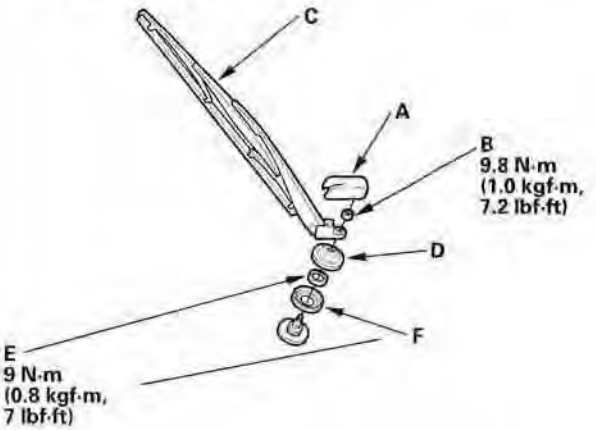
6. Align the "△" mark on the wiper link (C) and the "▽" mark on the wiper motor to show the original arrangement.

7. Install in the reverse order of removal, and note these items:

   - Apply multipurpose grease to the moving parts.
   - Before reinstalling the wiper arms, turn the wiper switch ON, then OFF to return the wiper shafts to the park position.
   - If necessary, replace any damaged clips.
   - Make sure the wiper motor operates properly.

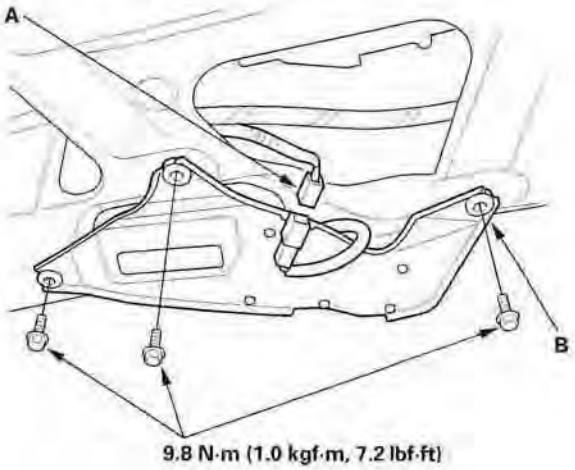
Rear Window Wiper Motor Replacement

1. Remove the cover (A), mounting nut (B), rear window wiper arm (C), wiper shaft cap (D), nut (E), and washer (F).



2. Open the tailgate and remove the tailgate lower trim panel (see page 20-64).

3. Disconnect the 4P connector (A) from the rear window wiper motor (B).



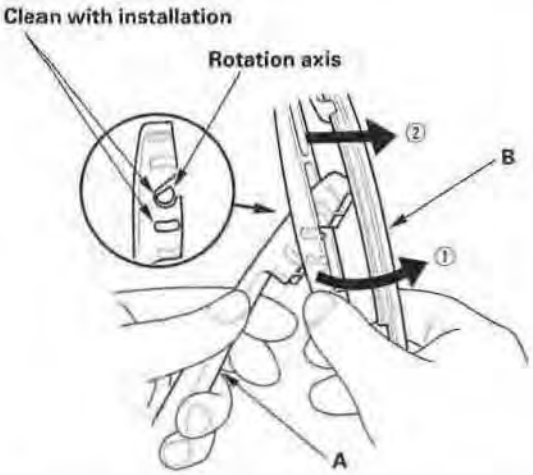
4. Remove the mounting bolts and the wiper motor.

5. Install in the reverse order of removal.

Rear Window Wiper Blade Replacement

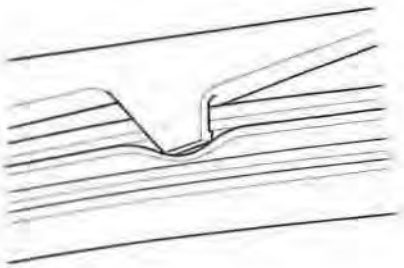
NOTE: Take care not to damage or deform the rear window wiper blade.

1. Raise the rear window wiper arm from the rear window.
2. Hold the rear window wiper arm (A) and blade assembly (B) as shown.



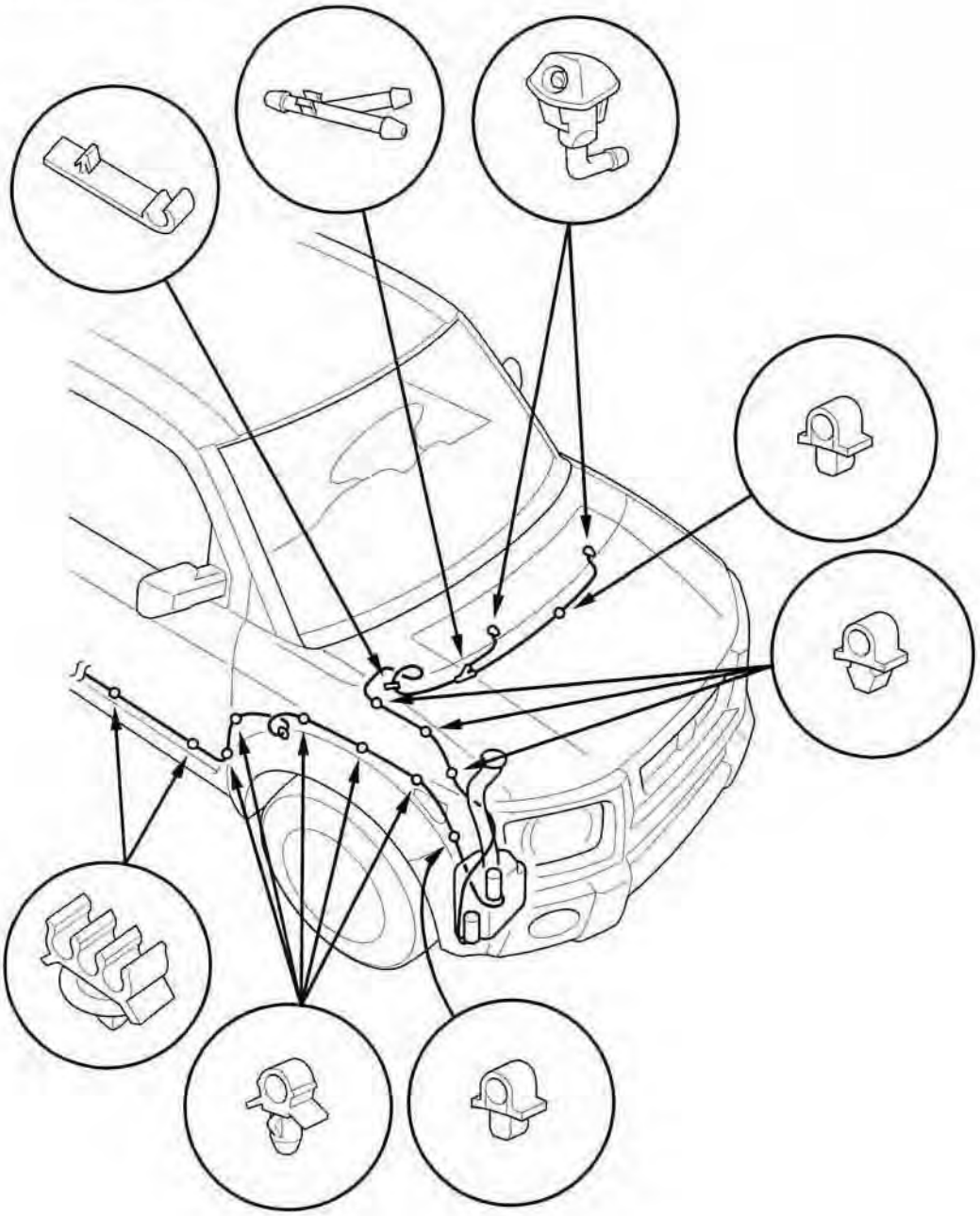
3. Rotate the rear window wiper blade assembly, and then remove it from the rear window wiper arm.
4. Remove the rear window wiper blade from the wiper blade holder.

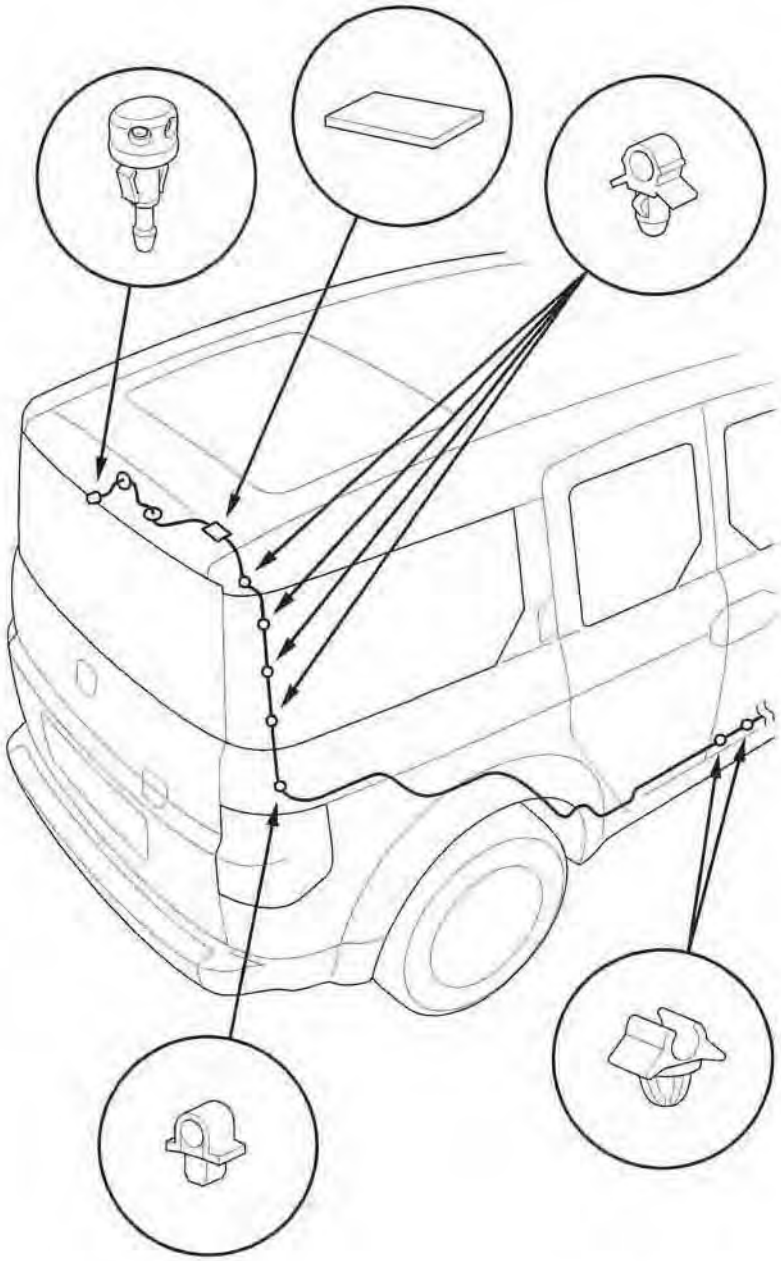
5. Install in the reverse order of removal, and note these items:
   - Clean the rear window wiper arm and blade holder, then install the wiper blade.
   - Make sure wiper blade is set securely.
   - Do not pinch the wiper blade.



Washer Tube Replacement

1. Remove the right inner fender (see page 20-138).
2. Remove the washer nozzles and clips, then remove the tubes.

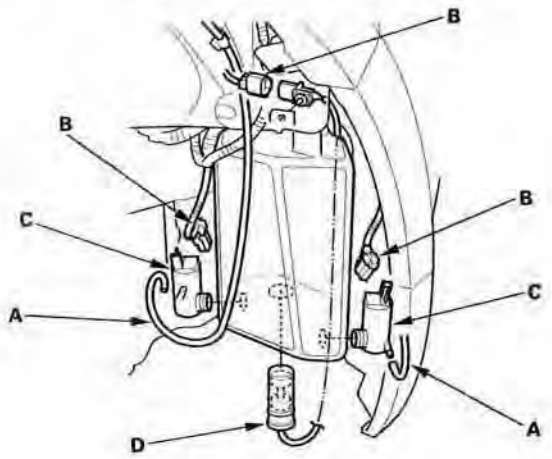




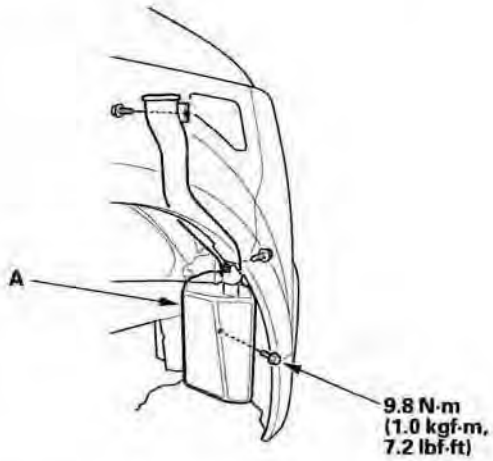
3. Install in the reverse order of removal. Take care not to pinch the washer tubes. Check the washer operation.

Washer Reservoir Replacement

1. Remove the front bumper (see page 20-105).
2. Disconnect the washer tubes (A).



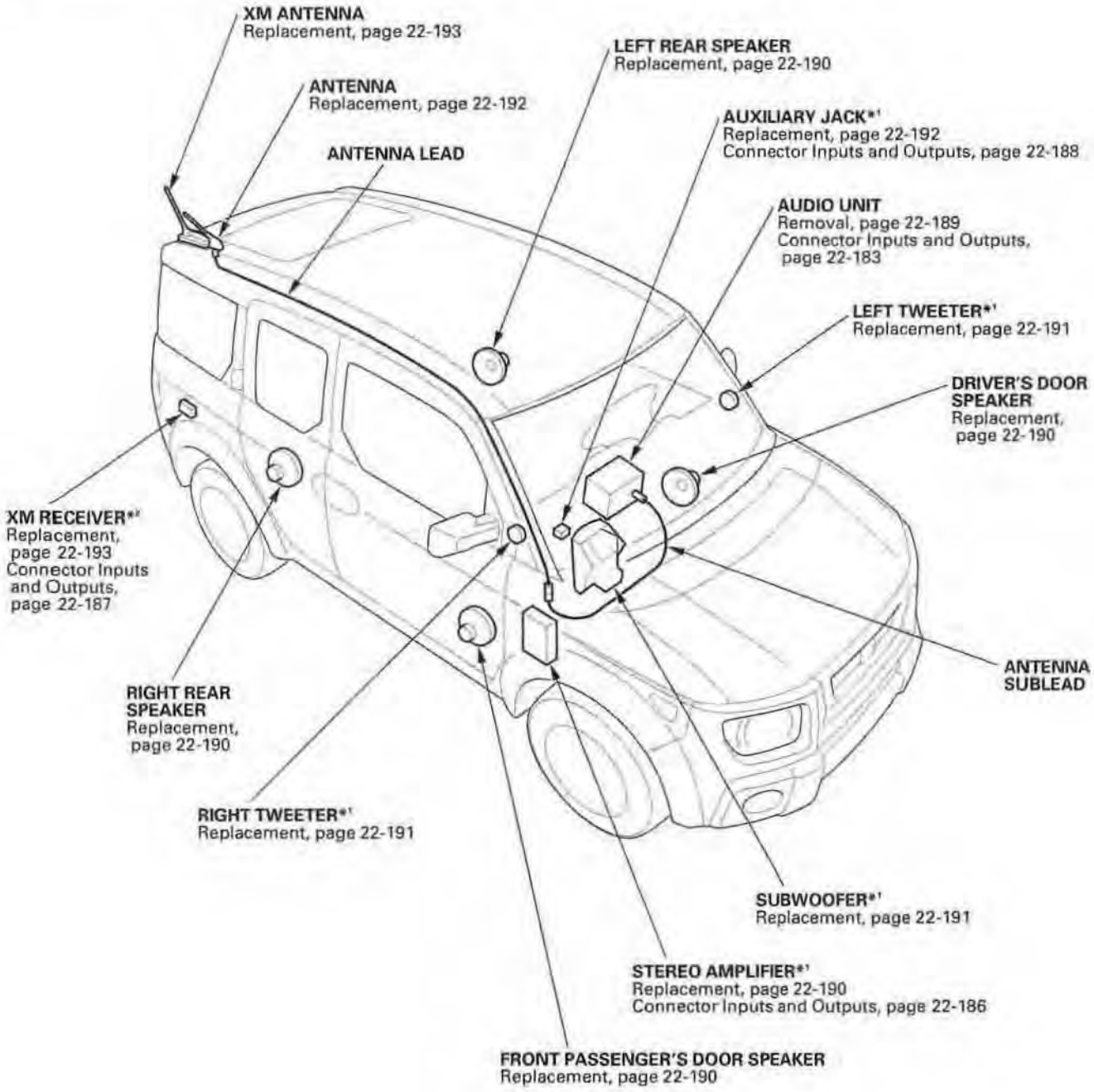
3. Disconnect the 2P connectors (B) from the washer motors (C) and the washer fluid level switch (D) (Canada).
4. Remove the three mounting bolts and washer reservoir (A).



5. Install in the reverse order of removal. Make sure the washer motors operate properly.

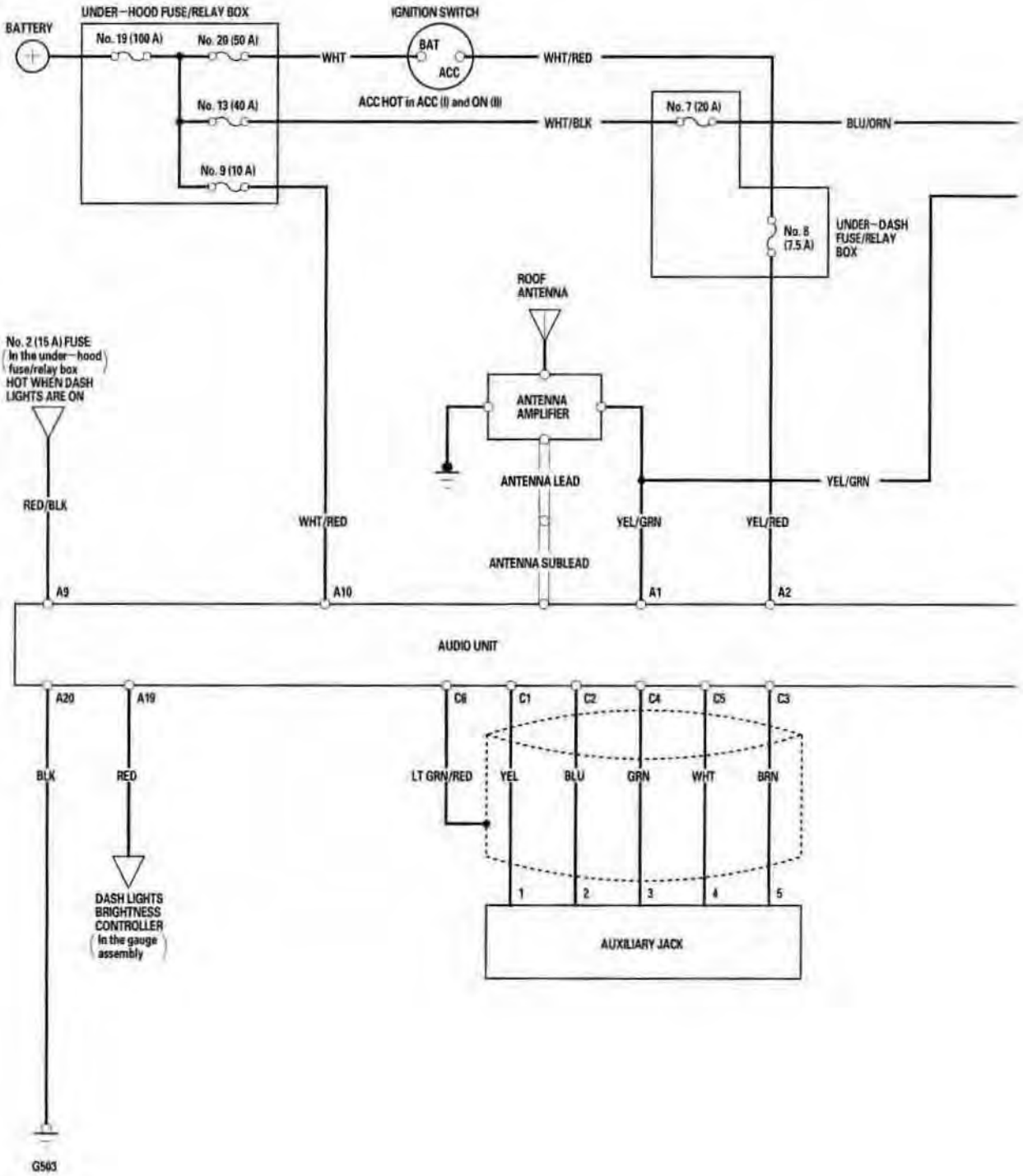
Component Location Index

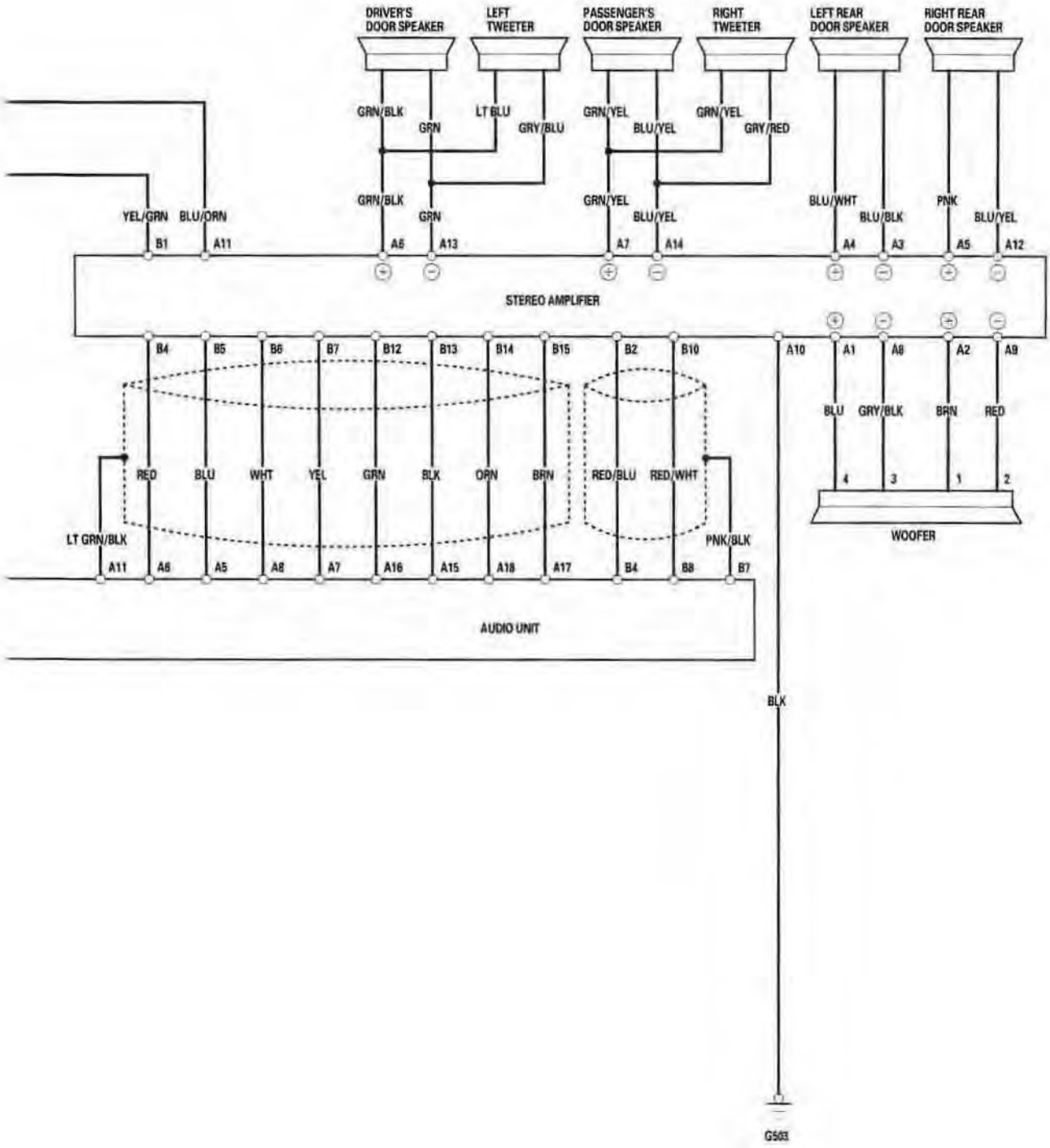
*1: EX model
*2: '05 EX model (USA)



Circuit Diagram

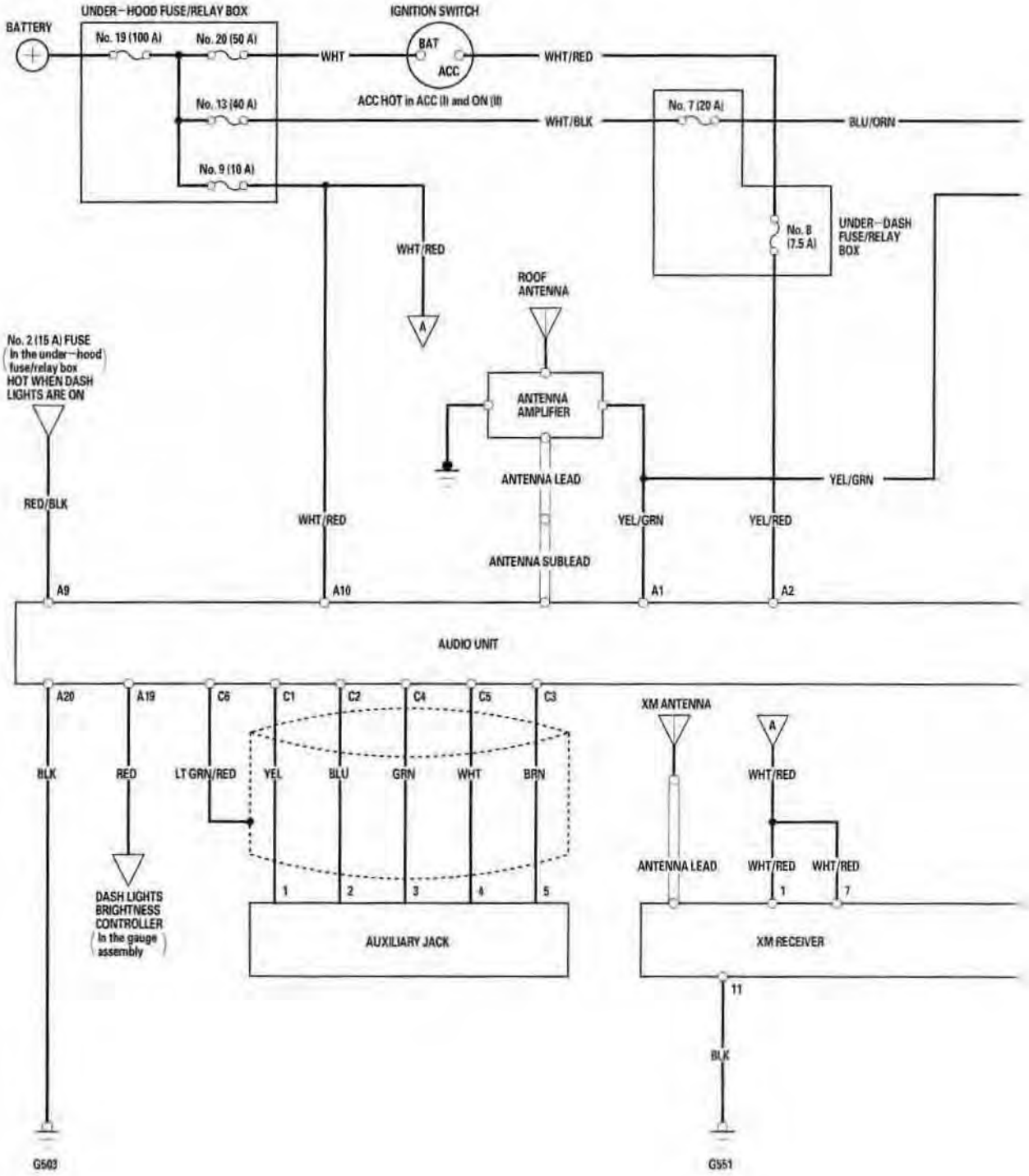
EX model without XM radio:

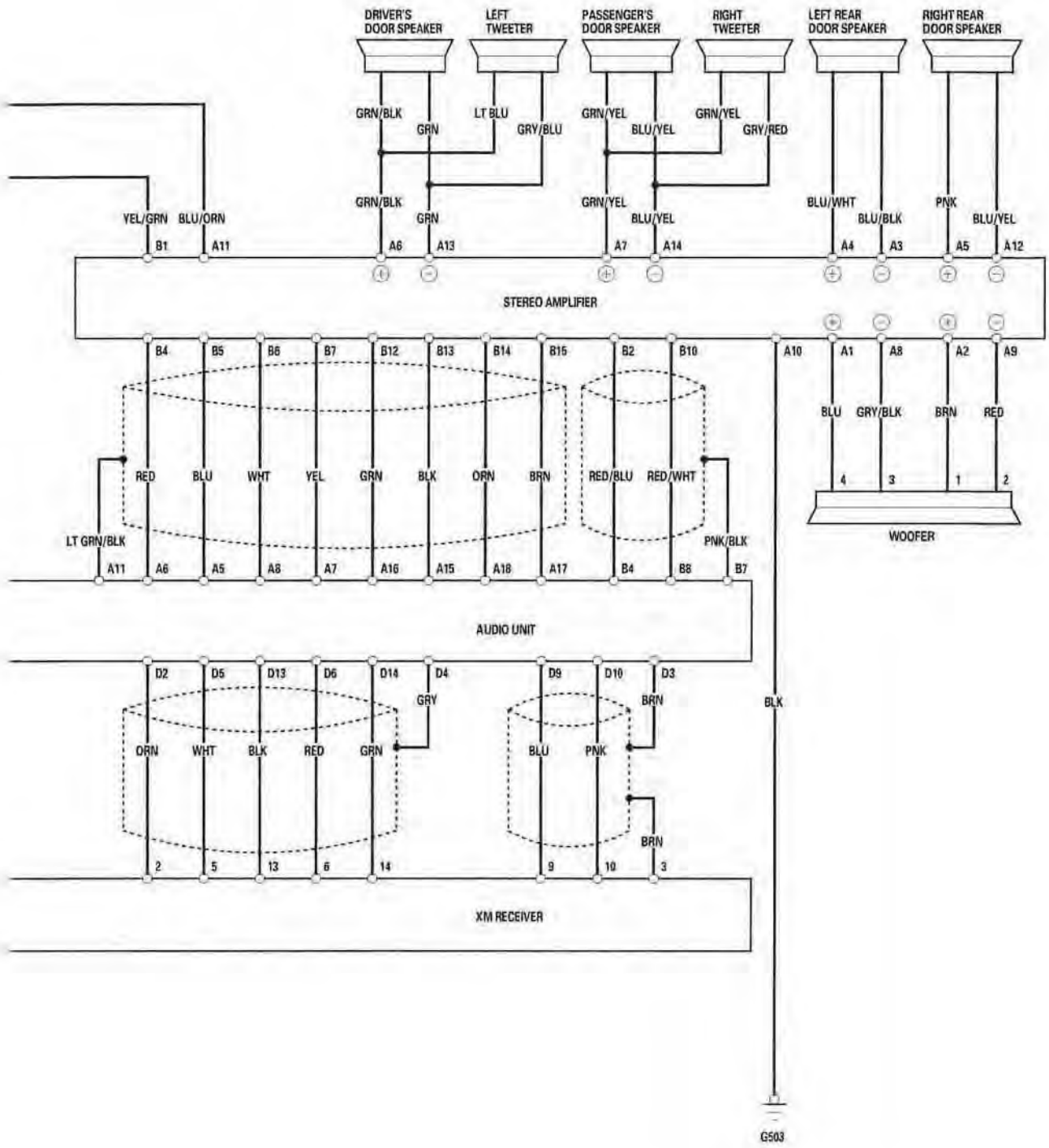



DRIVER'S DOOR SPEAKER
LEFT TWEETER
PASSENGER'S DOOR SPEAKER
RIGHT TWEETER
LEFT REAR DOOR SPEAKER
RIGHT REAR DOOR SPEAKER
GRN/BLK
GRN
LT BLU
GRY/BLU
GRN/YEL
BLU/YEL
GRN/YEL
GRY/RED
BLU/WHT
BLU/BLK
PNK
BLU/YEL
YEL/GRN
BLU/ORN
B1
A11
A6
A13
A7
A14
A4
A3
A5
A12
STEREO AMPLIFIER
B4
B5
B6
B7
B12
B13
B14
B15
B2
B10
A10
A1
A8
A2
A9
BLU
GRY/BLK
BRN
RED
RED
BLU
WHT
YEL
GRN
BLK
ORN
BRN
RED/BLU
RED/WHT
4
3
1
2
WOOFER
LT GRN/BLK
PNK/BLK
A11
A6
A5
A8
A7
A16
A15
A18
A17
B4
B8
B7
AUDIO UNIT
BLK
G503

Circuit Diagram (cont'd)

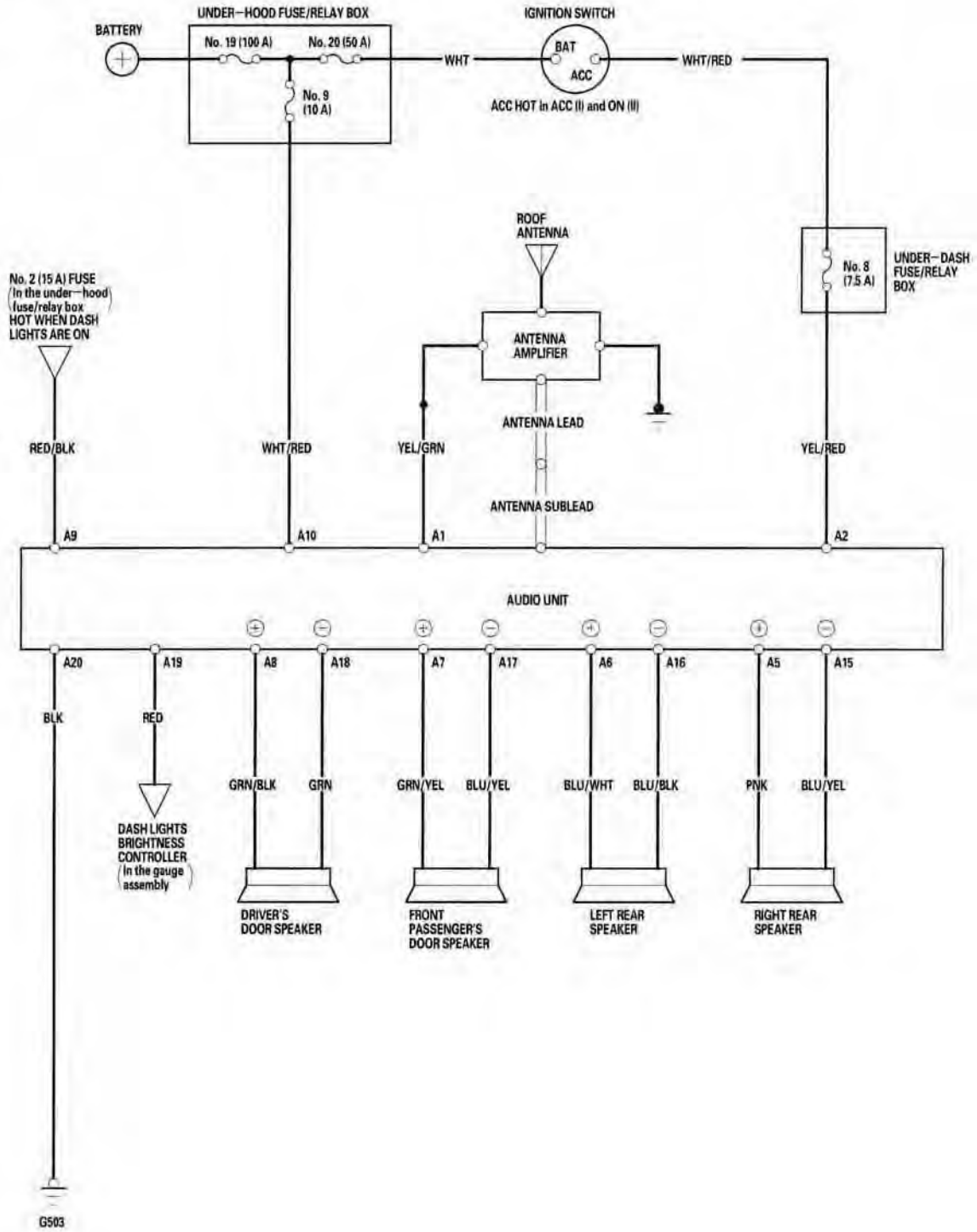
With XM radio:




DRIVER'S DOOR SPEAKER
LEFT TWEETER
PASSENGER'S DOOR SPEAKER
RIGHT TWEETER
LEFT REAR DOOR SPEAKER
RIGHT REAR DOOR SPEAKER
GRN/BLK
GRN
LT BLU
GRY/BLU
GRN/YEL
BLU/YEL
GRN/YEL
GRY/RED
BLU/WHT
BLU/BLK
PNK
BLU/YEL
YEL/GRN
BLU/ORN
B1
A11
A6
A13
A7
A14
A4
A3
A5
A12
STEREO AMPLIFIER
B4
B5
B6
B7
B12
B13
B14
B15
B2
B10
A10
A1
A8
A2
A9
BLU
GRY/BLK
BRN
RED
RED
BLU
WHT
YEL
GRN
BLK
ORN
BRN
RED/BLU
RED/WHT
4
3
1
2
WOOFER
LT GRN/BLK
PNK/BLK
A11
A6
A5
A8
A7
A16
A15
A18
A17
B4
B8
B7
AUDIO UNIT
D2
D5
D13
D6
D14
D4
D9
D10
D3
GRY
BRN
BLK
ORN
WHT
BLK
RED
GRN
BLU
PNK
BRN
2
5
13
6
14
9
10
3
XM RECEIVER
G503

Circuit Diagram (cont'd)

Canada-DX model, USA-LX model:

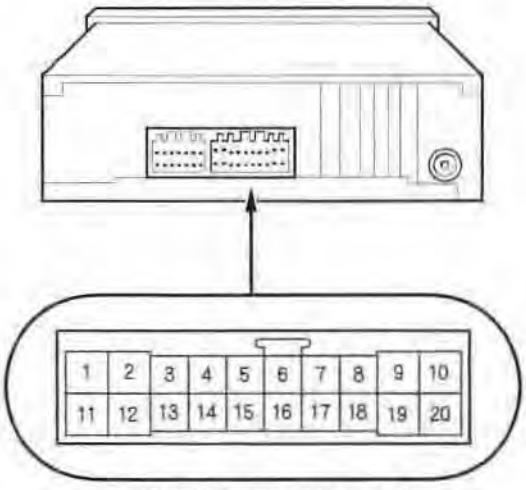


System Description

Audio Unit Connector Inputs and Outputs

Canada DX model, USA-LX model

Cavity	Wire	Connects to
1	YEL/GRN	Radio switched power
2	YEL/RED	ACC (Main stereo power supply)
3	———	Not used
4	———	Not used
5	PNK	Right rear speaker (+)
6	BLU/WHT	Left rear speaker (+)
7	GRN/YEL	Front passenger's door speaker (+)
8	GRN/BLK	Driver's door speaker (+)
9	RED/BLK	Lights-on signal
10	WHT/RED	Constant power
11	———	Not used
12	———	Not used
13	———	Not used
14	———	Not used
15	BLU/YEL	Right rear speaker (−)
16	BLU/BLK	Left rear speaker (−)
17	BLU/YEL	Front passenger's door speaker (−)
18	LT GRN	Driver's door speaker (−)
19	RED	Dash lights brightness controller
20	BLK	Ground (G503)



AUDIO UNIT CONNECTOR A

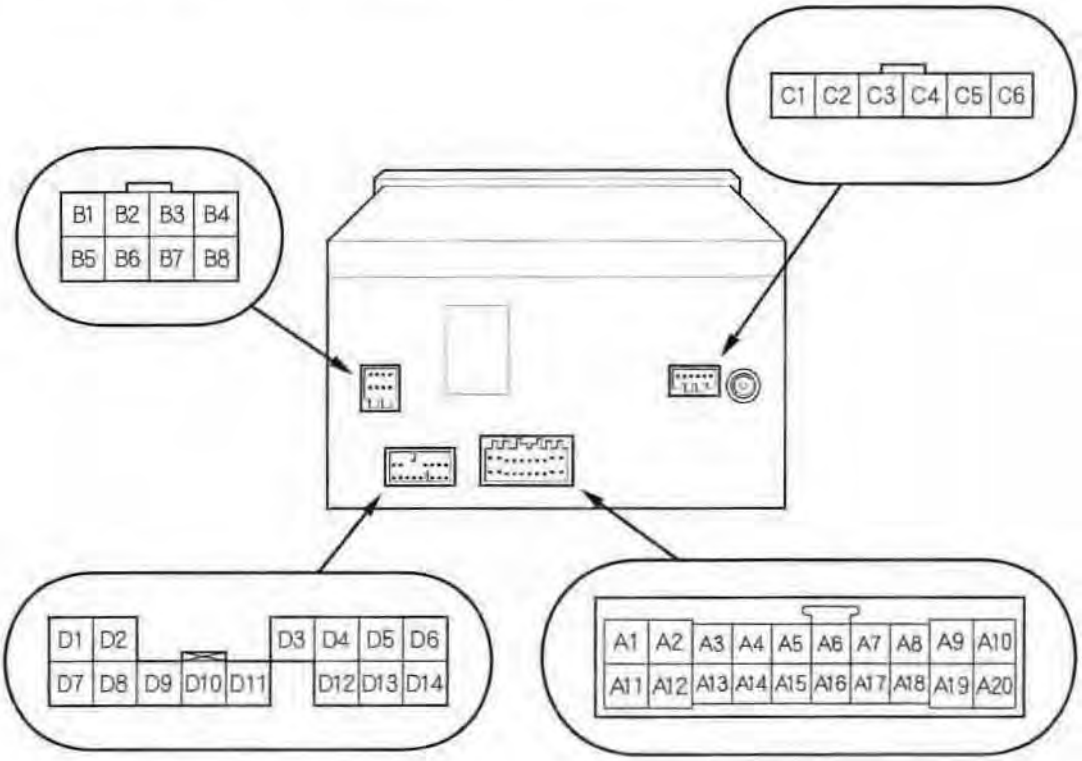
(cont'd)

System Description (cont'd)

Audio Unit Connector Inputs and Outputs

EX model

Cavity	Wire	Connects to
A1	YEL/GRN	Radio switched power
A2	YEL/RED	ACC (Main stereo power supply)
A3	———	Not used
A4	———	Not used
A5	BLU	Stereo amplifier — right rear (+)
A6	RED	Stereo amplifier — left rear (+)
A7	YEL	Stereo amplifier — front passenger's (+)
A8	WHT	Stereo amplifier — driver's (+)
A9	RED/BLK	Lights-on signal
A10	WHT/RED	Constant power
A11	LT GRN/BLK	Shielding
A12	———	Not used
A13	———	Not used
A14	———	Not used
A15	BLK	Stereo amplifier — right rear (−)
A16	GRN	Stereo amplifier — left rear (−)
A17	BRN	Stereo amplifier — front passenger's (−)
A18	ORN	Stereo amplifier — driver's (−)
A19	RED	Dash lights brightness controller
A20	BLK	Ground (G503)



Cavity	Wire	Connects to
B1	———	Not used
B2	———	Not used
B3	———	Not used
B4	RED/BLU	Stereo amplifier
B5	———	Not used
B6	———	Not used
B7	PNK/BLK	Shielding
B8	RED/WHT	Stereo amplifier

Cavity	Wire	Connects to
C1	YEL	Auxiliary jack (AUX-DET)
C2	BLU	Auxiliary jack (AUX-GND)
C3	BRN	Auxiliary jack (AUX-RCH)
C4	GRN	Auxiliary jack (AUX-S-GND)
C5	WHT	Auxiliary jack (AUX-LCH)
C6	LT GRN/RED	Shielding

Cavity	Wire	Connects to
D1	———	Not used
D2	ORN	XM receiver (ACC)
D3	BRN	Shielding
D4	GRY	Shielding
D5	WHT	XM receiver (R+)
D6	RED	XM receiver (L+)
D7	———	Not used
D8	———	Not used
D9	BLU	XM receiver (BUS+)
D10	PNK	XM receiver (BUS−)
D11	———	Not used
D12	———	Not used
D13	BLK	XM receiver (R−)
D14	GRN	XM receiver (L−)

(cont'd)

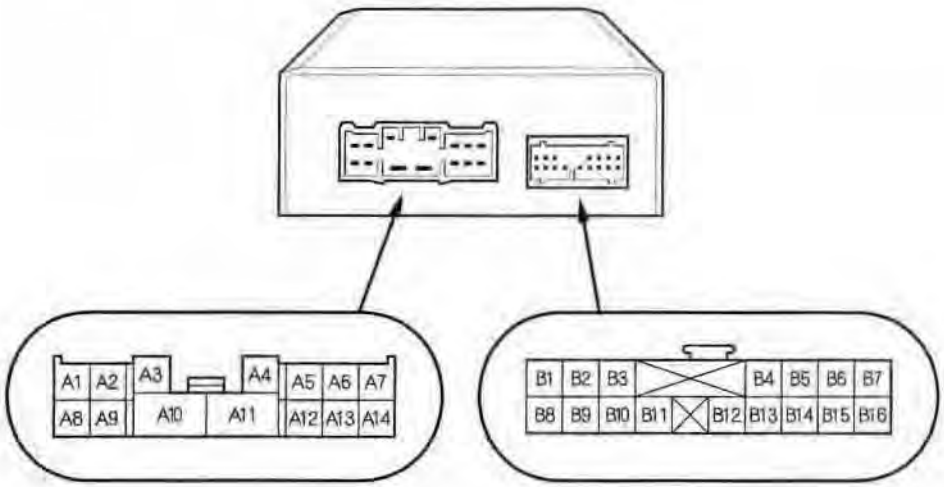
System Description (cont'd)

Stereo Amplifier Connector Inputs and Outputs

EX model

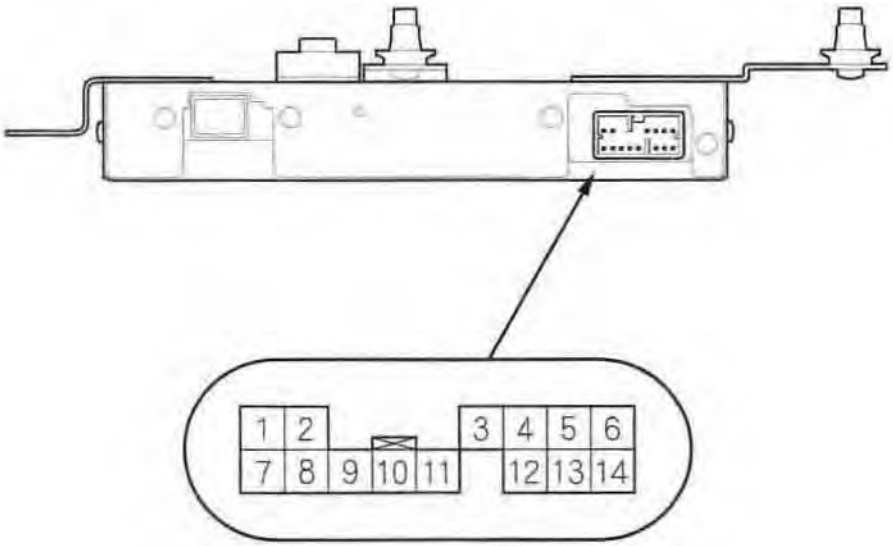
Cavity	Wire	Connects to	Cavity	Wire	Connects to
A1	BLU	Woofer 2 output (+)	A8	GRY/BLK	Woofer 2 output (−)
A2	BRN	Woofer 1 output (+)	A9	RED	Woofer 1 output (−)
A3	BLU/BLK	Left rear door speaker (−)	A10	BLK	GND (G503)
A4	BLU/WHT	Left rear door speaker (+)	A11	BLU/ORN	Constant power
A5	PNK	Right rear door speaker (+)	A12	BLU/YEL	Right rear door speaker (−)
A6	GRN/BLK	Left front door speaker (+)	A13	GRN	Left front door speaker (−)
A7	GRN/YEL	Right front door speaker (+)	A14	BLU/YEL	Right front door speaker (−)

Cavity	Wire	Connects to	Cavity	Wire	Connects to
B1	YEL/GRN	Radio switched power	B9	———	Not used
B2	RED/BLU	Woofer (+)	B10	RED/WHT	Woofer (−)
B3	———	Not used	B11	———	Not used
B4	RED	Audio unit-left rear (+)	B12	GRN	Audio unit-left rear (−)
B5	BLU	Audio unit-right rear (+)	B13	BLK	Audio unit-right rear (−)
B6	WHT	Audio unit-driver's (+)	B14	ORN	Audio unit-driver's (−)
B7	YEL	Audio unit-front passenger's (+)	B15	BRN	Audio unit-front passenger's (−)
B8	———	Not used	B16	———	Not used



XM Receiver Connector Inputs and Outputs

Cavity	Wire	Connects to
1	WHT/RED	Constant power
2	ORN	Audio unit (ACC)
3	BRN	Shielding
4	———	Not used
5	WHT	Audio unit (R+)
6	RED	Audio unit (L+)
7	WHT/RED	Constant power
8	———	Not used
9	BLU	Audio unit (BUS+)
10	PNK	Audio unit (BUS−)
11	BLK	Ground (G551)
12	———	Not used
13	BLK	Audio unit (R−)
14	GRN	Audio unit (L−)



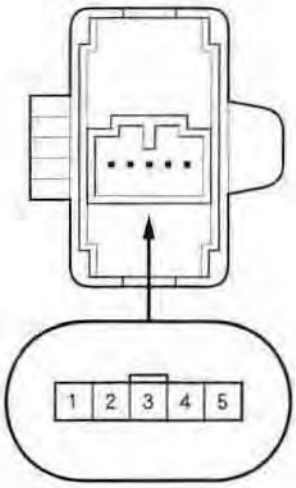
(cont'd)

System Description (cont'd)

Auxiliary Jack Connector Inputs and Outputs

EX model

Cavity	Wire	Connects to
1	YEL	Audio unit (AUX-DET)
2	BLU	Audio unit (AUX-GND)
3	GRN	Audio unit (S-GND)
4	WHT	Audio unit (AUX-LCH)
5	BRN	Audio unit (AUX-RCH)

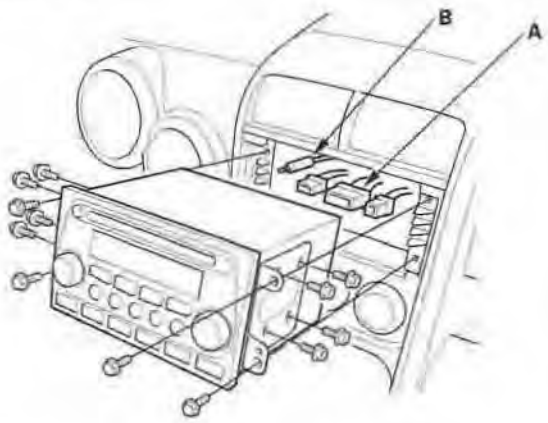


Audio Unit Removal/Installation

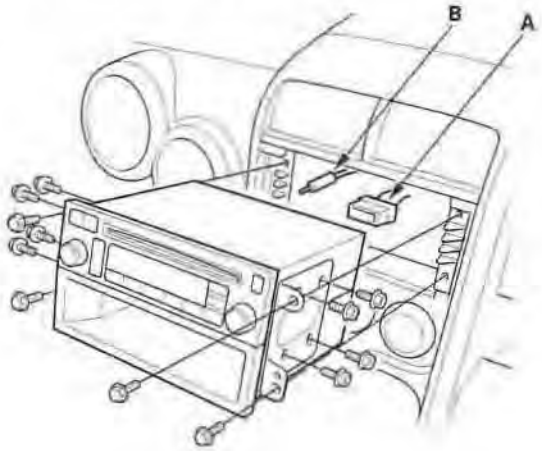
NOTE:
- Put on gloves to protect your hands.
- Take care not to scratch the dashboard and related parts.

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the dashboard center panel (see page 20-77).
3. Remove the four mounting bolts, then remove the audio unit.

EX model:



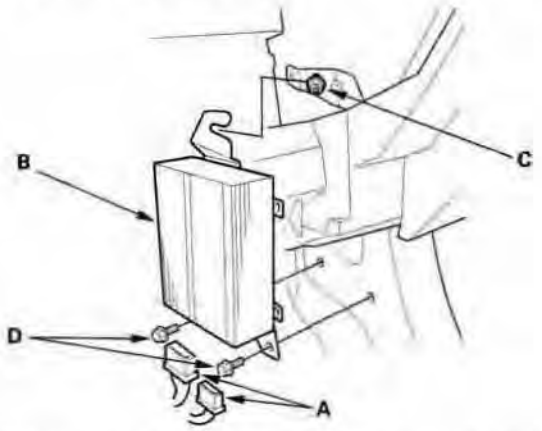
DX model (Canada), LX model (USA):



4. Disconnect the audio connectors (A) and antenna lead (B).
5. Remove the eight mounting bolts securing the audio unit to the audio unit bracket.
6. Install the audio unit in the reverse order of removal, and note these items:
   - Make sure the audio unit connector is plugged in properly, and the antenna lead is connected properly.
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Stereo Amplifier Replacement

1. Remove the right kick panel (see page 20-58).
2. Remove the stereo amplifier connectors (A) from the stereo amplifier (B).



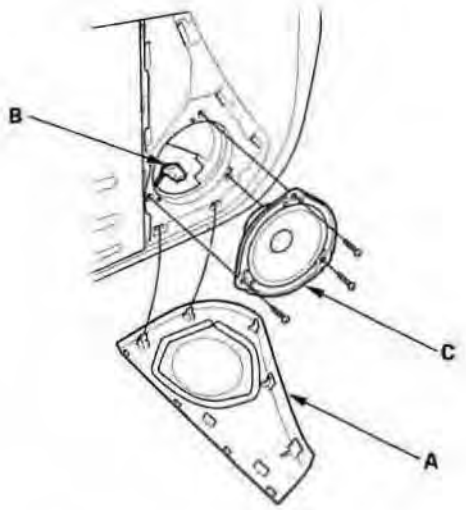
3. Loosen the mounting nut (C), and remove the two mounting bolts (D), then remove the stereo amplifier.
4. Install the stereo amplifier in the reverse order of removal.

Speaker Replacement

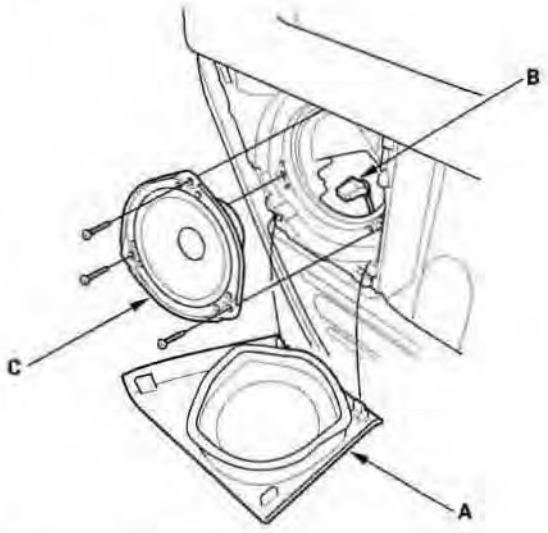
Door Speaker

1. Remove the speaker cover (A).
2. Remove the three screws, then disconnect the 2P connector (B) from the speaker (C).

Front:



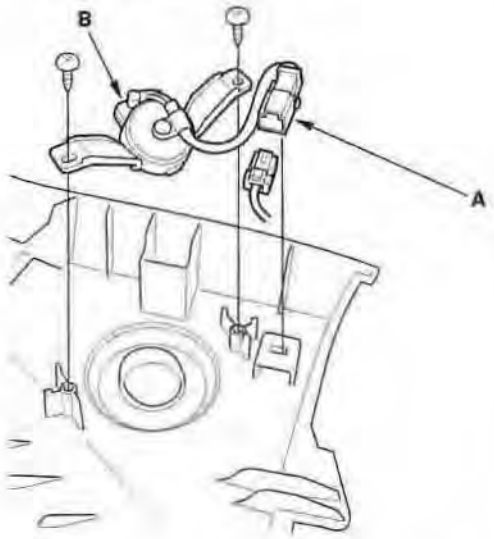
Rear:



3. Install in the reverse order of removal.

Tweeter (EX model)

1. Remove the A-pillar trim (see page 20-58).
2. Disconnect the 2P connector (A).



3. Remove the two mounting screws from the tweeter (B).
4. Install in the reverse order of removal.

Subwoofer (EX model)

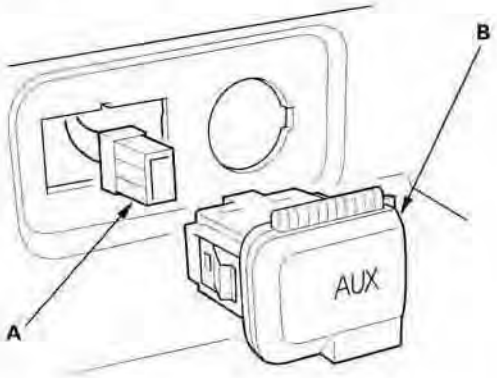
1. Remove the dashboard center lower cover (see page 20-73).
2. Disconnect the 4P connector (A) from the woofer (B).

3. Remove the four mounting bolts from the woofer.
4. Install in the reverse order of removal.

Auxiliary Jack Replacement

EX model

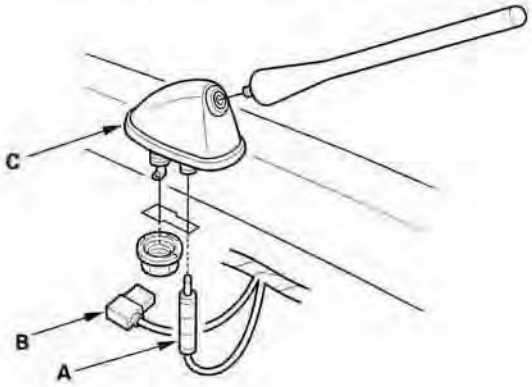
1. Remove the glove box (see page 20-78).
2. Remove the front accessory power socket (see page 22-158).
3. Disconnect the 5P connector (A) from the auxiliary jack (B).



4. Push the auxiliary jack (B) from behind the dashboard.

Roof Antenna Replacement

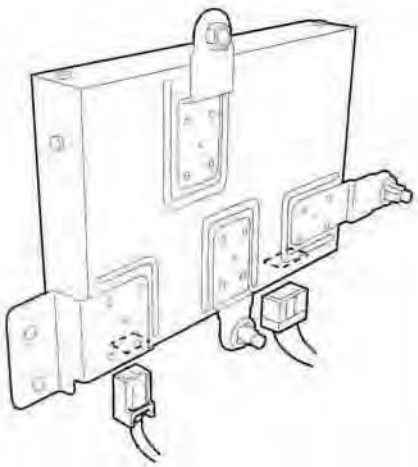
1. Remove the rear part of headliner (see page 20-65).
2. Disconnect the antenna lead connector (A) and 1P connector (B) from the roof antenna (C).



3. Remove the mounting nut and the antenna.
4. Install in the reverse order of removal.

XM Receiver Replacement

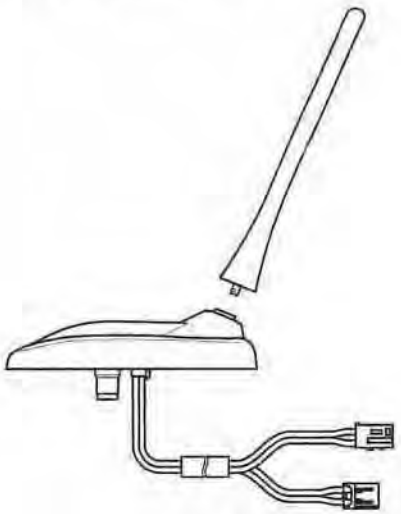
1. Remove the right rear side trim panel (see page 20-60).
2. Disconnect the XM receiver connector and antenna lead.



3. Remove the three mounting bolts, then remove the XM receiver.
4. Install the XM receiver in the reverse order of removal.

XM Antenna Replacement

1. Remove the rear part of headliner (see page 20-65).
2. Disconnect the connectors.



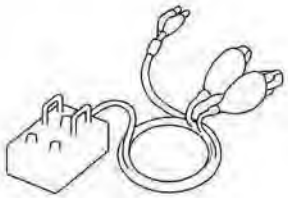
3. Remove the mounting nut and the antenna.
4. Install in the reverse order of removal.

Restraints

Special Tools

Ref. No.	Tool Number	Description	Qty
①*1	07HAZ-SG00500	Deployment Tool	1
②	07PAZ-0010100	SCS Service Connector	1
③	07SAZ-TB4011A	SRS Inflator Simulator	1
④	07TAZ-SZ5011A	SRS Simulator Lead C	1
⑤*2	07TAZ-001020A	Backprobe Adapter, 17 mm	2
⑥	07XAZ-S1A0200	SRS Simulator Lead E	1
⑦	07XAZ-SZ30100	SRS Simulator Lead F	1
⑧	07YAZ-S3AA100	SRS Simulator Lead H	1

* 1: Included in SRS Tool Set 07MAZ-SM5000B
* 2: Use with the stacking patch cords from T/N 07SAZ-001000A, Backprobe Set.



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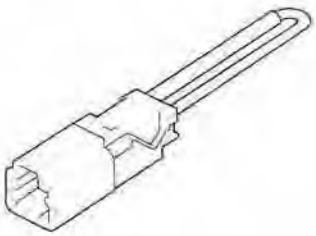

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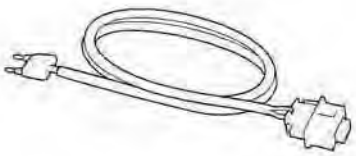
③



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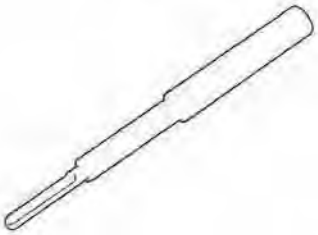
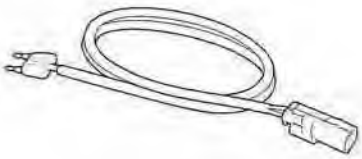
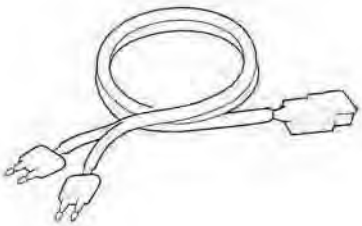


⑤



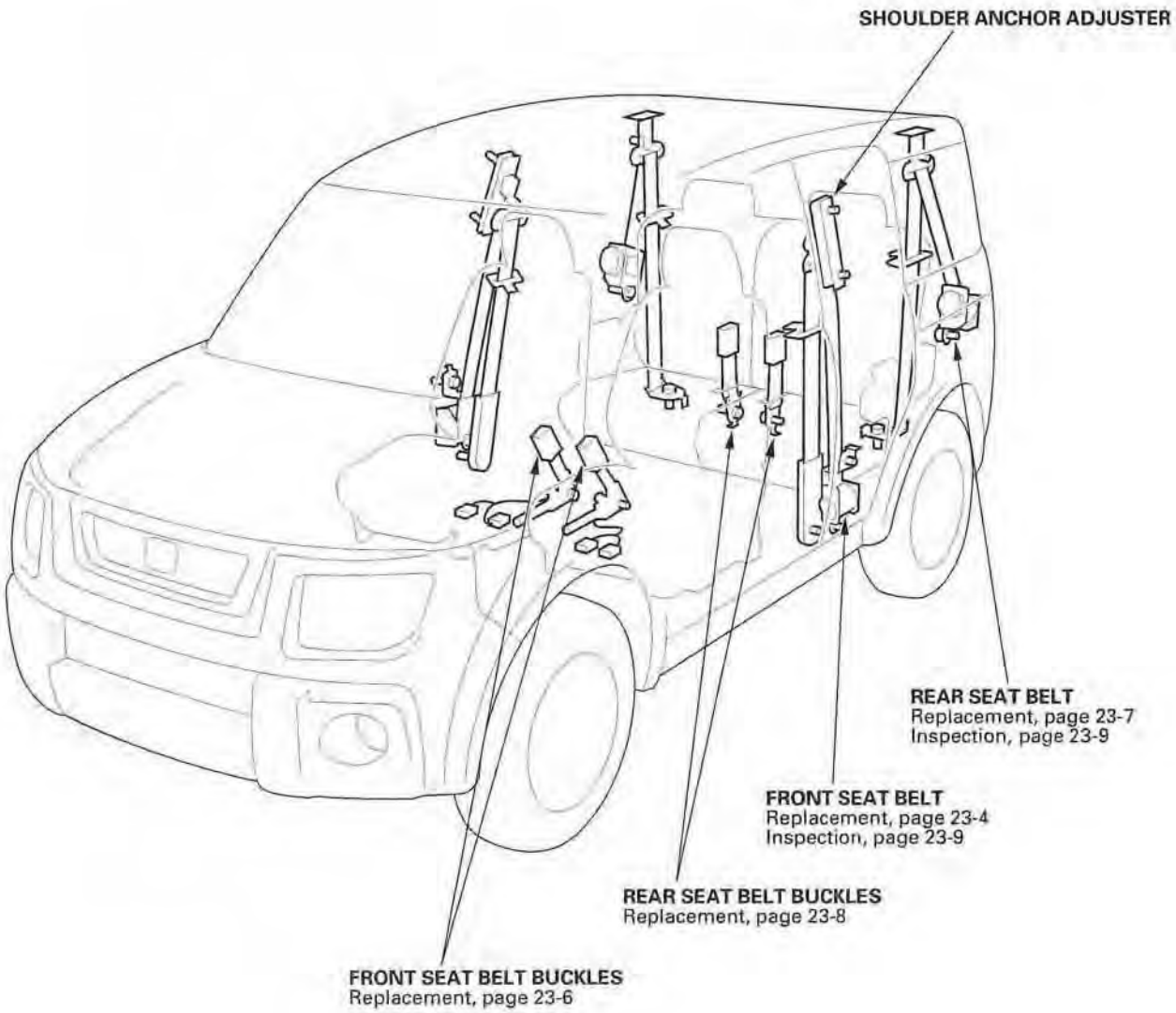
⑥



⑦

⑧

Component Location Index



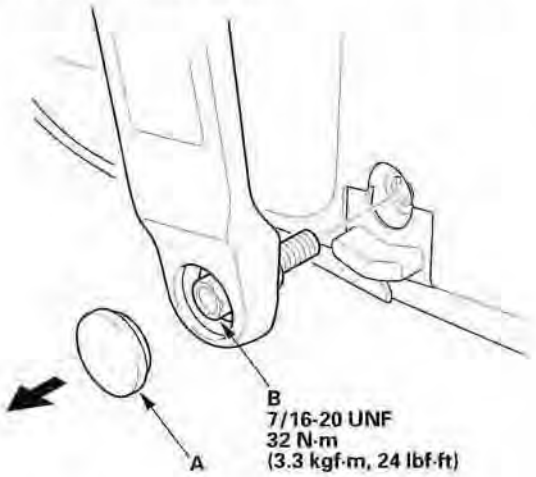
Front Seat Belt Replacement

SRS components are located in this area. Review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

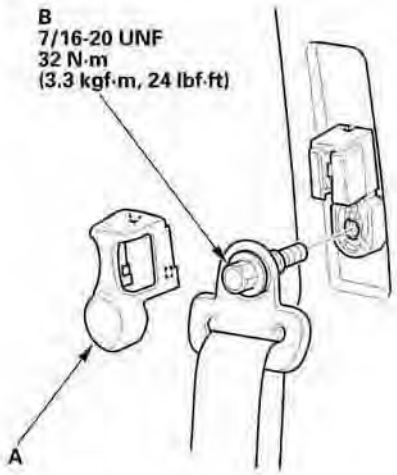
NOTE: Check the front seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Front Seat Belt

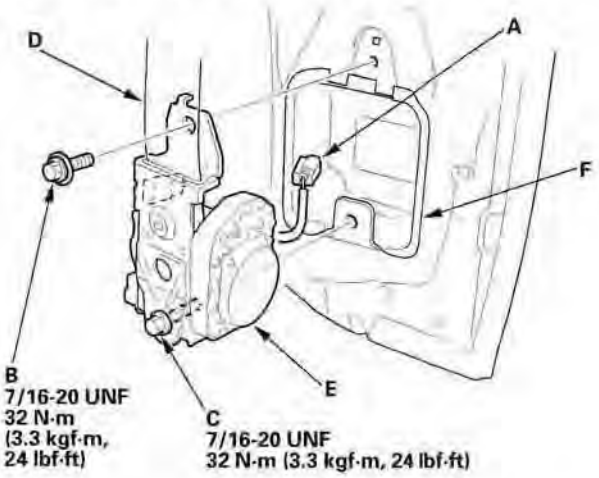
1. Make sure you have the anti-theft code for the radio, then write down the radio and XM presets.
2. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.
3. Using the appropriate tool from the KTC trim tool set, pry the lower anchor cap (A) out, and remove the lower anchor bolt (B).



4. Remove the rear door panel (see page 20-19).
5. Remove the upper anchor cover (A), and remove the upper anchor bolt (B).



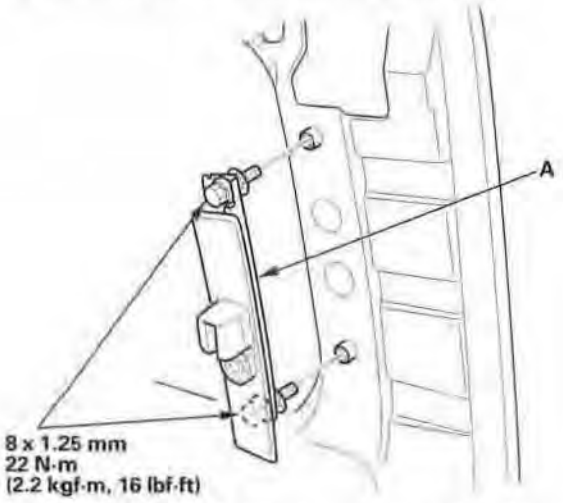
6. Disconnect the seat belt tensioner connector (A). Remove the upper retractor mounting bolt (B) and the lower retractor bolt (C), then remove the front seat belt (D) and retractor (E).



7. If necessary, remove the seat belt protector (F).

8. Remove the rear door trim (see page 20-21).

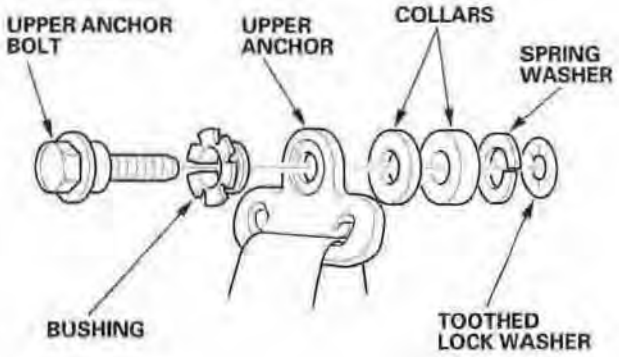
9. Remove the shoulder anchor adjuster (A).



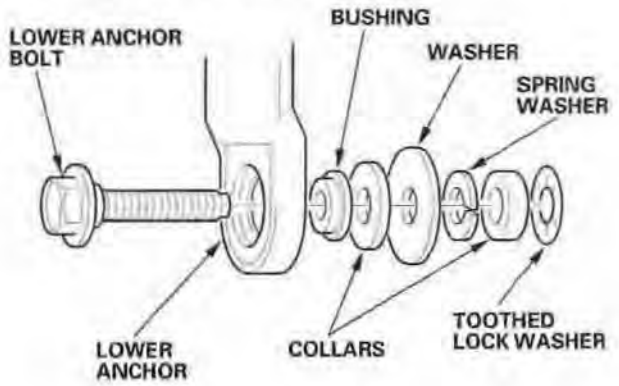
10. Install the seat belt in the reverse order of removal, and note these items:

- Apply liquid thread lock to the anchor bolts before reinstallation.
- Check that the retractor locking mechanism functions (see page 23-9).
- Assemble the washers, collars, and bushings on the upper and lower anchor bolts as shown.
- If the seat belt tensioner has been deployed, replace the seat belt protector with a new one.
- Before installing the anchor bolts, make sure there are no twists or kinks in the seat belt.
- Make sure the seat belt tensioner connector is plugged in properly.
- Reconnect the negative cable to the battery.
- Enter the anti-theft code for the radio, then enter the customer's radio and XM presets.
- Reset the clock.
- Do the ECM/PCM idle learn procedure (see page 11-207).
- Do the power window control unit reset procedure (see page 22-115).

Upper anchor bolt installation



Lower anchor bolt installation



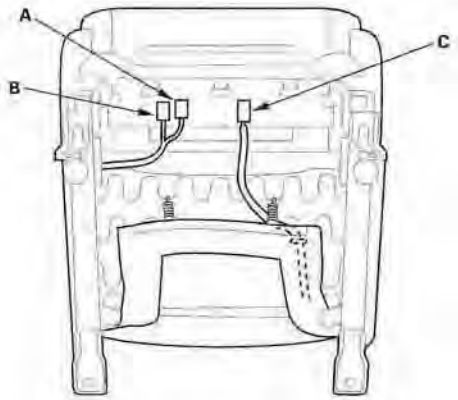
(cont'd)

Front Seat Belt Replacement (cont'd)

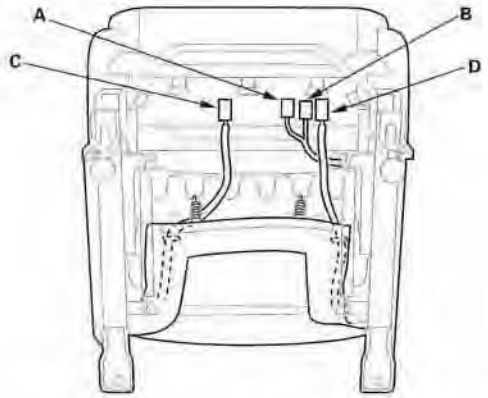
Seat Belt Buckle

1. Make sure you have the anti-theft code for the radio, then write down the radio and XM presets.
2. Disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.
3. Remove the front seat (see page 20-86).
4. Lift up the front seat, then disconnect the seat belt buckle switch connector (A), the seat belt buckle tensioner connector (B), the side airbag connector (C) on some driver's and passenger's seats, and the OPDS unit harness connector (D) on some passenger's seats.

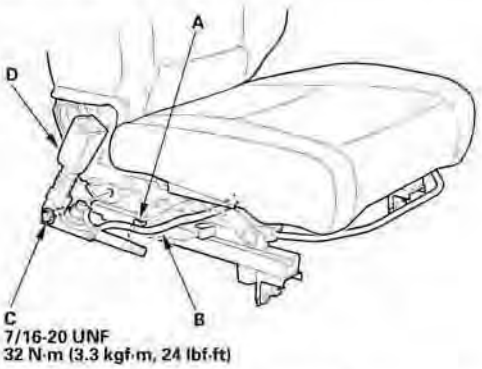
Driver's seat



Passenger's seat



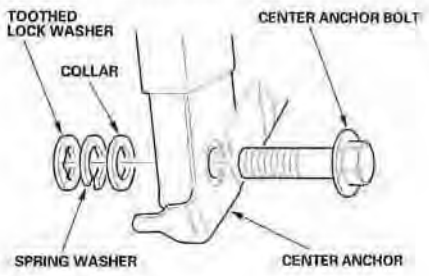
5. Remove the center cover from the seat; driver's seat (see page 20-88), passenger's seat (see page 20-89).
6. Detach the harness clip (A), and pull the seat belt switch/tensioner harness (B) out through the space between the seat cushion and the seat linkage (driver's seat), or the hole on the seat track (passenger's seat).



7. Remove the center anchor bolt (C), and remove the seat belt buckle (D).
8. Install the seat belt buckle in the reverse order of removal, and note these items:

- Apply liquid thread lock to the center anchor bolt before reinstallation, and collar.
- Assemble the washers on the center anchor bolt as shown.
- If the seat belt tensioner has been deployed, replace the front seat belt protector with a new one.
- Apply liquid thread lock to the seat mounting bolts before reinstallation.
- Reconnect the negative cable to the battery.
- Enter the anti-theft code for the radio, then enter the customer's radio and XM presets.
- Reset the clock.
- Do the ECM/PCM idle learn procedure (see page 11-207).
- Do the power window control unit reset procedure (see page 22-115).

Center anchor bolt installation

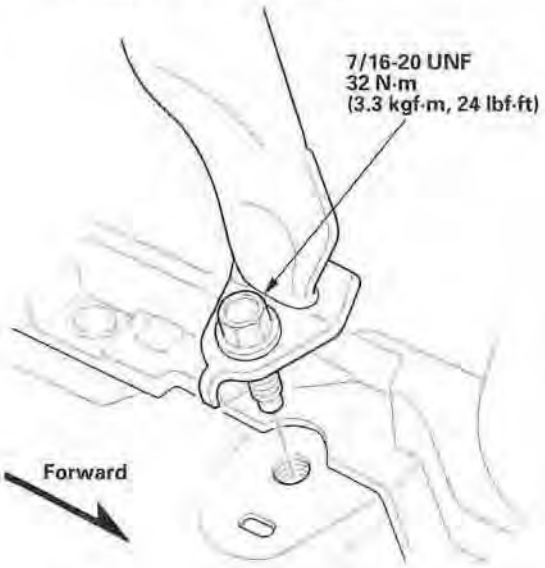


Rear Seat Belt Replacement

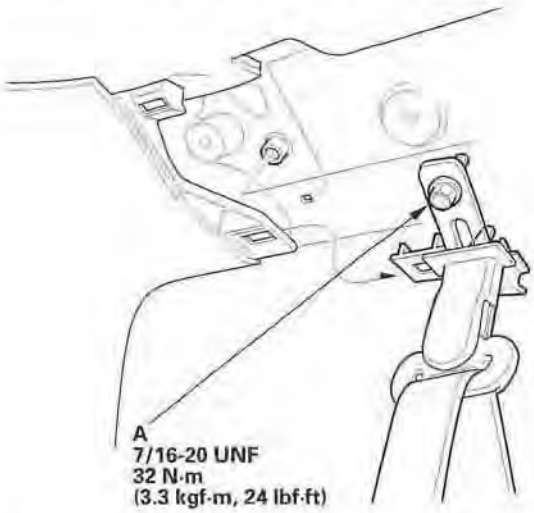
NOTE: Check the rear seat belts for damage, and replace them if necessary. Be careful not to damage them during removal and installation.

Rear Seat Belt

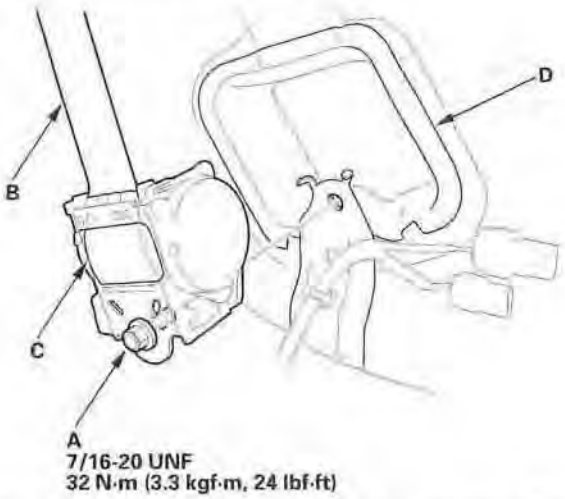
1. Remove these items:
   - Cargo floor lid (see page 20-59)
   - Rear trim panel (see page 20-59)
   - Rear seat
   - Rear seat striker (see page 20-104)
2. Remove the lower anchor bolt.



3. Remove the rear side trim panel (see page 20-60).
4. Remove the quarter pillar trim (see page 20-61).
5. Remove the upper anchor bolt (A).



6. Remove the retractor bolt (A), then remove the rear seat belt (B) and retractor (C).



7. If necessary, remove the seat belt protector (D).
8. Install the seat belt in the reverse order of removal, and note these items:
   - Apply liquid thread lock to the anchor bolts before reinstallation.
   - Check that the retractor locking mechanism functions as described (see page 23-9).
   - Before installing the anchor bolts, make sure there are no twists or kinks in the seat belt.

(cont'd)

Rear Seat Belt Replacement (cont'd)

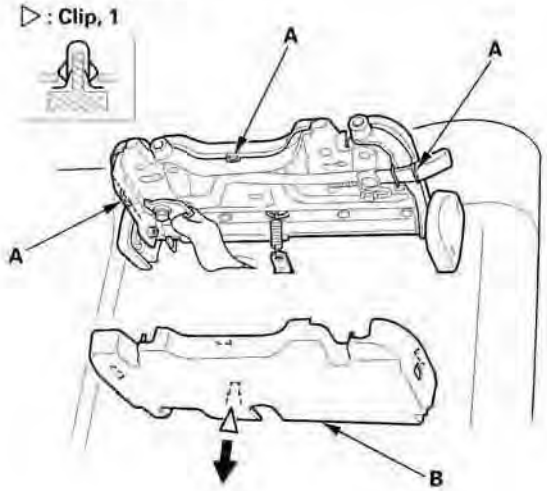
Seat Belt Buckle

NOTE: Take care not to tear the seams or damage the seat covers.

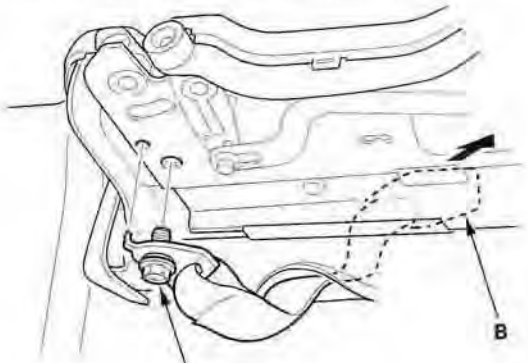
1. Pull the rear seat up, and hold it with the strap.
2. Detach the hooks (A) and clip, then remove the inner support cover (B).

Fastener Location

▷: Clip, 1



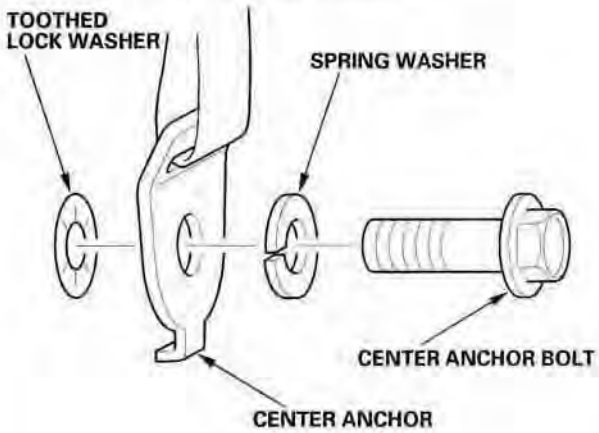
3. Remove the center anchor bolt (A), and pull the seat belt buckle (B) out, then remove it.



A
7/16-20 UNF
32 N·m (3.3 kgf·m, 24 lbf·ft)

4. Install the seat belt buckle in the reverse order of removal, and note these items:
   - Apply liquid thread lock to the center anchor bolt before reinstallation.
   - Make sure there are no twists or kinks in the seat belt buckle.
   - Assemble the washers on the center anchor bolt as shown.

Center anchor bolt installation



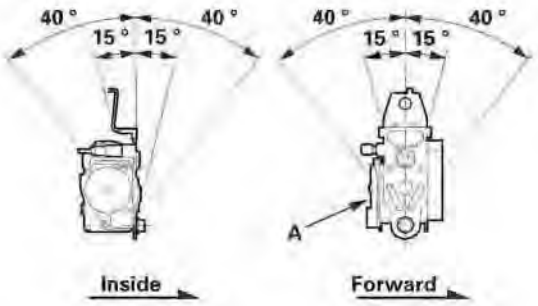
Inspection

For front seat belt retractor with seat belt tensioner, review the SRS component locations (see page 23-10) and the precautions and procedures (see page 23-11) before performing repairs or service.

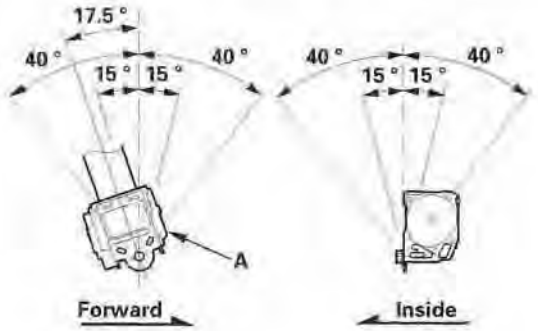
Retractor

1. Before installing the retractor, check that the seat belt can be pulled out freely.
2. Make sure that the seat belt does not lock when the retractor (A) is leaned slowly up to 15 ° from the mounted position. The seat belt should lock when the retractor is leaned over 40 °. Do not attempt to disassemble the retractor.

Front



Rear



3. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

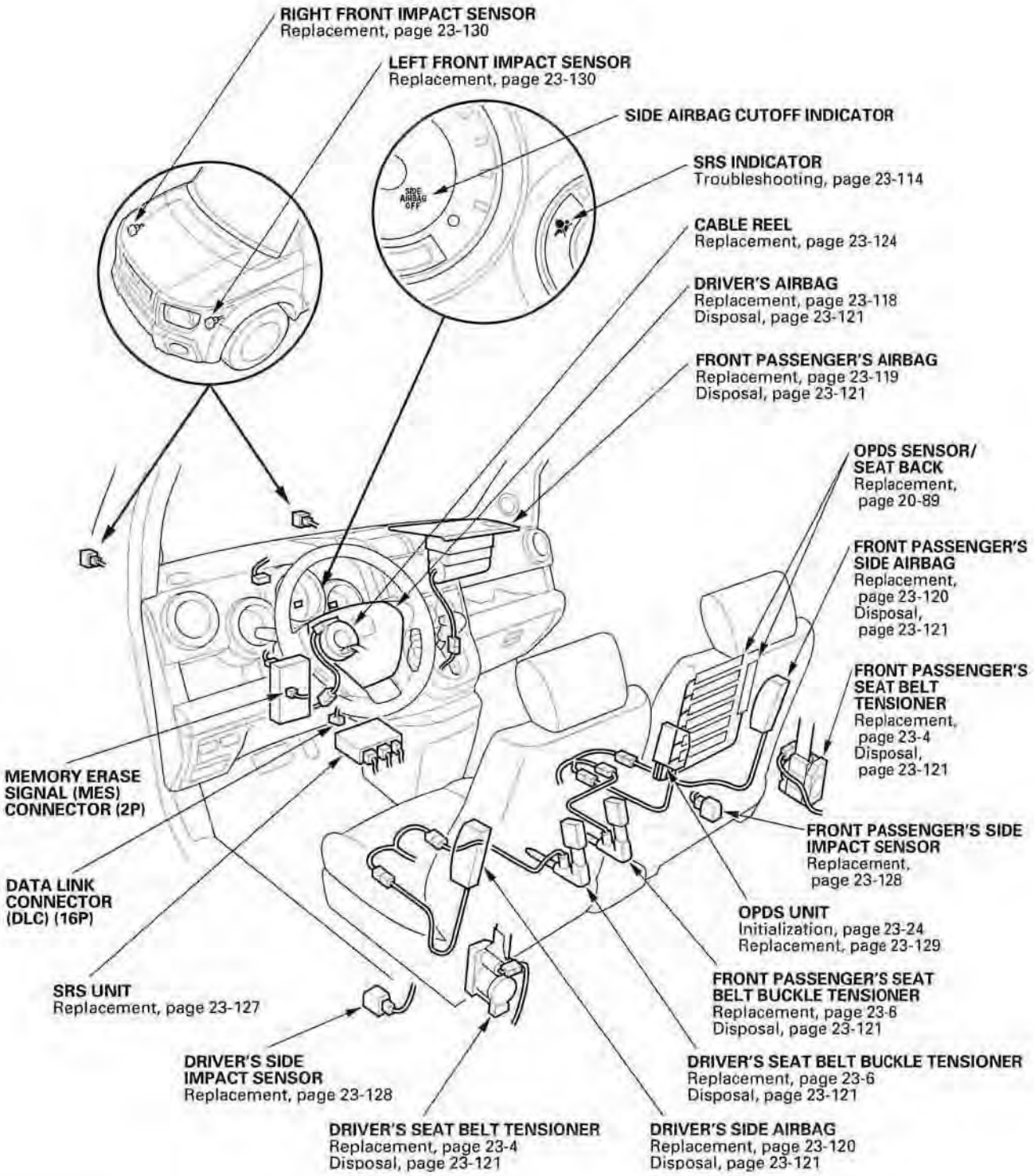
In-vehicle

1. Check that the seat belt is not twisted or caught on anything.
2. After installing the anchors, check for free movement on the anchor bolts. If necessary, remove the anchor bolts and check that the washers and other parts are not damaged or improperly installed.
3. Check the seat belts for damage or discoloration. Clean with a shop towel if necessary. Use only soap and water to clean.

   NOTE: Dirt build-up in the loops of the upper anchors can cause the seat belts to retract slowly. Wipe the inside of the loops with a clean cloth dampened in isopropyl alcohol.
4. Check that the seat belt does not lock when pulled out slowly. The seat belt is designed to lock only during a sudden stop or impact.
5. Make sure that the seat belt will retract automatically when released.
6. For front and rear passenger's seat belts, check the seat belt retractor locking mechanism ALR (automatic locking retractor). This function is for securing child seats:

   –1 Pull the seat belt all the way out to engage the ALR. The seat belt should retract with a ratcheting sound, but not extend. This is normal.
   –2 To disengage the ALR, release the seat belt and allow it to fully retract, then pull the seat belt out part-way. The seat belt should retract and extend normally.
7. Replace the seat belt with a new assembly if there is any abnormality. Do not disassemble any part of the seat belt for any reason.

Component Location Index

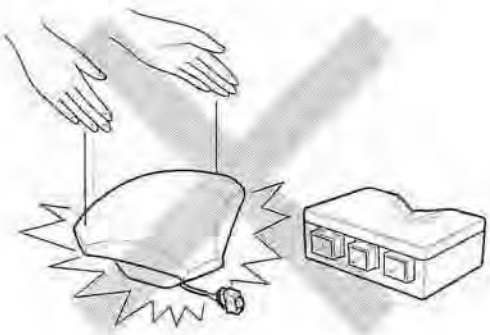


Precautions and Procedures

General Precautions

Please read the following precautions carefully before performing airbag system service. Observe the instructions described in this manual, or the airbags could accidentally deploy and cause damage or injuries.

- Except when performing electrical inspections, always turn the ignition switch OFF, ground the SCS line with the HDS to take the PCM out of active status, disconnect the negative cable from the battery, and wait at least 3 minutes before beginning work.
  NOTE: The SRS memory is not erased even if the ignition switch is turned OFF or the battery cables are disconnected from the battery.
- Use replacement parts which are manufactured to the same standards and quality as the original parts. Do not install used SRS parts. Use only new parts when making SRS repairs.
- Carefully inspect any SRS part before you install it. Do not install any part that shows signs of being dropped or improperly handled, such as dents, cracks, or deformation.



- Before removing any SRS parts (including disconnection of connectors), always disconnect the SRS connector.
- Use only a digital multimeter to check the system. If it is not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the lowest value in the ohmmeter range. A tester with a higher output could cause accidental deployment and possible injury.
- Do not put objects on the front passenger's airbag.
- The original radio has a coded theft protection circuit. Be sure to get the customer's anti-theft code and write down the radio and XM presets before disconnecting the battery negative cable.
- Before returning the vehicle to the customer, enter the anti-theft code, then enter the customer's radio and XM presets, and set the clock. Do the engine control module (ECM)/powertrain control module (PCM) idle learn procedure (see page 11-207) and the power window control unit resetting procedure (see page 22-115).

Steering-related Precautions

Cable Reel Alignment

- Misalignment of the cable reel could cause an open in the wiring, making the SRS system and the horn inoperative. Center the cable reel whenever the following is performed (see step 6 on page 23-126).
  - Installation of the steering wheel
  - Installation of the cable reel
  - Installation of the steering column
  - Other steering-related adjustment or installation
- Do not disassemble the cable reel.
- Do not apply grease to the cable reel.
- If the cable reel shows any signs of damage, replace it with a new one. For example, if it does not rotate smoothly, replace the cable reel.

(cont'd)

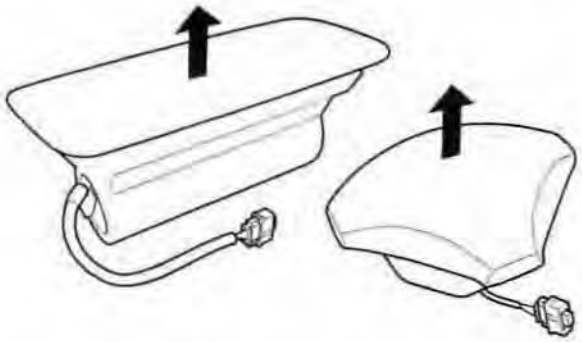
Precautions and Procedures (cont'd)

Airbag Handling and Storage

Do not disassemble an airbag. It has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.

For temporary storage of an airbag during service, observe the following precautions.

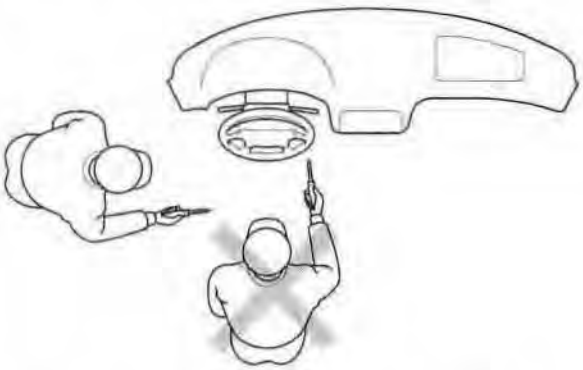
- Store the removed airbag with the pad surface up. Never put anything on the airbag.



- To prevent damage to the airbag, keep it away from any oil, grease, detergent, or water.

- Store the removed airbag on a secure, flat surface away from any high heat source (exceeding 200 °F/ 93 °C).

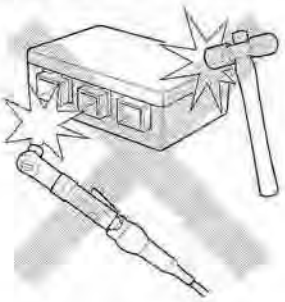
- Never perform electrical inspections to the airbags, such as measuring resistance.
- Do not position yourself in front of the airbag during removal, inspection, or replacement.



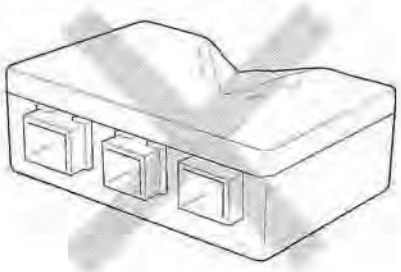
- For proper disposal of a damaged airbag, refer to the airbag disposal (see page 23-121).

SRS Unit, Front Impact Sensors, and Side Impact Sensors

- Be careful not to bump or impact the SRS unit, front impact sensors, or side impact sensors whenever the ignition switch is ON (II), or for at least 3 minutes after the ignition switch is turned OFF.
- During installation or replacement, be careful not to bump (by impact wrench, hammer, etc.) the area around the SRS unit, front impact sensors, and side impact sensors. The airbags could accidentally deploy and cause damage or injury.



- After a collision in which any airbags or seat belt tensioners were deployed, replace the SRS unit, front impact sensors, and other deployed components (see page 23-117). After a collision in which a side airbag was deployed, replace the side impact sensor on the deployed side and the SRS unit. After a collision in which the airbags or the side airbags did not deploy, inspect for any damage or any deformation on the SRS unit, front impact sensors, and the side impact sensors. If there is any damage, replace the SRS unit and/or the sensors.



- Do not disassemble the SRS unit, front impact sensors, or side impact sensors.
- Turn the ignition switch OFF, disconnect the battery negative cable, and wait at least 3 minutes before beginning installation or replacement of the SRS unit, or disconnecting the connectors from the SRS unit.
- Be sure the SRS unit, front impact sensors, and side impact sensors are installed securely, with the mounting bolts torqued to 9.8 N-m (1.0 kgf-m, 7.2 lbf-ft)
- Do not spill water or oil on the SRS unit or the side impact sensors, and keep them away from dust.
- Store the SRS unit, front impact sensors, and side impact sensors in a cool (less than 104 °F/40 °C) and dry (less than 80 % relative humidity, no moisture) area.

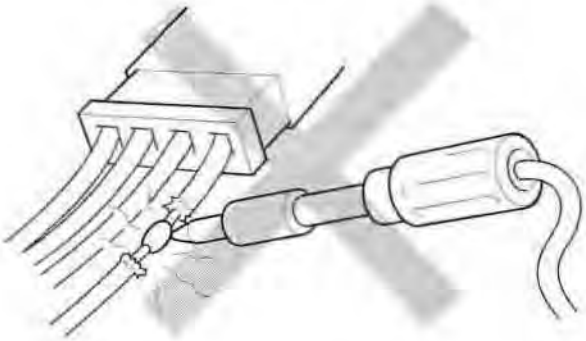
(cont'd)

Precautions and Procedures (cont'd)

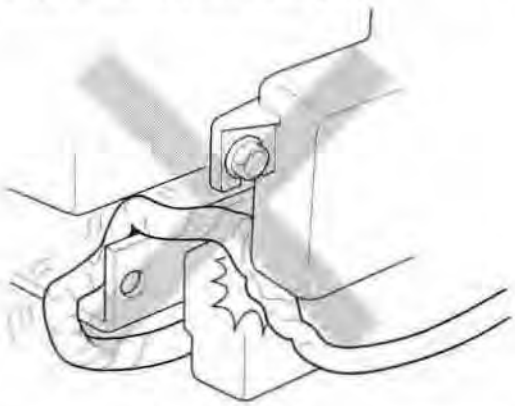
Wiring Precautions

Some of the SRS wiring can be identified by special yellow outer covering, and the SRS connectors can be identified by their yellow color. Observe the instructions.

- Never attempt to modify, splice, or repair SRS wiring. If there is an open or damage in SRS wiring, replace the harness.



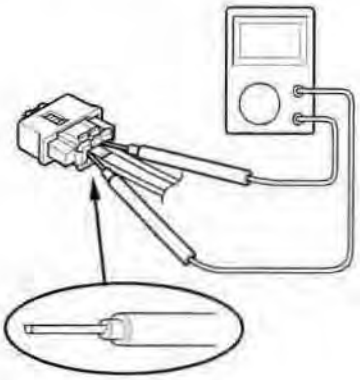
- Be sure to install the harness wires so they do not get pinched or interfere with other parts.



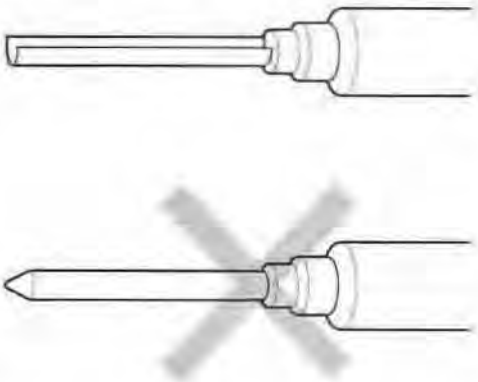
- Make sure all SRS ground locations are clean, and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

Precautions for Electrical Inspections

- When using electrical test equipment, insert the probe of the tester into the wire side of the connector. Do not insert the probe of the tester into the terminal side of the connector, and do not tamper with the connector.



- Use a U-shaped probe. Do not insert the probe forcibly.



- Use specified service connectors in troubleshooting. Using improper tools could cause an error in inspection due to poor metal-to-metal contact.

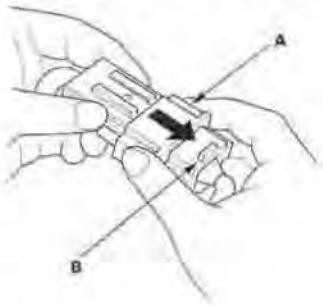
Spring-loaded Lock Connector

Some SRS system connectors have a spring-loaded lock.

Front Airbag Connectors

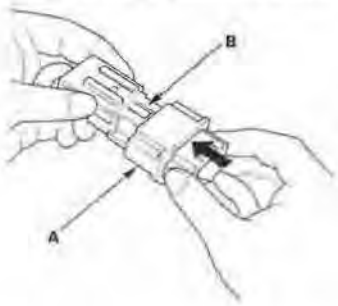
Disconnecting

To release the lock, pull the spring-loaded sleeve (A) toward the stop (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector.

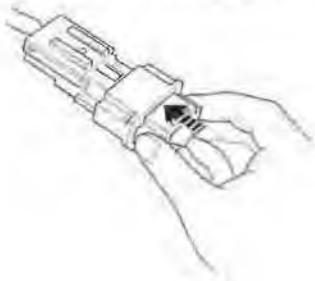


Connecting

1. To reconnect, hold the pawl-side connector, and press on the back of the sleeve-side connector in the direction shown. As the two connector halves are pressed together, the sleeve (A) is pushed back by the pawl (B). Do not touch the sleeve.



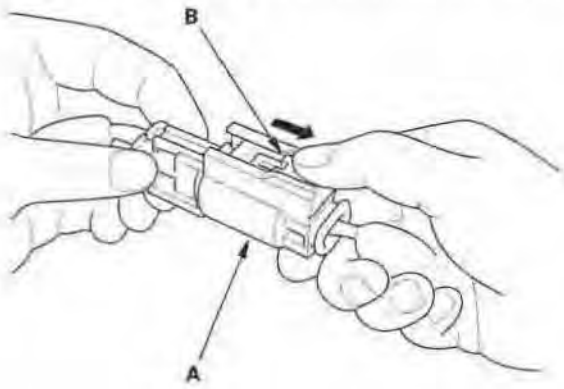
2. When the connector halves are completely connected, the pawl is released, and the spring-loaded sleeve locks the connector.



Side Airbag Connector

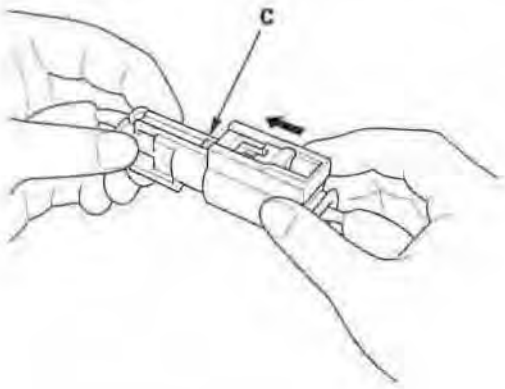
Disconnecting

To release the lock, pull the spring-loaded sleeve (A) and the slider (B) while holding the opposite half of the connector. Then pull the connector halves apart. Be sure to pull on the sleeve and not on the connector half.



Connecting

Hold both connector halves, and press them firmly together until the projection (C) of the sleeve-side connector clicks.



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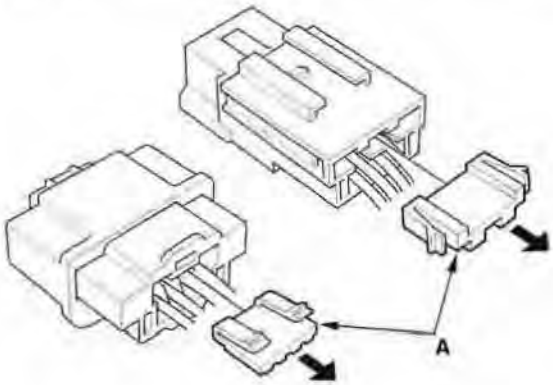
Precautions and Procedures (cont'd)

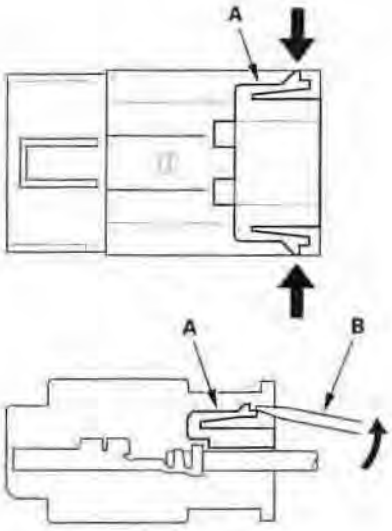
Backprobing Spring-loaded Lock Connectors

When checking voltage or resistance on this type of connector the first time, you must remove the retainer to insert the tester probe from the wire side.

NOTE: It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.

To remove the retainer (A), insert a flat-tip screwdriver (B) between the connector body and the retainer, then carefully pry out the retainer. Take care not to break the connector.





Seats with Side Airbags

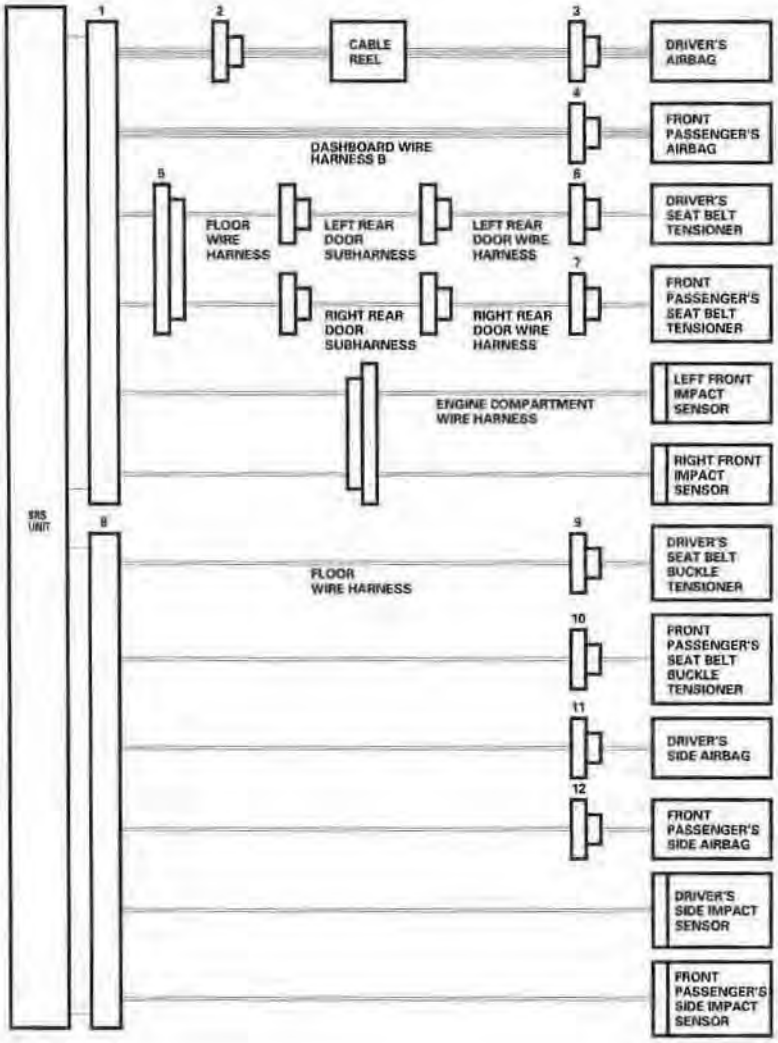
Seats with side airbags have a "SIDE AIRBAG" label on the seat-back. Because the component parts (seat-back cover, cushion, etc.) of seats with and without airbags are different, make sure you install only the correct replacement parts.

- When cleaning, do not saturate the seat with liquid, and do not spray steam on the seat.
- Do not repair a torn or frayed seat-back cover. Replace the seat-back cover.
- After a collision in which the side airbag was deployed, replace the side airbag with new parts; if the seat-back cushion is split, it must be replaced; if the seat-back frame is deformed, it must be replaced.
- Never put aftermarket accessories on the seat (covers, pads, seat heaters, lights, etc.).

Disconnecting System Connectors

Before removing a front airbag, side airbag, or other SRS related devices (the SRS unit, the cable reel, the front impact sensors, the side impact sensors, the seat belt buckle tensioners, and the seat belt tensioner connector), disconnecting connectors from related devices, or removing the dashboard or the steering column, disconnect the airbag connectors or the side airbag connectors to prevent accidental deployment. Turn the ignition switch OFF, disconnect the negative cable from the battery, and wait at least 3 minutes before beginning the following procedures.

- Before disconnecting SRS unit connector A (1) from the SRS unit, disconnect the driver's airbag 4P connector (3), the front passenger's airbag 4P connector (4), the driver's seat belt tensioner 2P connector (6), and the front passenger's seat belt tensioner 2P connector (7).
- Before disconnecting SRS unit connector B (8) from the SRS unit, disconnect both side airbag 2P connectors (11, 12), and both seat belt buckle tensioner 4P connectors (9, 10).
- Before disconnecting the cable reel 4P connector (2), disconnect the driver's airbag 4P connector (3).
- Before disconnecting the floor wire harness 4P connector (5), disconnect both seat belt tensioner 2P connectors (6, 7).



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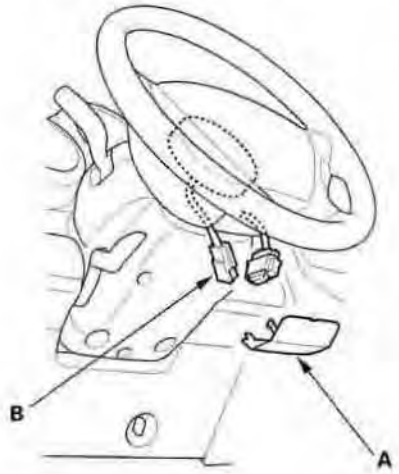
Precautions and Procedures (cont'd)

1. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait at least 3 minutes.

Driver's Airbag

2. Remove the access panel (A) from the steering wheel, then disconnect the driver's airbag 4P connector (B) from the cable reel.



Front Passenger's Airbag

3. Remove the glove box, then disconnect the front passenger's airbag 4P connector (A) from dashboard wire harness B.

Side Airbag

4. Disconnect the side airbag 2P connector (A) from the floor wire harness.

Seat Belt Tensioner

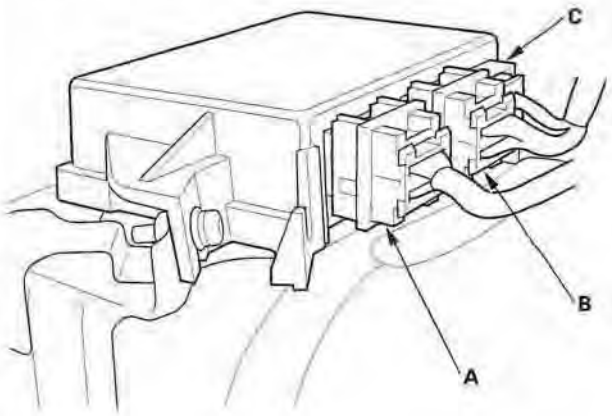
5. Disconnect the seat belt tensioner 2P connector (A) from the rear door wire harness.

Seat Belt Buckle Tensioner

6. Disconnect the seat belt buckle tensioner 4P connector (A).

SRS Unit

7. Disconnect SRS unit connector A, SRS unit connector B, or SRS unit connector C from the SRS unit.



General Troubleshooting Information

DTC (Diagnostic Trouble Codes)

The self-diagnostic function of the SRS system allows it to locate the causes of system problems and then store this information in memory. For easier troubleshooting, this data can be retrieved via a data link circuit.

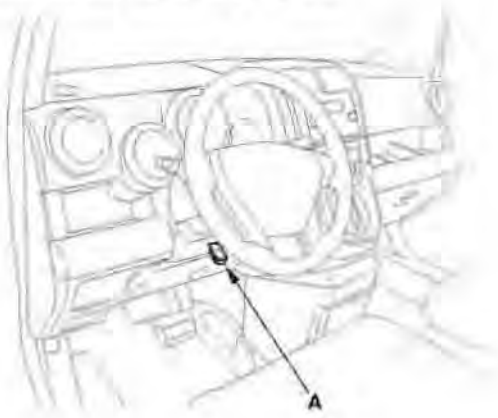
- When you turn the ignition switch ON (II), the SRS indicator comes on. If it goes off after 6 seconds, the system is normal.
- If there is an abnormality, the system locates and defines the problem, stores this information in memory, and turns the SRS indicator on. The data will remain in the memory even when the ignition switch is turned off or if the battery is disconnected.
- When you connect the Honda Diagnostic System (HDS) to the 16P data link connector (DLC) to short the SCS terminal, and turn the ignition switch ON (II), the SRS indicator will indicate the primary diagnostic trouble code (DTC) by the number of blinks.
- When you connect the HDS to the 16P data link connector (DLC), you can retrieve the DTC in the Honda Systems "SRS" menu.
- After reading and recording the DTC, proceed with the troubleshooting procedure for this code.

Precautions

- Make sure the battery is sufficiently charged. If the battery is dead or low, measuring values may not be correct.
- Use only a digital multimeter to check the system. If it's not a Honda multimeter, make sure its output is 10 mA (0.01 A) or less when switched to the smallest value in the ohmmeter range. A tester with a higher output could damage the airbag circuit or cause accidental airbag deployment and possible injury.
- Whenever the ignition switch is ON (II), or has been turned OFF for less than 3 minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.
- Before you remove the SRS harness, disconnect the driver's airbag connector, the front passenger's airbag connector, both side airbag connectors, both seat belt buckle tensioners, and both seat belt tensioner connectors.
- Do not touch a tester probe to the terminals in the SRS unit or harness connectors, and do not connect the terminals with a jumper wire. Use only the backprobe set and the multimeter. Backprobe spring-loaded lock type connectors correctly.

Reading the DTC

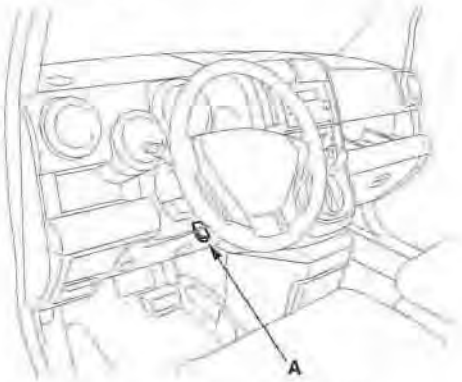
1. Make sure the ignition switch is OFF.
2. Connect the HDS to the DLC (A).



3. Turn the ignition switch ON (II).
4. Use the HDS to check for DTCs.
5. Read and record the DTC.
6. Turn the ignition switch OFF, and wait for 10 seconds.
7. Disconnect the HDS from the DLC.
8. Do the troubleshooting procedure for the DTC.

HDS "SCS" Menu Method (retrieving the flash codes)

The SRS indicator indicates the DTC by the number of blinks when the HDS is connected to the DLC (data link connector) (16P) (A).

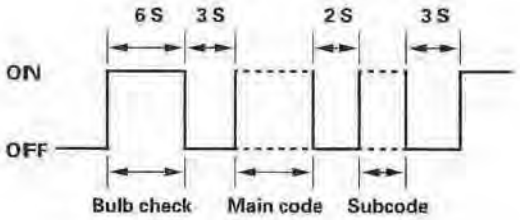


1. Make sure the ignition switch is OFF.
2. Connect the HDS to the DLC (16P), and follow the HDS prompts in the "SCS" menu.
3. Make sure the SCS line is grounded, then turn the ignition switch ON (II). The SRS indicator comes on for about 6 seconds, and then goes off. Then it will blink to indicate the DTCs.
4. Read the DTC.
5. Turn the ignition switch OFF, and wait for 10 seconds.
6. Disconnect the HDS from the DLC (16P).
7. Proceed the troubleshooting procedure for the DTC.

Patterns of DTC Indications

The DTC consists of a main code and subcode.

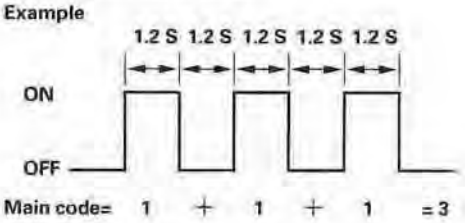
S: Second



Reading the main code

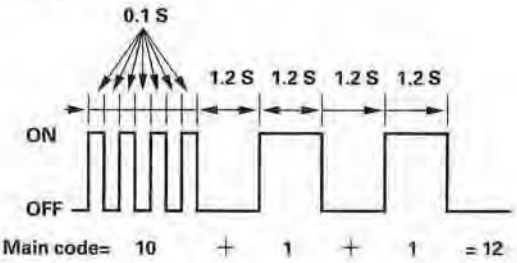
In case of 1 – 10
Count the number of blinks.

Example



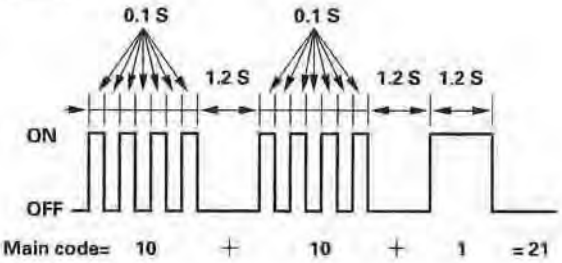
In case of 11 – 15
Four fast blinks count as 10.
Add any further blinks together as shown.

Example



In case of 20 or more
Two sets of four continuous blinks count as 20.
Add any further blinks together as shown.

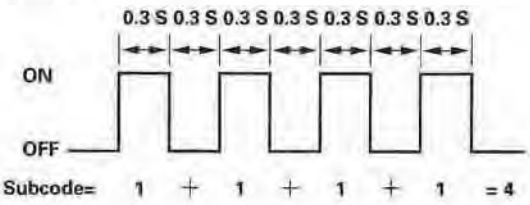
Example



Reading the subcode

Count the number of blinks.

Example



If the main code is '3', and the subcode is '4', record a DTC 3-4.

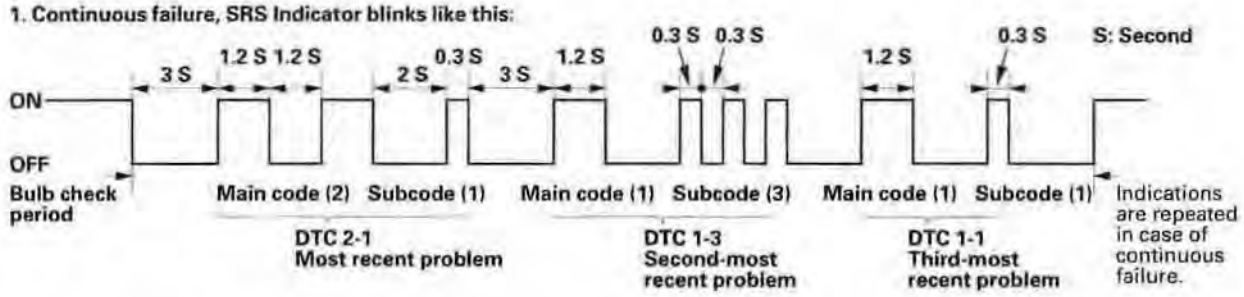
(cont'd)

General Troubleshooting Information (cont'd)

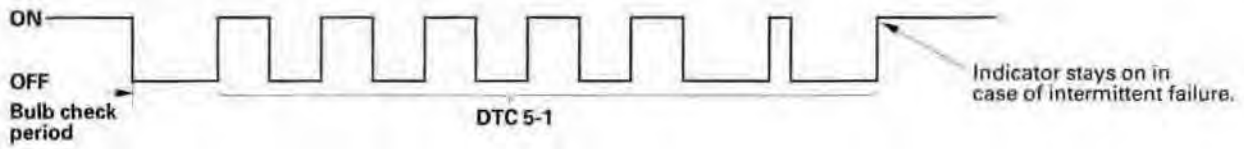
- Including the most recent problem, up to three different DTCs can be indicated (see example 1).
- In case of a continuous failure, the DTC will be indicated repeatedly (see example 1).
- In case of an intermittent failure, the SRS indicator will indicate the DTCs one time, then it will stay on (see example 2).
- If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
- When the system is normal (no DTC), the SRS indicator will stay on (see example 3).
- If the SRS indicator comes on continuously without a DTC, there may be a problem with the system.
- If the SRS indicator does not come on as indicated above, always check for an open or a short to ground in the SCS circuit before troubleshooting the system.

Examples of DTC indications

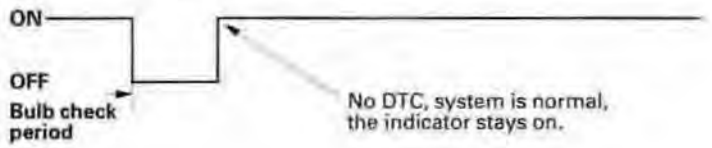
1. Continuous failure, SRS Indicator blinks like this:



2. Intermittent failure, SRS Indicator blinks like this:

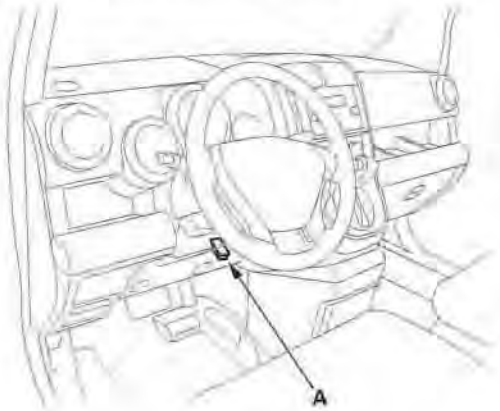


3. Normal (no failure, SRS Indicator blinks like this:



Erasing the DTC Memory with HDS

1. Make sure the ignition switch is OFF.
2. Connect the HDS to the DLC (A).



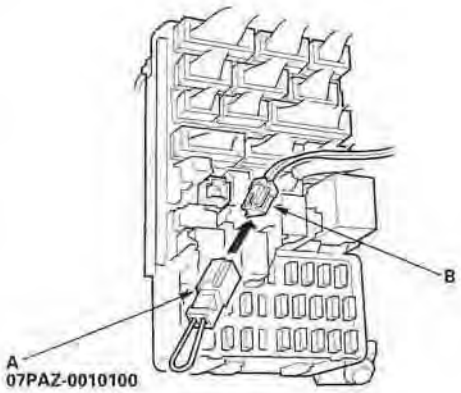
3. Turn the ignition switch ON (II).
4. In the TEST MODE MENU of the HDS, select DTC CLEAR. This erases the DTC(s).
5. Turn the ignition switch OFF, and wait for 10 seconds.
6. Disconnect the HDS from the DLC.

Erasing the DTC Memory with Manual Mode

Special Tools Required
SCS service connector 07PAZ-0010100

To erase the DTC(s) from the SRS unit, use the HDS, or the following procedure.

1. Make sure the ignition switch is OFF.
2. Connect the SCS service connector (A) to the yellow MES connector (2P) (B). Do not use a jumper wire.



3. Turn the ignition switch ON (II).
4. The SRS indicator will come on for about 6 seconds, and then go off. Remove the SCS service connector from the MES 2P connector within 4 seconds after the indicator goes off.
5. The SRS indicator will come on again. Reconnect the SCS service connector to the MES 2P connector within 4 seconds after the indicator comes on.
6. When the SRS indicator goes off, remove the SCS service connector from the MES 2P connector within 4 seconds.
7. The SRS indicator blinks two times, indicating that the memory has been erased.
8. Turn the ignition switch OFF, and wait for 10 seconds.
9. Turn the ignition switch ON (II) again. If the SRS indicator comes on for 6 seconds, and then goes off, the system is OK.

(cont'd)

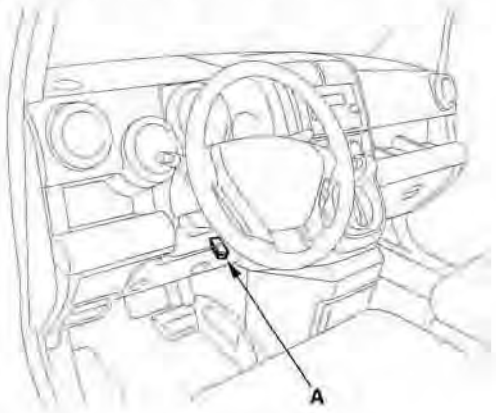
General Troubleshooting Information (cont'd)

Initializing the OPDS (Occupant Position Detection System) Unit with HDS

When a seat-back cover, seat-back cushion, and/or OPDS unit is replaced, initialize the OPDS by following the procedure.

NOTE: A new (uninitialized) OPDS unit installed with a faulty OPDS sensor can cause DTC 15-1.

1. Erase the DTC memory (see "Erasing the DTC Memory").
2. Make sure the front passenger's seat is dry. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.
3. Make sure the ignition switch is OFF.
4. Connect the HDS to the DLC (A).



5. Turn the ignition switch ON (II).
6. From the HDS Main Menu, select SRS, Misc Test, and Adjustments. Then select OPDS INIT to initialize the OPDS.
7. Turn the ignition switch OFF.
8. Disconnect the HDS from the DLC.

   NOTE: If the OPDS system fails to initialize after several attempts, replace the OPDS sensor and retry. If the OPDS system continues to fail to initialize, replace the OPDS unit (see page 23-129).

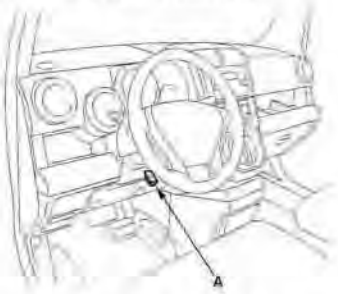
Initializing the OPDS (Occupant Position Detection System) Unit with Manual Mode

Special Tools Required
SCS service connector 07PAZ-0010100

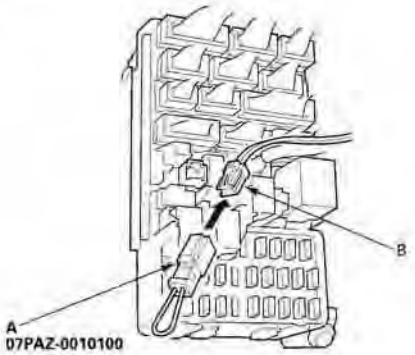
When a seat-back cover, seat-back cushion, and/or OPDS unit is replaced, initialize the OPDS by following the procedure.

NOTE: A new (uninitialized) OPDS unit installed with a faulty OPDS sensor can cause DTC 15-1.

1. Erase the DTC memory (see "Erasing the DTC Memory").
2. Make sure the front passenger's seat is dry. Set the seat-back in the normal position, and make sure there is nothing on the front passenger's seat.
3. Make sure the ignition switch is OFF.
4. Connect the HDS to the DLC (A).



5. From the HDS Main Menu, select SRS. In the PROGRAM MENU of the HDS, select SCS.
6. Connect the SCS service connector (A) to the yellow MES 2P connector (B). Do not use a jumper wire.



7. Turn the ignition switch ON (II).

8. The SRS indicator comes on for about 6 seconds and goes off. Remove the SCS service connector from the MES 2P connector within 4 seconds after the SRS indicator went off.

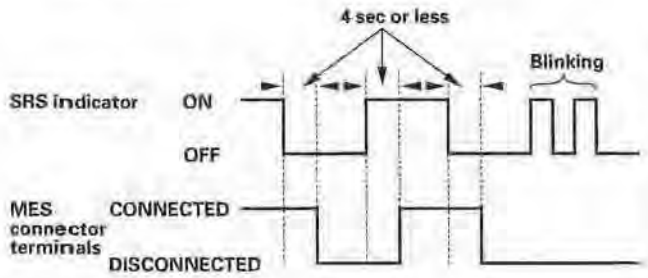
9. The SRS indicator comes on again. Reconnect the SCS service connector to the MES 2P connector within 4 seconds after the SRS indicator comes on.

10. The SRS indicator goes off. Remove the SCS service connector from the MES 2P connector within 4 seconds.

11. Watch the SRS indicator.

    - If the indicator blinks two times and then stays on, the OPDS is initialized, but the DTCs need to be erased. Go to step 12, then erase the DTCs.
    - If the indicator blinks two times and then goes off, the OPDS unit is initialized. Go to step 12.
    - If the indicator stays on without first blinking, the OPDS is not initialized. Read the DTC. If DTC 15-1 is indicated, repeat the initialization procedure. If another DTC is indicated, go to the appropriate page in the DTC Troubleshooting. If the OPDS system fails to initialize after several attempts, replace the OPDS sensor/seat back (see page 20-92) and retry. If the OPDS system continues to fail to initialize, replace the OPDS unit (see page 23-129).

12. Turn the ignition switch off, and disconnect the HDS.



Troubleshooting Intermittent Failures

If there was a malfunction, but it does not recur, it will be stored in the memory as an intermittent failure, and the SRS indicator may come on depending on the malfunction detected.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see "Reading the DTC").

2. Check all SRS connectors that are related to the temporary DTC stored in memory for poor or loose connections.

3. Erase the DTC memory (see "Erasing the DTC Memory").

4. Set the parking brake, start the engine, and let it idle.

5. The SRS indicator comes on for about 6 seconds and then goes off.

6. Shake the wire harness and the connectors, take a test drive (quick acceleration, quick braking, cornering), turn the steering wheel fully left and right, and hold it there for 5 to 10 seconds. If the problem recurs, the SRS indicator will come on.

7. If you cannot duplicate the intermittent failure, the system is OK at this time.

DTC Troubleshooting Index

DTC	Detection Item	Notes
1-1	Open or increased resistance in driver's airbag inflator	(see page 23-34)
1-3	Short to another wire or decreased resistance in driver's airbag inflator	(see page 23-35)
1-4	Short to power in driver's airbag inflator	(see page 23-37)
1-5	Short to ground in driver's airbag inflator	(see page 23-38)
2-1	Open or increased resistance in front passenger's airbag inflator	(see page 23-40)
2-3	Short to another wire or decreased resistance in front passenger's airbag inflator	(see page 23-41)
2-4	Short to power in front passenger's airbag inflator	(see page 23-43)
2-5	Short to ground in front passenger's airbag inflator	(see page 23-44)
3-1	Open or increased resistance in driver's seat belt tensioner	(see page 23-46)
3-3	Short to another wire or decreased resistance in driver's seat belt tensioner	(see page 23-48)
3-4	Short to power in driver's seat belt tensioner	(see page 23-51)
3-5	Short to ground in driver's seat belt tensioner	(see page 23-53)
4-1	Open or increased resistance in front passenger's seat belt tensioner	(see page 23-60)
4-3	Short to another wire or decreased resistance in front passenger's seat belt tensioner	(see page 23-63)
4-4	Short to power in front passenger's seat belt tensioner	(see page 23-65)
4-5	Short to ground in front passenger's seat belt tensioner	(see page 23-68)
5-1	Internal failure of SRS unit NOTE: Before troubleshooting DTCs 5-1 through 8-6, check battery/system voltage. If voltage is low, repair the charging system or replace the battery before troubleshooting the SRS.	(see page 23-75)
5-2		
5-4		
5-8		
6-3		
6-4		
6-7		
6-8		
7-1		
7-2		
7-3		
8-1		
8-2		
8-3		
8-4		
8-5		
8-6		
9-1	Internal failure of the SRS unit. If intermittent, it could mean internal failure of the unit or a faulty indicator circuit. Refer to Troubleshooting Intermittent Failures (see page 23-25). NOTE: Before troubleshooting DTC 9-1, check battery/system voltage. If the voltage is low, repair the charging system or replace the battery before troubleshooting the SRS.	(see page 23-77)
9-2	Faulty power supply (VB line). NOTE: Before troubleshooting DTC 9-2, check battery/system voltage. If the voltage is low, repair the charging system or replace the battery before troubleshooting the SRS.	(see page 23-78)

DTC	Detection Item	Notes
9-3	Faulty driver's seat belt buckle switch	(see page 23-80)
9-4	Faulty front passenger's seat belt buckle switch	(see page 23-83)
9-6	Faulty left front impact sensor	(see page 23-86)
9-7	Faulty right front impact sensor	(see page 23-88)
10-1	Seat belt and seat belt buckle tensioners (and airbag(s)) deployed	(see page 23-75)
10-2	Driver's side airbag deployed	
10-3	Seat belt and seat belt buckle tensioners (and airbag(s)) and driver's side airbag deployed	
10-4	Front passenger's side airbag deployed	
10-5	Seat belt and seat belt buckle tensioners (and airbag(s)) and front passenger's side airbag deployed	
10-6	Driver's and front passenger's side airbags deployed	
10-7	Seat belt and seat belt buckle tensioners (and airbag(s)) and driver's and front passenger's side airbags deployed	
11-1	Open or increased resistance in driver's side airbag inflator	(see page 23-90)
11-3	Short to another wire or decreased resistance in driver's side airbag inflator	(see page 23-91)
11-4	Short to power in driver's side airbag inflator	(see page 23-92)
11-5	Short to ground in driver's side airbag inflator	(see page 23-94)
12-1	Open or increased resistance in front passenger's side airbag inflator	(see page 23-95)
12-3	Short to another wire or decreased resistance in front passenger's side airbag inflator	(see page 23-96)
12-4	Short to power in front passenger's side airbag inflator	(see page 23-97)
12-5	Short to ground in front passenger's side airbag inflator	(see page 23-99)
13-1	Internal failure of the driver's side impact sensor	(see page 23-76)
13-2		
13-3	No signal from the driver's side impact sensor	(see page 23-100)
13-4	Faulty power supply to the driver's side impact sensor	(see page 23-101)
14-1	Internal failure of the front passenger's side impact sensor	(see page 23-76)
14-2		
14-3	No signal from the front passenger's side impact sensor	(see page 23-103)
14-4	Faulty power supply to the front passenger's side impact sensor	(see page 23-104)
15-1	Faulty OPDS unit or OPDS unit is not initialized	(see page 23-105)
15-2	Faulty side airbag cutoff indicator circuit	(see page 23-108)
15-3	Faulty OPDS sensor	(see page 23-113)
21-1	Open or increased resistance in driver's seat belt buckle tensioner	(see page 23-56)
21-3	Short to another wire or decreased resistance in driver's seat belt buckle tensioner	(see page 23-57)
21-4	Short to power in driver's seat belt buckle tensioner	(see page 23-58)
21-5	Short to ground in driver's seat belt buckle tensioner	(see page 23-59)
22-1	Open or increased resistance in front passenger's seat belt buckle tensioner	(see page 23-70)
22-3	Short to another wire or decreased resistance in front passenger's seat belt buckle tensioner	(see page 23-71)
22-4	Short to power in front passenger's seat belt buckle tensioner	(see page 23-72)
22-5	Short to ground in front passenger's seat belt buckle tensioner	(see page 23-74)

Symptom Troubleshooting Index

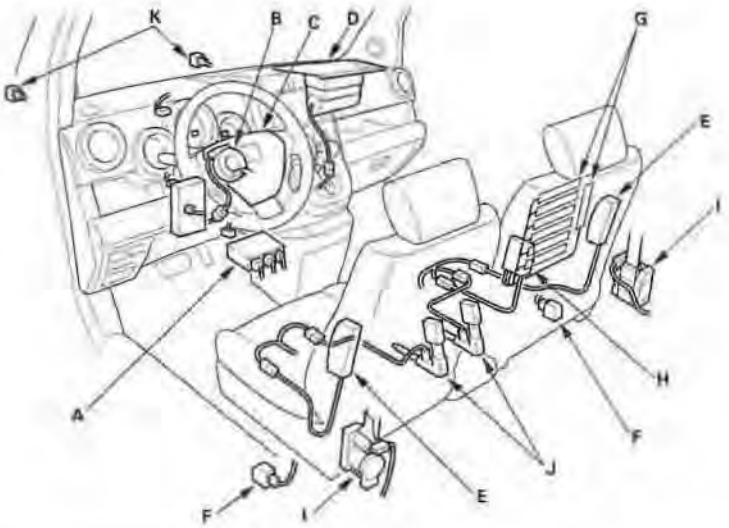
Symptom	Diagnostic procedure	Also check for
SRS indicator does not come on	Symptom Troubleshooting (see page 23-114)	
SRS indicator stays on, but no DTCs are stored	Symptom Troubleshooting (see page 23-116)	Flash code DTCs
Side airbag cutoff indicator stays on after bulb check, and no DTCs are stored, or side airbag cutoff indicator is flashing	• Make sure nothing is on the front passenger's seat. • If the side airbag cutoff indicator stays on after the ignition switch is turned ON (II), initialize the OPDS unit (see page 23-24). – If the side airbag cutoff indicator operates normally, the system is OK. – If the side airbag cutoff indicator stays on, replace the OPDS sensor (see page 20-92). The sensor is part of the seat-back pad.	DTC 15-2 troubleshooting (see page 23-108)

System Description

SRS Components

Airbags

The SRS is a safety device which, when used with the seat belt, is designed to help protect the driver and front passenger in a frontal impact exceeding a certain set limit. The system consists of the SRS unit, including safing sensor and impact sensor (A), the cable reel (B), the driver's airbag (C), the front passenger's airbag (D), seat belt tensioners (I), seat belt buckle tensioners (J), and front impact sensors (K). Since the driver's and front passenger's airbags use the same sensors, both normally inflate at the same time. However, it is possible for only one airbag to inflate. This can occur when the severity of a collision is at the margin, or threshold, that determines whether or not the airbags will deploy. In such cases, the seat belt will provide sufficient protection, and the supplemental protection offered by the airbag would be minimal.



Side Airbags

The side airbags (E) are in each front seat-back. They help protect the upper torso of the driver or front seat passenger during a moderate to severe side impact. Side impact sensors (F) in each door sill and in the SRS unit detect such an impact and instantly inflate the driver's or the passenger's side airbag. Only one side airbag will deploy during a side impact. If the impact is on the passenger's side, the passenger's side airbag will deploy even if there is no passenger.

Seat Belt and Seat Belt Buckle Tensioners

The seat belt and seat belt buckle tensioners are linked with the SRS airbags to further increase the effectiveness of the seat belt. In a front-end collision, the tensioners instantly retract the belt and buckle firmly to secure the occupants in their seats.

OPDS

The side airbag system also includes an occupant position detection system (OPDS). This system consists of sensors (G) and a OPDS unit (H) in the front passenger's seat-back. The OPDS unit sends occupant height and position data to the SRS unit. If the OPDS unit determines that the front passenger is of small stature (for example, a child) and the front passenger is leaning into the side airbag deployment path, the SRS unit will automatically disable the passenger's side airbag. The SRS unit will also disable the airbag when the OPDS detects certain objects on the seat. When the side airbag is disabled, the side airbag cutoff indicator on the instrument panel alerts the driver that the passenger's side airbag will not deploy in a side impact. When the object is removed, or the passenger sits upright, the side airbag cutoff indicator will go off after a few seconds, alerting the driver that the passenger's side airbag will deploy in a side impact.

(cont'd)

System Description (cont'd)

SRS Operation

The main circuit in the SRS unit senses and judges the force of impact and, if necessary, ignites the inflator charges. If battery voltage is too low or power is disconnected due to the impact, the voltage regulator and the back-up power circuit, respectively, will keep voltage at a constant level.

For the SRS to operate

Seat Belt Tensioners and Seat Belt Buckle Tensioners

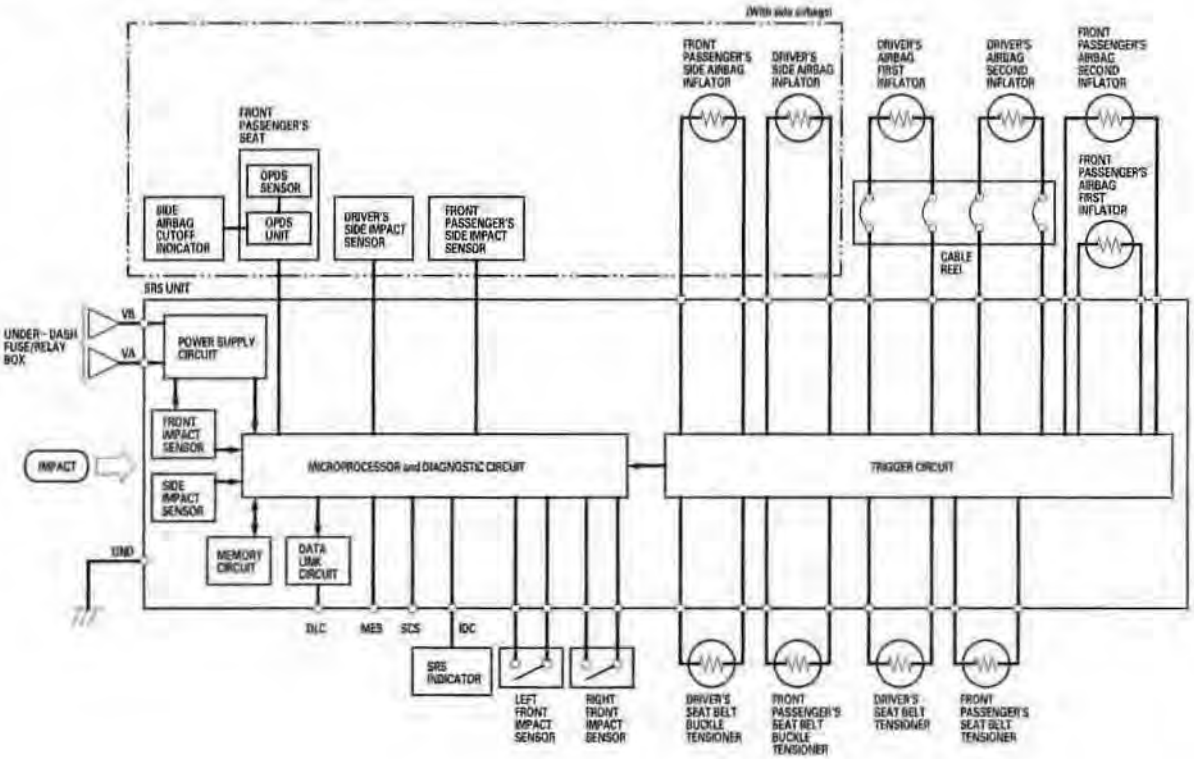
(1) A front impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and send them to the tensioners.
(3) The charges must ignite and deploy the tensioners.

Driver's and Front Passenger's Airbag(s)

(1) A front impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and depending on the severity of the collision and whether the seat belt buckle switch is ON or OFF, it sends the appropriate signals to the airbag inflator(s).
(3) The inflators that received signals must ignite and deploy the airbags.

Side Airbag(s)

(1) A side impact sensor must activate, and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals, and send them to the side airbag inflator(s). However, the microprocessor turns off the signals to the front passenger's side airbag if the OPDS unit determines that the front passenger's head is in the deployment path of the side airbag.
(3) The inflator that received the signal must ignite and deploy the side airbag.



Self-diagnosis System
A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator comes on and goes off after about 6 seconds if the system is operating normally. If the indicator does not come on, or does not go off after 6 seconds, or if it comes on while driving, it indicates an abnormality in the system. The system must be inspected and repaired as soon as possible.

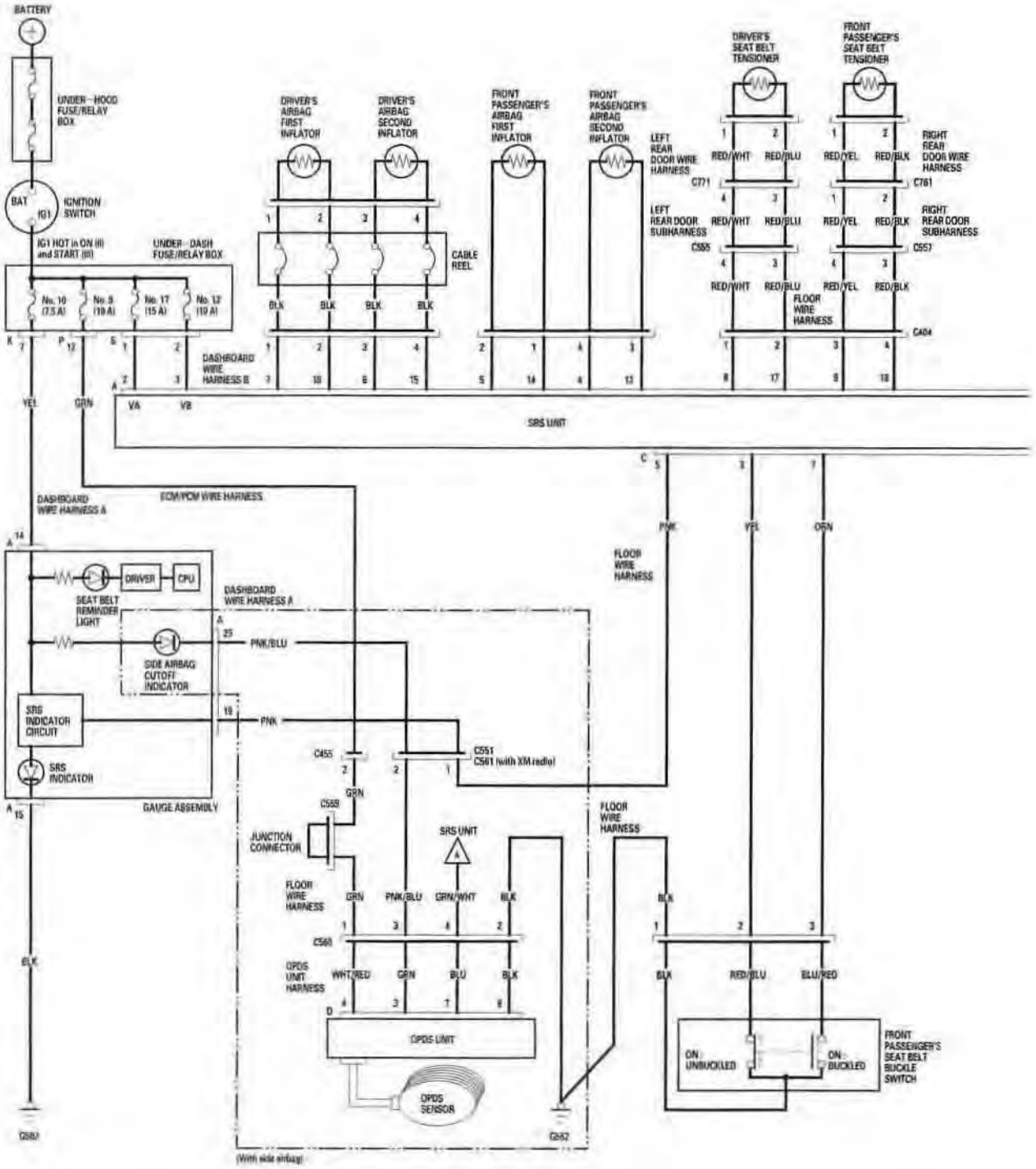
For better serviceability, the SRS unit memory stores a DTC that relates to the cause of the malfunction, and the unit is connected to the data link circuit. This information can be read with the HDS when it is connected to the data link connector (DLC) (see page 23-20).

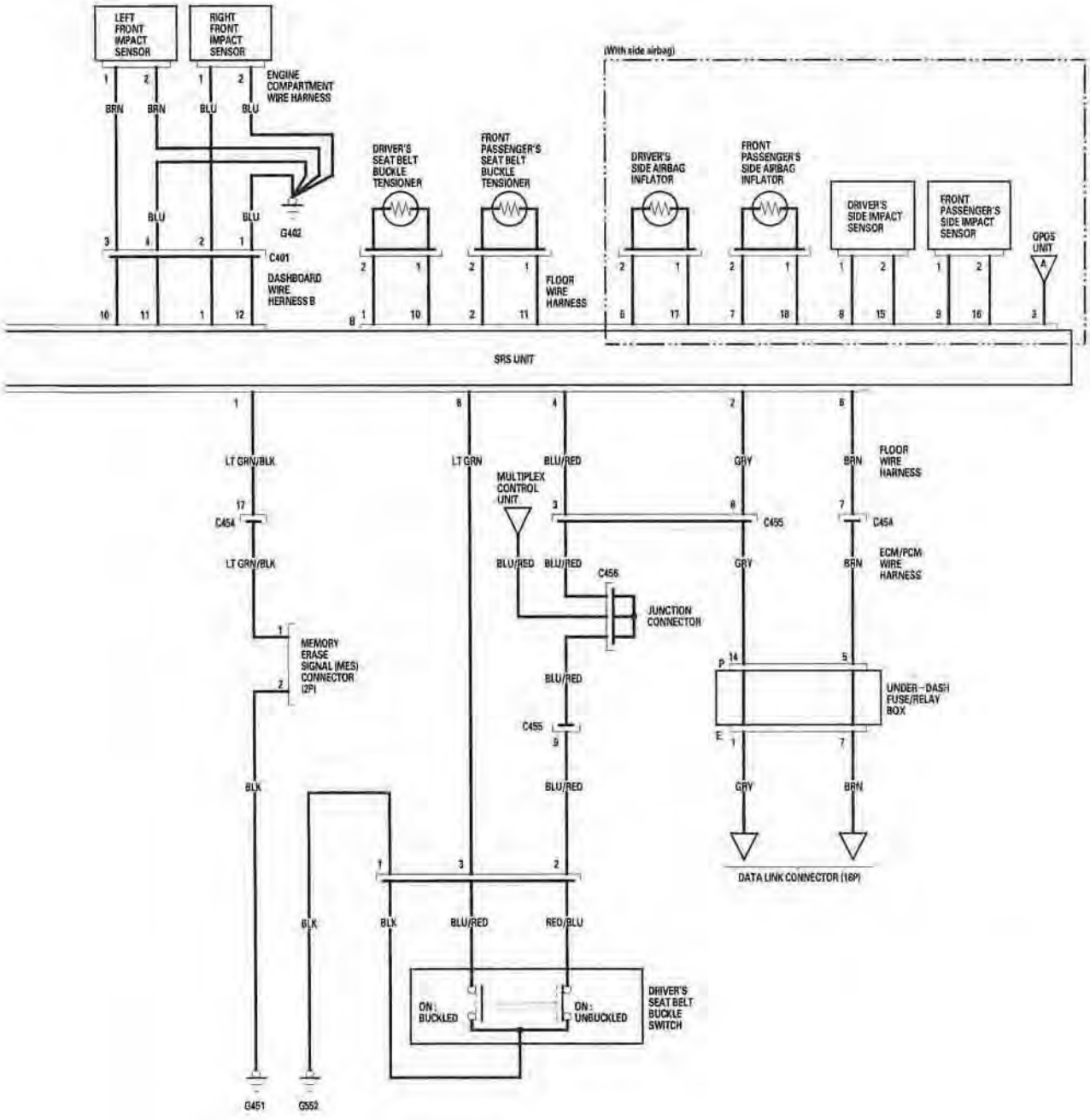
NOTE: If the battery negative cable is disconnected during troubleshooting, do the following:

Before you disconnect the battery:
- Make sure you have the anti-theft code for the radio, then write down the radio and XM preset.

After you reconnect the battery:
- Do the power window control unit reset procedure (see page 22-115).
- Enter the radio anti-theft code, enter the radio and XM presets, and set the clock.

Circuit Diagram




LEFT FRONT IMPACT SENSOR
RIGHT FRONT IMPACT SENSOR
ENGINE COMPARTMENT WIRE HARNESS
BRN
BLU
G402
C401
DASHBOARD WIRE HERNESS B
DRIVER'S SEAT BELT BUCKLE TENSIONER
FRONT PASSENGER'S SEAT BELT BUCKLE TENSIONER
FLOOR WIRE HARNESS
(With side airbag)
DRIVER'S SIDE AIRBAG INFLATOR
FRONT PASSENGER'S SIDE AIRBAG INFLATOR
DRIVER'S SIDE IMPACT SENSOR
FRONT PASSENGER'S SIDE IMPACT SENSOR
GPOS UNIT
SRS UNIT
LT GRN/BLK
LT GRN
BLU/RED
GRY
BRN
MULTIPLEX CONTROL UNIT
C454
C455
C456
C45A
ECM/PCM WIRE HARNESS
JUNCTION CONNECTOR
MEMORY ERASE SIGNAL (MES) CONNECTOR (2P)
UNDER-DASH FUSE/RELAY BOX
BLK
RED/BLU
DATA LINK CONNECTOR (16P)
ON: BUCKLED
ON: UNBUCKLED
DRIVER'S SEAT BELT BUCKLE SWITCH
G451
G552

DTC Troubleshooting

DTC 1-1: Open or Increased Resistance in Driver's Airbag Inflator

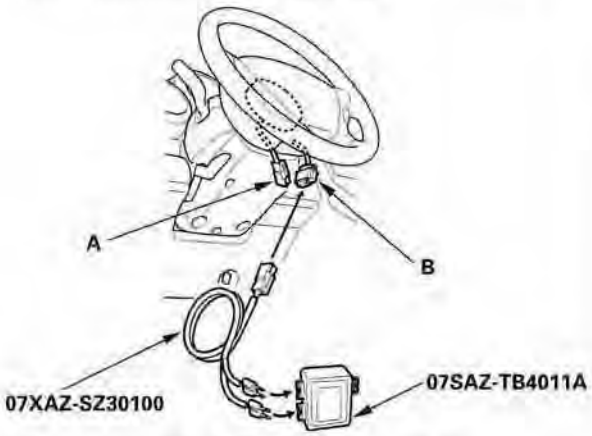
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 4P connector (A) from the cable reel connector (B).

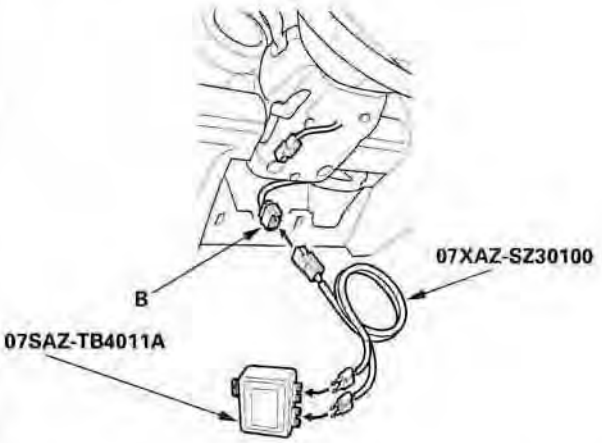


5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the cable reel connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the driver's airbag inflator; replace the driver's airbag (see page 23-118). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the dashboard wire harness B 4P connector from the cable reel.



11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

14. Read the DTC.

Is DTC 1-1 indicated?

YES—Go to step 15.

NO—Open or increased resistance in the cable reel; replace the cable reel (see page 23-124). ■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

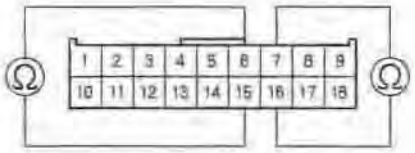
16. Disconnect the front passenger's airbag 4P connector from dashboard wire harness B (see step 3 on page 23-18).

17. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).

18. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19). Do not disconnect simulator lead F from the dashboard wire harness B 4P connector.

19. Check resistance between the No. 7 and the No. 16 terminals and between the No. 6 and the No. 15 terminals of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (18P) and the SRS unit, check the connection between the connector and the SRS unit. If the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 1-3: Short to Another Wire or Decreased Resistance in Driver's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

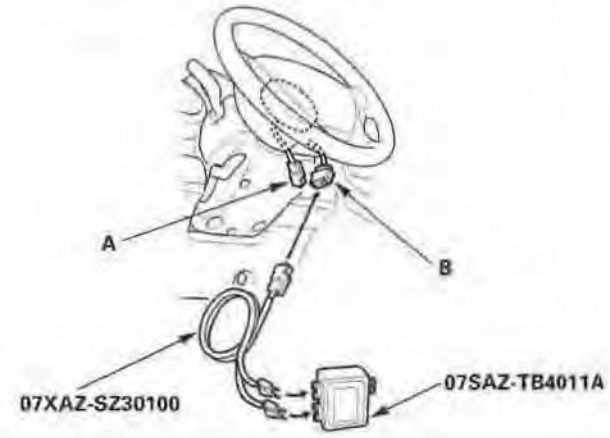
Does the SRS indicator stay on?

YES—Go to step 3.

NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's airbag 4P connector (A) from the cable reel connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the cable reel connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

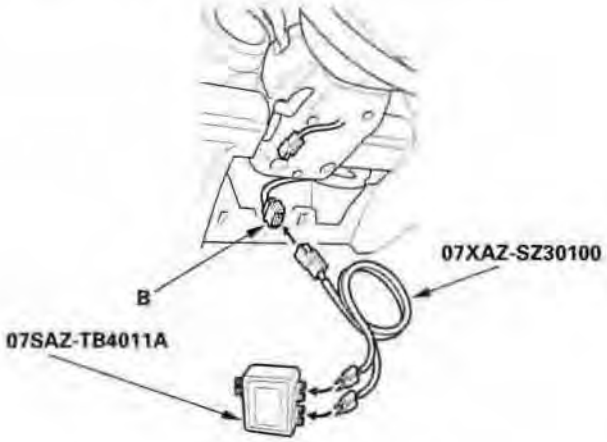
   Is DTC 1-3 indicated?

   YES—Go to step 9.

   NO—Short in the driver's airbag inflator; replace the driver's airbag (see page 23-118).■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the dashboard wire harness B 4P connector from the cable reel.



11. Connect the SRS inflator simulator (2 Ω connectors)and the simulator lead to dashboard wire harness B.

12. Reconnect the battery negative cable.

13. Erase the DTC memory.

14. Read the DTC.

    Is DTC 1-3 indicated?

    YES—Go to step 15.

    NO—Short in the cable reel; replace the cable reel (see page 23-124).■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 4P connector from dashboard wire harness B (see step 3 on page 23-18).

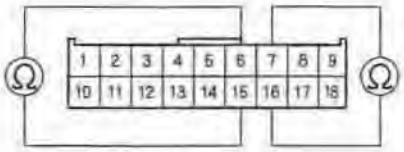
17. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).

18. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

19. Disconnect the simulator lead F from the dashboard wire harness B 4P connector.

20. Check resistance between the No. 7 and the No. 16 terminals and between the No. 6 and the No. 15 terminals of SRS unit connector A (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short in dashboard wire harness B; replace dashboard wire harness B.■

DTC 1-4: Short to Power in Driver's Airbag Inflator

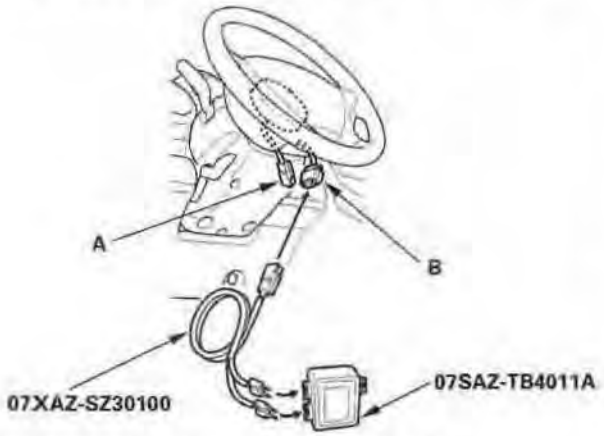
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's airbag 4P connector (A) from the cable reel connector (B).

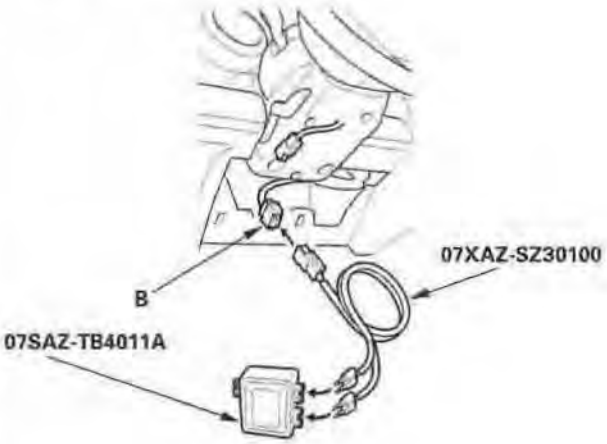


5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the cable reel connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 1-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the driver's airbag inflator; replace the driver's airbag (see page 23-118).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the dashboard wire harness B 4P connector from the cable reel.



11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

14. Read the DTC.

    Is DTC 1-4 indicated?

    YES—Go to step 15.

    NO—Short to power in the cable reel; replace the cable reel (see page 23-124).■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 4P connector from dashboard wire harness B (see step 3 on page 23-18).

17. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).

18. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

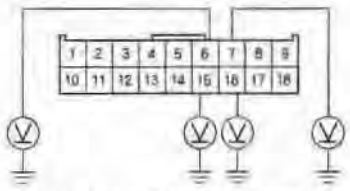
19. Disconnect the special tool from dashboard wire harness B.

20. Reconnect the battery negative cable.

21. Turn the ignition switch ON (II).

22. Check for voltage between the No. 7 terminal of SRS unit connector A (18P) and body ground, the No. 16 terminal and body ground, the No. 6 terminal and body ground, and the No. 15 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to power in dashboard wire harness B; replace dashboard wire harness B.■

DTC 1-5: Short to Ground in Driver's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

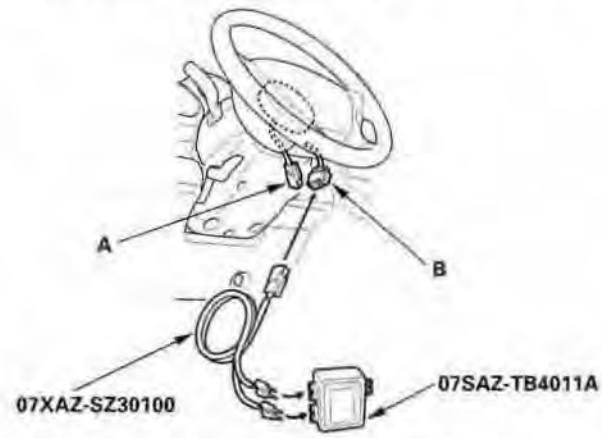
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's airbag 4P connector (A) from the cable reel connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the cable reel connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

8. Read the DTC.

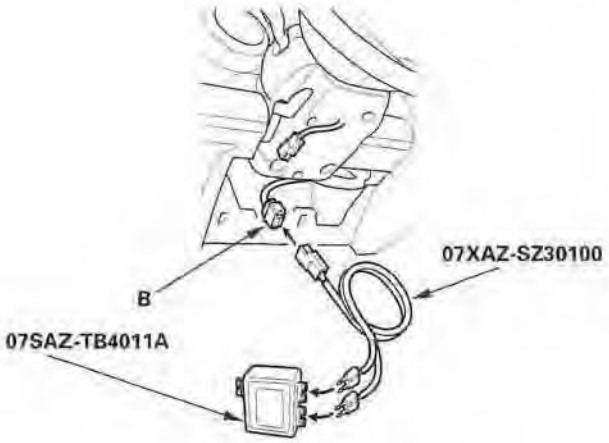
   Is DTC 1-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the driver's airbag inflator; replace the driver's airbag (see page 23-118).■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the dashboard wire harness B 4P connector from the cable reel.



11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.

12. Reconnect the battery negative cable.

13. Erase the DTC memory.

14. Read the DTC.

    Is DTC 1-5 indicated?

    YES—Go to step 15.

    NO—Short to ground in the cable reel; replace the cable reel (see page 23-124).■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the front passenger's airbag 4P connector from dashboard wire harness B (see step 3 on page 23-18).

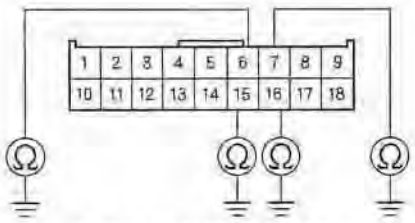
17. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).

18. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

19. Disconnect the simulator lead F from dashboard wire harness B.

20. Check resistance between the No. 7 terminal of SRS unit connector A (18P) and body ground, the No. 16 terminal and body ground, the No. 6 terminal and body ground, and the No. 15 terminal and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to ground in dashboard wire harness B; replace dashboard wire harness B.■

DTC Troubleshooting (cont'd)

DTC 2-1: Open or Increased Resistance in Front Passenger's Airbag Inflator

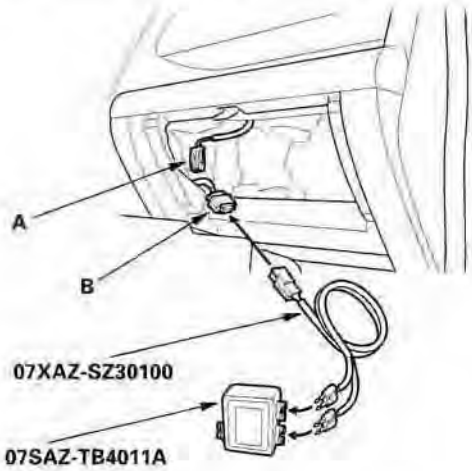
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector (A) from dashboard wire harness B.



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

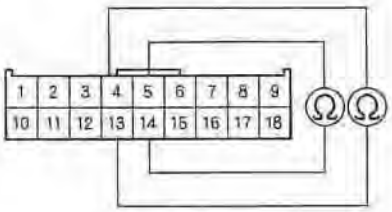
   Is DTC 2-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-119).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).
11. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).
12. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

13. Check resistance between the No. 4 and No. 13 terminals and between the No. 5 and No. 14 terminals of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (18P). Check the connection; if the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 2-3: Short to Another Wire or Decreased Resistance in Front Passenger's Airbag Inflator

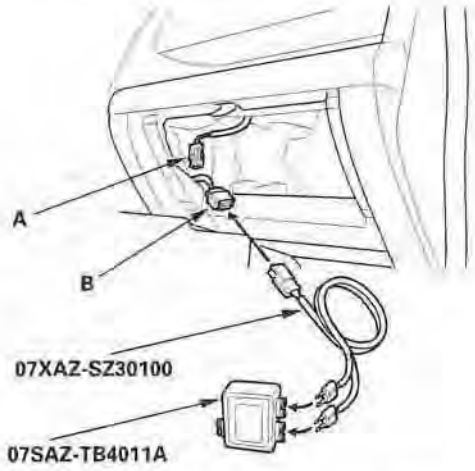
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector (A) from dashboard wire harness B.



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

   Is DTC 2-3 indicated?

   YES—Go to step 9.

   NO—Short in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-119). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).

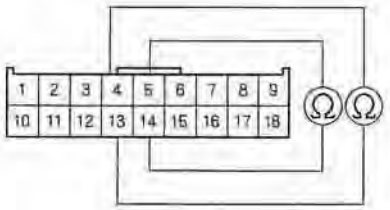
11. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).

12. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

13. Disconnect the simulator lead F from dashboard wire harness B.

14. Check resistance between the No. 4 and No. 13 terminals and between the No. 5 and No. 14 terminals of SRS unit connector A (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 2-4: Short to Power in Front Passenger's Airbag Inflator

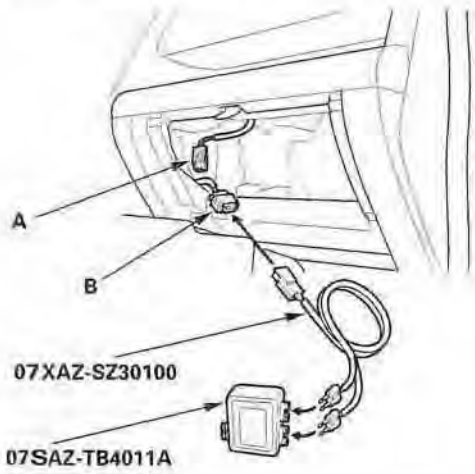
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's airbag 4P connector (A) from dashboard wire harness B.



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-119). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).
11. Disconnect both seat belt tensioner 2P connectors (A) from the rear door wire harness (see step 5 on page 23-19).

(cont'd)

DTC Troubleshooting (cont'd)

12. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

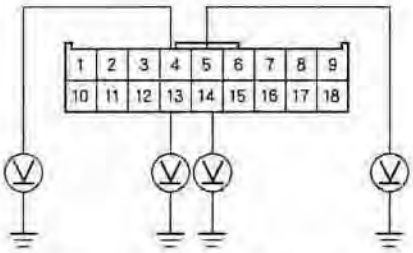
13. Disconnect the simulator lead F from dashboard wire harness B.

14. Reconnect the battery negative cable.

15. Turn the ignition switch ON (II).

16. Check for voltage between the No. 4 terminal of SRS unit connector A (18P) and body ground, the No. 13 terminal and body ground, the No. 5 terminal and body ground, and the No. 14 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to power in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 2-5: Short to Ground in Front Passenger's Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

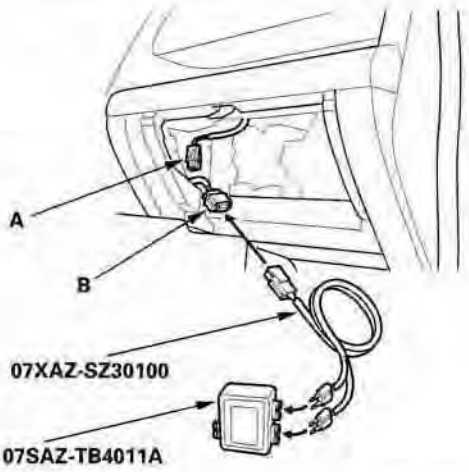
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's airbag 4P connector (A) from dashboard wire harness B.



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B.

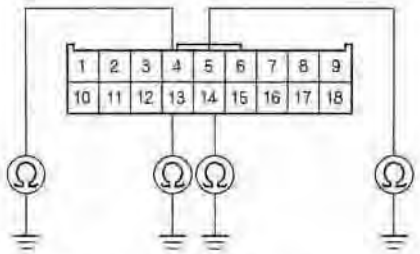
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 2-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the front passenger's airbag inflator; replace the front passenger's airbag (see page 23-119).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).
11. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).
12. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).
13. Disconnect the simulator lead F from dashboard wire harness B.
14. Check resistance between the No. 4 terminal of SRS unit connector A (18P) and body ground, the No. 13 terminal and body ground, the No. 5 terminal and body ground, and the No. 14 terminal and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to ground in dashboard wire harness B; replace dashboard wire harness B.■

DTC Troubleshooting (cont'd)

DTC 3-1: Open or Increased Resistance in Driver's Seat Belt Tensioner

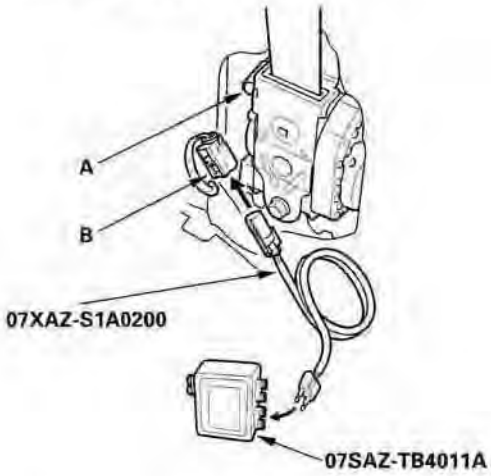
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector (A) from the left rear door wire harness connector (B).

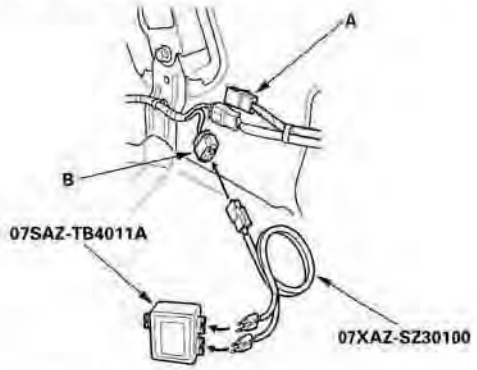


5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the left rear door wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect left rear door wire harness 4P connector C771 (A) from the left rear door subharness connector C771 (B).



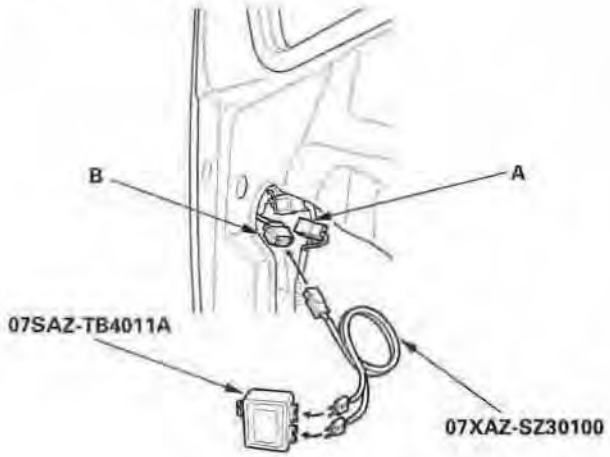
11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the left rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-1 indicated?

    YES—Go to step 15.

    NO—Open or increased resistance in the left rear door wire harness; replace the left rear door wire harness.■
15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect the left rear door subharness 4P connector C555 (A) from the floor wire harness connector C555 (B).



17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.

18. Reconnect the battery negative cable.

19. Erase the DTC memory.

20. Read the DTC.

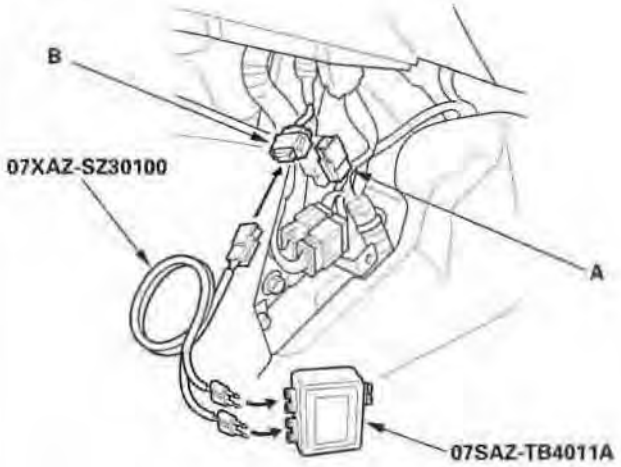
    Is DTC 3-1 indicated?

    YES—Go to step 21.

    NO—Open or increased resistance in the left rear door subharness; replace the left rear door subharness. ■

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

22. Disconnect floor wire harness 4P connector C404 (A) from dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

    Is DTC 3-1 indicated?

    YES—Go to step 27.

    NO—Open or increased resistance in the floor wire harness; replace the floor wire harness. ■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

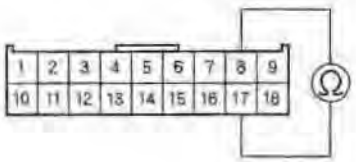
DTC Troubleshooting (cont'd)

28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and front passenger's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

30. Check resistance between the No. 8 terminal and the No. 17 terminal of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (18P) and the SRS unit. Check the connection; if the connection is OK, replace the SRS unit (see page 23-127).■

NO—Open or increased resistance in dashboard wire harness B; replace dashboard wire harness B.■

DTC 3-3: Short to Another Wire or Decreased Resistance in Driver's Seat Belt Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

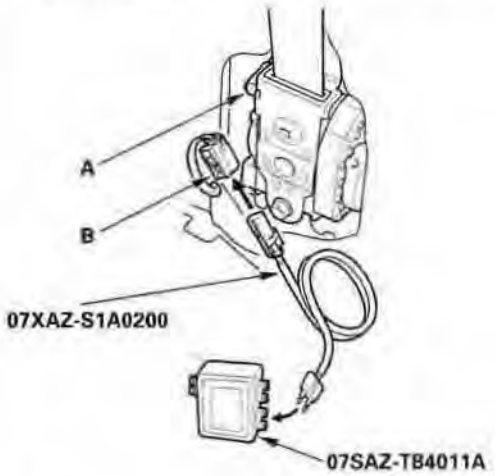
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's seat belt tensioner 2P connector (A) from the left rear door wire harness connector (B).



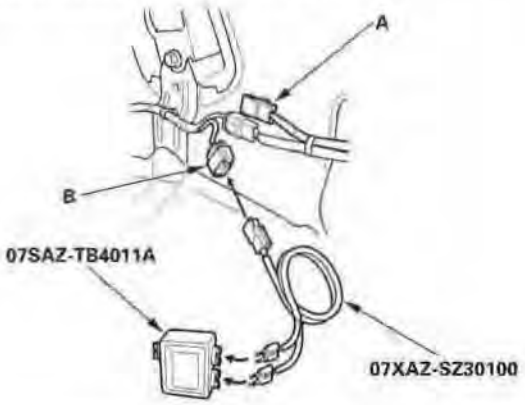
5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the left rear door wire harness connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-3 indicated?

   YES—Go to step 9.

   NO—Short in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect left rear door wire harness 4P connector C771 (A) from the left rear door subharness connector C771 (B).

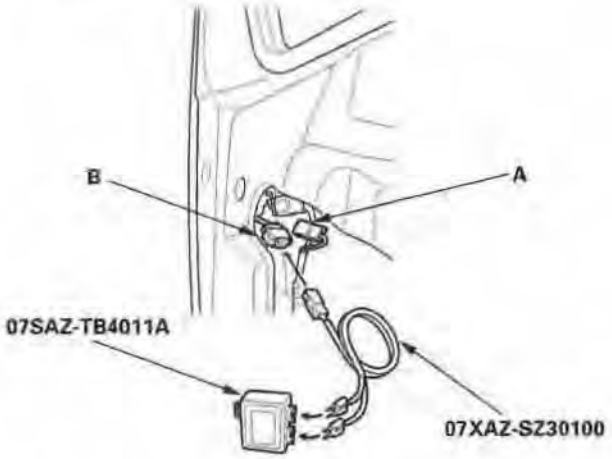


11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the left rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-3 indicated?

    YES—Go to step 15.

    NO—Short in the left rear door wire harness; replace the left rear door wire harness. ■
15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
16. Disconnect left rear door subharness 4P connector C555 (A) from the floor wire harness connector C555 (B).



17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
18. Reconnect the battery negative cable.
19. Erase the DTC memory.
20. Read the DTC.

    Is DTC 3-3 indicated?

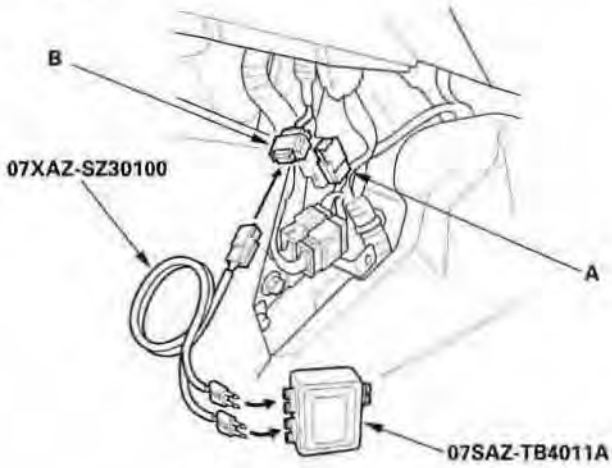
    YES—Go to step 21.

    NO—Short in the left rear door subharness; replace the left rear door subharness. ■
21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

DTC Troubleshooting (cont'd)

22. Disconnect floor wire harness 4P connector C404 (A) from dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

    Is DTC 3-3 indicated?

    YES—Go to step 27.

    NO—Short in the floor wire harness; replace the floor wire harness.■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

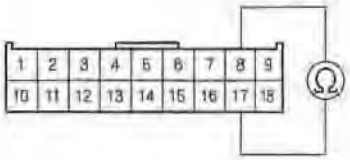
28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and front passenger's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

30. Disconnect the simulator lead F from dashboard wire harness B.

31. Check resistance between the No. 8 terminal and the No. 17 terminal of SRS unit connector A (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short in dashboard wire harness B; replace dashboard wire harness B.■

DTC 3-4: Short to Power in Driver's Seat Belt Tensioner

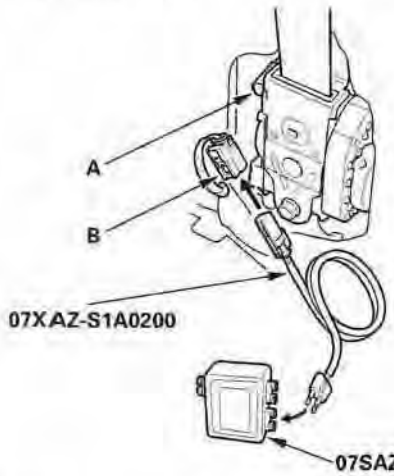
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt tensioner 2P connector (A) from the left rear door wire harness connector (B).

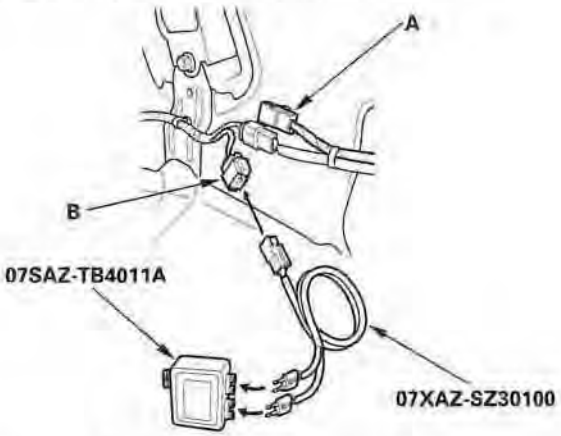


5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the left rear door wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect left rear door wire harness 4P connector C771 (A) from the left rear door subharness connector C771 (B).



11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the left rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-4 indicated?

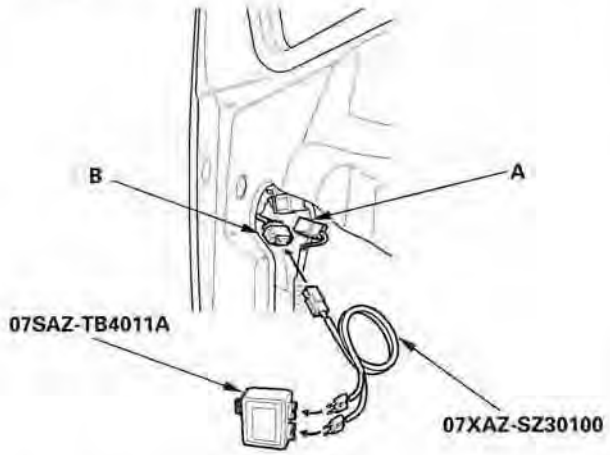
    YES—Go to step 15.

    NO—Short to power in the left rear door wire harness; replace the left rear door wire harness. ■

(cont'd)

DTC Troubleshooting (cont'd)

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
16. Disconnect left rear door subharness 4P connector C555 (A) from the floor wire harness connector C555 (B).



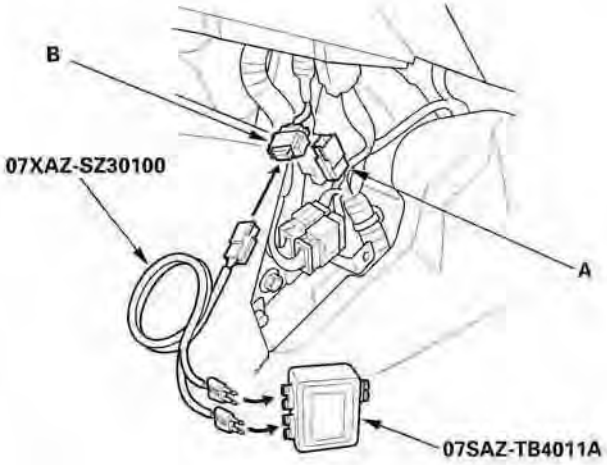
17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
18. Reconnect the battery negative cable.
19. Erase the DTC memory.
20. Read the DTC.

    Is DTC 3-4 indicated?

    YES—Go to step 21.

    NO—Short to power in the left rear door subharness; replace the left rear door subharness. ■

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
22. Disconnect floor wire harness 4P connector C404 (A) from dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.
24. Reconnect the battery negative cable.
25. Erase the DTC memory.
26. Read the DTC.

    Is DTC 3-4 indicated?

    YES—Go to step 27.

    NO—Short to power in the floor wire harness; replace the floor wire harness. ■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and front passenger's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

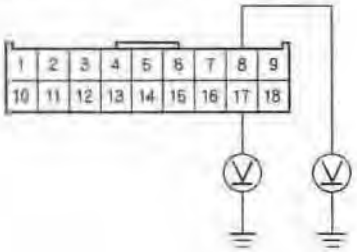
30. Disconnect the simulator lead F from dashboard wire harness B.

31. Reconnect the battery negative cable.

32. Turn the ignition switch ON (II).

33. Check for voltage between the No. 8 terminal of SRS unit connector A (18P) and body ground, and the No. 17 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to power in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 3-5: Short to Ground in Driver's Seat Belt Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

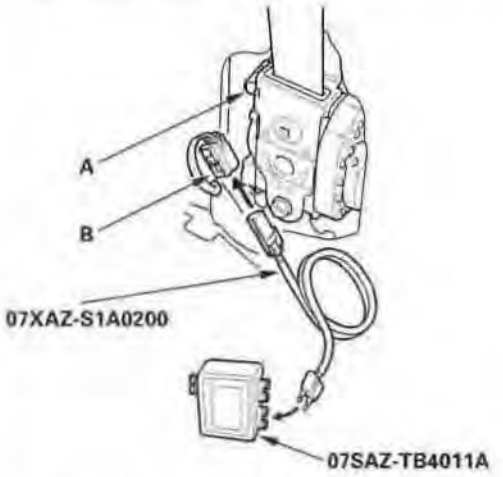
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's seat belt tensioner 2P connector (A) from the left rear door wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the left rear door wire harness connector.

(cont'd)

DTC Troubleshooting (cont'd)

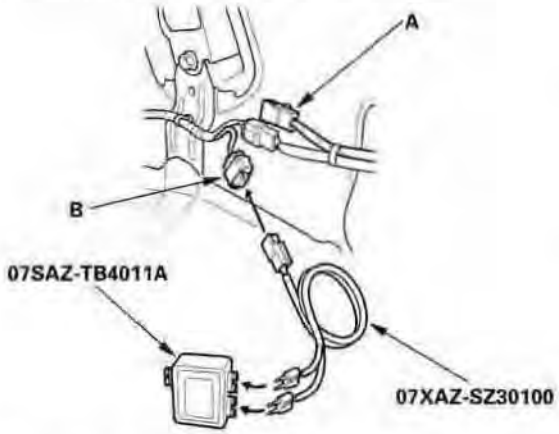
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 3-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the driver's seat belt tensioner; replace the driver's seat belt (see page 23-4). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect left rear door wire harness 4P connector C771 (A) from the left rear door subharness connector C771 (B).



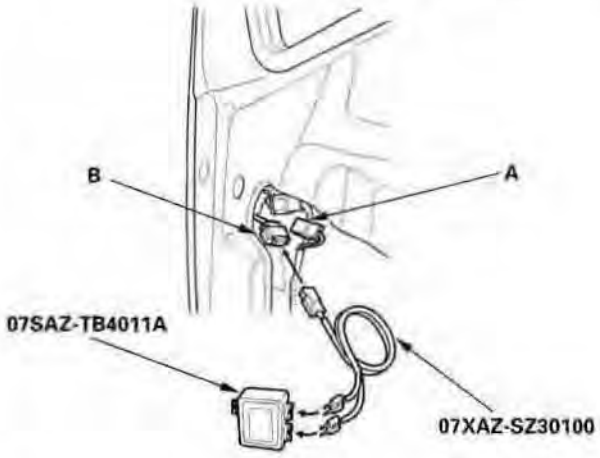
11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the left rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 3-5 indicated?

    YES—Go to step 15.

    NO—Short to ground in the left rear door wire harness; replace the left rear door wire harness. ■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
16. Disconnect left rear door subharness 4P connector C555 (A) from floor wire harness B connector C555.



17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
18. Reconnect the battery negative cable.
19. Erase the DTC memory.
20. Read the DTC.

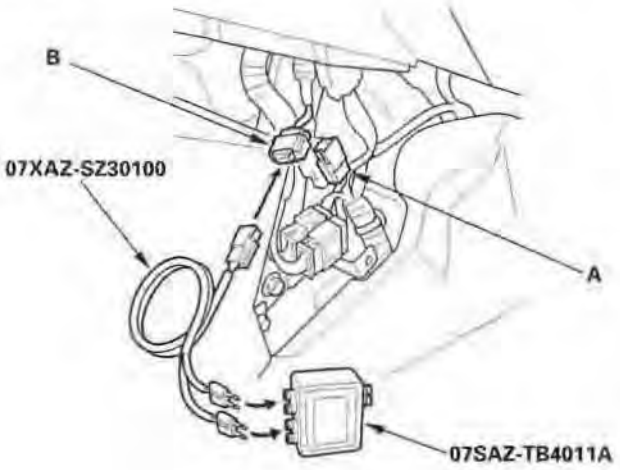
    Is DTC 3-5 indicated?

    YES—Go to step 21.

    NO—Short to ground in the left rear door subharness; replace the left rear door subharness. ■

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

22. Disconnect floor wire harness 4P connector C404 (A) from dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

Is DTC 3-5 indicated?

YES—Go to step 27.

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

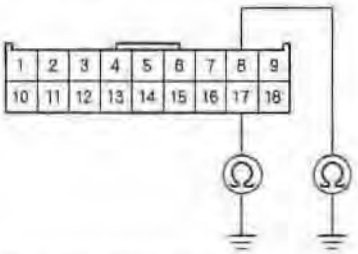
28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and front passenger's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

30. Disconnect the simulator lead F from dashboard wire harness B.

31. Check resistance between the No. 8 terminal of SRS unit connector A (18P) and body ground, and the No. 17 terminal and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to ground in dashboard wire harness B; replace dashboard wire harness B. ■

DTC Troubleshooting (cont'd)

DTC 21-1: Open or Increased Resistance in Driver's Seat Belt Buckle Tensioner

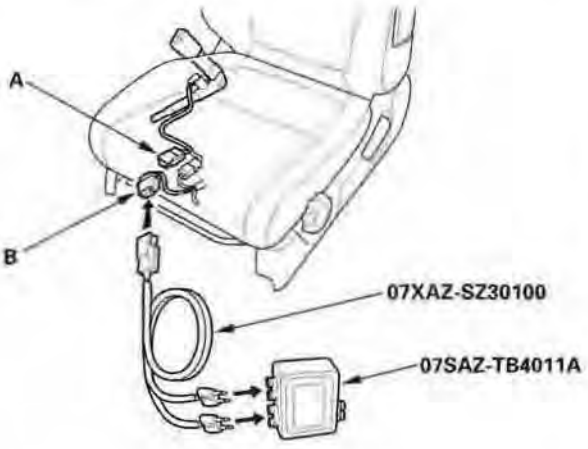
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



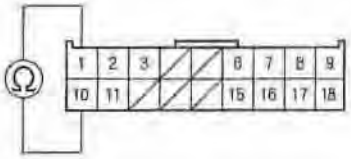
5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 21-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the driver's seat belt buckle tensioner; replace the driver's seat belt buckle (se page 23-6). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the front passenger's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Check resistance between the No. 1 and No. 10 terminals of SRS unit connector B (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection; if the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in the floor wire harness; replace the floor wire harness. ■

DTC 21-3: Short to Another Wire or Decreased Resistance in Driver's Seat Belt Buckle Tensioner

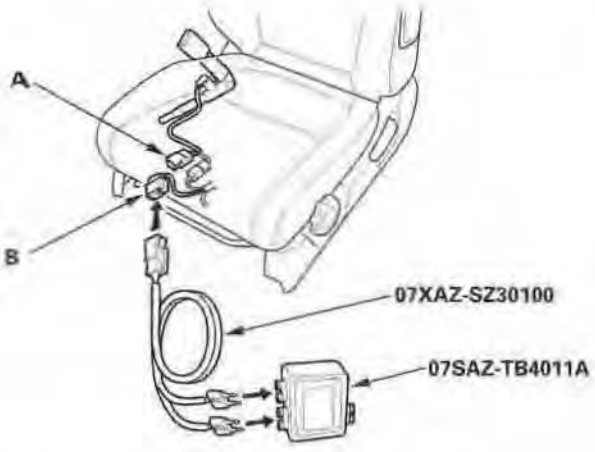
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



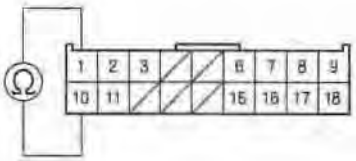
5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 21-3 indicated?

   YES—Go to step 9.

   NO—Short in the driver's seat belt buckle tensioner; replace the driver's seat belt buckle (see page 23-6).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the front passenger's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Disconnect the simulator lead F from the floor wire harness.
13. Check resistance between the No. 1 and No. 10 terminals of SRS unit connector B (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short in the floor wire harness; replace the floor wire harness.■

DTC Troubleshooting (cont'd)

DTC 21-4: Short to Power in Driver's Seat Belt Buckle Tensioner

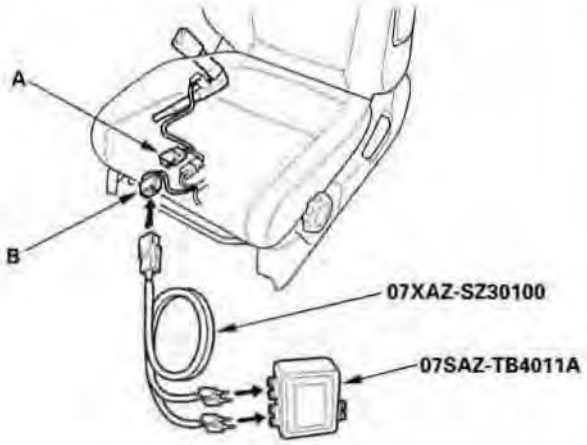
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the driver's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 21-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the driver's seat belt buckle tensioner; replace the driver's seat belt buckle (see page 23-6). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the front passenger's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).

11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

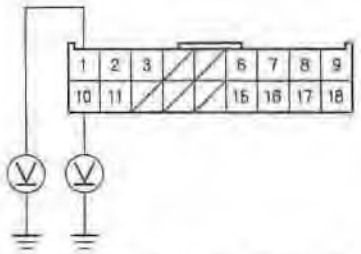
12. Disconnect the simulator lead F from the floor wire harness.

13. Reconnect the battery negative cable.

14. Turn the ignition switch ON (II).

15. Check for voltage between the No. 1 terminal of SRS unit connector B (18P) and body ground, and the No. 10 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to power in the floor wire harness; replace the floor wire harness. ■

DTC 21-5: Short to Ground in Driver's Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

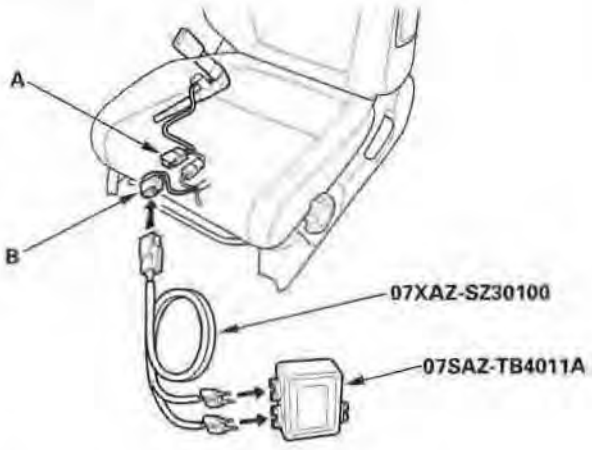
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

   Is DTC 21-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the driver's seat belt buckle tensioner; replace the driver's seat belt buckle (see page 23-6).■

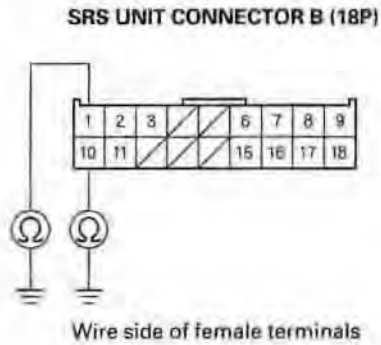
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the front passenger's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).

11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

12. Disconnect the simulator lead F from the floor wire harness.

13. Check resistance between the No. 1 terminal of SRS unit connector B (18P) and body ground, and the No. 10 terminal and body ground. There should be an open circuit or at least 1 MΩ.



Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to ground in the floor wire harness; replace the floor wire harness.■

DTC 4-1: Open or Increased Resistance in Front Passenger's Seat Belt Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

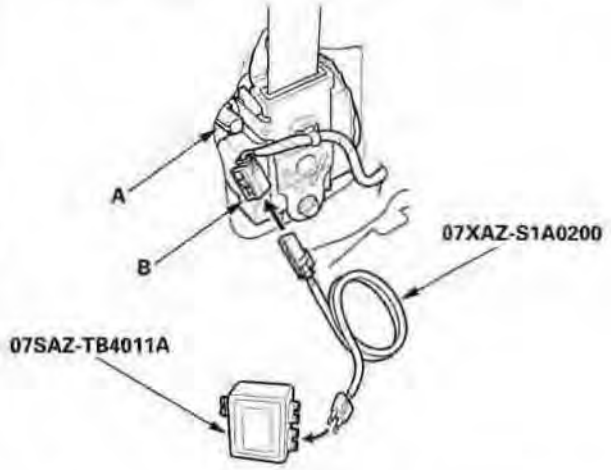
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's seat belt tensioner 2P connector (A) from the right rear door wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the right rear door wire harness connector.

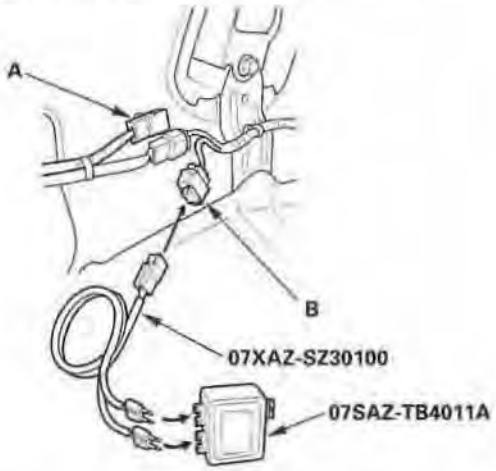
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4).■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect right rear door wire harness 4P connector C761 (A) from the right rear door subharness connector C761 (B).



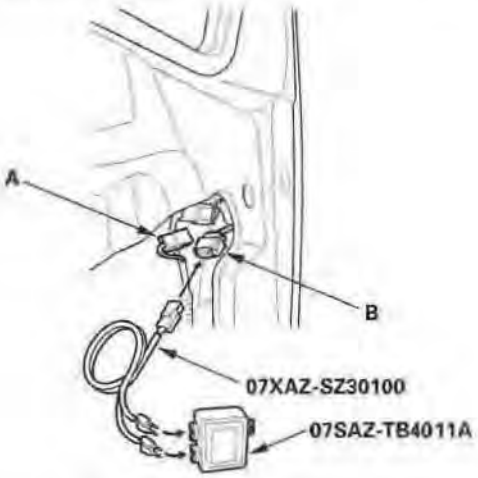
11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the right rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-1 indicated?

    YES—Go to step 15.

    NO—Open or increased resistance in the right rear door wire harness; replace the right rear door wire harness.■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
16. Disconnect right rear door subharness 4P connector C557 (A) from the floor wire harness connector C557 (B).



17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
18. Reconnect the battery negative cable.
19. Erase the DTC memory.
20. Read the DTC.

    Is DTC 4-1 indicated?

    YES—Go to step 21.

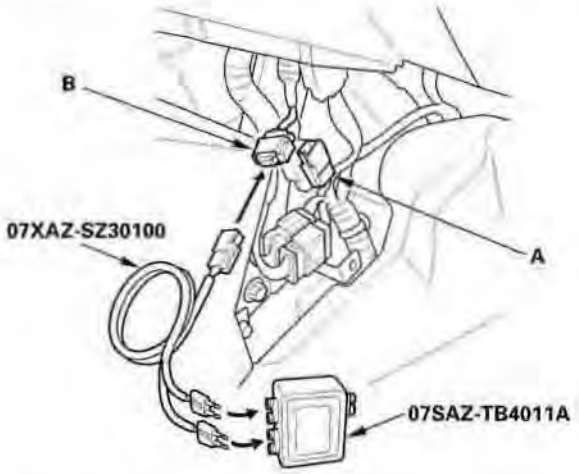
    NO—Open or increased resistance in the right rear door subharness; replace the right rear door subharness.■

(cont'd)

DTC Troubleshooting (cont'd)

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

22. Disconnect floor wire harness 4P connector C404 (A) from dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

    Is DTC 4-1 indicated?

    YES—Go to step 27.

    NO—Open or increased resistance in the floor wire harness; replace the floor wire harness. ■

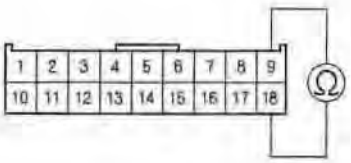
27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and driver's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

30. Check resistance between the No. 9 terminal and the No. 18 terminal of SRS unit connector A (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector A (18P) and the SRS unit. Check the connection; if the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 4-3: Short to Another Wire or Decreased Resistance in Front Passenger's Seat Belt Tensioner

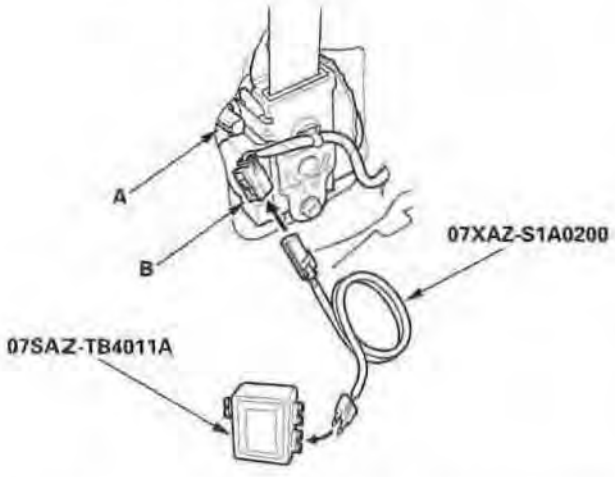
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector (A) from the right rear door wire harness connector (B).

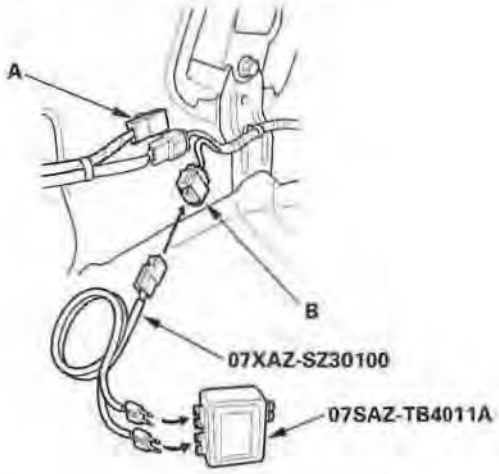


5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the right rear door wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-3 indicated?

   YES—Go to step 9.

   NO—Short in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect right rear door wire subharness 4P connector C761 (A) from the right rear door subharness connector C761 (B).



11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the right rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-3 indicated?

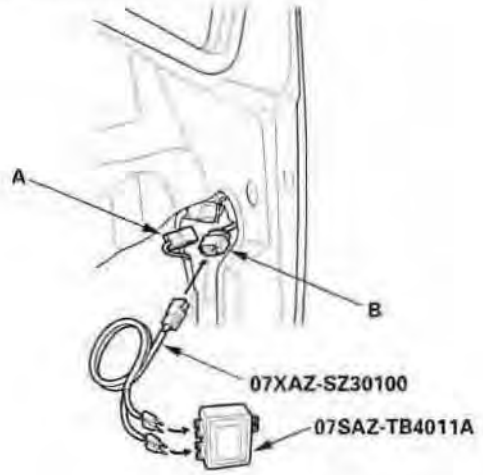
    YES—Go to step 15.

    NO—Short in the right rear door wire harness; replace the right rear door wire harness. ■
15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

DTC Troubleshooting (cont'd)

16. Disconnect right rear door subharness 4P connector C557 (A) from the floor wire harness connector C557 (B).



17. Connect the SRS inflator simulator (2 Ω connectors) and the simulator lead to the floor wire harness connector.

18. Reconnect the battery negative cable.

19. Erase the DTC memory.

20. Read the DTC.

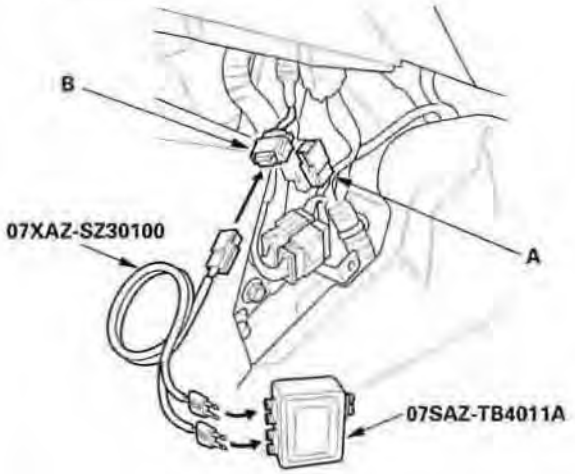
    Is DTC 4-3 indicated?

    YES—Go to step 21.

    NO—Short in the right rear door subharness; replace the right rear door subharness.■

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

22. Disconnect floor wire harness 4P connector C404 (A) from the dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

    Is DTC 4-3 indicated?

    YES—Go to step 27.

    NO—Short in the floor wire harness; replace the floor wire harness.■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

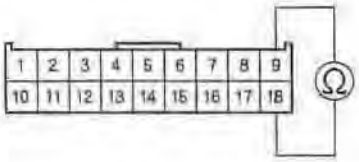
28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and driver's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

30. Disconnect the simulator lead F from dashboard wire harness B.

31. Check resistance between the No. 9 and No. 18 terminals of SRS unit connector A (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 4-4: Short to Power in Front Passenger's Seat Belt Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

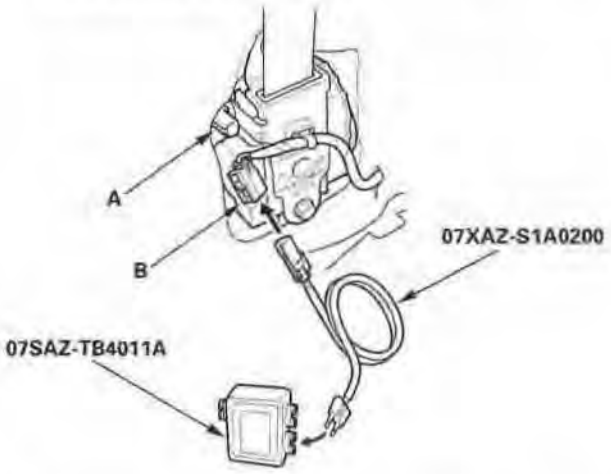
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's seat belt tensioner 2P connector (A) from the right rear door wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the right rear door wire harness connector.

(cont'd)

DTC Troubleshooting (cont'd)

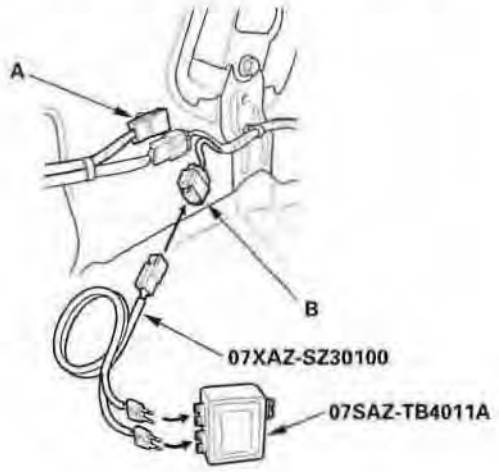
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the front passenger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect right rear door wire harness 4P connector C761 (A) from the right rear door subharness connector C761 (B).



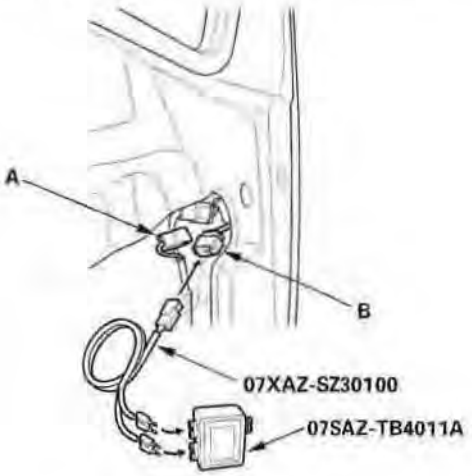
11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the right rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-4 indicated?

    YES—Go to step 15.

    NO—Short to power in the right rear door wire harness; replace the right rear door wire harness. ■

15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
16. Disconnect right rear door subharness 4P connector C557 (A) from the floor wire harness connector C557 (B).



17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
18. Reconnect the battery negative cable.
19. Erase the DTC memory.
20. Read the DTC.

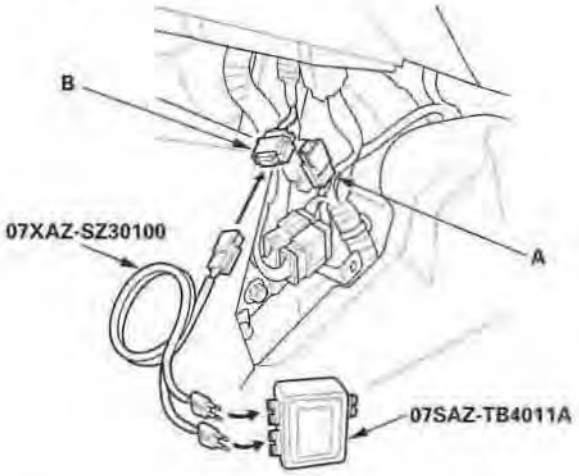
    Is DTC 4-4 indicated?

    YES—Go to step 21.

    NO—Short to power in the right rear door subharness; replace the right rear door subharness. ■

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

22. Disconnect floor wire harness 4P connector C404 (A) from dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

Is DTC 4-4 indicated?

YES—Go to step 27.

NO—Short to power in the floor wire harness; replace the floor wire harness.■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and driver's seat belt tensioner connector (see step 5 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

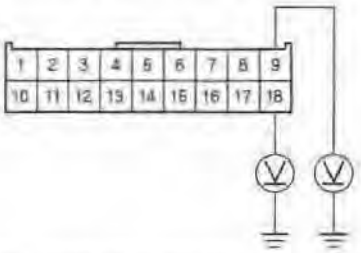
30. Disconnect the simulator lead F from dashboard wire harness B.

31. Reconnect the battery negative cable.

32. Turn the ignition switch ON (II).

33. Check for voltage between the No. 9 terminal of SRS unit connectors A (18P) and body ground, and the No. 18 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to power in dashboard wire harness B; replace dashboard wire harness B.■

DTC Troubleshooting (cont'd)

DTC 4-5: Short to Ground in Front Passenger's Seat Belt Tensioner

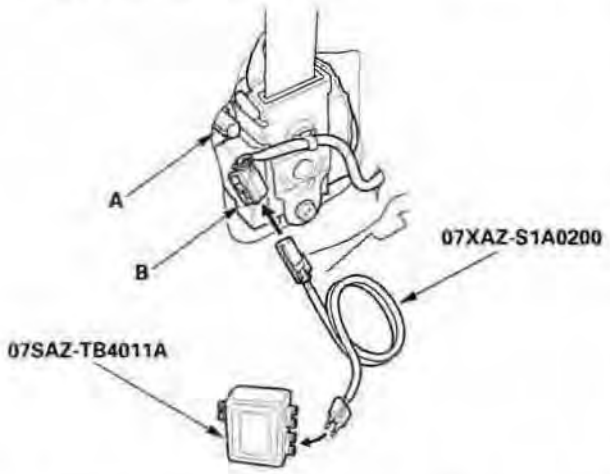
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt tensioner 2P connector (A) from the right rear door wire harness connector (B).

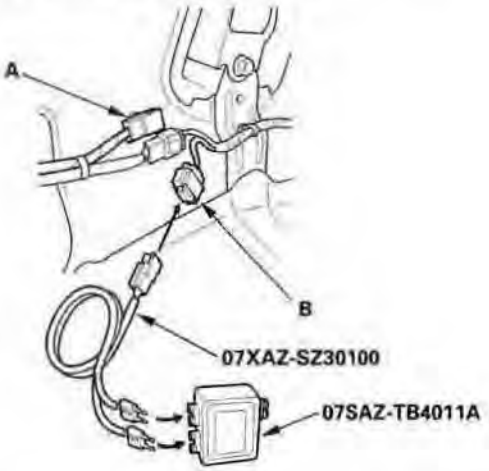


5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the right rear door wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 4-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the front passger's seat belt tensioner; replace the front passenger's seat belt (see page 23-4). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect right rear door wire harness 4P connector C761 (A) from the right rear door subharness connector C761 (B).



11. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the right rear door subharness connector.
12. Reconnect the battery negative cable.
13. Erase the DTC memory.
14. Read the DTC.

    Is DTC 4-5 indicated?

    YES—Go to step 15.

    NO—Short to ground in the right rear door wire harness; replace the right rear door wire harness. ■
15. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

16. Disconnect right rear door subharness 4P connector C557 (A) from the floor wire harness connector C557 (B).

17. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.

18. Reconnect the battery negative cable.

19. Erase the DTC memory.

20. Read the DTC.

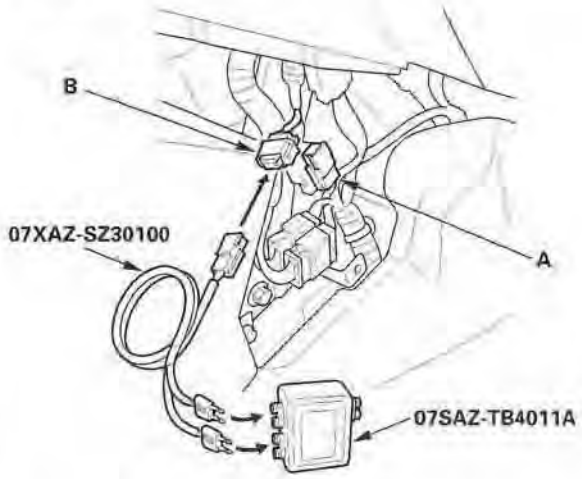
    Is DTC 4-5 indicated?

    YES—Go to step 21.

    NO—Short to ground in the right rear door subharness; replace the right rear door subharness. ■

21. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

22. Disconnect floor wire harness 4P connector C404 (A) from the dashboard wire harness B connector C404.



23. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to dashboard wire harness B connector.

24. Reconnect the battery negative cable.

25. Erase the DTC memory.

26. Read the DTC.

    Is DTC 4-5 indicated?

    YES—Go to step 27.

    NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

27. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

(cont'd)

DTC Troubleshooting (cont'd)

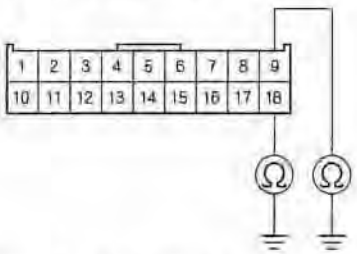
28. Disconnect the driver's airbag connector (see step 2 on page 23-18), front passenger's airbag connector (see step 3 on page 23-18), and driver's seat belt tensioner connector (see step 7 on page 23-19).

29. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

30. Disconnect the simulator lead F from dashboard wire harness B.

31. Check resistance between the No. 9 terminal of SRS unit connector A (18P) and body ground, and the No. 18 terminal and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to ground in dashboard wire harness B; replace dashboard wire harness B. ■

DTC 22-1: Open or Increased Resistance in Front Passenger's Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

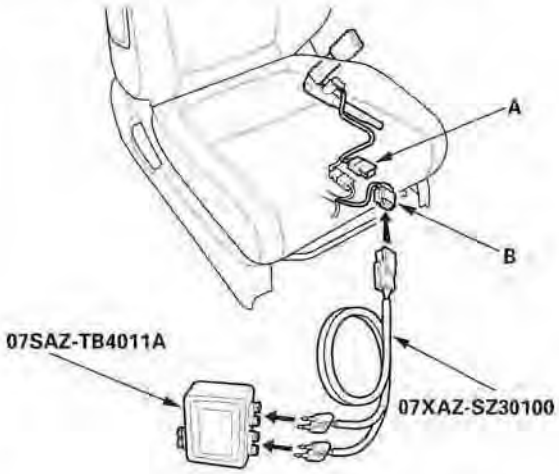
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

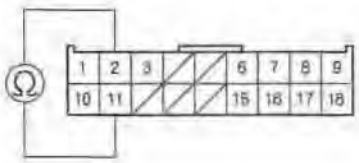
   Is DTC 22-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the front passenger's seat belt buckle tensioner; replace the front passenger's seat belt buckle (see page 23-6). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the driver's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Check resistance between the No. 2 and No. 11 terminals of SRS unit connector B (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection; if the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in the floor wire harness; replace the floor wire harness. ■

DTC 22-3: Short to Another Wire or Decreased Resistance in Front Passenger's Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

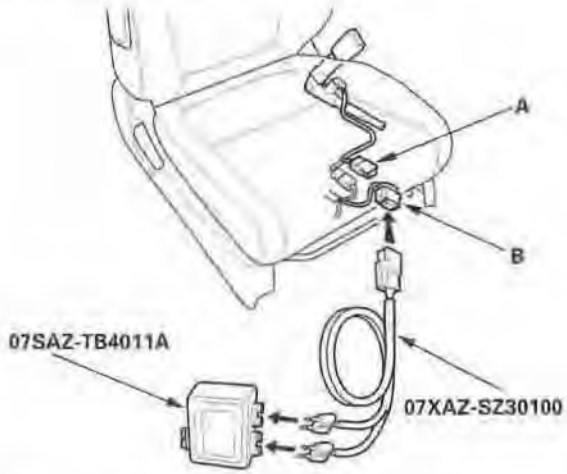
1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

   Is DTC 22-3 indicated?

   YES—Go to step 9.

   NO—Short in the front passenger's seat belt buckle tensioner; replace the front passenger's seat belt buckle (see page 23-6). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

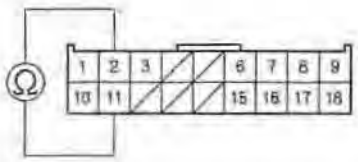
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the driver's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).

11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

12. Disconnect simulator lead F from the floor wire harness.

13. Check resistance between the No. 2 and No. 11 terminals of SRS unit connector B (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short in the floor wire harness; replace the floor wire harness. ■

DTC 22-4: Short to Power in Front Passenger's Seat Belt Buckle Tensioner

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

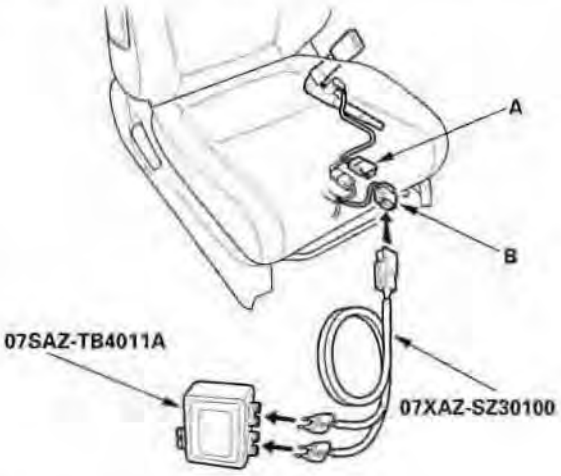
   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the front passenger's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

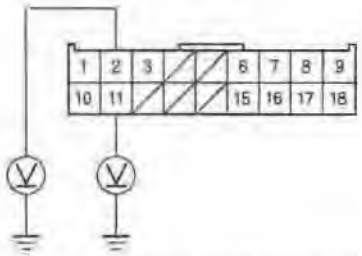
   Is DTC 22-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the front passenger's seat belt buckle tensioner; replace the front passenger's seat belt buckle (see page 23-6).■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the driver's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Disconnect the simulator lead F from the floor wire harness.
13. Reconnect the battery negative cable.
14. Turn the ignition switch ON (II).
15. Check for voltage between the No. 2 terminal of SRS unit connector B (18P) and body ground, and the No. 11 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to power in the floor wire harness; replace the floor wire harness.■

DTC Troubleshooting (cont'd)

DTC 22-5: Short to Ground in Front Passenger's Seat Belt Buckle Tensioner

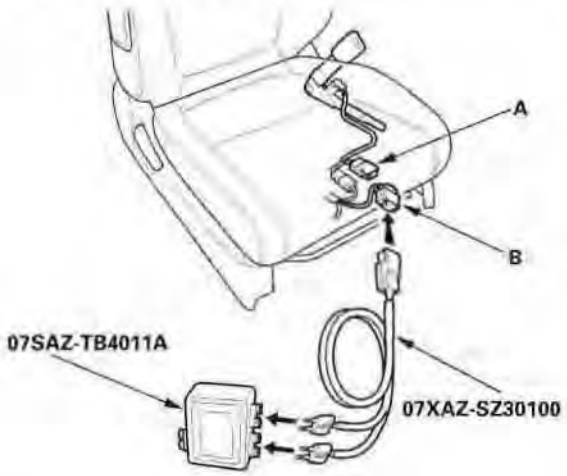
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead F 07XAZ-SZ30100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the front passenger's seat belt buckle tensioner 4P connector (A) from the floor wire harness connector (B).



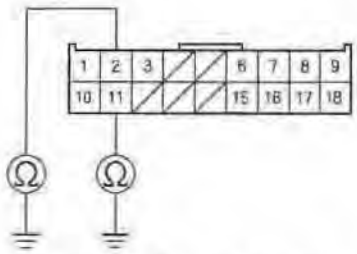
5. Connect the SRS inflator simulator (2 Ω connectors) and simulator lead F to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 22-5 Indicated?

   YES—Go to step 9.

   NO—Short to ground in the front passenger's seat belt buckle tensioner; replace the front passenger's seat belt buckle (see page 23-6).■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect both side airbag 2P connectors (see step 4 on page 23-18) and the driver's seat belt buckle tensioner 4P connector (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Disconnect simulator lead F from the floor wire harness.
13. Check resistance between the No. 2 terminal of SRS unit connector B (18P) and body ground, and the No. 11 terminal and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to ground in the floor wire harness; replace the floor wire harness.■

DTC 5-1, 5-2, 5-4, 5-8, 6-3, 6-4, 6-7, 6-8, 7-1, 7-2, 7-3, 8-1, 8-2, 8-3, 8-4, 8-5, 8-6: Internal Failure of the SRS Unit

NOTE: Before troubleshooting any of these DTCs, check the battery/system voltage. If the voltage is low, repair the charging system or replace the battery before troubleshooting the SRS. If the battery/system voltage is now OK, ask the customer if the battery ever went dead. A dead battery may trigger one of these DTCs.

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Replace the SRS unit (see page 23-127).■

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

DTC 10-1, 10-2, 10-3, 10-4, 10-5, 10-6, 10-7: Airbags, Side Airbags, and/or Seat Belt and Seat Belt Buckle Tensioners Deployed

The SRS unit must be replaced after any airbags and/or tensioners have deployed (see page 23-127).■

DTC Troubleshooting (cont'd)

DTC 13-1, 13-2: Internal Failure of the Driver's Side Impact Sensor

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Replace the driver's side impact sensor (see page 23-128). If the DTC returns, replace the SRS unit (see page 23-127). ■

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

DTC 14-1, 14-2: Internal Failure of the Front Passenger's Side Impact Sensor

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

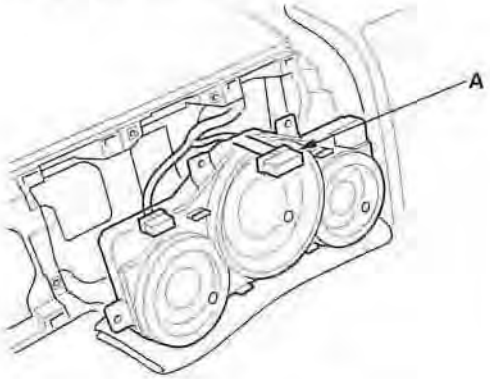
   Does the SRS indicator stay on?

   YES—Replace the front passenger's side impact sensor (see page 23-128). If the DTC returns, replace the SRS unit (see page 23-127). ■

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

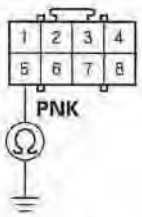
DTC 9-1: Internal Failure of the SRS Unit

1. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
2. Disconnect SRS unit connector C (8P) from the SRS unit (see step 7 on page 23-19).
3. Remove the gauge assembly (see page 22-69). Disconnect gauge assembly connector A (30P) from the gauge assembly.



4. Check resistance between the No. 5 terminal of SRS unit connector C (8P) and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR C (8P)



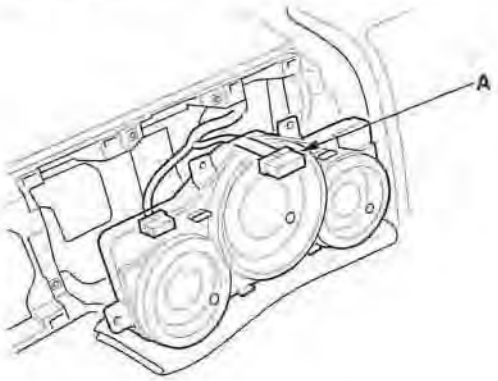
Wire side of female terminals

Is the resistance as specified?

YES—Go to step 5.

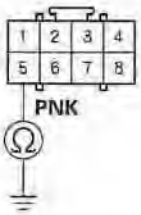
NO—Short to ground in the PNK wire of dashboard wire harness A or floor wire harness. Replace the faulty harness. ■

5. Reconnect the gauge assembly connector A (30P) to the gauge assembly.



6. Check resistance between the No. 5 terminal of SRS unit connector C (8P) and body ground. There should be 500 Ω or more.

SRS UNIT CONNECTOR C (8P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Faulty SRS indicator circuit in the gauge assembly; replace the gauge assembly. ■

DTC Troubleshooting (cont'd)

DTC 9-2: Faulty Power Supply (VB line)

1. Check the No. 13 (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 5.

   NO—Go to step 2.

2. Replace the No. 13 (10 A) fuse.

3. Turn the ignition switch ON (II), and wait for 30 seconds. Then turn the ignition switch OFF.

4. Check the No. 13 (10 A).

   Is the fuse OK?

   YES—The system is OK at this time.■

   NO—Short in the under-dash fuse/relay box No. 13 (10 A) fuse circuit (see page 22-53).■

5. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

6. Disconnect the driver's airbag 4P connector (see step 2 on page 23-18).

7. Disconnect the front passenger's airbag 4P connector (see step 3 on page 23-18).

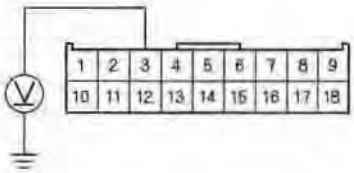
8. Disconnect both seat belt tensioner 2P connectors (see step 5 on page 23-19).

9. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).

10. Reconnect the battery negative cable.

11. Connect a voltmeter between the No. 3 terminal of SRS unit connector A (18P) and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is there battery voltage?

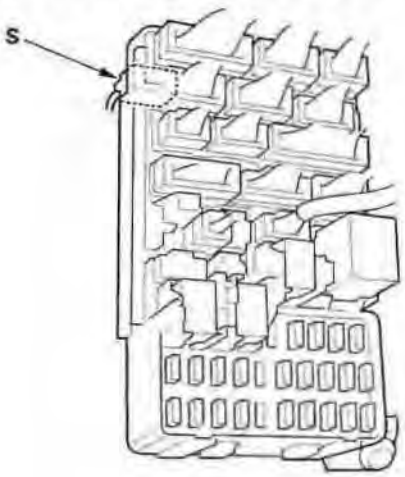
YES—Faulty SRS unit or poor contact at the SRS unit connector A (18P); check the connection. If the connection is OK, replace the SRS unit (see page 23-127).■

NO—Go to step 12.

12. Turn the ignition switch OFF.

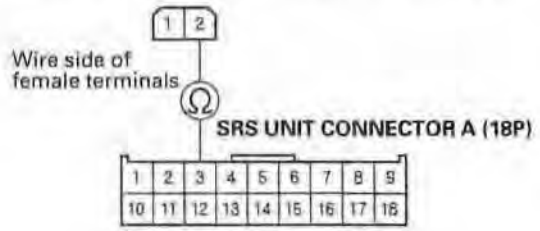
13. Disconnect the battery negative cable, and wait for 3 minutes.

14. Disconnect dashboard wire harness B connector S from the under-dash fuse/relay box.



15. Check resistance between the No. 3 terminal of SRS unit connector A (18P) and the No. 2 terminal of dashboard wire harness B connector S. There should be 0—1.0 Ω.

DASHBOARD WIRE HARNESS B CONNECTOR S



Wire side of female terminals

Is the resistance as specified?

YES—Open in the under-dash fuse/relay box or poor contact at the dashboard wire harness B connector S; check the connection. If the connection is OK, replace the under-dash fuse/relay box (see page 22-55).■

NO—Open in dashboard wire harness B; replace dashboard wire harness B.■

DTC Troubleshooting (cont'd)

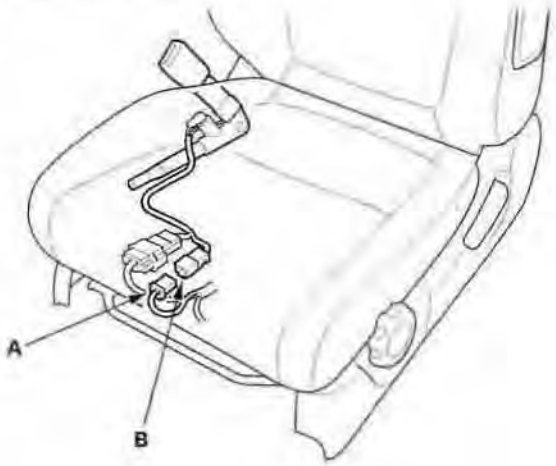
DTC 9-3: Faulty Driver's Seat Belt Buckle Switch

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), then buckle and unbuckle the driver's seat belt several times.
3. Read the DTC.

   Is DTC 9-3 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
4. Turn the ignition switch OFF.
5. Disconnect the floor wire harness 3P connector (A) from the driver's seat belt buckle switch 3P connector (B).

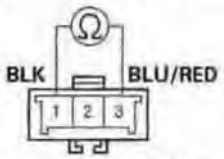


6. Buckle the driver's seat belt.

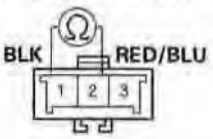
   Check resistance between the No. 1 and No. 3 terminals of the driver's seat belt buckle switch 3P connector. There should be 0—1 Ω.

   Check resistance between the No. 1 and No. 2 terminals of the same connector. There should be an open circuit or at least 1 MΩ.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

Are the resistances as specified?

YES—Go to step 7.

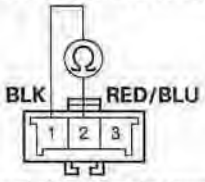
NO—Replace the driver's seat belt buckle assembly (see page 23-6), then clear the DTC. ■

7. Unbuckle the driver's seat belt.

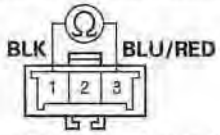
   Check resistance between the No. 1 and No. 2 terminals of the driver's seat belt buckle switch 3P connector. There should be 0—1 Ω.

   Check resistance between the No. 1 and No. 3 terminals of the same connector. There should be an open circuit or at least 1 MΩ.

DRIVER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

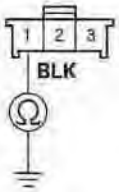
Are the resistances as specified?

YES—Go to step 8.

NO—Replace the driver's seat belt buckle assembly (see page 23-6), then clear the DTC. ■

8. Check resistance between the No. 1 terminal of the floor wire harness 3P connector and body ground. There should be 0—1 Ω.

FLOOR WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES—Go to step 9.

NO—Open in the floor wire harness or poor ground connection at G552 (see page 22-36). If G552 is OK, replace the floor wire harness. ■

9. Disconnect the negative cable from the battery.

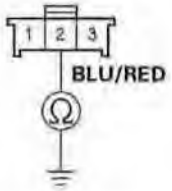
10. Disconnect SRS unit connector C (8P) from the SRS unit (see step 7 on page 23-19) and the multiplex control unit from the under-dash fuse/relay box.

(cont'd)

DTC Troubleshooting (cont'd)

11. Check resistance between the No. 2 terminal of the floor wire harness 3P connector and body ground. There should be an open circuit or at least 1 MΩ.

FLOOR WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

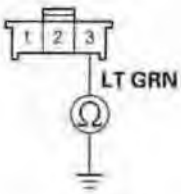
Is the resistance as specified?

YES—Go to step 12.

NO—Short to ground in the floor wire harness, ECM/PCM wire harness or multiplex control unit. Replace the faulty harness or part. ■

12. Check resistance between the No. 3 terminal of the floor wire harness 3P connector and body ground. There should be an open circuit or at least 1 MΩ.

FLOOR WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

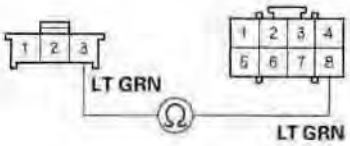
Is the resistance as specified?

YES—Go to step 13.

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

13. Check resistance between the No. 8 terminal of SRS unit connector C (8P) and the No. 3 terminal of the floor wire harness 3P connector. There should be 0—1 Ω.

FLOOR WIRE HARNESS 3P CONNECTOR **SRS UNIT CONNECTOR C (8P)**



Wire side of female terminals

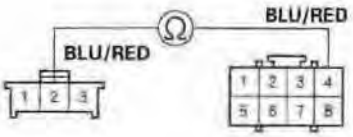
Is the resistance as specified?

YES—Go to step 14.

NO—Open in the floor wire harness; replace the floor wire harness. ■

14. Check resistance between the No. 4 terminal of SRS unit connector C (8P) and the No. 2 terminal of the floor wire harness 3P connector. There should be 0—1 Ω.

FLOOR WIRE HARNESS 3P CONNECTOR **SRS UNIT CONNECTOR C (8P)**



Wire side of female terminals

Is the resistance as specified?

YES—Replace the SRS unit (see page 23-127). ■

NO—Open in the floor wire harness, ECM/PCM wire harness or multiplex control unit, or poor connections at the ECM/PCM wire harness, the under-dash fuse/relay box, and the multiplex control unit. Check the connections. If they are OK, replace the faulty harness or part. ■

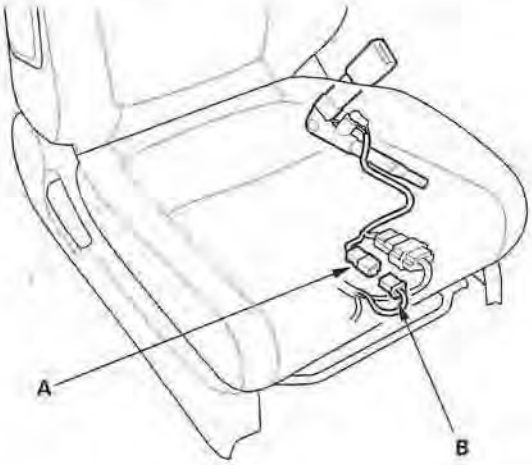
DTC 9-4: Faulty Front Passenger's Seat Belt Buckle Switch

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), then buckle and unbuckle the front passenger's seat belt several times.
3. Read the DTC.

   Is DTC 9-4 indicated?

   YES—Go to step 4.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
4. Turn the ignition switch OFF.
5. Disconnect the front passenger's seat belt buckle switch 3P connector (A) from the floor wire harness connector (B).

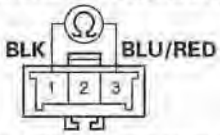


6. Buckle the front passenger's seat belt.

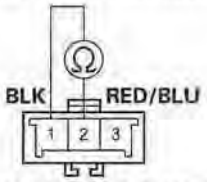
   Check resistance between the No. 1 and No. 3 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 0—1 Ω.

   Check resistance between the No. 1 and No. 2 terminals of the same connector. There should be an open circuit or at least 1 MΩ.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

Are the resistances as specified?

YES—Go to step 7.

NO—Replace the front passenger's seat belt buckle assembly (see page 23-6), then clear the DTC. ■

(cont'd)

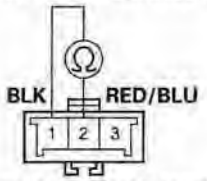
DTC Troubleshooting (cont'd)

7. Unbuckle the front passenger's seat belt.

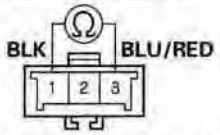
   Check resistance between the No. 1 and No. 2 terminals of the front passenger's seat belt buckle switch 3P connector. There should be 0—1 Ω.

   Check resistance between the No. 1 and No. 3 terminals of the same connector. There should be an open circuit or at least 1 MΩ.

FRONT PASSENGER'S SEAT BELT BUCKLE SWITCH 3P CONNECTOR



Terminal side of male terminals



Terminal side of male terminals

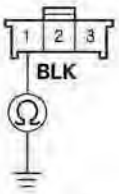
Are the resistances as specified?

YES—Go to step 8.

NO—Replace the front passenger's seat belt buckle assembly (see page 23-6), then clear the DTC.■

8. Check resistance between the No. 1 terminal of the floor wire harness 3P connector and body ground. There should be 0—1 Ω.

FLOOR WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

Is the resistance as specified?

YES—Go to step 9.

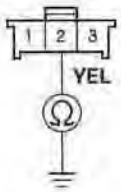
NO—Open in the floor wire harness or poor ground connection at G552 (see page 22-36). If G552 is OK, replace the floor wire harness.■

9. Disconnect the negative cable from the battery.

10. Disconnect SRS unit connector C (8P) from the SRS unit (see step 7 on page 23-19).

11. Check resistance between the No. 2 terminal of the floor wire harness 3P connector and body ground. There should be an open circuit or at least 1 MΩ.

FLOOR WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

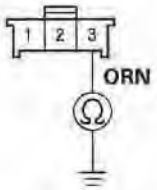
Is the resistance as specified?

YES—Go to step 12.

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

12. Check resistance between the No. 3 terminal of the floor wire harness 3P connector and body ground. There should be an open circuit or at least 1 MΩ.

FLOOR WIRE HARNESS 3P CONNECTOR



Wire side of female terminals

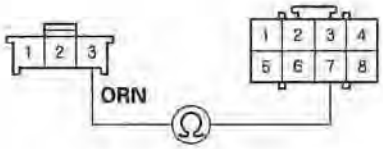
Is the resistance as specified?

YES—Go to step 13.

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

13. Check resistance between the No. 7 terminal of SRS unit connector C (8P) and the No. 3 terminal of the floor wire harness 3P connector. There should be 0—1 Ω.

FLOOR WIRE HARNESS 3P CONNECTOR **SRS UNIT CONNECTOR C (8P)**



Wire side of female terminals

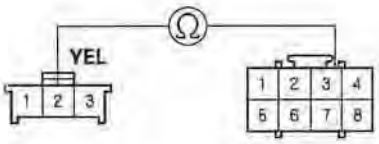
Is the resistance as specified?

YES—Go to step 14.

NO—Open in the floor wire harness; replace the floor wire harness. ■

14. Check resistance between the No. 3 terminal of SRS unit connector C (8P) and the No. 2 terminal of the floor wire harness 3P connector. There should be 0—1 Ω.

FLOOR WIRE HARNESS 3P CONNECTOR **SRS UNIT CONNECTOR C (8P)**



Wire side of female terminals

Is the resistance as specified?

YES—Replace the SRS unit (see page 23-127). ■

NO—Open in the floor wire harness; replace the floor wire harness. ■

DTC Troubleshooting (cont'd)

DTC 9-6: Faulty Left Front Impact Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3AA100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

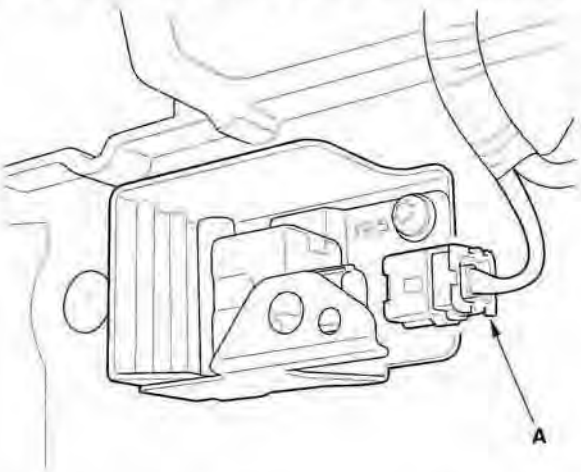
   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Check the connections between SRS unit connector A (18P) and the SRS unit, between the engine compartment wire harness 2P connector and the left front impact sensor (see page 23-10), and at connector C401 (see page 22-24).

   Are the connections OK?

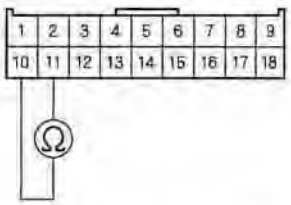
   YES—Go to step 4.

   NO—Repair the poor connections and retest. If DTC 9-6 is still present, go to step 4.
4. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
5. Disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).
6. Disconnect the front passenger's airbag 4P connector from dashboard wire harness B (see step 3 on page 23-18).
7. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).
8. Disconnect the engine compartment wire harness 2P connector (A) from the left front impact sensor.



9. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).
10. Check resistance between the No. 10 and No. 11 terminals of SRS unit connector A (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

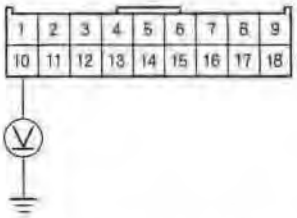
YES—Go to step 11.

NO—Short in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness. ■

11. Reconnect the battery negative cable.
12. Turn the ignition switch ON (II).

13. Check voltage between the No. 10 terminal of SRS unit connector A (18P) and body ground. There should be 1 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

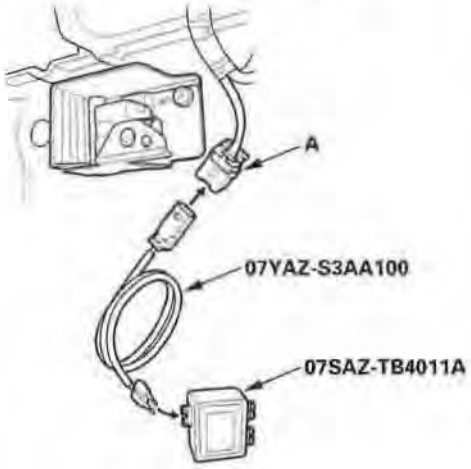
Is the voltage as specified?

YES—Go to step 14.

NO—Short to power in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness. ■

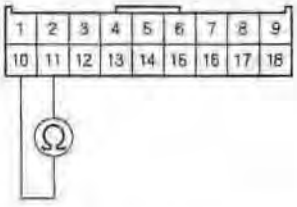
14. Turn the ignition switch OFF.

15. Connect the SRS inflator simulator (jumper connector) and simulator lead H to the engine compartment wire harness connector (A).



16. Check resistance between the No. 10 and No. 11 terminals of SRS unit connector A (18P). There should be 1 Ω or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty left front impact sensor or SRS unit; replace the left front impact sensor (see page 23-130). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO—Poor connection at C401, faulty engine compartment wire harness, or faulty dashboard wire harness B. Inspect C401. If it is OK, replace the faulty harness. ■

DTC Troubleshooting (cont'd)

DTC 9-7: Faulty Right Front Impact Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3AA100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

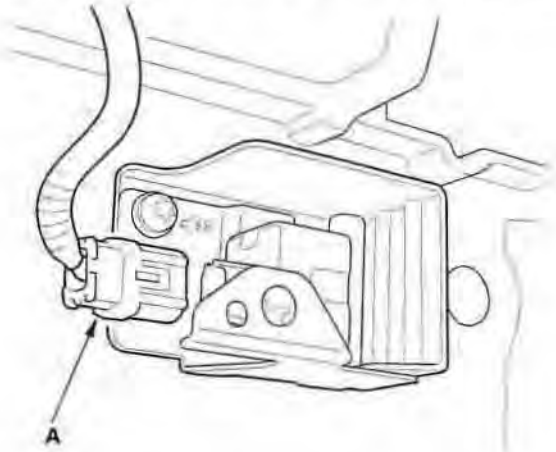
   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Check the connections between SRS unit connector A (18P) and the SRS unit, between the engine compartment wire harness 2P connector and the right front impact sensor (see page 23-10), and at connector C401 (see page 22-24).

   Are the connections OK?

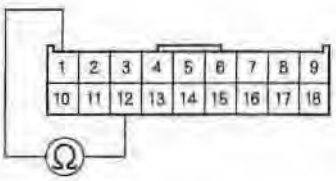
   YES—Go to step 4.

   NO—Repair the poor connections and retest. If DTC 9-7 is still present, go to step 4.
4. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
5. Disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).
6. Disconnect the front passenger's airbag 4P connector from dashboard wire harness B (see step 3 on page 23-18).
7. Disconnect both seat belt tensioner 2P connectors from the rear door wire harness (see step 5 on page 23-19).
8. Disconnect the engine compartment wire harness 2P connector (A) from the right front impact sensor.



9. Disconnect SRS unit connector A (18P) from the SRS unit (see step 7 on page 23-19).
10. Check resistance between the No. 1 and No. 12 terminals of SRS unit connector A (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

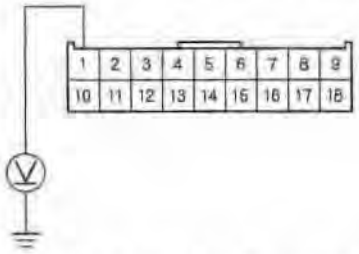
YES—Go to step 11.

NO—Short in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness. ■

11. Reconnect the battery negative cable.
12. Turn the ignition switch ON (II).

13. Check voltage between the No. 1 terminal of SRS unit connector A (18P) and body ground. There should be 1 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

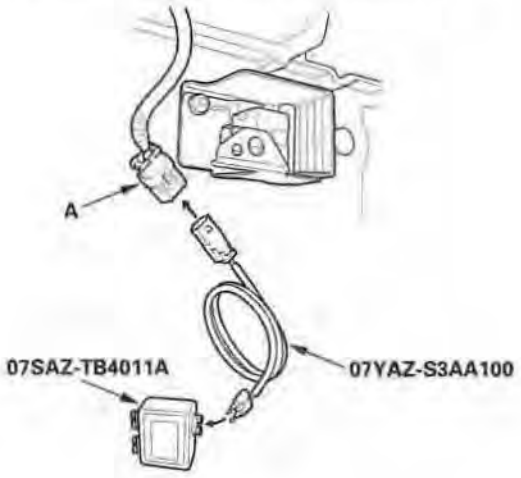
Is the voltage as specified?

YES—Go to step 14.

NO—Short to power in the engine compartment wire harness or dashboard wire harness B; replace the faulty harness. ■

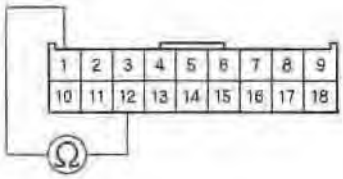
14. Turn the ignition switch OFF.

15. Connect the SRS inflator simulator (jumper connector) and simulator lead H to the engine compartment wire harness connector (A).



16. Check resistance between the No. 1 and No. 12 terminals of SRS unit connector A (18P). There should be 1 Ω or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty right front impact sensor or SRS unit; replace the right front impact sensor (see page 23-130). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO—Poor connection at C401, faulty engine compartment wire harness, or faulty dashboard wire harness B. Inspect C401. If it is OK, replace the faulty harness. ■

DTC Troubleshooting (cont'd)

DTC 11-1: Open or Increased Resistance in Driver's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the floor wire harness 2P connector (A) from the driver's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 11-1 indicated?

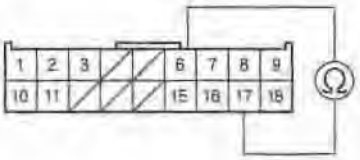
   YES—Go to step 9.

   NO—Open or increased resistance in the driver's side airbag inflator; replace the driver's side airbag (see page 23-120). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the front passenger's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19). Do not disconnect the special tool from the floor wire harness 2P connector.

12. Check resistance between the No. 6 and No. 17 terminals of SRS unit connector B (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection; if the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in the floor wire harness; replace the floor wire harness. ■

DTC 11-3: Short to Another Wire or Decreased Resistance in Driver's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the floor wire harness 2P connector (A) from the driver's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

(cont'd)

DTC Troubleshooting (cont'd)

8. Read the DTC.

   Is DTC 11-3 indicated?

   YES—Go to step 9.

   NO—Short to another wire in the driver's side airbag inflator; replace the driver's side airbag (see page 23-120).■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

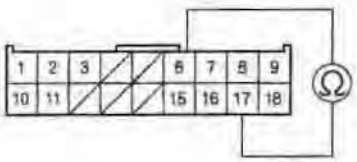
10. Disconnect the front passenger's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

11. Disconnect the simulator lead E from the floor wire harness 2P connector.

12. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

13. Check resistance between the No. 6 and No. 17 terminals of SRS unit connector B (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to another wire in the floor wire harness; replace the floor wire harness.■

DTC 11-4: Short to Power in Driver's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the floor wire harness 2P connector (A) from the driver's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

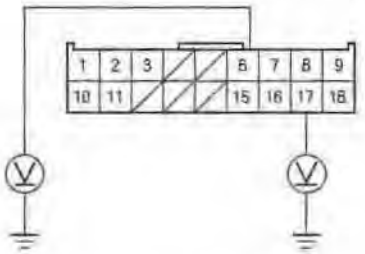
   Is DTC 11-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the driver's side airbag inflator; replace the driver's side airbag (see page 23-120). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the front passenger's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Turn the ignition switch ON (II).
13. Check for voltage between the No. 6 terminal of SRS unit connector B (18P) and body ground, and between the No. 17 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to power in the floor wire harness; replace the floor wire harness. ■

DTC Troubleshooting (cont'd)

DTC 11-5: Short to Ground in Driver's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

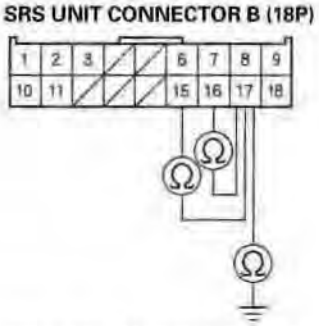
   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the floor wire harness 2P connector (A) from the driver's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 11-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the driver's side airbag inflator; replace the driver's side airbag (see page 23-120). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the front passenger's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Check resistance between the No. 17 and No. 15 terminals of SRS unit connector B (18P), and between the No. 17 and No. 16 terminals. Then check resistance between the No. 17 terminal and body ground. There should be an open circuit or at least 1 MΩ.



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

DTC 12-1: Open or Increased Resistance in Front Passenger's Side Airbag Inflator

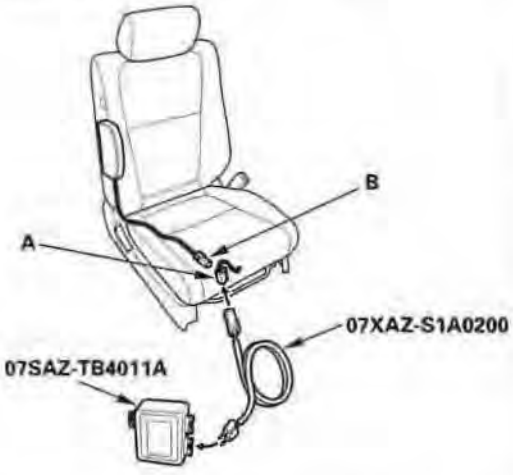
Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the floor wire harness 2P connector (A) from the front passenger's side airbag connector (B).



5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 12-1 indicated?

   YES—Go to step 9.

   NO—Open or increased resistance in the front passenger's side airbag inflator; replace the front passenger's side airbag (see page 23-120). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

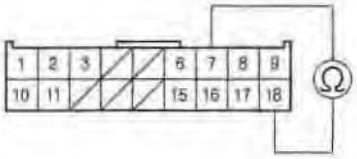
(cont'd)

DTC Troubleshooting (cont'd)

11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19). Do not disconnect the special tool from the floor wire harness 2P connector.

12. Check resistance between the No. 7 and No. 18 terminals of SRS unit connector B (18P). There should be 2.0—3.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit or poor contact at SRS unit connector B (18P) and the SRS unit. Check the connection; If the connection is OK, replace the SRS unit (see page 23-127). ■

NO—Open or increased resistance in the floor wire harness; replace the floor wire harness. ■

DTC 12-3: Short to Another Wire or Decreased Resistance in Front Passenger's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the floor wire harness 2P connector (A) from the front passenger's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.

6. Reconnect the battery negative cable.

7. Erase the DTC memory.

8. Read the DTC.

   Is DTC 12-3 indicated?

   YES—Go to step 9.

   NO—Short to another wire in the front passenger's side airbag inflator; replace the front passenger's side airbag (see page 23-120). ■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

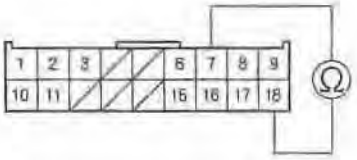
10. Disconnect the driver's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

11. Disconnect the simulator lead E from the floor wire harness 2P connector.

12. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

13. Check resistance between the No. 7 and No. 18 terminals of SRS unit connector B (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to another wire in the floor wire harness; replace the floor wire harness. ■

DTC 12-4: Short to Power in Front Passenger's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the floor wire harness 2P connector (A) from the front passenger's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.

(cont'd)

DTC Troubleshooting (cont'd)

6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

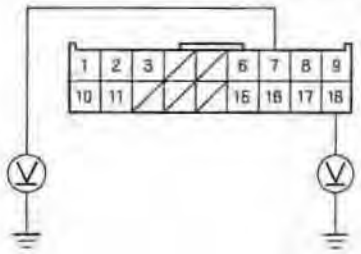
   Is DTC 12-4 indicated?

   YES—Go to step 9.

   NO—Short to power in the front passenger's side airbag inflator; replace the front passenger's side airbag (see page 23-120).■

9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Turn the ignition switch ON (II).
13. Check for voltage between the No. 7 terminal of SRS unit connector B (18P) and body ground, and between the No. 18 terminal and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to power in the floor wire harness; replace the floor wire harness.■

DTC 12-5: Short to Ground in Front Passenger's Side Airbag Inflator

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead E 07XAZ-S1A0200

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

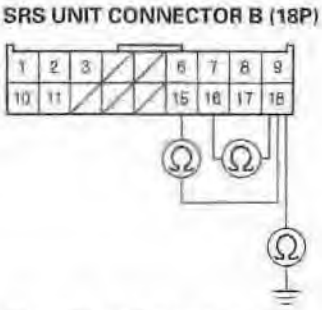
   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Disconnect the floor wire harness 2P connector (A) from the front passenger's side airbag connector (B).

5. Connect the SRS inflator simulator (2 Ω connector) and simulator lead E to the floor wire harness connector.
6. Reconnect the battery negative cable.
7. Erase the DTC memory.
8. Read the DTC.

   Is DTC 12-5 indicated?

   YES—Go to step 9.

   NO—Short to ground in the front passenger's side airbag inflator; replace the front passenger's side airbag (see page 23-120). ■
9. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
10. Disconnect the driver's side airbag 2P connector (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).
11. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).
12. Check resistance between the No. 15 and No. 18 terminals of SRS unit connector B (18P) and between the No. 16 and No. 18 terminals. Then check resistance between the No. 18 terminal and body ground. There should be an open circuit or at least 1 MΩ.



Wire side of female terminals

Is the resistance as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127). ■

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

DTC Troubleshooting (cont'd)

DTC 13-3: No Signal from the Driver's Side Impact Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3AA100

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

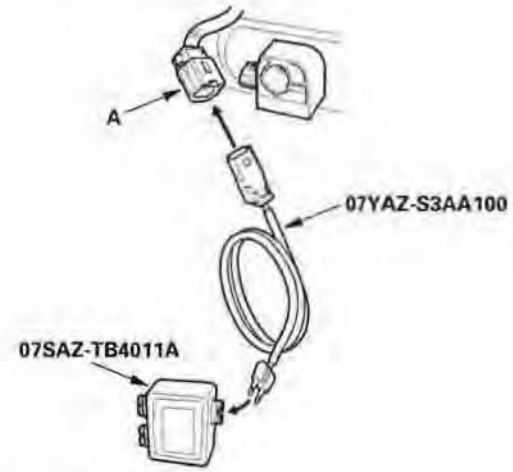
   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.
3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
4. Check the connection between the floor wire harness 2P connector and the driver's side impact sensor.

   Is the connection OK?

   YES—Go to step 5.

   NO—Poor contact between the floor wire harness 2P connector and the front passenger's side impact sensor; replace the driver's side impact sensor and/or the floor harness, as needed. ■
5. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (see step 4 on page 23-18). Also disconnect both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).
6. Disconnect the floor wire harness 2P connector (A) from the driver's side impact sensor.

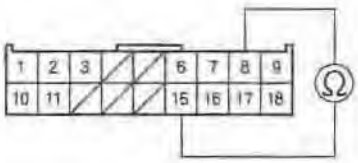


7. Connect the SRS inflator simulator (jumper connector) and simulator lead H to the floor wire harness connector.

8. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

9. Check resistance between the No. 8 and No. 15 terminals of SRS unit connector B (18P). There should be 0—1.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty driver's side impact sensor or SRS unit; replace the driver's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127).■

NO—Open in the floor wire harness; replace the floor wire harness.■

DTC 13-4: Faulty Power Supply to the Driver's Side Impact Sensor

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (see step 4 on page 23-18). Also disconnect both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

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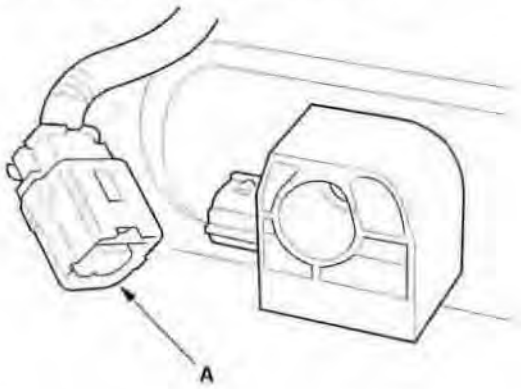
DTC Troubleshooting (cont'd)

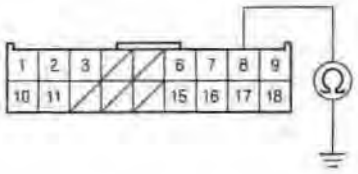
5. Disconnect the floor wire harness 2P connector (A) from the driver's side impact sensor.



6. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

7. Check resistance between the No. 8 terminal of SRS unit connector B (18P) and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

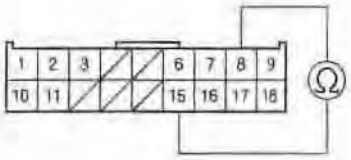
Is the resistance as specified?

YES—Go to step 8.

NO—Short to ground in the floor wire harness; replace the floor wire harness.■

8. Check resistance between the No. 8 and No. 15 terminals of SRS unit connector B (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty driver's side impact sensor or SRS unit; replace the driver's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127).■

NO—Short in the floor wire harness; replace the floor wire harness.■

DTC 14-3: No Signal from the Front Passenger's Side Impact Sensor

Special Tools Required
- SRS inflator simulator 07SAZ-TB4011A
- SRS simulator lead H 07YAZ-S3AA100

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Check the connection between the floor wire harness 2P connector and the front passenger's side impact sensor.

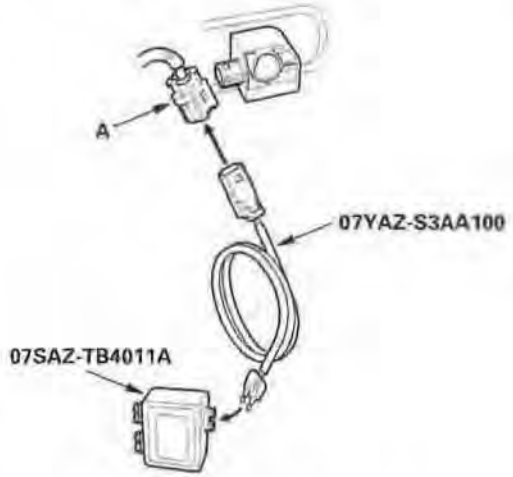
   Is the connection OK?

   YES—Go to step 5.

   NO—Poor contact between the floor wire harness 2P connector and the front passenger's side impact sensor; replace the front passenger's side impact sensor and/or the floor harness, as needed. ■

5. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (see step 4 on page 23-18). Also disconnect both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

6. Disconnect the floor wire harness 2P connector (A) from the front passenger's side impact sensor.



7. Connect the SRS inflator simulator (jumper connector) and simulator lead H to the floor wire harness connector.

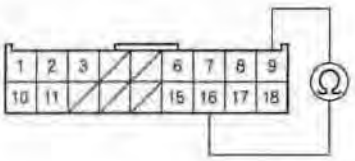
(cont'd)

DTC Troubleshooting (cont'd)

8. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

9. Check resistance between the No. 9 and No. 16 terminals of SRS unit connector B (18P). There should be 0—1.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty front passenger's side impact sensor or SRS unit; replace the front passenger's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO—Open in the floor wire harness; replace the floor wire harness. ■

DTC 14-4: Faulty Power Supply to the Front Passenger's Side Impact Sensor

1. Erase the DTC memory (see page 23-23).

2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

Does the SRS indicator stay on?

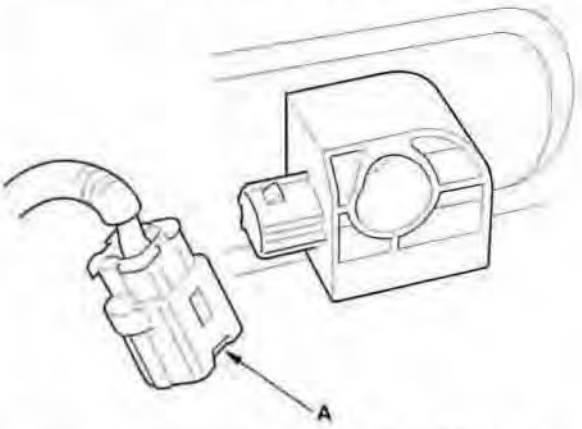
YES—Go to step 3.

NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

3. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

4. Disconnect the driver's side airbag and front passenger's side airbag 2P connectors (see step 4 on page 23-18). Also disconnect both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

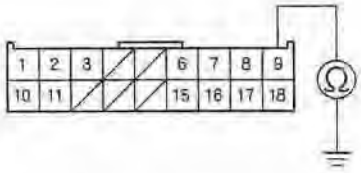
5. Disconnect the floor wire harness 2P connector (A) from the front passenger's side impact sensor.



6. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

7. Check resistance between the No. 9 terminal of SRS unit connector B (18P) and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

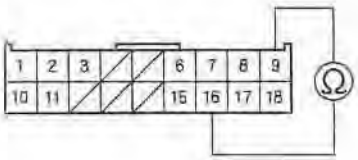
Is the resistance as specified?

YES—Go to step 8.

NO—Short to ground in the floor wire harness; replace the floor wire harness. ■

8. Check resistance between the No. 9 and No. 16 terminals of SRS unit connector B (18P). There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

Is the resistance as specified?

YES—Faulty front passenger's side impact sensor or SRS unit; replace the front passenger's side impact sensor (see page 23-128). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO—Short in the floor wire harness; replace the floor wire harness. ■

DTC 15-1: Faulty OPDS Unit or OPDS Unit is not Initialized

NOTE:
- An incorrect OPDS unit can cause DTC 15-1.
- A new (uninitialized) OPDS unit installed with a faulty OPDS sensor can also cause DTC 15-1.
- If you install a new OPDS unit and a new SRS unit at the same time, initialize the OPDS manually (see page 23-24), do not use the HDS.

1. Make sure nothing is on the front passenger's seat.
2. Initialize the OPDS unit (see page 23-24).
3. Erase the DTC memory (see page 23-23).
4. Read the DTC.

   Is DTC 15-1 indicated?

   YES—Go to step 5.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

5. Check the No. 9 (10 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 6.

   NO—Go to step 9.

6. Disconnect OPDS unit harness 8P connector D from the OPDS unit (see page 23-129).

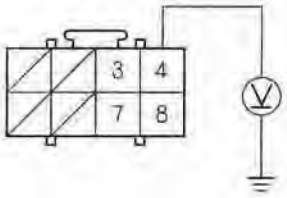
7. Turn the ignition switch ON (II).

(cont'd)

DTC Troubleshooting (cont'd)

8. Check for voltage between the No. 4 terminal of the OPDS unit harness 8P connector D and body ground. There should be battery voltage.

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

Is there battery voltage?

YES—Go to step 16.

NO—Open in the ECM/PCM wire harness, floor wire harness, or OPDS unit harness; replace the faulty harness.■

9. Replace the No. 9 (10 A) fuse in the under-dash fuse/relay box.

10. Turn the ignition switch ON (II) for 30 seconds, then turn it off.

11. Check the No. 9 (10 A) fuse in under-dash fuse/relay box.

Is the fuse OK?

YES—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

NO—Go to step 12.

12. Replace the No. 9 (10 A) fuse in the under-dash fuse/relay box.

13. Disconnect the OPDS unit harness 8P connector D from the OPDS unit.

14. Turn the ignition switch ON (II) for 30 seconds, then turn it off.

15. Check the No. 9 (10 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

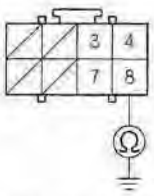
YES—Short to ground in the OPDS unit; replace the OPDS unit (see page 23-129).■

NO—Short to ground in the No. 9 (10 A) fuse circuit (floor harness, OPDS harness, or ECM/PCM wire harness); replace the faulty harness.■

16. Turn the ignition switch OFF.

17. Check resistance between the No. 8 terminal of the OPDS unit harness 8P connector D and body ground. There should be 0—1.0 Ω.

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

Is the resistance as specified?

YES—Go to step 18.

NO—Open in the floor wire harness or OPDS unit harness, or poor ground (G552) (see page 22-36). If G552 is OK,replace the faulty harness.■

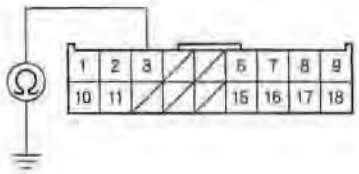
18. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.

19. Disconnect both side airbag connectors (see step 4 on page 23-18) and both seat belt buckle tensioner 4P connectors (see step 6 on page 23-19).

20. Disconnect SRS unit connector B (18P) from the SRS unit (see step 7 on page 23-19).

21. Check resistance between the No. 3 terminal of SRS unit connector B (18P) and body ground. There should be an open circuit or at least 1 MΩ.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

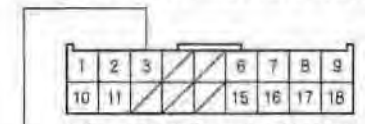
Is the resistance as specified?

YES—Go to step 22.

NO—Short to ground in the floor wire harness or OPDS unit harness; replace the faulty harness.■

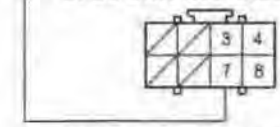
22. Check resistance between the No. 3 terminal of SRS unit connector B (18P) and the No. 7 terminal of OPDS unit harness 8P connector D. There should be 0—1.0 Ω.

SRS UNIT CONNECTOR B (18P)



Wire side of female terminals

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

Is the resistance as specified?

YES—Go to step 23.

NO—Open in the floor wire harness or in the OPDS unit harness; replace the faulty harness.■

23. Reconnect the battery negative cable.

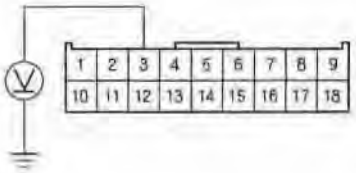
24. Turn the ignition switch ON (II).

(cont'd)

DTC Troubleshooting (cont'd)

25. Check for voltage between the No. 3 terminal of SRS unit connector A (18P) and body ground. There should be 0.5 V or less.

SRS UNIT CONNECTOR A (18P)



Wire side of female terminals

Is the voltage as specified?

YES—Go to step 26.

NO—Short to power in the floor wire harness or in the OPDS unit harness; replace the faulty harness. ■

26. Replace the OPDS unit (see page 23-129), then initialize the system (see page 23-24).

27. Erase the DTC memory, then check for DTC 15-1.

Is DTC 15-1 indicated?

YES—Replace the OPDS sensor/seat-back foam (see page 20-89), and initialize the OPDS (see page 23-24). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO—The system is OK. ■

DTC 15-2: Faulty Side Airbag Cutoff Indicator Circuit

1. Make sure nothing is on the front passenger's seat.

2. Erase the DTC memory (see page 23-23).

3. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

Does the SRS indicator stay on?

YES—Turn the ignition switch OFF, and go to step 4.

NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

NOTE: This DTC may have been caused by turning the ignition switch ON (II) with the gauge assembly disconnected.

4. Turn the ignition switch ON (II), and check that the side airbag cutoff indicator comes on.

Does the side airbag cutoff indicator come on?

YES—Go to step 5.

NO—Go to step 6.

5. Make sure the side airbag cutoff indicator goes off after 5 seconds.

Does the side airbag cutoff indicator go off after 5 seconds?

YES—Faulty OPDS unit or SRS unit; replace the OPDS unit (see page 23-129). If the problem is still present, replace the SRS unit (see page 23-127). ■

NO—Go to step 32.

6. Turn the ignition switch OFF.

7. Check the No. 10 (7.5 A) fuse in the under-dash fuse/relay box.

   Is the fuse OK?

   YES—Go to step 8.

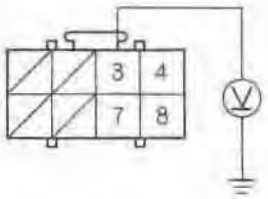
   NO—Replace the fuse, then turn the ignition switch ON (II). If the fuse blows again, check for a short in the No. 10 (7.5 A) fuse circuit (dashboard wire harness A, floor harness, or OPDS harness).■

8. Disconnect the OPDS unit harness 8P connector D from the OPDS unit (see page 23-129).

9. Turn the ignition switch ON (II).

10. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector D and body ground. There should be battery voltage.

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

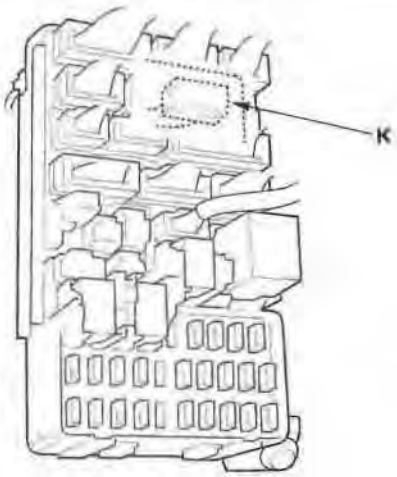
Is there battery voltage?

YES—Go to step 11.

NO—Go to step 23.

11. Turn the ignition switch OFF.

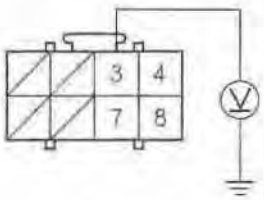
12. Disconnect dashboard wire harness 17P connector K from the under-dash fuse/relay box.



13. Turn the ignition switch ON (II).

14. Check for voltage between the No. 3 terminal of the OPDS unit harness 8P connector D and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

Is the voltage as specified?

YES—Faulty OPDS unit; replace the OPDS unit (see page 23-129).■

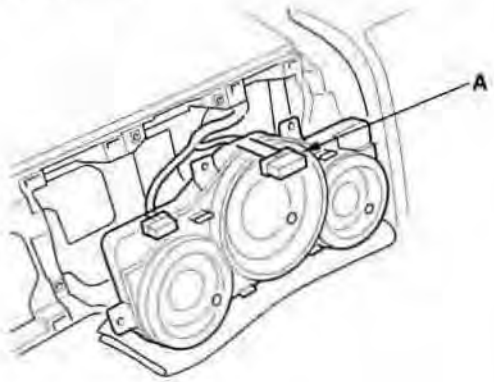
NO—Go to step 15.

(cont'd)

DTC Troubleshooting (cont'd)

15. Turn the ignition switch OFF.

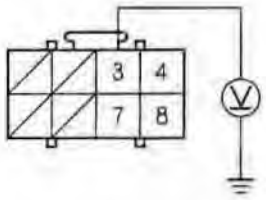
16. Remove the gauge assembly (see page 22-69), then disconnect gauge assembly connector A from the gauge assembly.



17. Turn the ignition switch ON (II).

18. Check for voltage between the No. 3 terminal of OPDS unit harness 8P connector D and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

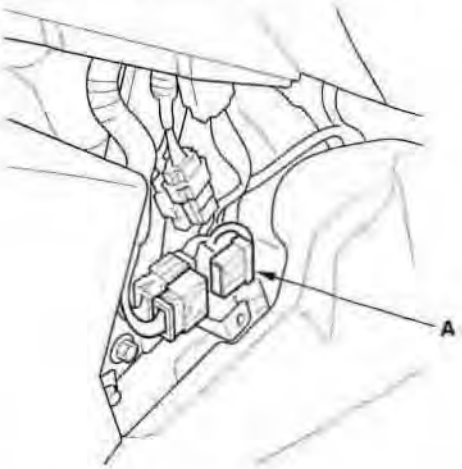
Is the voltage as specified?

YES—Short to power in the gauge assembly; replace the gauge assembly.■

NO—Go to step 19.

19. Turn the ignition switch OFF.

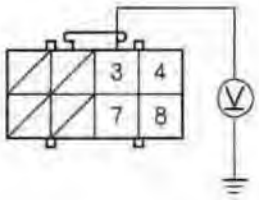
20. Disconnect floor wire harness 4P connector C551 or 23P connector C561 (with XM radio) (A) from dashboard wire harness A.



21. Turn the ignition switch ON (II).

22. Check for voltage between the No. 3 terminal of OPDS unit harness 8P connector D and body ground. There should be 0.5 V or less.

OPDS UNIT HARNESS 8P CONNECTOR D



Wire side of female terminals

Is the voltage as specified?

YES—Short to power in dashboard wire harness A; replace the dashboard wire harness A.■

NO—Short to power in the floor wire harness or in the OPDS unit harness; if the OPDS unit harness is OK, replace the floor wire harness.■

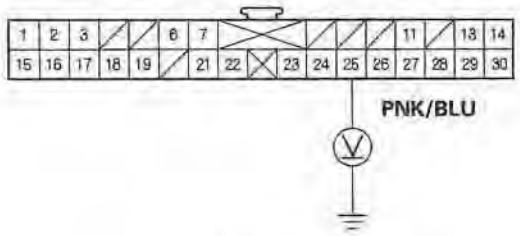
23. Turn the ignition switch OFF.

24. Remove the gauge assembly, but do not disconnect the connectors (see page 22-69). Backprobe the No. 25 terminal of gauge assembly connector A (30P).

25. Turn the ignition switch ON (II).

26. Check for voltage between the No. 25 terminal of gauge assembly connector A (30P) and body ground. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

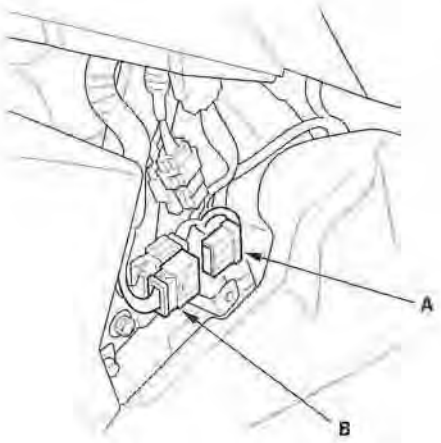
Is there battery voltage?

YES—Go to step 27.

NO—Go to step 31.

27. Turn the ignition switch OFF.

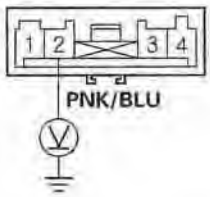
28. Disconnect floor wire harness 4P connector C551 or 23P connector C561 (with XM radio) (A) from dashboard wire harness A connector C551 or C561 (B).



29. Turn the ignition switch ON (II).

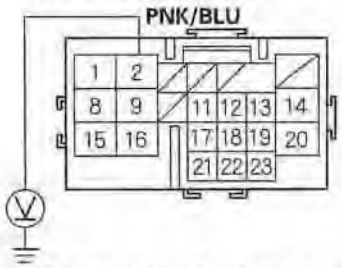
30. Check for voltage between the No. 2 terminal of dashboard wire harness A 4P connector C551 or 23P connector C561 and body ground. There should be battery voltage.

DASHBOARD WIRE HARNESS A 4P CONNECTOR C551



Terminal side of male terminals

DASHBOARD WIRE HARNESS A 23P CONNECTOR C561



Terminal side of male terminals

Is there battery voltage?

YES—Poor connection at dashboard wire harness A 4P or 23P connector and floor wire harness, an open in the floor wire harness, or an open in the OPDS unit harness. Check the connection; if the connection is OK, replace the faulty harness. ■

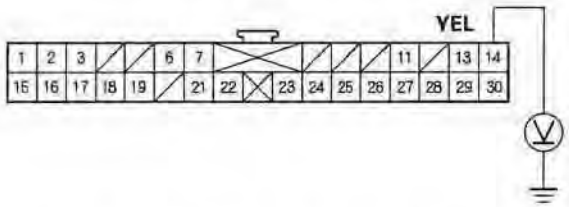
NO—Poor connection at gauge assembly connector A (30P) or an open in dashboard wire harness A. Check gauge assembly connector A (30P); if the connections are OK, replace dashboard wire harness A. ■

(cont'd)

DTC Troubleshooting (cont'd)

31. Check for voltage between the No. 14 terminal of gauge assembly connector A (30P) and body ground. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

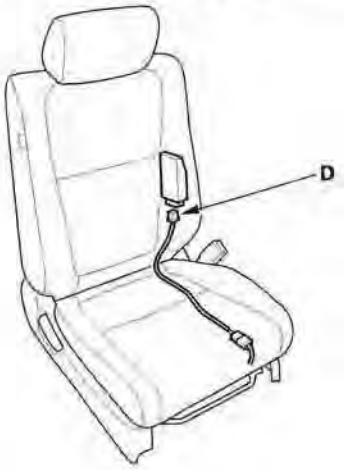
Is there battery voltage?

YES—Faulty side airbag cutoff indicator circuit; replace the gauge assembly. ■

NO—Open in dashboard wire harness A; replace dashboard wire harness A. ■

32. Turn the ignition switch OFF.

33. Disconnect the OPDS unit harness 8P connector D from the OPDS unit (see page 23-129).



34. Turn the ignition switch ON (II).

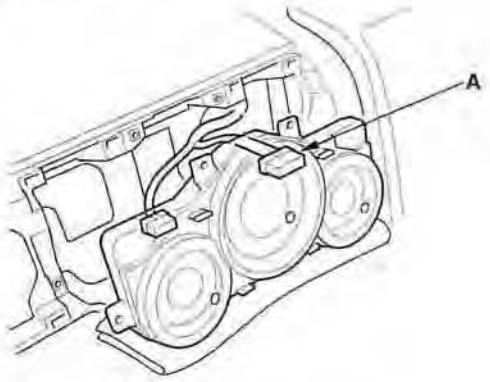
Does the side airbag cutoff indicator come on?

YES—Go to step 35.

NO—Faulty OPDS unit; replace the OPDS unit (see page 23-129). ■

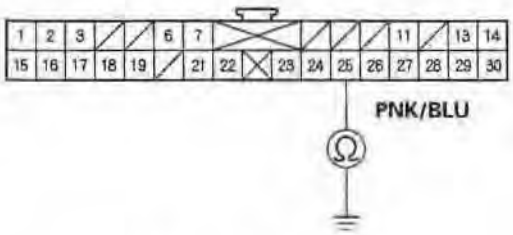
35. Turn the ignition switch OFF.

36. Remove the gauge assembly (see page 22-69), then disconnect gauge assembly connector A from the gauge assembly.



37. Check resistance between the No. 25 terminal of gauge assembly connector A (30P) and body ground. There should be an open circuit or at least 1 MΩ.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Is the resistance as specified?

YES—Short to ground in the side airbag cutoff indicator circuit; replace the gauge assembly. ■

NO—Short to ground in the dashboard wire harness A, floor wire harness, or OPDS unit harness; replace the faulty harness. ■

DTC 15-3: Faulty OPDS Sensor

1. Erase the DTC memory (see page 23-23).
2. Turn the ignition switch ON (II), and check that the SRS indicator comes on for about 6 seconds and then goes off.

   Does the SRS indicator stay on?

   YES—Go to step 3.

   NO—Intermittent failure, system is OK at this time. Go to Troubleshooting Intermittent Failures (see page 23-25). If another DTC is indicated, go to the DTC Troubleshooting Index.

   NOTE: Aftermarket devices (fluorescent lights, laptop computers, etc.) used near the front passenger's seat-back can interfere with the seat-back sensors and cause a false DTC 15-3. If one of these devices was used, erase the DTC, operate the device near the seat-back, and recheck for DTCs. If DTC 15-3 is reset, erase it, and do not use the device near the seat-back.
3. Check the connection at the OPDS sensor harness connector and the OPDS unit connector.

   Are the connections OK?

   YES—Go to step 4.

   NO—Reconnect the OPDS sensor harness connector, and clear the DTC. ■
4. Replace the OPDS sensor/seat-back foam (see page 20-89), and initialize the OPDS (see page 23-24).
5. Erase the DTC memory, then check for DTC 15-3.

   Is DTC 15-3 indicated?

   YES—Replace the OPDS unit (see page 23-129). ■

   NO—The system is OK. ■

Symptom Troubleshooting

SRS indicator does not come on

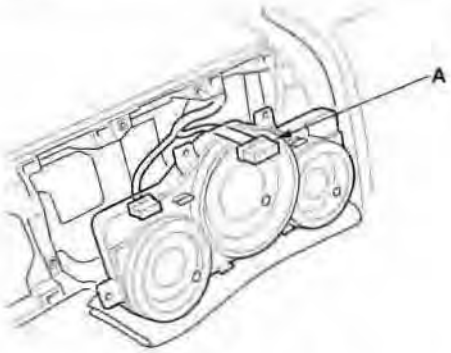
1. Turn the ignition switch ON (II), and see if the other indicators come on (brake system, etc).

   Do the other indicators come on?

   YES—Go to step 2.

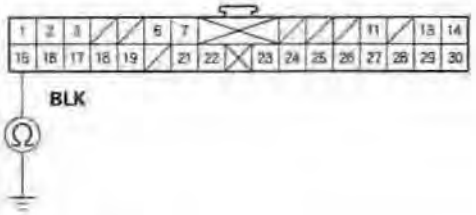
   NO—Go to step 8.

2. Turn the ignition switch OFF, then remove the gauge assembly (see page 22-69). Disconnect gauge assembly connector A from the gauge assembly.



3. Check resistance between the No. 15 terminal of gauge assembly connector A (30P) and body ground. There should be 0—1.0 Ω.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

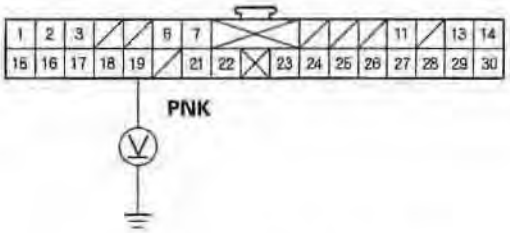
Is the resistance as specified?

YES—Go to step 4.

NO—Open in the BLK wire of dashboard wire harness A or faulty body ground terminal (G502) (see page 22-36). If the body ground terminal is OK, replace dashboard wire harness A.■

4. Check for voltage between the No. 19 terminal of gauge assembly connector A (30P) and body ground within the first 6 seconds after turning the ignition switch ON (II). There should be 8.5 V or less.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS indicator circuit in the gauge assembly; replace the gauge assembly.■

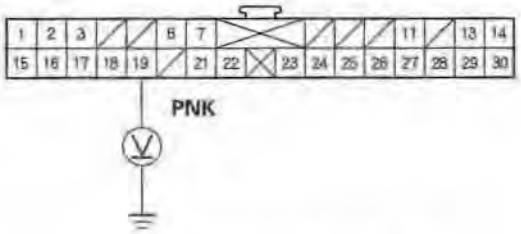
NO—Go to step 5.

5. Turn the ignition switch OFF.

6. Disconnect SRS unit connector C (8P) from the SRS unit (see step 7 on page 23-19).

7. Connect a voltmeter between the No. 19 terminal of gauge assembly connector A (30P) and body ground. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Is the voltage as specified?

YES—Faulty SRS unit; replace the SRS unit (see page 23-127).■

NO—Short to power in the PNK wire of dashboard wire harness A or in the floor wire harness; replace the faulty harness.■

8. Turn the ignition switch OFF. Check the No. 10 (7.5 A) fuse in the under-dash fuse/relay box.

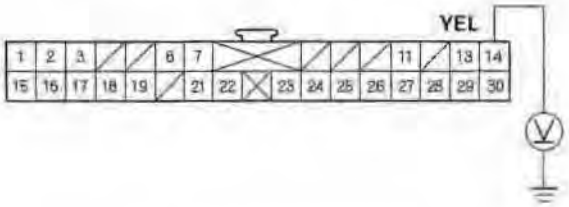
Is the fuse blown?

YES—Go to step 10.

NO—Go to step 9.

9. Connect a voltmeter between the No. 14 terminal of gauge assembly connector A (30P) and body ground. Turn the ignition switch ON (II), and measure the voltage. There should be battery voltage.

GAUGE ASSEMBLY CONNECTOR A (30P)



Wire side of female terminals

Is there battery voltage?

YES—Faulty SRS indicator circuit in the gauge assembly or poor connection at gauge assembly connector A (30P) and the gauge assembly; if the connection is OK, replace the gauge assembly.■

NO—Open in the under-dash fuse/relay box No. 10 (7.5 A) fuse circuit, or open in the YEL wire of dashboard wire harness A. If the under-dash fuse/relay box is OK, replace the faulty harness.■

10. Replace the No. 10 (7.5 A) fuse, then check to see if the indicators comes on.

Do the indicators come on?

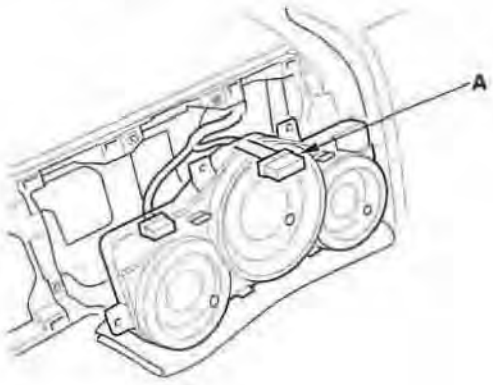
YES—The system is OK at this time.■

NO—Repair the short to ground in the under-dash fuse/relay box No. 10 (7.5 A) fuse circuit.■

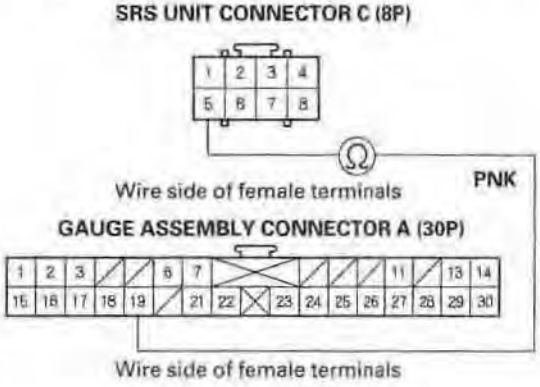
Symptom Troubleshooting (cont'd)

SRS indicator stays on, but no DTCs are stored

1. Turn the ignition switch OFF. Disconnect the battery negative cable, and wait for 3 minutes.
2. Disconnect the driver's airbag 4P connector (see page 23-18).
3. Disconnect the front passenger's airbag 4P connector (see page 23-18).
4. Disconnect both seat belt tensioner 2P connectors (see page 23-19).
5. Disconnect SRS unit connector A (18P) from the SRS unit (see page 23-19).
6. Remove the gauge assembly (see page 22-69). Disconnect gauge assembly connector A (30P) from the gauge assembly.



7. Check resistance between the No. 19 terminal of gauge assembly connector A (30P) and the No. 5 terminal of SRS unit connector C (8P). There should be 1 Ω or less.



Is the resistance as specified?

YES—Faulty SRS indicator circuit in the gauge assembly or poor connection at gauge assembly connector A (30P); check the connection. If the connection is OK, replace the gauge assembly. ■

NO—Open in the dashboard wire harness or floor wire harness; replace the faulty harness. ■

Component Replacement/Inspection After Deployment

NOTE: Before doing any SRS repairs, use the HDS SRS Menu Method to check for DTCs; refer to the DTC Troubleshooting Index for the less obvious deployed parts (seat belt tensioners, front impact sensors, side airbag sensors, etc.).

After a collision where the seat belt tensioners deployed, replace these items:
- Seat belt tensioners
- Seat belt buckle tensioners
- SRS unit
- Front impact sensors

After a collision where the front airbag(s) deployed, replace these items:
- SRS unit
- Deployed airbag(s)
- Seat belt tensioners
- Seat belt buckle tensioners
- Front impact sensors

After a collision where the side airbag(s) deployed, replace these items:
- SRS unit
- Deployed side airbag(s)
- Side impact sensor(s) for the side(s) that deployed

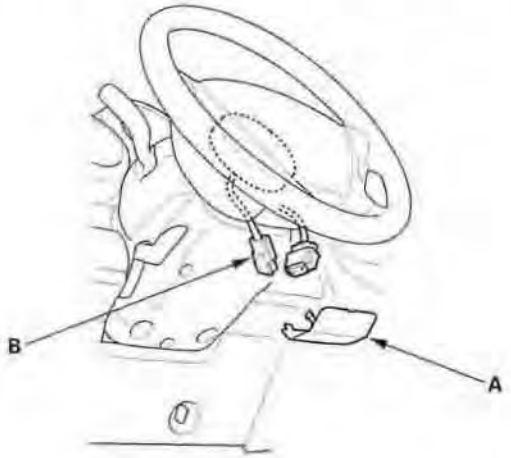
During the repair process, inspect these areas:
- Inspect all the SRS wire harnesses. Replace, do not repair, any damaged harnesses.
- Inspect the cable reel for heat damage. If there is any damage, replace the cable reel.

After the vehicle is completely repaired, turn the ignition switch ON (II). If the SRS indicator comes on for about 6 seconds and then goes off, the SRS airbag system is OK. If the indicator does not function properly, use the HDS SRS Menu Method to read the DTC (see page 23-20).

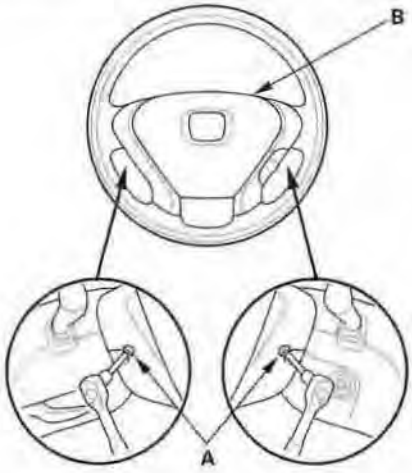
Driver's Airbag Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the access panel (A) from the steering wheel, then disconnect the driver's airbag 4P connector (B) from the cable reel.



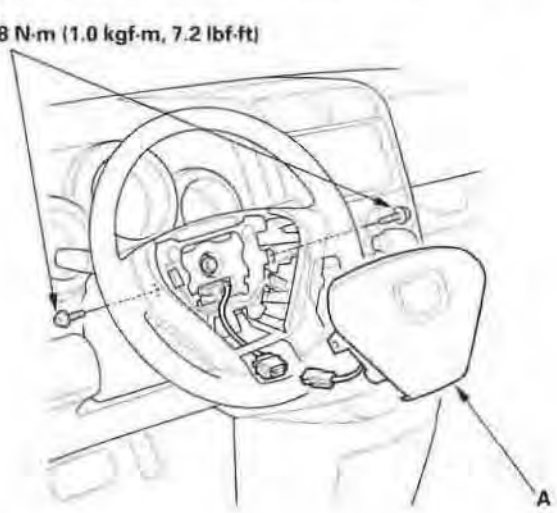
3. Remove the two Torx bolts (A) using a Torx T30 bit.



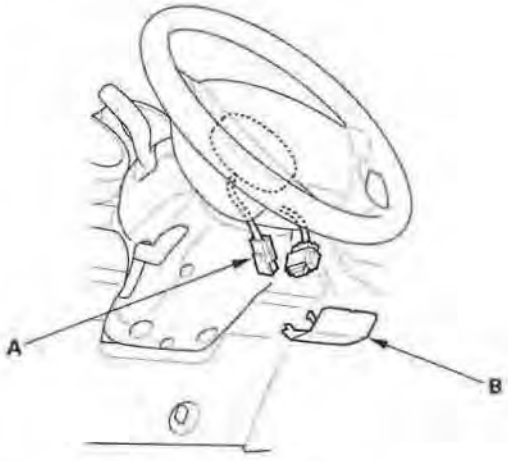
4. Remove the driver's airbag (B).

Installation

1. Place the new driver's airbag (A) in the steering wheel, and secure it with new Torx bolts (B).



2. Connect the cable reel to the driver's airbag 4P connector (A), then install the access panel (B) on the steering wheel.



3. Connect the battery negative cable.
4. After installing the airbag, confirm proper system operation:
   - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
   - Make sure the horn works.

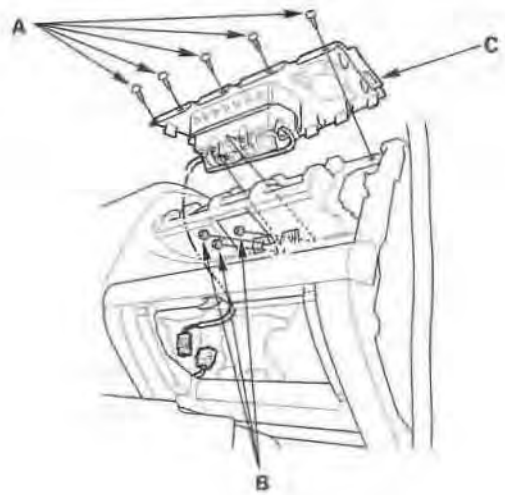
Front Passenger's Airbag Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Remove the glove box (see page 20-78).
3. Disconnect the front passenger's airbag 4P connector (A) from the dashboard wire harness.

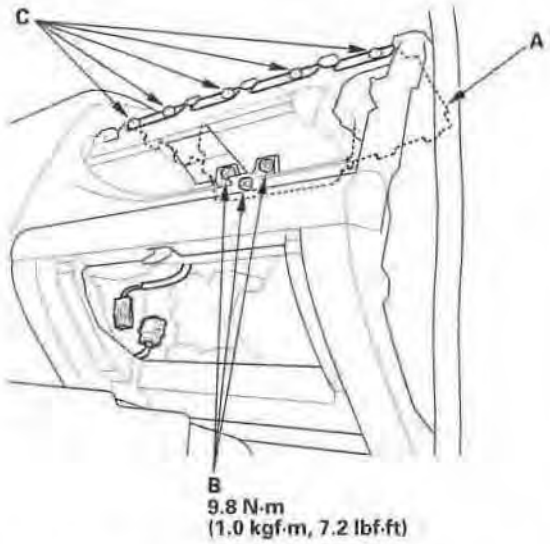
4. Remove the passenger's dashboard upper panel and the dashboard tray cover (see page 20-79).
5. Remove the screws (A) and the mounting nuts (B) from the bracket. Cover the lid and dashboard with a cloth, and pry carefully with a screwdriver to lift the front passenger's airbag (C) out of the dashboard.

   NOTE: The airbag lid has pawls on its side that attach it to the dashboard.



Installation

1. Place the new front passenger's airbag (A) into the dashboard. Tighten the mounting nuts (B) and screws (C).



2. Reinstall the dashboard tray cover and the passenger's dashboard upper panel (see page 20-79).
3. Connect the front passenger's airbag 4P connector (A) to dashboard wire harness.

4. Reinstall the glove box (see page 20-78).
5. Reconnect the battery negative cable.
6. After installing the airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Side Airbag Replacement

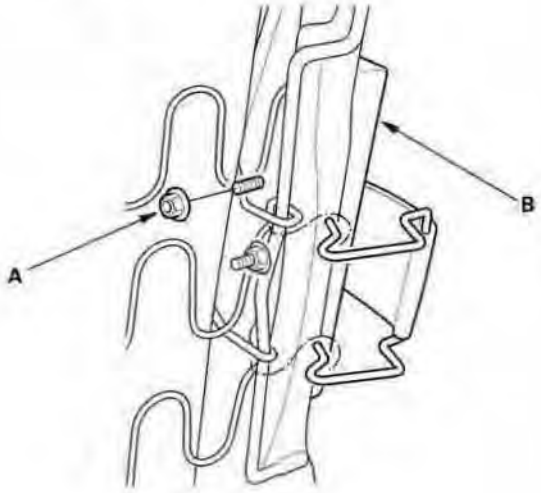
Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.

2. Disconnect the side airbag harness 2P connector (A).

3. Remove the seat assembly (see page 20-86) and seat-back cover (see page 20-92).

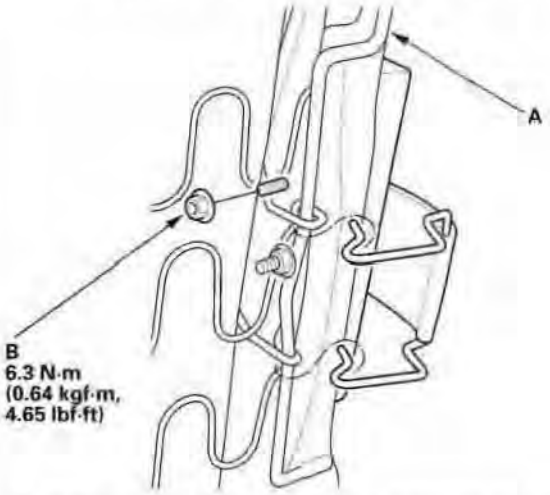
4. Remove the mounting nut (A) and the side airbag (B).



Installation

NOTE:
- If the side airbag lid is secured by a tape, remove the tape.
- Do not open the lid of the side airbag cover.
- Use new mounting nuts tightened to the specified torque.
- Make sure that the seat-back cover is installed properly. Improper installation may prevent proper deployment.
- Be sure to install the harness wires so they are not pinched or interfering with other parts.

1. Place the new side airbag on the seat-back frame (A). Tighten the side airbag mounting nut (B).



2. Install the seat-back cover in the reverse order of removal (see page 20-92).

3. Install the seat assembly (see page 20-86), then connect the side airbag harness 2P connector.

4. Move the front seat and the seat-back through their full range of movement, making sure the harness wires are not pinched or interfering with other parts.

5. Reconnect the battery negative cable.

6. After installing the side airbag, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Airbag Disposal

Special Tools Required
Deployment tool 07HAZ-SG00500

Before scrapping any airbags, side airbags, seat belt tensioners, or seat belt buckle tensioners (including those in a whole vehicle to be scrapped), they must be deployed. If the vehicle is still within the warranty period, the Honda District Parts and Service Manager must give approval and/or special instruction before deploying the airbags, side airbags, seat belt tensioners, or seat belt buckle tensioners. Only after the airbags, side airbags, seat belt tensioners, or seat belt buckle tensioners have been deployed (as the result of vehicle collision, for example), can they be scrapped.

If the airbags, side airbags, seat belt tensioners, and seat belt buckle tensioners appear intact (not deployed), treat them with extreme caution. Follow this procedure.

Deploying Airbags in the Vehicle

If an SRS equipped vehicle is to be entirely scrapped, its airbags, side airbags, seat belt tensioners, and seat belt buckle tensioners should be deployed while still in the vehicle. The airbags, side airbags, seat belt tensioners, and seat belt buckle tensioners should not be considered as salvageable parts and should never be installed in another vehicle.

1. Turn the ignition switch OFF, then disconnect the battery negative cable, and wait at least 3 minutes.
2. Confirm that each airbag, side airbag, seat belt buckle tensioners, or seat belt tensioner is securely mounted.
3. Confirm that the deployment tool is functioning properly by following the check procedure on the tool label.

Driver's Airbag

4. Remove the access panel from the steering wheel, then disconnect the driver's airbag 4P connector from the cable reel (see step 2 on page 23-18).

Front Passenger's Airbag

5. Lower the glove box, then disconnect the front passenger's airbag 4P connector from the dashboard wire harness (see step 3 on page 23-18).

Side Airbag

6. Disconnect the side airbag 2P connectors from the floor wire harness (see step 4 on page 23-18).

Seat Belt Tensioner

7. Disconnect the seat belt tensioner 2P connectors from the floor wire harness (see step 5 on page 23-19). Pull the seat belt out all the way, and cut it off.

Seat Belt Buckle Tensioner

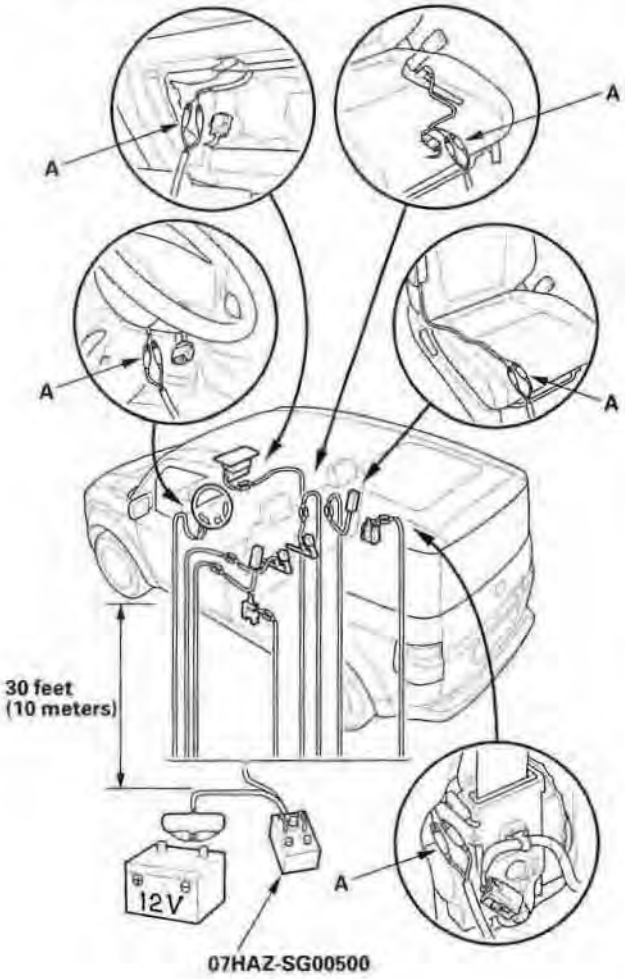
8. Disconnect the seat belt buckle tensioner 4P connectors from the floor wire harness (see step 6 on page 23-19).

(cont'd)

Airbag Disposal (cont'd)

9. Cut off each connector, strip the ends of the wires. Twist each pair of unlike colored wires together, and clip an alligator clip (A) to each pair. Place the deployment tool at least 30 feet (10 meters) away from the vehicle.

   NOTE: The driver's and the front passenger's airbags have four wires each, two yellow and two red. Twist each pair of unlike colored wires together, and connect an alligator clip to each pair.



10. Connect a 12 volt battery to the tool.

    - If the green light on the tool comes on, the igniter circuit is defective and cannot deploy the component. Go to Disposal of Damaged Components.
    - If the red light on the tool comes on, the component is ready to be deployed.

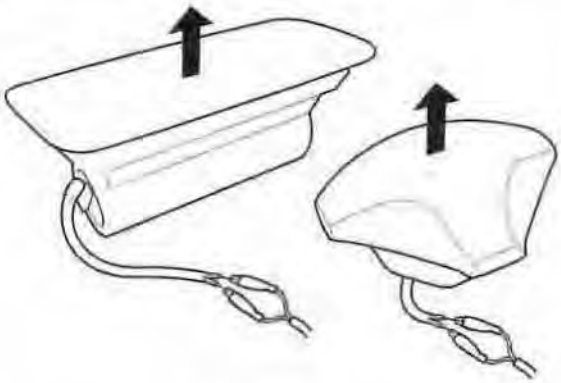
11. Push the tool's deployment switch. The airbags and tensioners should deploy (deployment is both highly audible and visible: a loud noise and rapid inflation of the bag, followed by slow deflation).

    - If the components deploy and the green light on the tool comes on, continue with this procedure.
    - If a component does not deploy, yet the green light comes on, its igniter is defective. Go to Disposal of Damaged Components.
    - During deployment, the airbags can become hot enough to burn you. Wait 30 minutes after deployment before touching the airbags.

12. Dispose of the complete airbag. No part of it can be reused. Place it in a sturdy plastic bag (A), and seal it securely. Dispose of the deployed airbag according to your local regulations.

Deploying Components Out of the Vehicle

If an intact airbag or tensioner has been removed from a scrapped vehicle, or has been found defective or damaged during transit, storage, or service, it should be deployed as follows:



1. Confirm that the deployment tool is functioning properly by following the check procedure on this page or on the tool label.
2. Position the airbag face up, outdoors, on flat ground, at least 30 feet (10 meters) from any obstacles or people.
3. Follow steps 9 through 12 of the Deploying Airbag in the Vehicle.

Disposal of Damaged Components

1. If installed in a vehicle, follow the removal procedure for the driver's airbag (see page 23-118), front passenger's airbag (see page 23-119), side airbag (see page 23-120), seat belt tensioner (see page 23-4), and seat belt buckle tensioner (see page 23-6).
2. In all cases, make a short circuit by cutting, stripping, and twisting together the like-colored inflator wires.

   NOTE: The driver's and passenger's airbag each have four wires: twist each pair of like-colored wires together.
3. Package the component in the same packaging that the new replacement part came in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED", "DAMAGED SIDE AIRBAG NOT DEPLOYED", "DAMAGED SEAT BELT TENSIONER NOT DEPLOYED" or "DAMAGED SEAT BELT BUCKLE TENSIONER NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your Honda District Parts and Service Manager for how and where to return the part for disposal.

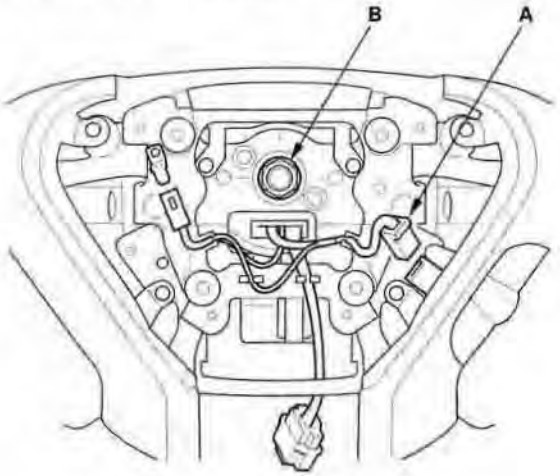
Deployment Tool Check

1. Connect the yellow clips to both switch protector handles on the tool; connect the tool to a battery.
2. Push the operation switch: green means the tool is OK; red means the tool is faulty.
3. Disconnect the yellow clips from the battery.

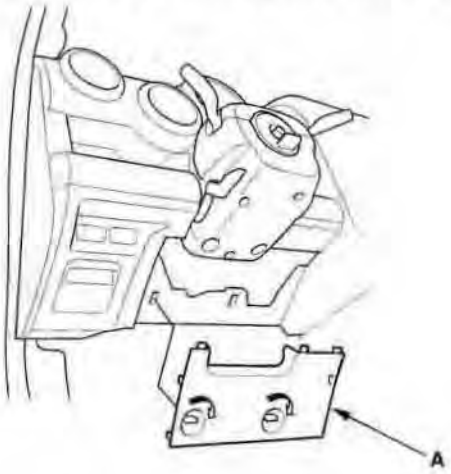
Cable Reel Replacement

Removal

1. Make sure the front wheels are aligned straight ahead.
2. Disconnect the battery negative cable, and wait at least 3 minutes.
3. Remove the driver's airbag (see page 23-118).
4. Disconnect the connector (A) from the cruise control set/resume switch, then remove the steering wheel bolt (B).



5. With the front wheels still straight ahead, remove the steering wheel with a steering wheel puller (see step 5 on page 17-22).
   Do not tap on the steering wheel or steering column shaft when removing the steering wheel.
6. Remove the driver's dashboard lower cover (A).



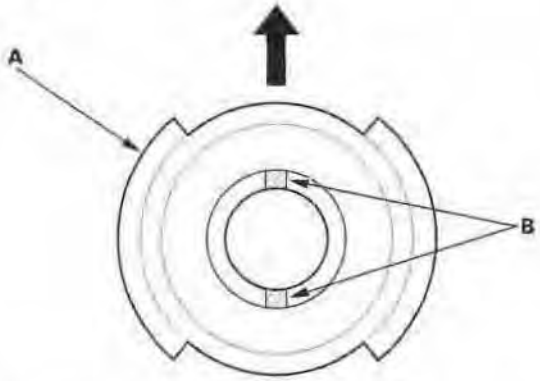
7. Remove the steering column cover screws (A), then remove the steering column covers (B, C).

8. Disconnect the dashboard wire harness B 5P connector (A) from the cable reel, then disconnect the dashboard wire harness B 4P connector (B) from the cable reel.

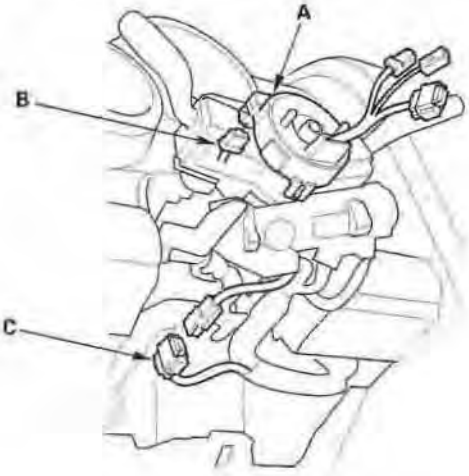
9. Release the lock tab (A) under the cable reel connector with a 90 ° hook shaped tool (B). Slide the tool below the cable reel connector just above the lock tab. Release the lower lock tab (C), and slide the cable reel off the column.

Installation

1. Before installing the steering wheel, align the front wheels straight ahead.
2. If not already done, disconnect the battery negative cable, and wait at least 3 minutes.
3. Set the cancel sleeve (A) so the projections (B) are aligned vertically.



4. Carefully install the cable reel (A) on the steering column shaft. Then connect the 5P connector (B) and the 4P connector (C).



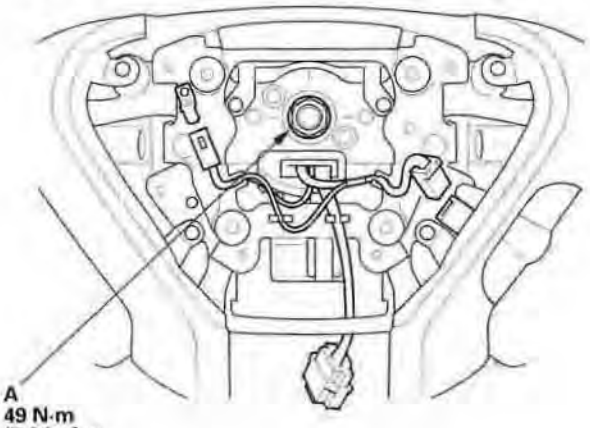
(cont'd)

Cable Reel Replacement (cont'd)

5. Install the steering column covers.

6. If necessary, center the cable reel. (New replacement cable reels come centered.) Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise about two and a half turns until the arrow mark on the cable reel label points straight up.

7. Align the projections on the cable reel with the holes on the steering wheel, and install the steering wheel with a new steering wheel bolt (A).



A
49 N·m (5.0 kgf·m, 36 lbf·ft)

8. Install the driver's airbag (see page 23-118).

9. Reconnect the battery negative cable.

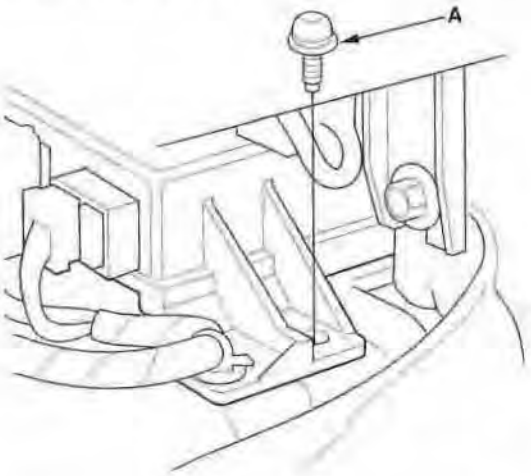
10. After installing the cable reel, confirm proper system operation:

    - Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
    - After the SRS indicator has turned off, turn the steering wheel fully left and right to confirm the SRS indicator does not come on.
    - Make sure the horn works.
    - Make sure the cruise control works.

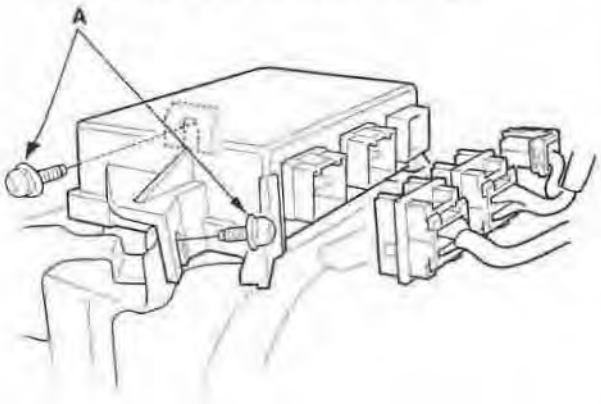
SRS Unit Replacement

Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the driver's and front passenger's airbag connectors (see page 23-18).
3. Disconnect the side airbag connectors (see page 23-18).
4. Disconnect both seat belt tensioner connectors (see page 23-19) and both seat belt buckle tensioner connectors (see page 23-19).
5. Remove the dashboard center lower cover (see page 20-76).
6. Pull down the carpet, then remove the Torx bolt (A) from the SRS unit.



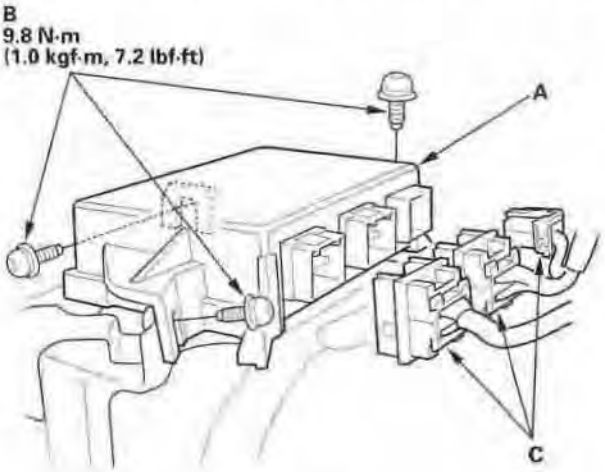
7. Disconnect the connectors and remove the two Torx bolts (A), then pull out the SRS unit.



Installation

1. Install the new SRS unit (A) with Torx bolts (B), then connect the connectors (C) to the SRS unit; push them into position until they click.

   NOTE: Be sure the SRS unit is sitting squarely against its bracket before torquing the Torx bolts.

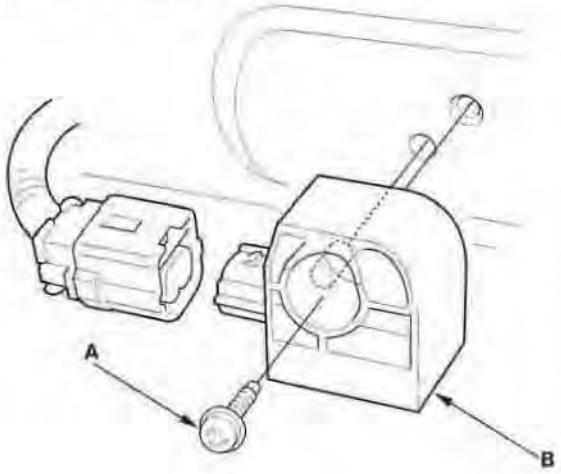


2. Reinstall the dashboard center lower cover (see page 20-76).
3. Reconnect the driver's and front passenger's airbag connectors (see page 23-18).
4. Reconnect the side airbag connectors (see page 23-18).
5. Reconnect both seat belt tensioner connectors (see page 23-19) and both seat belt buckle tensioner connectors (see page 23-19).
6. Reconnect the battery negative cable.
7. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Side Impact Sensor Replacement

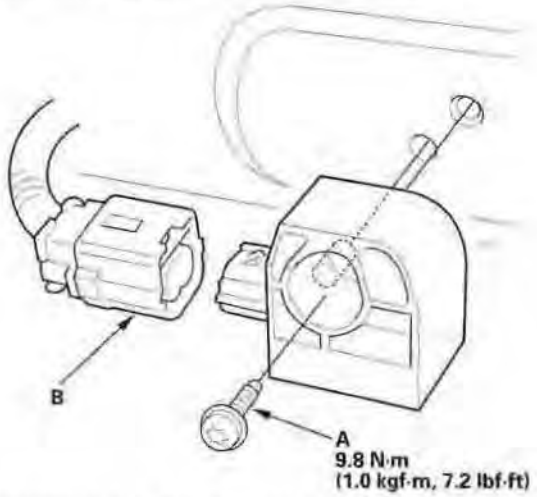
Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the appropriate side airbag 2P connector (see step 4 on page 23-18).
3. Remove the seat assembly (see page 20-86).
4. Remove the door sill trim (see page 20-58).
5. Disconnect the floor wire harness 2P connector from the side impact sensor.
6. Using a Torx T30 bit, remove the Torx bolt (A), then remove the side impact sensor (B).



Installation

1. Install the new side impact sensor with the Torx bolt (A), then connect the floor wire harness 2P connector (B) to the side impact sensor.

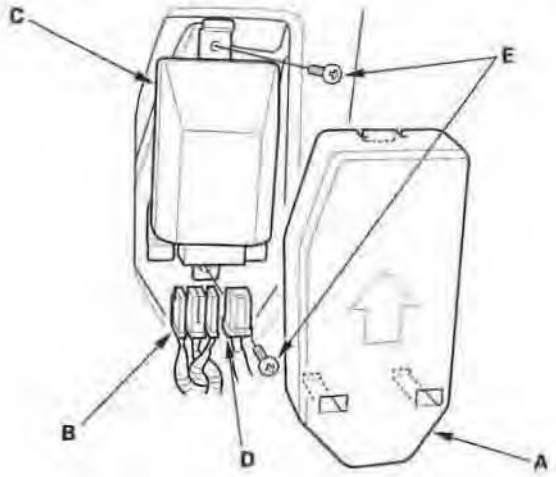


2. Reconnect the battery negative cable.
3. After installing the side impact sensor, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.
4. Install all removed parts.

OPDS Unit Replacement

Removal

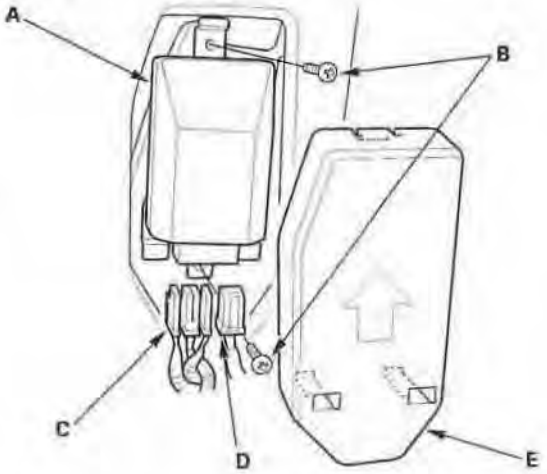
1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the passenger's side airbag harness 2P connector (see step 4 on page 23-18).
3. Remove the front passenger's seat assembly (see page 20-86) and seat-back cover (see page 20-92).
4. Remove the cover (A), then disconnect the OPDS unit harness 8P connector D and sensor connectors (B) from the OPDS unit (C).



5. Remove the two screws (E) and the OPDS unit.

Installation

1. Place the new OPDS unit (A) on the front passenger's seat-back frame. Tighten the two screws (B), and connect the OPDS unit harness 8P connector D and sensor connectors (C) to the OPDS unit. Reinstall the cover (E).

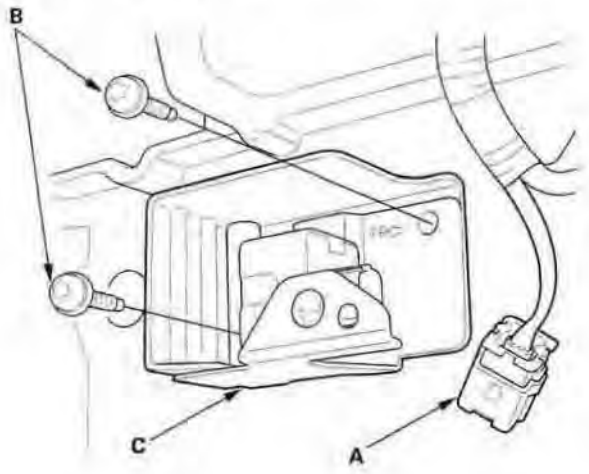


2. Install the seat-back cover in the reverse order of removal (see page 20-92).
3. Install the seat assembly (see page 20-86), then connect the side airbag harness 2P connector.
4. Reconnect the battery negative cable.
5. Set the seat-back in a normal position, and make sure there is nothing on the seat.
6. Initialize the OPDS unit (see page 23-24).
7. After installing the OPDS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Front Impact Sensor Replacement

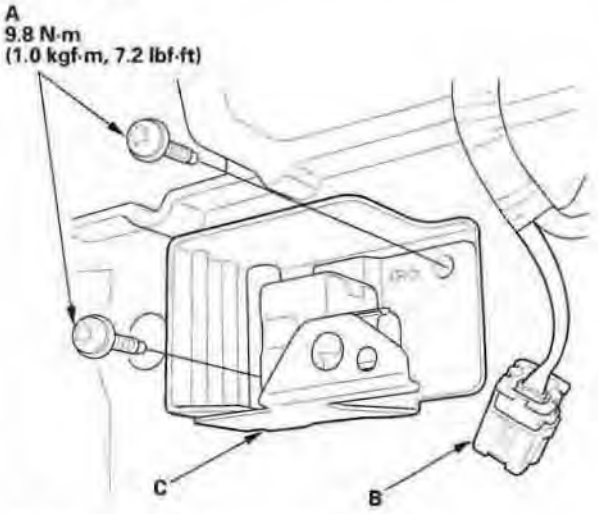
Removal

1. Disconnect the battery negative cable, and wait at least 3 minutes before beginning work.
2. Disconnect the driver's airbag 4P connector (see step 2 on page 23-18), the front passenger's airbag 4P connector (see step 3 on page 23-18), both seat belt tensioner 2P connectors (see step 5 on page 23-19), and both seat belt buckle 4P connectors (see step 6 on page 23-19).
3. Remove the front inner fender (see page 20-138).
4. Disconnect the engine compartment wire harness 2P connector (A), and using a Torx T30 bit, remove the two Torx bolts (B), then remove the front impact sensor (C).



Installation

1. Install the new front impact sensor with new Torx bolts (A), then connect the engine compartment wire harness 2P connector (B) to the front impact sensor (C).



2. Reconnect the battery negative cable.
3. After installing the front impact sensor, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator should come on for about 6 seconds and then go off.

Service Manual Index

NOTE: Refer to the following list to look up DTCs, symptoms, fuses, connectors, wire harnesses, specifications, maintenance schedules, and general service information:

A

(cont'd)

Service Manual Index

(cont'd)

D

(cont'd)

Service Manual Index

(cont'd)

(cont'd)

Service Manual Index

(cont'd)

(cont'd)

Service Manual Index

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