General Information

Chassis and Paint Codes

Vehicle Identification Number

2HH MB45 4 * V H 900001

Manufacturer, Make and Type of Vehicle
- 2HH: HONDA OF CANADA MFG., INC. ACURA Passenger car

Line, Body and Engine Type
- MB4: 1.6EL/D16Y8

Body Type and Transmission Type
- 5: Sedan/5-speed Manual
- 6: Sedan/4-speed Automatic

Vehicle Grade
- 4: Standard
- 5: Standard with ABS
- 6: Sport
- 7: Premium

Check Digit

Model Year
- V: 1997

Factory Code
- H: Alliston Plant, Ontario, Canada

Serial Number

Engine Number

D16Y8 - 2750001

Engine Type
- D16Y8: 1.6 ℓ SOHC VTEC 16-valves Sequential Multiport Fuel-injected Engine

Serial Number

Transmission Number

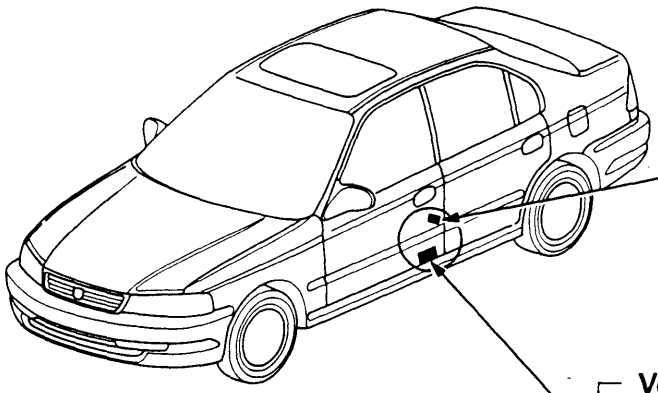
APBA - 1000001

Transmission Type
- APBA: 4-speed Automatic Transmission
- S40 : 5-speed Manual Transmission

Serial Number
- APBA: 1000001~
- S40 : 1000001~

Paint Code

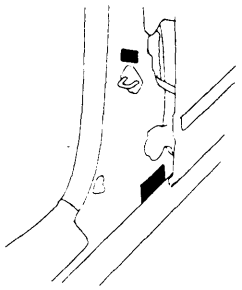
Paint Code	Color
B-73M	Cyclone Blue Metallic
G-82P	Cypress Green Pearl
NH-503P	Granada Black Pearl
R-97	Roma Red
RP-27M	Primrose Mist Metallic



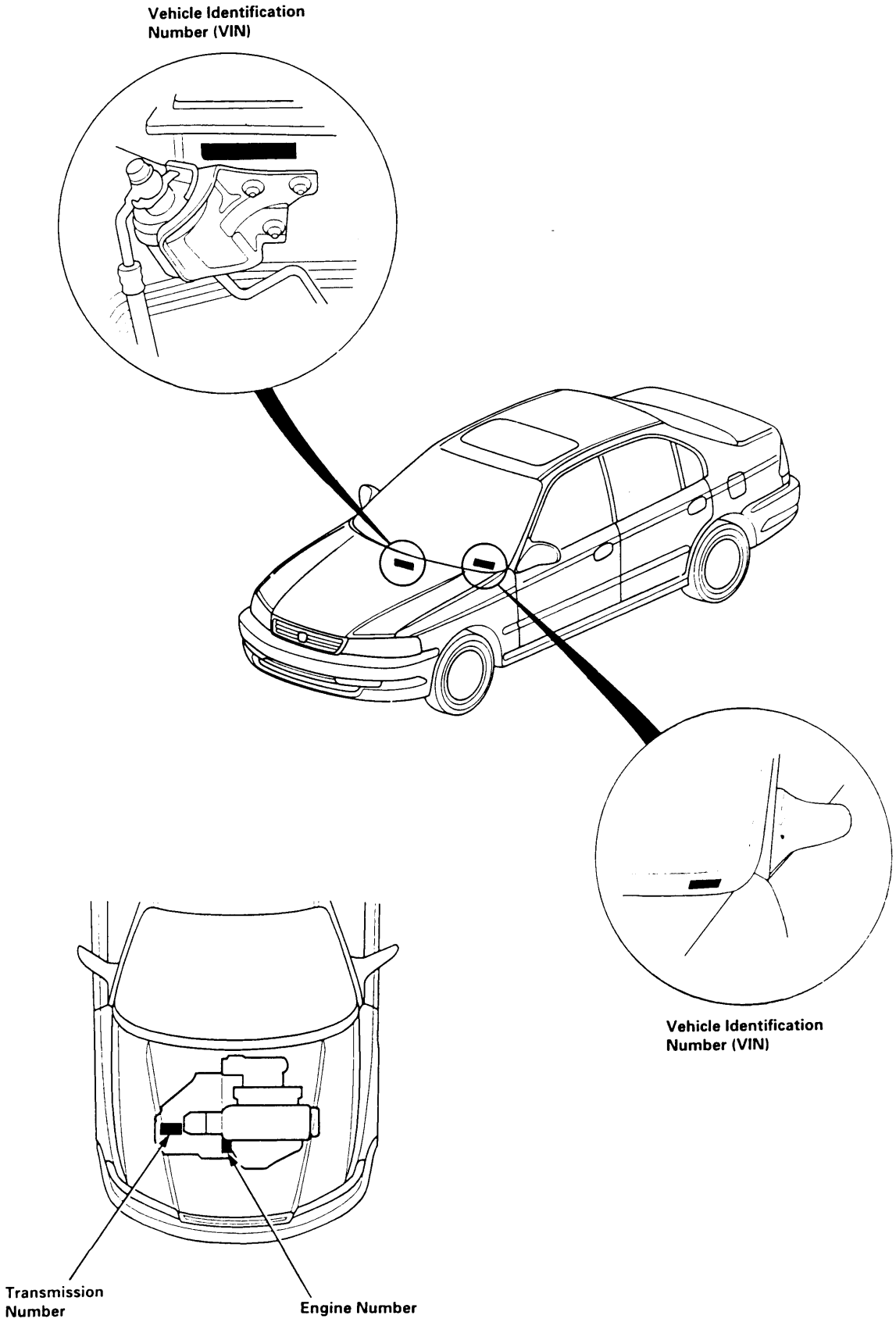
Paint Code

COLOR
B-73M

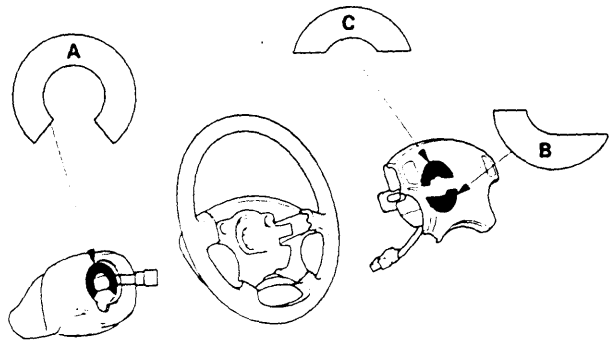
Vehicle Identification Number and Canadian Motor Vehicle Safety Standard Certification



Identification Number Locations



Warning/Caution Label Locations



A: CABLE REEL CAUTION

SRS
INSTALLATION OF THE SRS CABLE REEL IS CRITICAL TO THE PROPER OPERATION OF THE SRS AIRBAG SYSTEM. REFER TO SERVICE MANUAL FOR DETAILED INSTALLATION INSTRUCTIONS.

B: DRIVER MODULE WARNING

⚠ WARNING
THE AIRBAG INFLATOR IS EXPLOSIVE AND IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT OR KILL YOU.
- DO NOT USE ELECTRICAL TEST EQUIPMENT OR PROBING DEVICES.
  THEY CAN CAUSE ACCIDENTAL DEPLOYMENT.
- NO SERVICEABLE PARTS INSIDE. DO NOT DISASSEMBLE.
- PLACE AIRBAG UPRIGHT WHEN REMOVED.
- FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

C: DRIVER MODULE DANGER

⚠ DANGER
EXPLOSIVE/FLAMMABLE
CONTACT WITH ACID, WATER OR HEAVY METALS SUCH AS COPPER. LEAD OR MERCURY MAY PRODUCE HARMFUL AND IRRITATING GASES OR EXPLOSIVE COMPOUNDS. STORAGE TEMPERATURES MUST NOT EXCEED 200°F (100°C). FOR PROPER HANDLING, STORAGE AND DISPOSAL PROCEDURES REFER TO SERVICE MANUAL, SRS SUPPLEMENT.
POISON
CONTAINS POISONOUS SODIUM AZIDE AND POTASSIUM NITRATE.
FIRST AID:
IF CONTENTS ARE SWALLOWED, INDUCE VOMITING. FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES. IF GASES (FROM ACID OR WATER CONTACT) ARE INHALED, SEEK FRESH AIR. IN EVERY CASE, GET PROMPT MEDICAL ATTENTION.
KEEP OUT OF REACH OF CHILDREN.

D: DRIVER INFORMATION: (SUNVISOR)

SRS
AIRBAG ALWAYS WEAR YOUR SEAT BELT
- THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AND A FRONT SEAT PASSENGER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS).
- IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.
- BEFORE DRIVING, READ LABEL INSIDE THE GLOVE BOX.

E: SRS WARNING (HOOD)

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)
THIS VEHICLE IS EQUIPPED WITH DRIVER AND FRONT SEAT PASSENGER AIRBAGS.
ALL SRS ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW.
TAMPERING WITH, DISCONNECTING OR USING ELECTRICAL TEST EQUIPMENT ON THE SRS WIRING CAN MAKE THE SYSTEM INOPERATIVE OR CAUSE ACCIDENTAL FIRING OF THE INFLATOR.

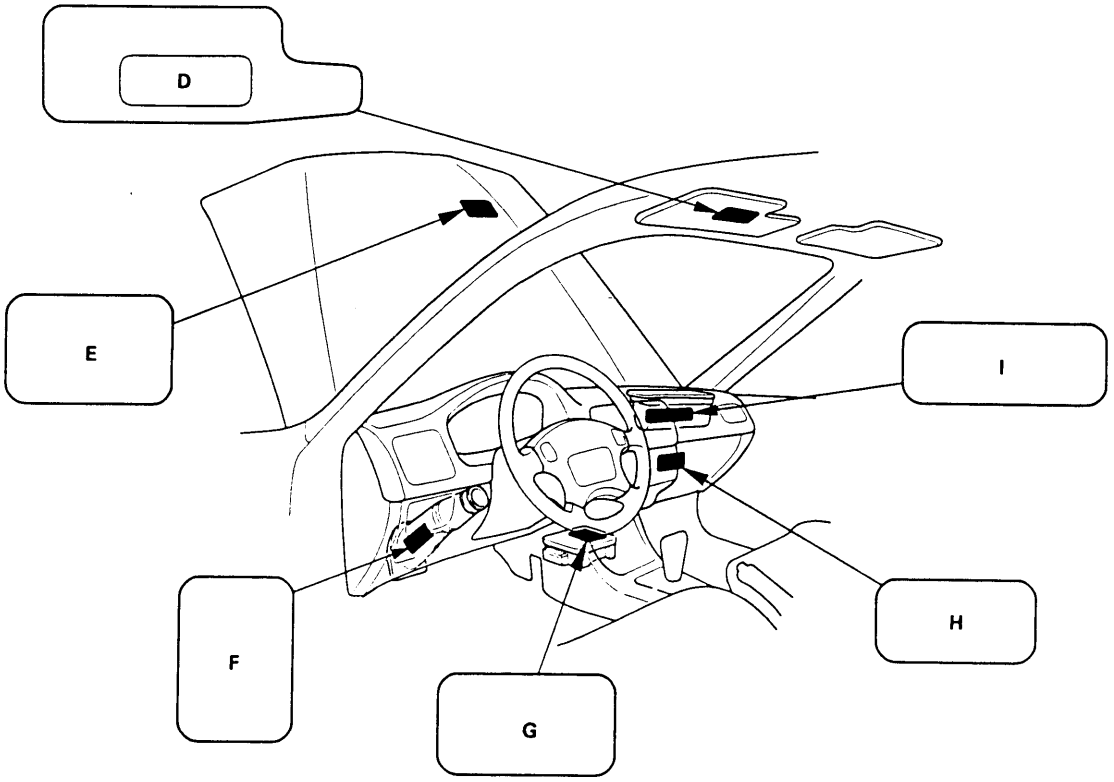
⚠ WARNING
THE AIRBAG INFLATOR IS EXPLOSIVE AND, IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT YOU. FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

F: STEERING COLUMN NOTICE

NOTICE
TO PREVENT SRS DAMAGE, REMOVE STEERING WHEEL BEFORE REMOVING STEERING SHAFT CONNECTING BOLT.

G: MONITOR CAUTION

NOTICE SRS
- NO SERVICEABLE PARTS INSIDE.
- REFER TO SERVICE MANUAL FOR DETAILED INSTRUCTIONS.



H: SRS INFORMATION LABEL (GLOVE BOX)

AIRBAG INFORMATION
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

- THE SRS MUST BE INSPECTED TEN YEARS AFTER IT IS INSTALLED. THE DATE OF INSTALLATION IS SHOWN ON THE CERTIFICATION PLATE, LOCATED ON THE DRIVER'S DOORJAMB.
- DIAGNOSTIC CHECKS AND REPLACEMENT OF SRS COMPONENTS MUST BE DONE BY AN AUTHORIZED DEALER.
- SEE YOUR OWNER'S MANUAL FOR ADDITIONAL SRS INFORMATION.

I: FRONT SEAT PASSENGER MODULE DANGER

⚠ DANGER
EXPLOSIVE/FLAMMABLE
CONTACT WITH ACID, WATER OR HEAVY METALS SUCH AS COPPER, LEAD OR MERCURY MAY PRODUCE HARMFUL AND IRRITATING GASES OR EXPLOSIVE COMPOUNDS. STORAGE TEMPERATURES MUST NOT EXCEED 200°F (100°C). FOR PROPER HANDLING, STORAGE AND DISPOSAL PROCEDURES REFER TO SERVICE MANUAL, SRS SUPPLEMENT.
POISON
CONTAINS POISONOUS SODIUM AZIDE AND POTASSIUM NITRATE.
FIRST AID
IF CONTENTS ARE SWALLOWED, INDUCE VOMITING. FOR EYE CONTACT, FLUSH EYES WITH WATER FOR 15 MINUTES. IF GASES (FROM ACID OR WATER CONTACT) ARE INHALED, SEEK FRESH AIR IN EVERY CASE, GET PROMPT MEDICAL ATTENTION.
KEEP OUT OF REACH OF CHILDREN.

⚠ WARNING
THE AIRBAG INFLATOR IS EXPLOSIVE AND, IF ACCIDENTALLY DEPLOYED, CAN SERIOUSLY HURT OR KILL YOU.

- DO NOT USE ELECTRICAL TEST EQUIPMENT OR PROBING DEVICES.
  THEY CAN CAUSE ACCIDENTAL DEPLOYMENT.
- NO SERVICEABLE PARTS INSIDE. DO NOT DISASSEMBLE.
- PLACE AIRBAG UPRIGHT WHEN REMOVED.
- FOLLOW SERVICE MANUAL INSTRUCTIONS CAREFULLY.

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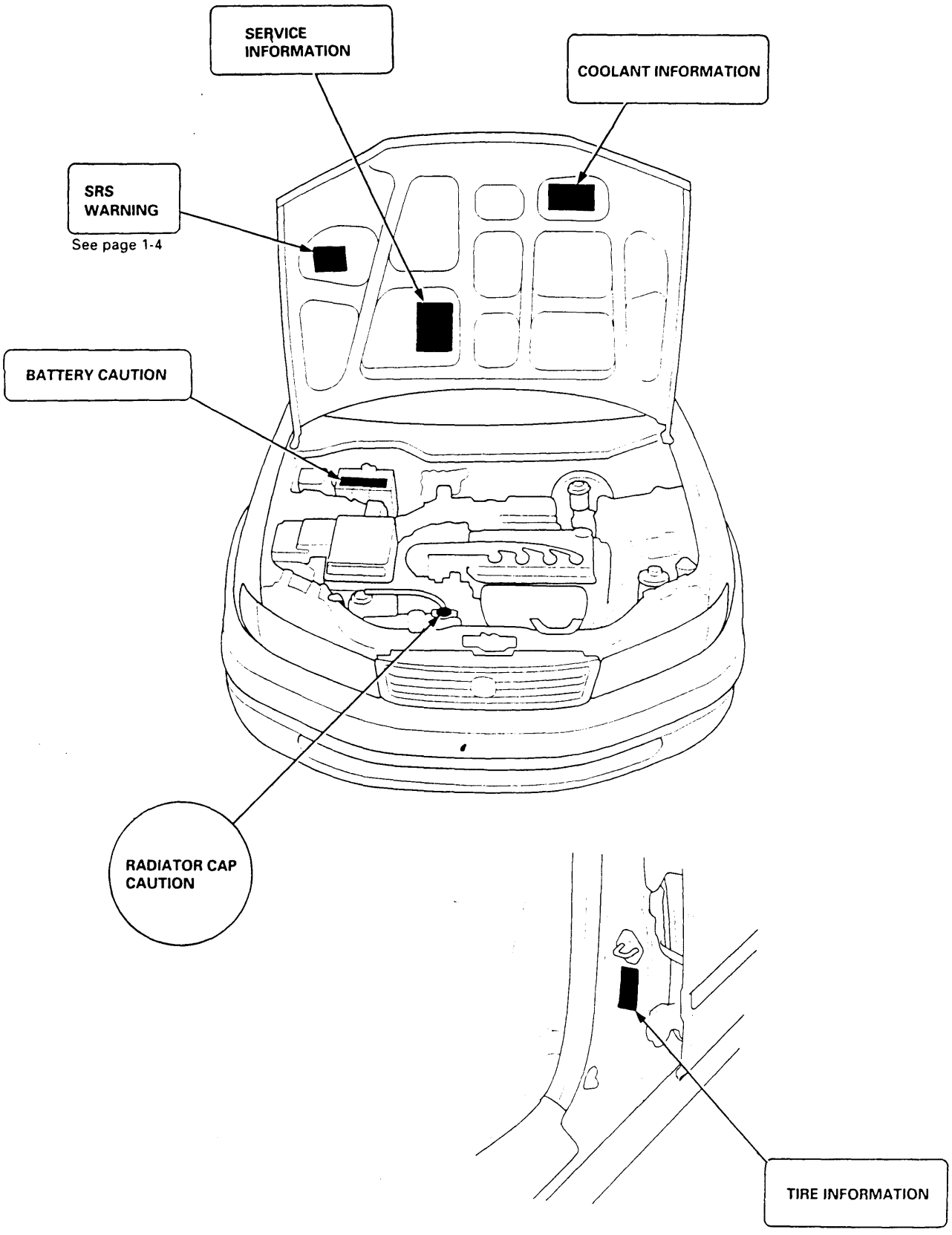
Warning/Caution Label Locations

(cont'd)



Lift and Support Points

Lift and Safety Stands

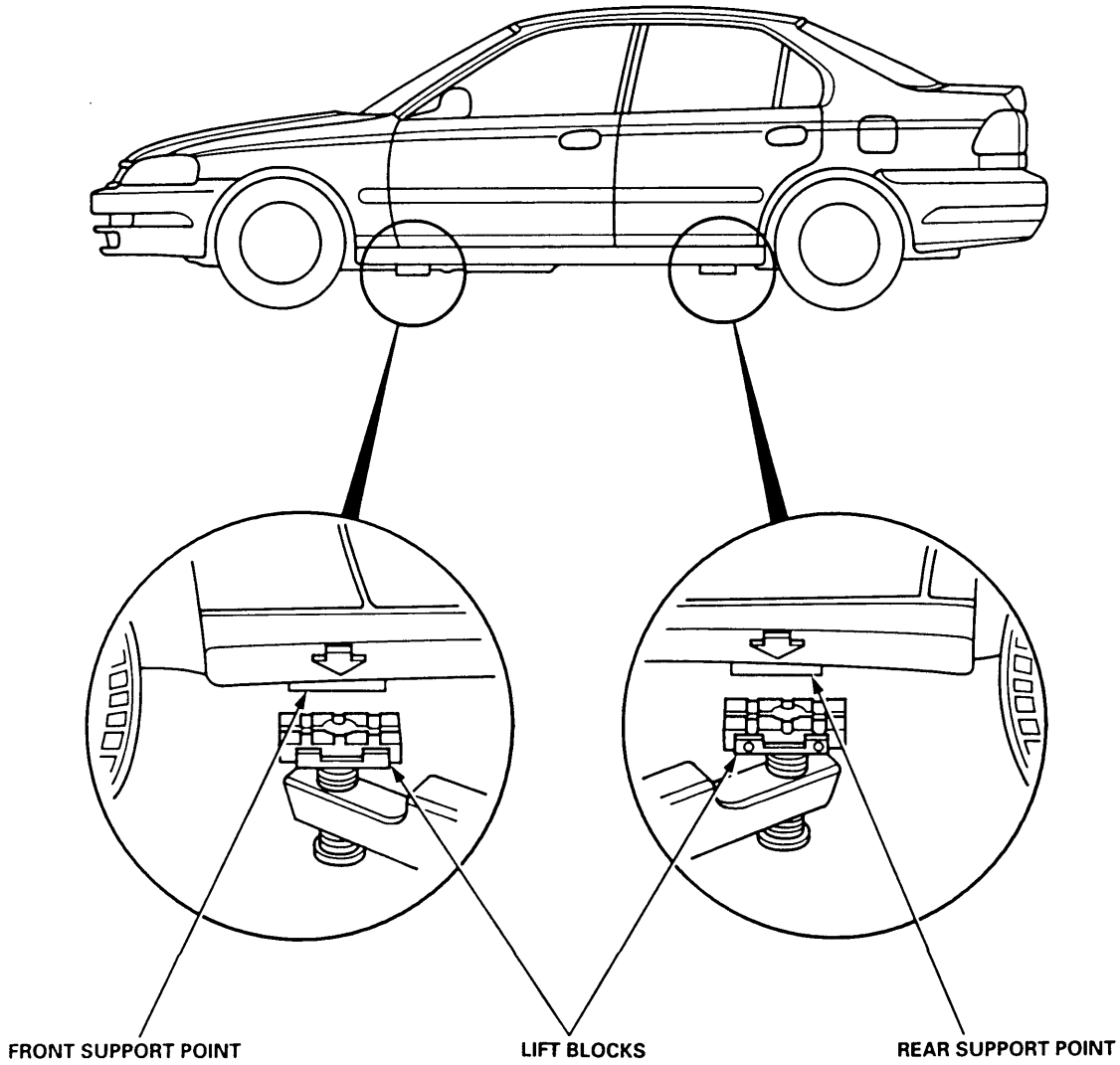
⚠WARNING When heavy rear components such as suspension, fuel tank, spare tire, and trunk lid are to be removed, place additional weight in the luggage area before hoisting. When substantial weight is removed from the rear of the vehicle, the center of gravity may change and can cause the vehicle to tip forward on the hoist.

NOTE:
- Since each tire/wheel assembly weighs approximately 30 lbs (14 kg), placing the front wheels in the luggage area can assist with the weight distribution.
- Use the same support points to support the vehicle on safety stands.

1. Place the lift blocks as shown.

2. Raise the hoist a few inches (centimeters) and rock the vehicle to be sure it is firmly supported.

3. Raise the hoist to full height and inspect lift points for solid support.



Lift and Support Points

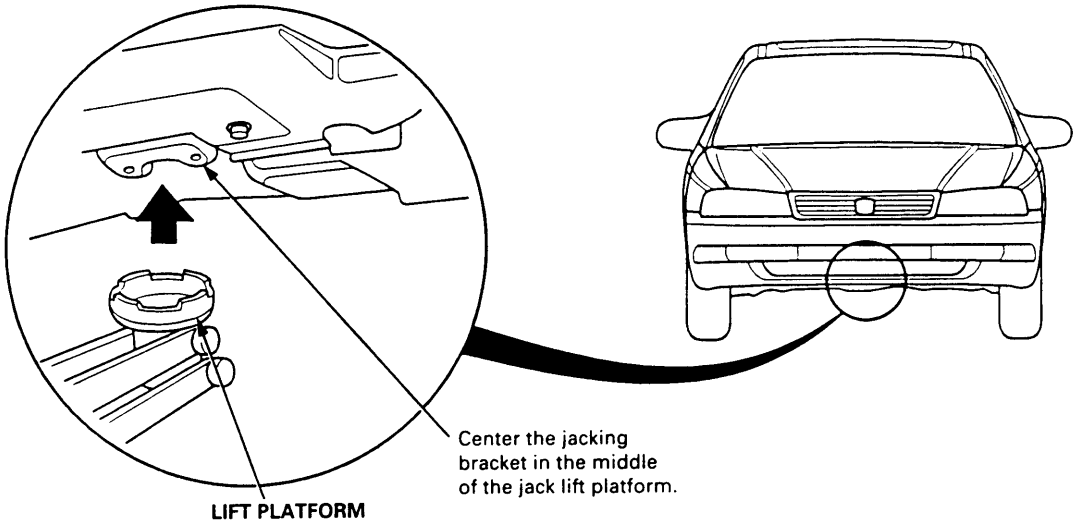
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the vehicle, put the gearshift lever in reverse (Automatic transmission in [P] position).
3. Raise the vehicle high enough to insert the safety stands.
4. Adjust and place the safety stands so the vehicle will be approximately level, then lower the vehicle onto them.

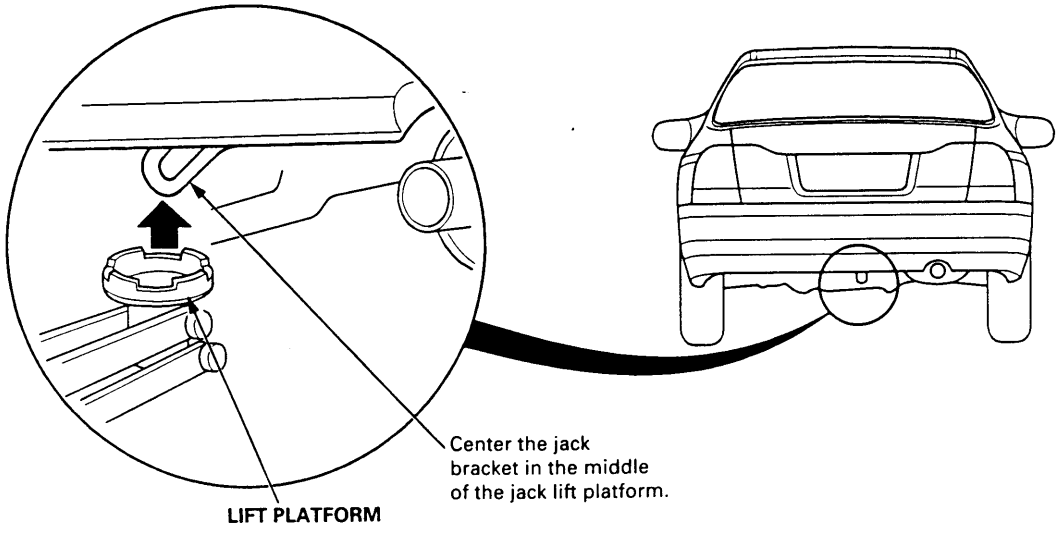
⚠ WARNING

- **Always use safety stands when working on or under any vehicle that is supported by only a jack.**
- **Never attempt to use a bumper jack for lifting or supporting the vehicle.**

FRONT:



REAR:



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 of transporting the vehicle.

Wheel Lift Equipment — The tow truck uses two pivoting arms that go under the tires (front or rear) and lifts them off the ground. The other two wheels remain on the ground.

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.

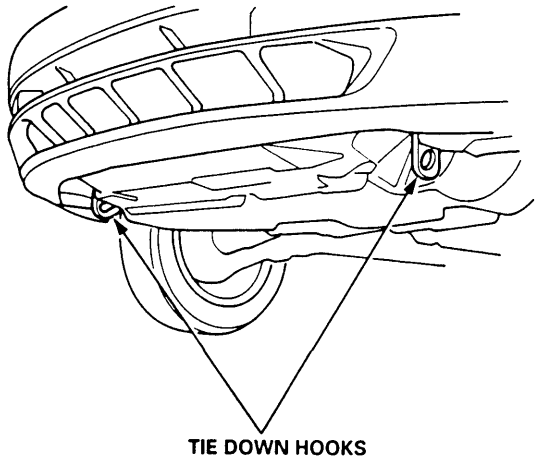
If the vehicle cannot be transported by flat-bed, it should be towed with the front wheels off the ground. If due to damage, the vehicle must be towed with the front wheels on the ground, do the following:

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

Automatic Transmission
- Release the parking brake.
- Start the engine.
- Shift to D4 position, then N position.
- Turn off the engine.

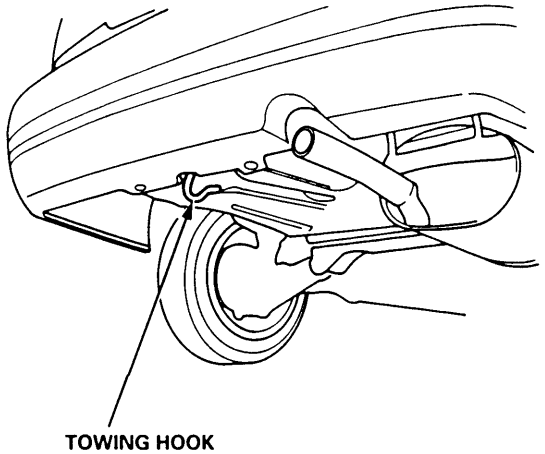
CAUTION:
- **Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), your vehicle must be transported on a flat-bed.**
- **It is best to tow the vehicle no farther than 50 miles (80 km), and keep the speed below 35 mph (55 km/h).**
- **Trying to lift or tow your vehicle by the bumpers will cause serious damage. The bumpers are not designed to support the vehicle's weight.**

Front:



TIE DOWN HOOKS

Rear:



TOWING HOOK

Specifications

Standards and Service Limits

Engine Electrical — Section 4

	MEASUREMENT	STANDARD (NEW)	
Ignition coil	Rated voltage V Primary winding resistance at 68°F (20°C) Ω Secondary winding resistance at 68°F (20°C) kΩ	12 0.63 – 0.77 12.8 – 19.2	
Ignition wire	Resistance at 68°F (20°C) kΩ	25 max.	
Spark plug	Type Gap	See section 4 1.0 – 1.1 (0.043 $^{0}_{-0.004}$)	
Ignition timing	At idle ° BTDC (Red)	12° ± 2°	
Alternator belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	8.0 – 10.5 (0.31 – 0.41) with used belt 6.0 – 8.5 (0.24 – 0.33) with new belt	
	Belt tension N (kgf, lbf) Measured with belt tension gauge	340 – 490 (35 – 50, 77 – 110) with used belt 540 – 740 (55 – 75, 121 – 165) with new belt	
		STANDARD (NEW)	**SERVICE LIMIT**
Alternator (MITSUBISHI)	Output 12 V at hot A Coil resistance (rotor) at 68°F (20°C) kΩ Slip ring O.D. Brush length Brush spring tension g (oz)	75 3.4 – 3.8 22.7 (0.89) 19.0 (0.75) 300 – 450 (10.6 – 15.9)	—— 22.2 (0.87) 5.0 (0.20) ——
Starter motor (MITSUBA 1.0 kW 1.2 kW)	Type Commutator mica depth Commutator runout Commutator O.D. Brush length Brush spring tension (new) N (kgf, lbf)	Gear reduction 0.4 – 0.5 (0.016 – 0.020) 0 – 0.02 (0 – 0.0008) 28.0 – 28.1 (1.102 – 1.106) 15.8 – 16.2 (0.62 – 0.64) 15.7 – 17.7 (1.60 – 1.80, 3.5 – 4.0)	 0.15 (0.006) 0.05 (0.002) 27.5 (1.083) 11.0 (0.43) ——

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Cylinder Head/Valve Train — Section 6

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Compression	250 rpm and wide open throttle kPa (kgf/cm², psi) Nominal Minimum Maximum variation		 1,270 (13.0, 184) 930 (9.5, 135) 200 (2.0, 28)	
Cylinder head	Warpage Height		—— 92.95 – 93.05 (3.659 – 3.663)	0.05 (0.002) ——
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe height	 IN Primary Mid Secondary EX	0.05 – 0.15 (0.002 – 0.006) 0.050 – 0.089 (0.002 – 0.004) 0.03 (0.001) max. 37.065 (1.4592) 38.274 (1.5068) 36.778 (1.4479) 38.008 (1.4964)	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) —— —— —— ——
Valve	Valve clearance (Cold)	IN EX	0.18 – 0.22 (0.007 – 0.009) 0.23 – 0.27 (0.009 – 0.011)	—— ——
	Valve stem O.D.	IN EX	5.48 – 5.49 (0.2157 – 0.2161) 5.45 – 5.46 (0.2146 – 0.2150)	5.45 (0.2146) 5.42 (0.2134)
	Stem-to-guide clearance	IN EX	0.02 – 0.05 (0.001 – 0.002) 0.05 – 0.08 (0.002 – 0.003)	0.08 (0.003) 0.11 (0.004)
Valve seat	Width	IN EX	0.85 – 1.15 (0.033 – 0.045) 1.25 – 1.55 (0.049 – 0.061)	1.6 (0.063) 2.0 (0.079)
	Stem installed height	IN EX	53.17 – 53.64 (2.093 – 2.112) 53.17 – 53.64 (2.093 – 2.112)	53.89 (2.122) 53.89 (2.122)
Valve spring	Free length	IN EX	58.0 (2.28) 58.7 (2.31)	—— ——
Valve guide	I.D.	IN EX	5.51 – 5.53 (0.217 – 0.218) 5.51 – 5.53 (0.217 – 0.218)	5.55 (0.219) 5.55 (0.219)
	Installed height	IN EX	17.85 – 18.35 (0.703 – 0.722) 18.65 – 19.15 (0.734 – 0.754)	—— ——
Rocker arm	Arm-to-shaft clearance	IN EX	0.017 – 0.050 (0.0007 – 0.0020) 0.018 – 0.054 (0.0007 – 0.0021)	0.08 (0.003) 0.08 (0.003)

Unit of length: mm (in)

Engine Block — Section 7

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Cylinder block	Warpage of deck surface		0.07 (0.003) max.	0.10 (0.004)
	Bore diameter		75.00 – 75.02 (2.953 – 2.954)	75.07 (2.956)
	Bore taper		———	0.05 (0.002)
	Reboring limit		———	0.5 (0.02)
Piston	Skirt O.D. at 5 mm (0.2 in) from bottom of skirt		74.980 – 74.990 (2.9520 – 2.9524)	74.970 (2.9516)
	Clearance in cylinder		0.010 – 0.040 (0.0004 – 0.0016)	0.05 (0.002)
	Groove width (for ring)	Top	1.020 – 1.030 (0.0402 – 0.0406)	1.05 (0.041)
		Second	1.220 – 1.230 (0.0480 – 0.0484)	1.25 (0.049)
		Oil	2.805 – 2.820 (0.1104 – 0.1110)	2.85 (0.112)
Piston ring	Ring-to-groove clearance	Top	0.035 – 0.060 (0.0014 – 0.0024)	0.13 (0.005)
		Second	0.030 – 0.055 (0.0012 – 0.0022)	0.13 (0.005)
	Ring end gap	Top	0.15 – 0.30 (0.006 – 0.012)	0.60 (0.024)
		Second	0.30 – 0.45 (0.012 – 0.018)	0.70 (0.028)
		Oil	0.20 – 0.70 (0.008 – 0.028)	0.80 (0.031)
Piston pin	O.D.		18.994 – 19.000 (0.7478 – 0.7480)	———
	Pin-to-piston clearance		0.010 – 0.022 (0.0004 – 0.0009)	———
Connecting rod	Pin-to-rod interference		0.014 – 0.040 (0.0006 – 0.0016)	———
	Small end bore diameter		18.96 – 18.98 (0.746 – 0.747)	———
	Large end bore diameter Nominal		48.0 (1.89)	———
	End play installed on crankshaft		0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter		54.976 – 55.000 (2.1644 – 2.1654)	———
	Rod journal diameter		44.976 – 45.000 (1.7707 – 1.7717)	———
	Taper		0.0025 (0.0001) max.	0.005 (0.0002)
	Out-of-round		0.0025 (0.0001) max.	0.005 (0.0002)
	End play		0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)
	Total runout		0.03 (0.001) max.	0.04 (0.002)
Bearings	Main bearing-to-journal oil clearance			
		No. 1 and 5 journals	0.018 – 0.036 (0.0007 – 0.0014)	0.05 (0.002)
		No. 2, 3 and 4 journals	0.024 – 0.042 (0.0009 – 0.0017)	0.05 (0.002)
	Rod bearing-to-journal oil clearance		0.020 – 0.038 (0.0008 – 0.0015)	0.05 (0.002)

Engine Lubrication — Section 8

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US qt, Imp qt)	4.0 (4.2, 3.5) for engine overhaul 3.6 (3.8, 3.2) for oil change, including filter 3.3 (3.5, 2.9) for oil change, without filter	
Oil pump	Inner-to-outer rotor radial clearance	0.02 – 0.14 (0.001 – 0.006)	0.20 (0.008)
	Pump housing-to-outer rotor radial clearance	0.10 – 0.18 (0.004 – 0.007)	0.20 (0.008)
	Pump housing-to rotor axial clearance	0.03 – 0.08 (0.001 – 0.003)	0.15 (0.006)
Relief valve	Pressure setting with oil temperature 176°F (80°C) kPa (kgf/cm², psi) at idle	70 (0.7, 10) min.	
	at 3,000 rpm	340 (3.5, 50) min.	

Standards and Service Limits

Cooling — Section 10

	MEASUREMENT		STANDARD (NEW)
Radiator	Engine coolant capacity ℓ (US qt, Imp qt) including engine, heater, cooling line and reservoir Reservoir capacity: 0.4 ℓ (0.42 US qt, 0.35 Imp qt)	M/T A/T	4.2 (4.4, 3.7) for overhaul 3.8 (4.0, 3.3) for coolant change 4.3 (4.5, 3.8) for overhaul 3.9 (4.1, 3.4) for coolant change
Radiator cap	Opening pressure kPa (kgf/cm², psi)		93 – 123 (0.95 – 1.25, 13.5 – 17.8)
Thermostat	Start to opening °F (°C) Fully open °F (°C) Valve lift at fully open		169 – 176 (76 – 80) 194 (90) 8.0 (0.31) min.
Cooling fan	Thermoswitch "ON" temperature Thermoswitch "OFF" temperature	°F (°C) °F (°C)	196 – 203 (91 – 95) Subtract 5 – 15 (3 – 8) from actual "ON" temperature

Fuel and Emission — Section 11

	MEASUREMENT	STANDARD (NEW)	
Fuel pressure regulator	Pressure with fuel pressure regulator vacuum hose disconnected kPa (kgf/cm², psi)	260 – 310 (2.7 – 3.2, 38 – 46)	
Fuel tank	Capacity ℓ (US gal, Imp gal)	45 (11.9, 9.9)	
Engine	Idle speed rpm	M/T (neutral)	A/T (N or P position)
		750 ± 50	750 ± 50
	Idle CO %	0.1 max.	

Clutch — Section 12

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Pedal height Stroke Pedal play Disengagement height	to floor to floor to carpet	165 (6 1/2) 130 – 140 (5.12 – 5.51) 12 – 21 (0.47 – 0.83) 83 (3.27) 44 (1.73) min. Reference	—— —— —— —— ——
Flywheel	Clutch surface runout		0.05 (0.002) max.	0.15 (0.006)
Clutch disc	Rivet head depth Thickness		1.3 – 1.9 (0.05 – 0.07) 8.5 – 9.1 (0.33 – 0.36)	0.2 (0.01) 5.5 (0.22)
Pressure plate	Warpage Diaphragm spring fingers alignment		0.03 (0.001) max. 0.6 (0.02) max.	0.15 (0.006) 1.0 (0.04)

Manual Transmission — Section 13

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US qt, Imp qt)	1.9 (2.0, 1.7) for overhaul 1.8 (1.9, 1.6) for oil change	
Mainshaft	End play	0.11 – 0.18 (0.004 – 0.007)	Adjust
	Diameter of ball bearing contact area A (Transmission housing side)	21.987 – 22.000 (0.8656 – 0.8661)	21.930 (0.8634)
	Diameter of 4th, 5th gear contact area B	26.980 – 26.993 (1.0622 – 1.0627)	26.930 (1.0602)
	Diameter of 3rd gear contact area C	33.984 – 34.000 (1.3380 – 1.3386)	33.930 (1.3358)
	Diameter of ball bearing contact area D (Clutch housing side)	25.977 – 25.990 (1.0227 – 1.0232)	25.920 (1.0205)
	Runout	0.02 (0.001) max.	0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D.	39.009 – 39.025 (1.5358 – 1.5364)	39.07 (1.538)
	End play 3rd	0.06 – 0.21 (0.002 – 0.008)	0.33 (0.013)
	4th	0.06 – 0.19 (0.002 – 0.007)	0.31 (0.012)
	Thickness 3rd	30.22 – 30.27 (1.190 – 1.192)	30.15 (1.187)
	4th	30.12 – 30.17 (1.186 – 1.188)	30.05 (1.183)
Mainshaft 5th gear	I.D.	37.009 – 37.025 (1.4570 – 1.4577)	37.07 (1.459)
	End play	0.06 – 0.19 (0.002 – 0.007)	0.31 (0.012)
	Thickness	28.42 – 28.47 (1.119 – 1.121)	28.35 (1.116)
Countershaft	Diameter of needle bearing contact area A	30.000 – 30.015 (1.1811 – 1.1817)	29.950 (1.1791)
	Diameter of 1st gear contact area B	35.984 – 36.000 (1.4167 – 1.4173)	35.930 (1.4146)
	Diameter of ball bearing contact area C	24.980 – 24.993 (0.9835 – 0.9840)	24.930 (0.9815)
	Runout	0.02 (0.001) max.	0.05 (0.002)
Countershaft 1st gear	I.D.	41.009 – 41.025 (1.6145 – 1.6152)	41.07 (1.617)
	End play (When tightened by the specified torque)	0.03 – 0.10 (0.001 – 0.004)	0.22 (0.009)
	Thickness	30.41 – 30.44 (1.197 – 1.198)	30.36 (1.195)
Countershaft 2nd gear	I.D.	44.009 – 44.025 (1.7326 – 1.7333)	44.07 (1.735)
	End play (When tightened by the specified torque)	0.04 – 0.12 (0.002 – 0.005)	0.24 (0.009)
	Thickness	31.92 – 31.97 (1.257 – 1.259)	31.85 (1.254)
Spacer collar (Countershaft 2nd gear)	I.D.	32.988 – 32.998 (1.2987 – 1.2991)	33.04 (1.301)
	O.D.	38.989 – 39.000 (1.5350 – 1.5354)	38.93 (1.533)
	Length	32.03 – 32.06 (1.261 – 1.262)	32.01 (1.260)
Spacer collar (Mainshaft 4th and 5th gear)	I.D.	27.002 – 27.012 (1.0631 – 1.0635)	27.06 (1.065)
	O.D. 4th	33.989 – 34.000 (1.3381 – 1.3386)	33.93 (1.336)
	5th	31.989 – 32.000 (1.2594 – 1.2598)	31.93 (1.257)
	Length 4th	22.83 – 22.86 (0.899 – 0.900)	22.81 (0.898)
	5th	23.53 – 23.56 (0.926 – 0.928)	23.51 (0.926)
Reverse idler gear	I.D.	15.016 – 15.043 (0.5912 – 0.5922)	15.08 (0.594)
	Gear-to-reverse gear shaft clearance	0.032 – 0.077 (0.0013 – 0.0030)	0.14 (0.006)
Synchro ring	Ring-to-gear clearance (Ring pushed against gear)	0.73 – 1.18 (0.029 – 0.046)	0.4 (0.016)
Shift fork	Fork finger thickness 1st/2nd	6.2 – 6.4 (0.244 – 0.252)	———
	3rd/4th	7.4 – 7.6 (0.291 – 0.299)	———
	Fork-to-synchro sleeve clearance	0.35 – 0.65 (0.014 – 0.026)	1.0 (0.04)
Reverse shift fork	Fork pawl groove width	12.7 – 13.0 (0.50 – 0.51)	———
	Fork-to-reverse idler gear clearance	0.5 – 1.1 (0.020 – 0.043)	1.8 (0.07)
	L-groove width	7.05 – 7.25 (0.278 – 0.285)	———
	Fork-to-5th/reverse shift piece pin clearance	0.05 – 0.35 (0.002 – 0.014)	0.5 (0.02)
Shift arm A	Inner diameter of shift arm C contact point	13.005 – 13.130 (0.5120 – 0.5169)	———
	Shift arm A-to-shift arm C clearance	0.005 – 0.230 (0.0002 – 0.0091)	0.35 (0.014)
Shift arm B	Inner diameter of shift arm B shaft contact point	13.973 – 14.000 (0.5501 – 0.5512)	———
	Shift arm B-to-shaft clearance	0.013 – 0.070 (0.0005 – 0.0028)	0.16 (0.006)
	Shift arm B-to-shift piece clearance	0.2 – 0.5 (0.008 – 0.020)	0.62 (0.0244)
	Diameter of shift piece contact point	12.9 – 13.0 (0.508 – 0.512)	12.78 (0.5031)
Final driven gear	Backlash	0.07 – 0.130 (0.0028 – 0.0051)	0.180 (0.0071)
Differential carrier	Pinion shaft bore diameter	18.010 – 18.028 (0.7091 – 0.7098)	———
	Carrier-to-pinion shaft clearance	0.023 – 0.057 (0.0009 – 0.0022)	0.095 (0.004)
	Driveshaft bore diameter	26.025 – 26.045 (1.0246 – 1.0254)	———
	Carrier-to-driveshaft clearance	0.045 – 0.086 (0.0018 – 0.0034)	0.14 (0.006)
Differential pinion gear	Backlash	0.05 – 0.15 (0.002 – 0.006)	———
	Pinion gear bore diameter	18.042 – 18.066 (0.7103 – 0.7113)	———
	Pinion gear-to-pinion shaft clearance	0.055 – 0.095 (0.0021 – 0.0037)	0.15 (0.006)
Set ring-to-bearing outer race		0 – 0.1 (0 – 0.004)	Adjust with shim

Standards and Service Limits

Automatic Transmission — Section 14

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Transmission fluid	Capacity ℓ (US qt, Imp qt)		5.9 (6.2, 5.2) for overhaul 2.7 (2.9, 2.4) for fluid change	
Hydraulic pressure kPa (kgf/cm², psi)	Line pressure at 2,000 rpm in [N] or [P] position		830 – 880 (8.5 – 9.0, 120 – 130)	780 (8.0, 110)
	1st clutch pressure at 2,000 rpm in [D4] position			
	2nd clutch pressure at 2,000 rpm in [D4] position		800 – 850 (8.2 – 8.7, 120 – 124) with linear solenoid connector disconnected 0 – 150 (0 – 1.5, 0 – 21) with linear solenoid connected to battery voltage	760 (7.7, 110) with linear solenoid connector disconnected 150 (1.5, 21) with linear solenoid connected to battery voltage
	3rd and 4th clutch pressure at 2,000 rpm in [D4] position		810 – 860 (8.3 – 8.8, 118 – 125) with linear solenoid connector disconnected 0 – 150 (0 – 1.5, 0 – 21) with linear solenoid connected to battery voltage	760 (7.8, 110) with linear solenoid connector disconnected 150 (1.5, 21) with linear solenoid connected to battery voltage
Stall speed rpm (Check with vehicle on level ground)			2,700	2,550 – 2,850
Clutch	Clutch initial clearance	1st, 2nd	0.65 – 0.85 (0.026 – 0.033)	———
		3rd, 4th	0.40 – 0.60 (0.016 – 0.024)	———
	Clutch return spring free length	1st	32.0 (1.26)	30.0 (1.18)
		2nd, 3rd, 4th	30.5 (1.20)	28.5 (1.12)
	Clutch disc thickness		1.88 – 2.00 (0.074 – 0.079)	Until grooves worn out
	Clutch plate thickness	1st	1.55 – 1.65 (0.061 – 0.065)	Discoloration
		2nd, 3rd, 4th	1.95 – 2.05 (0.077 – 0.081)	
	Clutch end plate thickness	Mark 1	2.05 – 2.10 (0.081 – 0.083)	Discoloration
		Mark 2	2.15 – 2.20 (0.085 – 0.087)	
		Mark 3	2.25 – 2.30 (0.089 – 0.091)	
		Mark 4	2.35 – 2.40 (0.093 – 0.094)	
		Mark 5	2.45 – 2.50 (0.096 – 0.098)	
		Mark 6	2.55 – 2.60 (0.100 – 0.102)	
		Mark 7	2.65 – 2.70 (0.104 – 0.106)	
		Mark 8	2.75 – 2.80 (0.108 – 0.110)	
		Mark 9	2.85 – 2.90 (0.112 – 0.114)	Discoloration

Automatic Transmission — Section 14

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Diameter of needle bearing contact area		
	On mainshaft stator shaft bearing	22.980 – 22.993 (0.9047 – 0.9052)	Wear or damage
	On mainshaft 2nd gear	35.975 – 35.991 (1.4163 – 1.4169)	↕
	On mainshaft 4th gear collar	31.975 – 31.991 (1.2589 – 1.2595)	↕
	On mainshaft 1st gear collar	30.975 – 30.991 (1.2195 – 1.2201)	↕
	On countershaft (left side)	36.004 – 36.017 (1.4175 – 1.4180)	↕
	On countershaft 3rd gear collar	35.980 – 35.996 (1.4165 – 1.4172)	↕
	On countershaft 4th gear	27.980 – 27.993 (1.1016 – 1.1021)	↕
	On countershaft reverse gear collar	31.975 – 31.991 (1.2589 – 1.2595)	↕
	On countershaft 1st gear collar	31.975 – 31.991 (1.2589 – 1.2595)	↕
	On reverse idler gear shaft	13.990 – 14.000 (0.5508 – 0.5512)	Wear or damage
	Inside diameter of needle bearing contact area		
	On mainshaft 1st gear	35.000 – 35.016 (1.3780 – 1.3786)	Wear or damage
	On mainshaft 2nd gear	41.000 – 41.016 (1.6142 – 1.6148)	↕
	On mainshaft 4th gear	38.000 – 38.016 (1.4961 – 1.4967)	↕
	On countershaft 1st gear	38.000 – 38.016 (1.4961 – 1.4967)	↕
	On countershaft 3rd gear	41.000 – 41.016 (1.6142 – 1.6148)	↕
	On countershaft 4th gear	33.000 – 33.016 (1.2992 – 1.2998)	↕
	On countershaft reverse gear	38.000 – 38.016 (1.4961 – 1.4967)	↕
	On reverse idler gear	18.007 – 18.020 (0.7089 – 0.7094)	↕
	On stator shaft (ATF pump side)	29.000 – 29.013 (1.1417 – 1.1422)	↕
	On stator shaft (stator side)	27.000 – 27.021 (1.0630 – 1.0638)	↕
	Reverse idler gear shaft holder I.D.	14.416 – 14.434 (0.5676 – 0.5683)	Wear or damage
	End play		
	Mainshaft 1st gear	0.08 – 0.19 (0.003 – 0.007)	———
	Mainshaft 2nd gear	0.05 – 0.13 (0.002 – 0.005)	———
	Mainshaft 4th gear	0.075 – 0.185 (0.003 – 0.007)	———
	Countershaft 1st gear	0.1 – 0.5 (0.004 – 0.020)	———
	Countershaft 3rd gear	0.05 – 0.17 (0.002 – 0.007)	———
	Countershaft 4th gear	0.10 – 0.18 (0.004 – 0.007)	———
	Reverse idler gear	0.05 – 0.18 (0.002 – 0.007)	———
	Countershaft reverse gear	0.10 – 0.25 (0.004 – 0.010)	———
	Selector hub O.D.	51.87 – 51.90 (2.042 – 2.043)	Wear or damage
	Mainshaft 4th gear collar length	45.00 – 45.03 (1.771 – 1.773)	———
	Mainshaft 4th gear collar flange thickness	4.435 – 4.525 (0.1746 – 0.1781)	Wear or damage
	Mainshaft 1st gear collar length	27.00 – 27.15 (1.063 – 1.069)	———
	Countershaft distance collar length	38.87 – 38.90 (1.530 – 1.531)	———
		38.92 – 38.95 (1.532 – 1.533)	———
		38.97 – 39.00 (1.534 – 1.535)	———
		39.02 – 39.05 (1.536 – 1.537)	———
		39.07 – 39.10 (1.538 – 1.539)	———
		39.12 – 39.15 (1.540 – 1.541)	———
		39.17 – 39.20 (1.542 – 1.543)	———
		39.22 – 39.25 (1.544 – 1.545)	———
		39.27 – 39.30 (1.546 – 1.547)	———
	Countershaft 3rd gear collar length	21.15 – 21.20 (0.8327 – 0.8346)	———
	Countershaft reverse gear collar length	14.5 – 14.6 (0.571 – 0.575)	———
	Countershaft reverse gear collar flange thickness	2.4 – 2.6 (0.094 – 0.102)	Wear or damage
	Countershaft 1st gear collar length	14.5 – 14.6 (0.571 – 0.575)	———
	Countershaft 1st gear collar flange thickness	2.4 – 2.6 (0.094 – 0.102)	Wear or damage

(cont'd)

Standards and Service Limits

Automatic Transmission (cont'd) — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission	Mainshaft 2nd gear thrust washer thickness	3.97 – 4.00 (0.156 – 0.157) 4.02 – 4.05 (0.158 – 0.159) 4.07 – 4.10 (0.160 – 0.161) 4.12 – 4.15 (0.162 – 0.163) 4.17 – 4.20 (0.164 – 0.165) 4.22 – 4.25 (0.166 – 0.167) 4.27 – 4.30 (0.168 – 0.169) 4.32 – 4.35 (0.170 – 0.171) 4.37 – 4.40 (0.172 – 0.173) 4.42 – 4.45 (0.174 – 0.175)	Wear or damage ↕ Wear or damage
	Thrust washer thickness Mainshaft ball bearing left side Mainshaft 1st gear Countershaft 3rd gear splined washer	 2.95 – 3.05 (0.116 – 0.120) 2.43 – 2.50 (0.096 – 0.098) 4.45 – 4.50 (0.175 – 0.177)	 Wear or damage ↕ Wear or damage
	One-way clutch contact area I.D. Countershaft 1st gear Parking gear Mainshaft feed pipe A, O.D. (at 15 mm from end) Mainshaft feed pipe B, O.D. (at 30 mm from end) Countershaft feed pipe O.D. (at 15 mm from end) Mainshaft sealing ring thickness (29 mm and 35 mm) Mainshaft bushing I.D. Mainshaft bushing I.D. Countershaft bushing I.D. Mainshaft sealing ring goove width	 83.339 – 83.365 (3.2810 – 3.2821) 66.685 – 66.698 (2.6254 – 2.6259) 8.97 – 8.98 (0.353 – 0.354) 5.97 – 5.98 (0.2350 – 0.2354) 7.97 – 7.98 (0.3138 – 0.3142) 1.87 – 1.97 (0.074 – 0.078) 6.018 – 6.030 (0.2369 – 0.2374) 9.000 – 9.015 (0.3543 – 0.3549) 8.000 – 8.015 (0.3150 – 0.3156) 2.025 – 2.075 (0.0797 – 0.0817)	 Wear or damage Wear or damage 8.95 (0.352) 5.95 (0.234) 7.95 (0.313) 1.80 (0.071) 6.045 (0.2380) 9.03 (0.356) 8.03 (0.316) 2.08 (0.082)
Regulator valve body	Sealing ring contact area I.D.	35.000 – 35.025 (1.3780 – 1.3782)	35.050 (1.3799)
Shifting device and parking brake control	Reverse shift fork finger thickness Parking brake pawl Parking gear	5.90 – 6.00 (0.232 – 0.236) ——— ———	5.40 (0.213) Wear or other defect
Servo body	Shift fork shaft bore I.D. Shift fork shaft valve bore I.D.	14.000 – 14.010 (0.5512 – 0.5516) 37.000 – 37.039 (1.4567 – 1.4582)	——— 37.045 (1.4585)
ATF pump	ATF pump gear side clearance ATF pump gear-to-body clearance Drive Driven ATF pump driven gear I.D. ATF pump driven gear shaft O.D.	0.03 – 0.05 (0.001 – 0.002) 0.1050 – 0.1325 (0.0041 – 0.0052) 0.0350 – 0.0625 (0.0014 – 0.0025) 14.016 – 14.034 (0.5518 – 0.5525) 13.980 – 13.990 (0.5504 – 0.5508)	0.07 (0.003) ——— ——— Wear or damage Wear or damage
Differential carrier	Pinion shaft contact area I.D. Carrier-to-pinion clearance Driveshaft contact are I.D. Carrier-to-driveshaft clearance	18.000 – 18.018 (0.7087 – 0.7094) 0.016 – 0.052 (0.0006 – 0.0020) 26.005 – 26.025 (1.0238 – 1.0246) 0.025 – 0.066 (0.0010 – 0.0026)	——— 0.1 (0.004) ——— 0.12 (0.005)
Differential pinion gear	Backlash I.D. Pinion gear-to-pinion shaft clearance	0.05 – 0.15 (0.002 – 0.006) 18.042 – 18.066 (0.7103 – 0.7113) 0.059 – 0.095 (0.0023 – 0.0037)	——— ——— 0.15 (0.006)
Set ring-to-bearing outer race clearance		0 – 0.15 (0 – 0.006)	Adjust

Automatic Transmission — Section 14

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)			
		Wire Dia.	O.D.	Free Length	No. of Coils
Springs	Regulator valve spring A	1.8 (0.071)	14.7 (0.584)	87.8 (3.457)	16.5
	Regulator valve spring B	1.8 (0.071)	9.6 (0.381)	44.0 (1.732)	11.0
	Stator reaction spring	4.5 (0.177)	35.4 (1.407)	30.3 (1.193)	1.9
	Modulator valve spring	1.4 (0.055)	9.4 (0.374)	35.0 (1.378)	10.9
	Torque converter check valve spring	1.0 (0.039)	8.4 (0.334)	33.8 (1.331)	8.2
	Cooler relief valve spring	1.0 (0.039)	8.4 (0.334)	33.8 (1.331)	8.2
	Relief valve spring	1.1 (0.043)	8.6 (0.342)	37.1 (1.461)	13.4
	2nd orifice control valve spring	0.7 (0.028)	6.6 (0.262)	34.8 (1.370)	22.0
	1-2 shift valve spring	0.9 (0.035)	7.6 (0.302)	41.3 (1.626)	16.3
	2-3 shift valve spring	0.9 (0.035)	7.6 (0.302)	57.0 (2.244)	26.8
	3-4 shift valve spring	0.9 (0.035)	7.6 (0.302)	57.0 (2.244)	26.8
	1st accumulator spring	2.1 (0.083)	16.0 (0.636)	89.1 (3.508)	16.2
	4th accumulator spring B	2.3 (0.091)	10.2 (0.402)	51.6 (2.031)	13.8
	4th accumulator spring A	2.6 (0.102)	17.0 (0.676)	87.0 (3.425)	14.2
	2nd accumulator spring A	2.4 (0.094)	29.0 (1.152)	39.0 (1.535)	2.9
	3rd accumulator spring A	2.8 (0.110)	17.5 (0.695)	89.3 (3.516)	15.6
	2nd accumulator spring B	1.6 (0.063)	9.0 (0.358)	20.7 (0.815)	6.1
	3rd accumulator spring B	2.2 (0.087)	31.0 (1.220)	35.1 (1.382)	2.4
	2nd accumulator spring C	2.2 (0.087)	14.5 (0.576)	68.0 (2.677)	13.9
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.302)	73.7 (2.902)	32.0
	Lock-up timing valve spring	0.9 (0.035)	8.1 (0.319)	80.7 (3.177)	45.8
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.262)	38.0 (1.496)	14.1
	3-4 orifice control valve spring	0.7 (0.028)	6.6 (0.262)	37.5 (1.476)	24.6
	Servo control valve spring	1.0 (0.039)	8.1 (0.322)	52.1 (2.051)	20.8
	CPC valve spring	0.6 (0.024)	5.6 (0.223)	12.2 (0.480)	5.5
	CPB valve spring	0.9 (0.035)	8.1 (0.322)	47.2 (1.858)	18.3
	4th exhaust valve spring	0.9 (0.035)	6.1 (0.242)	36.4 (1.433)	19.5

Steering — Section 17

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Play at steering wheel circumference	0 – 10 (0 – 0.4)
	Starting load at steering wheel circumference N (kgf, lbf)	
	Manual steering	15 (1.5, 3.3)
	Power steering Engine running	29 (3.0, 6.6)
Gearbox	Angle of rack guide screw loosened from locked position	20° Max
	Preload at pinion gear shaft N·m (kgf·cm, lbf·in)	0.6 – 1.2 (6 – 12, 5.20 – 10.42)
Pump	Pump pressure with valve closed (oil temp./speed: 40°C (105°F) min./idle. Do not run for more than 5 seconds). kPa (kgf/cm², psi)	6,400 – 7,400 (65 – 75, 920 – 1,070)
Power steering fluid	Recommended power steering fluid	HONDA Power Steering Fluid (V or S)
	Fluid capacity ℓ (US qt, Imp qt)	0.85 (0.90, 0.75) at disassembly
	Reservoir	0.4 (0.42, 0.35)
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	10.5 – 14.0 (0.41 – 0.55) with used belt 7.5 – 10.0 (0.30 – 0.39) with new belt
	Tension measured with belt tension gauge N (kgf, lbf)	340 – 490 (35 – 50, 77 – 110) with used belt 640 – 780 (65 – 80, 143 – 176) with new belt

M/S: Manual steering, P/S: Power steering

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust the deflection or tension to used belt values.

Standards and Service Limits

Suspension — Section 18

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Wheel alignment	Camber		Front	0°00' ± 1°	———
			Rear	-1° ± 1°	———
	Caster		Front	1°40' ± 1°	———
	Total toe		Front	In 2 ± 2 (0.08 ± 0.08)	———
			Rear	In 2 $^{+2}_{-1}$ (0.08 $^{+0.08}_{-0.04}$)	———
	Front wheel turning angle	Inward wheel		35°50'	———
		Outward wheel		35°50' (Reference)	———
Wheel	Rim runout	Aluminum wheel	Axial	0 – 0.7 (0 – 0.03)	2.0 (0.08)
			Radial	0 – 0.7 (0 – 0.03)	1.5 (0.06)
		Steel wheel	Axial	0 – 1.0 (0 – 0.04)	2.0 (0.08)
			Radial	0 – 1.0 (0 – 0.04)	1.5 (0.06)
Wheel bearing	End play		Front	0 – 0.05 (0 – 0.002)	———
			Rear	0 – 0.05 (0 – 0.002)	———

Brakes — Section 19

	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
Parking brake lever	Play in stroke at 196 N (20 kgf, 44 lbf) lever force		To be locked when pulled 6 – 9 notches	———
Foot brake pedal	Pedal height (with floor mat removed)	M/T	156.5 (6.16)	———
		A/T	161 (6 5/16)	———
	Free play		1 – 5 (1/16 – 3/16)	———
Master cylinder	Piston-to-pushrod clearance		0 – 0.4 (0 – 0.02)	———
Disc brake	Disc thickness	Front	20.9 – 21.8 (0.82 – 0.86)	19.0 (0.75)
	Disc runout	Front	———	0.10 (0.004)
	Disc parallelism	Front	———	0.015 (0.0006)
	Pad thickness	Front	9.5 – 10.5	1.6 (0.06)
Rear brake drum	I.D.		200 (7.87)	201 (7.91)
	Lining thickness		4.0 (0.16)	2.0 (0.08)

Air Conditioning — Section 22

	MEASUREMENT		STANDARD (NEW)
Air Conditioning system	Lubricant type: SP-10 (P/N 38899 – P13 – A01 or 38897 – P13 – A01AH) (For refrigerant: HFC-134a (R-134a))		
	Lubricant capacity mℓ (fl oz, Imp oz)	Condenser	20 (2/3 0.7)
		Evaporator	45 (1 1/2, 1.6)
		Line or hose	10 (1/3, 0.4)
		Receiver	10 (1/3, 0.4)
Compressor	Lubricant type: SP-10 (P/N 38899 – P13 – A01 or 38897 – P13 – A01AH) (For refrigerant: HFC-134a (R-134a))		
	Lubricant capacity mℓ (fl oz, Imp oz)		130 – 150 (4 1/3 – 5, 4.6 – 5.3)
	Field coil resistance at 68°F (20°C) Ω		3.05 – 3.35
	Pulley-to-pressure plate clearance		0.5 ± 0.15 (0.020 ± 0.006)
Compressor belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.5 – 9.5 (0.30 – 0.37) with used belt 5.0 – 6.5 (0.20 – 0.26) with new belt
	Belt tension N (kgf, lbf) Measured with belt tension gauge		340 – 490 (35 – 50, 77 – 110) with used belt 690 – 830 (70 – 85, 154 – 187) with new belt

*: When using a new belt, adjust deflection or tension to new values. Run the engine for 5 minutes then turn it off. Readjust deflection or tension to used belt values.

Design Specifications

specs

	ITEM	METRIC	ENGLISH	NOTES
DIMENSIONS	Overall Length	4,478 mm	176.3 in	
	Overall Width	1,705 mm	67.1 in	
	Overall Height	1,395 mm	54.9 in	
	Wheelbase	2,620 mm	103.1 in	
	Track Front/Rear	1,475/1,475 mm	58.1/58.1 in	
	Ground Clearance	150 mm	5.9 in	
	Seating Capacity	Five		
WEIGHT	Gross Vehicle Weight Rating (GVWR)	1,600 kg	——	
ENGINE	Type	Water-cooled, 4-stroke SOHC VTEC gasoline engine		
	Cylinder Arrangement	Inline 4-cylinder, transverse		
	Bore and Stroke	75.0 x 90.0 mm	2.95 x 3.54 in	
	Displacement	1,590 cm³ (mℓ)	97.0 cu-in	
	Compression Ratio	9.6		
	Valve Train	Belt driven, SOHC 4 valve per cylinder		
	Lubrication System	Forced and wet sump, trochoid pump		
	Oil Pump Displacement at 6,800 engine rpm	33.4 ℓ (35.3 US qt, 29.4 Imp qt)/minute		
	Water Pump Displacement at 6,000 engine rpm	125 ℓ (132 US qt, 110 Imp qt)/minute		
	Fuel Required	UNLEADED gasoline with 86 Pump Octane Number or higher		
STARTER	Type/Make	Gear reduction/MITSUBA		
	Normal Output	1.0 kW, 1.2 kW		
	Nominal Voltage	12 V		
	Hour Rating	30 seconds		
	Direction of Rotation	Clockwise as viewed from gear end		

(cont'd)

Design Specifications

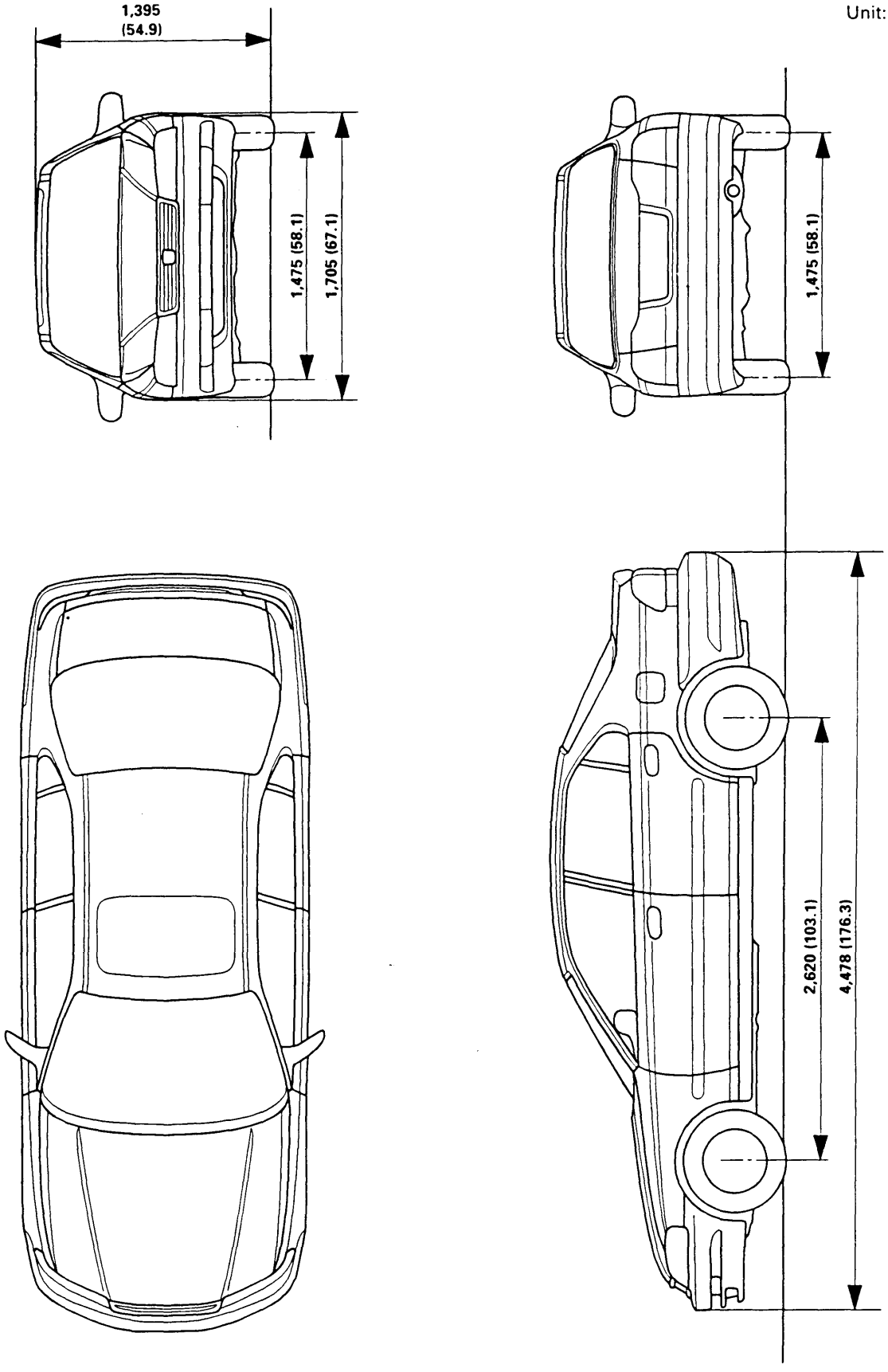
(cont'd)

	ITEM		METRIC	ENGLISH	NOTES
STARTER (cont'd)	Weight MITSUBA 1.0, 1.2 kW		3.4 kg	7.5 lbf	
CLUTCH	Clutch Type	M/T	Single plate dry, diaphragm spring		
		A/T	Torque converter		
	Clutch Facing Area	M/T	160 cm²	25 sq-in	
TRANSMISSION	Transmission Type	M/T	Synchronized 5-speed forward, 1 reverse		
		A/T	4-speed automatic, 1 reverse		
	Primary Reduction		Direct 1 : 1		
TRANSMISSION	Manual transmission Gear Ratio	1st	3.250		
		2nd	1.909		
		3rd	1.250		
		4th	0.909		
		5th	0.702		
		Reverse	3.153		
	Final Reduction	Gear ratio	4.250		
		Gear type	Single helical gear		
	Automatic transmission Gear Ratio	1st	2.722		
		2nd	1.516		
		3rd	0.975		
		4th	0.638		
		Reverse	1.954		
	Final Reduction	Gear ratio	4.357		
		Gear type	Single helical gear		
AIR CONDITIONING	Cooling Capacity		3,530 Kcal/h	14,000 BTU/h	
	Compressor	Type/Make	Scroll/Sanden		
		No. of Cylinder	—		
		Capacity	85.7 mℓ/rev	5.22 cu-in/rev	
		Max. Speed	10,000 rpm		
		Lubricant Capacity	130 mℓ	4 1/3 fl oz, 4.6 Imp oz	SP-10
	Condenser	Type	Corrugated fin		
	Evaporator	Type	Corrugated fin		
	Blower	Type	Sirocco fan		
		Motor Input	200 W/12 V		
		Speed Control	4-speed variable		
		Max. Capacity	460 m³/h	16,200 cu-ft/h	
	Temperature Control		Air-mix type		
	Compressor Clutch	Type	Dry, single plate, poly-V-belt drive		
		Power Consumption	40 W max./12 V at 68°F (20°C)		
	Refrigerant	Type	HFC-134a (R-134a)		
		Quantity	650^{0}_{-50} g	$22.9^{0}_{-1.8}$ oz	

	ITEM		METRIC	ENGLISH	NOTES
STEERING SYSTEM	Type		Power assisted, rack and pinion		
	Overall Ratio		17.7		
	Turns, Lock-to-Lock		3.6		
	Steering Wheel Dia.		380 mm	15 in	
SUSPENSION	Type	Front and Rear	Independent double wishbone, coil spring		
	Shock Absorber	Front and Rear	Telescopic, hydraulic nitrogen gas-filled		
WHEEL ALIGNMENT	Camber	Front	0°00′		
		Rear	−1°		
	Caster	Front	1°40′		
	Total Toe	Front	In 2 mm	0.08 in	
		Rear	In 2 mm	In 0.08 in	
BRAKE SYSTEM	Type	Front	Power-assisted self-adjusting ventilated disc		
		Rear	Power-assisted self-adjusting solid disc		
	Pad Surface Area	Front	37.5 cm^2 x 2	5.8 sq-in x 2	
	Parking Brake	Type	Mechanical actuating, rear two wheel brakes		
TIRE	Size	Front and Rear	P195/55R15 84V		
	Spare Tire		T125/70D14		
ELECTRICAL	Battery		12 V – 38AH/5HR		
	Starter		12 V – 1.0 kW, 1.2 kW		
	Alternator		12 V – 75 A		
	Fuses	In Under-dash Fuse/Relay Box	7.5 A, 10 A, 15 A, 20 A		
		In Under-hood Fuse/Relay Box	7.5 A, 10 A, 15 A, 20 A, 30 A, 40 A, 80 A		
		In Under-hood ABS Fuse/Relay Box	7.5 A, 20 A, 40 A		
	Headlights	High/Low	12 V – 60/55 W		
	Front Turn Signal		12 V – 50 CP		
	Rear Turn Signal Lights		12 V – 21 W		
	Brake/Taillights		12 V – 21/5 W		
	Taillights		12 V – 5 W		
	High Mount Brake Light		12 V – 21 W		
	Back-up Lights		12 V – 21 W		
	License Plate Lights		12 V – 8 W		
	Ceiling Light		12 V – 8 W (With moonroof) 12 V – 5 W (Without moonroof)		
	Trunk Lights		12 V – 3.4 W		
	Gauge Lights		12 V – 1.4 W, 3 W, 3.4 W		
	Indicator Lights		12 V – 1.12 W, 1.4 W, 3 W		
	Illumination and Pilot Lights		12 V – 0.84 W, 1.4 W		

Body Specifications

Unit: mm (in)



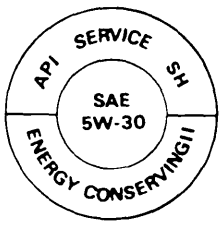
Maintenance

Lubrication Points

For the details of lubrication points and types 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.

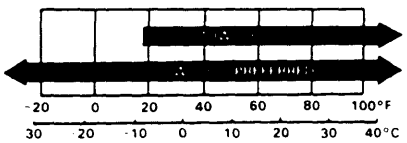
No.	LUBRICATION POINTS		LUBRICANT
1	Engine		API Service Grade: Use SH "Energy Conserving II" grade oil. The oil container may also display the API Certification Seal shown below. Make sure it says "For Gasoline Engines." SAE Viscosity: See chart below.
2	Transmission	Manual	Genuine Honda MTF*1
		Automatic	Genuine Honda Premium Formula Automatic Transmission Fluid (ATF)*2
3	Brake Line		Genuine Honda DOT3 Brake Fluid*3
4	Clutch Line		Genuine Honda DOT3 Brake Fluid*3
5	Power steering gearbox		Steering grease P/N 08733 – B070E
6	Shift lever pivots (manual transmission)		Grease with molybdenum disulfide
7	Release fork (manual transmission)		Super High Temp Urea Grease (P/N 08798 – 9002)
8 9 10 11 12 13 14 15 16 17 18 19 20 21	Steering boots Steering ball joints Shift lever (automatic transmission) Pedal linkage Brake master cylinder pushrod Trunk hinges and latch Door hinges upper and lower Door opening detents Fuel filler lid Engine hood hinges and engine hood latch Clutch master cylinder pushrod Throttle cable end and throttle linkage Rear brake shoe linkages Steering wheel (back side)		Multi-purpose grease
22 23	Caliper piston seal, dust seal, caliper pin, piston Throttle cable end (dashboard lower panel)		Silicone grease
24	Power steering system		Genuine Honda Power Steering Fluid (V or S)*4
25	Air conditioning compressor		Compressor oil: SANDEN: SP-10 P/N 38899 – P13 – A01 or 38897 – P13 – A01AH (For Refrigerant: HFC-134a (R-134a))

API SERVICE LABEL



API CERTIFICATION SEAL

Recommended Engine Oil



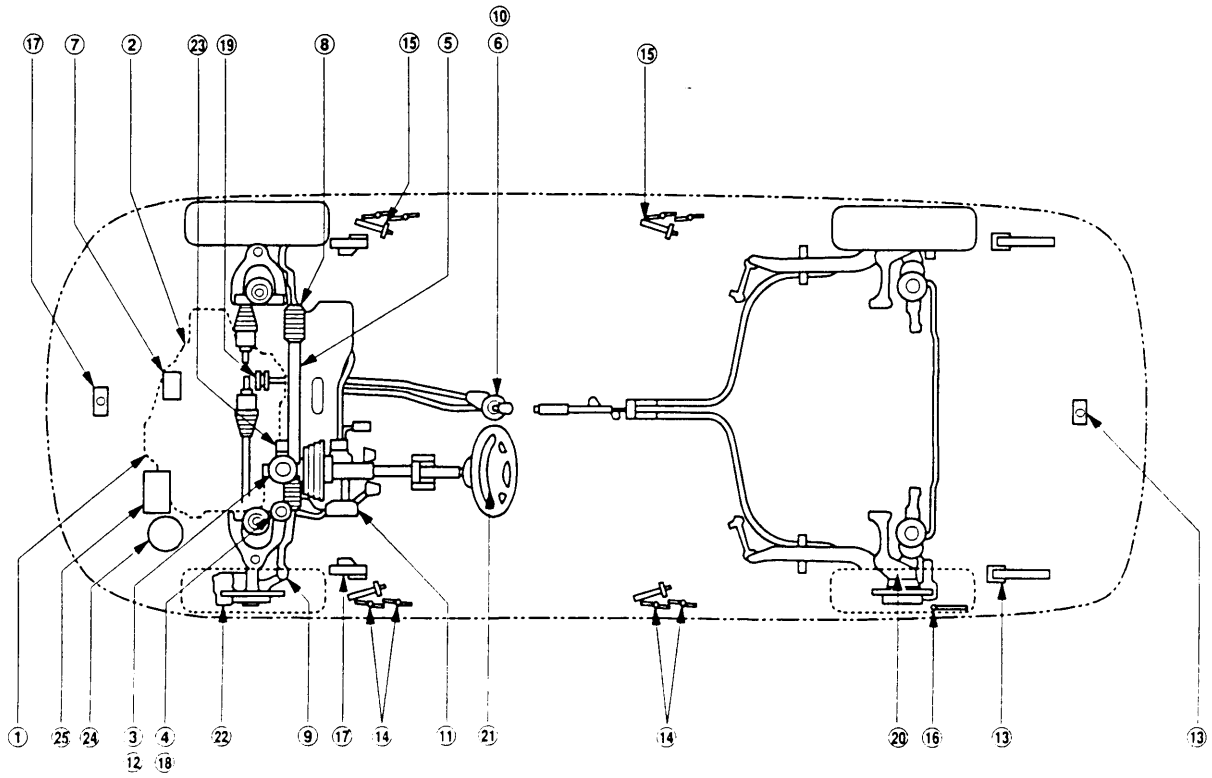
Engine oil viscosity for ambient temperature ranges

*1: Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.

*2: Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

*3: Always use Genuine Honda DOT3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.

*4: Always use Genuine Honda Power Steering Fluid (V or S). Using any other type of power steering fluid or automatic transmission fluid can cause increase wear and poor steering in cold weather.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① ㉕ ㉔ ③ ⑫ ④ ⑱ ㉒ ⑨ ⑰ ⑭ ⑪ ㉑ ⑭ ⑳ ⑯ ⑬ ⑬

Normal Conditions

Follow the Normal Conditions Maintenance Schedule if the severe driving conditions specified in the Severe Conditions Maintenance Schedule on pages 3-6 and 3-7 do not apply.

Service at the indicated distance or time whichever comes first.										NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105	120		
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil		Replace every 7,500 miles (12,000 km) or 12 months								Capacity for change with filter: 3.6 ℓ (3.8 US qt, 3.2 Imp qt)	8-4
Replace engine oil filter		●	●	●	●	●	●	●	●		8-5, 6
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 10-4
Replace air cleaner element			●		●		●		●		11-123
Inspect valve clearance		Inspect at 30,000 miles (48,000 km) only								Intake: 0.18 – 0.22 mm (0.007 – 0.009 in) Exhaust: 0.23 – 0.27 mm (0.009 – 0.011 in) Measured when cold	6-10
Replace spark plugs			●		●		●		●	ZFR5F-11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)	4-21
Replace timing belt and inspect water pump								●		Replace the timing belt. Check water pump for signs of seal leakage.	6-17, 10-11
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 8.0 – 10.5 mm (0.31 – 0.41 in) P/S pump belt: 10.5 – 14.0 mm (0.41 – 0.55 in) A/C compressor belt: 7.5 – 9.5 mm (0.30 – 0.37 in)	4-34 17-14 22-37
Inspect idle speed								●		750 ± 50 rpm (M/T: neutral) 750 ± 50 rpm (A/T: [N] or [P] position)	11-103
Replace engine coolant				●		●		●		Capacity for change: M/T: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) A/T: 3.9 ℓ (4.1 US qt, 3.4 Imp qt) Check specific gravity for freezing point.	10-5, 6
Replace transmission fluid							●			Manual transmission: Genuine Honda MTF 1.8 ℓ (1.9 US qt, 1.6 Imp qt) for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with Genuine Honda Premium Formula ATF	13-3 14-95
Inspect front and rear brakes		●	●	●	●	●	●	●	●	• Check the brake pad and disc thickness and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leakage.	19-9, 11, 12, 18, 19, 22
Replace brake fluid				●			●			Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 6 to 9 notches.	19-6
Rotate tires (Check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	——

Service at the indicated distance or time whichever comes first.	miles x 1,000	15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Visually inspect the following items:											
Tie-rod ends, steering gear box, and boots										Check steering linkage for looseness. Check condition of boots. Check for fluid leaks.	17-22
Suspension components										Check the bolts for tightness. Check the condition of ball joint boots.	18-8, 9, 20, 21
Driveshaft boots										Check condition of boots.	16-3
Brake hoses and lines (including ABS)										Check for damage or leakage.	19-4
All fluid levels and condition of fluid		●	●	●	●	●	●	●	●	Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-4, 13-3, 14-95, 19-7
Cooling system hoses and connections										Check all hoses for damage, leaks, and deterioration. Check for proper fan operation.	10-2
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness.	9-3, 4 11-126
Fuel lines and connections*										Check for leaks. Retighten loose connections and replace any damaged parts.	11-105
Inspect supplemental restraint system		10 years after production									—

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Honda recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

For Canada model: Follow the Severe Conditions Maintenance Schedule on page 3-6 and 3-7.

Severe Conditions

Follow the Severe Conditions Maintenance Schedule if the vehicle is driven MAINLY under one or more of the Severe Driving Conditions (page 3-7):

Service at the indicated distance or time whichever comes first.										NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105	120		
	km x 1,000	24	48	72	96	120	144	168	192		
	months	12	24	36	48	60	72	84	96		
Replace engine oil and oil filter		Replace every 3,750 miles (6,000 km) or 6 months								Capacity for change with filter: 3.6 ℓ (3.8 US qt, 3.2 Imp qt)	8-4
Check engine oil and coolant		Check oil and coolant at each fuel stop								Check levels and check for leaks.	8-4, 10-4
Replace air cleaner element Use normal schedule except in dusty conditions		●	●	●	●	●	●	●	●		11-123
Inspect valve clearance		Inspect at 30,000 miles (48,000 km) only								Intake: 0.18 – 0.22 mm (0.007 – 0.009 in) Exhaust: 0.23 – 0.27 mm (0.009 – 0.011 in) Measured when cold	6-10
Replace spark plugs			●		●		●		●	ZFR5F-11 Gap: 1.0 – 1.1 mm (0.039 – 0.043 in)	4-21
Replace timing belt*1 and inspect water pump								●		Replace the timing belt. Check water pump for signs of seal leakage.	6-17, 10-11
Inspect and adjust drive belts			●		●		●		●	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 8.0 – 10.5 mm (0.31 – 0.41 in) P/S pump belt: 10.5 – 14.0 mm (0.41 – 0.55 in) A/C compressor belt: 7.5 – 9.5 mm (0.30 – 0.37 in)	4-34 17-14 22-37
Inspect idle speed								●		750 ± 50 rpm (M/T: neutral) 750 ± 50 rpm (A/T: N or P position)	11-103
Replace engine coolant				●		●		●		Capacity for change: M/T: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) A/T: 3.9 ℓ (4.1 US qt, 3.4 Imp qt) Check specific gravity for freezing point.	10-5, 6
Replace transmission fluid			●		●		●		●	Manual transmission: Genuine Honda MTF 1.8 ℓ (1.9 US qt, 1.6 Imp qt) for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with Genuine Honda Premium Formula ATF	13-3 14-95
Inspect front and rear brakes		Inspect every 7,500 miles (12,000 km) or 6 months								• Check the brake pad and disc thickness and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leak.	19-9, 11, 13, 18, 19, 22
Replace brake fluid				●			●			Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7
Check parking brake adjustment		●	●	●	●	●	●	●	●	Fully engaged 6 to 9 clicks.	19-6

*1: Replace the timing belt at 60,000 miles (U.S.) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:

- In very high temperatures (over 110°F, 43°C).
- In very low temperatures (under – 20°F, – 29°C).

Service at the indicated distance or time whichever comes first.										NOTE	SECTION and PAGE
	miles x 1,000	15	30	45	60	75	90	105	120		
	km x 1,000	24	48	72	96	120	144	168	196		
	months	12	24	36	48	60	72	84	96		
Lubricate locks and hinges		●	●	●	●	●	●	●	●		3-2, 3
Clean antenna mast		●	●	●	●	●	●	●	●		——
Rotate tires (Check tire inflation and condition at least once per month)		Rotate tires every 7,500 miles (12,000 km)								The suggested rotation method is shown in the diagram of the Owner's Manual.	——
Visually inspect the following items:											
Tie-rod ends, steering gear box, and boots		Every 7,500 miles (12,000 km) or 6 months								Check steering linkage for looseness. Check condition of boots. Check for fluid leaks.	17-22
Suspension components										Check the bolts for tightness. Check the condition of ball joint boots.	18-8, 9, 20, 21
Driveshaft boots										Check condition of boots.	16-3
Brake hoses and lines (including ABS)										Check for damage or leakage.	19-4
All fluid levels and condition of fluid										Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-4, 13-3, 14-95, 19-7
Cooling system hoses and connections		●	●	●	●	●	●	●	●	Check all hoses for damage, leaks, and deterioration. Check for proper fan operation.	10-2
Exhaust system*										Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness.	9-3, 4 11-126
Fuel lines and connections*										Check for leaks.	11-105
Lights and controls										Check all lighting functions.	——
Vehicle underbody										Check for damage and fluid leaks.	——
Inspect supplemental restraint system		10 years after production									——

According to state and federal regulations, failure to perform maintenance on the items marked with an asterisk (*) will not void customer's emission warranties. However, Honda recommends that all maintenance services be performed at the recommended time or mileage period to ensure long-term reliability.

Severe Driving Conditions:

- Driving less than 5 miles (8 km) per trip or, in freezing temperatures, driving less than 10 miles (16 km) per trip.
- Driving in extremely hot [over 90°F (32°C)] conditions.
- Extensive idling or long periods of stop-and-go driving.
- Trailer towing, driving with a car-top carrier, or driving in mountainous conditions.
- Driving on muddy, dusty, or de-iced roads.

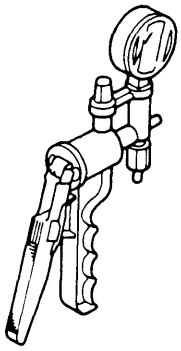
NOTE: If the vehicle is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule on pages 3-4 and 3-5.

Engine Electrical

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	A973X – 041 – XXXXX	Vacuum Pump/Gauge, 0 – 30 in.Hg.	1	4-40
*②	07JGG – 001010A	Belt Tension Gauge	1	4-33
③	07PAZ – 0010100	SCS Service Connector	1	4-16

* Included in the Belt Tension Gauge Set, T/N 07JGG – 001000A



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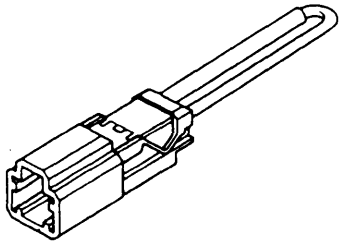

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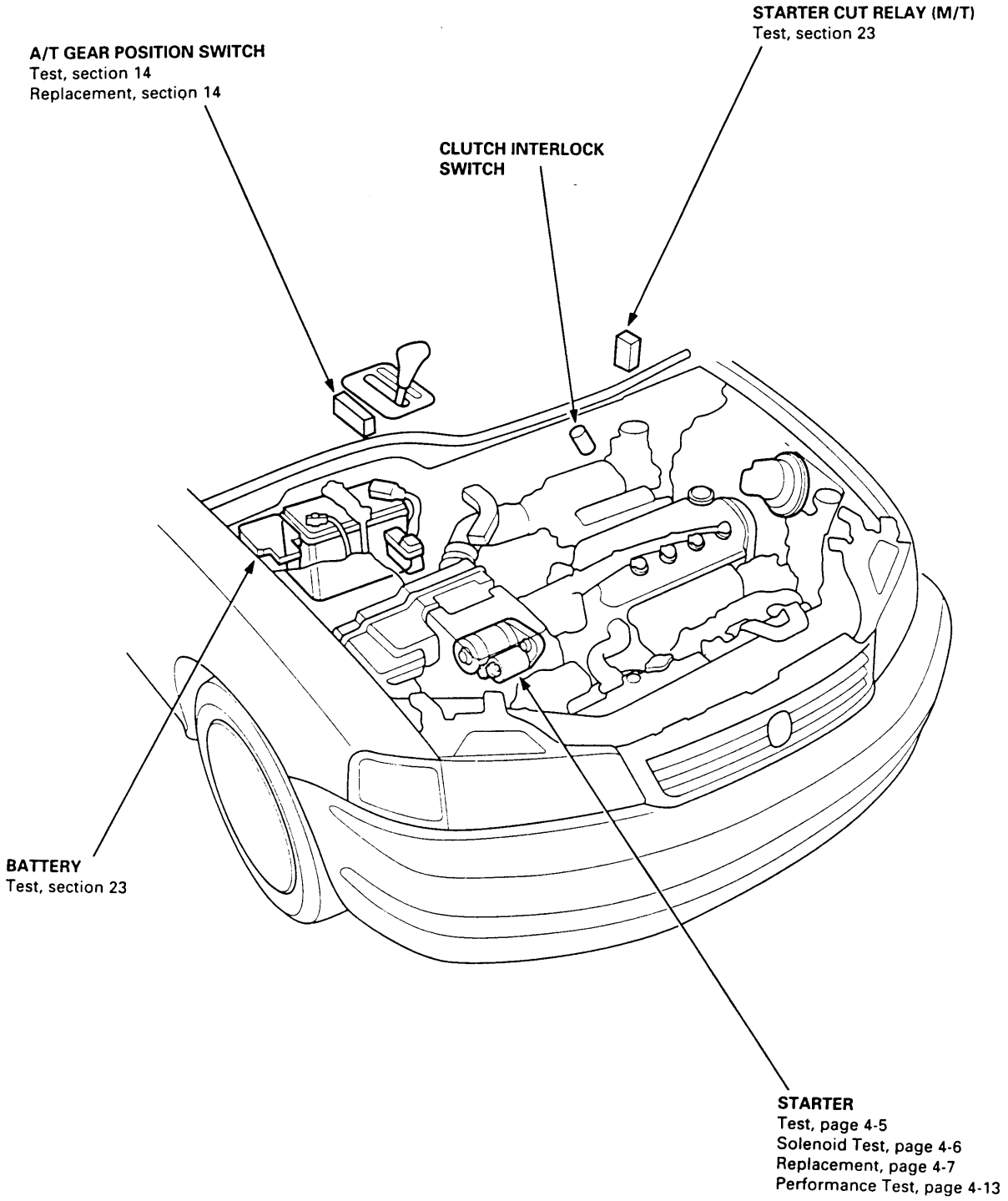
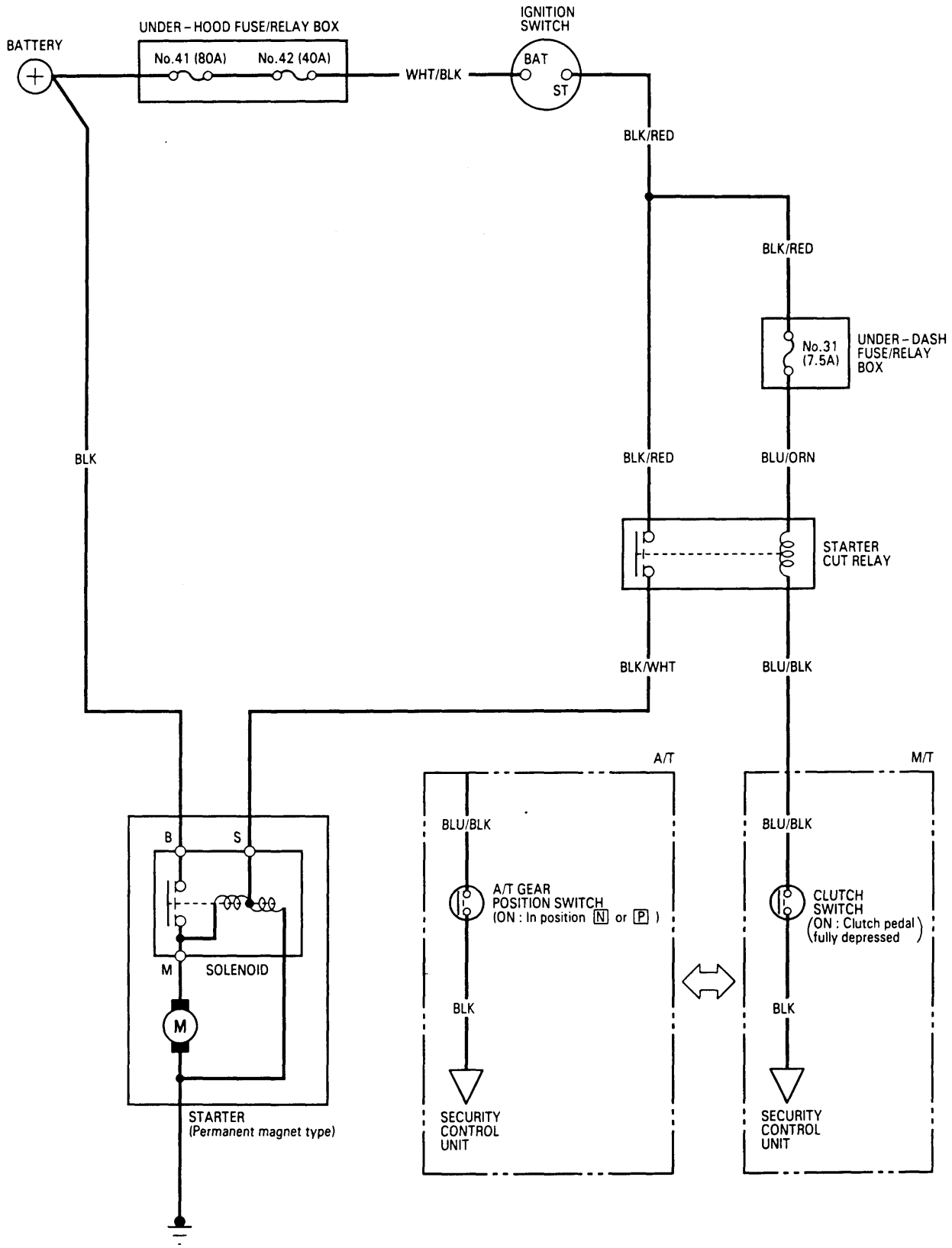
Component Location Index



Circuit Diagram



Starter Test

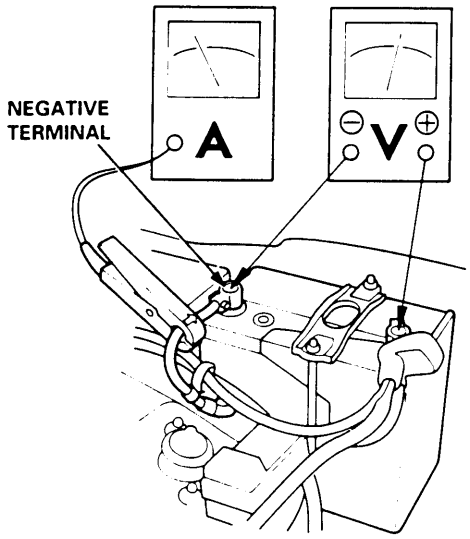
NOTE: The air temperature must be between 59 and 100°F (15 and 38°C) before testing.

Recommended Procedure:

- Use a starter system tester.
- Connect and operate the equipment in accordance with the manufacturer's instructions.
- Test and troubleshoot as described.

Alternate Procedure:

- Use following equipment:
  — Ammeter, 0 – 400 A
  — Voltmeter, 0 – 20 V (accurate within 0.1 volt)
  — Tachometer, 0 – 1,200 rpm
- Hook up a voltmeter and ammeter as shown.



NOTE: After this test, or any subsequent repair, reset the ECM/PCM to clear any codes (see section 11).

Check the Starter Engagement:

1. Remove the No. 44 (15 A) fuse from the under-hood fuse/relay box.

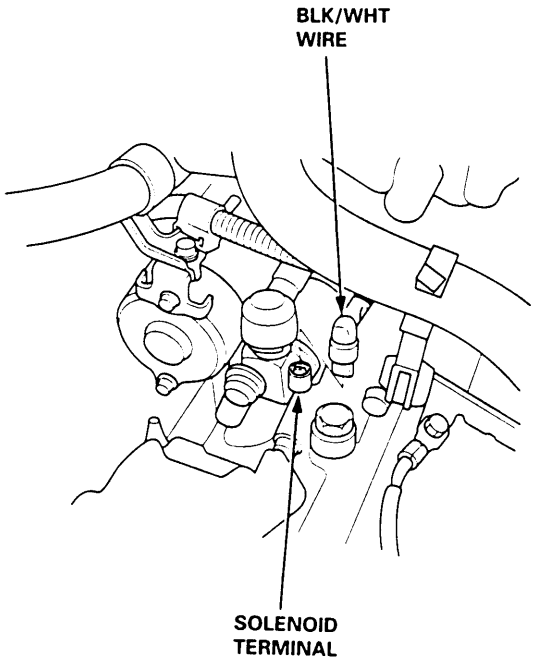
2. Turn the ignition switch to START (III) with the shift lever in [N] or [P] position (A/T) or with the clutch pedal depressed (M/T). The starter should crank the engine.

   - If the starter does not crank the engine, go to step 3.
   - If it cranks the engine erratically or too slowly, go to "Check for Wear and Damage" on the next page.

3. Check the battery, battery positive cable, ground, starter cut relay, and the wire connections for looseness and corrosion. Test again.
   If the starter still does not crank the engine, go to step 4.

4. Unplug the connector (BLK/WHT wire and solenoid terminal) from the starter.

5. Connect a jumper wire from the battery positive (+) terminal to the solenoid terminal.
   The starter should crank the engine.



   - If the starter still does not crank the engine, remove it, and diagnose its internal problem.
   - If the starter cranks the engine, go to step 6.

6. Check the ignition switch (see section 23).

7. Check the starter cut relay and clutch interlock switch (see section 23).

8. Check the A/T gear position switch (see section 14).

9. Check for an open in the wire between the ignition switch and starter.

(cont'd)

Starter Test (cont'd)

Check for Wear and Damage
The starter should crank the engine smoothly and steadily, If the starter engages, but cranks the engine erratically, remove it, and inspect the starter drive gear and torque converter or flywheel ring gear for damage.

Check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held.
If damaged, replace the gears.

Check Cranking Voltage and Current Draw
Cranking voltage should be no less than 8.5 volts.
Current draw should be no more than 350 amperes.

If cranking voltage is too low, or current draw too high, check for:
- dead or low battery.
- open circuit in starter armature commutator segments.
- starter armature dragging.
- shorted armature winding.
- excessive drag in engine.

Check Cranking rpm
Engine speed during cranking should be above 100 rpm.
If speed is too low, check for:
- loose battery or starter terminals.
- excessively worn starter brushes.
- open circuit in commutator segments.
- dirty or damaged helical spline or drive gear.
- defective drive gear overrunning clutch.

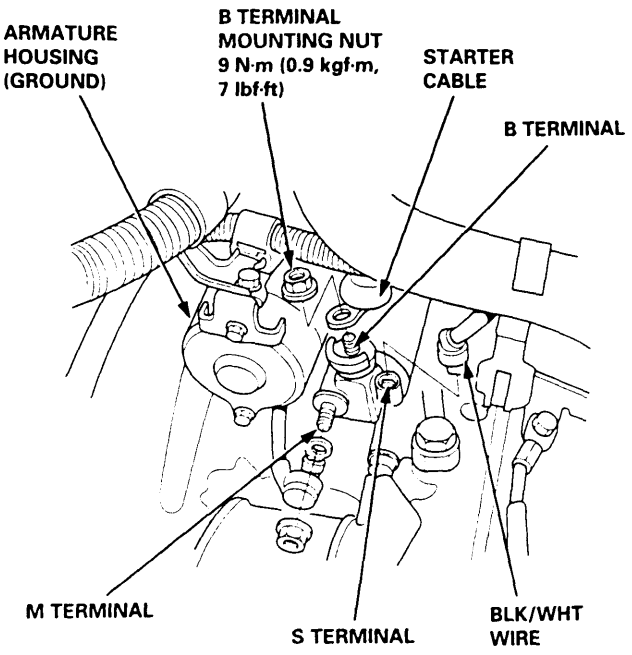
Check Starter Disengagement

With the shift lever in [N] or [P] position (A/T) or with the clutch pedal depressed (M/T), turn the ignition switch to START (III), and release to ON (II).
The starter drive gear should disengage from the torque converter or flywheel ring gear when you release the key.

If the drive gear hangs up on the torque converter or flywheel ring gear, check for:
- solenoid plunger and switch malfunction.
- dirty drive gear assembly or damaged overrunning clutch.

Starter Solenoid Test

1. Check the hold-in coil for continuity between the S terminal and the armature housing (ground). The coil is OK if there is continuity.

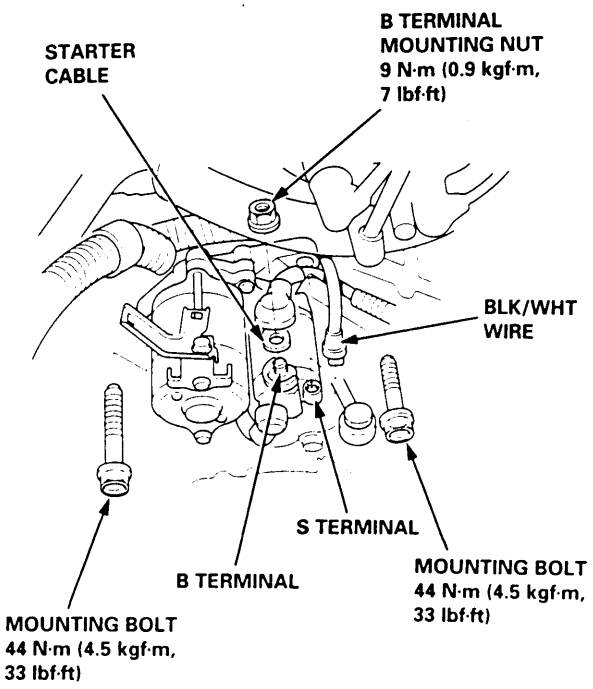


2. Check the pull-in coil for continuity between the S and M terminals. The coil is OK if there is continuity.

Starter Replacement

1. Disconnect the battery negative cable.

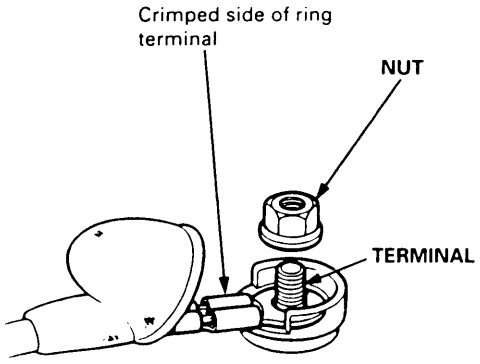
2. Disconnect the starter cable from the B terminal on the solenoid, then disconnect the BLK/WHT wire from the S terminal.



3. Remove the two bolts holding the starter, then remove the starter.

4. Install in the reverse order of removal.

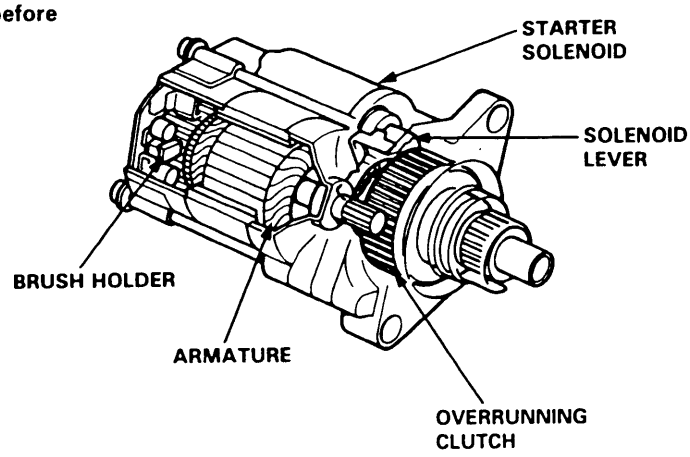
   NOTE: When installing the starter cable, make sure that the crimped side of the ring terminal is facing out.

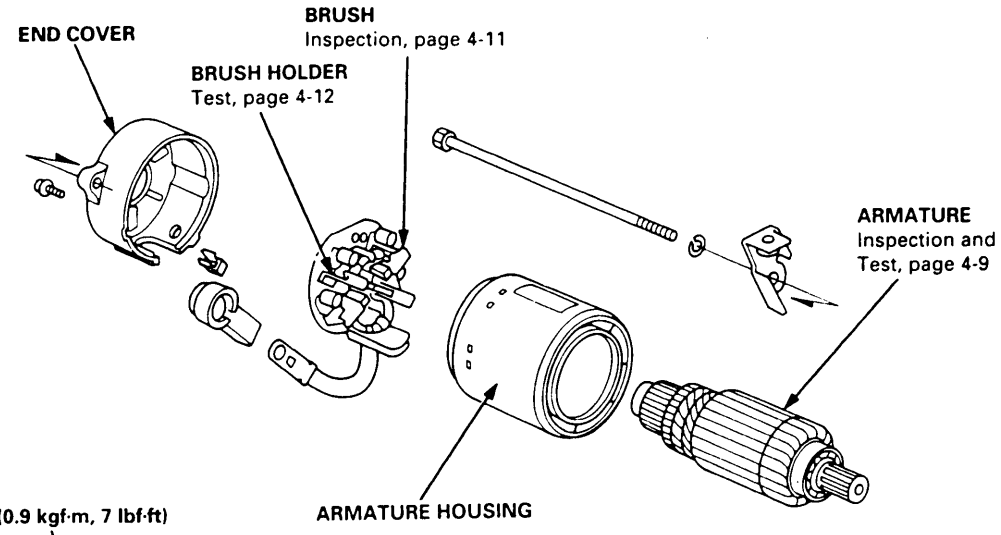


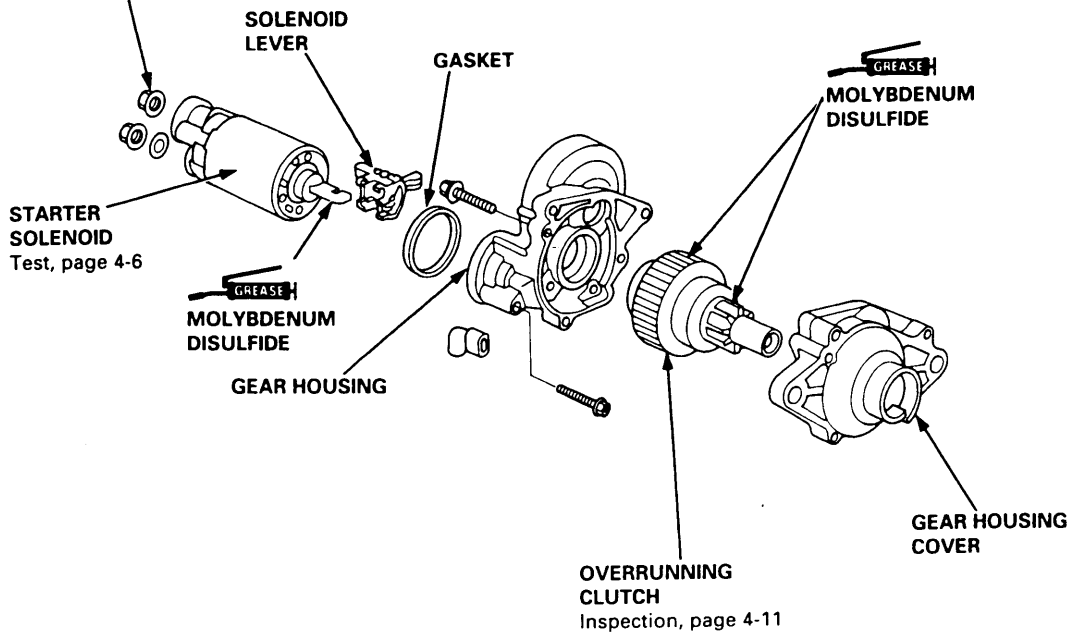
5. Connect the battery positive cable and negative cable to the battery.

Starter Overhaul

CAUTION: Disconnect the battery negative cable before removing the starter.



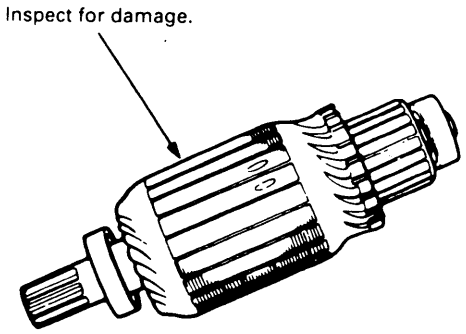




Armature Inspection and Test

1. Inspect the armature for wear or damage due to contact with the permanent magnet or field winding.

   If there is wear or damage, replace the armature.

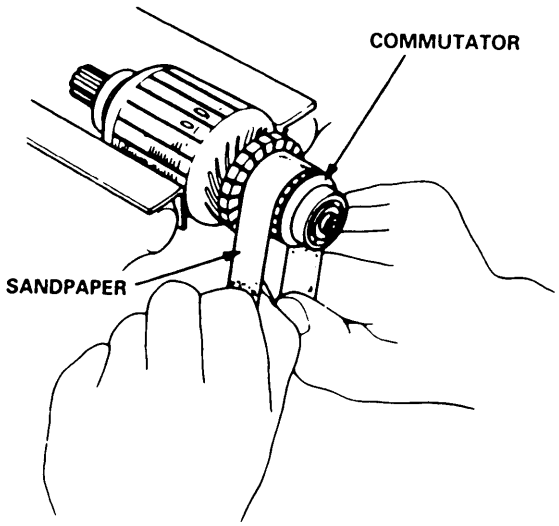


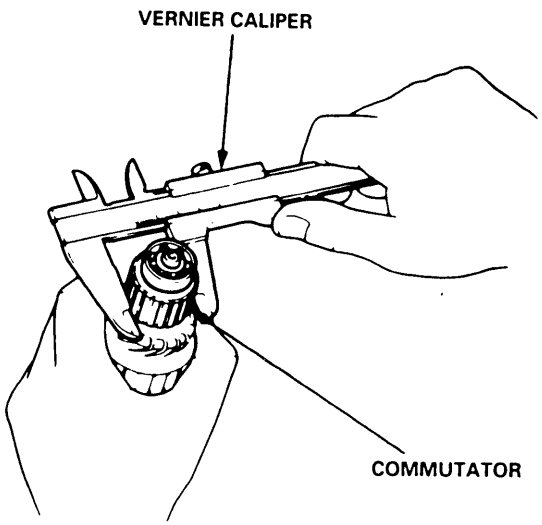
2. Check commutator surface and diameter.

   - If the surface is dirty or burnt, resurface with emery cloth or a lathe within the following specifications, or recondition with #500 or #600 sandpaper.
   - If commutator diameter is below the service limit, replace the armature.

Commutator Diameter

Standard (NEW)	Service Limit
28.0 – 28.1 mm (1.102 – 1.106 in)	27.5 mm (1.083 in)



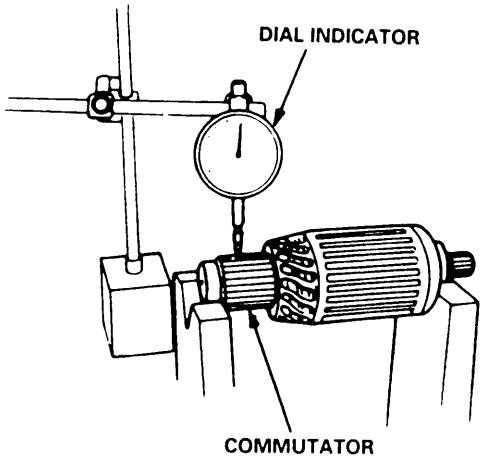


3. Measure the commutator runout.

   - 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

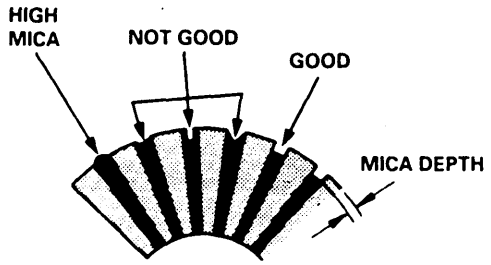
Standard (NEW)	Service Limit
0 – 0.02 mm (0 – 0.0008 in)	0.05 mm (0.002 in)



(cont'd)

Armature Inspection and Test (cont'd)

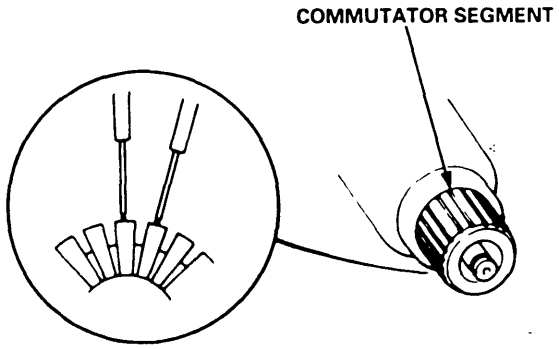
4. Check the mica depth. If necessary, undercut the mica with a hacksaw blade to achieve the proper depth. If service limit cannot be maintained, replace the armature.



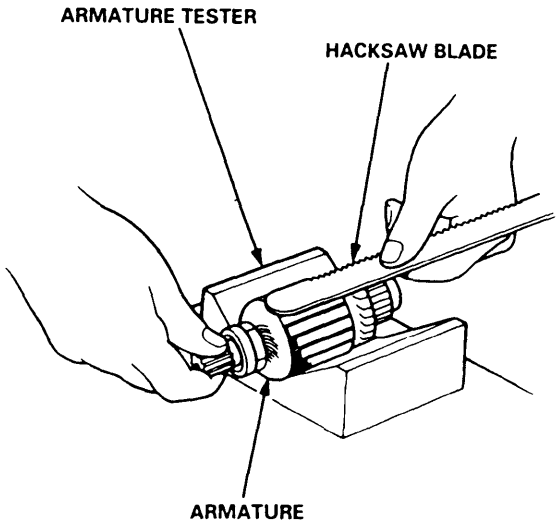
Commutator Mica Depth

Standard (NEW)	Service Limit
0.4 – 0.5 mm (0.016 – 0.02 in)	0.15 mm (0.006 in)

5. Check for continuity between the segments of the commutator. If an open circuit exists between any segments, replace the armature.

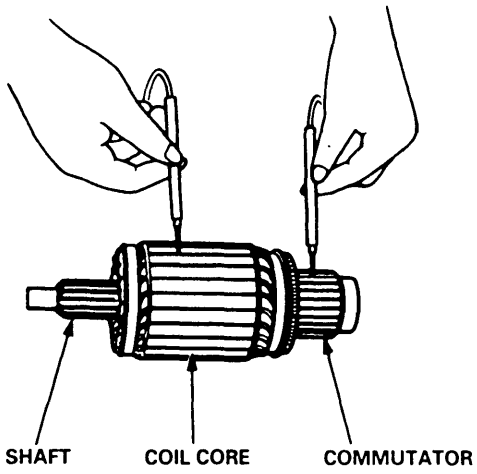


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



If the blade is attracted to the core or vibrates while the core is turned, the armature is shorted. Replace the armature.

7. Check with an ohmmeter that no continuity exists between the commutator and armature coil core, and between the commutator and armature shaft. If there is continuity, replace the armature.

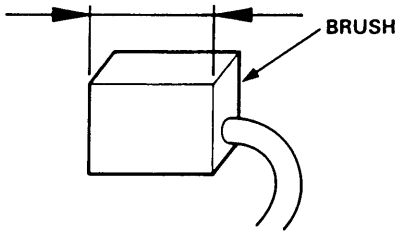


Brush Inspection

Measure the brush length. If not within the service limit, replace the brush holder assembly.

Brush Length

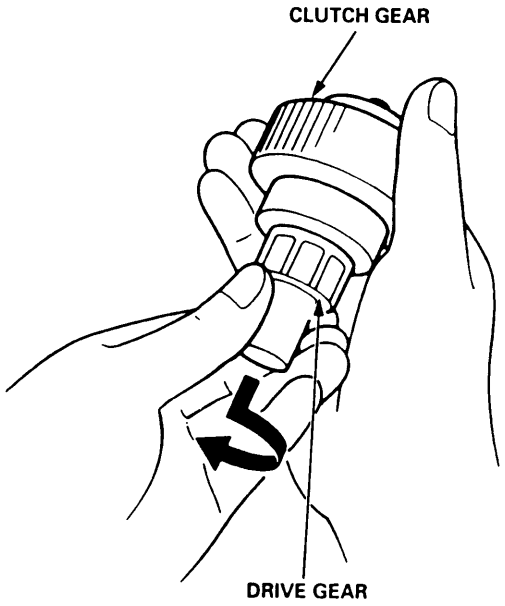
Standard (NEW)	Service Limit
15.8 – 16.2 mm (0.62 – 0.64 in)	11.0 mm (0.43 in)



NOTE: To seat new brushes after installing them in their holders, slip a strip of #500 or #600 sandpaper, with the grit side up, over the commutator and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.

Overrunning Clutch Inspection

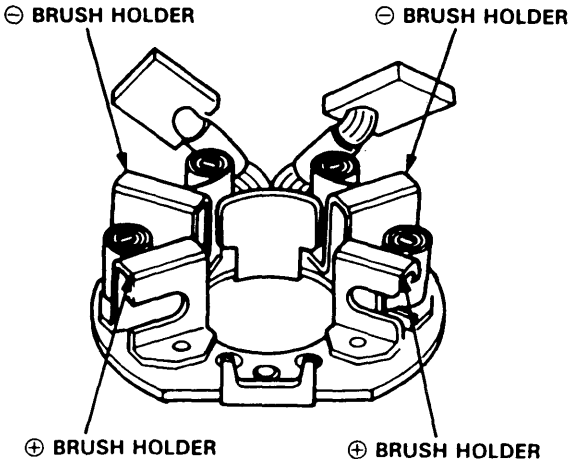
1. Slide the overrunning clutch along the shaft. Does it move freely? If not, replace it.
2. Rotate the overrunning clutch both ways. Does it lock in one direction and rotate smoothly in reverse? If it does not lock in either direction or it locks in both directions, replace it.



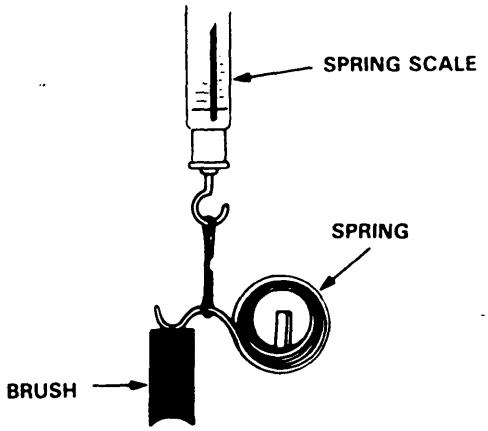
3. If the starter drive gear is worn or damaged, replace the overrunning clutch assembly; the gear is not available separately.
4. Check the condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

Brush Holder Test

1. Check that there is no continuity between the ⊕ and ⊖ brush holders.
   If there is continuity, replace the brush holder assembly.



2. Insert the brush into the brush holder, and bring the brush into contact with the commutator, then attach a spring scale to the spring. Measure the spring tension at the moment the spring lifts off the brush.

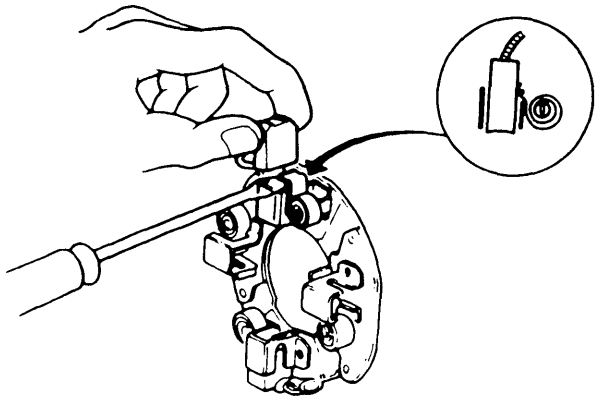


Spring Tension
18.5 – 23.5 N (1.85 – 2.35 kgf, 4.1 – 5.2 lbf)

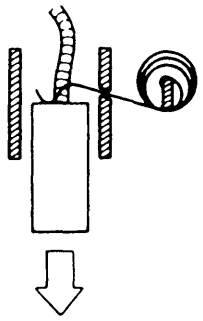
Starter Reassembly

NOTE: Use the illustration on page 4-8 as reference for reassembly.

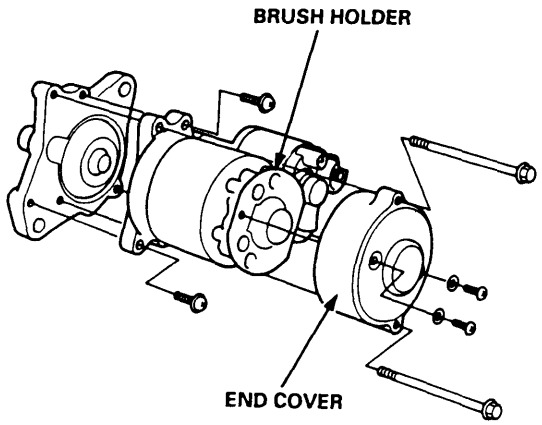
1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



2. Install the armature in the housing. Next, pry back each brush spring again, and push the brush down until it seats against the commutator, then release the spring against the end of the brush.



3. Install the end cover on the brush holder.



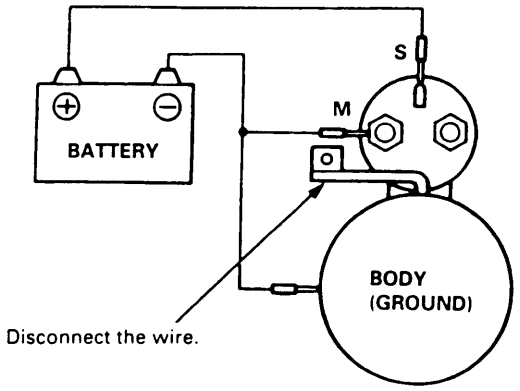
Performance Test

NOTE: Before starting the following checks, disconnect the wire from terminal M, and make a connection as described below using as heavy a wire as possible (preferably equivalent to the wire used for the vehicle).

Pull-in Coil Test:

Connect the battery as shown. If the starter pinion pops out, it is working properly.

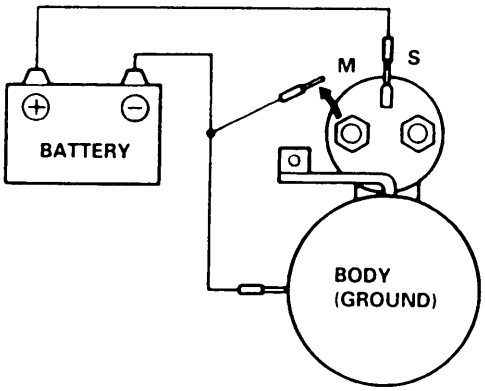
CAUTION: Do not leave the battery connected for more than 10 seconds.



Hold-in Coil Test:

Disconnect the battery from the M terminal. If the pinion does not retract, the hold-in coil is working properly.

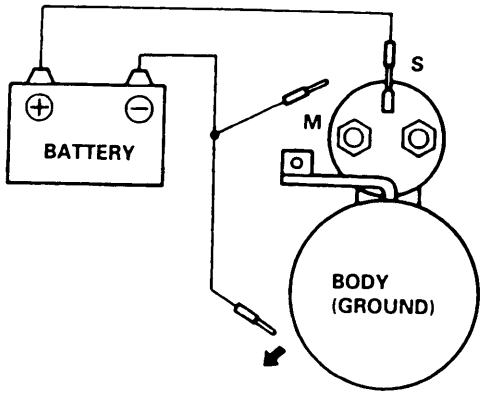
CAUTION: Do not leave the battery connected for more than 10 seconds.



Retracting Test:

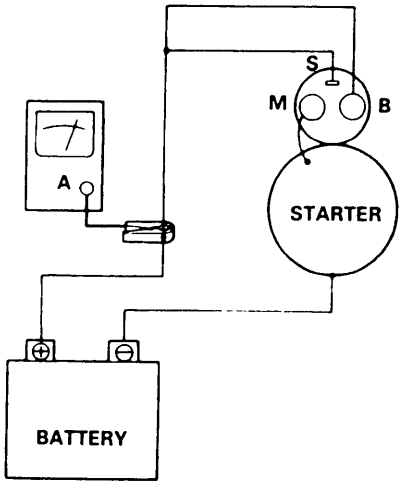
Disconnect the battery also from the body. If the pinion retracts immediately, it is working properly.

CAUTION: Do not leave the battery connected for more than 10 seconds.



Starter No-load Test:

1. Clamp the starter firmly in a vise.
2. Connect the starter to the battery as described in the diagram below, and confirm that the motor starts and keeps rotating.



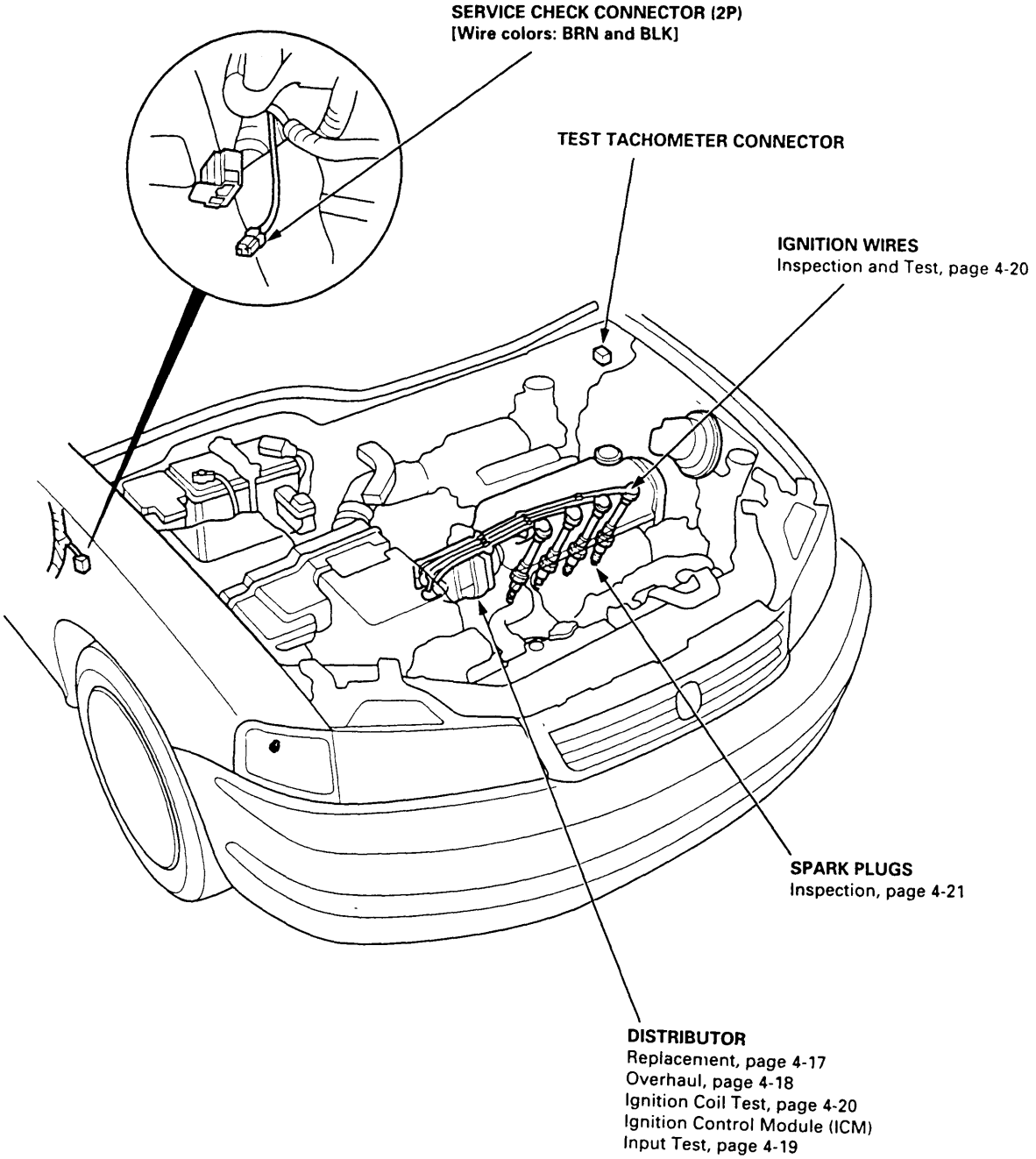
3. If the electric current and motor speed meet the specifications when the battery voltage is at 11.5 V, the starter is working properly.

Specifications:

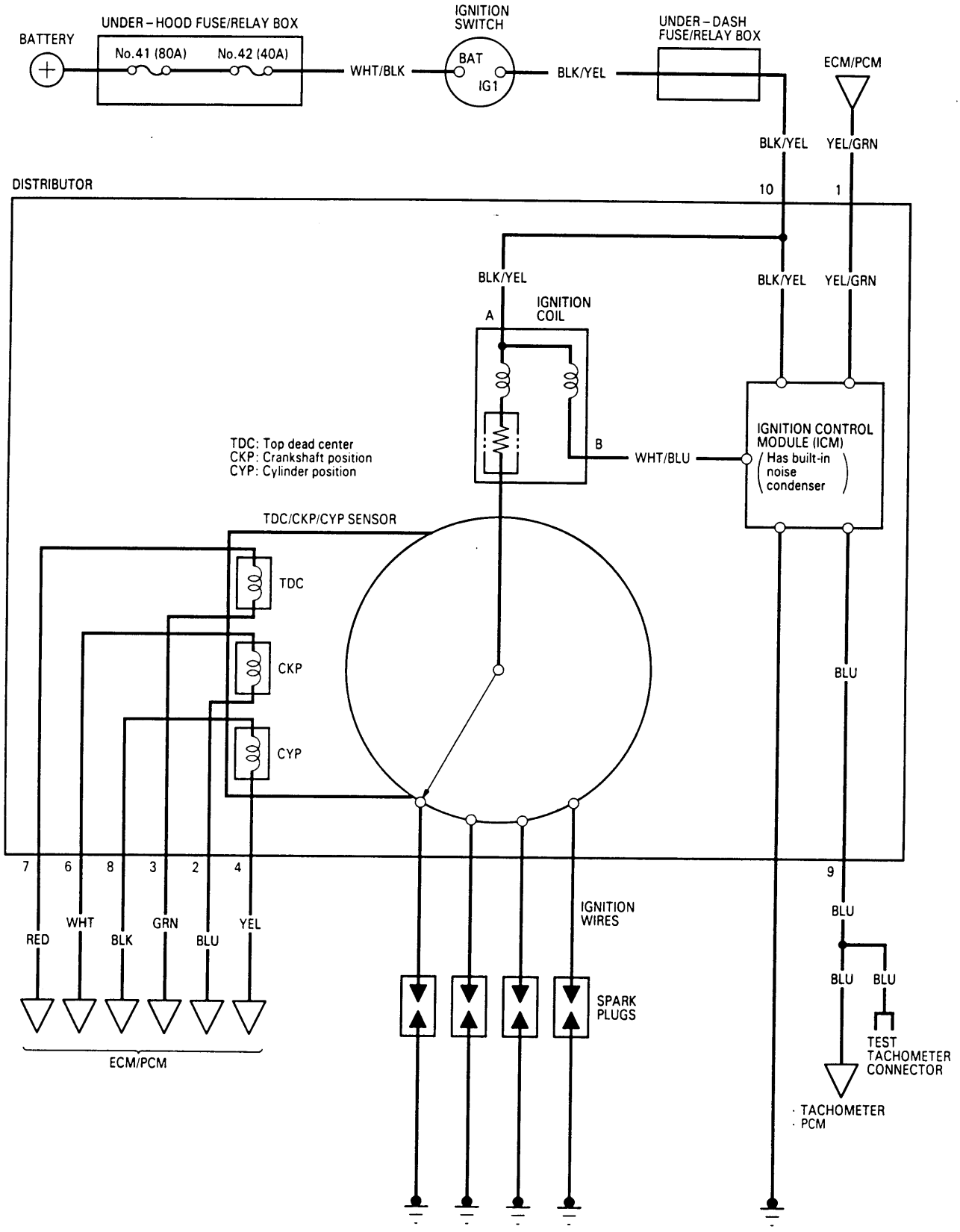
80 A or less (Electric current), 2,600 rpm or more (Motor-speed)

Component Location Index

IGNITION TIMING CONTROL SYSTEM
- Troubleshooting, section 11
- Idle speed Inspection/Adjustment, section 11
- Inspection and Setting, page 4-16



Circuit Diagram



Ignition Timing Inspection and Setting

1. Check the idle speed, and adjust it if necessary (see section 11).

2. Remove the service check connector 2P (BRN and BLK wires) from the connector holder located under the dash on the front passenger side, then connect the SCS service connector (T/N 07PAZ – 0010100) to it.

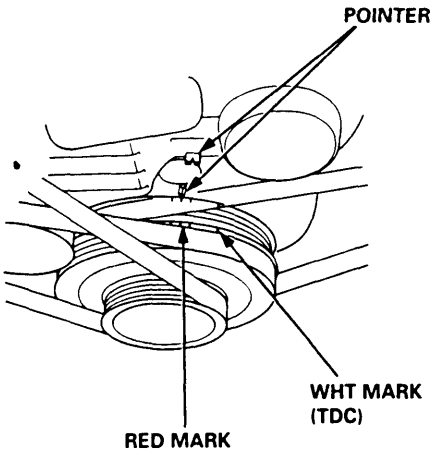
3. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P], M/T in neutral) until the radiator fan comes on, then let it idle.

4. Connect the timing light to the No. 1 ignition wire, then point the light toward the pointer on the timing belt cover.

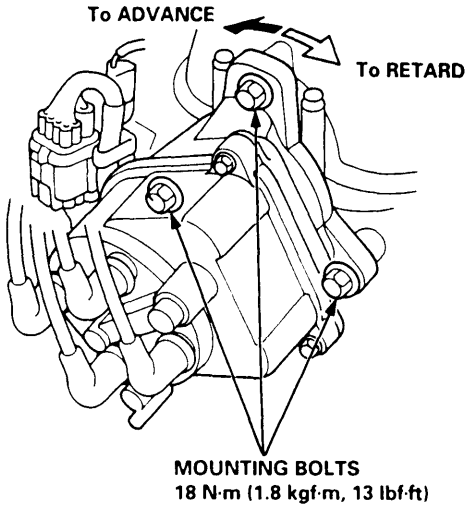
5. Check the ignition timing in no load conditions: headlights, blower fan, rear window defogger, and air conditioner are not operating.

   Ignition Timing:

M/T	12° ± 2° BTDC (RED) during idling in neutral
A/T	12° ± 2° BTDC (RED) during idling in [N] or [P]



6. Adjust the ignition timing if necessary, as follows. Loosen the distributor mounting bolts, and turn the distributor ignition (DI) housing counterclockwise to advance the timing, or clockwise to retard the timing.



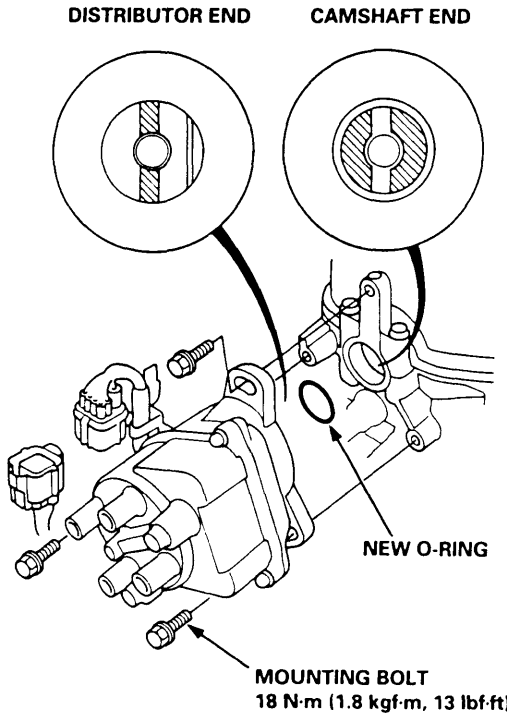
7. Tighten the distributor mounting bolts, and recheck the ignition timing.

8. Disconnect the SCS service connector from the service check connector.

Distributor Replacement

Removal:

1. Disconnect the connector from the distributor.
2. Disconnect the ignition wires from the distributor ignition (DI) cap.
3. Remove the mounting bolts from the distributor, then remove the distributor from the cylinder head.



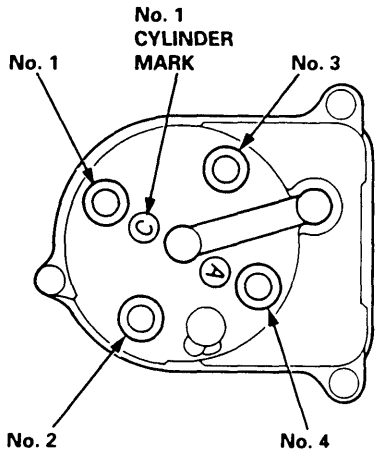
Installation:

NOTE: Before you install the distributor, bring the No. 1 piston to compression stroke TDC.

1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

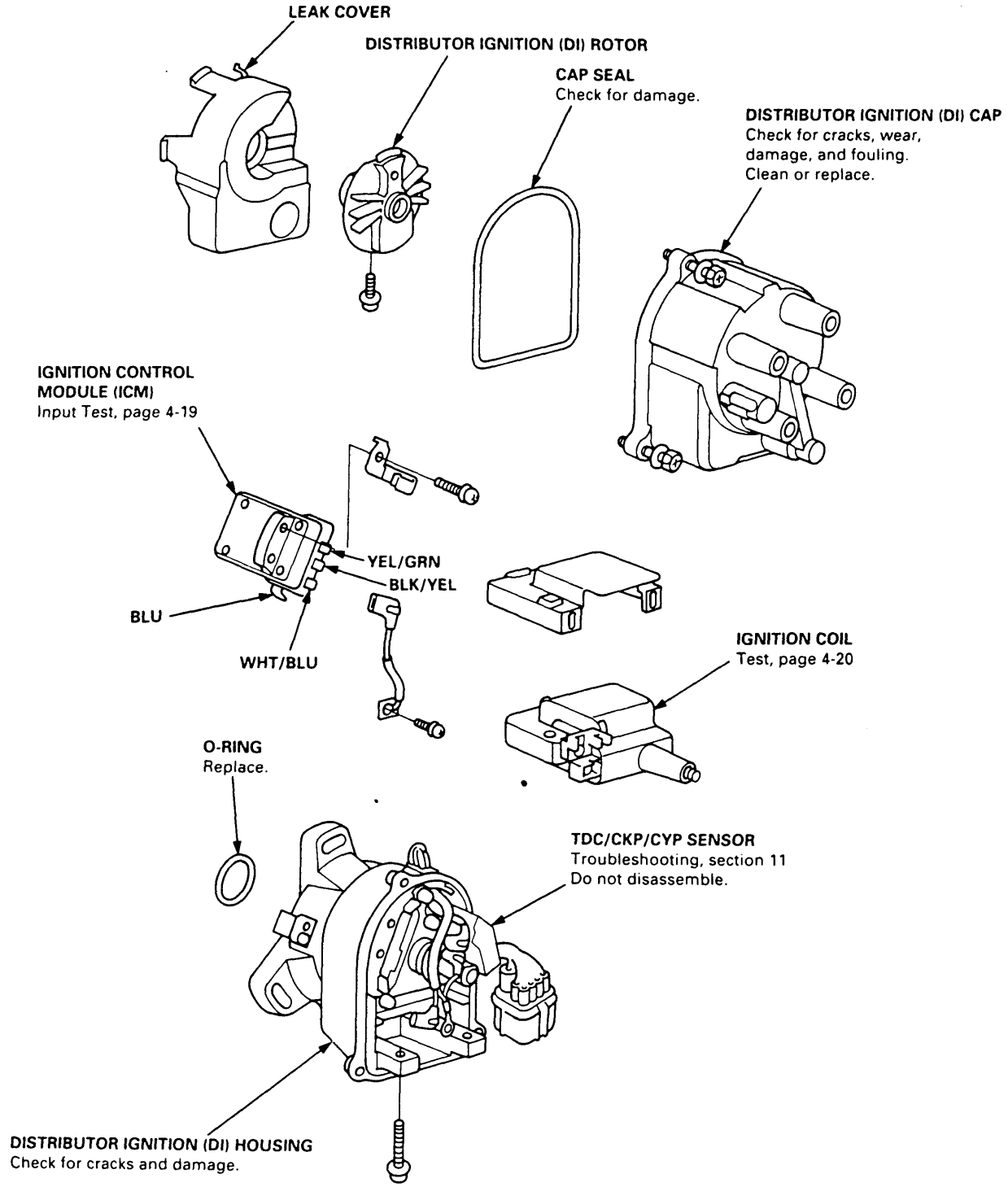
   NOTE: The lug on the end of the distributor and its mating grooves in the camshaft end are both offset to eliminate the possibility of installing the distributor 180° out of time.

3. Install the mounting bolts, and tighten them lightly.
4. Connect the ignition wires to the distributor ignition (DI) cap as shown.



5. Connect the connector to the distributor.
6. Set the ignition timing (see previous page).
7. After setting the ignition timing, tighten the mounting bolts.

Distributor Overhaul

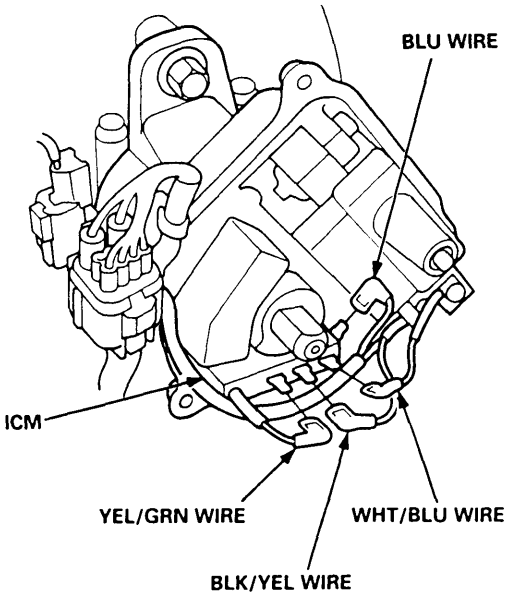


Ignition Control Module (ICM) Input Test

NOTE:
- See section 11 if the malfunction indicator lamp (MIL) came on.
- Perform an input test for the ignition control module (ICM) after finishing the fundamental tests for the ignition system and the fuel and emissions systems.

1. Remove the distributor ignition (DI) cap, the distributor ignition (DI) rotor and the leak cover.

2. Disconnect the wires from the ICM.



3. Turn the ignition switch ON (II). Check for voltage between the BLK/YEL wire and body ground.
There should be battery voltage.

   - If there is no battery voltage, check the BLK/YEL wire between the under-dash fuse/relay box and the ICM.
   - If there is battery voltage, go to step 4.

4. Turn the ignition switch ON (II). Check for voltage between the WHT/BLU wire and body ground.
There should be battery voltage.

   - If there is no battery voltage, check:
     — the ignition coil.
     — the WHT/BLU wire between the ignition coil and the ICM.
   - If there is battery voltage, go to step 5.

5. Disconnect the ECM/PCM connector A (32P). Check for continuity on the YEL/GRN wire between the ECM/PCM and the ICM.
There should be continuity.

6. Check for continuity on the YEL/GRN wire to body ground.
There should be no continuity. If there is continuity (short to ground), the ICM is probably damaged.

7. Check for continuity on the BLU wire between the test tachometer connector and the ICM.
There should be continuity.

8. Check for continuity on the BLU wire to body ground.
There should be no continuity.

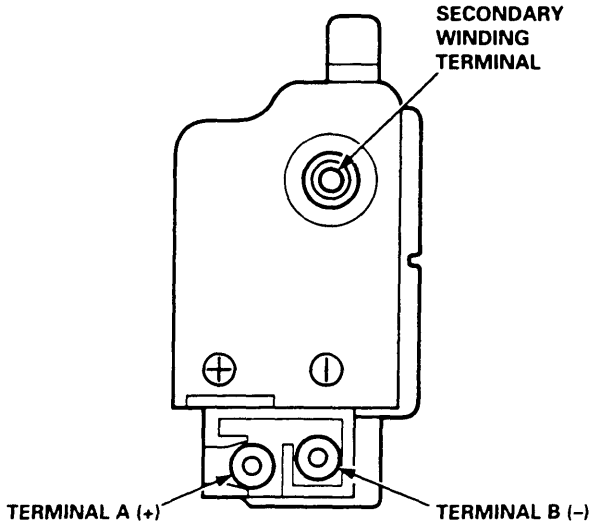
9. If all the tests are normal, replace the ICM.

Ignition Coil Test

Using an ohmmeter, measure resistance between the terminals. If the resistance is not within specifications, replace the ignition coil.

NOTE: Resistance will vary with the coil temperature; specifications are at 68°F (20°C).

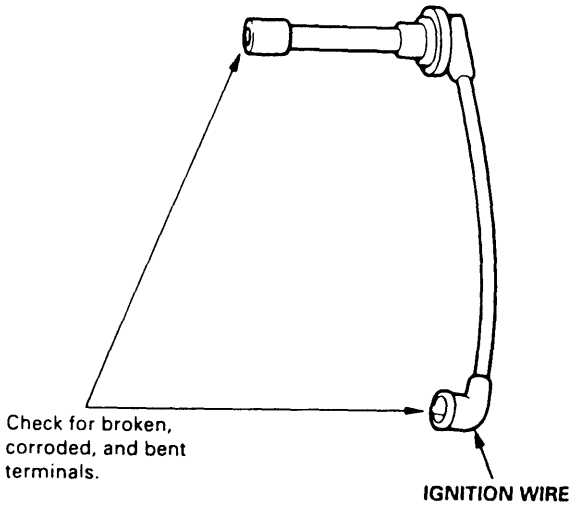
Primary Winding Resistance
(Between the A and B terminals):
0.63 – 0.77 Ω
Secondary Winding Resistance
(Between the A and secondary winding terminals):
12.8 – 19.2 kΩ



Ignition Wire Inspection and Test

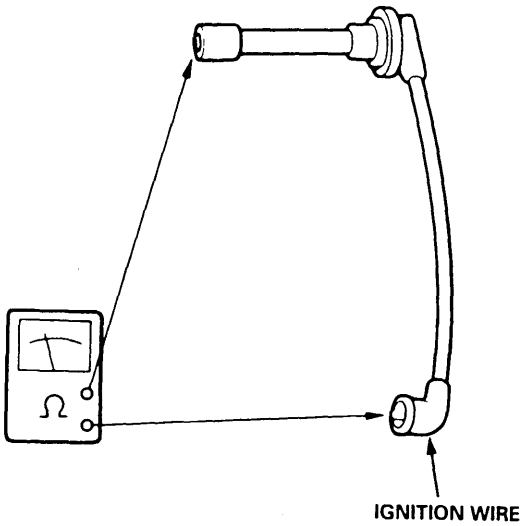
CAUTION: Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires; you might break them inside.

1. Check the condition of the ignition wire terminals. If any terminal is corroded, clean it, and if it is broken or distorted, replace the ignition wire.



2. Connect ohmmeter probes and measure resistance.

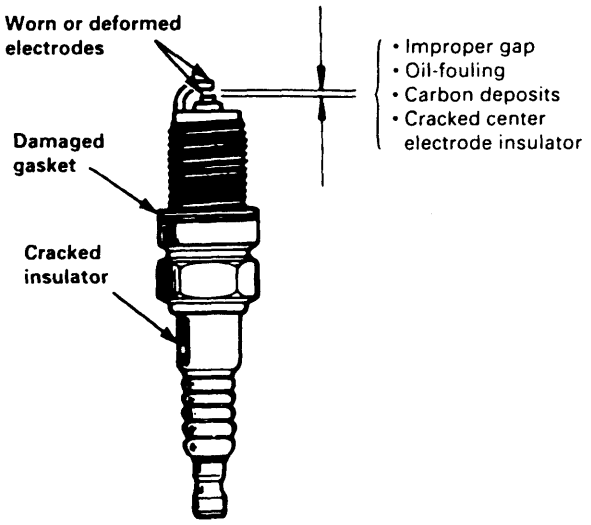
   Ignition Wire Resistance:
   25 kΩ max. at 68°F (20°C)



3. If resistance exceeds 25 kΩ, replace the ignition wire.

Spark Plug Inspection

1. Inspect the electrodes and ceramic insulator for:



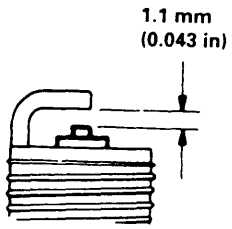
Burned or worn electrodes may be caused by:
- Advanced ignition timing
- Loose spark plug
- Plug heat range too hot
- Insufficient cooling

Fouled plugs 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 coil or ignition wires

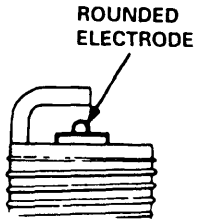
2. Check the electrode gap.
   - Adjust the gap with a suitable gapping tool.

Electrode Gap

Standard	1.1 $^{0}_{-0.1}$ mm (0.043 $^{0}_{-0.004}$ in)



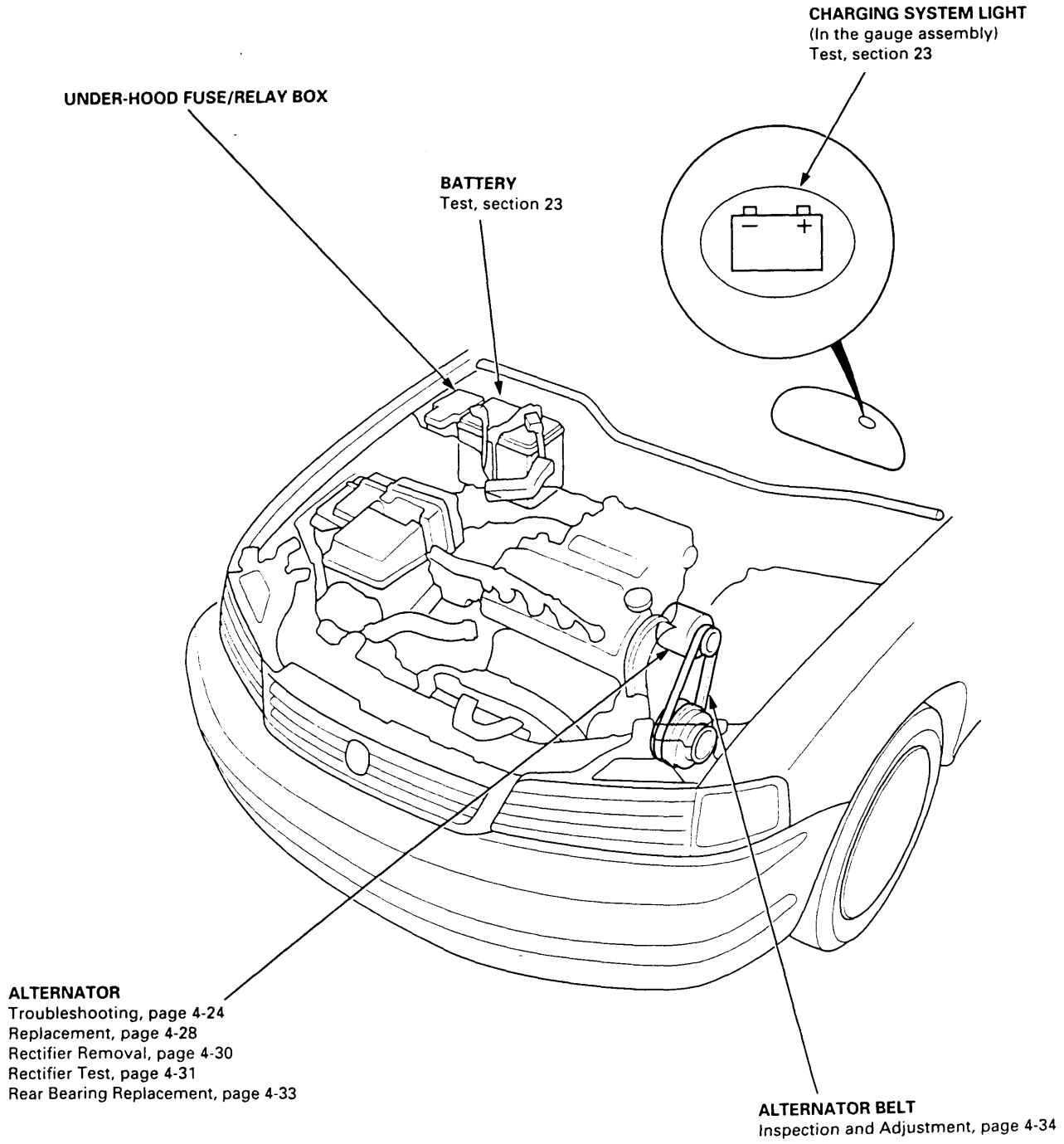
   - Replace the plug if the center electrode is rounded as shown below:



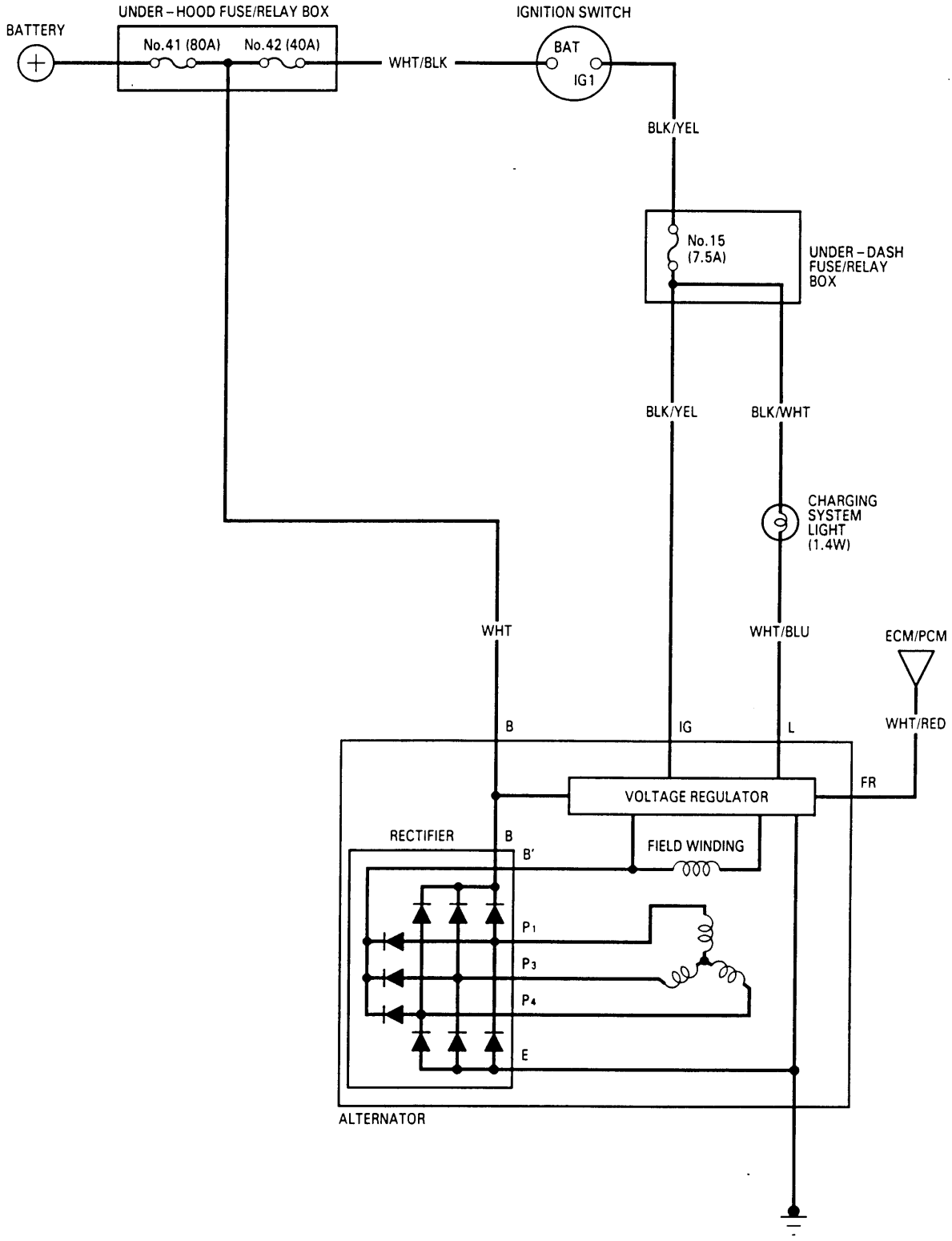
Spark Plugs:
ZFR5F-11 (NGK)
KJ16CR-L11 (ND)

3. Apply a small quantity 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



Circuit Diagram



Troubleshooting

If the charging system light does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:

1. Battery (see section 23)
2. Charging system light
3. Voltage
4. Alternator/regulator

Charging System Light Test

Charging System Light Check-1:
Make sure the charging system light comes on.

Does the charging system light come on?

NO → **Check for a blown No. 15 (7.5 A) fuse and a blown charging system light bulb. If the fuse and bulb are OK, repair the open in the WHT/BLU wire.**

YES

Charging System Light Check-2:
Start the engine.

Does the charging system light go off?

YES → **Go to Alternator/Regulator Test (see page 4-26).**

NO

Voltage Check:
Measure the voltage at the No. 2 terminal of the 3P connector with the ignition switch ON (II).

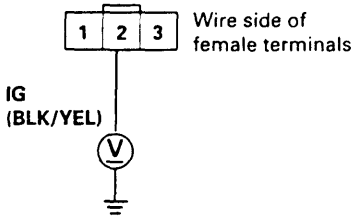
Is there battery voltage?

NO → **Repair the open in the BLK/YEL wire between the alternator and under-dash fuse/relay box.**

YES

(To next page)

ALTERNATOR 3P CONNECTOR



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Check for an open in the L circuit:
1. Turn the ignition switch OFF.
2. Disconnect the 3P connector from the alternator.
3. Ground the No. 3 terminal of the 3P connector with a jumper wire.
4. Turn the ignition switch ON (II).

Does the charging system light come on?

NO → **Turn the ignition switch OFF, and repair the open in the WHT/BLU wire.**

YES

Check for an open in the L circuit (cont'd):
Disconnect the jumper wite between the No. 3 terminal of the 3P connector and ground.

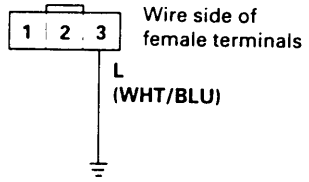
Does the charging system light go off?

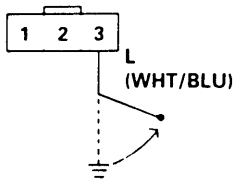
YES → **Test and repair the alternator components.**

NO

Turn the ignition switch OFF, and repair the short to ground in the WHT/BLU wire.

ALTERNATOR 3P CONNECTOR





(cont'd)

Troubleshooting (cont'd)

Alternator/Regulator Test

NOTE: Make sure the battery is sufficiently charged (see section 23).

Alternator/Regulator Test-1:
1. Connect a Sun VAT-40 (or equivalent tester), and turn the selector switch to position 1 (starting).
2. Shift to neutral (A/T in [P] or [N]) position, and start the engine. Hold the engine at 3,000 rpm with no load until the radiator fan comes on, then let it idle.
3. Raise the engine speed to 2,000 rpm, and hold it there.

Is the voltage over 15.1 V?

YES

NO

Alternator/Regulator Test-2:
1. Release the accelerator pedal, and let the engine idle.
2. Make sure all accessories are turned off. Turn the selector switch to position 2 (charging).
3. Remove the inductive pick-up, and zero the ammeter.
4. Place the inductive pick-up over the battery ground cable so that the arrow points to the battery negative terminal.
5. Raise the engine speed to 2,000 rpm, and hold it there.

Replace the voltage regulator.

Is the voltage less than 13.5 V?

YES

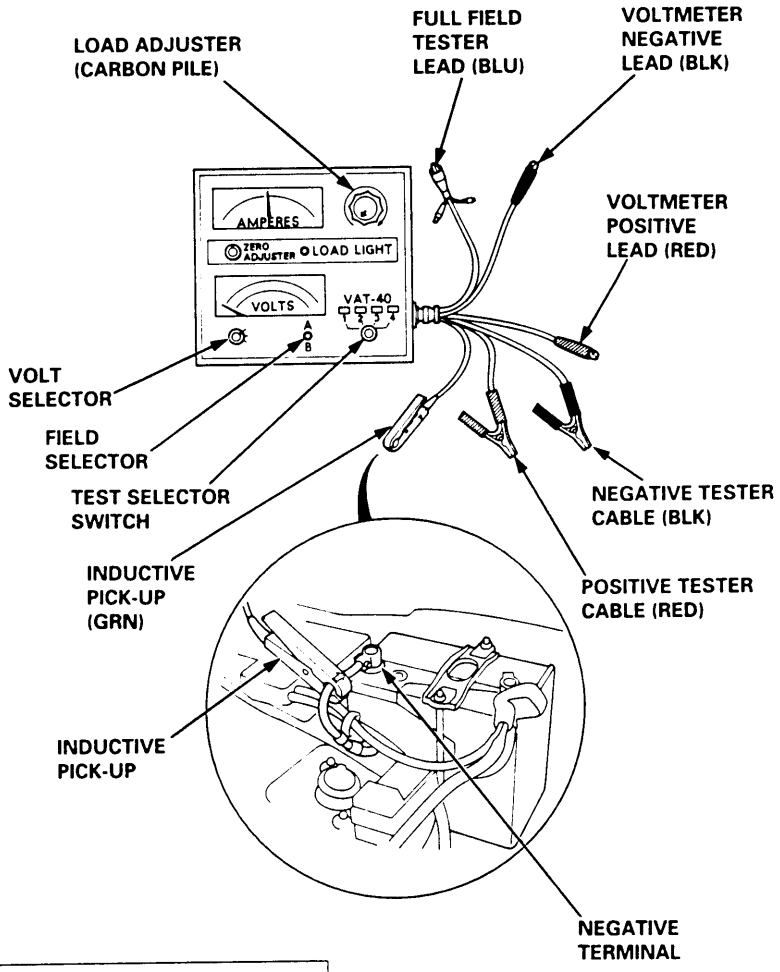
Test and repair the alternator components.

NO

Alternator/Regulator Test-3:
Apply a load with a VAT-40 until the battery voltage drops to between 12 – 13.5 V.

2

To next page



From previous page

2

Is the amperage 50 A or more?

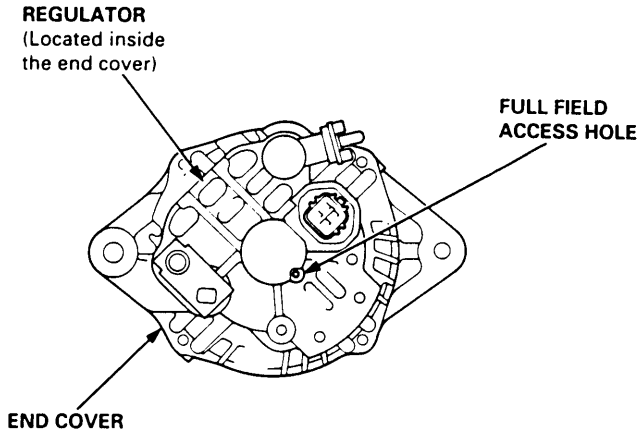
YES → **The charging system is OK.**

NO

Alternator/Regulator Test-4:
With the engine speed still at 2,000 rpm, full-field the alternator.

CAUTION: The voltage will rise quickly when the alternator is full-fielded. Do not allow the voltage to exceed 18 V; it may damage the electrical system.

NOTE: Attach a probe to a VAT-40 full field test lead, and insert the probe into the full field access hole at the back of the alternator. Switch the field selector to the "A (Ground)" position momentarily, and check the amperage reading.



Is the alternator output 50 A or more?

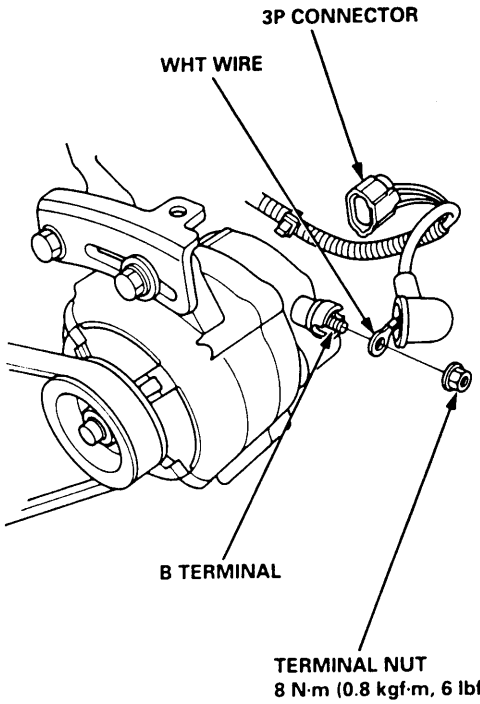
NO → **Test and repair the alternator components.**

YES

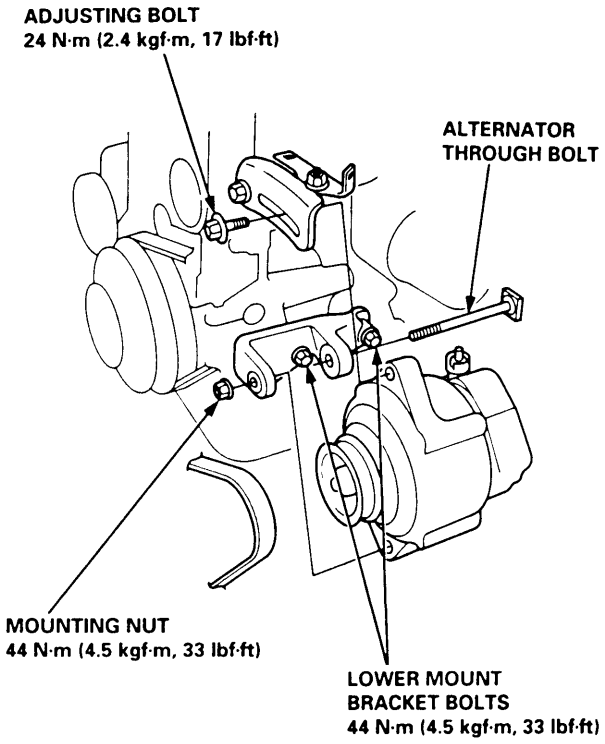
Replace the voltage regulator.

Alternator Replacement

1. Remove the battery negative cable, then disconnect the positive cable.
2. Disconnect the 3P connector from the alternator.



3. Remove the terminal nut and the WHT wire from the B terminal.
4. Remove the adjusting bolt, mounting nut, then remove the alternator belt from the pulley.

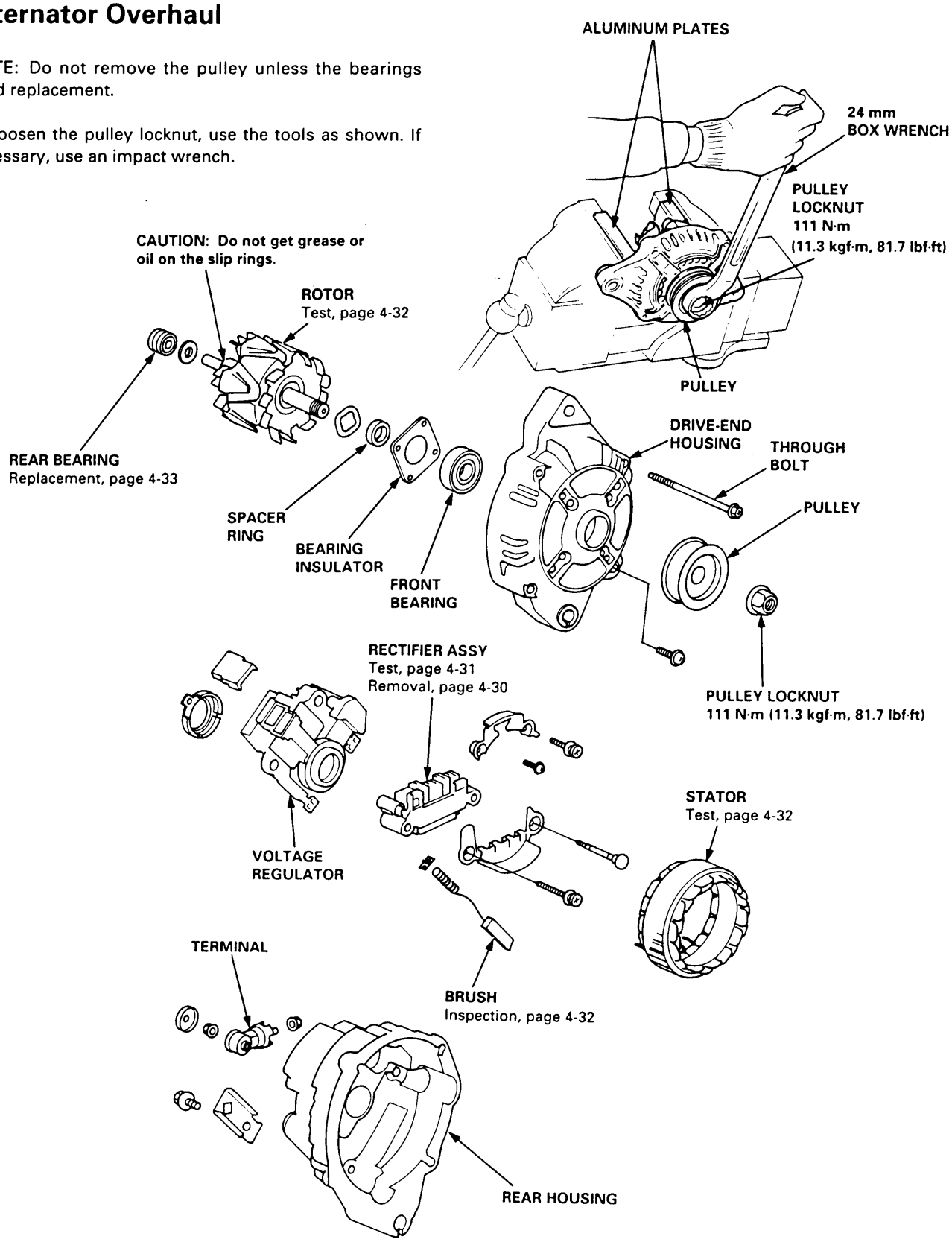


5. Pull out the through bolt, then remove the alternator from the mount brackets.
6. Remove the lower mount bracket, then remove the alternator from below the vehicle.
7. Install in the reverse order of removal.
8. Adjust the alternator belt tension after installation (see page 4-34).

Alternator Overhaul

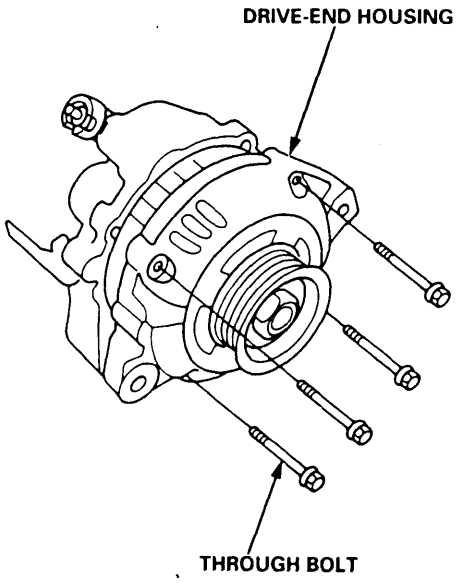
NOTE: Do not remove the pulley unless the bearings need replacement.

To loosen the pulley locknut, use the tools as shown. If necessary, use an impact wrench.

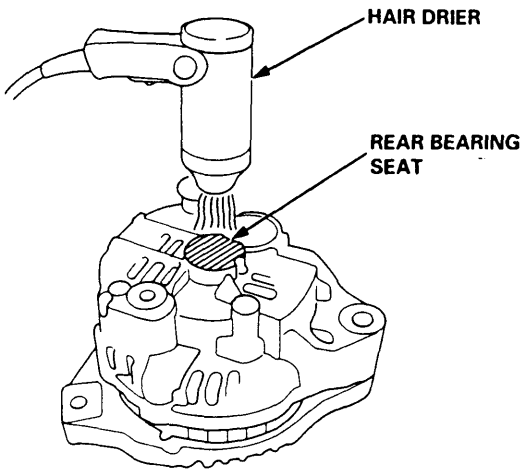


Rectifier Removal

1. Remove the four through bolts.

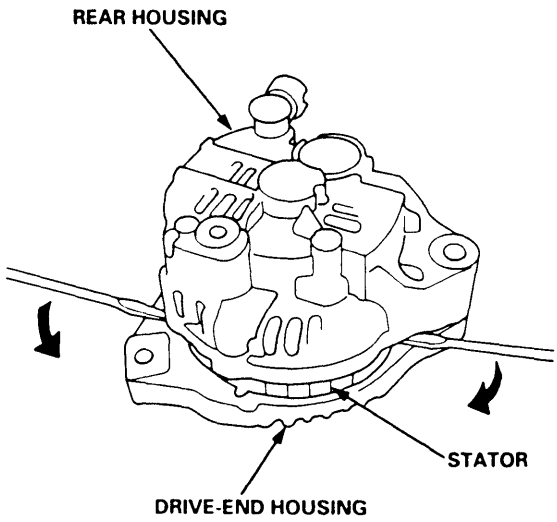


2. Heat the rear bearing seat with a 1,000 W hair drier for about five minutes (120 – 140°F, 50 – 60°C).



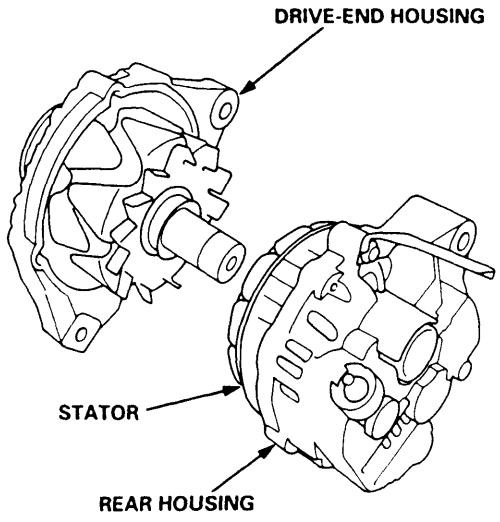
3. Separate the rear housing from the drive-end housing by inserting a flat tip screwdriver into the openings and prying them a part.

NOTE: Be careful not to damage the stator with the tip of the screwdriver.

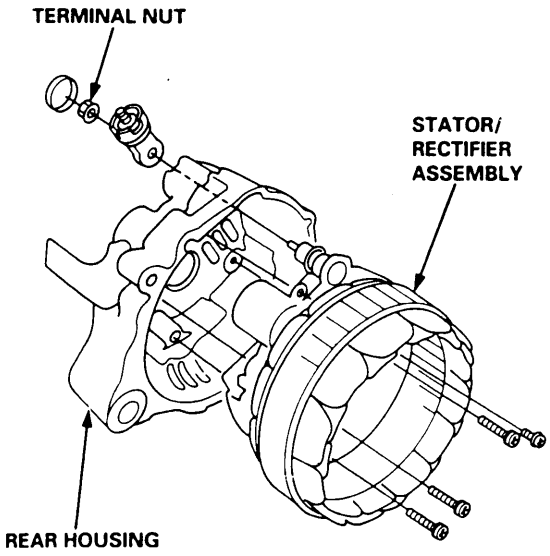


4. Separate the rear housing and drive-end housing.

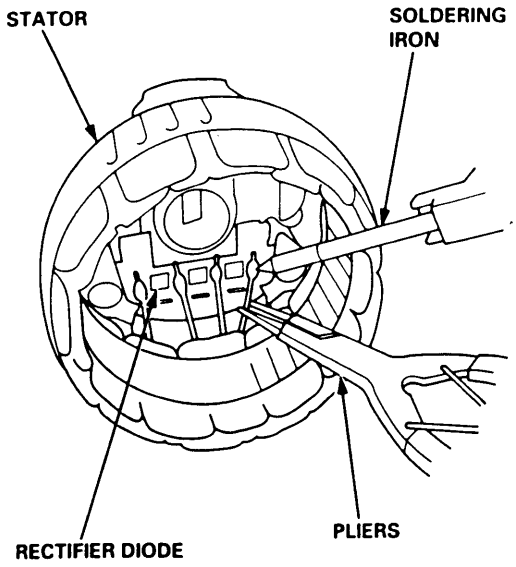
NOTE: Separate the rear housing and drive-end housing with the stator attached to the rear housing.



5. Separate the rear housing from the stator/rectifier assembly by removing the four screws and the terminal nut.



6. Unsolder the rectifier from the stator leads.
   - To avoid damaging the diodes with heat, pinch the stator leads between pliers to carry heat off, and apply the soldering iron only long enough to separate the leads from the rectifier.
   - Use a 100 W soldering iron.

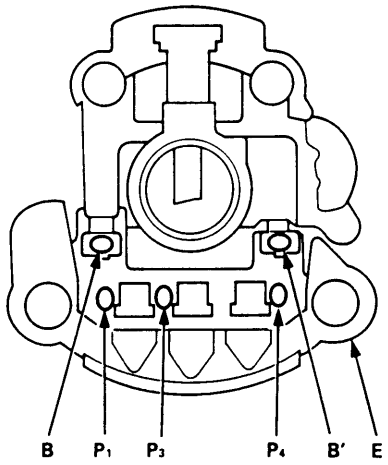


7. Install the new rectifier in the reverse order of removal.
   - Apply the soldering iron only long enough to ensure a good connection so the heat will not damage the diodes.
   - Use only a rosin core type solder or solder joints will corrode.

Rectifier Test

NOTE: The diodes are designed to allow current to pass in one direction while blocking it in the opposite direction. Since the alternator rectifier is made up of nine diodes, each diode must be tested for continuity in both directions with an ohmmeter that has diode checking capability; a total of 18 checks.

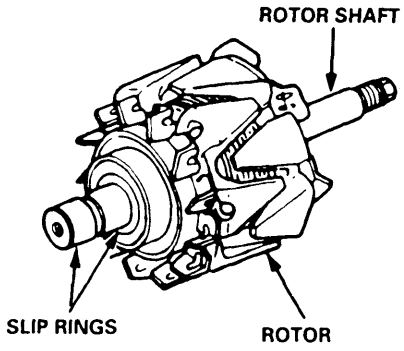
1. Check for continuity in each direction between
   — the B and P terminals.
   — the B' and P terminals.
   — E (ground) and the P terminals.
   All diodes should have continuity in only one direction.



2. If any of the diodes fails, replace the rectifier assembly. (Diodes are not available separately.)

Rotor Slip Ring Test

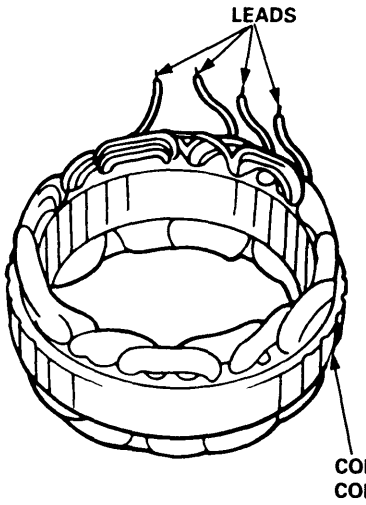
1. Check the resistance between the slip rings. There should be 1.8 – 3.0 ohms.
   - If resistance meets the specification, go to step 2.
   - If resistance does not meet the specification, replace the alternator.



2. Check that there is no continuity between the slip rings and the rotor or rotor shaft.
3. If the rotor fails either continuity check, replace the alternator.

Stator Test

1. Check that there is continuity between each pair of leads.



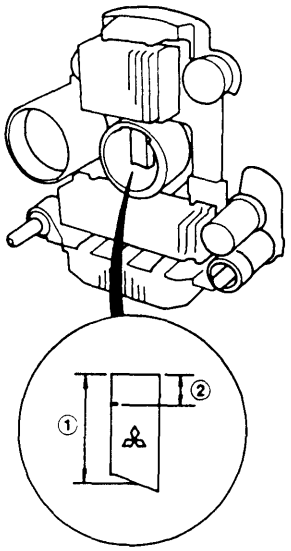
2. Check that there is no continuity between each lead and the coil core.
3. If the coil fails either continuity check, replace the alternator.

Alternator Brush Inspection

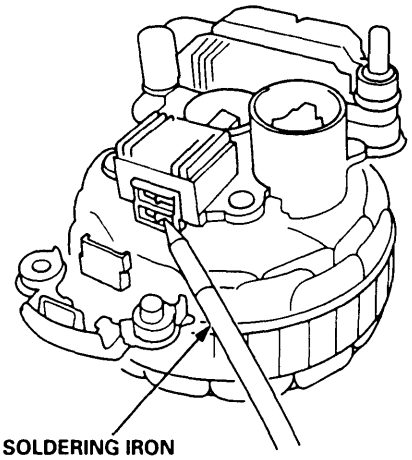
1. Separate the drive-end housing from the rear housing as described on page 4-30.
2. Separate the rear housing from the stator/rectifier assembly by removing the four screws and the terminal nut from the rear housing (see page 4-30).
3. Measure the length of the brushes with vernier calipers.

Alternator Brush Length:

① Standard (NEW)	② Service Limit
19.0 mm (0.75 in)	5.0 mm (0.20 in)



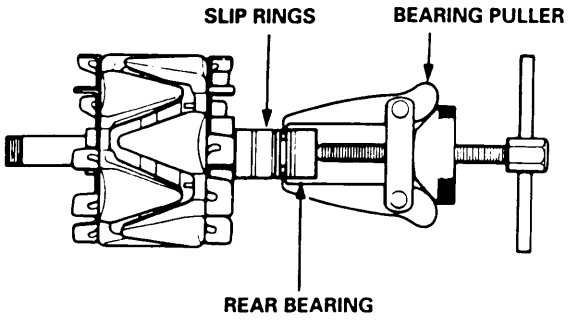
4. If the brushes are less than the service limit, replace them.



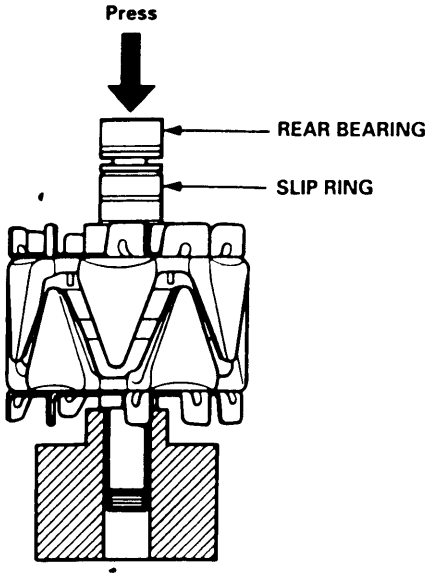
Rear Bearing Replacement

1. Pull off the rear bearing.

   - Make sure the tips of the bearing puller jaws are thin enough to fit between the bearing and the slip rings.
   - Do not reuse the bearing.

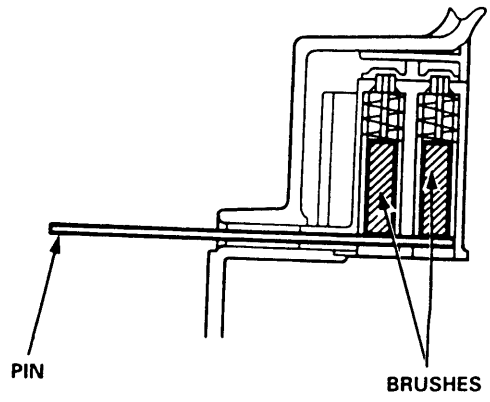


2. Use a hand press to install the new bearing. Apply pressure only on the inner race to avoid damaging the bearing.



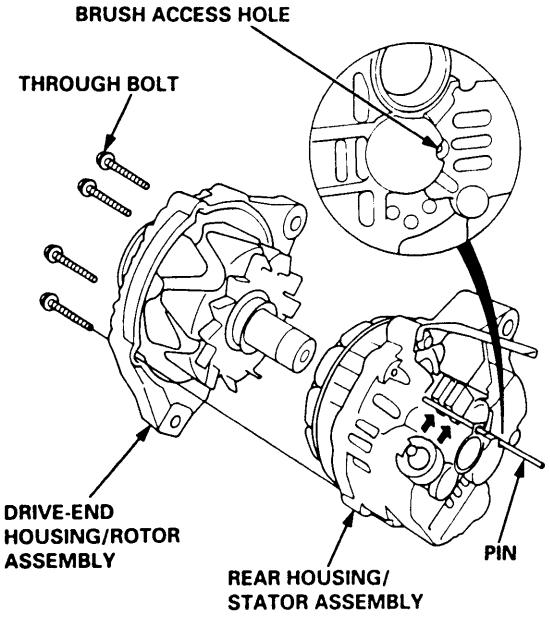
Alternator Reassembly

1. Push the brushes in, then insert a pin or drill bit (about 1.8 mm diameter) to hold them there.



2. Heat the rear bearing seat in the rear housing as described on page 4-30. After heating, continue immediately with assembling before the rear bearing seat cools completely.

3. Put the rear housing/stator assembly and drive-end housing/rotor assembly together, tighten the four through bolts and pull out the pin.



4. After assembling the alternator, turn the pulley by hand to make sure the rotor rotates smoothly and without noise.

Alternator Belt Inspection and Adjustment

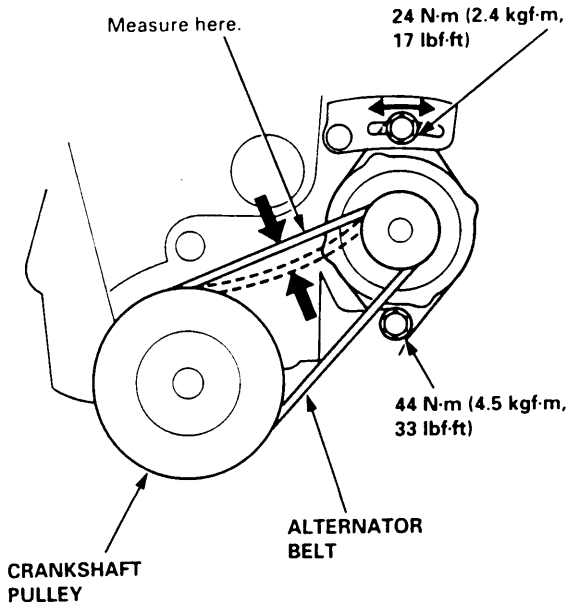
NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

Deflection method:

Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection between the alternator and crankshaft pulley.

Deflection:
Used Belt: 8.0 – 10.5 mm (0.31 – 0.41 in)
New Belt: 6.0 – 8.5 mm (0.24 – 0.33 in)

NOTE: If the belt is worn or damaged, replace it.



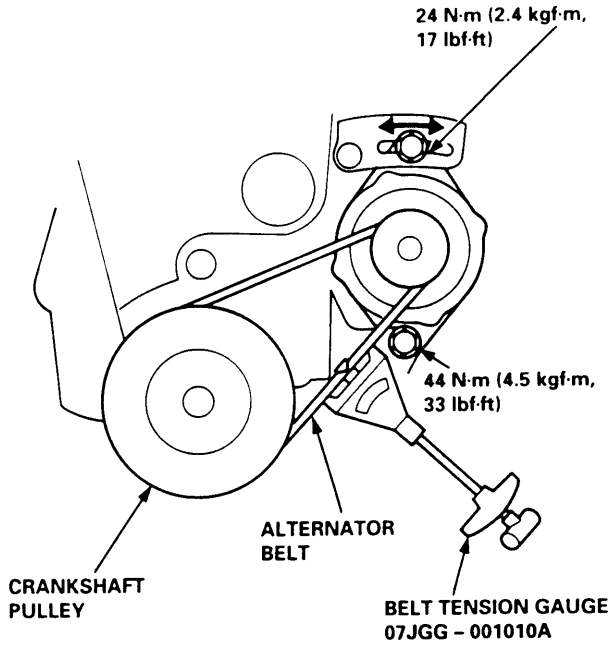
Belt tension gauge method:

1. Remove the three bolts from the left end of the splash shield, and pull it back as needed.

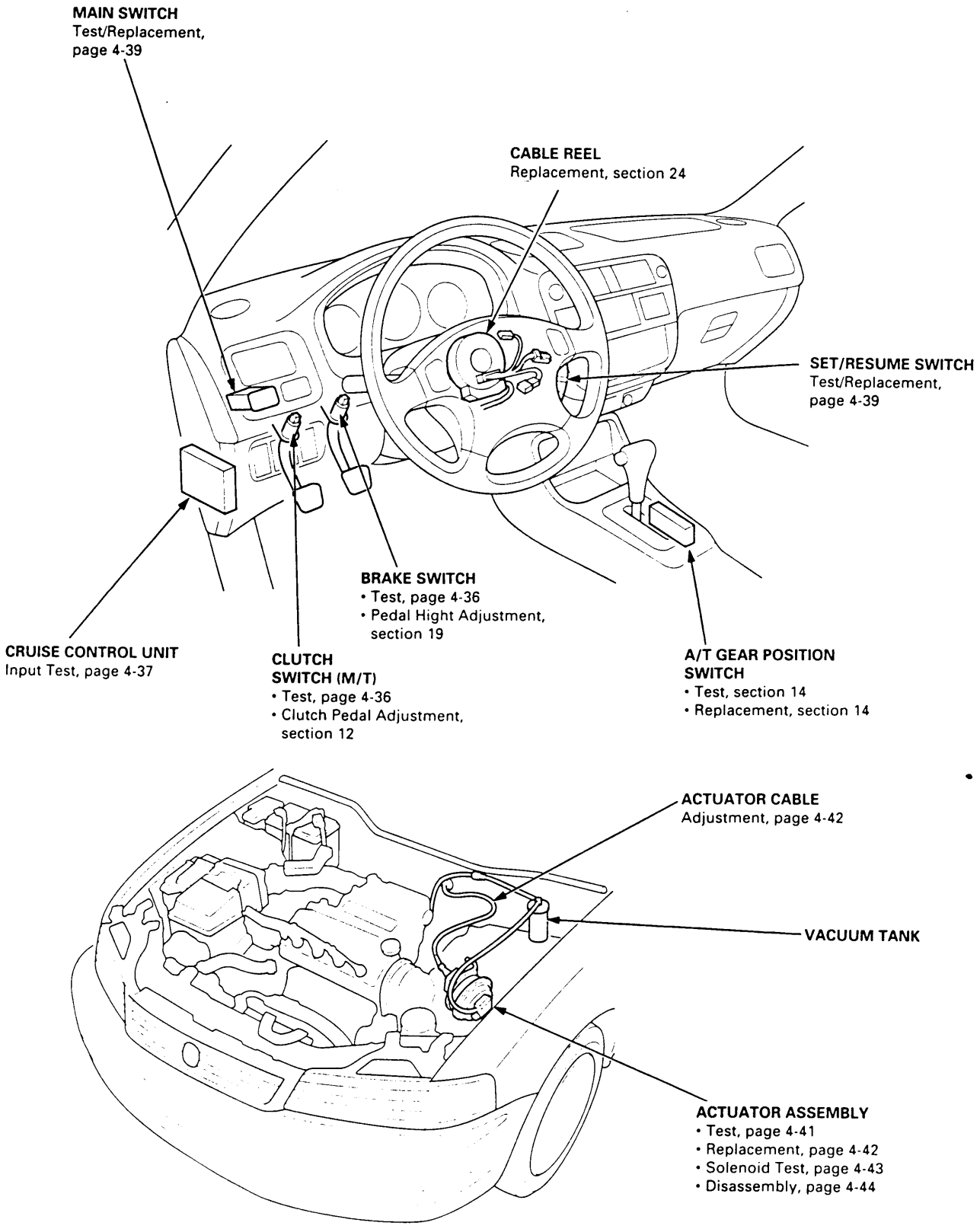
2. Attach the belt tension gauge to the belt, and measure the tension. Follow the gauge manufacturer's instructions.

Tension:
Used Belt: 300 – 490 N (35 – 50 kgf, 77 – 110 lbf)
New Belt: 540 – 740 N (55 – 75 kgf, 121 – 165 lbf)

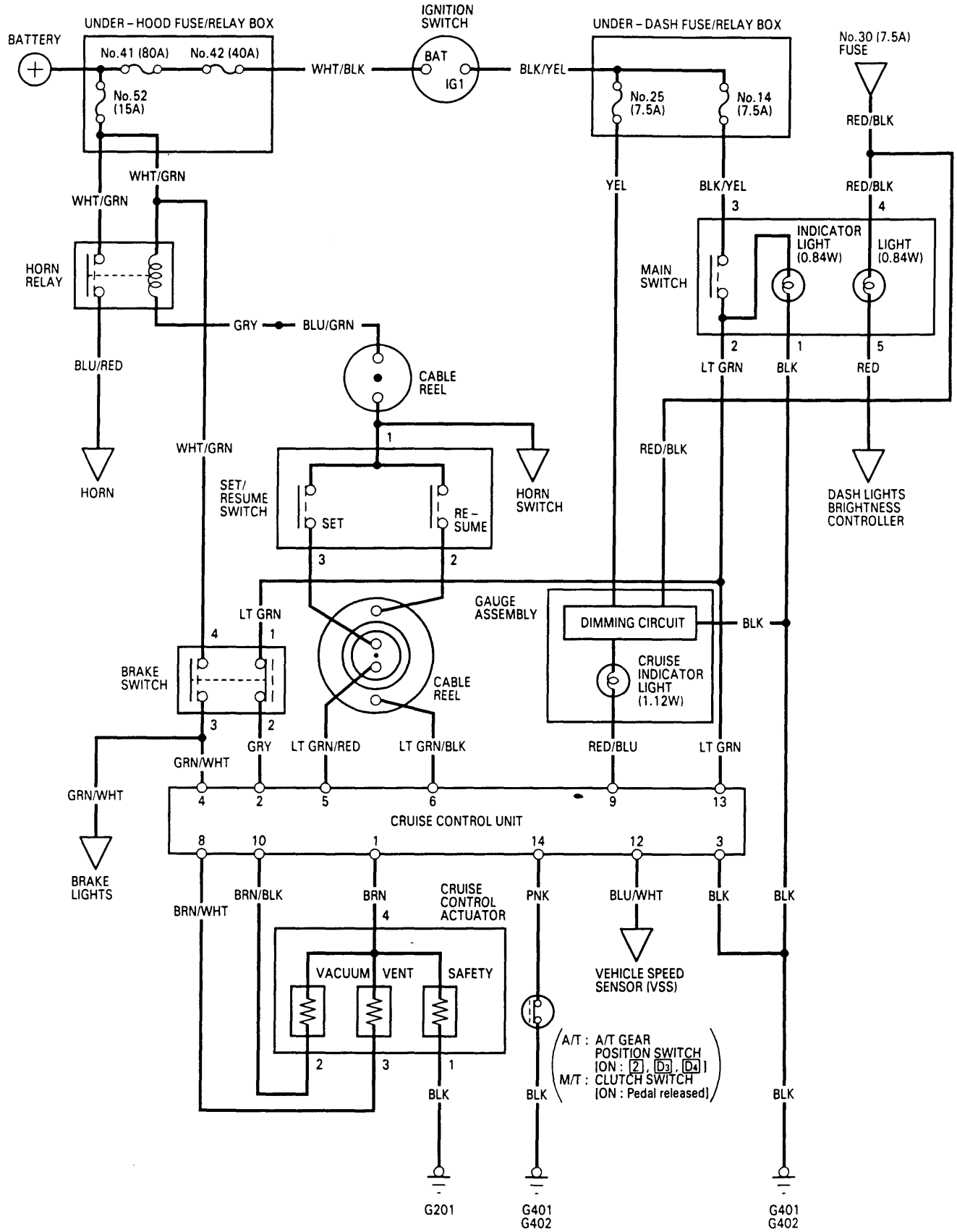
NOTE: If the belt is worn or damaged, replace it.



Component Location Index



Circuit Diagram



Control Unit Input Test

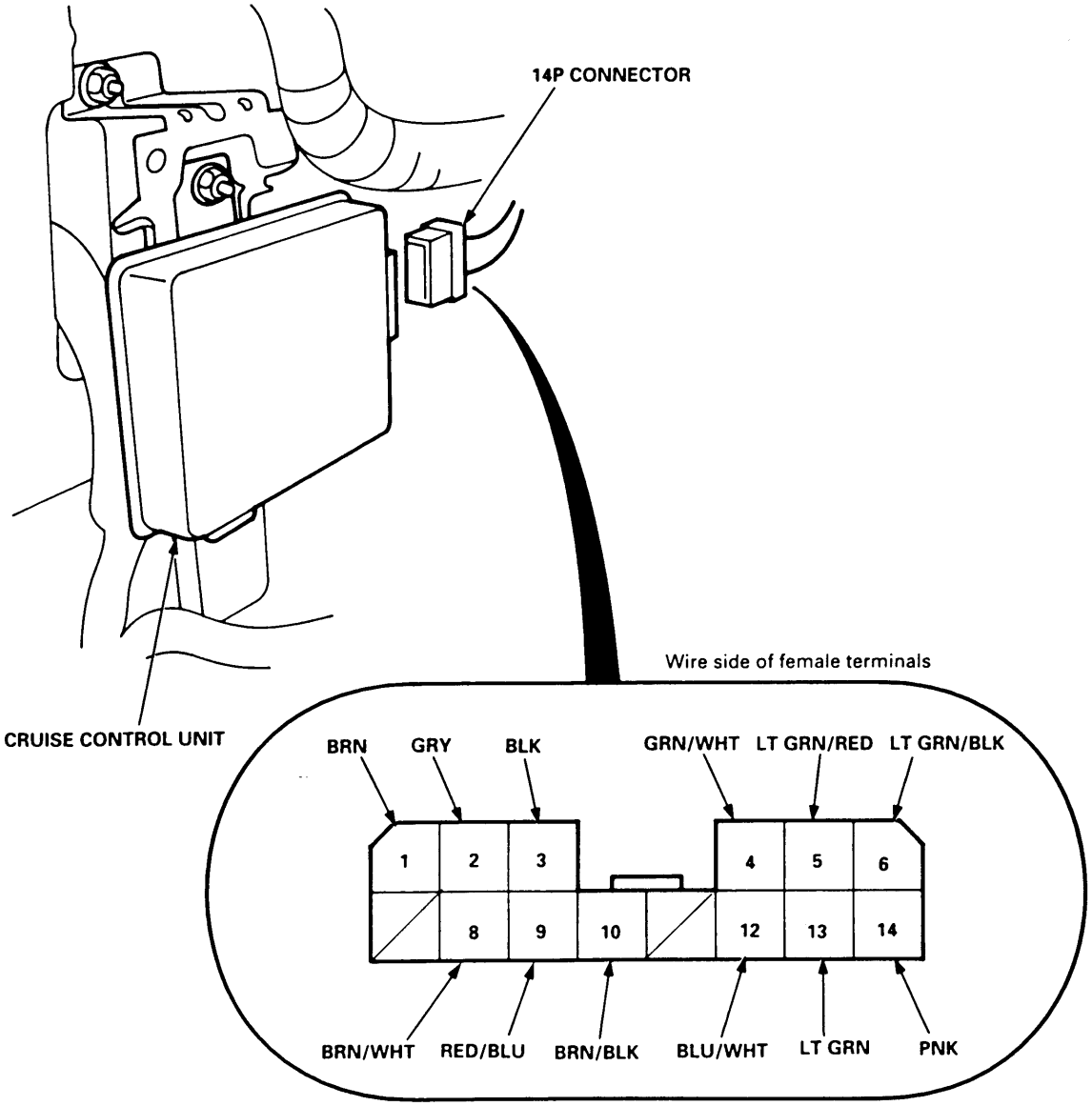
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Remove the driver's dashboard lower cover (see section 20).

2. Disconnect the 14P connector from the control unit.

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, make the following 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.



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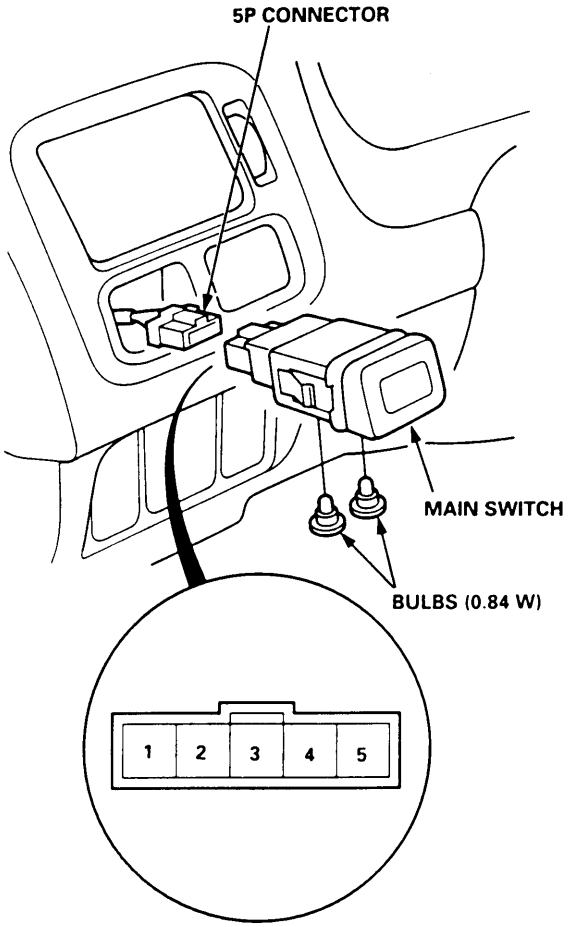
Control Unit Input Test (cont'd)

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
8	BRN/WHT	Under all conditions	Check for resistance to ground: There should be 80 – 120 Ω.	• Faulty actuator solenoid • Poor ground (G201) • An open in the wire
1	BRN	Under all conditions	Check for resistance to ground: There should be 40 – 60 Ω.	
10	BRN/BLK	Under all conditions	Check for resistance to ground: There should be 70 – 110 Ω.	
2	GRY	Ignition switch ON (II), main switch ON and brake pedal depressed, then released	Check for voltage to ground: There should be 0 V with the pedal depressed and battery voltage with the pedal released.	• Faulty brake switch • An open in the wire
3	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
4	GRN/WHT	Brake pedal depressed, then released	Check for voltage to ground: There should be battery voltage with the pedal depressed, and 0 V with the pedal released.	• Blown No. 52 (15 A) fuse in the under-hood fuse/relay box • Faulty brake switch • An open in the wire
5	LT GRN/ RED	Set button depressed	Check for voltage to ground: There should be battery voltage.	• Blown No. 52 (15 A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty set/resume switch • Faulty cable reel • An open in the wire
6	LT GRN/ BLK	Resume button depressed		
9	RED/BLU	Ignition switch ON (II)	Attach to ground: Cruise indicator light in the gauge assembly should come on.	• Blown bulb • Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Faulty dimming circuit in the gauge assembly • An open in the wire
12	BLU/WHT	Ignition switch ON (II) and main switch ON; raise the front of the vehicle, and rotate one wheel slowly with the other one blocked.	Check for voltage between the BLU/WHT ⊕ and BLK ⊖ terminals: There should be 0 – 5 V or more –0 – 5 V or more repeatedly.	• Faulty vehicle speed sensor (VSS) • An open in the wire
13	LT GRN	Ignition switch ON (II) and main switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (7.5 A) fuse in the under-dash fuse/relay box • Faulty main switch • An open in the wire
14	PNK	A/T: Shift lever in 2, D3 or D4 M/T: Clutch pedal released	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity when the clutch pedal is depressed or when the shift lever is in other positions.	• Faulty A/T gear position switch • Faulty or misadjusted clutch switch (M/T) • Poor ground (G401, G402) • An open in the wire

Main Switch Test/Replacement

1. Remove the driver's dashboard lower cover (see section 20).
2. Carefully push out the switch from behind the dashboard.
3. Disconnect the connector from the switch.



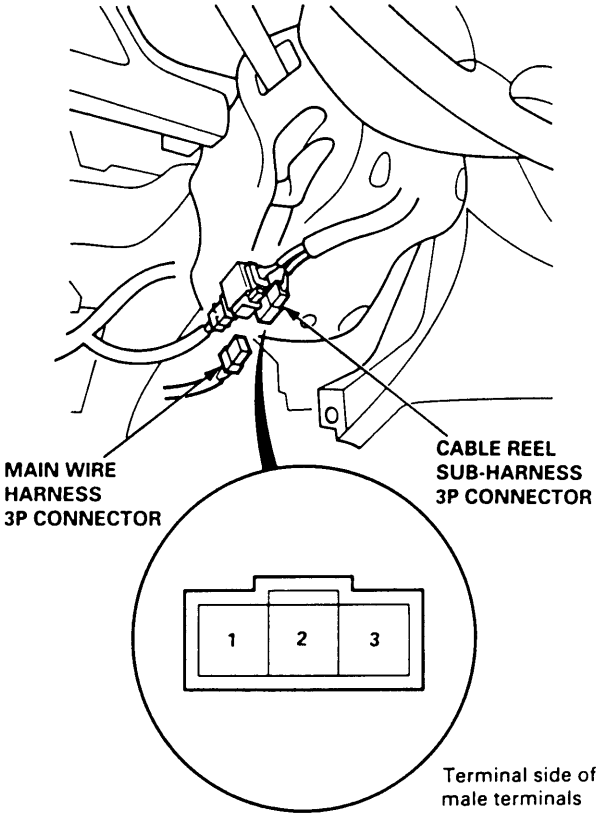
4. Check for continuity between the terminals in each switch position according to the table.

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

If there is no continuity, replace the switch.

Set/Resume Switch Test/Replacement

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
2. Disconnect the driver's airbag connector (see section 24).
3. Remove the dashboard driver's lower cover (see section 20).
4. Disconnect the cable reel sub-harness 3P connector from the main wire harness.



5. Check for continuity between the terminals of the cable reel sub-harness 3P connector in each switch position according to the table.

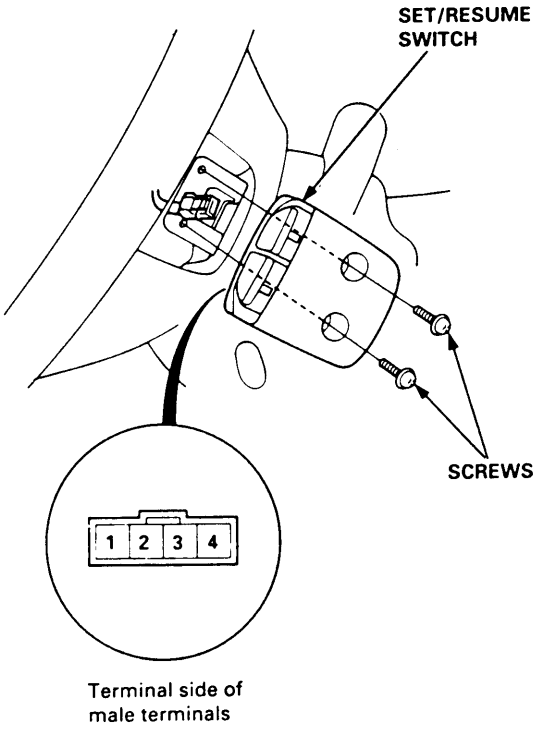
Position \ Terminal	1	2	3
SET (ON)	○	○	
RESUME (ON)		○	○

- If there is continuity, and it matches the table, the switch is OK.
- If there is no continuity in one or both positions, go to step 6.

(cont'd)

Set/Resume Switch Test/Replacement (cont'd)

6. Remove the two screws, then remove the switch.



7. Check for continuity between the terminals in switch position according to the table.

Position \ Terminal	1	2	3
SET (ON)	○		○
RESUME (ON)	○	○	

- If there is continuity, and it matches the table, replace the cable reel.
- If there is no continuity in one or both positions, replace the switch.

8. If all tests prove OK, reconnect the cable reel and cable reel sub-harness connector, then reinstall the steering column covers.

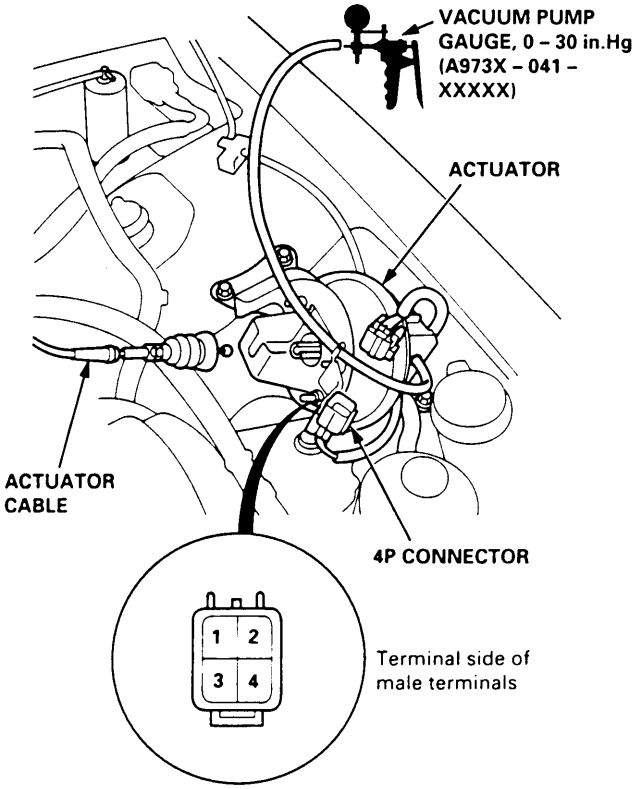
9. Reconnect the driver's airbag connector, and reinstall the access panel on the steering wheel.

10. Reconnect the battery positive cable, then the negative cable.

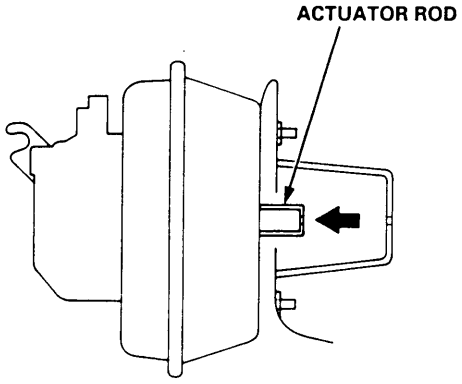
11. After connecting the airbag connectors, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.

Actuator Test

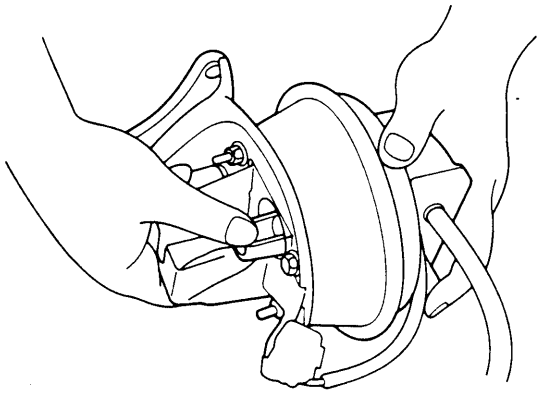
1. Disconnect the actuator cable from the actuator rod and the 4P connector.
2. Connect battery power to the No. 4 terminal and ground to the No. 1, No. 2 and No. 3 terminals.
3. Connect a vacuum pump to the vacuum hose. Then apply vacuum to the actuator.



4. The actuator rod should pull in completely. If the rod pulls in only part-way or not at all, check for a leaking vacuum line or defective solenoid.



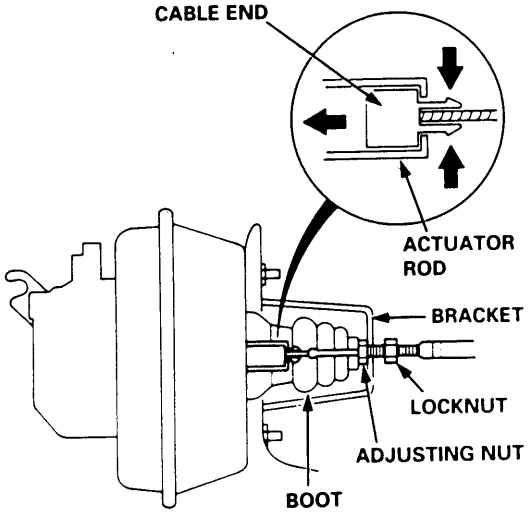
5. With voltage and vacuum still applied, try to pull the actuator rod out by hand. You should not be able to pull it out. If you can, it is defective.



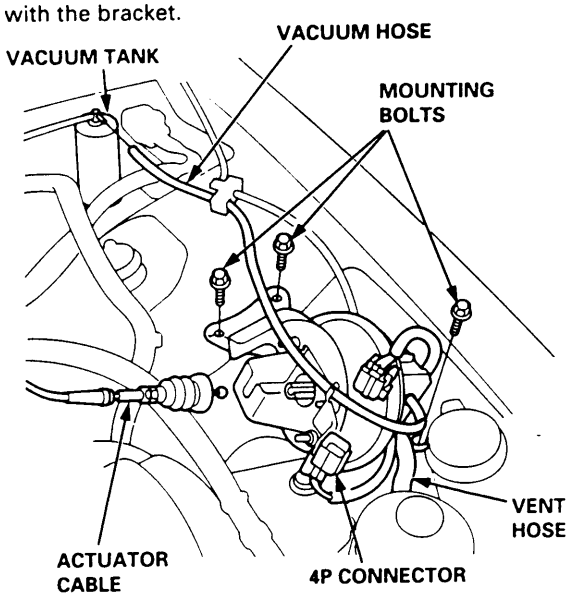
6. Disconnect ground from the No. 3 terminal. The actuator rod should return. If it does not return, but the vent hose and filter are not plugged, the solenoid valve assembly is defective.
7. Repeat steps 2 through 5, and disconnect ground from the No. 1 terminal. The actuator rod should return. If it does not return, but the vent hose and filter are not plugged, the solenoid valve assembly is defective.
8. If you replace the solenoid valve assembly, be sure to use new O-rings on each solenoid.
9. Disconnect power and ground from the 4P connector. Disconnect the vent hose from the actuator. Connect a vacuum pump to the actuator vent hose port, and apply vacuum. The actuator rod should pull in completely. If not, the vacuum valve is stuck open. Replace the actuator.

Actuator Replacement

1. Pull back the boot, and loosen the locknut. Then disconnect the cable from the bracket.
2. Disconnect the cable end from the actuator rod.



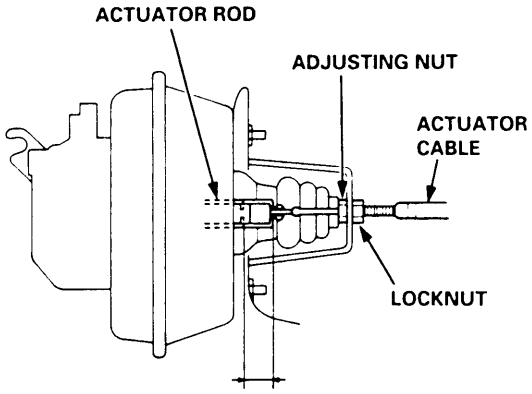
3. Disconnect the 4P connector from the actuator.
4. Disconnect the vacuum hose from the vacuum tank. Pull out the vent hose.
5. Remove the three mounting bolts and the actuator with the bracket.



6. If necessary, disconnect the cable end from the linkage over the accelerator pedal, then turn the grommet 90° in the bulkhead, and remove the cable.
7. Install in the reverse order of removal, and adjust the free play at the actuator rod after connecting the cable (see next column).

Actuator Cable Adjustment

1. Check that the actuator cable operates smoothly with no binding or sticking.
2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P], M/T in neutral) until the radiator fan comes on, then let it idle.
3. Measure the amount of movement of the actuator rod until the cable pulls on the accelerator lever (engine speed starts to increase). Free play should be 11 ± 1.0 mm (0.43 ± 0.04 in).



LOCKNUT FREE PLAY: 11 ± 1.0 mm (0.43 ± 0.04 in)

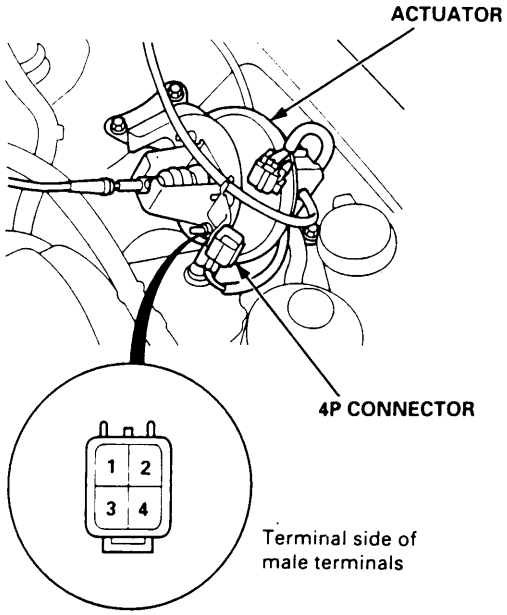
4. If free play is not within specs, loosen the locknut, and turn the adjusting nut as required.

   NOTE: If necessary, check the throttle cable free play (see section 11), then recheck the actuator rod free play.

5. Retighten the locknut, and recheck the free play.

Actuator Solenoid Test

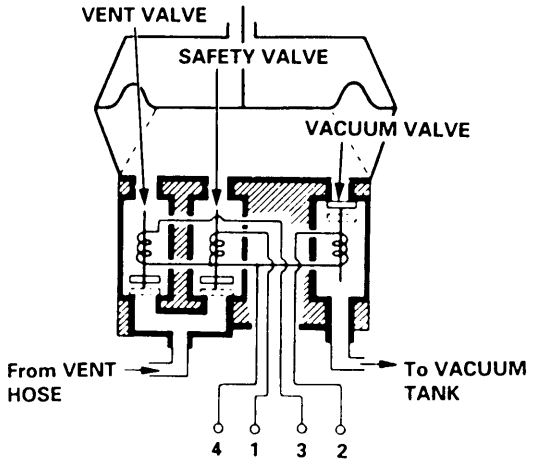
1. Disconnect the 4P connector from the actuator.



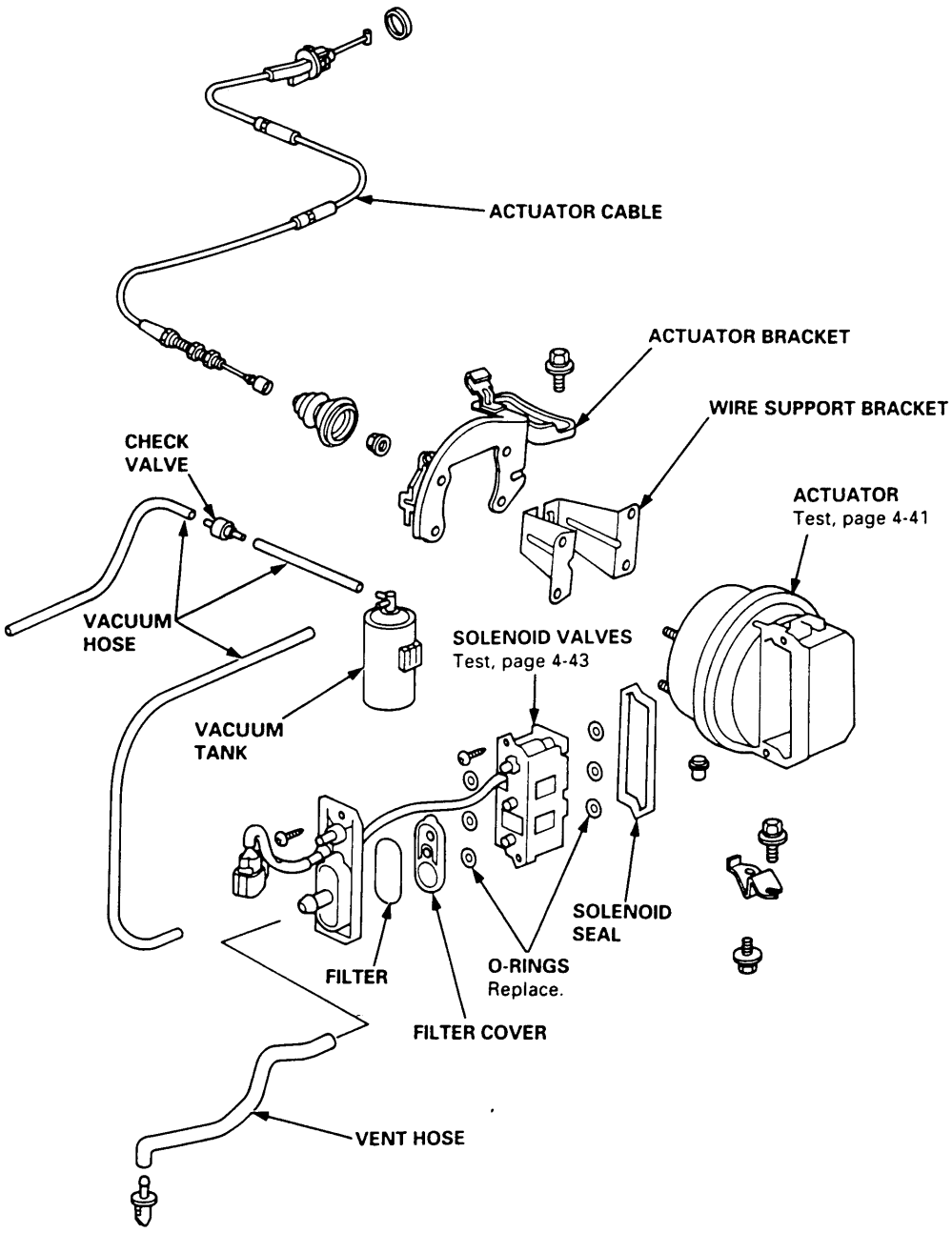
2. Check for resistance between the terminals according to the table.

Terminal / Resistance (Ω)	1	2	3	4
VENT SOLENOID 40 – 60Ω			○	○
VACUUM SOLENOID 30 – 50Ω		○		○
SAFETY SOLENOID 40 – 60Ω	○			○

NOTE: Resistance will vary slightly with temperature; specified resistance is at 70°F (20°C).

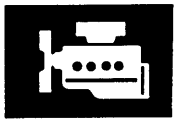


Actuator Disassembly



Engine

Engine Removal/Installation



Removal

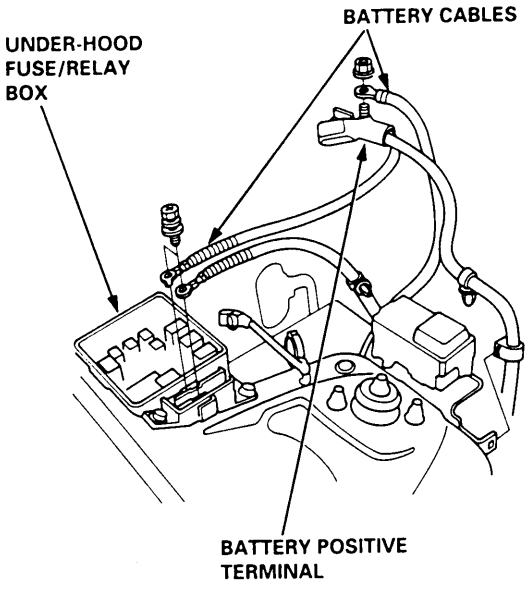
⚠ WARNING

- **Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine.**
- **Make sure the vehicle will not roll off stands and fall while you are working under it.**

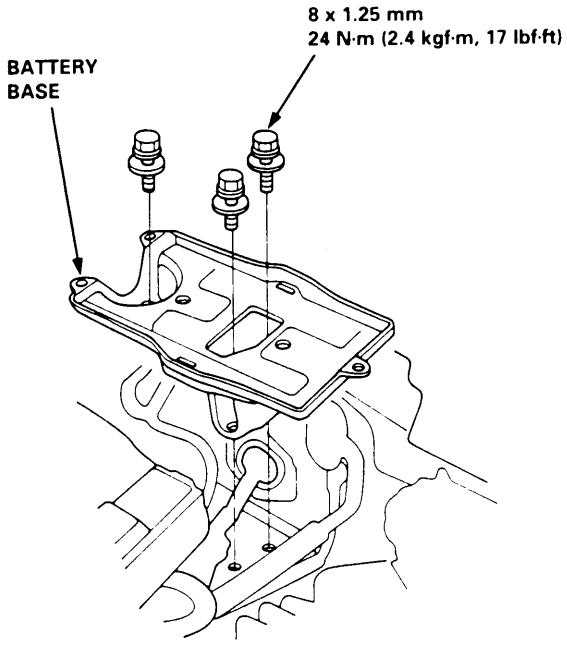
CAUTION:

- **Use fender covers to avoid damaging painted surface.**
- **Unspecified items are common.**
- **To avoid damage, 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.**

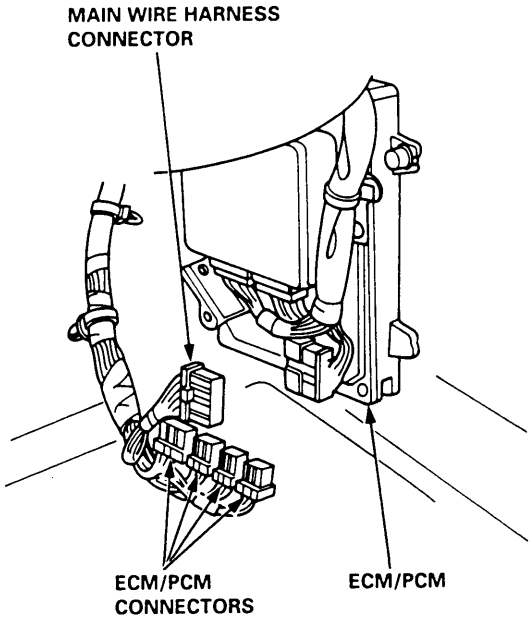
1. Secure the hood open as far as possible.
2. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
3. Disconnect the battery negative terminal first, then the positive terminal.
4. Disconnect the battery cables from the under-hood fuse/relay box and battery positive terminal.



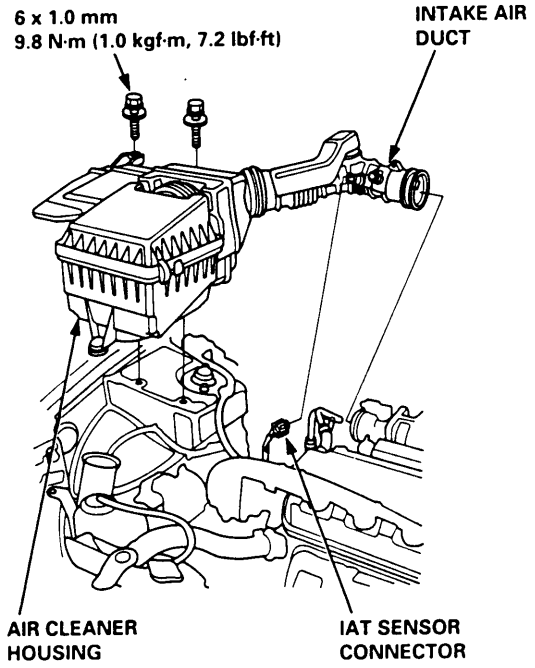
5. Remove the battery and battery base.



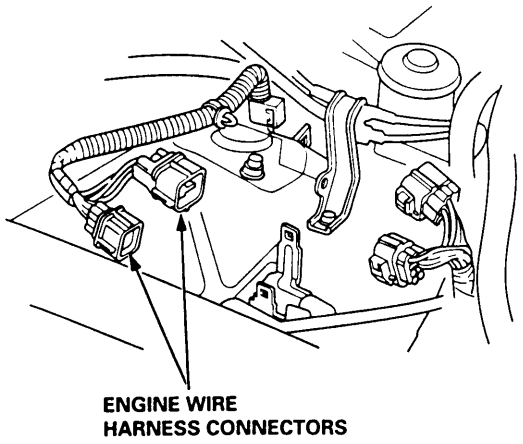
6. Disconnect the connectors from the ECM/PCM.
7. Disconnect the main wire harness connector.



8. Disconnect the intake air temperature (IAT) sensor connector, then remove the intake air duct and air cleaner housing.



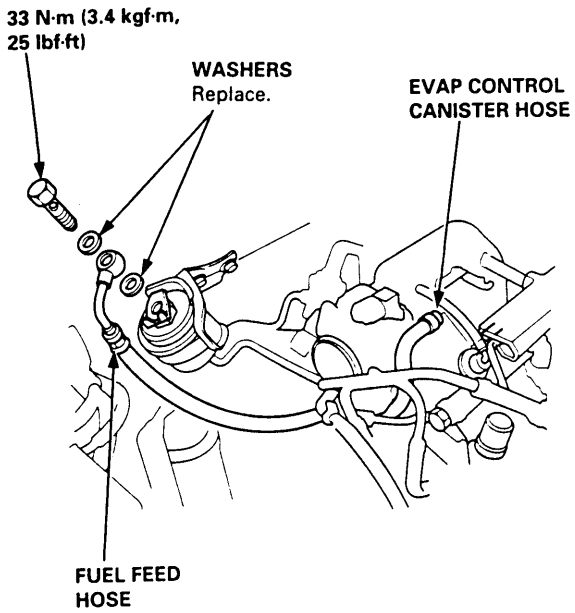
9. Disconnect the engine wire harness connectors on the left side engine compartment.



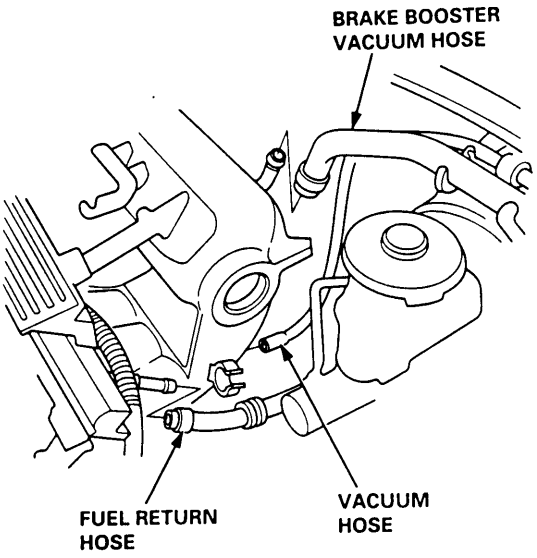
10. Relieve fuel pressure (see section 11).

⚠ WARNING Do not smoke while working on the fuel system. Keep open flame or spark away from the work area. Drain fuel only into an approved container.

11. Remove the evaporative emission (EVAP) control canister hose and fuel feed hose.



12. Remove the brake booster vacuum hose, fuel return hose and vacuum hose.

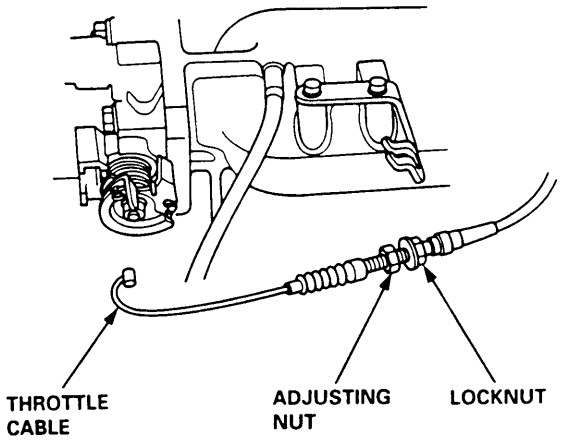


(cont'd)

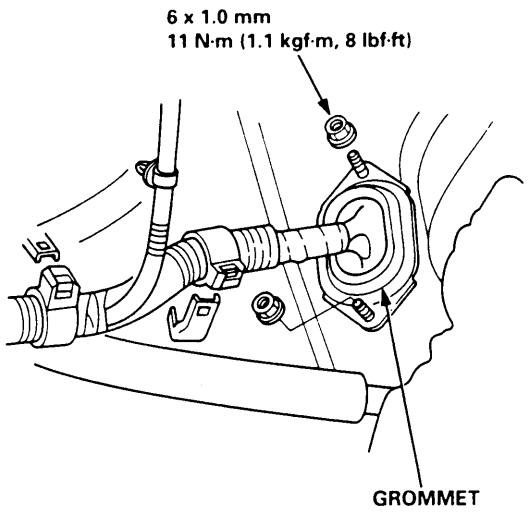
Removal (cont'd)

13. Remove the throttle cable by loosening the locknut, then slip the cable end out of the accelerator linkage.

    NOTE:
    - Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
    - Adjust the throttle cable when installing (see section 11).

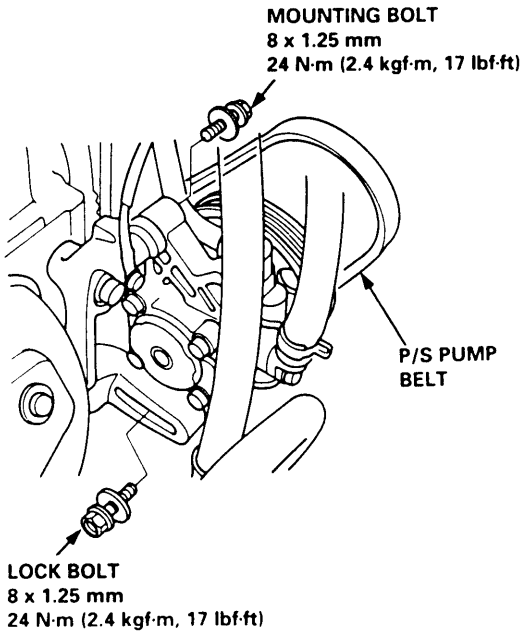


14. Remove the grommet and wire harness clamps, then pull out the ECM/PCM connectors.

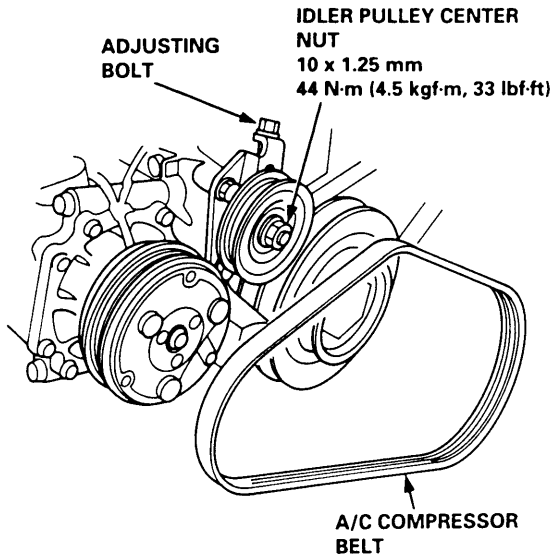


15. Remove the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump.

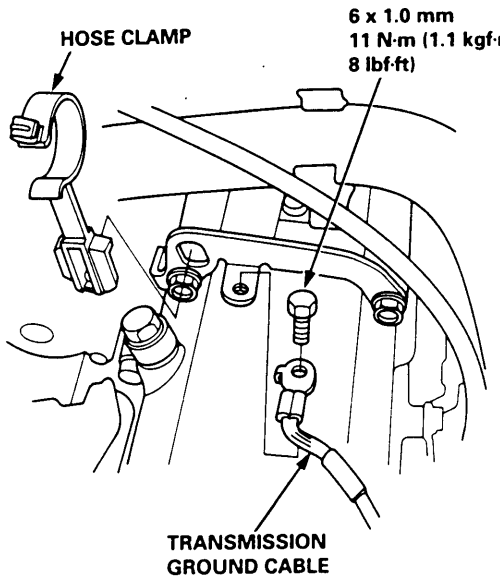
    NOTE: Do not disconnect the P/S hoses.



16. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt.

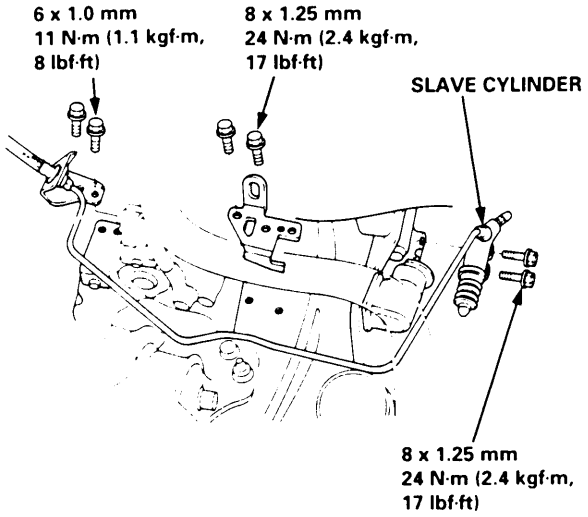


17. Remove the transmission ground cable and hose clamp.



18. Remove the clutch slave cylinder and line/hose assembly (M/T).

NOTE:
- Do not disconnect the line/hose assembly.
- Do not operate the clutch pedal once the slave cylinder has been removed.
- Take care not to bend the line.

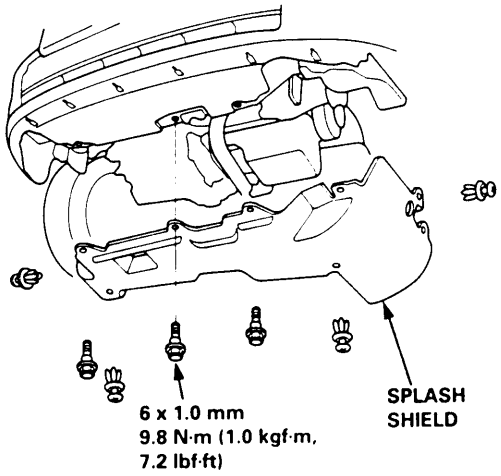


19. Remove the radiator cap.

⚠ WARNING Use care when removing the radiator cap to avoid scalding by hot coolant or steam.

20. Raise the hoist to full height.

21. Remove the front tires/wheels and splash shield.



22. Drain the engine coolant (see page 10-5).
    - Loosen the drain plug in the radiator.

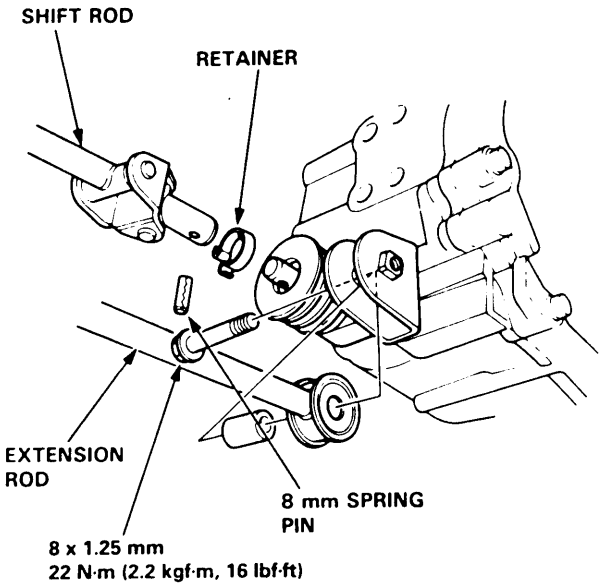
23. Drain the transmission oil or fluid. Reinstall the drain plug using a new washer (see section 13, 14).

24. Drain the engine oil. Reinstall the drain bolt using a new washer (see page 8-4).

(cont'd)

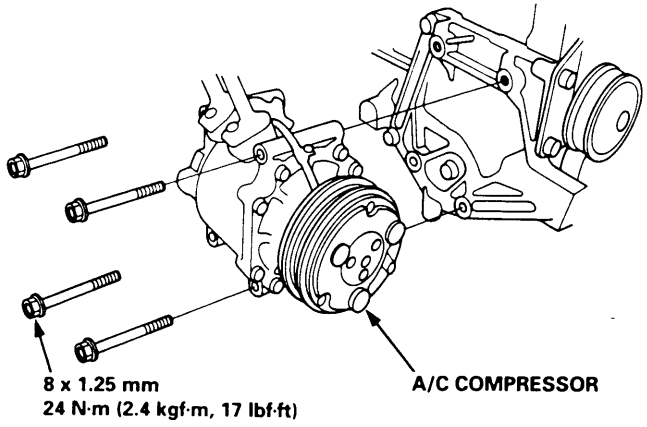
Removal (cont'd)

25. Remove the shift rod and extension rod (M/T).



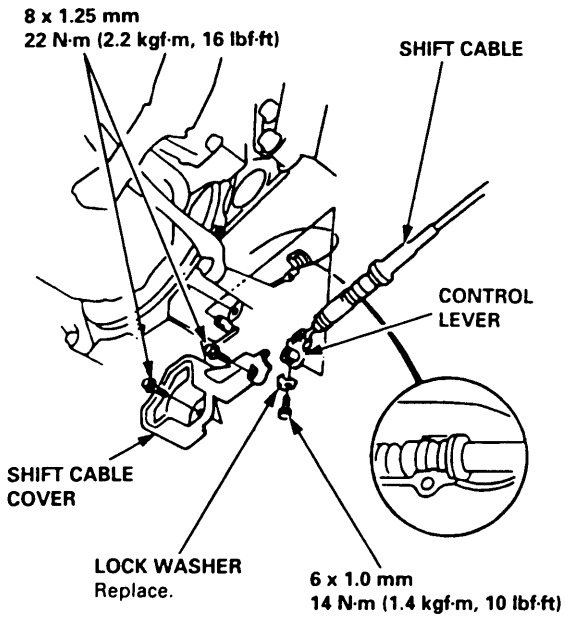
26. Remove the A/C compressor.

NOTE: Do not disconnect the A/C hoses.

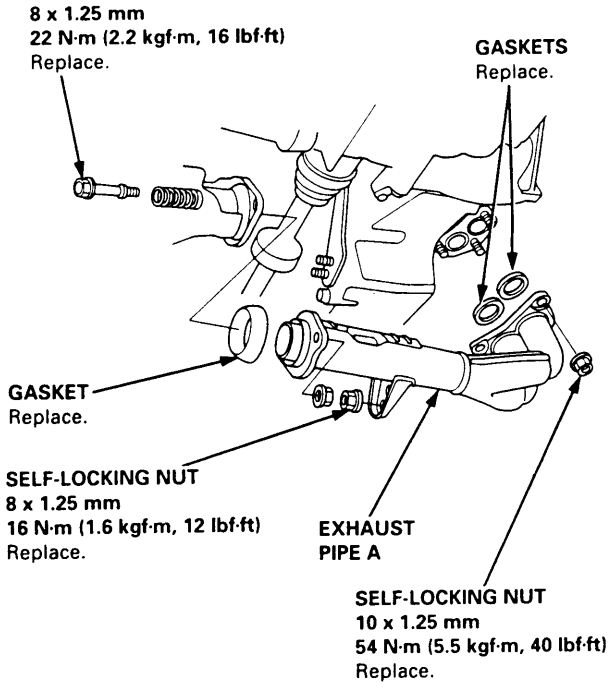


27. Remove the shift cable (A/T).

NOTE:
- Take care not to bend the cable when removing it. Always replace any kinked cable with new one.
- Adjust the shift cable when installing (see section 14).



28. Remove exhaust pipe A.



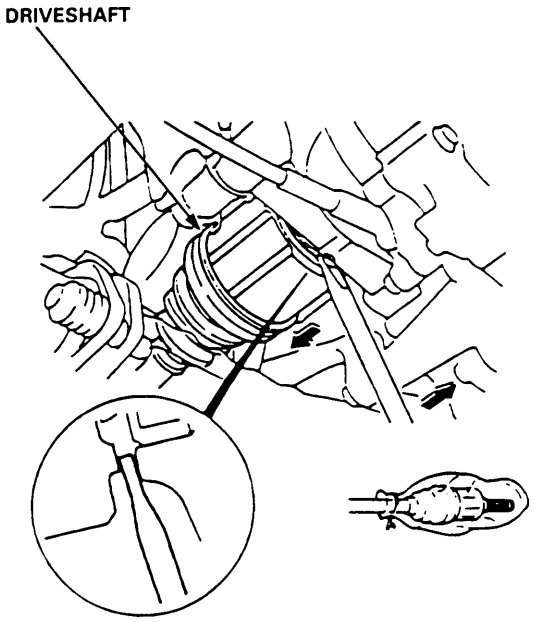
29. Remove the damper forks (see section 18).

30. Disconnect the suspension lower arm ball joints (see section 18).

31. Remove the driveshafts.

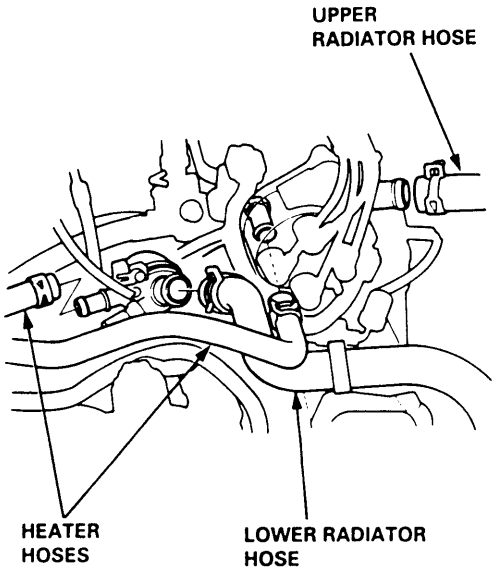
CAUTION:
- **Do not pull on the driveshaft, the CV joint may come apart.**
- **Use care when prying out the assembly. Pull it straight to avoid damaging the differential oil seal or intermediate shaft dust seal.**

NOTE: Coat all precision-finished surfaces with clean engine oil. Tie plastic bags over the driveshaft ends.

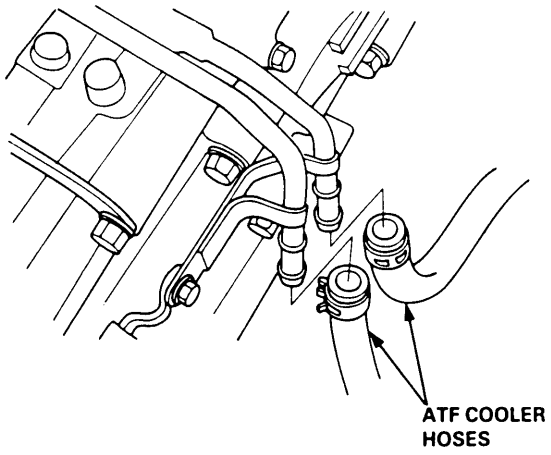


32. Lower the hoist.

33. Remove the upper and lower radiator hoses and heater hoses.



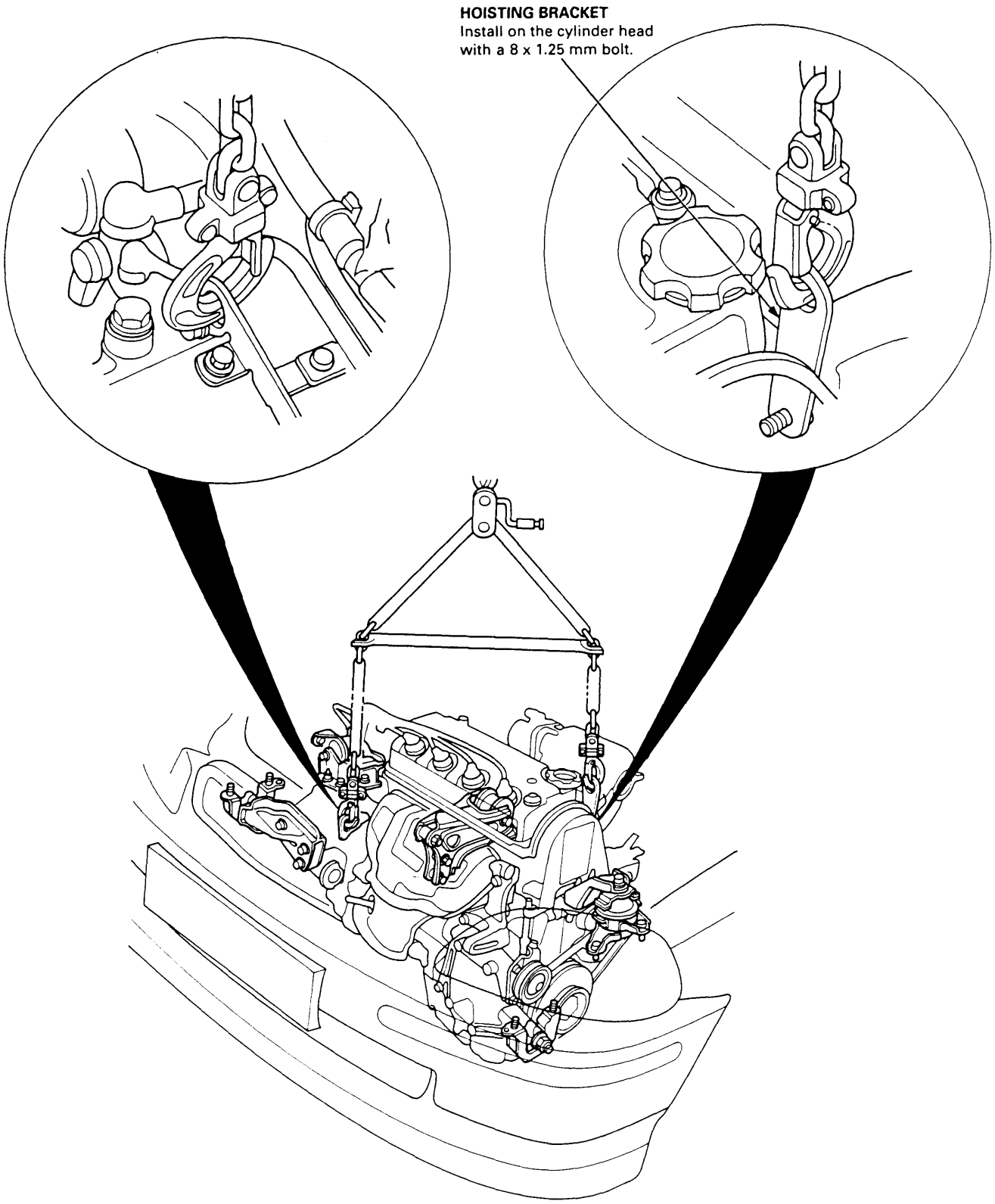
34. Remove the ATF cooler hoses, then plug the ATF cooler hoses and pipes (A/T).



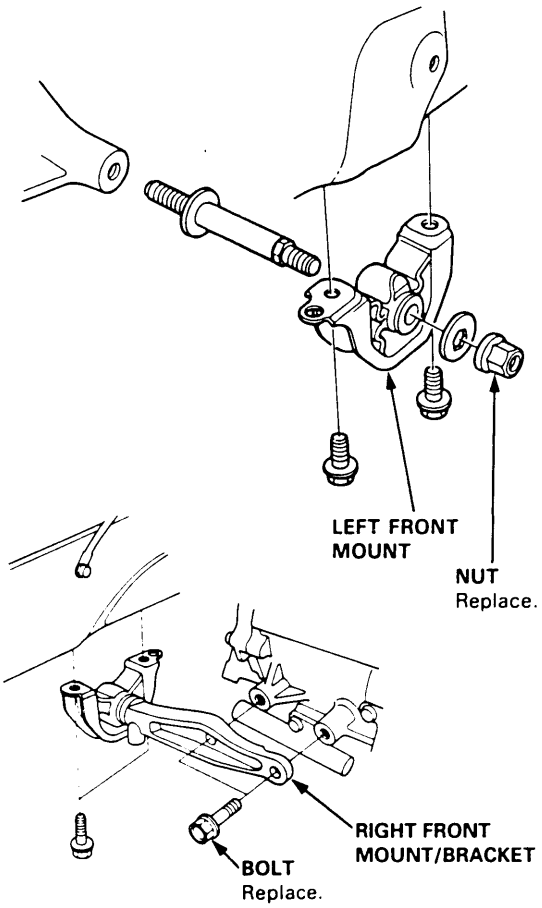
(cont'd)

Removal (cont'd)

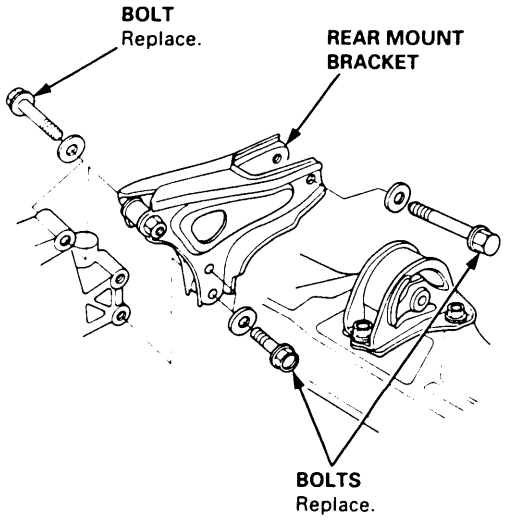
35. Attach the chain hoist to the engine.



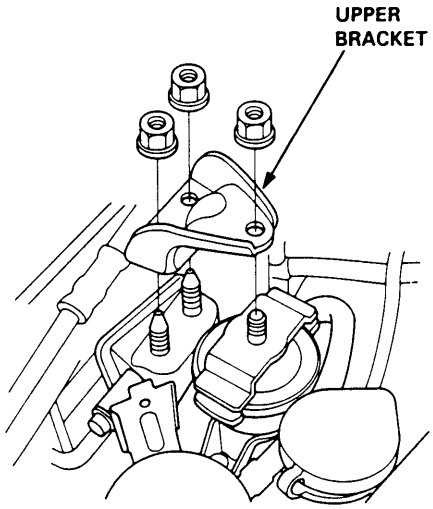
36. Remove the left and right front mount and bracket.



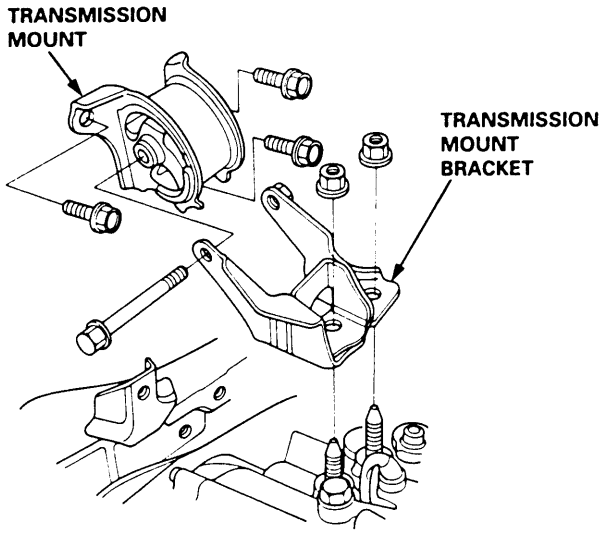
37. Remove the rear mount bracket.



38. Remove the upper bracket.



39. Remove the transmission mount bracket, then remove the transmission mount.



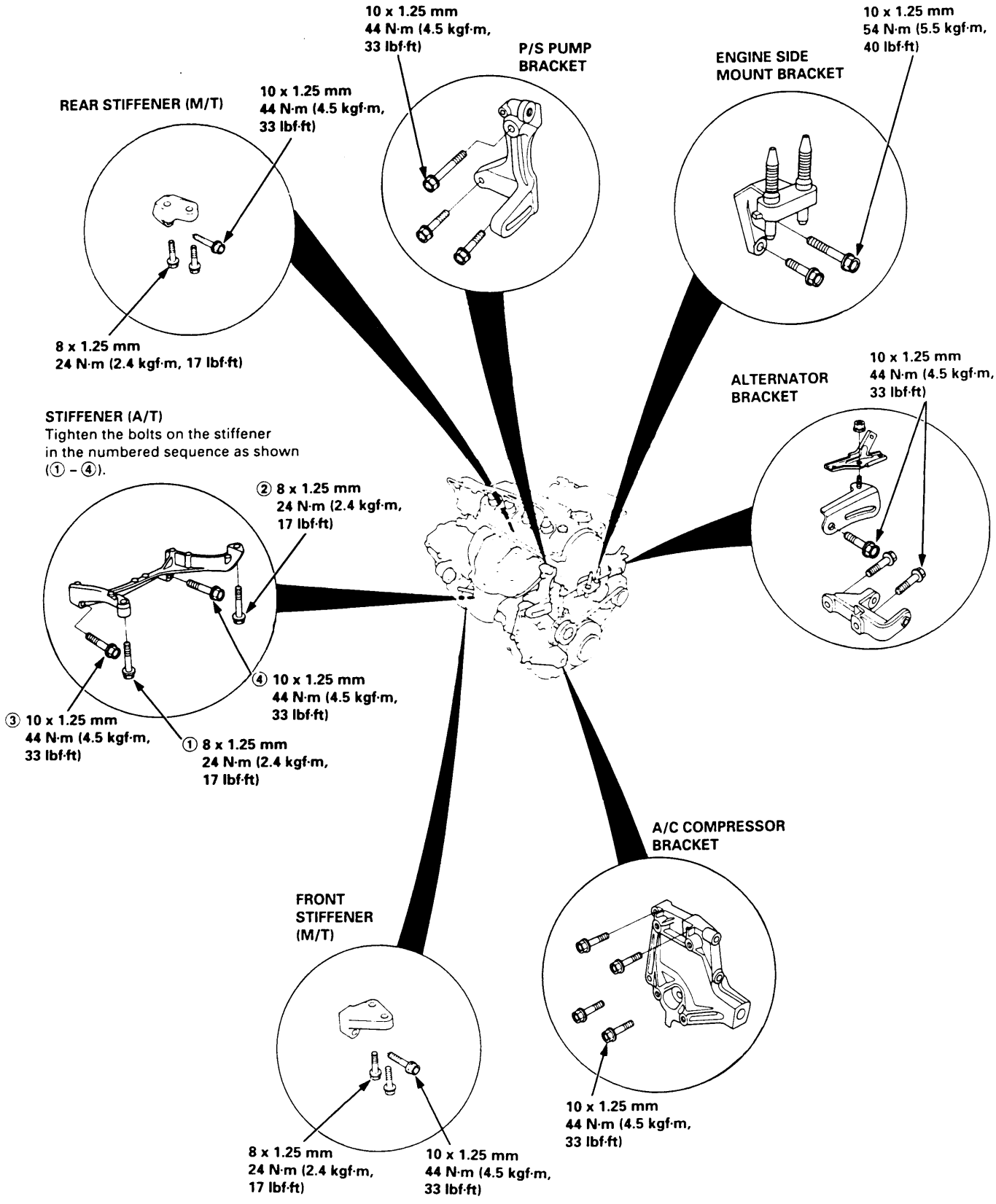
40. Check that the engine/transmission is completely free of vacuum hoses, fuel and coolant hoses and electrical wiring.

41. Slowly raise the engine approximately 150 mm (6 in). Check once again that all hoses and wires are disconnected from the engine/transmission.

42. Raise the engine all the way, and remove it from the vehicle.

Installation

Bracket Bolts Torque Specifications:

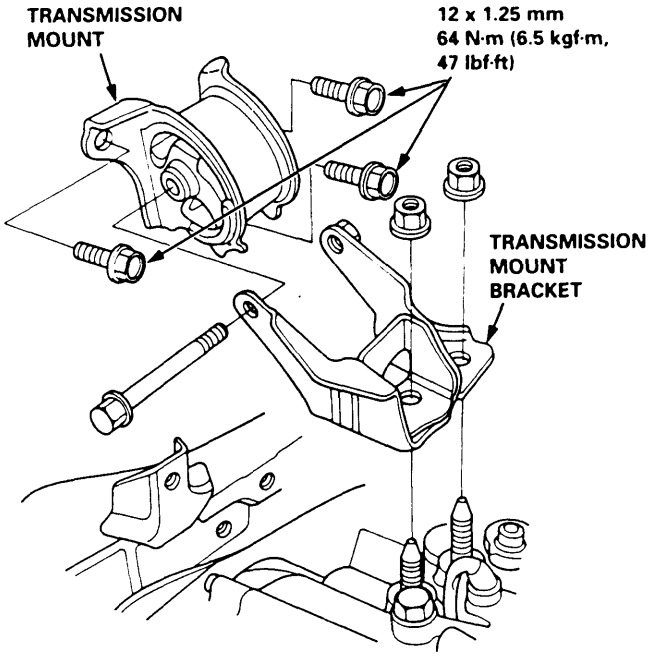


Engine Installation:

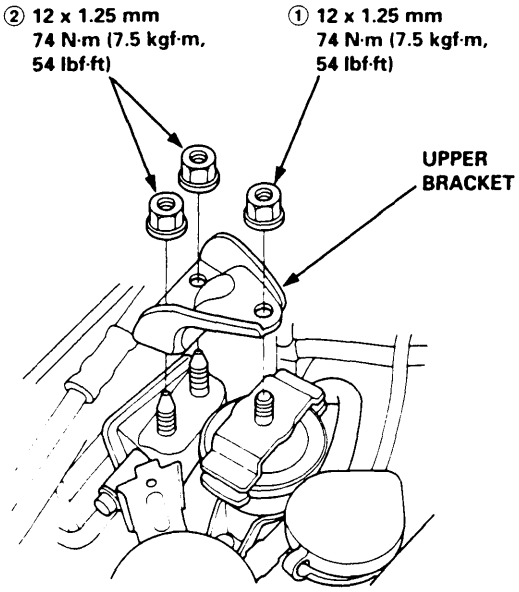
Install the engine in the reverse order of removal. Reinstall the mount bolts/nuts in the following sequence. Failure to follow these procedures may cause excessive noise and vibration, and reduce bushing life.

1. Install the transmission mount and bracket, then tighten the bolts on the frame side.

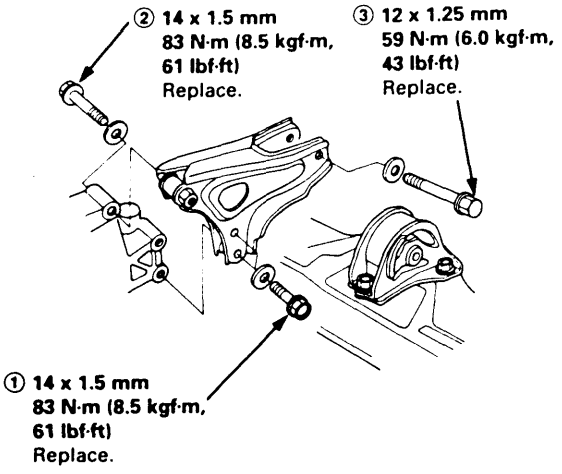
   NOTE: Do not tighten the bolts/nuts on the transmission side.



2. Install the upper bracket, then tighten the nuts in the numbered sequence shown (① - ②).



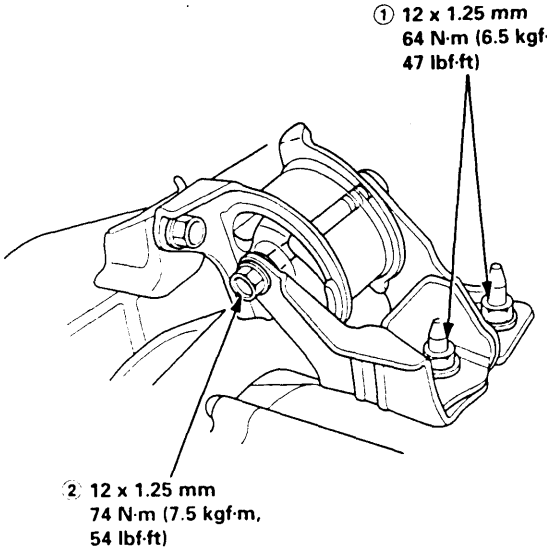
3. Install the rear mount bracket, then tighten the bolts in the numbered sequence shown (① - ③).



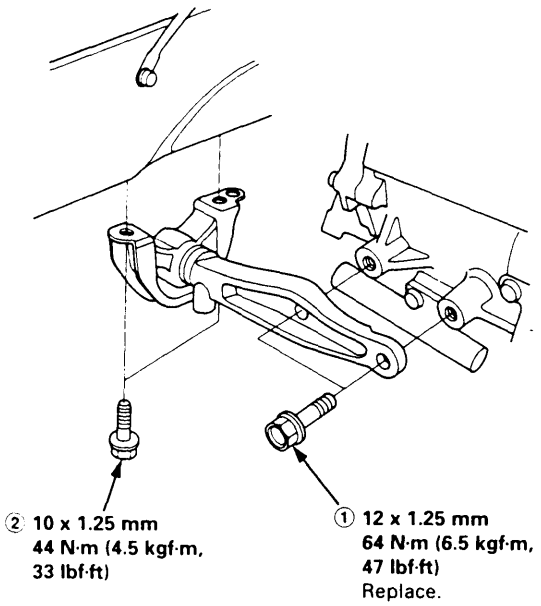
(cont'd)

Installation (cont'd)

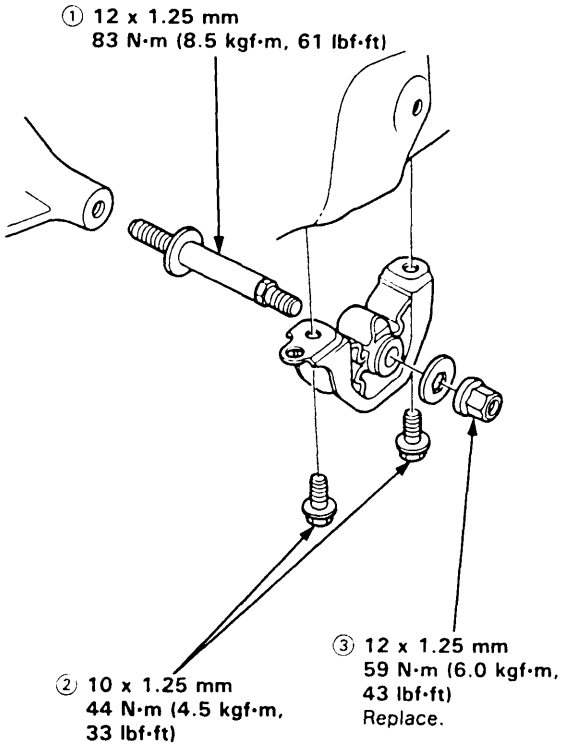
4. Tighten the bolt/nuts on the transmission mount bracket in the numbered sequence shown (① - ②).



5. Tighten the bolts on the right front mount/bracket in the numbered sequence shown (① - ②).



6. Tighten the bolts/nut on the left front mount in the numbered sequence shown (① - ③).



7. Perform the following:

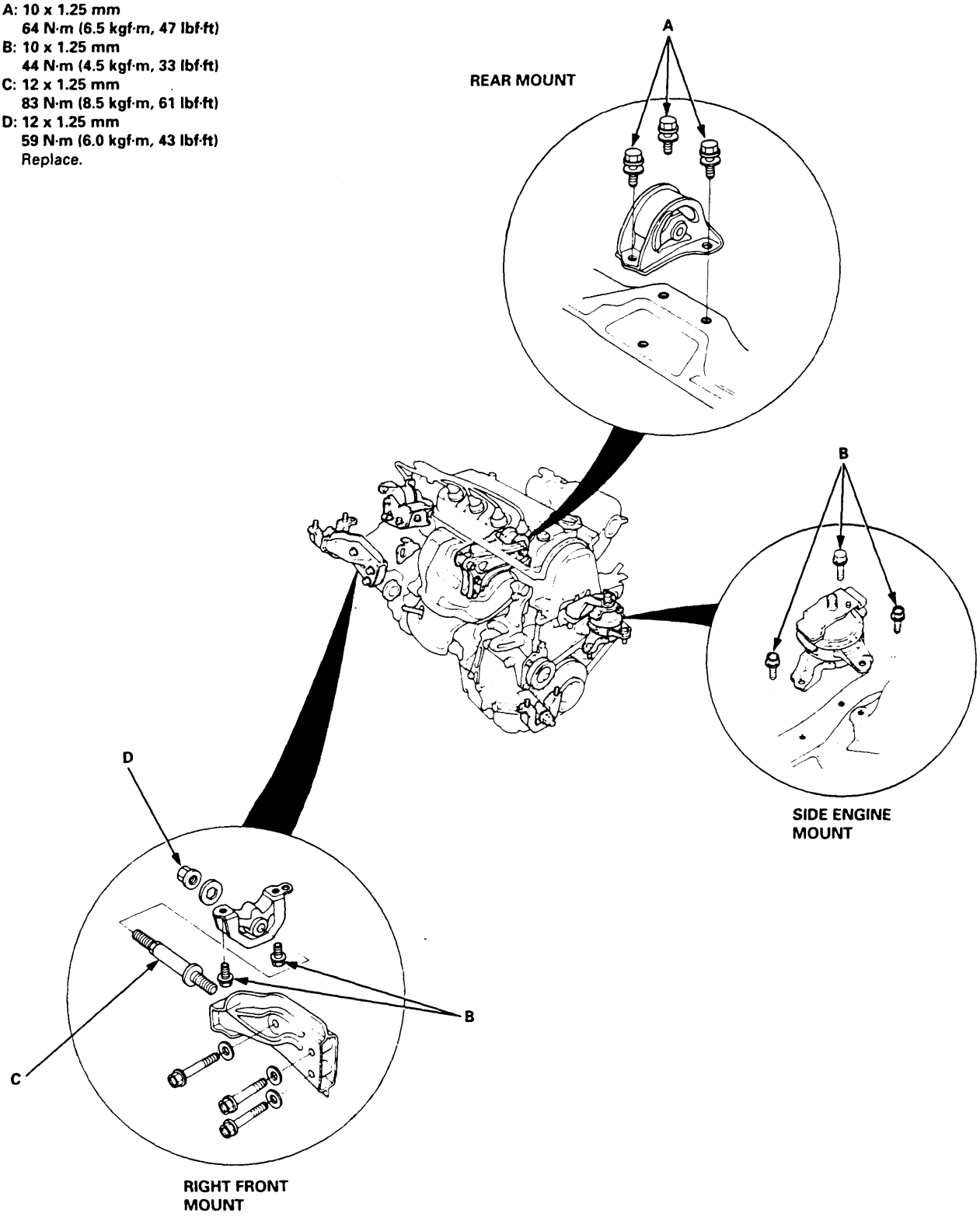
- Clean the areas where the driveshaft(s) and the intermediate shaft contact the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air.
- Check that the set rings on the ends of the driveshaft click into place.
  CAUTION: Use new set rings.
- Adjust the shift cable (see section 14).
- Adjust the throttle cable (see section 11).
- Adjust the cruise control cable (see section 4).
- Refill the engine with engine oil (see page 8-4).
- Refill the transmission with fluid (see section 13, 14).
- Refill the radiator with engine coolant (see page 10-5).
- Bleed air from the cooling system with the heater valve open (see page 10-5).
- Clean the battery posts and cable terminals with sandpaper, assemble them, then apply grease to prevent corrosion.
- Inspect for fuel leakage (see section 11).
  After assembling the fuel line, turn ON (II) the ignition switch (do not operate the starter) so that the fuel pump runs for approximately two seconds and the fuel line pressurizes. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

(cont'd)

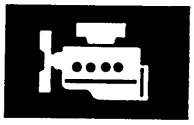
Installation (cont'd)

Mount and Bracket Bolts/Nuts Torque Value Specifications:

A: 10 x 1.25 mm
64 N·m (6.5 kgf·m, 47 lbf·ft)
B: 10 x 1.25 mm
44 N·m (4.5 kgf·m, 33 lbf·ft)
C: 12 x 1.25 mm
83 N·m (8.5 kgf·m, 61 lbf·ft)
D: 12 x 1.25 mm
59 N·m (6.0 kgf·m, 43 lbf·ft)
Replace.

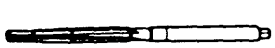


Cylinder Head/Valve Train

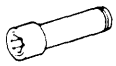


Special Tools

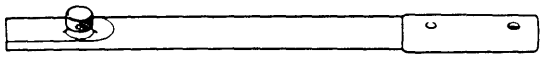
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAH – PJ7010B	Valve Guide Reamer, 5.5 mm	1	6-37
②	07JAA – 001010A	Socket, 17 mm	1	6-14
③	07JAB – 001020A	Holder Handle	1	6-14
④	07LAJ – PR3020B	Air Stopper	1	6-7, 8
⑤	07NAB – 001040A	Holder Attachment, 50 mm	1	6-14
⑥	07NAJ – P07010A	Pressure Gauge Adapter	1	6-4
⑦	07406 – 0020201	A/T Pressure Hose	1	6-4
or ⑦-1	07MAJ – PY4011A	A/T Pressure Hose, 2,210 mm	1	6-4
and ⑦-2	07MAJ – PY40120	A/T Pressure Adapter	1	6-4
⑧	07406 – 0070300	A/T Low Pressure Gauge W/Panel	1	6-4
⑨	07742 – 0010100	Valve Guide Driver, 5.5 mm	1	6-35, 36



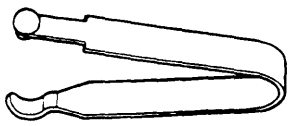
①



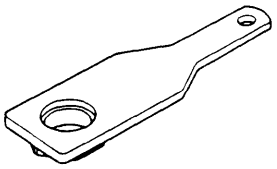
②



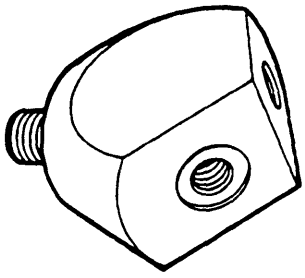
③



④

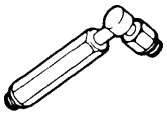


⑤

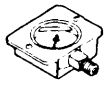


⑥

⑦
⑦ - 1



⑦ - 2



⑧

⑨

Troubleshooting Flowchart

P1259 The scan tool indicates Diagnostic Trouble Code (DTC) P1259: A problem in the VTEC Pressure Switch circuit or VTEC Solenoid Valve circuit.

Refer to page 11-38 through 11-55 before troubleshooting.

— The MIL has been reported on.
— DTC P1259 is stored.

Check the VTEC Control System:
1. Do the engine control module (ECM)/powertrain control module (PCM) Reset Procedure (see section 11).
2. Start the engine.
3. Warm up the engine to normal operating temperature (cooling fan comes on).
4. Do the Road Test.*

* Road Test:
Accelerate in 1st gear to an engine speed over 6,000 rpm.
Hold that engine speed for at least two seconds.
If the DTC P1259 is not repeated during the first road test, repeat this test two more times.

Is DTC P1259 indicated?

NO → **Intermittent failure, system is OK at this time.**
Check for poor connections or loose wires at the VTEC pressure switch, VTEC solenoid valve and ECM/PCM.

YES

Test the VTEC Pressure Switch:
1. Turn the ignition switch OFF.
2. Disconnect the VTEC Pressure switch connector.
3. Check for continuity between VTEC pressure switch connector terminal No. 1 and No. 2.

Is there continuity?

NO → **Replace the VTEC pressure switch.**

YES

Test the VTEC Pressure Switch Wire:
1. Turn the ignition switch ON (II).
2. Measure the voltage between VTEC pressure switch connector No. 1 and body ground.

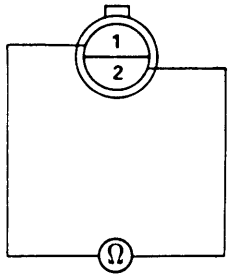
Is there approx. 12 V?

NO → **Inspect for an open or short to ground in the wire between the VTEC pressure switch and ECM/PCM (C15).**
If the wire is OK, substitute a known-good ECM/PCM and recheck.

YES

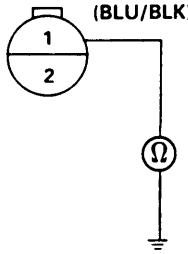
(To page 6-4)

VTEC PRESSURE SWITCH CONNECTOR



Terminal side of male terminals

VTM (BLU/BLK)



Wire side of female terminals

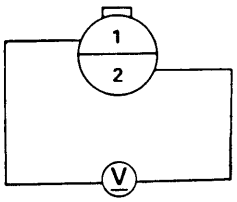
(cont'd)

Troubleshooting Flowchart (cont'd)

(From page 6-3)

Test the VTEC Pressure Switch Wire:
Measure voltage across the VTEC pressure switch connector.

VTEC PRESSURE SWITCH CONNECTOR



Wire side of female terminals

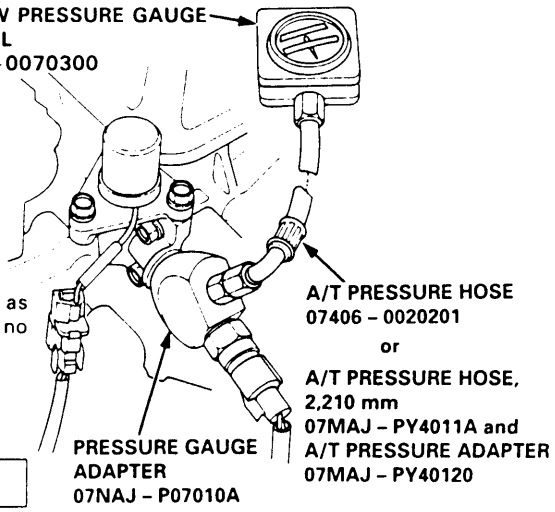
Is there approx. 12 V?

NO → **Repair open in the wire between VTEC pressure switch and A10 or A23 of the ECM/PCM. If the wire is OK, substitute a known-good ECM/PCM and recheck.**

YES

Test the VTEC Solenoid Valve:
1. Turn the ignition switch OFF.
2. Remove the VTEC pressure switch and install the special tool as shown, then reinstall the VTEC pressure switch.
3. Connect a tachometer (see section 11).
4. Start the engine.
5. Warm up engine to normal operating temperature (cooling fan comes on).
6. Check oil pressure at the following engine speeds 1,000, 3,000 and 5,000 rpm.

NOTE: Keep measuring time as short as possible because engine is running with no load (less than one minute).

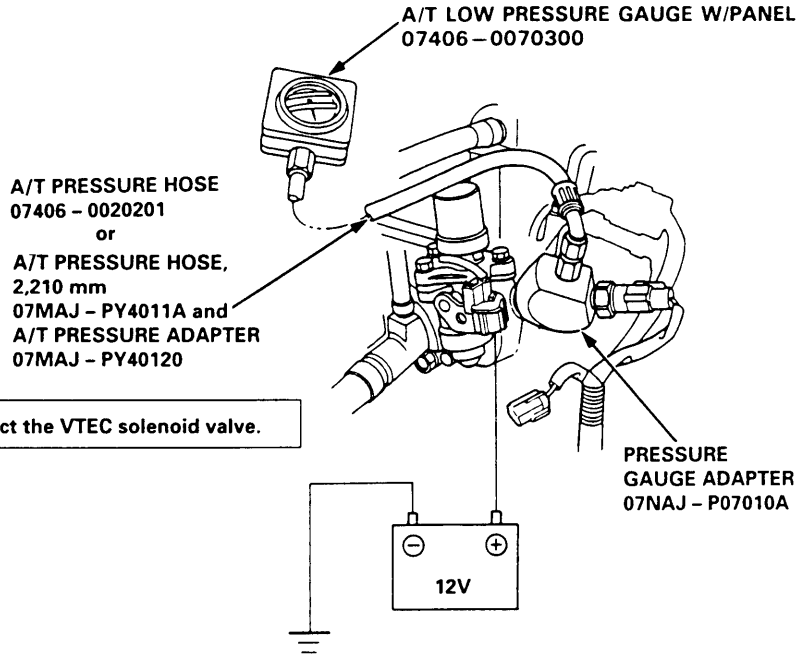


Is pressure below 49 kPa (0.5 kgf/cm², 7 psi)?

NO → **Inspect the VTEC solenoid valve.**

YES

Test the VTEC Solenoid Valve:
1. Turn the ignition switch OFF.
2. Disconnect the VTEC solenoid valve connector.
3. Attach the battery positive terminal to the GRN/YEL terminal.
4. Start the engine and check the oil pressure at engine speed 5,000 rpm.



Is the pressure above 390 kPa (4.0 kgf/cm², 57 psi)?

NO → **Inspect the VTEC solenoid valve.**

YES

(To page 6-5)

(From page 6-4)

Test the VTEC Pressure Switch:
1. Turn the ignition switch OFF.
2. Reconnect the VTEC pressure switch connector.
3. Start the engine.
4. With the battery positive terminal connected to the VTEC solenoid valve, measure voltage between C15 and A10 or A23.

Is there approx. 12 V above 5,000 rpm?

NO → **Replace the VTEC pressure switch.**

YES

Test the VTEC Solenoid Valve:
1. Turn the ignition switch OFF.
2. Disconnect the battery positive terminal from the VTEC solenoid valve.
3. Check for continuity between the VTEC solenoid valve connector terminal No. 1 and body ground.

Is there 14 – 30 Ω?

NO → **Replace the VTEC solenoid valve.**

YES

Test the VTEC Solenoid Valve Wire:
Check for continuity between the VTEC solenoid valve connector terminal No. 1 and A8.

Is there continuity?

NO → **Repair open in the wire between the ECM/PCM (A8) and VTEC solenoid valve connector.**

YES

Test the VTEC Solenoid Valve Wire:
Check for continuity between the VTEC solenoid valve connector terminal No. 1 and body ground.

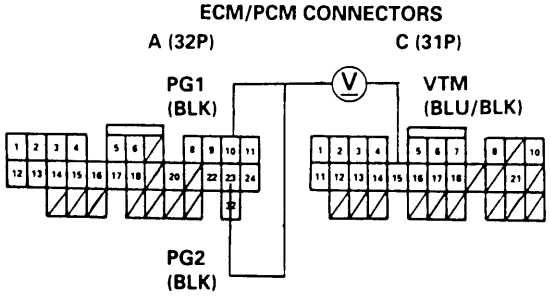
Is there continuity?

YES → **Repair short in the wire between the ECM/PCM (A8) and VTEC solenoid valve connector.**

NO

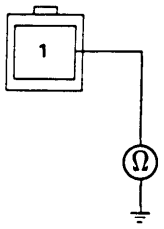
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

ECM/PCM CONNECTORS



Wire side of female terminals

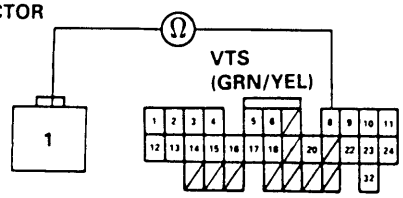
VTEC SOLENOID VALVE CONNECTOR



Terminal side of male terminal

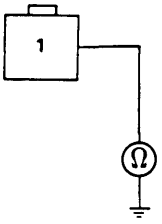
VTEC SOLENOID VALVE CONNECTOR

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

VTEC SOLENOID VALVE CONNECTOR



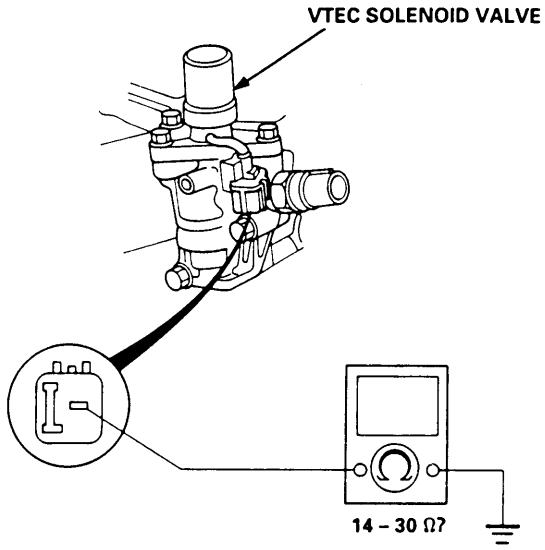
Wire side of female terminal

VTEC Solenoid Valve

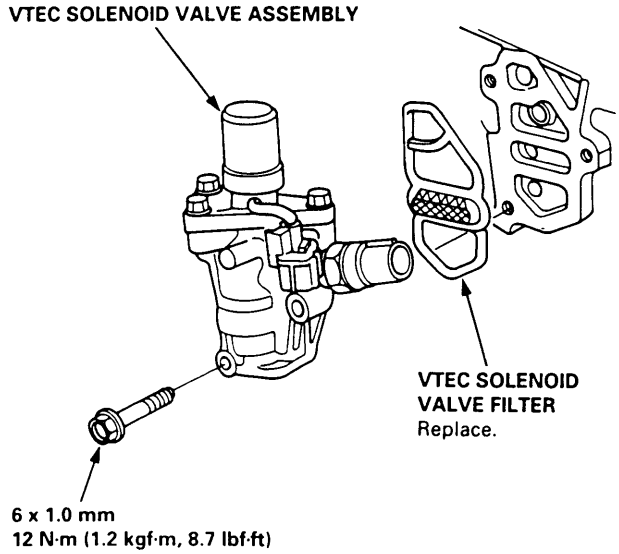
Inspection

1. Disconnect the 1P connector from the VTEC solenoid valve.
2. Measure resistance between the terminal and body ground.

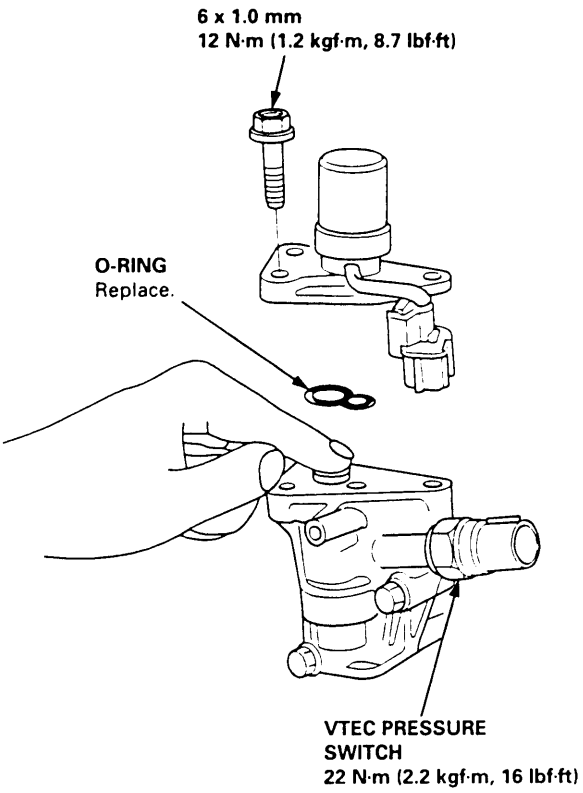
Resistance: 14 – 30 Ω



3. If the resistance is within specifications, remove the VTEC solenoid valve assembly from the cylinder head, and check the VTEC solenoid valve filter for clogging.
   - If there is clogging, replace the engine oil filter and the engine oil.



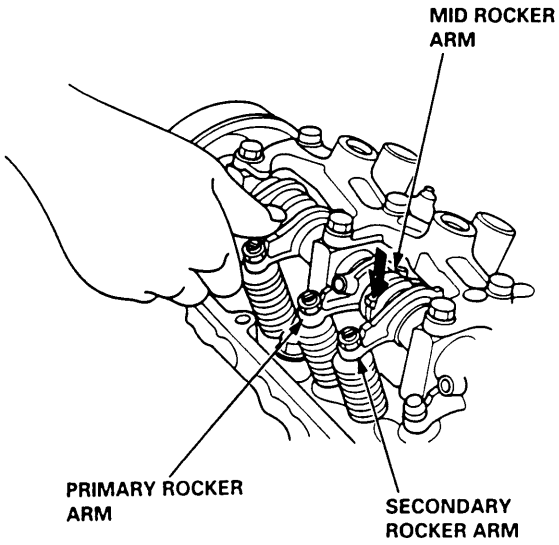
4. If the filter is not clogged, push the VTEC solenoid valve with your finger and check its movement.
   - If the VTEC solenoid valve is normal, check the engine oil pressure.



Manual Inspection

1. Set the No. 1 piston at TDC.
2. Remove the cylinder head cover.

   NOTE: Refer to page 6-40 when installing the cylinder head cover.
3. Push the intake mid rocker arm on the No. 1 cylinder manually.
4. Check that the intake mid rocker arm moves independently of the primary and secondary intake rocker arms.



5. Check the intake mid rocker arm of each cylinder at TDC.

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

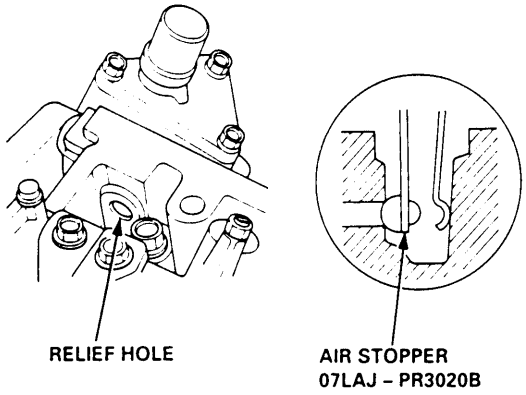
Inspection Using Special Tools

CAUTION:

- **Before using the Valve Inspection Tool, make sure that the air pressure gauge on the air compressor indicates over 400 kPa (4 kgf/cm², 57 psi).**
- **Inspect the valve clearance before rocker arm inspection.**
- **Cover the timing belt with a shop towel to protect the belt.**
- **Check the intake primary rocker arm of each cylinder at TDC.**

1. Remove the cylinder head cover.

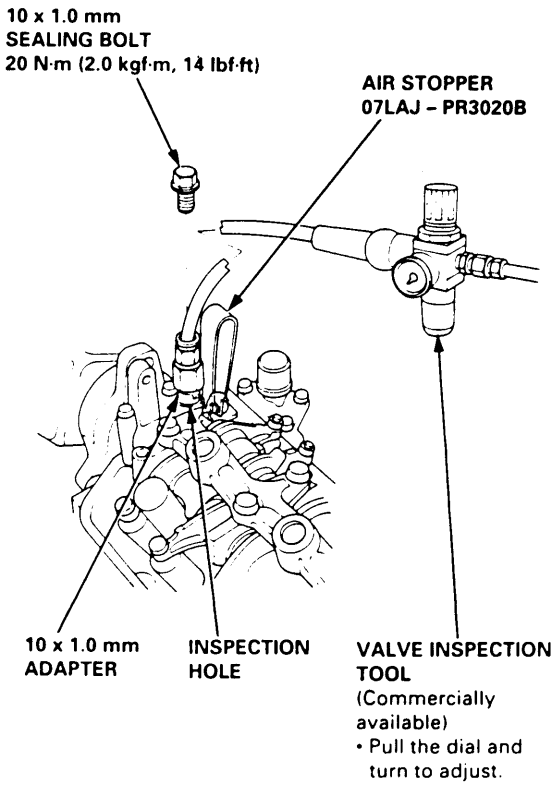
   NOTE: Refer to page 6-40 when installing the cylinder head cover.
2. Plug the relief hole with the special tool.



(cont'd)

Inspection Using Special Tools (cont'd)

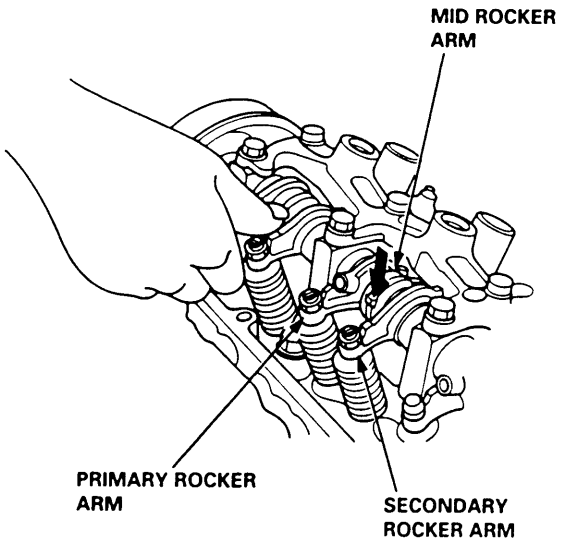
3. Remove the sealing bolt from the inspection hole and connect the Valve Inspection Tool.



4. Loosen the regulator valve on the valve inspection tool and apply the specified air pressure to the rocker arm synchronizing piston A/B.

Specified Air Pressure:
250 kPa (2.5 kgf/cm², 36 psi)

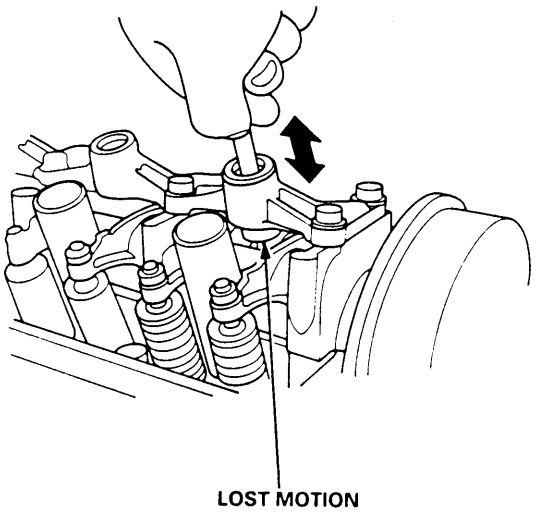
5. Make sure that the intake primary and secondary rocker arms are mechanically connected by the piston and that the mid rocker arm does not move when pushed manually.



If any intake mid rocker arm moves independently of the primary and secondary rocker arms, replace the rocker arms as a set.

6. Remove the special tools.

7. Use a 10 mm diameter rod to depress each lost motion assembly through its full movement. Replace any lost motion assembly that does move smoothly.



8. After inspection, check that the malfunction indicator lamp (MIL) does not come on.

Valve Clearance

Adjustment

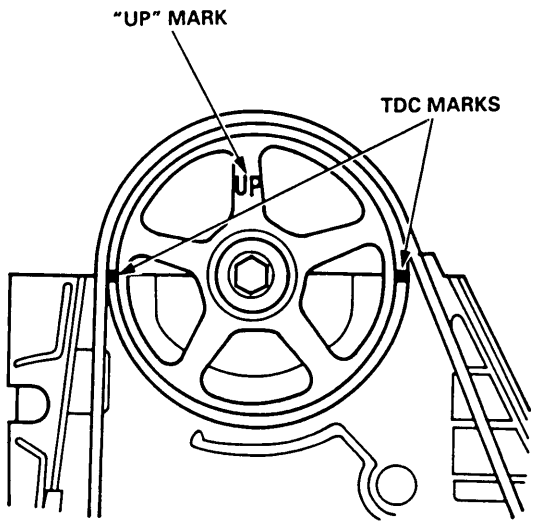
NOTE:
- Valves should be adjusted only when the cylinder head temperature is less than 100°F (38°C).
- After adjusting, retorque the crankshaft pulley bolt to 181 N·m (18.5 kgf·m, 134 lbf·ft).

1. Remove the cylinder head cover.

   NOTE: Refer to page 6-40 when installing the cylinder head.

2. Remove the upper cover (see page 6-17).

3. Set the No. 1 piston at TDC. The "UP" mark on the cam-shaft pulley should be at the top, and the TDC marks should align with the cylinder head upper surface.

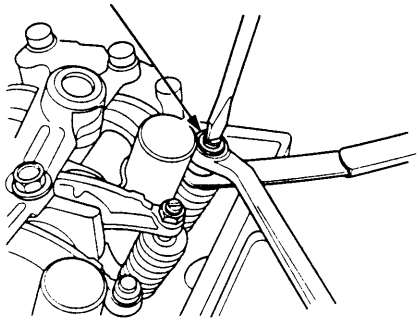


4. Adjust the valves on No. 1 cylinder.

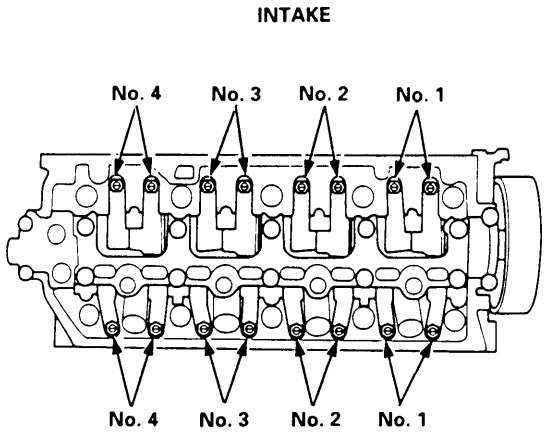
   Intake: 0.18 – 0.22 mm (0.007 – 0.009 in)
   Exhaust: 0.23 – 0.27 mm (0.009 – 0.011 in)

5. Loosen the locknut, and turn the adjustment screw until the feeler gauge slides back and forth with a slight amount of drag.

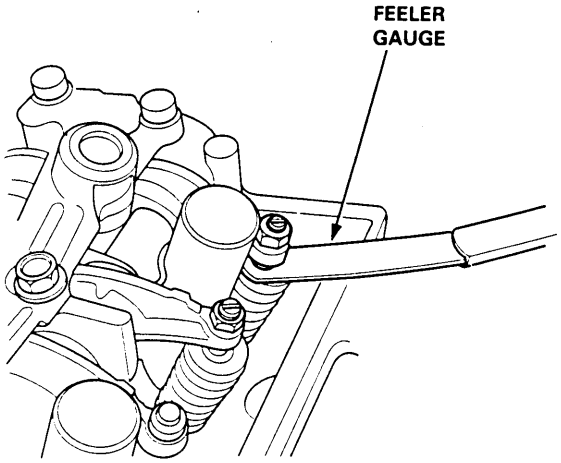
INTAKE and EXHAUST VALVE LOCKNUTS
20 N·m (2.0 kgf·m, 14 lbf·ft)



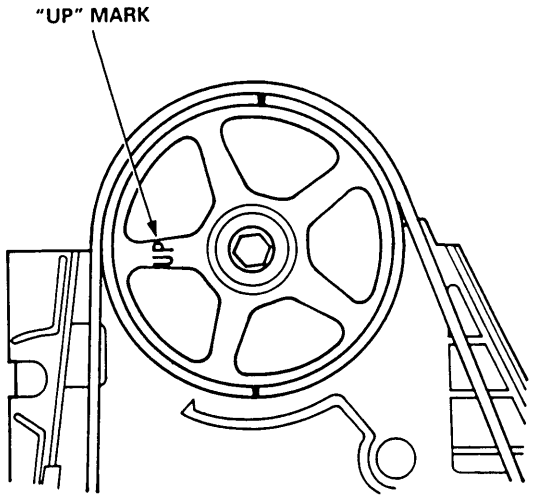
Adjusting screw locations:



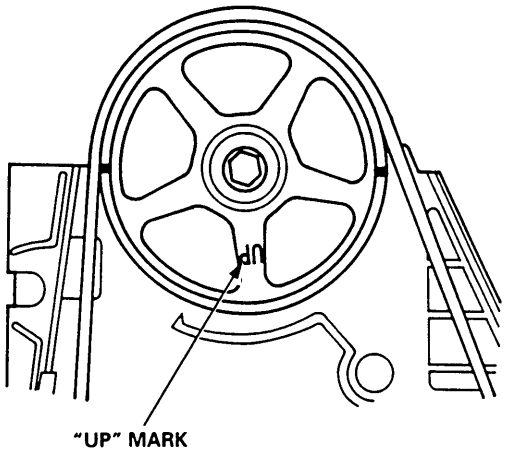
6. Tighten the locknut, and check the clearance again. Repeat the adjustment if necessary.



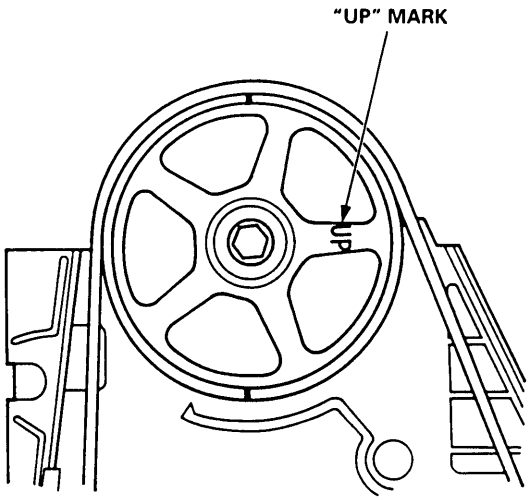
7. Rotate the crankshaft 180° counterclockwise (camshaft pulley turns 90°). The "UP" mark should be on the exhaust side. Adjust the valves on No. 3 cylinder.



8. Rotate the crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both TDC grooves are once again visible. Adjust the valves on No. 4 cylinder.



9. Rotate the crankshaft 180° counterclockwise to bring No. 2 piston to TDC. The "UP" mark should be on the intake side. Adjust the valves on No. 2 cylinder.



Replacement (Cylinder head removal not required)

NOTE: Cylinder head removal is not required in this procedure.

The procedure shown below applies when using the in-car valve spring compressor (Snap-on YA8845 with YA8845 – 2 A 7/8" attachment).

⚠ WARNING Alway wear approved eye protection when using the in-car valve spring compressor.

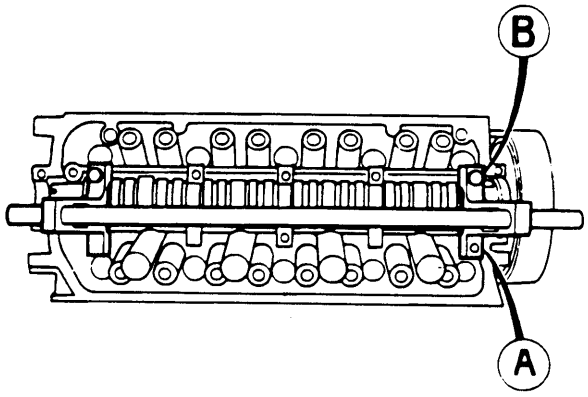
1. Turn the crankshaft so that the No. 1 and the No. 4 pistons are at top dead center (TDC).

2. Remove the cylinder head cover and the rocker arm assembly.

   NOTE:
   - Refer to page 6-26 for rocker arm assembly removal.
   - When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.
   - Refer to page 6-40 when installing the cylinder head cover.

3. Remove the fuel injectors and the wire harness.

4. Using the 8 mm bolts supplied with the tool, mount the two uprights to the cylinder head at the end camshaft holders. The uprights fit over the camshaft as shown.



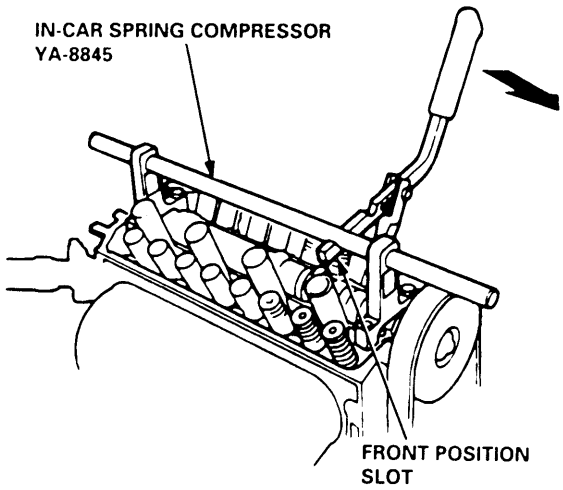
5. Insert the cross shaft through the top hole of the two uprights.

Intake Valve Seals:

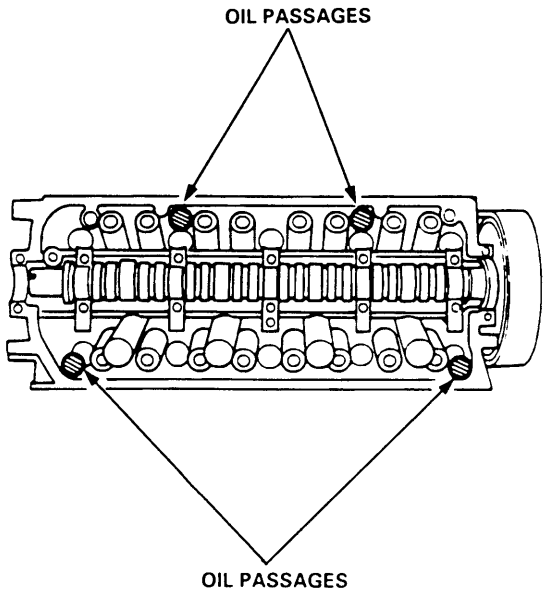
6. Select the 7/8 in diameter short compressor attachment, and fasten the attachment to the No. 4 hole of the lever arm with the speed pin supplied.

7. Insert an air adaptor into the spark plug hole. Pump air into the cylinder to keep the valve closed while compressing the springs and removing the valve keepers.

8. Position the lever arm under the cross shaft so the lever is perpendicular to the shaft and the compressor attachment rests on top of the retainer for the spring being compressed. Use the front position slot on the lever as shown.



NOTE: Put shop towels over the oil passages to prevent the valve keepers from falling into the cylinder head.



9. Using a downward motion on the lever arm, compress the valve spring and remove the keepers from the valve stem. Slowly release pressure on the spring.

10. Remove the valve seals (see page 6-32).

11. Install the valve seals (see page 6-37).

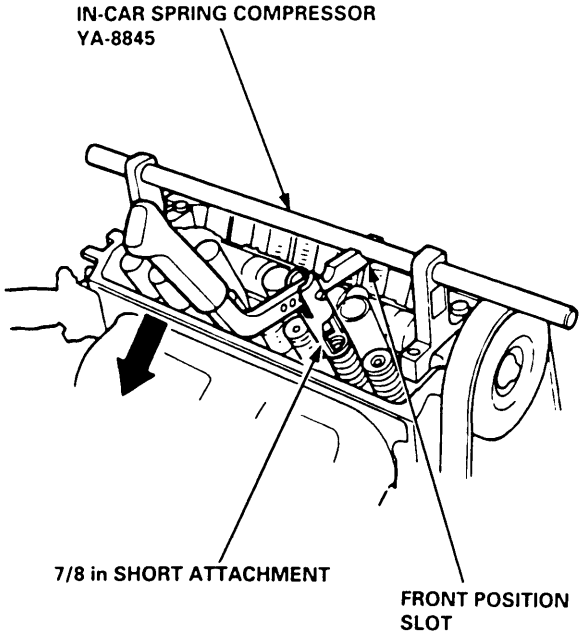
12. Install the springs, the retainers and the keepers in reverse order of removal.

Exhaust Valve Seals:

13. Select the 7/8 in. diameter short compressor attachment, and fasten the attachment to the No. 2 hole of the lever arm with the speed pin supplied.

14. Position the lever arm under the cross shaft so the lever is perpendicular to the shaft and the compressor attachment rests on top of the retainer for the spring being compressed. Use the front position slot on the lever as shown.

    NOTE: Put shop towels over the oil passages to prevent the valve keepers from falling into the cylinder head.



15. Using a downward motion on the lever arm, compress the valve spring and remove the keepers from the valve stem. Slowly release pressure on the spring.

16. Remove the valve seals (see page 6-32).

17. Install the valve seals (see page 6-37).

18. Install the springs, the retainers and the keepers in reverse order of removal.

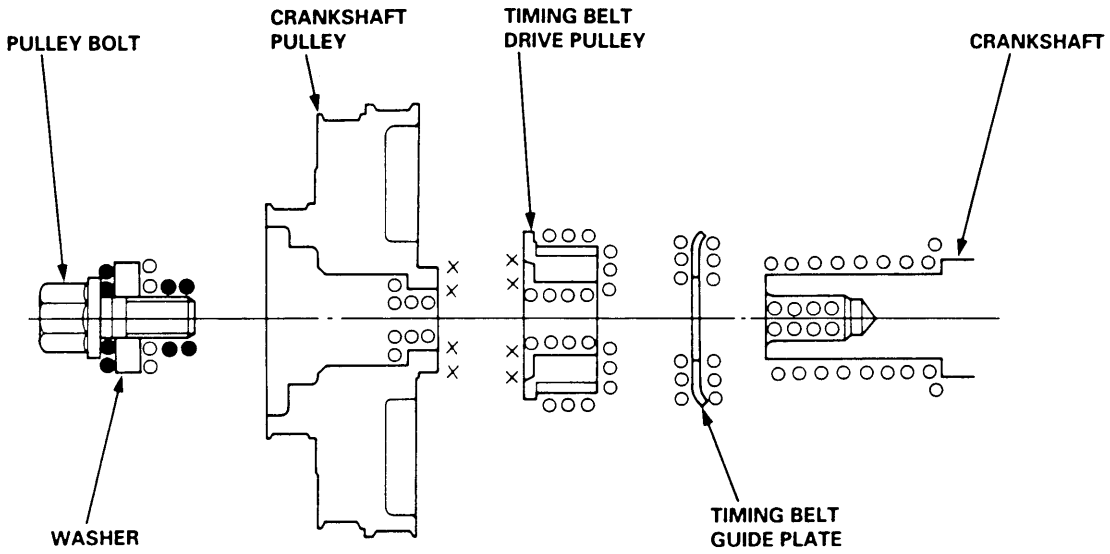
19. Repeat steps 6 to 18 on the other cylinders.

Crankshaft Pulley and Pulley Bolt

Replacement

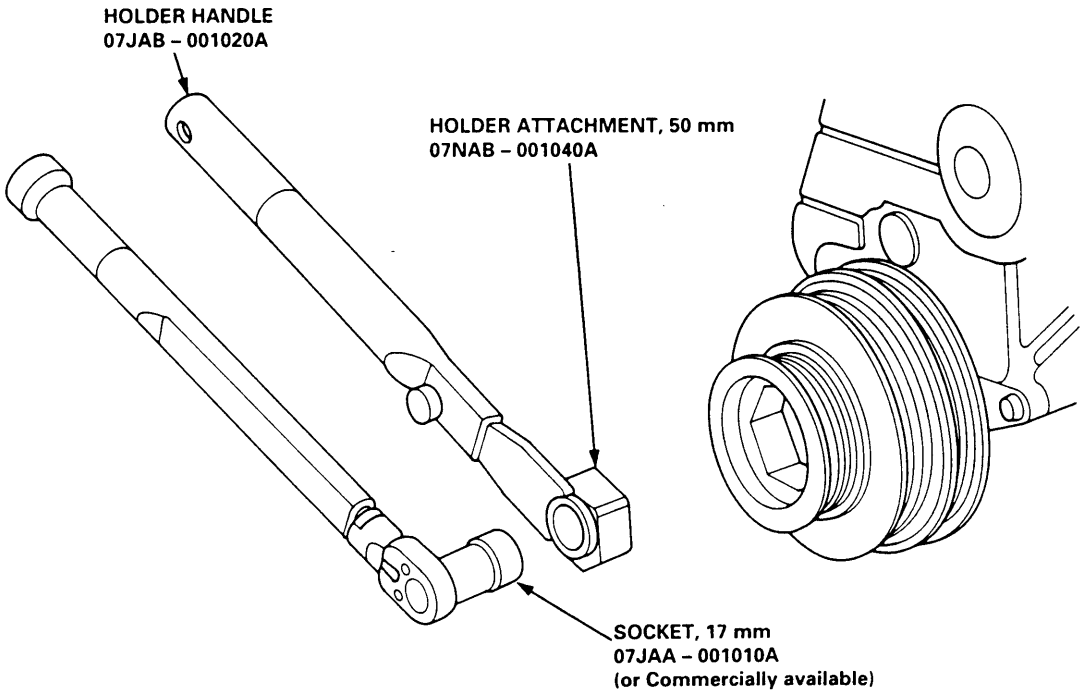
When installing and tightening the pulley, follow the procedure below.

Clean, remove any oil, and lubricate the points shown below.
○ : Clean
× : Remove any oil
● : Lubricate



Crankshaft pulley bolt size and torque value:
14 x 1.25 mm
181 N·m (18.5 kgf·m, 134 lbf·ft)

NOTE: Do not use an impact wrench when installing.



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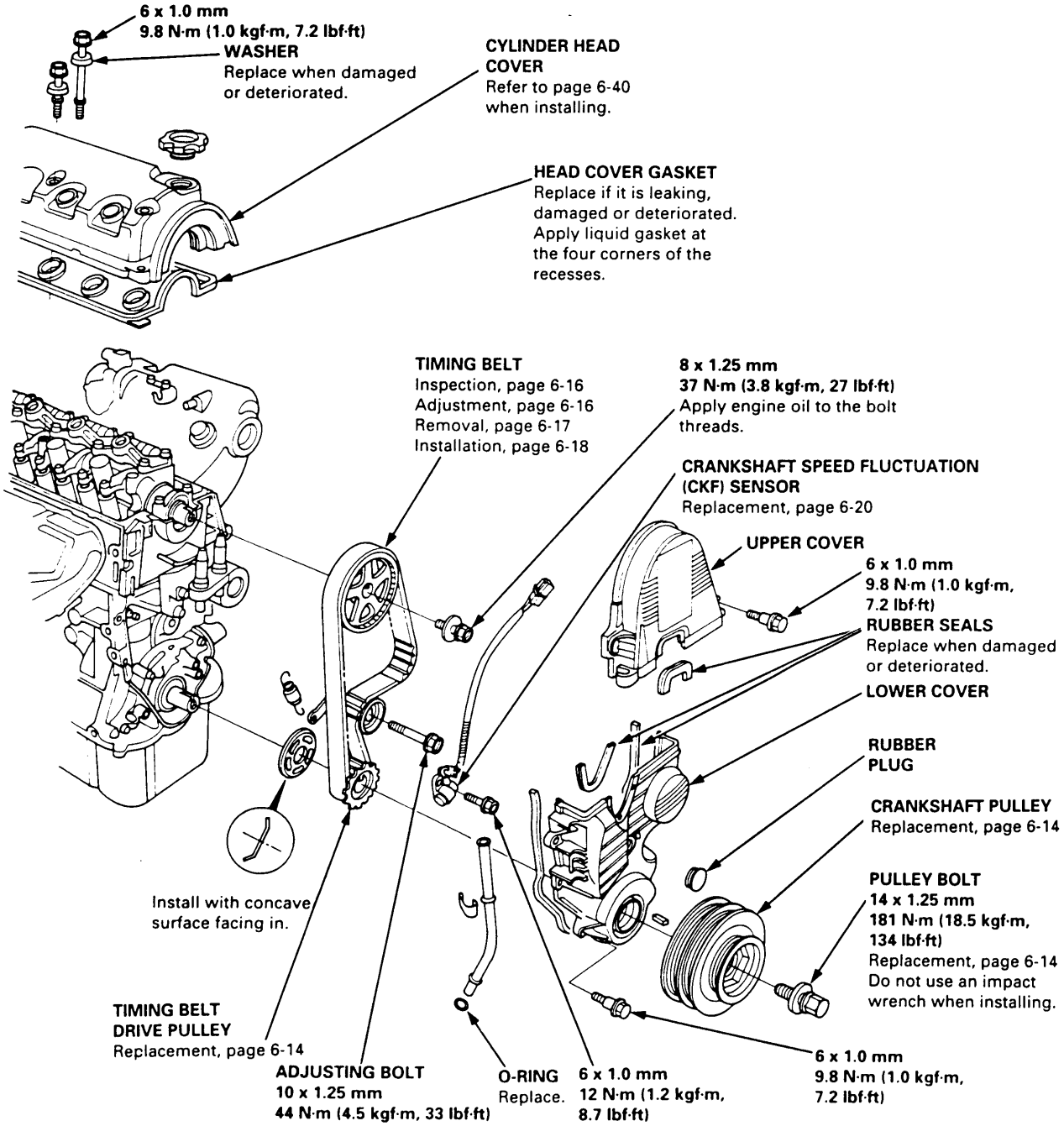
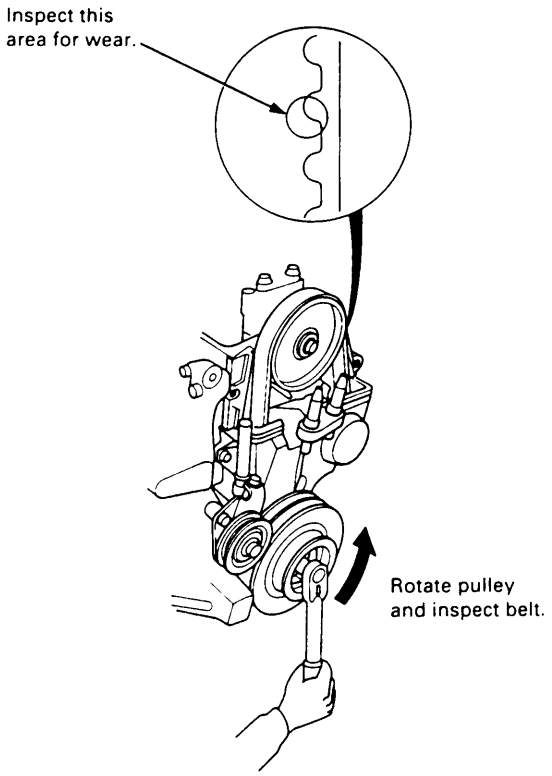
NOTE:
- Refer to page 6-18 for how to position the crankshaft and pulley before installing the belt.
- Mark the direction of rotation on the belt before removing it.
- Do not use the upper cover and lower cover to store removed items.
- Clean the upper cover and lower cover before installing them.
- Replace the camshaft seals and crankshaft seals if there is oil leakage.
- Refer to page 6-14 before installing the timing belt.



Inspection

1. Remove the cylinder head cover.
   - Refer to page 6-40 when installing.
2. Remove the upper cover (see page 6-17).
3. Inspect the timing belt for cracks and oil or coolant soaking.

   NOTE:
   - Replace the belt if it is oil or coolant soaked.
   - Remove any oil or solvent that gets on the belt.



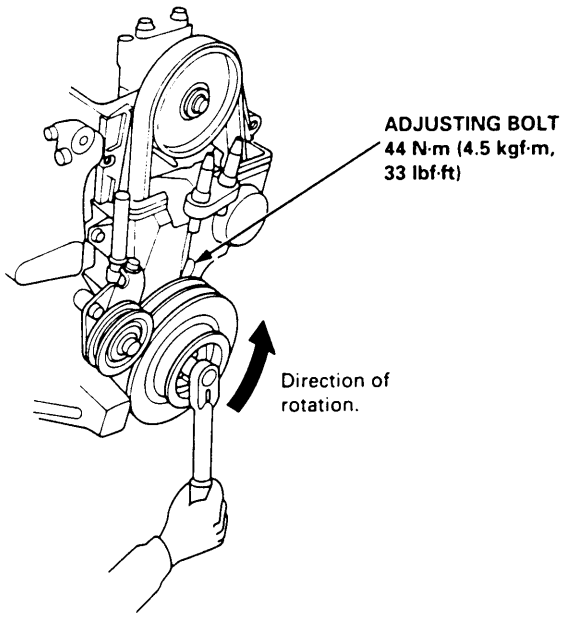
4. After inspecting, retorque the crankshaft pulley bolt to 181 N·m (18.5 kgf·m, 134 lbf·ft).

Tension Adjustment

CAUTION: Always adjust the timing belt tension with the engine cold.

NOTE:
- The tensioner is spring-loaded to apply tension to the belt automatically after making the following adjustment.
- Always rotate the crankshaft counterclockwise when viewed from the pulley side. Rotating it clockwise may result in improper adjustment of the belt tension.
- Inspect the timing belt before adjusting the belt tension.

1. Remove the cylinder head cover.
   - Refer to page 6-40 when installing.
2. Remove the upper cover (see page 6-17).
3. Rotate the crankshaft five or six revolutions to set the belt.
4. Set the No. 1 piston at TDC (see page 6-19).
5. Loosen the adjusting bolt 180°.



6. Rotate the crankshaft counterclockwise three teeth on the camshaft pulley.
7. Tighten the adjusting bolt.
8. After inspecting, retorque the crankshaft pulley bolt to 181 N·m (18.5 kgf·m, 134 lbf·ft).

Removal

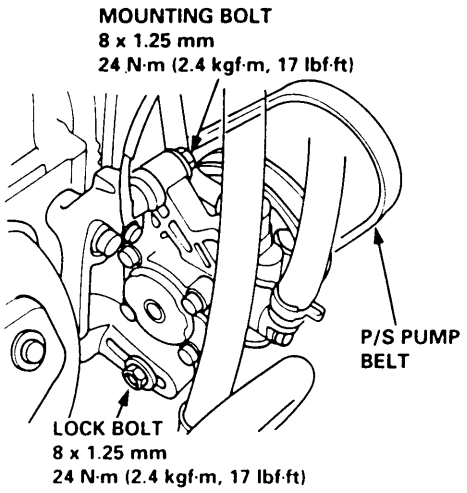
CAUTION:

- **Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (see page 6-19).**
- **Inspect the water pump before installing the timing belt (see page 10-11).**
- **Replace the timing belt at 168,000 km according to the maintenance schedule (normal conditions/severe conditions).**
  If the vehicle is regularly driven in one or more of the following conditions, replace the timing belt at 100,000 km.
  In very high temperatures (over 110°F, 43°C)
  In very low temperatures (under –20°F, –29°C)

NOTE: If the timing belt is going to be reused, mark the direction of rotation on the belt before removing it.

1. Remove the splash shield (see page 5-5).

2. Loosen the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump.

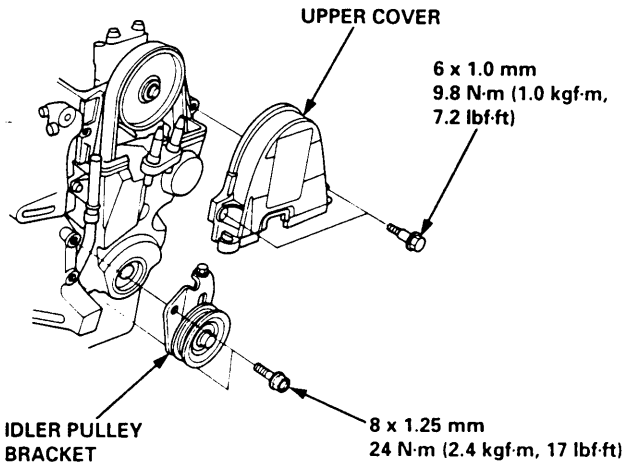


3. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt (see page 5-4).

4. Loosen the mounting nut and lock bolt, then remove the alternator belt (see page 6-23).

5. Remove the dipstick, then remove the upper cover and idler pulley bracket.

   NOTE: Do not use the upper cover to store removed items.



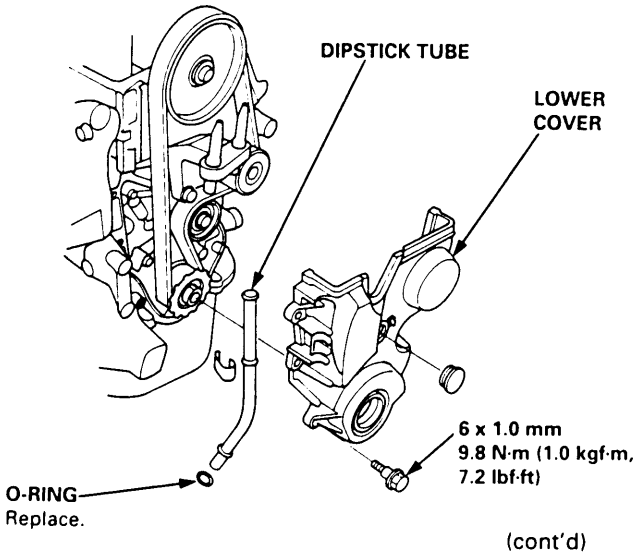
6. Remove the upper bracket (see page 6-25).

   NOTE:
   - Use a jack to support the engine before removing the upper bracket.
   - Make sure to place a cushion between the oil pan and the jack.

7. Remove the crankshaft pulley (see page 6-14).

8. Remove the lower cover and dipstick tube.

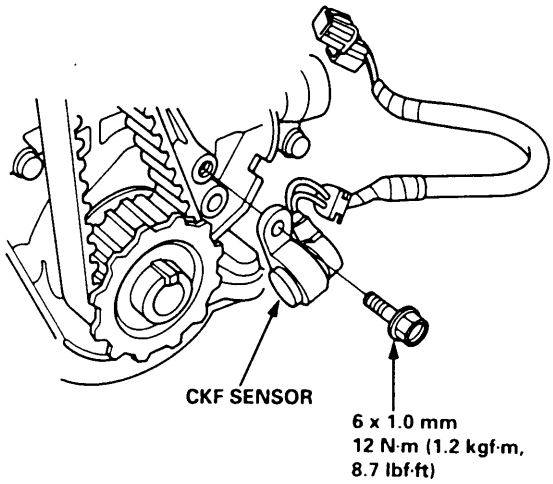
   NOTE: Do not use the lower cover to store removed items.



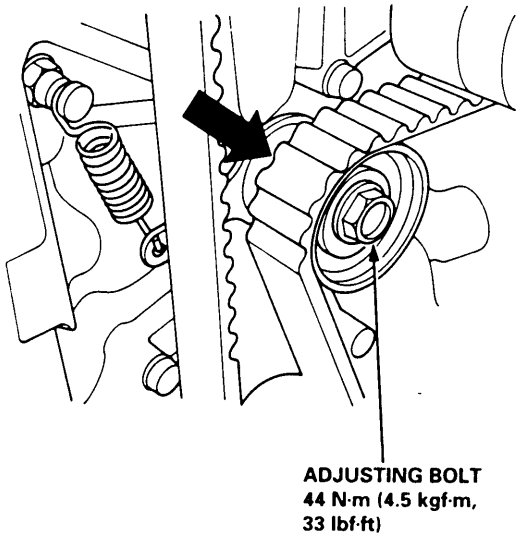
(cont'd)

Removal (cont'd)

9. Remove the CKF sensor from the oil pump.



10. Loosen the adjusting bolt 180°. Push the tensioner to remove tension from the timing belt, then retighten the adjusting bolt.

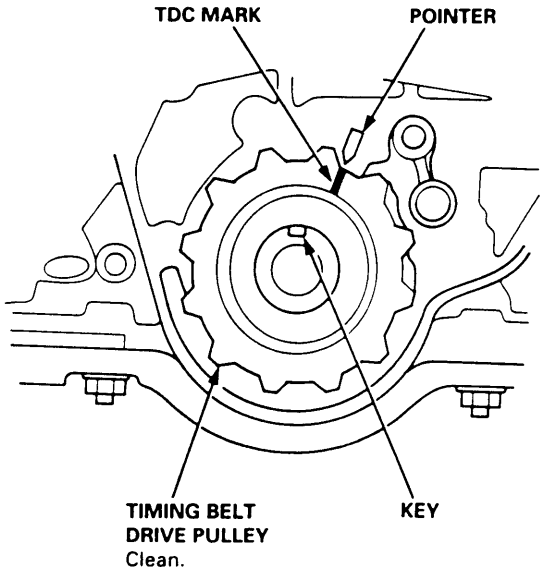


11. Remove the timing belt.

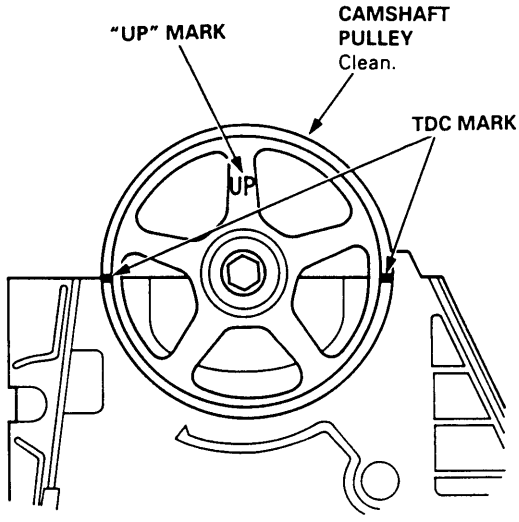
Installation

Install the timing belt in the reverse order of removal; Only key points are described here.

1. Set the timing belt drive pulley so that the No. 1 piston is at top dead center (TDC). Align the groove or the timing belt drive pulley to the pointer on the oi pump.

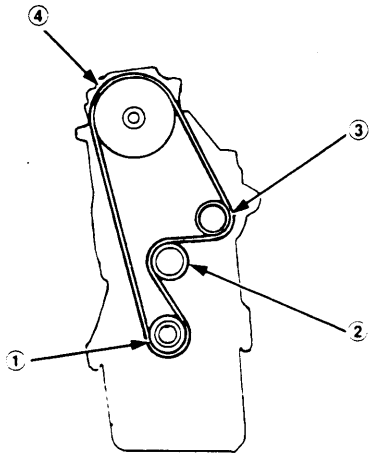


2. Set the camshaft pulley to TDC. Align the TDC marks on the camshaft pulley to the cylinder head upper surface.



3. Install the timing belt tightly in the sequence shown. ①Timing belt drive pulley (crankshaft) →②Adjusting pulley →③Water pump pulley →④Camshaft pulley.

   NOTE: Make sure the timing belt drive pulley and camshaft pulley are at TDC.



4. Loosen and retighten the adjusting bolt to tension the timing belt.

5. Install the lower cover and upper cover.

   NOTE: Clean the upper and lower covers before installation.

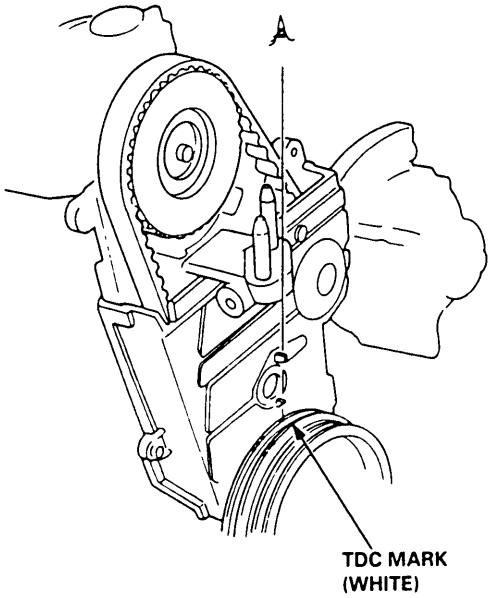
6. Install the crankshaft pulley, then tighten the pulley bolt (see page 6-14).

7. Rotate the crankshaft pulley about five or six turns counterclockwise so that the timing belt positions on the pulleys.

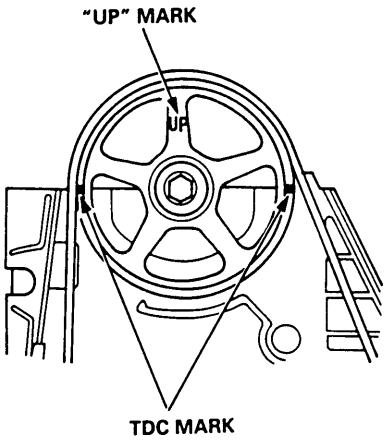
8. Adjust the timing belt tension (see page 6-16).

9. Check that the crankshaft pulley and camshaft pulley are both at TDC.

CRANKSHAFT PULLEY:



CAMSHAFT PULLEY:



10. If the camshaft pulley is not positioned at TDC, remove the timing belt and adjust the position following the procedure on page 6-18. Then reinstall the timing belt.

11. After installation, adjust the tension of each belt.

    - See section 4 for alternator belt tension adjustment.
    - See section 22 for A/C compressor belt tension adjustment.
    - See section 17 for P/S pump belt tension adjustment.

Crankshaft Speed Fluctuation (CKF) Sensor

Replacement

1. Remove the cylinder head cover.

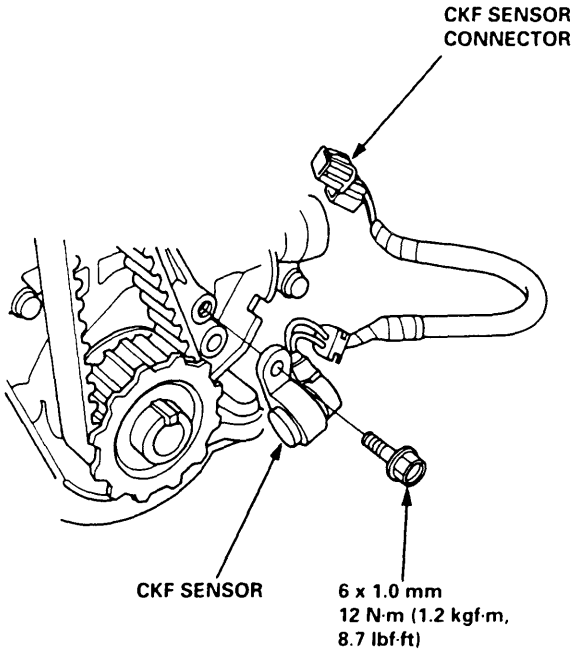
   NOTE: Refer to page 6-40 when installing.

2. Remove the crankshaft pulley (see page 6-14).

3. Remove the upper cover and dipstick/tube (see page 6-17).

4. Remove the lower cover and idler pulley bracket (see page 6-17).

5. Disconnect the CKF sensor connector, then remove the CKF sensor.

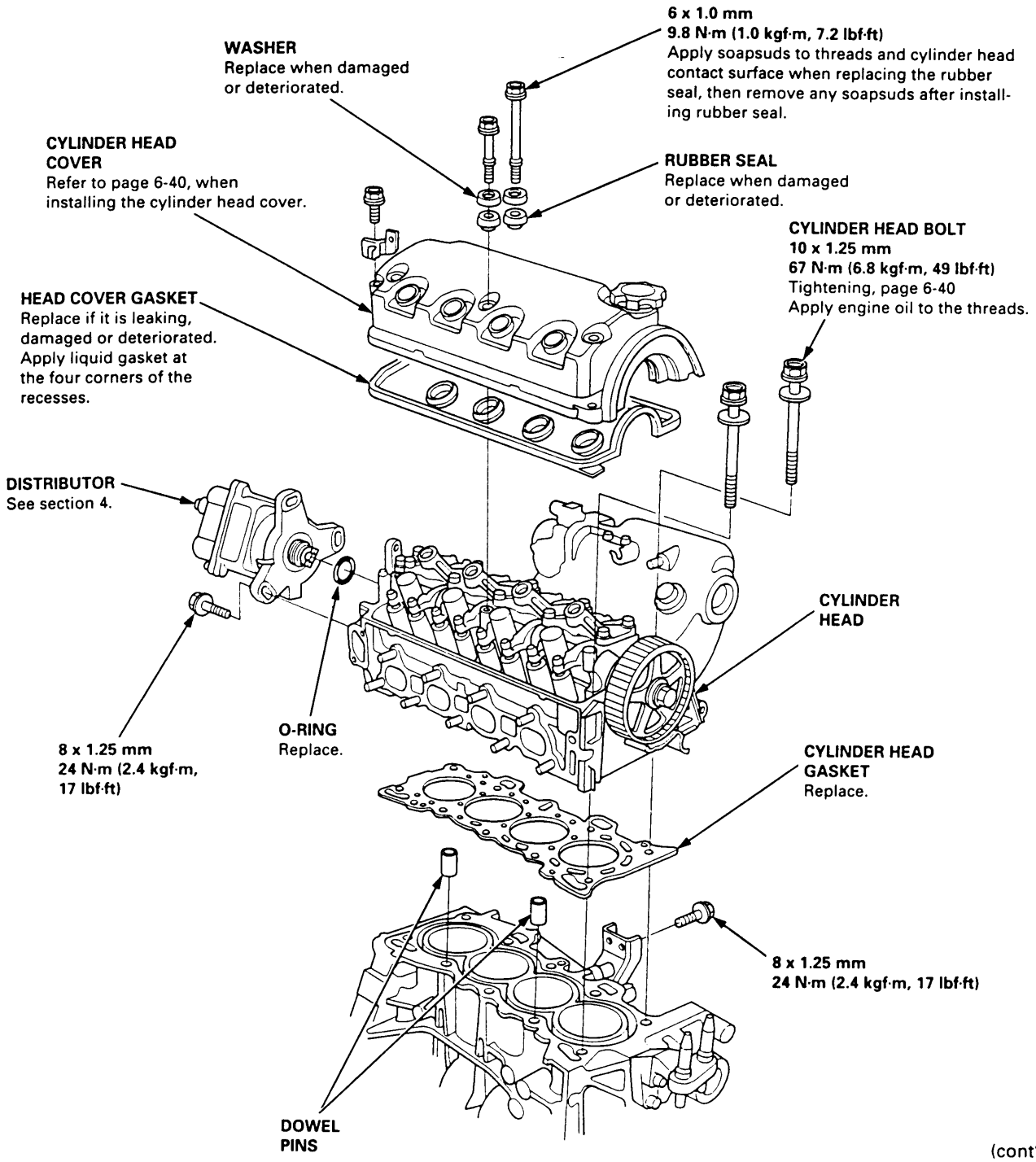


6. Install the CKF sensor in reverse order of removal.

Illustrated Index

CAUTION:
- **To avoid damage, wait until the engine coolant temperature drops below 100°F (38°C) before removing the cylinder head.**
- **When handling a metal gasket, take care not to fold it or damage the contact surface.**

NOTE: Use new O-rings and gaskets when reassembling.



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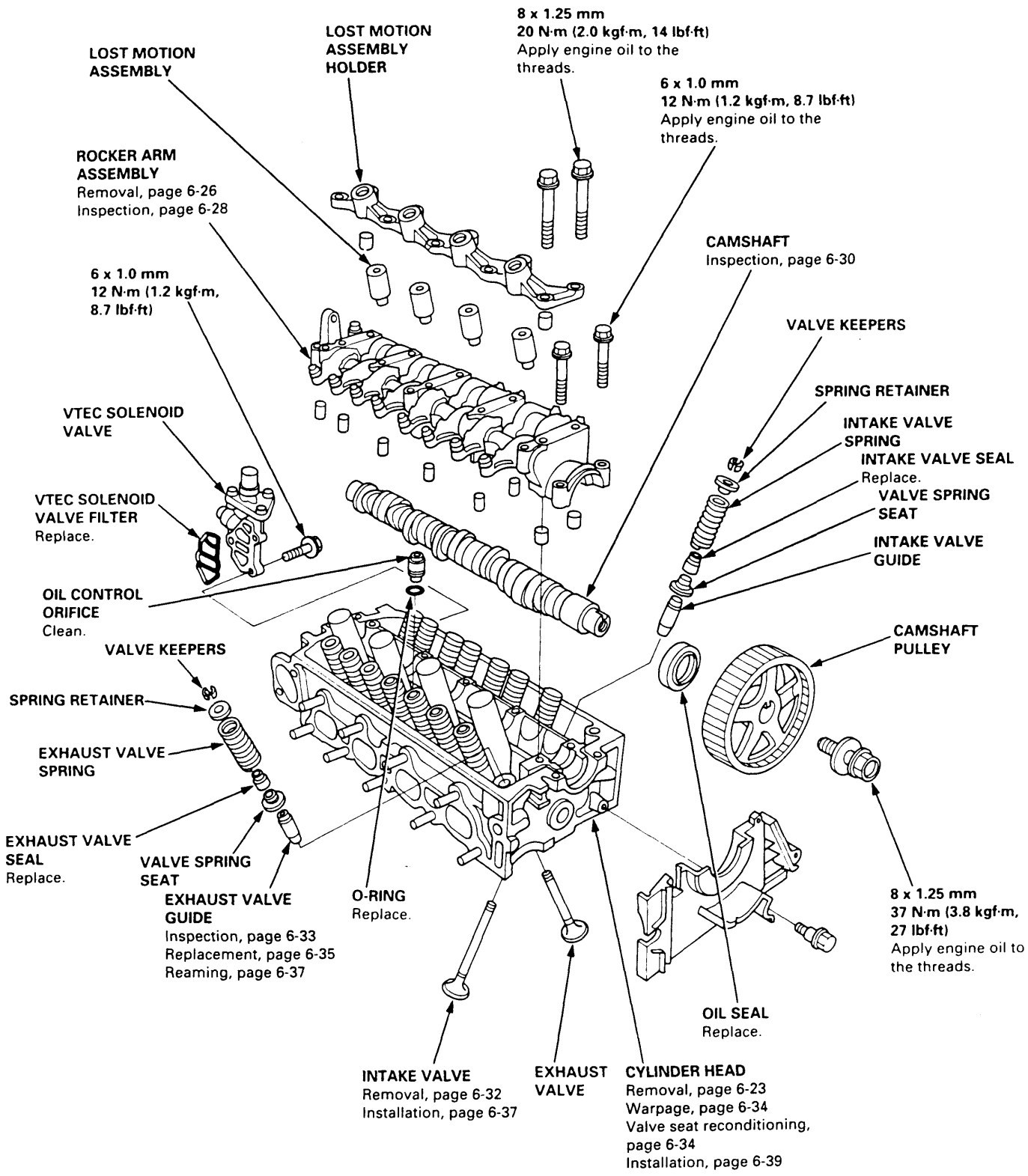
Illustrated Index (cont'd)

Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact parts.



Removal

Engine removal is not required for this procedure.

⚠WARNING Make sure jacks and safety stands are placed properly and hoist brackets are attached to the correct positions on the engine.

CAUTION:
- **Use fender covers to avoid damaging painted surfaces.**
- **To avoid damage, 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 retaining bolts.**

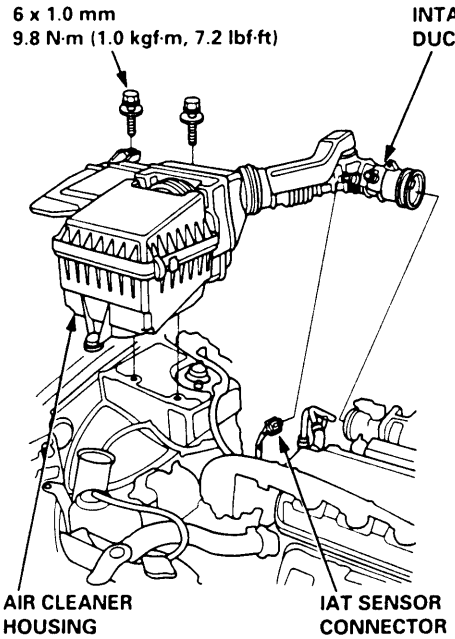
NOTE:
- Unspecified items are common.
- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.
- Inspect the timing belt before removing the cylinder head.
- Turn the crankshaft pulley so that the No. 1 piston is at top dead center (see page 6-19).

1. Make sure you have anti-theft code for the radio, them write down the frequencies for the radio's preset buttons.

2. Disconnect the negative terminal from the battery.

3. Drain the engine coolant (see page 10-5).
   - Remove the radiator cap to speed draining.

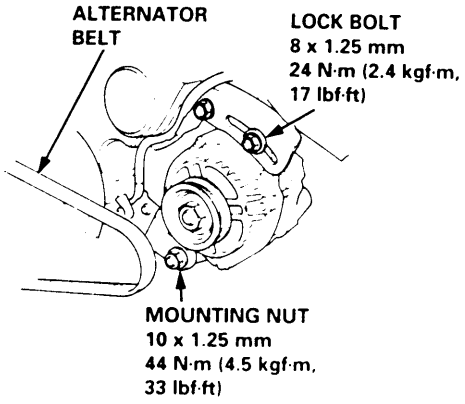
4. Disconnect the intake air temperature (IAT) sensor connector, then remove the air cleaner housing.



5. Loosen the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump (see page 5-4).

6. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt (see page 5-4).

7. Loosen the mounting nut and lock bolt, then remove the alternator belt.



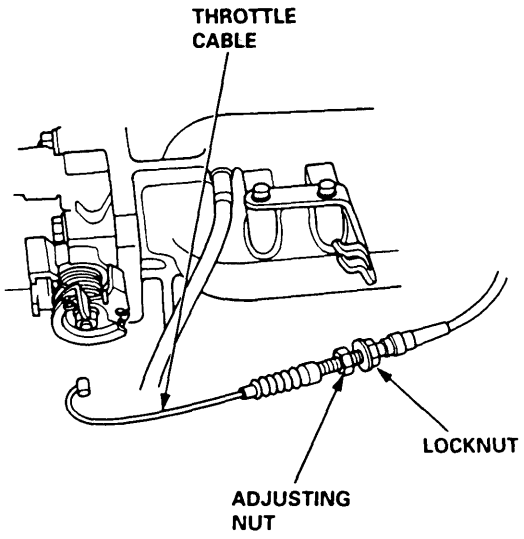
8. Remove the P/S pump bracket (see page 5-10).

(cont'd)

Removal (cont'd)

9. Remove the throttle cable by loosening the locknut, then slip the cable end out of the throttle linkage.

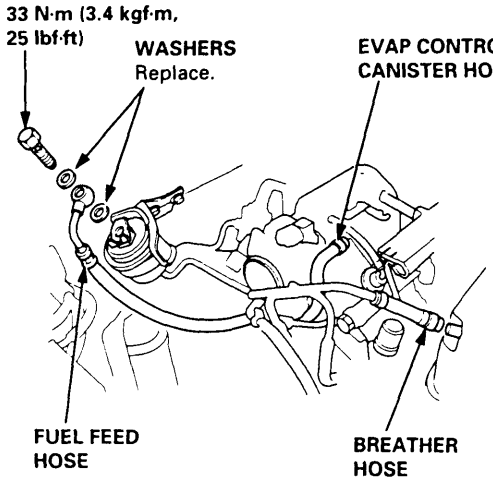
   NOTE:
   - Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
   - Adjust the throttle cable when installing (see section 11).



10. Relieve fuel pressure (see section 11).

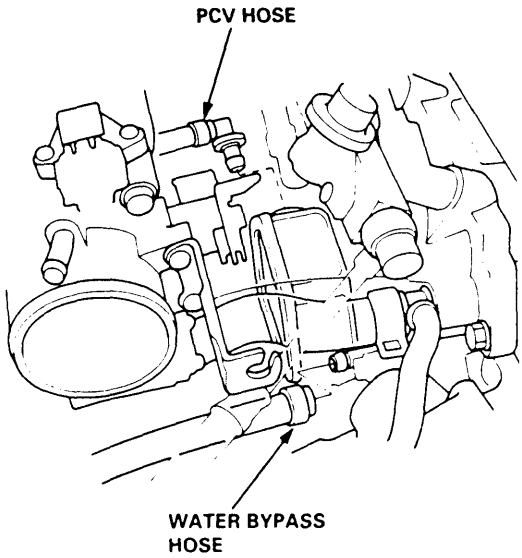
   ⚠WARNING Do not smoke while working on the fuel system. Keep open flame or spark away from the work area. Drain fuel only into an approved container.

11. Remove the evaporative emission (EVAP) control canister hose, fuel feed hose and breather hose.

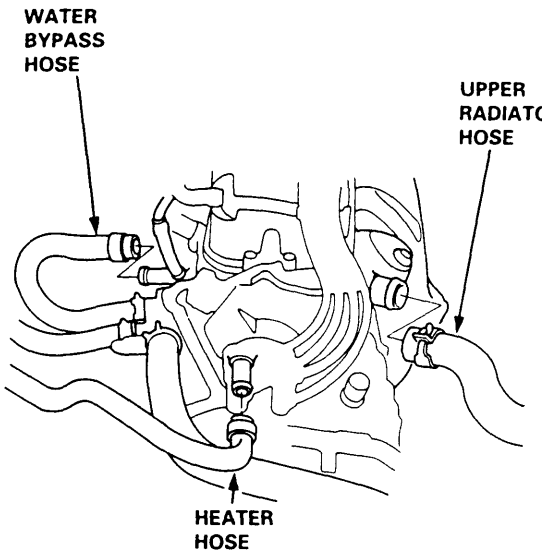


12. Remove the brake booster vacuum hose, fuel re hose and vacuum hose (see page 5-3).

13. Remove the water bypass hose and positive cr case ventilation (PCV) hose.



14. Remove the upper radiator hose, heater hose a water bypass hose.

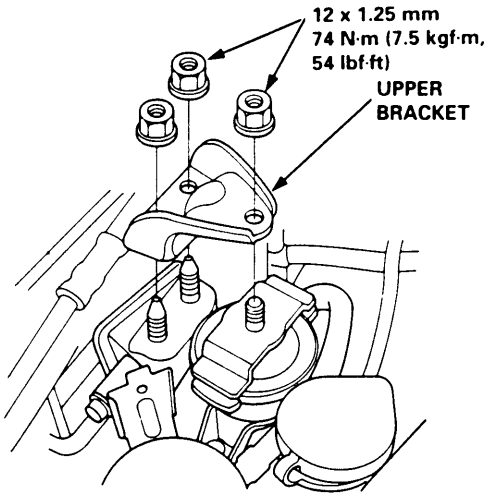


15. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.
    - Four fuel injector connectors
    - Engine coolant temperature (ECT) sensor connector
    - ECT switch connector
    - ECT gauge sending unit connector
    - Throttle position sensor connector
    - Manifold absolute pressure (MAP) sensor connector
    - Primary heated oxygen sensor (primary HO2S) connector
    - Secondary heated oxygen sensor (secondary HO2S) connector
    - VTEC solenoid valve connector
    - VTEC pressure switch connector
    - Idle air control (IAC) valve connector

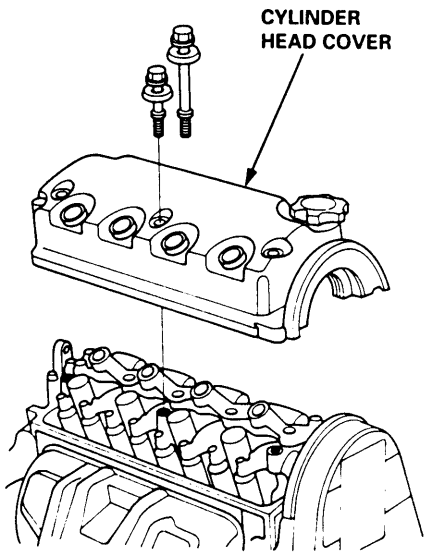
16. Remove the spark plug caps and distributor from the cylinder head.

17. Remove the upper bracket.

    NOTE:
    - Use a jack to support the engine before removing the upper bracket.
    - Make sure to place a cushion between the oil pan and the jack.

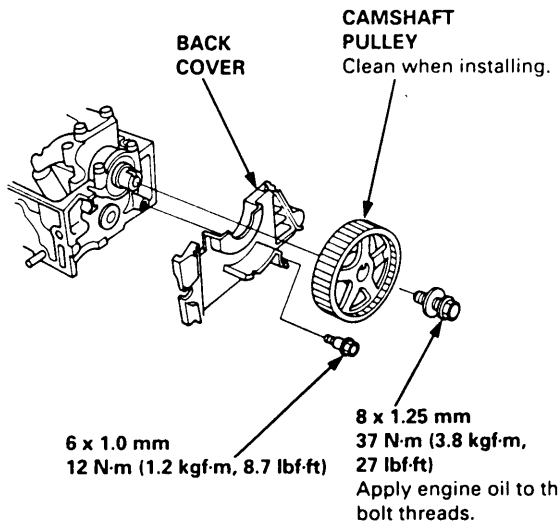


18. Remove the cylinder head cover.



19. Remove the timing belt (see page 6-17).

20. Remove the camshaft pulley.



(cont'd)

Removal (cont'd)

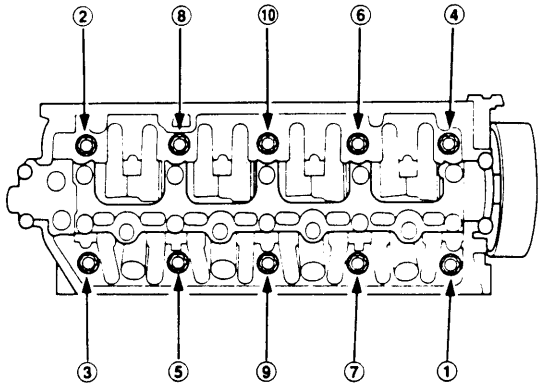
21. Remove the exhaust manifold (see page 9-3).

22. Remove the intake manifold (see page 9-2).

23. Remove the cylinder head bolts, then remove the cylinder head.

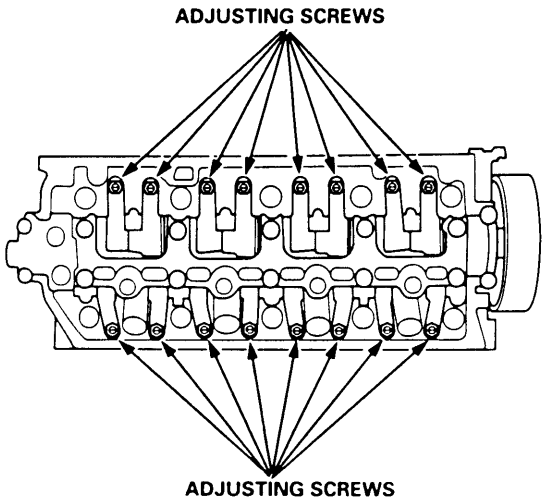
CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all the bolts are loosened.

CYLINDER HEAD BOLTS LOOSENING SEQUENCE:



Removal

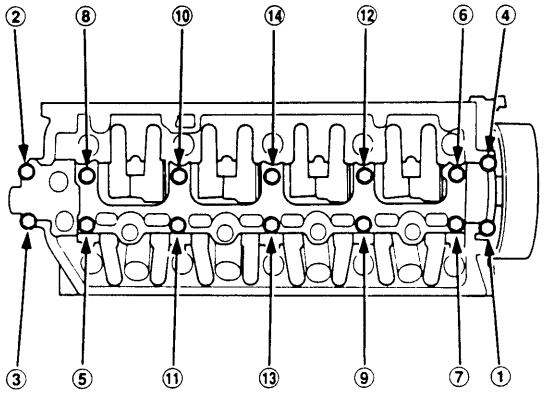
1. Loosen the adjusting screws.



2. Unscrew the camshaft holder bolts, then remove the rocker arm assembly.

NOTE:
- Unscrew the camshaft holder bolts two turns at a time, in a crisscross pattern, to prevent damaging the valves or rocker arm assembly.
- When removing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the camshaft holders, the springs and the rocker arms on the shaft.

CAMSHAFT HOLDER BOLTS LOOSENING SEQUENCE:

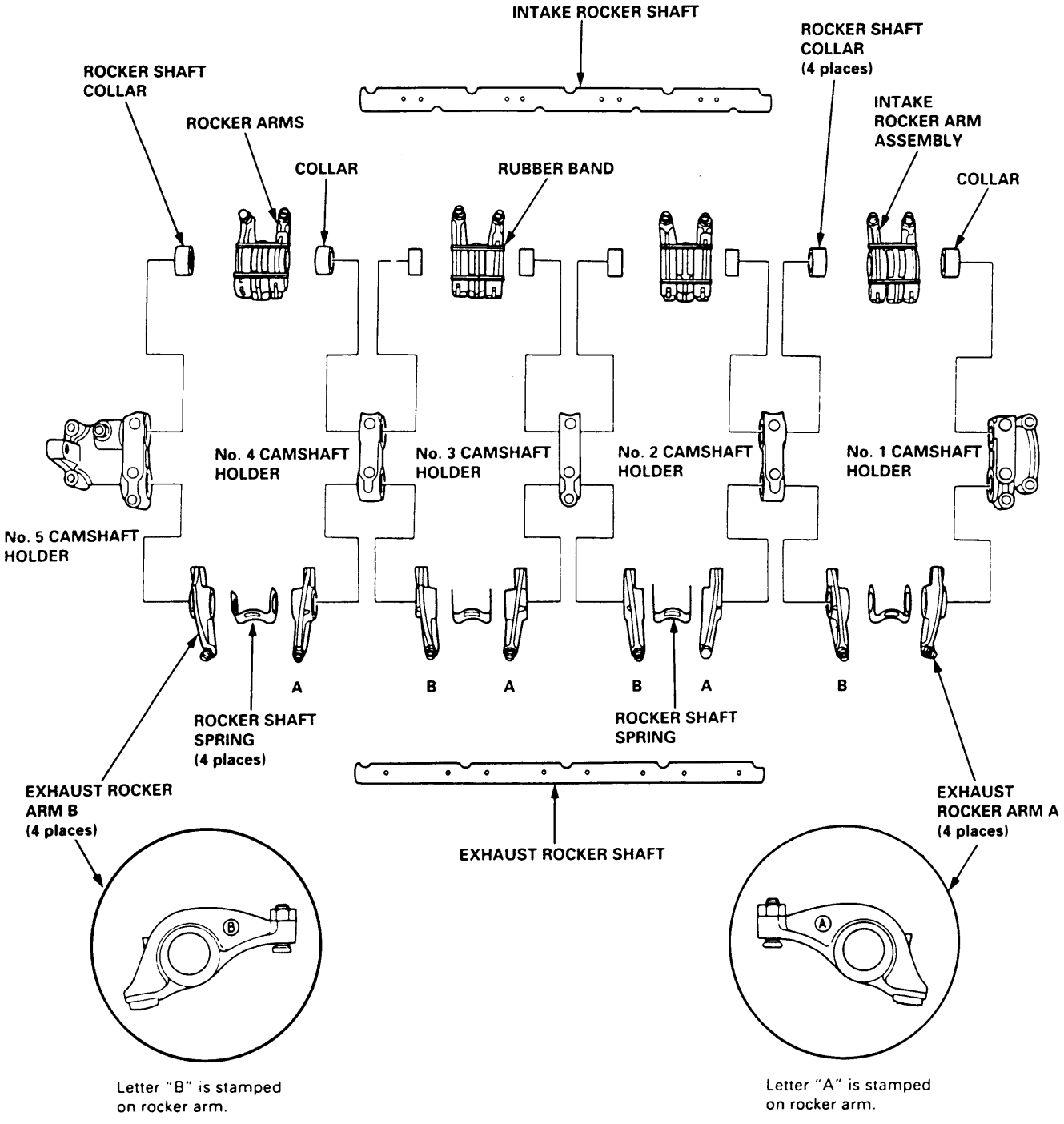


Disassembly/Reassembly

NOTE:

- Identify parts as they are removed to ensure reinstallation in original locations.
- Inspect rocker shafts and rocker arms (see page 6-28).
- Rocker arms must be installed in the same position if reused.
- When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.

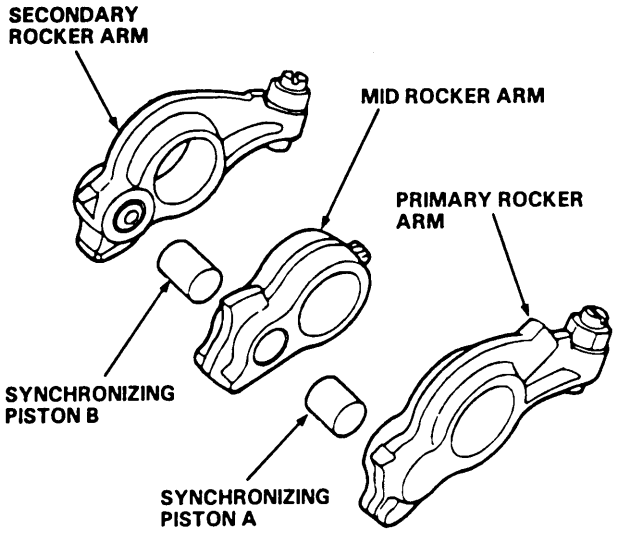
Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact points.



Inspection

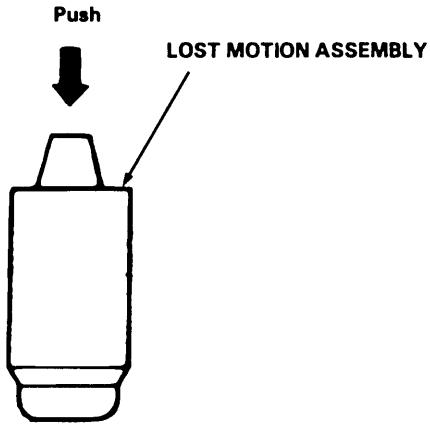
NOTE: When reassembling the primary rocker arm, carefully apply air pressure to the oil passage of the rocker arm.

1. Inspect the rocker arm piston. Push it manually.
   — If it does not move smoothly, replace the rocker arm assembly.



NOTE:
- Apply oil to the pistons when reassembling.
- Bundle the rocker arms with a band to prevent them from separating.

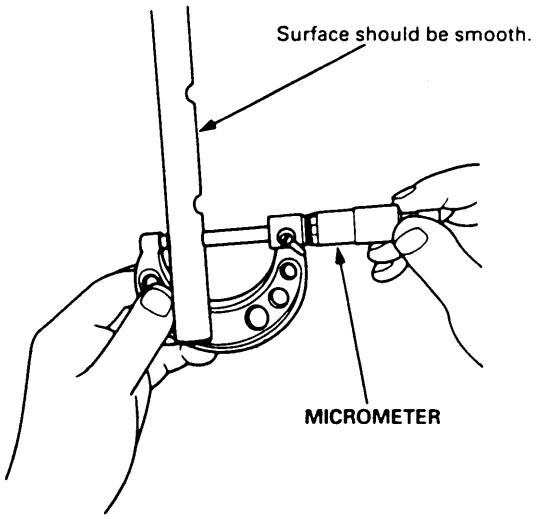
2. Remove the lost motion assembly from the holder and inspect it. Test it by pushing the plunger with your finger.
   — If the lost motion assembly plunger does not move smoothly, replace it.



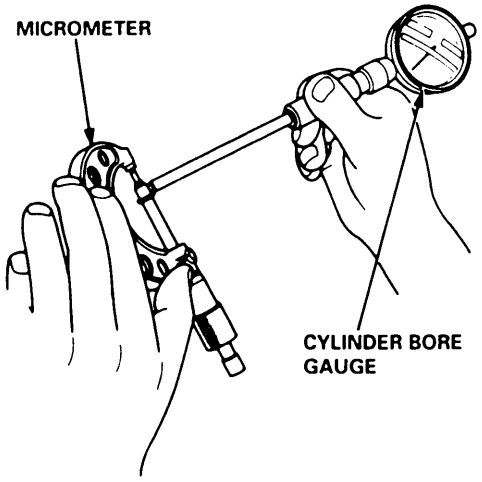
Clearance Inspection

Measure both the intake rocker shaft and exhaust rocker shaft.

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

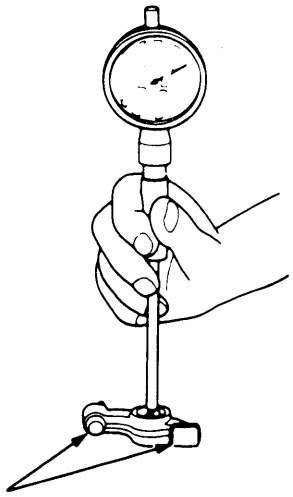


2. Zero the gauge to the shaft diameter.



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

Rocker Arm-to-Shaft Clearance:
Standard (New):
Intake: 0.017 – 0.050 mm (0.0007 – 0.0020 in)
Exhaust: 0.018 – 0.054 mm (0.0007 – 0.0021 in)
Service Limit: 0.08 mm (0.003 in)



4. Repeat these measurements on all the rockers.
   — If the clearance is over the service limit, replace the rocker shaft and all over-tolerance rocker arms.

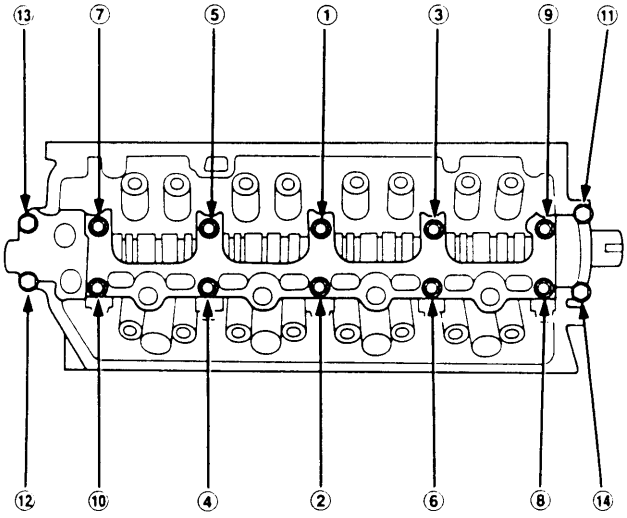
Inspection

NOTE:
- Do not rotate the camshaft during inspection.
- Remove the rocker arms and rocker shafts.

1. Put the camshaft and the camshaft holders on the cylinder head, then tighten the bolts to the specified torque.

   Specified torque:
   8 mm bolts: 20 N·m (2.0 kgf·m 14 lbf·ft)
   Apply engine oil to the threads.
   6 mm bolts: 12 N·m (1.2 kgf·m 8.7 lbf·ft)
   Apply engine oil to the threads.

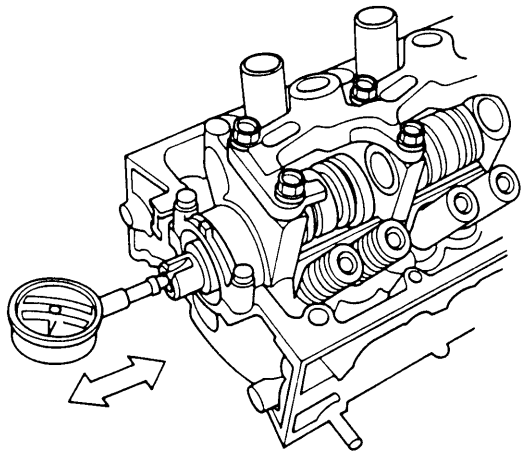
6 mm bolts: ⑪, ⑫ ⑬, ⑭



2. Seat the camshaft by pushing it toward the rear of the cylinder head.

3. Zero the dial indicator against the end of the camshaft. Push the camshaft back and forth, and read the end play.

   Camshaft End Play:
   Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)
   Service Limit: 0.5 mm (0.02 in)



4. Remove the bolts, then remove the camshaft holders from the cylinder head.

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

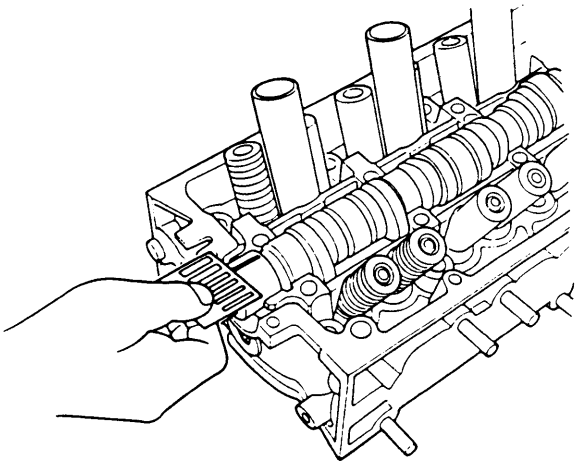
6 Clean the camshaft bearing surfaces in the cylinder head, then set the camshaft back in place.

7 Place a plastigage strip across each journal.

8. Install the camshaft holders, and tighten the bolts to the specified torque.

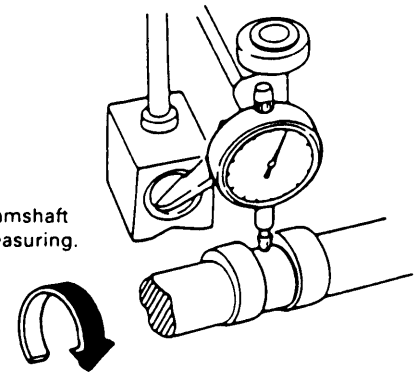
9. Remove the camshaft holders, then measure the widest portion of the plastigage on each journal.

Camshaft-to-Holder Oil Clearance:
Standard (New): 0.050 – 0.089 mm (0.002 – 0.004 in)
Service Limit : 0.15 mm (0.006 in)



10. If the camshaft-to-holder oil clearance is out of tolerance:
— And the camshaft has already been replaced, you must replace the cylinder head.
— If the camshaft has not been replaced, first check the total runout with the camshaft supported on V-blocks.

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



— If the total runout of the camshaft is within tolerance, replace the cylinder head.
— If the total runout is out of tolerance, replace the camshaft and recheck. If the bearing clearance is still out of tolerance, replace the cylinder head.

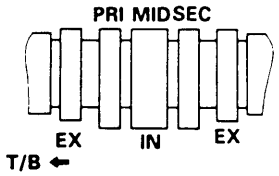
11. Check the cam lobe height wear.

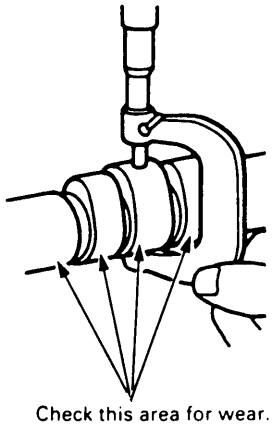
Cam lobe height standard (New)

Unit mm (in)

	INTAKE	EXHAUST
PRI	37.065 (1.4592)	38.008 (1.4964)
MID	38.274 (1.5068)	
SEC	36.778 (1.4479)	

PRI: Primary cam lobe, SEC: Secondary cam lobe
MID: Mid cam lobe, T/B: Timing belt
IN: Intake, EX: Exhaust



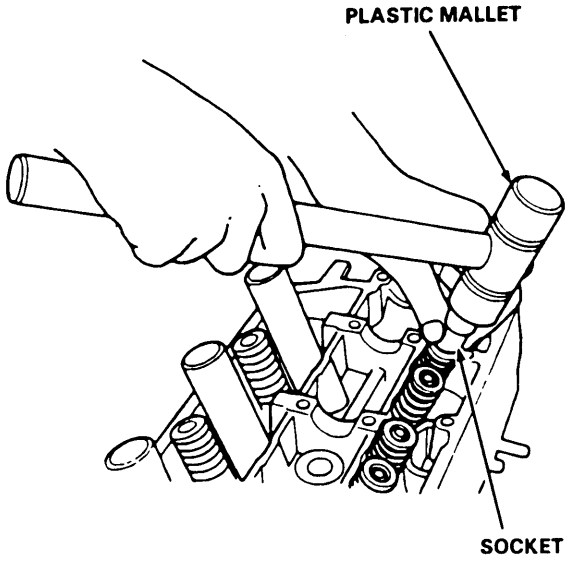


Check this area for wear.

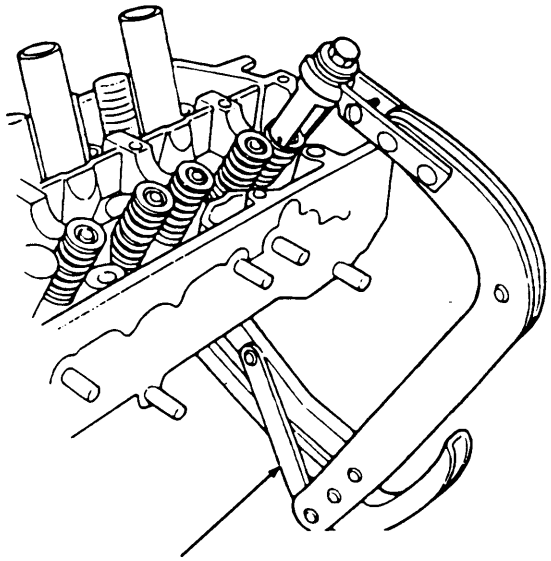
Removal

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

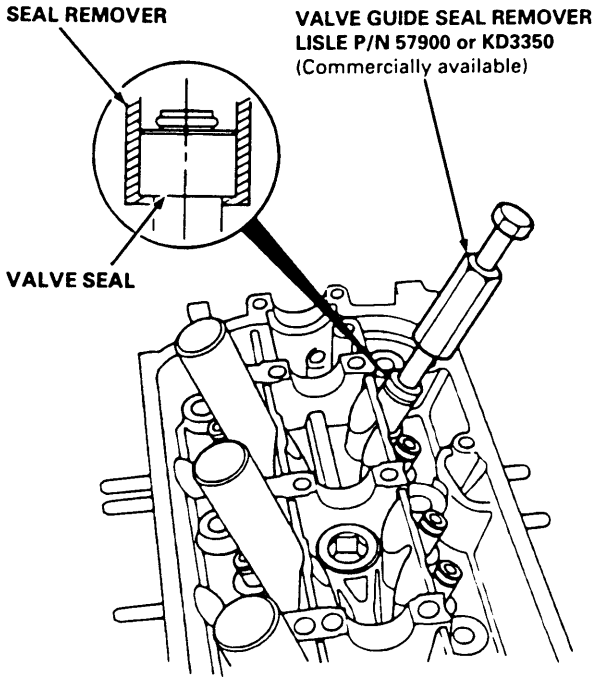
1. Using an appropriate-sized socket and plastic mallet, lightly tap the valve retainer to loosen the valve keepers before installing the valve spring compressor.



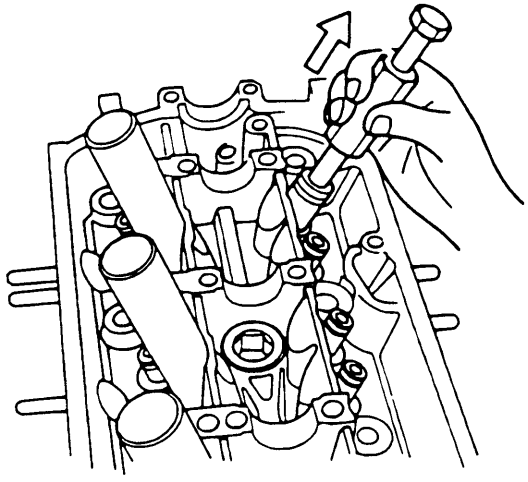
2. Install the spring compressor. Compress the spring and remove the valve keeper.

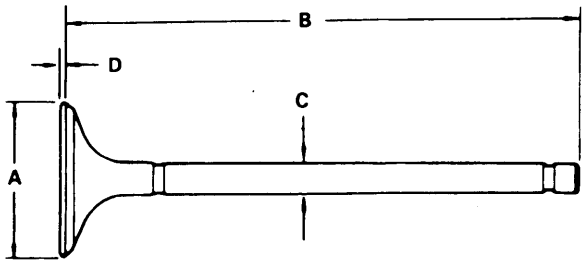


3. Install the valve guide seal remover.



4. Remove the valve seal.





Intake Valve Dimensions

A	Standard (New):	29.9 – 30.1 mm (1.18 – 1.19 in)
B	Standard (New):	117.42 – 117.72 mm (4.623 – 4.635 in)
C	Standard (New):	5.48 – 5.49 mm (0.2157 – 0.2161 in)
C	Service Limit:	5.45 mm (0.2146 in)
D	Standard (New):	0.85 – 1.15 mm (0.033 – 0.045 in)
D	Service Limit:	0.65 mm (0.026 in)

Exhaust Valve Dimensions

A	Standard (New):	25.9 – 26.1 mm (1.02 – 1.03 in)
B	Standard (New):	114.60 – 114.90 mm (4.512 – 4.524 in)
C	Standard (New):	5.45 – 5.46 mm (0.2146 – 0.2150 in)
C	Service Limit:	5.42 mm (0.2134 in)
D	Standard (New):	1.05 – 1.35 mm (0.041 – 0.053 in)
D	Service Limit:	0.95 mm (0.037 in)

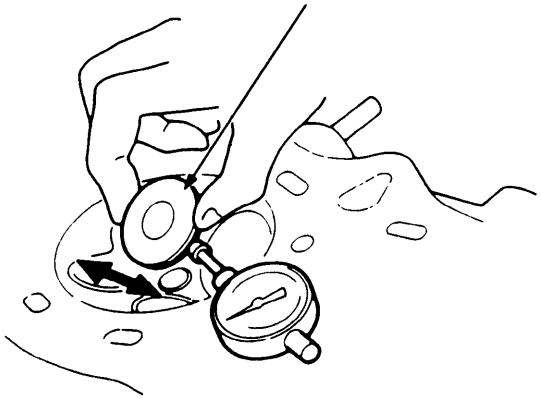
Valve Movement

Measure the guide-to-stem clearance with a dial indicator while rocking the stem in the direction of normal thrust (wobble method).

Intake Valve Stem-to-Guide Clearance:
Standard (New): 0.04 – 0.10 mm (0.002 – 0.004 in)
Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:
Standard (New): 0.10 – 0.16 mm (0.004 – 0.006 in)
Service Limit: 0.22 mm (0.009 in)

Valve extended 10 mm out from seat.



- If the measurement exceeds the service limit, recheck using a new valve.
- If the measurement is now within the service limit, reassemble using a new valve.
- If the measurement still exceeds the limit, recheck using the alternate method below, then replace the valve and guide, if necessary.

NOTE: An alternate method of checking guide to stem clearance is to 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): 0.02 – 0.05 mm (0.001 – 0.002 in)
Service Limit: 0.08 mm (0.003 in)

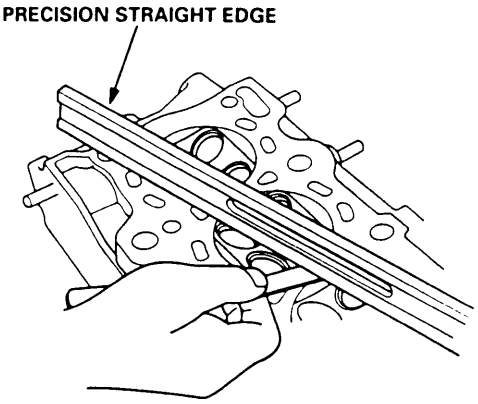
Exhaust Valve Stem-to-Guide Clearance:
Standard (New): 0.05 – 0.08 mm (0.002 – 0.003 in)
Service Limit: 0.11 mm (0.004 in)

Warpage

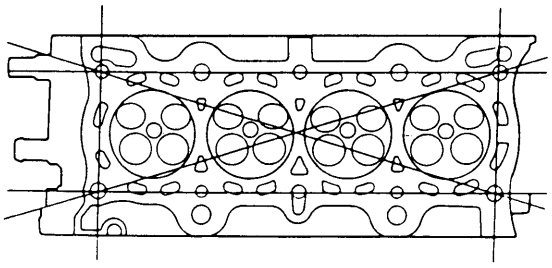
NOTE: If the camshaft-to-holder oil clearances (see page 6-30) are not within specification, the cylinder head cannot be resurfaced.

If the camshaft-to-holder oil clearances are within specifications, check the cylinder head for warpage.

- 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 93 mm (3.66 in).



Measure along edges, and three ways across center.

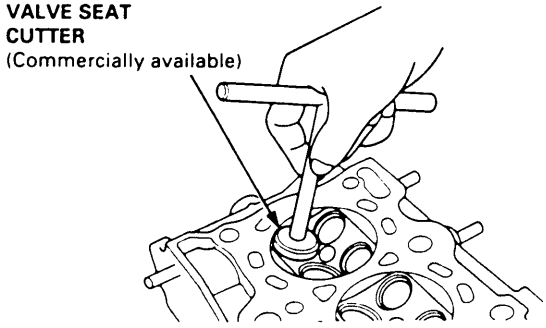


Cylinder Head Height:
Standard (New): 92.95 – 93.05 mm (3.659 – 3.663 in)

Reconditioning

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

   NOTE: If the guides are worn (see page 6-33) replace them (see page 6-35) before cutting the valve seats.

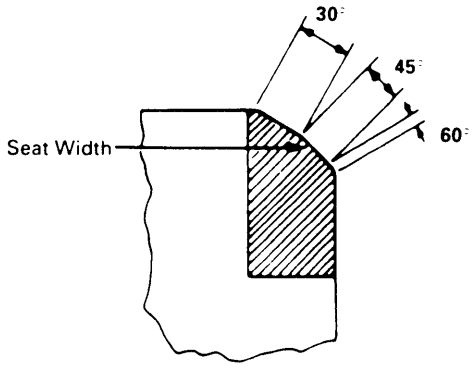


2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.

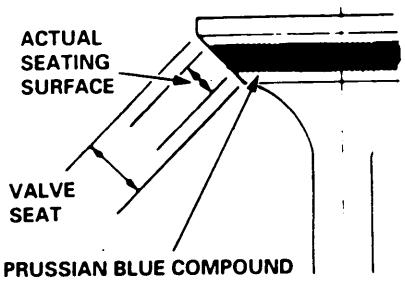
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check the width of the seat and adjust accordingly.

4. 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):
   Intake: 0.85 – 1.15 mm (0.033 – 0.045 in)
   Exhaust: 1.25 – 1.55 mm (0.049 – 0.061 in)
   Service Limit:
   Intake: 1.6 mm (0.063 in)
   Exhaust: 2.0 mm (0.079 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face, and insert the valve in its original location in the head, then lift and snap it closed against the seat several times.



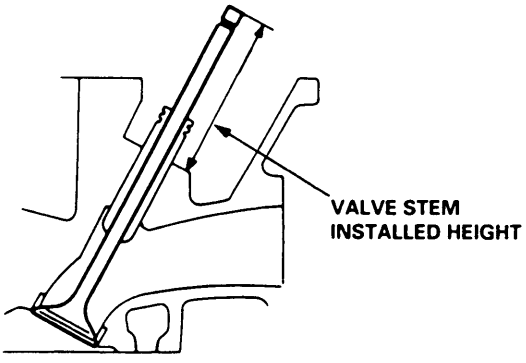
6. The actual valve seating surface, as shown by the blue compound, should be centered on the seat.
   - If it is too high (closer to the valve stem), you must make a second cut with the 60° cutter to move it down, then one more cut with the 45° cutter to restore seat width.
   - If it is too low (closer to the valve edge), you must make a second cut with the 30° cutter to move it up, then one more cut with the 45° cutter to restore seat width.

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

7. Insert the intake and exhaust valves in the head and measure the valve stem installed height.

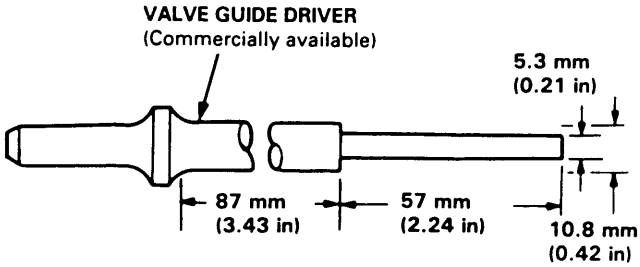
   Intake, Exhaust Stem Installed Height:
   Standard (New): 53.17 – 53.64 mm (2.093 – 2.112 in)
   Service Limit: 53.89 mm (2.122 in)

8. If the 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.



Replacement

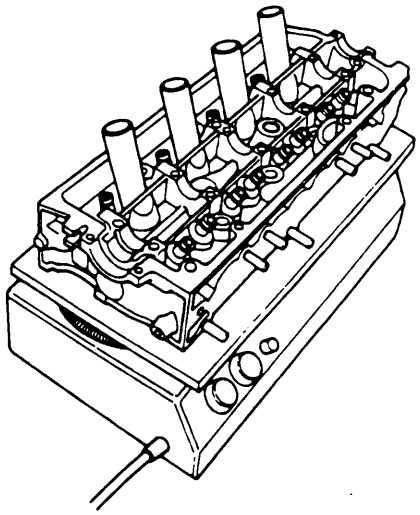
1. As illustrated below, use a commercially-available air-impact valve guide driver attachment modified to fit the diameter of the valve guides. In most cases, the same procedure can be done using the special tool and a conventional hammer.



or
VALVE GUIDE DRIVER, 5.5 mm
07742 – 0010100

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

3. Use a hot plate or oven to evenly heat the cylinder head to 300°F (150°C). Monitor the temperature with a cooking thermometer.



CAUTION:
- **Do not use a torch; it may warp the head.**
- **Do not get the head hotter than 300°F (150°C); excessive heat may loosen the valve seats.**
- **To avoid burns, use heavy gloves when handling the heated cylinder head.**

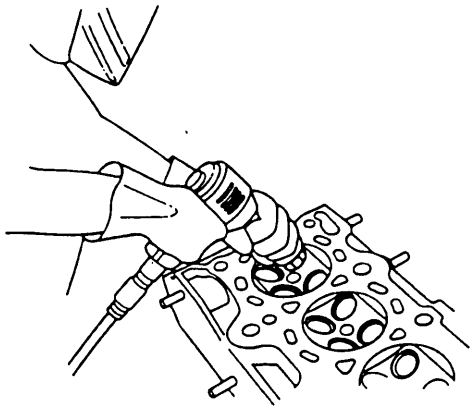
(cont'd)

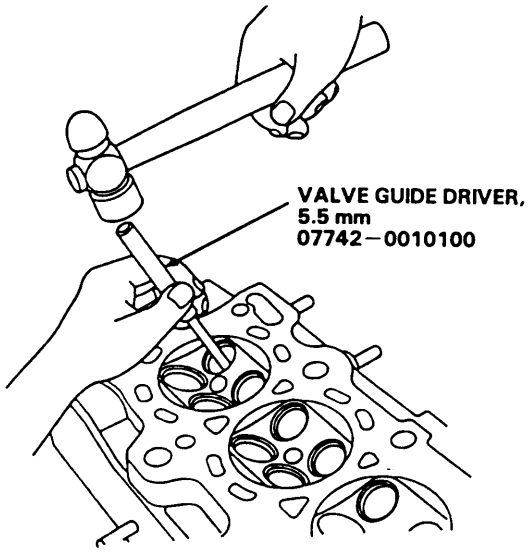
Replacement (cont'd)

4. 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.

   CAUTION:
   - **Always wear safety goggles or a face shield when driving valve guides.**
   - **Hold the air hammer directly in line with the valve guide to prevent damaging the driver.**

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



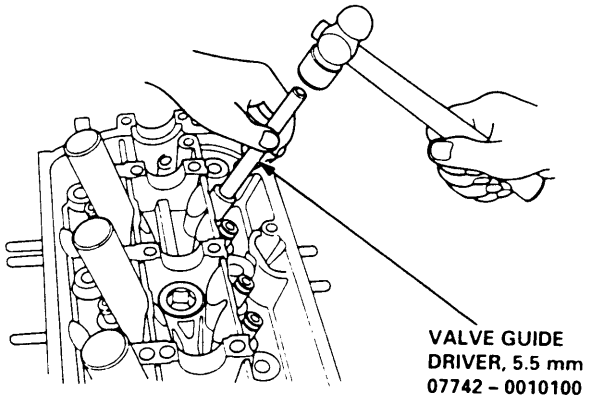


If a valve guide still won't move, drill it out with a 8 mm (5/16 in) bit, then try again.

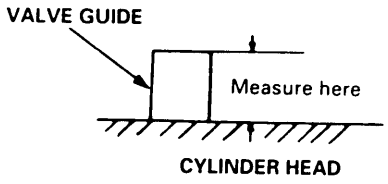
CAUTION: Drill guides only in extreme cases; you could damage the cylinder head if the guide breaks.

6. Remove the new guides from the freezer, one at a time, as you need them.

7. 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 in to the specified installed height. If you have all 16 guides to do, you may have to reheat the head.



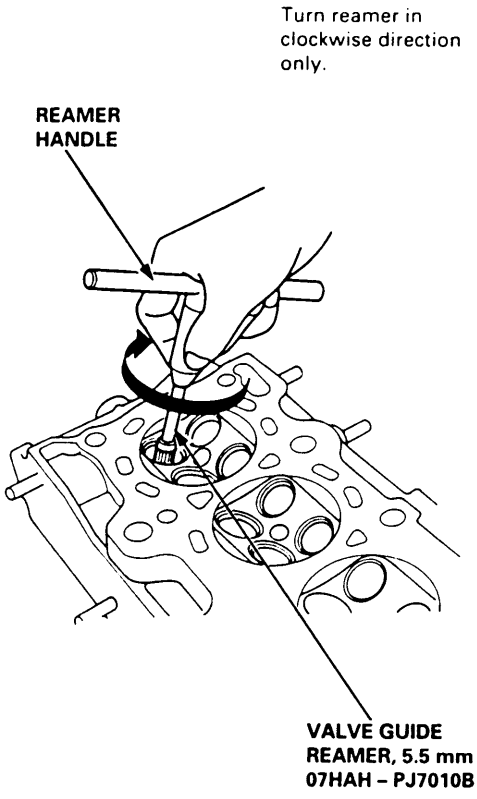
Valve Guide Installed Height:
Intake: 17.85 - 18.35 mm (0.703 - 0.722 in)
Exhaust: 18.65 - 19.15 mm (0.734 - 0.754 in)



Reaming

NOTE: For new valve guides only.

1. Coat both the reamer and valve guide with cutting oil.
2. Rotate the reamer clockwise the full length of the valve guide bore.
3. Continue to rotate the reamer clockwise while removing it from the bore.
4. Thoroughly wash the guide in detergent and water to remove any cutting residue.
5. Check the clearance with a valve (see page 6-33). Verify that the valve slides in the valve guide without exerting pressure.

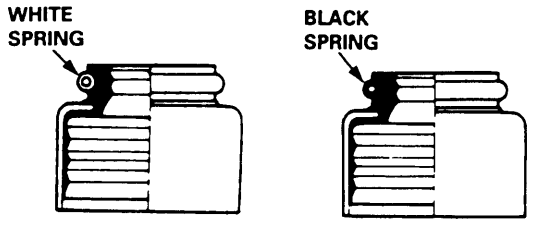


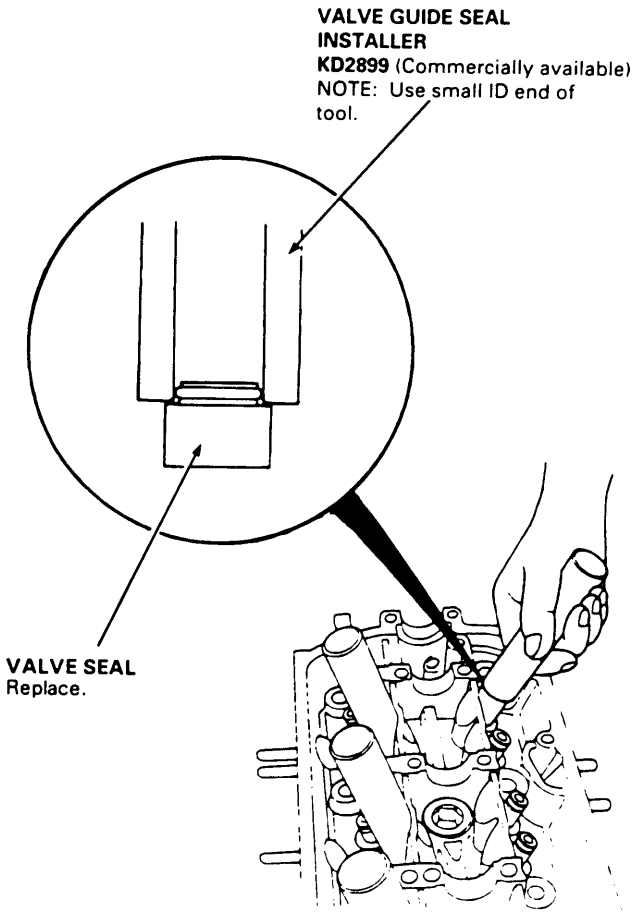
Installation

1. Coat the valve stems with engine oil. Insert the valves in the valve guides.

   NOTE: Make sure the valves move up and down smoothly.
2. Install the spring seats on the cylinder head.
3. Install the valve seals using the valve guide seal installer.

   NOTE: Exhaust and intake valve seals are not interchangeable.



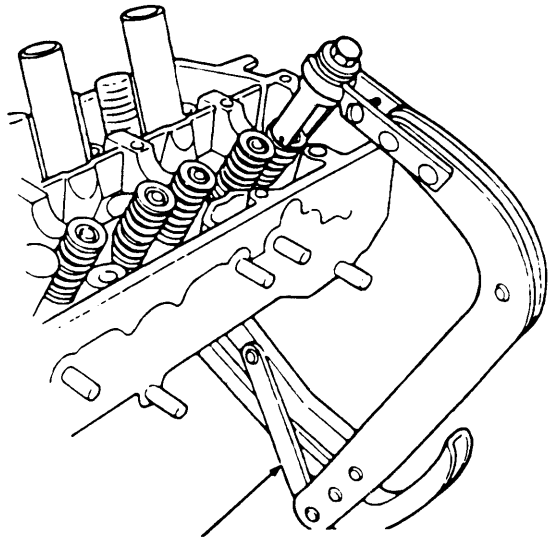


(cont'd)

Installation (cont'd)

4. Install the valve spring and valve retainer, then install the valve spring compressor. Compress the spring and install the valve keepers.

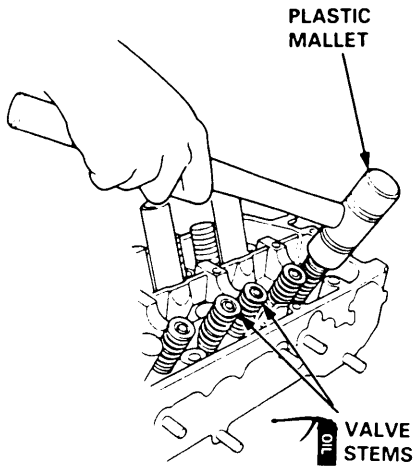
   NOTE: Place the end of the valve spring with closely wound coils toward the cylinder head.



VALVE SPRING COMPRESSOR
(Commercially available)
Snap-on CF711 or KD – 383
with #32 JAWS

5. Lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of the valve and valve keepers.

   NOTE: Tap the valve stem only along its axis so you do not bend the stem.

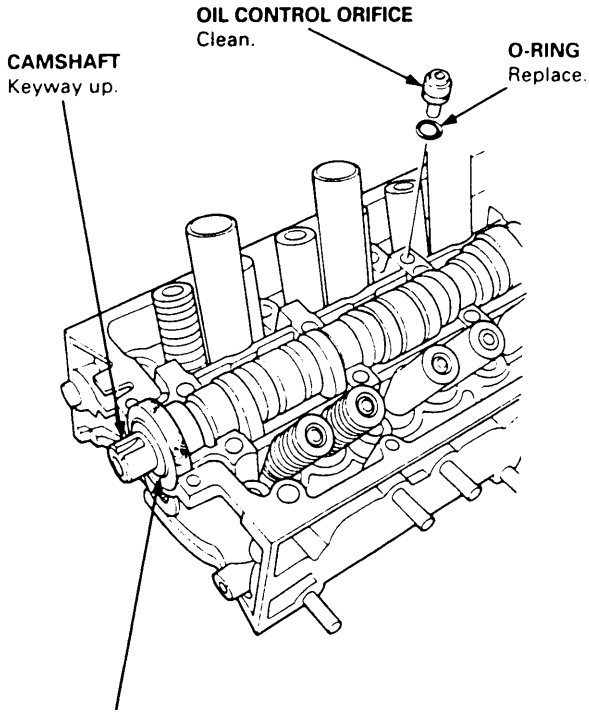


Installation

CAUTION:
- **Make sure that all rockers are in alignment with their valves when torquing the rocker assembly bolts.**
- **Valve locknuts should be loosened and adjusting screws backed off before installation.**
- **To prevent the rocker arm assembly from coming apart, leave the camshaft holder bolts in the holders.**

1. After wiping down the camshaft, camshaft seal and journals in the cylinder head, lubricate both surfaces and install the camshaft.

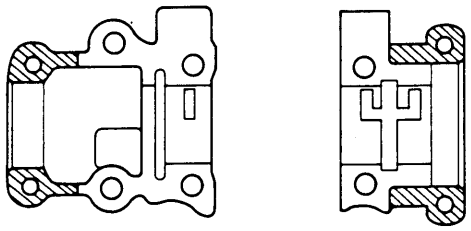
2. Clean and install the oil control orifice with a new O-ring.



CAMSHAFT SEAL
Seal housing surface should be dry.
Apply a light coat of oil to camshaft and inner lip of seal.

3. Turn the camshaft until its keyway is facing up (No. 1 piston at TDC).

4. Apply liquid gasket (Part No. 08718 – 0001 or 08718 – 0003) to the head mating surfaces of the No. 1 and No. 5 camshaft holders.
   — Apply liquid gasket to the shaded areas.



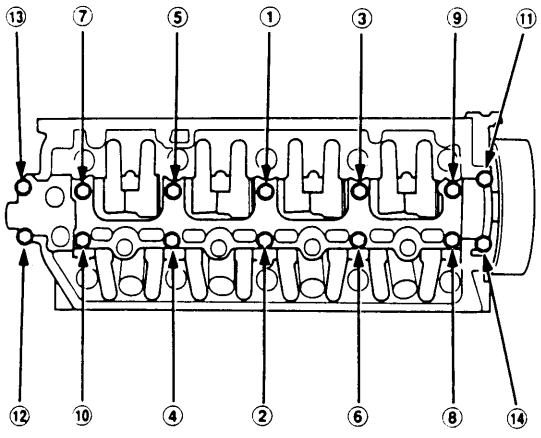
No. 5 No. 1

5. Set the rocker arm assembly in place and loosely install the bolts.
   — Make sure that the rocker arms are properly positioned on the valve stems.

6. Tighten each bolt two turns at a time in the sequence shown below to ensure that the rockers do not bind on the valves.

Specified torque:
8 mm bolts: 20 N·m (2.0 kgf·m, 14 lbf·ft)
Apply engine oil to the threads.
6 mm bolts: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)
Apply engine oil to the threads.

6 mm bolts: ⑪, ⑫, ⑬, ⑭



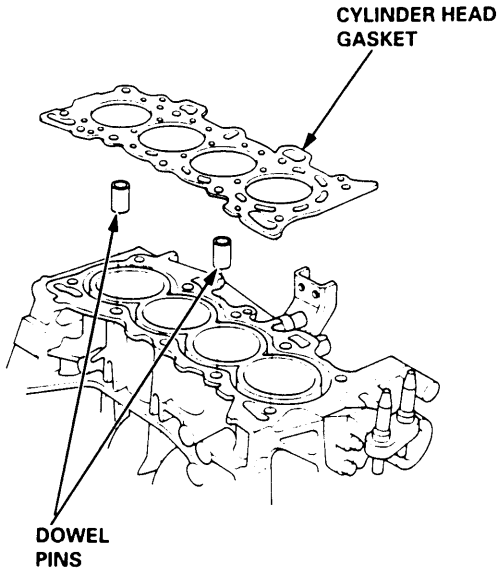
7. Install the back cover, then install the camshaft pulley.

Installation

Install the cylinder head in the reverse order of removal:

NOTE:
- Always use a new head gasket.
- Cylinder head and cylinder block surface must be clean.
- "UP" mark on the camshaft pulley should be at the top.
- Turn the crankshaft so the No. 1 piston is at TDC (see page 6-18).
- Clean the oil control orifice before installing.
- Do not use the upper cover and lower cover to store removed items.
- Clean the upper cover and lower cover before installation.

1. Cylinder head dowel pins must be aligned.



(cont'd)

Installation (cont'd)

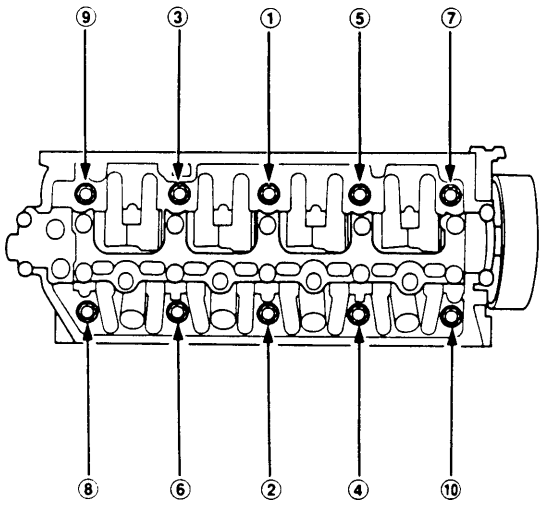
2. Position the camshaft correctly (see page 6-18).

3. Tighten the cylinder head bolts sequentially in four steps.

   1st step: ① – ⑩ 20 N·m (2.0 kgf·m, 14 lbf·ft)
   2nd step: ① – ⑩ 49 N·m (5.0 kgf·m, 36 lbf·ft)
   3rd step: ① – ⑩ 67 N·m (6.8 kgf·m, 49 lbf·ft)
   4th step: ①, ② 67 N·m (6.8 kgf·m, 49 lbf·ft)

   NOTE:
   - We recommend using a beam-type torque wrench. When using a preset-type torque wrench, be sure to tighten slowly and not to overtighten.
   - If a bolt makes any noise while you are torquing it, loosen the bolt, and retighten it from the 1st step.

CYLINDER HEAD BOLTS TORQUE SEQUENCE:



4. Install the intake manifold and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nuts (see page 9-2).

   - Always use a new intake manifold gasket.

5. Install the exhaust manifold and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nut (see page 9-3).

   - Always use a new exhaust manifold gasket.

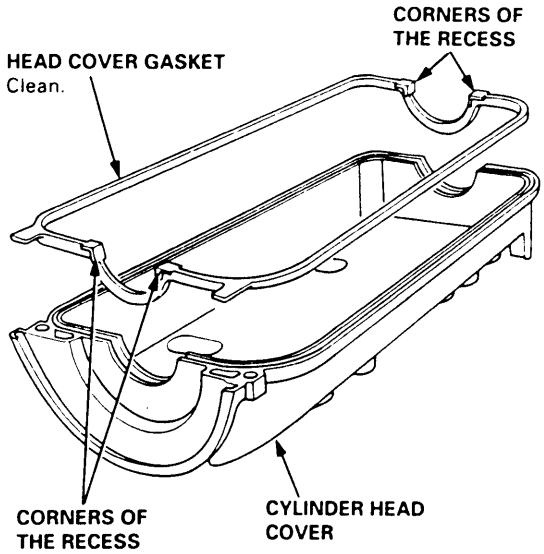
6. Install the exhaust manifold bracket. Install exhaust pipe A and the bracket, then install the cover.

7. Install the timing belt (see page 6-18).

8. Adjust the valve clearance (see page 6-10).

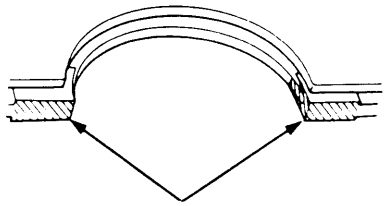
9. Install the head cover gasket in the groove of the cylinder head cover. Seat the recesses for the camshaft first, then work it into the groove around the outside edges.

   NOTE:
   - Before installing the head cover gasket, thoroughly clean the seal and the groove.
   - When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.



10. Apply liquid gasket to the head cover gasket at the four corners of the recesses.

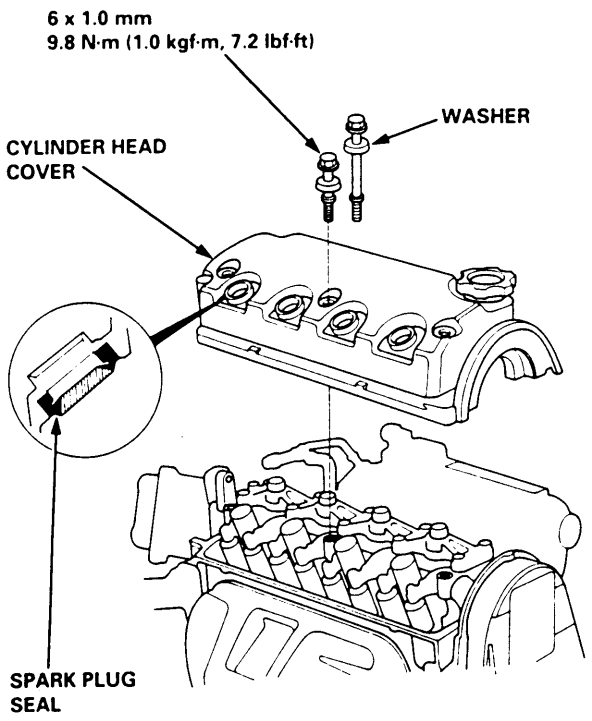
    NOTE:
    - Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
    - Check that the mating surfaces are clean and dry before applying liquid gasket.
    - Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
    - After assembly, wait at least 20 minutes before filling the engine with oil.



Apply liquid gasket to the shaded areas.

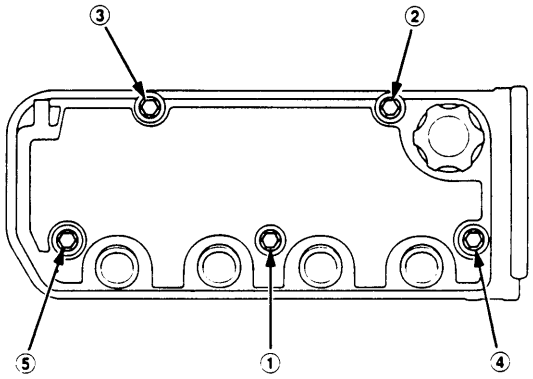
11. When installing the cylinder head cover, hold the head cover gasket in the groove by placing your fingers on the camshaft holder contacting surfaces (top of the semicircles).
    Set the spark plug seal on the spark plug tube.
    Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

    NOTE:
    - Before installing the cylinder head cover, clean the cylinder head contacting surfaces with a shop towel.
    - Do not touch the parts where liquid gasket was applied.
    - Take care not to damage the spark plug seals when installing the cylinder head cover.
    - Visually check the spark plug seals for damage.
    - Replace the washer if it is damaged or deteriorated.



12. Tighten the bolts in two or three steps. In the final step, tighten all the bolts, in sequence, to 9.8 N·m (1.0 kgf·m, 7.2 lbf·ft).

    NOTE: After assembly, wait at least 20 minutes before filling the engine with oil.



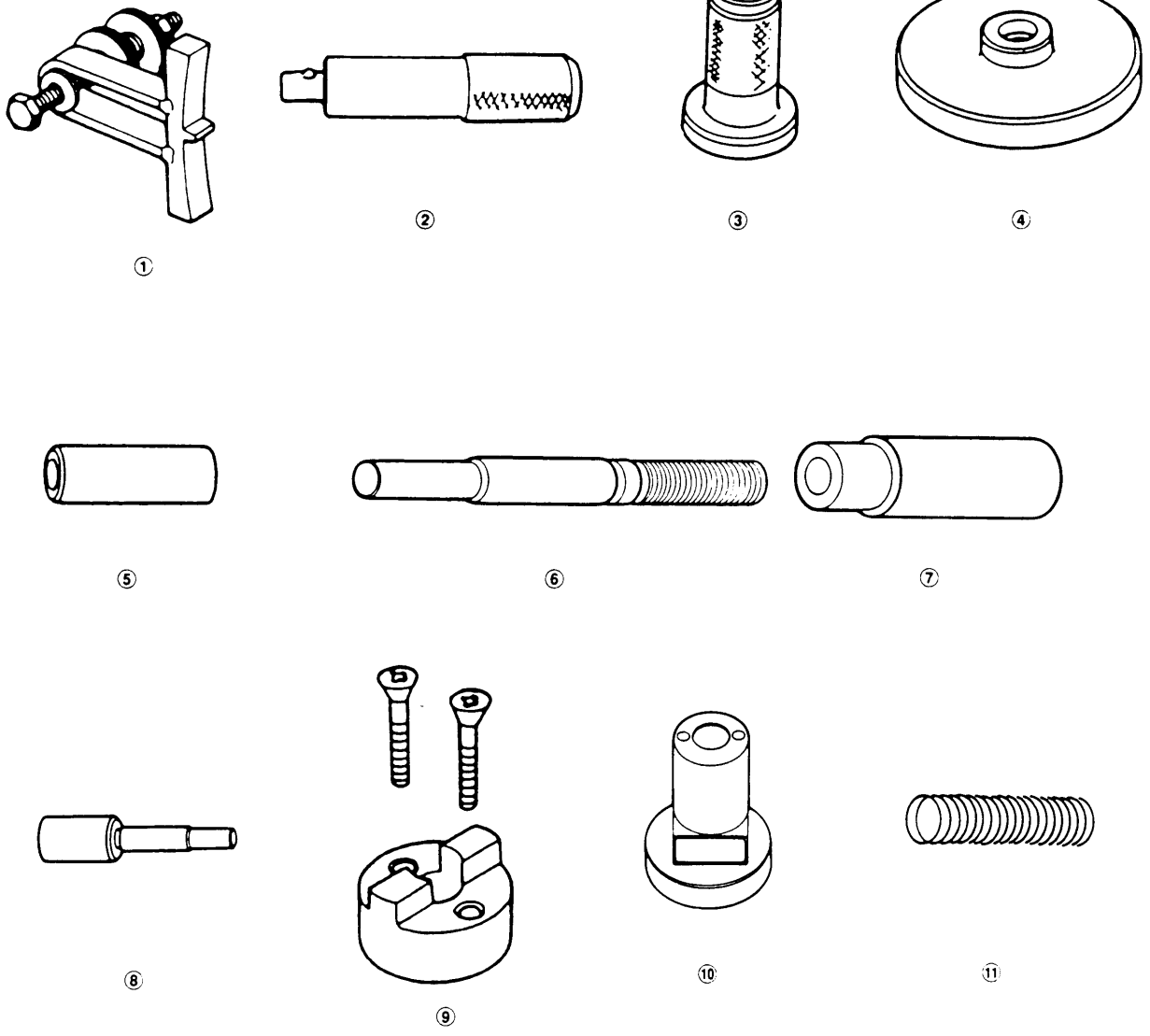
13. After installation, check that all tubes, hoses and connectors are installed correctly.

14. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Engine Block

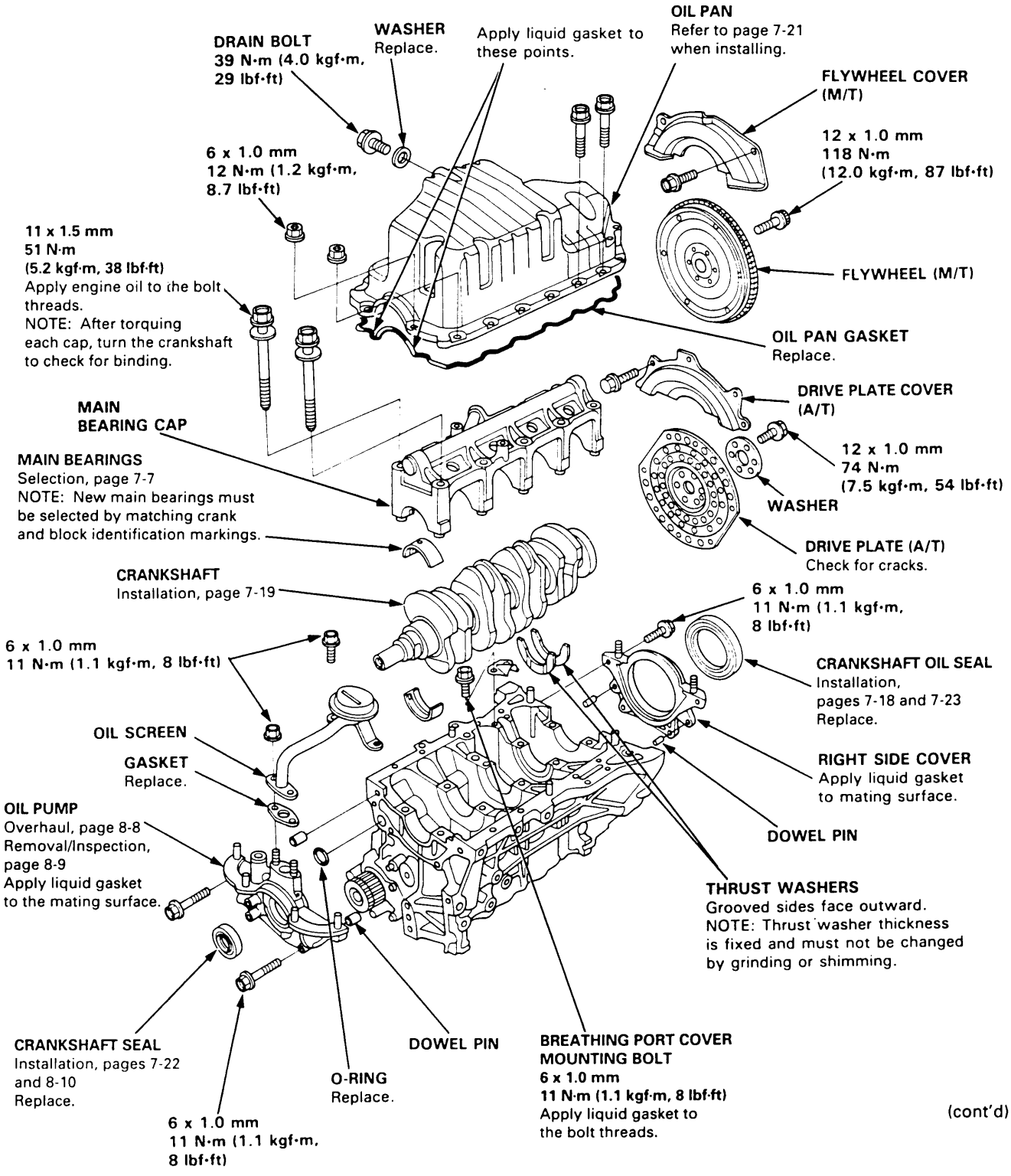
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07LAB – PV00100	Ring Gear Holder	1	7-5
②	07749 – 0010000	Driver	1	7-18, 23
③	07947 – SB00200	Seal Driver	1	7-22
④	07948 – SB00101	Driver Attachment	1	7-18, 23
⑤	07973 – PE00200	Pilot Collar	1	7-13, 14
⑥	07973 – PE00310	Piston Pin Driver Shaft	1	7-13, 14
⑦	07973 – PE00320	Piston Pin Driver Head	1	7-13, 14
⑧	07973 – PE00400	Piston Pin Base Insert	1	7-13, 14
⑨	07973 – SB00100	Piston Base Head	1	7-13, 14
⑩	07973 – 6570500	Piston Base	1	7-13, 14
⑪	07973 – 6570600	Piston Base Spring	1	7-13, 14



Lubricate all internal parts with engine oil during reassembly.

NOTE:
- Apply liquid gasket to the mating surfaces of the right side cover and oil pump case before installing them.
- Use liquid gasket, part No. 08718 – 0001 or 08718 – 0003.
- Clean the oil pan gasket mating surfaces before installing the oil pan.



(cont'd)

Illustrated Index

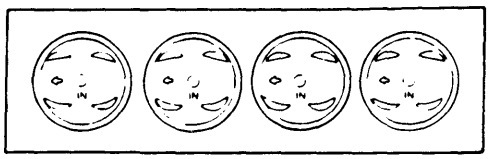
(cont'd)

NOTE: New rod bearings must be selected by matching connecting rod assembly and crankshaft identification markings (see page 7-8).

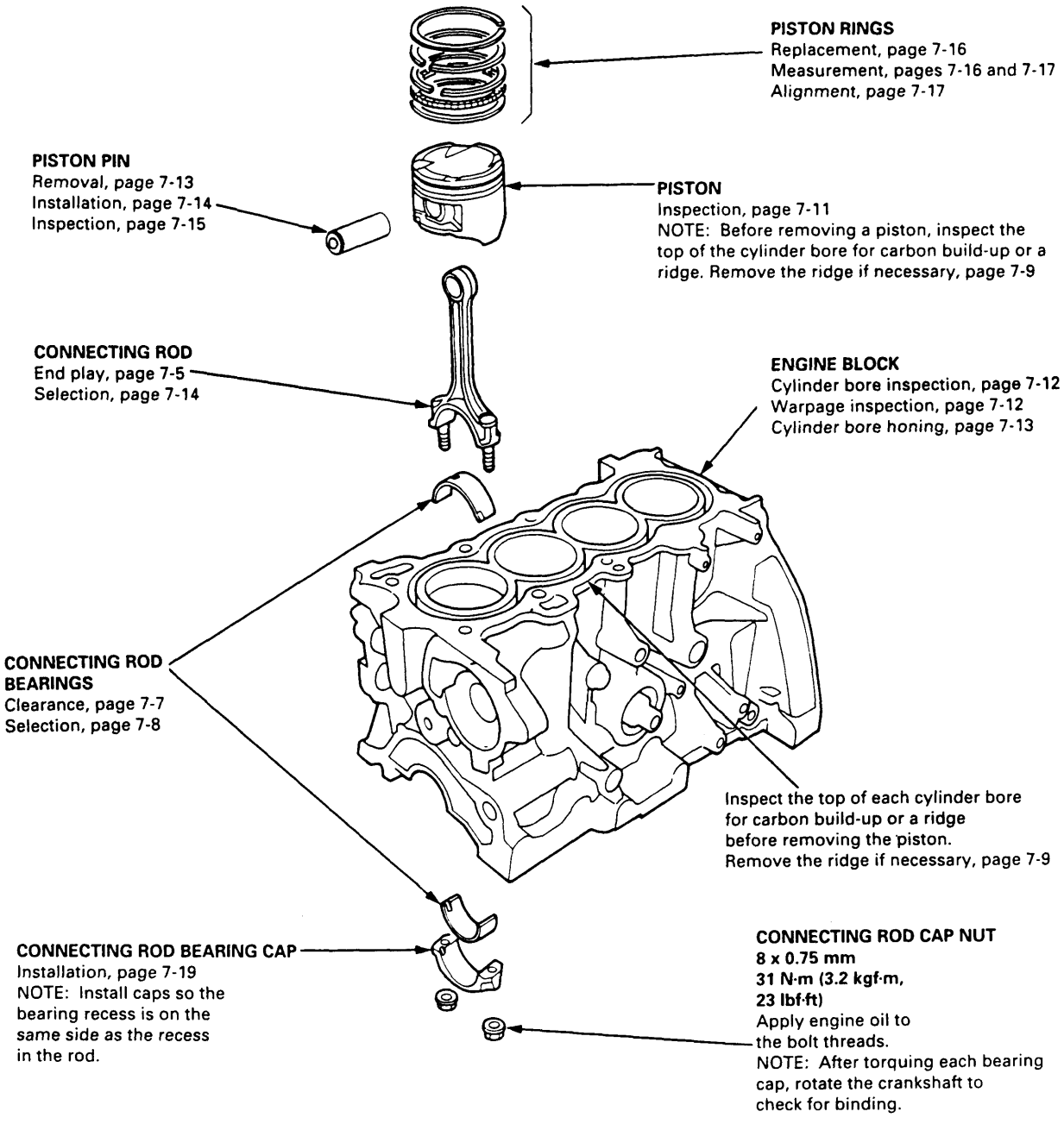
Lubricate all internal parts with engine oil during reassembly.

PISTON INSTALLATION DIRECTION:

EXHAUST

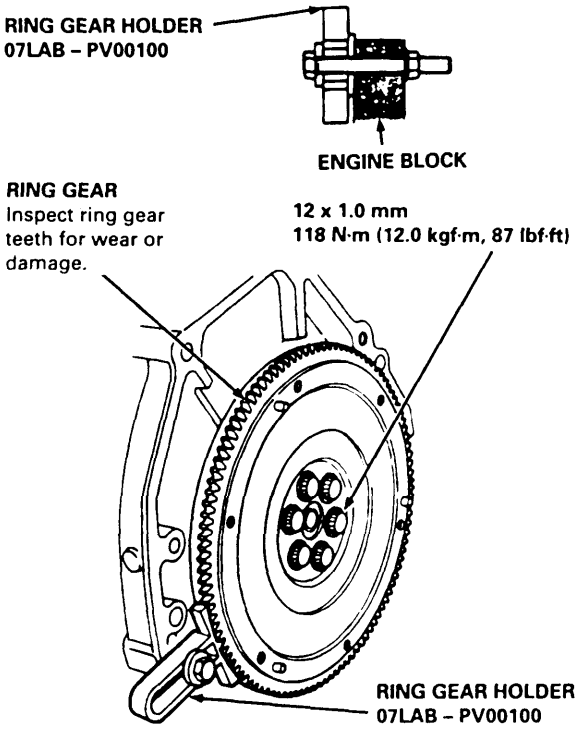


INTAKE

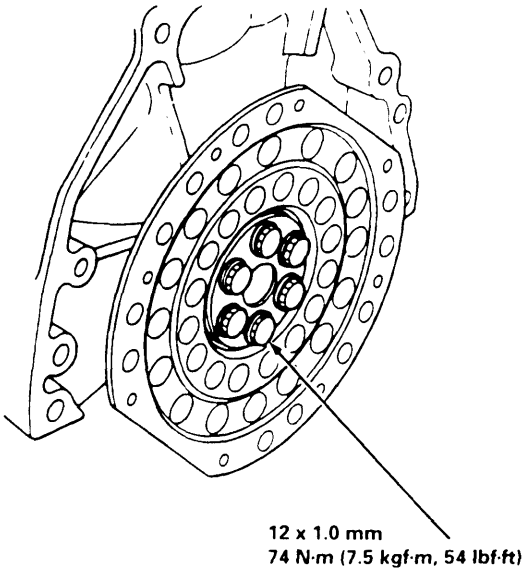


Replacement

Manual Transmission:
Remove the six flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in a crisscross pattern.

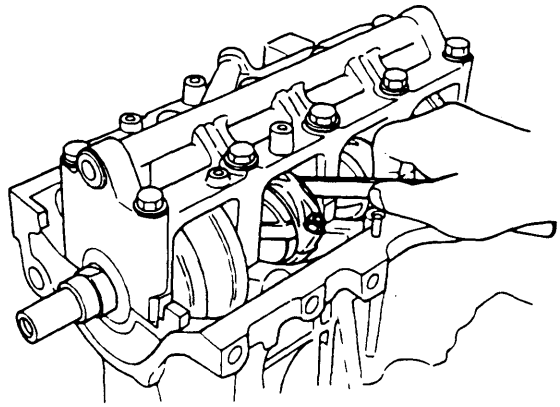


Automatic Transmission:
Remove the six drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in a crisscross pattern.



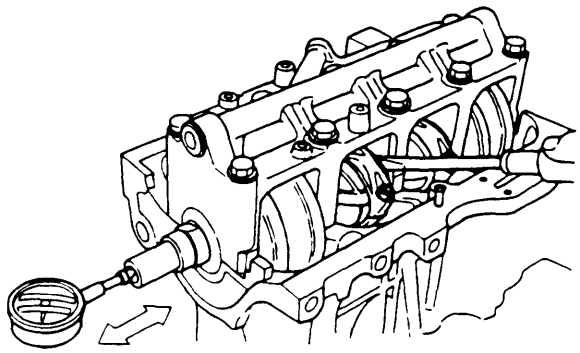
End Play

Connecting Rod End Play:
Standard (New): 0.15 – 0.30 mm (0.006 – 0.012 in)
Service Limit: 0.40 mm (0.016 in)



- If out-of-tolerance, install a new connecting rod.
- If still out-of-tolerance, replace the crankshaft (see pages 7-8 and 7-19).

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; 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)

- If end play is excessive, inspect the thrust washers and thrust surface on the crankshaft.
  Replace parts as necessary.

NOTE: Thrust washer thickness is fixed and must not be changed either by grinding or shimming.
Thrust washers are installed with the grooved sides facing outward.

Main Bearings

Clearance

1. To check main bearing-to-journal oil clearance, remove the main caps and bearing halves.

2. Clean each main journal and bearing half with a clean shop towel.

3. Place one strip of plastigage across each main journal.

   NOTE: If the engine is still in the car when you bolt the main cap down to check clearance, the weight of the crankshaft and flywheel will flatten the plastigage further than just the torque on the cap bolt, and give you an incorrect reading. For an accurate reading, support the crank with a jack under the counterweights and check only one bearing at a time.

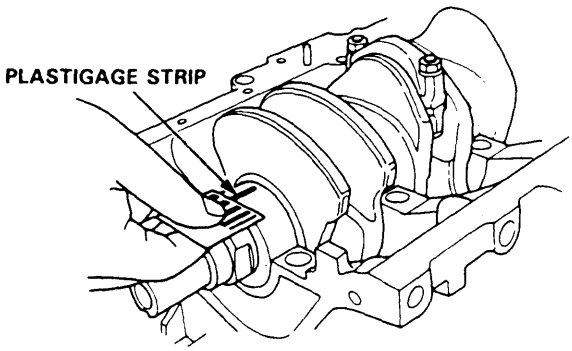
4. Reinstall the bearings and caps, then torque the bolts.

   1st step: 25 N·m (2.5 kgf·m, 18 lbf·ft)
   Final step: 51 N·m (5.2 kgf·m, 38 lbf·ft)

   NOTE: Do not rotate the crankshaft during inspection.

5. Remove the cap and bearing again, and measure the widest part of the plastigage.

   Main Bearing-to-Journal Oil Clearance:
   Standard (New):
   No. 1, 5 Journals:
   0.018 – 0.036 mm (0.0007 – 0.0014 in)
   No. 2, 3, 4 Journals:
   0.024 – 0.042 mm (0.0009 – 0.0017 in)
   Service Limit: 0.05 mm (0.002 in)



6. If the plastigage measures too wide or too narrow, (remove the engine if it's still in the car), remove the crankshaft, and remove the upper half of the bearing. Install a new, complete bearing with the same color code (select the color as shown on the next page), and recheck the clearance.

   CAUTION: 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.

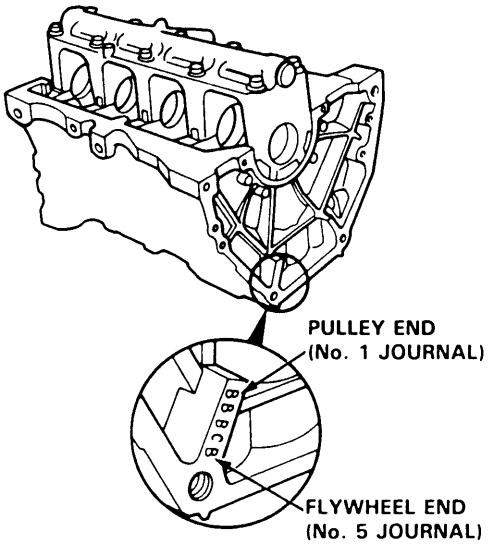
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Selection

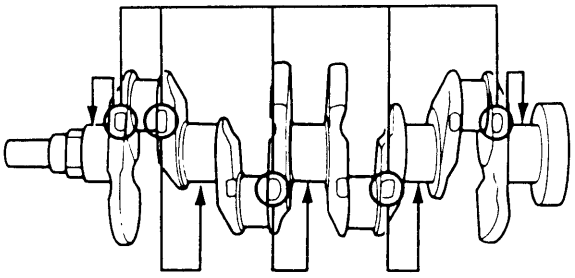
CAUTION: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Crankshaft Bore Code Location

Letters have been stamped on the end of the block as a code for the size of each of the 5 main journal bores.
Use them, and the numbers stamped on the crankshaft (codes for main journal size), to choose the correct bearings.



Main Journal Code Location (Numbers)



Bearing Identification

Color code is on the edge of the bearing. → Larger crank bore

A	B	C	D

→ Smaller bearing (thicker)

1	Red	Pink	Yellow	Green
2	Pink	Yellow	Green	Brown
3	Yellow	Green	Brown	Black
4	Green	Brown	Black	Blue

Smaller main journal ↓ Smaller bearing (thicker) ↓

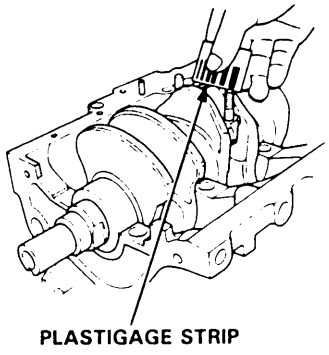
Clearance

1. Remove the connecting rod cap and bearing half.
2. Clean the crankshaft rod journal and bearing half with a clean shop towel.
3. Place a strip of plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the nuts.

   Torque: 31 N·m (3.2 kgf·m, 23 lbf·ft)

   NOTE: Do not rotate the crankshaft during inspection.
5. 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 – 0.038 mm (0.0008 – 0.0015 in)
   Service Limit: 0.05 mm (0.002 in)



6. 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 (select the color as shown on the next page), and recheck the clearance.

   CAUTION: 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 clearance again.

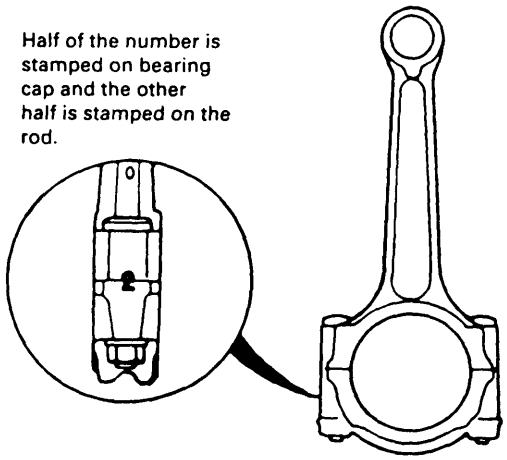
   NOTE: If the proper clearance cannot be obtained by using the appropriate larger or smaller bearings, replace the crankshaft and start over.

Selection

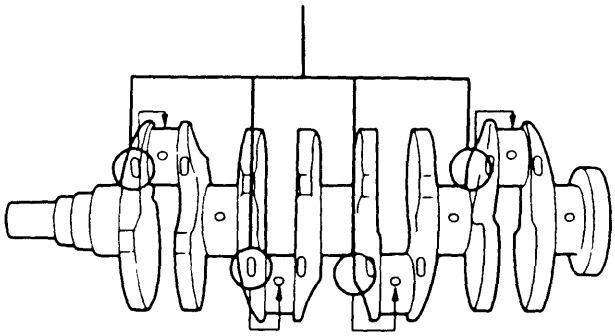
CAUTION: If the codes are indecipherable because of an accumulation of dirt and dust, do not scrub them with a wire brush or scraper. Clean them only with solvent or detergent.

Connecting Rod Code Location

Numbers have been stamped on the side of each connecting rod as a code for the size of the big end. Use them, and the letters stamped on the crankshaft (codes for rod journal size), to choose the correct bearings.



Connecting Rod Journal Code Locations (Letters)



Bearing Identification

Color code is on the edge of the bearing. → Larger big end bore

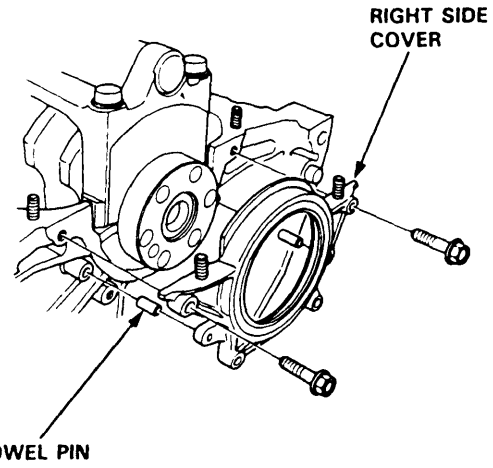
1	2	3	4

→ Smaller bearing (thicker)

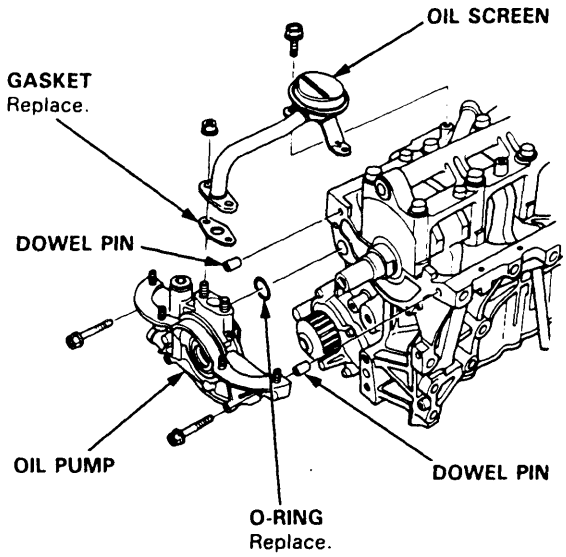
Smaller rod journal	Smaller bearing (thicker)			
A or I	Red	Pink	Yellow	Green
B or II	Pink	Yellow	Green	Brown
C or III	Yellow	Green	Brown	Black
D or IIII	Green	Brown	Black	Blue

Removal

1. Remove the oil pan assembly.
2. Remove the right side cover.



3. Remove the oil screen.

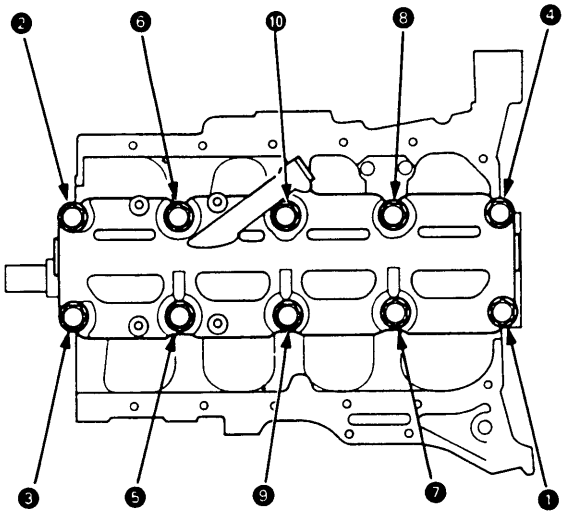


4. Remove the oil pump.

5. Remove the bolts and the bearing cap.

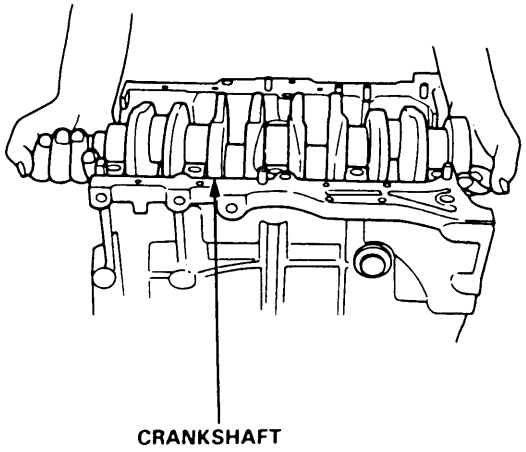
CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

MAIN BEARING CAP BOLTS LOOSENING SEQUENCE



6. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.

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

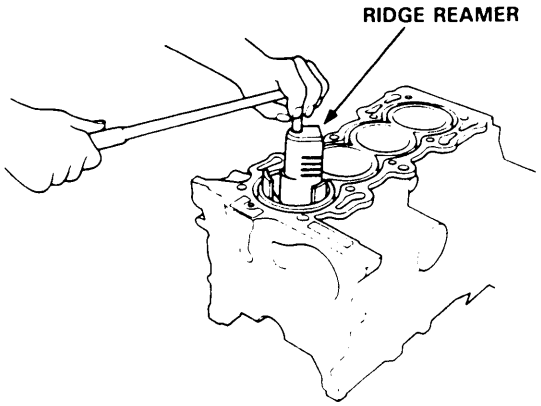


8. Remove the upper bearing halves from the connecting rods and set them aside with their respective caps.

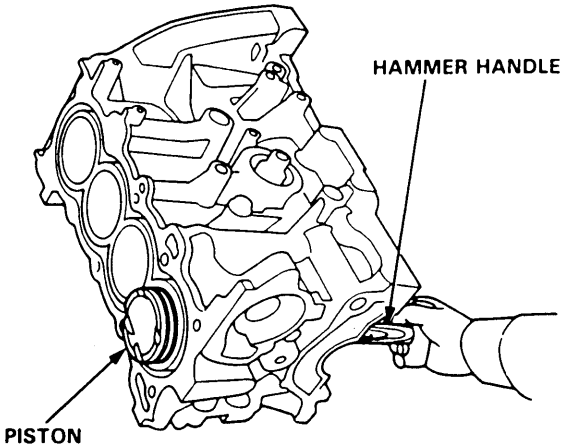
9. Reinstall the main caps and bearings on the engine in proper order.

10. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow the reamer manufacturer's instructions.

CAUTION: If the ridge is not removed, it may damage the pistons as they are pushed out.



11. Use the wooden handle of a hammer to drive the pistons out.



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

13. Mark each piston/connecting rod assembly with its cylinder number to avoid mixup on reassembly.

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

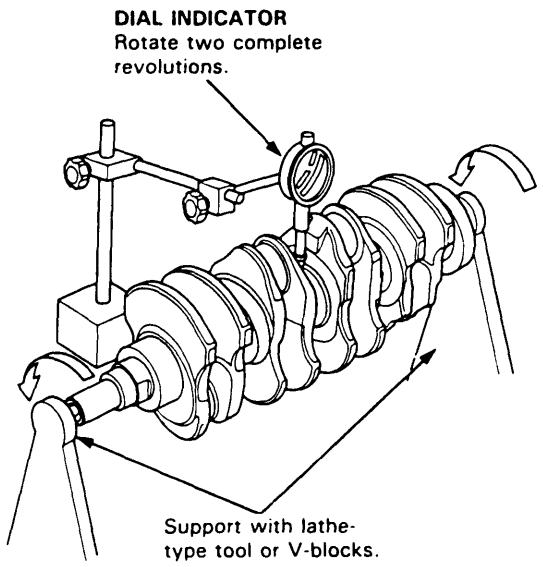
Inspection

- Clean the crankshaft oil passages with pipe cleaners or a suitable brush.
- Check the keyway and threads.

Alignment

- Measure runout on all main journals to make sure the crank is not bent.
- The difference between measurements on each journal must not be more than the service limit.

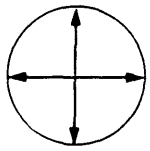
Crankshaft Total Indicated Runout:
Standard (New): 0.03 mm (0.001 in) max.
Service Limit: 0.04 mm (0.002 in)

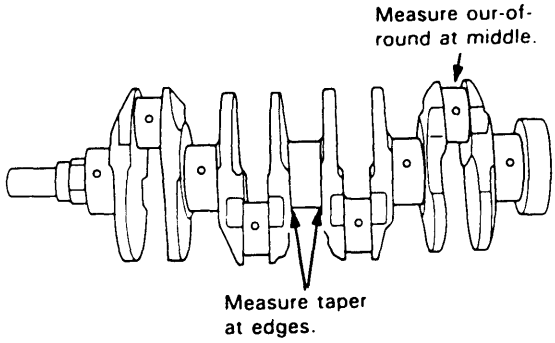


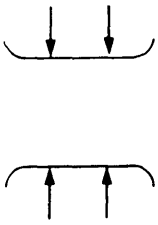
Out-of-Round and Taper

- 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): 0.0025 mm (0.0001 in) max.
Service Limit: 0.005 mm (0.0002 in)







- 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): 0.0025 mm (0.0001 in) max.
Service Limit: 0.005 mm (0.0002 in)

Inspection

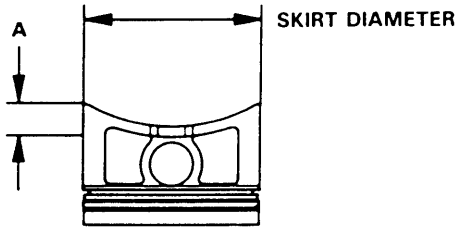
1. Check the piston for distortion or cracks.

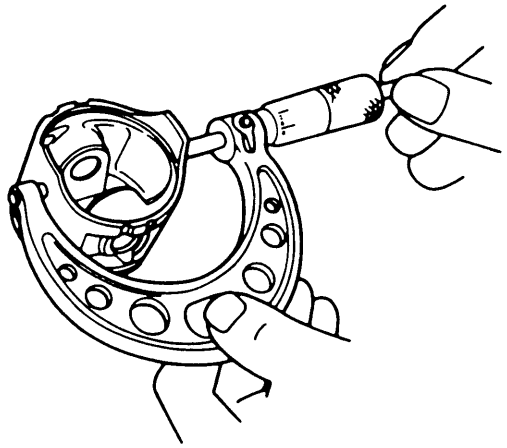
   NOTE: If a cylinder is bored, an oversized piston must be used.

2. Measure the piston diameter at distance A from the bottom of the skirt.

   A: 5 mm (0.2 in)

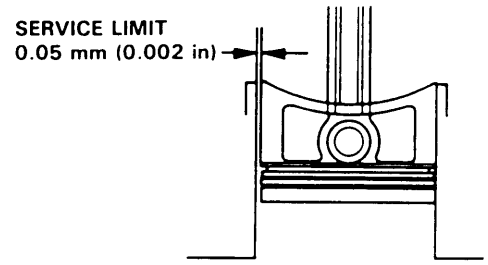
   Piston Diameter:
   Standard (New): 74.980 – 74.990 mm (2.9520 – 2.9524 in)
   Service Limit: 74.970 mm (2.9516 in)





3. Calculate the difference between the cylinder bore diameter (see page 7-12) and piston diameter.

   Piston-to-Cylinder Clearance
   Standard (New): 0.010 – 0.040 mm (0.0004 – 0.0016 in)
   Service Limit: 0.05 mm (0.002 in)

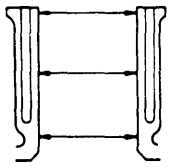


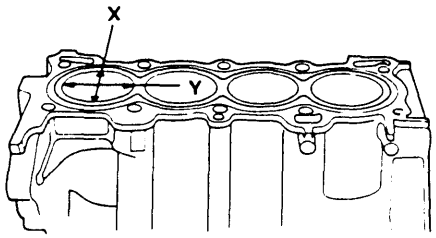
If the clearance is near or exceeds the service limit, inspect the piston and cylinder block for excessive wear.

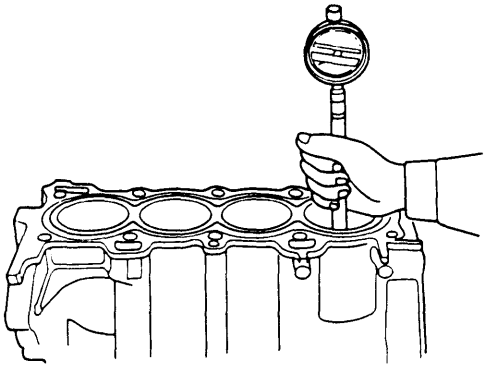
Oversize Piston Diameter
0.25: 75.23 – 75.24 mm (2.9618 – 2.9622 in)
0.50: 75.48 – 75.49 mm (2.9716 – 2.9720 in)

Inspection

1. Measure wear and taper in directions X and Y at three levels in each cylinder as shown.







Cylinder Bore Size
Standard (New): 75.00 – 75.02 mm (2.953 – 2.954 in)
Service Limit: 75.07 mm (2.956 in)

Oversize
0.25: 75.25 – 75.27 mm (2.9626 – 2.9634 in)
0.50: 75.50 – 75.52 mm (2.9724 – 2.9732 in)

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

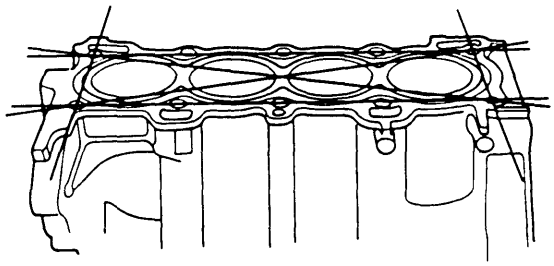
- If measurements in any cylinder are beyond the Oversize Bore Service Limit, replace the block.
- If the block is to be rebored, refer to Piston Clearance Inspection (see page 7-11) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Reboring Limit: 0.50 mm (0.020 in)

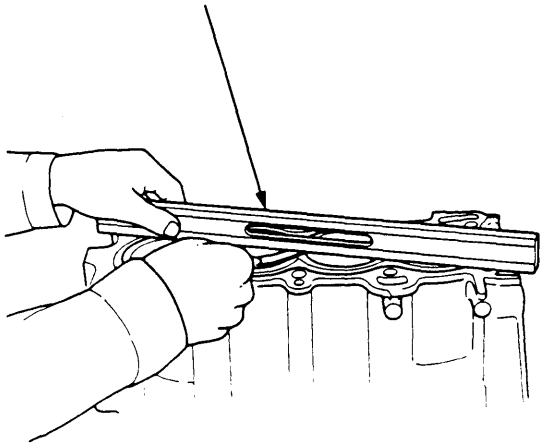
2. Check the top of the block for warpage.
Measure along the edges and across the center as shown.

SURFACES TO BE MEASURED



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

PRECISION STRAIGHT EDGE

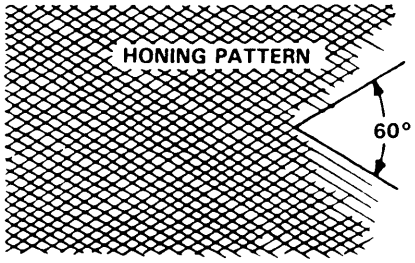


Bore Honing

1. Measure the cylinder bores as shown on page 7-12. If the 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 dagree cross-hatch pattern.

   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.

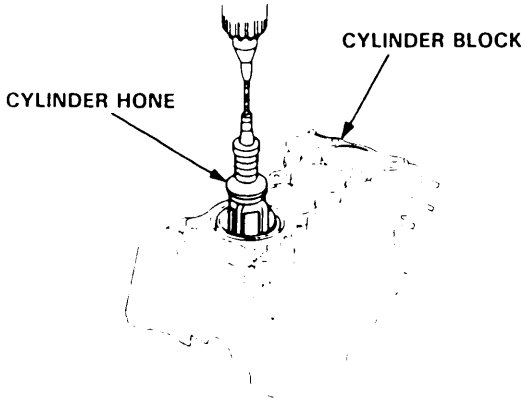


3. When honing is complete, thoroughly clean the engine block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil them immediately to prevent rusting.

   NOTE: 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 cylinder block.

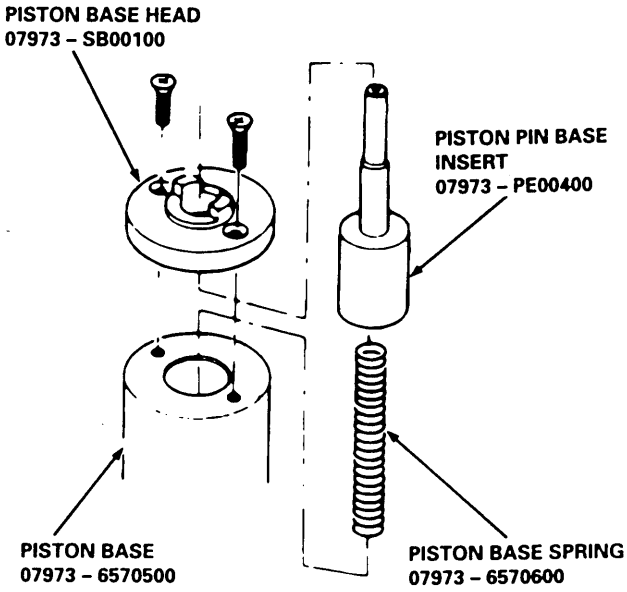
   NOTE: Some light vertical scoring and scratching is acceptable if it is not deep enough to catch your fingernail and does not run the full length of the bore.



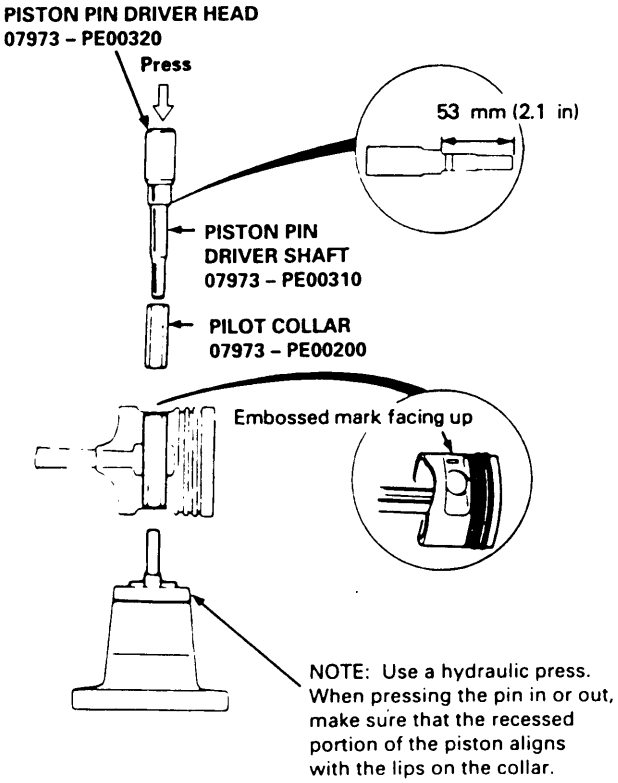
   NOTE:
   - After honing, clean the cylinder thoroughly with soapy water.
   - Only a scored or scratched cylinder bore must be honed.

Removal

1. Assemble the special tool as shown.



2. Assemble and adjust the length of the piston pin driver and shaft to 53 mm (2.1 in) as shown.



3. Place the piston on the special tool and press the pin out with the special tools and a hydraulic press.

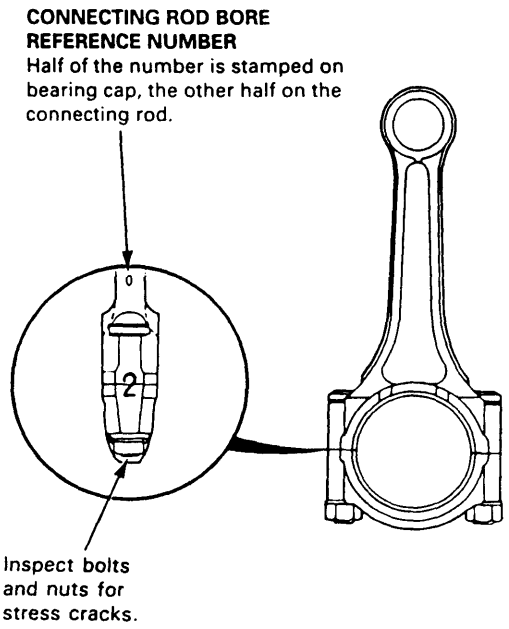
Connecting Rods

Selection

Each rod falls into one of four tolerance ranges (from 0 to + 0.024 mm (0 to + 0.0009 in), in 0.006 mm (0.0002 in) increments) depending on the size of its big end bore. It's then stamped with a number (1, 2, 3, or 4) indicating the range.
You may find any combination of 1, 2, 3, or 4 in any engine.

Normal Bore Size: 48.0 mm (1.89 in)

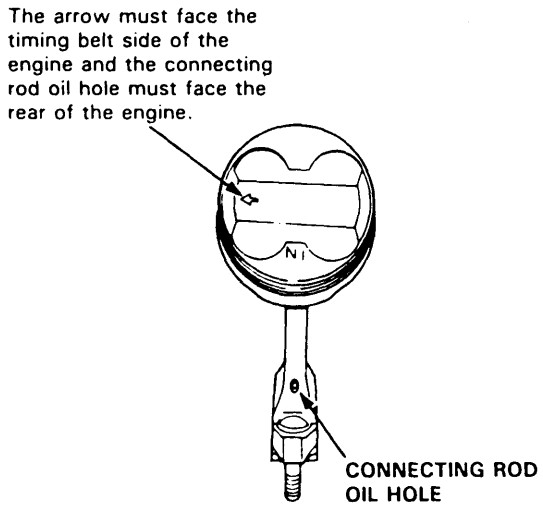
NOTE:
- Reference numbers are for the big end bore size and do NOT indicate the position of the rod in the engine.
- Inspect each connecting rod for cracks and heat damage.

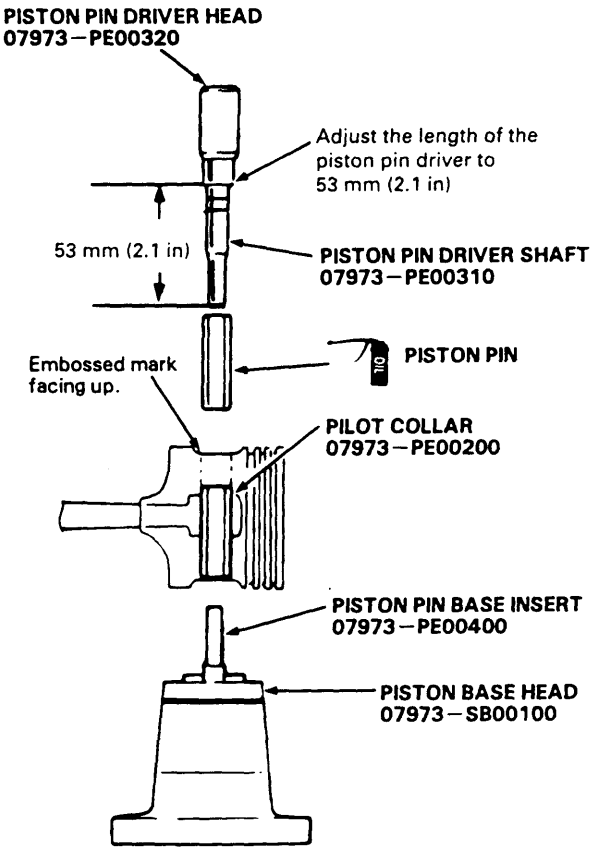


Piston Pins

Installation

1. Use a hydraulic press for installation.
   - When pressing the pin in or out, be sure you position the recessed flat on the piston against the lugs on the base attachment.



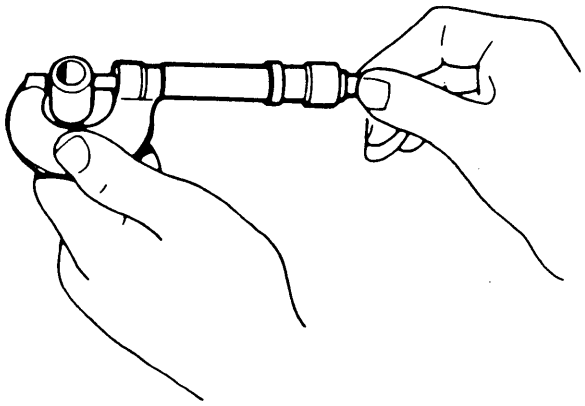


Inspection

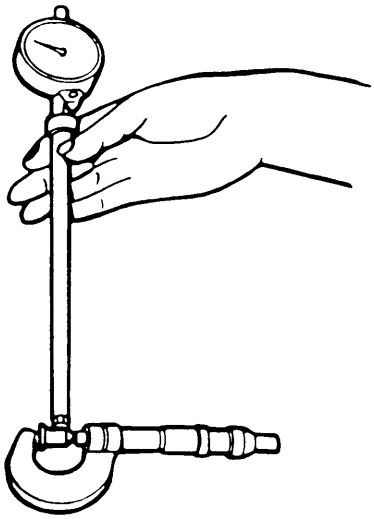
1. Measure the diameter of the piston pin.

   Piston Pin Diameter:
   Standard (New): 18.994 – 19.000 mm
   (0.7478 – 0.7480 in)
   Oversize: 18.997 – 19.003
   (0.7479 – 0.7481 in)

   NOTE: All replacement piston pins are oversize.



2. Zero the dial indicator to the piston pin diameter.

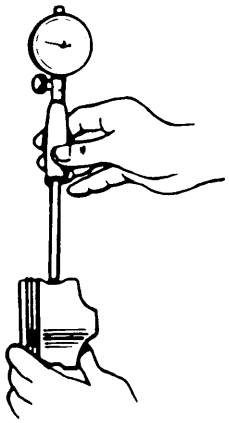


3. Measure the piston pin-to-piston clearance.

   NOTE: Check the piston for distortion or cracks.

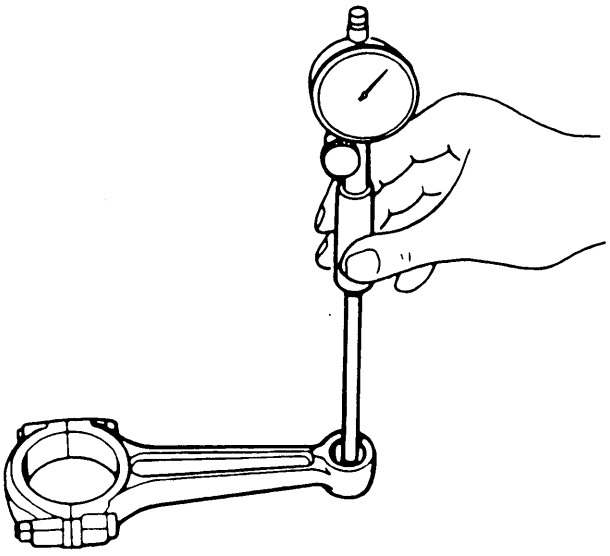
   If the piston pin clearance is greater than 0.024 mm (0.0009 in), remeasure using an oversized piston pin.

   Piston Pin-to-Piston Clearance:
   Standard (New): 0.010 – 0.022 mm
   (0.0004 – 0.0009 in)



4. Check the difference between the piston pin diameter and the connecting rod small end diameter.

   Piston Pin-to-Connecting Rod Interference:
   Standard (New): 0.014 – 0.040 mm
   (0.0006 – 0.0016 in)



Piston Rings

End Gap

1. Using a piston, push a new ring into the cylinder bore 15 – 20 mm (0.6 – 0.8 in) from the bottom.

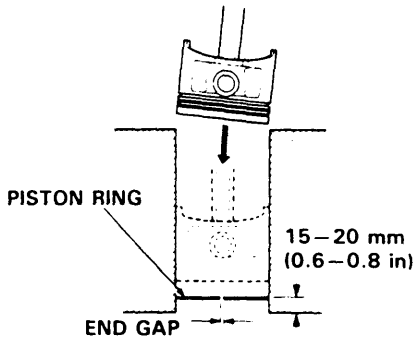
2. Measure the piston ring end-gap with a feeler gauge:

   - 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 on page 7-12. If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:
Top Ring
Standard (New): 0.15 – 0.30 mm (0.006 – 0.012 in)
Service Limit: 0.60 mm (0.024 in)

Second Ring
Standard (New): 0.30 – 0.45mm (0.012 – 0.018 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)



Replacement

1. Using a ring expander, remove the old piston rings.

2. Clean all ring grooves thoroughly.

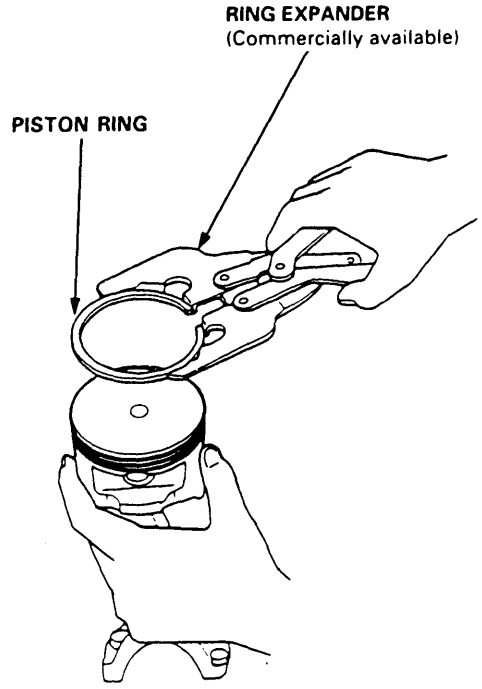
   NOTE:
   - Use a squared-off broken ring or ring groove cleaner with a blade to fit the piston grooves.
   - Top ring groove is 1.0 mm (0.039 in) wide.
   - Second ring groove is 1.2 mm (0.047 in) wide.
   - Oil ring groove is 2.8 mm (0.11 in) wide.
   - File down the blade if necessary.

   CAUTION: Do not use a wire brush to clean ring lands, or cut ring lands deeper with cleaning tool.

   NOTE: If the piston is to be separated from the connecting rod, do not install new rings yet.

3. Install new rings in the proper sequence and position (see pages 7-17, 18).

   NOTE: Do not reuse old piston rings.

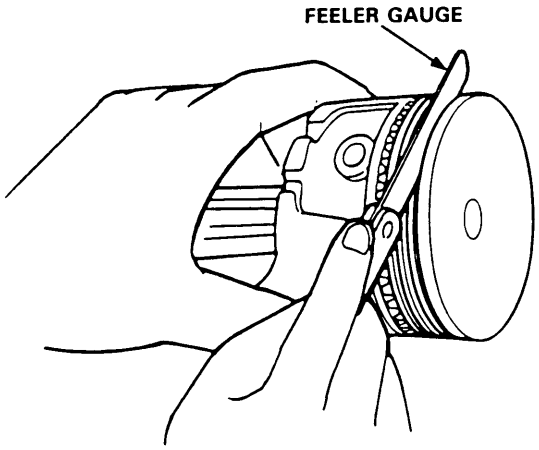


Ring-to-Groove Clearance

After installing a new set of rings, measure the ring-to-groove clearances:

Top Ring Clearance
Standard (New): 0.035 – 0.060 mm (0.0014 – 0.0024 in)
Service Limit: 0.13 mm (0.005 in)

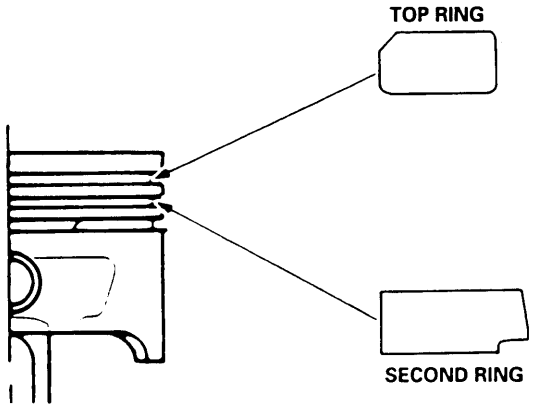
Second Ring Clearance
Standard (New): 0.030 – 0.055 mm (0.0012 – 0.0022 in)
Service Limit: 0.13 mm (0.005 in)



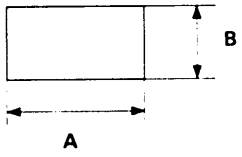
Alignment

1. Install the rings as shown.

NOTE:
- The top ring has an A mark.
- The second ring has an R mark.



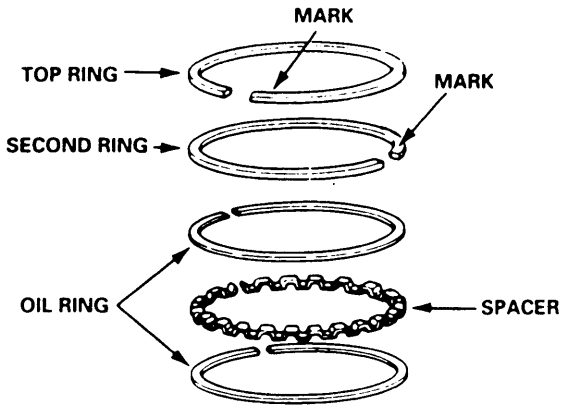
Piston Ring Dimensions:



Top Ring (Standard):
A: 2.6 mm (0.10 in)
B: 1.0 mm (0.04 in)

Second Ring (Standard):
A: 3.0 mm (0.12 in)
B: 1.2 mm (0.05 in)

NOTE: The manufacturing marks must be facing upward.

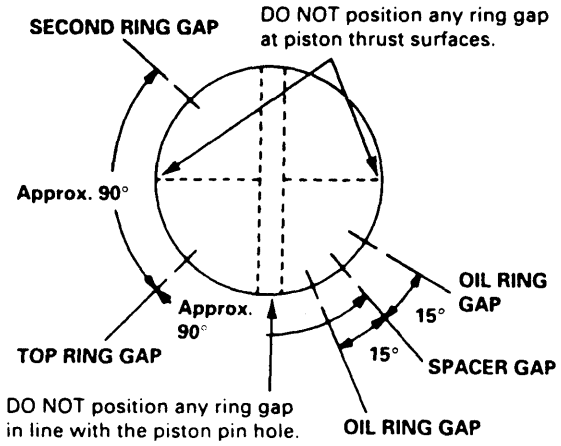


(cont'd)

Alignment (cont'd)

2. Rotate the rings in their grooves to make sure they do not bind.

3. Position the ring end gaps as shown:

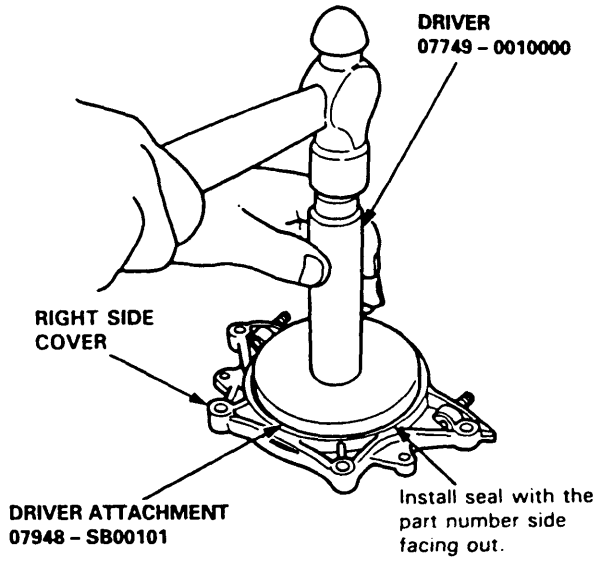


Installation

OIL The seal surface on the block should be dry. Apply a light coat of oil to the crankshaft and to the lip of the seal.

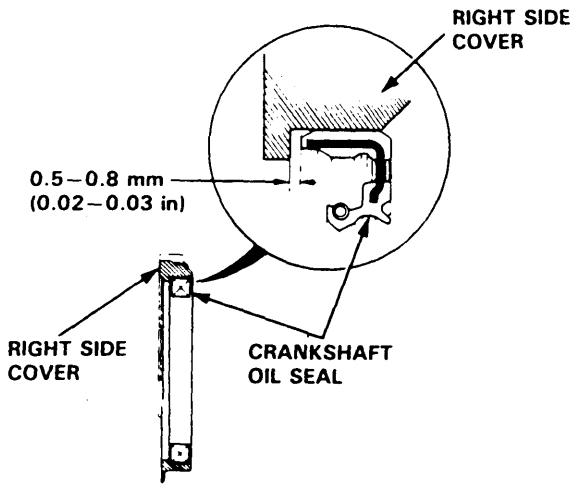
1. Drive the crankshaft oil seal into the right side cover using the special tools.

   NOTE: Drive the crankshaft oil seal in squarely.



2. Confirm equal clearance all the way around with a feeler gauge.

   Clearance: 0.5 – 0.8 mm (0.02 – 0.03 in)



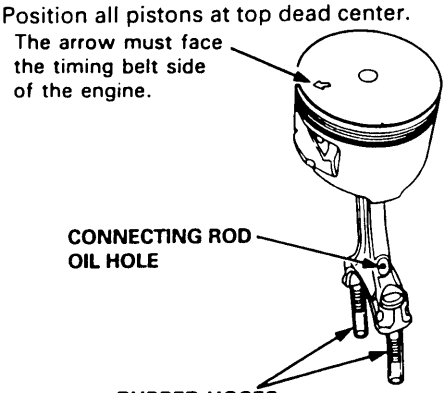
NOTE: Refer to pages 7-22 and 8-10 for installation of the oil pump side crankshaft oil seal.

Installation

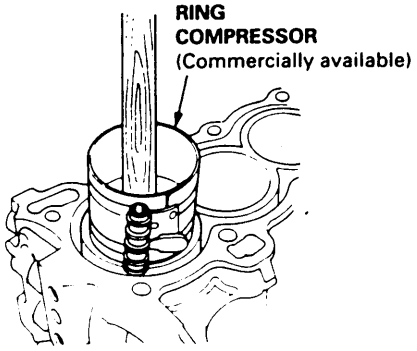
Before installing the pistons, apply a coat of engine oil to the ring grooves and cylinder bores.

1. If the crankshaft is already installed:
   - Set the crankshaft to BDC for each cylinder.
   - Remove the connecting rod caps, and slip short sections of rubber hose over the threaded ends of the connecting rod bolts.
   - Install the ring compressor, check that the bearing is securely in place, then position the piston in the cylinder, and tap it in using the wooden handle of a hammer.
   - Stop after the ring compressor pops free, and check the connecting rod-to-crank journal alignment before pushing the piston into place.
   - Install the rod caps with bearings, and torque the nuts to:
     31 N·m (3.2 kgf·m, 23 lbf·ft)
     Apply engine oil to the bolt threads.

2. If the crankshaft is not installed:
   - Remove the rod caps and bearings, install the ring compressor, then position the piston in the cylinder and tap it in using the wooden handle of a hammer.
   - Position all pistons at top dead center.



NOTE: Maintain downward force on the ring compressor to prevent the rings from expanding before they enter the cylinder bore.



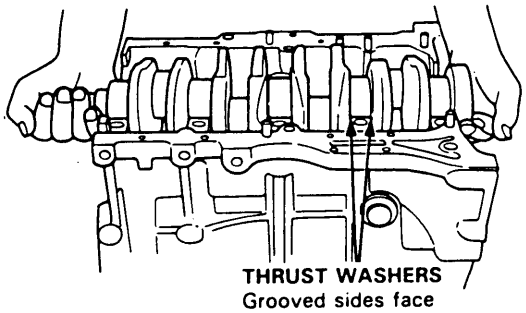
Installation

Before installing the crankshaft, apply a coat of engine oil to the main bearings and rod bearings.

1. Insert the bearing halves in the cylinder block and connecting rods.

2. Hold the crankshaft so the rod journals for cylinders No. 2 and No. 3 are straight down.

3. Lower the crankshaft into the block, seating the rod journals into connecting rods No. 2, No. 3. Install the rod caps and nuts finger-tight.



4. Rotate the crankshaft clockwise, seat the journals into connecting rods No. 1 and No. 4. Install the rod caps and nuts finger-tight.

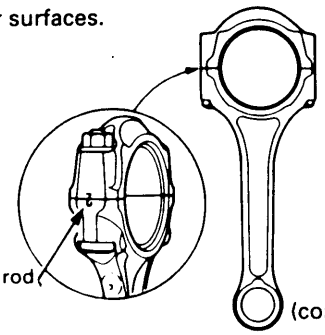
   NOTE: Install the caps so the bearing recess is on the same side as the recess in the rod.

5. Check rod bearing clearance with plastigage (see page 7-7), then torque the capnuts.

   Torque: 31 N·m (3.2 kgf·m, 23 lbf·ft)
   Apply engine oil to the bolt threads.

   NOTE: Reference numbers on the connecting rods are for big-end bore tolerance and do not indicate the position of the piston in the engine.

6. Install the thrust washers on the No. 4 journal. Oil the thrust washer surfaces.



(cont'd)

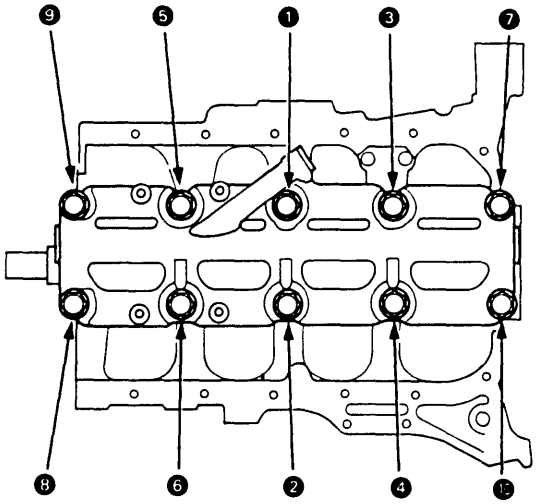
Installation (cont'd)

7. Install the main bearing caps.
   Check clearances with plastigage (see page 7-6), then tighten the bearing cap bolts in 2 steps.

   First step: 25 N·m (2.5 kgf·m, 18 lbf·ft)
   Second step: 51 N·m (5.2 kgf·m, 38 lbf·ft)

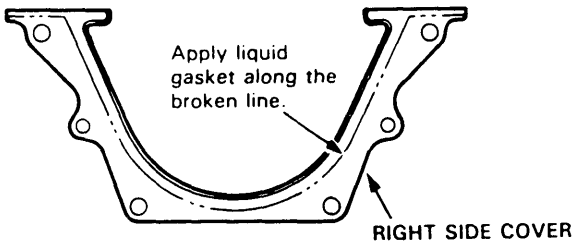
   NOTE: Coat the thrust washer surfaces and bolt threads with oil.

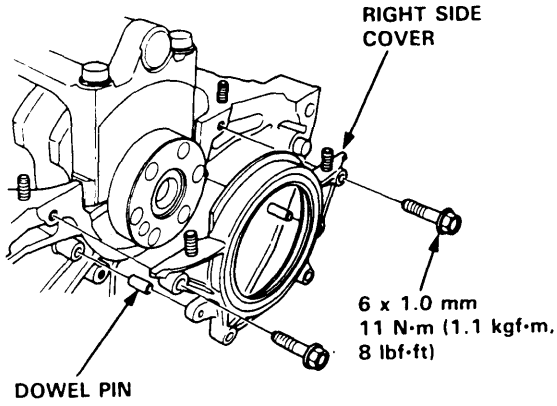
MAIN BEARING CAP BOLTS TIGHTENING SEQUENCE



8. Apply liquid gasket to the block mating surface of the right side cover, then install it on the cylinder block.

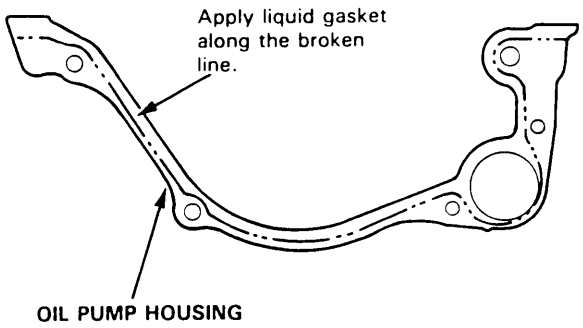
   NOTE:
   - Use liquid gasket, part No. 08718 – 0001 or 08718 – 0003.
   - Check that the mating surfaces are clean and dry before applying liquid gasket.
   - Apply liquid gasket evenly, being careful to cover all the mating surface.
   - To prevent oil leakage, apply liquid gasket to the inner threads of the bolt holes.
   - Do not install the parts if five minutes or more have elapsed since applying the liquid gasket. Instead reapply liquid gasket after removing the old residue.
   - After assembly, wait at least 20 minutes before filling the engine with oil.





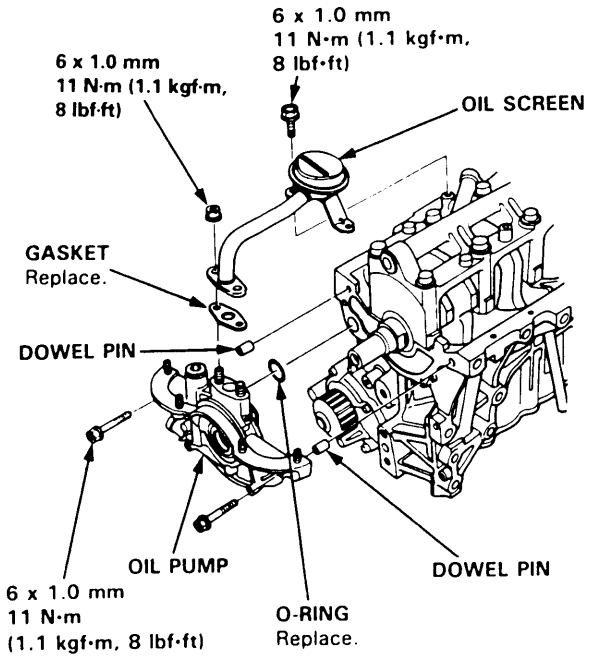
9. Apply liquid gasket to the oil pump mating surface of the block, then install the oil pump on the cylinder block.

   Apply grease to the lips of the oil seals.
   Then, install the oil pump while aligning the inner rotor with the crankshaft. When the pump is in place, clean any excess grease off the crankshaft, then check that the oil seal lips are not distorted.



   NOTE:
   - Apply a light coat of oil to the crankshaft and to the lip of the seal.
   - Use new O-rings, and apply oil when installing them.

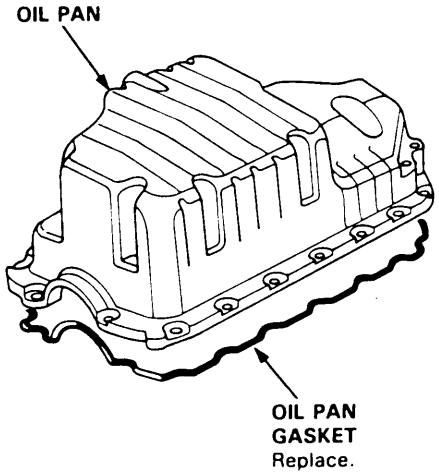
10. Install the oil pump and oil screen.



Installation

1. Install the oil pan gasket on the oil pan.

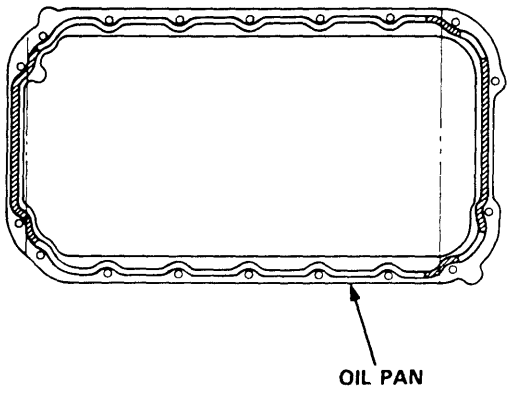
   NOTE:
   - Use liquid gasket, part No. 08718 – 0001 or 08718 – 0003.
   - Check that the mating surfaces are clean and dry before applying liquid gasket.
   - Apply liquid gasket as an even bead, centered between the edges of the mating surface.
   - To prevent oil leakage, apply liquid gasket to the inner threads of the bolt holes.
   - Do not install the parts if five minutes or more have elapsed since applying the liquid gasket. Instead, reapply liquid gasket after removing the old residue.
   - After assembly, wait at least 20 minutes before filling the engine with oil.



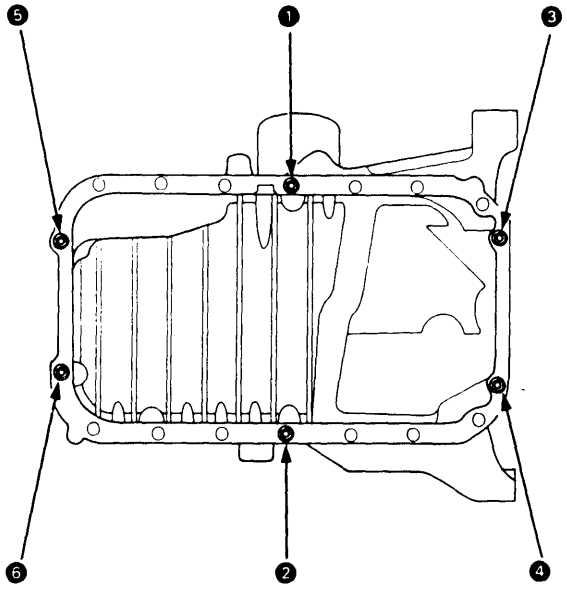
(cont'd)

Installation (cont'd)

2. Apply liquid gasket to the block mating surfaces, then install the oil pan. Apply liquid gasket to the shaded areas.



3. Tighten the nuts finger-tight at six points as shown below.



4. Tighten all bolts and nuts, starting from nut ①, clockwise in three steps.

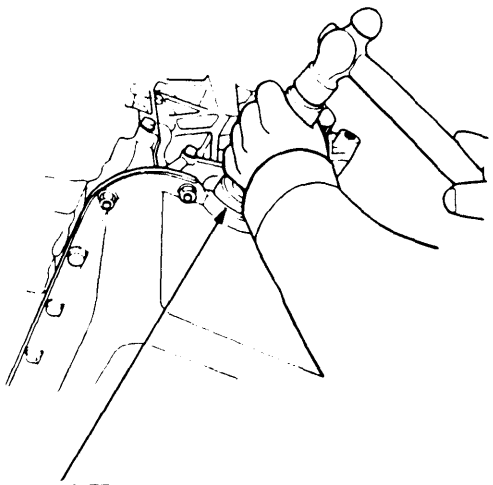
   NOTE: Excessive tightening can cause distortion of the oil pan gasket and oil leakage.

   Torque: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)

Installation

NOTE:
- Engine removal is not required.
- The crankshaft oil seal housing should be dry. Apply a light coat of grease to the crankshaft and to the lips of the seals.

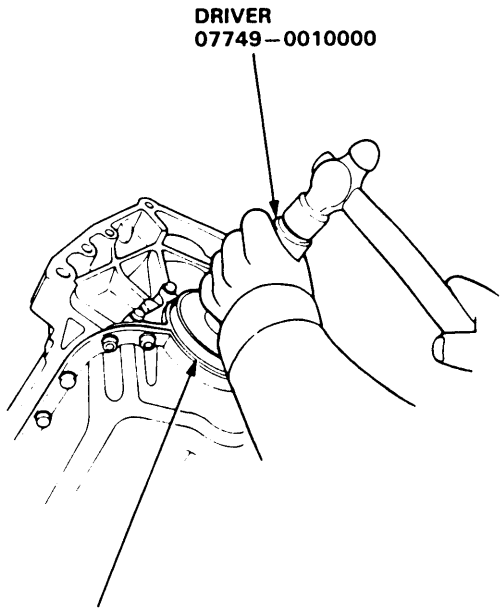
1. Using the special tool, drive in the timing pulley-end seal until the driver bottoms against the oil pump. When the seal is in place, clean any excess grease off the crankshaft and check that the oil seal lip is not distorted.



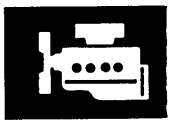
SEAL DRIVER
07947–SB00200
Install seal with the part number side facing out.

2. Measure the flywheel-end seal thickness and the oil seal housing depth. Using the special tool, drive the flywheel-end seal into the rear cover to the point where the clearance between the bottom of the oil seal and the right side cover is 0.5 – 0.8 mm (0.02 – 0.03 in) (see page 7-18).

   NOTE: Align the hole in the driver attachment with the pin on the crankshaft.

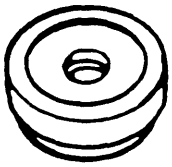


Engine Lubrication

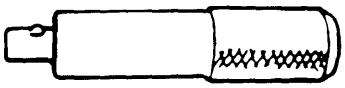


Special Tools

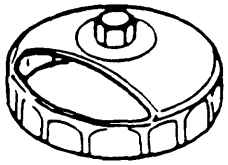
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07746 – 0010400	Attachment, 52 x 55 mm	1	8-10
②	07749 – 0010000	Driver	1	8-10
③	07912 – 6110001	Oil Filter Wrench	1	8-6



①



②

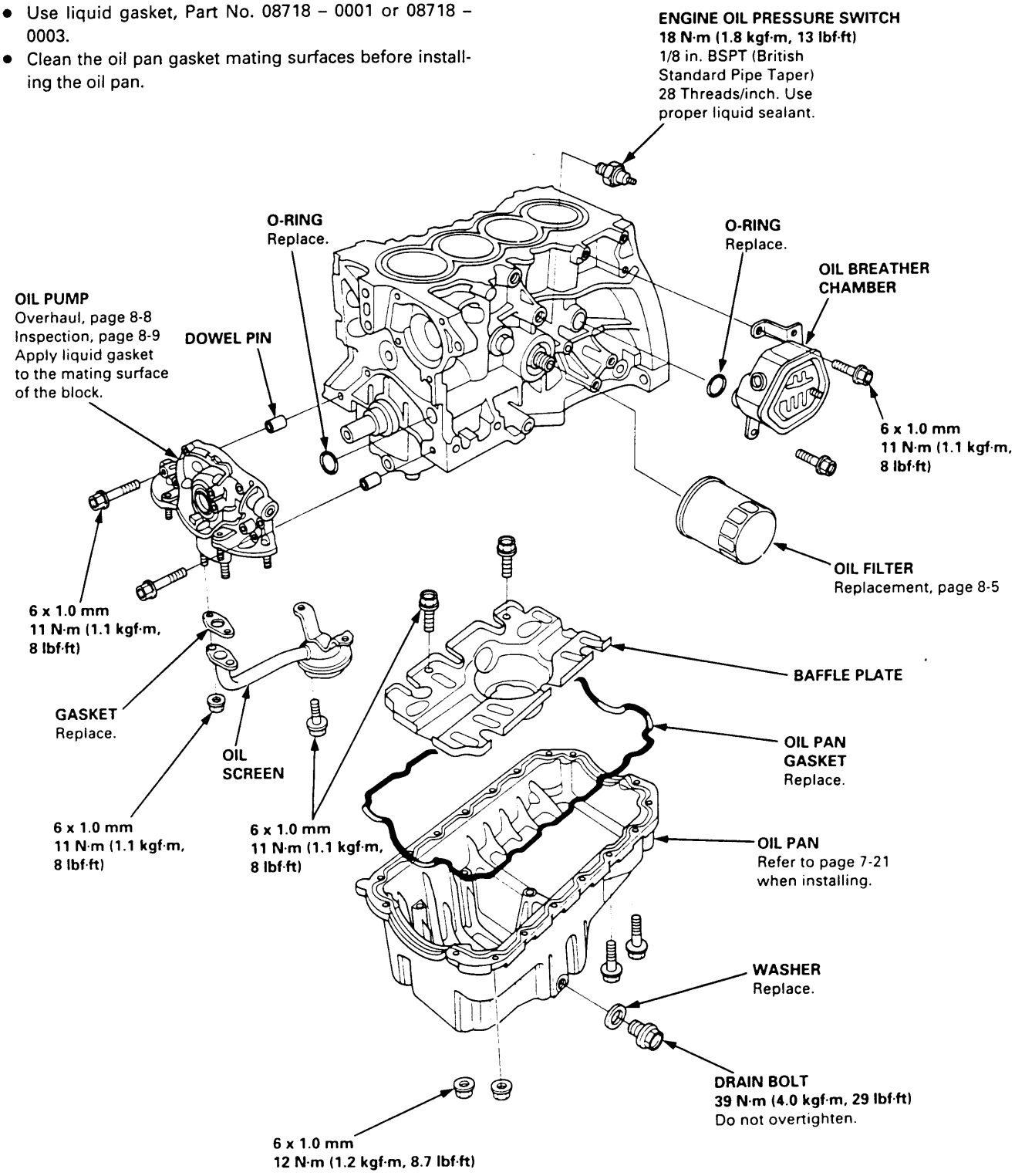


③

NOTE:

- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- Clean the oil pan gasket mating surfaces before installing the oil pan.

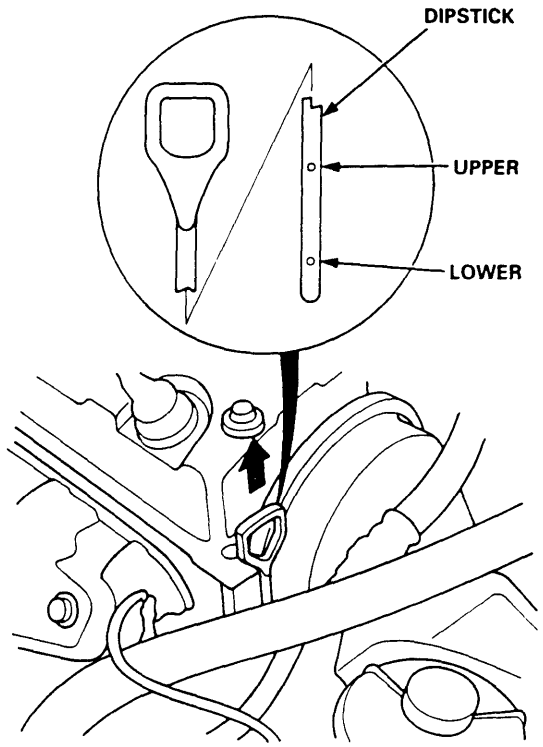
CAUTION: Do not overtighten the drain bolt.



Engine Oil

Inspection

1. Check the engine oil level with the engine off and the car parked on level ground.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.



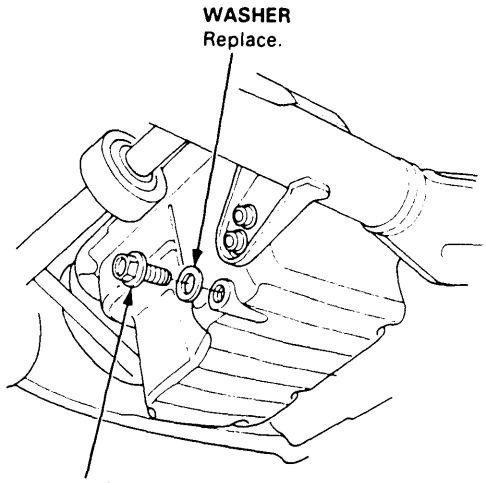
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.

   CAUTION: Insert the dipstick carefully to avoid bending it.

Replacement

CAUTION: Remove the drain bolt carefully while the engine is hot; the hot oil may cause scalding.

1. Warm up the engine.
2. Drain the engine oil.

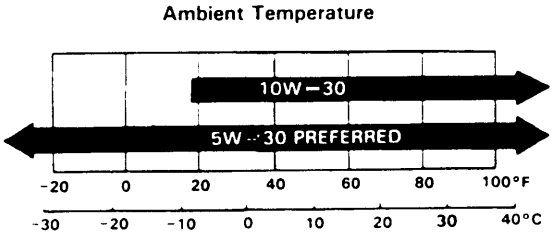


3. Reinstall the drain bolt with a new washer, and refill the engine with the recommended oil.

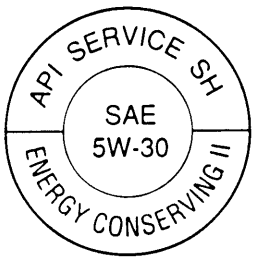
Requirement	API Service Grade: Use "Energy Conserving II" SH grade oil. SAE 5W-30 preferred. You can also use an oil that bears the API CERTIFICATION mark.
Capacity	3.6 ℓ (3.8 US qt, 3.2 Imp qt) at change, including filter. 3.3 ℓ (3.5 US qt, 2.9 Imp qt) at change, without filter. 4.0 ℓ (4.2 US qt, 3.5 Imp qt) after engine overhaul.
Change	Every 7,500 miles (12,000 km) or 12 months (Normal Conditions). Every 3,750 miles (6,000 km) or 6 months (Severe Conditions).

NOTE: Under normal conditions, the oil filter should be replaced at every other oil change.
Under severe conditions, the oil filter should be replaced at each oil change.

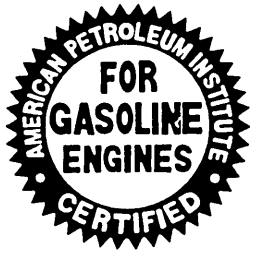
The numbers in the middle of the API Service label tell you the oil's SAE viscosity or weight. Select the oil for your car according to this chart:



An oil with a viscosity of 5W-30 is preferred for improved fuel economy and year-round protection in the car. You may use a 10W-30 oil if the climate in your area is limited to the temperature range shown on the chart.



API SERVICE LABEL



API CERTIFICATION MARK

4. Run the engine for more than three minutes, then check for oil leakage. Recheck the oil level, and add oil if necessary.

Replacement

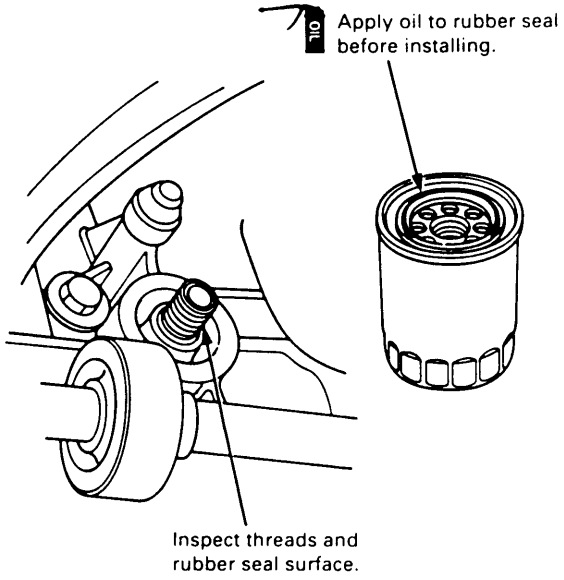
⚠ WARNING

- **After the engine has been run, the exhaust pipe will be hot; be careful when working around the exhaust pipe.**
- **Be careful when loosening the drain bolt while the engine is hot. Burns can result because the oil temperature is very high.**

1. Remove the oil filter with the oil filter wrench.

2. Inspect the threads and rubber seal on the new filter. Wipe off the seat on the engine block, then apply a light coat of oil to the new filter's rubber seal.

   NOTE: Use only filters with a built-in bypass system.



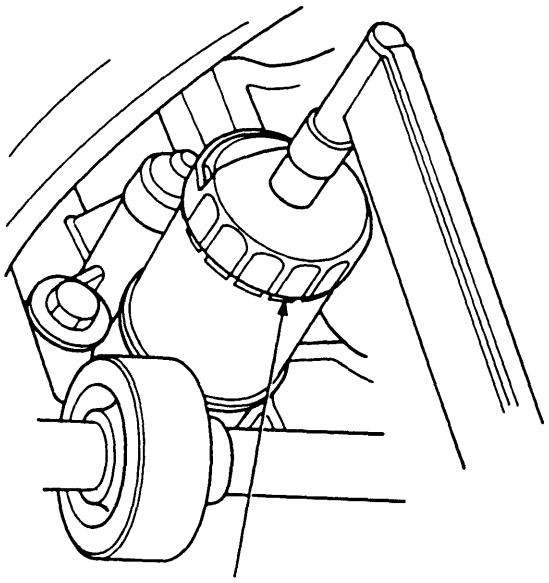
(cont'd)

Replacement (cont'd)

3. Install the oil filter by hand.

4. After the rubber seal seats, tighten the oil filter clockwise with the oil filter wrench.

   Tighten: 7/8 turn clockwise.
   Tightening torque: 22 N·m (2.2 kgf·m, 16 lbf·ft)



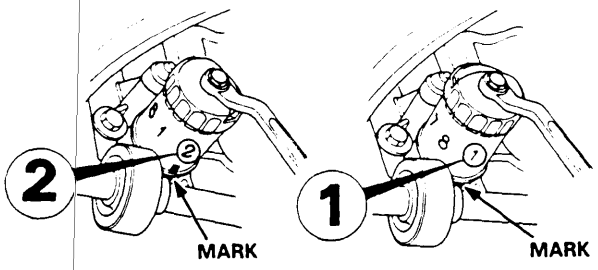
OIL FILTER WRENCH
07912 – 6110001

Use this procedure to tighten the filter if eight numbers (1 to 8) are printed on the surface of the filter.

1) Make a mark on the oil filter base under the number that shows at the bottom of the filter when the rubber seal is seated.

2) Tighten the filter by turning it clockwise seven numbers from the marked point. For example, if a mark is made under the number 2 when the rubber seal is seated, the filter should be tightened until the number 1 comes up to the marked point.

7/8 turn clockwise.



Number when rubber seal is seated.

Number after tightening.

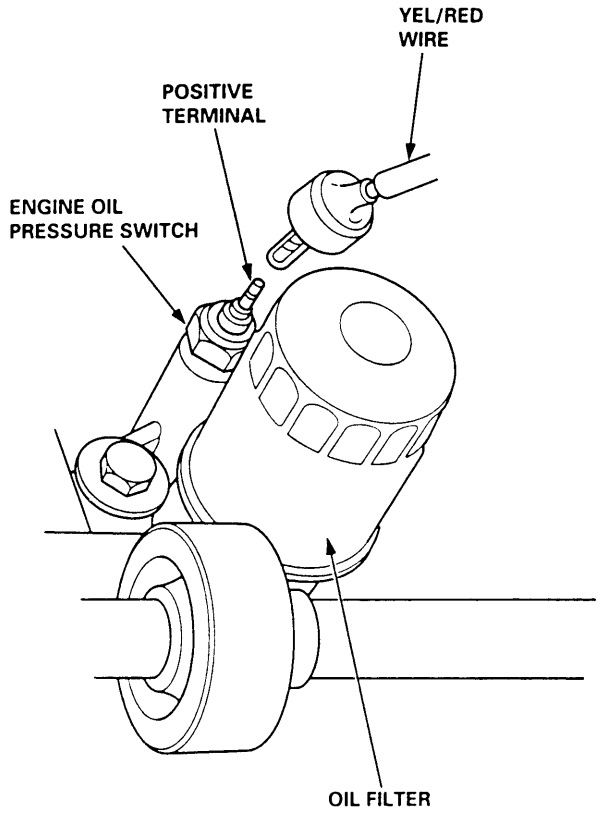
Number when rubber seal is seated	1	2	3	4	5	6	7	8
Number after tightening	8	1	2	3	4	5	6	7

CAUTION: Using any procedure other than those shown could result in serious engine damage due to oil leakage.

5. After installation, fill the engine with oil up to the specified level, run the engine for more than three minutes, then check for oil leakage.

Testing

1. Remove the YEL/RED wire from the engine oil pressure switch.
2. Check for continuity between the positive terminal and the engine (ground).
   - There should be continuity with the engine stopped.
   - There should be no continuity with the engine running.

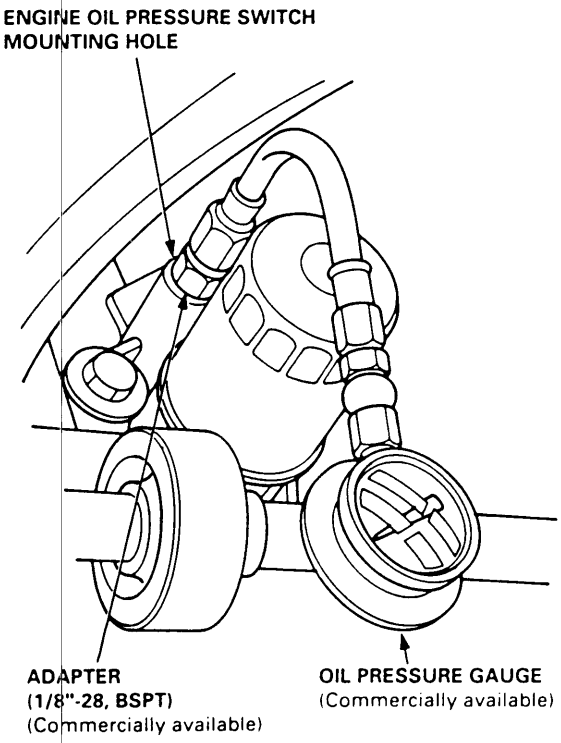


3. If the switch fails to operate, check the engine oil level. If the engine oil level is OK, check the engine oil pressure.

Testing

If the oil pressure warning light stays on with the engine running, check the engine oil level. If the oil level is correct:

1. Connect a tachometer.
2. Remove the engine oil pressure switch, and install an oil pressure gauge.



3. Start the engine. Shut it off immediately if the gauge registers no oil pressure. Repair the problem before continuing.
4. Allow the engine to reach operating temperature (fan comes on at least twice). The pressure should be:

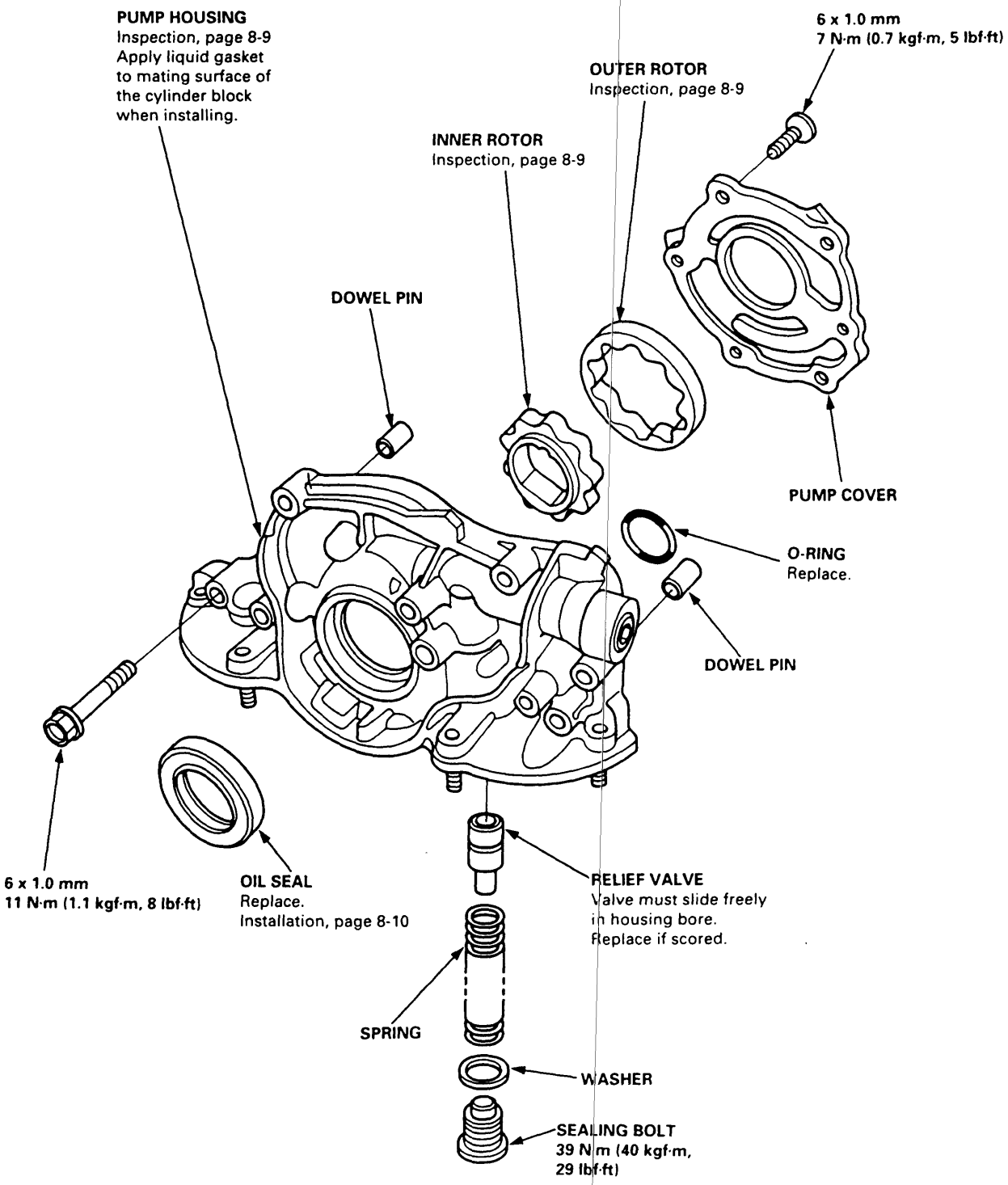
   Engine Oil Temperature: 176°F (80°C)
   Engine Oil Pressure:
   At Idle: 70 kPa (0.7 kgf/cm², 10 psi) minimum
   At 3,000 rpm: 340 kPa (3.5 kgf/cm², 50 psi) minimum

   - If oil pressure is NOT within specifications, inspect the oil pump (see page 8-9).

Oil Pump

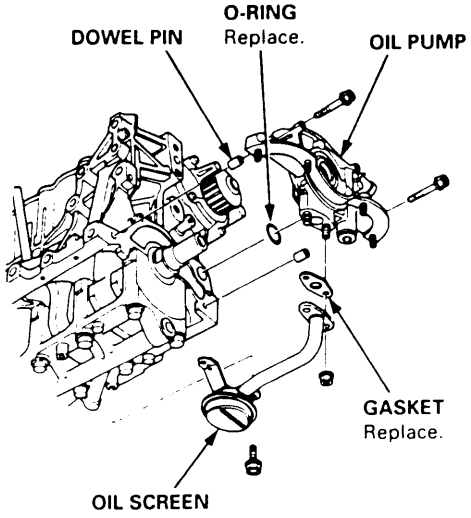
Overhaul

NOTE:
- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.
- The rotors must be installed in the same direction.
- After reassembly, check that the rotors move without binding.



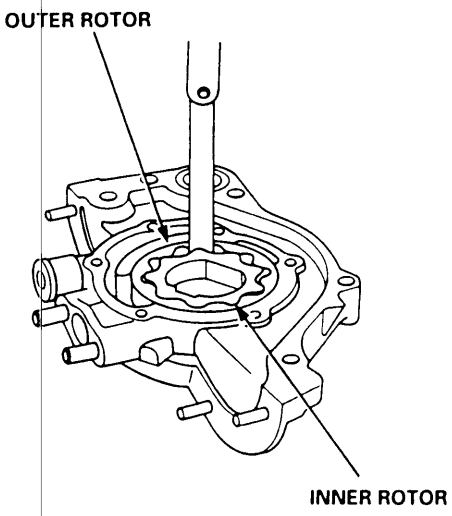
Removal/Inspection/Installation

1. Drain the engine oil.
2. Turn the crankshaft and align the white groove on the crankshaft pulley with the pointer on the lower cover.
3. Remove the cylinder head cover and upper cover.
4. Remove the power steering pump belt, air conditioner belt and the alternator belt.
5. Remove the crankshaft pulley and remove the lower cover.
6. Remove the timing belt.
7. Remove the drive pulley.
8. Remove the oil pan and oil screen.



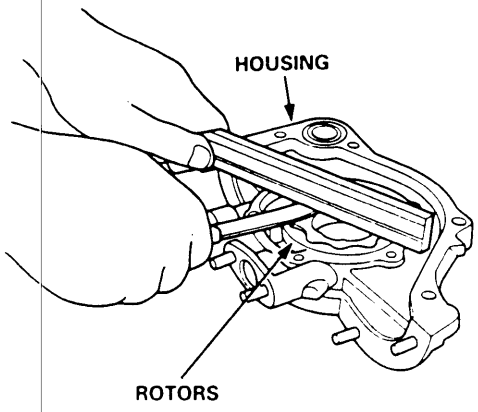
9. Remove the oil pump.
10. Remove the screws from the pump housing, then separate the housing and cover.
11. Check the inner-to-outer rotor radial clearance on the pump rotor. If the inner-to-outer rotor clearance exceeds the service limit, replace the inner and outer rotors.

Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.02 – 0.14 mm (0.001 – 0.006 in)
Service Limit: 0.20 mm (0.008 in)



12. Check the housing-to-rotor axial clearance on the pump rotor. If the housing-to-rotor axial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

Housing-to-Rotor Axial Clearance
Standard (New): 0.03 – 0.08 mm (0.001 – 0.003 in)
Service Limit: 0.15 mm (0.006 in)

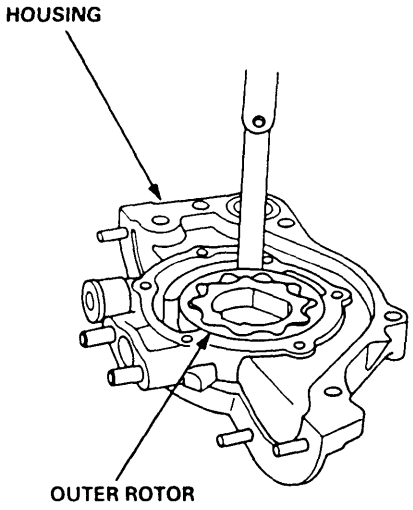


(cont'd)

Removal/Inspection/Installation (cont'd)

13. Check the housing-to-outer rotor radial clearance. If the housing-to-outer rotor radial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

    Housing-to-Outer Rotor Radial Clearance:
    Standard (New): 0.10 – 0.18 mm (0.004 – 0.007 in)
    Service Limit: 0.20 mm (0.008 in)

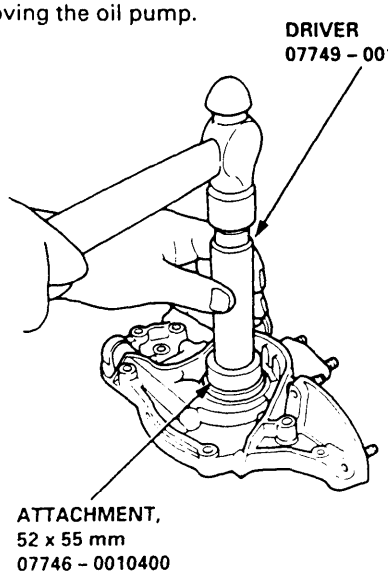


14. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.

15. Remove the old oil seal from the oil pump.

16. Using the special tool, gently tap in the new oil seal until the driver bottoms against the pump.

    NOTE: The oil seal alone can be replaced without removing the oil pump.



17. Reassemble the oil pump, applying thread lock to the pump housing screws.

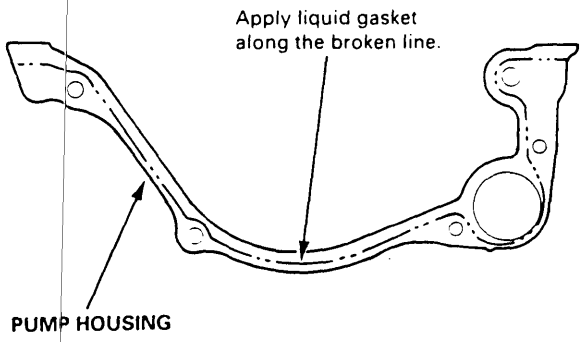
18. Check that the oil pump turns freely.

19. Apply a light coat of oil to the seal lip.

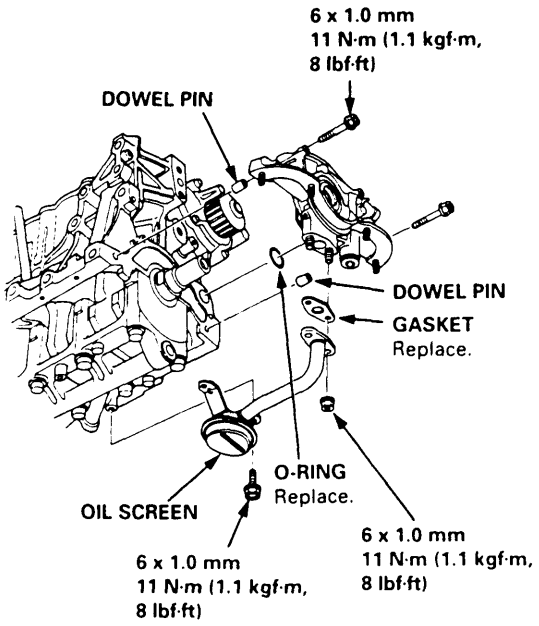
20. Install the two dowel pins and new O-ring on the oil pump.

21. Apply liquid gasket to the cylinder block mating surface of the oil pump.

    NOTE:
    - Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003
    - Check that the mating surfaces are clean and dry before applying liquid gasket.
    - Apply liquid gasket evenly, in a narrow bead centered on the mating surface.
    - To prevent oil leakage, apply liquid gasket to the inner threads of the bolt holes.
    - Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead reapply liquid gasket after removing the old residue.
    - After assembly, wait at least 20 minutes before filling the engine with oil.



22. Install the oil pump on the cylinder block. Apply grease to the lip of the oil pump seal. Then, install the oil pump onto the crankshaft. When the pump is in place, clean any excess grease off the crankshaft and check that the oil seal lip is not distorted.



23. Install the oil screen.

24. Install the oil pan (see page 7-21).

NOTE: Clean the oil pan gasket mating surfaces.

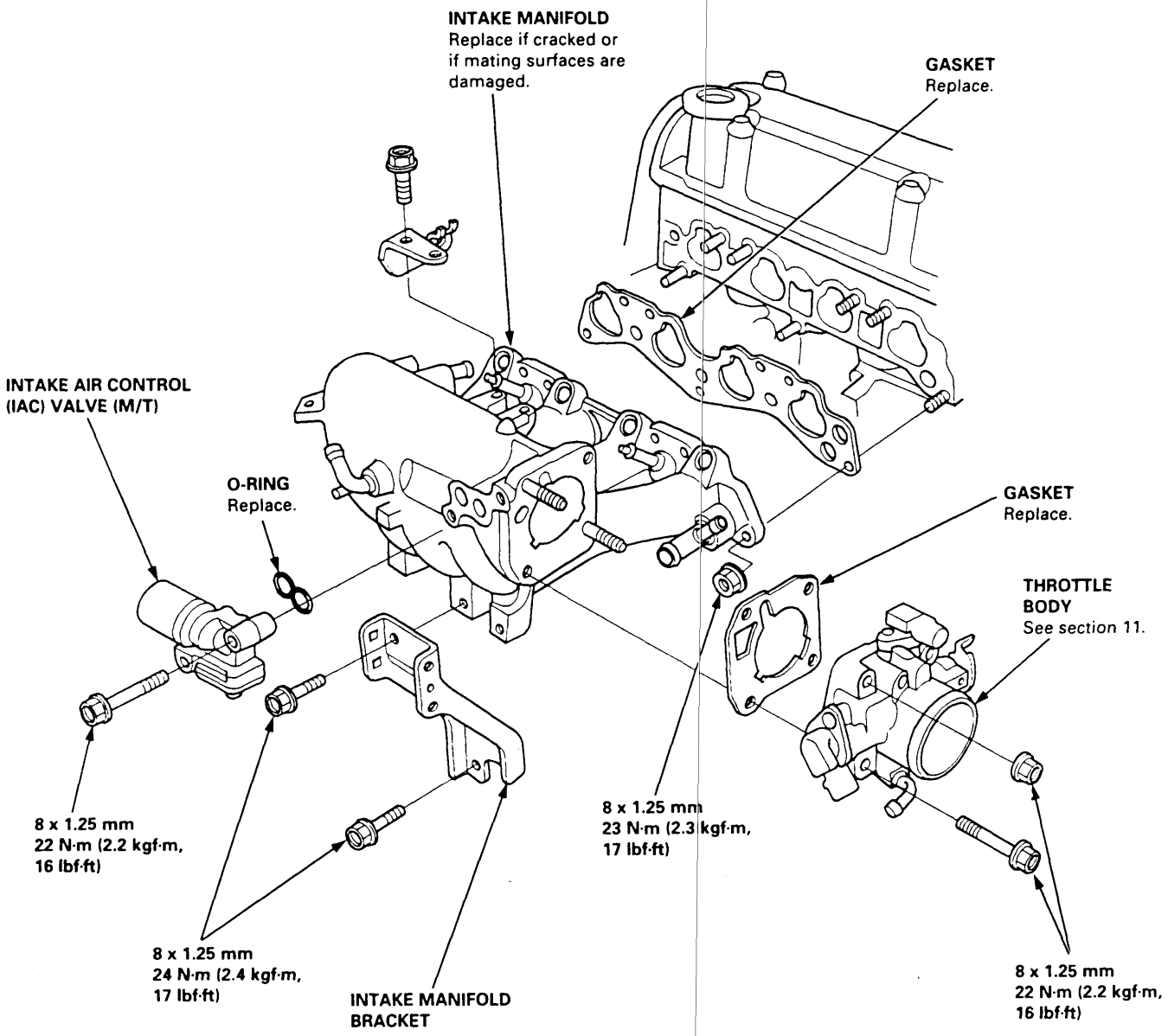
Intake Manifold/Exhaust System

Intake Manifold

Replacement

NOTE: Use new O-rings and gaskets when reassembling.

CAUTION:
- **Check for folds or scratches on the surface of the gasket.**
- **Replace with a new gasket if damaged.**

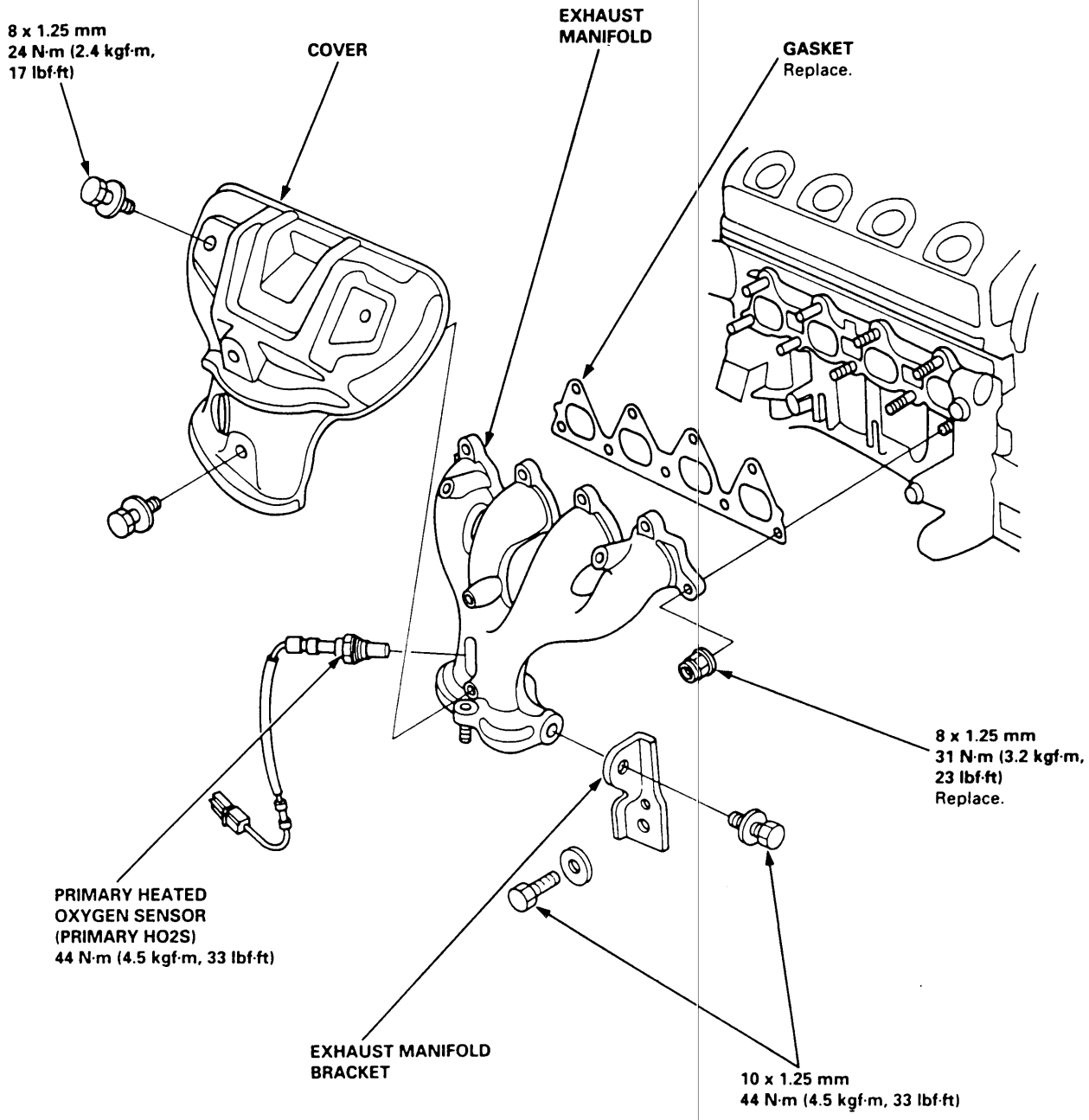


Exhaust Manifold

Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.

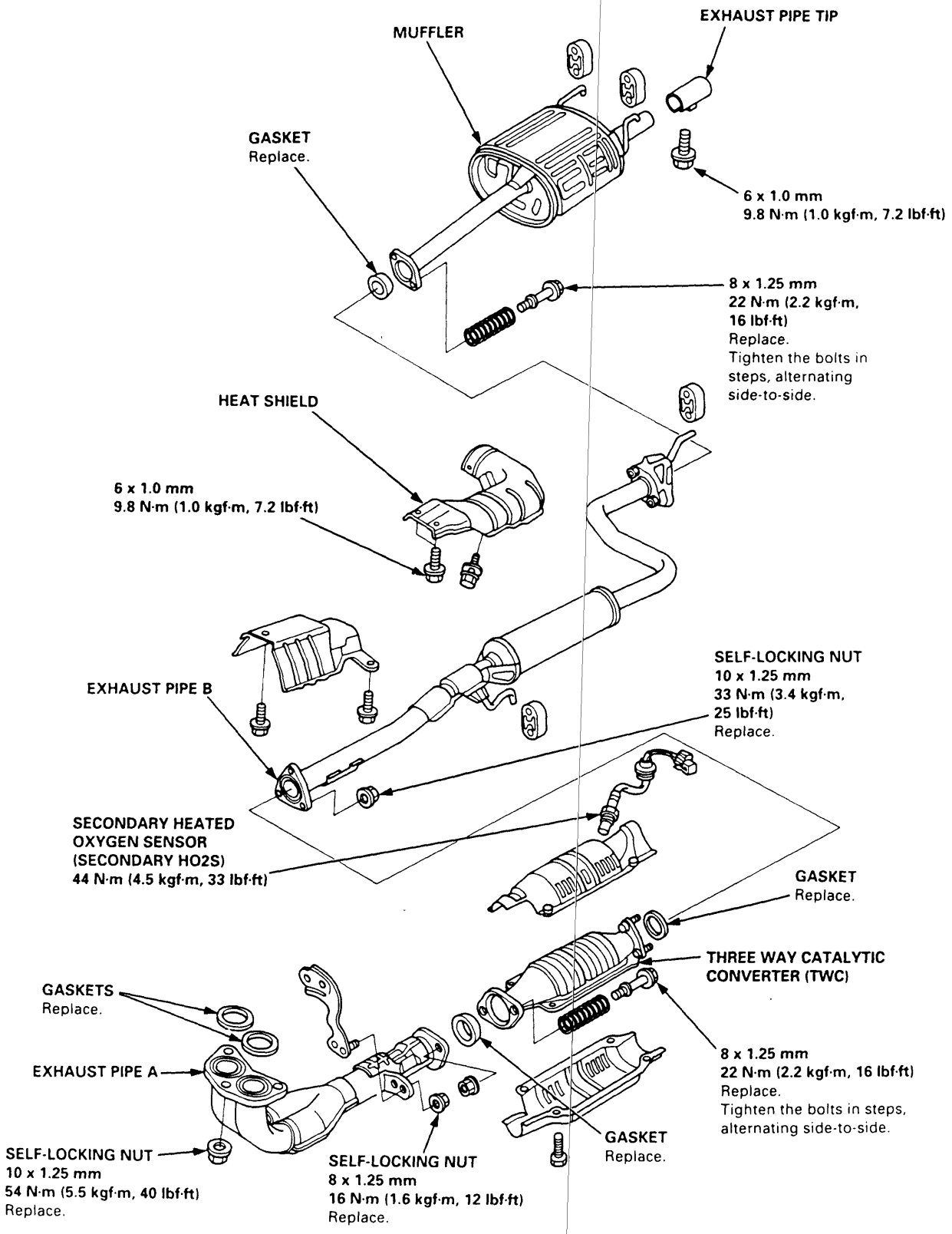
CAUTION:
- **Check for folds or scratches on the surface of the gasket.**
- **Replace with a new gasket if damaged.**



Exhaust Pipe and Muffler

Replacement

NOTE: Use new gaskets and self-locking nuts when reassembling.



Cooling

Illustrated Index

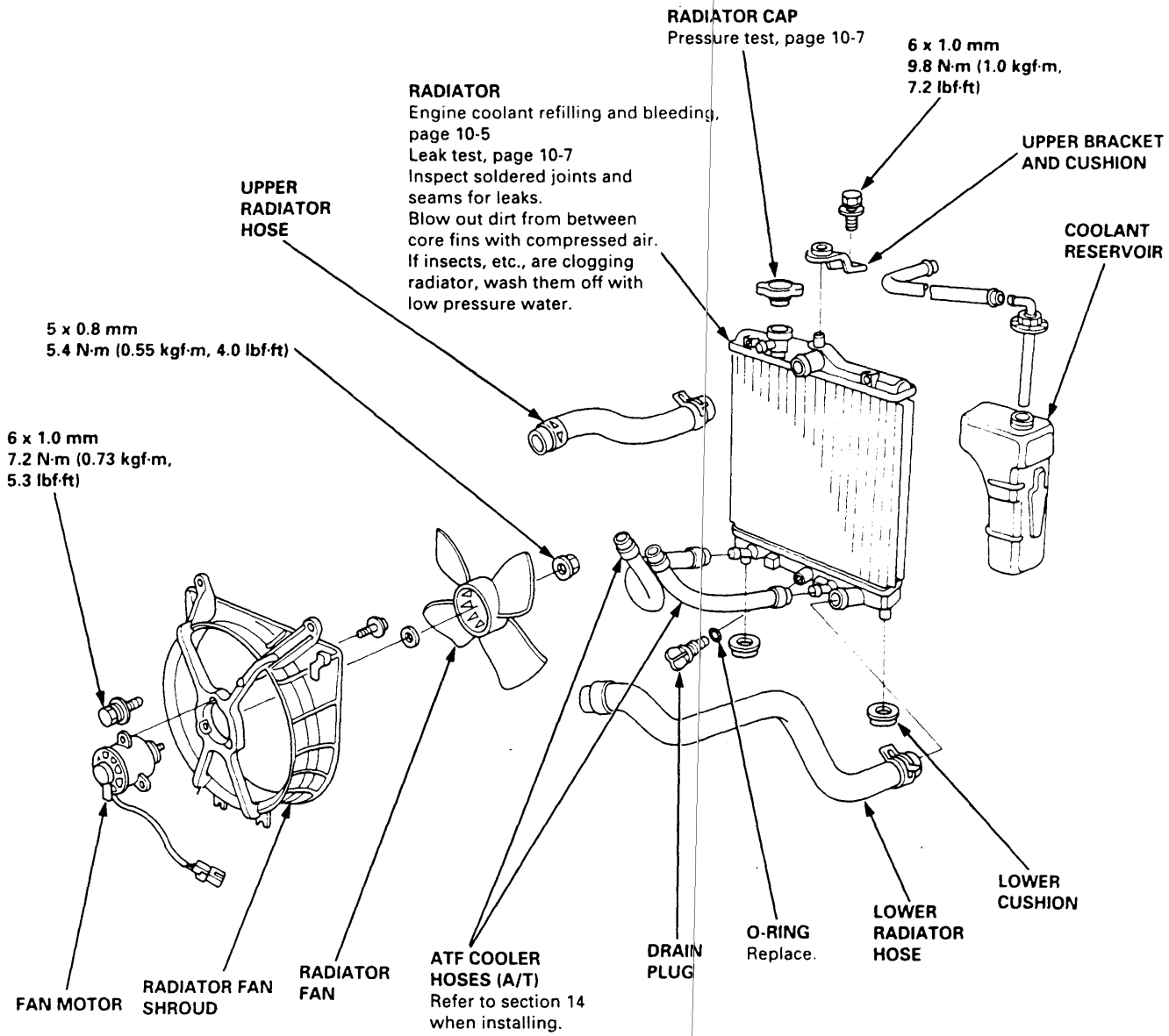
⚠WARNING **System is under high pressure when the engine is hot. To avoid danger of releasing scalding engine coolant, remove the cap only when the engine is cool.**

Total Cooling System Capacity [Including heater and reservoir (0.4 ℓ (0.42 US qt, 0.35 Imp qt))]:

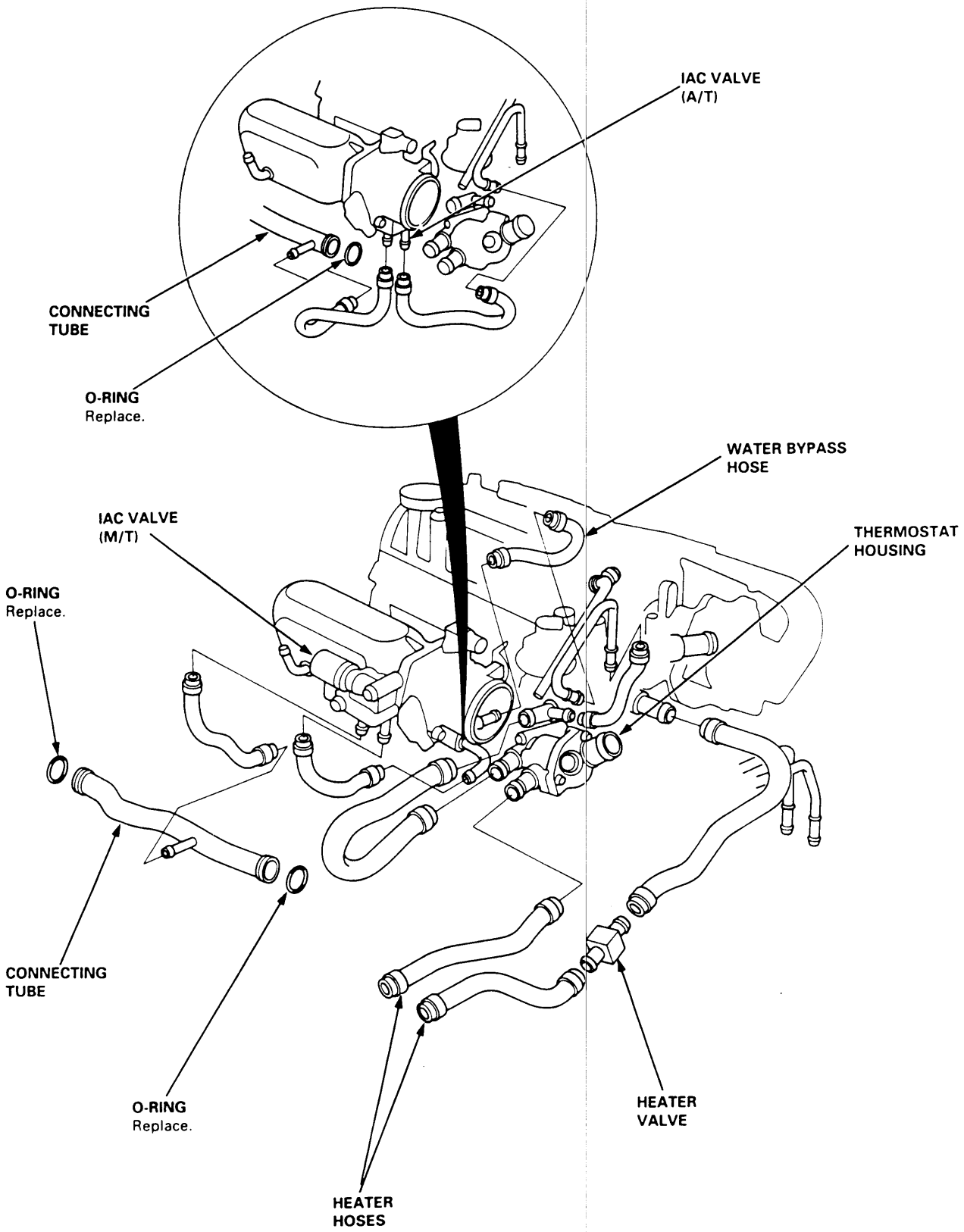
M/T	4.2 ℓ (4.4 US qt, 3.7 Imp qt)
A/T	4.3 ℓ (4.5 US qt, 3.8 Imp qt)

CAUTION: If any engine coolant spills on painted portions of the body, rinse it off immediately.

NOTE:
- Check all cooling system hoses for damage, leaks or deterioration and replace if necessary.
- Check all hose clamps and retighten if necessary.
- Use new O-rings when reassembling.



Engine Hose Connections:



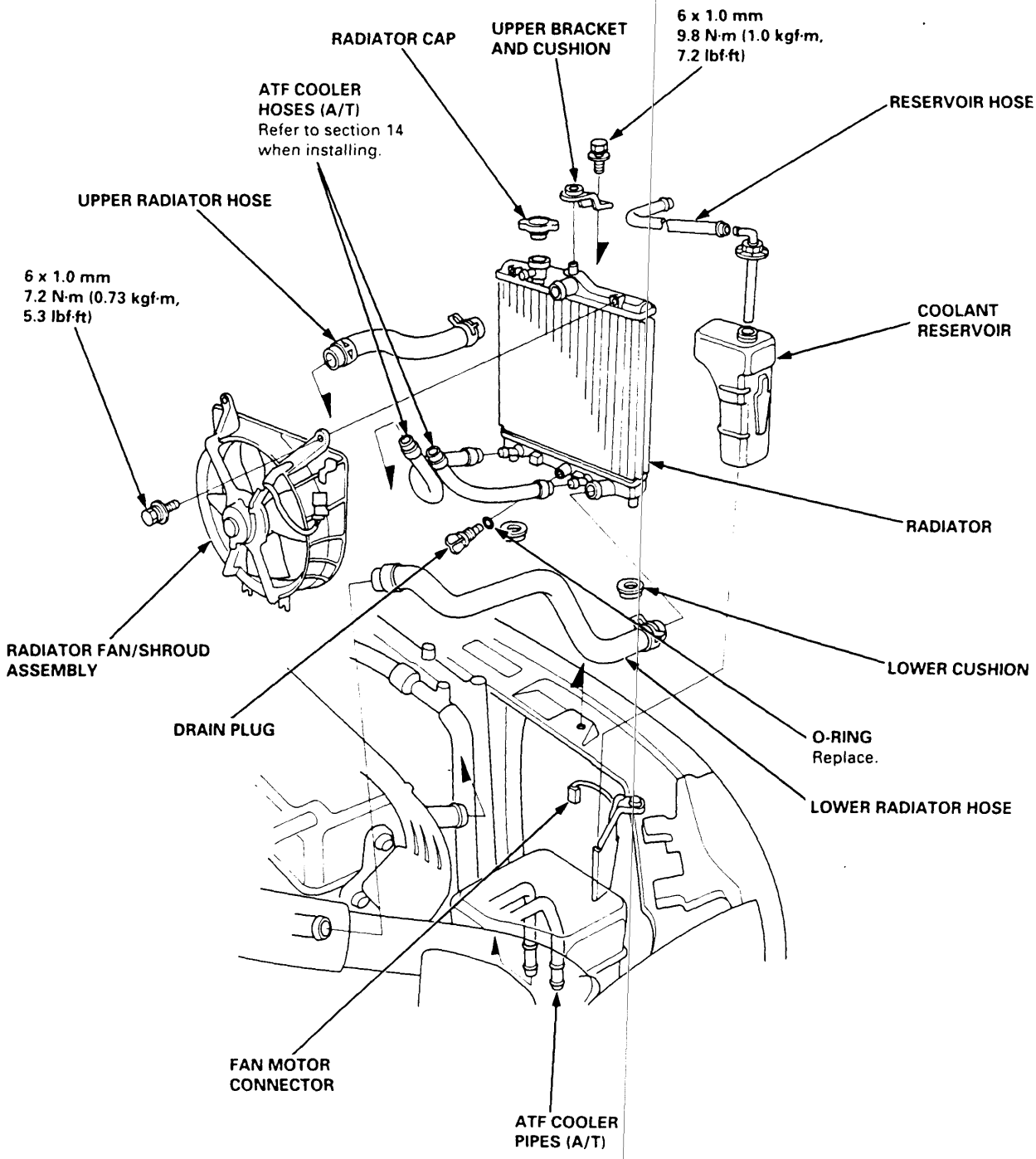
Radiator

Replacement

1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses, and ATF cooler hoses.
3. Disconnect the fan motor connector.
4. Remove the radiator upper bracket, then pull up the radiator.
5. Remove the fan shroud assemblies and other parts from the radiator.

Install the radiator in the reverse order of removal:

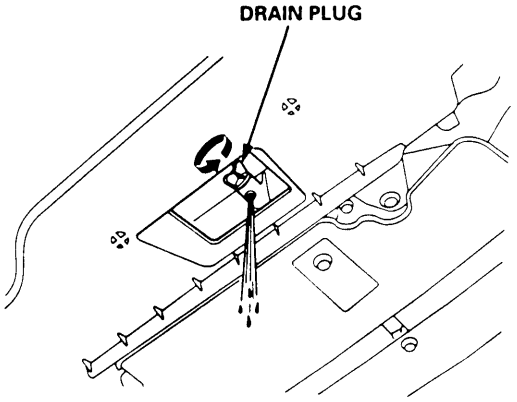
NOTE:
- Set the upper and lower cushions securely.
- Fill the radiator with engine coolant and bleed the air.



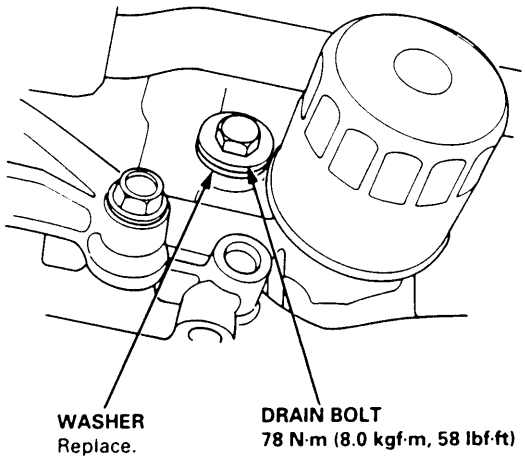
Engine Coolant Refilling and Bleeding

CAUTION: When pouring engine coolant, be sure to shut the relay box lid and not to let coolant spill on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

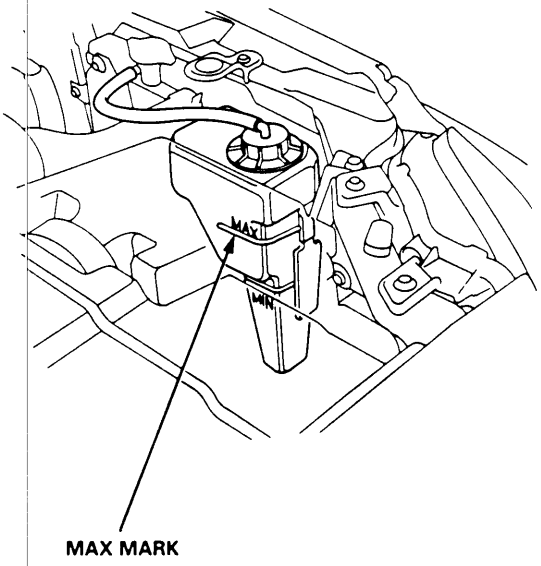
1. Slide the heater temperature control lever to maximum heat. Make sure the engine and radiator are cool to the touch.
2. Remove the radiator cap.
3. Loosen the drain plug, and drain the coolant.



4. Remove the drain bolt from the cylinder block.



5. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
6. Tighten the radiator drain plug securely.
7. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with water, then up to MAX mark with antifreeze.



(cont'd)

Engine Coolant Refilling and Bleeding (cont'd)

8. Mix the recommended antifreeze with an equal amount of water in a clean container.

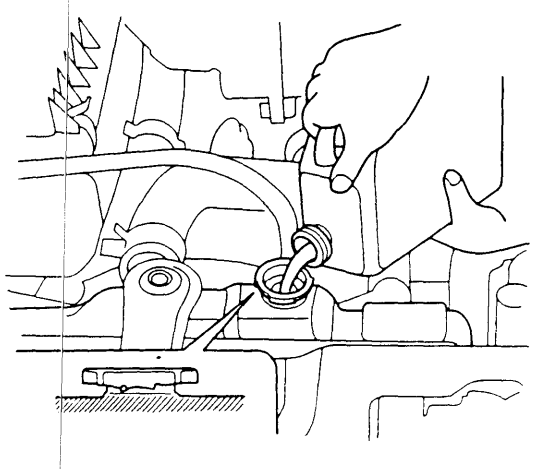
   NOTE:
   - Always use Genuine Honda Antifreeze/Coolant. Using a non-Honda coolant can result in corrosion, causing the cooling system to malfunction or fail.
   - For best corrosion protection, the coolant concentration must be maintained year-round at 50% minimum. Coolant concentrations less than 50% may not provide sufficient protection against corrosion or freezing.
   - Coolant concentrations greater than 60% will impair cooling efficiency and are not recommended.

   CAUTION:
   - **Do not mix different brands of antifreeze/coolants.**
   - **Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the coolant.**

   Engine Coolant Refill Capacity [including reservoir (0.4 ℓ (0.42 US qt, 0.35 Imp qt))]:

M/T	3.8 ℓ (4.0 US qt, 3.3 Imp qt)
A/T	3.9 ℓ (4.1 US qt, 3.4 Imp qt)

9. Pour coolant into the radiator up to the base of the filler neck, and install the radiator cap loosely.



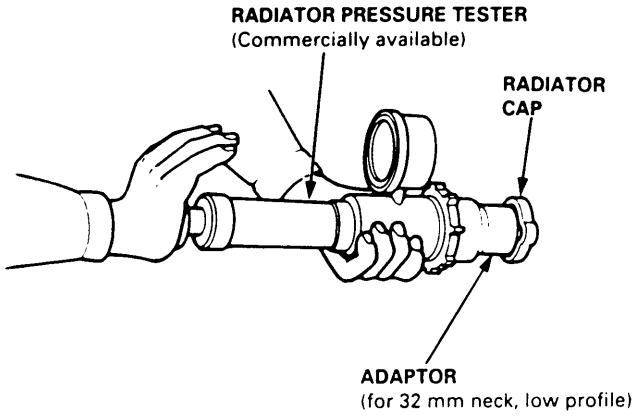
10. Start the engine and let it run until it warms up (the radiator fan comes on at least twice).

11. Turn off the engine. Check the level in the radiator, add coolant if needed.

12. Put the radiator cap on tightly, then run the engine again and check for leaks.

Cap Testing

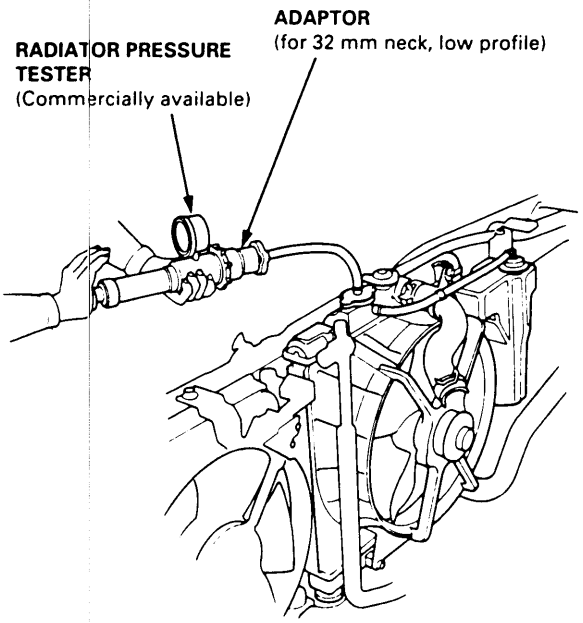
1. Remove the radiator cap, wet its seal with engine coolant, then install it on the pressure tester.



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.

Testing

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 to the radiator and apply a pressure of 93 – 123 kPa (0.95 – 1.25 kgf/cm², 14 – 18 psi).



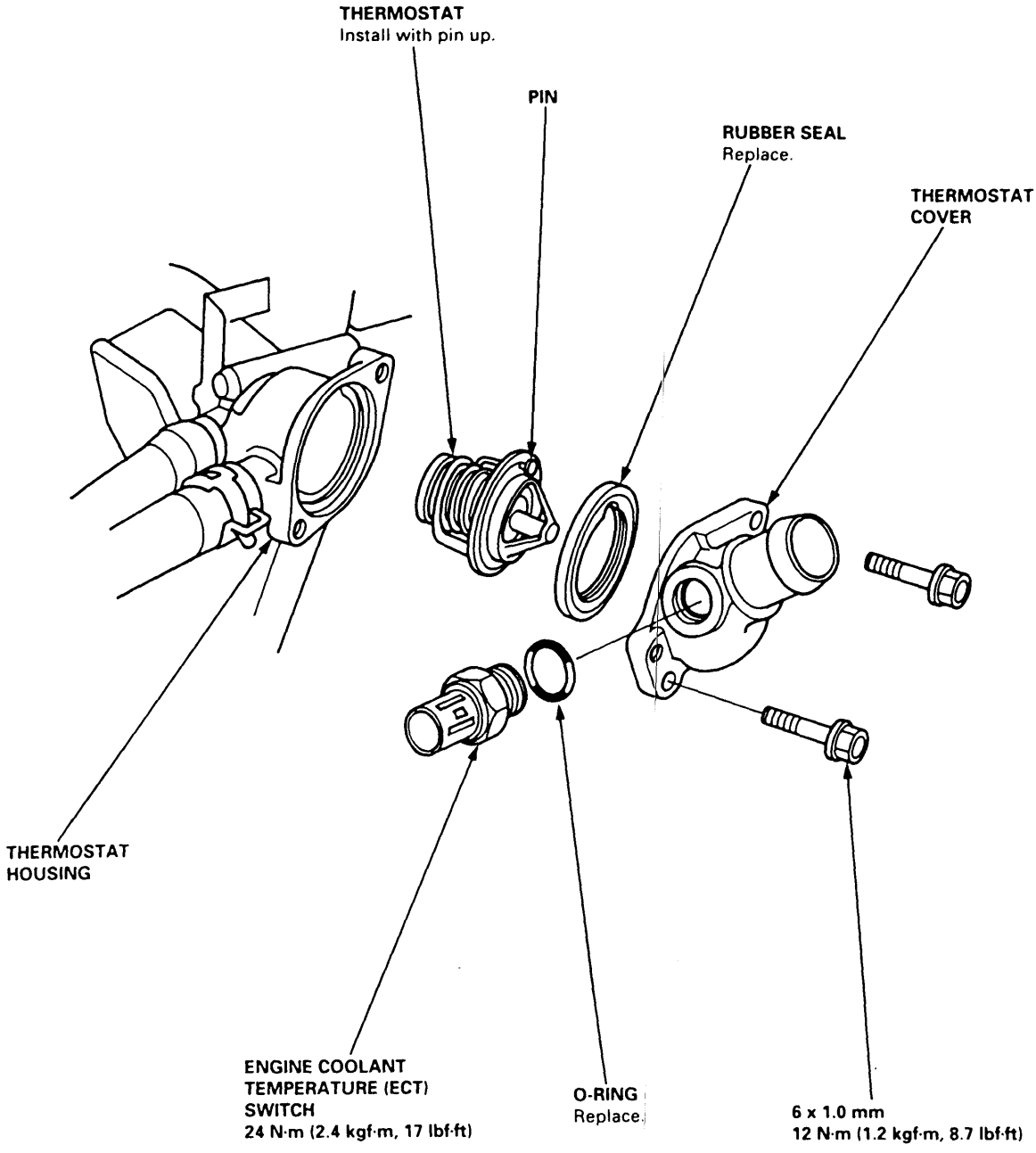
3. Inspect for engine coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the radiator cap.

   NOTE: Check for engine oil in the coolant and/or coolant in the engine oil.

Thermostat

Replacement

NOTE: Use a new O-ring when reassembling.

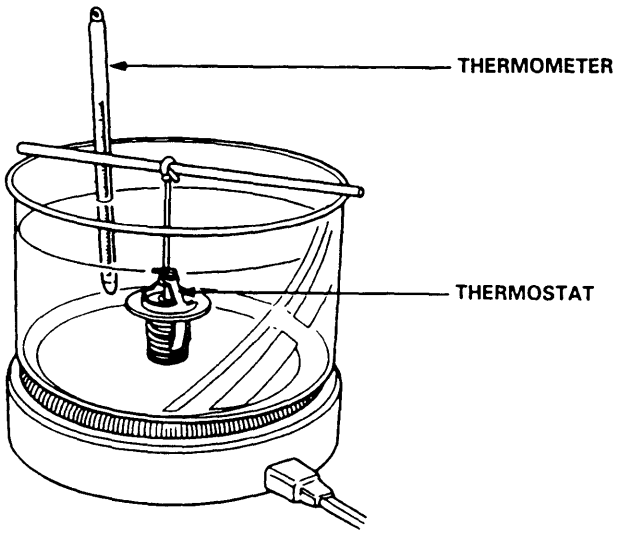


Testing

Replace the thermostat if it is open at room temperature.

To test a closed thermostat:

1. Suspend the thermostat in a container of water as shown.



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.

   CAUTION: Do not let the thermometer touch the bottom of the hot container.

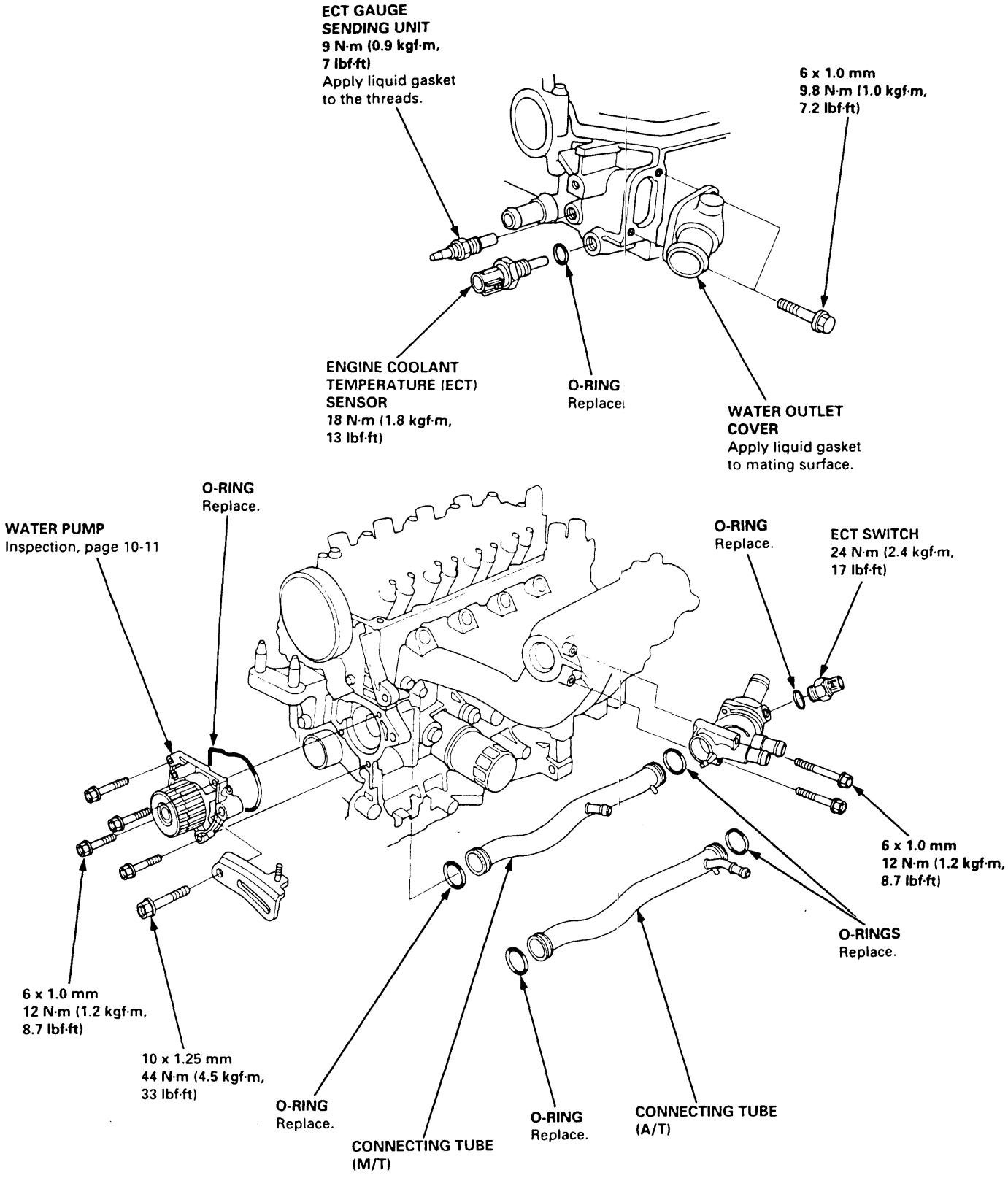
3. Measure lift height of the thermostat when fully open.

   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

Illustrated Index

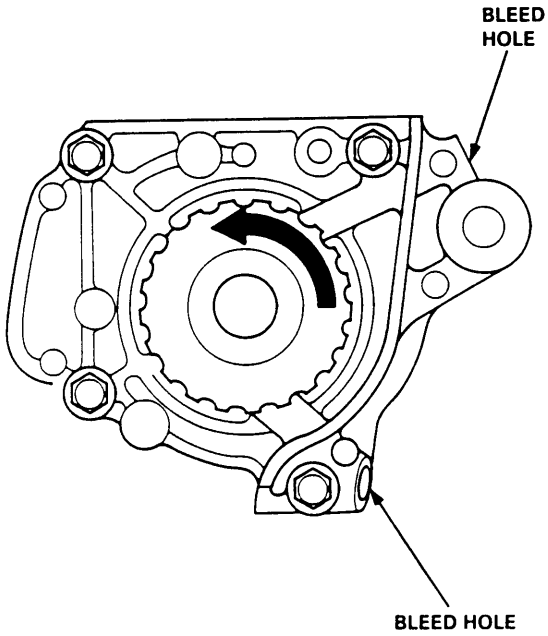
NOTE:
- Use new O-rings when reassembling.
- Use liquid gasket, Part No. 08718 – 0001 or 08718 – 0003.



Inspection

1. Remove the timing belt (see page 6-17).

2. Turn the water pump pulley counterclockwise. Check that it turns freely.



3. Check for signs of seal leakage.

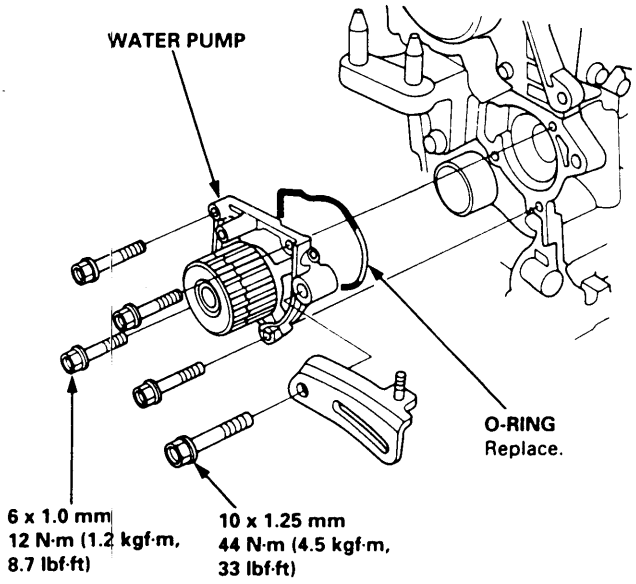
   NOTE: A small amount of "weeping" from the bleed hole is normal.

Replacement

1. Remove the timing belt (see page 6-17).

2. Remove the water pump by removing five bolts.

   NOTE: Inspect, repair and clean the O-ring groove and mating surface with the cylinder block.

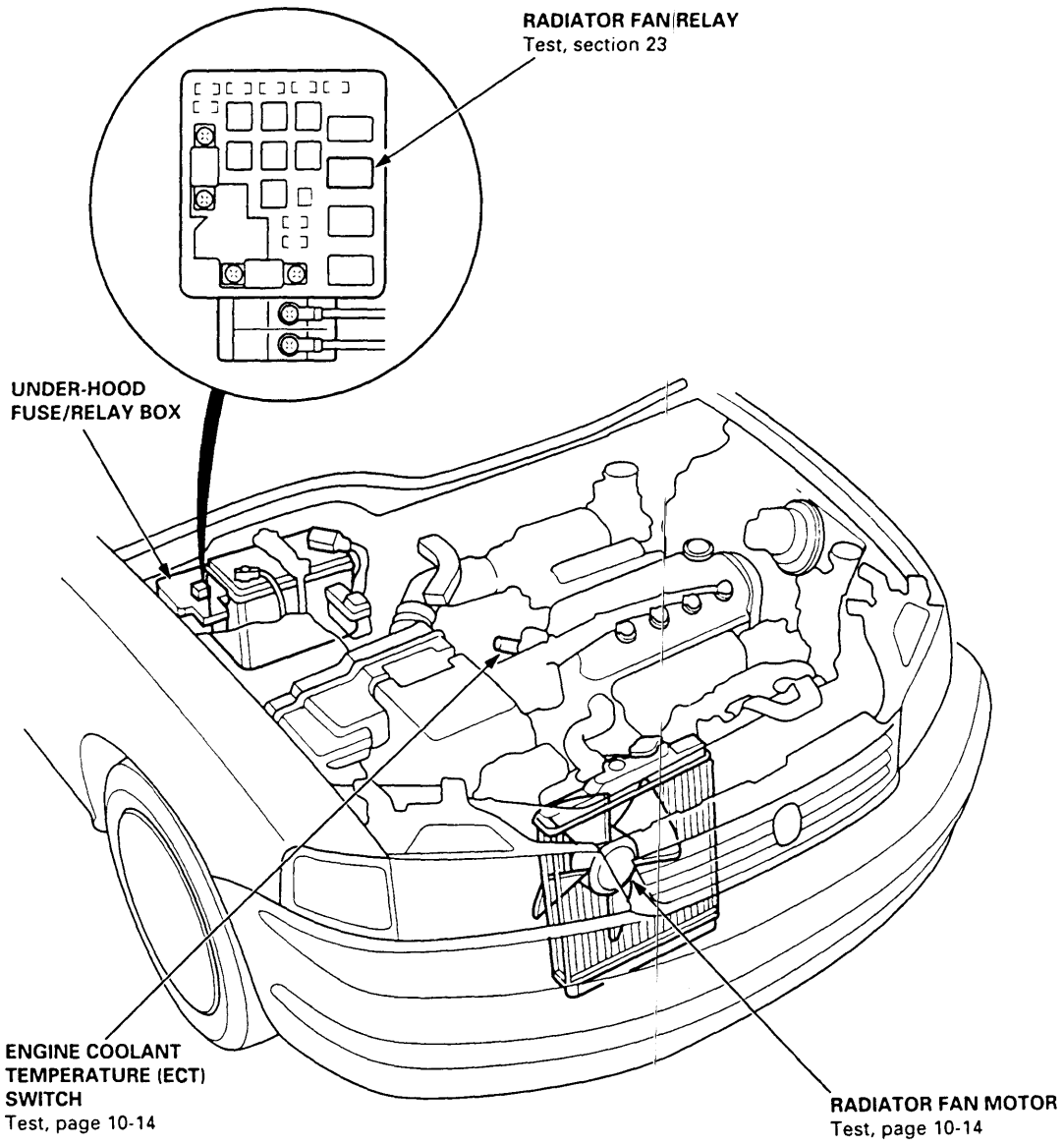


3. Install the water pump in the reverse order of removal.

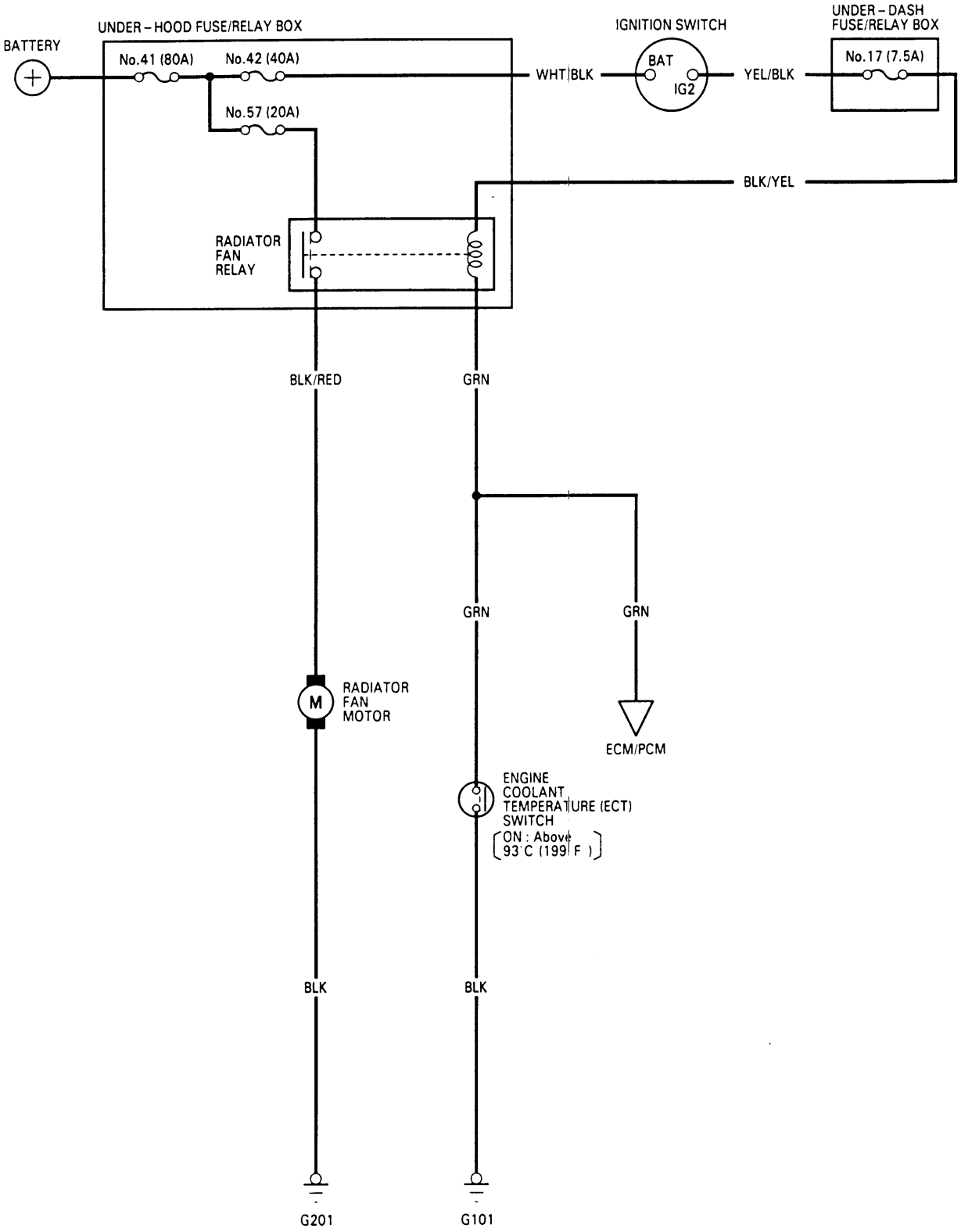
   NOTE:
   - Keep the O-ring in position when installing.
   - Clean up the spilled engine coolant.

Fan Control

Component Location Index



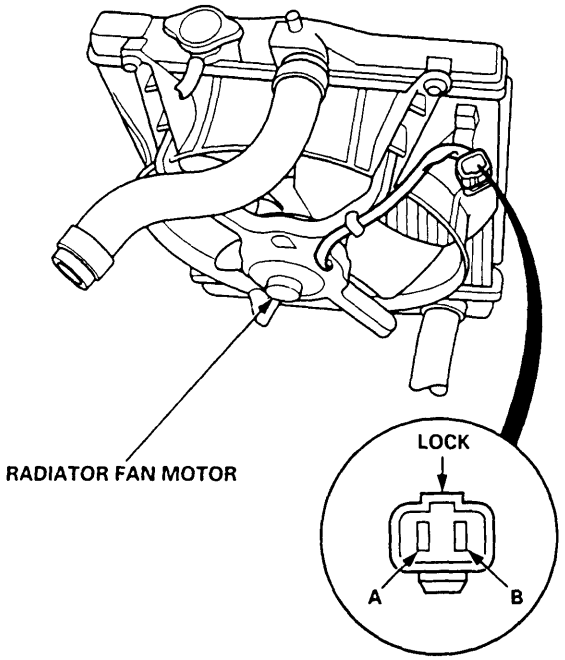
Circuit Diagram



Fan Control

Fan Motor Testing

1. Disconnect the 2P connectors from each fan motor.



View from terminal side

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.

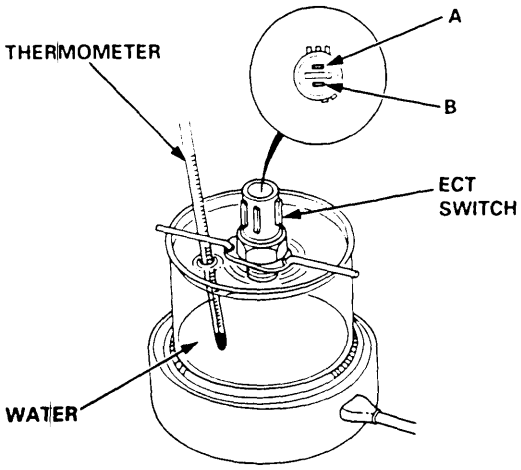
ECT Switch Testing

⚠ WARNING Removing the ECT switch while the engine is hot can cause the coolant to spray out, seriously scalding you. Always let the engine and radiator cool down before removing the ECT switch.

NOTE: Bleed air from the cooling system after installing the ECT switch (see page 10-5).

1. Remove the ECT switch from the thermostat cover (see page 10-8).

2. Suspend the ECT switch in a container of water as shown.



3. Heat the water and check the temperature with a thermometer.

CAUTION: Do not let the thermometer touch the bottom of the hot container.

4. Measure the continuity between the A and B terminals according to the table.

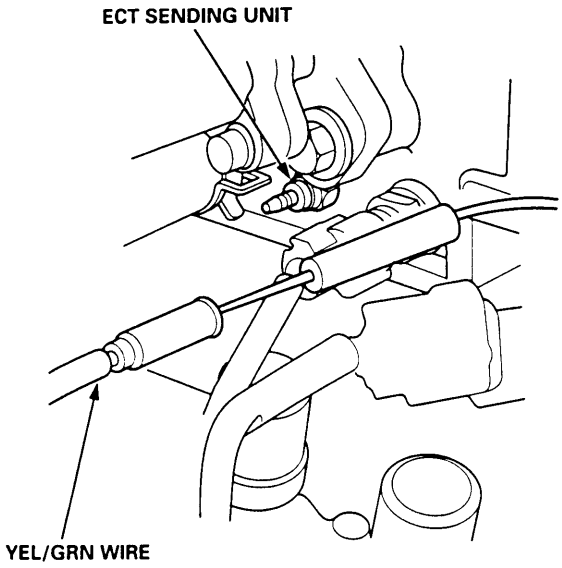
Operation		Temperature	A	B
SWITCH	ON	196° – 203°F (91° – 95°C)	○	○
	OFF	5° – 15°F (3° – 8°C) lower than the temperature when it goes on		

Engine Coolant Temperature (ECT) Gauge

Gauge Testing

1. Check the No. 13 (15 A) fuse in the under-dash fuse/relay box before testing.

2. Make sure the ignition switch is OFF, then disconnect the YEL/GRN wire from the ECT gauge sending unit, and ground it with a jumper wire.



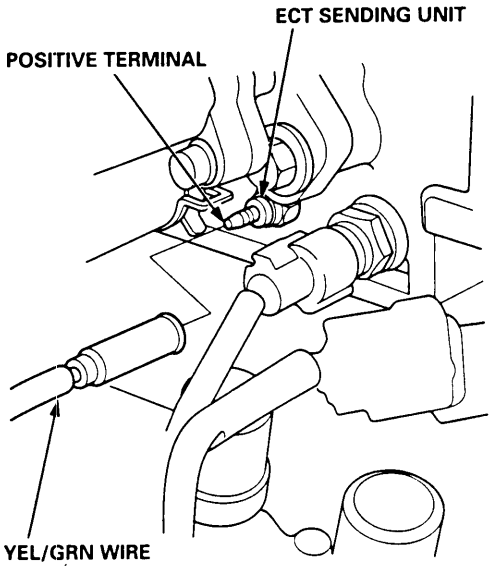
3. Turn the ignition switch ON (II).
Check that the pointer of the ECT gauge starts moving toward the "H" mark.

CAUTION: Turn the ignition switch OFF before the pointer reaches "H" on the gauge dial. Failure to do so may damage the gauge.

- If the pointer of the gauge does not move at all, check for an open in the YEL/GRN wire.
If the wires are OK, replace the ECT gauge.
- If the ECT gauge works, test the ECT sending unit.

ECT Sending Unit Testing

1. Disconnect the YEL/GRN wire from the ECT sending unit.



2. Using an ohmmeter, measure the change in resistance between the positive terminal and the engine (ground) with the engine cold and with the engine at operating temperature.

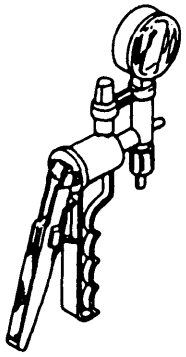
Temperature	133°F (56°C)	185°F (85°C) – 212°F (100°C)
Resistance (Ω)	137	46 – 30

3. If the obtained readings are substantially different from the specifications above, replace the sending unit.

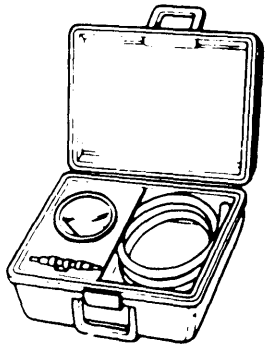
Fuel and Emissions

Special Tools

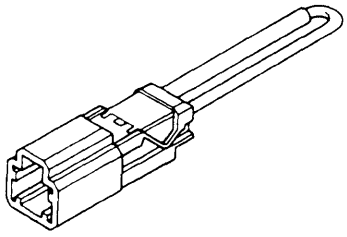
Ref. No.	Tool Number	Description	Qty	Page Reference
①	A973X – 041 – XXXXX	Vacuum Pump/Gauge, 0 – 30 in.Hg	1	11-132, 133
②	07JAZ – 001000B	Vacuum/Pressure Gauge, 0 – 4 in.Hg	1	11-132, 133
③	07PAZ – 0010100	SCS Service Connector	1	11-26, 45, 67, 127, 130
④	07SAZ – 001000A	Backprobe Set	2	11-28
⑤	07406 – 0040001	Fuel Pressure Gauge	1	11-110, 113



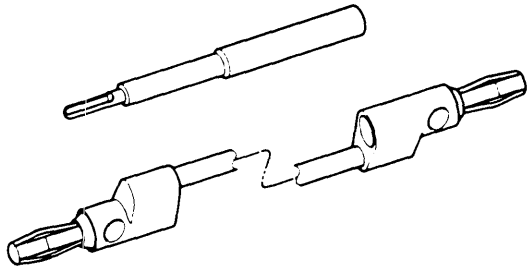
①



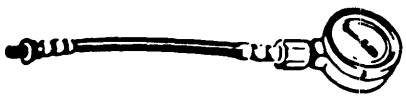
②



③



④



⑤

Component Locations

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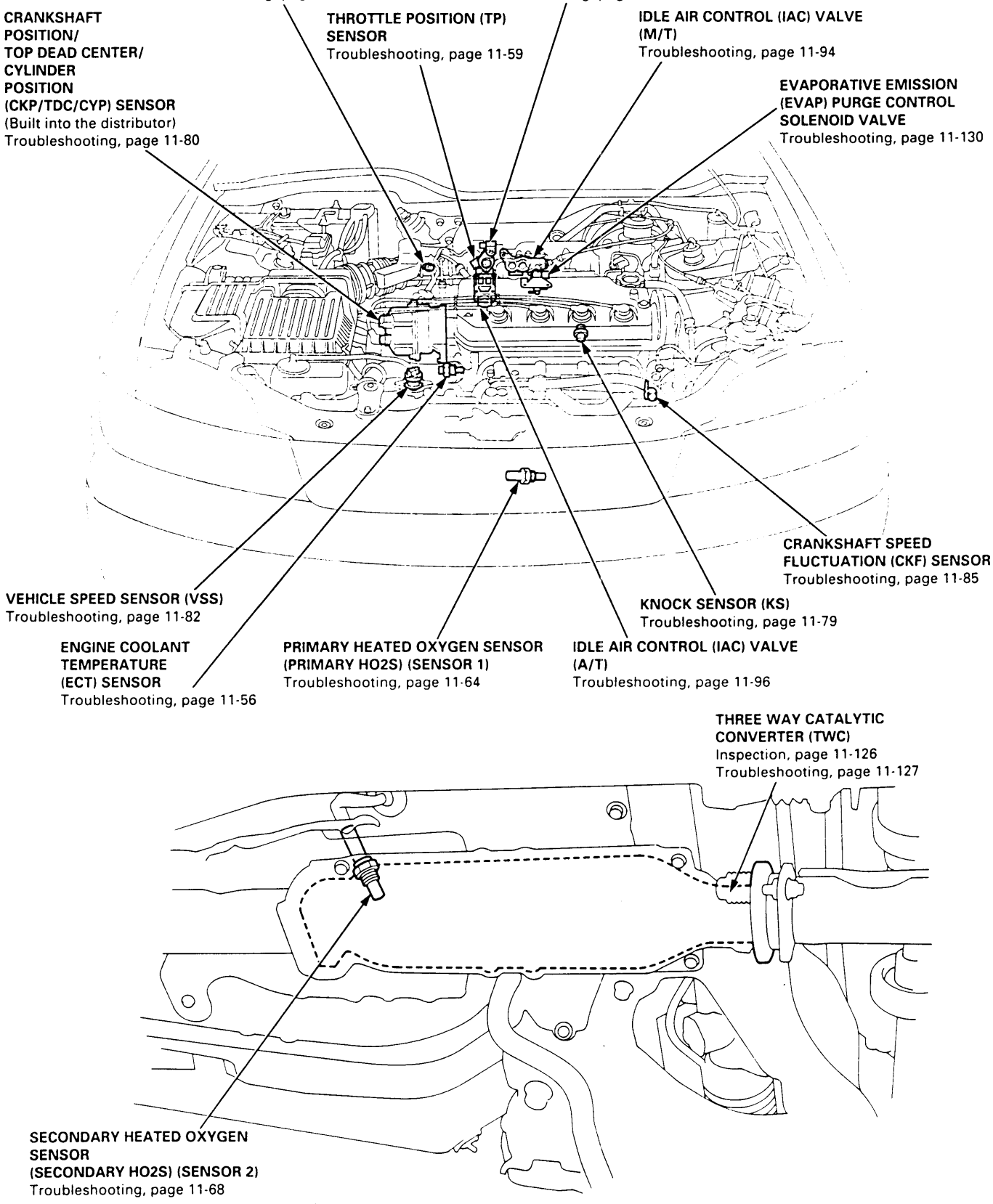
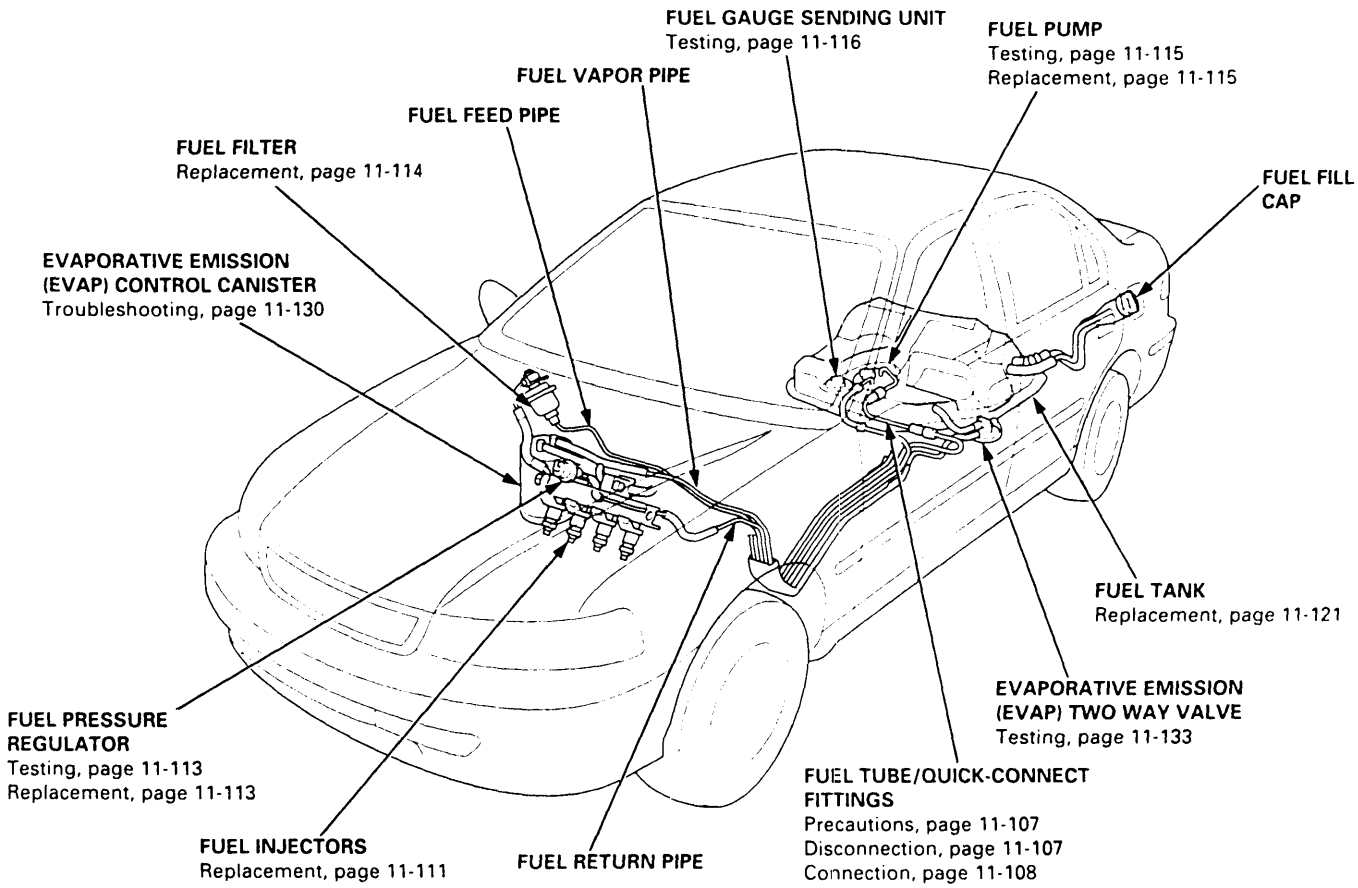
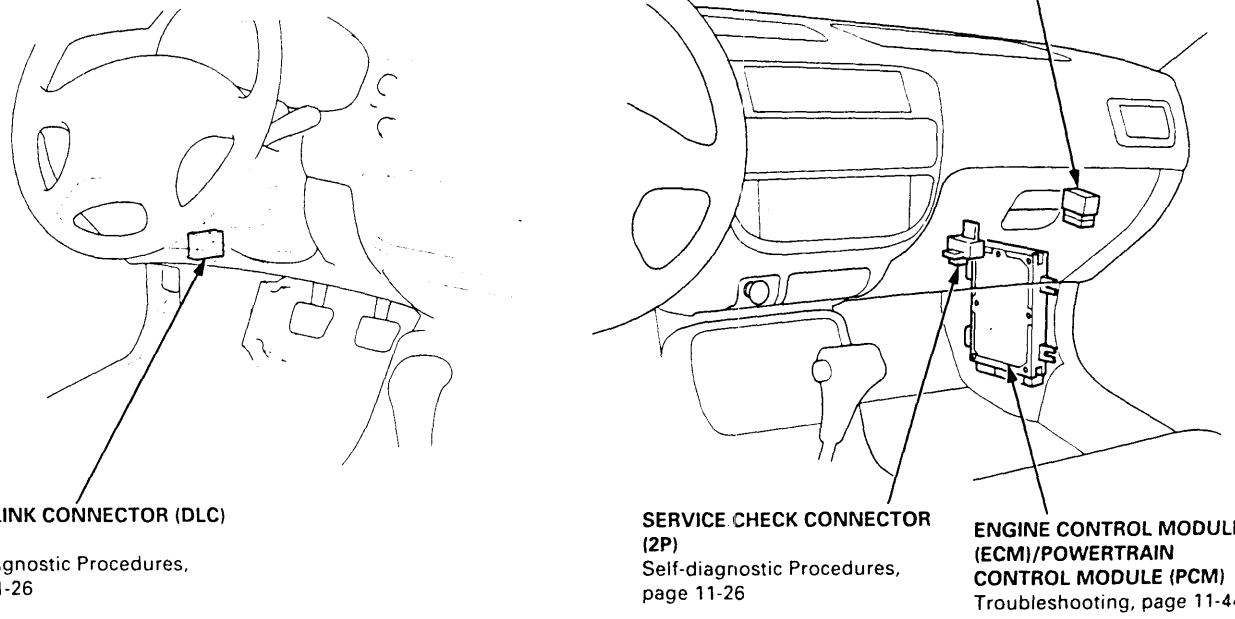
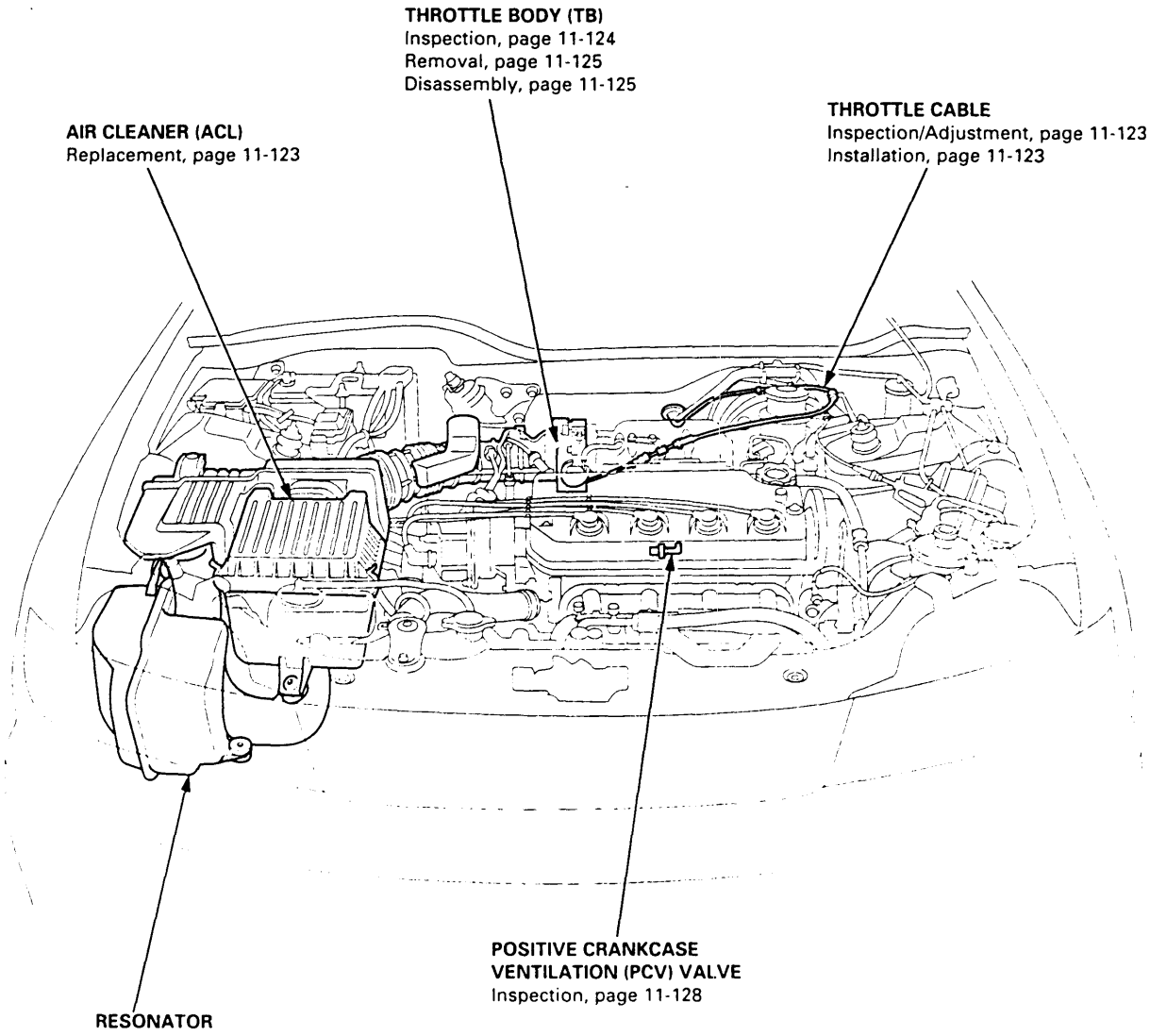


Component Locations

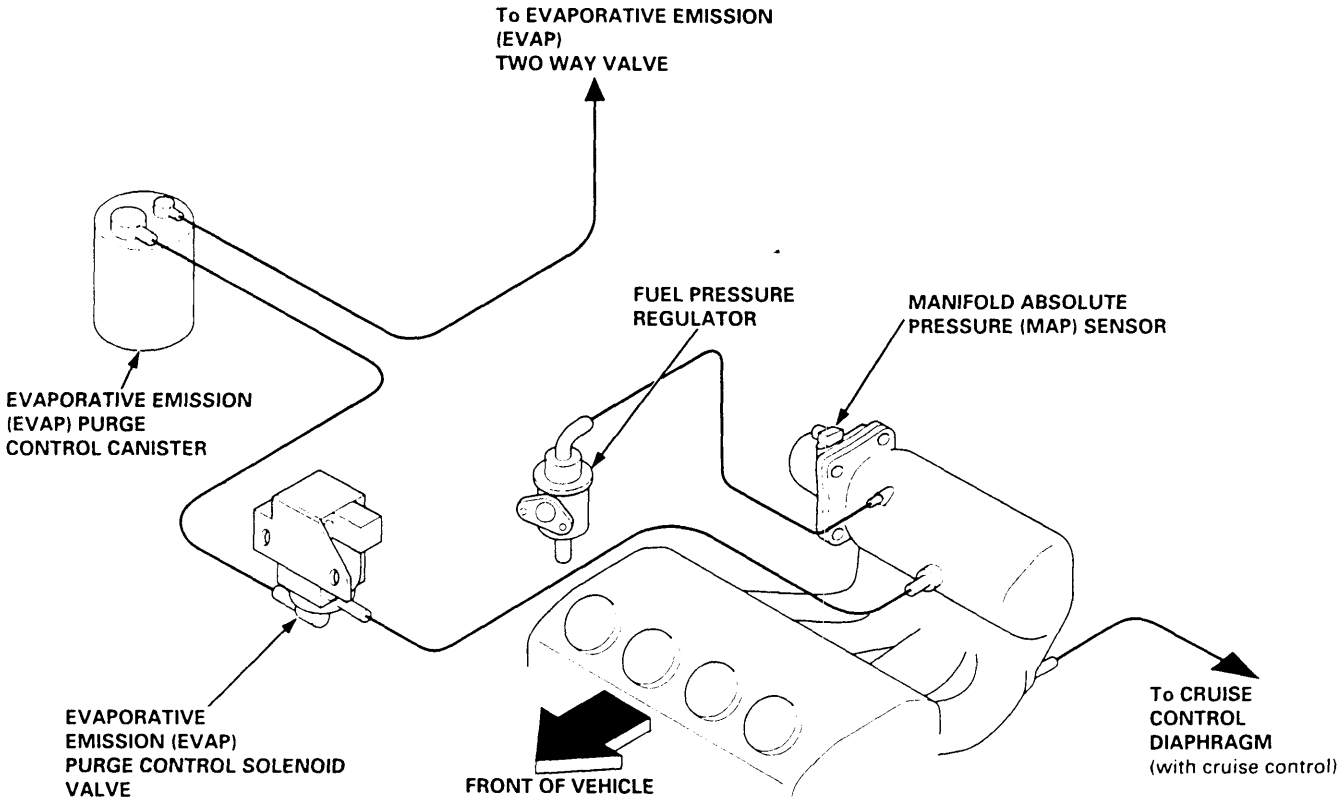
Index (cont'd)

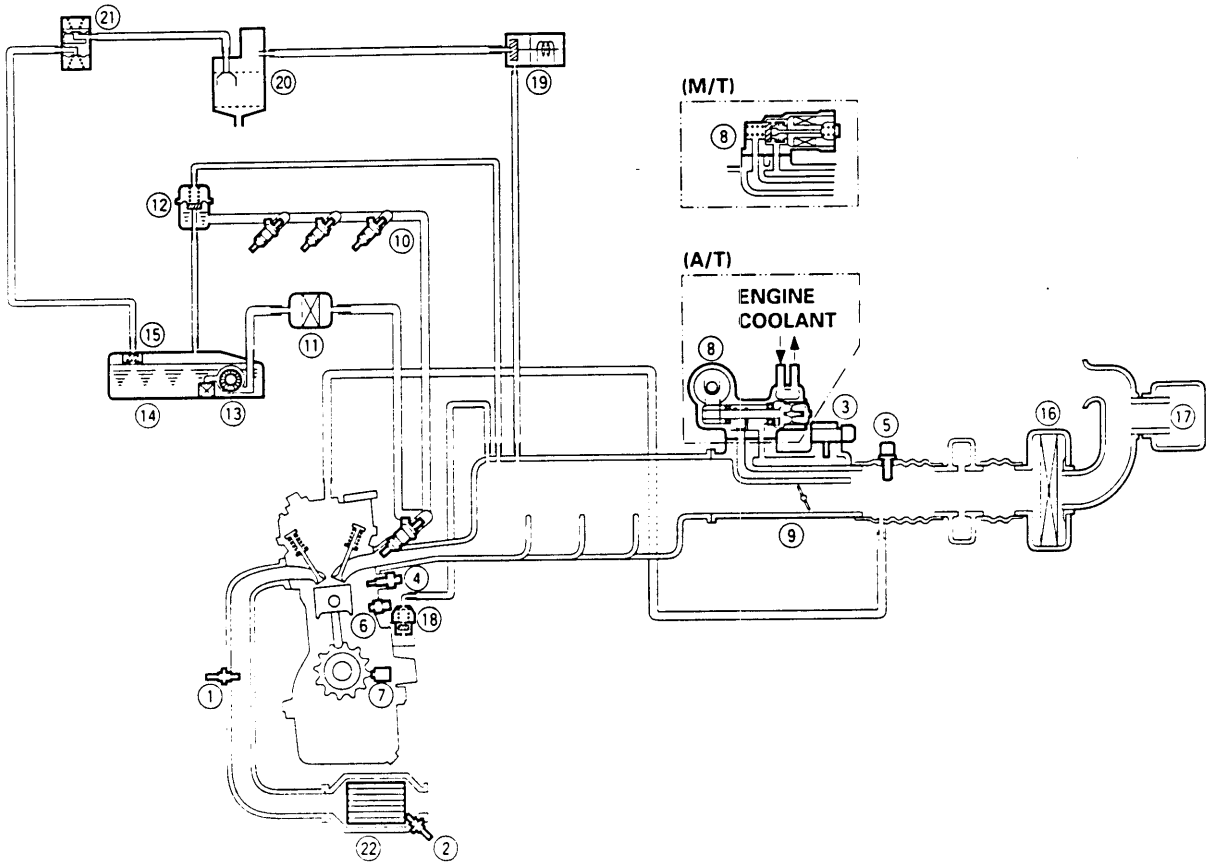





THROTTLE BODY (TB)
Inspection, page 11-124
Removal, page 11-125
Disassembly, page 11-125
AIR CLEANER (ACL)
Replacement, page 11-123
THROTTLE CABLE
Inspection/Adjustment, page 11-123
Installation, page 11-123
POSITIVE CRANKCASE
VENTILATION (PCV) VALVE
Inspection, page 11-128
RESONATOR

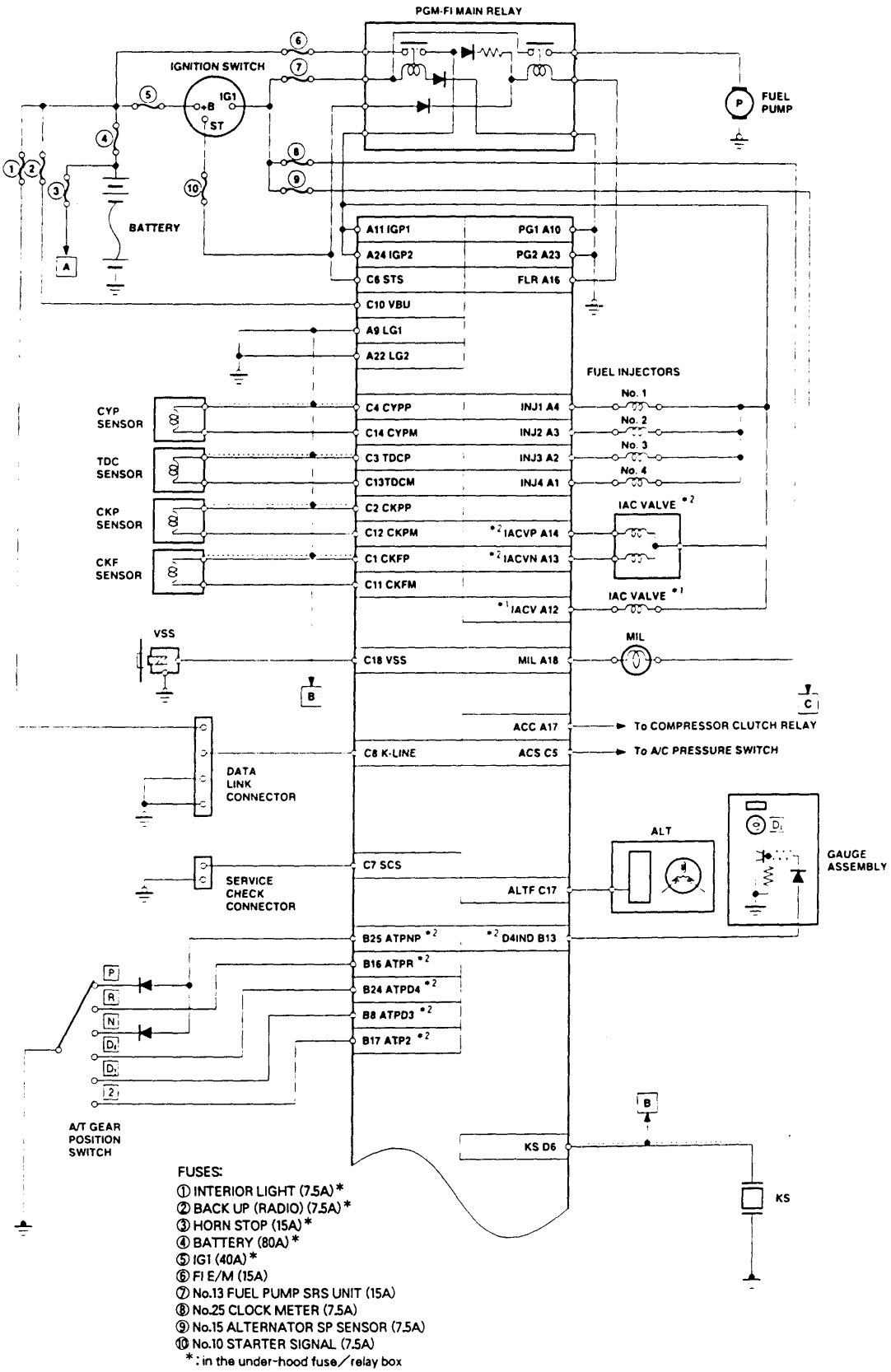
Vacuum Connections

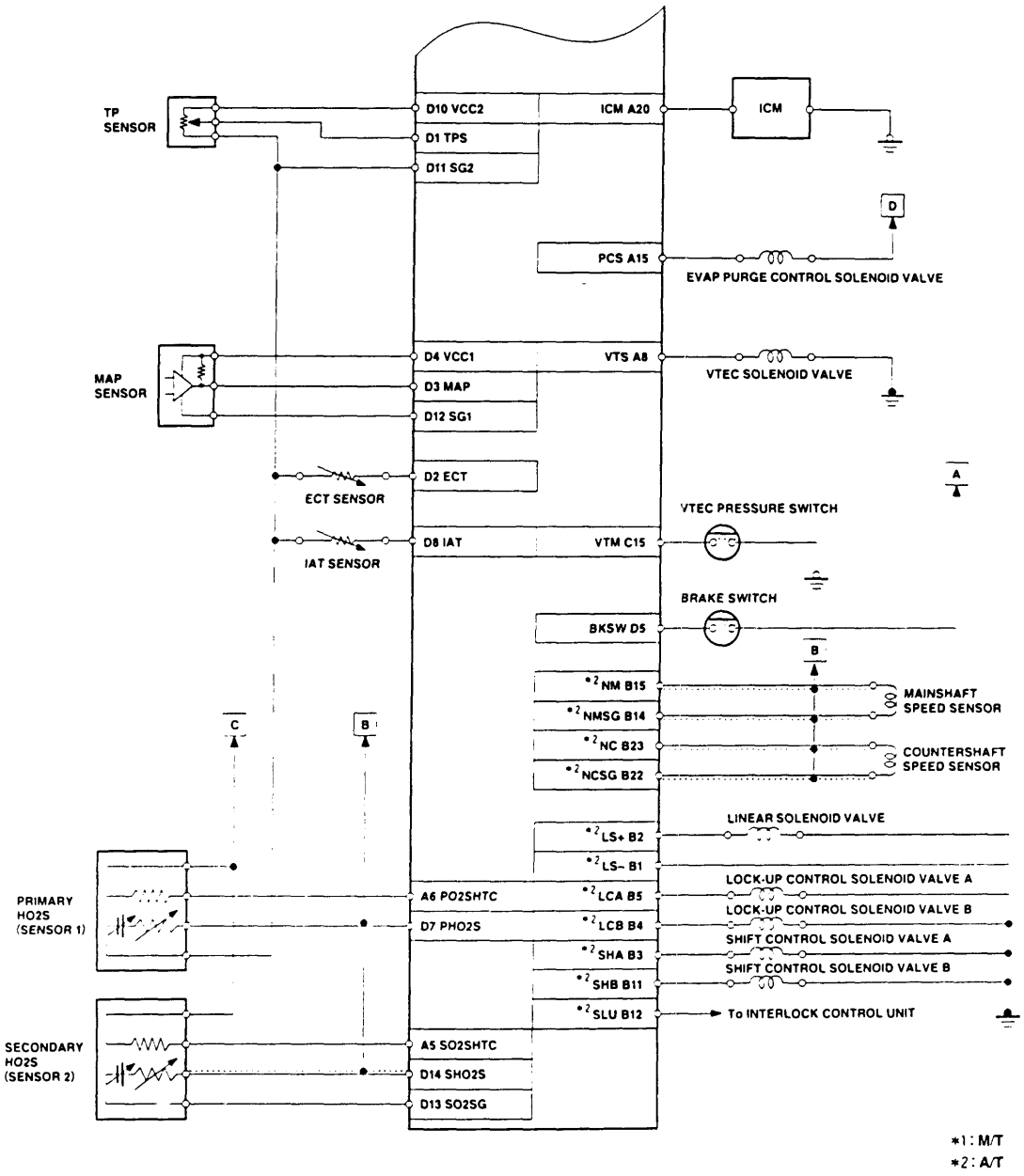


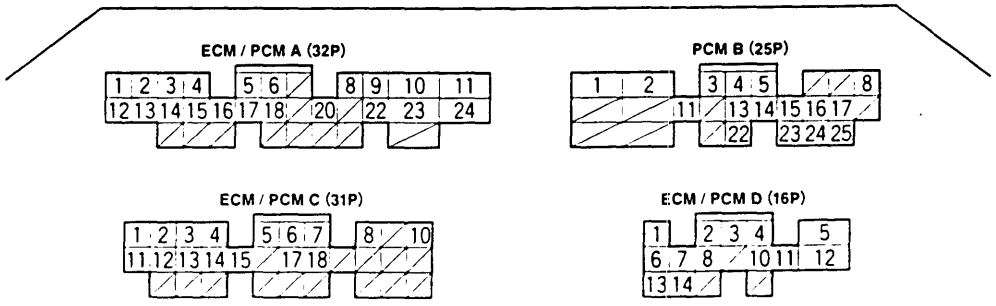


① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO2S, SENSOR 1)
② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO2S, SENSOR 2)
③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
⑤ INTAKE AIR TEMPERATURE (IAT) SENSOR
⑥ KNOCK SENSOR (KS)
⑦ CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
⑧ IDLE AIR CONTROL (IAC) VALVE
⑨ THROTTLE BODY (TB)
⑩ FUEL INJECTOR
⑪ FUEL FILTER
⑫ FUEL PRESSURE REGULATOR
⑬ FUEL PUMP (FP)
⑭ FUEL TANK
⑮ FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE
⑯ AIR CLEANER
⑰ RESONATOR
⑱ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
⑲ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
⑳ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
㉑ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
㉒ THREE WAY CATALYTIC CONVERTER (TWC)

Electrical Connections

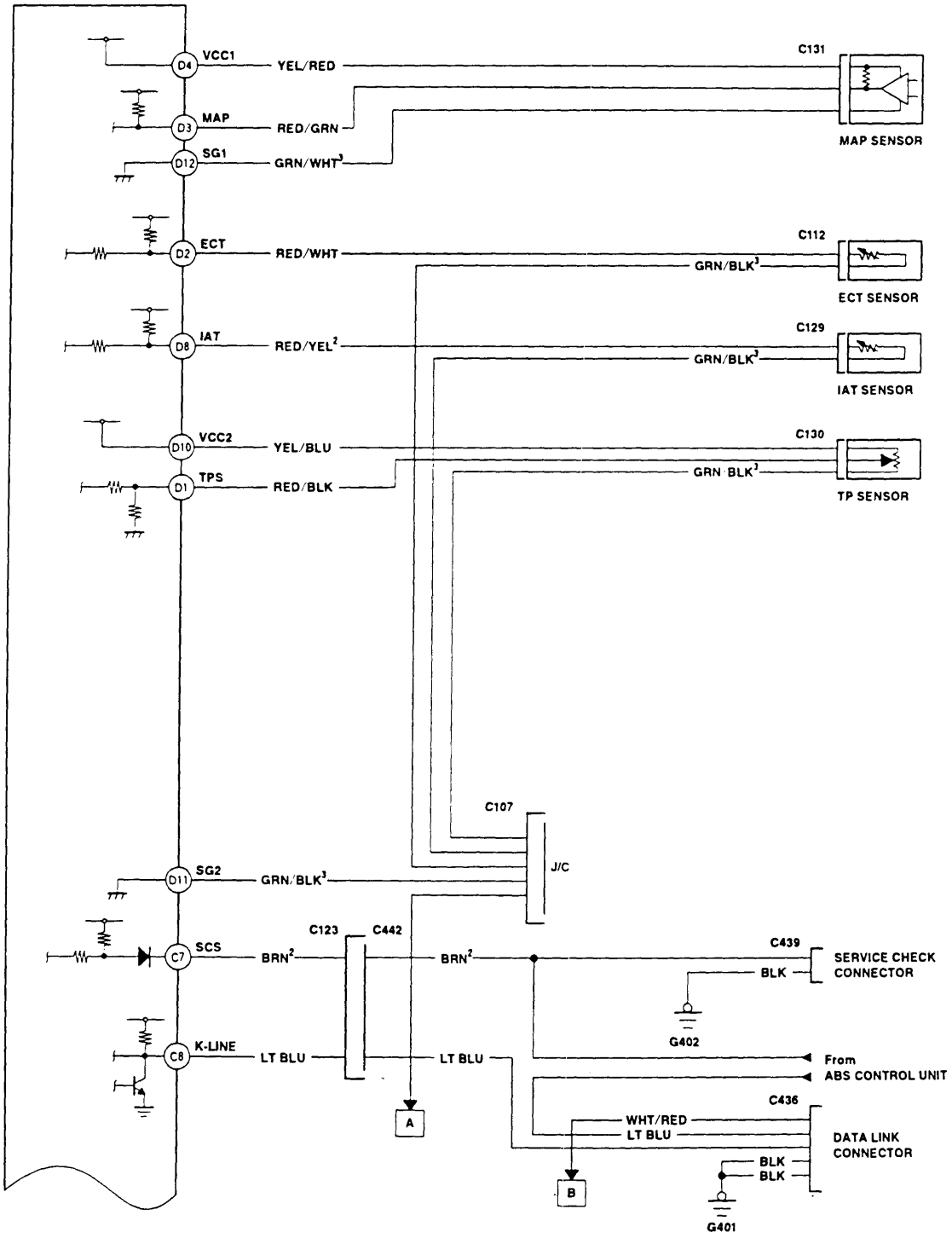


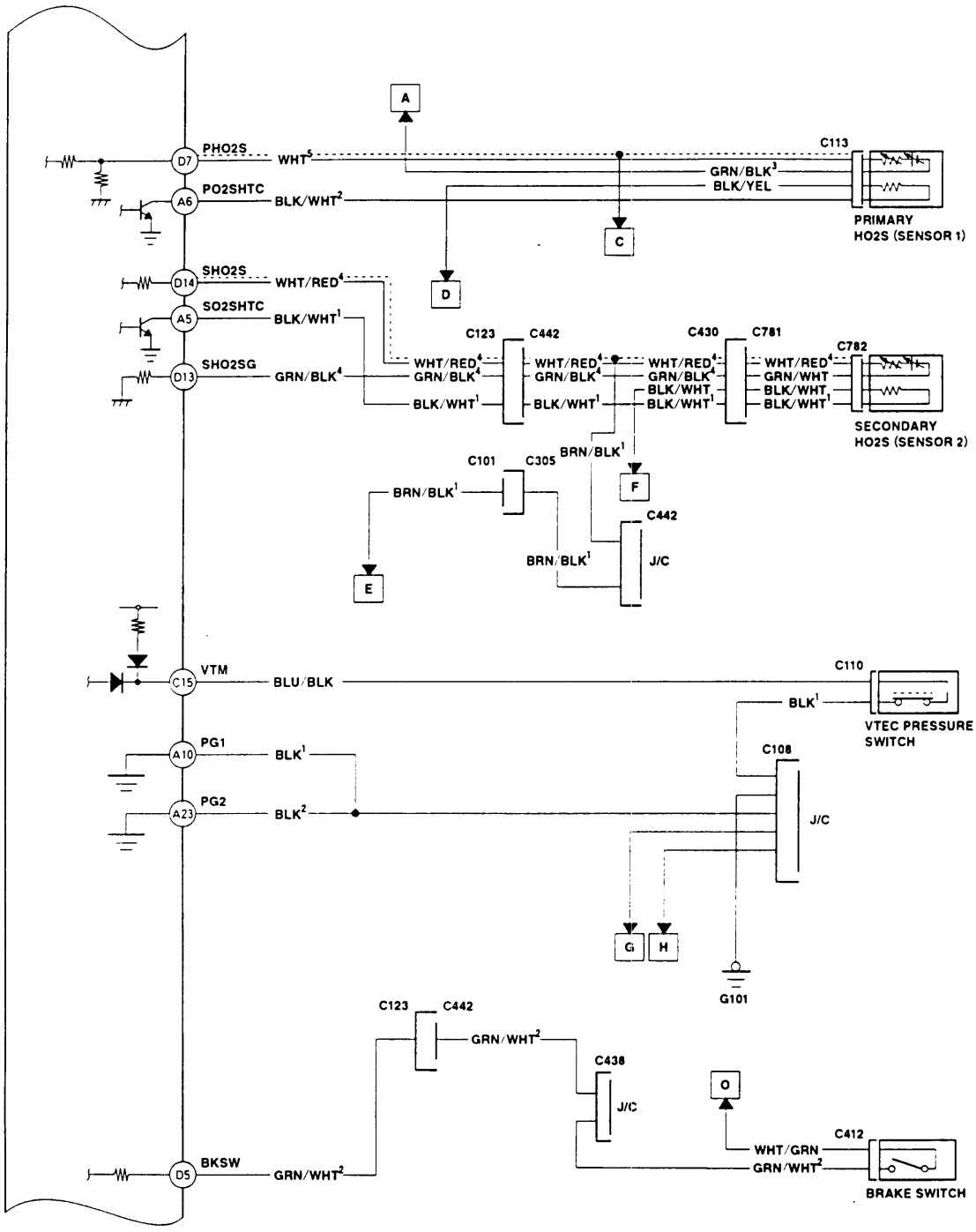




TERMINAL LOCATIONS

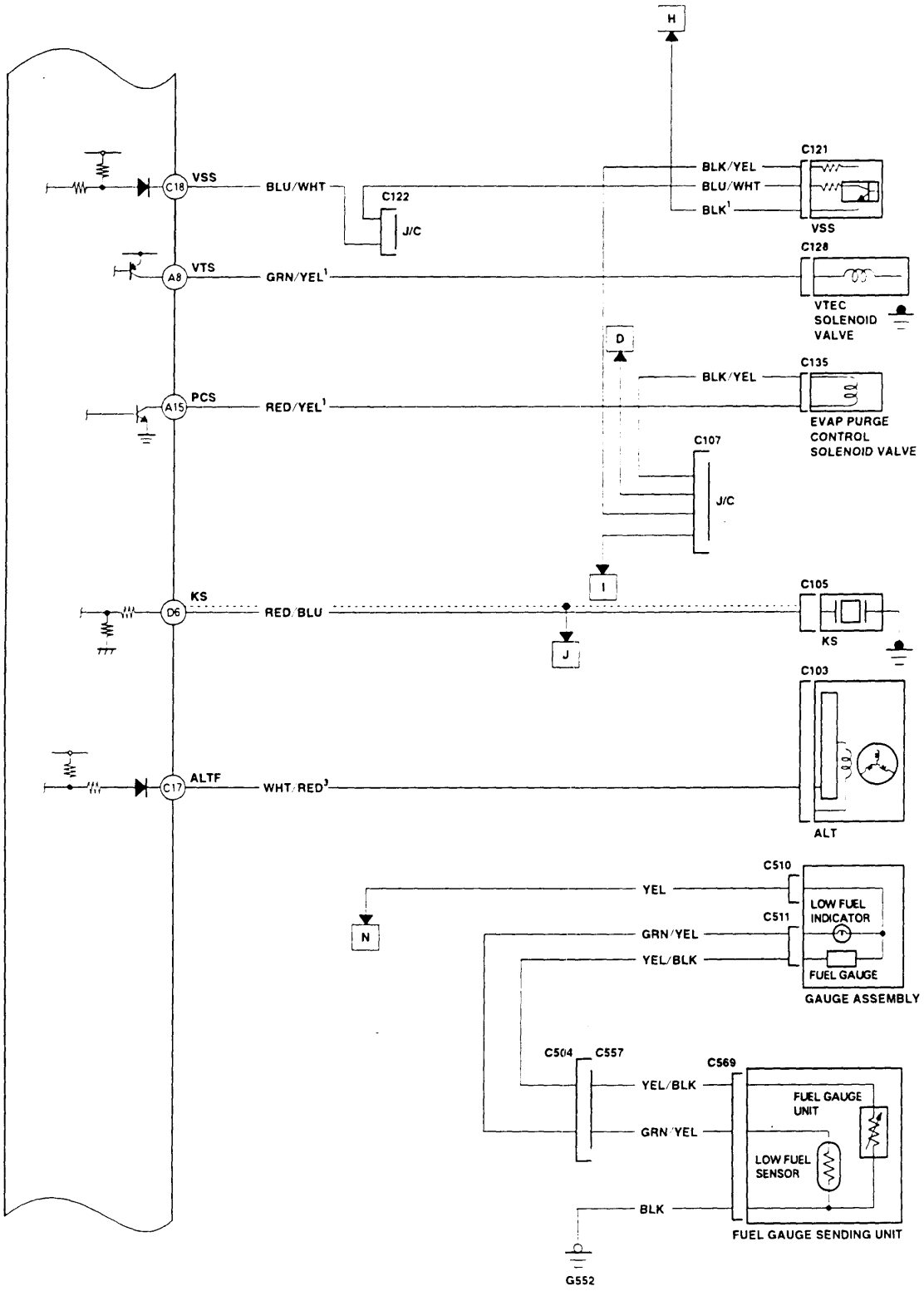
Electrical Connections

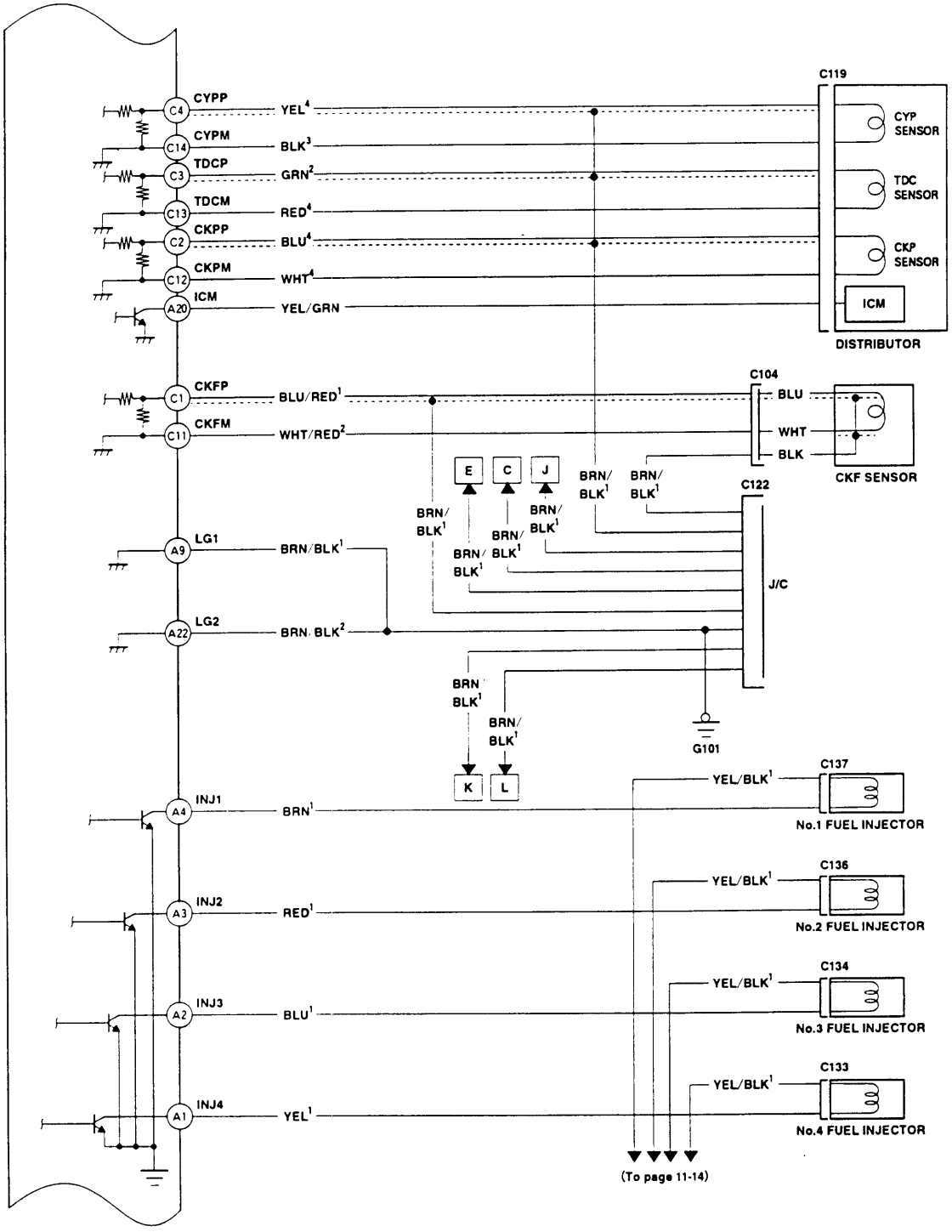



A
PHO2S
D7
WHT5
C113
GRN/BLK3
BLK/YEL
PO2SHTC
A6
BLK/WHT2
PRIMARY
HO2S (SENSOR 1)
C
D
SHO2S
D14
WHT/RED4
SO2SHTC
A5
BLK/WHT1
C123
C442
C430
C781
C782
SHO2SG
D13
GRN/BLK4
WHT/RED4
GRN/BLK4
BLK/WHT1
GRN/WHT
SECONDARY
HO2S (SENSOR 2)
BRN/BLK1
C101
C305
F
E
J/C
VTM
C15
BLU/BLK
C110
VTEC PRESSURE
SWITCH
PG1
A10
PG2
A23
C108
J/C
G
H
G101
C123
C442
GRN/WHT2
C438
J/C
O
C412
WHT/GRN
BKSW
D5
BRAKE SWITCH

(cont'd)

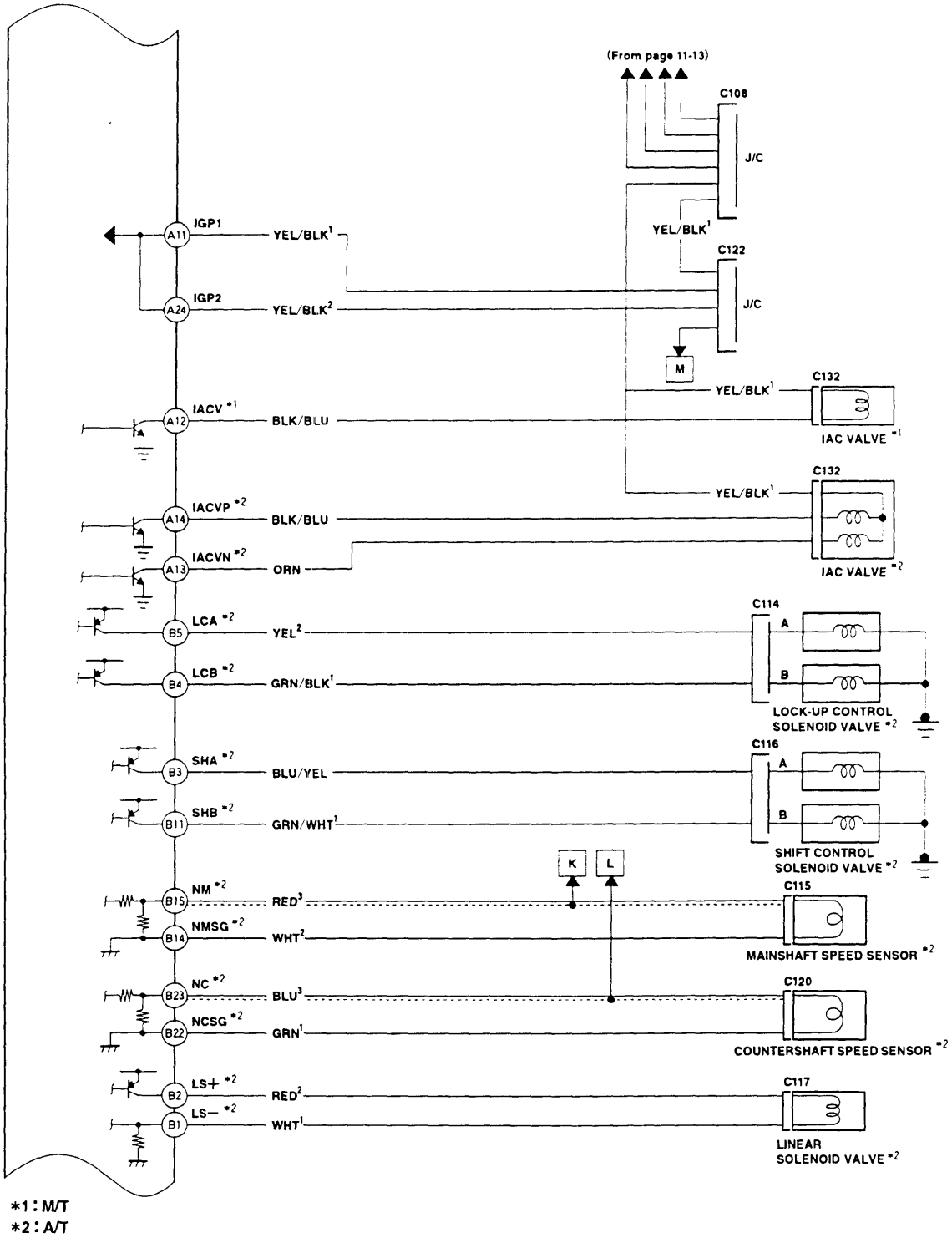
Electrical Connections (cont'd)

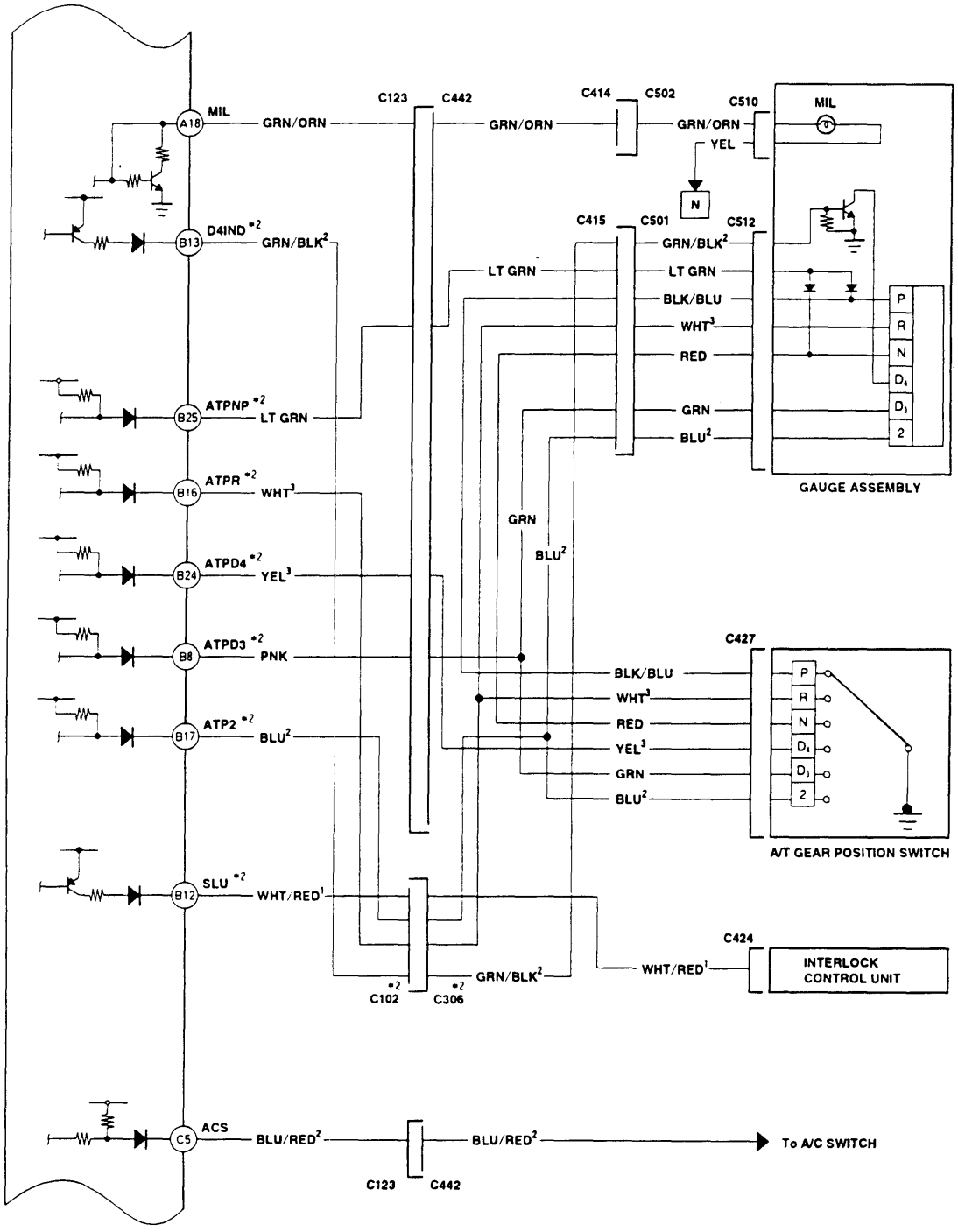



C119
CYPP
C4
YEL4
CYPM
C14
BLK3
TDCP
C3
GRN2
TDCM
C13
RED4
CKPP
C2
BLU4
CKPM
C12
WHT4
ICM
A20
YEL/GRN
CYP SENSOR
TDC SENSOR
CKP SENSOR
ICM
DISTRIBUTOR
C104
CKFP
C1
BLU/RED1
CKFM
C11
WHT/RED2
BLU
WHT
BLK
CKF SENSOR
E
C
J
BRN/ BLK1
C122
J/C
LG1
A9
BRN/BLK1
LG2
A22
BRN/BLK2
K
L
G101
C137
YEL/BLK1
INJ1
A4
BRN1
No.1 FUEL INJECTOR
C136
INJ2
A3
RED1
No.2 FUEL INJECTOR
C134
INJ3
A2
BLU1
No.3 FUEL INJECTOR
C133
INJ4
A1
YEL1
No.4 FUEL INJECTOR
(To page 11-14)

(cont'd)

Electrical Connections (cont'd)

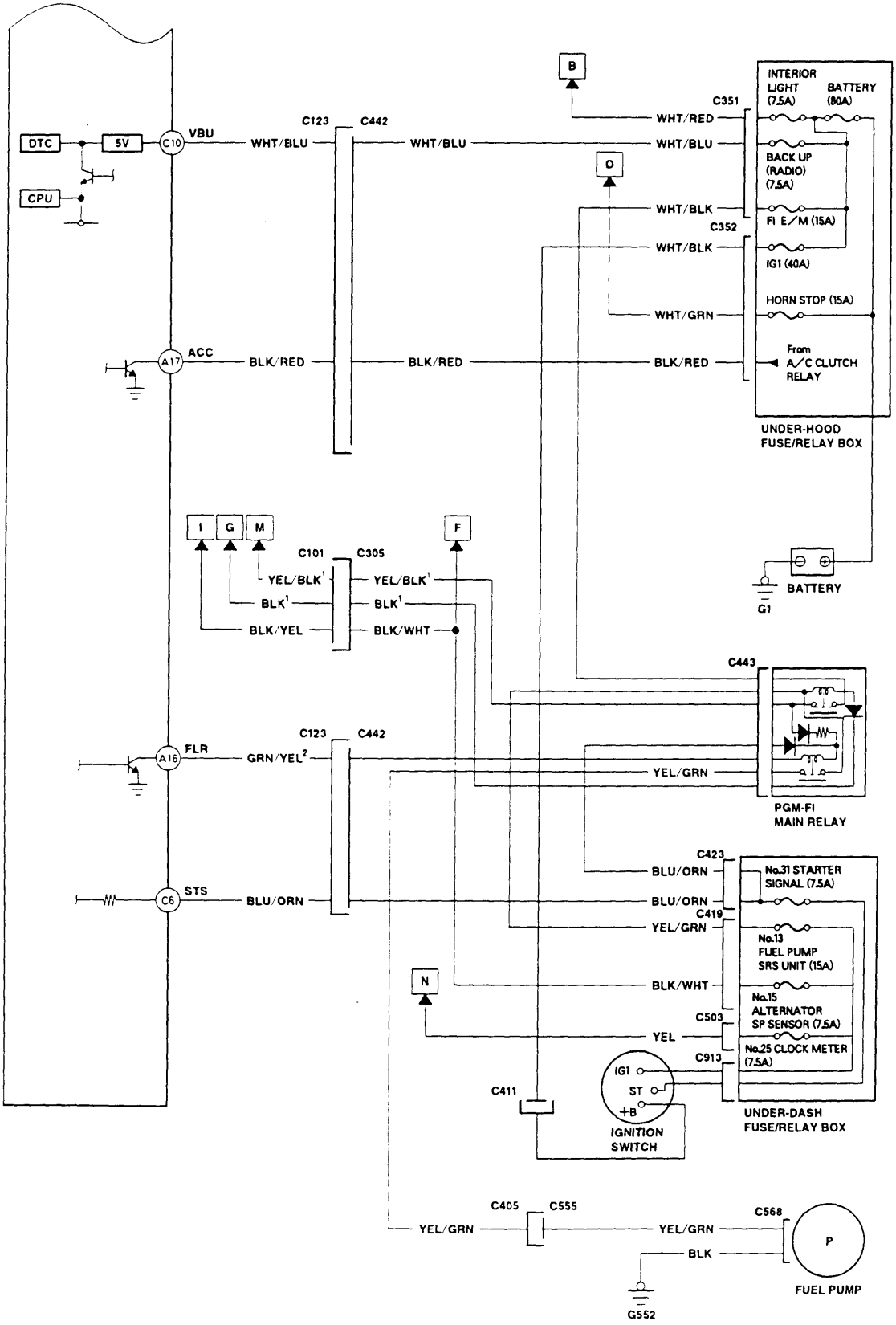



MIL
A18
GRN/ORN
C123
C442
GRN/ORN
C414
C502
GRN/ORN
C510
MIL
YEL
N
D4IND *2
B13
GRN/BLK2
C415
C501
C512
GRN/BLK2
LT GRN
LT GRN
BLK/BLU
WHT3
RED
P
R
N
D4
D3
2
ATPNP *2
B25
LT GRN
GRN
BLU2
GAUGE ASSEMBLY
ATPR *2
B16
WHT3
ATPD4 *2
B24
YEL3
ATPD3 *2
B8
PNK
C427
BLK/BLU
WHT3
RED
YEL3
GRN
BLU2
ATP2 *2
B17
BLU2
A/T GEAR POSITION SWITCH
SLU *2
B12
WHT/RED1
C424
INTERLOCK CONTROL UNIT
WHT/RED1
GRN/BLK2
*2
C102
*2
C306
ACS
C5
BLU/RED2
BLU/RED2
To A/C SWITCH
C123
C442

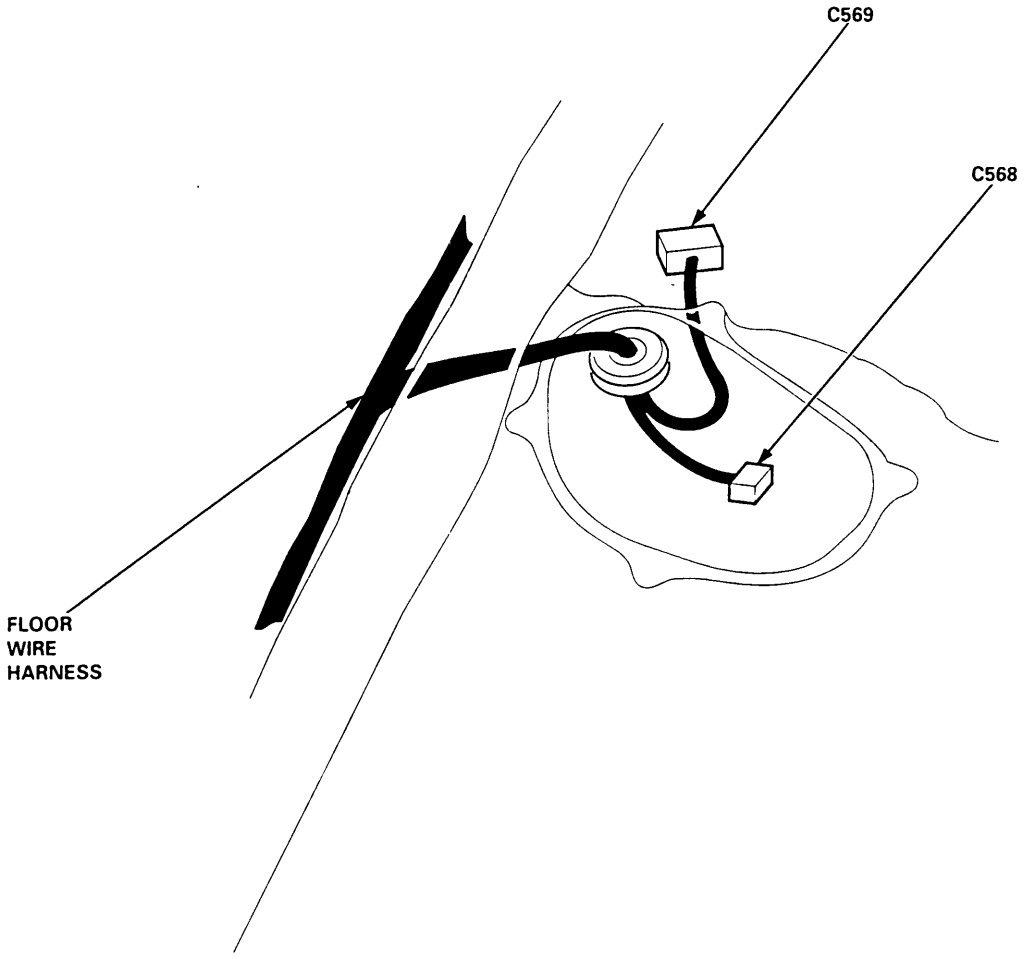
*2 : A/T

(cont'd)

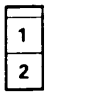
Electrical Connections (cont'd)



System Connectors (Fuel Pump)

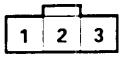


C568



1	BLK
2	YEL/GRN

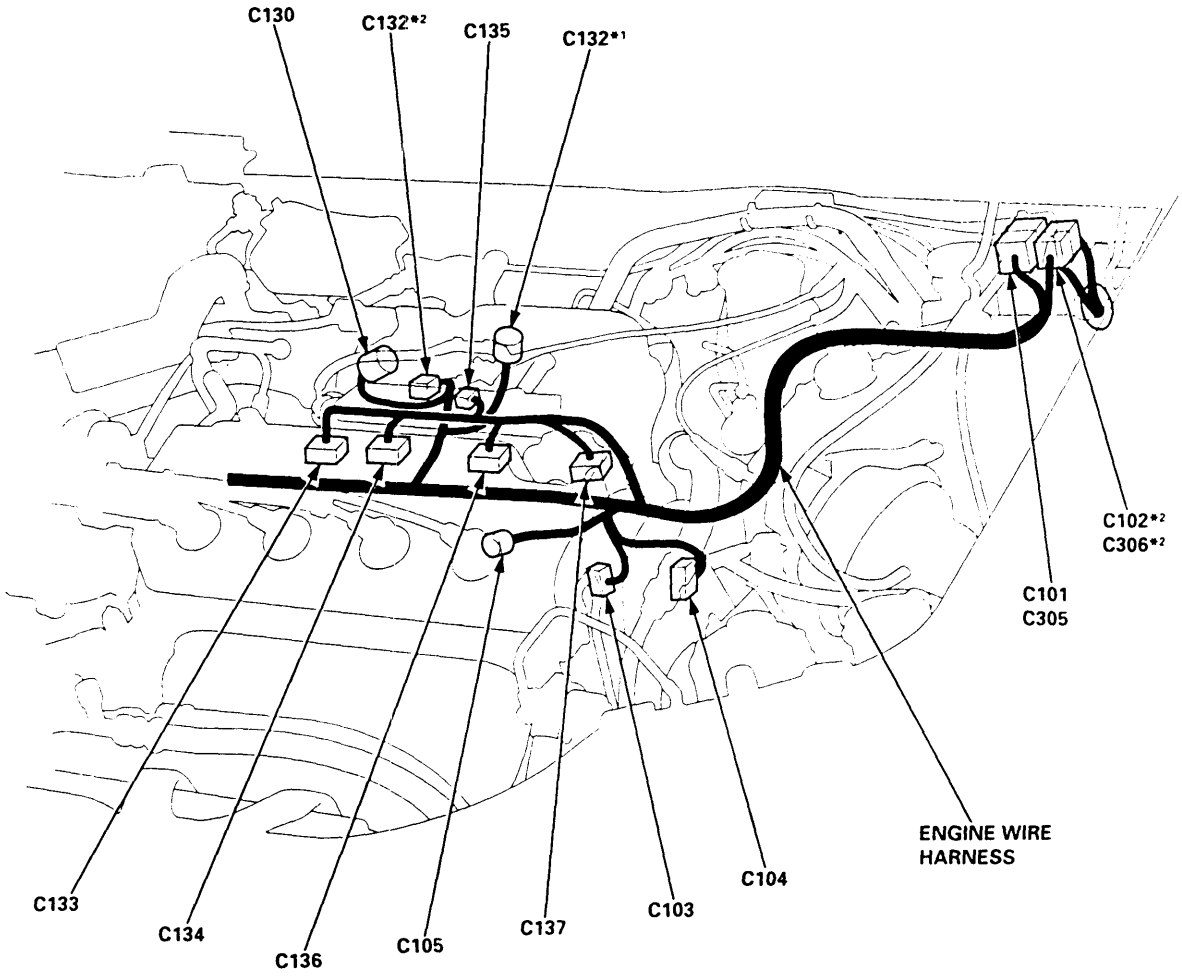
C569



1	BLK
2	YEL/BLK
3	GRN/YEL

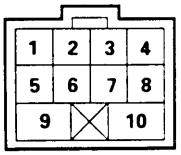
NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
○: Related to Fuel and Emissions System.
• — Connector with male terminals (double outline): View from terminal side
— Connector with female terminals (single outline): View from wire side

System Connectors (Engine Compartment)



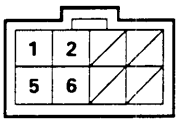
*1: M/T
*2: A/T

C101



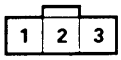
①	BLK/YEL	6	WHT/BLU
②	BLK[1]	7	YEL/GRN
3	YEL/RED	8	BLU
④	BRN/BLK[1]	9	BLK/WHT
⑤	YEL/BLK[1]	10	BLK/YEL

C102*2



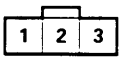
①	GRN/BLK[2]	⑤	WHT[3]
②	WHT/RED[1]	⑥	BLU[2]
3	——	7	——
4	——	8	——

C103



①	WHT/RED[3]
2	BLK/YEL
3	WHT/BLU

C104

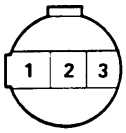


①	WHT/RED[2]
②	BRN/BLK[1]
③	BLU/RED[1]

C105

①	RED/BLU
2	——

C130

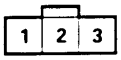


①	GRN/BLK[3]
②	RED/BLK
③	YEL/BLU

C132*1

①	BLK/BLU
②	YEL/BLK[1]

C132*2



①	ORN
②	YEL/BLK[1]
③	BLK/BLU

C133

①	YEL/BLK[1]
②	YEL[1]

C134

①	YEL/BLK[1]
②	BLU[1]

C135

①	BLK/YEL
②	RED/YEL[1]

C136

①	YEL/BLK[1]
②	RED[1]

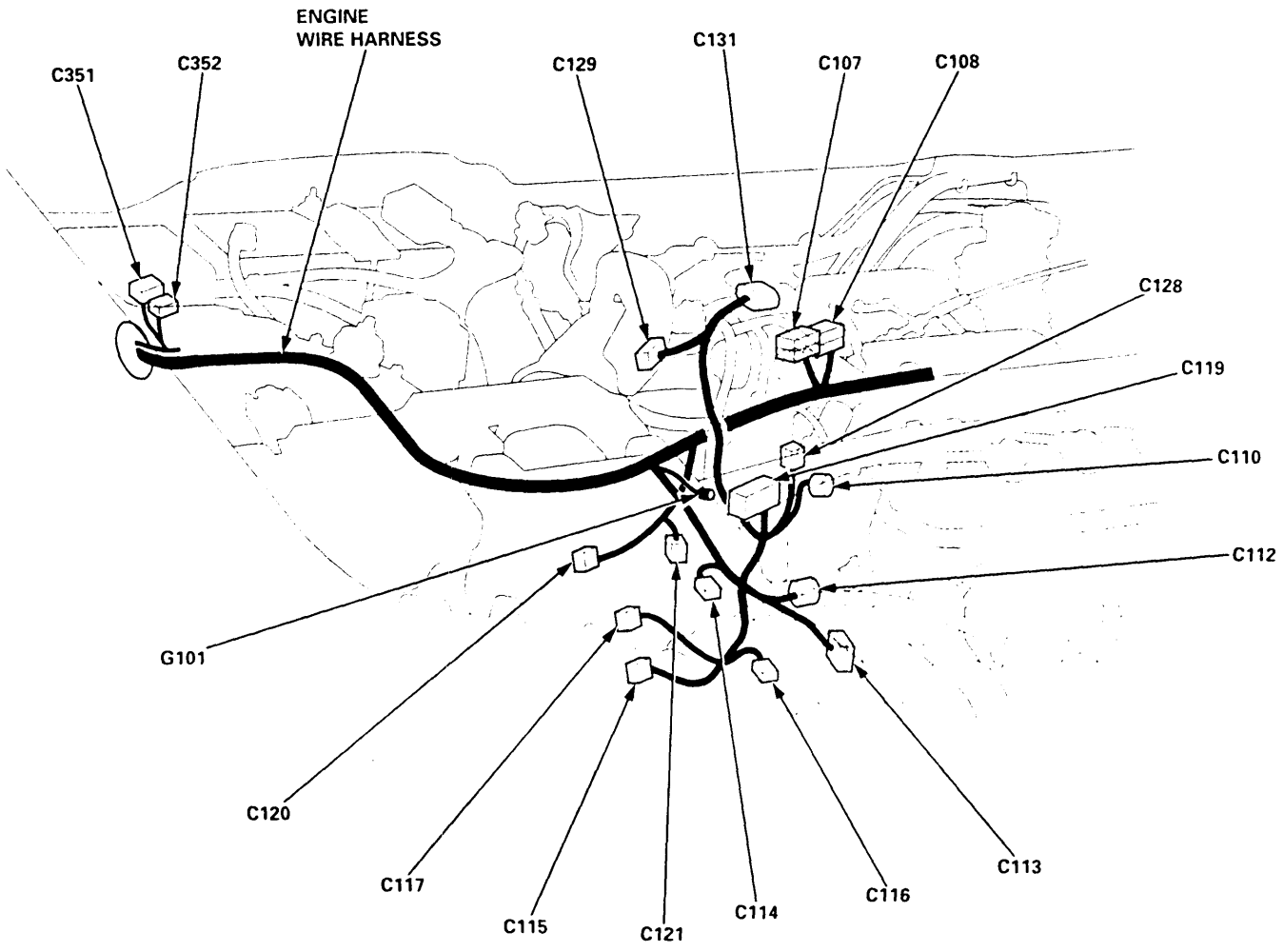
C137

①	YEL/BLK[1]
②	BRN[1]

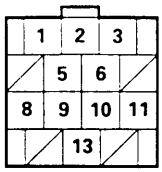
NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
○: Related to Fuel and Emissions System.
• — Connector with male terminals (double outline): View from terminal side
— Connector with female terminals (single outline): View from wire side

(cont'd)

System Connectors (Engine Compartment) (cont'd)

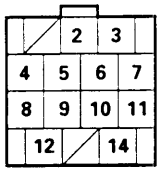


C107



1	BLK/YEL	8	GRN/BLK[3]
2	BLK/YEL	9	GRN/BLK[3]
3	BLK/YEL	10	GRN/BLK[3]
4	——	11	GRN/BLK[3]
5	BLK/YEL	12	——
6	BLK/YEL	13	GRN/BLK[3]
7	——	14	——

C108



1	——	8	BLK
2	YEL/BLK[1]	9	BLK[1]
3	YEL/BLK[1]	10	BLK[1]
4	YEL/BLK[1]	11	BLK[1]
5	YEL/BLK[1]	12	BLK[1]
6	YEL/BLK[1]	13	——
7	YEL/BLK[1]	14	BLK[1]

C110

1	BLU/BLK
2	BLK[1]

C112

1	RED/WHT
2	GRN/BLK[3]

C113

1	WHT[5]
2	GRN/BLK[3]
3	BLK/YEL
4	BLK/WHT[2]

C114*2

1	GRN/BLK[1]
2	YEL[2]

C115*2

1	WHT[2]
2	RED[3]

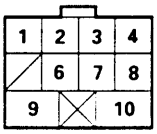
C116*2

1	BLU/YEL
2	GRN/WHT[1]

C117*2

1	RED[2]
2	WHT[1]

C119

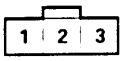


1	YEL/GRN	6	WHT[4]
2	BLU[4]	7	RED[4]
3	GRN[2]	8	BLK[3]
4	YEL[4]	9	BLU
5	——	10	BLK/YEL

C120*2

1	GRN[1]
2	BLU[3]

C121



1	BLK[1]
2	BLK/YEL
3	BLU/WHT

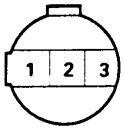
C128

1	GRN/YEL[1]

C129

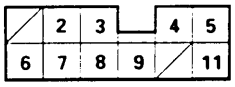
1	GRN/BLK[3]
2	RED/YEL[2]

C131



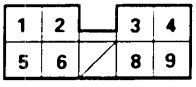
1	YEL/RED
2	GRN/WHT[3]
3	RED/GRN

C351



1	——	7	WHT/BLK
2	WHT/BLU	8	WHT/BLU
3	WHT/GRN	9	WHT/GRN
4	BLK	10	——
5	WHT/RED	11	BLU/WHT
6	WHT/RED		

C352



1	GRN	6	BLK/YEL
2	BLU/WHT	7	——
3	WHT/BLK	8	WHT/GRN
4	WHT/BLK	9	WHT
5	BLK/RED		

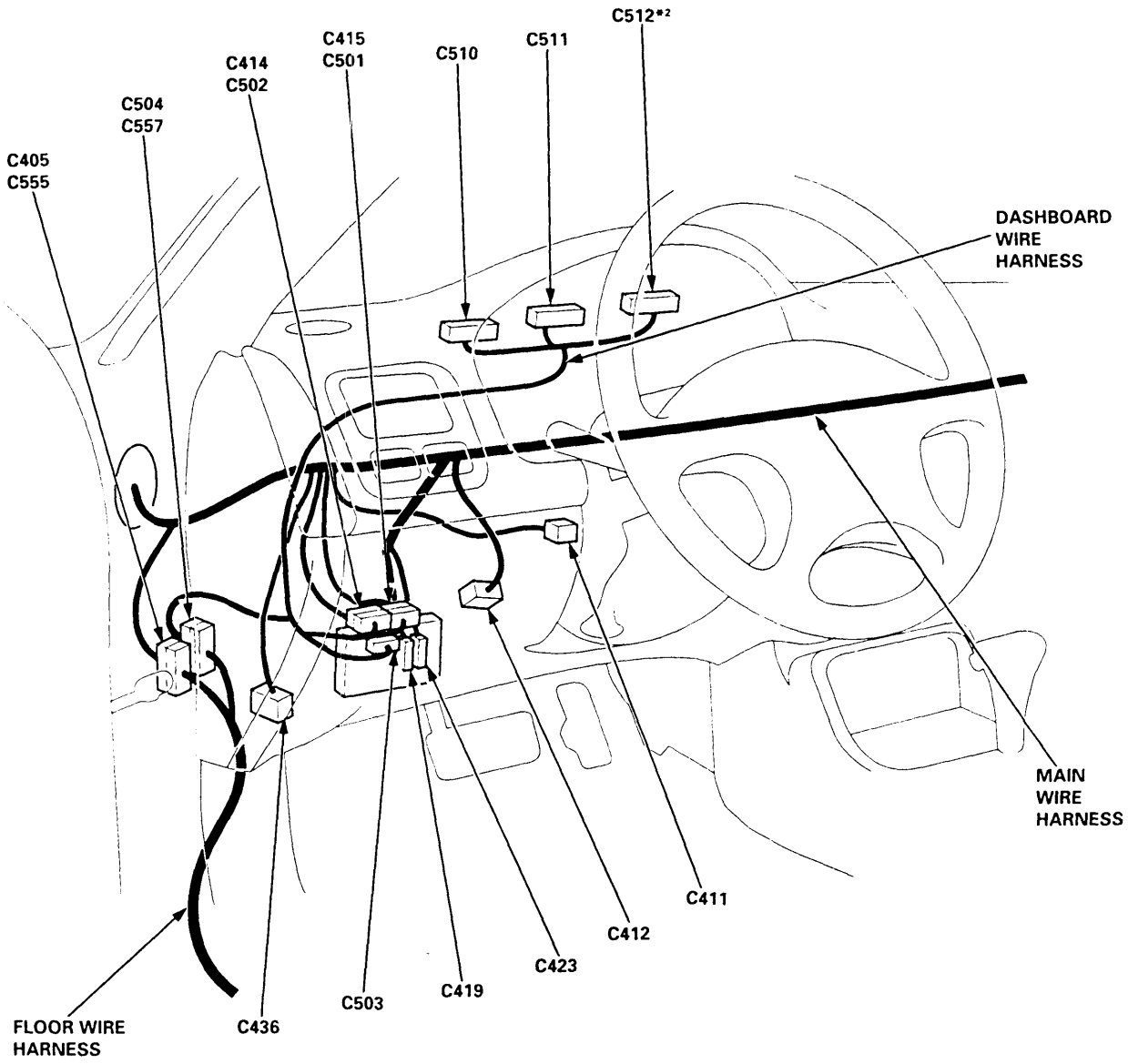
NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).

○: Related to Fuel and Emissions System.

• — Connector with male terminals (double outline): View from terminal side

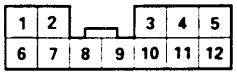
— Connector with female terminals (single outline): View from wire side

System Connectors (Dash and Floor)



*2: A/T

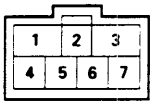
C405



1	BLU/RED	7	GRY
2	RED/GRN	8	GRN
3	YEL/RED*	9	LT GRN/RED
4	LT BLU	10	GRN/BLK
5	RED/BLU	11	GRN/WHT
6	WHT/GRN	12	YEL/GRN

*: ABS

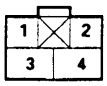
C411



1	BLK/WHT
2	BLU/RED
3	WHT/BLK
4	BLK
5	WHT*
6	WHT/BLU*
7	WHT/GRN*

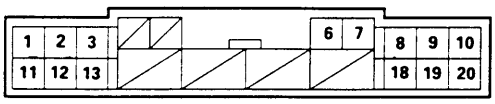
*: Security Alarm System

C412



1	LT GRN
2	GRY
3	GRN/WHT²
4	WHT/GRN

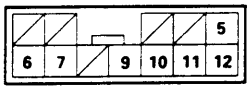
C414



1	YEL/RED	11	BLU/WHT
2	RED/BLU	12	BLU
3	WHT/BLU	13	WHT/BLK
4	——	14	——
5	——	15	——
6	YEL/RED*	16	——
7	BLU	17	——
8	GRN/ORN	18	YEL/GRN
9	RED/BLU	19	RED
10	LT GRN	20	BLU/RED*

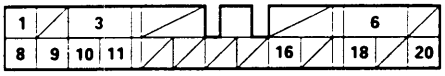
*: ABS

C415 (A/T)



1	——	7	BLK/BLU
2	——	8	——
3	——	9	BLU²
4	——	10	GRN
5	WHT³	11	GRN/BLK²
6	RED	12	LT GRN

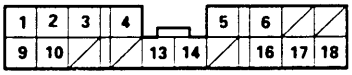
C419



1	RED/BLU	11	BLU/ORN
2	——	12	——
3	BLK	13	——
4	——	14	——
5	——	15	——
6	WHT/BLU	16	BLK/WHT
7	——	17	——
8	YEL/GRN	18	WHT/GRN*
9	BLK/YEL	19	——
10	BLU/ORN	20	WHT/RED

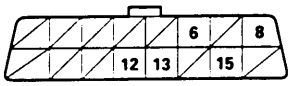
*: Security Alarm System

C423



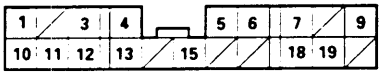
1	RED/YEL	10	GRN/YEL
2	BLK/BLU	11	——
3	RED/GRN	12	——
4	GRN/BLK	13	BLK/WHT
5	RED/BLU	14	GRN/RED
6	WHT/BLU	15	——
7	——	16	GRN/RED
8	——	17	RED/BLK
9	RED/WHT	18	RED/BLK

C436



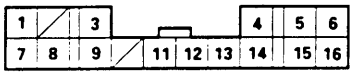
1	——	9	——
2	——	10	——
3	——	11	——
4	——	12	BLK
5	——	13	BLK
6	LT BLU	14	——
7	——	15	LT BLU
8	WHT/RED	16	——

C503



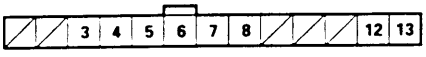
1	RED/GRN	11	YEL/BLK
2	——	12	BLK/YEL
3	WHT/BLU	13	YEL/GRN
4	BLK	14	——
5	GRN/WHT	15	RED/BLK
6	GRN/RED	16	——
7	GRN/ORN	17	——
8	——	18	BLK/WHT
9	GRN/YEL	19	YEL/RED
10	YEL	20	——

C504



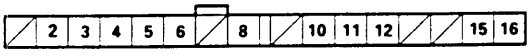
1	RED	9	GRY/WHT
2	——	10	——
3	GRN/RED	11	BRN/WHT
4	YEL/BLK	12	RED/YEL
5	GRN/YEL	13	GRY/BLK
6	BLU/BLK	14	BLU
7	BLU/YEL	15	BRN/BLK
8	YEL/BLK	16	RED/GRN

C510



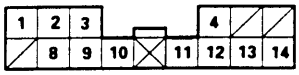
1	——	8	BLU
2	——	9	——
3	YEL/RED	10	——
4	YEL	11	——
5	GRN/ORN	12	RED
6	RED/GRN	13	RED/BLK
7	GRN/RED		

C511



1	——	9	——
2	BLK	10	YEL/BLK
3	BLU/BLK	11	BLU/WHT
4	GRN/YEL	12	YEL/GRN
5	GRN/RED	13	——
6	RED/BLU	14	——
7	——	15	BLK/WHT
8	GRN/YEL	16	WHT/BLU

C512 (A/T)



1	YEL	8	BLK
2	RED/BLK	9	GRN/BLK²
3	RED	10	GRN
4	BLU³	11	RED
5	——	12	WHT³
6	——	13	BLK/BLU
7	——	14	LT GRN

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK¹ and YEL/BLK² are not the same).

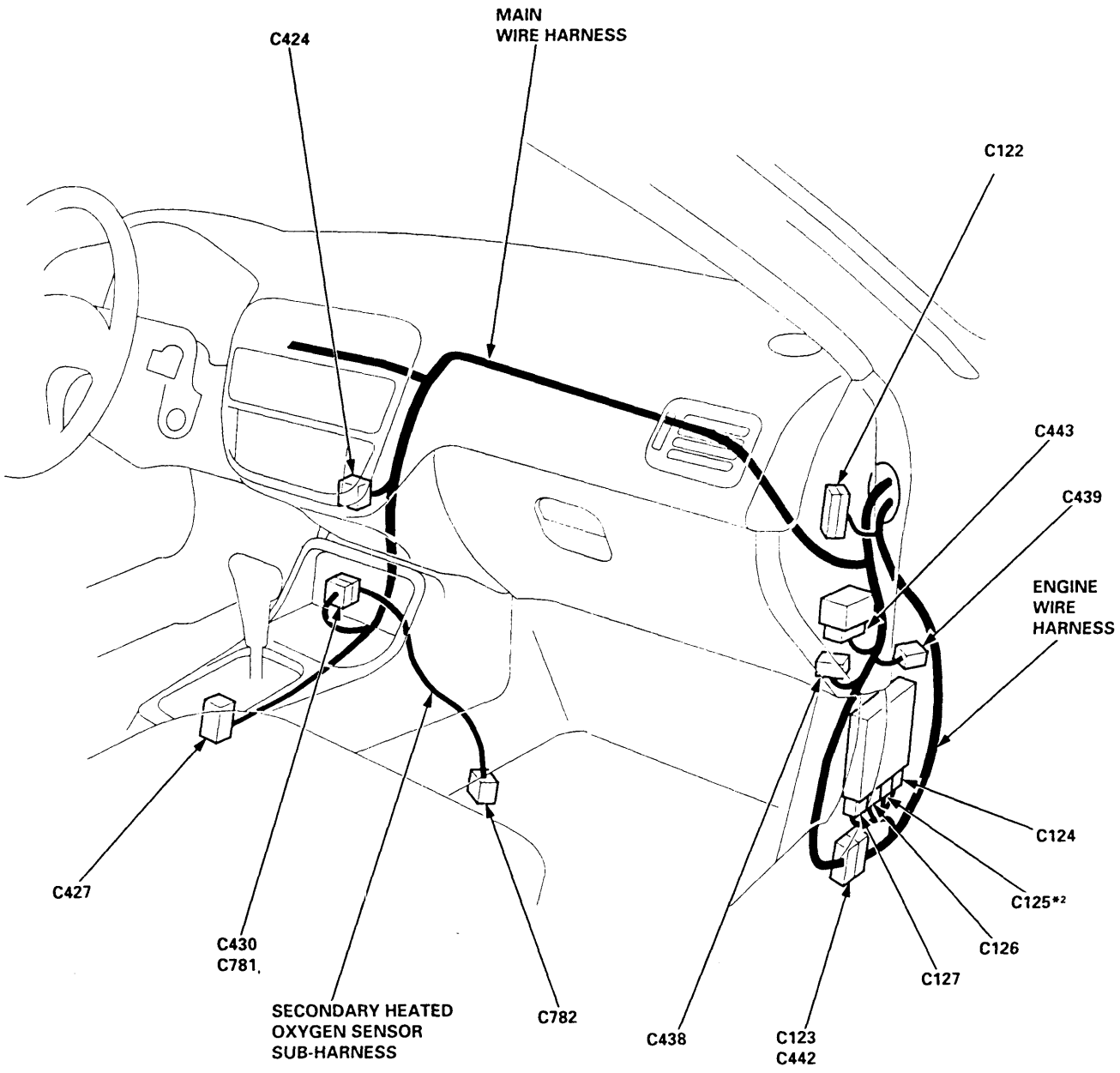
○: Related to Fuel and Emissions System.

• — Connector with male terminals (double outline): View from terminal side

— Connector with female terminals (single outline): View from wire side

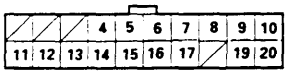
(cont'd)

System Connectors (Dash and Floor) (cont'd)



*2: A/T

C122



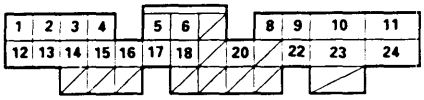
1	—	11	BRN/BLK[1]
2	—	12	BRN/BLK[1]
3	—	13	BRN/BLK[1]
4	YEL/BLK[1]	14	BRN/BLK[1]
5	YEL/BLK[1]	15	BRN/BLK[1]
6	YEL/BLK[1]	16	BRN/BLK[1]
7	YEL/BLK[2]	17	BRN/BLK[1]
8	BLU/WHT	18	—
9	BLU/WHT	19	BRN/BLK[1*2]
10	BLU/WHT	20	BRN/BLK[1*2]

C123

1	—	11	—	18	BLK/RED
2	GRN/BLK[2]	12	BLK/WHT[1]	20	GRN/YEL[2]
3	WHT/RED[2]	13	—	21	LT BLU
4	LT GRN[*2]	14	YEL[1*2]	22	BLU/ORN
5	—	14	GRN/BLK[*1]		
6	GRN	15	PNK[*2]		
7	BLU/RED[2]	15	YEL[*1]		
8	GRN/ORN	16	—		
9	BRN[2]	17	GRN/WHT[2]		
10	WHT/BLU	18	BLU/WHT		

*1: M/T
*2: A/T

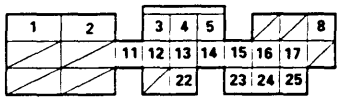
C124 (ECM/PCM-A)



1	YEL[1]	13	ORN[*2]	25	—
2	BLU[1]	14	BLK/BLU[*2]	26	—
3	RED[1]	15	RED/YEL[1]	27	—
4	BRN[1]	16	GRN/YEL[2]	28	—
5	BLK/WHT[1]	17	BLK/RED	29	—
6	BLK/WHT[2]	18	GRN/ORN	30	—
7	—	19	—	31	—
8	GRN/YEL[1]	20	YEL/GRN	32	—
9	BRN/BLK[1]	21	—		
10	BLK[1]	22	BRN/BLK[2]		
11	YEL/BLK[1]	23	BLK[2]		
12	BLK/BLU[*1]	24	YEL/BLK[2]		

*1: M/T
*2: A/T

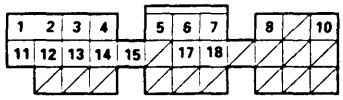
C125[*2] (PCM-B)



1	WHT[1]	11	GRN/WHT[1]	21	—
2	RED[1]	12	WHT/RED[1]	22	GRN[1]
3	BLU/YEL	13	GRN/BLK[2]	23	BLU[1]
4	GRN/BLK[1]	14	WHT[2]	24	YEL[1]
5	YEL[2]	15	RED[*]	25	LT GRN
6	—	16	WHT[1]		
7	—	17	BLU[2]		
8	PNK	18	—		
9	—	19	—		
10	—	20	—		

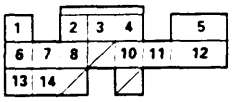
*2: A/T

C126 (ECM/PCM-C)



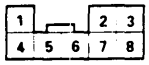
1	BLU/RED[1]	13	RED[*]	25	—
2	BLU[*]	14	BLK[1]	26	—
3	GRN[2]	15	BLU/BLK	27	—
4	YEL[*]	16	—	28	—
5	BLU/RED[2]	17	WHT/RED[2]	29	—
6	BLU/ORN	18	BLU/WHT	30	—
7	BRN[2]	19	—	31	—
8	LT BLU	20	—		
9	—	21	—		
10	WHT/BLU	22	—		
11	WHT/RED[2]	23	—		
12	WHT[*]	24	—		

C127 (ECM/PCM-D)



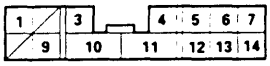
1	RED/BLK	9	—
2	RED/WHT	10	YEL/BLU
3	RED/GRN	11	GRN/BLK[1]
4	YEL/RED	12	GRN/WHT[1]
5	GRN/WHT[2]	13	GRN/BLK[*]
6	RED/BLU	14	WHT/RED[*]
7	WHT[1]	15	—
8	RED/YEL[2]	16	—

C424
(Security Alarm System)



1	WHT/BLU	5	BLK
2	YEL	6	BLK/BLU
3	YEL/BLK	7	WHT/RED
4	BLK	8	WHT/BLK

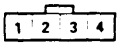
C427 (A/T)



1	BLK	8	—
2	—	9	PNK[*]
3	YEL/RED	10	ORN
4	GRN/BLK	11	BLU/BLK
5	BLU[1]	12	BLK/BLU
6	GRN	13	WHT[1]
7	YEL[1]	14	RED

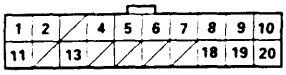
* Cruise control

C430



1	BLK/WHT
2	GRN/WHT[1]
3	WHT/RED[1]
4	BLK/WHT[1]

C438

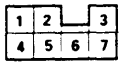


1	BRN/BLK[1]	11	GRN/RED
2	BRN/BLK[1]	12	—
3	—	13	GRN/RED
4	BLU/WHT	14	—
5	BLU/WHT	15	—
6	BLU/WHT	16	—
7	GRN/WHT[2]	17	—
8	GRN/WHT[2]	18	BLU
9	GRN/WHT	19	BLU
10	GRN/WHT[2]	20	BLU

C439

1	BRN[2]
2	BLK

C443



1	GRN/YEL[2]	5	YEL/GRN
2	BLU/ORN	6	YEL/BLK[1]
3	BLK[1]	7	WHT/BLK
4	YEL/GRN		

C782

1	WHT/RED[1]
2	GRN/WHT
3	BLK/WHT[1]
4	BLK/WHT

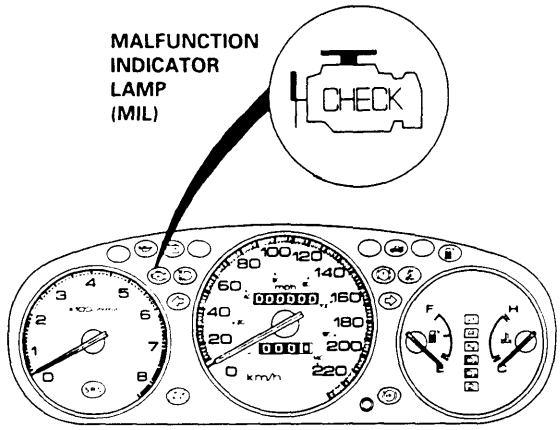
NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK[1] and YEL/BLK[2] are not the same).
○: Related to Fuel and Emissions System.
• — Connector with male terminals (double outline): View from terminal side
— Connector with female terminals (single outline): View from wire side

Troubleshooting Procedures

I. How To Begin Troubleshooting
When the Malfunction Indicator Lamp (MIL) has been reported on, or there is a driveability problem, use the appropriate procedure below to diagnose and repair the problem.

A. When the MIL has come on:

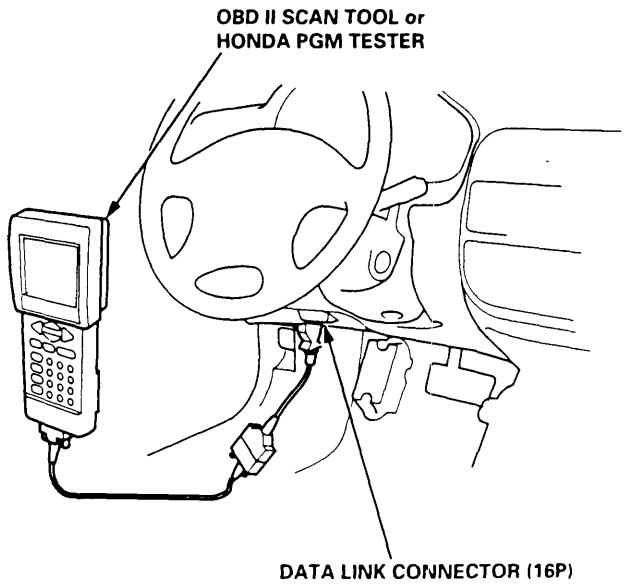
1. Connect the Honda PGM Tester or an OBD II scan tool to the 16P Data Link Connector (DLC) located near the left kick panel.
2. Turn the ignition switch ON (II).
3. Honda PGM Tester: Begin troubleshooting as indicated by the tester. The DTC troubleshooting flowcharts are not needed with the tester; follow the tester's prompts.
OBD II scan tool: Check the DTC and note it. Also check and note the freeze frame data.
Refer to the Diagnostic Trouble Code Chart and begin troubleshooting.

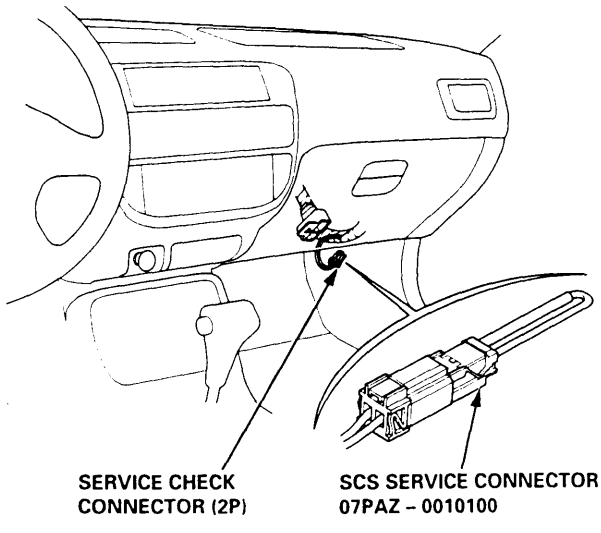


NOTE:
- See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.
- The scan tool or tester can read the Diagnostic Trouble Codes (DTC), freeze frame data, current data, and other Engine Control Module (ECM)/Powertrain Control Module (PCM) data.
- Freeze frame data indicates the engine conditions when the first malfunction, misfire or fuel trim malfunction was detected. It can be useful information when troubleshooting.

B. When the MIL has not come on , but there is a driveability problem, refer to the Symptom Chart on page 11-30.

C. DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS service connector connected.
Connect the SCS service connector to Service Check Connector as shown (The 2P Service Check Connector is located under the dash on the passenger's side of the vehicle). Turn the ignition switch ON (II).





II. Engine Control Module (ECM)/Powertrain Control Module (PCM) Reset Procedure

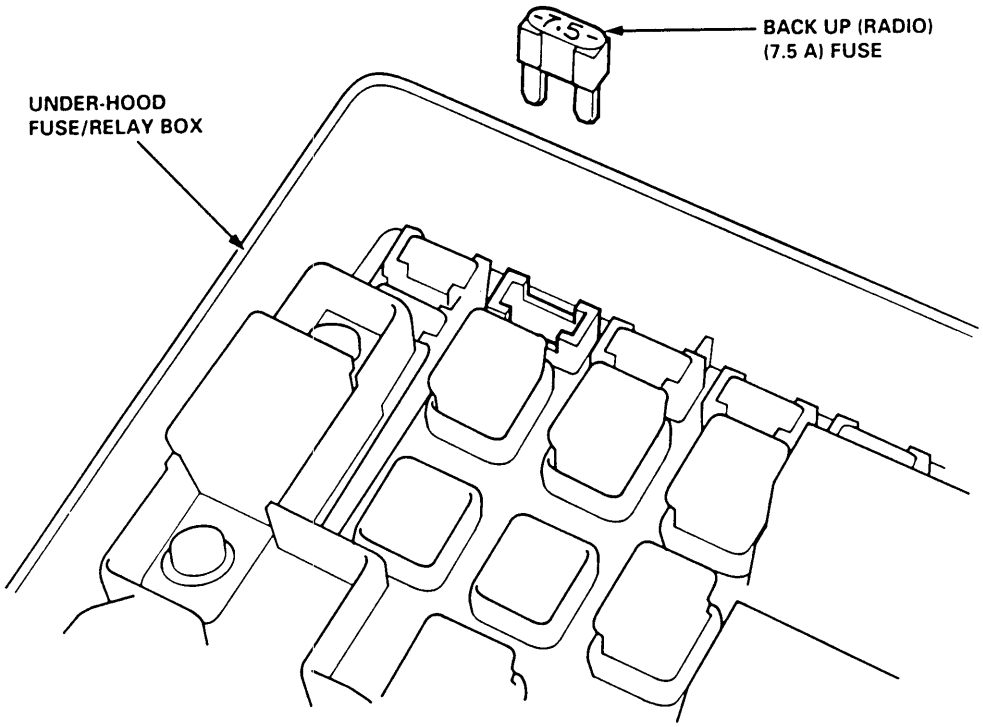
Either of the following actions will reset the ECM/PCM.

- Use the OBD II scan tool or Honda PGM Tester to clear the ECM's/PCM's memory.

  NOTE: See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.

- Turn the ignition switch OFF. Remove the BACK UP (RADIO) (7.5 A) fuse from the under-hood fuse/relay box for 10 seconds.

  NOTE: Removing the BACK UP (RADIO) (7.5 A) fuse cancels the clock and the radio presets. Make note of the customer's presets so you can reset them.



III. Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the SCS Service Connector if it is connected.

   NOTE: If the SCS service connector is connected and there are no DTCs stored in the ECM/PCM, the MIL will stay on when the ignition switch is turned ON (II).

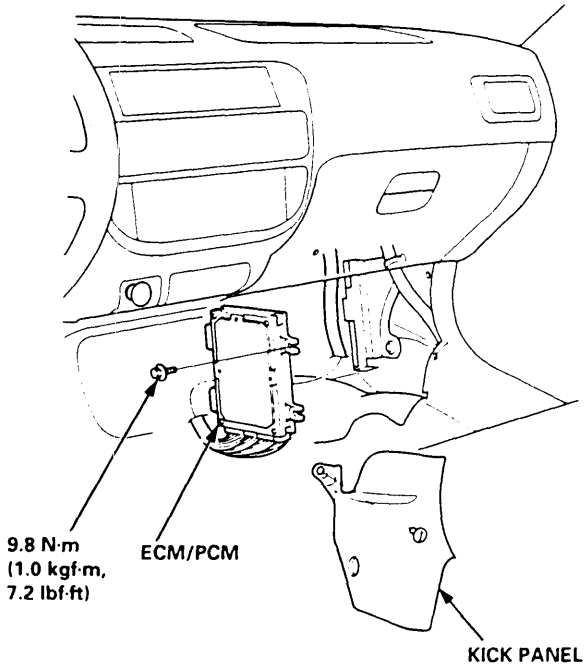
2. Do the ECM/PCM Reset Procedure.

3. Turn the ignition switch OFF.

(cont'd)

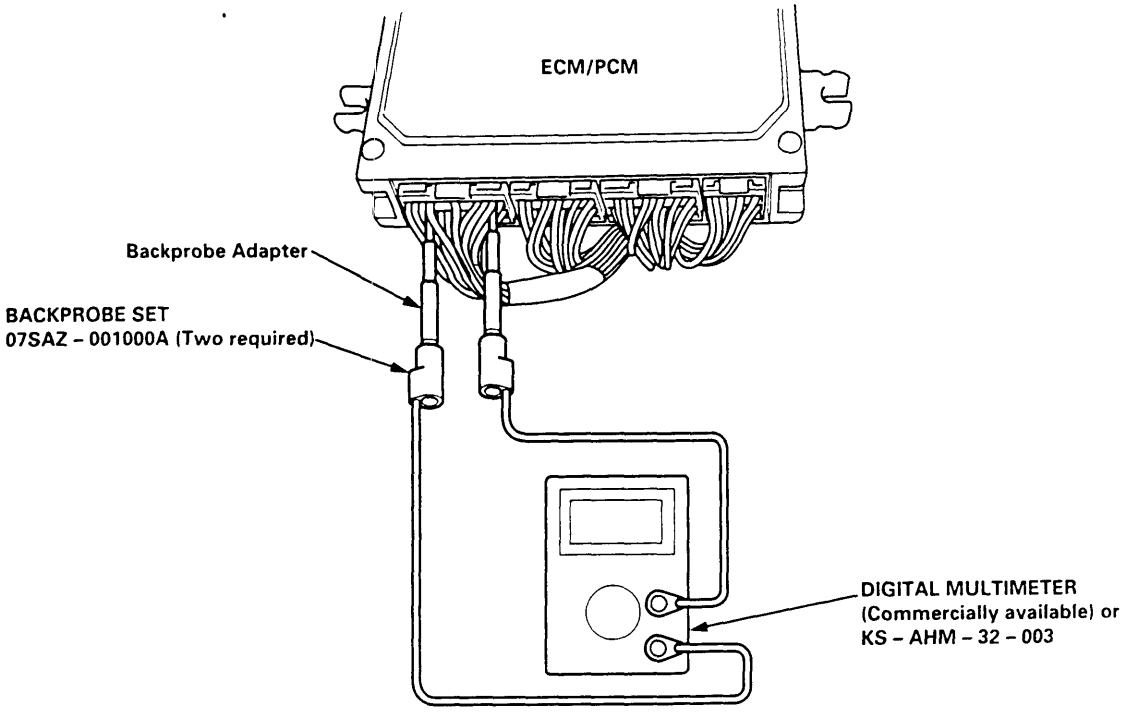
Troubleshooting Procedures (cont'd)

If the inspection for a particular code requires voltage or resistance checks at the ECM/PCM connectors, remove the right kick panel. Pull the carpet back to expose the ECM/PCM. Remove the ABS control unit if so equipped. Unbolt the ECM/PCM bolt. Turn the ignition switch OFF, and connect the backprobe sets and a digital multimeter as described below. Check the system according to the procedure described for the appropriate code(s) listed on the following pages.



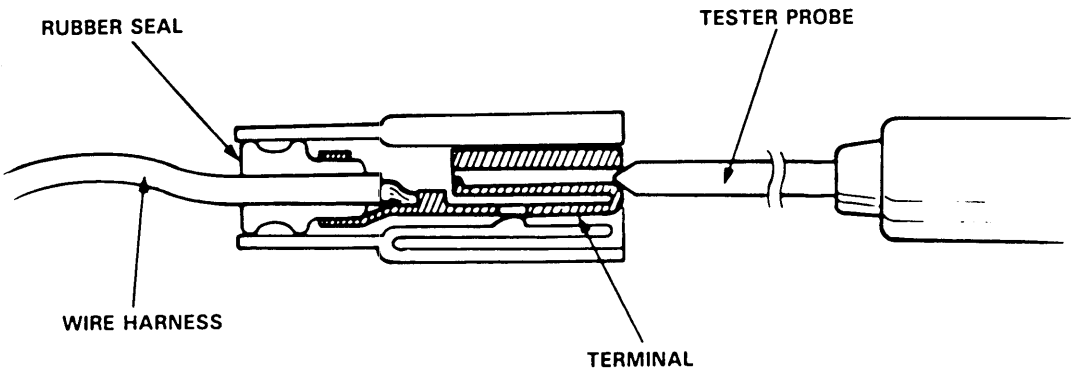
How to Use the Backprobe Sets

Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. 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 comes in contact with terminal end of the wire.



CAUTION:

- Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- Bring the tester probe into contact with the terminal from the terminal side of wire harness connectors in the engine compartment. For female connectors, just touch lightly with the tester probe and do not insert the probe.



(cont'd)

Troubleshooting Procedures (cont'd)

Symptom Chart

Listed below are symptoms and probable causes for problems that DO NOT cause the Malfunction indicator Lamp (MIL) to come on. If the MIL was reported on, go to page 11-26.

Troubleshoot each probable cause in the order listed (from left to right) until the symptom is eliminated.

The probable cause and troubleshooting page reference can be found below.

SYMPTOM	PROBABLE CAUSE
Engine will not start	4, 2, 3, 5, 20, 14, 1
Hard starting	2, 4, 11, 16, 13, 19
Cold fast idle too low	7, 8, 6, 16
Cold fast idle too high	7, 8, 10, 9
Idle speed fluctuates	7, 8, 10, 9
Misfire or rough running	Troubleshoot for misfire on pages 11-75, 78
Low power	2, 9, 10, 12, 17, 16, 18, 20
Engine stalls	2, 4, 11, 7, 20, 8, 5, 15

Other Probable Causes for an engine that will not start:

- — Compression
- — Intake air leakage
- — Engine locked up
- — Timing belt
- — Starting system
- — Overheating
- — Battery

Probable Cause List (For the DTC Chart, see page 11-37)

Probable Cause	Page	System
1	11-44	Engine Control Module (ECM)/Powertrain Control Module (PCM)
2	11-110	Fuel pressure
3	11-118	PGM-FI main relay
4	Section 23	Ignition system
5	11-80, 85	Crankshaft Position/Top Dead Center/Cylinder Position sensor circuit, CKF sensor circuit
6	11-53	Intake Air Temperature (IAT) sensor circuit
7	11-94, 96	Idle Air Control Valve (IACV)
8	11-103, 104	Idle speed adjustment
9	11-124	Throttle body
10	11-123	Throttle cable
11	11-48	Manifold Absolute Pressure (MAP) sensor
12	11-59	Throttle Position (TP) sensor
13	11-83	Barometric pressure (BARO) sensor
14	Section 14	A/T gear position signal
15	11-102	Brake switch signal
16	11-123	Air Cleaner
17	——	Intake air pipe
18	11-126	Three Way Catalytic Converter (TWC)
19	11-130	Evaporative emission (EVAP) control
20	——	Contaminated fuel

ECM/PCM Data

By connecting the OBD II scan tool or the Honda PGM Tester to the 16P data link connector (DLC), various data can be retrieved from the ECM/PCM. The items listed in the table below conform to the SAE recommended practice.
The Honda PGM Tester also reads data beyond that recommended by SAE.
Understanding this data will help to find the causes of intermittent failures or engine problems.

NOTE:

- The "operating values" given below are approximate values and may be different depending on the environment and the individual vehicle.
- Unless noted otherwise, "at idle speed" means idling with the engine completely warmed up, A/T in position [P] or [N], M/T in neutral, and the A/C and all accessories turned off.

Data	Description	Operating Value	Freeze Data
Diagnostic Trouble Code (DTC)	If the ECM /PCM detects a problem, it will store it as a code consisting of one letter and four numbers. Depending on the problem, an SAE-defined code (P0xxx) or a Honda-defined code (P1xxx) will be output to the tester.	If no problem is detected, there is no output.	○
Engine Speed	The ECM/PCM computes engine speed from the signals sent from the Crankshaft Position sensor. This data is used for determining the time and amount of fuel injection.	Nearly the same as tachometer indication.	○
Vehicle Speed	The ECM/PCM converts pulse signals from the Vehicle Speed Sensor (VSS) into speed data.	Nearly the same as speedometer indication	○
Manifold Absolute Pressure (MAP)	The absolute pressure caused in the intake manifold by engine load and speed.	With engine stopped: Nearly the same as atmospheric pressure At idle speed: 24 – 37 kPa (180 – 280 mmHg, 7.1 – 11.0 inHg)	○
Engine Coolant Temperature (ECT)	The ECT sensor converts coolant temperature into voltage and signals the ECM/PCM. The sensor is a thermistor whose internal resistance changes with coolant temperature. The ECM/PCM uses the voltage signals from the ECT sensor to determine the amount of injected fuel.	With cold engine: Same as ambient temperature and IAT With engine warmed up: 176 – 194°F (80 – 90°C)	○
Heated Oxygen Sensor (HO2S) (Primary, Sensor 1) (Secondary Sensor 2)	The Heated Oxygen Sensor detects the oxygen content in the exhaust gas and sends voltage signals to the ECM/PCM. Based on these signals, the ECM/PCM controls the air/fuel ratio. When the oxygen content is high (that is, when the ratio is leaner than the stoichiometric ratio), the voltage signal is lower. When the oxygen content is low (that is, when the ratio is richer than the stoichiometric ratio), the voltage signal is higher.	0.0 – 1.25 V At idle speed: about 0.1 – 0.9 V	× (Sensor 1)

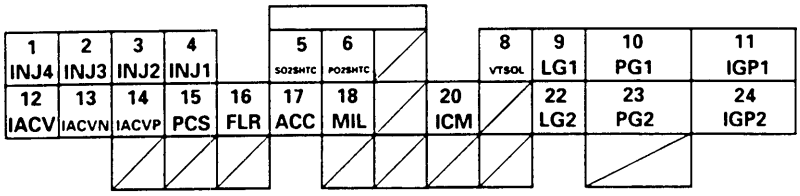
(cont'd)

Troubleshooting Procedures (cont'd)

Data	Description	Operating Value	Freeze Data
HO2S Feedback Loop Status	Loop status is indicated as "open" or "closed". Closed: Based on the HO2S output, the ECM/PCM determines the air/fuel ratio and controls the amount of injected fuel. Open: Ignoring HO2S output, the ECM/PCM refers to signals from the TP, MAP, and ECT sensors to control the amount of injected fuel.	At idle speed: closed	○
Short Term Fuel Trim	The air/fuel ratio correction coefficient for correcting the amount of injected fuel when HO2S feedback is in the closed loop status. When the signal from the HO2S is weak, short term fuel trim gets higher, and the ECM/PCM increases the amount of injected fuel. The air/fuel ratio gradually gets richer, causing a higher HO2S output. Consequently, the short term fuel trim is lowered, and the ECM/PCM reduces the amount of injected fuel. This cycle keeps the air/fuel ratio close to the stoichiometric ratio when in closed loop status.	± 20%	○
Long Term Fuel Trim	Long term fuel trim is computed from short term fuel trim and indicates changes occurring in the fuel supply system over a long period. If long term fuel trim is higher than 1.00, the amount of injected fuel must be increased. If it is lower than 1.00, the amount of injected fuel must be reduced.	± 20%	○
Intake Air Temperature (IAT)	The IAT sensor converts intake air temperature into voltage and signals the ECM/PCM. When intake air temperature is low, the internal resistance of the sensor increases, and the voltage signal is higher.	With cold engine: Same as ambient temperature and ECT	○
Throttle Position	Based on the accelerator pedal position, the opening angle of the throttle valve is indicated.	At idle speed: approx. 10 %	○
Ignition Timing	Ignition timing is the ignition advance angle set by the ECM/PCM. The ECM/PCM matches ignition timing to the driving conditions.	At idle speed: 12° ± 2° BTDC with the SCS service connector connected.	×
Calculated Load Value (CLV)	CLV is the engine load calculated from the MAP data.	At idle speed: 15 – 35 % At 2,500 rpm with no load: 12 – 30%	○

Engine/Powertrain Control Module Terminal Arrangement

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

ECM/PCM CONNECTOR A (32P)

NOTE: Standard battery voltage is 12 V.

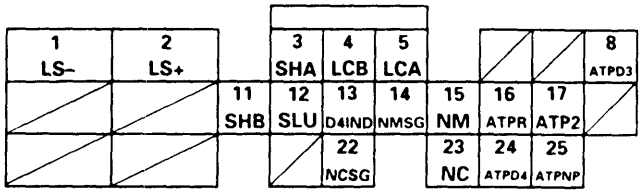
Terminal number	Wire color	Terminal name	Description	Signal
1	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	With engine running: pulses
2	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel injector.	
3	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	
4	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector.	
5	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
6	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
8	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low engine speed: 0 V With engine at high engine speed: battery voltage
9	BRN/BLK	LG1 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
10	BLK	PG1 (POWER GROUND)	Ground for the ECM/PCM power circuit.	
11	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
12*1	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IACV.	With engine running: pulses
13*2	ORN	IACV N (IDLE AIR CONTROL VALVE NEGATIVE SIDE)	Drives the IAC valve (negative side).	
14*2	BLK/BLU	IACV P (IDLE AIR CONTROL VALVE POSITIVE SIDE)	Drives IAC valve (positive side).	
15	RED/YEL	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant below 154°F (68°C): battery voltage With engine running, engine coolant above 154°F (68°C): 0 V
16	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	0 V for two seconds after turning ignition switch ON (II), then battery voltage
17	BLK/RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LAMP)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
20	YEL/GRN	ICM (IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): battery voltage With engine running: about 10 V (depending on engine speed)
22	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
23	BLK	PG2 (POWER GROUND)	Ground for the ECM/PCM power circuit.	
24	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V

*1: M/T
*2: A/T

(cont'd)

Engine/Powertrain Control Module Terminal Arrangement (cont'd)

PCM CONNECTOR B (25P)



Wire side of female terminals

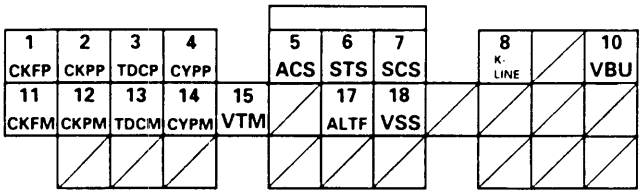
PCM CONNECTOR B (25P)*2

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	WHT	LS– (LINEAR SOLENOID VALVE – SIDE)	Ground for linear solenoid valve.	With ignition switch ON (II): pulses
2	RED	LS+ (LINEAR SOLENOID VALVE + SIDE)	Drives linear solenoid valve.	With ignition switch ON (II): pulses
3	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A.	With engine running in 2nd, 3rd gears: battery voltage With engine running in 1st, 4th gears: about 0 V
4	GRN/BLK	LC B (LOCK-UP CONTROL SOLENOID VALVE B)	Drives lock-up control solenoid valve B.	With lock-up ON: battery voltage With lock-up OFF: 0 V
5	YEL	LC A (LOCK-UP CONTROL SOLENOID VALVE A)	Drives lock-up control solenoid valve A.	With lock-up ON: battery voltage With lock-up OFF: 0 V
8	PNK	ATPD3 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D3 position: 0 V In any other position: battery voltage
11	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B.	With engine running in 1st, 2nd: battery voltage With engine running in 3rd, 4th: about 0 V
12	WHT/RED	SLU (INTERLOCK CONTROL UNIT)	Drives interlock control unit.	With ignition switch ON (II) and brake pedal depressed: 0 V
13	GRN/BLK	D4 IND (D4 INDICATOR LIGHT)	Drives D4 indicator light.	With D4 indicator light turned ON: battery voltage With D4 indicator light turned OFF: 0 V
14	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor.	
15	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signal.	With engine running: pulses
16	WHT	ATPR (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal	In R position: 0 V In any other position: battery voltage
17	BLU	ATP2 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 2 position: 0 V In any other position: battery voltage
22	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor.	
23	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signal.	With ignition switch ON (II), and front wheels rotating: pulses
24	YEL	ATPD4 (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D4 position: 0 V In any other position: 5 V
25	LT GRN	ATPNP (A/T GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In N or P position: 0 V In any other position: battery voltage

*2: A/T

ECM/PCM CONNECTOR C (31P)



Wire side of female terminals

ECM/PCM CONNECTOR C (31P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLU/RED	CKFP (CKF SENSOR P SIDE)	Detects CKF sensor.	With engine running: pulses
2	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
3	GRN	TDCP (TDC SENSOR P SIDE)	Detects TDC sensor.	With engine running: pulses
4	YEL	CYPP (CYP SENSOR P SIDE)	Detects CYP sensor.	With engine running: pulses
5	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: battery voltage
6	BLU/ORN	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON (III): battery voltage With starter switch OFF: 0 V
7	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the connector connected: 0 V With the connector disconnected: 5 V
8	LT BLU	K-LINE (DLC)	Sends and receives scan tool signal.	With ignition switch ON (II): about 5 V
10	WHT/BLU	VBU (VOLTAGE BACK UP)	Power source for the ECM/ PCM control circuit. Power source for the DTC memory	Battery voltage at all times
11	WHT/RED	CKFM (CKF SENSOR M SIDE)	Ground for CKF sensor signal.	
12	WHT	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor signal.	
13	RED	TDCM (TDC SENSOR M SIDE)	Ground for TDC sensor signal.	
14	BLK	CYPM (CKP SENSOR M SIDE)	Ground for CYP sensor signal.	
15	BLU/BLK	VTM (VTEC PRESSURE SWITCH)	Detects VTEC pressure switch signal.	With engine at low engine speed: 0 V With engine at high engine speed: battery voltage
17	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V – battery voltage (depending on electrical load)
18	BLU/WHT	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheels rotating: cycles 0 V – 5 V

*1: M/T
*2: A/T

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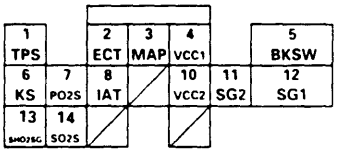
Engine/Powertrain Control Module Terminal Arrangement (cont'd)

ECM/PCM CONNECTOR D (16P)



Wire side of female terminals

ECM/PCM CONNECTOR D (16P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
2	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR	Detects ECT sensor signal.	With ignition switch ON(II): about 0.1 – 4.8 V (depending on engine coolant temperature)
3	RED/GRN	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)
4	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source for MAP sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
5	GRN/WHT	BKSW (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage
6	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal.	With engine knocking: pulses
7	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
8	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 – 4.8 V (depending on intake air temperature)
10	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON(II): about 5 V With ignition switch OFF: 0 V
11	GRN/BLK	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times
12	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times
13	GRN/BLK	SHO2SG (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2 GROUND)	Ground for secondary heated oxygen sensor (sensor 2).	
14	WHT/RED	SO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects secondary heated oxygen sensor (sensor 2) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V

*1: M/T
*2: A/T

Diagnostic Trouble Code (DTC) Chart

DTC (MIL indication*)		Detection Item	Probable Cause	Page
P0107	(3)	Manifold Absolute Pressure Circuit Low Input	• Open or short in MAP sensor circuit • MAP sensor • ECM/PCM	11-48
P0108	(3)	Manifold Absolute Pressure Circuit High Input	• Open in MAP sensor circuit • MAP sensor	11-50
P0111	(10)	Intake Air Temperature Circuit Range/Performance Problem	• IAT sensor	11-53
P0112	(10)	Intake Air Temperature Circuit Low Input	• Short in IAT sensor circuit • IAT sensor • ECM/PCM	11-54
P0113	(10)	Intake Air Temperature Circuit High Input	• Open in IAT sensor circuit • IAT sensor • ECM/PCM	11-55
P0116	(86)	Engine Coolant Temperature Circuit Range/Performance Problem	• ECT sensor • Cooling system	11-56
P0117	(6)	Engine Coolant Temperature Circuit Low Input	• Short in ECT sensor circuit • ECT sensor • ECM/PCM	11-57
P0118	(6)	Engine Coolant Temperature Circuit High Input	• Open in ECT sensor circuit • ECT sensor • ECM/PCM	11-58
P0122	(7)	Throttle Position Circuit Low Input	• Open or short in TP sensor circuit • TP sensor • ECM/PCM	11-59
P0123	(7)	Throttle Position Circuit High Input	• Open in TP sensor circuit • TP sensor • ECM/PCM	11-61
P0131	(1)	Primary Heated Oxygen Sensor Circuit Low Voltage (Sensor 1)	• Short in Primary HO2S (Sensor 1) circuit • Primary HO2S (Sensor 1) • Fuel supply system • ECM/PCM	11-64
P0132	(1)	Primary Heated Oxygen Sensor Circuit High Voltage (Sensor 1)	• Open in Primary HO2S (Sensor 1) circuit • Primary HO2S (Sensor 1) • ECM/PCM	11-66
P0133	(61)	Primary Heated Oxygen Sensor Slow Response (Sensor 1)	• Primary HO2S (Sensor1) • Exhaust system	11-67
P0135	(41)	Primary Heated Oxygen Sensor Heater Circuit Malfunction (Sensor 1)	• Open or short in Primary HO2S (Sensor 1) heater circuit • ECM/PCM	11-71

*: These DTCs will be indicated by the blinking of the Malfunction Indicator Lamp (MIL) with the SCS service connector connected.

(cont'd)

Diagnostic Trouble Code (DTC) Chart (cont'd)

DTC (MIL indication)	Detection Item	Probable Cause	Page
P0137 (63)	Secondary Heated Oxygen Sensor Circuit Low Voltage (Sensor 2)	• Short in Secondary HO2S (Sensor 2) circuit • Secondary HO2S (Sensor 2) • ECM/PCM	11-68
P0138 (63)	Secondary Heated Oxygen Sensor Circuit High Voltage (Sensor 2)	• Open in Secondary HO2S (Sensor 2) circuit • Secondary HO2S (Sensor 2) • ECM/PCM	11-69
P0139 (63)	Secondary Heated Oxygen Sensor Slow Response (Sensor 2)	• Secondary HO2S (Sensor 2)	11-70
P0141 (65)	Secondary Heated Oxygen Sensor Heater Circuit Malfunction (Sensor 2)	• Open or short in Secondary HO2S (Sensor 2) heater circuit • ECM/PCM	11-71
P0171 (45)	System Too Lean	• Fuel supply system • Primary HO2S (Sensor 1) • MAP sensor • Contaminated fuel • Valve clearance • Exhaust leakage	11-73
P0172 (45)	System Too Rich	• Fuel supply system • Primary HO2S (Sensor 1) • MAP sensor • Contaminated fuel • Valve clearance	11-73
P0301 (71) P0302 (72) P0303 (73) P0304 (74)	— Cylinder 1 — Cylinder 2 — Cylinder 3 — Cylinder 4 Misfire Detected	• Fuel Injector • Fuel Injector circuit • Ignition system • Low compression • Valve clearance	11-75
P0325 (23)	Knock Sensor (KS) Circuit Malfunction	• Open or short in Knock Sensor (KS) circuit • Knock Sensor (KS) • ECM/PCM	11-79
P0335 (4)	Crankshaft Position Sensor Circuit Malfunction	• Crankshaft Position Sensor • Crankshaft Position Sensor circuit • ECM/PCM	11-80
P0336 (4)	Crankshaft Position Sensor Range/Performance	• Crankshaft Position Sensor • Timing belt skipped teeth	11-80
P0420 (67)	Catalyst System Efficiency Below Threshold	• Three Way Catalytic converter • Secondary HO2S	11-127

*1: M/T
*2: A/T

DTC (MIL indication)	Detection Item	Probable Cause	Page
P0441 (92)	Evaporative Emission Control System Insufficient Purge Flow	• EVAP Purge Control Solenoid Valve • Open or short in EVAP Purge Control Solenoid Valve circuit • EVAP Control Canister • Vacuum lines • ECM/PCM	11-130
P0500*1 (17)	Vehicle Speed Sensor Circuit Malfunction	• Vehicle Speed Sensor • Vehicle Speed Sensor circuit • ECM	11-82
P0501*2 (17)	Vehicle Speed Sensor Circuit Range/Performance	• Vehicle Speed Sensor • Vehicle Speed Sensor circuit • PCM	11-82
P0505 (14)	Idle Control System Malfunction	• IAC valve • Throttle Body	11-92
P0700*2 and some of P0715 P0720 P0730 P0740 P0753 P0758 (70)*	Automatic Transaxle	——	Section 14
P1106 (13)	Barometric Pressure Circuit Range/Performance Problem	• ECM/PCM (Baro sensor)	11-83
P1107 (13)	Barometric Pressure Circuit Low Input	• ECM/PCM (Baro sensor)	11-84
P1108 (13)	Barometric Pressure Circuit High Input	• ECM/PCM (Baro sensor)	11-84
P1121 (7)	Throttle Position Lower Than Expected	• TP sensor	11-62
P1122 (7)	Throttle Position Higher Than Expected	• TP sensor	11-63
P1128 (5)	Manifold Absolute Pressure Lower Than Expected	• MAP sensor	11-51
P1129 (5)	Manifold Absolute Pressure Higher Than Expected	• MAP sensor	11-52

*: The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.
*1: M/T
*2: A/T

(cont'd)

Diagnostic Trouble Code (DTC) Chart (cont'd)

DTC (MIL indication)	Detection Item	Probable Cause	Page
P1259 (22)	VTEC System Malfunction	• VTEC Solenoid Valve • Open or short in VTEC Solenoid Valve circuit • VTEC Pressure Switch • Open or short in VTEC Pressure Switch circuit • ECM/PCM	Section 6
P1300 or some of P0301 (71), P0302 (72), P0303 (73), P0304 (74)	Random Misfire	• Ignition system • Fuel supply system • Contaminated fuel • Lack of fuel	11-78
P1336 (54)	Crankshaft Speed Fluctuation Sensor Intermittent Interruption	• CKF sensor	11-85
P1337 (54)	Crankshaft Speed Fluctuation Sensor No Signal	• CKF sensor • CKF sensor circuit • ECM/PCM	11-85
P1359 (8)	Crankshaft Position/Top Dead Center Sensor Disconnected	• CKP/TDC sensor circuit	11-87
P1361 (8)	Top Dead Center Sensor Intermittent Interruption	• TDC sensor	11-80
P1362 (8)	Top Dead Center Sensor No Signal	• TDC sensor • TDC sensor circuit • ECM/PCM	11-80
P1381 (9)	Cylinder Position Sensor Intermittent Interruption	• CYP sensor	11-80
P1382 (9)	Cylinder Position Sensor No Signal	• CYP sensor • CYP sensor circuit • ECM/PCM	11-80
P1508*1 (14)	Idle Air Control Valve Circuit Failure	• IAC valve • IAC valve circuit • ECM	11-94
P1509*2 (14)	Idle Air Control Valve Circuit Failure	• Open or short in IAC valve circuit • IAC valve • PCM	11-96
P1607 (–)	Engine Control Module/Powertrain Control Module Internal Circuit Failure A	• ECM/PCM	11-88
P1705, P1706, P1753, P1758, P1768, P1785, P1790, P1791, P1793 (70)*, P1870, P1873, P1879, P1885, P1886, P1888, P1890, P1891	Automatic Transaxle	——	Section 14

*: The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously.
*1: M/T
*2: A/T

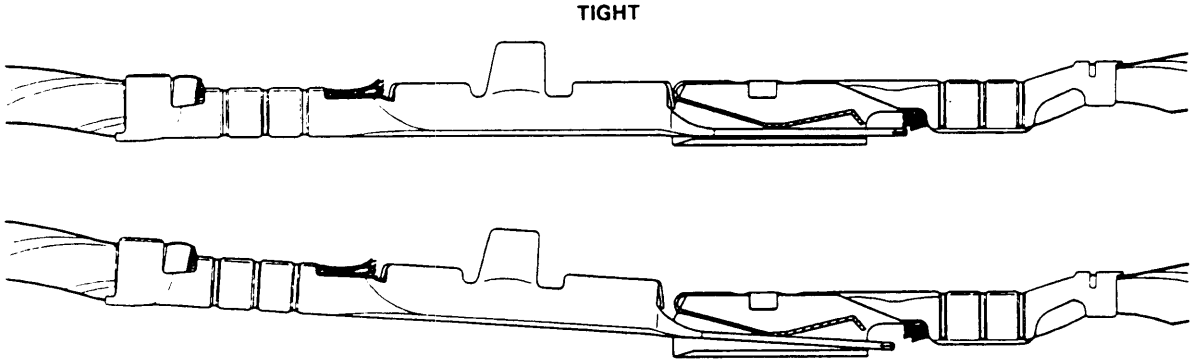
How to Read Flowcharts

A flowchart is designed to be used from start to final repair. It's like a map showing you the shortest distance. But beware: If you go off the "map" anywhere but a "stop" symbol, you can easily get lost.

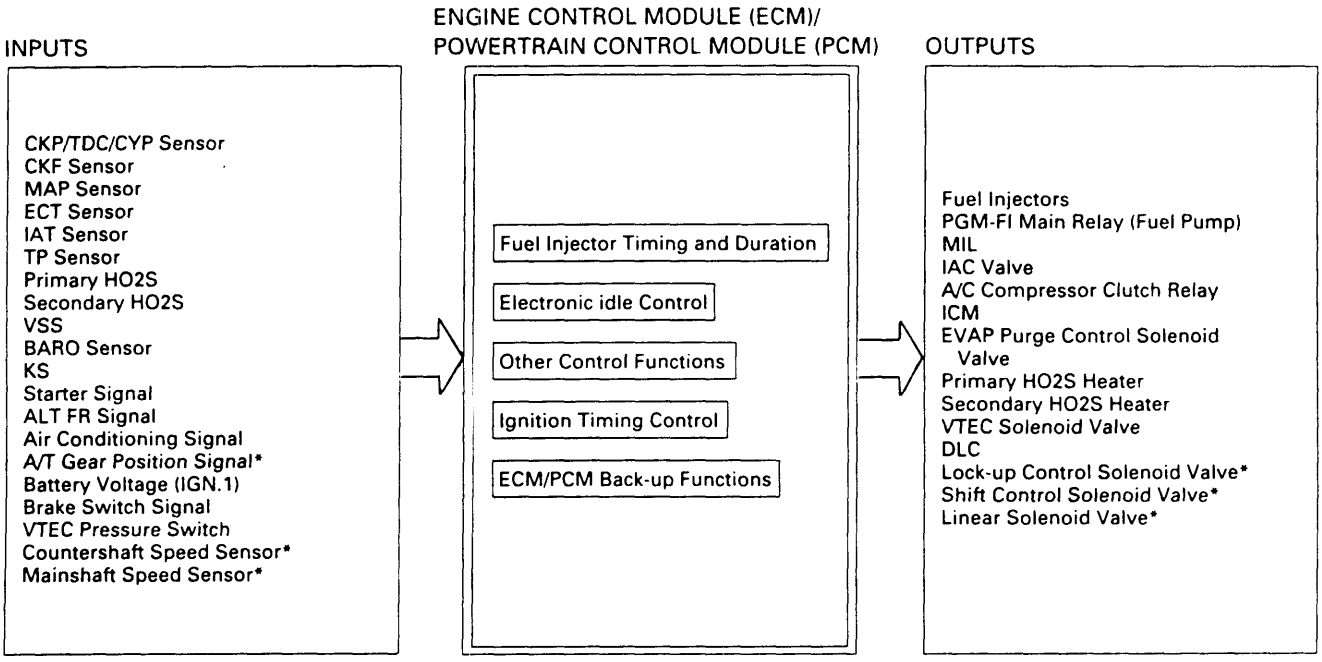
START (bold type)	Describes the conditions or situation to start a troubleshooting flowchart.
ACTION	Asks you to do something; perform a test, set up a condition etc.
DECISION	Asks you about the result of an action, then sends you in the appropriate troubleshooting direction.
STOP (bold type)	The end of a series of actions and decisions, describes a final repair action and sometimes directs you to an earlier part of the flowchart to confirm your repair.

NOTE:

- The term "Intermittent Failure" is used in these charts. It simply means a system may have had a failure, but it checks out OK at this time. If the Malfunction Indicator Lamp (MIL) on the dash does not come on, check for poor connections or loose wires at all connectors related to the circuit that you are troubleshooting (see illustration below).
- Most of the troubleshooting flowcharts have you reset the Engine Control Module (ECM)/Powertrain Control Module (PCM) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you can't duplicate the code, do not continue though the flowchart. To do so will only result in confusion and, possibly, a needlessly replaced ECM/PCM.
- "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. In complex electronics (like ECM's/PCM's), this can sometimes mean something works, but not the way it's supposed to.



System Description



*: A/T

PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel injector Timing and Duration

The ECM/PCM contains memories for the basic discharge durations at various engine speeds and manifold air flow rates. 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.

Idle Air Control

Idle Air Control Valve (IAC Valve)

When the engine is cold, the A/C compressor is on, the transmission is in gear, the brake pedal is depressed, or the alternator is charging, the ECM/PCM controls current to the IAC Valve to maintain the correct idle speed.

Ignition Timing Control

- The ECM/PCM contains memories for basic ignition timing at various engine speeds and manifold air flow rates. Ignition timing is also adjusted for engine coolant temperature.
- A knock control system was adopted which sets the ideal ignition timing for the octane rating of the gasoline used.

Other Control Functions

1. Starting Control
   When the engine is started, the ECM/PCM provides a rich mixture by increasing fuel injector duration.
2. Fuel Pump Control
   - When the ignition switch is initially turned on, the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump for two seconds to pressurize the fuel system.
   - When the engine is running, the ECM/PCM supplies ground to the PGM-FI main relay that supplies current to the fuel pump.
   - When the engine is not running and the ignition is on, the ECM/PCM cuts ground to the PGM-FI main relay which cuts current to the fuel pump.

3. Fuel Cut-off Control
   - During deceleration with the throttle valve closed, current to the fuel injectors is cut off to improve fuel economy at speeds over the following rpm:
     - M/T: 1,000 rpm
     - A/T: 990 rpm
   - Fuel cut-off action also takes place when engine speed exceeds 7,000 rpm, regardless of the position of the throttle valve, to protect the engine from over-revving.
4. A/C Compressor Clutch Relay
   When the ECM/PCM receives a demand for cooling from the air conditioning system, it delays the compressor from being energized, and enriches the mixture to assure smooth transition to the A/C mode.
5. Evaporative Emission (EVAP) Purge Control Solenoid Valve
   When the engine coolant temperature is above 154°F (68°C), the ECM/PCM controls the EVAP purge control solenoid valve which controls vacuum to the EVAP purge control canister.

ECM/PCM Fail-safe/Back-up Functions

1. Fail-safe Function
   When an abnormality occurs in a signal from a sensor, the ECM/PCM ignores that signal and assumes a pre-programmed value for that sensor that allows the engine to continue to run.
2. Back-up Function
   When an abnormality occurs in the ECM/PCM itself, the fuel injectors are controlled by a back-up circuit independent of the system in order to permit minimal driving.
3. Self-diagnosis Function [Malfunction Indicator Lamp (MIL)]
   When an abnormality occurs in a signal from a sensor, the ECM/PCM supplies ground for the MIL and stores the DTC in erasable memory. When the ignition is initially turned on, the ECM/PCM supplies ground for the MIL for two seconds to check the MIL bulb condition.
4. Two Trip Detection Method
   To prevent false indications, the Two Trip Detection Method is used for the HO2S, fuel metering-related, idle control system, ECT sensor and EVAP control system self-diagnostic functions. When an abnormality occurs, the ECM/PCM stores it in its memory. When the same abnormality recurs after the ignition switch is turned OFF and ON (II) again, the ECM/PCM informs the driver by lighting the MIL. However, to ease troubleshooting, this function is cancelled when you jump the service check connector. The MIL will then blink immediately when an abnormality occurs.
5. Two (or Three) Driving Cycle Detection Method
   A "Driving Cycle" consists of starting the engine, beginning closed loop operation, and stopping the engine. If misfiring that increases emissions is detected during two consecutive driving cycles, or TWC deterioration is detected during three consecutive driving cycles, the ECM/PCM turns the MIL on. However, to ease troubleshooting, this function is cancelled when you jump the service check connector. The MIL will then blink immediately when an abnormality occurs.

Engine Control Module/Powertrain Control Module (ECM/PCM)

The Malfunction Indicator Lamp (MIL) never comes on (even for two seconds) after ignition switch is turned ON (II).

NOTE: If this symptom is intermittent, check for a loose No. 25 CLOCK METER (7.5 A) fuse in the under-dash fuse/relay box, a poor connection at ECM/PCM terminal A18, or an intermittent open in the GRN/ORN wire between the ECM/PCM (A18) and the gauge assembly.

Turn the ignition switch ON (II).

Is the low oil pressure light on?

NO

- **Repair short or open in the wire between No. 25 CLOCK METER (7.5 A) fuse and gauge assembly.**
- **Replace No. 25 CLOCK METER (7.5 A) fuse.**

YES

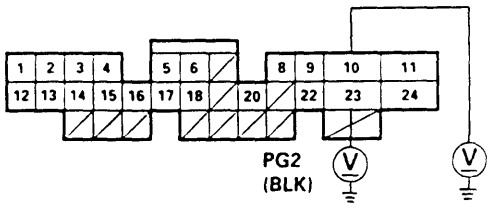
Try to start the engine.

Does the engine start?

NO

Check for an open in the wires (PG1, PG2 lines):
1. Turn the ignition switch ON (II).
2. Measure voltage between body ground and ECM/PCM connector terminals A10 and A23 individually.

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

Is there less than 1.0 V?

NO

Repair open in the wire(s) between ECM/PCM and G101 (located at the thermostat housing) that had more than 1.0 V.

YES

Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

YES

Check for an open in the wire or bulb (MIL line):
1. Turn the ignition switch OFF.
2. Connect the ECM/PCM connector terminal A18 to body ground with a jumper wire.
3. Turn the ignition switch ON (II).

Is the MIL on?

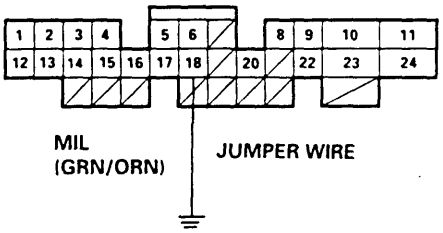
NO

- **Repair open in the wires between ECM/PCM (A18) and gauge assembly.**
- **Replace the MIL bulb.**

YES

Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

The Malfunction Indicator Lamp (MIL) stays on or comes on after two seconds.

Check the Diagnostic Trouble Code (DTC):
1. Connect a scan tool or Honda PGM Tester.
2. Turn the ignition switch ON (II).
3. Read the DTC with the scan tool or Honda PGM Tester.

Are any DTC(s) indicated?

YES → **Go to Diagnostic Trouble Code (DTC) chart (see page 11-37).**

NO

Check the DTC by MIL indication:
1. Turn the ignition switch OFF.
2. Connect the SCS service connector to the service check connector.
3. Turn the ignition switch ON (II).

Does the MIL indicate any DTC?

YES → **— Repair open or short in wire between the ECM/PCM (C8) and Data Link Connector.**
— Go to Diagnostic Trouble Code (DTC) chart (see page 11-37).

NO

Try to start the engine.

Does the engine start?

NO → (A) (To page 11-46)

YES

Check for a short in the wire (SCS line):
1. Disconnect the SCS service check connector.
2. Stop the engine and turn the ignition switch ON (II).
3. Measure voltage between the ECM/PCM connector terminal C7 and body ground.

Is there approx. 5 V?

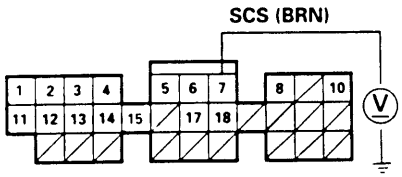
NO → **Repair short to body ground in the wire between ECM/PCM (C7) and service check connector.**

YES

(To page 11-46)

NOTE:
- When there is no Diagnostic Trouble Code (DTC) stored, the MIL will stay on if the SCS service connector is connected and the ignition switch is on.
- If this symptom is intermittent, check for:
  - — A loose FI E/M (15 A) fuse in the under-hood fuse/relay box
  - — A loose No. 13 FUEL PUMP SRS UNIT (15 A) fuse in the under-dash fuse/relay box
  - — An intermittent short in the wire between the ECM/PCM (C7) and the service check connector
  - — An intermittent short in the wire between the ECM/PCM (A18) and the gauge assembly
  - — An intermittent short in the wire between the ECM/PCM (D4) and the MAP sensor
  - — An intermittent short in the wire between the ECM/PCM (D10) and the TP sensor.
  - — PGM-FI main relay
- See the OBD II scan tool or Honda PGM Tester user's manuals for specific operating instructions.

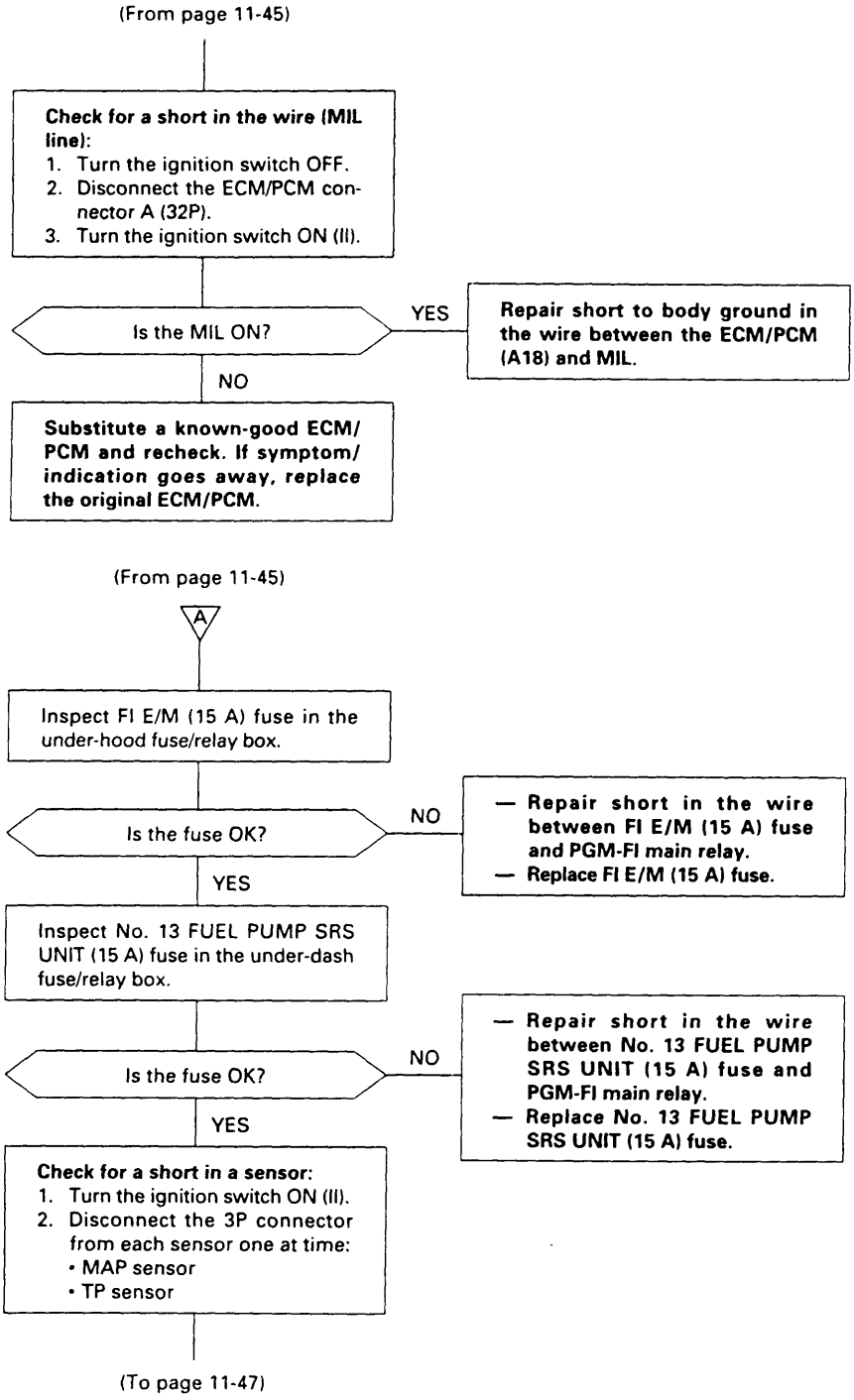
ECM/PCM CONNECTOR C (31P)



Wire side of female terminals

(cont'd)

Engine Control Module/Powertrain Control Module (ECM/PCM) (cont'd)



(From page 11-46)

Does the MIL go OFF momentarily?

YES → **Replace the sensor that caused the light to go out.**

NO

Check for a short in the wires (VCC lines):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector D (16P).
3. Check for continuity between body ground and ECM/PCM connector terminals D4 and D10 individually.

Is there continuity?

YES → **— Repair short to body ground in the wire between ECM/PCM (D4) and MAP sensor.**
— Repair short to body ground in the wire between ECM/PCM (D10) and the TP sensor.

NO

Check for an open in the wires (IGP lines):
1. Disconnect the fuel injectors and IAC valve connectors.
2. Turn the ignition switch ON (II).
3. Measure voltage between body ground and ECM/PCM connector terminals A11 and A24 individually.

Is there battery voltage?

NO → **— Repair open in the wire(s) between ECM/PCM (A11, A24) and PGM-FI main relay.**
— Check for poor connections or loose wires at the PGM-FI main relay.
— Test the PGM-FI main relay (see page 11-118).

YES

Check for an open in the wires (LG lines):
1. Reconnect all sensor connectors.
2. Reconnect the ECM/PCM connector D (16P).
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and ECM/PCM connector terminals A9 and A22 individually.

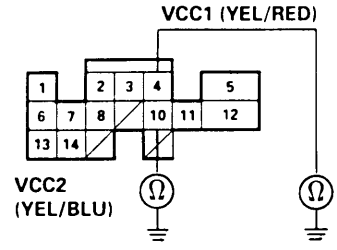
Is there less than 1.0 V?

NO → **Repair open in the wire(s) between ECM/PCM (A9, A22) and G101 that had more than 1.0 V.**

YES

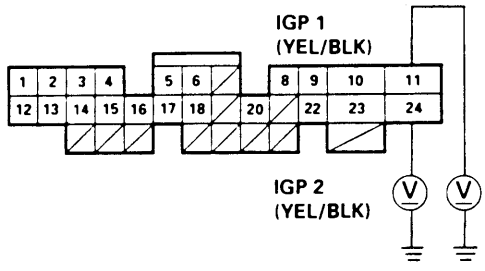
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

ECM/PCM CONNECTOR D (16P)

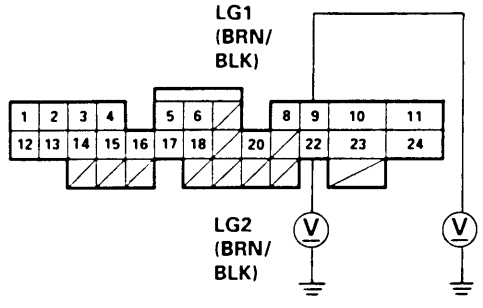


Wire side of female terminals

ECM/PCM CONNECTOR A (32P)

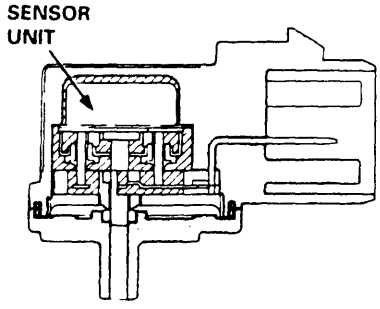


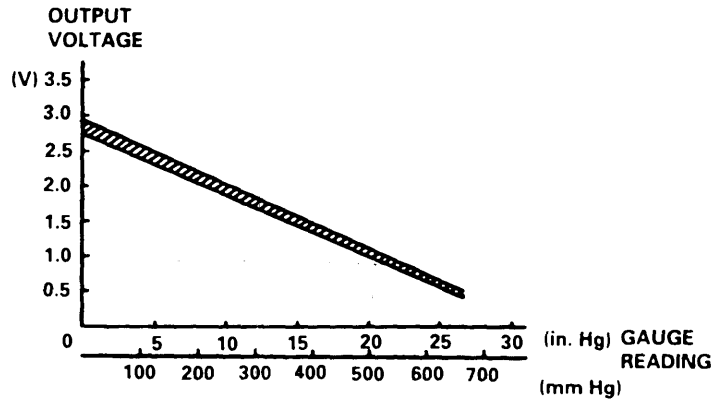
Wire side of female terminals



Manifold Absolute Pressure (MAP) Sensor

The MAP sensor converts manifold absolute pressure into electrical signals and inputs the ECM/PCM.





P0107 The scan tool indicates Diagnostic Trouble Code (DTC) P0107: A low voltage (high vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

— The MIL has been reported on.
— DTC P0107 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the MAP with the scan tool.

Is approx. 0 kPa (0 mmHg, 0 in.Hg) indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C131 (MAP sensor) and ECM/PCM.**

YES

Check for an open or short in the MAP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the MAP sensor 3P connector.
3. Turn the ignition switch ON (II).
4. Check the MAP with the scan tool.

Is approx. 0 kPa (0 mmHg, 0 in.Hg) indicated?

NO → **Replace the MAP sensor.**

YES

Check for an open in wire (VCC1 line):
Measure voltage between the MAP sensor connector No. 1 terminal and No. 2 terminal

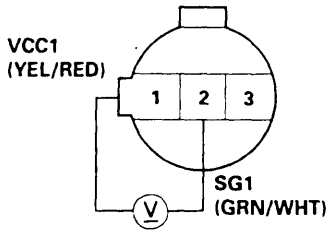
Is there approx. 5 V?

NO → **Repair open in the wire between ECM/PCM (D4) and MAP sensor.**

YES

(To page 11-49)

MAP SENSOR 3P CONNECTOR (C131)



Wire side of female terminals

(From page 11-48)

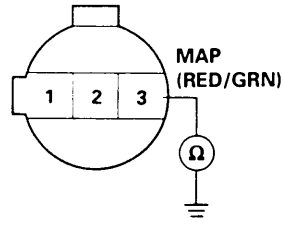
Check for a short in the wire (MAP line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector D (16P).
3. Check for continuity between the MAP sensor connector No. 3 terminal and body ground.

Is there continuity?

YES → **Repair short in the wire between ECM/PCM (D3) and MAP sensor.**

NO → **Substitute a known-good ECM/PCM and recheck. If normal MAP is indicated, replace the original ECM/PCM.**

MAP SENSOR 3P CONNECTOR (C131)



Wire side of female terminals

(cont'd)

Manifold Absolute Pressure (MAP) Sensor (cont'd)

P0108 The scan tool indicates Diagnostic Trouble Code (DTC) P0108: A high voltage (low vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

— The MIL has been reported on.
— DTC P0108 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.
2. Check the MAP with the scan tool.

Is 101 kPa (760 mmHg, 30.0 in.Hg) or higher indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C131 (MAP sensor) and ECM/PCM.**

YES

Check for an open in the MAP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the MAP sensor 3P connector.
3. Install a jumper wire between the MAP sensor 3P connector terminals No. 3 and No. 2.
4. Turn the ignition switch ON (II).
5. Check the MAP with the scan tool.

Is 101 kPa (760 mmHg, 30.0 in.Hg) or higher indicated?

NO → **Replace the MAP sensor.**

YES

Check for an open in the wire (SG1 line):
1. Remove the jumper wire.
2. Measure voltage between the MAP sensor 3P connector terminals No. 1 and No. 2.

Is there approx. 5 V?

NO → **Repair open in the wire between ECM/PCM (D12) and MAP sensor.**

YES

Check for an open in the wire (MAP line):
1. Turn the ignition switch OFF.
2. Install a jumper wire on the ECM/PCM connectors between D3 and D12.
3. Turn the ignition switch ON (II).
4. Check the MAP with the scan tool.

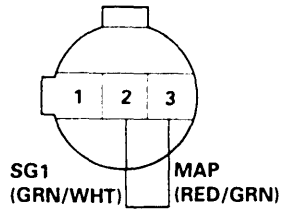
Is 101 kPa (760 mmHg, 30.0 in.Hg) or higher indicated?

NO → **Repair open in the wires between ECM/PCM (D3) and MAP sensor.**

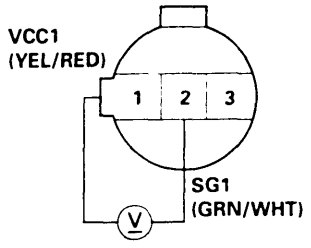
YES

Substitute a known-good ECM/PCM and recheck. If normal MAP is indicated, replace the original ECM/PCM.

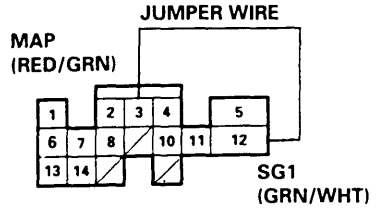
MAP SENSOR 3P CONNECTOR (C131)



Wire side of female terminals

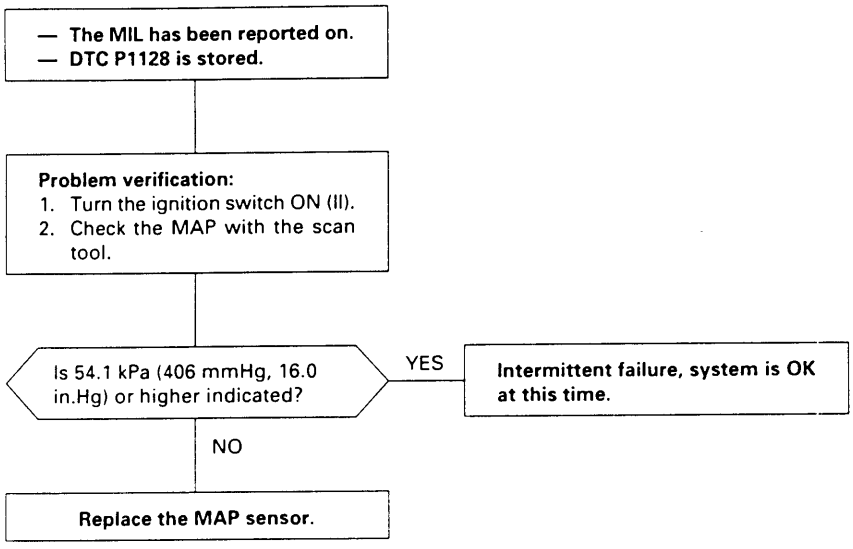


ECM/PCM CONNECTOR D (16P)



Wire side of female terminals

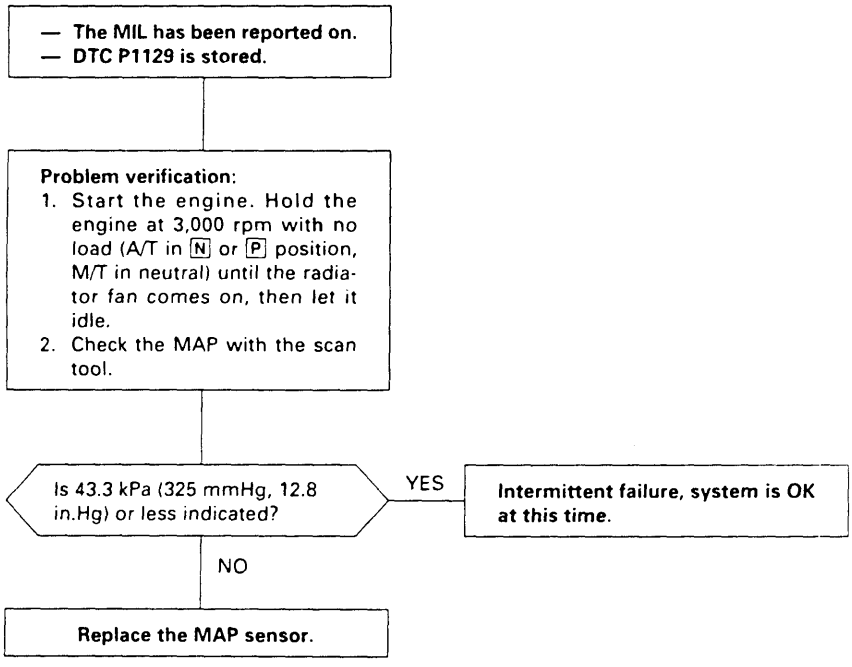
P1128 The scan tool indicates Diagnostic Trouble Code (DTC) P1128: Manifold Absolute Pressure (MAP) lower than expected.



(cont'd)

Manifold Absolute Pressure (MAP) Sensor (cont'd)

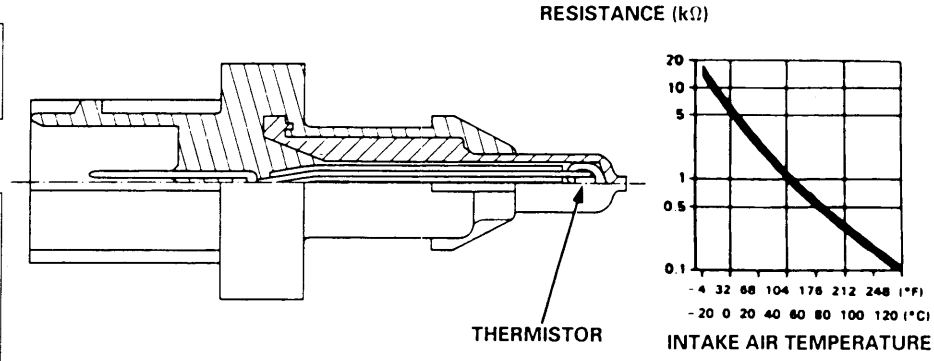
P1129 The scan tool indicates Diagnostic Trouble Code (DTC) P1129: Manifold Absolute Pressure (MAP) higher than expected.



Intake Air Temperature (IAT) Sensor

P0111 The scan tool indicates Diagnostic Trouble Code (DTC) P0111: A range/performance problem in the Intake Air Temperature (IAT) Sensor circuit.

The IAT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases as shown below.



— **The MIL has been reported on.**
— **DTC P0111 is stored.**
— **Or from Probable Cause List.**

Problem verification:
1. Turn the ignition switch OFF.
2. Disconnect the IAT sensor 2P connector.
3. Remove the IAT sensor.
4. Reconnect the IAT sensor 2P connector.
5. Leave the IAT sensor exposed to ambient temperature.
6. Turn the ignition switch ON (II).
7. Check the IAT with the scan tool.

Is ambient temperature indicated? NO → **Replace the IAT sensor.**

YES

Check the IAT sensor output:
1. Warm the IAT sensor with a hair dryer.
2. Check the IAT with the scan tool.

Did the IAT rise 2°F (1°C) or more from the ambient temperature? YES → **Intermittent failure, system is OK at this time.**

NO

Replace the IAT sensor.

(cont'd)

Intake Air Temperature (IAT) Sensor (cont'd)

P0112 The scan tool indicates Diagnostic Trouble Code (DTC) P0112: A low voltage (high temperature) problem in the Intake Air Temperature (IAT) sensor circuit.

— The MIL has been reported on.
— DTC P0112 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

Is 302°F (150°C) or higher indicated?

NO → Is the correct ambient temperature indicated*? NO → **Replace the IAT sensor.**

*: If the engine is warm, it will be higher than ambient temperature.

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C129 (IAT sensor) and ECM/PCM.**

YES →

Check for a short in the IAT sensor:
1. Disconnect the IAT sensor 2P connector.
2. Check the IAT with the scan tool.

Is 302°F (150°C) or higher indicated?

NO → **Replace the IAT sensor.**

YES →

Check for a short in the wire (IAT line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector D (16P).
3. Check for continuity between the IAT sensor 2P connector terminal No. 2 and body ground.

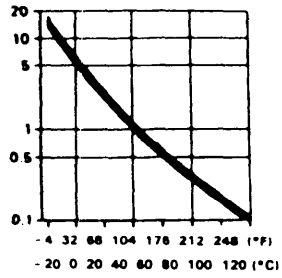
Is there continuity?

YES → **Repair short in the wire between ECM/PCM (D8) and IAT sensor.**

NO →

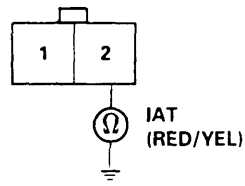
Substitute a known-good ECM/PCM and recheck. If normal IAT is indicated, replace the original ECM/PCM.

RESISTANCE (kΩ)



INTAKE AIR TEMPERATURE

IAT SENSOR 2P CONNECTOR (C129)



Wire side of female terminals

P0113 The scan tool indicates Diagnostic Trouble Code (DTC) P0113: A high voltage (low temperature) problem in the Intake Air Temperature (IAT) sensor circuit.

— The MIL has been reported on.
— DTC P0113 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the IAT with the scan tool.

Is −4°F (−20°C) or less indicated? NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C129 (IAT sensor) and ECM/PCM.**

YES

Check for an open in the IAT sensor:
1. Disconnect the IAT sensor 2P connector.
2. Connect the IAT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.
3. Check the intake air temperature with the scan tool.

Is −4°F (−20°C) or less indicated? NO → **Replace the IAT sensor.**

YES

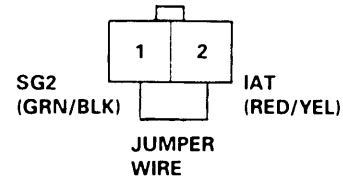
Check for an open in the wires (IAT, SG2 lines):
1. Turn the ignition switch OFF.
2. Connect ECM/PCM connector terminals D8 and D11 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the IAT with the scan tool.

Is −4°F (−20°C) or less indicated? NO → **Repair open in the wires between ECM/PCM (D8, D11) and IAT sensor.**

YES

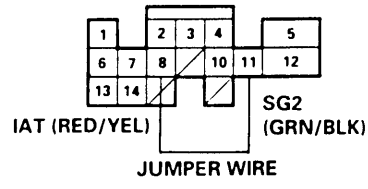
Substitute a known-good ECM/PCM and recheck. If normal IAT is indicated, replace the original ECM/PCM.

IAT SENSOR 2P CONNECTOR (C129)



Wire side of female terminals

ECM/PCM CONNECTOR D (16P)

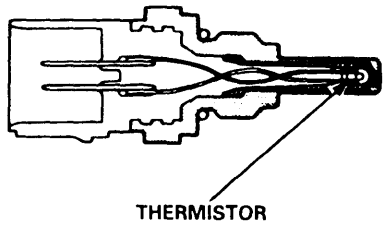


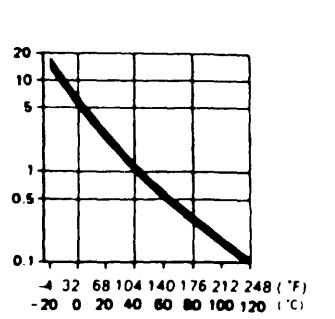
Wire side of female terminals

Engine Coolant Temperature (ECT) Sensor

P0116 The scan tool indicates Diagnostic Trouble Code (DTC) P0116: A range/performance problem in the Engine Coolant Temperature (ECT) Sensor circuit.

The ECT Sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below.





NOTE: If DTC P0117 and/or P0118 are stored at the same time as DTC P0116, troubleshoot those DTCs first, then troubleshoot DTC P0116.

Possible Cause

- ECT sensor deterioration
- Malfunction in the cooling system

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0116 is stored.

↓

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in N or P position, M/T in neutral) until the radiator fan comes on, then let it idle.
2. With the scan tool, check the ECT.

↓

Is 176 – 200°F (80 – 93°C) indicated?

YES → **Intermittent failure, system is OK at this time. Check the cooling system.**

NO ↓

Check the cooling system. If the cooling system is OK, replace the ECT sensor.

P0117 The scan tool indicates Diagnostic Trouble Code (DTC) P0117: A low voltage (high temperature) problem in the Engine Coolant Temperature (ECT) sensor circuit.

— The MIL has been reported on.
— DTC P0117 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

Is 302°F (150°C) or higher indicated? — NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C112 (ECT sensor) and ECM/PCM.**

YES

Check for a short in the ECT sensor:
1. Disconnect the ECT sensor 2P connector.
2. Check the ECT with the scan tool.

Is 302°F (150°C) or higher indicated? — NO → **Replace the ECT sensor.**

YES

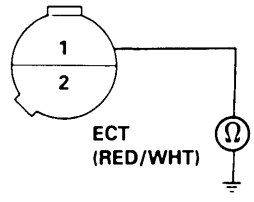
Check for a short in the wire (ECT line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector D (16P).
3. Check for continuity between the ECT sensor 2P connector terminal No. 1 and body ground.

Is there continuity? — YES → **Repair short in the wire between ECM/PCM (D2) and ECT sensor.**

NO

Substitute a known-good ECM/PCM and recheck. If normal ECT is indicated, replace the original ECM/PCM.

ECT SENSOR 2P CONNECTOR (C112)



Wire side of female terminals

(cont'd)

Engine Coolant Temperature (ECT) Sensor (cont'd)

P0118 The scan tool indicates Diagnostic Trouble Code (DTC) P0118: A high voltage (low temperature) problem in the Engine Coolant Temperature (ECT) sensor circuit.

— The MIL has been reported on.
— DTC P0118 is stored.

Problem verification:
1. Turn the ignition switch ON (II).
2. Check the ECT with the scan tool.

Is −4°F (−20°C) or less indicated? NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C112 (ECT sensor) and ECM/PCM.**

YES

Check for an open in the ECT sensor:
1. Disconnect the ECT sensor 2P connector.
2. Connect the ECT sensor 2P connector terminals No. 1 and No. 2 with a jumper wire.
3. Check the ECT with the scan tool.

Is −4°F (−20°C) or less indicated? NO → **Replace the ECT sensor.**

YES

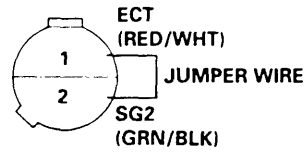
Check for an open in the wires (ECT, SG2 lines):
1. Turn the ignition switch OFF.
2. Connect ECM/PCM connector terminals D2 and D11 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the ECT with the scan tool.

Is −4°F (−20°C) or less indicated? NO → **Repair open in the wires between ECM/PCM (D2, D11) and ECT sensor.**

YES

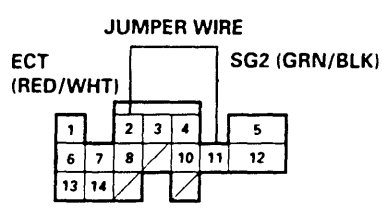
Substitute a known-good ECM/PCM and recheck. If normal ECT is indicated, replace the original ECM/PCM.

ECT SENSOR 2P CONNECTOR (C112)



Wire side of female terminals

ECM/PCM CONNECTOR D (16P)



Wire side of female terminals

Throttle Position (TP) Sensor

P0122 The scan tool indicates Diagnostic Trouble Code (DTC) P0122: A low voltage problem in the Throttle Position (TP) sensor circuit.

The TP Sensor is a potentiometer. It is connected to the throttle valve shaft. As the throttle position changes, the throttle position sensor varies the voltage signal to the ECM/PCM.

— The MIL has been reported on.
— DTC P0122 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in N or P position, M/T in neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

Is there approx. 10% when the throttle is fully closed and approx. 90% when the throttle is fully opened?

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C130 (TP sensor) and ECM/PCM.**

NO

Check for an open in the wire (VCC2 line):
1. Turn the ignition switch OFF.
2. Disconnect the TP sensor 3P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between the TP sensor 3P connector terminals No. 1 and No. 3.

Is there approx. 5 V?

NO → **Check for an open in wire (VCC2 line):**
Measure voltage between ECM/PCM connector terminals D10 and D11.

Is there approx. 5 V?

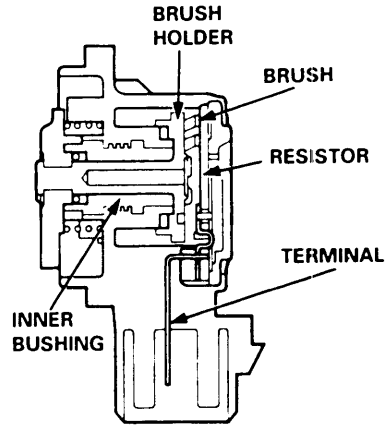
YES → **Repair open in the wire between ECM/PCM (D10) and TP sensor.**

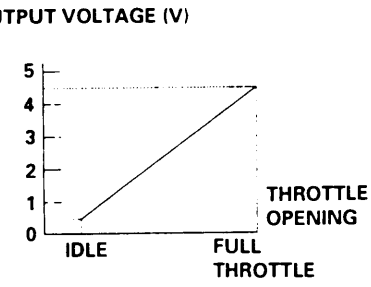
NO → **Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.**

YES

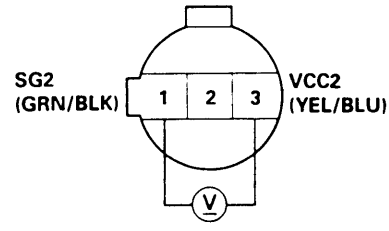
Check for an open or short in TP sensor:
1. Turn the ignition switch OFF.
2. At the sensor side, measure resistance between the TP sensor terminals No. 1 and No. 2 with the throttle fully closed.

(To page 11-60)



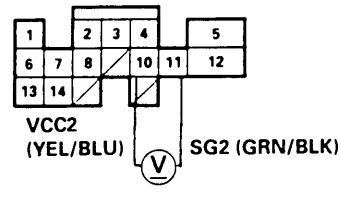


TP SENSOR 3P CONNECTOR (C130)

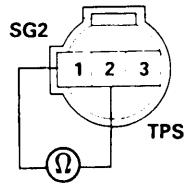


Wire side of female terminals

ECM/PCM CONNECTOR D (16P)



Wire side of female terminals



Terminal side of male terminals

(cont'd)

Throttle Position (TP) Sensor (cont'd)

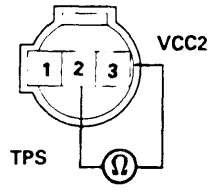
(From page 11-59)

Is there approx. 0.5 – 0.9 kΩ?
- NO → **Replace the throttle body.**
- YES → **Check for an open or short in the TP sensor:** Measure resistance between the TP sensor terminnals No. 2 and No. 3 with the throttle fully closed.

Is there approx. 3.6 – 5.4 kΩ?
- NO → **Replace the throttle body.**
- YES → **Check for an open in the ECM/PCM (TPS line):**
  1. Reconnect the TP sensor 3P connector.
  2. Turn the ignition switch ON (II).
  3. Measure voltage between D1 terminal and D11 terminal on the ECM/PCM connector.

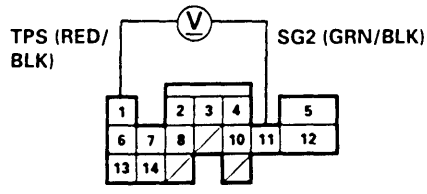
Is there approx. 0.5 V when the throttle is fully closed and approx. 4.5 V when the throttle is fully opened?
- YES → **Repair short in the wire between ECM/PCM (D1) and TP sensor.**
- NO → **Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.**

TP SENSOR 3P CONNECTOR



Terminal side of male terminals

ECM/PCM CONNECTOR D (16P)



Wire side of female terminals

P0123 The scan tool indicates Diagnostic Trouble Code (DTC) P0123: A high voltage problem in the Throttle Position (TP) sensor circuit.

— The MIL has been reported on.
— DTC P0123 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then turn the ignition switch OFF.
2. Turn the ignition switch ON (II).
3. Check the throttle position with the scan tool.

Is there approx. 10% when the throttle is fully closed and approx. 90% when the throttle is fully opened?

YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C130 (TP sensor) and ECM/PCM.**

NO

Check for an open in the TP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the TP sensor 3P connector.
3. Turn the ignition switch ON (II).
4. At the harness side, measure voltage between the TP sensor 3P connecter terminals No. 1 and No. 3.

Is there approx. 5 V?

YES → **Replace the throttle body.**

NO

Check for an open in the wire (SG2 line):
Measure voltage between ECM/PCM connector terminals D10 and D11.

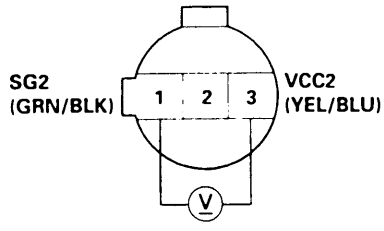
Is there approx. 5 V?

YES → **Repair open in the wire between ECM/PCM (D11) and TP sensor.**

NO

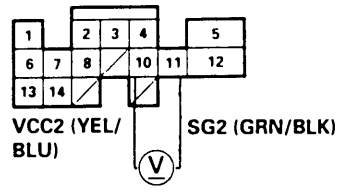
Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.

TP SENSOR 3P CONNECTOR (C130)



Wire side of female terminals

ECM/PCM CONNECTOR D (16P)

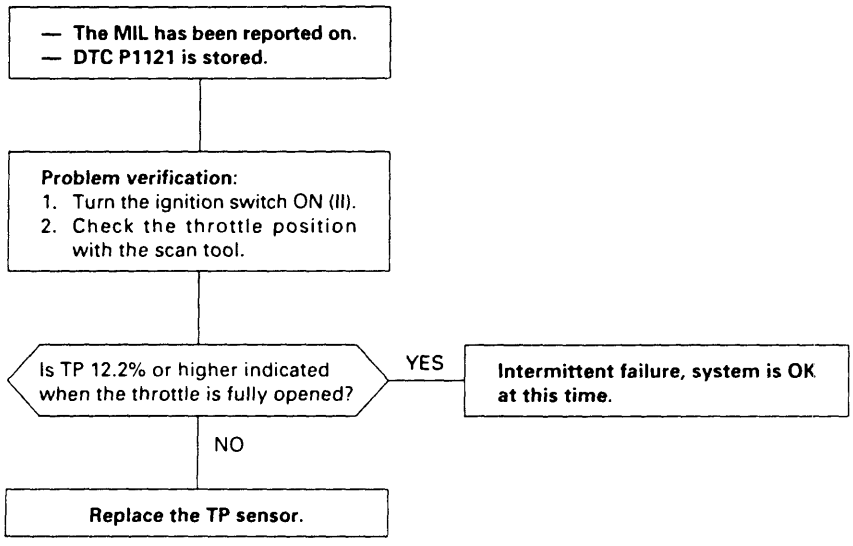


Wire side of female terminals

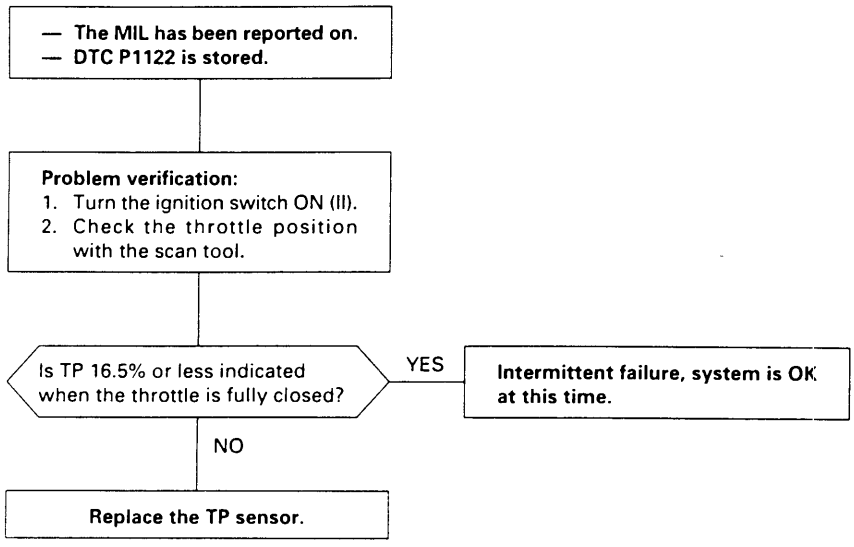
(cont'd)

Throttle Position (TP) Sensor (cont'd)

P1121 The scan tool indicates Diagnostic Trouble Code (DTC) P1121: Throttle Position (TP) lower than expected.

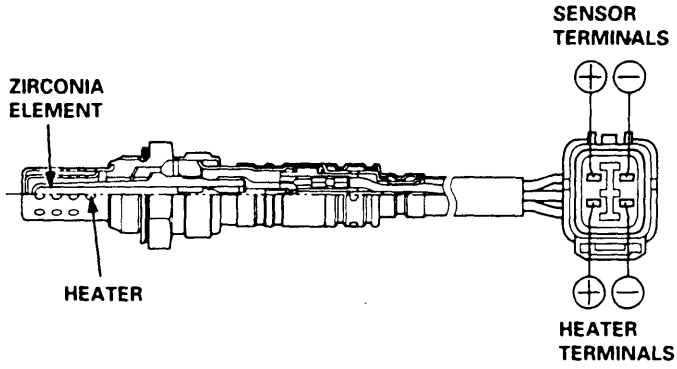


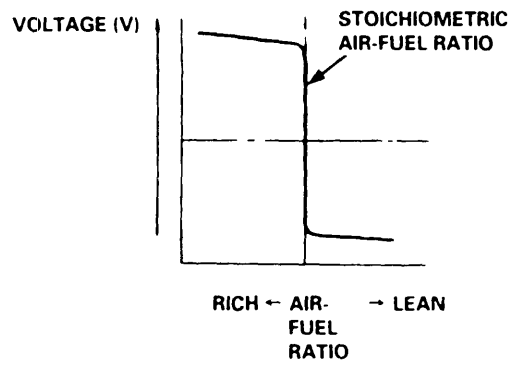
P1122 The scan tool indicates Diagnostic Trouble Code (DTC) P1122: Throttle Position (TP) higher than expected.



Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1)

The Heated Oxygen Sensor (HO2S) detects the oxygen content in the exhaust gas and signals the ECM/PCM. In operation, the ECM/PCM receives the signals from the sensor and varies the duration during which fuel is injected. To stabilize the sensor's output, the sensor has an internal heater. The Primary HO2S (Sensor 1) is installed in the exhaust manifold.





P0131 The scan tool indicates Diagnostic Trouble Code (DTC) P0131: A low voltage problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.

— The MIL has been reported on.
— DTC P0131 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in N or P position, M/T in neutral) until the radiator fan comes on.
3. Test-drive with the A/T in 2 position (M/T in 4th gear)
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool during acceleration using wide open throttle.

Does the voltage stay at 0.1 V or less?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C113 (Primary HO2S, sensor 1) and ECM/PCM.**

YES

Check the fuel pressure.

Is it normal?

NO → **Repair fuel supply system.**

YES

(To page 11-65)

(From page 11-64)

Check for a short in the Primary HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S (Sensor 1) 4P connector.
3. Start the engine and let it idle.
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

Does it stay at 0.1 V or less?

NO → **Replace the Primary HO2S (Sensor 1) (see page 11-89).**

YES

Check for a short in the wire (PHO2S line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector D (16P).
3. Check for continuity between the Primary HO2S (Sensor 1) 4P connector terminal No. 1 and body ground.

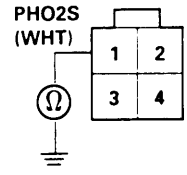
Is there continuity?

YES → **Repair short in the wire between ECM/PCM (D7) and Primary HO2S (Sensor 1).**

NO

Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

PRIMARY HO2S (Sensor 1) 4P CONNECTOR (C113)



Wire side of female terminals

(cont'd)

Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) (cont'd)

P0132 The scan tool indicates Diagnostic Trouble Code (DTC) P0132: A high voltage problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

— The MIL has been reported on.
— DTC P0132 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on.
3. Test-drive with the A/T in [2] position (M/T in 4th gear).
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool during deceleration using completely closed throttle.

Does the voltage stay at 1.0 V or more?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C113 (Primary HO2S, Sensor 1) and ECM/PCM.**

YES

Check for an open in the Primary HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Primary HO2S (Sensor 1) 4P connector.
3. Connect the Primary HO2S (Sensor 1) 4P connector terminals No. 1 and No. 2 with a jumper wire.
4. Turn the ignition switch ON (II).
5. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

Is there 1.0 V or more?

NO → **Replace the Primary HO2S (Sensor 1) (see page 11-89).**

YES

Check for an open in the wires (PHO2S, SG2 line):
1. Turn the ignition switch OFF.
2. Connect ECM/PCM connector terminals D7 and D11 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the Primary HO2S (Sensor 1) output voltage with the scan tool.

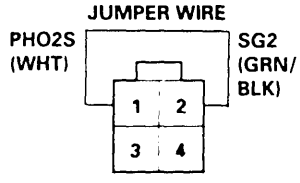
Is there 1.0 V or more?

NO → **Repair open in the wire between ECM/PCM (D7, D11) and Primary HO2S (Sensor 1).**

YES

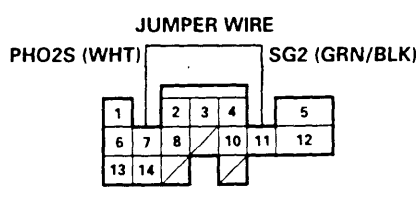
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

PRIMARY HO2S (Sensor 1) 4P CONNECTOR



Wire side of female terminals

ECM/PCM CONNECTOR D (16P)



Wire side of female terminals

P0133 The scan tool indicates Diagnostic Trouble Code (DTC) P0133: A slow response problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) circuit.

Description

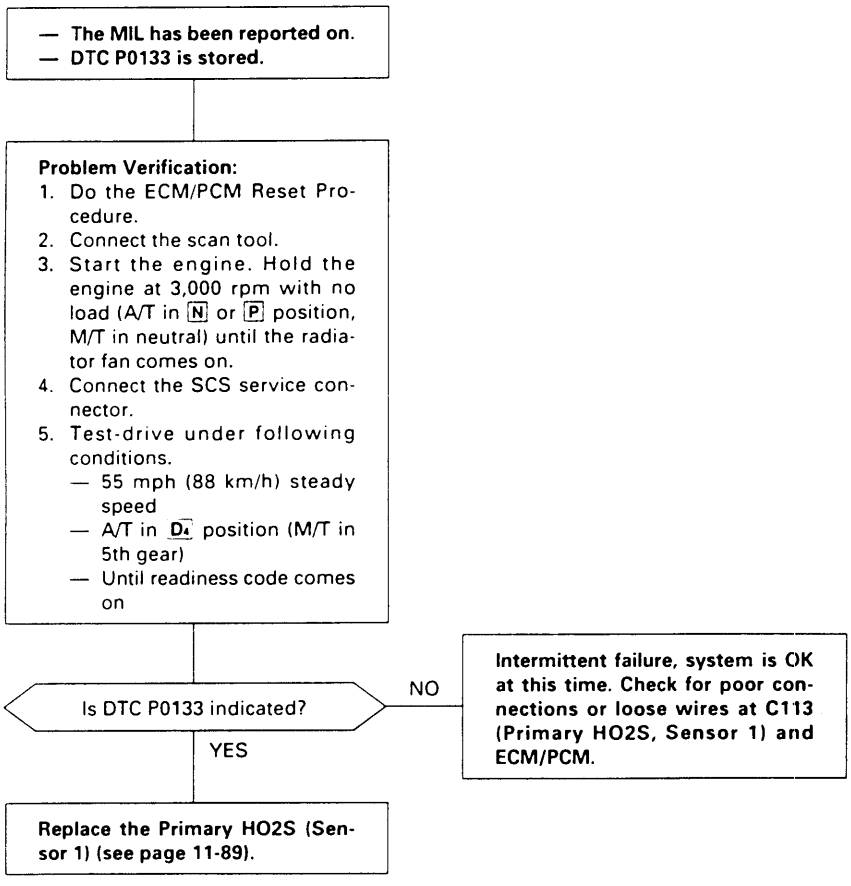
By controlling the air/fuel ratio with a Primary HO2S (Sensor 1) and a Secondary HO2S (Sensor 2), the deterioration of the Primary HO2S (Sensor 1) can be evaluated by its feedback period. When the feedback period of the HO2S exceeds a certain value during stable driving conditions, the sensor will be judged as deteriorated.
When deterioration has been detected during two consecutive trips, the MIL comes on and DTC P0133 will be stored.

NOTE: If DTC P0131, P0132 and/or P0135 are stored at the same time as DTC P0133, troubleshoot those DTCs first, then troubleshoot DTC P0133.

Possible Cause

- Primary HO2S (Sensor 1) Deterioration
- Primary HO2S Heater (Sensor 1) Deterioration
- Exhaust system leakage

Troubleshooting Flowchart



Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2)

P0137 The scan tool indicates Diagnostic Trouble Code (DTC) P0137: A low voltage problem in the Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) circuit.

— The MIL has been reported on.
— DTC P0137 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in N or P position, M/T in neutral) until the radiator fan comes on.
3. With the scan tool, check the Secondary HO2S (Sensor 2) output voltage at 3,000 rpm.

Does the voltage stay at 0.3 V or less?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C128 (located under right side of dash), C430 (located under middle of dash), C782 (Secondary HO2S) (Sensor 2) and ECM/PCM.**

YES

Check for a short in the Secondary HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Secondary HO2S (Sensor 2) 4P connector.
3. Start the engine.
4. Check the Secondary HO2S (Sensor 2) output with the scan tool.

Does the voltage stay at 0.3 V or less?

NO → **Replace the Secondary HO2S (Sensor 2) (see page 11-89).**

YES

Check for a short in the wire (SHO2S line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector D (16P).
3. Check for continuity between the Secondary HO2S (Sensor 2) 4P connector terminal No. 1 and body ground.

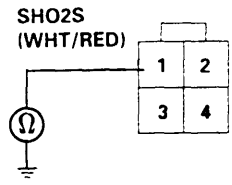
Is there continuity?

YES → **Repair short in the wire between ECM/PCM (D14) and Secondary HO2S (Sensor 2).**

NO

Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

SECONDARY HO2S (Sensor 2) 4P CONNECTOR (C782)



Wire side of female terminals

P0138 The scan tool indicates Diagnostic Trouble Code (DTC) P0138: A high voltage problem in the Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) circuit.

— The MIL has been reported on.
— DTC P0138 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on.
3. With the scan tool, check the Secondary HO2S (Sensor 2) output voltage at 3,000 rpm.

Does the voltage stay at 0.6 V or more?

NO — **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C123 (located under right side of dash), C430 (located under middle of dash), C782 (Secondary HO2S, Sensor 2) and ECM/PCM.**

YES

Check for an open in the Secondary HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the Secondary HO2S (Sensor 2) 4P connector.
3. Connect the Secondary HO2S (Sensor 2) 4P connector terminals No. 1 and No. 2 with a jumper wire.
4. Turn the ignition switch ON (II).
5. Check the Secondary HO2S (Sensor 2) output voltage with the scan tool.

Is there 0.6 V or more?

NO — **Replace the Secondary HO2S (Sensor 2) (see page 11-89).**

YES

Check for an open in the wire (SHO2S, SHO2SG lines):
1. Turn the ignition switch OFF.
2. Connect ECM/PCM connector terminals D14 and D13 with a jumper wire.
3. Turn the ignition switch ON (II).
4. Check the Secondary HO2S (Sensor 2) output voltage with the scan tool.

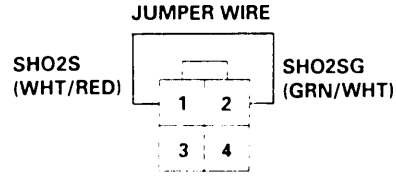
Is there 0.6 V or more?

NO — **Repair open in the wire between ECM/PCM (D13 and/or D14) and Secondary HO2S (Sensor 2).**

YES

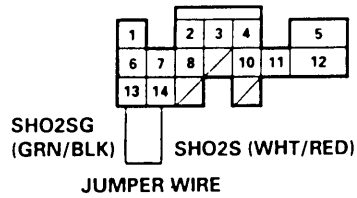
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

SECONDARY HO2S (Sensor 2) 4P CONNECTOR C782



Wire side of female terminals

ECM/PCM CONNECTOR D (16P)

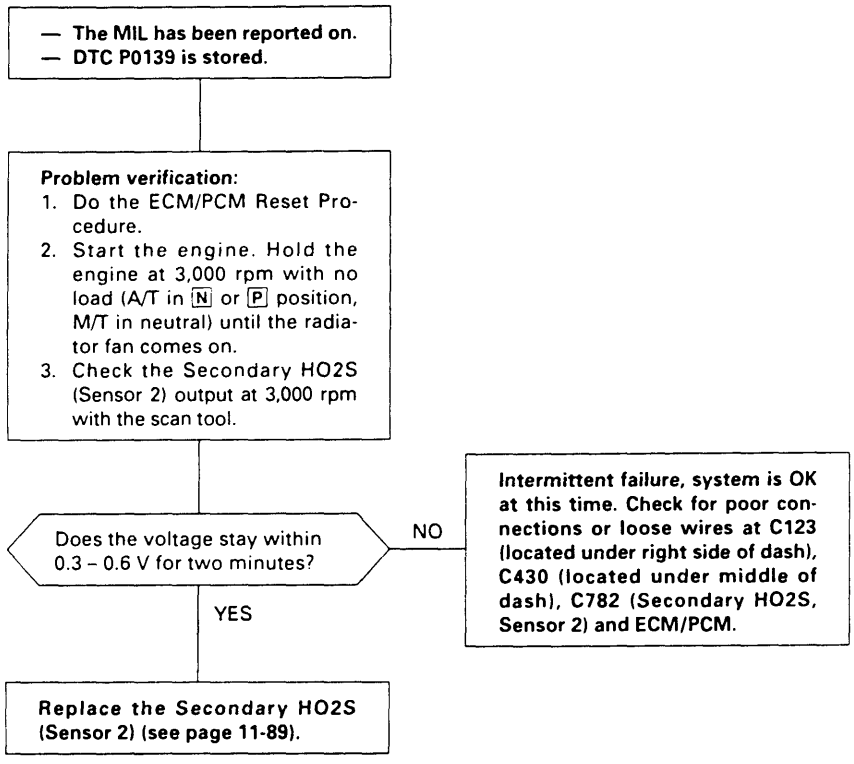


Wire side of female terminals

(cont'd)

Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) (cont'd)

P0139 The scan tool indicates Diagnostic Trouble Code (DTC) P0139: A slow response problem in the Secondary Heated Oxygen Sensor (HO2S) (Sensor 2) circuit.



Heated Oxygen Sensor (HO2S) Heater

P0135 The scan tool indicates Diagnostic Trouble Code (DTC) P0135: An electrical problem in the Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) Heater system.

P0141 The scan tool indicates Diagnostic Trouble Code (DTC) P0141: A problem in the Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2) Heater circuit.

— The MIL has been reported on.
— DTC P0135, and/or P0141 are stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine.

Is DTC P0135 or P0141 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C123 (located under right side of dash), C430 (located under middle of dash), C113 (Primary HO2S, Sensor 1), C782 (Secondary HO2S, Sensor 2)* and ECM/PCM.**

YES

Check for an open or short in the HO2S:
1. Turn the ignition switch OFF.
2. Disconnect the HO2S (Primary or Secondary*) (Sensor 1 or Sensor 2*) 4P connector.
3. At the HO2S side, measure resistance between the HO2S 4P connector terminals No.3 and No. 4.

Is there 10 – 40 Ω?

NO → **Replace the HO2S (Primary or Secondary*) (see page11-89).**

YES

Check for continuity between body ground and the HO2S 4P connector terminals No. 3 and No. 4 individually.

Is there continuity?

YES → **Replace the HO2S (Primary or Secondary*) (see page11-89).**

NO

Check for an open or short in the wire (PO2SHTC, SO2SHTC* line):
1. Turn the ignition switch ON (II).
2. At the harness side, measure voltage between the HO2S 4P connector terminals No. 3 and No. 4.

Is there battery voltage?

YES → (B)

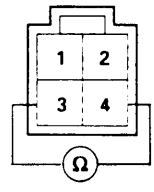
NO → (A)

(To page 11-72)

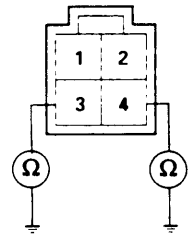
*: P0141

(To page 11-72)

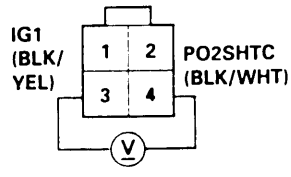
PRIMARY HO2S (Sensor 1) 4P CONNECTOR
SECONDARY HO2S (Sensor 2) 4P CONNECTOR*



Terminal side of male terminals

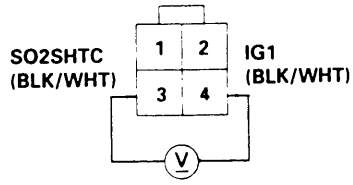


PRIMARY HO2S (SENSOR 1) 4P CONNECTOR (C113)



Wire side of female terminals

SECONDARY HO2S (SENSOR 2)
4P CONNECTOR (C782)*



Wire side of female terminals

(cont'd)

Heated Oxygen Sensor (HO2S) Heater (cont'd)

(From page 11-71)

A

Check for an open or short in the wire (IG1 line):
Measure voltage between the HO2S 4P connector terminals No. 3 (No. 4*) and body ground.

Is there battery voltage?

NO

- **Repair open or short in the wire between Primary HO2S (Sensor 1), No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse and Secondary HO2S (Sensor 2)*.**
- **Replace the No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse.**

YES

Check for an open in the wire (PO2SHTC, SO2SHTC* line):
1. Turn the ignition switch OFF.
2. Reconnect the HO2S 4P connector.
3. Disconnect the ECM/PCM connector A (32P).
4. Turn the ignition switch ON (II).
5. Measure voltage between the ECM/PCM connector terminals A6 and A10 (A5 and A10)*.

Is there 0.1 V or less?

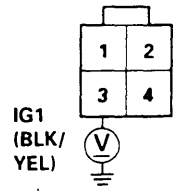
YES

Repair open in the wire between ECM/PCM (A6, A5*) and HO2S (Primary, Secondary*).

NO

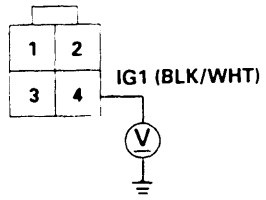
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

PRIMARY HO2S (SENSOR 1) 4P CONNECTOR (C113)



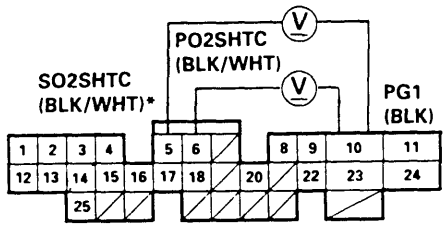
Wire side of female terminals

SECONDARY HO2S (SENSOR 2) 4P CONNECTOR (C782)*



Wire side of female terminals

ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

(From page 11-71)

B

Check for a short in the wire (PO2SHTC, SO2SHTC* line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector A (32P).
3. Check for continuity between the ECM/PCM connector terminal A6 (A5)* and body ground.

Is there continuity?

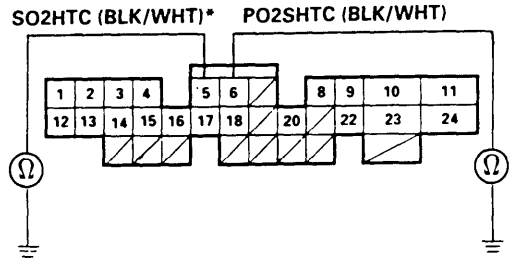
YES

Repair short in the wire between ECM/PCM (A6, A5*) and HO2S (Primary, Secondary*).

NO

Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

SO2HTC (BLK/WHT)* PO2SHTC (BLK/WHT)



*: P0141

Fuel Supply System

P0171 The scan tool indicates Diagnostic Trouble Code (DTC) P0171: The fuel system is too lean.

P0172 The scan tool indicates Diagnostic Trouble Code (DTC) P0172: The fuel system is too rich.

Description

By monitoring the Long Term Fuel Trim, long term malfunctions in the fuel system will be detected.
If a malfunction has been detected during two consecutive trips, the MIL will come on and DTC P0171 and/or P0172 will be stored.

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 troubleshoot DTC P0171 and/or P0172.

P0107-8, P1128-9: MAP Sensor
P0135: Primary HO2S Heater
P0137-8: Secondary HO2S
P0141: Secondary HO2S Heater
P0441: EVAP System Insufficient Purge Flow
P1259: VTEC System

Possible Cause

DTC P0171
System too lean

- Fuel Pump insufficient flow/pressure
- Fuel Feed Line clogged, leaking
- Fuel Pressure Regulator stuck open
- Fuel Filter clogged
- Fuel Injector clogged, air inclusion
- Gasoline doesn't meet Owner's Manual spec.
- Primary HO2S (Sensor 1) deteriorated
- MAP Sensor range/performance
- Valve Clearance
- Exhaust leak

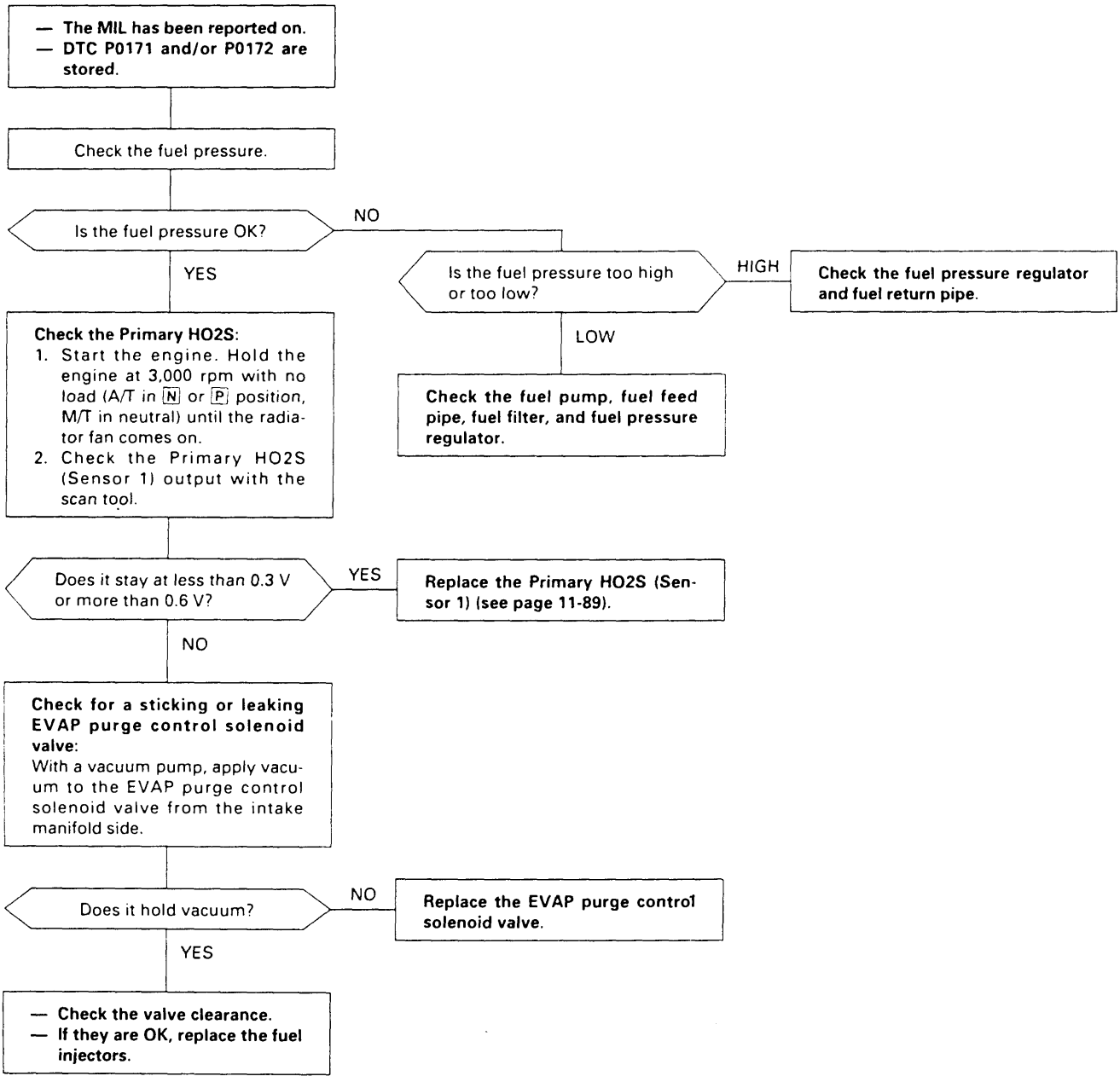
DTC P0172
System too rich

- Fuel Pressure Regulator clogged, stuck closed
- Fuel Return Pipe clogged
- Fuel Injector leaking
- Gasoline doesn't meet Owner's Manual spec.
- Primary HO2S (Sensor 1) deteriorated
- MAP Sensor range/performance
- EVAP Purge Control Solenoid Valve leaking, stuck opened
- Valve Clearance

(cont'd)

Fuel Supply System (cont'd)

Troubleshooting Flowchart



Misfire Detected in One Cylinder

P0301 The scan tool indicates Diagnostic Trouble Code (DTC) P0301: Cylinder 1 misfire detected.

P0302 The scan tool indicates Diagnostic Trouble Code (DTC) P0302: Cylinder 2 misfire detected.

P0303 The scan tool indicates Diagnostic Trouble Code (DTC) P0303: Cylinder 3 misfire detected.

P0304 The scan tool indicates Diagnostic Trouble Code (DTC) P0304: Cylinder 4 misfire detected.

Description

Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft speed fluctuation (CKF) sensor which is attached to the crankshaft.

If misfiring strong enough to damage the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P0301, P0302, P0303 and/or P0304 will be stored. Then, after the misfire has ceased, the MIL will come on.

If misfiring that increases emissions is detected during two consecutive driving cycles, the MIL will come on, and DTC P0301, P0302, P0303 and/or P0304 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then troubleshoot the misfire DTC.

P0106: MAP sensor
P0171, P0172: Fuel supply system
P0335, P0336: CKF sensor
P0441: EVAP Insufficient purge flow
P1359, P1361, P1362: TDC sensor
P1381, P1382: CYP sensor

Possible Cause

- Fuel injector clogging, fuel leakage, air leakage
- Fuel injector circuit open or shorted
- Spark plug carbon deposits, fouling, malfunction
- Ignition wires open, leaking
- Distributor malfunction
- Compression low
- Valve clearance out of spec
- VTEC system malfunction

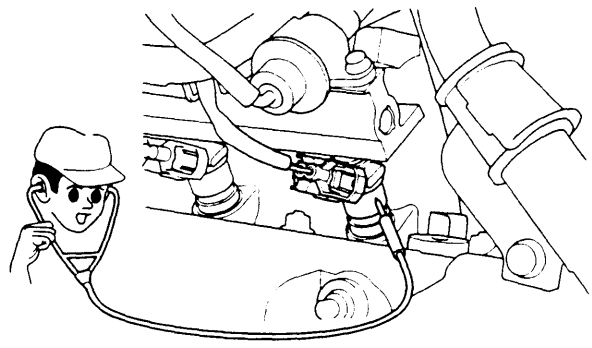
(cont'd)

Misfire in Detected One Cylinder (cont'd)

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0301, P0302, P0303, or P0304 is indicated.

Check the fuel injector function: Start the engine, and listen for a clicking sound at the fuel injector in the problem cylinder.



Does it click?

NO

Check for an open or short in the harness between ECM/PCM and the fuel injector.

Are the wires OK?

NO

Repair open or short in the wire.

YES

— Replace the fuel injector.
— Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

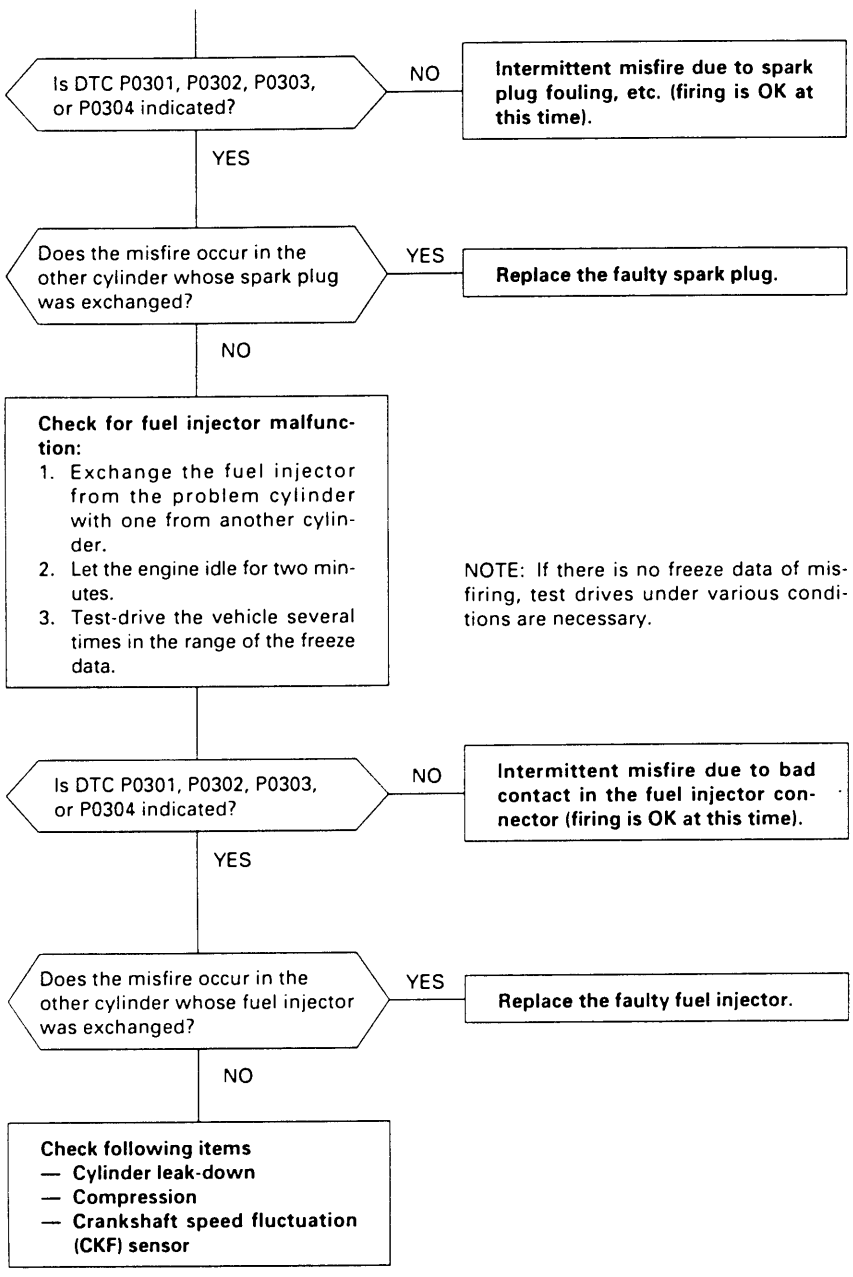
YES

Problem verification:
1. Check and record the freeze data, then do the ECM/PCM Reset Procedure.
2. Exchange the spark plug from the problem cylinder with one of another cylinder.
3. Connect the SCS service connector.
4. Test-drive the vehicle several times in the range of the freeze data.

NOTE:
- If there is no freeze data of misfiring, just clear the DTC.
- If there is no freeze data of misfiring, test drives under various conditions are necessary.

(To page 11-77)

(From page 11-76)



Random Misfire

P1300 or **P0301 through P0304** The scan tool indicates Diagnostic Trouble Code (DTC) P1300 or some of P0301 – P0304: Random misfire.

Description

Misfire detection is accomplished by monitoring the crankshaft speed with the crankshaft speed fluctuation (CKF) sensor which is attached to the crankshaft.

If misfiring strong enough to damage the catalyst is detected, the MIL will blink during the time of its occurrence, and DTC P1300 or some of DTCs P0301 through P0304 will be stored. Then, after misfire has ceased, the MIL will come on.

If misfiring that increases emissions is detected during two consecutive driving cycles, the MIL will come on, and DTC P1300 or some of DTCs P0301 through P0304 will be stored.

NOTE: If some of the DTCs listed below are stored at the same time as a misfire DTC, troubleshoot those DTCs first, then troubleshoot the misfire DTC.

P1128-9 MAP sensor
P0171, P0172: Fuel metering
P0505: Idle Control System
P1253: VTEC System
P1361, P1362: TDC sensor
P1381, P1382: CYP sensor
P1508: IAC valve

Possible Cause

- Fuel pump insufficient fuel pressure, amount of flow
- Fuel line clogging, blockage, leakage
- Fuel filter clogging
- Fuel pressure regulator stuck open
- Distributor malfunction
- Ignition coil wire open, leakage
- Ignition control module malfunction
- Valves carbon deposit
- Compression low
- VTEC system malfunction
- Fuel does not meet Owner's Manual spec., lack of fuel

Troubleshooting

By test-driving, determine the conditions during which misfire occurs. Depending on these conditions, test in the order described in the table below.

Possible cause / Page / Condition	Crankshaft position (CKP) sensor	Fuel pressure	Distributor and Ignition wires	ICM	Valve Clearance
	section 6	11-110	section 4	section 4	section 6
Only low rpm and load	②	①			②
Only accelerating		②	①	③	
Only high rpm and load	④	①	②	③	④
Not specific	④	①	②	③	④

NOTE: If misfire doesn't recur, some possible causes are fuel that doesn't meet owner's manual spec, lack of fuel, carbon deposits on spark plug, etc.

Knock Sensor (KS)

P0325 The scan tool indicates Diagnostic Trouble Code (DTC) P0325: A malfunction in the circuit of the Knock Sensor (KS).

— The MIL has been reported on.
— DTC P0325 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.
3. Hold the engine at 3,000 – 4,000 rpm for at least 60 seconds.

Is DTC P0325 indicated?
- NO → **Intermittent failure, system is OK at this time (test drive may be necessary).**
  Check for poor connections or loose wires between C105 (knock sensor (KS)) and ECM/PCM.
- YES ↓

Check for a short in the wire (KS line):
1. Turn the ignition switch OFF.
2. Disconnect the knock sensor 2P connector.
3. Disconnect the ECM/PCM connector D (16P).
4. Check for continuity between ECM/PCM connector terminals D6 and body ground.

Is there continuity?
- YES → **Repair short in the wire between ECM/PCM (D6) and knock sensor.**
- NO ↓

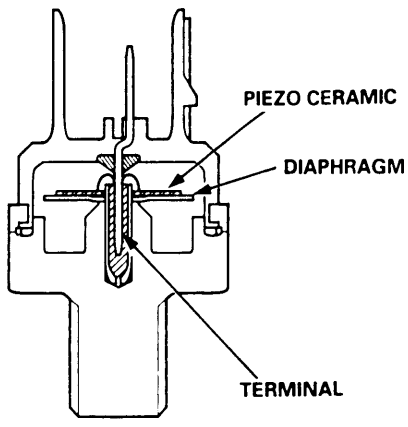
Check for an open in the wire (KS line):
Check for continuity between ECM/PCM connector terminal D6 and knock sensor 2P connector terminal No. 1.

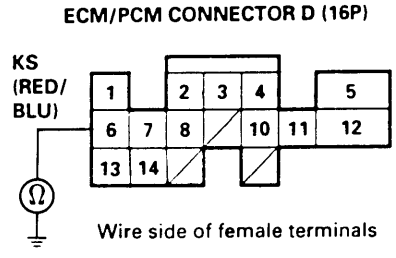
Is there continuity?
- NO → **Repair open in the wire between ECM/PCM (D6) and knock sensor.**
- YES ↓

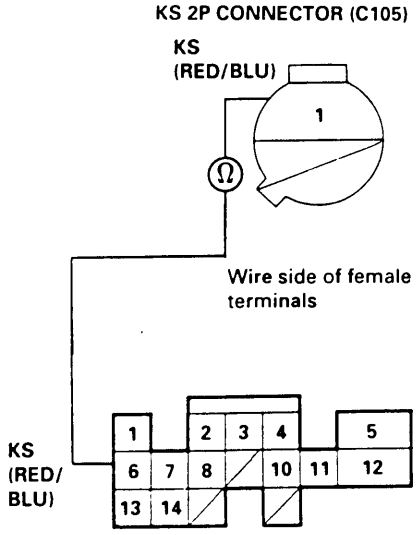
Substitute a known-good knock sensor and recheck.

Is DTC P0325 indicated?
- NO → **Replace the original knock sensor.**
- YES ↓

Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.







Crankshaft Position/Top Dead Center/Cylinder Position (CKP/TDC/CYP) Sensor

P0335 The scan tool indicates Diagnostic Trouble Code (DTC) P0335: A malfunction in the Crankshaft Position (CKP) sensor circuit.

P0336 The scan tool indicates Diagnostic Trouble Code (DTC) P0336: A range/performance problem in the Crankshaft Position (CKP) sensor circuit.

P1361 The scan tool indicates Diagnostic Trouble Code (DTC) P1361: Intermittent interruption in the Top Dead Center (TDC) sensor circuit.

P1362 The scan tool indicates Diagnostic Trouble Code (DTC) P1362: No signal in the Top Dead Center (TDC) sensor circuit.

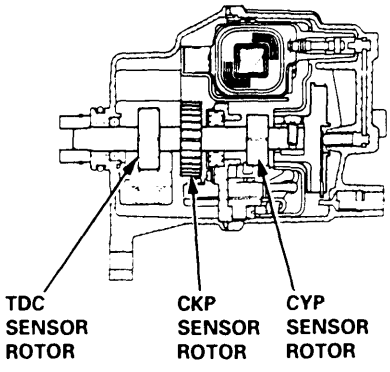
P1381 The scan tool indicates Diagnostic Trouble Code (DTC) P1381: Intermittent interruption in the Cylinder Position (CYP) sensor circuit.

P1382 The scan tool indicates Diagnostic Trouble Code (DTC) P1382: No signal in the Cylinder Position (CYP) sensor circuit.

Description

The CKP Sensor determines timing for fuel injection and ignition of each cylinder and also detects engine speed. The TDC Sensor determines ignition timing at start-up (cranking) and when crank angle is abnormal. The CYP Sensor detects the position of No. 1 cylinder for sequential fuel injection to each cylinder. The CKP/TDC/CYP Sensor is built into the distributor.

NOTE: If DTC P1359 is stored at the same time as DTC P0335, P0336, P1361, P1362, P1381 and/or P1382, troubleshoot DTC P1359 first, then troubleshoot those DTCs.



— The MIL has been reported on.
— DTC P0335, P0336, P1361, P1362, P1381 and/or P1382 are stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine.

Is DTC P0335, P0336, P1361, P1362, P1381 and/or P1382 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C119 (distributor) and ECM/PCM.**

YES

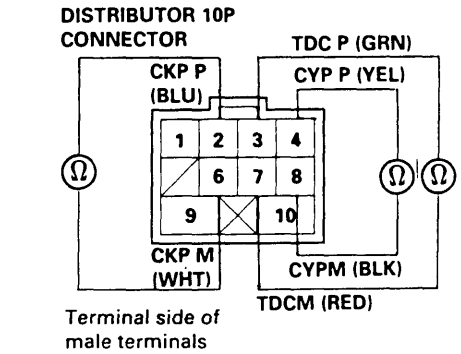
Check for an open in the CKP/TDC/CYP sensor:
1. Turn the ignition switch OFF.
2. Disconnect the distributor 10P connector.
3. Measure resistance between the terminals of the indicated sensor (see table).

* Is there 350 – 700 Ω?

NO → **Replace the distributor ignition housing (see section 4).**

YES

(To page 11-81)



Terminal side of male terminals

SENSOR	DTC	SENSOR TERMINAL	ECM/PCM TERMINAL	WIRE COLOR
CKP	P0335	2	C2	BLU
	P0336	6	C12	WHT
TDC	P1361	3	C3	GRN
	P1362	7	C13	RED
CYP	P1381	4	C4	YEL
	P1382	8	C14	BLK

(From page 11-80)

Check for a short in the CKP/TDC/CYP sensor:
Check for continuity to body ground on both terminals of the indicated sensor individually (see table).

Is there continuity?

YES → **Replace the distributor ignition housing (see section 4).**

NO

Check for an open in the wires (CKP/TDC/CYP lines):
1. Reconnect the distributor 10P connector.
2. Disconnect the ECM/PCM connector C (31P).
3. Measure resistance between the terminals of the indicated sensor on the ECM/PCM connector (see table).

Is there 350 – 700 Ω?

NO → **Repair open in the indicated sensor wires (see table).**

YES

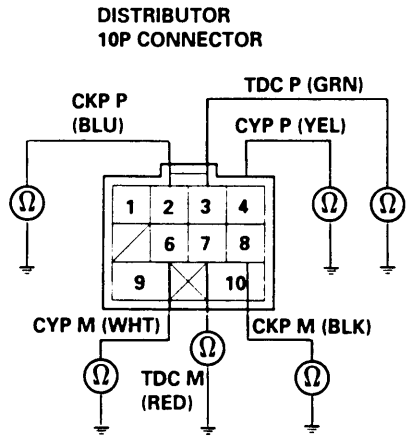
Check for a short in the wires (CKP/TDC/CYP lines):
Check for continuity between body ground and ECM/PCM connector terminals C2, C3 and/or C4 individually.

Is there continuity?

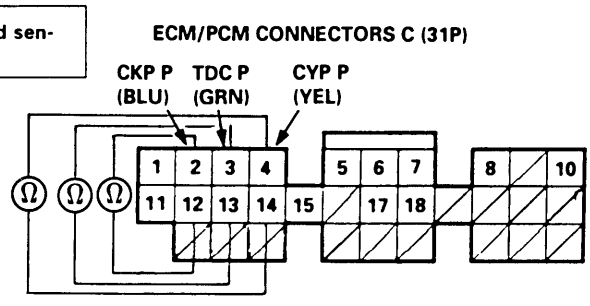
YES → **Repair short in the indicated sensor wires (see table).**

NO

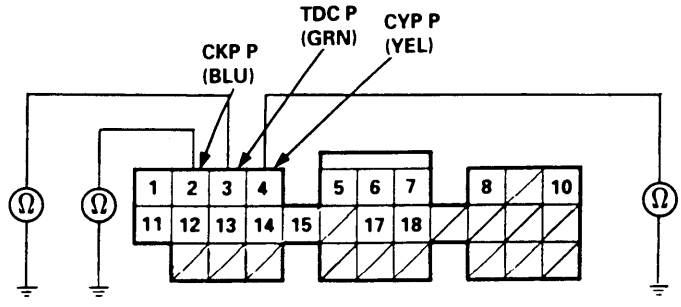
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.



Terminal side of male terminals



Wire side of female terminals



Vehicle Speed Sensor (VSS)

P0500 The scan tool indicates Diagnostic Trouble Code (DTC) P0500: A malfunction problem in the Vehicle Speed Sensor (VSS) circuit (M/T).

P0501 The scan tool indicates Diagnostic Trouble Code (DTC) P0501: A range/performance problem in the Vehicle SpeedSensor (VSS) circuit (A/T).

— The MIL has been reported on.
— DTC P0500 or P0501 is stored.

Problem verification:
1. Test-drive the vehicle.
2. Check the vehicle speed with the scan tool.

Is the correct speed indicated? — YES → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C121 (VSS) and ECM/PCM.**

NO

Check for an open in the ECM/PCM:
1. Turn the ignition switch OFF.
2. Block the rear wheels and set the parking brake.
3. Jack up the front of the vehicle and support it with safety stands.
4. Turn the ignition switch ON (II).
5. Block the right front wheel and slowly rotate the left front wheel.
6. Measure voltage between the ECM/PCM connector terminals C18 and A9.

Does the voltage pulse 0 V and 5 V? — YES → **Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.**

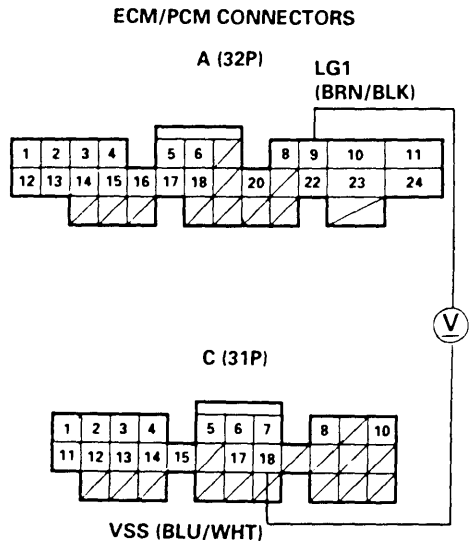
NO

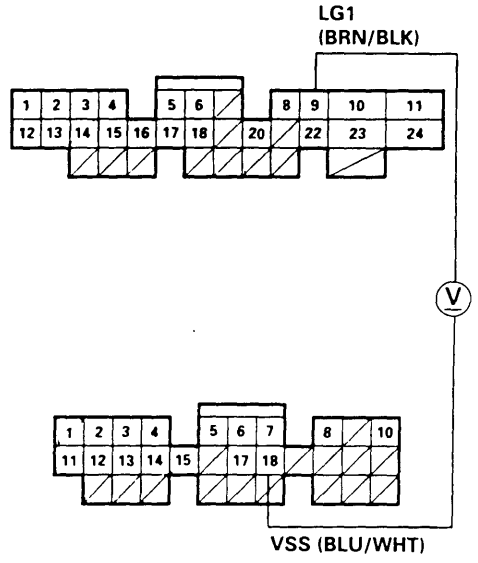
Check for a short in the ECM/PCM:
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector C (31P).
3. Turn the ignition switch ON (II).
4. Block the right front wheel and slowly rotate the left front wheel.
5. Measure voltage between the ECM/PCM connector terminals C18 and A9.

Does the voltage pulse 0 V and 5 V? — YES → **Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.**

NO

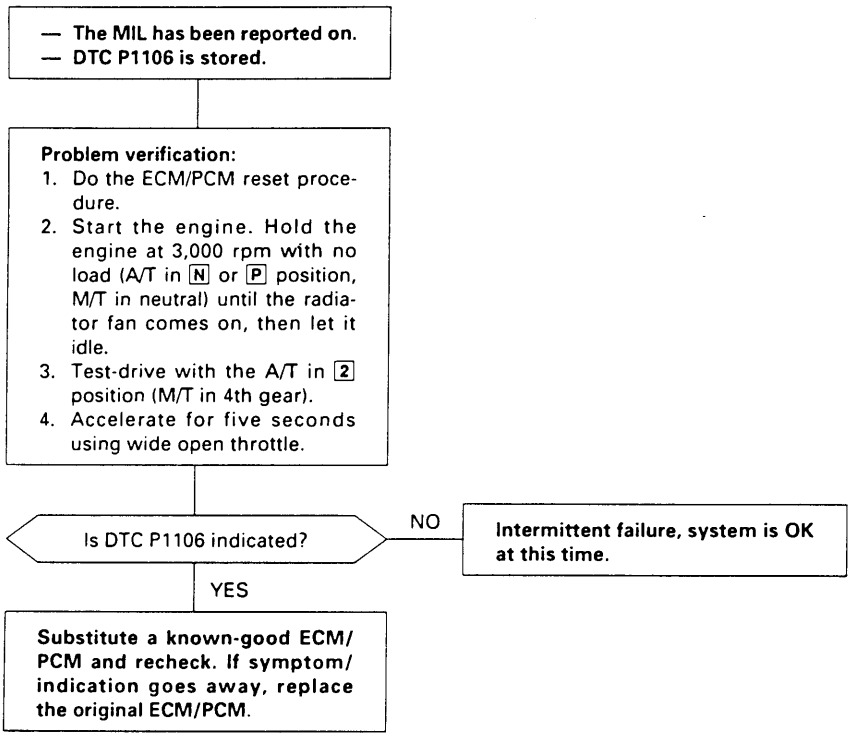
— Repair short in the wire between ECM/PCM (C18) and VSS.
— Repair open in the wire between ECM/PCM (C18) and VSS.
— If wire is OK, test the VSS (see page 23-60).





Barometric Pressure (Baro) Sensor

P1106 The scan tool indicates Diagnostic Trouble Code (DTC) P1106: A range/performance problem in the Barometric Pressure (Baro) Sensor circuit.

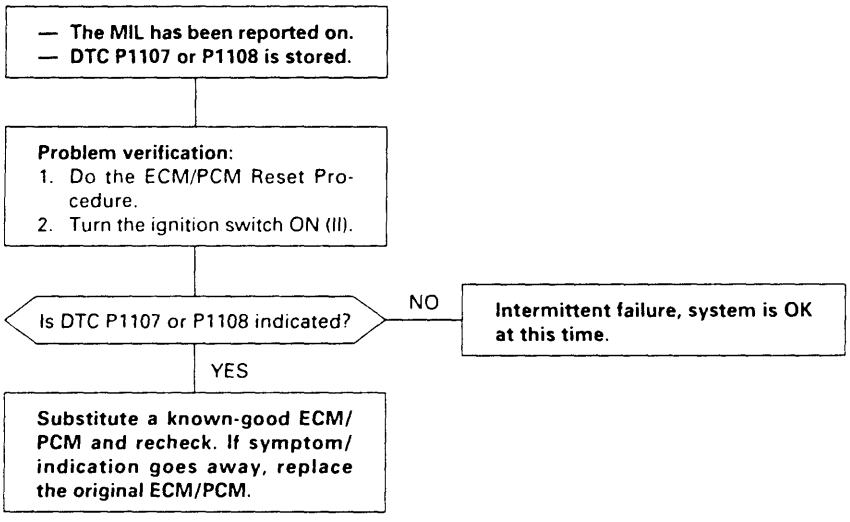


(cont'd)

Barometric Pressure (Baro) Sensor (cont'd)

P1107 The scan tool indicates Diagnostic Trouble Code (DTC) P1107: A low voltage problem in the Baro sensor circuit.

P1108 The scan tool indicates Diagnostic Trouble Code (DTC) P1108: A high voltage problem in the Baro sensor circuit.



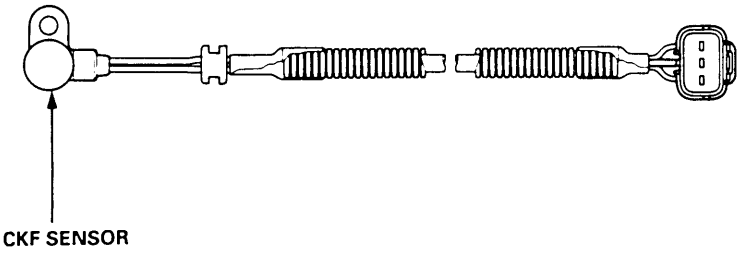
Crankshaft Speed Fluctuation (CKF) Sensor

P1336 The scan tool indicates Diagnostic Trouble Code (DTC) P1336: Intermittent interruption in the Crankshaft Speed Fluctuation (CKF) sensor circuit.

P1337 The scan tool indicates Diagnostic Trouble Code (DTC) P1337: No signal in the Crankshaft Speed Fluctuation (CKF) sensor circuit.

Description

The diagnostic system has a pulser rotor on the crankshaft and a pulse pick-up sensor on the engine block. The ECM/PCM monitors the crankshaft speed fluctuation based on the CKF sensor signal, and judges that an engine misfire occurred if the fluctuation goes beyond a predetermined limit.



— The MIL has been reported on.
— DTC P1336 and/or P1337 are stored.

↓

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine.

↓

Is DTC P1336 and/or P1337 indicated?

NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C104 (CKF sensor) and ECM/PCM.**

YES ↓

Check for an open in the CKF sensor:
1. Turn the ignition switch OFF.
2. Disconnect the CKF sensor 3P connector.
3. Measure the resistance between the CKF sensor 3P connector terminals No. 1 and No. 3.

↓

Is there 1.6 – 3.2 kΩ?

NO → **Replace the CKF sensor (see section 6).**

YES ↓

Check for a short in the CKF sensor:
Check for continuity between body ground and the CKF sensor 3P connector terminals No. 1 and No. 3 individually.

↓

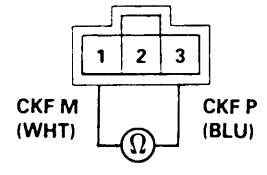
Is there continuity?

YES → **Replace the CKF sensor (see section 6).**

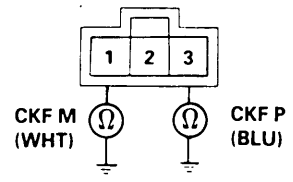
NO ↓

(To page 11-86)

CKF SENSOR 3P CONNECTOR



Terminal side of male terminals



(cont'd)

Crankshaft Speed Fluctuation (CKF) Sensor (cont'd)

(From page 11-85)

Check for an open in the wires (CKF lines):
1. Reconnect the CKF sensor 3P connector.
2. Disconnect the ECM/PCM connector C (31P).
3. Measure resistance between ECM/PCM connector terminals C1 and C11.

Is there 1.6 – 3.2 kΩ?

NO → **Repair open in the wire between ECM/PCM (C1, C11) and the CKF sensor.**

YES

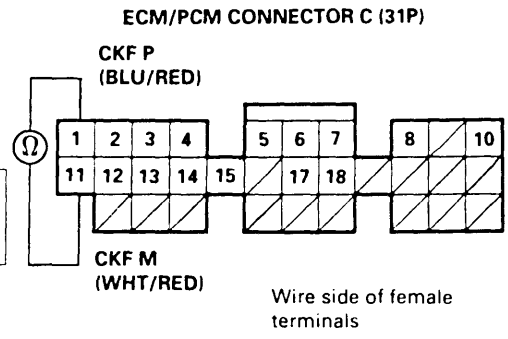
Check for a short in the wire (CKF line):
Check for continuity between body ground and ECM/PCM connector terminal C1.

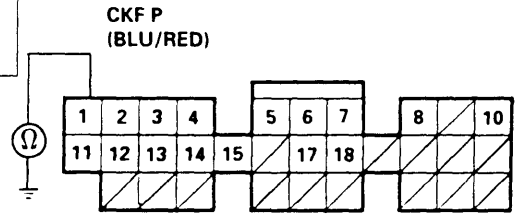
Is there continuity?

YES → **Repair short in the wire between ECM/PCM (C1) and the CKF sensor.**

NO

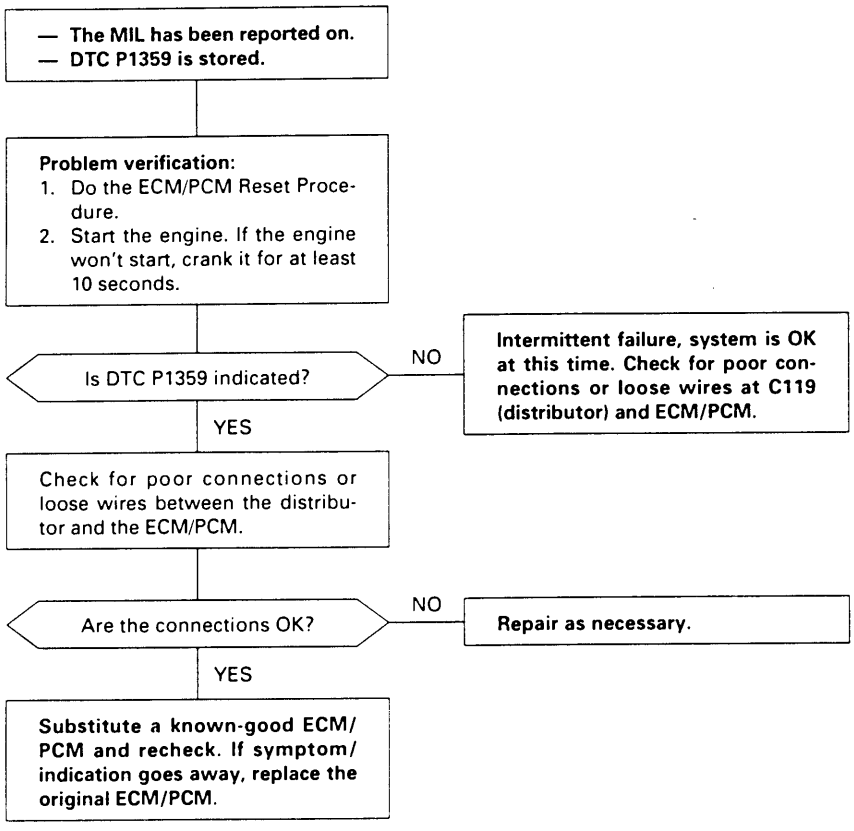
Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.





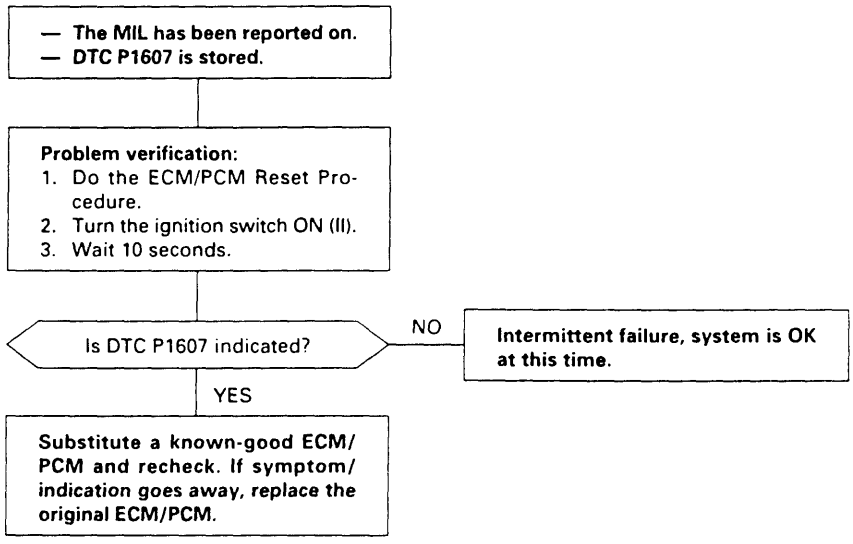
Crankshaft Position/Top Dead Center/Cylinder Position (CKP/TDC/CYP) Sensor

P1359 The scan tool indicates Diagnostic Trouble Code (DTC) P1359: A problem in the Crankshaft Position/Top Dead Center/Cylinder Position (CKP/TDC/CYP) sensor circuit.



ECM/PCM Internal Circuit

P1607 The scan tool indicates Diagnostic Trouble Code (DTC) P1607: An ECM/PCM Internal Circuit Problem.

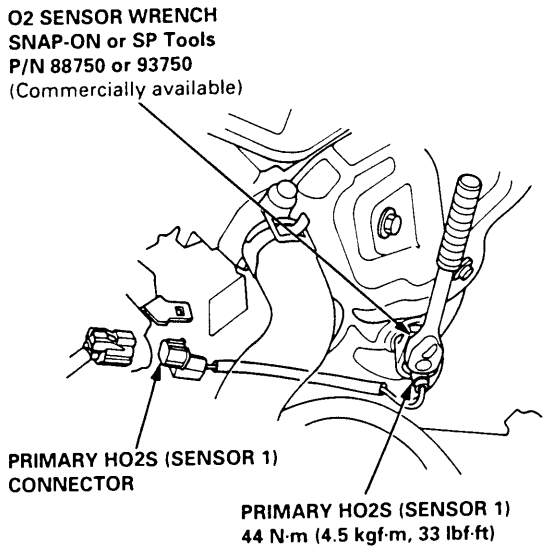


Heated Oxygen Sensor (HO2S)

Replacement

Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1):

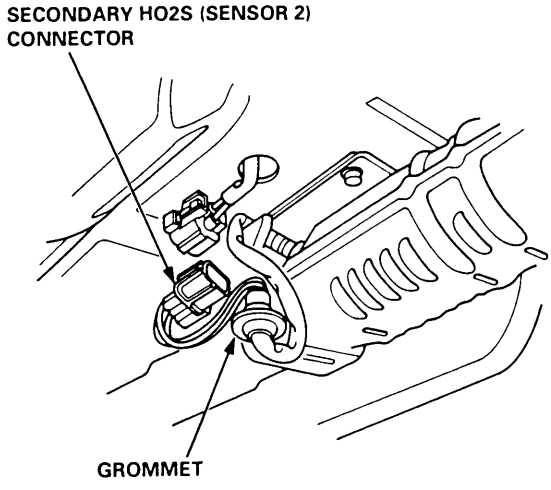
1. Disconnect the primary HO2S (sensor 1) connector, then remove the primary HO2S (sensor 1).



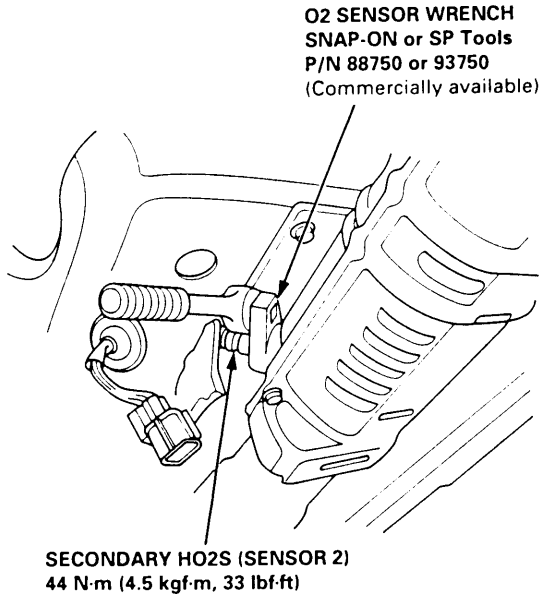
2. Install the primary HO2S (sensor 1) in reverse order of removal.

Secondary Heated Oxygen Sensor (Secondary HO2S) (Sensor 2):

1. Remove the grommet, pull out the secondary HO2S (sensor 2) connector, then disconnect the secondary HO2S (sensor 2) connector.



2. Remove the secondary HO2S (sensor 2).



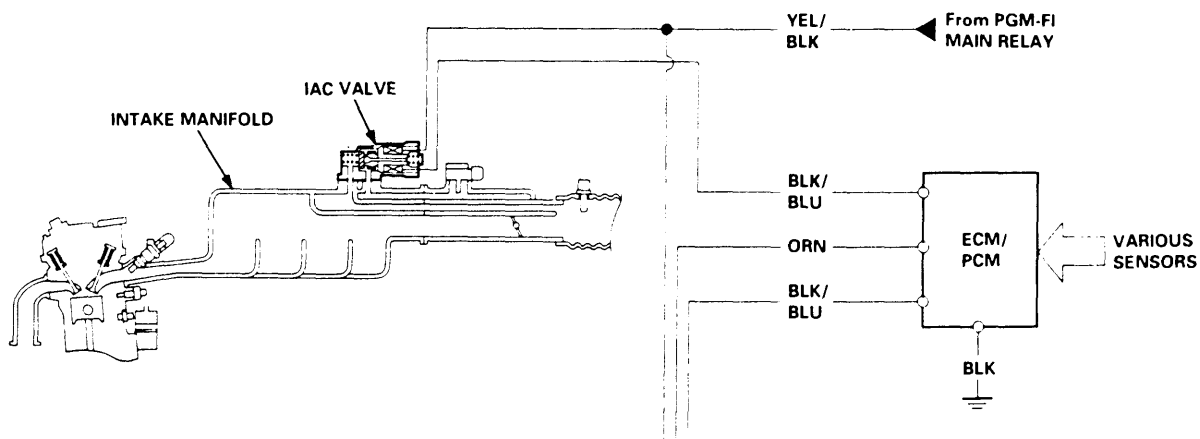
3. Install the secondary HO2S (sensor 2) in reverse order of removal.

Idle Control System

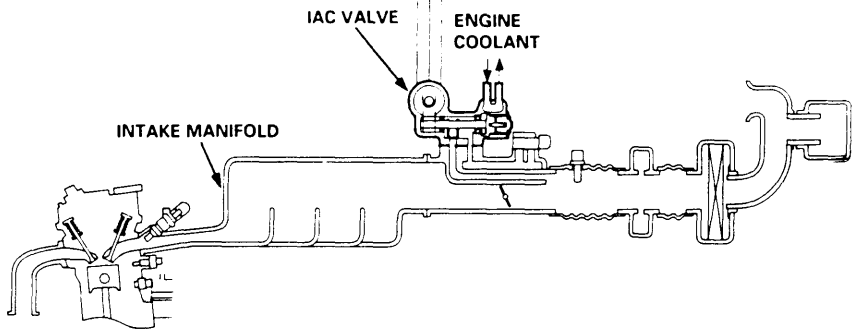
System Description

The idle speed of the engine is controlled by the Idle Air Control (IAC) Valve.
The valve changes the amount of air bypassing into the intake manifold in response to electric current controlled by the ECM/PCM. When the IAC Valve is activated, the valve opens to maintain the proper idle speed.

M/T:

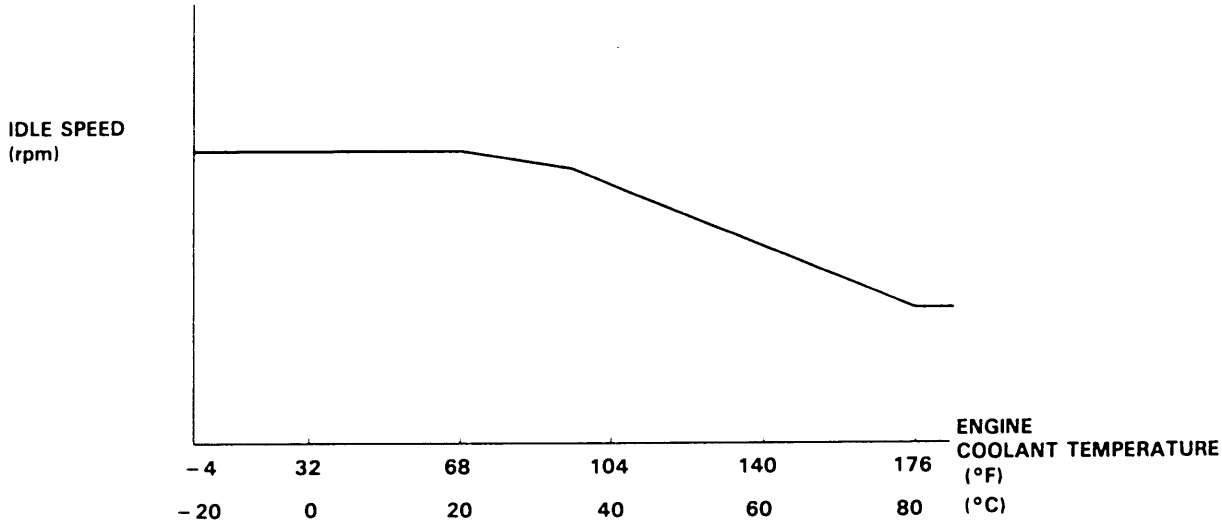


A/T:



1. After the engine starts, the IAC valve opens for a certain time. The amount of air is increased to raise the idle speed about 150 – 300 rpm.

2. When the coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.



3. When the idle speed is out of specification and the scan tool does not indicate Diagnostic Trouble Code (DTC) P0505 or P1508, check the following items:
   - Adjust the idle speed (see page 11-103)
   - Starter switch signal (see page 11-98)
   - Air conditioning signal (see page 11-99)
   - ALT FR signal (see page 11-101)
   - Brake switch signal (see page 11-102)
   - A/T gear position signal (see section 14)
   - Hoses and connections
   - IAC valve and its mounting O-rings

4. If the above items are normal, substitute a known-good IAC valve and readjust the idle speed (see page 11-103).

   If the idle speed still cannot be adjusted to specification (and the scan tool does not indicate DTC P0505 or P1508) after IAC valve replacement, substitute a known-good ECM/PCM and recheck. If symptom goes away, replace the original ECM/PCM.

Idle Control System

Idle Control System

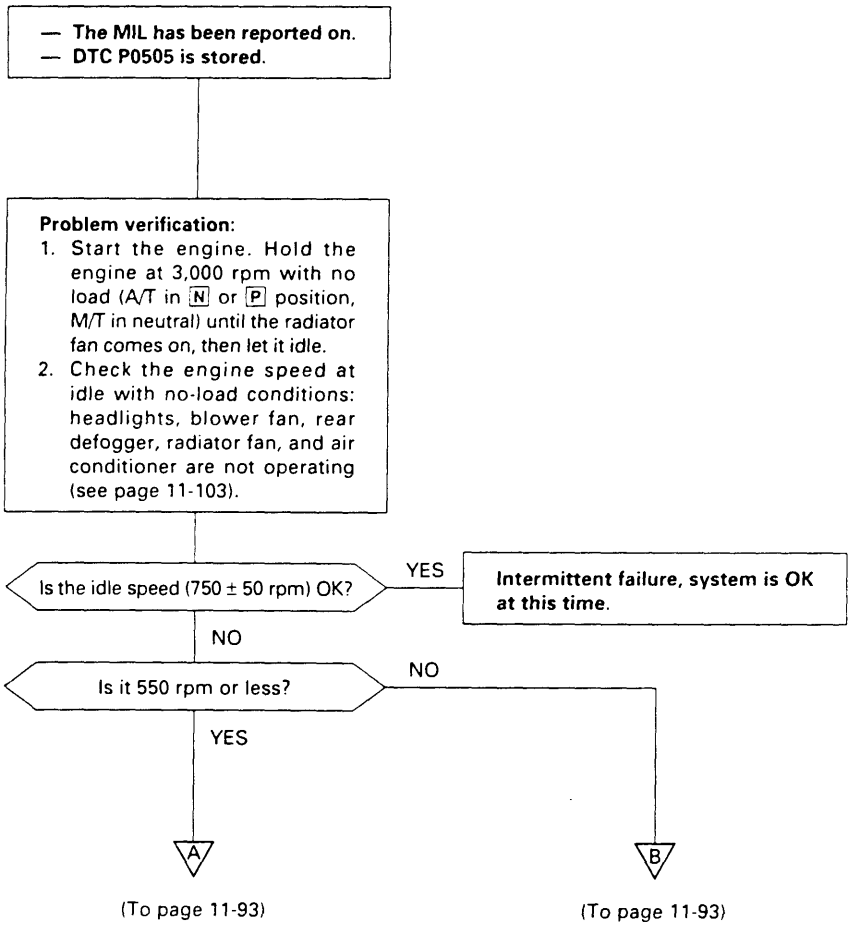
P0505 The scan tool indicates Diagnostic Trouble Code (DTC) P0505: Idle control system malfunction.

NOTE: If DTC P1508 or P1509 is stored at the same time as DTC P0505, troubleshoot DTC P1508 or P1509 first, then troubleshoot DTC P0505.

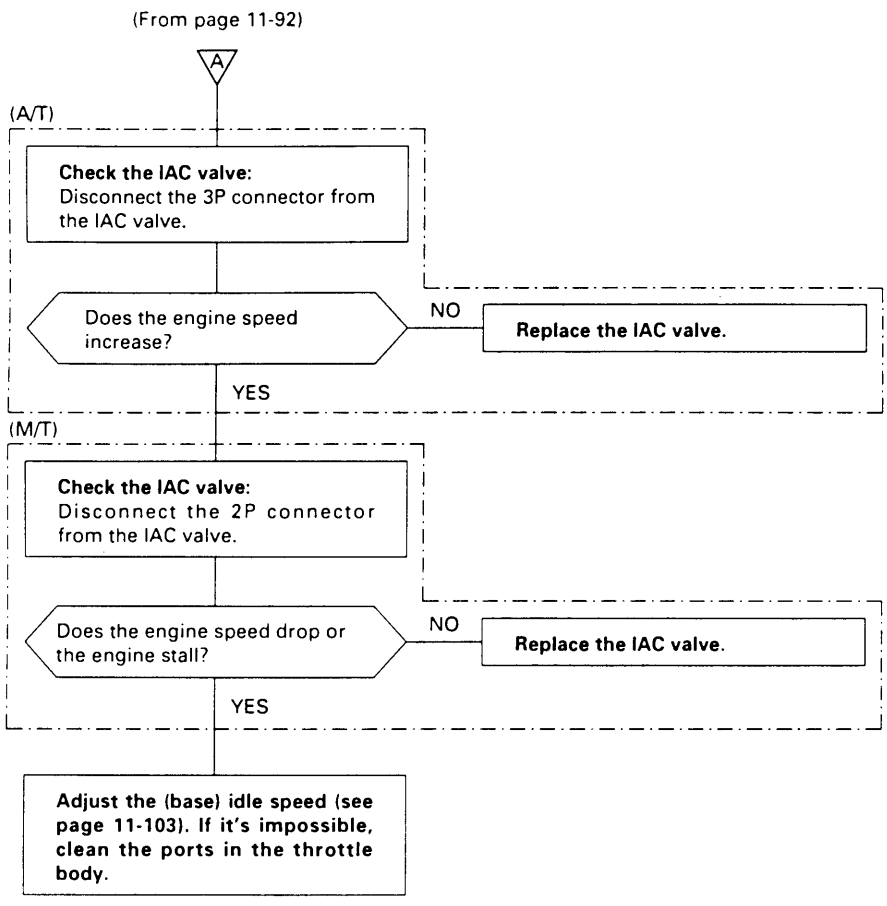
Possible Cause

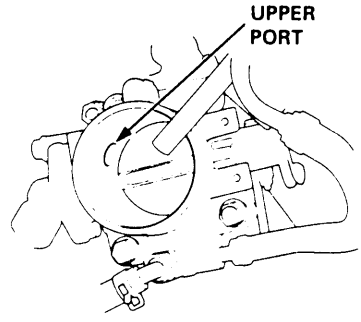
- IAC valve mechanical malfunction
- Throttle body clogged port, improper adjustment
- Intake manifold gasket leakage
- Intake air hose loose leakage
- Vacuum leak
- ECT sensor range/performance problem
- Throttle Position sensor range/performance problem

Troubleshooting Flowchart

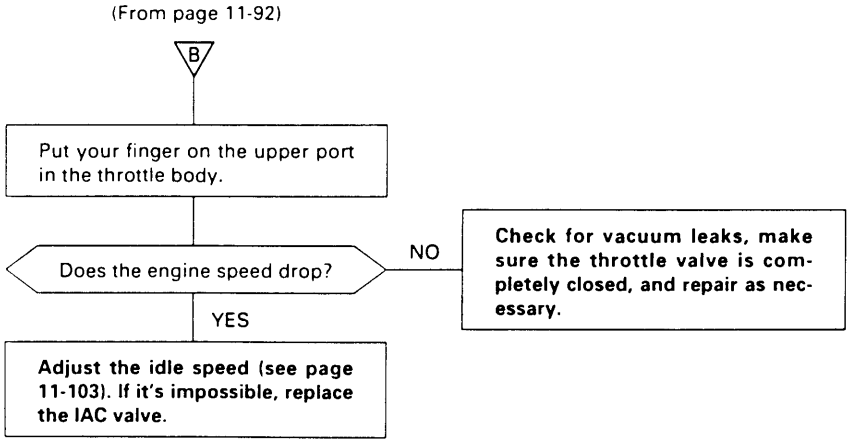


(From page 11-92)





(From page 11-92)

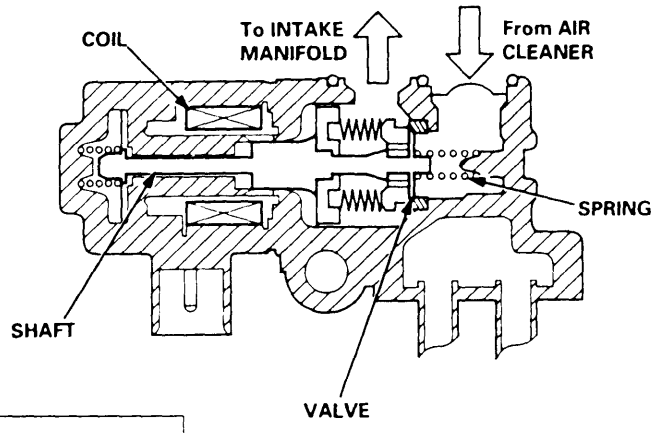


Idle Control System

Idle Air Control (IAC) Valve (M/T)

P1508 The scan tool indicates Diagnostic Trouble Code (DTC) P1508: A problem in the Idle Air Control (IAC) valve circuit.

The IAC Valve changes the amount of air bypassing the throttle body in response to a current signal from the ECM in order to maintain the proper idle speed.



— **The MIL has been reported on.**
— **DTC P1508 is stored.**

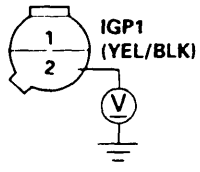
Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Start the engine, and warm it up to normal operating temperature.

Is DTC P1508 indicated? — NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C132 (IAC valve) and ECM.**

YES

Check for an open in the wire (IGP1 line):
1. Turn the ignition switch OFF.
2. Disconnect the IAC valve 2P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and the IAC valve 2P connector terminal No. 2.

IAC VALVE 2P CONNECTOR (C132)



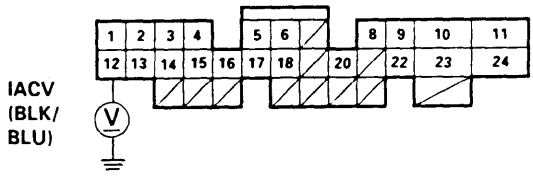
Wire side of female terminals

Is there battery voltage? — NO → **Repair open in the wire between IAC valve and PGM-FI main relay.**

YES

Check for an open or short in the wire (IACV line):
1. Turn the ignition switch OFF and reconnect the IAC valve connector.
2. Disconnect the ECM connector A (32P).
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and ECM connector terminal A12.

ECM CONNECTOR A (32P)



Wire side of female terminals

(To page 11-95)

(From page 11-94)

Is there battery voltage?

NO → **Repair open or short in the wire between ECM (A12) and IAC valve.**

YES

Check the IAC valve function: Momentarily connect ECM connector terminals A12 and A10 with a jumper wire several times.

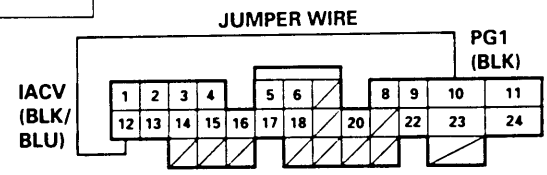
Does the IAC valve click?

NO → **Replace the IAC valve.**

YES

Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

ECM CONNECTOR A (32P)



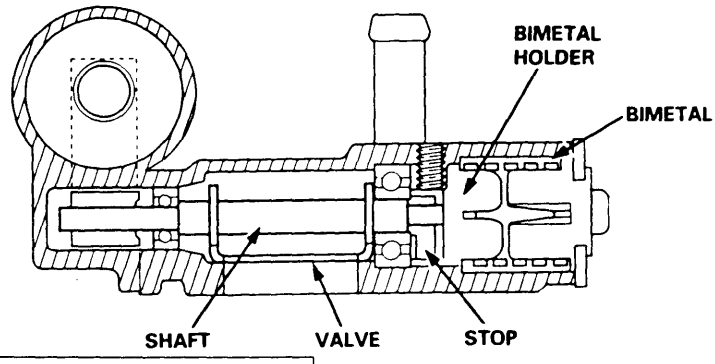
Wire side of female terminals

Idle Control System

Idle Air Control (IAC) Valve (A/T)

P1509 The scan tool indicates Diagnostic Trouble Code (DTC) P1509: A problem in the idle Air Control (IAC) valve circuit.

The IAC Valve changes the amount of air bypassing the throttle body in response to a current signal from the PCM in order to maintain the proper idle speed.



— The MIL has been reported on.
— DTC P1509 is stored.

Problem verification:
1. Do the ECM/PCM Reset Procedure.
2. Turn the ignition switch ON (II).

Is DTC P1509 indicated? NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C132 (IAC valve) and PCM.**

YES

Check for open in the wires (PG lines):
Measure voltage between body ground and PCM connector terminals A10 and A23 individually.

Is there more than 1.0 V? YES → **Repair open in the wires between PCM and G101 (located at the thermostat housing).**

NO

Check the PCM input voltage:
1. Turn the ignition switch OFF.
2. Disconnect PCM connector A (32P) from the PCM.
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and PCM connector terminals A14 and A13* individually.

Is there battery voltage? NO → (A) (To page 11-97)

YES

Check the IAC valve:
1. Turn the ignition switch OFF.
2. Disconnect the IAC valve 3P connector.
3. Measure resistance between IAC valve 3P connector terminal No. 2 and terminals No. 1 and 3 individually.

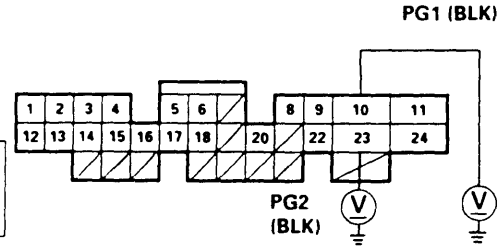
Is there 16 – 28 Ω? NO → **Replace the IAC valve.**

YES

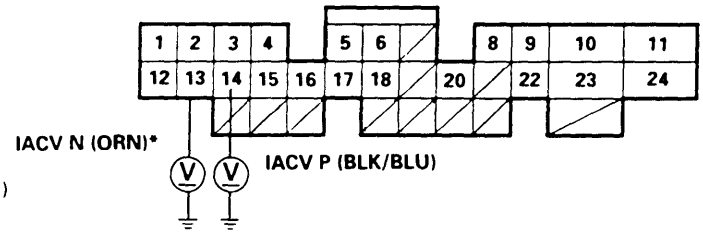
Substitute a known-good PCM and recheck. If symptom/indication goes away, replace the original PCM.

*: IACV N line

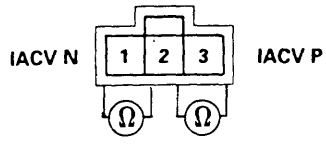
PCM CONNECTOR A (32P)



Wire side of female terminals



IAC VALVE 3P CONNECTOR



IGP

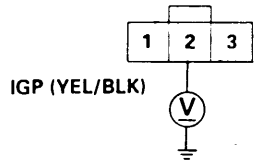
Terminal side of male terminals

(From page 11-96)

A

Check for an open in the wire (IGP line):
1. Turn the ignition switch OFF.
2. Disconnect the IAC valve 3P connector.
3. Turn the ignition switch ON (II).
4. At the wire harness, measure voltage between IAC valve 3P connector terminal No. 2 and body ground.

IAC VALVE 3P CONNECTOR (C132)



Wire side of female terminals

Is there battery voltage?

NO → **Repair open in the wire between the IAC valve and PGM-FI main relay.**

YES

Check for an open in the wires (IACV P, IACV N* lines):
1. Turn the ignition switch OFF.
2. Disconnect the PCM connector A (32P).
3. Check for continuity between IAC valve 3P connector terminal No. 3 and PCM connector terminal A14 (between IAC valve 3P connector terminal No. 1 and PCM connector terminal A13)*.

Is there continuity?

NO → **Repair open in the wire between the IAC valve and PCM (A14, A13*).**

YES

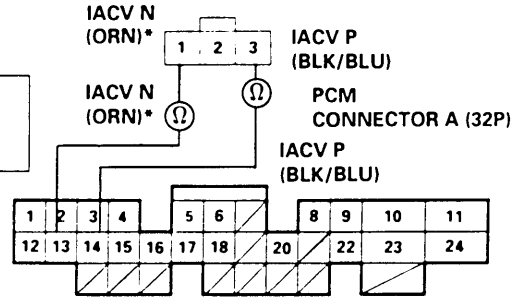
Check for a short in the wires (IACV P, IACV N* lines):
Check for continuity between body ground and PCM connector terminals A14 and A13* individually.

Is there continuity?

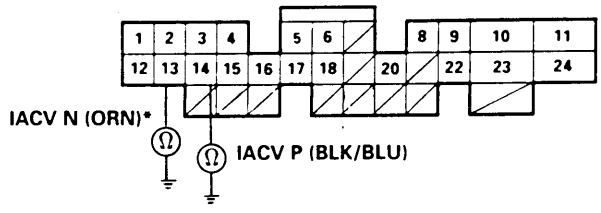
YES → **Repair short in the wire between the IAC valve and PCM (A14, A13*).**

NO

Substitute a known-good PCM and recheck. If symptom/indication goes away, replace the original PCM.



Wire side of female terminals



*: IACV N line

Idle Control System

Starter Switch Signal

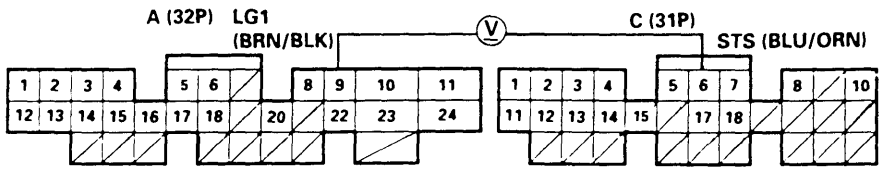
This signals the ECM/PCM when the engine is cranking.

Inspection of Starter Switch Signal.

NOTE:
- A/T: Transmission in [N] or [P] position.
- M/T: in neutral

Check for an open or short in the wire (STS line):
Measure voltage between ECM/PCM connector terminals A9 and C6 with the ignition switch in the start (III) position.

ECM/PCM CONNECTORS



Wire side of female terminals

Is there battery voltage?

NO → Inspect the No. 31 STARTER SIGNAL (7.5 A) fuse in the under-dash fuse/relay box.

YES → **Starter switch signal is OK.**

Is the fuse OK?

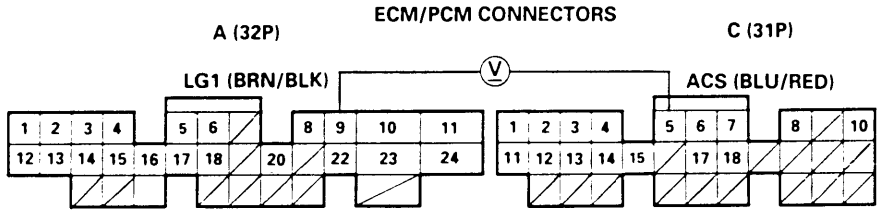
NO → **— Repair short in the wire between the ECM/PCM (C6) and the No. 31 STARTER SIGNAL (7.5 A) fuse or the PGM-FI main relay.**
— Replace the No. 31 STARTER SIGNAL (7.5 A) fuse.

YES → **Repair open in the wire between the ECM/PCM (C6) and the No. 31 STARTER SIGNAL (7.5 A) fuse.**

Air Conditioning Signal

This signals the ECM/PCM when there is a demand for cooling from the air conditioning system.

Inspection of Air Conditioning Signal.



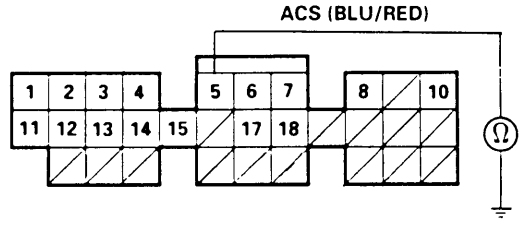
Wire side of female terminals

Check for a short in the wire (ACS line):
1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch 2P connector (see section 22).
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM/PCM connector terminals C5 and A9.

Is there approx. 5 V?

NO

Check for a short in the wire (ACS line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector C (31P).
3. Check for continuity between body ground and ECM/PCM connector terminal C5.



YES

Is there continuity?

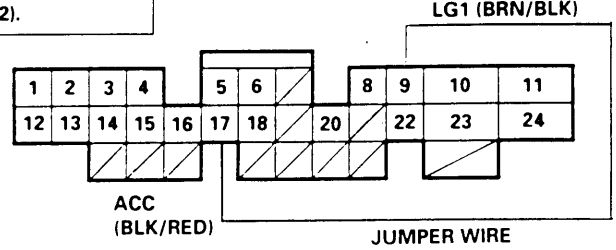
YES

Repair short in the wire between the ECM/PCM (C5) and the A/C pressure switch.

NO

Check for an open in the wire (ACC line):
1. Turn the ignition switch OFF.
2. Reconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Momentarily connect ECM/PCM connector terminals A9 and A17 with a jumper wire several times.

— Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.
— See the air conditioner inspection (see section 22).



(To page 11-100)

(cont'd)

Air Conditioning Signal (cont'd)

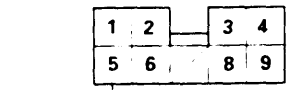
(From page 11-99)

Is there a clicking noise from the A/C compressor clutch?

NO

Check for an open in the wire (ACC line):
Momentarily connect under-hood fuse/relay box 9P connector terminal No. 5 to body ground with a jumper wire several times.

UNDER-HOOD FUSE/RELAY BOX 9P CONNECTOR (C352)



JUMPER WIRE

ACC (BLK/RED)
Wire side of female terminals

YES

Is there a clicking noise from the A/C compressor clutch?

NO

See air conditioner inspection (see section 22).

YES

Repair open in the wire between the ECM/PCM (A17) and the under-hood fuse/relay box 9P connector (C352).

Check the A/C operation:
1. Start the engine.
2. Turn the blower switch ON.
3. Turn the A/C switch ON.

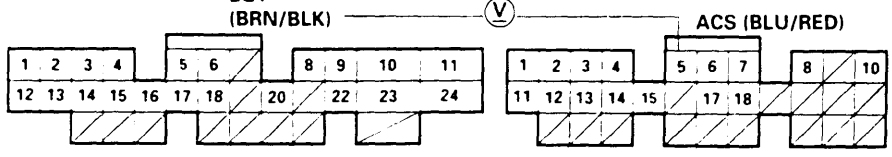
ECM/PCM CONNECTORS

A (32P)

LG1 (BRN/BLK)

C (31P)

ACS (BLU/RED)



Wire side of female terminals

Does the A/C operate?

NO

Check for an open in the wire (ACS line):
Measure voltage between ECM/PCM connector terminals A9 and C5.

YES

Air conditioning signal is OK.

Is there less than 1.0 V?

NO

Repair open in the wire between the ECM/PCM (C5) and the A/C switch.

YES

- **Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.**
- **See the air conditioner inspection (see section 22).**

Alternator (ALT) FR Signal

This signals the ECM/PCM when the Alternator (ALT) is charging.

Inspection of ALT FR Signal.

Check for a short in the wire (ALT F line):
1. Disconnect the 3P connector from the ALT.
2. Turn the ignition switch ON (II).
3. Measure voltage between ECM/PCM connector terminals C17 and A9.

Is there approx. 5 V?

NO

Check for a short in the wire (ALT F line):
1. Turn the ignition switch OFF.
2. Disconnect the negative battery cable from the battery.
3. Disconnect the ECM/PCM connector C (31P).
4. Check for continuity between body ground and ECM/PCM connector terminal C17.

Is there continuity?

YES

Repair short in the wire between the ECM/PCM (C17) and the ALT.

NO

Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.

YES

Check the operation of the ALT:
1. Turn the ignition switch OFF.
2. Reconnect the ALT 3P connector to the ALT.
3. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.
4. Measure voltage between ECM/PCM connector terminals C17 and A9.

Does the voltage decrease when headlights and rear defogger are turned on?

YES

ALT FR signal is OK.

NO

Check for an open in the wire (ALT F line):
1. Turn the ignition switch OFF.
2. Disconnect the 3P connector from the ALT.
3. Turn the ignition switch ON (II).
4. Measure voltage between the ALT 3P connector terminal No. 1 and body ground.

Is there approx. 5 V?

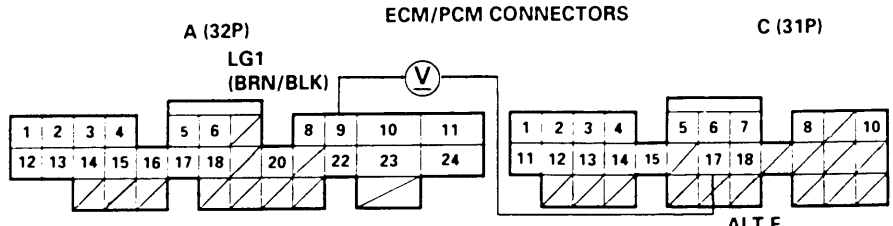
NO

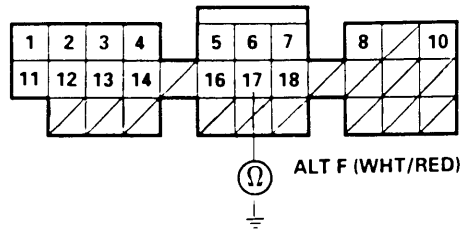
Repair open wire between the ECM/PCM (C17) and the ALT.

YES

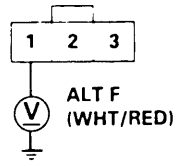
See the ALT inspection (see section 4).

ECM/PCM CONNECTORS





ALT 3P CONNECTOR (C103)



Wire side of female terminals

Idle Control System

Brake Switch Signal

This signals the ECM/PCM when the brake pedal is depressed.

Inspection of Brake Switch Signal.

Are the brake lights on without depressing the brake pedal?

YES → **Inspect the brake switch (see section 19).**

NO

Depress the brake pedal.

Do the brake lights come on?

NO → Inspect the HORN STOP (15 A) fuse in the under-hood fuse/relay box.

YES

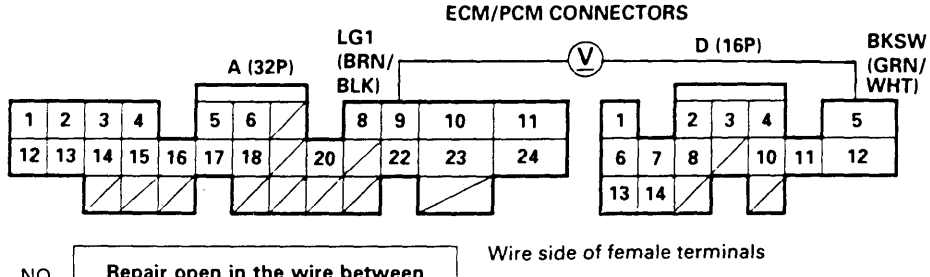
Is the fuse OK?

NO → **— Repair short in the wire between the brake switch and the HORN STOP (15 A) fuse.**
— Replace the HORN STOP (15 A) fuse.

YES

— Repair open in the wire between the brake switch and the HORN STOP (15 A) fuse.
— Inspect the brake switch (see section 19).

Check for an open in the wire (BKSW line):
1. Depress the brake pedal.
2. Measure voltage between ECM/PCM connector terminals A9 and D5 with the brake pedal depressed.



Wire side of female terminals

Is there battery voltage?

NO → **Repair open in the wire between the ECM/PCM (D5) and the brake switch.**

YES

Brake switch signal is OK.

Idle Speed Setting

Inspection/Adjustment

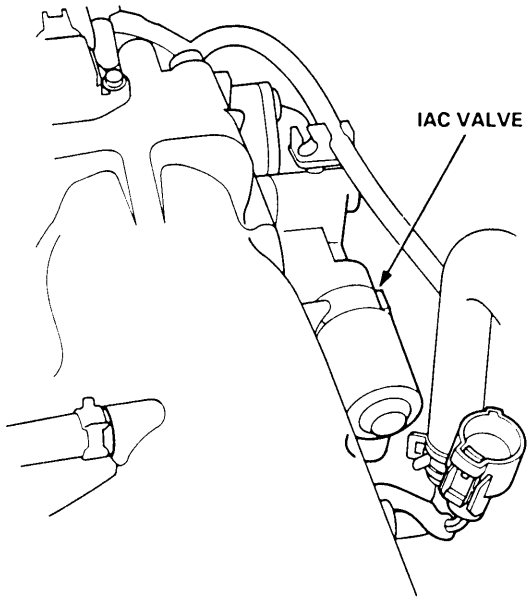
M/T:

NOTE:
- Before setting the idle speed, check the following items:
  — The MIL has not been reported on.
  — Ignition timing
  — Spark plugs
  — Air cleaner
  — PCV system
- Pull the parking brake lever up. Start the engine, then check that the headlights are off.

1. Start the engine. Hold the engine at 3,000 rpm with no load (transmission in neutral) until the radiator fan comes on, then let it idle.

2. Connect a tachometer.

3. Disconnect the IAC valve connector.



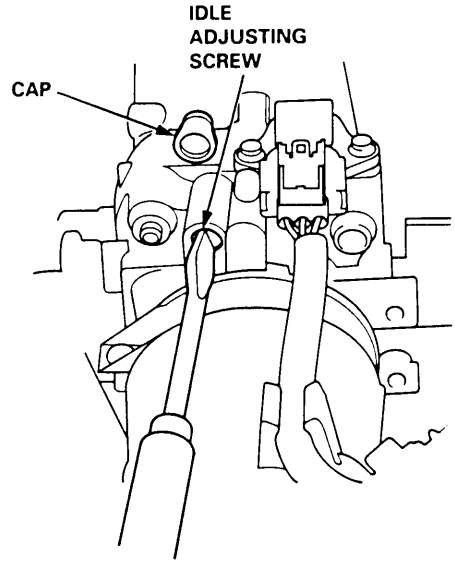
4. If the engine stalls, restart the engine with the accelerator pedal slightly depressed. Stabilize the rpm at 1,000, then slowly release the pedal until the engine idles.

5. Check idling in no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

   Idle speed should be:
   450 ± 50 rpm

   Adjust the idle speed, if necessary, by removing the cap and turning the idle adjusting screw.

   NOTE: After adjusting the idle speed in this step, recheck the ignition timing (see section 4).
   If it is out of spec, go back to step 4.



6. Turn the ignition switch OFF.

7. Reconnect the 2P connector on the IAC valve, then do the ECM reset procedure.

8. Restart and idle the engine with no-load conditions for one minute, then check the idle speed.

   NOTE: Pull the parking brake lever up. Start the engine, then check that the headlights are off.

   Idle speed should be:
   750 ± 50 rpm

9. Idle the engine for one minute with headlights (Low) ON, and check the idle speed.

   Idle speed should be:
   750 ± 50 rpm

10. Turn the headlights off. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

    Idle speed should be:
    810 ± 50 rpm

    NOTE: If the idle speed is not within specification, see Symptom Chart on page 11-30.

(cont'd)

Idle Speed Setting (cont'd)

A/T:

Adjust the idle speed using a Honda PGM Tester if possible. If not, use the following procedure:

NOTE:
- Leave the IAC valve connected.
- Before setting the idle speed, check the following items:
  — The MIL has not been reported on.
  — Ignition timing
  — Spark plugs
  — Air cleaner
  — PCV system

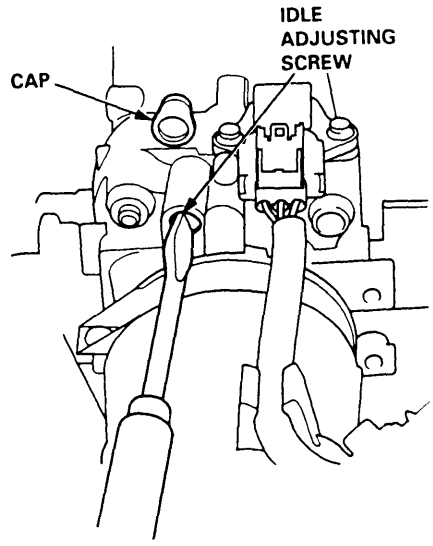
1. Connect a tachometer.

2. Start the engine. Hold the engine at 3,000 rpm with no load (transmission in [N] or [P] position) until the radiator fan comes on, then let it idle.

3. Check the idle speed with no-load conditions: headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

   Idle speed should be:
   750 ± 50 rpm (in [N] or [P] position)

4. Adjust the idle speed, if necessary, by removing the cap and turning the idle adjusting screw 1/2-turn clockwise or counterclockwise.



5. After turning the idle adjusting screw 1/2-turn, check the idle speed again. If it is out of spec, turn the idle adjusting screw 1/2-turn again.

   NOTE: Do not turn the idle adjusting screw more than 1/2-turn without checking the idle speed.

6. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

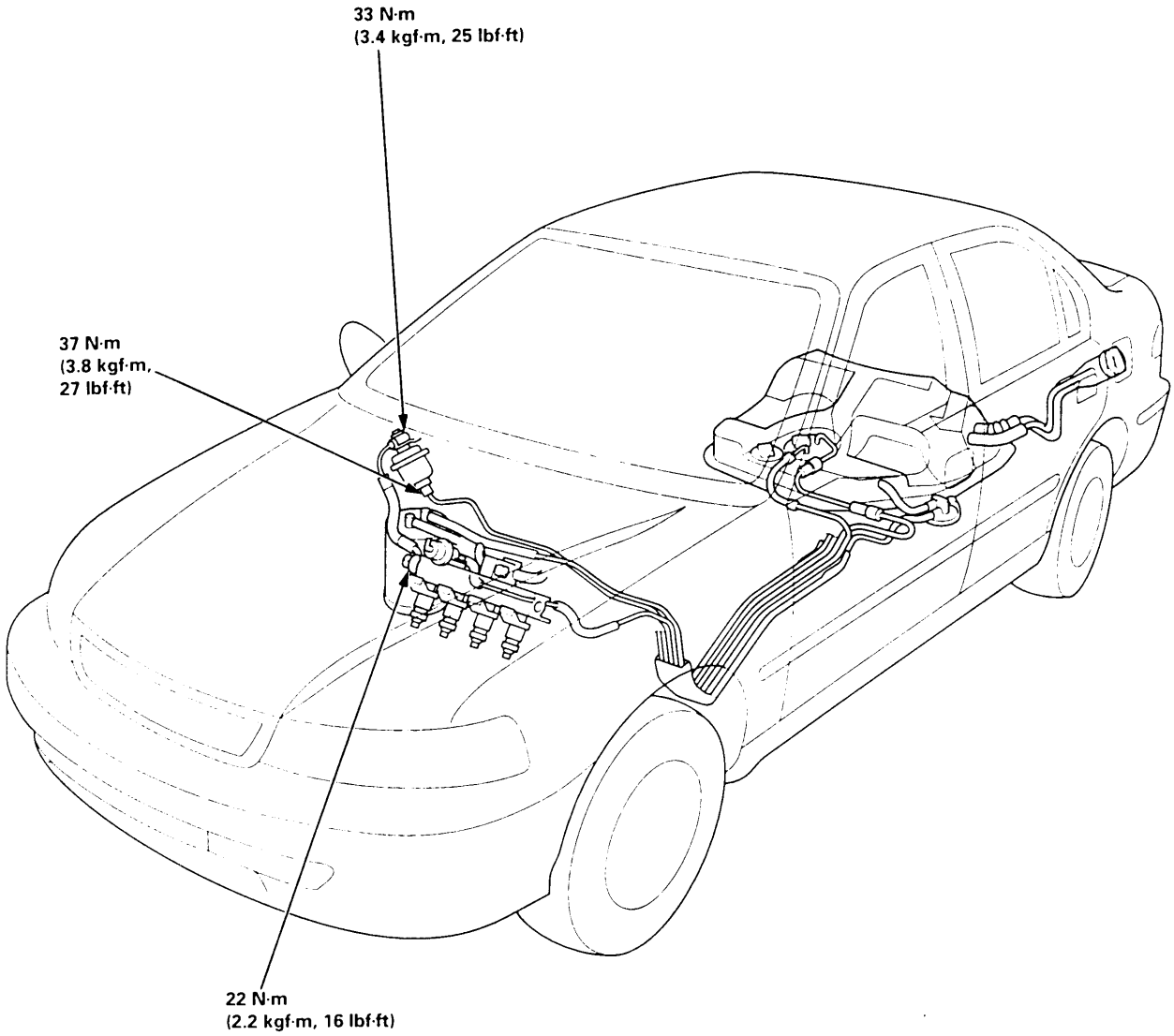
   Idle speed should be:
   810 ± 50 rpm (in [N] or [P] position)

   NOTE:
   - Do not turn the idle adjusting screw when the air conditioner is on.
   - If the idle speed is not within specification, see Symptom Chart on page 11-30.

Fuel Supply System

Fuel Lines

NOTE: Check fuel system lines, hoses, connections, fuel filter and other components for damage, leaks and deterioration, and replace if necessary.



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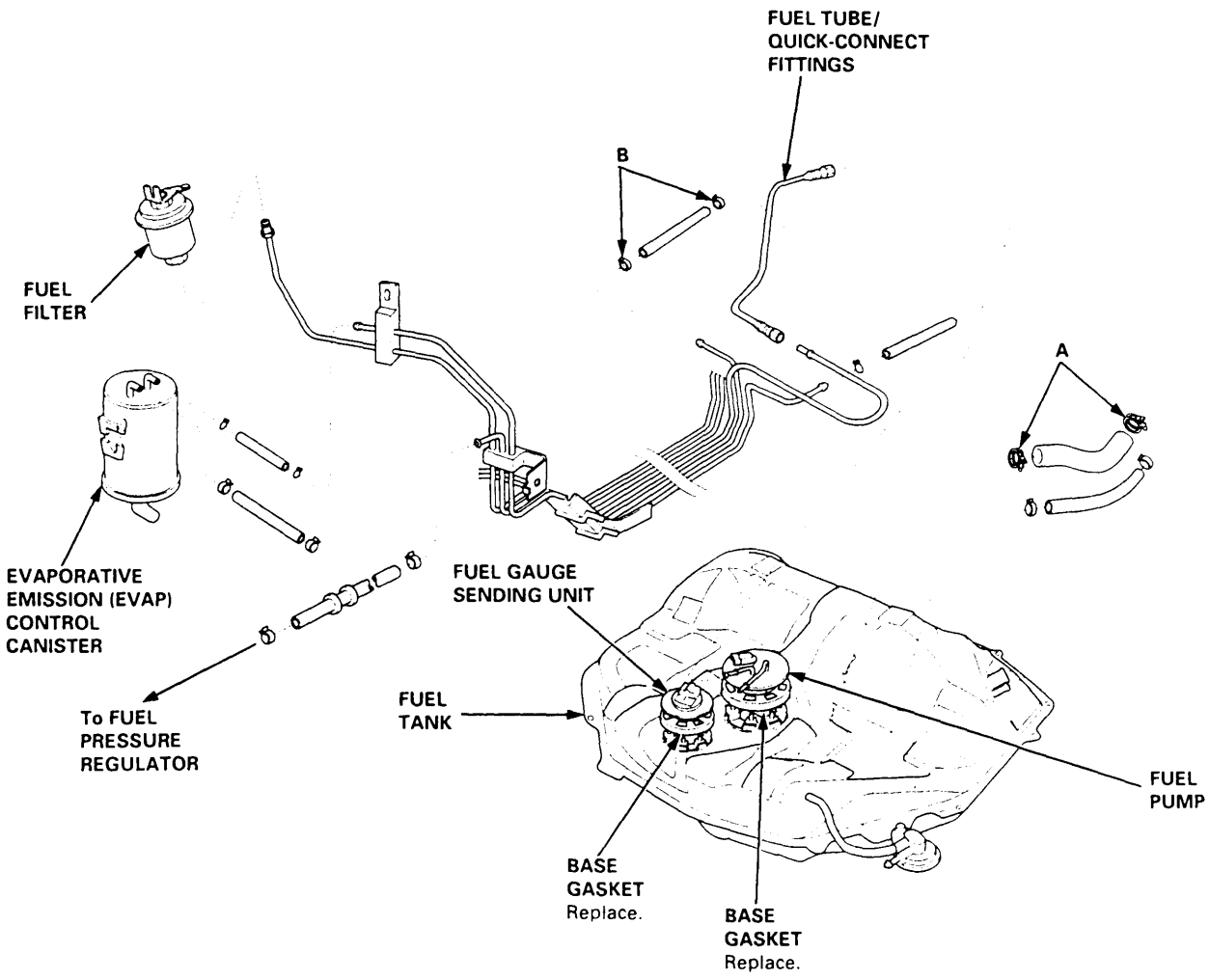
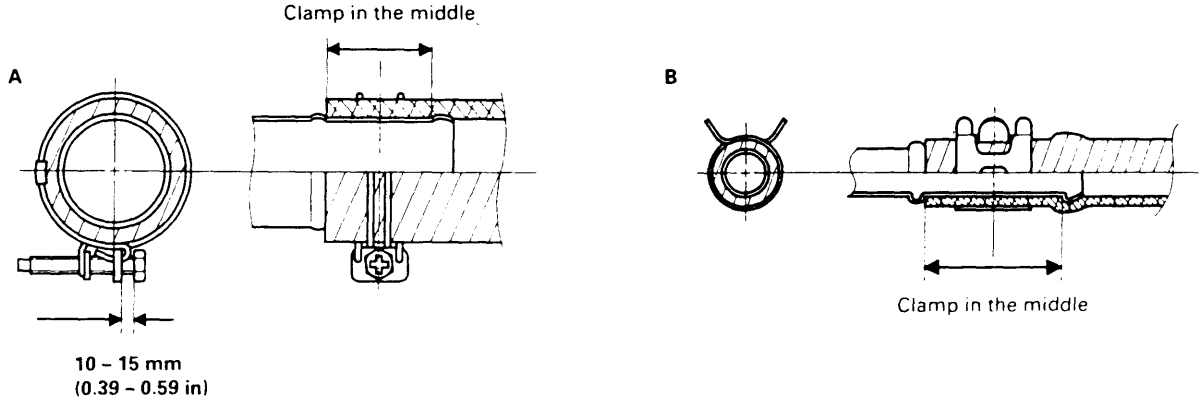
Fuel Supply System

Fuel Lines (cont'd)

NOTE: Check all hose clamps and retighten if necessary.





Fuel Tube/Quick-Connect Fittings

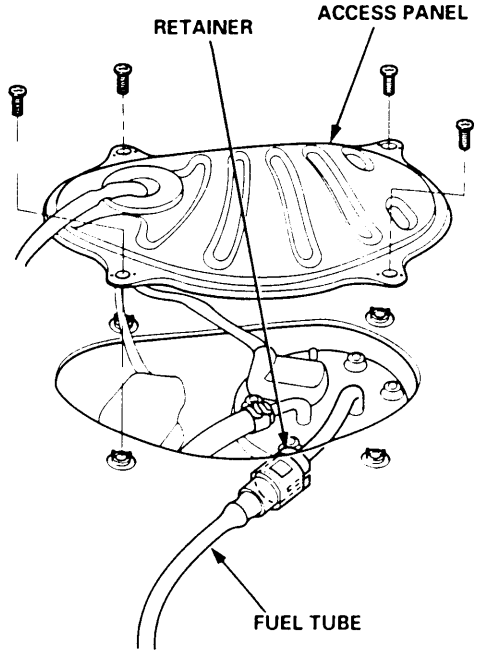
Precautions

⚠WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

The fuel tube/quick-connect fittings assembly connects the in-tank fuel pump with the fuel feed pipe. For removing or installing the fuel pump and fuel tank, it is necessary to disconnect or connect the quick-connect fittings. Pay attention to following:

- The fuel tube/quick-connect fittings assembly is not heat-resistant; be careful not to damage it during welding or other heat-generating procedures.
- The fuel tube/quick-connect fittings assembly is not acid-proof; do not touch it with a shop towel which was used for wiping battery electrolyte. Replace the fuel tube/quick-connect fittings assembly if it came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel tube/quick-connect fittings assembly, be careful not to bend or twist it excessively. Replace it if damaged.

A disconnected quick-connect fitting can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when
- Replacing the fuel pump.
- Replacing the fuel feed pipe.
- It has been removed from the pipe.
- It is damaged.

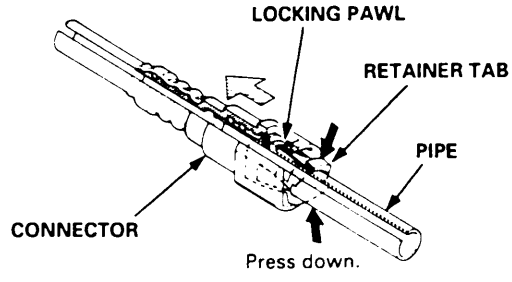


Disconnection

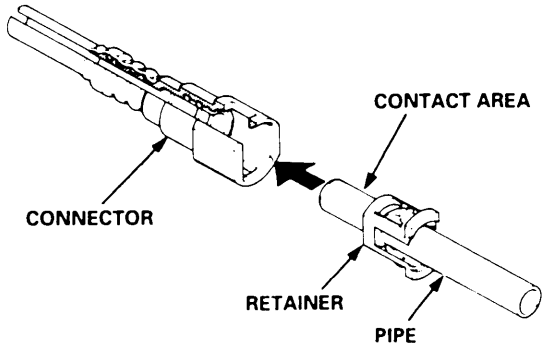
⚠WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

1. Relieve fuel pressure (see page 11-110).
2. Check the fuel quick-connect fittings for dirt, and clean if necessary.
3. Hold the connector with one hand and press down the retainer tabs with the other hand, then pull the connector off.

   NOTE:
   - Be careful not to damage the pipe 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 pipe; once removed, the retainer must be replaced with a new one.



4. Check the contact area of the pipe for dirt and damage.
   - If the surface is dirty, clean it.
   - If the surface is rusty or damaged, replace the fuel pump or fuel feed pipe.



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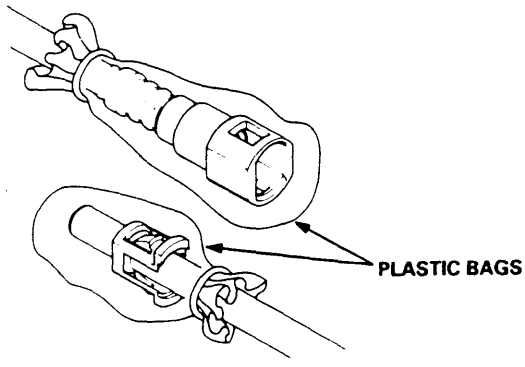
Fuel Tube/Quick-Connect Fittings (cont'd)

5. To prevent damage and keep out foreign matter, cover the disconnected connector and pipe end with plastic bags.

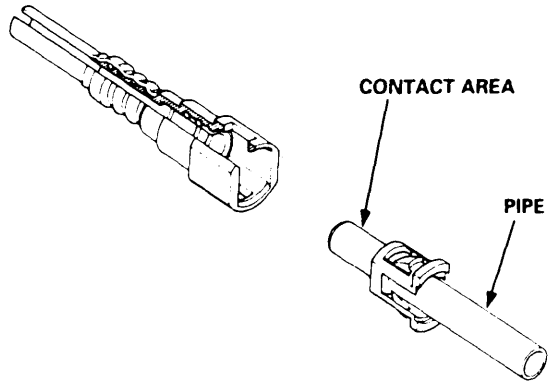


NOTE: The retainer cannot be reused once it has been removed from the pipe.
Replace the retainer when
— replacing the fuel pump.
— replacing the fuel feed pipe.
— it has been removed from the pipe.
— it is damaged.

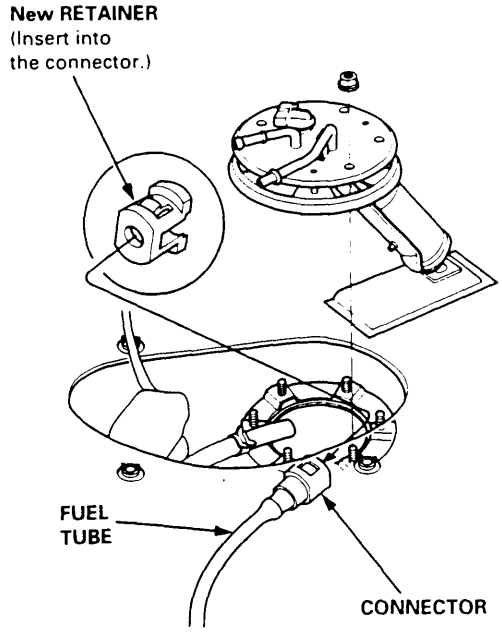
Connection

⚠ WARNING Do not smoke while working on the fuel system. Keep open flames away from your work area.

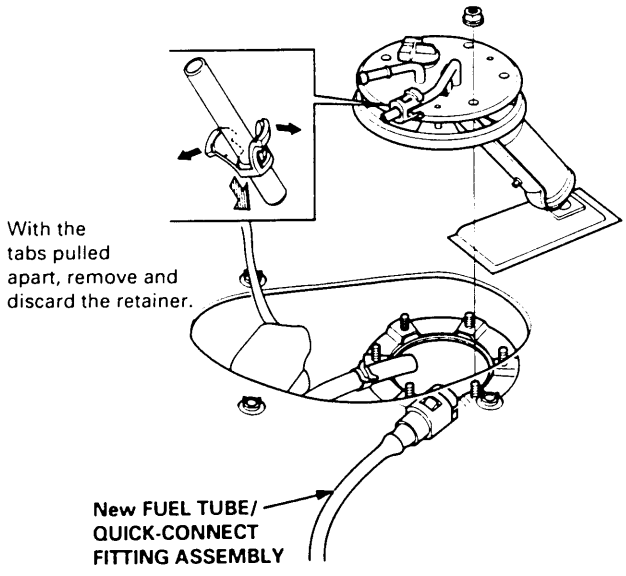
1. Check the pipe contact area for dirt and damage, and clean if necessary.



2. Insert a new retainer into the connector if the retainer is damaged, or after
   - replacing the fuel pump.
   - replacing the fuel feed pipe.
   - removing the retainer from the pipe.



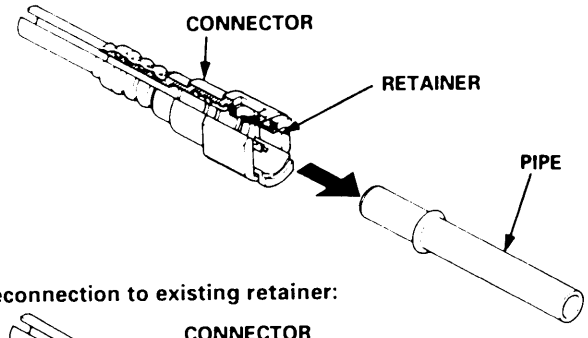
Before connecting a new fuel tube/quick-connect fitting assembly, remove the old retainer from the mating pipe.



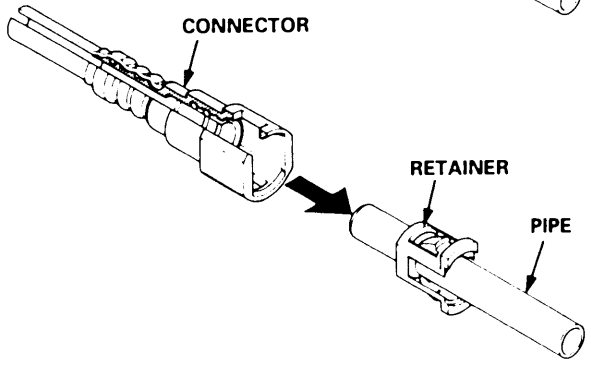
3. Align the quick-connect fittings with the pipe, and align the retainer locking pawls with the connector grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.

   NOTE: If it is hard to connect, put a small amount of new engine oil on the pipe end.

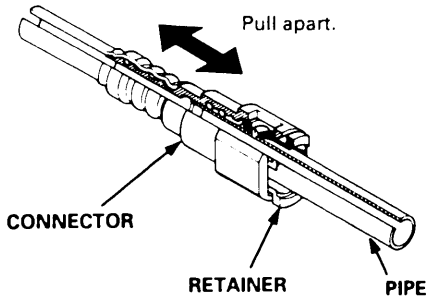
Connection with new retainer:



Reconnection to existing retainer:



4. Make sure the connection is secure and the pawls are firmly locked into place; check visually and by pulling the connector.



5. Reconnect the battery negative cable, and turn the ignition switch ON (II). The fuel pump will run for about two seconds, and fuel pressure will rise. Repeat two or three times, and check that there is no leakage in the fuel supply system.

Fuel Supply System

System Description

The fuel supply system consists of a fuel tank, in-tank high pressure fuel pump, PGM-FI main relay, fuel filter, fuel pressure regulator, fuel injectors, and fuel delivery and return lines. This system delivers pressure-regulated fuel to the fuel injectors and cuts the fuel delivery when the engine is not running.

Fuel Pressure

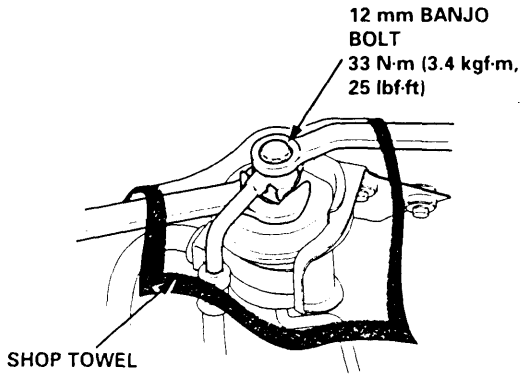
Relieving

Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 12 mm banjo bolt on top of the fuel filter.

⚠ WARNING

- **Do not smoke while working on the fuel system. Keep open flames or sparks away from your work area.**
- **Be sure to relieve fuel pressure while the ignition switch is off.**

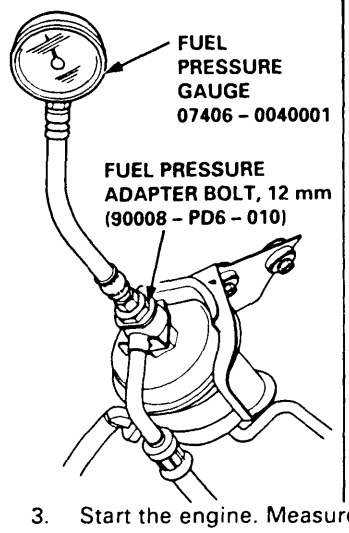
1. Write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable from the battery negative terminal.
3. Remove the fuel fill cap.
4. Use a box end wrench on the 12 mm banjo bolt at the fuel filter while holding the fuel filter with another wrench.
5. Place a rag or shop towel over the 12 mm banjo bolt.
6. Slowly loosen the 12 mm banjo bolt one complete turn.

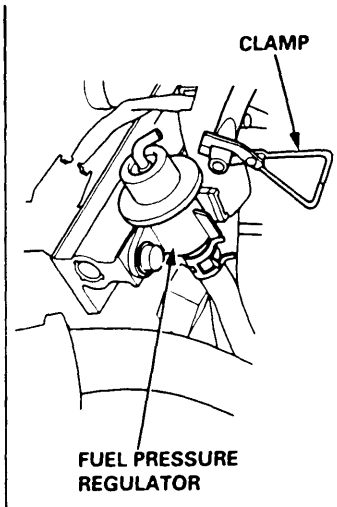


NOTE: Replace the washers whenever the 12 mm banjo bolt is loosened or removed.

Inspection

1. Relieve fuel pressure.
2. Remove the 12 mm banjo bolt from the fuel filter while holding the fuel filter with another wrench. Attach the fuel pressure adapter bolt, 12 mm, and special tool.





3. Start the engine. Measure the fuel pressure with the engine idling and the vacuum hose of the fuel pressure regulator disconnected from the fuel pressure regulator and pinched. If the engine will not start, turn the ignition switch ON (II), wait for two seconds, turn it off, then back on again and read the fuel pressure.

   Pressure should be:
   260 - 310 kPa (2.7 - 3.2 kgf/cm², 38 - 46 psi)

4. Reconnect vacuum hose to the fuel pressure regulator.

   Pressure should be:
   200 - 250 kPa (2.0 - 2.5 kgf/cm², 28 - 36 psi)

   If the fuel pressure is not as specified, first check the fuel pump (see page 11-115). If the fuel pump is OK, check the following:

   - If the fuel pressure is higher than specified, inspect for:
     - — Pinched or clogged fuel return hose or line.
     - — Faulty fuel pressure regulator (see page 11-113).
   - If the fuel pressure is lower than specified, inspect for:
     - — Clogged fuel filter.
     - — Faulty fuel pressure regulator (see page 11-113).
     - — Fuel line leakage.

Fuel Injectors

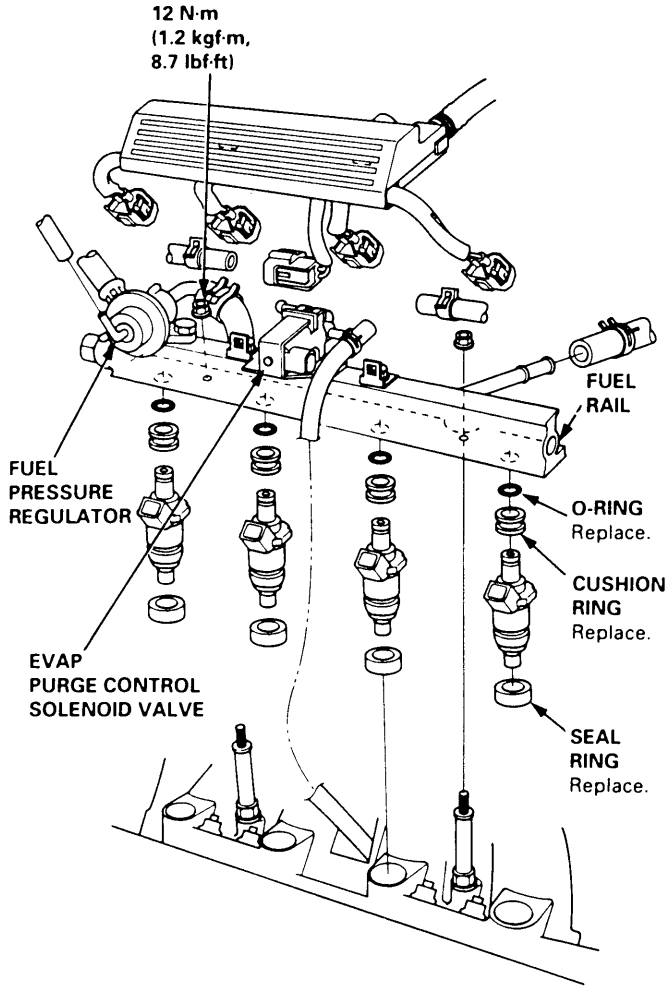
Replacement

⚠WARNING Do not smoke when working on the fuel system. Keep open flames away from your work area.

1. Relieve the fuel pressure (see page 11-110).
2. Disconnect the connectors from the fuel injectors.
3. Disconnect the vacuum hoses and fuel return hose from the fuel pressure regulator. Disconnect the vacuum hoses and 2P connector from the EVAP purge control solenoid valve.

   NOTE: Place a rag or shop towel over the hoses before disconnecting them.

4. Remove the retainer nuts on the fuel rail.
5. Disconnect the fuel rail.
6. Remove the fuel injectors from the intake manifold.



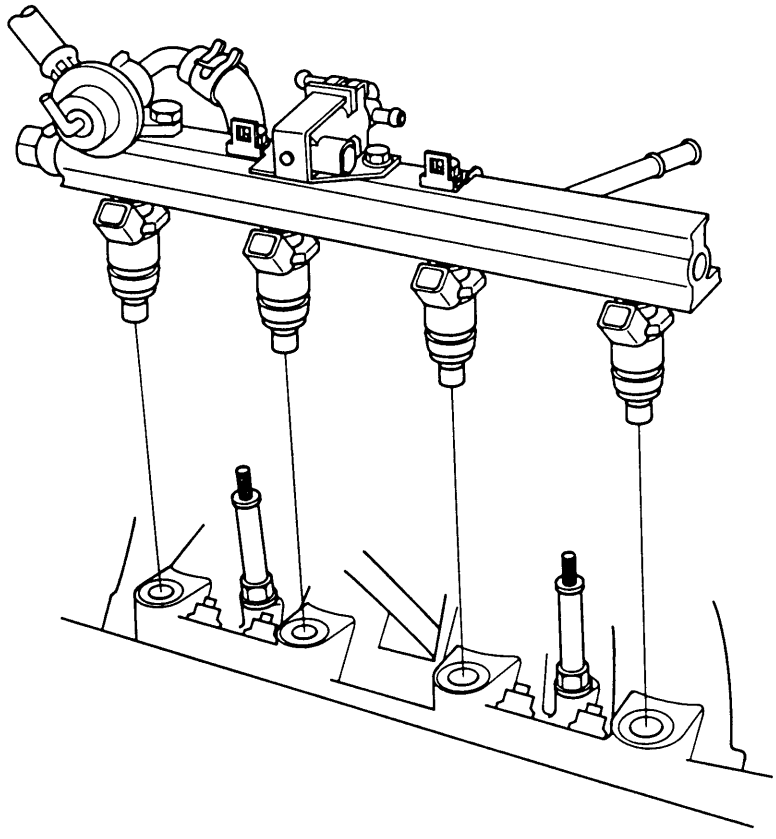
7. Slide new cushion rings onto the fuel injectors.
8. Coat new O-rings with clean engine oil, and put them on the fuel injectors.
9. Insert the fuel injectors into the fuel rail first.
10. Coat new seal rings with clean engine oil, and press them into the intake manifold.

(cont'd)

Fuel Injectors (cont'd)

11. Install the fuel injectors and fuel rail assembly in the intake manifold.

CAUTION: To prevent damage to the O-rings, install the fuel injectors in the fuel rail first, then install them in the intake manifold.



12. Install and tighten the retainer nuts.
13. Connect the vacuum hoses and fuel return hose to the fuel pressure regulator. Connect the vacuum hoses and 2P connector to the EVAP purge control solenoid valve.
14. Install the connectors on the fuel injectors.
15. Turn the ignition switch ON (II), but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.

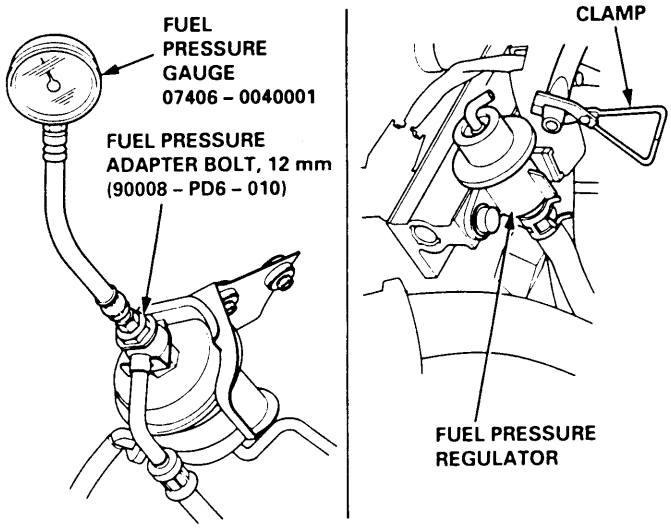
Fuel Pressure Regulator

Testing

⚠WARNING Do not smoke during the test. Keep open flames away from your work area.

1. Attach the special tool and the fuel pressure adapter bolt, 12 mm, (90008-PD6-010) on the fuel filter (see page 11-110).

   Pressure should be:
   260 – 310 kPa (2.7 – 3.2 kgf/cm², 38 – 46 psi)
   (with the fuel pressure regulator vacuum hose disconnected and pinched)



2. Reconnect the vacuum hose to the fuel pressure regulator.

3. Check that the fuel pressure rises when the vacuum hose from the fuel pressure regulator is disconnected again.

   If the fuel pressure did not rise, replace the fuel pressure regulator.

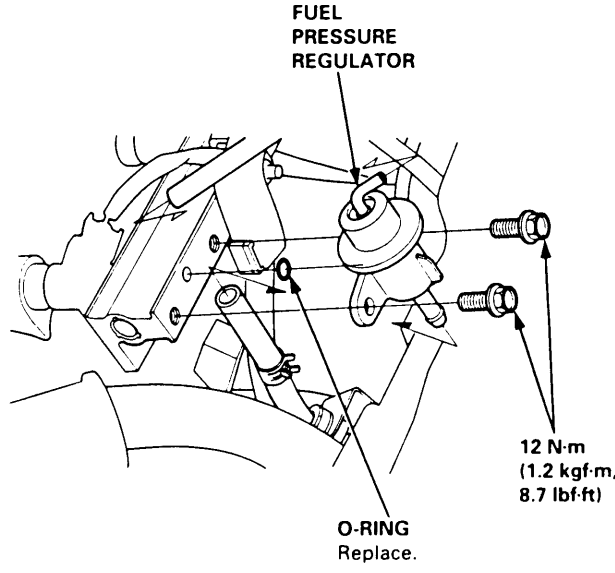
Replacement

⚠WARNING Do not smoke while working on fuel system. Keep open flame away from your work area.

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (see page 11-110).

2. Disconnect the vacuum hose and fuel return hose.

3. Remove the two 6 mm retainer bolts.



NOTE:
- Replace the O-ring.
- When assembling the fuel pressure regulator, apply clean engine oil to the O-ring and assemble it into its proper position, taking care not to damage the O-ring.

Fuel Supply System

Fuel Filter

Replacement

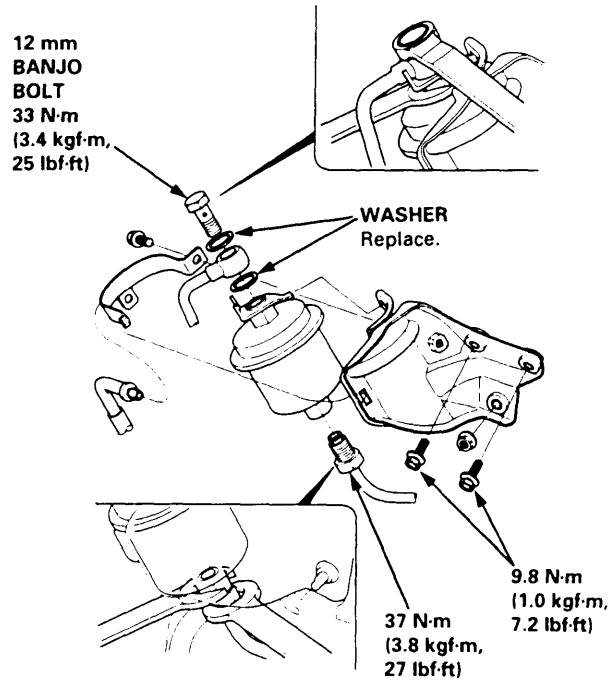
⚠ WARNING

- **Do not smoke while working on fuel system. Keep open flame away from your work area.**
- **While replacing the fuel filter, be careful to keep a safe distance between battery terminals and any tools.**

The fuel filter should be replaced whenever the fuel pressure drops below the specified value [260 – 310 kPa (2.7 – 3.2 kgf/cm², 38 – 46 psi) with the fuel pressure regulator vacuum hose disconnected and pinched] after making sure that the fuel pump and the fuel pressure regulator are OK.

1. Place a shop towel under and around the fuel filter.
2. Relieve fuel pressure (see page 11-110).
3. Remove the 12 mm banjo bolt and the fuel feed pipe from the fuel filter, while supporting it with the another wrench, as shown.
4. Remove the fuel filter clamp and fuel filter.
5. When assembling, use new washers as shown.

   NOTE: Clean the flared joint of high pressure hoses thoroughly before reconnecting them.



Fuel Pump

Testing

⚠ WARNING Do not smoke during the test. Keep open flame away from your work area.

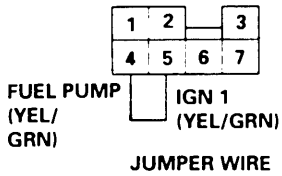
If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON (II), you will hear some noise if you hold your ear to the fuel fill port with the fuel fill cap removed. The fuel pump should run for two seconds when ignition switch is first turned ON (II). If the fuel pump does not make noise, check it as follows:

1. Remove the seat cushion (see section 20).
2. Remove the access panel from the floor.
3. Disconnect the fuel pump 2P connector.

   CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

4. Connect the PGM-FI main relay 7P connector terminal No. 4 and No. 5 with a jumper wire.

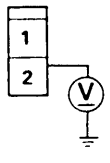
PGM-FI MAIN RELAY 7P CONNECTOR (C443)



Wire side of female terminals

5. Check that battery voltage is available between the fuel pump 2P connector terminal No. 2 and body ground when the ignition switch is turned ON (II).

FUEL PUMP 2P CONNECTOR (C568)



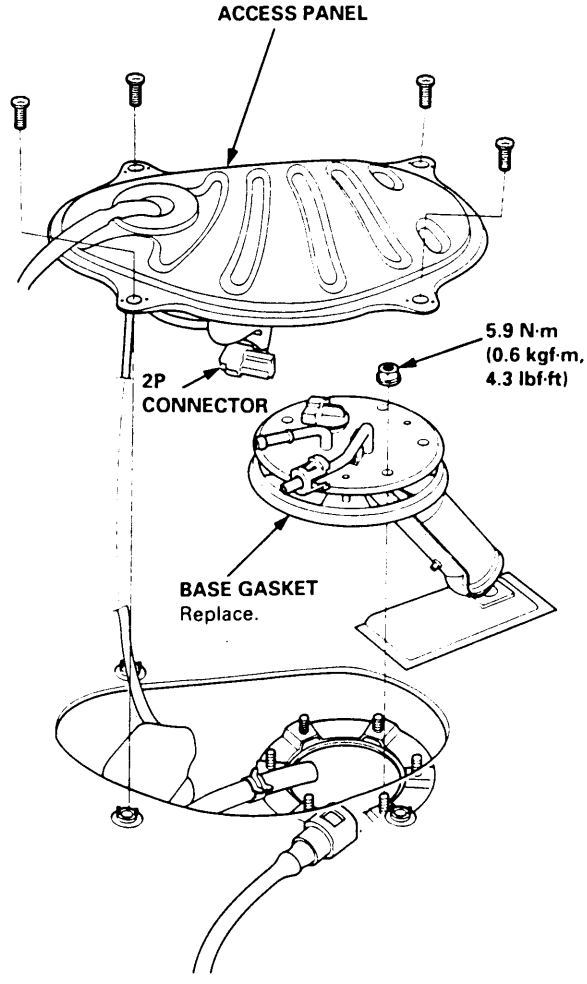
Wire side of female terminals

- If battery voltage is available, check the fuel pump ground. If the ground is OK, replace the fuel pump.
- If there is no voltage, check the wire harness (see page 11-119).

Replacement

⚠ WARNING Do not smoke while working on fuel system. Keep open flames away from your work area.

1. Remove the seat cushion (see section 20).
2. Remove the access panel from the floor.
3. Disconnect the 2P connector from the fuel pump.
4. Remove the fuel pump mounting nuts.
5. Remove the fuel pump from the fuel tank.
6. Install parts in the reverse order of removal.

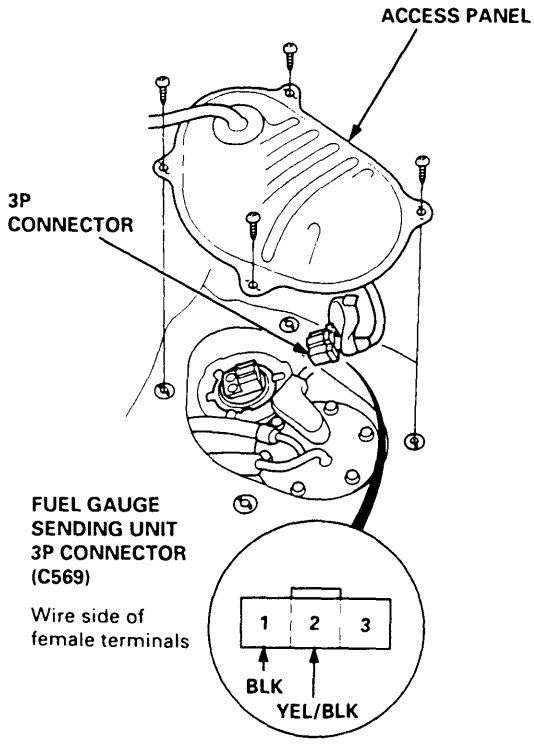


Fuel Gauge/Fuel Gauge Sending Unit

Testing

⚠ WARNING Do not smoke while working on the fuel system. Keep open flame away from your work area.

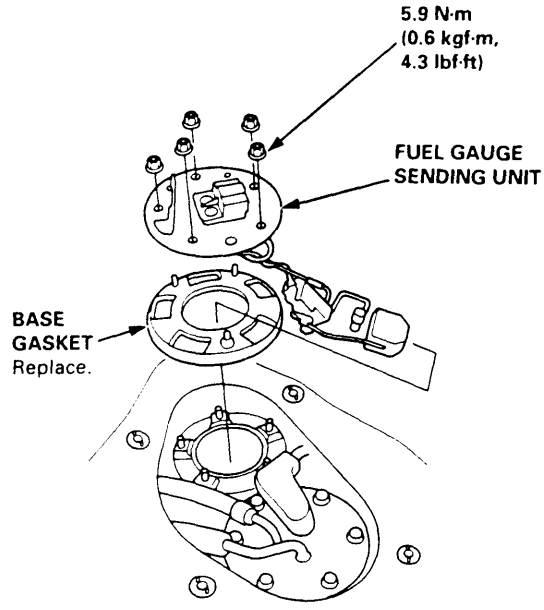
1. Check the No. 25 CLOCK METER (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Remove the rear seat cushion (see section 20).
3. Remove the access panel from the floor.



4. Disconnect the 3P connector from the fuel gauge sending unit.
5. Connect the voltmeter positive probe to the No. 2 terminal and the negative probe to the No. 1 terminal, then turn the ignition switch ON (II).
   There should be between 5 and 8 V.
   - If the voltage is as specified, go to step 5.
   - If the voltage is not as specified, check for:
     — an open in the YEL/BLK or BLK wire.
     — poor ground (G552).
6. Turn the ignition switch OFF.
7. Attach a jumper wire between the No. 1 and No. 2 terminals, then turn the ignition switch ON (II).
8. Check that the pointer of the fuel gauge starts moving toward the "F" mark.

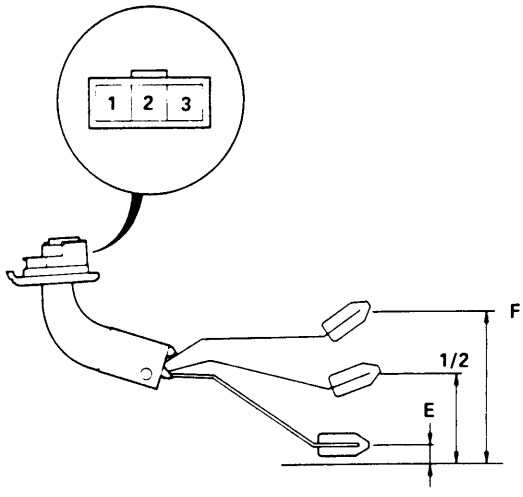
   CAUTION: Turn the ignition switch OFF before the pointer reaches "F" on the gauge dial. Failure to do so may damage the fuel gauge.

   NOTE: The fuel gauge is a bobbin (cross-coil) type, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves more slowly than that of a bimetal type.
   - If the pointer of the fuel gauge does not move at all, replace the gauge.
   - If the gauge is OK, inspect the fuel gauge sending unit.
9. Remove the fuel gauge sanding unit as shown.



10. Measure the resistance between the No. 1 and No. 2 terminals at E (EMPTY), 1/2 (HALF FULL) and F (FULL) by moving the float.

Float Position	E	1/2	F
Resistance (Ω)	105 – 108	29.5 – 35.5	3.5 – 5



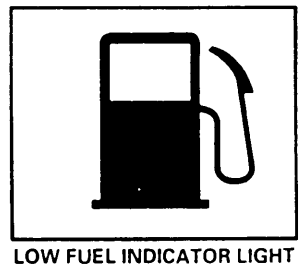
If the readings are beyond the range, replace the fuel gauge sending unit.

Low Fuel Indicator System

Indicator Light Testing

1. Check the No. 25 CLOCK METER (7.5 A) fuse in the under-dash fuse/relay box, and the gauge relay before testing.
2. Park the vehicle on level ground.

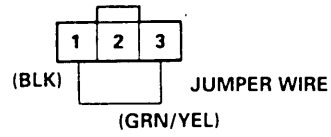
   ⚠ WARNING Do not smoke while working on the fuel system. Keep open flame away from the work area. Drain fuel only into an approved container.
3. Drain the fuel into an approved container. Then install the drain bolt with a new washer.
4. Add less than 8.5 ℓ (2.2 U.S. Gal. 1.8 Imp. Gal) of fuel, and turn the ignition switch ON (II). The low fuel indicator light should come on within five minutes.



LOW FUEL INDICATOR LIGHT

   - If the light comes on within four minutes, go to step 8.
   - If the light does not come on within four minutes, go to step 5.
5. Remove the rear seat cushion (see section 20).
6. Remove the access panel from the floor, and disconnect the 3P connector from the fuel gauge sending unit.
7. Connect the No. 1 and No. 3 terminals with a jumper wire.
   - if the light comes on, check the sending unit.
   - If the light does not come on, check for:
     — an open in the GRN/YEL wire between the fuel unit and fuel gauge assembly.
     — blown bulb.
     — poor ground (G552).

FUEL GAUGE SENDING UNIT 3P CONNECTOR (C569)



Wire side of female terminals

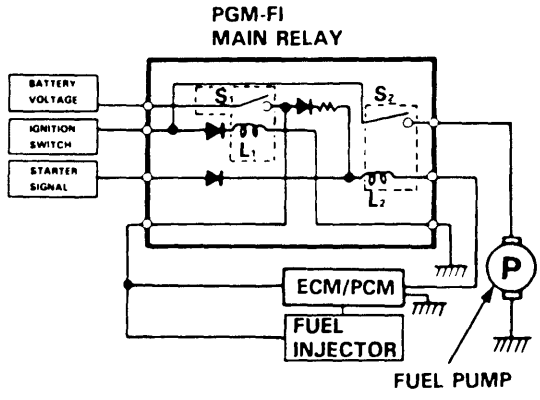
8. Add 4 ℓ of fuel (1.1 U.S. Gal. 0.9 Imp. Gal). The light should go off within five minutes.

Fuel Supply System

PGM-FI Main Relay

Description

The PGM-FI main relay actually contains two individual relays. This relay is located at the right side of the cowl. One relay is energized whenever the ignition is on which supplies the battery voltage to the ECM/PCM, power to the fuel injectors, and power for the second relay. The second relay is energized for two seconds when the ignition is switched ON (II), and when the engine is running, to supply power to the fuel pump.

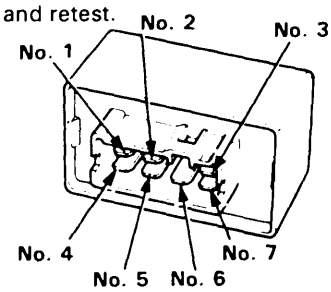


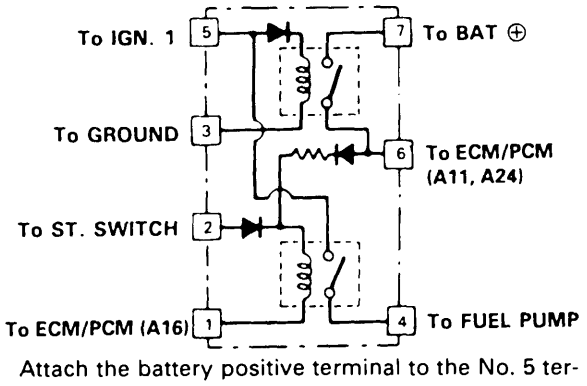
Relay Testing

NOTE:

- If the engine starts and continues to run, the PGM-FI main relay is OK.
- Use the terminal numbers below; ignore the terminal numbers molded into the relay.

1. Remove the PGM-FI main relay.
2. Attach the battery positive terminal to the No. 2 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check for continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.
   - If there is continuity, go on to step 3.
   - If there is no continuity, replace the PGM-FI main relay and retest.





3. Attach the battery positive terminal to the No. 5 terminal and the battery negative terminal to the No. 3 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 7 terminal and No. 6 terminal of the PGM-FI main relay.
   - If there is continuity, go on to step 4.
   - If there is no continuity, replace the PGM-FI main relay and retest.
4. Attach the battery positive terminal to the No. 6 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.
   - If there is continuity, the PGM-FI main relay is OK. If the fuel pump still does not work, go to Harness Testing on the next page.
   - If there is no continuity, replace the PGM-FI main relay and retest.

Troubleshooting

— Engine will not start.
— Inspection of PGM-FI main relay and relay harness.

Check for an open in the wire (GND line):
1. Turn the ignition switch OFF.
2. Disconnect the PGM-FI main relay 7P connector.
3. Check for continuity between the PGM-FI main relay 7P connector terminal No. 3 and body ground.

Is there continuity? — NO → **Repair open in the wire between the PGM-FI main relay and G101.**

YES

Check for an open or short in the wire (BAT line):
Measure voltage between the PGM-FI main relay 7P connector terminal No. 7 and body ground.

Is there battery voltage? — NO → **— Repair open or short in the wire between the PGM-FI main relay and the FI E/M (15 A) fuse.**
— Replace the FI E/M (15 A) fuse in the under-hood fuse/relay box.

YES

Check for an open or short in the wire (IG1 line):
1. Turn the ignition switch ON (II).
2. Measure the voltage between the PGM-FI main relay 7P connector terminal No. 5 and body ground.

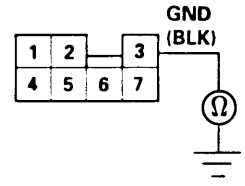
Is there battery voltage? — NO → **— Repair open or short in the wire between the PGM-FI main relay and the No. 13 FUEL PUMP SRS UNIT (15 A) fuse.**
— Replace the No. 13 FUEL PUMP SRS UNIT (15 A) fuse in the under-dash fuse/relay box.

YES

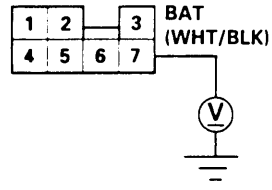
Check for an open or short in the wire (STS line):
1. Turn the ignition switch to the START (III) position.
   NOTE:
   • M/T: Clutch pedal must be depressed.
   • A/T: Transmission in [N] or [P] position.
2. Measure the voltage between the PGM-FI main relay 7P connector terminal No. 2 and body ground.

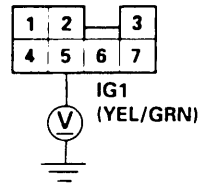
(To page 11-120)

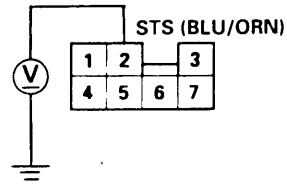
PGM-FI MAIN RELAY 7P CONNECTOR (C443)



Wire side of female terminals







(cont'd)

PGM-FI Main Relay (cont'd)

(From page 11-119)

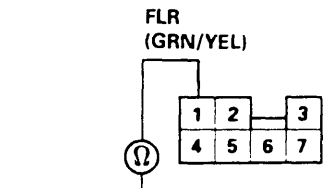
Is there battery voltage?

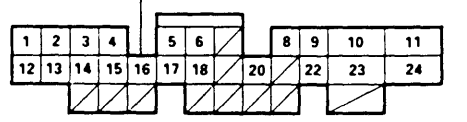
NO → **— Repair open or short in the wire between the PGM-FI main relay and the No. 31 STARTER SIGNAL (7.5 A) fuse.**
— Replace the No. 31 STARTER SIGNAL (7.5 A) fuse in the under-dash fuse/relay box.

YES

Check for an open in the wire (FLR line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector A (32P).
3. Check for continuity between the PGM-FI main relay 7P connector terminal No. 1 and ECM/PCM connector terminal A16.

PGM-FI MAIN RELAY 7P CONNECTOR (C443)





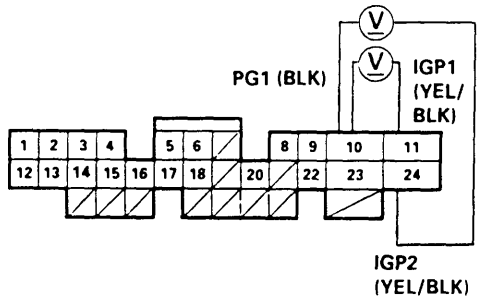
Wire side of female terminals

Is there continuity?

NO → **Repair open in the wire between the ECM/PCM (A16) and the PGM-FI main relay.**

YES

Check for an open in the wires (IGP1, IGP2 lines):
1. Reconnect the ECM/PCM connector A (32P).
2. Reconnect the PGM-FI main relay connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM/PCM connector terminals A11 and A10, and between A24 and A10.

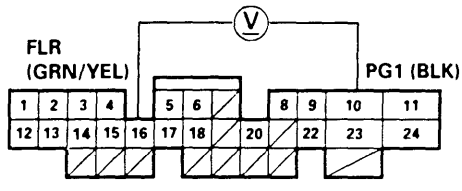


Is there battery voltage?

NO → **— Repair open in the wire between the ECM/PCM (A11, A24) and the PGM-FI main relay.**
— Replace the PGM-FI main relay.

YES

Check for an open in the ECM/PCM:
1. Turn the ignition switch OFF.
2. Measure voltage between ECM/PCM connector terminals A16 and A10 when the ignition switch is first turned ON (II) for two seconds.



Is there 1.0 V or less?

NO → **Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.**

YES

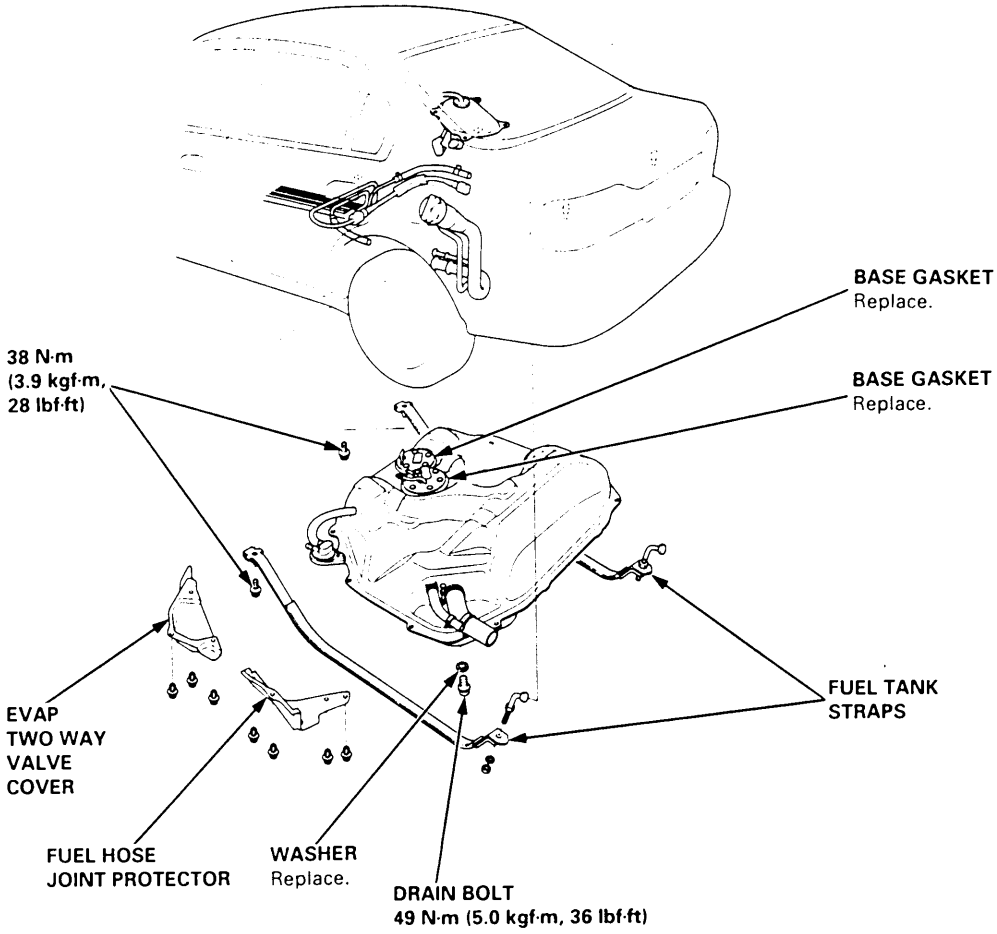
Check the PGM-FI main relay (see page 11-118).

Fuel Tank

Replacement

⚠ WARNING **Do not smoke while working on fuel system. Keep open flame away from your work area.**

1. Relieve the fuel pressure (see page 11-110).
2. Remove the seat cushion (see section 20).
3. Remove the access panel from the floor.
4. Disconnect the 2P (C568) and 3P (C569) connectors.
5. Disconnect the hose and quick-connect fittings (see pages 11-106, 107).
6. Jack up the vehicle, and support it with jackstands.
7. Remove the EVAP two way valve cover and the fuel hose joint protector.
8. Remove the drain bolt, and drain the fuel into an approved container.
9. Disconnect the hoses (see page 11-106).
   CAUTION:
   - **When disconnecting the hoses, slide back the clamps, then twist hoses as you pull, to avoid damaging them.**
   - **Clean the flared joint of high pressure hoses thoroughly before reconnecting them.**
10. Place a jack, or other support, under the tank.
11. Remove the strap nuts, and let the straps fall free.
12. Remove the fuel tank.
    NOTE: The tank may stick on the undercoat applied to its mount. To remove, carefully pry it off the mount.
13. Install the drain bolt with a new washer, then coat the drain bolt with Noxrust 124B, Allow the Noxrust dry for 20 minutes.
14. Install the remaining parts in the reverse order of removal.

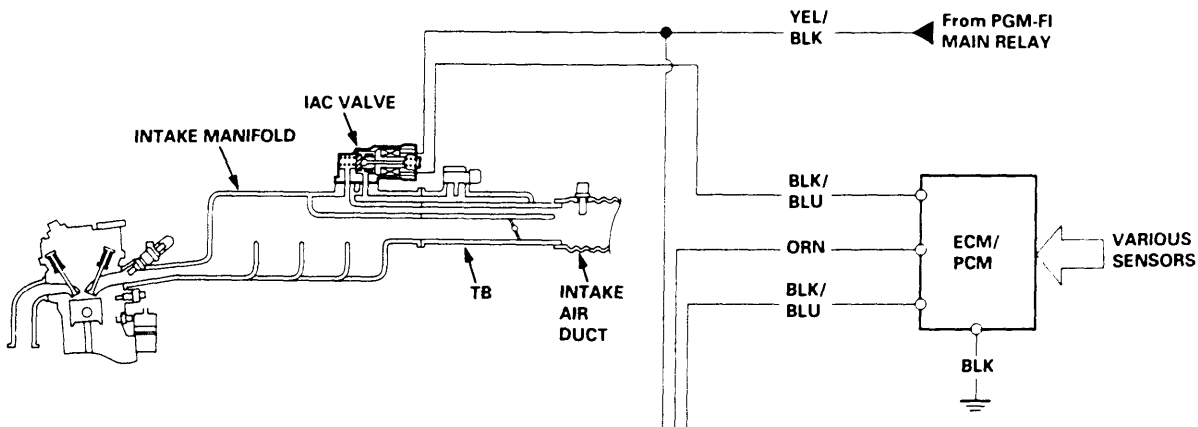


Intake Air System

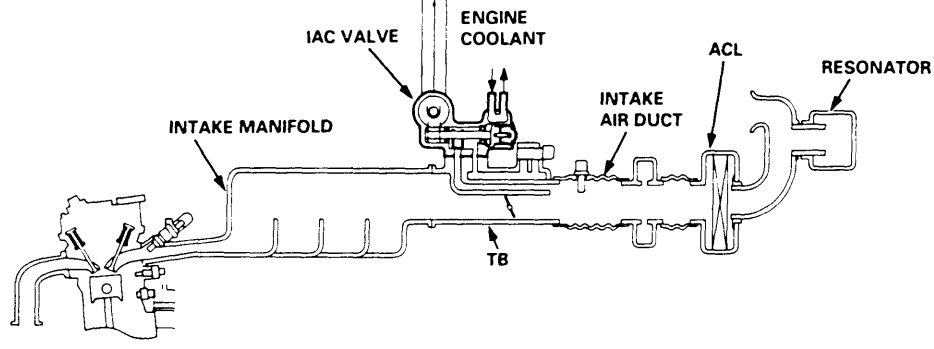
System Description

The system supplies air for all engine needs. It consists of the intake air pipe, Air Cleaner (ACL), intake air duct, Throttle Body (TB), Idle Air Control (IAC) Valve and intake manifold. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.

M/T:



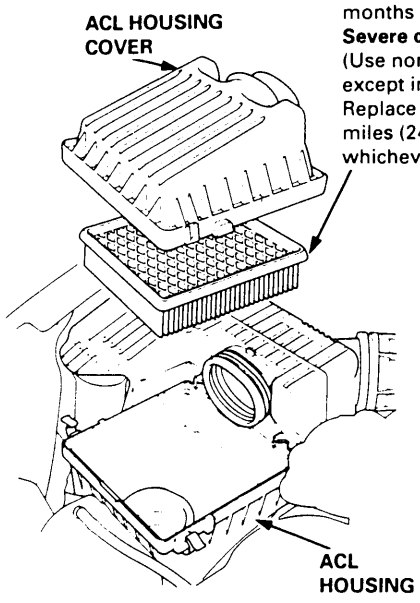
A/T:



Air Cleaner (ACL)

NOTE: Do not clean the ACL element by blowing it with compressed air.

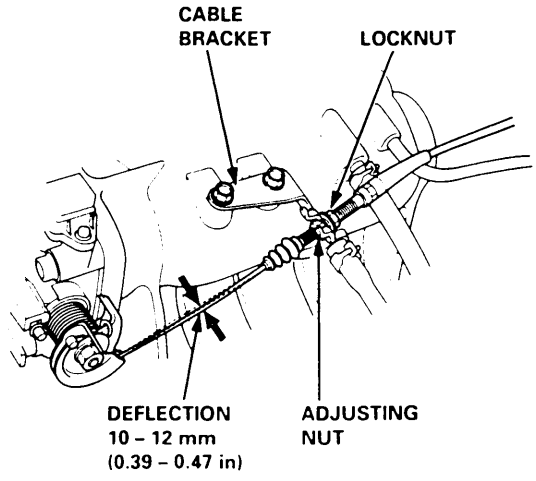
ACL ELEMENT
Normal conditions:
Replace air cleaner element every 30,000 miles (48,000 km) or 24 months whichever comes first.
Severe conditions:
(Use normal schedule except in dusty conditions)
Replace every 15,000 miles (24,000 km) or 12 months whichever comes first.



Throttle Cable

Inspection/Adjustment

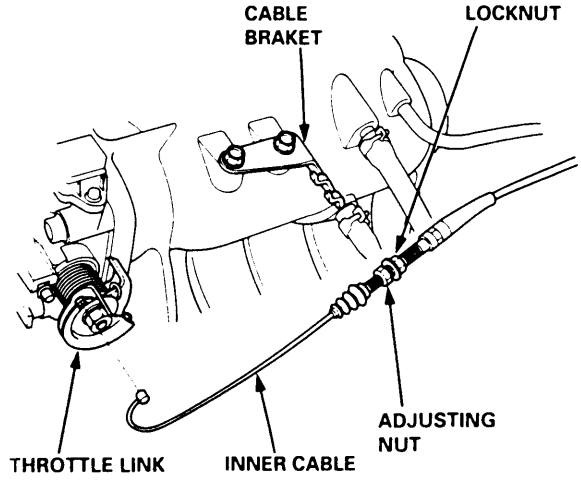
1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.
2. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Check cable free play at the throttle linkage. Cable deflection should be 10 – 12 mm (0.39 – 0.47 in.).



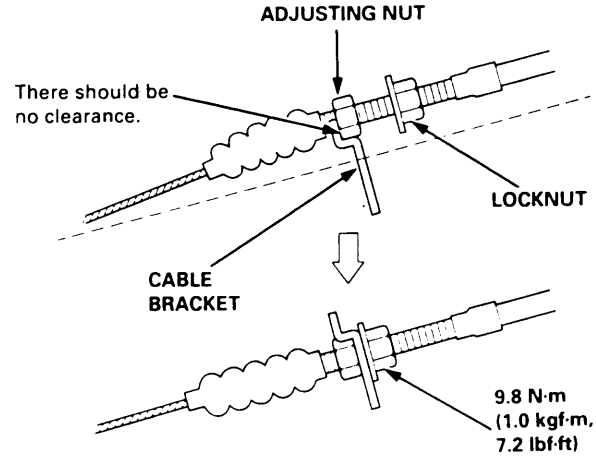
4. If deflection is not within specs, loosen the locknut, turn the adjusting nut until the deflection is as specified, then retighten the locknut.
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Installation

1. Open the throttle valve fully, then install the throttle cable in the throttle linkage, and install the cable housing in the cable bracket.



2. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.
3. Hold the cable sheath, removing all slack from the cable.
4. Set the locknut on the cable bracket. Adjust the adjusting nut so that its free play is 0 mm.
5. Remove the cable sheath from the throttle bracket, reset the adjusting nut and tighten the locknut.

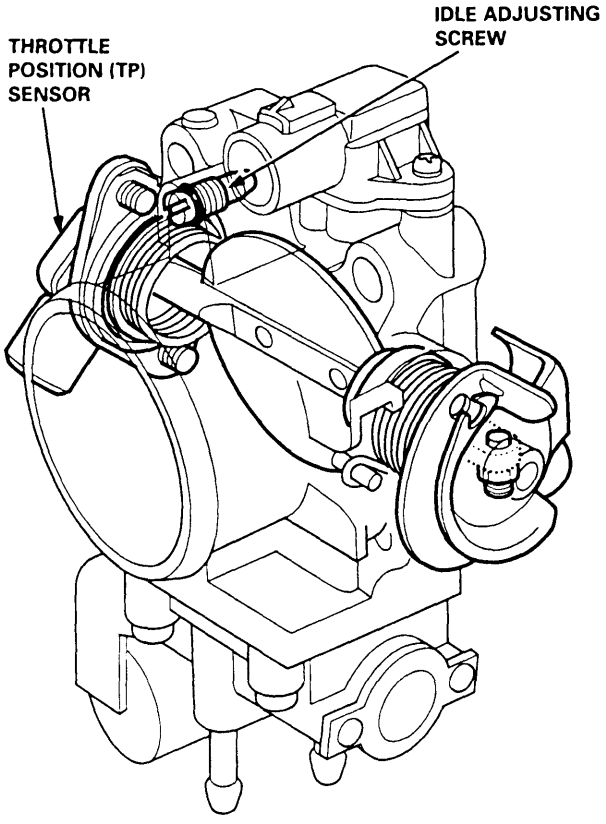


Intake Air System

Throttle Body

Description

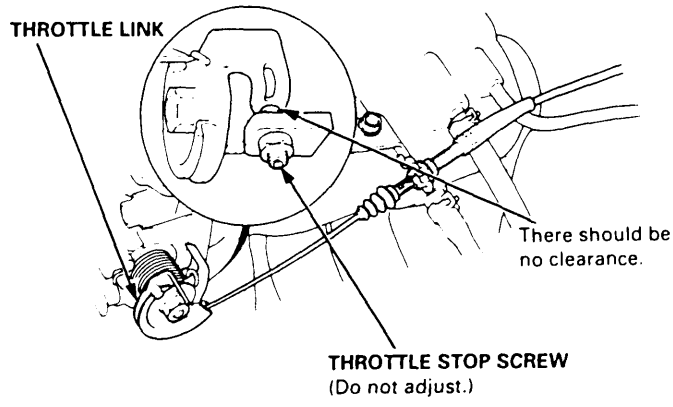
The throttle body is a single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant from the cylinder head. The idle adjusting screw which regulates the bypass air is located on the top of the throttle body.



Inspection

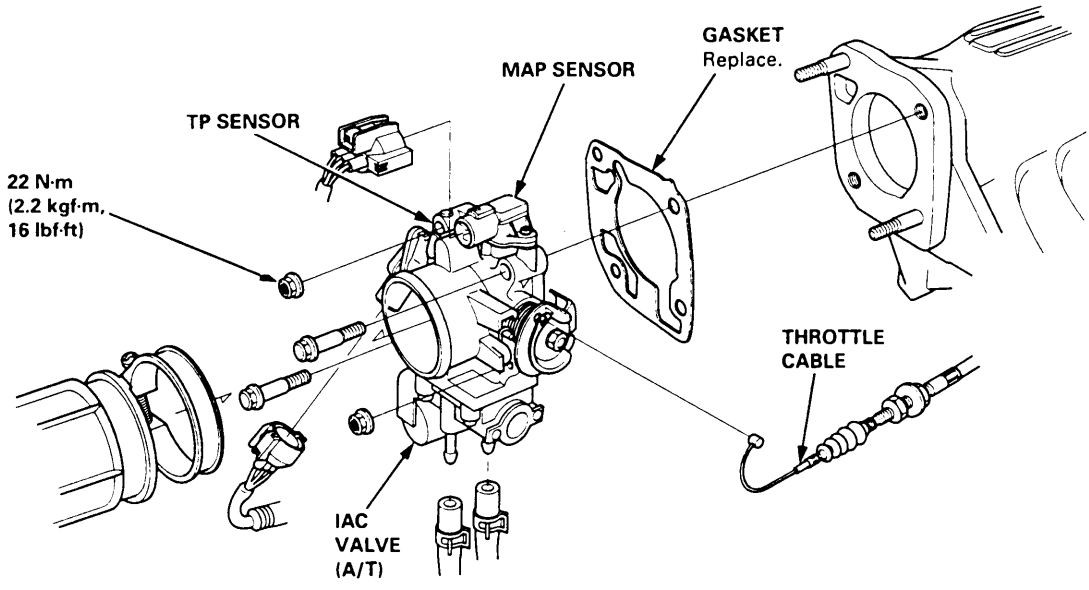
1. Check that the throttle cable operates smoothly without binding or sticking.

   If there are any abnormalities, check for:
   - Excessive wear or play in the throttle valve shaft.
   - Sticky or binding throttle lever at the fully closed position.
   - Clearance between throttle stop screw and throttle lever at the fully closed position.



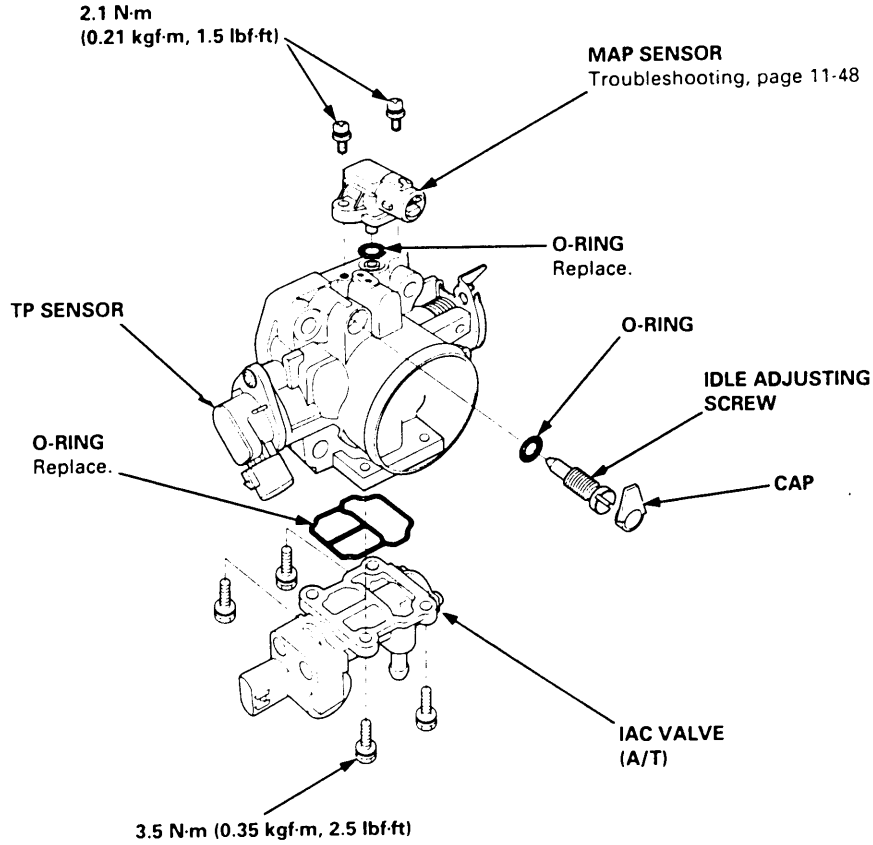
Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.

Removal



CAUTION:
- Do not adjust the throttle stop screw.
- After reassembly, adjust the throttle cable (see page 11-123).
- The TP sensor is not removable.

Disassembly



Emission Control System

System Description

The emission control system includes a Three Way Catalytic Converter (TWC), Positive Crankcase Ventilation (PCV) system and Evaporative Emission (EVAP) Control system.

Tailpipe Emission

Inspection

⚠ WARNING Do not smoke during this procedure. Keep any open flame away from your work area.

1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in [N] or [P] position, M/T in neutral) until the radiator fan comes on, then let it idle.
2. Connect a tachometer.
3. Check and, if necessary, adjust the idle speed (see page 11-103).
4. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
5. Check idle CO with the headlights, heater blower, rear window defogger, cooling fan, and air conditioner off.

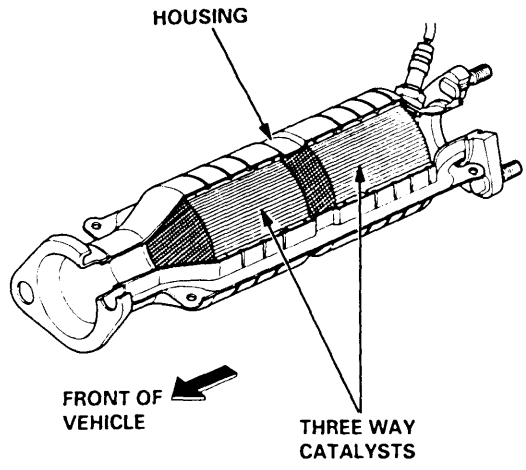
   NOTE: Pull the parking brake lever up. Start the engine, then check that the headlights are off.

   CO meter should indicate 0.1% maximum.

Three Way Catalytic Converter (TWC)

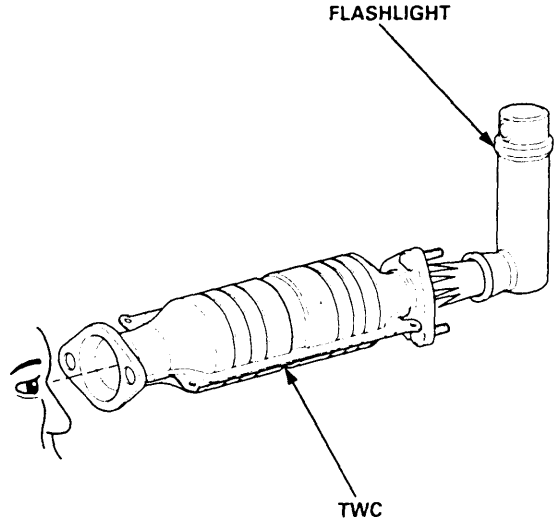
Description

The Three Way Catalytic Converter (TWC) is used to convert hydrocarbons (HC), carbon monoxide (CO), and oxides of nitrogen (NOx) in the exhaust gas to carbon dioxide (CO_2), dinitrogen (N_2) and water vapor.



Inspection

If excessive exhaust system back-pressure is suspected, remove the TWC from the car and using a flashlight, make a visual check for plugging, melting or cracking of the catalyst. Replace the TWC if any of the visible area is damaged or plugged.



P0420 The scan tool indicates Diagnostic Trouble Code (DTC) P0420: Catalyst system efficiency below threshold.

Description

This system evaluates the catalyst's capacity by means of the HO2S (Primary and Secondary) output during stable driving conditions. If deterioration has been detected during two consecutive driving cycles, the MIL comes on and DTC P0420 will be stored.

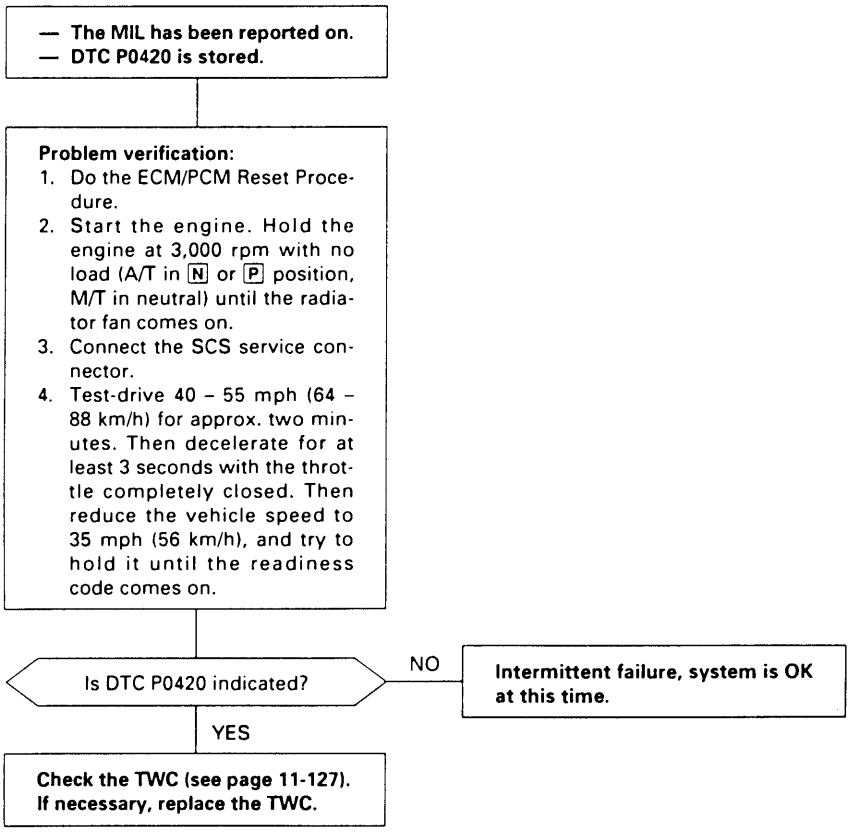
NOTE: If some of the DTCs listed below are stored at the same time as DTC P0420, troubleshoot those DTCs first, then troubleshoot DTC P0420.

P0137, P0138: Secondary HO2S (Sensor 2)
P0141: Secondary HO2S (Sensor 2) Heater

Possible Cause

- TWC Deterioration
- Exhaust system leakage

Troubleshooting Flowchart

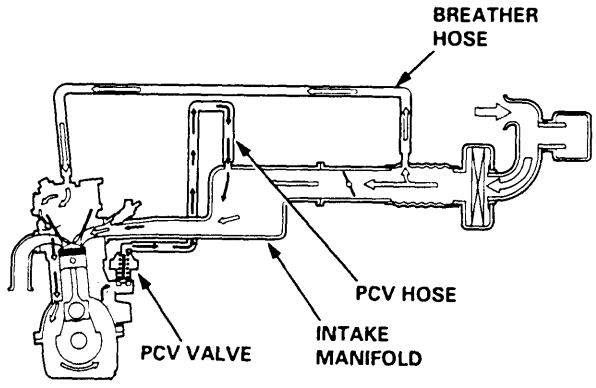


Emission Control System

Positive Crankcase Ventilation (PCV) System

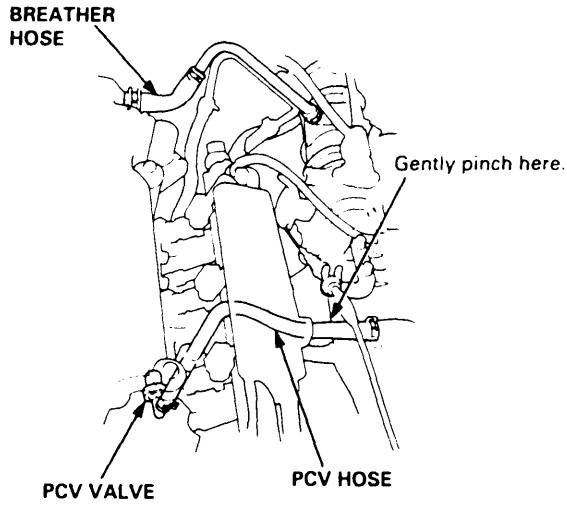
Description

The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.



Inspection

1. Check the PCV hoses and connections for leaks and clogging.
2. At idle, make sure there is a clicking sound from the PCV valve when the hose between PCV valve and intake manifold in lightly pinched with your fingers or pliers.



If there is no clicking sound, check the PCV valve grommet for cracks and damage. If the grommet is OK, replace the PCV valve and recheck.

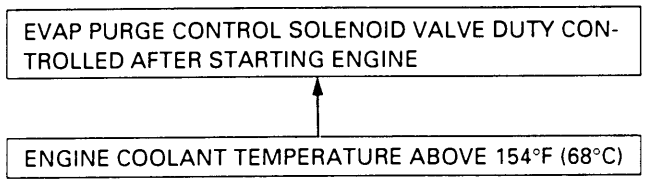
Evaporative Emission (EVAP) Controls

Description

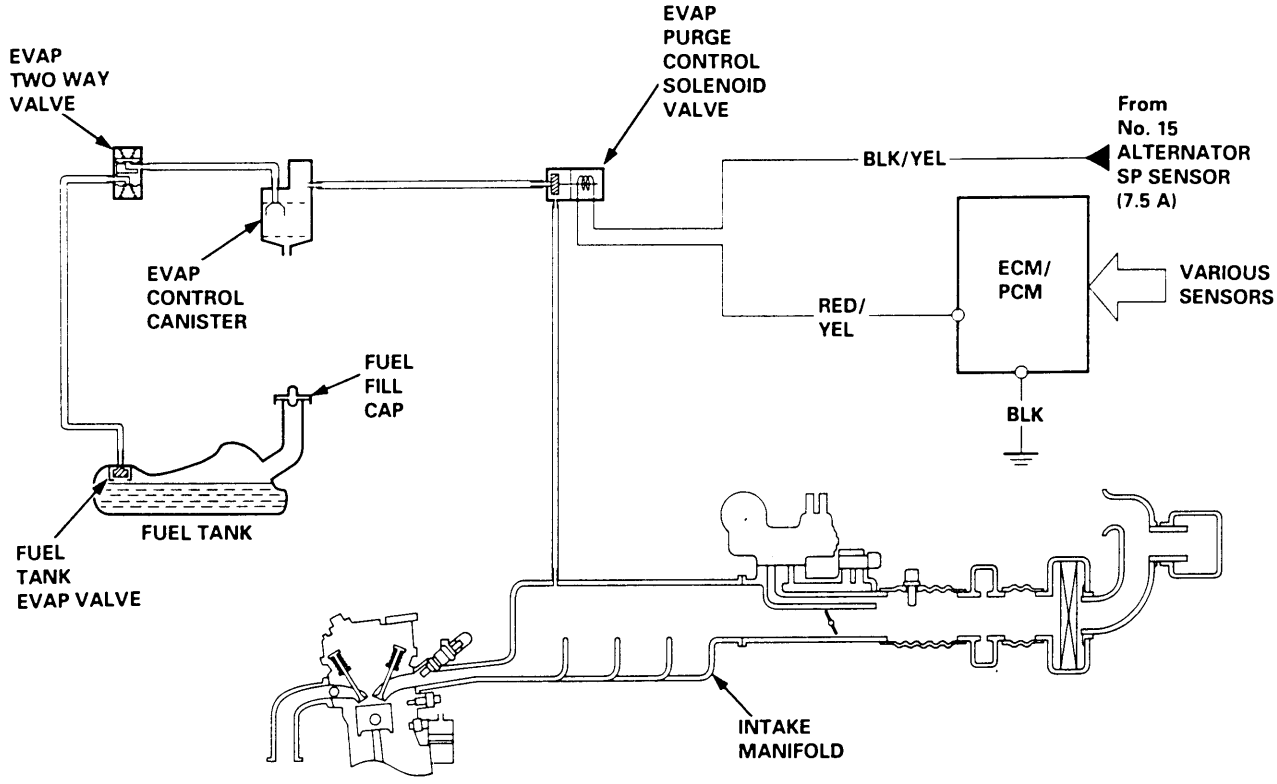
The evaporative emission controls are designed to minimize the amount of fuel vapor escaping to the atmosphere. The system consists of the following components:

A. **Evaporative Emission (EVAP) Control Canister**
An EVAP control canister is used for the temporary storage of fuel vapor until the fuel vapor can be purged from the EVAP control canister into the engine and burned.

B. **Vapor Purge Control System**
EVAP control canister purging is accomplished by drawing fresh air through the EVAP control canister and into a port on the throttle body. The purging vacuum is controlled by the EVAP purge control solenoid valve.



C. **Fuel Tank Vapor Control System**
When fuel vapor pressure in the fuel tank is higher than the set value of the EVAP two way valve, the valve opens and regulates the flow of fuel vapor to the EVAP control canister.



(cont'd)

Emission Control System

Evaporative Emission (EVAP) Controls (cont'd)

P0441 The scan tool indicates Diagnostic Trouble Code (DTC) P0441: Evaporative Emission (EVAP) control system insufficient purge flow.

Description

By monitoring the purge line vacuum with the MAP sensor, the ECM/PCM can detect insufficient EVAP control system purge flow.

Possible Cause

- EVAP Purge Control Solenoid Valve
- EVAP Purge Control Solenoid Valve Circuit
- EVAP Control Canister
- Vacuum Lines
- ECM/PCM

Troubleshooting Flowchart

— The MIL has been reported on.
— DTC P0441 is stored.

Problem verification:
1. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in N or P position, M/T in neutral) until the radiator fan comes on.
2. Do the ECM/PCM Reset Procedure.
3. Connect the SCS service connector.
4. Test-drive under following conditions on the road.
   — Without any electrical load
   — A/T in D3 or D4 position (M/T in 3rd-5th gear)
   — Engine speed between 1,200 – 2,400 rpm
   — Decelerate from 50 mph (80 km/h) to 15 mph (24 km/h)

Is DTC P0441 indicated? — NO → **Intermittent failure, system is OK at this time. Check for poor connections or loose wires at C135 (EVAP purge control solenoid valve) and ECM/PCM.**

YES

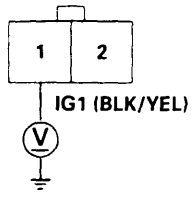
Check for an open in the wire (IG1 line):
1. Turn the ignition switch OFF.
2. Disconnect the EVAP purge control solenoid valve 2P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between body ground and the EVAP purge control solenoid valve 2P connector terminal No. 1.

Is there battery voltage? — NO → **Repair open in the wires between the EVAP purge control solenoid valve and the No. 15 ALTERNATOR SP SENSOR (7.5 A) fuse.**

YES

(To page 11-131)

EVAP PURGE CONTROL SOLENOID VALVE 2P CONNECTOR (C135)



Wire side of female terminals

(From page 11-130)

Check the EVAP purge control solenoid valve:
1. Reconnect the EVAP purge control solenoid valve 2P connector.
2. Connect ECM/PCM connector terminals A15 and A10 with a jumper wire.

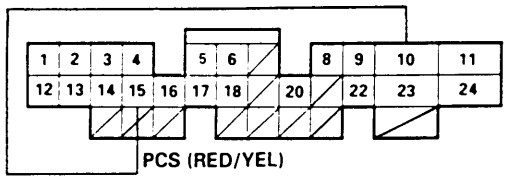
Does the solenoid valve click when the jumper is connected?

NO

Check for an open or short in the wire (PCS line):
Measure voltage between ECM/PCM connector terminal A15 and body ground.

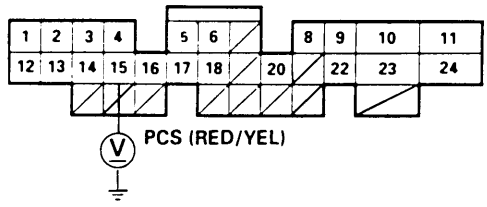
ECM/PCM CONNECTOR D (32P)

PG1 (BLK)



JUMPER WIRE

Wire side of female terminals



Is there battery voltage?

NO

Check for a short in the wire (PCS line):
1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector A (32P).
3. Disconnect the EVAP purge control solenoid valve 2P connector.
4. Check for continuity between body ground and ECM/PCM connector terminal A15.

YES

Replace the EVAP purge control solenoid valve.

Is there continuity?

YES

Repair short in the wires between the EVAP purge control solenoid valve and ECM/PCM (A15).

NO

Repair open in the wires between the EVAP purge control solenoid valve and ECM/PCM (A15).

YES

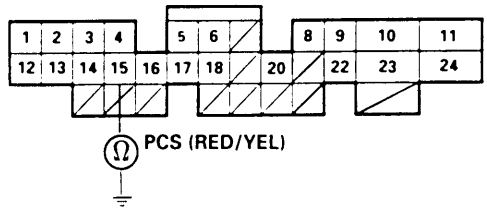
Check the vacuum lines:
Check the vacuum lines of EVAP system for misrouting, leakage, breakage and clogging.

Are the vacuum lines OK?

NO

Repair or replace vacuum lines as necessary.

YES



(cont'd)

(To page 11-132)

Evaporative Emission (EVAP) Controls (cont'd)

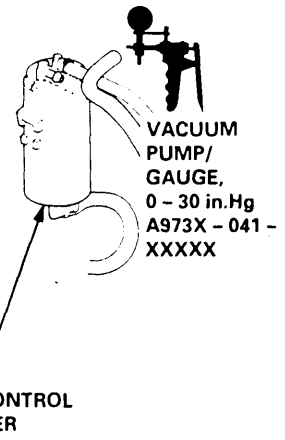
(From page 11-131)

Check the EVAP purge control solenoid valve:
1. Disconnect the vacuum hose from the EVAP control canister.
2. Connect the vacuum pump to the hose and apply vacuum.

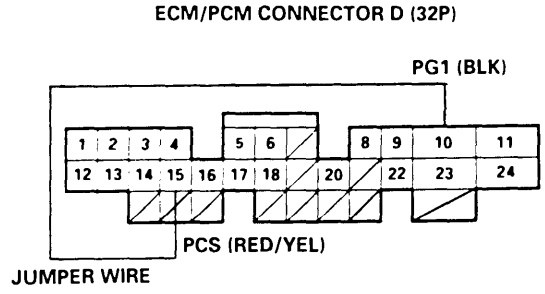
Does it hold vacuum?

NO → **Replace the EVAP purge control solenoid valve.**

YES



Check the EVAP control canister:
1. Reconnect the vacuum hose to the EVAP control canister.
2. Connect the vacuum/pressure gauge to the purge air hose.
3. Connect ECM/PCM connector terminals A15 and A10 with a jumper wire.
4. Start the engine.
5. Check the vacuum.



Does vacuum appear on the gauge?

NO → **Replace the EVAP control canister.**

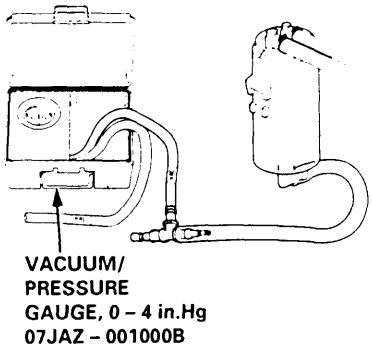
YES

Check the EVAP two way valve (see page 11-133)

Does the EVAP two way valve work properly?

NO → **Replace the EVAP two way valve.**

YES

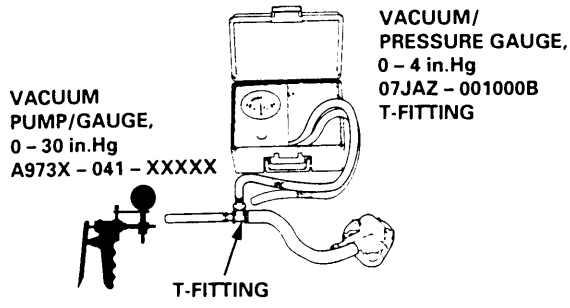


Substitute a known-good ECM/PCM and recheck. If symptom/indication goes away, replace the original ECM/PCM.

Evaporative Emission (EVAP) Two Way Valve Testing

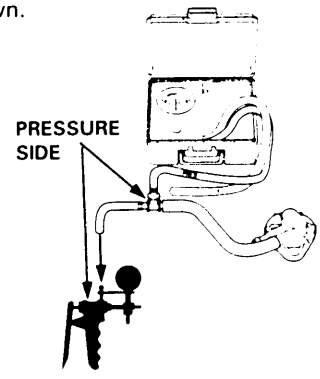
1. Remove the fuel fill cap.

2. Remove the vapor line from the EVAP two way valve on the fuel tank, and connect it to a T-fitting from a vacuum gauge and a vacuum pump as shown.



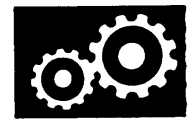
3. Apply vacuum slowly and continuously while watching the gauge. The vacuum should stabilize momentarily at 0.7 – 2.0 kPa (5 – 15 mmHg, 0.2 – 0.6 in.Hg).
   If the vacuum stabilizes (valve opens) below 0.7 kPa (5 mmHg, 0.2 in.Hg) or above 2.0 kPa (15 mmHg, 0.6 in.Hg), install a new valve and retest.

4. Move the vacuum pump hose from the vacuum fitting to the pressure fitting, and move the vacuum gauge hose from the vacuum side to the pressure side as shown.

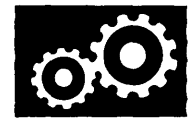


5. Slowly pressurize the vapor line while watching the gauge. The pressure should stabilize at 1.3 – 4.7 kPa (0 – 35 mmHg, 0.4 – 1.4 in.Hg).
   - If the pressure momentarily stabilizes (valve opens) at 1.3 – 4.7 kPa (10 – 35 mmHg, 0.4 – 1.4 in. Hg), the valve is OK.
   - If the pressure stabilizes below 1.3 kPa (10 mmHg, 0.4 in.Hg) or above 4.7 kPa (35 mmHg, 1.4 in.Hg), install a new valve and retest.

Transaxle

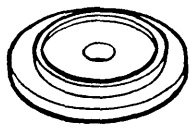


Clutch

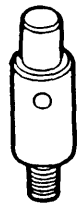


Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAF – PM7011A	Clutch Alignment Disc	1	12-7
②	07JAF – PM7012A	Clutch Alignment Shaft	1	12-7, 8, 10, 11
③	07LAB – PV00100 or 07924 – PD20003	Ring Gear Holder	1	12-7, 9, 10, 11
④	07746 – 0010100	Attachment, 32 x 35 mm	1	12-10
⑤	07749 – 0010000	Driver	1	12-10
⑥	07936 – 3710100	Handle	1	12-7, 8, 10, 11



①



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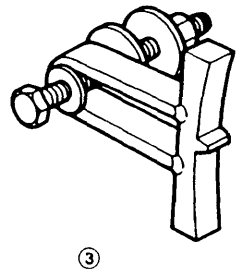
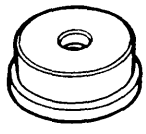
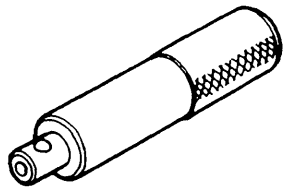


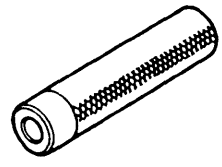
③



④



⑤

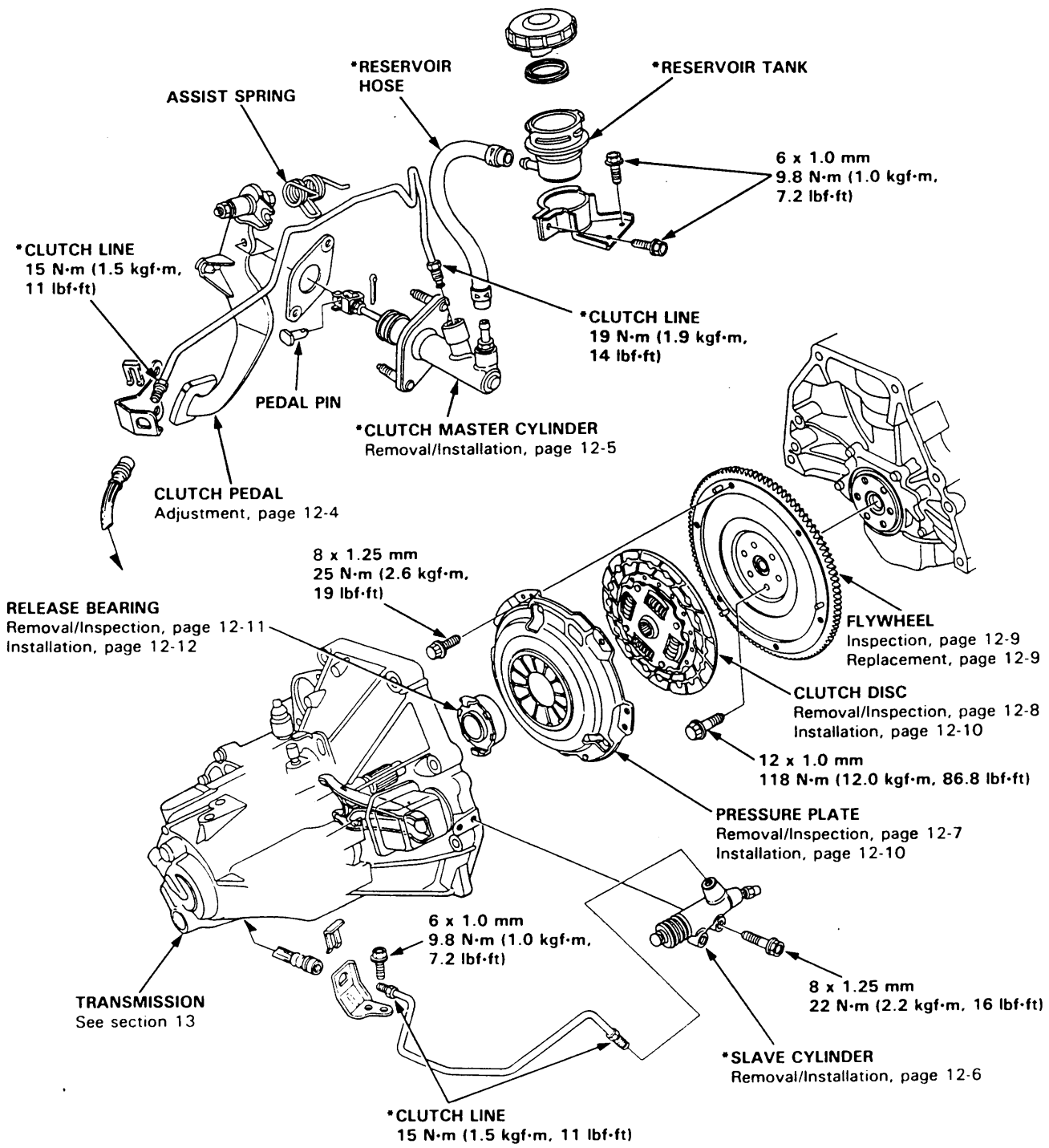


⑥

Illustrated Index

NOTE:

- Whenever the transmission is removed, clean and grease the release bearing sliding surface.
- If the parts marked with an asterisk (*) are removed, the clutch hydraulic system must be bled (see page 12-6).
- Inspect the hoses for damage, leaks, interference, and twisting.



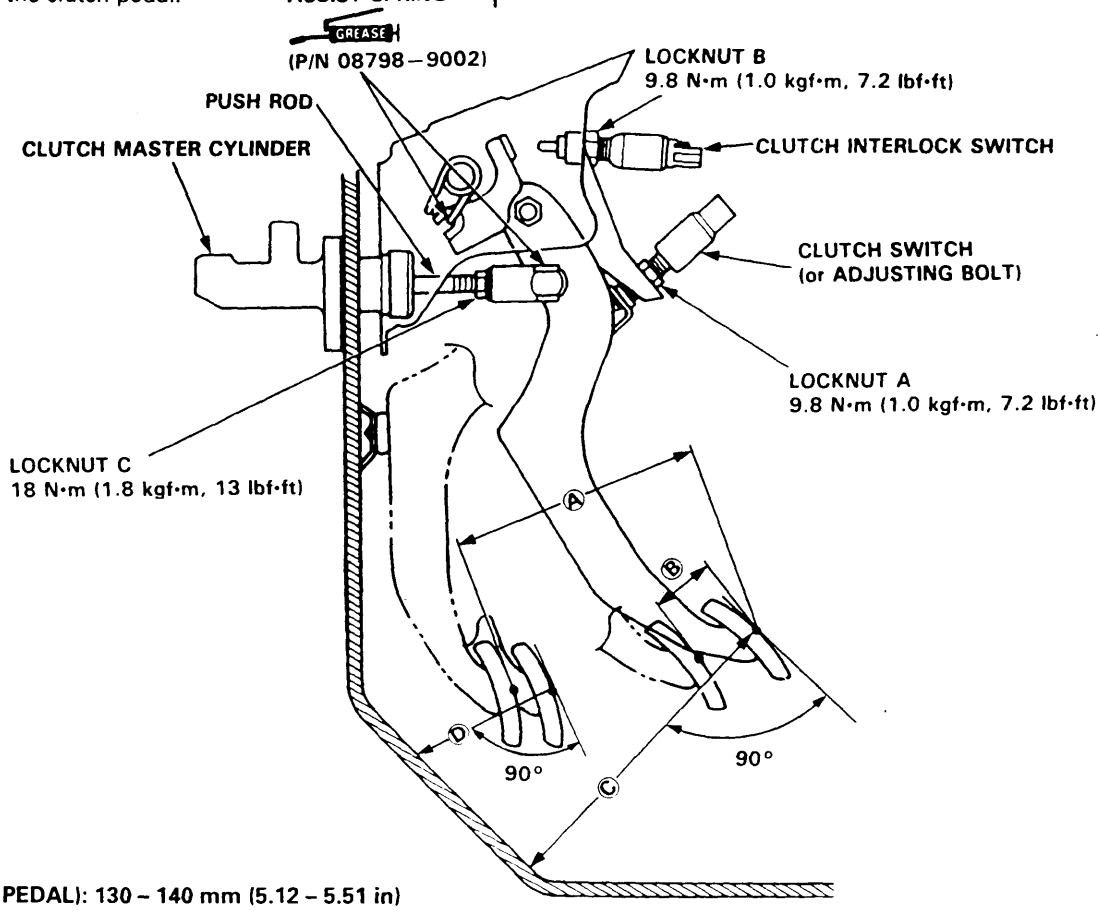
Clutch Pedal

Adjustment

NOTE:
- To check the clutch interlock switch and clutch switch, see section 23.
- The clutch is self-adjusting to compensate for wear.

CAUTION: If there is no clearance between the master cylinder piston and push rod, the release bearing is held against the diaphragm spring, which can result in clutch slippage or other clutch problems.

1. Loosen locknut A, and back off the clutch switch (or adjusting bolt) until it no longer touches the clutch pedal.
2. Loosen locknut C, and turn the push rod in or out to get the specified stroke (Ⓐ) and height (Ⓒ) at the clutch pedal.
3. Tighten locknut C.
4. Thread in the clutch switch (or adjusting bolt) until it contacts the clutch pedal.
5. Turn the clutch switch (or adjusting bolt) in an additional 3/4 to 1 full turn.
6. Tighten locknut A.
7. Loosen locknut B or the clutch interlock switch.
8. Measure the clearance between the floor board and clutch pedal with the clutch pedal fully depressed.
9. Release the clutch pedal 15 – 20 mm (0.59 – 0.79 in) from the fully depressed position and hold it there. Adjust the position of the clutch interlock switch so that the engine will start with the clutch pedal in this position.
10. Thread in the clutch interlock switch an additional 3/4 to 1 full turn.
11. Tighten locknut B.



Ⓐ (STROKE at PEDAL): 130 – 140 mm (5.12 – 5.51 in)
Ⓑ (TOTAL CLUTCH PEDAL FREE PLAY): 12 – 21 mm (0.47 – 0.83 in) include the pedal play 1 – 10 mm (0.04 – 0.39 in)
Ⓒ (CLUTCH PEDAL HEIGHT): 165 mm (6.50 in) to the floor
Ⓓ (CLUTCH PEDAL DISENGAGEMENT HEIGHT): 83 mm (3.27 in) minimum to the floor

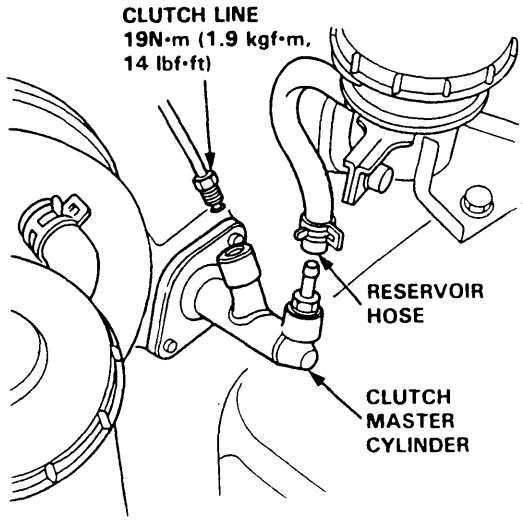
Clutch Master Cylinder

Removal/Installation

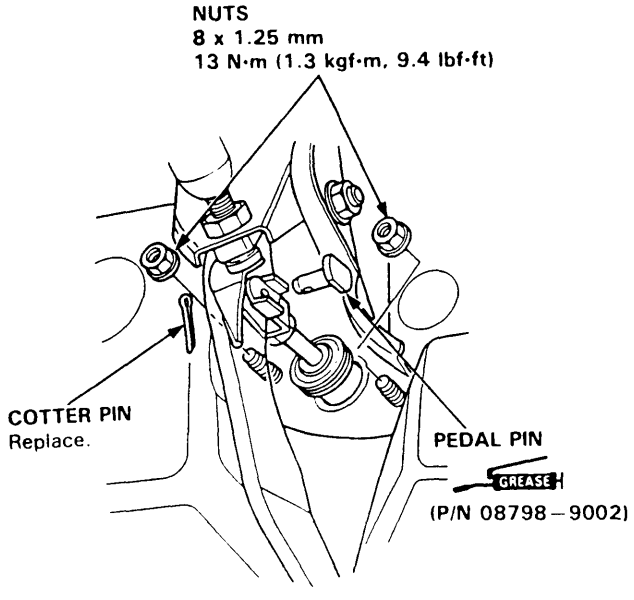
CAUTION:
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Plug the end of the clutch line and reservoir hose with a shop towel to prevent brake fluid from coming out.**

1. The brake fluid can be removed from the clutch master cylinder reservoir with a syringe.

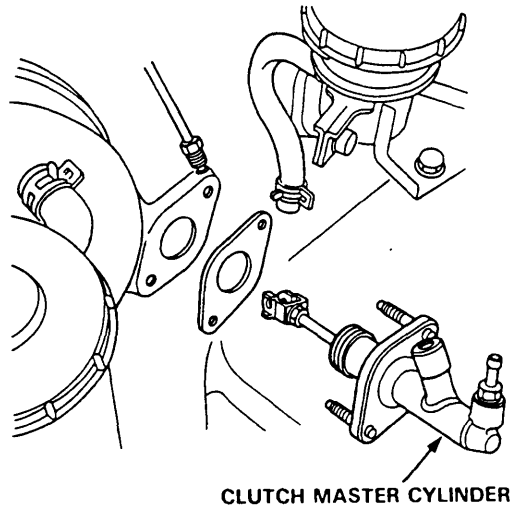
2. Disconnect the clutch line and reservoir hose from the clutch master cylinder.



3. Pry out the cotter pin, and pull the pedal pin out of the yoke. Remove the nuts.



4. Remove the clutch master cylinder.



5. Install the clutch master cylinder in the reverse order of removal.

   NOTE: Bleed the clutch hydraulic system (see page 12-6).

Slave Cylinder

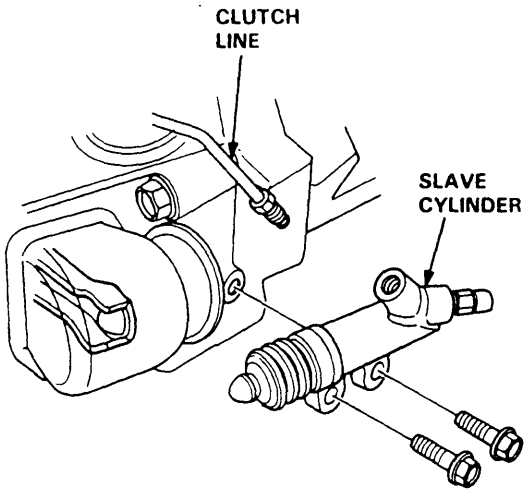
Removal/Installation

CAUTION:
- **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.**
- **Plug the end of the clutch line with a shop towel to prevent brake fluid from coming out.**

GREASE: Super High Temp Urea Grease (P/N 08798 - 9002).

GREASE: Brake Assembly Lube or equivalent rubber grease.

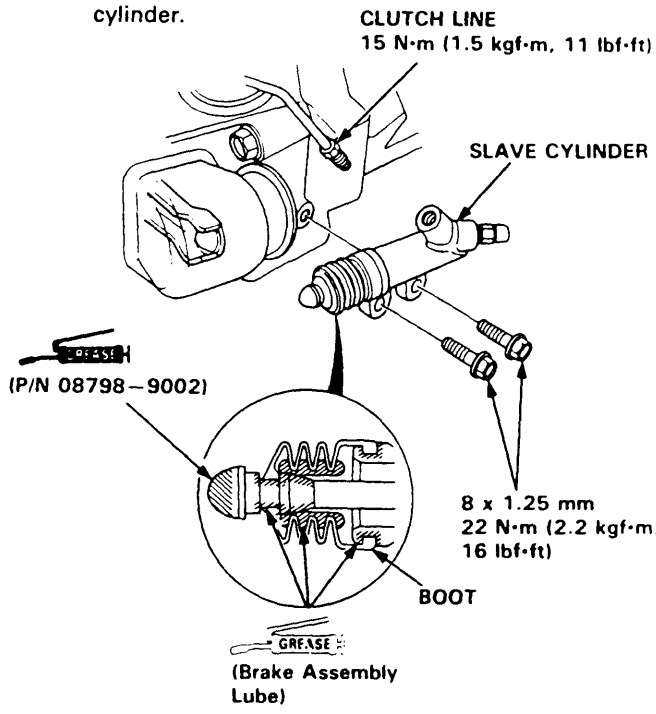
1. Disconnect the clutch line from the slave cylinder.



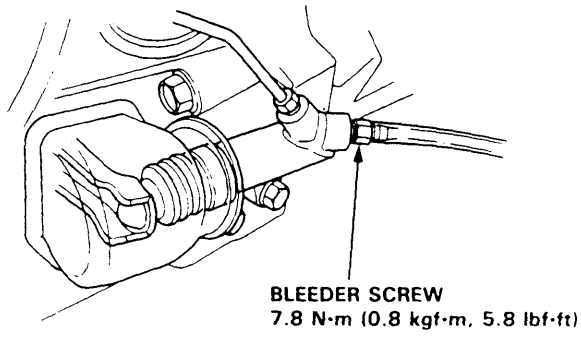
2. Remove the slave cylinder from the clutch housing.

3. Install the slave cylinder in the reverse order of removal.

NOTE: Make sure the boot is installed on the slave cylinder.



4. Bleed the clutch hydraulic system.
   - Attach a hose to the bleeder screw, and suspend the hose in a container of brake fluid.
   - Make sure there is an adequate supply of fluid at the clutch master cylinder, then slowly pump the clutch pedal until no more bubbles appear at the bleeder hose.
   - Refill the clutch master cylinder with fluid when done.
   - Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
   - Confirm clutch operation, and check for leaking fluid.



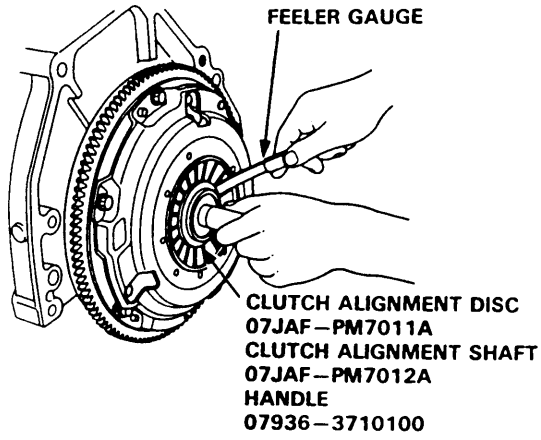
Pressure Plate

Removal/Inspection

1. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.

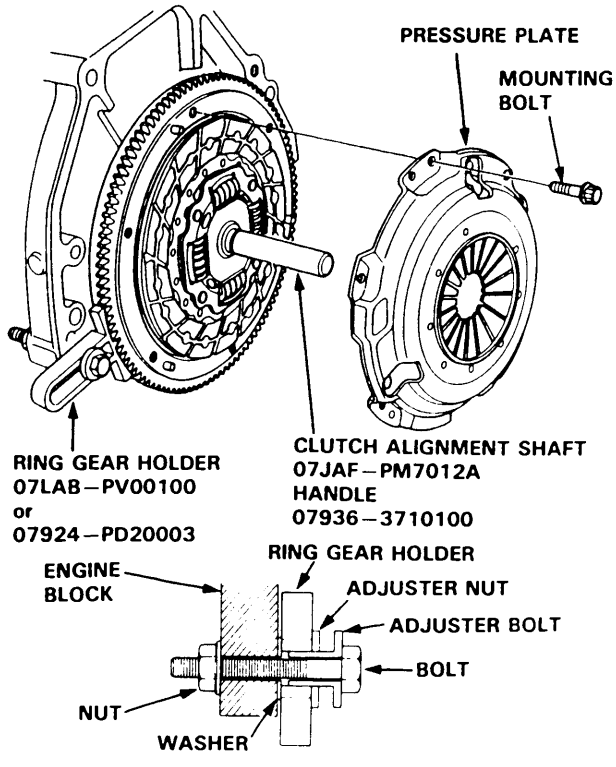
2. Check the diaphragm spring fingers for height using the special tools and a feeler gauge.

   Standard (New): 0.6 mm (0.02 in) max.
   Service Limit: 1.0 mm (0.04 in)



   If the height exceeds the service limit, replace the pressure plate.

3. Install the special tools.



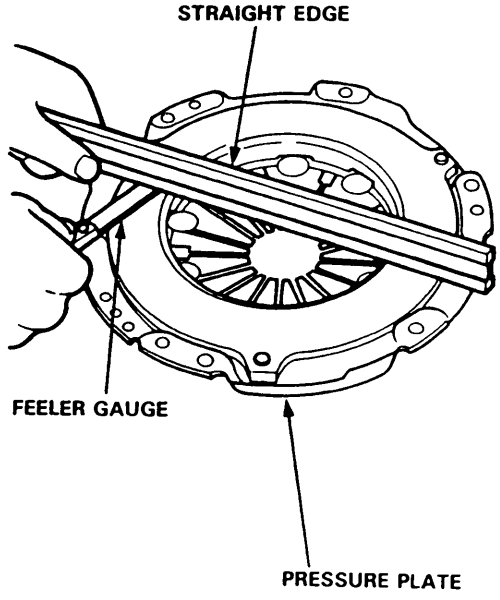
4. To prevent warping, unscrew the pressure plate mounting bolts in a crisscross pattern in several steps, then remove the pressure plate.

5. Inspect the pressure plate surface for wear, cracks, and burning.

6. Inspect for warpage using a straight edge and feeler gauge.

   NOTE: Measure across the pressure plate at three points.

   Standard (New): 0.03 mm (0.001 in) max.
   Service Limit: 0.15 mm (0.006 in)

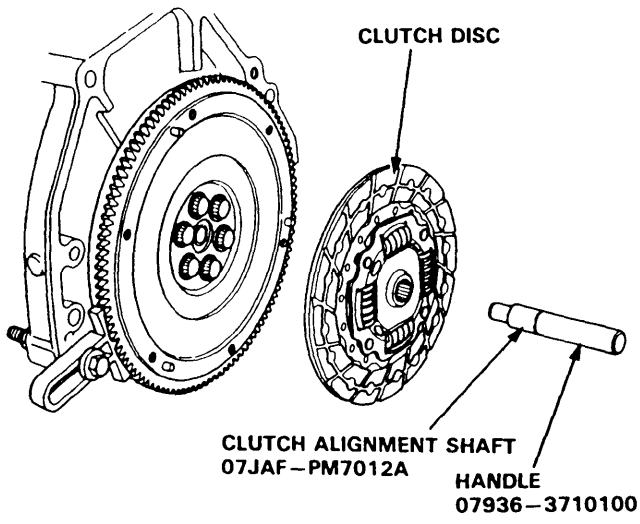


   If the warpage exceeds the service limit, replace the pressure plate.

Clutch Disc

Removal/Inspection

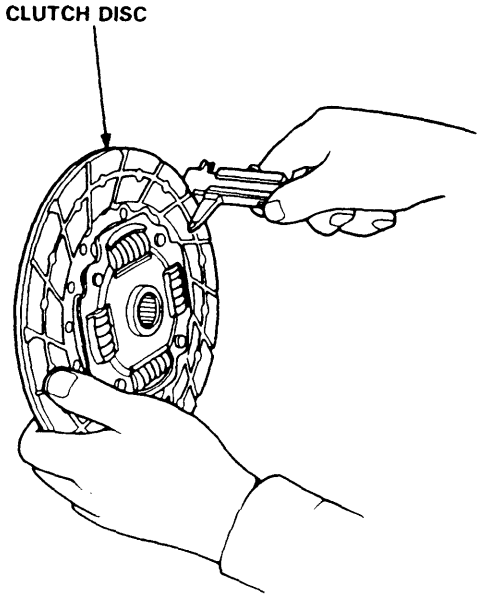
1. Remove the clutch disc and special tools.



2. Inspect lining of the clutch disc for signs of slipping or oil. If it is burned black or oil soaked, replace it.

3. Measure the clutch disc thickness.

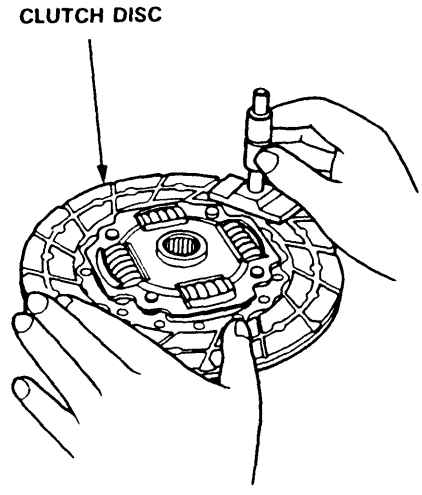
Clutch Disc Thickness:
Standard (New): 8.5 – 9.1 mm (0.33 – 0.36 in)
Service Limit: 5.5 mm (0.22 in)

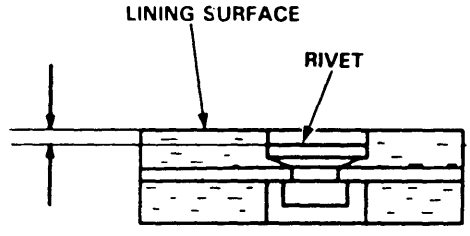


If the thickness is less than the service limit, replace the clutch disc.

4. Measure the depth from the lining surface to the rivets, on both sides.

Rivet Depht:
Standard (New): 1.3 – 1.9 mm (0.05 – 0.07 in) min.
Service Limit: 0.2 mm (0.01 in)





If the depth is less than the service limit, replace the clutch disc.

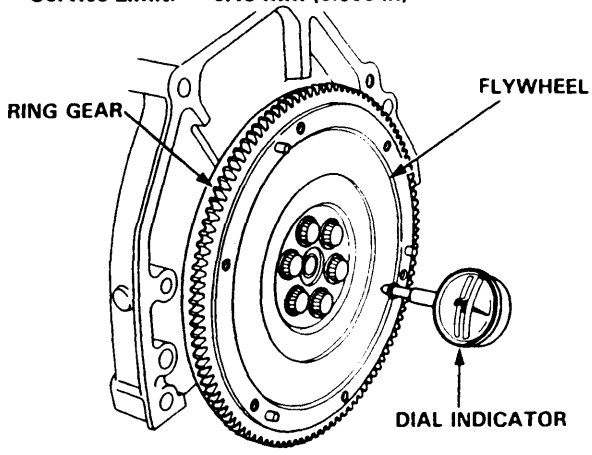
Flywheel

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 runout using a dial indicator through at least two full turns. Push against the flywheel each time you turn it to take up the crankshaft thrust washer clearance.

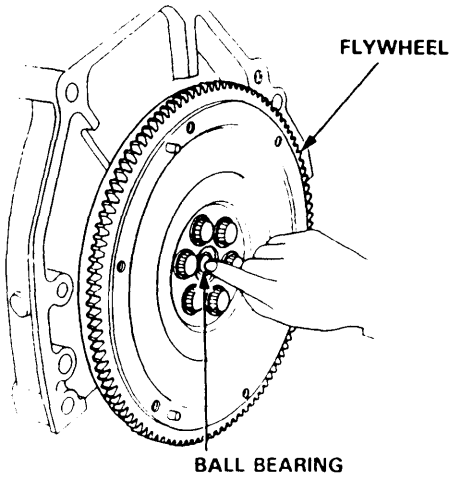
   NOTE: The runout can be measured with engine installed.

   Standard (New): 0.05 mm (0.002 in) max.
   Service Limit: 0.15 mm (0.006 in)



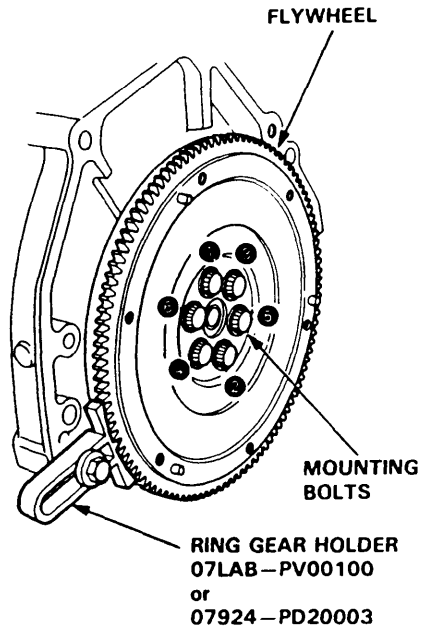
   If the runout exceeds the service limit, replace the flywheel.

4. Turn the inner race of the ball bearing with your finger. The ball bearing should turn smoothly and quietly. Check that the ball bearing outer race fits tightly in the flywheel. If the inner race does not turn smoothly, quietly, or fit tight in the flywheel, replace the ball bearing.

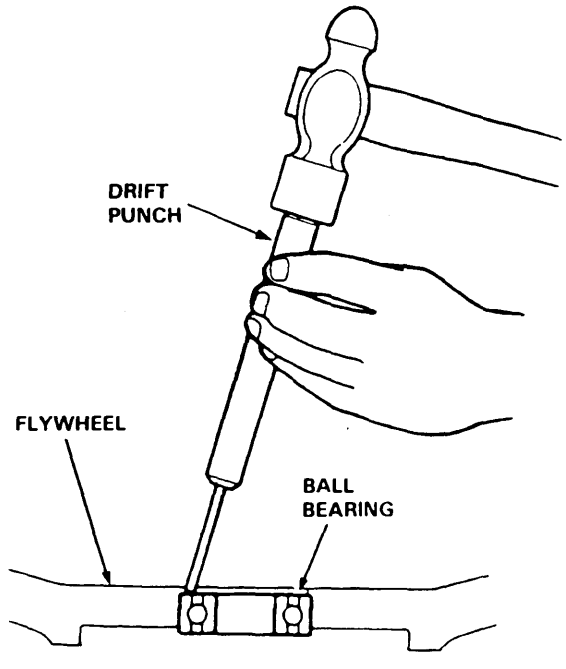


Replacement

1. Install the special tool.



2. Remove the flywheel mounting bolts in a crisscross pattern in several steps as shown, and remove the flywheel.
3. Remove the ball bearing from the flywheel.

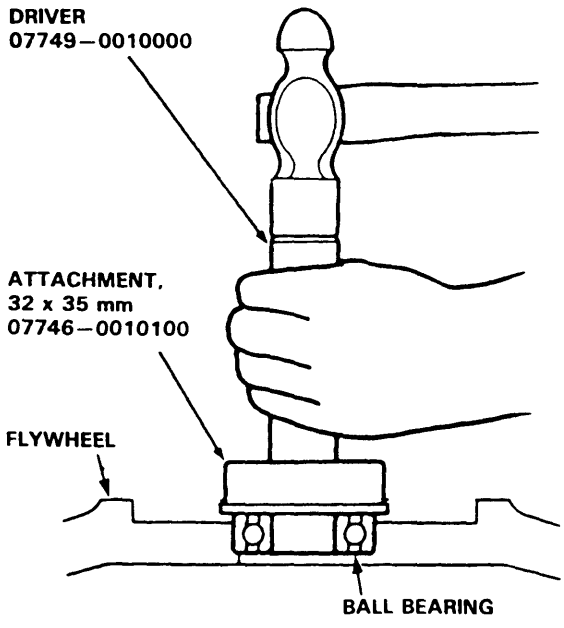


(cont'd)

Flywheel

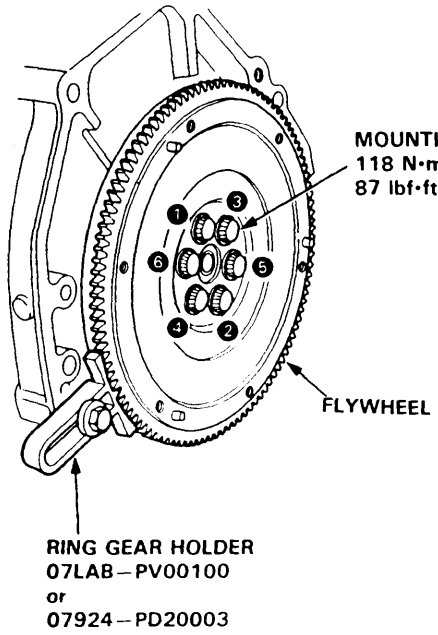
Replacement (cont'd)

4. Drive the new ball bearing into the flywheel using the special tools as shown.



5. Align the hole in the flywheel with the crankshaft dowel pin and install the flywheel. Install the mounting bolts finger-tight.

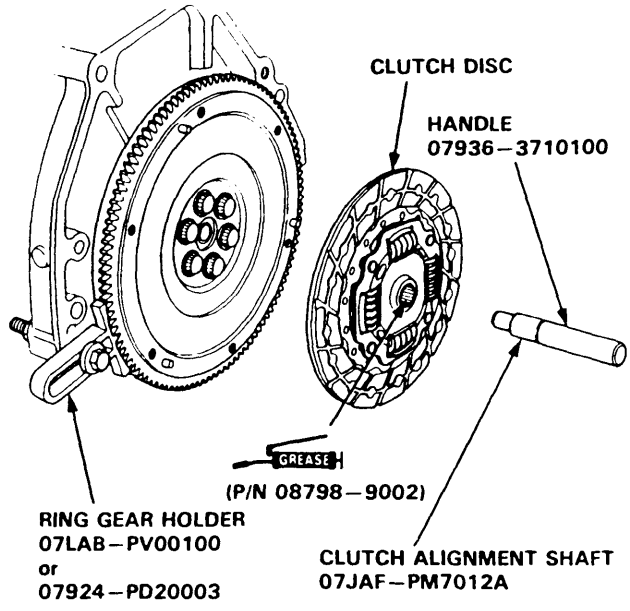
6. Install the special tool, then torque the flywheel mounting bolts in a crisscross pattern in several steps as shown.



Clutch Disc, Pressure Plate

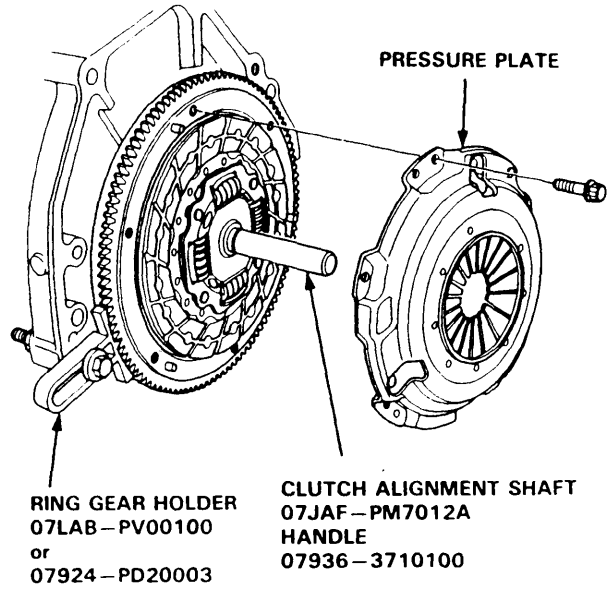
Installation

1. Install the special tool.

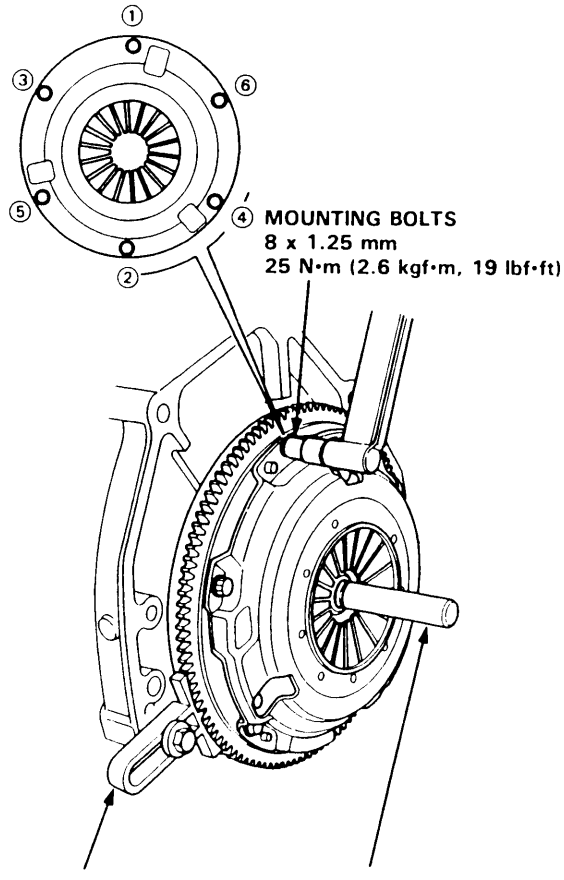


2. Install the clutch disc using the special tools.

3. Install the pressure plate.

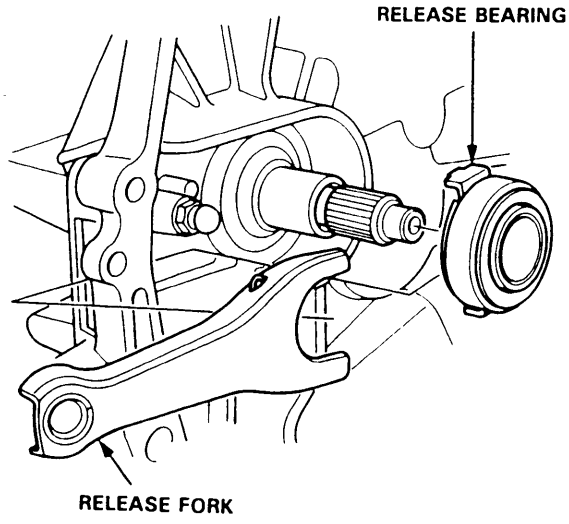


4. Torque the mounting bolts in a crisscross pattern as shown. Tighten them in several steps to prevent warping the diaphragm spring.



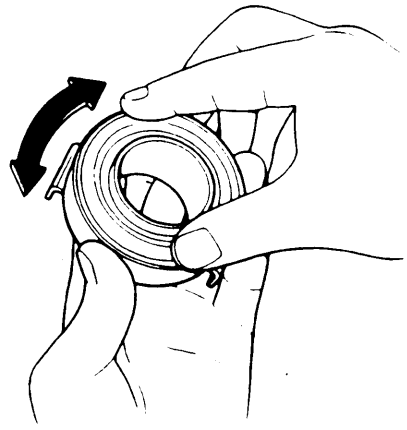
Remove/Inspection

1. Remove the release fork boot from the clutch housing.
2. Remove the release fork from the clutch housing by squeezing the release fork set spring with pliers. Remove the release bearing.



3. Check the release bearing for play by spinning it by hand.

CAUTION: The release bearing is packed with grease. Do not wash it in solvent.



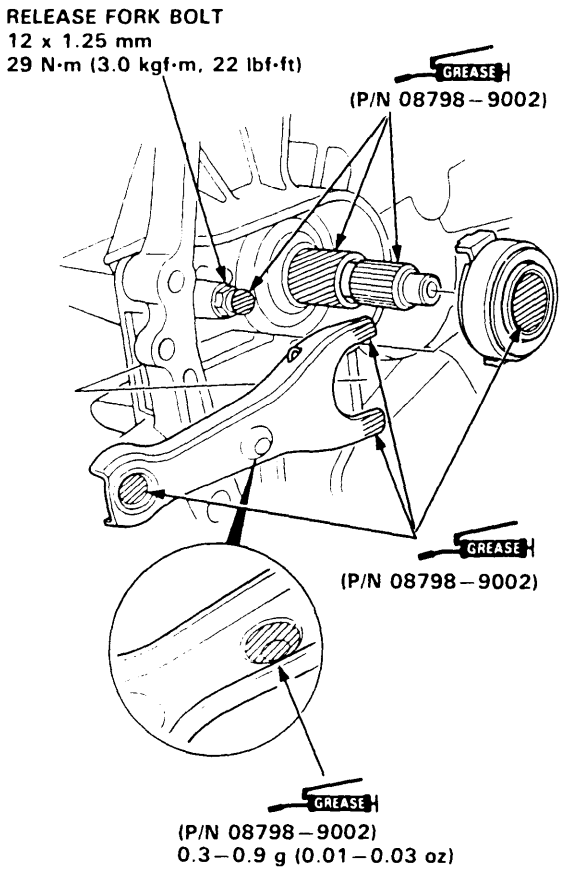
4. If there is excessive play, replace the release bearing with a new one.

Release Bearing

Installation

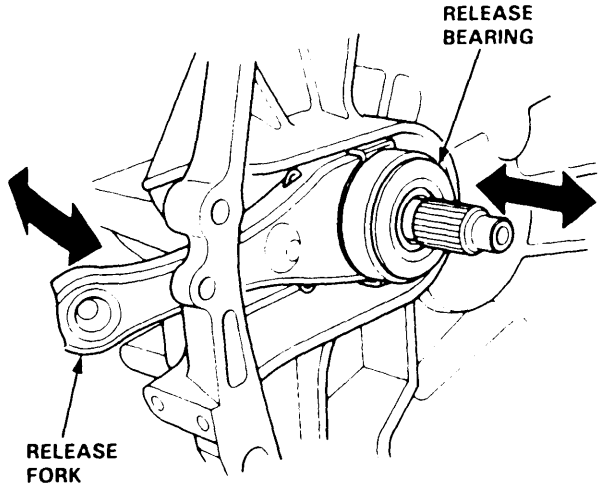
NOTE: Use only Super High Temp Urea Grease (P/N 08798 - 9002).

1. 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.



2. Align the detent of the release fork with the release fork bolt, then press the release fork over the release fork bolt sequarely.

3. Move the release fork right and left to make sure that it fits properly against the release bearing, and that the release bearing slides smoothly.



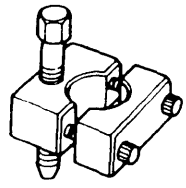
4. Install the release fork boot; make sure the boot seals around the release fork and clutch housing.

Manual Transmission

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAJ – PG20110	Mainshaft Holder	1	13-38
②	07GAJ – PG20120	Collar	1	13-37
③	07GAJ – PG20130	Mainshaft Base	1	13-37
*④	07736 – A01000A	Adjustable Bearing Puller, 25 – 40 mm	1	13-34, 35
⑤	07746 – 0010300	Attachment, 42 x 47 mm	1	13-34, 35
⑥	07746 – 0010400	Attachment, 52 x 55 mm	1	13-34, 35
⑦	07746 – 0030100	Driver, 40 mm I.D.	1	13-19, 24 31, 32
⑧	07746 – 0030300	Attachment, 30 mm I.D.	1	13-19, 24
⑨	07746 – 0030400	Attachment, 35 mm I.D.	1	13-19, 24
⑩	07749 – 0010000	Driver	1	13-34, 35, 43
⑪	07JAD – PH80101	Driver Attachment	1	13-43
⑫	07JAD – PH80200	Pilot, 26 x 30 mm	1	13-43
⑬	07947 – 6110501 or 07947 – 6110500	Seal Driver Attachment	1	13-43

* Must be used with commercially-available 3/8"-16 Slide Hammer.



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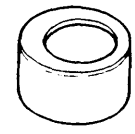

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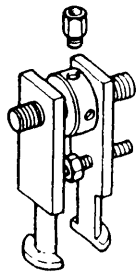

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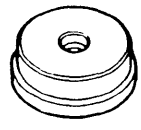
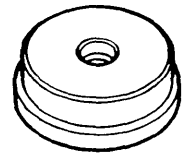


⑤



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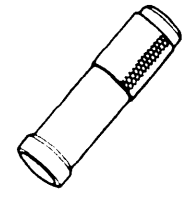

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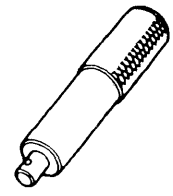
⑨



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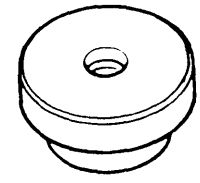
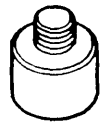


⑪



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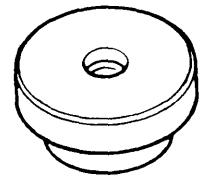


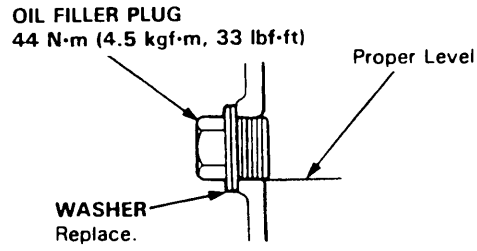
⑬

Back-up Light Switch

Transmission Oil

NOTE: Check the transmission oil with the engine OFF and the vehicle on level ground.

1. Remove the oil filler plug, then check the level and condition of the oil.



2. The oil level must be up to the filler hole. If it is below the hole, add oil until it runs out, then reinstall the oil filler plug with a new washer.

3. If the transmission oil is dirty, remove the drain plug and drain the oil.

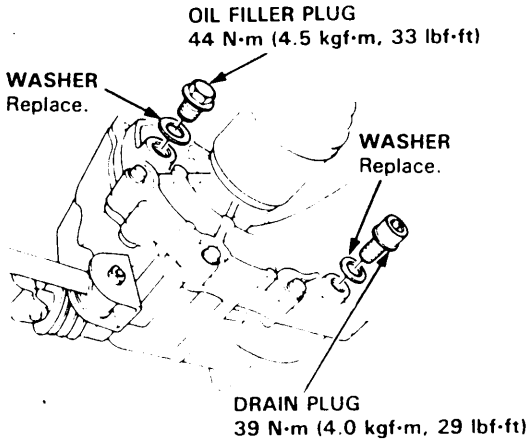
4. Reinstall the drain plug with a new washer, and refill the transmission with the recommended oil to the proper level.

   NOTE: The drain plug washer should be replaced at every oil change.

5. Reinstall the oil filler plug with a new washer.

   Oil Capacity
   1.8 ℓ (1.9 US qt, 1.6 Imp qt) at oil change
   1.9 ℓ (2.0 US qt, 1.7 Imp qt) at overhaul

   Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it dose not contain the proper additives.

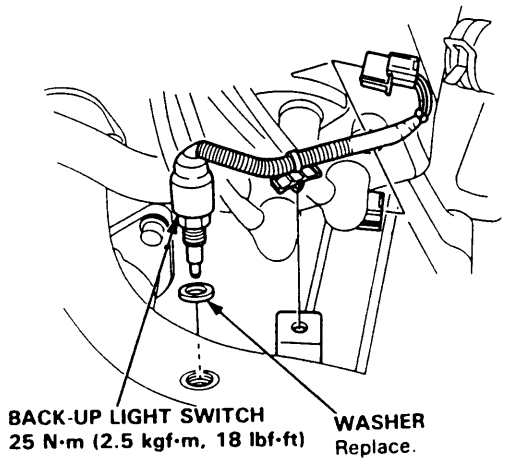


Replacement

NOTE: To test the back-up light switch, see section 23.

1. Disconnect the connector, then remove the back-up light switch connector from the connector clamp.

2. Remove the back-up light switch.



3. Install the new washer and back-up light switch.

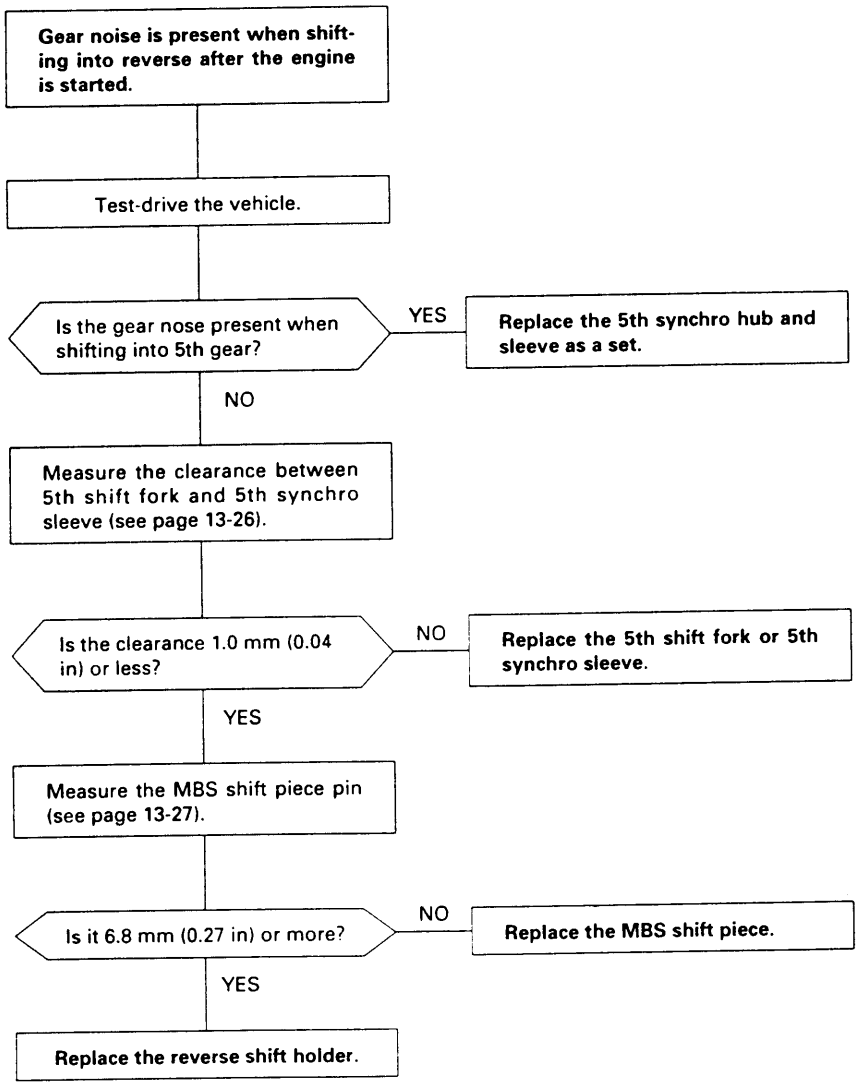
4. Connect the back-up light switch connector.

Troubleshooting

Reverse Gear Noise Reduction System

Whenever the clutch pedal is depressed to shift into reverse, the mainshaft continues to rotate because of its inertia. The resulting speed difference between mainshaft and reverse idler gear produces gear noise.
The reverse gear noise reduction system employs a cam plate which was added to the reverse shift holder. When shifting into reverse, the 5th/reverse shift piece, connected to the shift lever, rotates the cam plate. This cause the 5th synchro set to stop the rotating mainshaft. As there is no speed difference between mainshaft and reverse idler gear, there will be less gear noise.

NOTE: This system is not a fully-synchronized gear noise reduction system.
Therefore, you may hear gear noise when
① you shift into reverse with the vehicle not yet completely stopped.
② you shift quickly into reverse during fast idling.



Transmission Assembly

Removal

⚠ WARNING

- **Make sure jacks and safety stands are placed properly, and hoist brackets are attached to correct position on the engine.**
- **Apply parking brake and block rear wheels so the vehicle will not roll off stands and fall on you while working under it.**

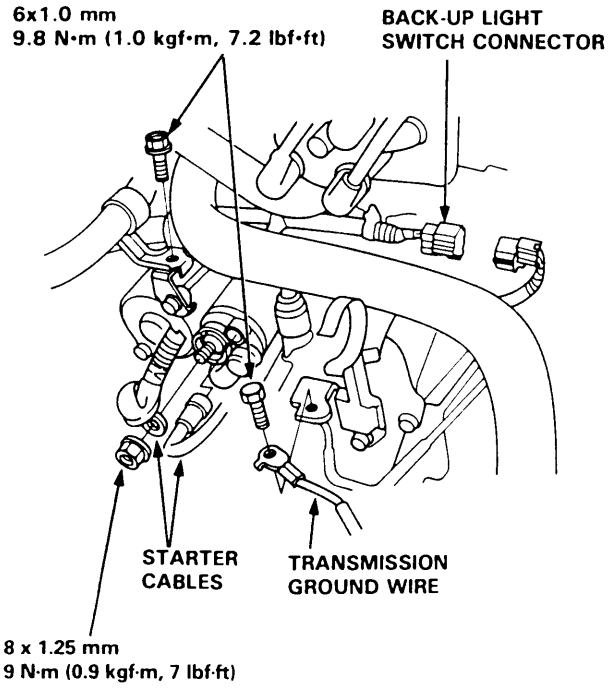
CAUTION: Use fender covers to avoid damaging painted surfaces.

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 first, then the positive (+) cable from the battery.

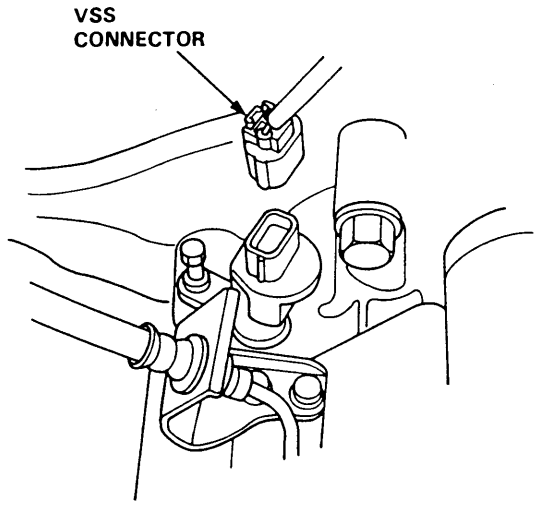
3. Remove the intake air duct and air cleaner housing assembly (see section 5).

4. Disconnect the starter motor cables, transmission ground wire and back-up light switch connector.



5. Remove the wire harness clamps.

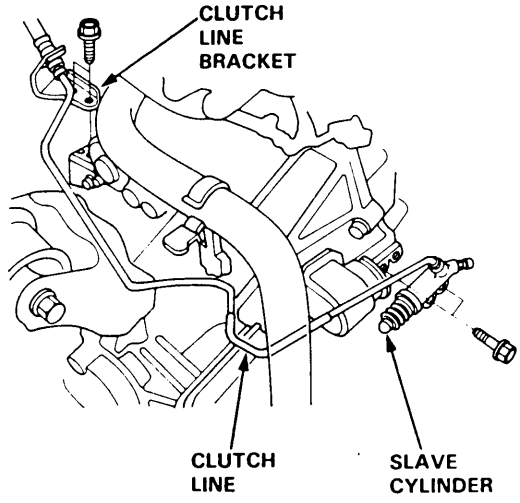
6. Disconnect the vehicle speed sensor (VSS) connector.



7. Remove the clutch line bracket, clutch line clamp, and slave cylinder.

CAUTION:

- **Do not operate the clutch pedal once the slave cylinder has been removed.**
- **Take care not to bend the clutch line.**



8. Drain transmission oil (see page 13-3).

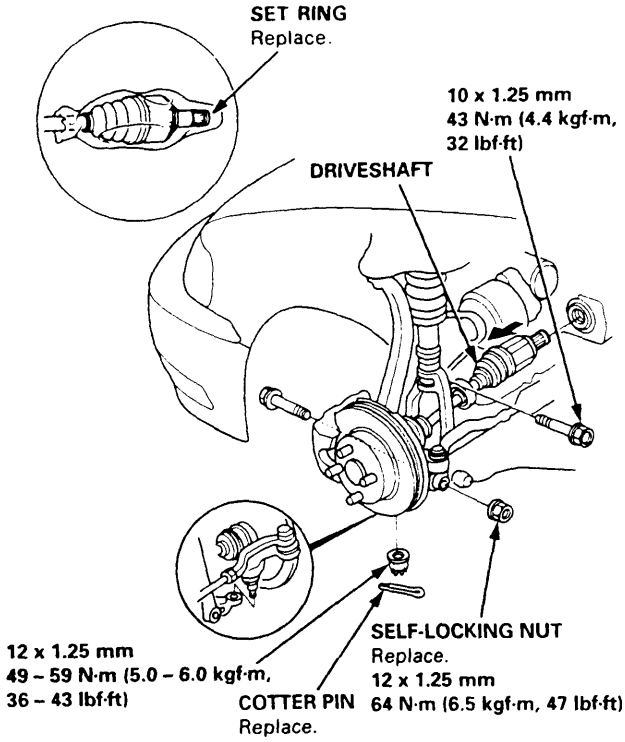
(cont'd)

Transmission Assembly

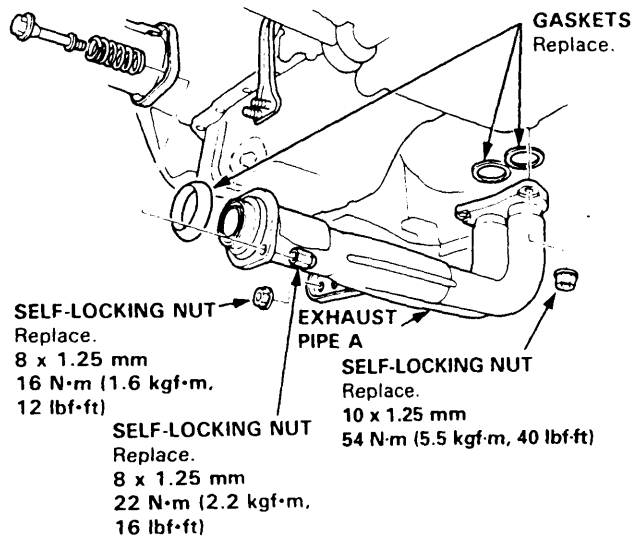
Removal (cont'd)

9. Remove the driveshafts (see section 16).

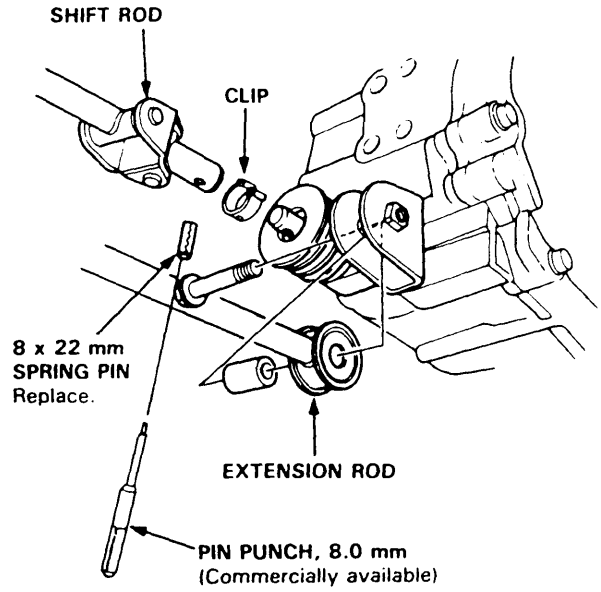
   NOTE: Coat all the precision finished surfaces with clean engine oil or grease. Tie plastic bags over the driveshaft ends.



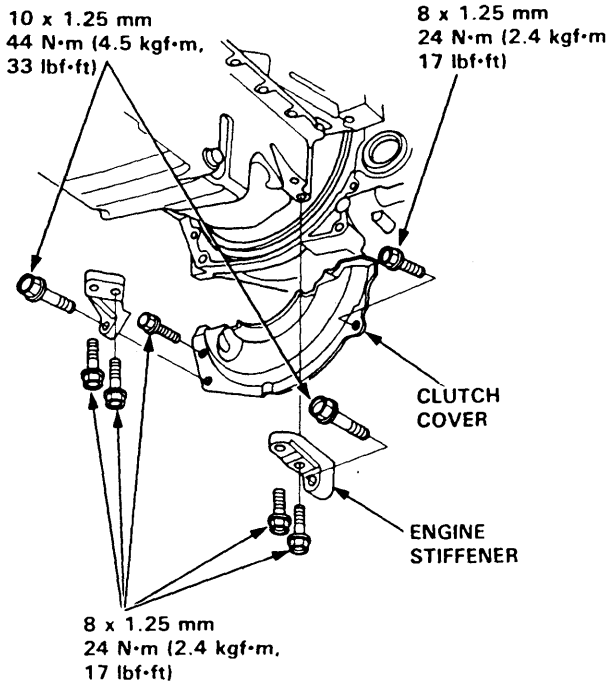
10. Remove exhaust pipe A.



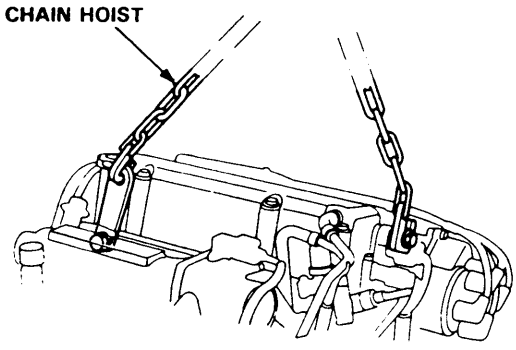
11. Remove the shift rod and extension rod.



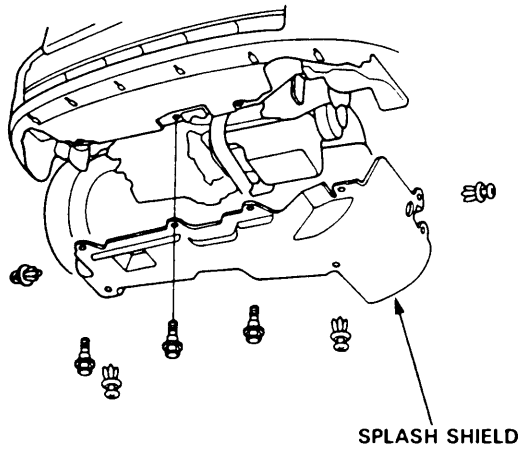
12. Remove the engine stiffeners and clutch cover.



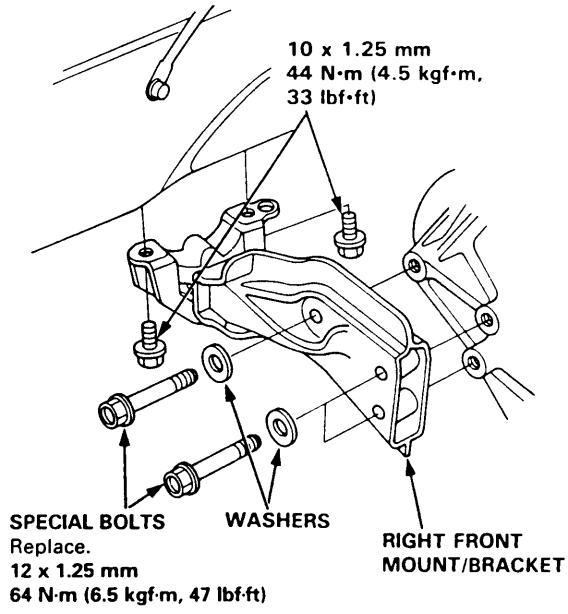
13. Install the bolts in the cylinder head and attach a chain hoist to the bolts, then lift the engine slightly to unload the engine and transmission mounts.



14. Remove the splash shield.

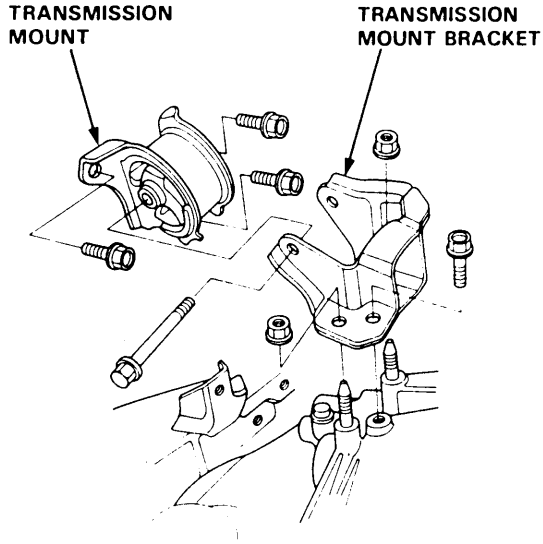


15. Remove the right front mount/bracket.



16. Place a jack under the transmission.

17. Remove the transmission mount bracket and mount.

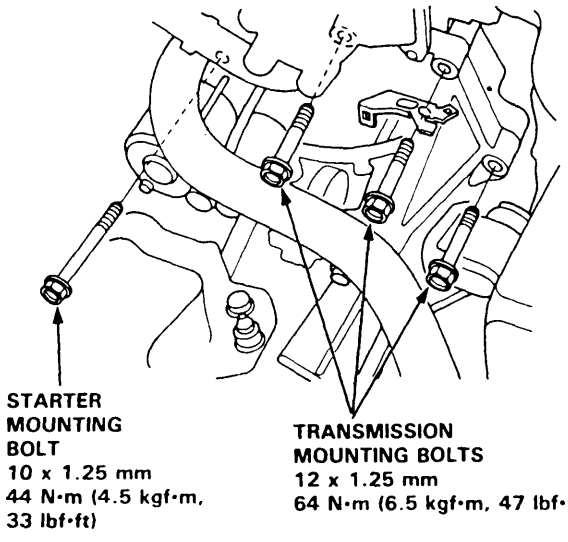


(cont'd)

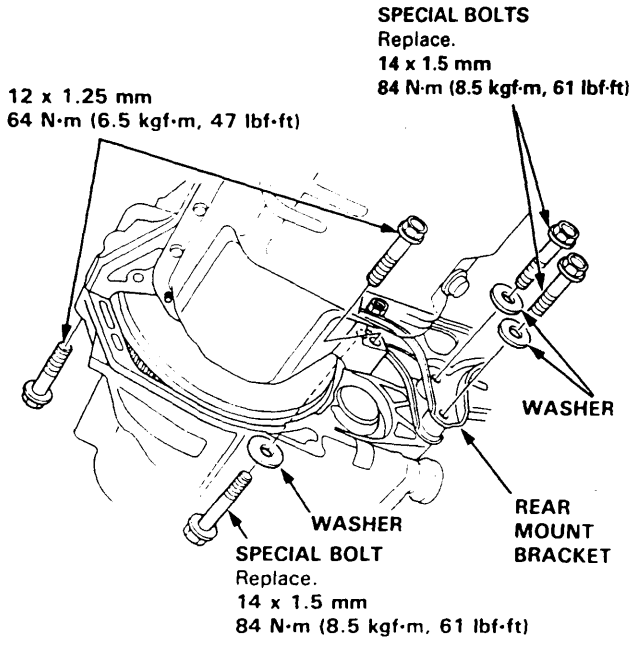
Transmission Assembly

Removal (cont'd)

18. Remove the three upper transmission mounting bolts and the lower starter mounting bolt.



19. Remove the rear mount bracket bolts and transmission mounting bolts.



20. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack.

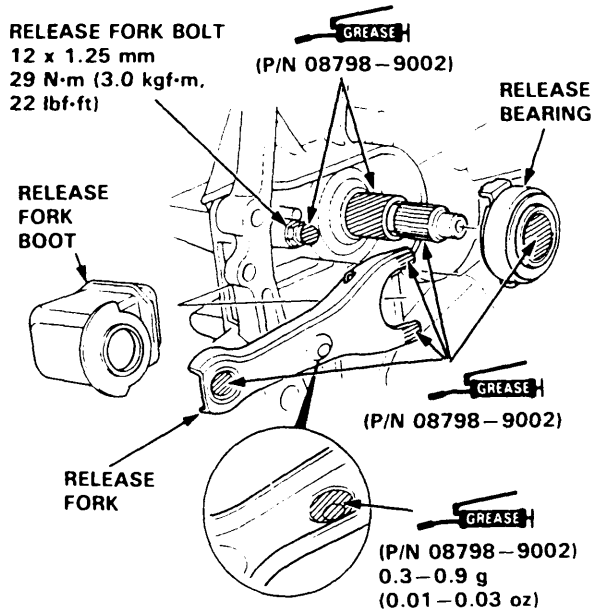
CAUTION: **Take care not to bend the clutch line.**

Installation

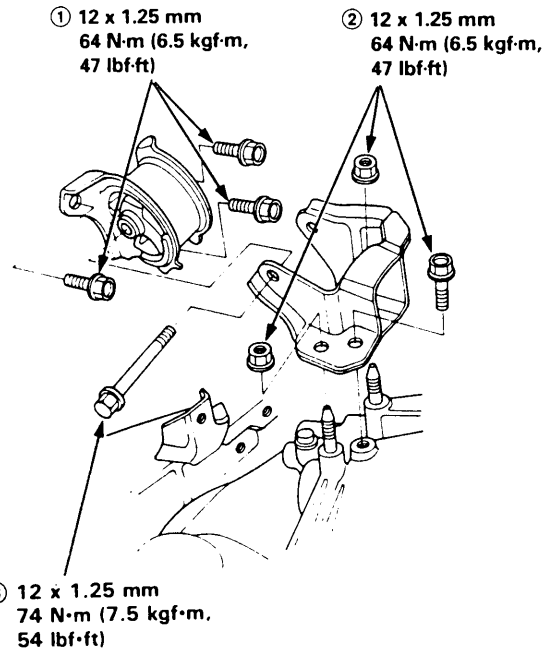
Install the transmission assembly in the reverse order of removal.

- Before installing, check that the two dowel pins are installed in the clutch housing.
- Apply grease to the parts as shown, then install the release fork and release bearing.

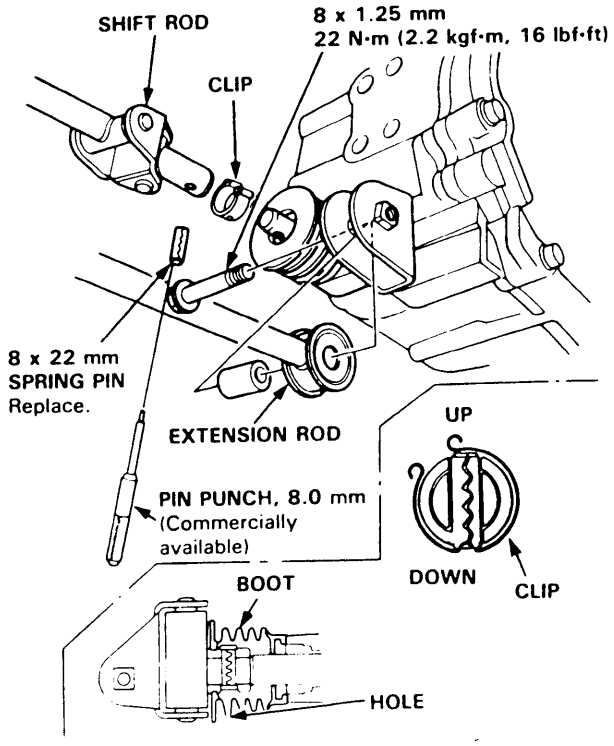
NOTE: Use only Super High Temp Urea Grease (P/N 08798 - 9002).



- Torque the mounting bolt and nuts in the sequence shown.



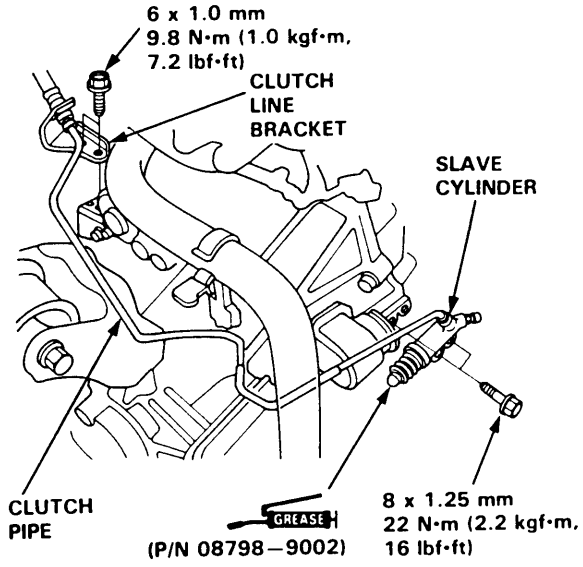
- Check that the bushings are not twisted or offset.
- Install the clip as shown.



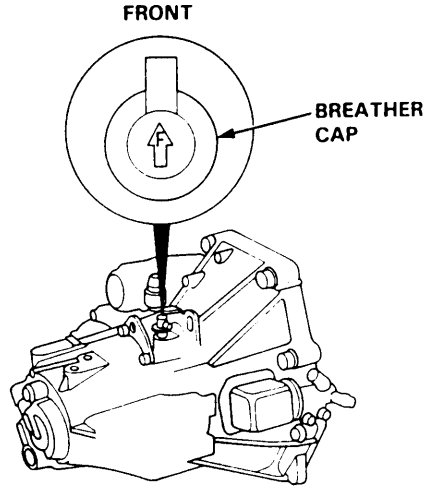
- Turn the boot so the hole is facing down.
- Make sure the boot is installed on the shift rod.

- Apply grease to the slave cylinder push rod.

NOTE: Use only Super High Temp Urea Grease (P/N 08798 – 9002).



- Turn the breather cap so that the "F" mark points at the front of the vehicle as shown.



- Installing the starter cable, make sure that the crimped side of the ring terminal is facing out (see section 4).
- Refill the transmission with the recommended oil (see page 13-3).
- Connect th positive (+) cable first, then the negative (–) cable to the battery.
- Check the clutch operation.
- Shift the transmission and check for smooth operation.
- Check the front wheel alignment (see section 18).
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

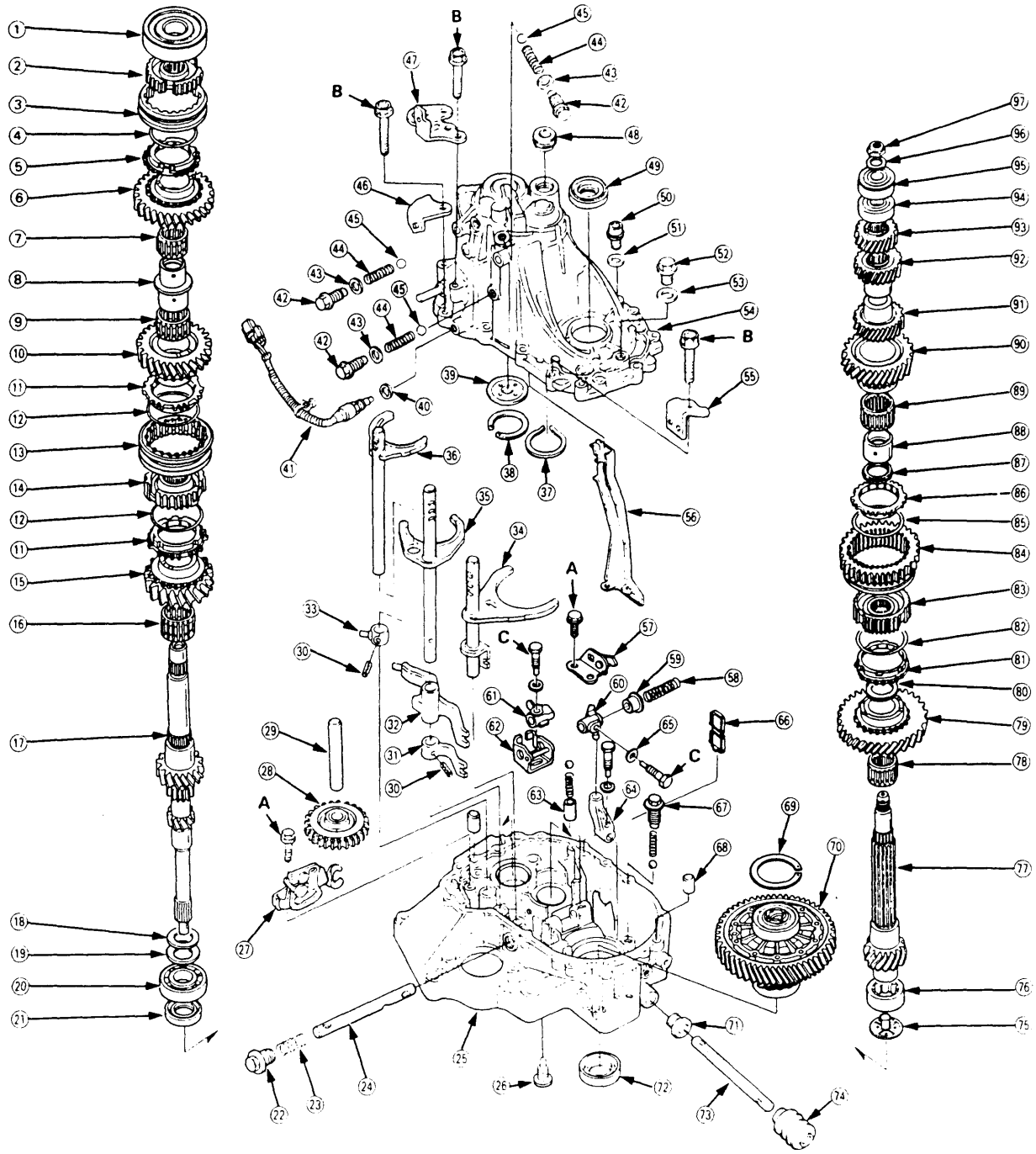
Illustrated Index

Refer to the drawing below for the transmission disassembly/reassembly.
Clean all parts thoroughly in solvent and dry with compressed air.

Lubricate all the parts with oil before reassembly.

NOTE:

- This transmission uses no gaskets between the major housings; use liquid gasket (P/N 08718 — 0001 or 08718 — 0003) (see page 13-41).
- Always clean the magnet ⑯ whenever the transmission housing is disassembled.
- Inspect all the bearings for wear and operation.



Torque Value
A – 15 N·m (1.5 kgf·m, 11 lbf·ft)
B – 27 N·m (2.8 kgf·m, 20 lbf·ft)
C – 31 N·m (3.2 kgf·m, 23 lbf·ft)

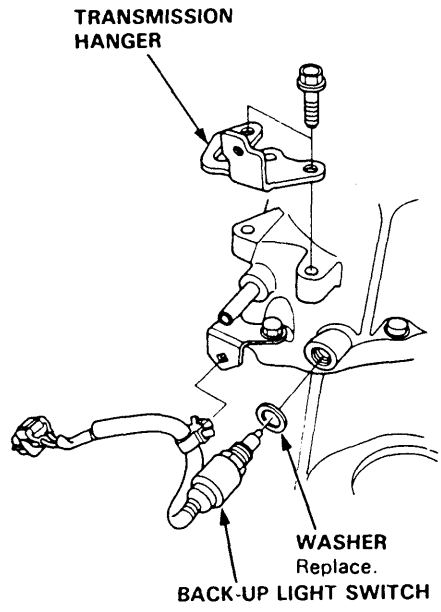
① BALL BEARING
② 5TH SYNCHRO HUB
③ 5TH SYNCHRO SLEEVE
④ SYNCHRO SPRING
⑤ SYNCHRO RING
⑥ 5TH GEAR
⑦ 32 x 37 x 23.5 mm NEEDLE BEARING
⑧ SPACER COLLAR
⑨ 34 x 39 x 23 mm NEEDLE BEARING
⑩ 4TH GEAR
⑪ SYNCHRO RING
⑫ SYNCHRO SPRING
⑬ 3RD/4TH SYNCHRO SLEEVE
⑭ 3RD/4TH SYNCHRO HUB
⑮ 3RD GEAR
⑯ 34 x 39 x 27.5 mm NEEDLE BEARING
⑰ MAINSHAFT
⑱ WASHER
⑲ SPRING WASHER
⑳ BALL BEARING
Check for wear and operation.
㉑ 26 x 42 x 7 mm OIL SEAL
Replace.
㉒ 28 mm PLUG BOLT
54 N·m (5.5 kgf·m, 40 lbf·ft)
㉓ 1ST/2ND SELECT SPRING
L. 36.26 mm (1.428 in)
㉔ SHIFT ARM SHAFT
㉕ CLUTCH HOUSING
㉖ INTERLOCK GUIDE BOLT
39 N·m (4.0 kgf·m, 29 lbf·ft)
㉗ REVERSE SHIFT HOLDER
㉘ REVERSE IDLER GEAR
㉙ REVERSE IDLER GEAR SHAFT
㉚ 5 x 22 mm SPRING PIN
Replace.
㉛ 3RD/4TH SHIFT PIECE
㉜ 5TH/REVERSE SHIFT PIECE
㉝ MBS SHIFT PIECE
㉞ 1ST/2ND SHIFT FORK
㉟ 3RD/4TH SHIFT FORK
㊱ 5TH/REVERSE SHIFT FORK
㊲ 52 mm SNAP RING
㊳ 70 mm THRUST SHIM
Selection, page 13-36
㊴ OIL GUIDE PLATE
㊵ WASHER Replace.
㊶ BACK-UP LIGHT SWITCH
25 N·m (2.5 kgf·m, 18 lbf·ft)
㊷ SET SCREW
22 N·m (2.2 kgf·m, 16 lbf·ft)
㊸ WASHER Replace.
㊹ SPRING L. 31.6 mm (1.24 in)
㊺ STEEL BALL (5/16 in)
㊻ BACK-UP LIGHT SWITCH HARNESS BRACKET
㊼ TRANSMISSION HANGER
㊽ 32 mm SEALING BOLT
25 N·m (2.5 kgf·m, 18 lbf·ft)
㊾ OIL SEAL
Replace.
㊿ OIL DRAIN PLUG
39 N·m (4.0 kgf·m, 29 lbf·ft)
(51) WASHER Replace.
(52) OIL FILLER PLUG
44 N·m (4.5 kgf·m, 33 lbf·ft)
(53) WASHER Replace.
(54) TRANSMISSION HOUSING
(55) RELEASE PIPE BRACKET
(56) OIL GUTTER PLATE
(57) REVERSE LOCK CAM
(58) REVERSE SELECT SPRING
L. 63.4 mm (2.496 in)
(59) REVERSE SELECT RETAINER
(60) SHIFT ARM C
(61) SHIFT ARM B
(62) INTERLOCK
(63) COLLAR
(64) SHIFT ARM A
(65) SPRING WASHER
(66) MAGNET
(67) SET BALL SPRING BOLT
22 N·m (2.2 kgf·m, 16 lbf·ft)
(68) 14 x 20 mm DOWEL PIN
(69) 80 mm THRUST SHIM
Selection, page 13-33
(70) DIFFERENTIAL ASSEMBLY
See page 13-30
(71) 14 x 25 x 17.5 mm OIL SEAL
Replace.
(72) 35 x 56 x 8 mm OIL SEAL
Replace.
(73) SHIFT ROD
(74) BOOT
(75) OIL GUIDE PLATE
(76) 30 x 55 x 21 mm NEEDLE BEARING
(77) COUNTERSHAFT
(78) 36 x 41 x 25.5 mm NEEDLE BEARING
Check for wear and operation.
(79) 1ST GEAR
(80) FRICTION DAMPER
(81) SYNCHRO RING
(82) SYNCHRO SPRING
(83) 1ST/2ND SYNCHRO HUB
(84) REVERSE GEAR
(85) SYNCHRO SPRING
(86) SYNCHRO RING
(87) FRICTION DAMPER
(88) SPACER
(89) 39 x 44 x 27 mm NEEDLE BEARING
(90) 2ND GEAR
(91) 3RD GEAR
(92) 4TH GEAR
(93) 5TH GEAR
(94) NEEDLE BEARING
(95) BALL BEARING
(96) SPRING WASHER
(97) LOCKNUT Replace.
108 → 0 → 108 N·m
(11.0 → 0 → 11.0 kgf·m, 79.6 → 0 → 79.6 lbf·ft)

Transmission Housing

Removal

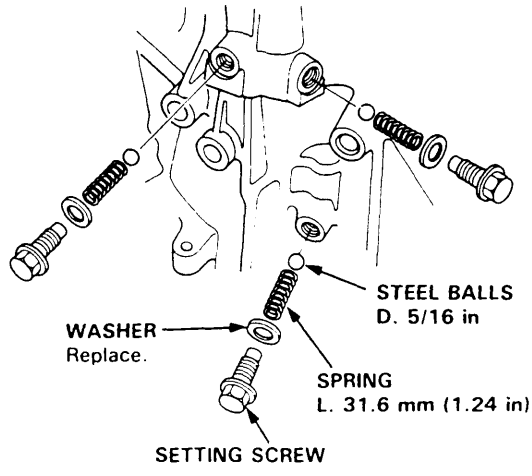
NOTE: Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

1. Remove the back-up light switch.



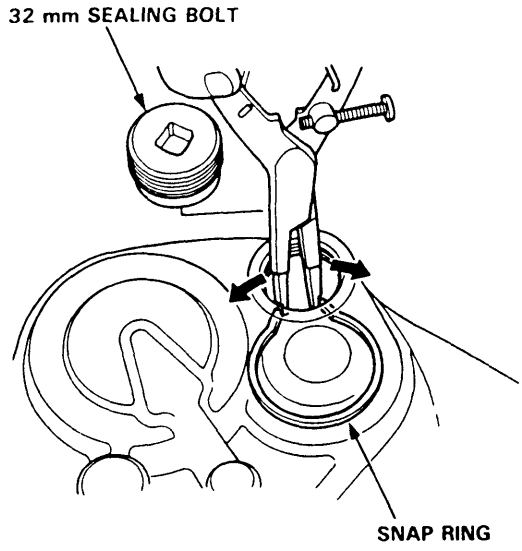
2. Remove transmission hanger.

3. Remove the setting screws, washers, springs, and steel balls.



4. Loosen the transmission housing attaching bolts in a crisscross pattern in several steps, then remove them.

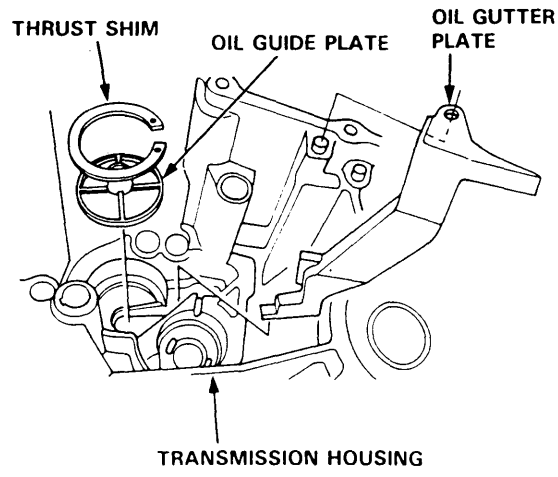
5. Remove the 32 mm sealing bolt.



6. Expand the snap ring on the countershaft ball bearing, and remove it from the groove using a pair of snap ring pliers.

7. Separate the transmission housing from the clutch housing, and wipe it clean of the sealant.

8. Remove the thrust shim, oil guide plate, and oil gutter plate from the tramsmission housing.

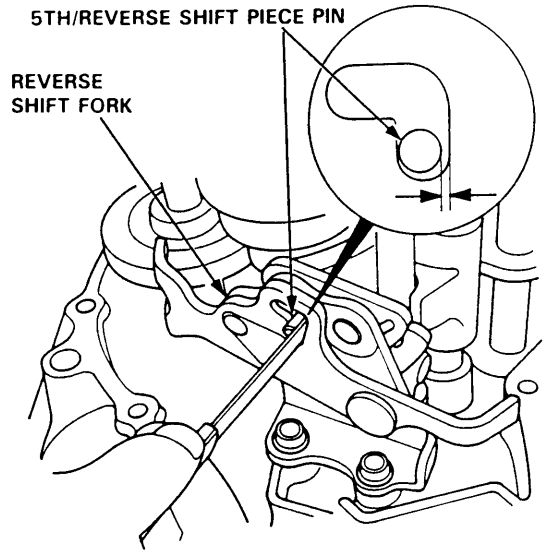


Reverse Shift Holder

Clearance Inspection

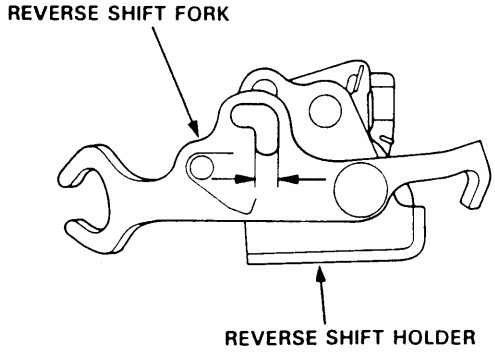
1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.

   Standard: 0.05 – 0.35 mm (0.002 – 0.014 in)
   Service Limit: 0.5 mm (0.02 in)



2. If the clearances are more than the service limit, measure the widths of the groove in the reverse shift fork.

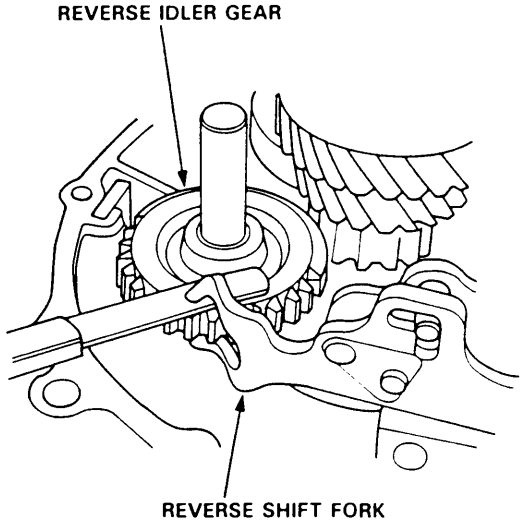
   Standard: 7.05 – 7.25 mm (0.278 – 0.285 in)



- If the widths of the grooves are not within the standard, replace the reverse shift holder with a new one.
- If the width of the grooves are within the standard, replace the 5th/reverse shift piece with a new one.

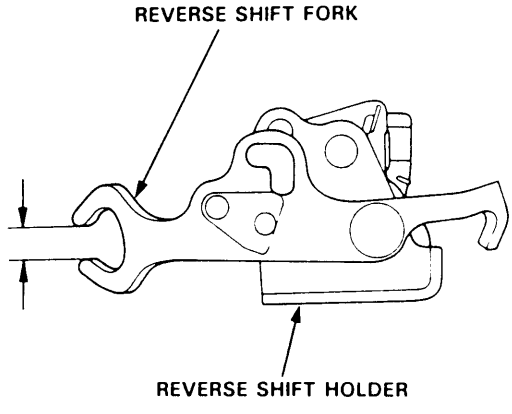
3. Measure the clearance between the reverse idler gear and the reverse shift fork.

   Standard: 0.5 – 1.1 mm (0.02 – 0.04 in)
   Service Limit: 1.8 mm (0.07 in)



4. If the clearance is more than the service limit, measure the width of the reverse shift fork.

   Standard: 12.7 – 13.0 mm (0.500 – 0.512 in)

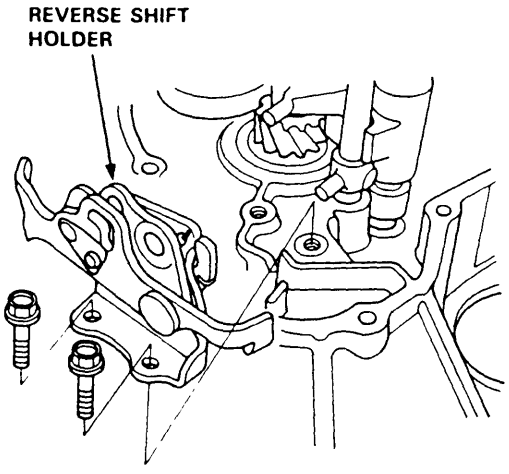


- If the width is not within the standard, replace the reverse shift holder with a new one.
- If the width is within the standard, replace the reverse idler gear with a new one.

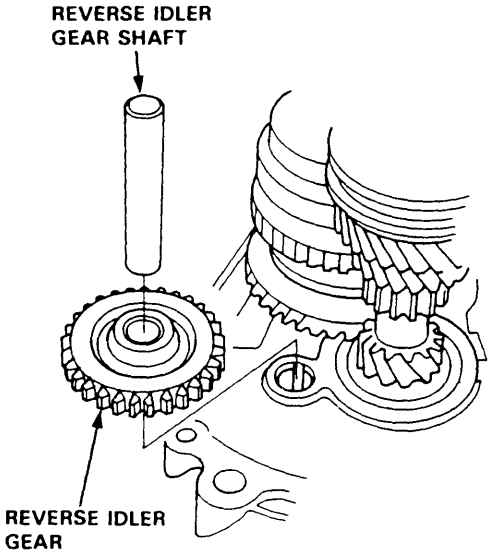
Reverse Idler Gear

Removal

1. Remove the reverse shift holder.



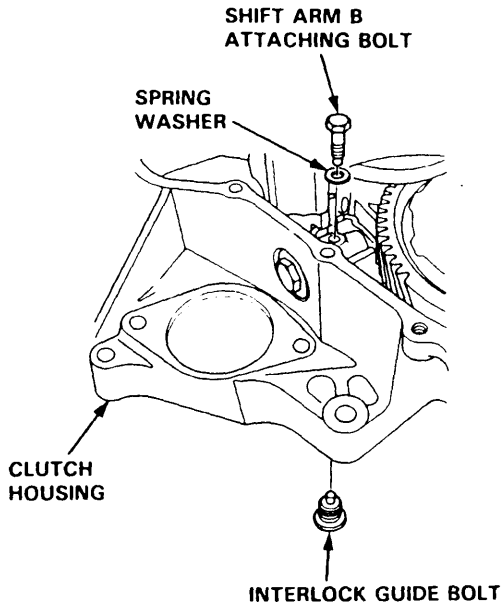
2. Remove the reverse idler gear shaft and reverse idler gear.



Mainshaft, Countershaft, Shift Fork

Disassembly

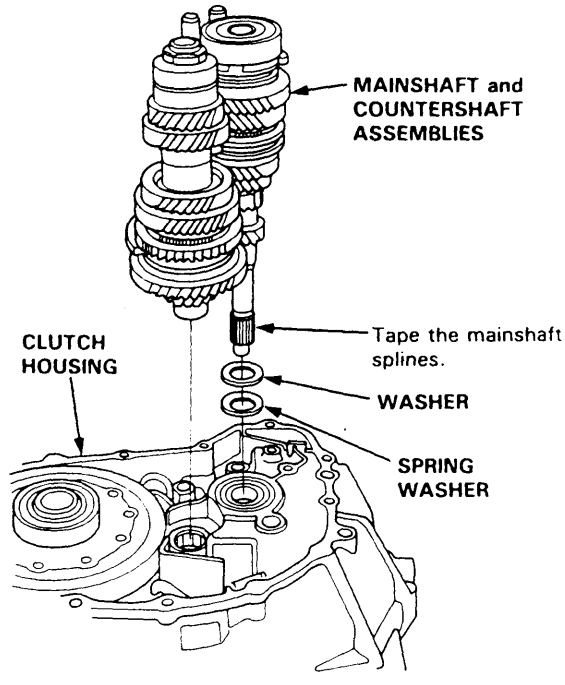
1. Remove the interlock guide bolt from under the clutch housing.



2. Remove the shift arm B attaching bolt.

3. Remove the mainshaft and countershaft assemblies with the shift fork from the clutch housing.

   NOTE: Before removing the mainshaft and countershaft assemblies, tape the mainshaft splines to protect the seal.

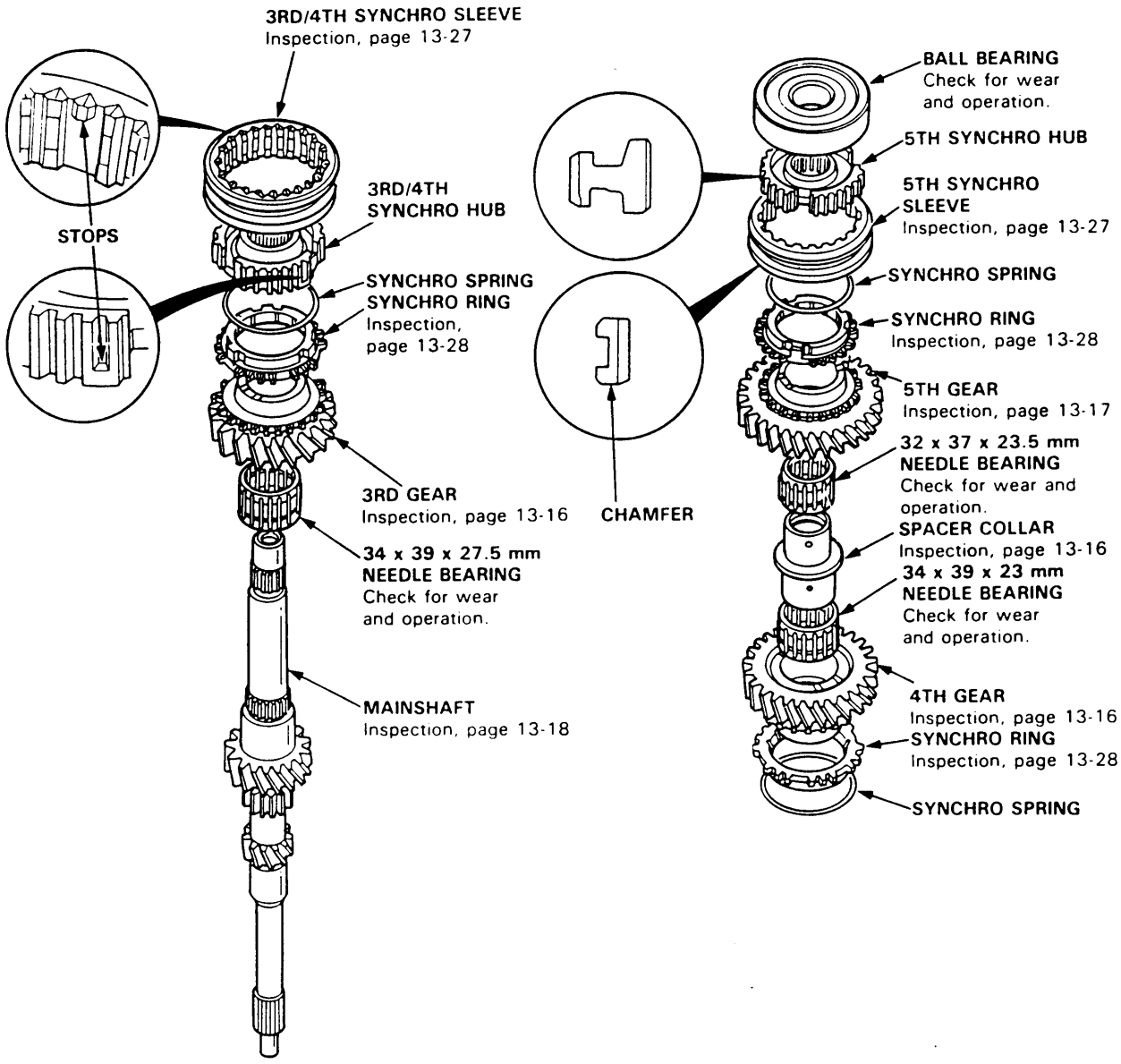


Mainshaft Assembly

Index

NOTE: The 3rd/4th and 5th synchro hubs are installed with a press.

Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact surfaces. The 3rd/4th and 5th synchro hubs, however, should be installed with a press before lubricating them.



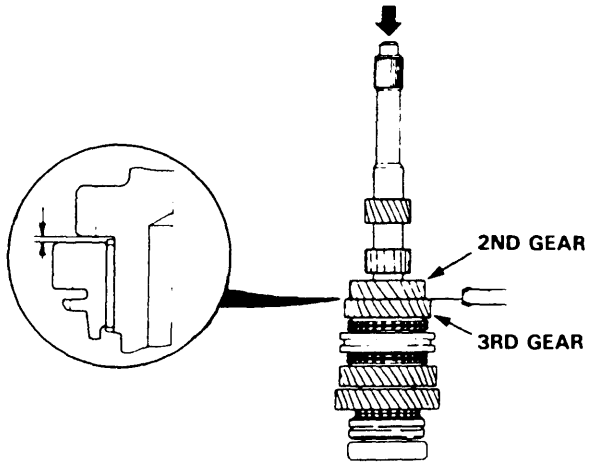
Mainshaft Assembly

Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

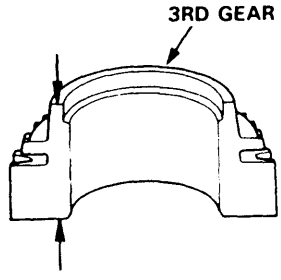
1. Measure the clearance between 2nd and 3rd gears.

   Standard: 0.06 – 0.21 mm (0.002 – 0.008 in)
   Service Limit: 0.33 mm (0.013 in)



2. If the clearance is more than the service limit, measure the thickness of 3rd gear.

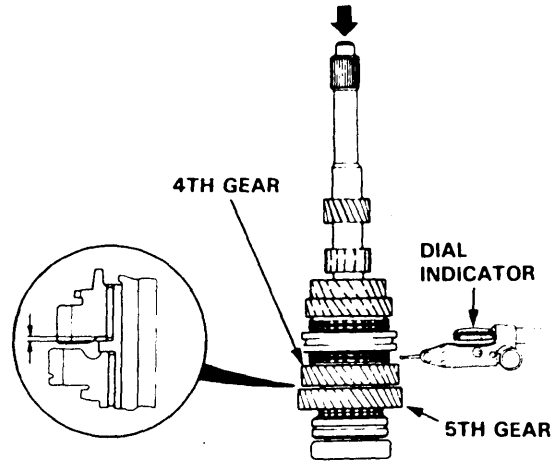
   Standard: 30.22 – 30.27 mm (1.190 – 1.192 in)
   Service Limit: 30.15 mm (1.187 in)



- If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.
- If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

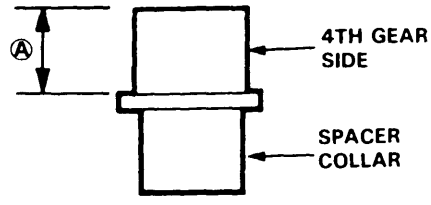
3. Measure the clearance between 4th gear and the spacer collar.

   Standard: 0.06 – 0.19 mm (0.002 – 0.007 in)
   Service Limit: 0.31 mm (0.012 in)



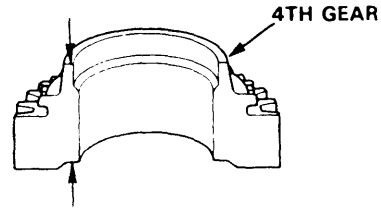
4. If the clearance is more than the service limit, measure distance Ⓐ on the spacer collar.

   Standard: 22.82 – 22.86 mm (0.898 – 0.900 in)
   Service Limit: 22.81 mm (0.898 in)



5. If distance Ⓐ is less than the service limit, replace the spacer collar with a new one.
   If distance Ⓐ is within the service limit, measure the thickness of 4th gear.

   Standard: 30.12 – 30.17 mm (1.186 – 1.188 in)
   Service limit: 30.05 mm (1.183 in)

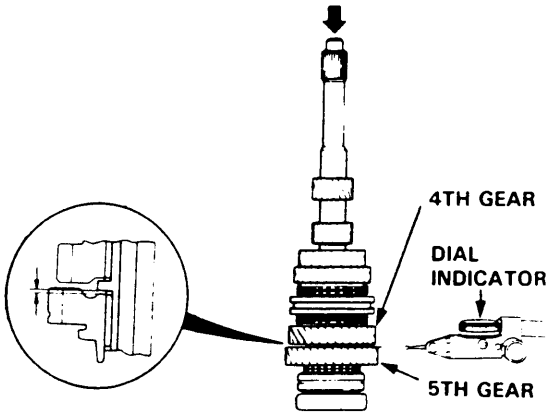


- If the thickness of 4th gear is less than the service limit, replace 4th gear with a new one.
- If the thickness of 4th gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

Disassembly

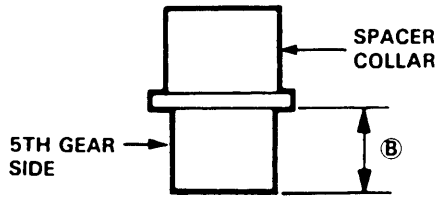
6. Measure the clearance between the spacer collar and 5th gear.

Standard: 0.06 – 0.19 mm (0.002 – 0.007 in)
Service Limit: 0.31 mm (0.012 in)



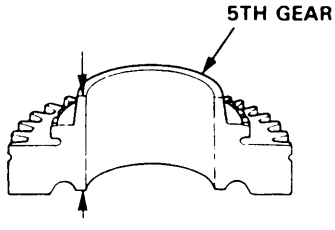
7. If the clearance is more than the service limit, measure distance Ⓑ on the spacer collar.

Standard: 23.53 – 23.56 mm (0.926 – 0.928 in)
Service Limit: 23.51 mm (0.926 in)



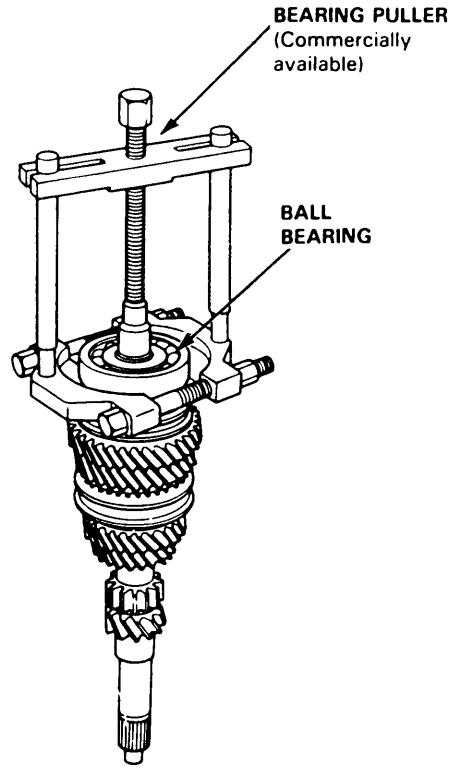
8. If distance Ⓑ is less than the service limit, replace the spacer collar with a new one.
If distance Ⓑ is within the service limit, measure thickness of 5th gear.

Standard: 28.42 – 28.47 mm (1.119 – 1.121 in)
Service Limit: 28.35 mm (1.116 in)



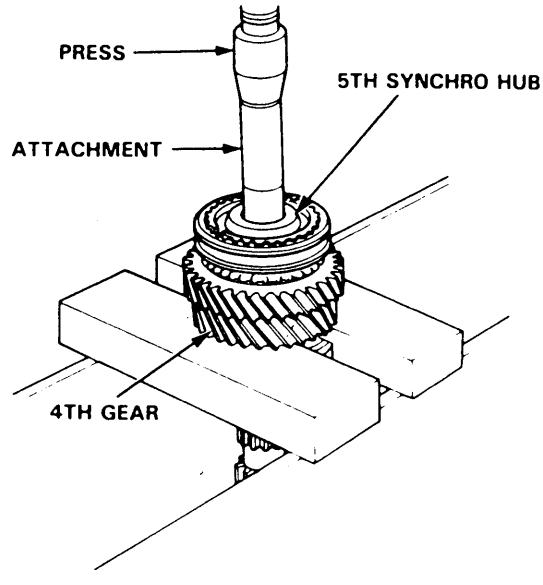
- If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.
- If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

1. Remove the ball bearing using a bearing puller as shown.



CAUTION: Remove the synchro hubs using a press and steel blocks as shown. Use of a jaw-type puller can cause damage to the gear teeth.

2. Support 4th gear on steel blocks, and press the mainshaft out of the 5th synchro hub as shown.

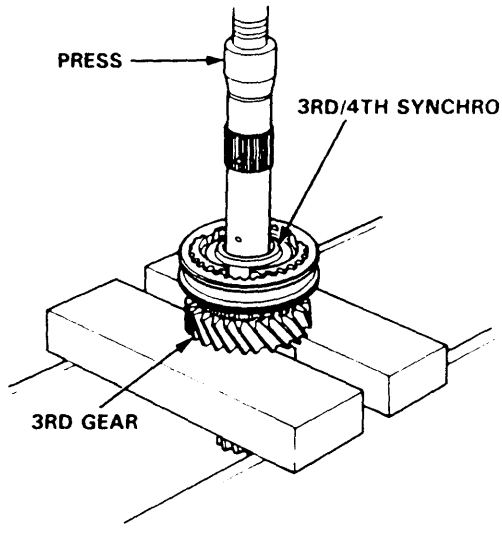


(cont'd)

Mainshaft Assembly

Disassembly (cont'd)

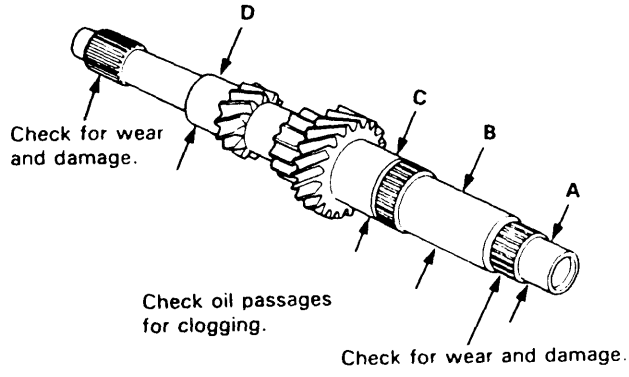
3. Support the 3rd gear on steel blocks, and press the mainshaft out of the 3rd/4th synchro hub as shown.



Inspection

1. Inspect the gear surface and bearing surface for wear and damage, then measure the mainshaft at points A, B, C, and D.

Standard: **A: 21.987 – 22.000 mm (0.8656 – 0.8661 in)**
B: 26.980 – 26.993 mm (1.0622 – 1.0627 in)
C: 33.984 – 34.000 mm (1.3380 – 1.3386 in)
D: 25.977 – 25.990 mm (1.0227 – 1.0232 in)
Service Limit: A: 21.930 mm (0.8634 in)
B: 26.930 mm (1.0602 in)
C: 33.930 mm (1.3358 in)
D: 25.920 mm (1.0205 in)

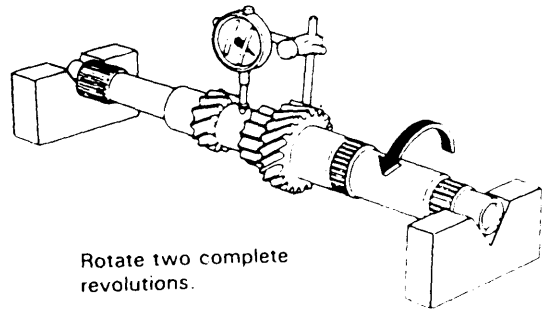


If any part of the mainshaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: **0.02 mm (0.001 in) max.**
Service Limit: 0.05 mm (0.002 in)

NOTE: Support the mainshaft at both ends as shown.



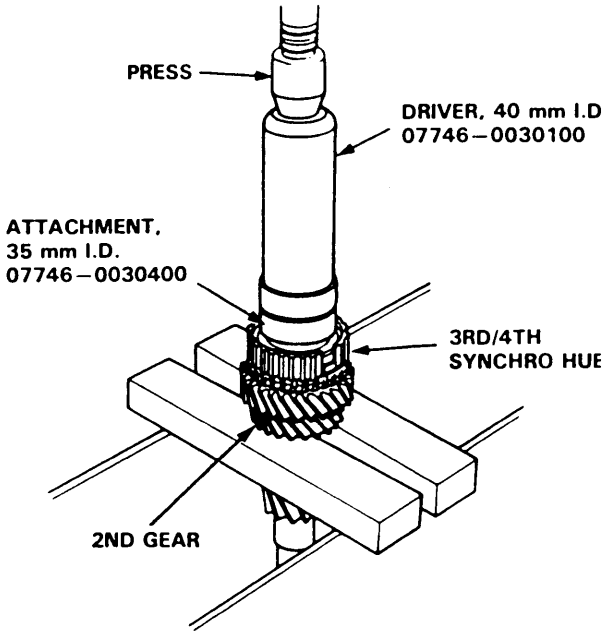
If the runout is more than the service limit, replace the mainshaft with a new one.

Reassembly

CAUTION: When installing the 3rd/4th and 5th synchro hubs, support the shaft on steel blocks, and install the synchro hubs using a press.

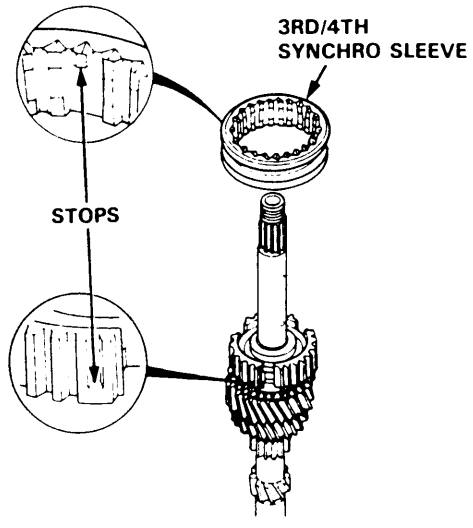
NOTE: Refer to page 13-15 for reassembly sequence.

1. Support 2nd gear on steel blocks, then install the 3rd/4th synchro hub using the special tools and a press as shown.

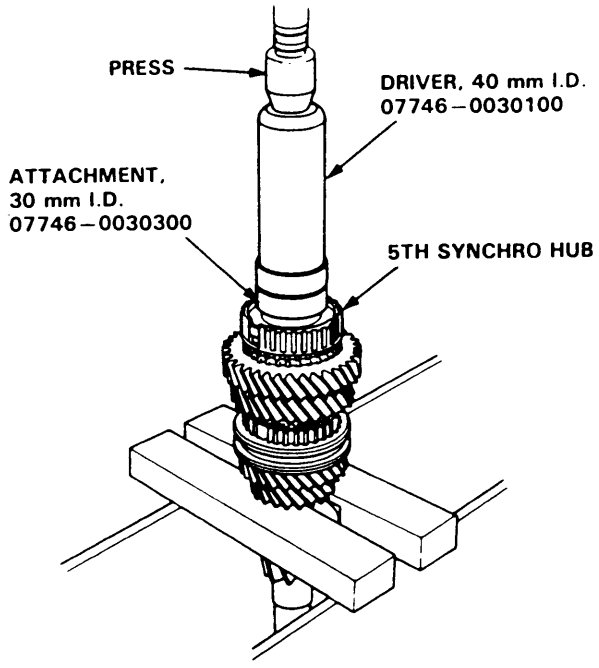


2. Install the 3rd/4th synchro sleeve by aligning the stops of the 3rd/4th synchro sleeve and hub.

   NOTE: After installing, check the operation of the 3rd/4th synchro hub set.

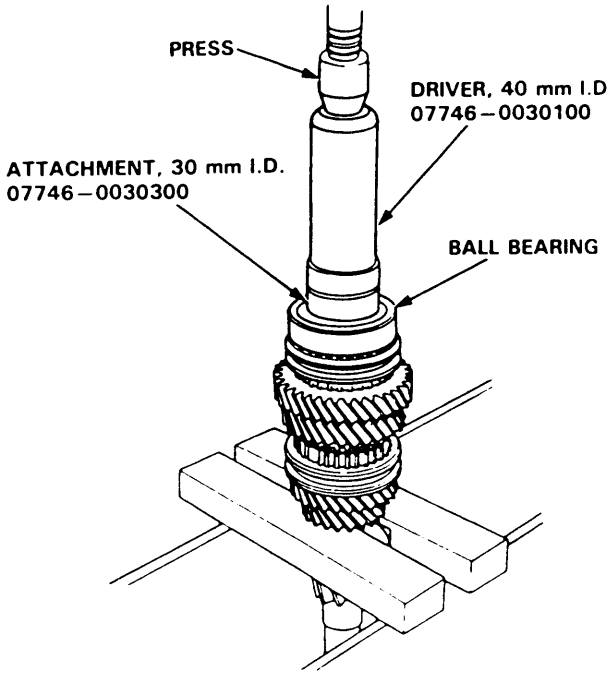


3. Install the 5th synchro hub using the special tools and a press as shown.



4. Install the ball bearing using the special tools and a press as shown.

   NOTE: Install the ball bearing with the tapered end facing down.



Countershaft Assembly

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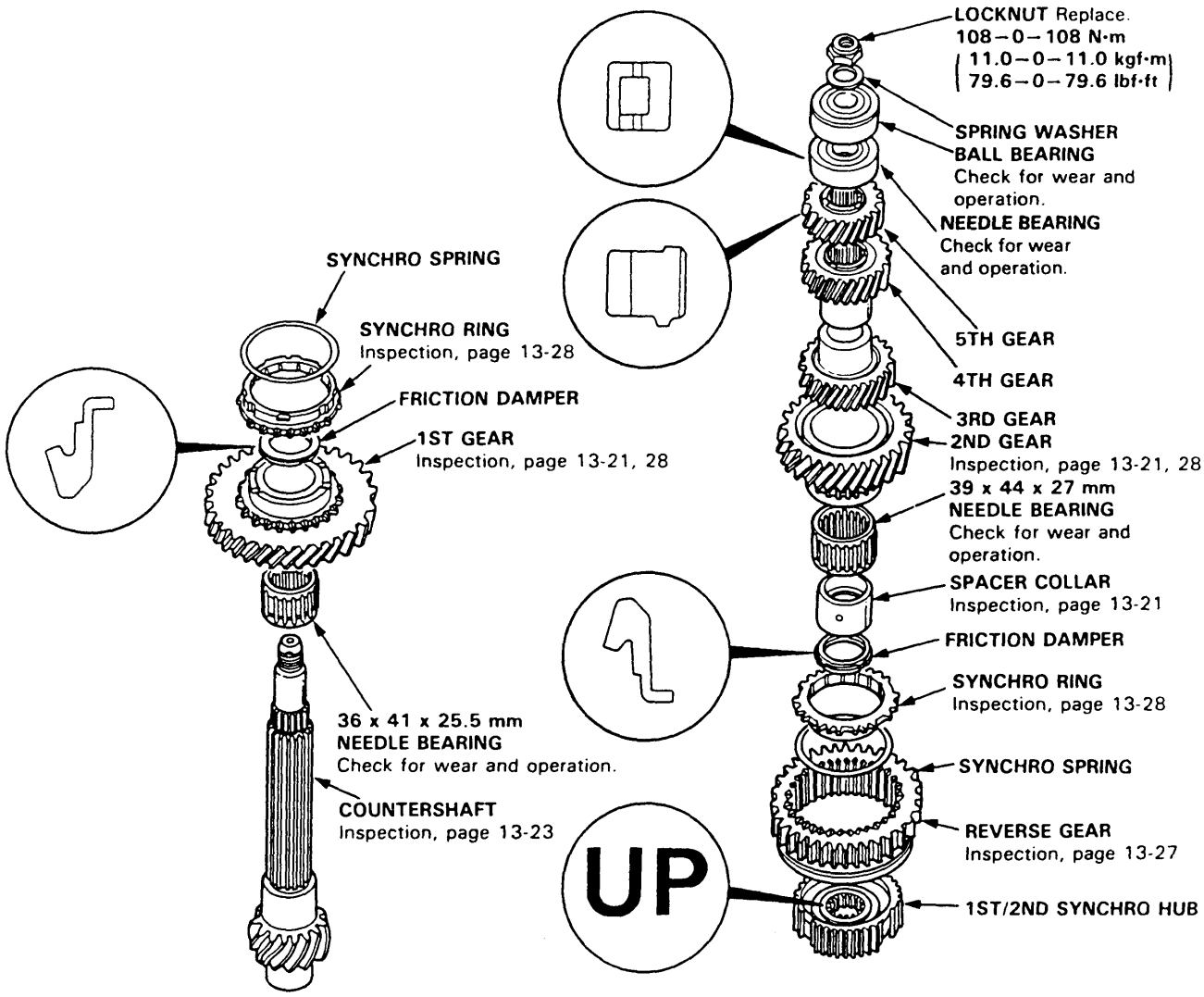
NOTE: The 3rd, 4th, and 5th gears are installed with a press.

Prior to reassembling, clean all the parts in solvent, dry them and apply lubricant to any contact surfaces. The 3rd, 4th, and 5th gears, however, should be installed with a press before lubricating them.

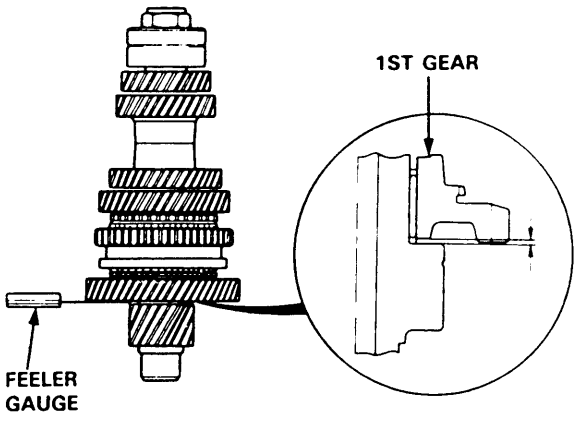


Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

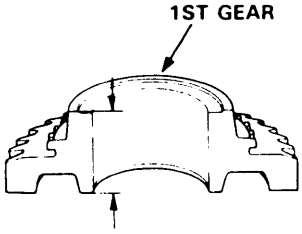
1. Measure the clearance between the countershaft and 1st gear.

   Standard: 0.03 – 0.10 mm (0.001 – 0.004 in)
   Service Limit: 0.22 mm (0.009 in)



2. If the clearance is more than the service limit, measure the thickness of 1st gear.

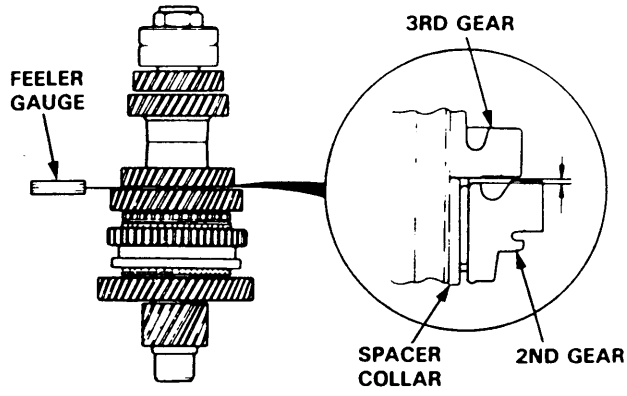
   Standard: 30.41 – 30.44 mm (1.197 – 1.198 in)
   Service Limit: 30.36 mm (1.195 in)



- If the thickness of 1st gear is less than the service limit, replace 1st gear with a new one.
- If the thickness of 1st gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

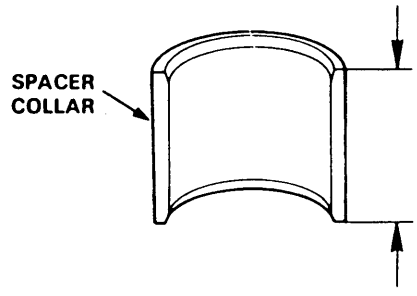
3. Measure the clearance between 2nd and 3rd gears.

   Standard: 0.04 – 0.12 mm (0.002 – 0.005 in)
   Service Limit: 0.24 mm (0.009 in)



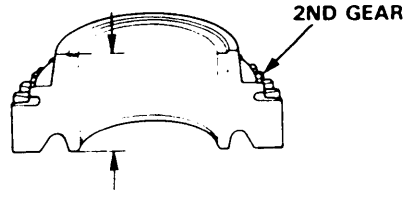
4. If the clearance is more than the service limit, measure the thickness of the spacer collar.

   Standard: 32.03 – 32.06 mm (1.261 – 1.262 in)
   Service Limit: 32.01 mm (1.260 in)



5. If the thickness is less than the service limit, replace the spacer collar with a new one.
   If the thickness is within the service limit, measure the thickness of 2nd gear

   Standard: 31.92 – 31.97 mm (1.257 – 1.259 in)
   Service Limit: 31.85 mm (1.254 in)



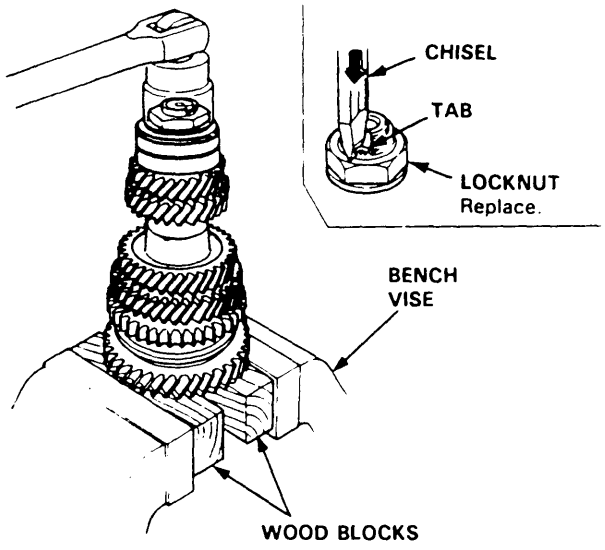
- If the thickness of 2nd gear is less than the service limit, replace 2nd gear with a new one.
- If the thickness of 2nd gear is within the service limit, replace the 1st/2nd synchro hub with a new one.

Countershaft Assembly

Disassembly

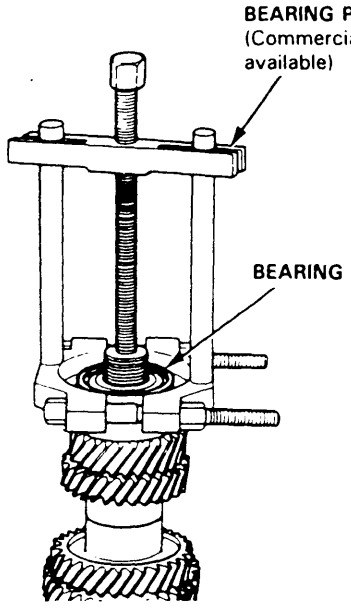
CAUTION: Remove the gears using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

1. Securely clamp the countershaft assembly in a bench vise with wood blocks.

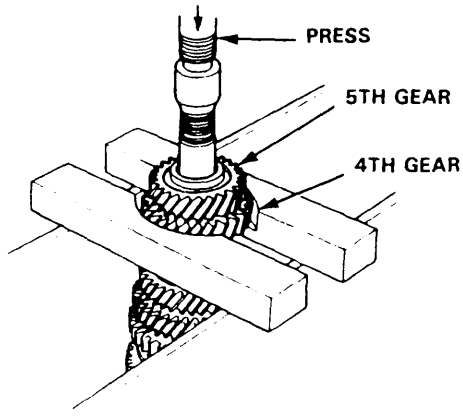


2. Raise the locknut tab from the groove of the countershaft, then remove the locknut and the spring washer.

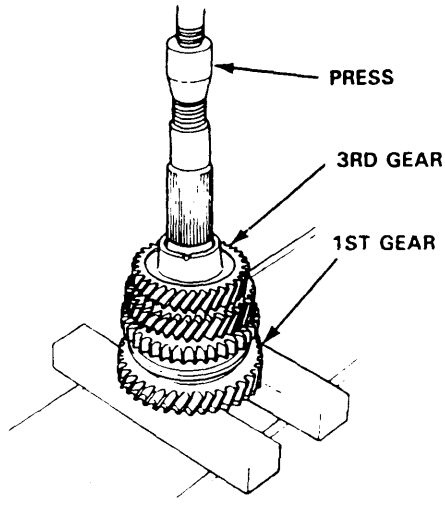
3. Remove the bearings using a bearing puller as shown.



4. Support 4th gear on steel blocks, and press the countershaft out of 5th and 4th gears as shown.



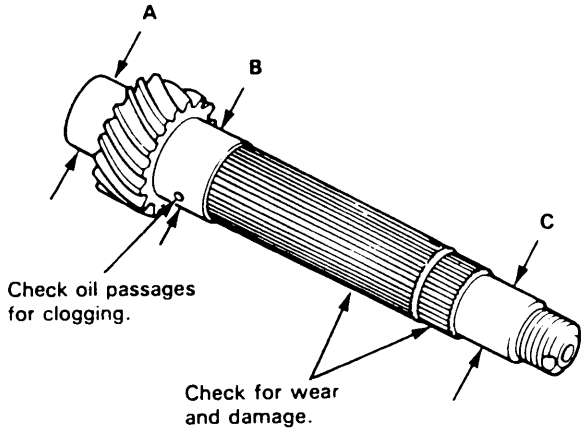
5. Support 1st gear on steel blocks, and press the countershaft out of 3rd gear as shown.



Inspection

1. Inspect the gear surfaces and bearing surfaces for wear and damage, then measure the countershaft at points A, B, and C.

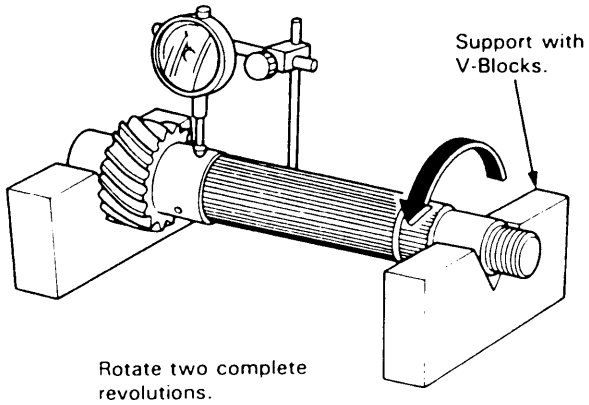
Standard: **A: 30.000 – 30.015 mm (1.1811 –1.1817 in)**
B: 35.984 – 36.000 mm (1.4167 –1.4173 in)
C: 24.980 – 24.993 mm (0.9835 – 0.9840 in)
Service Limit: A: 29.950 mm (1.1791 in)
B: 35.930 mm (1.4146 in)
C: 24.930 mm (0.9815 in)



If any part of the countershaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: **0.02 mm (0.001 in) max.**
Service Limit: 0.05 mm (0.002 in)



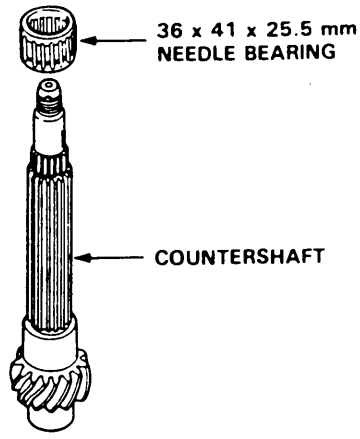
If the runout is more than the service limit, replace the countershaft with a new one.

Reassembly

CAUTION:
- **Press the 3rd, 4th, and 5th gears on the countershaft without lubrication.**
- **When installing the 3rd, 4th, and 5th gears, support the shaft on steel blocks and install the gears using a press.**

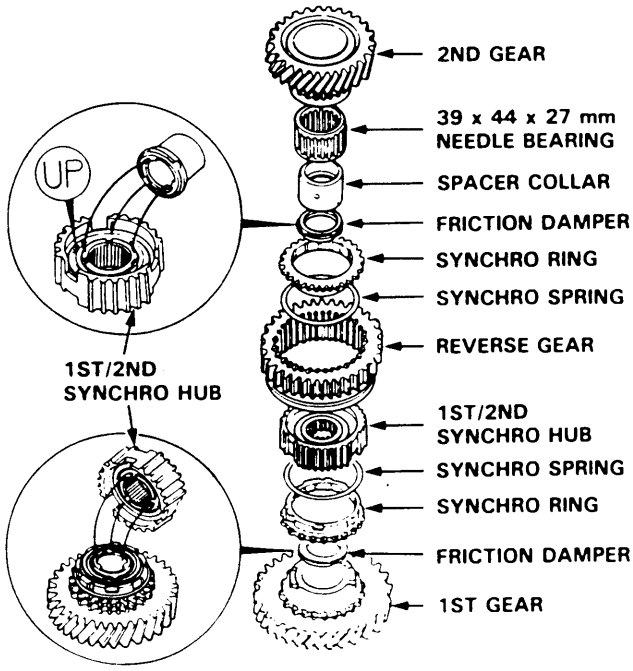
NOTE: Refer to page 13-20 for reassembly sequence.

1. Install the needle bearing on the countershaft.



2. Assemble the parts below as shown.

NOTE: Check that the fingers of the friction damper are securely set in the grooves of the 1st/2nd synchro hub.



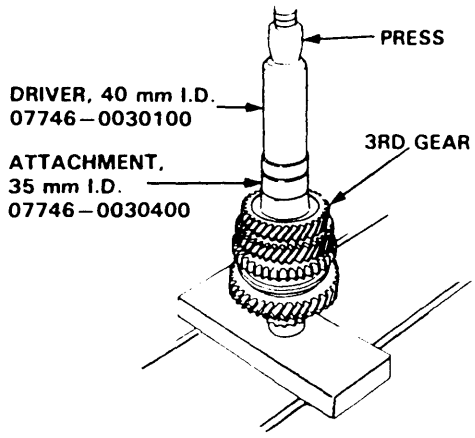
3. Install the parts on the countershaft.

(cont'd)

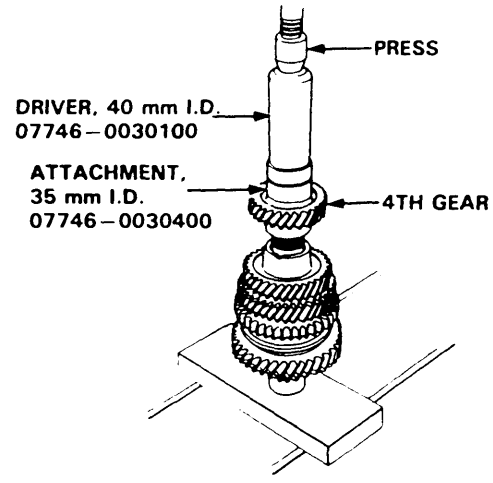
Countershaft Assembly

Reassembly (cont'd)

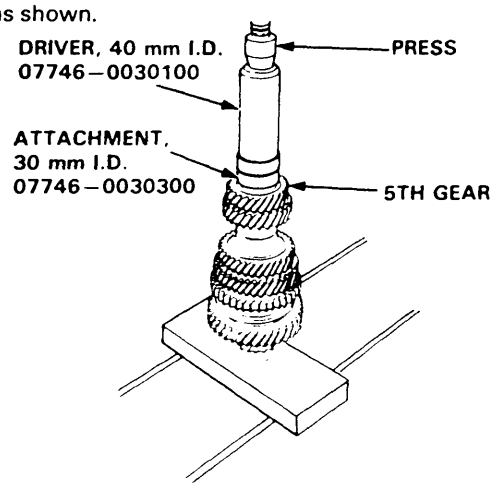
4. Support the countershaft on a steel block as shown and install 3rd gear using the special tools and a press as shown.



5. Install 4th gear using the special tools and a press as shown.

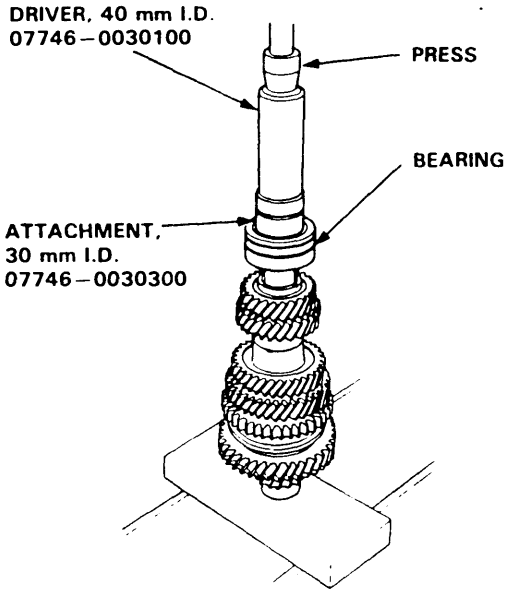


6. Install 5th gear using the special tools and a press as shown.



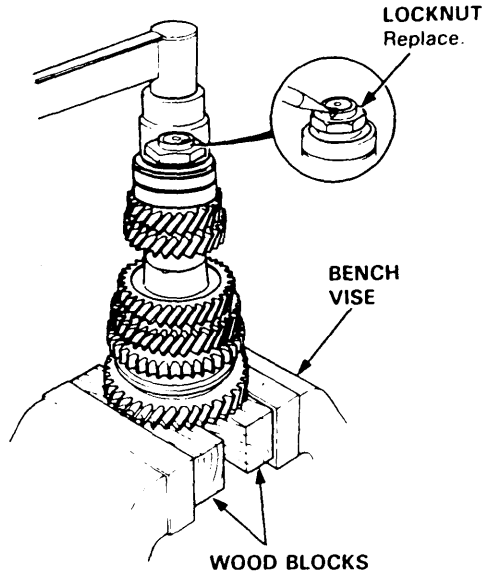
7. Install the bearings using the special tools and a press as shown.

CAUTION: Install the bearings with a maximum pressure of 7.8 kN (800 kgf, 5,786 lbf).



8. Securely clamp the countershaft assembly in a bench vise with wood blocks.

LOCKNUT
108 → 0 → 108 N·m
(11.0 → 0 → 11.0 kgf·m, 79.6 → 0 → 79.6 lbf·ft)



9. Install the spring washer, tighten the locknut, then stake the locknut tab into groove.

Shift Fork Assembly

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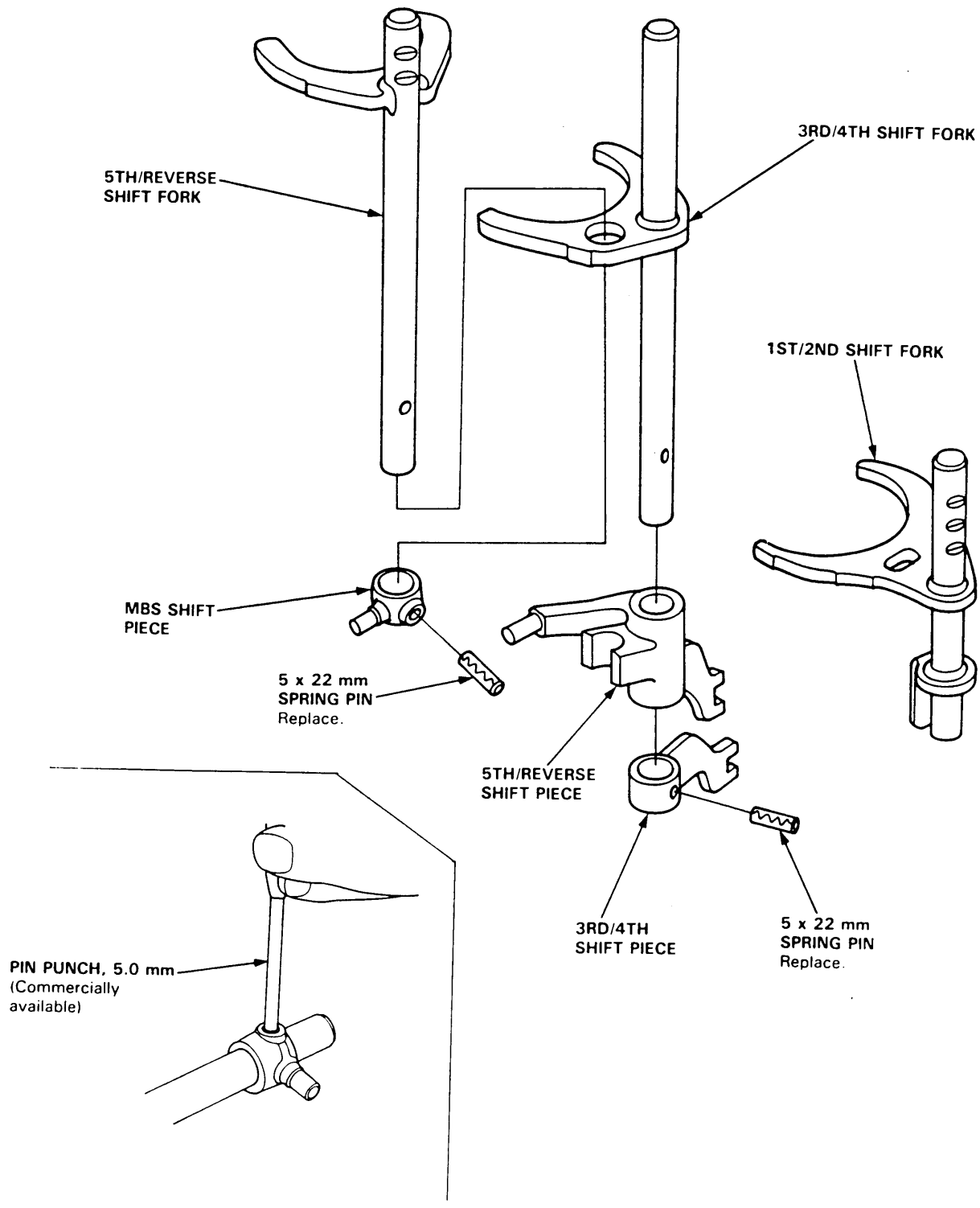
Prior to reassembling, clean all the parts in solvent, dry them, and apply lubricant to any contact parts.



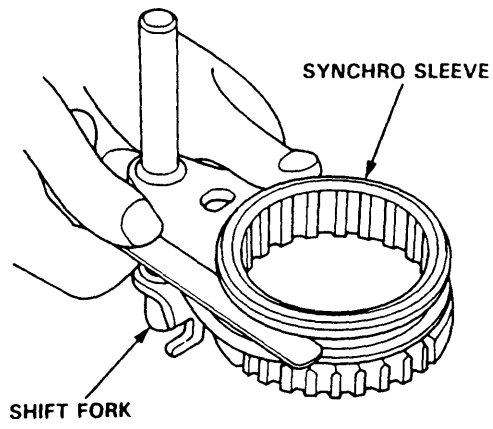
Shift Fork Assembly

Clearance Inspection

NOTE: The synchro sleeve and the synchro hub should be replaced as a set.

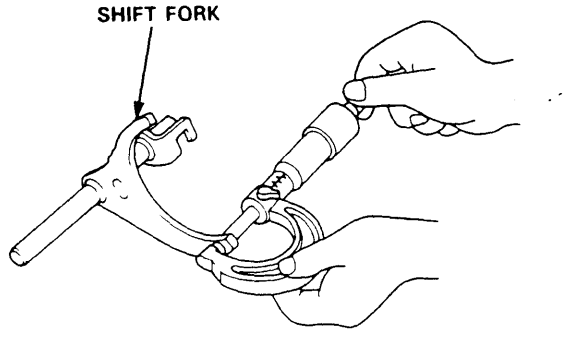
1. Measure the clearance between each shift fork and its matching synchro sleeve.

   Standard: 0.35 – 0.65 mm (0.014 – 0.026 in)
   Service Limit: 1.00 mm (0.04 in)



2. If the clearance is more than the service limit, measure the thickness of the shift fork fingers.

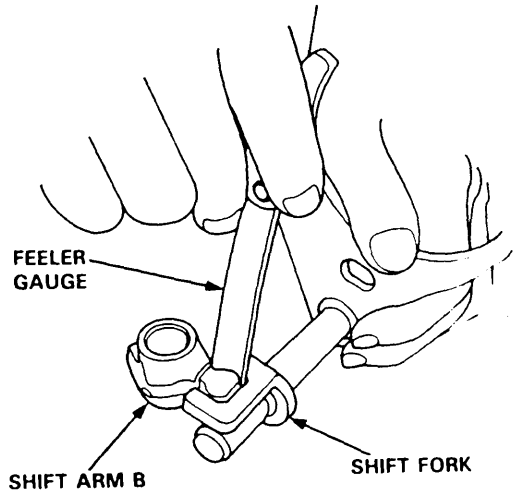
   Standard:
   3rd/4th: 7.4 – 7.6 mm (0.291 – 0.299 in)
   1st/2nd, 5th: 6.2 – 6.4 mm (0.244 – 0.252 in)



- If the thickness of the shift fork fingers is not within the standard, replace the shift fork with a new one.
- If the thickness of the shift fork fingers is within the standard, replace the synchro sleeve with a new one.

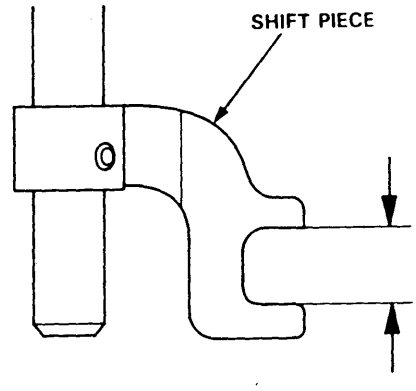
3. Measure the clearance between the shift piece or shift fork and the shift arm B.

   Standard: 0.2 – 0.5 mm (0.008 – 0.02 in)
   Service Limit: 0.8 mm (0.03 in)



4. If the clearance is more than the service limit, measure the groove of the shift piece or shift fork.

   Standard: 13.2 – 13.4 mm (0.520 – 0.528 in)

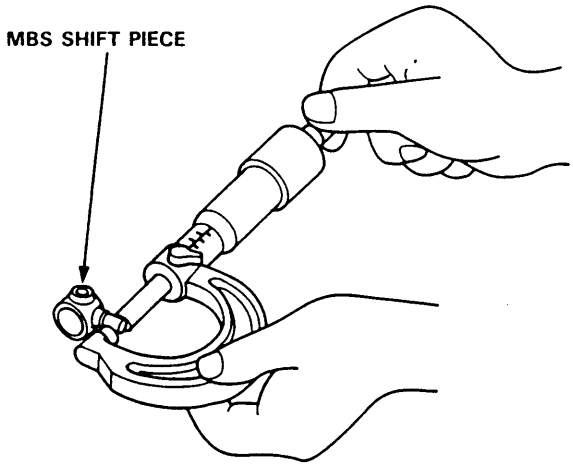


- If the groove of the shift piece or shift fork is not within the standard, replace the shift piece or shift fork with a new one.
- If the groove of the shift piece or shift fork is within the standard, replace the shift arm B with a new one.

MBS Shift Piece Inspection

1. Measure the width of the MBS shift piece.

   Standard: 6.9 – 7.1 mm (0.272 – 0.280 in)
   Service Limit: 6.8 mm (0.268 in)



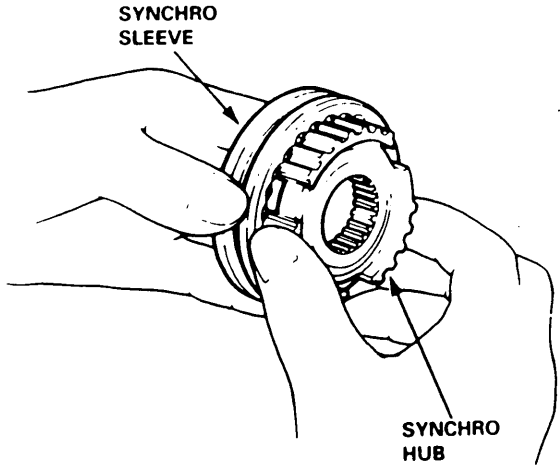
If the width of the MBS shift piece is less than the service limit, replace the MBS shift piece.

Inspection/Installation

1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicate wear.

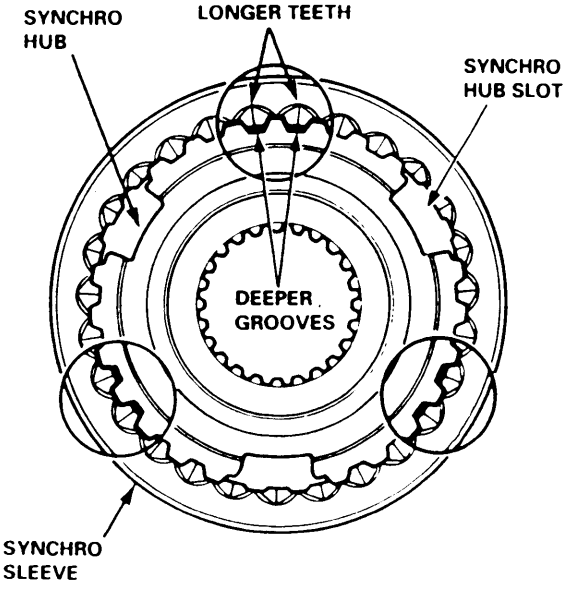
2. Install each synchro hub in its mating synchro sleeve, and check for freedom of movement.

   NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.



3. When assembling the synchro sleeve and synchro hub, be sure to match the three sets of longer teeth (120 degrees apart) on the synchro sleeve with the three sets of deeper grooves in the synchro hub.

   CAUTION: Do not install the synchro sleeve with its longer teeth in the synchro hub slots because it will damage the spring ring.



Synchro Ring, Gear

Inspection

1. Inspect the synchro ring and gear.

   A: Inspect the inside of the synchro ring for wear.

   B: Inspect the synchro sleeve teeth and matching teeth on the synchro ring for wear (rounded off).

   C: Inspect the synchro sleeve teeth and matching teeth on the gear for wear (rounded off).

   D: Inspect the gear hub thrust surface for wear.

   E: Inspect the cone surface for wear and roughness.

   F: Inspect the teeth on all gears for uneven wear, scoring, galling, and cracks.

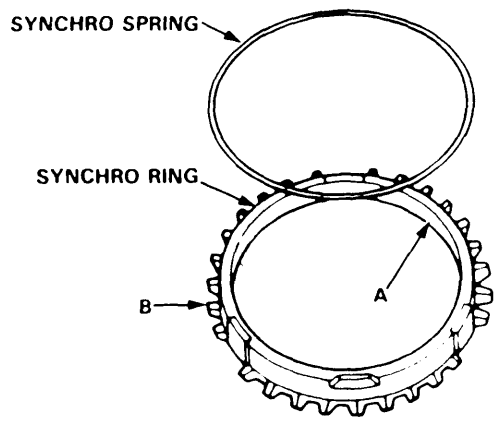
2. Coat the cone surface of the gear with oil, and place the synchro ring on the matching gear. Rotate the synchro ring, making sure that it does not slip.

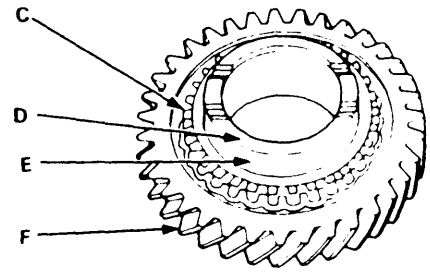
   Measure the clearance between the synchro ring and gear all the way around.

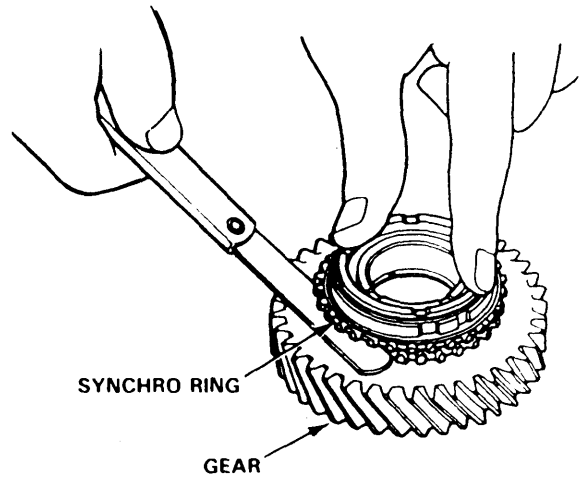
   NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

   Synchro Ring-to-Gear Clearance
   Standard: 0.73 – 1.18 mm (0.029 – 0.046 in)
   Service Limit: 0.4 mm (0.02 in)

   If the clearance is less than the service limit, replace the synchro ring and synchro cone.







Shift Rod

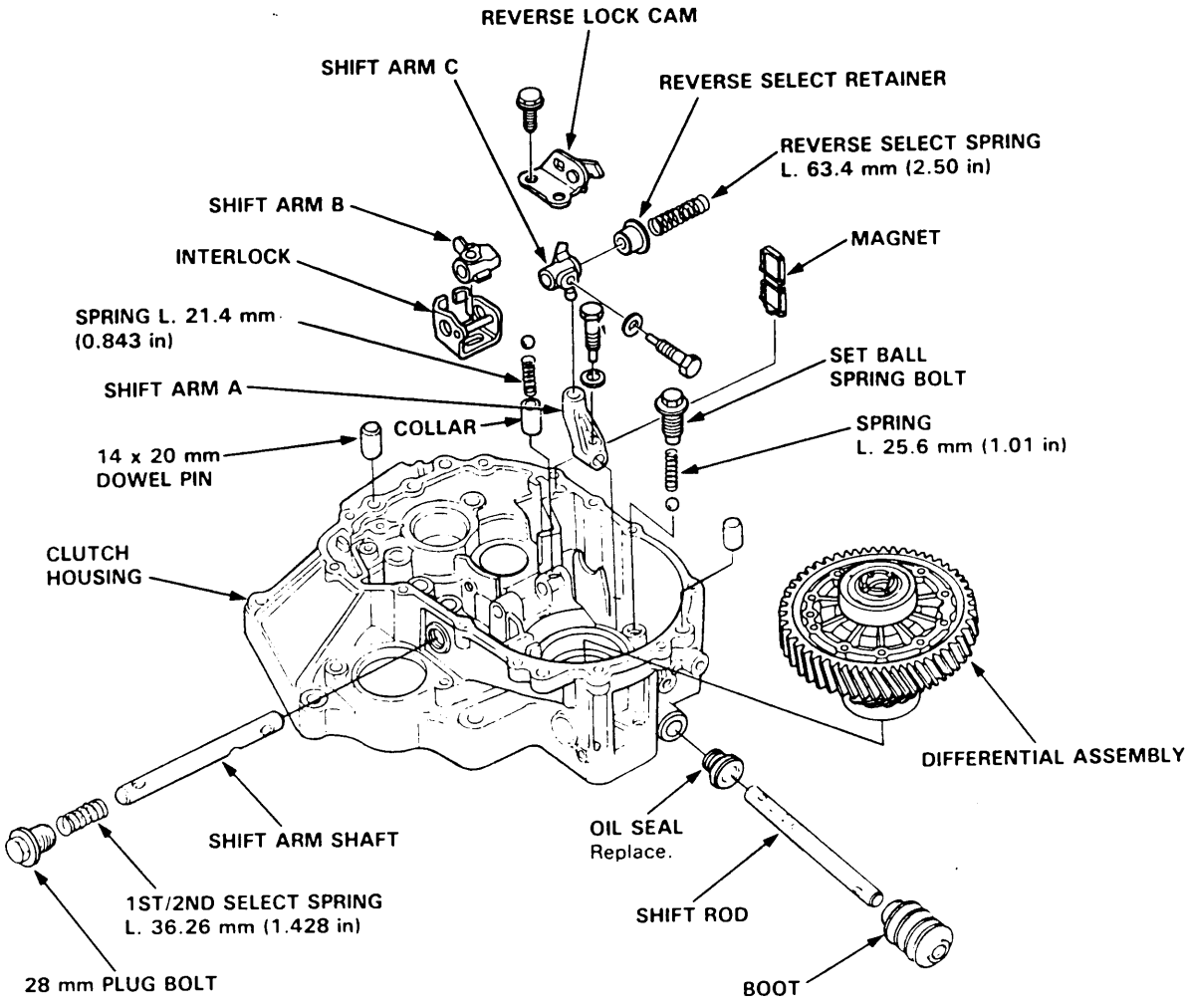
Removal

NOTE: The steel balls are all of the same size (5/16 in).

1. Remove the differential assembly.
2. Remove the 28 mm plug bolt and 1st/2nd select spring.
3. Remove the shift arm C attaching bolt.
4. Remove the shift arm shaft.

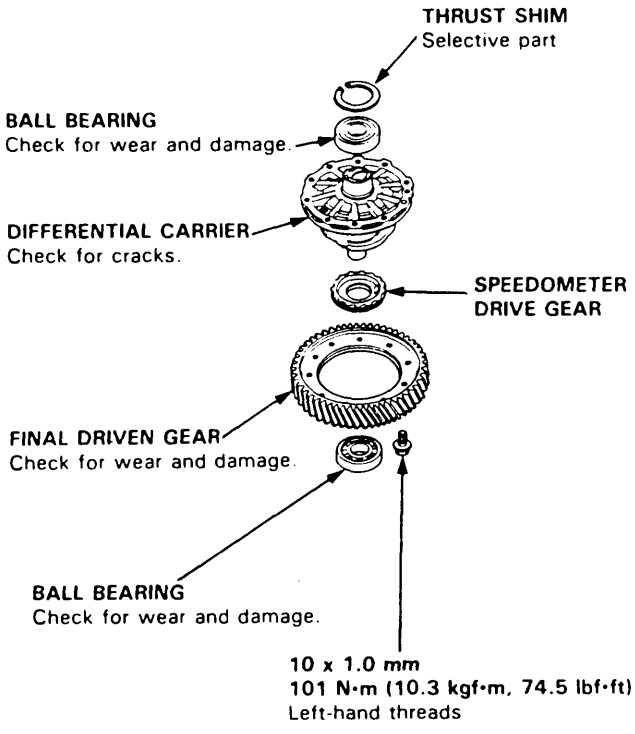
   NOTE: Be careful not to lose the steel ball.

5. Remove the steel ball, spring, and collar.
6. Remove shift arms C and B, and the interlock, then remove the reverse select spring and retainer.
7. Remove the shift arm A attaching bolt, the set ball spring bolt, set spring, and steel ball.
8. Remove the shift rod, then remove the shift arm A.
9. Remove the reverse lock cam.
10. Remove the magnet.



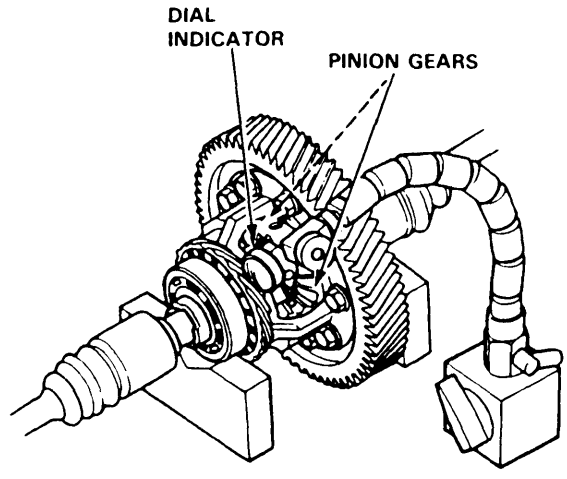
Differential

Index



Backlash Inspection

1. Place differential assembly on V-blocks, and install both driveshafts.



2. Measure backlash of both pinion gears.

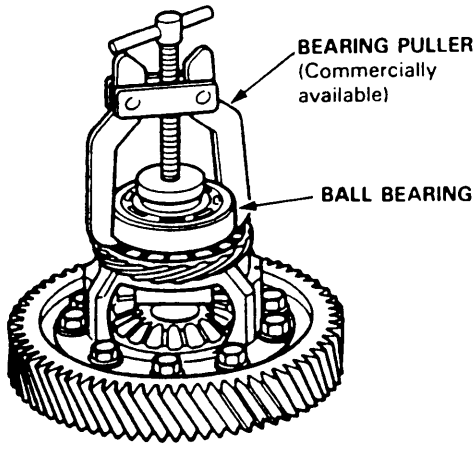
   Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)

3. If the backlash is not within the standard, replace the differential carrier.

Bearing Replacement

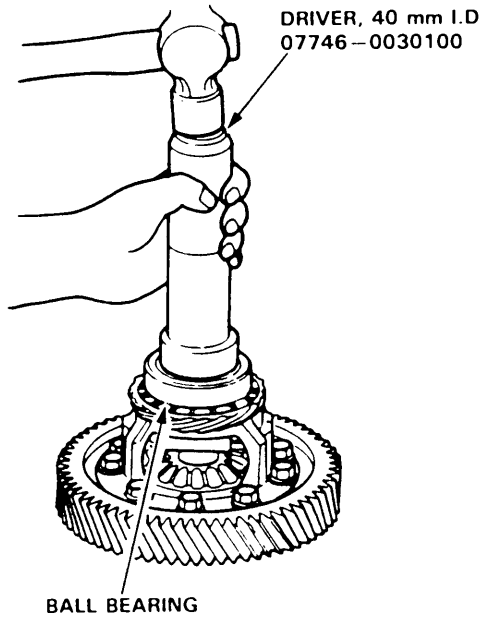
NOTE: Check bearings for wear and rough rotation. If the bearings are OK, removal is not necessary.

1. Remove the ball bearings using a bearing puller as shown.



2. Install new ball bearings using the special tool as shown.

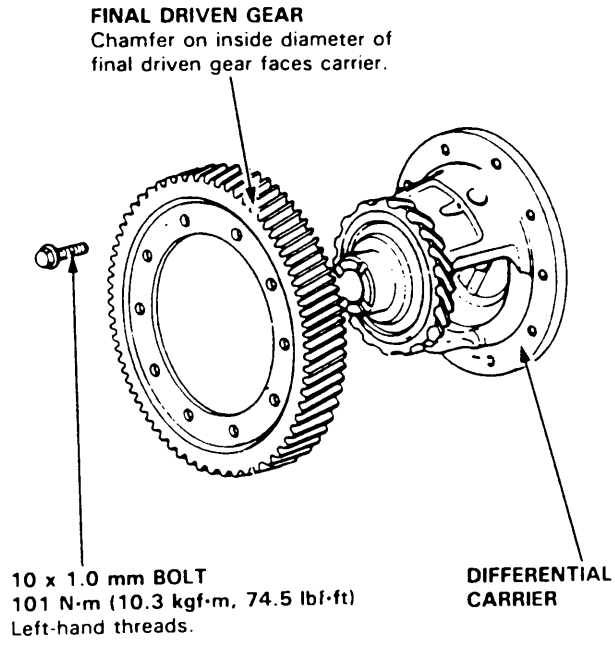
   NOTE: Drive the bearings squarely until they bottom against the carrier.



Final Driven Gear Replacement

1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear from the differential carrier.

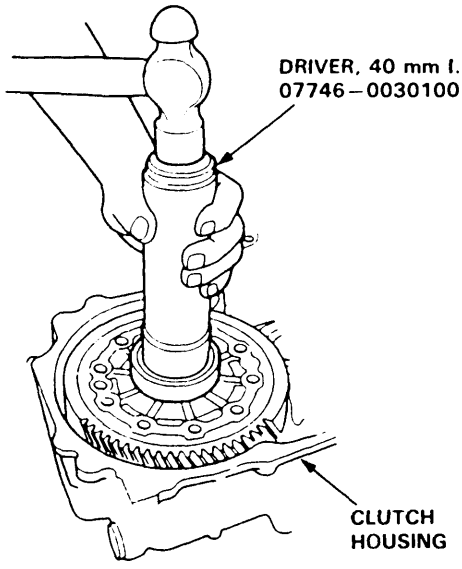
   NOTE: The final driven gear bolts have left-hand threads.



2. Install the final driven gear by tightening the bolts in a crisscross pattern in several steps.

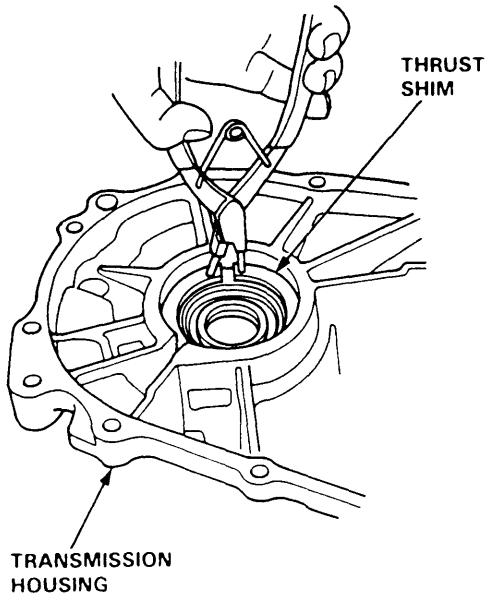
Thrust Shim Adjustment

1. Install the differential assembly, making sure it bottoms in the clutch housing, using the special tool as shown.



2. Install the thrust shim.

   NOTE: Install the same size thrust shim that was removed.



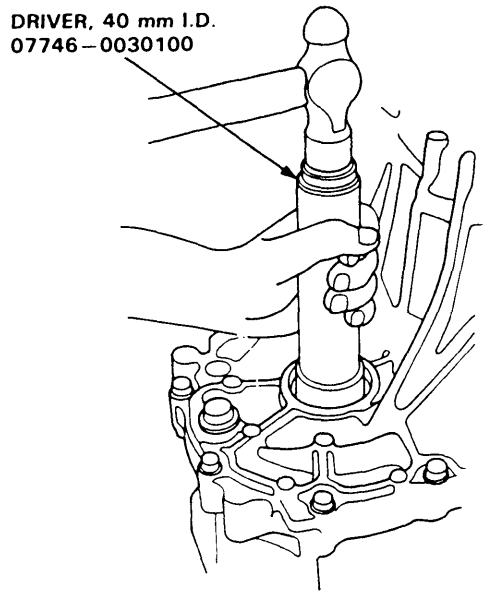
3. Install the transmission housing (see page 13-41).

   NOTE: Do not apply liquid gasket to the mating surface of the clutch housing.

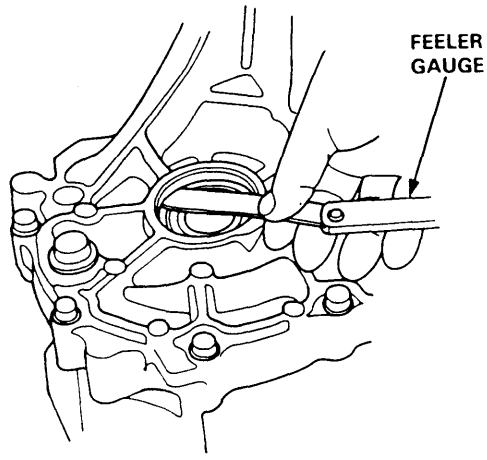
4. Tighten the transmission housing attaching bolts (see page 13-42).

   8 x 1.25 mm
   27 N·m (2.8 kgf·m, 20 lbf·ft)

5. Use the special tool to bottom the differential assembly in the clutch housing.



6. Measure clearance between thrust shim and bearing outer race in transmission housing.



7. If the clearance is more than the standard, select a new thrust shim from the following table.

   NOTE: If the clearance measured in step 6 is within the standard, go to step 10.

   Standard: 0 – 0.10 mm (0 – 0.004 in)

80 mm THRUST SHIM:

Part Number	Thickness
41441 – PL3 – B00	1.0 mm (0.0394 in)
41442 – PL3 – B00	1.1 mm (0.0433 in)
41443 – PL3 – B00	1.2 mm (0.0472 in)
41444 – PL3 – B00	1.3 mm (0.0512 in)
41445 – PL3 – B00	1.4 mm (0.0551 in)
41446 – PL3 – B00	1.5 mm (0.0591 in)
41447 – PL3 – B00	1.6 mm (0.0630 in)
41448 – PL3 – B00	1.7 mm (0.0669 in)
41449 – PL3 – B00	1.8 mm (0.0709 in)
41450 – PL3 – B00	1.05 mm (0.0413 in)
41451 – PL3 – B00	1.15 mm (0.0453 in)
41452 – PL3 – B00	1.25 mm (0.0492 in)
41453 – PL3 – B00	1.35 mm (0.0532 in)
41454 – PL3 – B00	1.45 mm (0.0571 in)
41455 – PL3 – B00	1.55 mm (0.0610 in)
41456 – PL3 – B00	1.65 mm (0.0650 in)
41457 – PL3 – B00	1.75 mm (0.0689 in)

8. Remove the bolts and transmission housing.

9. Replace the thrust shim selected in step 7, then recheck the clearance.

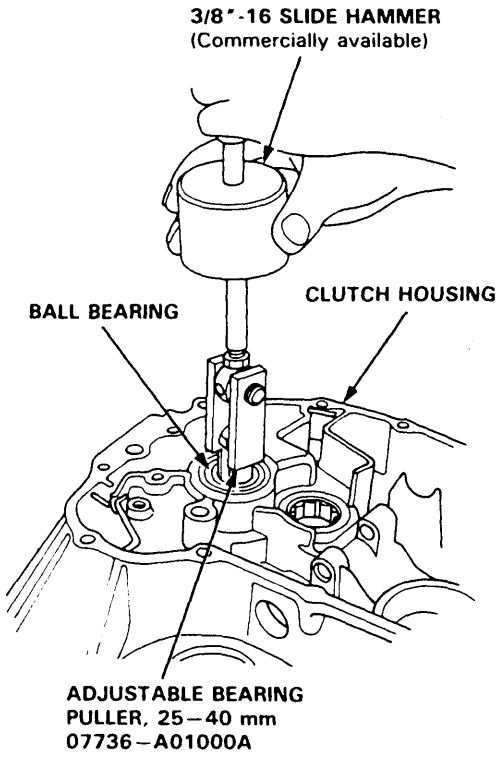
10. Remove the bolts and transmission housing. Apply liquid gasket to the surface of the transmission housing and reassemble.

Clutch Housing Bearing

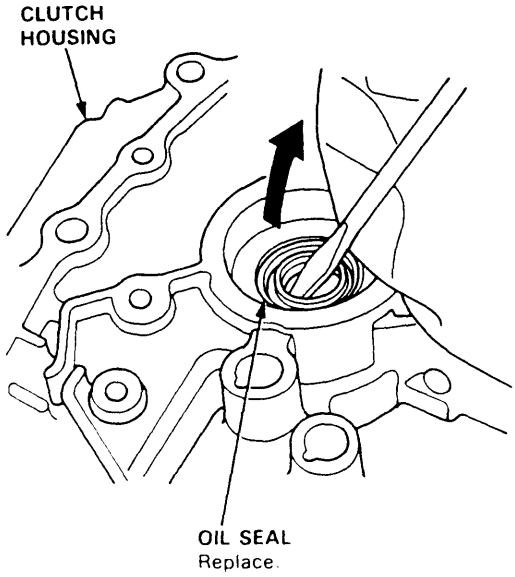
Replacement

Mainshaft

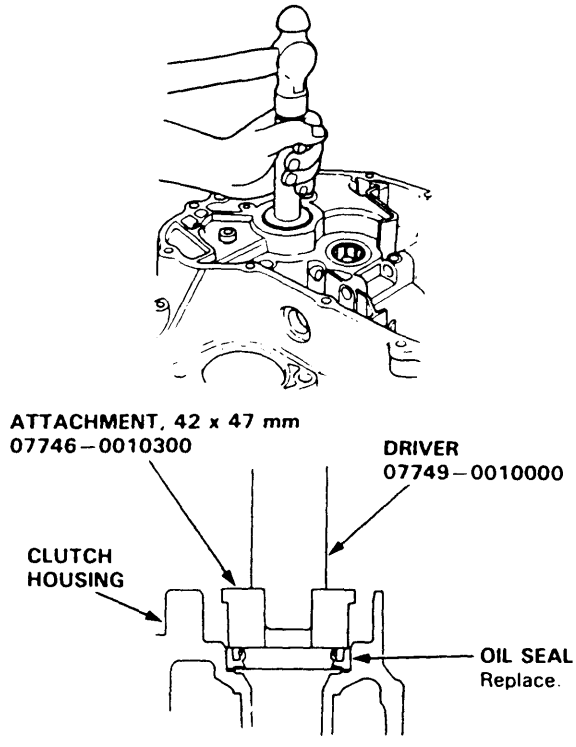
1. Remove the ball bearing using the special tool as shown.



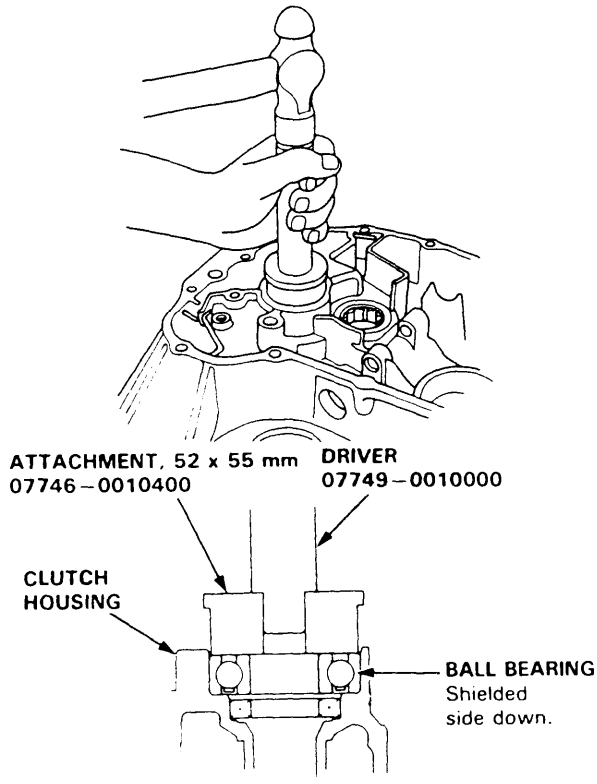
2. Remove the oil seal from the clutch housing.



3. Drive the new oil seal into the clutch housing using the special tools asn shown.

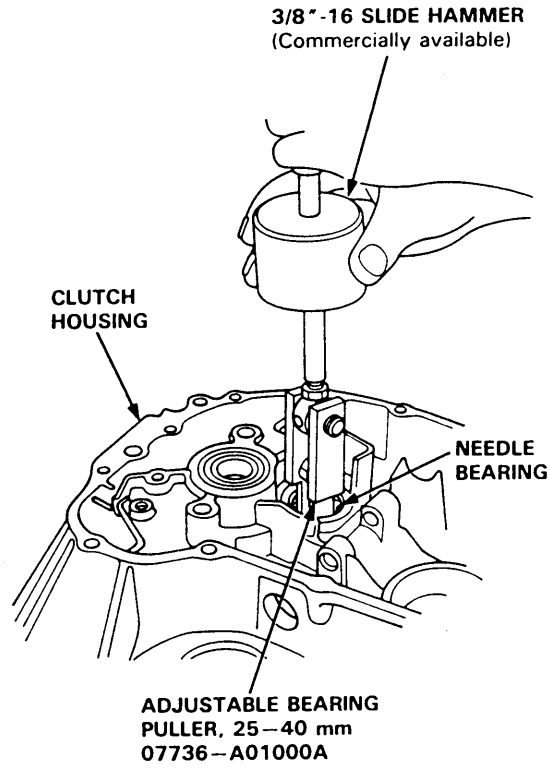


4. Drive the ball bearing into the clutch housing using the special tools as shown.

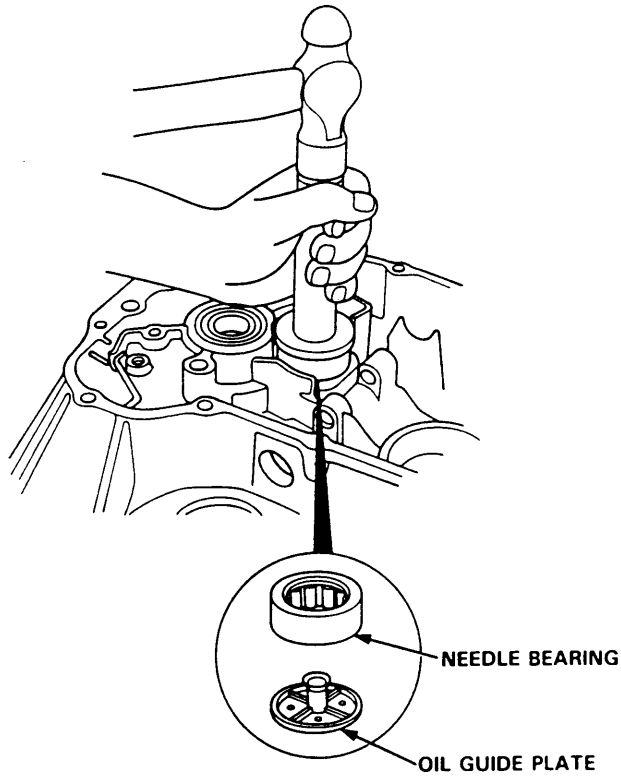


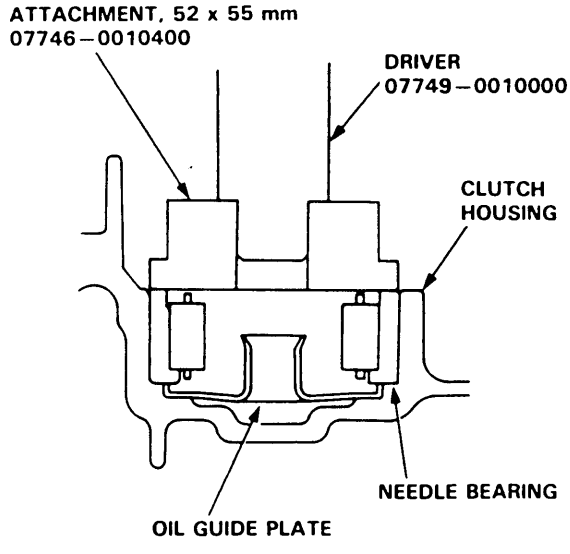
Countershaft

1. Remove the needle bearing using the special tool as shown, then remove the oil guide plate.



2. Install the oil guide plate, then drive the needle bearing into the clutch housing using the special tools as shown.

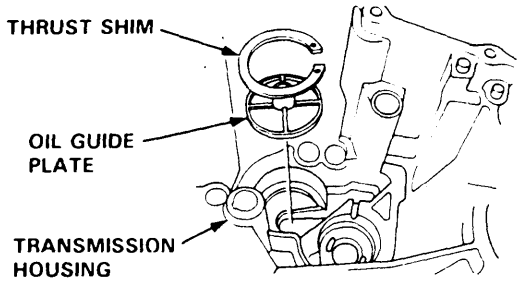




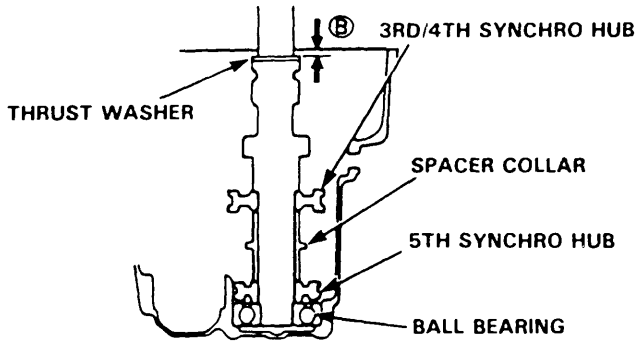
Mainshaft Thrust Shim

Adjustment

1. Remove the thrust shim and oil guide plate from the transmission housing.



2. Install the 3rd/4th synchro hub, spacer collar, 5th synchro hub, ball bearing, and thrust washer on the mainshaft. Install the assembly in the transmission housing.

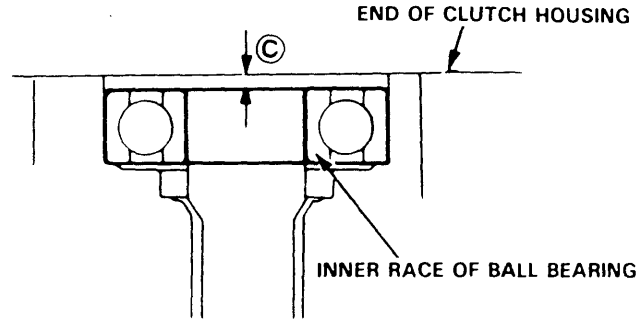


3. Measure the distance Ⓑ between the end of the transmission housing and thrust washer.

   NOTE:
   - Use a straight edge and vernier caliper.
   - Measure at three locations and average the readings.

4. Measure the distance Ⓒ between the surfaces of the clutch housing and bearing inner race.

   NOTE:
   - Use a straight edge and depth gauge.
   - Measure at three locations and average the readings.



5. Select the proper shim on the basis of the following calculations:

   NOTE: Use only one thrust shim.

   (Basic Formula)
   (B) + (C) – 0.95 = shim thickness

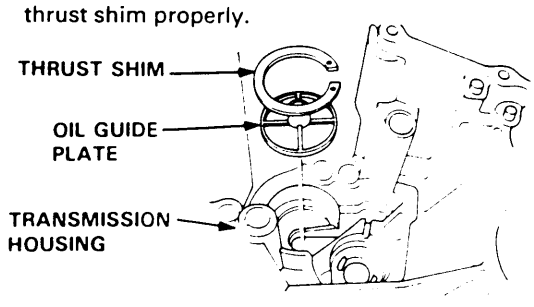
   Example of calculation:
   Distance Ⓑ (2.00 mm) + Distance Ⓒ (0.09 mm)
   = 2.09 mm

   subtract the spring washer height (0.95 mm) = the required thrust shim (1.14 mm)

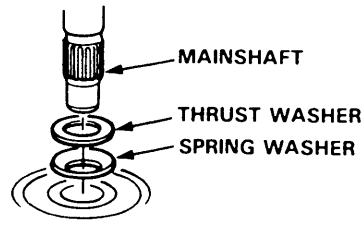
70 mm THRUST SHIM:

	Part Number	Thickness
A	23931 - PL3 - B00	0.60 mm (0.0236 in)
B	23932 - PL3 - B00	0.63 mm (0.0284 in)
C	23933 - PL3 - B00	0.66 mm (0.0260 in)
D	23934 - PL3 - B00	0.69 mm (0.0272 in)
E	23935 - PL3 - B00	0.72 mm (0.0283 in)
F	23936 - PL3 - B00	0.75 mm (0.0295 in)
G	23937 - PL3 - B00	0.78 mm (0.0307 in)
H	23938 - PL3 - B00	0.81 mm (0.0319 in)
I	23939 - PL3 - B00	0.84 mm (0.0331 in)
J	23940 - PL3 - B00	0.87 mm (0.0343 in)
K	23941 - PL3 - B00	0.90 mm (0.0354 in)
L	23942 - PL3 - B00	0.93 mm (0.0366 in)
M	23943 - PL3 - B00	0.96 mm (0.0378 in)
N	23944 - PL3 - B00	0.99 mm (0.0390 in)
O	23945 - PL3 - B00	1.02 mm (0.0402 in)
P	23946 - PL3 - B00	1.05 mm (0.0413 in)
Q	23947 - PL3 - B00	1.08 mm (0.0425 in)
R	23948 - PL3 - B00	1.11 mm (0.0437 in)
S	23949 - PL3 - B00	1.14 mm (0.0449 in)
T	23950 - PL3 - B00	1.17 mm (0.0461 in)
U	23951 - PL3 - B00	1.20 mm (0.0472 in)
V	23952 - PL3 - B00	1.23 mm (0.0484 in)
W	23953 - PL3 - B00	1.26 mm (0.0496 in)
X	23954 - PL3 - B00	1.29 mm (0.0508 in)
Y	23955 - PL3 - B00	1.32 mm (0.0520 in)
Z	23956 - PL3 - B00	1.35 mm (0.0531 in)
AA	23957 - PL3 - B00	1.38 mm (0.0543 in)
AB	23958 - PL3 - B00	1.41 mm (0.0555 in)
AC	23959 - PL3 - B00	1.44 mm (0.0567 in)
AD	23960 - PL3 - B00	1.47 mm (0.0579 in)
AE	23961 - PL3 - B00	1.50 mm (0.0591 in)
AF	23962 - PL3 - B00	1.53 mm (0.0602 in)
AG	23963 - PL3 - B00	1.56 mm (0.0614 in)
AH	23964 - PL3 - B00	1.59 mm (0.0626 in)
AI	23965 - PL3 - B00	1.62 mm (0.0638 in)
AJ	23966 - PL3 - B00	1.65 mm (0.0650 in)
AK	23967 - PL3 - B00	1.68 mm (0.0661 in)
AL	23968 - PL3 - B00	1.71 mm (0.0673 in)
AM	23969 - PL3 - B00	1.74 mm (0.0685 in)
AN	23970 - PL3 - B00	1.77 mm (0.0697 in)
AO	23971 - PL3 - B00	1.80 mm (0.0709 in)

6. Install the oil guide plate and selected thrust shim in the transmission housing.
   NOTE:
   - Clean the thrust washer, spring washer and thrust shim thoroughly before installation.
   - Install the thrust washer, spring washer and thrust shim properly.



7. Install the thrust washer and spring washer in the mainshaft.



8. Install the mainshaft in the clutch housing.
9. Place the transmission housing over the mainshaft and onto the clutch housing.
10. Tighten the clutch and transmission housings with several 8 mm bolts.

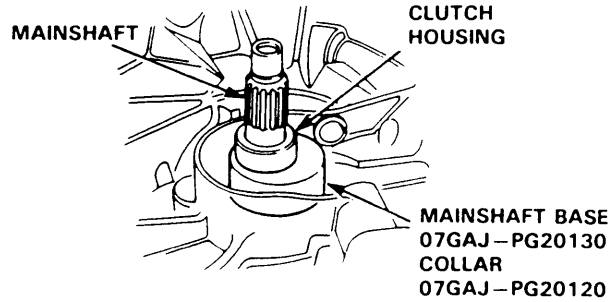
    NOTE: It is not necessary to use sealing agent between the housings.

    8 x 1.25 mm
    27 N·m (2.8 kgf·m, 20 lbf·ft)

11. Tap the mainshaft with a plastic hammer.
12. Check the thrust clearance in the manner described below.

    CAUTION: Measurement should be made at room temperature.

    a. Slide the mainshaft base and the collar over the mainshaft.

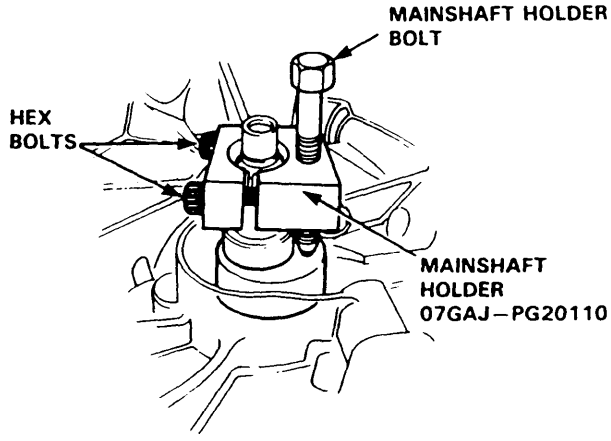


(cont'd)

Adjustment (cont'd)

b. Attach the mainshaft holder to the mainshaft as follows:

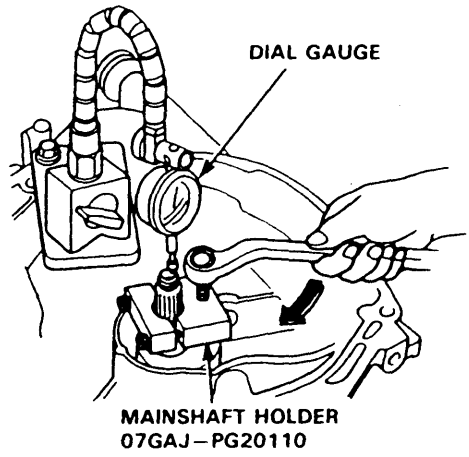
NOTE:
- Back-out the mainshaft holder bolt and loosen the two hex bolts.
- Fit the holder over the mainshaft so its lip is toward the transmission.
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



c. Seat the mainshaft fully by tapping on the end with a plastic hammer.

d. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.

e. Zero a dial gauge on the end of the mainshaft.



f. Turn the mainshaft holder bolt clockwise; stop turning when the dial gauge has reached its maximum movement. The reading on the dial gauge is the amount of mainshaft end play.

CAUTION: Turning the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving may damage the transmission.

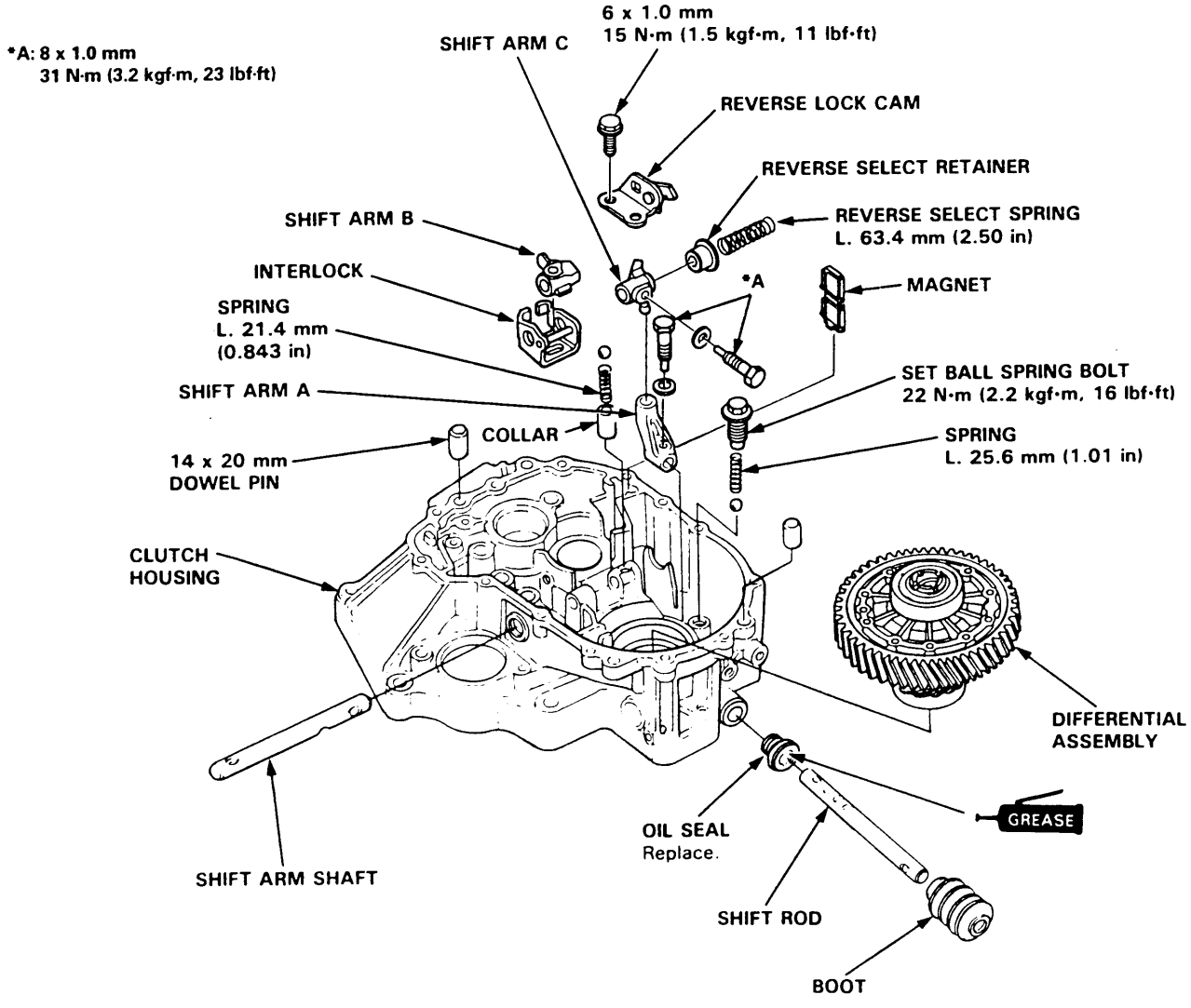
g. If the reading is within the standard, the clearance is correct.
If the reading is not within the standard, recheck the shim thickness.

Standard: 0.11 – 0.18 mm (0.004 – 0.007 in)

Reassembly

NOTE: The steel balls are all of the same size (5/16 in).

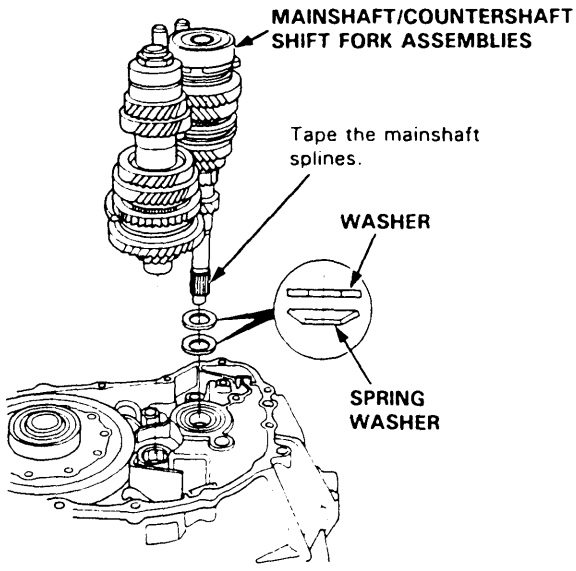
1. Install the magnet and reverse lock cam.
2. Set shift arm A on the clutch housing, then install the shift rod.
3. Install the spring washer and shift arm A attaching bolt.
4. Install the steel ball, spring, and set ball spring bolt.
5. Install shift arm B in the interlock, then set it on the clutch housing.
6. Insert shift arm shaft in the clutch housing.
7. Install the collar, spring, and steel ball into the case. Compress the ball and insert the shift arm shaft.
8. Install shift arm C in shift arm A, then insert the shift arm shaft.
9. Install the reverse select retainer and reverse select spring onto shift arm shaft.
10. Install the differential assembly.



(cont'd)

Reassembly (cont'd)

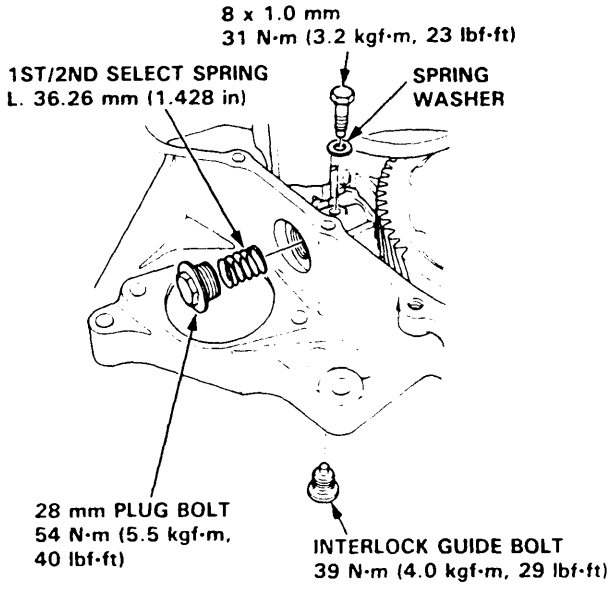
11. Position the 36 mm spring washer and washer onto the mainshaft bearing.



12. Install the mainshaft, countershaft, and shift fork assemblies.

    NOTE: Align the finger of the interlock with the groove in the shift fork shaft.

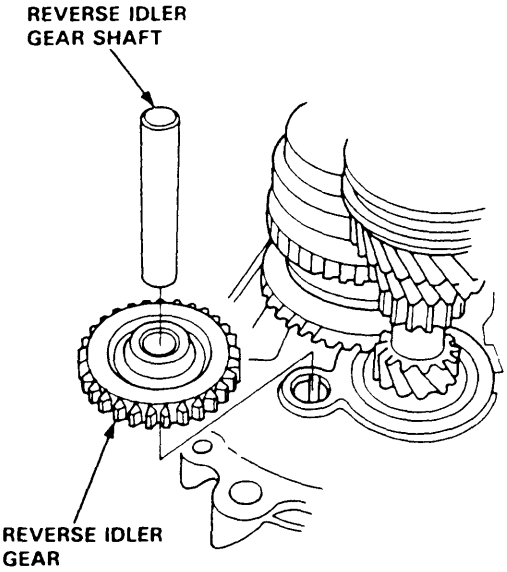
13. Install the spring washer and shift arm B attaching bolt.



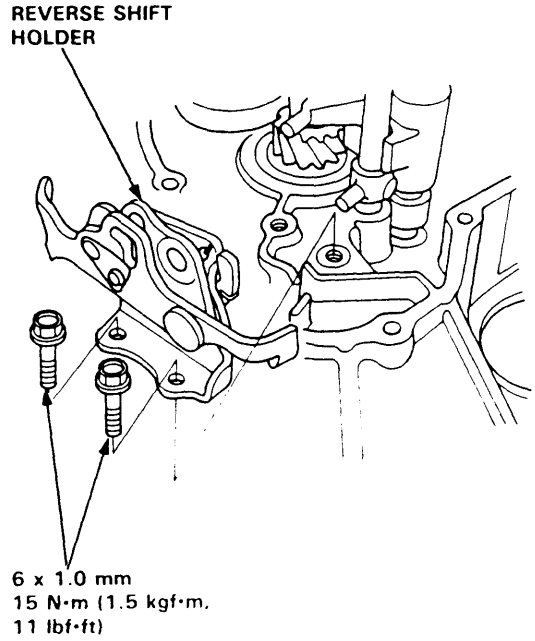
14. Install the 1st/2nd select spring, 28 mm plug bolt, and interlock guide bolt.

    NOTE: Apply liquid gasket (P/N 08718 – 0001 or 08718 – 0003) to the threads of the 28 mm plug bolt and interlock guide bolt.

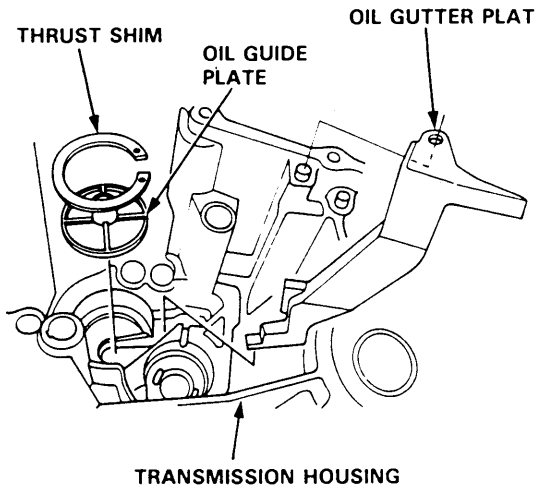
15. Install the reverse idler gear and reverse idler gear shaft.



16. Install the reverse shift holder.



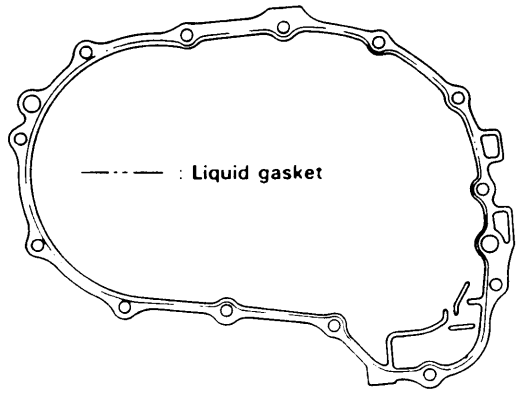
17. Install the oil gutter plate.



18. Install the oil guide plate and thrust shim on the transmission housing.

19. Apply liquid gasket to the surface of the transmission housing mating with the clutch housing as shown.

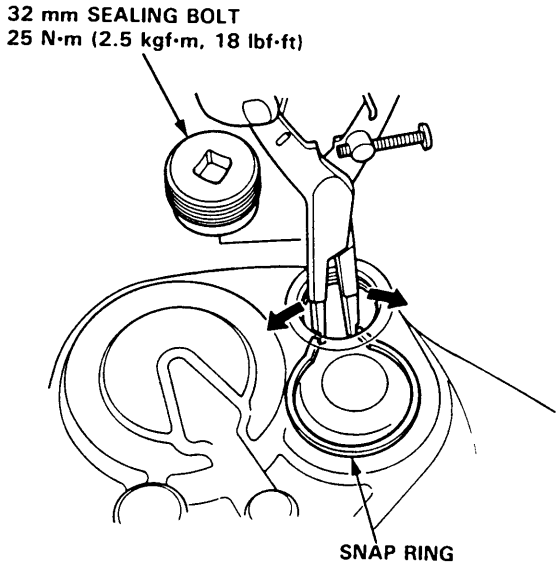
NOTE:
- Use liquid gasket (P/N 08718 – 0001 or 08718 – 0003).
- Remove the dirty oil from the sealing surface.
- If 20 minutes have passed after applyhing liquid gasket, reapply it and assemble the housings.
- Allow it to cure at least 20 minutes after assembly before filling the transmission with oil.

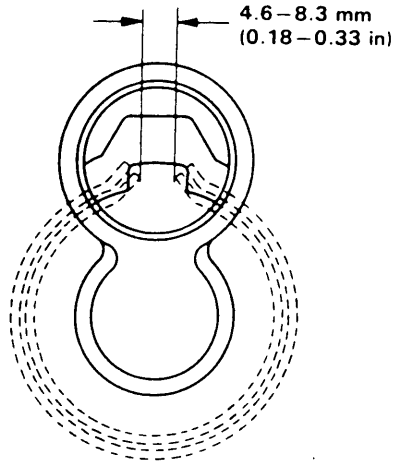


20. Install the dowel pins and the transmission housing.

21. Lower the transmission housing with the snap ring pliers, and set the snap ring into the groove of the countershaft bearing.

NOTE: Check that the snap ring is securely seated in the groove of the countershaft bearing.





22. Install the 32 mm sealing bolt.

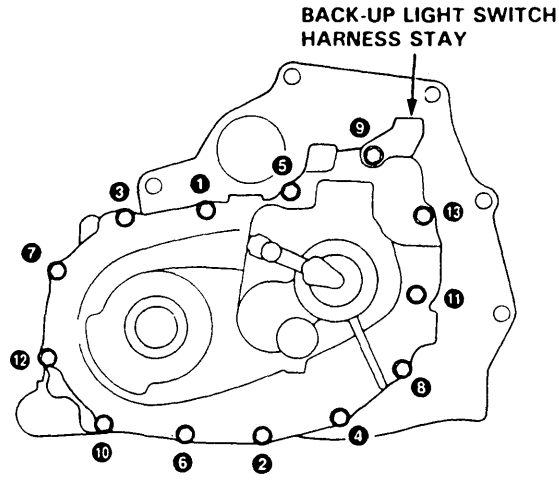
NOTE: Apply liquid gasket (P/N 08718 – 0001 or 08718 – 0003) to the threads.

(cont'd)

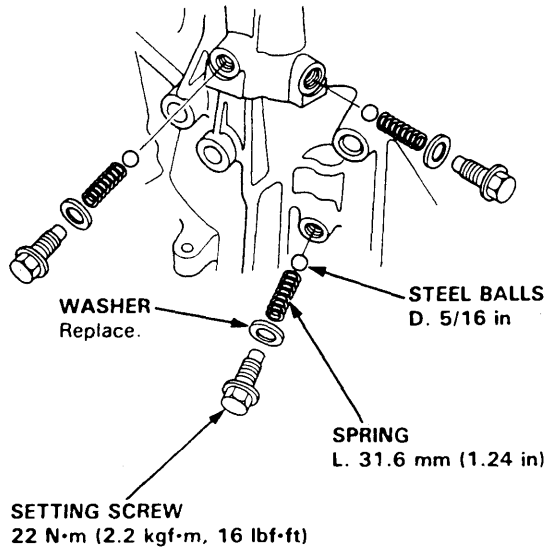
Reassembly (cont'd)

23. Tighten the transmission housing attaching bolts in the numbered sequence in several steps shown below.

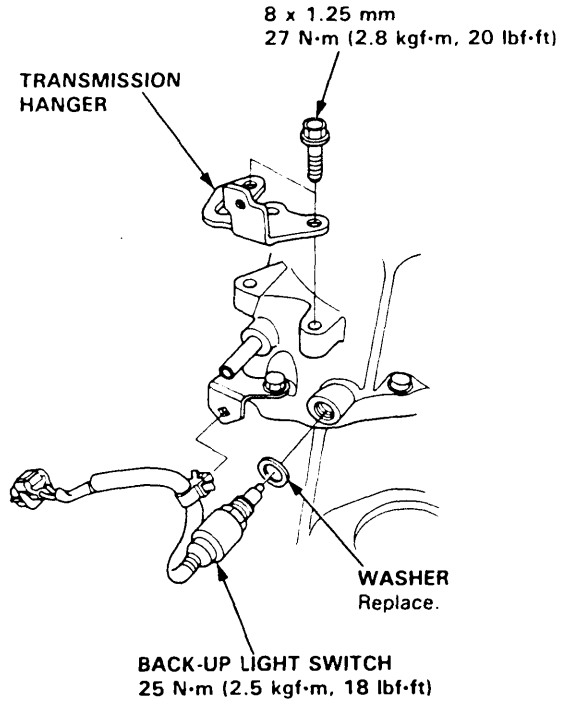
8 x 1.25 mm
Torque: 27 N·m (2.8 kgf·m, 20 lbf·ft)



24. Install the steel balls, springs, and set screws.



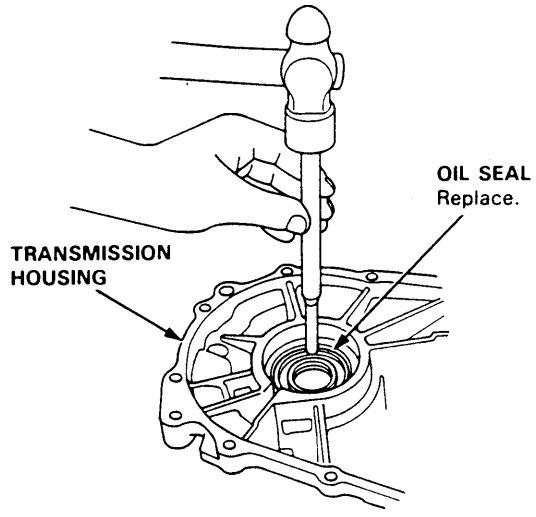
25. Install the back-up light switch and transmission hanger.



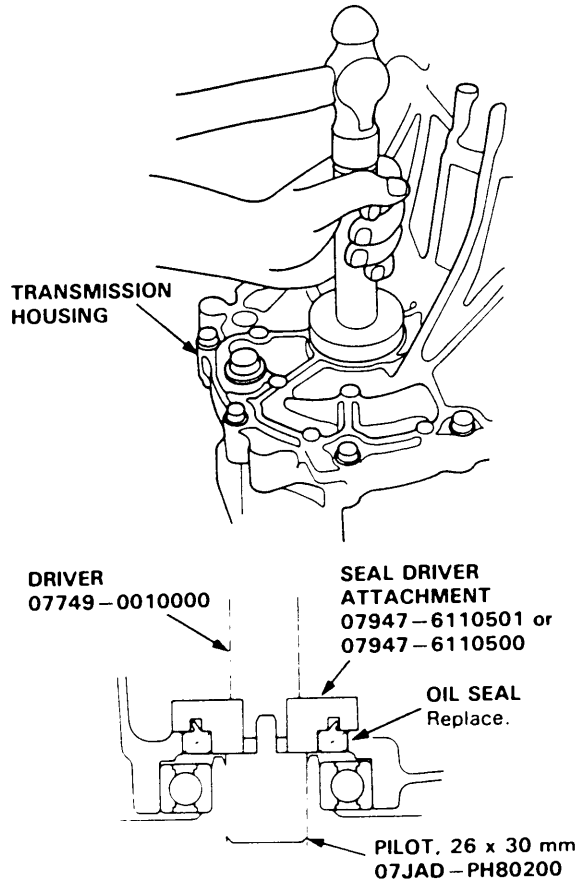
Replacement

Transmission Housing:

1. Remove the oil seal from the transmission housing.

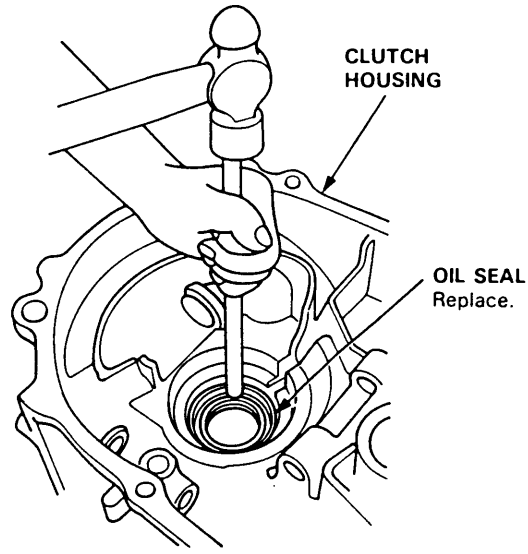


2. Install the oil seal into the transmission housing using the special tools as shown.

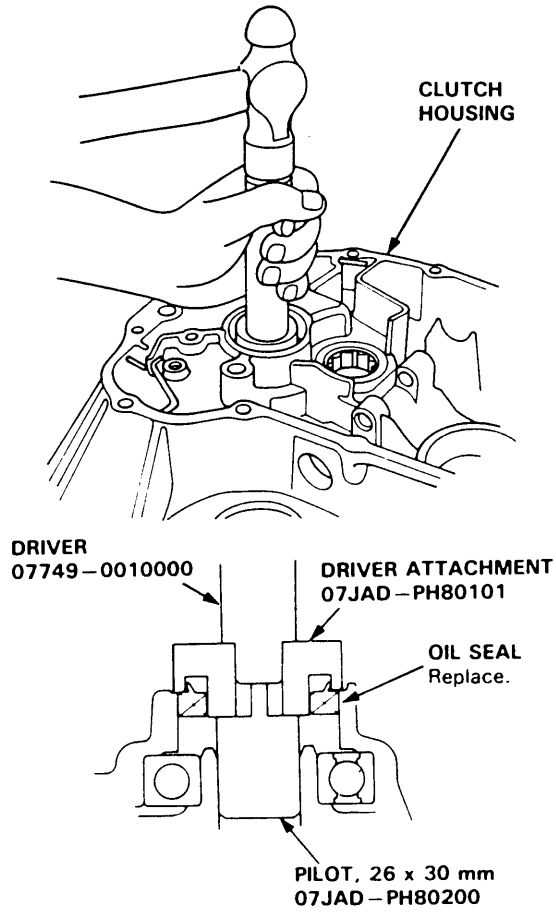


Clutch Housing:

1. Remove the oil seal from the clutch housing.

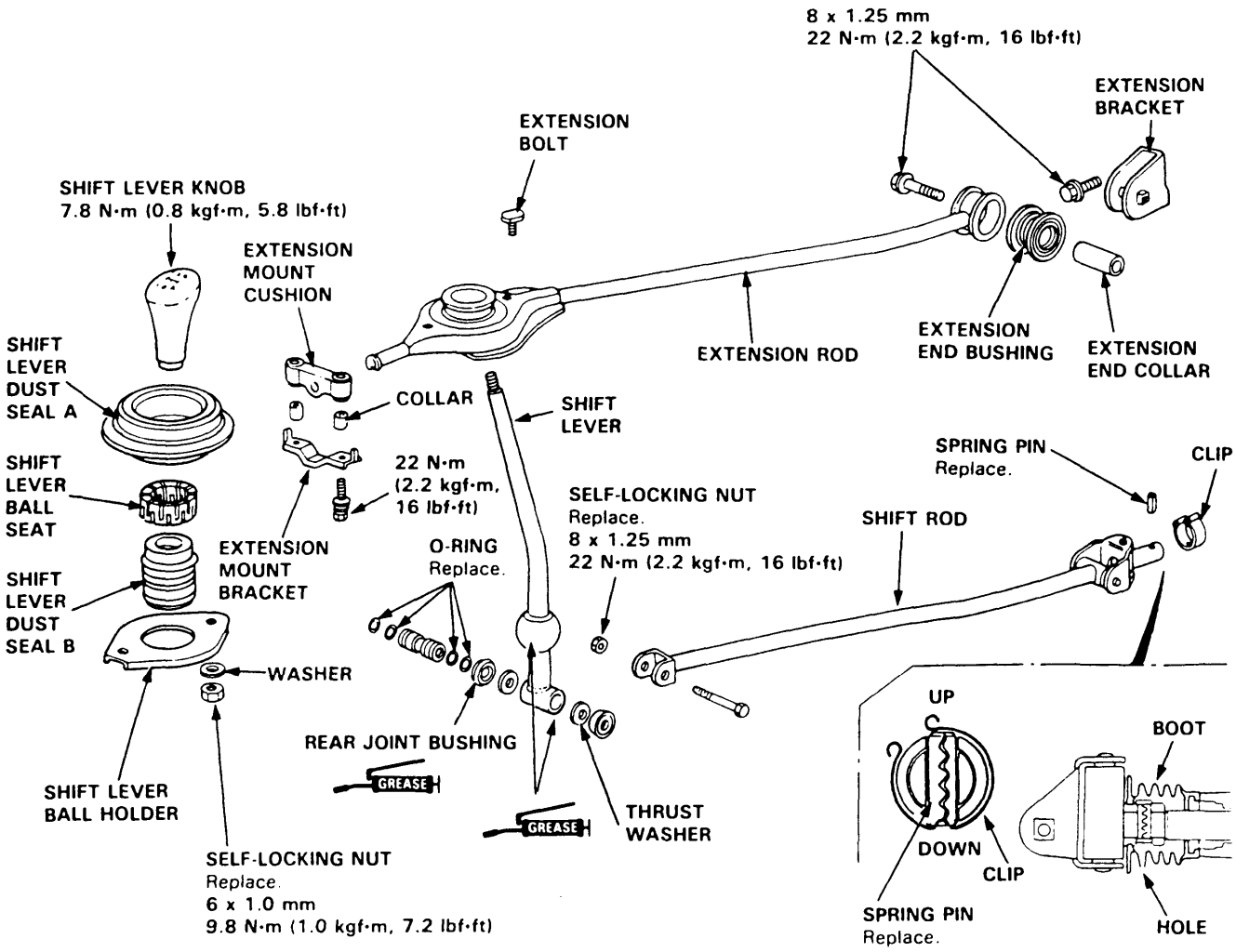


2. Install the oil seal into the clutch housing using the special tools as shown.

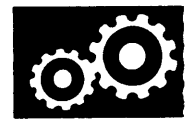


Overhaul

NOTE:
- Inspect rubber parts for wear and damage when disassembling; replace any worn or damaged parts.
- Install the clip as shown.
- Turn the boot so the hole is facing down as shown.
- Make sure the boot is installed on the shift rod.



Automatic Transmission

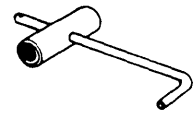


Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAB – PF50101	Mainshaft Holder	1	14-111, 156
②	07GAE – PG40200 or	Clutch Spring Compressor Bolt Assembly	1	14-136, 139
③	07HAC – PK4010A	Housing Puller	1	14-113
④	07JAD – PH80101	Driver Attachment	1	14-147
⑤	07JAD – PH80200	Pilot, 26 x 30 mm	1	14-147
*⑥	07LAE – PX40100	Clutch Spring Compressor Attachment	2	14-136, 139
⑦	07MAJ – PY4011A	A/T Pressure Hose, 2210 mm	4	14-96
⑧	07MAJ – PY40120	A/T Pressure Hose Adapter	4	14-96
⑨	07PAZ – 0010100	SCS Service Connector	1	14-45
⑩	07SAZ – 001000A	Backprobe Set	2	14-46, 92
⑪	07406 – 0020400	A/T Oil Pressure Gauge Set w/Panel	1	14-96
⑫	07406 – 0070300	A/T Low Pressure Gauge w/Panel	1	14-96
**⑬	07736 – A01000B or 07736 – A01000A	Adjustable Bearing Puller, 25 – 40 mm	1	14-148, 149
⑭	07746 – 0010500	Attachment, 62 x 68 mm	1	14-148, 149, 150
⑮	07746 – 0010600	Attachment, 72 x 75 mm	1	14-148, 150
⑯	07746 – 0030100	Driver 40 mm I.D.	1	14-131, 143, 145, 146
⑰	07749 – 0010000	Driver	1	14-147, 148, 149, 150
⑱	07947 – 611501	Driver Attachment, 68 mm	1	14-147

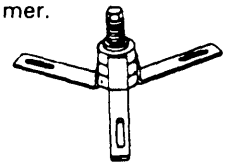
* 07HAE – PL50101 may be used to substitute one of these tools.

** Must be used with commercially-available 3/8" – 16 slide hammer.



①

②



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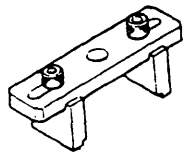

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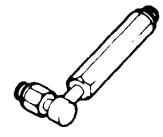

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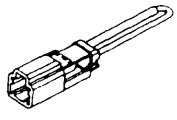

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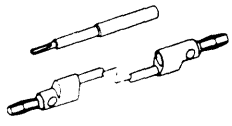

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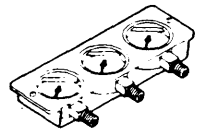

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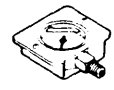

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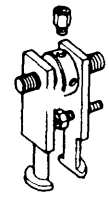

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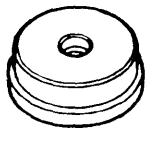

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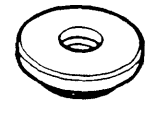


⑱

The automatic transmission is a combination of a 3-element torque converter and a dual-shaft electronically controlled automatic transmission which provides 4 speeds forward and 1 reverse.

Torque Converter, Gears and Clutches
The torque converter consists of a pump, turbine and stator, assembled in a single unit. They are connected to the engine crankshaft so they turn together as a unit 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 two parallel shafts: the mainshaft and the countershaft. The mainshaft is in line with the engine crankshaft. The mainshaft includes the 1st, 2nd and 4th clutches, gears for 2nd, 4th, reverse and 1st (3rd gear is integral with the mainshaft, while the reverse gear is integral with the 4th gear). The countershaft includes the 3rd clutch, and gears for 3rd, 2nd, 4th, reverse, 1st and parking. The gears on the mainshaft are in constant mesh with those on the countershaft. When certain combinations of gears in transmission are engaged by clutches, power is transmitted from the mainshaft to the countershaft to provide [2], [D3], [D4], and [R] positions.

Electronic Control
The electronic control system consists of the Powertrain Control Module (PCM), sensors, a linear solenoid and four solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel on the passenger's side.

Hydraulic Control
The valve bodies include the main valve body, the secondary valve body, the regulator valve body, the servo body and the lock-up valve body through the respective separator plates. They are bolted on the torque converter housing.

The main valve body contains the manual valve, the 1-2 shift valve, the 2nd orifice control valve, the CPB (Clutch Pressure Back-up) valve, the modulator valve, the servo control valve, the relief valve, and ATF pump gears. The secondary valve body contains the 2-3 shift valve, the 3-4 shift valve, the 3-4 orifice control valve, the 4th exhaust valve and the CPC (Clutch Pressure Control) valve. The regulator valve body contains the pressure regulator valve, the torque converter check valve, the cooler relief valve, and the lock-up control valve. The servo body contains the servo valve which is integrated with the reverse shift fork shaft, and the accumulators. The lock-up valve body contains the lock-up shift valve and the lock-up timing valve. The linear solenoid and the shift control solenoid valve A/B are bolted on the outside of the transmission housing, and the lock-up control solenoid valve A/B is bolted on the outside of the torque converter housing. Fluid from regulator passes through the manual valve to the various control valves. The clutches receive fluid from their respective feed pipes or internal hydraulic circuit.

Shift Control Mechanism
Input from various sensors located throughout the vehicle determines which shift control solenoid valve the PCM will activate. Activating a shift control solenoid valve changes modulator pressure, causing a shift valve to move. This pressurizes a line to one of the clutches, engaging that clutch and its corresponding gear. The shift control solenoid valves A and B are controlled by the PCM.

Lock-up Mechanism
In [D4] position, in 3rd and 4th, and in [D3] position in 3rd, pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up 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 hydraulic control, the PCM optimizes the timing of the lock-up mechanism. The lock-up valves control the range of lock-up according to lock-up control solenoid valves A and B, and linear solenoid. When lock-up control solenoid valves A and B activate, the modulator pressure changes. The lock-up control solenoid valves A and B and the linear solenoid are controlled by the PCM.

(cont'd)

(cont'd)

Gear Selection
The shift lever has six positions: [P] PARK, [R] REVERSE, [N] NEUTRAL, [D4] 1st through 4th gear ranges, [D3] 1st through 3rd gear ranges, [2] 2nd gear.

Position	Description
[P] PARK	Front wheels locked; parking brake pawl engaged with parking gear on countershaft. All clutches released.
[R] REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th clutch locked.
[N] NEUTRAL	All clutches released.
[D4] DRIVE (1st through 4th)	General driving; starts off in 1st, shifts automatically to 2nd, 3rd, then 4th, depending on vehicle speed and throttle position. Downshift through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in [D4] position in 3rd and 4th gear.
[D3] DRIVE (1st through 3rd)	Use 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 comes into operation in 3rd gear.
[2] SECOND	Use for engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up and down.

Starting is possible only in [P] and [N] positions through the use 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 gear has been selected without having to look down at the console.

Clutches
The four-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 the 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 end of the mainshaft, just behind the right side cover. The 1st clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

2nd Clutch
The 2nd clutch engages/disengages 2nd gear, and is located at the middle of the mainshaft. The 2nd clutch is joined back-to-back to the 4th clutch. The 2nd clutch is supplied hydraulic pressure through the mainshaft by a circuit connected to the internal hydraulic circuit.

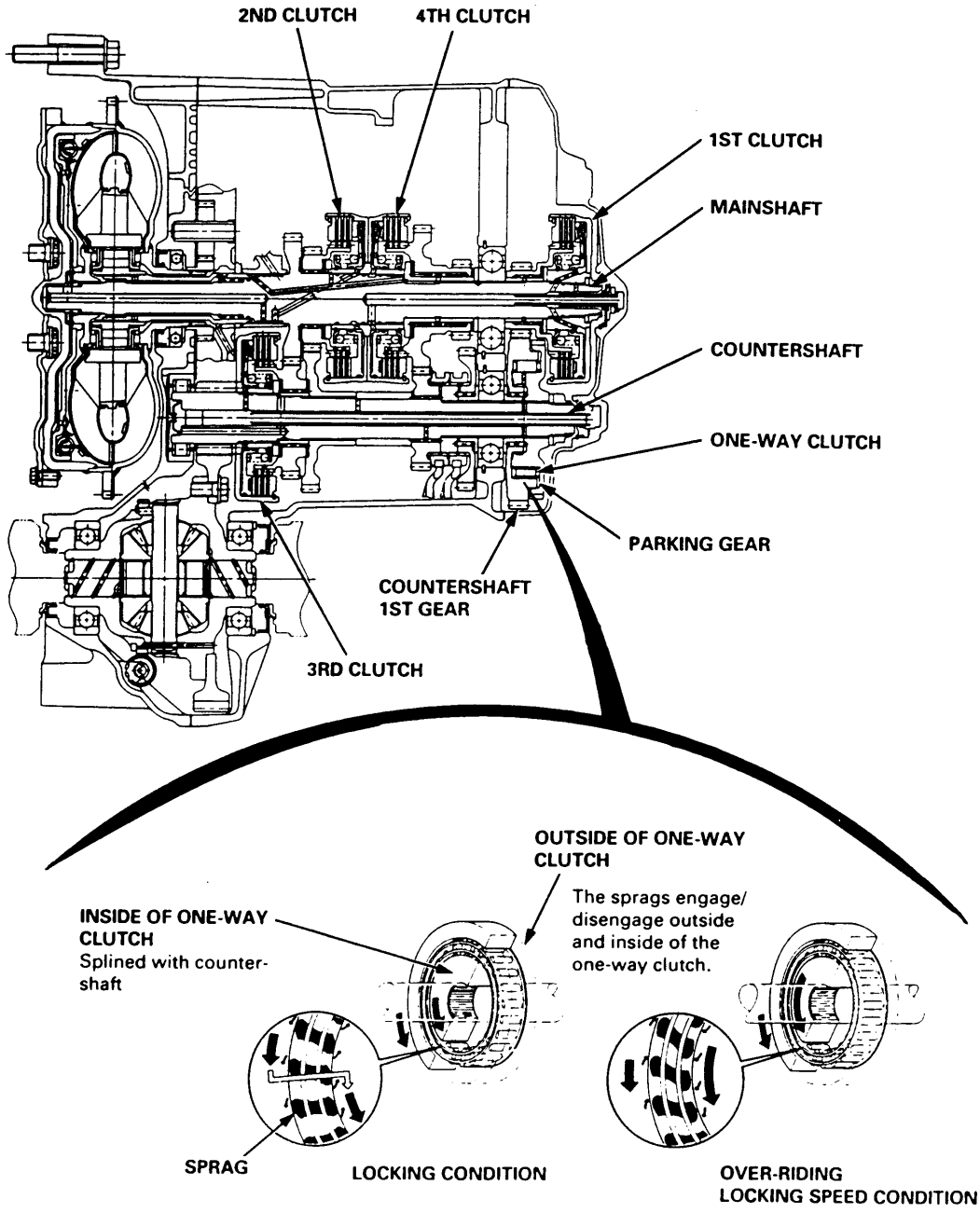
3rd Clutch
The 3rd clutch engages/disengages 3rd gear, and is located at the end of the countershaft. The 3rd clutch is supplied hydraulic pressure by its ATF feed pipe within the countershaft.

4th Clutch
The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the middle of the mainshaft. The 4th clutch is joined back-to-back to the 2nd clutch. The 4th clutch is supplied hydraulic pressure by its ATF feed pipe within the mainshaft.

One-way Clutch

The one-way clutch is positioned between the countershaft 1st gear and the parking gear, with the parking gear splined to the countershaft. The 1st gear provides the outer race surface, and the parking gear provides the inner race surface. The one-way clutch locks up when power is transmitted from the mainshaft 1st gear to the countershaft 1st gear. The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the D4, D3 or 2 position.

However, the one-way clutch disengages when the 2nd, 3rd, or 4th clutches/gears are applied in the D4, D3 or 2 position. This is because the increased rotational speed of the gears on the countershaft overrides the locking "speed range" of the one-way clutch. Thereafter, the one-way clutch free-wheels with the 1st clutch still engaged.



Power Flow

PART / POSITION		TORQUE CONVERTER	1ST GEAR 1ST CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH		REVERSE GEAR	PARKING GEAR
						GEAR	CLUTCH		
P		○	×	×	×	×	×	×	○
R		○	×	×	×	×	○	○	×
N		○	×	×	×	×	×	×	×
D4	1ST	○	○*2	×	×	×	×	×	×
	2ND	○	○*1	○	×	×	×	×	×
	3RD	○	○*1	×	○	×	×	×	×
	4TH	○	○*1	×	×	○	○	×	×
D3	1ST	○	○*2	×	×	×	×	×	×
	2ND	○	○*1	○	×	×	×	×	×
	3RD	○	○*1	×	○	×	×	×	×
2		○	○*1	○	×	×	×	×	×

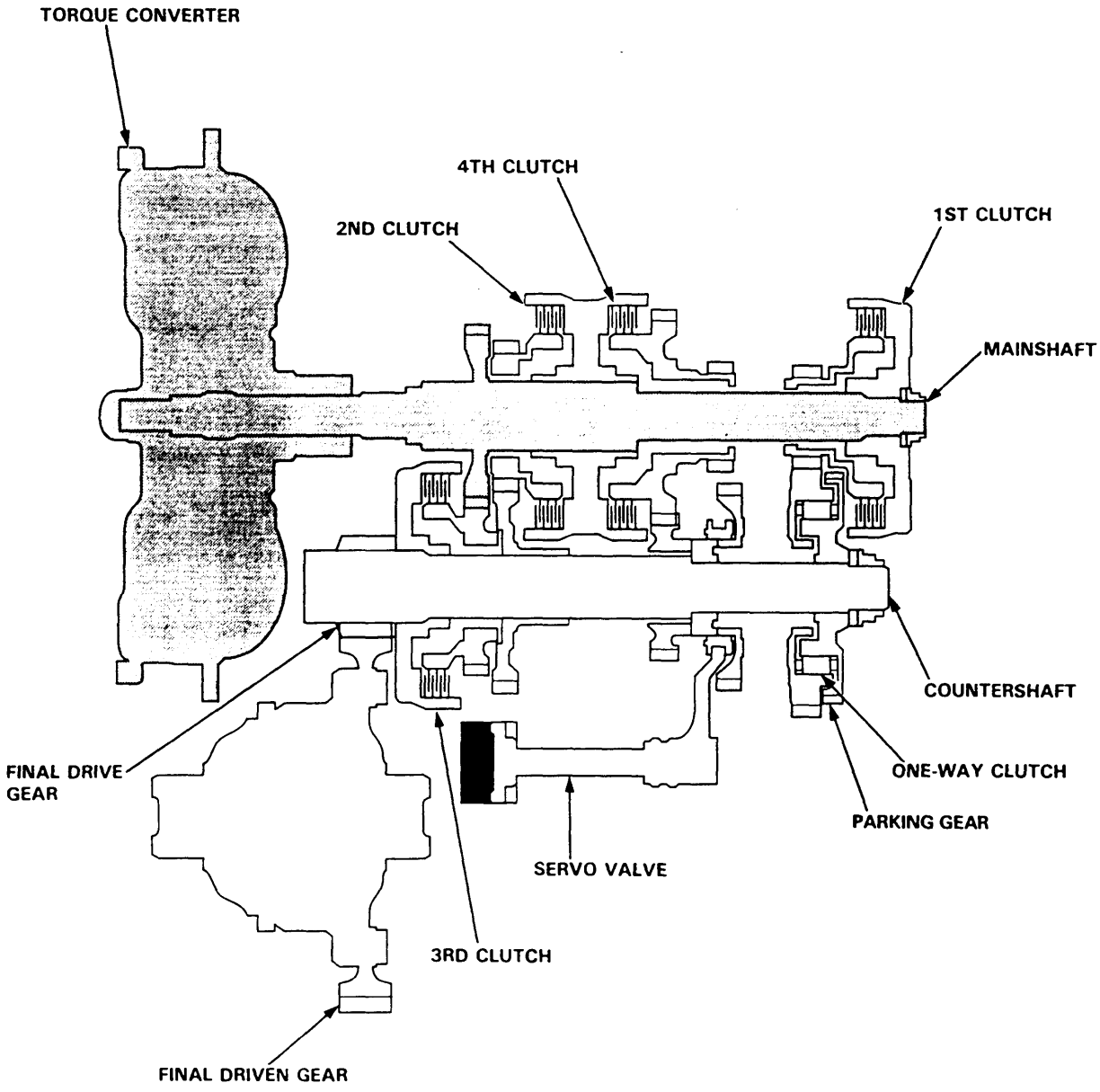
○: Operates, ×: Doesn't operate.

*1: Although the 1st clutch engages, driving power is not transmitted as the one-way clutch slips.

*2: The one-way clutch engages when accelerating, and slips when decelerating.

[N] Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft.

[P] Position
Hydraulic pressure is not applied to the clutches. Power is not transmitted to the countershaft. The countershaft is locked by the parking pawl interlocking the parking gear.



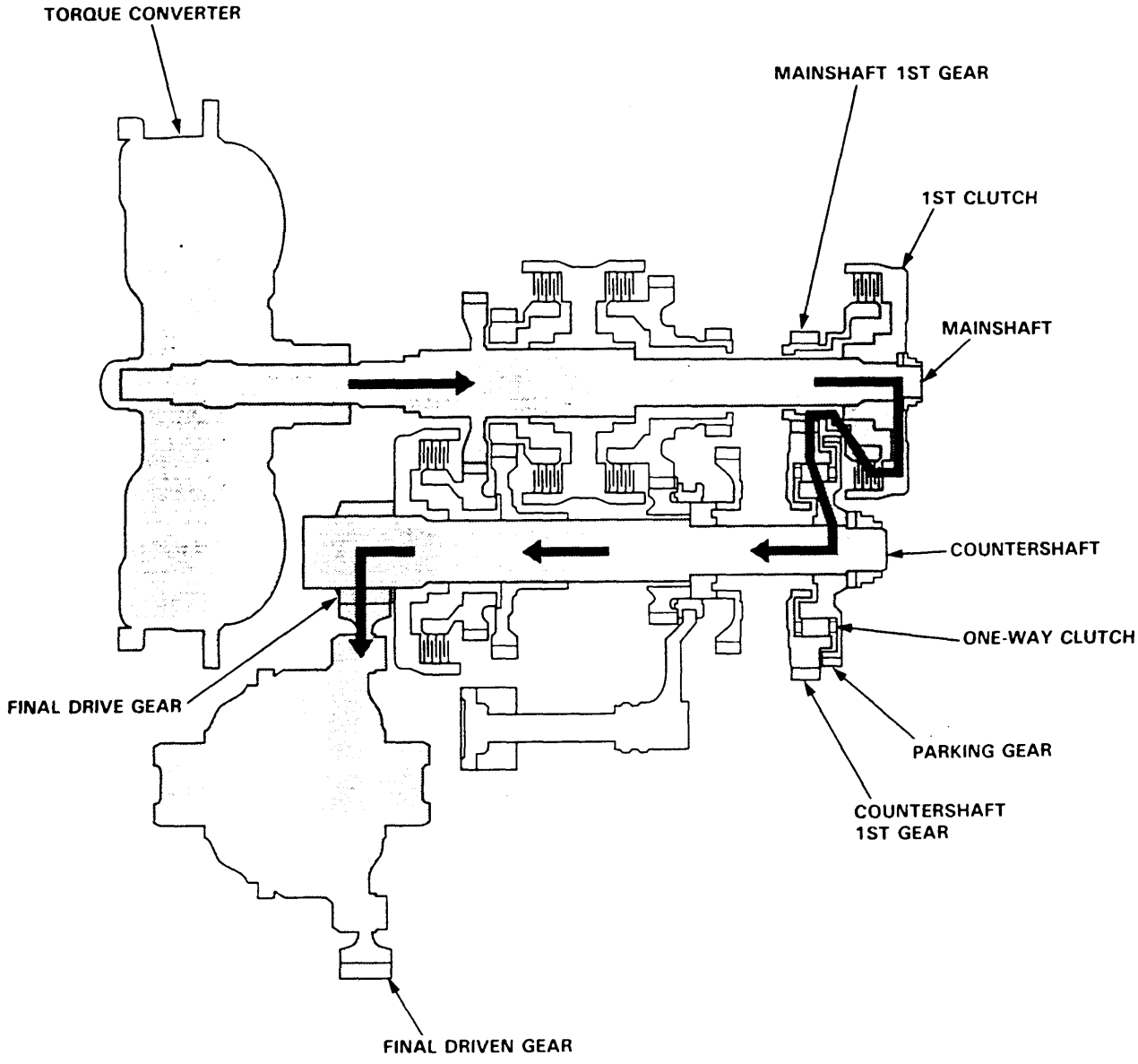
(cont'd)

Power Flow (cont'd)

1st Gear ([D4] or [D3] position)

In [D4] or [D3] position, the optimum gear is automatically selected from 1st, 2nd, 3rd and 4th gears, according to conditions such as the balance between throttle opening (engine load) and vehicle speed.

1. Hydraulic pressure is applied to the 1st clutch, which rotates together with the mainshaft, causing the mainshaft 1st gear to rotate.
2. Power is transmitted to the countershaft 1st gear, which drives the countershaft via the one-way clutch.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

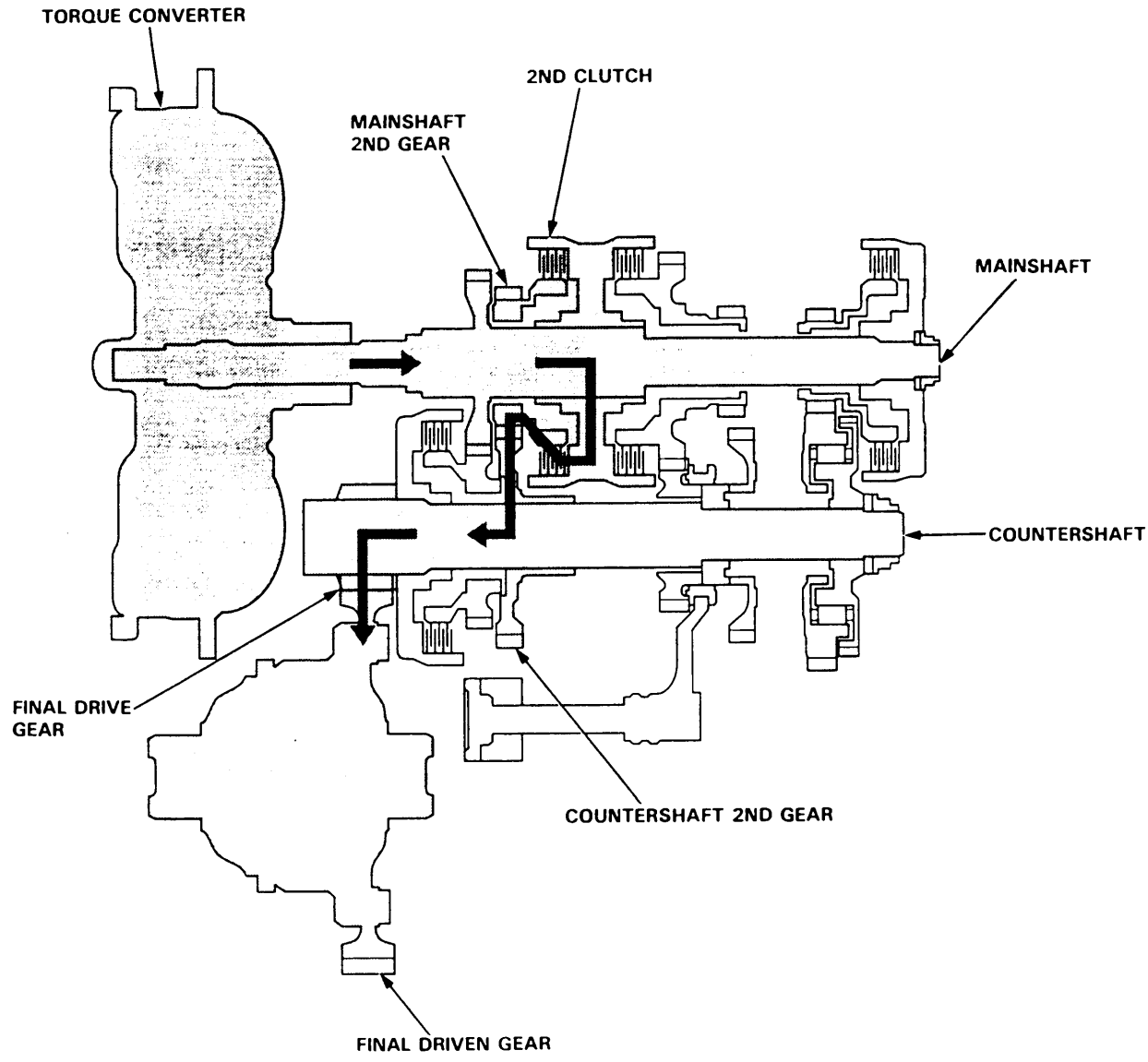


2nd Gear (D4, D3 or 2 position)

2 Position is provided to drive only 2nd gear.

1. Hydraulic pressure is applied to the 2nd clutch on the mainshaft, and power is transmitted via the 2nd clutch to the mainshaft 2nd gear.
2. Power transmitted to the mainshaft 2nd gear is conveyed via the countershaft 2nd gear, which drives the countershaft.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

   NOTE: Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of the 2nd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



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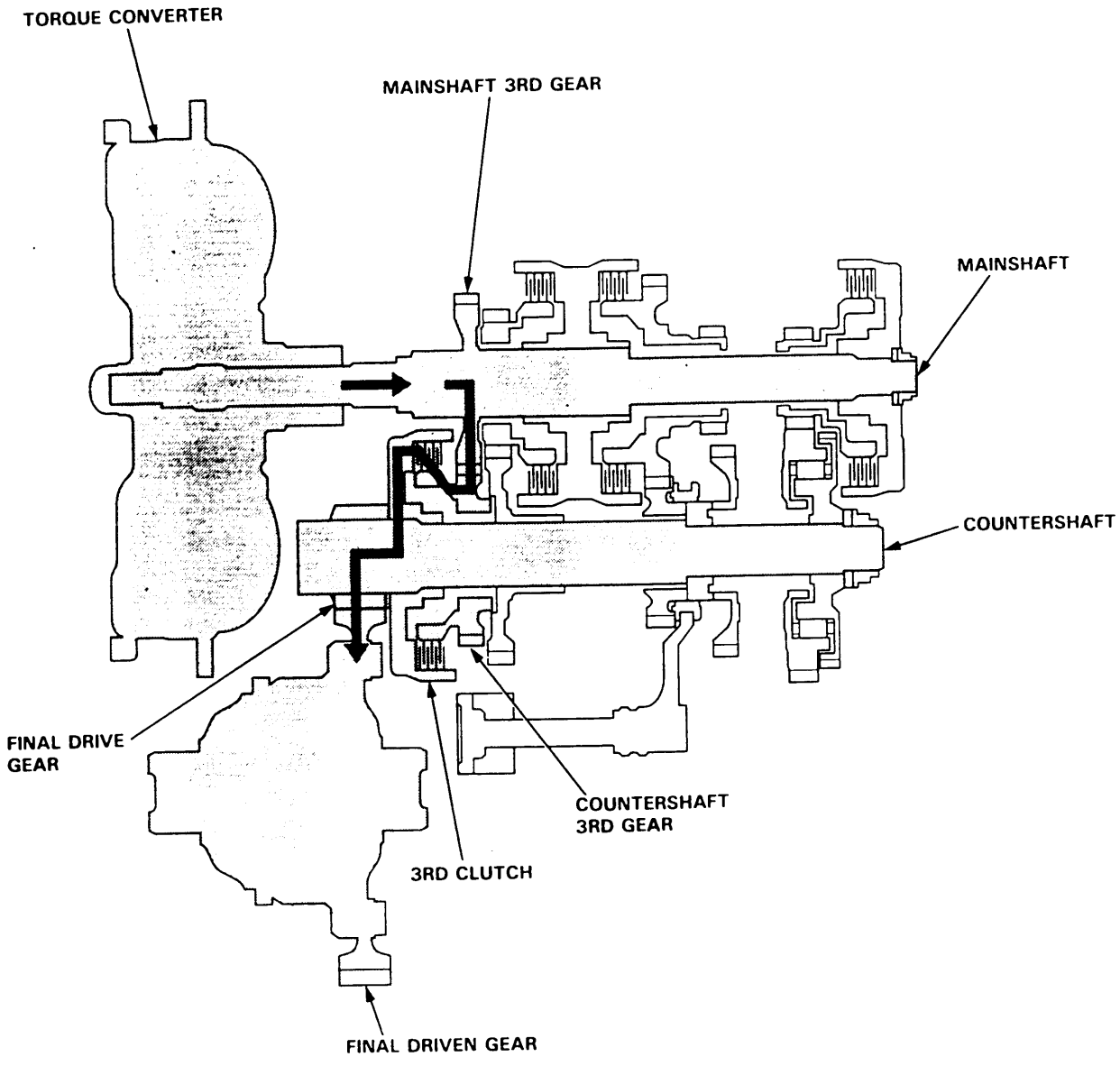
Power Flow (cont'd)

3rd Gear (D4 or D3 position)

1. Hydraulic pressure is applied to the 3rd clutch. Power from the mainshaft 3rd gear is transmitted to the countershaft 3rd gear.

2. Power is transmitted to the final drive gear, which drives the final driven gear.

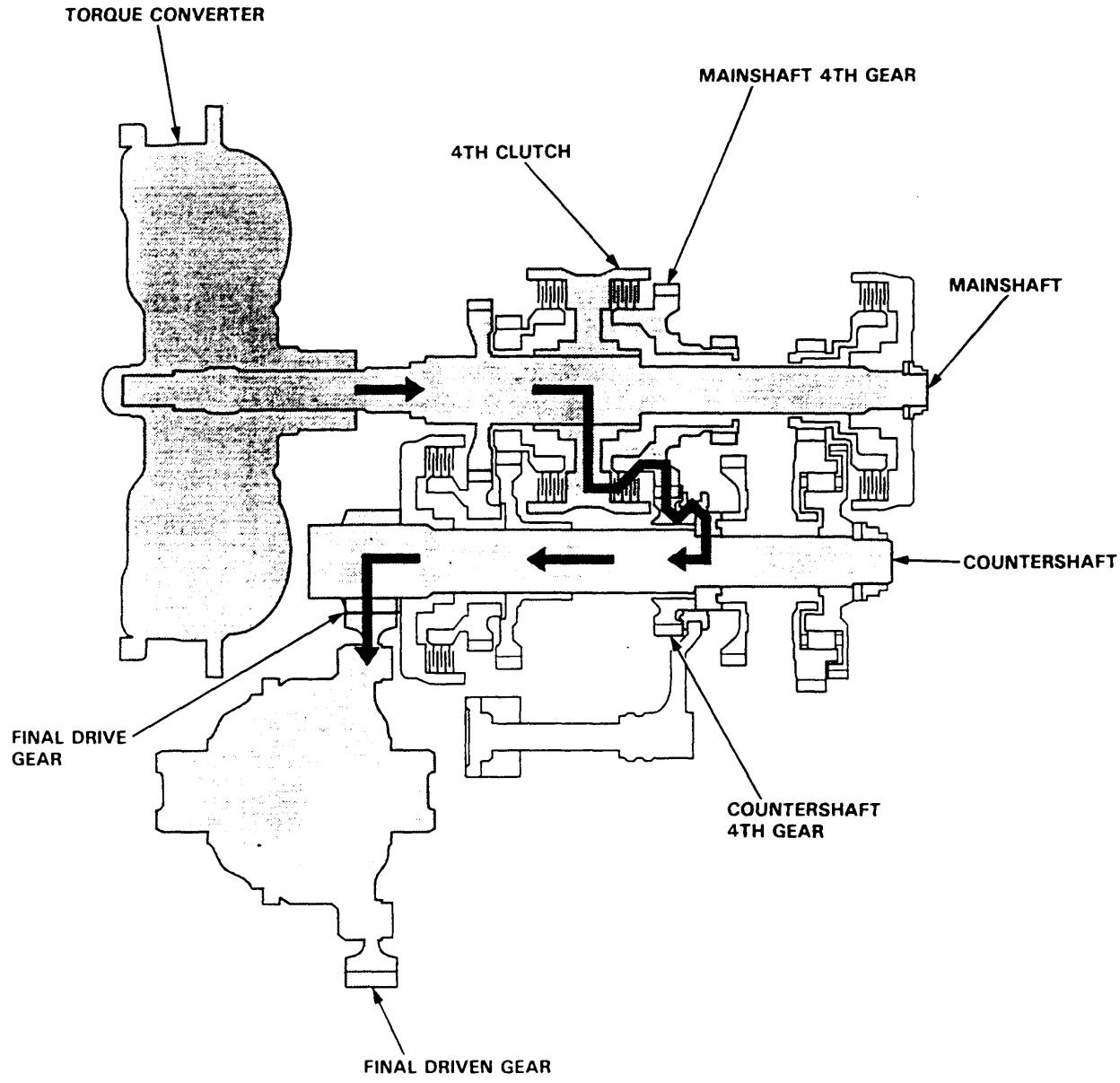
   NOTE: Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 3rd gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



4th Gear (D4 position)

1. Hydraulic pressure is applied to the 4th clutch, which rotates together with the mainshaft, causing the mainshaft 4th gear to rotate.
2. Power is transmitted to the countershaft 4th gear, which drives the countershaft.
3. Power is transmitted to the final drive gear, which drives the final driven gear.

   NOTE: Hydraulic pressure is also applied to the 1st clutch, but since the rotation speed of 4th gear exceeds that of 1st gear, power from 1st gear is cut off at the one-way clutch.



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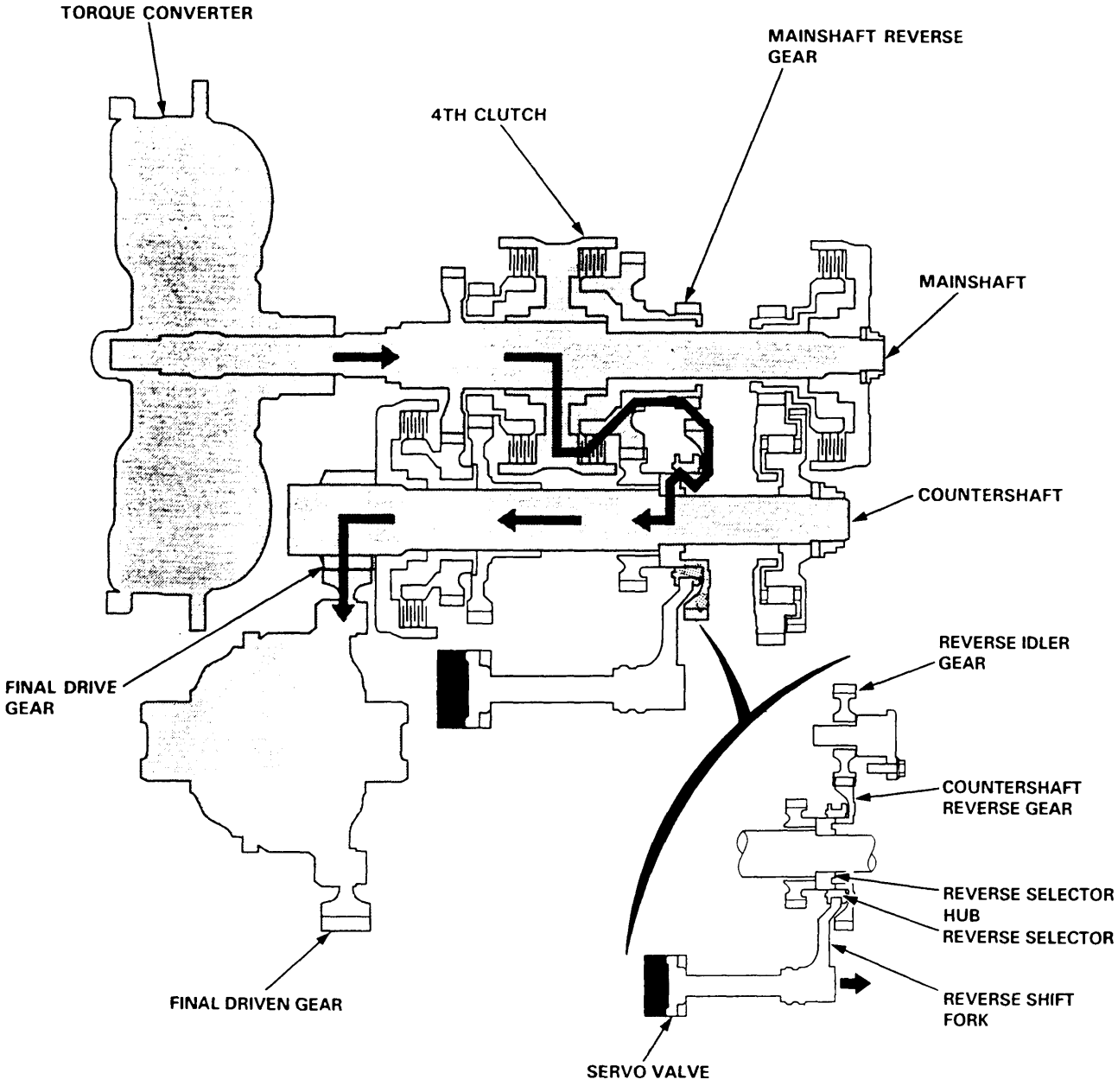
Power Flow (cont'd)

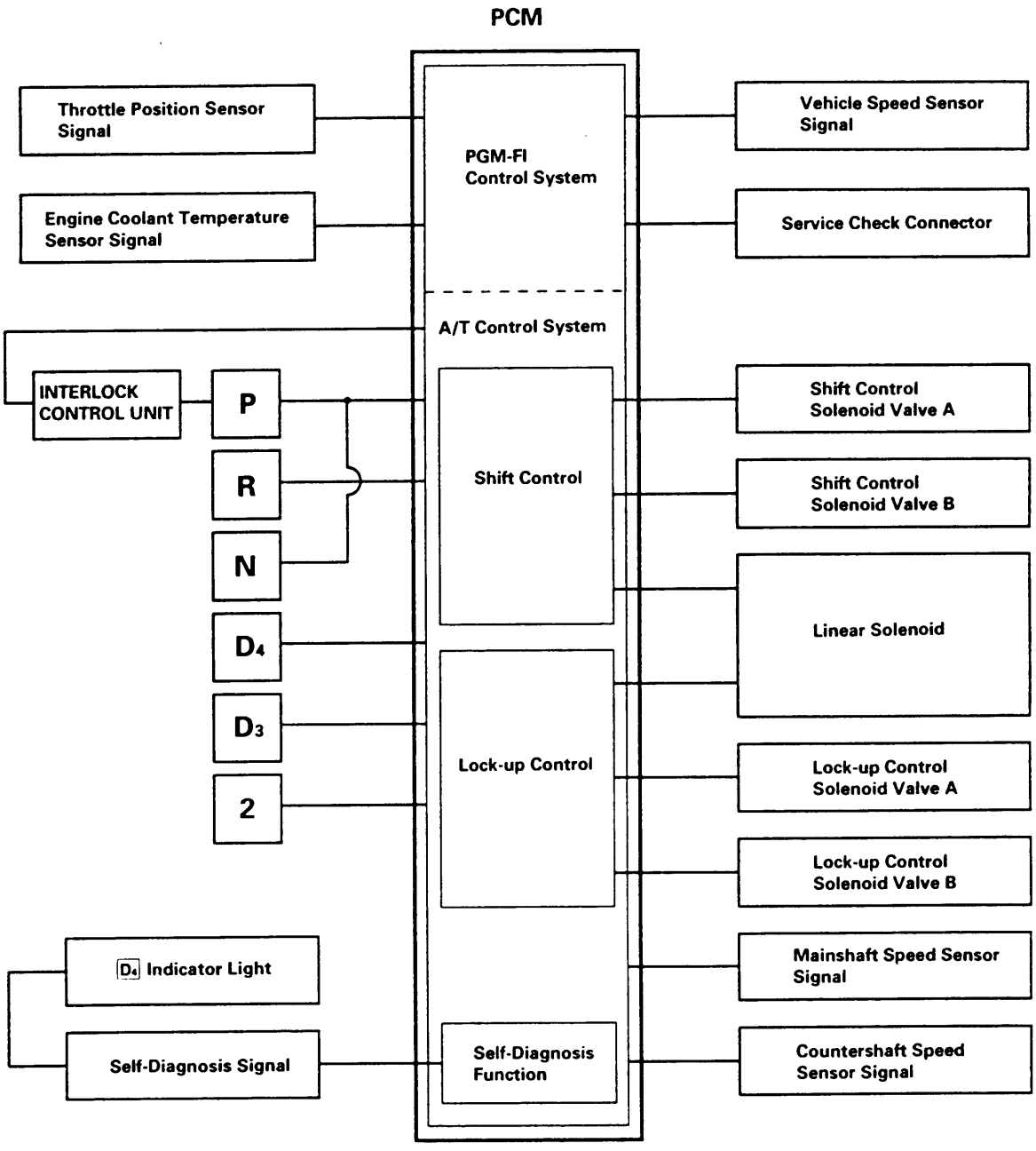
[R] Position

1. Hydraulic pressure is switched by the manual valve to the servo valve, which moves the reverse shift fork to the reverse position. The reverse shift fork engages with the reverse selector, reverse selector hub, and the countershaft reverse gear.
2. Hydraulic pressure is also applied to the 4th clutch. Power is transmitted from the mainshaft reverse gear via the reverse idler gear to the countershaft reverse gear.
3. The rotation direction of the countershaft reverse gear is changed via the reverse idler gear.
4. Power is transmitted to the final drive gear, which drives the final driven gear.



Electronic Control System

The electronic control system consists of a Powertrain Control Module (PCM), sensors, a linear solenoid and four solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel on the passenger's side.



(cont'd)

Electronic Control System (cont'd)

Shift Control

The PCM instantaneously determines which gear should be selected by various signals sent from sensors, and actuates the shift control solenoid valves A and B to control shifting. Also, a Grade Logic Control System has been adopted to control shifting in [D4] position while the vehicle is ascending or descending a slope, or reducing speed.

Position	Gear	Shift Control Solenoid Valve A	Shift Control Solenoid Valve B
[D4], [D3]	1st	OFF	ON
	2nd	ON	ON
	3rd	ON	OFF
[D4]	4th	OFF	OFF
[2]	2nd	ON	ON
[R]*	Reverse	ON	OFF

*See page 14-30 for reverse inhibitor control description.

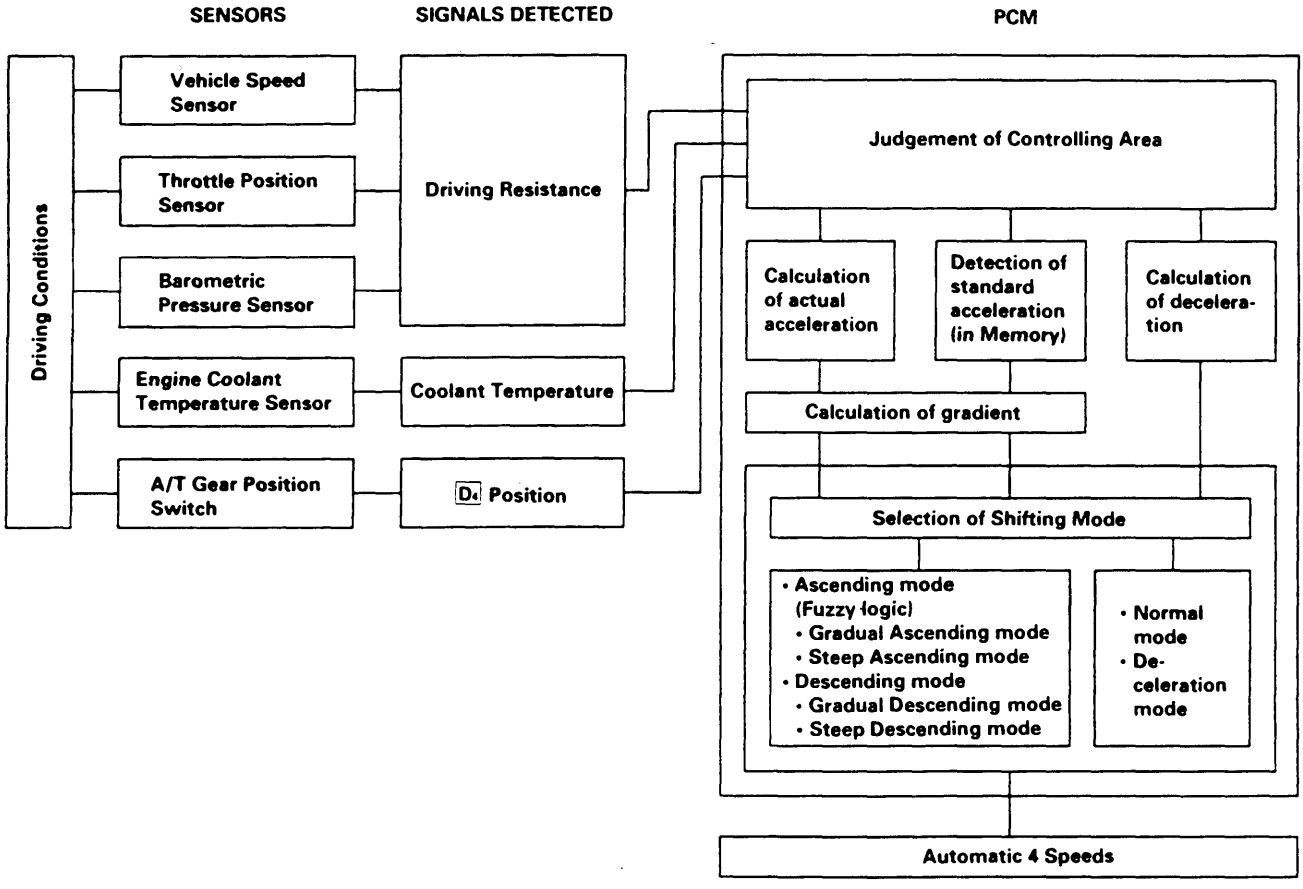
Lock-up Control

From sensor input signals, the PCM determines whether to turn the lock-up ON or OFF, and activates lock-up control solenoid valve A and/or B accordingly. The combination of driving signals to lock-up control solenoid valves A and B and the linear solenoid pressure is shown in the table below.

Lock-up Conditions	Lock-up Control Solenoid Valve A	Lock-up Control Solenoid Valve B	Linear Solenoid Pressure
Lock-up OFF	OFF	OFF	High
Lock-up, Half	ON	Duty operation OFF ↔ ON	Low
Lock-up, Full	ON	ON	High
Lock-up during deceleration	ON	Duty operation OFF ↔ ON	Low

Grade Logic Control System

How it works:
The PCM compares actual driving conditions with driving conditions memorized in the PCM, based on the input from the vehicle speed sensor, the throttle position sensor, the barometoric pressure sensor, the engine coolant temperature sensor, the brake switch signal, and the shift lever position signal. The PCM is then able to control shifting while the vehicle is ascending or descending a slope, or reducing speed.



(cont'd)

Electronic Control System (cont'd)

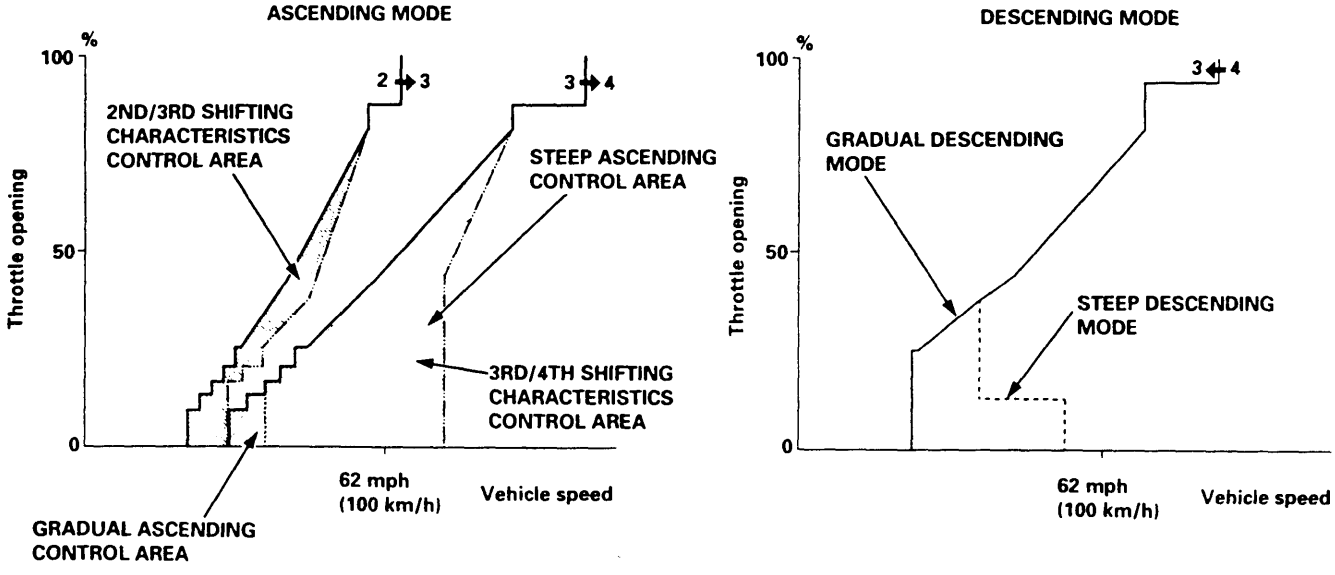
Ascending Control

When the PCM determines that the vehicle is climbing a hill in D4 position, the system extends the engagement area of 2nd gear and 3rd gear 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. There are two ascending modes with different 3rd gear driving areas according to the magnitude of a gradient stored in the PCM.

NOTE:
- The PCM memory contains shift schedules between 2nd and 3rd gears, and between 3rd and 4th gears that enable the PCM's fuzzy logic to automatically select the most suitable gear according to the magnitude of a gradient.
- Fuzzy logic is a form of artificial intelligence that lets computers respond to changing conditions much like a human mind would.

Descending Control

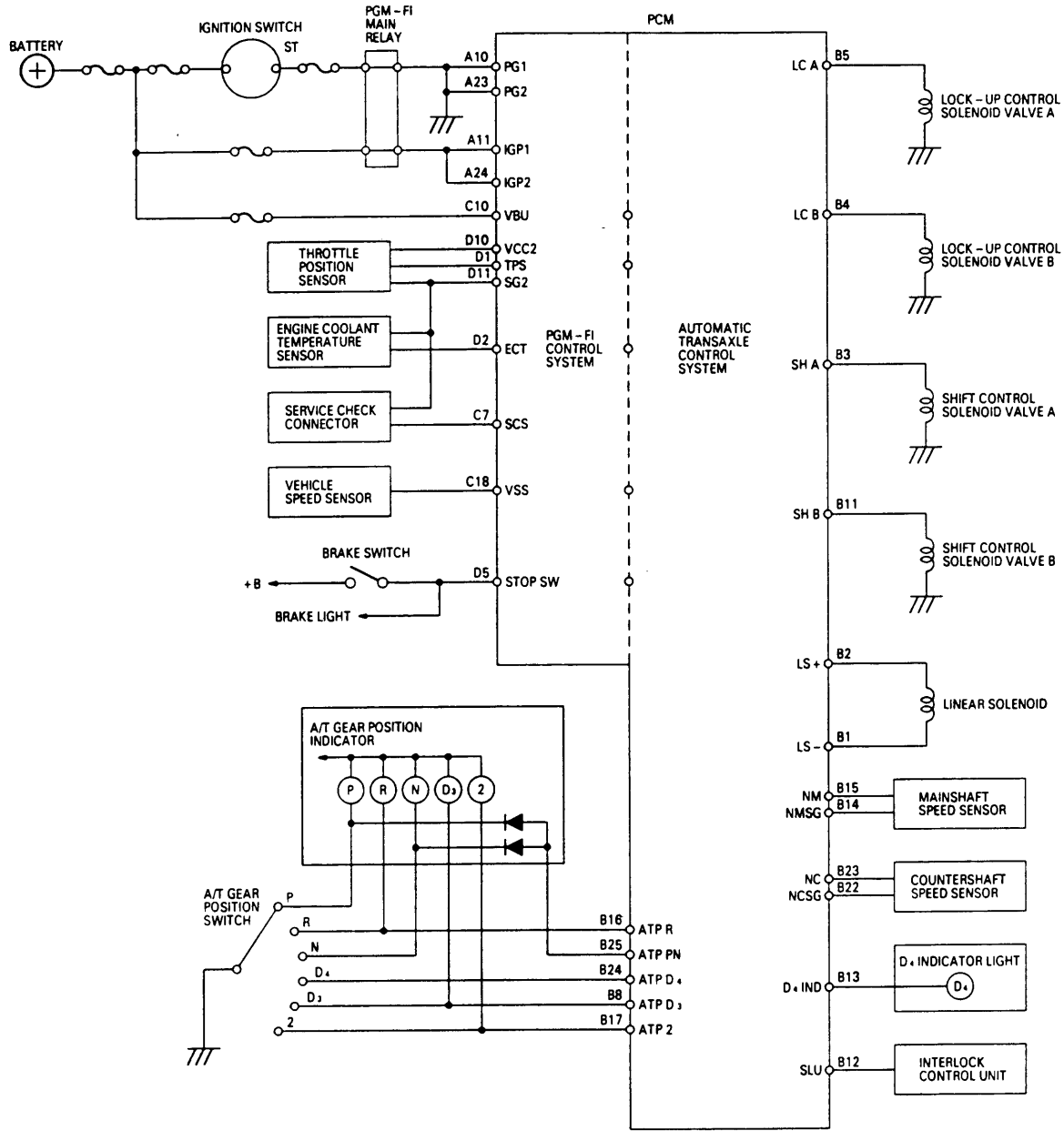
When the PCM determines that the vehicle is going down a hill in D4 position, the shift-up speed from 3rd to 4th gear when the throttle is closed becomes faster than the set speed for flat road driving to widen the 3rd gear driving area.
This, in combination with engine braking from the deceleration lock-up, achieves smooth driving when the vehicle is descending. There are two descending modes with different downshift (4 – 3) schedules according to the magnitude of a gradient stored in the PCM. When the vehicle is in 4th gear, and you are decelerating on a gradual hill, or when you are applying the brakes on a steep hill, the transmission will downshift to 3rd gear. When you accelerate, the transmission will then return to 4th gear.



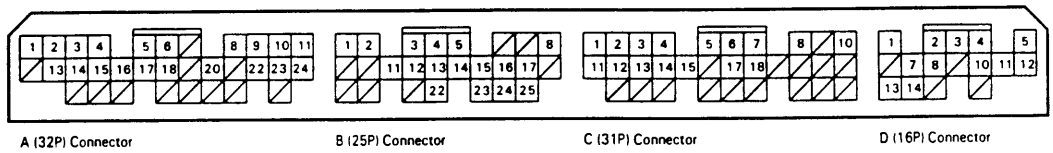
Deceleration Control

When the vehicle goes around a corner, and needs to first decelerate and then accelerate, the PCM sets the data for deceleration control to reduce the number of times the transmission shifts. When the vehicle is decelerating from speeds above 26 mph (41 km/h), the PCM shifts the transmission from 4th to 2nd earlier than normal to cope with upcoming acceleration.

Circuit Diagram and Terminal Locations



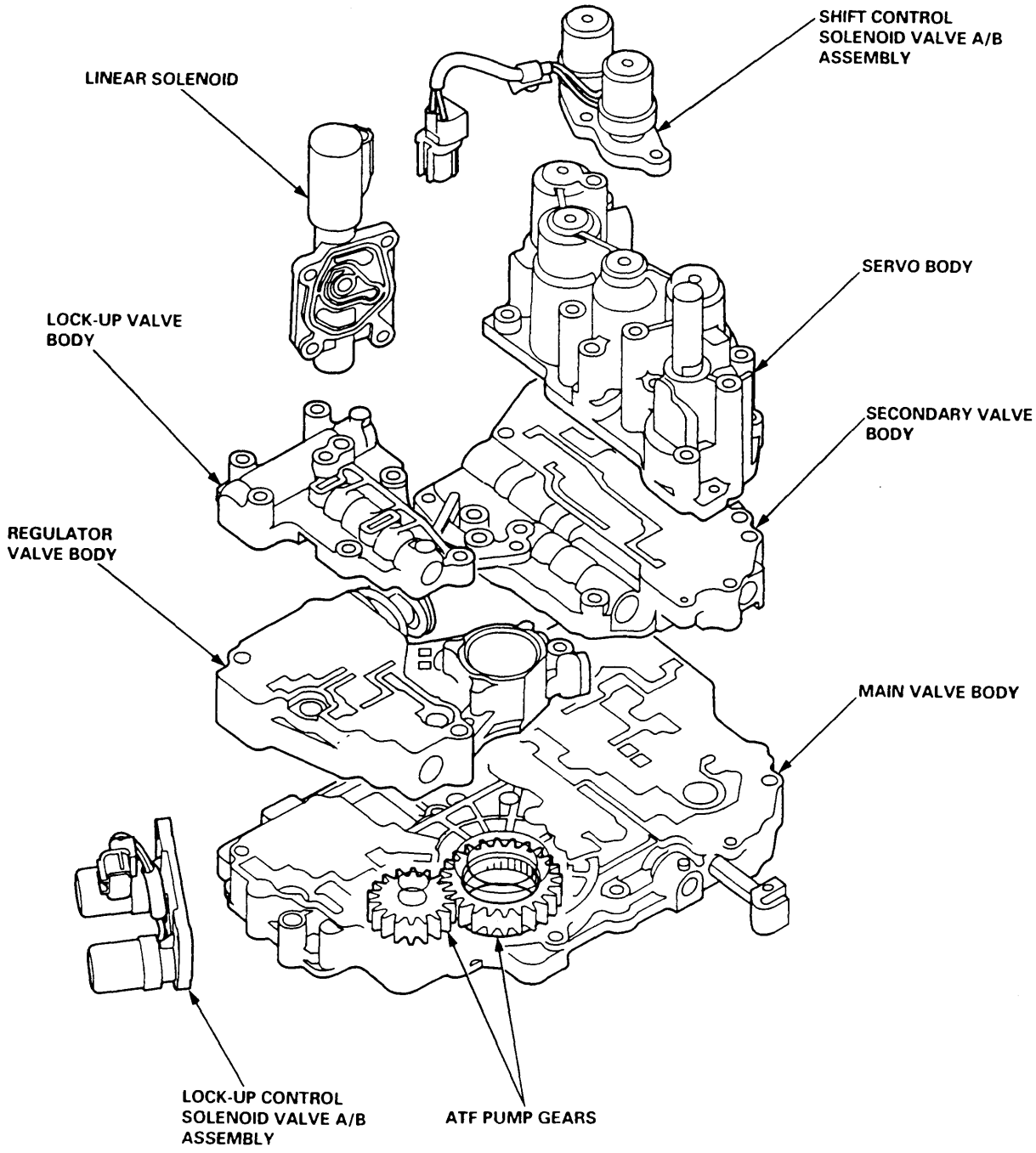
PCM Terminal Locations



A (32P) Connector B (25P) Connector C (31P) Connector D (16P) Connector

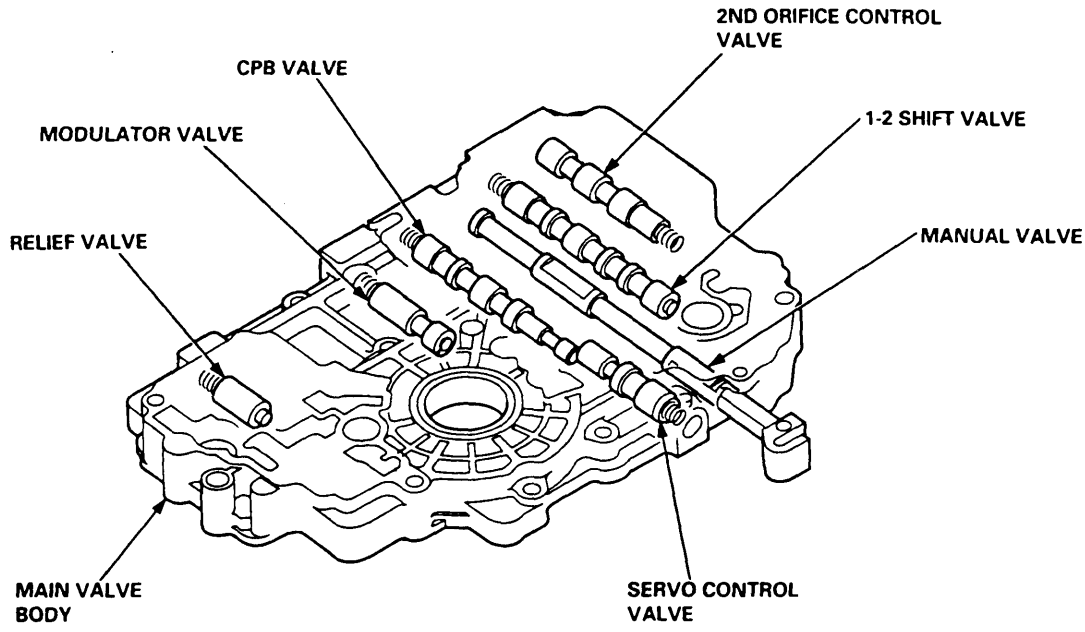
Hydraulic Control

The hydraulic control system is controlled by the ATF pump, valves, accumulators, and electronically controlled solenoids. The ATF pump is driven by splines on the end of the torque converter which is attached to the engine. Fluid from the ATF pump flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each clutch. The valve body includes the main valve body, the regulator valve body, the lock-up valve body, the secondary valve body, the servo body, the linear solenoid, the shift control solenoid valve A/B assembly, and the lock-up control solenoid valve A/B assembly. The shift control solenoid valve A/B assembly and the linear solenoid are bolted to the outside of the transmission housing. The lock-up control solenoid valve A/B assembly is bolted to the outside of the torque converter housing.



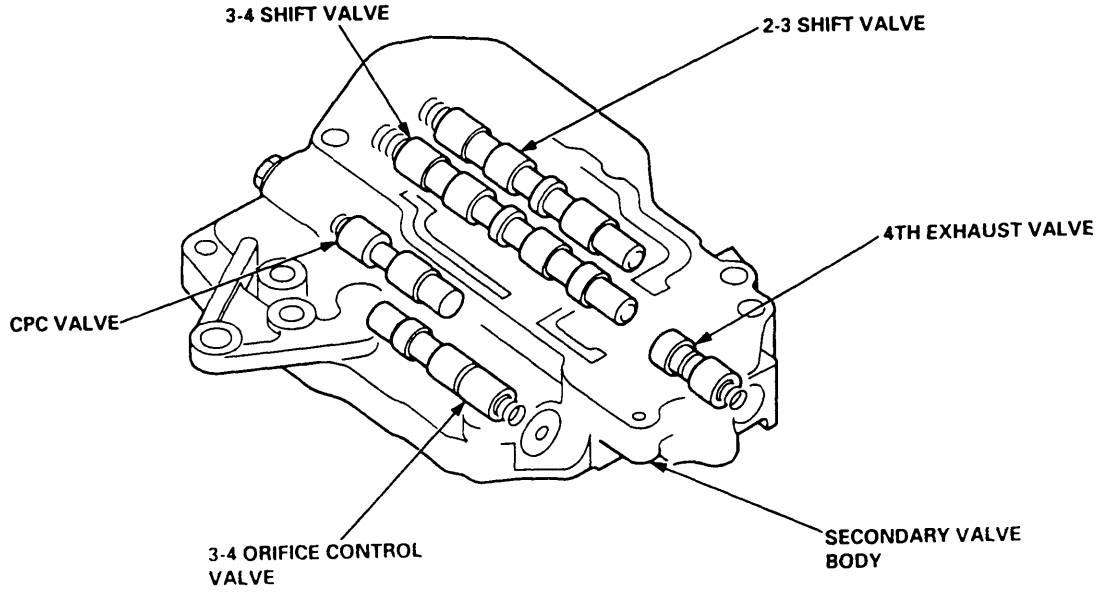
Main Valve Body

The main valve body houses the manual valve, the 1-2 shift valve, the 2nd orifice control valve, the CPB valve, the modulator valve, the servo control valve, and the relief valve. The primary functions of the main valve body are to switch fluid pressure on and off and to control the hydraulic pressure going to the hydraulic control system.



Secondary Valve Body

The secondary valve body is located on the main valve body. The secondary valve body houses the 2-3 shift valve, the 3-4 shift valve, the 3-4 orifice control valve, the 4th exhaust valve and CPC valve.

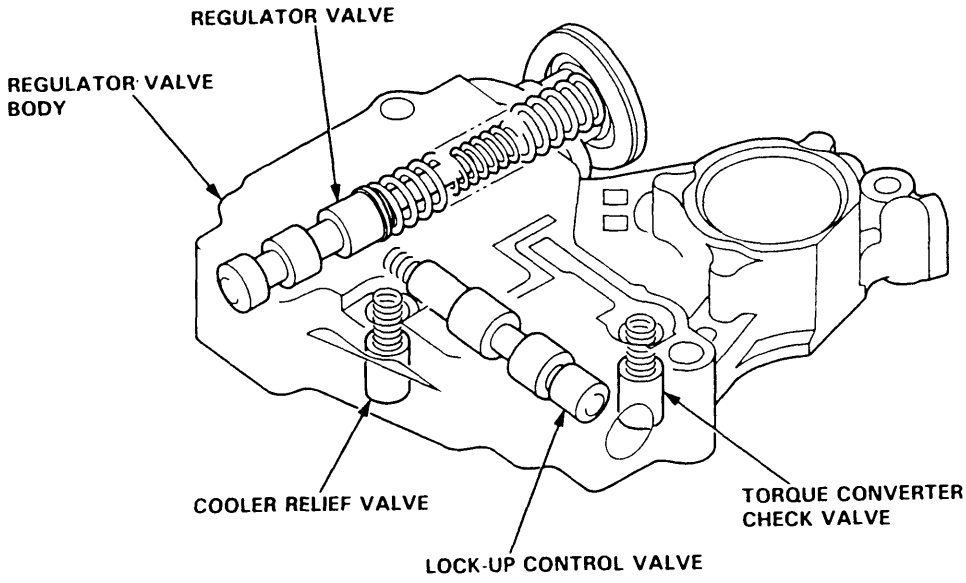


(cont'd)

Hydraulic Control (cont'd)

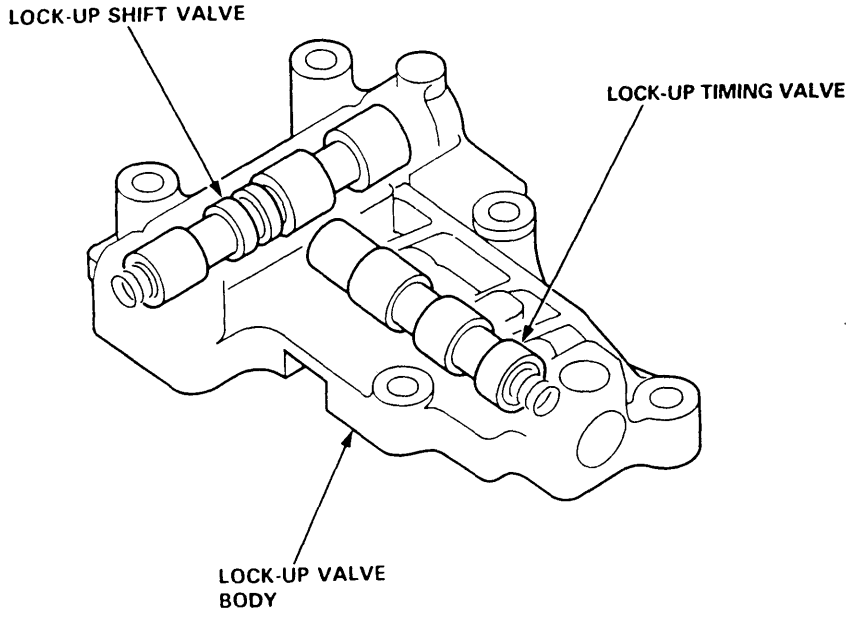
Regulator Valve Body

The regulator valve body is located on the main valve body. The regulator valve body consists of the regulator valve, the torque converter check valve, the cooler relief valve, and the lock-up control valve.



Lock-up Valve Body

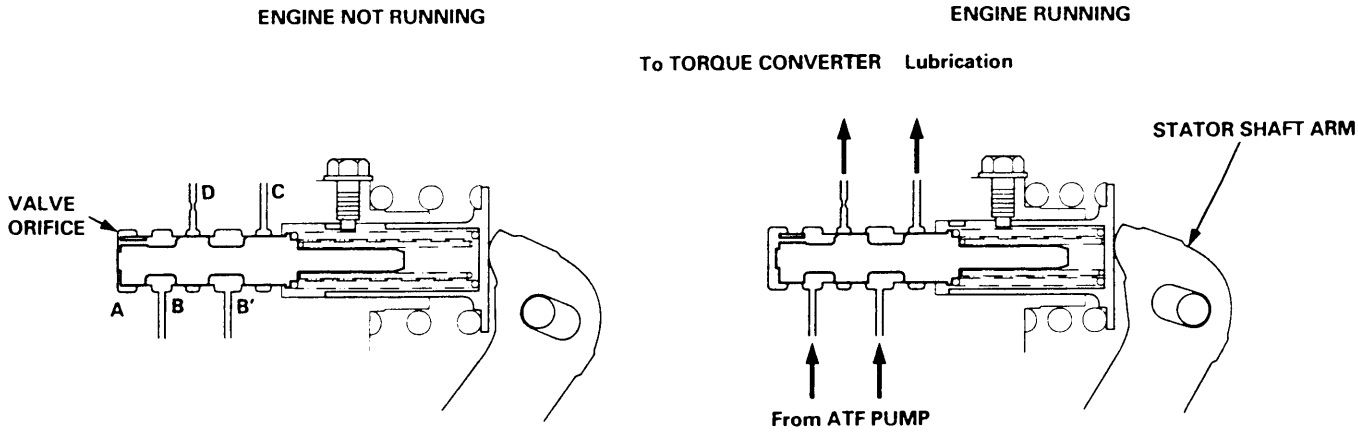
The lock-up valve body with the lock-up shift valve and the lock-up timing valve is located on the regulator valve body.



Regulator Valve

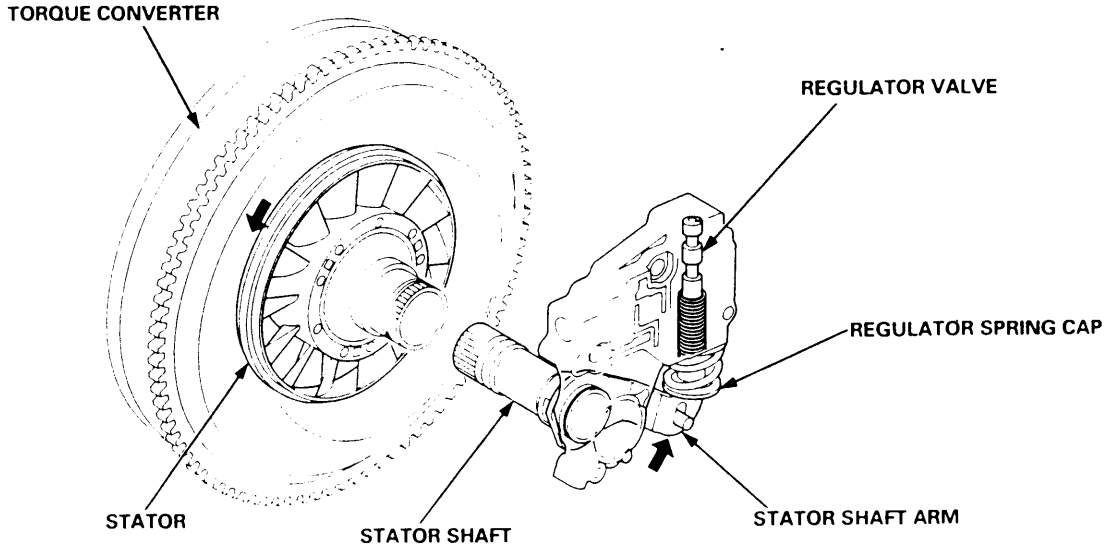
The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. The fluid from the ATF pump flows through B and B'. The regulator valve has a valve orifice. The fluid entering from B flows through the 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 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 the fluid from B' through D and C also changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



Stator Reaction Hydraulic Pressure Control

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), the 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.

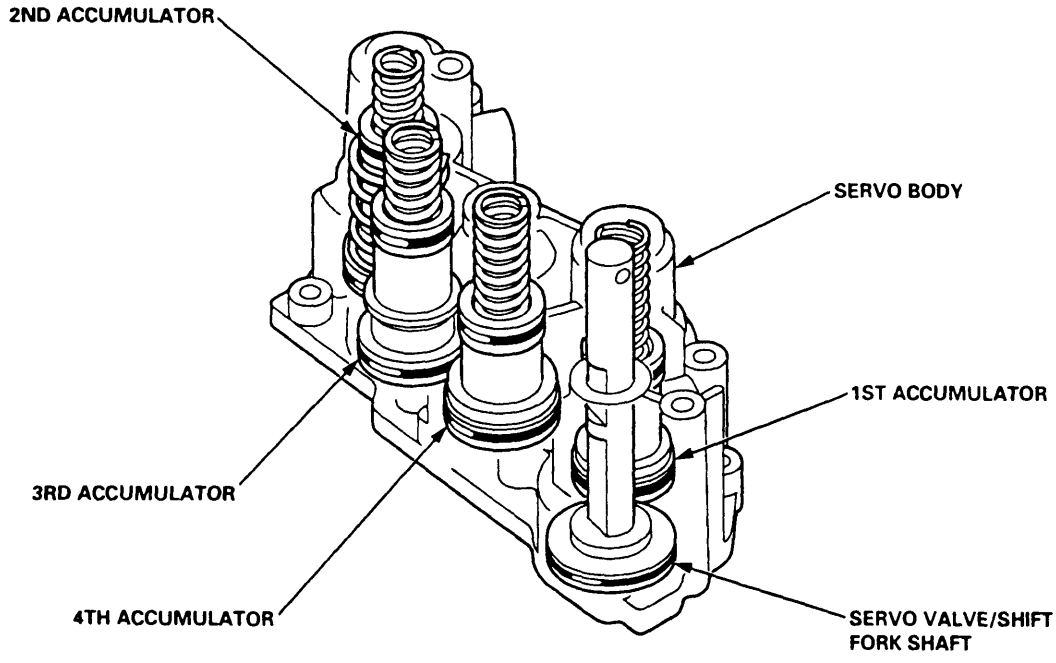


(cont'd)

Hydraulic Control (cont'd)

Servo Body

The servo body is located on the secondary valve body. The servo body contains the servo valve which is integrated with the reverse shift fork shaft, and the accumulators.



Hydraulic Flow

General Chart of Hydraulic Pressure

ATF Pump — Regulator Valve — Line Pressure — Modulator Pressure — Linear Solenoid
Line Pressure — Clutch Pressure
Line Pressure — Torque Converter Pressure
Line Pressure — Lubrication Pressure

Distribution of Hydraulic Pressure

- Regulator Valve — Torque Converter Pressure
  Regulator Valve — Lubrication Pressure
  Regulator Valve — To regulate Line Pressure
- Manual Valve — To select Line Pressure — Clutch Pressure
- Modulator Valve — Modulator Pressure — Shift Control Solenoid Valves
  Modulator Pressure — Lock-up Control Solenoid Valves
  Modulator Pressure — Linear Solenoid
- 1-2 Shift Valve — Clutch Pressure
- 2-3 Shift Valve — Clutch Pressure
- 3-4 Shift Valve — Clutch Pressure

NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE	NO.	DESCRIPTION OF PRESSURE
1	LINE	6B	MODULATE (SHIFT CONTROL SOLENOID VALVE B)	41	4TH CLUTCH
1'	LINE	6C	MODULATE (LOCK-UP CONTROL SOLENOID VALVE A)	56	LINEAR SOLENOID
1''	LINE	6D	MODULATE (LOCK-UP CONTROL SOLENOID VALVE B)	90	TORQUE CONVERTER
2	LINE	6D'	MODULATE (LOCK-UP CONTROL SOLENOID VALVE B)	91	TORQUE CONVERTER
3	LINE	7	LINE	92	TORQUE CONVERTER
3'	LINE	8	LINE/CPC	93	ATF COOLER
3''	LINE	9	LINE	94	TORQUE CONVERTER
4	LINE	10	1ST CLUTCH	95	LUBRICATION
4'	LINE	20	2ND CLUTCH	96	TORQUE CONVERTER
4''	LINE	20A	2ND ACCUMULATOR	97	TORQUE CONVERTER
5	CPC	25	LINE	99	SUCTION
6	MODULATE	30	3RD CLUTCH	X	DRAIN
6A	MODULATE (SHIFT CONTROL SOLENOID VALVE A)	40	4TH CLUTCH		

(cont'd)

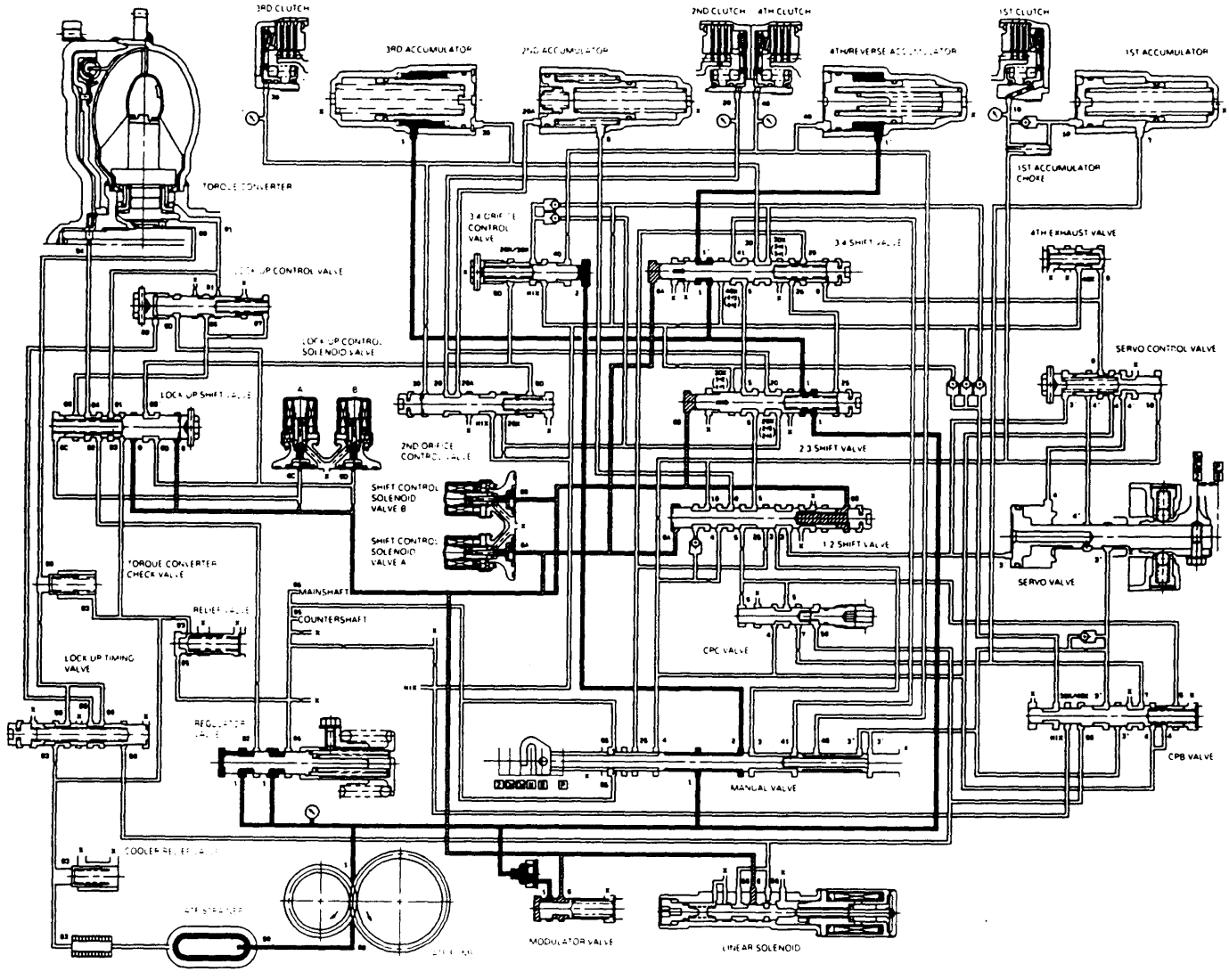
Description

Hydraulic Flow (cont'd)

[N] Position

As the engine turns, the ATF pump also starts to operate. Automatic transmission fluid (ATF) is drawn from (99) and discharged into (1). Then, ATF flowing from the ATF pump becomes line pressure (1). The line pressure (1) is regulated by the regulator valve. The torque converter inlet pressure (92) enters (94) of the torque converter through the lock-up shift valve and discharges into (90). The torque converter check valve prevents the torque converter pressure from rising. Under this condition, hydraulic pressure is not applied to the clutches.

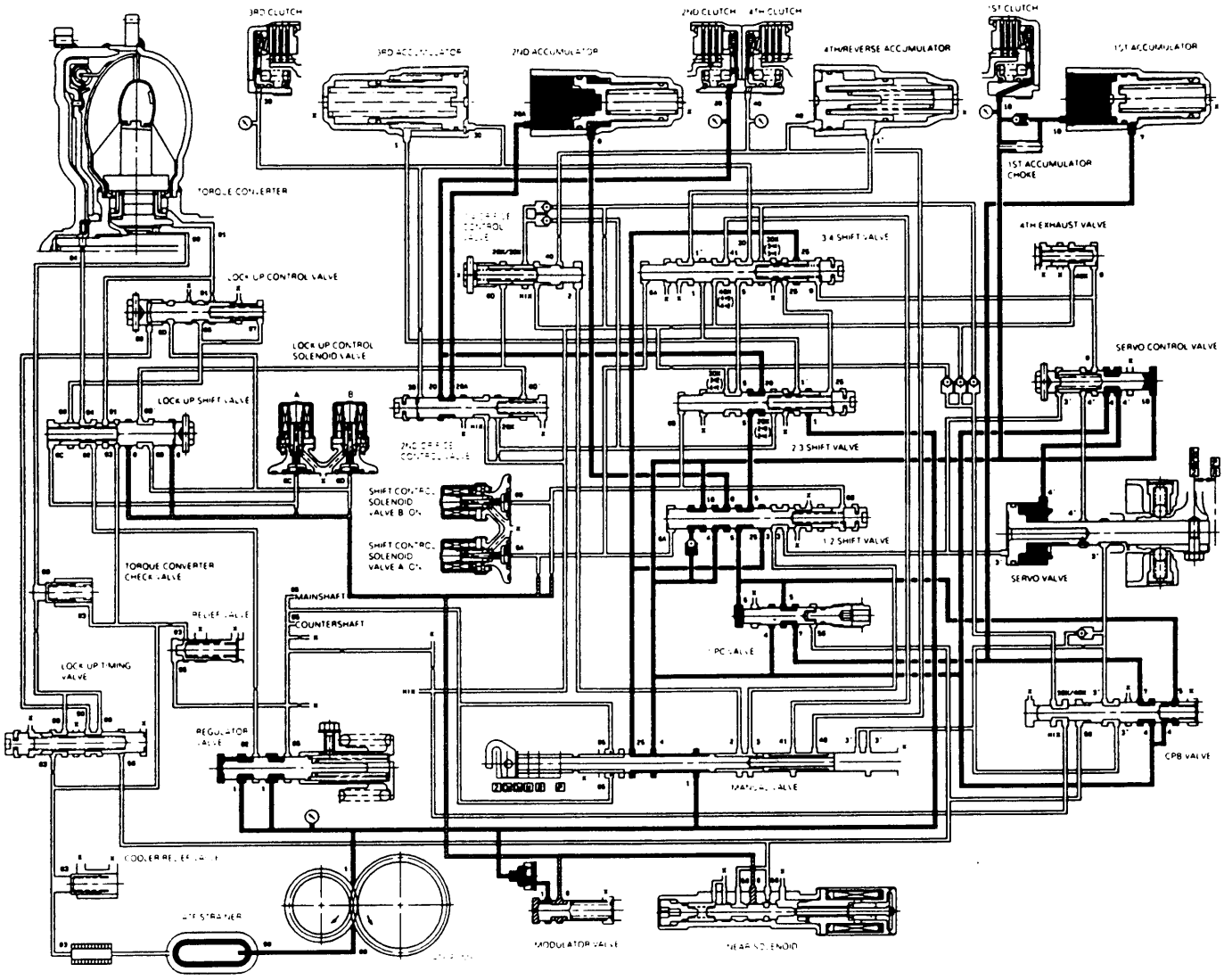
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[2] Position

The line pressure (1) flows to the manual valve and the modulator valve. The line pressure (1) changes to line pressure (4) and (25) at the manual valve, and changes to modulator pressure at the modulator valve. But the modulator pressure (6) does not flow to each shift valve because shift control solenoid valves A and B are turned ON by the PCM. The line pressure (4) passes through the CPB valve and the CPC valve, and changes to line pressure (5), then flows to the 1-2 shift valve. The line pressure (5) from the 1-2 shift valve changes to 2nd clutch pressure (20) at the 2-3 shift valve. The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged. The line pressure (4) passes through the 1-2 shift valve and the orifice, and changes to 1st clutch pressure. The 1st clutch pressure (10) also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Description

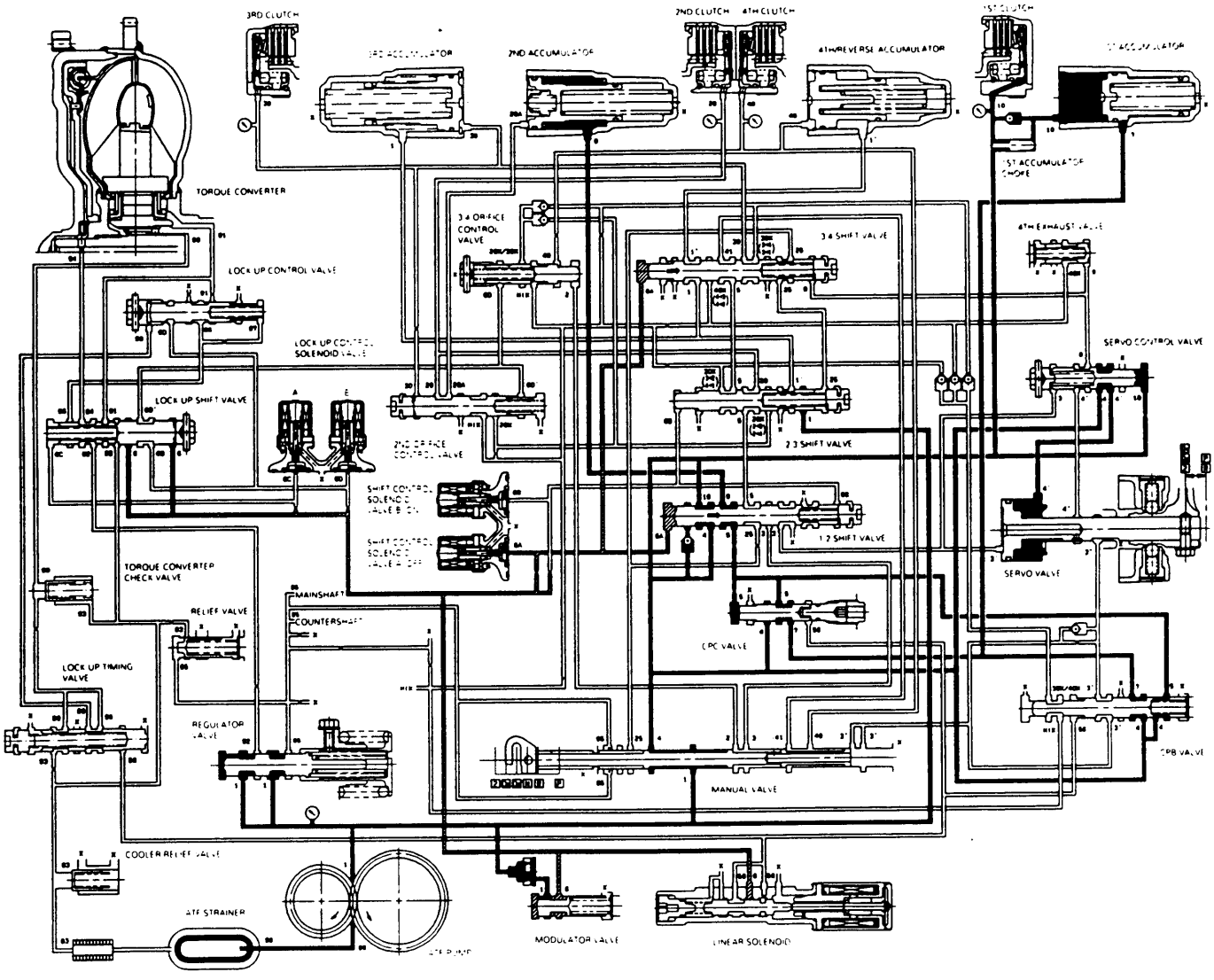
Hydraulic Flow (cont'd)

[D4] or [D3] Position

1. 1st Gear

The flow of fluid through the torque converter circuit is same as in [N] position. The line pressure flows to the manual valve and the modulator valve. The line pressure changes to modulator pressure (6) at the modulator valve and to line pressure (4) at the manual valve. The modulator pressure (6) flows to the left end of the 1-2 shift valve and the 3-4 shift valve because shift control solenoid valve A is turned OFF and B is turned ON by the PCM. The 1-2 shift valve is moved to the right side. The line pressure (4) changes to 1st clutch pressure (10) at the 1-2 shift valve and the orifice. The 1st clutch pressure (10) is applied to the 1st clutch and the 1st accumulator; consquently, the vehicle will move as the engine power is transmitted.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



2. 2nd Gear

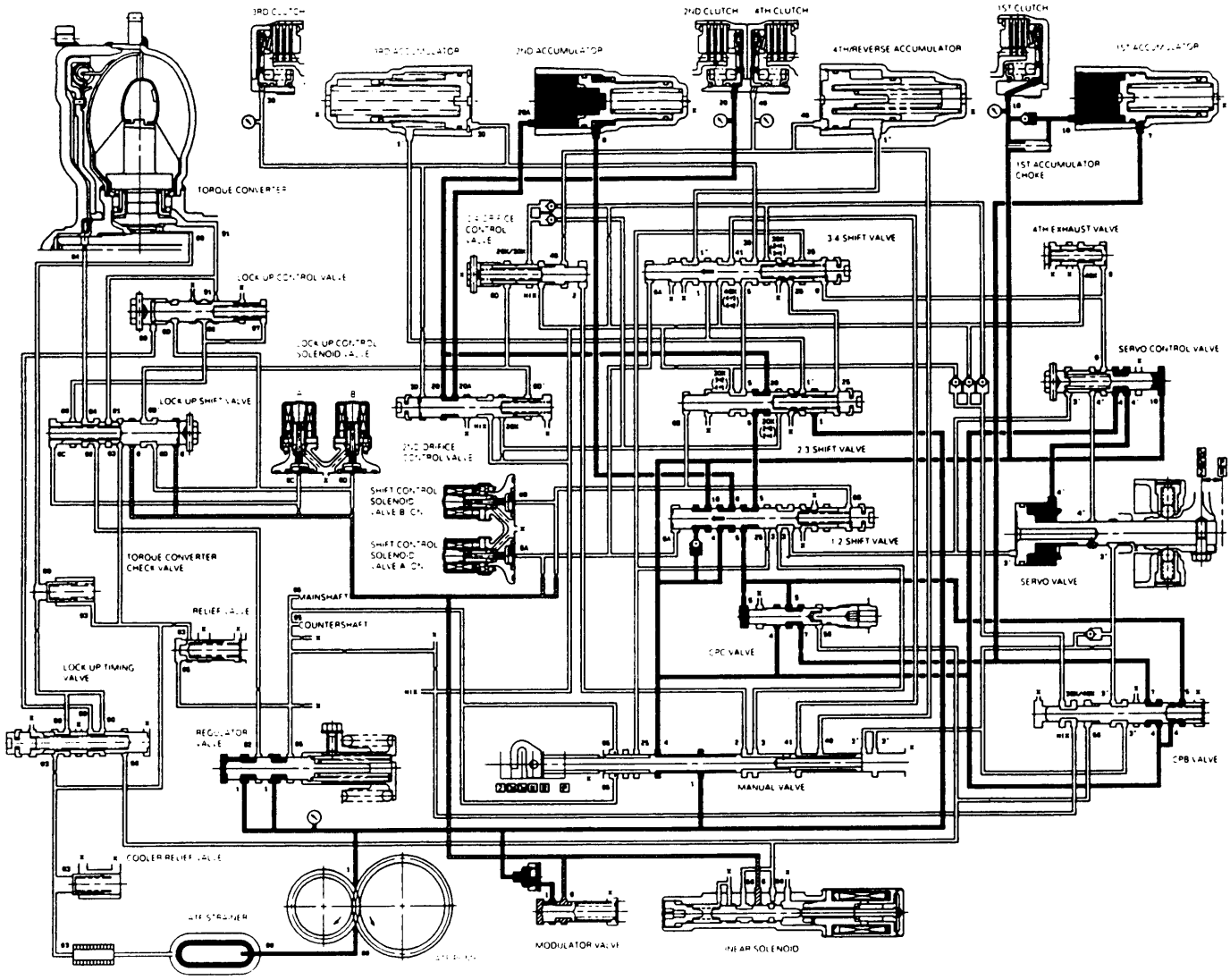
As the speed of the vehicle reaches the prescribed value, shift control solenoid valve A is turned ON by means of the PCM. The modulator pressure (6A) in the left end of the 1-2 shift valve is released by turning shift control solenoid valve A ON. The 1-2 shift valve is moved to the left side and uncovers the port to allow line pressure (5) to the 2-3 shift valve. The line pressure (5) changes to 2nd clutch pressure (20) at the 2-3 shift valve. The 2nd clutch pressure (20) is applied to the 2nd clutch, and the 2nd clutch is engaged.

Fluid flows by way of:

- Line Pressure (4) → CPB Valve – Line Pressure (5) → 1-2 Shift Valve – Line Pressure (5) → 2-3 Shift Valve
- 2nd Clutch Pressure (20) → 2nd Clutch

The hydraulic pressure also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Description

Hydraulic Flow (cont'd)

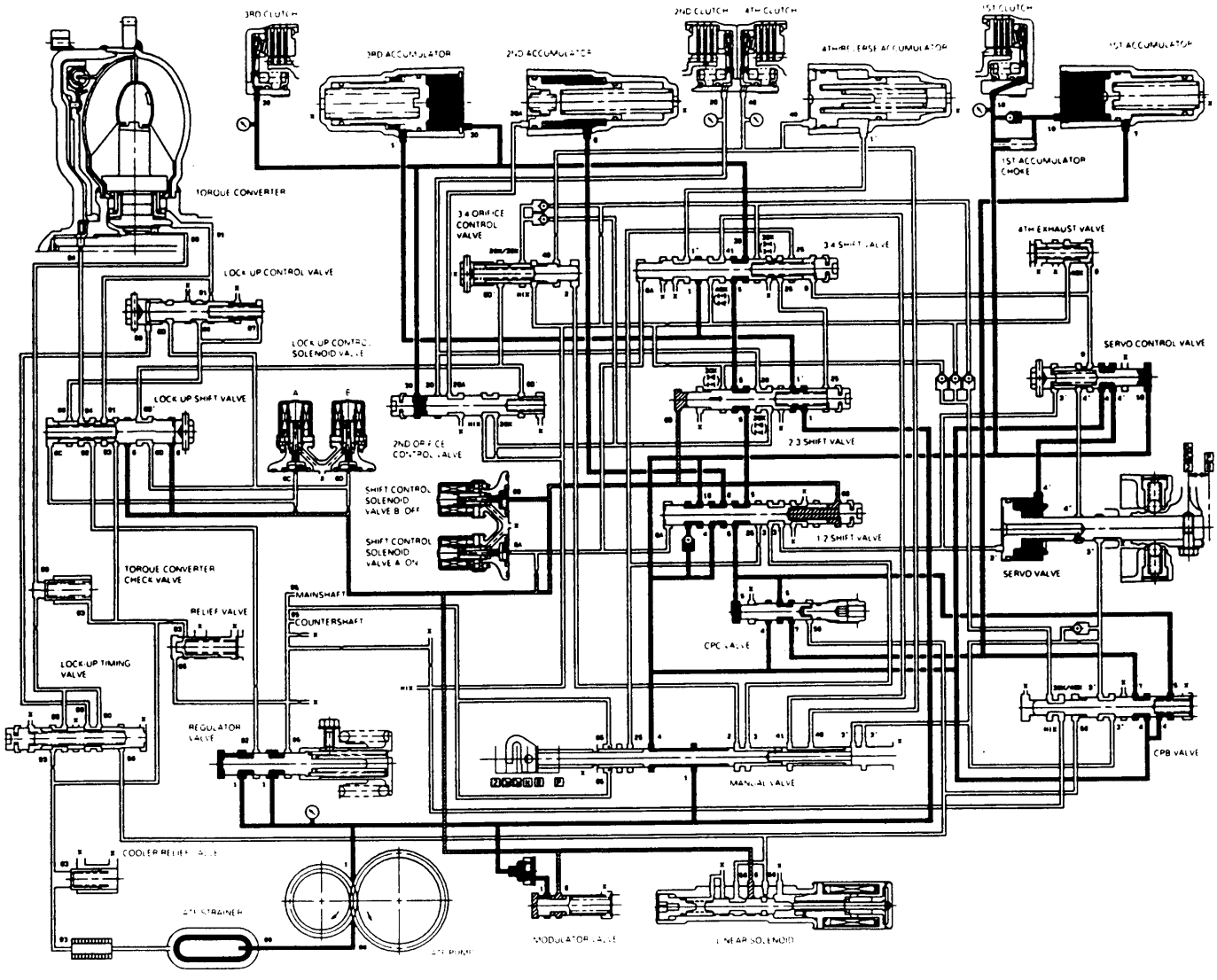
3. 3rd Gear

As the speed of the vehicle reaches the prescribed value, shift control solenoid valve B is turned OFF by means of the PCM. Shift control solenoid valve A remains ON. The modulator pressure (6) flows to the right end of the 1-2 shift valve and the left end of the 2-3 shift valve. The 2-3 shift valve is moved to the right side by modulator pressure (6B). The 2-3 shift valve covers the port to stop line pressure (5) to the 2nd clutch and uncovers to the 3-4 shift valve as the 2-3 shift valve is moved to the right side. The line pressure (5) becomes 3rd clutch pressure (30) at the 3-4 shift valve. The 3rd clutch pressure (30) is applied to the 3rd clutch, and the 3rd clutch is engaged.

Fluid flows by way of:
- Line pressure (4) → CPB Valve – Line Pressure (5) → 1-2 Shift Valve – Line Pressure (5) → 2-3 Shift Valve
- Line Pressure (5) → 3-4 Shift Valve – 3rd Clutch Pressure (30) → 3rd Clutch

The hydraulic pressure also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch as in 2nd gear.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



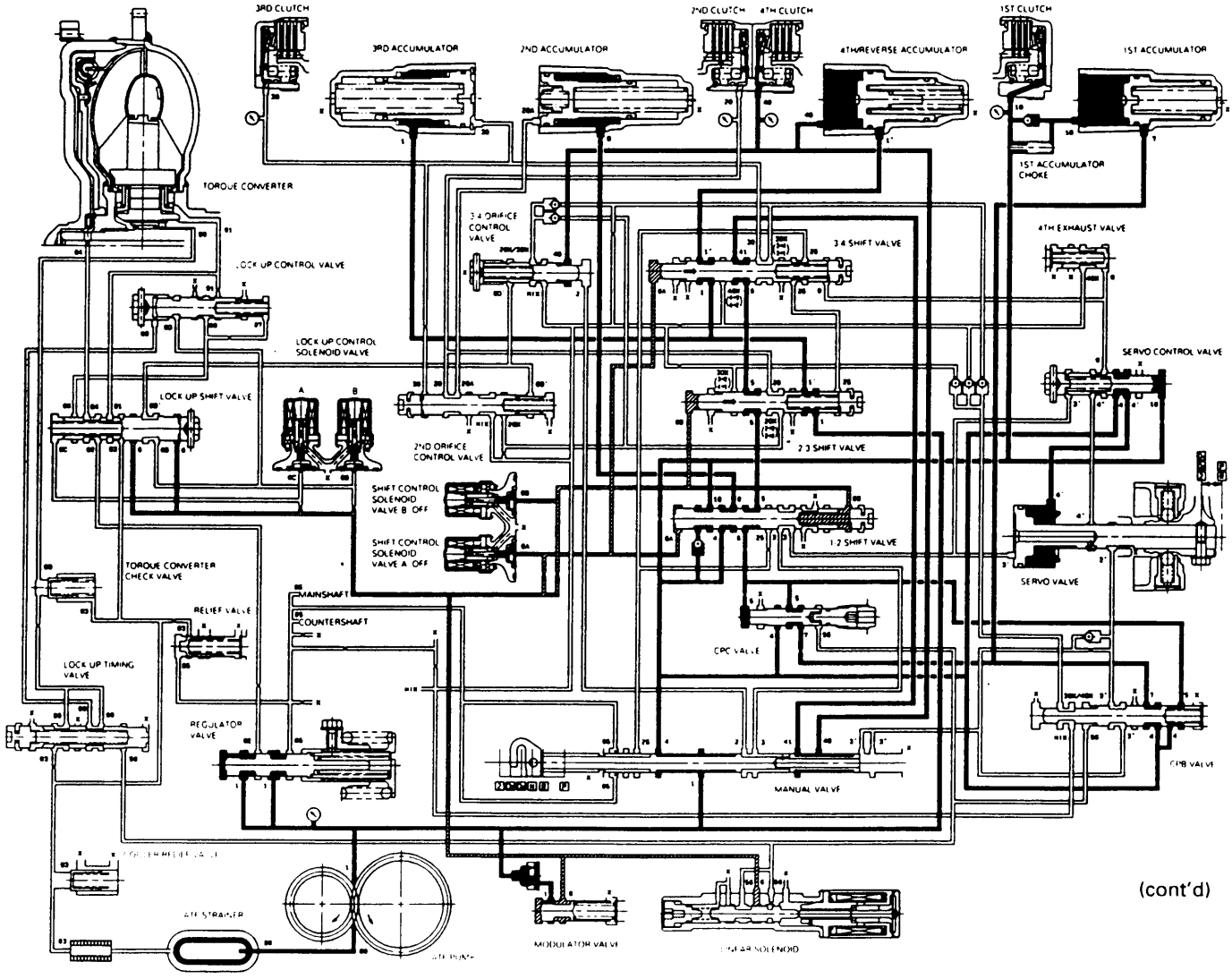
4. **4th Gear (D4 Position)**

As the speed of the vehicle reaches the prescribed value, shift control solenoid valve A is turned OFF by means of the PCM. Shift control solenoid valve B remains OFF. The modulator pressure (6) flows to the left end of the 1-2 shift valve and the left end of the 3-4 shift valve. The modulator pressure (6A) in the left end of the 1-2 shift valve equals the modulator pressure (6B) in the right end of the 1-2 shift valve, the 1-2 shift valve remains at left side by the tension of the valve spring.
The 3-4 shift valve is moved to the right side by modulator pressure (6A). The 3-4 shift valve covers the port to the 3rd clutch and uncovers the port to the 4th clutch as this valve is moved to the right side. The 4th clutch pressure (41) from the 3-4 shift valve becomes 4th clutch pressure (40) at the manual valve. The 4th clutch pressure (40) is applied to the 4th clutch, and the 4th clutch is engaged.

Fluid flows by way of:
- Line pressure (4) → CPB Valve – Line Pressure (5) → 1-2 Shift Valve – Line Pressure (5) → 2-3 Shift Valve
- Line Pressure (5) → 3-4 Shift Valve – 4th Clutch Pressure (41) → Manual Valve – 4th Clutch Pressure (40) → 4th Clutch

The hydraulic pressure also flows to the 1st clutch. However, no power is transmitted because of the one-way clutch as in 2nd and 3rd gear.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



(cont'd)

Hydraulic Flow (cont'd)

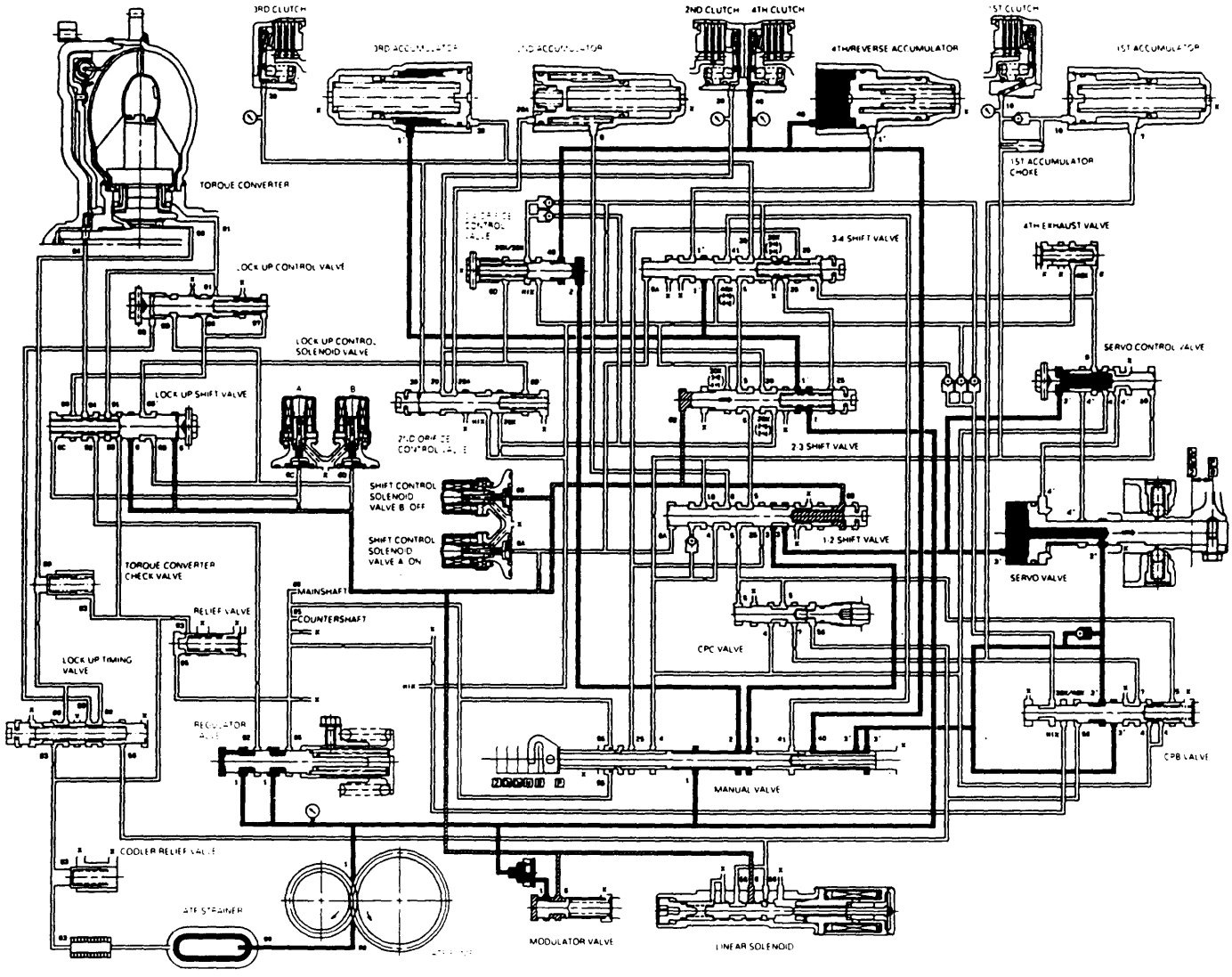
[R] Position

The flow of fluid through the torque converter circuit is the same as in [N] position. The line pressure (1) changes to line pressure (3) and flows to the 1-2 shift valve. The line pressure (3) changes to line pressure (3') at the 1-2 shift valve and flows to the servo valve. The servo valve is moved to the right side (Reverse range position) and uncovers the port to allow line pressure (3") to the manual valve. The line pressure (3') from the 1-2 shift valve flows through the servo valve to the manual valve and changes to 4th clutch pressure (40). The 4th clutch pressure (40) is applied to the 4th clutch, and the 4th clutch is engaged.

Reverse Inhibitor Control

When the [R] position is selected while the vehicle is moving forward at speeds over 6 mph (10 km/h), the PCM outputs the 1st speed signal to shift control solenoid valves A and B; shift control solenoid valve A is turned OFF, shift control solenoid valve B is turned ON. The 1-2 shift valve is moved to the right side and covers the port to stop line pressure (3') to the servo valve. The line pressure (3') is not applied to the servo valve, and the 4th clutch pressure (40) is not applied to the 4th clutch, as a result, power is not transmitted to the reverse direction.

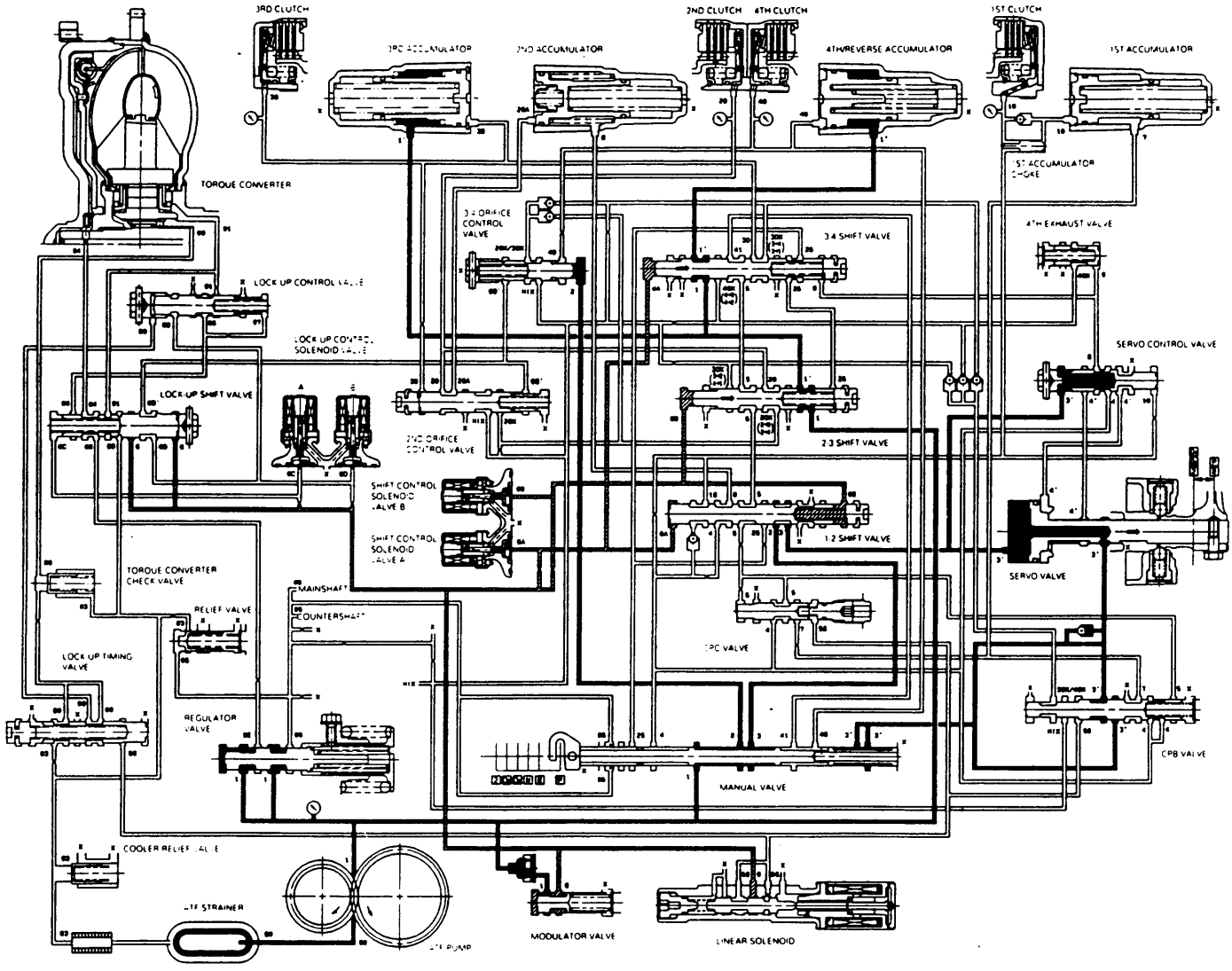
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



[P] Position

The flow of fluid through the torque converter circuit is the same as in [N] position. The line pressure (1) changes to line pressure (3) and flows to the 1-2 shift valve. The line pressure (3) changes to line pressure (3') at the 1-2 shift valve and flows to the servo valve. The servo valve is moved to the right side (Reverse range position) and uncovers the port to allow line pressure (3") to the manual valve as in [R] position. The line pressure (3") from the servo valve is intercepted by the manual valve. However, hydraulic pressure is not supplied to the clutches, and the power is not transmitted.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.



Description

Lock-up System

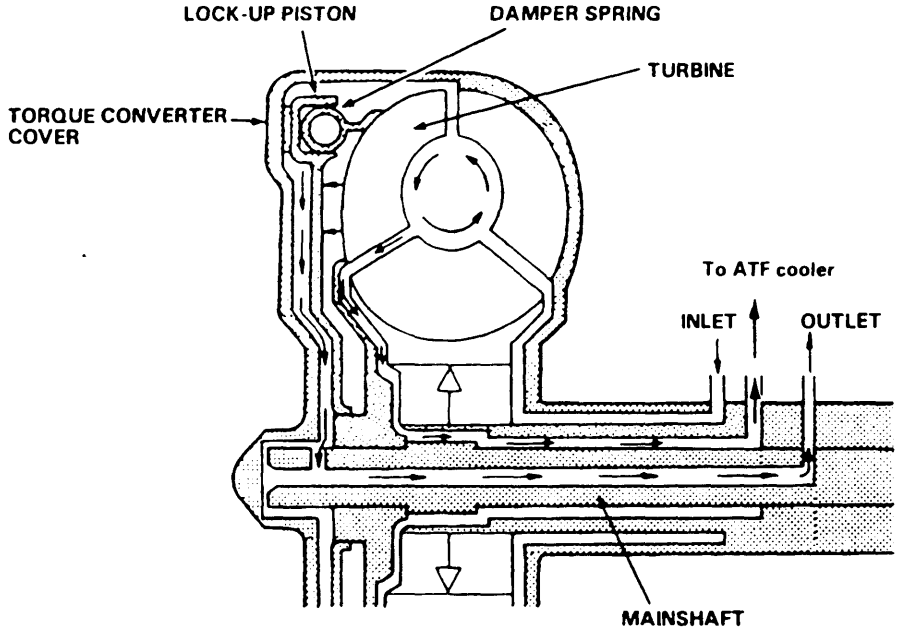
Lock-up Clutch

1. Operation (clutch on)
With the lock-up clutch on, the fluid in the chamber between the torque converter cover and the lock-up piston is drained off, and the converter fluid exerts pressure through the piston against the torque converter cover. As a result, the converter turbine is locked to the converter cover. The effect is to bypass the converter, thereby placing the vehicle in direct drive.

Power flow

The power flows by way of:

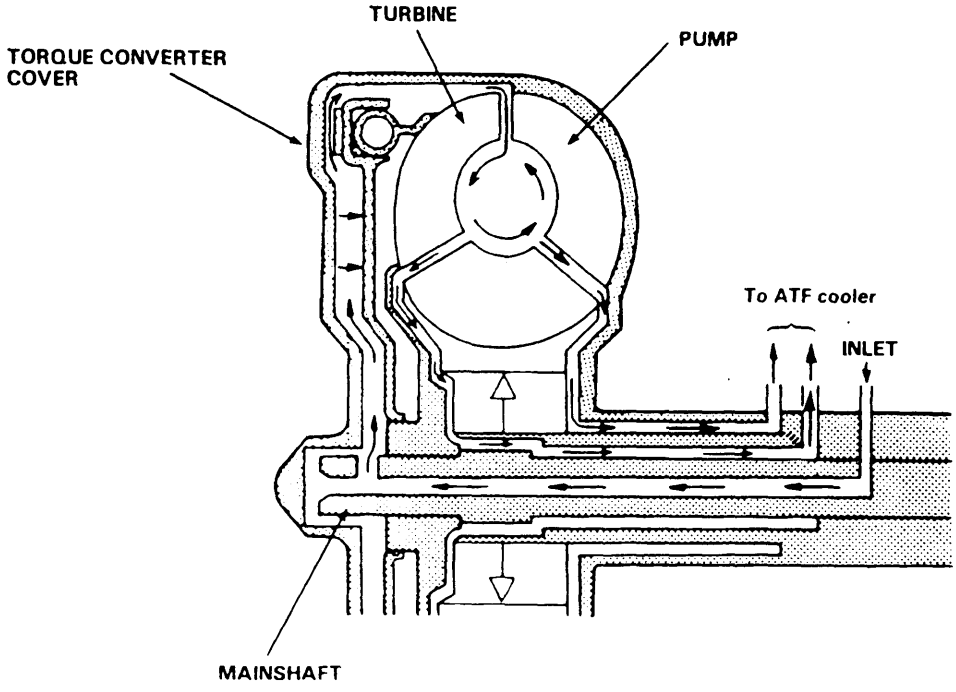
Engine
↓
Drive plate
↓
Torque converter cover
↓
Lock-up piston
↓
Damper spring
↓
Turbine
↓
Mainshaft



2. Operation (clutch off)
With the lock-up clutch off, the fluid flows in the reverse of "clutch on." As a result, the lock-up piston moves away from the converter cover, and the torque converter lock-up is released.

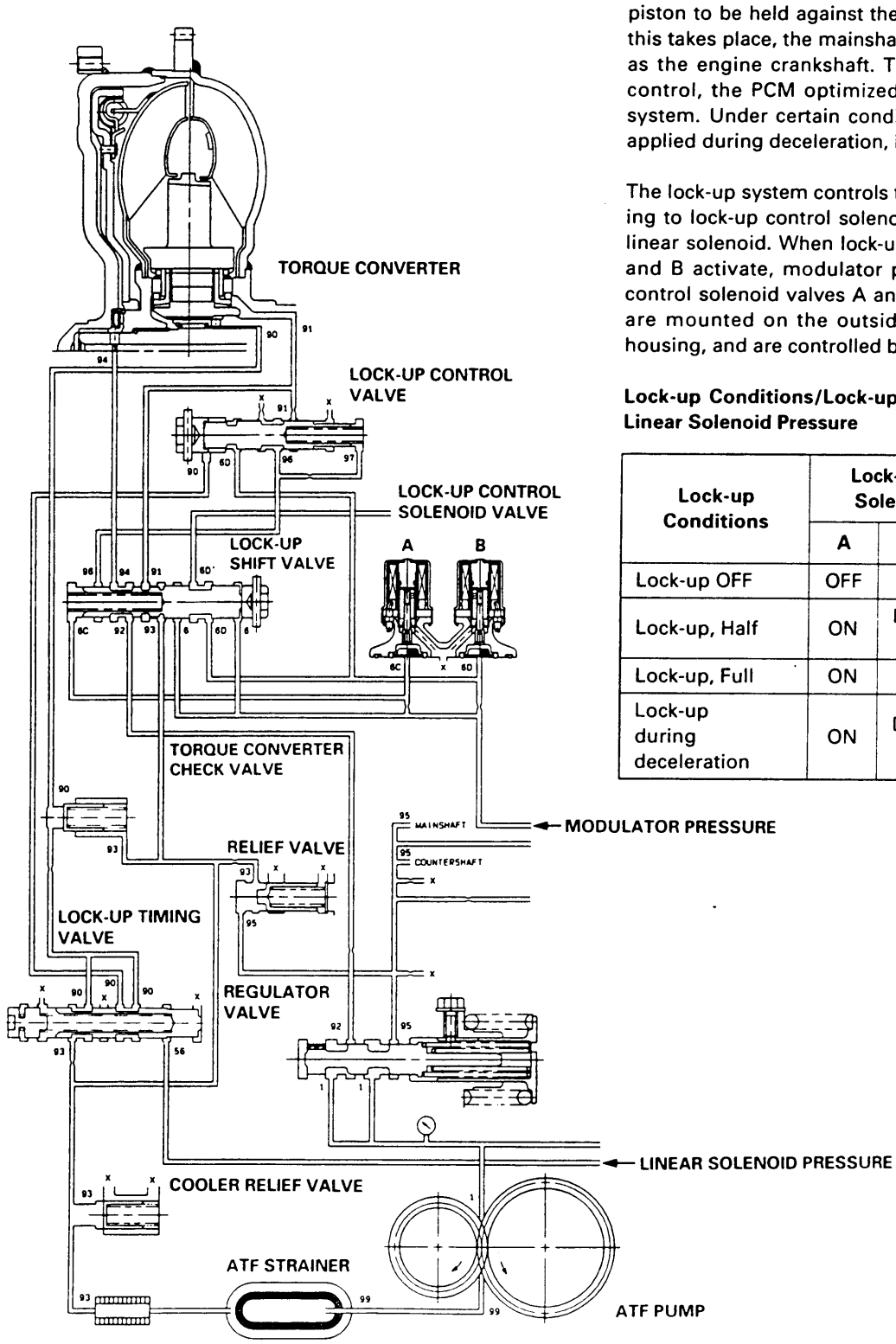
Power flow

Engine
↓
Drive plate
↓
Torque converter cover
↓
Pump
↓
Turbine
↓
Mainshaft



In [D4] position, in 3rd and 4th, and [D3] position in 3rd, pressurized fluid is drained from the back of the torque converter through a fluid passage, causing the lock-up 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 optimized the timing of the lock-up system. Under certain conditions, the lock-up clutch is applied during deceleration, in 3rd and 4th gear.

The lock-up system controls the range of lock-up according to lock-up control solenoid valves A and B, and the linear solenoid. When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B and the linear solenoid are mounted on the outside of the torque converter housing, and are controlled by the PCM.



Lock-up Conditions/Lock-up Control Solenoid Valves/ Linear Solenoid Pressure

Lock-up Conditions	Lock-up Control Solenoid Valve		Linear Solenoid Pressure
	A	B	
Lock-up OFF	OFF	OFF	High
Lock-up, Half	ON	Duty operation OFF ↔ ON	Low
Lock-up, Full	ON	ON	High
Lock-up during deceleration	ON	Duty operation OFF ↔ ON	Low

(cont'd)

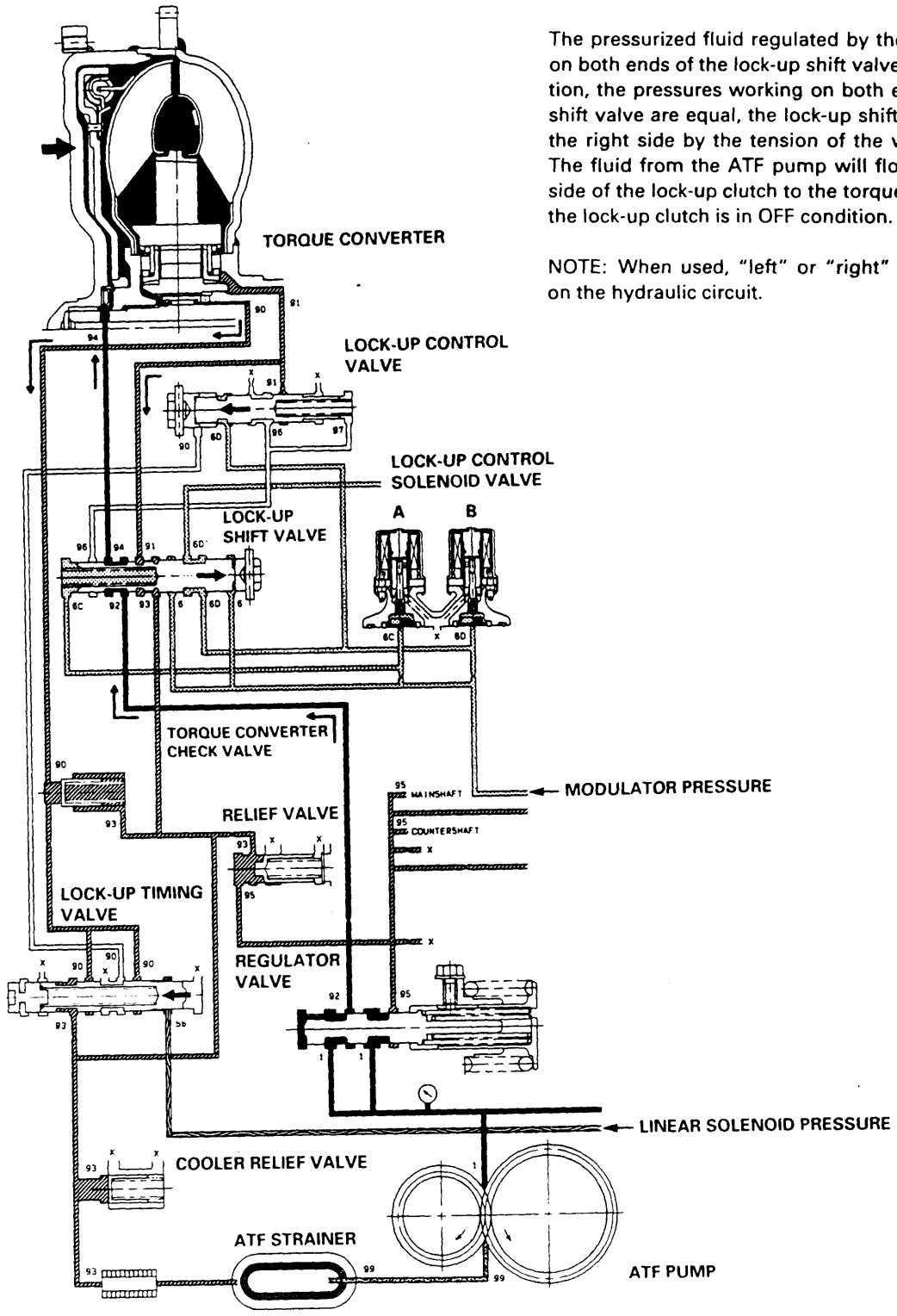
Lock-up System (cont'd)

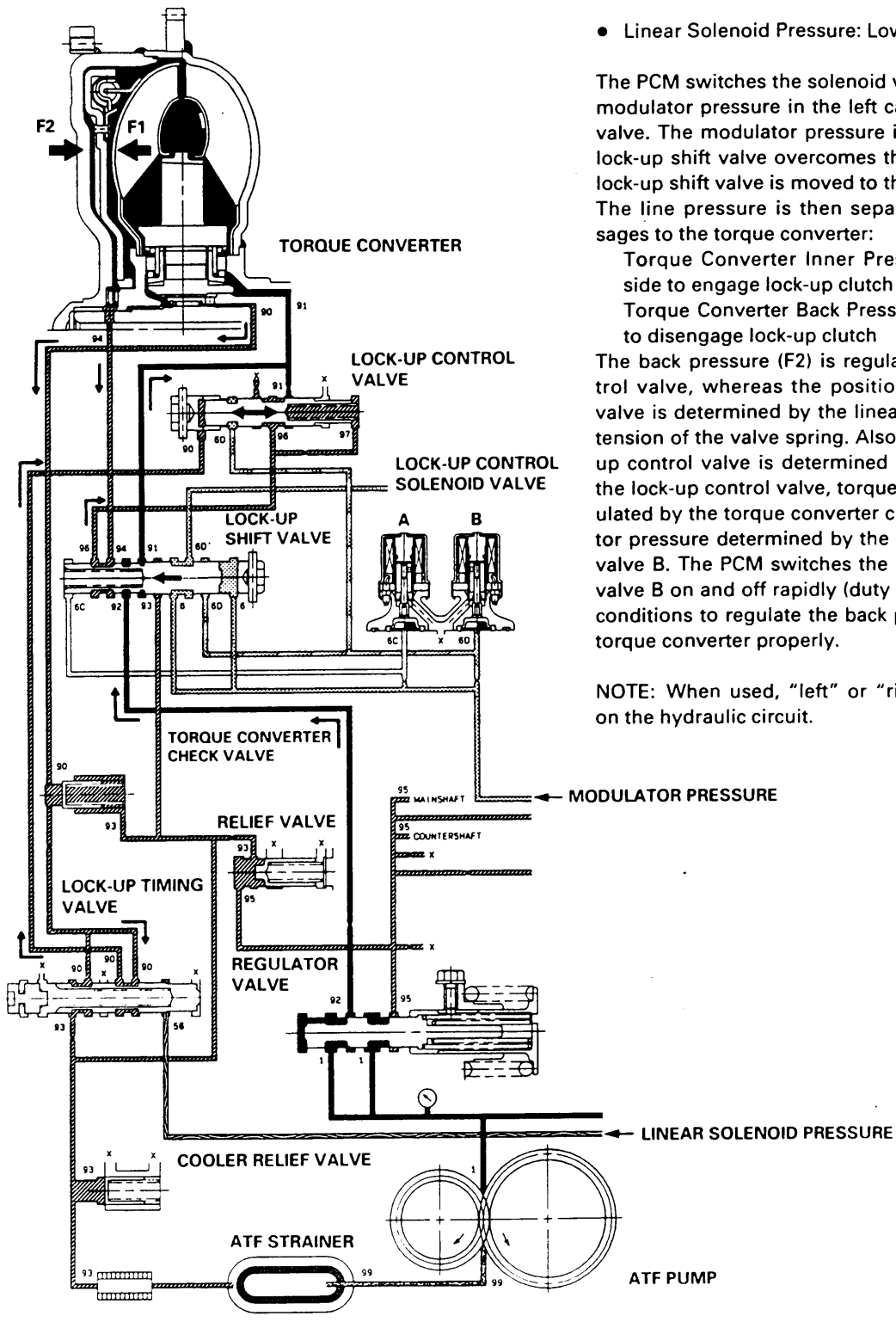
No Lock-up

- Lock-up Control Solenoid Valve A: OFF
- Lock-up Control Solenoid Valve B: OFF
- Linear Solenoid Pressure: High

The pressurized fluid regulated by the modulator works on both ends of the lock-up shift valve. Under this condition, the pressures working on both ends of the lock-up shift valve are equal, the lock-up shift valve is moved to the right side by the tension of the valve spring alone. The fluid from the ATF pump will flow through the left side of the lock-up clutch to the torque converter; that is, the lock-up clutch is in OFF condition.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.





Half Lock-up

- Lock-up Control Solenoid Valve A: ON
- Lock-up Control Solenoid Valve B: Duty Operation
  OFF ↔ ON
- Linear Solenoid Pressure: Low

The PCM switches the solenoid valve A on to release the modulator pressure in the left cavity of the lock-up shift valve. The modulator pressure in the right cavity of the lock-up shift valve overcomes the spring force; thus the lock-up shift valve is moved to the left side.

The line pressure is then separated into the two passages to the torque converter:

Torque Converter Inner Pressure: enters into right side to engage lock-up clutch

Torque Converter Back Pressure: enters into left side to disengage lock-up clutch

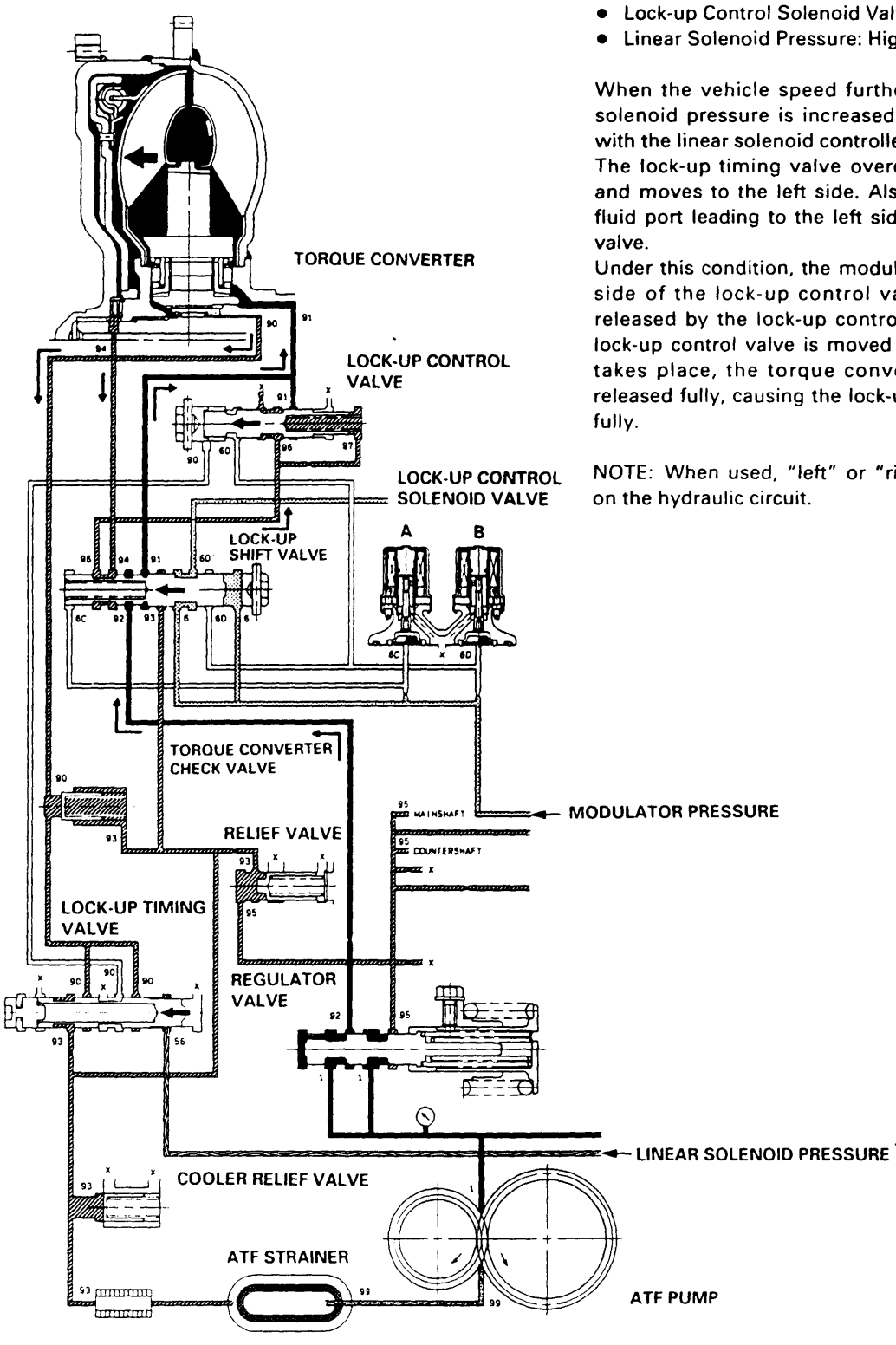
The back pressure (F2) is regulated by the lock-up control valve, whereas the position of the lock-up timing valve is determined by the linear solenoid pressure and tension of the valve spring. Also the position of the lock-up control valve is determined by the back pressure of the lock-up control valve, torque converter pressure regulated by the torque converter check valve, and modulator pressure determined by the lock-up control solenoid valve B. The PCM switches the lock-up control solenoid valve B on and off rapidly (duty operation) under certain conditions to regulate the back pressure (F2) to lock the torque converter properly.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

(cont'd)

Description

Lock-up System (cont'd)



Full Lock-up

- Lock-up Control Solenoid Valve A: ON
- Lock-up Control Solenoid Valve B: ON
- Linear Solenoid Pressure: High

When the vehicle speed further increases, the linear solenoid pressure is increased to high, in accordance with the linear solenoid controlled by the PCM.
The lock-up timing valve overcomes the spring force and moves to the left side. Also, this valve closes the fluid port leading to the left side of the lock-up control valve.
Under this condition, the modulator pressure in the left side of the lock-up control valve had already been released by the lock-up control solenoid valve B; the lock-up control valve is moved to the left side. As this takes place, the torque converter back pressure is released fully, causing the lock-up clutch to be engaged fully.

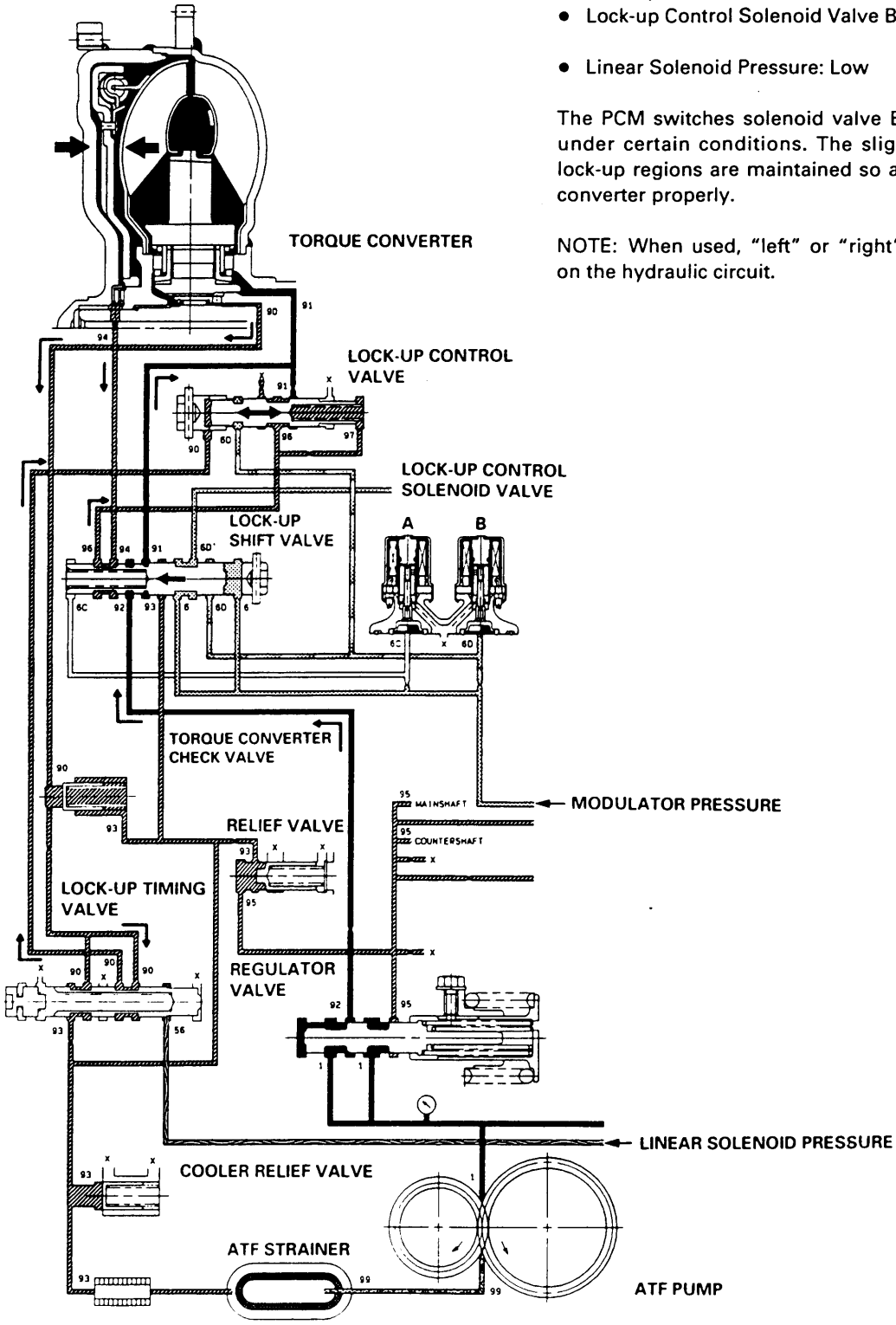
NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

Deceleration Lock-up

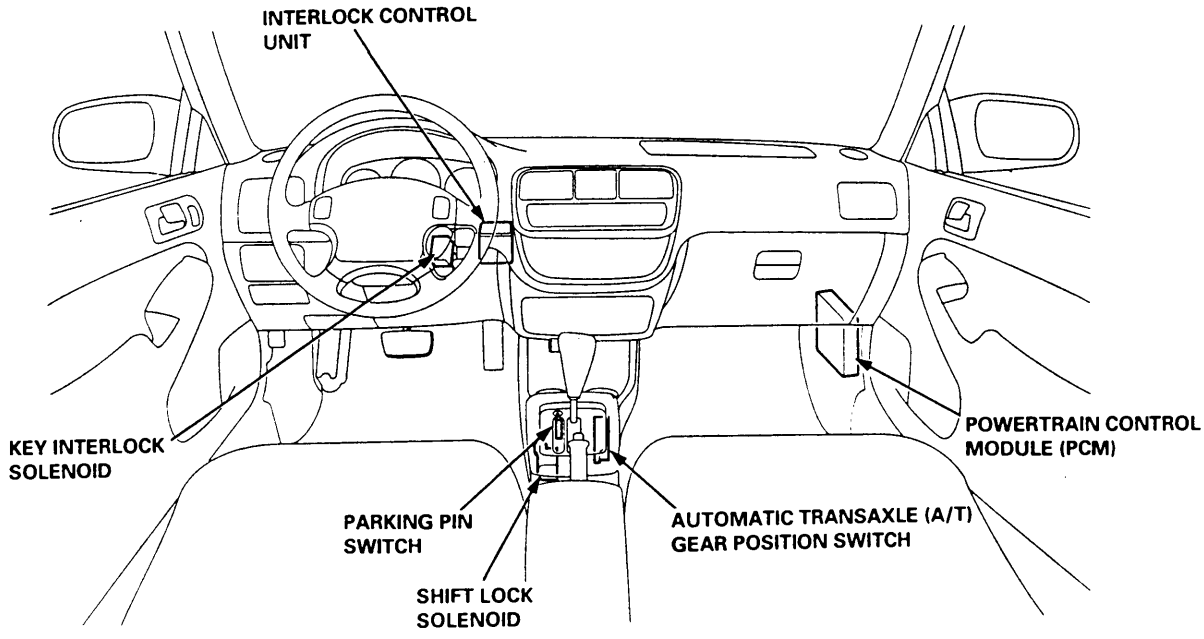
- Lock-up Control Solenoid Valve A: ON
- Lock-up Control Solenoid Valve B: Duty Operation
  OFF ↔ ON
- Linear Solenoid Pressure: Low

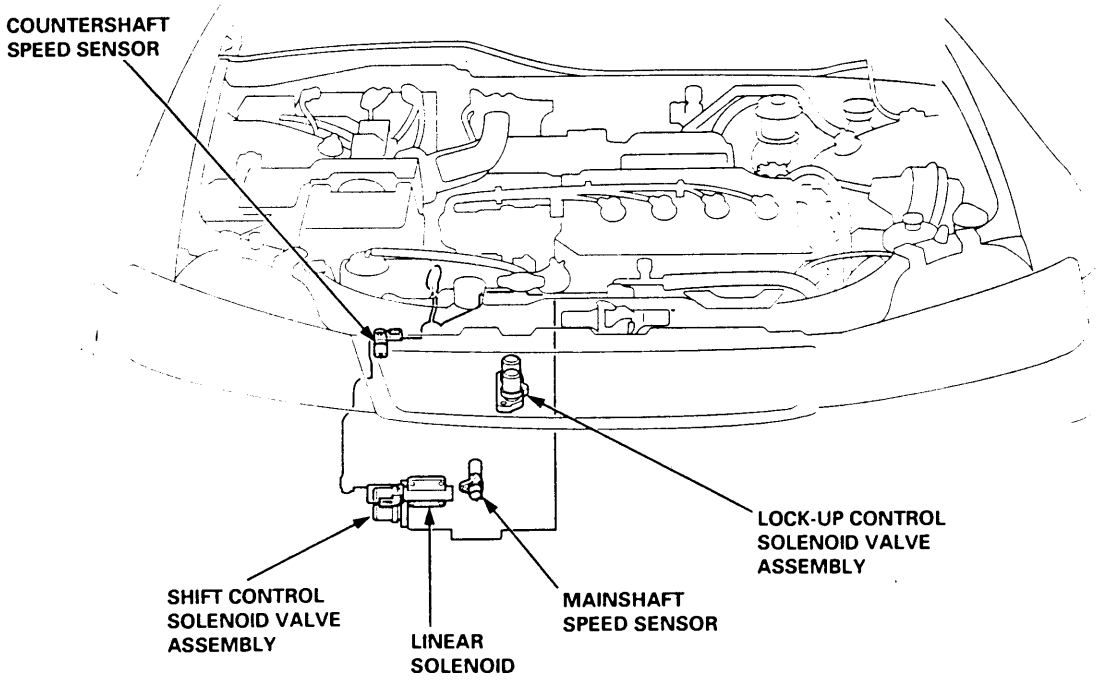
The PCM switches solenoid valve B on and off rapidly under certain conditions. The slight lock-up and half lock-up regions are maintained so as to lock the torque converter properly.

NOTE: When used, "left" or "right" indicates direction on the hydraulic circuit.

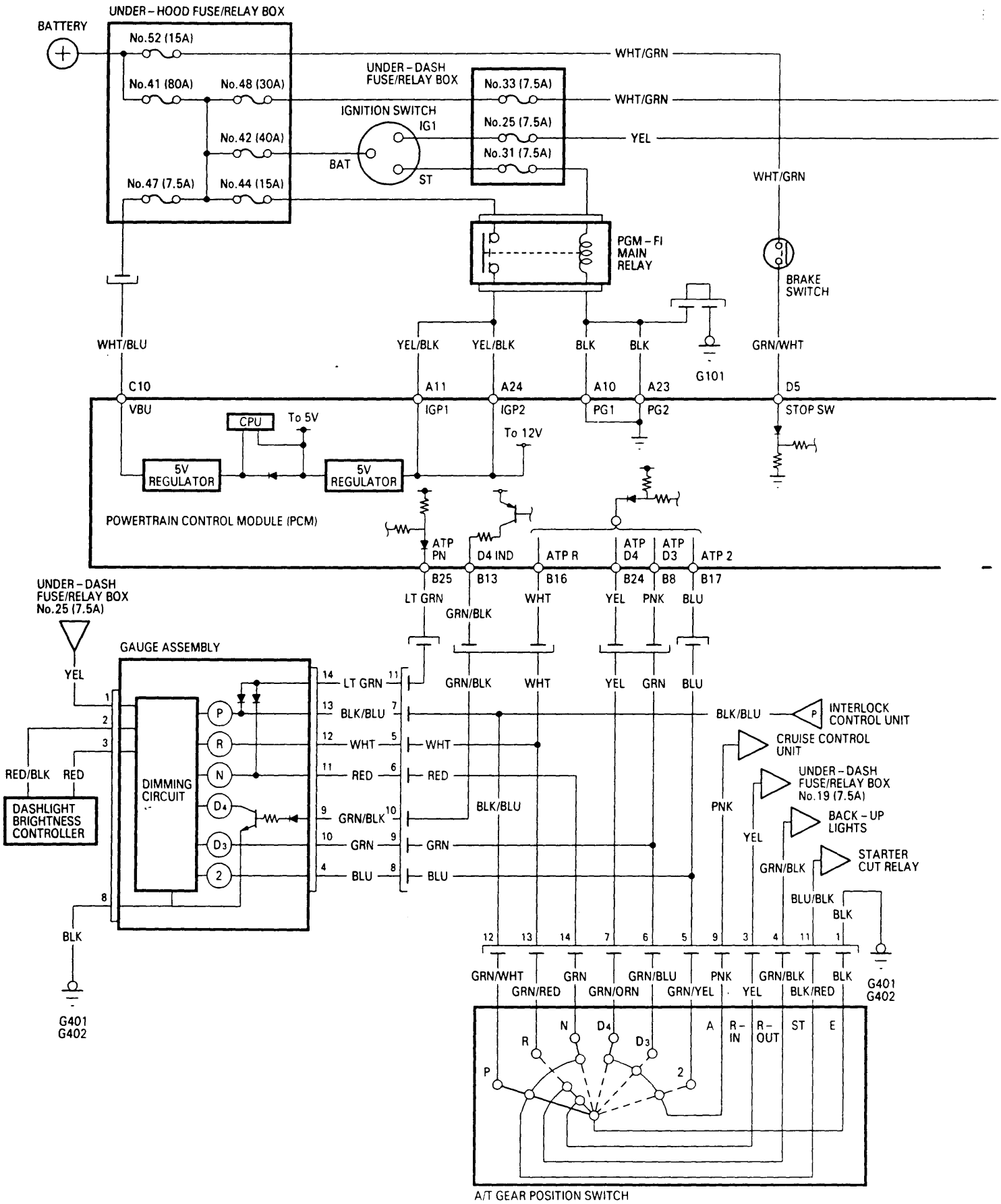


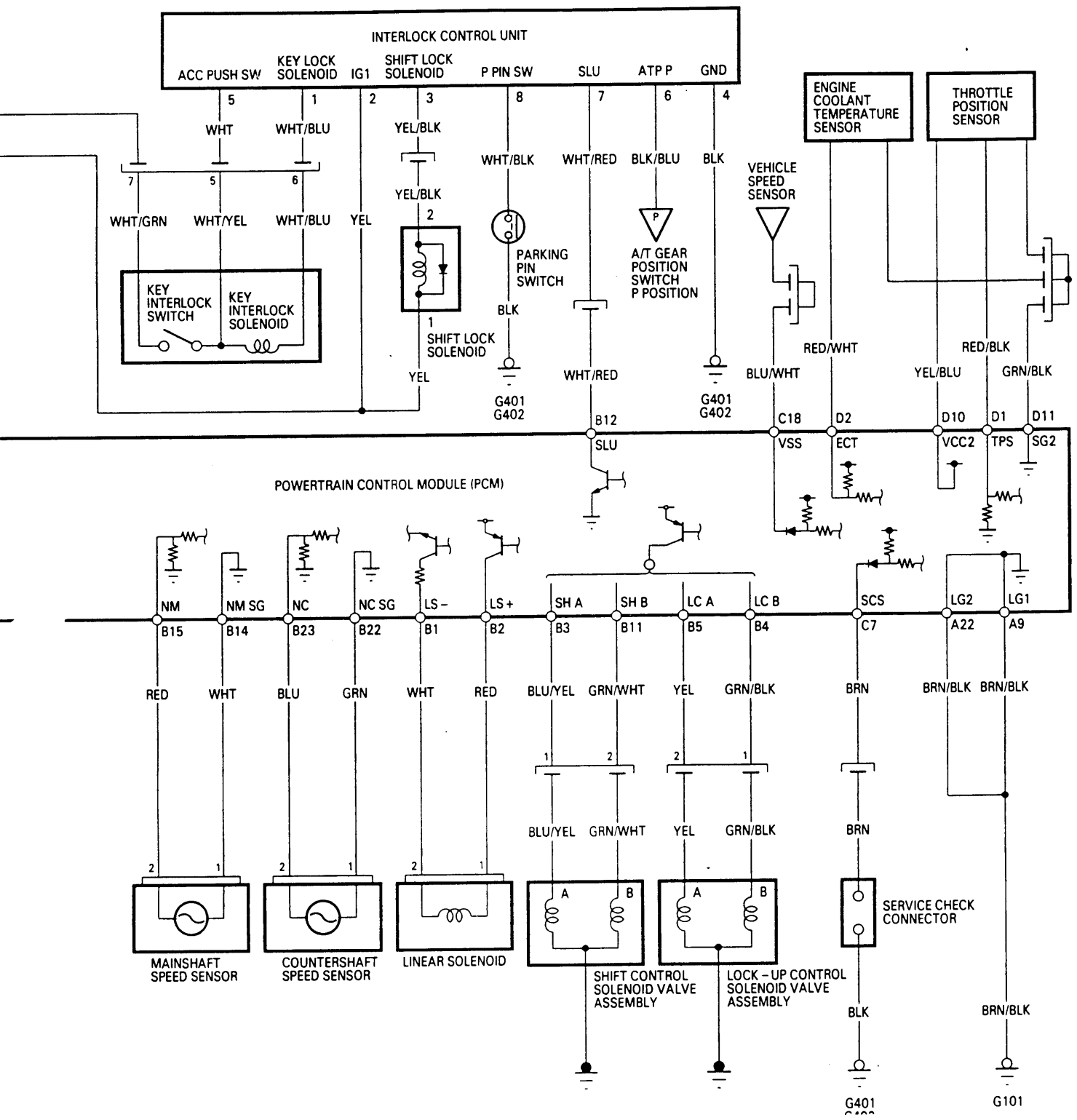
Component Locations



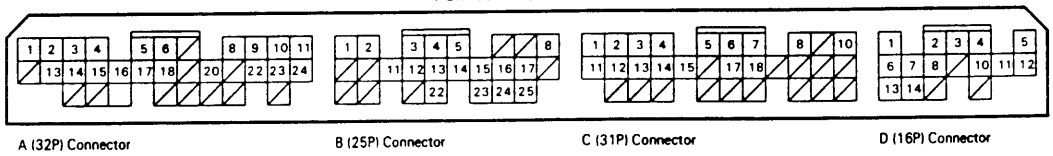


PCM Circuit Diagram (A/T Control System)





PCM Terminal Locations



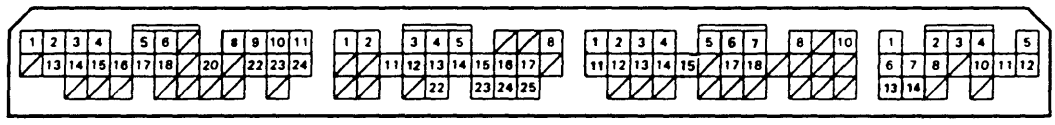
A (32P) Connector B (25P) Connector C (31P) Connector D (16P) Connector

PCM Terminal Voltage/Measuring Conditions

A/T Control System

The PCM terminal voltage and measuring conditions are shown for the connector terminals related to the A/T control system. The other PCM terminal voltage and measuring conditions are described in section 11.

PCM Terminal Locations



A (32P) Connector B (25P) Connector C (31P) Connector D (16P) Connector

PCM CONNECTOR A (32P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
A1 to A8	– see section 11 –		
A9	LG1	Ground	
A10	PG1	Ground	
A11	IGP1	Power supply system	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
A12 to A21	– see section 11 –		
A22	LG2	Ground	
A23	PG2	Ground	
A24	IGP2	Power supply system	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
A25 to A32	– see section 11 –		

PCM CONNECTOR B (25P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
B1	LS–	Linear solenoid power supply negative electrode	Ignition switch ON (II): Pulsing signal
B2	LS+	Linear solenoid power supply positive electrode	Ignition switch ON (II): Pulsing signal
B3	SHA	Shift control solenoid valve A control	In 2nd gear and 3rd gear in D3, D4 position, and in 2 position: Battery voltage In 1st gear and 4th gear in D3, D4 position: 0 V
B4	LCB	Lock-up control solenoid valve B control	With half lock-up, full lock-up, and during deceleration: Pulsing 0 V and battery voltage With no lock-up: 0 V
B5	LCA	Lock-up control solenoid valve A control	When lock-up is ON: Battery voltage With no lock-up: 0 V
B6 to B7	—	Not used	
B8	ATP D3	A/T gear position switch D3 position signal input	In D3 position: 0 V In other than D3 position: Battery voltage
B9 to B10	—	Not used	

PCM CONNECTOR B (25P) (cont'd)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
B11	SHB	Shift control solenoid valve B control	In 1st gear and 2nd gear in D3, D4 position, and in 2 position: Battery voltage In 3rd gear in D3, D4 position and 4th gear in D4 position: 0 V
B12	SLU	Interlock control	When ignition switch is ON (II), brake pedal depressed and accelerator pedal released: 0 V
B13	D4 IND	D4 Indicator light control	When ignition switch is first turned ON (II): Battery voltage for two seconds In D4 position: Battery voltage
B14	NMSG	Mainshaft speed sensor ground	Always: 0 V
B15	NM	Mainshaft speed sensor signal input	Depending on engine speed: Pulsing signal When engine is stopped: 0 V
B16	ATP R	A/T gear position switch R position signal input	In R position: 0 V In other than R position: Battery voltage
B17	ATP 2	A/T gear position switch 2 position signal input	In 2 position: 0 V In other than 2 position: Battery voltage
B18 to B21	—	Not used	
B22	NCSG	Countershaft speed sensor ground	Always: 0 V
B23	NC	Countershaft speed sensor signal input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: 0 V
B24	ATP D4	A/T gear position switch D4 position signal input	In D4 position: 0 V In other than D4 position: 5 V
B25	ATP PN	A/T gear position switch P and N position signals input	In P and N positions: 0 V In other than P and N positions: Battery voltage

PCM CONNECTOR C (31P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
C1 to C6	– see section 11 –		
C7	SCS	Service check signal	With ignition switch ON (II) and service check connector open: 5 V With ignition switch ON (II) and service check connector connected with special tool: 0 V
C8 to C9	– see section 11 –		
C10	VBU	Back-up power system	Always battery voltage
C11 to C31	– see section 11 –		

PCM CONNECTOR D (16P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
D1 to D4	– see section 11 –		
D5	STOP SW	Brake switch signal input	With ignition switch ON (II) and brake pedal depressed: Battery voltage With ignition switch ON (II) and brake pedal released: 0 V
D6 to D16	– see section 11 –		

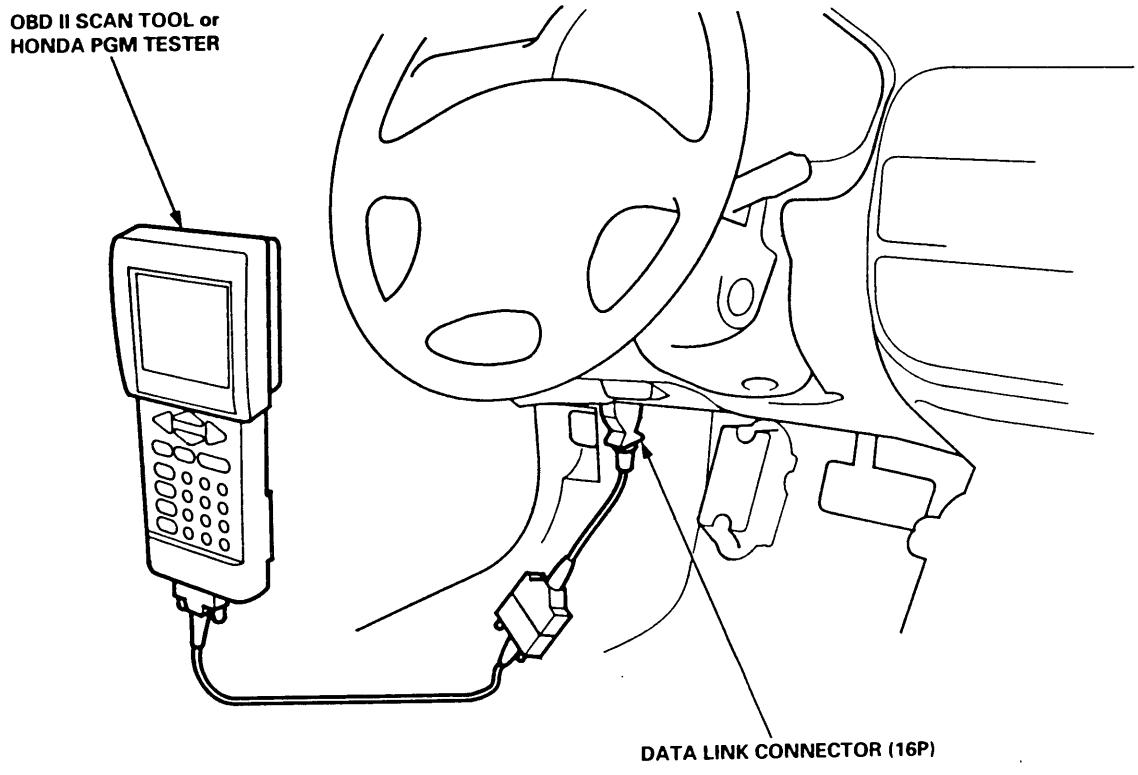
Troubleshooting Procedures

Checking the Diagnostic Trouble Code (DTC)
with an OBD II Scan tool or Honda PGM Tester

When the PCM senses an abnormality in the input or output systems, the D4 indicator light in the gauge assembly will blink. When the 16P Data Link Connector (DLC) (located under the dash on the driver's side) is connected to the OBD II Scan Tool or Honda PGM Tester as shown, the scan tool or tester will indicate the Diagnostic Trouble Code (DTC) when the ignition switch is turned ON(II).

When the D4 indicator light has been reported on, connect the OBD II Scan Tool conforming to SAE J1978 or Honda PGM Tester to the DLC (16P). Turn the ignition switch on (II), and observe the DTC on the screen of the OBD II Scan Tool or Honda PGM Tester. After determining the DTC, refer to the electrical system Symptom-to-Component Chart on pages 14-48 and 14-49.

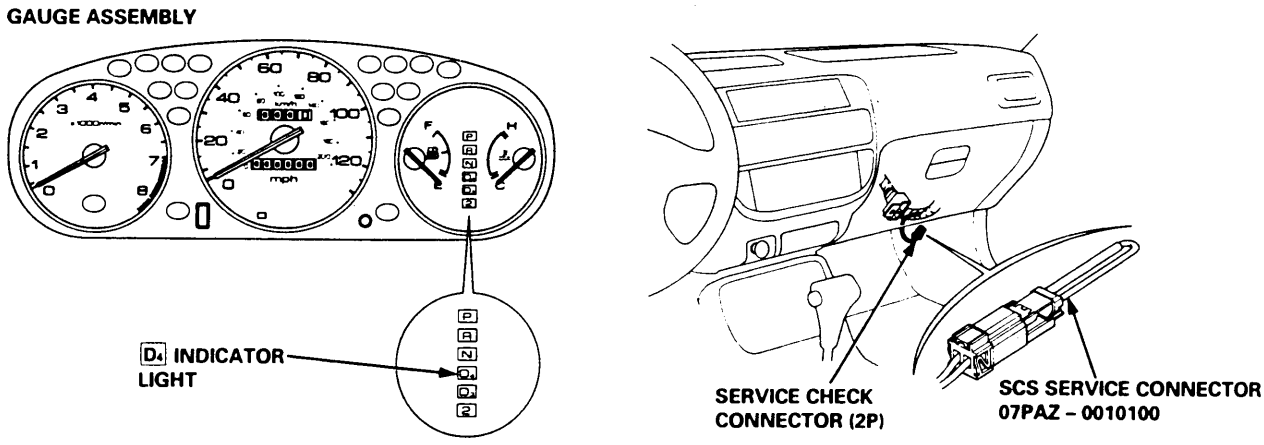
NOTE: See the OBD II Scan Tool or Honda PGM Tester user's manual for specific instruction.



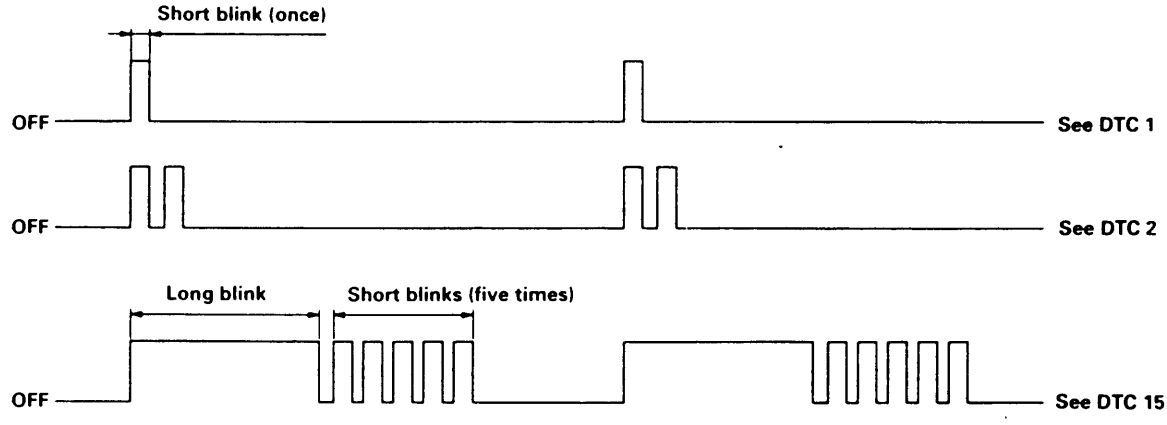
Checking the Diagnostic Trouble Code (DTC)
with the Service Check Connector and Special Tool

When the PCM senses an abnormality in the input or output systems, the D4 indicator light in the gauge assembly will blink. When the Service Check Connector (located under the dash on the passenger side) is connected with the special tool as shown, the D4 indicator light will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned on (II).

When the D4 indicator light has been reported on, connect the Service Check Connector (2P) with the special tool. Then turn on (II) the ignition switch and observe the D4 indicator light.



Codes 1 through 9 are indicated by individual short blinks. Codes 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. After determining the code, refer to the electrical system Symptom-to Component Chart on pages 14-48 and 14-49.

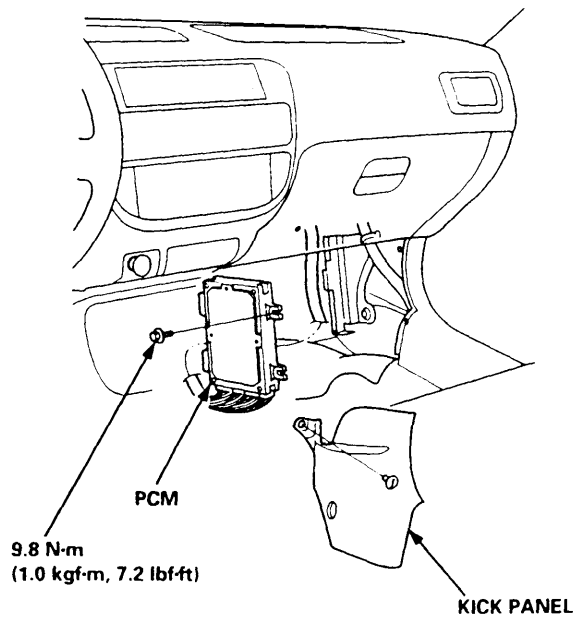


(cont'd)

(cont'd)

1. Remove the kick panel on the passenger's side (see section 20).

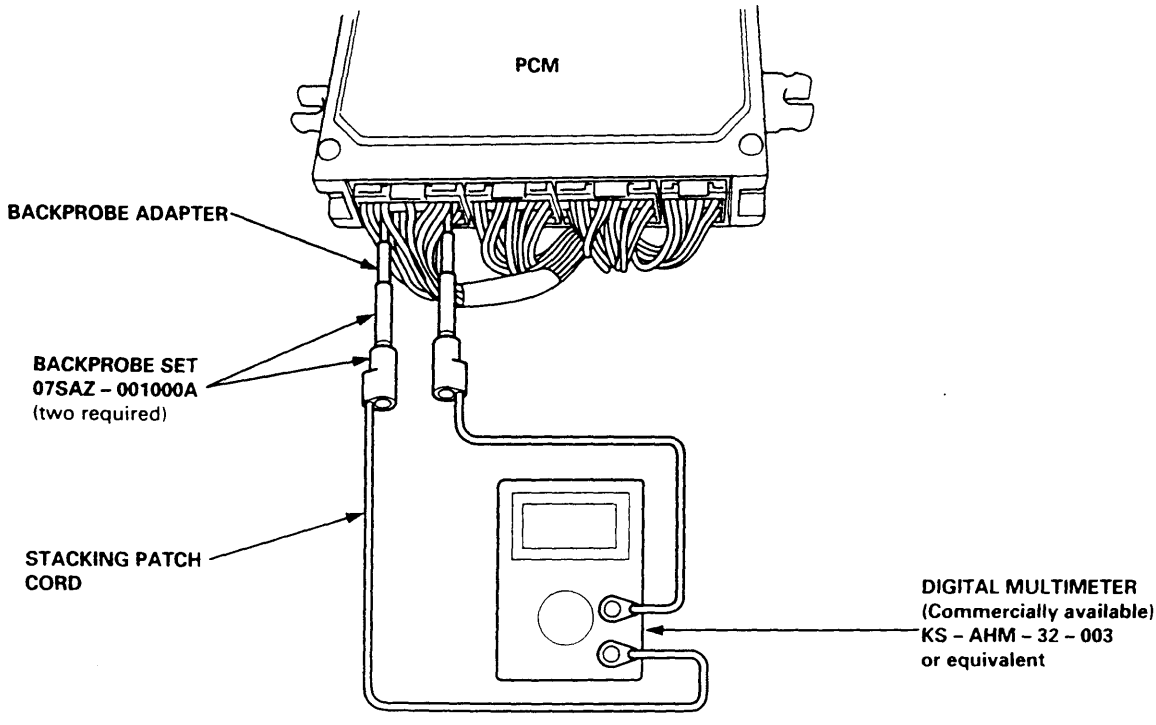
2. Remove the PCM, and turn the PCM over.



3. Inspect the circuit on the PCM according to the troubleshooting flowchart with the special tools and a digital multimeter as shown.

How to Use the Backprobe Set

Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. 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 comes in contact with the terminal end of the wire.

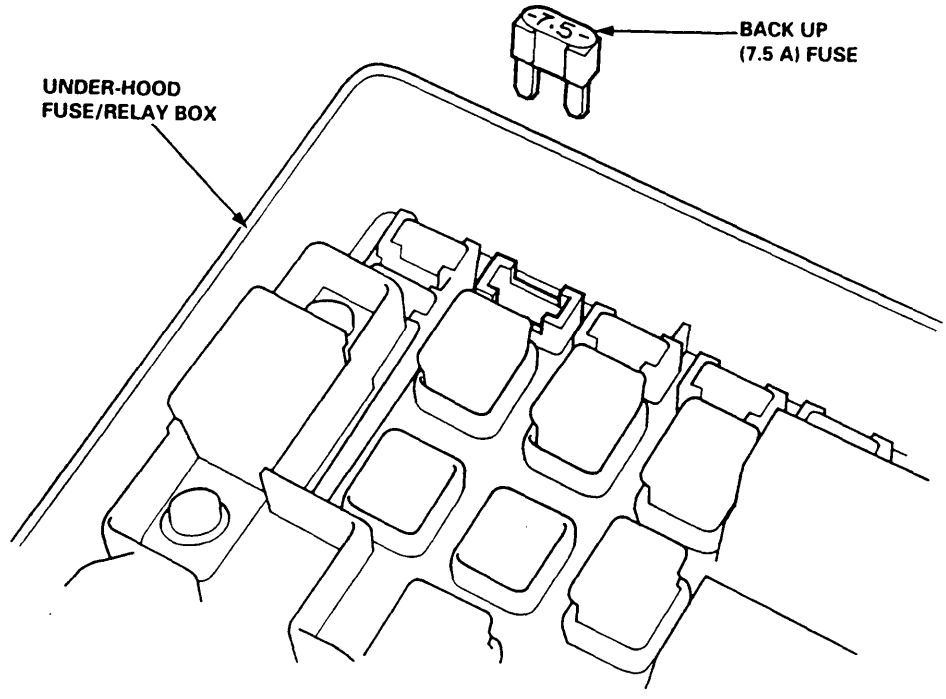


- **PCM Reset Procedure**

1. Turn the ignition switch off.

2. Remove the BACK UP fuse (7.5 A) from the under-hood fuse/relay box for 10 seconds to reset the PCM.

   NOTE:
   - Disconnecting the BACK UP fuse also cancels the radio preset stations and clock setting. Make note of the radio presets before removing the fuse so you can reset them.
   - The PCM memory cannot be cleared by using the OBD II Scan Tool or Honda PGM Tester; be sure to remove the BACK UP fuse to reset the PCM.



- **Final Procedure**

NOTE: This procedure must be done after any troubleshooting.

1. Turn the ignition switch OFF.

2. Reset the PCM.

3. Disconnect the OBD II Scan Tool or Honda PGM Tester from the Data Link Connector (16P), or remove the special tool from the Service Check Connector (2P).

4. Turn the ignition switch ON (II), and set the radio presets and clock setting.

Symptom-to-Component Chart

Electrical System

Diagnostic Trouble Code (DTC)*	D4 Indicator Light	Symptom	Possible Cause	Refer to Page
P1753 (1)	Blinks	• Lock-up clutch does not engage. • Lock-up clutch does not disengage. • Unstable idle speed.	• Disconnected lock-up control solenoid valve connector • Short or open in lock-up control solenoid valve A wire • Faulty lock-up control solenoid valve A	14-50
P1758 (2)	Blinks	• Lock-up clutch does not engage.	• Disconnected lock-up control solenoid valve connector • Short or open in lock-up control solenoid valve B wire • Faulty lock-up control solenoid valve B	14-52
P1705 (5)	Blinks	• Fails to shift other than 2nd – 4th gears. • Lock-up clutch does not engage.	• Short in A/T gear position switch wire • Faulty A/T gear position switch	14-54
P1706 (6)	OFF	• Fails to shift other than 2nd – 4th gears. • Lock-up clutch does not engage. • Lock-up clutch engages and disengages alternately.	• Disconnected A/T gear position switch connector • Open in A/T gear position switch wire • Faulty A/T gear position switch	14-56
P0753 (7)	Blinks	• Fails to shift (between 1st – 4th gear only).	• Disconnected shift control solenoid valve connector • Short or open in shift control solenoid valve A wire • Faulty shift control solenoid valve A	14-58
P0758 (8)	Blinks	• Fails to shift (between 3rd – 4th gear only).	• Disconnected shift control solenoid valve connector • Short or open in shift control solenoid valve B wire • Faulty shift control solenoid valve B	14-60
P0720 (9)	Blinks	• Lock-up clutch does not engage.	• Disconnected countershaft speed sensor connector • Short or open in countershaft speed sensor wire • Faulty countershaft speed sensor	14-62

(DTC)*: The DTC in parentheses is the code the D4 indicator light blinks when the service check connector is connected with the special tool (SCS service connector).

Diagnostic Trouble Code (DTC)*	D4 Indicator Light	Symptom	Possible Cause	Refer to Page
P0715 (15)	OFF	• Transmission jerks hard when shifting.	• Disconnected mainshaft speed sensor connector • Short or open in mainshaft speed sensor wire • Faulty mainshaft speed sensor	14-63
P1768 (16)	Blinks	• Transmission jerks hard when shifting. • Lock-up clutch does not engage.	• Disconnected linear solenoid connector • Short or open in linear solenoid wire • Faulty linear solenoid	14-65
P0740 (40)	OFF	• Lock-up clutch does not engage. • Lock-up clutch does not disengage. • Unstable idle speed.	• Faulty lock-up control system	14-66
P0730 (41)	OFF	• Fails to shift (between 1st – 3rd or 3rd – 4th gears only).	• Faulty shift control system	14-68
P0700 (none)	———	• Any automatic transmission problem To eliminate DTC P0700, troubleshoot the other automatic transmission problem(s) according to the DTC(s) indicated.		———

(DTC)*: The DTC in parentheses is the code the D4 indicator light blinks when the service check connector is connected with the special tool (SCS service connector).

NOTE: When the OBD II Scan Tool or Honda PGM Tester indicate the DTC(s) for the automatic transmission control system, the scan tool or tester also indicates code P0700 simultaneously. Code P0700 means detection of some automatic transmission problem on the PGM FI control system.

If the self-diagnostic D4 indicator light does not blink, perform an inspection according to the table below.

Symptom	Inspection	Ref. page
D4 indicator light does not come on for two seconds after ignition is first turned on (II).	———	14-70
D4 indicator light is on constantly (not blinking) whenever the ignition is on (II).	———	14-72
Shift lever cannot be moved from P position with the brake pedal depressed.	Check interlock system-Shift lock system	14-73
Ignition key cannot be moved from ACC (I) position to LOCK (0) position while pushing the ignition key with the shift lever is in P position.	Check interlock system-Key interlock system	14-75

NOTE:

- If a customer describes the symptom for code P1706 (6), it will be necessary to recreate the symptom by test-driving, then recheck the DTC.
- The D4 indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously. Check the PGM-FI system according to the DTC, then reset the memory by removing the BACK UP (RADIO) fuse in the under-hood fuse/relay box for more than 10 seconds. Drive the vehicle for several minutes at a speed over 30 mph (50 km/h), then recheck the DTC.
- Disconnecting the BACK UP (RADIO) fuse also cancels the radio anti-theft code, preset stations and the clock setting. Get the customer's code number, and make note of the radio presets before removing the fuse so you can reset them.

Troubleshooting Flowchart — Lock-up Control Solenoid Valve A

- OBD II Scan Tool indicates Code P1753.
- Self-diagnosis D4 indicator light blinks once.

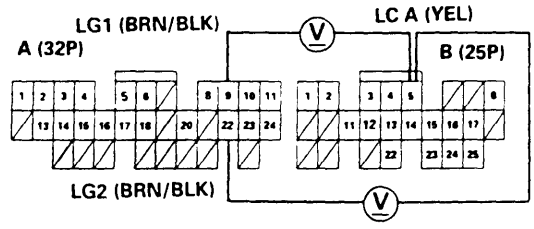
Possible Cause

- Disconnected lock-up control solenoid valve connector
- Short or open in lock-up control solenoid valve A wire
- Faulty lock-up control solenoid valve A

Check for a Short to Power:

1. Turn the ignition switch OFF.
2. Disconnect the A (32P) and B (25P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B5 and A9 or A22 terminals.

PCM CONNECTORS



Wire side of female terminals

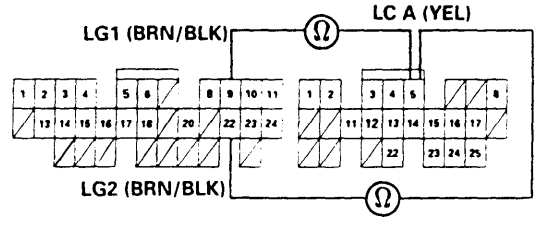
Is there voltage?

YES → **Repair short to power in the wire between the B5 terminal and the lock-up control solenoid valve A.**

NO

Measure Lock-up Control Solenoid Valve A Resistance:

1. Turn the ignition switch OFF.
2. Measure the resistance between the B5 and A9 or A22 terminals.



Is the resistance 14 – 25 Ω?

YES → **Check for loose PCM connectors. If necessary, substitute a known-good solenoid valve assembly or PCM and recheck.**

NO

To page 14-51

From page 14-50

Check Lock-up Control Solenoid Valve A for a Short Circuit:
1. Disconnect the 2P connector from the lock-up control solenoid valve assembly.
2. Check for continuity between the B5 and A9 or A22 terminals.

Is there continuity?

YES → **Repair short to ground in the wire between the B5 terminal and the lock-up control solenoid valve A.**

NO

Measure Lock-up Control Solenoid Valve A Resistance at the Solenoid Connector:
Measure the resistance between the No. 2 terminal of the lock-up control solenoid connector and body ground.

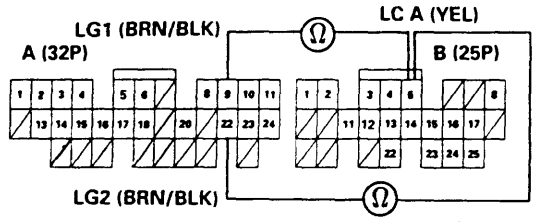
Is the resistance 14 – 25 Ω?

YES → **Check for open in the wire between the B5 terminal and the lock-up control solenoid valve A.**

NO

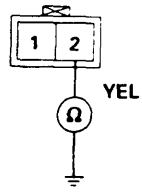
Replace the lock-up control solenoid valve assembly.

PCM CONNECTORS



Wire side of female terminals

LOCK-UP CONTROL SOLENOID CONNECTOR



Terminal side of male terminals

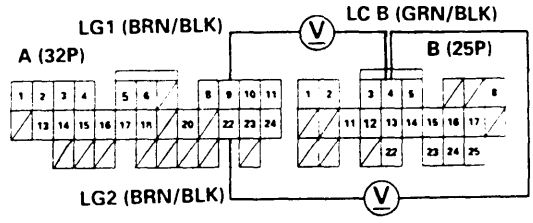
Troubleshooting Flowchart — Lock-up Control Solenoid Valve B

- **OBD II Scan Tool indicates Code P1758.**
- **Self-diagnosis D4 indicator light blinks twice.**

Possible Cause
• Disconnected lock-up control solenoid valve connector • Short or open in lock-up control solenoid valve B wire • Faulty lock-up control solenoid valve B

Check for a Short to Power:
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) and B (25P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B4 and A9 or A22 terminals.

PCM CONNECTORS



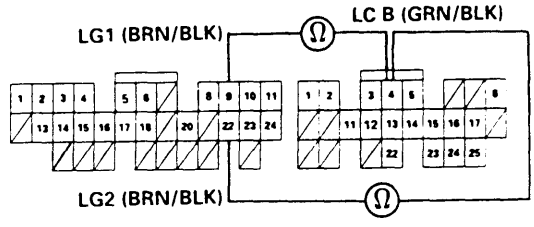
Wire side of female terminals

Is there voltage?

YES → **Repair short to power in the wire between the B4 terminal and the lock-up control solenoid valve B.**

NO

Measure Lock-up Control Solenoid Valve B Resistance:
1. Turn the ignition switch OFF.
2. Measure the resistance between the B4 and A9 or A22 terminals.



Is the resistance 14 – 25 Ω?

YES → **Check for loose PCM connectors. If necessary, substitute a known-good solenoid valve assembly or PCM and recheck.**

NO

To page 14-53

From page 14-52

Check Lock-up Control Solenoid Valve B for a Short Circuit:
1. Disconnect the 2P connector from the lock-up control solenoid valve assembly.
2. Check for continuity between the B4 and A9 or A22 terminals.

Is there continuity?

YES → **Repair short to ground in the wire between the B4 terminal and the lock-up control solenoid valve B.**

NO

Measure Lock-up Control Solenoid Valve B Resistance at the Solenoid Connector:
Measure the resistance between the No. 1 terminal of the lock-up control solenoid connector and body ground.

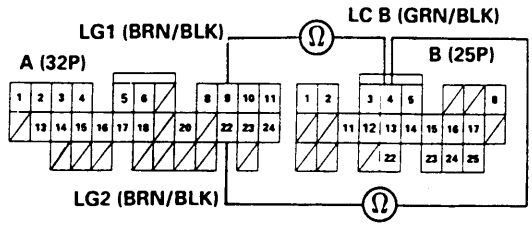
Is the resistance 14 – 25 Ω?

YES → **Check for open in the wire between the B4 terminal and the lock-up control solenoid valve B.**

NO

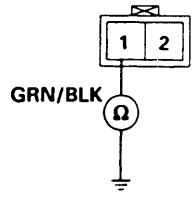
Replace the lock-up control solenoid valve assembly.

PCM CONNECTORS



Wire side of female terminals

LOCK-UP CONTROL SOLENOID CONNECTOR



Terminal side of male terminals

Troubleshooting Flowchart — A/T Gear Position Switch (Short)

- **OBD II Scan Tool indicates Code P1705.**
- **Self-diagnosis D4 indicator light blinks five times.**

Possible Cause
• Short in A/T gear position switch wire • Faulty A/T gear position switch

NOTE: Code P1705 (5) is caused when the PCM receives two gear position inputs at the same time.

Observe the A/T Gear Position Indicator:
1. Turn the ignition switch ON (II).
2. Observe the A/T gear position indicator, and shift to each position.

Do any indicators stay on when the shift lever is not in those positions?

NO → **The system is OK at this time. Check the wire harness for damage.**

YES

Disconnect the A/T gear position switch connector.

Do all gear position indicators go out?

YES → **Replace the A/T gear position switch.**

NO

Reconnect the A/T gear position switch connector.

Measure ATP R Voltage:
1. Shift to all positions other than R.
2. Measure the voltage between the B16 and A9 or A22 terminals.

Is there battery voltage?

NO → **Check for short in the wire between the B16 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.**

YES

Measure ATP PN Voltage:
1. Shift to all positions other than N or P.
2. Measure the voltage between the B25 and A9 or A22 terminals.

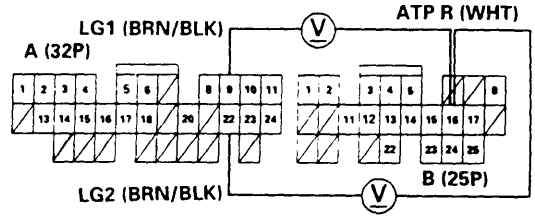
Is there battery voltage?

NO → **Check for short in the wire between the B25 terminal and the A/T gear position indicator, or short in the P or N position wire between the A/T gear position indicator and the A/T gear position switch. If wires are OK, check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.**

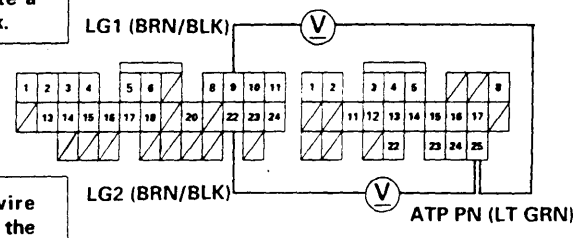
YES

To page 14-55

PCM CONNECTORS



Wire side of female terminals



From page 14-54

Measure ATP D4 Voltage:
1. Shift to all positions other than [D4].
2. Measure the voltage between the B24 and A9 or A22 terminals.

Is there approx. 5 V?

NO

Check for short in the wire between the B24 terminal and the A/T gear position switch. If wire is OK, check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

YES

Measure ATP D3 Voltage:
1. Shift to all positions other than [D3].
2. Measure the voltage between the B8 and A9 or A22 terminals.

Is there battery voltage?

NO

Check for short in the wire between the B8 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

YES

Measure ATP2 Voltage:
1. Shift to all positions other than [2].
2. Measure the voltage between the B17 and A9 or A22 terminals.

Is there battery voltage?

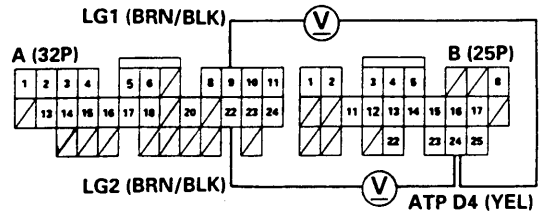
NO

Check for short in the wire between the B17 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

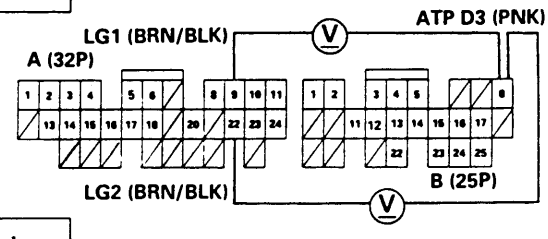
YES

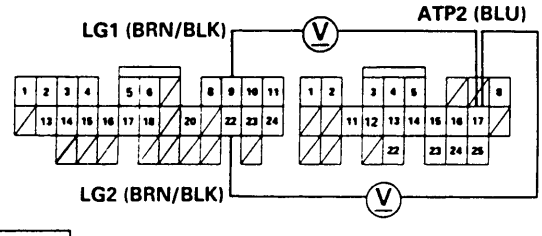
Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminals





Troubleshooting Flowchart — A/T Gear Position Switch (Open)

- **OBD II Scan Tool indicates Code P1706.**
- **Self-diagnosis [D4] indicator light blinks six times.**

Possible Cause
• Disconnected A/T gear position switch connector • Open in A/T gear position switch wire • Faulty A/T gear position switch

Test the A/T gear position switch (see page 14-81).

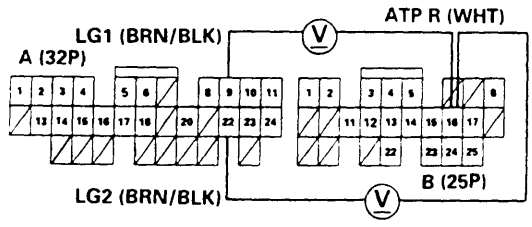
Is the switch OK?

NO → **Replace the A/T gear position switch.**

YES

Measure ATP R Voltage:
1. Turn the ignition switch ON (II).
2. Shift to [R] position.
3. Measure the voltage between the B16 and A9 or A22 terminals.

PCM CONNECTORS



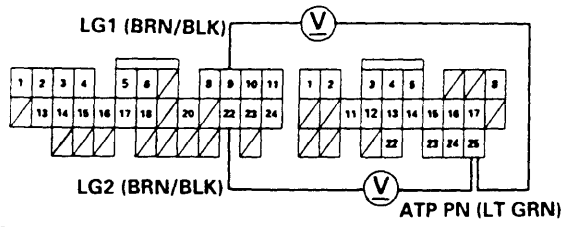
Wire side of female terminals

Is there voltage?

YES → **Repair open in the wire between the B16 terminal and the A/T gear position switch.**

NO

Measure ATP PN Voltage:
1. Shift to [N] or [P] position.
2. Measure the voltage between the B25 and A9 or A22 terminals.

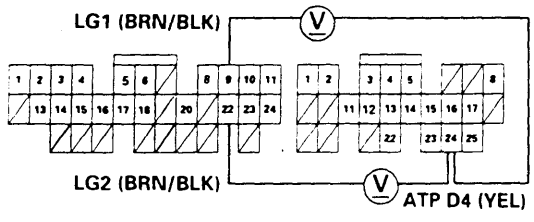


Is there voltage?

YES → **Repair open in the wire between the B25 terminal and the A/T gear position indicator or repair open in the [P] or [N] position wire between the A/T gear position switch and the A/T gear position indicator.**

NO

Measure ATP D4 Voltage:
1. Shift to [D4] position.
2. Measure the voltage between the B24 and A9 or A22 terminals.



Is there voltage?

YES → **Repair open in the wire between the B24 terminal and the A/T gear position switch.**

NO

To page 14-57

From page 14-56

Measure ATP D3 Voltage:
1. Shift to [D3] position.
2. Measure the voltage between the B8 and A9 or A22 terminals.

Is there voltage?

YES → **Repair open in the wire between the B8 terminal and the A/T gear position switch.**

NO

Measure ATP2 Voltage:
1. Shift to [2] position.
2. Measure the voltage between the B17 and A9 or A22 terminals.

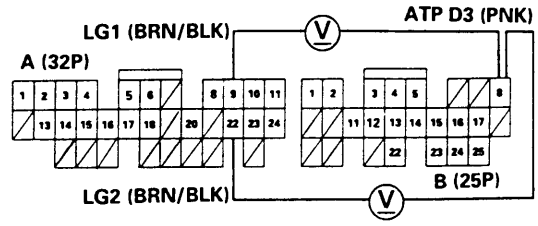
Is there voltage?

YES → **Repair open in the wire between the B17 terminal and the A/T gear position switch.**

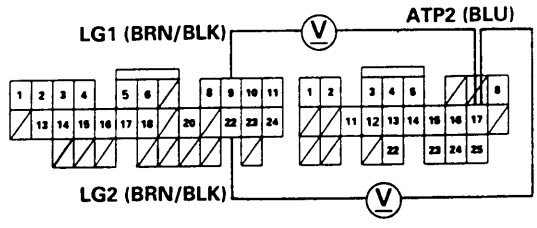
NO

Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

PCM CONNECTORS



Wire side of female terminals



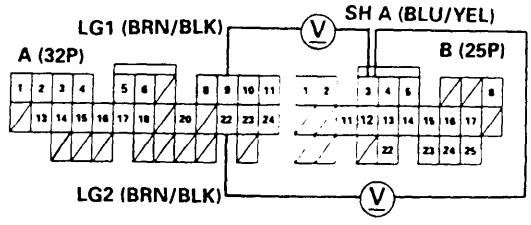
Troubleshooting Flowchart — Shift Control Solenoid Valve A

- **OBD II Scan Tool indicates Code P0753.**
- **Self-diagnosis D4 indicator light blinks seven times.**

Possible Cause
• Disconnected shift control solenoid valve connector • Short or open in shift control solenoid valve A wire • Faulty shift control solenoid valve A

Check for a Short to Power:
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) and B (25P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B3 and A9 or A22 terminals.

PCM CONNECTORS



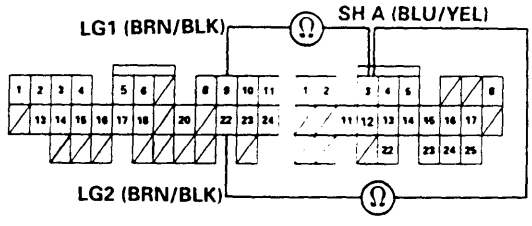
Wire side of female terminals

Is there voltage?

YES → **Repair short to power in the wire between the B3 terminal and the shift control solenoid valve A.**

NO

Measure Shift Control Solenoid Valve A Resistance:
1. Turn the ignition switch OFF.
2. Measure the resistance between the B3 and A9 or A22 terminals.



Is the resistance 14 – 25 Ω?

YES → **Check for loose PCM connectors. If necessary, substitute a known-good solenoid valve assembly or PCM and recheck.**

NO

To page 14-59

From page 14-58

Check Shift Control Solenoid Valve A for a Short Circuit:
1. Disconnect the 2P connector from the shift control solenoid valve assembly.
2. Check for continuity between the B3 and A9 or A22 terminals.

Is there continuity?

YES → **Repair short to ground in the wire between the B3 terminal and the shift control solenoid valve A.**

NO

Measure Shift Control Solenoid Valve A Resistance at the Solenoid Connector:
Measure the resistance between the No. 1 terminal of the shift control solenoid connector and body ground.

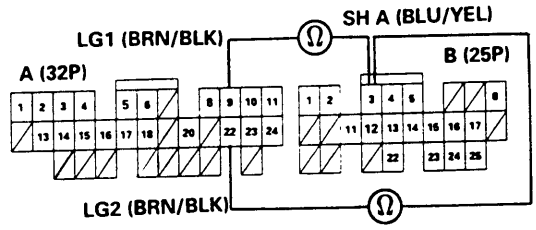
Is the resistance 14 – 25 Ω?

YES → **Check for open in the wire between the B3 terminal and the shift control solenoid valve A.**

NO

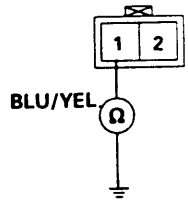
Replace the shift control solenoid valve assembly.

PCM CONNECTORS



Wire side of female terminals

SHIFT CONTROL SOLENOID CONNECTOR



Terminal side of male terminals

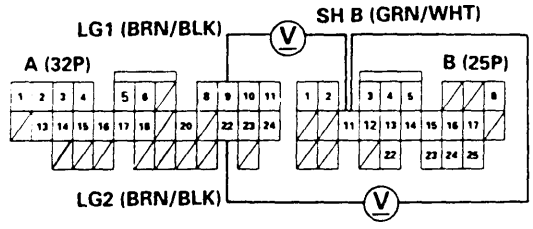
Troubleshooting Flowchart — Shift Control Solenoid Valve B

- **OBD II Scan Tool indicates Code P0758.**
- **Self-diagnosis D4 indicator light blinks eight times.**

Possible Cause
• Disconnected shift control solenoid valve connector • Short or open in shift control solenoid valve B wire • Faulty shift control solenoid valve B

Check for a Short to Power:
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) and B (25P) connectors from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B11 and A9 or A22 terminals.

PCM CONNECTORS



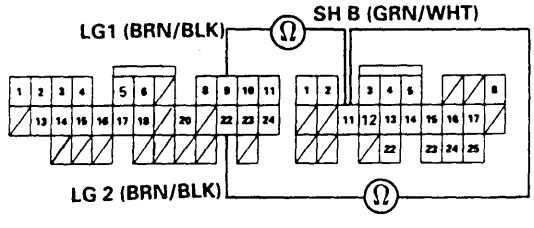
Wire side of female terminals

Is there voltage?

YES → **Repair short to power in the wire between the B11 terminal and the shift control solenoid valve B.**

NO

Measure Shift Control Solenoid Valve B Resistance:
1. Turn the ignition switch OFF.
2. Measure the resistance between the B11 and A9 or A22 terminals.



Is the resistance 14 – 25 Ω?

YES → **Check for loose PCM connectors. If necessary, substitute a known-good solenoid valve assembly or PCM and recheck.**

NO

To page 14-61

From page 14-60

Check Shift Control Solenoid Valve B for a Short Circuit:
1. Disconnect the 2P connector from the shift control solenoid valve assembly.
2. Check for continuity between the B11 and A9 or A22 terminals.

Is there continuity?

YES → **Repair short to ground in the wire between the B11 terminal and the shift control solenoid valve B.**

NO

Measure Shift Control Solenoid Valve B Resistance at the Solenoid Connector:
Measure the resistance between the No. 2 terminal of the shift control solenoid connector and body ground.

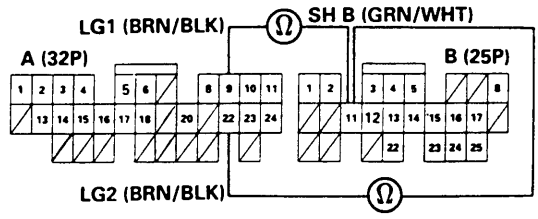
Is the resistance 14 – 25 Ω?

YES → **Check for open in the wire between the B11 terminal and the shift control solenoid valve B.**

NO

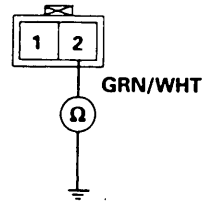
Replace the shift control solenoid valve assembly.

PCM CONNECTORS



Wire side of female terminals

SHIFT CONTROL SOLENOID CONNECTOR



Terminal side of male terminals

Troubleshooting Flowchart — Countershaft Speed Sensor

- **OBD II Scan Tool indicates Code P0720.**
- **Self-diagnosis D4 indicator light blinks nine times.**

Possible Cause

- **Loose or faulty connection between the PCM and vehicle harness**
- **Disconnected countershaft speed sensor connector**
- **Short or open in countershaft speed sensor wire**
- **Faulty countershaft speed sensor**

Check the countershaft speed sensor installation.

Is the countershaft speed sensor installed properly? — NO → **Reinstall and recheck.**

YES

Measure Countershaft Speed Sensor Resistance at the Sensor Connector:
1. Disconnect the 2P connector from the countershaft speed sensor connector.
2. Measure the resistance of the countershaft speed sensor.

Is the resistance 400 – 600 Ω? — NO → **Replace the countershaft speed sensor.**

YES

Check Countershaft Speed Sensor for a Short Circuit:
1. Disconnect the B (25P) connector from the PCM.
2. Check for continuity between the body ground and the B23 terminal and B22 terminal individually.

Is there continuity? — YES → **Repair short in the wires between the B23 and B22 terminals and the countershaft speed sensor.**

NO

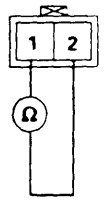
Measure Countershaft Speed Sensor Resistance:
1. Connect the countershaft speed sensor connector.
2. Measure the resistance between the B23 and B22 terminals.

Is the resistance 400 – 600 Ω? — NO → **Repair loose terminal or open in the wires between the B23 and B22 terminals and the countershaft speed sensor.**

YES

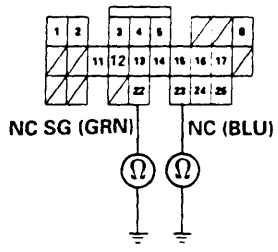
Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

COUNTERSHAFT SPEED SENSOR CONNECTOR

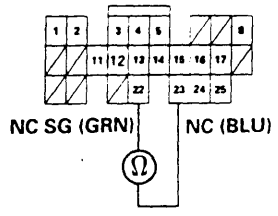


Terminal side of male terminals

PCM CONNECTOR B (25P)



Wire side of female terminals



Troubleshooting Flowchart — Mainshaft Speed Sensor

- **OBD II Scan Tool indicates Code P0715.**
- **Self-diagnosis D4 indicator light indicates Code 15.**

Possible Cause

- **Disconnected mainshaft speed sensor connector**
- **Short or open in mainshaft speed sensor wire**
- **Faulty mainshaft speed sensor**

NOTE: Code P0715(15) on the PCM doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code P0715(15) may also indicate a mechanical problem in the transmission.

Check the mainshaft and countershaft speed sensor installation.

Are the mainshaft and countershaft speed sensor installed properly?

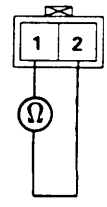
NO → **Reinstall and recheck.**

YES

Measure Mainshaft Speed Sensor Resistance at the Sensor Connector:

1. Disconnect the 2P connector from the mainshaft speed sensor connector.
2. Measure the resistance of the mainshaft speed sensor.

MAINSHAFT SPEED SENSOR CONNECTOR



Terminal side of male terminals

Is the resistance 400 – 600 Ω?

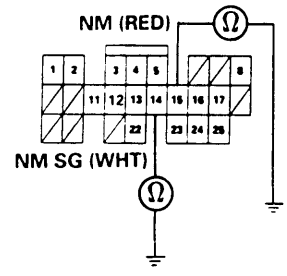
NO → **Replace the mainshaft speed sensor.**

YES

Check Mainshaft Speed Sensor for a Short Circuit:

1. Disconnect the B (25P) connector from the PCM.
2. Check for continuity between body ground and B15 terminal and the B14 terminal individually.

PCM CONNECTOR B (25P)



Wire side of female terminals

Is there continuity?

YES → **Repair short in the wires between the B15 and B14 terminals and the mainshaft speed sensor.**

NO

To page 14-64

(cont'd)

Troubleshooting Flowchart — Mainshaft Speed Sensor (cont'd)

From page 14-63

Measure Mainshaft Speed Sensor Resistance:
1. Connect the mainshaft speed sensor 2P connector.
2. Measure the resistance between the B15 and B14 terminals.

Is the resistance 400 – 600 Ω?

YES → **Run the Electrical Troubleshooting Flowchart for code P0720 (9). Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.**

NO

Check NM Wire Continuity:
1. Disconnect the 2P connector from the mainshaft speed sensor connector.
2. Check for continuity between the B15 terminal and the No. 2 terminal of the mainshaft speed sensor connector.

Is there continuity?

NO → **Repair open in the wire between the B15 terminal and the mainshaft speed sensor.**

YES

Check NMSG Wire Continuity:
Check for continuity between the B14 terminal and the No. 1 terminal of the mainshaft speed sensor connector.

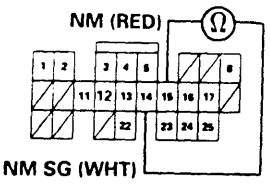
Is there continuity?

NO → **Repair open in the wire between the B14 terminal and the mainshaft speed sensor.**

YES

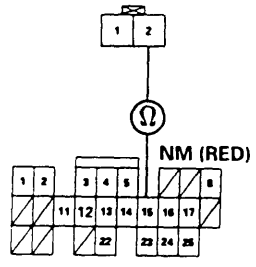
Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

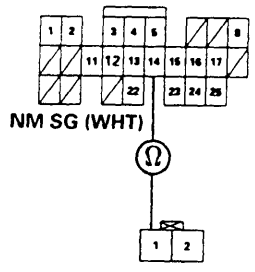
PCM CONNECTOR B (25P)



Wire side of female terminals

MAINSHAFT SPEED SENSOR CONNECTOR





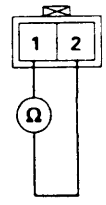
Troubleshooting Flowchart — Linear Solenoid

- **OBD II Scan Tool indicates Code P1768.**
- **Self-diagnosis D4 indicator light indicates Code 16.**

Possible Cause
• Disconnected linear solenoid connector • Short or open in linear solenoid wire • Faulty linear solenoid

Measure Linear Solenoid Resistance at the Solenoid Connector:
1. Disconnect the 2P connector from the linear solenoid connector.
2. Measure the resistance of the linear solenoid.

LINEAR SOLENOID CONNECTOR



Terminal side of male terminals

Is the resistance 4.0 – 9.0 Ω?

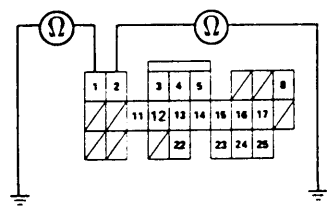
NO → **Replace the linear solenoid assembly.**

YES

Check Linear Solenoid for a Short Circuit:
1. Disconnect the B (25P) connector from the PCM.
2. Check for continuity between the body ground and the B1 terminal and B2 terminal individually.

PCM CONNECTOR B (25P)

LS – (WHT) LS + (RED)



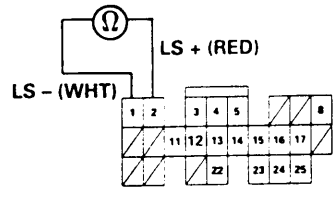
Wire side of female terminals

Is there continuity?

YES → **Repair short in the wires between the B1 and B2 terminals and the linear solenoid.**

NO

Measure Linear Solenoid Resistance:
1. Connect the linear solenoid connector.
2. Measure the resistance between the B1 and B2 terminals.



Is the resistance 4.0 – 9.0 Ω?

NO → **Repair loose terminal or open in the wires between the B1 and B2 terminals and the linear solenoid.**

YES

Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.

Troubleshooting Flowchart — Lock-up Control System

- **OBD II Scan Tool indicates Code P0740.**
- **Self-diagnosis D4 indicator light indicates Code 40.**

Possible Cause
Faulty Lock-up control system

Check for Another Code:
Check whether the OBD II scan tool or the D4 indicator light indicates another code.

Does the OBD II scan tool or the D4 indicator light indicate another code?

YES → **Perform the Troubleshooting Flowchart for the indicated Code(s). Recheck for code P0740 (40) after troubleshooting.**

NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

NO

Test Line Pressure:
Measure the line pressure (see page 14-96 and 14-97).

Is the line pressure within the service limit?

NO → **Repair the hydraulic system as necessary (see page 14-97).**

YES

Test 1st, 2nd, 3rd and 4th Clutch Pressure:
Measure the 1st, 2nd, 3rd and 4th clutch pressure (see page 14-96 thru 14-98).

Is each clutch pressure within the service limit?

NO → **Repair the hydraulic system as necessary (see page 14-96 thru 14-98).**

YES

Replace the Lock-up Control Solenoid Valve Assembly and Recheck:

1. Replace the lock-up control solenoid valve A/B assembly (see page 14-77).
2. Turn the ignition switch OFF and reset the PCM by removing the BACK UP (7.5 A) fuse in the under-hood fuse/relay box for more than 10 seconds.
3. Drive the vehicle at 50 mph (80 km/h) constantly for more than one minute.
4. Recheck for code P0740 (40).

Does the OBD II scan tool or the D4 indicator light indicate code P0740 (40)?

NO → **The system is OK at this time.**

YES

To page 14-67

From page 14-66

Replace the Linear Solenoid Assembly and Recheck:

1. Replace the linear solenoid assembly (see page 14-80).
2. Turn the ignition switch OFF and reset the PCM memory by removing the BACK UP (7.5 A) fuse in the under-hood fuse/relay box for more than 10 seconds.
3. Drive the vehicle at 50 mph (80 km/h) constantly for more than one minute.
4. Recheck for code P0740 (40).

Does the OBD II scan tool or the D4 indicator light indicate code P0740 (40)?

NO → **The system is OK at this time.**

YES

Replace the Torque Converter and Recheck:

1. Replace the torque converter.
2. Turn the ignition switch OFF and reset the PCM memory by removing the BACK UP (7.5 A) fuse in the under-hood fuse/relay box for more than 10 seconds.
3. Drive the vehicle at 50 mph (80 km/h) constantly for more than one minute.
4. Recheck for code P0740 (40).

Does the OBD II scan tool or the D4 indicator light indicate code P0740 (40)?

NO → **The system is OK at this time.**

YES

Replace the transmission.

Troubleshooting Flowchart — Shift Control System

- **OBD II Scan Tool indicates Code P0730.**
- **Self-diagnosis D4 indicator light indicates Code 41.**

Possible Cause
Faulty shift control system

Check for Another Code:
Check whether the OBD II scan tool or the D4 indicator light indicates another code.

Does the OBD II scan tool or the D4 indicator light indicate another code?

YES → **Perform the Troubleshooting Flowchart for the indicated Code(s). Recheck for code P0730 (41) after troubleshooting.**

NOTE: Do not continue with this troubleshooting until the causes of any other DTCs have been corrected.

NO

Test-drive and Recheck for Another Code:
1. Drive the vehicle at a speed over 12 mph (20 km/h) in 2nd, 3rd and 4th gear for more than 30 seconds.
2. Check whether the OBD II scan tool or the D4 indicator light indicates another code.

Does the OBD II scan tool or the D4 indicator light indicate another code?

YES → **Perform the Troubleshooting Flowchart for the indicated Code(s). Recheck for code P0730 (41) after troubleshooting.**

NO

Test 1st, 2nd, 3rd and 4th Clutch Pressure:
Measure the 1st, 2nd, 3rd and 4th clutch pressure (see page 14-96 thru 14-98).

Is each clutch pressure within the service limit?

NO → **Repair the hydraulic system as necessary (see page 14-96 thru 14-98).**

YES

To page 14-69

From page 14-68

Replace Shift Control Solenoid Valve Assembly and Recheck:

1. Replace the shift control solenoid valve A/B assembly (see page 14-78).
2. Turn the ignition switch OFF and reset the PCM memory by removing the BACK UP (7.5 A) fuse in the under-hood fuse/relay box for more than 10 seconds.
3. Drive the vehicle at over 12 mph (20 km/h) in 2nd, 3rd and 4th gear for more than 30 seconds.
4. Recheck for code P0730 (41).

Does the OBD II scan tool or the D4 indicator light indicate code P0730 (41)?

NO → **The system is OK at this time.**

YES

Replace Linear Solenoid Assembly and Recheck:

1. Replace the linear solenoid assembly (see page 14-80).
2. Turn the ignition switch OFF and reset the PCM memory by removing the BACK UP (7.5 A) fuse in the under-hood fuse/relay box for more than 10 seconds.
3. Drive the vehicle at over 12 mph (20 km/h) in 2nd, 3rd and 4th gear for more than 30 seconds.
4. Recheck for code P0730 (41).

Does the OBD II scan tool or the D4 indicator light indicate code P0730 (41)?

NO → **The system is OK at this time.**

YES

Replace the transmission.

Troubleshooting Flowchart — [D4] Indicator Light Does Not Come On

The [D4] indicator light does not come on when the ignition switch is first turned ON (II). (It should come on for about two seconds.)

Check the Service Check Connector:
Make sure the special tool (SCS Service Connector) is not connected to the service check connector.

Is the special tool (SCS Service Connector) connected to the service check connector?

YES → **Disconnect the special tool from the service check connector and recheck.**

NO

Check the [D4] indicator Light:
Shift to [D4] position.

Does the [D4] indicator light come on?

YES → **Check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.**

NO

Check the Ground Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) connector from the PCM.
3. Check for continuity between the A9 terminal and body ground and the A22 terminal and body ground.

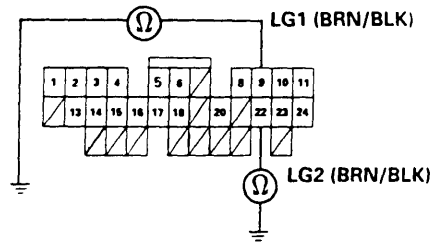
Is there continuity?

NO → **• Repair open in the wires between the A9 or A22 terminals and G101.**
• Repair poor ground (G101).

YES

To page 14-71

PCM CONNECTOR A (32P)



Wire side of female terminals

From page 14-70

Measure Power Supply Circuit Voltage:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the A11 and A9 terminals and between the A22 and A24 terminals.

Is there battery voltage?

NO → **Repair open or short in the wire between the A11 and/or A24 terminals and the PGM-FI main relay, and the fuse box.**

YES

Measure D4 IND Voltage:
1. Turn the ignition switch OFF.
2. Connect the A (32P) connector to the PCM.
3. Connect a digital multimeter to the B13 and A9 or A22 terminals.
4. Turn the ignition switch ON (II) and make sure that the voltage is available for two seconds.

Is there voltage?

YES → **Check for open in the wire between the B13 terminal and the gauge assembly. If wire is OK, check for a faulty D4 indicator light bulb or a faulty gauge assembly printed circuit board.**

NO

Check D4 IND for a Open Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the B (25P) connector from the PCM.
3. Check for continuity between the B13 terminal and the No. 9 terminal of the gauge assembly 14P connector.

Is there continuity?

NO → **Repair open in the wire between the B13 terminal and the gauge assembly.**

YES

Check D4 IND for a Short Circuit:
Check for continuity between the B13 terminal and body ground.

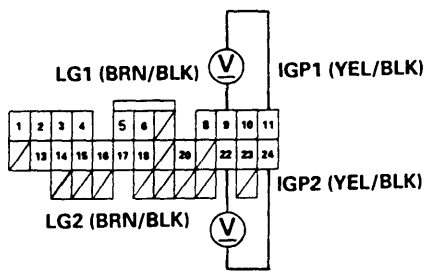
Is there continuity?

YES → **Repair short in the wire between the B13 terminal and the gauge assembly.**

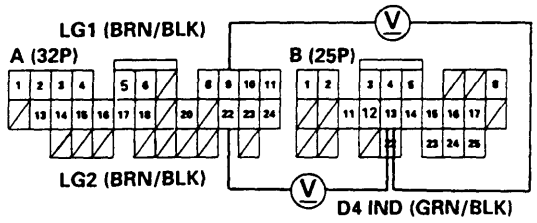
NO

Check for loose PCM connectors. Check the A/T gear position switch. If necessary, substitute a known-good PCM and recheck.

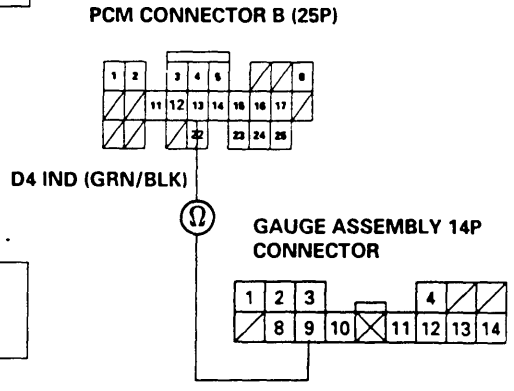
PCM CONNECTOR A (32P)



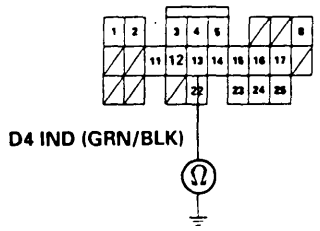
Wire side of female terminals



PCM CONNECTOR B (25P)



Wire side of female terminals

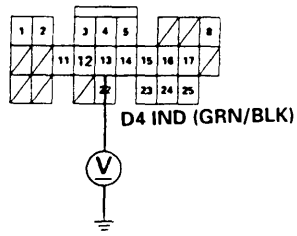


Troubleshooting Flowchart — [D4] Indicator Light On Constantly

The [D4] indicator light is on constantly (not blinking) whenever the ignition switch is ON (II).

Measure D4 IND Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the B (25P) connector from the PCM.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the B13 terminal and body ground.

PCM CONNECTOR B (25P)



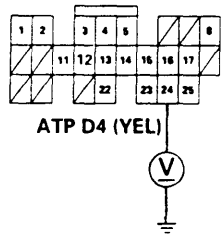
Wire side of female terminals

Is there voltage?

YES → **Repair short to power in the wire between the B13 terminal and the gauge assembly.**

NO

Measure ATP D4 Voltage:
1. Turn the ignition switch OFF.
2. Connect the B (25P) connector to the PCM.
3. Turn the ignition switch ON (II).
4. Shift to any position other than [D4].
5. Measure the voltage between the B24 terminal and body ground.



Is there approx. 5 V?

YES → **Replace the PCM.**

NO

Test the A/T gear position switch (see page 14-81).

Is the switch OK?

NO → **Replace the A/T gear position switch.**

YES

Check for a short to ground in the wire between the B24 terminal and the A/T gear position switch. If the wire is OK, substitute a known-good PCM and recheck.

Troubleshooting Flowchart — Interlock System — Shift Lock System

Shift lever cannot be moved from [P] position with the brake pedal depressed.

Check Brake Light Operation:
Depress the brake pedal.

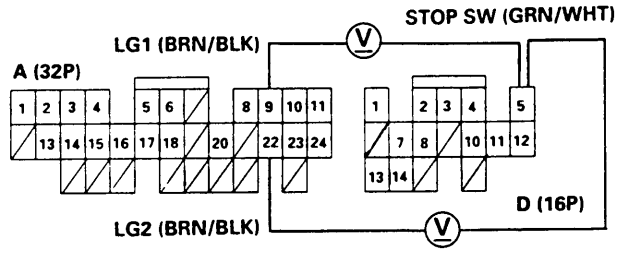
Are the brake lights ON?

NO → **Repair faulty brake switch circuit (see section 23).**

YES

Measure STOP SW Voltage:
1. Turn the ignition switch OFF.
2. Disconnect the A (32P) and D (16P) connectors from the PCM.
3. Measure the voltage between the D5 and A9 or A22 terminals with the brake pedal depressed.

PCM CONNECTORS



Wire side of female terminals

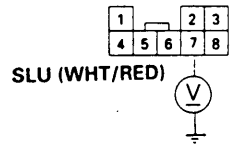
Is there battery voltage?

NO → **Repair open in the wire between the D5 terminal and the brake switch.**

YES

Measure SLU Voltage:
1. Connect the A (32P) and D (16P) connectors to the PCM.
2. Disconnect the 8P connector from the interlock control unit.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 7 terminal of the interlock control unit and body ground with the brake pedal depressed.

INTERLOCK CONTROL UNIT (8P) CONNECTOR



Wire side of female terminals

Is there 1 V or less?

NO → **Check open in the wire between the No. 7 terminal of the interlock control unit and the B12 terminal of the PCM. If wire is OK, check for loose PCM connectors. If necessary, substitute a known-good PCM and recheck.**

YES

To page 14-74

(cont'd)

Troubleshooting Flowchart — Interlock System — Shift Lock System (cont'd)

From page 14-73

Measure ATP P Voltage:
Measure the voltage between the No. 6 terminal of the interlock control unit and body ground.

NOTE: Shift lever must be in [P].

Is there 1 V or less?

NO → **Repair open in the wire between the No. 6 terminal of the interlock control unit and the A/T gear position switch.**

YES

Check Shift Lock Solenoid for a Open Circuit:
1. Turn the ignition switch OFF.
2. Disconnect the shift lock solenoid connector.
3. Check for continuity between the No. 3 terminal of the interlock control unit and the No. 2 terminal of the shift lock solenoid connector.

Is there continuity?

NO → **Repair open in the wire between the No. 3 terminal of the interlock control unit and the shift lock solenoid.**

YES

Check Shift Lock Solenoid Operation:
1. Connect the No. 1 terminal of the shift lock solenoid connector to the battery positive terminal, and connect the No. 2 terminal to the battery negative terminal.
2. Check that the shift lock solenoid operates.

NOTE: Do not connect the No. 2 terminal to the battery positive terminal, or you will damage the diode inside the shift lock solenoid.

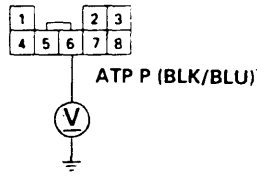
Does the shift lock solenoid operate properly?

NO → **Replace the shift lock solenoid.**

YES

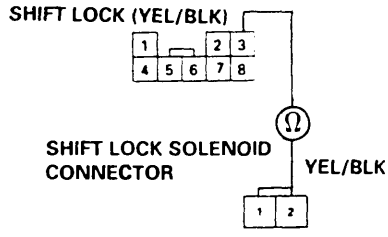
Check for a loose interlock control unit connector. If necessary, substitute a known-good interlock control unit and recheck.

INTERLOCK CONTROL UNIT (8P) CONNECTOR



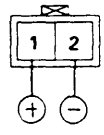
Wire side of female terminals

INTERLOCK CONTROL UNIT CONNECTOR (8P)



Wire side of female terminals

SHIFT LOCK SOLENOID CONNECTOR (directly on solenoid)



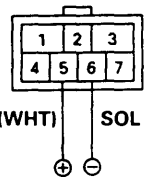
Terminal side of male terminals

Troubleshooting Flowchart — Interlock System — Key Interlock System

Ignition key cannot be moved from ACC (I) position to LOCK (0) position while pushing the ignition key with the shift lever in [P] position.

Check Key Interlock Solenoid Operation:
1. Disconnect the ignition switch connector (7P).
2. Connect the No. 5 terminal of the ignition switch connector to the battery positive terminal, and connect the No. 6 terminal to the battery negative terminal.
3. Check the key interlock solenoid operation. A clicking sound should be heard.

IGNITION SWITCH CONNECTOR (7P)



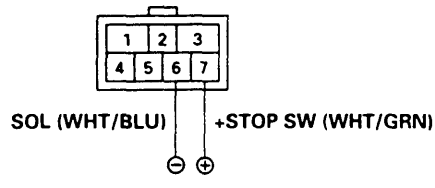
Terminal side of male terminals

Does the key interlock solenoid operate properly?

NO → **Faulty key interlock solenoid. Replace the ignition key cylinder/ steering lock assembly.**

YES

Check Key Interlock Switch Operation:
1. Connect the No. 7 terminal of the ignition switch connector to the battery positive terminal, and connect the No. 6 terminal to the battery negative terminal.
2. Turn the ignition switch to ACC (I), then push it.
3. Check the key interlock solenoid operation. A clicking sound should be heard while pushing the ignition key, and no sound should be heard when releasing the ignition key.



Does the key interlock solenoid operate properly?

NO → **Faulty key interlock switch. Replace the ignition key cylinder/ steering lock assembly.**

YES

To page 14-76

(cont'd)

Troubleshooting Flowchart — Interlock System – Key Interlock System (cont'd)

From page 14-75

Check Key Interlock Solenoid for a Short Circuit:
1. Disconnect the 8P connector from the interlock control unit.
2. Check for continuity between the No. 1 terminal and body ground and between the No. 5 terminal and body ground individually.

Is there continuity?

YES → **Repair short in the wire between the No. 1 or No. 5 terminal of the interlock control unit and the ignition switch connector.**

NO

Check Parking Pin Switch Operation:
Check for continuity between the No. 8 terminal and body ground.

Is there continuity?

YES → **Check for short in the wire between the No. 8 terminal of the interlock control unit and the parking pin switch. If wire is OK, check the parking pin switch.**

NO

Measure ATP P Voltage:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the No. 6 terminal and body ground.

NOTE: Shift lever must be in [P].

Is there voltage?

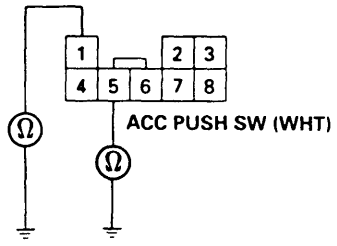
YES → **Repair open in the wire between the No. 6 terminal of the interlock control unit and the A/T gear position switch.**

NO

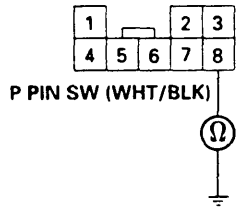
Check for loose interlock control unit connectors. If necessary, substitute a known-good interlock control unit and recheck.

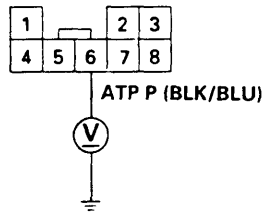
INTERLOCK CONTROL UNIT (8P) CONNECTOR

KEY LOCK SOL (WHT/BLU)



Wire side of female terminals

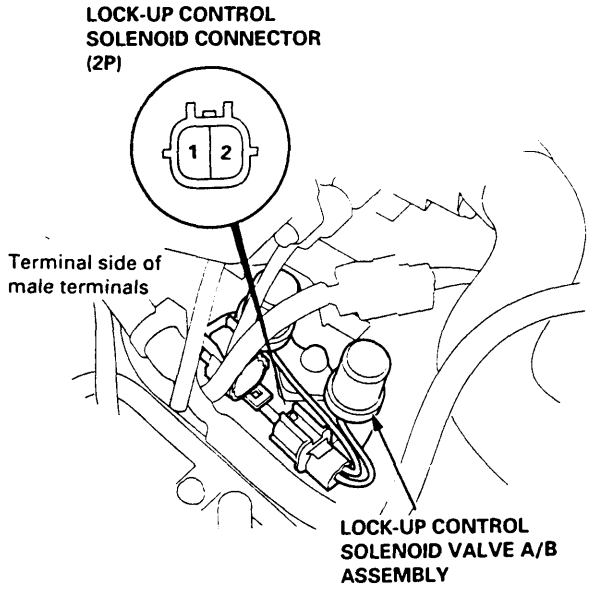




Lock-up Control Solenoid Valve A/B Assembly

Test

1. Disconnect the 2P connector from the lock-up control solenoid valve A/B assembly.



2. Measure the resistance between the No. 2 terminal (solenoid valve A) of the lock-up control solenoid valve connector and body ground, and between the No. 1 terminal (solenoid valve B) and body ground.

   STANDARD: 14 – 25 Ω

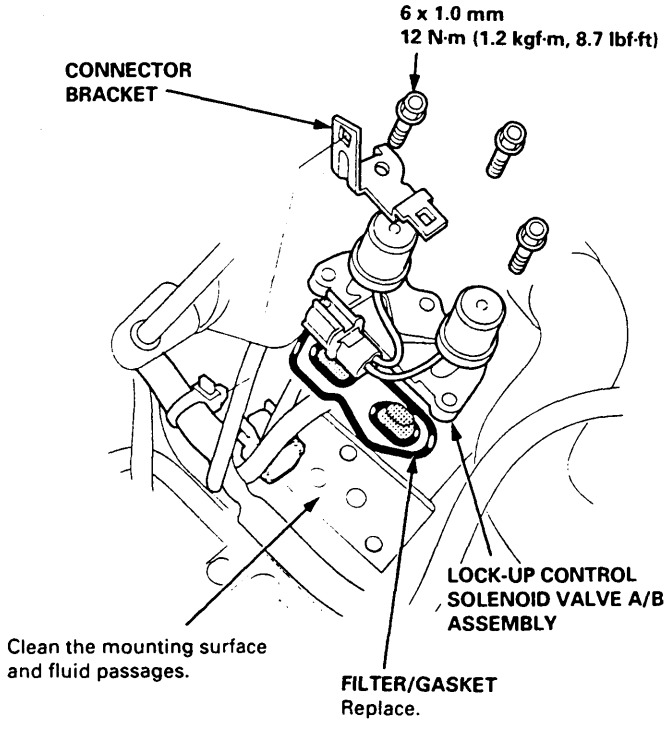
3. Replace the lock-up control solenoid valve A/B assembly if the resistance is out of specification.

4. If the resistance is within the standard, connect the No. 1 terminal of the lock-up control solenoid valve connector to the battery positive terminal. A clicking sound should be heard. Connect the No. 2 terminal to the battery positive terminal. A clicking sound should be heard. Replace the lock-up control solenoid valve assembly if no clicking sound is heard.

Replacement

NOTE: Lock-up control solenoid valves A and B must be removed/replaced as an assembly.

1. Remove the mounting bolts and lock-up control solenoid valve A/B assembly.



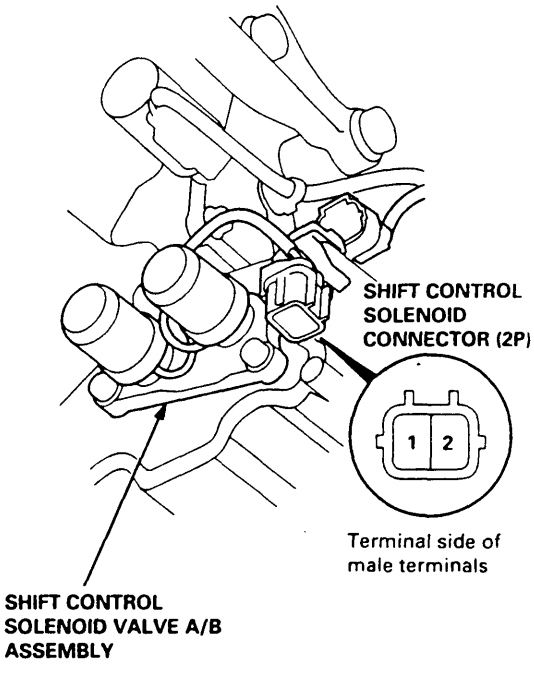
2. Clean the mounting surface and fluid passages of the lock-up control solenoid valve A/B assembly, and install a new lock-up control solenoid valve A/B with a new filter/gasket.

3. Check the connector for rust, dirt or oil, and reconnect it securely.

Shift Control Solenoid Valve A/B Assembly

Test

1. Disconnect the 2P connector from the shift control solenoid valve A/B assembly.



2. Measure the resistance between the No. 1 terminal (solenoid valve A) of the shift control solenoid valve connector and body ground, and between the No. 2 terminal (solenoid valve B) and body ground.

   STANDARD: 14 – 25 Ω

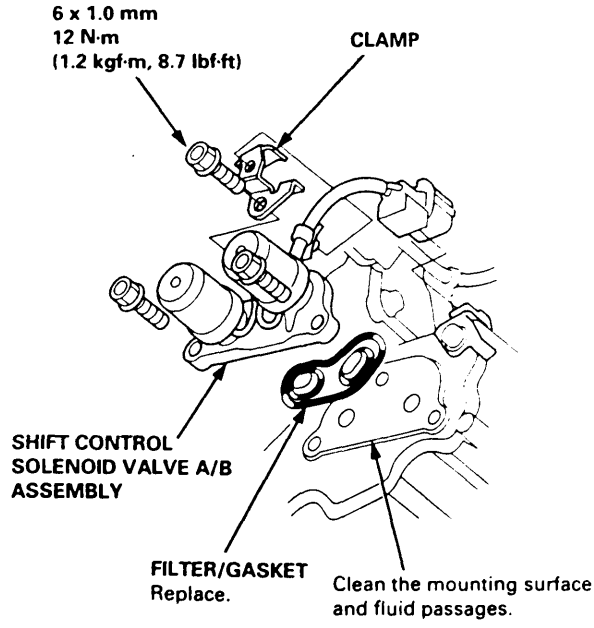
3. Replace the shift control solenoid valve A/B assembly if the resistance is out of specification.

4. If the resistance is within the standard, connect the No. 1 terminal of the shift control solenoid valve connector to the battery positive terminal. A clicking sound should be heard. Connect the No. 2 terminal to the battery positive terminal. A clicking sound should be heard. Replace the shift control solenoid valve assembly if no clicking sound is heard.

Replacement

NOTE: Shift control solenoid valves A and B must be removed/replaced as an assembly.

1. Remove the mounting bolts, the clamp and the shift control solenoid valve A/B assembly. Then, disconnect the connector.



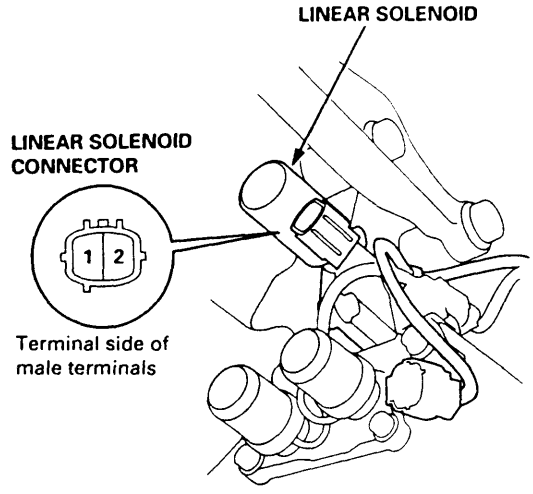
2. Clean the mounting surface and fluid passages of the shift control solenoid valve assembly, and install a new shift control solenoid valve A/B assembly with a new filter/gasket and the clamp.

3. Check the connector for rust, dirt or oil, and reconnect it securely.

Linear Solenoid Assembly

Test

1. Disconnect the linear solenoid connector.



2. Measure the resistance between the No. 1 and the No. 2 terminals of the linear solenoid connector.

   STANDARD: 4.0 – 9.0 Ω

3. If the resistance is out of specification, replace the linear solenoid assembly.

4. Connect the No. 2 terminal of the linear solenoid connector to the battery positive terminal and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard.

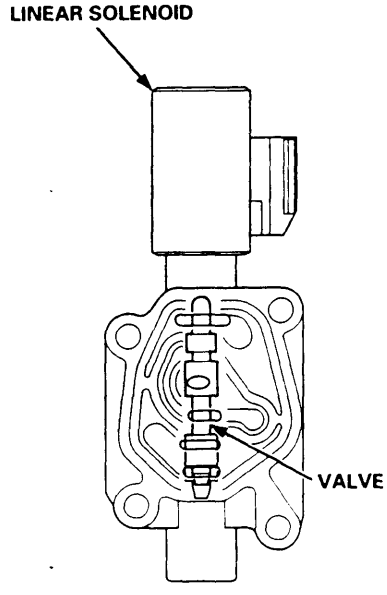
5. If a clicking sound is not heard, remove the linear solenoid assembly.

6. Check the linear solenoid fluid passage for dust or dirt.

7. Connect the No. 2 terminal of the linear solenoid connector to the battery positive terminal and connect the No. 1 terminal to the battery negative terminal. Make sure the valve moves.

8. Disconnect the negative battery terminal, and make sure the valve releases.

   NOTE: You can see the valve movement through the fluid passage in the mounting surface of the linear solenoid assembly.

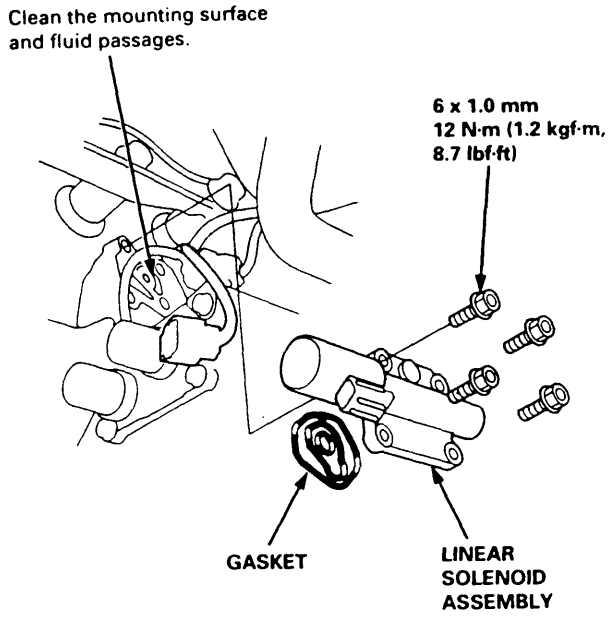


9. If the valve binds, or moves sluggishly, or if the linear solenoid does not operate, replace the linear solenoid assembly.

Linear Solenoid Assembly

Replacement

1. Remove the mounting bolts and the linear solenoid assembly.



2. Clean the mounting surface and fluid passage of the linear solenoid assembly and transmission housing.
3. Install a new linear solenoid assembly with a new gasket.

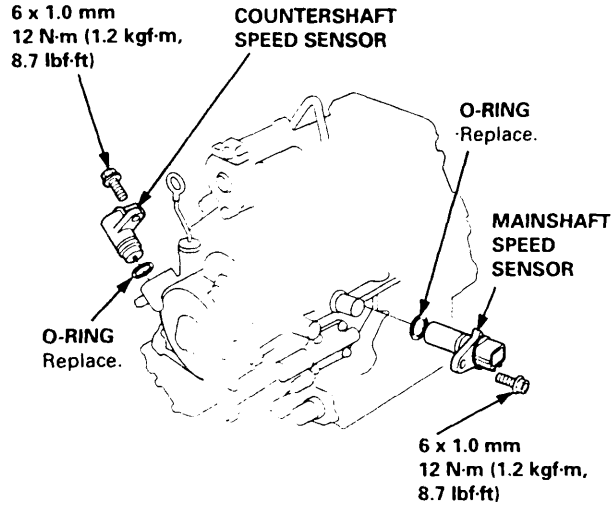
   NOTE: Do not pinch the gasket when installing the linear solenoid; make sure that the gasket is installed properly in the mounting groove of the linear solenoid.

4. Check the linear solenoid connector for rust, dirt or oil, and connect it securely.

Mainshaft/Countershaft Speed Sensors

Replacement

1. Remove the 6 mm bolt and the countershaft speed sensor from the right side cover.



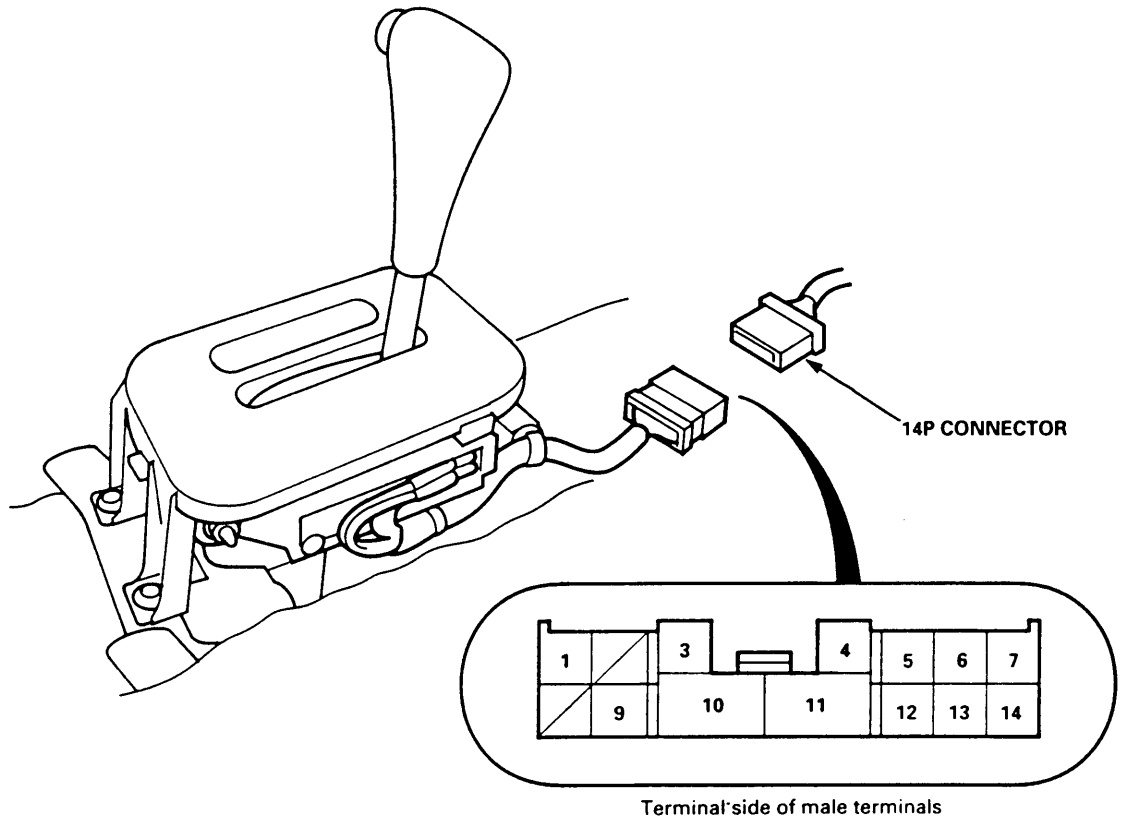
2. Remove the 6 mm bolt and the mainshaft speed sensor from the transmission housing.
3. Replace the O-ring with a new one before installing the countershaft speed sensor or the mainshaft speed sensor.

A/T Gear Position Switch

Test

1. Remove the front console (see section 20).
2. Disconnect the A/T gear position switch connector (14P).
3. Check for continuity between the terminals in each switch position according to the table below.
4. Move the shift lever back and forth without pushing the push button at each switch position, and check for continuity within the range of free play.

   If there is no continuity within the range of free play, adjust the position of the switch as described on the next page.



Terminal side of male terminals

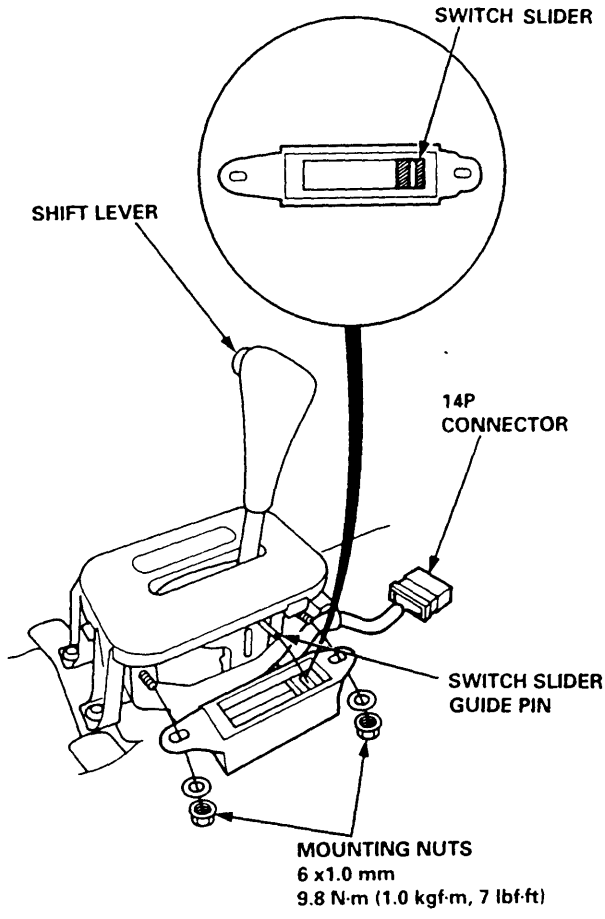
A/T Gear Position Switch									Back-up Light Switch		Neutral Position Switch	
Position \ Terminal	1	5	6	7	9*1	12	13	14	3	4	10	11
2	○	○			○							
D3	○		○		○							
D4	○			○	○							
N	○							○			○	○
R	○						○		○	○		
P	○					○					○	○

*1: With cruise control system

A/T Gear Position Switch

Replacement

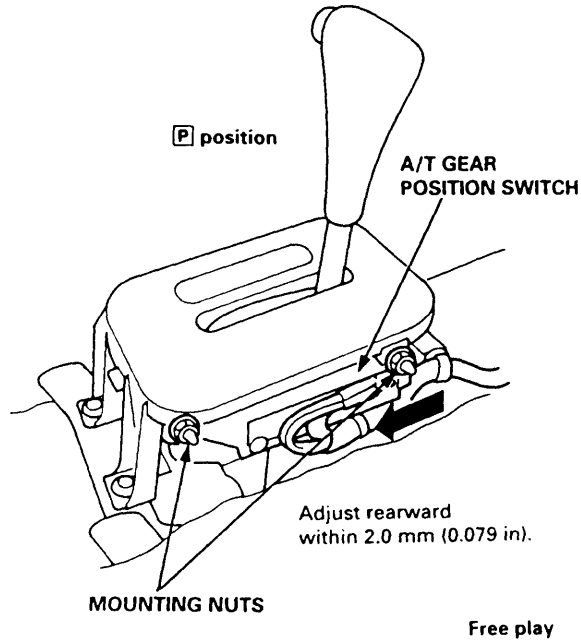
1. Remove the front console (see section 20).
2. Disconnect the A/T gear position switch connector (14P).

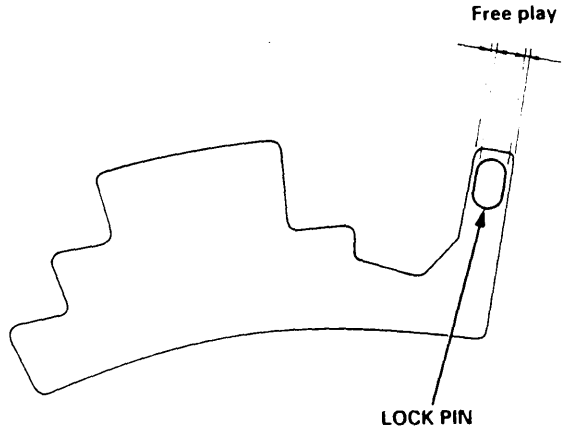


3. Remove the A/T gear position switch from the shift lever mounting bracket.
4. Position the switch slider of the new A/T gear position switch to [N] position.
5. Move the shift lever to [N] position, then install the A/T gear position switch while aligning the switch slider with the switch slider guide pin.
6. Test the A/T gear position switch.
7. Connect the 14P connector.

Adjustment

1. Shift to the [P] position, and loosen the A/T gear position switch mounting nuts.





2. Move the A/T gear position switch to the rear side up to 2.0 mm (0.079 in). There should be continuity between the No. 1 and No. 12 terminals of the A/T gear position switch connector, in the range of the free play of the shift lever.
3. Check for continuity between each of the terminals.

   NOTE: If adjustment is not possible, check for damage to the shift lever detent and/or the shift lever mounting bracket.

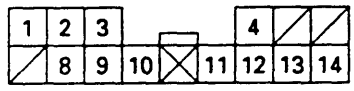
A/T Gear Position Indicator

Input Test

1. Remove the gauge assembly from the dashboard (see section 20), and disconnect the 14P connector from the gauge assembly (see section 23).

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, make the following input tests at the 14P connector.
     — If a test indicates a problem, find and correct the cause, then recheck the system.
     — If all the input tests prove OK, but the indicator is faulty, replace the printed circuit board.

GAUGE ASSEMBLY 14P CONNECTOR



Wire side of female terminals

Terminal Number	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
1	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
2	RED/BLK	Combination light switch ON and dash lights brightness control dial on full bright	Check for voltage between No. 2 and No. 3 terminals: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Faulty combination light switch • Faulty dash light brightness controller • An open in the wire
3	RED			
4	BLU	Shift lever in 2	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity in any other shift lever position.	• Faulty A/T gear position switch • An open in the wire
8	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
9	GRN/BLK	Ignition switch ON (II) and shift lever in any position except D4	Check for voltage to ground: There should be battery voltage for two seconds after the ignition switch is turned ON (II), and less than 1 V two seconds later.	• Faulty PCM • An open in the wire
10	GRN	Shift lever in D3	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity in any other shift lever position.	• Faulty A/T gear position switch • An open in the wire
11	RED	Shift lever in N		
12	WHT	Shift lever in R		
13	BLK/BLU	Shift lever in P NOTE: Do not push the brake pedal.		
14	LT GRN	Ignition switch ON (II)	Check for voltage to ground: There should be about 5 V.	• Faulty PCM • An open in the wire

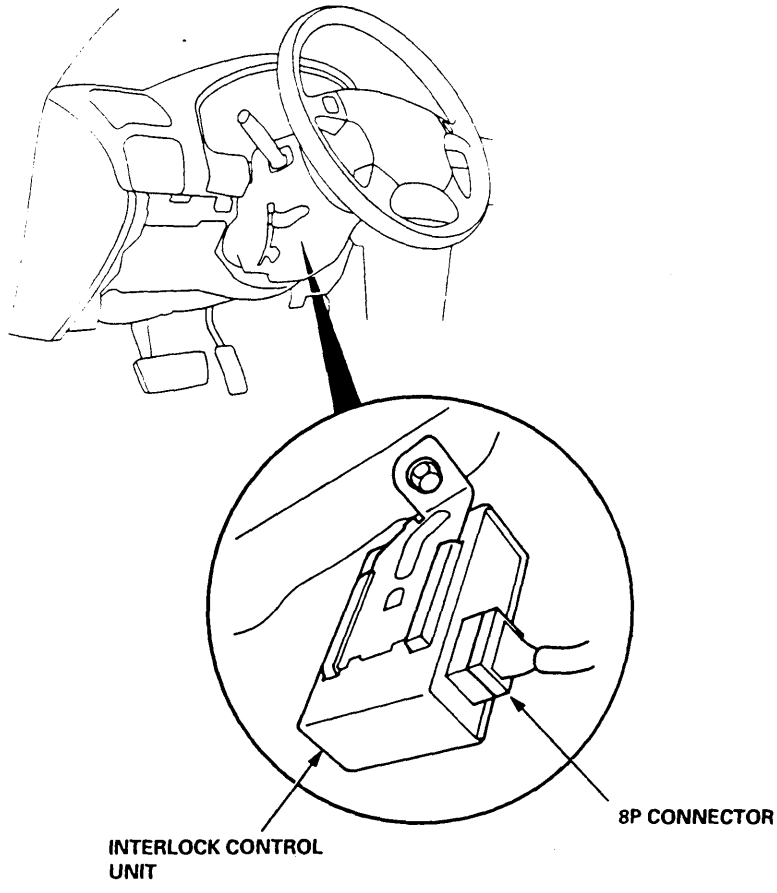
Interlock System

Interlock Control Unit Input Test

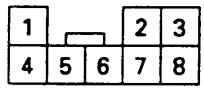
1. Disconnect the 8P connector from the interlock control unit.

2. Inspect the connector and 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, make the following input test at the connector.
     — If a test indicates a problem, find and correct the cause, then recheck the system.
     — If all the input tests prove OK, substitute a known-good control unit, and recheck the system. If the check is OK, the control unit must be faulty; replace it.

NOTE: If the shift lock solenoid clicks when the ignition switch is turned ON (II) and brake pedal is depressed with the shift lever in [P] position, the shift lock system is electronically normal; if the shift lever cannot be shifted from [P] position, test the A/T gear position switch.



INTERLOCK CONTROL UNIT CONNECTOR (8P)



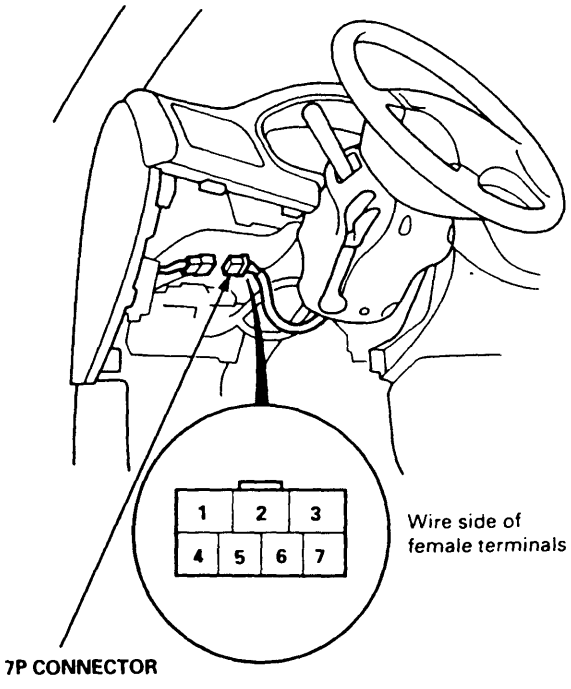
Wire side of female terminals

Terminal Number	Wire Color	Test Condition	Test: Desired Result	Possible Cause (If result is not obtained)
1	WHT/BLU	Ignition switch turned to ACC (I), ignition key pushed all the way in	Check for voltage to ground: There should be battery voltage.	• Blown No. 48 (30A) fuse in the under-hood fuse/relay box • Blown No. 33 (7.5 A) fuse in the under-dash fuse/relay box • Faulty steering lock assembly (key interlock solenoid) • An open in the wire
2	YEL	Ignition switch turned ON (II)	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 steering lock assembly (key interlock solenoid) • An open in the wire
3	YEL/BLK	Ignition switch turned ON (II)	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 shift lock solenoid • An open in the wire
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
5	WHT	Ignition switch turned to ACC (I), ignition key pushed all the way in	Check for voltage to ground: There should be battery voltage.	• Blown No. 48 (30 A) fuse in the under-hood fuse/relay box • Blown No. 33 (7.5 A) fuse in the under-dash fuse/relay box • Faulty steering lock assembly (key interlock solenoid) • An open in the wire
6	BLK/BLU	Shift lever in P	Check for continuity to ground: There should be continuity.	• Faulty A/T gear position switch • Poor ground (G401, G402) • An open in the wire
8	WHT/BLK	Shift lever in P and push button pressed	Check for continuity to ground: There should be continuity.	• Faulty parking pin switch • Short to ground
		Shift lever in P and push button released	Check for continuity to ground: There should be no continuity.	
Reconnect the interlock control unit 8P connector.				
7	WHT/RED	Ignition switch ON (II) and brake pedal pushed	Check for voltage to ground: There should be 1 V or less.	• Faulty brake switch • Faulty throttle position (TP) sensor • Faulty PCM • An open in the wire
		Ignition switch ON (II), brake pedal and accelerator pedal depressed at the same time	Check for voltage to ground: There should be battery voltage.	

Interlock System

Key Interlock Solenoid Test

1. Remove the driver's dashboard lower cover and knee bolster (see section 20).
2. Disconnect the 7P connector from the main wire harness.



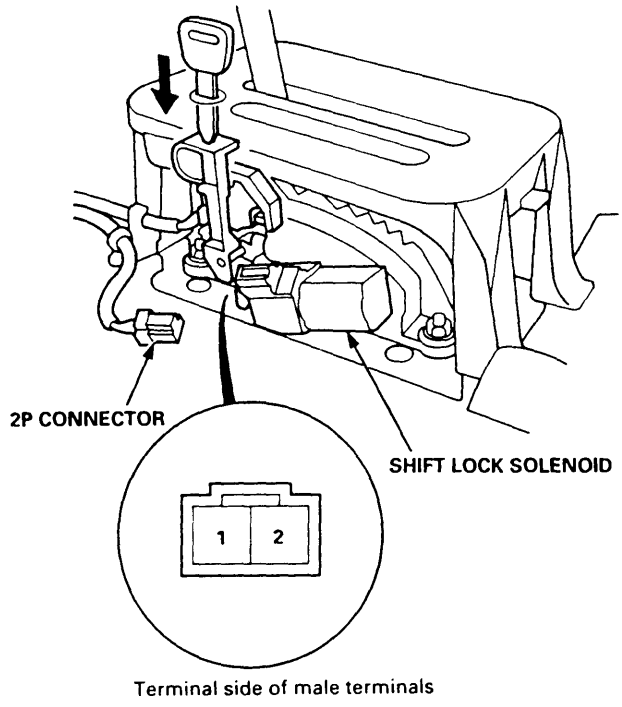
3. Check for continuity between the terminals in each key position according to the table.

Position \ Terminal		5	6	7
Ignition switch ACC (I)	Key pushed in	○	○	○
	Key released	○	○	

4. Check that the key cannot be removed with power and ground connected to the No. 7 and No. 5 terminals.
   - If the key cannot be removed, the key interlock solenoid is OK.
   - If the key can be removed, replace the steering lock assembly (the interlock solenoid is not available separately).

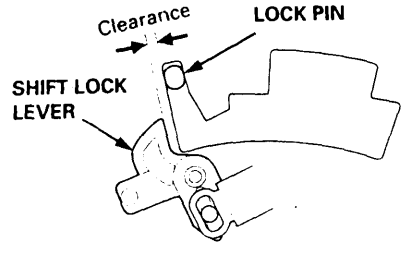
Shift Lock Solenoid Test

1. Remove the front console (see section 20).
2. Disconnect the shift lock solenoid 2P connector.



3. Connect battery power to the No. 1 terminal, and to the No. 2 terminal of the solenoid, momentarily.

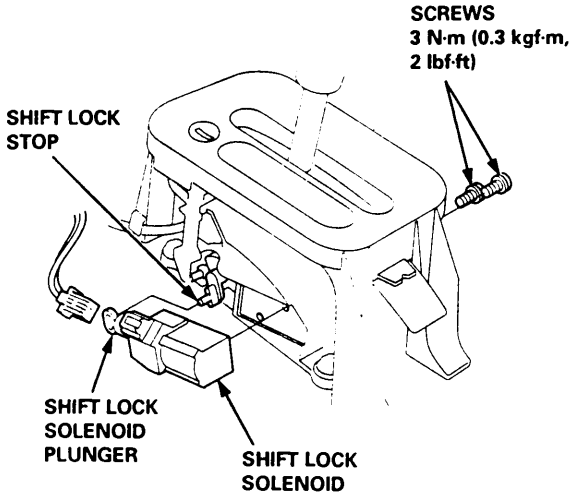
   NOTE:
   - Do not connect power to the No. 2 (–) terminal (reverse polarity), or you will damage the diode inside the solenoid.
   - Make sure there is clearance between the stop pin and the base bracket when the solenoid switches ON and OFF.



4. Check that the shift lock releases when the release lever is pushed, and check that it locks when the release lever is released.
5. If the solenoid does not work, replace it.

Shift Lock Solenoid Replacement

1. Remove the front console (see section 20).
2. Shift to [P] position, then disconnect the 2P connector from the shift lock solenoid.
3. Remove the A/T gear position switch.
4. Remove the two screws securing the shift lock solenoid, then remove the shift lock solenoid.
5. Apply silicone grease to the shift lock solenoid plunger mating surfaces with the shift lock stop.
6. Install the shift lock solenoid and connect the shift lock solenoid plunger to the shift lock stop.

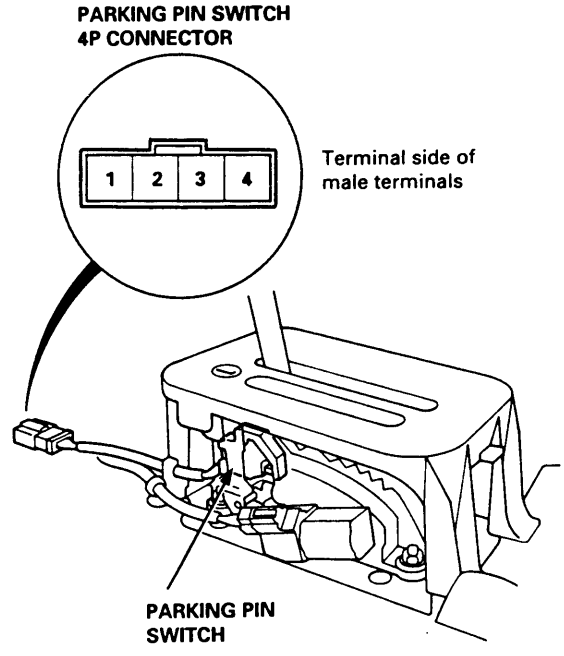


7. Be sure to install the projected tips of the shift lock solenoid in the holes of the position plate, then tighten the screws.
8. Install the A/T gear position switch.
9. Connect the 2P connector to the shift lock solenoid.
10. Check the shift lock solenoid operation.

Parking Pin Switch Test

1. Remove the front console (see section 20).
2. Shift to [P] position.
3. Disconnect the parking pin switch 4P connector.
4. Check for continuity between the No. 3 and No. 4 terminals.

   There should be continuity while pushing the push button.
   There should be no continuity when the push button is released.



5. If necessary, replace the parking pin switch.

   NOTE: The parking pin switch is assembled with the position plate. If parking pin switch replacement is required, refer to page 14-168.

Symptom-to-Component Chart

Hydraulic System

SYMPTOM	Check these items on the PROBABLE CAUSE List	Check these items on the NOTES List
Engine runs, but vehicle does not move in any gear.	1, 2, 3, 5, 6, 7, 36, 38	K, L, R, S
Vehicle moves in [2], [R], but not in [D3], [D4], position.	6, 8, 9, 10, 30, 54	C, M, O
Vehicle moves in [D3], [D4], [R], but not in [2] position.	6, 11, 12, 24	C, L
Vehicle moves in [D3], [D4], [2], but not in [R] position.	4, 6, 14, 15, 31	C, L, Q
Vehicle moves in [N] position.	10, 12, 13, 14, 16, 29, 33, 34, 35	C, D
Excessive idle vibration	1, 2, 19, 32, 36, 45, 47, 48, 52	B, K, L
Poor acceleration; flares on starting off in [D4], [D3] position		
Stall rpm high in [D4], [D3], [2] position	1, 2, 3, 6, 38, 41	K, L, R
Stall rpm high in [D4], [D3] position	6, 8, 10	C, D
Stall rpm high in [2] position	6, 12	C, D
Stall rpm is in specification	14	N
Stall rpm low	17, 18, 32, 45, 47, 48, 52	R
No shift	19, 20, 40, 48, 49, 52	G, L
Fails to shift in [D3], [D4] position; from 1st to 3rd gear	22, 49, 52	
Fails to shift in [D3], [D4] position; from 1st to 4th gear	22, 23, 48, 52	
Erratic upshifting		
1-2 upshift, 2-3 upshift, 3-4 upshift	18, 52, 59	
1-2 upshift	21, 48, 52	
2-3 upshift	22, 49, 52	
3-4 upshift	23, 48, 52	
Harsh upshift (1-2)	12, 19, 20, 29, 50, 51, 52, 58, 59	C, D, E
Harsh upshift (2-3)	13, 19, 20, 24, 27, 29, 50, 51, 52, 58, 59	C, D, E, H, L
Harsh upshift (3-4)	14, 19, 20, 25, 28, 29, 50, 51, 52, 58, 59	C, D, E, I, L
Harsh downshift (2-1)	19, 20, 24, 43, 52, 55, 58, 59	O
Harsh downshift (3-2)	12, 19, 20, 25, 43, 52, 56, 58, 59	C, D, E, H
Harsh downshift (4-3)	13, 19, 20, 26, 43, 52, 57, 58, 59	C, D, E, I
Flares on 2-3 upshift	13, 19, 20, 24, 27, 51, 52	E, L
Flares on 3-4 upshift	14, 19, 20, 25, 28, 51, 52	E, L, N
Excessive shock on 2-3 upshift	13, 19, 20, 24, 27, 43, 50, 51, 52, 58, 59	E, L, N
Excessive shock on 3-4 upshift	14, 19, 20, 25, 28, 43, 50, 51, 52, 58, 59	E, L, N
Late shift from [N] position to [D4] or [D3] position	10, 30	M
Late shift from [N] position to [R] position	4, 14, 21, 53	Q
Noise from transmission in all shift lever positions	2, 37	K, L, Q
Vehicle does not accelerate more than 31 mph (50 km/h).	17	
Shift lever does not operate smoothly.	6, 39	P
Fails to shift; stuck in 4th gear	48, 49, 52	
Transmission will not shift into parking gear in [P] position.	6, 39	P
Stall rpm high; all clutch pressures are in specification.	41	D, K, O
Lock-up clutch does not disengage.	19, 44, 45, 46, 47, 50, 51, 52, 59	E, L
Lock-up clutch does not operate smoothly.	19, 41, 44, 45, 46, 47, 50, 51, 52, 59	L
Lock-up clutch does not engage.	19, 41, 44, 45, 46, 47, 50, 51, 52, 59	E, L
Vibration in all positions	36	

PROBABLE CAUSE			
1	Low ATF	41	Torque converter check valve stuck
2	ATF pump worn or binding	42	Foreign material in separator plate
3	Regulator valve stuck	43	CPB valve stuck
4	Servo valve stuck	44	Lock-up timing valve stuck
5	Mainshaft worn/damaged	45	Lock-up shift valve stuck
6	Shift cable broken/out of adjustment	46	Lock-up control valve stuck
7	Final gears worn/damaged	47	Lock-up piston defective
8	One-way (sprag) clutch worn/damaged	48	Shift control solenoid valve A defective
9	1st gears worn/damaged (2 gears)	49	Shift control solenoid valve B defective
10	1st clutch defective	50	Lock-up control solenoid valve A defective
11	2nd gears worn/damaged (2 gears)	51	Lock-up control solenoid valve B defective
12	2nd clutch defective	52	PCM defective
13	3rd clutch defective	53	Servo control valve stuck
14	4th clutch defective	54	1st accumulator defective
15	Reverse gears worn/damaged (3 gears)	55	Foreign material in 2nd exhaust orifice
16	Excessive ATF	56	Foreign material in 3rd exhaust orifice
17	Torque converter one-way clutch defective	57	Foreign material in 4th exhaust orifice
18	Engine throttle cable out of adjustment	58	Mainshaft speed sensor defective
19	Linear solenoid assembly defective	59	Countershaft speed sensor defective
20	CPC valve stuck		
21	1-2 shift valve stuck		
22	2-3 shift valve stuck		
23	3-4 shift valve stuck		
24	2nd accumulator defective		
25	3rd accumulator defective		
26	4th accumulator defective		
27	2nd orifice control valve stuck		
28	3-4 orifice control valve stuck		
29	Foreign material in main orifice		
30	Foreign material in 1st orifice		
31	Foreign material in reverse orifice		
32	Engine output low		
33	Needle bearing worn/damaged		
34	Thrust washer worn/damaged		
35	Clutch clearance incorrect		
36	Drive plate defective or transmission misassembly		
37	Torque converter housing or transmission housing bearing worn/damaged		
38	ATF strainer clogged		
39	Joint in shift cable and transmission or body worn		
40	Modulator valve stuck		

(cont'd)

Symptom-to-Component Chart

Hydraulic System (cont'd)

The following symptoms can be caused by improper repair or assembly	Check these items on the PROBABLE CAUSE DUE TO IMPROPER REPAIR List	Items on the NOTES List
Vehicle creeps in [N] position.	R1, R2	
Vehicle does not move in [D3] or [D4] position.	R4	
Transmission locks up in [R] position.	R3, R11	
Excessive drag in transmission	R6	K, R
Excessive vibration, rpm related	R7	
Noise with wheels moving only	R5	
Main seal pops out.	R8	S
Various shifting problems	R9, R10	

PROBABLE CAUSE DUE TO IMPROPER REPAIR	
R1	Improper clutch clearance
R2	Improper gear clearance
R3	Parking brake lever installed upside down.
R4	One-way (sprag) clutch installed upside down.
R5	Reverse selector hub installed upside down.
R6	ATF pump binding
R7	Torque converter not fully seated in ATF pump.
R8	Main seal improperly installed.
R9	Springs improperly installed.
R10	Valves improperly installed.
R11	Shift fork bolt not installed.

NOTES	
A	See flushing procedure, page 14-164 and 165.
B	Set idle rpm in gear to specified idle speed. If still no good, adjust the motor mounts as outlined in the engine section of this manual.
C	If the large clutch piston O-ring is broken, inspect the piston groove for rough machining.
D	If the clutch pack is seized or is excessively worn, inspect the other clutches for wear, and check the orifice control valves, CPC valve, and linear solenoid for free movement.
E	If the linear solenoid is stuck, inspect the clutches for wear.
G	If the 1-2 shift valve is stuck closed, the transmission will not upshift. If stuck open, the transmission has no 1st gear.
H	If the 2nd orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I	If the 3-4 orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
J	If the clutch pressure control valve is stuck closed, the transmission will not shift out of 1st gear.
K	Improper alignment of main valve body and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high-pitched squeak.
L	If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump and differential pinion shaft. If both are OK and no cause for the contamination is found, replace the torque converter.
M	If the 1st clutch feed pipe guide in the right side cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the right side cover as it is dented. The O-ring under the guide is probably worn.
N	• Replace the mainshaft if the bushing for the 4th feed pipe is loose or damaged. If the 4th feed pipe is damaged or out of round, replace the right side cover. • Replace the mainshaft if the bushing for the 1st feed pipe is loose or damaged. If the 1st feed pipe is damaged or out of round, replace it.
O	A worn or damaged sprag clutch is mostly a result of shifting the transmission in D3 or D4 position while the wheels rotate in reverse, such as rocking the vehicle in snow.
P	Inspect the frame for collision damage.
Q	Inspect for damage and wear: 1. Reverse selector gear teeth chamfers. 2. Engagement teeth chamfers of countershaft 4th and reverse gear. 3. Shift fork for scuff marks in center. 4. Differential pinion shaft for wear under pinion gears. 5. Bottom of 3rd clutch for swirl marks. Replace items 1, 2, 3 and 4 if worn or damaged. If the transmission makes a clicking, grinding, or whirring noise, also replace mainshaft 4th gear, reverse idler gear, and countershaft 4th gear. If the differential pinion shaft is worn, overhaul the differential assembly, replace ATF strainer, thoroughly clean the transmission and flush the torque converter, cooler, and lines. If bottom of 3rd clutch is swirled and transmission makes gear noise, replace the countershaft and final driven gear.
R	Be very 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.
S	Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.

Road Test

NOTE: Warm up the engine to normal operating temperature (the radiator fan comes on).

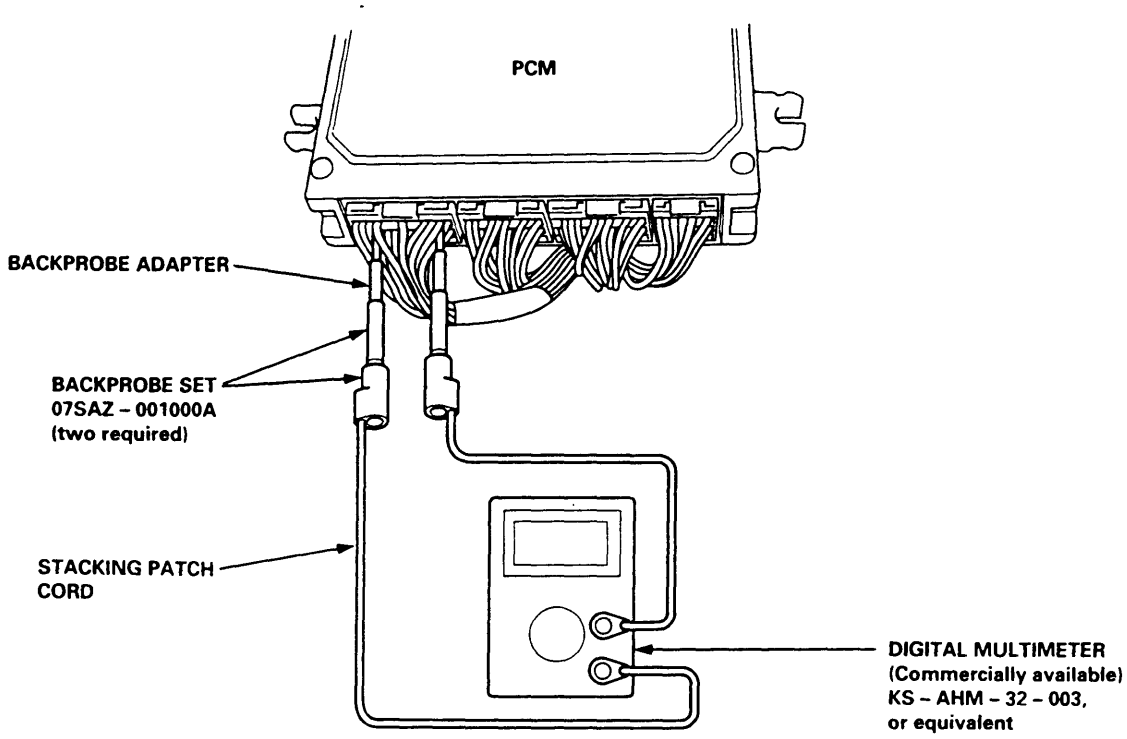
1. Apply the parking brake and block the wheels. Start the engine, then shift to D4 position while depressing the brake pedal. Depress the accelerator pedal and release it suddenly. The engine should not stall.

2. Repeat same test in D3 position.

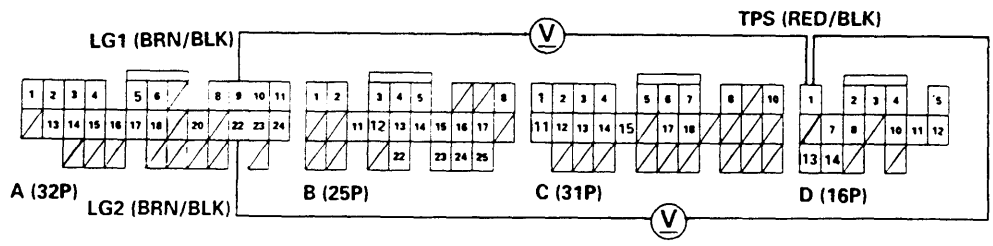
3. Test-drive the vehicle on a flat road in the D4 position. Check that the shift points occur at the approximate speeds (shown on the next page) on a flat road. Also check for abnormal noise and clutch slippage.

   NOTE: Throttle position sensor voltage represents the throttle opening.

   a. Unbolt the PCM for road testing; refer to page 14-46.
   b. Set the digital multimeter to check voltage between D1 (+) terminal and A9 (–) or A22 (–) terminal of the PCM for the throttle position sensor.



PCM CONNECTORS



Wire side of female terminals

- **Upshift**

Throttle Opening	Unit of speed	1st → 2nd	2nd → 3rd	3rd → 4th	Lock-up ON
Throttle position sensor voltage: 0.75 V	mph	9 – 12	20 – 23	28 – 33	22 – 25
	km/h	15 – 19	32 – 37	45 – 52	34 – 39
Throttle position sensor voltage: 2.25 V	mph	22 – 26	41 – 47	59 – 65	61 – 67
	km/h	34 – 40	65 – 73	95 – 104	99 – 108
Fully-opened throttle Throttle position sensor voltage: 4.5 V	mph	32 – 38	62 – 71	97 – 108	96 – 107
	km/h	51 – 59	99 – 112	155 – 172	153 – 170

- **Downshift**

Throttle Opening	Unit of speed	Lock-up OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Fully-closed throttle Throttle position sensor voltage: 0.5 V	mph	19 – 22	17 – 20	7 – 10 (3rd → 1st)	
	km/h	30 – 35	27 – 32	10 – 15 (3rd → 1st)	
Fully-opened throttle Throttle position sensor voltage: 4.5 V	mph	92 – 103	86 – 97	54 – 61	25 – 31
	km/h	147 – 163	137 – 153	87 – 98	40 – 48

NOTE:
- Lock-up ON: The lock-up control solenoid valve A turns ON.
- Lock-up OFF: The lock-up control solenoid valve A turns OFF.

4. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift from [D4] position to [2] position. The vehicle should immediately begin slowing down from engine braking.

   CAUTION: Do not shift from [D4] or [D3] position to [2] position at speeds over 63 mph (100 km/h); you may damage the transmission.

5. Check for abnormal noise and clutch slippage in the following positions.

   [2] (2nd Gear) Position
   a. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
   b. Upshifts and downshifts should not occur with the selector in this position.

   [R] (Reverse) Position
   Accelerate from a stop at full throttle, and check for abnormal noise and clutch slippage.

6. Test in [P] (Parking) Position
   Park the vehicle on slope (approx. 16°), apply the parking brake, and shift into [P] position. Release the brake; the vehicle should not move.

Stall Speed

Test

CAUTION:
- **To prevent transmission damage, do not test stall speed for more than 10 seconds at a time.**
- **Do not shift the lever while raising the engine speed.**
- **Be sure to remove the pressure gauge before testing stall speed.**

1. Engage the parking brake, and block the front wheels.
2. Connect a tachometer to the engine, and start the engine.
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 into [2] position.
5. Fully depress the brake pedal and accelerator for 6 to 8 seconds, and note engine speed.
6. Allow two minutes for cooling, then repeat the test in [D4] and [R] positions.

   NOTE:
   - Stall speed tests should be used for diagnostic purposes only.
   - Stall speed should be the same in [D4], [2] and [R] positions.

Stall Speed RPM:
Specification: 2,700 rpm
Service Limit: 2,550 – 2,850 rpm2

TROUBLE	PROBABLE CAUSE
Stall rpm high in [D4], [2] and [R] positions	• Low fluid level or ATF pump output • Clogged ATF strainer • Pressure regulator valve stuck closed • Slipping clutch
Stall rpm high in [R] position	Slippage of 4th clutch
Stall rpm high in [2] position	Slippage of 2nd clutch
Stall rpm high in [D4] position	Slippage of 1st clutch or 1st gear one-way clutch
Stall rpm low in [D4], [2] and [R] positions	• Engine output low • Torque converter one-way clutch slipping

Fluid Level

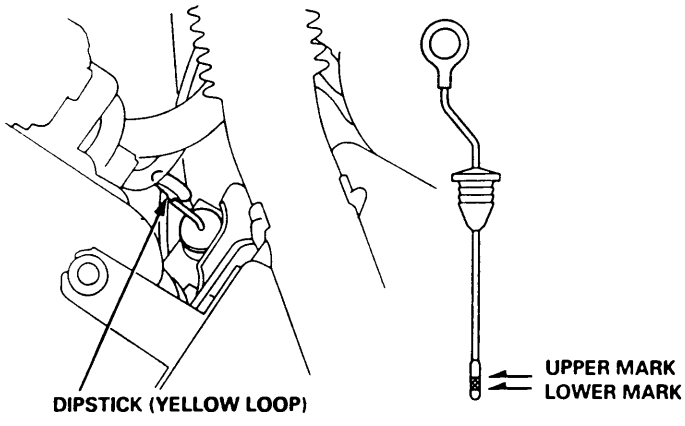
Checking/Changing

CAUTION: While checking or changing fluid, be sure not to allow dust and other foreign particles to enter into the transmission.

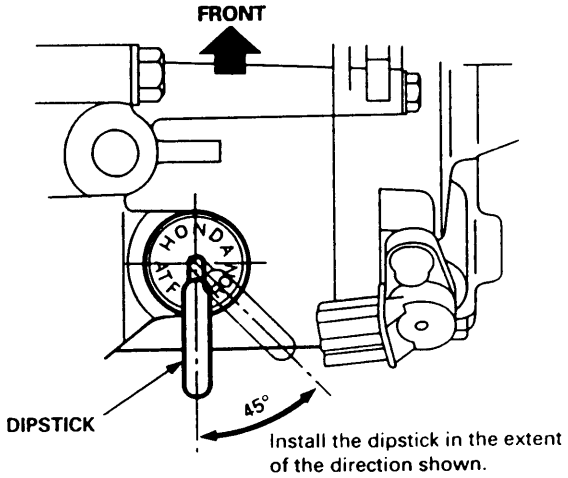
Checking

NOTE: Check the fluid level with the engine at normal operating temperature (the radiator fan comes on).

1. Park the vehicle on level ground. Turn off the engine.
2. Remove the dipstick (yellow loop) from the transmission, and wipe it with a clean cloth.



3. Insert the dipstick into the transmission.
4. Remove the dipstick and check the fluid level. It should be between the upper and lower marks.
5. If the level is below the lower mark, pour the recommended fluid* into the filler hole to bring it to the upper mark.
6. Reinstall the dipstick in the direction shown.



Changing

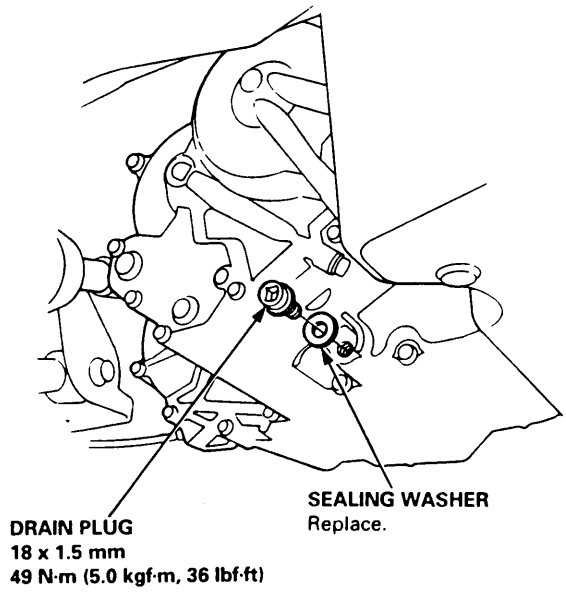
1. Bring the transmission up to operating temperature by driving the vehicle. Park the vehicle on level ground, turn the engine off, then remove the drain plug.

   NOTE: If a cooler flusher is to be used, see page 14-164 and 165.

2. Reinstall the drain plug with a new sealing washer, then refill the transmission with the recommended fluid* to the upper mark on the dipstick.

   Automatic Transmission Fluid Capacity:
   2.7 ℓ (2.9 US qt, 2.4 Imp qt) at change
   5.9 ℓ (6.2 US qt, 5.2 Imp qt) at overhaul

   Recommended Automatic Transmission Fluid:
   Genuine Honda Premium Formula Automatic Transmission Fluid (ATF)*



* Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

Pressure Testing

⚠ WARNING

- **While testing, be careful of the rotating front wheels.**
- **Make sure lifts, jacks, and safety stands are placed properly (see section 1).**

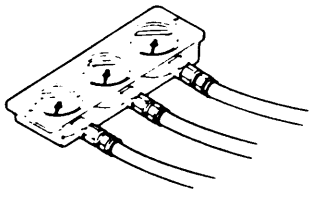
CAUTION:

- **Before testing, be sure the transmission fluid is filled to the proper level.**
- **Warm up the engine before testing.**

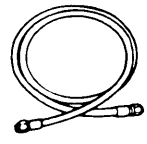
1. Set the parking brake, and block both rear wheels securely.
2. Raise the front of the vehicle, and support it with safety stands (see section 1).
3. Warm up the engine, then stop the engine and connect a tachometer.
4. Connect the oil pressure gauges to each inspection hole.

   TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

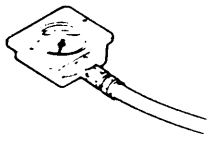
   CAUTION: Connect the oil pressure gauges securely; be sure not to allow dust or other foreign particles to enter the inspection holes.



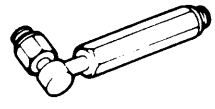
A/T OIL PRESSURE GAUGE SET W/PANEL
07406 – 0020400



A/T PRESSURE HOSE, 2210 mm
07MAJ – PY4011A
(4 Required)



A/T LOW PRESSURE GAUGE W/PANEL
07406 – 0070300



A/T PRESSURE HOSE ADAPTER
07MAJ – PY40120
(4 Required)

NOTE: the A/T Oil Pressure Gauge Set (07406 – 0020003) or A/T Low Pressure Gauge (07406 – 0070000) may also be used.

5. Measure the following pressure:
   - Line Pressure: page 14-97
   - 1st Clutch Pressure: page 14-97
   - 2nd, 3rd and 4th Clutch Pressure: page 14-98
6. Install a new washer and the sealing bolt in the inspection hole, and tighten to the specified torque.

   TORQUE: 18 N·m (1.8 kgf·m, 13 lbf·ft)

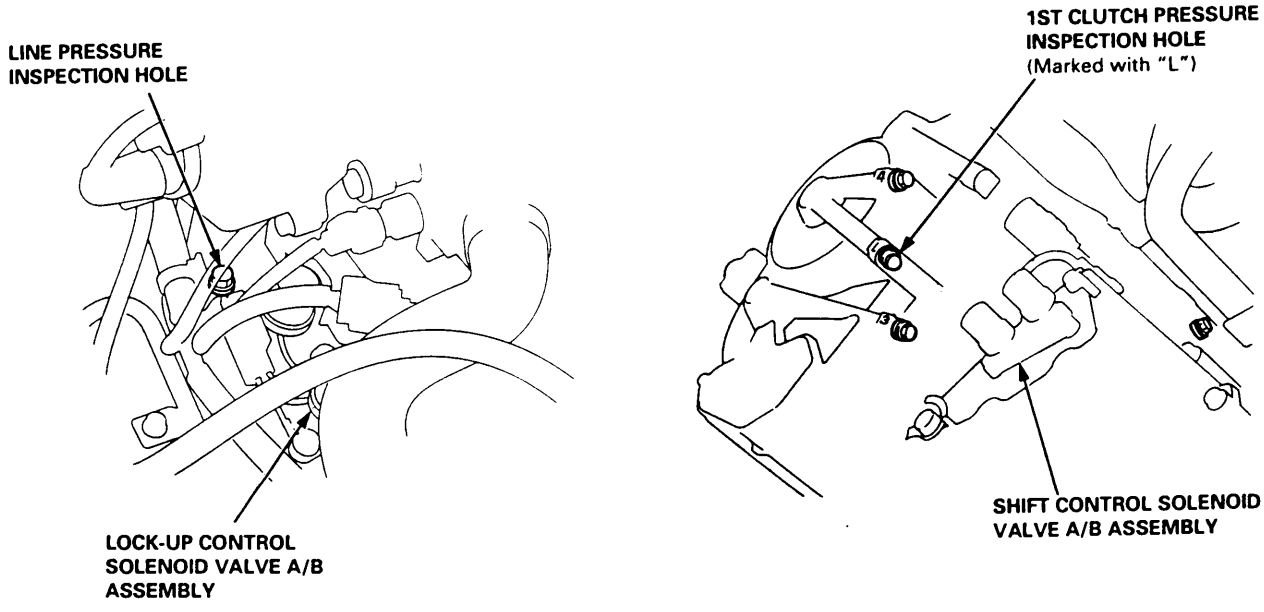
   NOTE: Do not reuse old sealing washers.

Line Pressure/1st Clutch Pressure Measurement

1. Start the engine, and run it at 2,000 rpm.
2. Shift to [N] or [P] position, then measure line pressure.

   NOTE: Higher pressure may be indicated if measurements are made in shift lever positions other than [N] or [P] position.

3. Shift to [D4] position, then measure 1st clutch pressure.



PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line	[N] or [P]	No (or low) line pressure	Torque converter, ATF pump, pressure regulator, torque converter check valve	830 – 880 kPa (8.5 – 9.0 kgf/cm², 120 – 130 psi)	780 kPa (8.0 kgf/cm², 110 psi)
1st Clutch	[D4]	No or low 1st pressure	1st Clutch		

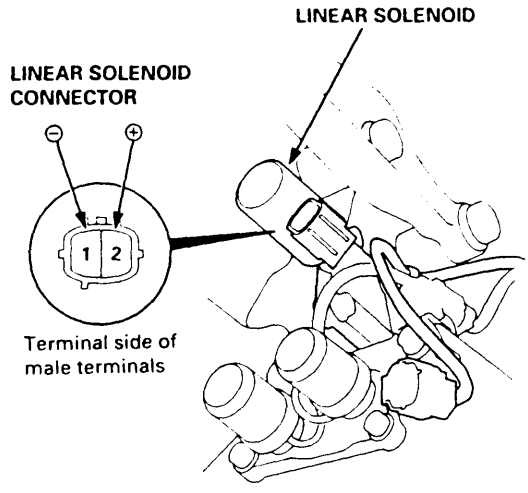
(cont'd)

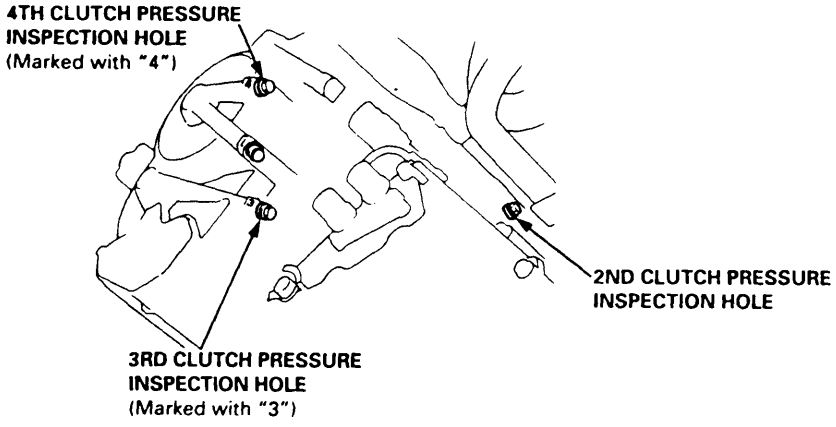
Pressure Testing

(cont'd)

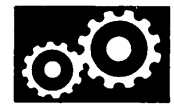
2nd, 3rd and 4th Clutch Pressure Measurement

1. Disconnect the linear solenoid connector.
2. Start the engine, and run it at 2,000 rpm.
3. Shift to D4 position, and measure each clutch pressure.
4. Connect battery voltage and ground to the linear solenoid connecter terminals, then measure each clutch pressure.





PRESSURE	SHIFT LEVER POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
2rd Clutch	D4	No or low 2nd pressure	2nd Clutch	800 – 850 kPa (8.2 – 8.7 kgf/cm², 120 – 120 psi) with linear solenoid disconnected 0 – 150 kPa (0 – 1.5 kgf/cm², 0 – 21 psi) with linear solenoid connected to battery voltage	760 kPa (7.7 kgf/cm², 110 psi) with linear solenoid disconnected 150 kPa (1.5 kgf/cm², 21 psi) with linear solenoid connected to battery voltage
3rd Clutch		No or low 3rd pressure	3rd Clutch	810 – 860 kPa (8.3 – 8.8 kgf/cm², 120 – 130 psi) with linear solenoid disconnected 0 – 150 kPa (0 – 1.5 kgf/cm², 0 – 21 psi) with linear solenoid connected to battery voltage	760 kPa (7.8 kgf/cm², 110 psi) with linear solenoid disconnected 150 kPa (1.5 kgf/cm², 21 psi) with linear solenoid connected to battery voltage
4th Clutch		No or low 4th pressure	4th Clutch		
	R		Servo Valve or 4th Clutch		



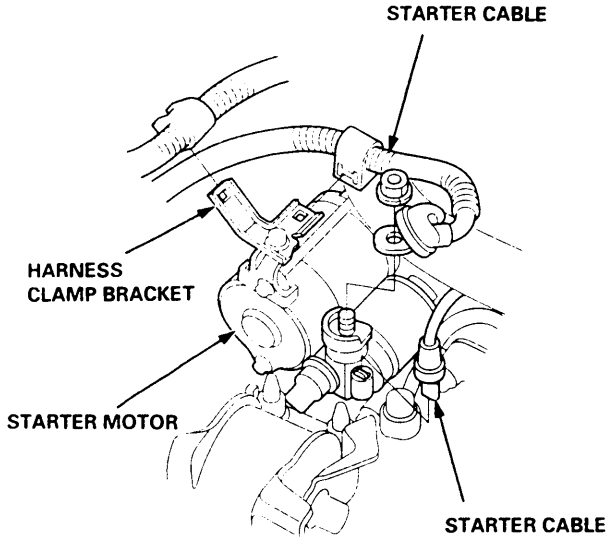
Removal

⚠ WARNING

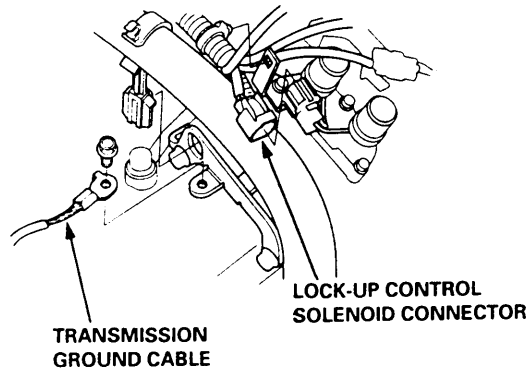
- **Make sure lifts, jacks and safety stands are placed properly, and hoist bracket are attached to the correct position on the engine (see section 1).**
- **Apply parking brake and block rear wheels so vehicle will not roll off stands and fall on you while working under it.**

CAUTION: Use fender covers to avoid damaging painted surfaces.

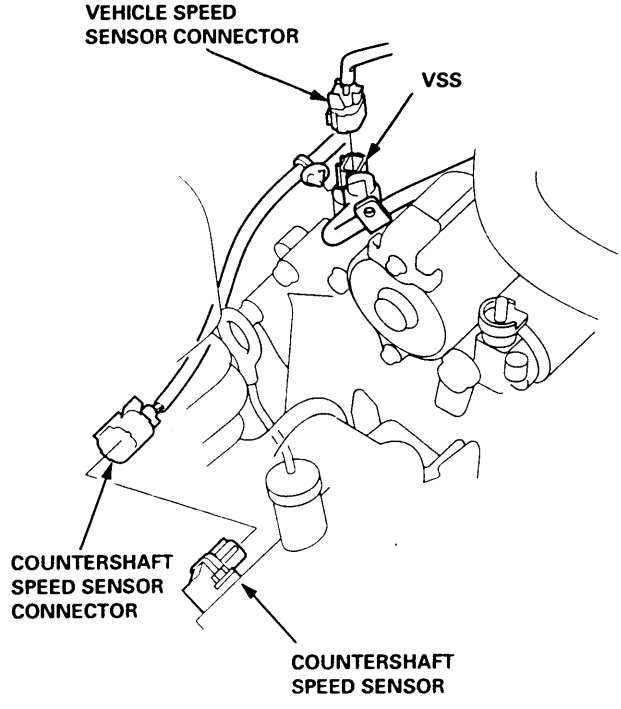
1. Before disconnecting power, make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative (–) terminal from the battery, then remove the positive (+) terminal.
3. Remove the intake air duct and the air cleaner housing assembly.
4. Remove the starter cables and cable holder from the starter motor.



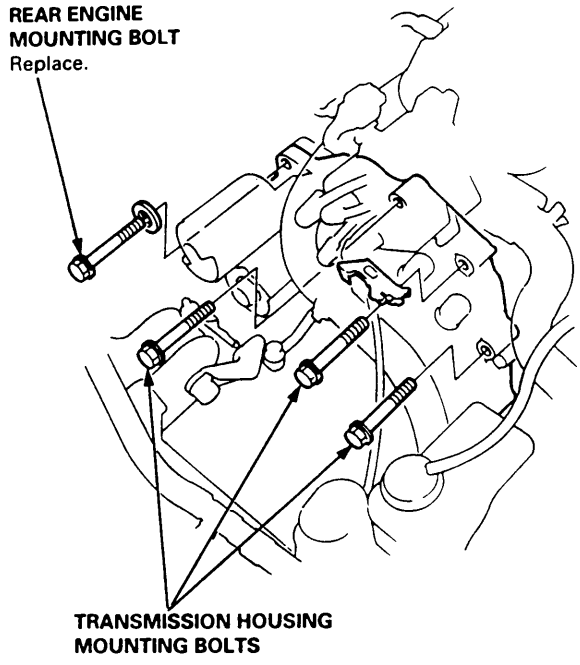
5. Remove the transmission ground cable, and disconnect the lock-up control solenoid connector.



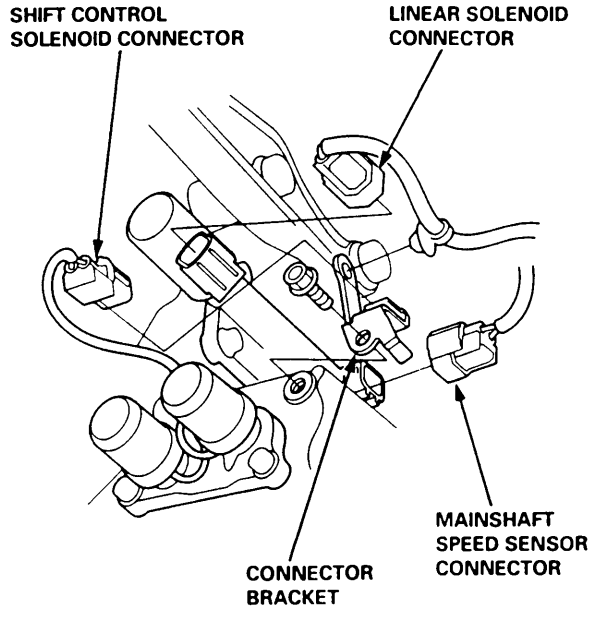
6. Disconnect the vehicle speed sensor (VSS) connector and the countershaft speed sensor connector.



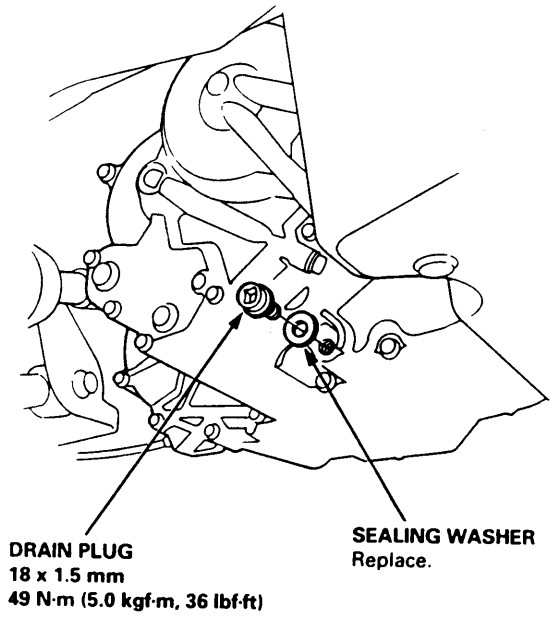
7. Remove the transmission housing mounting bolts and the rear engine mounting bolt.



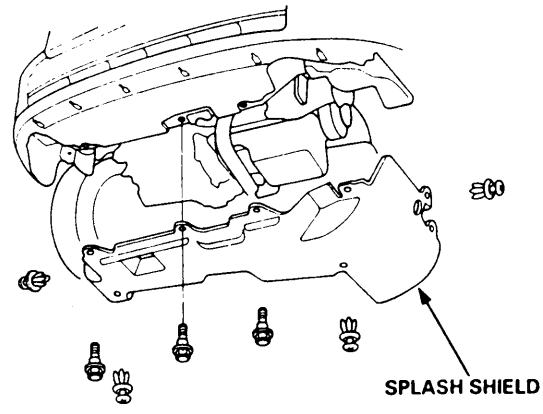
8. Disconnect the shift control solenoid, the linear solenoid, and the mainshaft speed sensor connectors.



9. Remove the drain plug, and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer.



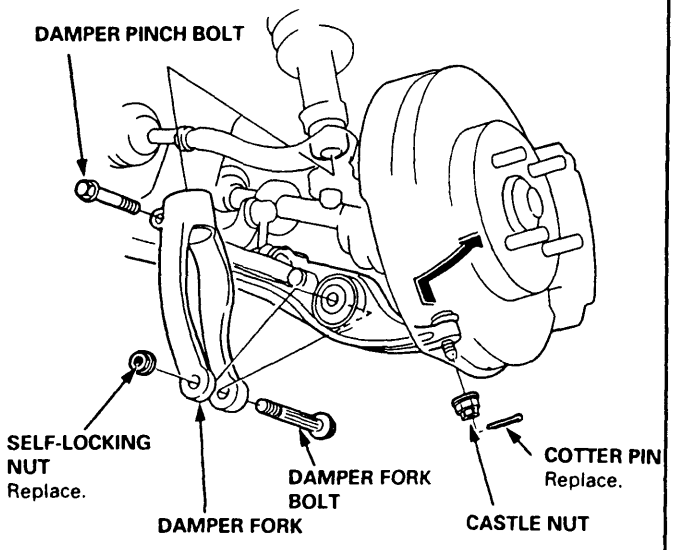
10. Remove the splash shield.



(cont'd)

Removal (cont'd)

11. Remove the cotter pins and castle nuts, then separate the right and left ball joints from the lower arms (see section 18).



12. Remove the right damper fork bolt, then separate the right damper fork and damper.

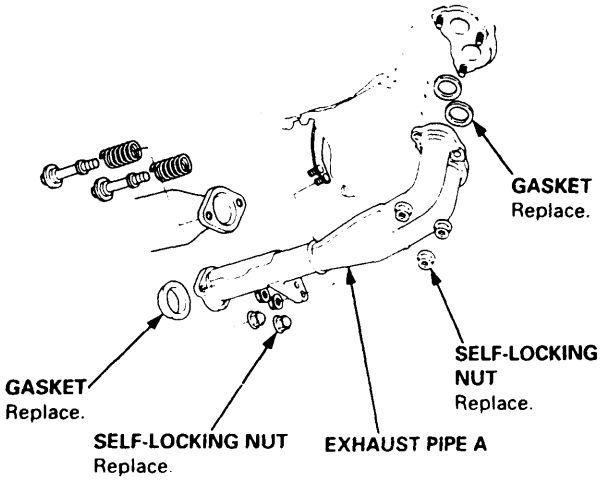
13. Pry the right and left driveshafts out of the differential.

14. Pull on the inboard joint and the right and left driveshafts (see section 16).

15. Tie plastic bags over the driveshaft ends.

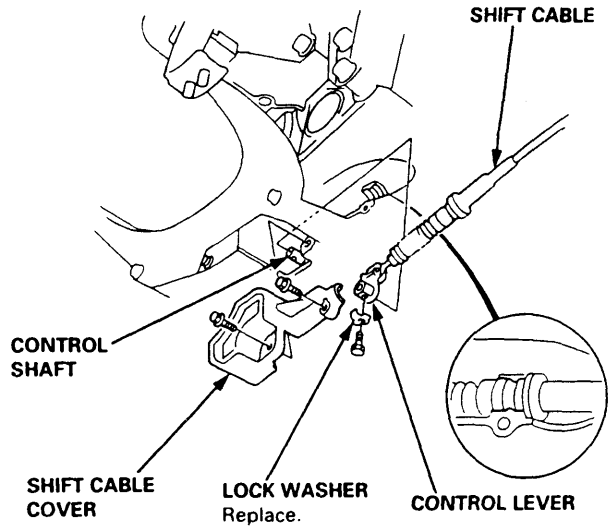
    NOTE: Coat all precision finished surfaces with clean engine oil.

16. Remove the exhaust pipe A.



17. Remove the shift cable cover, then remove the shift cable by removing the control lever.

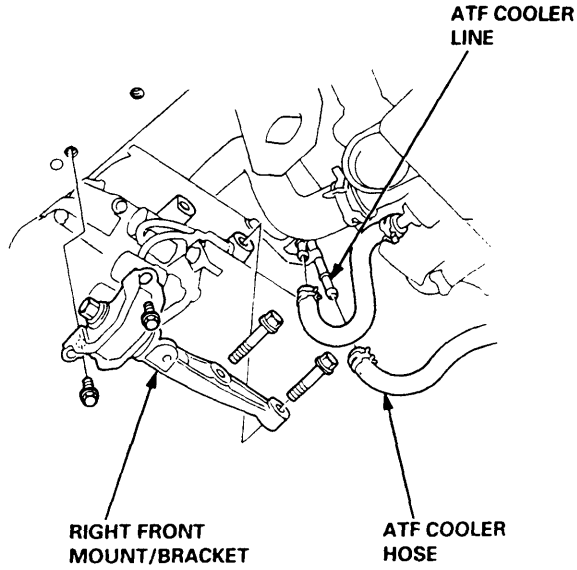
    CAUTION: Take care not to bend the shift cable.



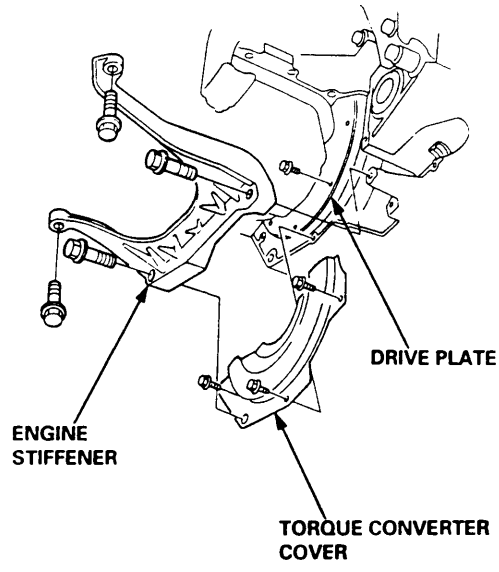
18. Remove the right front mount/bracket.

19. Remove the ATF cooler hoses at the ATF cooler lines. Turn the ends of the ATF cooler hoses up to prevent ATF from flowing out, then plug the ATF cooler hoses and lines.

    NOTE: Check for any sign of leakage at the hose joints.



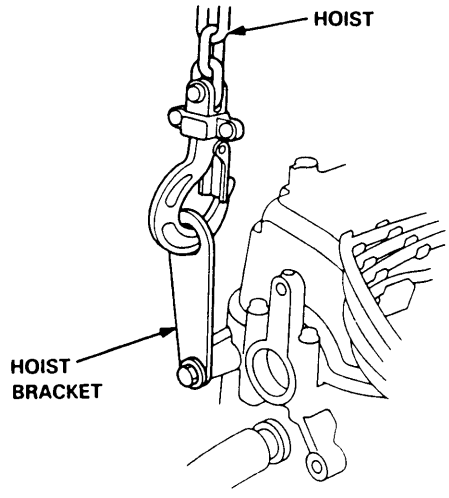
20. Remove the engine stiffener and the torque converter cover.



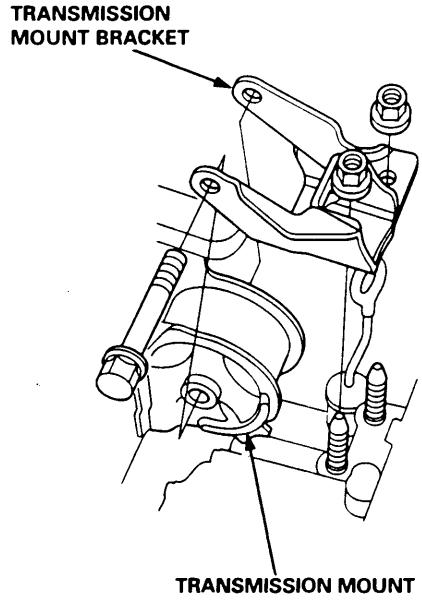
21. Remove the eight drive plate bolts one at a time while rotating the crankshaft pulley.

22. Remove the distributor.

23. Attach a hoisting bracket to the engine, then lift the engine slightly.

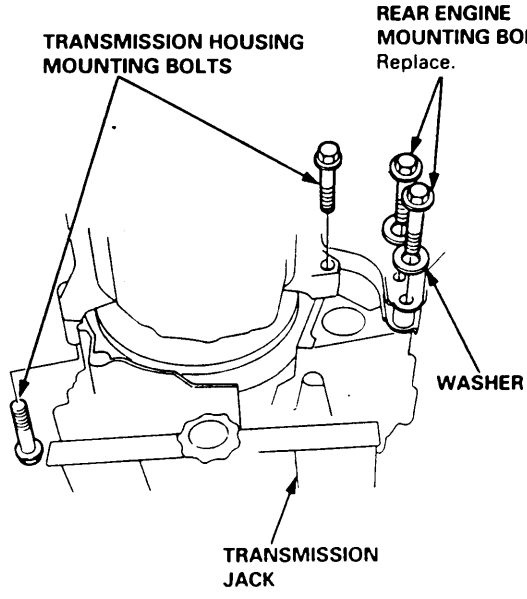


24. Place a jack under the transmission, and raise the transmission just enough to take weight off of the mounts, then remove the transmission mount.

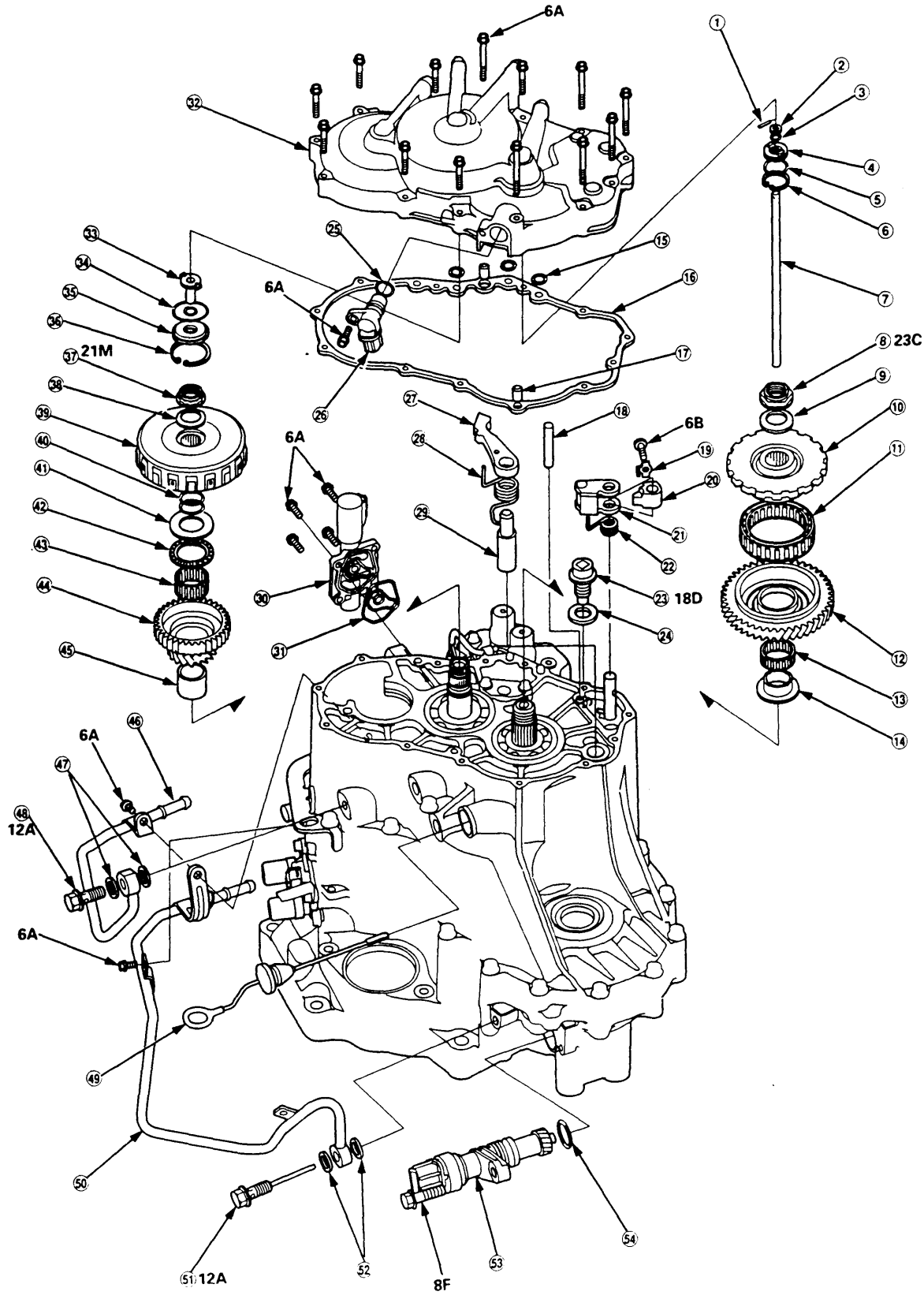


25. Remove the transmission housing mounting bolts and the rear engine mounting bolts.

26. Pull the transmission away from the engine until it clears the 14 mm dowel pins, then lower it on the transmission jack.



Transmission/Right Side Cover



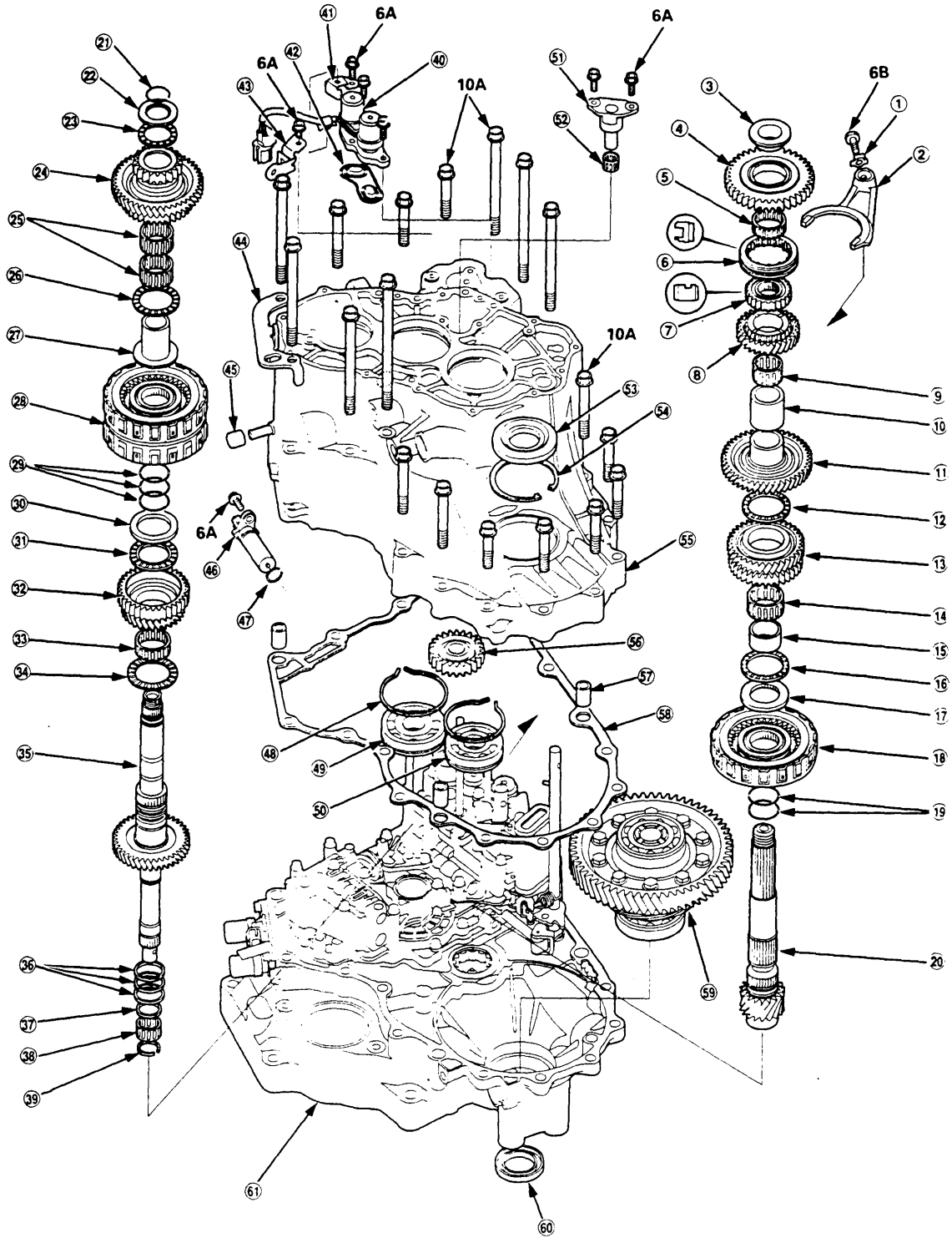
① **ROLLER**
② **COLLAR**
③ **O-RING** Replace.
④ **FEED PIPE FLANGE**
⑤ **O-RING** Replace.
⑥ **SNAP RING**
⑦ **3RD CLUTCH FEED PIPE**
⑧ **COUNTERSHAFT LOCKNUT (FLANGE NUT) 23 x 1.25 mm** Replace.
⑨ **CONICAL SPRING WASHER** Replace.
⑩ **PARKING GEAR**
⑪ **ONE-WAY CLUTCH**
⑫ **COUNTERSHAFT 1ST GEAR**
⑬ **NEEDLE BEARING**
⑭ **COUNTERSHAFT 1ST GEAR COLLAR**
⑮ **O-RINGS** Replace.
⑯ **RIGHT SIDE COVER GASKET** Replace.
⑰ **DOWEL PINS**
⑱ **PARKING BRAKE PAWL STOP**
⑲ **LOCK WASHER** Replace.
⑳ **PARKING BRAKE STOP** Selective part
㉑ **PARKING BRAKE LEVER**
㉒ **PARKING BRAKE LEVER SPRING**
㉓ **DRAIN PLUG**
㉔ **SEALING WASHER** Replace.
㉕ **O-RING** Replace.
㉖ **COUNTERSHAFT SPEED SENSOR**
㉗ **PARKING BRAKE PAWL**
㉘ **PARKING BRAKE PAWL SPRING**
㉙ **PARKING BRAKE PAWL SHAFT**
㉚ **LINEAR SOLENOID ASSEMBLY**
㉛ **LINEAR SOLENOID GASKET** Replace.
㉜ **RIGHT SIDE COVER**
㉝ **1ST CLUTCH FEED PIPE**
㉞ **O-RINGS** Replace.
㉟ **FEED PIPE FLANGE**
㊱ **SNAP RING**
㊲ **MAINSHAFT LOCKNUT (FLANGE NUT) 21 x 1.25 mm** Replace.
㊳ **CONICAL SPRING WASHER** Replace.
㊴ **1ST CLUTCH ASSEMBLY**
㊵ **O-RINGS** Replace.
㊶ **THRUST WASHER**
㊷ **THRUST NEEDLE BEARING**
㊸ **NEEDLE BEARING**
㊹ **MAINSHAFT 1ST GEAR**
㊺ **MAINSHAFT 1ST GEAR COLLAR**
㊻ **ATF COOLER LINE**
㊼ **SEALING WASHERS** Replace.
㊽ **JOINT BOLT**
㊾ **ATF DIPSTICK**
㊿ **ATF COOLER LINE**
(51) **JOINT BOLT**
(52) **SEALING WASHERS** Replace.
(53) **VEHICLE SPEED SENSOR**
(54) **O-RING** Replace.

TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
6B	14 N·m (1.4 kgf·m, 10 lbf·ft)	6 x 1.0 mm	
8F	22 N·m (2.2 kgf·m, 16 lbf·ft)	8 x 1.25 mm	
12A	28 N·m (2.9 kgf·m, 21 lbf·ft)	12 x 1.25 mm	Joint bolt
18D	49 N·m (5.0 kgf·m, 36 lbf·ft)	18 x 1.5 mm	Drain plug
21M	78 N·m (8.0 kgf·m, 58 lbf·ft)	21 x 1.25 mm	Mainshaft locknut: Left-hand threads
23C	103 N·m (10.5 kgf·m, 75.9 lbf·ft) → 0 → 103 N·m (10.5 kgf·m, 75.9 lbf·ft)	23 x 1.25 mm	Countershaft locknut: Left-hand threads

Illustrated Index

Transmission Housing

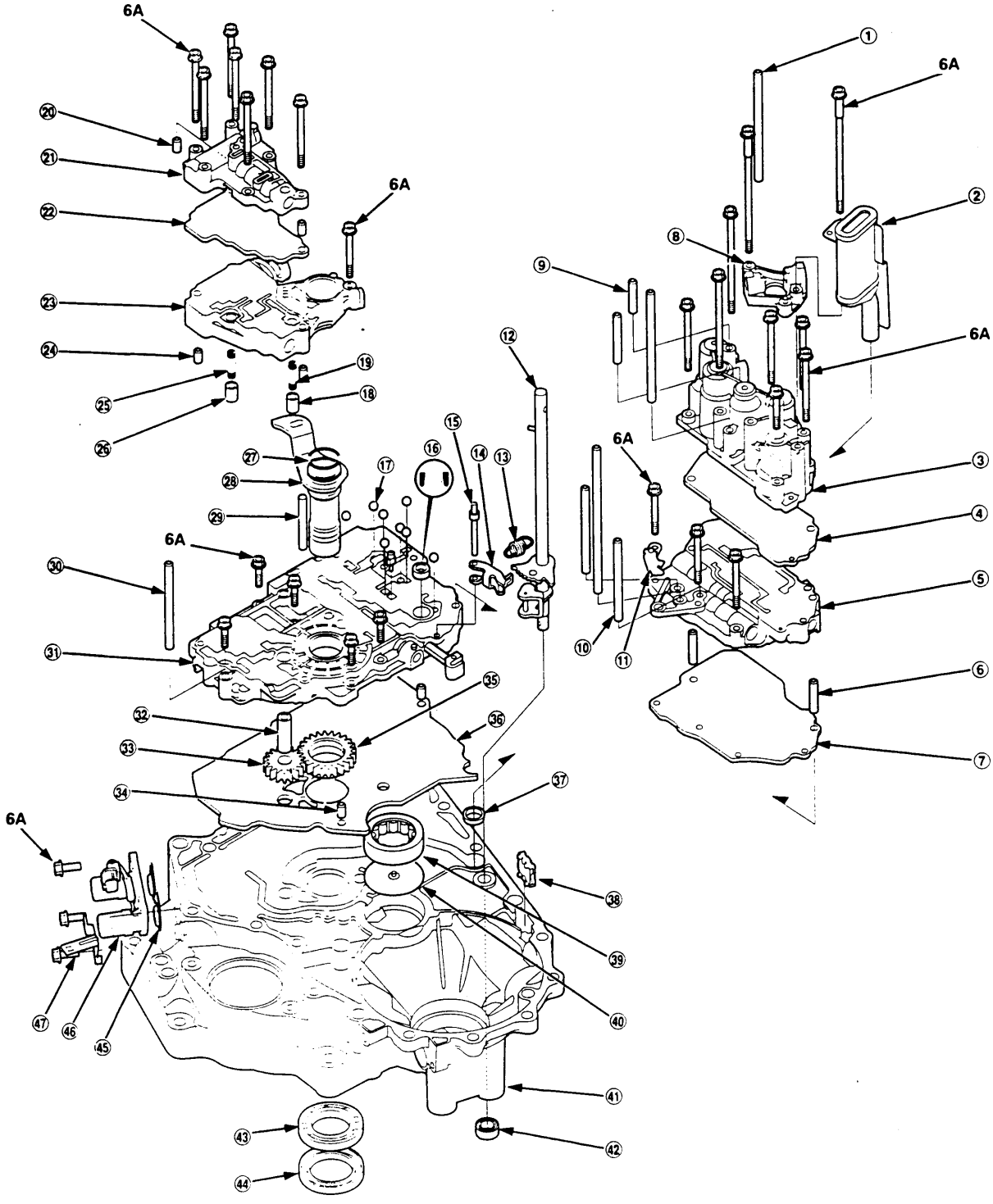


① **LOCK WASHER** Replace.
② **REVERSE SHIFT FORK**
③ **COUNTERSHAFT REVERSE GEAR COLLAR**
④ **COUNTERSHAFT REVERSE GEAR**
⑤ **NEEDLE BEARING**
⑥ **REVERSE SELECTOR**
⑦ **REVERSE SELECTOR HUB**
⑧ **COUNTERSHAFT 4TH GEAR**
⑨ **NEEDLE BEARING**
⑩ **DISTANCE COLLAR, 28 mm** Selective part
⑪ **COUNTERSHAFT 2ND GEAR**
⑫ **THRUST NEEDLE BEARING**
⑬ **COUNTERSHAFT 3RD GEAR**
⑭ **NEEDLE BEARING**
⑮ **COUNTERSHAFT 3RD GEAR COLLAR**
⑯ **THRUST NEEDLE BEARING**
⑰ **SPLINED WASHER**
⑱ **3RD CLUTCH ASSEMBLY**
⑲ **O-RINGS** Replace.
⑳ **COUNTERSHAFT**
㉑ **SNAP RING**
㉒ **THRUST WASHER**
㉓ **THRUST NEEDLE BEARING**
㉔ **MAINSHAFT 4TH GEAR/REVERSE GEAR**
㉕ **NEEDLE BEARINGS**
㉖ **THRUST NEEDLE BEARING**
㉗ **MAINSHAFT 4TH GEAR COLLAR**
㉘ **2ND/4TH CLUTCH ASSEMBLY**
㉙ **O-RINGS** Replace.
㉚ **THRUST WASHER, 36.5 x 55 mm** Selective part
㉛ **THRUST NEEDLE BEARING**
㉜ **MAINSHAFT 2ND GEAR**
㉝ **NEEDLE BEARING**
㉞ **THRUST NEEDLE BEARING**
㉟ **MAINSHAFT**
㊱ **SEALING RINGS, 35 mm**
㊲ **SEALING RING, 29 mm**
㊳ **NEEDLE BEARING**
㊴ **SET RING**
㊵ **SHIFT CONTROL SOLENOID VALVE A/B ASSEMBLY**
㊶ **HARNESS CLAMP BRACKET**
㊷ **SHIFT CONTROL SOLENOID FILTER/GASKET** Replace.
㊸ **CONNECTOR BRACKET**
㊹ **TRANSMISSION HANGER**
㊺ **BREATHER CAP**
㊻ **MAINSHAFT SPEED SENSOR**
㊼ **O-RING** Replace.
㊽ **SNAP RING**
㊾ **TRANSMISSION HOUSING MAINSHAFT BEARING**
㊿ **TRANSMISSION HOUSING COUNTERSHAFT BEARING**
(51) **REVERSE IDLER GEAR SHAFT HOLDER ASSEMBLY**
(52) **NEEDLE BEARING**
(53) **OIL SEAL** Replace.
(54) **SET RING, 80 mm** Selective part
(55) **TRANSMISSION HOUSING**
(56) **REVERSE IDLER GEAR**
(57) **DOWEL PINS**
(58) **TRANSMISSION HOUSING GASKET** Replace.
(59) **DIFFERENTIAL ASSEMBLY**
(60) **OIL SEAL** Replace.
(61) **TORQUE CONVERTER HOUSING**

TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	
6B	14 N·m (1.4 kgf·m, 10 lbf·ft)	6 x 1.0 mm	
10A	44 N·m (4.5 kgf·m, 33 lbf·ft)	10 x 1.25 mm	

Torque Converter Housing/Valve Body



① ATF FEED PIPE
② ATF STRAINER
③ SERVO BODY
④ SERVO SEPARATOR PLATE
⑤ SECONDARY VALVE BODY
⑥ DOWEL PINS
⑦ SECONDARY SEPARATOR PLATE
⑧ SERVO DETENT BASE
⑨ ATF FEED PIPES
⑩ ATF FEED PIPES
⑪ SHAFT STOP
⑫ CONTROL SHAFT
⑬ DETENT ARM SPRING
⑭ DETENT ARM
⑮ DETENT ARM SHAFT
⑯ FILTER Replace.
⑰ CHECK BALLS
⑱ TORQUE CONVERTER CHECK VALVE
⑲ TORQUE CONVERTER CHECK VALVE SPRING
⑳ DOWEL PINS
㉑ LOCK-UP VALVE BODY
㉒ LOCK-UP SEPARATOR PLATE
㉓ REGULATOR VALVE BODY
㉔ DOWEL PINS
㉕ COOLER RELIEF VALVE SPRING
㉖ COOLER RELIEF VALVE
㉗ O-RING Replace.
㉘ STATOR SHAFT
㉙ STOP SHAFT
㉚ ATF FEED PIPE
㉛ MAIN VALVE BODY
㉜ ATF PUMP DRIVEN GEAR SHAFT
㉝ ATF PUMP DRIVEN GEAR
㉞ DOWEL PINS
㉟ ATF PUMP DRIVE GEAR
㊱ MAIN SEPARATOR PLATE
㊲ SUCTION PIPE COLLAR
㊳ ATF MAGNET
㊴ TORQUE CONVERTER HOUSING COUNTERSHAFT BEARING
㊵ ATF GUIDE PLATE
㊶ TORQUE CONVERTER HOUSING
㊷ OIL SEAL Replace.
㊸ TORQUE CONVERTER HOUSING MAINSHAFT BEARING
㊹ OIL SEAL Replace.
㊺ LOCK-UP CONTROL SOLENOID FILTER/GASKET Replace.
㊻ LOCK-UP CONTROL SOLENOID VALVE A/B ASSEMBLY
㊼ CONNECTOR BRACKET

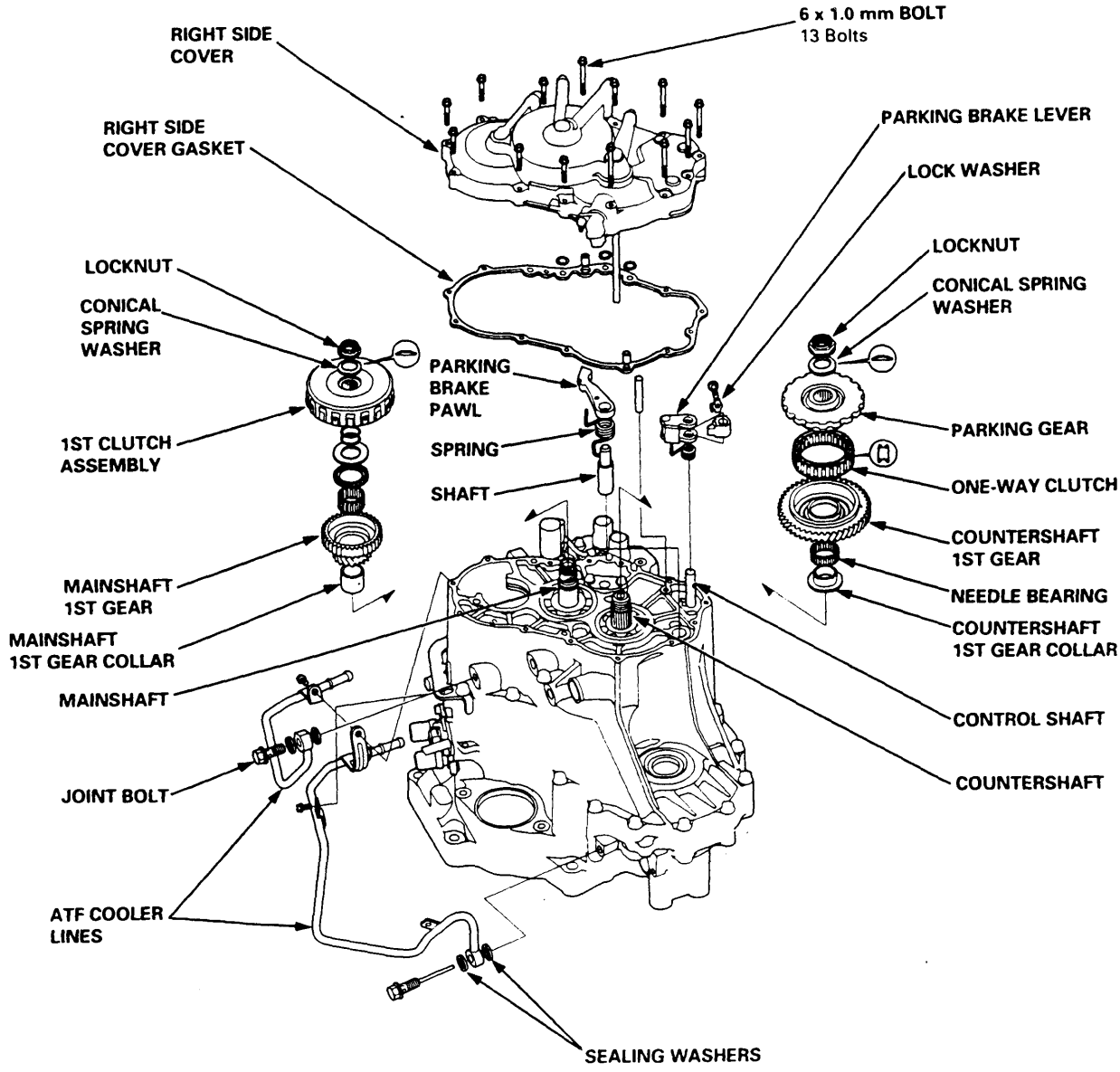
TORQUE SPECIFICATIONS

Bolt/Nut No.	Torque Value	Size	Remarks
6A	12 N·m (1.2 kgf·m, 8.7 lbf·ft)	6 x 1.0 mm	

Right Side Cover

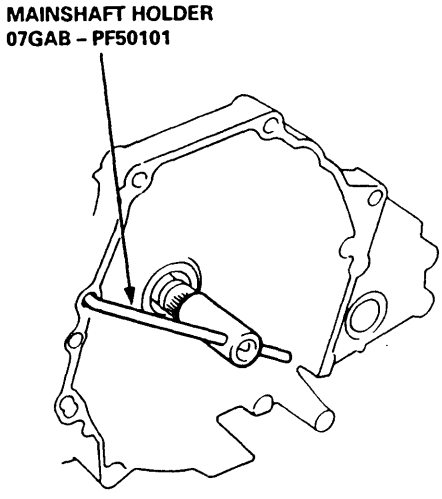
Removal

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- When removing the right side cover, replace the following:
  - — O-rings
  - — Mainshaft and countershaft locknuts
  - — Conical spring washers
  - — Right side cover gasket
  - — Lock washer
  - — Sealing washers



1. Remove the 13 bolts securing the right side cover, then remove the right side cover.

2. Slip the special tool onto the mainshaft as shown.

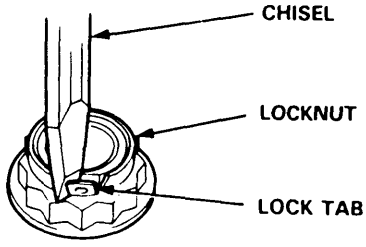


3. Engage the parking brake pawl with the parking gear.

4. Cut the lock tabs of the mainshaft and countershaft locknuts using a chisel as shown, then remove the locknuts and conical spring washers.

   CAUTION: Keep all of the chiseled particles out of the transmission.

   NOTE:
   - Mainshaft and countershaft locknuts have left-hand threads.
   - Always wear safety glasses.



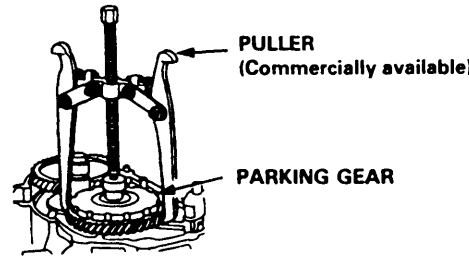
5. Remove the special tool from the mainshaft after removing the locknuts.

6. Remove the 1st clutch and mainshaft 1st gear assembly and mainshaft 1st gear collar from the mainshaft.

7. Remove the parking brake pawl, spring and shaft.

8. Remove the parking brake lever from the control shaft.

9. Using a universal two-jaw puller, remove the parking gear, one-way clutch and countershaft 1st gear assembly.

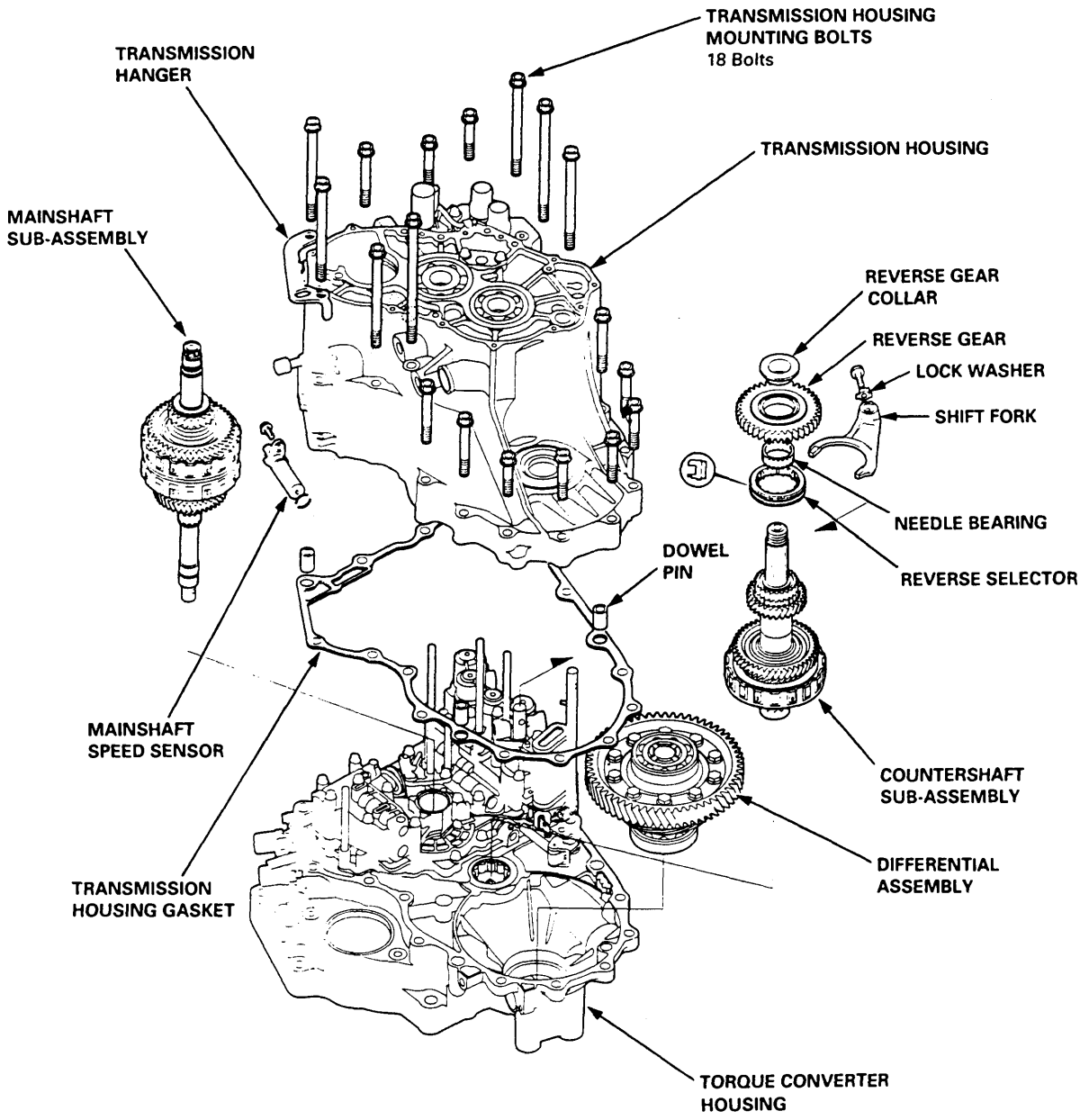


10. Remove the needle bearing and the countershaft 1st gear collar from the countershaft.

11. Remove the ATF cooler lines and ATF dipstick.

Transmission Housing

Removal

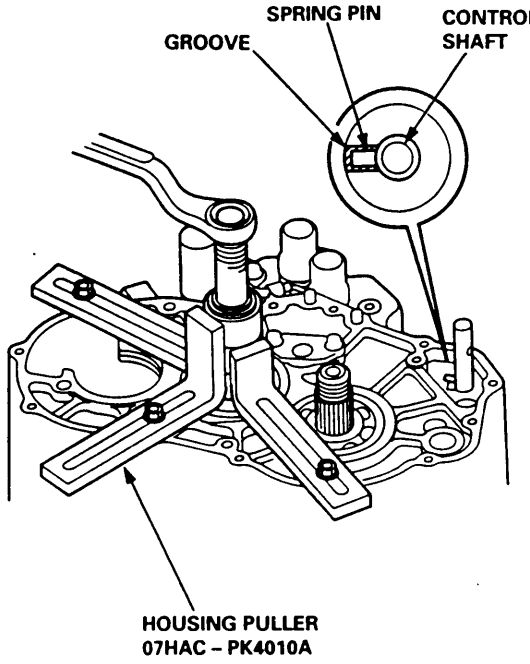


NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- When removing the transmission housing, replace the following:
  — O-ring
  — Transmission housing gasket
  — Lock washer

1. Remove the mainshaft speed sensor from the transmission housing.

2. Remove the transmission housing mounting bolts and hanger.

3. Align the spring pin on the control shaft with the transmission housing groove by turning the control shaft.



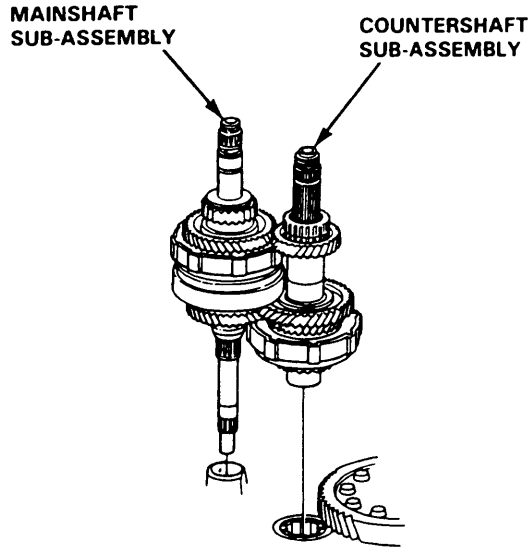
4. Install the special tool on the transmission housing, then remove the housing as shown.

   CAUTION: Make sure the mainshaft speed sensor has been removed from the transmission housing before removing the transmission housing from the torque converter housing.

5. Remove the countershaft reverse gear with the collar and needle bearing.

6. Remove the lock bolt securing the shift fork, then remove the fork with the reverse selector from the countershaft.

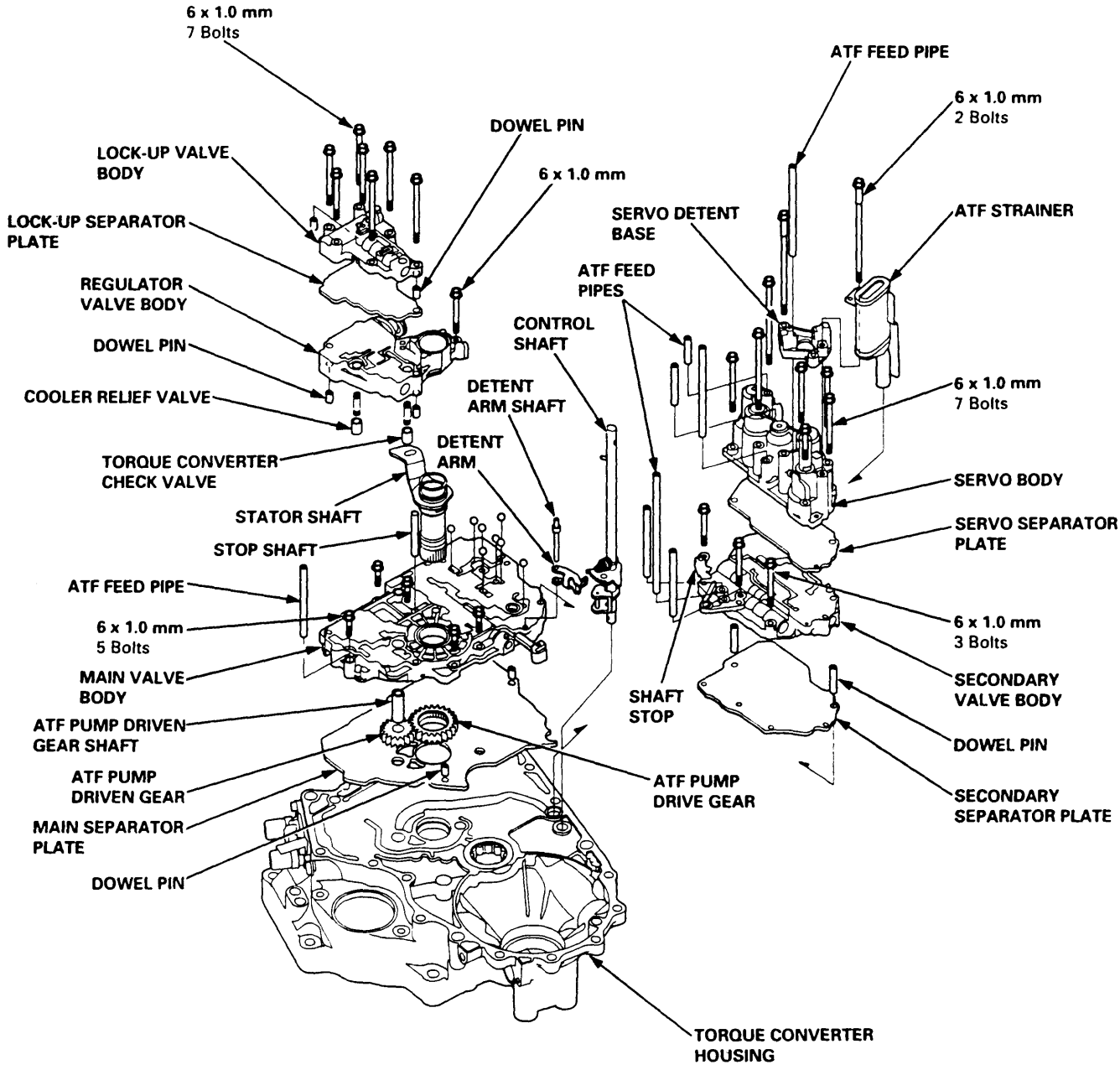
7. Remove the countershaft sub-assembly and the mainshaft sub-assembly together.



8. Remove the differential assembly from the torque converter housing.

Torque Converter Housing/Valve Body

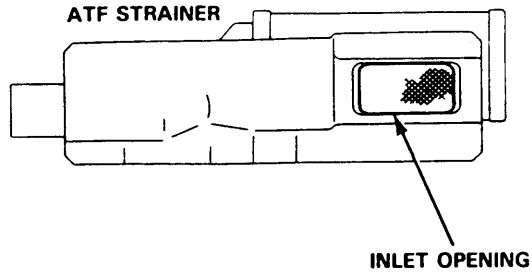
Removal



NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- When removing the valve body, replace the O-ring.

1. Remove the ATF feed pipes from the servo body, secondary valve body and main valve body.
2. Remove the ATF strainer and servo detent base (two bolts).
3. Remove the servo body and servo separator plate (seven bolts).
4. Remove the secondary valve body, shaft stop and secondary separator plate (three bolts).
5. Remove the lock-up valve body and separator plate (seven bolts).
6. Remove the regulator valve body (one bolt).
7. Remove the stator shaft and stop shaft.
8. Remove the detent spring from the detent arm, then remove the control shaft from the torque converter housing.
9. Remove the detent arm and detent arm shaft from the main valve body.
10. Remove the main valve body (five bolts).

    NOTE: Do not let the eight check balls fall out of the main valve body when removing the main valve body.
11. Remove the ATF pump driven gear shaft, then remove the ATF pump gears.
12. Remove the main separator plate and two dowel pins.
13. Clean the inlet opening of the ATF strainer thoroughly with compressed air, then check that it is in good condition, and the inlet opening is not clogged.



14. Test the filter by pouring clean ATF fluid through the inlet opening. Replace the ATF strainer if it is clogged or damaged.

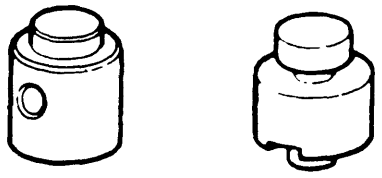
    NOTE: The ATF strainer can be reused if it is not clogged.

Valve Caps

Description

- Caps with one projected tip and one flat end are installed with the flat end toward the inside of the valve body.
- Caps with a projected tip on each end are installed with the smaller tip toward the inside of the valve body. The small tip is a spring guide.

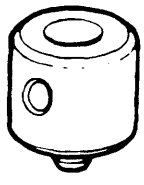
Toward outside of valve body.



Toward inside of valve body.

- Caps with one projected tip and hollow end are installed with the tip toward the inside of the valve body. The tip is a spring guide.

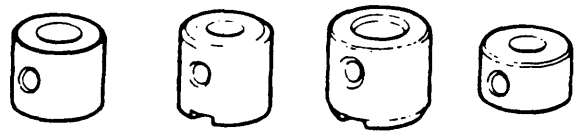
Toward outside of valve body.



Toward inside of valve body.

- Caps with hollow ends are installed with the hollow end away from the inside of the valve body.
- Caps with notched ends are installed with the notch toward the inside of the valve body.
- Caps with flat ends and a hole through the center are installed with the smaller hole toward the inside of the valve body.

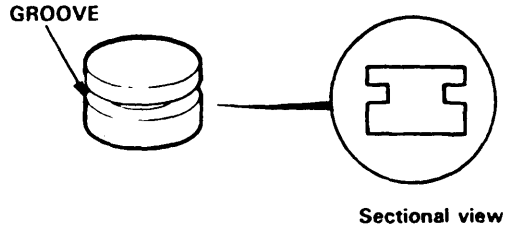
Toward outside of valve body.



Toward inside of valve body.

- Caps with flat ends and a groove around the cap are installed with the grooved side toward the outside of the valve body.

Toward outside of valve body.



Sectional view.

Toward inside of valve body.

Repair

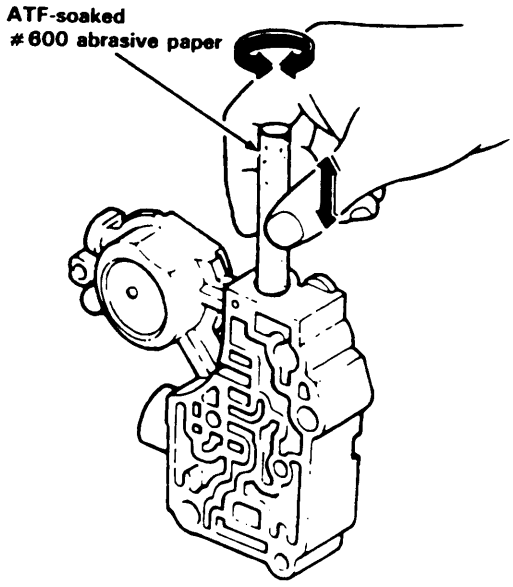
NOTE: This repair is only necessary if one or more of the valves in a valve body do not slide smoothly in their bores. You may use this procedure to free the valves in the valve bodies.

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.

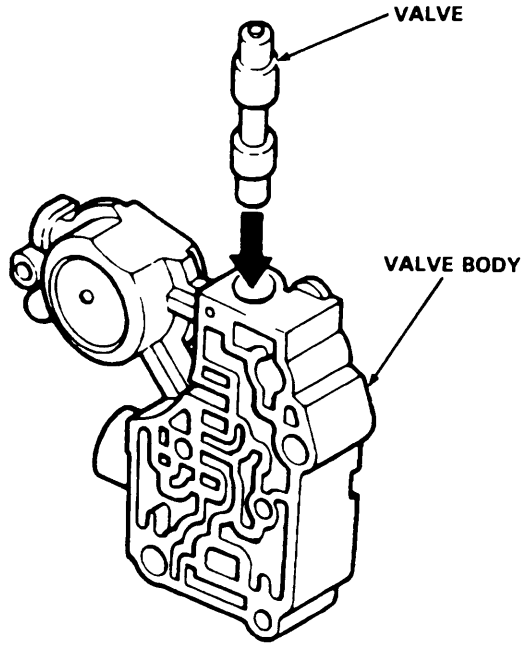
   CAUTION: It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.

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 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.

   CAUTION: The valve body is aluminum and doesn't require much polishing to remove any burrs.



5. Remove the #600 paper and 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.



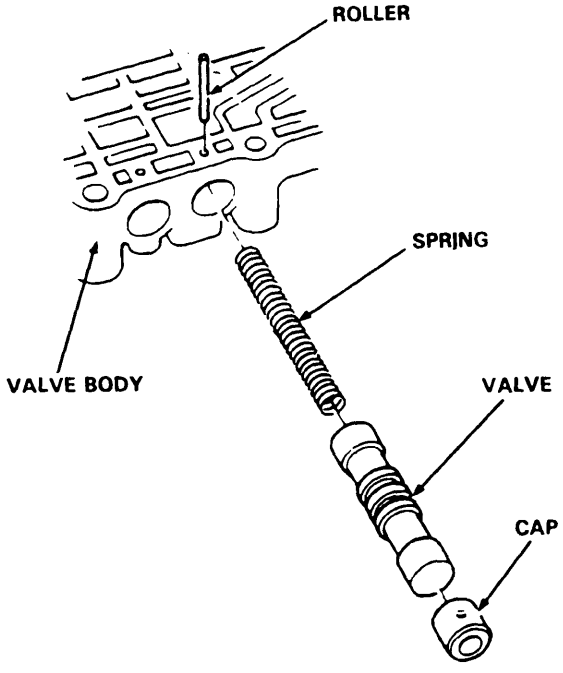
7. Remove the valve, then thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.

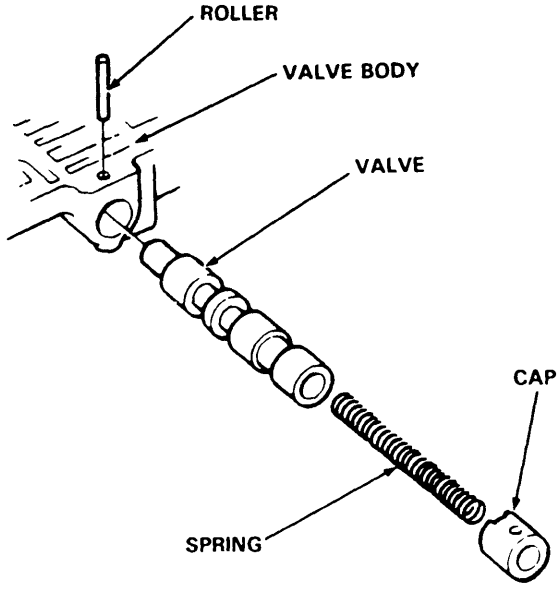
Valve

Assembly

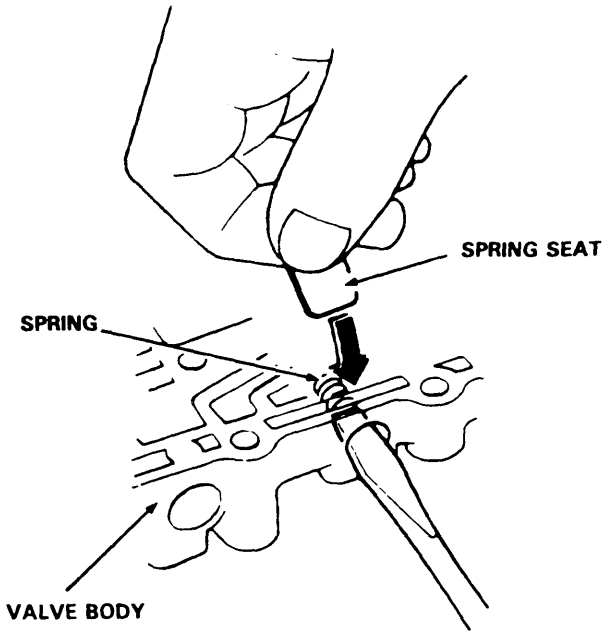
NOTE:
Coat all parts with ATF before assembly.

- Install the valve, valve spring and cap in the valve body and secure with the roller.

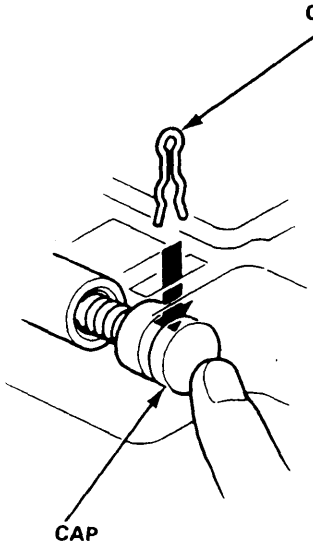




- Set the spring in the valve and install it in the valve body. Push the spring in with a screwdriver, then install the spring seat.



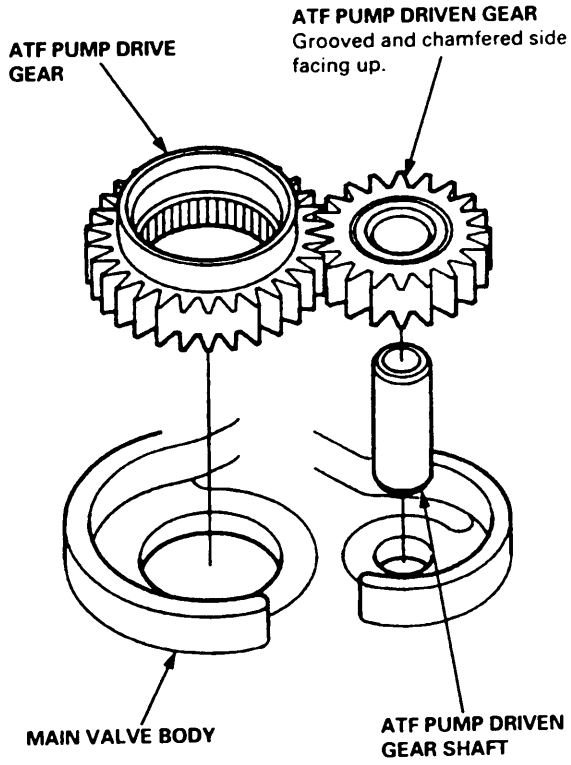
- Install the valve, spring and cap in the valve body. Push the cap, then install the clip.



Inspection

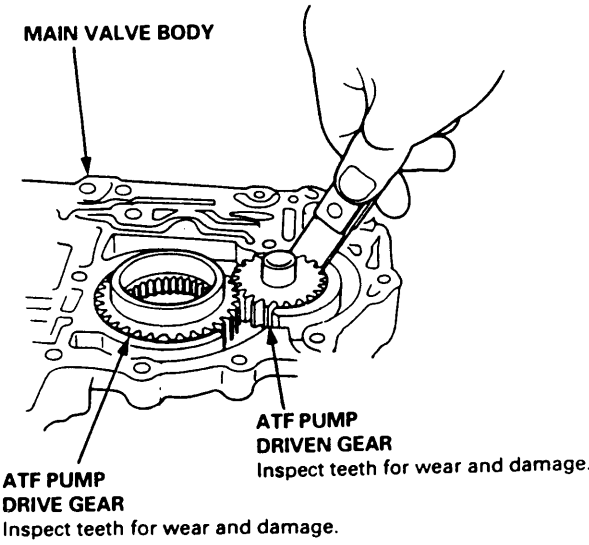
1. Install the ATF pump gears and ATF pump driven gear shaft in the main valve body.

   NOTE:
   - Lubricate all parts with ATF during inspection.
   - Install the ATF pump driven gear with its grooved and chamfered side facing up as shown.



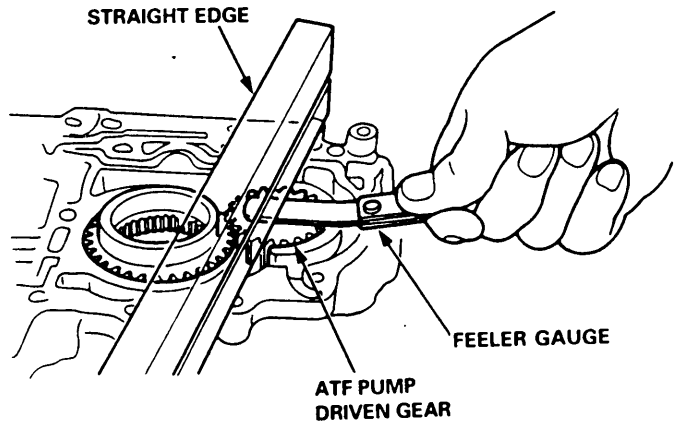
2. Measure the side clearance of the ATF pump drive and driven gears.

   ATF Pump Gears Side (Radial) Clearance:
   Standard (New):
   ATF Pump Drive Gear
   0.105 – 0.1325 mm (0.004 – 0.005 in)
   ATF Pump Driven Gear
   0.035 – 0.0625 mm (0.0014 – 0.0025 in)



3. Remove the ATF pump driven gear shaft. Measure the thrust clearance of the ATF pump driven gear-to-valve body.

   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)



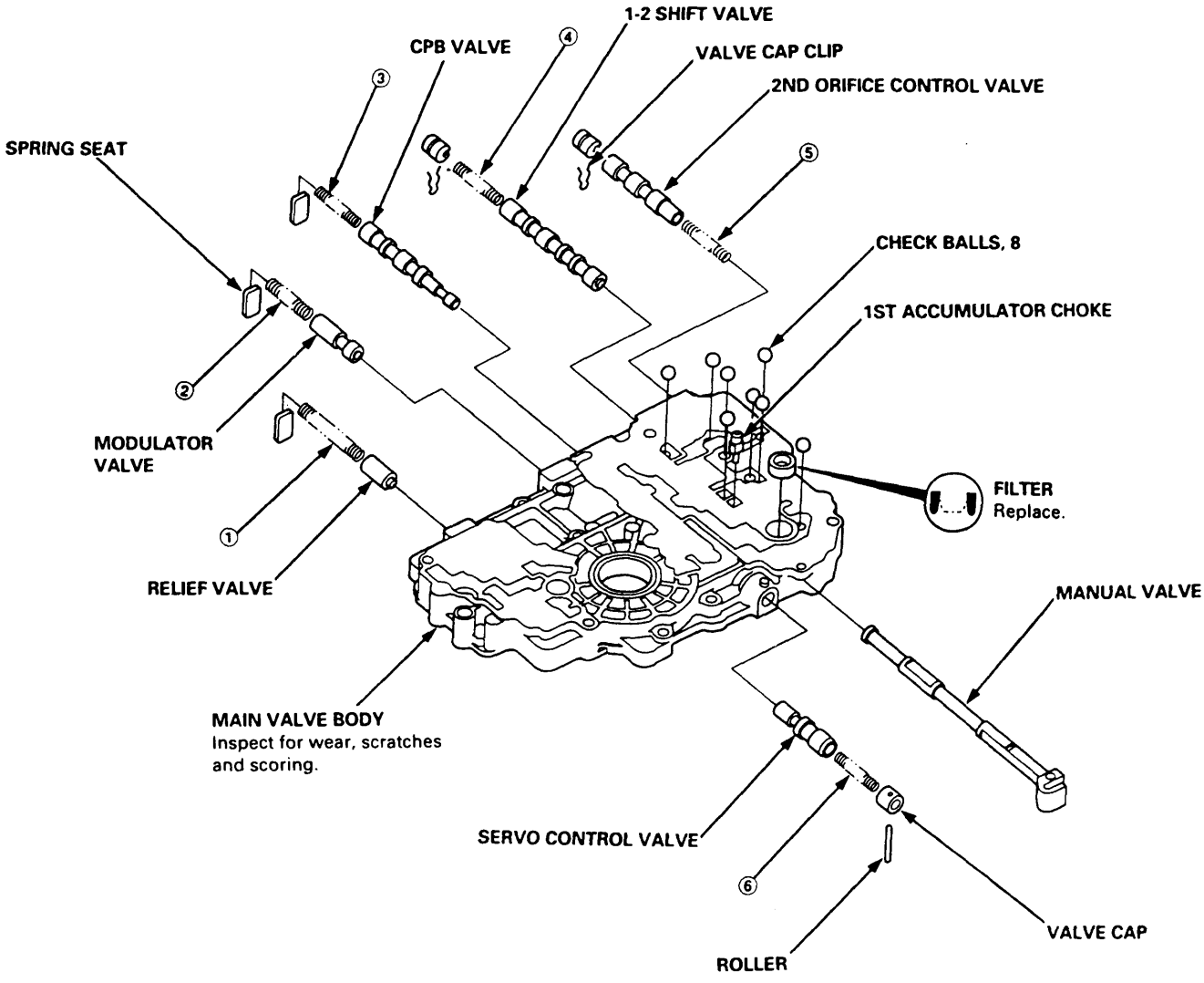
Main Valve Body

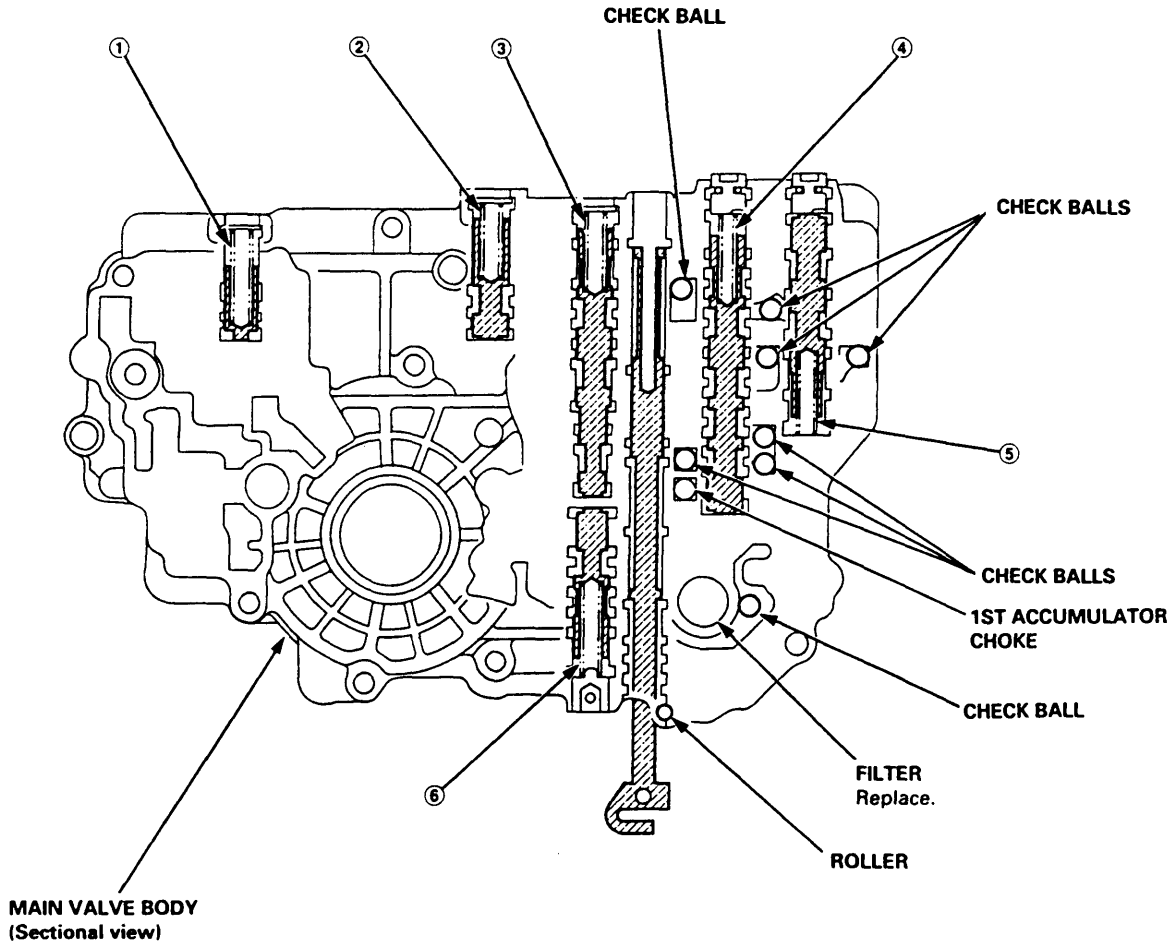
Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace the valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-117.
- Coat all parts with ATF during assembly.

CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.





SPRING SPECIFICATIONS

Unit: mm (in)

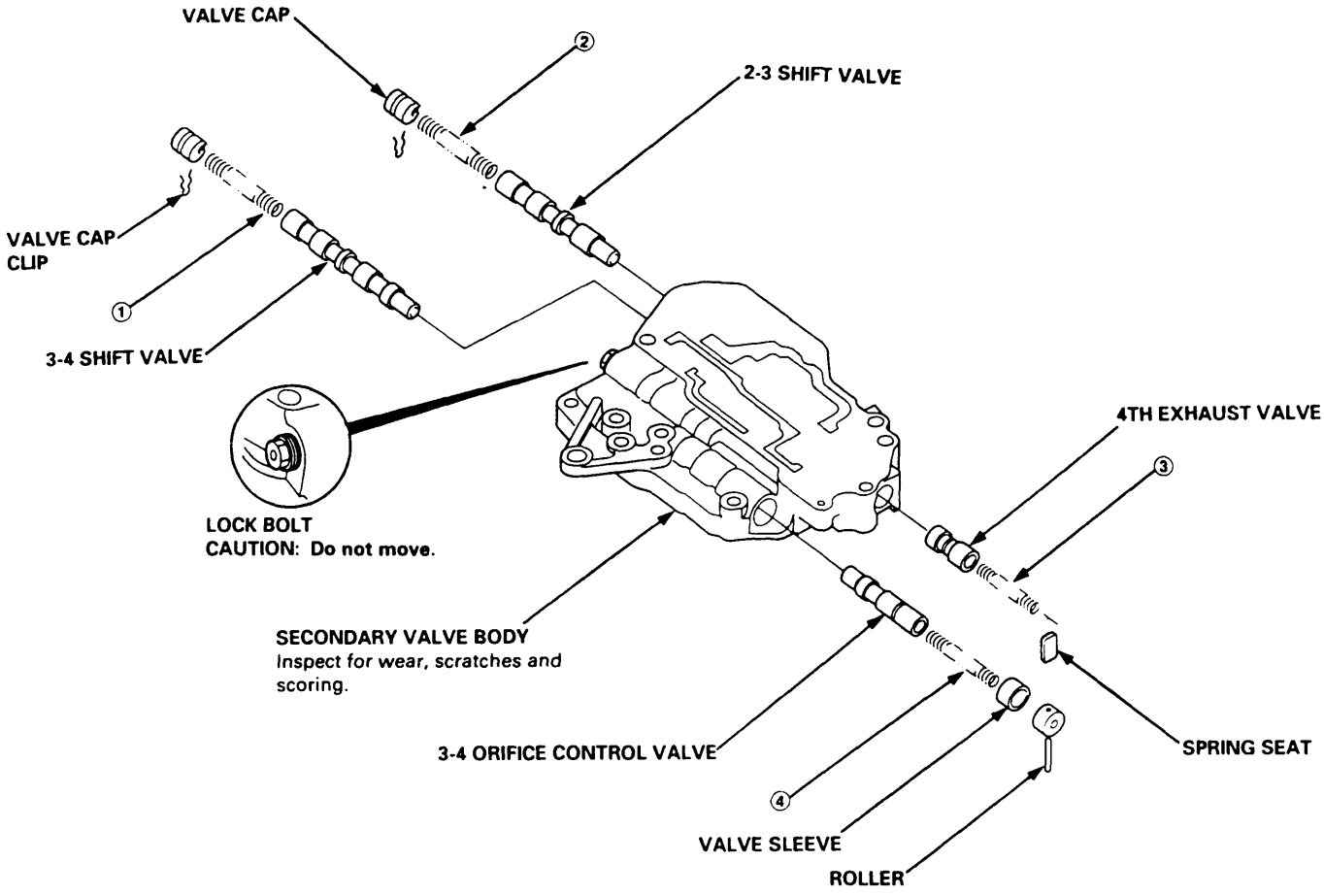
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Relief valve spring	1.1 (0.043)	8.6 (0.342)	37.1 (1.461)	13.4
②	Modulator valve spring	1.4 (0.055)	9.4 (0.374)	35.0 (1.378)	10.9
③	CPB valve spring	0.9 (0.035)	8.1 (0.322)	47.2 (1.858)	18.3
④	1-2 shift valve spring	0.9 (0.035)	7.6 (0.302)	41.3 (1.626)	16.3
⑤	2nd orifice control valve spring	0.7 (0.028)	6.6 (0.262)	34.8 (1.370)	22.0
⑥	Servo control valve spring	1.0 (0.039)	8.1 (0.322)	52.1 (2.051)	20.8

Secondary Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace the secondary valve body kit, P/N 27700 – P4R – 305 (The secondary valve body kit includes the linear solenoid assembly) if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-117.
- Coat all parts with ATF during assembly.
- The CPC valve is installed in the secondary valve body, held in place by the lock bolt.



SPRING SPECIFICATIONS

Unit: mm (in)

No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	3-4 shift valve spring	0.9 (0.035)	7.6 (0.302)	57.0 (2.244)	26.8
②	2-3 shift valve spring	0.9 (0.035)	7.6 (0.302)	57.0 (2.244)	26.8
③	4th exhaust valve spring	0.9 (0.035)	6.1 (0.242)	36.4 (1.433)	19.5
④	3-4 orifice control valve spring	0.7 (0.028)	6.6 (0.262)	37.5 (1.476)	24.6

Regulator Valve Body

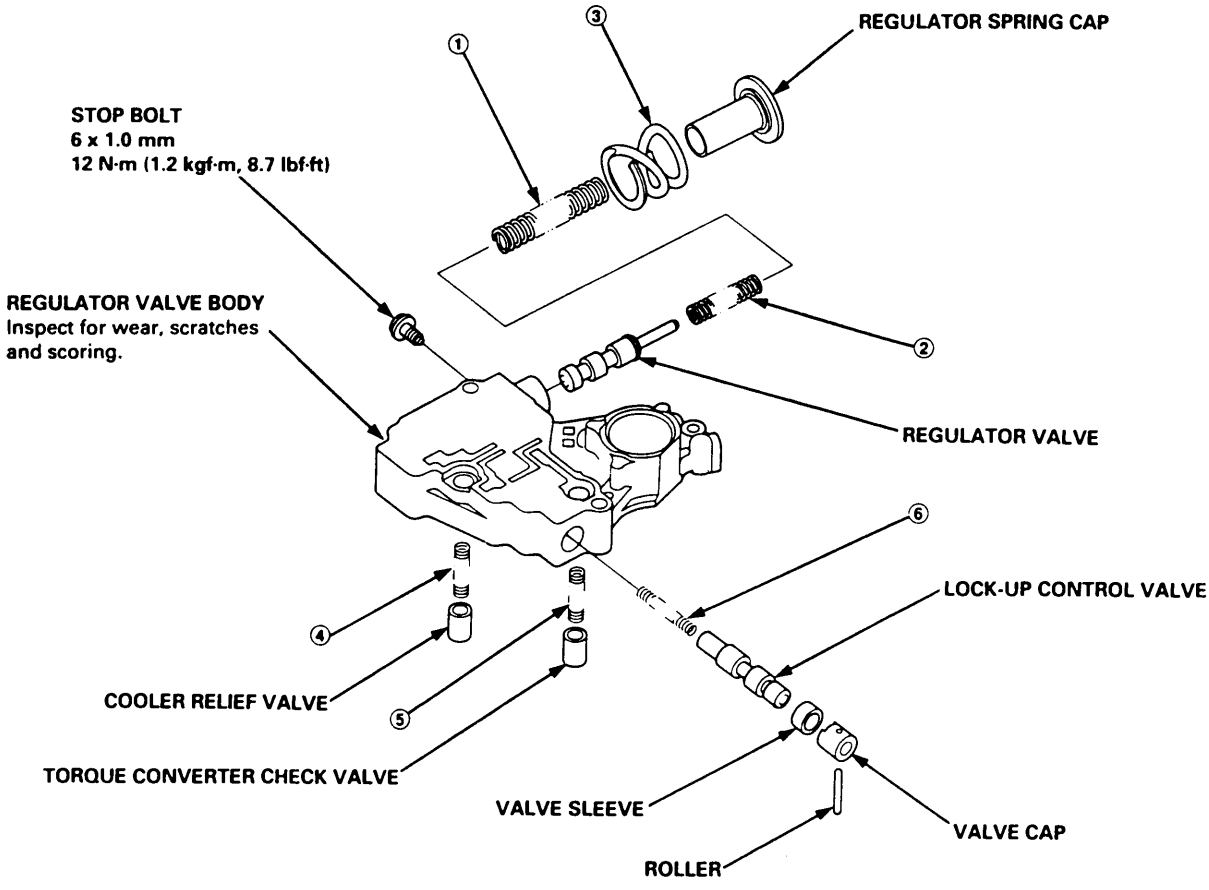
Disassembly/Inspection/Reassembly

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace the valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-117.

1. 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.

2. Reassembly is the reverse order of the disassembly procedure.

   NOTE:
   - Coat all parts with ATF during assembly.
   - 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

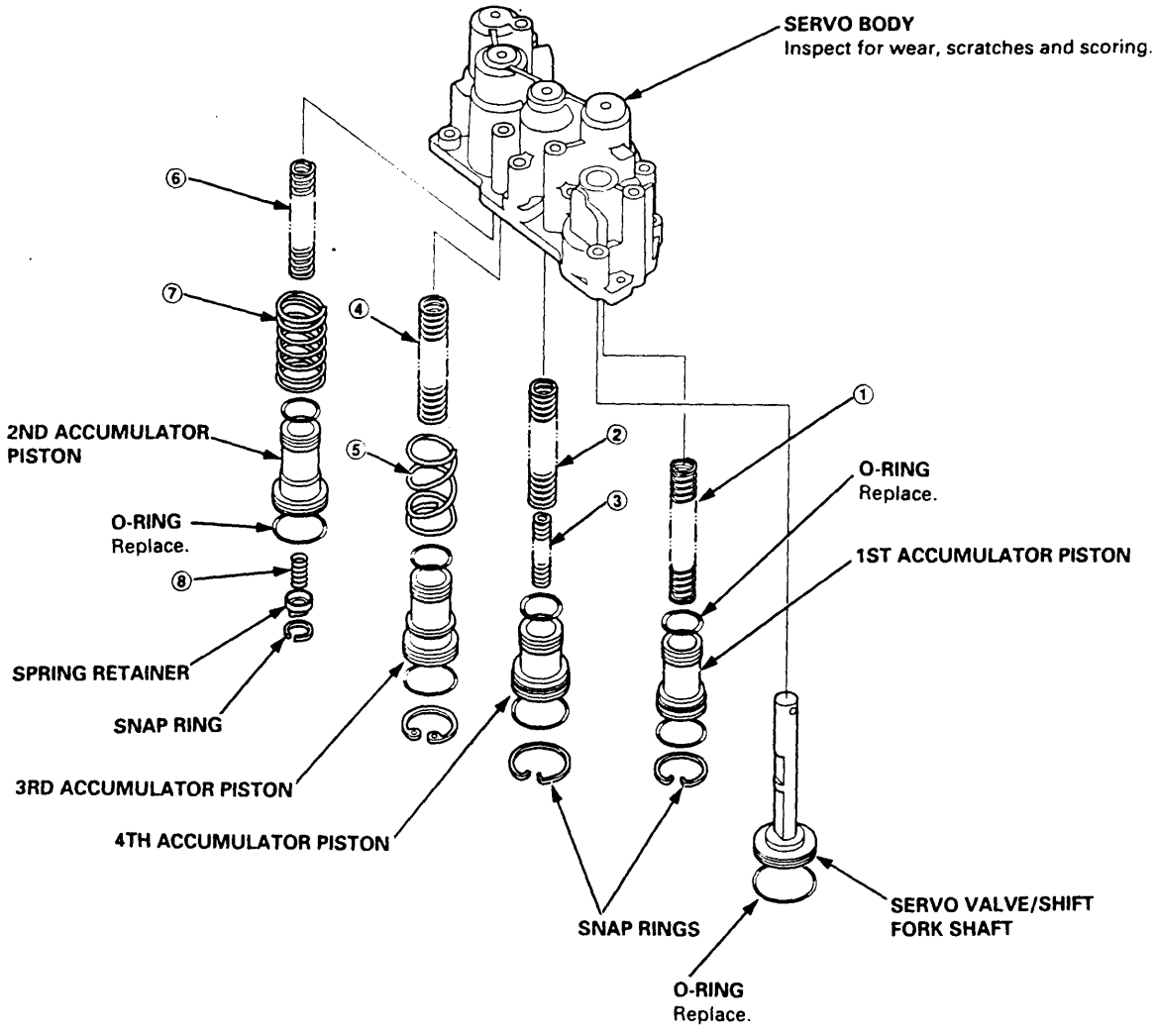
Unit: mm (in)

No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Regulator valve spring A	1.8 (0.071)	14.7 (0.584)	87.8 (3.457)	16.5
②	Regulator valve spring B	1.8 (0.071)	9.6 (0.381)	44.0 (1.732)	11.0
③	Stator reaction spring	4.5 (0.177)	35.4 (1.407)	30.3 (1.193)	1.9
④	Cooler relief valve spring	1.0 (0.039)	8.4 (0.334)	33.8 (1.331)	8.2
⑤	Torque converter check valve spring	1.0 (0.039)	8.4 (0.334)	33.8 (1.331)	8.2
⑥	Lock-up control valve spring	0.7 (0.028)	6.6 (0.262)	38.0 (1.496)	14.1

Servo Body

Disassembly/Inspection/Reassembly

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace the valve body as an assembly if any parts are worn or damaged.
- Coat all parts with ATF during assembly.
- Replace the O-rings.



SPRING SPECIFICATIONS

Unit: mm (in)

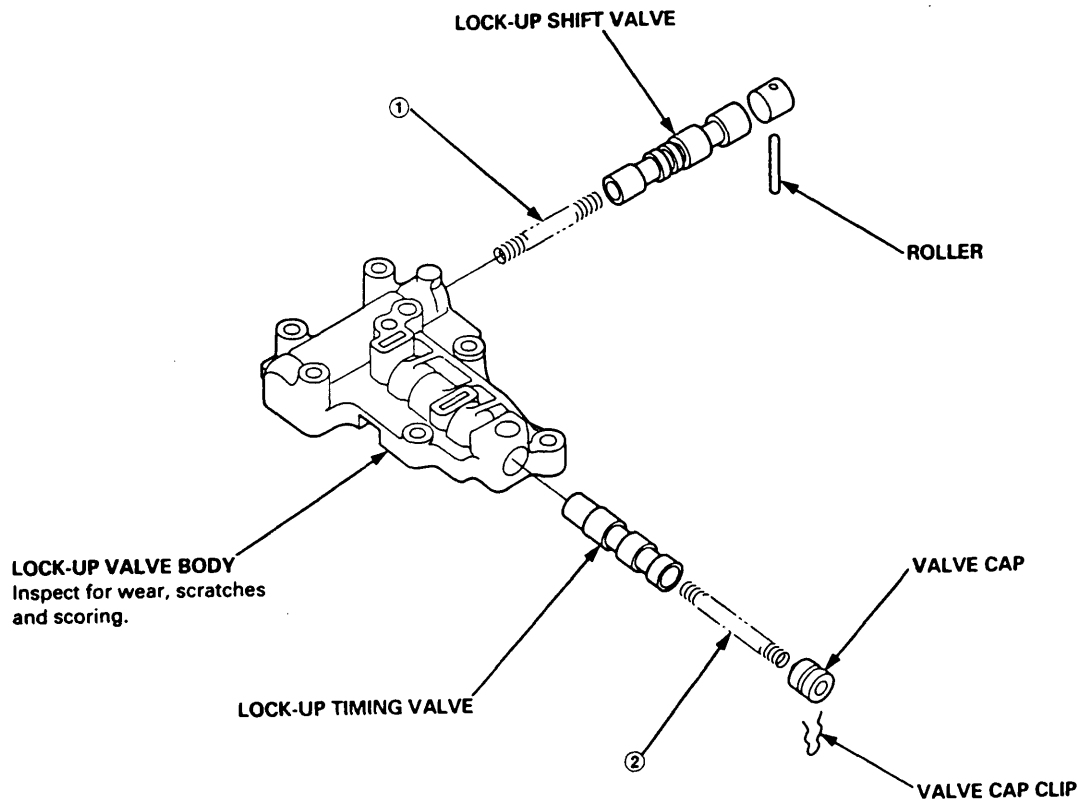
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	1st accumulator spring	2.1 (0.083)	16.0 (0.636)	89.1 (3.508)	16.2
②	4th accumulator spring A	2.6 (0.102)	17.0 (0.676)	87.0 (3.425)	14.2
③	4th accumulator spring B	2.3 (0.091)	10.2 (0.402)	51.6 (2.031)	13.8
④	3rd accumulator spring A	2.8 (0.110)	17.5 (0.695)	89.3 (3.516)	15.6
⑤	3rd accumulator spring B	2.2 (0.087)	31.0 (1.220)	35.1 (1.382)	2.4
⑥	2nd accumulator spring C	2.2 (0.087)	14.5 (0.576)	68.0 (2.677)	13.9
⑦	2nd accumulator spring A	2.4 (0.094)	29.0 (1.152)	39.0 (1.535)	2.9
⑧	2nd accumulator spring B	1.6 (0.063)	9.0 (0.358)	20.7 (0.815)	6.1

Lock-up Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace the valve body as an assembly if any parts are worn or damaged.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-117.
- Coat all parts with ATF during assembly.



SPRING SPECIFICATIONS

Unit: mm (in)

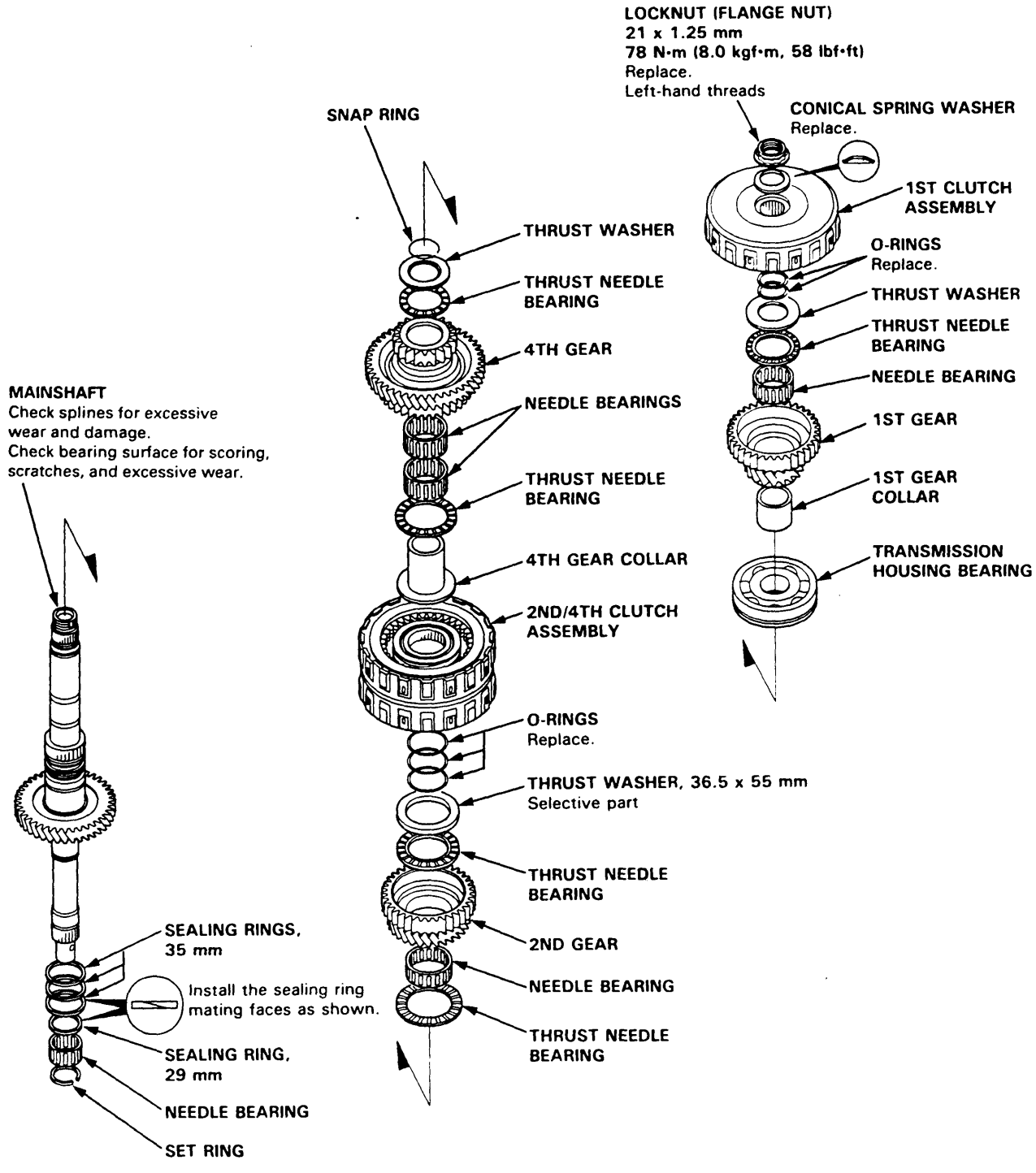
No.	Springs	Standard (New)			
		Wire Dia.	O.D.	Free Length	No. of Coils
①	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.302)	73.7 (2.902)	32.0
②	Lock-up timing valve spring	0.9 (0.035)	8.1 (0.319)	80.7 (3.177)	45.8

Mainshaft

Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.
- Locknut has left-hand threads.
- Inspect the condition of the sealing rings. If the sealing rings are worn, distorted, or damaged, replace them (see page 14-128).



Inspection

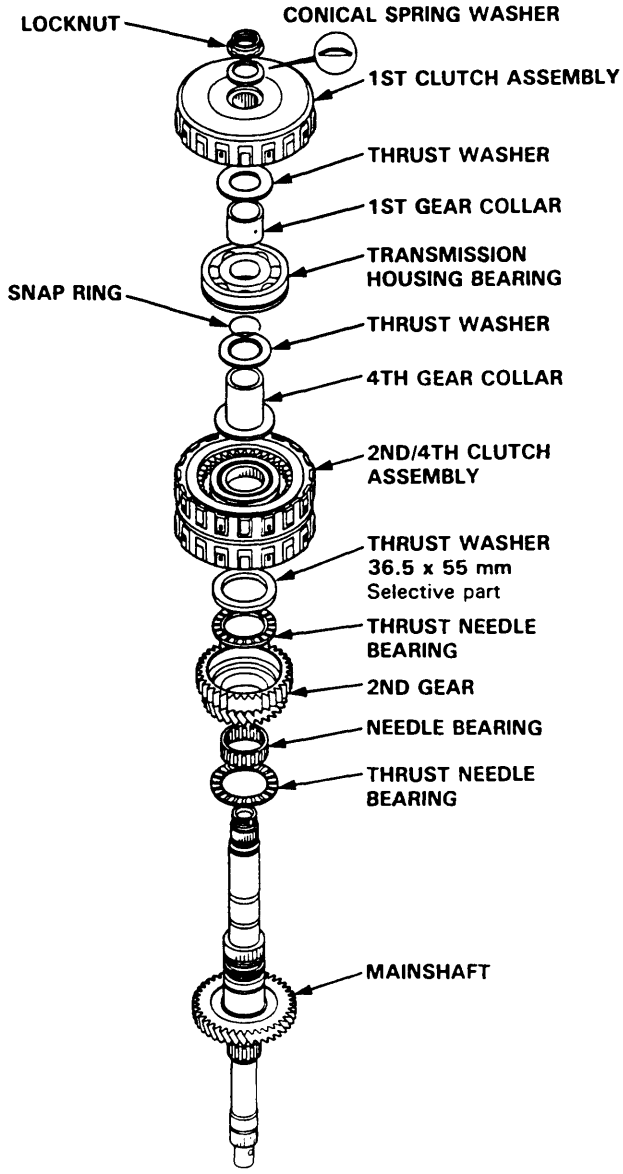
Clearance Measurement

NOTE: Lubricate all parts with ATF during assembly.

1. Remove the mainshaft bearing from the transmission housing (see page 14-150).

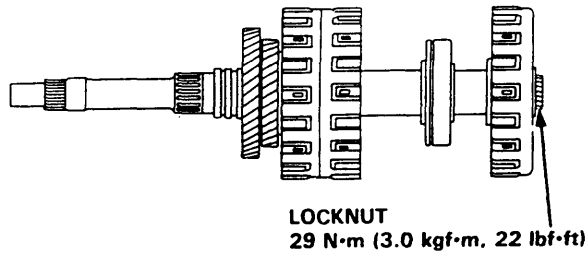
2. Assemble the parts below on the mainshaft.

   NOTE: Do not assemble the O-rings during inspection.



3. Torque the mainshaft locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

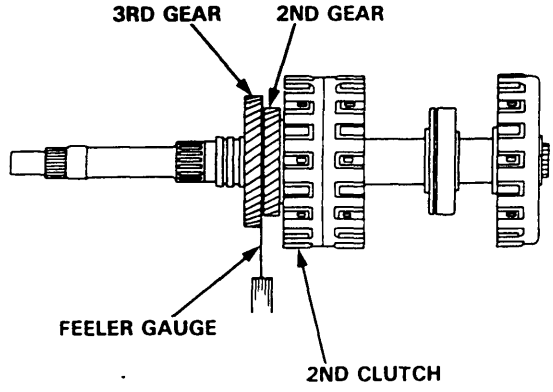
   NOTE: Mainshaft locknut has left-hand threads.

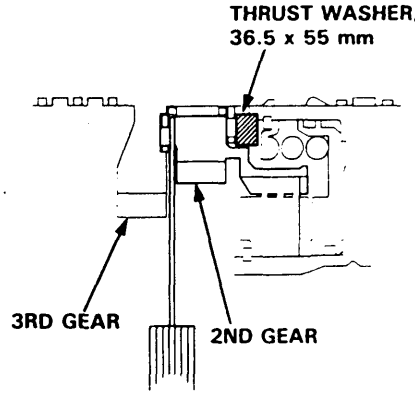


4. Hold 2nd gear against the 2nd clutch, then measure the clearance between 2nd gear and 3rd gear with a feeler gauge.

   NOTE: Take measurements in at least three places, and use the average as the actual clearance.

   STANDARD: 0.05 – 0.13 mm (0.002 – 0.005 in)





(cont'd)

Inspection (cont'd)

5. If the clearance is out of tolerance, remove the thrust washer and measure the thickness.

6. Select and install a new washer, then recheck.

THRUST WASHER 36.5 x 55 mm

No.	Part Number	Thickness
1	90441 – P4P – 010	4.00 mm (0.157 in)
2	90442 – P4P – 010	4.05 mm (0.159 in)
3	90443 – P4P – 010	4.10 mm (0.161 in)
4	90444 – P4P – 010	4.15 mm (0.163 in)
5	90445 – P4P – 010	4.20 mm (0.165 in)
6	90446 – P4P – 010	4.25 mm (0.167 in)
7	90447 – P4P – 010	4.30 mm (0.169 in)
8	90448 – P4P – 010	4.35 mm (0.171 in)
9	90449 – P4P – 010	4.40 mm (0.173 in)
10	90450 – P4P – 000	4.45 mm (0.175 in)

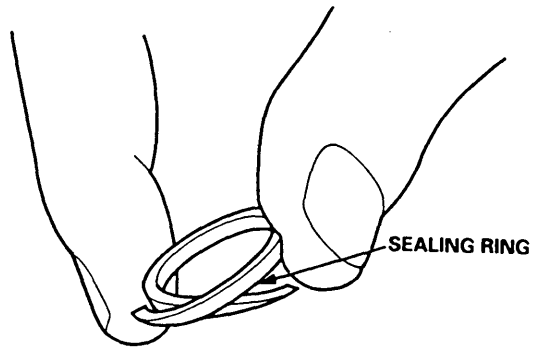
7. After replacing the thrust washer, make sure the clearance is within tolerance.

Replacement

The sealing rings (35 mm and 29 mm) are synthetic resin with chamfered ends. Check the condition of the sealing rings and replace them only if they are worn, distorted or damaged.

NOTE: Lubricate all parts with ATF during assembly.

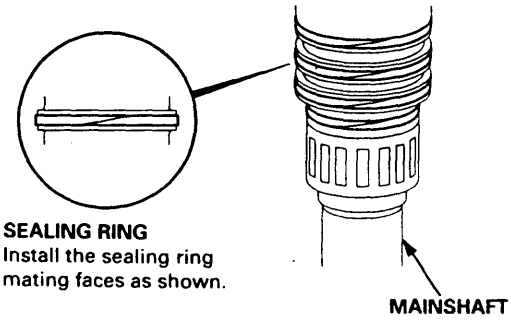
1. Squeeze the sealing ring together slightly before installing, for better fit.



2. Install new sealing rings on the mainshaft.

3. After installing the sealing rings, verify the following:

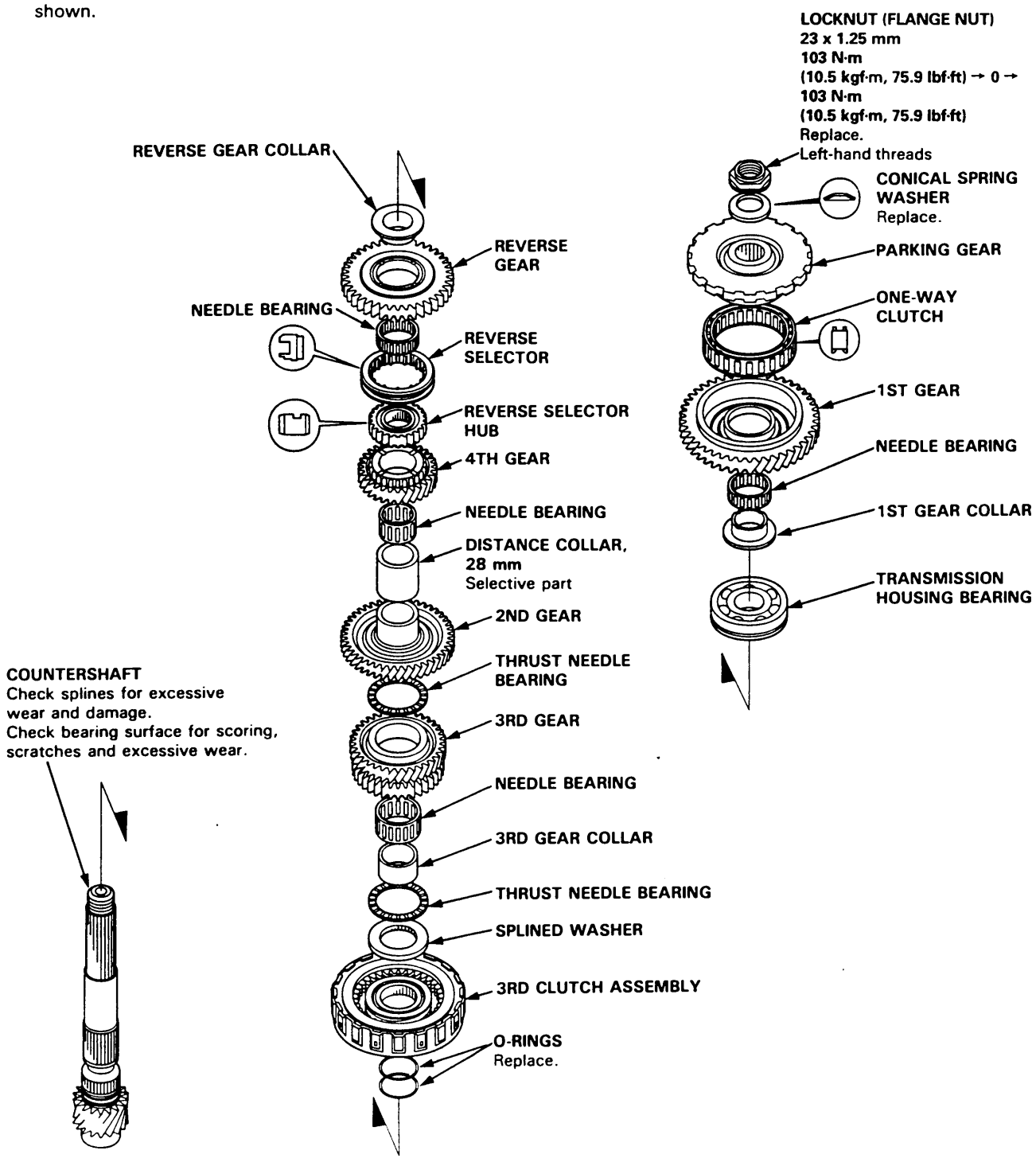
   - The sealing rings are fully seated in the groove.
   - The sealing rings are not twisted.
   - The chamfered ends of the sealing ring are properly joined.



Countershaft

Disassembly/Inspection/Reassembly

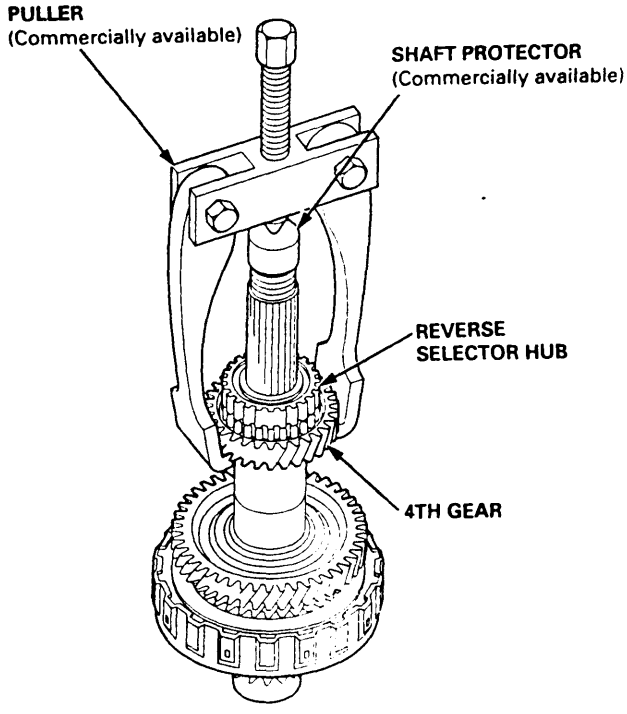
NOTE:
- Lubricate all parts with ATF before reassembly.
- Inspect the thrust needle bearings and the needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.
- Locknut has left-hand threads.
- Install the conical spring washer, the one-way clutch, the reverse selector, and the reverse selector hub in the direction shown.



Countershaft

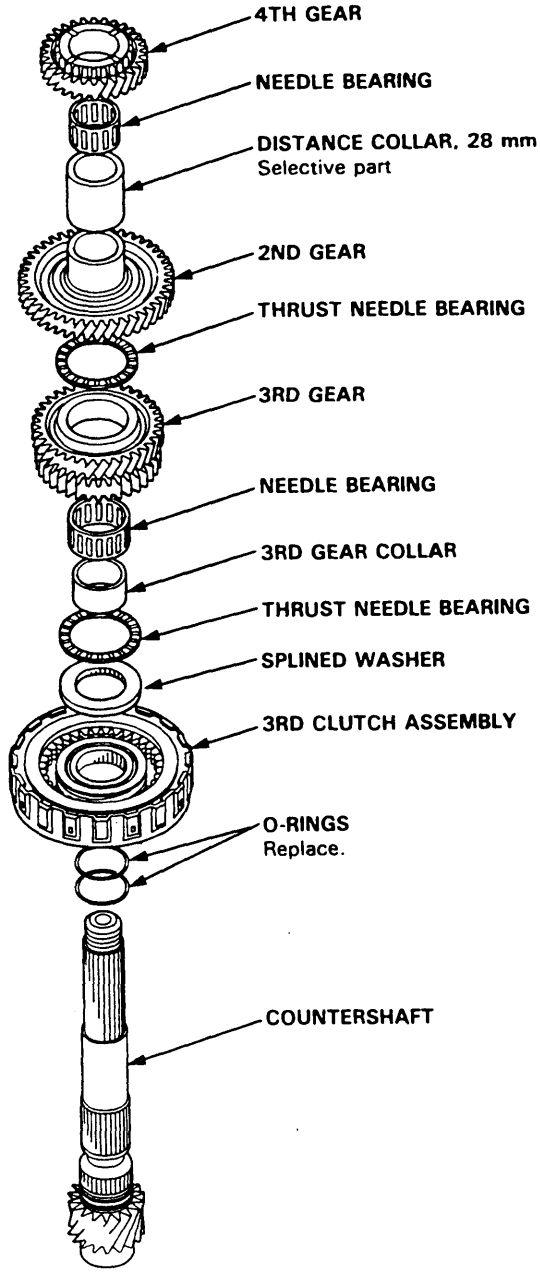
Disassembly/Reassembly

1. Remove the reverse selector hub and the 4th gear using a universal two-jaw (or three-jaw) puller as shown.

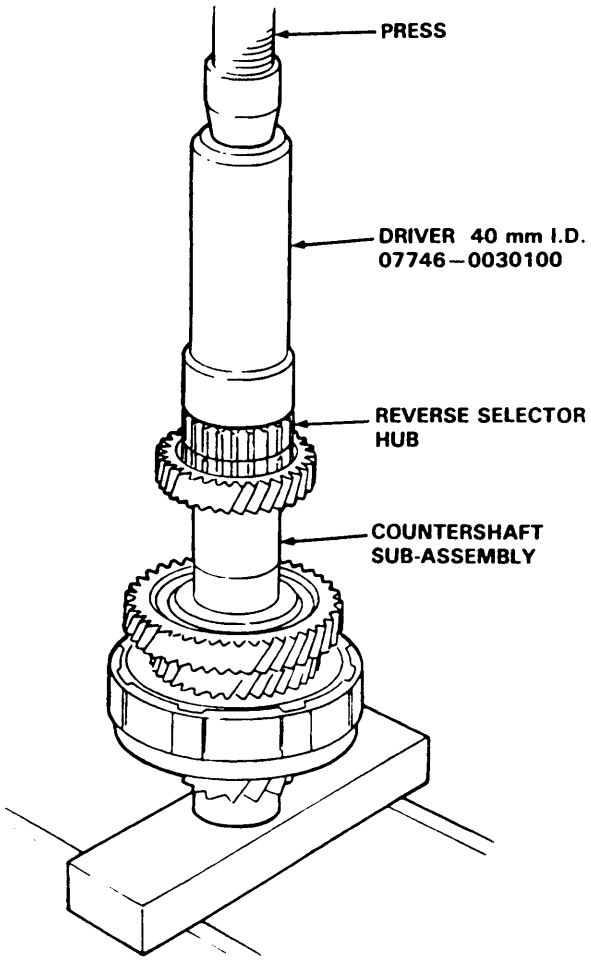


2. Assemble the parts on the countershaft as shown below.

NOTE:
- Lubricate all parts with ATF during assembly.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damaging the O-rings.



3. Install the reverse selector hub on the countershaft sub-assembly, and then press the reverse selector hub using the special tool and a press as shown.



Inspection

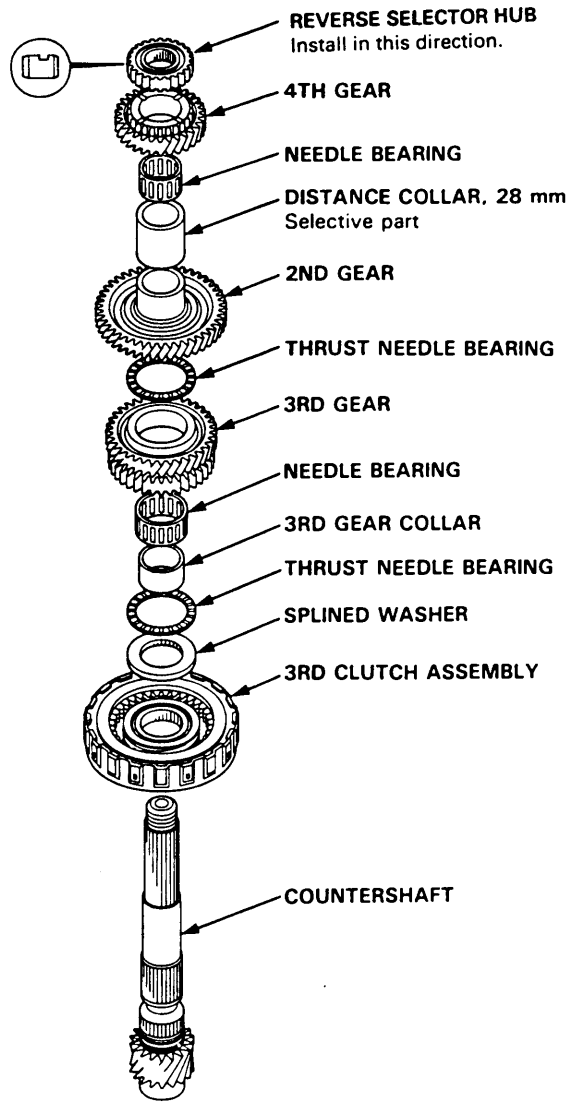
Clearance Measurement

NOTE: Lubricate all parts with ATF during assembly.

1. Remove the countershaft bearing from the transmission housing (see page 14-150).

2. Install the parts below on the countershaft using the special tool and a press as described on this page.

   NOTE: Do not assemble the O-rings during inspection.



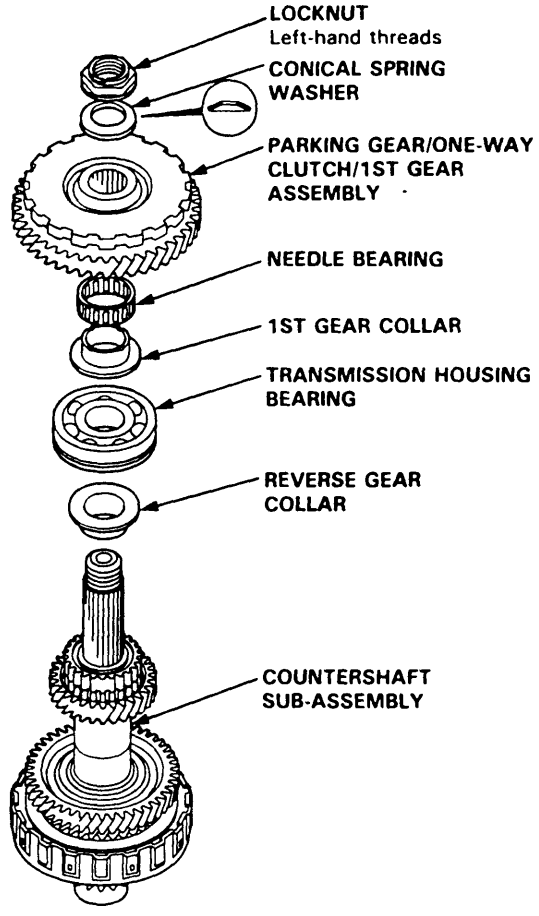
(cont'd)

Countershaft

Inspection (cont'd)

3. Install the parts below on the countershaft sub-assembly, then torque the locknut to 29 N·m (3.0 kgf·m, 22 lbf·ft).

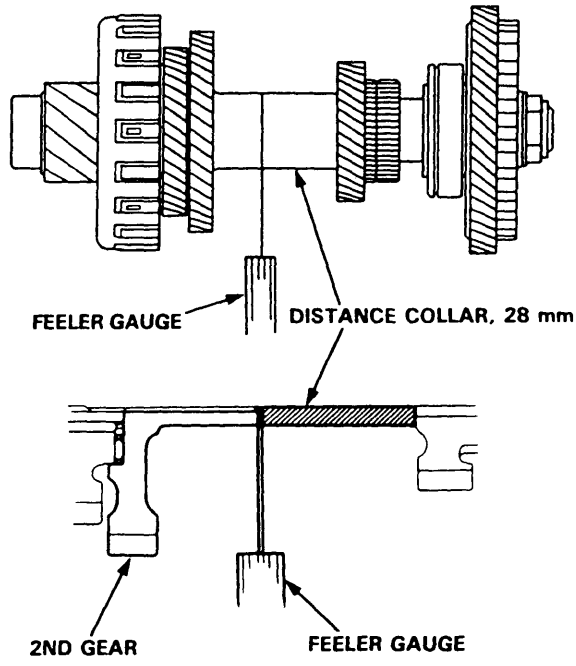
   NOTE: Countershaft locknut has left-hand threads.



4. Measure the clearance between the 2nd gear and the 28 mm distance collar with a feeler gauge.

   NOTE: Take measurements in at least three places, and use the average as the actual clearance.

   STANDARD: 0.10 – 0.18 mm (0.004 – 0.007 in)



5. If the clearance is out of tolerance, remove the 28 mm distance collar and measure the width.

6. Select and install a new distance collar, then recheck.

DISTANCE COLLAR, 28 mm

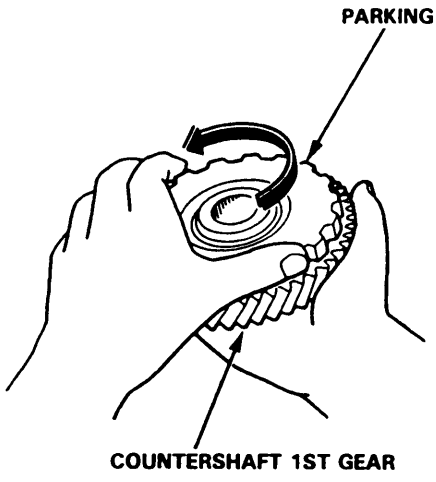
No.	Part Number	Width
1	90503 – PC9 – 000	39.00 mm (1.535 in)
2	90504 – PC9 – 000	39.10 mm (1.539 in)
3	90505 – PC9 – 000	39.20 mm (1.543 in)
4	90507 – PC9 – 000	39.30 mm (1.547 in)
5	90508 – PC9 – 000	39.05 mm (1.537 in)
6	90509 – PC9 – 000	39.15 mm (1.541 in)
7	90510 – PC9 – 000	39.25 mm (1.545 in)
8	90511 – PC9 – 000	38.90 mm (1.531 in)
9	90512 – PC9 – 000	38.95 mm (1.533 in)

7. Recheck the distance collar clearance to make sure it is within tolerance.

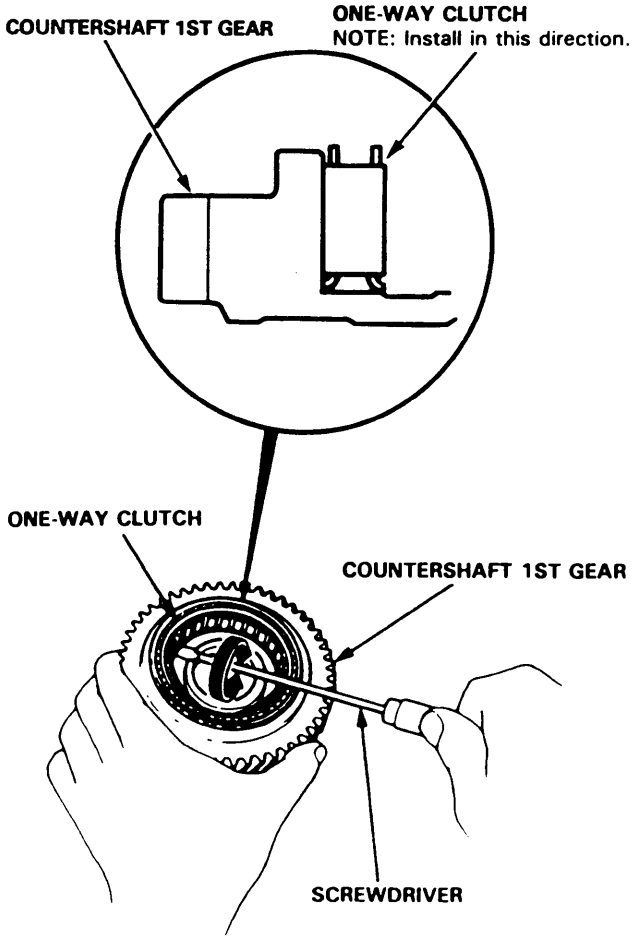
One-way Clutch

Disassembly/Inspection/Reassembly

1. Separate countershaft 1st gear from the parking gear by turning the parking gear in the direction shown.

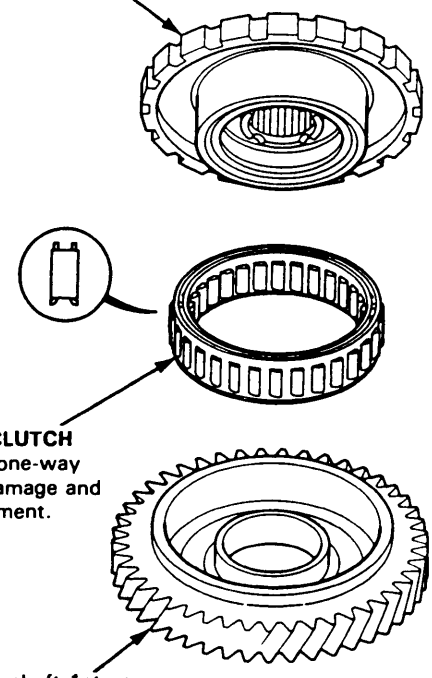


2. Remove the one-way clutch by prying it up with the end of a screwdriver.



3. Inspect the parts as follows:

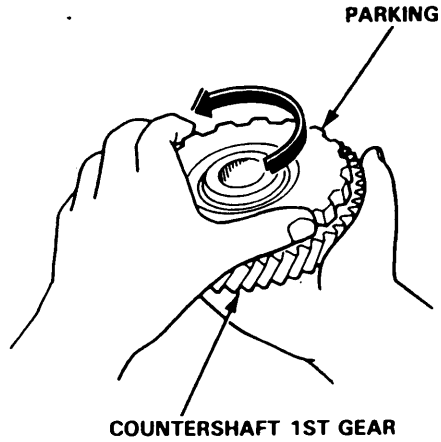
PARKING GEAR
Inspect the parking gear for wear and scoring.



ONE-WAY CLUTCH
Inspect the one-way clutch for damage and faulty movement.

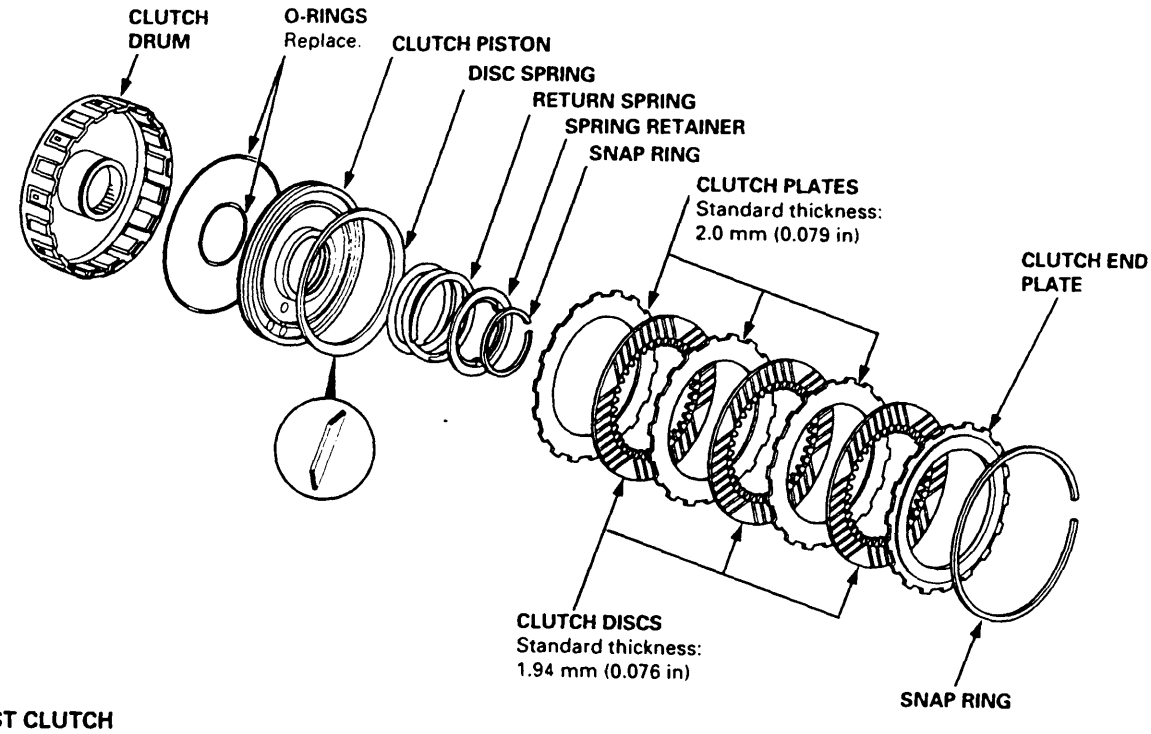
1ST GEAR
Inspect countershaft 1st gear for wear and scoring.

4. After the parts are assembled, hold countershaft 1st gear and turn the parking gear in the direction shown to be sure it turns freely. Also make sure the parking gear does not turn in the opposite direction.

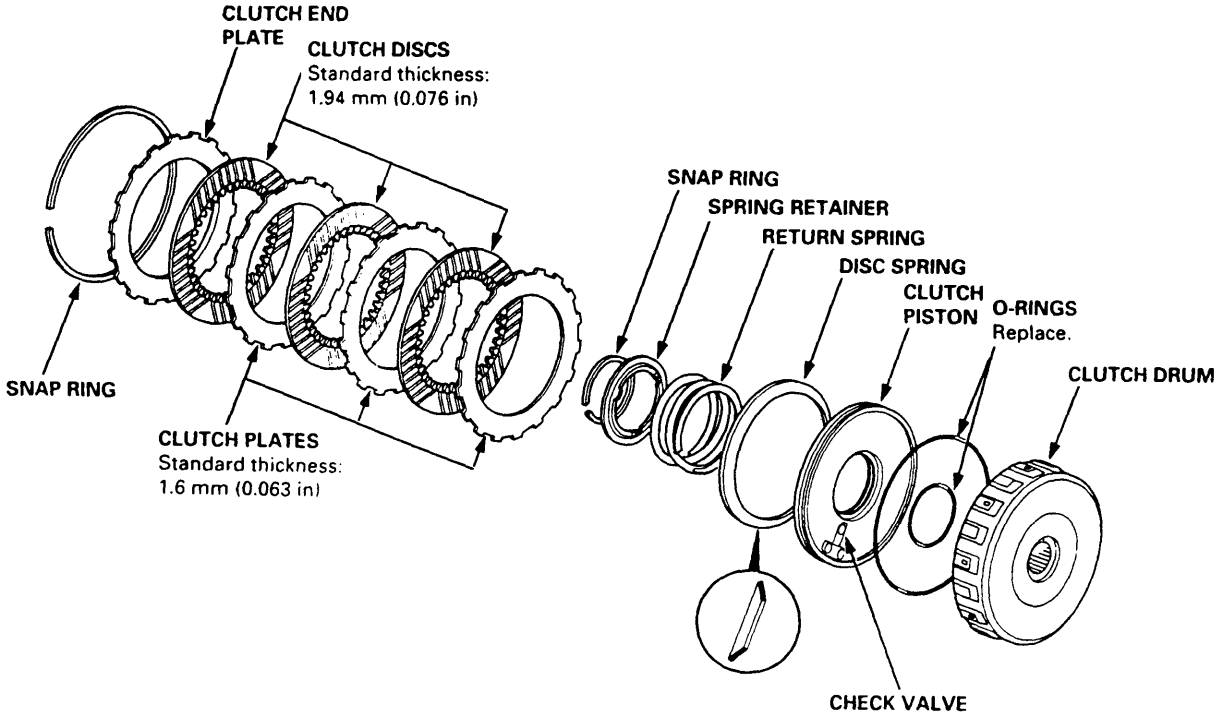


Illustrated Index

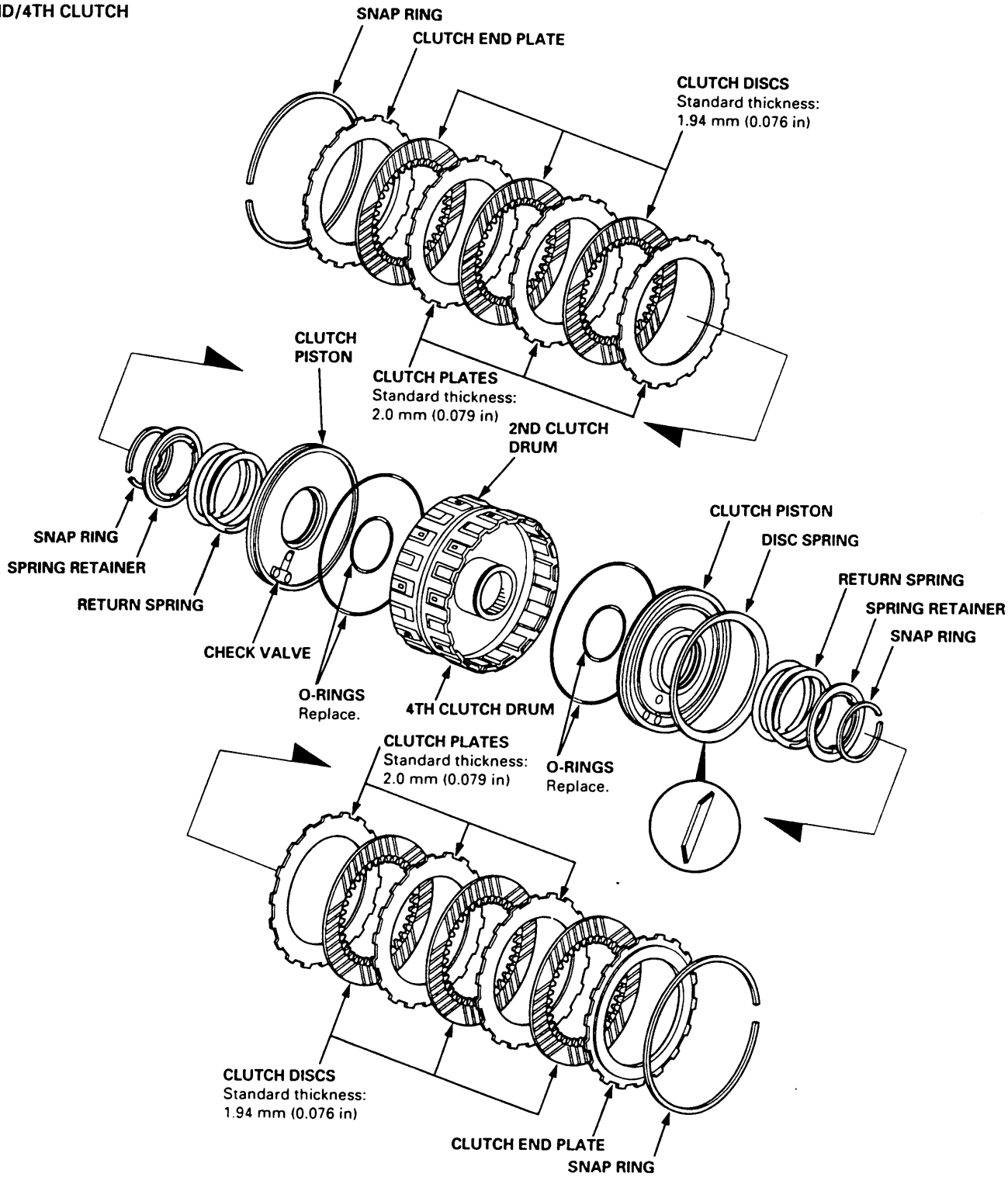
3RD CLUTCH



1ST CLUTCH

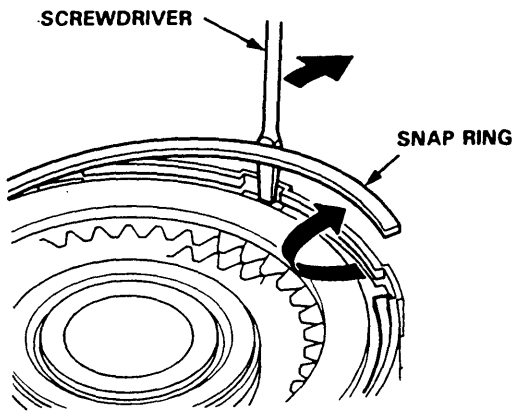


2ND/4TH CLUTCH



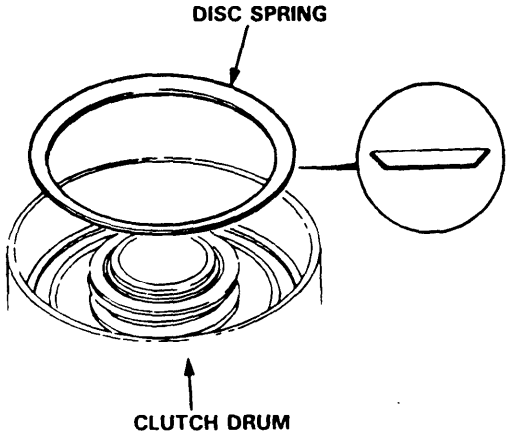
Disassembly

1. Remove the snap ring, then remove the clutch end plate, clutch discs and plates.

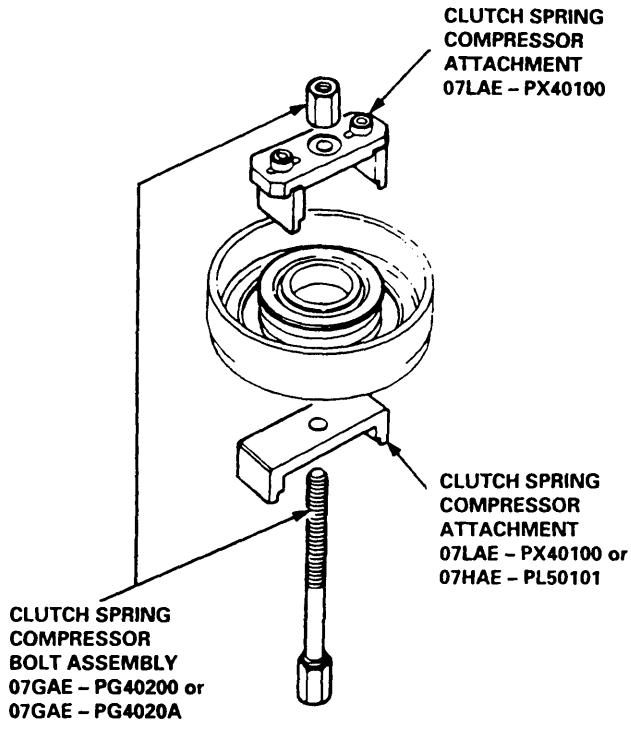


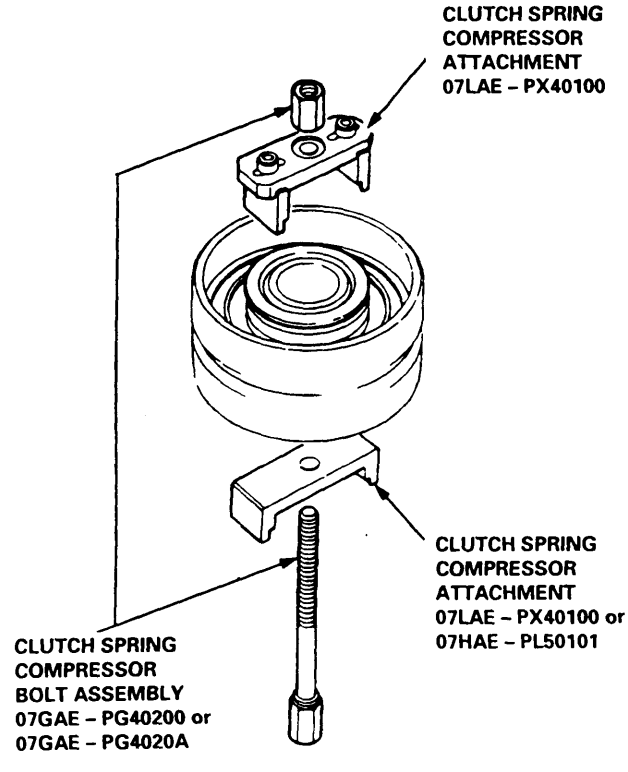
2. Remove the disc spring.

   NOTE: Except 2nd clutch.

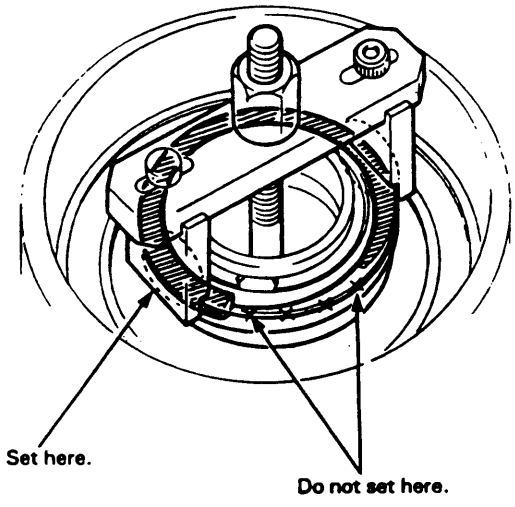


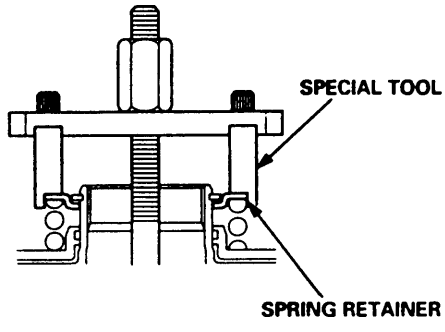
3. Install the special tools as shown.



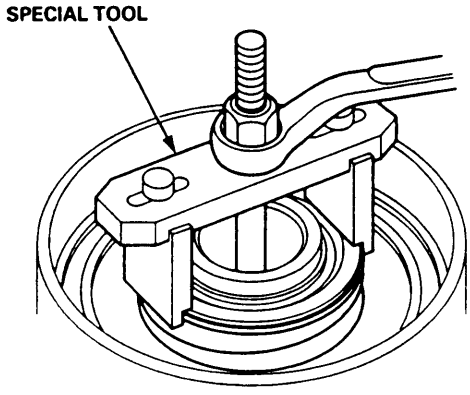


CAUTION: If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged. Be sure the special tool is adjusted to have full contact with the spring retainer.

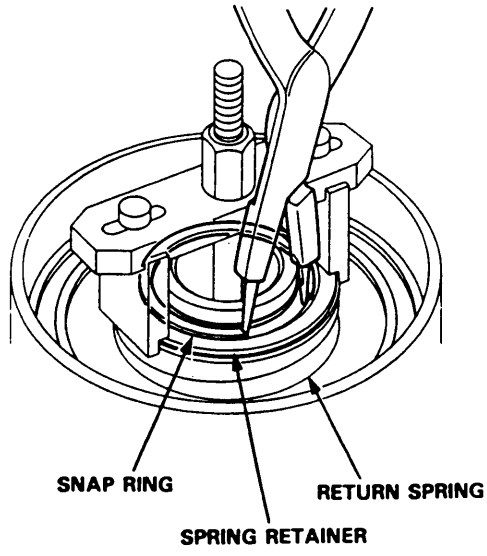




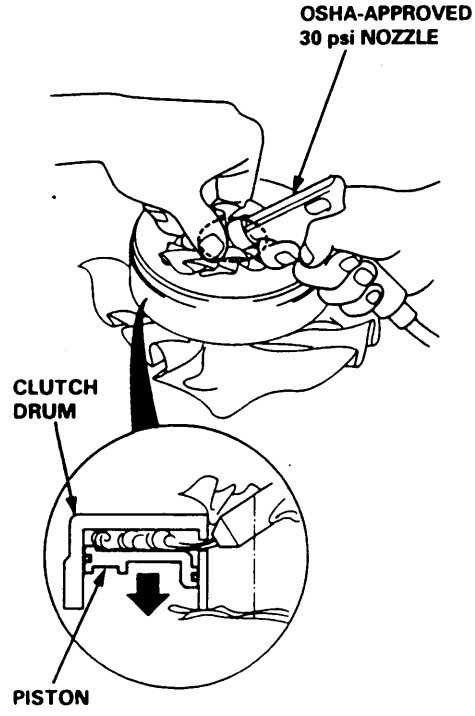
4. Compress the return spring.



5. Remove the snap ring. Then remove the special tools, spring retainer and return spring.



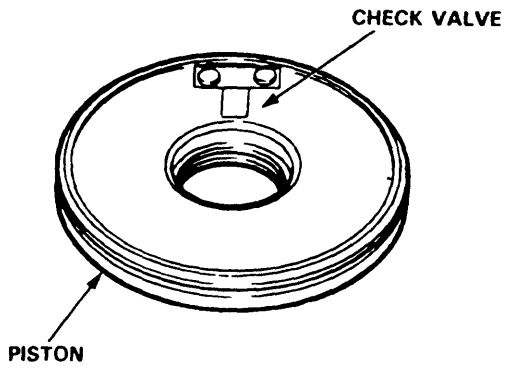
6. Wrap a shop rag around the clutch drum, and apply air pressure to the ATF passage to remove the piston.
   Place a finger tip on the other end while applying air pressure.



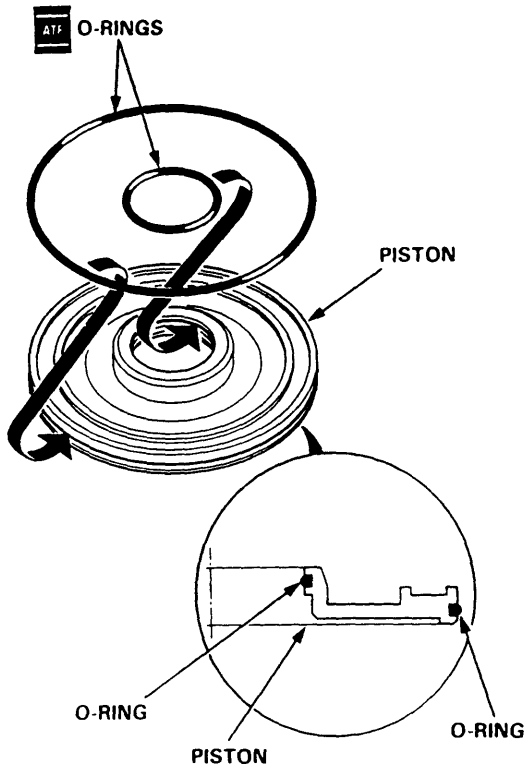
Reassembly

NOTE:
- Clean all parts thoroughly in solvent or carburetor cleaner, and dry them with compressed air.
- Blow out all passages.
- Lubricate all parts with ATF before reassembly.

1. Inspect the check valve; if it's loose, replace the piston.



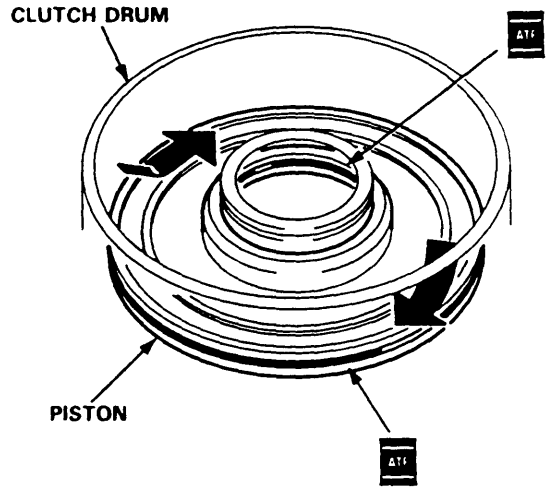
2. Install new O-rings on the clutch piston.



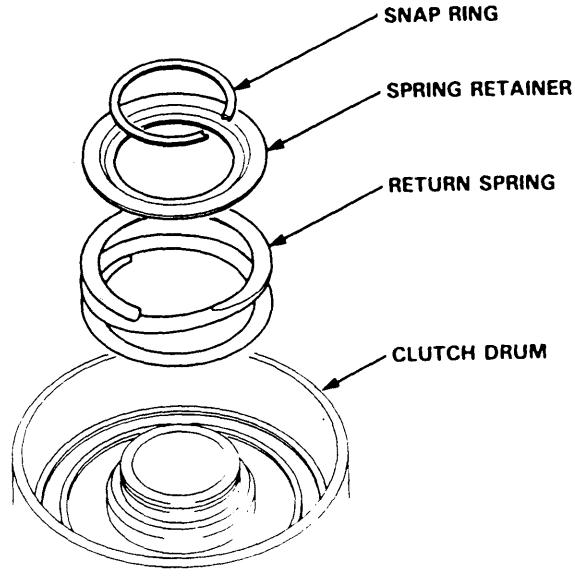
3. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

   NOTE: Lubricate the piston O-ring with ATF before installing.

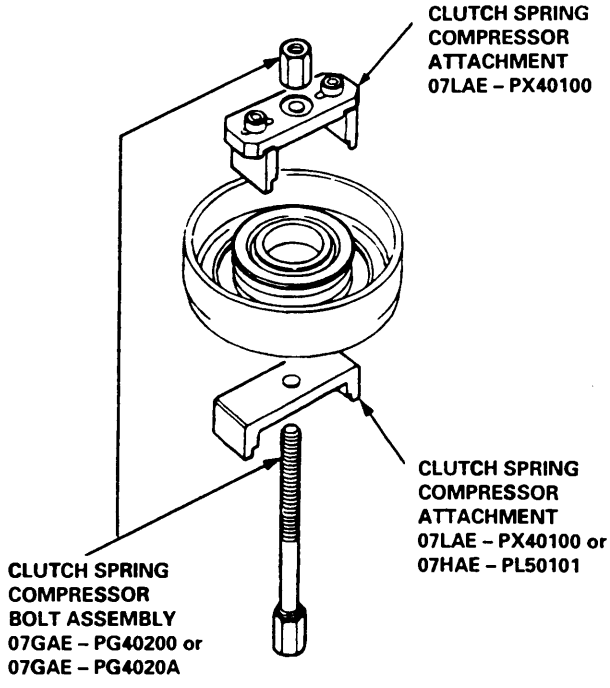
   CAUTION: Do not pinch the O-ring by installing the piston with too much force.

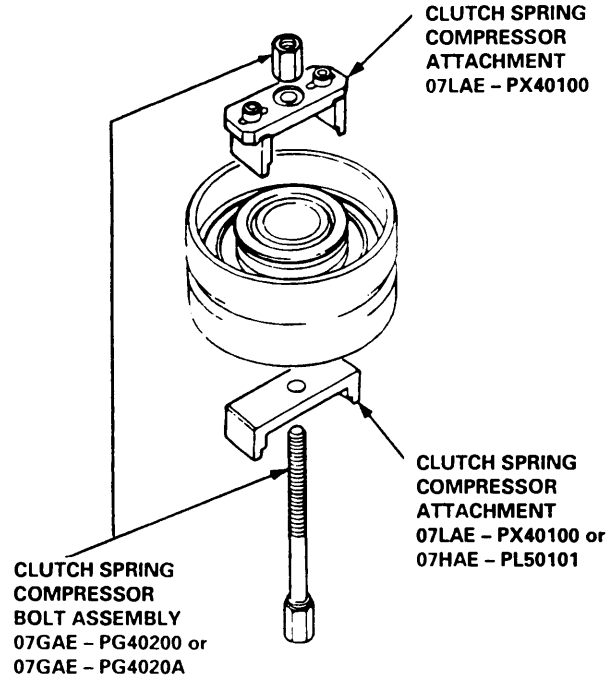


4. Install the return spring and spring retainer, and position the snap ring on the retainer.

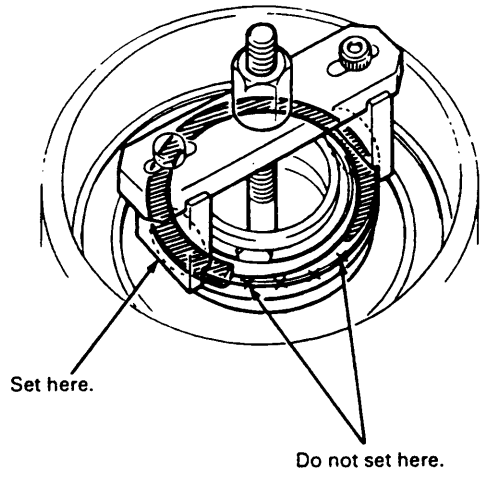


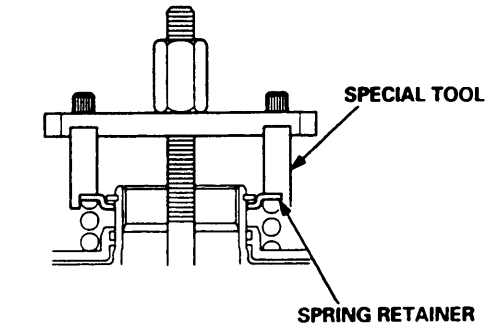
5. Install the special tools as shown.



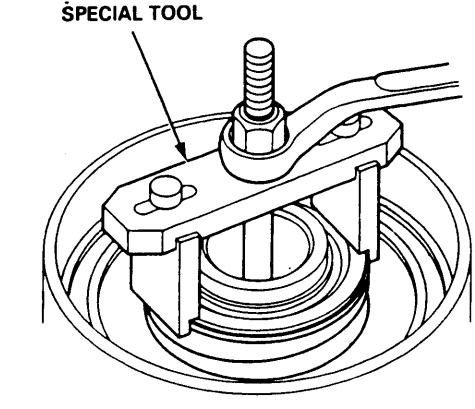


CAUTION: If either end of the special tool is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged. Be sure the special tool is adjusted to have full contact with the spring retainer.





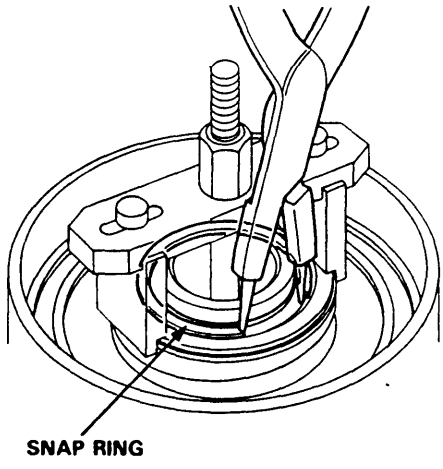
6. Compress the return spring.



(cont'd)

Reassembly (cont'd)

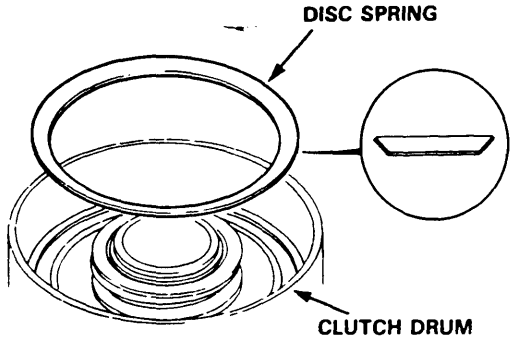
7. Install the snap ring.



8. Remove the special tools.

9. Install the disc spring.

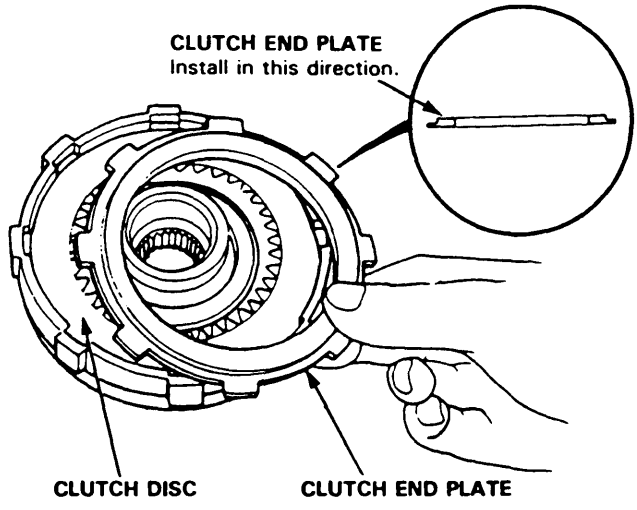
   NOTE: Install the disc spring in the direction shown, except 2nd clutch.



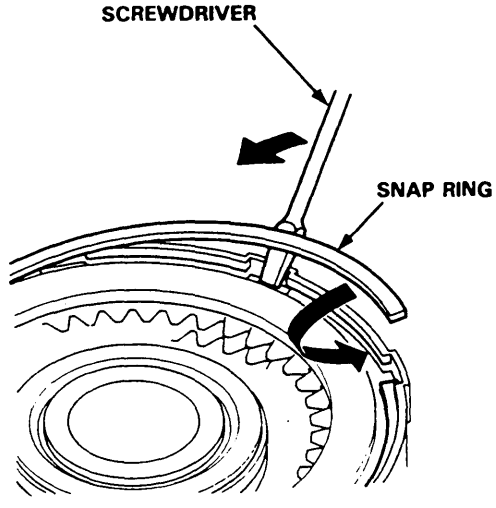
10. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

11. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

    NOTE: Before installing the plates and discs, make sure the inside of the clutch drum is free of dirt or other foreign matter.



12. Install the snap ring.

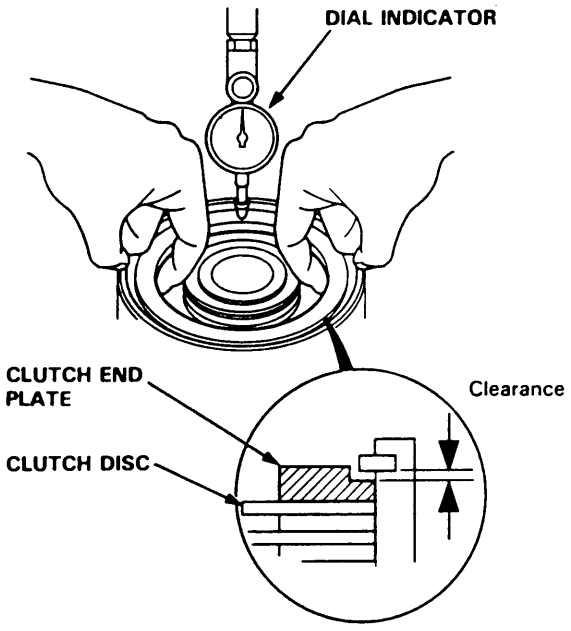


13. Measure the clearance between the clutch end plate and top disc with a dial indicator. Zero the dial indicator with the clutch end plate lowered and lift it up to the snap ring. The distance that the clutch end plate moves is the clearance between the clutch end plate and top disc.

    NOTE: Take measurements in at least three places, and use the average as the actual clearance.

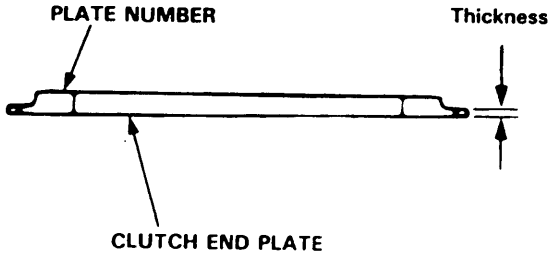
Clutch End Plate-to-Top Disc Clearance:

Clutch	Service Limit
1st	0.65 – 0.85 mm (0.026 – 0.033 in)
2nd	0.65 – 0.85 mm (0.026 – 0.033 in)
3rd	0.40 – 0.60 mm (0.016 – 0.024 in)
4th	0.40 – 0.60 mm (0.016 – 0.024 in)



14. If the clearance is not within the service limits, select a new clutch end plate from the following table.

    NOTE: If the thickest clutch end plate is installed, but the clearance is still over the standard, replace the clutch discs and clutch plates.

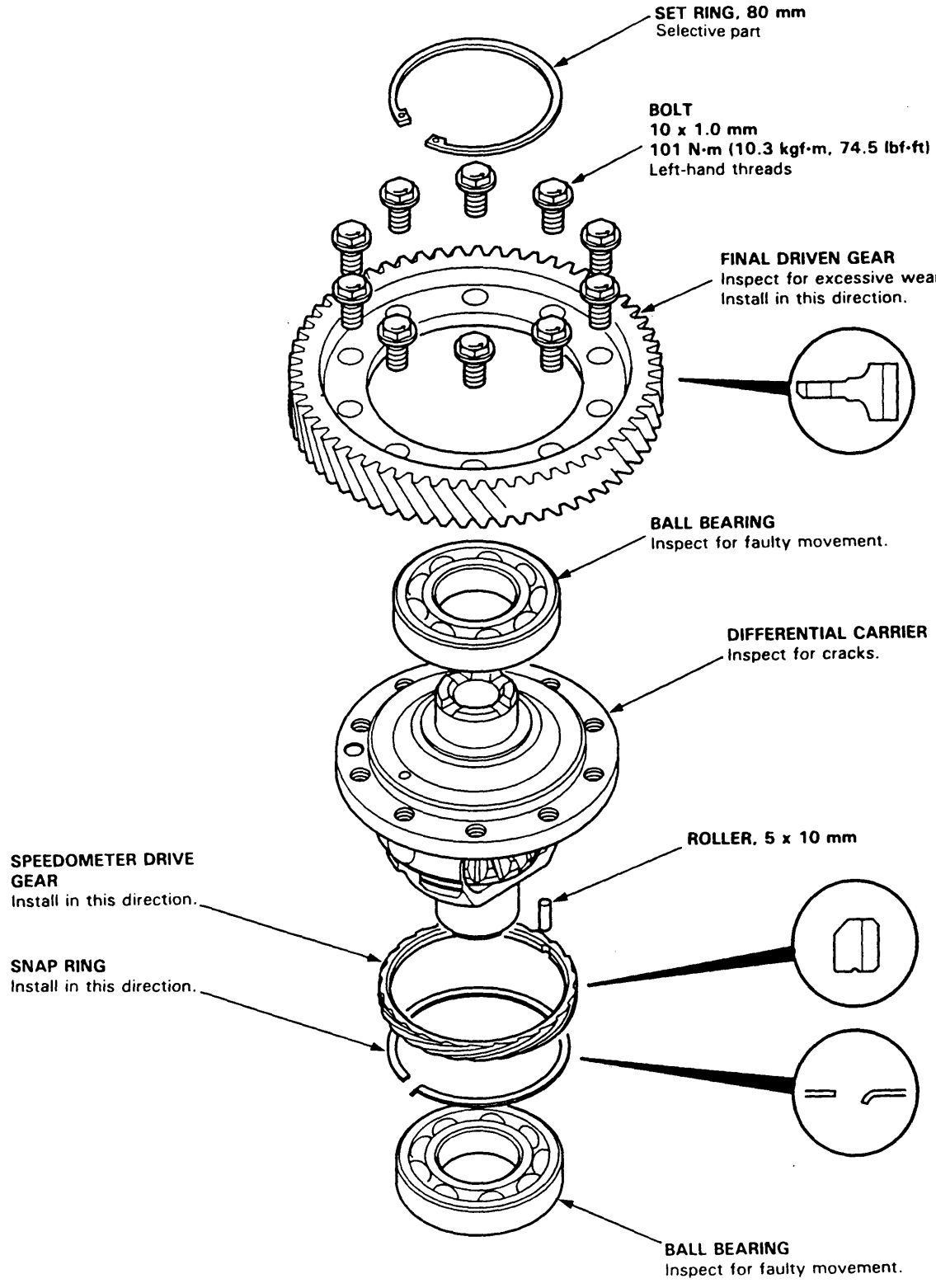


CLUTCH END PLATE

Plate No.	Part Number	Thickness
1	22551 – P4R – 003	2.1 mm (0.083 in)
2	22552 – P4R – 003	2.2 mm (0.087 in)
3	22553 – P4R – 003	2.3 mm (0.091 in)
4	22554 – P4R – 003	2.4 mm (0.094 in)
5	22555 – P4R – 003	2.5 mm (0.098 in)
6	22556 – P4R – 003	2.6 mm (0.102 in)
7	22557 – P4R – 003	2.7 mm (0.106 in)
8	22558 – P4R – 003	2.8 mm (0.110 in)
9	22559 – P4R – 003	2.9 mm (0.114 in)

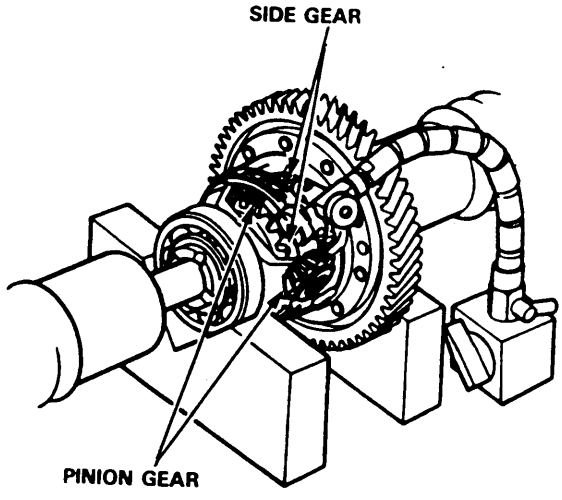
Differential

Illustrated Index



Backlash Inspection

1. Place differential assembly on V-blocks and install both axles.



2. Check backlash of both pinion gears.

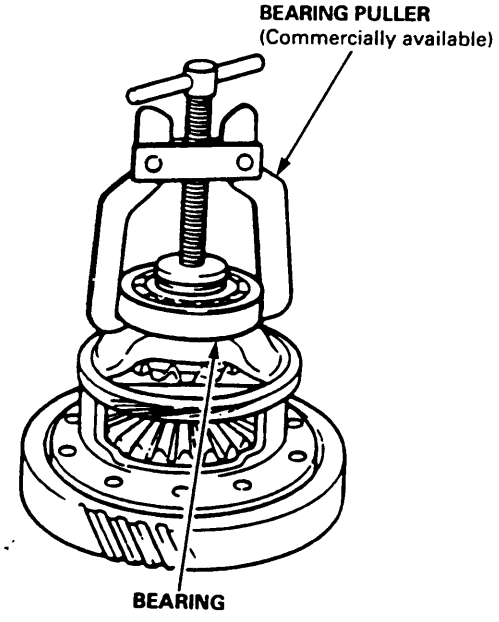
   Standard (New): 0.05 – 0.15 mm (0.002 – 0.006 in)

3. If backlash is out of tolerance, replace the differential carrier (see page 14-144).

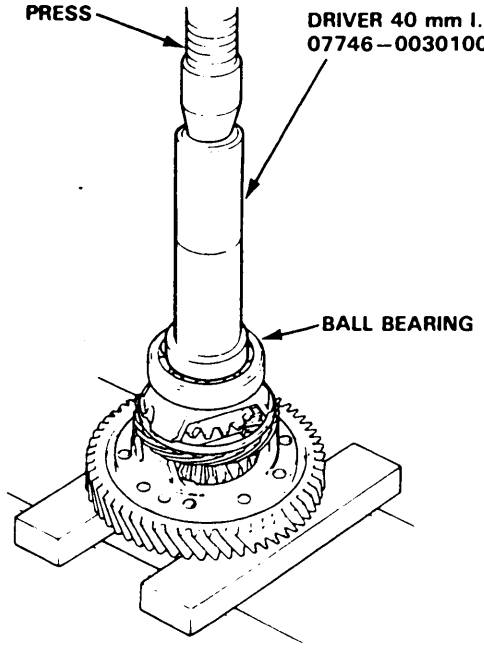
Bearing Replacement

NOTE: Check bearings for wear and rough rotation. If bearings are OK, removal is not necessary.

1. Remove bearings using a bearing puller.



2. Install new bearings using the special tool as shown.

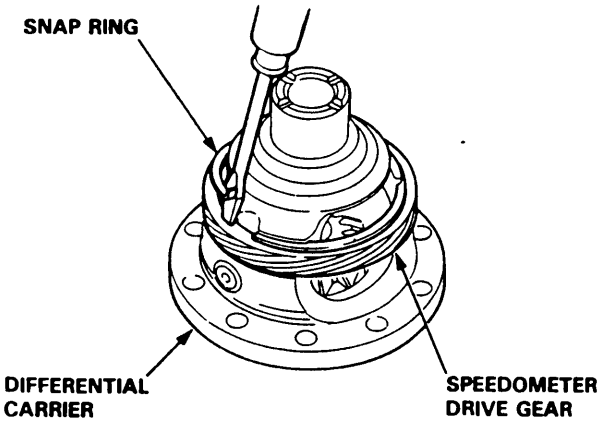


Differential Carrier Replacement

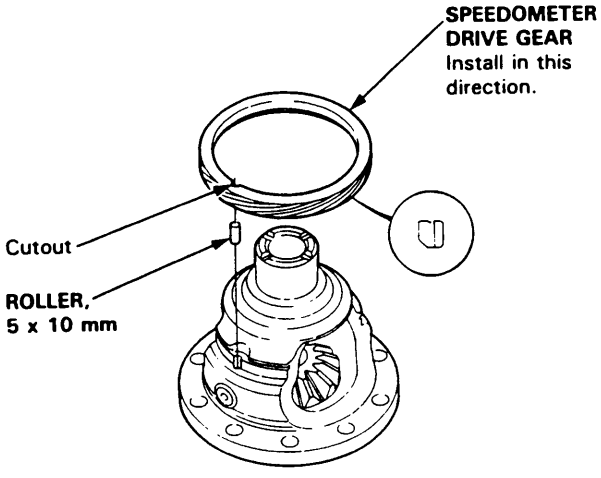
1. Remove the final driven gear from the differential carrier.

   NOTE: The final driven gear bolts have left-hand threads.

2. Pry the snap ring off differential carrier, then remove the speedometer drive gear and 5 x 10 mm roller.

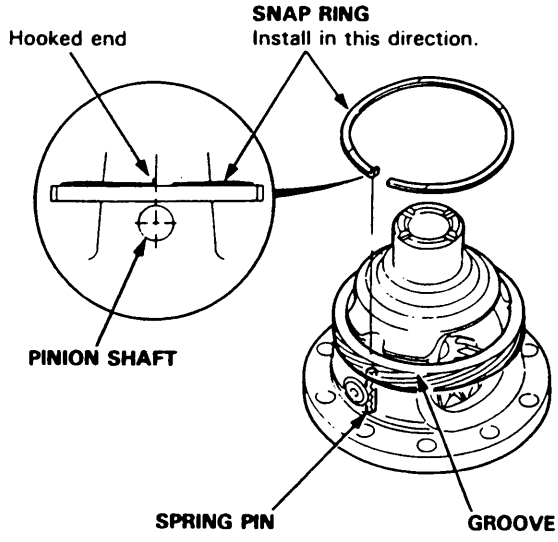


3. Install the 5 x 10 mm roller in the differential carrier.



4. Install the speedometer drive gear with its chamfered side facing the carrier. Align the cutout on the bore of the speedometer drive gear with the 5 x 10 mm roller.

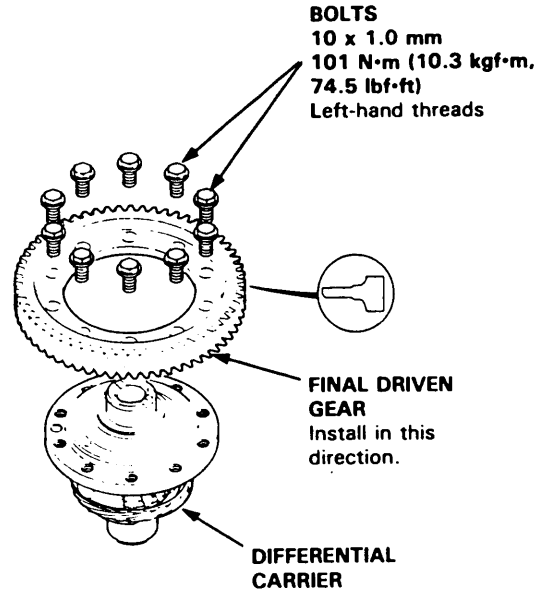
5. Align the hooked end of the snap ring with the pinion shaft as shown, then install the snap ring in the differential carrier groove.



6. Install the final driven gear, then tighten the bolts to the specified torque.

   TORQUE: 101 N·m (10.3 kgf·m, 74.5 lbf·ft)

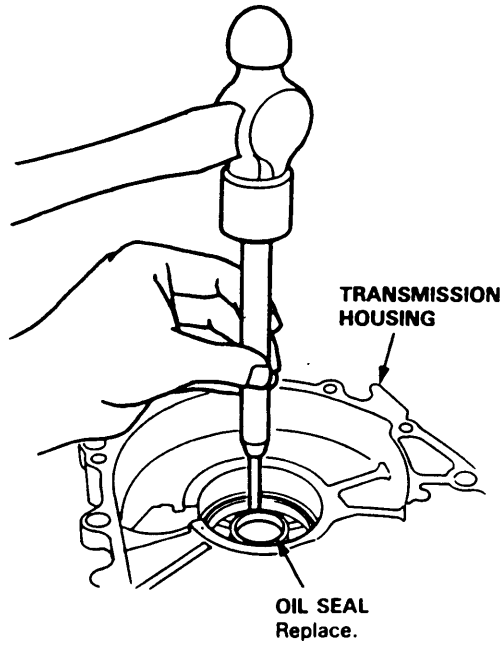
   NOTE: The final driven gear bolts have left-hand threads.



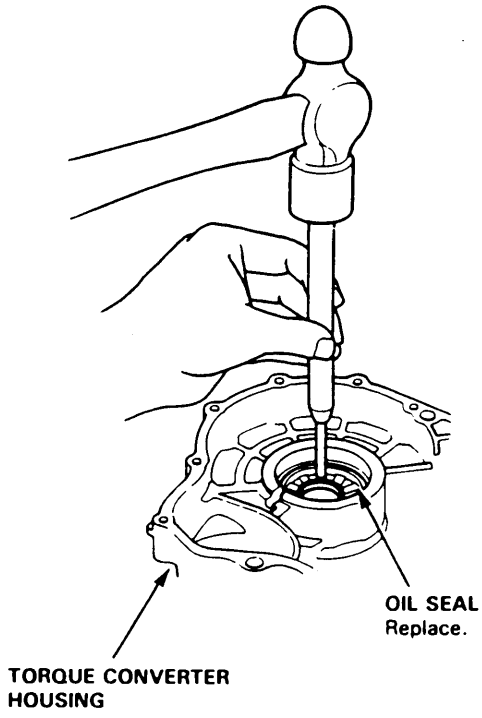
7. Install the ball bearings (see page 14-143).

Oil Seal Removal

1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



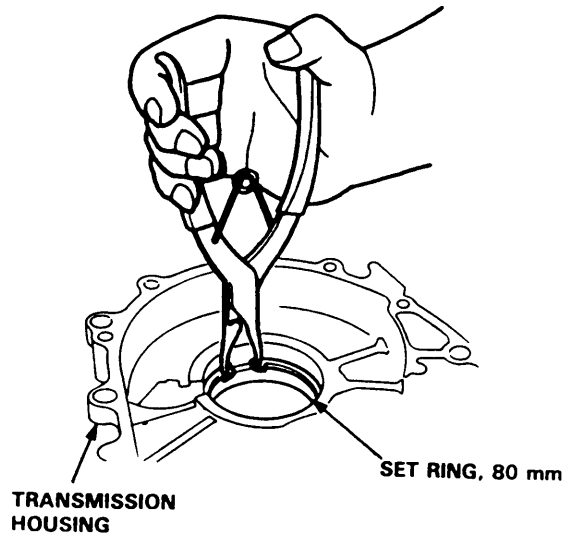
3. Remove the oil seal from the torque converter housing.



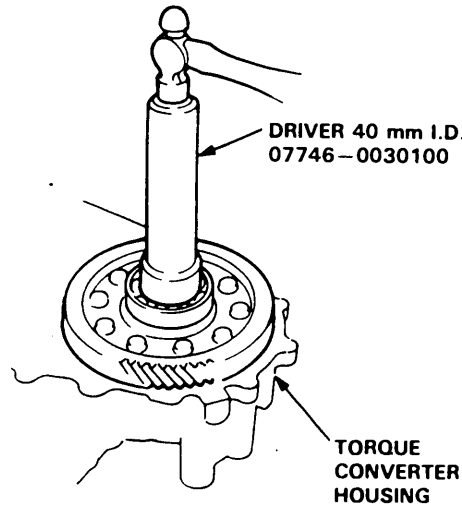
Oil Seal Installation/Side Clearance

1. Install a 2.50 mm (0.098 in) set ring, 80 mm in transmission housing.

   NOTE: Do not install the oil seal yet.



2. Install the differential assembly into the torque converter housing using the special tool as shown.

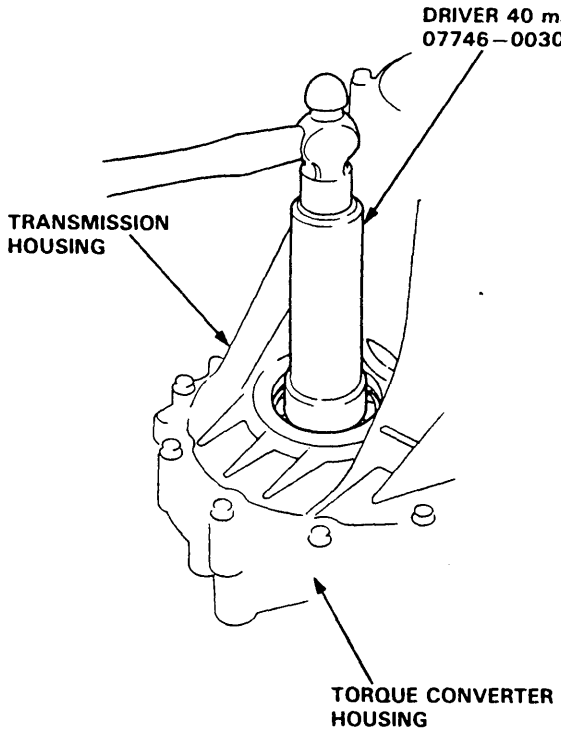


3. Install the transmission housing and tighten the bolts (see page 14-154 and 14-155).

(cont'd)

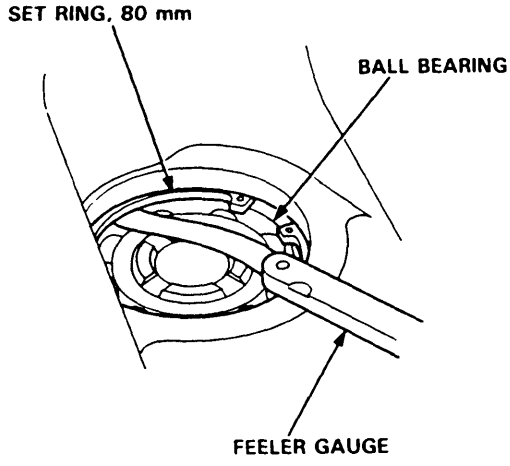
Oil Seal Installation/Side Clearance (cont'd)

4. Tap on the transmission housing side of the differential assembly with the special tool to seat the differential assembly in the torque converter housing.



5. Measure the clearance between the 80 mm set ring and outer race of the ball bearing in the transmission housing.

STANDARD: 0 – 0.15 mm (0 – 0.006 in)



6. If the clearance is more than the standard, select a new 80 mm set ring from the following table and install:

SET RING, 80 mm

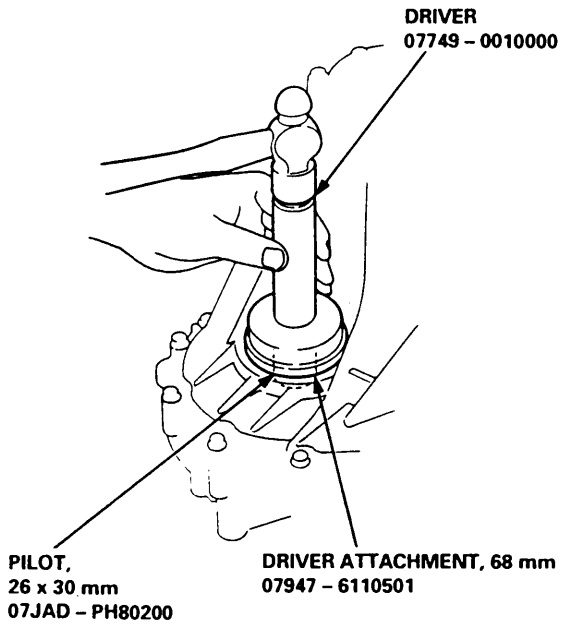
Part Number	Thickness
90414 – 689 – 000	2.50 mm (0.098 in)
90415 – 689 – 000	2.60 mm (0.102 in)
90416 – 689 – 000	2.70 mm (0.106 in)
90417 – 689 – 000	2.80 mm (0.110 in)
90418 – 689 – 000	2.90 mm (0.114 in)
90419 – PH8 – 000	3.00 mm (0.118 in)

NOTE: If the 80 mm set ring-to-ball bearing outer race clearance measured in step 5 is less than the specification, it is not necessary to perform steps 7 and 8.

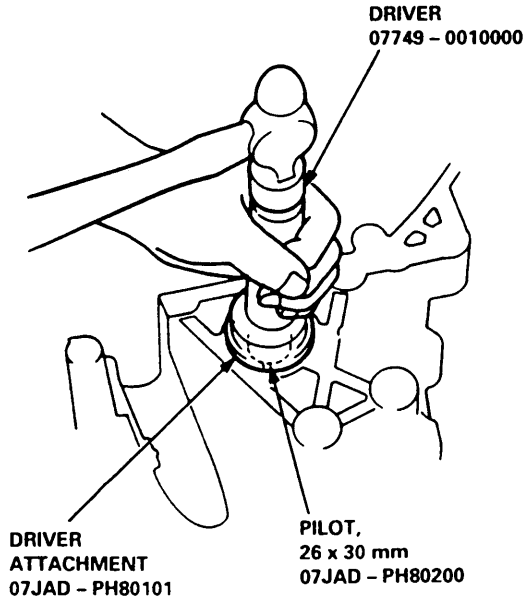
7. Remove the transmission housing.

8. Replace the 2.50 mm (0.098 in) 80 mm set ring with the one of the correct thickness selected in step 6.

9. Install the oil seal in the transmission housing using the special tools as shown.



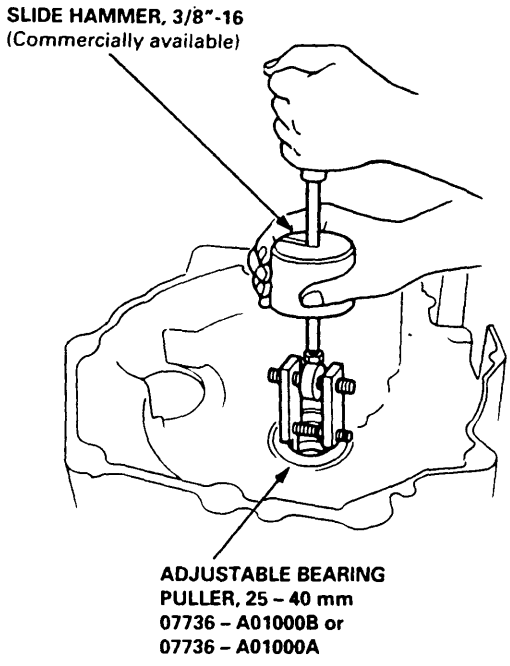
10. Install the oil seal in the torque converter housing using the special tools as shown.



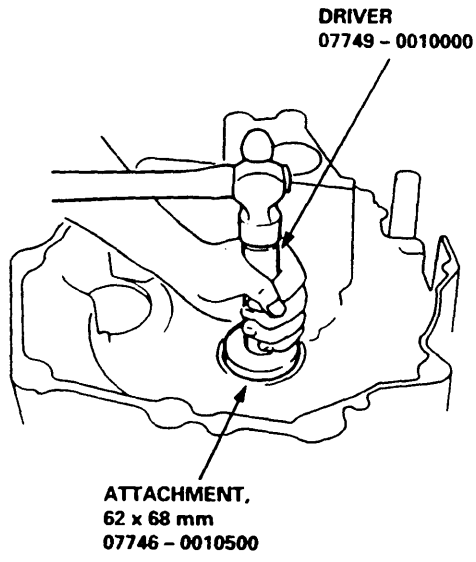
Torque Converter Housing Bearings

Mainshaft Bearing/Oil Seal Replacement

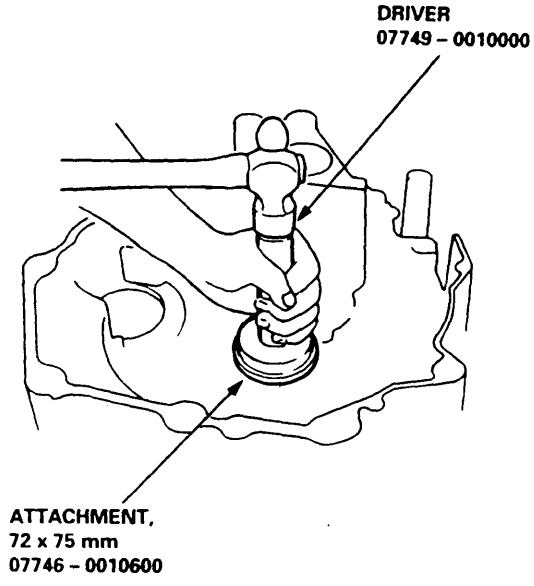
1. Remove the mainshaft bearing and oil seal using the special tools as shown.



2. Drive in the new mainshaft bearing until it bottoms in the housing using the special tools as shown.

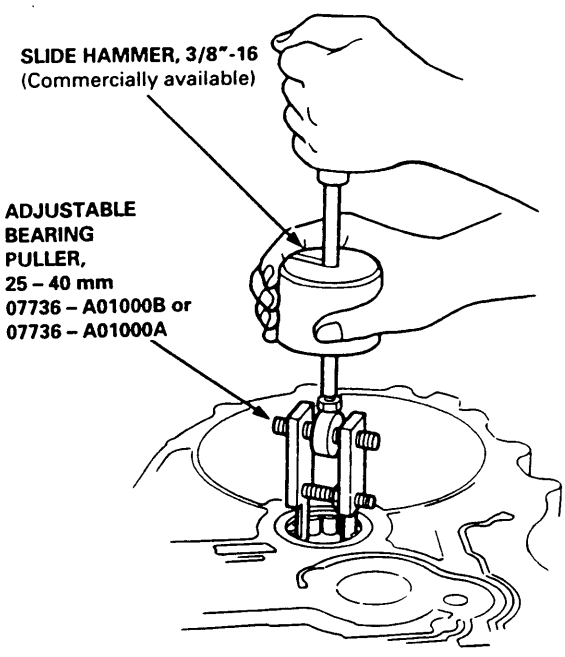


3. Install the new oil seal flush with the housing using the special tools as shown.



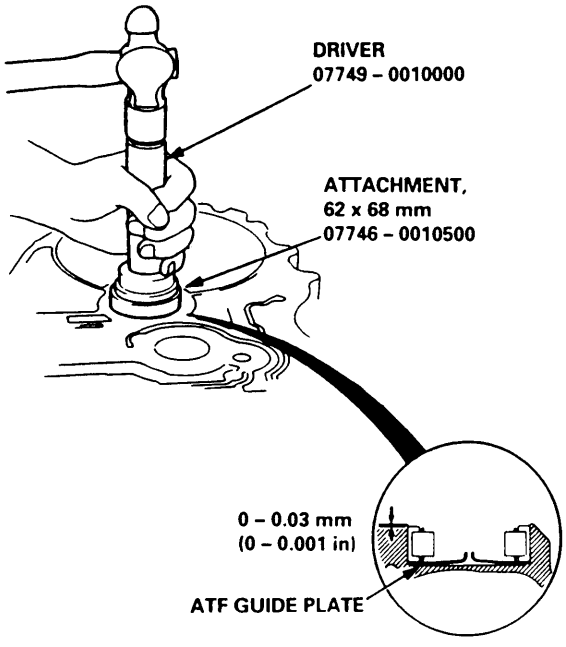
Countershaft Bearing Replacement

1. Remove the countershaft bearing using the special tools as shown.



2. Install the ATF guide plate.

3. Drive the new bearing into the housing using the special tools as shown.

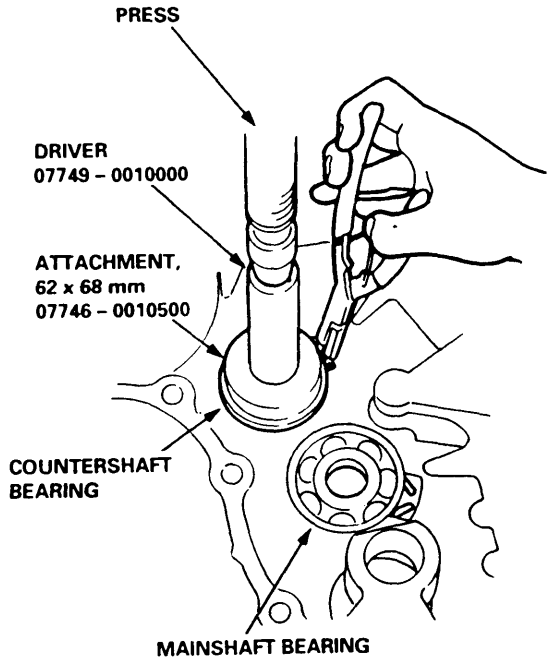


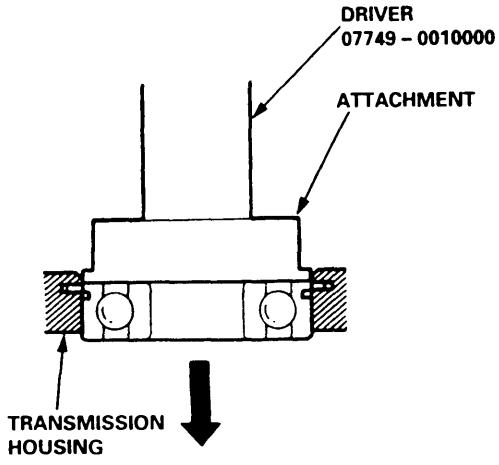
Transmission Housing Bearings

Mainshaft/Countershaft Bearings Replacement

1. To remove the mainshaft and countershaft bearings from the transmission housing, expand each snap ring with snap ring pliers, then push the bearing out using the special tools and a press as shown.

   NOTE: Do not remove the snap rings unless it's necessary to clean the grooves in the housing.



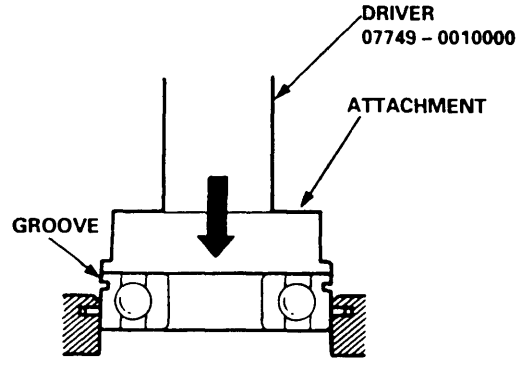


ATTACHMENT
- **Mainshaft Bearing Installation use:**
  ATTACHMENT, 72 x 75 mm
  07746 - 0010600
- **Countershaft Bearing Installation use:**
  ATTACHMENT, 62 x 68 mm
  07746 - 0010500

2. Expand each snap ring with snap ring pliers, then insert the new bearing part-way into the housing using the special tools and a press as shown. Install the bearing with the groove facing outside the housing.

   NOTE: Coat all parts with ATF.

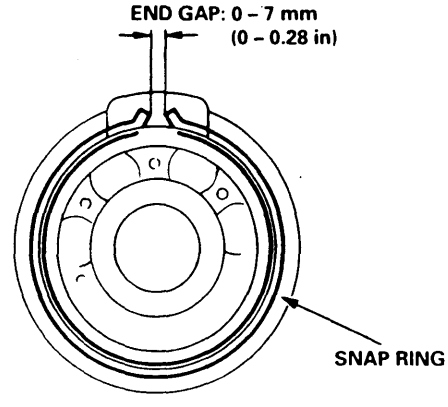
3. Release the pliers, then push the bearing down into the housing until the ring snaps in place around it.



ATTACHMENT
- **Mainshaft Bearing Removal use:**
  ATTACHMENT, 72 x 75 mm
  07746 - 0010600
- **Countershaft Bearing Removal use:**
  ATTACHMENT, 62 x 68 mm
  07746 - 0010500

4. After installing the bearing verify the following:

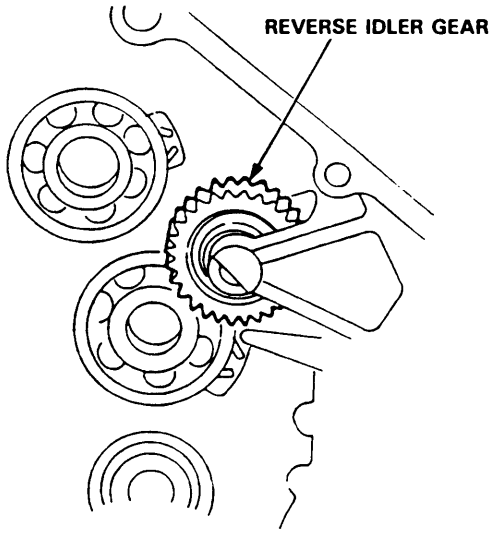
   - The snap ring is seated in the bearing and housing grooves.
   - The snap ring operates properly.
   - The ring end gap is correct.



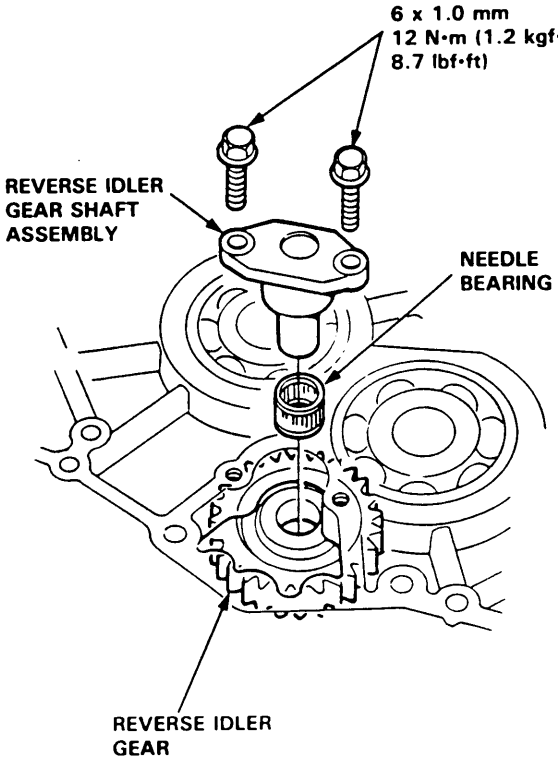
Reverse Idler Gear

Installation

1. Install the reverse idler gear.



2. Install the reverse idler gear shaft holder and needle bearing into the transmission housing, then tighten the bolts.

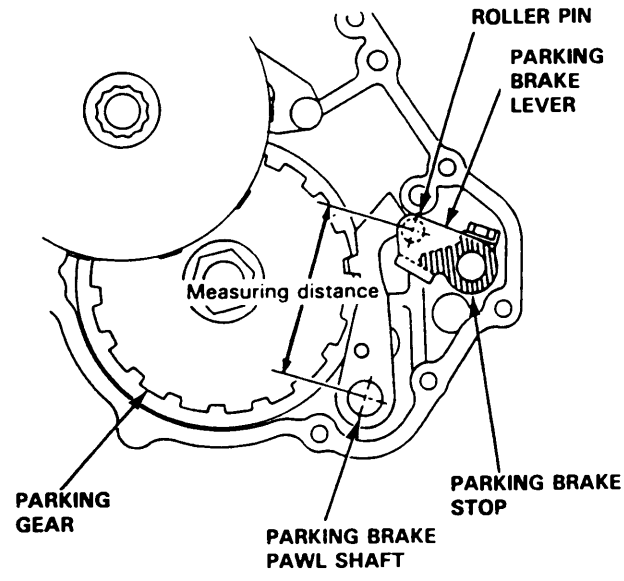


Parking Brake Stop

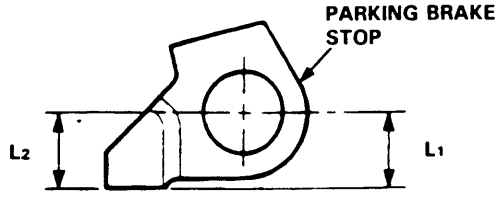
Inspection/Adjustment

1. Set the parking brake lever in the [P] position.
2. Measure the distance between the parking brake pawl shaft and the parking brake lever roller pin as shown.

STANDARD: 72.9 – 73.9 mm (2.87 – 2.91 in)



3. If the measurement is out of tolerance, select and install the appropriate parking brake stop from the table below.



PARKING BRAKE STOP

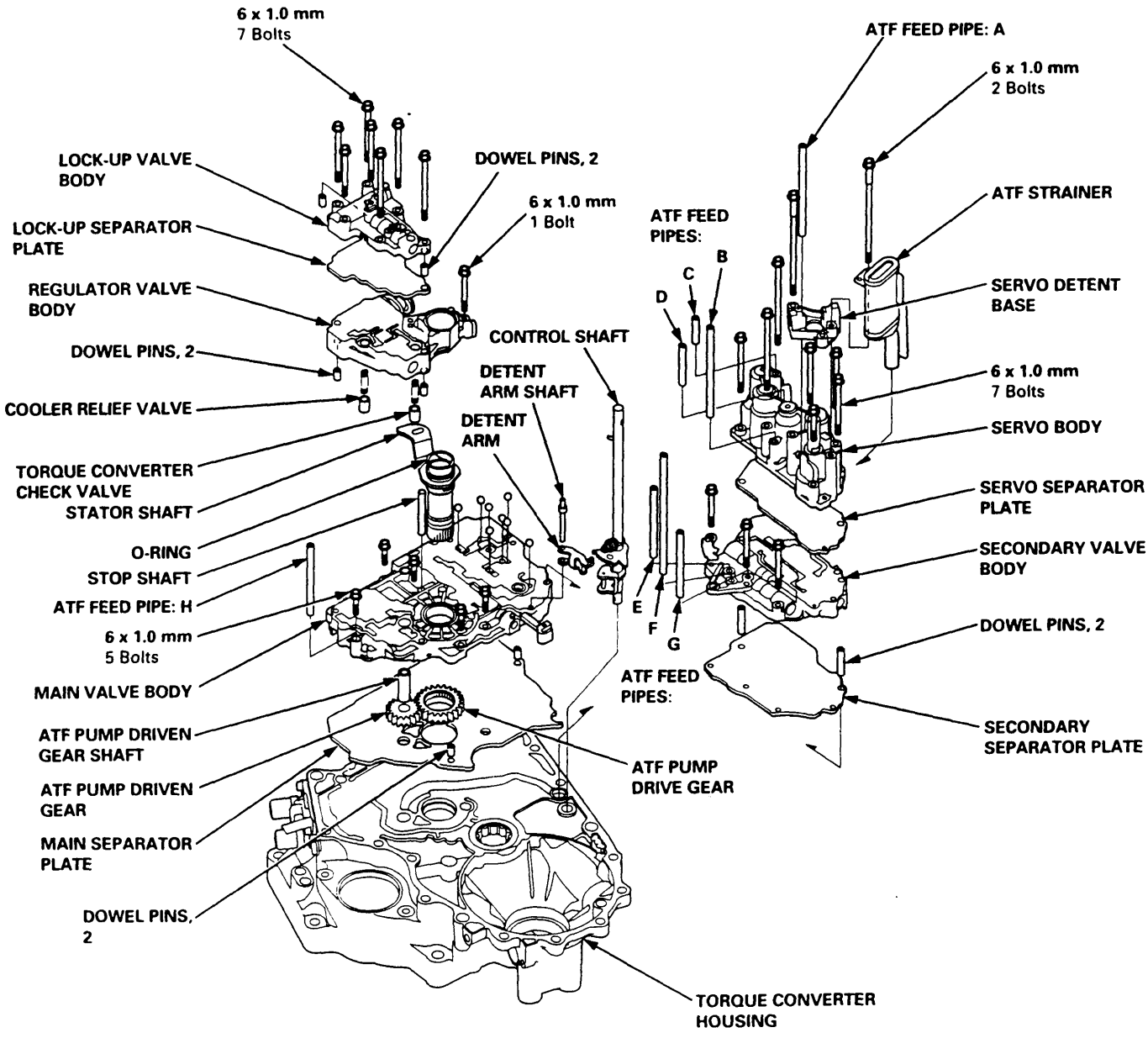
Mark	Part Number	L_1	L_2
1	24537 – PA9 – 003	11.00 mm (0.433 in)	11.00 mm (0.433 in)
2	24538 – PA9 – 003	10.80 mm (0.425 in)	10.65 mm (0.419 in)
3	24539 – PA9 – 003	10.60 mm (0.417 in)	10.30 mm (0.406 in)

4. After replacing the parking brake stop, make sure the distance is within tolerance.

Reassembly

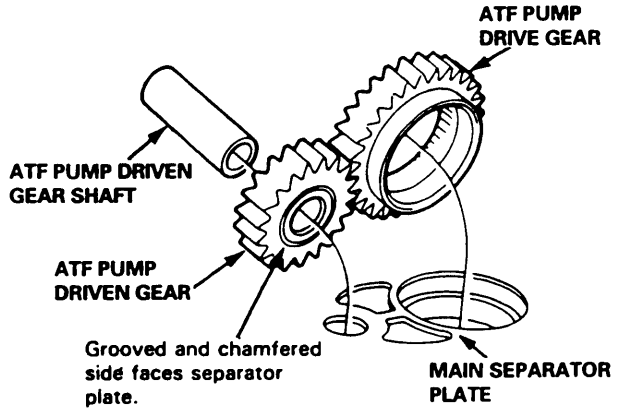
NOTE:
- Coat all parts with ATF.
- Replace the following parts:
  - — O-rings
  - — Lock washers
  - — Gaskets
  - — Mainshaft and countershaft locknuts and conical spring washers
  - — Sealing washers

TORQUE: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)



1. Install the ATF magnet and suction pipe collar in the torque converter housing, if necessary.
2. Install the main separator plate and the two dowel pins on the torque converter housing.
3. Install the ATF pump drive gear, ATF pump driven gear and ATF pump driven gear shaft on the torque converter housing.

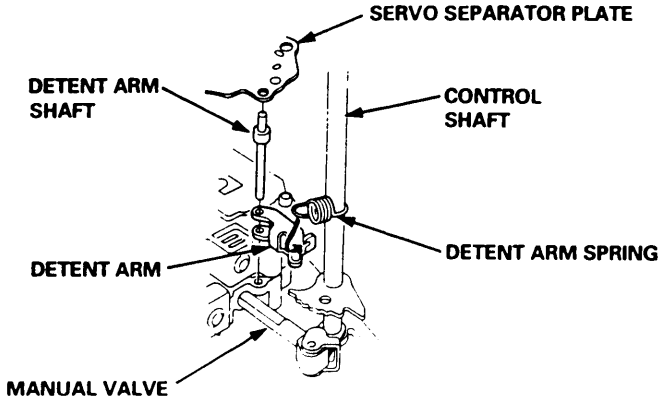
   NOTE: Install the ATF pump driven gear with its grooved and chamfered side facing down.



4. Loosely install the main valve body with five bolts. Make sure the ATF pump drive gear rotates smoothly in the normal operating direction and the ATF pump driven gear shaft moves smoothly in the axial and normal operating directions.
5. Install the secondary valve body, separator plate and two dowel pins on the main valve body.

   NOTE: Do not install the bolts.

6. Install the control shaft in the housing with the control shaft and manual valve together.
7. Install the detent arm and arm shaft in the main valve body, then hook the detent arm spring to the detent arm.



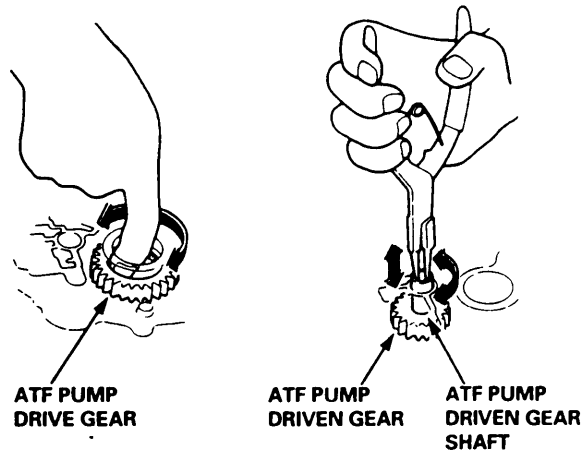
8. Install the servo body and separator plate on the secondary valve body (seven bolts).

9. Install the servo detent base and the ATF strainer (two bolts).

10. Tighten the five bolts on the main valve body to 12 N·m (1.2 kgf·m, 8.7 lbf·ft).
    Make sure the ATF pump drive gear and ATF pump driven gear shaft move smoothly.

11. If the ATF pump drive gear and ATF pump driven gear shaft do not move freely, loosen the five bolts on the main valve body, and disassemble the valve bodies.
    Realign the ATF pump driven gear shaft and reassemble the valve bodies, then retighten the bolts to the specified torque.

    CAUTION: 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.



12. Install the stator shaft and stop shaft.

13. Install the bolts and the shaft stop on the secondary valve body, then tighten the bolts (three bolts).

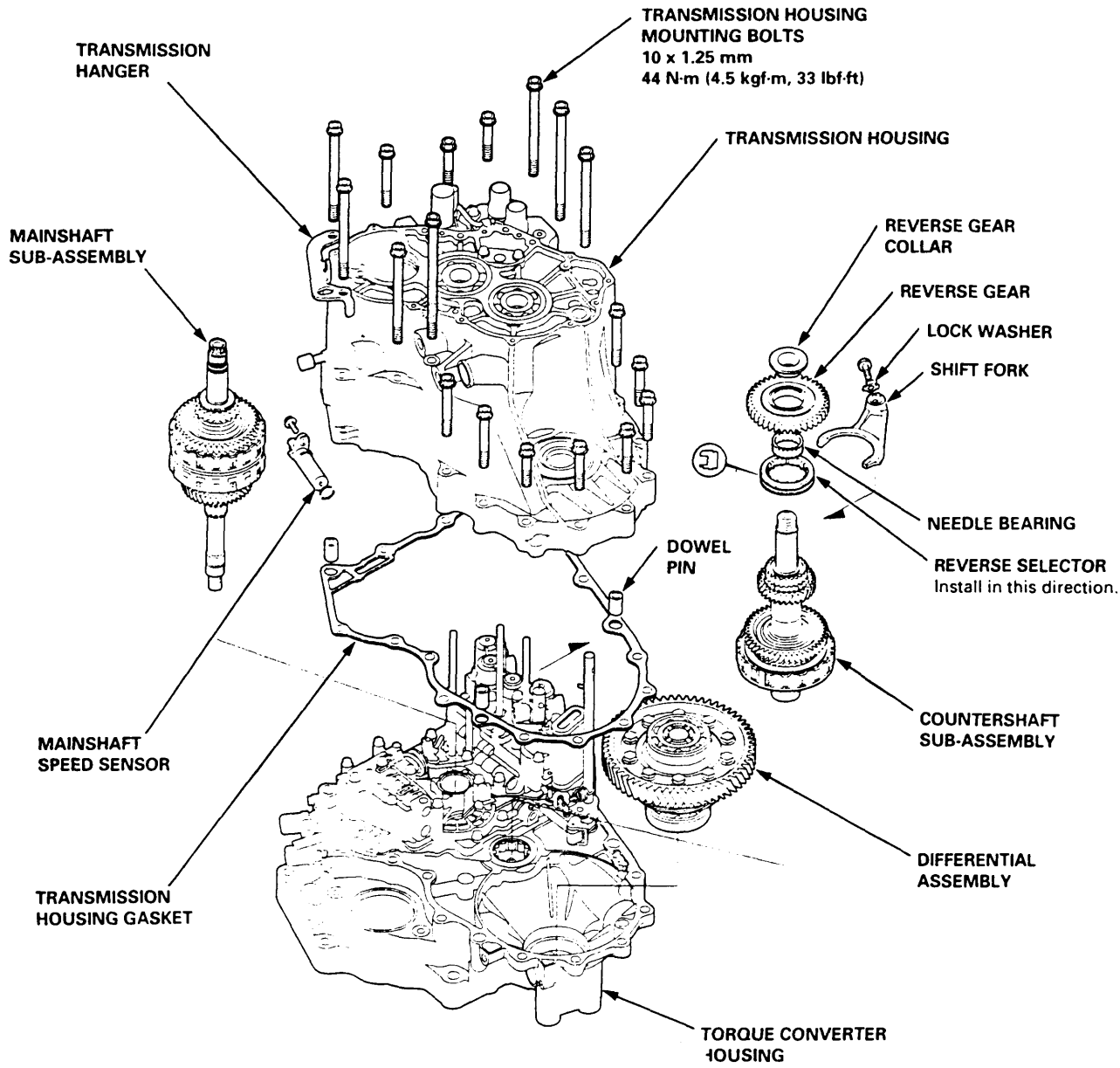
14. Install the torque converter check valve, cooler relief valve and valve springs in the regulator valve body, then install the regulator valve body on the main valve body (one bolt).

15. Install the lock-up valve body on the regulator valve body (seven bolts).

16. Install the ATF feed pipe in the main valve body, the three ATF feed pipes in the secondary valve and the four ATF feed pipes in the servo body.

(cont'd)

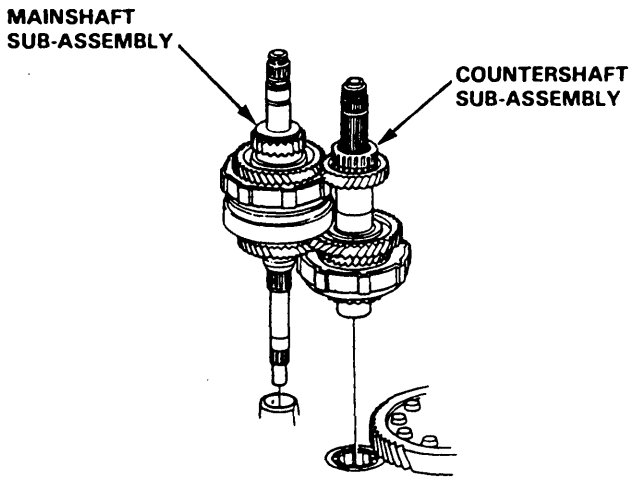
Reassembly (cont'd)



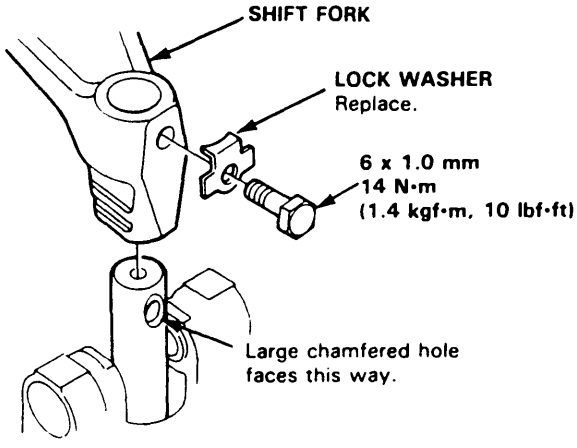
17. Install the reverse idler gear and the gear shaft holder (see page 14-151).

18. Install the differential assembly in the torque converter housing.

19. Assemble the mainshaft and the countershaft sub-assembly, then install them together in the torque converter housing.

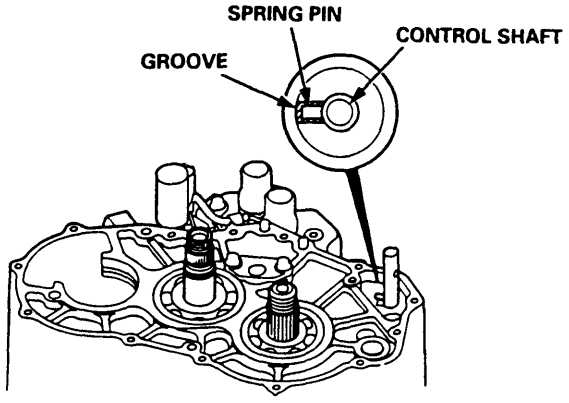


20. Turn the shift fork so the large chamfered hole is facing the fork bolt hole, then install the shift fork with the reverse selector, and torque the lock bolt. Bend the lock tab against the bolt head.



21. Install the needle bearing, countershaft reverse gear and reverse gear collar on the countershaft.

22. Align the spring pin on the control shaft with the transmission housing groove by turning the control shaft.



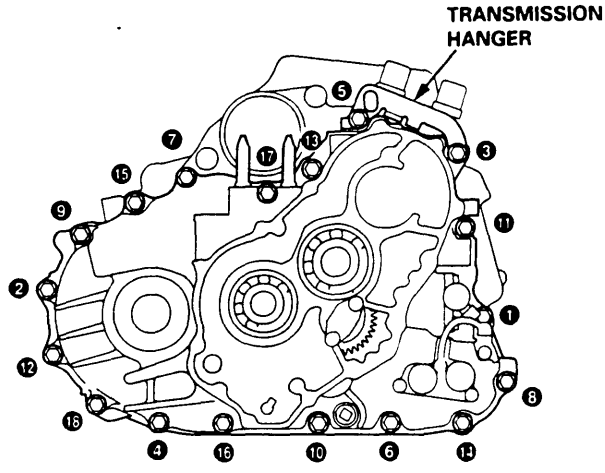
23. Install the two dowel pins and a new gasket on the torque converter housing.

24. Place the transmission housing on the torque converter housing.

CAUTION: Make sure that the mainshaft speed sensor is not installed on the transmission housing before installing the transmission housing on the torque converter housing.

25. Install the transmission housing mounting bolts along with the transmission hanger, then tighten the bolts in two or more steps in the sequence as shown.

TORQUE: 44 N·m (4.5 kgf·m, 33 lbf·ft)



26. Install the mainshaft speed sensor on the transmission housing. (cont'd)

Reassembly (cont'd)

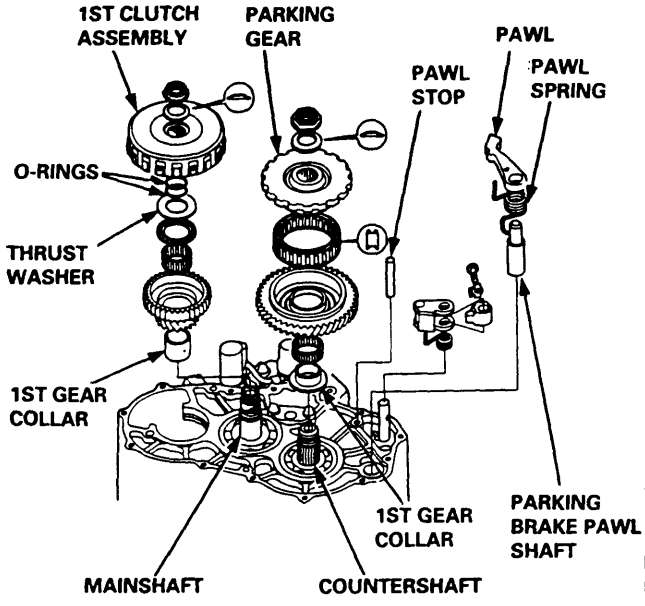
27. Install the parking brake lever on the control shaft.

28. Assemble the one-way clutch and the parking gear with the countershaft 1st gear (see page 14-133).

29. Lubricate the following parts with ATF:
    - Countershaft threads
    - Old locknut threads and flat end
    - Old conical spring washer
    - Parking gear contact area with conical spring washer

30. Install the countershaft 1st gear collar, needle bearing, and the countershaft 1st gear/parking gear assembly on the countershaft.

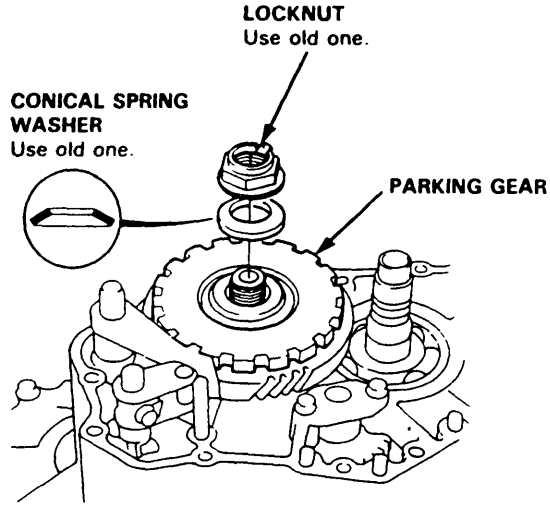
31. Install the parking brake pawl shaft, pawl spring, pawl, and pawl stop on the transmission housing, then engage the parking brake pawl with the parking gear.



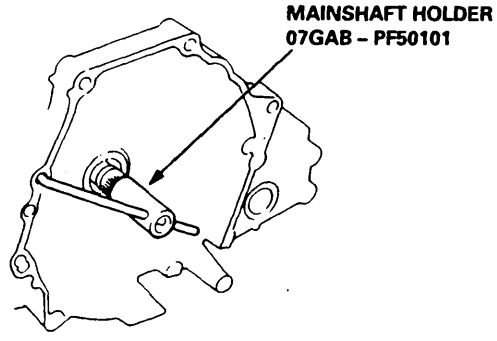
32. Install the old locknut and conical spring washer on the countershaft. Tighten the old locknut to seat the parking gear to the specified torque, then remove them.

    NOTE:
    - The locknut has left-hand threads.
    - Do not use an impact wrench, always use a torque wrench to tighten the locknut.

    TORQUE: 103 N·m (10.5 kgf·m, 75.9 lbf·ft)



33. Slip the special tool onto the mainshaft as shown.



34. Install the mainshaft 1st gear collar, mainshaft 1st gear, needle bearing, thrust needle bearing, and the thrust washer on the mainshaft.

35. Wrap the shaft splines with tape to prevent O-ring damage, then install new O-rings on the mainshaft.

36. Install the 1st clutch assembly on the mainshaft.

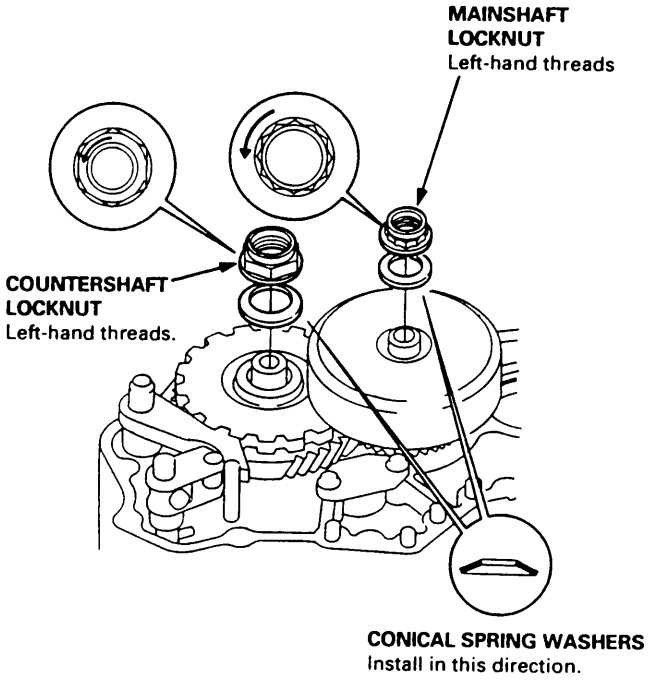
37. Install the new conical spring washer with the "C" facing the locknut side on the countershaft in the direction as shown.

38. Install the new conical spring washer with the "U" facing the locknut side on the mainshaft in the direction shown.

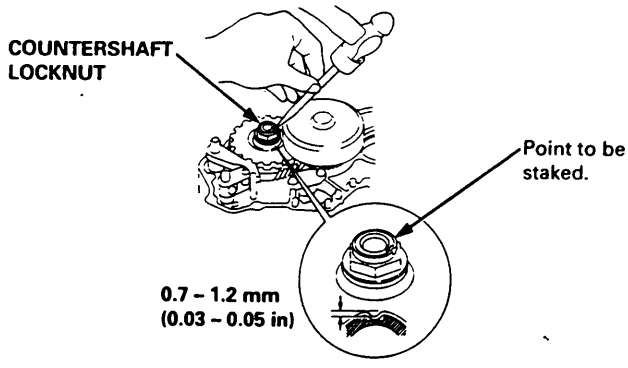
39. Lubricate the flat side of the new locknuts with ATF, then install and tighten the locknuts to the specified torque.

    TORQUE:
    MAINSHAFT: 78 N·m (8.0 kgf·m, 58 lbf·ft)
    COUNTERSHAFT: 103 N·m (10.5 kgf·m, 75.9 lbf·ft)

    NOTE:
    - The locknuts have left-hand threads.
    - Do not use an impact wrench, always use a torque wrench to tighten the locknuts.



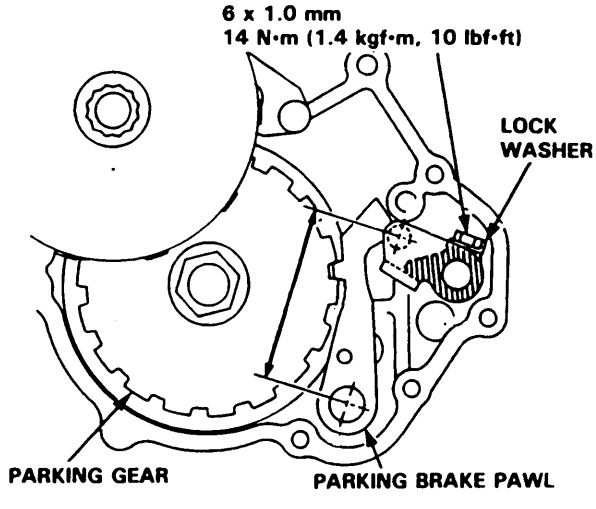
40. Stake each locknut using a 3.5 mm punch as shown.



41. Set the parking brake lever in the [P] position, then verify that the parking brake pawl engages the parking gear.

42. If the pawl does not engage fully, check the distance between the parking brake pawl shaft and the parking brake lever roller pin (see page 14-151).

43. Tighten the lock bolt and bend the lock tab.

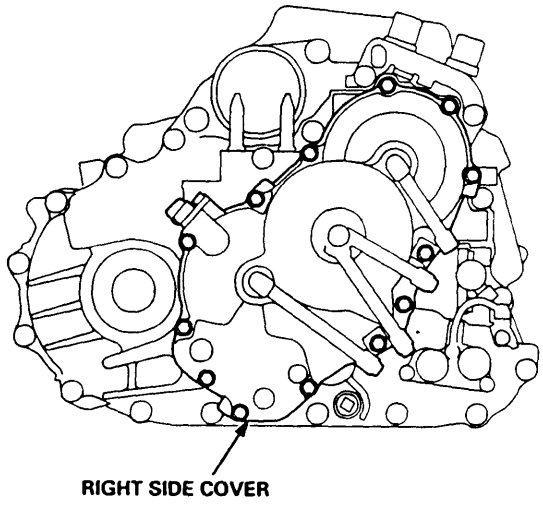


(cont'd)

Reassembly (cont'd)

44. Install the right side cover with two dowel pins and a new gasket (thirteen bolts).

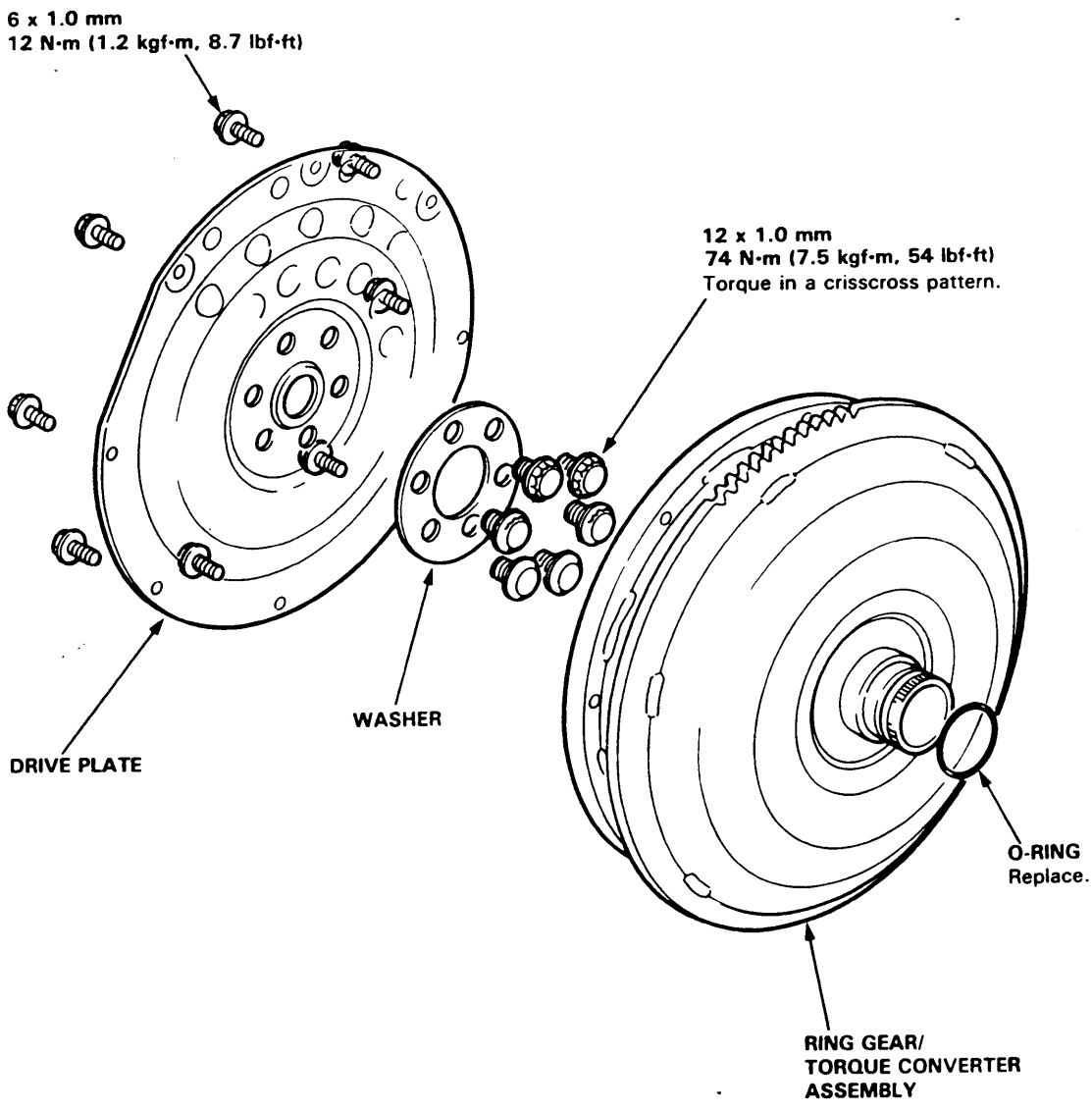
    TORQUE: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)



45. Install the ATF cooler lines with new sealing washers.

    TORQUE: 28 N·m (2.9 kgf·m, 21 lbf·ft)

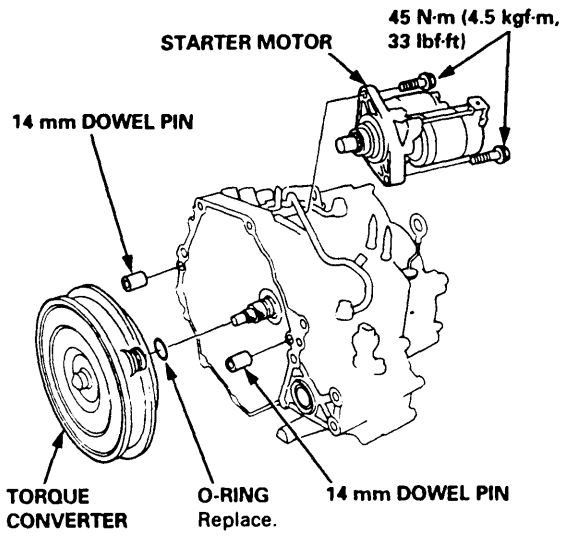
46. Install the ATF dipstick.


6 x 1.0 mm
12 N·m (1.2 kgf·m, 8.7 lbf·ft)
12 x 1.0 mm
74 N·m (7.5 kgf·m, 54 lbf·ft)
Torque in a crisscross pattern.
DRIVE PLATE
WASHER
O-RING
Replace.
RING GEAR/
TORQUE CONVERTER
ASSEMBLY

Installation

1. Flush the ATF cooler as described on page 14-164 and 14-165.

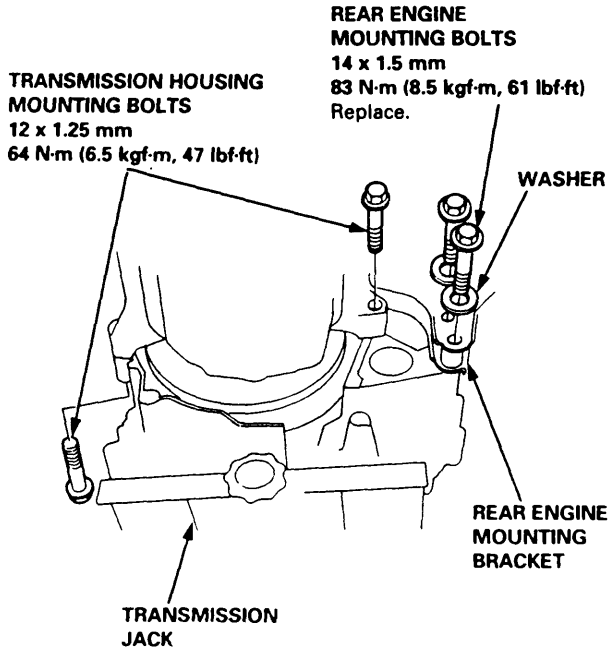
2. Install the torque converter assembly securely with a new O-ring on the mainshaft.



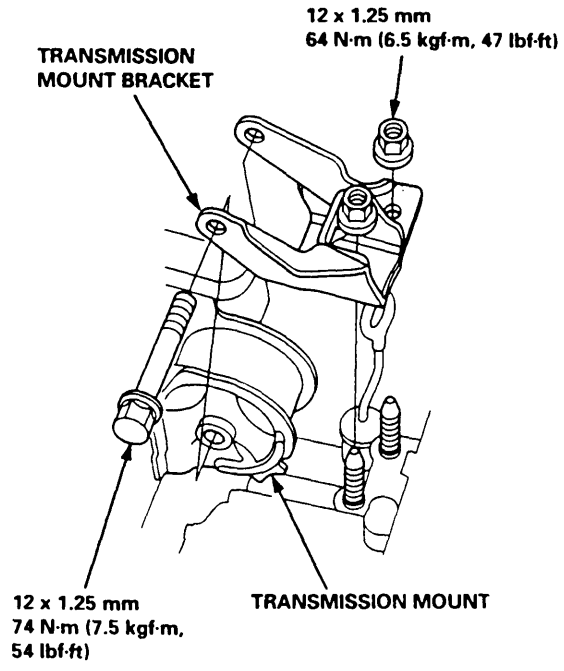
3. Install the starter motor on the torque converter housing, then install the two 14 mm dowel pins in the torque converter housing.

4. Place the transmission on a jack, and raise it to the engine assembly level.

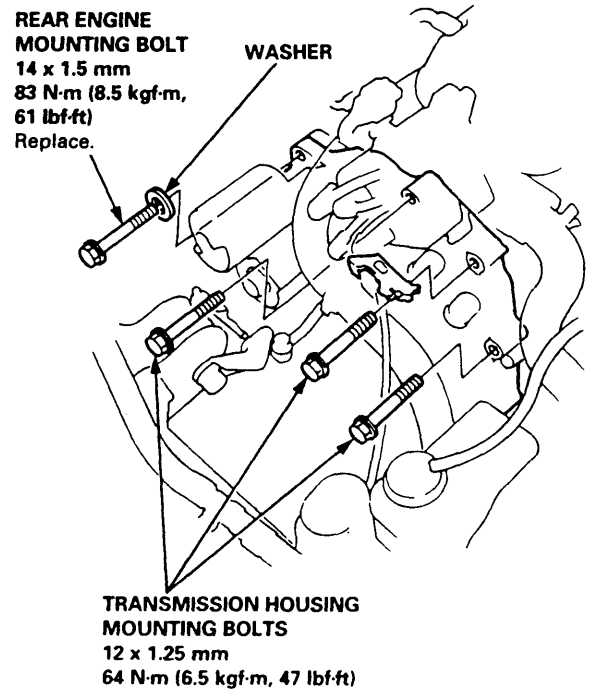
5. Attach the transmission to the engine, then install two transmission housing mounting bolts and two rear engine mounting bolts.



6. Install the transmission mount bracket.



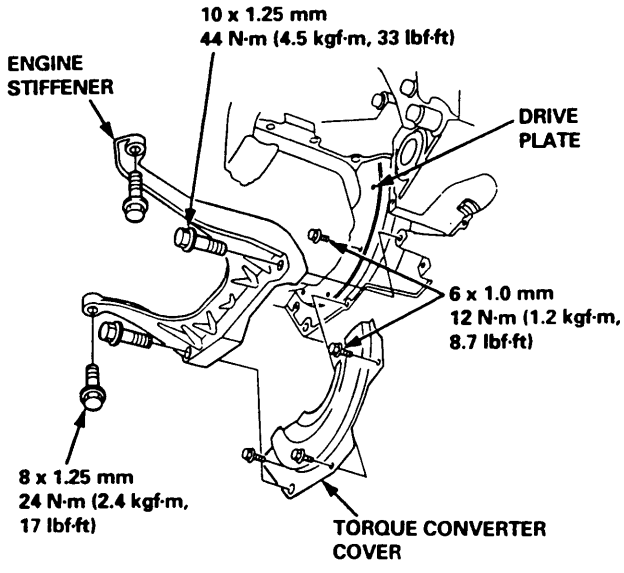
7. Install the remaining transmission housing mounting bolts and remaining rear engine mounting bolt.



8. Remove the transmission jack.

9. Attach the torque converter to the drive plate with eight drive plate bolts and torque as follows:
   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.

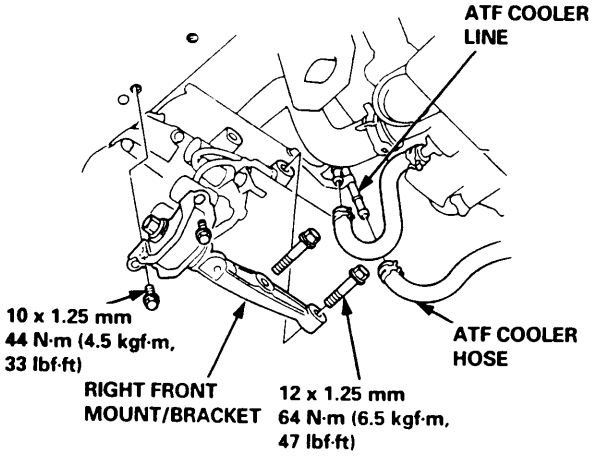
   TORQUE: 12 N·m (1.2 kgf·m, 8.7 lbf·ft)



10. Install the torque converter cover and the engine stiffener.

11. Tighten the crankshaft pulley bolt, if necessary (see section 6).

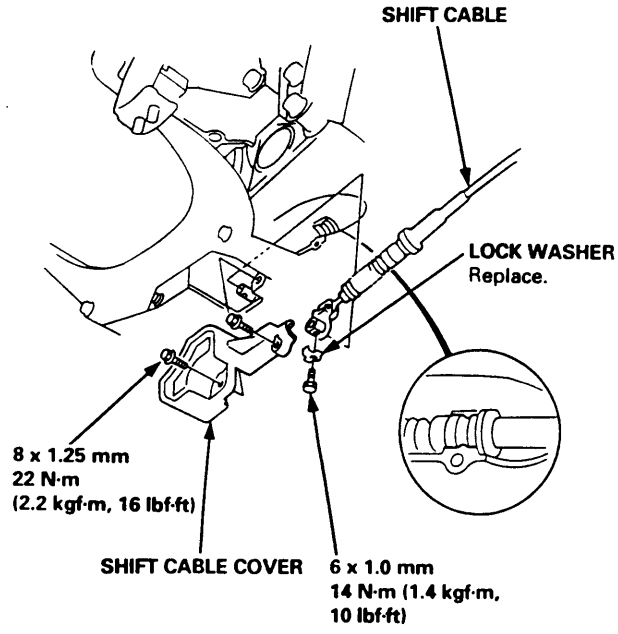
12. Connect the ATF cooler hoses to the ATF cooler lines (see page 14-169).



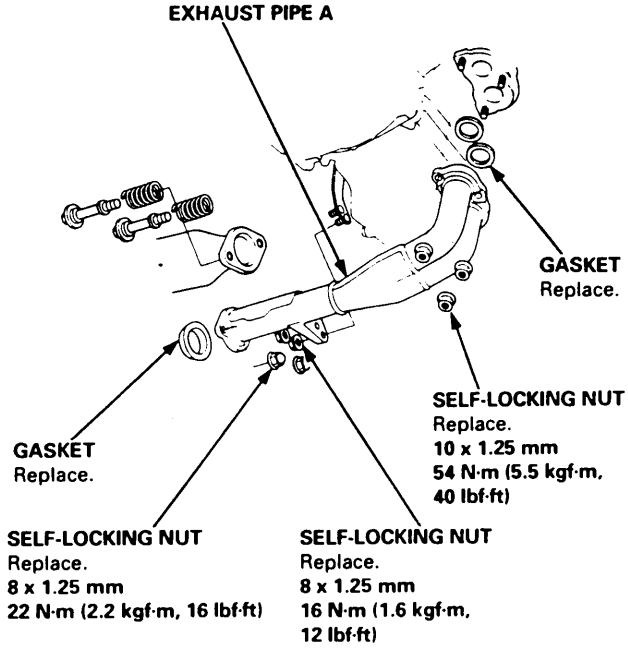
13. Install the right front mount/bracket.

14. Install the control lever with a new lock washer to the control shaft, then install the shift cable cover.

    CAUTION: Take care not to bend the shift cable.



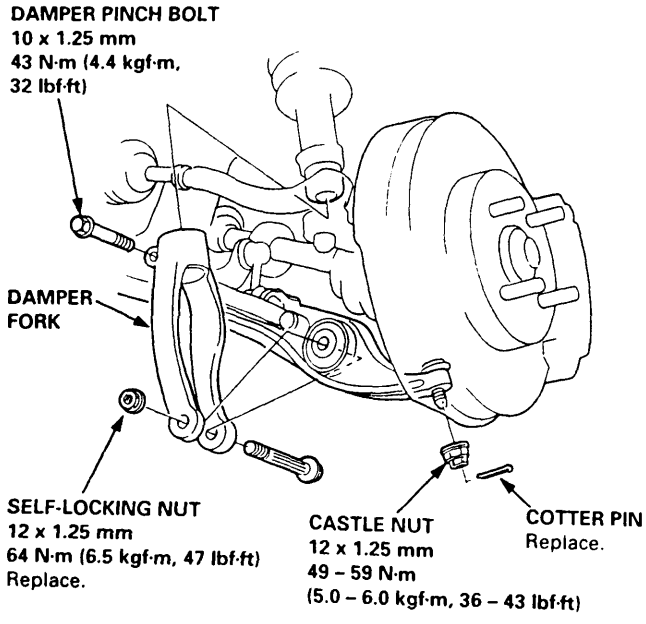
15. Install the exhaust pipe A.



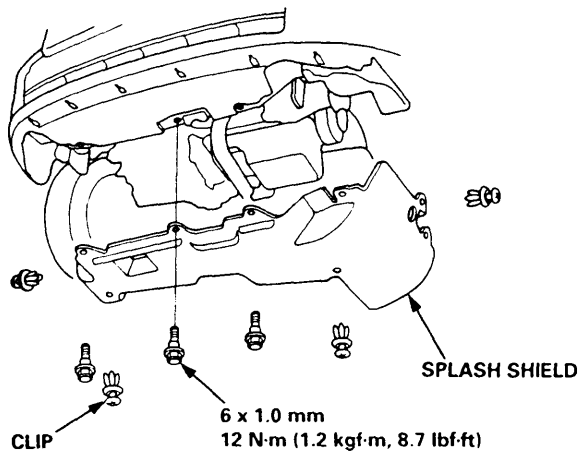
(cont'd)

Installation (cont'd)

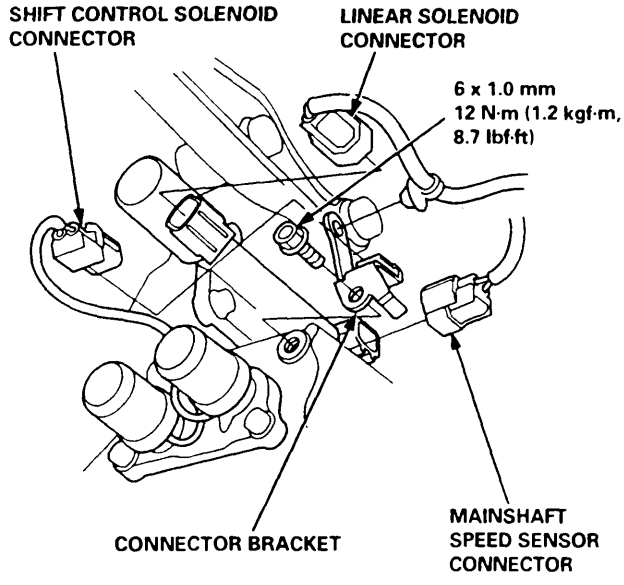
16. Install a new set ring on the end of each driveshaft.
17. Install the right and left driveshafts (see section 16).
    CAUTION: While installing the driveshafts in the differential, be sure not to allow dust and other foreign particles to enter into the transmission.
    NOTE:
    - Clean the areas where the driveshafts contact the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air.
    - Turn the right and left steering knuckle fully outward, and slide each driveshaft into the differential until you feel its set ring clip engage the side gear.
18. Install the damper fork, then install the right and left ball joints to the each lower arm with the castle nuts and new cotter pins.



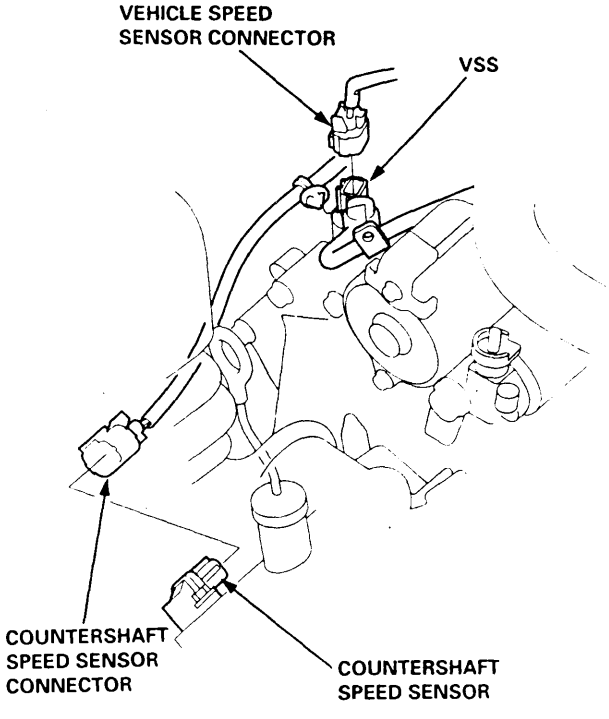
19. Install the splash shield.



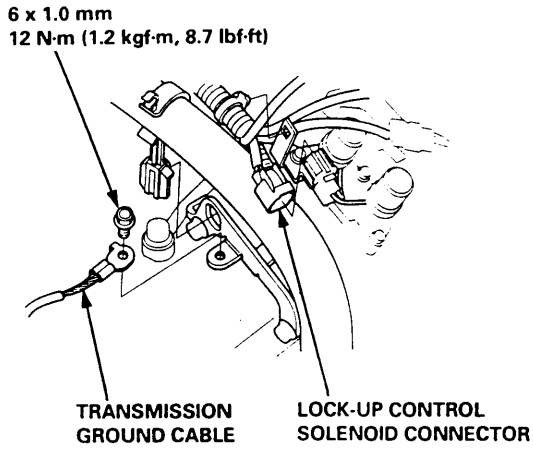
20. Connect the mainshaft speed sensor, the linear solenoid and the shift control solenoid connectors.



21. Connect the countershaft speed sensor and the vehicle speed sensor (VSS) connectors.

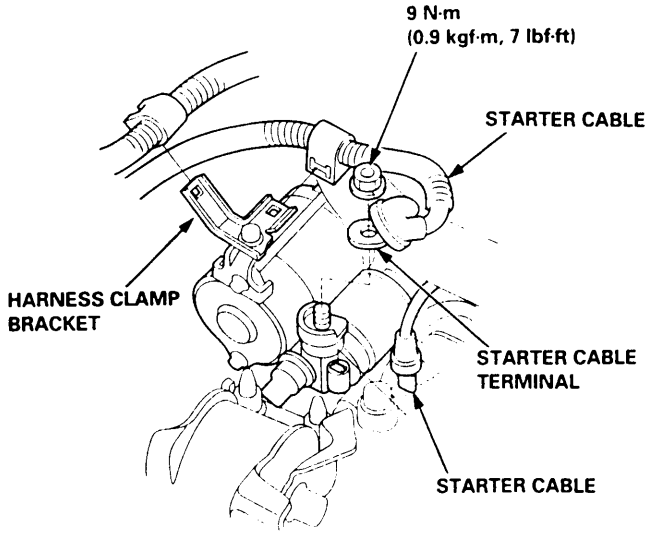


22. Connect the lock-up control solenoid connector, and install the transmission ground cable.



23. Connect the starter cables on the starter motor, and install the cable holder.

NOTE: When installing the starter cable terminal, make sure that the crimped side of the ring terminal is facing out.



24. Install the intake air duct and the air cleaner housing assembly.

25. Refill the transmission with ATF (see page 14-95).

26. Connect the positive (+) cable first, then the negative (–) cable to the battery.

27. Check the ignition timing (see section 23).

28. Start the engine. Set the parking brake, and shift the transmission through all gears, three times. Check the shift cable adjustment (see page 14-167).

29. Check the front wheel alignment (see section 18).

30. Let the engine reach operating temperature (the cooling fan comes on) with the transmission in [N] or [P] position, then turn it off and check the fluid level.

31. Road test as described on pages 14-92 and 14-93.

32. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Cooler Flushing

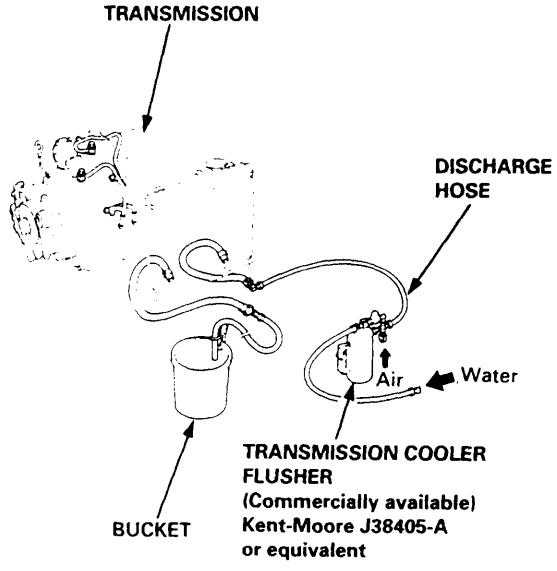
⚠ WARNING To prevent injury to face and eyes, always wear safety glasses or a face shield when using the transmission flusher.

NOTE: This procedure should be performed before reinstalling the transmission.

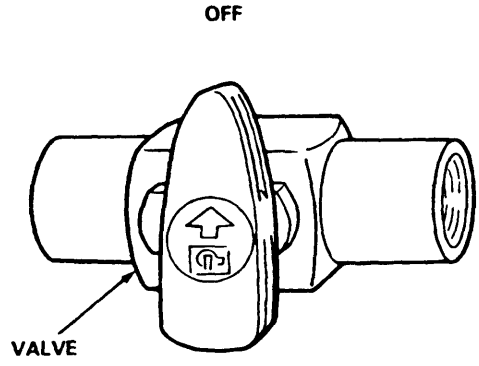
1. Check tool and hoses for wear and cracks before using. If wear or cracks are found, replace the hoses before using.
2. Using the measuring cup, fill the tank with 21 ounces (approximately 2/3 full) of biodegradable flushing fluid (J35944 - 20). Do not substitute with any other fluid. Follow the handling procedure on the fluid container.
3. Secure the flusher filler cap, and pressurize the tank with compressed air to between 550 - 829 kpa (5.6 - 8.45 kgf/cm², 80 - 120psi).

   NOTE: The air line should be equipped with a water trap to ensure a dry air system.
4. Hang the tool under the vehicle.
5. Attach the tank's discharge hose to the return line of the transmission cooler using a clamp.
6. Connect the drain hose to the inlet line on the transmission cooler using a clamp.

   IMPORTANT:
   Securely clamp the opposite end of the drain hose to a bucket or floor drain.



7. With the water and air valves off, attach the water and air supplies to the flusher. (Hot water if available.)



8. Turn on the flusher water valve so water will flow through the cooler for 10 seconds.

   NOTE: If water does not flow through the cooler, it is completely plugged, cannot be flushed, and must be replaced.
9. Depress the trigger to mix the flushing fluid into the water flow. Use the wire clip to hold the trigger down.
10. While flushing with the water and flushing fluid for two minutes, turn the air valve on for five seconds every 15 - 20 seconds to create a surging action.
    AIR PRESSURE: MAX 845 kpa (8.45 kgf/cm², 120 psi)
11. Turn the water valve off. Release the trigger, then reverse the hoses to the cooler so you can flush in the opposite direction. Repeat steps 8 through 10.
12. Release the trigger, and rinse the cooler with water only for one minute.
13. Turn the water valve off, and turn off the water supply.
14. Turn the air valve on to dry the system out with air for two full minutes or until no moisture is visible leaving the drain hose.

    CAUTION: Residual moisture in the cooler or pipes can damage the transmission.
15. Remove the flusher from the cooler line. Attach the drain hose to a container.
16. Install the transmission, and leave the drain hose attached to the cooler line.

17. Make sure the transmission is in the [P] position. Fill the transmission with ATF, and run the engine for 30 seconds or until approximately 0.95 ℓ (1.0 US qt., 0.8 Imp qt.) is discharged.

18. Remove the drain hose, and reconnect the cooler return hose to the transmission (see page 14-169).

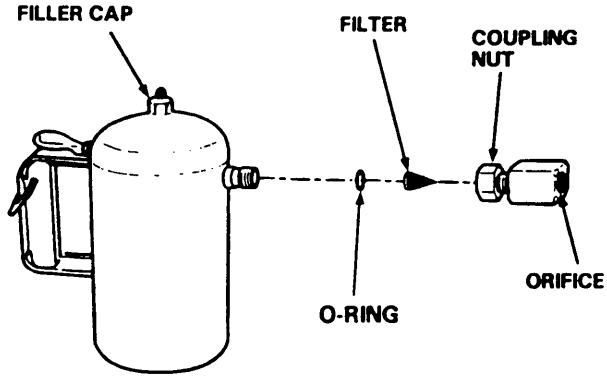
19. Refill the transmission with ATF to the proper level (see page 14-95).

TOOL MAINTENANCE

1. Empty and rinse after each use. Fill the can with water and pressurize the can. Flush the discharge line to ensure that the unit is clean.

2. If discharge liquid does not foam, the orifice may be blocked.

3. To clean, disconnect the plumbing from the tank at the large coupling nut.



4. Remove the in-line filter from the discharge side and clean if necessary.

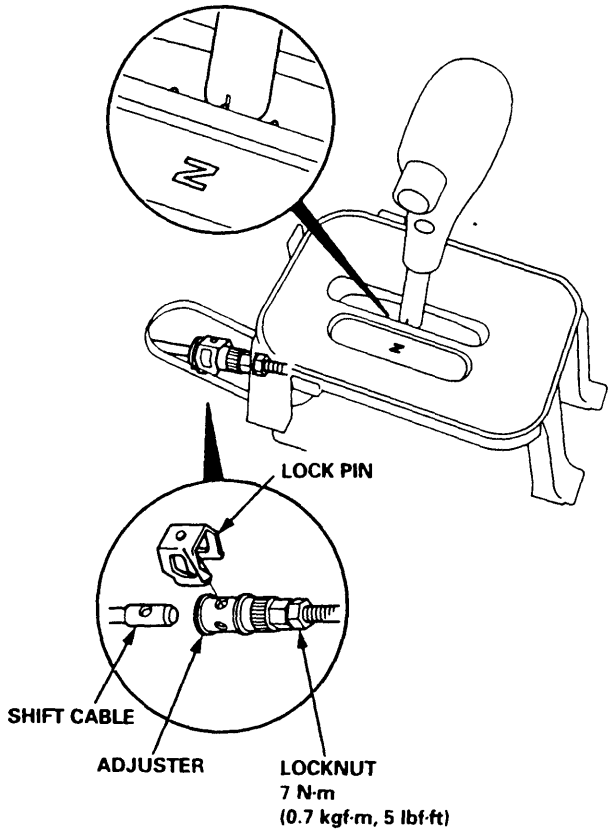
5. The fluid orifice is located behind the filter. Clean it with the pick stored in the bottom of the tank handle, or blow it clean with air. Securely reassemble all parts.

Shift Cable

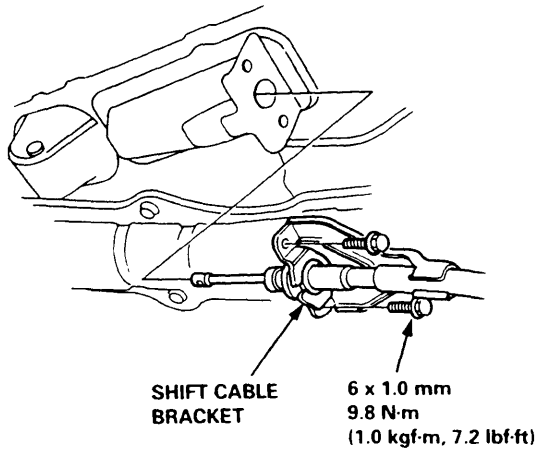
Removal/Installation

⚠ WARNING **Make sure lifts are placed properly (see section 1).**

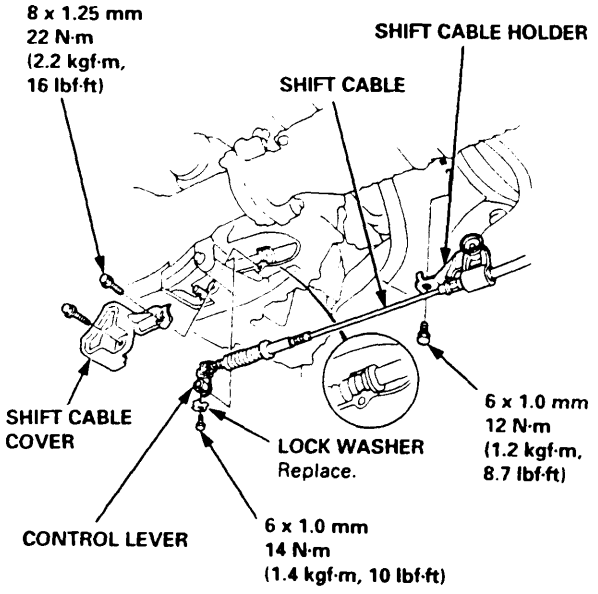
1. Remove the front console (see section 20).
2. Shift to [N] position, then remove the lock pin from the adjuster.



3. Remove the shift cable bracket.



4. Remove the shift cable holder.
5. Remove the shift cable cover.
6. Remove the control lever from the control shaft, then remove the shift cable. Take care not to bend the cable when removing/installing it.

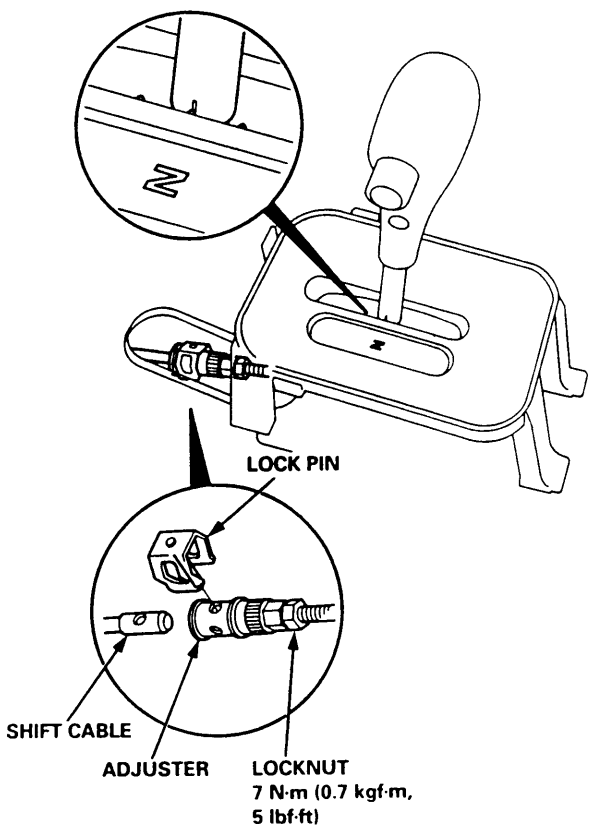


7. Install the shift cable in the reverse order of removal.
8. Check the cable adjustment on reassembly.

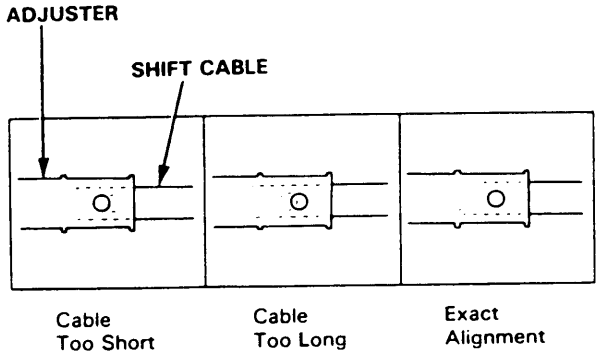
Adjustment

⚠ WARNING Make sure lifts are placed properly (see section 1).

1. Remove the front console (see section 20).
2. Shift to [N] position, then remove the lock pin from the adjuster.

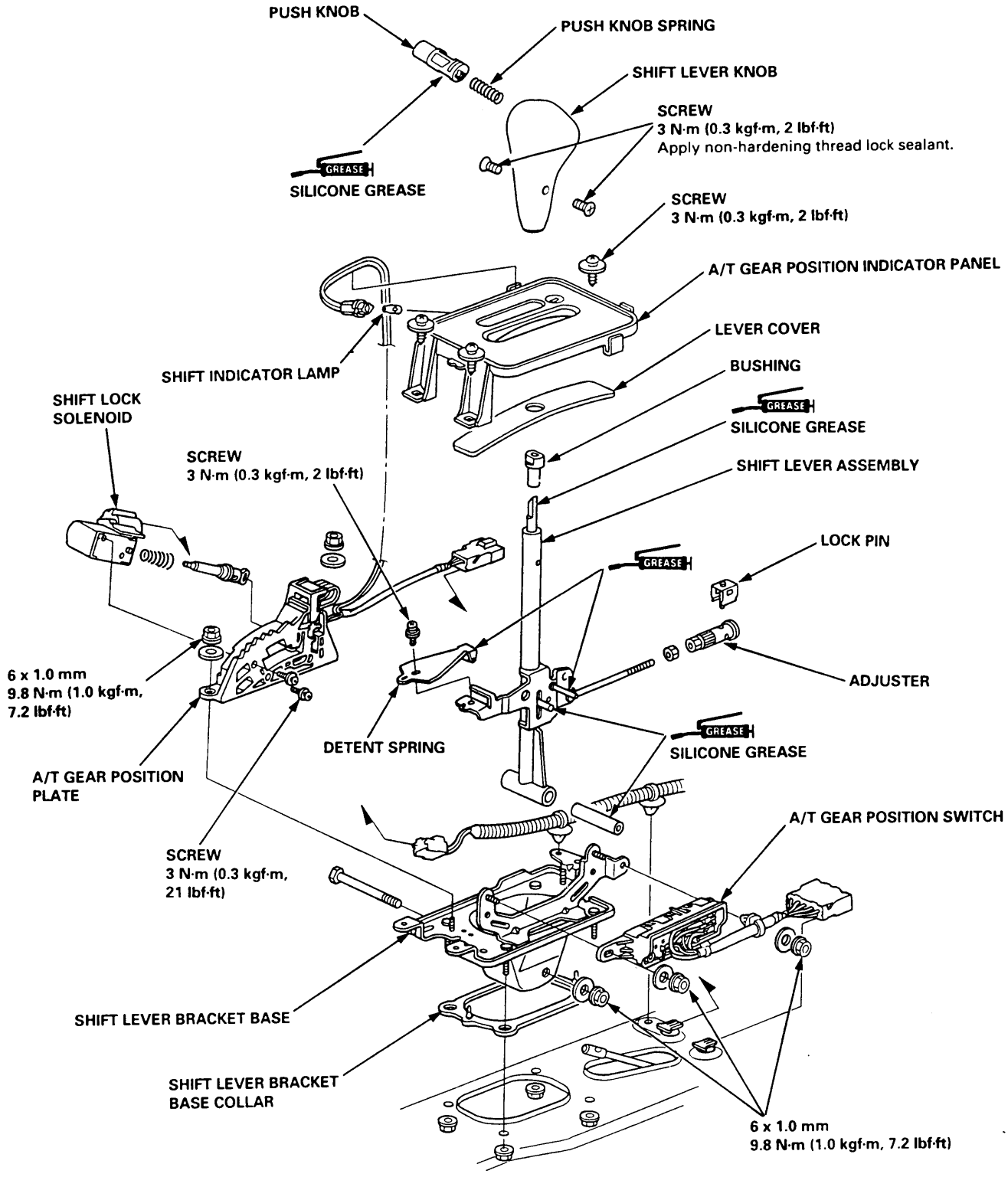


3. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable. There are two holes in the adjuster. They are positioned 90° apart to allow cable adjustment in 1/4 turn increments.



4. If the hole is not perfectly aligned, loosen the locknut on the adjuster and adjust as required.
5. Tighten the locknut to 7 N·m (0.7 kgf·m, 5 lbf·ft).
6. Install the lock pin on the adjuster. If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.
7. Make sure the lock pin is seated in the adjuster securely.
8. Move the shift lever to each gear, and verify that the shift position indicator follows the automatic transaxle gear position switch.
9. Start the engine, and check the shift lever in all gears. If any gear does not work properly, refer to troubleshooting (see page 14-92 and 14-93).
10. Insert the ignition key into the key cylinder on the A/T gear position indicator panel, and verify that the shift lock lever is released.

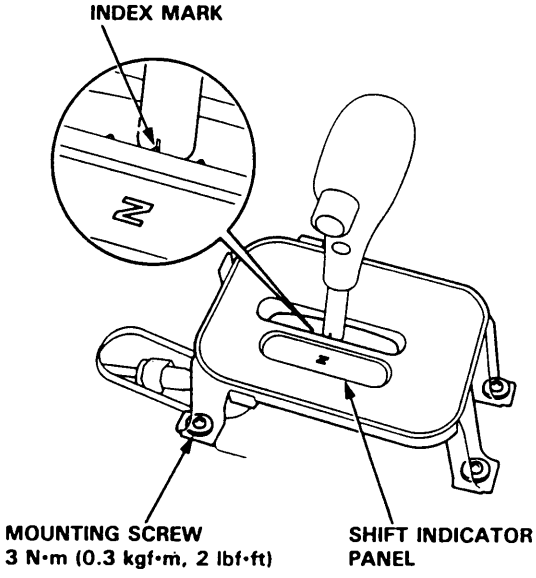
Shift Lever


PUSH KNOB
PUSH KNOB SPRING
SHIFT LEVER KNOB
SCREW
3 N·m (0.3 kgf·m, 2 lbf·ft)
Apply non-hardening thread lock sealant.
GREASE
SILICONE GREASE
SCREW
3 N·m (0.3 kgf·m, 2 lbf·ft)
A/T GEAR POSITION INDICATOR PANEL
LEVER COVER
BUSHING
SHIFT INDICATOR LAMP
SHIFT LOCK SOLENOID
GREASE
SILICONE GREASE
SCREW
3 N·m (0.3 kgf·m, 2 lbf·ft)
SHIFT LEVER ASSEMBLY
LOCK PIN
GREASE
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
ADJUSTER
DETENT SPRING
GREASE
SILICONE GREASE
A/T GEAR POSITION PLATE
A/T GEAR POSITION SWITCH
SCREW
3 N·m (0.3 kgf·m, 21 lbf·ft)
SHIFT LEVER BRACKET BASE
SHIFT LEVER BRACKET BASE COLLAR
6 x 1.0 mm
9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)

Shift Indicator Panel

Adjustment

1. Check that the index mark on the shift lever aligns with the [N] mark on the shift indicator panel when the transmission is in NEUTRAL.



2. If not aligned, remove the front console (see section 20).

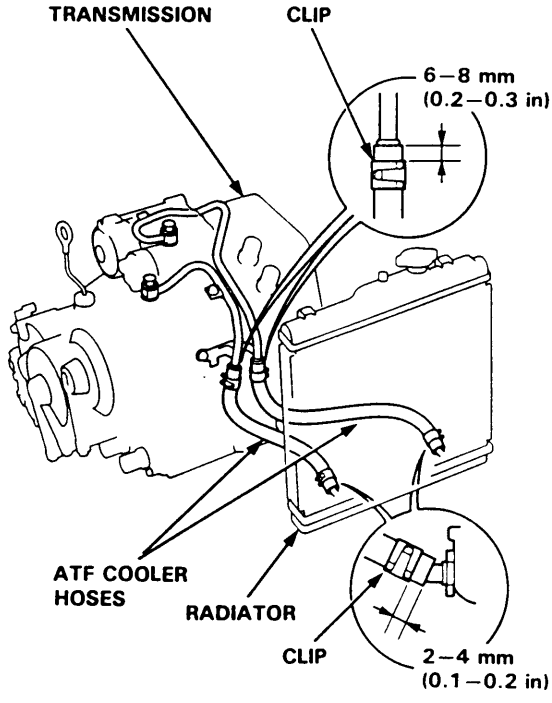
3. Remove the shift indicator panel mounting screws and adjust by moving the panel.

   NOTE: Whenever the shift indicator panel is removed, reinstall the panel as described above.

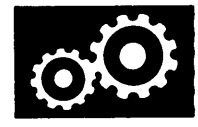
ATF Cooler Hoses

Connection

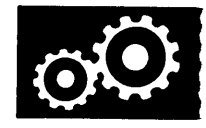
1. Connect the ATF cooler hoses to the ATF cooler lines and ATF cooler, and secure them with the clips as shown.



Differential

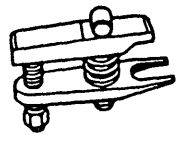


Driveshafts



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07MAC – SL00200	Ball Joint Remover, 28 mm	1	16-4



①

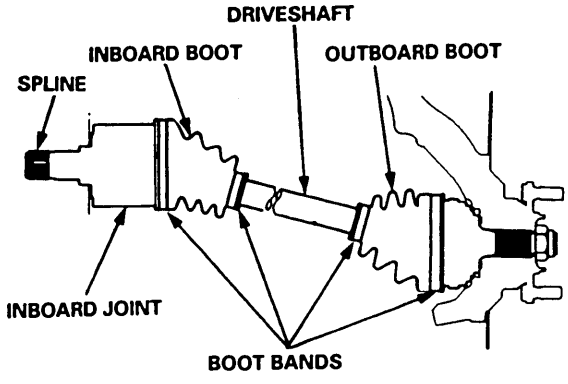
Driveshafts

Inspection

Driveshaft Boot
Check the boots on the driveshaft for cracks, damage, leaking grease and loose boot bands. If any damage is found, replace the boot and boot bands.

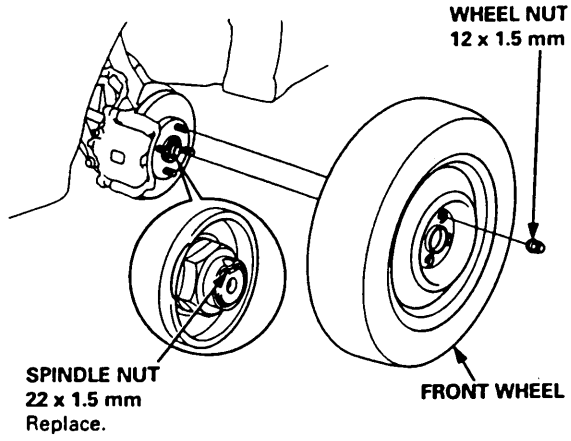
Loose Splines
Turn the driveshaft by hand and make sure the splines and joint are not excessively loose. If any damage is found, replace the inboard joint.

Twisted or Cracked
Make sure the driveshaft is not twisted or cracked. Replace it if necessary.

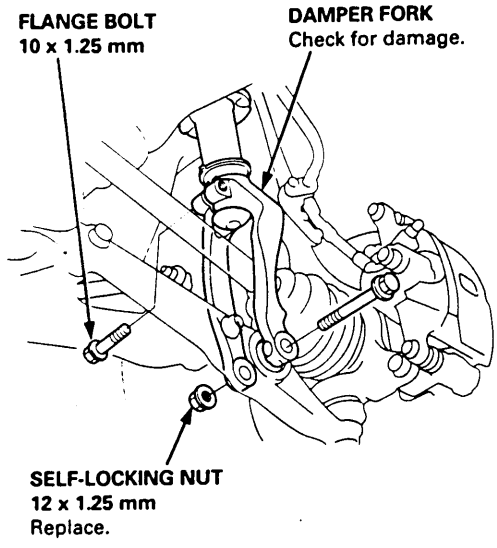


Removal

1. Loosen the wheel nuts slightly.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and front wheels.



4. Drain the transmission fluid (see section 13 or 14).
5. Raise the locking tab on the spindle nut, then remove the nut.
6. Remove the self-locking nut and flange bolts.

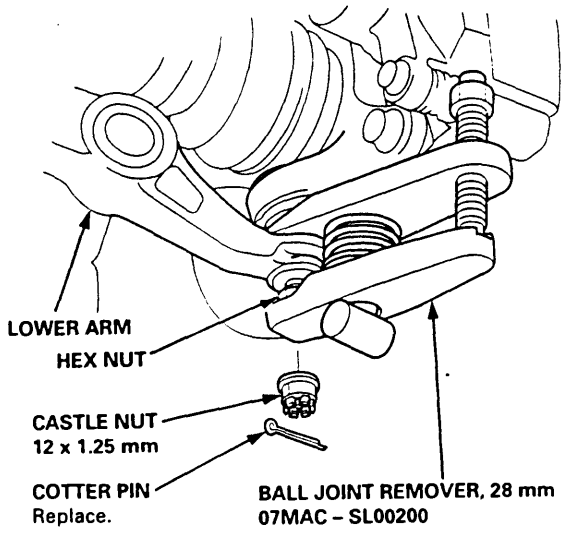


7. Remove the damper fork.

(cont'd)

Removal (cont'd)

8. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.



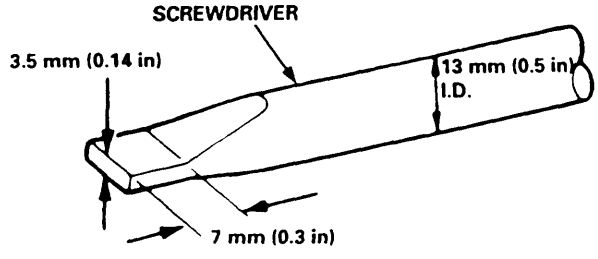
9. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.

10. Use the special tool as shown in section 18, to separate the ball joint and lower arm.

    CAUTION: Be careful not to damage the ball joint boot.

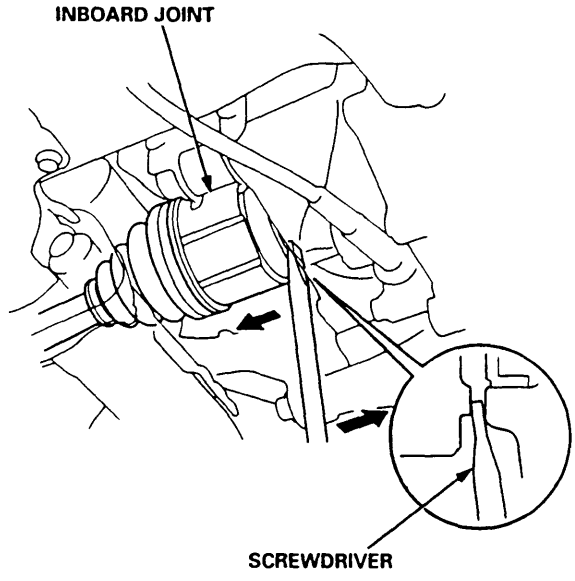
    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

11. Pry the driveshaft assembly with a screwdriver, as shown, to force the set ring at the driveshaft end past the groove.

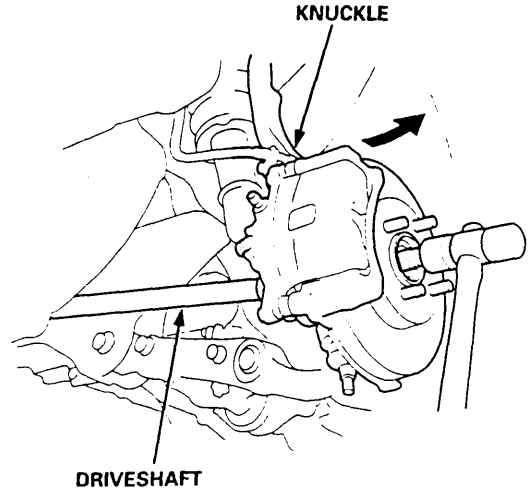


12. Pull the inboard joint, and remove the driveshaft from the differential case as an assembly.

    CAUTION:
    - **Do not pull on the driveshaft; the inboard joint may come apart.**
    - **Use care when prying out the assembly, and pull it straight to avoid damaging the differential oil seal.**



13. Pull the knuckle outward, and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



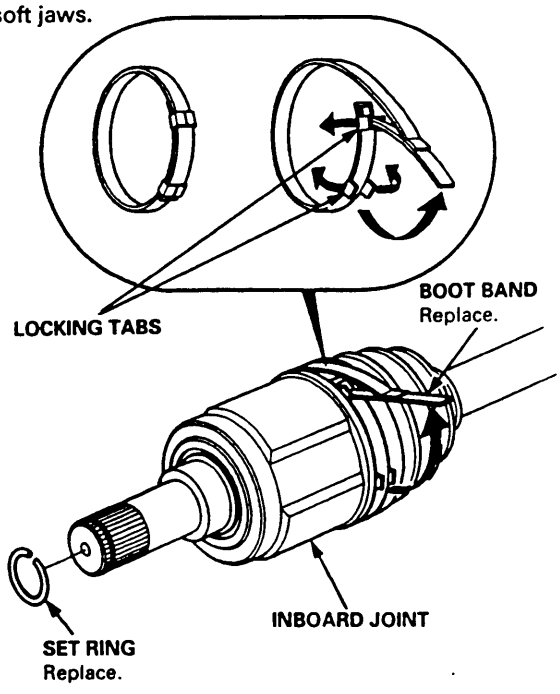
Disassembly

1. Remove the set ring from the inboard joint.

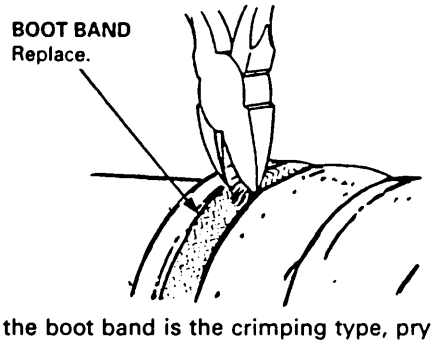
2. To remove the boot band, pry up the locking tabs with a screwdriver and raise the end of the band.

   CAUTION: Take care not to damage the boot.

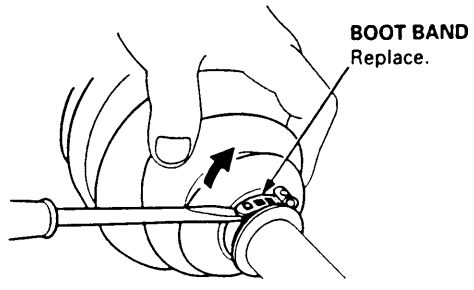
   NOTE: Carefully clamp the driveshaft in a vise with soft jaws.



   — If the boot band is the welded type, cut it off as shown.

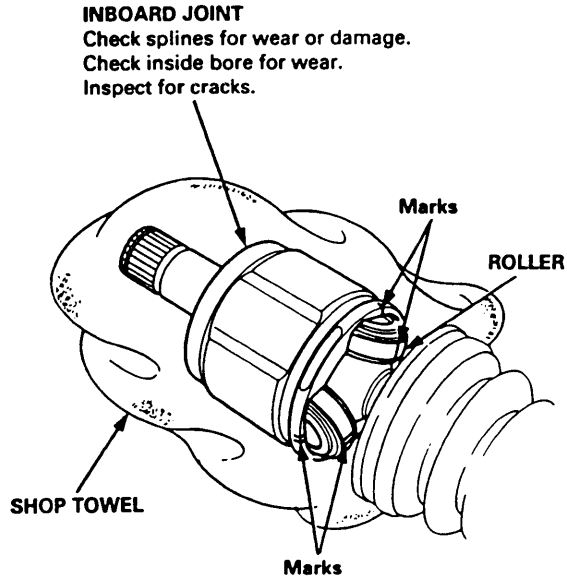


   — If the boot band is the crimping type, pry up the end of the band with a screwdriver.



3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel.

   NOTE: Be careful not to drop the rollers when separating them from the inboard joint.



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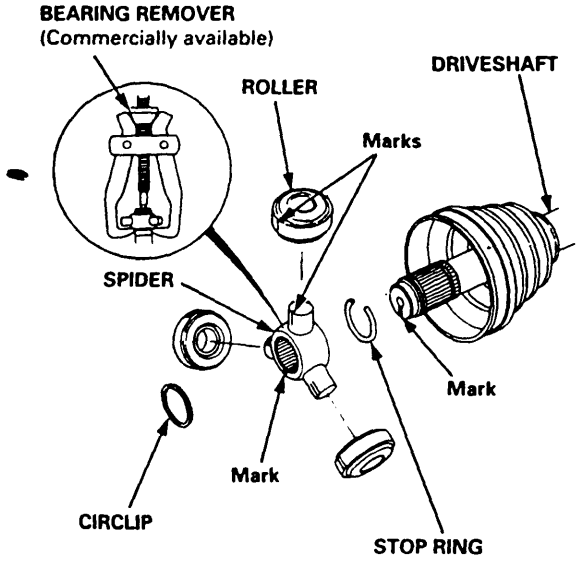
Disassembly (cont'd)

4. Mark the rollers and spider to identify the locations of rollers on the spider, then remove the rollers.



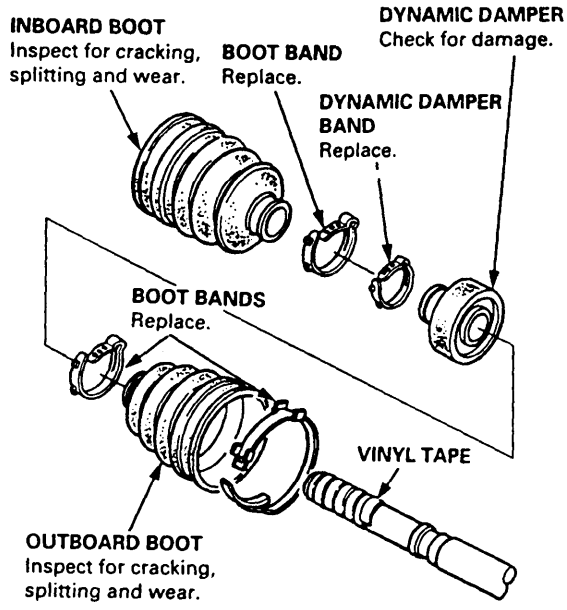
5. Remove the circlip.

6. Mark the spider and driveshaft to identify the position of the spider on the shaft.

7. Remove the spider using a bearing remover.

8. Remove the stop ring.

9. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boots and dynamic damper.



10. Remove the boot band and inboard boot.

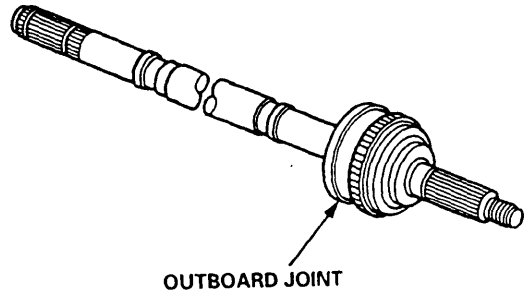
    CAUTION: Take care not to damage the boot.

11. Remove the dynamic damper band and dynamic damper, if equipped.

    CAUTION: Take care not to damage the dynamic damper.

12. Remove the boot bands and outboard boot, then remove the vinyl tape.

13. Inspect the outboard joint for faulty movement and wear. If any roughness or excess play is felt, replace the outboard joint.



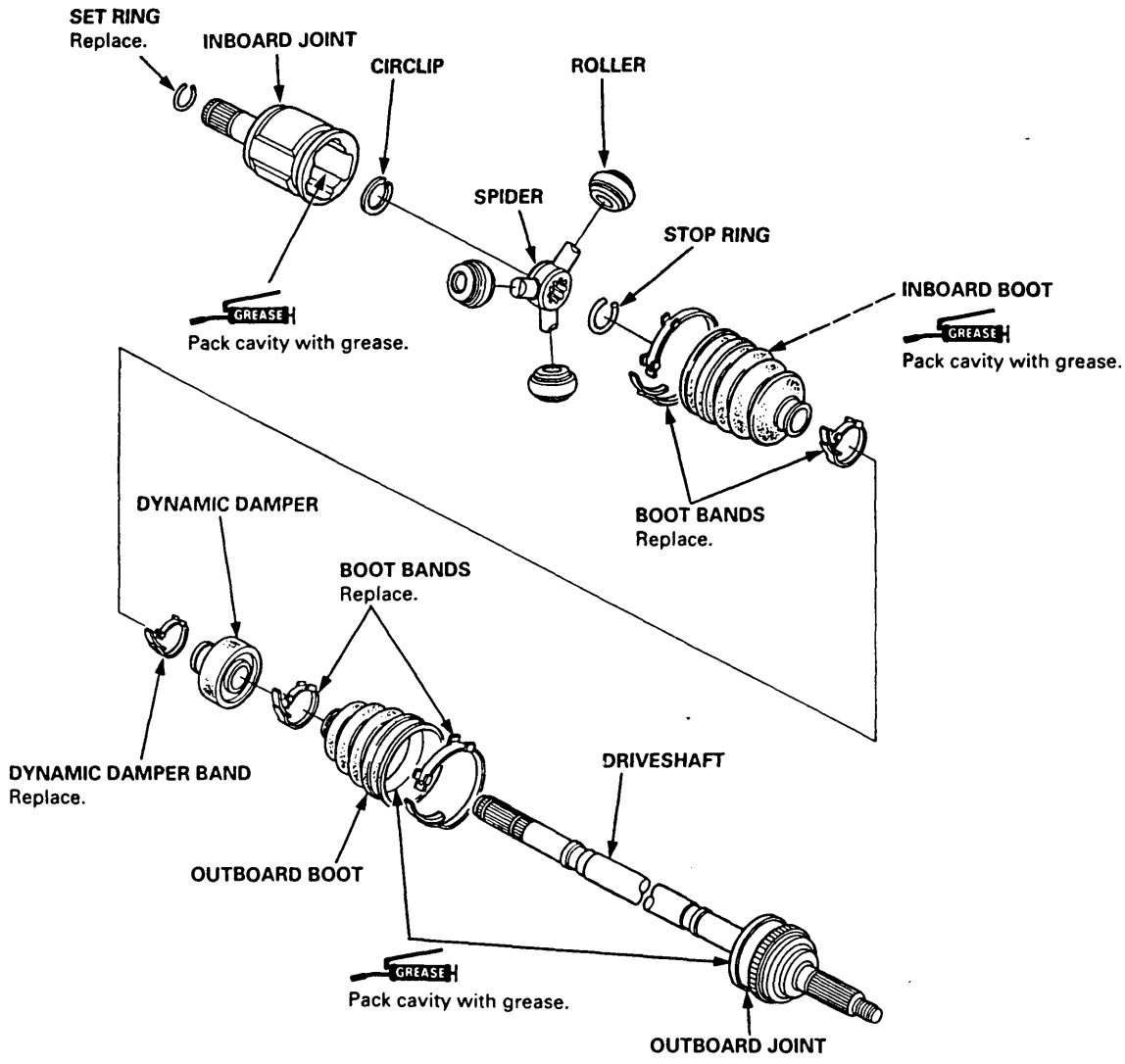
Reassembly

NOTE: Clean the disassembled parts with solvent, and dry them throughly with compressed air. Do not wash the rubber parts with solvent.

GREASE : Thoroughly pack the inboard joint and both joint boots with the joint grease included in the new driveshaft set.

Grease quantity:

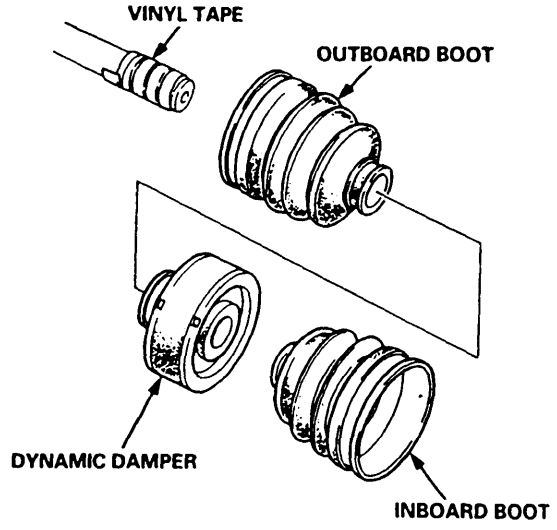
Inboard Joint	120 – 130 g (4.2 – 4.6 oz)
Outboard Joint	115 – 135 g (4.0 – 4.8 oz)



(cont'd)

Reassembly (cont'd)

1. Wrap the splines with vinyl tape to prevent damage to the boots and dynamic damper.

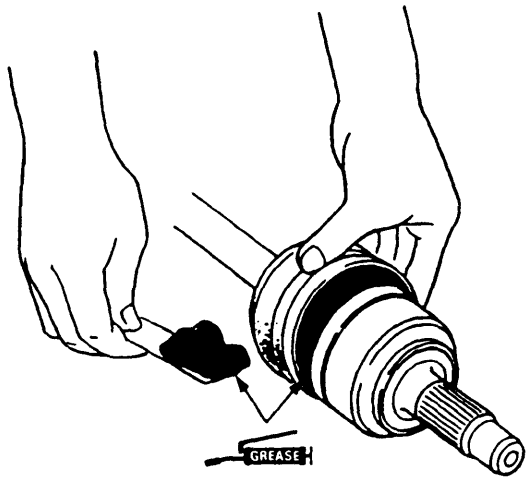


2. Install the outboard boot, dynamic damper and inboard boot to the driveshaft, then remove the vinyl tape.

   CAUTION: Take care not to damage the boots and dynamic damper.

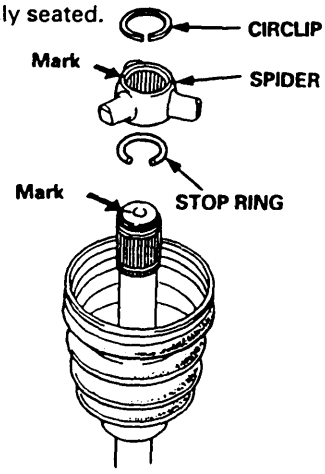
3. Pack the outboard joint with the joint grease included in the new driveshaft set.

   Grease quantity:
   115 – 135 g (4.0 – 4.8 oz)



4. Install the stop ring into the driveshaft groove.

   NOTE: Always rotate the stop ring in its groove to be sure it is fully seated.



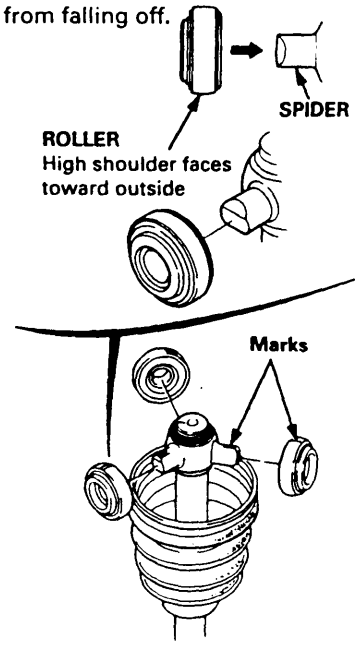
5. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.

6. Fit the circlip into the driveshaft groove.

   NOTE: Always rotate the circlip in its groove to be sure it is fully seated.

7. Fit the rollers to the spider with their high shoulders facing outward.

   NOTE:
   - Reinstall the rollers in their original positions on the spider by aligning the marks.
   - Hold the driveshaft pointed up to prevent the rollers from falling off.

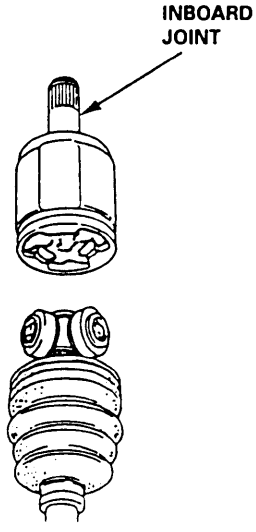


8. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease quantity:
120 – 130 g (4.2 – 4.6 oz)

9. Fit the inboard joint onto the driveshaft.

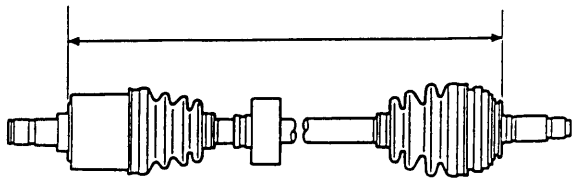
NOTE:
- Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint with the marks on the rollers.
- Hold the driveshaft so the inboard joint points up to prevent it from falling off.



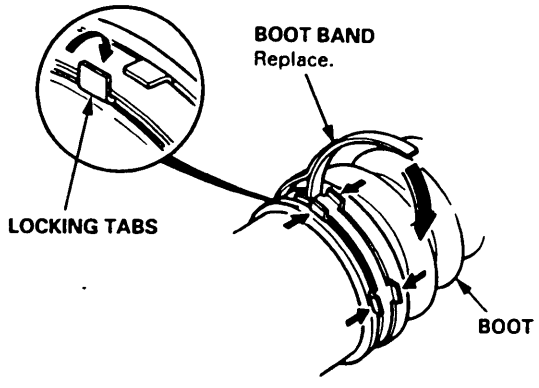
10. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension.

NOTE: The ends of boots seat in the groove of the driveshaft and joint.

Left driveshaft: 773.1 – 778.1 mm (30.44 – 30.63 in)
Right driveshaft: 500.6 – 505.6 mm (19.70 – 19.91 in)



11. Install new boot bands on the boots, and bend both sets of locking tabs.



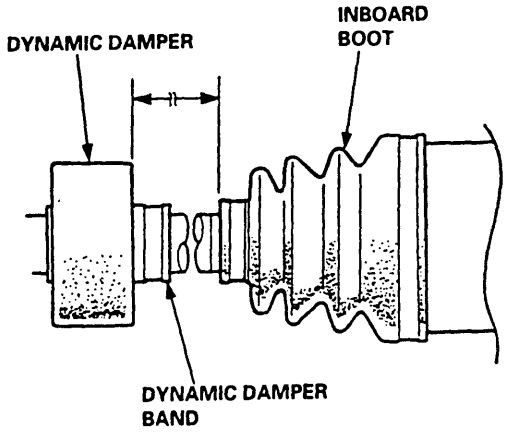
12. Lightly tap on the doubled-over portions to reduce their height.

(cont'd)

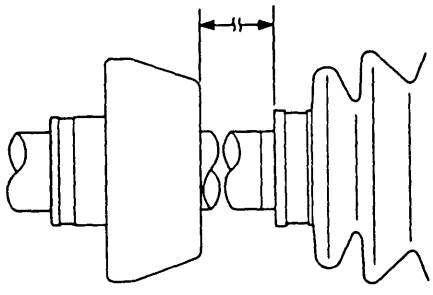
Reassembly (cont'd)

13. Position the dynamic damper as shown below.
    - Install a new dynamic damper band, and bend down both sets of locking tabs.
    - Lightly tap on the doubled-over portion of the band to reduce its height.

Left: 75 ± 2 mm (2.9 ± 0.1 in)

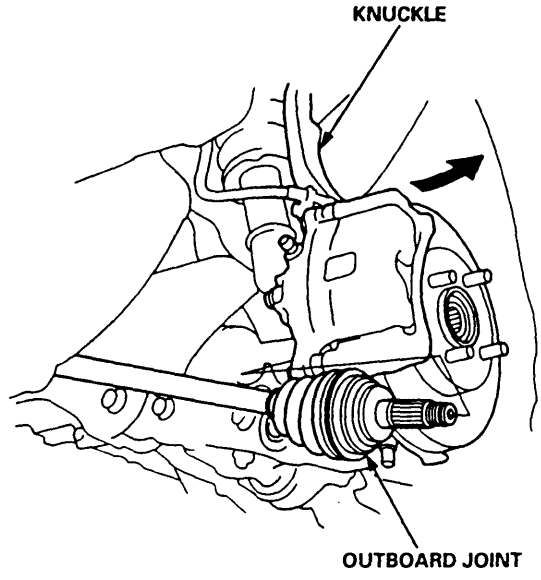


Right: 55 ± 2 mm (2.2 ± 0.1 in)



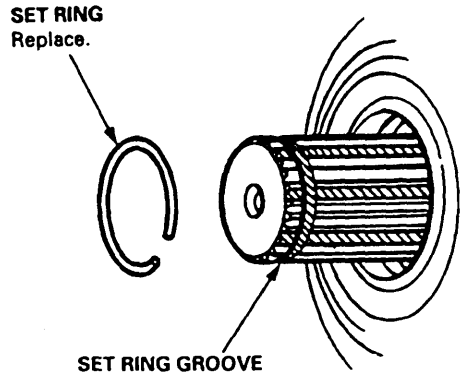
Installation

1. Install the outboard joint into the knuckle.



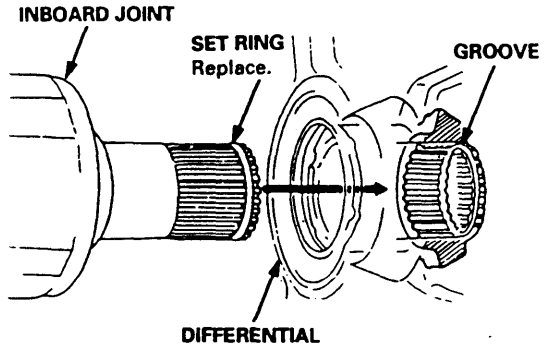
2. Install the new set ring onto the driveshaft groove.

CAUTION: Always use a new set ring whenever the driveshaft is being installed.



3. Insert the inboard end of the driveshaft into the differential until the set ring locks in the groove.

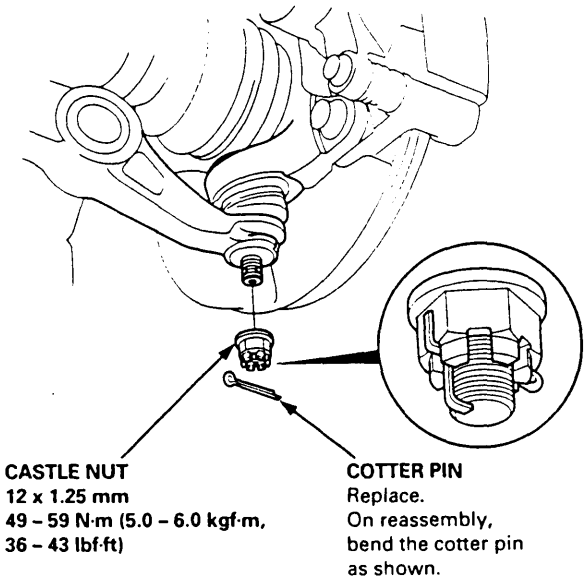
   NOTE: Clean the areas where the driveshaft contact the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air.



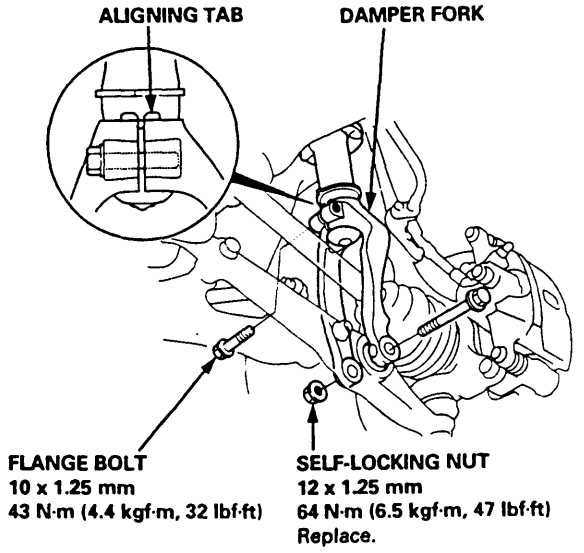
4. Install the knuckle on the lower arm, then tighten the castle nut and install a new cotter pin.

   NOTE: Wipe off the grease before tightening the nut at the ball joint.

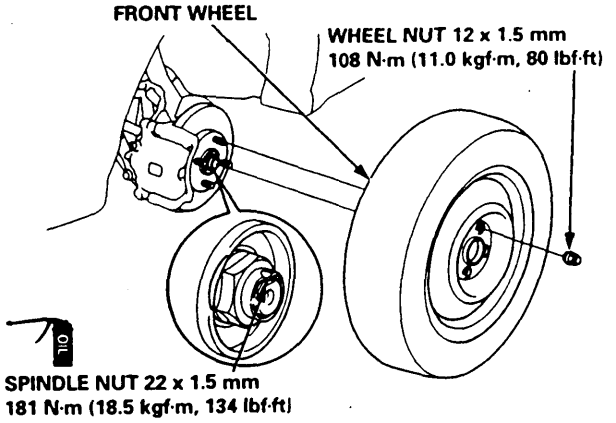
   CAUTION:
   - **Be careful not to damage the ball joint boot.**
   - **Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.**



5. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.



6. Loosely install the flange bolts and the new self-locking nut.
   NOTE: The bolts and nut should be tightened with the vehicle's weight on the damper.
7. Install a new spindle nut, then tighten the nut.



8. Install the front wheel with the wheel nuts.
   NOTE: Before installing the wheel, clean the mating surfaces of the brake disc and the wheel.
9. Tighten the flange bolts and the new self-locking nut with the vehicle's weight on the damper.
10. Refill the transmission with recommended fluid (see section 13 or 14).
11. Check the front wheel alignment and adjust if necessary (see section 18).

Steering

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)
(If the steering wheel and steering column maintenance are required)

The Acura 1.6EL SRS includes a driver's airbag located in the steering wheel hub, and a passenger's airbag located in the dashboard above the glove box. 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 will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

⚠ WARNING

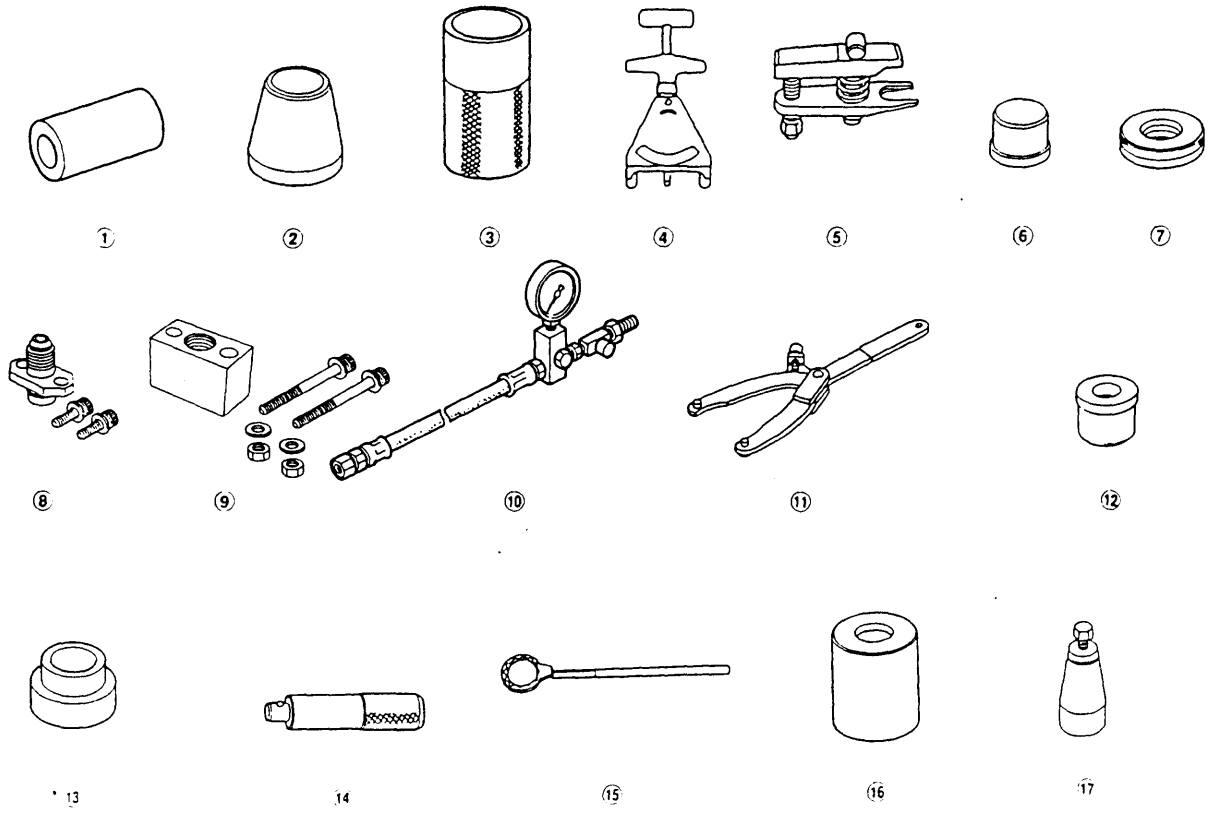
- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional activation of the airbags.**
- **Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

Special Tools

Ref. No	Tool Number	Description	Qty	Page Reference
①	07GAF – PH70100	Pilot Collar	1	17-37
②	07GAG – SD40100 or 07GAG – SD4010A	Piston Seal Ring Guide	1	17-42
③	07GAG – SD40200 or 07GAG – SD4020A	Piston Seal Ring Sizing Tool	1	17-42
④	*07JGG – 001010A	Belt Tension Gauge	1	17-14
⑤	07MAC – SL00200	Ball Joint Remover, 28 mm	1	17-30
⑥	07NAD – SR3020A	Cylinder End Seal Remover Attachment	1	17-34
⑦	07NAG – SR30900 or 07NAG – SR3090A	Piston Seal Ring Sizing Tool	1	17-39
⑧	07RAK – S040110	P/S Joint Adaptor (Pump)	1	17-16
⑨	07RAK – S040120	P/S Joint Adaptor (Hose)	1	17-16
⑩	07406 – 0010001	P/S Pressure Gauge	1	17-16
⑪	07725 – 0030000	Universal Holder	1	17-25, 29
⑫	07746 – 0010100	Attachment, 32 x 35 mm	1	17-40, 41
⑬	07746 – 0030300	Attachment, 30 mm I.D.	1	17-27
⑭	07749 – 0010000	Driver	1	17-40
⑮	07916 – SA50001	Locknut Wrench, 40 mm	1	17-15
⑯	07974 – SA50200 or 07974 – SA5020A	Sleeve Seal Ring Sizing Tool	1	17-40
⑰	07974 – SA50800	Ball Joint Boot Clip Guide	1	17-50, 40

* Included in the Belt Tension Gauge, 07TGG – 001000A.

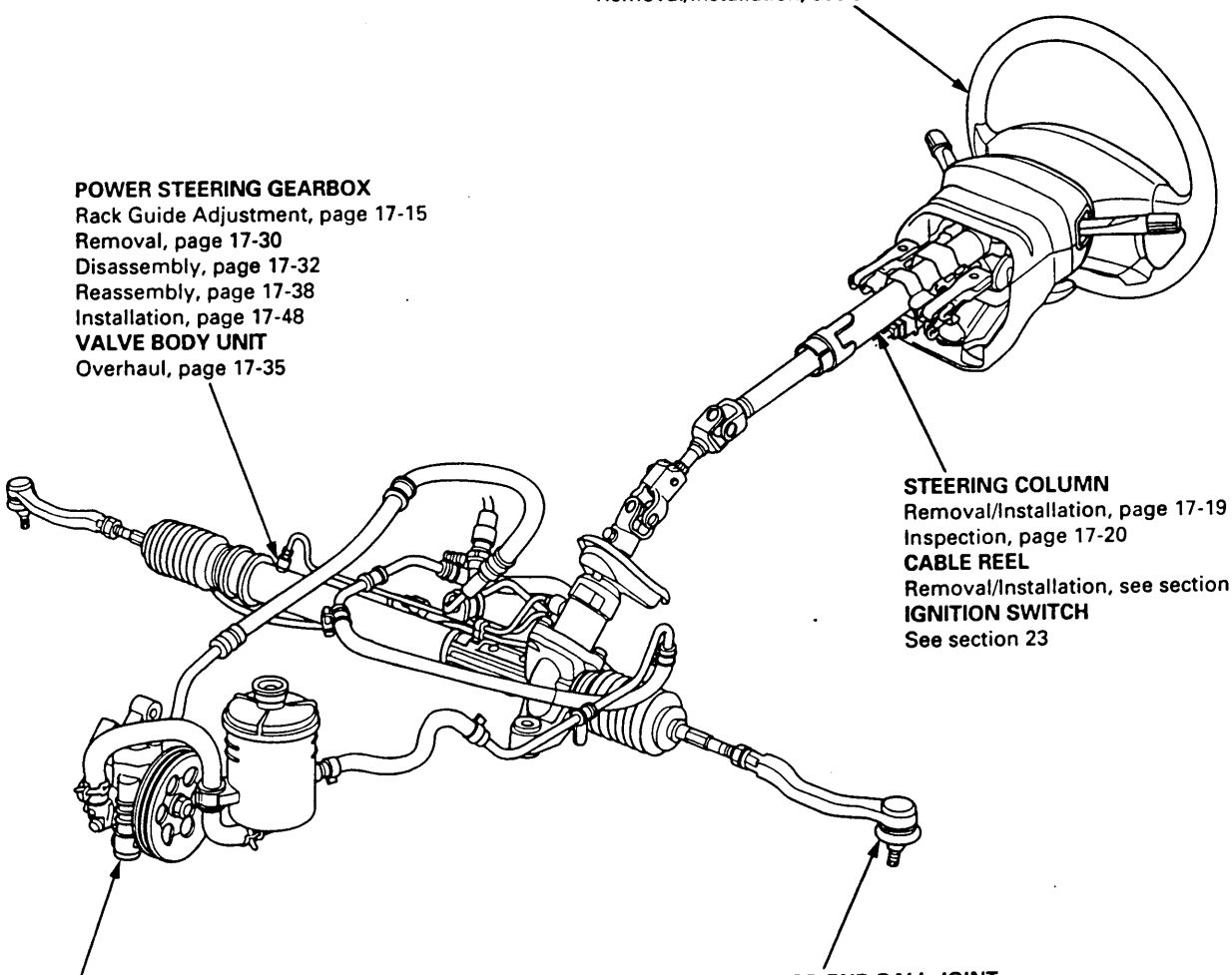


Component Locations

Index

NOTE:
- If an intact airbag assembly has been removed from a scrapped vehicle or has been found defective or damaged during transit, storage or service, it should be deployed (see section 24).
- Before removing the gearbox, remove the driver's airbag assembly and steering wheel.
- After installing the gearbox, check the wheel alignment and adjust if necessary.

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

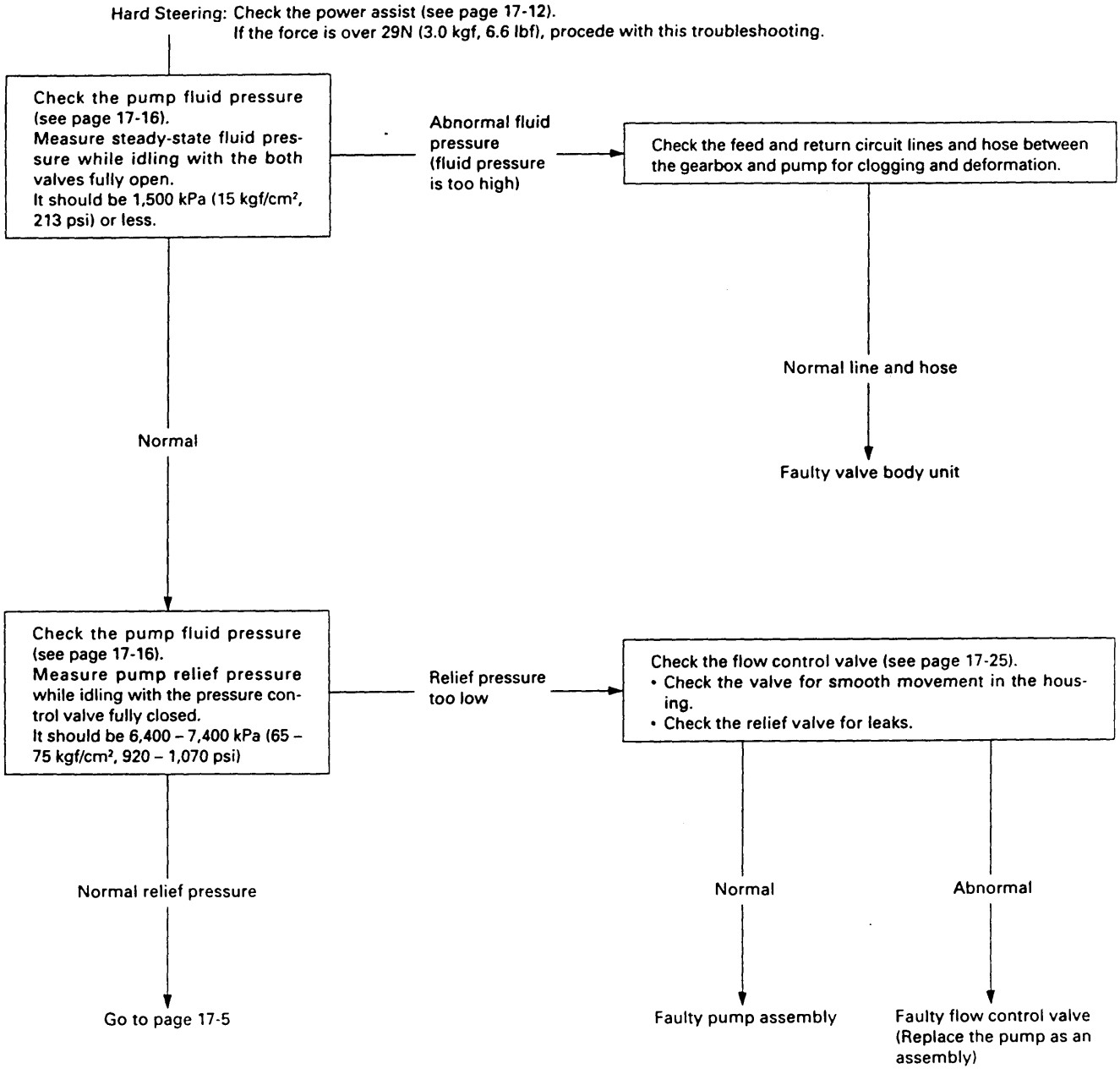


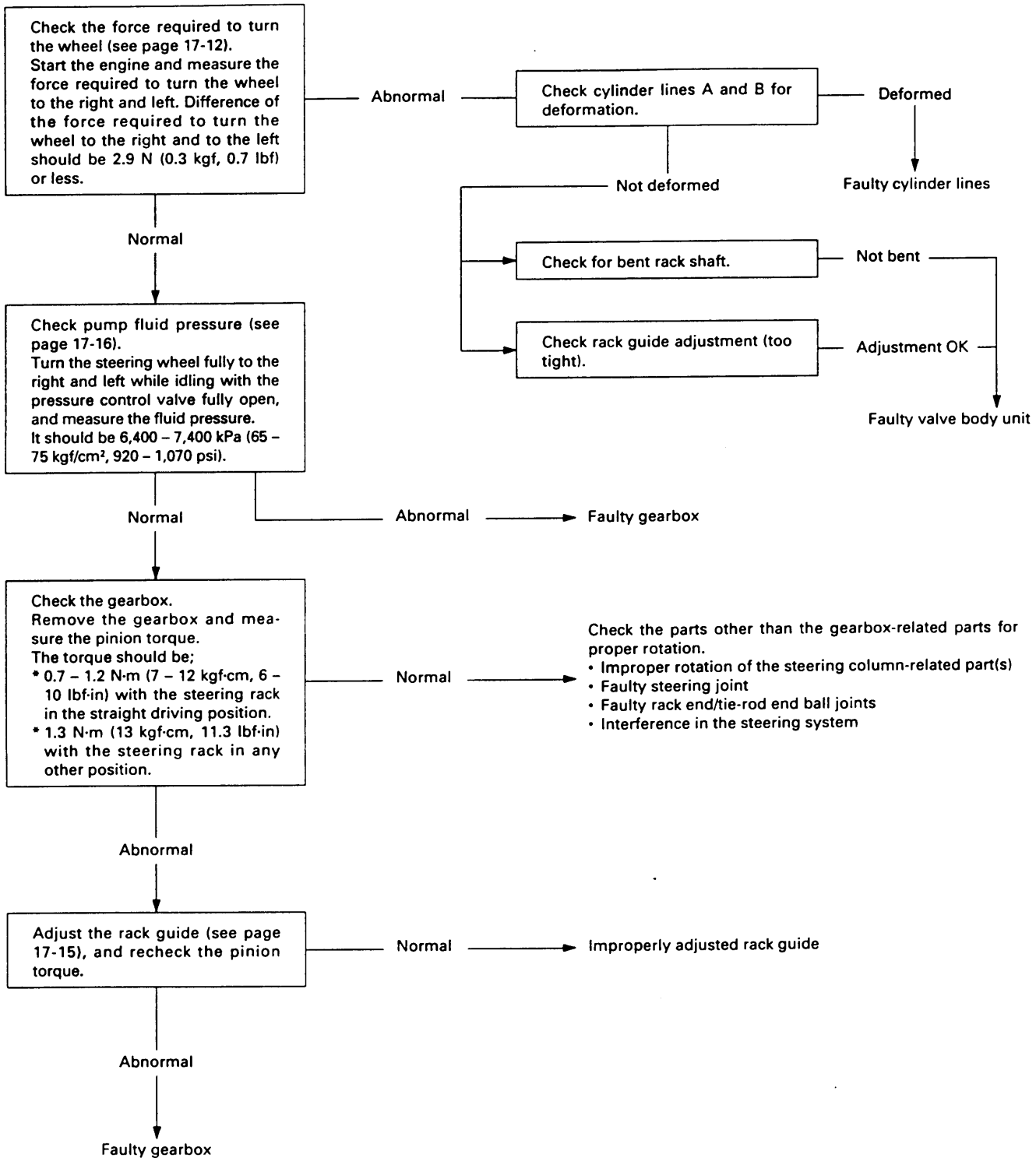
Troubleshooting

General Troubleshooting

Check the following before you begin:

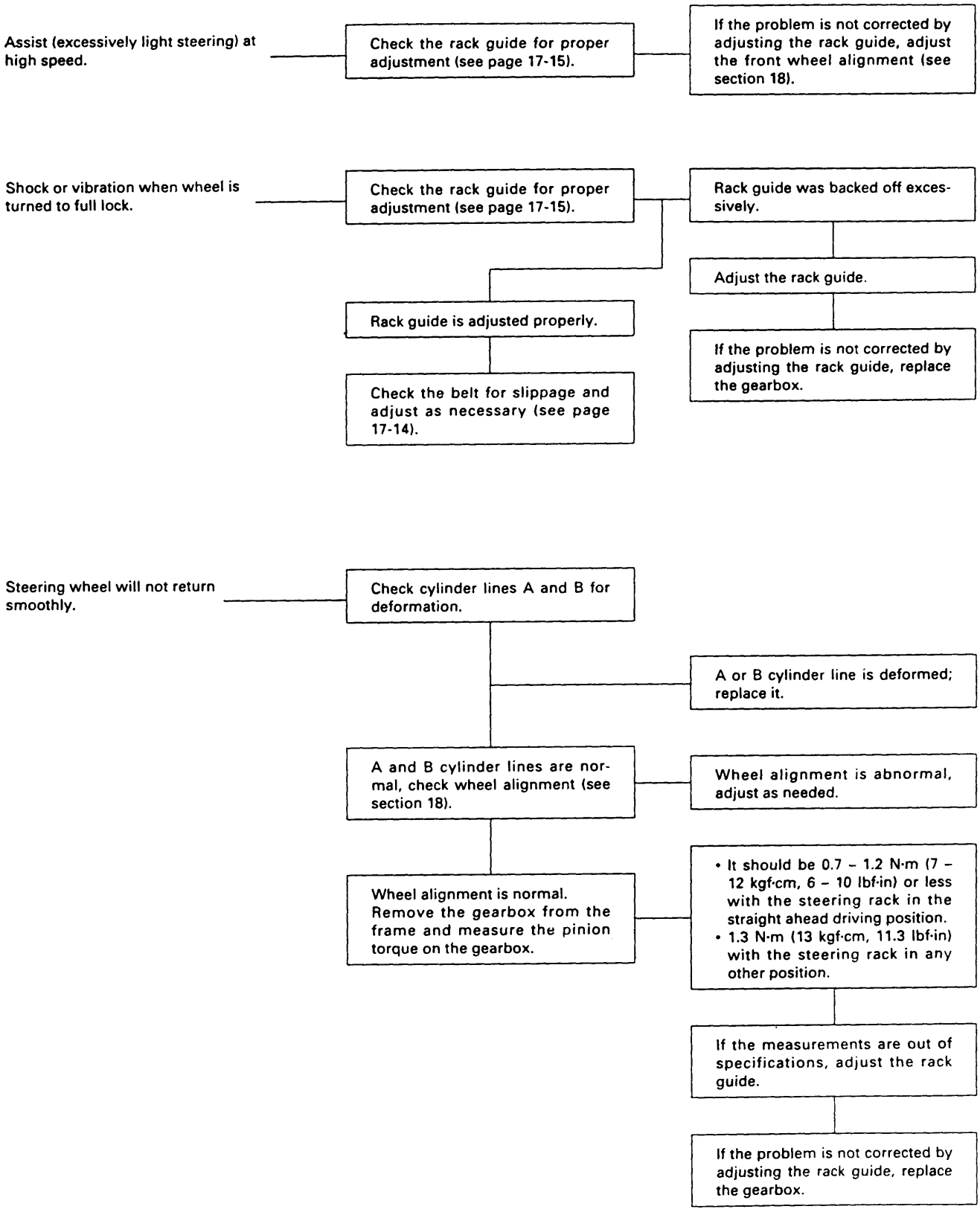
- Has the suspension been modified in a way that would affect steering?
- Are tire sizes, tire variety and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?




Check the force required to turn the wheel (see page 17-12).
Start the engine and measure the force required to turn the wheel to the right and left. Difference of the force required to turn the wheel to the right and to the left should be 2.9 N (0.3 kgf, 0.7 lbf) or less.
Abnormal
Check cylinder lines A and B for deformation.
Deformed
Faulty cylinder lines
Not deformed
Check for bent rack shaft.
Not bent
Check rack guide adjustment (too tight).
Adjustment OK
Faulty valve body unit
Normal
Check pump fluid pressure (see page 17-16).
Turn the steering wheel fully to the right and left while idling with the pressure control valve fully open, and measure the fluid pressure.
It should be 6,400 – 7,400 kPa (65 – 75 kgf/cm², 920 – 1,070 psi).
Normal
Abnormal
Faulty gearbox
Check the gearbox.
Remove the gearbox and measure the pinion torque.
The torque should be;
* 0.7 – 1.2 N·m (7 – 12 kgf·cm, 6 – 10 lbf·in) with the steering rack in the straight driving position.
* 1.3 N·m (13 kgf·cm, 11.3 lbf·in) with the steering rack in any other position.
Normal
Check the parts other than the gearbox-related parts for proper rotation.
• Improper rotation of the steering column-related part(s)
• Faulty steering joint
• Faulty rack end/tie-rod end ball joints
• Interference in the steering system
Abnormal
Adjust the rack guide (see page 17-15), and recheck the pinion torque.
Normal
Improperly adjusted rack guide
Abnormal
Faulty gearbox

(cont'd)

General Troubleshooting (cont'd)



Uneven or rough steering.

- Improperly adjusted rack guide.
  - Adjust the rack guide (see page 17-15).
    - If the problem is not corrected by adjusting the rack guide, replace the gearbox.
- Belt slipping on pulley.
  - Adjust the belt tension. Replace the belt, if necessary (see page 17-14).
- Idle speed low or erratic.
  - If the engine stalls when the wheel is turned while the vehicle is stopped or moving at low speed, adjust the idle speed (see section 11).
- Air in reservoir, or check power steering fluid level.
  - Check power steering fluid level. If the level is excessively low, check for leaks in the system. Add fluid to the specified level.
    - If fluid level is OK, check O-rings and seals on both ends of the pump inlet hose, and the P/S pump housing mating surfaces and the pump shaft oil seal for suction leaks. Replace parts as necessary.

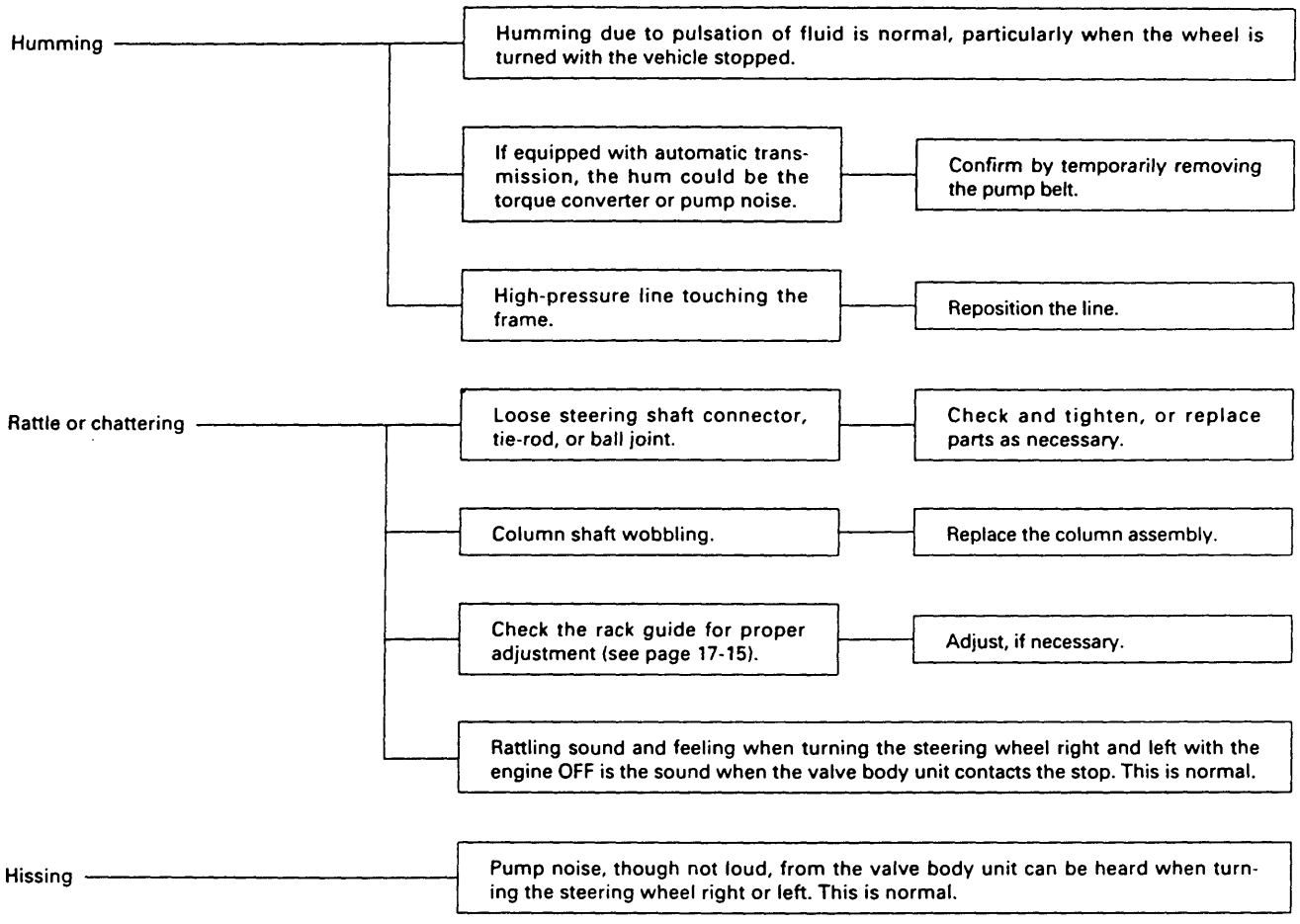
Steering wheel kicks back during wide turns.

- Pump belt slipping on pulley (pump stops momentarily).
  - Adjust the belt tension (see page 17-14) or replace belt.
- Install the power steering pressure gauge. Close the pressure control valve fully and measure the pump pressure (see page 17-16).
  - Check if pump pressure is normal and the gauge needle travel is 500 kPa (5 kgf/cm², 71 psi) or less. Check the flow control valve if the needle travel exceeds 500 kPa (5 kgf/cm², 71 psi). If the flow control valve is normal, replace the pump as an assembly.

Troubleshooting

Noise and Vibration

NOTE: Pump noise in first 2 – 3 minutes after starting in cold weather is normal.



CAUTION: When inspecting, do not hold the steering wheel all the way to the right or the left.

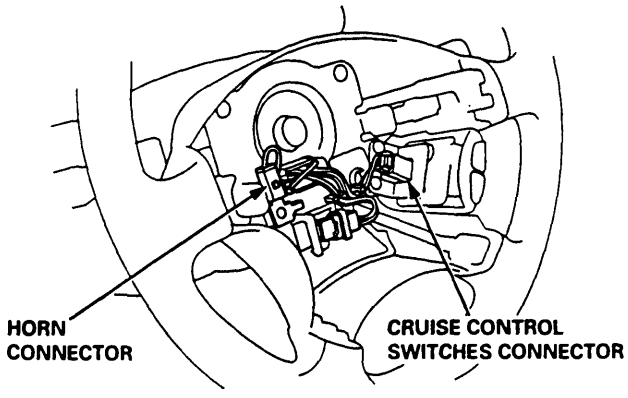
Steering Wheel

Removal

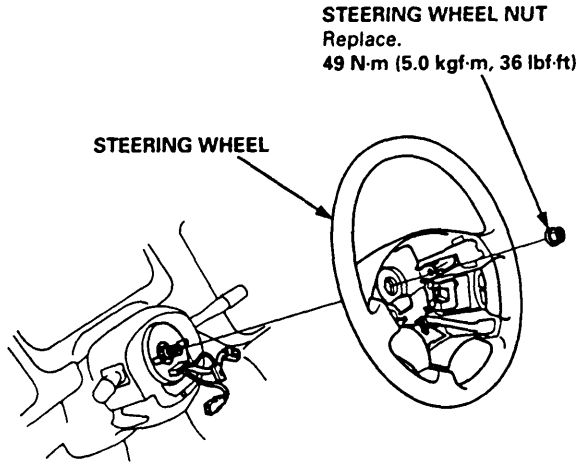
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

NOTE: Before removing the steering wheel, align the front wheels straight ahead.

1. Remove the driver's airbag assembly from the steering wheel (see section 24).
2. Disconnect the horn connector and cruise control switches connector.



3. Remove the steering wheel nut.



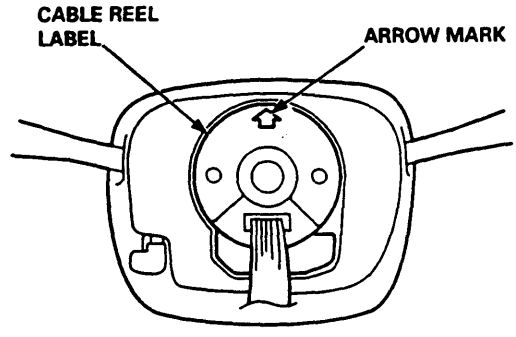
4. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.

Installation

CAUTION: Do not tap on the steering wheel or steering column shaft when installing the steering wheel.

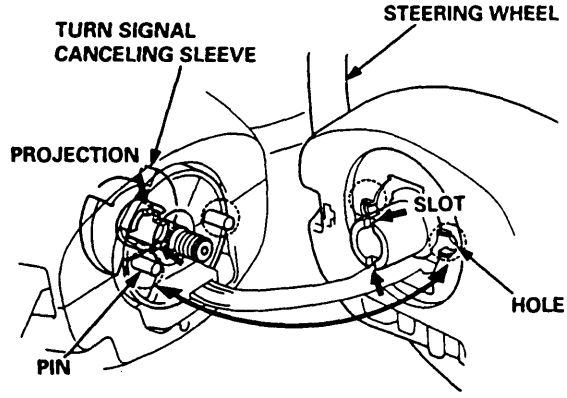
NOTE: Before installing the steering wheel, align the front wheels straight ahead.

1. Before installing the steering wheel, center the cable reel. Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise approximately two turns. The arrow mark on the cable reel label should point straight up.



2. Install the steering wheel with the steering wheel nut.

   NOTE: Be sure the steering wheel shaft engages the cable reel and canceling sleeve.

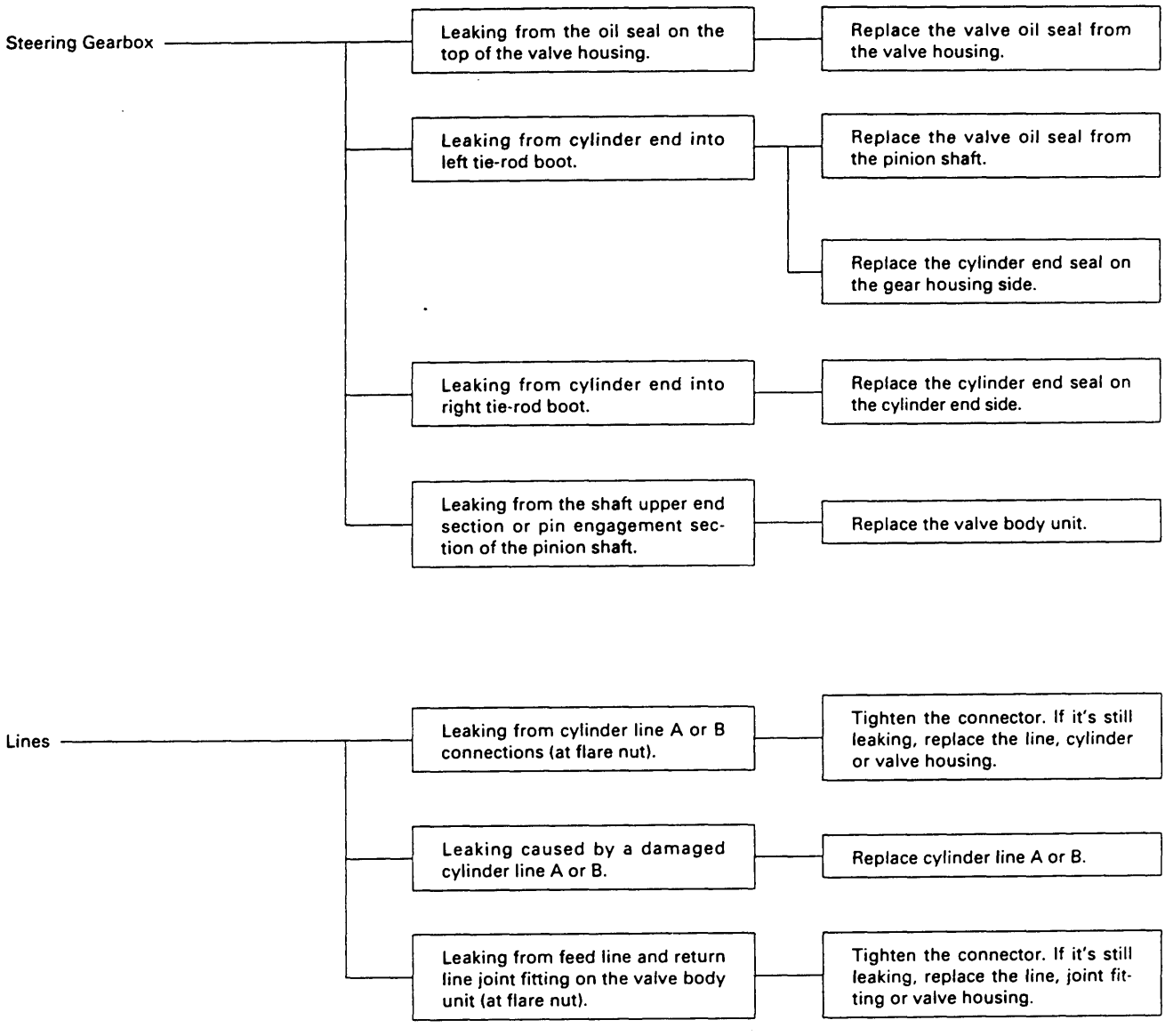


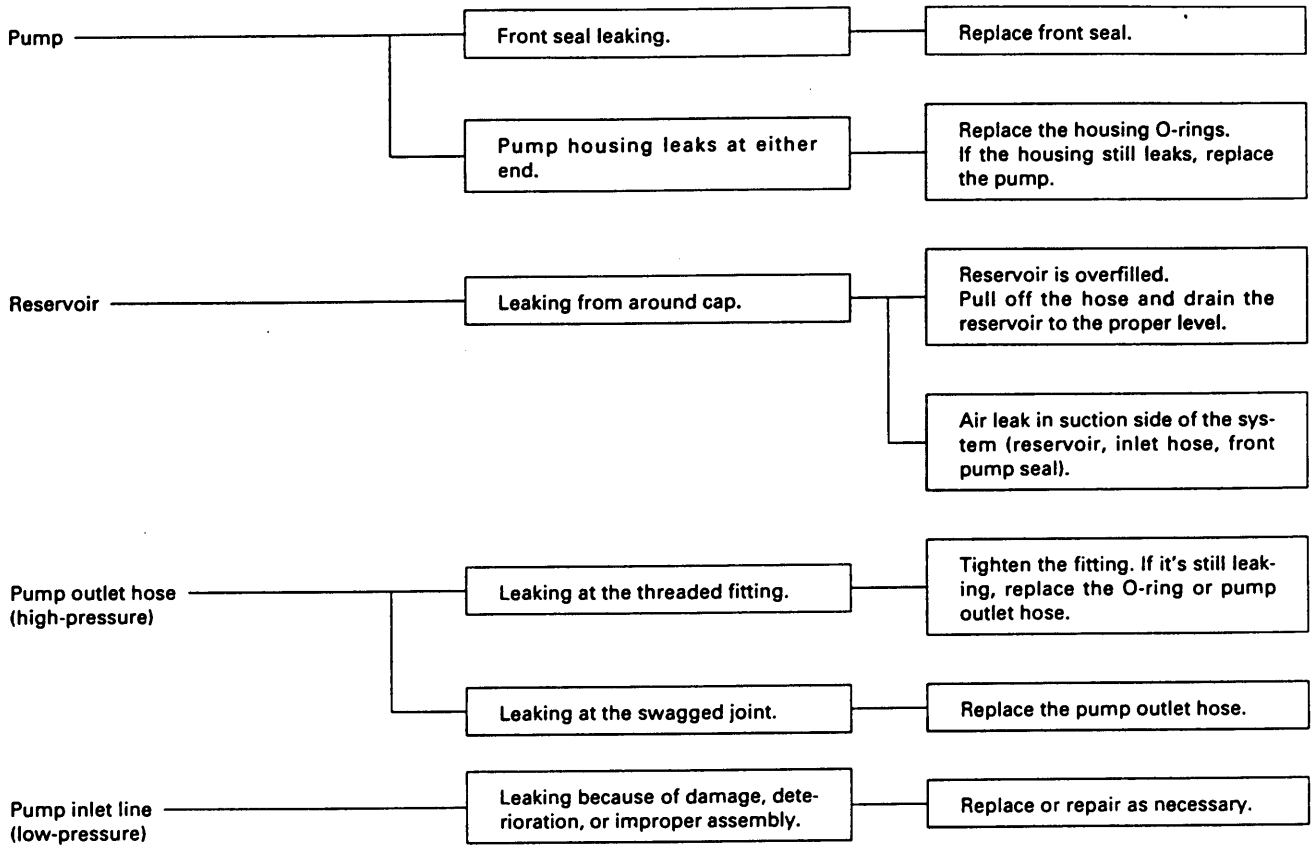
3. Attach the cruise control switches connector to the steering wheel clip.
4. Connect the horn connector.
5. Install the driver's airbag assembly, and confirm proper system operation (see section 24).
6. Check the horn and cruise control switches for proper operations.

Troubleshooting

Fluid Leaks

Check the gearbox assembly for oil leaks carefully. Oil can leak out of various points, depending on location of the faulty oil seals/seal rings. Check the following before removing the gearbox from the frame.



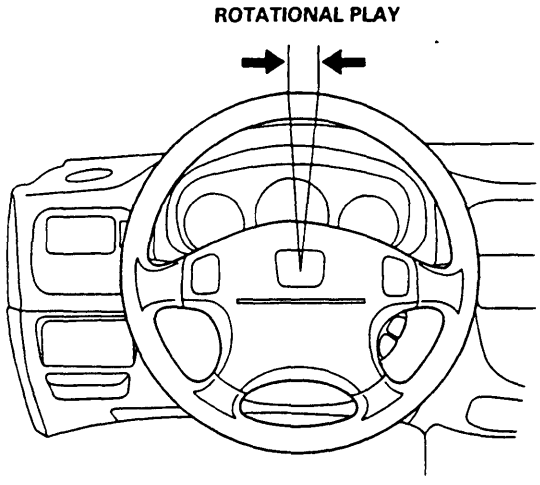

Pump
Front seal leaking.
Replace front seal.
Pump housing leaks at either end.
Replace the housing O-rings. If the housing still leaks, replace the pump.
Reservoir
Leaking from around cap.
Reservoir is overfilled. Pull off the hose and drain the reservoir to the proper level.
Air leak in suction side of the system (reservoir, inlet hose, front pump seal).
Pump outlet hose (high-pressure)
Leaking at the threaded fitting.
Tighten the fitting. If it's still leaking, replace the O-ring or pump outlet hose.
Leaking at the swagged joint.
Replace the pump outlet hose.
Pump inlet line (low-pressure)
Leaking because of damage, deterioration, or improper assembly.
Replace or repair as necessary.

Steering Operation

Place the front wheels in the straight ahead position, and measure the distance the steering wheel can be turned without moving the front wheels.

ROTATIONAL PLAY: 0 – 10 mm (0 – 0.39 in)

If the play exceeds the service limit, perform rack guide adjustment (see page 17-15).
If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox as described on the next page.

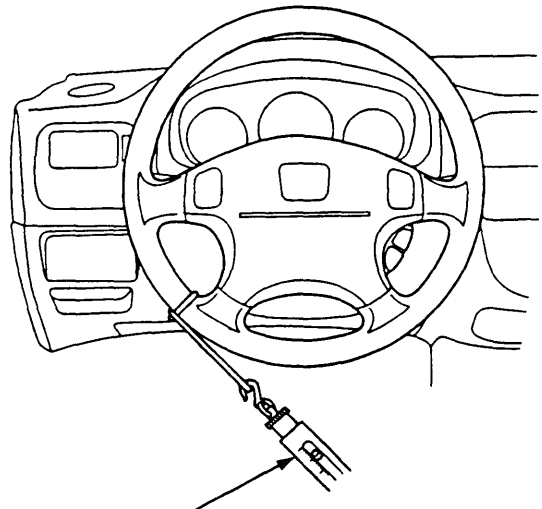


Power Assist Check with Vehicle Parked

1. Check the power steering fluid level (see page 17-15) and pump belt tension (see page 17-14).

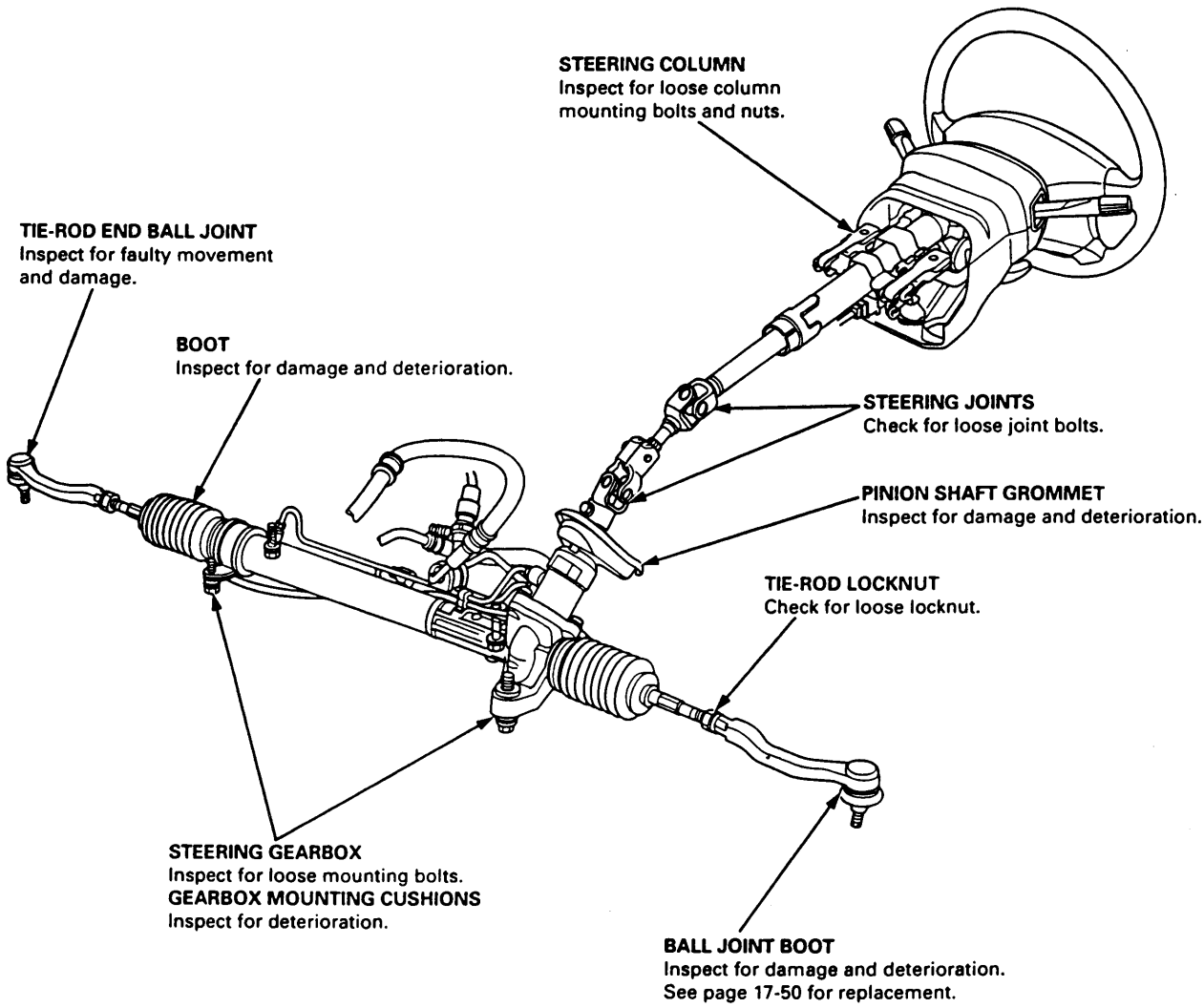
2. Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.

3. Attach a 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.



4. The scale should read no more than 29 N (3.0 kgf, 6.6 lbf). If it reads more, check the gearbox and pump.

Steering Linkage and Gearbox



Pump Belt

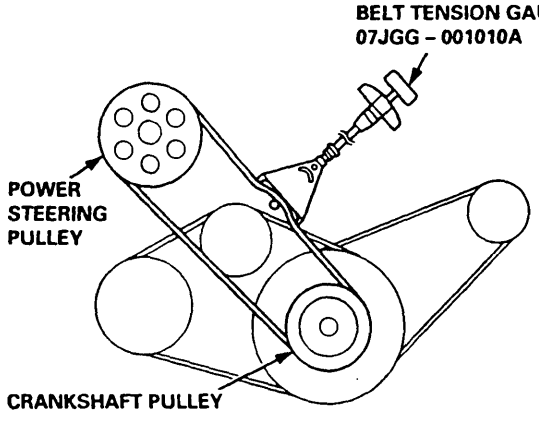
NOTE: When using a new belt, first adjust the deflection or tension to the values for the new belt, then readjust the deflection or tension to the values for the used belt after running engine for five minutes.

Inspection

Attach the special tool to the belt and measure the tension of the belt.

Tension:
Used Belt: 340 – 490 N (35 – 50 kgf, 77 – 110 lbf)
New Belt: 640 – 780 N (65 – 80 kgf, 143 – 176 lbf)
NOTE:

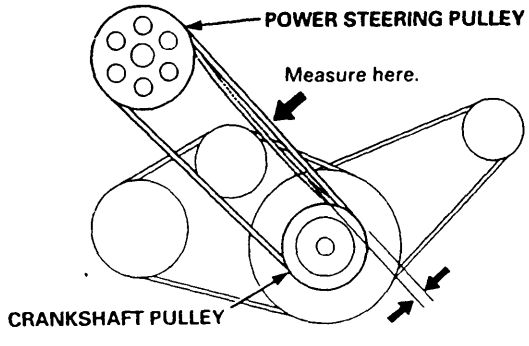
- If there are cracks or any damage evident on the belt, replace it with a new one.
- Follow the manufacturer's instructions for the tension gauge.



Inspect the pump belt for cracks or any damage. Replace the belt with a new one if necessary.

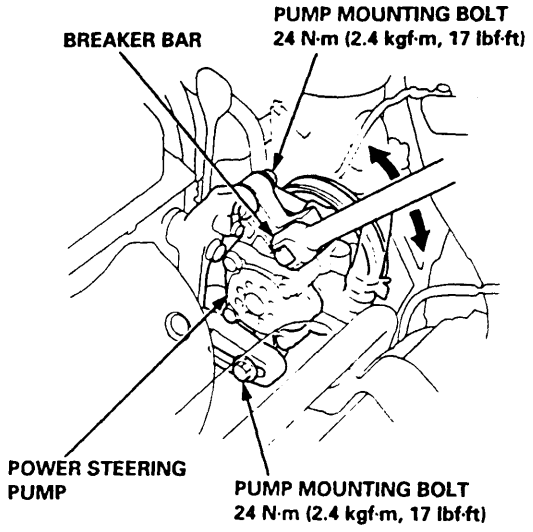
Measurement without Belt Tension Gauge:
Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the power steering pump and the crankshaft pulleys.

Deflection:
Used Belt: 10.5 – 14.0 mm (0.41 – 0.55 in)
New Belt: 7.5 – 10.0 mm (0.30 – 0.39 in)



Adjustment

1. Loosen the power steering pump mounting bolts.



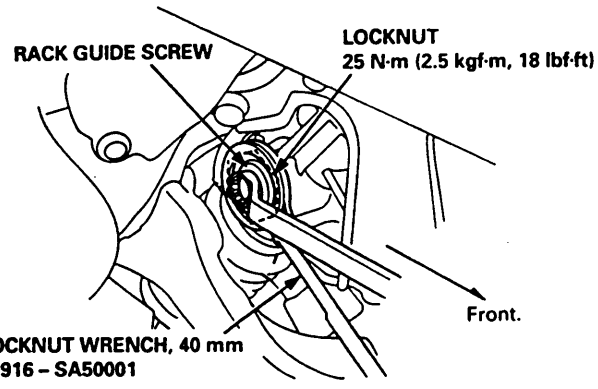
2. Adjust the belt tension by moving the power steering pump with a 1/2" drive breaker bar to obtain the proper belt tension, then retighten the mounting bolts.

3. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the deflection of the belt.

Rack Guide Adjustment

NOTE: Perform the rack guide adjustment with the wheels in the straight ahead position.

1. Loosen the rack guide screw locknut with the special tool, then loosen the rack guide screw.



2. Tighten the rack guide screw to 25 N·m (2.5 kgf·m, 18 lbf·ft), then loosen it.
3. Retighten the rack guide screw to 3.9 N·m (0.4 kgf·m, 2.9 lbf·ft), then back it off to specified angle.

   Specified Return Angle: 20° max.
4. Tighten the locknut while holding the rack guide screw.
5. Check for tight or loose steering through the complete turning travel.
6. Perform following inspections:
   - Steering operation (see page 17-12).
   - Power assist with vehicle parked.

Fluid Replacement

Check the reservoir at regular intervals, and add fluid as necessary.

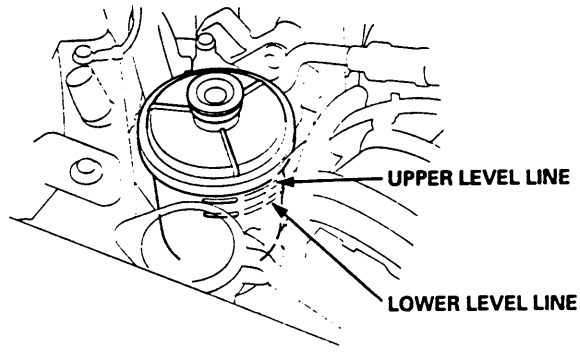
CAUTION: Always use Genuine HONDA Power Steering Fluid-V or S. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

SYSTEM CAPACITY:

0.85 liter (0.90 US. qt, 0.75 Imp.qt) at disassembly

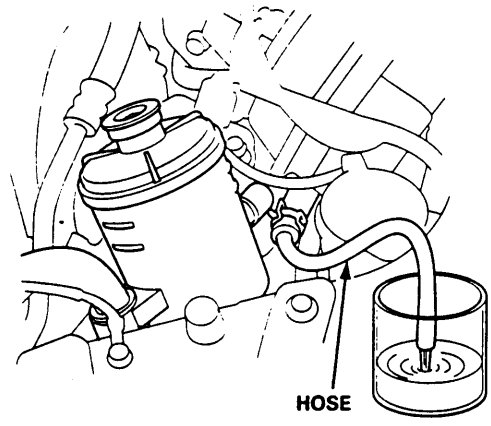
RESERVOIR CAPACITY:

0.4 liter (0.42 US. qt, 0.35 Imp.qt)



1. Raise the reservoir, then disconnect the return hose.
2. Connect a hose of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.

   CAUTION: Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.



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. Refit the return hose on the reservoir.
5. Fill the reservoir to the upper level line.
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 some if necessary.

   CAUTION: Do not fill the reservoir beyond the upper level line.

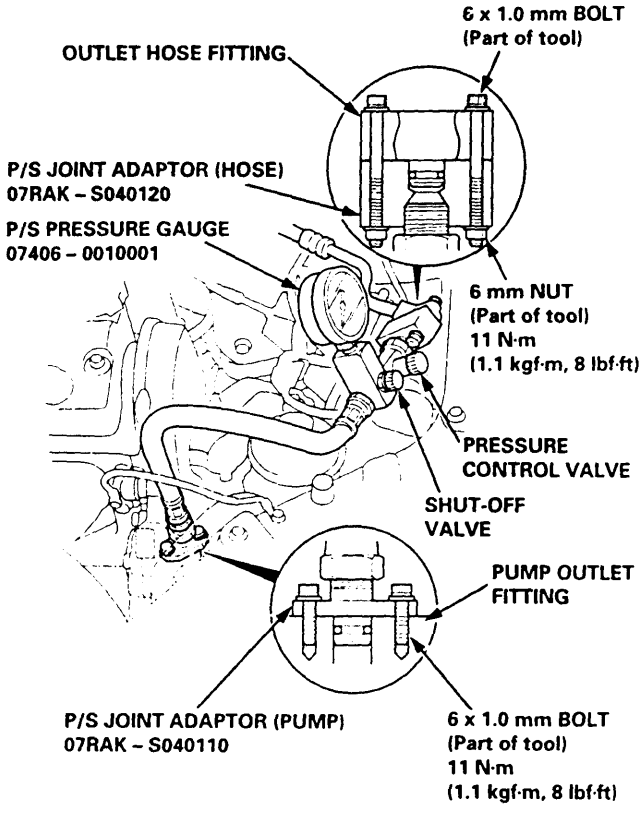
Pump Pressure Check

Check the fluid pressure as follows to determine whether the trouble is in the pump or gearbox.

NOTE: First check the power steering fluid level and pump belt tension.

CAUTION: Disconnect the high pressure hose with care so as not to spill the power steering fluid on the frame and other parts.

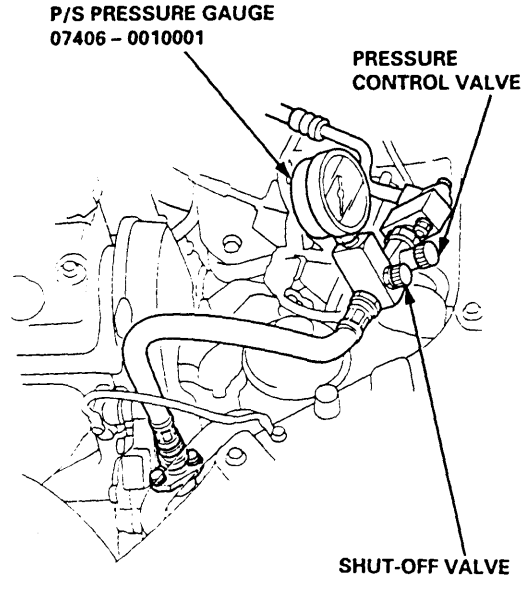
1. Disconnect the pump outlet from the pump outlet fitting, then install the P/S joint adaptor (pump) on the pump outlet.
2. Connect the P/S joint adaptor (hose) to the power steering pressure gauge, then connect the outlet hose to the adaptor.
3. Install the power steering pressure gauge to the P/S joint adaptor (pump) as shown.



4. Open the shut-off valve fully.
5. Open the pressure control valve 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.
8. Measure steady-state fluid pressure while idling. If the pump is in good condition, the gauge should read less than 1500 kPa (15 kgf/cm², 213 psi).
   If it reads high, check the outlet hose or valve body unit (see General Troubleshooting 17-4).
9. Close the pressure control valve, then close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.
10. Immediately open the pressure control valve fully.

    CAUTION: Do not keep the pressure control valve closed more then 5 seconds or the pump could be damaged by over-heating.

    If the pump is in good condition, the gauge should read at least 6,400 - 7,400 kPa (65 - 75 kgf/cm², 920 - 1,070 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.



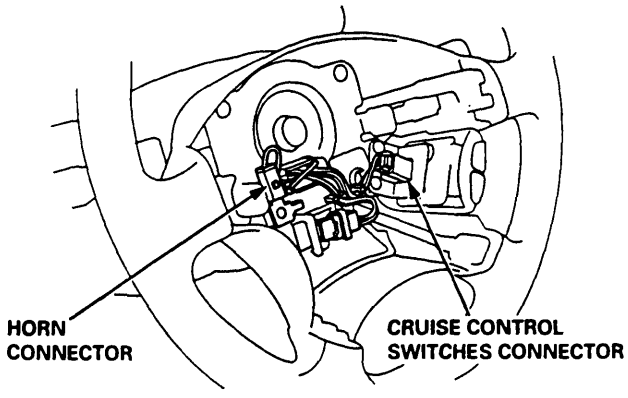
Steering Wheel

Removal

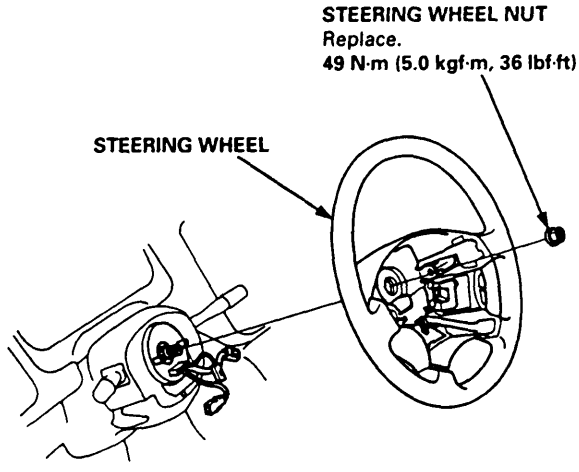
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

NOTE: Before removing the steering wheel, align the front wheels straight ahead.

1. Remove the driver's airbag assembly from the steering wheel (see section 24).
2. Disconnect the horn connector and cruise control switches connector.



3. Remove the steering wheel nut.



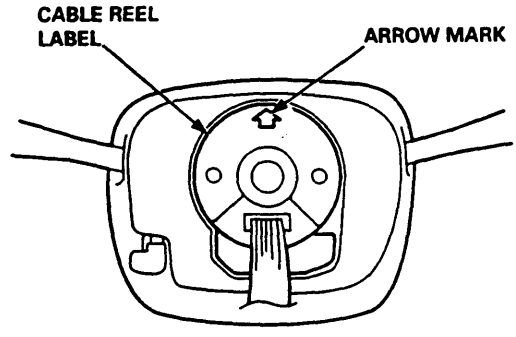
4. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.

Installation

CAUTION: Do not tap on the steering wheel or steering column shaft when installing the steering wheel.

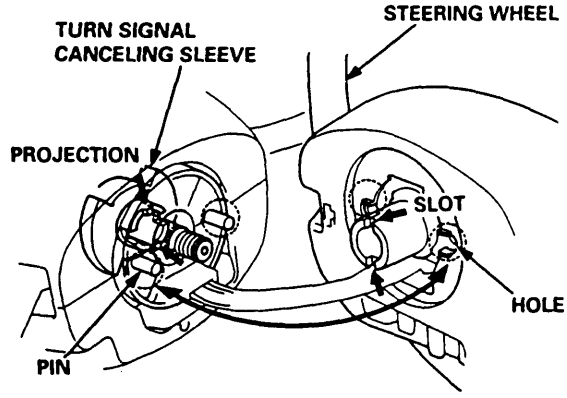
NOTE: Before installing the steering wheel, align the front wheels straight ahead.

1. Before installing the steering wheel, center the cable reel. Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise approximately two turns. The arrow mark on the cable reel label should point straight up.



2. Install the steering wheel with the steering wheel nut.

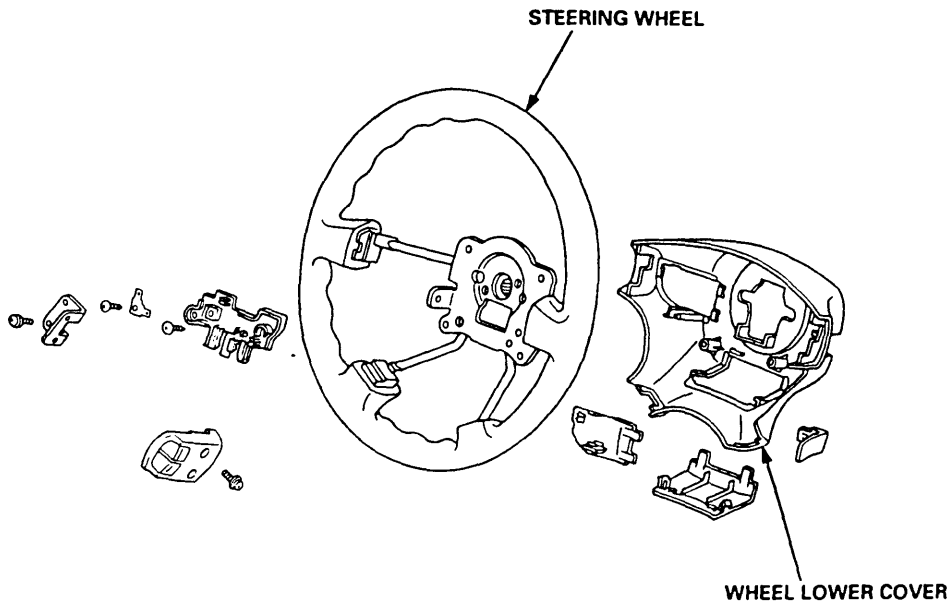
   NOTE: Be sure the steering wheel shaft engages the cable reel and canceling sleeve.



3. Attach the cruise control switches connector to the steering wheel clip.
4. Connect the horn connector.
5. Install the driver's airbag assembly, and confirm proper system operation (see section 24).
6. Check the horn and cruise control switches for proper operations.

Steering Wheel

Disassembly/Reassembly



Steering Column

Removal/Installation

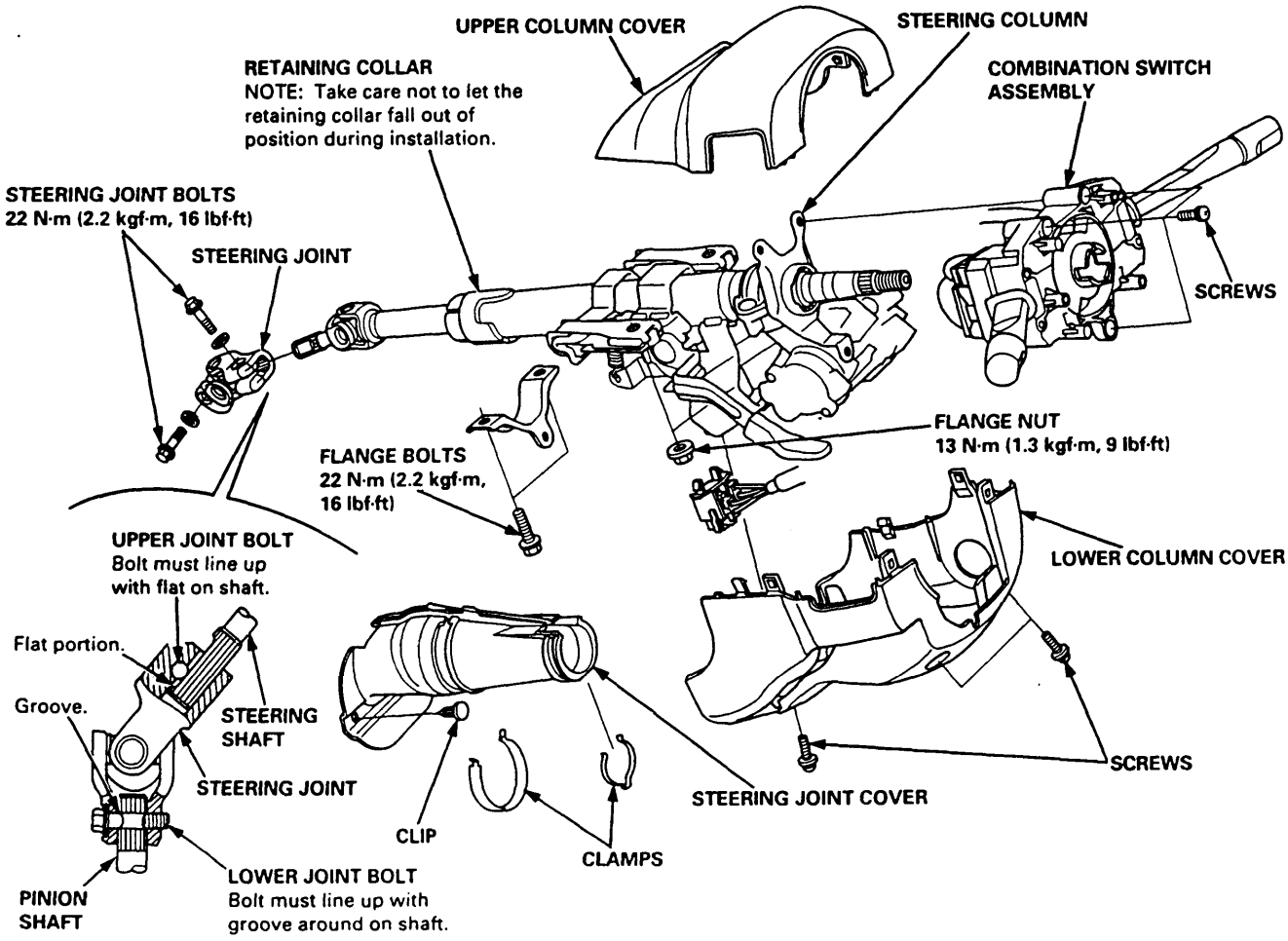
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

NOTE: Before removing the steering column for SRS, remove the driver's airbag assembly and cable reel (see section 24).

1. Remove the steering wheel (see page 17-17).
2. Remove the driver's dashboard lower cover and driver's knee bolster (see section 20).
3. Remove the combination switch assembly from the steering column shaft by disconnecting the connectors.
4. Disconnect the ignition switch connectors.
5. Remove the steering joint cover.
6. Remove the steering joint bolts.
7. Disconnect the steering joint by moving the joint toward the column, and remove it from the column shaft.
8. Remove the steering column by removing the attaching nuts and bolt.
9. Installation is the reverse of the removal procedure.

NOTE:

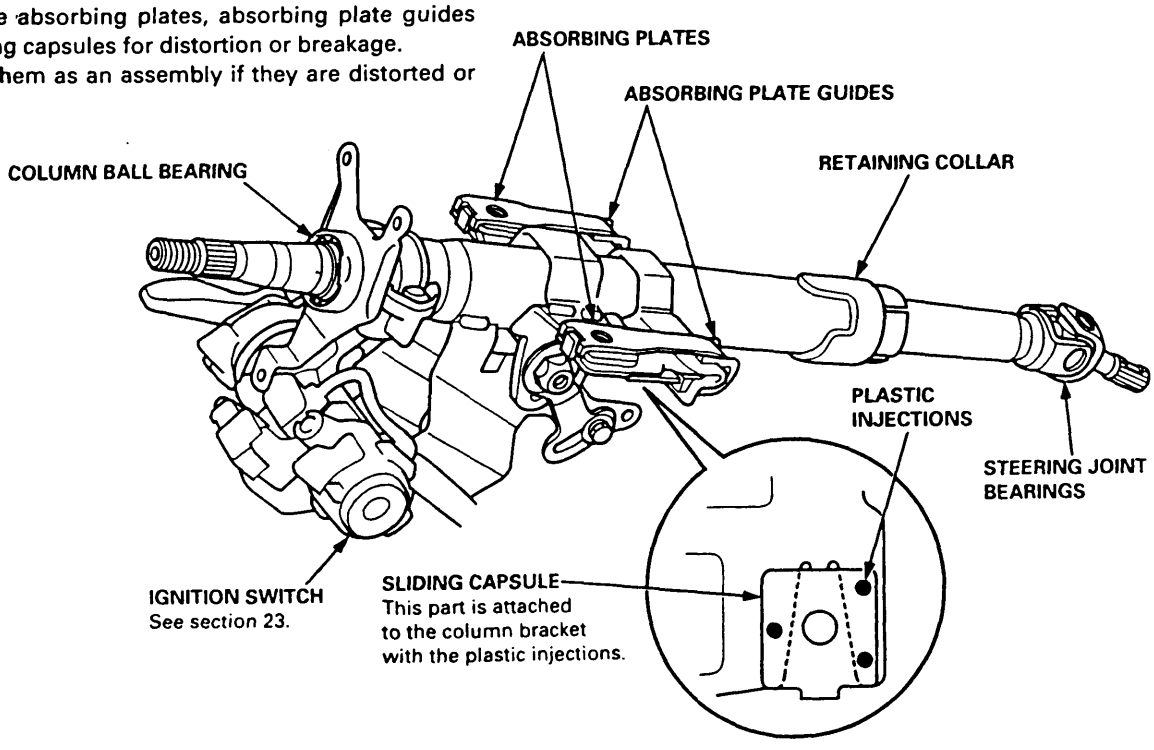
- Make sure the steering joint is connected as follows:
  a. Insert the upper end of the steering joint onto the steering shaft (line up the bolt hole with the flat on the shaft), and loosely install the upper joint bolt.
  b. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove 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.
  c. Pull on the steering joint to make sure that the steering joint is fully seated. Then tighten the joint bolts.
- Be sure the wires are not caught or pinched by any parts when installing the column.
- Make sure the wire harness is routed and fastened properly.
- Make sure the connectors are properly connected.



Steering Column

Inspection

- Check the steering column ball bearing and the steering joint bearings for play and proper movement. If there is noise or if there is excessive play, replace the steering column as an assembly.
- Check the retaining collar for damage. If it is damaged, replace the steering column as an assembly.
- Check the absorbing plates, absorbing plate guides and sliding capsules for distortion or breakage. Replace them as an assembly if they are distorted or broken.



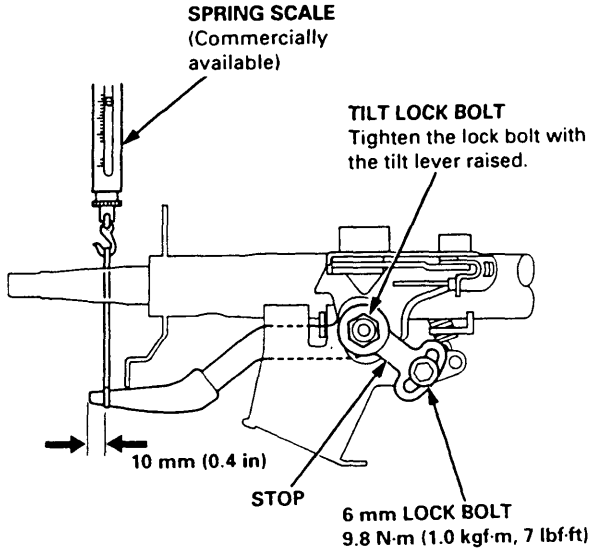
1. Move the tilt lever from the loose position to the lock position 3 to 5 times; then measure the tilt lever preload 10 mm (0.4 in) from the end of the tilt lever.

   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.

   a. Loosen the tilt lever, and set the steering column in the neutral position.
   b. Remove the 6 mm lock bolt and remove the stop.
   c. Adjust the preload by turning the tilt lock bolt left or right.
   d. 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 "a" through "c" to adjust.

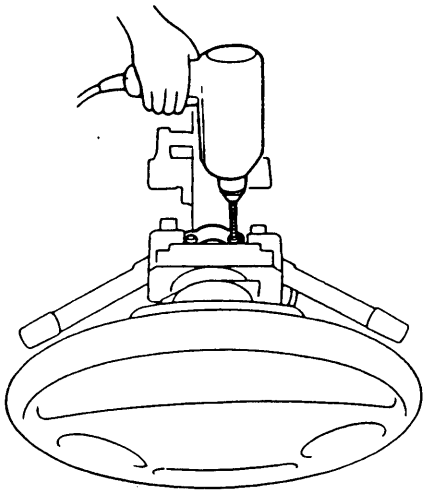
   CAUTION: Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.



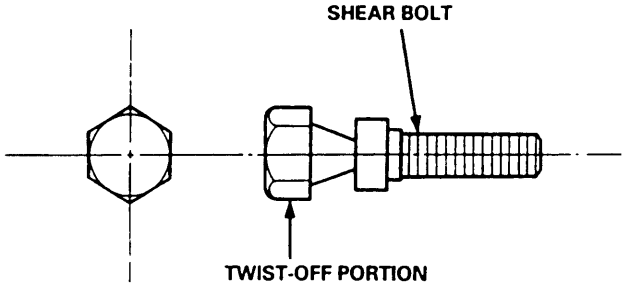
Steering Lock Replacement

1. Remove the steering column (see page 17-19).
2. Center punch each of the two shear bolts, and drill their heads off with a 5 mm (3/16 in) drill bit.

   CAUTION: Do not 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 until the hex heads twist off.

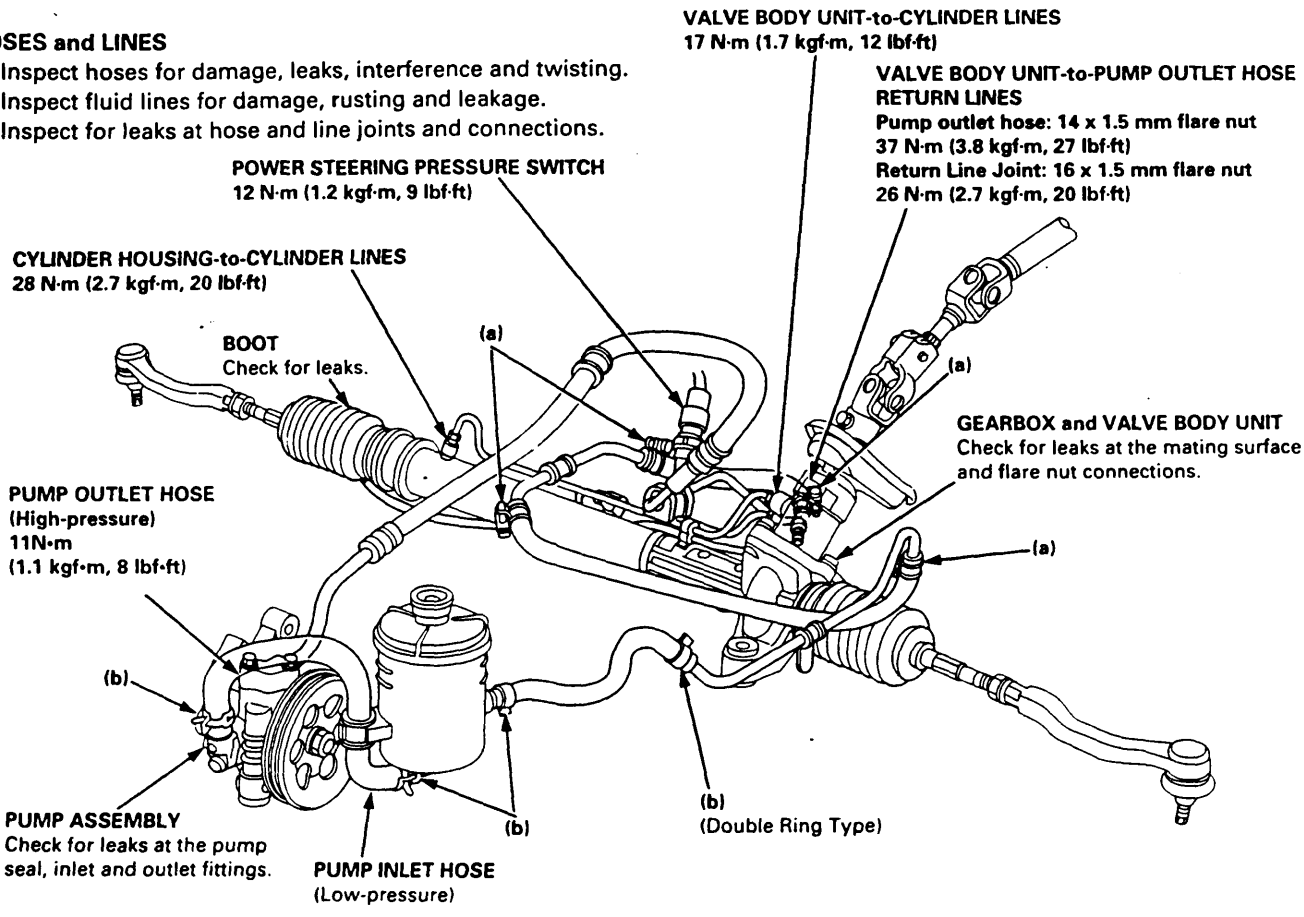


Power Steering Hoses, Lines

Fluid Leakage Inspection

HOSES and LINES

- Inspect hoses for damage, leaks, interference and twisting.
- Inspect fluid lines for damage, rusting and leakage.
- Inspect for leaks at hose and line joints and connections.



Replacement

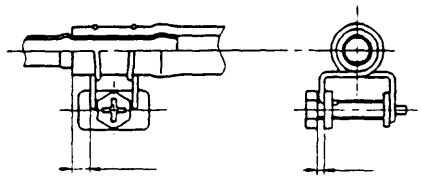
NOTE:

- 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.
- Add the recommended power steering fluid to the specified level on the reservoir and check for leaks.

CAUTION: Check all clamps for deterioration or deformation; replace with the clamps new ones if necessary.

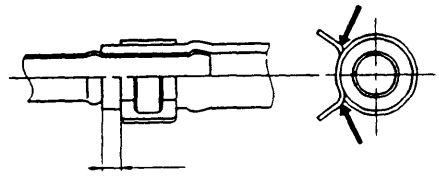
ADJUSTABLE HOSE CLAMP:

- Position the adjustable hose clamps at the points indicated by (a) in the drawing above.
- Slide the hose over the line until it contacts the stop.



HOSE CLAMP:

- Position the hose clamps at the points indicated by (b) in the drawing above.
- Slide the hose over the line until it contacts the stop.

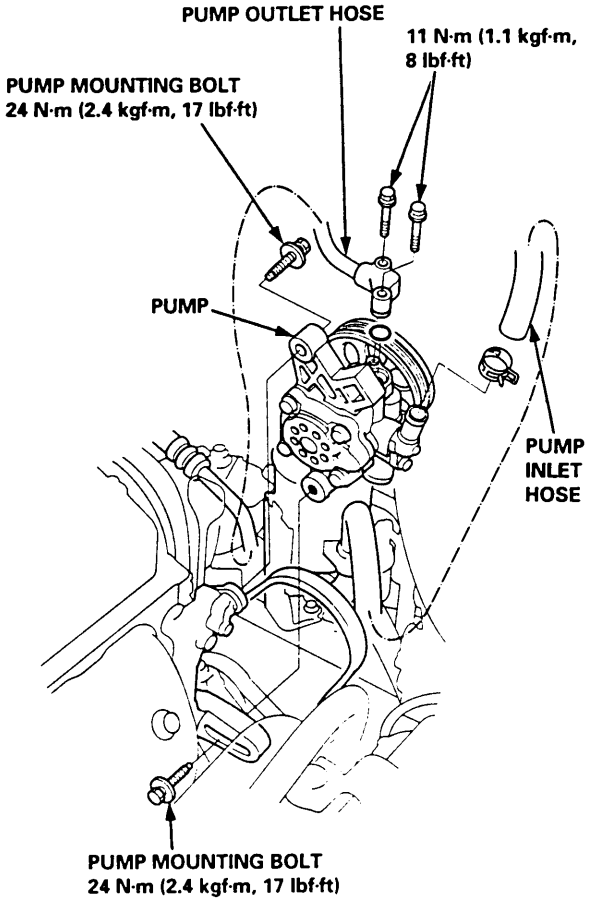


Power Steering Pump

Replacement

NOTE: Before disconnecting the hoses from the pump, place a suitable container under the vehicle.

1. Remove the belt by loosening the pump mounting bolts.



2. Cover the A/C compressor with several shop towels to protect it from spilled power steering fluid. Disconnect the inlet hose and the outlet hose from the pump, and plug them.

   NOTE: Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once.

3. Remove the pump mounting bolts, then remove the pump.

   NOTE: Do not turn the steering wheel with the pump removed.

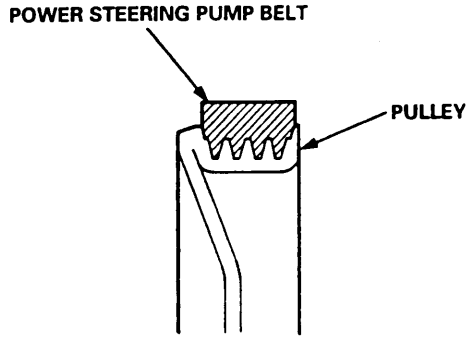
4. Wrap the opening of the pump with a piece of tape to prevent foreign material from entering the pump.

5. Connect the inlet hose and the outlet hose. Tighten the pump fittings securely.

6. Loosely install the pump in the pump bracket with mounting bolts.

7. Install the pump belt.

   CAUTION:
   - **Make sure that the power steering belt is properly positioned on the pulleys.**
   - **Do not get power steering fluid or grease on the power steering belt or pulley faces. Clean off any fluid or grease before installation.**



8. Adjust the pump belt (see page 17-14).

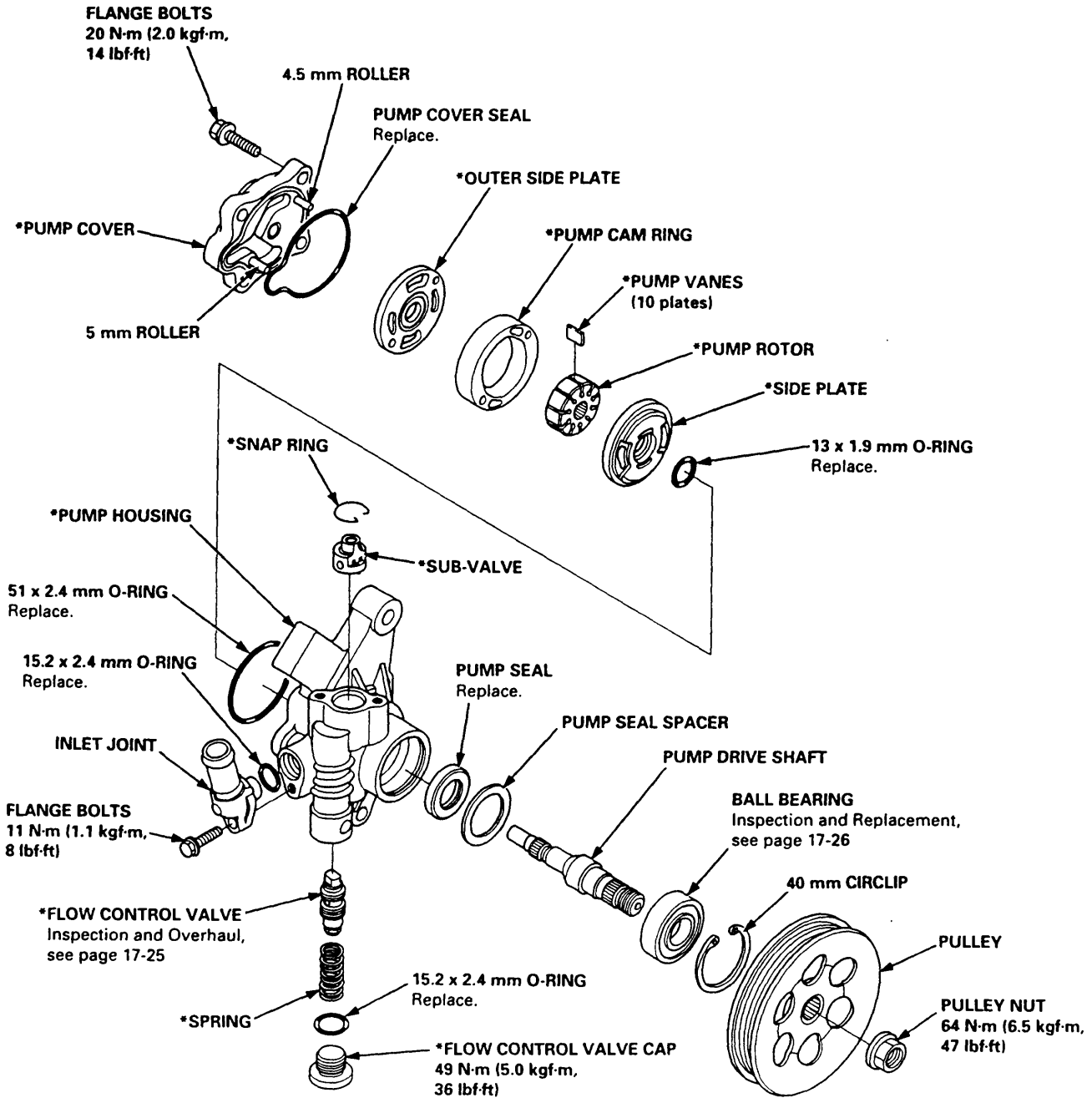
9. Fill the reservoir to the upper level line (see page 17-15).

Power Steering Pump

Disassembly

CAUTION: The power steering components are made of aluminum. Avoid damaging the components during assembly.

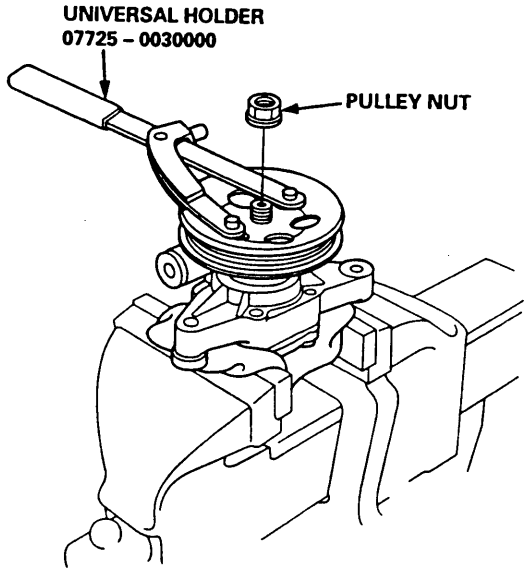
NOTE:
- Clean the disassembled parts with a solvent, and dry them with compressed air. Do not dip the rubber parts in a solvent.
- Always replace the O-rings and rubber seals with new ones before assembly.
- Apply recommended power steering fluid to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- Replace the pump as an assembly if the parts indicated with asterisk (*) are worn or damaged.



1. Drain the fluid from the pump.

2. Hold the steering pump in a vise with soft jaws, hold the pulley with the special tool, and remove the pulley nut and pulley.

   CAUTION: Be careful not to damage the pump housing with the jaws of the vise and extension bar.



3. Loosen the flow control valve cap with a hex wrench and remove it.

4. Remove the O-ring, flow control valve and spring.

5. Remove the inlet joint and O-ring.

6. Remove the pump cover and pump cover seal.

7. Remove the outer side plate, pump cam ring, pump rotor, pump vanes, side plate and O-rings.

8. Remove the snap ring, then remove the sub-valve from the pump housing.

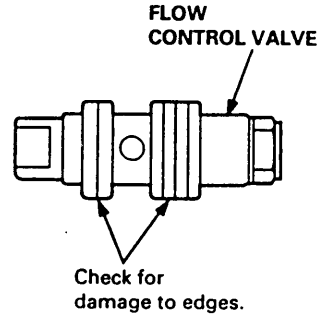
9. Remove the circlip, then remove the pump drive shaft by tapping the shaft end with the plastic hammer.

10. Remove the pump seal spacer and pump seal.

Inspection

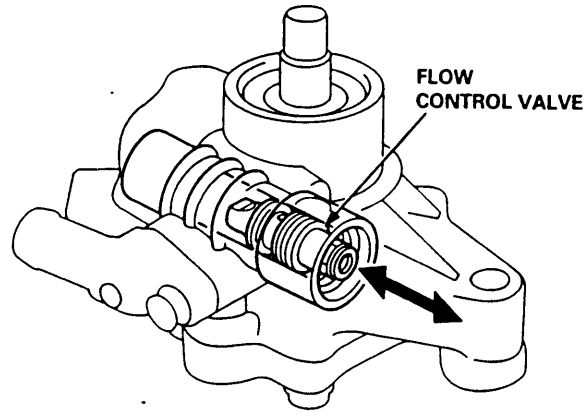
Flow Control Valve:

1. Check the flow control valve for wear, burrs, and other damage to the edges of the grooves in the valve.



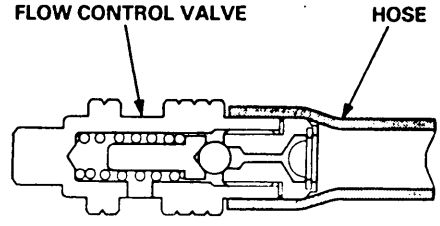
2. Inspect the bore of the flow control valve for scratches or wear.

3. Slip the valve back in the pump, and check that it moves in and out smoothly.



   If OK, go on step 4; if not, replace the pump as an assembly. The flow control valve is not available separately.

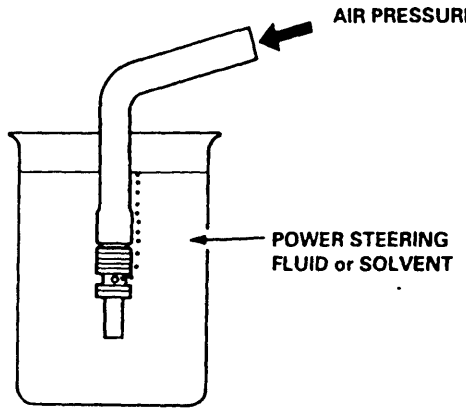
4. Attach a hose to the end of the valve as shown.



(cont'd)

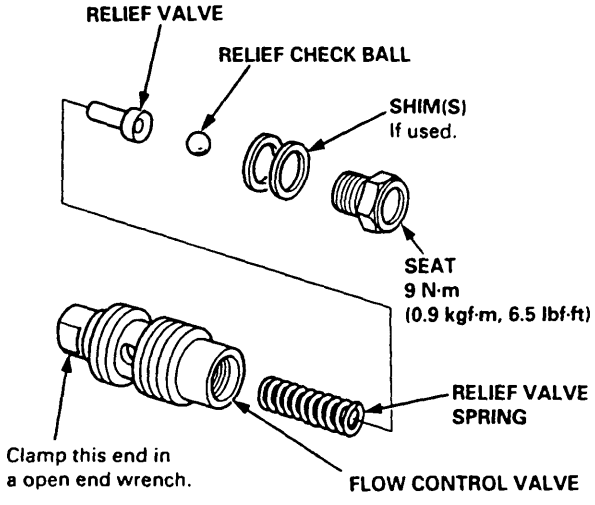
Inspection (cont'd)

5. Submerge the valve in a container of power steering fluid or solvent, and blow in the hose. If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm², 14.2 psi), repair it as follows.



6. Hold the bottom end of the valve with a open end wrench.

7. Unscrew the seat in the top end of the valve, and remove any shims, the relief check ball, relief valve and relief valve spring.

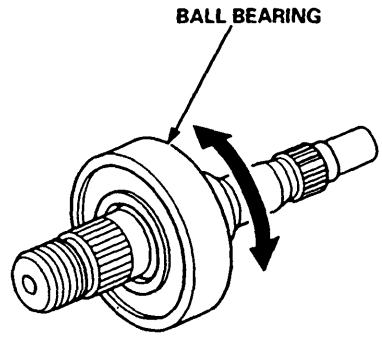


8. Clean all the parts in solvent, dry them off, then reassemble and retest the valve. If the flow control valve tests OK, reinstall it in the pump. If the flow control valve still leaks air, replace the pump as an assembly. The flow control valve is not available separately.

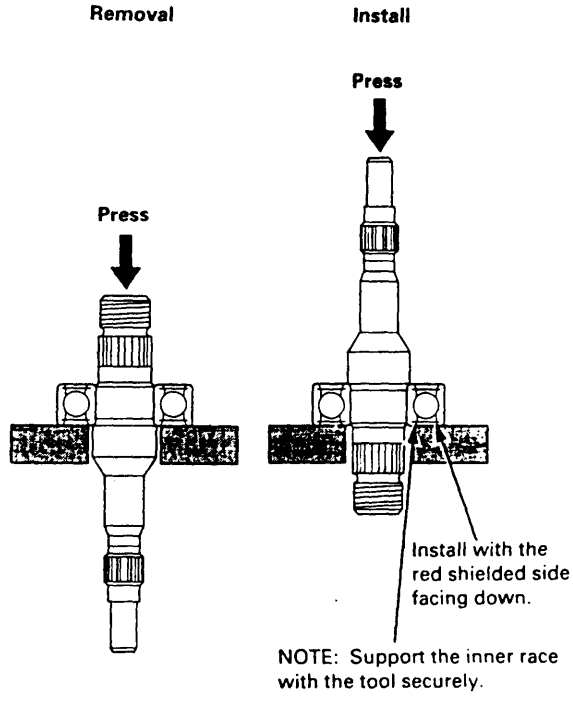
   NOTE: If necessary, relief pressure is adjusted at the factory by adding shims under the check ball seat. If you found shims in your valve, be sure you reinstall as many as you took out.

Ball Bearing:

1. Inspect the ball bearing by rotating the outer race slowly. If any play or roughness is felt, replace the ball bearing.

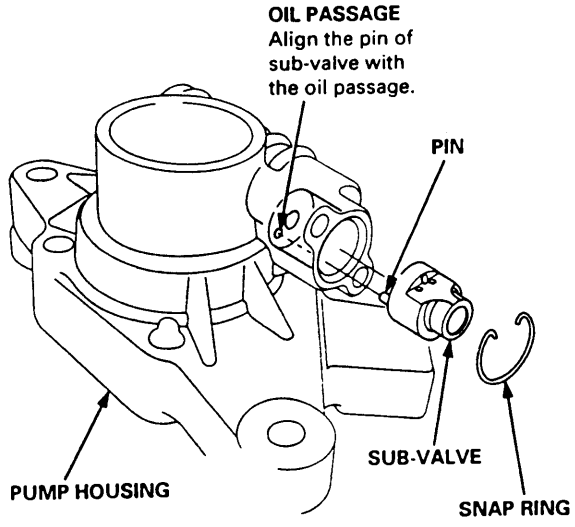


2. Replace the ball bearing using a press as shown.



Reassembly

1. Align the pin of the sub-valve with the oil passage in pump housing, and push down the sub-valve. Install the snap ring properly.

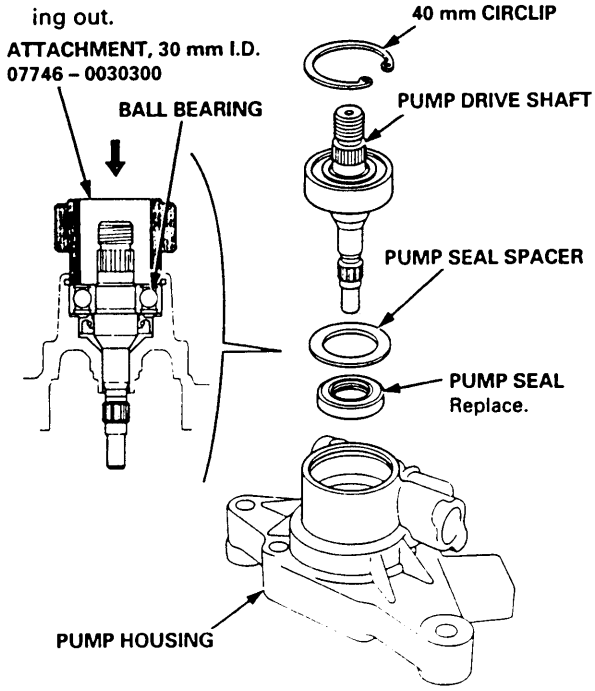


2. Install the new pump seal in the pump housing by hand, then install the pump seal spacer.

   NOTE: Insert the pump seal with its grooved side facing in.

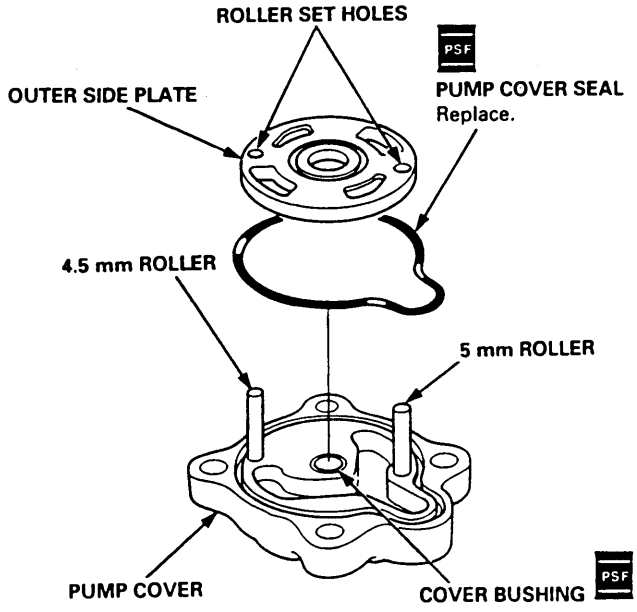
3. Position the pump drive shaft in the pump housing, then drive it in using a special tool as shown.

4. Install the 40 mm circlip with its radiused side facing out.

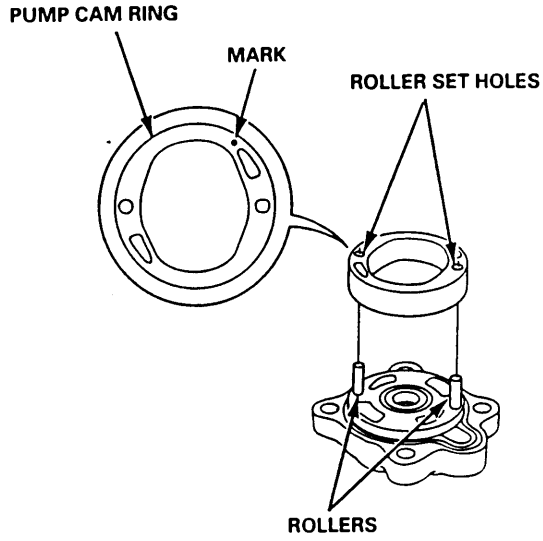


5. Coat the pump cover seal and the cover bushing with the power steering fluid, then install the pump cover seal into the groove in the pump cover.

6. Install the outer side plate over the two rollers.



7. Set the pump cam ring over the two rollers with the " ○ " mark on the cam ring upward.



(cont'd)

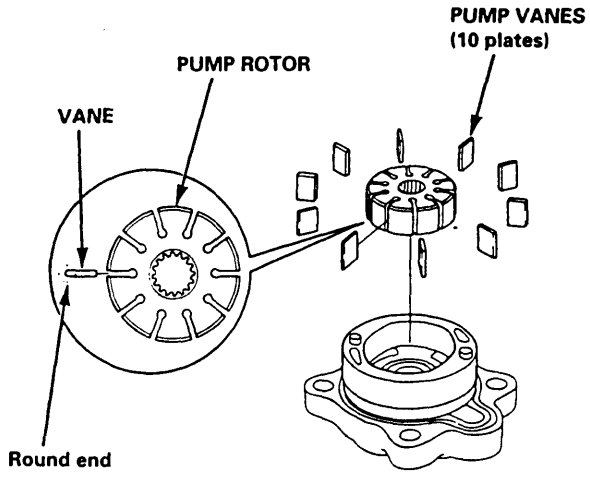
Power Steering Pump

Reassembly (cont'd)

8. Install the pump rotor to the pump cover.

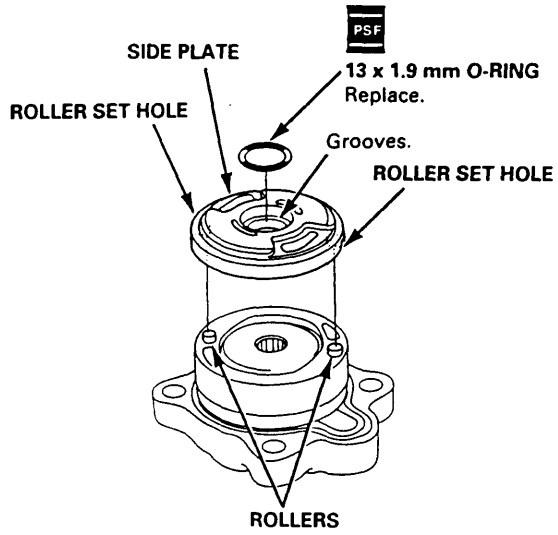
9. Set the 10 vanes in the grooves in the rotor.

   NOTE: Be sure that the round ends of the vanes are in contact with the sliding surface of the cam ring.



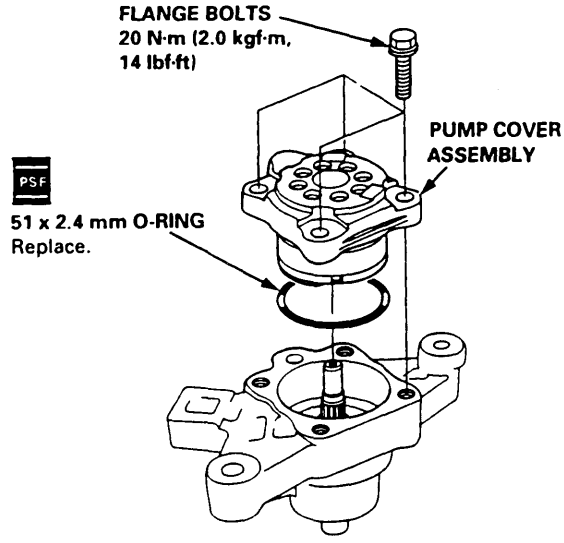
10. Coat the O-ring with power steering fluid, and install it into the grooves in the side plate.

11. Install the side plate on the cam ring by aligning the roller set holes in the side plate with the rollers.



12. Coat the O-ring with power steering fluid, and position it into the pump housing.

13. Install the pump cover assembly in the pump housing.

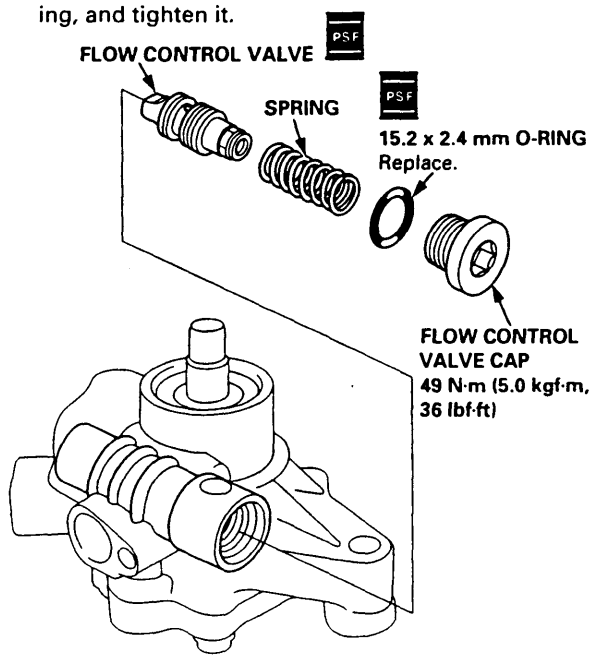


14. Coat the flow control valve with power steering fluid.

15. Install the flow control valve and spring on the pump housing.

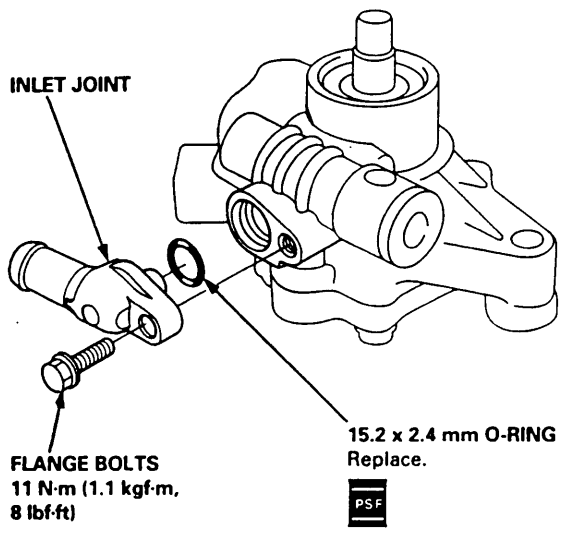
16. Coat the O-ring with power steering fluid, and install it on the flow control valve cap.

17. Install the flow control valve cap on the pump housing, and tighten it.



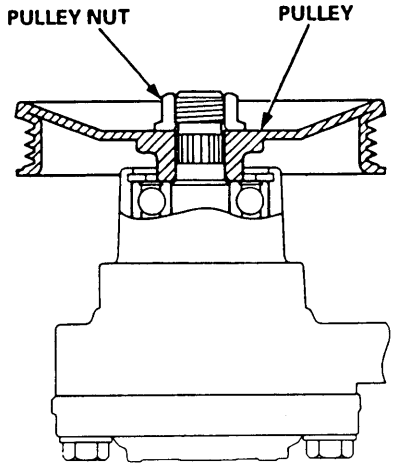
18. Coat the O-ring with power steering fluid, and install it into the grooves in the inlet joint.

19. Install the inlet joint on the pump housing.

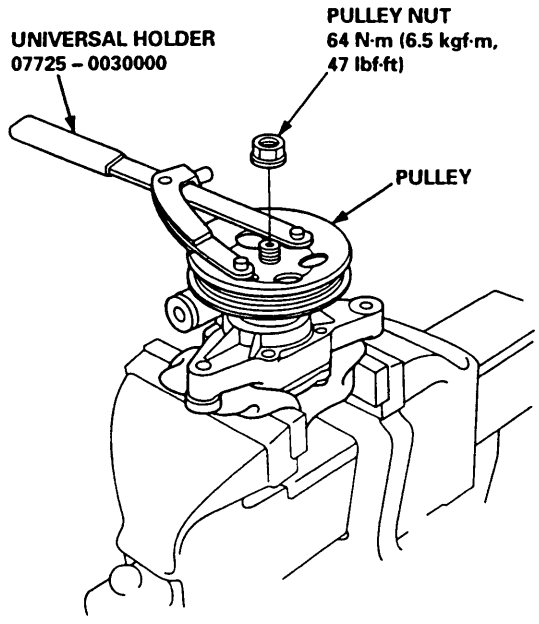


20. Install the pulley as shown below, then loosely install the pulley nut. Hold the steering pump in a vise with soft jaws.

CAUTION: Be careful not to damage the pump housing with the jaws of the vise.



21. Hold the pulley with the special tool, and tighten the pulley nut.



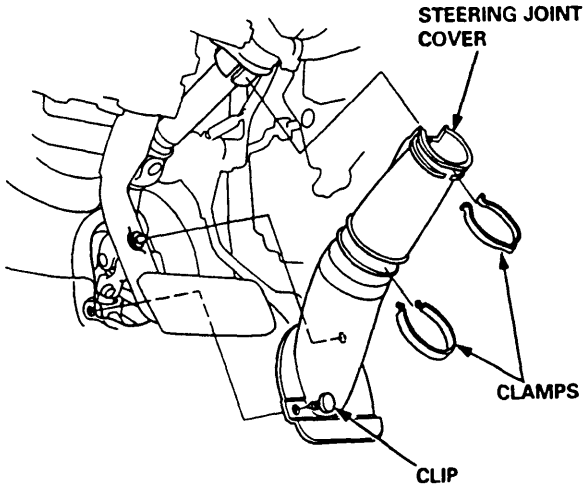
22. Check that the pump turns smoothly by turning the pulley by hand.

Power Steering Gearbox

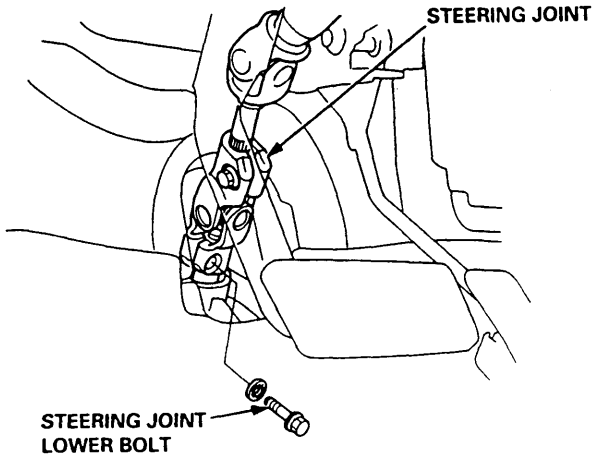
Removal

NOTE: Using solvent and a brush, wash any oil and dirt off the valve body unit its lines, and the end if the gearbox. Blow dry with compressed air.

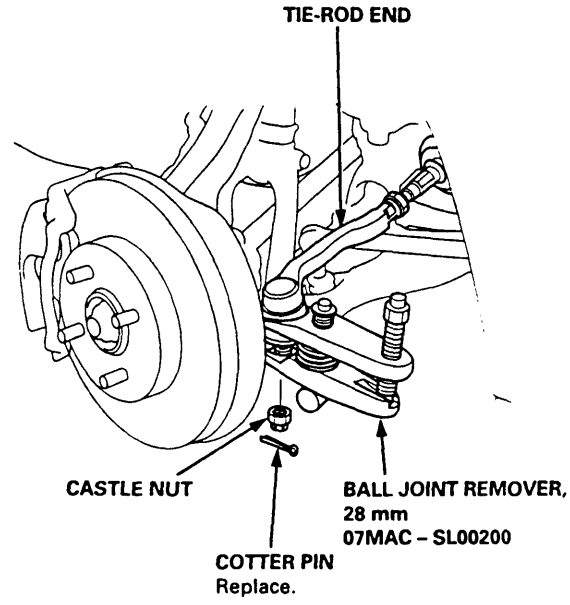
1. Drain the power steering fluid as described on page 17-15.
2. Raise the front of vehicle, and support it on safety stands in the proper locations (see section 1).
3. Remove the front wheels.
4. Remove the driver's airbag assembly, and steering wheel (see page 17-17).
5. Remove the steering joint cover.



6. Remove the steering joint lower bolt, and disconnect the steering joint by moving the joint toward the column.



7. Remove the cotter pin from the castle nut and remove the nut.



8. Install the 10 mm hex nut on the ball joint.
   Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.

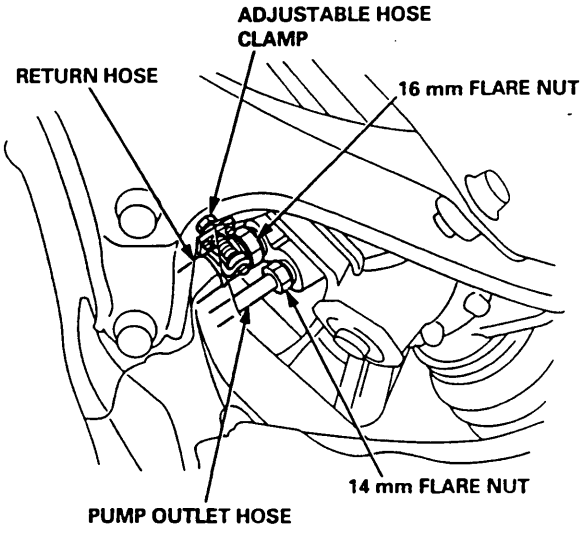
   NOTE: Remove the ball joint using the special tool. Refer to section 18 for how to use the ball joint remover.

9. Separate the tie-rod ball joint and knuckle using the special tool.

   CAUTION: Avoid damaging the ball joint boot.

10. Remove the left tie-rod end, then slide the rack all the way to the right.
11. Remove exhaust pipe A (see section 9).
12. Disconnect the shift linkage (see section 13 or section 14).

13. Loosen the 14 mm flare nut and disconnect the pump outlet hose.



14. Loosen the adjustable hose clamp and disconnect the return hose.

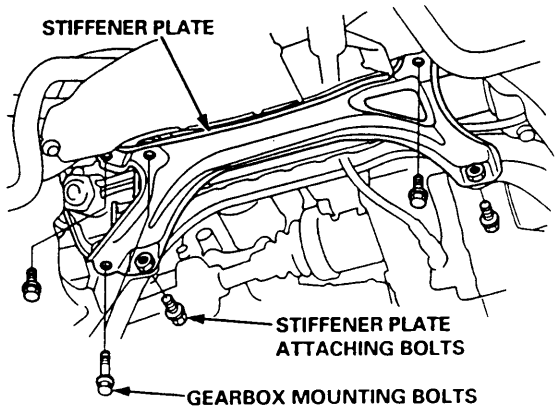
15. Loosen the 16 mm flare nut and remove the return hose joint from the valve body unit.

CAUTION: After disconnecting the hose and line, plug or seal the hose and line with a piece of tape or equivalent to prevent foreign materials from entering the valve body unit.

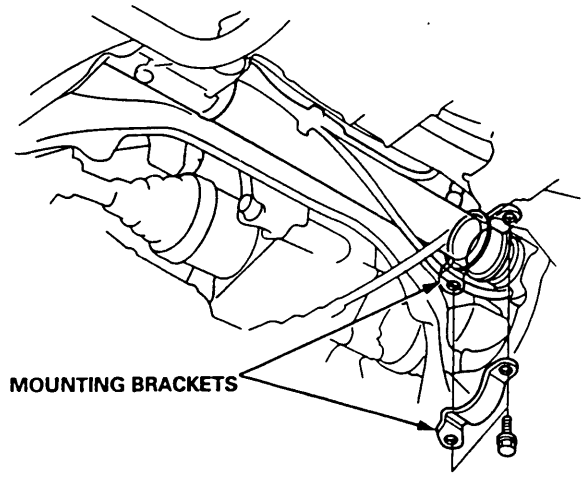
NOTE: Do not loosen the cylinder line A and B between the valve body unit and cylinder.

16. Remove the stiffener plate.

NOTE: Some stiffener plate attaching bolts are also used as gearbox mounting bolts. The gearbox will tilt to side when these bolts are removed.



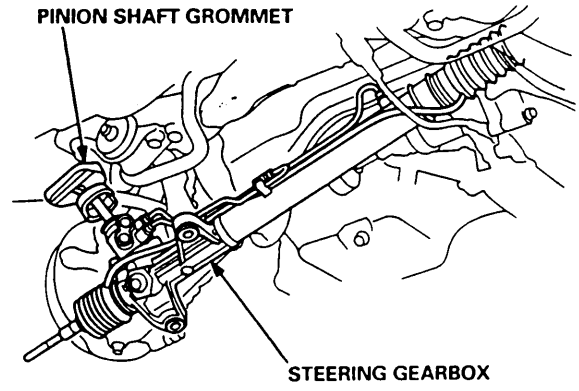
17. Remove the mounting brackets.



18. Pull the steering gearbox all the way down to clear the pinion shaft from the bulkhead, then remove the pinion shaft grommet.

19. Move the steering gearbox to right so the left rack end clears the rear beam, then tilt the left side down to remove it from the vehicle.

CAUTION: Be careful not to bend or damage the pump outlet hose and cylinder lines when removing the gearbox.



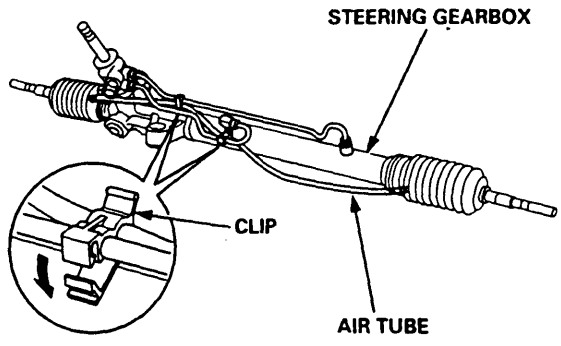
Power Steering Gearbox

Disassembly

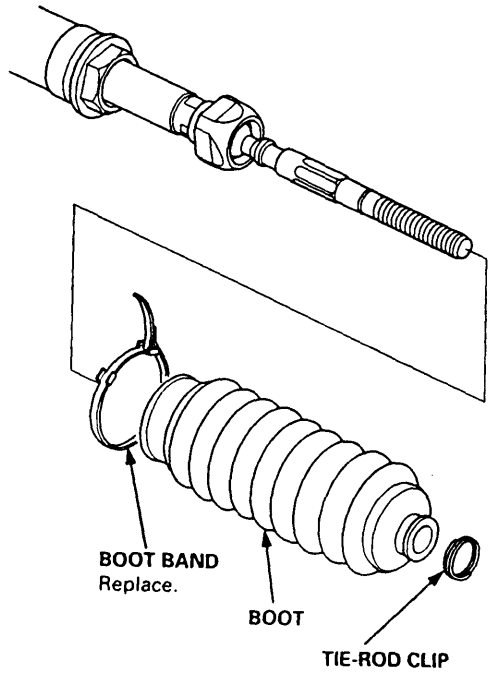
Steering Rack Disassembly

NOTE:
- Before you disassemble the gearbox, wash it off with solvent and a brush.
- Do not dip seals and O-rings in solvent.

1. Remove the steering gearbox (see page 17-30).
2. Remove the tie-rod end and locknut.
3. Remove air tube and clips.

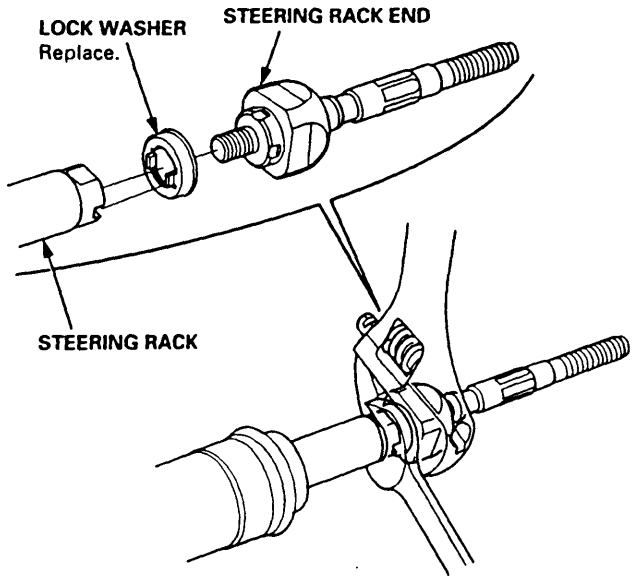


4. Remove the boot bands and tie-rod clips. Pull the boots away from the ends of the gearbox.

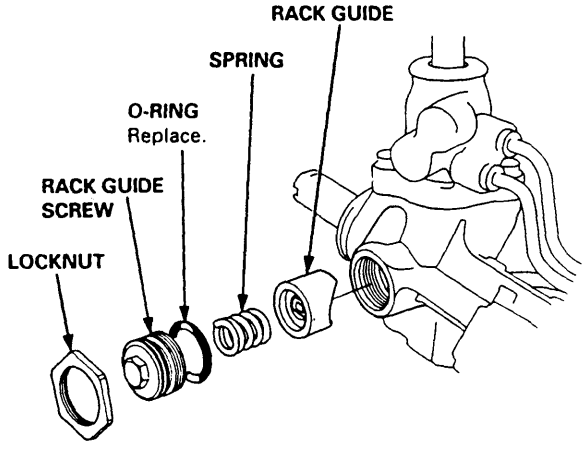


5. Hold the steering rack with a wrench, and unscrew the rack end with another wrench.

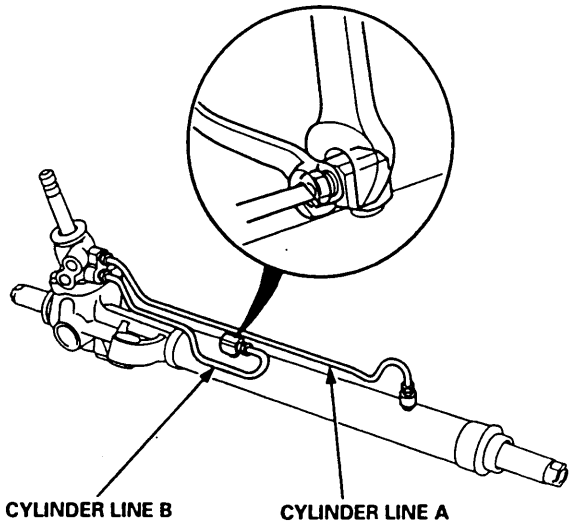
CAUTION: Be careful not to damage the rack surface with the wrench.



6. Loosen the locknut, then remove the rack guide screw and O-ring.
7. Remove the spring and the rack guide from the gearbox housing.

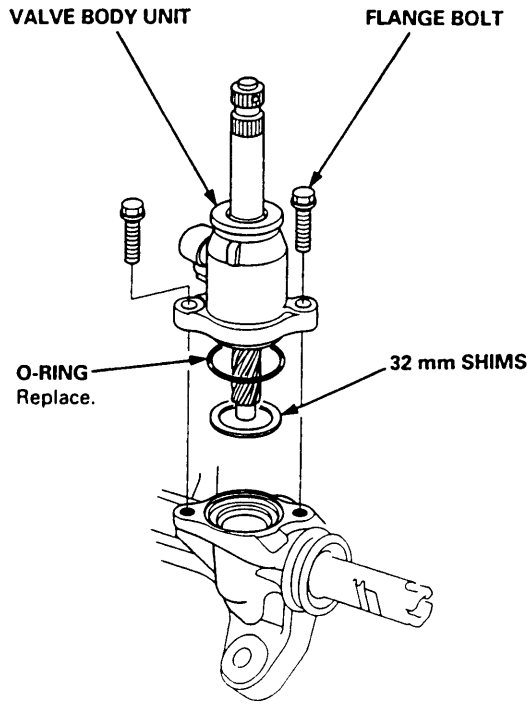


8. Remove cylinder lines A and B from the gearbox.



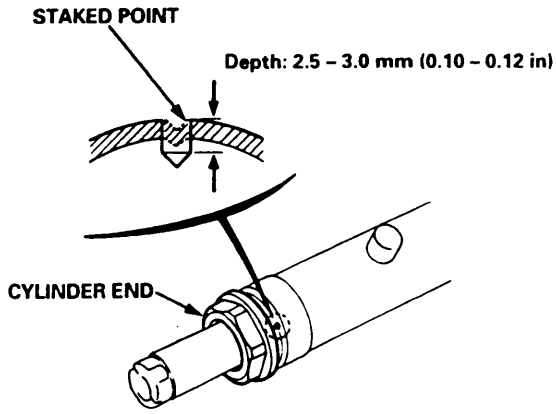
9. Drain the fluid from the cylinder fittings by slowly moving the steering rack back and forth.

10. Remove the two flange bolts, then remove the valve body unit from the gearbox housing. (See page 17-35 for valve body unit disassembly.)

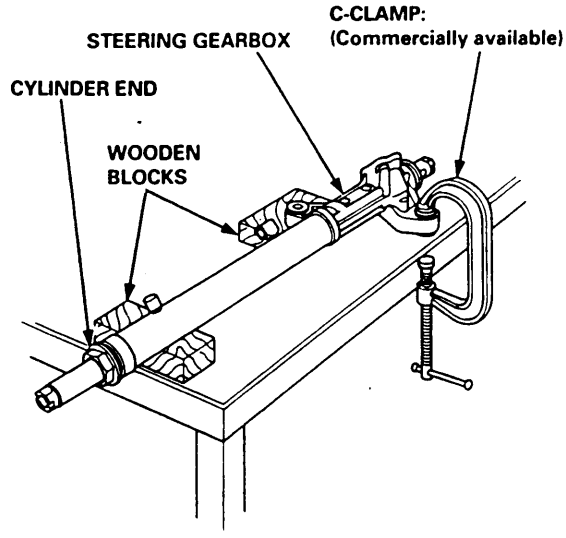


11. Drill a 3 mm (0.12 in) diameter hole approximately 2.5 – 3.0 mm (0.10 – 0.12 in) in depth in the staked point on the cylinder.

CAUTION:
- **Do not allow metal shavings to enter the cylinder.**
- **After removing the cylinder end, remove any burrs at the staked point.**



12. Hold the steering gearbox using a C-clamp as shown.



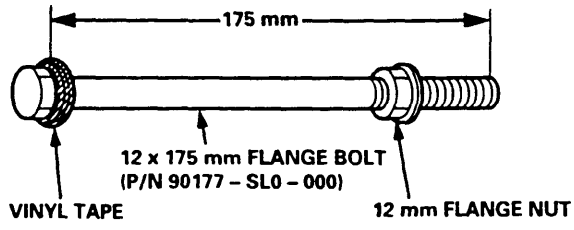
13. Loosen and remove the cylinder end.

(cont'd)

Disassembly (cont'd)

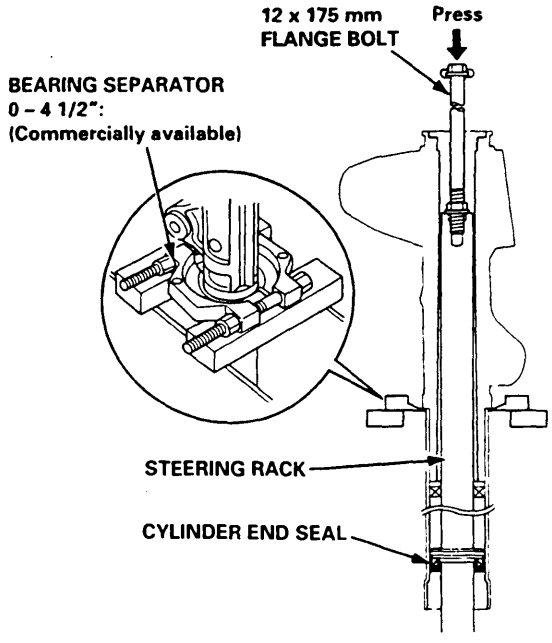
14. Assemble a 12 x 1.25 mm flange nut onto a 12 x 175 mm grade 10 flange bolt as shown.

    NOTE: Wrap the flange portion of the bolt with vinyl tape to protect the cylinder.



15. Install the flange bolt into the end of the steering rack until it bottoms in the hole, then back the flange bolt out 1/4 turn. Hold the flange bolt, and tighten the flange nut against the rack by hand.

16. Install the bearing separator on the gearbox housing as shown.

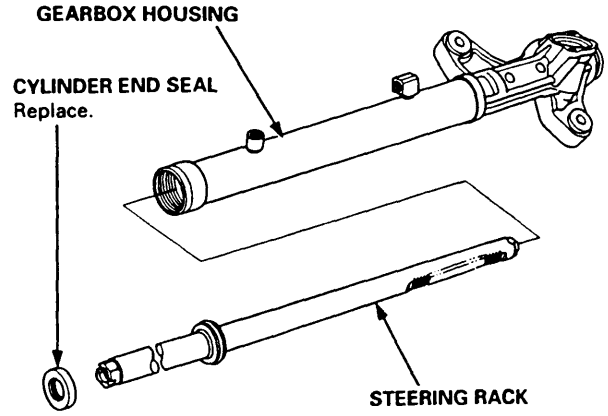


17. Set the gearbox in a press so the gearbox housing points upward, then press the cylinder end seal and steering rack out of the gearbox housing.

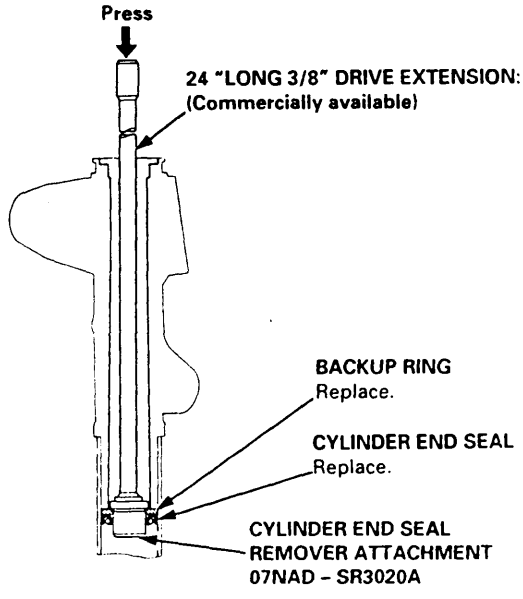
    NOTE: Hold the steering rack to keep it from falling when pressed clear.

    CAUTION:
    - **Be careful not damage to inner surface of the cylinder with the flange bolt.**
    - **Do not place your fingers under the steering rack.**

18. Remove the 12 mm bolt and nut from the steering rack.
19. Remove the cylinder end seal from the steering rack.

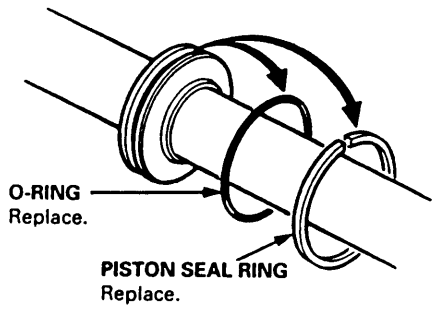


20. Insert a 24" long, 3/8" drive extension and the special tool into the cylinder from the gearbox side.
    NOTE: Make sure that the special tool is securely positioned on the backup ring edges.
    CAUTION: Be careful not damage to inner surface of the cylinder with the special tool.
21. Set the gearbox housing in a press, then press out the cylinder end seal and backup ring from the gearbox housing.
    CAUTION:
    - **Keep the 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. It will break the backup ring, and the cylinder end seal will remain in the gearbox housing.**



22. Carefully pry the piston seal ring and O-ring off the piston rack.

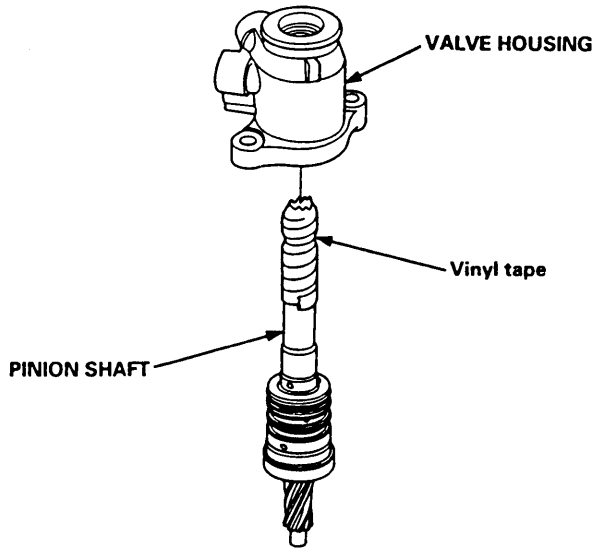
CAUTION: Be careful not to damage the inside of seal ring groove and piston edges when removing the seal ring.



Valve Body Unit Disassembly

23. Before removing the valve housing, apply vinyl tape to splines of the pinion shaft.

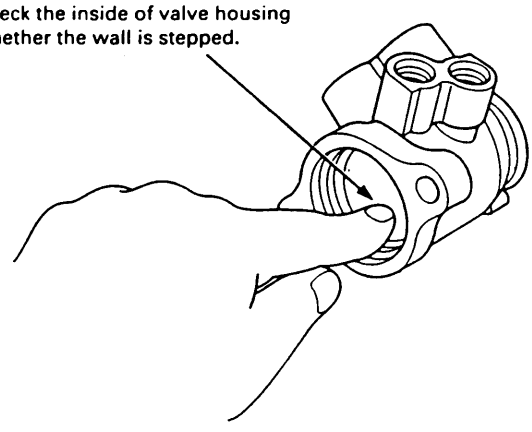
24. Separate the valve housing from the pinion shaft/ valve using a press.



25. Check the inner wall of the valve housing where the seal ring slides with your finger. If there is a step in the wall, the valve housing is worn. Replace the valve housing.

NOTE:
- There may be the sliding marks from the seal ring on the wall of the valve housing. Replace the valve housing only if the wall is stepped.
- When the valve housing is replaced, install new shim(s) on the bearing surface of the housing to adjust the thickness.

Check the inside of valve housing whether the wall is stepped.

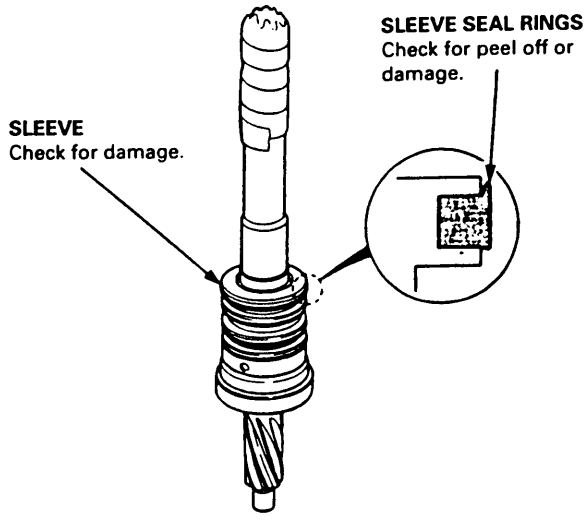


(cont'd)

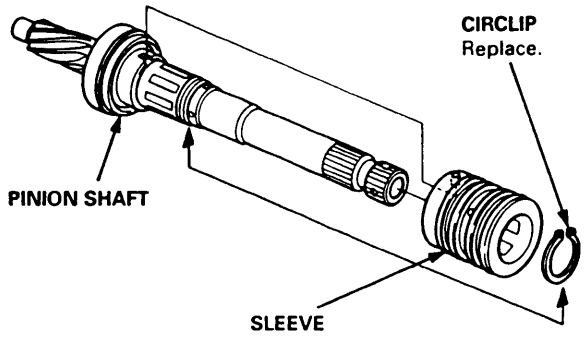
Disassembly (cont'd)

26. 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.

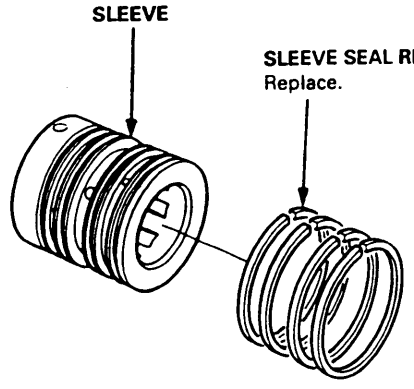


27. Remove the circlip and pinion shaft sleeve from the pinion shaft.



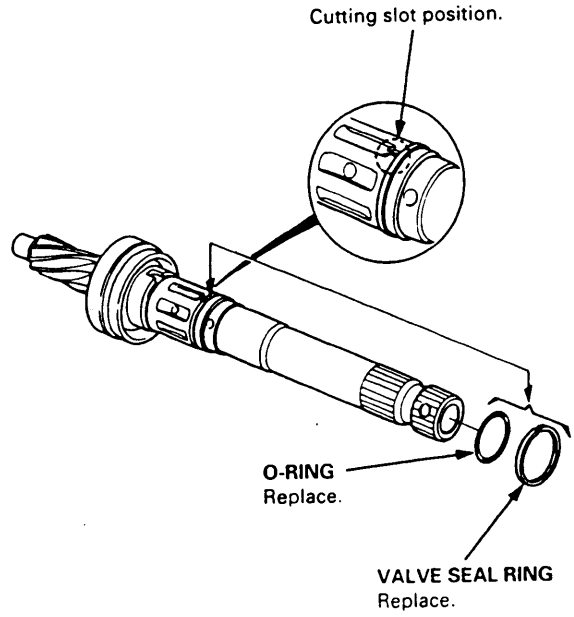
28. Using a cutter or an equivalent tool, cut and remove the four seal rings from the sleeve.

    CAUTION: Be careful not to damage the edges of the sleeve grooves and outer surface when removing the seal rings.



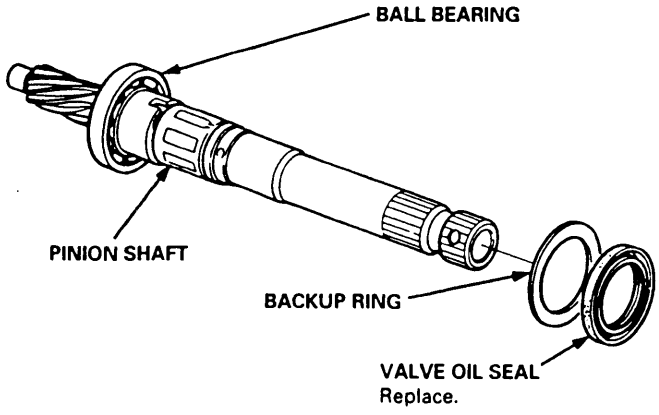
29. Using a cutter or an equivalent tool, cut the valve seal ring and O-ring at the groove the pinion shaft. Remove the valve seal ring and O-ring.

    CAUTION: Be careful not to damage the edges of the pinion shaft groove and outer surface when removing the valve seal ring and O-ring.

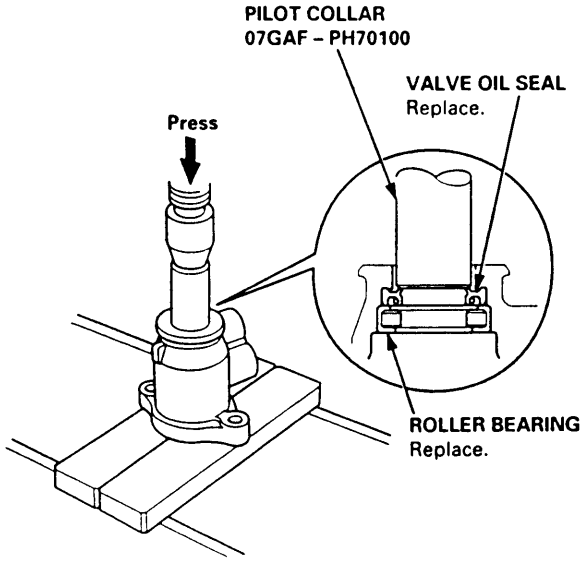


30. Remove the valve oil seal and backup ring from the pinion shaft.

NOTE:
- Inspect the ball bearing 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.



31. Press the valve oil seal and roller bearing out of the valve housing using a hydraulic press and special tool shown below.

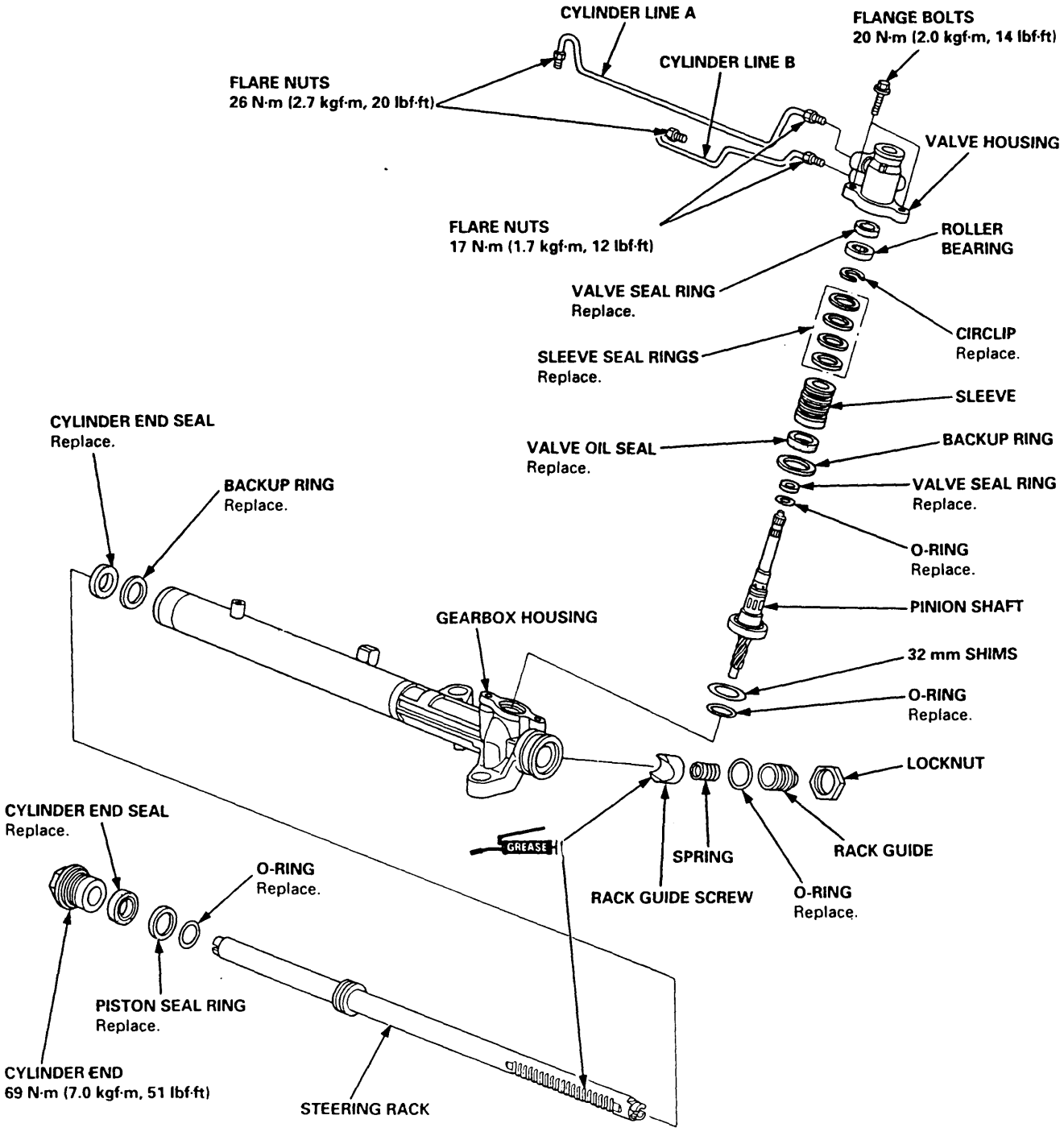


Power Steering Gearbox

Reassembly

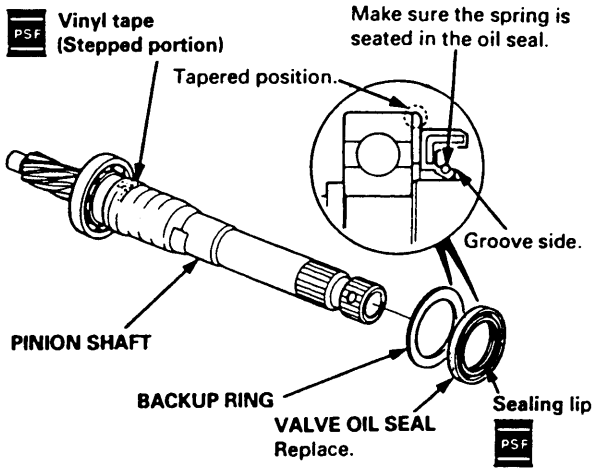
NOTE:

- Clean the disassembled parts with a solvent, and dry them with compressed air. Do not dip the rubber parts in a solvent.
- Always replace the O-rings and rubber seals with new ones before assembly.
- Apply the recommended power steering fluid to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- Use the appropriate special tools where necessary.



Valve Body Unit Reassembly

1. Apply vinyl tape to the stepped portion of the pinion shaft, and coat the surface of the vinyl tape with the power steering fluid.



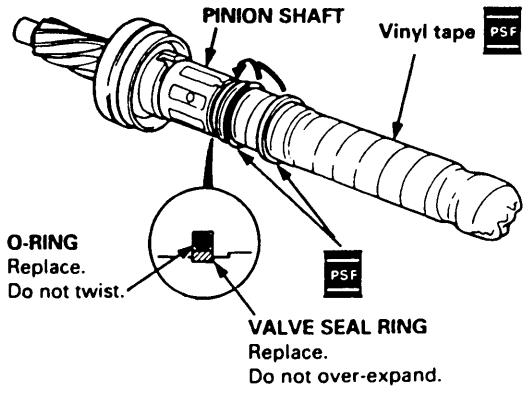
2. Install the backup ring with its tapered side as shown above.

3. Coat the inside surface of the new valve oil seal with power steering fluid.

4. Slide the valve oil seal over the pinion shaft, being careful not to damage the sealing lip.

   CAUTION: Install the valve oil seal with its grooved side facing opposite the bearing.

5. Apply vinyl tape to the splines and stepped portion of the shaft, and coat the surface of the vinyl tape with the power steering fluid.



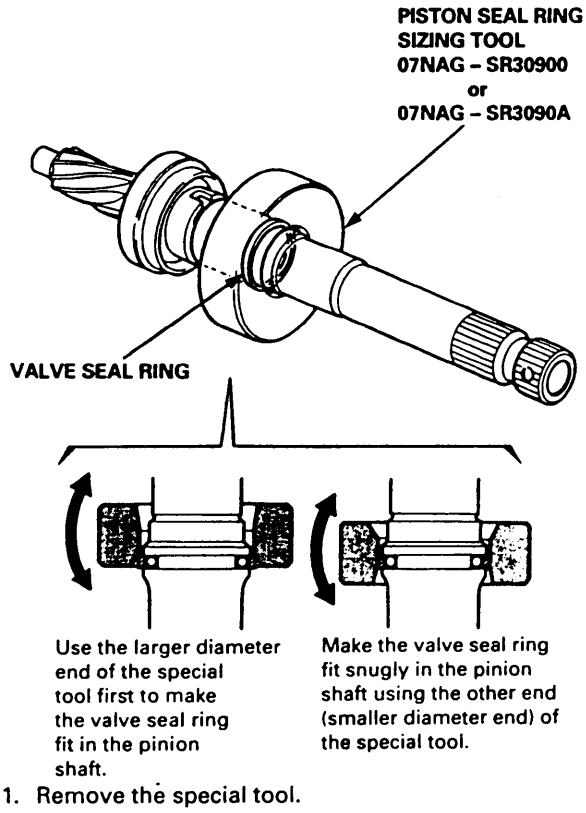
6. Fit the new O-ring in the groove of the pinion shaft. Then slide the new valve seal ring over the shaft and the groove in on the pinion shaft.

7. Remove the vinyl tape from the pinion shaft.

8. Apply power steering fluid to the surface of the valve seal ring that was installed on the pinion shaft.

9. 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.

10. Move the special tool up and down several times to make the valve seal ring fit in the pinion shaft.



11. Remove the special tool.

12. Turn the special tool over, and set the smaller diameter end of the special tool over the valve seal ring. Move the special tool up and down several times to make the valve seal ring fit snugly in the pinion shaft.

(cont'd)

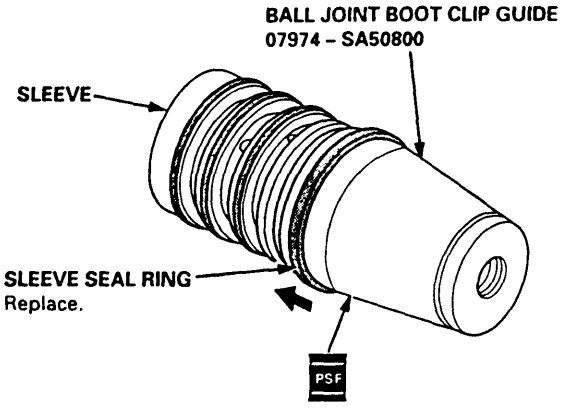
Reassembly (cont'd)

13. Apply power steering fluid to the surface of the special tool. Set the new seal rings over the special tool from the smaller diameter end of the tool, and expand the seal rings. Do two rings at a time from each end of the sleeve.

    NOTE:
    - Do not over-expand the seal ring. 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 sleeve seal rings as they are not compatible.

14. Align the special tool with each groove in the sleeve, and slide a sleeve seal ring into each groove.

    NOTE: After installation, compress the seal rings with your fingers temporarily.

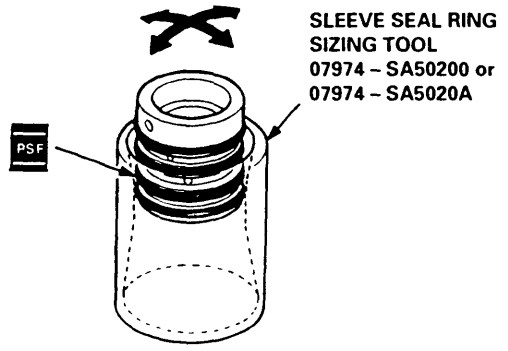


15. Apply power steering fluid to the seal rings on the sleeve, and to the entire inside surface of the special tool.

16. Insert the sleeve into the special tool slowly.

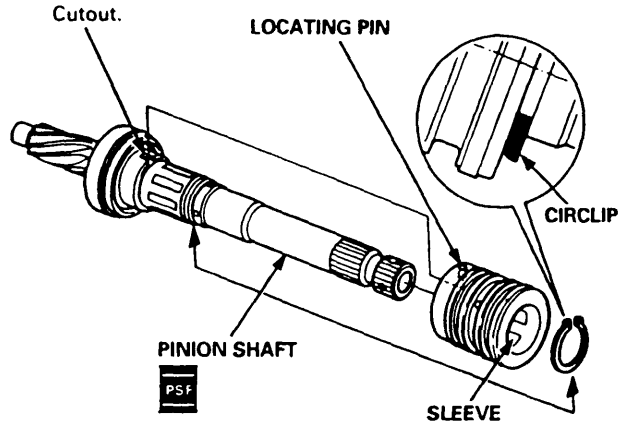
17. Move the sleeve each direction several times to make the seal rings snugly fit in the sleeve.

    NOTE: Be sure that the seal rings are not turned up.



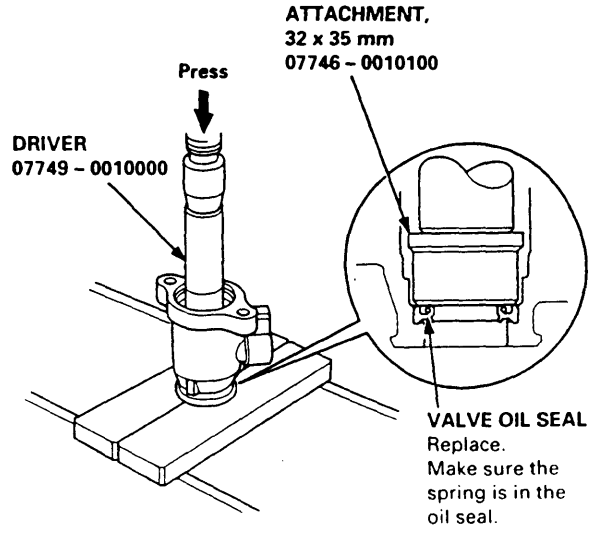
18. Apply power steering fluid to the surface of the pinion shaft. Assemble the sleeve over the pinion shaft by aligning the locating pin on the inside of the sleeve with the cutout in the shaft. Then install the new circlip securely in the pinion shaft groove.

    NOTE:
    - Be careful not to damage the valve seal ring when inserting the sleeve.
    - Install the circlip with its radiused side toward the sleeve.



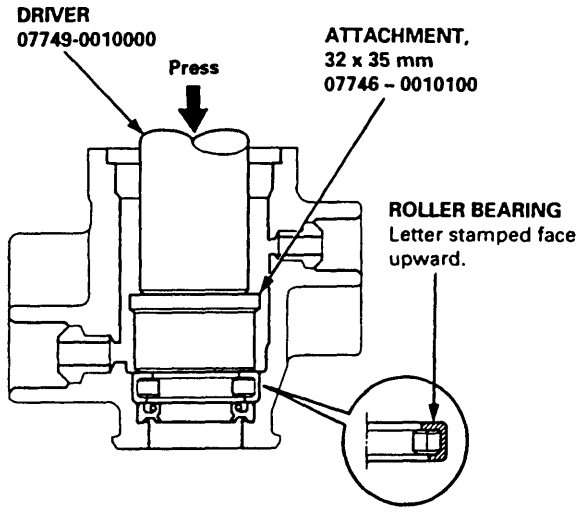
19. Apply power steering fluid to the seal ring lip of the valve oil seal, then install the seal in the valve housing using a hydraulic press and special tools as shown.

    CAUTION: Install the valve oil seal with its grooved side facing the tool.

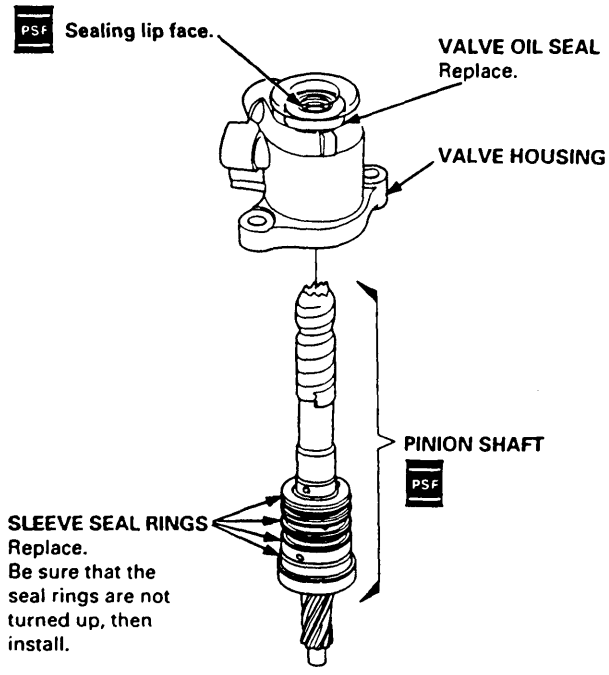


20. Press the new bearing into the valve housing using a hydraulic press and special tool as shown.

    NOTE: Place the roller bearing on the valve housing with the stamped letter facing up towards the valve side.



21. Apply vinyl tape to the pinion shaft, then coat the vinyl tape with power steering fluid.



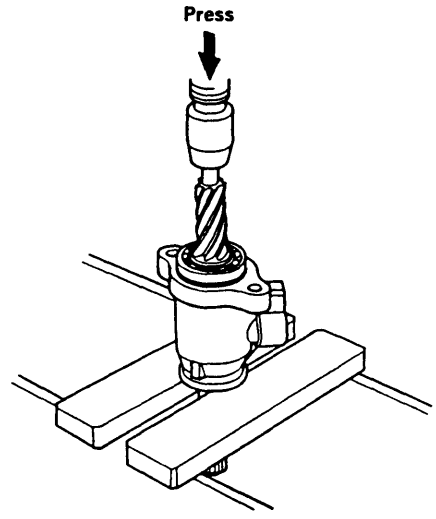
22. Insert the pinion shaft into the valve housing.

    CAUTION: **Be careful not to damage the valve seal rings.**

23. Remove the vinyl tape from the pinion shaft.

24. Press the pinion shaft/sleeve using a hydraulic press as shown.

    NOTE: Check that the pinion shaft/sleeve turns smoothly by turning the pinion shaft.



(cont'd)

Reassembly (cont'd)

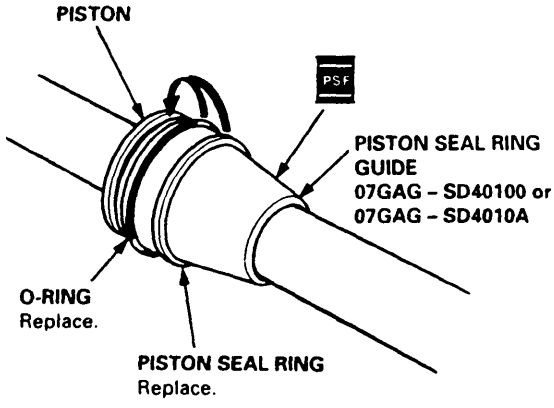
Steering Rack Reassembly

25. Coat the piston seal ring guide with power steering fluid, then slide it onto the rack, big end first.

26. Position the new O-ring and new piston seal ring on the special tool, then slide them down toward the big end of the tool.

    NOTE:
    - Do not over expand the resin seal rings. Install the resin seal rings with care so as not to damage them. After installation, be sure to contract the seal ring using the special tool (sizing tool).
    - Replace the piston's O-ring and seal ring as a set.

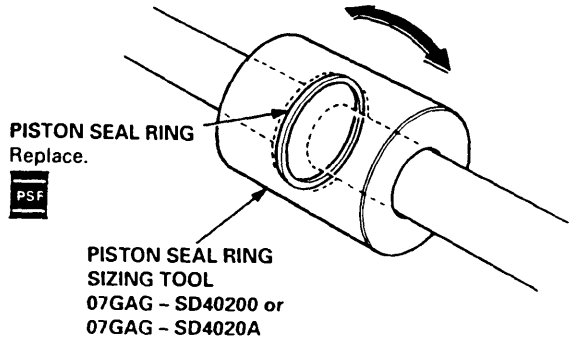
27. Pull the O-ring off into the piston groove, then pull the piston seal ring off into the piston groove on top of the O-ring.



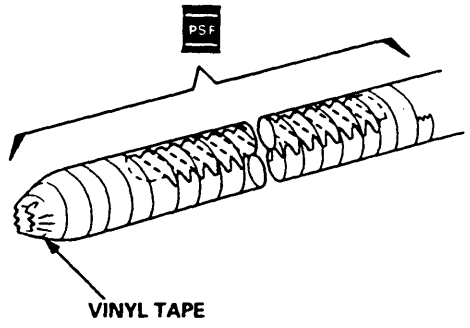
28. Coat the piston seal ring and the inside of the special tool with power steering fluid.

29. Carefully slide the tool onto the rack and over the piston seal ring.

30. Move the special tool back and forth several times to make the piston seal ring fits snugly in the piston.

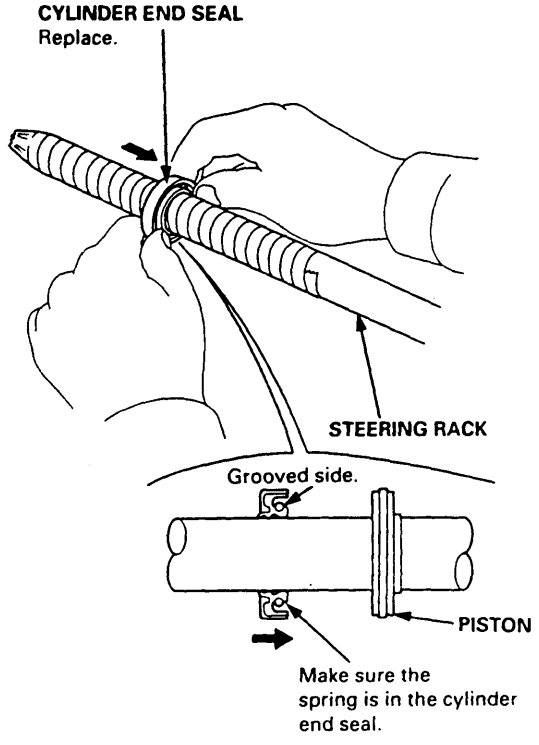


31. Wrap vinyl tape around the rack teeth and rack end edges, then coat the surface of the tape with the power steering fluid.
    NOTE: Make sure that the vinyl tape is wrapped carefully so that there is no stepped portion.



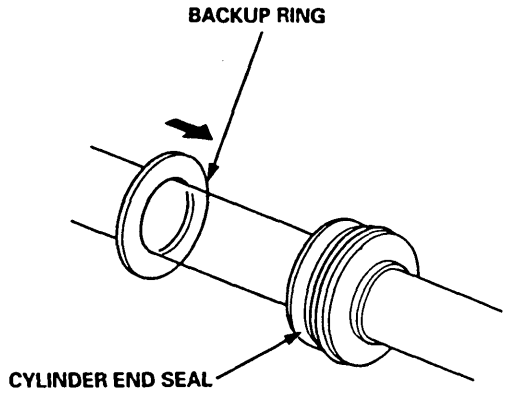
32. Coat the inside surface of the new cylinder end seal with power steering fluid.

33. Install the cylinder end seal onto the steering rack with its grooved side toward the piston.
    CAUTION: When installing the cylinder end seal, be careful not damage the sealing lip face of the seal with the edges or teeth of the steering rack.



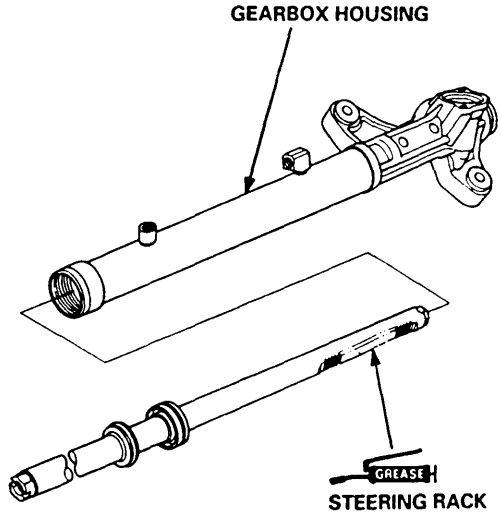
34. Remove the vinyl tape from the steering rack.
    NOTE: Remove any residue of tape adhesive.

35. Install the new backup ring on the steering rack, then place the cylinder end seal to piston.



36. Grease the steering rack teeth, then insert the steering rack into the gearbox housing.

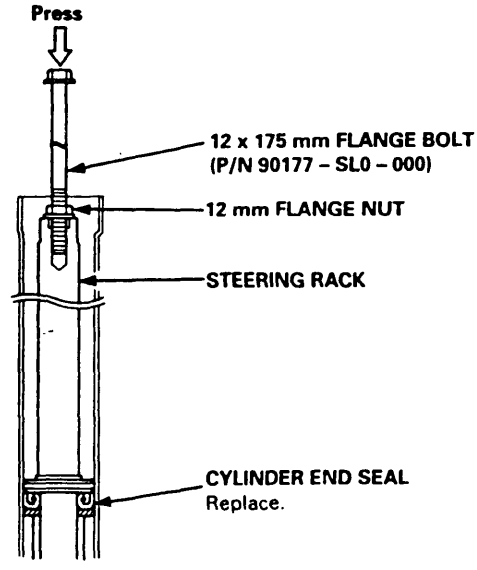
CAUTION: Be careful not to damage to inner surface of the cylinder with the rack edges.



37. Install the flange bolt into the end of the steering rack until it bottoms in the hole, then back the flange bolt out 1/4 turn. Hold the flange bolt and tighten the flange nut against the rack by hand.

38. Install the cylinder end seal into the bottom of the cylinder by pressing on the bolt with a press as shown.

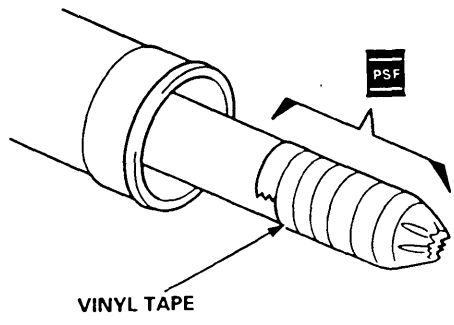
CAUTION: Do not push on the bolt with excessive force as it may damage the cylinder end seal.



39. Remove the flange bolt, and center the steering rack.

40. Wrap vinyl tape around the rack end edges, and coat the surface of the tape with the power steering fluid.

NOTE: Make sure that the vinyl tape is wrapped carefully so that there is no stepped portion.



(cont'd)

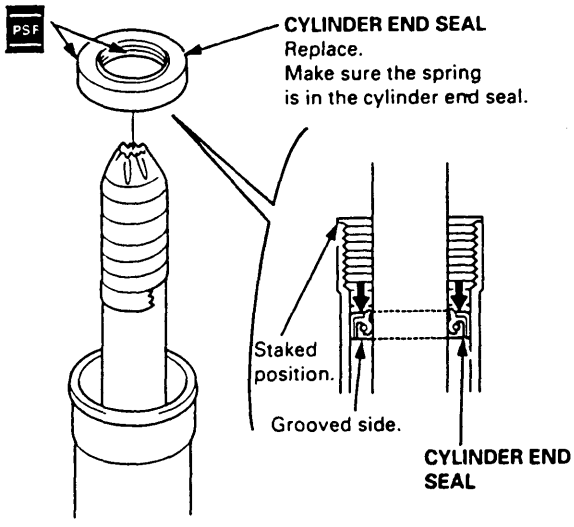
Reassembly (cont'd)

41. Coat the inside surface of the new cylinder end seal with power steering fluid.

42. Install the cylinder end seal onto the steering rack with its grooved side toward the piston.

43. Push in the cylinder end seal with your finger.

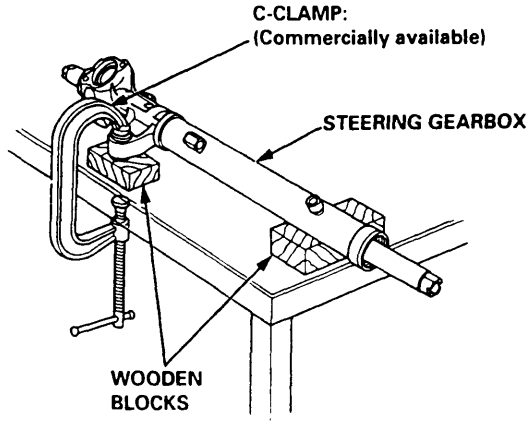
    CAUTION: When installing the cylinder end seal, be careful not damage the sealing face of the seal with the threads and burrs at the staked position of the cylinder.



44. Remove the vinyl tape from the steering rack.

    NOTE: Remove any residue of tape adhesive.

45. Hold the steering gearbox using a C-clamp as shown.

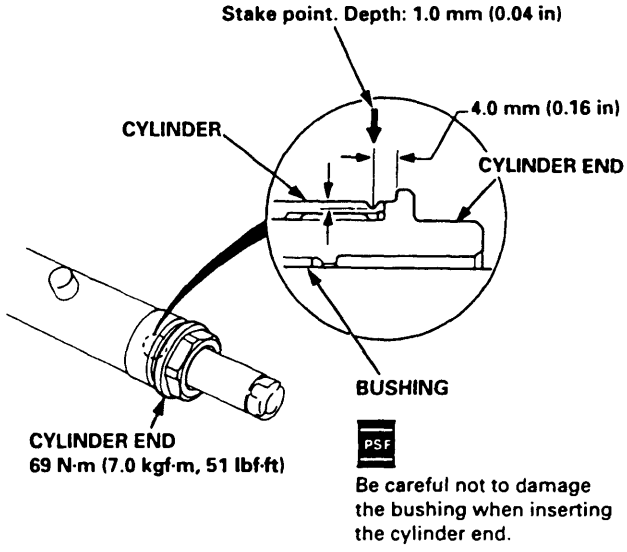


46. Coat the inside surface of the cylinder end with power steering fluid, then install the cylinder end by screwing it into the cylinder.

47. Remove the C-clamp from the steering gearbox.

48. After tightening the cylinder end, stake the point of the cylinder housing shown below.

    NOTE: Stake the cylinder in the position opposite from where the stake was removed during disassembly.



49. Select the 32 mm shim(s).

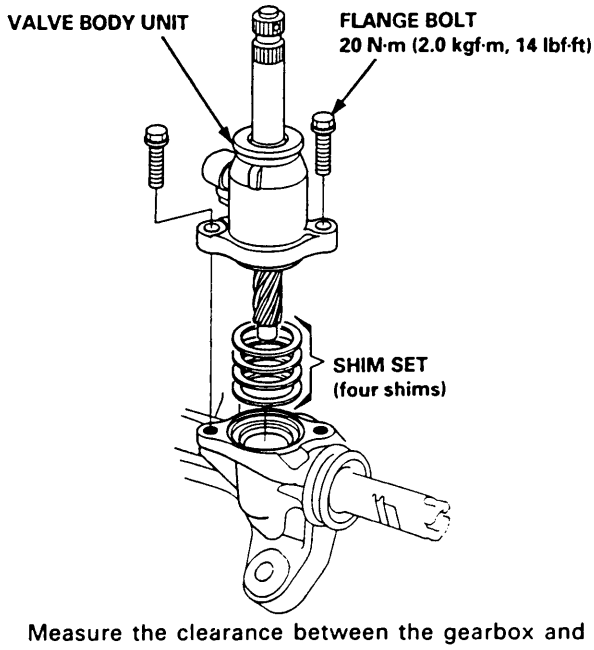
    NOTE: Only reinstall the original 32 mm shim(s) when the steering gearbox is reassembled without replacing the pinion shaft, valve housing, and gearbox housing with new ones.
    If the pinion shaft, valve housing, and gearbox housing are replaced, select the new shim(s) as follows.

Shim selection:

a. Set the four 32 mm shims on the bearing surface of the gearbox housing. Total thickness of the four shims should equal no more than 0.70 mm.
   Shim set: four 32 mm shims (Thickness: 0.10 mm, 0.15 mm, 0.20 mm, 0.25 mm respectively)

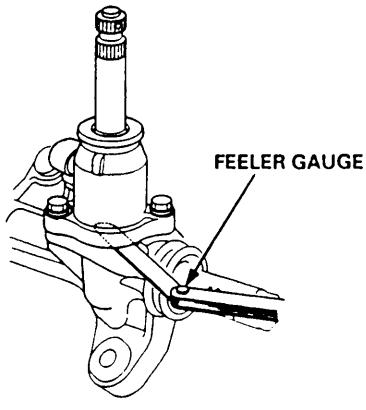
   CAUTION: The four 32 mm shims do not have thickness identification marks. Measure the thickness of each shim using a micrometer, and mark the shim for identification.

b. Install the valve body unit on the gearbox, and tighten the flange bolts to the specified torque.



c. Measure the clearance between the gearbox and valve body unit using a feeler gauge as shown.

NOTE: Measure the clearance at the point midway between the two mounting bolts.



d. Determine the required thickness of the 32 mm shims by subtracting the clearance obtained in the step "c" from the total thickness of the four shims. (Total thickness of the 4 shims) – (Clearance) = Required thickness of the shims

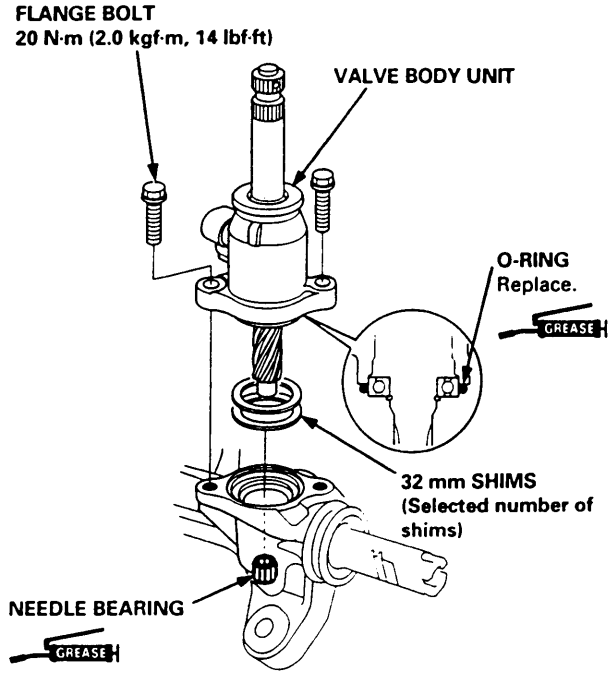
NOTE: Select the shims so that the total thickness is close to, but less than, the required thickness.

Example:
Measurement is 0.28 mm (0.011 in):
0.70 – 0.28 = 0.42 mm (0.028 – 0.011 = 0.017 in)

The selected shims should be 0.25 mm (0.010 in) and 0.15 mm (0.006 in) in thickness.

If the required shim thickness is 0.10 mm or less, no shims are necessary.

50. Set the selected 32 mm shims on the bearing surface of the gearbox housing.



51. Coat the new O-ring with grease, and carefully fit it on the valve housing.

52. Apply grease to the needle bearing in the gearbox housing.

53. Install the valve body unit on the gearbox housing by engaging the gears.

NOTE: Note the valve body unit installation position (direction of line connection).

54. Tighten the flange bolts to the specified torque.

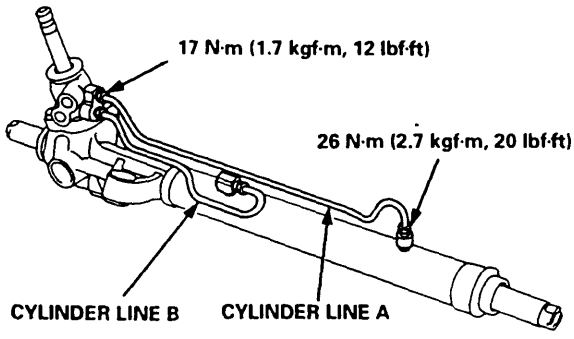
(cont'd)

Power Steering Gearbox

Reassembly (cont'd)

55. Install the cylinder lines A and B.

    NOTE:
    - Clean the joints of the cylinder lines A and B thoroughly. The joints must be free of foreign material.
    - Install the cylinder lines A and B by tighting the flare nuts by hand first, then tighten the flare nuts to the specified torque.



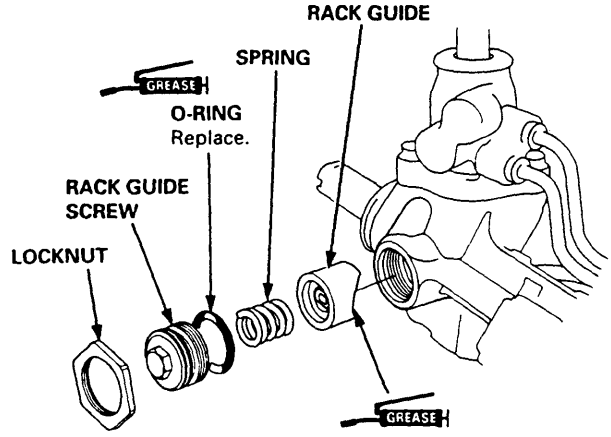
56. Grease the sliding surface of the rack guide, and install it onto the gearbox housing.

57. Apply a thin coat of grease to the new O-ring, and install it on the rack guide screw.

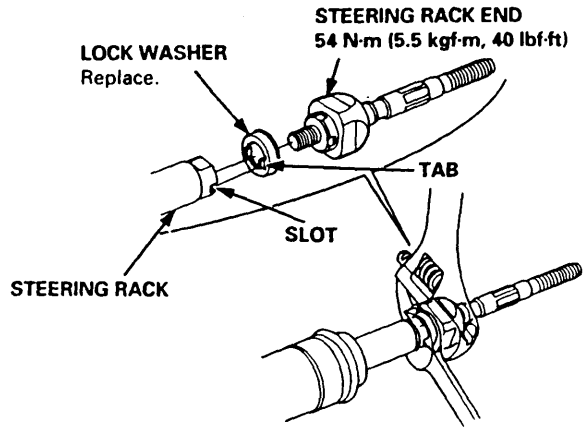
58. Install the spring, rack guide screw and locknut on the gearbox housing.

59. Adjust the rack guide screw (see page 17-15).

    NOTE: After adjusting, check that the rack moves smoothly by sliding the rack right and left.



60. Install the new lockwasher in the groove in the steering rack.

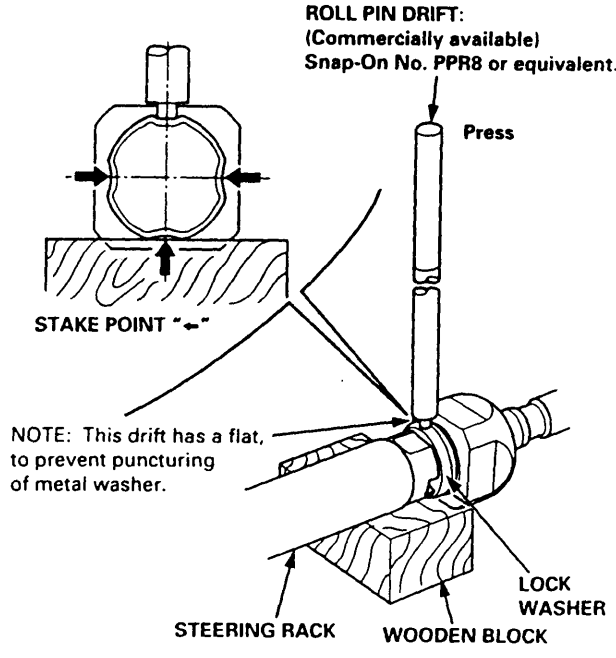


61. Screw each rack ends into the rack.

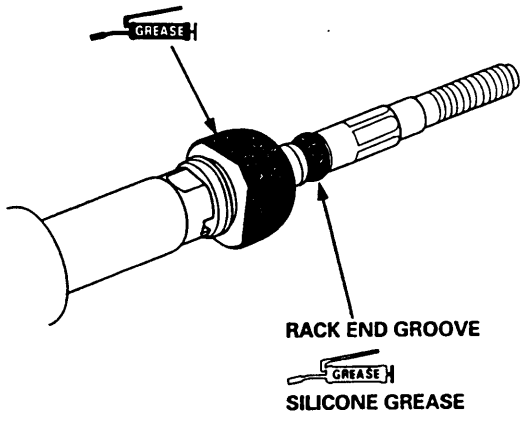
62. Hold the steering rack with a wrench, and tighten the rack ends.

    CAUTION: Be careful not to damage the rack surface with the wrench.

63. After tightening the rack ends, stake the four sections of lock washer with a drift and a mallet.
    - Place the wood block on the press table, then set the lock washer section of the rack end on the wood block securely.
    - Be sure the tool is aligned with the flat sections of the steering rack end before pressing.
    - Stake the lock washer in the center of the flat section of the steering rack end.



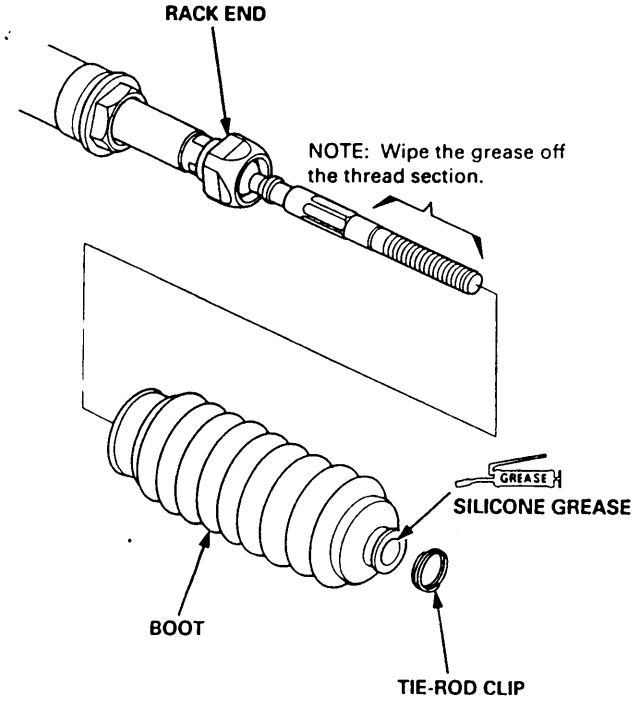
64. Apply grease to the circumference of the rack end housing.



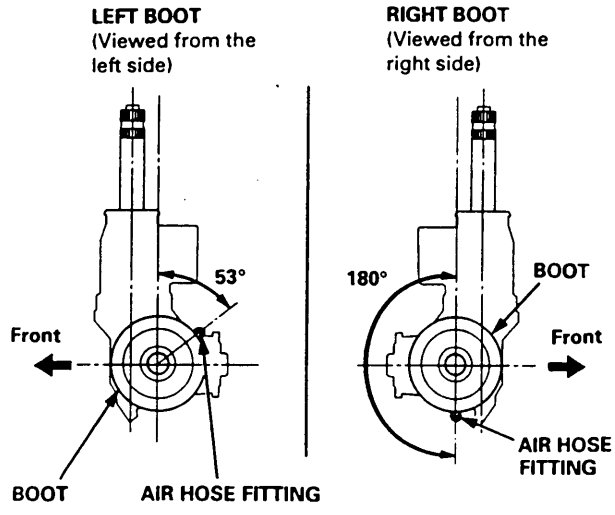
65. Apply a light coat of silicone grease to the boot grooves on the rack ends.

66. Install the boots in the rack end with the tie-rod clips.

NOTE: Install the boots with the rack in the straight ahead position (right and left tie-rods are equal in length).

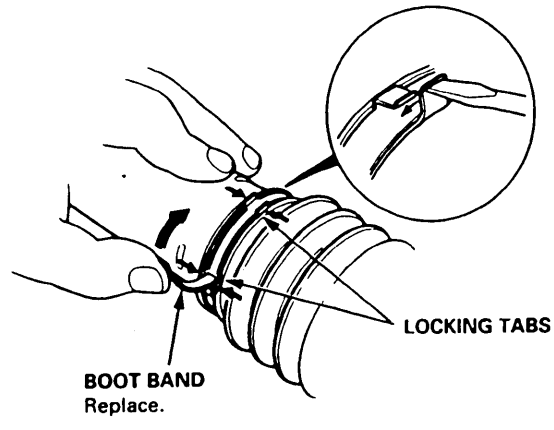


67. Adjust the air hose fitting position of the boots by turning it as shown below.



68. Install new boot bands on the boot, and bend both sets of locking tabs.

CAUTION: Stake the band locking tabs firmly.



69. Lightly tap on the doubled-over portions to reduce their height.

70. Slide the rack right and left to be certain that the boots are not deformed or twisted.

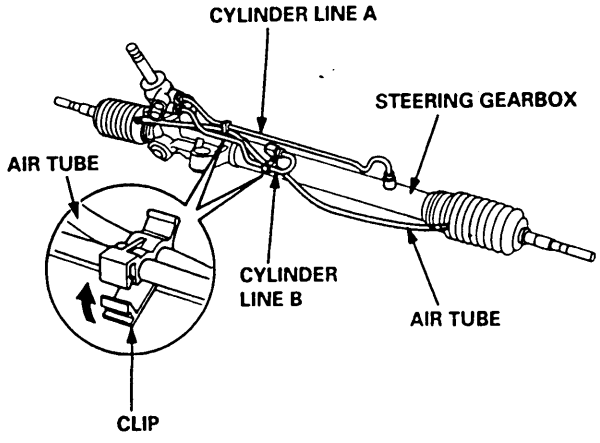
(cont'd)

Power Steering Gearbox

Reassembly (cont'd)

71. Connect the air tube between the right and left boot.

72. Install the clips on the cylinder lines, then clamp the air tube with the clips.



Installation

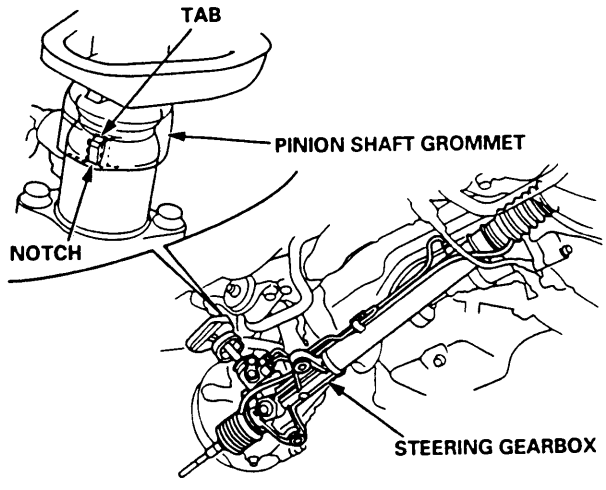
CAUTION: Be careful not to bend or damage the pump outlet hose and cylinder lines when installing the gearbox.

1. Before installing the gearbox, slide the rack all the way to right.

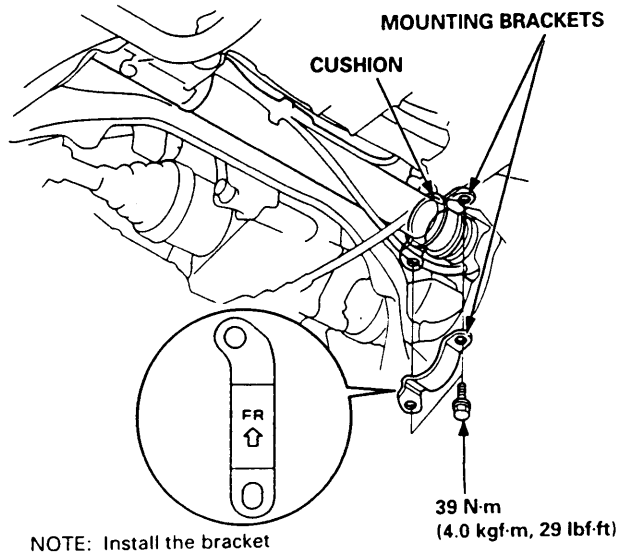
2. Install the mounting cushion on the steering gearbox.

3. Install the pinion shaft grommet, then insert the pinion shaft up through the bulkhead.

   NOTE: Align the notch in the pinion shaft grommet with the tab on the valve housing.



4. Install the mounting bracket over the mounting cushion, then install two gearbox mounting bolts.

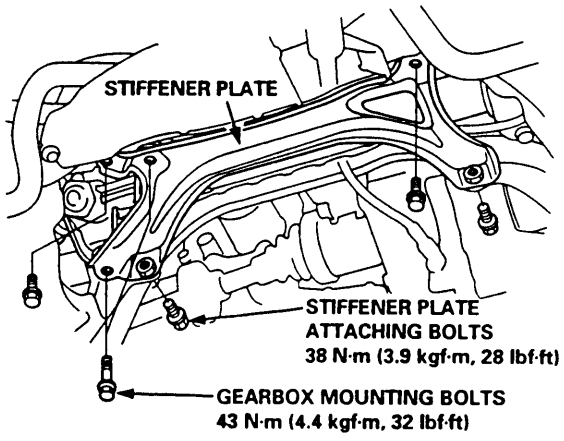


NOTE: Install the bracket with the arrow pointing toward the front.

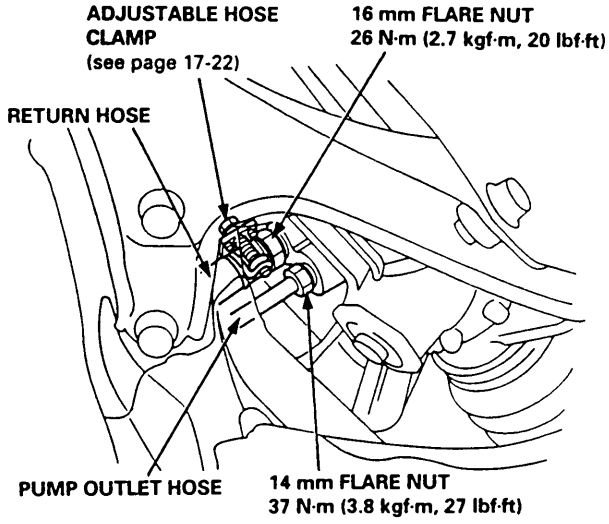
5. Install the stiffener plate with the two gearbox mounting bolts and stiffener plate attaching bolts.

   CAUTION: Be sure the air tube is not caught or pinched by stiffener plate.

   NOTE: Install the bolts loosely first, then tighten them securely.



6. Install the return hose joint by tightening the 16 mm flare nut.



7. Connect the return hose securely, and tighten the adjustable hose clamp from the engine compartment.

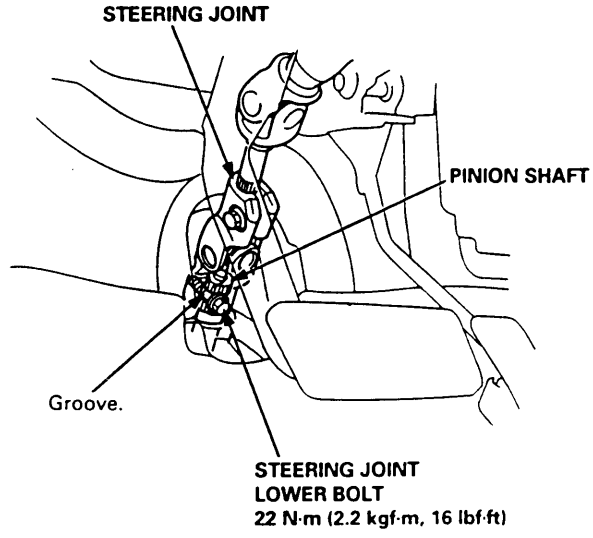
8. Connect the pump outlet hose and tighten the 14 mm flare nut.

   NOTE: Make sure that there is no interference between the fluid lines, the rear beam or any other parts.

9. Center the steering rack within its stroke.

10. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft), and tighten the lower bolt.

    NOTE:
    - Connect the steering shaft and pinion with the cable reel and steering rack centered.
    - Be sure that the lower steering joint bolt is securely in the groove in the steering gearbox pinion.
    - If the steering wheel and rack are not centered, reposition the serrations at lower end of the steering joint.

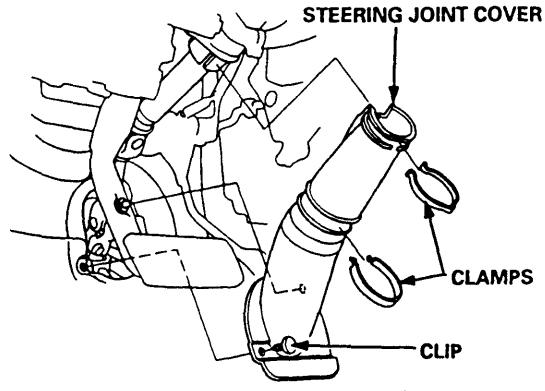


11. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (approximately two turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see page 17-17).

(cont'd)

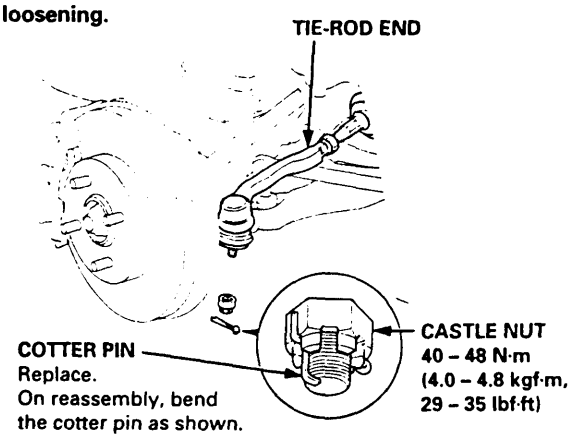
Installation (cont'd)

12. Install the steering joint cover with the clamps and a clip.



13. Reconnect the tie-rod ends to the steering knuckles, tighten the castle nut to the specified torque, and install new cotter pins.
NOTE: Before connecting the tie-rod ends, wipe off any grease contamination from the ball joint tapered section and threads.

CAUTION: Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



14. Install exhaust pipe A (see section 9).
15. Connect the shift linkage (see section 13 or section 14).
16. Install the front wheels.
17. Fill the system with power steering fluid, and bleed air from the system (see page 17-15).
18. 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 17-22).
    - Adjust the front toe (see section 18).
    - Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods, if necessary.

NOTE: Turn the right and left tie-rods equally.

Ball Joint Boot Replacement

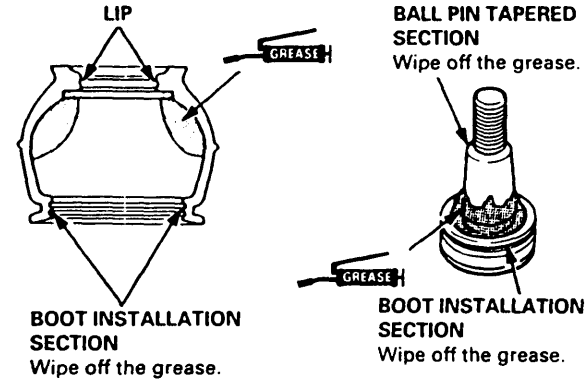
1. Remove the boot set ring and the boot.

CAUTION: Do not contaminate the boot installation section with grease.

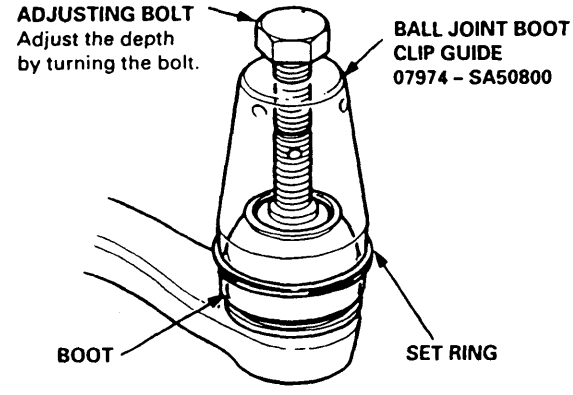
2. Pack the interior of the boot and lip with grease.

3. Wipe the grease off the sliding surface of the ball pin, then pack the lower area with fresh grease.

CAUTION:
- **Keep grease off the boot installation section and the tapered section of the ball pin.**
- **Do not allow dust, dirt, or other foreign materials to enter the boot.**



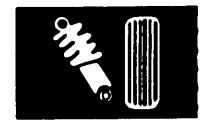
4. Install the boot in the groove of the boot installation section securely, then bleed the air from the boot.



5. Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the set ring over the tool and into position.

CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

Suspension



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAF – SE00200	Hub Assembly Guide Attachment	1	18-14
②	07GAF – SE00401	Hub Dis/Assembly Base	1	18-13
③	07GAG – SD40700	Ball Joint Boot Clip Guide	1	18-16
④	07JAF – SH20110	Hub Dis/Assembly Pilot, 38 mm	1	18-13
⑤	07JAF – SH20120	Hub Dis/Assembly Shaft, 22.4 x 25.4 mm	1	18-13
⑥	07JAF – SH20200	Ball Joint Remover Base	1	18-15
⑦	07MAC – SL00200	Ball Joint Remover, 28 mm	1	18-11, 12
⑧	07746 – 0010500	Attachment, 62 x 68 mm	1	18-13
⑨	07749 – 0010000	Driver	1	18-13
⑩	07947 – 6340201	Driver Attachment	1	18-14
⑪	07965 – SB00100	Ball Joint Remover/Installer	1	18-15
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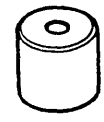
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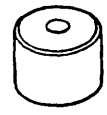
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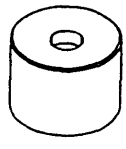
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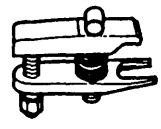
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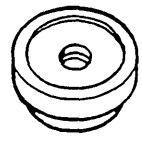
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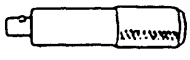
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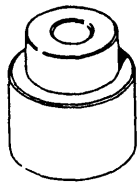
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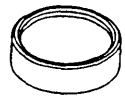
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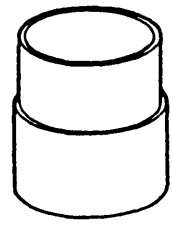
⑬

Component Locations

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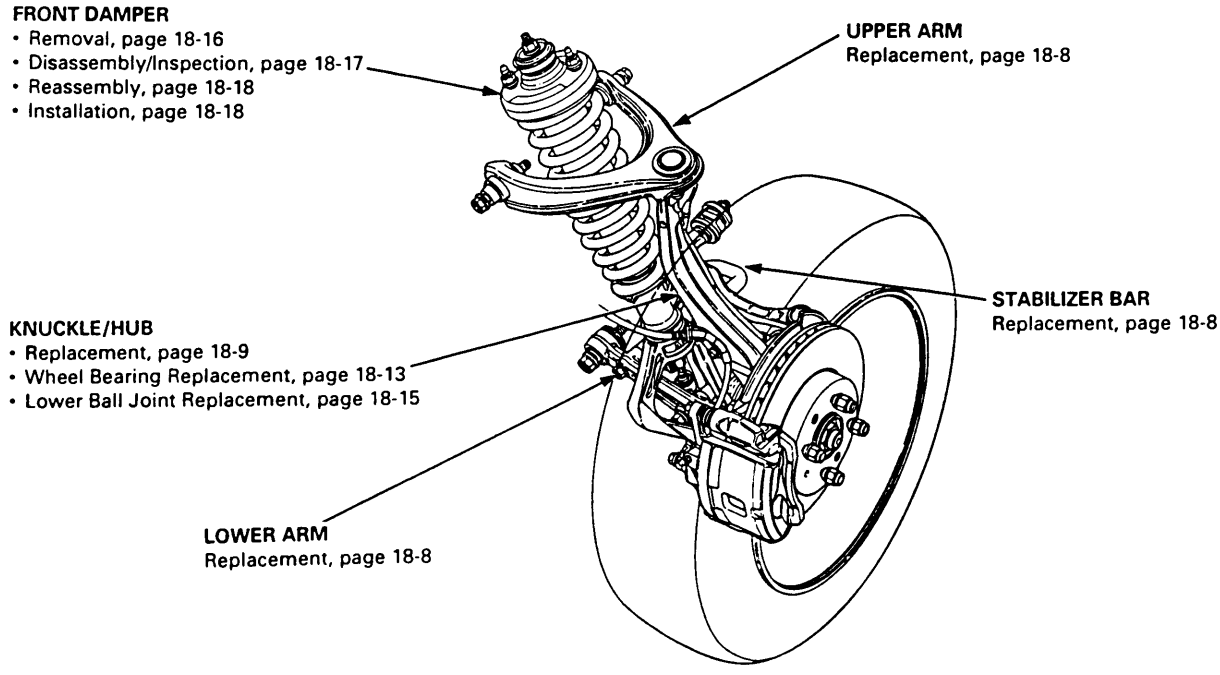
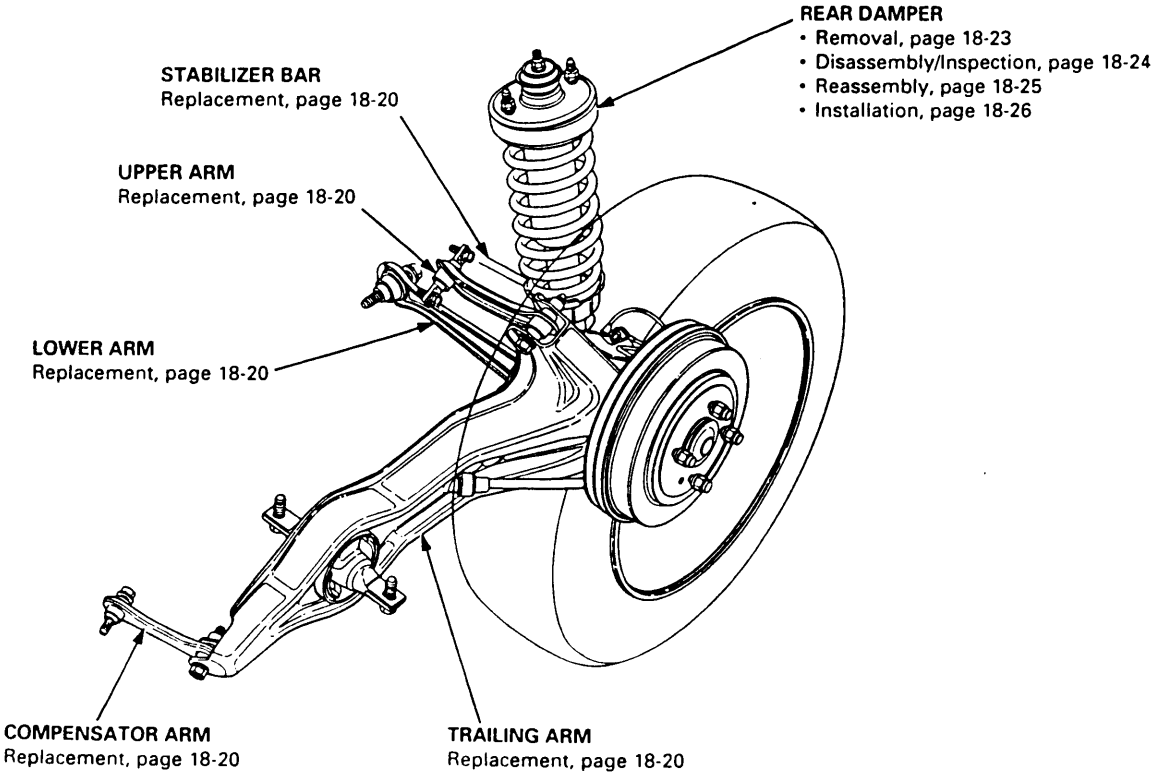
Front Suspension:



Rear Suspension:

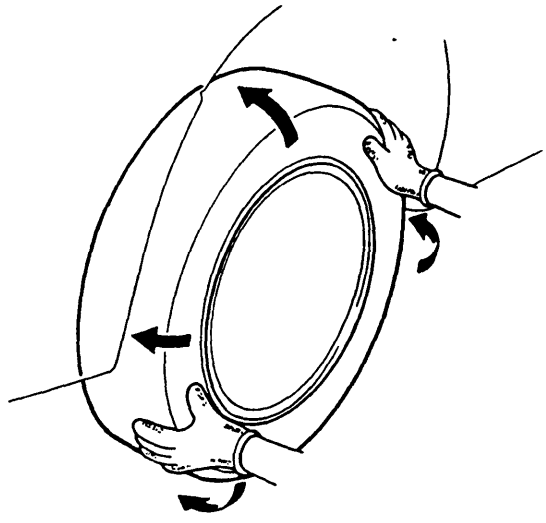


Wheel Alignment

Caster

NOTE: For proper inspection/adjustment of the wheel alignment check and adjust the following before checking the alignment.

- Check that the suspension is not modified.
- Check the tire size and tire pressure.
- Check the runout of the wheels and tires.
- 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.)



Inspection

NOTE: 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. Check the caster angle.

   Caster angle: 1°40′ ± 1°

2. If out of specification, check for bent or damaged suspension components.

Camber

Inspection

NOTE: 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. Check the camber angle.

   Camber angle:
   Front: 0°00′ ± 1°
   Rear: – 1° ± 1°

2. If out of specification, check for bent or damaged suspension components.

Front Toe Inspection/Adjustment

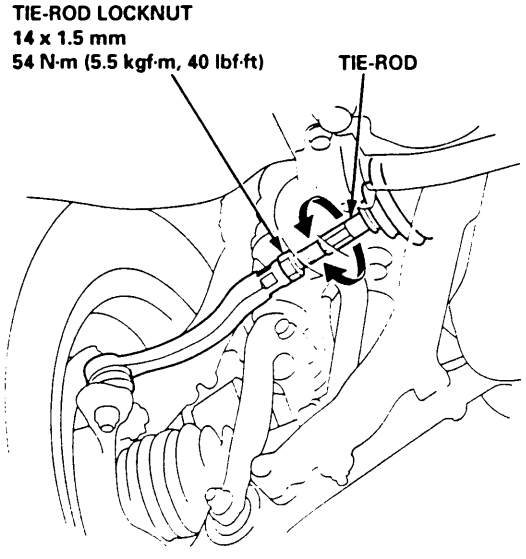
NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Check the tire pressure.
2. Center steering wheel spokes.
3. Check the toe with the wheels pointed straight ahead.

   Front toe: IN 2 ± 2 mm (IN 0.08 ± 0.08 in)

   — If adjustment is required, go on to step 4.

   — If no adjustment is required, remove alignment equipment.
4. Loosen the tie-rod locknuts, and turn both tie-rods in the same direction until the front wheels are in straight ahead position.



5. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.
6. After adjusting, tighten the tie-rod locknuts.

   NOTE: Reposition the tie-rod boot if it is twisted or displaced.

Rear Toe Inspection/Adjustment

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

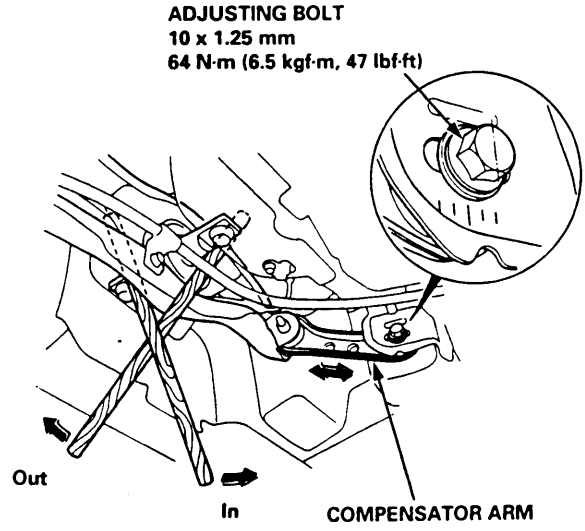
1. Release parking brake.

   NOTE:
   - Measure difference in toe measurements with the wheels pointed straight ahead.
   - If the parking brake is engaged, you may get an incorrect reading.

   Rear toe-in: 2 ± 2 mm (0.08 ± 0.08 in)

   — If adjustment is required, go to step 2.

   — If no adjustment is required, remove alignment equipment.
2. Before adjustment, note the locations of adjusting bolts on the right and left compensator arms.
3. Loosen the adjusting bolts, and slide the compensator arm in or out, as shown, to adjust the toe.



4. Tighten the adjusting bolts.

   Example: After the rear toe inspection, the wheel is 2 mm (0.08 in) out of the specification.
   — Move the arm so the adjusting bolt moves 2 mm (0.08 in) inward from the position recorded before the adjustment.
   — The distance the adjusting bolt is moved should be equal to the amount out-of-specification.

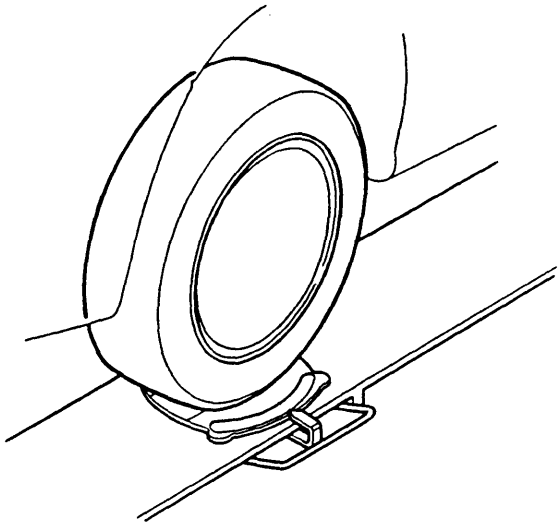
Wheel Alignment

Turning Angle Inspection

NOTE: 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 wheel: 35°50'
   Outward wheel (reference): 30°50'



2. If the turning angle is not within the specifications, check for bent or damaged suspension components.

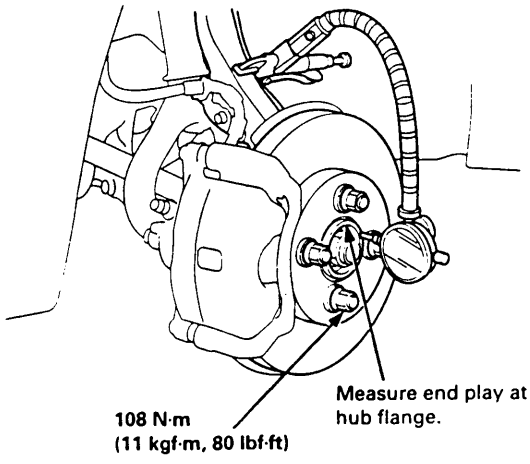
Wheel/Hub Inspection

Bearing End Play

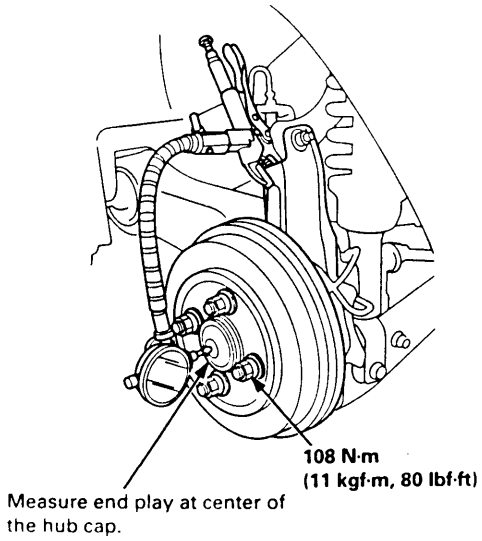
1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see section 1).
2. Remove the wheels, then reinstall the wheel nuts.
3. Attach the dial gauge as shown.
4. Measure the bearing end play by moving the disc in or outward.

Front/Rear:
Standard: 0 – 0.05 mm (0 – 0.002 in)

Front:



Rear:

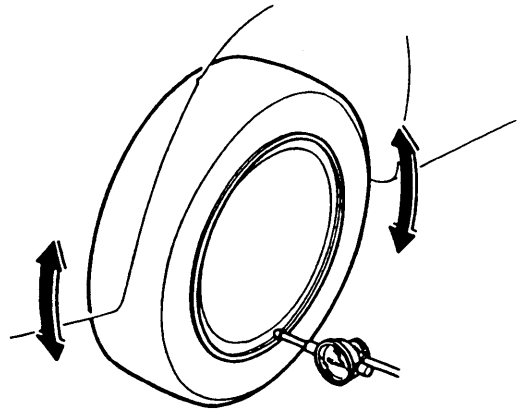


5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

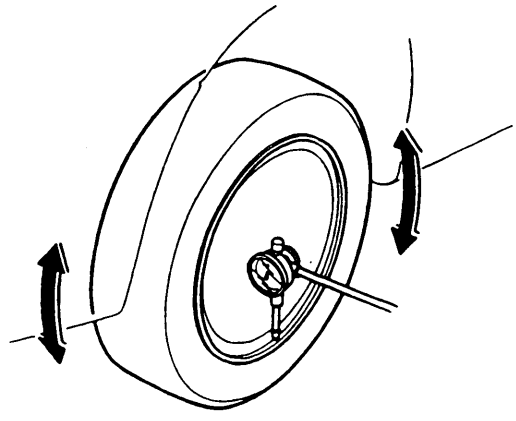
Wheel Runout

1. Raise the vehicle off the ground, and support it with safety stands in the proper locations (see section 1).
2. Check for bent or deformed wheels.
3. Attach the dial gauge as shown.
4. Measure the wheel runout by turning the wheel.

Front and Rear Wheel Axial Runout:
Standard:
Steel Wheel: 0 – 1.0 mm (0 – 0.04 in)
Aluminum Wheel: 0 – 0.7 mm (0 – 0.03 in)
Service Limit: 2.0 mm (0.08 in)



Front and Rear Wheel Radial Runout:
Standard:
Steel Wheel: 0 – 1.0 mm (0 – 0.04 in)
Aluminum Wheel: 0 – 0.7 mm (0 – 0.03 in)
Service Limit: 1.5 mm (0.06 in)



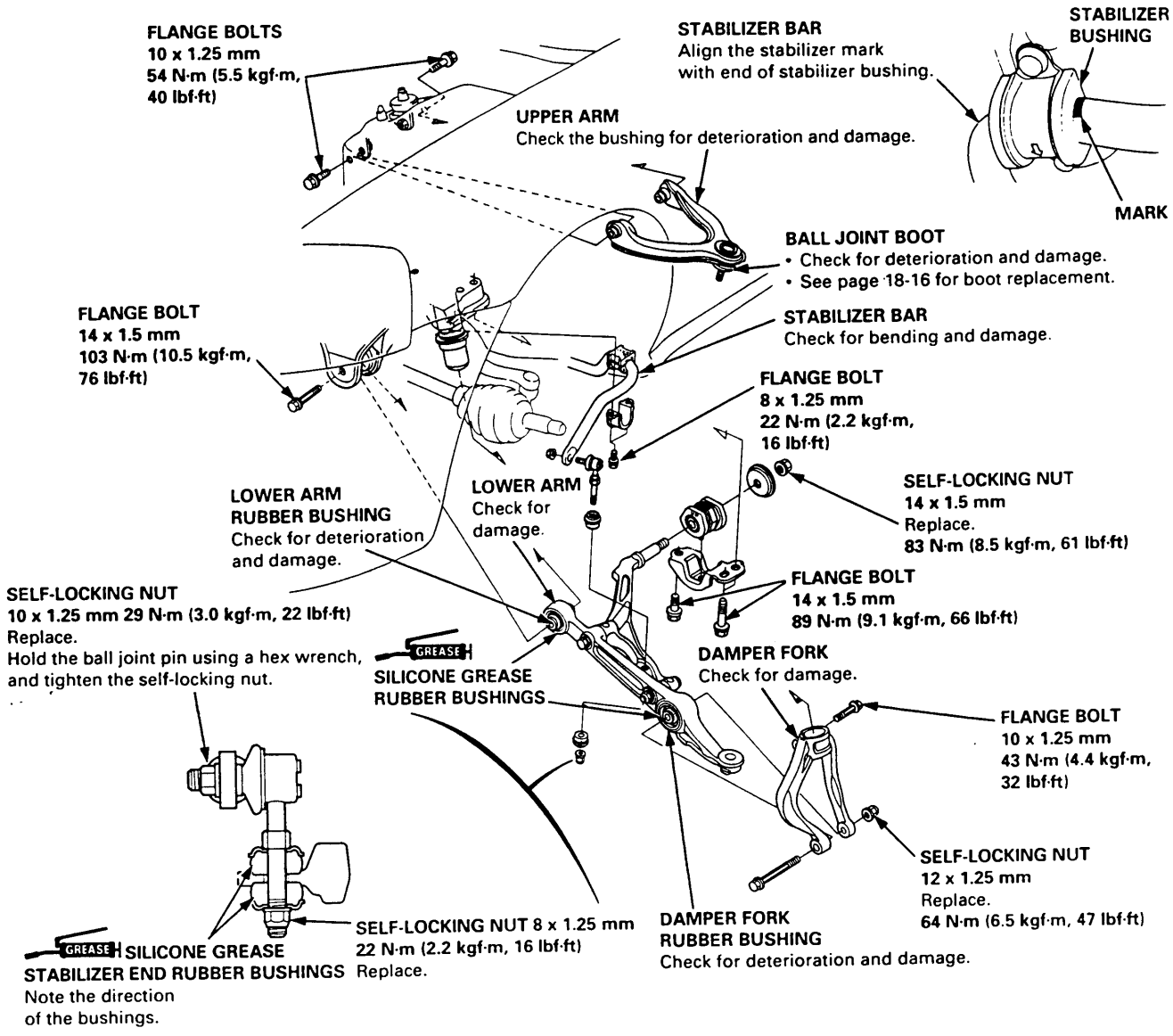
5. If the wheel runout is more than the service limit, replace the wheel.

Front Suspension

Suspension Arms Replacement

CAUTION:
- **Replace the self-locking nuts after removal.**
- **The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.**

NOTE:
- Wipe off any dirt, oil from grease on the threads before tightening the fasteners.
- The right and left damper forks are not interchangeable. The left damper fork is marked with "AL" while the right damper fork is marked with "AR".
- The right and left upper arms are not interchangeable. The left upper arm is marked with "SO1-L" while the right arm is marked with "SO1-R".
- Before tightening the upper and lower mounting nuts on the stabilizer link, adjust the location of the link with the suspension under vehicle load.
- When installing the radius arm washers, the "FR" mark faces the front of the vehicle.
- After installing the suspension arm, check the front wheel alignment, and adjust if necessary (see page 18-4).



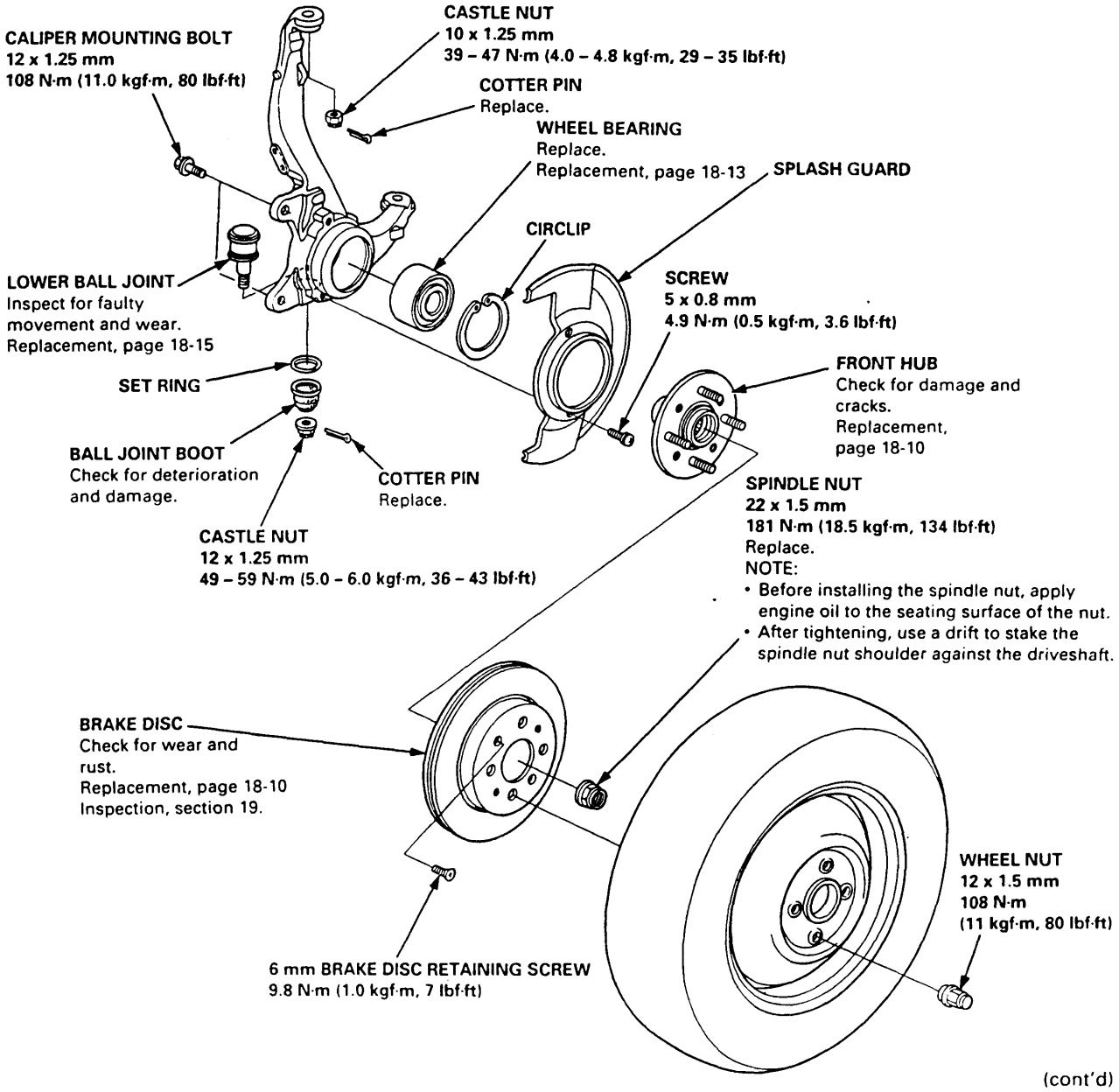
Knuckle/Hub Replacement

CAUTION:

- **Replace the self-locking nuts after removal.**
- **The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.**
- **Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.**

NOTE:

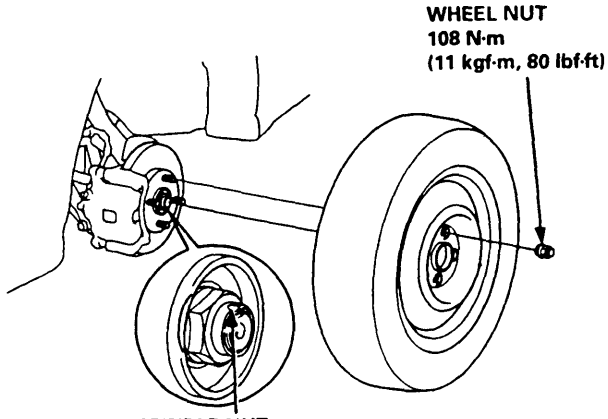
- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- On the aluminum wheels, remove the center cap from the inside of the wheel after removing the wheel.
- Before installing the brake disc, clean the mating surfaces of the front hub and brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and wheel.
- Wipe off the grease before tightening the nut at the ball joint.



(cont'd)

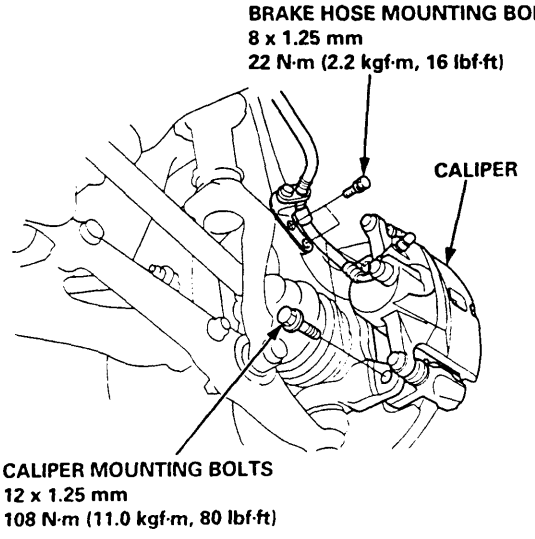
Knuckle/Hub Replacement (cont'd)

1. Loosen the wheel nuts slightly.
2. Raise the front of vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and wheel.

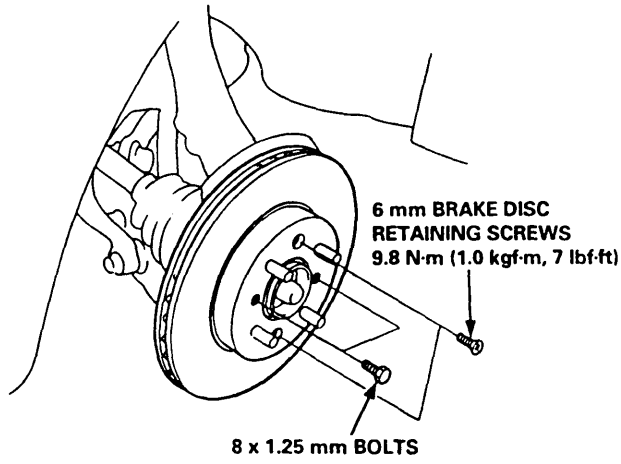


4. Raise the locking tab on the spindle nut, then remove the nut.
5. Remove the brake hose mounting bolts.

CAUTION: To prevent accidental damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.



6. Remove the caliper mounting bolts and hang the caliper assembly to one side.
7. Remove the 6 mm brake disc retaining screws.

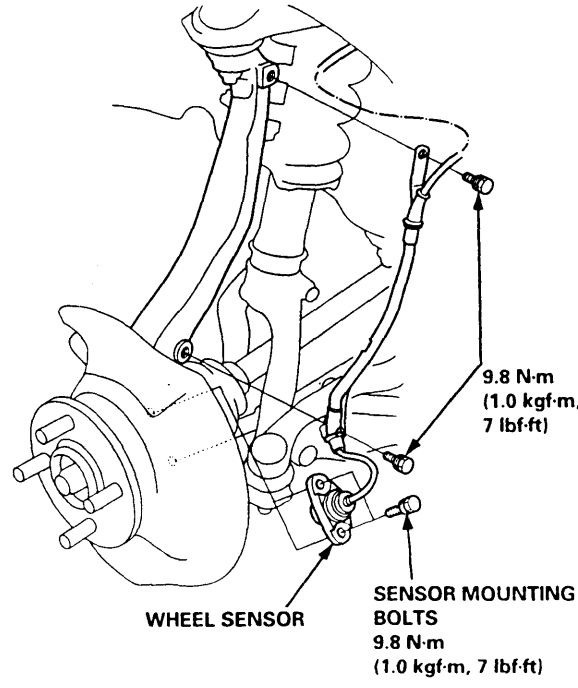


8. Screw two 8 x 1.25 mm bolts into the disc to push it away from the hub.

   NOTE: Turn each bolt two turns at a time to prevent cocking the disc excessively.

9. Remove the brake disc from the knuckle.
10. Check the front hub for damage and cracks.
11. Remove the wheel sensor from the knuckle (for vehicles with ABS).

    NOTE: Do not disconnect the wheel sensor connector.



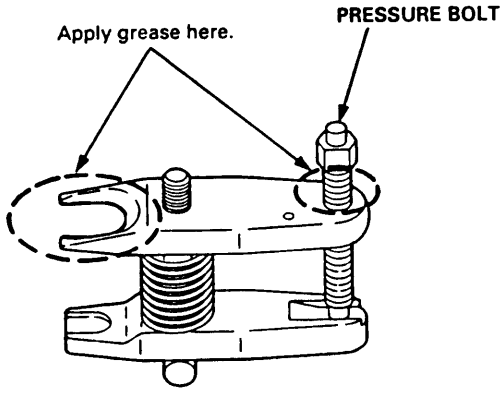
NOTE: Use the special tool to separate the ball joints from the suspension or steering arm.

CAUTION: Be careful not to damage the ball joint boot.

12. Clean any dirt or grease off the ball joint.

13. Remove the cotter pin from the steering arm and remove the nut.

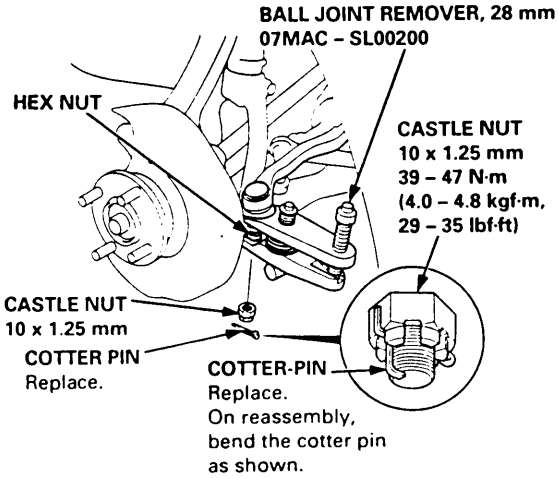
14. Apply grease to the special tool on the areas shown. This will ease installation of the tool and prevent damage to the pressure bolt threads.



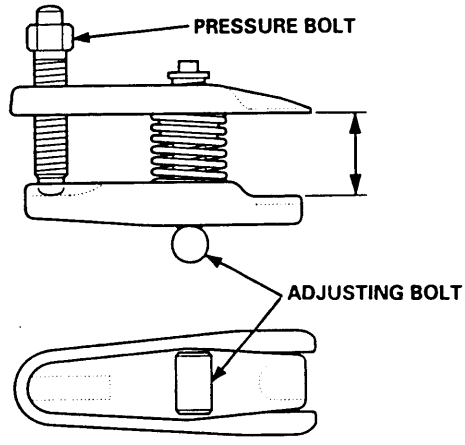
15. Install a 10 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end to prevent damage to the threaded end of the ball joint.

16. Install the special tool as shown. Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



17. Once the special tool is in place, turn the adjusting bolt as necessary to make the jaws parallel. Then hand-tighten the pressure bolt, and recheck the jaws to make sure they are still parallel.



    NOTE: After making the adjustment to the adjusting bolt, be sure the head of the adjusting bolt is in this position to the allow the jaw to pivot.

18. With a wrench, tighten the pressure bolt until the ball joint shaft pops loose from the steering arm.

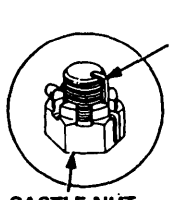
    ⚠ WARNING Wear eye protection. The ball joint can break loose suddenly and scatter dirt or other debris in your eyes.

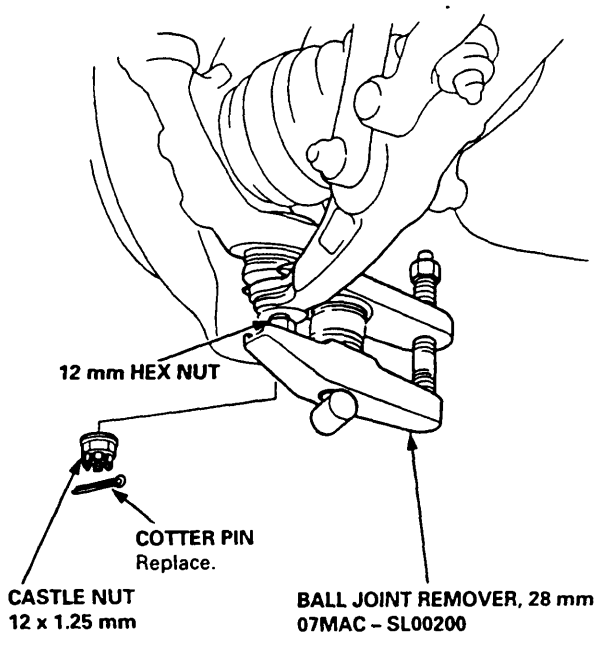
19. Remove the tool, then remove the nut from the end of the ball joint and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot and replace it if damaged.

(cont'd)

Knuckle/Hub Replacement (cont'd)

20. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.



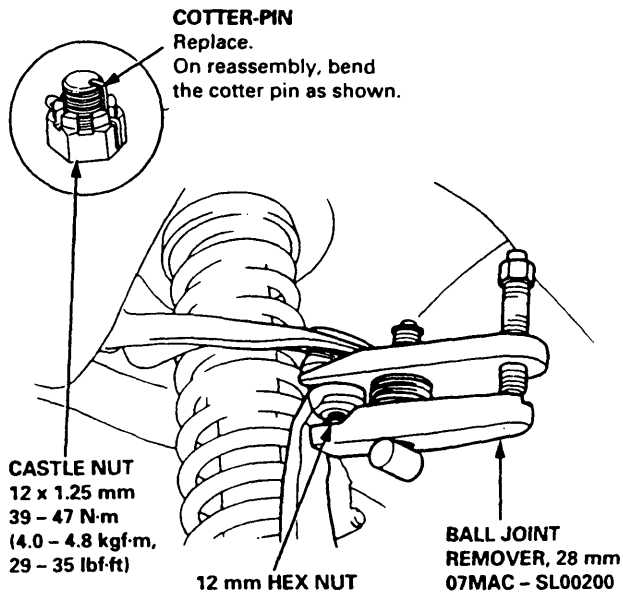


21. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

22. Use the special tool as shown on page 18-11 to separate the ball joint and lower arm.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

23. Remove the cotter pin from the upper ball joint castle nut, and remove the nut.

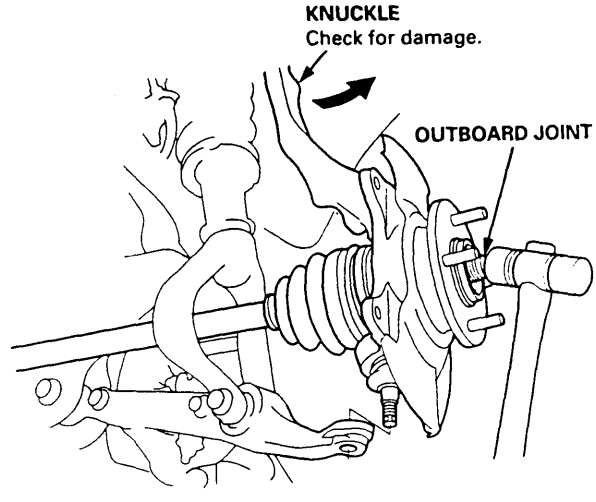


24. Install the 12 mm hex nut on the ball joint.
    Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

25. Use the special tool as shown on page 18-11 to separate the ball joint and knuckle.

    NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

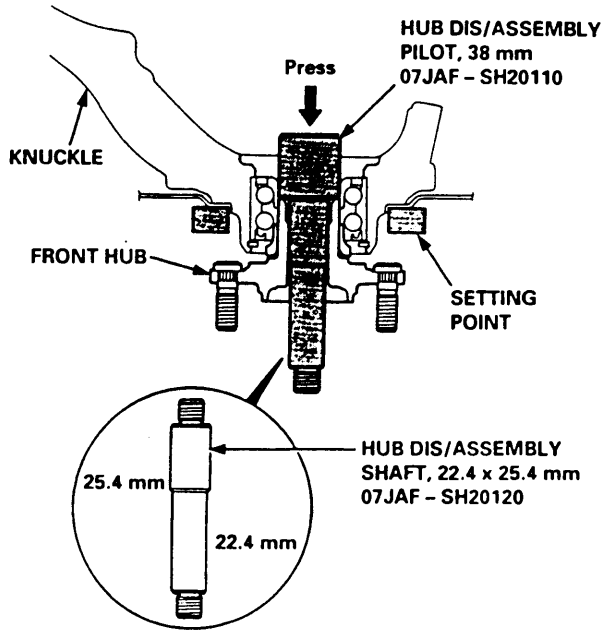
26. Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle by tapping the driveshaft end with a plastic hammer, then remove the knuckle.



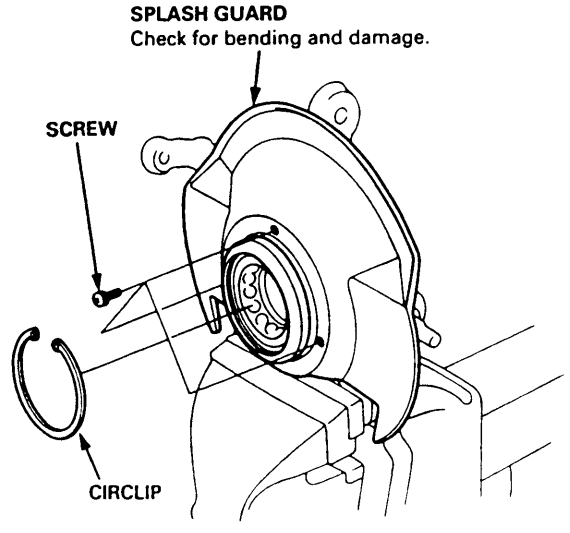
NOTE: Replace the bearing with a new one after removal.

27. Separate the hub from the knuckle using the special tools and a hydraulic press.

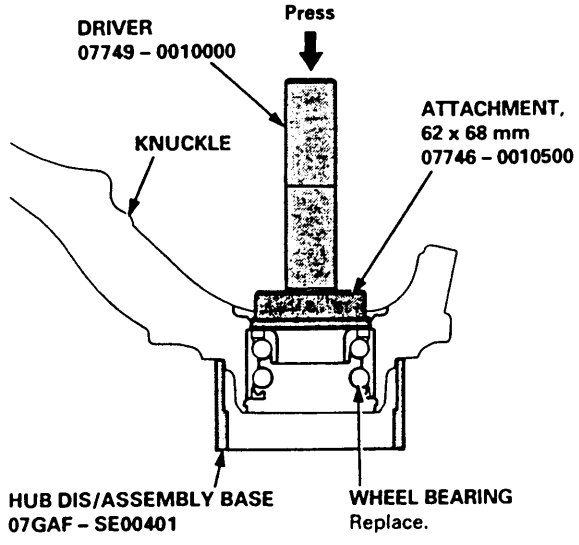
CAUTION:
- **Take care not to distort the splash guard.**
- **Hold onto the hub to keep it from falling when pressed clear.**
- **To prevent damage to the tool, make sure the threads are fully engaged before pressing.**



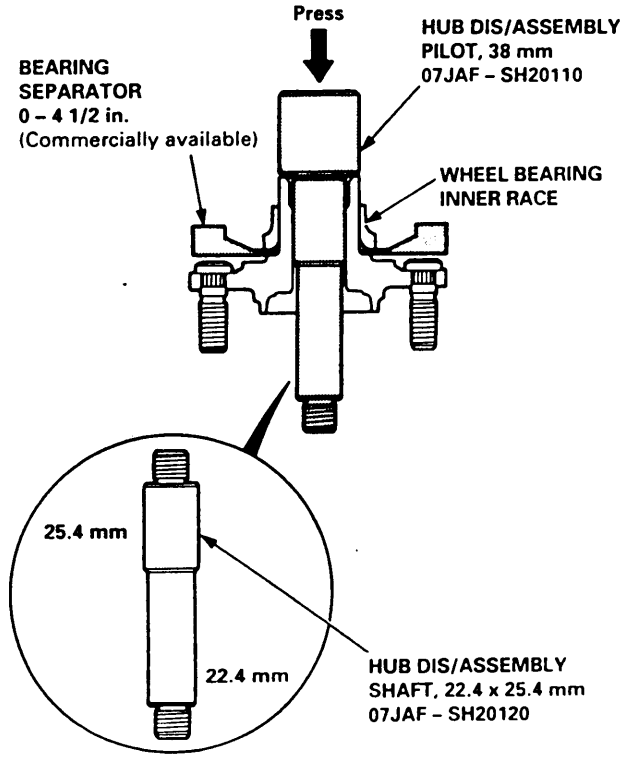
28. Remove the circlip and the splash guard from the knuckle.



29. Press the wheel bearing out of the knuckle using the special tools and a press as shown.



30. Press the wheel bearing inner race from the hub using the special tools, a bearing separator, and a press as shown.



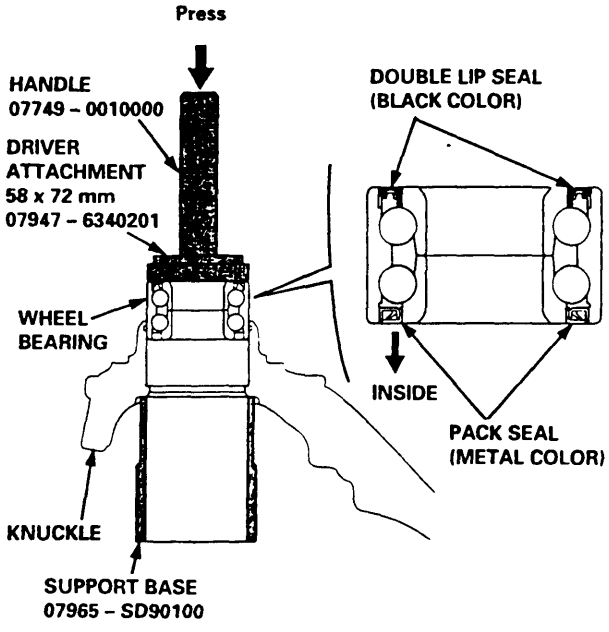
(cont'd)

Knuckle/Hub Replacement (cont'd)

NOTE: Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

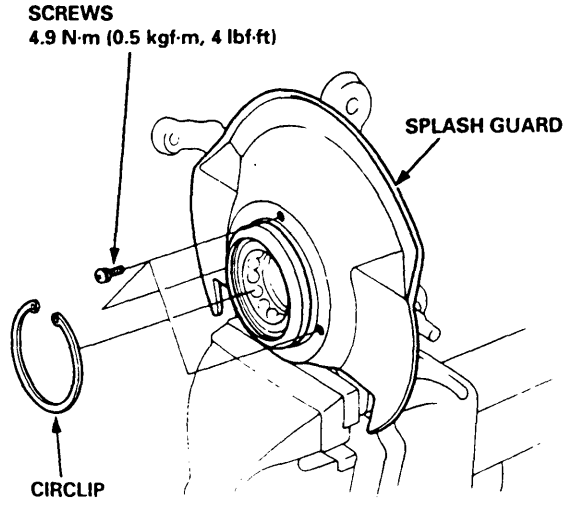
31. Press a new wheel bearing into the knuckle using the special tools and a press as shown.

    NOTE: Place the wheel bearing on the knuckle with the pack seal (metal color) toward the inside. Be careful not to damage the sleeve of the pack seal.



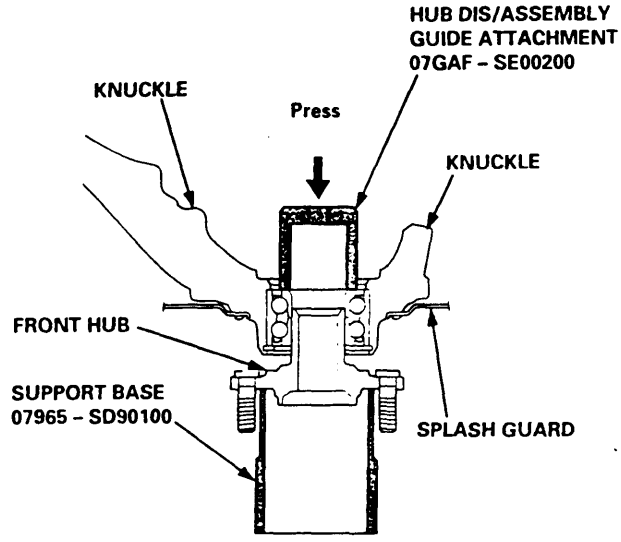
32. Install the circlip securely in the knuckle groove.

33. Install the splash guard and tighten the screws.



34. Install the hub on the knuckle using the special tools shown and a hydraulic press as shown.

    CAUTION: Take care not to distort the splash guard.

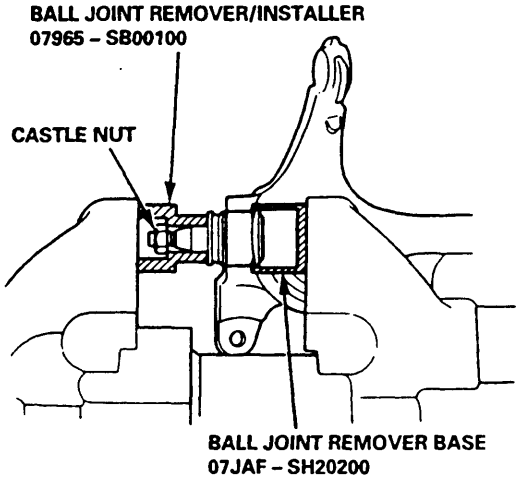


35. Install the knuckle in the reverse order of removal, and pay particular attention to the following items:

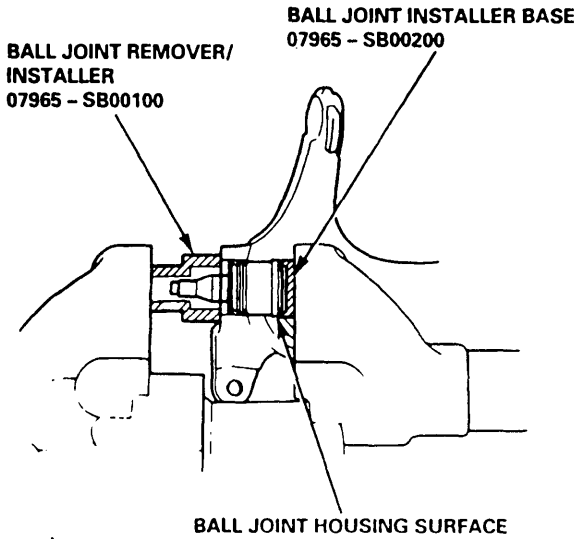
- Be careful not to damage the ball joint boots when installing the knuckle.
- Torque all mounting hardware to the specified torque values.
- Torque the castle nuts to the lower torque specifications, then tighten them only far enough to align the slot with the pin hole. Do not align the castle nut by loosening.
- Install new cotter pins on the castle nuts after torquing.
- Avoid twisting the sensor wires when installing the wheel sensor.
- Before installing the brake disc, clean the mating surfaces 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 18-4).

Lower Ball Joint Replacement

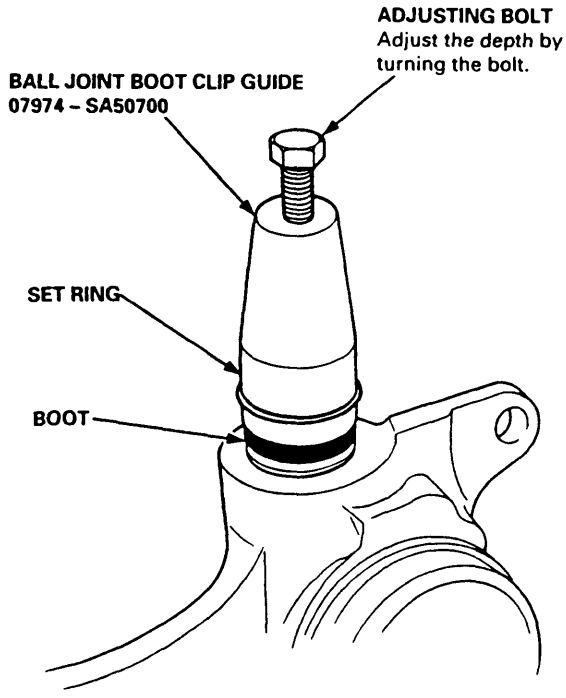
1. Remove the knuckle (see page 18-10).
2. Remove the boot by prying the set ring off.
3. Check the boot for deterioration and damage, replace if necessary.
4. Install the special tools on the ball joint and tighten the castle nut.
5. Position the special tools over the ball joint as shown, then set the assembly in a vise. Press the ball joint out of the knuckle.



6. Place the ball joint in position by hand.
7. Install the special tools over the ball joint as shown, then press the ball joint in.



8. Install the ball joint boot and set ring using the special tool (see page 18-16).



9. Install the knuckle in the reverse order of removal, and pay particular attention to the following items:

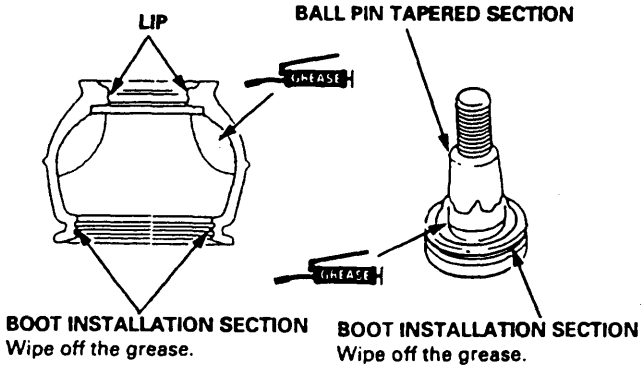
- Be careful not to damage the ball joint boots when installing the knuckle.
- Torque all mounting hardware to the specified torque values.
- Torque the castle nuts to the lower torque specifications, then tighten them only far enough to align the slot with the pin hole. Do not align the castle nut by loosening.
- Install new cotter pins on the castle nuts after torquing.
- Avoid twisting the sensor wires when installing the wheel sensor.
- Before installing the brake disc, clean the mating surfaces 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 18-4).

Ball Joint Boot Replacement

1. Remove the set ring and the boot.

   CAUTION: Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.



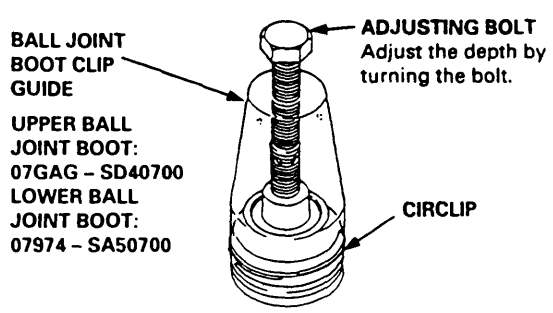
3. Wipe the grease off the sliding surface of the ball pin and pack with fresh grease.

   CAUTION:
   - **Keep grease off the boot installation section and the tapered section of the ball pin.**
   - **Do not allow dust, dirt, or other foreign materials to enter the boot.**

4. Install the boot in the groove of the boot installation section securely, then bleed air.

5. Install the upper and lower ball joint boot set rings using the special tools as follows:

   Lower ball joint: Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the set ring over the tool and into position.

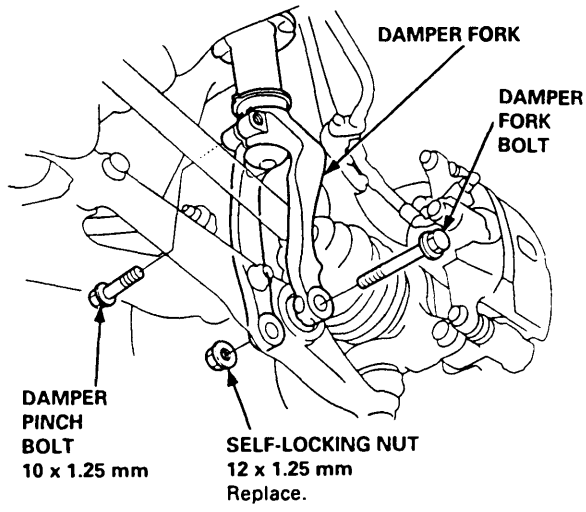


CAUTION: After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

Removal

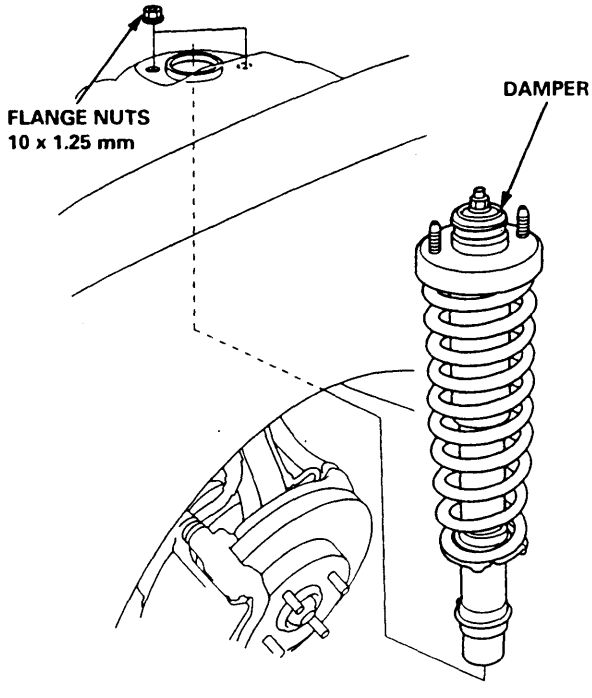
1. Remove the front wheels (see page 18-10).

2. Remove the damper pinch bolt from the top of damper fork.



3. Remove the damper fork bolt and self-locking nut from the bottom of the damper fork, then remove damper fork.

4. Remove the damper by removing the two nuts.

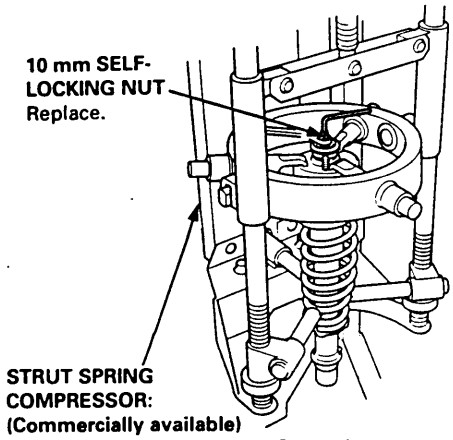


Disassembly/Inspection

Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's linstructions, then remove the self-locking nut.

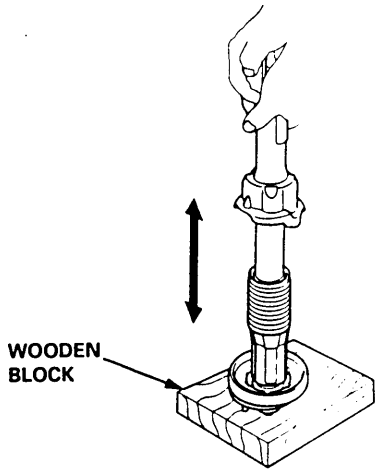
   CAUTION: Do not compress the spring more than necessary to remove the nut.



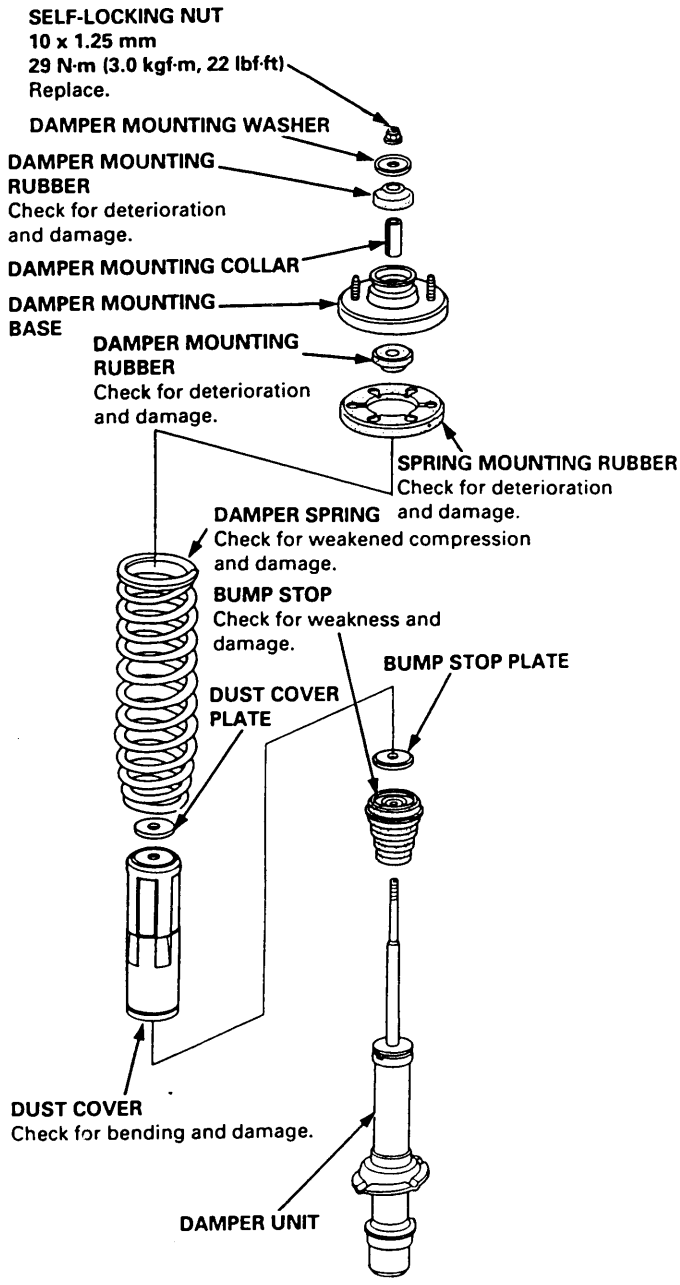
2. Release the pressure from the spring compressor, then disassemble the damper as shown in the next column.

Inspection

1. Reassemble all parts, except the spring.
2. Push on the damper assembly as shown.



3. Check for smooth operation through a full stroke, both compression and extension.
   NOTE: The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.
4. Check for oil leaks, abnormal noises or binding during these tests.

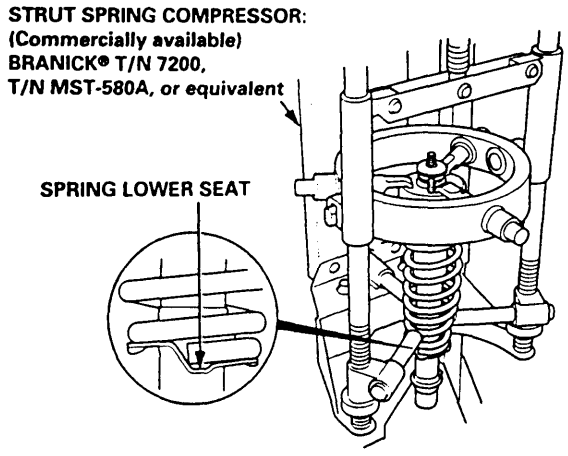


Front Damper

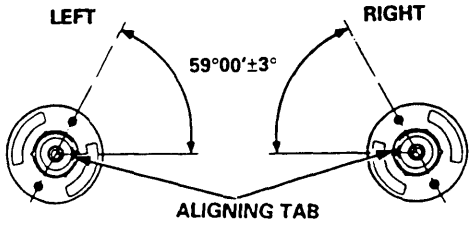
Reassembly

1. Install the damper unit on a spring compressor.
2. Assemble the damper in reverse order of removal except the damper mounting washer and self locking nut.

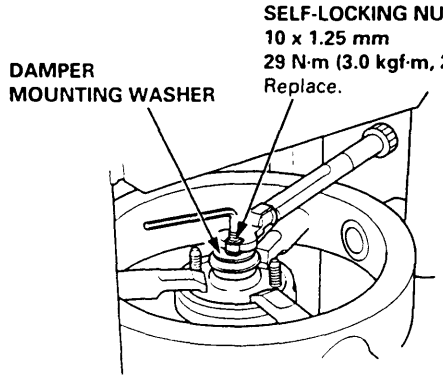
   NOTE: Align the bottom of damper spring and spring lower seat as shown.



3. Position the damper mounting base on the damper unit as shown.

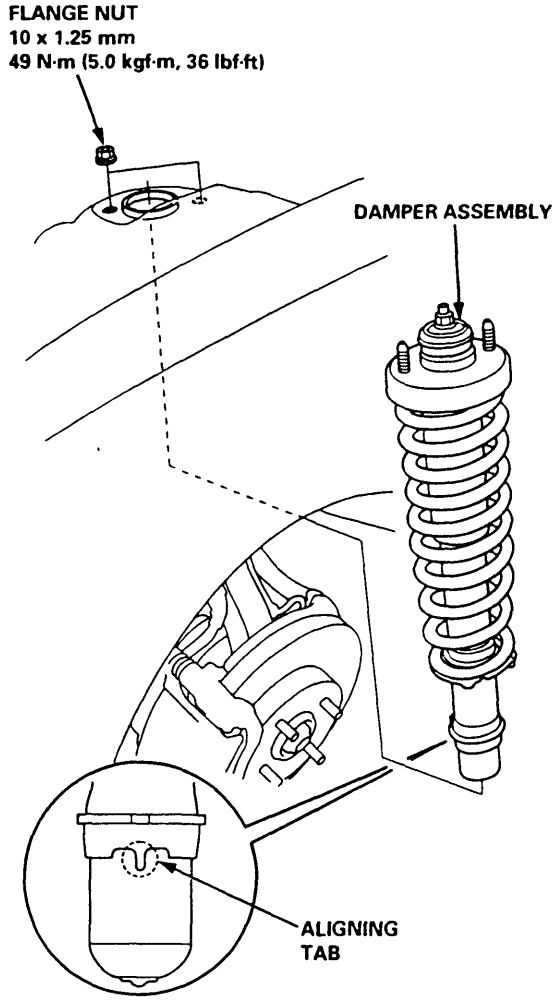


4. Compress the damper spring.
5. Install the damper mounting rubber, damper mounting washer and a new 10 mm self-locking nut.
6. Hold the damper shaft and tighten the 10 mm self-locking nut.

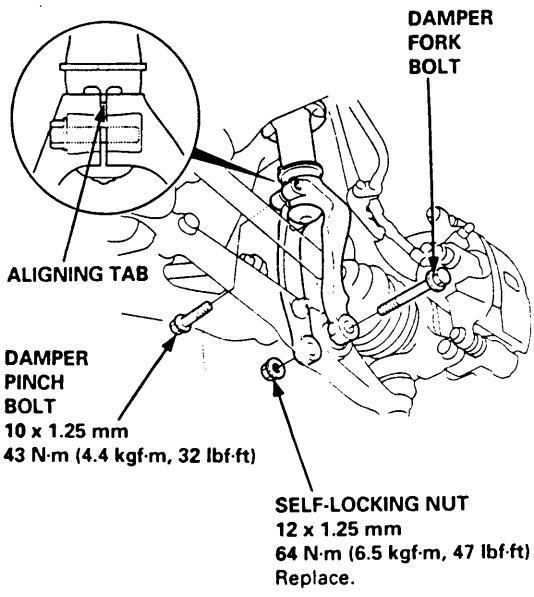


Installation

1. Loosely install the damper on the frame with the aligning tab facing inside, then loosely install the two flange nuts.



2. Install the damper fork over the driveshaft and onto the lower arm. Install the front damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.



3. Loosely install the damper pinch bolt on the top of the damper fork.
4. Loosely install the damper fork bolt and a new self-locking nut on the bottom of the damper fork.
5. Raise the knuckle with a floor jack until the vehicle just lifts off the safety stand.

⚠WARNING The floor jack must be securely positioned or personal injury may result.

6. Tighten the damper pinch bolt.
7. Tighten the damper fork bolt and self-locking nut.
8. Tighten the flange nuts on top of the damper.
9. Install the brake hose mounts with the brake hose mounting bolts.
10. Install the front wheel.

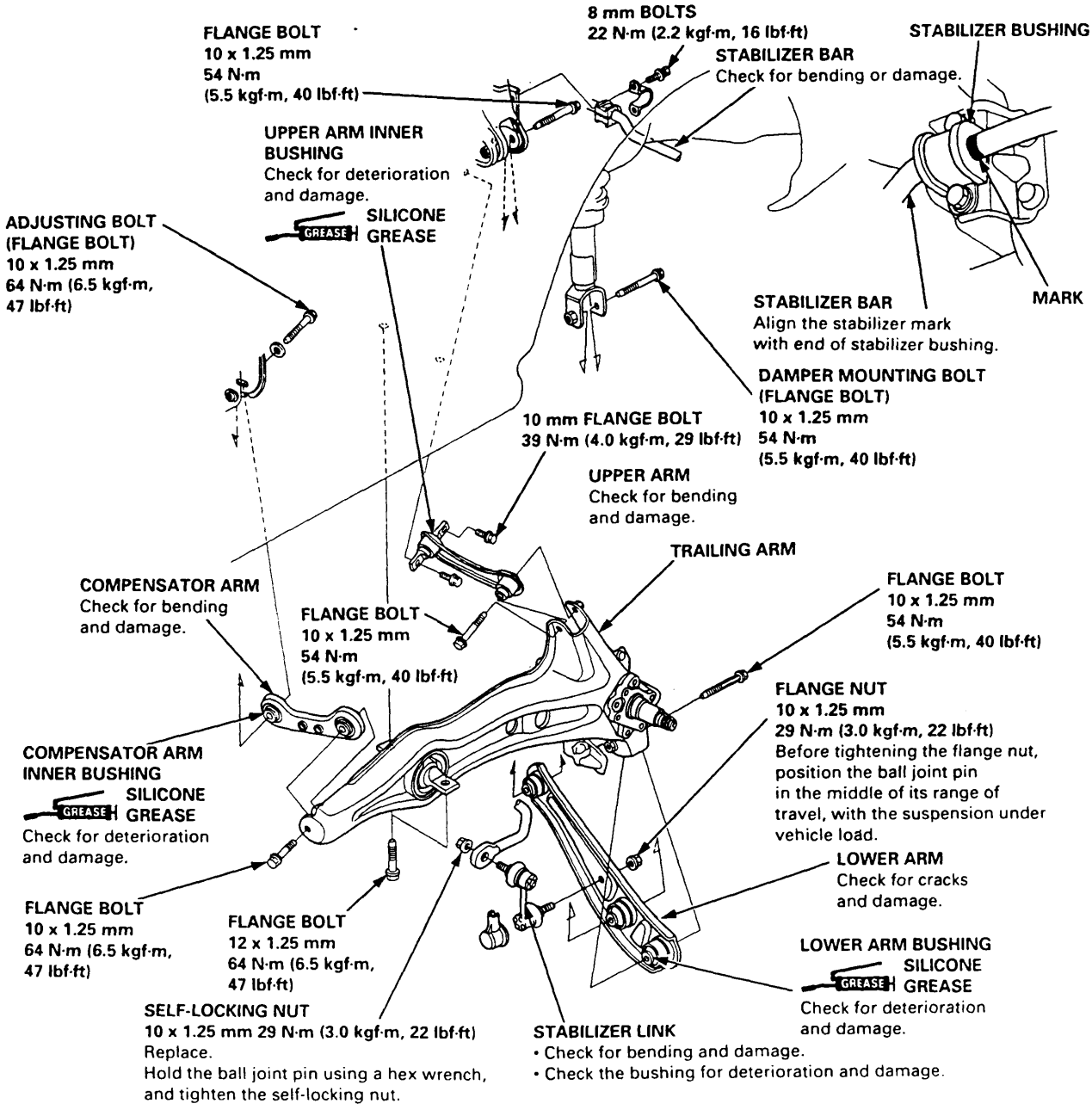
Rear Suspension

Suspension Arms Replacement

⚠ WARNING When the suspension arms are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the vehicle, the center of gravity may change causing the vehicle to tip forward.

CAUTION:
- **Replace the self-locking nuts after removal.**
- **The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.**

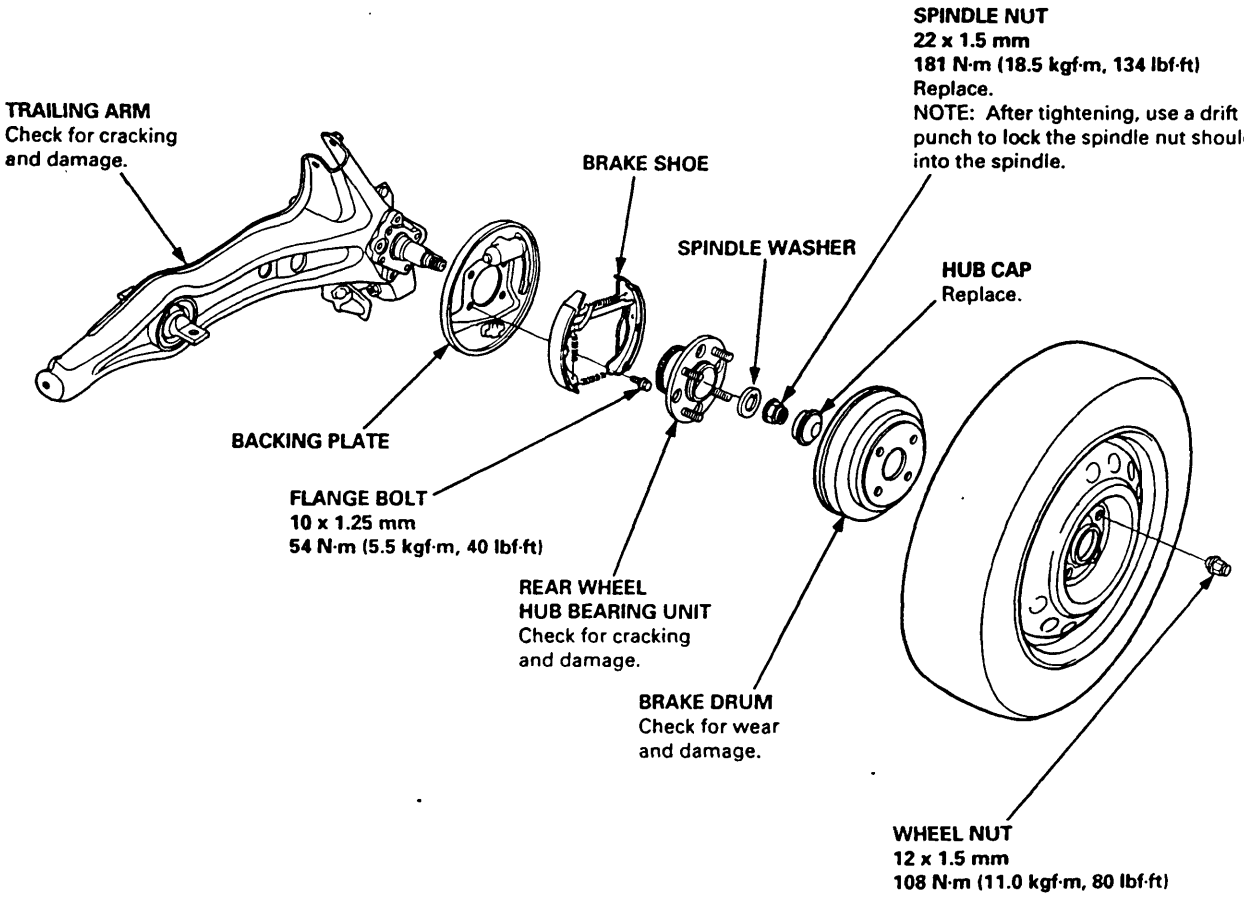
NOTE:
- Make sure the toe adjusting bolts on the compensator arm are installed in the same direction.
- "↑ UP L" or "↑ UP LH G" or "↑ UP LK" or "↑ UP LS" is stamped on the left upper arm and "↑ UP R" or "↑ UP RH G" or "↑ UP RK" or "↑ UP RS" on the right upper arm.
- The right and left compensator arm are symmetrical. Install so the "↑ UP" mark stamped side faces forward.
- After installing the suspension arm, check the rear wheel alignment, and adjust if necessary (see page 18-4).



Hub Bearing Unit Replacement

NOTE:

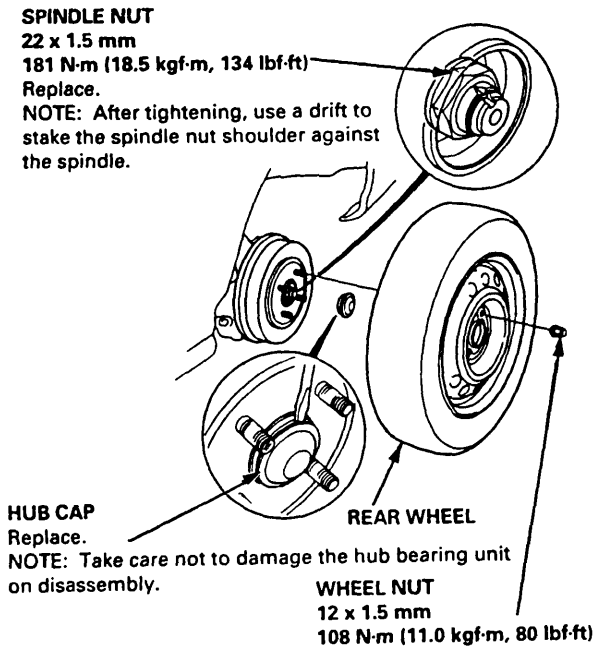
- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- On the aluminum wheels, remove the center cap from the inside of the wheel after removing the wheel.
- Before installing the brake drum, clean the mating surfaces of the rear hub and the brake drum.
- Before installing the wheel, clean the mating surfaces of the brake drum and wheel.



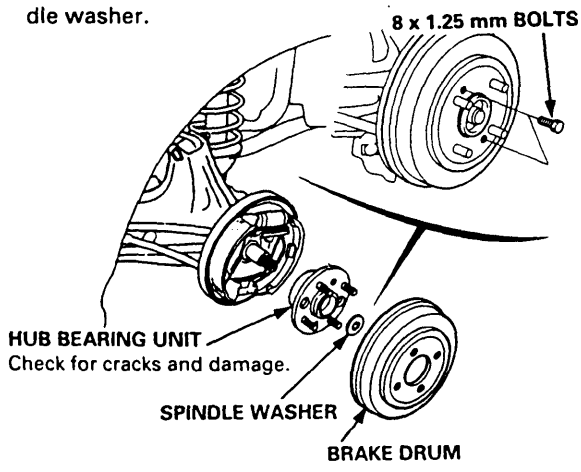
(cont'd)

Hub Bearing Unit Replacement (cont'd)

1. Loosen the wheel nuts slightly.
2. Raise the rear of vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and rear wheel.



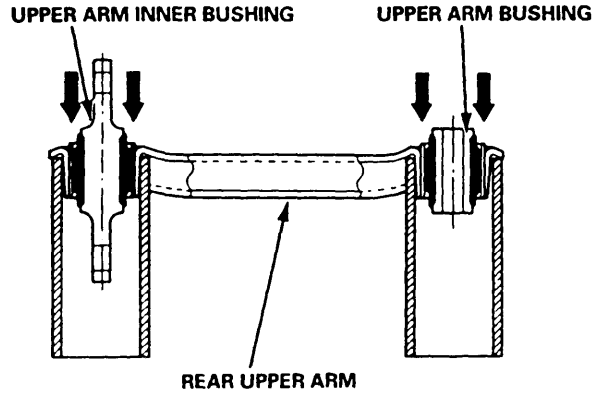
4. Pull the parking brake lever up.
5. Remove the hub cap.
6. Raise the locking tab on the spindle nut, then remove the nut.
7. Release the parking brake lever.
8. Remove the brake drum, hub bearing unit and spindle washer.



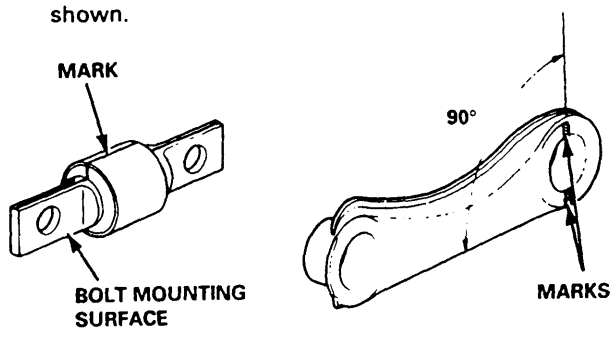
9. Screw two 8 x 1.25 mm bolts into the drum to push it away from the hub bearing unit.
   NOTE: Turn each bolt two turns at a time to prevent cocking the drum excessively.
10. Install in the reverse order of removal.

Upper Arm Bushing Replacement

1. Remove the upper arm bushing and inner bushing as shown.

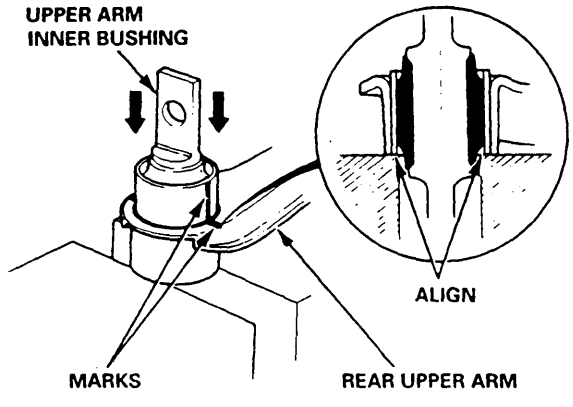


2. Mark a scribe line on the upper arm inner bushing so that it is in line with the bolt mounting surface.
3. Mark on the upper arm at two points so that they are in line and make a right angle with the arm as shown.



4. Drive in the upper arm inner bushing with the marks aligned.
5. Drive the upper arm bushing into the upper arm.

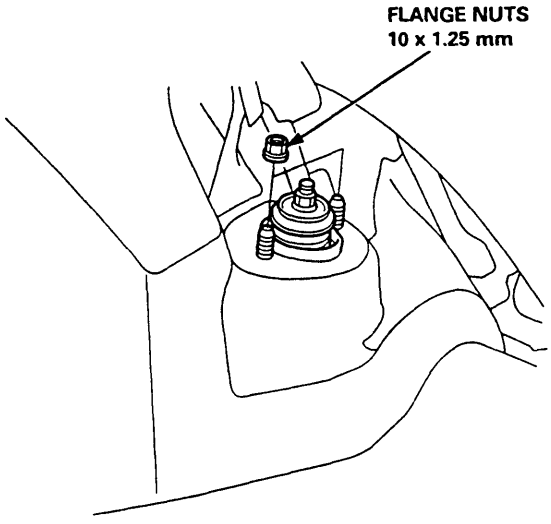
   NOTE: Drive in the upper arm bushing and inner bushing until their leading edges are flush with the upper arm.



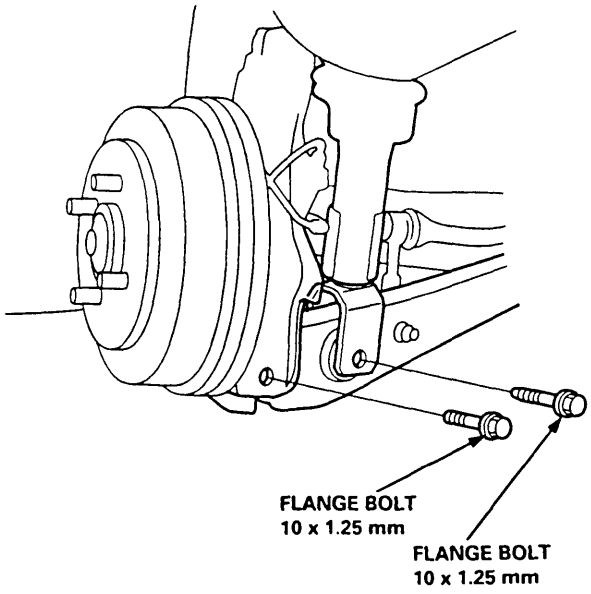
Rear Damper

Removal

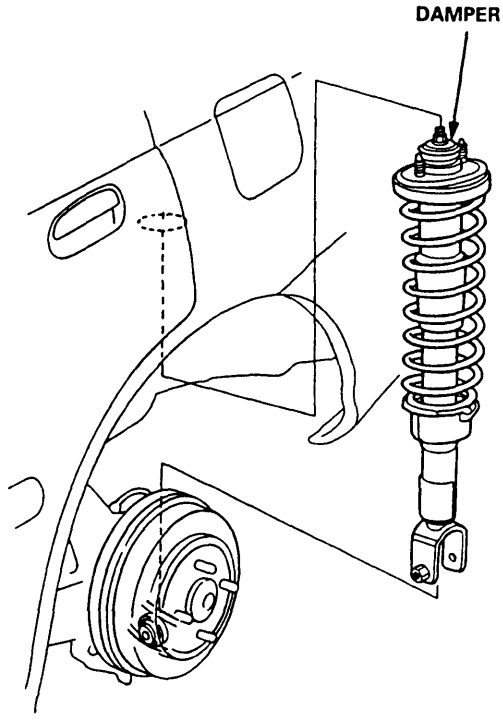
1. Remove the rear wheels (see page 18-22).
2. Remove the trunk side panel (see section 20).
3. Remove the two flange nuts.



4. Remove the flange bolt from the damper.



5. Remove the flange bolt that connects the lower arm to the trailing arm.
6. Lower the rear suspension, and remove the damper.



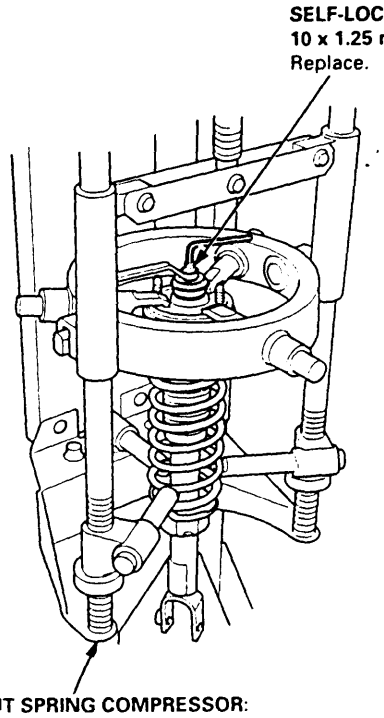
Rear Damper

Disassembly/Inspection

Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions, then remove the self-locking nut.

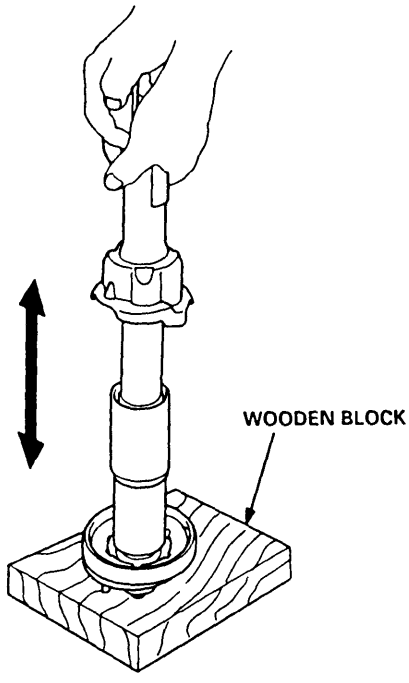
   CAUTION: Do not compress the spring more than necessary to remove the self-locking nut.



2. Release the pressure from the spring compressor, then disassemble the damper as shown on page 18-25.

Inspection

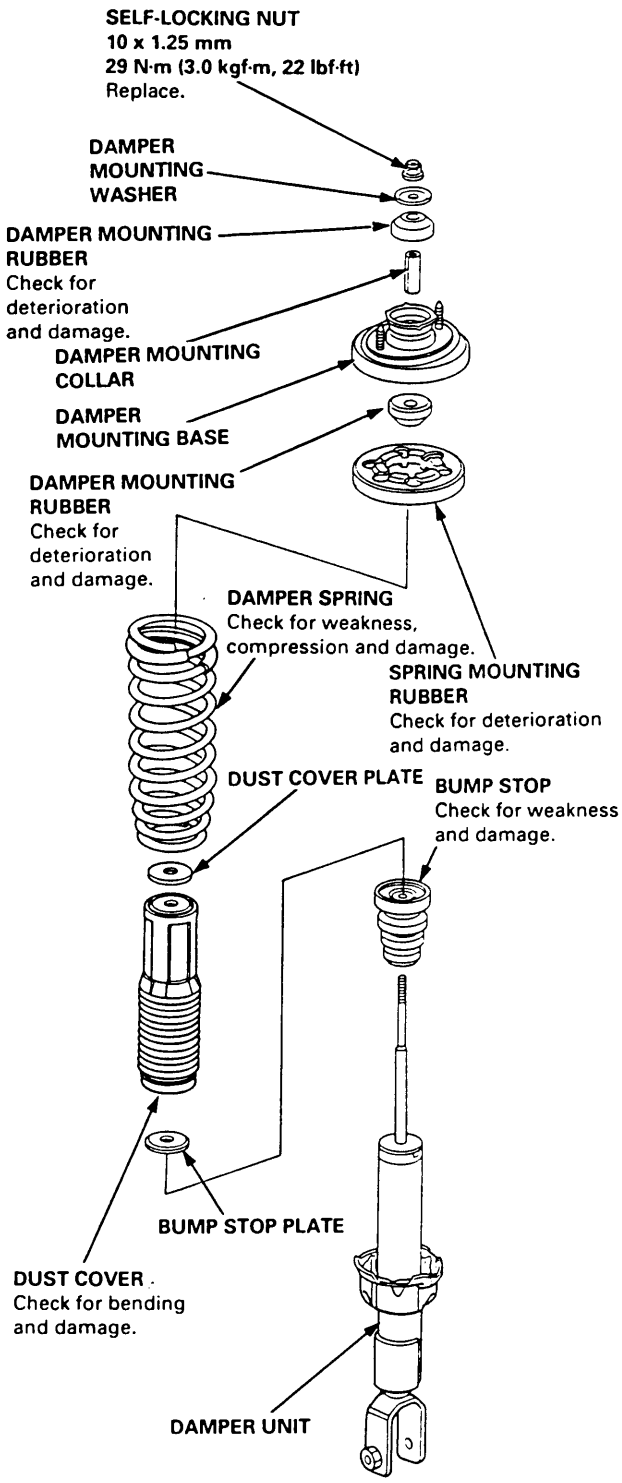
1. Reassemble all parts, except the spring.
2. Push on the damper as shown.



3. Check for smooth operation through a full stroke, both compression and extension.

   NOTE: The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.

4. Check for oil leaks, abnormal noises and binding during these tests.



Reassembly

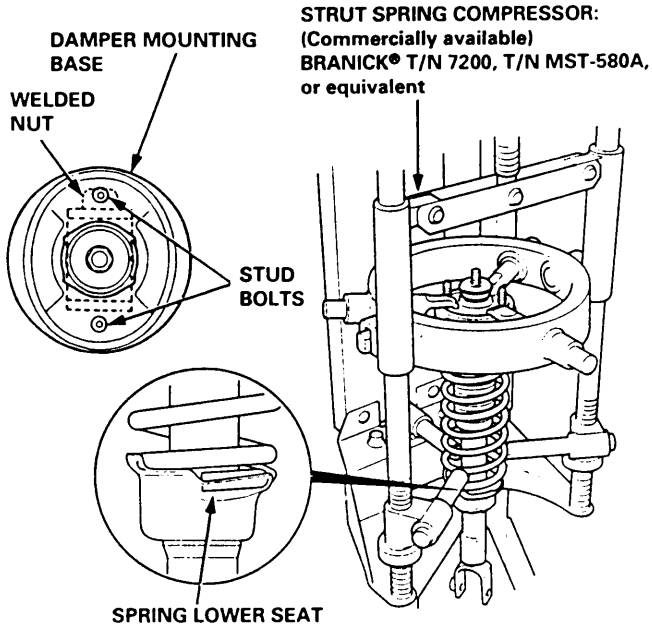
1. Install the damper unit on a spring compressor.

   NOTE: Follow the manufacturer's instructions.

2. Assemble the rear damper in reverse order of disassembly except the damper mounting washer and self-locking nut.

   NOTE: Align the bottom of damper spring and spring lower seat as shown.

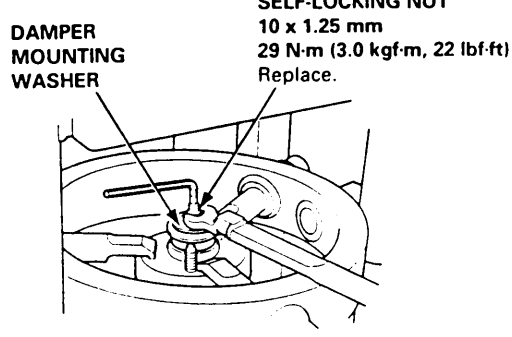
3. Position the damper mounting base on the damper unit as shown.



4. Compress the damper spring with the spring compressor.

5. Install the damper mounting washer, and loosely install a new self-locking nut.

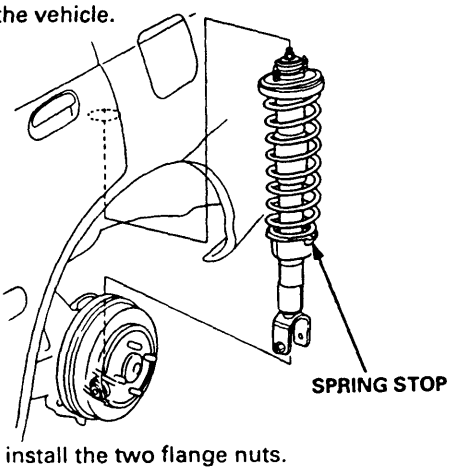
6. Hold the damper shaft with a hex wrench and tighten the self-locking nut.



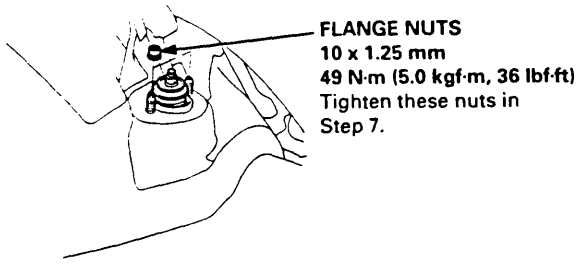
Rear Damper

Installation

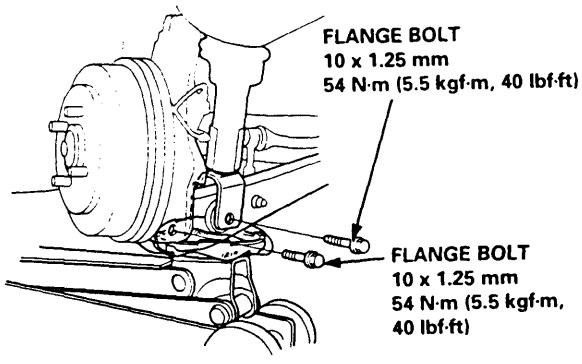
1. Lower the rear suspension, and position the damper with the spring stop pointed toward the left side of the vehicle.



2. Loosely install the two flange nuts.



3. Loosely install the flange bolt.



4. Raise the rear suspension with a floor jack until the vehicle just lifts off the safety stand.

⚠ WARNING The floor jack must be securely positioned or personal injury may result.

5. Tighten the flange bolt.

6. Tighten the two flange nuts on top of the damper to the specified torque.

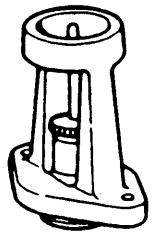
7. Check the rear wheel alignment and adjust if necessary (see page 18-4).

Brakes

Conventional Brakes

Special Tools

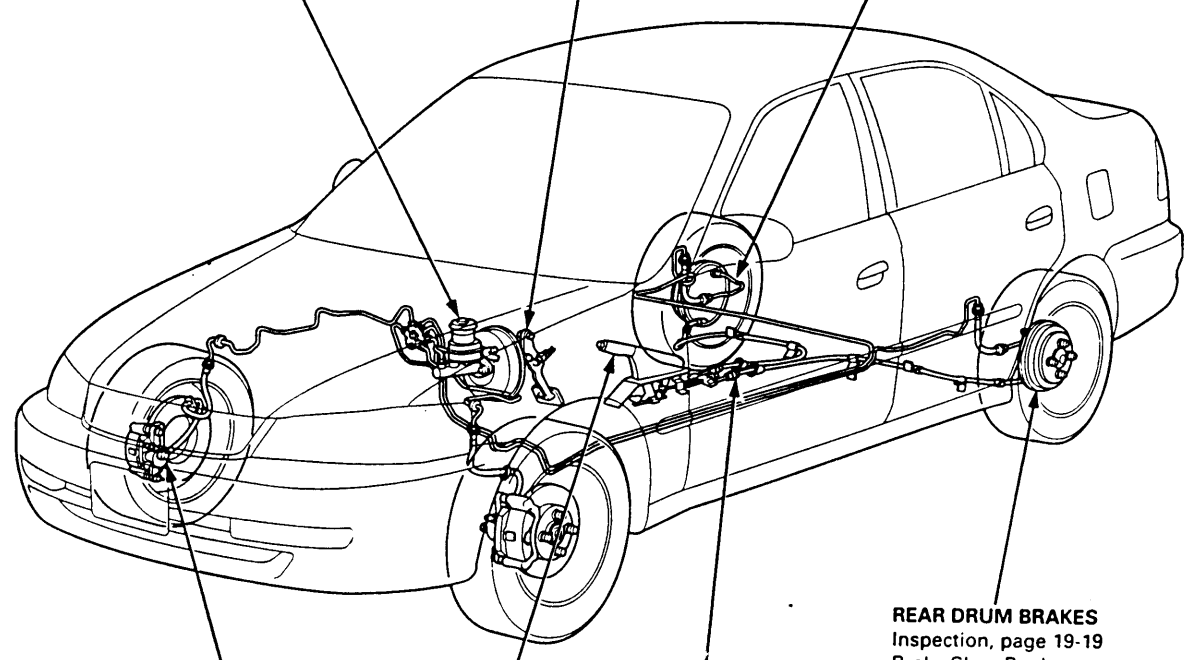
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAG – SD40100	Pushrod Adjustment Gauge	1	19-16



①

Component Locations

Index



BRAKE PEDAL
Inspection and
Adjustment, page 19-5

BRAKE HOSES/LINES
Inspection/Torque specifications, page 19-22
Hose Replacement, page 19-23

MASTER CYLINDER/BRAKE BOOSTER
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Pushrod Clearance Adjustment, page 19-16
Brake Booster Inspection, page 19-17

REAR DRUM BRAKES
Inspection, page 19-19
Brake Shoe Replacement, page 19-20

PARKING BRAKE CABLE
Inspection and Replacement,
page 19-24

PARKING BRAKE
Adjustment, page 19-6

FRONT BRAKES
Front Brake Pads, page 19-9
Front Brake Disc, page 19-11
Front Brake Caliper, page 19-12

Inspection and Adjustment

Brake System Rubber Parts and Brake Booster

Ⓐ **Brake Booster**
Check brake operation by applying the brakes.
If the brakes do not work properly, check the brake booster. Replace the brake booster as an assembly if it does not work properly or if there are signs of leakage.

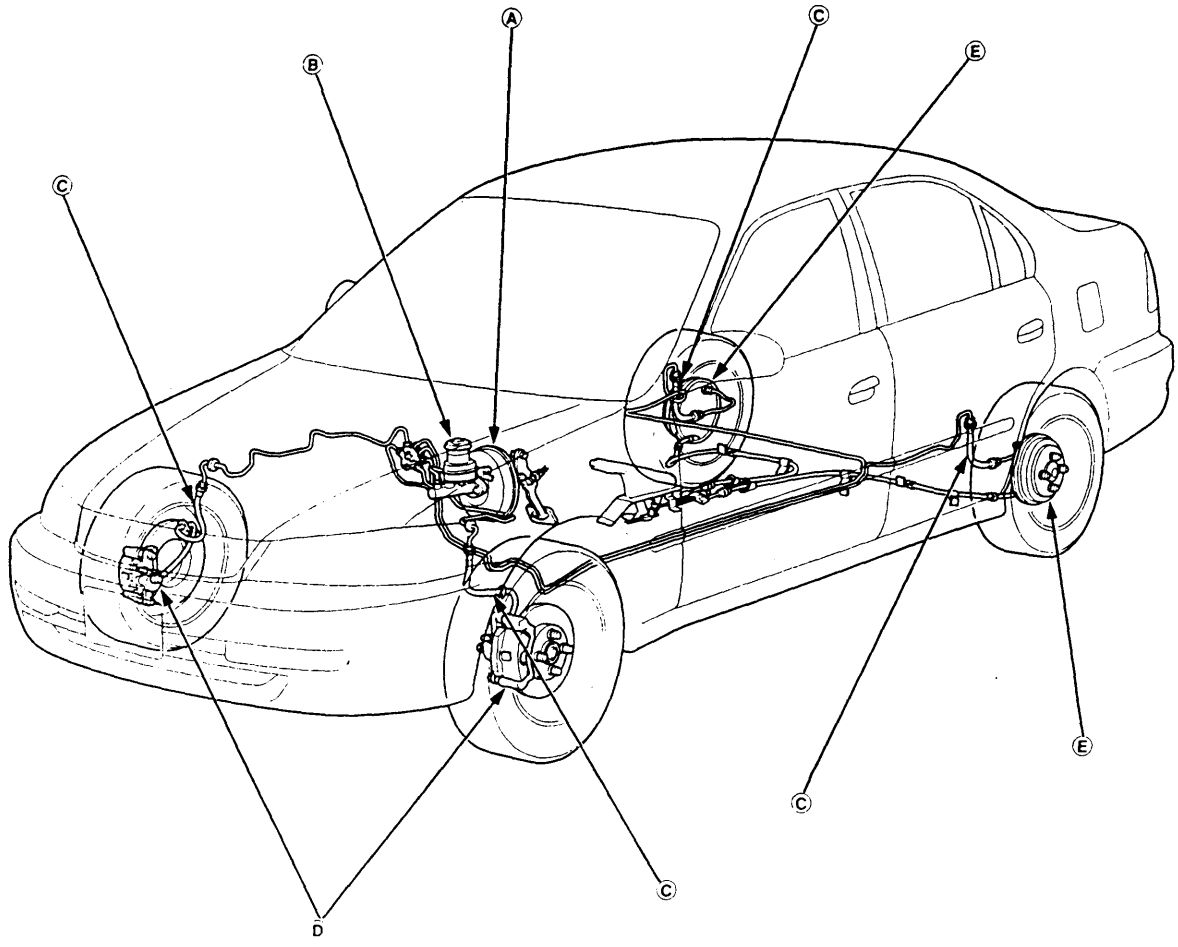
Ⓑ **Piston Cup and Pressure Cup Inspection**
- Check brake operation by applying the brakes. Visually check for damage or signs of fluid leakage. Replace the master cylinder as an assembly if the pedal does not work properly or if there is damage or signs of fluid leakage.

- Check for a difference in brake pedal stroke between quick and slow brake applications. Replace the master cylinder if there is a difference in pedal stroke.

Ⓒ **Brake Hoses**
Visually check for damage or signs of fluid leakage. Replace the brake hose with a new one if it is damaged or leaking.

Ⓓ **Caliper Piston Seal and Piston Boots**
Check brake operation by applying the brakes.
Visually check for damage or signs of fluid leakage.
If the pedal does not operate properly, the brakes drag, or there is damage or signs of fluid leakage, disassemble and inspect the brake caliper. Replace the boots and seals with new ones whenever the brake caliper is disassembled.

Ⓔ **Wheel Cylinder Piston Cup and Dust Cover**
Check brake operation by applying the brakes.
Visually check for damage or signs of fluid leakage.
If the pedal does not operate properly, the brakes drag, or there is damage or signs of fluid leakage, inspect the wheel cylinder. If necessary, replace the wheel cylinder as an assembly.

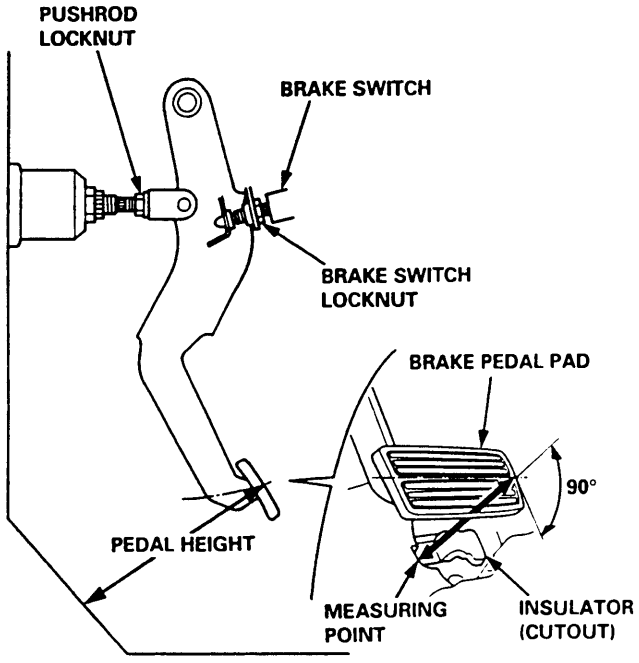


Brake Pedal

Pedal Height

1. Disconnect the brake switch connector, loosen the brake switch locknut, and back off the brake switch until it is no longer touching the brake pedal.

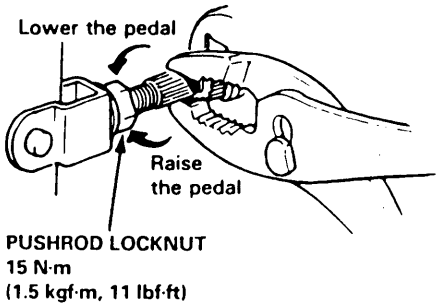
2. Turn up the carpet. At the insulator cutout, measure the pedal height from the right side center of the pedal pad.



Standard Pedal Height (with carpet removed):
M/T: 156.5 mm (6.16 in)
A/T: 161 mm (6.34 in)

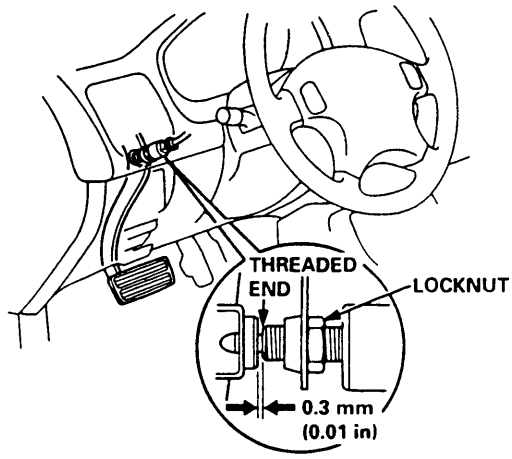
3. Loosen the pushrod locknut, and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly.

   NOTE: Do not adjust the pedal height with the pushrod depressed.



4. Screw in the brake switch until its plunger is fully depressed (threaded end touching the pad on the pedal arm). Then back off the switch 1/4 turn to make 0.3 mm (0.01 in) of clearance between the threaded end and pad. Tighten the locknut firmly. Connect the brake switch connector.

   CAUTION: Make sure that the brake lights go off when the pedal is released.



5. Check the brake pedal free play as described below.

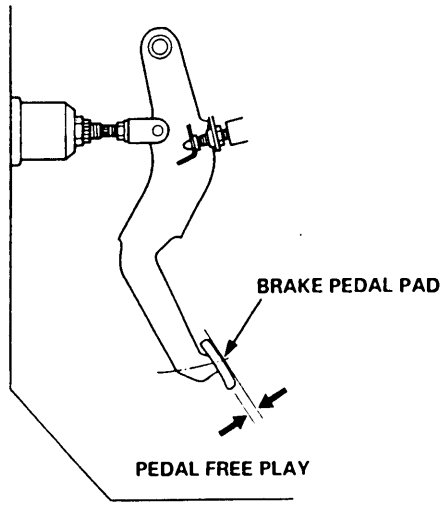
Pedal Free Play

1. With the engine off, inspect the play on the pedal pad by pushing the pedal by hand.

   Free Play: 1 – 5 mm (1/16 – 3/16 in)

2. If the pedal free play is out of specification, adjust the brake switch.

   CAUTION: If the pedal free play is insufficient, it may result in brake drag.

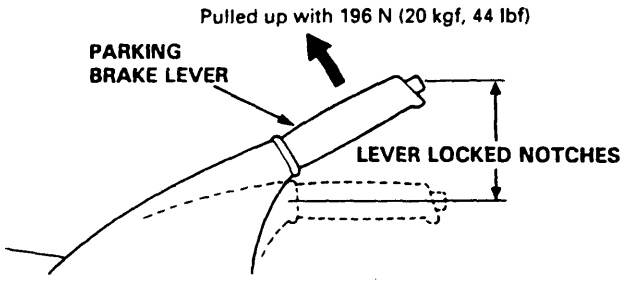


Parking Brake

Inspection

1. Pull the parking brake lever with 196 N (20 kgf, 44 lbf) force to fully apply the parking brake. The parking brake lever should be locked within the specified notches.

   Lever Locked Notches: 6 – 9



2. Adjust the parking brake if the lever notches are out of specification.

Adjustment

NOTE: After rear brake shoe servicing, loosen the parking brake adjusting nut, start the engine, and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

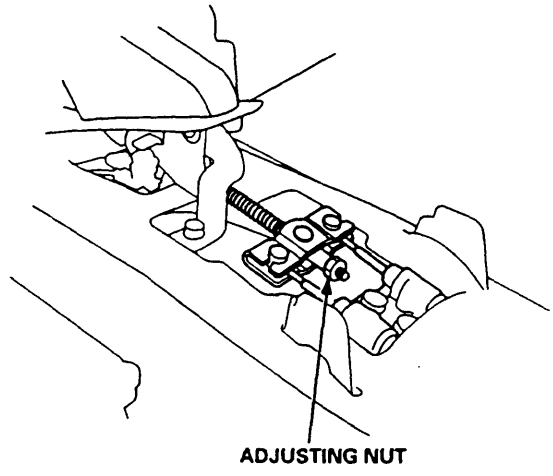
1. Raise the rear wheels off the ground, and support the vehicle on safety stands.

   ⚠WARNING Block the front wheels before jacking up the rear of the vehicle.

2. Remove the rear console (see section 20).

3. Pull the parking brake lever up one notch.

4. Tighten the adjusting nut until the rear wheels drag slightly when turned.



5. Release the parking brake lever fully, and check that the rear wheels do not drag when turned. Readjust if necessary.

6. Make sure that the parking brakes are fully applied when the parking brake lever is pulled up fully.

7. Reinstall the rear console.

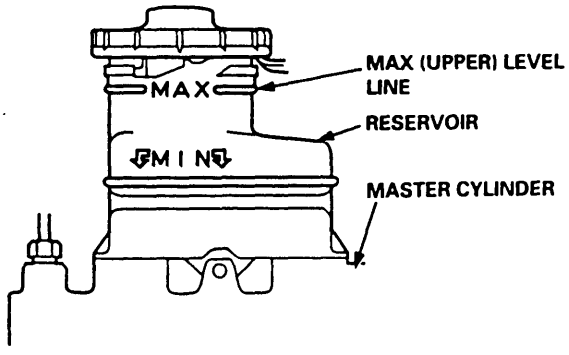
Bleeding

CAUTION:

- **Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **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.**

NOTE: The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.

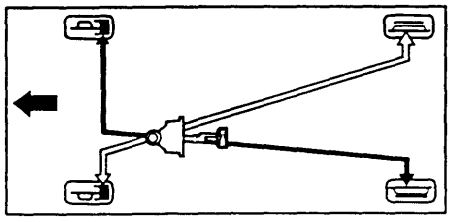
1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line.



2. Have someone slowly pump the brake pedal several times, then apply steady pressure.
3. Loosen the brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
4. Repeat the procedure for each wheel in the sequence shown below until air bubbles no longer appear in the fluid.
5. Refill the reservoir of master cylinder to the MAX (upper) level line.

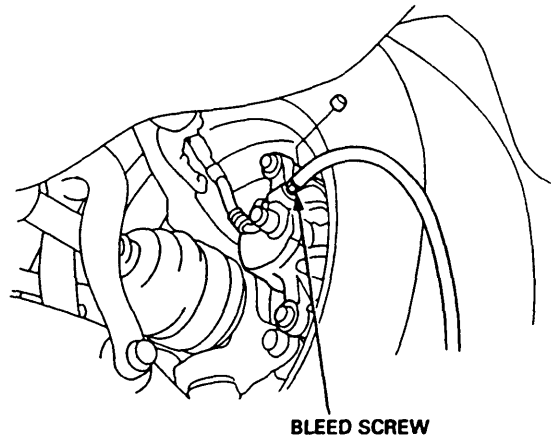
BLEEDING SEQUENCE:

❹ Front Right ❶ Rear Right



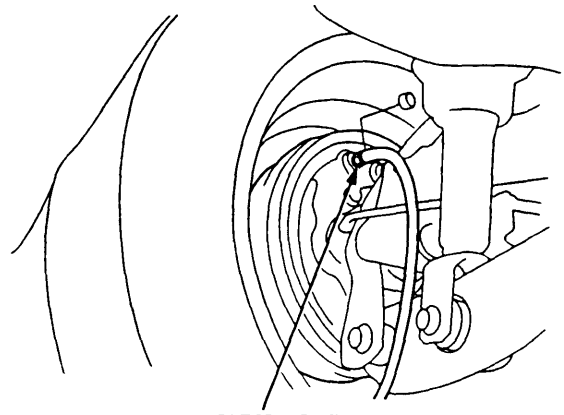
❷ Front Left ❸ Rear Left

FRONT:



BLEED SCREW
9 N·m (0.9 kgf·m, 6.5 lbf·ft)

REAR:

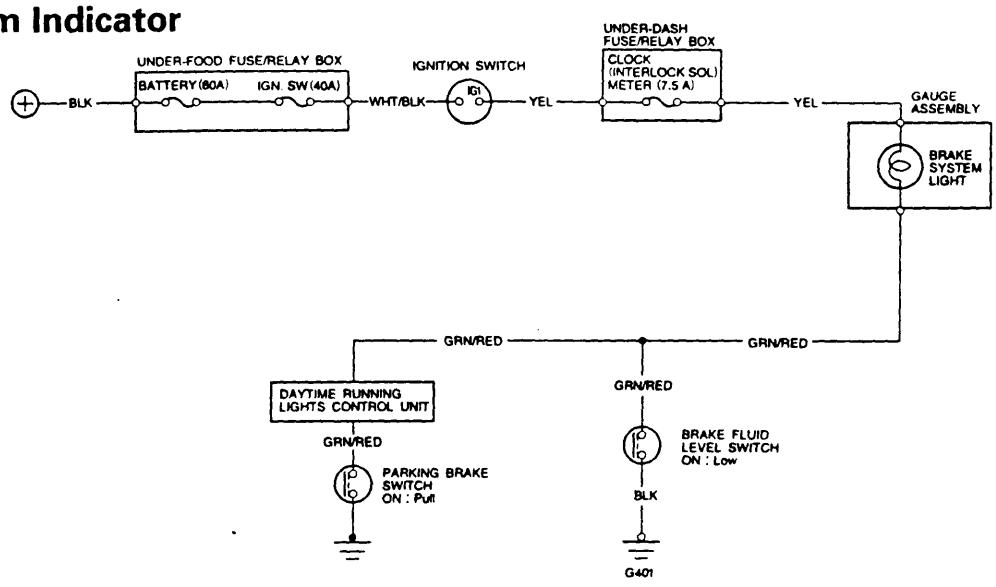


BLEED SCREW
7 N·m (0.7 kgf·m, 5 lbf·ft)

Inspection and Adjustment

Brake System Indicator

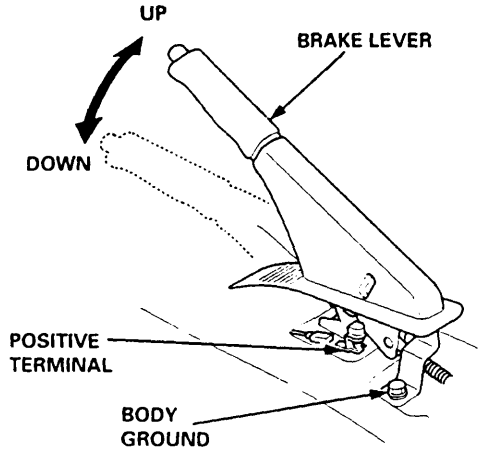
Circuit Diagram



Parking Brake Switch Test

1. Remove the rear console, and disconnect the connector from the switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	Positive Terminal	Body Ground
BRAKE LEVER UP	○———	———○
BRAKE LEVER DOWN		

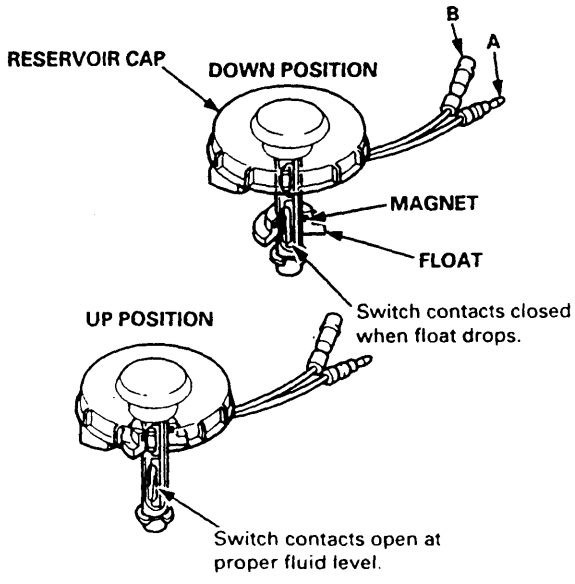


NOTE: If the parking brake switch is OK, but the brake system indicator does not function, perform the input test for the daytime running lights control unit (see section 23).

Brake Fluid Level Switch Test

1. Remove the reservoir cap. Check that the float moves up and down freely; if it doesn't, replace the reservoir cap assembly.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	A	B
FLOAT UP		
FLOAT DOWN	○———	———○



Front Brake Pads

Inspection and Replacement

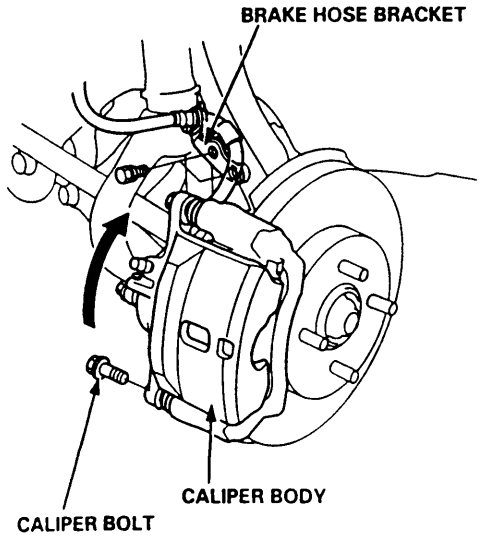
⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA approved vacuum cleaner to avoid breathing brake dust.**

1. Loosen the front wheel nuts slightly, then raise the vehicle, and support it on safety stands.

2. Remove the brake hose bracket from the knuckle.

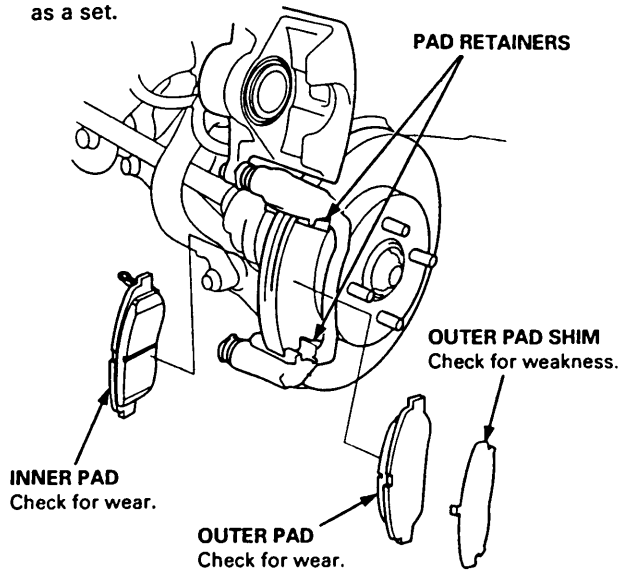
3. Remove the caliper bolt, and pivot the caliper up out of the way.



NOTE: Check the hoses and pin boots for damage and deterioration.

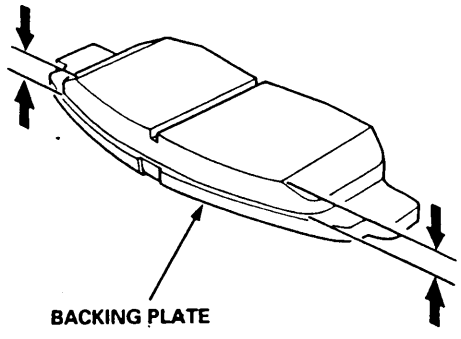
4. Remove the pad shim, pad retainers and pads.

NOTE: When the caliper is equipped with on outer pad shim, replace the shim together with the pads as a set.



5. Using vernier calipers, measure the thickness of each brake pad lining.

Brake Pad Thickness:
Standard: 9.5 – 10.5 mm (0.37 – 0.41 in)
Service Limit: 1.6 mm (0.06 in)



NOTE: Measurement does not include pad backing plate thickness.

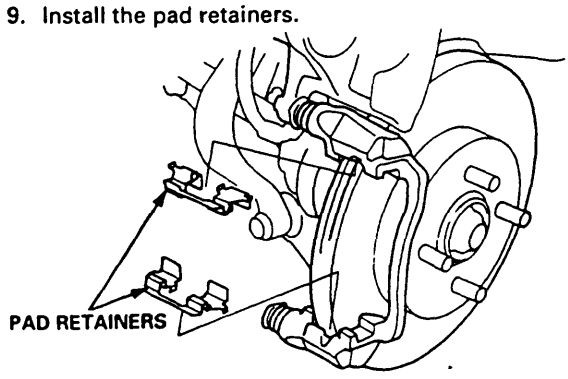
6. If the brake pad thickness is less than service limit, replace the front pads as a set.

(cont'd)

Front Brake Pads

Inspection and Replacement (cont'd)

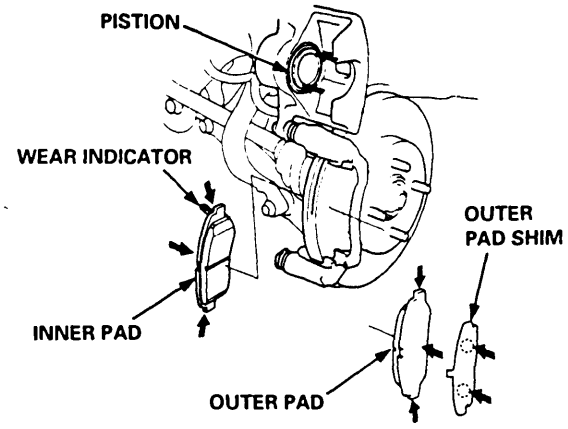
7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.



10. Apply grease to the points indicated by the arrows in the following illustration:

    NOTE: Use the pad grease included in the pad set or Molykote M77 grease, and apply a thin coat of grease evenly to the designated points.

    - Piston end and inner pad contact surface
    - Pad and caliper bracket contact surface
    - Outer pad and caliper body contact surface
    - Outer pad shim and outer pad contact surface
    - Outer pad shim and caliper body contact surface



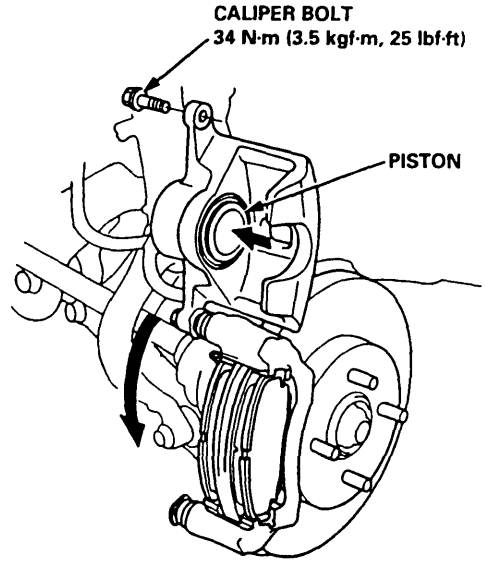
11. Install the brake pads and pad shim correctly.

    ⚠WARNING

    - **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**
    - **Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.**

    NOTE: Install the pad with the wear indicator on the inside.

12. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.



13. Pivot the caliper down into position, then install caliper bolt and tighten it.

    CAUTION: Be careful not damage the pin boot when pivoting the caliper down.

14. Install the brake hose bracket on the knuckle.

    NOTE: Inspect the brake hose for interference or twisting.

15. Depress 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.

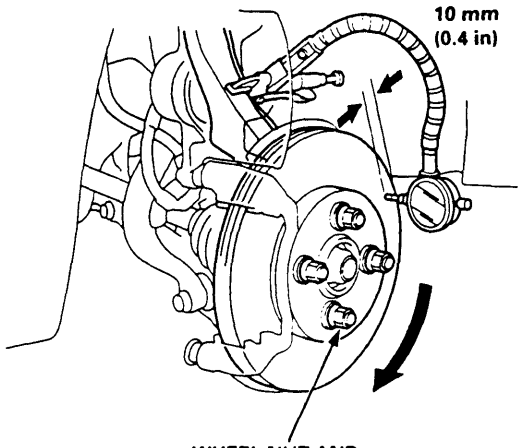
16. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

Front Brake Disc

Disc Runout Inspection

1. Loosen the front wheel nuts slightly, then raise the vehicle, and support it on safety stands. Remove the front wheels.
2. Remove the brake pads (see page 19-9).
3. Inspect the disc surface for damage and cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable plain washers to hold the disc securely against the hub, then mount a dial indicator as shown, and measure the runout at 10 mm (0.4 in) from the outer edge of the disc.

   Brake Disc Runout:
   Service Limit: 0.10 mm (0.004 in)



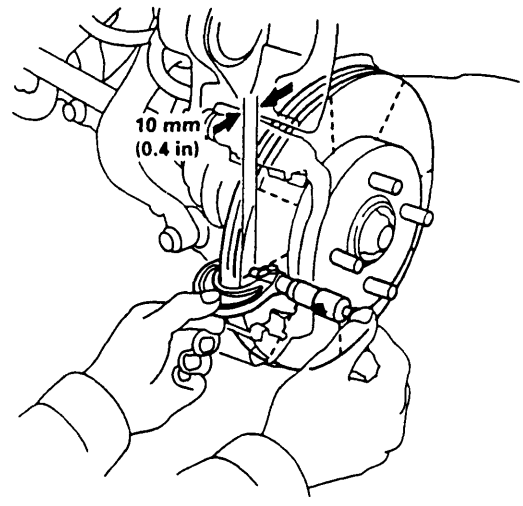
5. If the disc is beyond the service limit, refinish the brake disc with an on-car brake lathe. The Kwik-Lathe produced by Kwik-way manufacturing Co. and the "Front Brake Disc Lathe" offered by Snap-on Tools Co. are approved for this operation.

   Max. Refinish Limit: 19.0 mm (0.75 in)

   NOTE: A new disc should be refinished if its runout is greater than 0.10 mm (0.004 in)

Disc Thickness and Parallelism Inspection

1. Loosen the front wheel nuts slightly, then raise the vehicle, and support it on safety stands. Remove the front wheels.
2. Remove the brake pads (see page 19-9).
3. Using a micrometer, measure disc thickness at eight points, approximately 45° apart and 10 mm (0.4 in) in from the outer edge of the disc.



   Brake Disc Thickness:
   Standard: 20.9 – 21.8 mm (0.82 – 0.86 in)
   Max. Refinishing Limit: 19.0 mm (0.75 in)

   NOTE: Replace the brake disc if the smallest measurement is less than the max. refinishing limit.

   Brake Disc Parallelism: 0.015 mm (0.0006 in) max.

   NOTE: This is the maximum allowable difference between the thickness measurements.

4. 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.

   NOTE: See section 18 for brake disc replacement.

Front Brake Caliper

Disassembly

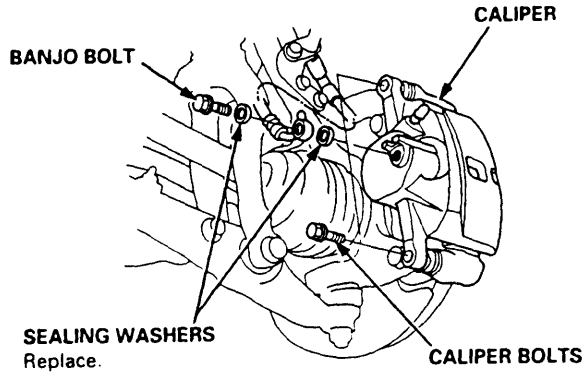
⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA approved vacuum cleaner to avoid breathing brake dust.**

CAUTION:

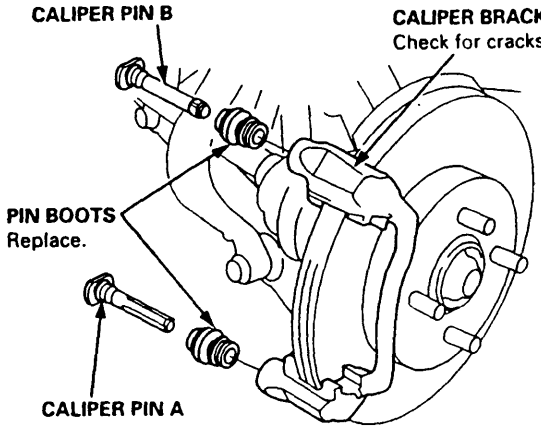
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **To prevent spills, cover the hose joints with rags or shop towels.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**

1. Remove the banjo bolt, and disconnect the brake hose from the caliper.



2. Remove the caliper bolts, then remove the caliper from the bracket.

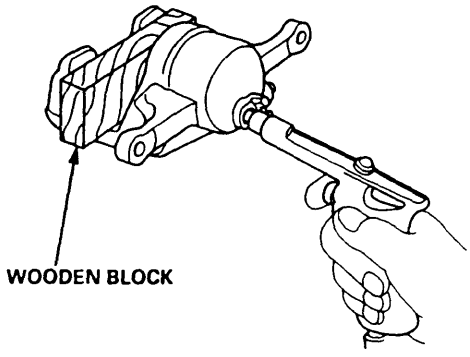
3. Remove the caliper pins and pin boots from the caliper bracket.



4. If necessary, apply compressed air to the caliper fluid inlet to get the piston out. Place a shop rag or wooden block as shown to cushion the piston when it is expelled. Use low pressure air in short spurts.

⚠ WARNING

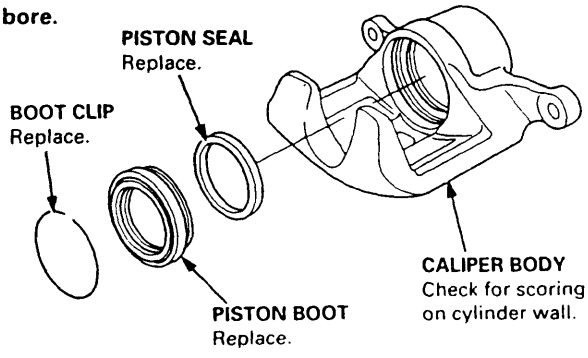
- **Do not place your fingers in front of the piston.**
- **Do not use high air pressure; use an OSHA approved 30 PSI nozzle.**



5. Remove the piston from the caliper, and check the piston for scoring.

6. Remove the boot clip, piston boot and piston seal.

CAUTION: Take care not to damage the cylinder bore.



Reassembly

⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA approved vacuum cleaner to avoid breathing brake dust.**
- **Contaminated brake discs or pads reduce stopping ability.**
- **When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.**

CAUTION:

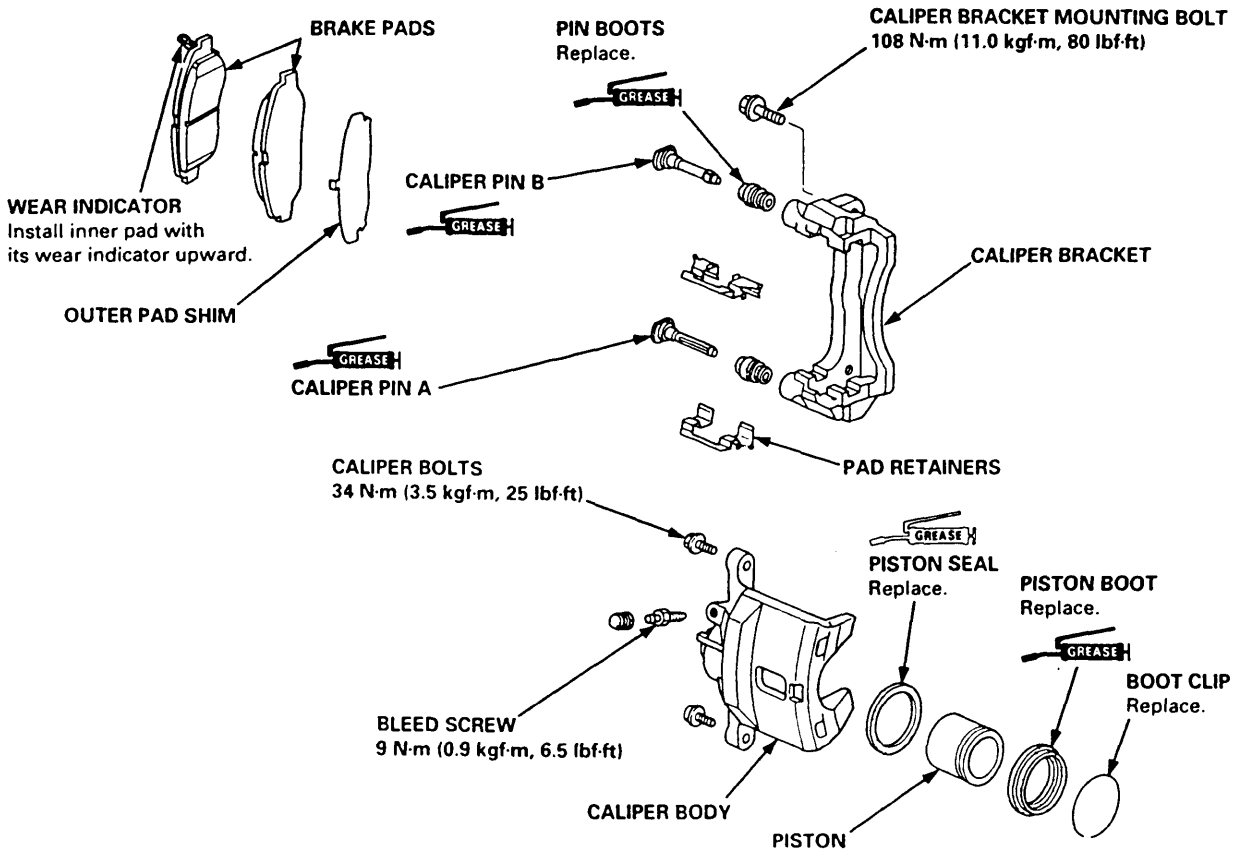
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **Clean all parts in brake fluid and air dry; blow out all passages with compressed air.**
- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**
- **Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.**

NOTE:

- Coat the piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

GREASE: Use recommended rubber grease in the caliper seal set.

GREASE: Use recommended seal grease in the caliper seal set.



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Front Brake Caliper

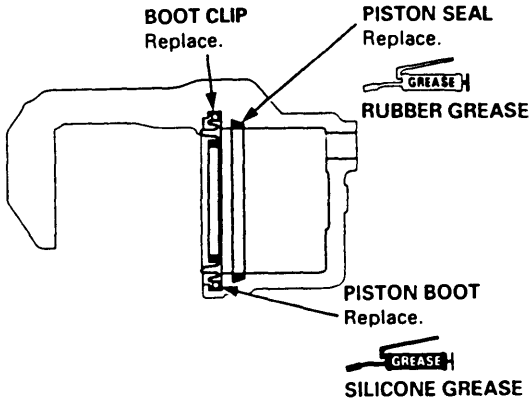
Reassembly (cont'd)

1. Clean the piston and caliper bore with brake fluid, and inspect for wear and damage.

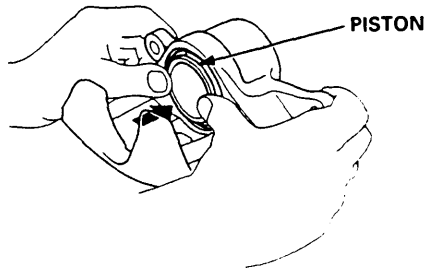
2. Coat the new piston seal with the recommended rubber grease in the caliper seal set, and install the seal in the cylinder groove.

3. Apply the recommended seal grease in the caliper seal set to the sealing lips and inside of a new piston boot, and secure install it in the caliper with the new boot clip.

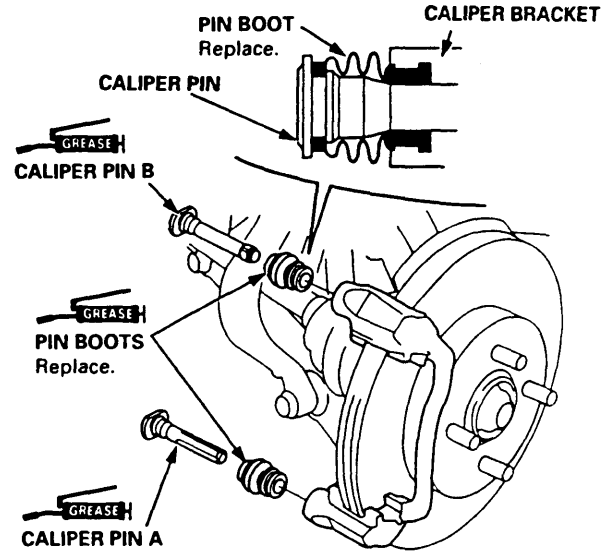
   CAUTION: Be careful not to damage the caliper cylinder wall.



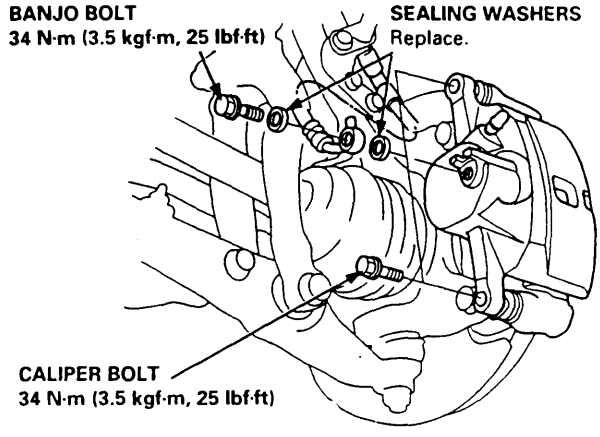
4. Lubricate the caliper and piston with brake fluid, then install the piston in the cylinder with the dished end facing in.



5. Apply the recommended seal grease in the caliper seal set to the sliding surface of the pins and the inside of the new pin boots.
6. Install the pin boots into the grooves in the caliper bracket properly.



7. Insert pin A and pin B into the caliper bracket.
8. Install the pin boots into the grooves in the pins properly.
9. Install the brake pads in their original positions (see page 19-10).
10. Push in the piston so that the caliper will fit over the pads, and install the caliper.
11. Tighten the caliper bolts.
12. Connect the brake hose to the caliper with new sealing washers, and tighten the banjo bolt.



13. Fill the brake reservoir and bleed the brake system (see page 19-7).
14. Perform the following checks.
    - Check for leaks at hose and line joints and connections, and retighten if necessary.
    - Check for brake hoses for interference and twisting.

Master Cylinder/Brake Booster

Removal/Installation

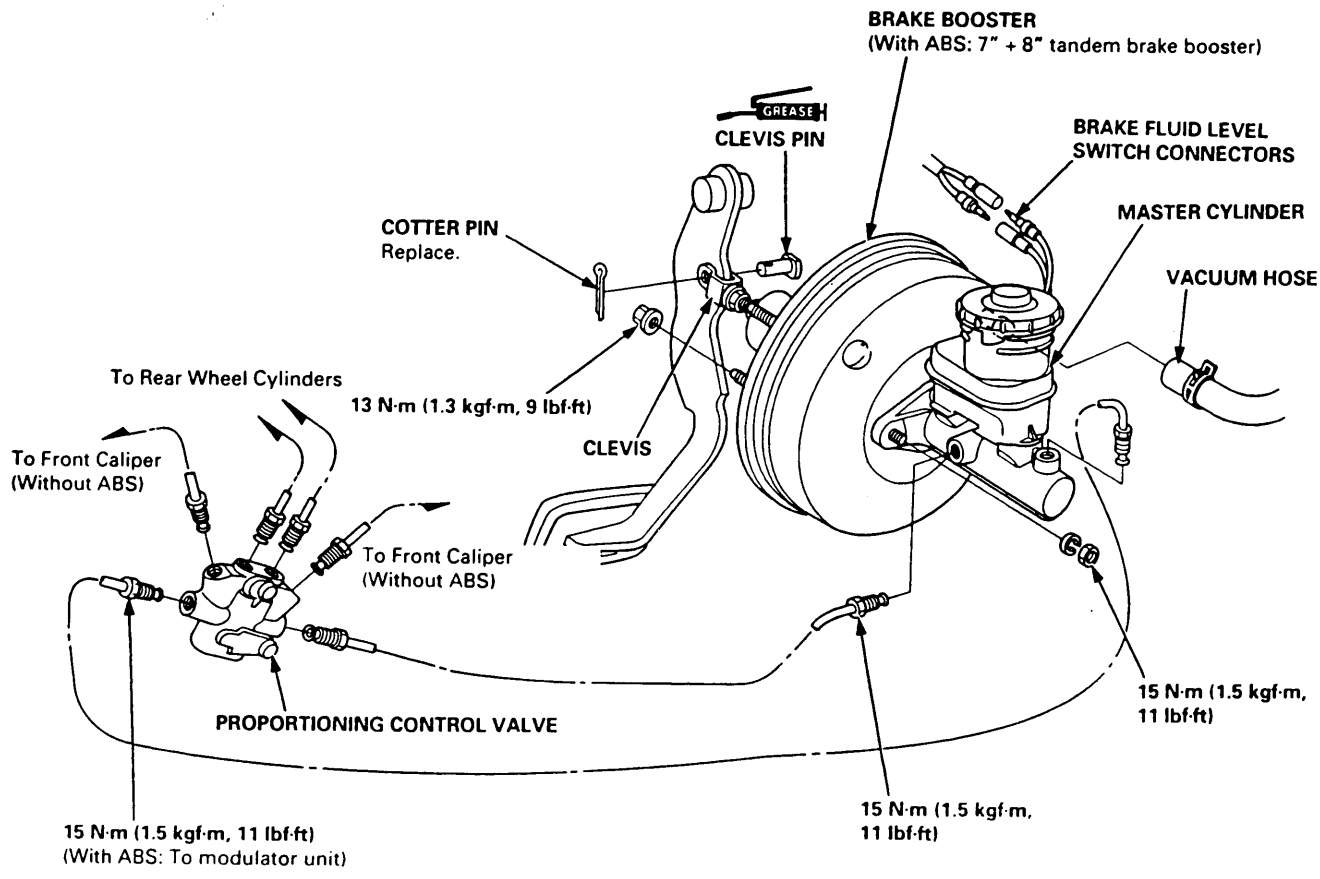
CAUTION:
- **Be careful not to bend or damage the brake lines when removing the master cylinder.**
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**
- **To prevent spills, cover the hose joints with rags or shop towels.**

1. Disconnect the brake fluid level switch connectors.
2. Remove the reservoir cap from the master cylinder.
3. The brake fluid may be sucked out through the top of the master cylinder reservoir with a syringe.
4. Disconnect the brake lines from the master cylinder.
5. Remove the master cylinder mounting nuts and washers.
6. Remove the master cylinder from the brake booster.
7. Disconnect the vacuum hose from the brake booster.
8. Remove the cotter pin and clevis pin from the clevis.

   CAUTION: Do not disconnect the clevis by removing it from the operating rod of the brake booster. If the clevis is loosened, adjust the pushrod length before installing the brake booster (see page 19-17).
9. Remove the four booster mounting nuts.
10. Pull the brake booster forward until the clevis is clear of the bulkhead.
11. Remove the brake booster from the engine compartment.
12. Install the brake booster and master cylinder in the reverse order of removal.

    CAUTION:
    - **When connecting the brake lines, make sure that there is no interference between the brake lines and other parts.**
    - **Be careful not to bend or damage the brake lines when installing the master cylinder.**

    NOTE: If replacing the master cylinder or brake booster, check and adjust the pushrod clearance before installing the master cylinder (see page 19-19).
13. Fill the master cylinder reservoir, and bleed the brake system (see page 19-7).
14. After installation, check the brake pedal height and brake pedal free play (see page 19-5) and adjust if necessary.

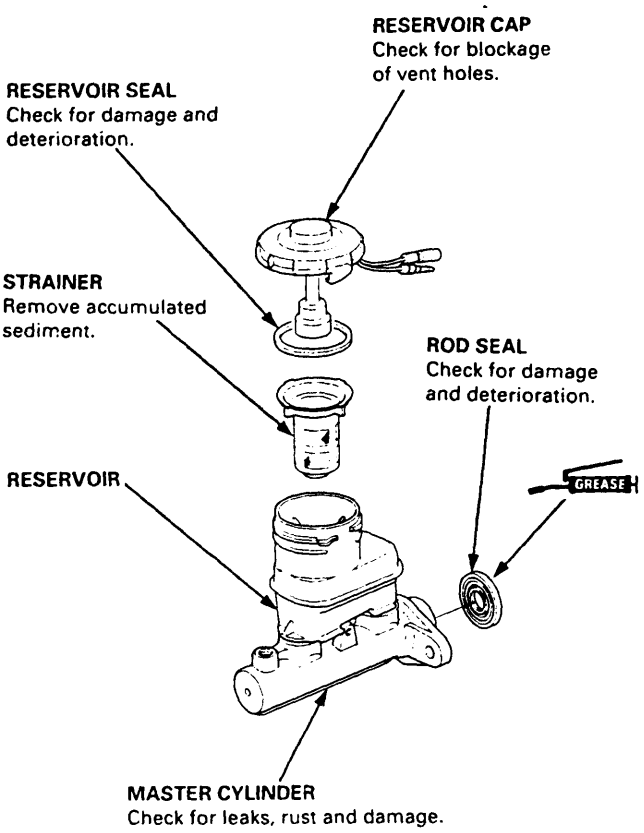


Master Cylinder/Brake Booster

Inspection/Disassembly

CAUTION:

- **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.**
- **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.**
- **Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.**

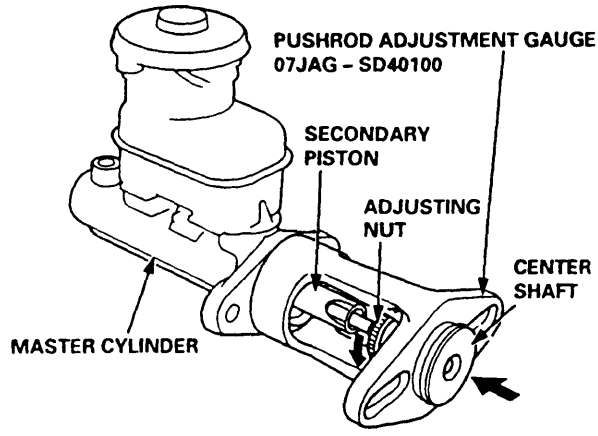


Pushrod Clearance Adjustment

NOTE:

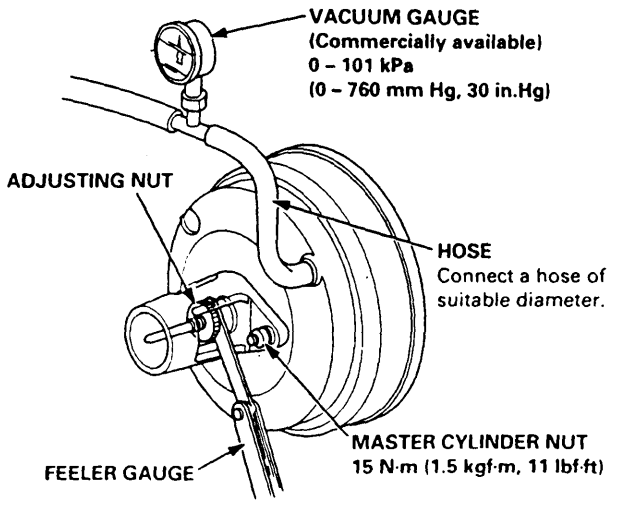
- Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.
- ABS type is shown, conventional brake type is similar.

1. Set the special tool on the master cylinder body; push in the center shaft until the top of it contacts the end of the secondary piston by turning the adjusting nut.



2. Without disturbing the center shaft's position, install the special tool upside down on the booster.
3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge 0 – 101 kPa (0 – 760 mmHg, 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, measure the clearance between the gauge body and the adjusting nut as shown.

Clearance: 0 – 0.4 mm (0 – 0.02 in)



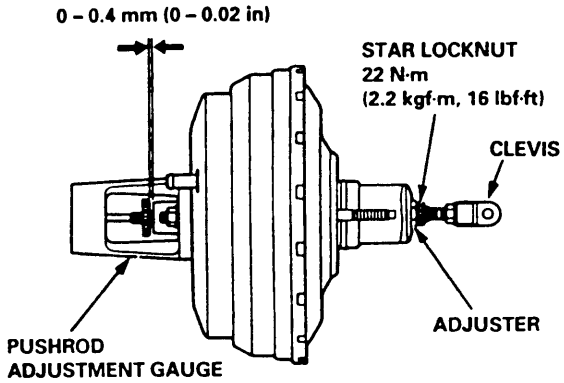
NOTE: If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in) or more. Therefore it must be adjusted and rechecked.

6. If clearance is incorrect, loosen the star locknut and turn the adjuster in or out to adjust.

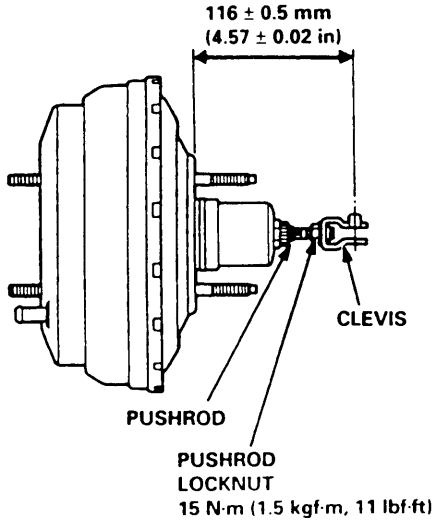
   NOTE:
   - Adjust the clearance while the specified vacuum is applied to the booster.
   - Hold the clevis while adjusting.

7. Tighten the star locknut securely.

8. Remove the special tool.



9. Adjust the pushrod length as shown if the booster is removed.



10. Install the master cylinder (see page 19-15).

Brake Booster Inspection

Functional Test

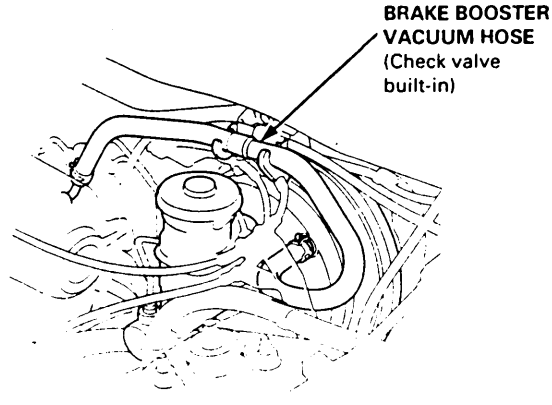
1. With the engine stopped, depress the brake pedal several times to deplete the vacuum reservoir, then depress the pedal hard and hold it for 15 seconds. If the pedal sinks, either the master cylinder is bypassing internally, or the brake system (master cylinder, lines, modulator, proportioning control valve, or caliper) is leaking.
2. Start the engine with the pedal depressed. 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, depress the brake pedal lightly. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 25 mm (1.0 in.) in three minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off if normal. (The A/C compressor load changes the vacuum available to the booster.)

Leak Test

1. Depress the brake pedal with the engine running, then stop the engine. If the pedal height does not vary while depressed for 30 seconds, the vacuum booster is OK. If the pedal rises, the booster is faulty.
2. With the engine stopped, depress the brake pedal several times using normal pressure. When the pedal is first depressed, 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.

Booster Check Valve Test

1. Disconnect the brake booster vacuum hose at the booster.
2. Start the engine and let it idle. There should be vacuum. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.



Rear Drum Brakes

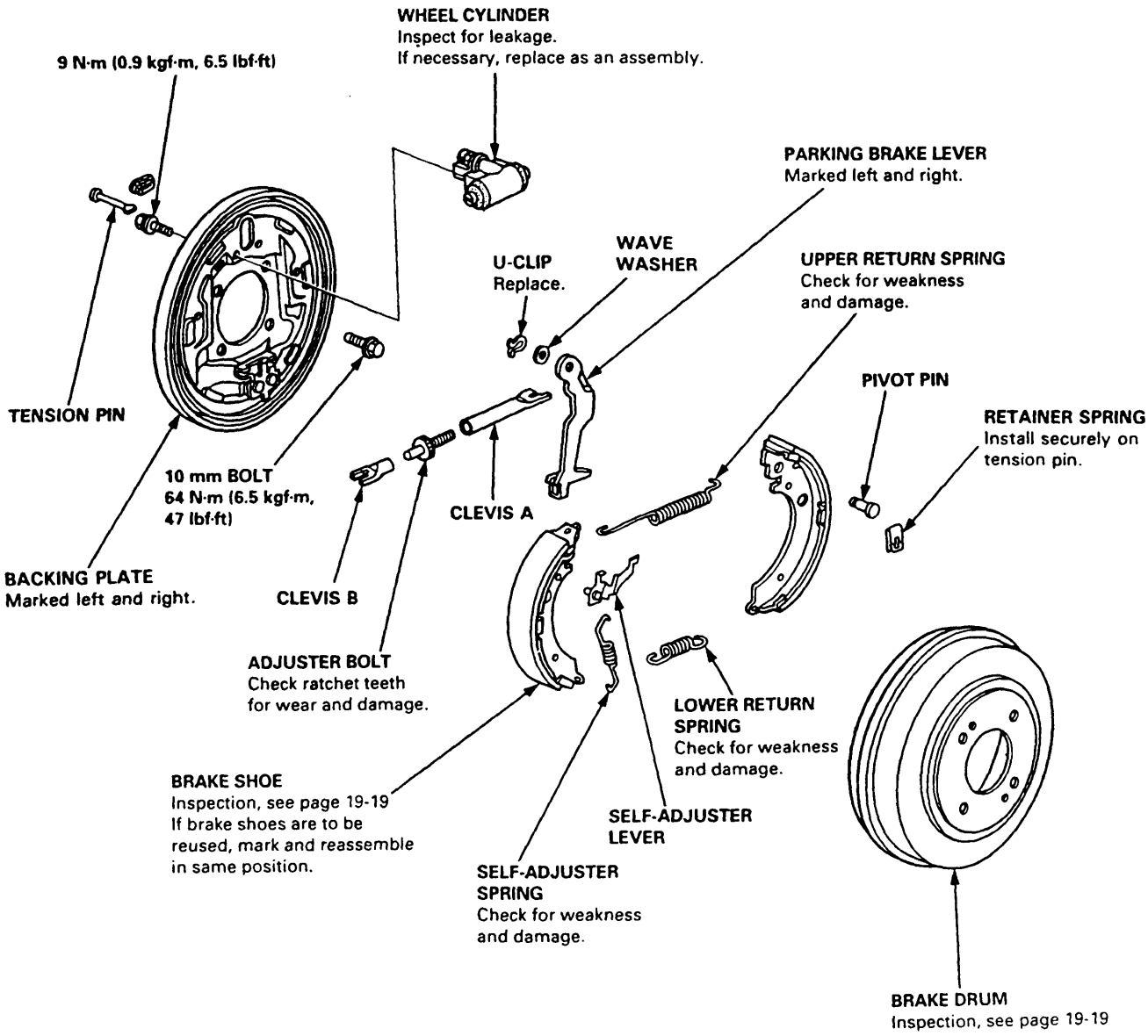
Index/Inspection

⚠ WARNING

- **Never use an air hose or dry brush to clean brake assemblies.**
- **Use an OSHA approved vacuum cleaner to avoid breathing brake dust.**
- **Contaminated brake linings or drums reduce stopping ability.**
- **Block the front wheels before jacking up the rear of the vehicle.**

1. Block the front wheels, loosen the rear wheel nuts slightly, support the rear of vehicle on safety stands, then remove the rear wheels.

2. Release the parking brake, and remove the rear brake drum.



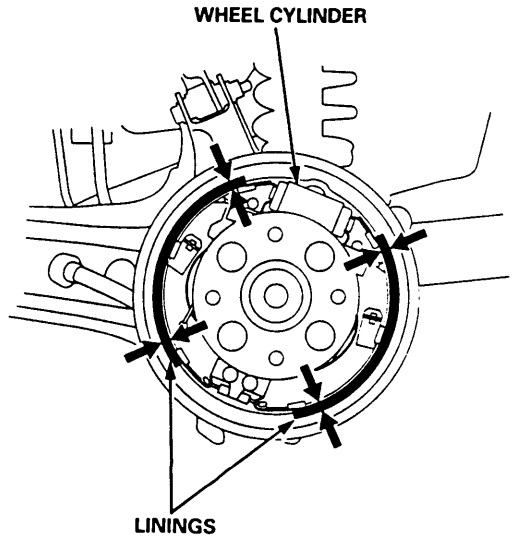
Inspection

1. Check the wheel cylinder for leakage.

2. Check the brake linings for cracking, glazing, wear and contamination.

3. Measure the brake lining thickness.

   Brake Lining Thickness:
   Standard: 4.0 mm (0.157 in)
   Service Limit: 2.0 mm (0.08 in)



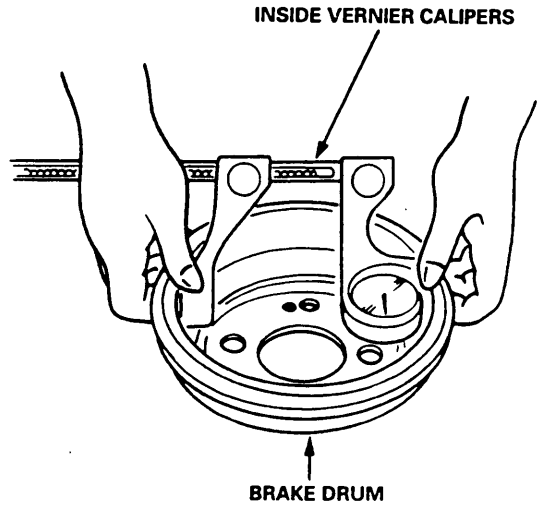
   NOTE: Measurement does not include brake shoe thickness.

4. If the brake lining thickness is less than service limit, replace the brake shoes as a set.

5. Check the bearings in the hub unit for smooth operation. If defective, refer to section 18.

6. Measure the inside diameter of the brake drum using the inside vernier calipers.

   Drum Inside Diameter:
   Standard: 199.9 – 200.0 mm (7.870 – 7.874 in)
   Service Limit: 201.0 mm (7.913 in)

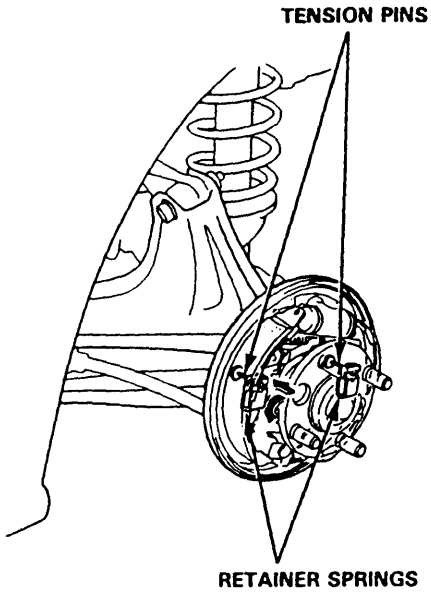


7. If the inside diameter of the brake drum is more than service limit, replace the brake drum.

8. Check the brake drum for scoring, grooves and cracks.

Brake Shoe Disassembly

1. Remove the tension pins by pushing the retainer springs and turning them.



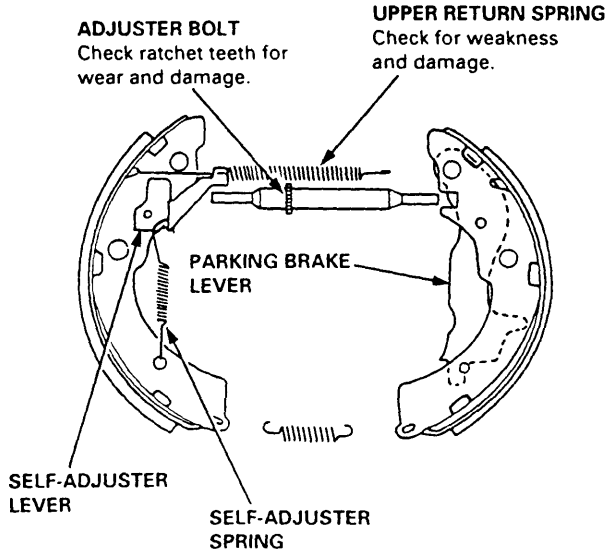
2. Lower the brake shoe assembly, and remove the lower return spring.

   NOTE: Be careful not to damage the dust cover on the wheel cylinder.

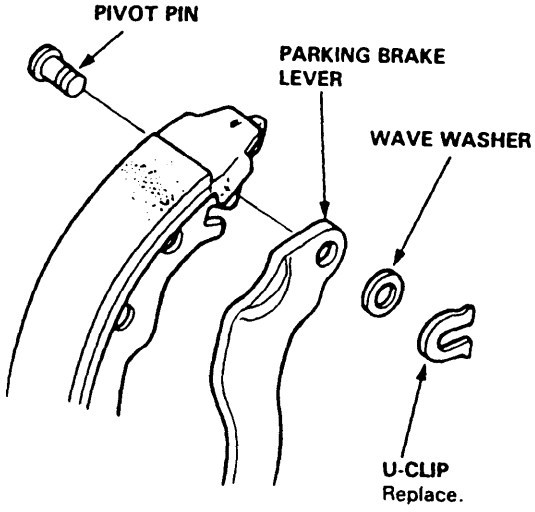
3. Remove the brake shoe assembly.

4. Disconnect the parking brake cable from the parking brake lever.

5. Remove the upper return spring, self-adjuster lever and self-adjuster spring, and separate the brake shoes.



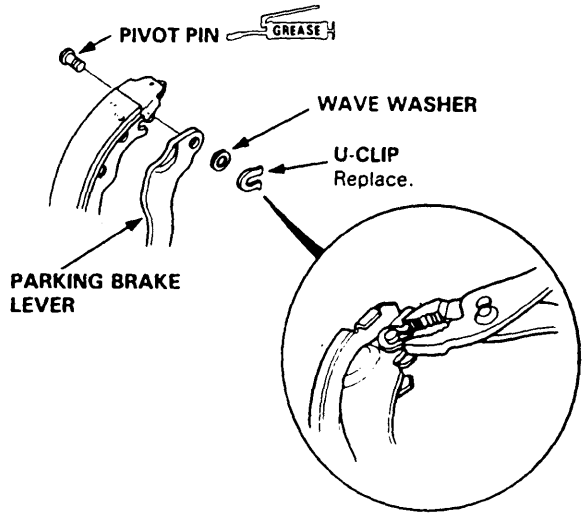
6. Remove the wave washer, parking brake lever and pivot pin from the brake shoe by removing the U-clip.



7. Apply brake cylinder grease (P/N: 08733 – B020E) or equivalent rubber grease to the sliding surface of the pivot pin, and insert the pin into the brake shoe.

8. Install the parking brake lever and wave washer on the pivot pin and secure with U-clip.

   NOTE: Pinch the U-clip securely to prevent the pivot pin from coming out of the brake shoe.



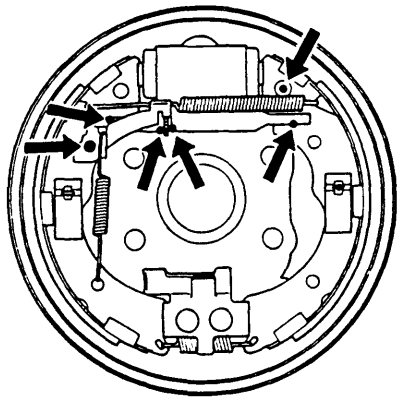
9. Connect the parking brake cable to the parking brake lever.

10. Apply grease on each sliding surface.

⚠WARNING Contaminated brake linings reduce stopping ability. Keep grease or oil off the brake linings. Wipe any excess grease off the parts.

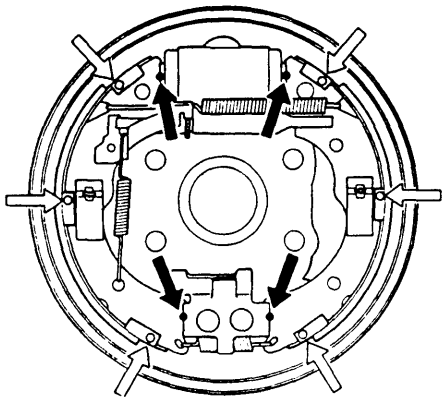
- Apply brake cylinder grease (P/N: 08733 – B020E) or equivalent rubber grease to the sliding surfaces as shown.

➡ ● Sliding surface



- Apply Molykote 44MA to the brake shoe ends and opposite edges of the shoes as shown.

➡ ● Opposite edge of the shoe
⇨ ○ Brake shoe ends



11. Clean the threaded portions of clevises A and B. Coat the threads of the clevises with grease. To shorten the clevises, turn the adjuster bolt.

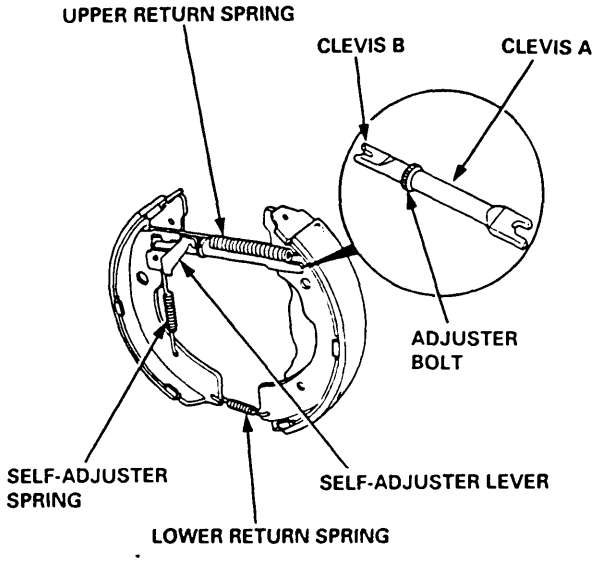
12. Hook the self-adjuster spring to the self-adjuster lever first, then to the brake shoe.

13. Install the clevises and upper return spring noting the installation direction.

NOTE: Be careful not to damage the wheel cylinder dust covers.

14. Install the lower return spring.

15. Install the tension pins and retaining springs.



16. Install the brake drum.

17. If the wheel cylinder has been removed, bleed the brake system (see page 19-7), and check for leaks at brake line connections, and retighten if necessary.

18. Depress the brake pedal several times to set the self-adjusting brake.

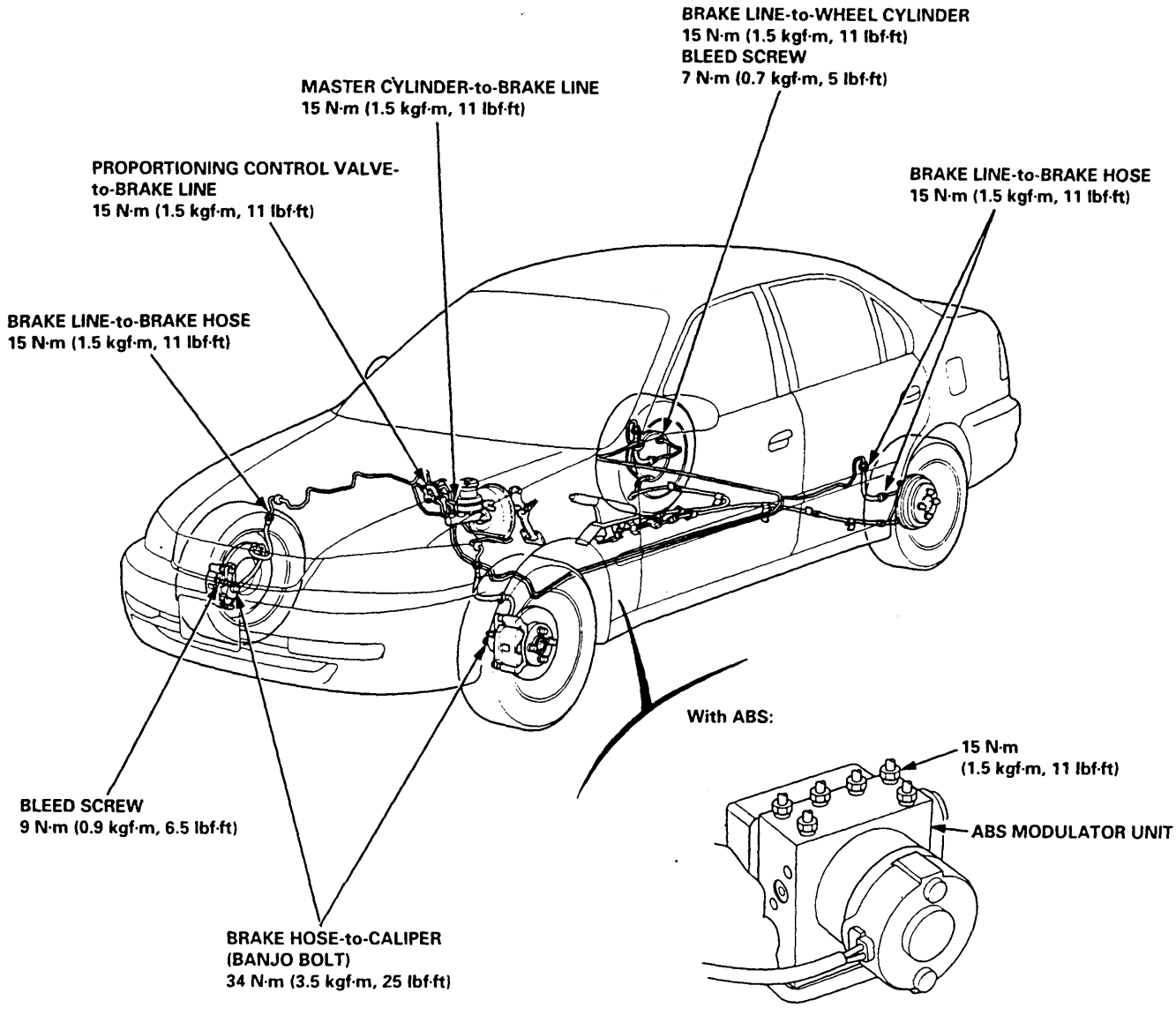
19. Adjust the parking brake (see page 19-6).

Brake Hoses/Lines

Inspection/Torque Specifications

1. Inspect the brake hoses for damage, deterioration, leaks, interference and twisting.
2. Check the brake lines for damage, rusting and leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints and connections, and retighten if necessary.
4. Check the master cylinder and ABS modulator unit for damage and leakage.

CAUTION: Replace the brake hose clip whenever the brake hose is serviced.

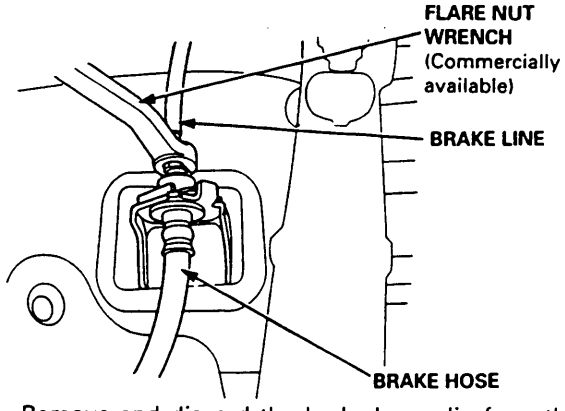


Hose Replacement

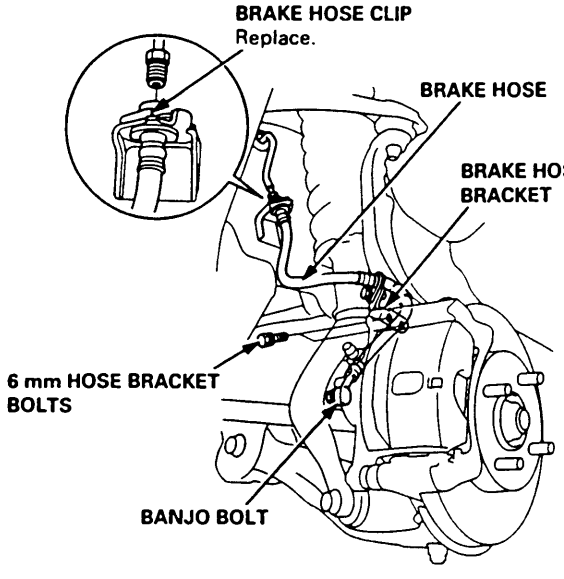
CAUTION:
- **Before reassembling, check that all parts are free of dust and other foreign particles.**
- **Replace parts with new ones whenever specified to do so.**
- **Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.**

1. Replace the brake hose if the hose is twisted, cracked, or if it leaks.

2. Disconnect the brake hose from the brake line using a 10 mm flare nut wrench.



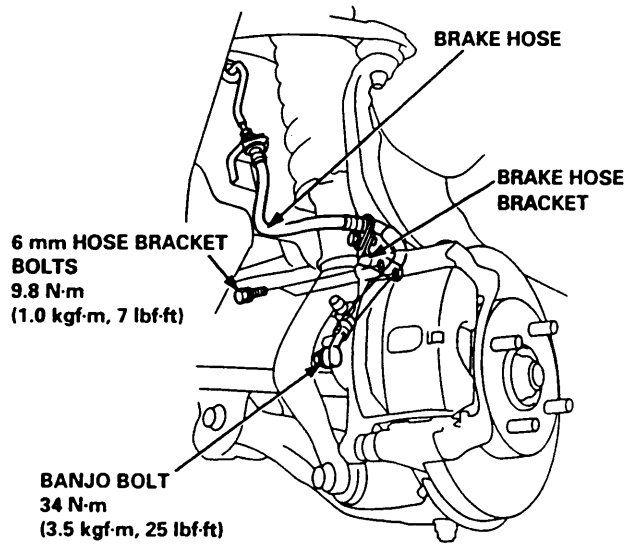
3. Remove and discard the brake hose clip from the brake hose.



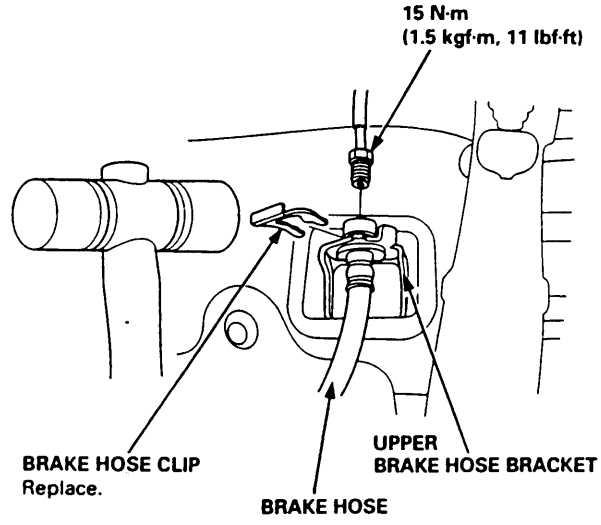
4. Remove the banjo bolt, and disconnect the brake hose from the caliper.

5. Remove the brake hose bracket from the knuckle.

6. Install the brake hose bracket and brake hose on the knuckle first, then connect the brake hose to the caliper with the banjo bolt and new sealing washers.



7. Install the brake hose on the upper brake hose bracket with a new brake hose clip.



8. Connect the brake line to the brake hose.

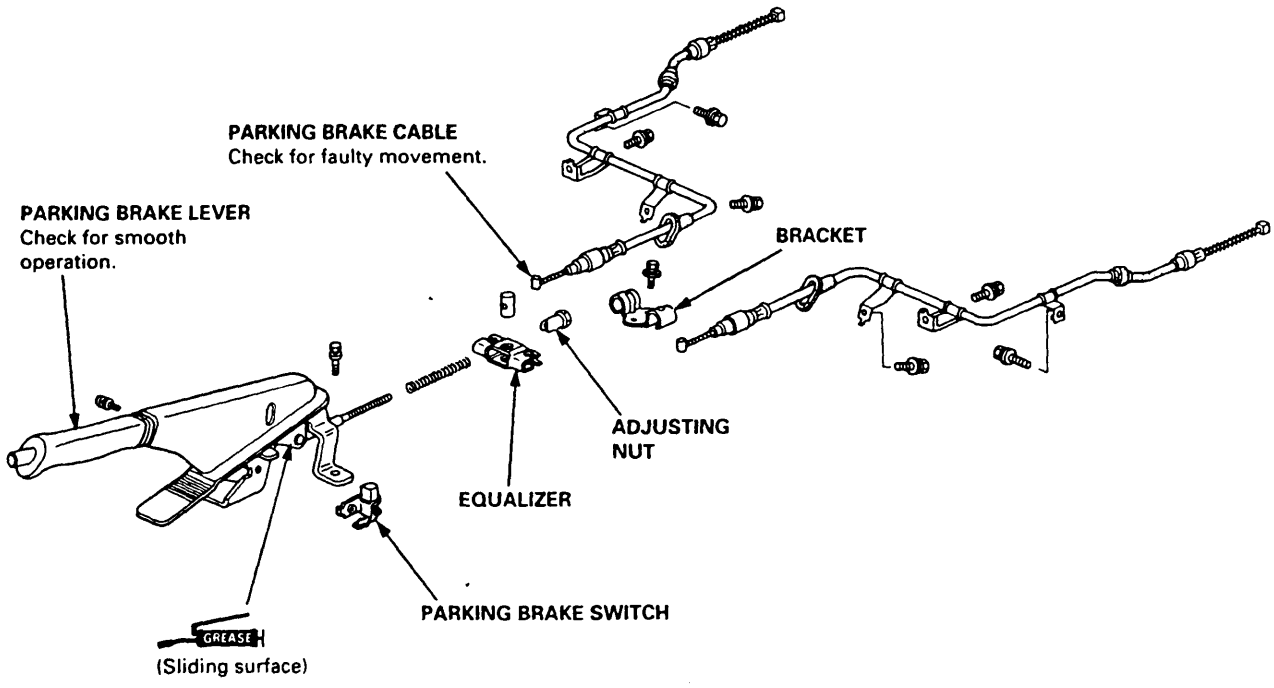
9. After installing the brake hose, bleed the brake system (see page 19-7).

10. Perform the following checks.
    - Check the brake hose and line joint for leaks, and tighten if necessary.
    - Check the brake hoses for interference and twisting.

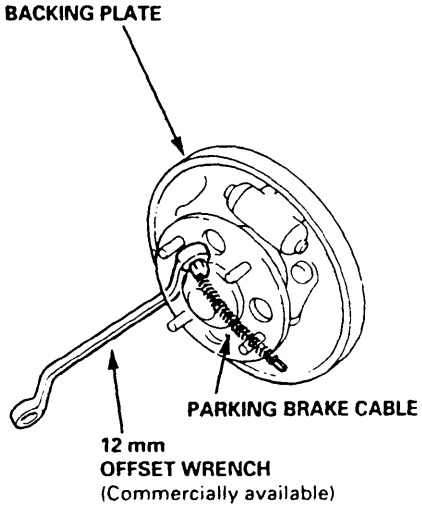
Parking Brake Cable

Inspection and Replacement

CAUTION: The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature cable failure.



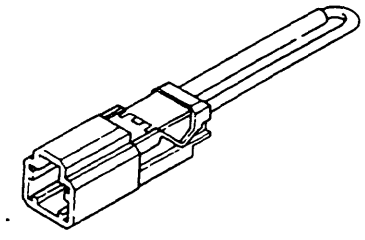
Remove the parking brake cable from the backing plate using a 12 mm offset wrench as shown.



Anti-lock Brake System (ABS)

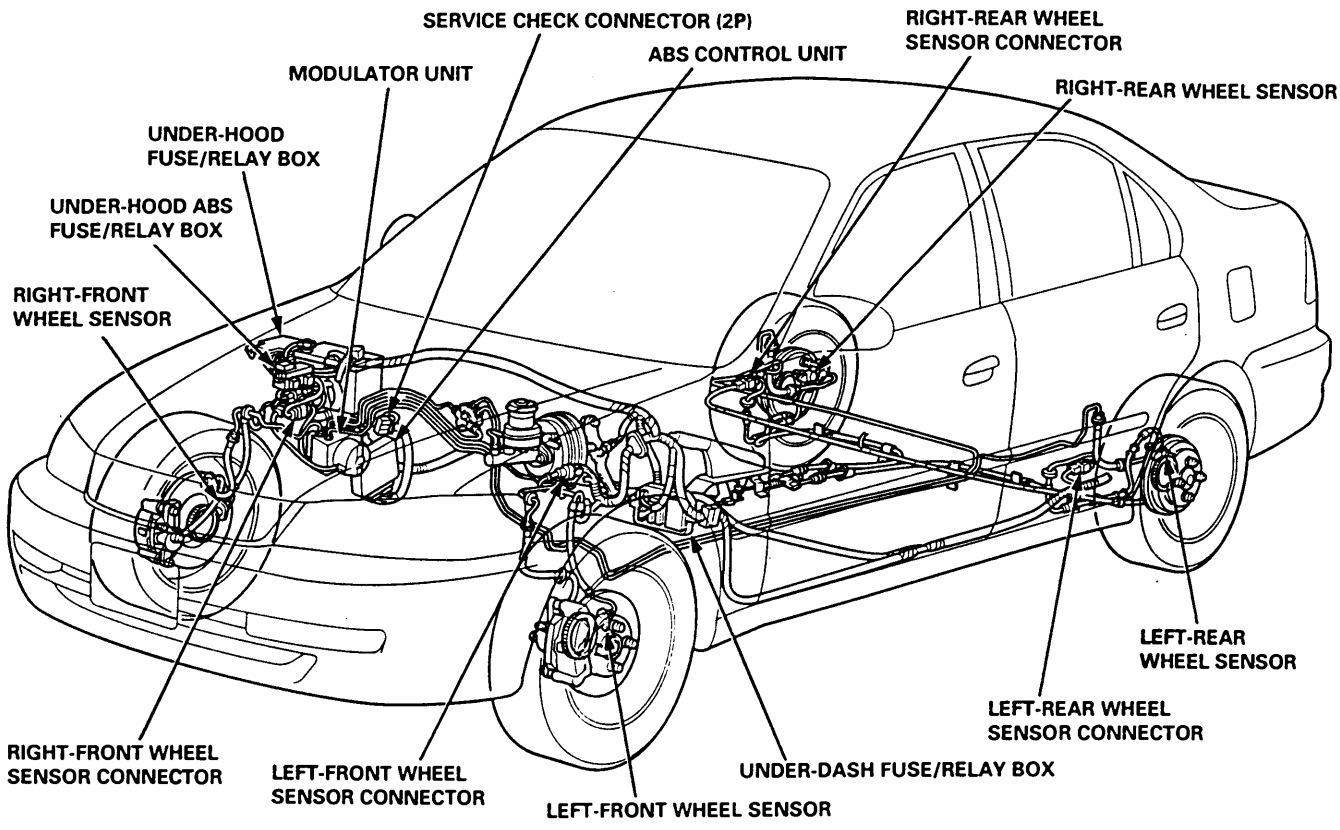
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07PAZ – 0010100	SCS Service Connector	1	19-38

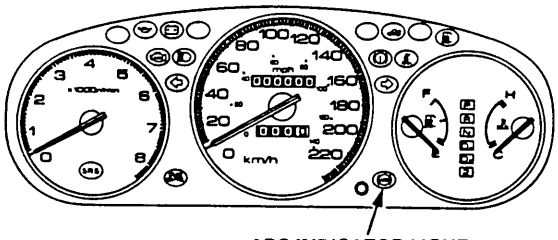


①

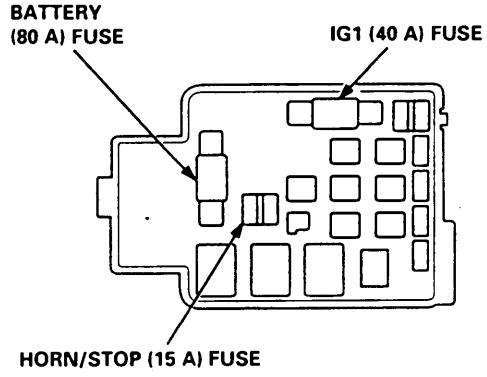
Component Locations



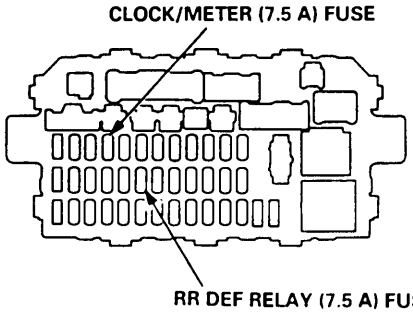
GAUGE ASSEMBLY



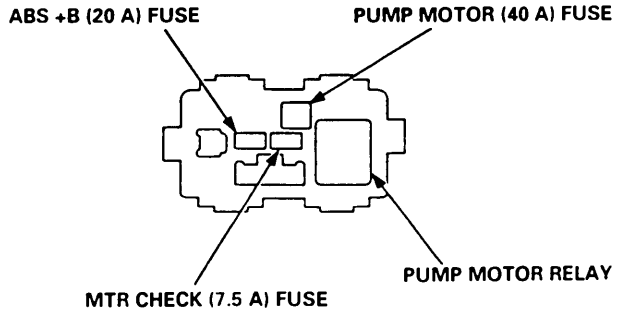
UNDER-HOOD FUSE/RELAY BOX



UNDER-DASH FUSE/RELAY BOX



UNDER-HOOD ABS FUSE/RELAY BOX

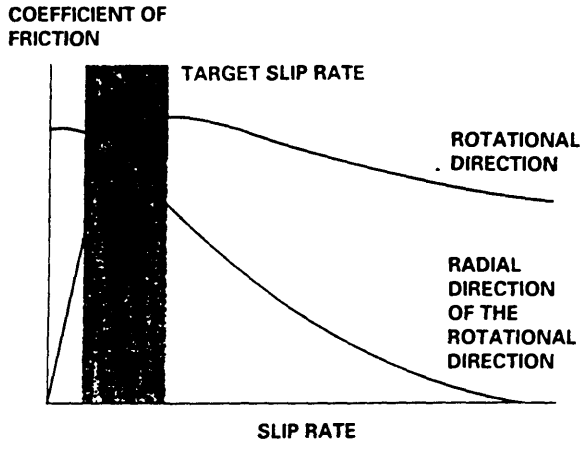


Anti-lock Brake System (ABS)

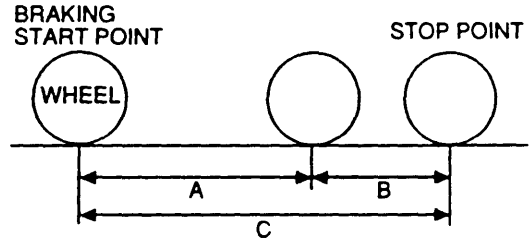
Features/Construction

When the brake pedal is depressed during driving, the wheels can lock before the vehicle comes to a stop. In such a case, 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 the grip force of the tires, and it thereby ensures the maneuverbility and stability of the vehicle.
Judging the vehicle speed, 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 attain the target slip rate.

Grip Force of Tire and Road Surface

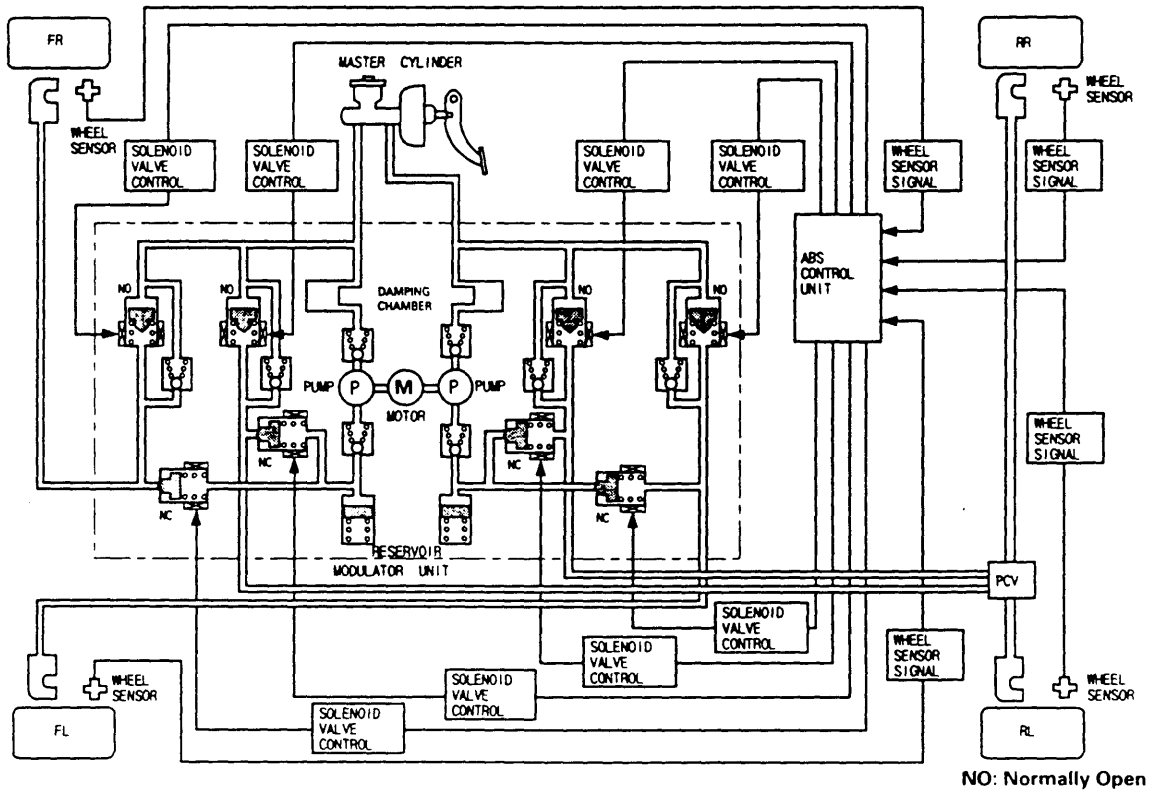


Slip Rate



A: Distance without slip
B: Slipped distance
C: Actual distance to stop

$$\text{SLIP RATE} = \frac{B}{C} = \frac{\text{VEHICLE SPEED} - \text{WHEEL SPEED}}{\text{VEHICLE SPEED}}$$



NO: Normally Open
NC: Normally Closed

Operation

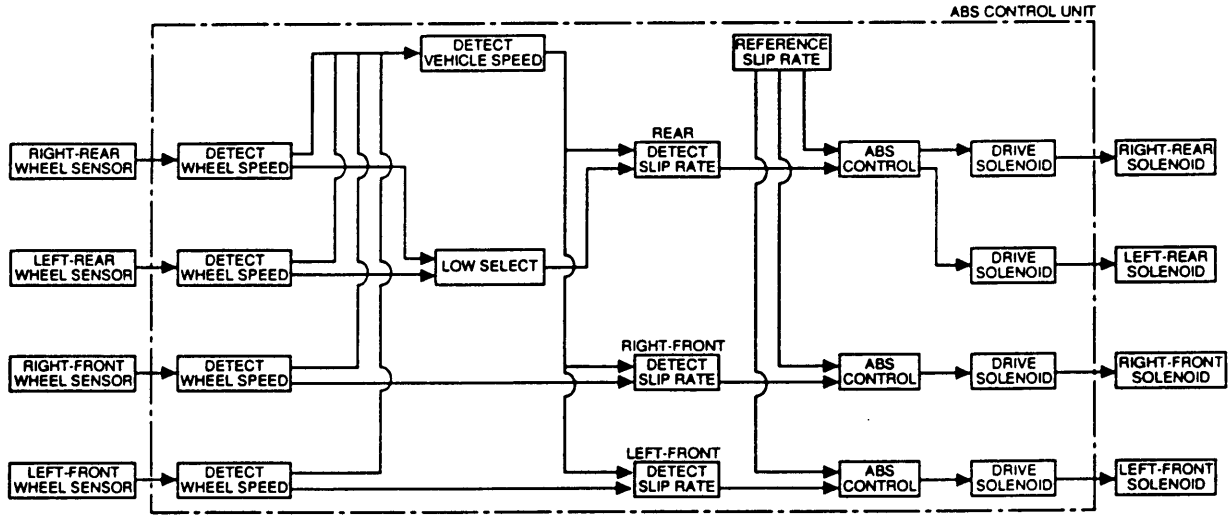
ABS Control Unit

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 it transmits the control signal to the modulator unit solenoid valve when the slip rate is high.

The pressure reduction control is a three-mode system, that is pressure reduction, pressure retaining and pressure intensifying modes.



Self-diagnosis Function

The ABS control unit is equipped with a main CPU and a sub CPU, and the CPUs check each other.

The CPUs check the circuit of the system.

When the CPUs detect failure, they shift to the "system down mode" or the "control inhibition mode".

MODE	ABS INDICATOR LIGHT	MAIN RELAY	SOLENOID VALVE	CPU	Restart condition		DTC
SYSTEM DOWN	ON	No operation	Drive inhibition	Operation*1	Ignition switch	OFF → ON (II)	Memory
CONTROL INHIBITION	ON	No operation	Drive inhibition	Operation	Automatic		Memory

*1: Except CPU failure

The self-diagnosis can be classifield into these four categories.

①: Initial diagnosis

②: Except ABS control

③: During ABS control

④: During warning

On-board Diagnosis Function

The ABS control unit is connected to the data link connector (16P).

The ABS system can be diagnosed with the Honda PGM Tester.

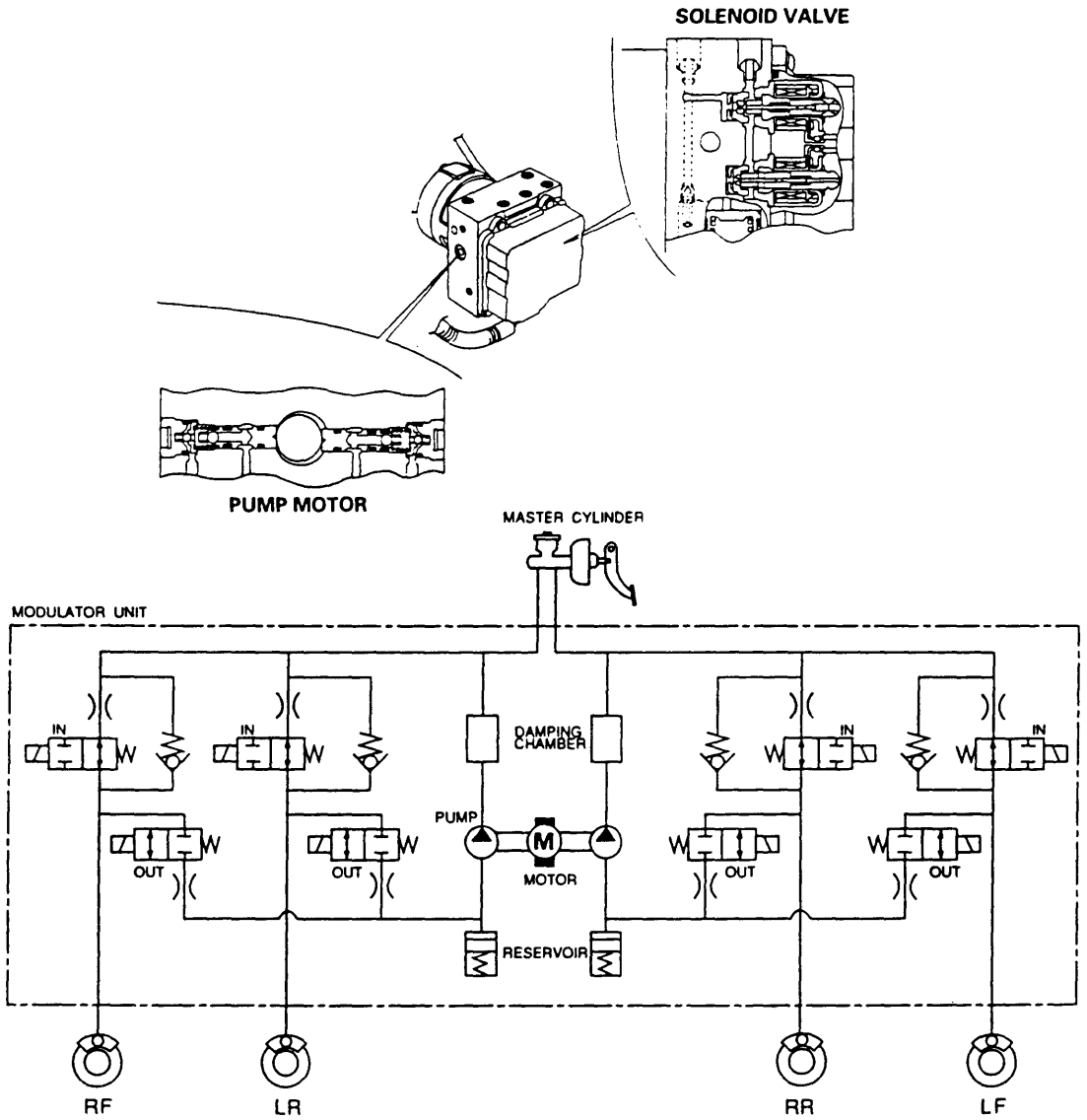
(cont'd)

Anti-lock Brake System (ABS)

Operation (cont'd)

ABS Modulator

The ABS modulator consists of the inlet solenoid valve, outlet solenoid valve, reservoir, pump, pump motor and the damping chamber.
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: pressure reduction, pressure retaining and pressure intensifying.
The hydraulic circuit is the independent four channel-type, one channel for each wheel.



IN: INLET VALVE (NORMALLY OPEN)
OUT: OUTLET VALVE (NORMALLY CLOSED)

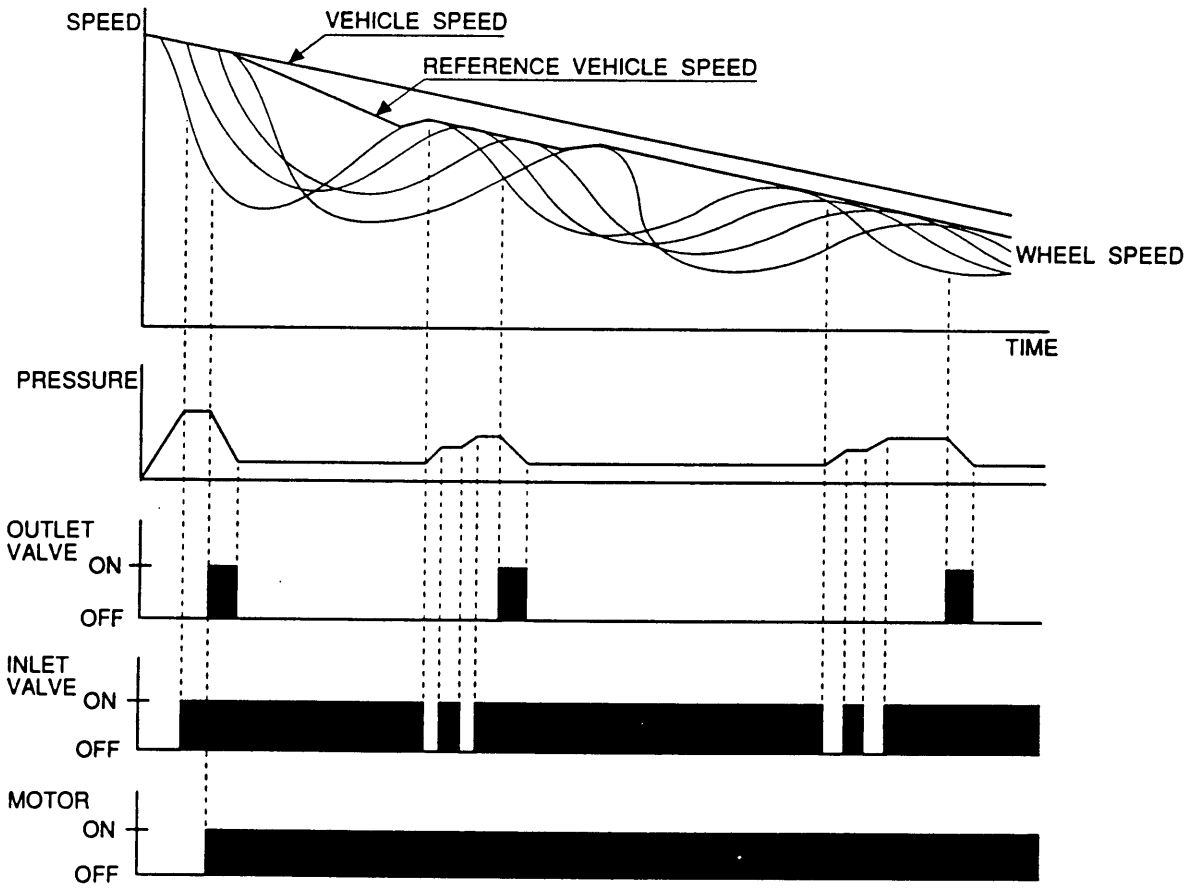
Pressure intensifying mode: Inlet valve open, outlet valve closed
Master cylinder fluid is pumped out to the caliper.

Pressure retaining mode: Inlet valve closed, outlet valve closed
Caliper fluid is retained by the inlet valve and outlet valve.

Pressure reduction mode: Inlet valve closed, outlet valve open
Caliper fluid flows through the outlet valve to the reservoir.

Motor operation mode: When starting the pressure reduction mode, the pump motor is ON.
When stopping ABS operation, the pump motor is OFF.
The reservoir fluid is pumped out by the pump, through the damping chamber, to the master cylinder.

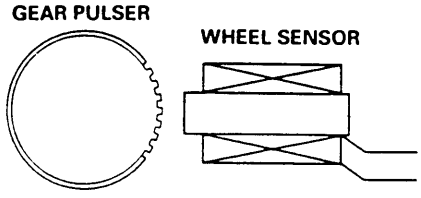
Wheel Speed and Modulator Control

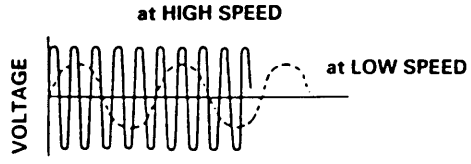


When the wheel speed drops sharply below the vehicle speed, the inlet valve closes to retain the caliper fluid pressure.
When the wheel speed drops further, the outlet valve opens momentarily to reduce the caliper fluid pressure. The pump motor starts at this time.
As the wheel speed is restored, the inlet valve opens momentarily to increase the caliper fluid pressure.

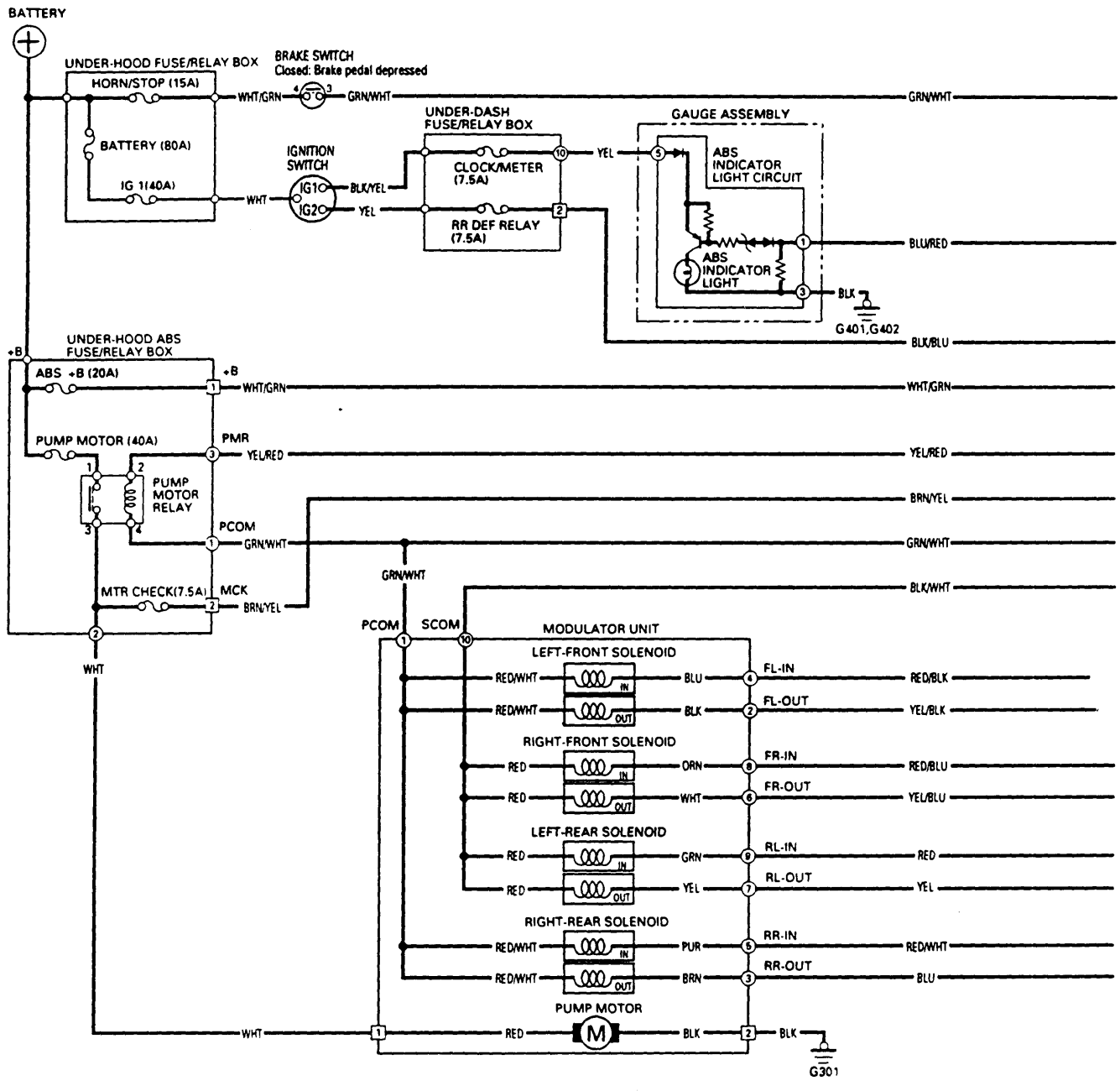
Wheel Sensor

The wheel sensors are the magnetic contactless type.
As the gear pulser teeth rotate past the wheel sensor's magnetic coil, AC current is generated. The AC frequency changes in accordance with the wheel speed. The ABS control unit detects the wheel sensor signal frequency and thereby detects the wheel speed.
There are four wheel sensors, one for each wheel.
The gear pulser has 50 teeth.

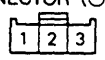




Circuit Diagram



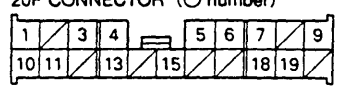
UNDER-HOOD ABS FUSE/RELAY BOX 3P CONNECTOR (○ number)



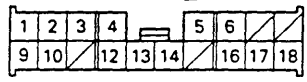
UNDER-HOOD ABS FUSE/RELAY BOX 2P CONNECTOR (□ number)

BRAKE SWITCH CONNECTOR

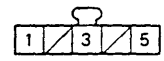
UNDER-DASH FUSE/RELAY BOX 20P CONNECTOR (○ number)



UNDER-DASH FUSE/RELAY BOX 18P CONNECTOR (□ number)

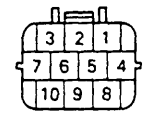


GAUGE ASSEMBLY 5P CONNECTOR



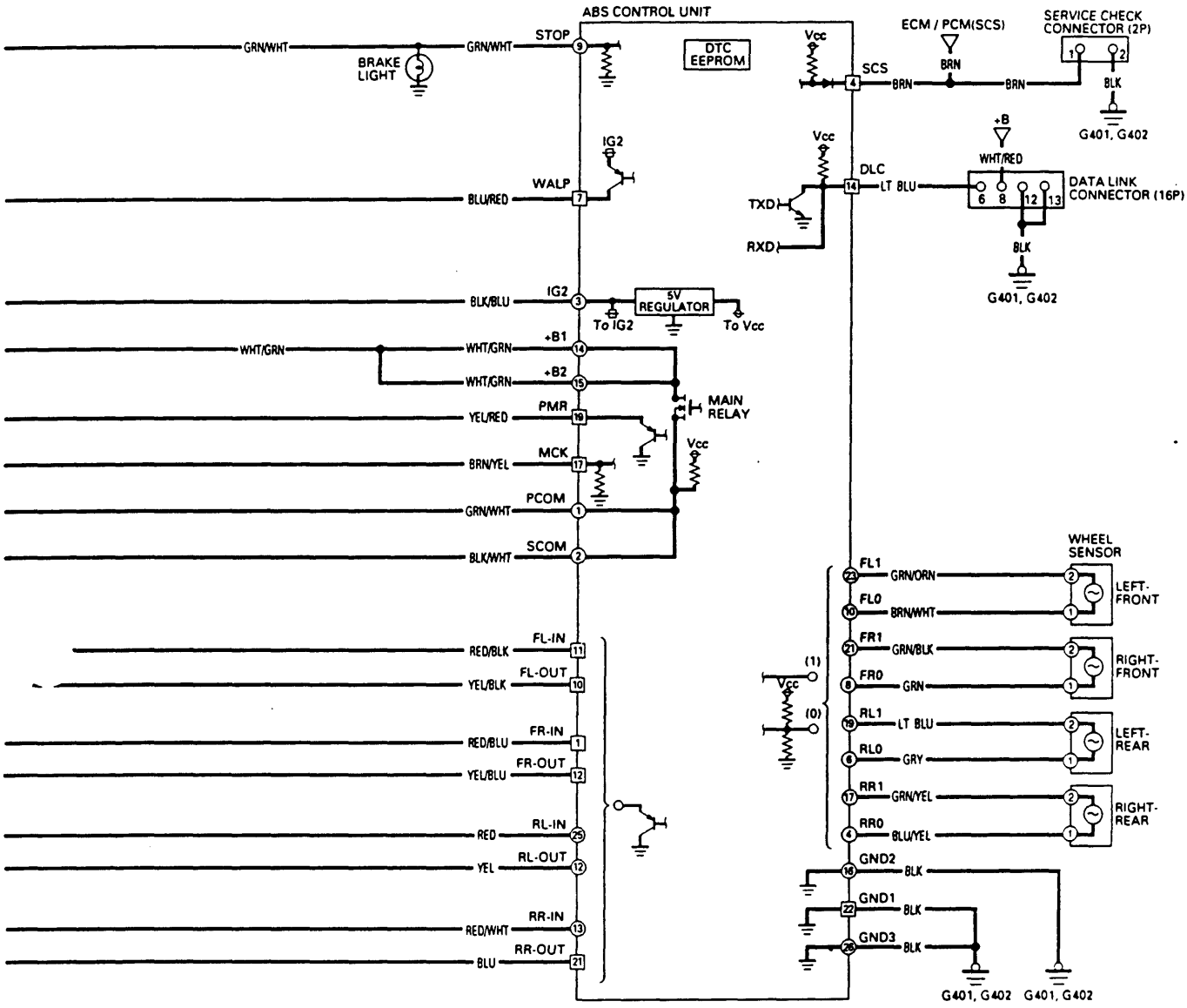
Wire side of female terminals

MODULATOR UNIT 10P CONNECTOR (○ number)



PUMP MOTOR 2P CONNECTOR (□ number)

Terminal side of female terminals



ABS CONTROL UNIT 26P CONNECTOR
(○ number)

1	2	3	4		6		8	9	10		12	13
14	15	16	17		19		21		23		25	26

ABS CONTROL UNIT 22P CONNECTOR
(□ number)

1			4			7			10	11
12		14			17		19		21	22

Wire side of female terminals

SERVICE CHECK CONNECTOR (2P)

1	2

DATA LINK CONNECTOR (16P)

					6		8
			12	13		15	

WHEEL SENSOR 2P CONNECTOR

FRONT

1	2

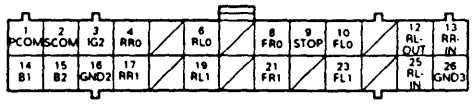
REAR

1	2

Terminal side of male terminals

ABS Control Unit Terminal Arrangement

ABS CONTROL UNIT 26P CONNECTOR

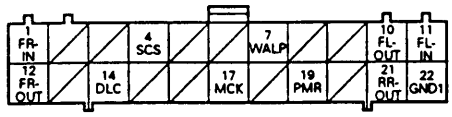


Wire side of female terminals

VB: Battery Voltage

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Voltage				
				Measurement terminals	Conditions (Ignition Switch ON (II))			Output voltage
1	GRN/WHT	PCOM (Primary common)	Power source for the solenoid valve and pump motor.	1-GND	Engine: ON / Solenoid: ON			0 V
					Engine: ON / Solenoid: OFF			AC: 3~6 V
2	BLK/WHT	SCOM (Secondary common)	Power source for the solenoid valve.	2-GND	Engine: OFF (Connect the SCS service connector)			Approx. 3 V
3	BLK/BLU	IG2 (Ignition 2)	Detects ignition switch 2 signal. (System activate signal)	3-GND				VB
4	BLU/YEL	RR0 (Rear-right 0)	Detects right-rear wheel sensor signal.	4-17	When the wheel is turned at 1 turn/second.			53 mV or above on digital tester (AC range) (Referance) 150 mVp-p or above on oscilloscope
6	GRY	RL0 (Rear-left 0)	Detects left-rear wheel sensor signal.	6-19				
8	GRN	FR0 (Front-right 0)	Detects right-front wheel sensor signal.	8-21				
					Stops			Approx. 2.5 V
9	GRN/WHT	STOP (Stop)	Detects brake switch signal. (Prevents unnecessary ABS operation)	9-GND	Brake pedal depressed.			VB
					Brake pedal released.			0 V
10	BRN/WHT	FL0 (Front-left 0)	Detects left-front wheel sensor signal.	10-23	When the wheel is turned at 1 turn/second.			53 mV or above on digital tester (AC range) (Referance) 150 mVp-p or above on oscilloscope
					Stops			Approx. 2.5 V
12	YEL	RL-OUT (Rear-left outlet)	Drives left-rear outlet solenoid valve.	12-GND	Engine: ON / Solenoid: ON			0 V
					Engine: ON / Solenoid: OFF			AC: 3~6 V
13	RED/WHT	RR-IN (Rear-right inlet)	Drives right-rear inlet solenoid valve.	13-GND	Engine: OFF (Connect the SCS service connector)			Approx. 3 V
14	WHT/GRN	B1 (Battery 1)	Power source for the solenoid valve and pump motor.	14-GND				VB
15	WHT/GRN	B2 (Battery 2)	Power source for the solenoid valve and pump motor.	15-GND				
16	BLK	GND2 (Ground 2)	Ground for the ABS control unit.	16-GND				Below 0.3 V
17	GRN/YEL	RR1 (Rear-right 1)	Detects right-rear wheel sensor signal.	17-4	When the wheel is turned at 1 turn/second.			53 mV or above on digital tester (AC range) (Referance) 150 mVp-p or above on oscilloscope
19	LT BLU	RL1 (Rear-left 1)	Detects left-rear wheel sensor signal.	19-6				
21	GRN/BLK	FR1 (Front-right 1)	Detects right-front wheel sensor signal.	21-8				
23	GRN/ORN	FL1 (Front-left 1)	Detects left-front wheel sensor signal.	23-10				
					Stops			Approx. 2.5 V
25	RED	RL-IN (Rear-left inlet)	Drives left-rear inlet solenoid valve.	25-GND	Engine: ON / Solenoid: ON			0 V
					Engine: ON / Solenoid: OFF			AC: 3~6 V
					Engine: OFF (Connect the SCS service connector)			Approx. 3 V
26	BLK	GND3 (Ground 3)	Ground for the ABS control unit.	26-GND				Below 0.3 V

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

VB: Battery Voltage

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement terminals	Voltage: Conditions (Ignition Switch ON (II))				Voltage: Output voltage
1	RED/BLU	FR-IN (Front-right inlet)	Drives right-front inlet solenoid valve.	1-GND	Engine	ON	Solenoid	ON	0 V
								OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)			Approx. 3 V
4	BRN	SCS (Service check signal)	Detects service check signal (Diagnostic trouble code indication)	4-GND	SCS service connector connected.				0 V
					SCS service connector disconnected.				Approx. 5 V
7	BLU/RED	WALP (Warning lamp)	Drives ABS indicator light (The indicator light goes off when ABS control unit outputs battery voltage).	7-GND	Indicator light ON				Approx. 2 V
					Indicator light OFF				VB
10	YEL/BLK	FL-OUT (Front-left outlet)	Drives left-front outlet solenoid valve.	10-GND	Engine	ON	Solenoid	ON	0 V
								OFF	AC: 3~6 V
11	RED/BLK	FL-IN (Front-left inlet)	Drives left-front inlet solenoid valve.	11-GND					
12	YEL/BLU	FR-OUT (Front-right outlet)	Drives right-front outlet solenoid valve.	12-GND		OFF (Connect the SCS service connector)			Approx. 3 V
14	LT BLU	DLC (Data link connector)	Communicates with Honda PGM Tester.	14-GND	——				Approx. 5 V
17	BRN/YEL	MCK (Motor check)	Detects pump motor drive signal.	17-GND	Pump motor relay	ON			VB
						OFF			0 V
19	YEL/RED	PMR (Pump motor relay)	Drives pump motor relay.	19-GND	Engine	ON	Solenoid	ON	0 V
								OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)			Approx. 3 V
21	BLU	RR-OUT (Rear-right outlet)	Drives right-rear outlet solenoid valve.	21-GND	Engine	ON	Pump motor relay	ON	0 V
								OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)			Approx. 3 V
22	BLK	GND2 (Ground 2)	Ground for the ABS control unit.	22-GND					Below 0.3 V

Troubleshooting Precautions

ABS Indicator Light

1. If the system is OK, the ABS indicator light goes off two seconds after turning the ignition switch ON (II) without starting the engine. After starting the engine, the ABS indicator light comes on again and goes off after two seconds. This occurs because the ABS control unit is activated by the IG2 power source.
2. The ABS indicator light comes on when the ABS control unit detects a problem in the system. However, even though the system is normal, the ABS indicator light can come on, too, under the following conditions. To determine the actual cause of problem, question the customer about the problem, taking the following conditions into consideration.
   - Signal disturbance
   - Wheel spin
   - Only drive wheels rotate
   - Battery voltage fluctuates
3. When a problem is detected and the ABS indicator light comes on, the indicator light can stay on until the ignition switch is turned off, or it can automatically go off, depending on the mode.
   - Light stays on until the ignition switch is turned off: When the system is in the system down mode.
   - Light automatically goes off: When the system is in the control inhibition mode. (refer to symptom-to-system chart)
4. The ABS indicator light stays on when the system is reactivated without erasing the DTC, but it goes off after starting the vehicle.
   When the wheel sensor system is faulty and the ABS indicator light comes on, the algorithm of the system automatically turns off the ABS indicator light after the wheel speed signal returns to the normal speed. While, when the DTC is erased, the CPU is reset and the ABS indicator light goes off when the system checked out normal by the initial diagnosis.
   Therefore, test-drive the vehicle after servicing the wheel sensor system, and be sure that the ABS indicator light does not come on.
5. When the ABS control unit outputs battery voltage to gauge assembly, the ABS indicator light goes off.

Diagnostic Trouble Code (DTC)

1. The diagnostic trouble code (DTC) is memorized when a problem is detected and the ABS indicator light does not go off, or when the ABS indicator light comes on.
   The DTC is not memorized when the ABS indicator light comes on unless the CPU is activated.
2. The memory can hold any number of DTCs. However, when the same DTC is detected twice or more, the later one is written over the old one.
   Therefore, when the same problem is detected repeatedly, it is recorded as one DTC.
3. The DTCs are indicated in the order of ascending number, not in the order they occur.
4. The DTCs are memorized in the EEPROM (non-volatile memory).
   Therefore, the memorized DTCs cannot be canceled by disconnecting the battery. Perform the specified procedures to erase.

Self-diagnosis

1. The self-diagnosis can be classifield into these four categories.
   - Initial diagnosis: Performed right after the engine starts and until the ABS indicator light goes off.
   - Except ABS control: Performed when the ABS is not functioning.
   - During ABS control: Performed when the ABS is functioning.
   - During warning: Performed when the ABS indicator light is ON.
2. The system performs the following controls when a problem is detected by the self-diagnosis.
   - ABS indicator light ON
   - Memory of DTC
   - Mode change to the "system down mode" or the "control inhibition mode".

MODE	ABS INDICATOR LIGHT	MAIN RELAY	SOLENOID VALVE	CPU	Restart condition		DTC
SYSTEM DOWN	ON	No operation	Drive inhibition	Operation*1	Ignition switch	OFF → ON (II)	Memory
CONTROL INHIBITION	ON	No operation	Drive inhibition	Operation	Automatic		Memory

*1: Except CPU failure

Kickback

1. The 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.

2. The ABS control unit operates the solenoid valve when the brake pedal is released after the initial diagnosis. You may hear the faint solenoid valve operation sound at this time, but it is normal.

Pump Motor

1. The pump motor operates when the ABS is functioning.

2. The ABS control unit checks the pump motor operation during acceleration. You may hear the faint operation sound at this time, but it is normal.

Brake Fluid Replacement/Air Bleeding

1. Brake fluid replacement and air bleeding procedures are the same as vehicles without ABS. To ease bleeding, start with the front wheels.

Troubleshooting

1. The troubleshooting flowcharts procedures assume that the cause of the problem is still present and the ABS indicator light is still on. Following the flowchart when the ABS indicator light does not come on can result in incorrect judgement.

2. Question the customer about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting.
   Self-diagnosis is made at various times such as the initial diagnosis, except ABS control, during ABS control, during acceleration, during the specified vehicle speed, etc. Therefore, the symptom cannot be checked unless the check conditions match with the problem conditions.

3. When the ABS indicator light does not come on during the test-drive, but the troubleshooting is performed based on the DTC, check for the loose connectors, poor contact of the terminals, etc, before troubleshooting.

4. After troubleshooting, erase the DTC and test-drive the vehicle. Be sure that the ABS indicator light does not come on.

5. The connector illustrations show the female connectors with a single outline and the male connector with a double outline.

ABS Function Test

To simulate ABS operation and activate the solenoid valves and pump, use the Honda PGM Tester.

Connect the PGM Tester to the 16P Data Link Connector (DLC). When the System Select menu is displayed, select the ABS Test Mode menu and follow the tester's prompts.

Diagnostic Trouble Code (DTC)

Diagnostic Trouble Code (DTC) Indication (SCS Mode)

NOTE: This operation can also be done with the Honda PGM Tester.

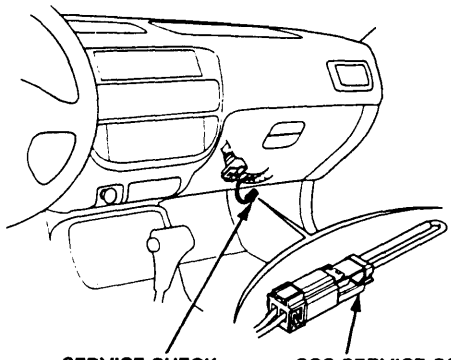
1. Connect the SCS service connector to the service check connector inside the passenger's side kick panel.
2. Turn the ignition switch ON (II).
   NOTE: Do not depress the brake pedal when turning the ignition switch.
3. Record the blinking frequency of the ABS indicator light. The blinking frequency indicates the DTC.
4. Turn the ignition switch OFF, and remove the SCS service connector.
   NOTE: The Malfunction Indicator Lamp (MIL) will stay on after the engine is started if the SCS service connector is connected.
5. Erase the DTC.

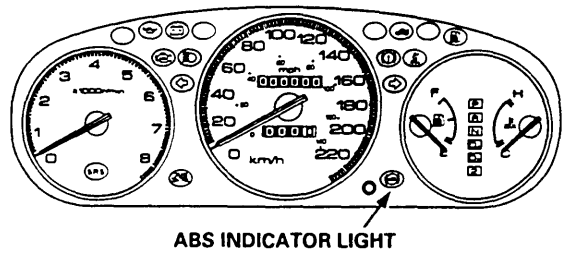
Conditions for DTC indication

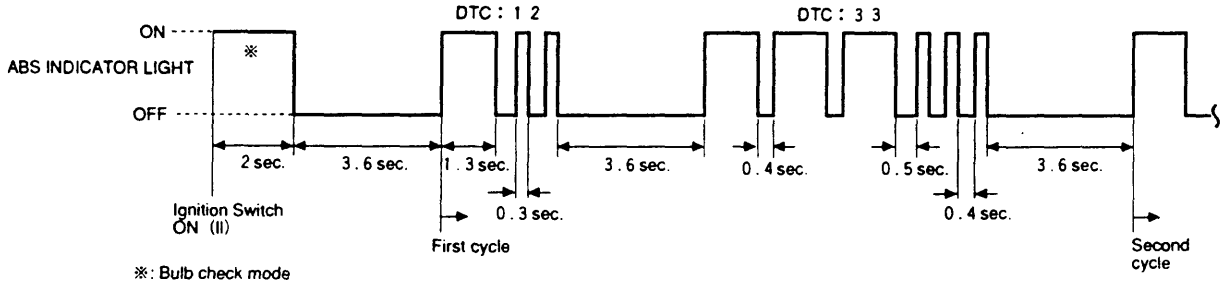
- The car is stopped.
- The SCS service connector is connected before the ignition switch is turned ON (II).
- The brake pedal is released.
- The SCS service connector remains connected during this procedure.

The DTC indication stops and the ABS control unit executes the software function if at least one of the following conditions is satisfied.

- The car is not stopped.
- The ABS control unit receives the normal signal (which is for the ABS control unit) from a Honda PGM Tester.
- The SCS service connector is disconnected during this procedure.







- When ignition switch is turned ON (II), the ABS indicator light comes on to check the bulb. Do not count it as a DTC.
- The ABS control unit can memorize any number of DTCs.
- The new DTC is not memorized when the ABS control unit has already memorized the same DTC.
- If the DTC is not memorized, the ABS indicator light stays ON after it goes off for 3.6 seconds.

DTC Erasure (MES Mode)

NOTE: This operation can also be done with the Honda PGM Tester.

1. Connect the SCS service connector to the service check connector inside the passenger's side kick panel.
2. Depress the brake pedal.
3. Turn the ignition switch ON (II) while keeping the brake pedal depressed. The ABS indicator light goes off after two seconds.
4. After the indicator light goes off, release the brake pedal. The indicator light comes on after four seconds.
5. After the indicator light comes on, depress the brake pedal again. The indicator light goes off again after four seconds. (the brake pedal is still depressed.)
6. After the indicator light goes off, release the brake pedal again.
7. After four seconds, the indicator light blinks twice for 0.3 second and the DTC is erased.
8. Confirm the DTC indication, and check that the DTC was erased.

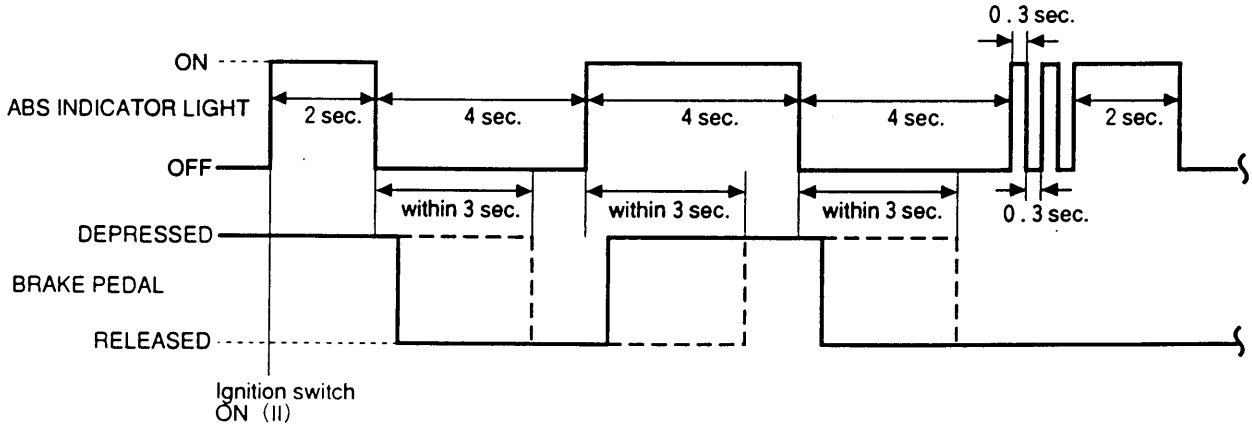
NOTE: Always maintain these steps. If you disconnect the SCS service connector and/or fail to operate the brake pedal according to the indicator light indication, the DTC will not be erased.

Conditions for DTC erasure

- The car is stopped.
- The SCS service connector is connected before the ignition switch is turned ON (II).
- The brake pedal is depressed before the ignition switch is turned ON (II).
- The SCS service connector remains connected during this procedure.

The DTC erasure stops and ABS control unit executes the software function if at least one of the following conditions is satisfied.

- The car is not stopped.
- The SCS service connector is disconnected during this service.
- The ABS control unit receives the normal signal (which is for the ABS control unit) from a Honda PGM Tester.
- The brake pedal is not operated according to the indicator light indication.
- The DTC erasure is finished.



Diagnostic Trouble Code (DTC)

Troubleshooting Index

NOTE: This operation can also be done with the Honda PGM Tester.

DTC	ABS INDICATOR LIGHT	DIAGNOSIS/SYMPTOM	DETECTION TIMING				PROBLEM LOCATION	REFER TO PAGE
			INITIAL DIAGNOSIS	EXCEPT ABS CONTROL	DURING ABS CONTROL	DURING WARNING		
No DTC	OFF	ABS indicator light does not come on when ignition switch is turned ON (II).						19-41
	ON	ABS indicator light does not go off after engine is started. (No DTC)						19-43
11	ON*	Wheel sensor (open/short to body ground/short to power)	○	○	○	○	FR	19-45
13							FL	
15							RR	
17							RL	
12	ON*	Wheel sensor/Pulser (chipped pulser gear/electrical noise)		○	○	○	FR	19-45
14							FL	
16							RR	
18							RL	
31	ON	Solenoid (open/short to body ground/short to power/stuck)	○	○	○		FR-IN	19-47
32							FR-OUT	
33							FL-IN	
34							FL-OUT	
35							RR-IN	
36							RR-OUT	
37							RL-IN	
38							RL-OUT	
51	ON	Motor lock		○	○			19-49
52	ON	Motor stuck OFF		○	○			19-49
53	ON	Motor stuck ON		○				19-49
54	ON	Main relay stuck OFF	○	○	○			19-52
61	ON	Ignition voltage (low voltage/high voltage)	○	○	○	○		19-54
81	ON	CPU	○	○	○	○		19-55

*: If DTCs 11-18 (wheel sensor codes) were detected the last the vehicle was driven, the ABS indicator light will stay on until the ignition switch is turned ON (II), and the control unit confirms that the wheel sensors are OK.

ABS Indicator Light Does Not Come On

The ABS indicator light does not come on when ignition switch is turned ON (II).

The ABS indicator light does not come on when ignition switch is turned ON (II).

Check the CLOCK/METER (7.5 A) fuse in the under-dash fuse/relay box.

NOTE: All indicator lights except the charging system light will not come on when the CLOCK/METER (7.5 A) fuse is blown.

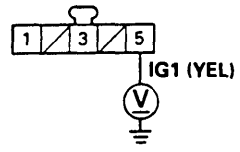
Is the fuse OK?

NO → **Replace the fuse and recheck.**

YES
NOTE: Reinstall the fuse if it is OK.

Check for an open in the IG1 circuit:
1. Disconnect the gauge assembly 5P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the gauge assembly 5P connector terminal No. 5 and body ground.

GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals

Is there battery voltage?

NO → **• Repair open in the wire between the CLOCK/METER (7.5 A) fuse and gauge assembly.**
• Replace the under-dash fuse/relay box. (Open circuit inside the box.

YES

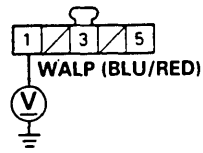
Check the ABS indicator light bulb in the gauge assembly.

Is the bulb OK?

NO → **Replace the ABS indicator light bulb.**

YES

Check for a short to power in the WALP circuit:
Measure the voltage between the gauge assembly 5P connector terminal No. 1 and body ground.



Is there battery voltage?

YES → **Repair short to power in the wire between the gauge assembly and ABS control unit.**

NO

(To page 19-42)

(cont'd)

ABS Indicator Light Does Not Come On (cont'd)

(From page 19-41)

Check the gauge assembly:
1. Turn the ignition switch OFF.
2. Connect the gauge assembly 5P connector.
3. Connect the terminal No. 3 to body ground with a jumper wire.
4. Turn the ignition switch ON (II).

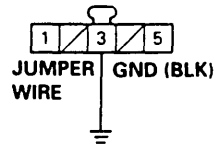
Does the ABS indicator light come on?

NO → **Replace the ABS indicator light drive circuit in the gauge assembly.**

YES

- **Repair open in the wire between the gauge assembly and body ground.**
- **Repair poor ground (G401, G402).**

GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals

ABS Indicator Light Does Not Go Off (No DTC)

The ABS indicator light does not go off after the engine is started.

— With engine running, the ABS indicator light is ON.
— With the SCS service connector connected (see page 19-38), no DTC is indicated.

Check the RR DEF RELAY (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK? NO → **Replace the fuse and recheck.**

YES NOTE: Reinstall the fuse if it is OK.

Check the ABS +B (20 A) fuse in the under-hood fuse/relay box.

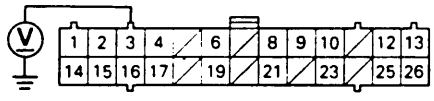
Is the fuse OK? NO → **Replace the fuse and recheck.**

YES NOTE: Reinstall the fuse if it is OK.

Check for an open in the IG2 circuit:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the ABS control unit 26P connector terminal No. 3 and body ground.

ABS CONTROL UNIT 26P CONNECTOR

IG2 (BLK/BLU)



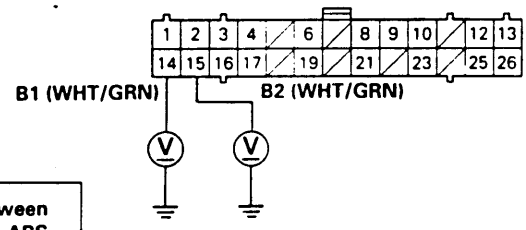
Wire side of female terminals

Is there battery voltage? NO → **Repair open in the wire between the RR DEF RELAY (7.5 A) fuse and ABS control unit.**

YES

Check for an open in the B1 and B2 circuit:
Measure the voltage between body ground and terminals No. 14 and No. 15 individually.

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

Is there battery voltage? NO → **Repair open in the wire between the ABS +B (20 A) fuse and ABS control unit.**

YES

(To page 19-44)

(cont'd)

ABS Indicator Light Does Not Go Off (No DTC) (cont'd)

(From page 19-43)

Check for a short to body ground in the WALP circuit:
1. Turn the ignition switch OFF.
2. Disconnect the ABS control unit 22P and gauge assembly 5P connectors.
3. Check for continuity between the ABS control unit 22P connector terminal No. 7 and body ground.

Is there continuity?

YES → **Repair short to body ground in the wire between the ABS control unit and gauge assembly.**

NO

Check the ABS control unit:
1. Connect the ABS control unit 22P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the ABS control unit 22P connector terminal No. 7 and body ground.

Is there battery voltage?

NO → **Check for an open in the GND2 circuit:**
1. Connect the ABS control unit 26P connector terminal No. 16 to body ground with a jumper wire.
2. Measure the voltage between the ABS control unit 22P connector terminal No. 7 and body ground.

Is there battery voltage?

YES → • **Repair open in the wire between the ABS control unit and body ground.**
• **Repair poor ground (G401, G402).**

NO → **Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**

YES

Check for an open in the WALP circuit:
Measure the voltage between the gauge assembly 5P connector terminal No. 1 and body ground.

Is there battery voltage?

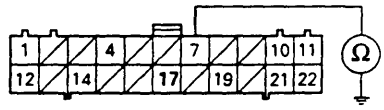
NO → **Repair open in the wire between the ABS control unit and gauge assembly.**

YES

Replace the ABS indicator light drive circuit in the gauge assembly.

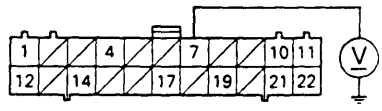
ABS CONTROL UNIT 22P CONNECTOR

WALP (BLU/RED)

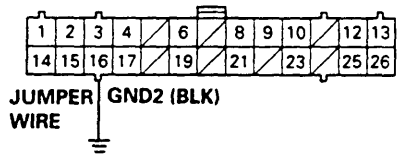


Wire side of female terminals

WALP (BLU/RED)

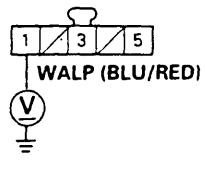


ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals

DTC 11 – 18: Wheel Sensor

NOTE: The ABS indicator light comes on when only the drive wheels are turning, signal disturbance is detected, etc. Therefore, test-drive the car at a speed of 12 mph (20 km/h) or more after turning the ignition switch from OFF to ON (II), and if the ABS indicator light does not come on, the system is OK.

— With the ignition switch ON (II), the ABS indicator light does not go off.
— After driving, the ABS indicator light comes on.
— With the SCS service connector connected (see page 19-38), DTCs 11 – 18 are indicated.

Check the wheel sensor circuit:
1. Disconnect the ABS control unit 26P connector.
2. Measure the resistance between the appropriate wheel sensor (0) and (1) circuit terminals (see table).

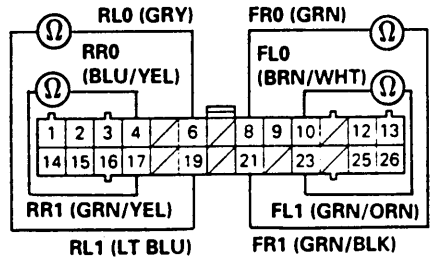
DTC	Appropriate Terminal	
	(0) SIDE	(1) SIDE
11, 12 (Right-front)	No. 8: FR0	No. 21: FR1
13, 14 (Left-front)	No. 10: FL0	No. 23: FL1
15, 16 (Right-rear)	No. 4: RR0	No. 17: RR1
17, 18 (Left-rear)	No. 6: RL0	No. 19: RL1

Is the resistance OK?
(Front: 750 – 1050 Ω/20°C
Rear: 850 – 1150 Ω/20°C (Drum))

NO → **• Repair open in the (0) or (1) circuit wire, or short to the (0) circuit wire in the (1) circuit wire between the ABS control unit and appropriate wheel sensor.**
• Replace the appropriate wheel sensor.

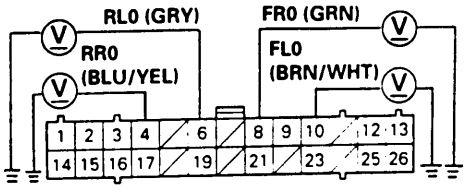
YES

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

Check for a short to power in the wheel sensor circuit:
1. Reconnect the ABS control unit 26P connector.
2. Start the engine.
3. Measure the voltage between the ABS control unit 26P connector appropriate wheel sensor (0) circuit terminal and body ground (see table).



NOTE: Judgement value for short to power is 4 V.

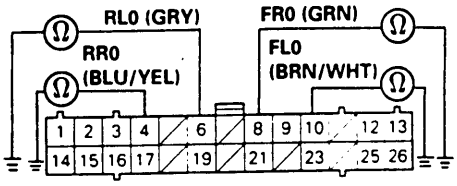
Is there 4 V or more?

YES → **Repair short to power in the (0) or (1) circuit wire between the ABS control unit and appropriate wheel sensor.**

NO

NOTE:
• Normal voltage: Approx. 2 V
• 0 V: Replace the ABS control unit.
• 4 V or more indicates a short to power.

Check for a short to body ground in the wheel sensor circuit:
1. Disconnect the ABS control unit 26P connector.
2. Check for continuity between the ABS control unit 26P connector appropriate wheel sensor (0) circuit terminal and body ground (see table).



Is there continuity?

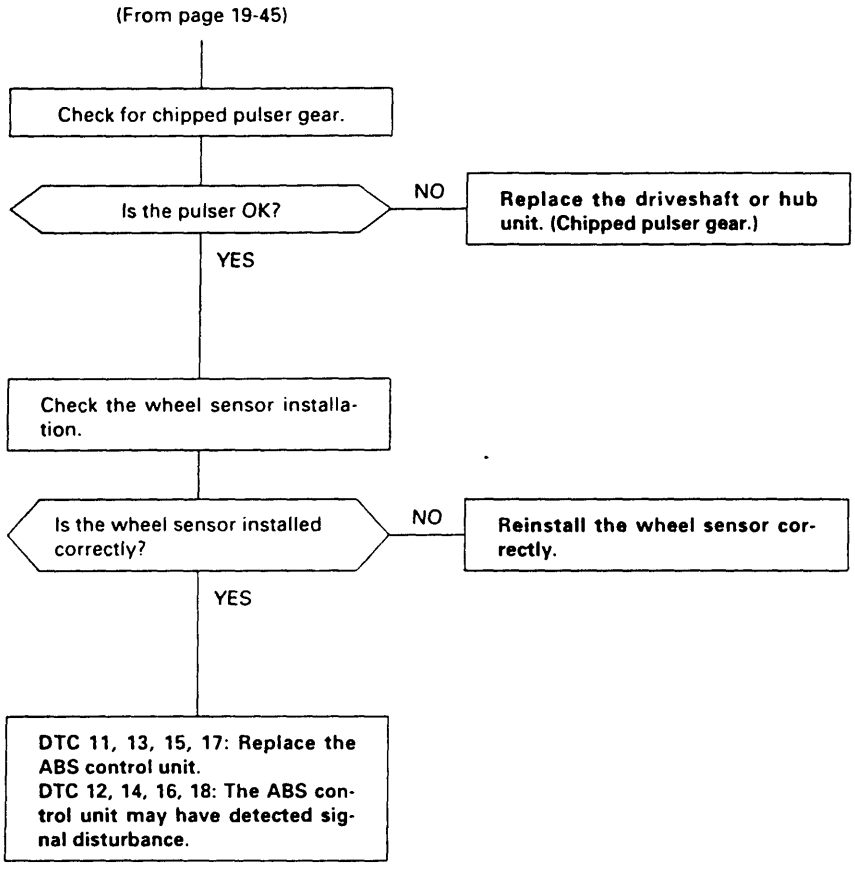
YES → **• Repair short to body ground in the (0) or (1) circuit wire between the ABS control unit and appropriate wheel sensor.**
• Replace the appropriate wheel sensor.

NO

(To page 19-46)

(cont'd)

DTC 11 – 18: Wheel Sensor (cont'd)



DTC 31 – 38: Solenoid

— **With the ignition switch ON (II), the ABS indicator light does not go off, or the ABS indicator light comes on while ABS is functioning.**
— **With the SCS service connector connected (see page 19-38), DTCs 31 – 38 are indicated.**

DTC	Appropriate Connector	Appropriate Terminal
31: FR-IN	22P	No. 1
32: FR-OUT	22P	No. 12
33: FL-IN	22P	No. 11
34: FL-OUT	22P	No. 10
35: RR-IN	26P	No. 13
36: RR-OUT	22P	No. 21
37: RL-IN	26P	No. 25
38: RL-OUT	26P	No. 12

Check for a short to power in the solenoid circuit:
1. Disconnect the ABS control unit 22P and 26P connectors.
2. Start the engine.
3. Measure the voltage between the appropriate ABS control unit connector solenoid circuit terminal and body ground (see table).

Is there battery voltage?

YES — **Repair short to power in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.**

NO

Check for a short to body ground in the solenoid circuit:
Check for continuity between the appropriate solenoid circuit terminal and body ground (see table).

Is there continuity?

YES — **• Repair short to body ground in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.**
• Replace the modulator unit.

NO

Check the ABS control unit:
1. Turn the ignition switch OFF.
2. Connect the ABS control unit 22P and 26P connectors.
3. Connect the SCS service connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the appropriate ABS control unit 26P connector COM circuit terminal and body ground (see table).

DTC	Appropriate Terminal
31: FR-IN	No. 2: SCOM
32: FR-OUT	No. 2: SCOM
33: FL-IN	No. 1: PCOM
34: FL-OUT	No. 1: PCOM
35: RR-IN	No. 1: PCOM
36: RR-OUT	No. 1: PCOM
37: RL-IN	No. 2: SCOM
38: RL-OUT	No. 2: SCOM

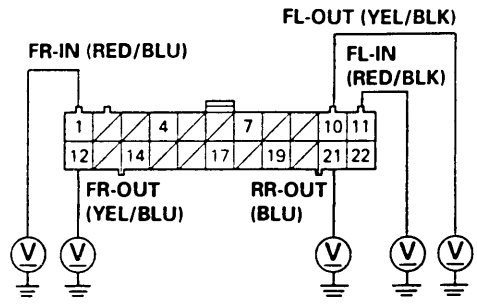
Is there approx. 3 V?

NO — **Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**

YES

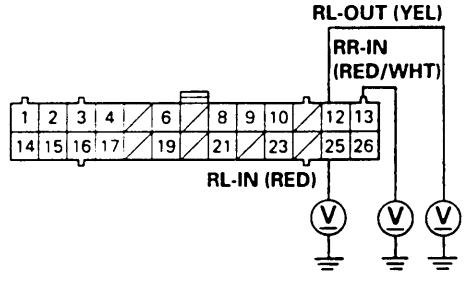
(To page 19-48)

ABS CONTROL UNIT 22P CONNECTOR

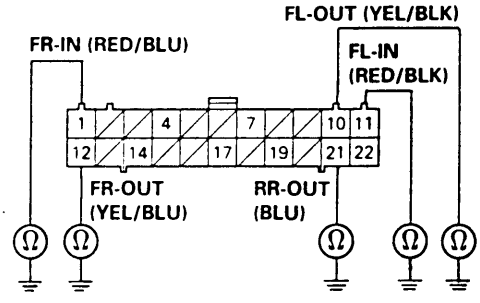


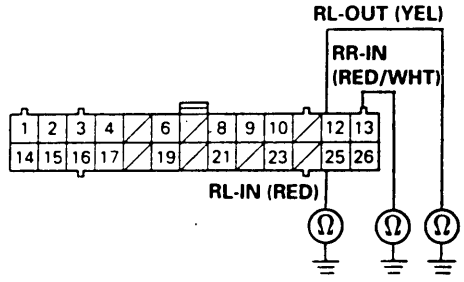
Wire side of female terminals

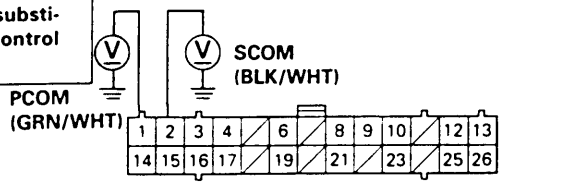
ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals







(cont'd)

DTC 31 – 38: Solenoid (cont'd)

(From page 19-47)

Check for an open in the solenoid circuit:
Measure the voltage between the appropriate ABS control unit connector solenoid circuit terminal and body ground (see table).

Is there approx. 3 V?

NO

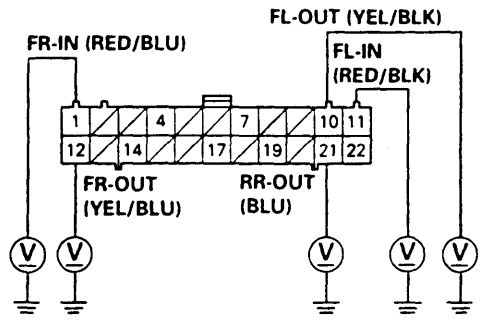
- **Repair open in the appropriate COM circuit wire between the ABS control unit and modulator unit.**
- **Repair open in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.**
- **Replace the modulator unit.**

YES

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

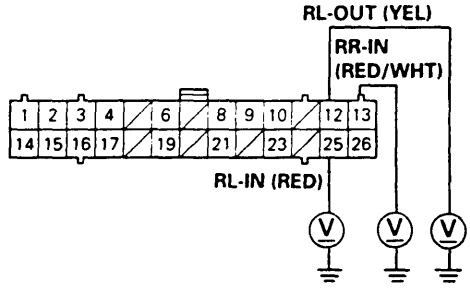
DTC	Appropriate Connector	Appropriate Terminal
31: FR-IN	22P	No. 1
32: FR-OUT	22P	No. 12
33: FL-IN	22P	No. 11
34: FL-OUT	22P	No. 10
35: RR-IN	26P	No. 13
36: RR-OUT	22P	No. 21
37: RL-IN	26P	No. 25
38: RL-OUT	26P	No. 12

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

DTC 51 – 53: ABS Pump Motor

— With the ignition switch ON (II), the ABS indicator light does not go off.
— With the SCS service connector connected (see page 19-38), DTCs 51 – 53 are indicated.

Check the MTR CHECK (7.5 A) fuse in the under-hood ABS fuse/relay box.

Is the fuse OK?

NO → **Replace the fuse and recheck.**

NOTE: Short the PMR terminal to body ground for a moment, and recheck the fuse. If the fuse is blown, check for a short to body ground in the MCK circuit.

YES
NOTE: Reinstall the fuse if it is OK.

Check the PUMP MOTOR (40 A) fuse in the under-hood ABS fuse/relay box.

Is the fuse OK?

NO → **Replace the fuse and recheck.**

NOTE: Short the PMR terminal to body ground for a moment, and recheck the fuse. If the fuse is blown, check for a short to body ground in the wire between the under-hood ABS fuse/relay box and pump motor.

YES
NOTE: Reinstall the fuse if it is OK.

Check the pump motor relay (see section 23).

Is the relay OK?

NO → **Replace the pump motor relay.**

YES

Check the pump motor power source circuit:
Turn the ignition switch ON (II).

Does the pump motor operate?

YES → **Check for a short to power in the pump motor power source circuit:** Remove the pump motor relay.

Does the pump motor operate?

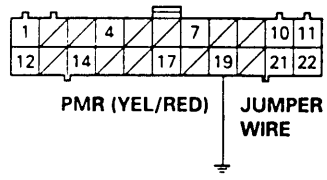
YES → **Repair short to power in the wire between the under-hood ABS fuse/relay box and ABS pump motor.**

NO → **Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**

NO

(To page 19-50)

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

(cont'd)

DTC 51 – 53: ABS Pump Motor (cont'd)

(From page 19-49)

Check the pump motor circuit:
1. Remove the pump motor relay.
2. Turn the ignition switch ON (II).
3. Connect the pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment.

Does the pump motor operate?

NO

Check for an open in the pump motor +B circuit:
1. Turn the ignition switch OFF.
2. Disconnect the pump motor 2P connector.
3. Turn the ignition switch ON (II).
4. Connect the pump motor relay connector +B and MOTOR terminals with a jumper wire.
5. Measure the voltage between the pump motor 2P connector terminal No. 1 and body ground.

Is there battery voltage?

NO

Repair open in the wire between the under-hood ABS fuse/relay box and pump motor.

YES

Check the pump motor operation:
Connect the battery (+) terminal to the pump motor 2P connector terminal No. 1, and the (–) terminal to the terminal No. 2 for a moment.

Does the pump motor operate?

NO

Replace the modulator unit. (Faulty pump motor)

YES

Repair open in the wire between the pump motor and body ground, or poor ground (G301).

YES

Check for a short to body ground in the PMR circuit:
1. Turn the ignition switch OFF.
2. Disconnect the ABS control unit 22P connector.
3. Check for continuity between terminal No. 19 and body ground.

Is there continuity?

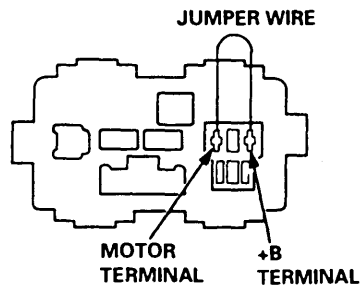
YES

Repair short to body ground in the wire between the under-hood ABS fuse/relay box and ABS control unit.

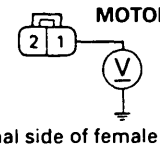
NO

(To page 19-51)

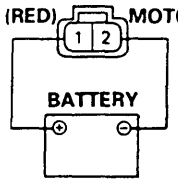
UNDER-HOOD ABS FUSE/RELAY BOX



PUMP MOTOR 2P CONNECTOR

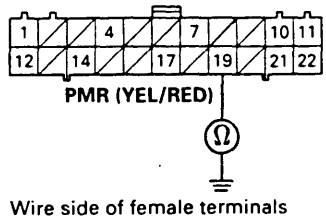


Terminal side of female terminals



Terminal side of male terminals

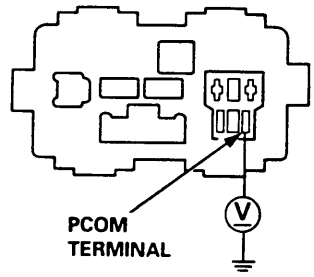
ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

(From page 19-50)

Check for an open in the PCOM circuit:
1. Turn the ignition switch OFF.
2. Reconnect the ABS control unit 22P connector.
3. Connect the SCS service connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the pump motor relay connector PCOM terminal and body ground.



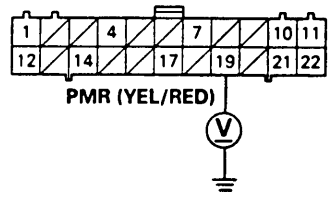
Is there approx. 3 V?

NO → **Repair open in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

YES

Check for an open in the PMR circuit:
Measure the voltage between the ABS control unit 22P connector terminal No. 19 and body ground.

ABS CONTROL UNIT 22P CONNECTOR



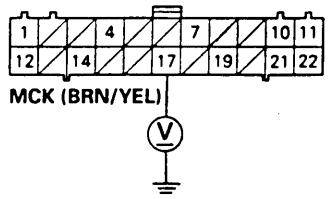
Wire side of female terminals

Is there approx. 3 V?

NO → **Repair open in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

YES

Check for an open in the MCK circuit:
1. Turn the ignition switch OFF.
2. Disconnect the SCS service connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the ABS control unit 22P connector terminal No. 17 and body ground while connecting the pump motor relay connector +B and MOTOR terminal with a jumper wire for moment.



Is there battery voltage?

NO → **Repair open in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

YES

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

DTC 54: Main Relay

— With the ignition switch ON (II), the ABS indicator light does not go off.
— With the SCS service connector connected (see page 19-38), DTC 54 is indicated.

Check the ABS +B (20 A) fuse in the under-hood ABS fuse/relay box.

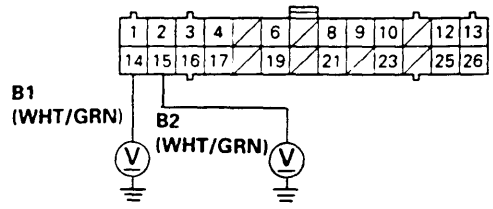
Is the fuse OK?

NO → **Replace the fuse and recheck.**

YES
NOTE: Reinstall the fuse if it is OK.

Check for an open in the B1, B2 circuit:
Measure the voltage between body ground and the ABS control unit 26P connector terminal No. 14 and No. 15 individually.

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

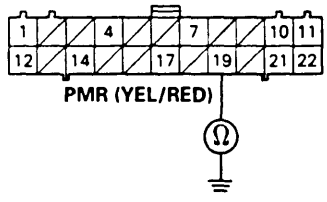
Is there battery voltage?

NO → **Repair open in the wire between the ABS control unit and under-hood ABS fuse/relay box.**

YES

Check for a short to body ground in the PMR circuit:
1. Turn the ignition switch OFF.
2. Disconnect the ABS control unit 22P connector.
3. Check for continuity between terminal No. 19 and body ground.

ABS CONTROL UNIT 22P CONNECTOR



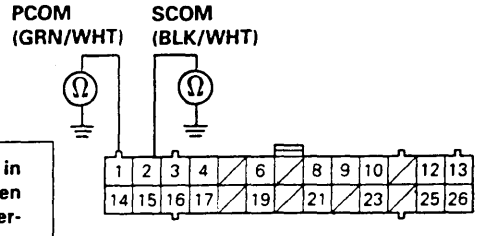
Wire side of female terminals

Is there continuity?

YES → **Repair short to body ground in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

NO

Check for a short to body ground in the PCOM, SCOM circuit:
1. Remove the pump motor relay.
2. Disconnect the ABS control unit 26P connector.
3. Check for continuity between body ground and the ABS control unit 26P terminals No. 1 and No. 2 individually.



Is there continuity?

YES →
- **Repair short to body ground in the PCOM circuit wire between the ABS control unit and under-hood ABS fuse/relay box.**
- **Repair short to body ground in the PCOM or SCOM circuit wire between the ABS control unit and modulator unit.**
- **Replace the modulator unit. (Short circuit inside the unit)**

NO

(To page 19-53)

(From page 19-52)

Check for a short to power in the PCOM, SCOM circuit:
1. Start the engine.
2. Measure the voltage between body ground and ABS control unit 26P connector terminals No. 1 and No. 2 individually.

Is there 8 V or more?

YES

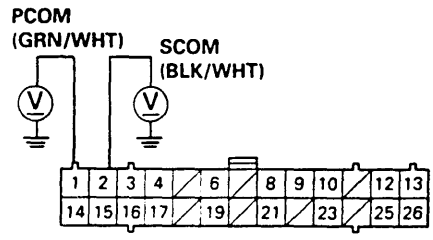
- **Repair short to power in the PCOM circuit wire between the ABS control unit and underhood ABS fuse/relay box.**
- **Repair short to power in the PCOM or SCOM circuit wire between the ABS control unit and modulator unit.**
- **Replace the modulator unit. (Short to power inside the unit)**

NOTE: 8 V or more indicates a short to power.

NO

Turn the ignition switch OFF and connect the SCS service connector. Then turn the ignition switch ON (II) and measure the voltage between the PCOM and SCOM terminals and body ground. If there is 0 V, replace the ABS control unit.

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

DTC 61: Ignition Voltage

— With the engine running, the ABS indicator light is ON.
— With the SCS service connector connected (see page 19-50), DTC 61 is indicated.

Problem verification:
1. Erase the DTC.
2. Start the engine.

Does the ABS indicator light come on and is DTC 61 indicated?

NO → **The system is OK at this time.**

YES

Check the IG2 circuit:
Measure the voltage between the ABS control unit 26P connector terminal No. 3 and body ground.

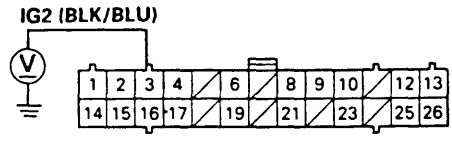
Is there 18 V or above?

YES → **Check the charging system.**

NO

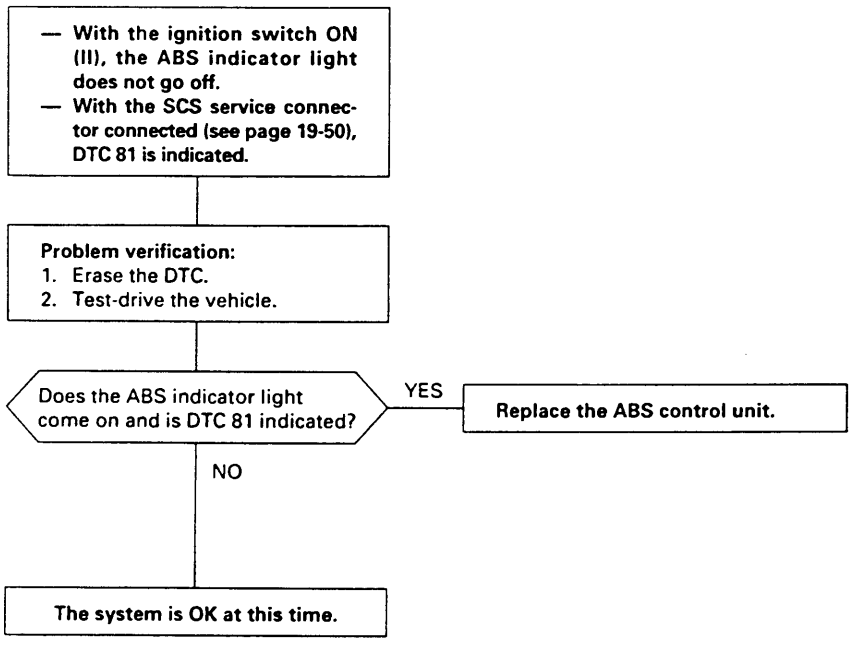
If the voltage is 0 V, check for an open in the IG2 circuit.
If there is 12 – 17 V, substitute a known-good ABS control unit and recheck.

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

DTC 81: Central Processing Unit (CPU)



Modulator Unit

Removal/Installation

CAUTION:

- **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.**
- **Take care 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.**

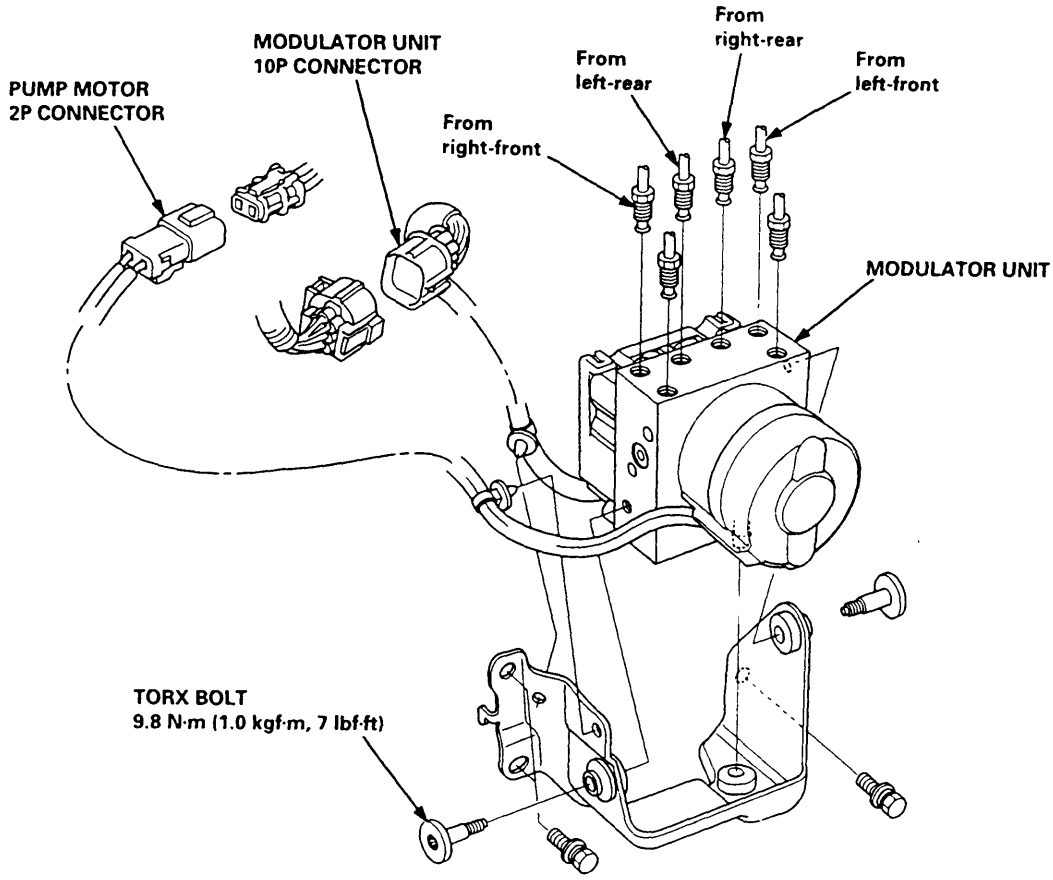
NOTE: Tighten the flare nuts to 15 N·m (1.5 kgf·m, 11 lbf·ft).

Removal

1. Disconnect the modulator unit 10P and pump motor 2P connectors.
2. Disconnect the brake lines, then remove the modulator unit.

Installation

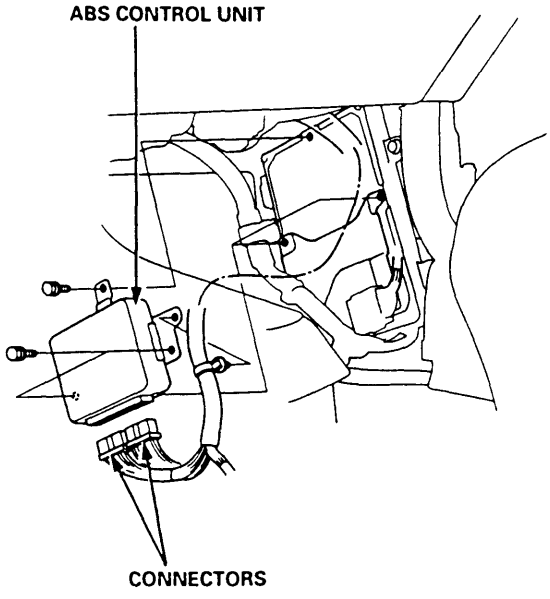
1. Install the modulator unit, then connect the brake lines.
2. Connect the modulator unit 10P and pump motor 2P connectors.
3. Bleed the brake system, starting with the front wheels.
4. Start the engine, and check that the ABS indicator light goes off.
5. Test-drive the vehicle, and check that the ABS indicator light does not come on.



ABS Control Unit

Replacement

1. Remove the right side kick panel.
2. Disconnect the ABS control unit connectors.
3. Remove the ABS control unit.
4. Install the ABS control unit in the reverse order of removal.



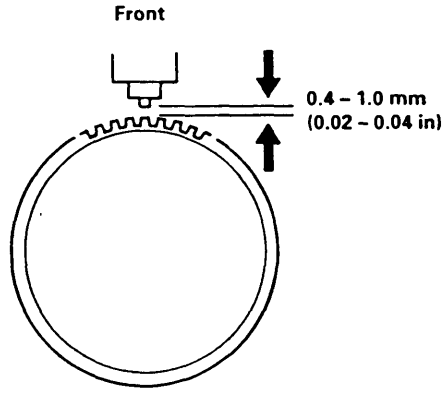
Pulsers/Wheel Sensors

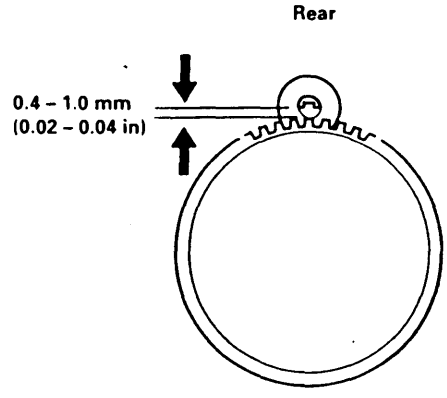
Inspection

1. Check the front and rear pulser for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser.

   Standard: 0.4 – 1.0 mm (0.02 – 0.04 in)

   NOTE: If the gap exceeds 1.0 mm (0.04 in), the probability is a distorted suspension arm which should be replaced.



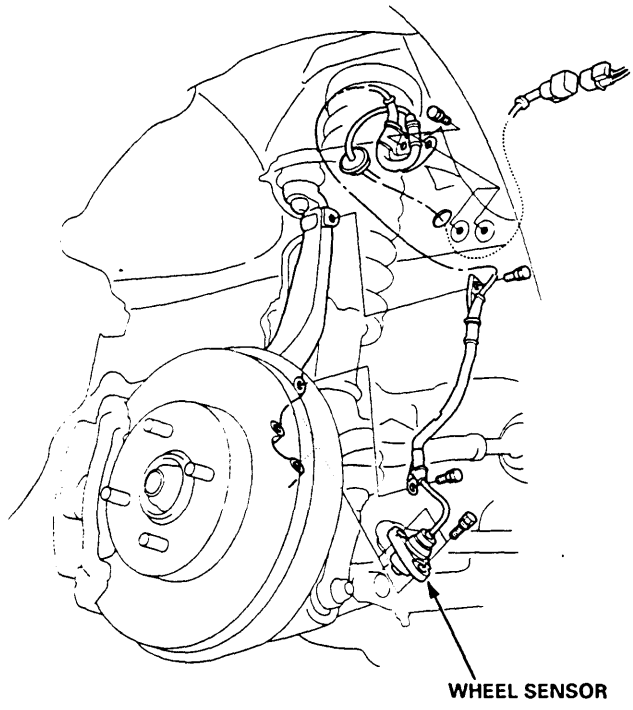


Pulsers/Wheel Sensors

Wheel Sensor Replacement

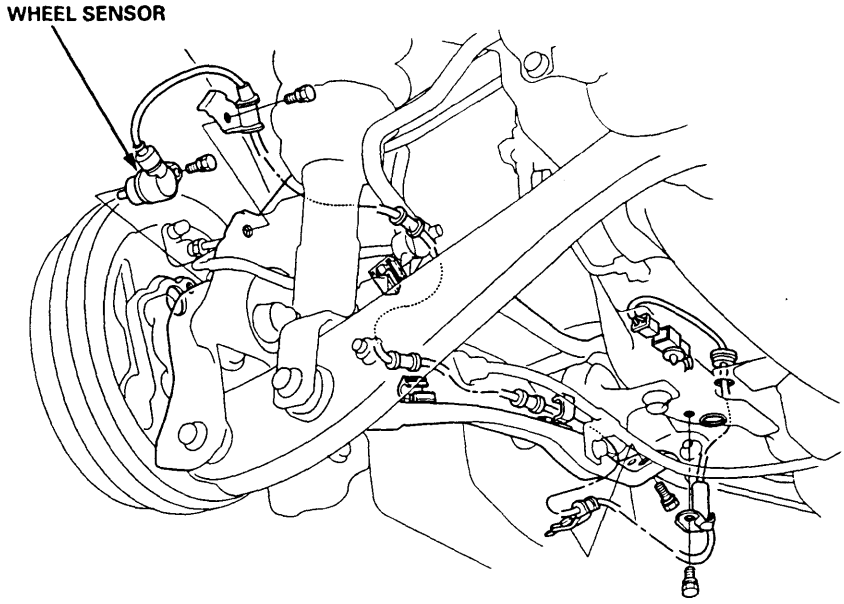
NOTE:
- Be careful when installing the sensors to avoid twisting the wires.
- The torque value of the bolts is at 9.8 N·m (1.0 kgf·m, 7 lbf·ft).

Front



Rear

1. Remove the hub bearing unit (see section 18).
2. Remove the four backing plate bolts.
3. Pull the backing plate away from the trailing arm, then remove the wheel sensor. It is not necessary to disconnect the brake line.



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (if body maintenance is required)

The Acura 1.6EL SRS includes a driver's airbag located in the steering wheel hub, and a passenger's airbag located in the dashboard above the glove box. 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 will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

⚠ WARNING

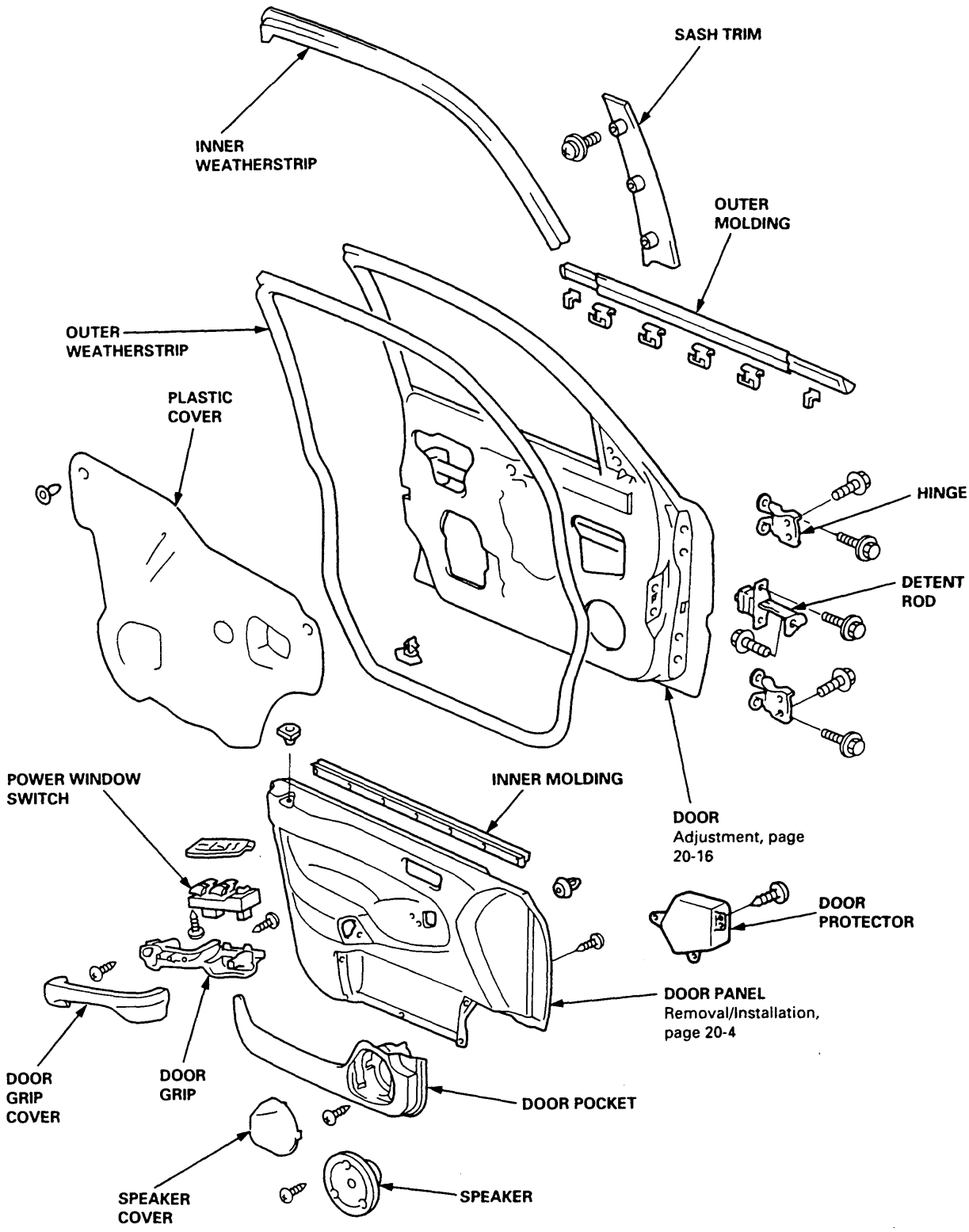
- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional activation of the airbags.**
- **Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

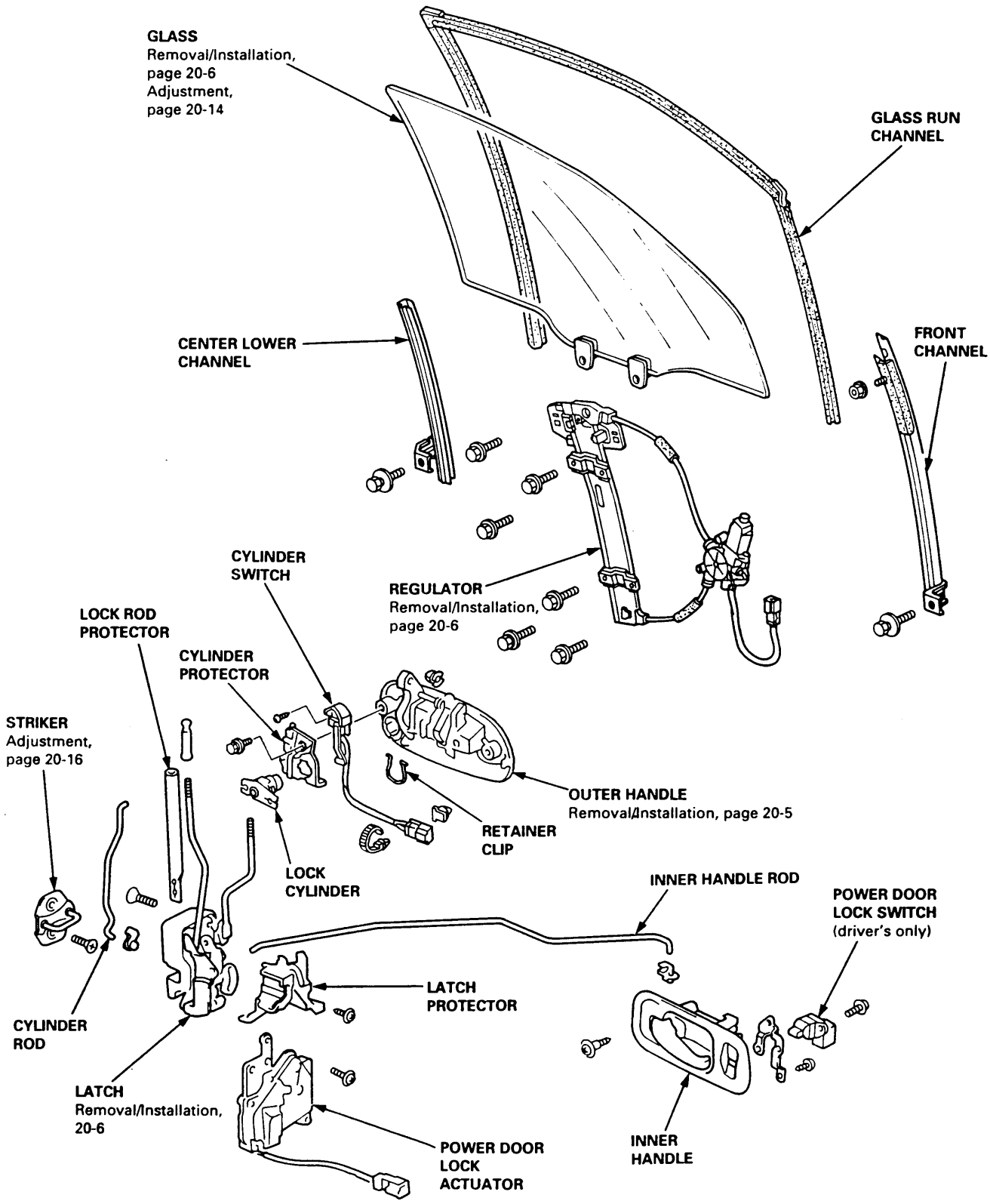
NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

Body

Doors

Front Door Index




GLASS
Removal/Installation, page 20-6
Adjustment, page 20-14
GLASS RUN CHANNEL
CENTER LOWER CHANNEL
FRONT CHANNEL
CYLINDER SWITCH
REGULATOR
Removal/Installation, page 20-6
LOCK ROD PROTECTOR
CYLINDER PROTECTOR
STRIKER
Adjustment, page 20-16
OUTER HANDLE
Removal/Installation, page 20-5
RETAINER CLIP
LOCK CYLINDER
INNER HANDLE ROD
POWER DOOR LOCK SWITCH
(driver's only)
LATCH PROTECTOR
CYLINDER ROD
LATCH
Removal/Installation, 20-6
POWER DOOR LOCK ACTUATOR
INNER HANDLE

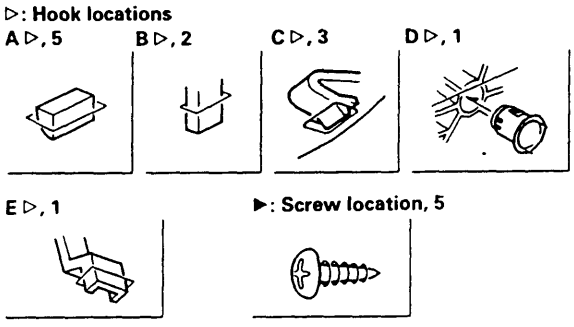
Doors

Door Panel Removal/Installation

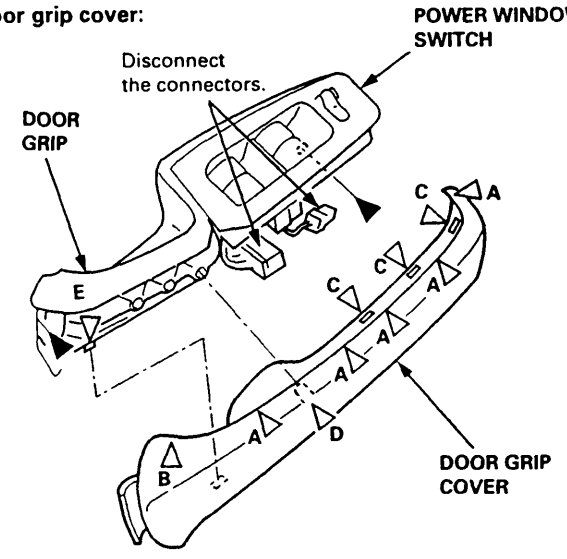
NOTE: Take care not to scratch the door panel and other parts.

1. Remove:
   - Inner handle (see page 20-3)
   - Mirror mount cover panel (see page 20-18)

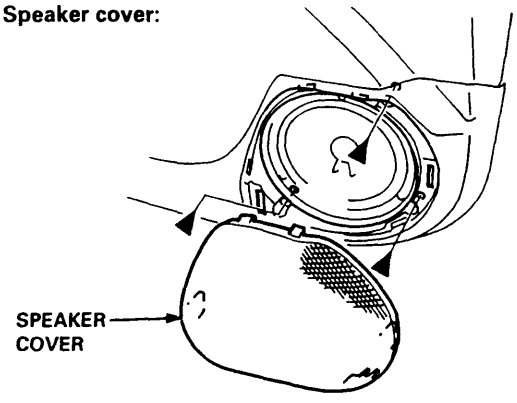
2. Remove the door grip cover and speaker cover, then remove the screws.



Door grip cover:

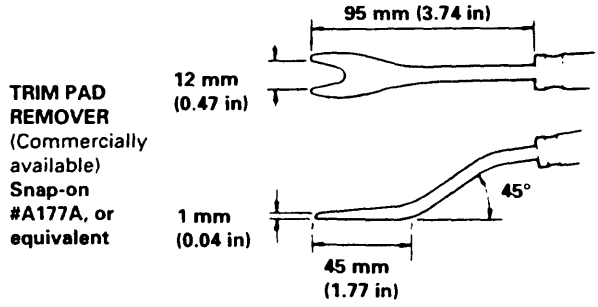


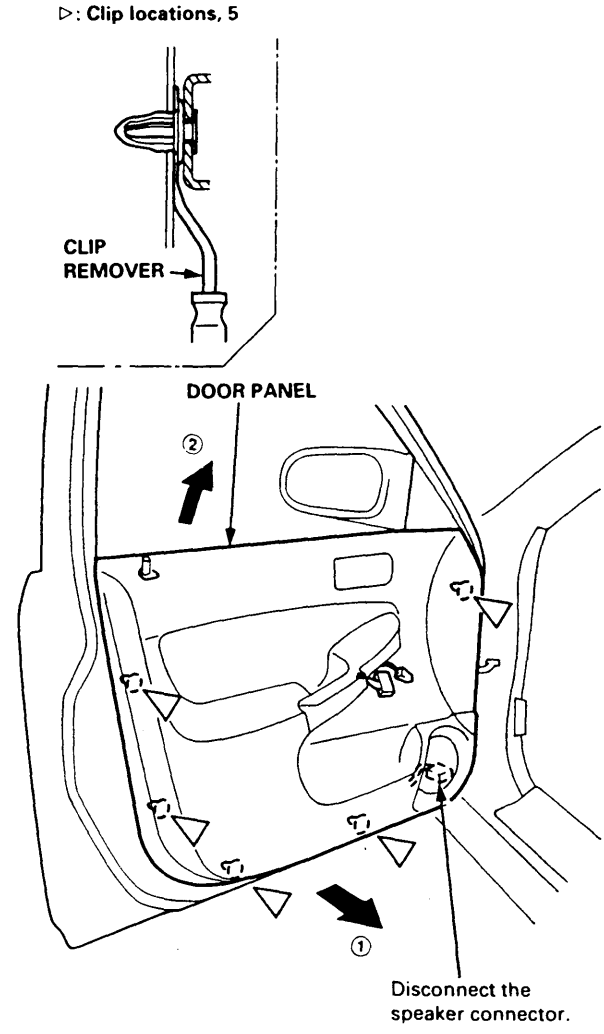
Speaker cover:



3. Release the clips that hold the door panel. Remove the door panel by pulling it upward.

   NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking it.





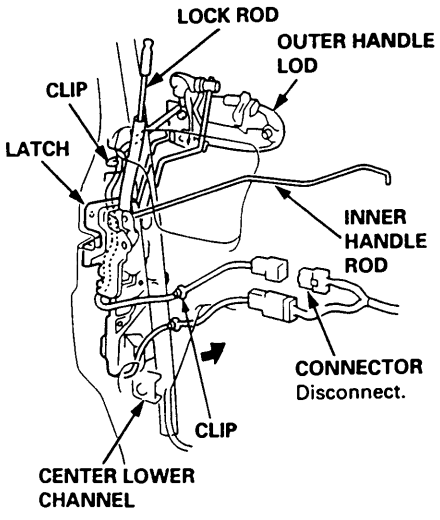
4. Installation is the reverse of the removal procedure.

Outer Handle Removal/Installation

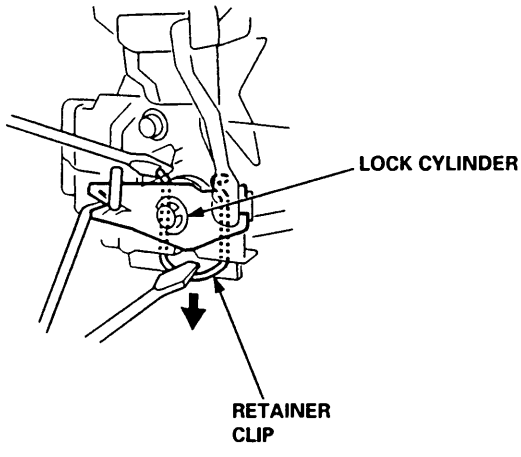
NOTE: Raise the glass fully.

1. Remove:
   - Door panel (see page 20-2)
   - Plastic cover (see page 20-2)

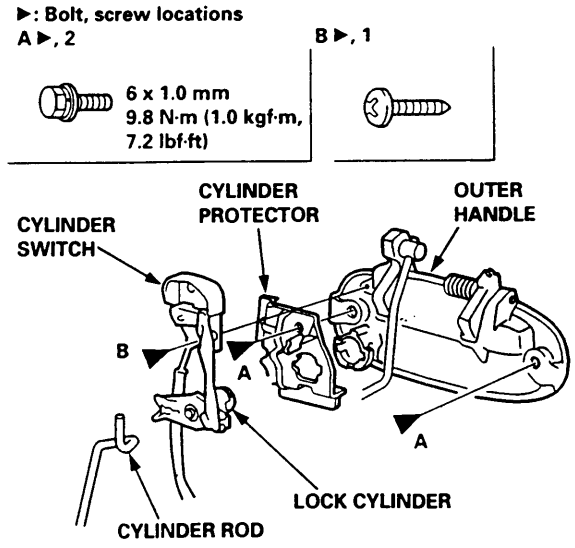
2. Disconnect the connector, and detach the harness clip from the door.



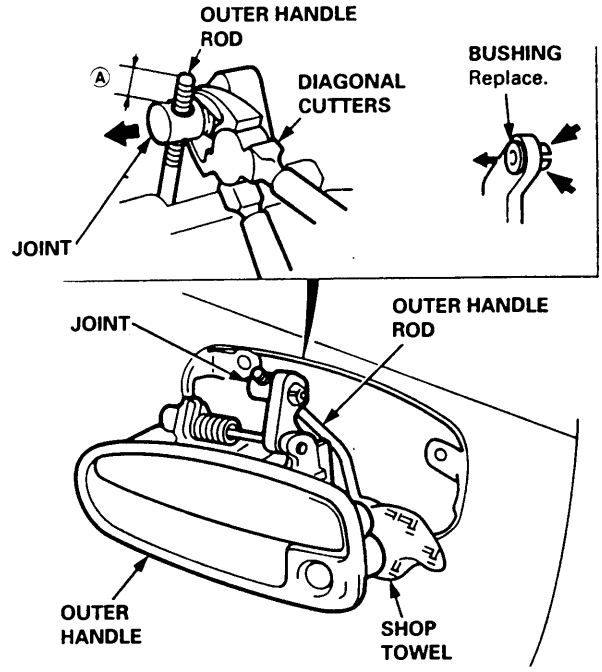
3. Pull out the retainer clip.



4. Remove the bolts and screw, then remove the cylinder protector, lock cylinder, cylinder switch and outer handle.



5. Pull out the outer handle. Pry the outer handle rod out of its joint using diagonal cutters.
   NOTE:
   - To ease reassembly, note distance location Ⓐ of the outer handle rod on the joint before disconnecting it.
   - Take care not to bend the outer handle rod.
   - Use a shop towel to protect the opening in the door.



6. Installation is the reverse of the removal procedure.
   NOTE: Make sure the door locks and opens properly.

Latch Removal/Installation

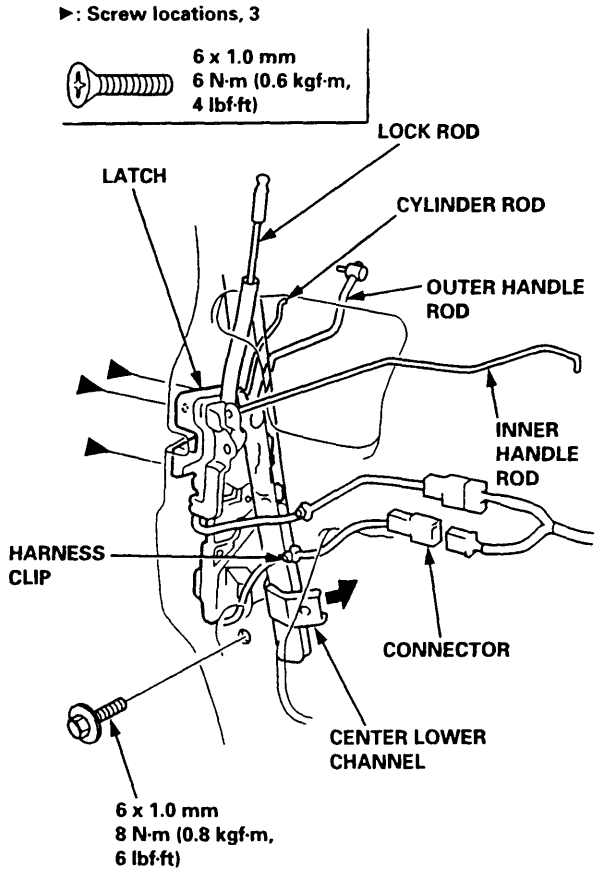
NOTE: Raise the glass fully up.

1. Remove:
   - Door panel (see page 20-4)
   - Plastic cover (see page 20-2)
   - Outer handle (see page 20-5)

2. Remove the bolt, then move the center lower channel forward.

3. Disconnect the connector, and detach the harness clip from the door. Remove the latch through the hole in the door.

   NOTE: Take care not to bend any of the rods.



4. Installation is the reverse of the removal procedure.

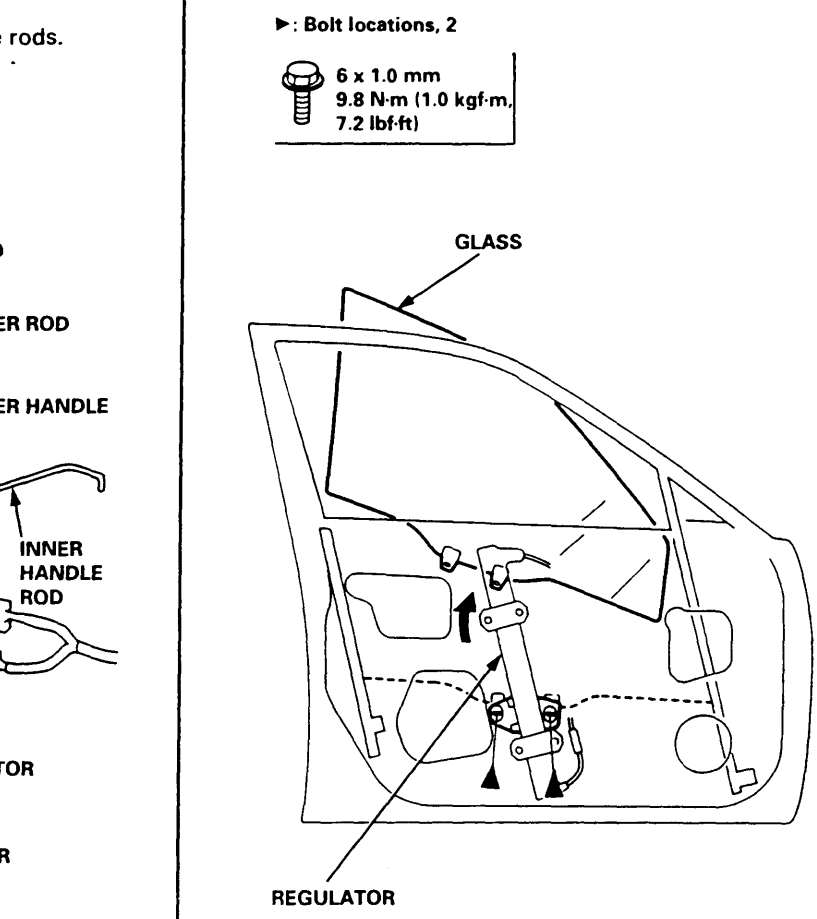
   NOTE:
   - Make sure the inner handle rod and connector are connected properly.
   - Make sure the door locks and opens properly.

Glass and Regulator Removal/ Installation

1. Remove:
   - Door panel (see page 20-4)
   - Plastic cover (see page 20-2)

2. Carefully move the glass until you can see the bolts, then remove them. Carefully pull the glass out through the window slot.

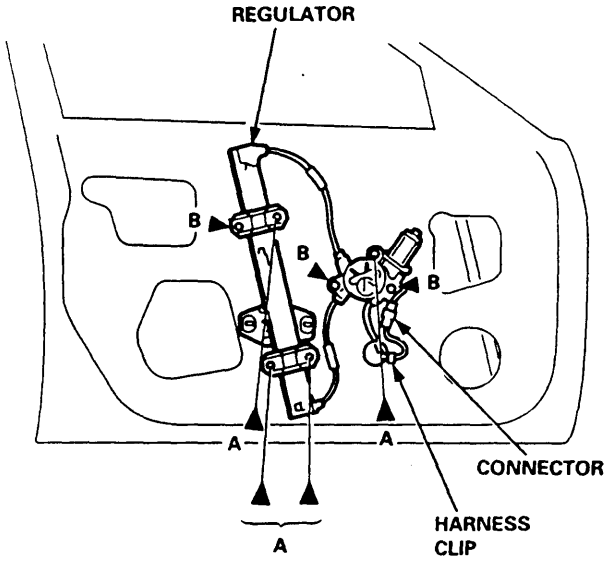
   NOTE: Take care not to drop the glass inside the door.



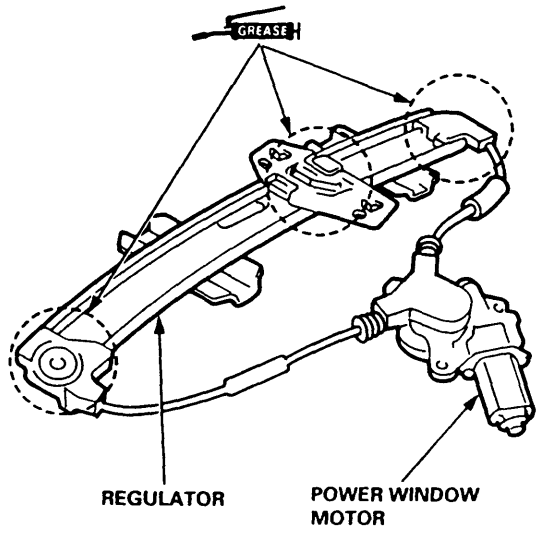
3. Disconnect the connector, and detach the harness clip, then remove the regulator through the hole in the door.

►: Bolt locations

A ►, 4	B ►, 3
6 x 1.0 mm 8 N·m (0.8 kgf·m, 6 lbf·ft)	6 x 1.0 mm 8 N·m (0.8 kgf·m, 6 lbf·ft) Loosen.



4. Grease all the sliding surfaces of the regulator where shown.

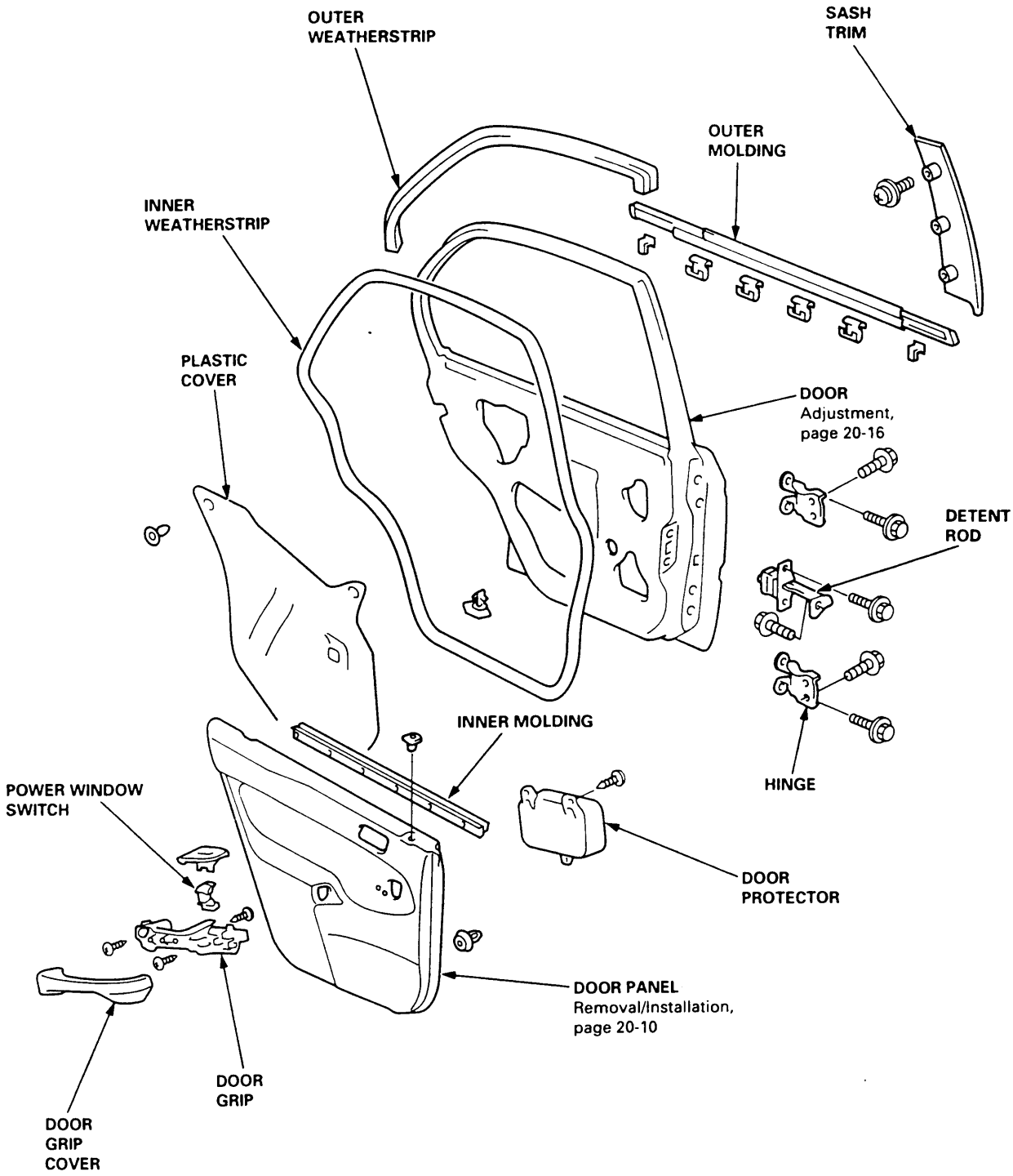


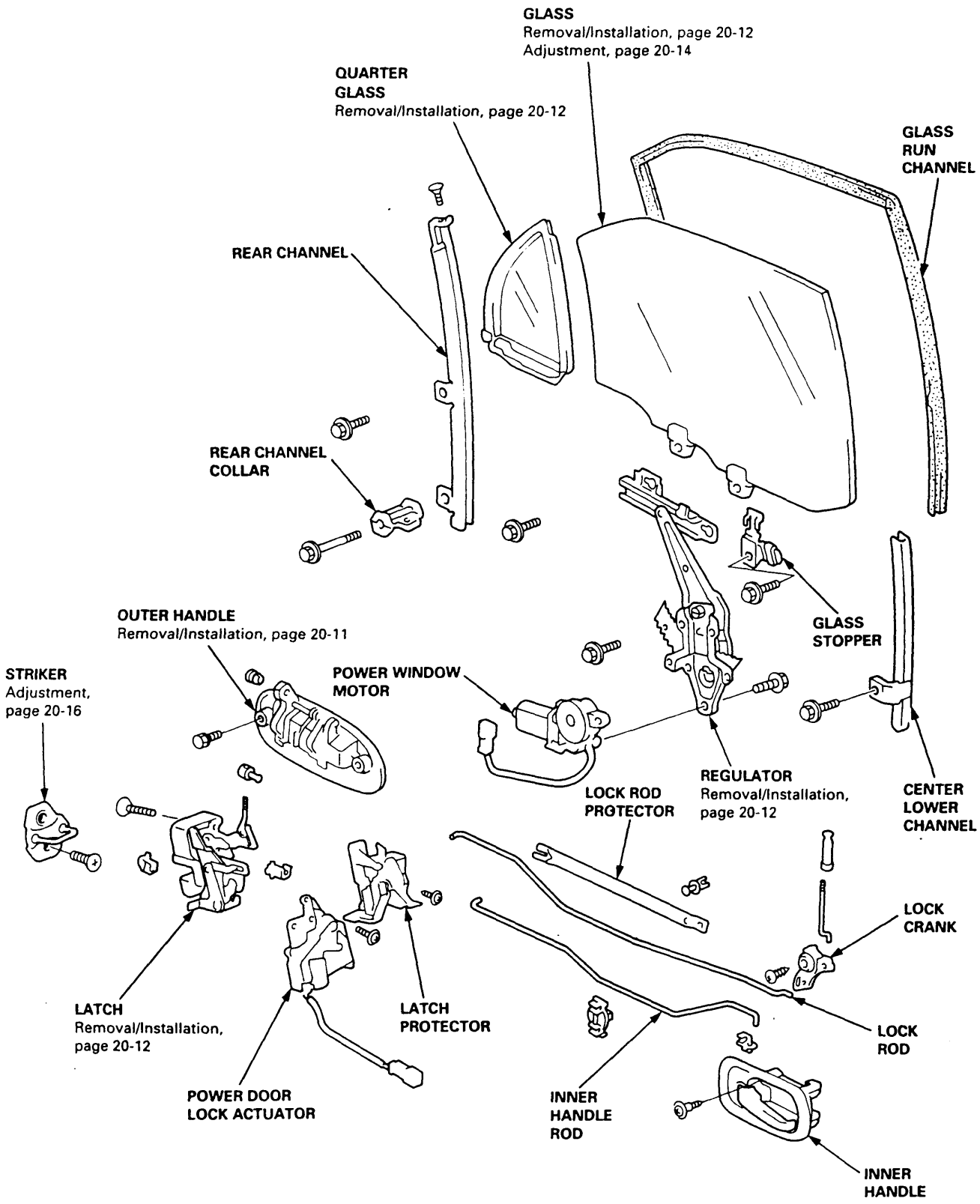
5. Installation is the reverse of the removal procedure.

NOTE: Roll the glass up and down to see if it moves freely without binding. Also 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).

Doors

Rear Door Index



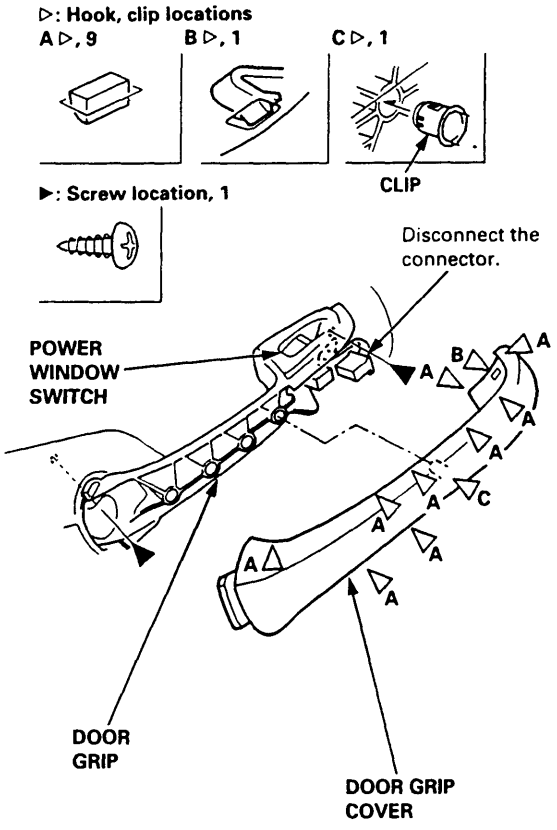

GLASS
Removal/Installation, page 20-12
Adjustment, page 20-14
QUARTER GLASS
Removal/Installation, page 20-12
GLASS RUN CHANNEL
REAR CHANNEL
REAR CHANNEL COLLAR
OUTER HANDLE
Removal/Installation, page 20-11
STRIKER
Adjustment, page 20-16
POWER WINDOW MOTOR
GLASS STOPPER
REGULATOR
Removal/Installation, page 20-12
CENTER LOWER CHANNEL
LOCK ROD PROTECTOR
LOCK CRANK
LOCK ROD
LATCH
Removal/Installation, page 20-12
LATCH PROTECTOR
POWER DOOR LOCK ACTUATOR
INNER HANDLE ROD
INNER HANDLE

Door Panel Removal/Installation

NOTE: Take care not to scratch the door panel and other parts.

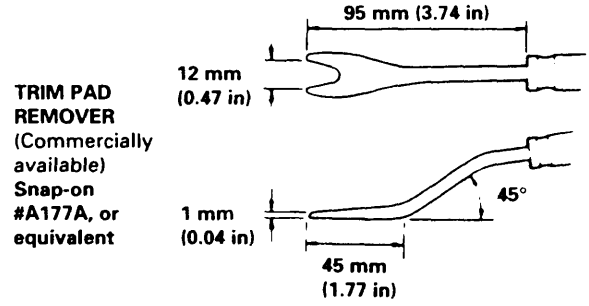
1. Remove:
   - Inner handle (see page 20-9)
   - Regulator handle (see page 20-4)

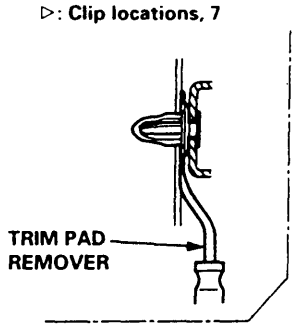
2. Remove the door grip cover, then remove the screws.

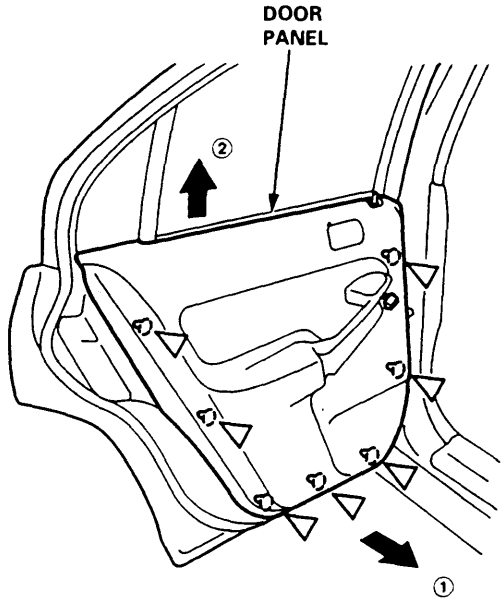


3. Release the clips that hold the door panel. Remove the door panel by pulling it upward.

   NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking it.







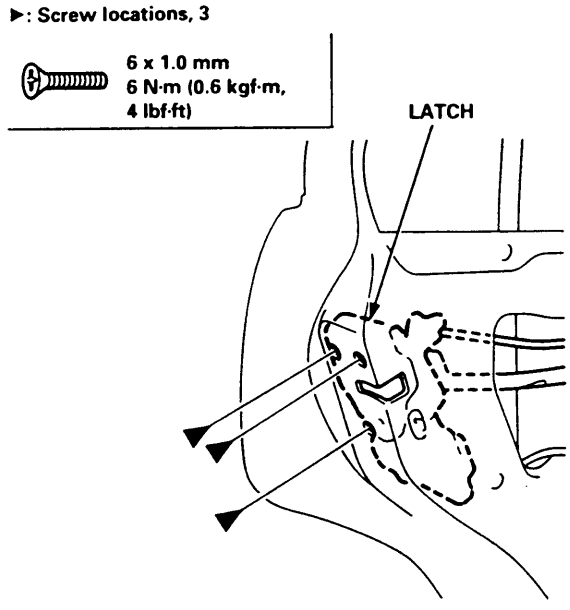
4. Installation is the reverse of the removal procedure.

Outer Handle Removal/Installation

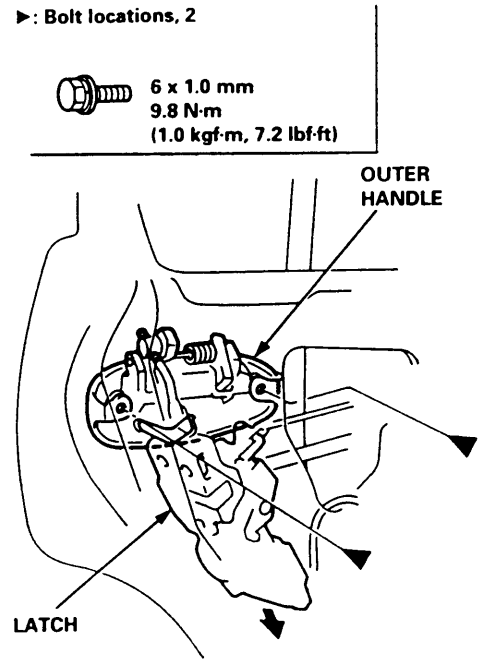
NOTE: Raise the glass fully.

1. Remove:
   - Door panel
   - Plastic cover (see page 20-8)

2. Remove the screws.

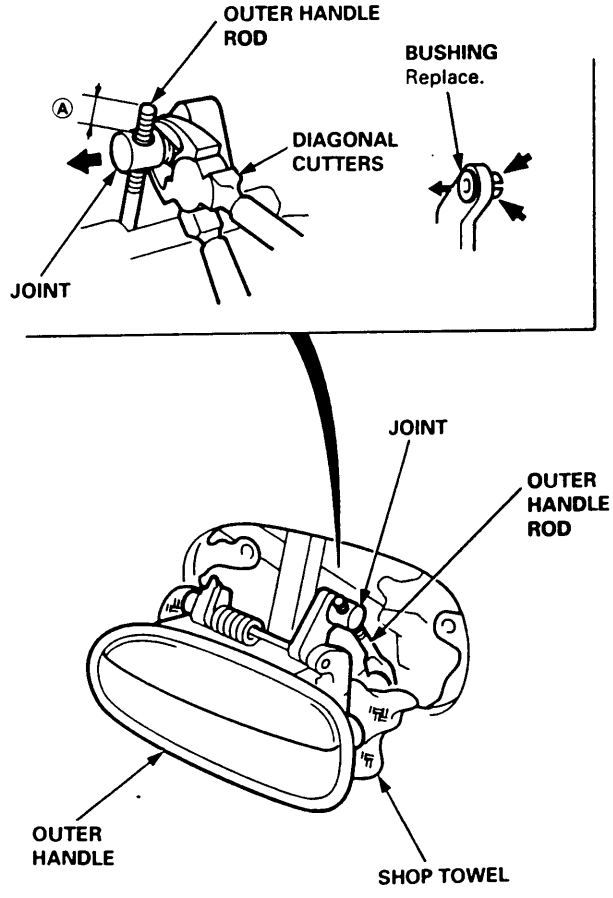


3. Move the latch down, and remove the bolts.



4. Pull out the outer handle. Pry the outer handle rod out of its joint using diagonal cutters.

   NOTE:
   - To ease reassembly, note location Ⓐ of the outer handle rod on the joint before disconnecting it.
   - Take care not to bend the outer handle rod.
   - Use a shop towel to protect the opening in the door.



5. Installation is the reverse of the removal procedure.

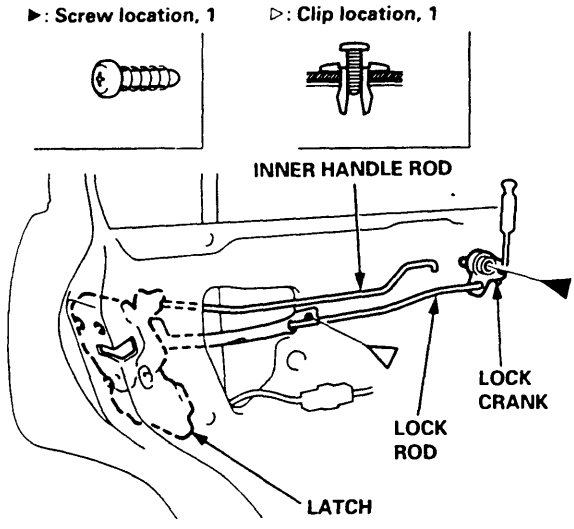
   NOTE: Make sure the door locks and opens properly.

Latch Removal/Installation

NOTE: Raise the glass fully.

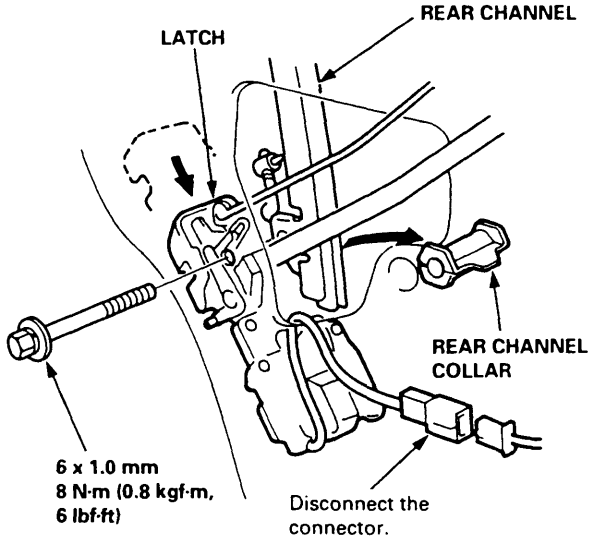
1. Remove:
   - Door panel (see page 20-10)
   - Plastic cover (see page 20-8)
   - Outer handle (see page 20-11)

2. Remove the lock crank and clip.



3. Remove the rear channel collar.

   NOTE: Take care not to bend the lock rod and inner handle rod.



4. Remove the latch through the hole in the door.

5. Installation is the reverse of the removal procedure.

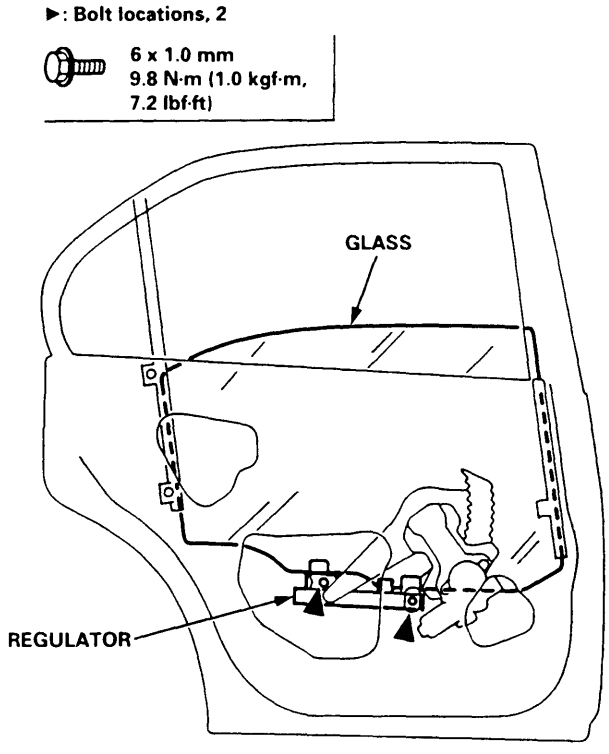
   NOTE: Make sure the door locks and opens properly.

Glass and Regulator Removal/ Installation

1. Remove:
   - Door panel (see page 20-10)
   - Plastic cover (see page 20-8)

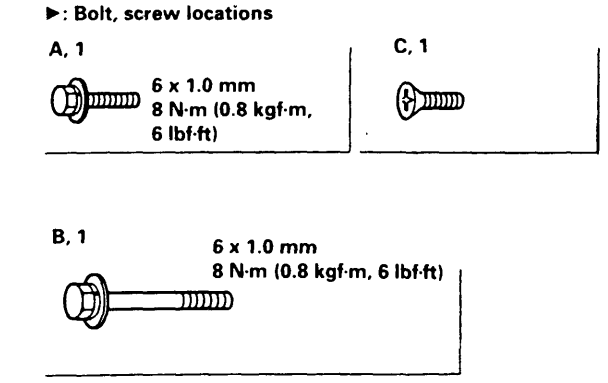
2. Carefully move the glass until you can see the bolts, then remove them.

   NOTE: Take care not to drop the glass inside the door.

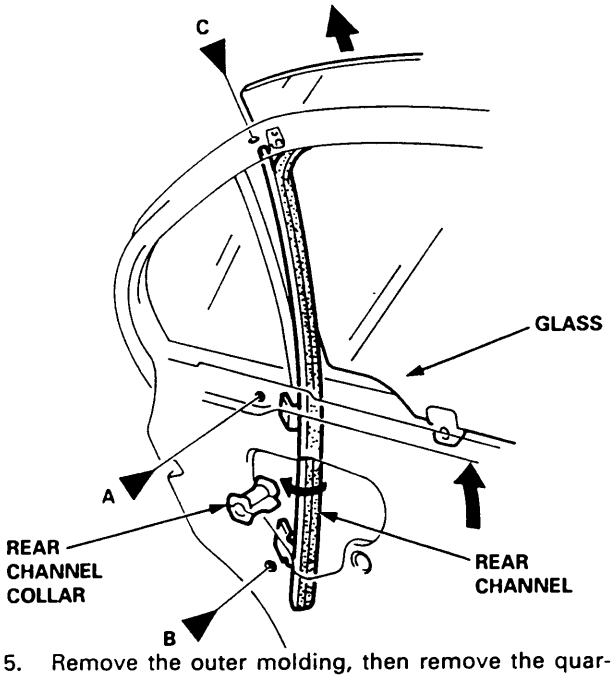


3. Carefully lower the glass. Remove the bolts and screw from the rear channel, then remove the glass from the rear channel.

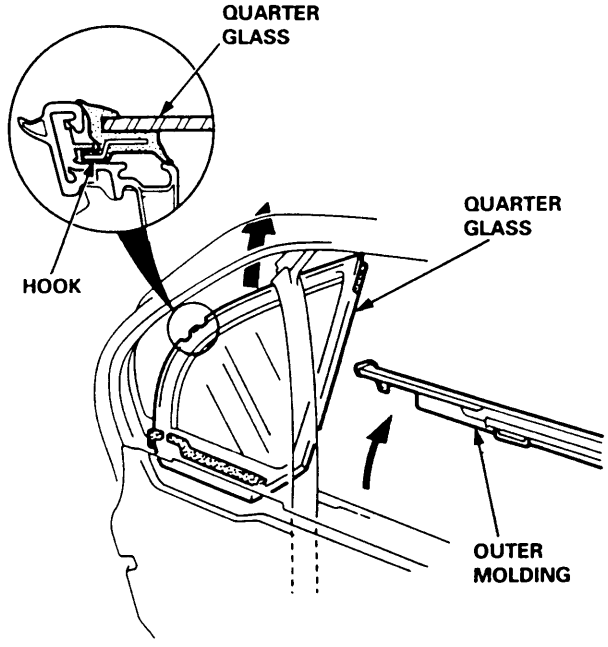
   NOTE: Take care not to drop the glass inside the door.



4. Carefully remove the glass from the window slot.

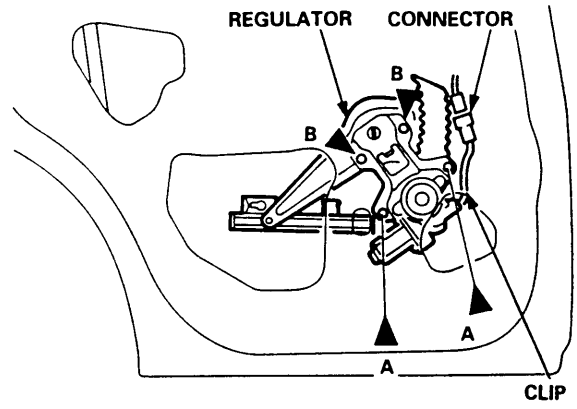


5. Remove the outer molding, then remove the quarter glass.



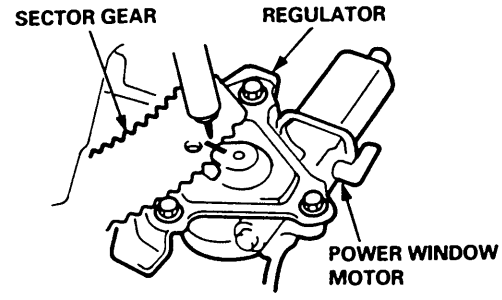
6. Disconnect the connector, and detach the harness clip, then remove the regulator through the hole in the door.

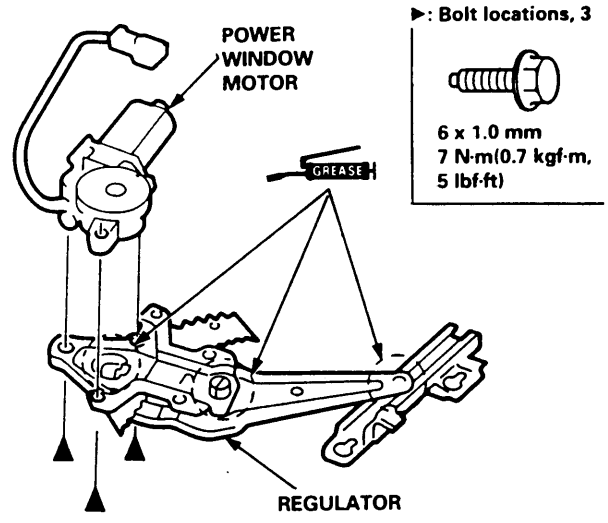
A ▶, 2	B ▶, 2
6 x 1.0 mm 8 N·m (0.8 kgf·m, 6 lbf·ft)	6 x 1.0 mm 8 N·m (0.8 kgf·m, 6 lbf·ft) Loosen.



7. Grease all the sliding surfaces of the regulator where shown.

NOTE:
- If necessary, remove the power window motor from the regulator.
- Before removing the power window motor, scribe a line across the sector gear and regulator.





▶: Bolt locations, 3

6 x 1.0 mm
7 N·m(0.7 kgf·m, 5 lbf·ft)

8. Installation is the reverse of the removal procedure.

NOTE: Roll the glass up and down to see if it moves freely without binding. Also 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).

Glass Adjustment

NOTE:
- Place the vehicle on a firm, level surface when adjusting the glass.
- Check the weatherstrips and glass run channel for damage or deterioration, and replace them if necessary.

1. Remove:
   - Door panel (see page 20-4, 10)
   - Plastic cover (see page 20-2, 8)

2. Adjust the glass.

   a. Raise the glass fully.

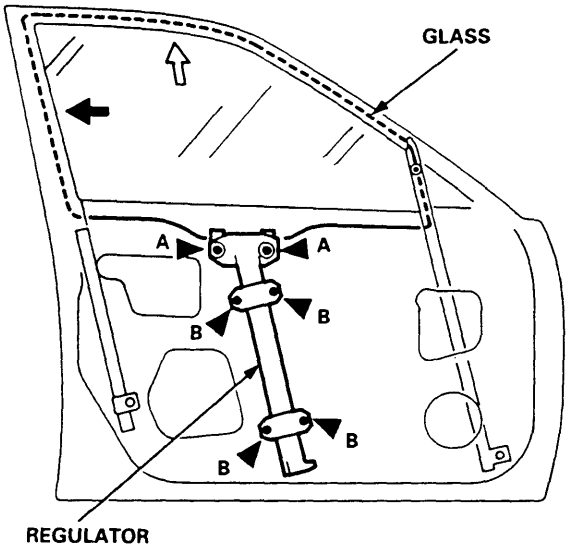
   b. Loosen the glass mounting bolts (front door) and regulator mounting bolts.

   c. Push the glass rearward (front door glass) or forward (rear door glass).

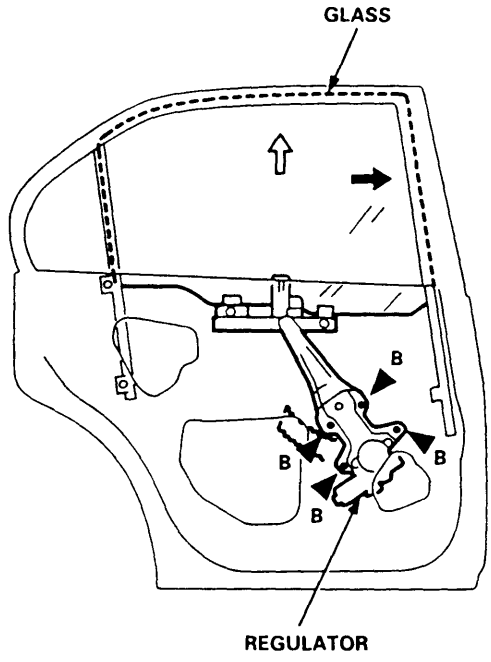
   d. Tighten the glass mounting bolts (front door) and regulator mounting bolts.

A▶: Glass mounting bolt locations.
B▶: Regulator mounting bolt locations.

Front:



Rear:



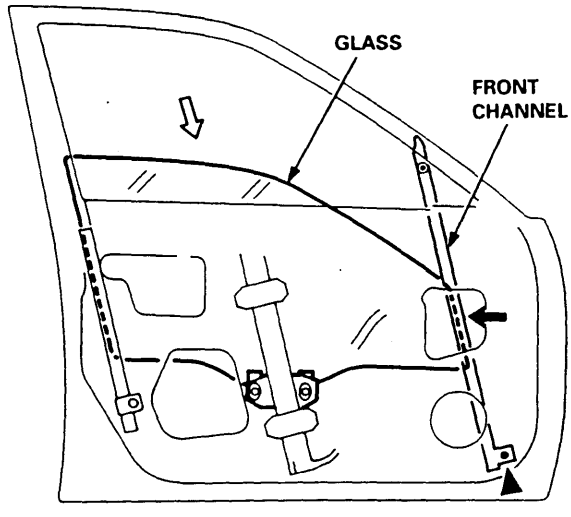
e. Loosen the front channel mounting bolts (front door or rear channel mounting bolt (rear door).

f. Lower the glass.

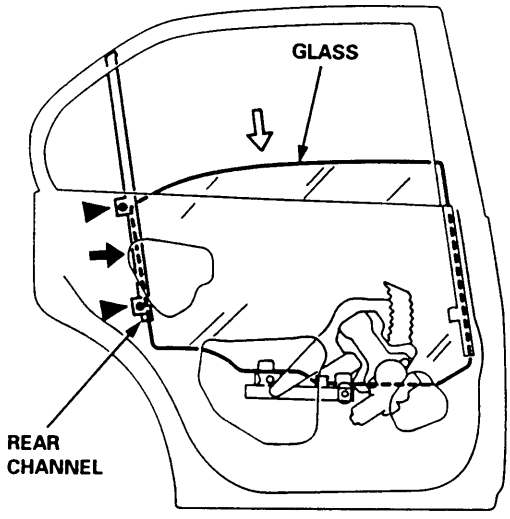
g. Push the front or rear channels against the glass while you tighten the mounting bolts.

▶: Front and rear channel mounting bolt locations

Front:

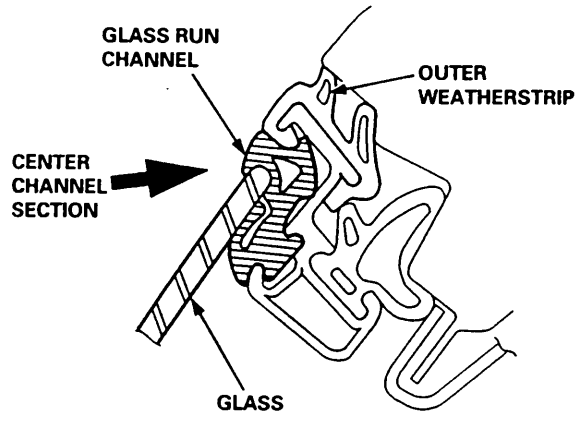


Rear:



3. Check that the glass moves smoothly.
4. Raise the glass fully and check for gaps.
5. Check the glass operation.

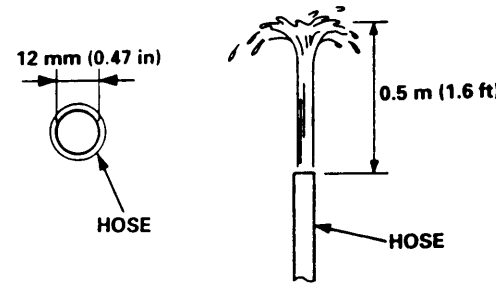
   NOTE: Check that the glass contacts the glass run channel evenly.

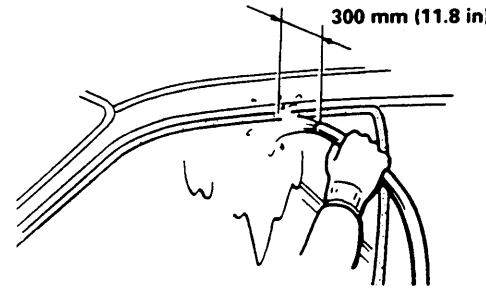


6. Check for water leaks.

   Spray water over the roof and on the sealing area as shown.

   NOTE:
   - Adjust the water pressure as shown.
   - Do not squeeze the tip of the hose.





7. Reattach the plastic cover, then reinstall the door panel (see pages 20-4, 10).

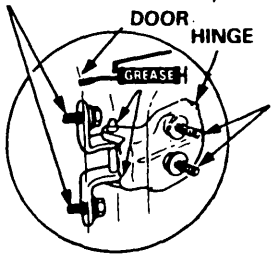
Position Adjustment

NOTE: Place the vehicle on a firm, level surface when adjusting the doors.

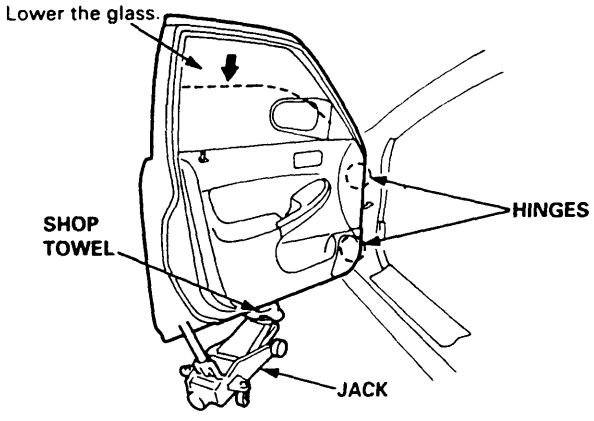
After installing the door, check for a flush fit with the body, then check for equal gaps between the front, rear, and bottom door edges and the body. The door and body edges should also be parallel. Adjust at the hinges as shown.

CAUTION: Place a shop towel on the jack to prevent damage to the door when loosening the door and hinge mounting bolts for adjustment.

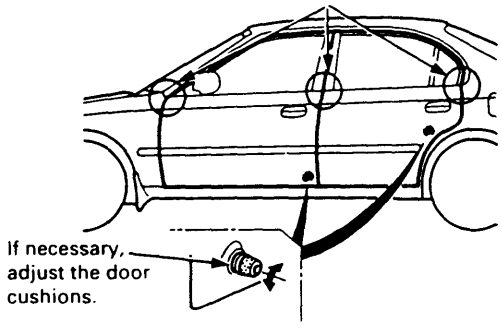
DOOR MOUNTING BOLTS
8 x 1.25 mm
28 N·m (2.9 kgf·m, 21 lbf·ft)
Loosen the door mounting bolts slightly to move the door IN or OUT until it's flush with the body. If necessary, you can install a shim behind one hinge to make the door edges PARALLEL with the body.



HINGE MOUNTING BOLTS
8 x 1.25 mm
28 N·m (2.9 kgf·m, 21 lbf·ft)
Remove the inner fender, loosen the hinge mounting bolts, and move the door BACKWARD or FORWARD, UP or DOWN as necessary to equalize the gaps. Lower the glass.



The door and body edges should be parallel.



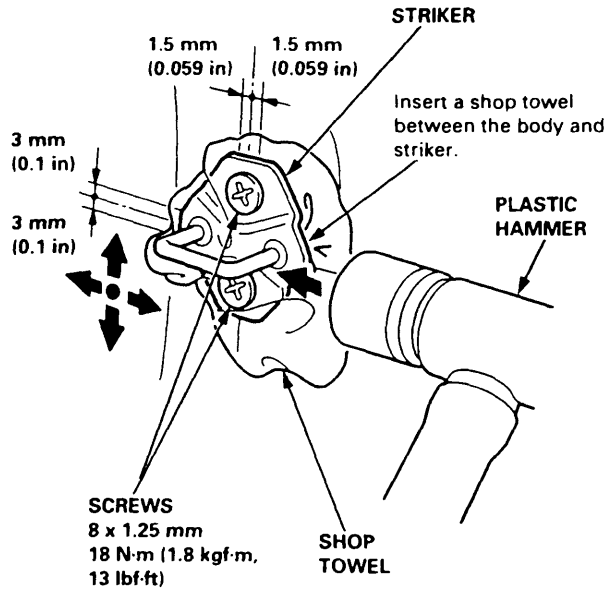
NOTE: Check for water leaks.

Striker Adjustment

Make sure the door latches securely without slamming. If it needs adjustment:

NOTE: The striker nuts are fixed. The striker can be adjusted 1.5 mm (0.059 in) up or down, and 3 mm (0.1 in) in or out.

1. Loosen the screws, then insert a shop towel 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.

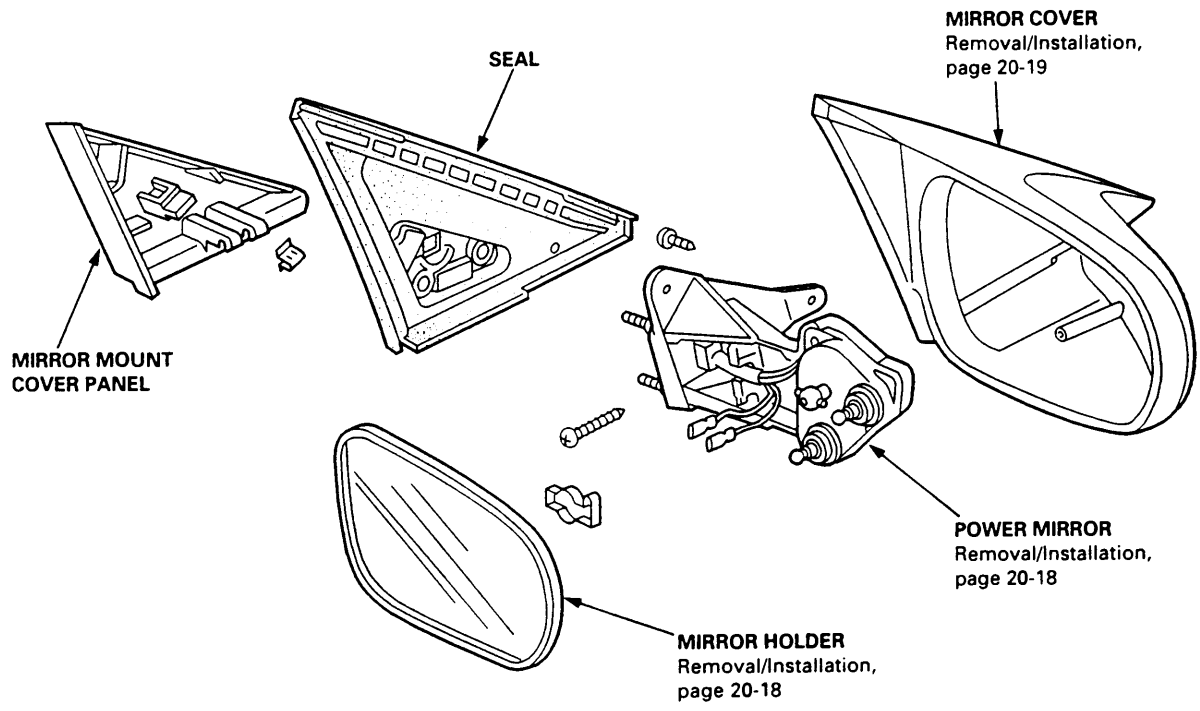
   CAUTION: Do not tap the striker too hard.

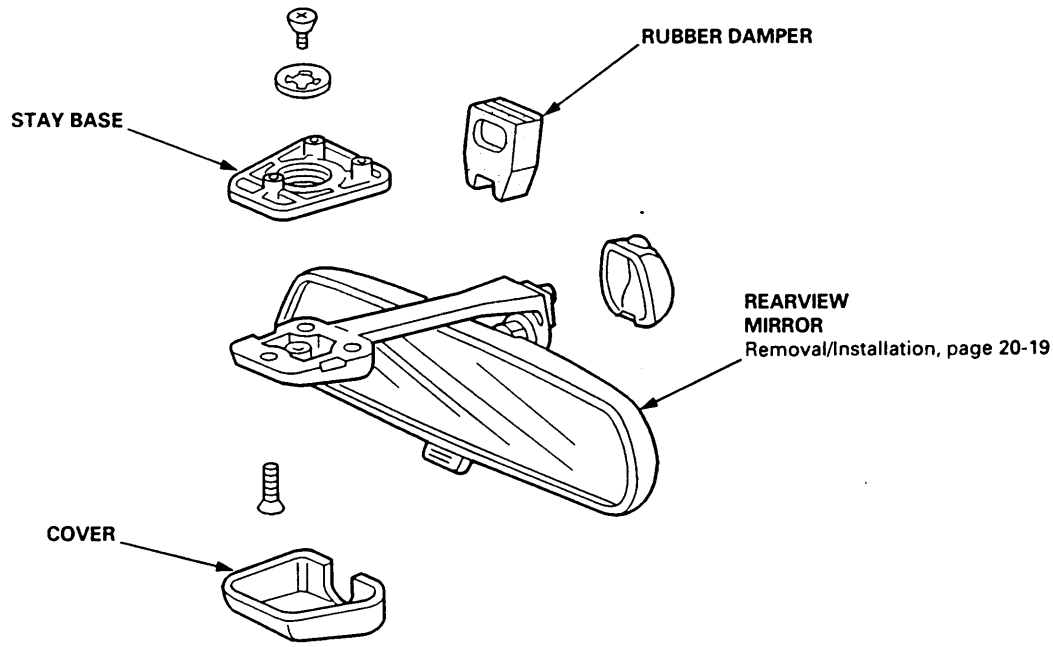
   NOTE: Hold the outer handle out, and push the door against the body to be sure the striker allows a flush fit.

4. If the door latches properly, loosen the screws, then remove the shop towel. Tighten the screws and recheck.

Mirrors

Index



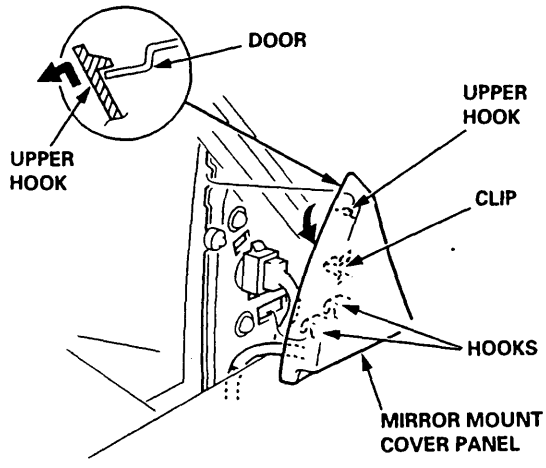


Mirrors

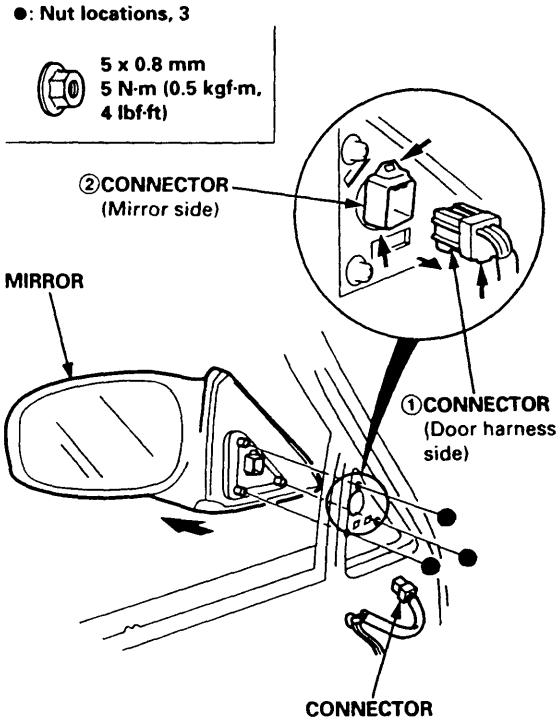
Power Mirror Removal/Installation

NOTE: Take care not to scratch the mirror, or the door.

1. Lower the door glass.
2. Carefully pry out the mirror mount cover panel by hand.



3. Disconnect the mirror connector. While holding the mirror, remove the nuts and remove the mirror.



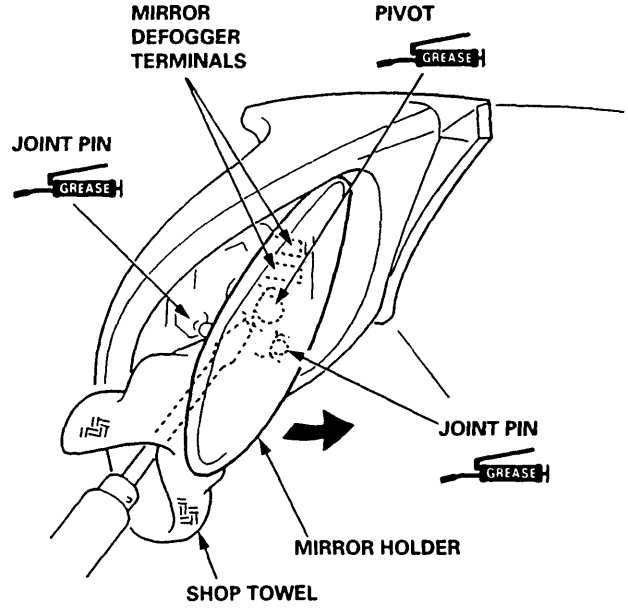
4. Installation is the reverse of the removal procedure.

   NOTE: Make sure the connector is connected properly.

Mirror Holder Removal/Installation

CAUTION:
- **When prying with a flat tip screwdriver, wrap it with a shop towel to prevent damage.**
- **Wear gloves to remove and install the mirror holder.**

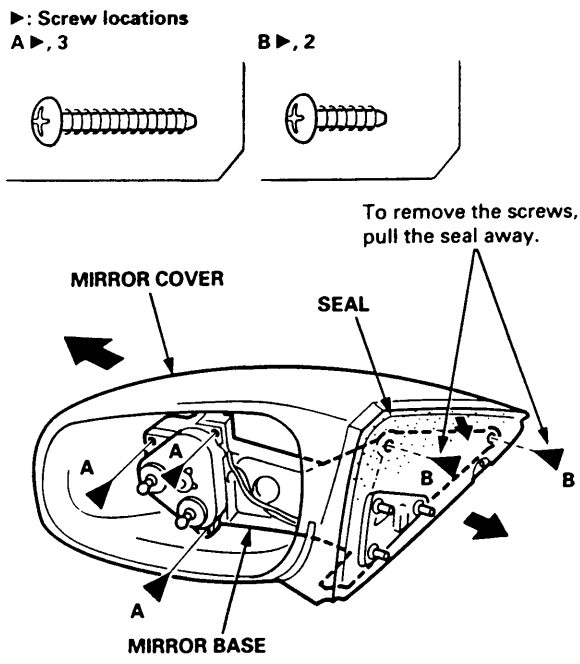
1. Carefully pry out the mirror holder with a flat tip screwdriver as shown. Disconnect the mirror defogger terminals.



2. Installation is the reverse of the removal procedure.

   NOTE: Apply grease to the locations indicated by the arrows.

Mirror Cover Removal/Installation

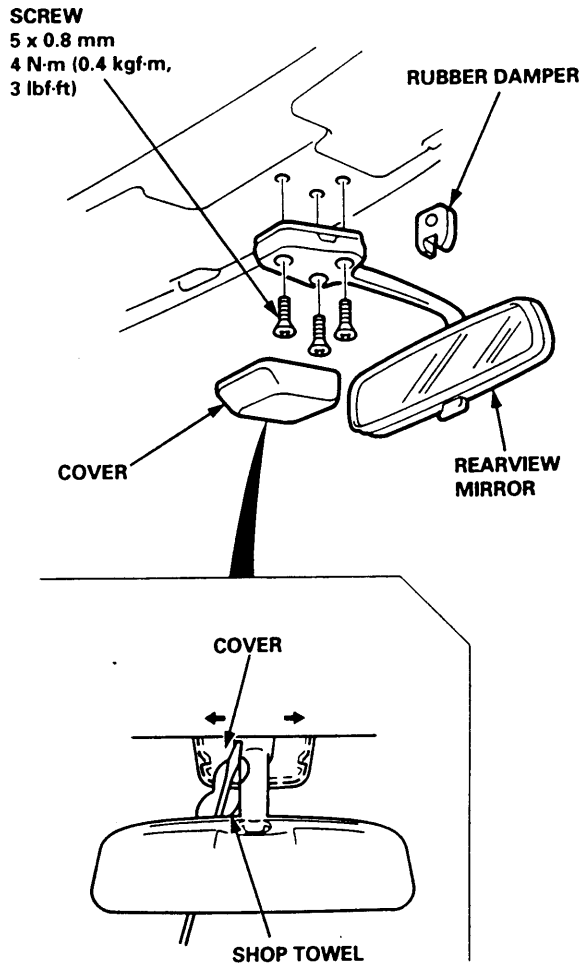


Rearview Mirror Removal/ Installation

1. Remove the rubber damper.
2. Pry the cover off using the end of a flat tip screwdriver.

   CAUTION: When prying with a flat tip screwdriver, wrap it with a shop towel to prevent damage.

3. Remove the screws, then remove the rearview mirror.



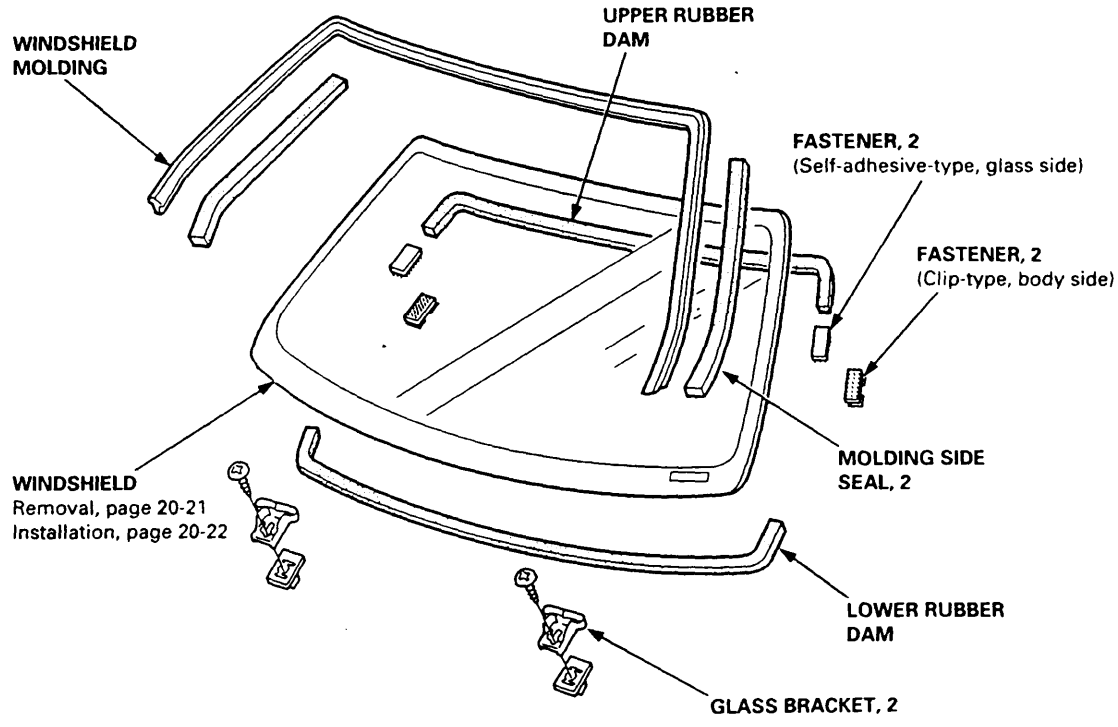
4. Installation is the reverse of the removal procedure.

Windshield/Rear Window

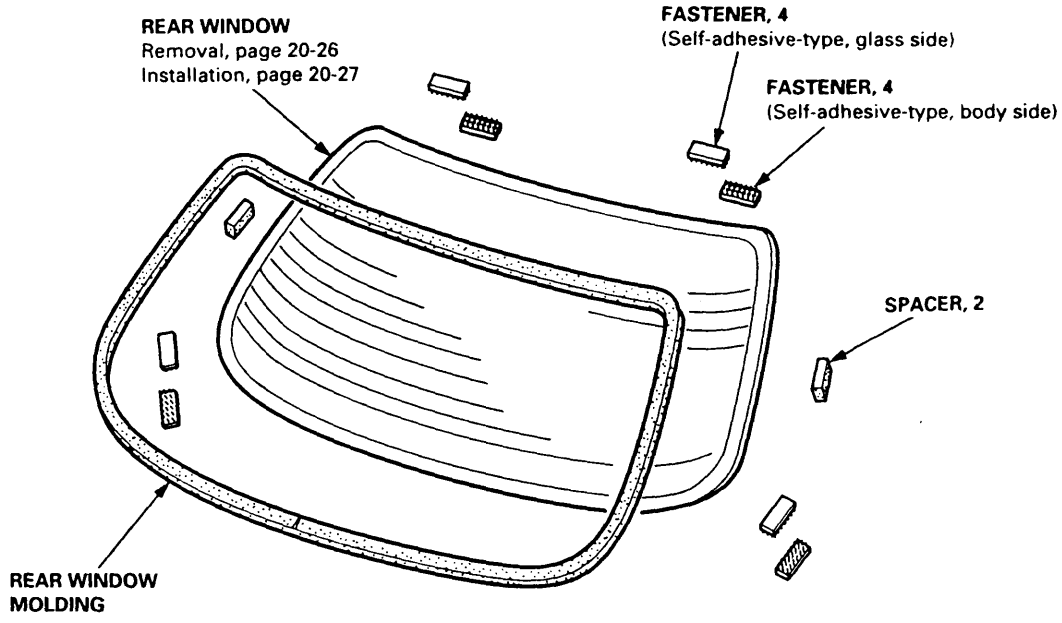
Index

NOTE: The numbers after the part names show the quantities of the parts used.

Windshield:



Rear Window:



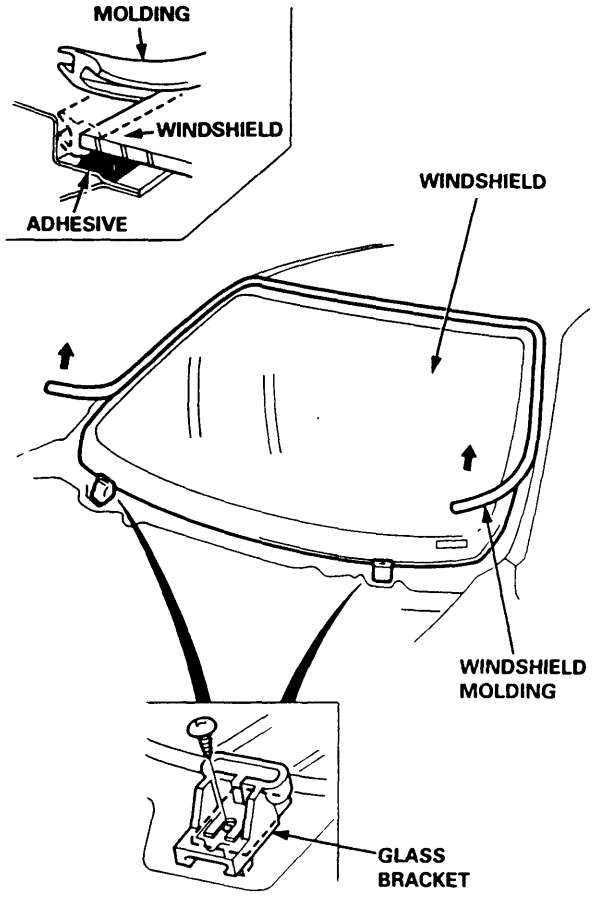
Windshield Removal

CAUTION:
- **Wear gloves to remove and install the windshield.**
- **Use seat covers to avoid damaging any surfaces.**

1. To remove the windshield, first remove the:
   - Rearview mirror (see page 20-19)
   - Sunvisors and holders (see page 20-41)
   - Front pillar trim (see page 20-39)
   - Windshield wiper arms and cowl cover (see page 20-73)

2. Remove off the windshield molding, and remove the glass brackets.

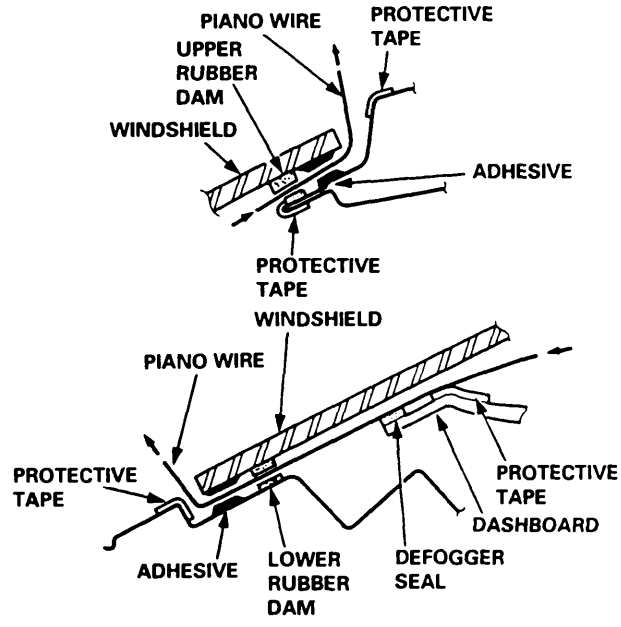
   NOTE: If removing the windshield molding is difficult, cut the molding with a utility knife.



3. Pull down the front portion of the headliner (see page 20-41).

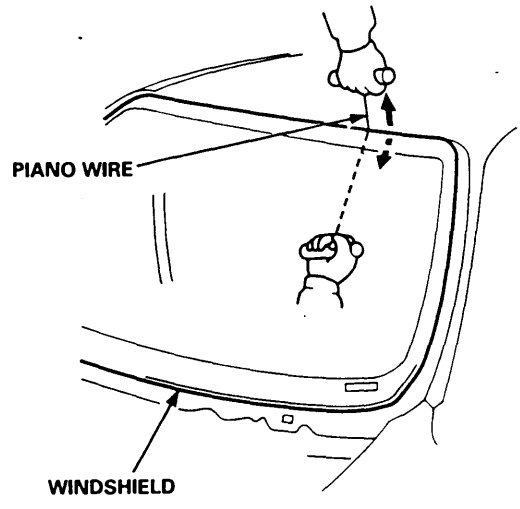
   CAUTION: Take care not to bend the headliner excessively or you may break it.

4. Apply protective tape along the edge of the dashboard and body as shown. Using an awl, make a hole through the rubber dam and adhesive from inside the vehicle. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.



   CAUTION: Hold the piano wire as close to the windshield as possible to prevent damage to the body and dashboard.

5. With a helper on the outside, pull the piano wire back and forth in a sawing motion, and carefully cut through the rubber dam and adhesive around the entire windshield.



6. Carefully remove the windshield.

Windshield Installation

1. Using 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 windshield opening flange.

   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding.
   - Remove the rubber dams and fasteners from the body.
   - Mask off surrounding surfaces before painting.

2. Clean the body bonding surface with a sponge dampened in alcohol.

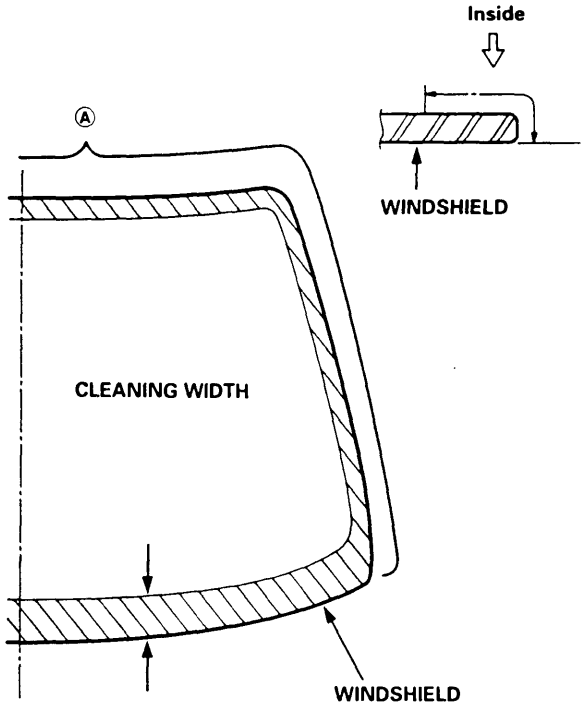
   NOTE: After cleaning, keep oil, grease and water from getting on the surface.

3. If the old windshield is to be reinstalled, use a putty knife to scrape off all traces of old adhesive and the rubber dam, then clean the windshield surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

   CAUTION: Avoid setting the windshield on its edges; small chips may later develop into cracks.

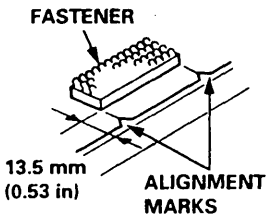
   NOTE:
   - Clean the shadowed area.
   - Clean area Ⓐ as shown.

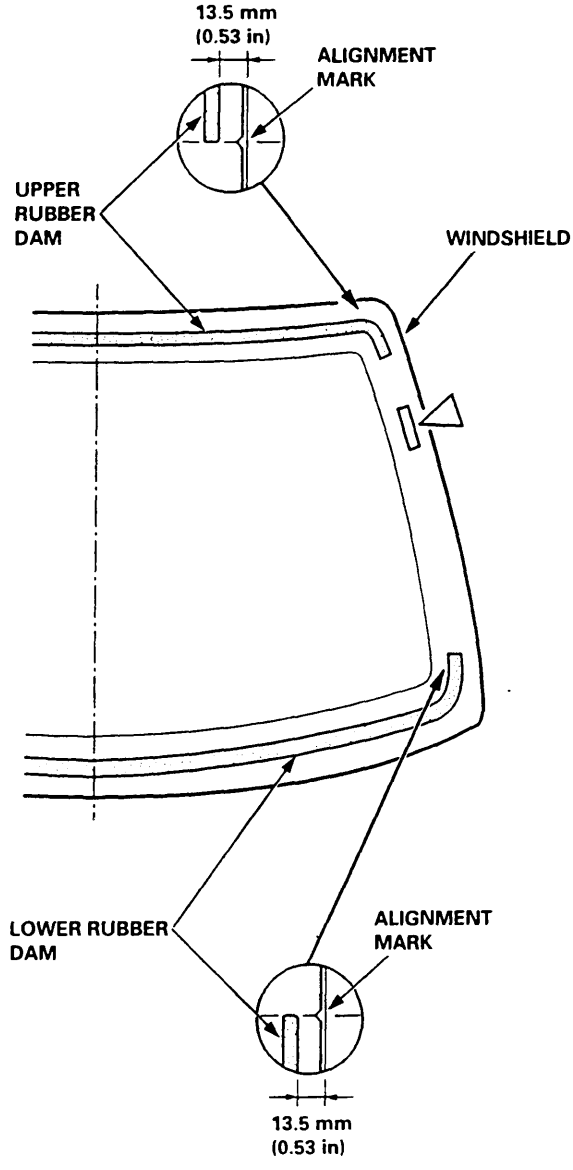


4. Glue the rubber dam and fasteners to the inside face of the windshield as shown.

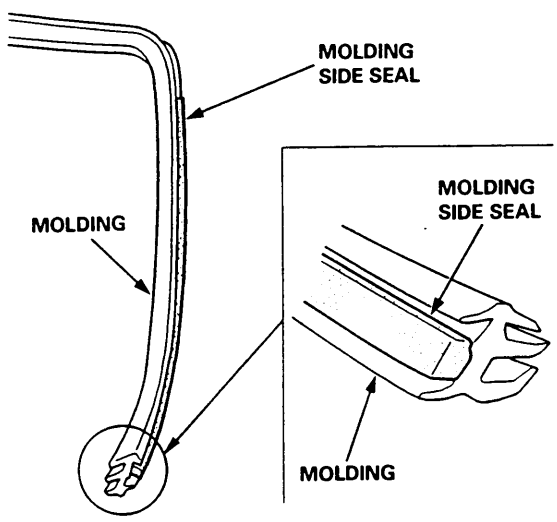
   NOTE: Be careful not to touch the windshield where adhesive will be applied.

▷: **Fastener locations, 2**



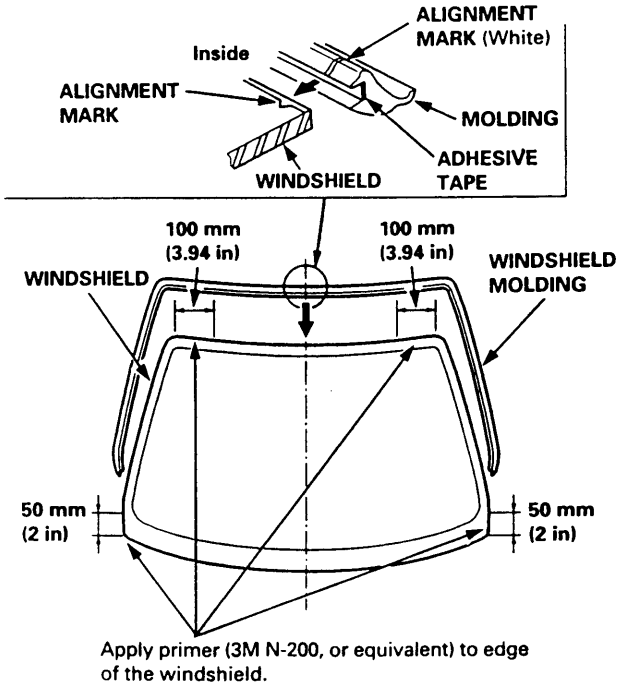


5. Glue the molding side seal to the windshield molding on each side.



6. Align and glue the molding to the edge of the windshield.

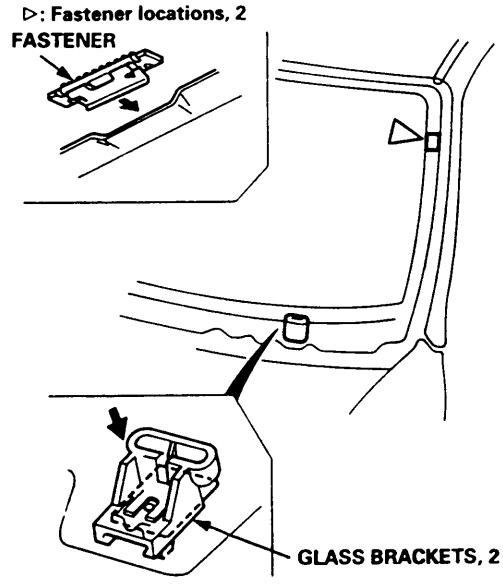
NOTE: Be careful not to touch the windshield where adhesive will be applied.



Apply primer (3M N-200, or equivalent) to edge of the windshield.

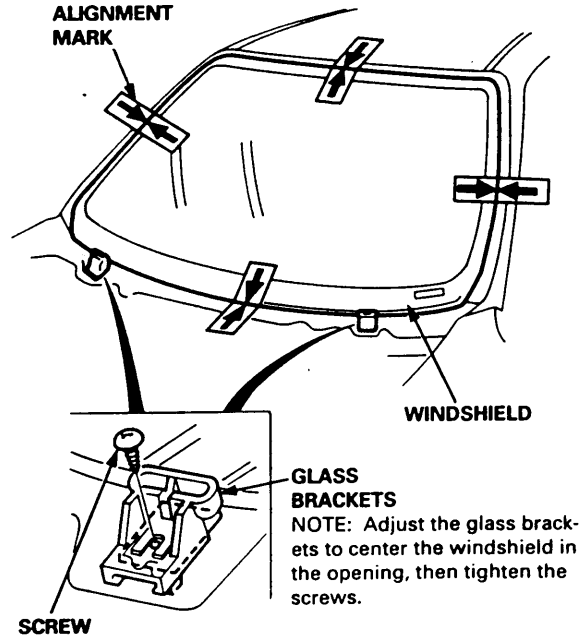
7. Install the glass brackets and fasteners as shown.

NOTE: The numbers after the part names show the quantities of the parts used.



8. Set the windshield on the glass brackets, then center it in the opening. Make alignment marks across the windshield and body with a grease pencil at the four points shown.

NOTE: Be careful not to touch the windshield where adhesive will be applied.



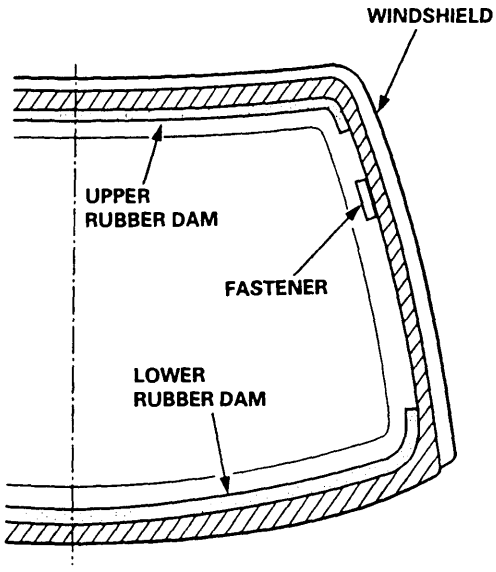
9. Remove the windshield. (cont'd)

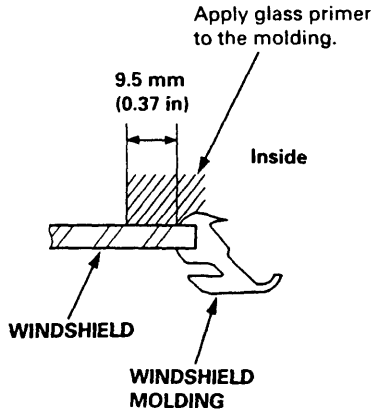
Windshield Installation (cont'd)

10. With a sponge, apply a light coat of glass primer around the edge of the windshield as shown, then lightly wipe it off with gauze or cheesecloth.

    NOTE:
    - 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.

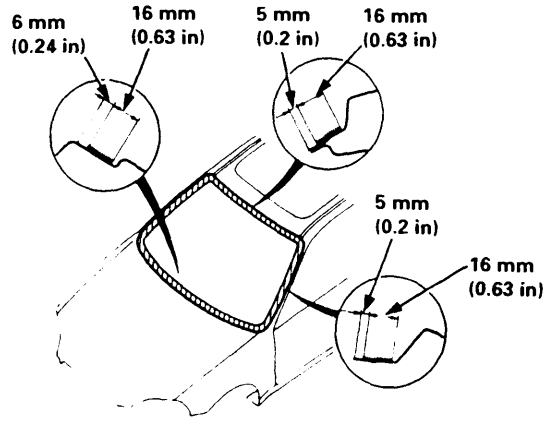




11. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for at least 10 minutes.

    NOTE:
    - Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
    - Never touch the primed surfaces with your hands.
    - Mask off the dashboard before painting the flange.

: Apply body primer here.

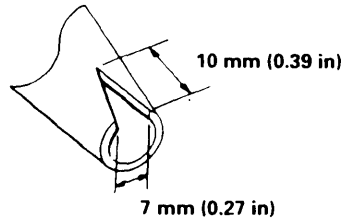


12. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

    NOTE:
    - Clean the plate with a sponge and alcohol before mixing.
    - Follow the instructions that come with the adhesive.

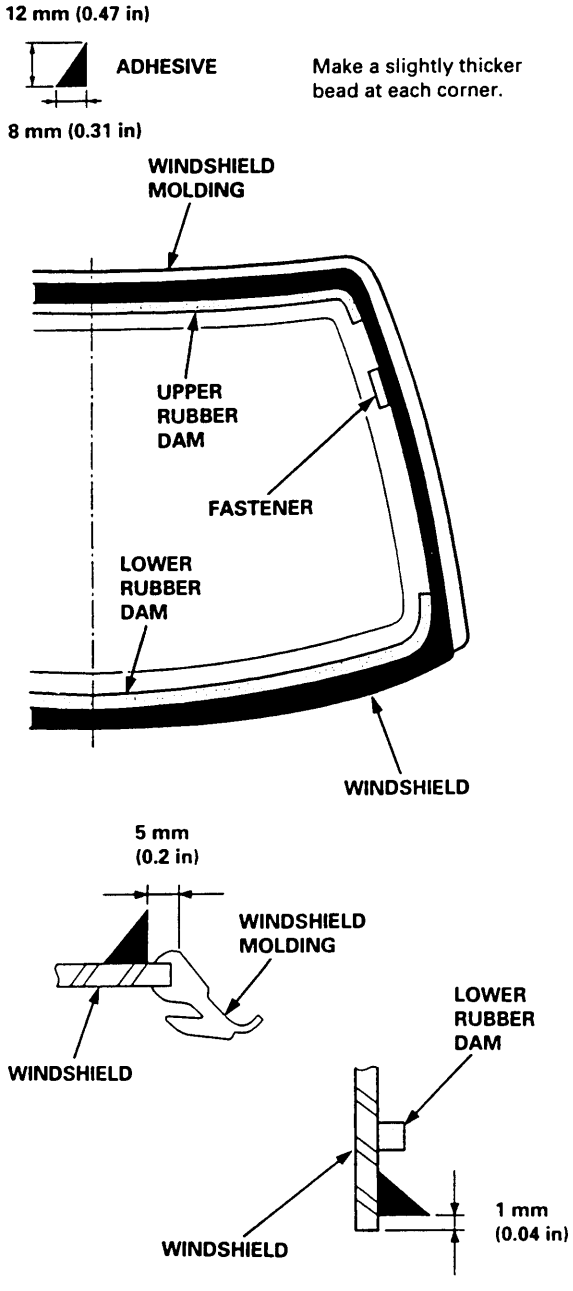
13. Before filling a cartridge, cut the end of the nozzle as shown.

Cut nozzle end as shown.



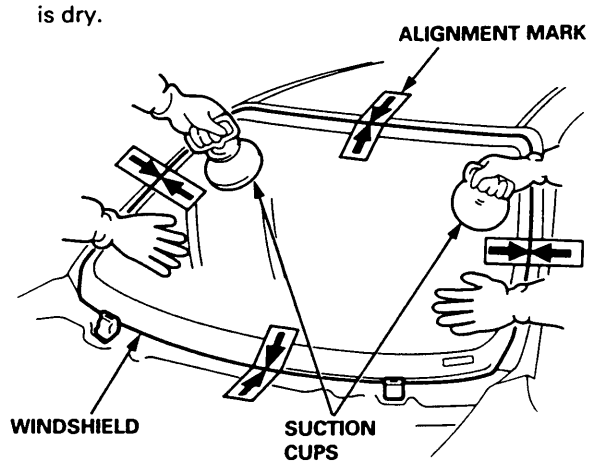
14. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the windshield as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



15. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 8, and set it down on the adhesive. Lightly push on the windshield until its edge is fully seated on the adhesive all the way around.

    NOTE: Do not open or close the doors until adhesive is dry.



16. Scrape or wipe the excess adhesive off with a putty knife or towel.

    NOTE: To remove adhesive from a painted surface or the windshield, wipe with a soft shop towel dampened with alcohol.

17. Let the adhesive dry for at least one hour, then spray water over the windshield and check for leaks. Mark the leaking areas, let the windshield dry, then seal with sealant.

    NOTE:
    - Let the adhesive dry stand for at least four hours after windshield installation. If the vehicle has to be used within the first four hours, it must be driven slowly.
    - Keep the windshield dry for the first hour after installation.
    - Check that the ends of the side molding are set under the air scoop.

18. Reinstall all remaining removed parts.

    NOTE:
    - Install the rearview mirror rubber damper after the adhesive has dried thoroughly.
    - Advise the customer not to do the following things for two to three 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 Removal

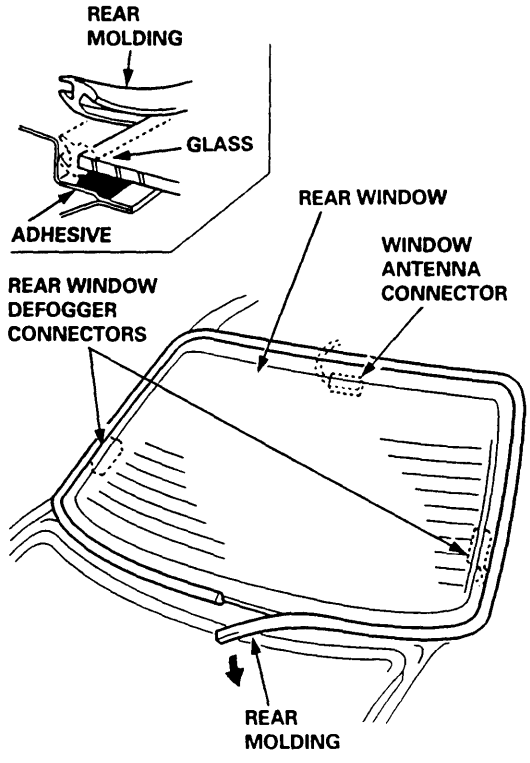
CAUTION:
- **Wear gloves to remove and install the rear window.**
- **Use seat covers to avoid damaging any surfaces.**
- **Do not damage the rear window defogger grid lines, window antenna grid lines, and terminals.**

1. To remove the rear window, first remove the:
   - Trunk lid (see body repair manual)
   - Rear seat cushion (see page 20-55)
   - Rear seat side bolsters (see page 20-55)
   - Rear shelf (see page 20-39)
   - Rear pillar trim (see page 20-39)
   - Rear roof trim (see page 20-41)

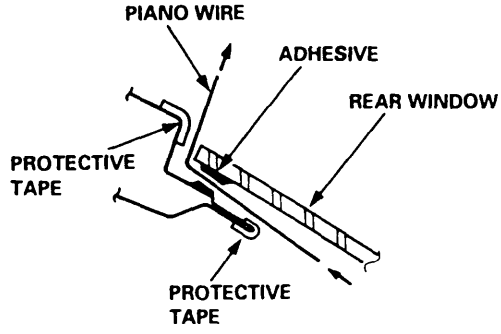
2. Disconnect the rear window defogger connectors from each side and window antenna connector.

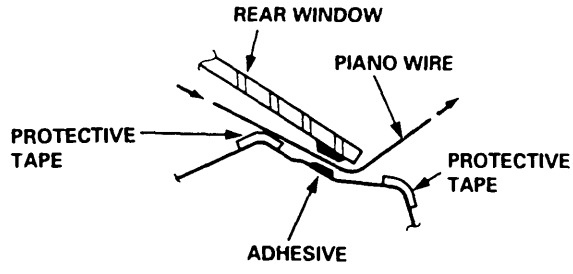
3. Remove off the rear molding.

   NOTE: If removing the rear molding is difficult, cut the molding with a utility knife.



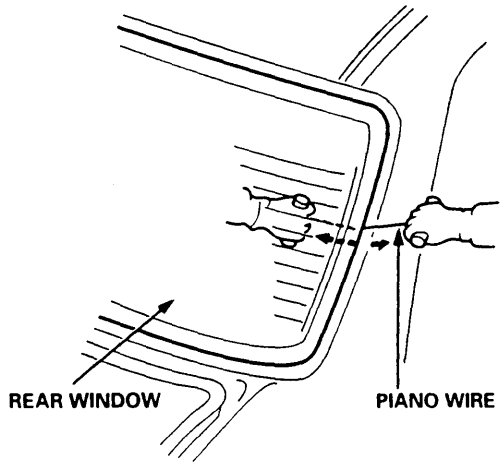
4. Apply protective tape along the edge of the body as shown. Using an awl, make a hole through the adhesive from inside the vehicle. Push a piece of piano wire through the hole, and wrap each end around a piece of wood.





CAUTION: Hold the piano wire as close to the rear window as possible to prevent damage to the body.

5. With a helper on the outside, pull the piano wire back and forth in a sawing motion, and carefully cut through the adhesive around the entire rear window.



6. Carefully remove the rear window.

Rear Window Installation

1. Using 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.

   NOTE:
   - Do not scrape down to the painted surface of the body; damaged paint will interfere with proper bonding
   - Mask off surrounding surfaces before painting.
   - Remove the fasteners and spacers from the body.

2. Clean the body bonding surface with a sponge dampened in alcohol.

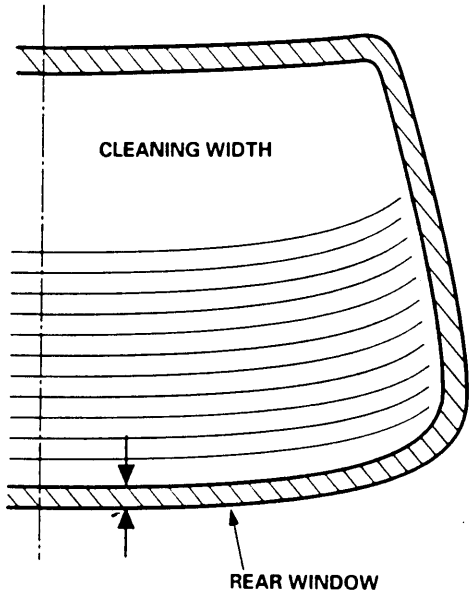
   NOTE: After cleaning, keep oil, grease and water from getting on the surface.

3. If the old rear window is to be reinstalled, use a putty knife to scrape off all traces of old adhesive and the rubber dam, then clean the rear window surface with alcohol where new adhesive is to be applied.

   NOTE: Make sure the bonding surface is kept free of water, oil and grease.

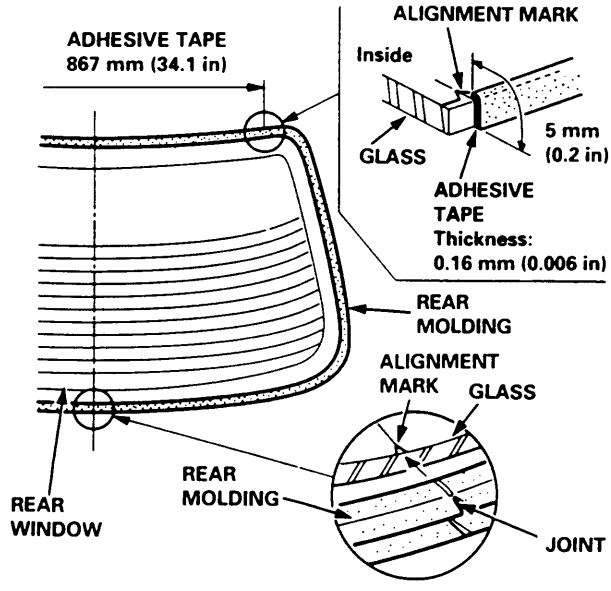
   CAUTION: Avoid setting the rear window on its edges; small chips may later develop into cracks.

   NOTE: Clean the shadowed area.



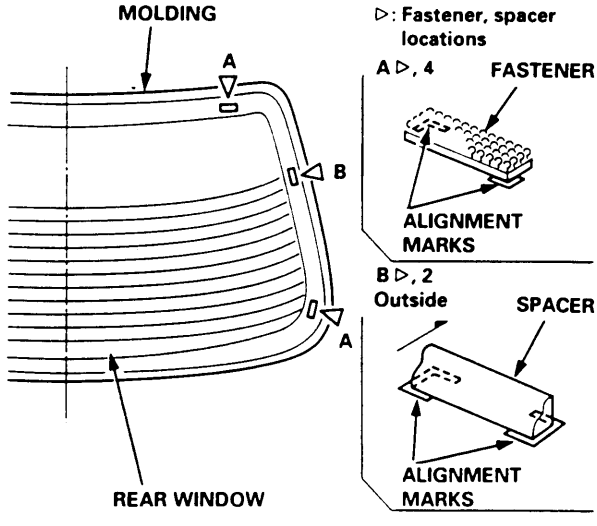
4. Apply the double-faced adhesive tape to the edge of the rear window, then install the molding around the edge of the rear window as shown.

   NOTE: Be careful not to touch the rear window where adhesive will be applied.



5. Glue the fasteners and spacers to the inside face of the rear window as shown.

   NOTE: Be careful not to touch the rear window where adhesive will be applied.

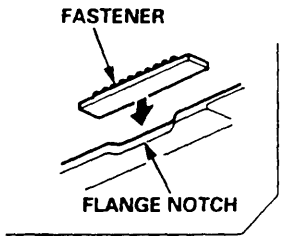


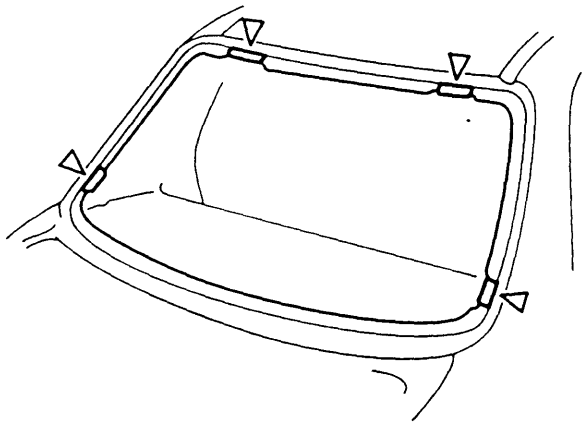
(cont'd)

Rear Window Installation (cont'd)

6. Glue the fasteners to the body as shown.

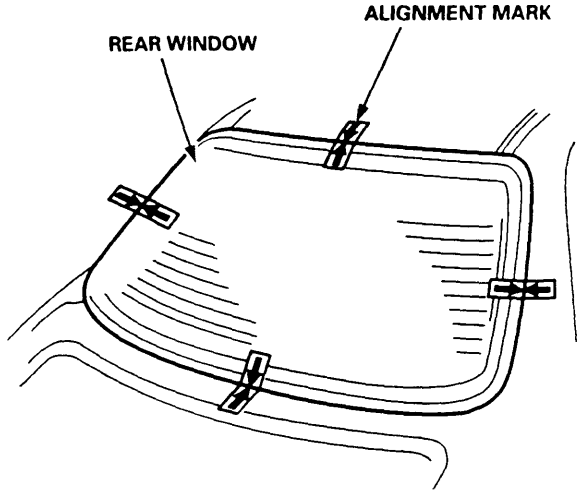
▷: **Fastener locations, 4**





7. Set the rear window in the window opening, and then center it. Make alignment marks across the rear window and body with a grease pencil at the four points shown.

NOTE: Be careful not to touch the rear window where adhesive will be applied.

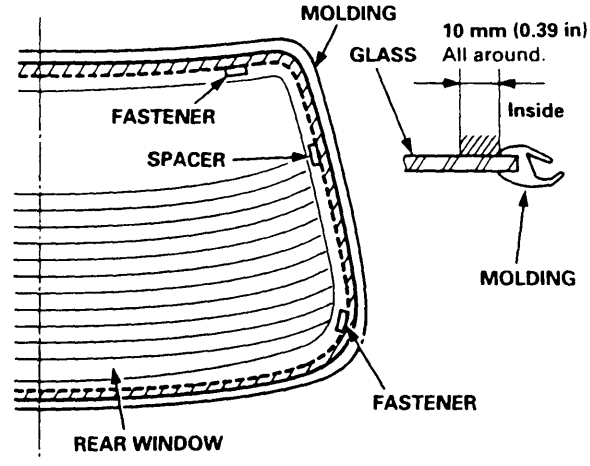


8. Remove the rear window.

9. With a sponge, apply a light coat of glass primer around the edge of the rear window as shown, then lightly wipe it off with gauze or cheesecloth.

NOTE:
- 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.

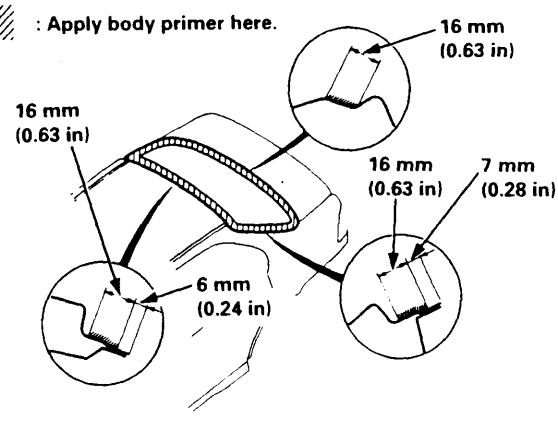
: **Apply glass primer here.**



10. With a sponge, apply a light coat of body primer to the original adhesive remaining around the rear window opening flange. Let the body primer dry for at least 10 minutes.

NOTE:
- Do not apply glass primer to the body, and be careful not to mix up glass and body primer sponges.
- Never touch the primed surfaces with your hands.

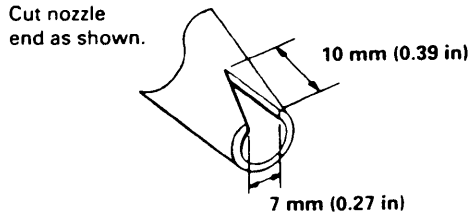
: **Apply body primer here.**



11. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

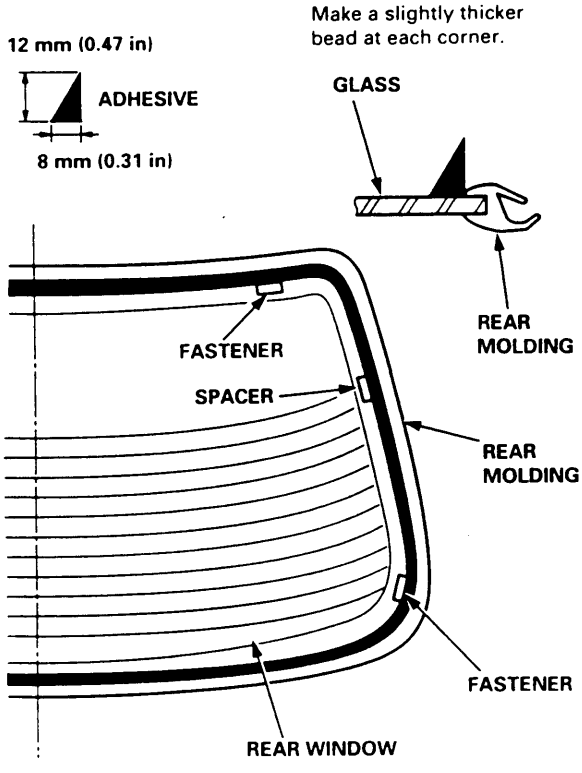
    NOTE:
    - Clean the plate with a sponge and alcohol before mixing.
    - Follow the instructions that came with the adhesive.

12. Before filling a cartridge, cut the end of the nozzle as shown.



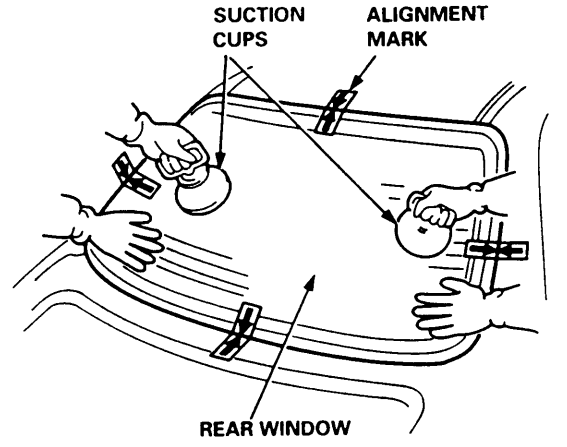
13. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun, and run a bead of adhesive around the edge of the rear window as shown.

    NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



14. Use suction cups to hold the rear window over the opening, align it with the alignment marks you made in step 7, 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.

    NOTE: Do not open or close the doors until the adhesive is dry.



15. Scrape or wipe the excess adhesive off with a putty knife or towel.

    NOTE: To remove adhesive from a painted surface or the rear window, use a soft shop towel dampened with alcohol.

16. Let the adhesive dry for at least one 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.

    NOTE: Let the adhesive stand for at least four hours after rear window installation. If the vehicle has to be used within the first four hours, it must be driven slowly.

17. Reinstall all remaining removed parts.

    NOTE: Advise the customer not to do the following things for two to three 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).

Moonroof

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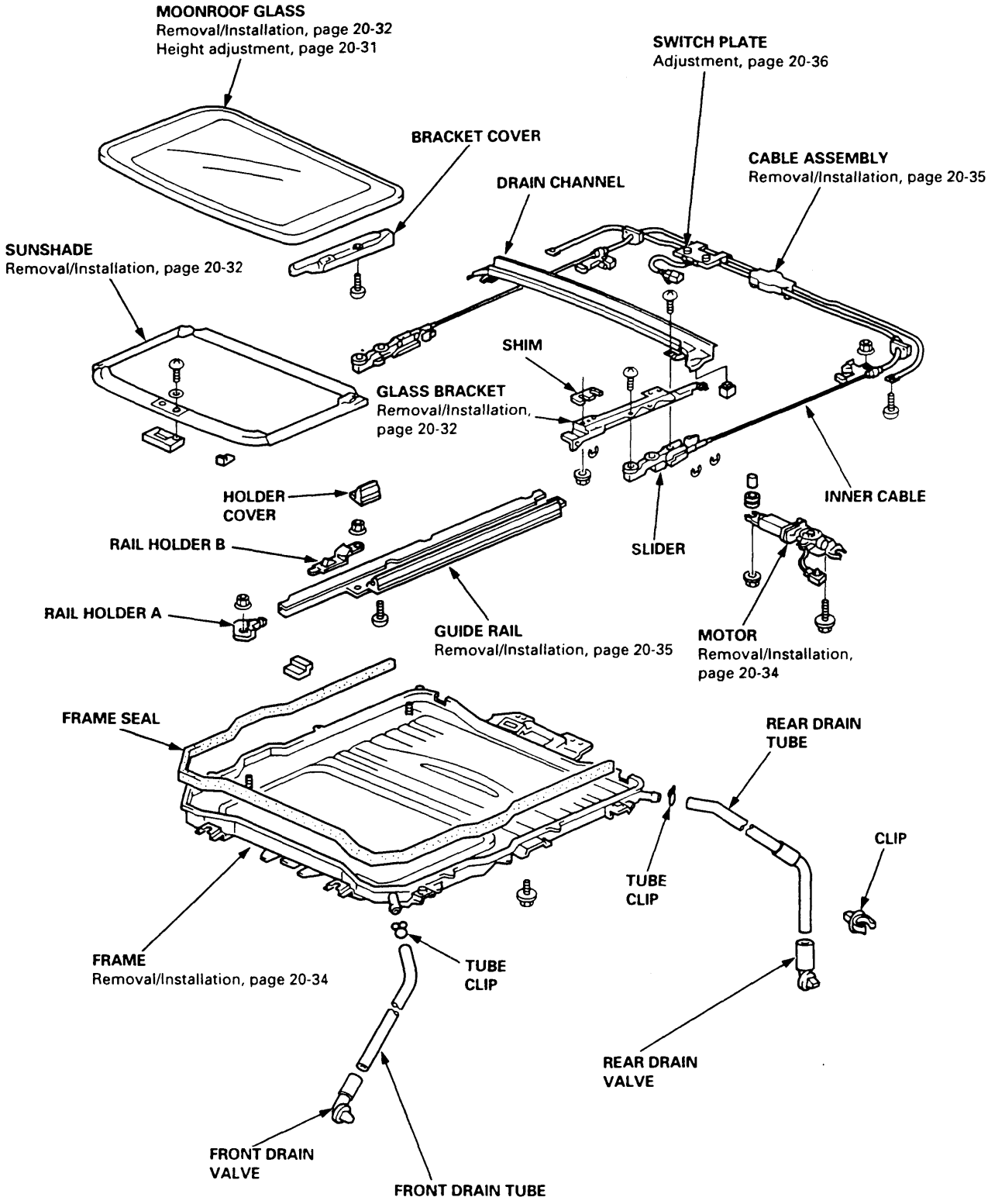
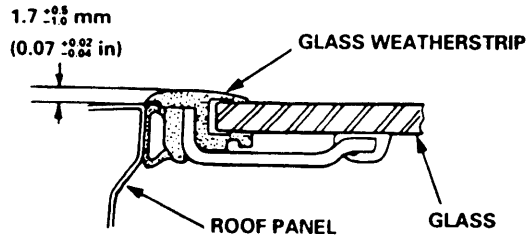


Troubleshooting

Symptom	Probable Cause
Water leaks	1. Clogged drain tube. 2. Gap between glass weatherstrip and roof panel. 3. Defective or improperly installed glass weatherstrip. 4. Gap between drain seal and roof panel.
Wind noise	1. Excessive clearance between glass weatherstrip and roof panel.
Motor noise	1. Loose motor. 2. Worn gear or bearing. 3. Cable assembly deformed.
Glass does not move, but motor turns	1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and slider. 3. Inner cable loose. 4. Cable assembly not attached properly.
Glass does not move and motor does not turn (glass can be moved with moonroof wrench)	1. Blown fuse. 2. Faulty switch. 3. Battery run down. 4. Defective motor. 5. Faulty relay.

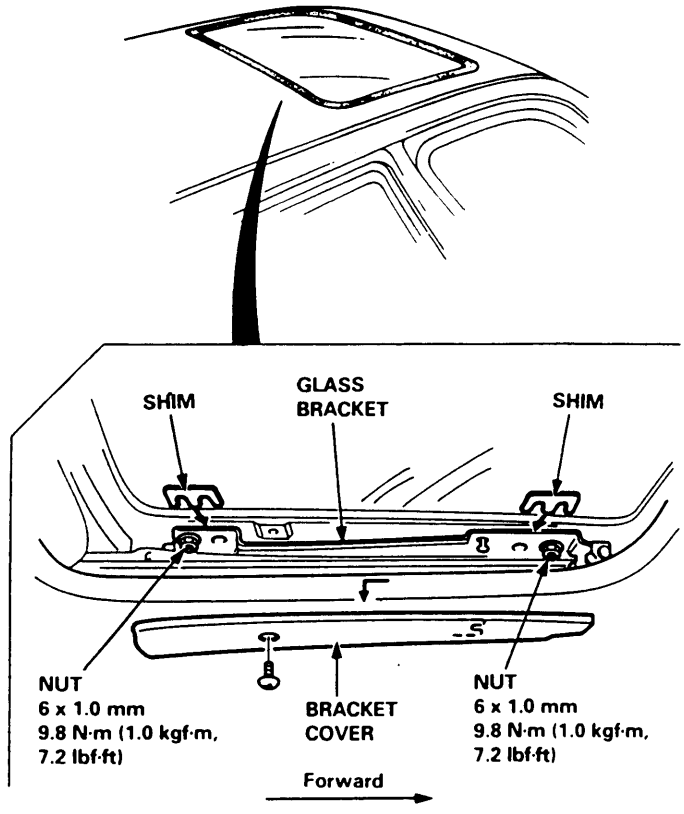
Glass Height Adjustment

The roof panel should be even with the glass weatherstrip, to within 1.7 $^{+0.5}_{-1.0}$ mm (0.07 $^{+0.02}_{-0.04}$ in) all the way around. If not, open the glass fully, and:



1. Remove the bracket cover.
2. Loosen the nuts, and install the shims between the glass frame and glass bracket as shown.

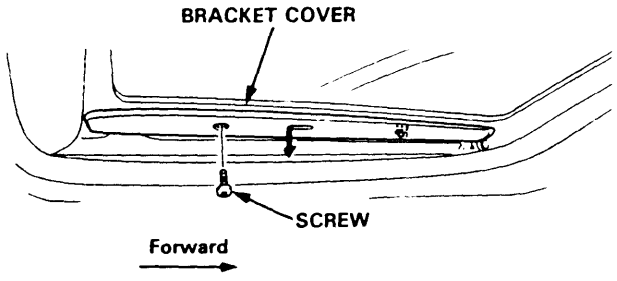
   Shim thickness: Front max. 3 mm (0.12 in)
   Rear max. 2 mm (0.08 in)
3. Repeat on opposite side if necessary.



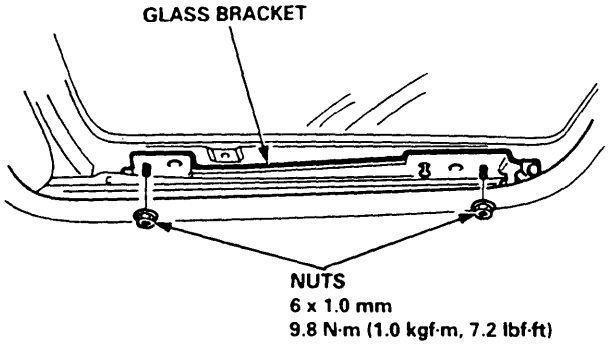
Moonroof

Glass, Glass Bracket and Sunshade Removal/Installation

1. Close the glass fully.
2. Slide the sunshade all the way back.
3. Remove both bracket covers.

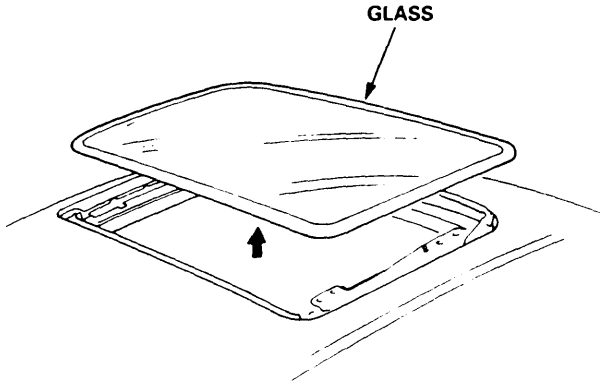


4. Remove the nuts from both glass brackets.

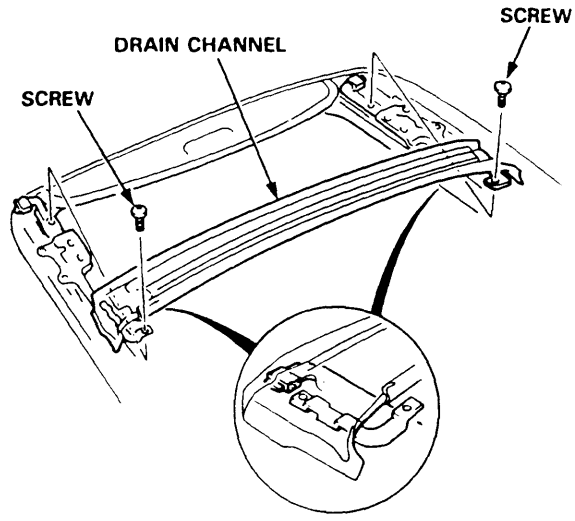


5. Remove the glass by lifting up and pulling forward as shown.

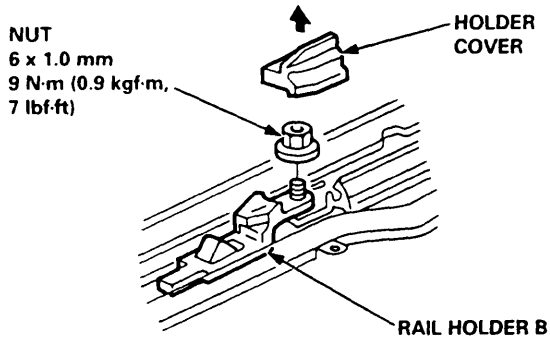
   NOTE: Do not damage the roof panel.



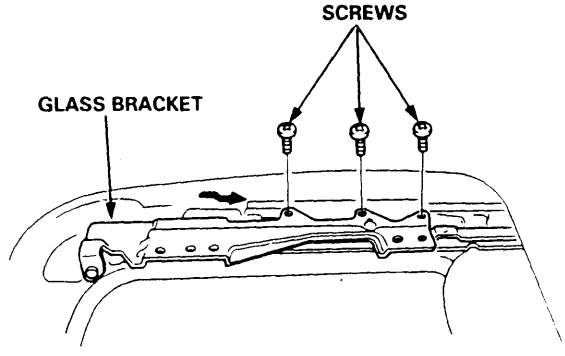
6. Remove the drain channel.



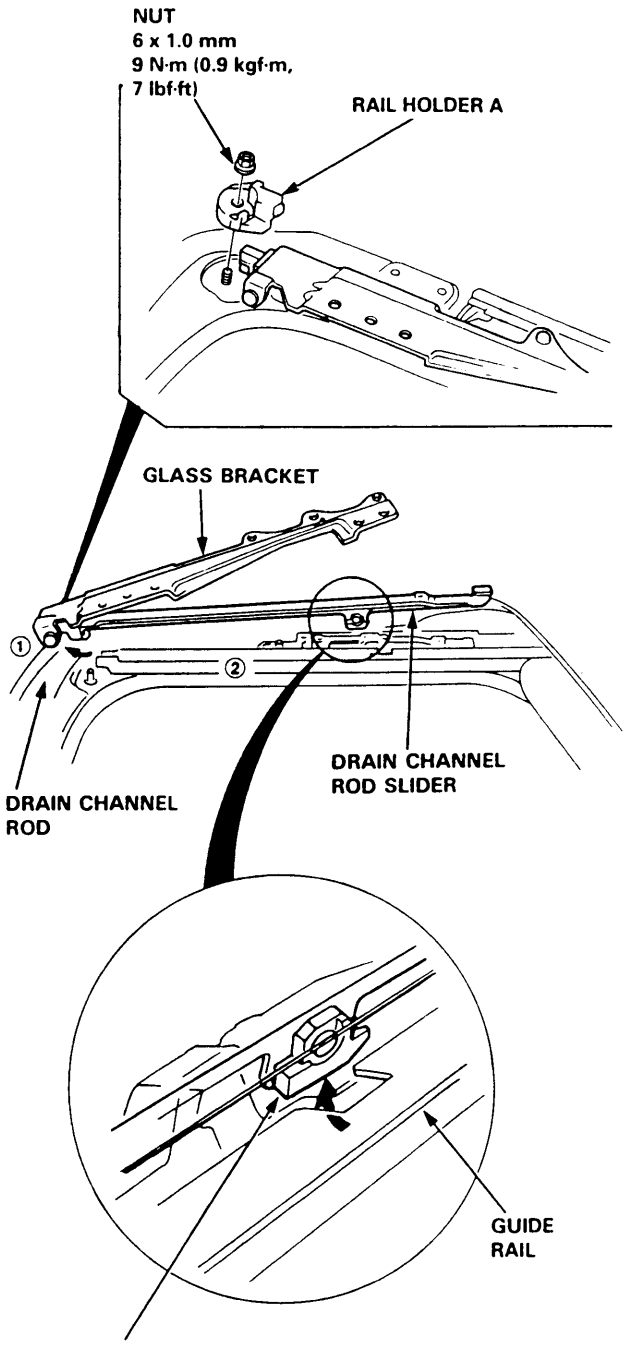
7. Remove the holder cover, then remove the rail holder B.



8. Using the moonroof wrench, move the glass bracket to the position where the moonroof normally pivots down, and remove the screws.



9. Remove the rail holder A.

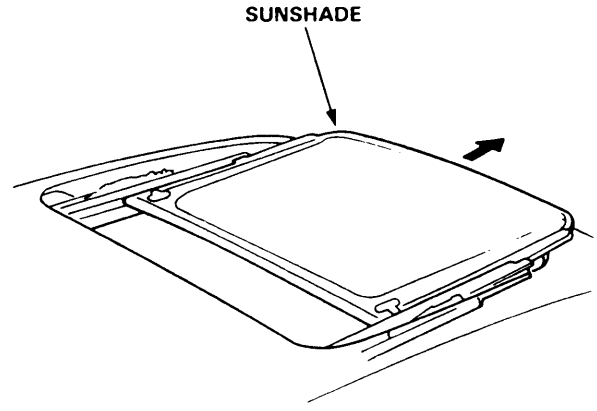


DRAIN CHANNEL ROD STOP
Rotate as shown to remove it from the guide rail.

10. Remove the drain channel rod slider by moving the cable slider forward using the moonroof wrench.

11. Detach the drain channel rod stop from the cutout of the guide rail as shown.

12. Slide the sunshade forward, then remove it.



13. Installation is the reverse of the removal procedure.

    NOTE: Check the glass height (see page 20-31).

14. Check for water leaks.

    NOTE: Do not use high-pressure water.

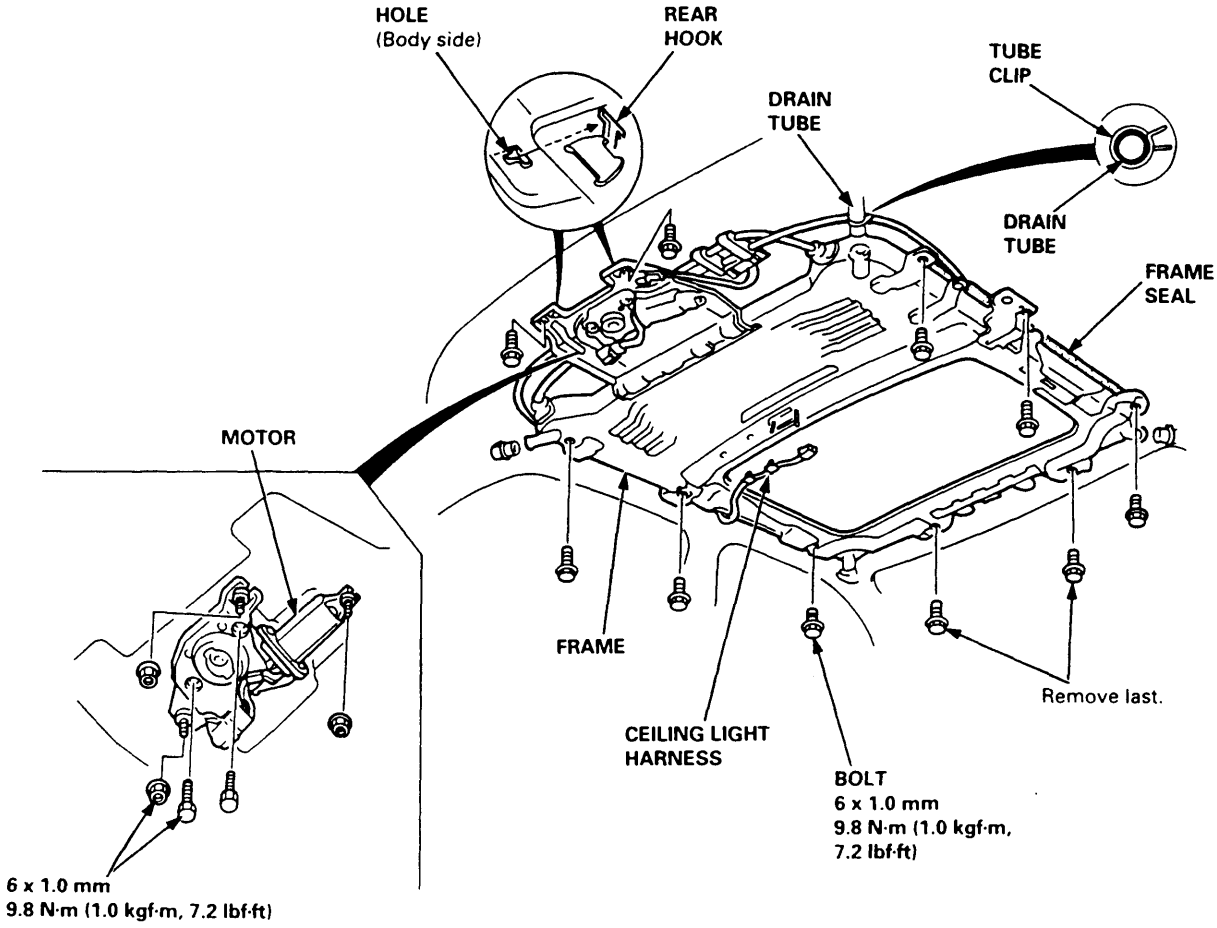
Moonroof

Motor, Drain Tube and Frame Removal/Installation

CAUTION:
- **Wear gloves to remove and install the frame.**
- **Be careful not to damage the seats, the dashboard or any other interior panels.**

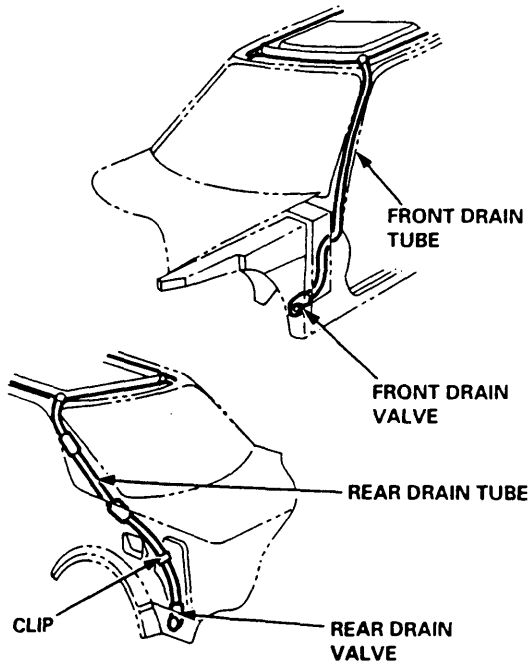
1. Remove the headliner (see page 20-41).
2. Disconnect the motor connector and glass position switch connector, then remove the bolts and nuts, and remove the motor.
3. Remove the moonroof glass (see page 20-32).
4. Disconnect the drain tubes, and detach the ceiling light harness.
5. The moonroof frame with an assistant holding, remove the frame mounting bolts. Detach the rear hooks by moving the frame forward, and remove the frame.

   NOTE: Remove the front bolts last.



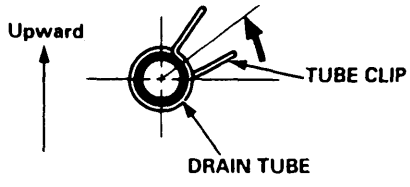
6. Pull the drain tubes out the front and rear pillars.

   NOTE: Before removing the drain tube, tie a string to the end of it so it can be reinstalled.



7. Installation is the reverse of the removal procedure.

   NOTE:
   - 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 installing the frame, first attach the rear hooks into the body holes.
   - When connecting the drain tube, slide it over the frame nozzle at least 10 mm (0.39 in).
   - Install the tube clip as shown.



8. Check for water leaks.

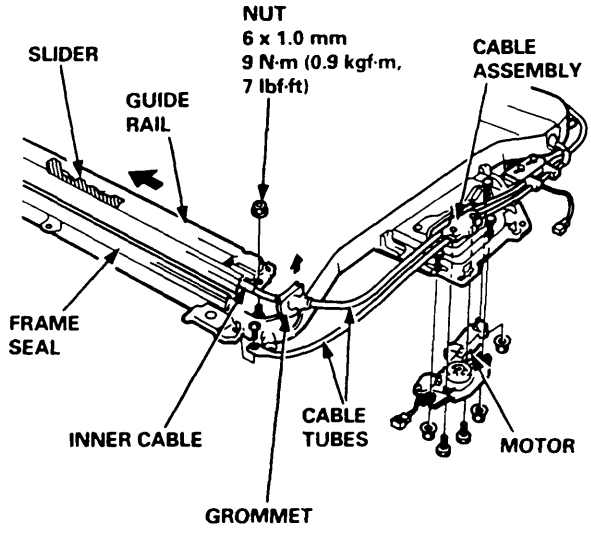
   NOTE: Do not use high-pressure water.

Guide Rails and Cable Assembly Removal/Installation

CAUTION: Wear gloves to remove and install the guide rails and cable assembly.

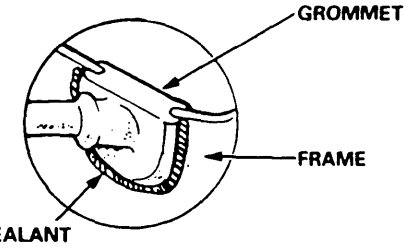
1. Remove the frame.
2. Remove the motor and glass bracket (see page 20-32).
3. Remove the nuts, and lift off each guide rail, then remove the cable assembly with the sliders attached.

   NOTE: Take care not to bend the cable tubes and the guide rails.



4. Installation is the reverse of the removal procedure.

   NOTE:
   - Damaged parts should be replaced.
   - Grease the sliding portion with Super High Temp Urea Grease, P/N 08798 - 9002.
   - Fill the groove in each grommet with sealant.



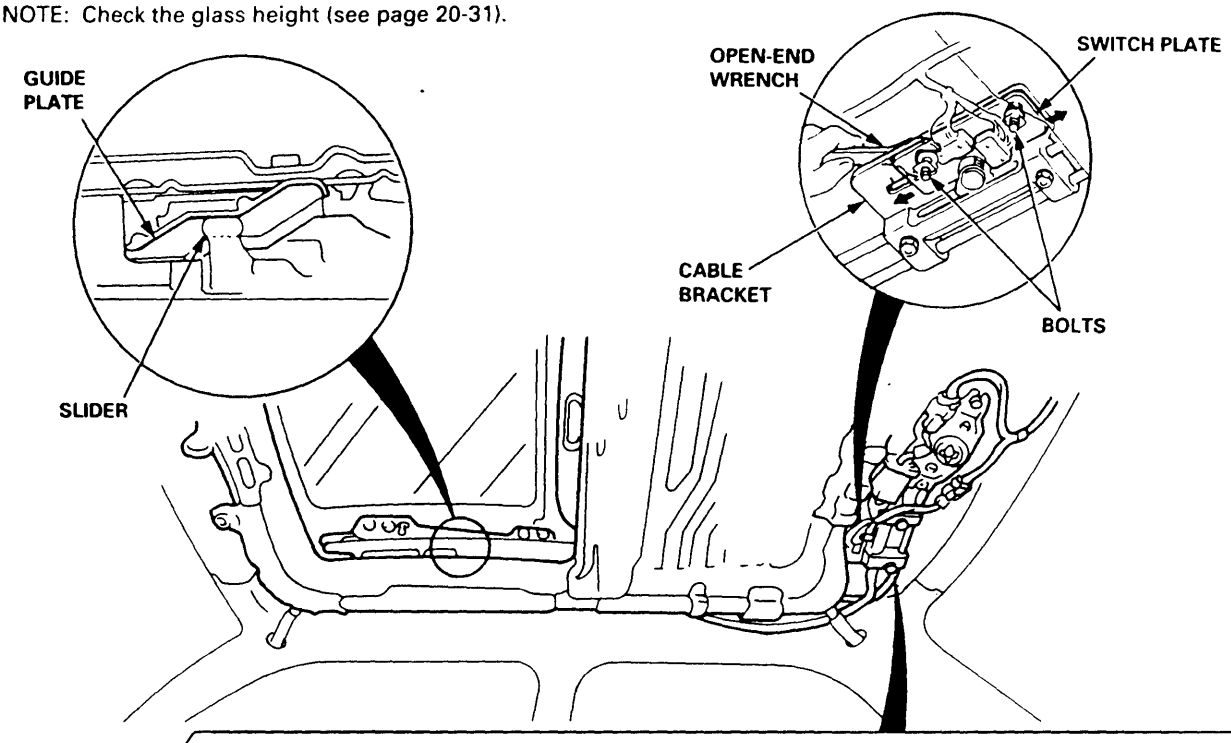
   - Install the frame seal securely.
   - Before installing the motor, make sure both sliders are parallel.
   - Before installing the motor, install the frame and glass, then check the opening drag (see page 20-37).

Switch Plate Adjustment (Fully Closed Position)

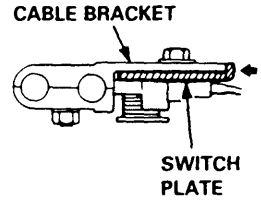
1. Remove the headliner (see page 20-41).
2. Using the moonroof wrench, close the glass fully.

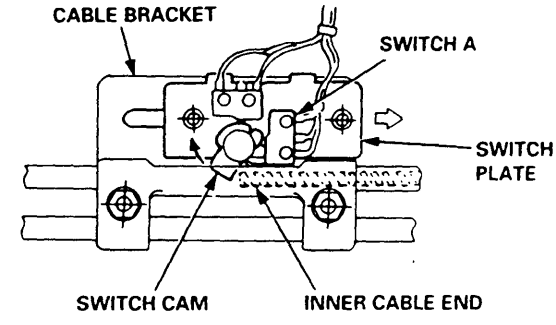
   NOTE: Check the glass fit to the roof panel.
3. Using an open-end wrench, loosen the switch plate mounting bolts.
4. Adjust position of the switch plate (switch cam) as shown.
5. Check the operation of the glass (from tilt-up position to fully closed position, from the fully open position to the fully closed position) by operating the moonroof switch.

   NOTE: Check the glass height (see page 20-31).



Check the switch plate contacts the cable bracket.





While moving the switch plate little by little, secure the switch plate at the position where the switch cam contacts the switch A (a faint click is heard).

6. Close the glass fully, and check for water leaks.

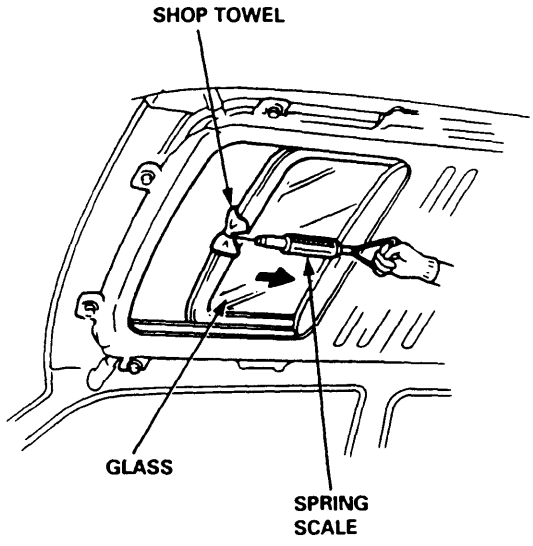
   NOTE: Do not use high-pressure water.

Opening Drag Check (Motor Removed)

Before installing the motor, measure the effort required to open the glass using a spring scale as shown.

CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

If load is over 40 N (4 kgf, 9 lbf), check the side clearance and glass height (see page 20-31).

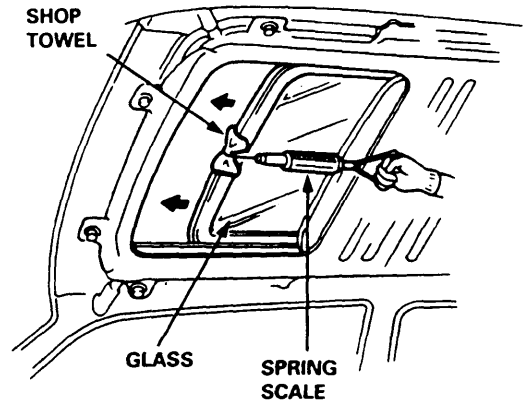


Closing Force Check (Motor Installed)

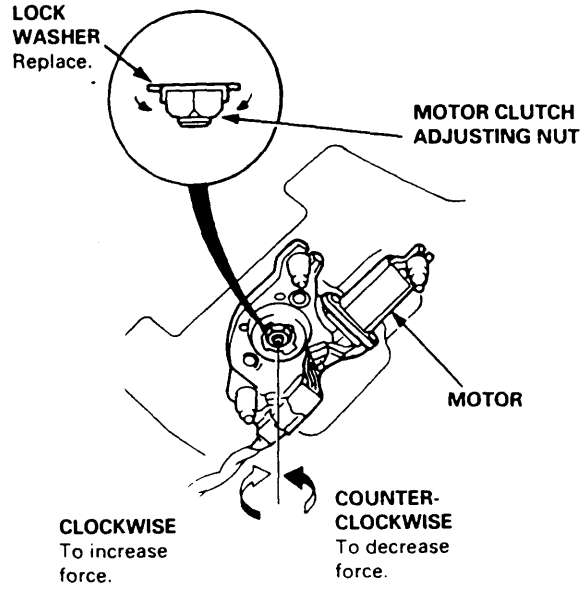
1. After installing all removed parts, have a helper hold the switch to close the glass while you measure the force required to stop it. Attach a spring scale as shown. Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

   CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

   Closing Force: 200 – 290 N
   (20 – 30 kgf, 44 – 66 lbf)



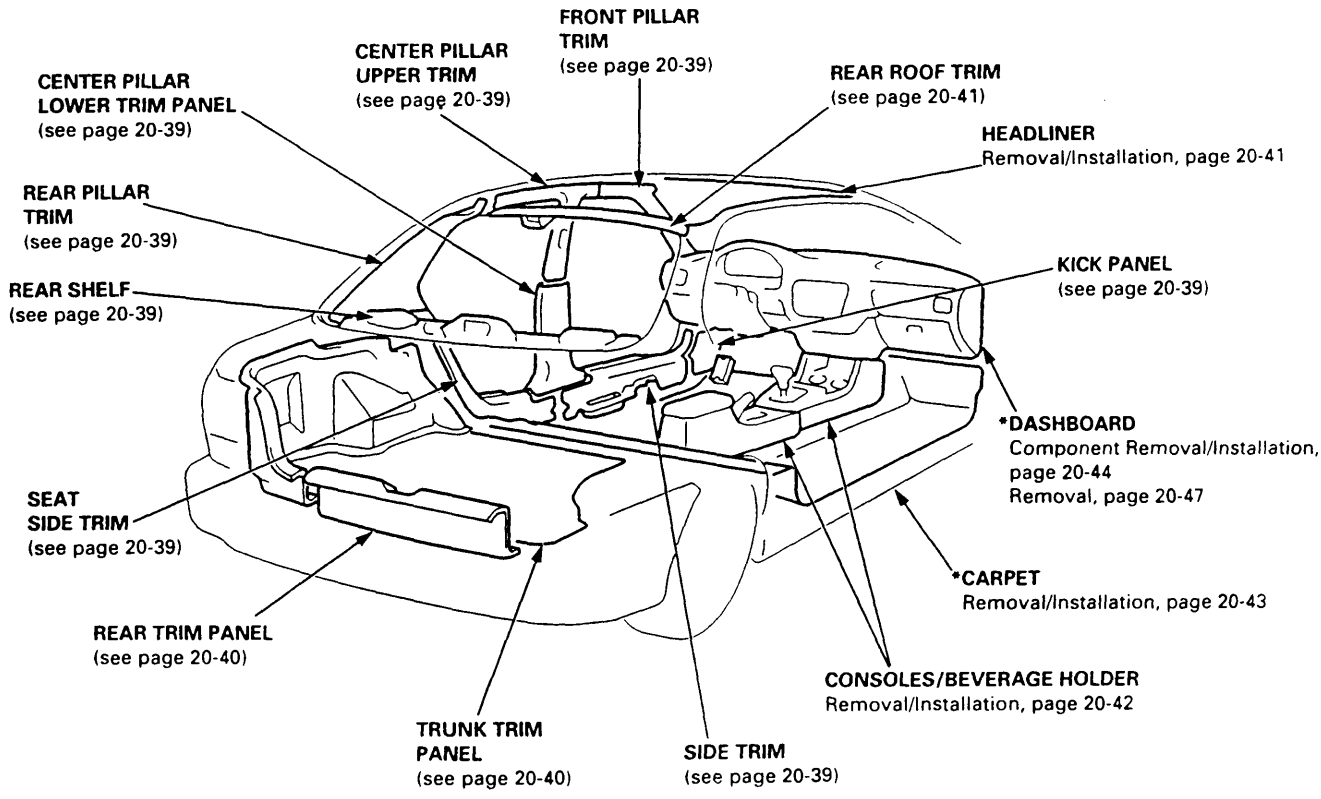
2. If the force in not within specification, install a new lock washer, adjust the tension by turning the motor clutch adjusting nut, and bend the lock washer against the motor clutch adjusting nut.



Interior

Component Location Index

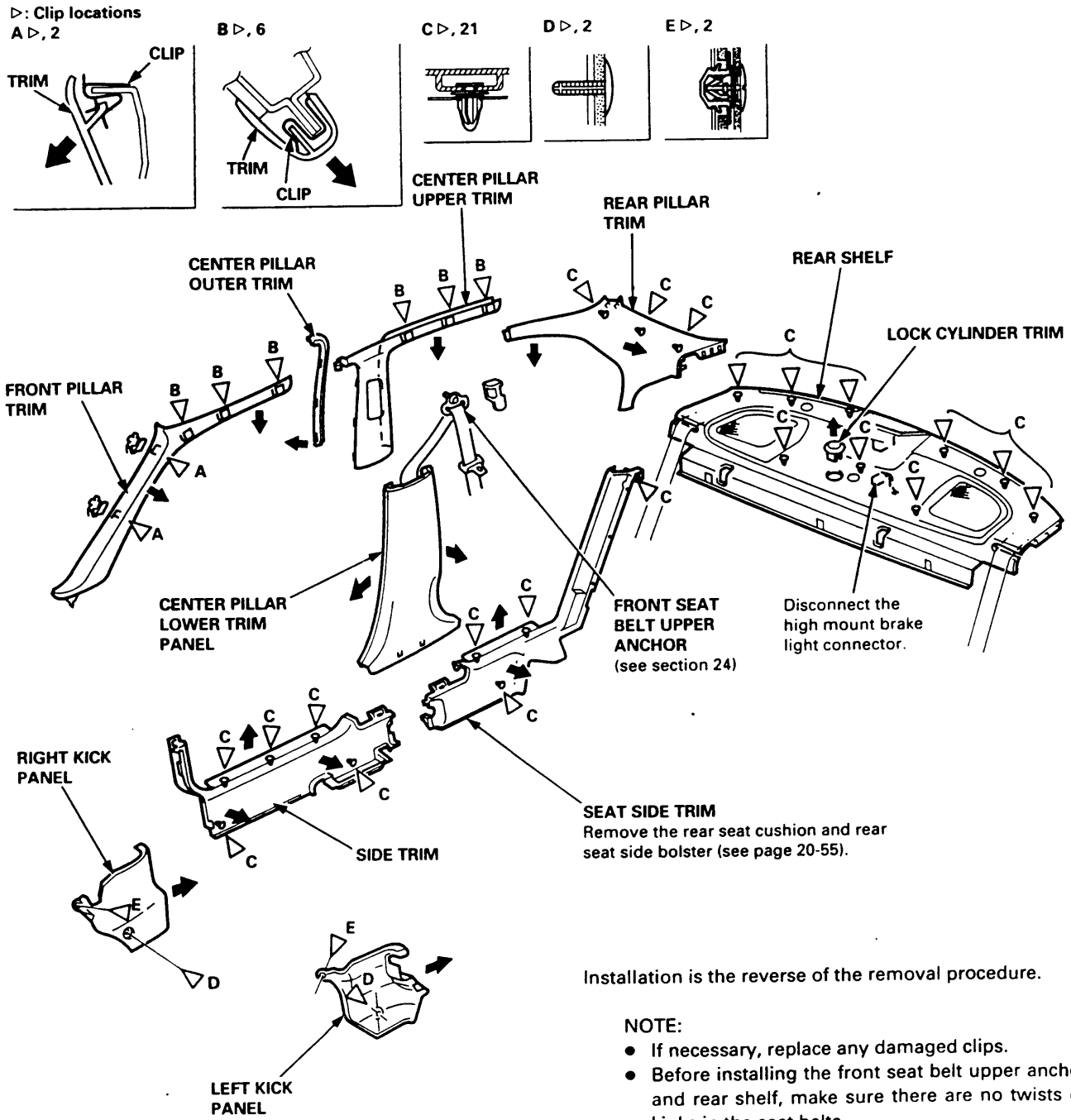
SRS components are located in the parts areas marked with an asterisk (*). Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.



Interior Trim Removal/Installation

CAUTION:
- **Wear gloves to remove and install the trim and panels.**
- **When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.**

NOTE: Take care not to bend or scratch the trim and panels.



Installation is the reverse of the removal procedure.

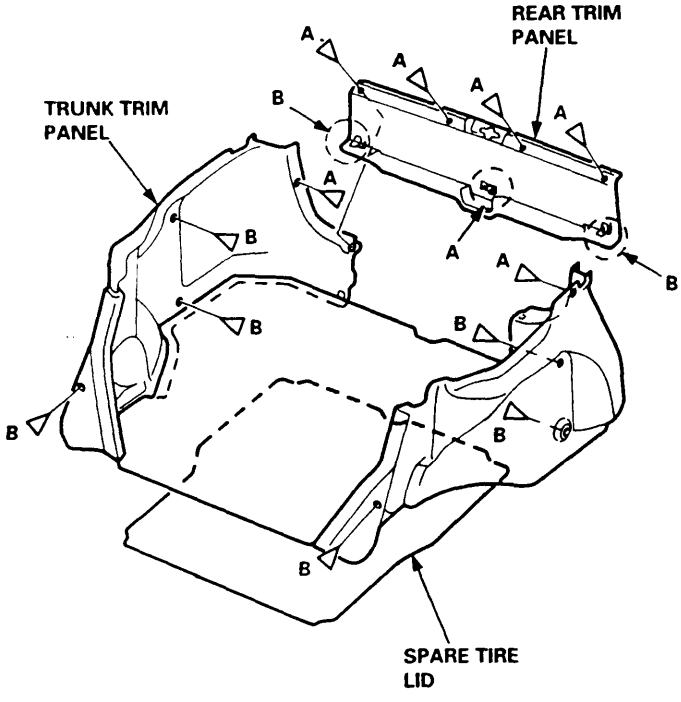
NOTE:
- If necessary, replace any damaged clips.
- Before installing the front seat belt upper anchor and rear shelf, make sure there are no twists or kinks in the seat belts.

(cont'd)

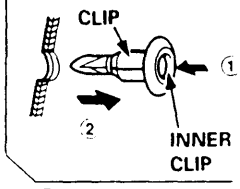
Trunk Trim Removal/Installation

CAUTION:
- **Wear gloves to remove and install the trim and panels.**
- **When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.**

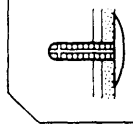
NOTE:
- Take care not to bend or scratch the trim and panels.
- When removing the trunk side trim or trunk trim panel, fold the seat-back forward.



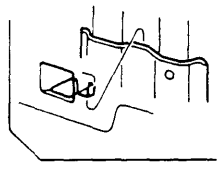
▷: **Clip locations**
A ▷, 6
NOTE: Do not push the inner clip in too far.



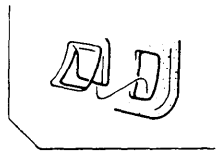
B ▷, 6



◌ :**Hook locations**
A ◌, 1



B ◌, 2



Installation is the reverse of the removal procedure.

NOTE:
- If necessary, replace any damaged clips.
- To install the A clips, pull the inner clip up, install the clip, then push the inner clip until it's flush.

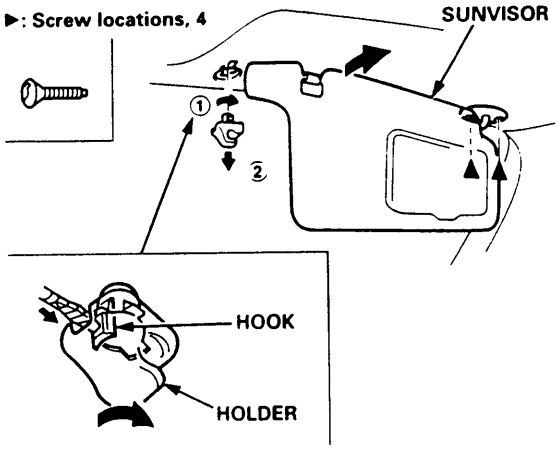
Headliner Removal/Installation

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

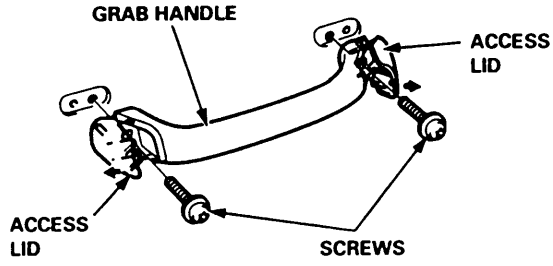
NOTE:
- Take care not to bend and scratch the headliner.
- Be careful not to damage the dashboard and other interior trim.

1. Remove:
   - Front pillar trim (both sides, see page 20-39)
   - Center pillar lower trim panel (both sides, see page 20-39)
   - Upper anchor bolt from the front seat belt (both sides, see section 24)
   - Center pillar outer trim and center pillar upper trim (both sides, see page 20-39)
   - Ceiling light (see section 23)
   - Rearview mirror (see page 20-19)

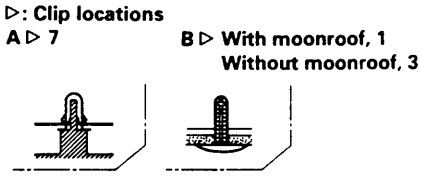
2. Remove the sunvisor and holder from each side.

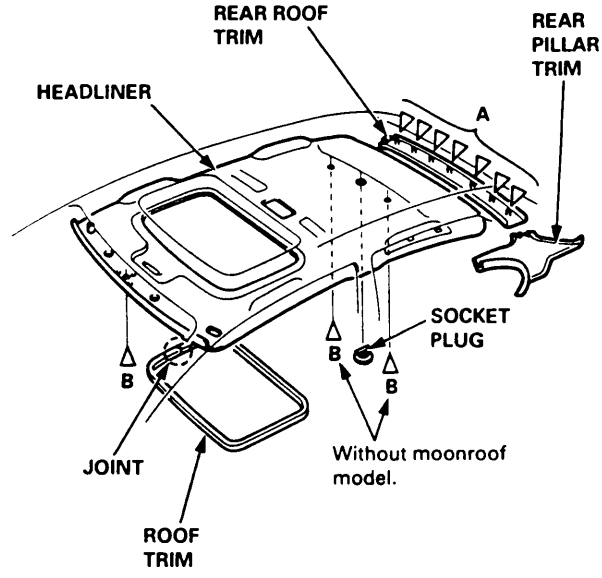


3. Remove the grab handles and coat hanger.



4. Remove the rear roof trim and clips, and remove the roof trim and socket plug (moonroof model).





5. Lower the rear pillar trim on both sides.

6. Lower the headliner.

7. Carefully remove the headliner through the passenger's door opening.

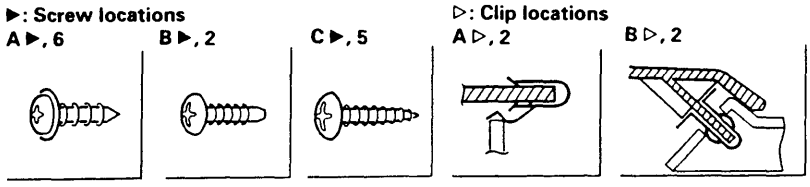
8. Installation is the reverse of the removal procedure.

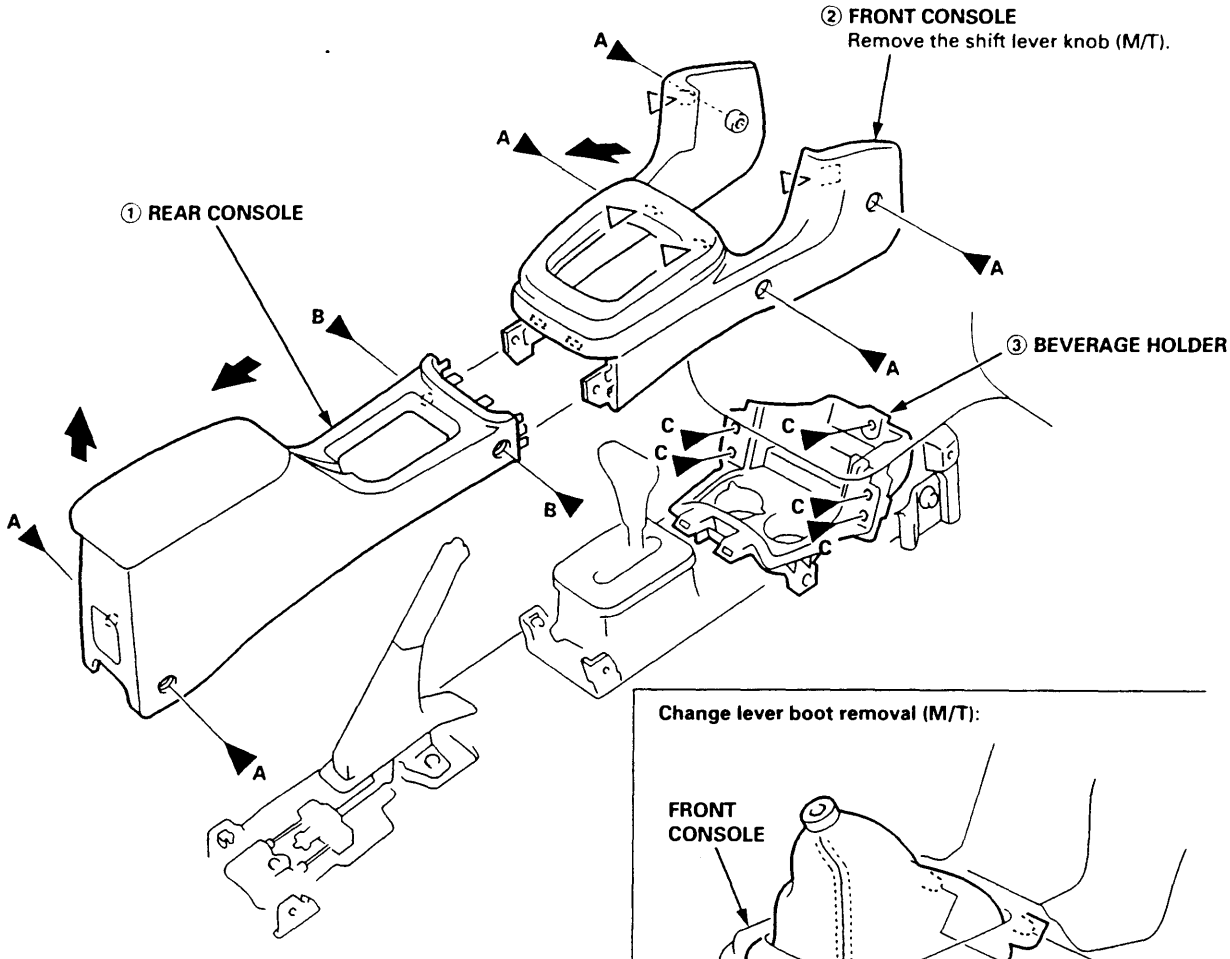
   NOTE:
   - When inserting the headliner through the opening, be careful not to fold or bend it. Also, be careful not to scratch the body.
   - Check that both sides of the headliner are securely attached to the trim.
   - When installing the roof trim, install the joint toward the right side (with moonroof model).

Consoles and Beverage Holder Removal/Installation

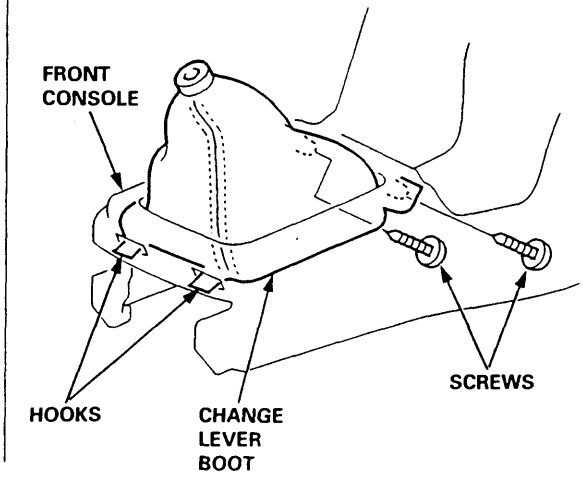
NOTE: Take care not to scratch the front and rear consoles, front seat and related parts.

Disassemble in numbered sequence.





Change lever boot removal (M/T):



Installation is the reverse of the removal procedure.

NOTE:
- If necessary, replace any damaged clips.
- Make sure the wire harnesses are not pinched.

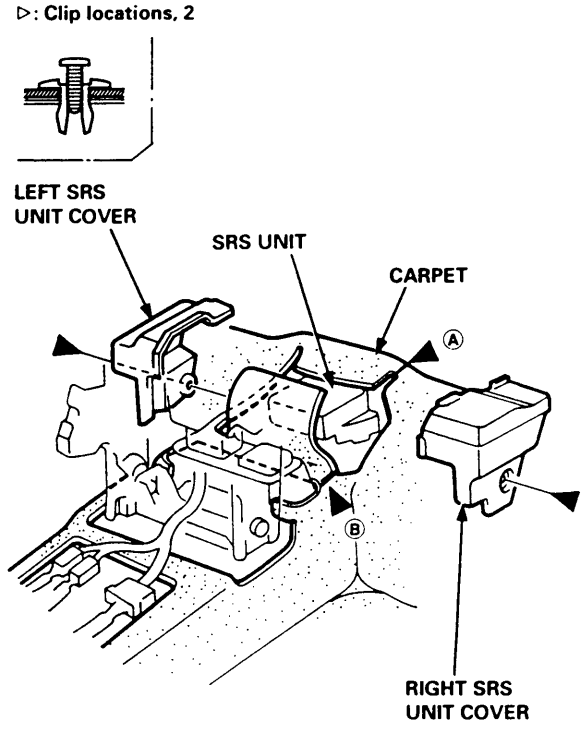
Carpet Removal/Installation

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

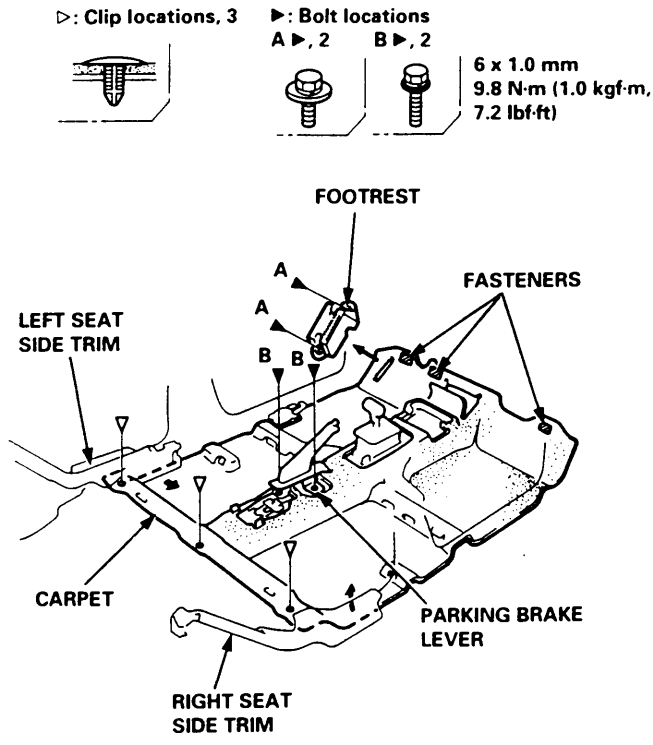
1. Remove:
   - Front seat (see page 20-51)
   - Rear seat cushion (see page 20-55)
   - Kick panel (see page 20-39)
   - Center pillar lower trim panel (see page 20-39)
   - Side trim (see page 20-39)
   - Front and rear consoles
   - Beverage holder

2. Remove the SRS unit covers.

3. Cut areas Ⓐ and Ⓑ in the carpet, then pull it back as shown.



4. Remove the footrest and parking brake lever mounting bolts, and detach the clips, then remove the carpet.



5. Installation is the reverse of the removal procedure.

   NOTE:
   - Take care not to damage, wrinkle or twist the carpet.
   - Make sure the wire harnesses are routed correctly.
   - If necessary, replace any damaged clips.
   - Slip the carpet under the seat side trim on each side properly.
   - Reattach the cut areas Ⓐ and Ⓑ in the carpet with wire ties.

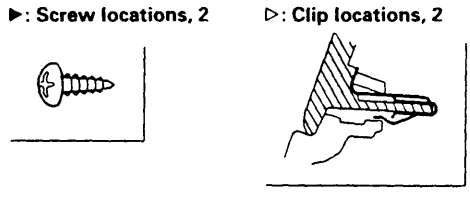
Dashboard Component Removal/Installation

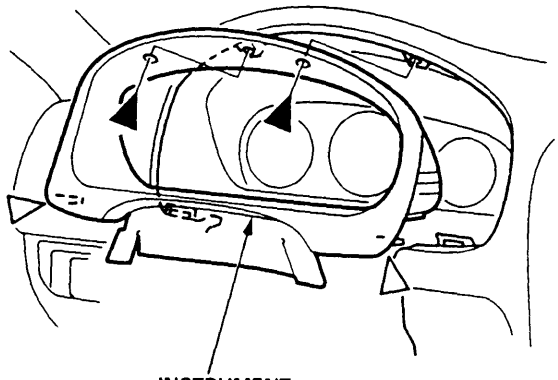
CAUTION:
- **When prying with a flat tip screwdriver, wrap it with protective tape, and apply protective tape around the related parts, to prevent damage.**
- **Were gloves to remove and install the dashboard component parts.**

NOTE: Take care not to scratch the dashboard and related parts.

Instrument panel removal:

1. Tilt the steering column down.
2. Remove the screws, and detach the clips, then carefully remove the instrument panel.



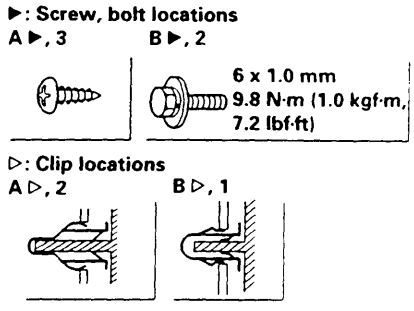


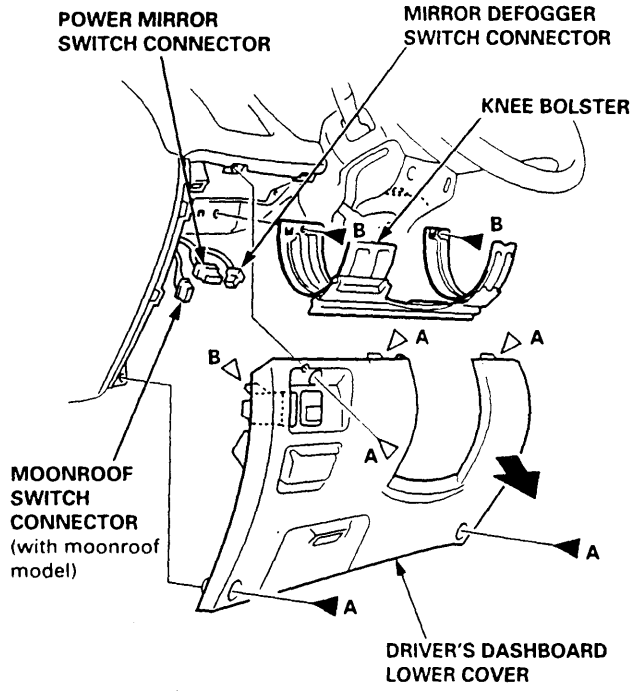
3. Installation is the reverse of the removal procedure.

Driver's dashboard lower cover and knee bolster removal:

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Remove the screws, and detach the clips, then remove the driver's dashboard lower cover. Disconect the power mirror switch and mirror defogger switch connector. If equipped with and moonroof, disconnect the connector.

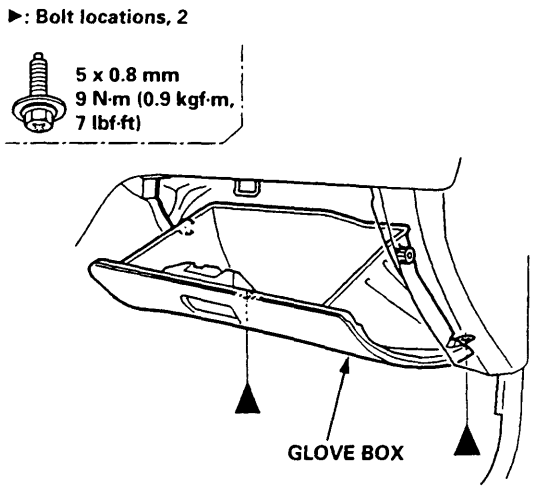




2. Remove the bolts, then remove the knee bolster.
3. Installation is the reverse of the removal procedure.

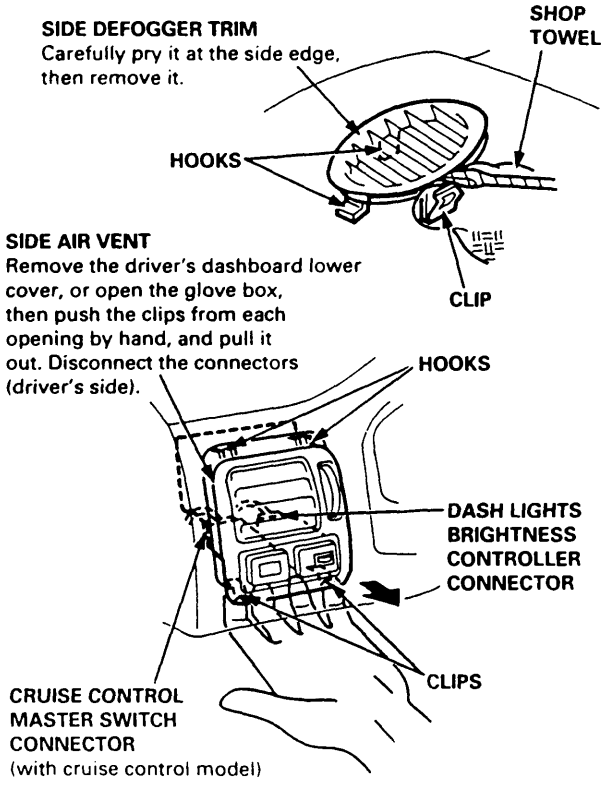
Glove box:

Lower the glove box, and remove the bolts, then remove the glove box.



Installation is the reverse of the removal procedure.

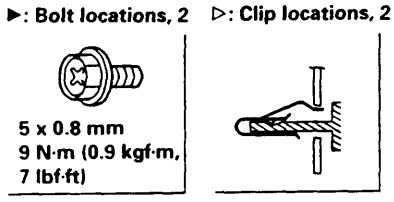
Side air vent/Side defogger trim:

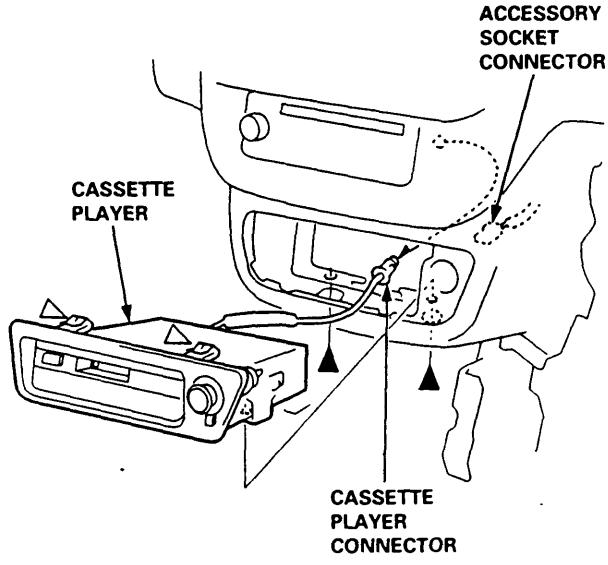


Center dashboard lower:

1. Remove:
   - Driver's dashboard lower cover
   - Glove box
   - Beverage holder

2. Remove the screws. Disconnect the cassette player connector from glove box opening, then remove the cassette player. Disconnect the accessory socket connector.

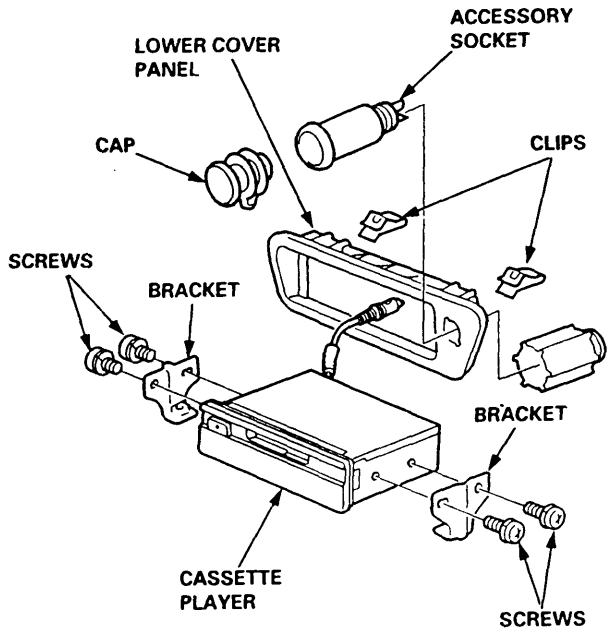




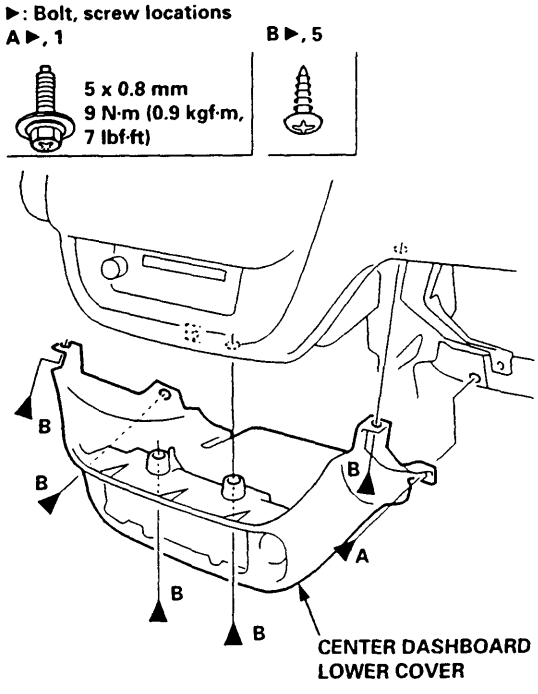
(cont'd)

Dashboard Component Removal/Installation (cont'd)

3. If necessary, remove the brackets from the cassette player nuit.



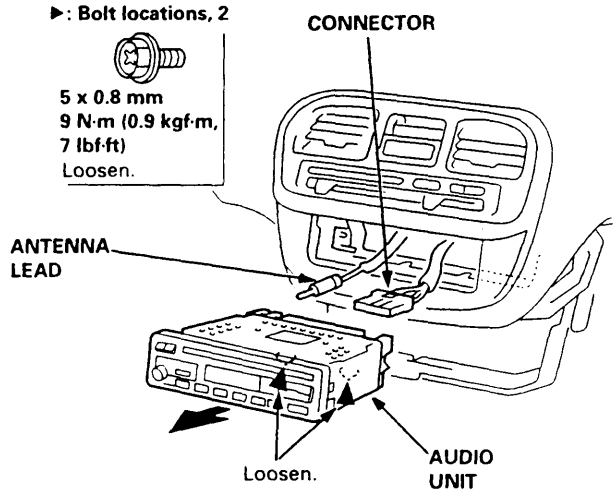
4. Remove the screws and bolt, then remove the center dashboard lower cover.



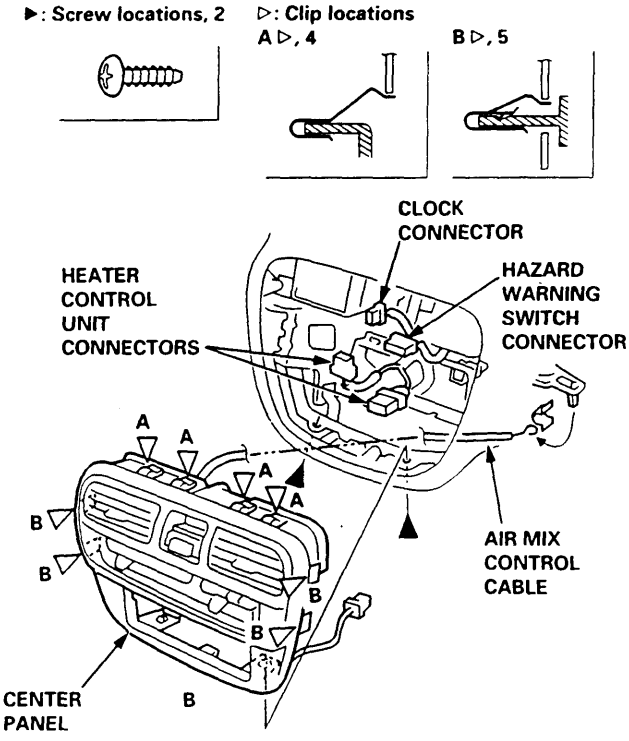
5. Installation is the reverse of the removal procedure.

Center panel removal:

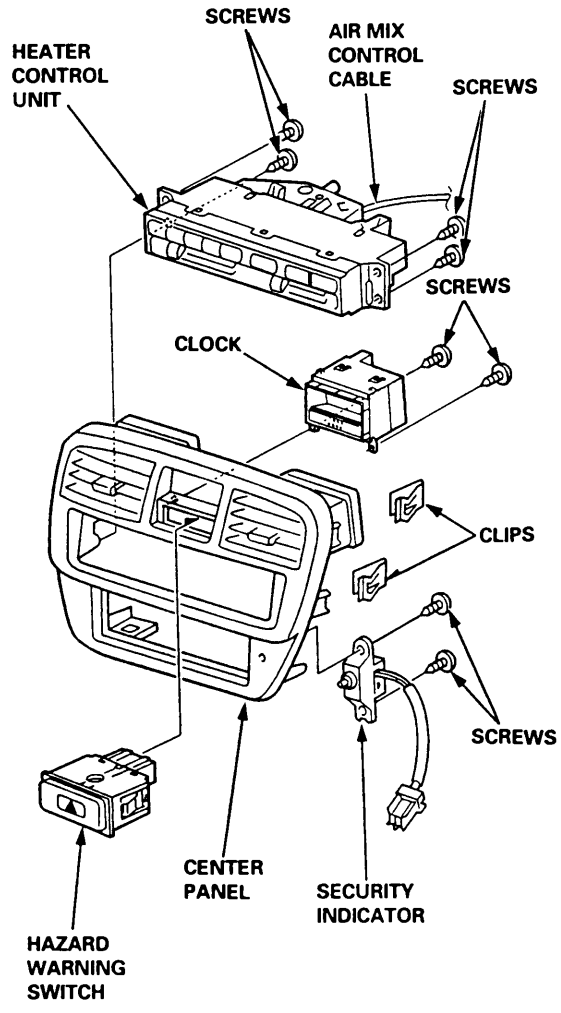
1. Remove the center dashboard lower cover.
2. Loosen the screws, then remove the audio unit. Disconnect the antenna lead and connector.
   NOTE: Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.



3. Disconnect the air mix control cable, and remove the screws, then pull out the center panel.
4. Disconnect the connectors.



5. If necessary, disassemble the center panel.



6. Installation is the reverse of the removal procedure.

NOTE:
- Make sure the connectors are connected properly.
- Adjust the air mix control cable (see section 21).
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

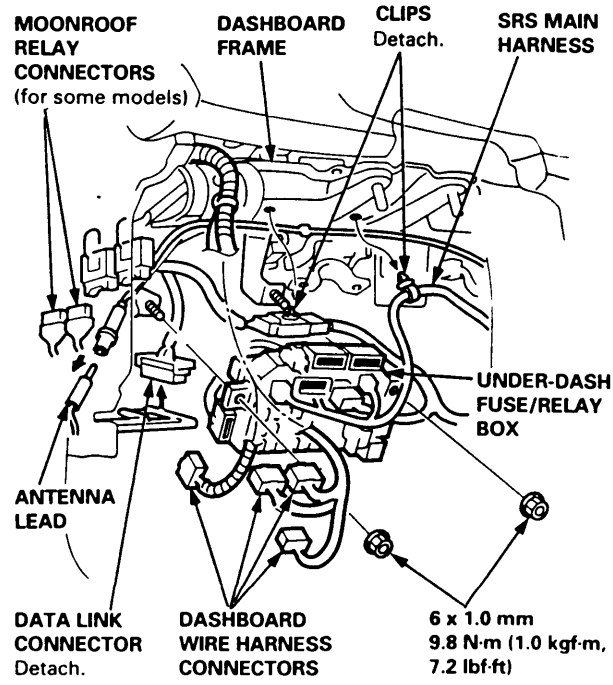
Dashboard Removal/Installation

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before preforming repairs or service.

CAUTION: Wear gloves to remove and install the dashboard.

NOTE:
- An assistant is helpful when removing and installing the dashboard.
- Take care not to scratch the dashboard, body and other related parts.
- Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.

1. Remove:
   - Front and rear consoles (see page 20-42)
   - Beverage holder (see page 20-42)
   - Driver's dashboard lower cover and knee bolster (see page 20-44)
   - Glove box (see page 20-45)
   - Center dashboard lower cover (see page 20-46)
2. Lower the steering column (see section 17).
   ⚠ WARNING To avoid accidental deployment and possible injury, always disconnect the driver's airbag connector before lowering the steering column (see section 24).
   NOTE: To prevent damage to the steering column, wrap it with a shop towel.
3. Disconnect the dashboard wire harness connectors, remove the nuts, then move the under-dash fuse/relay box. Disconnect the antenna lead and moonroof relay connectors.



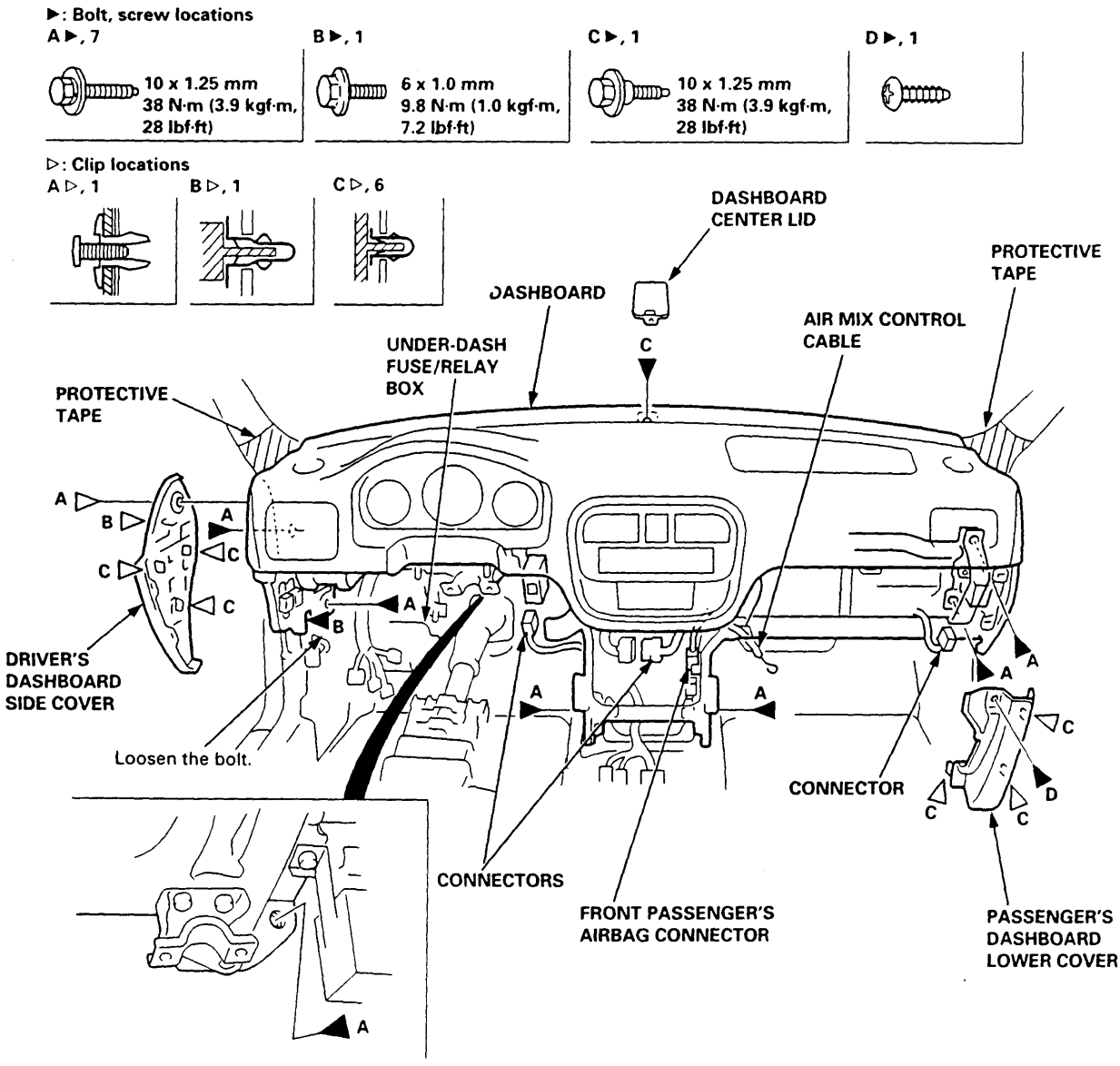
(cont'd)

Dashboard Removal/Installation (cont'd)

4. Remove:
   - Driver's dashboard side cover
   - Passenger's dashboard lower cover
   - Dashboard center lid

5. Disconnect the connectors and air mix control cable.

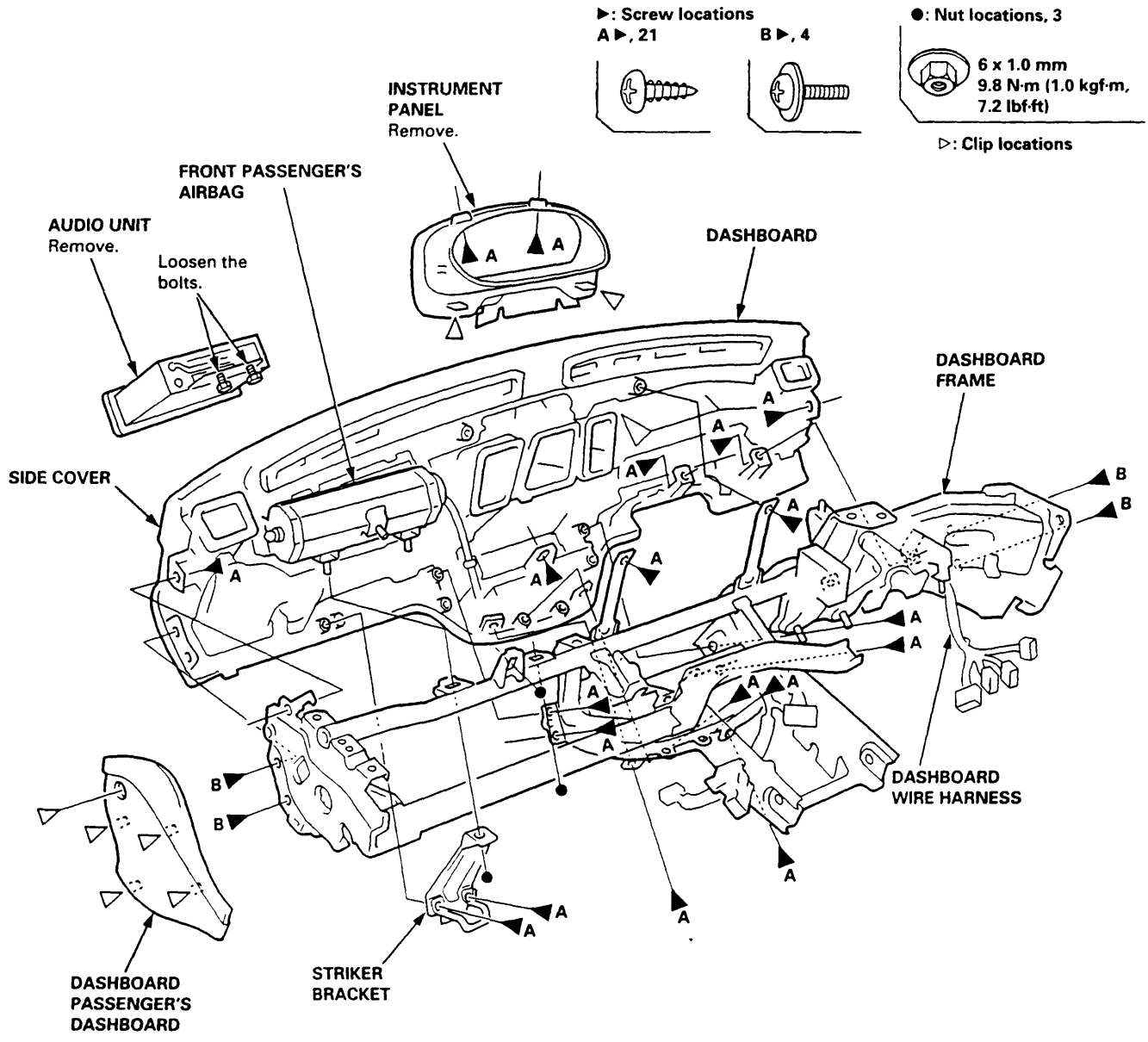
⚠ WARNING To avoid accidental deployment and possible injury, always disconnect the front passenger's airbag connector when the SRS main harness is disconnected (see section 24).



6. Remove the bolts, then lift and remove the dashboard.

CAUTION: Use protective tape on the bottom of the front pillar trim.

7. If necessary, remove the dashboard frame from the dashboard.



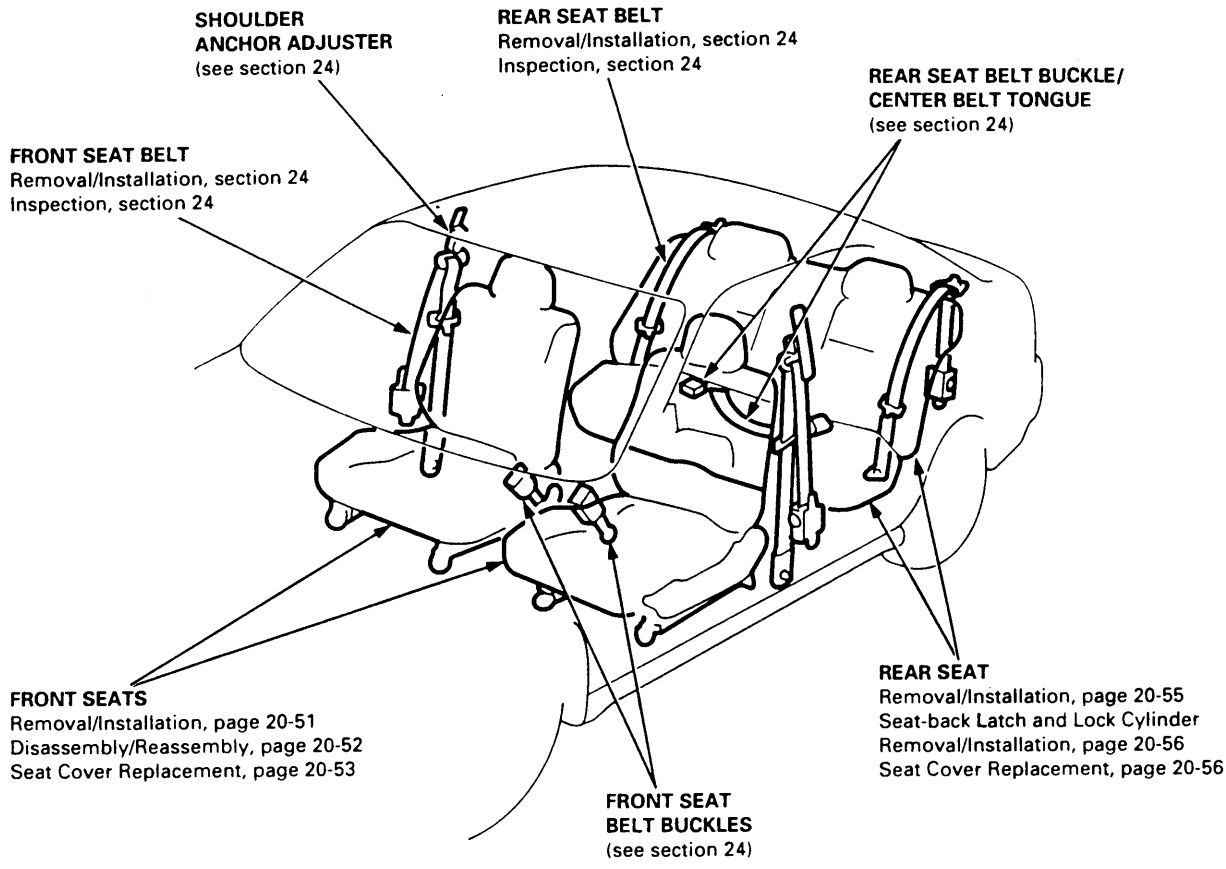
8. Installation is the reverse of the removal procedure.

NOTE:

- Before tightening the bolts, make sure the dashboard wire harnesses are not pinched.
- Make sure the connectors, antenna lead and air mix control cable are connected properly.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Seats

Component Location Index

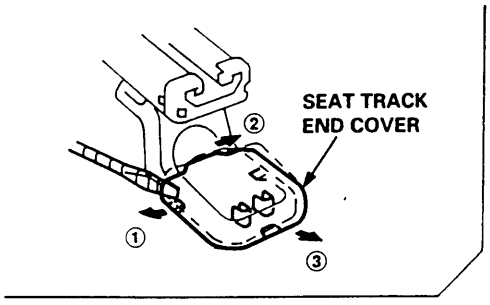


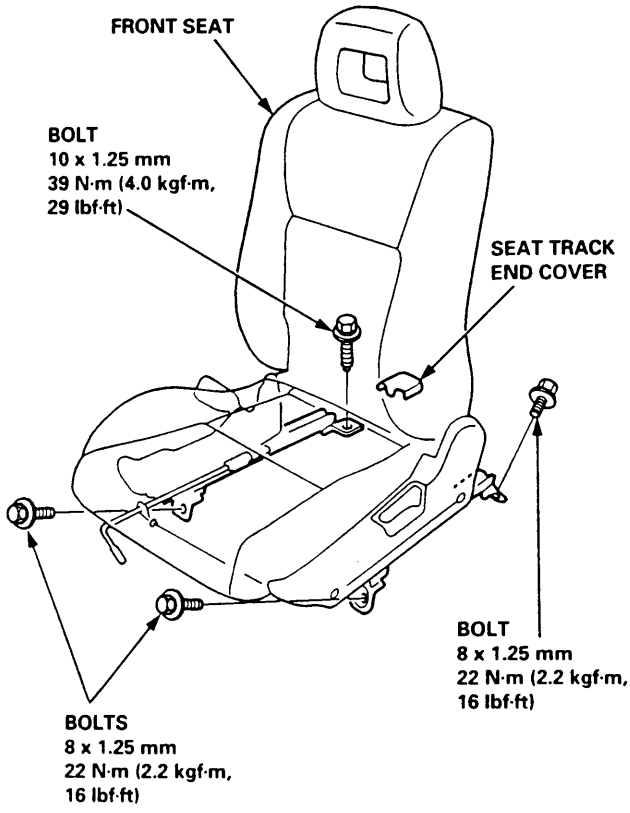
Front Seat Removal/Installation

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

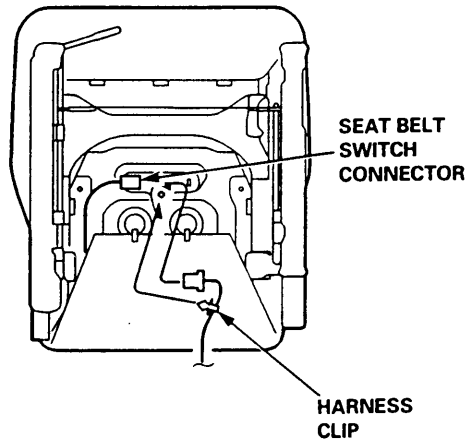
NOTE: Take care not to scratch the seat covers and body.

1. Remove the seat track end cover, then remove the bolts.





2. Lift the driver's front seat, and disconnect the seat belt switch connector, and detach the harness clip.



3. Remove the headrest.

4. Carefully remove the front seat through the front door opening.

5. Installation is the reverse of the removal procedure.

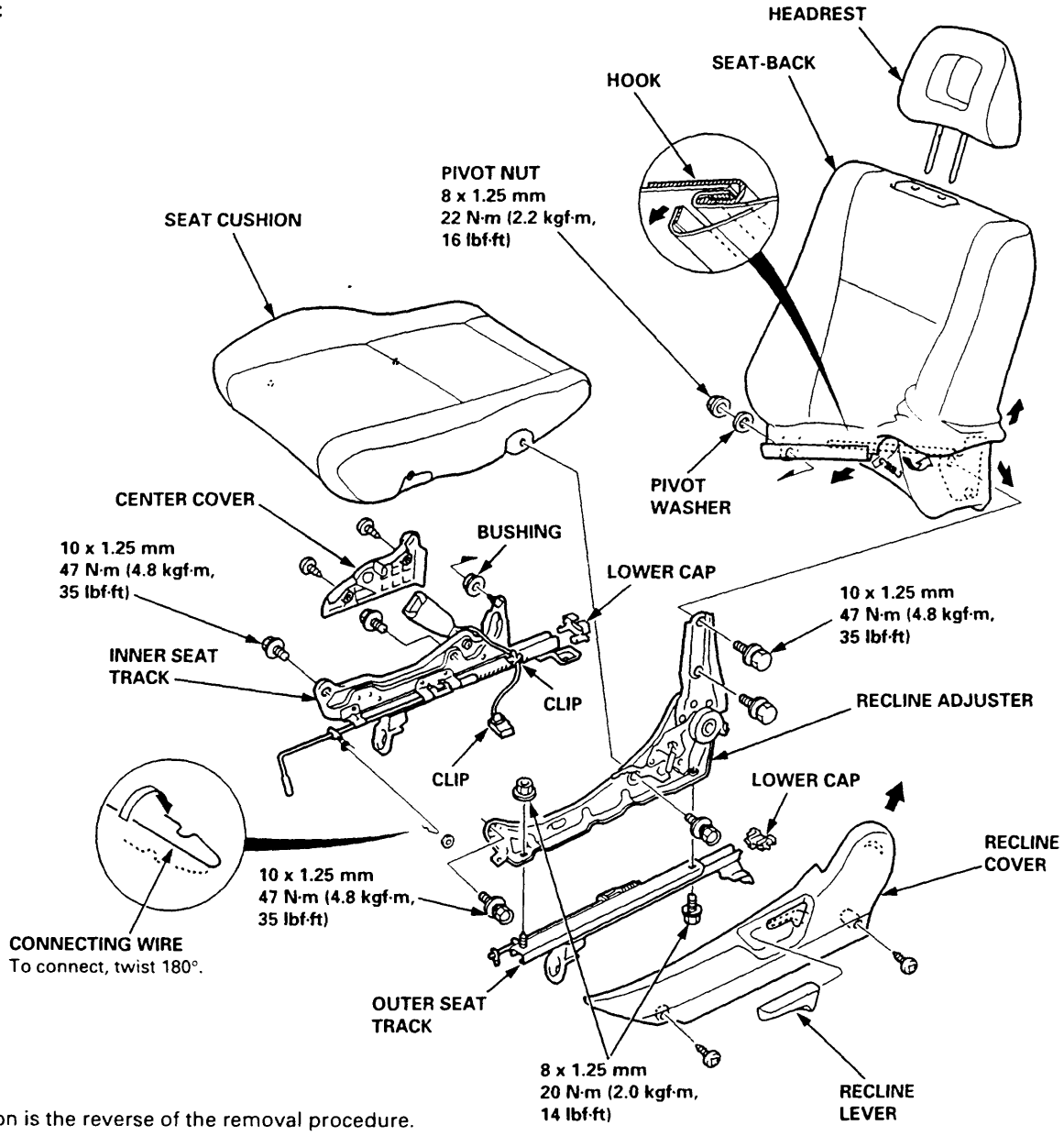
   NOTE: Make sure the connector is connected properly.

Front Seat Disassembly/Reassembly

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

NOTE:
- Take care not to scratch the seat covers and body.
- Remove the front seat through the front door opening.

Driver's:



Installation is the reverse of the removal procedure.

NOTE:
- Make sure the bushing and pivot washer are installed properly.
- To prevent wrinkles when installing the seat-back cover, make sure the material is stretched evenly over the pad.
- Grease the sliding portion of the seat track.

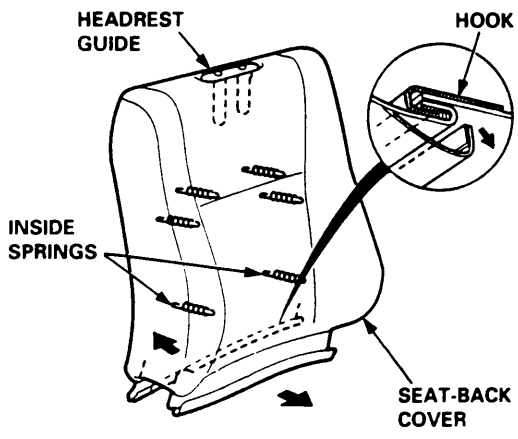
Front Seat Cover Replacement

CAUTION: Wear gloves to remove and install the seat covers.

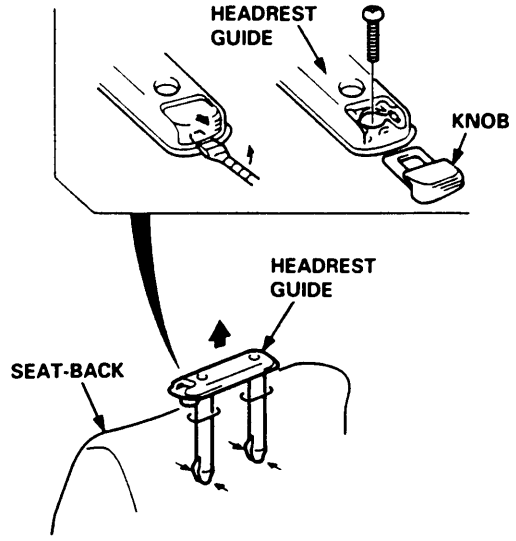
NOTE: Take care not to tear the seams or damage the seat covers.

Seat-back cover:

1. Release the hook, and fold back the seat-back cover.



2. Release all inside springs, then fold back the seat-back cover.
3. Remove the headrest.
4. Remove the headrest guide, then remove the seat-back cover.



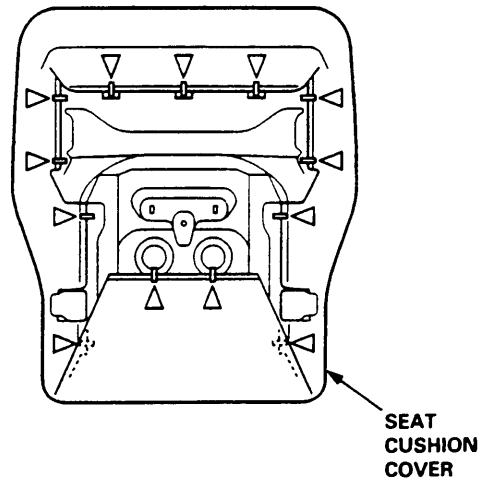
5. Installation is the reverse of the removal procedure.

   NOTE: To prevent wrinkles when installing a seat-back cover, make sure the material is stretched evenly over the pad before securing the inside springs and hook.

Seat cushion cover:

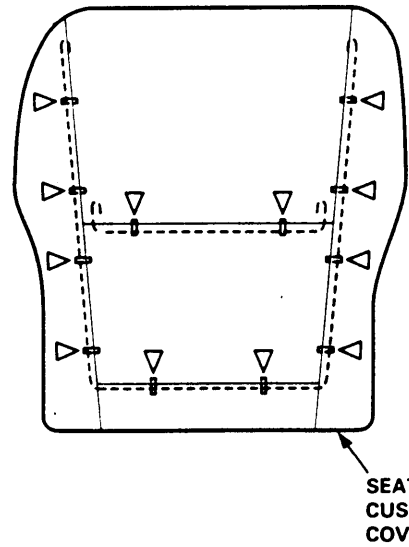
1. Remove the seat cushion (see page 20-52).
2. Remove the clips from under the seat cushion, then loosen the seat cushion cover.

▷: **Clip locations**



3. Pull back the edge of the seat cushion cover all the way around, then release the clips, and remove the seat cushion cover.

▷: **Clip locations**

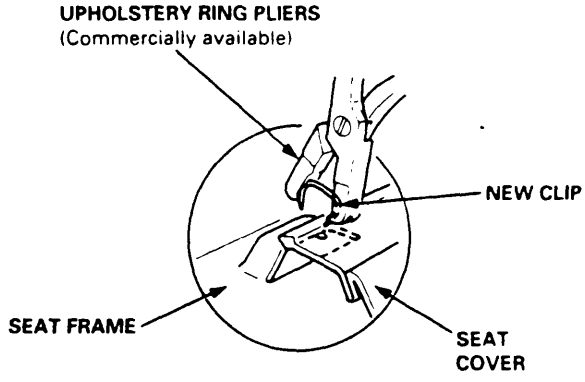


(cont'd)

Front Seat Cover Replacement (cont'd)

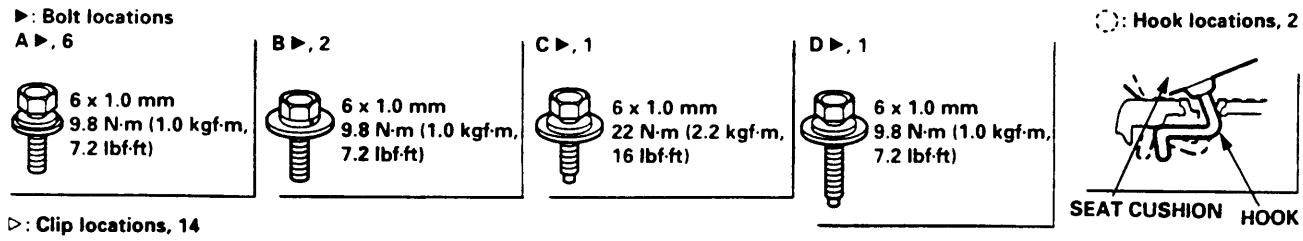
4. Installation is the reverse of the removal procedure.

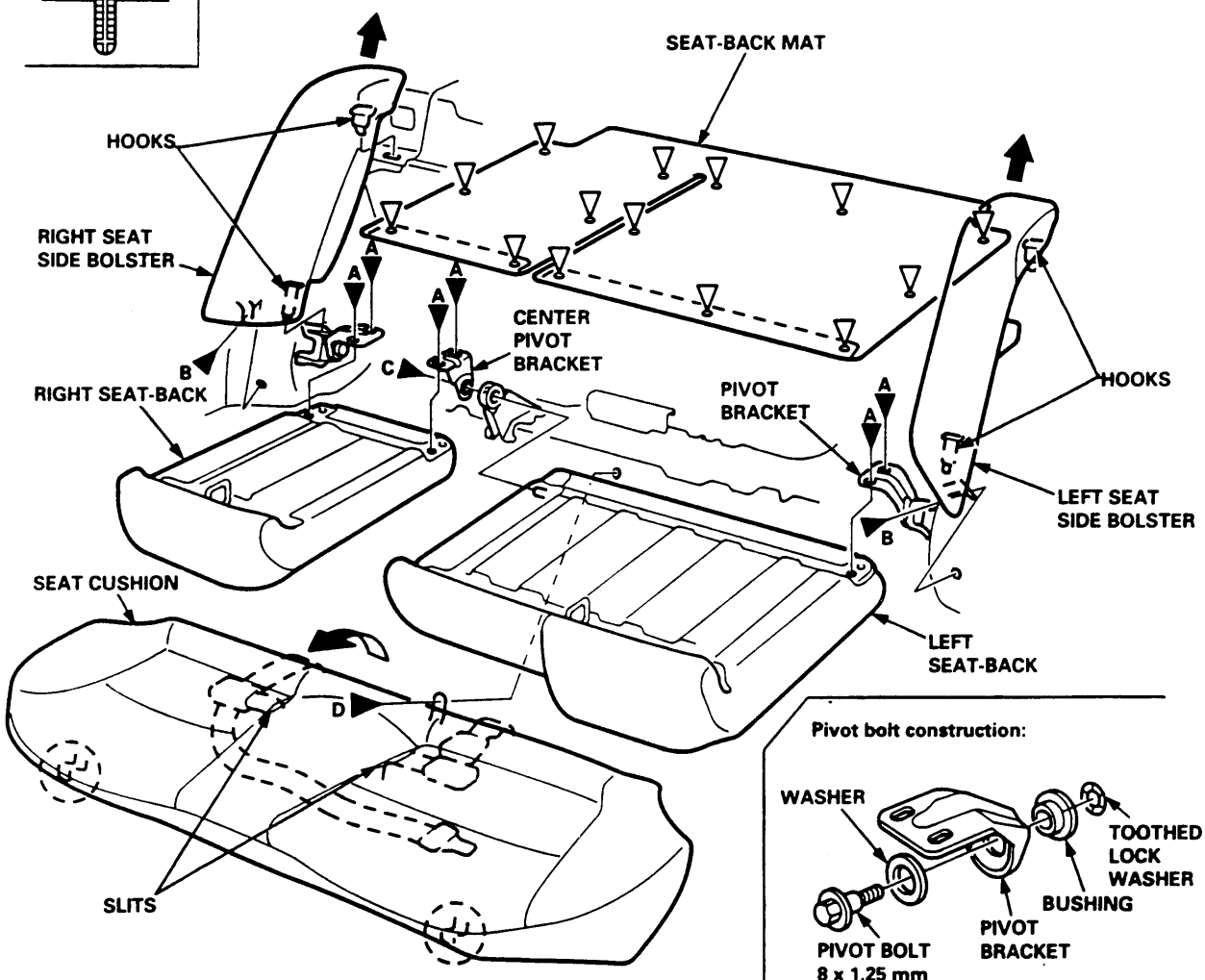
   NOTE:
   - To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips.
   - Replace the clips with new ones.



Rear Seat Removal/Installation

NOTE: Take care not to scratch the seat covers and body.





Installation is the reverse of the removal procedure.

NOTE:

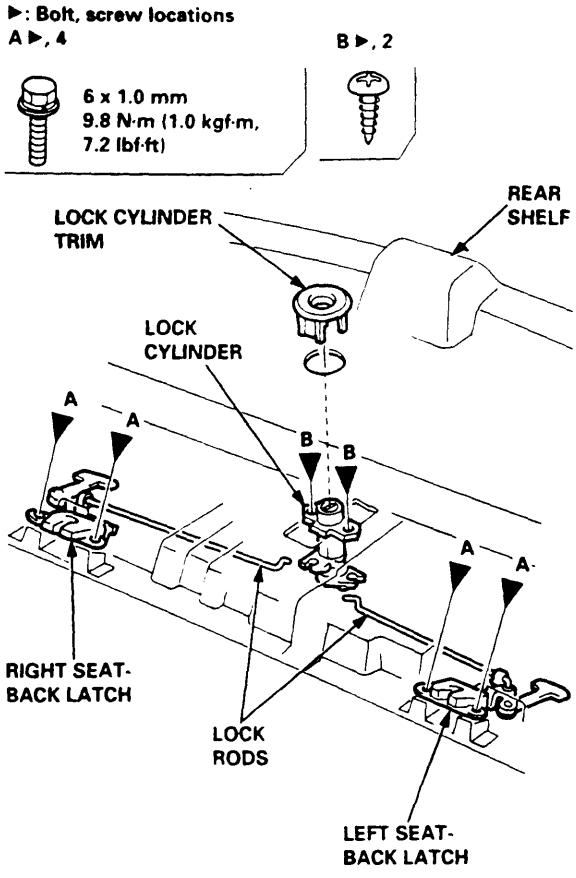
- Before attaching the rear seat-back and seat cushion, make sure there are no twists or kinks in the rear seat belts and center belt.
- When installing the seat cushion, slip the seat belt buckles through the slits in the seat cushion.
- Make sure the seat-back locks securely.
- If necessary, adjust the rear seat-back latch (see page 20-56) and rear seat-back.

(cont'd)

Rear Seat-back Latch and Lock Cylinder Removal/Installation

Remove the lock cylinder trim, then remove the rear shelf (see page 20-39).

NOTE: Take care not to bend each lock rod.



Installation is the reverse of the removal procedure.

NOTE:
- Make sure each lock rod is connected securely.
- Make sure each seat-back locks securely and opens properly.
- If necessary, adjust the seat-back latch.

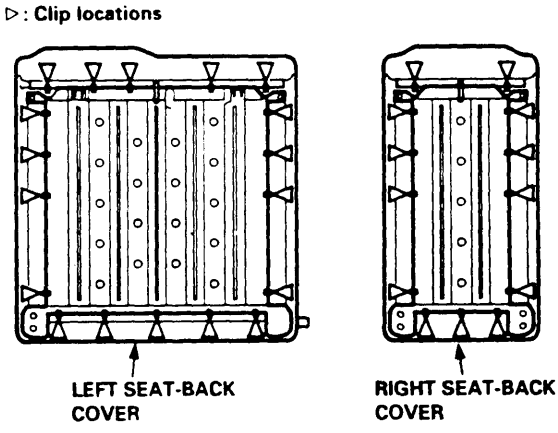
Rear Seat Cover Replacement

CAUTION: Wear gloves to remove and install the seat covers.

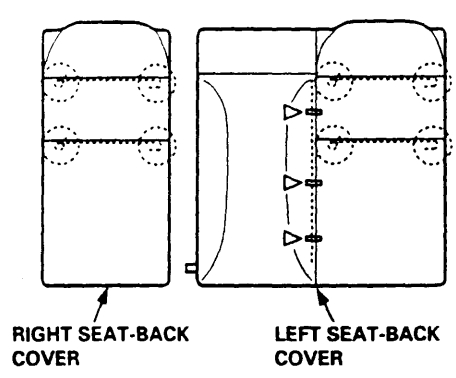
NOTE: Take care not to tear the seams or damage the seat covers.

Seat-back cover:

1. Remove the seat-back (see page 20-55).
2. Release the hooks and clips, and loosen the seat-back cover.



3. Pull back the edge of the seat-back cover all the way around, and release the hooks and clips. Remove the seat-back cover.



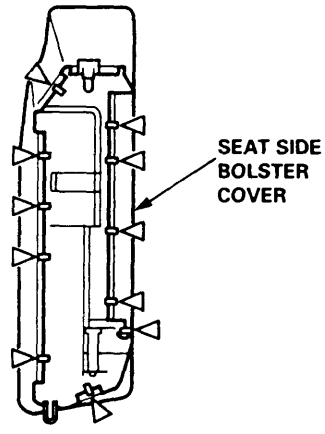
4. Installation is the reverse of the removal procedure.

NOTE:
- 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 the clips with new ones.

Seat side bolster cover:

1. Remove the seat side bolster (see page 20-55).
2. Loosen the seat side bolster cover by releasing all the clips, then remove it.

▷: **Clip locations**



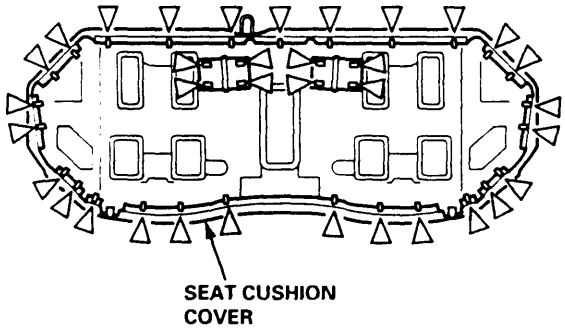
3. Installation is the reverse of the removal procedure.

NOTE:
- To prevent wrinkles when installing a seat side bolster cover, make sure the material is stretched evenly over the pad before securing the clips.
- Replace the released clips with new ones.

Seat cushion cover:

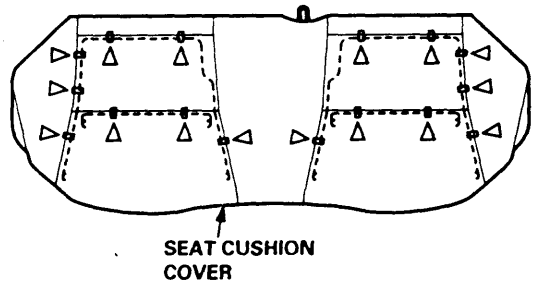
1. Remove the seat cushion (see page 20-55).
2. Loosen the seat cushion cover by releasing all the clips.

▷: **Clip locations**



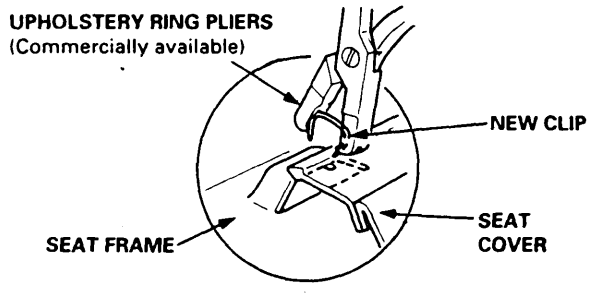
3. Pull back the edge of the seat cushion cover all the way around, and release the clips, then remove the seat cushion cover.

▷: **Clip locations**



4. Installation is the reverse of the removal procedure.

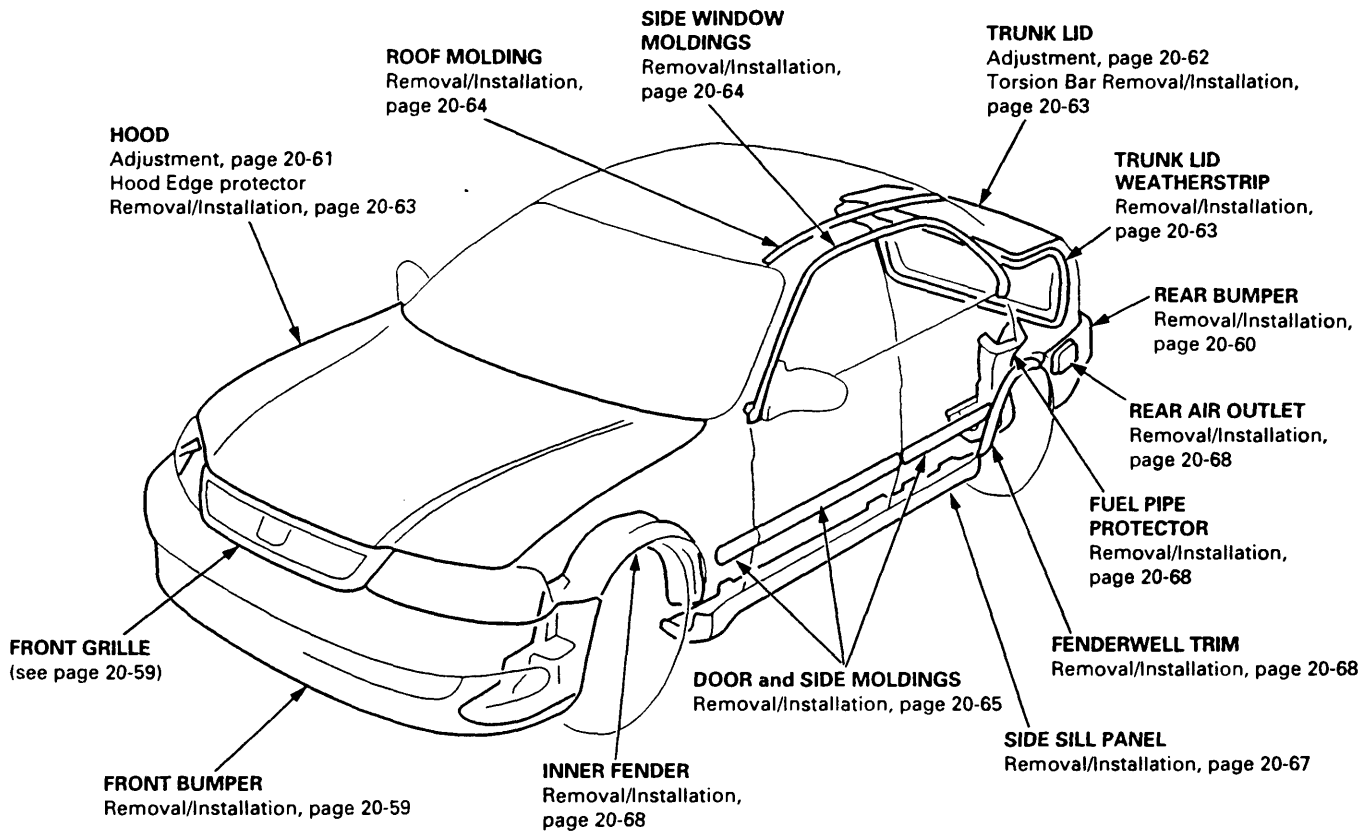
NOTE:
- To prevent wrinkles when installing a seat cushion cover, make sure the material is stretched evenly over the pad before securing the clips.
- Replace the clips with new ones.



Exterior

Component Location Index

NOTE: Refer to the Acura 1.6 EL Body Repair Manual, 1997 Model Series, P/N. 61S5230, for the hood and trunk lid removal.

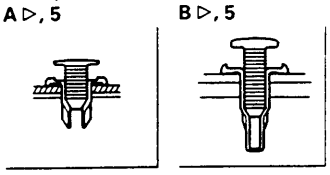


Front Bumper Removal/Installation

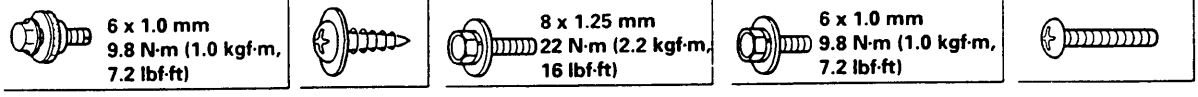
CAUTION: Wear gloves to remove and install the front bumper.

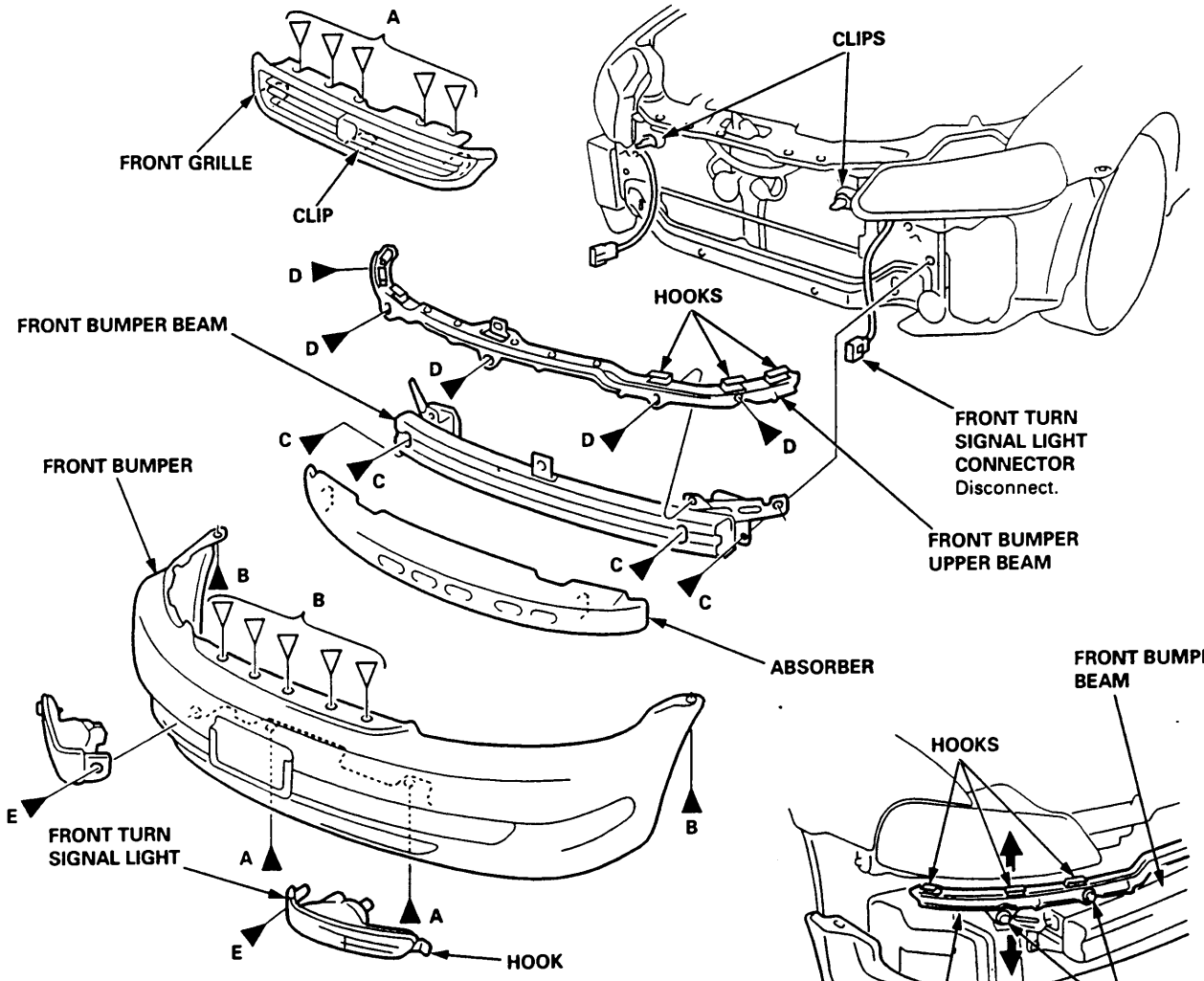
NOTE:
- An assistant is helpful when removing the front bumper.
- Take care not to scratch the front bumper and body.

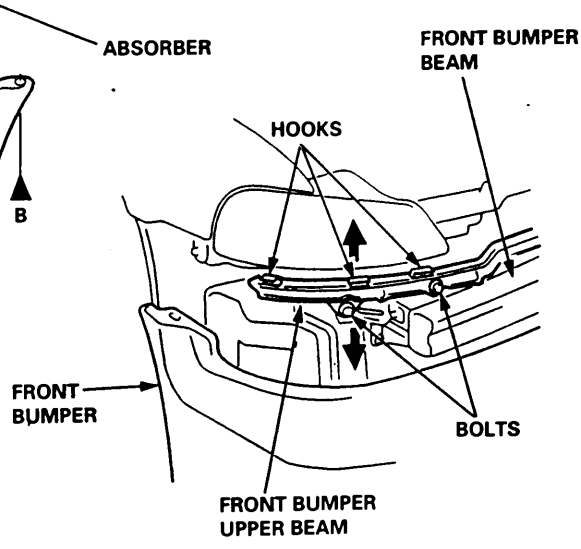
▷: Clip locations
A ▷, 5 **B ▷, 5**



►: Bolt, screw locations
A ►, 2 **B ►, 2** **C ►, 4** **D ►, 5** **E ►, 2**







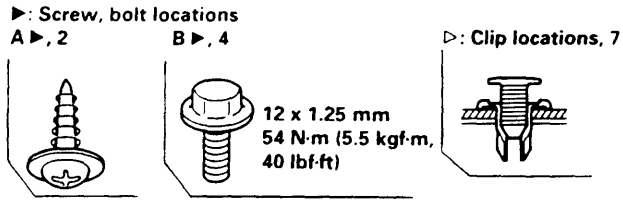
Installation is the reverse of the removal procedure.

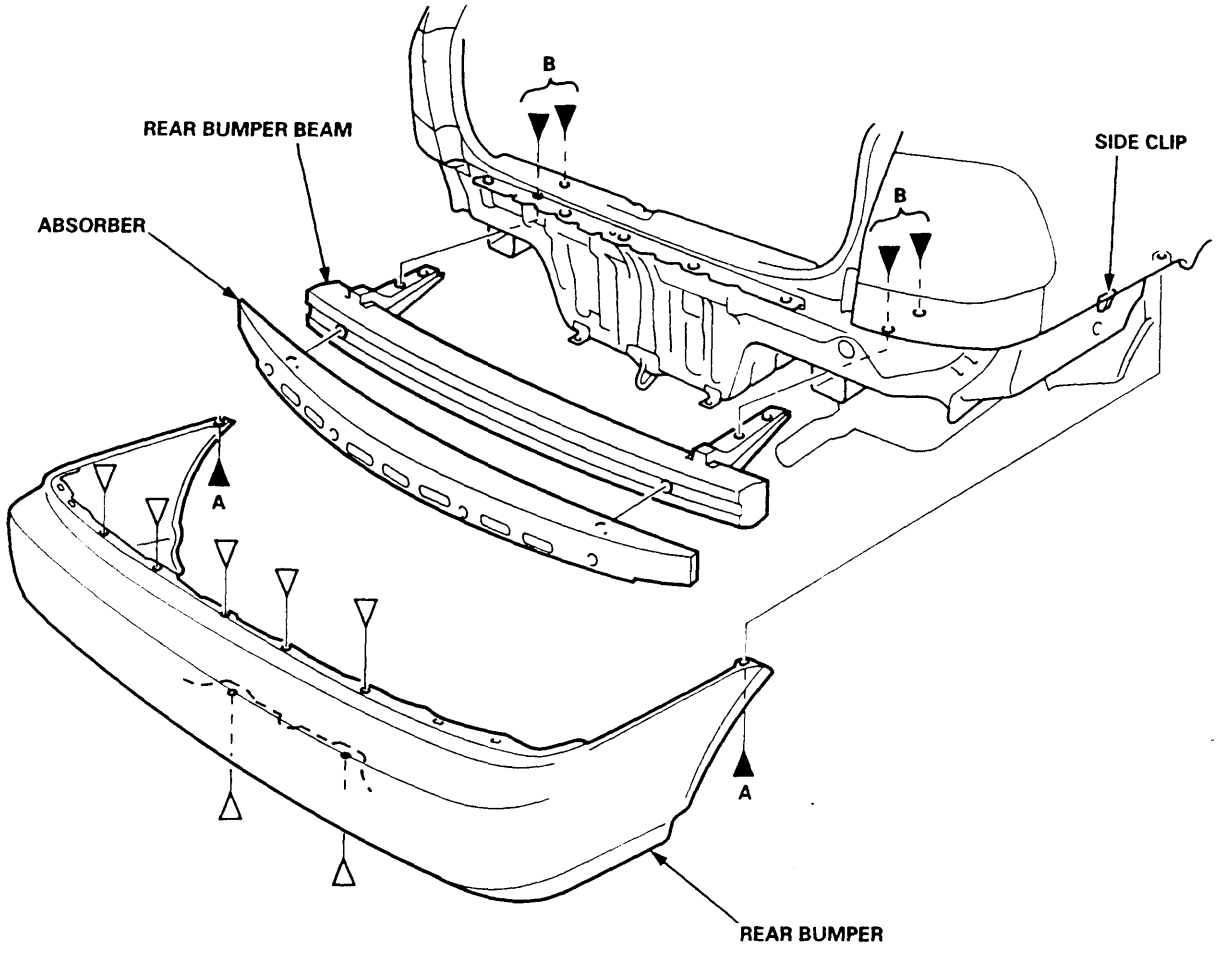
NOTE:
- Make sure the front bumper engages the front bumper upper beam on each side securely.
- If necessary, adjust the front bumper beam and upper beam to obtain the proper gap.

Rear Bumper Removal/Installation

CAUTION: Wear gloves to remove and install the rear bumper.

NOTE:
- An assistant is helpful when removing the rear bumper.
- Take care not to scratch the rear bumper and body.





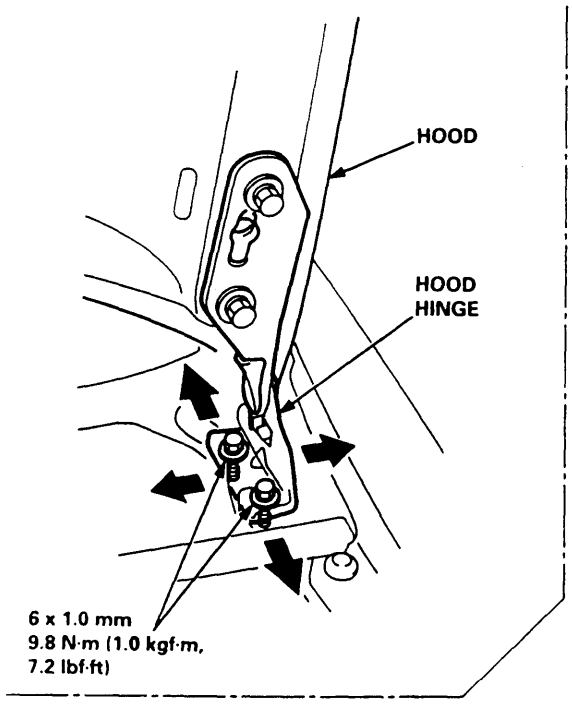
Installation is the reverse of the removal procedure.

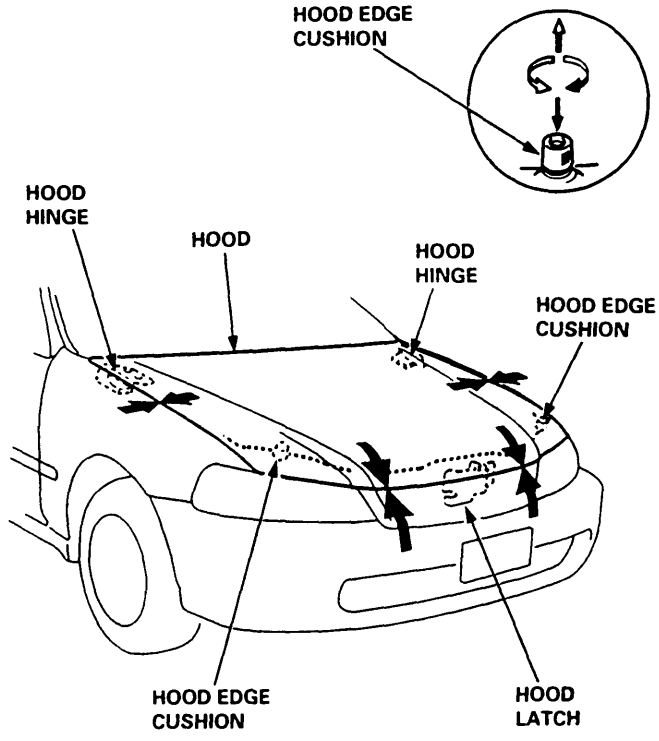
NOTE:
- If necessary, replace any damaged clips.
- Make sure the rear bumper engages the side clip on each side securely.

Hood Adjustment

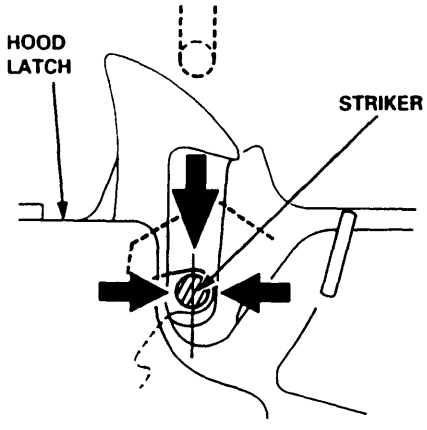
NOTE: Before adjusting the hood, loosen each bolt slightly.

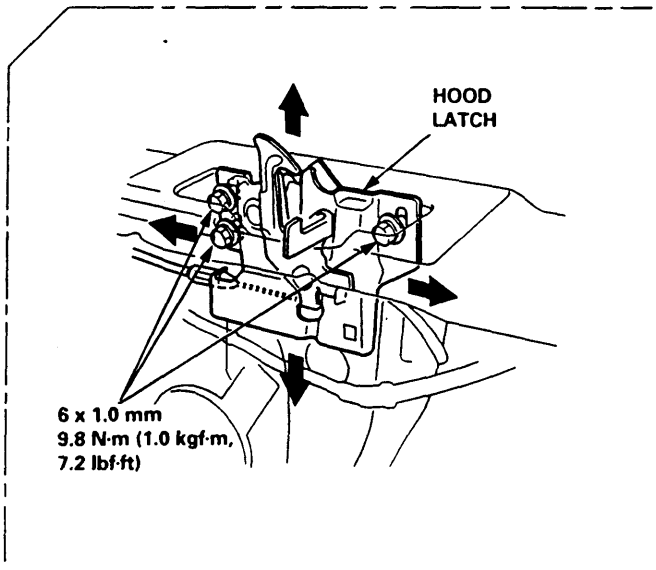
1. Adjust the hood hinges right and left, as well as fore and aft, by using the elongated holes.
2. Turn the hood edge cushions, as necessary, to make the hood fit flush with the body at front and side edges.
3. Adjust the hood latch to obtain the proper height at the forward edge.
4. After adjustment, tighten each bolt securely.





NOTE: Move the hood latch right or left until the striker is centered in the hood latch as shown.

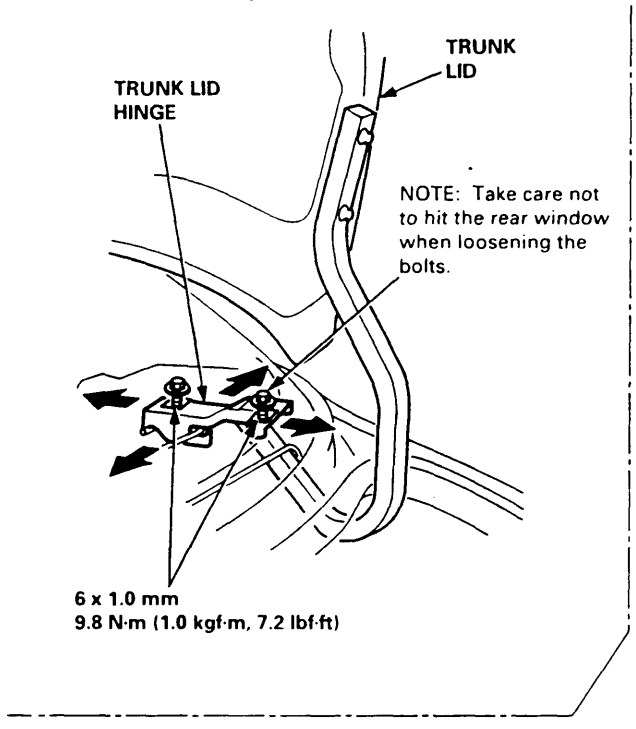


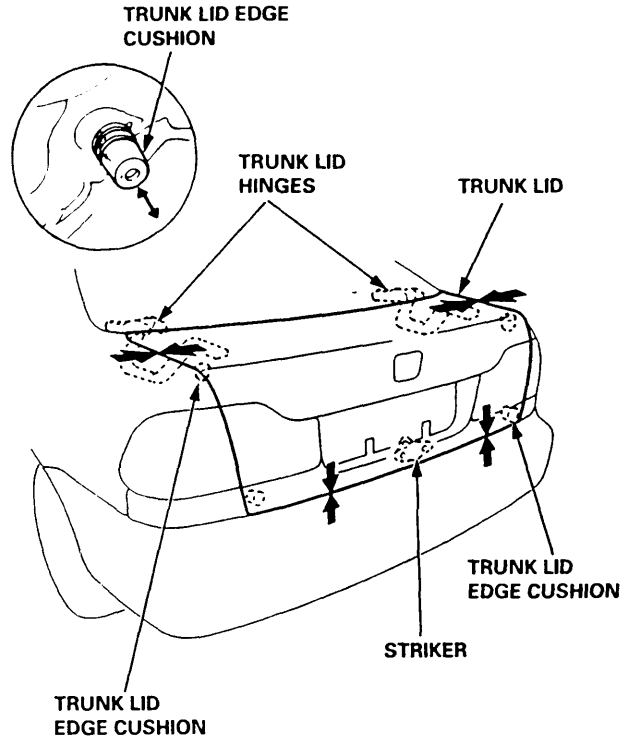


Trunk Lid Adjustment

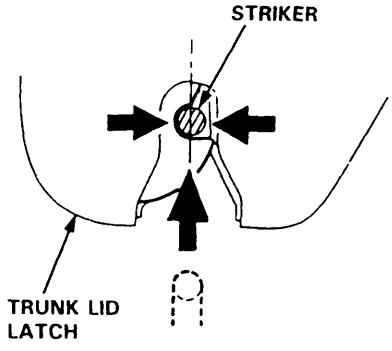
NOTE: Before adjusting the trunk lid, loosen each bolt slightly.

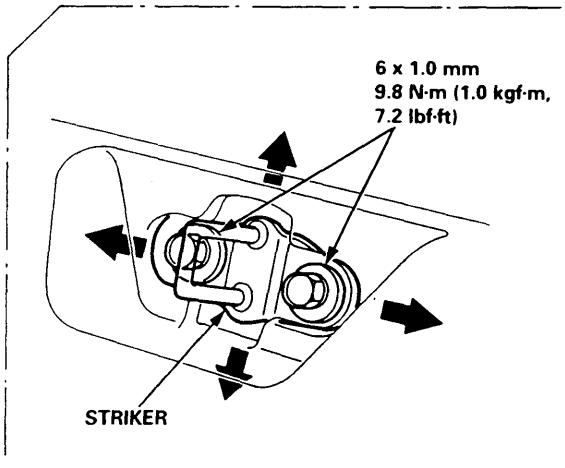
1. Remove the rear shelf (see page 20-39), and adjust the trunk lid hinges right and left, as well as fore and aft, by using the elongated holes.
2. Turn the trunk lid edge cushions, as necessary, to make the trunk lid fit flush with the body at the rear and side edges.
3. Adjust the fit between the trunk lid and the trunk lid opening by moving the striker.
4. After adjustment, tighten each bolt securely.





NOTE: Move the striker right or left until it's centered in the trunk lid latch as shown.



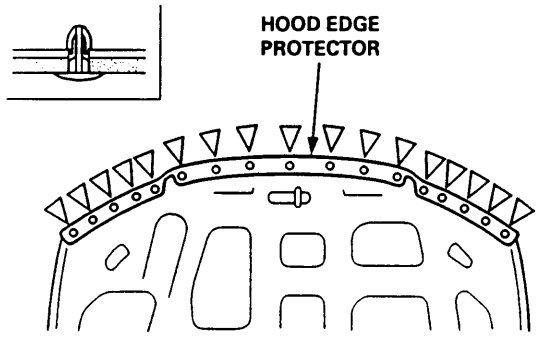


Hood Edge Protector and Trunk Lid Weatherstrip Removal/Installation

Hood edge protector:

NOTE:
- When removing the clips, use a clip remover.
- If necessary, replace any damaged clips.

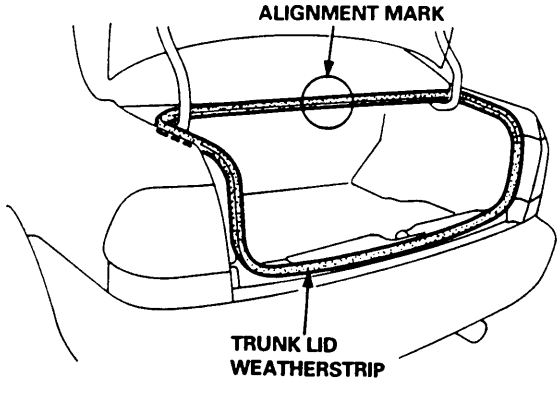
▷: **Clip locations, 17**

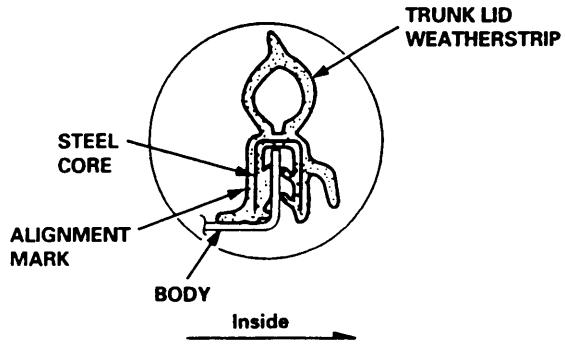


Trunk lid weatherstrip:

When installing the trunk lid weatherstrip, align it with the alignment mark on the trunk lid opening.

NOTE:
- Make sure there are no wrinkles in the weatherstrip.
- Check for water leaks.



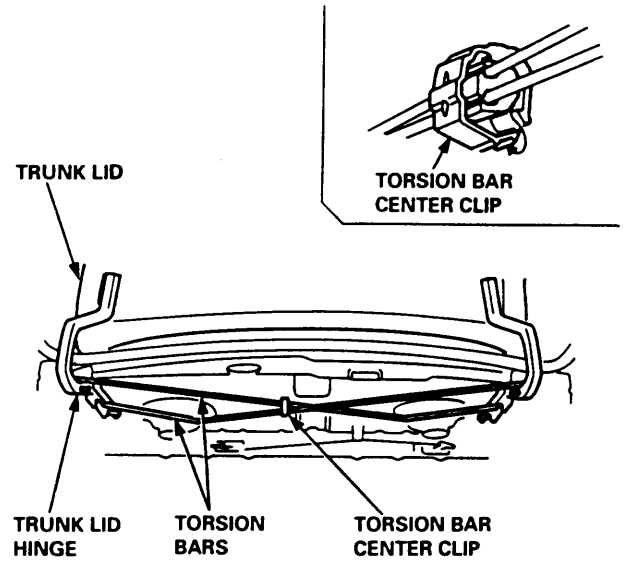


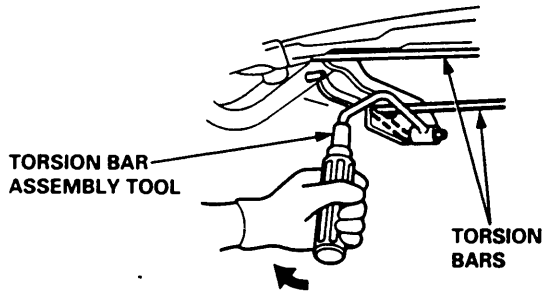
Trunk Lid Torsion Bars Removal/ Installation

CAUTION: Wear gloves to remove and install the torsion bars.

NOTE: Take care not to damage the body.

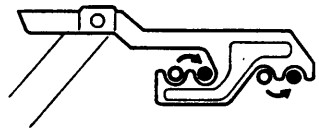
Remove the torsion bars with the torsion bar assembly tool while holding the trunk lid as shown.





Installation is the reverse of the removal procedure.

NOTE:
- Adjust the torsion bars fore or aft with the torsion bar assembly tool as shown.



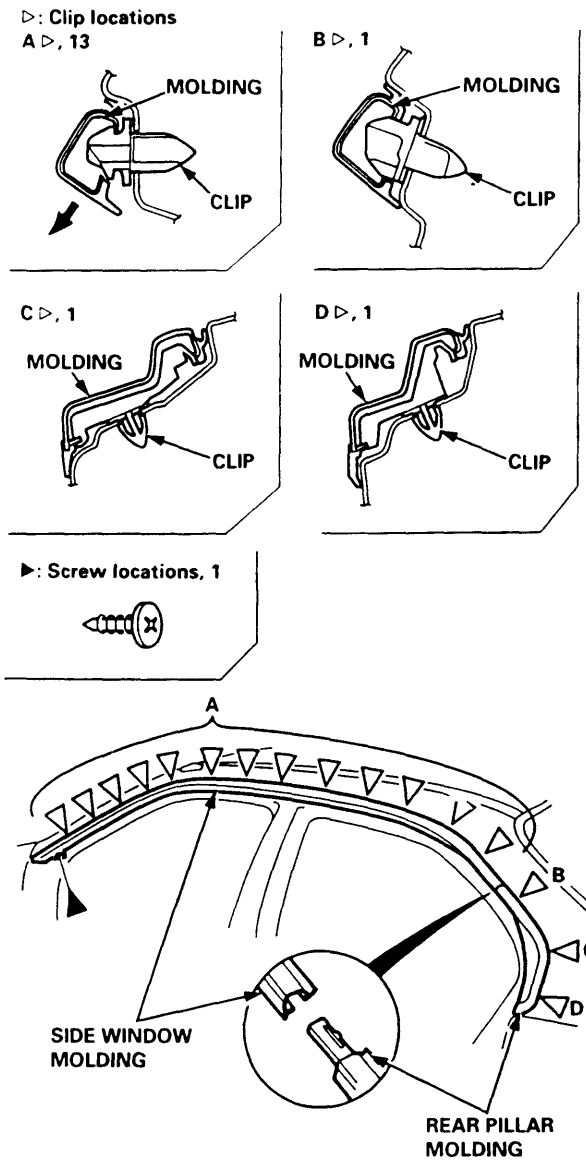
○ = Normal position
● = Higher tension

- Make sure the trunk lid opens properly.

Side Window Moldings Removal/ Installation

CAUTION: Wear gloves to remove and install the side window moldings.

NOTE:
- Take care not to scratch the body.
- Remove the screw, and pull the side window molding by hand.



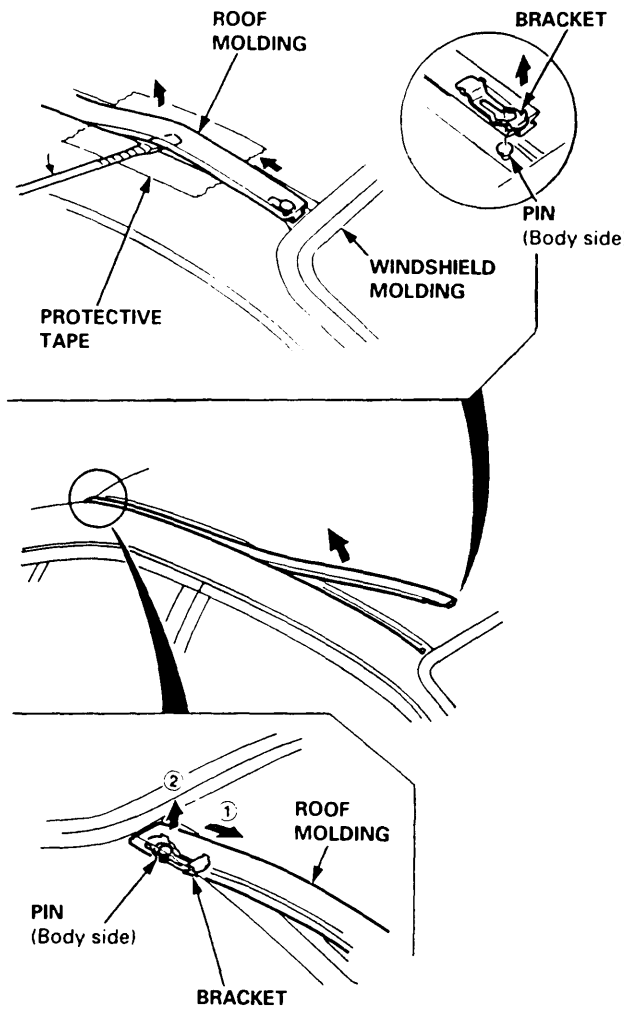
Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

Roof Molding Removal/Installation

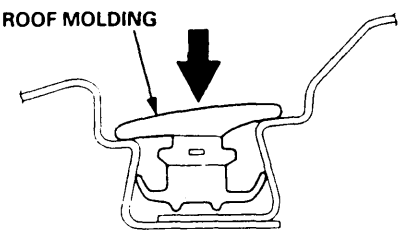
CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage, and use protective tape on the body.

NOTE: Take care not to scratch the body.



Installation is the reverse of the removal procedure.

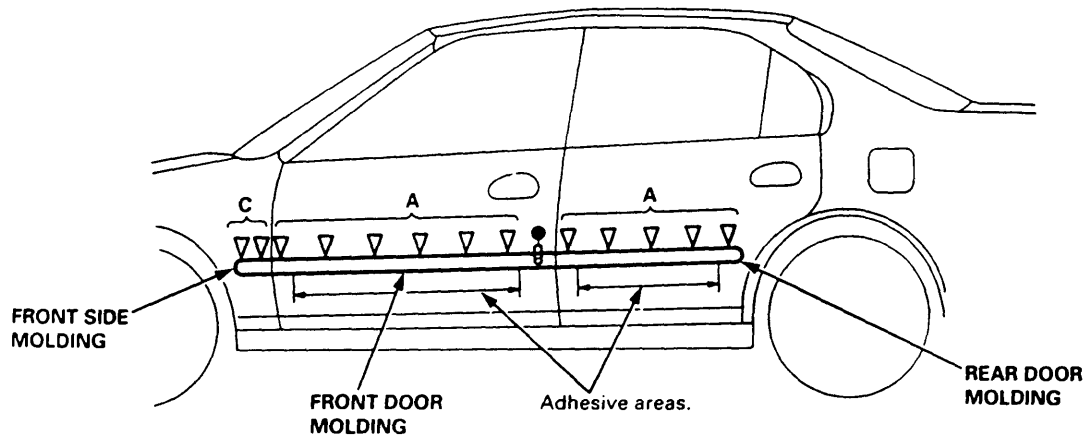
NOTE:
- Take care not to damage the windshield molding.
- Make sure the roof molding is installed securely.



Door and Side Moldings Removal/Installation

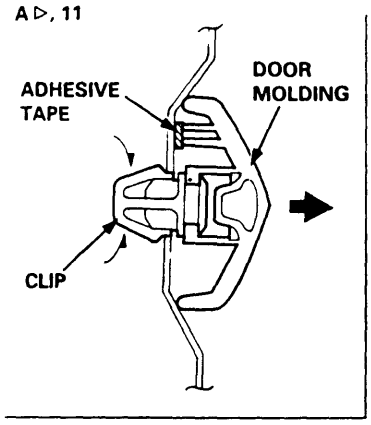
CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

NOTE:
- To remove the front side molding, remove the inner fender (see page 20-68).
- To remove the door molding, remove the door panel (see pages 20-4, 10) and plastic cover.
- Take care not to bend the door moldings.
- Before reassembling, clean the door bonding surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- If necessary, replace any damaged clips.

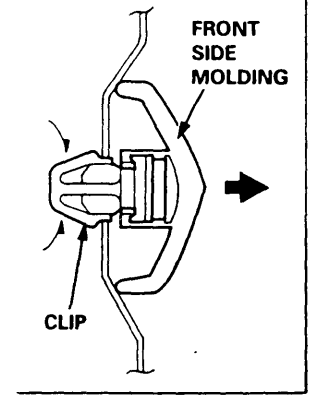


▷: Clip locations

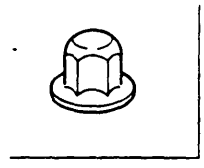
A ▷, 11



B ▷, 2



●: Plastic nut location, 1



(cont'd)

Door and Side Moldings Removal/Installation (cont'd)

Door molding removal:

The following materials and tools are required to repair the door moldings.

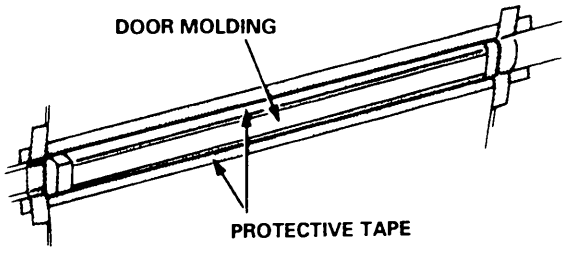
NOTE: Follow the manufacturer's instructions.

Materials: (Reference)
- Stripe remover
  3M 08907
- Stripe adhesive remover
  3M 08908
- Adhesive tape
  3M Super Automotive Attachment Tape

Tools:
- Protective tape
- Knife or Cutter
- Sponge or Shop towel
- Infrared dryer
- Film
- Putty knife
- Alcohol

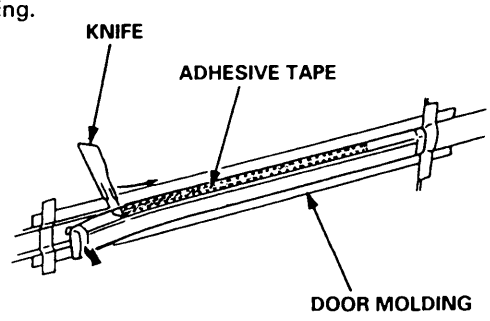
CAUTION: Wear gloves to remove and install the door moldings.

1. Remove the door panel, and pull back the plastic cover.
2. Apply protective tape on and around the molding.



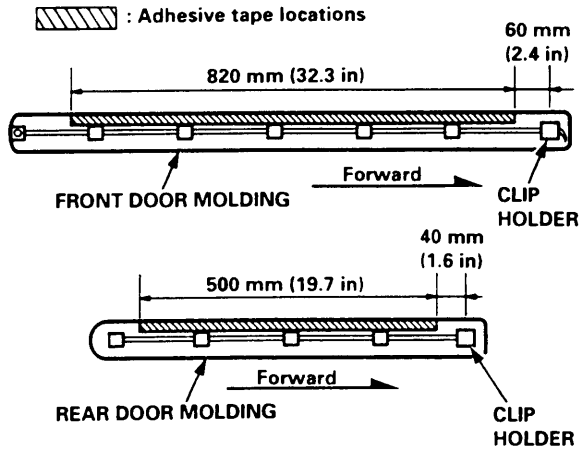
3. Release the clips from inside of the door. Carefully cut the adhesive tape with a knife or cutter while pulling the edge of the molding away from the door as shown.

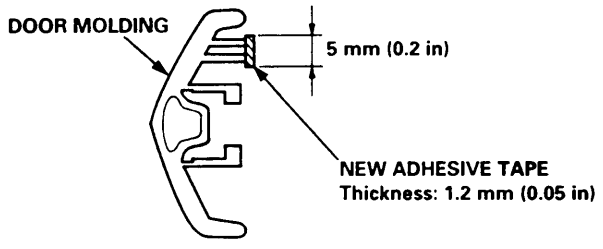
   NOTE: Take care not to scratch or bend the molding.



Door molding installation:

1. Glue the new adhesive tape to the moldings as shown.





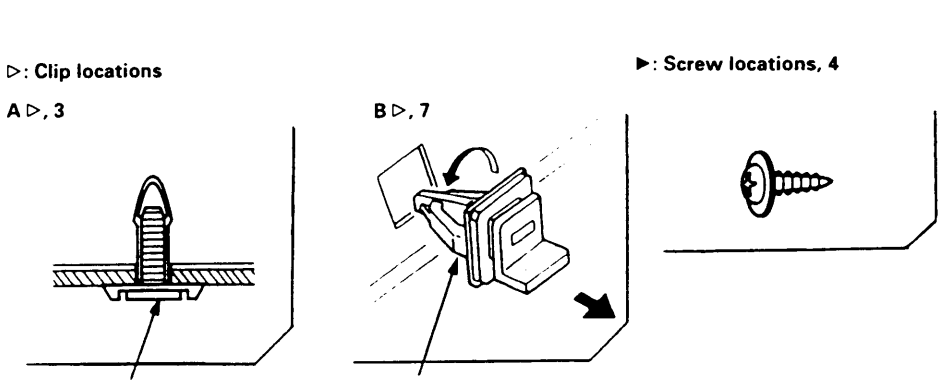
2. Install the clips on the molding.
3. Heat the bonding surface of the door and door molding with an infrared dryer.
   Door: 40 – 60°C (104 – 140°F)
   Molding: 20 – 30°C (68 – 86°F)

   NOTE: Use care when heating to prevent deformation of the molding.
4. Align the molding with the clip locations, and set the molding. Lightly push on the molding until its edge is fully seated on the adhesive tape.

   NOTE: Do not spray water on the molding within the first 24 hours after installation.
5. Reassemble all removed parts.

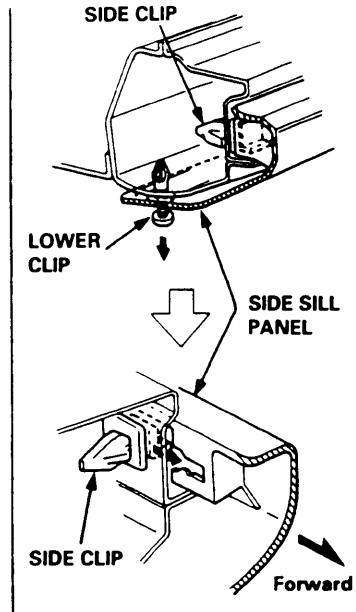
Side Sill Panel Removal/Installation

NOTE: Take care not to scratch the body.

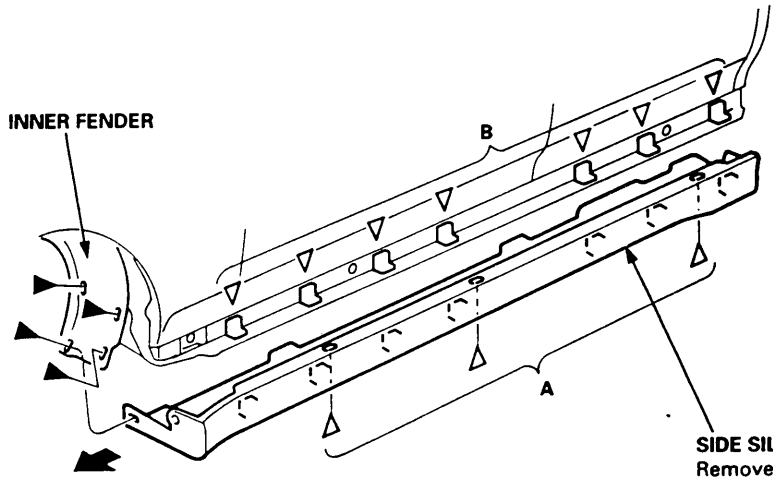


NOTE: Loosen the screw, then remove the lower clip using a clip remover.

SIDE CLIP
Remove the side clips from the body by turning them 45°



NOTE: When removing the side sill panel, the side clips will stay in the body.



SIDE SILL PANEL
Remove the lower clips, then remove the side sill panel by sliding it forward.

To install the side sill panel, remove the side clips from the body, install them on the side sill panel, then install the side sill panel on the vehicle.

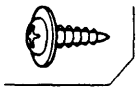
NOTE:
- Take care not to twist the side sill panel.
- If necessary, replace any damaged side and lower clips.

Inner Fender, Fenderwell Trim, Fuel Pipe Protector and Rear Air Outlet Removal/Installation

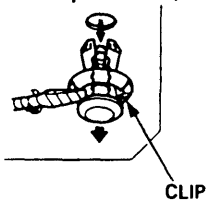
NOTE: If necessary, replace any damaged clips.

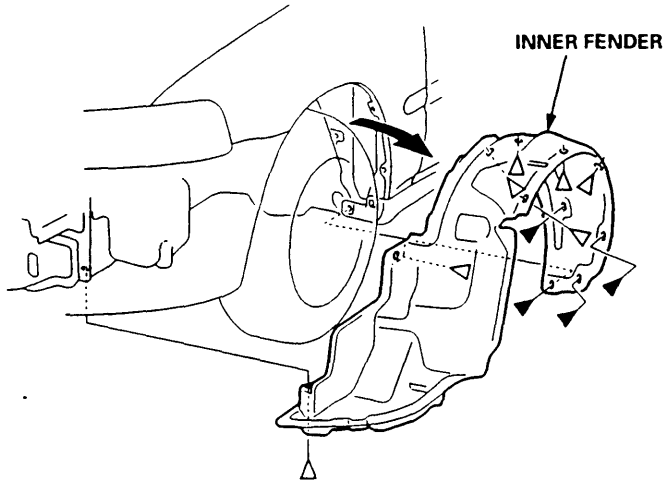
Inner fender:

▶: Screw locations, 4



▷: Clip locations, 7





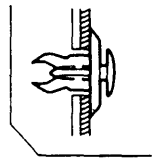
Fenderwell trim/Fuel pipe protector/Rear air outlet:

NOTE:

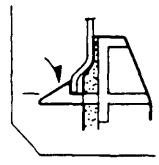
- Take care not to bend the fenderwell trim.
- Before installing the fenderwell trim, clean the body bonding surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease or water from getting on the surface.
- To remove the fuel pipe protector, first remove the rear wheel (see section 18).
- To remove the rear air outlet, first remove the rear bumper (see page 20-60).

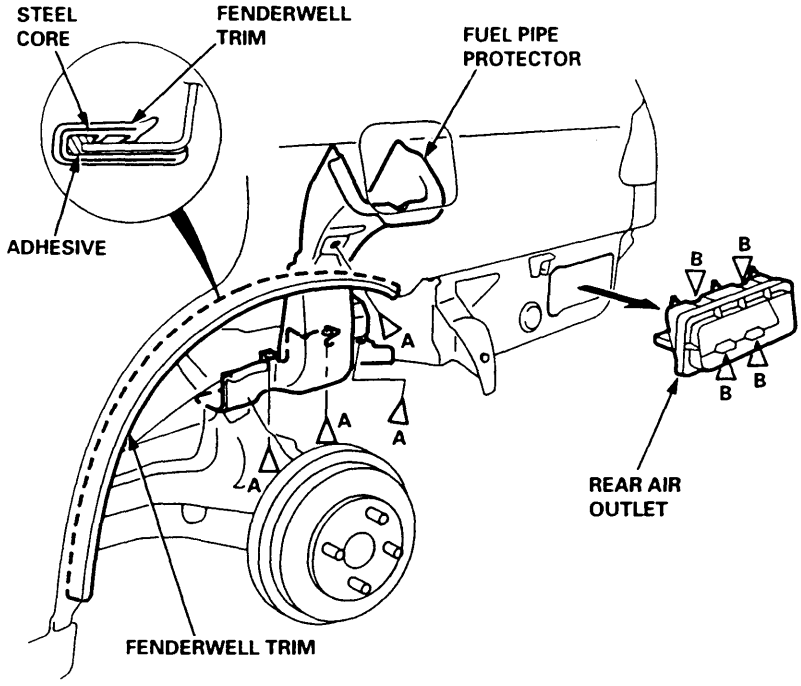
▷: Clip locations

A ▷, 4



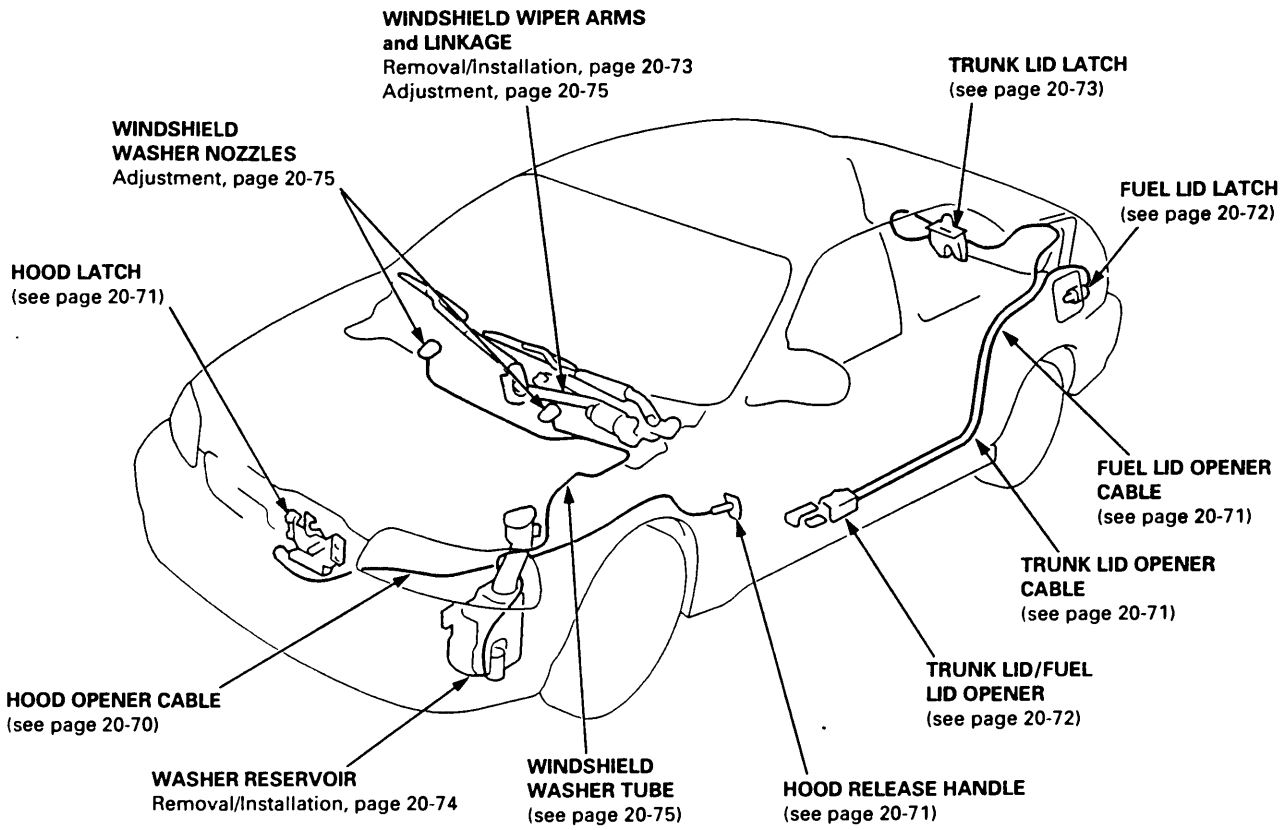
B ▷, 4





Opener Cable/Opener and Latch/Wiper and Washer

Component Location Index



Opener Cable/Opener and Latch/Wiper and Washer

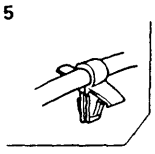
Opener Cables Removal/Installation

NOTE:
- Use a clip remover to remove the clips.
- Take care not to bend the opener cables.

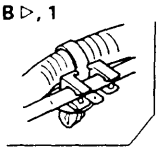
Hood opener cable:

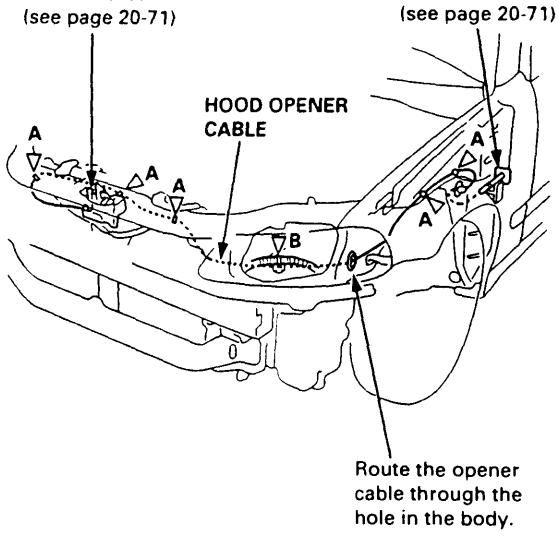
NOTE: Remove the front bumper (see page 20-59) and inner fender (see page 20-68).

▷: Clip locations
A ▷, 5



B ▷, 1





Installation is the reverse of the removal procedure.

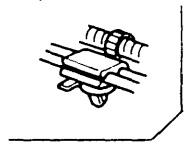
NOTE:
- Make sure the hood opener cable is routed and connected properly.
- Make sure the hood opens properly.

Trunk lid/Fuel lid opener cable:

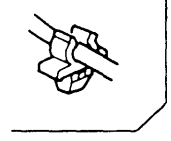
NOTE: Remove the following parts from the left side of the vehicle, then pull the carpet back, as necessary (see page 20-43).

- Rear seat cushion (see page 20-55)
- Rear seat side bolster (see page 20-55)
- Center pillar lower trim panel (see page 20-39)
- Side trim (see page 20-39)
- Seat side trim (see page 20-39)
- Rear trim panel and spare tire lid (see page 20-40)
- Trunk trim panel (see page 20-40)

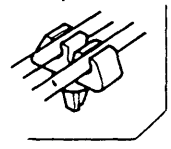
▷: Clip, cable cushion locations
A ▷, 4



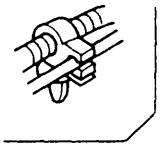
B ▷, 1



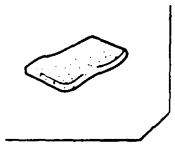
C ▷, 1

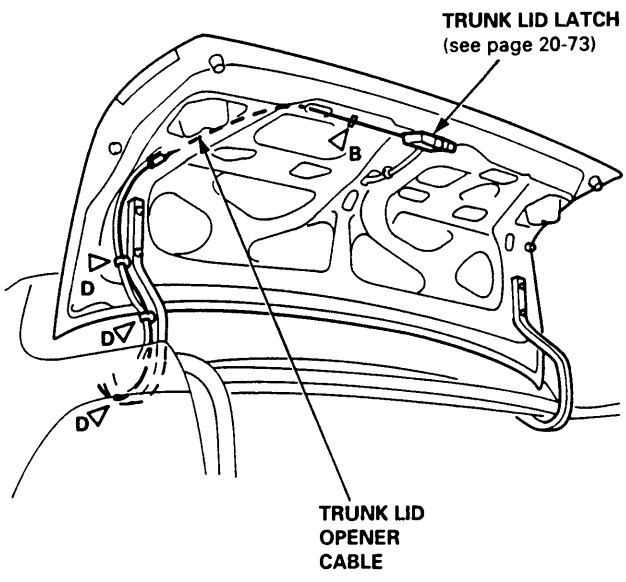


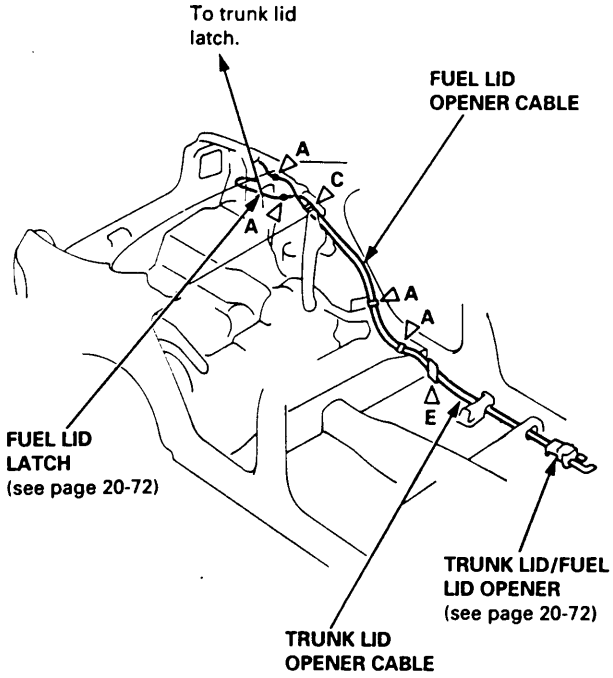
D ▷, 3



E ▷, 1





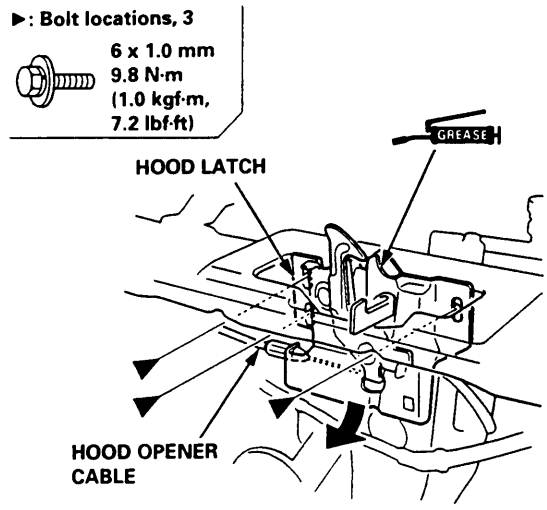


Opener and Latch Removal/ Installation

NOTE: Take care not to bend the opener cables.

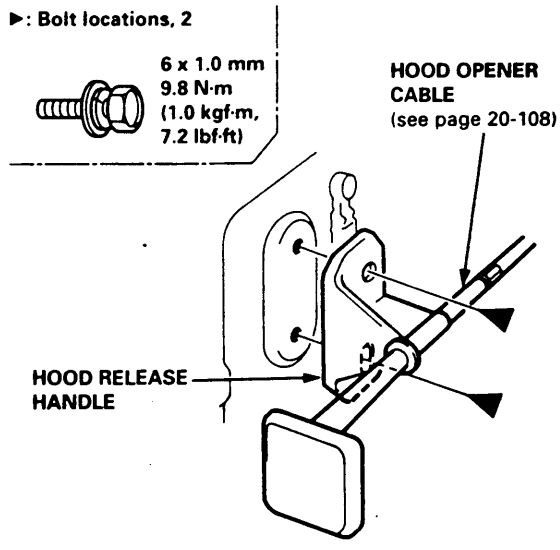
Hood release handle:

NOTE: Remove the kick panel (see page 20-39).



Hood latch:

NOTE: Remove the front grille (see page 20-59).



Installation is the reverse of the removal procedure.

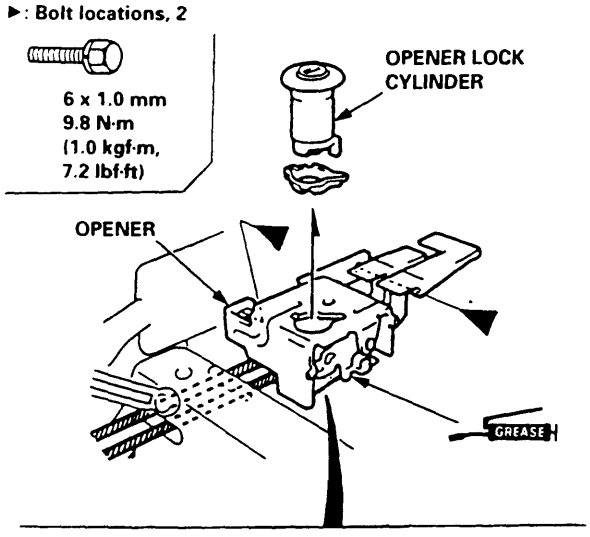
NOTE:

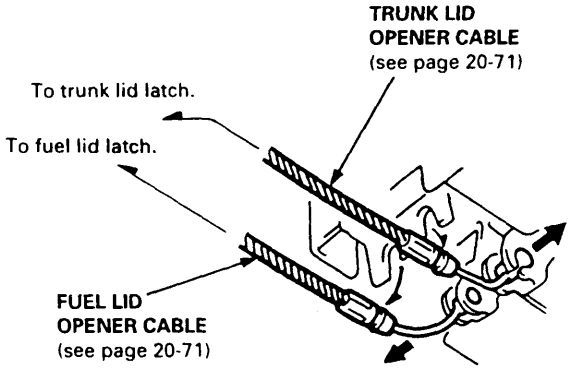
- Make sure the opener cable is connected properly.
- Make sure the hood opens properly and locks securely. (cont'd)

Opener and Latch Removal/Installation (cont'd)

Trunk lid/Fuel lid opener:

NOTE: Remove the side trim (see page 20-39).





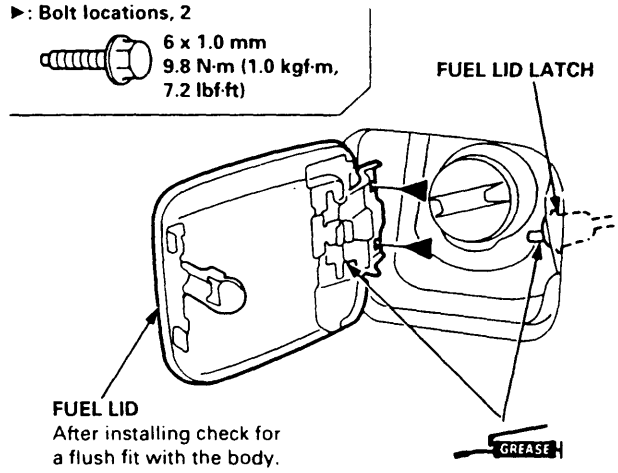
Installation is the reverse of the removal procedure.

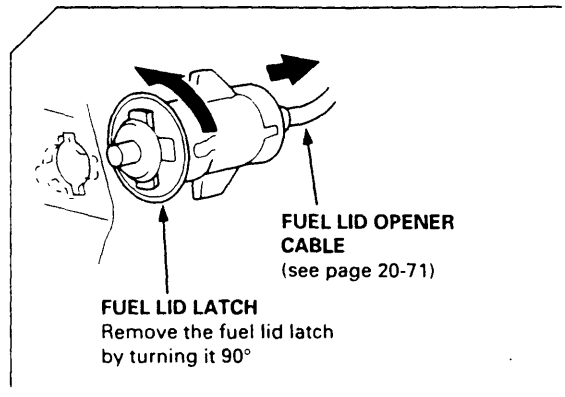
NOTE:
- Make sure the opener cable is connected properly.
- Make sure the trunk lid and fuel lid open properly.

Fuel lid latch:

NOTE: Remove the following parts.

- Rear trim panel (see page 20-40)
- Rear edge of the trunk trim panel (left side, see page 20-40)

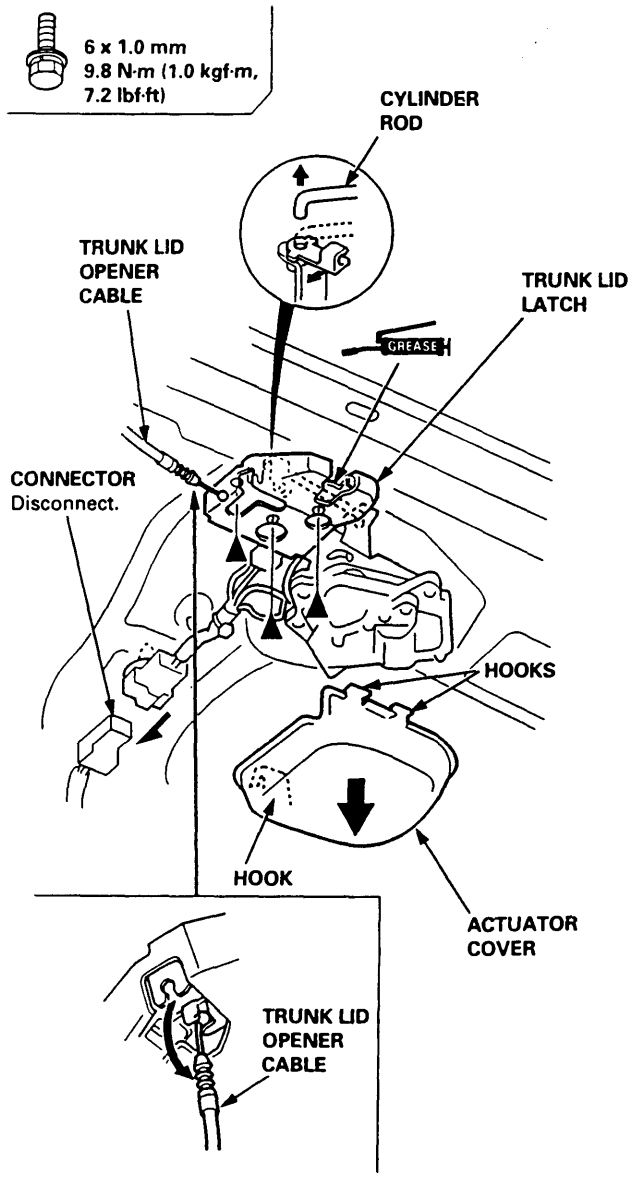




Installation is the reverse of the removal procedure.

NOTE:
- Make sure each opener cable is connected properly.
- Make sure the fuel lid opens properly and locks securely.

Trunk lid latch:



Installation is the reverse of the removal procedure.

NOTE:

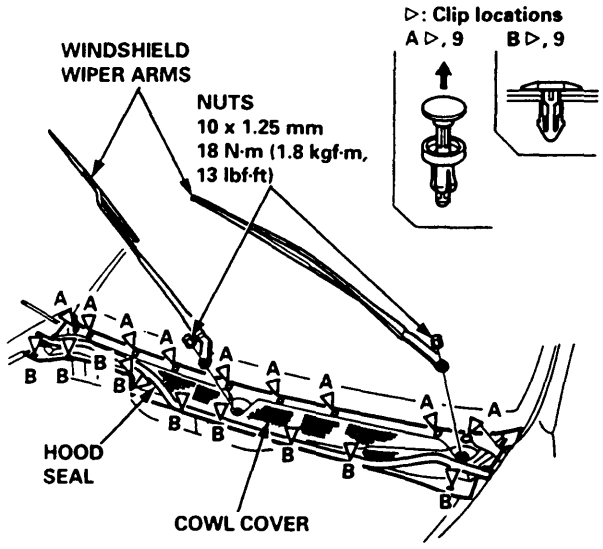
- Grease the trunk lid latch.
- Make sure the trunk lid opens properly and locks securely.
- Make sure the connector and cylinder rod are connected properly.

Windshield Wiper Arms and Linkage Removal/Installation

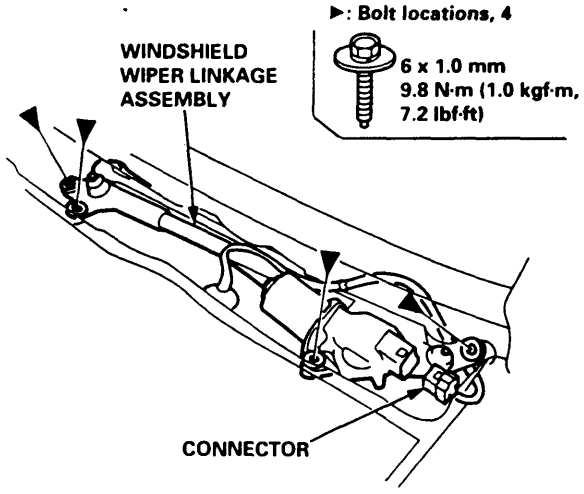
CAUTION: Wear gloves to remove and install the windshield wiper linkage.

NOTE: Take care not to scratch the hood and body.

1. Remove the windshield wiper arms, then remove the hood seal and cowl cover.



2. Disconnect the connector, then remove the windshield wiper linkage assembly.

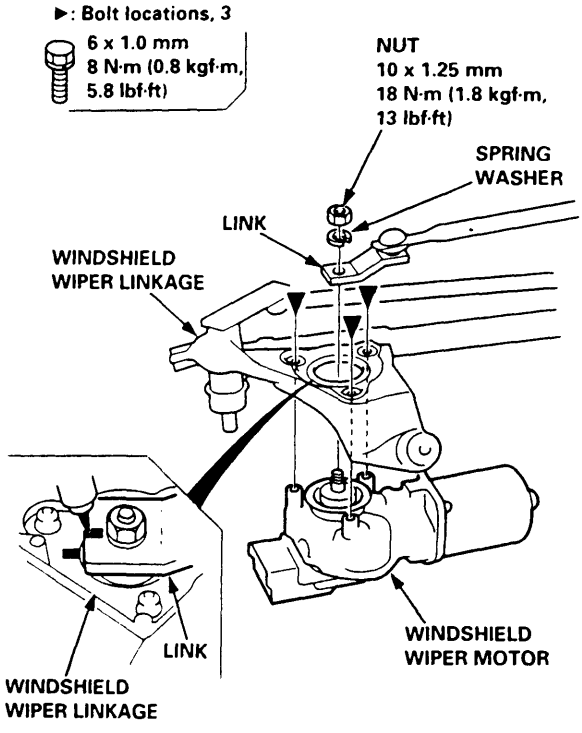


(cont'd)

Windshield Wiper Arms and Linkage Removal/Installation (cont'd)

3. Separate the windshield wiper linkage and windshield wiper motor.

   NOTE: Scribe a line across the link and windshield wiper linkage to show the original adjustment.



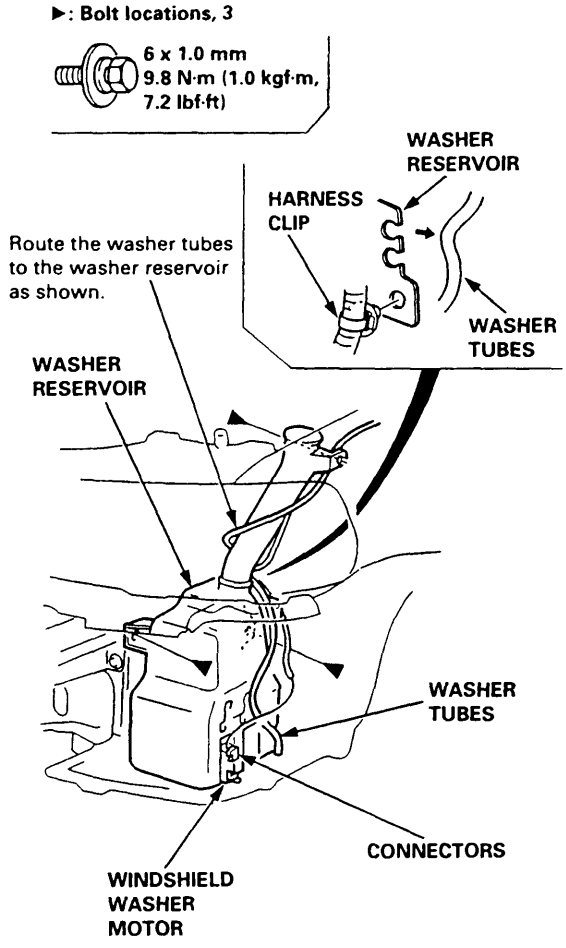
4. Installation is the reverse of the removal procedure.

   NOTE:
   - Make sure the connector is connected properly.
   - If necessary, replace any damaged clips.
   - Adjust the windshield wiper arms as described on page 20-75.
   - Check the windshield wiper motor operation.
   - Grease the moving parts.

Washer Reservoir Removal/Installation

1. Remove the front bumper (see page 20-59).

2. Disconnect the connectors and washer tubes from the washer motors.



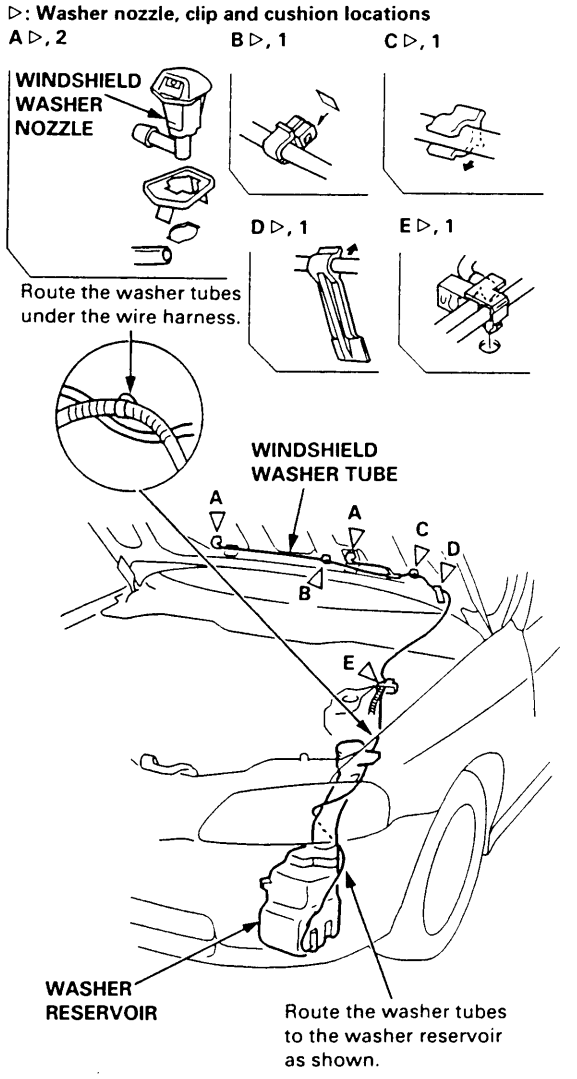
3. Remove the bolts, then remove the washer reservoir.

4. Installation is the reverse of the removal procedure.

   NOTE:
   - Make sure the washer motor connectors and washer tubes are connected properly.
   - Check the washer motor operation.

Windshield Washer Tube Removal/ Installation

NOTE: To remove the windshield washer tube, remove the left inner fender (see page 20-68).



Installation is the reverse of the removal procedure.

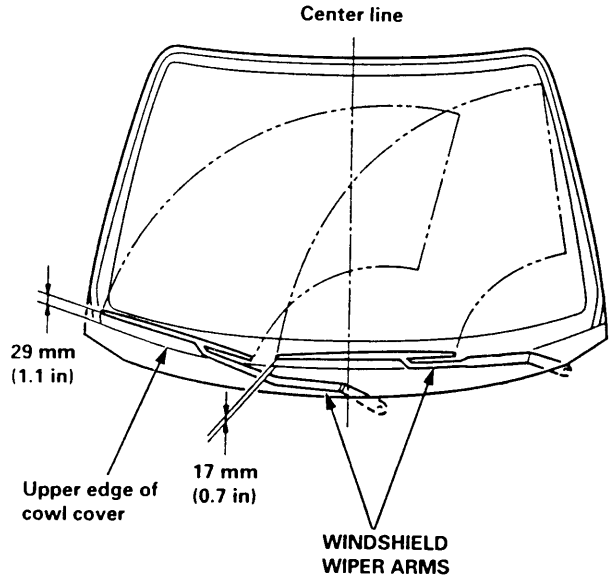
NOTE:

- Take care not to pinch the washer tubes.
- If necessary, replace any damaged clips.
- After installing, adjust the aim of the windshield washer nozzles.

Windshield Wiper Arms Adjustment

Adjust the windshield wiper arms so that their park positions match the illustration.

View from front to rear



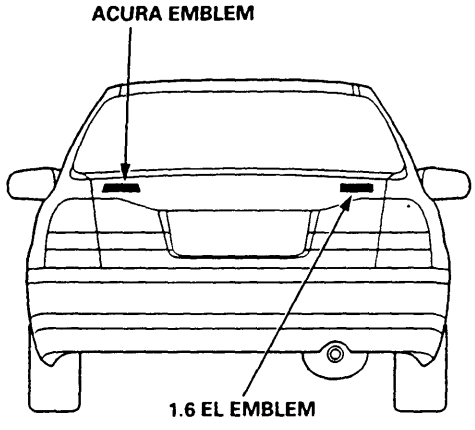
Emblems

Installation

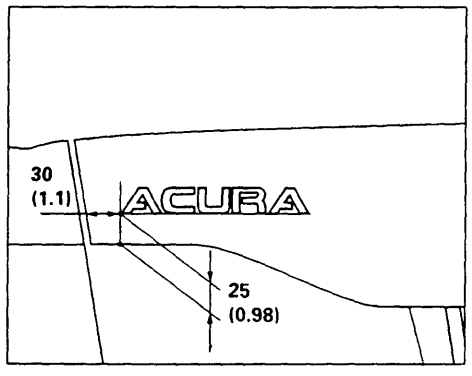
Apply the emblems where shown.

NOTE:
- Before applying, clean the body surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.

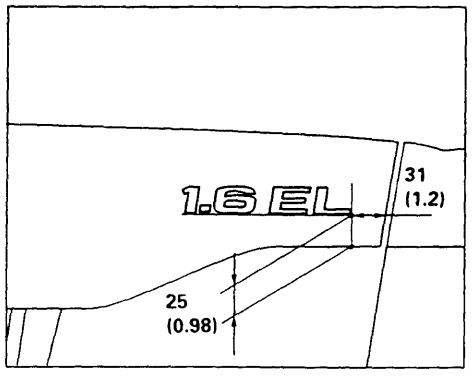
Attachment Points (Reference):



ACURA Emblem **Unit: mm (in)**



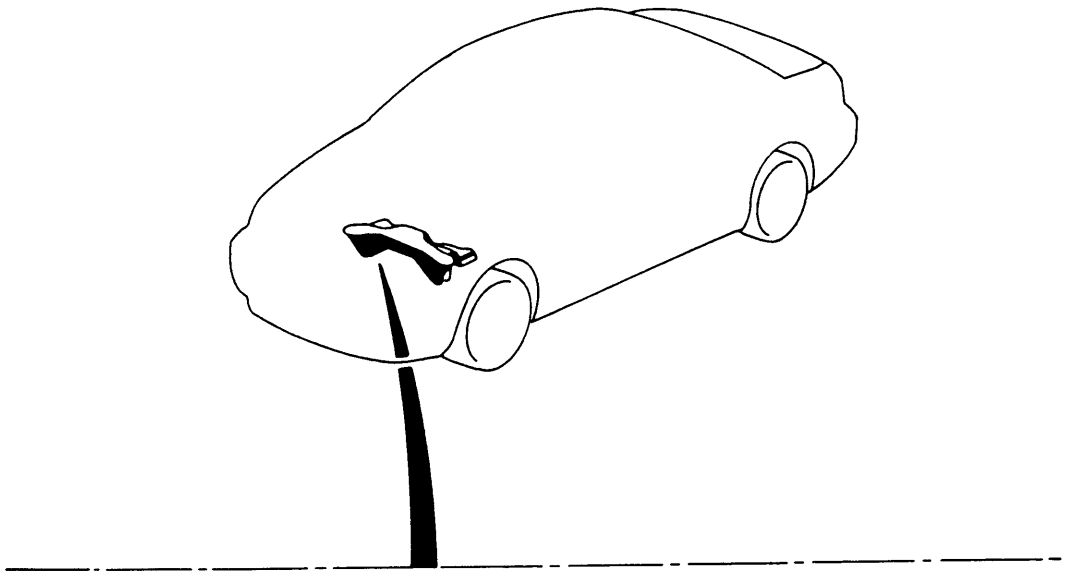
1.6 EL Emblem

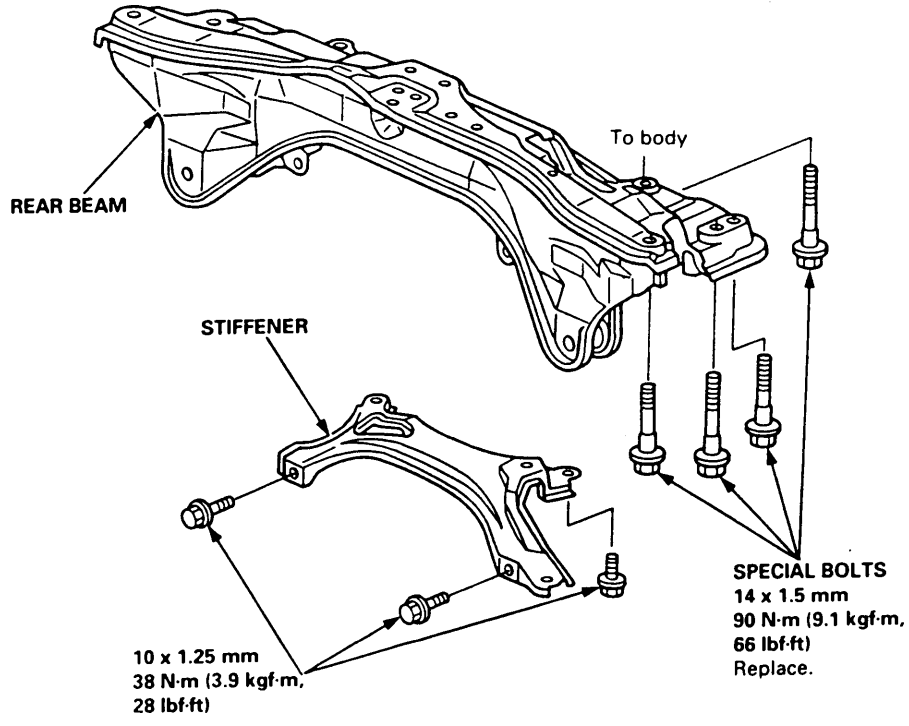


Sub-frame

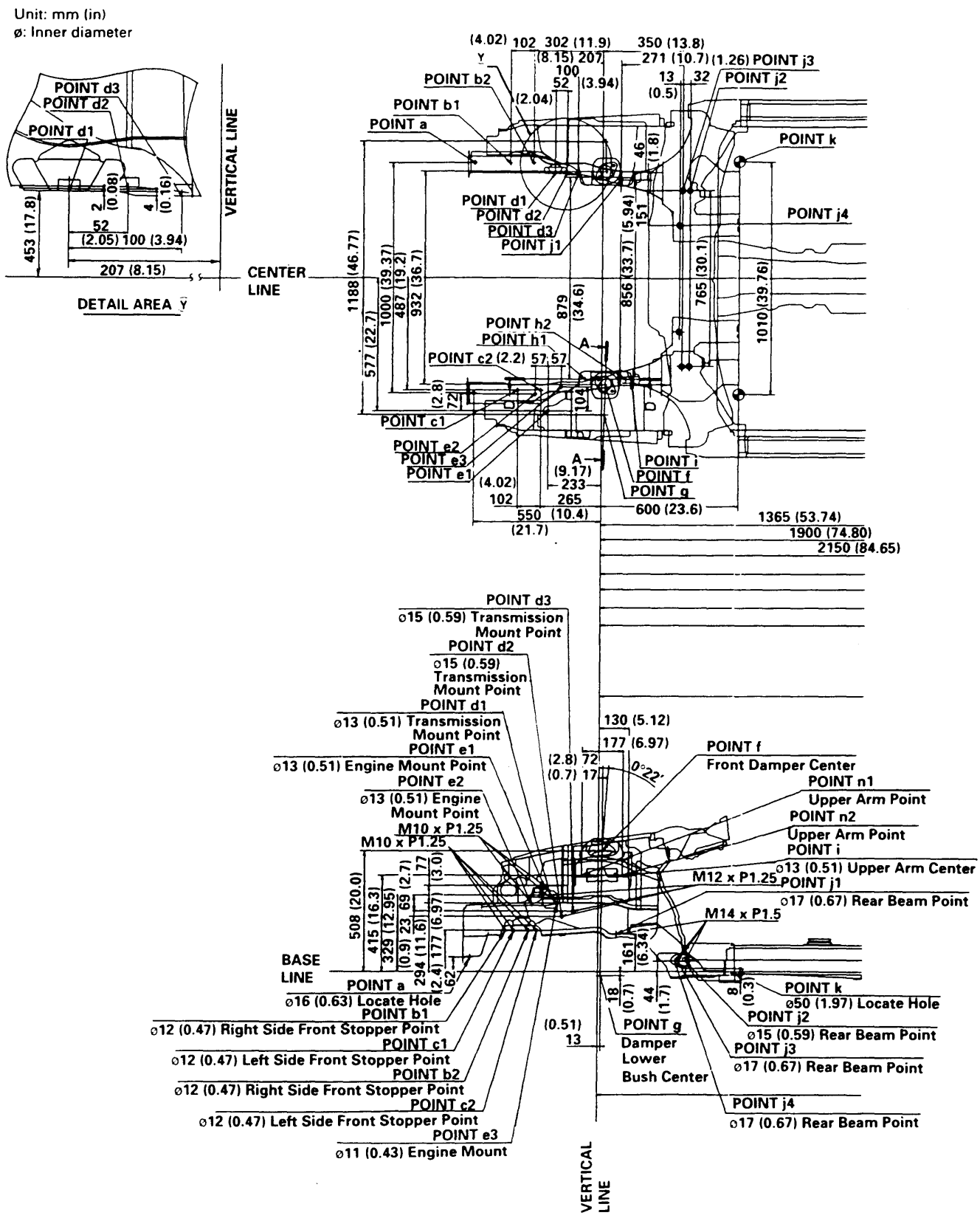
Sub-frame Torque Sequence:

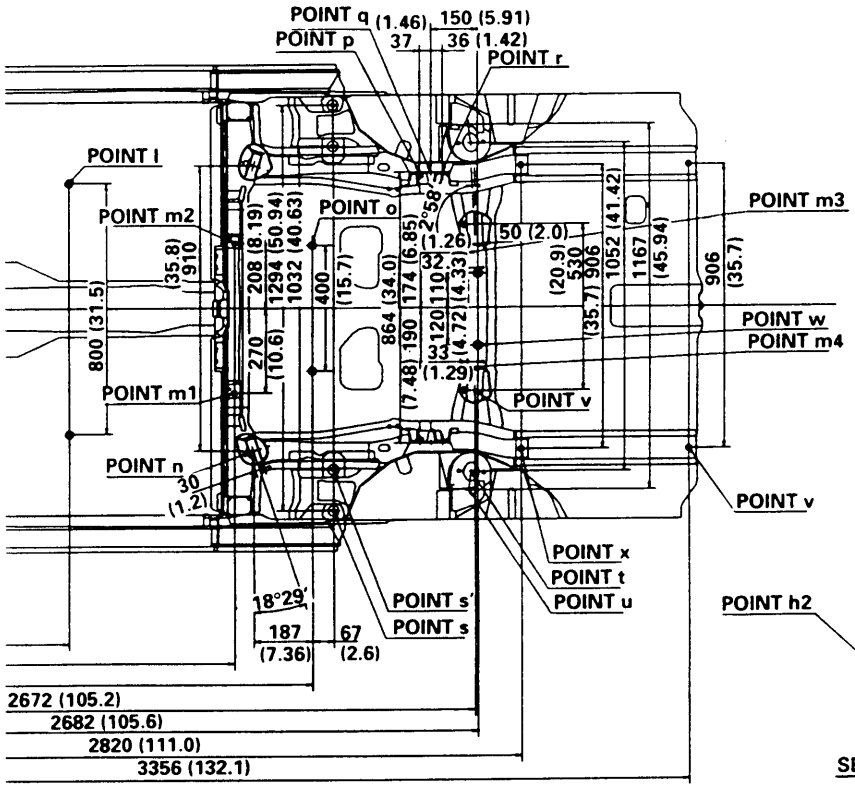
CAUTION: After loosening the sub-frame mounting bolts, be sure to replace them with new ones.

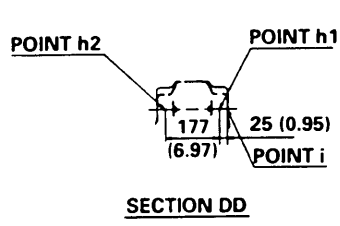




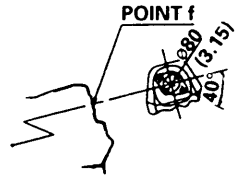
Frame Repair Chart



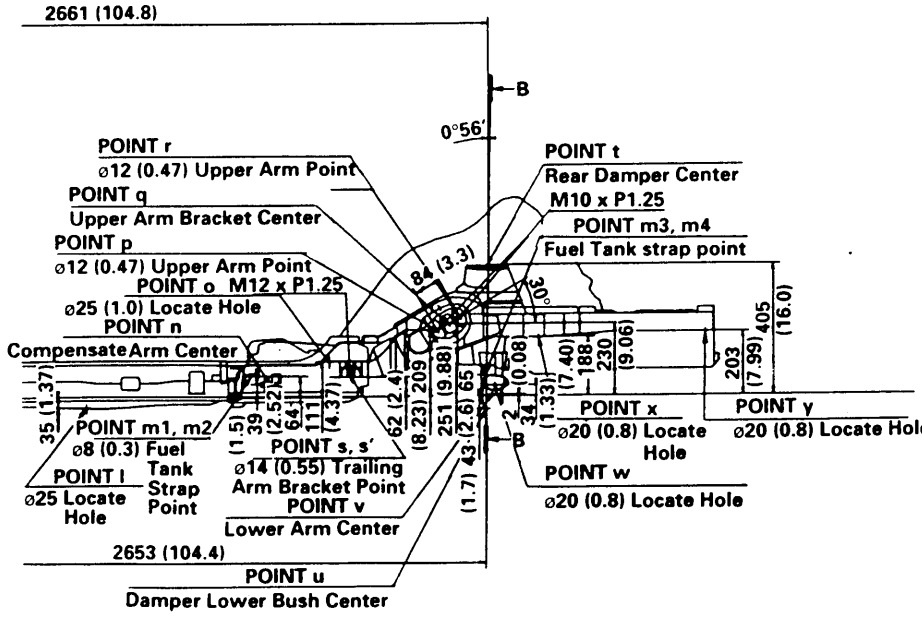


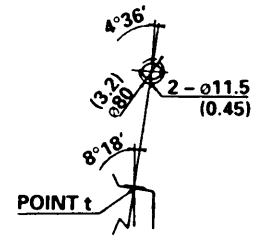


SECTION DD



SECTION AA





SECTION BB

Heater and Air Conditioning

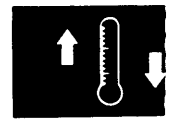
SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Acura 1.6EL SRS includes a driver's airbag located in the steering wheel hub, and a passenger's airbag located in the dashboard above the glove box. 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 will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

⚠ WARNING

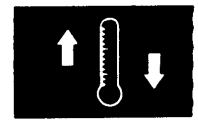
- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional activation of the airbags.**
- **Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.



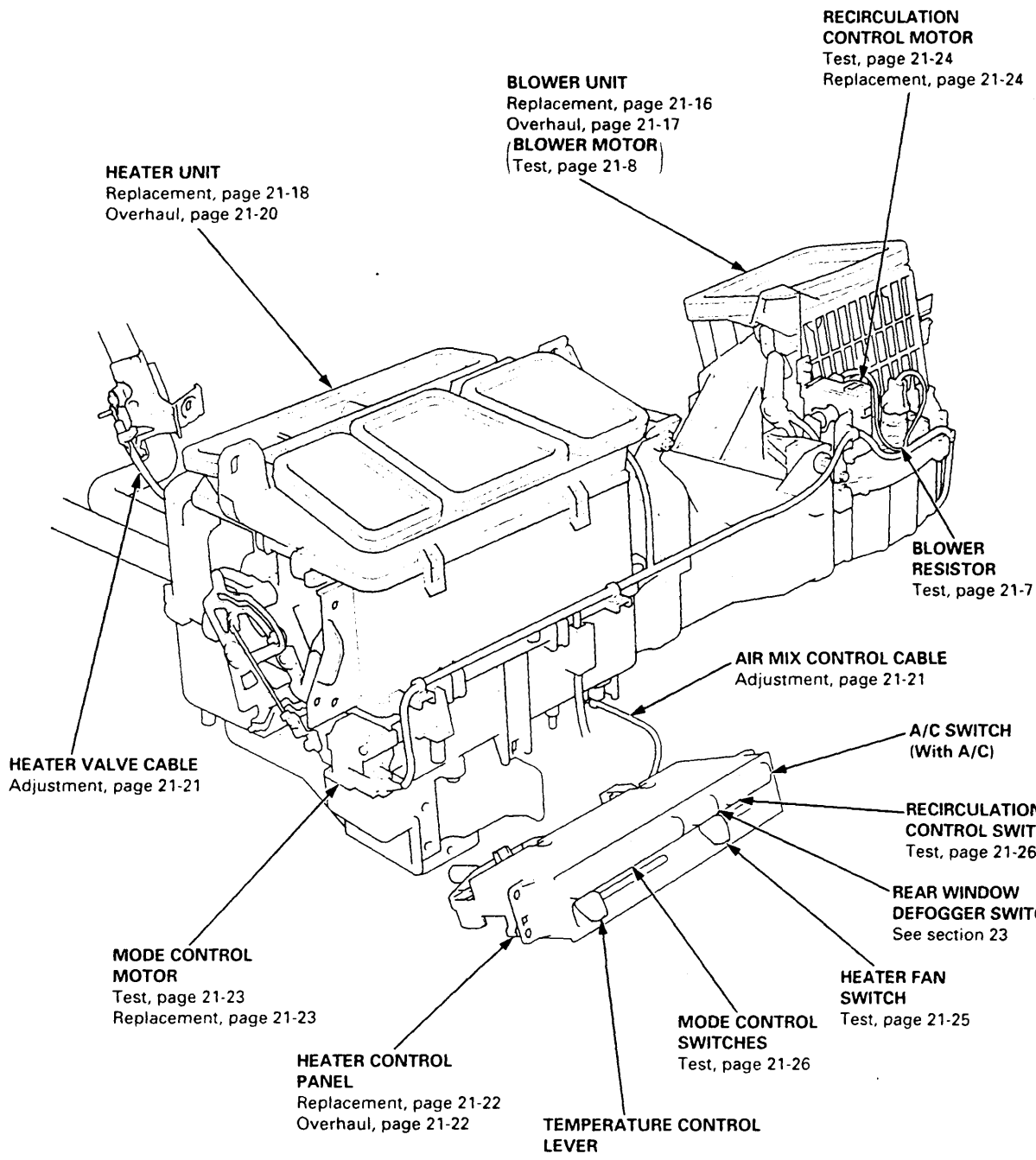
Heater

* Read SRS precautions before working in this area.

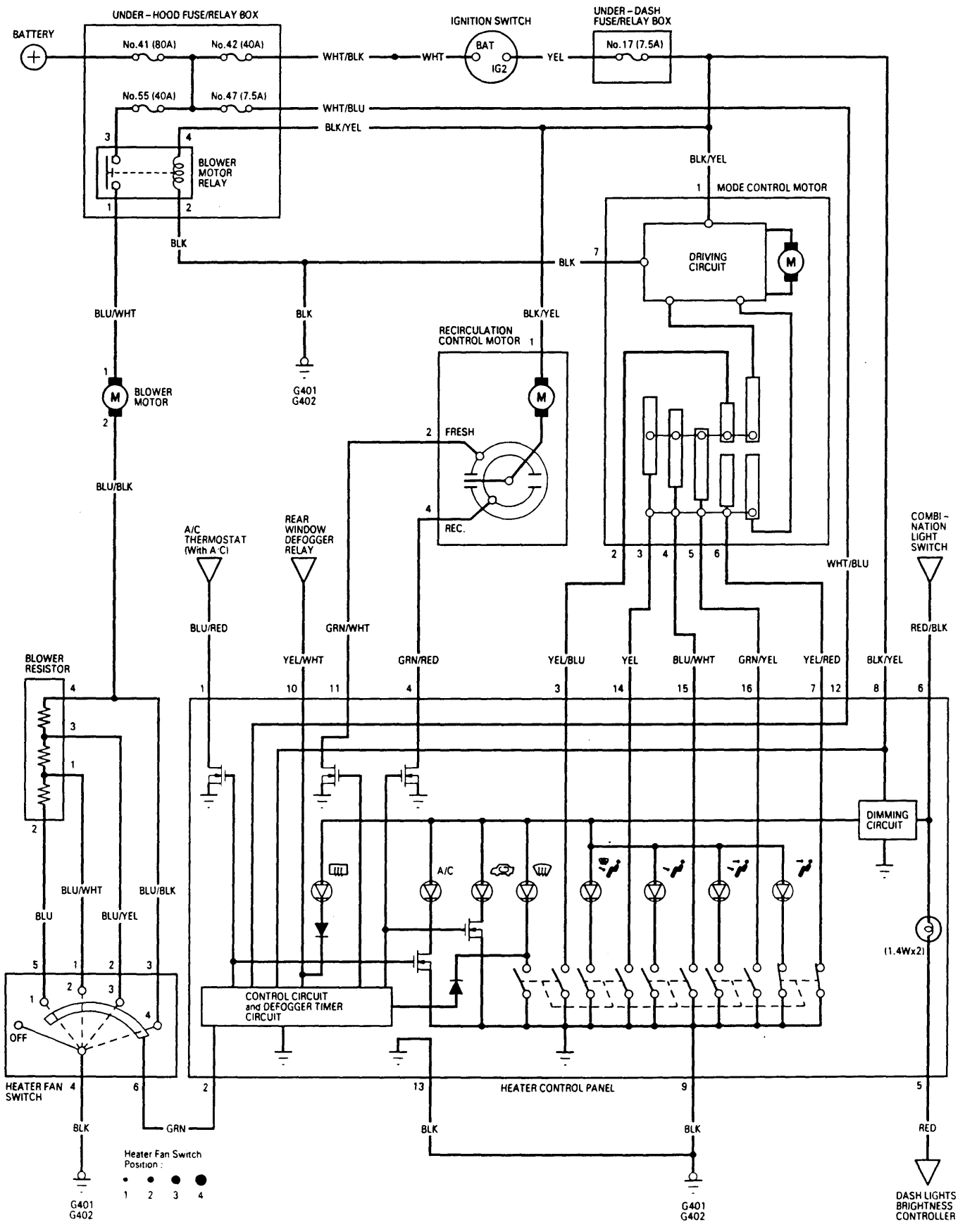


Illustrated Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.



Circuit Diagram



Troubleshooting

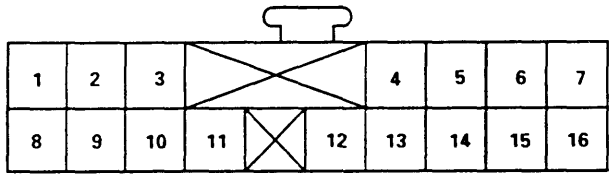
Symptom Chart

NOTE:
- Check the engine coolant level, and allow the engine to warm up before troubleshooting.
- Any abnormality must be corrected before continuing the test.
- Because of the precise measurements needed, use a multimeter when testing.
- Before performing any troubleshooting procedures check:
  — Fuses No. 47 (7.5 A), No. 55 (40 A) in the under-hood fuse/relay box, and No. 17 (7.5 A) in the under-dash fuse/relay box.
  — Grounds No. G401, G402
  — Cleanliness and tightness of all connectors

Symptom		Remedy
Hot air flow is low.	Blower motor runs, but one or more speeds are inoperative.	Perform the procedures in the flowchart (see page 21-6).
	Blower runs properly.	Check for the following: • Clogged heater duct • Clogged heater outlet • Incorrect door position
No hot air flow.	Blower motor does not run at all.	Perform the procedures in the flowchart (see page 21-8).
	Blower motor runs.	Check for the following: • Clogged heater duct • Clogged blower outlet • Clogged heater valve • Faulty air mix door • Heater valve cable adjustment (see page 21-21) • Air mix control cable adjustment (see page 21-21) • Faulty cooling system thermostat (see section 10) • Clogged evaporator (with air conditioning) • Frozen evaporator (with air conditioning)
Mode control motor does not run, or one or more modes are inoperative.		Perform the procedures in the flowchart (see page 21-11).
Recirculation control door does not change between FRESH and RECIRCULATE.		Perform the procedures in the flowchart (see page 21-14).

Heater Control Panel Input/Output Signals

HEATER CONTROL PANEL 16P CONNECTOR



Wire side of female terminals

Cavity	Wire color	Signal		Cavity	Wire color	Signal	
1	BLU/RED	A/C THERMOSTAT	INPUT	9	BLK	MODE SWITCH GROUND	OUTPUT
2	GRN	HEATER FAN SWITCH	OUTPUT	10	YEL/WHT	REAR WINDOW DEFOGGER RELAY	INPUT
3	YEL/BLU	DEF	INPUT	11	GRN/WHT	FRESH	INPUT
4	GRN/RED	RECIRCULATE	INPUT	12	WHT/BLU	+B (Power)	INPUT
5	RED	DASH LIGHTS BRIGHTNESS CONTROLLER	OUTPUT	13	BLK	GROUND	OUTPUT
6	RED/BLK	COMBINATION LIGHT SWITCH (Via No. 30 (7.5 A) fuse)	INPUT	14	YEL	HEAT/DEF	INPUT
7	YEL/RED	VENT	INPUT	15	BLU/WHT	HEAT	INPUT
8	BLK/YEL	IG2 (Power)	INPUT	16	GRN/YEL	HEAT/VENT	INPUT

Blower Motor Speed

Blower motor runs, but one or more speeds are inoperative.

Check for a short or an open in the wires:
Turn the ignition switch ON (II), and the heater fan switch OFF.

Does the blower motor run? — NO → To page 21-7

YES

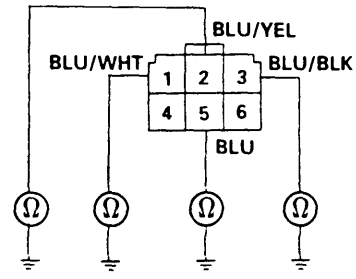
Check for a short in the wires:
1. Turn the ignition switch OFF.
2. Disconnect the blower motor 2P connector.
3. Remove the audio unit (see section 20), and disconnect the heater fan switch 6P connector.
4. Disconnect the blower resistor 4P connector.
5. Check for continuity between the No. 5, 1, 2 and 3 terminals of the heater fan switch 6P connector and body ground individually.

Is there continuity? — NO → **Replace the heater fan switch.**

YES

Repair short in the wire(s) between the blower resistor, the heater fan switch and the blower motor.

HEATER FAN SWITCH 6P CONNECTOR



Wire side of female terminals

From page 21-6

Check the blower resistor:
1. Turn the ignition switch OFF.
2. Disconnect the blower resistor 4P connector.
3. Measure the resistance between the No. 2 and No. 4 terminals of the blower resistor.

Is there approx. 2 – 3 ohms?

NO → **Replace the blower resistor.**

YES

Check for an open in the wires:
1. Reconnect the blower resistor 4P connector.
2. Remove the audio unit (see section 20), and disconnect the heater fan switch 6P connector.
3. Turn the ignition switch ON (II).
4. Ground each of the heater fan switch 6P connector terminals individually in the following order: No. 5, 1, 2 and 3.

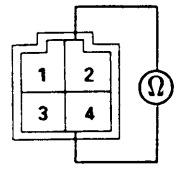
Does the blower motor run at progressively higher speeds?

NO → **Repair open or cause of excessive resistance in the appropriate wire(s) between the blower resistor and the heater fan switch.**

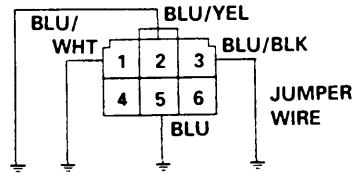
YES

Replace the heater fan switch.

BLOWER RESISTOR



HEATER FAN SWITCH 6P CONNECTOR



Wire side of female terminals

Blower Motor

Blower motor does not run at all.

Check the No. 55 (40 A) fuse in the under-hood fuse/relay box, and the No. 17 (7.5 A) fuse in the under-dash fuse/relay box.

Are the fuses OK? — NO → **Replace the fuse(s), and recheck.**

YES

Check the blower motor:
1. Connect the No. 2 terminal of the blower motor 2P connector to body ground with a jumper wire.
2. Turn the ignition switch ON (II).

Does the blower motor run? — YES → To page 21-9

NO

Check for an open in the wire:
1. Disconnect the jumper wire and the blower motor 2P connector.
2. Measure the voltage between the No. 1 terminal and body ground.

Is there battery voltage? — YES → **Replace the blower motor.**

NO

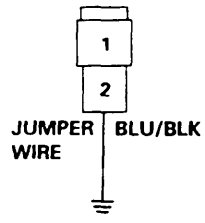
Check the blower motor relay:
1. Turn the ignition switch OFF.
2. Remove the blower motor relay from the under-hood fuse/relay box, and test it (see page 21-25).

Is the relay OK? — NO → **Replace the blower motor relay.**

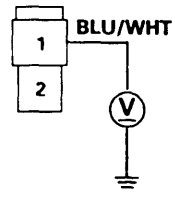
YES

To page 21-10

BLOWER MOTOR 2P CONNECTOR



Wire side of female terminals



From page 21-8

Check for an open in the wire:
1. Turn the ignition switch OFF, and disconnect the jumper wire.
2. Remove the audio unit (see section 20), and disconnect the heater fan switch 6P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 3 terminal and body ground.

Is there battery voltage?

NO → **Repair open in the wire between the blower motor and the heater fan switch.**

YES

Check for an open in the wire:
1. Turn the ignition switch OFF.
2. Check for continuity between the No. 4 terminal of the heater fan switch 6P connector and body ground.

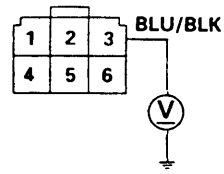
Is there continuity?

NO → **Check for an open in the wire between the heater fan switch and body ground. If the wire is OK, check for poor ground at G401 and G402.**

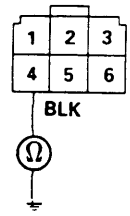
YES

Replace the heater fan switch.

HEATER FAN SWITCH 6P CONNECTOR



Wire side of female terminals



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Blower Motor (cont'd)

From page 21-8

Check the under-hood fuse/relay box:
Measure the voltage between the No. 3 terminal of the blower motor relay 4P socket and body ground.

Is there battery voltage?

NO → **Replace the under-hood fuse/relay box.**

YES

Check for an open in the wire:
1. Turn the ignition switch ON (II).
2. Measure the voltage between the No. 4 terminal of the blower motor relay 4P socket and body ground.

Is there battery voltage?

NO → **Repair open in the wire between the No. 17 fuse and the blower motor relay.**

YES

Check for an open in the wire:
1. Turn the ignition switch OFF.
2. Check for continuity between the No. 2 terminal of the blower motor relay 4P socket and body ground.

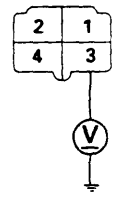
Is there continuity?

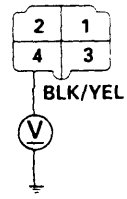
NO → **Check for an open in the wire between the blower motor relay and body ground. If the wire is OK, check for poor ground at G401 and G402.**

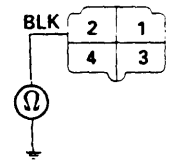
YES

Repair open in the BLU/WHT wire between the blower motor relay and the blower motor.

BLOWER MOTOR RELAY 4P SOCKET







Mode Control Motor

Mode control motor does not run, or one or more modes are inoperative.

Check the No. 17 (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

NO → **Replace the fuse, and recheck.**

YES

Check for an open in the wire:
1. Disconnect the mode control motor 7P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 1 terminal and body ground.

Is there battery voltage?

NO → **Repair open in the wire between the No. 17 fuse and the mode control motor.**

YES

Check for an open in the wire:
1. Turn the ignition switch OFF.
2. Check for continuity between the No. 7 terminal of the mode control motor 7P connector and body ground.

Is there continuity?

NO → **Check for an open in the wire between the mode control motor and body ground. If the wire is OK, check for poor ground at G401 and G402.**

YES

Test the mode control motor (see page 21-23).

Is the mode control motor OK?

NO → **Check the mode control linkage and doors:**
1. Remove the mode control motor (see page 21-23).
2. Check the mode control linkage and doors for smooth movement.

YES

To page 21-12

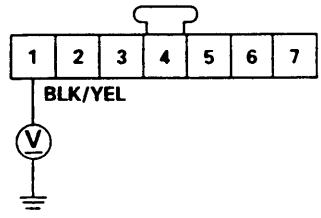
Do the mode control linkage and doors move smoothly?

NO → **Repair the mode control linkage or doors.**

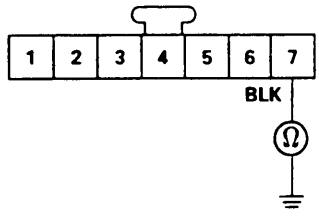
YES

Replace the mode control motor.

MODE CONTROL MOTOR 7P CONNECTOR



Wire side of female terminals



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Mode Control Motor (cont'd)

From page 21-11

Check for a short in the wires:
1. Remove the audio unit (see section 20), and disconnect the heater control panel 16P connector.
2. Check for continuity between the No. 3, 7, 14, 15 and 16 terminals and body ground individually.

Is there continuity?

YES → **Repair any short in the wire(s) between the mode control motor and the heater control panel.**

NO

Check for a short to power:
Check the same wires for voltage.

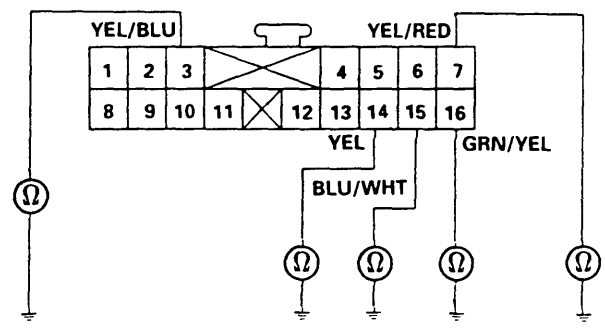
Is there any voltage?

YES → **Repair short to power in the wire between the mode control motor and the heater control panel. (This short damages the heater control panel.)**

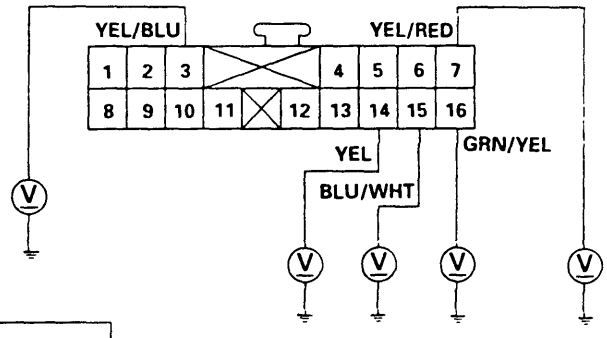
NO

To page 21-13

HEATER CONTROL PANEL 16P CONNECTOR



Wire side of female terminals



From page 21-12

Check for an open in the wires:
Check for continuity between the following terminals of the mode control motor 7P connector and the heater control panel 16P connector.

7P:	16P:
No. 2	No. 3
No. 3	No. 14
No. 4	No. 15
No. 5	No. 16
No. 6	No. 7

Is there continuity?

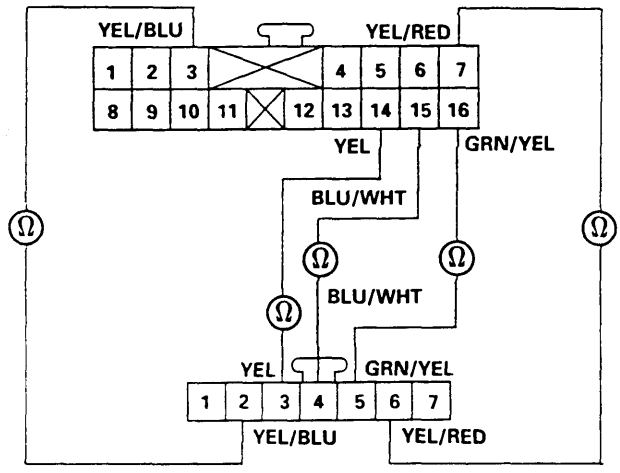
NO → **Repair any open in the wire(s) between the mode control motor and the heater control panel.**

YES

Check for loose wires or poor connections at the heater control panel 16P connector and at the mode control motor 10P connector. If the connections are good, replace the heater control panel.

HEATER CONTROL PANEL 16P CONNECTOR

Wire side of female terminals



MODE CONTROL MOTOR 7P CONNECTOR

Wire side of female terminals

Recirculation Control Motor

Recirculation control door does not change between FRESH and RECIRCULATE.

Check the No. 17 (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

NO → **Replace the fuse, and recheck.**

YES

Check for an open in the wire:
1. Disconnect the recirculation control motor 4P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 1 terminal and body ground.

Is there battery voltage?

NO → **Repair open in the wire between the No. 17 fuse and the recirculation control motor.**

YES

Check the recirculation control motor:
1. Turn the ignition switch OFF.
2. Test the recirculation control motor (see page 21-24).

Is the recirculation control motor OK?

NO → **Check the recirculation control linkage and door:**
1. Remove the recirculation control motor (see page 21-24).
2. Check the recirculation control linkage and door for smooth movement.

YES

To page 21-15

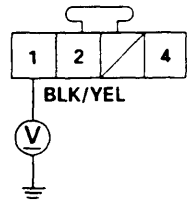
Do the recirculation control linkage and door move smoothly?

NO → **Repair the recirculation control linkage or door.**

YES

Replace the recirculation control motor.

RECIRCULATION CONTROL MOTOR 4P CONNECTOR



Wire side of female terminals

From page 21-14

Check for a short in the wires:
1. Remove the audio unit (see section 20), and disconnect the heater control panel 16P connector.
2. Check for continuity between the No. 4 and No. 11 terminals and body ground individually.

Is there continuity?

YES → **Repair short in the wire(s) between the recirculation control motor and the heater control panel.**

NO

Check for a short to power:
Check the same wires for voltage.

Is there any voltage?

YES → **Repair short to power in the wire between the recirculation control motor and the heater control panel. (This short damages the heater control panel.)**

NO

Check for an open in the wires:
Check for continuity between the following terminals of the recirculation control motor 4P connector and the heater control panel 16P connector.

4P:	16P:
No. 2	No. 11
No. 4	No. 4

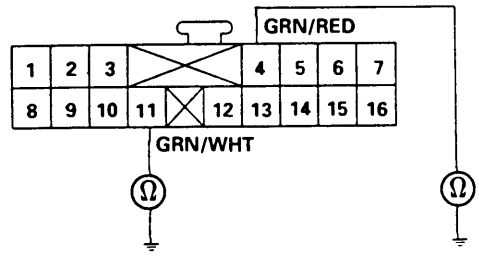
Is there continuity?

NO → **Repair open in the wire(s) between the recirculation control motor and the heater control panel.**

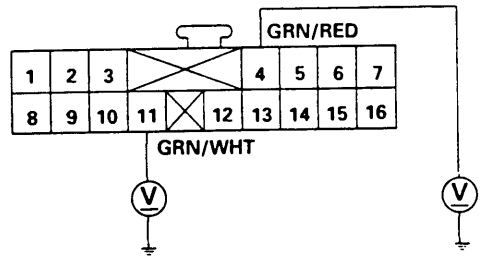
YES

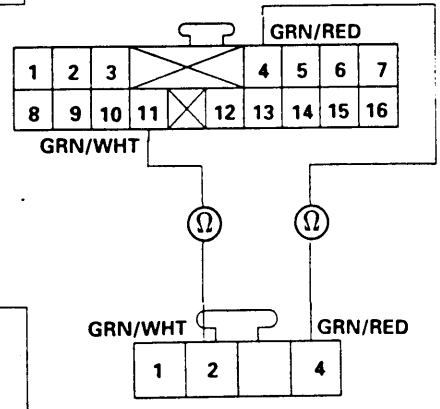
Check for loose wires or poor connections at the heater control panel 16P connector and at the recirculation control motor 4P connector. If the connections are good, replace the heater control panel.

HEATER CONTROL PANEL 16P CONNECTOR



Wire side of female terminals





RECIRCULATION CONTROL MOTOR 4P CONNECTOR

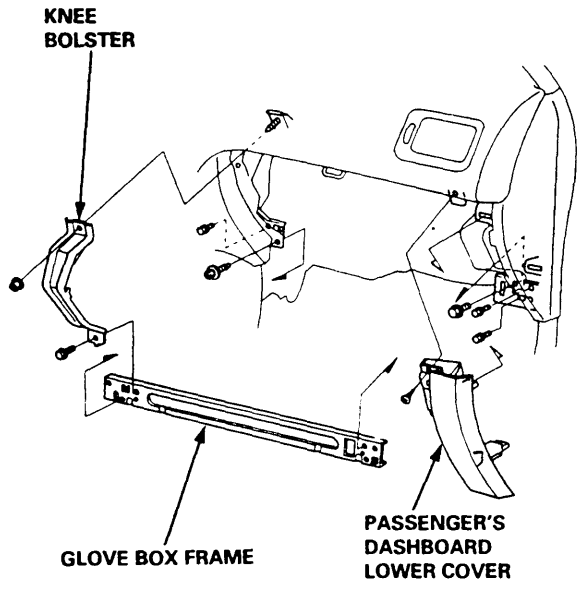
Wire side of female terminals

Blower Unit

Replacement

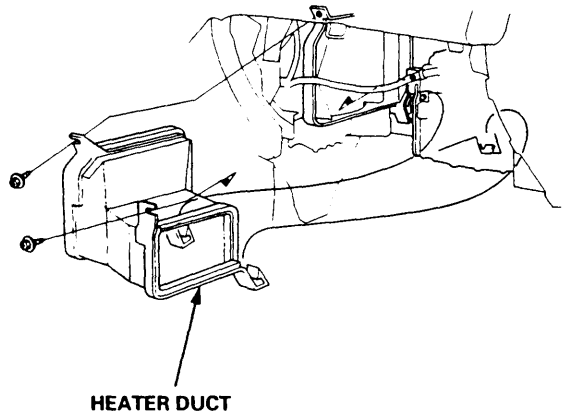
1. Remove the glove box (see section 20).

2. Remove the self-tapping screw and the passenger's dashboard lower cover. Remove the bolt, the nut and the knee bolster, then remove the bolts and the glove box frame.



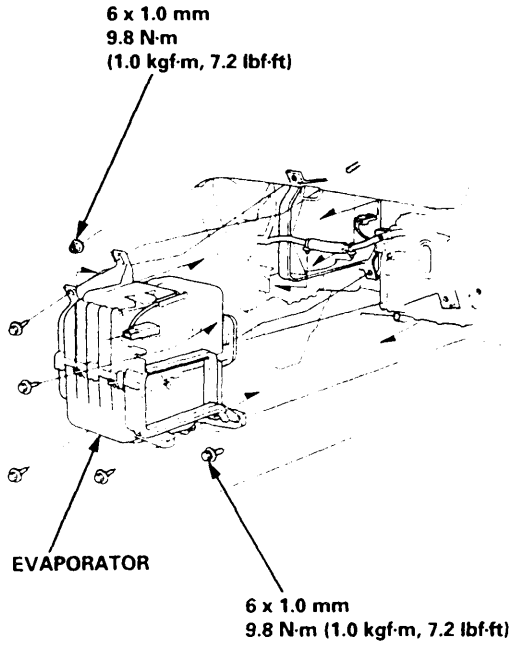
Without Air Conditioning

3-a. Remove the wire harness from the heater duct, then remove the self-tapping screws and the heater duct.

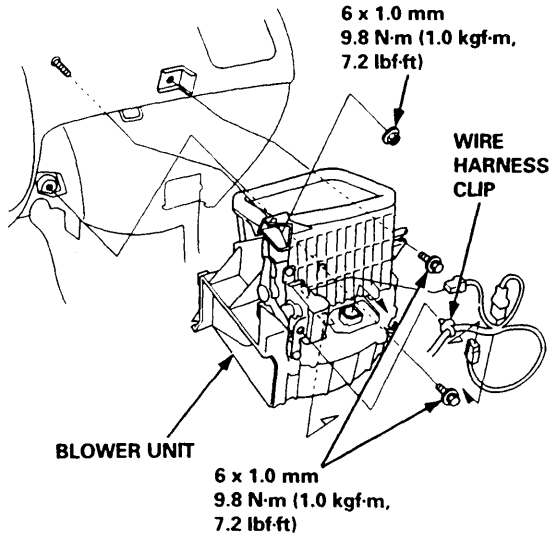


With Air Conditioning

3-b. Remove the evaporator (see page 22-27).



4. Disconnect the connectors from the blower motor, blower resistor and recirculation control motor. Remove the wire harness clip from the recirculation control motor, and release the wire harness from the clamp on the blower unit. Remove the mounting bolts, the mounting nut and the blower unit.

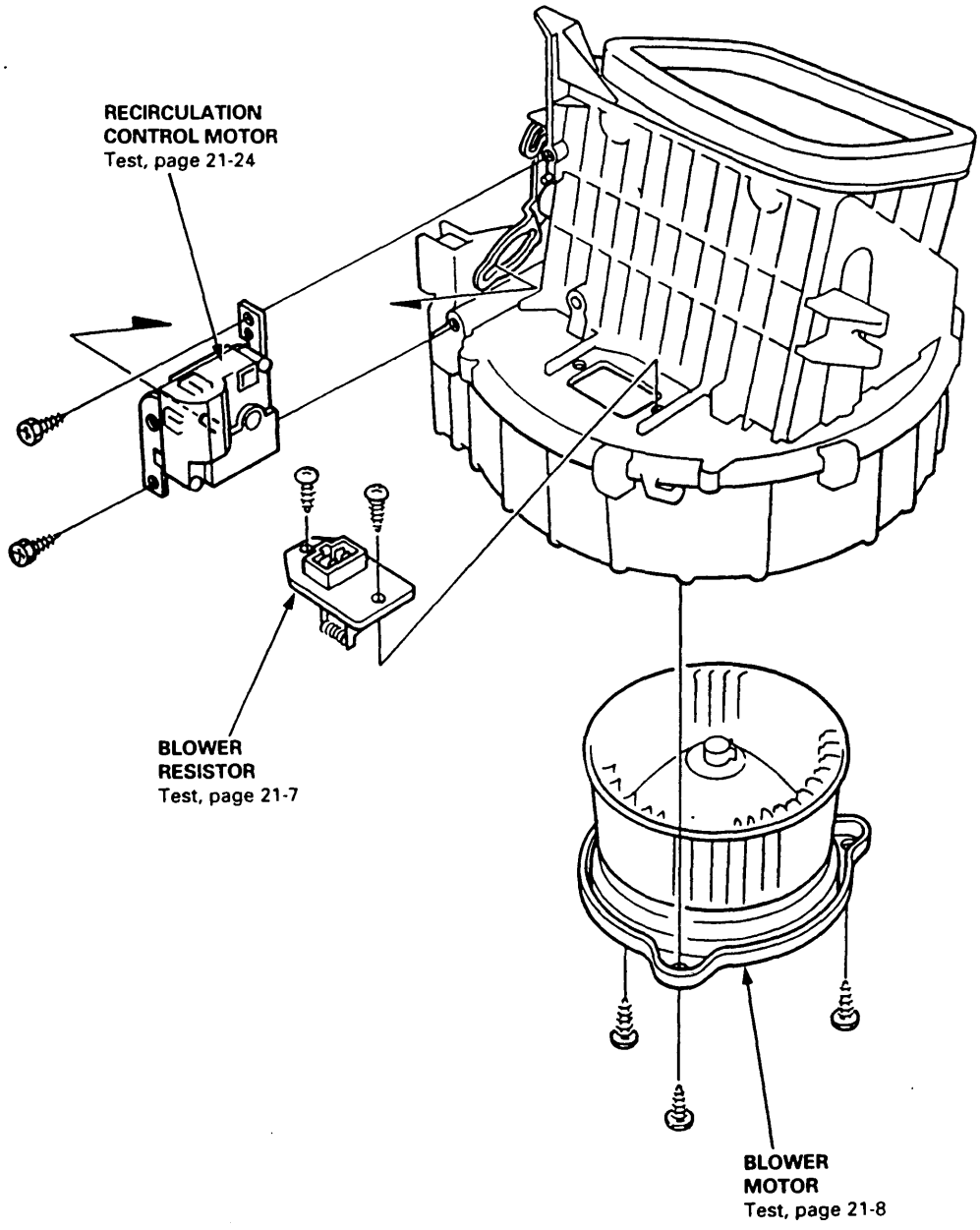


5. Install in the reverse order of removal. Make sure that there is no air leakage.

Overhaul

NOTE:

- The recirculation control motor, the blower resistor and the blower motor can be replaced without removing the blower unit.
- Before reassembly, make sure that the recirculation control door and linkage move smoothly without binding.
- After reassembly, make sure the recirculation control motor runs smoothly (see page 21-24).
- Make sure that there is no air leakage.



Heater Unit

Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

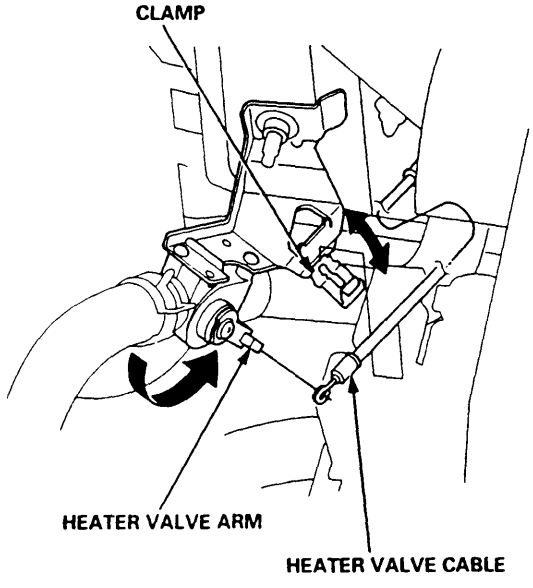
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.

2. Disconnect the negative cable from the battery.

3. When the engine is cool, set the temperature control lever to MAX. HOT (open the heater valve), then drain the engine coolant from the radiator (see section 10).

   ⚠ WARNING Do not remove the radiator cap when the engine is hot; the engine coolant is under pressure and could severely scald you.

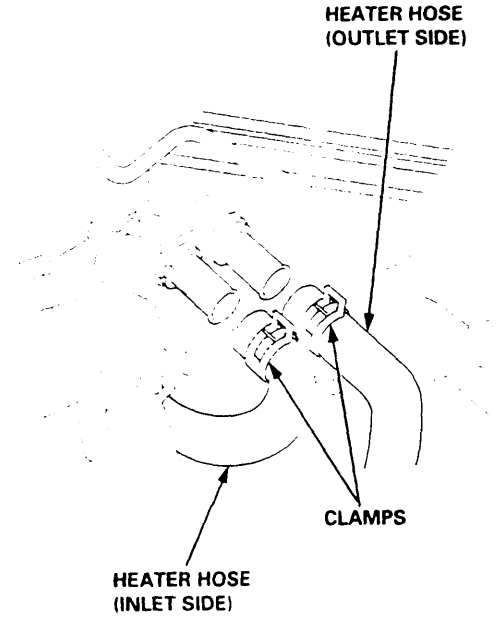
4. Open the clamp, then disconnect the heater valve cable from the heater valve arm.



5. Disconnect the heater hoses from the heater unit.

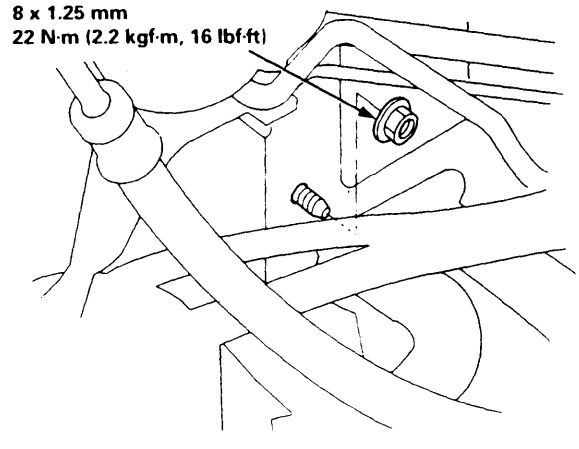
   CAUTION: Engine coolant will damage paint. Quickly rinse any spilled engine coolant from painted surfaces.

   NOTE: Engine coolant will run out when the hoses are disconnected; drain it into a clean drip pan.



6. Remove the mounting nut from the heater unit.

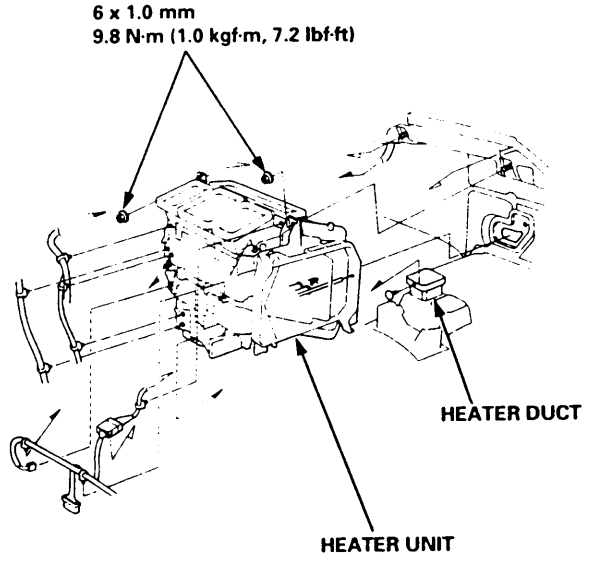
   NOTE: When removing the mounting nut, take care not to damage or bend the fuel lines, the brake lines, etc.



7. Remove the dashboard (see section 20).

8. Remove the heater duct (see page 21-16) or evaporator (see page 22-27).

9. Disconnect the connector from the mode control motor, and remove the wire harness clips and wire harness from the heater unit. Remove the clip from the heater duct, then remove the mounting nuts and the heater unit.



10. Install in the reverse order of removal. Make note of the following items.

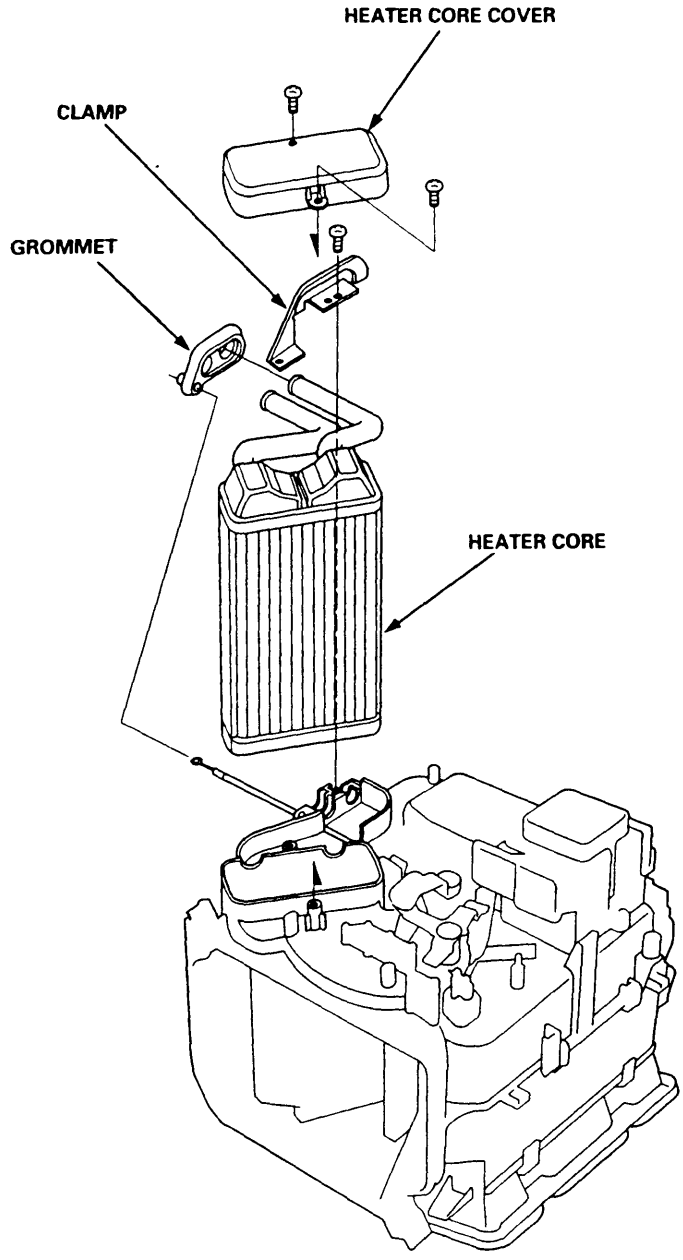
- Apply sealant to the grommets.
- Do not interchange the inlet and outlet heater hoses. Make sure that the clamps are secure.
- Refill the cooling system with engine coolant (see section 10).
- Adjust the air mix control cable and the heater valve cable (see page 21-21).
- Make sure that there is no air leakage.
- Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Heater Unit

Overhaul

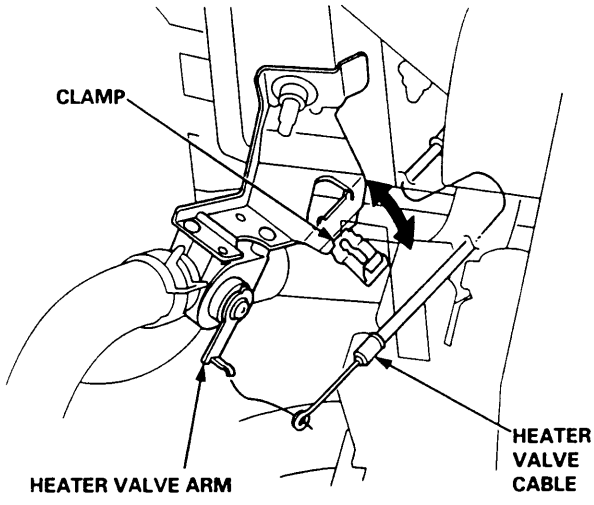
1. Remove the self-tapping screws and the heater core cover.
2. Pull out the grommet from the heater core pipes.
3. Remove the self-tapping screw and the clamp.
4. Pull out the heater core from the heater unit.

   NOTE: Be careful not to bend the inlet and outlet pipes during heater core removal.
5. Assemble in the reverse order of disassembly.

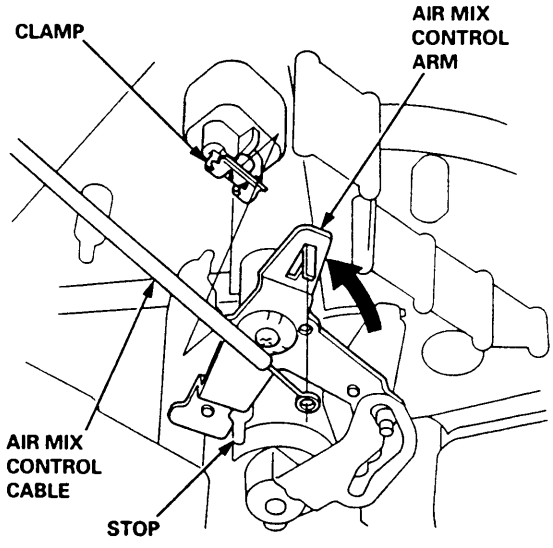


Adjustment

1. Under the hood. Open the cable clamp, then disconnect the heater valve cable from the heater valve arm.



2. Under the dash, disconnect the air mix control cable housing from the cable clamp, and air mix control cable from the air mix control arm.

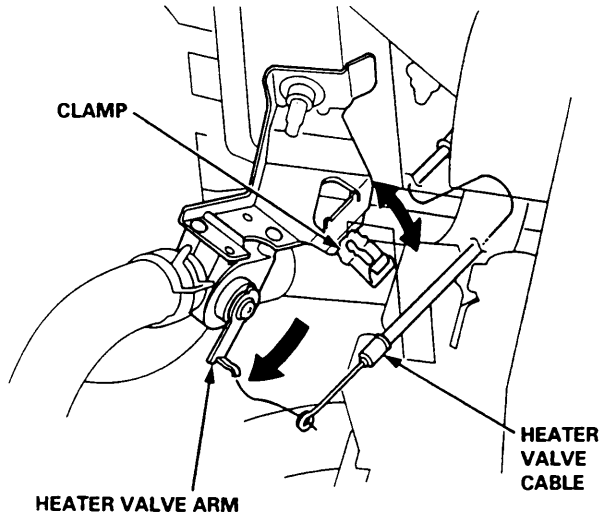


3. Set the temperature control lever to MAX. COOL.

4. With the air mix control cable attached to the air mix control arm, gently pull on the outer cable housing to fully close the door and to remove any slack in the cable. Don't pull to hard, or the temperature cotrol lever will move.

5. Hold the air mix control arm against the stop, then snap the air mix control cable housing into the cable clamp.

6. Under the hood, move the heater valve arm to the fully closed position, then attach the heater valve cable to the heater valve arm.

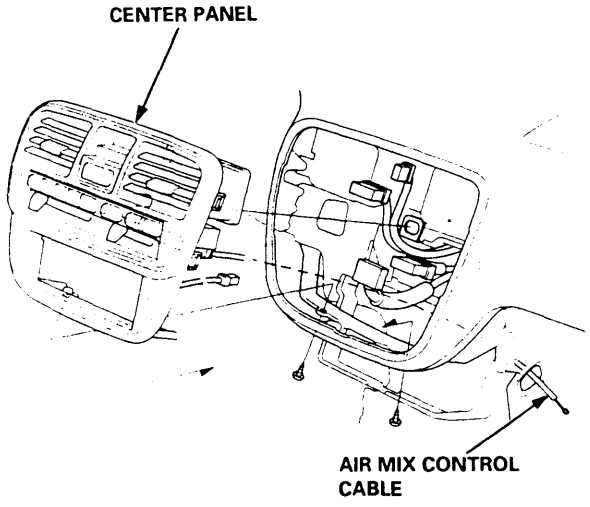


7. Hold the heater valve arm in the closed position, and gently pull on the heater cable outer housing to take up any slack, then install the heater valve cable housing into the cable clamp.

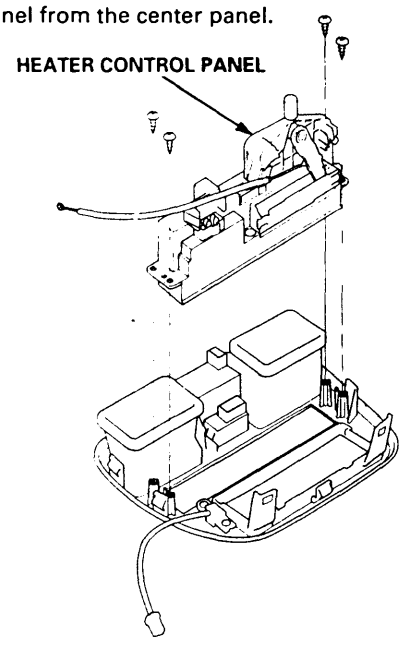
Heater Control Panel

Replacement

1. Remove the audio unit (see section 20).
   NOTE: 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 air mix control cable from the heater unit (see page 21-21).
3. Remove the center panel together with the heater control panel, then disconnect the connectors.

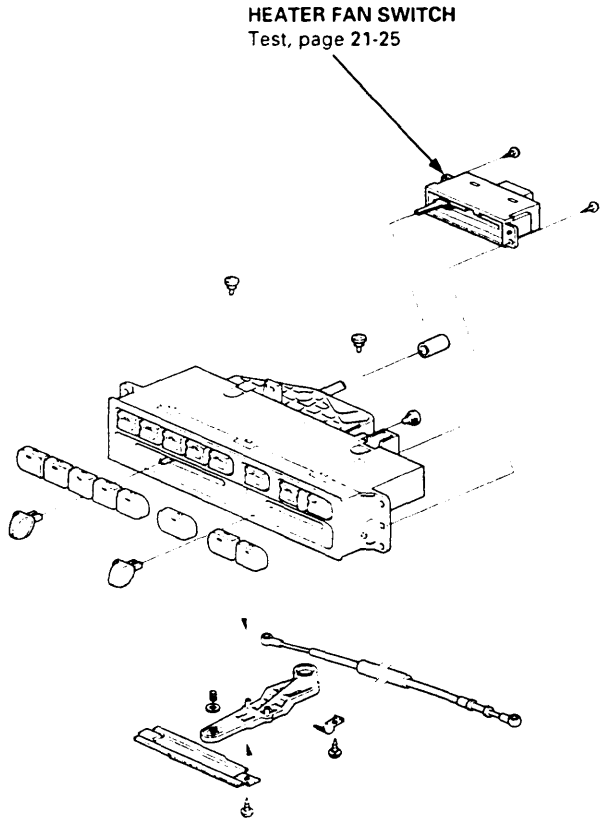


4. Remove the self-tapping screws and the heater control panel from the center panel.



5. Install in the reverse order of removal. Make note of th following items.
   - Adjust the air mix control cable and the heater valve cable (see page 21-21).
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Overhaul



Mode Control Motor

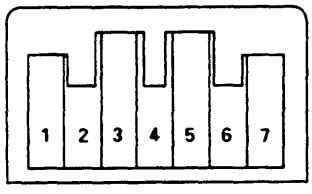
Test

1. Disconnect the 7P connector from the mode control motor.

2. Connect battery power to the No. 1 terminal, and ground the No. 7 terminal.

   CAUTION: Never connect the battery in the opposite direction.

MODE CONTROL MOTOR



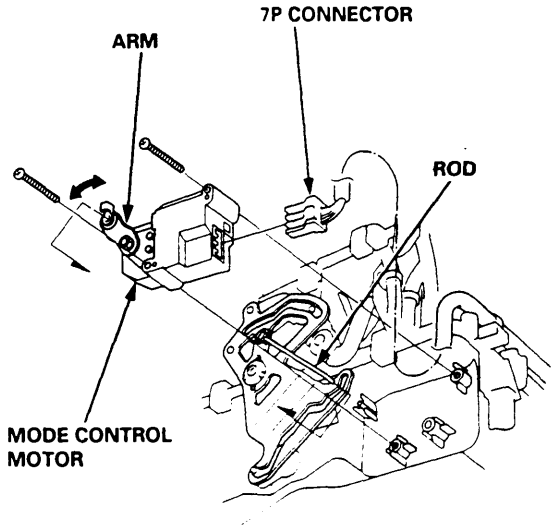
3. Using a jumper wire, connect the No. 7 terminal individually to the No. 2, 3, 4, 5 and 6 terminals in that order. Each time the connection is made, the mode control motor should run smoothly and stop.

   NOTE: If the mode control motor does not run when jumping the first terminal, jump that terminal again after jumping the other terminals. The mode control motor is OK if it runs when jumping the first terminal again.

4. If the mode control motor does not run in step 3, remove it, then check the mode control linkage and doors for smooth movement. If they move smoothly, replace the mode control motor.

Replacement

1. Disconnect the 7P connector from the mode control motor.



2. Remove the rod from the arm of the mode control motor.

3. Remove the self-tapping screws and the mode control motor.

4. Install in the reverse order of removal. After installation, make sure the mode control motor runs smoothly.

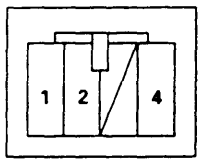
Recirculation Control Motor

Test

1. Disconnect the 4P connector from the recirculation control motor.
2. Connect battery power to the No. 1 terminal, and ground the No. 2 and No. 4 terminals; the recirculation control motor should run smoothly.

   CAUTION: Never connect the battery in the opposite direction.

RECIRCULATION CONTROL MOTOR



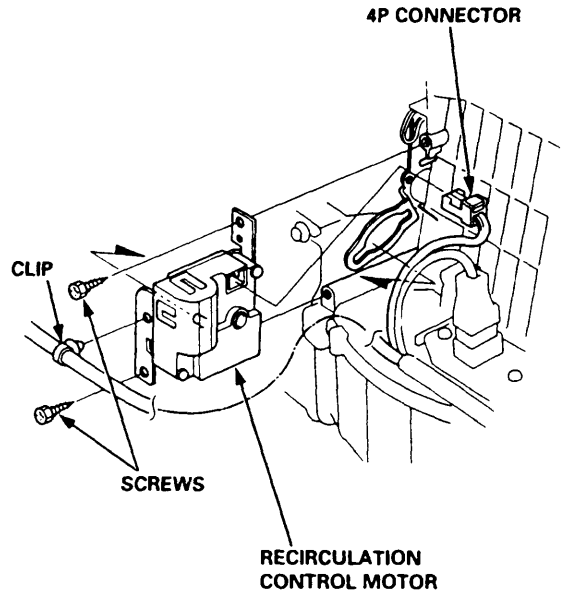
3. Disconnect the No. 2 or No. 4 terminals from ground; the recirculation control motor should stop at FRESH or RECIRCULATE.

   NOTE: Don't cycle the recirculation control motor for a long time.

4. If the recirculation control motor does not run in step 2, remove it, then check the recirculation control linkage and door for smooth movement. If they move smoothly, replace the recirculation control motor.

Replacement

1. Disconnect the 4P connector and the wire harness clip from the recirculation control motor.

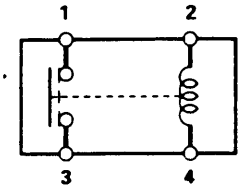


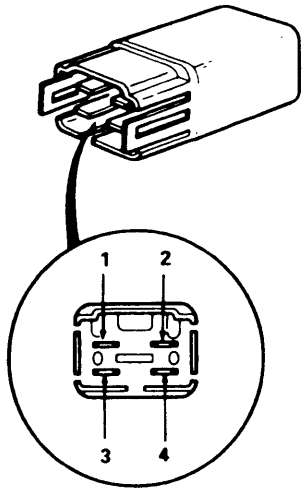
2. Remove the self-tapping screws and the recirculation control motor.
3. Install in the reverse order of removal. After installation, make sure the recirculation control motor runs smoothly.

Relay

Test

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, and there should be no continuity when power is disconnected.



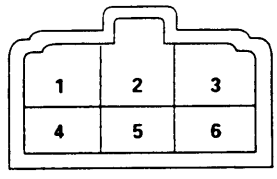


Heater Fan Switch

Test

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

Position \ Terminal	1	2	3	4	5	6
OFF						
•				○—○	○—○	
•	○—○			○—○	○—○	
•		○—○		○—○	○—○	
•			○—○	○—○	○—○	

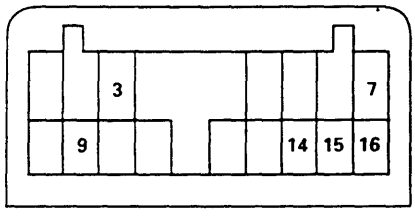


Mode Control Switch

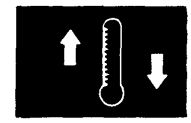
Test

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

Position \ Terminal	3	7	9	14	15	16
Heat			○		○	
Heat/Def			○	○		
Def	○		○			
Vent		○	○			
Heat/Vent			○			○



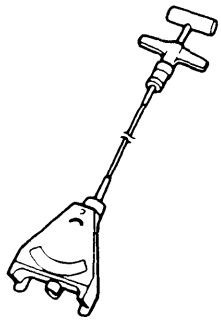
Air Conditioning



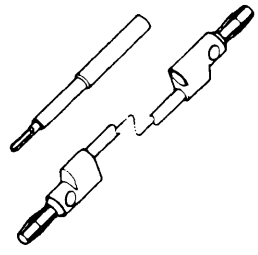
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	*07JGG – 001010A	Belt Tension Gauge	1	22-36
②	07SAZ – 001000A	Backprobe Set	2	22-12, 14
③	07947 – 6340300	Driver Attachment	1	22-33
④	07965 – 6920500	Hub Assembly Guide Attachment	1	22-34

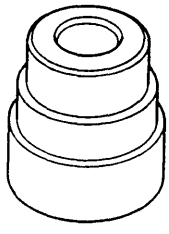
* Included in the Belt Tension Gauge Set, 07TGG – 001000A



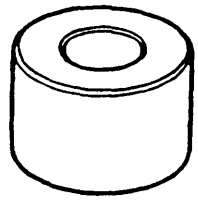
①



②

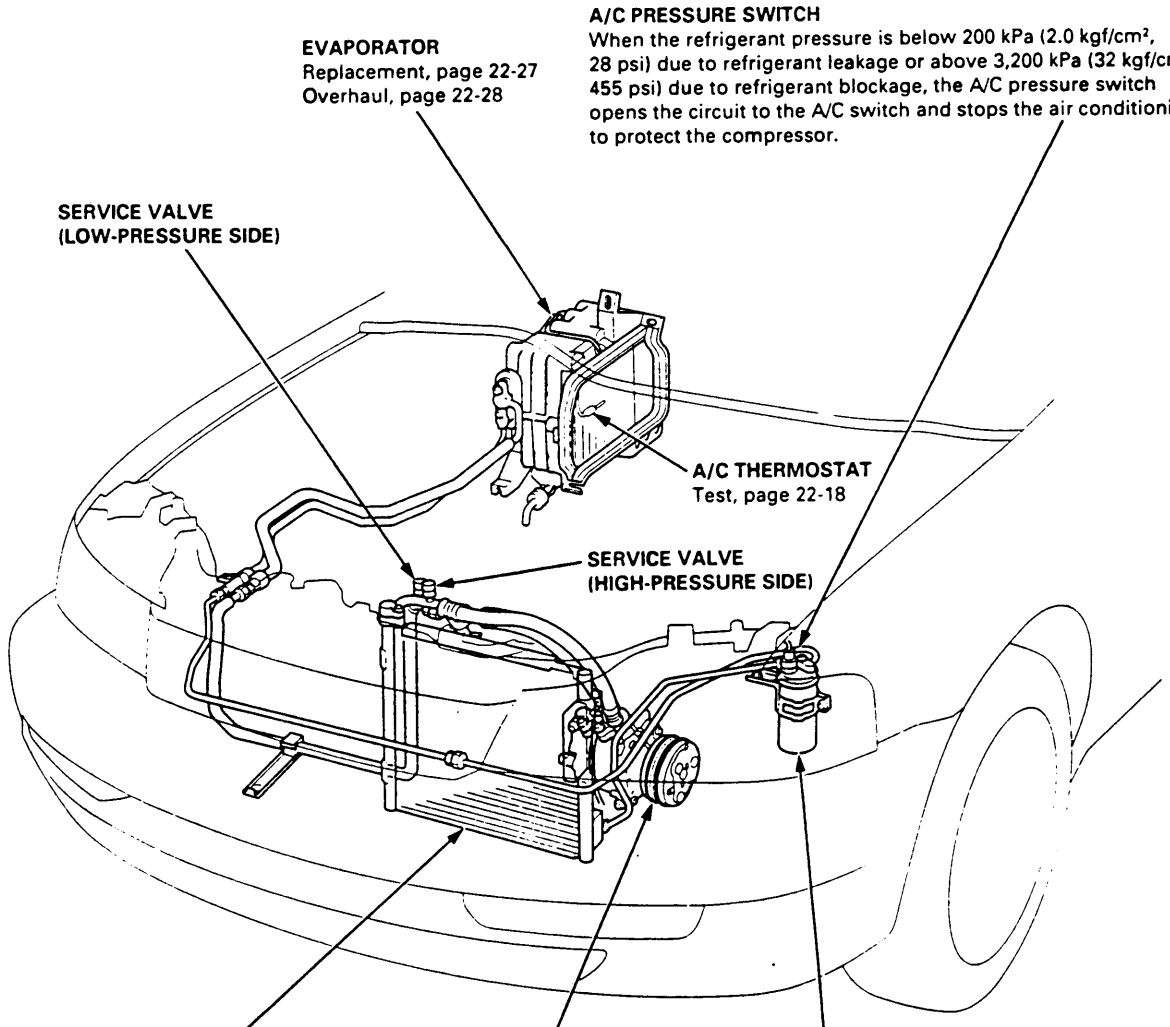


③



④

Illustrated Index



EVAPORATOR
Replacement, page 22-27
Overhaul, page 22-28

A/C PRESSURE SWITCH
When the refrigerant pressure is below 200 kPa (2.0 kgf/cm², 28 psi) due to refrigerant leakage or above 3,200 kPa (32 kgf/cm², 455 psi) due to refrigerant blockage, the A/C pressure switch opens the circuit to the A/C switch and stops the air conditioning to protect the compressor.

SERVICE VALVE (LOW-PRESSURE SIDE)

A/C THERMOSTAT
Test, page 22-18

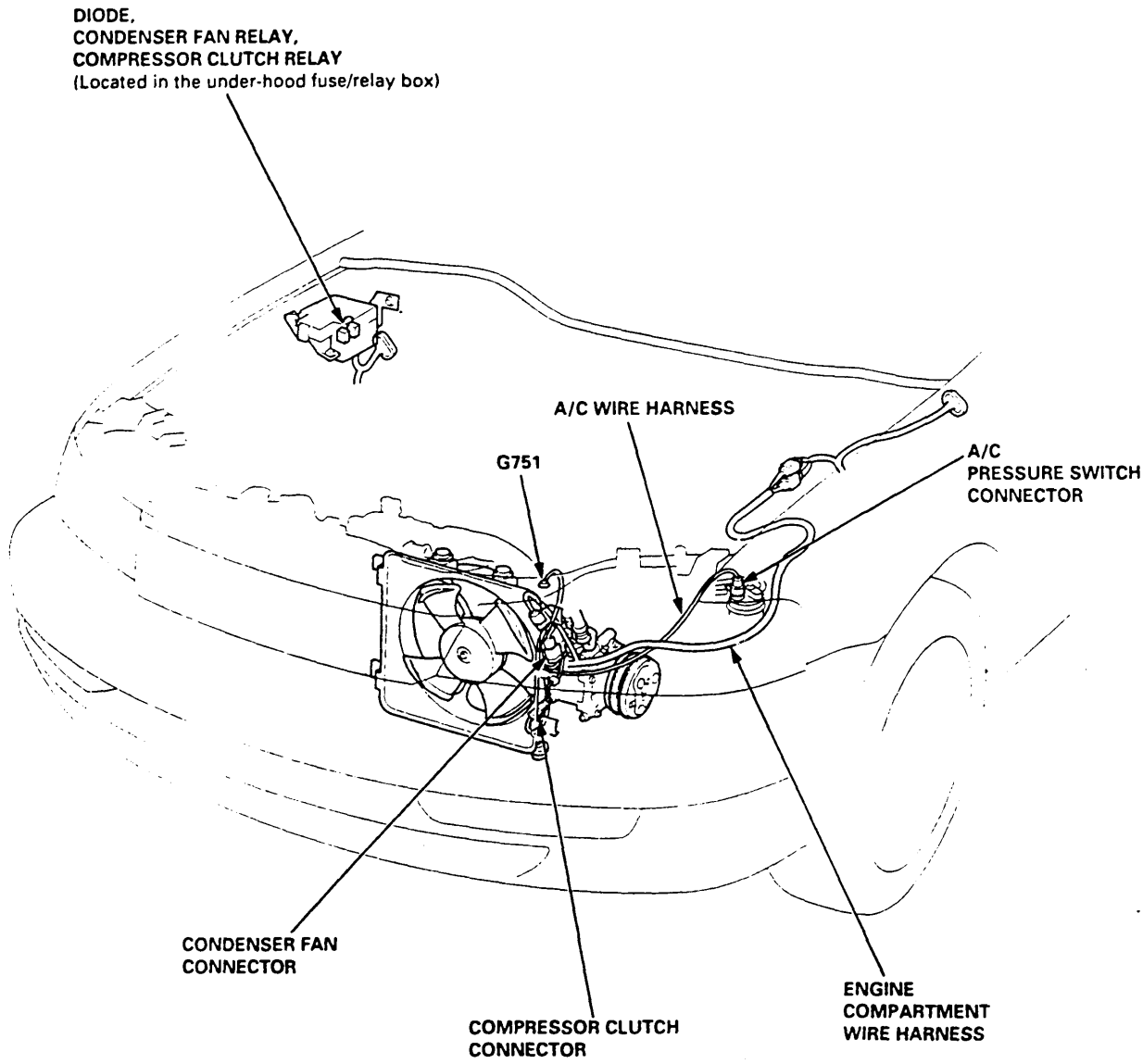
SERVICE VALVE (HIGH-PRESSURE SIDE)

CONDENSER
Replacement, page 22-37

RECEIVER/DRYER

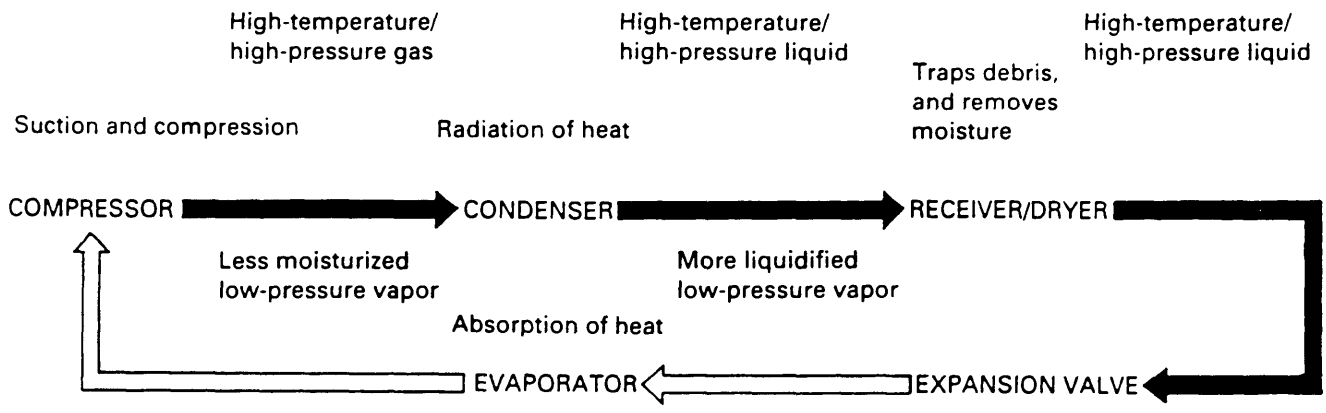
COMPRESSOR
Replacement, page 22-29
Clutch Inspection, page 22-32
Clutch Overhaul, page 22-33
Thermal Protector Replacement, page 22-35
Relief Valve Replacement, page 22-35

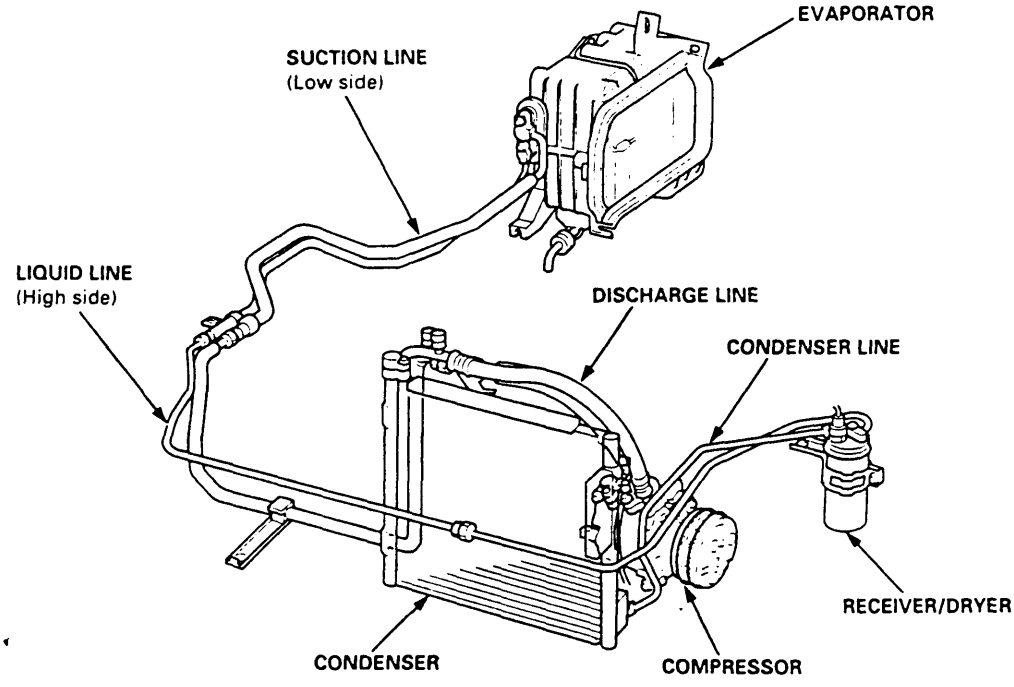
Wiring/Connector Locations



Description

The air conditioner system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.

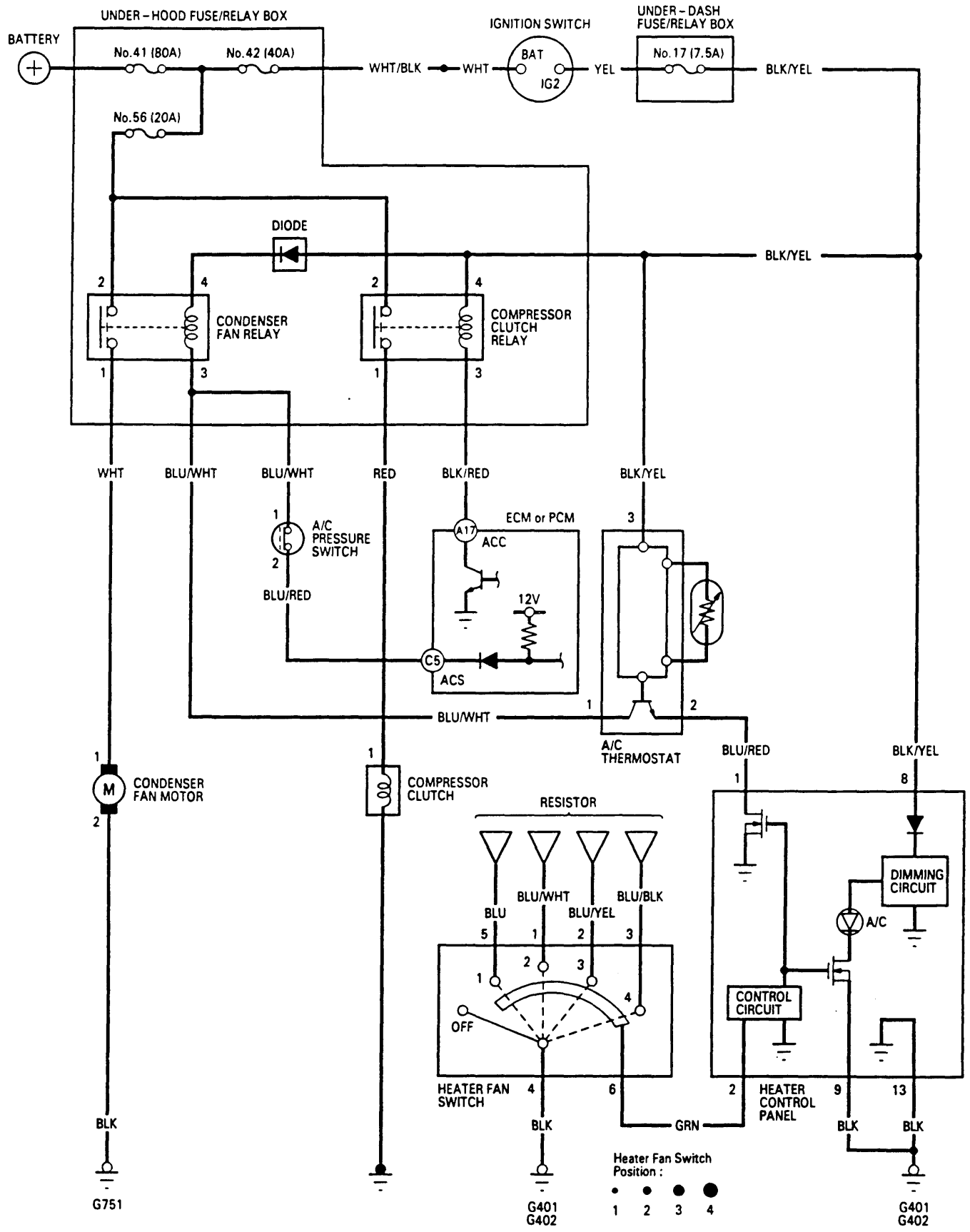




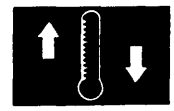
This vehicle uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- 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 (SP-10) designed for the R-134a compressor. Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- R-12 and R-134a refrigerant servicing equipment are not interchangeable. Use only a Recovery/Recycling/Charging System that is U.L.-listed and is certified to meet the requirements of SAE J2210 to service R-134a air conditioning systems.
- Always recover the refrigerant R-134a with an approved Recovery/Recycling/Charging System before disconnecting any A/C fitting.

Circuit Diagram



Troubleshooting



Symptom Chart

NOTE:
- Check the engine coolant level, and allow the engine to warm up before troubleshooting.
- Any abnormality must be corrected before continuing the test.
- Because of the precise measurements needed, use a multimeter when testing.
- Before performing any troubleshooting procedures check:
  — Fuse No. 56 (20 A) in the under-hood fuse/relay box and fuse No. 17 (7.5 A) in the under-dash fuse/relay box.
  — Grounds No. G401, G402, G751
  — Cleanliness and tightness of all connectors

Symptom	See page
Condenser fan does not run at all.	22-8
Compressor clutch does not engage.	22-11
A/C system does not come on (condenser fan and compressor).	22-15

Condenser Fan

Condenser fan does not run at all.

Check the No. 56 (20 A) fuse in the under-hood fuse/relay box, and the No. 17 (7.5 A) fuse in the under-dash fuse/relay box.

Are the fuses OK?

NO → **Replace the fuse(s), and recheck.**

YES

Remove the condenser fan relay, and test it (see page 22-18).

Is the relay OK?

NO → **Replace the condenser fan relay.**

YES

Check the under-hood fuse/relay box:
Measure the voltage between the No. 2 terminal of the condenser fan relay 4P socket and body ground.

Is there battery voltage?

NO → **Replace the under-hood fuse/relay box.**

YES

Check the condenser fan:
Connect the No. 1 and No. 2 terminals of the condenser fan relay 4P socket with a jumper wire.

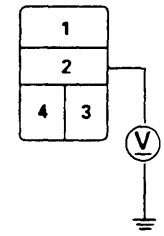
Does the condenser fan run?

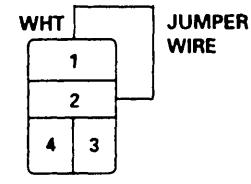
NO → To page 22-9

YES

To page 22-10

CONDENSER FAN RELAY 4P SOCKET





From page 22-8

Check for an open in the wire:
1. Disconnect the jumper wire.
2. Disconnect the condenser fan 2P connector.
3. Check for continuity between the No. 1 terminal of the condenser fan relay 4P socket and the No. 1 terminal of the condenser fan 2P connector.

Is there continuity?

NO → **Repair open in the wire between the condenser fan relay and the condenser fan.**

YES

Check for an open in the wire:
Check for continuity between the No. 2 terminal of the condenser fan 2P connector and body ground.

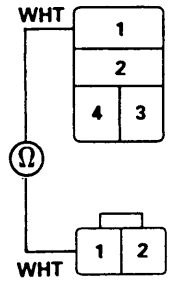
Is there continuity?

NO → **Check for an open in the wire between the condenser fan and body ground. If the wire is OK, check for poor ground at G751.**

YES

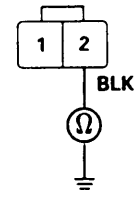
Replace the condenser fan motor.

CONDENSER FAN RELAY 4P SOCKET



CONDENSER FAN 2P CONNECTOR

Wire side of female terminals



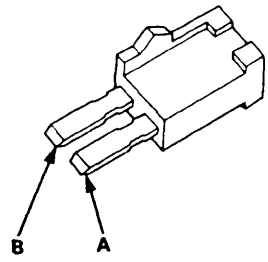
(cont'd)

Condenser Fan (cont'd)

From page 22-8

Check the diode:
1. Disconnect the jumper wire.
2. Remove the diode from the under-hood fuse/relay box.
3. Check for current flow in both directions between the A and B terminals.

NOTE: Use a multimeter with diode checking capabilities.



Is there current flow in only one direction?

NO → **Replace the diode.**

YES

Replace the under-hood fuse/ relay box.

Compressor

Compressor clutch does not engage.

Check the No. 56 (20 A) fuse in the under-hood fuse/relay box, and the No. 17 (7.5 A) fuse in the under-dash fuse/relay box.

Are the fuses OK? — NO → **Replace the fuse(s), and recheck.**

YES

Remove the compressor clutch relay, and test it (see page 22-18).

Is the relay OK? — NO → **Replace the compressor clutch relay.**

YES

Check the under-hood fuse/relay box:
Measure the voltage between the No. 2 terminal of the compressor clutch relay 4P socket and body ground.

Is there battery voltage? — NO → **Replace the under-hood fuse/relay box.**

YES

Check the compressor clutch:
Connect the No. 1 and No. 2 terminals of the compressor clutch relay 4P socket with a jumper wire.

Does the compressor clutch click? — YES → To page 22-12

NO

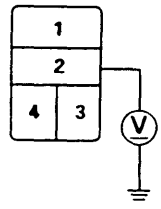
Check for an open in the wire:
1. Disconnect the jumper wire.
2. Disconnect the compressor clutch 1P connector.
3. Check for continuity between the No. 1 terminal of the compressor clutch relay 4P socket and the terminal of the compressor clutch 1P connector.

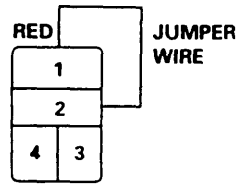
Is there continuity? — NO → **Repair open in the wire between the compressor clutch relay and the compressor clutch.**

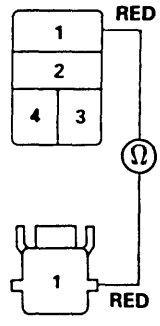
YES

Inspect the compressor clutch clearance, the thermal protector, and the compressor clutch field coil (see page 22-32).

COMPRESSOR CLUTCH RELAY 4P SOCKET







COMPRESSOR CLUTCH 1P CONNECTOR

Wire side of female terminals

(cont'd)

Compressor (cont'd)

From page 22-11

Check for an open in the wire:
1. Disconnect the jumper wire.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 4 terminal of the compressor clutch relay 4P socket and body ground.

Is there battery voltage?

NO → **Replace the under-hood fuse/ relay box.**

YES

Check for an open in the wire:
1. Turn the ignition switch OFF, then reinstall the compressor clutch relay.
2. Make sure the A/C and heater fan switches are OFF, then turn the ignition switch ON (II).
3. Using a *Backprobe Set (T/N 07SAZ – 001000A), measure the voltage between the No. 17 terminal of the ECM/PCM connector A (32P) and body ground with the ECM/PCM connectors connected.

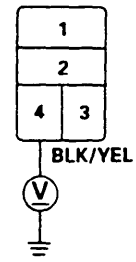
Is there battery voltage?

NO → **Repair open in the wire between the compressor clutch relay and the ECM/PCM.**

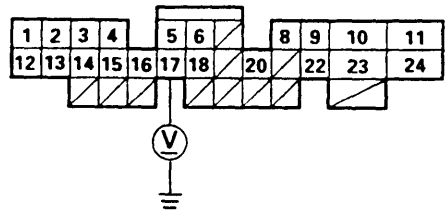
YES

To page 22-13

COMPRESSOR CLUTCH RELAY 4P SOCKET



ECM/PCM CONNECTOR A (32P)



Wire side of female terminals

* How to use the backprobe sets
Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. 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 comes in contact with the terminal end of the wire (see section 11).

From page 22-12

Check for an open in the wire:
1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal and body ground.

Is there battery voltage? — NO → **Repair open in the wire between the condenser fan relay and the A/C pressure switch.**

YES

Check the A/C pressure switch:
1. Turn the ignition switch OFF.
2. Check for continuity between the No. 1 and No. 2 terminals of the A/C pressure switch.

Is there continuity? — YES → To page 22-14

NO

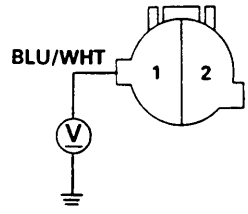
Check for A/C system pressure.

Is the pressure within specifications? — NO → **Repair the A/C pressure problem.**

YES

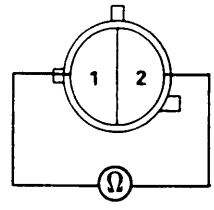
Replace the A/C pressure switch.

A/C PRESSURE SWITCH 2P CONNECTOR



Wire side of female terminals

A/C PRESSURE SWITCH



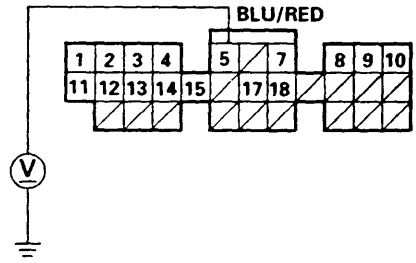
(cont'd)

Compressor (cont'd)

From page 22-13

Check for an open in the wire:
1. Reconnect the A/C pressure switch 2P connector.
2. Turn the A/C and heater fan switches ON, then turn the ignition switch ON (II).
3. Using a *Backprobe Set (T/N 07SAZ – 001000A), measure the voltage between the No. 5 terminal of the ECM/PCM connector C (31P) and body ground with the ECM/PCM connectors connected.

ECM/PCM CONNECTOR C (31P)



Wire side of female terminals

Is there less than 1 volt?

NO → **Repair open in the wire between the A/C pressure switch and the ECM/PCM.**

YES

Check for loose wires or poor connections at the ECM/PCM connectors A (32P) and C (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.

* How to use the backprobe sets
Connect the backprobe adapters to the stacking patch cords, and connect the cords to a multimeter. 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 comes in contact with the terminal end of the wire (see section 11).

A/C System

A/C system does not come on (compressor and fan).

Check the No. 56 fuse in the under-hood fuse/relay box and the No. 17 fuse in the under-dash fuse/relay box.

Are the fuses OK? — NO → **Replace the fuse(s), and recheck.**

YES

Check for an open in the wire:
1. Remove the condenser fan relay from the under-hood fuse/relay box.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the No. 4 terminal of the condenser fan relay 4P socket and body ground.

Is there battery voltage? — NO → **Repair open in the wire between the No. 17 fuse and the condenser fan relay.**

YES

Check the under-hood fuse/relay box:
Measure the voltage between the No. 2 terminal of the condenser fan relay 4P socket and body ground.

Is there battery voltage? — NO → **Replace the under-hood fuse/relay box.**

YES

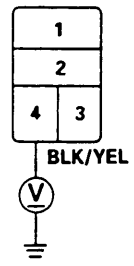
Check for an open in the wire:
1. Turn the ignition switch OFF, and reinstall the condenser fan relay.
2. Disconnect the A/C thermostat 3P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 3 terminal and body ground.

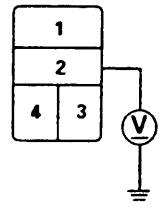
Is there battery voltage? — NO → **Repair open in the wire between the No. 17 fuse and the A/C thermostat.**

YES

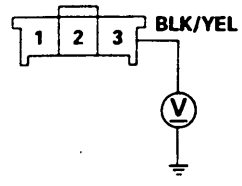
To page 22-16

CONDENSER FAN RELAY 4P SOCKET





A/C THERMOSTAT 3P CONNECTOR



Wire side of female terminals

(cont'd)

A/C System (cont'd)

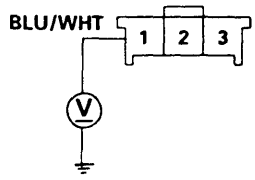
From page 22-15

Check for an open in the wire:
Measure the voltage between the No. 1 terminal of the A/C thermostat 3P connector and body ground.

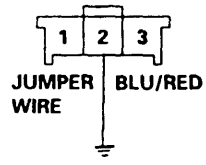
Is there battery voltage?

NO → **Repair open in the wire between the condenser fan relay and the A/C thermostat.**

YES



Check the A/C thermostat:
1. Turn the ignition switch OFF.
2. Reconnect the A/C thermostat 3P connector.
3. Connect the No. 2 terminal to ground with a jumper wire.
4. Start the engine.



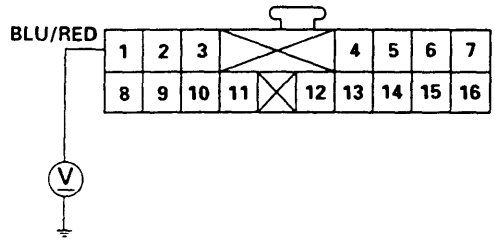
Does the condenser fan run and does the compressor clutch engage?

NO → **Replace the A/C thermostat.**

YES

Check for an open in the wire:
1. Turn the ignition switch OFF, then disconnect the jumper wire.
2. Remove the audio unit (see section 20), and disconnect the heater control panel 16P connector.
3. Turn the ignition switch ON (II).
4. Measure the voltage between the No. 1 terminal and body ground.

HEATER CONTROL PANEL 16P CONNECTOR



Wire side of female terminals

Is there battery voltage?

NO → **Repair open in the wire between the A/C thermostat and the heater control panel.**

YES

To page 22-17

From page 22-16

Check for an open in the wire:
1. Turn the ignition switch OFF.
2. Disconnect the heater fan switch 6P connector.
3. Check for continuity between the No. 2 terminal of the heater control panel 16P connector and the No. 6 terminal of the heater fan switch 6P connector.

Is there continuity?

NO → **Repair open in the wire between the heater control panel and the heater fan switch.**

YES

Check for an open in the wire: Check for continuity between the No. 4 terminal of the heater fan switch 6P connector and body ground.

Is there continuity?

NO → **Check for an open in the wire between the heater fan switch and body ground. If the wire is OK, check for poor ground at G401 and G402.**

YES

Test the heater fan switch (see page 21-25).

Is the heater fan switch OK?

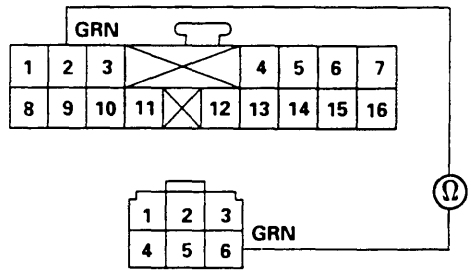
NO → **Replace the heater fan switch.**

YES

Check for loose wires or poor connections at the heater control panel 16P connector. If the connections are good, replace the heater control panel.

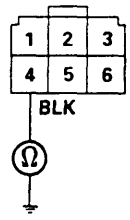
HEATER CONTROL PANEL 16P CONNECTOR

Wire side of female terminals



HEATER FAN SWITCH 6P CONNECTOR

Wire side of female terminals



A/C Thermostat

Test

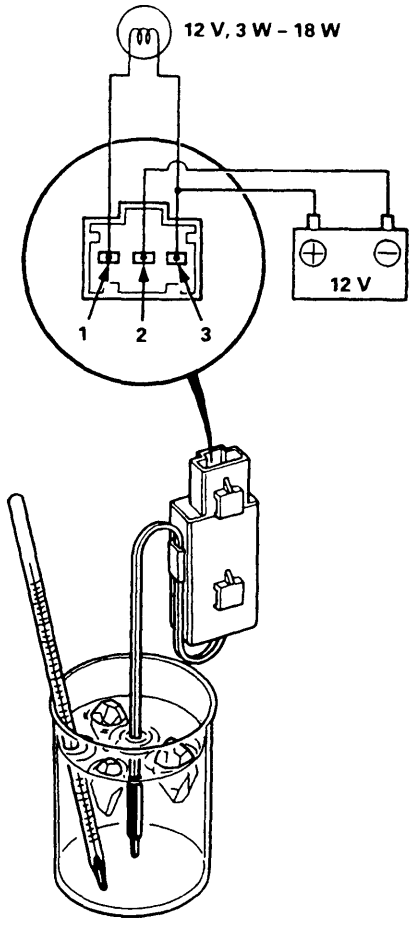
Connect battery power to the No. 3 terminal, ground the No. 2 terminal, and connect a test light between the No. 1 and No. 3 terminals.

NOTE: Use a 12 V, 3 W – 18 W test light.

Dip the A/C thermostat into a cup filled with ice water, and check the test light.

The light should go off at 36 – 39°F (2 – 4°C) or less, and should come on at 39 – 41°F (4 – 5°C) or more.

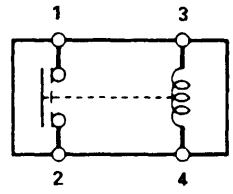
If the light doesn't come on and go off as specified, replace the A/C thermostat.

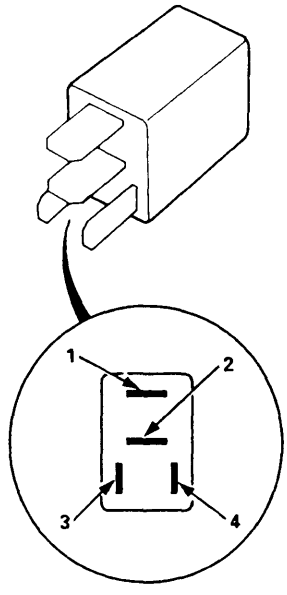


Relay

Test

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, and there should be no continuity when power is disconnected.





A/C Service Tips and Precautions

The air conditioner 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 conditioner system or your servicing equipment will result.
* Sanden SP-10:
- P/N 38897 – P13 – A01AH: 120 mℓ (4 fl·oz, 4.2 Imp·oz)
- P/N 38899 – P13 – A01: 40 mℓ (1 1/3 fl·oz, 1.4 Imp·oz)

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 conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

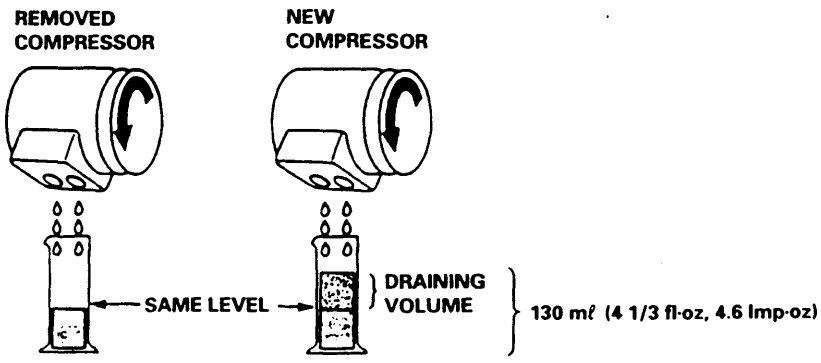
⚠WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

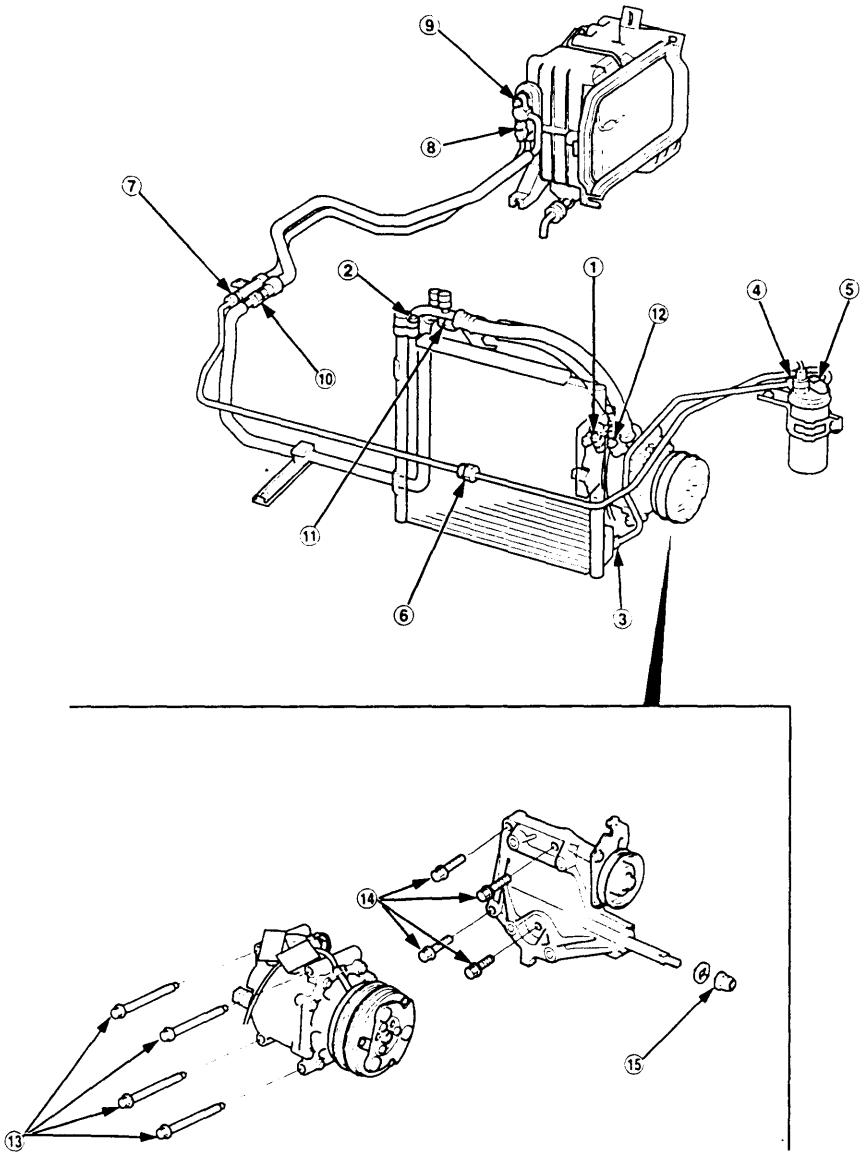
1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, use a R-134a refrigerant Recovery/Recycling/Charging System; don't release refrigerant into the atmosphere.
6. Add refrigerant oil after replacing the following parts:

   NOTE:
   - 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 the refrigerant oil contacts the paint, wash it off immediately.

   Condenser ..... 20 mℓ (2/3 fl·oz, 0.7 Imp·oz)
   Evaporator ..... 45 mℓ (1 2/3 fl·oz, 1.6 Imp·oz)
   Line or hose ..... 10 mℓ (1/3 fl·oz, 0.4 Imp·oz)
   Receiver/Dryer ..... 10 mℓ (1/3 fl·oz, 0.4 Imp·oz)
   Leakage repair ..... 25 mℓ (5/6 fl·oz, 0.9 Imp·oz)
   Compressor ..... For compressor replacement, subtract the volume of oil drained from the removed compressor from 130 mℓ (4 1/3 fl·oz, 4.6 Imp·oz), and drain the calculated volume of oil from the new compressor: 130 mℓ (4 1/3 fl·oz, 4.6 Imp·oz) — Volume of removed compressor = Volume to drain from new compressor.
   NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 mℓ (1 2/3 fl·oz, 1.8 Imp·oz) from the new compressor.



A/C System Torque Specifications



① Discharge hose to the compressor (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
② Discharge hose to the condenser (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
③ Condenser line to the condenser (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
④ Condenser line to the receiver/dryer (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑤ Receiver line A to the receiver/dryer (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑥ Receiver line B to the receiver line A	13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑦ Receiver line C to the receiver line B	13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑧ Receiver line C to the evaporator (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑨ Suction line B to the evaporator (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑩ Suction line A to the suction line B	31 N·m (3.2 kgf·m, 23 lbf·ft)
⑪ Suction hose to the suction line A	31 N·m (3.2 kgf·m, 23 lbf·ft)
⑫ Suction hose to the compressor (6 x 1.0 mm)	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑬ Compressor to the compressor bracket (8 x 1.25 mm)	24 N·m (2.4 kgf·m, 17 lbf·ft)
⑭ Compressor bracket to the cylinder block (10 x 1.25 mm)	44 N·m (4.5 kgf·m, 33 lbf·ft)
⑮ Compressor bracket to the left front mount (12 x 1.25 mm)	59 N·m (6.0 kgf·m, 43 lbf·ft)

Pressure Test Chart

NOTE: Performance Test is on page 22-22.

Test results	Related symptoms	Probable cause	Remedy
Discharge (high) pressure abnormally high	After stopping compressor, pressure drops to about 200 kPa (2.0 kgf/cm², 28 psi) quickly, and then falls gradually.	Air in system	Recover, evacuate, and recharge with specified amount. Evacuation: see page 22-25 Charging: see page 22-26
	Reduced or no air flow through condenser	• Clogged condenser fins • Condenser fan not working properly	• Clean • Check voltage and fan rpm. • Check fan direction.
	Line to 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 compressor. Low side is higher than normal.	• Faulty compressor discharge valve • Faulty compressor seal	Replace the 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 • Faulty expansion valve	Replace the expansion valve.
	Discharge temperature is low, and the air flow from vents is restricted.	Frozen evaporator	Run the fan with compressor off, then check A/C thermostat.
	Expansion valve is frosted.	Clogged expansion valve	Clean or replace.
	Receiver/dryer outlet is cool, and inlet is warm (should be warm during operation).	Clogged receiver/dryer	Replace
Suction pressure abnormally high	Low-pressure hose and check joint are cooler than the temperature around evaporator.	• Expansion valve open too long • Loose expansion capillary tube	Repair or replace.
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Recover, evacuate, and recharge with specified amount.
	High and low pressure are equalized as soon as the compressor is stopped, and both gauges fluctuate while running.	• Faulty gasket • Faulty high pressure valve • Foreign particle stuck in high-pressure valve	Replace the compressor.
Suction and discharge pressures abnormally high	Reduced air flow through condenser.	• Clogged condenser fins • Condenser fan not working properly	• Clean condenser. • Check voltage and fan rpm. • Check fan direction.
Suction and discharge pressure 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	Compressor clutch is dirty.	Compressor shaft seal leaking	Replace the compressor.
	Compressor bolt(s) are dirty.	Leaking around bolt(s)	Tighten bolt(s) or replace compressor.
	Compressor gasket is wet with oil.	Gasket leaking	Replace the compressor.

A/C System Service

Performance Test

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 conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

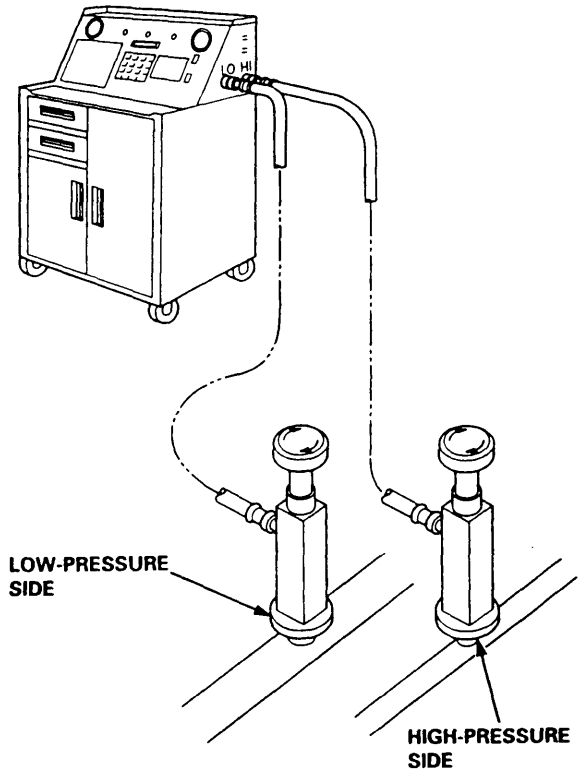
1. Connect a R-134a refrigerant Recover/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.

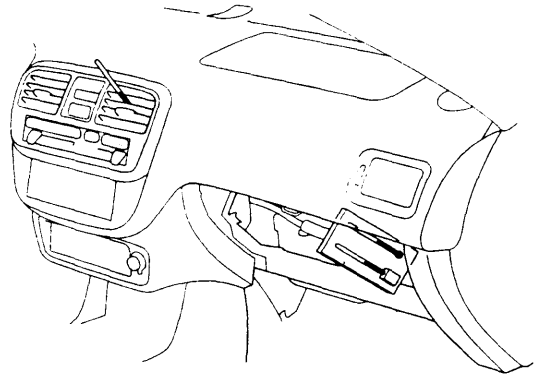
2. Insert a thermometer in the center air vent. Determine the relative humidity and air temperature.

3. Test conditions:
   - Avoid direct sunlight.
   - Open hood.
   - Open front doors.
   - Set the temperature control lever to MAX. COOL, the mode control switch on VENT and the recirculation control switch on RECIRCULATE.
   - Turn the A/C switch on, and the heater fan switch on MAX.
   - Run the engine at 1,500 rpm.
   - No driver or passengers in vehicle

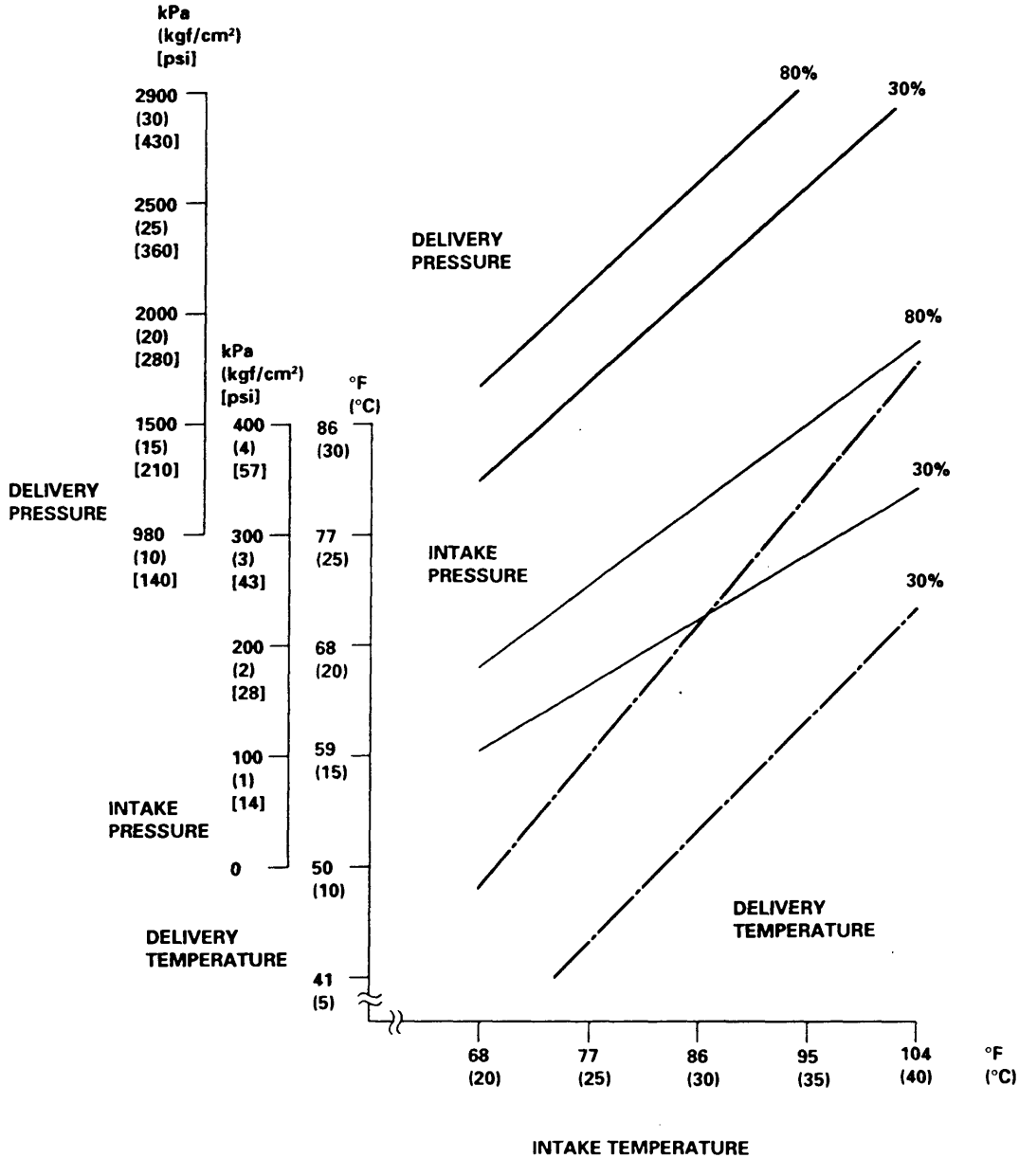
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent and the high and low system pressure from the A/C gauges.

Recovery/Recycling/Charging System





5. 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 one line above and one line below the humidity level (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.



A/C System Service

Recovery

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 conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

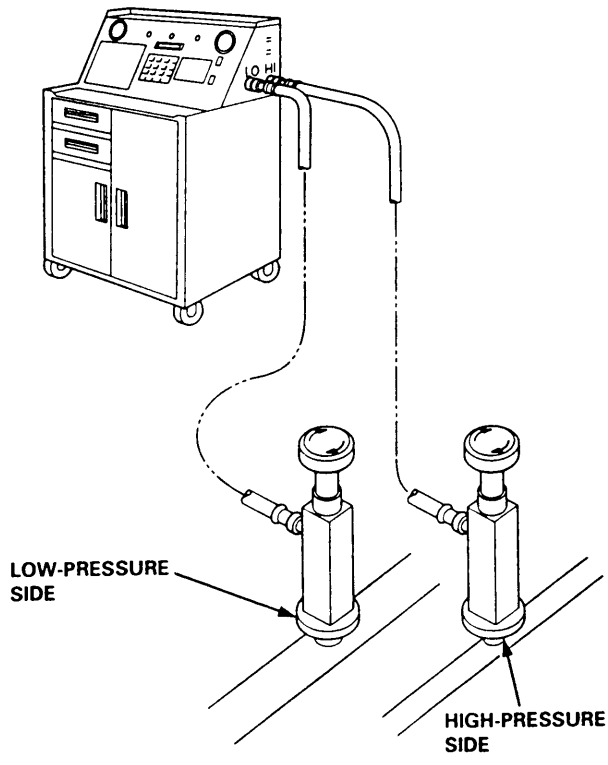
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, 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.

   NOTE: Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

Recovery/Recycling/Charging System



Evacuation

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 conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

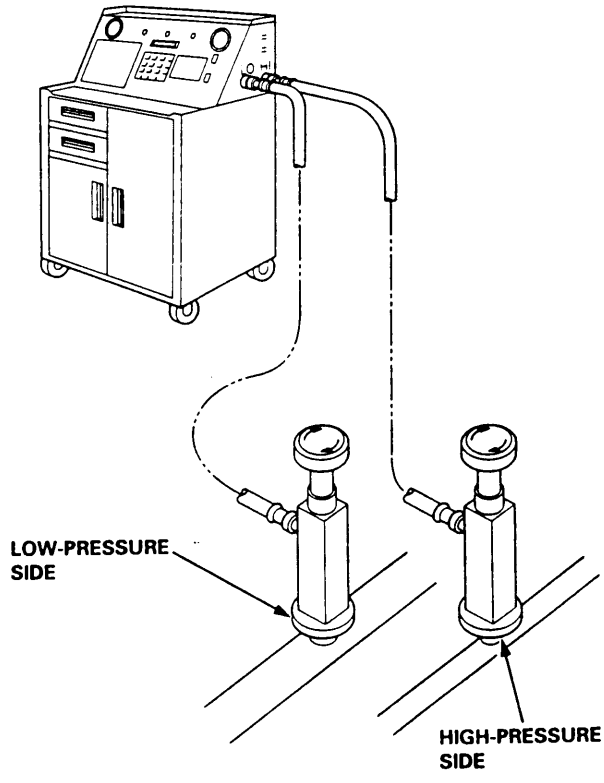
Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant Recovery/Recycling/Charging System. (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 a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.

   NOTE: If 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 Leak Test).

Recovery/Recycling/Charging System



A/C System Service

Charging

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 conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

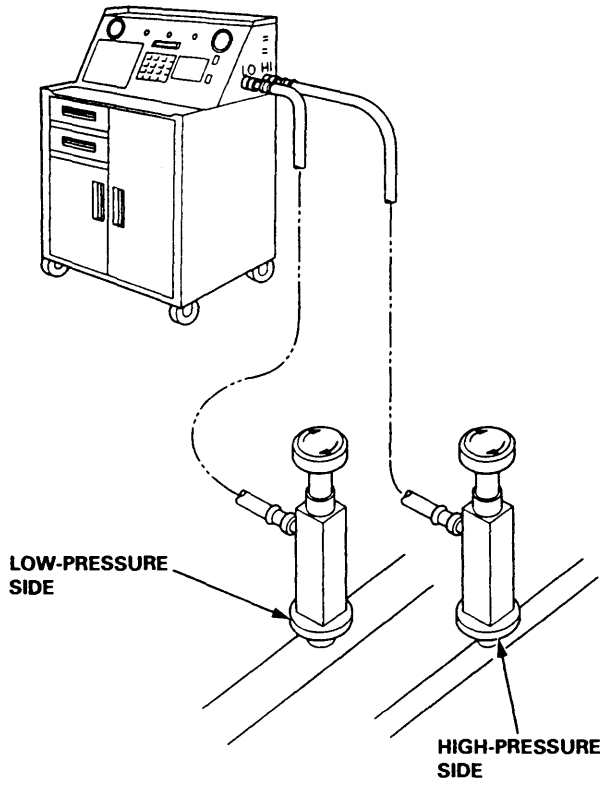
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

Refrigerant capacity: 650^{+0}_{-50} g ($22.9^{+0}_{-1.8}$ oz)

CAUTION: Do not overcharge the system; the compressor will be damaged.

Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown, following the equipment manufacturer's instructions.

Recovery/Recycling/Charging System



Leak Test

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 conditioner system.

CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

⚠ WARNING Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant Recovery/Recycling/Charging System to the vehicle, as shown in the previous column following the equipment manufacturer's instructions.

   NOTE: Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

2. Open high-pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

   Refrigerant capacity: 650^{+0}_{-50} g ($22.9^{+0}_{-1.8}$ oz)

3. Check the system for leaks using a 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 according to the Recovery Procedure on page 22-24.

5. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 22-25).

Evaporator

Replacement

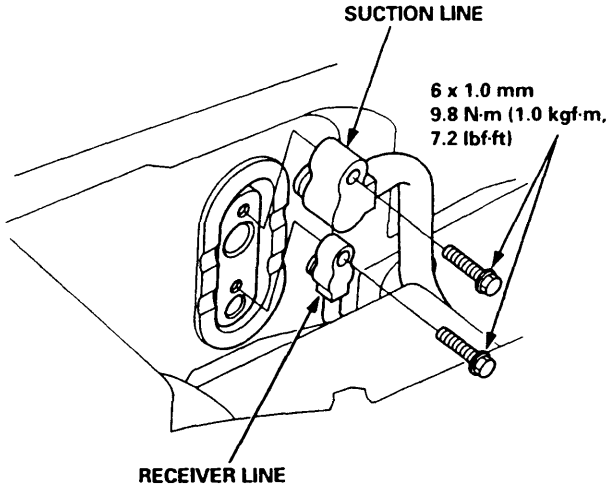
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.

2. Remove the battery.

3. Recover the refrigerant with a Recovery/Recycling/Charging System (see page 22-24).

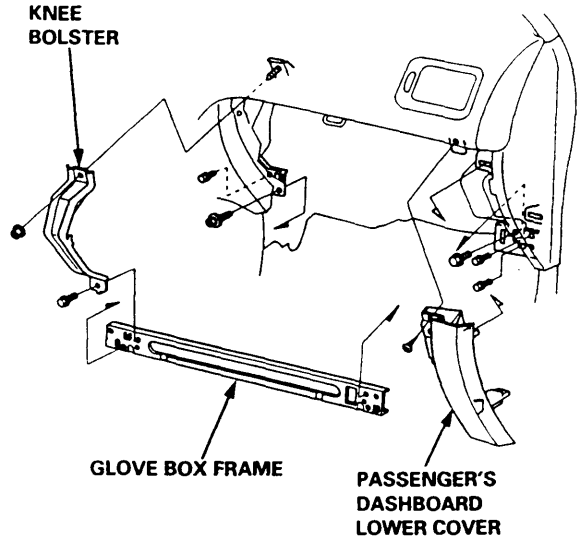
4. Remove the bolts, then disconnect the suction and receiver lines from the evaporator.

   NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

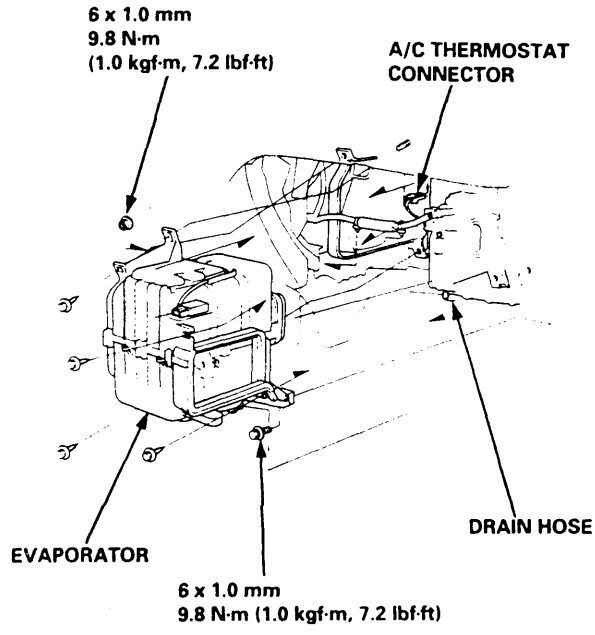


5. Remove the glove box (see section 20).

6. Remove the self-tapping screw and the passenger's dashboard lower cover. Remove the bolt, the nut and the knee bolster, then remove the bolts and the glove box frame.



7. Disconnect the connector from the A/C thermostat, and remove the wire harness from the evaporator. Remove the self-tapping screws, the mounting bolt and the mounting nut. Disconnect the drain hose, then remove the evaporator.



8. Install in the reverse order of removal. Make note of the following items.

   - If you're installing a new evaporator, add refrigerant oil (SP-10) (see page 22-19).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
     NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Apply sealant to the grommets.
   - Make sure that there is no air leakage.
   - Charge the system (see page 22-26), and test its performance (see page 22-22).
   - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

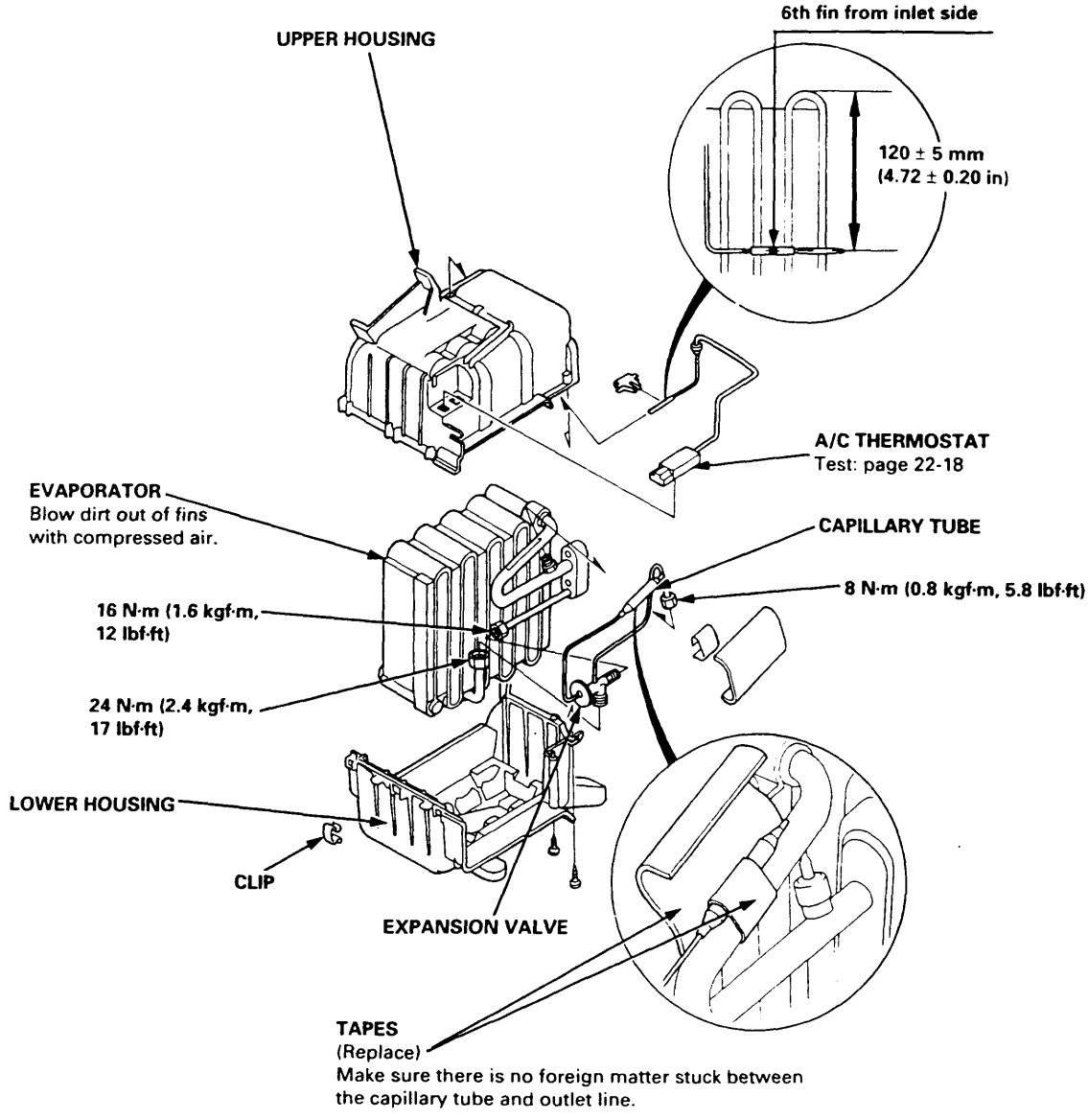
Evaporator

Overhaul

1. Pull out the A/C thermostat sensor from the evaporator fins.
2. Remove the self-tapping screws and clamps from the housings.
3. Carefully separate the housings, then remove the evaporator.
4. If necessary, remove the expansion valve.

   NOTE: When loosening the nuts of the expansion valve, use a second wrench to hold the expansion valve or the evaporator line. Otherwise, they can be damaged.
5. Assemble in the reverse order of disassembly. Make note of following items.

   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
     NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Install the expansion valve capillary tube with the capillary tube in contact with the outlet line, and wrap it with tape.
   - Reinstall the A/C thermostat sensor to its original location.
   - Make sure that there is no air leakage.

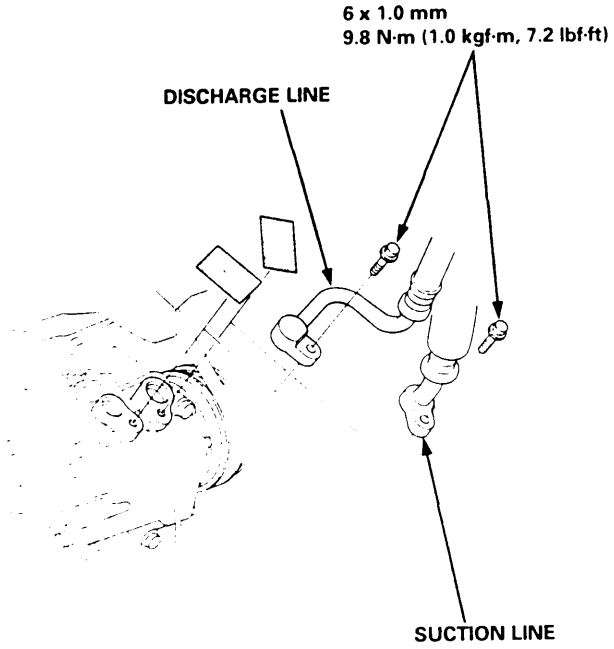


Compressor

Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioner 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 System (see page 22-24).
5. Remove the bolts, then disconnect the suction and discharge lines from the compressor.

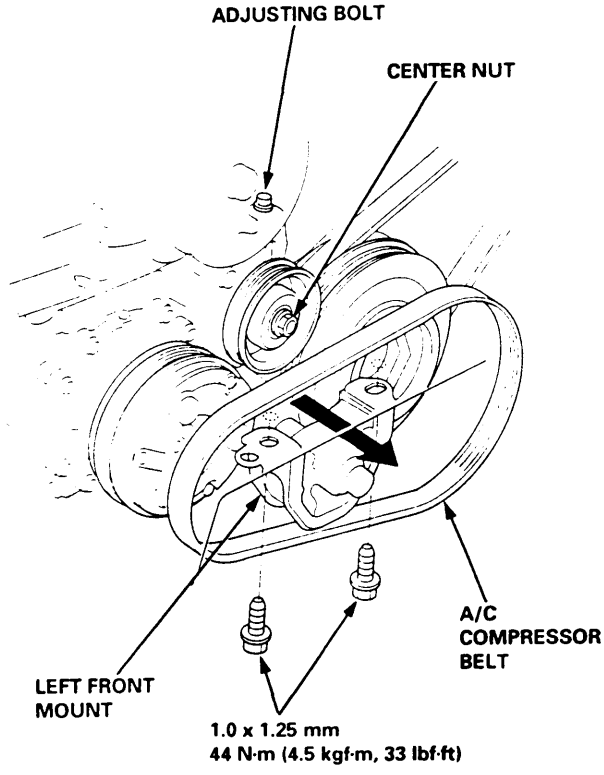
   NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



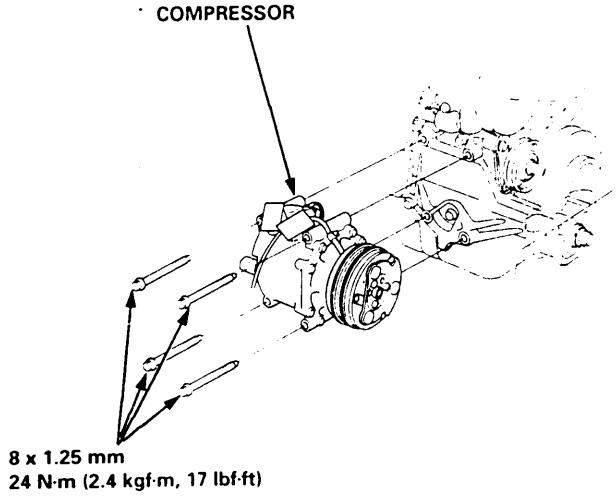
6. Remove the condenser (see page 22-37).

   NOTE: Do not disconnect the discharge hose from the condenser.

7. Remove the power steering pump belt (see section 17).
8. Loosen the center nut of the idler pulley and the adjusting bolt, then remove the A/C compressor belt from the pulleys. If necessary, remove the mounting bolts from the left front mount, then remove the A/C compressor belt by passing it through the gap between the body and the left front mount.



9. Remove the mounting bolts and the compressor.



(cont'd)

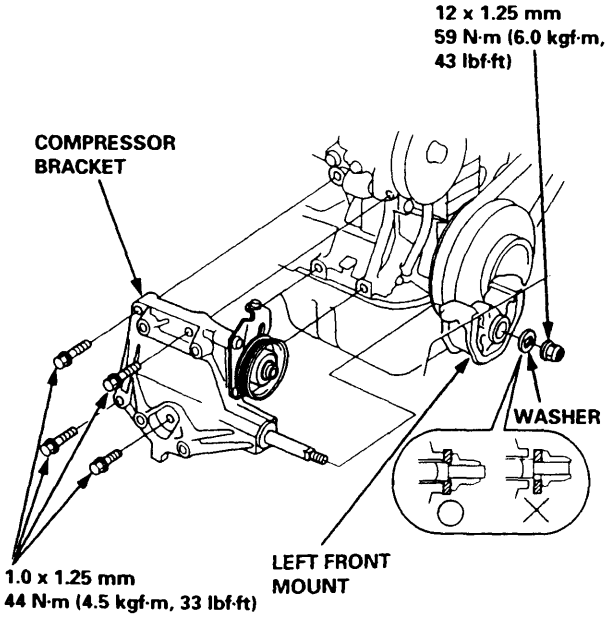
Replacement (cont'd)

10. If necessary, remove the compressor bracket as follows.

    - Remove the nut and the washer from the left front mount.

      NOTE: When tightening the nut to the left front mount, make sure the washer is set properly on the left front mount as shown.

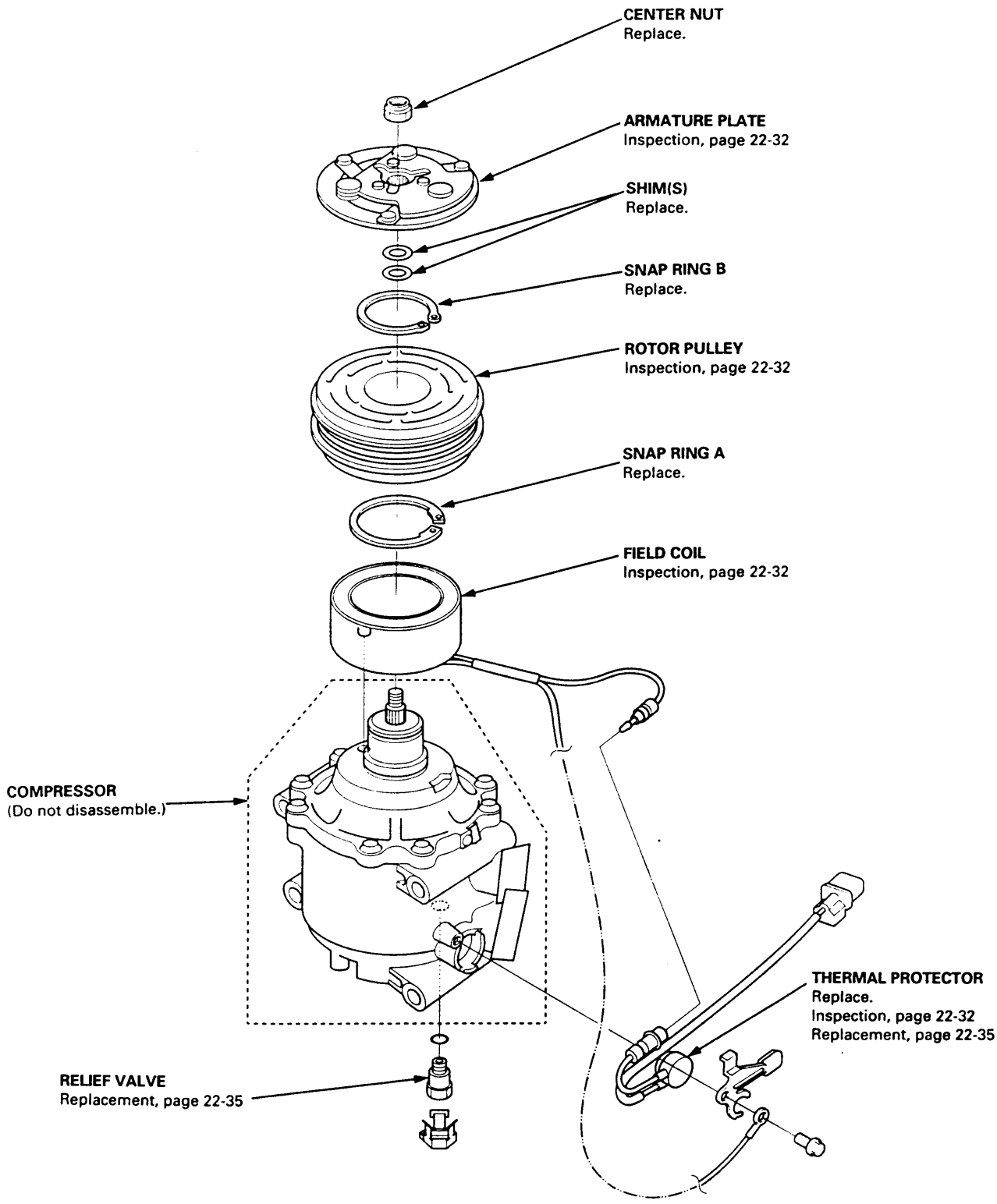
    - Remove the four mounting bolts and the compressor bracket.



11. Install in the reverse order of removal. Make note of the following items.

    - If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 130mℓ (4 1/3 fl·oz, 4.6 Imp·oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
    - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
      NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
    - Use refrigerant oil (SP-10) for R-134a Sanden spiral type compressors 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, 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 the refrigerant oil contacts the paint, wash it off immediately.
    - Adjust the A/C compressor belt (see page 22-36) and the power steering pump belt (see section 17).
    - Charge the system (see page 22-26), and test its performance (see page 22-22).
    - Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Illustrated Index

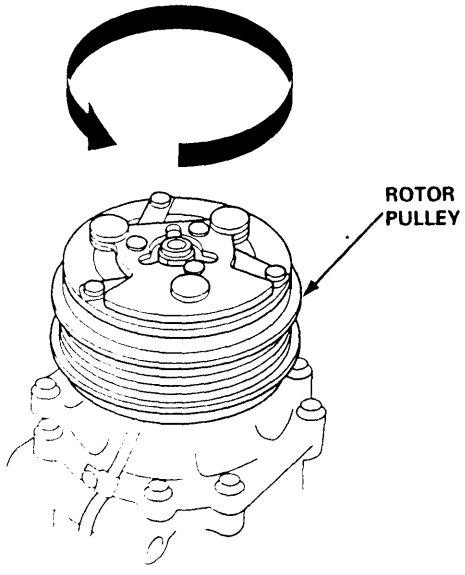


Compressor

Clutch Inspection

- Check the plated parts of the armature plate for color changes, peeling or other damage. If there is damage, replace the clutch set.

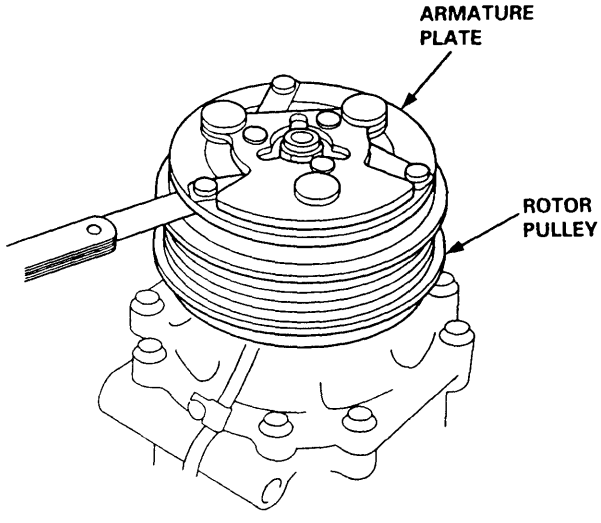
- Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



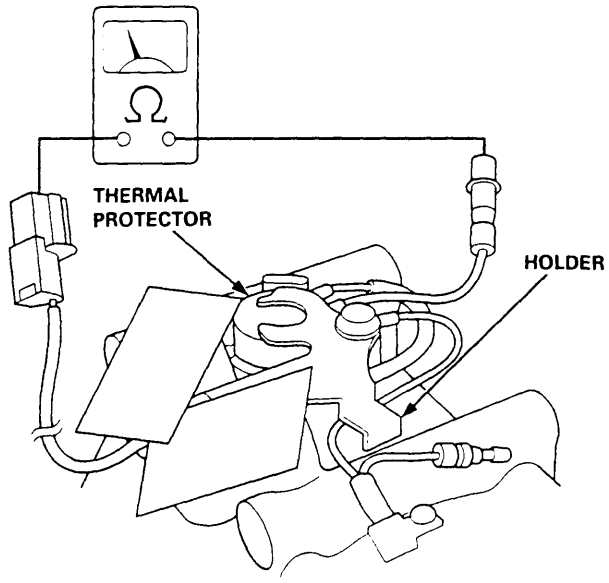
- Measure the clearance between the rotor pulley and the armature plate all the way around. If the clearance is not within specified limits, the armature plate must be removed and shims added or removed as required, following the procedure on page 22-33.

  Clearance: 0.5 ± 0.15 mm (0.020 ± 0.006 in)

  NOTE: The shims are available in four thicknesses: 0.1 mm, 0.2 mm, 0.4 mm and 0.5 mm



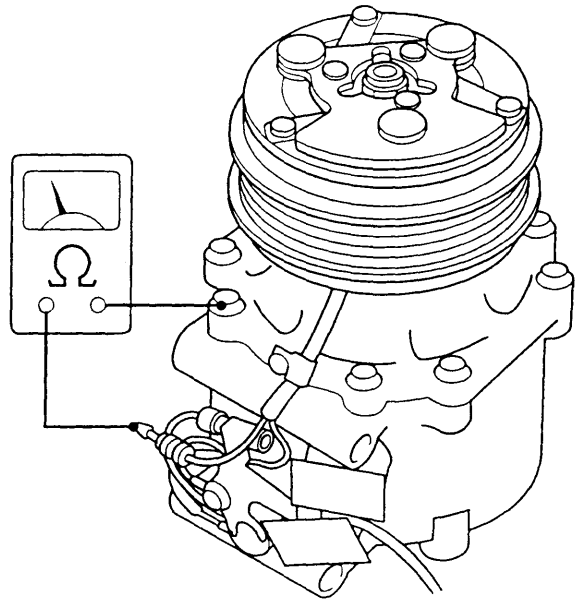
- Release the field coil connector from the holder, then disconnect it. Check the thermal protector for continuity. If there is no continuity, replace the thermal protector.



- Check resistance of the field coil.

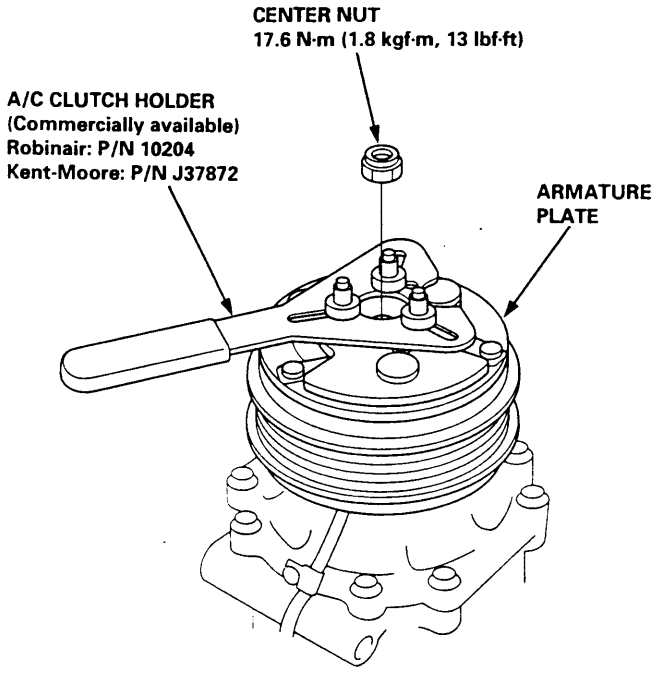
  Field Coil Resistance: 3.2 ± 0.15 ohms at 68°F (20°C)

  If resistance is not within specifications, replace the field coil.

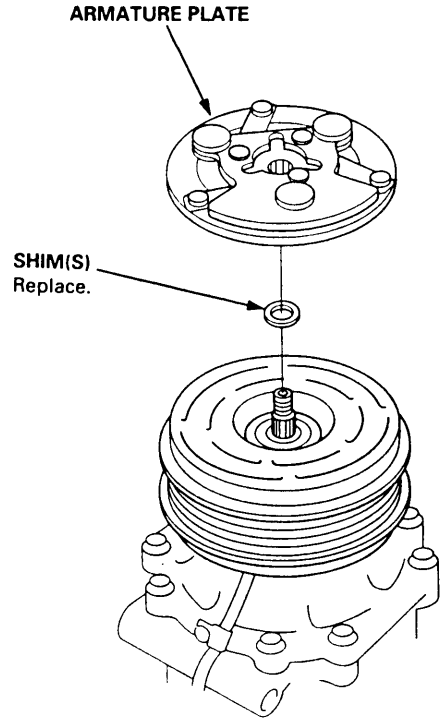


Clutch Overhaul

1. Remove the center nut while holding the armature plate with the tool.

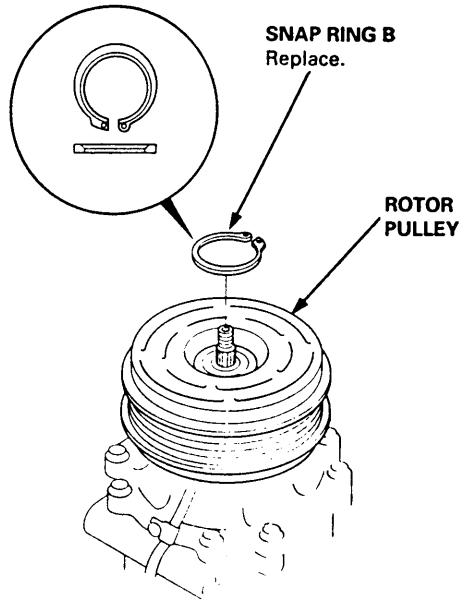


2. Remove the armature plate by pulling it up by hand.



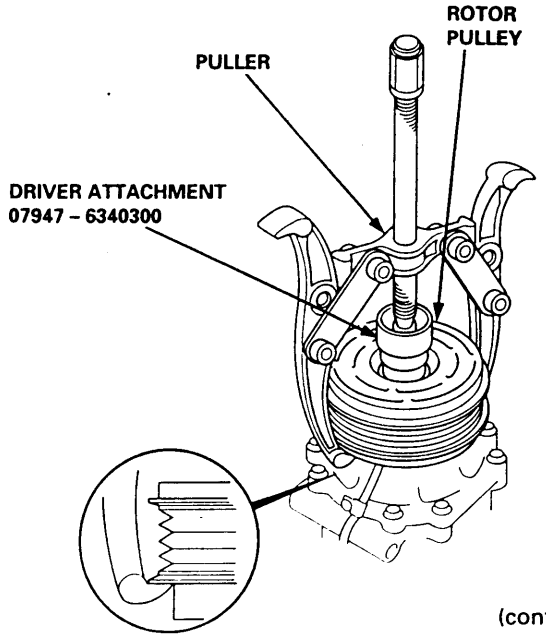
3. Remove snap ring B with snap ring pliers.

NOTE:
- Be careful not to damage the rotor pulley and compressor during removal/installation.
- Once snap ring B is removed, replace it with a new one.



4. Remove the rotor pulley from the shaft with a puller and the special tool.

NOTE: Put the claws of the puller on the back of the rotor pulley, not on the belt area; otherwise the rotor pulley can be damaged.

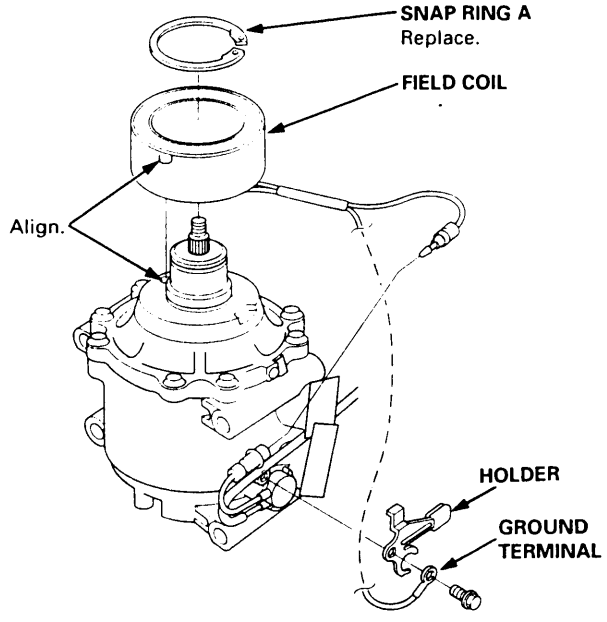


(cont'd)

Clutch Overhaul (cont'd)

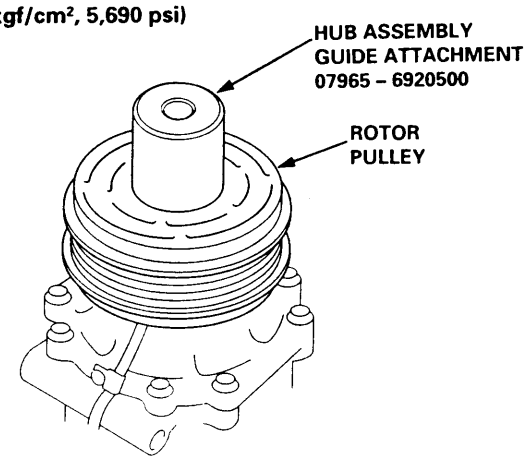
5. Remove the screw from the field coil ground terminal, then disconnect the field coil connector. Remove snap ring A with snap ring pliers, then remove the field coil.

   NOTE:
   - Be careful not to damage the field coil and compressor during remove/installation.
   - Once snap ring A is removed, replace it with a new one.
   - When installing the field coil, align the boss on the field coil with the hole in the compressor.



6. Position the rotor pulley squarely over the field coil. Press the rotor pulley onto the compressor boss with the special tool. If the rotor pulley does not press on straight, remove it, and check the rotor pulley and compressor boss for burrs or damage.

   CAUTION: Maximum press load: 39,200 kPa (400 kgf/cm², 5,690 psi)

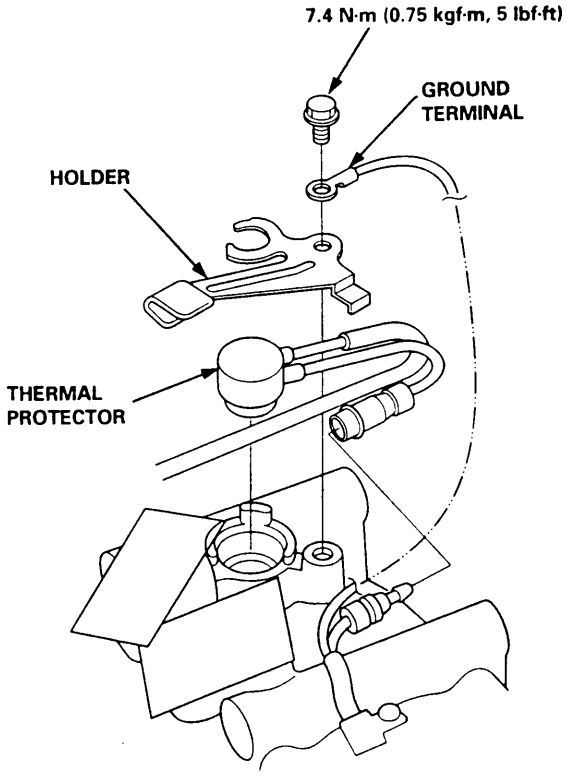


7. Assemble in the reverse order of disassembly. Make note of the following items.

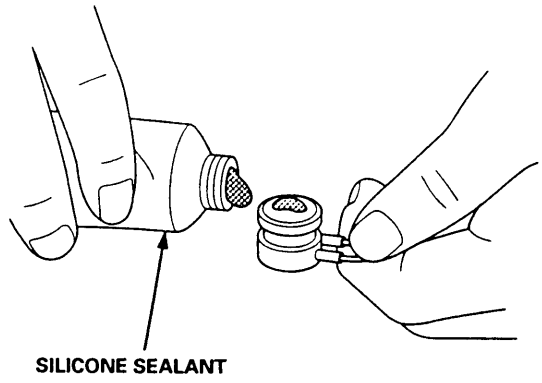
   - Install the field coil with the wire side facing down.
   - Clean the rotor pulley and compressor sliding surfaces with non-petroleum solvent.
   - Make sure the snap rings are fully seated in the groove.
   - Make sure that the rotor pulley turns smoothly after it's reassembled.
   - Route and clamp the wires properly or they can be damaged by the rotor pulley.

Thermal Protector Replacement

1. Remove the bolt, the ground terminal and the holder. Disconnect the field coil connector, then remove the thermal protector.



2. Replace the thermal protector with a new one, and apply silicone sealant to the top of the thermal protector.

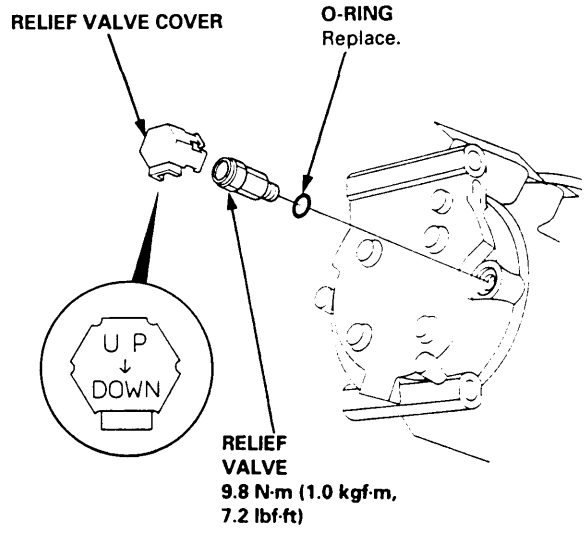


3. Install in the reverse order of removal.

Relief Valve Replacement

1. Remove the relief valve cover, the relief valve and the O-ring.

   NOTE:
   - Do not let the compressor oil run out.
   - Make sure that no foreign matter enters the system.



2. Clean the mating surfaces.

3. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.

   NOTE:
   - 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 the refrigerant oil contacts the paint, wash it off immediately.

4. Install and tighten the relief valve.

5. Put the cover on the relief valve so that the arrow directs downwards as shown in the illustration above.

6. Charge the system (see page 22-26), and test its performance (see page 22-22).

A/C Compressor Belt

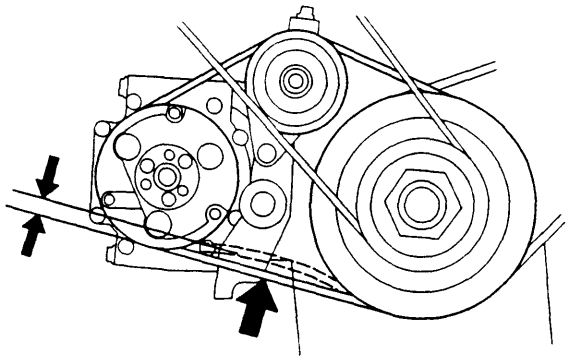
Adjustment

Deflection Method

1. Apply a force of 98 N (10 kgf, 22 lbf), and measure the deflection between the A/C compressor and the crankshaft pulley.

   A/C Compressor Belt
   Used Belt: 7.5 – 9.5 mm (0.30 – 0.37 in)
   New Belt: 5.0 – 6.5 mm (0.20 – 0.26 in)

   NOTE:
   - If there are cracks or any damage evident on the belt, replace it with a new one.
   - "Used belt" means a belt which has been used for five minutes or more.
   - "New belt" means a belt which has been used for less than five minutes.



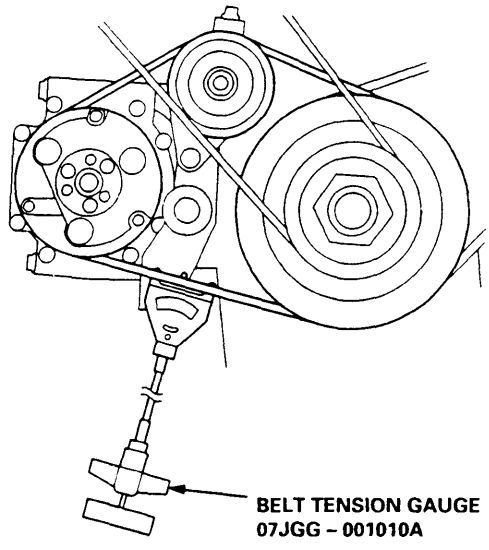
2. Loosen the center nut of the idler pulley.
3. Turn the adjusting bolt to get proper belt tension.
4. Retighten the center nut of the idler pulley.
5. Recheck the deflection of the A/C compressor belt.

Tension Gauge Method

1. Attach the special tool to the A/C compressor belt as shown below, and measure the tension of the belt.

   A/C Compressor Belt
   Used Belt: 340 – 490 N (35 – 50 kgf, 77 – 110 lbf)
   New Belt: 690 – 830 N (70 – 85 kgf, 150 – 190 lbf)

   NOTE:
   - Follow the manufacturer's instructions for the belt tension gauge.
   - If there are cracks or any damage evident on the belt, replace it with a new one.
   - "Used belt" means a belt which has been used for five minutes or more.
   - "New belt" means a belt which has been used for less than five minutes.



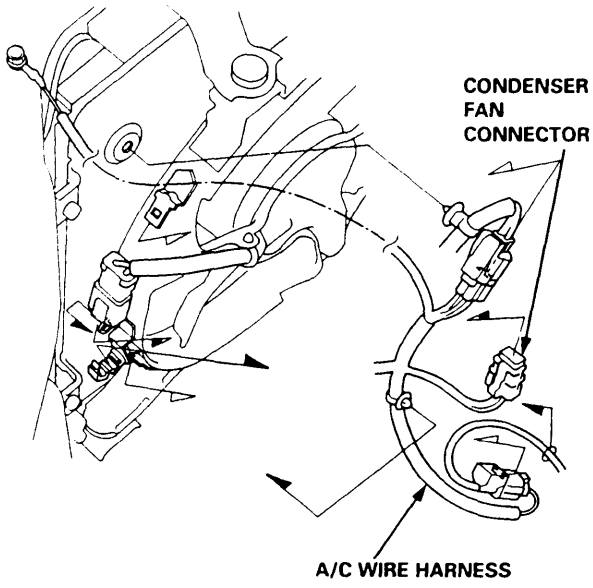
2. Loosen the center nut of the idler pulley.
3. Turn the adjusting bolt to get proper belt tension.
4. Retighten the center nut of the idler pulley.
5. Recheck the tension of the A/C compressor belt.

Condenser

Replacement

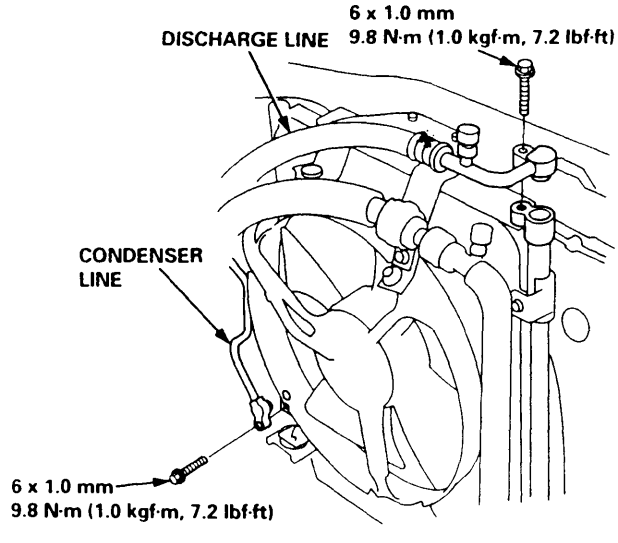
1. Recover the refrigerant with a Recovery/Recycling/Charging System (see page 22-24).

2. Disconnect the condenser fan connector from the A/C wire harness, then remove the A/C wire harness from the condenser fan shroud.



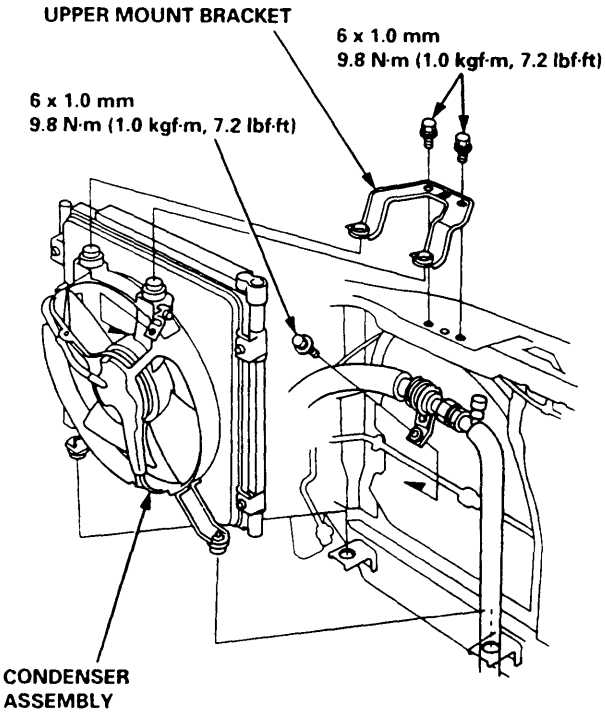
3. Remove the bolts, then disconnect the discharge and condenser lines from the condenser.

   NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



4. Remove the bolt from the suction hose bracket, and remove the bolts and the upper mount bracket. Remove the condenser assembly by lifting it up.

   NOTE: Be careful not to damage the condenser fins when removing the condenser assembly.



5. Install in the reverse order of removal. Make note of the following items.

   - If you're installing a new condenser, add refrigerant oil (SP-10) (see page 22-19).
   - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.
     NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
   - Be careful not to damage the condenser fins when installing the condenser assembly.
   - Charge the system (see page 22-26), and test its performance (see page 22-22).

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

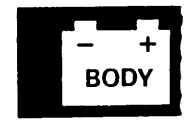
The Acura 1.6EL SRS includes a driver's airbag located in the steering wheel hub, and a passenger's airbag located in the dashboard above the glove box. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized Acura dealer.

⚠ WARNING

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of severe frontal collision, all SRS service work must be performed by an authorized Acura dealer.**
- **Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional activation of the airbags.**
- **Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).**
- **All SRS electrical wiring harnesses are covered with yellow insulation. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.**

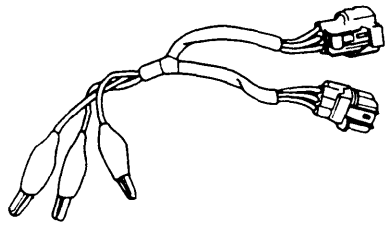
NOTE: The original radio has a coded theft protection circuit. Be sure to get the customer's code number before
— disconnecting the battery.
— removing the No. 47 (7.5 A) fuse from the under-hood fuse/relay box.
— removing the radio.
After service, reconnect power to the radio and turn it on. When the word "CODE" is displayed, enter the customer's 5-digit code to restore radio operation.

Body Electrical



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07LAJ – PT3020A	Test Harness	1	23-60



①

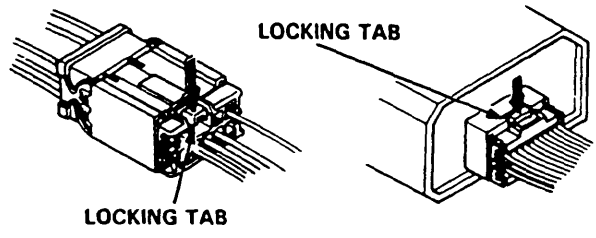
Troubleshooting

Tips and Precautions

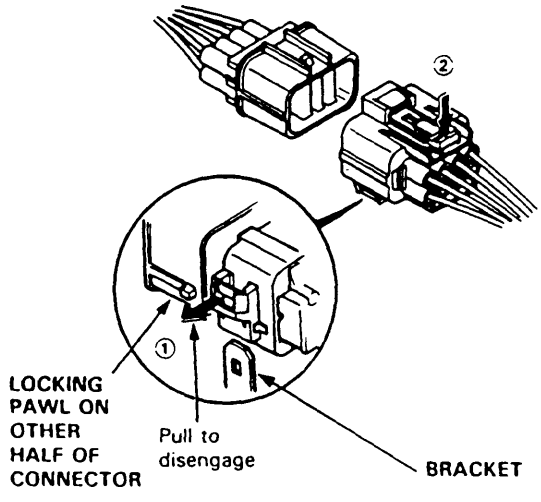
Before Troubleshooting
- Check applicable fuses in the appropriate fuse/relay box.
- Check the battery for damage, state of charge, and clean and tight connections.
- Check the alternator belt tension.

CAUTION:
- **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.**

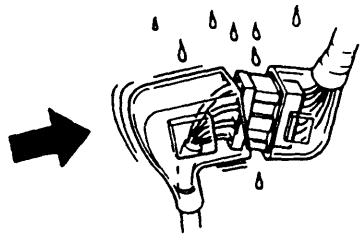
Handling Connectors
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks.



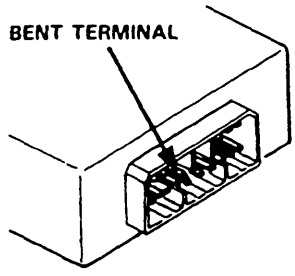
- Some connectors have a clip on their side used to attach them to a mount bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its mount bracket.



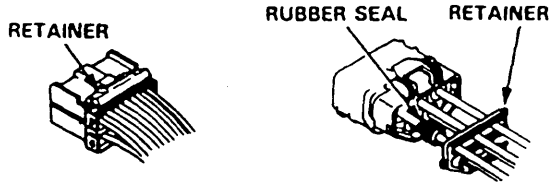
- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



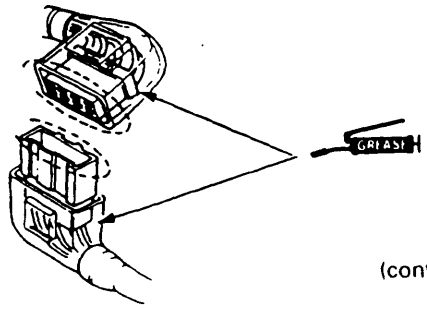
- Before connecting connectors, make sure the terminals are in place and not bent.



- Check for loose retainer and rubber seals.



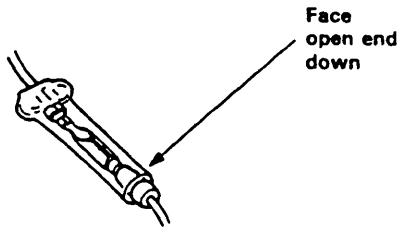
- The backs of some connectors are packed with grease. Add grease if necessary. If the grease is contaminated, replace it.



(cont'd)

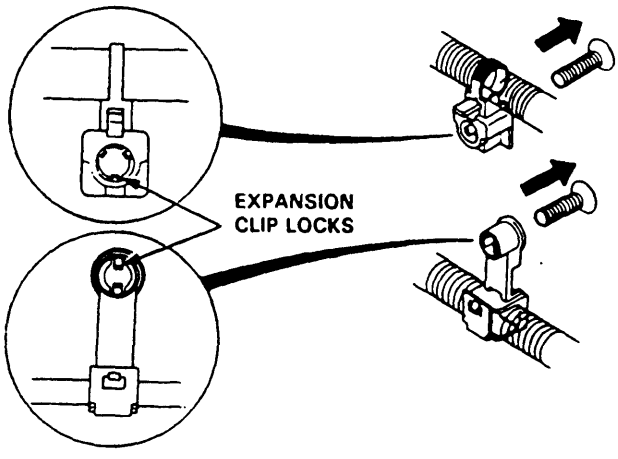
Tips and Precautions (cont'd)

- 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.

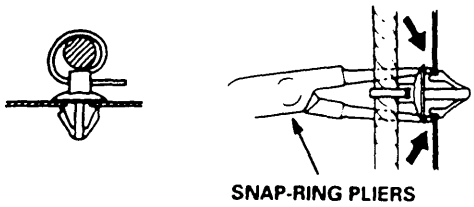


Handling Wires and Harnesses

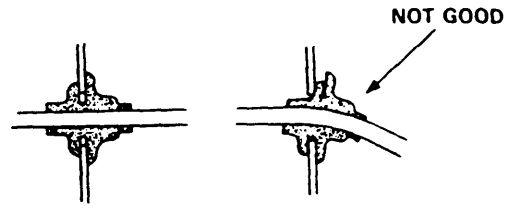
- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; don't damage their locks.



Slip pliers under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.

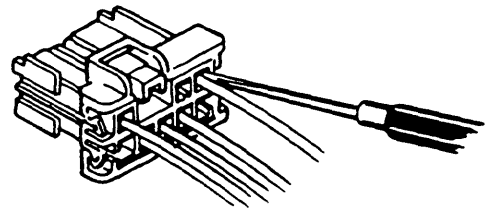


- After installing harness clips, make sure the harness doesn't interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.
- Seat grommets in their grooves properly.



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.

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.

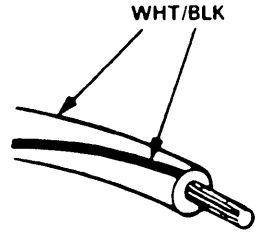
5. Make Sure The Circuit Works
   Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:

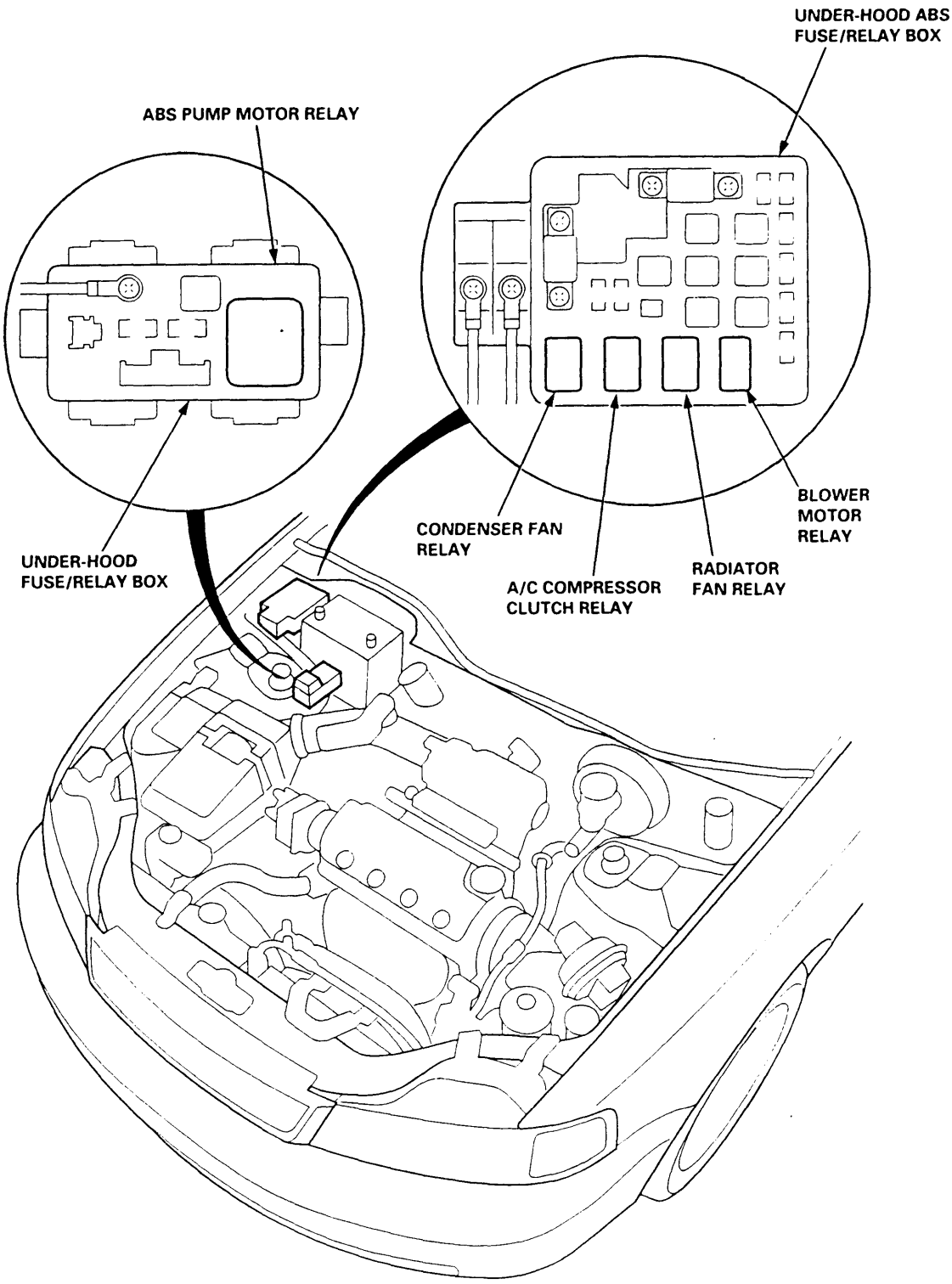
WHT	White
YEL	Yellow
BLK	Black
BLU	Blue
GRN	Green
RED	Red
ORN	Orange
PNK	Pink
BRN	Brown
GRY	Gray
PUR	Purple
LT BLU	Light Blue
LT GRN	Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.

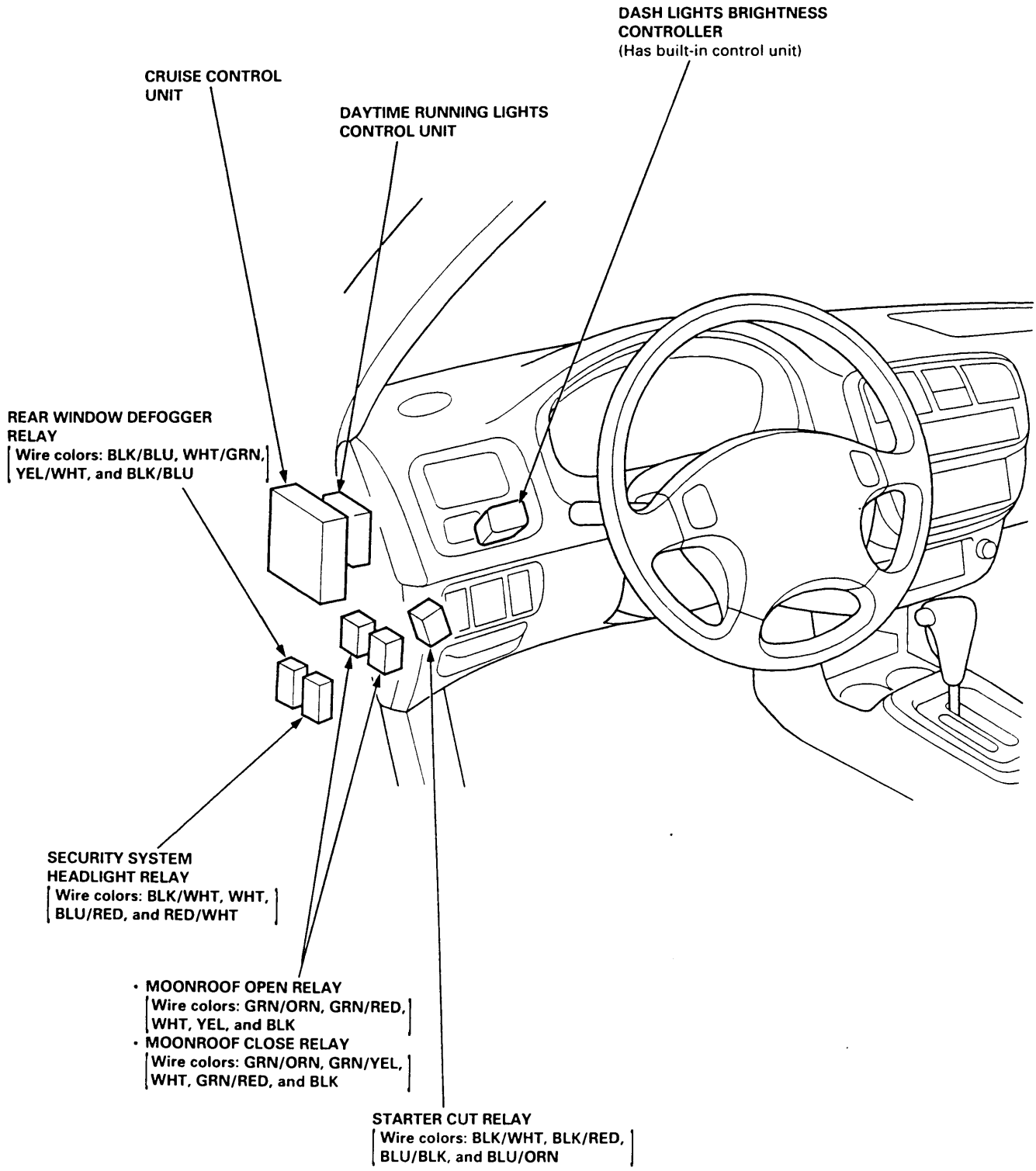


Relay and Control Unit Locations

Engine Compartment

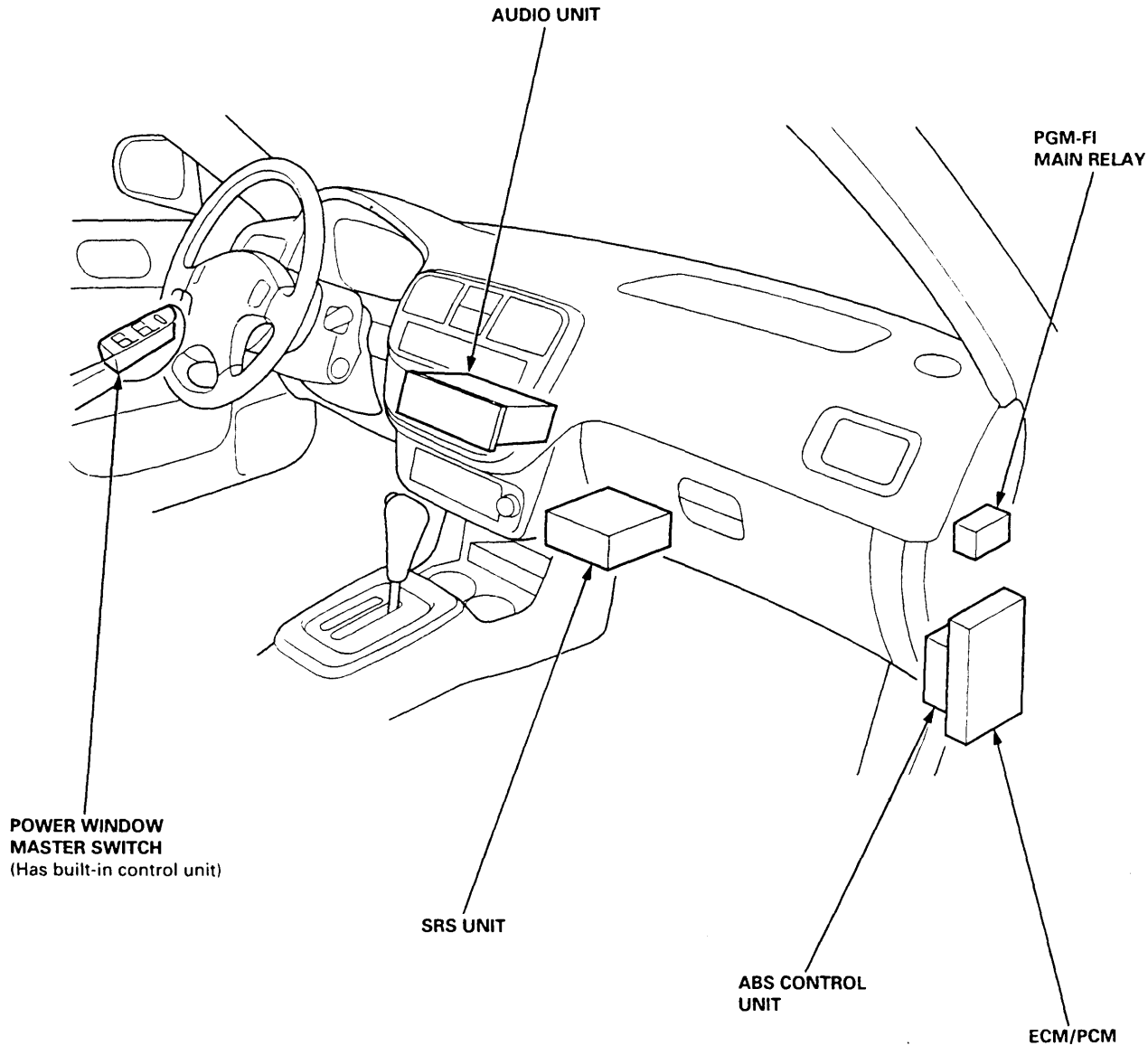


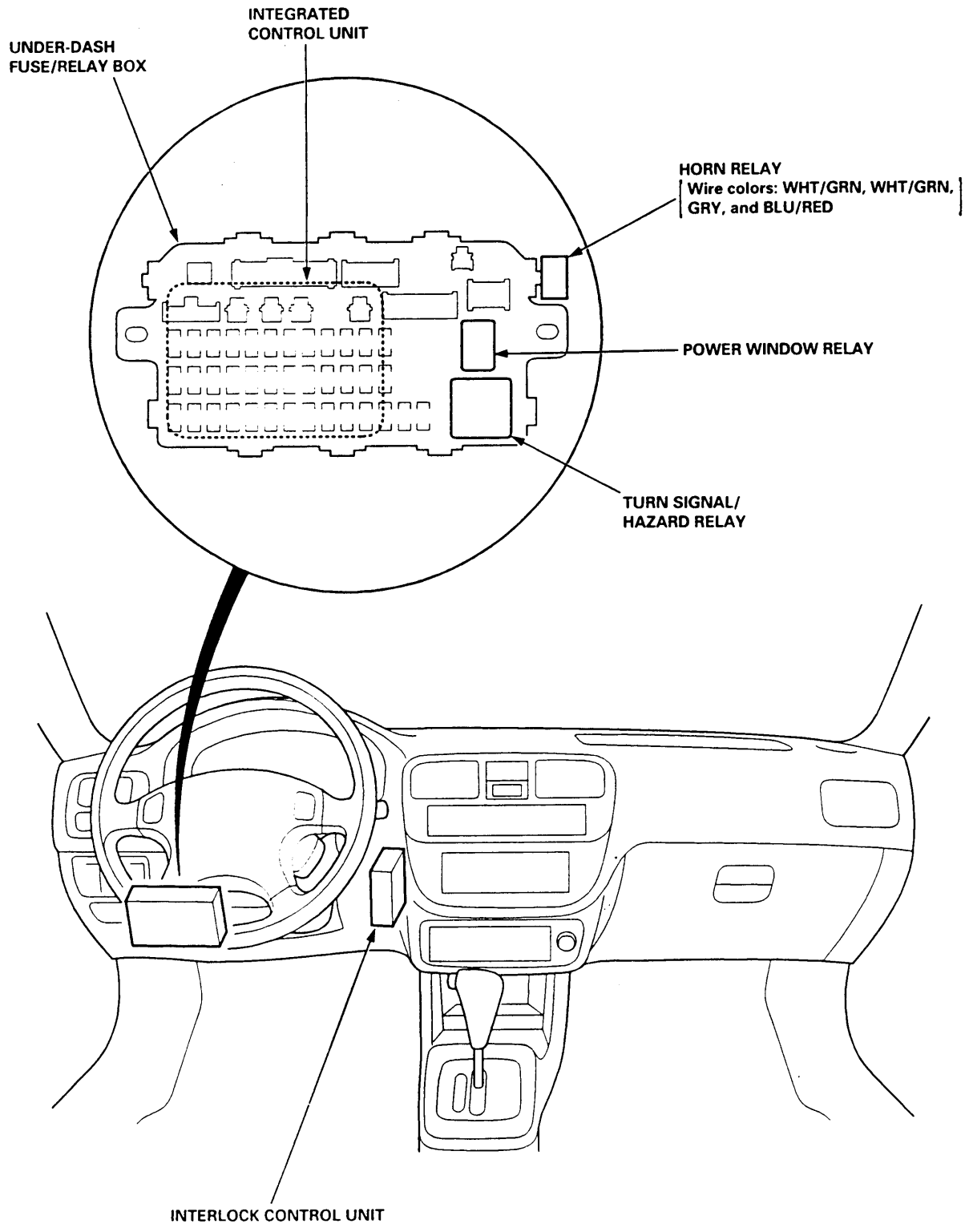
Dashboard


DASH LIGHTS BRIGHTNESS CONTROLLER
(Has built-in control unit)
CRUISE CONTROL UNIT
DAYTIME RUNNING LIGHTS CONTROL UNIT
REAR WINDOW DEFOGGER RELAY
Wire colors: BLK/BLU, WHT/GRN, YEL/WHT, and BLK/BLU
SECURITY SYSTEM HEADLIGHT RELAY
Wire colors: BLK/WHT, WHT, BLU/RED, and RED/WHT
• MOONROOF OPEN RELAY
Wire colors: GRN/ORN, GRN/RED, WHT, YEL, and BLK
• MOONROOF CLOSE RELAY
Wire colors: GRN/ORN, GRN/YEL, WHT, GRN/RED, and BLK
STARTER CUT RELAY
Wire colors: BLK/WHT, BLK/RED, BLU/BLK, and BLU/ORN

Relay and Control Unit Locations

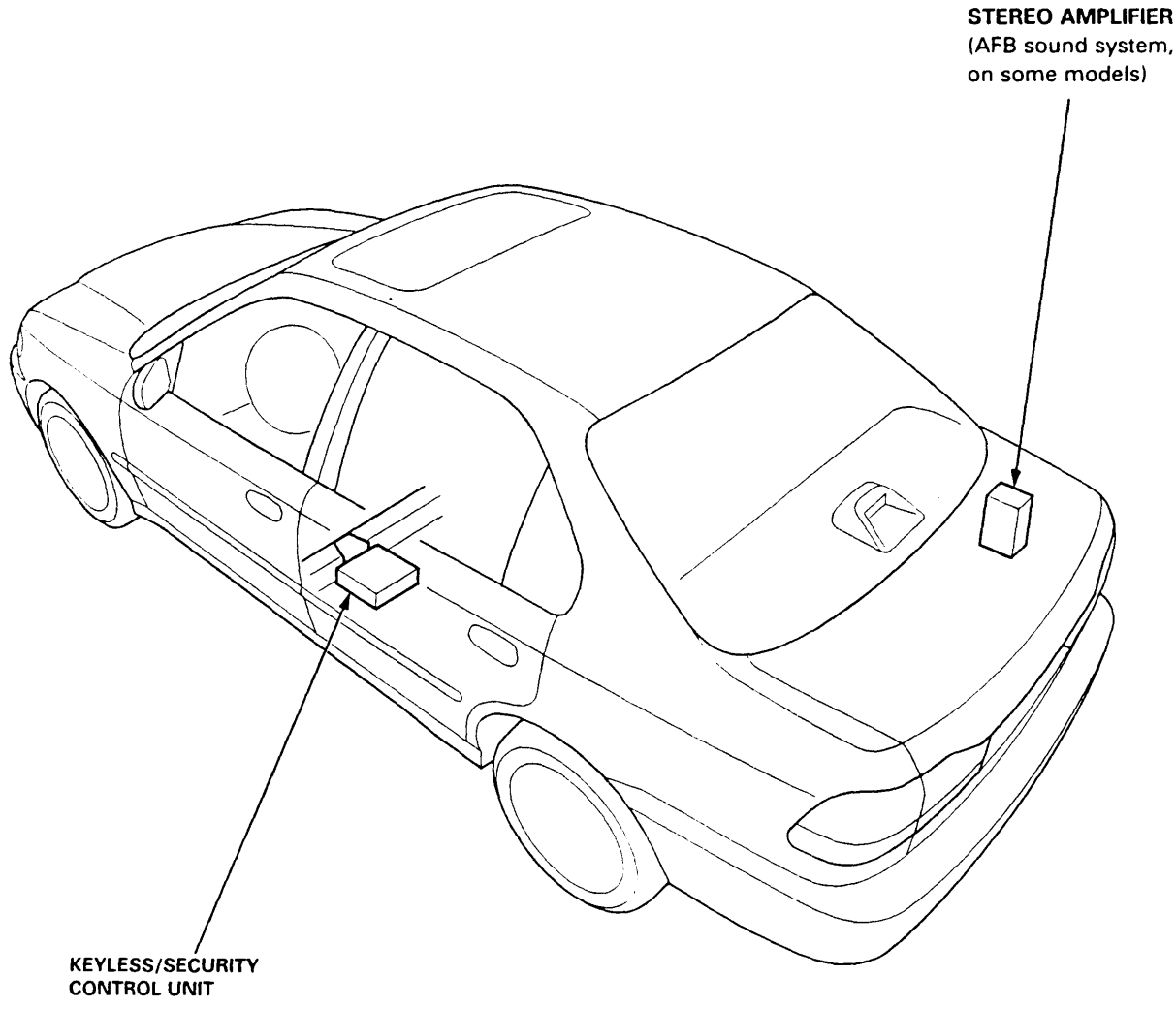
Dashboard and Door



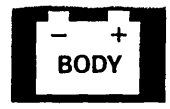

INTEGRATED
CONTROL UNIT
UNDER-DASH
FUSE/RELAY BOX
HORN RELAY
Wire colors: WHT/GRN, WHT/GRN,
GRY, and BLU/RED
POWER WINDOW RELAY
TURN SIGNAL/
HAZARD RELAY
INTERLOCK CONTROL UNIT

Relay and Control Unit Locations

Floor and Rear



Connector Identification and Wire Harness Routing



How to Identify Connectors:
Identification numbers have been assigned to all connectors. The number is preceded by the letter "C" for connectors, "G" for ground terminals or "T" for non-ground terminals.

Location / Harness	Engine Compartment	Dashboard	Others (Floor, Door, Trunk, and Roof)
Starter cables	T1, T2 and ⊕		
Battery ground cable	G1 and ⊖		
Engine ground cable A	T3 G2		
Engine ground cable B	T4 G3		
Under-hood ABS fuse/relay box wire harness (With ABS)	T5 and ⊕		
Engine wire harness	C101 thru C137 T101 and T102 G101		
Engine compartment wire harness	C201 thru C216 G201 and G202		
Main wire harness	C301 thru C310 C351 thru C359 G301	C401 thru C443 G401 and G402	
Dashboard wire harness		C501 thru C518 G501	
Floor wire harness		C551 thru C577 G551 and G552	
Rear wire harness			C601 thru C617 G601
Driver's door wire harness			C631 thru C639
Front passenger's door wire harness			C651 thru C657
Left rear door wire harness			C661 thru C664
Right rear door wire harness			C671 thru C674
Roof wire harness (Without moonroof)			C701 thru C703
Moonroof wire harness (With moonroof)			C711 thru C718
Heater sub-harness A		C721 thru C727	
Heater sub-harness B		C741 thru C743	
A/C wire harness	C751 thru C754 G751		
Rear window defogger wire harness			C771 thru C773
Secondary heated oxygen sensor sub-harness			C781 and C782
SRS main harness			C801 thru C806 G801

Connector Identification and Wire Harness Routing

Starter Cables

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T1 T2		Right side of engine compartment Right side of engine compartment	Under-hood fuse/relay box Starter motor	
⊕		Battery	Battery positive terminal	

Battery Ground Cable

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
G1		Right front shock tower	Body ground, via battery ground cable	
⊖		Battery	Battery negative terminal	

Engine Ground Cable A

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T3		Left side of engine	Power steering pump bracket	
G2		Left side of engine compartment	Body ground, via engine ground cable A	

Engine Ground Cable B

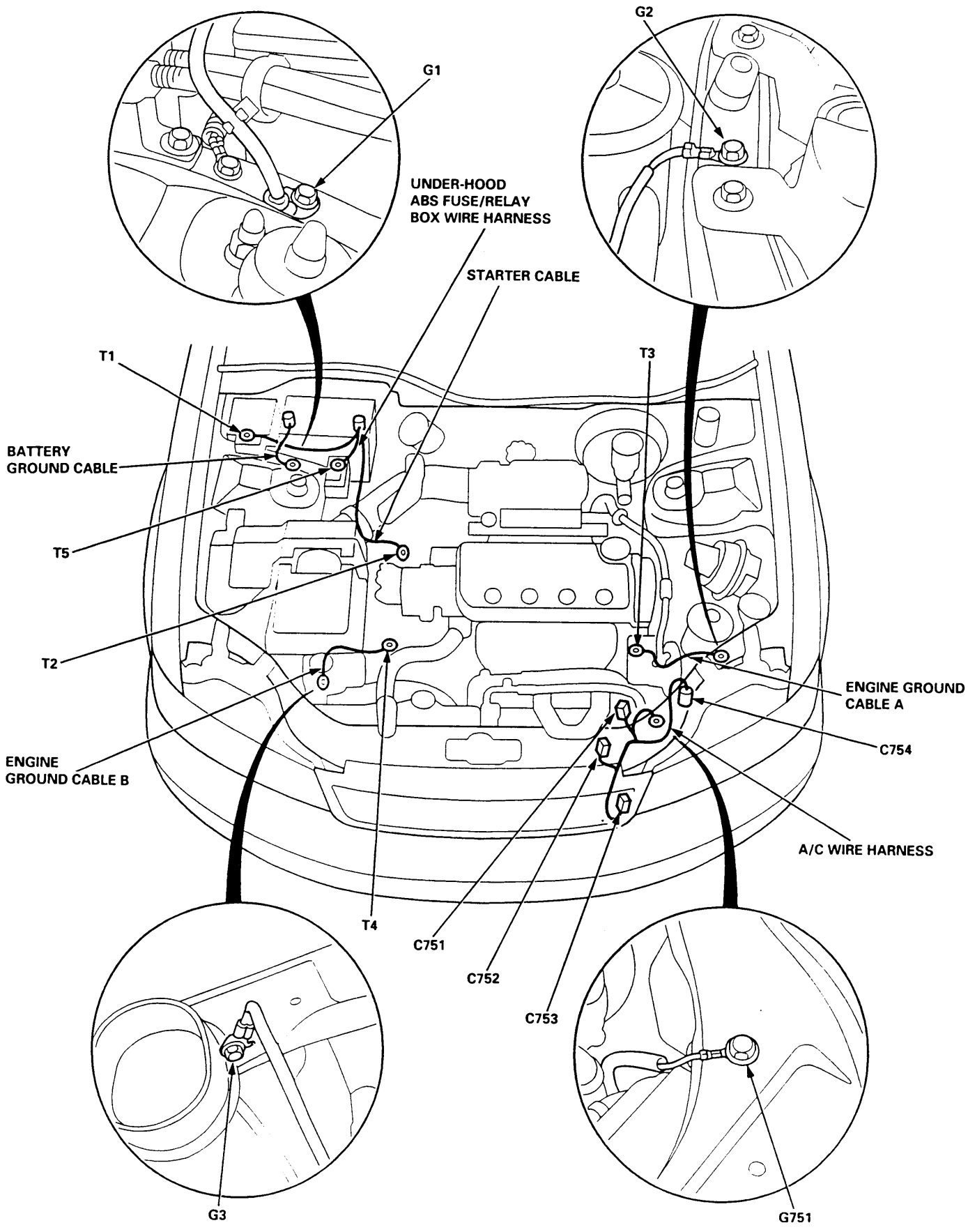
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T4		Right side of engine compartment	Transmission	
G3		Right side of front frame	Body ground, via engine ground cable B	

Under-hood ABS Fuse/Relay Box Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T5		Right side of engine compartment	Under-hood fuse/relay box	
⊕		Battery	Battery positive terminal	

A/C Wire Harness

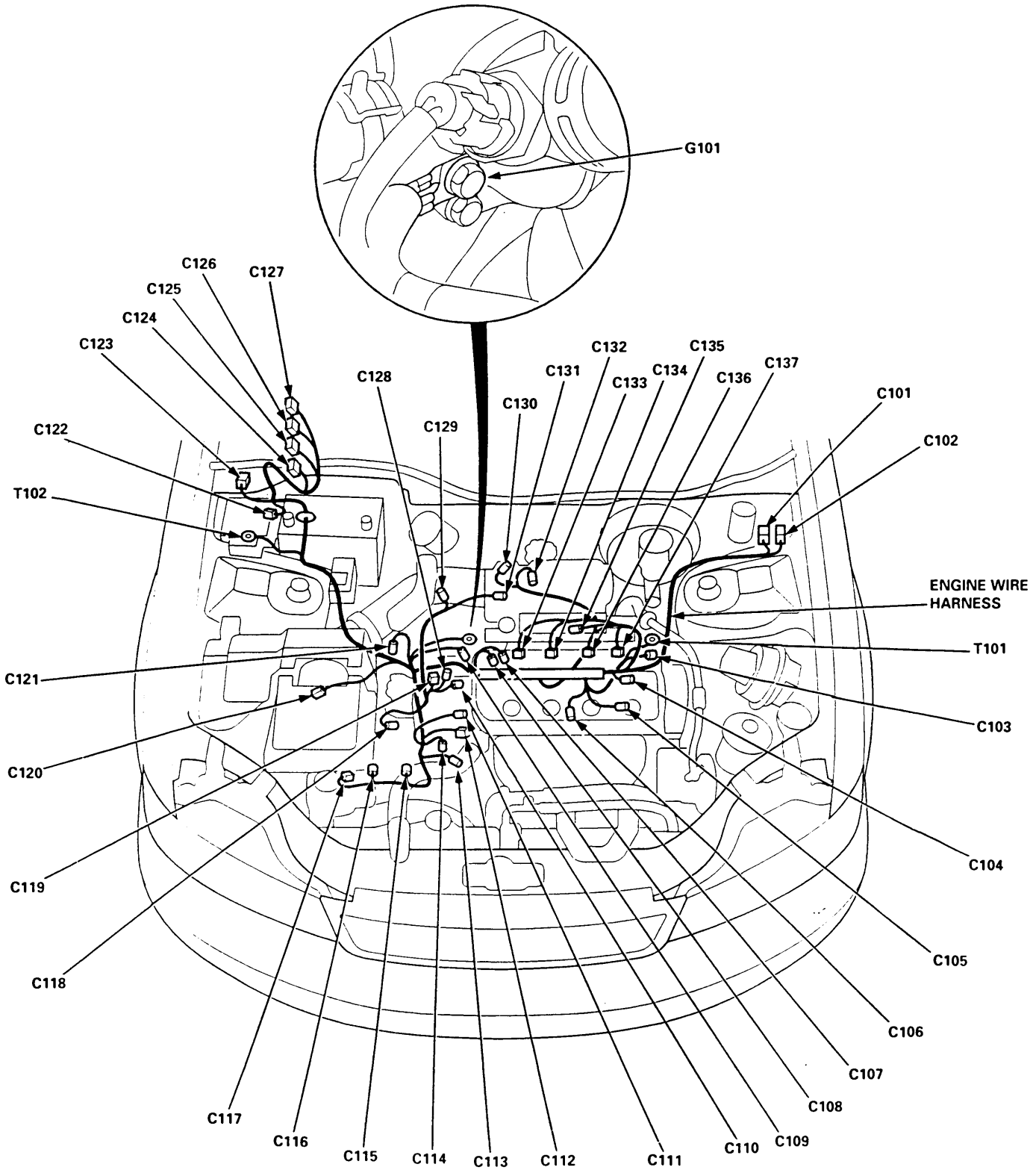
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C751	4	Right side of engine compartment	Engine compartment wire harness (C209)	
C752	2	Right side of engine compartment	Condenser fan motor	
C753	1	Right side of engine compartment	Compressor clutch	
C754	2	Right side of engine compartment	A/C pressure switch	
G751		Left side of engine compartment	Body ground, via A/C wire harness	


G1
G2
UNDER-HOOD
ABS FUSE/RELAY
BOX WIRE HARNESS
STARTER CABLE
T1
T3
BATTERY
GROUND CABLE
T5
T2
ENGINE
GROUND CABLE B
ENGINE GROUND
CABLE A
C754
A/C WIRE HARNESS
T4
C751
C752
C753
G3
G751

Connector Identification and Wire Harness Routing

Engine Wire Harness

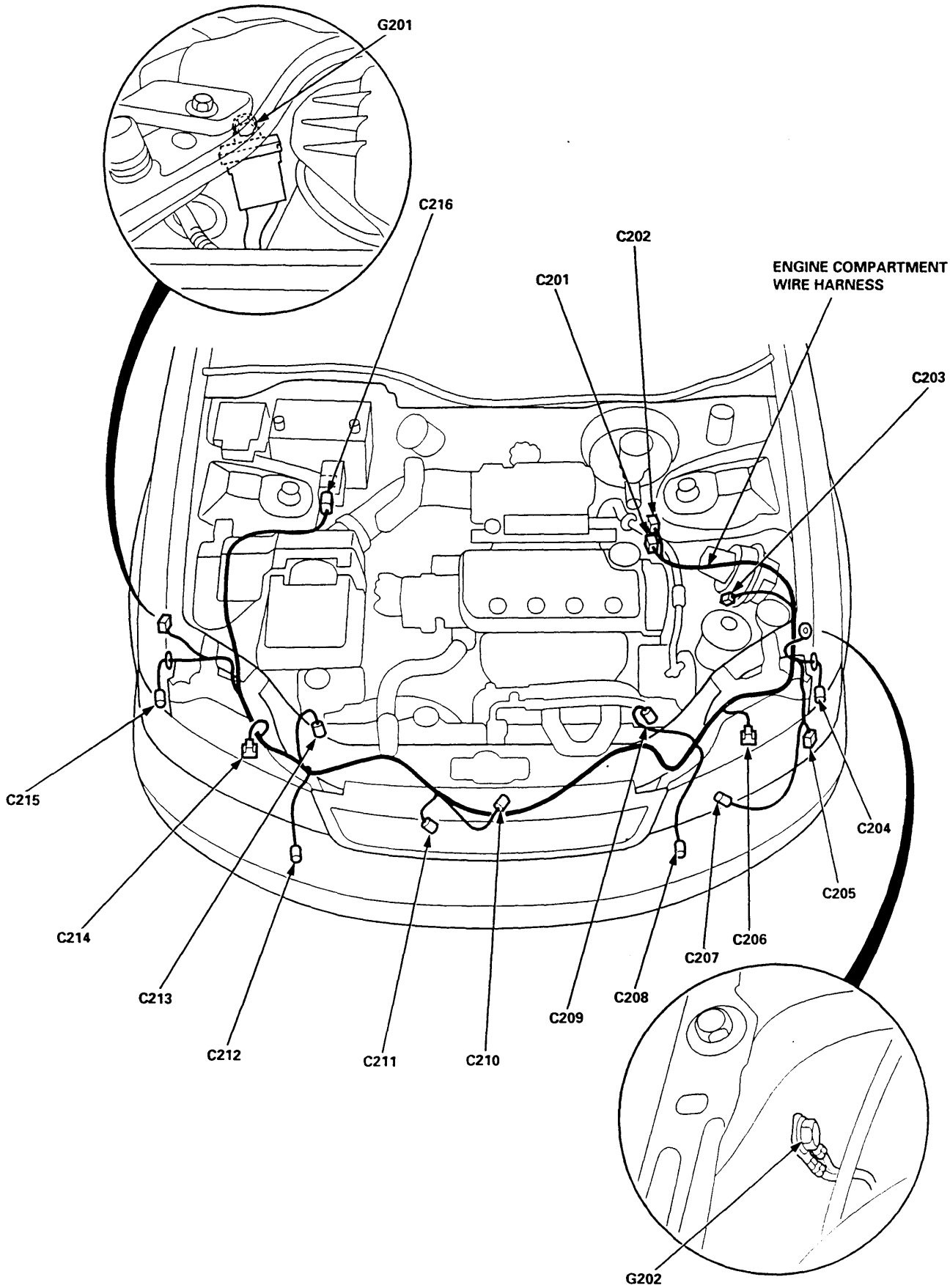
Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C101	10	Left side of engine compartment	Main wire harness (C305)	
C102	8	Left side of engine compartment	Main wire harness (C306)	
C103	3	Left side of engine compartment	Alternator	
C104	3	Middle of engine	Crankshaft speed fluctuation (KCF) sensor	
C105	2	Middle of engine	Knock sensor (KS)	
C106	1	Middle of engine	Engine oil pressure switch	
C107	14	Middle of engine	Junction connector	
C108	14	Middle of engine	Junction connector	
C109	3	Middle of engine	Engine coolant temperature (ECT) switch	
C110	2	Middle of engine	VTEC pressure switch	
C111	1	Middle of engine	Engine coolant temperature (ECT) sending unit	
C112	2	Middle of engine	Engine coolant temperature (ECT) sensor	
C113	4	Middle of engine	Primary HO2S (sensor 1)	
C114	2	Middle of engine	Back-up light switch	M/T
C115	2	Middle of engine	Mainshaft speed sensor	A/T
C116	2	Middle of engine	Shift control solenoid valve	A/T
C117	2	Middle of engine	Linear solenoid valve	A/T
C118	1	Right side of engine compartment	Starter solenoid	
C119	10	Middle of engine	Distributor	
C120	2	Middle of engine	Countershaft speed sensor	A/T
C121	3	Left side of engine compartment	Vehicle speed sensor (VSS)	
C122	20	Behind right kick panel	Junction connector	
C123	22	Under right side of dash	Main wire harness (C442)	
C124	32	Under right side of dash	ECM/PCM	
C125	25	Under right side of dash	PCM	A/T
C126	31	Under right side of dash	ECM/PCM	
C127	16	Under right side of dash	ECM/PCM	
C128	1	Middle of engine	VTEC valve	
C129	2	Middle of engine	Intake air temperature (IAT) sensor	
C130	3	Middle of engine	Throttle position (TP) sensor	
C131	3	Middle of engine	Manifold absolute pressure (MAP) sensor	
C132	3	Middle of engine	IAC valve	A/T
C132	2	Middle of engine	IAC valve	M/T
C133	2	Middle of engine	No. 4 fuel injector	
C134	2	Middle of engine	No. 3 fuel injector	
C135	2	Middle of engine	EVAP purge control solenoid valve	
C136	2	Middle of engine	No. 1 fuel injector	
C137	2	Middle of engine	No. 1 fuel injector	
T101 T102		Left side of engine compartment Right side of engine compartment	Alternator Under-hood fuse/relay box	
G101		Middle of engine	Engine ground, via engine wire harness	


G101
C126
C127
C125
C124
C123
C128
C132
C131
C135
C134
C133
C136
C137
C130
C129
C101
C102
C122
T102
ENGINE WIRE HARNESS
T101
C121
C103
C120
C104
C119
C105
C118
C106
C107
C108
C117
C116
C115
C114
C113
C112
C111
C110
C109

Connector Identification and Wire Harness Routing

Engine Compartment Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C201	10	Left side of engine compartment	Main wire harness (C310)	
C202	3	Left side of engine compartment	Main wire harness (C309)	
C203	4	Left side of engine compartment	Cruise actuator	
C204	2	Left side of engine compartment	Left front parking light	
C205	2	Behind front bumper	Windshield washer motor	
C206	3	Left side of engine compartment	Left headlight	
C207	2	Behind front bumper	Left horn	
C208	2	Behind front bumper	Left front turn signal light	
C209	4	Left side of engine compartment	A/C wire harness (C751)	
C210	2	Behind front bumper	Hood switch	
C211	2	Behind front bumper	Right horn	
C212	2	Behind front bumper	Right front turn signal light	
C213	2	Right side of engine compartment	Radiator fan motor	
C214	3	Right side of engine compartment	Right headlight	
C215	2	Right side of engine compartment	Right front parking light	
C216	8	Right side of engine compartment	Main wire harness (C356)	
G201		Left side of engine compartment	Body ground, via engine compartment wire harness	
G202		Right side of engine compartment	Body ground, via engine compartment wire harness	


G201
C216
C202
C201
ENGINE COMPARTMENT
WIRE HARNESS
C203
C215
C214
C213
C212
C211
C210
C209
C208
C207
C206
C205
C204
G202

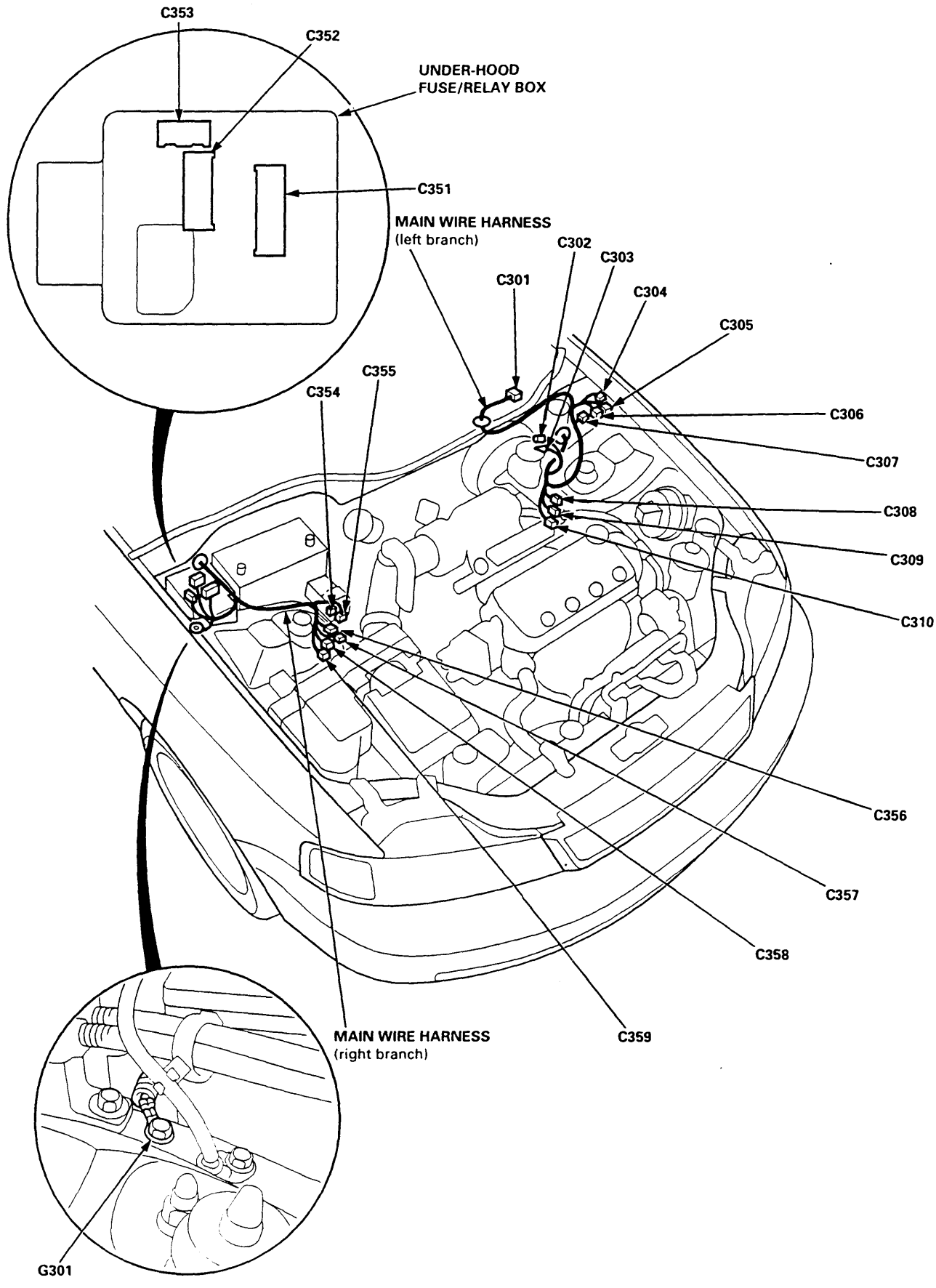
Connector Identification and Wire Harness Routing

Main Wire Harness (Left side of engine compartment branch)

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C301	5	Left side of engine compartment	Windshield wiper motor	
C302	1	Left side of engine compartment	Brake fluid level switch (+)	
C303	1	Left side of engine compartment	Brake fluid level switch (–)	
C304	2	Left side of engine compartment	Test tachmeter connector	
C305	10	Left side of engine compartment	Engine wire harness (C101)	
C306	8	Left side of engine compartment	Engine wire harness (C102)	
C307	3	Left side of engine compartment	Daytime running lights resistor	
C308	2	Left side of engine compartment	Left front ABS wheel sensor	
C309	3	Left side of engine compartment	Engine compartment wire harness (C202)	
C310	10	Left side of engine compartment	Engine compartment wire harness (C201)	

Main Wire Harness (Right side of engine compartment branch)

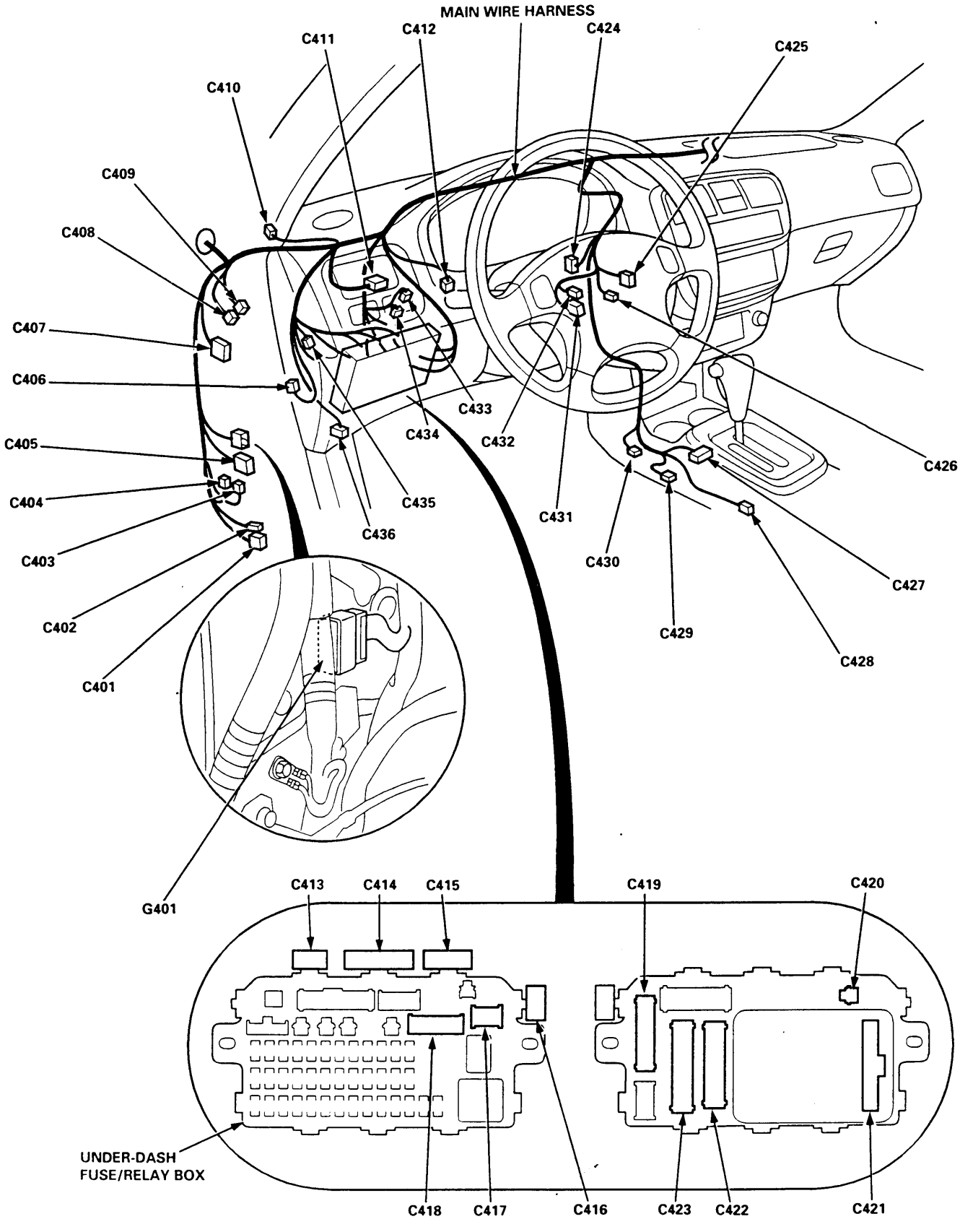
Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C351	11	Right side of engine compartment	Under-hood fuse/relay box (C907)	
C352	9	Right side of engine compartment	Under-hood fuse/relay box (C906)	
C353	5	Right side of engine compartment	Under-hood fuse/relay box (C905)	
C354	3	Right side of engine compartment	Under-hood ABS fuse/relay box (C930)	
C355	2	Right side of engine compartment	Under-hood ABS fuse/relay box (C931)	
C356	8	Right side of engine compartment	Engine compartment wire harness (C216)	
C357	2	Right side of engine compartment	Right front ABS wheel sensor	
C358	10	Right side of engine compartment	ABS solenoids	
C359	2	Right side of engine compartment	ABS pump motor	
G301		Right side of engine compartment	Body ground, via main wire harness	


C353
C352
UNDER-HOOD
FUSE/RELAY BOX
C351
MAIN WIRE HARNESS
(left branch)
C302
C303
C301
C304
C305
C355
C354
C306
C307
C308
C309
C310
C356
C357
C358
C359
MAIN WIRE HARNESS
(right branch)
G301

Connector Identification and Wire Harness Routing

Main Wire Harness (Left side of dash and floor branch)

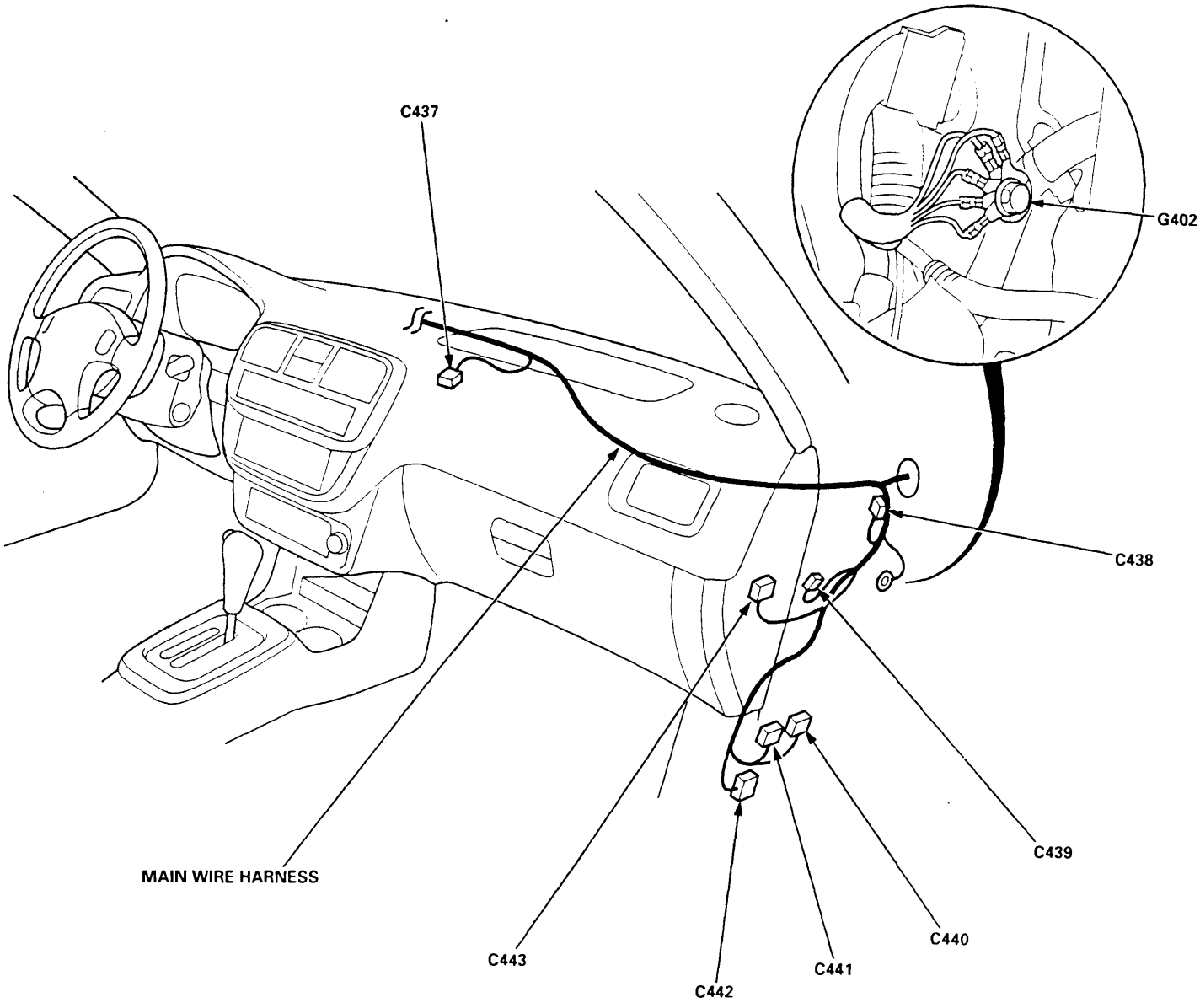
Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C401	8	Under left side of dash	Floor wire harness (C553)	ABS
C402	2	Under left side of dash	Floor wire harness (C554)	
C403	4	Under left side of dash	Rear window defogger relay	
C404	4	Under left side of dash	Security system headlight relay	
C405	12	Under left side of dash	Floor wire harness (C555)	
C406	4	Under left side of dash	Starter cut relay	
C407	14	Under left side of dash	Cruise control unit	
C408	4	Under left side of dash	Daytime running lights control unit	
C409	8	Under left side of dash	Daytime running lights control unit	
C410	2	Under left side of dash	Moonroof wire harness (C701)	
C411	7	Above under-dash fuse/relay	Ignition switch	
C412	4	Under left.side of dash	Brake switch	
C413	3	Above under-dash fuse/relay box	SRS main harness (C802)	
C414	14	Above under-dash fuse/relay box	Dashboard wire harness (C502)	
C415	12	Above under-dash fuse/relay box	Dashboard wire harness (C501)	A/T
C416	4	Above under-dash fuse/relay box	Horn relay	
C417	6	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C915)	
C418	7	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C914)	
C419	18	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C922)	
C420	1	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C925)	
C421	10	Behind under-dash fuse/relay box	Integrated control unit	
C422	18	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C919)	
C423	20	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C920)	
C424	8	Under middle of dash	Interlock control unit	A/T
C425	8	In the steering column cover	Windshield wiper/washer switch	
C426	3	Under left side of dash	Cable reel	
C427	14	Under middle of dash	A/T gear position switch	A/T
C428	2	Under middle of dash	Shift lock solenoid	A/T
C429	4	Under middle of dash	Parking pin switch and A/T gear position console light	
C430	4	Under middle of dash	Secondary heated oxygen sensor sub-harness (C781)	
C431	7	In the steering column cover	Combination light/turn signal switch	
C432	4	In the steering column cover	Turn signal switch	
C433	2	Under left side of dash	Clutch switch	M/T
C434	2	Under left side of dash	Clutch interlock switch	M/T
C435	1	Under left side of dash	Front fog light connector	Optional
C436	16	Under left side of dash	Data link connector	
G401		Left kick panel	Body ground, via main wire harness	


MAIN WIRE HARNESS
C411
C412
C424
C425
C410
C409
C408
C407
C406
C405
C404
C403
C402
C401
G401
C433
C434
C435
C436
C432
C431
C430
C429
C428
C427
C426
C413
C414
C415
C419
C420
UNDER-DASH
FUSE/RELAY BOX
C418
C417
C416
C423
C422
C421

Connector Identification and Wire Harness Routing

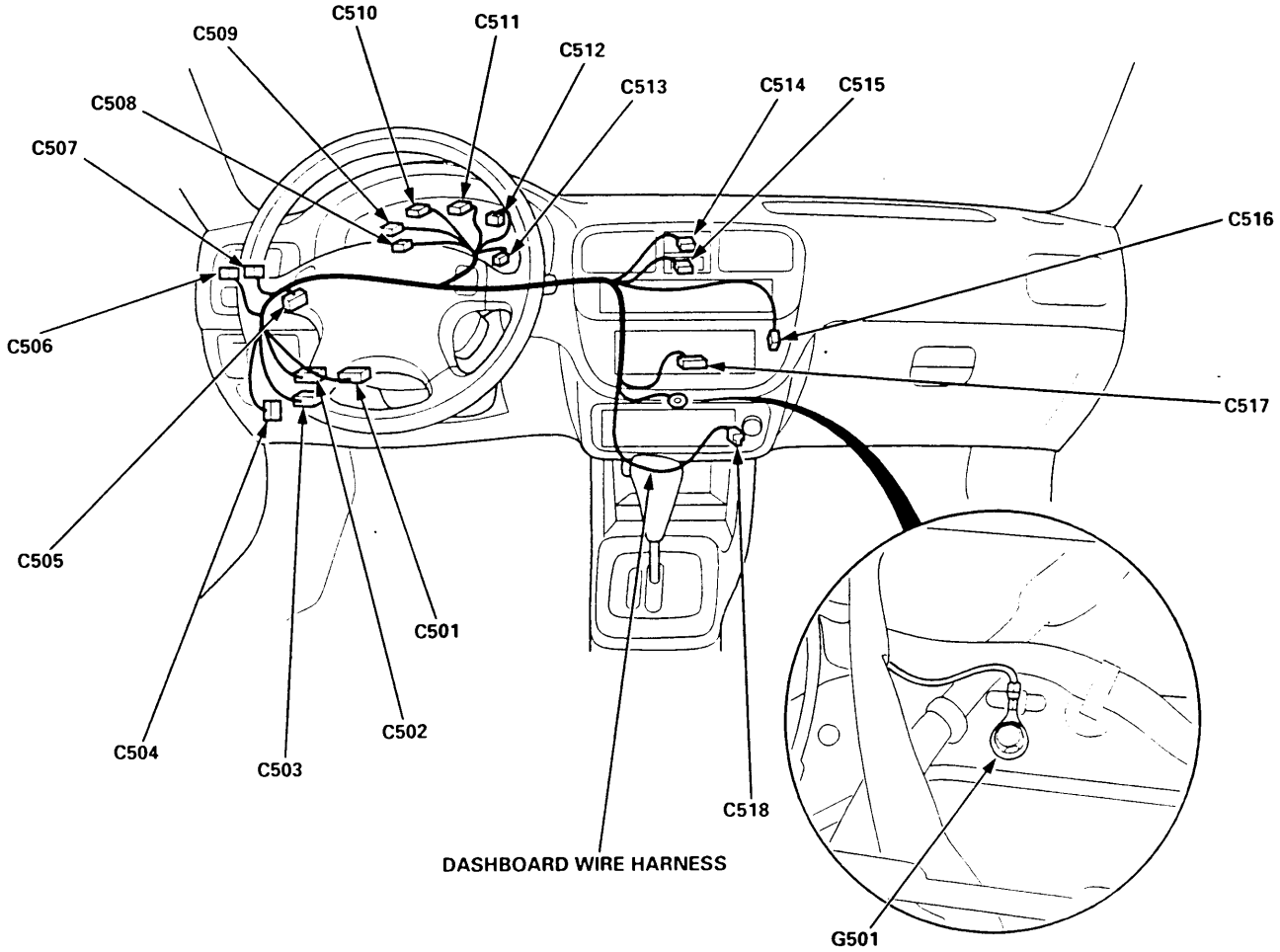
Main Wire Harness (Right side of dash branch)

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C437	16	Under right side of dash	Heater sub-harness A (C721)	
C438	20	Under right side of dash	Junction connector	
C439	2	Under right side of dash	Service check connector	
C440	26	Under right side of dash	ABS control unit	
C441	22	Under right side of dash	ABS control unit	
C442	22	Under right side of dash	Engine wire harness (C123)	
C443	7	Under right side of dash	PGM-FI main relay	
G402		Right kick panel	Body ground, via main wire harness	



Dashboard Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C501	12	Above under-dash fuse/relay box	Main wire harness (C415)	A/T
C502	14	Above under-dash fuse/relay box	Main wire harness (C414)	
C503	20	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C912)	
C504	16	Above under-dash fuse/relay box	Floor wire harness (C557)	
C505	20	Below gauges	Junction connector	
C506	5	Left side of steering wheel	Cruise main switch	
C507	3	Left side of steering wheel	Dash lights brightness controller	
C508	5	Behind gauges	Gauge assembly	
C509	5	Behind gauges	Gauge assembly	
C510	13	Behind gauges	Gauge assembly	
C511	16	Behind gauges	Gauge assembly	
C512	14	Behind gauges	Gauge assembly	A/T
C513	5	Behind gauges	Gauge assembly	ABS
C514	4	Behind middle of dash	Clock	
C515	10	Behind middle of dash	Hazard warning switch	
C516	2	Behind middle of dash	Security indicator light	
C517	16	Behind middle of dash	Audio unit	
C518	2	Behind middle of dash	Accessory socket	
G501		Under middle of dash	Body ground, via dashboard wire harness	

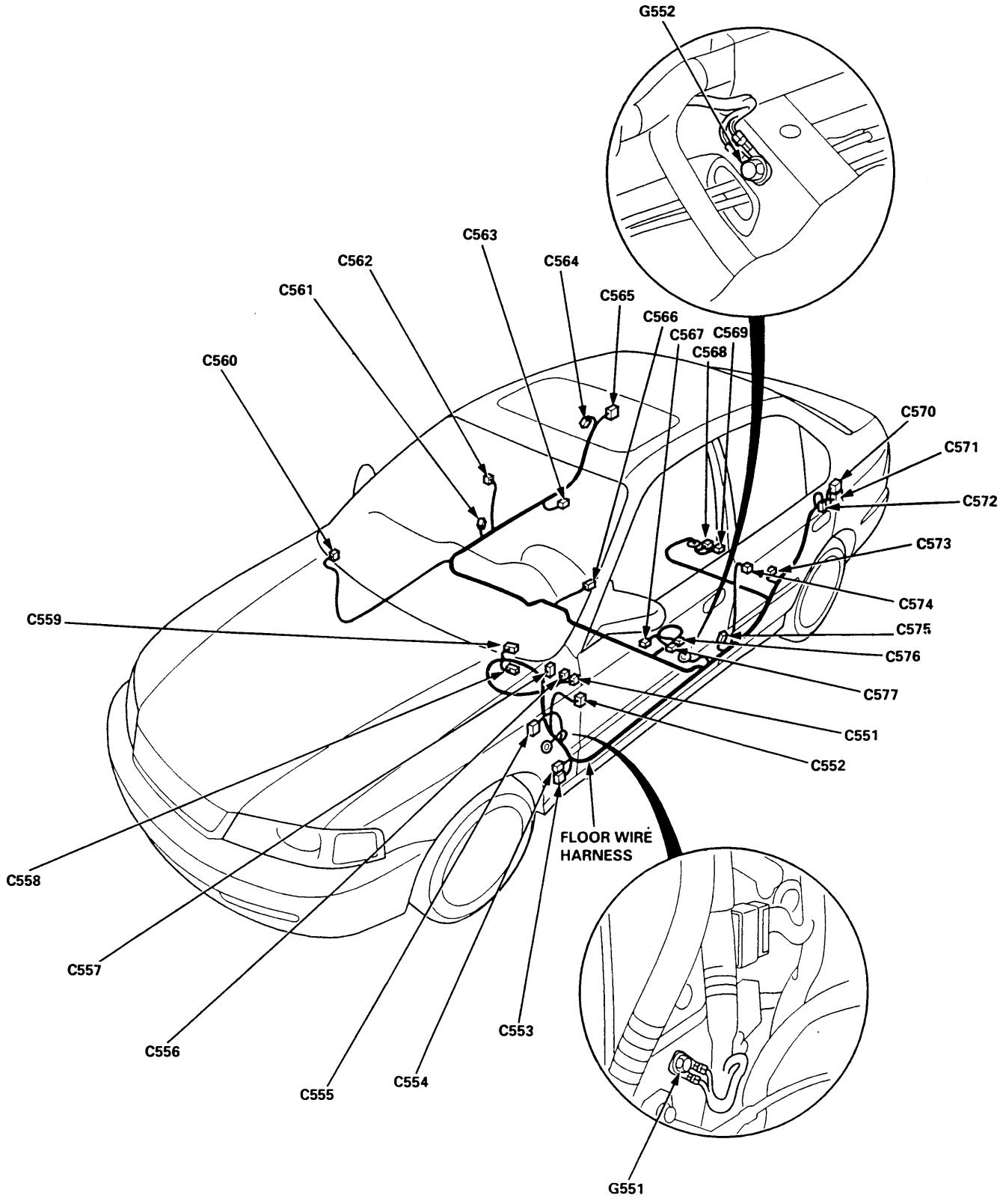


Connector Identification and Wire Harness Routing

Floor Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C551	2	Under left side of dash	Power mirror defogger switch	
C552	25	Driver's door	Driver's door wire harness (C631)	
C553	8	Behind left kick panel	Main wire harness (C401)	ABS
C554	2	Behind left kick panel	Main wire harness (C402)	
C555	12	Behind left kick panel	Main wire harness (C405)	
C556	10	Under left side of dash	Power mirror switch	
C557	16	Above under-dash fuse/relay box	Dashboard wire harness (C504)	
C558	8	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C921)	
C559	16	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C923)	
C560	25	Front passenger's door	Front passenger's door wire harness (C651)	
C561	1	Right B-pillar	Front passenger's door switch	
C562	6	Right B-pillar	Right rear door wire harness (C671)	
C563	2	Right side of rear floor	Right rear ABS wheel sensor	
C564	1	Right quarter panel	Right rear door switch	
C565	6	Right quarter panel	Rear wire harness (C613)	*
C566	1	Middle of floor	Parking brake switch	
C567	2	Left side of floor	Driver's seat belt switch	
C568	2	Fuel tank	Fuel pump (FP)	
C569	3	Fuel tank	Fuel gauge sending unit	
C570	2	Left quarter panel	Rear wire harness (C601)	
C571	16	Left quarter panel	Rear wire harness (C602)	
C572	1	Left quarter panel	Left rear door switch	
C573	2	Left side of rear floor	Left rear ABS wheel sensor	
C574	6	Left B-pillar	Left rear door wire harness (C661)	
C575	1	Left side of floor	Driver's door switch	
C576	12	Left side of floor	Keyless/security control unit	
C577	18	Left side of floor	Keyless/security control unit	
G551		Left kick panel	Body ground, via floor wire harness	
G552		Left side of floor	Body ground, via floor wire harness	

*: With AFB sound system

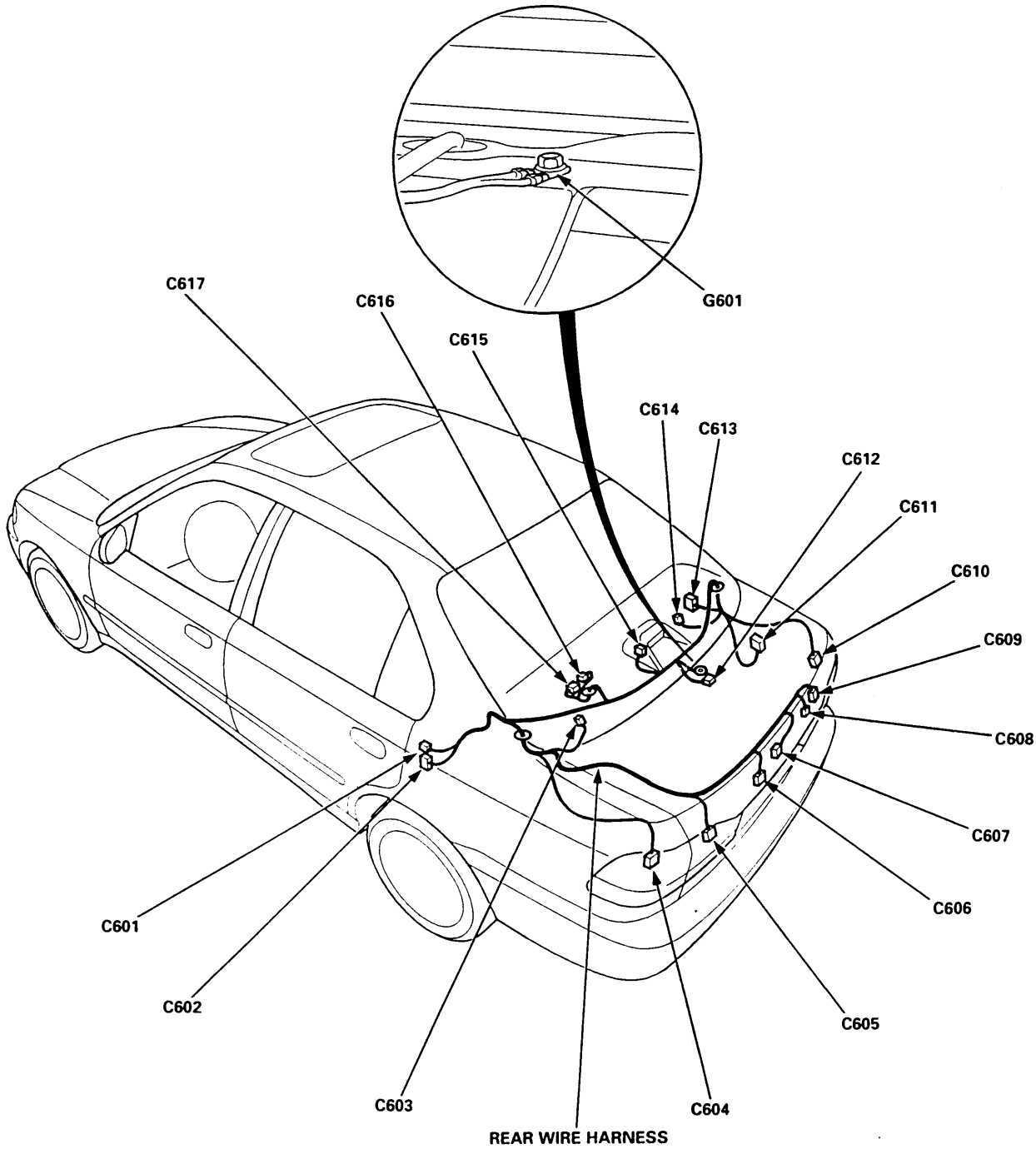

G552
C563
C562
C564
C561
C565
C566
C567
C569
C568
C560
C570
C571
C572
C573
C574
C559
C575
C576
C577
C551
C552
FLOOR WIRE HARNESS
C558
C557
C556
C555
C554
C553
G551

Connector Identification and Wire Harness Routing

Rear Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C601	2	Left quarter panel	Floor wire harness (C570)	
C602	16	Left quarter panel	Floor wire harness (C571)	
C603	2	Left side of rear shelf	Left rear speaker	
C603	4	Left side of rear shelf	Left rear speaker	*
C604	4	Left side of trunk	Left outer taillight	
C605	4	Left side of trunk	Left inner taillight	
C606	2	Middle of trunk	Left license plate light	
C607	4	Middle of trunk	Trunk latch switch	
C608	2	Middle of trunk	Right license plate light	
C609	4	Right side of trunk	Right outer taillight	
C610	4	Right side of trunk	Right inner taillight	
C611	18	Right quarter panel	Stereo amplifier	*
C612	2	Middle of rear shelf	Trunk light	
C613	6	Right quarter panel	Floor wire harness (C565)	*
C614	2	Right side of rear shelf	Right rear speaker	
C614	4	Right side of rear shelf	Right rear speaker	*
C615	2	Middle of rear shelf	High mount brake light	
C616	1	Left side of rear shelf	Rear window defogger coil	
C617	2	Left side of rear shelf	Rear window defogger coil	
G601		Middle of trunk	Body ground, via rear wire harness	

*: With AFB sound system


G601
C617
C616
C615
C614
C613
C612
C611
C610
C609
C608
C607
C606
C605
C604
C603
C602
C601
REAR WIRE HARNESS

Connector Identification and Wire Harness Routing

Roof Wire Harness (Without moonroof)

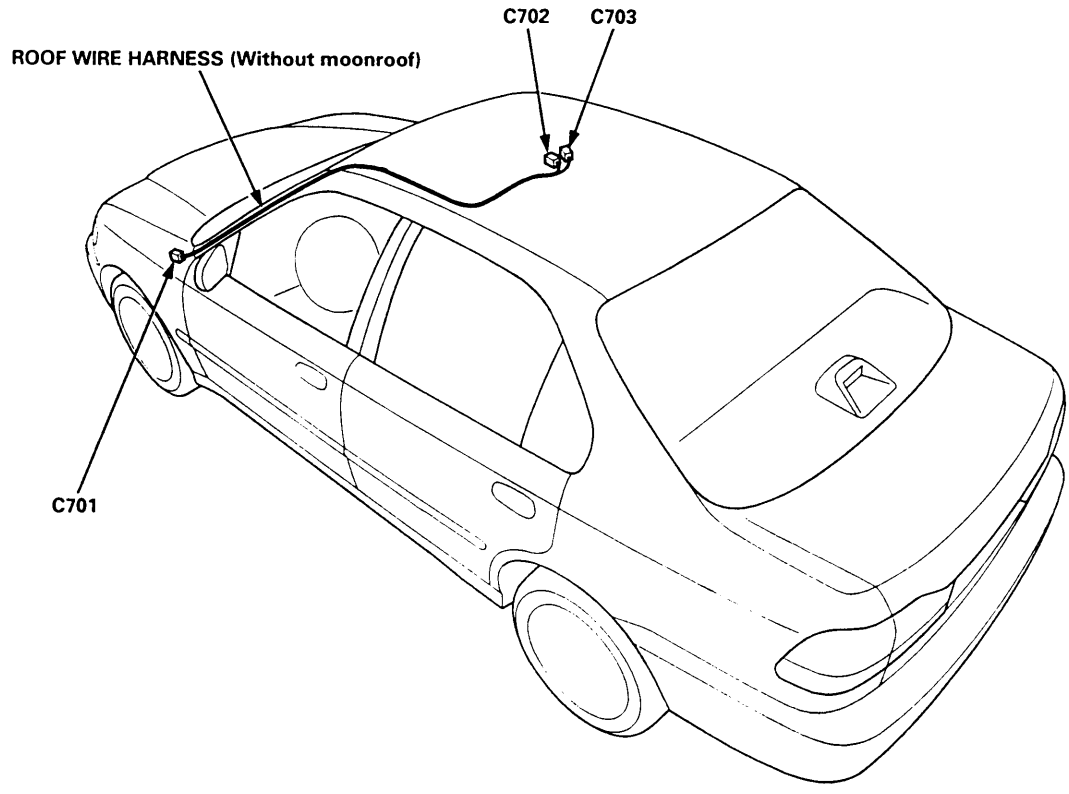
Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C701	2	Under left side of dash	Main wire harness (C410)	
C702	1	Center of roof	Ceiling light	
C703	1	Center of roof	Ceiling light	

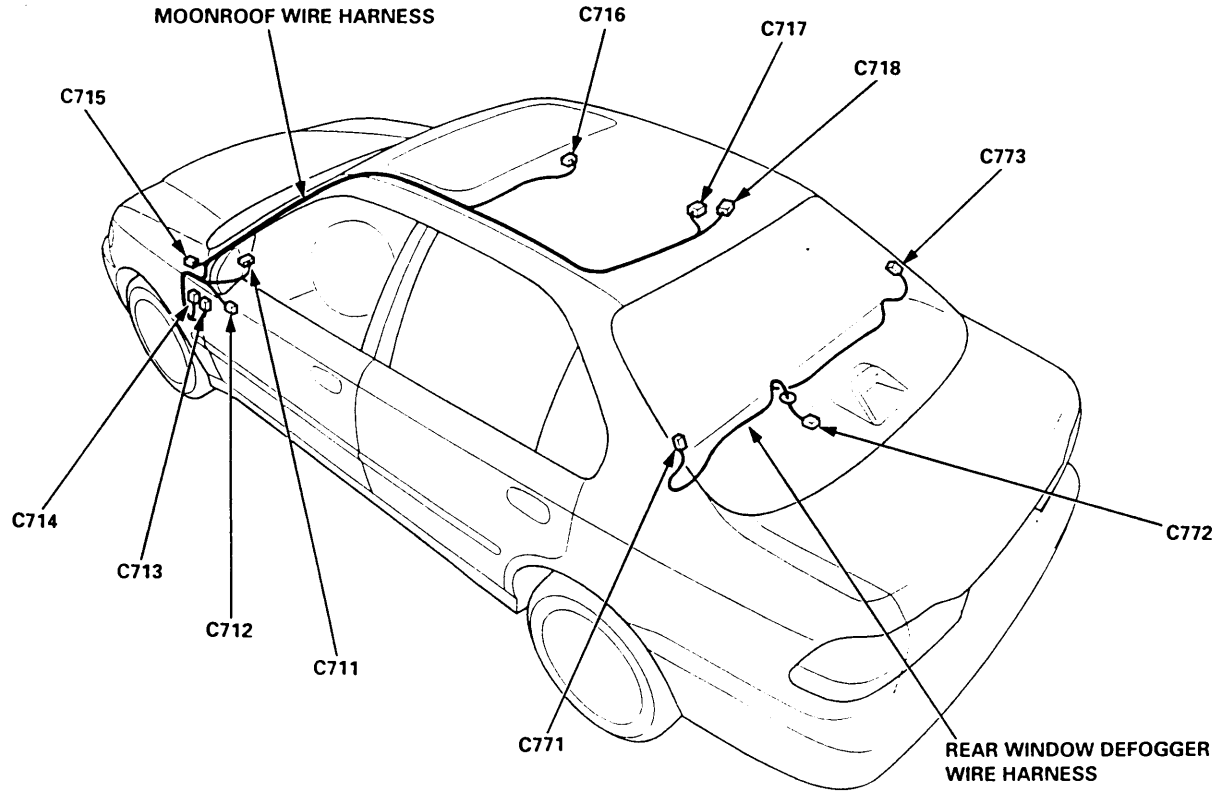
Moonroof Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C711	3	Behind dashboard lower panel	Under-dash fuse/relay box (C910)	
C712	4	Behind dashboard lower panel	Moonroof switch	
C713	6	Left side of dashboard bracket	Moonroof open relay	
C714	6	Left side of dashboard bracket	Moonroof close relay	
C715	2	Under left side of dash	Main wire harness (C410)	
C716	3	Center of roof	Ceiling light	
C717	2	Rear of roof	Moonroof motor	
C718	4	Rear of roof	Moonroof motor (Tilt switch)	

Rear Window Defogger Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C771	1	Left C-pillar	Rear window defogger (–)	
C772	2	Left side of rear shelf	Window antenna coil	
C773	1	Right C-pillar	Rear window defogger (+)	


C702
C703
ROOF WIRE HARNESS (Without moonroof)
C701


MOONROOF WIRE HARNESS
C716
C717
C718
C715
C773
C714
C713
C712
C711
C772
C771
REAR WINDOW DEFOGGER
WIRE HARNESS

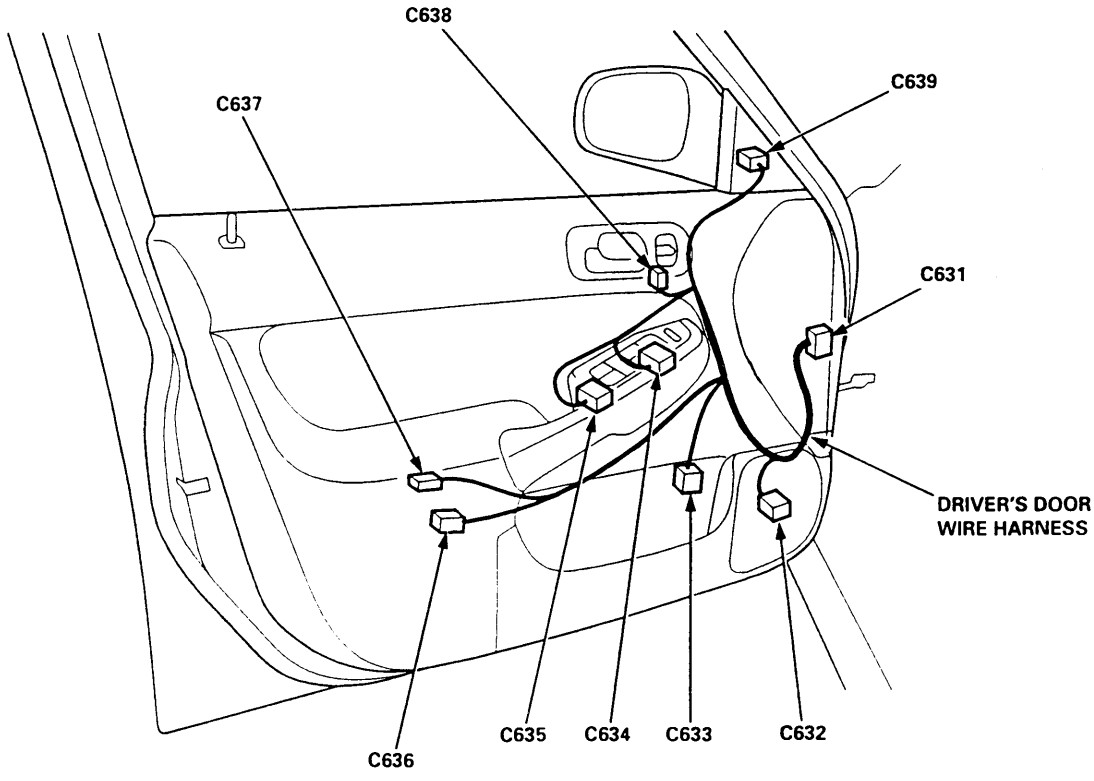
Connector Identification and Wire Harness Routing

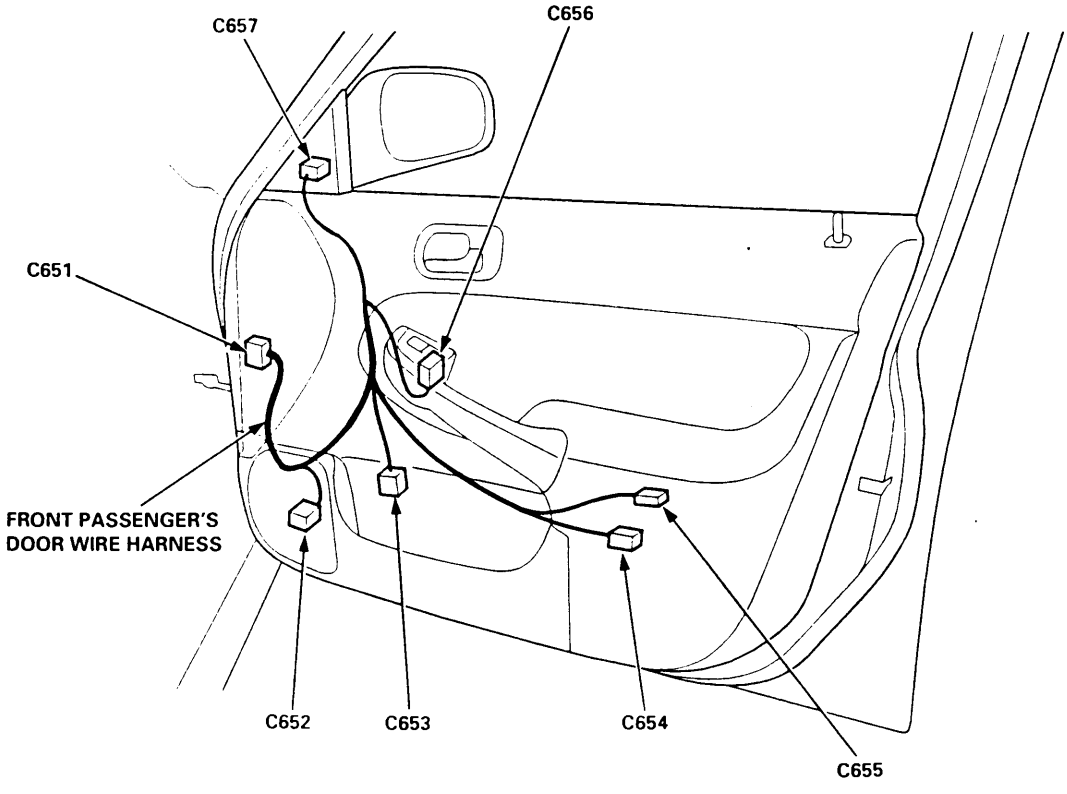
Driver's Door Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C631	25	Driver's door	Floor wire harness (C552)	
C632	2	Driver's door	Left front door speaker	
C633	4	Driver's door	Driver's power window motor	
C634	16	Driver's door	Power window master switch	
C635	1	Driver's door	Power window master switch	
C636	6	Driver's door	Driver's door lock actuator	
C637	3	Driver's door	Driver's door key cylinder switch	
C638	3	Driver's door	Driver's door lock switch	
C639	8	Inside of left power mirror	Left power mirror	

Front Passenger's Door Wire Harness

Connector or Terminals	Number of Cavities	Location	Connects to	Notes
C651	25	Passenger's door	Floor wire harness (C560)	
C652	2	Passenger's door	Right front door speaker	
C653	3	Passenger's door	Front passenger's power window motor	
C654	4	Passenger's door	Front passenger's door lock actuator	
C655	3	Passenger's door	Front passenger's door key cylinder switch	
C656	5	Passenger's door	Front passenger's power window switch	
C657	8	Inside of right power mirror	Right power mirror	


C638
C637
C639
C631
DRIVER'S DOOR
WIRE HARNESS
C636
C635
C634
C633
C632


C657
C656
C651
FRONT PASSENGER'S
DOOR WIRE HARNESS
C652
C653
C654
C655

Connector Identification and Wire Harness Routing

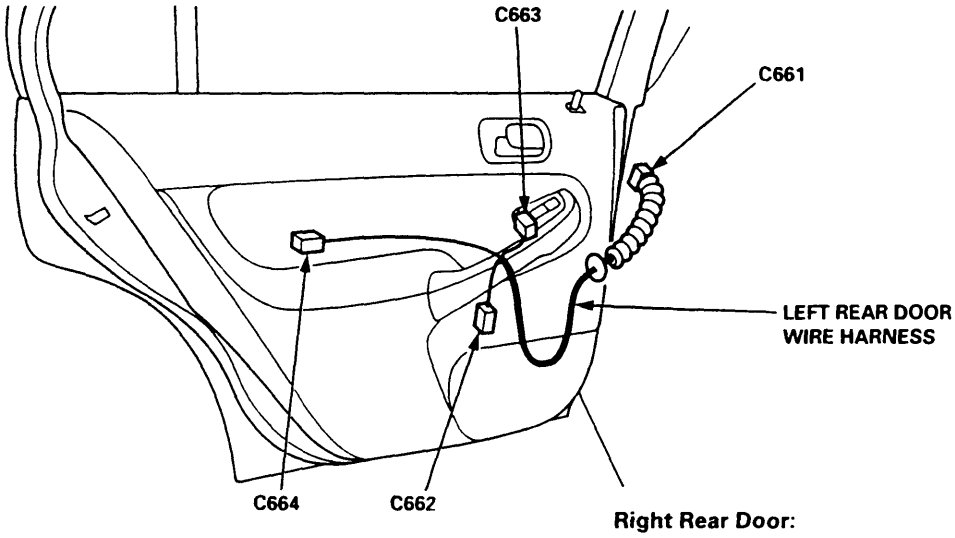
Left Rear Door Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C661	6	Left B-pillar	Floor wire harness (C574)	
C662	2	Left rear door	Left rear power window motor	
C663	5	Left rear door	Left rear power window switch	
C664	2	Left rear door	Left rear door lock actuator	

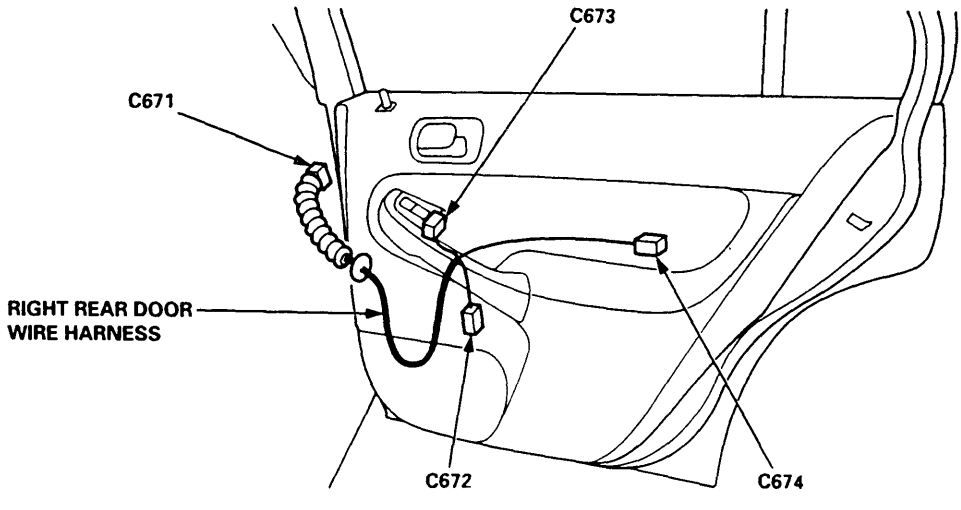
Right Rear Door Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C671	6	Right B-pillar	Floor wire harness (C562)	
C672	2	Right rear door	Right rear power window motor	
C673	5	Right rear door	Right rear power window switch	
C674	2	Right rear door	Right rear door lock actuator	

Left Rear Door:



Right Rear Door:

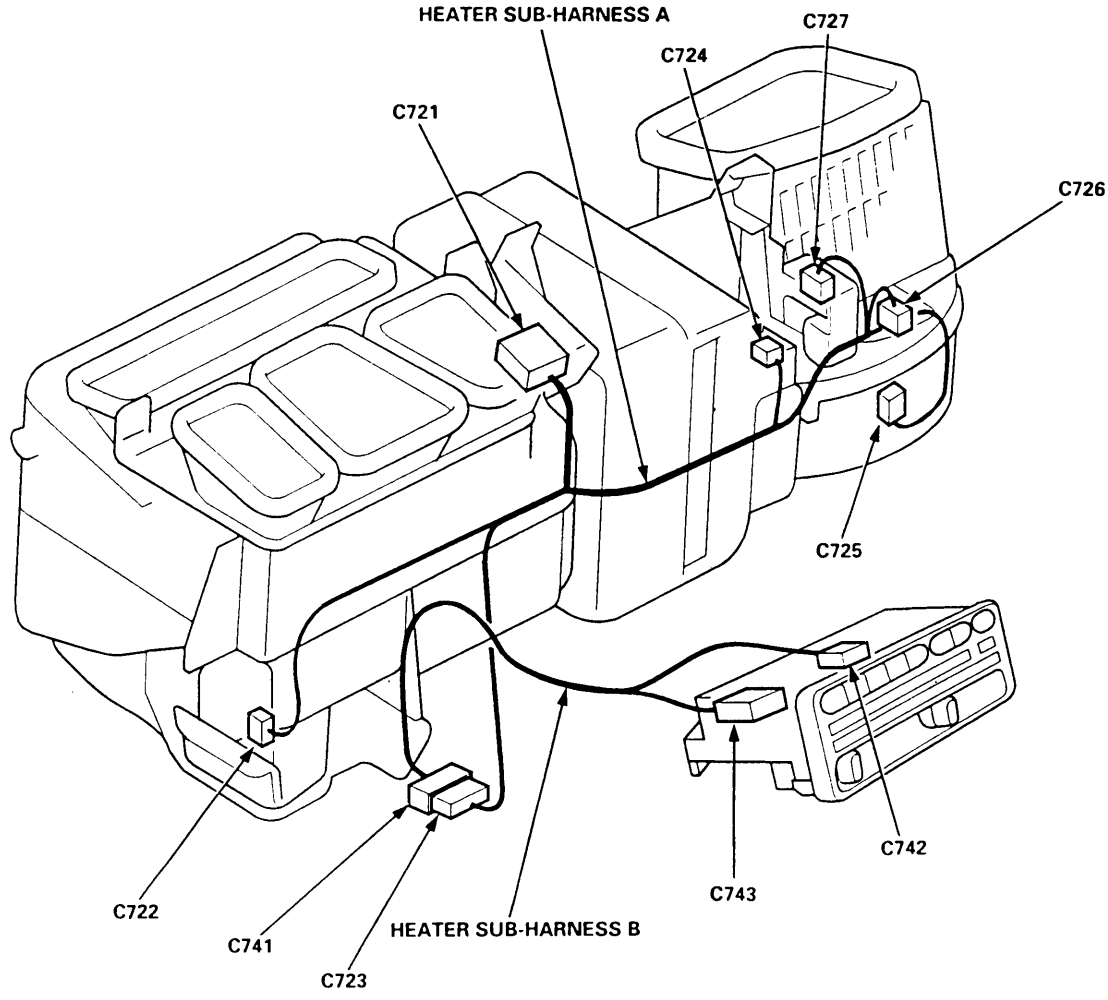


Heater Sub-harness A

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C721	16	Under left side of dash	Main wire harness (C437)	
C722	7	Behind glove box	Mode control motor	
C723	20	Behind glove box	Heater sub-harness B (C741)	
C724	3	Behind glove box	A/C thermostat	
C725	2	Behind glove box	Blower motor	
C726	4	Behind glove box	Blower resister	
C727	4	Behind glove box	Recirculation control motor	

Heater Sub-harness B

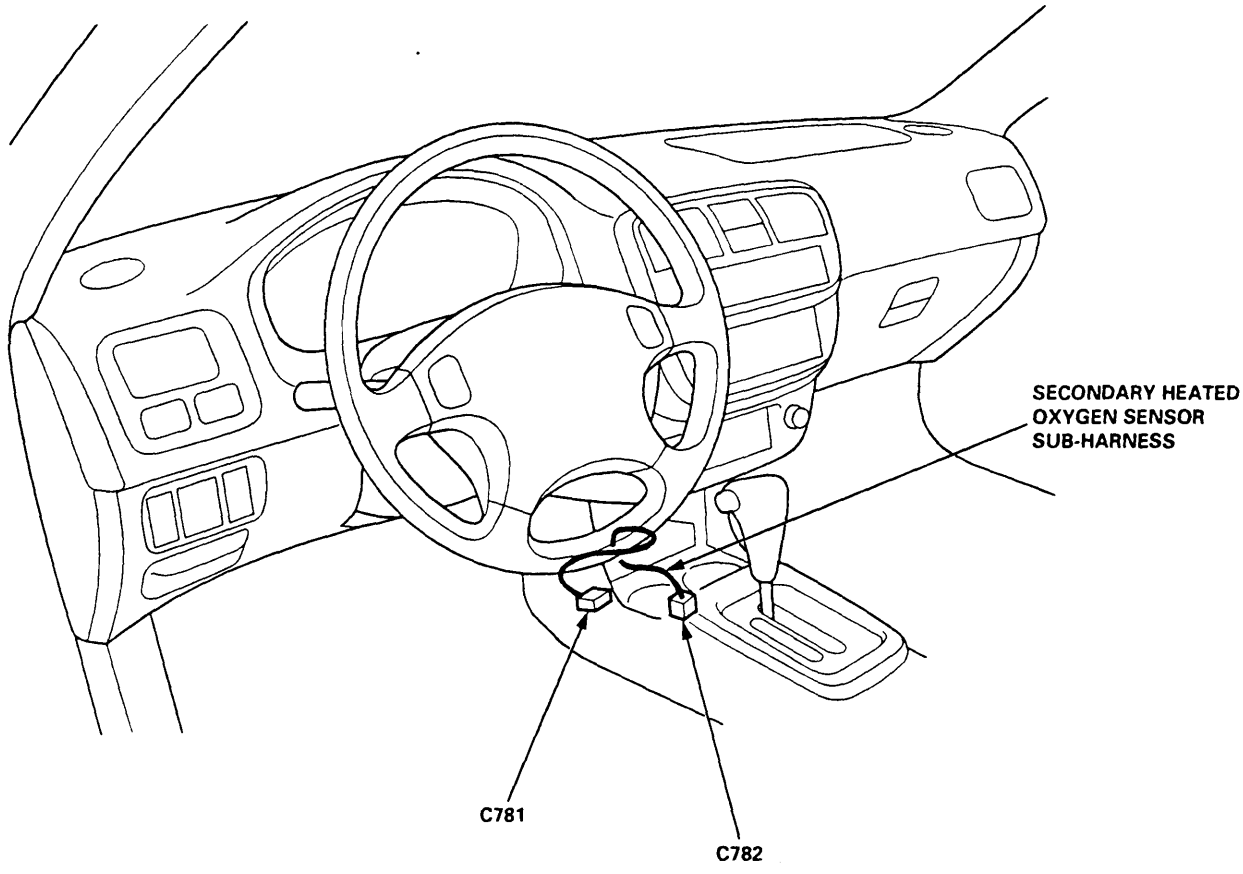
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C741	20	Behind glove box	Heater sub-harness A (C723)	
C742	6	Behind middle of dash	Heater fan switch	
C743	16	Behind middle of dash	Heater control panel	



Connector Identification and Wire Harness Routing

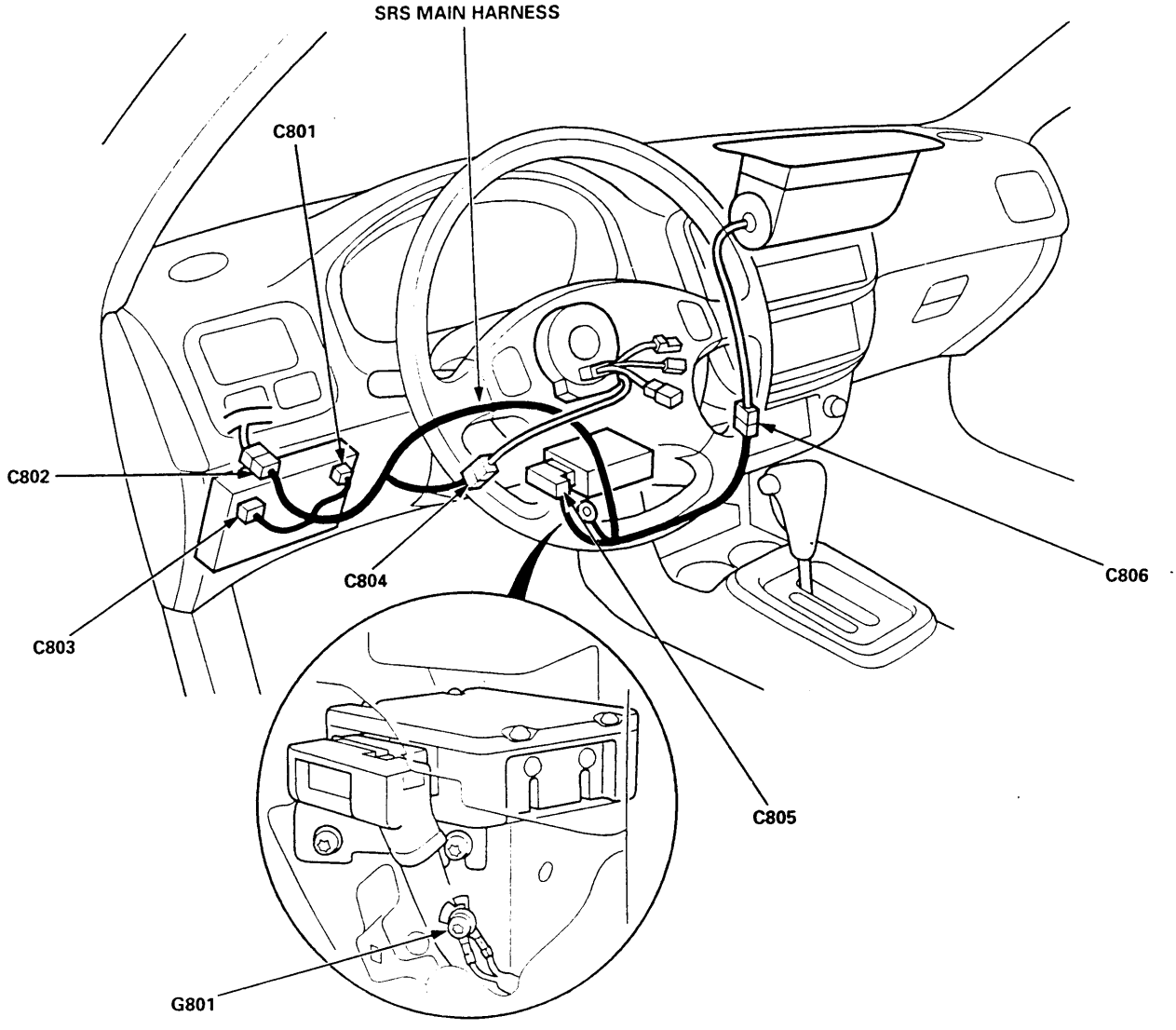
Secondary Heated Oxygen Sensor Sub-harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C781 C782	4 4	Under middle of dash Under middle of dash	Main wire harness (C430) Secondary heated oxygen sensor (Secondary HO2S) (Sensor 2)	



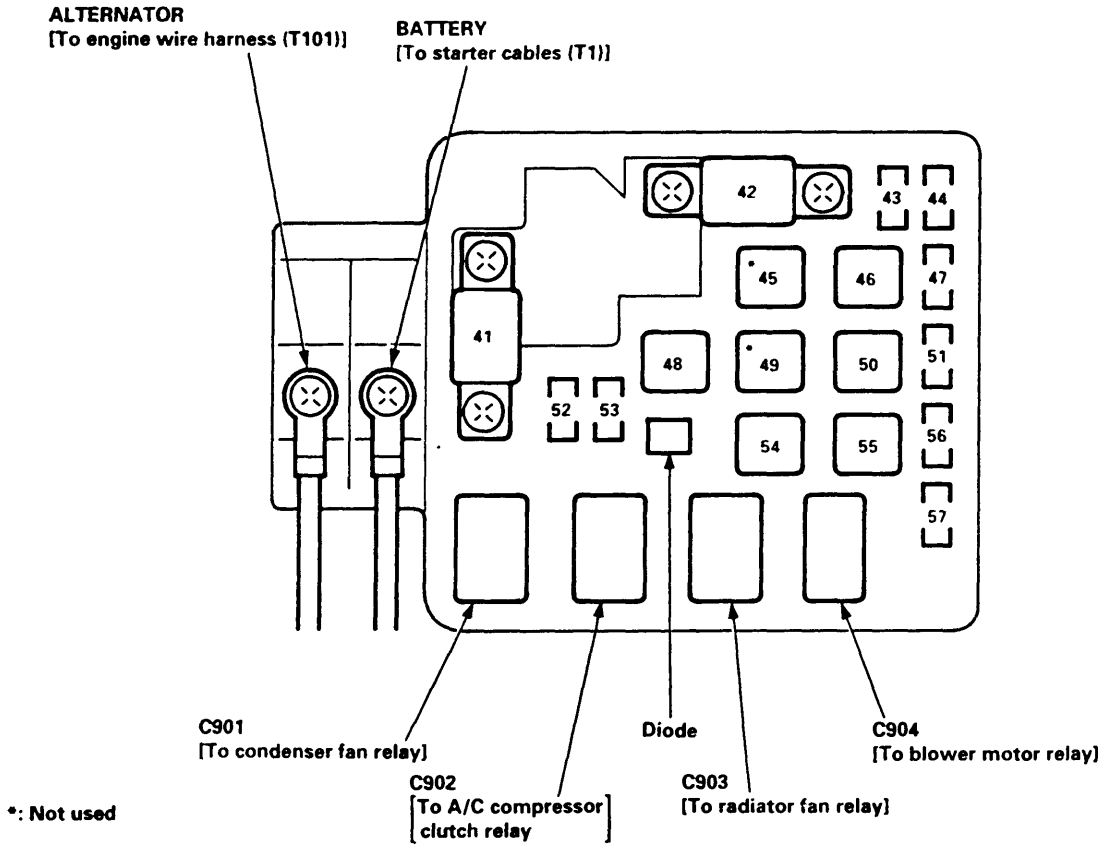
SRS Main Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C801	2	Under left side of dash	Under-dash fuse/relay box (C911)	
C802	3	Above under-dash fuse/relay box	Main wire harness (C413)	
C803	2	Right side of under-dash fuse/ relay box	Memory erase signal (MES) connector	
C804	2	Under left side of dash	Cable reel	
C805	18	Middle of floor	SRS unit	
C806	2	Under right side of dash	Passenger's airbag assembly	
G801		Middle of floor	Body ground, via SRS main harness	

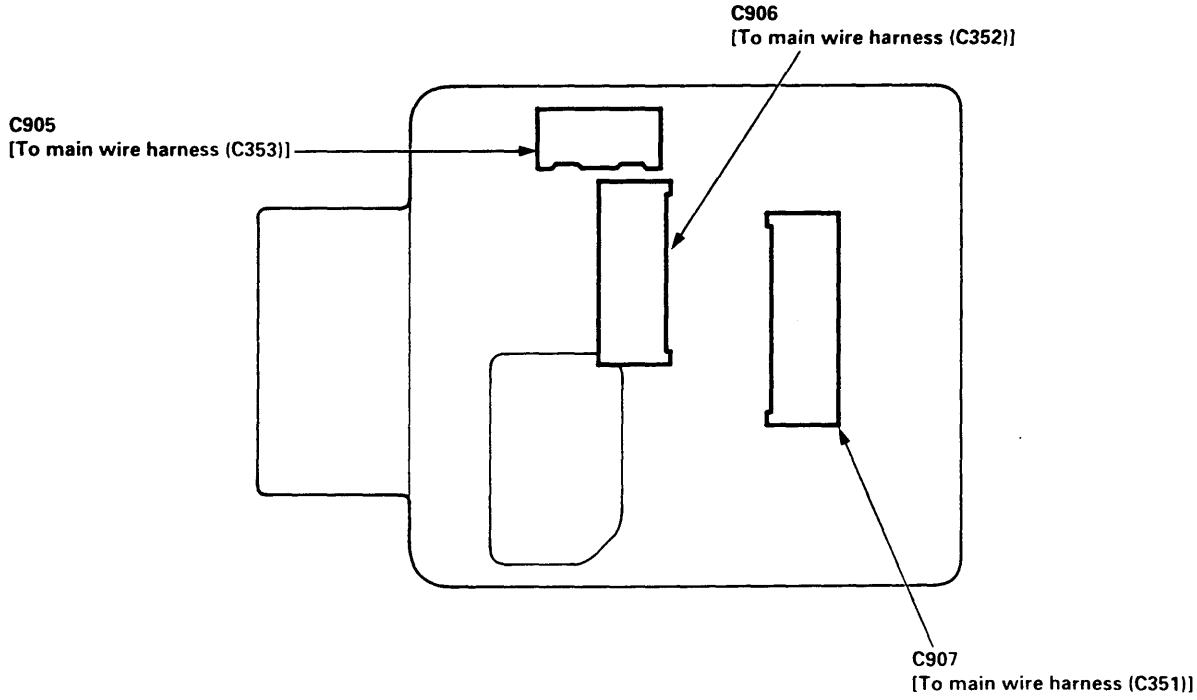


Fuses

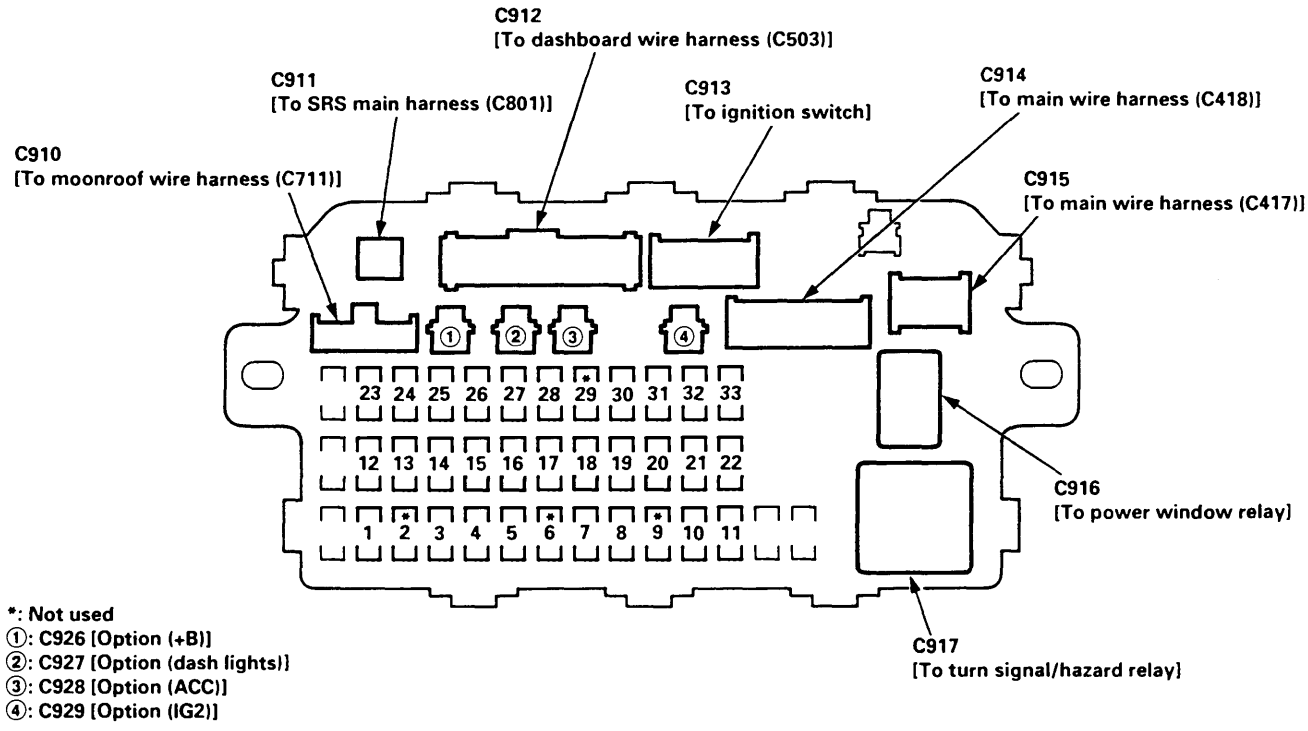
Under-hood Fuse/Relay Box



NOTE: View from the backside of the under hood fuse/relay box.

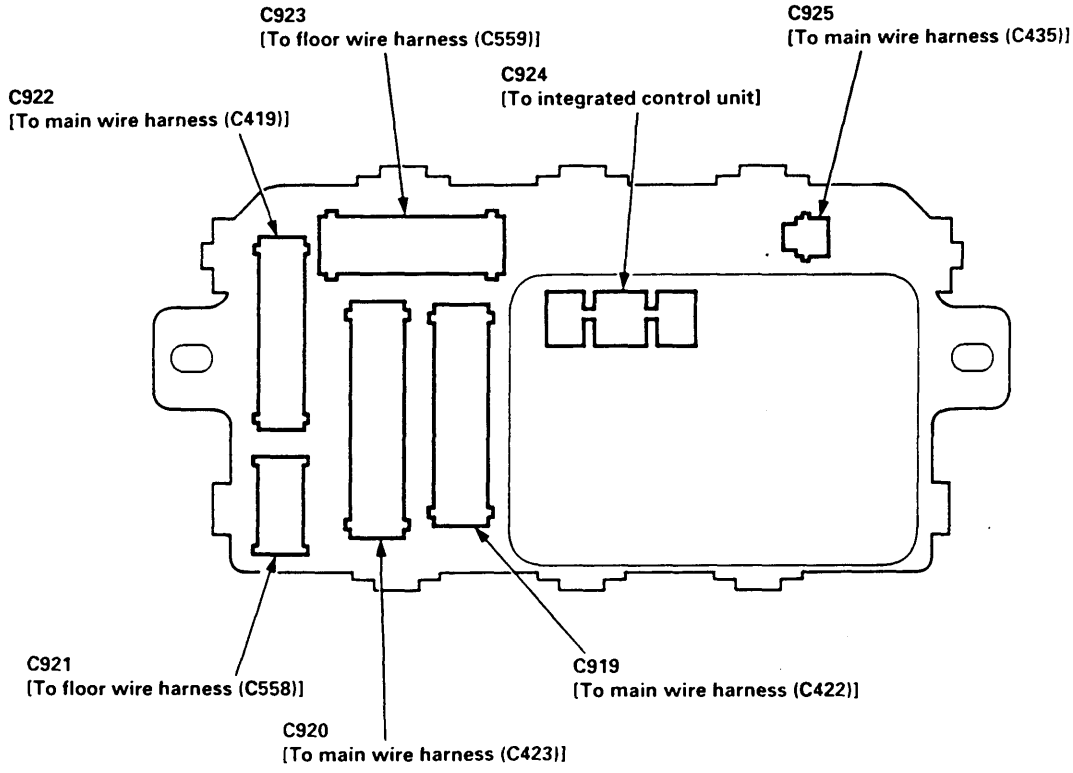


Under-dash Fuse/Relay Box



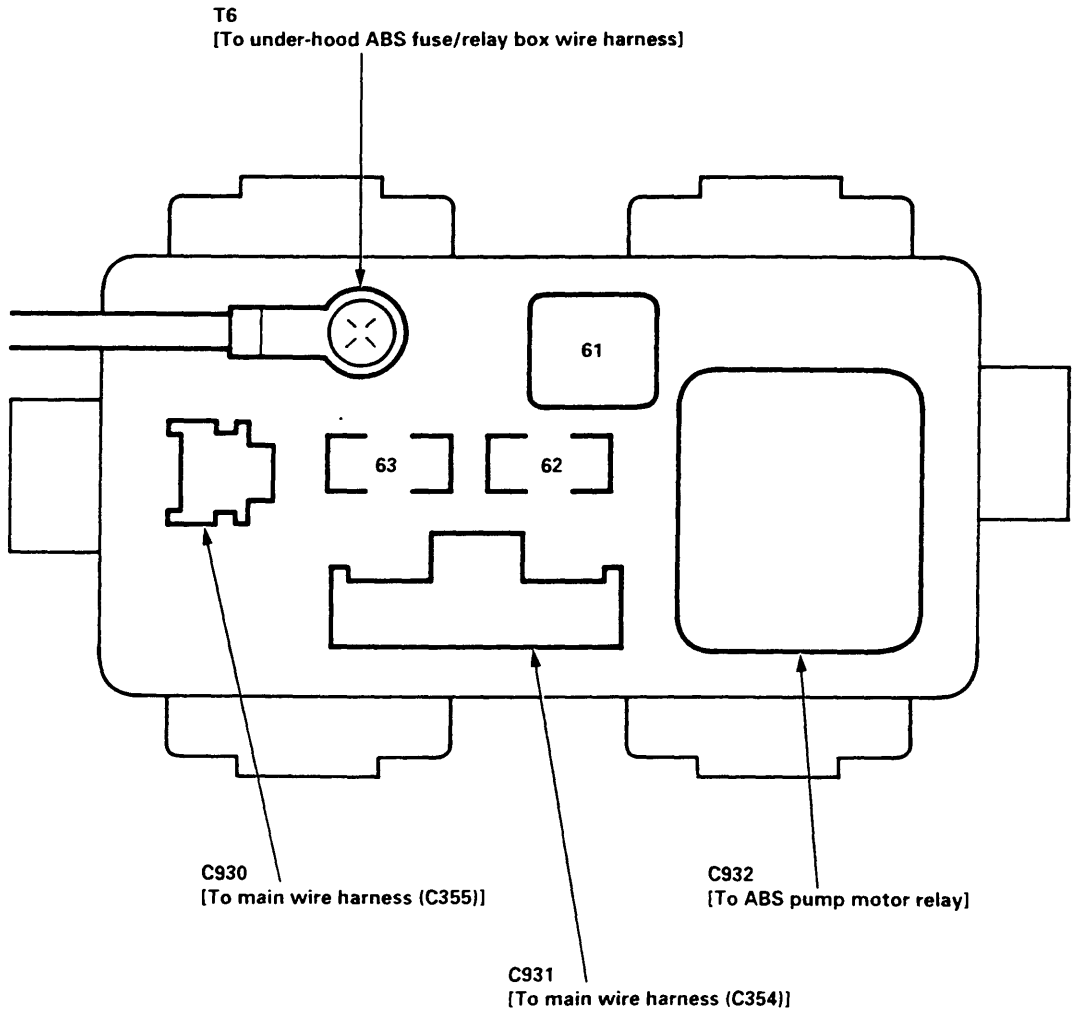
*: Not used
①: C926 [Option (+B)]
②: C927 [Option (dash lights)]
③: C928 [Option (ACC)]
④: C929 [Option (IG2)]

NOTE: View from the backside of the under-dash fuse/relay box.



Fuses

Under-hood ABS Fuse/Relay Box



Power Distribution

Fuse-to-Component(s) Index (in numerical sequence)

Under-hood Fuse/Relay Box:

Fuse	Capacity	Wire Color	Circuit(s) Protected
41	80 A	—	All
42	40 A	WHT/BLK	Ignition switch (BAT)
43	7.5 A	WHT	Ceiling light
			Data link connector
			Trunk light
			Integrated control unit (under-dash fuse relay/box socket)
44	15 A	WHT/BLK	PGM-FI main relay
45	Not used	—	
46	40 A	WHT/BLU	Power window relay
47	7.5 A	WHT/BLU	Audio unit
			Clock
			ECM (M/T)
			Heater control panel
			PCM (A/T)
			Security indicator
48	30 A	WHT	No. 20, 33 fuses (in under-dash fuse/relay box)
			No. 21, 22 fuses (via security headlight relay or dimmer low switch)
			Combination light switch
49	Not used	—	
50	30 A	WHT/GRN	Rear window defogger
51	20 A	WHT/GRN	Keyless/security control unit
			Moonroof motor
54	40 A	WHT/RED	Option connector
55	40 A	BLU/WHT	Blower motor
56	20 A	WHT	Condenser fan motor
		RED	A/C compressor clutch
57	20 A	BLK/RED	Radiator fan motor

Under-hood ABS Fuse/Relay Box:

Fuse	Capacity	Wire Color	Circuit(s) Protected
61	40 A	WHT	ABS pump motor
62	7.5 A	BRN/YEL	ABS control unit (MCK)
63	20 A	WHT/GRN	ABS control unit (BAT)

(cont'd)

Fuse-to-Component(s) Index (in numerical sequence) (cont'd)

Under-dash Fuse/Relay Box:

Fuse	Capacity	Wire Color	Circuit(s) Protected
1	Not used	—	
2	Not used	—	
3	Not used	—	
4	10 A	RED/BLU	Resistor
			Right headlight (high beam)
5	10 A	RED/GRN	High beam indicator
			Left headlight (high beam)
			Resistor
6	Not used	—	
7	20 A	RED/WHT	Left rear power window motor
8	20 A	YEL/BLK	Right rear power window motor
9	Not used	—	
10	20 A	GRN/BLK	Front passenger's window motor
11	20 A	BLU/BLK	Driver's window motor
			Power window master switch
12	7.5 A	YEL/BLK	Turn signal/hazard relay
13	15 A	YEL/GRN	PGM-FI main relay
		BLK/YEL	SRS unit (VA)
14	7.5 A	BLK/YEL	Cruise control unit
			Keyless/security control unit
15	7.5 A	BLK/YEL	Alternator
			Charging system light (Wire color: BLK/WHT)
			EVAP purge control solenoid valve
			Heated oxygen sensor
			Secondary heated oxygen sensor
			Vehicle speed sensor
16	7.5 A	BLK/BLU	ABS control unit
			Rear window defogger relay
17	7.5 A	BLK/YEL	A/C compressor clutch relay
			A/C thermostat
			Condenser fan relay
			Heater control panel
			Mode control motor
			Power mirror actuator
			Power mirror defogger
			Radiator fan relay
			Recirculation control motor
		—	Option connector
18	7.5 A	YEL/BLK	Daytime running lights control unit
19	7.5 A	YEL	Back-up lights
20	10 A	BLK/WHT	Daytime running lights control unit
			Keyless/security control unit
21	10 A	RED/WHT	Right headlight (low beam)
22	10 A	RED/YEL	Left headlight (low beam)
23	10 A	PNK	SRS unit (VB)
24	7.5 A	GRN/ORN	Moonroof open relay
			Moonroof close relay
		—	Power window relay

Under-dash Fuse/Relay box:

Fuse	Capacity	Wire Color	Circuit(s) Protected
25	7.5 A	YEL	ABS indicator circuit
			A/T gear position dimming circuit
			Clock
			Cruise indicator circuit
			Gauge assembly
			Interlock control unit
			Shift lock solenoid
			SRS indicator circuit
		—	Integrated control unit
26	20 A	GRN/BLK	Windshield wiper motor
			Windshield washer motor
27	15 A	YEL/GRN	Accessory power socket
28	15 A	YEL/RED	Audio unit
			Stereo amplifier (AFB sound system)
		—	Option connector
29	Not used	—	
30	7.5 A	RED/BLK	Audio unit light
			A/T gear position console light
			A/T gear position indicator dimming circuit
			Clock
			Cruise indicator circuit
			Cruise main switch light
			Dash lights brightness controller
			Gauge lights
			Hazard warning switch light
			Heater control panel lights
		—	Integrated control unit
			Option connector
31	7.5 A	BLU/ORN	ECM (M/T)
			PCM (A/T)
			PGM-FI main relay
			Keyless/security control unit
			Starter cut relay
		—	Integrated control unit
32	7.5 A	RED/BLK	Front parking lights
			License plate lights
			Taillights
33	7.5 A	WHT/GRN	Key interlock solenoid

Ground Distribution

Ground-to-Component(s) Index

NOTE: All ground wires are BLK unless otherwise noted.

Ground	Component or Circuits Grounded
G1	Battery (BLK/YEL)
G2	Power steering pump bracket
G3	Transmission housing
G101	Crankshaft speed fluctuation (CKF) sensor (BRN/BLK) Engine control module (ECM)/Powertrain control module (PCM) (LG1, LG2: BRN/BLK) Shielding: between ECM/PCM and CKF sensor (BRN/BLK) between ECM/PCM and Knock sensor (BRN/BLK) between ECM/PCM and Primary H02S (BRN/BLK) between ECM/PCM and Secondary H02S (BRN/BLK) between ECM/PCM and CKP sensor (BRN/BLK) between ECM/PCM and TDC sensor (BRN/BLK) between ECM/PCM and CYP sensor (BRN/BLK) between PCM and Mainshaft speed sensor (BRN/BLK) between PCM and Countershaft speed sensor (BRN/BLK) Engine control module (ECM)/Powertrain control module (PCM) (PG1, PG2) Engine coolant temperature (ECT) switch PGM-FI main relay Vehicle speed sensor (VSS) VTEC pressure switch
G201	Cruise actuator Headlight, right Hood switch Horns Parking light, right front Radiator fan motor Turn signal light, right front
G202	Headlight, left Parking light, left front Turn signal light, left front Washer motor, windshield
G301	ABS pump motor

NOTE: All ground wires are BLK unless otherwise noted.

Ground	Component or Circuits Grounded
G401	A/T gear position indicator dimming circuit A/T gear position switch ABS indicator light circuit Accessory power socket Brake fluid level switch Clock Clutch switch (M/T with cruise control) Cruise control unit Cruise indicator dimming circuit Cruise main switch light Dash lights brightness controller Data link connector (DLC) Daytime running lights control unit Gauges and indicator lights Ignition key switch Integrated control unit Inter lock control unit (A/T) Moonroof close relay Moonroof open relay Moonroof switch Parking pin switch (A/T) Power window relay SRS indicator light circuit Wiper motor, windshield Wiper switch, windshield — Plus everything grounded through G402
G402	A/T gear position switch ABS control unit Blower motor relay Heater control panel Heater fan switch Mode motor Service check connector — Plus everything grounded through G401

(cont'd)

Ground Distribution

Ground-to-Component(s) Index (cont'd)

NOTE: All ground wires are BLK unless otherwise noted.

Ground	Component or Circuits Grounded
G501	Audio unit
G551	Door key cylinder switch, driver's Door key cylinder switch, front passenger's Door lock knob switch, front passenger's Door lock knob switch, driver's Door lock switch, driver's Mirror defogger, driver's Mirror defogger, front passenger's Power mirror switch Power window motor, driver's Power window switch, driver's
G552	Fuel pump (FP) Fuel unit Keyless/Security control unit Seat belt switch, driver's
G601	High mount brake light License plate light, left License plate light, right Rear window defogger coil Stereo amplifier Taillight assembly, left Taillight assembly, right Trunk latch switch
G751	Condenser fan motor
G801	SRS unit (GRY or BLK)

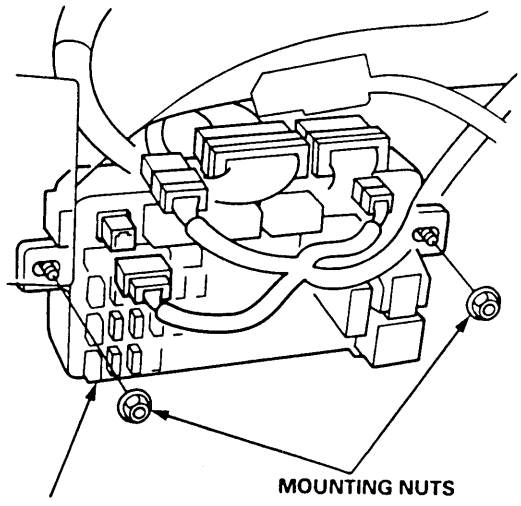
Under-dash Fuse/Relay Box

Removal/Installation

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) 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 battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Remove the driver's dashboard lower cover and knee bolster (see section 20).
4. Remove the two mounting nuts, and pull the under-dash fuse/relay box out from under the dash.



5. Disconnect the connectors from the under-dash fuse/relay box, and take out the under-dash fuse/relay box (see section 24).

Installation:

1. Connect the connectors to the under-dash fuse/relay box, then install the under-dash fuse/relay box in the reverse order of removal (see section 24).
2. Install the driver's dashboard lower cover (see section 20).
3. Connect the battery positive cable, then connect the negative cable.
4. Enter the anti-theft code for the radio, then enter the customer's radio station presets.
5. Confirm that all systems work properly.

Power Relays

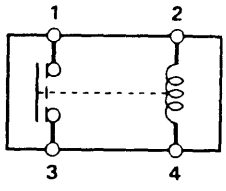
Relay Test

NOTE: See page 23-77 for turn signal/hazard relay input test.

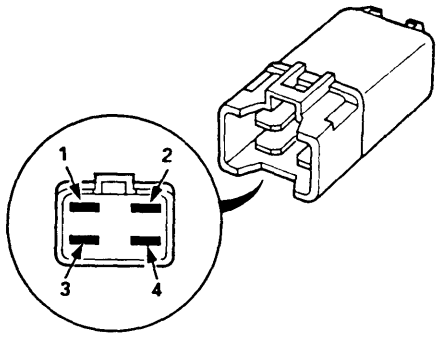
Normally-open type A:

1. 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.

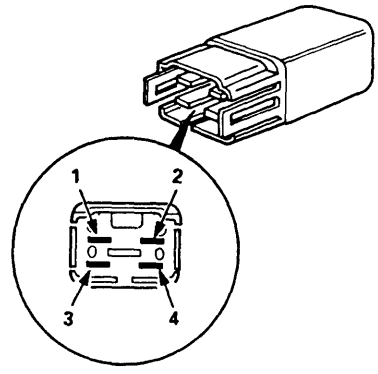
Terminal / Power (No. 2 – No. 4)	1	3
Disconnected		
Connected	○	○



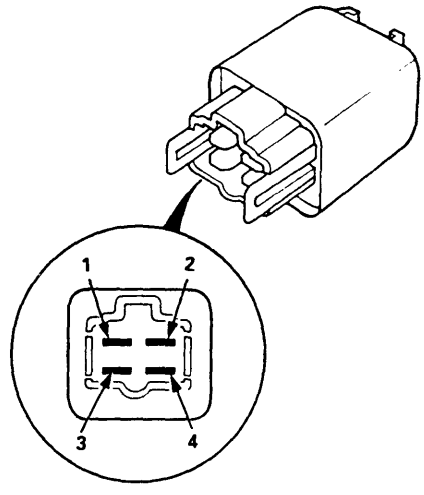
- Horn relay
- Rear window defogger relay
- Security headlight relay



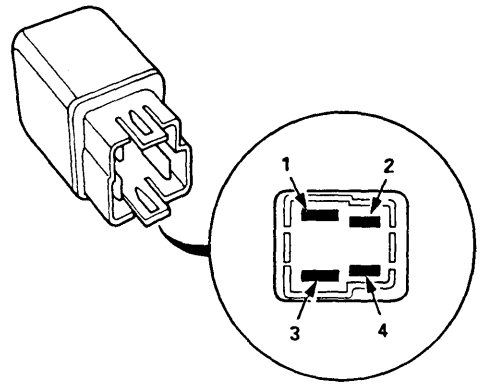
- Blower motor relay



- Starter cut relay



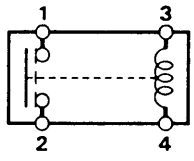
- ABS pump motor relay



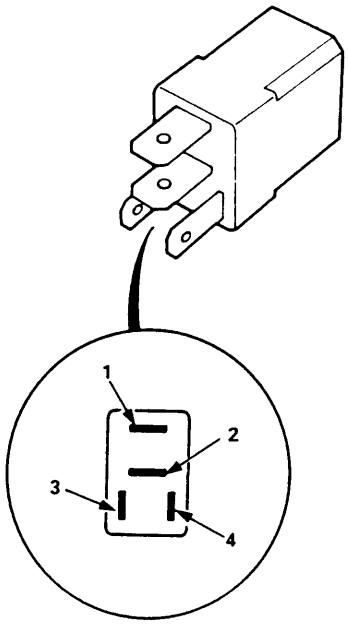
Normally-open type B:

1. 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.

Terminal / Power (No.3 – No.4)	1	2
Disconnected		
Connected	○	○



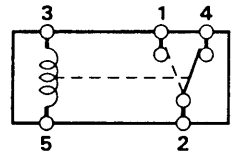
- Power window relay
- Radiator fan relay
- Condenser fan relay
- A/C compressor clutch relay



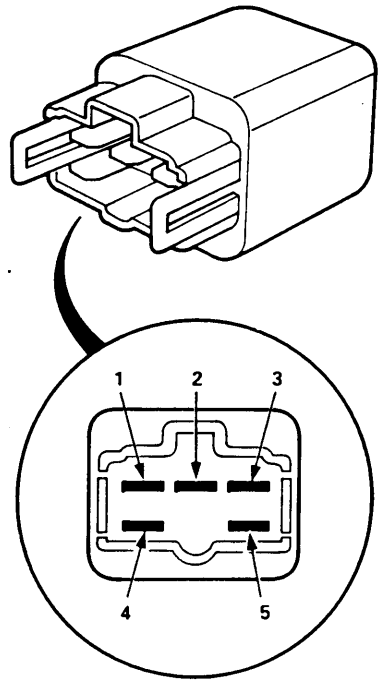
Five-terminal type:

1. 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. 5 terminals.
   - There should be continuity between the No. 2 and No. 4 terminals when power is disconnected.

Terminal / Power (No.2 – No.4)	1	2	4
Disconnected		○	○
Connected	○	○	



- Moonroof open relay
- Moonroof close relay



Ignition Switch

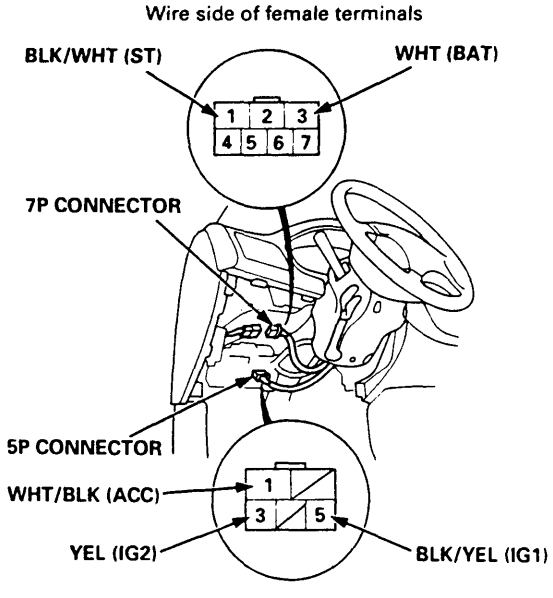
Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Make sure you have the anti-theft code for radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable.
3. Remove the driver's dashboard lower cover and knee bolster (see section 20).
4. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness.
5. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1 (ACC)	(3) (BAT)	5 (IG1)	3 (IG2)	(1) (ST)
O (LOCK)					
I (ACC)	○——	——○			
II (ON)	○——	——○——	——○——	——○	
III (START)		○——	——○——		——○

[ ] : 7P connector

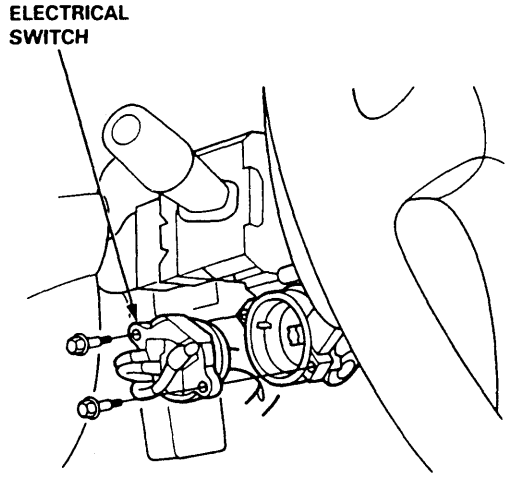


6. If the continuity checks do not agree with the table, replace the electrical switch.
7. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Electrical Switch Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Make sure you have the anti-theft code for radio, then write down the frequencies for the radio's preset buttons.
2. Disconnect the battery negative cable.
3. Remove the driver's dashboard lower cover and knee bolster (see section 20).
4. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness (see left column).
5. Remove the steering column covers (see section 17).
6. Insert the ignition key, and turn it to "0".
7. Remove the two screws and the electrical switch from the steering lock.



8. Install in the reverse order of removal.
9. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

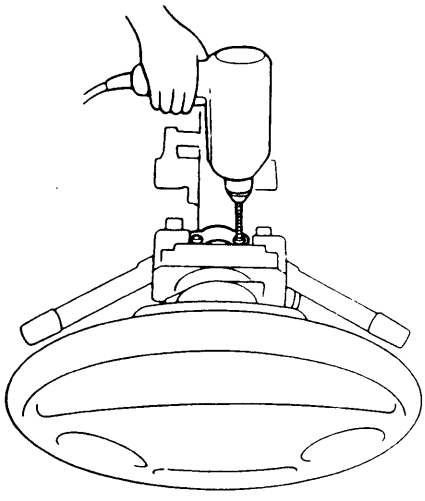
Steering Lock Replacement

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) 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 battery negative cable.
3. Remove the driver's dashboard lower cover and knee bolster (see section 20).
4. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness (see previous page).
5. Remove the steering column covers, then remove the mounting bolts and nuts from the steering column (see section 17).
6. Lower the steering column assembly.
7. Center-punch each of the two shear bolts, then drill their heads off with a 5 mm (3/16 in) drill bit.

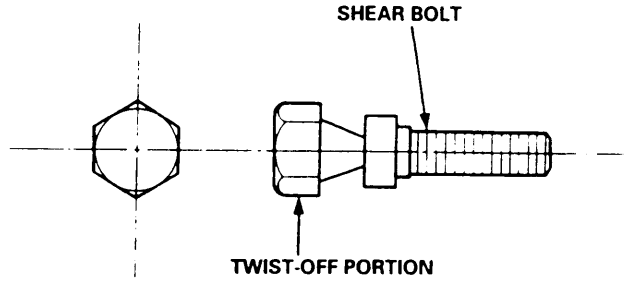
   CAUTION: Do not damage the steering lock body.



8. Remove the shear bolts and the steering lock assembly.

Installation:

1. Install the new steering lock assembly without the key inserted.
2. Loosely tighten the new shear bolts.
3. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.
4. Tighten the shear bolts until the hex heads twist off.



5. Install in the reverse order of removal.
6. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

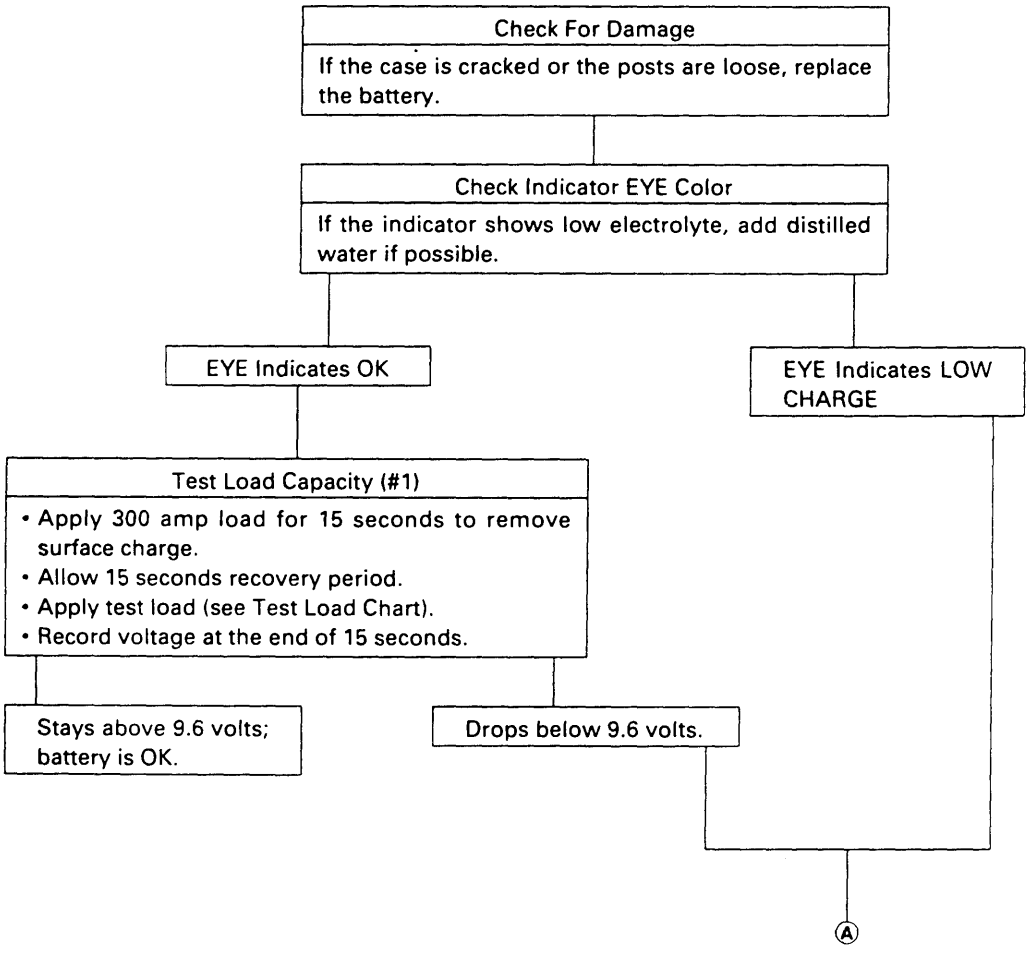
Battery

Test

⚠ WARNING

- **Battery fluid (electrolyte) contains sulfuric acid. It may cause severe burns if it gets on your skin or in your eyes. Wear protective clothing and a face shield.**
  - **— If electrolyte gets on your skin or clothes, rinse it off with water immediately.**
  - **— If electrolyte gets in your eyes, flush it out by splashing water in your eyes for at least 15 minutes; call a physician immediately.**
- **A battery gives off hydrogen gas. If ignited, the hydrogen will explode and could crack the battery case and splatter acid on you. Keep sparks, flames, and cigarettes away from the battery.**
- **Overcharging will raise the temperature of the electrolyte. This may force electrolyte to spray out of the battery vents. Follow the charger manufacturer's instructions, and charge the battery at a proper rate.**

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:
To get accurate results, the temperature of the electrolyte must be between 70°F (21°C) and 100°F (38°C).



Ⓐ

Charge on High Setting (40 amps)

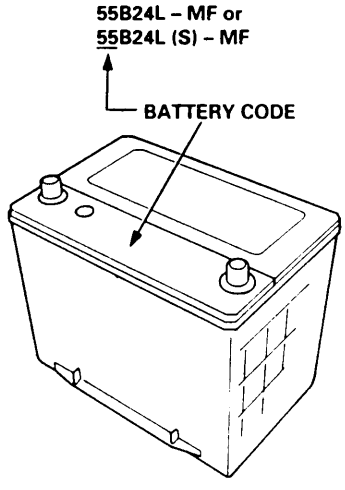
Charge until EYE shows charge is OK; plus an additional 30 minutes to assure full charge.
NOTE: If the battery charge is very low, it may be necessary to bypass the charger's polarity protection circuitry.
If the EYE does not show charge is OK within three hours, the battery is no-good; replace it.
Write down how long the battery was charged.

Test Load Capacity (#2)

- Apply 300 amp load for 15 seconds to remove surface charge.
- Allow 15 seconds recovery period.
- Apply test load (see Test Load Chart).
- Record voltage at the end of 15 seconds.

Stays above 9.6 volts; battery is OK.

Drops below 9.6 volts; battery is no-good.



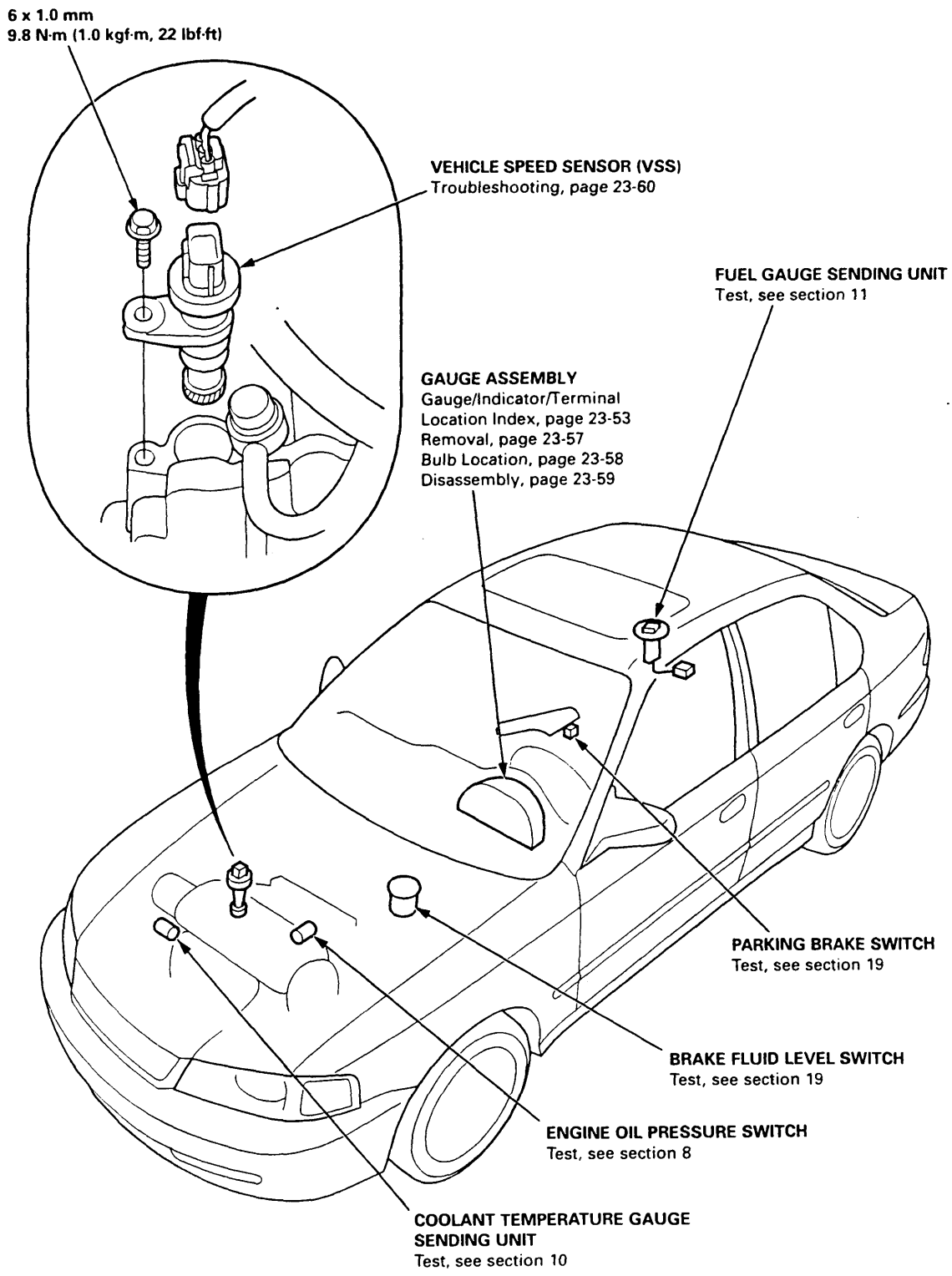
TEST LOAD CHART		
Use the test load or 1/2 the cold cranking amps (CCA) printed on the label on the top of the battery. If neither is indicated, use the information below:		
BATTERY CODE	COLD CRANKING AMPS (CCA)	LOAD (amps)
55	405 (*410)	200

*: 55B24L (S) – MF

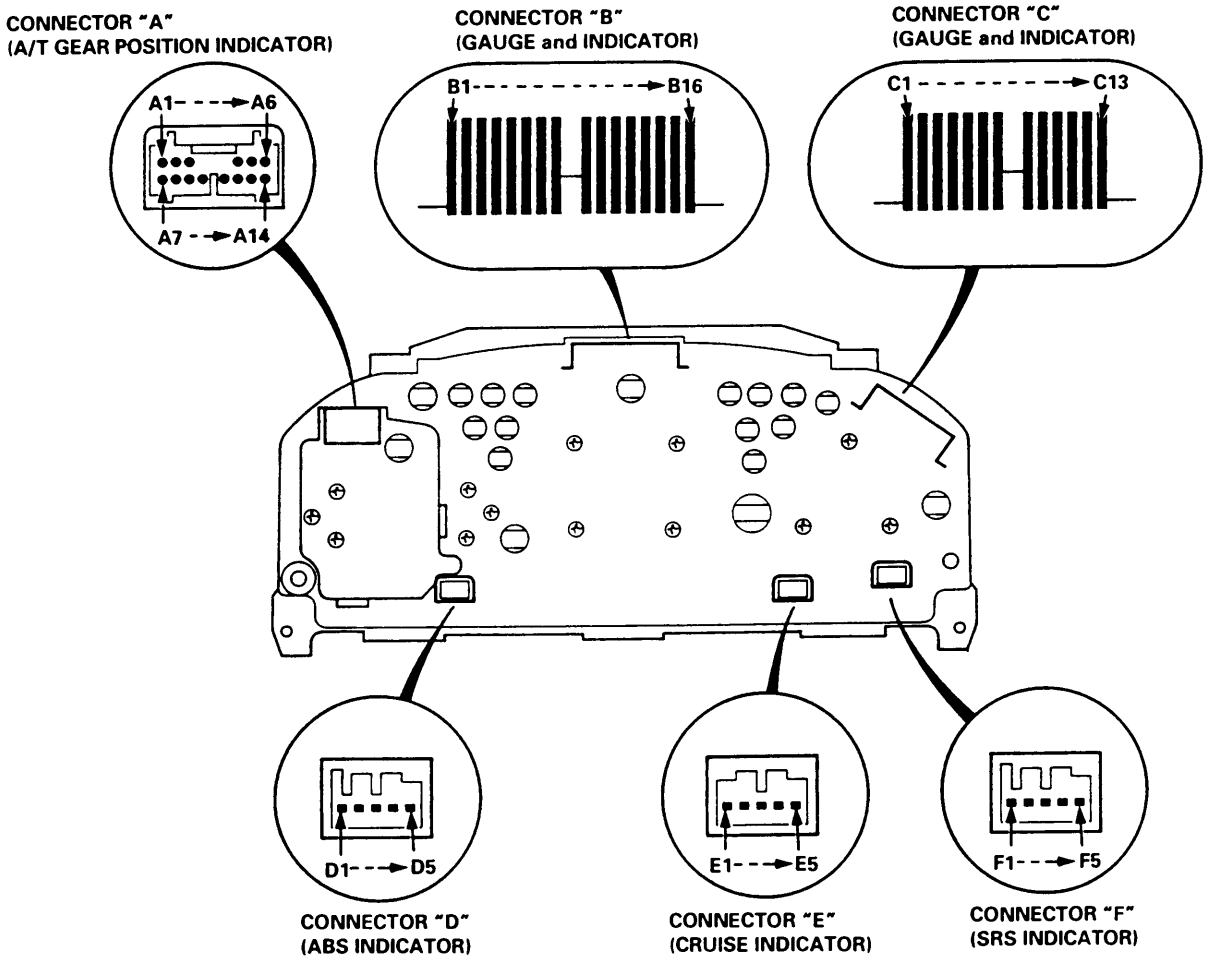
Gauge Assembly

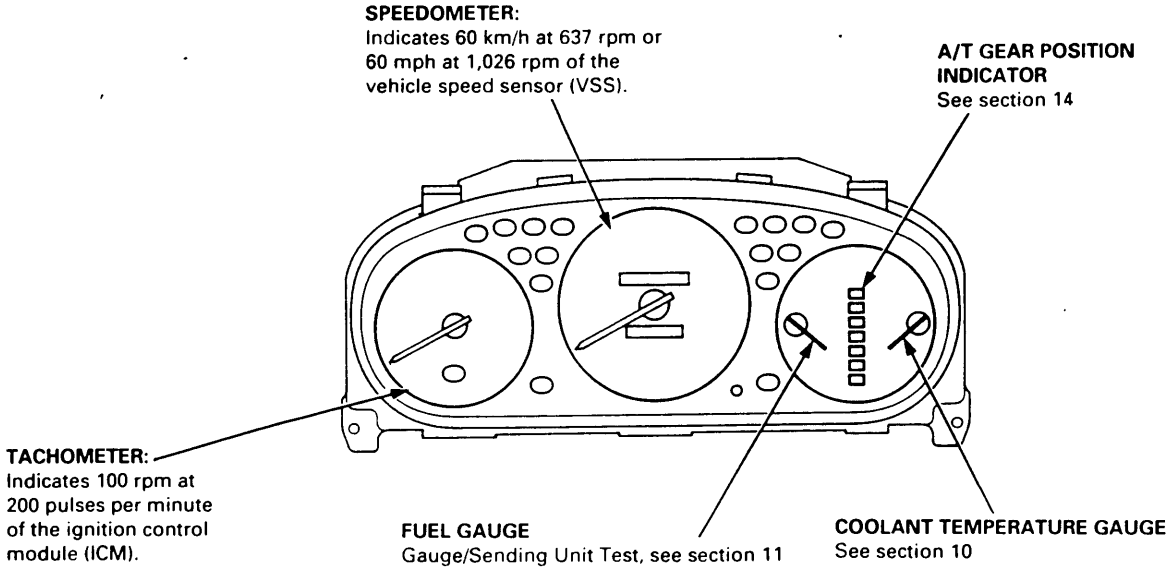
Component Location Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.



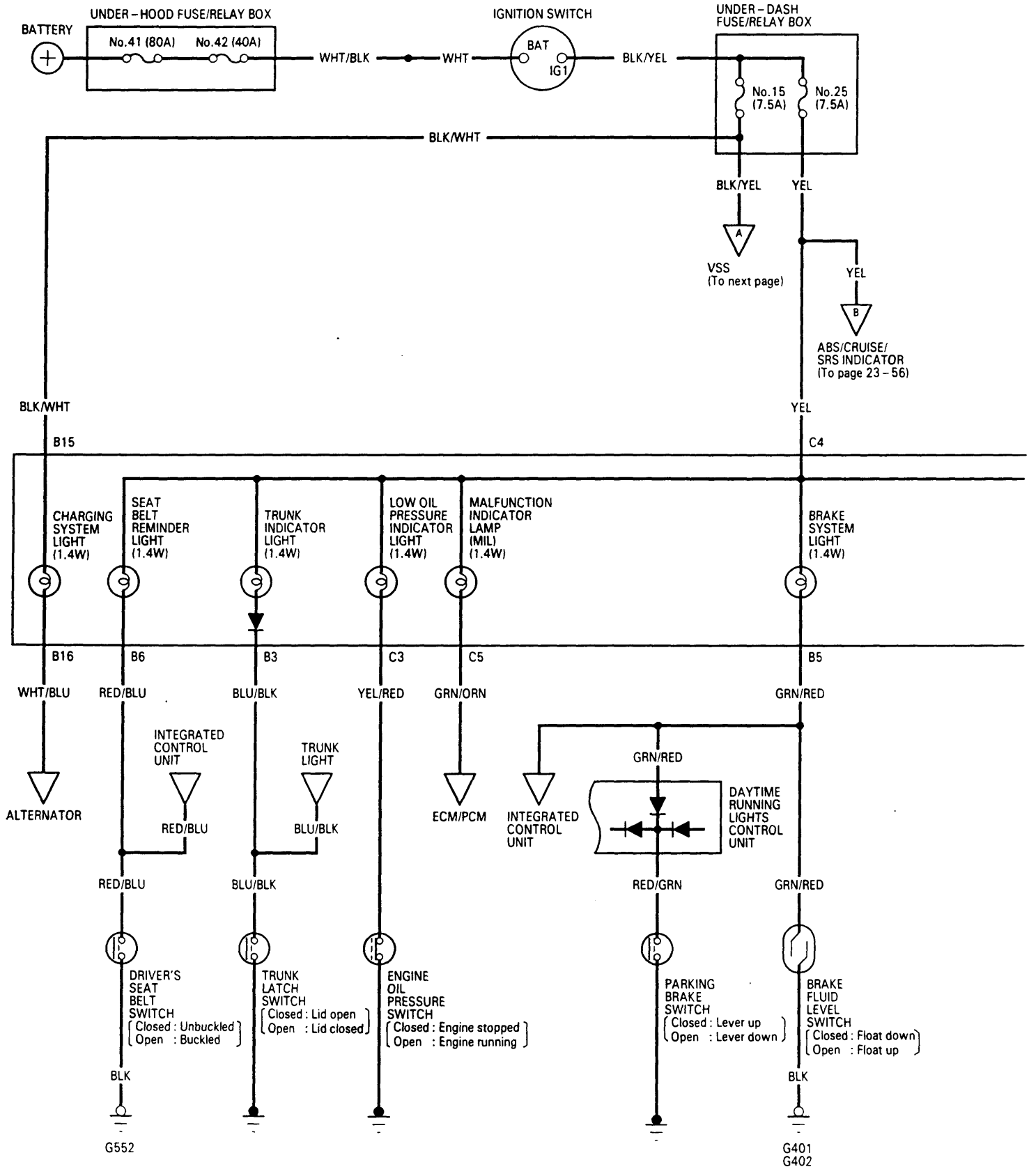
Gauge/Indicator/Terminal Location Index

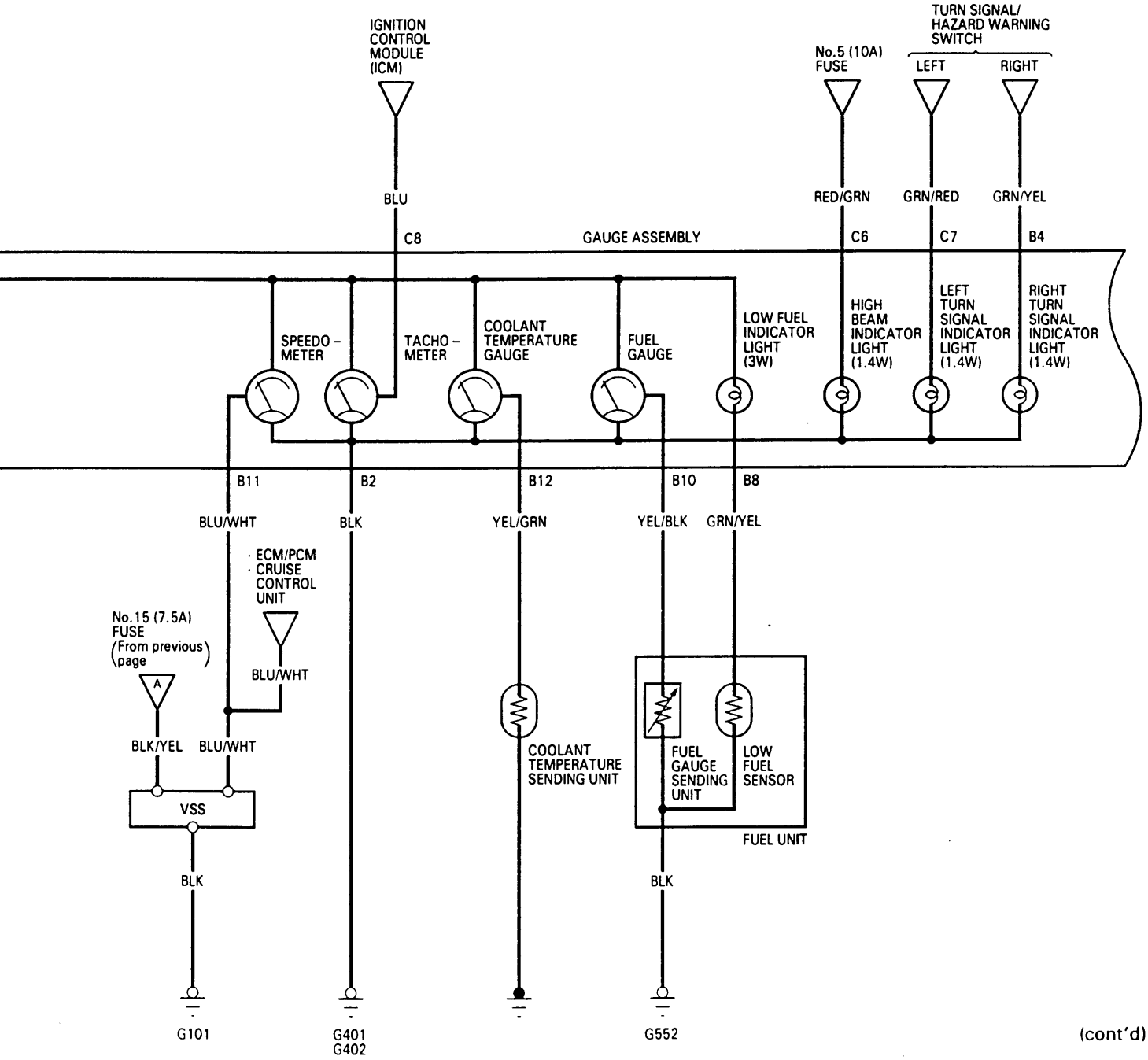




Gauge Assembly

Circuit Diagram

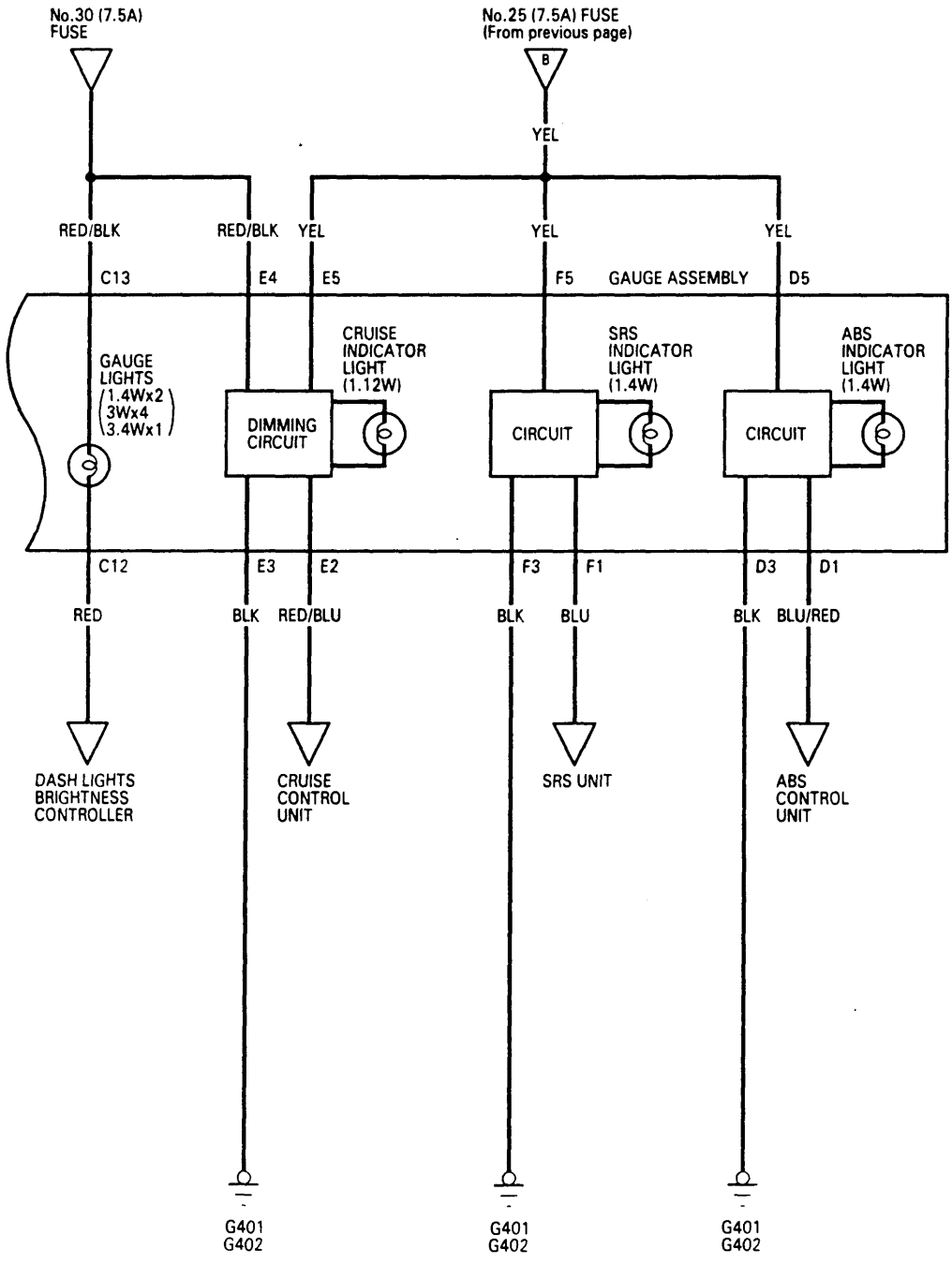



IGNITION CONTROL MODULE (ICM)
No.5 (10A) FUSE
TURN SIGNAL/ HAZARD WARNING SWITCH
LEFT
RIGHT
BLU
RED/GRN
GRN/RED
GRN/YEL
C8
GAUGE ASSEMBLY
C6
C7
B4
SPEEDO - METER
TACHO - METER
COOLANT TEMPERATURE GAUGE
FUEL GAUGE
LOW FUEL INDICATOR LIGHT (3W)
HIGH BEAM INDICATOR LIGHT (1.4W)
LEFT TURN SIGNAL INDICATOR LIGHT (1.4W)
RIGHT TURN SIGNAL INDICATOR LIGHT (1.4W)
B11
B2
B12
B10
B8
BLU/WHT
BLK
YEL/GRN
YEL/BLK
GRN/YEL
· ECM/PCM
· CRUISE CONTROL UNIT
No.15 (7.5A) FUSE (From previous page)
A
BLU/WHT
BLK/YEL
BLU/WHT
VSS
BLK
COOLANT TEMPERATURE SENDING UNIT
FUEL GAUGE SENDING UNIT
LOW FUEL SENSOR
FUEL UNIT
BLK
G101
G401
G402
G552

(cont'd)

Gauge Assembly

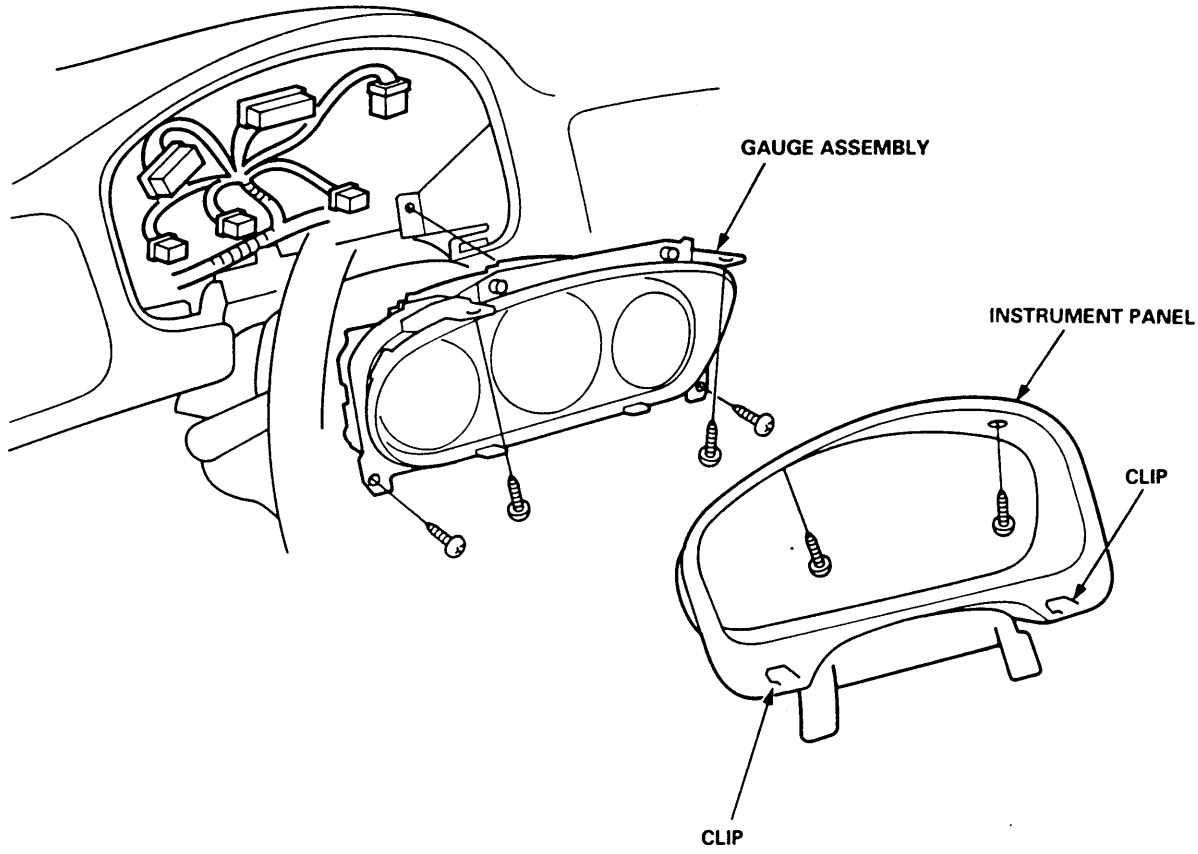
Circuit Diagram (cont'd)



Removal

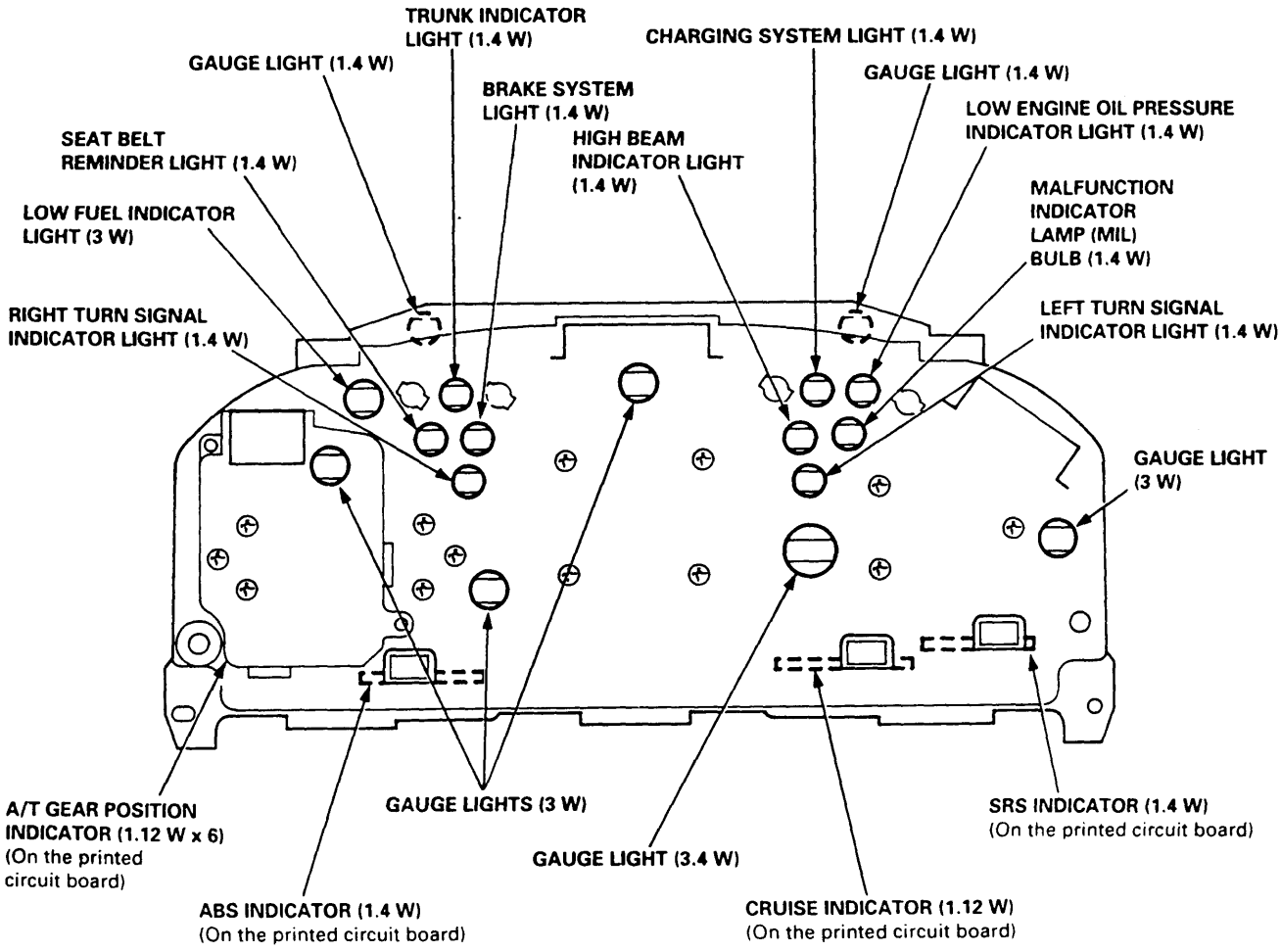
1. Remove the two screws from the instrument panel.
2. Remove the instrument panel.

   CAUTION: Carefully remove the instrument panel without damaging the clips.
3. Tilt the steering wheel down with the tilt adjustment lever.
4. Spread a protective cloth over the steering column.
5. Remove the four mounting screws from the gauge assembly.
6. Pry the gauge assembly out, and disconnect all connectors from it.
7. Take out the gauge assembly.



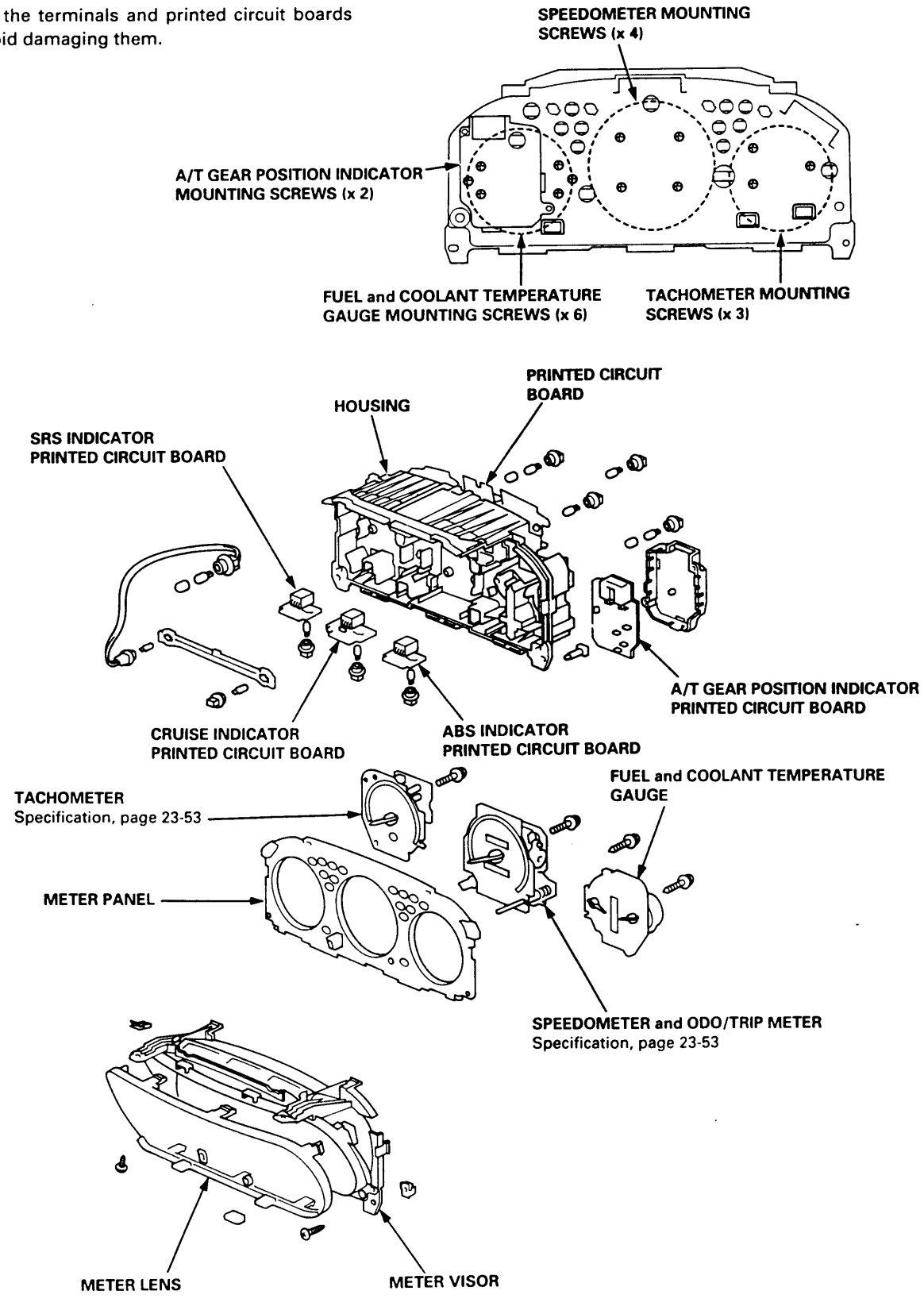
Gauge Assembly

Bulb Locations



Disassembly

NOTE: Handle the terminals and printed circuit boards carefully to avoid damaging them.

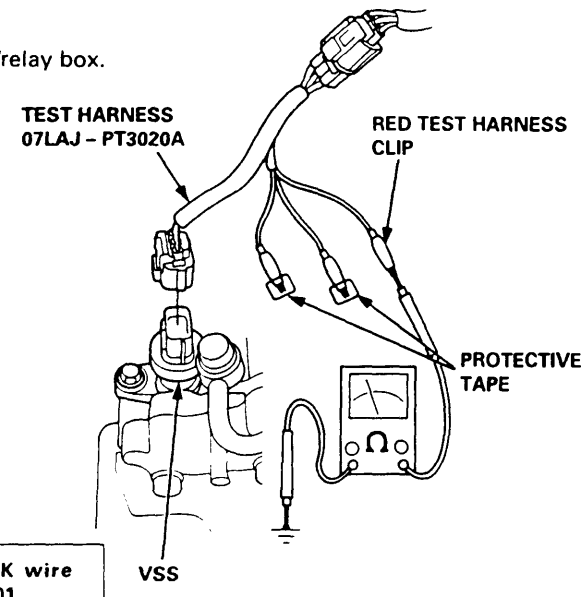


Vehicle Speed Sensor (VSS)

Troubleshooting

Before testing, inspect the No. 15 (7.5 A) fuse in the under-dash fuse/relay box.

Test the BLK wire:
1. Disconnect the 3P connector from the vehicle speed sensor (VSS).
2. Connect the test harness (07LAJ – PT30200) only to the engine wire harness.
3. Connect the RED test harness clip to the positive probe of a ohmmeter.
4. Check for continuity between the RED test harness clip and body ground.

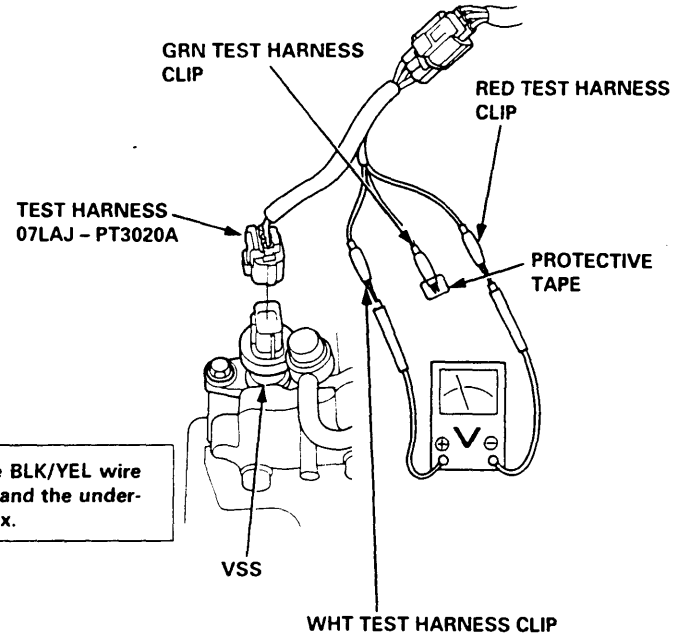


Is there continuity?

NO → **Repair open in the BLK wire between the VSS and G101.**

YES

Test the BLK/YEL wire:
1. Connect the WHT test harness clip to the positive probe of a voltmeter, and connect the RED test harness clip to the negative probe.
2. Turn the ignition switch ON (II).



Is there battery voltage?

NO → **Repair open in the BLK/YEL wire between the VSS and the under-dash fuse/relay box.**

YES

A

(To next page)

(From previous page)

A

Test the BLU/WHT wire:
Connect the GRN test harness clip to the positive probe of a voltmeter, and connect the RED test harness clip to the negative probe.

Is there about 5 V or more?

NO → **Repair open in the BLU/WHT wire between the VSS and ECM/PCM, and cruise control unit.**

YES

Test the VSS:
1. Turn the ignition switch OFF.
2. Connect the other test harness connector to the VSS.
3. Raise the front of the vehicle, and support it with safety stands.
4. Put the vehicle in neutral with the ignition switch ON (II).
5. Slowly rotate one wheel with the other wheel blocked.

Does voltage pulse from 0 to approx. 5 V or more?

NO → **Replace the VSS.**

YES

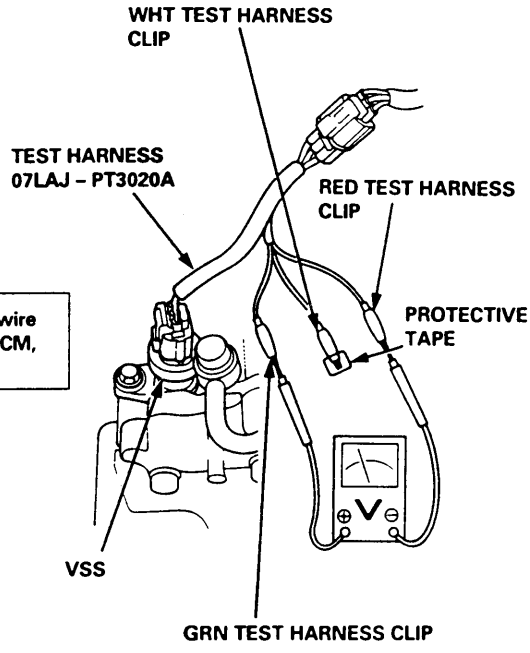
Speedometer Test:
1. Disconnect the 16P connector "B" from the gauge assembly.
2. Touch a probe to the BLU/WHT wire, and connect it to body ground through a voltmeter.
3. Slowly rotate one wheel with the other wheel blocked.

Does the meter indicate pulsing voltage?

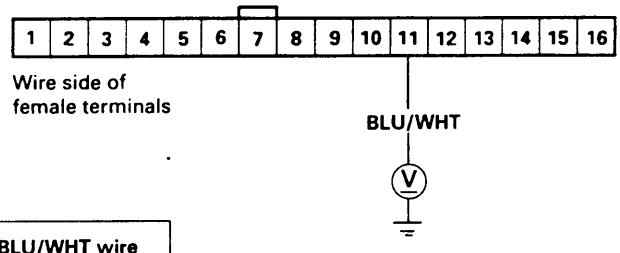
NO → **Repair open in the BLU/WHT wire between the VSS and the speedometer.**

YES

Replace the speedometer.

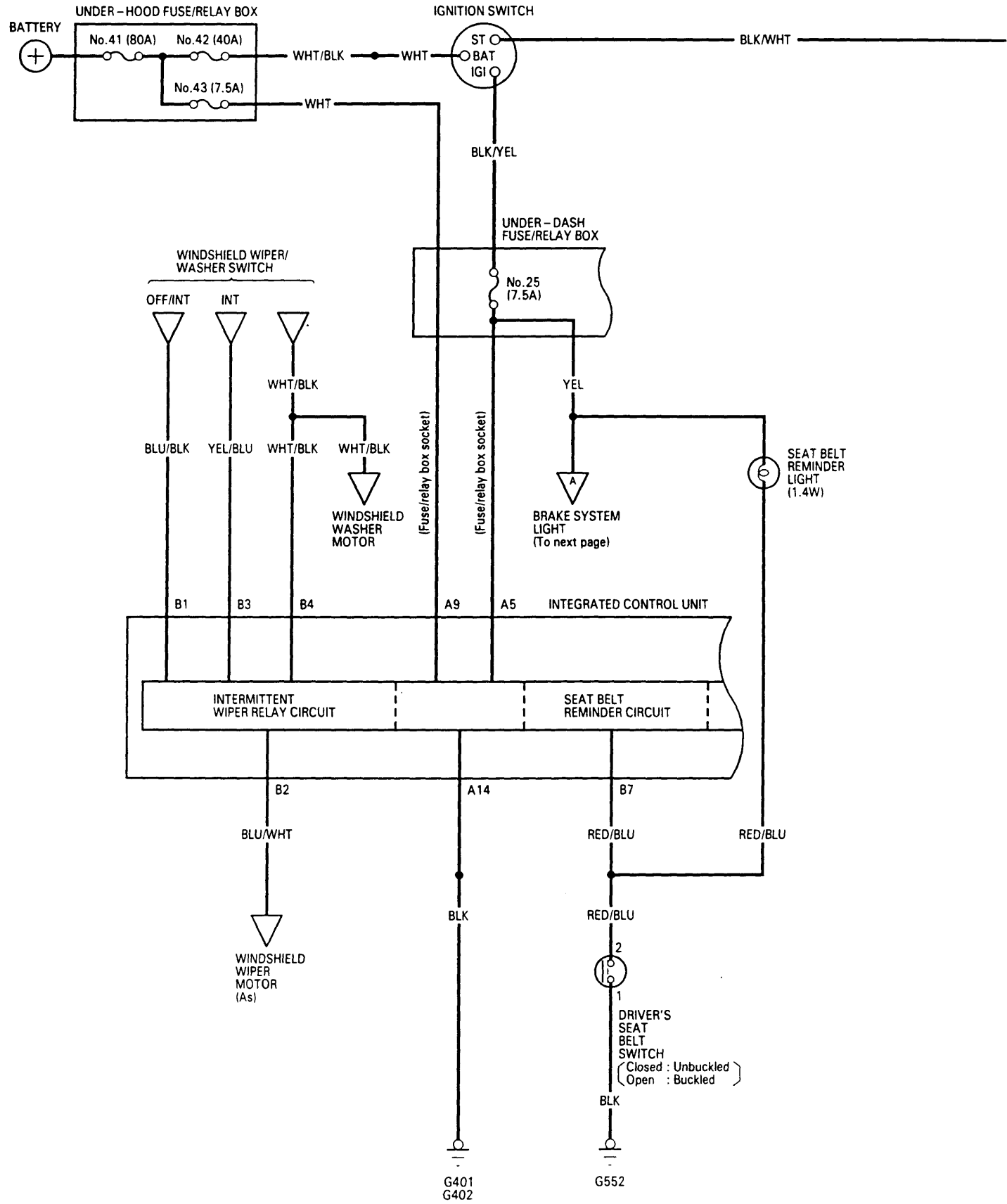


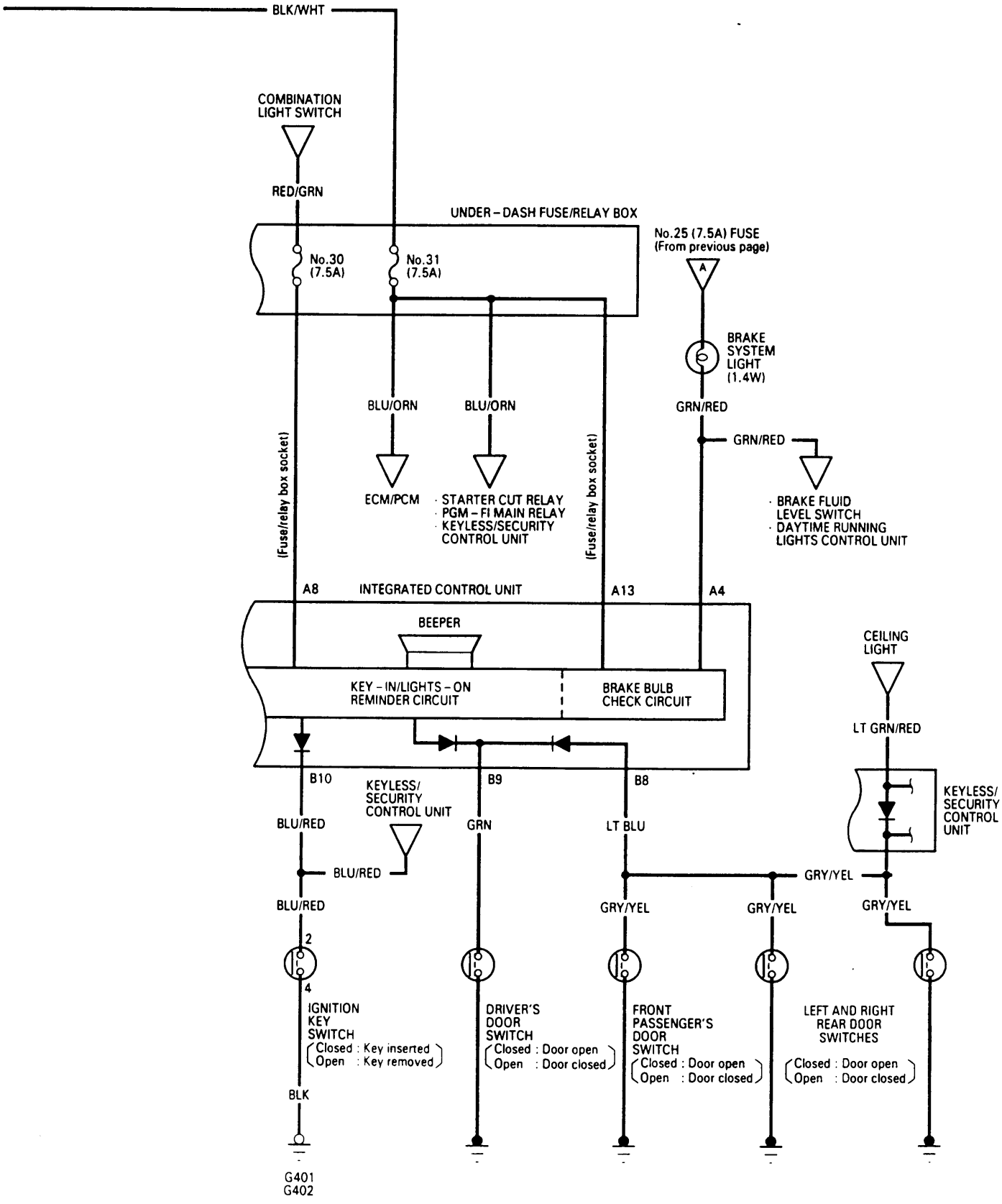
GAUGE ASSEMBLY 16P CONNECTOR "B"



Integrated Control Unit

Circuit Diagram



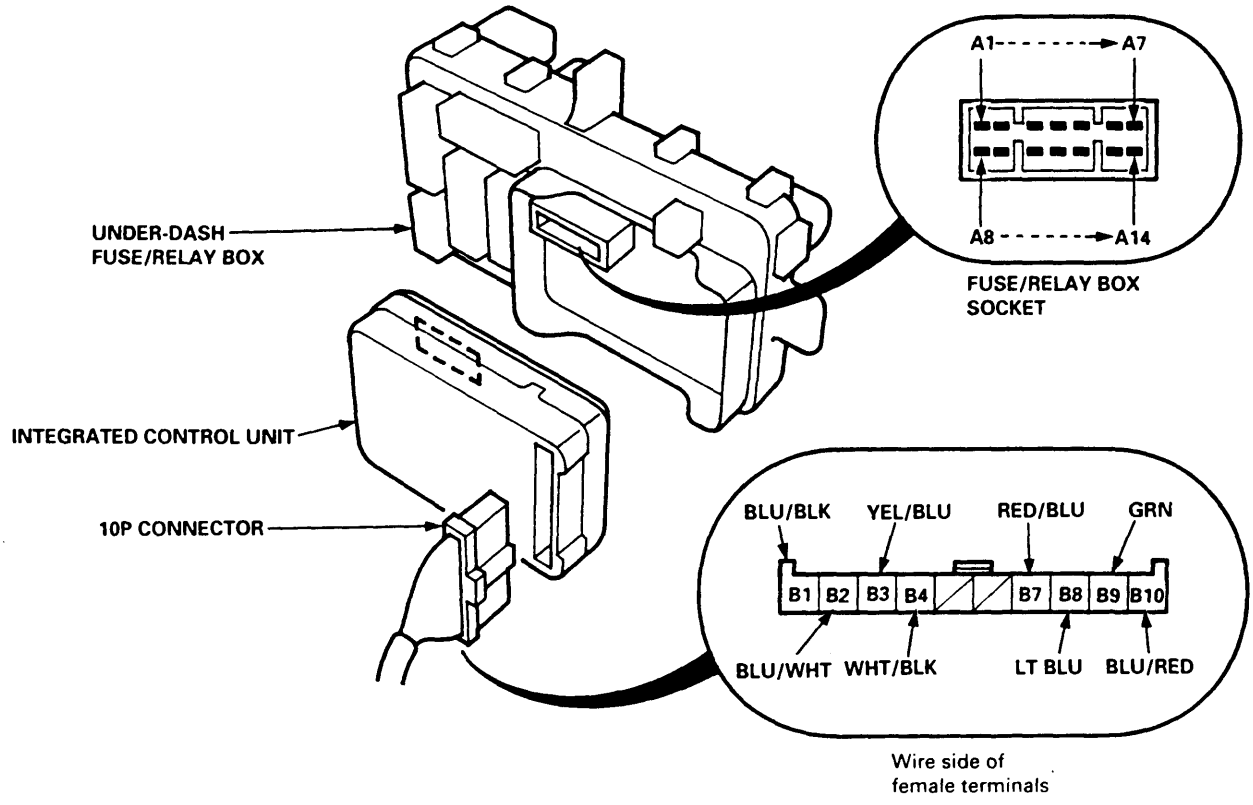

BLK/WHT
COMBINATION LIGHT SWITCH
RED/GRN
UNDER – DASH FUSE/RELAY BOX
No.30 (7.5A)
No.31 (7.5A)
No.25 (7.5A) FUSE (From previous page)
A
BRAKE SYSTEM LIGHT (1.4W)
GRN/RED
BLU/ORN
BLU/ORN
GRN/RED
(Fuse/relay box socket)
(Fuse/relay box socket)
ECM/PCM
· STARTER CUT RELAY
· PGM – FI MAIN RELAY
· KEYLESS/SECURITY CONTROL UNIT
· BRAKE FLUID LEVEL SWITCH
· DAYTIME RUNNING LIGHTS CONTROL UNIT
A8
INTEGRATED CONTROL UNIT
A13
A4
BEEPER
CEILING LIGHT
KEY – IN/LIGHTS – ON REMINDER CIRCUIT
BRAKE BULB CHECK CIRCUIT
LT GRN/RED
B10
KEYLESS/ SECURITY CONTROL UNIT
B9
B8
KEYLESS/ SECURITY CONTROL UNIT
BLU/RED
GRN
LT BLU
BLU/RED
GRY/YEL
BLU/RED
GRY/YEL
GRY/YEL
GRY/YEL
2
4
IGNITION KEY SWITCH
(Closed : Key inserted
Open : Key removed)
DRIVER'S DOOR SWITCH
(Closed : Door open
Open : Door closed)
FRONT PASSENGER'S DOOR SWITCH
(Closed : Door open
Open : Door closed)
LEFT AND RIGHT REAR DOOR SWITCHES
(Closed : Door open
Open : Door closed)
BLK
G401
G402

Integrated Control Unit

Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Remove the driver's dashboard lower cover and knee bolster (see section 20).
2. Disconnect the 10P connector from the integrated control unit.
3. Remove the integrated control unit from the under-dash fuse/relay box.
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, make the following input tests at the connector and the fuse/relay box socket.
     — 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.



All Systems:

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A14	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
A9	Fuse/relay box socket	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 43 (7.5 A) fuse in the under-hood fuse/relay box • An open in the wire
A6	Fuse/relay box socket	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire

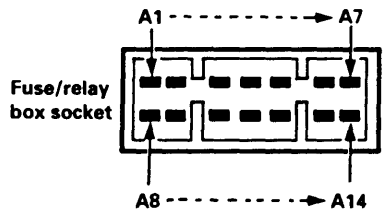
Intermittent Wiper System:

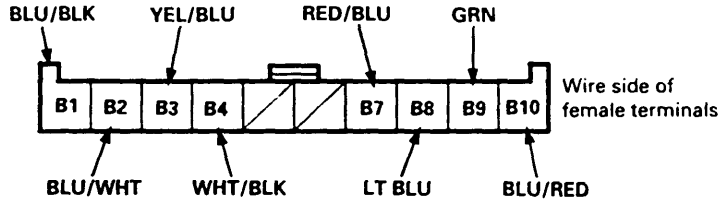
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B1	BLU/BLK	Ignition switch ON (II), and windshield wiper switch at OFF or INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 26 (20 A) fuse in the under-dash fuse/relay box • Faulty windshield wiper switch • Faulty windshield wiper motor • An open in the wire
B2	BLU/WHT	Ignition switch ON (II)		
B3	YEL/BLU	Ignition switch ON (II), and windshield wiper switch at INT	Check for voltage to ground: There should be battery voltage.	• Blown No. 26 (20 A) fuse in the under-dash fuse/relay box • Faulty windshield wiper switch • An open in the wire
B4	WHT/BLK	Ignition switch ON (II), and windshield washer switch ON	Check for voltage to ground: There should be battery voltage.	• Faulty windshield washer switch • An open in the wire

(cont'd)

Integrated Control Unit

Input Test (cont'd)





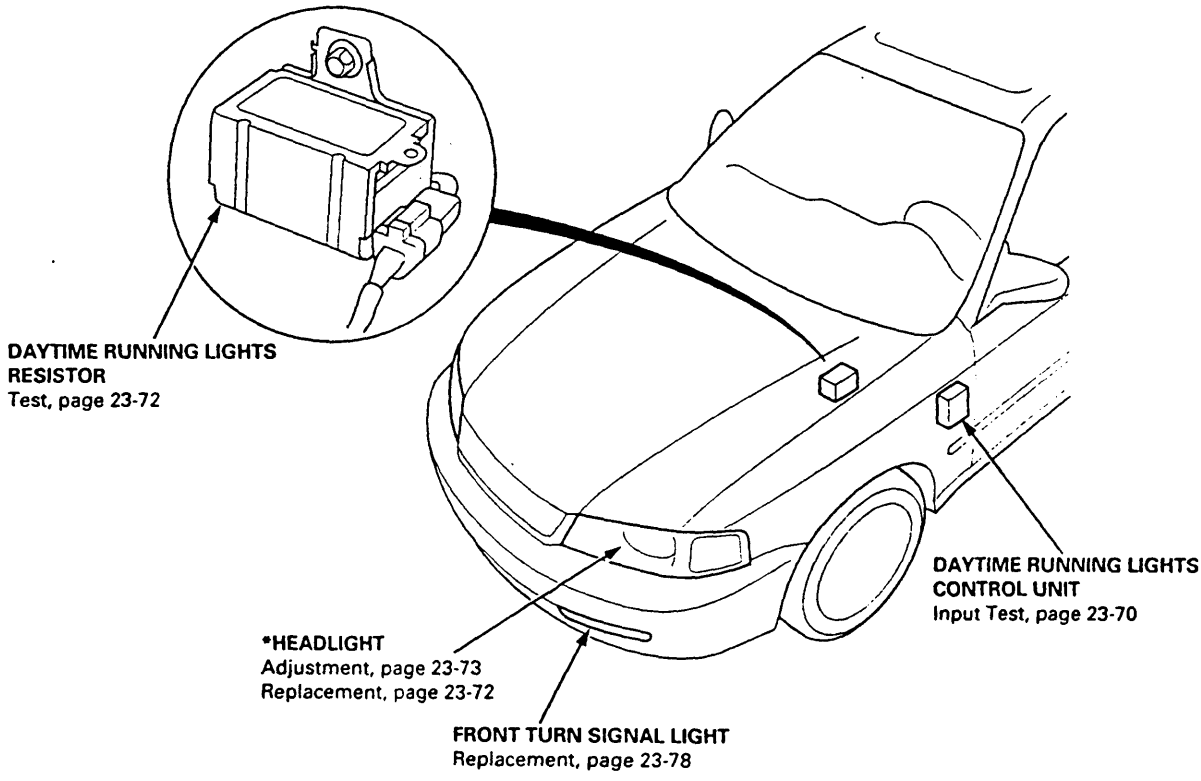
Key-in/Seat Belt Reminder, Lights-on Reminder System:

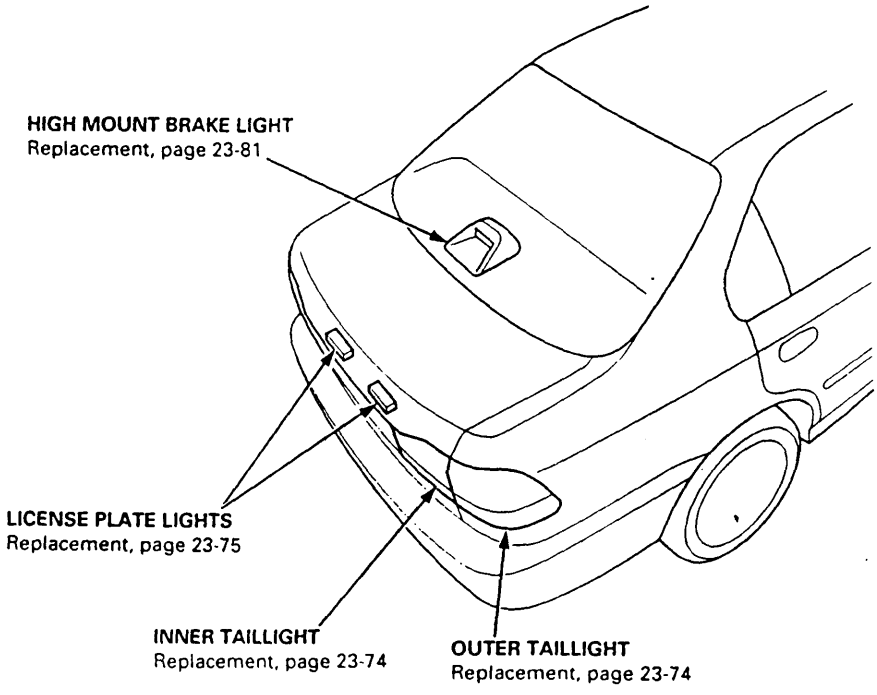
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	Fuse/relay box socket	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 30 (7.5 A) fuse in the under-dash fuse/relay box • Faulty combination light switch • An open in the wire
B7	RED/BLU	Ignition switch ON (II), and driver's seat belt switch unbuckled	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G552) • Faulty seat belt switch • An open in the wire
B9	GRN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	• Faulty driver's door switch • An open in the wire
B10	BLU/RED	Ignition key inserted into the ignition key switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401, G402) • Faulty ignition key switch • An open in the wire

Bulb Check System (Brake System Light):

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A4	Fuse/relay box socket	Ignition switch ON (II), brake fluid reservoir full, and parking brake lever down	Connect to ground: Brake system light should come on.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Blown brake system light bulb • An open in the wire
A13	Fuse/relay box socket	Ignition switch at START (III)	Check for voltage to ground: There should be battery voltage.	• Blown No. 31 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire

Component Location Index

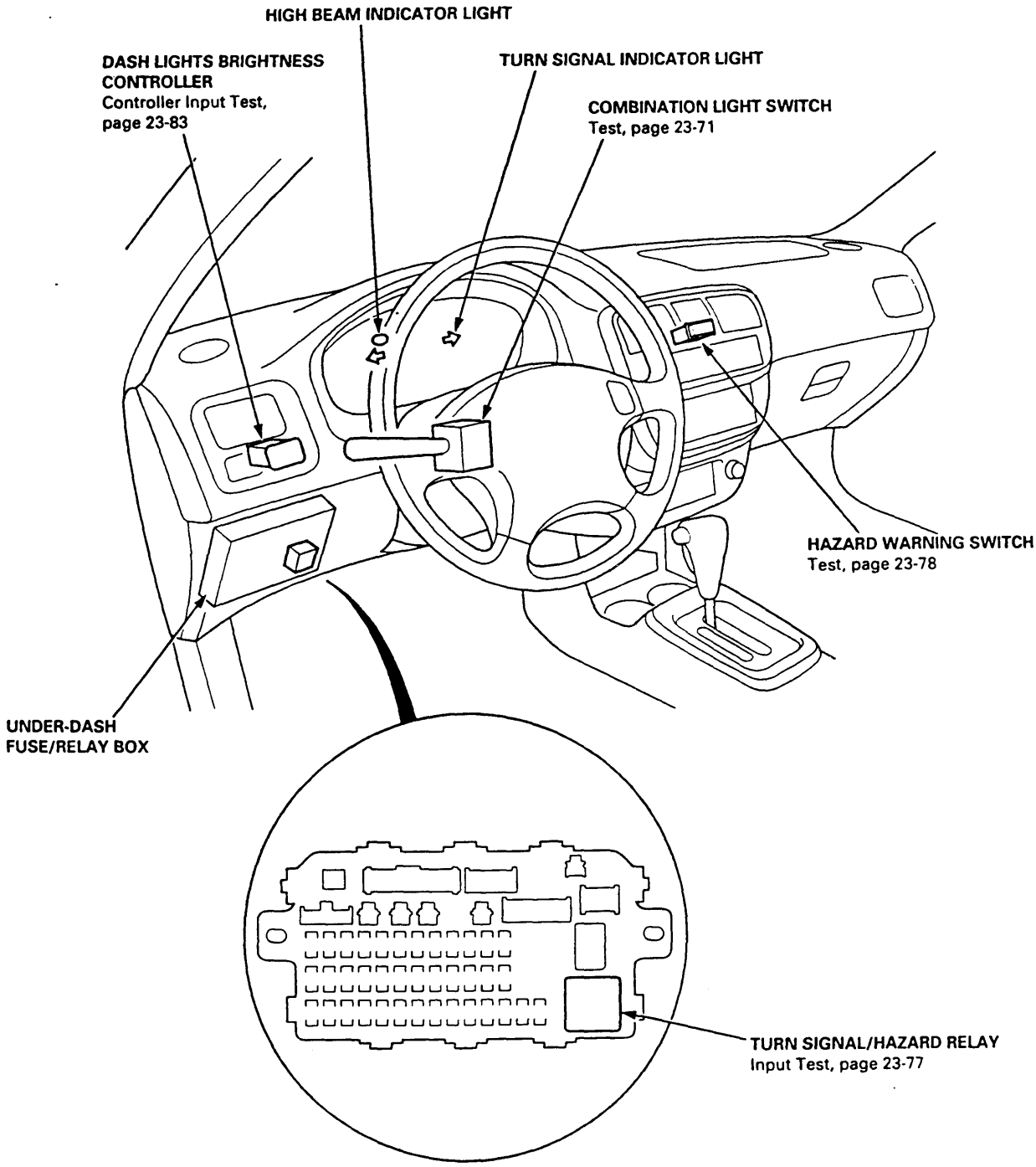




*: Headlight and front parking light cannot be separated.

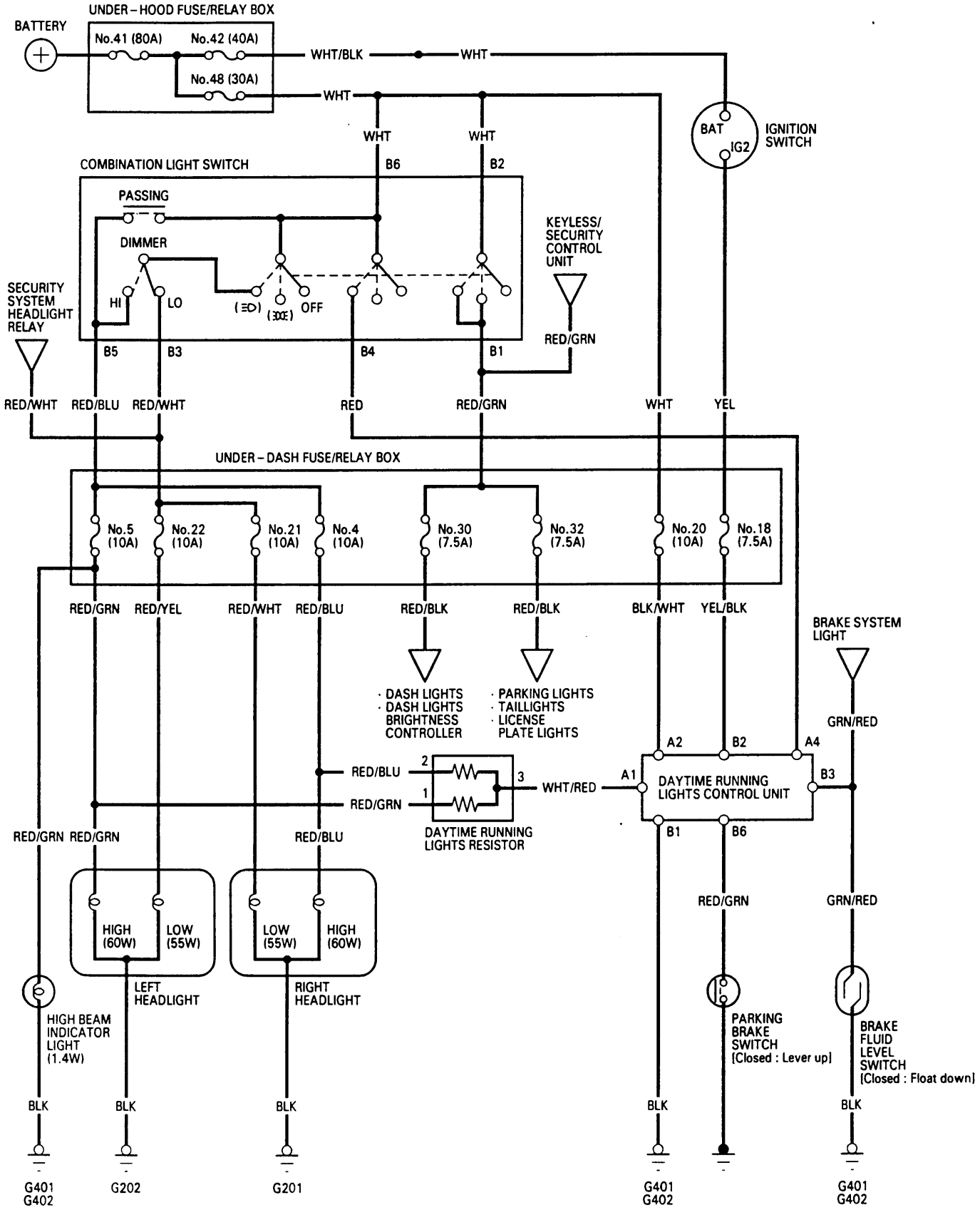
(cont'd)

Component Location Index (cont'd)



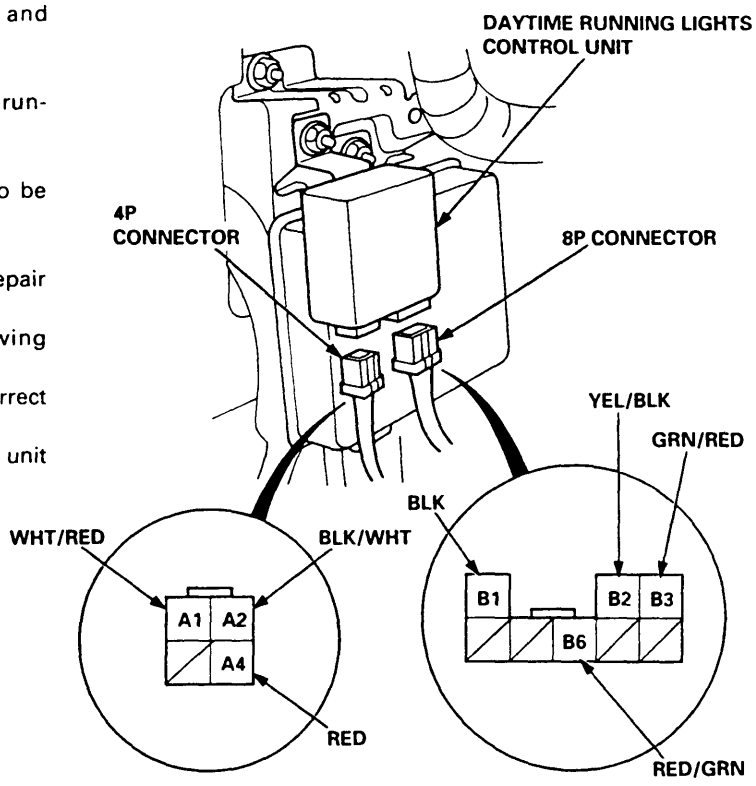
Lighting System

Circuit Diagram



Daytime Running Lights Control Unit Input Test

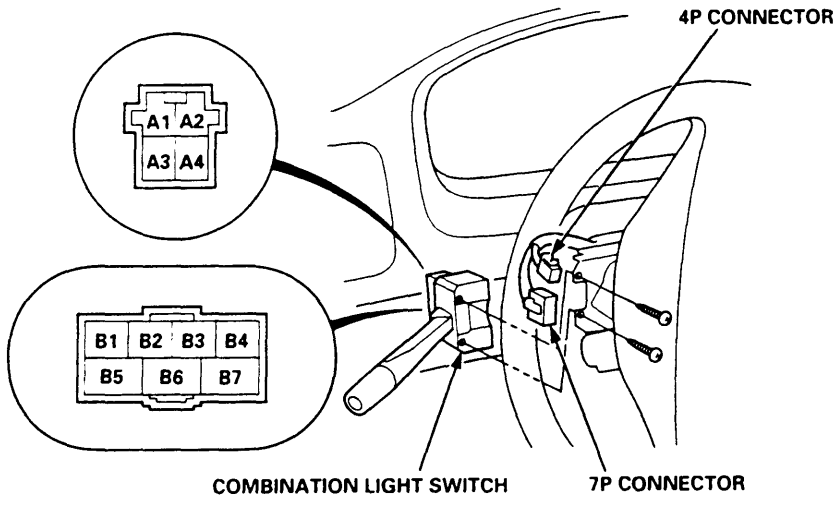
1. Remove the driver's dashboard lower cover and knee bolster (see section 20).
2. Disconnect the connectors from the daytime running lights control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following 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
B1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
A2	BLK/WHT	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 20 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
B2	YEL/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 18 (7.5 A) fuse in the under-dash fuse/relay box • Faulty ignition switch • An open in the wire
A4	RED	Combination light switch in the headlights on position	Check for voltage to ground: There should be battery voltage.	• Blown No. 48 (30 A) fuse in the under-hood fuse/relay box • Faulty combination light switch • An open in the wire
A1	WHT/RED	Combination light switch OFF; connect a jumper wire between the BLK/WHT and WHT/RED terminals, then turn the ignition switch ON (II)	Headlights (high beam) should come on, (and high beam indicator should come on dimly).	• Poor ground (G201, G202, G401, G402) • Blown bulbs • Faulty daytime running lights resistor • An open in the wire
B3	GRN/RED	Ignition switch ON (II), and brake fluid reservoir full	Connect to ground: The brake system light should come on.	• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box • Blown brake system light • An open in the wire
B6	RED/GRN	Parking brake lever up	Check for continuity to ground: There should be continuity.	• Faulty parking brake switch • An open in the wire

Combination Light Switch Test

1. Remove the driver's dashboard lower cover and steering column covers (see section 20).
2. Disconnect the 4P and 7P connectors from the switch.
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, check for continuity between them in each switch position according to the tables. If there is no continuity between any of them, check for continuity in the switch harness.
     — If there is continuity in the switch harness, replace the combination light switch.
     — If there is no continuity in the switch harness, replace it.



Headlight/Dimmer/Passing Switch:

Position \ Terminal			B1	B2	B3	B4	B5	B6
Headlight switch	OFF							
	≡DO≡		○——	——○				
	≡D	LOW	○——	——○		○——	——	——○
					○——			——○
		HIGH	○——	——○		○——	——	——○
							○——	——○
Passing switch	OFF							
	ON						○——	——○

Turn Signal Switch:

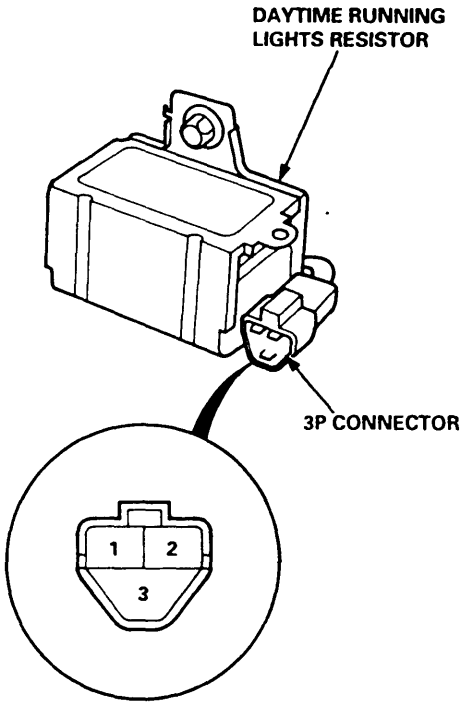
Position \ Terminal	A1	A2	A4
RIGHT	○——	——	——○
NEUTRAL			
LEFT	○——	——○	

Headlights/Front Parking Lights

Daytime Running Lights Resistor Test

CAUTION: The daytime running lights resistor becomes very hot when the daytime running lights are on; do not touch it or the attaching hardware immediately after the lights have been turned off.

1. Disconnect the 3P connector from the resistor.



Terminal side of male terminals

2. Measure the resistance between the resistor terminals (No. 1 and No. 2) and the power terminal No. 3.

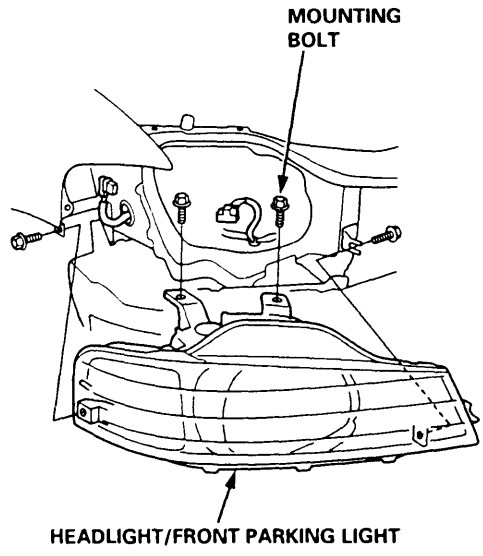
   Resistance: 1.3 - 1.5 Ω

3. Replace the resistor with a new one if any of the resistances are beyond specification.

Replacement

CAUTION: Halogen headlights become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.

1. Remove the front bumper (see section 20).
2. Remove the mounting bolts.
3. Disconnect each connector, then remove the headlight/front parking light assembly.



HEADLIGHT: 60/55 W
FRONT PARKING LIGHT: 5 W

Headlights

Adjustment

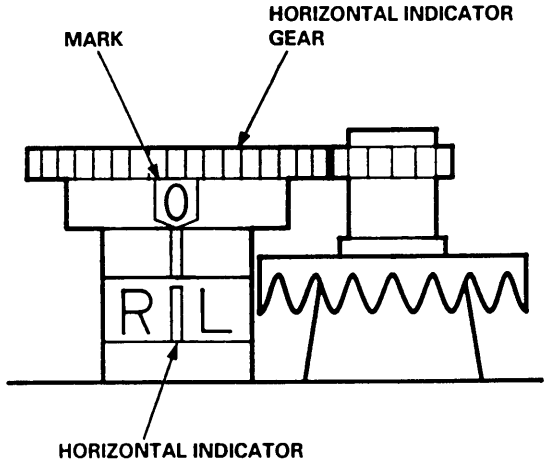
Before adjusting the headlights:

- Park the vehicle on level ground.
- Make sure the fuel tank is full.
- The driver or someone who weighs the same should sit in the driver's seat.
- Load the trunk with the items you usually carry.
- Push down on the front and rear bumpers several times to make sure the vehicle is sitting normally.

CAUTION: Halogen headlights become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.

1. Open the hood.

2. Check the horizontal adjustment indicator.
   The "0" mark on the horizontal indicator gear should be aligned with the mark on the horizontal indicator.



3. Check the vertical adjustment indicator.
   The bubble should be centered underneath the longest scribe mark on the gauge.

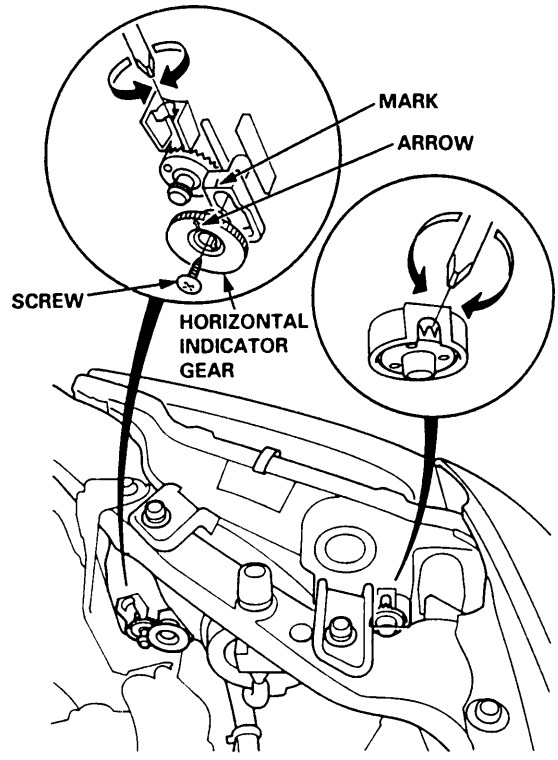
4. If either indicator is not aligned with its "0" mark as described above, an adjustment can be made by using a Phillips screwdriver.

5. Adjust the headlights to local requirements by turning the adjusters.

6. After headlight replacement, it may be necessary to readjust the horizontal indicator gear.

   - First install the headlight, and adjust its horizontal and vertical aimings according to local requirements.
   - Then check that the arrow on the horizontal indicator gear is aligned with the mark on the horizontal indicator.
     — If they are not aligned, remove the screw, adjust the indicator gear, and retighten the screw.

   NOTE: As the outer lenses are made of an acrylic-coated, polycarbonated material, do not cover the headlights when they are turned on.



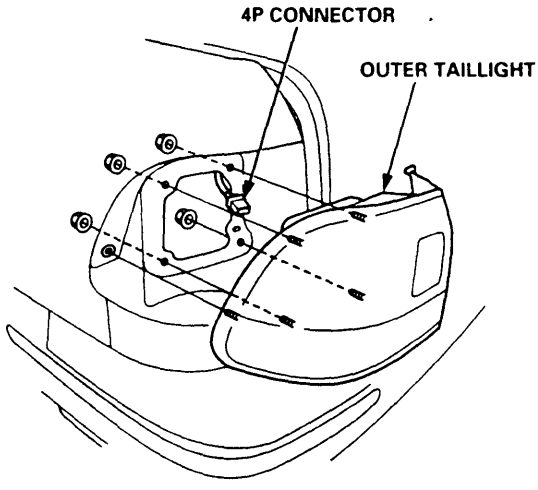
Taillights

Replacement

NOTE:
- Inspect the gasket; replace it if it is distorted or stays compressed.
- After installing the taillights, run water over them to make sure they do not leak.

Outer Taillights:

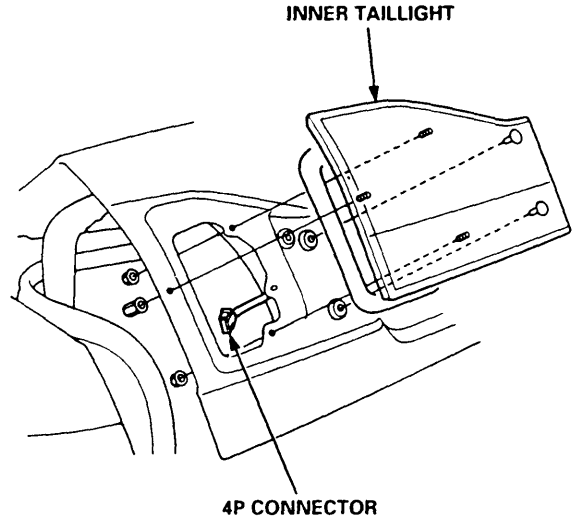
1. Open the trunk lid, and pull back the trunk side panel.
2. Disconnect the 4P connector from the outer taillight.
3. Remove the four mounting nuts, then pull out the outer taillight.



BRAKE/TAILLIGHT: 21/5 W
TURN SIGNAL LIGHT: 21 W

Inner Taillights:

1. Open the trunk lid.
2. Disconnect the 4P connector from the inner taillight.
3. Remove the three mounting nuts, then pull out the inner taillight.

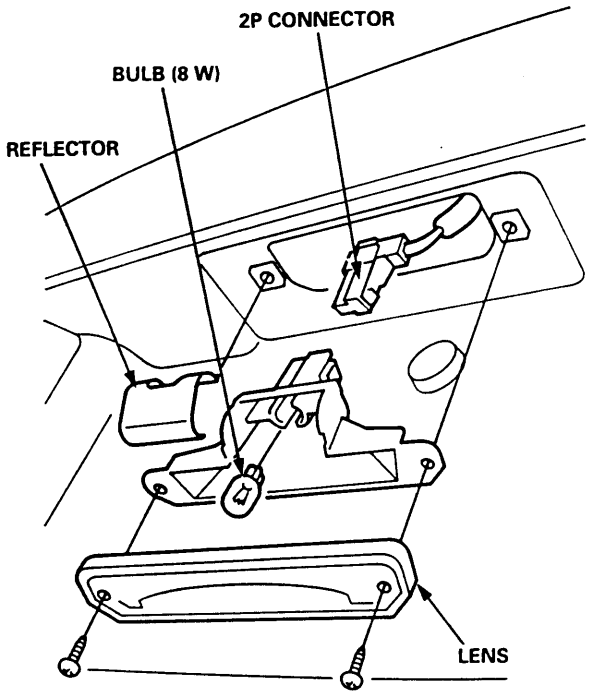


BRAKE/TAILLIGHT: 21/5 W
BACK-UP LIGHT: 21 W

License Plate Lights

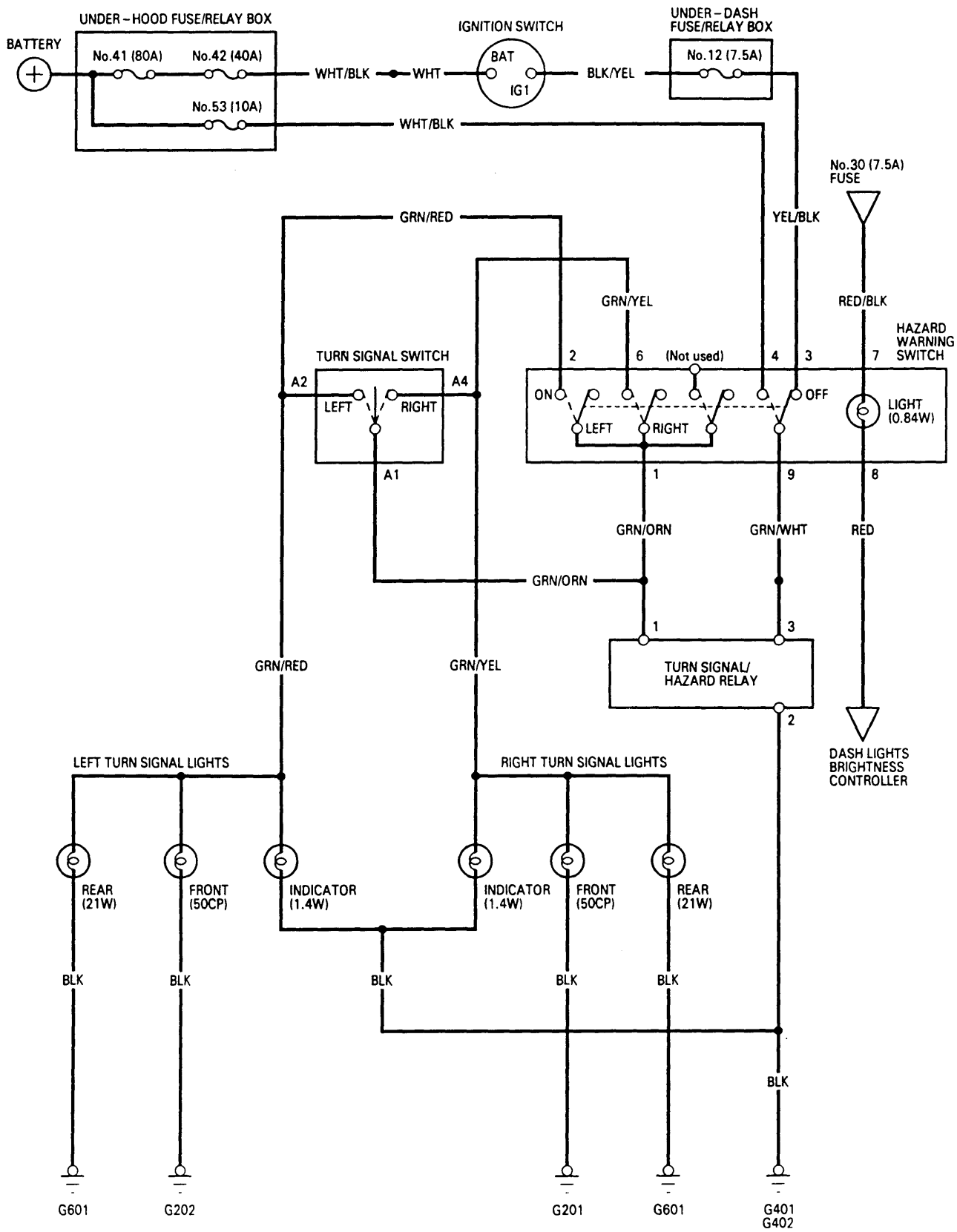
Replacement

1. Remove the two screws from the license plate light, and pull the light out part of the way.
2. Disconnect the 2P connector from the light.
3. Take the lens and reflector off, then replace the bulb.



Turn Signal/Hazard Flasher System

Circuit Diagram



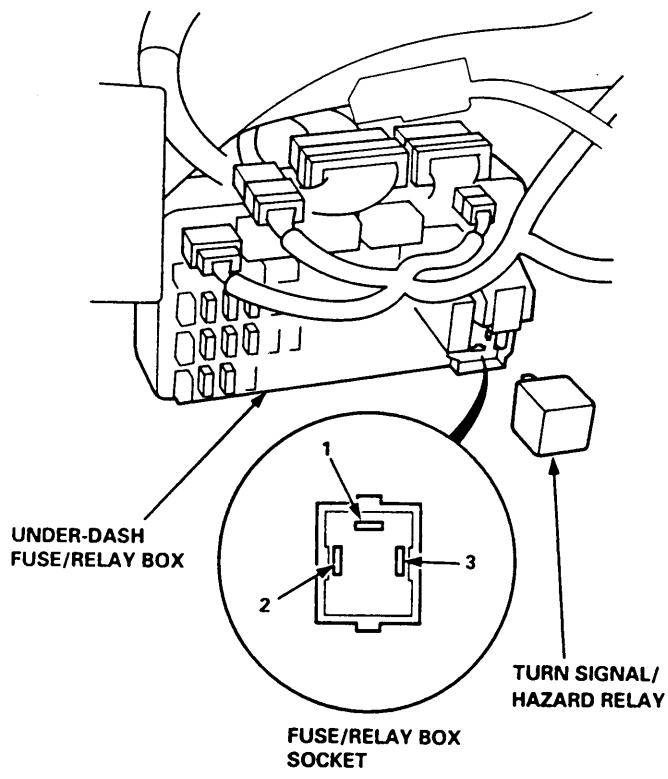
Turn Signal/Hazard Relay Input Test

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Remove the turn signal/hazard relay from the under-dash fuse/relay box.

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, make the following input tests at the fuse/relay box socket.
     — 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.



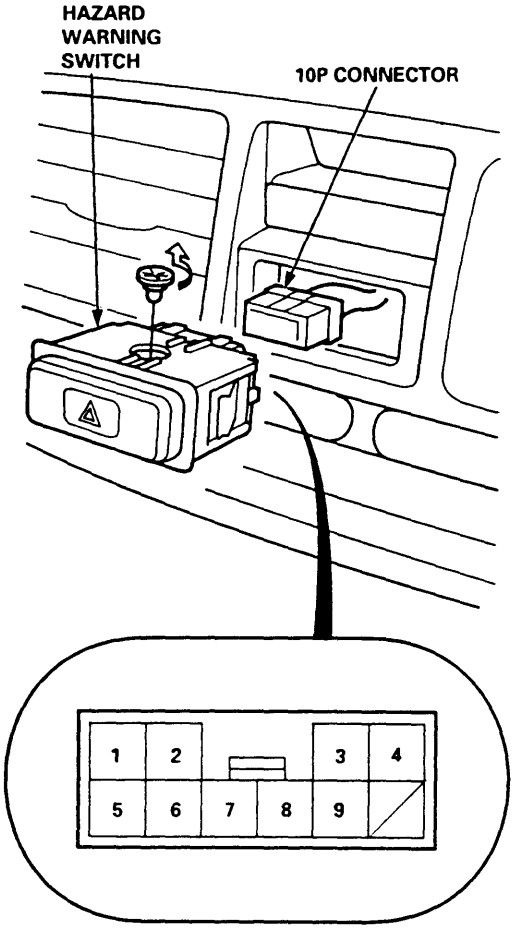
Cavity	Test condition	Test: Desired results	Possible cause if result is not obtained
2	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
3	Ignition switch ON (II)	Connect for voltage to ground: There should be battery voltage.	• Blown No. 12 (7.5 A) fuse in the under-dash fuse/relay box • Faulty hazard warning switch • An open in the wire
	Hazard warning switch ON	Connect for voltage to ground: There should be battery voltage.	• Blown No. 53 (10 A) fuse in the under-hood fuse/relay box • Faulty hazard warning switch • An open in the wire
1	Hazard warning switch ON; connect the No. 1 terminal to the No. 3 terminal.	Hazard lights should come on.	• Poor ground (G201, G202, G401, G402, G601) • Faulty hazard warning switch • An open in the wire
	Ignition switch ON (II) and turn signal switch in right or left; connect the No. 1 terminal to the No. 3 terminal.	Right or left turn signal lights should come on.	• Faulty turn signal switch

Turn Signal/Hazard Flasher System

Hazard Warning Switch Test

CAUTION: Be careful not to damage the hazard warning switch or the center outlet panel when prying the switch out.

1. Pry the hazard warning switch out of the center outlet panel.
2. Disconnect the 10P connector from the hazard warning switch.
3. Check for continuity between the terminals in each switch position according to the table.



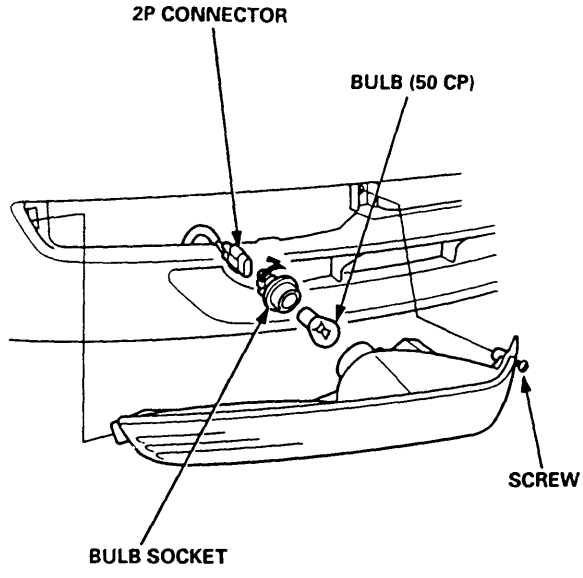
Position \ Terminal	1	2	3	4	5	6	7		8	9
OFF			○				○	○	○	○
ON	○	○		○	○	○	○	○	○	○

Terminal No.5 is not used

Front Turn Signal Lights

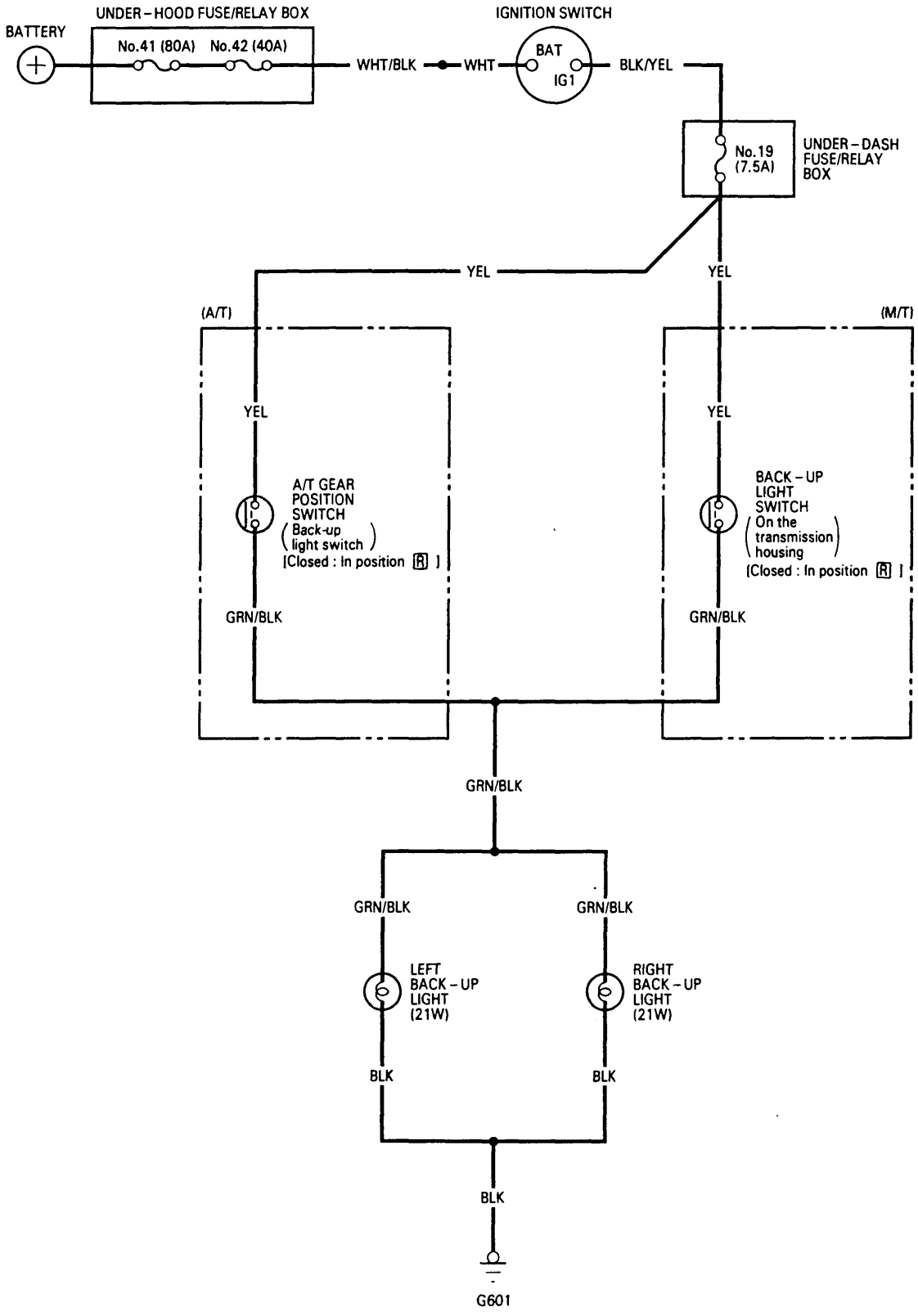
Replacement

1. Remove the screw from the front turn signal light, and pull the light out part of the way.
2. Disconnect the 2P connector from the light.
3. Turn the bulb socket 45° counterclockwise, remove it from the light housing, then replace the bulb.



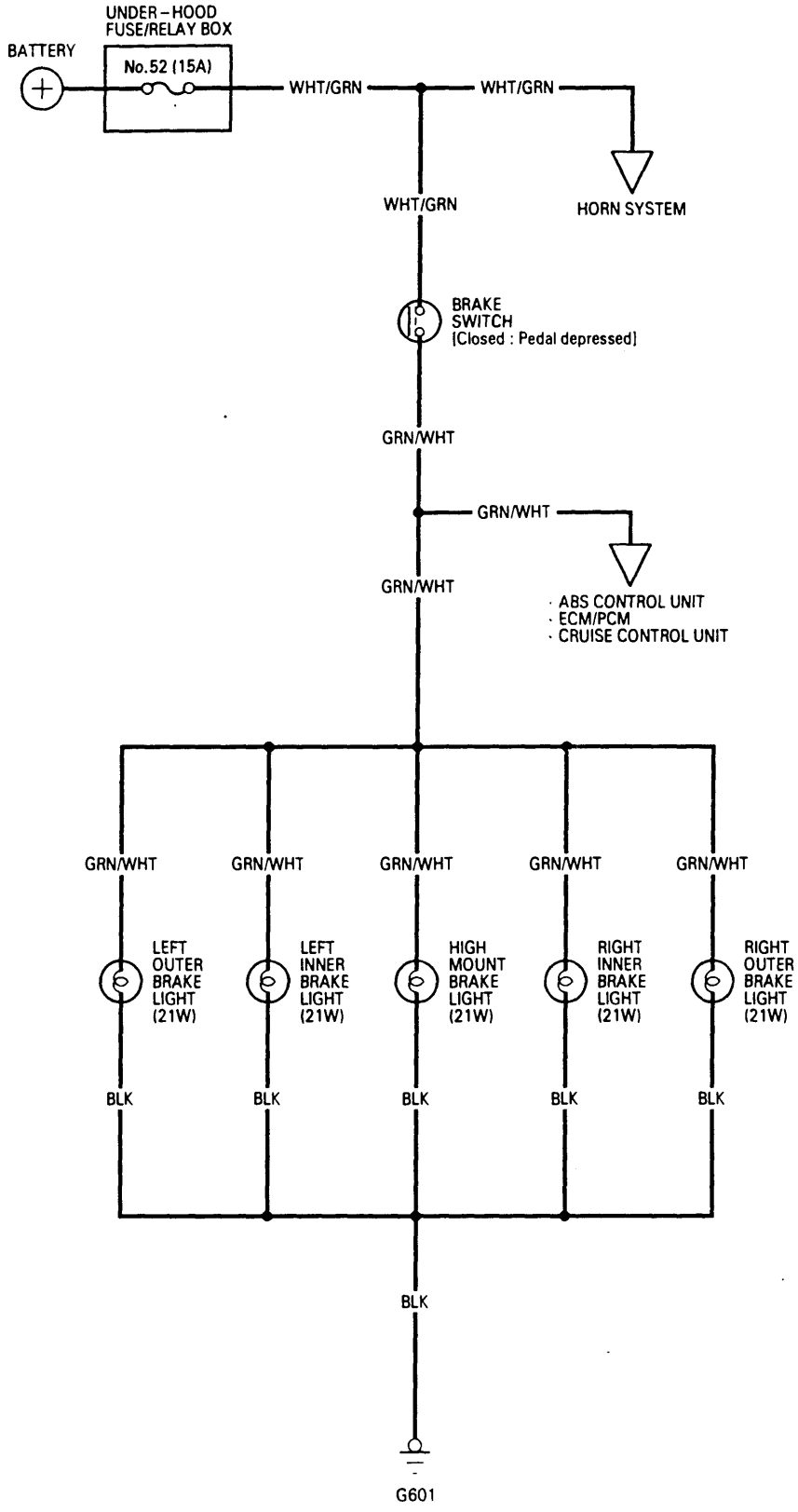
Back-up Lights

Circuit Diagram



Brake Lights

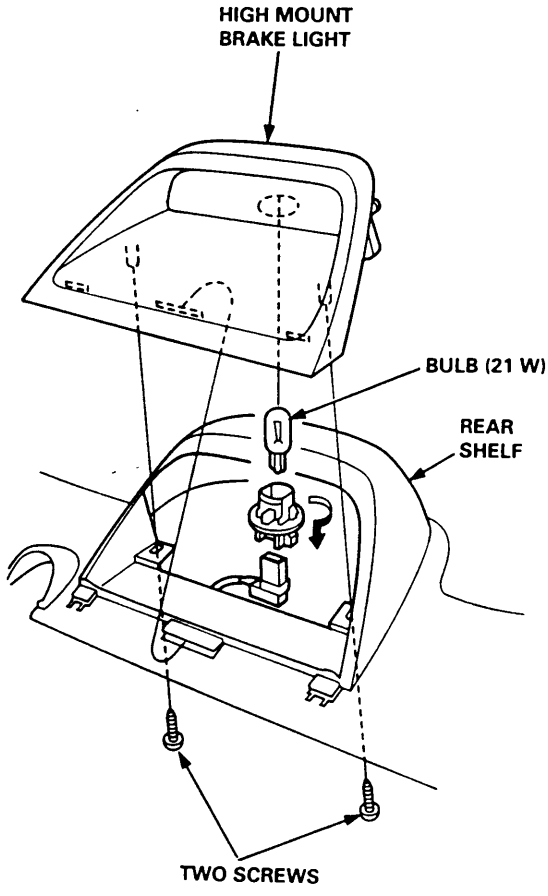
Circuit Diagram



High Mount Brake Light Replacement

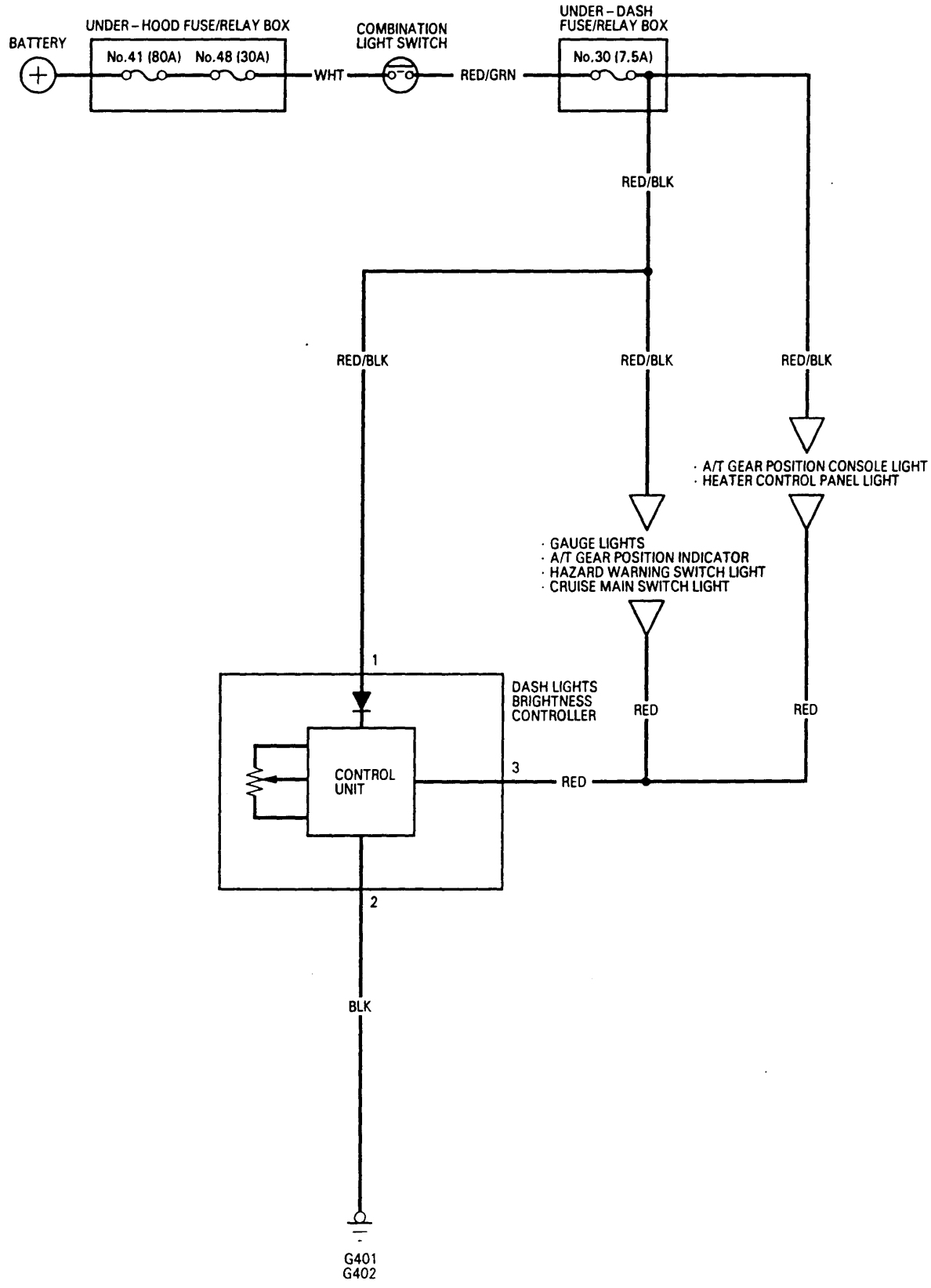
1. Remove the rear shelf (see section 20).

2 Remove the two screws, then remove the high mount brake light from the rear shelf.



Dash Lights Brightness Controller

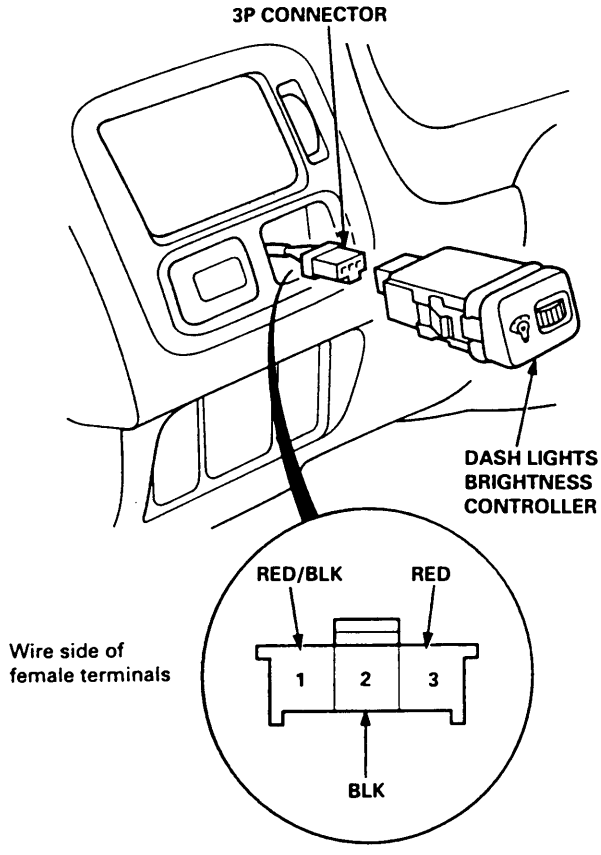
Circuit Diagram



Controller Input test

NOTE: The control unit is built into the dash lights brightness controller.

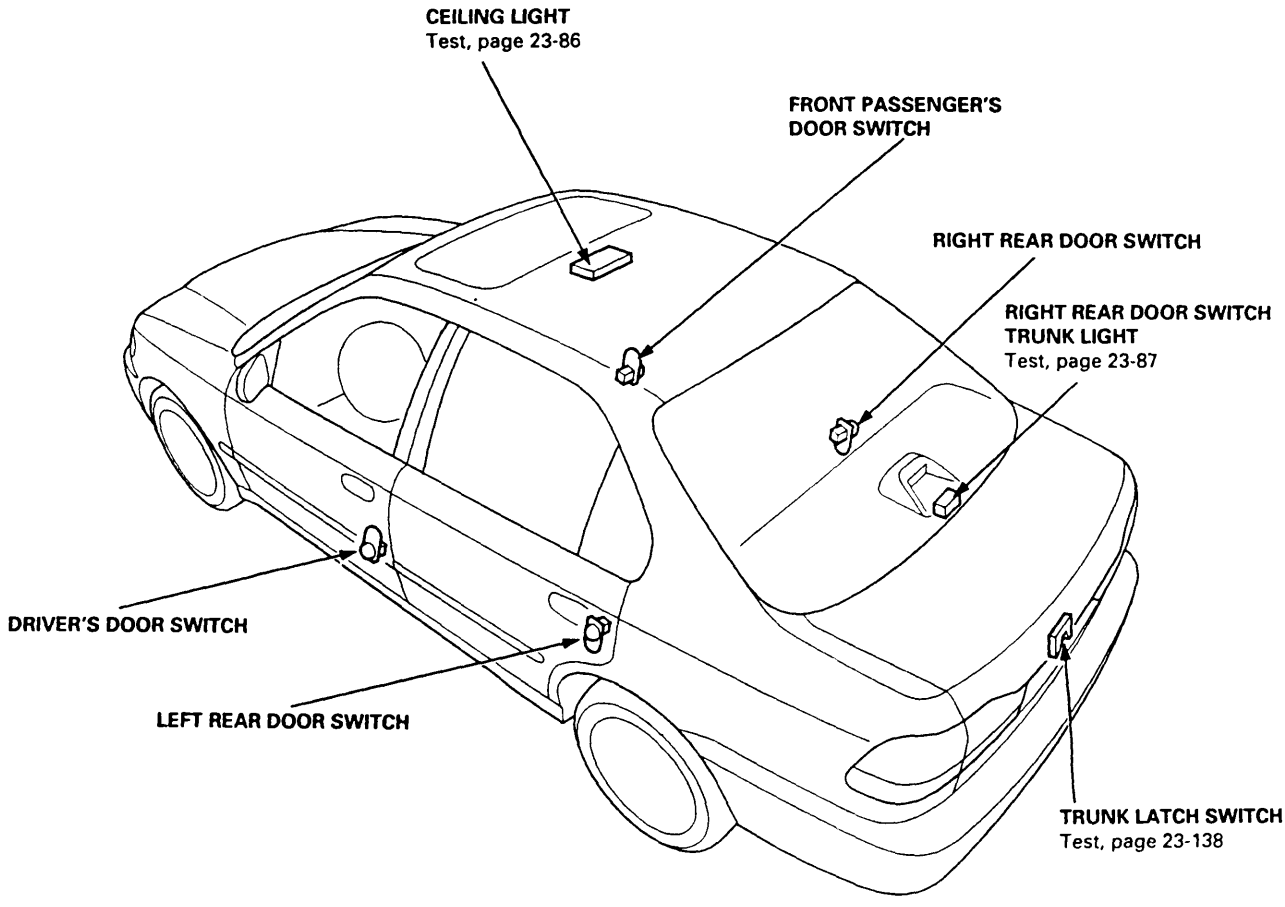
1. Carefully pry the controller out of the dashboard.
2. Disconnect the 3P connector from the controller.
3. Inspect the connector terminals to be sure they are all making good contact.
   - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following 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 controller must be faulty; replace it.



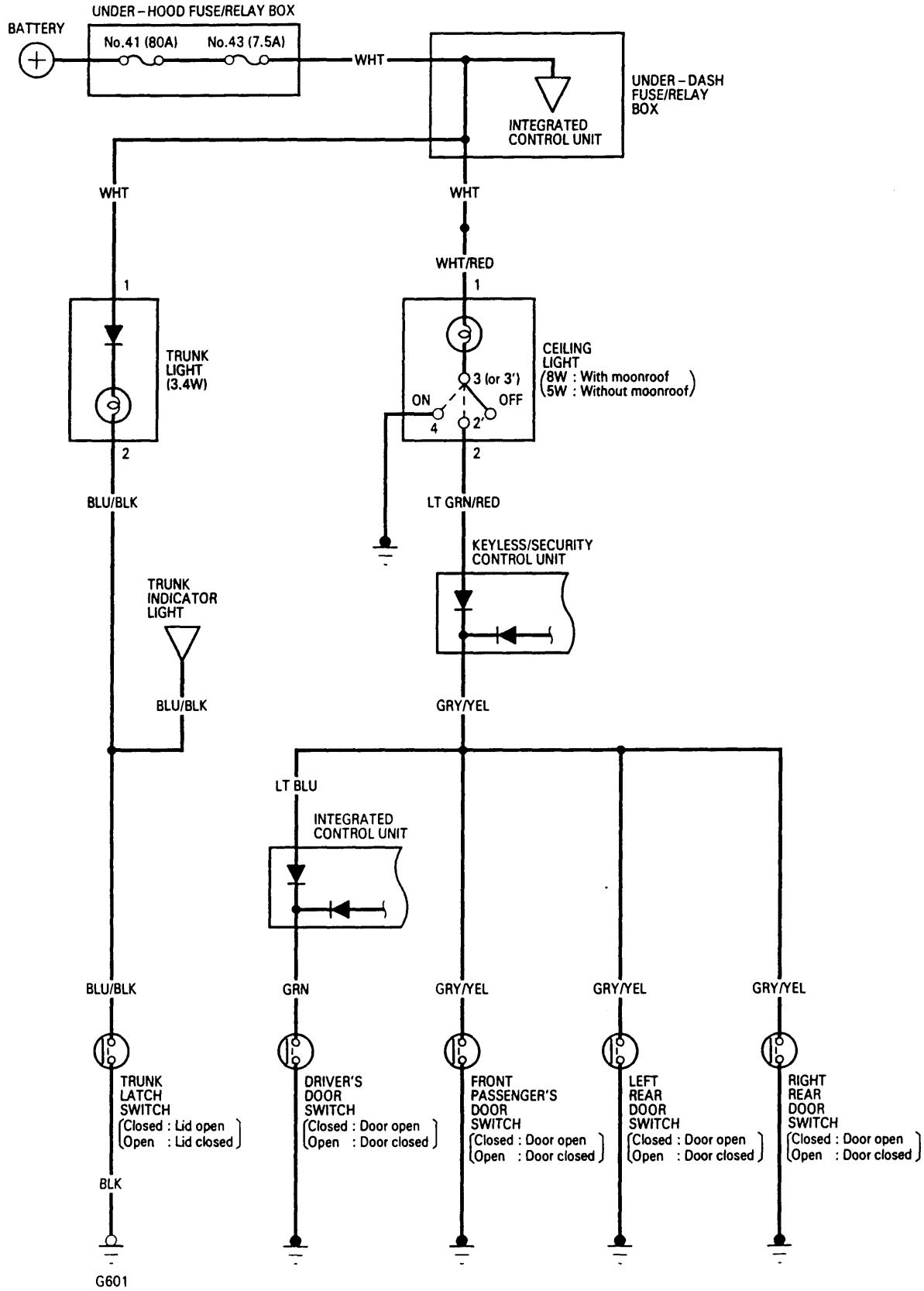
Cavity	Wire	Test condition	Test: Desired results	Possible cause if result is not obtained
1	RED/BLK	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	• Blown No. 30 (7.5 A) fuse in the under-dash fuse/relay box • Faulty combination light switch • An open in the wire
2	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G401, G402) • An open in the wire
3	RED	Combination light switch ON	Connect to ground: Dash lights should come on full bright.	• An open in the wire

Interior Lights

Component Location Index



Circuit Diagram

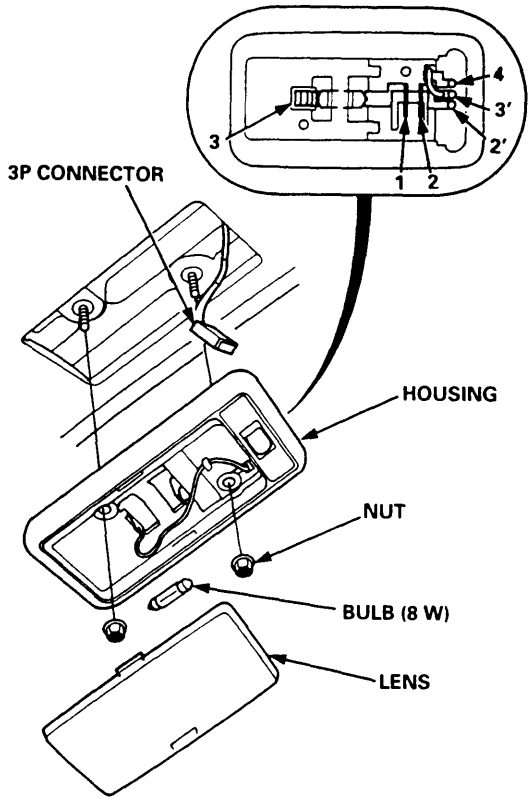


Ceiling Light Test

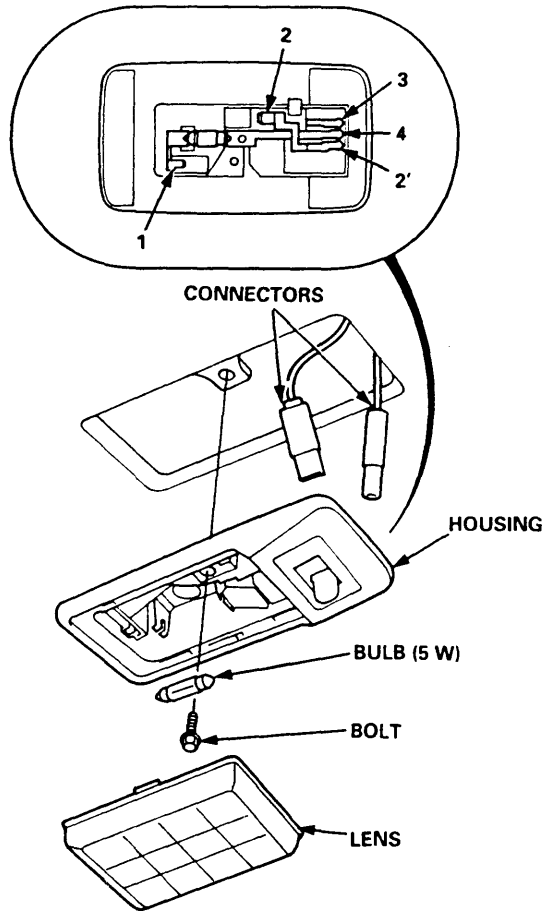
1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the two mounting nuts (or a bolt) from the housing, then remove the housing.
4. Disconnect the connector(s) from the housing.
5. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1		2 or 2'	3 or 3'	4
OFF	○	○		○	
MIDDLE	○	○	○	○	
ON	○	○		○	○

With moonroof:



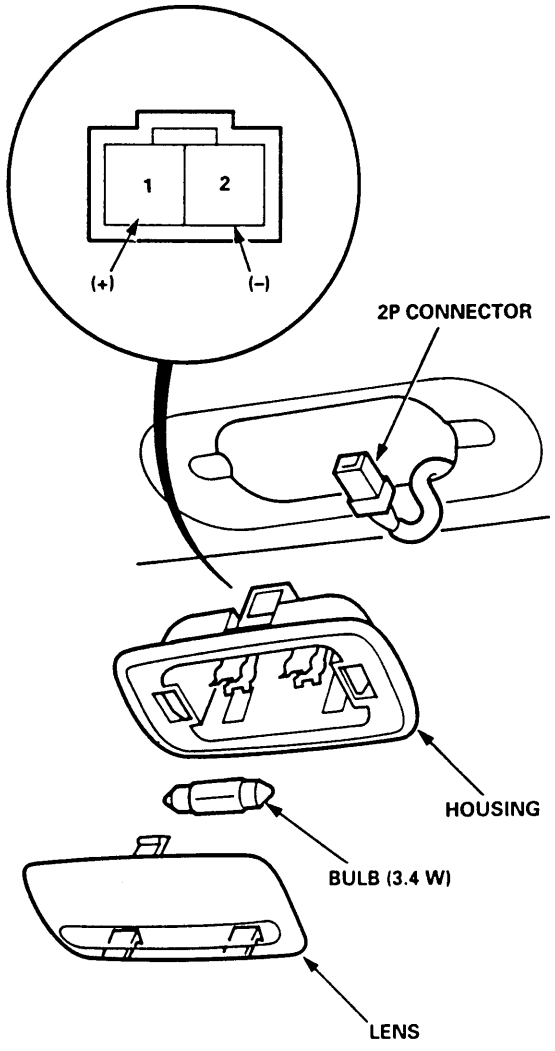
Without moonroof:



Trunk Light Test

1. Open the trunk lid, and pry off the trunk light lens from the housing.
2. Pry out the light assembly.
3. Disconnect the 2P connector from the housing.
4. Make sure that the bulb is OK. Check for continuity between the No. 1 (+) and No. 2 (–) terminals.

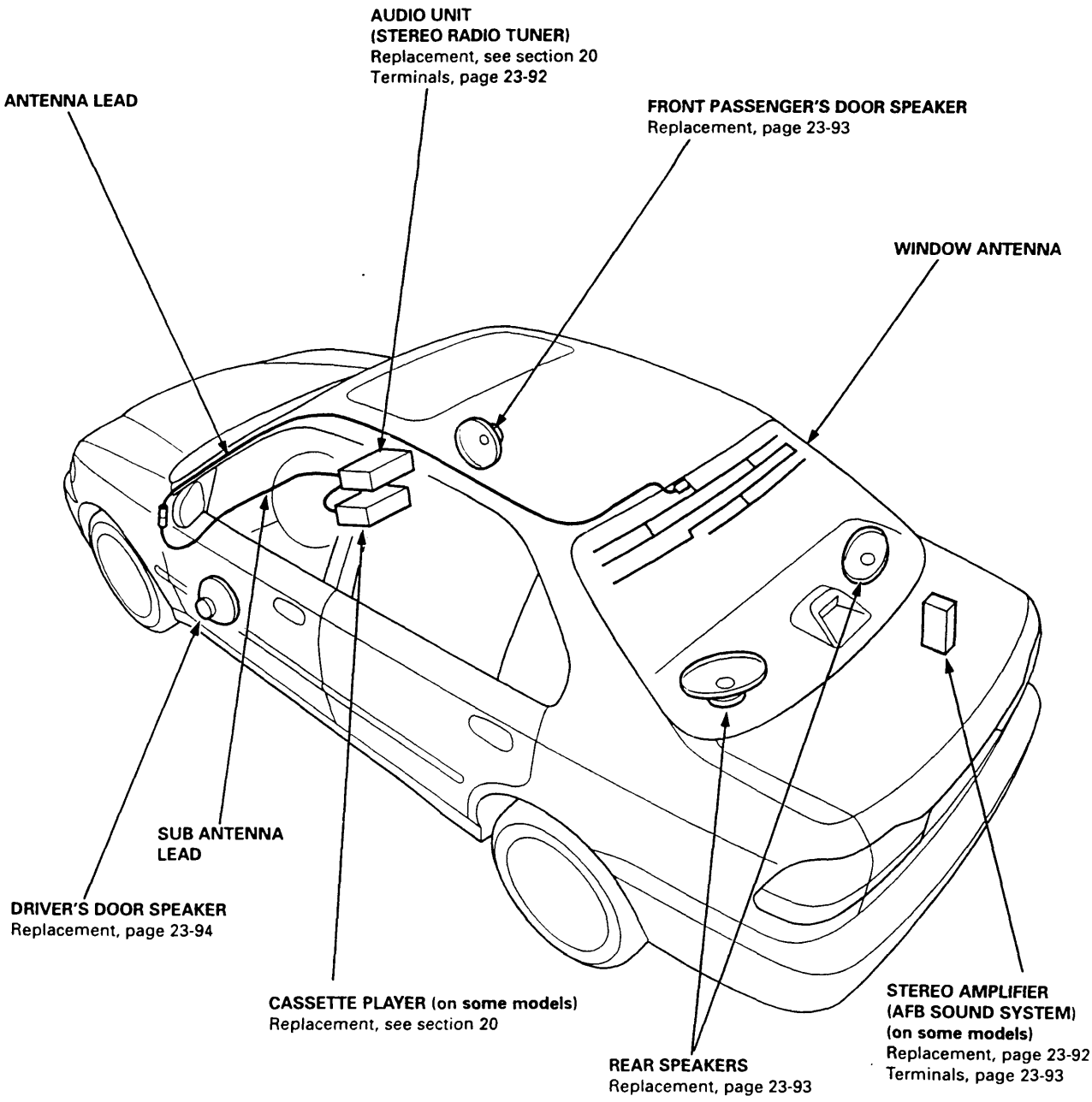
   NOTE: The diode is built into the trunk light housing.



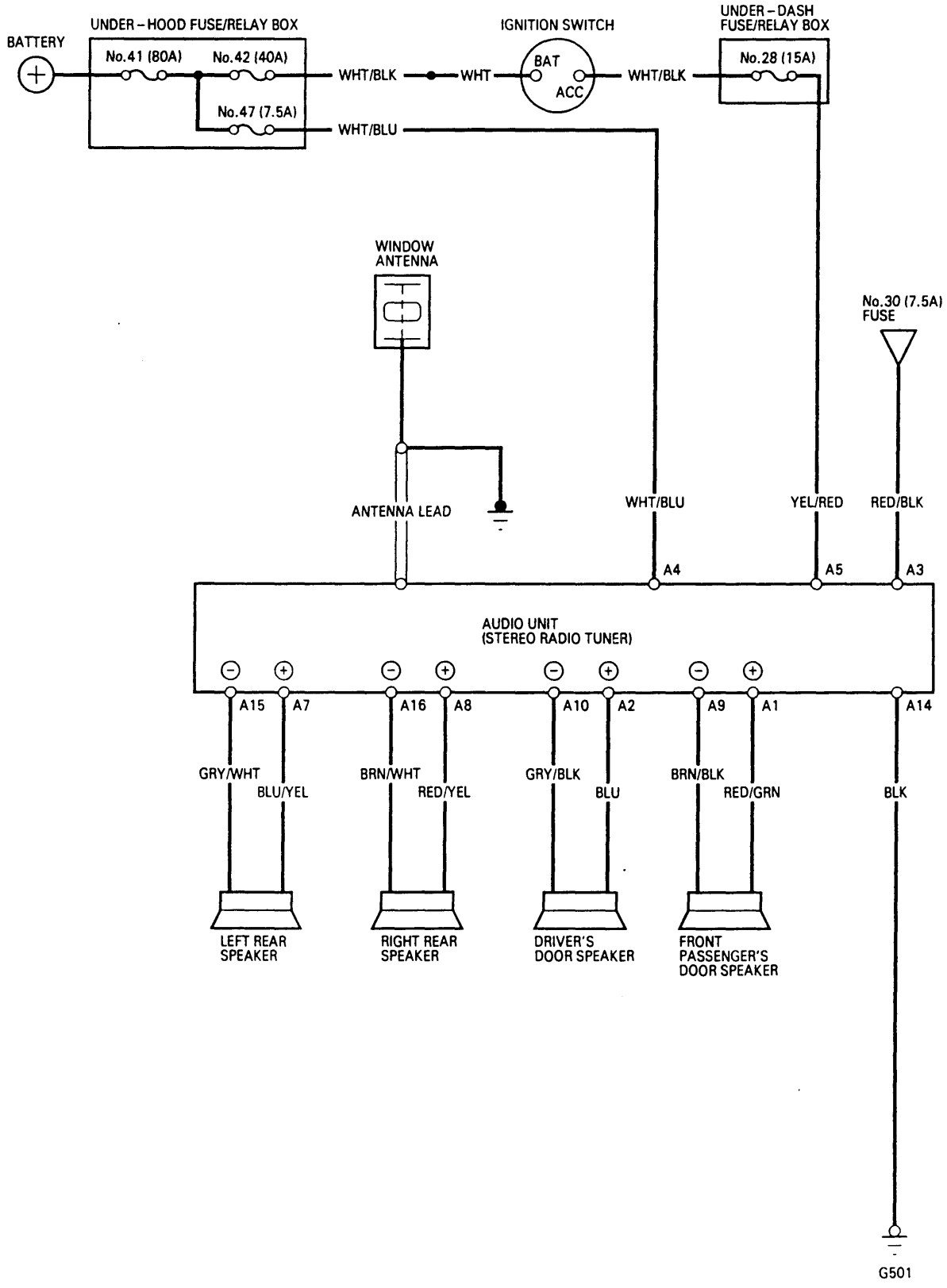
Stereo Sound System

Component Location Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

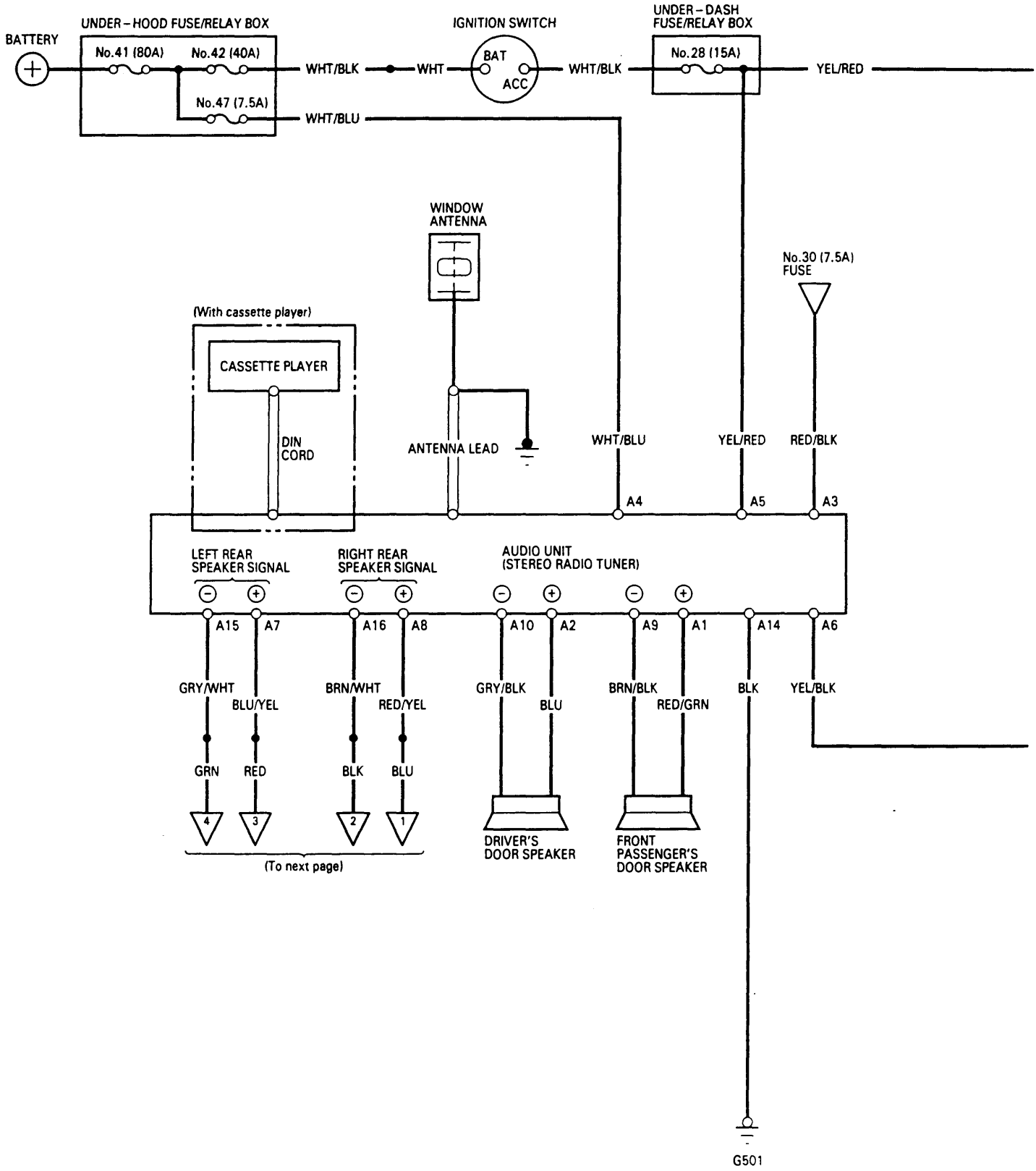


Circuit Diagram (Without AFB Sound System)

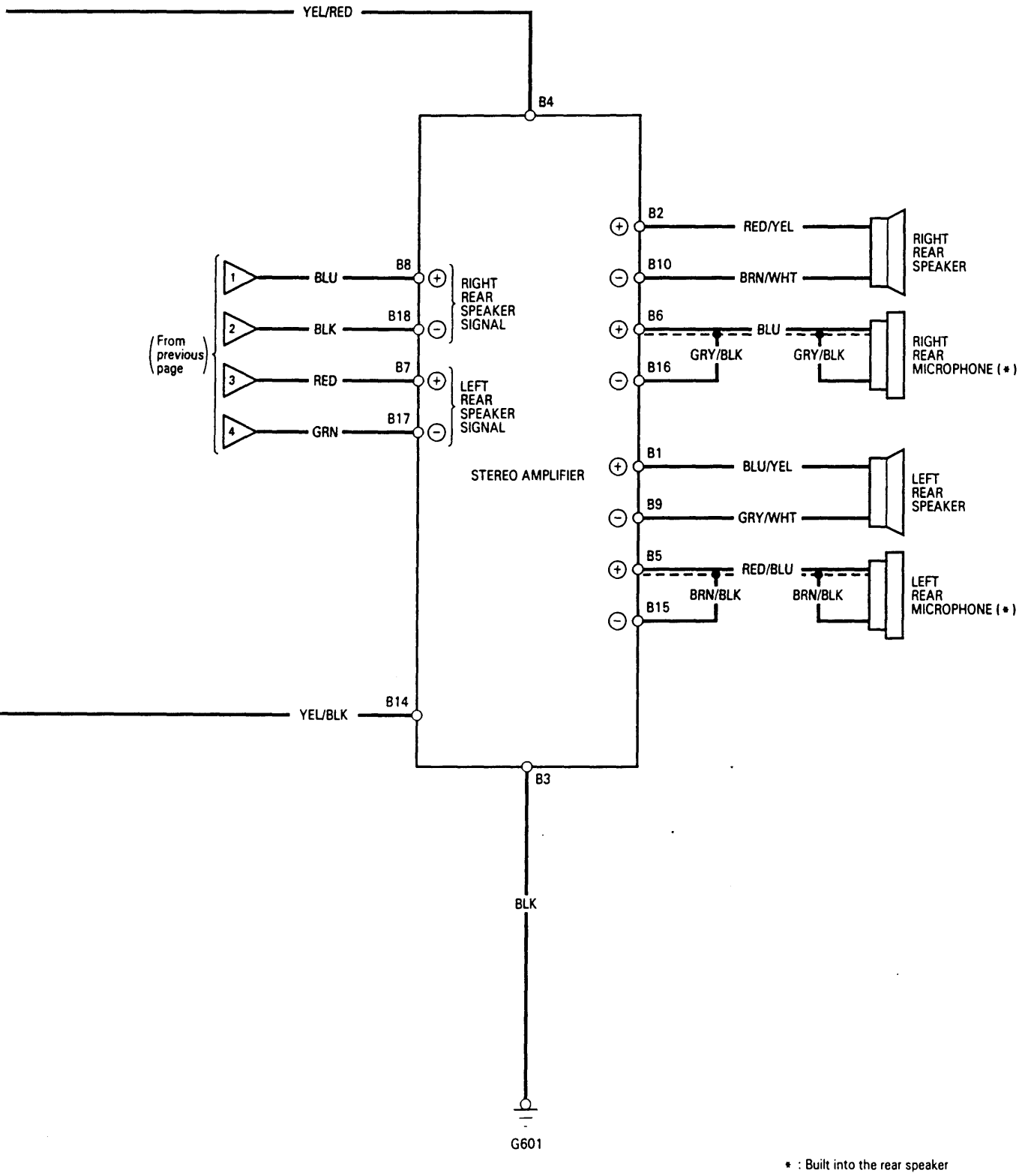


Stereo Sound System

Circuit Diagram (With AFB Sound System)



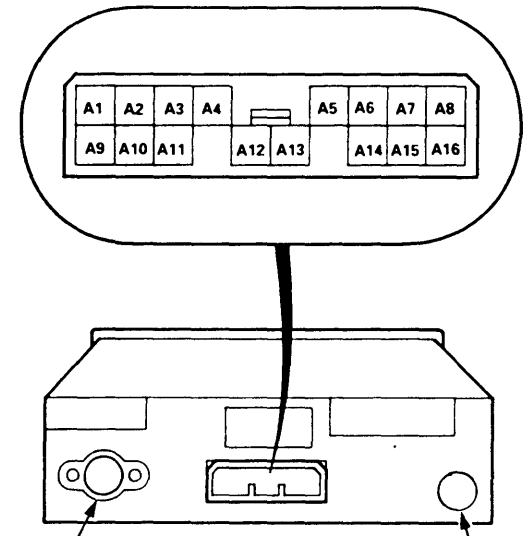
NOTE: The stereo amplifier controls the sound from the rear speakers to feed back the sound picked up by the inner rear speaker microphones.



* : Built into the rear speaker

Stereo Sound System

Audio Unit Terminals

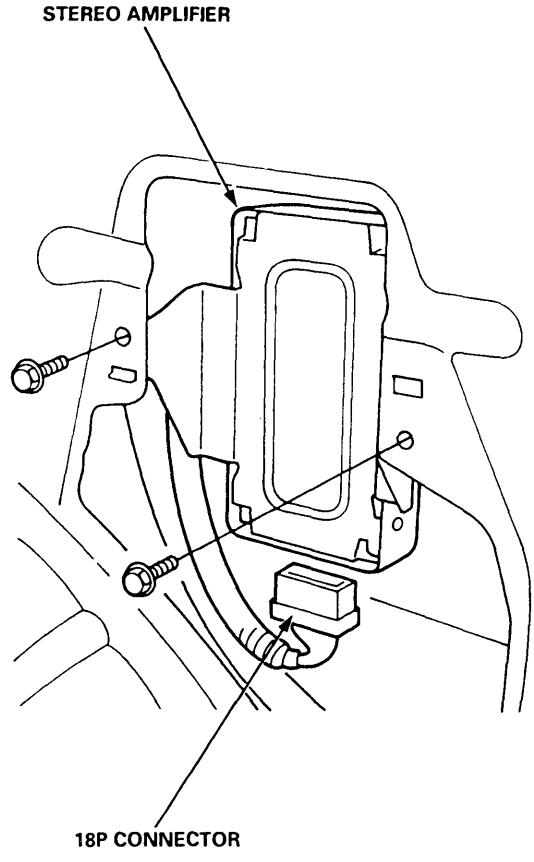


Cavity	Wire	Connect to
A1	RED/GRN	Front passenger's door speaker ⊕
A2	BLU	Driver's door speaker ⊕
A3	RED/BLK	Light-on signal
A4	WHT/BLU	Constant power (tuning memory)
A5	YEL/RED	ACC (main stereo power supply)
A6	YEL/BLK	Radio switched power (To amplifier)*
A7	BLU/YEL	Left rear speaker ⊕, left rear speaker signal ⊕*
A8	RED/YEL	Right rear speaker ⊕, right rear speaker signal ⊕*
A9	BRN/BLK	Front passenger's door speaker ⊖
A10	GRY/BLK	Driver's door speaker ⊖
A11	——	(not used)
A12	——	(not used)
A13	——	(not used)
A14	BLK	Ground (G 501)
A15	GRY/WHT	Left rear speaker ⊖, left rear speaker signal ⊖*
A16	BRN/WHT	Right rear speaker ⊖, right rear speaker signal ⊖*

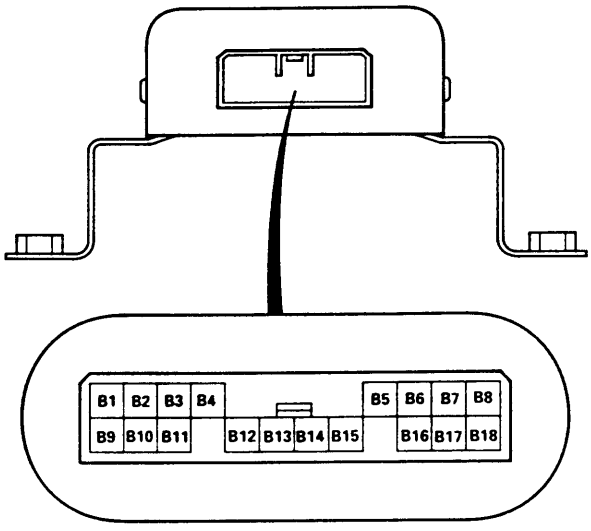
*: AFB sound system

Stereo Amplifier Replacement

1. Open the trunk lid, and pull back the trunk side panel.
2. Disconnect the 18P connector from the stereo amplifier.
3. Remove the two mounting bolts, then remove the stereo amplifier from the trunk.



Stereo Amplifier Terminals

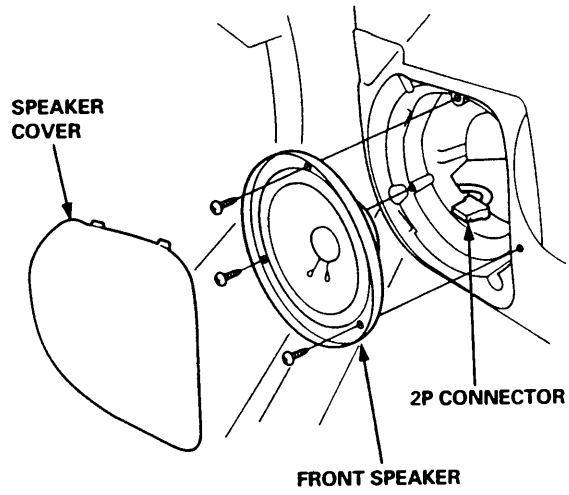


Cavity	Wire	Connect to
B1	BLU/YEL	Left rear speaker ⊕
B2	RED/YEL	Right rear speaker ⊕
B3	BLK	Ground (G601)
B4	YEL/RED	ACC (main stereo power supply)
B5	RED/BLU	Left rear microphone ⊕
B6	BLU	Right rear microphone ⊕
B7	RED	Left rear speaker signal ⊕
B8	BLU	Right rear speaker signal ⊕
B9	GRY/WHT	Left rear speaker ⊖
B10	BRN/WHT	Right rear speaker ⊖
B11	———	(not used)
B12	———	(not used)
B13	———	(not used)
B14	YEL/BLK	Radio switched power (from audio unit)
B15	BRN/BLK	Left rear microphone ⊖
B16	GRY/BLK	Right rear microphone ⊖
B17	GRN	Left rear speaker signal ⊖
B18	BLK	Right rear speaker signal ⊖

Speaker Replacement

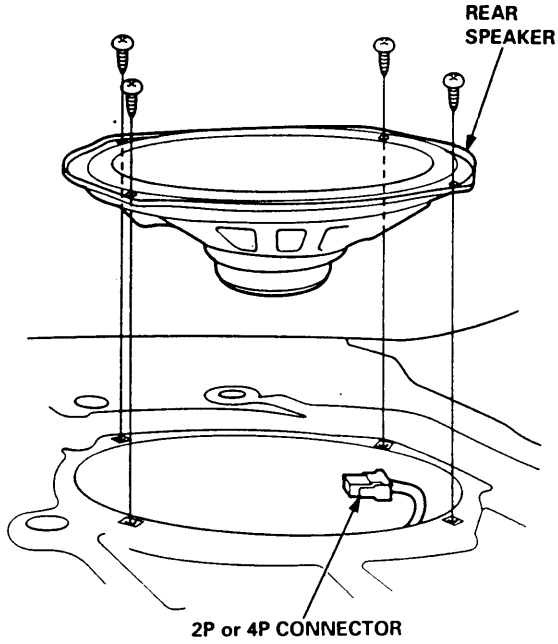
Front speaker:

1. Remove the speaker cover.
2. Remove the three screws from the speaker.
3. Disconnect the 2P connector, and remove the door speaker.



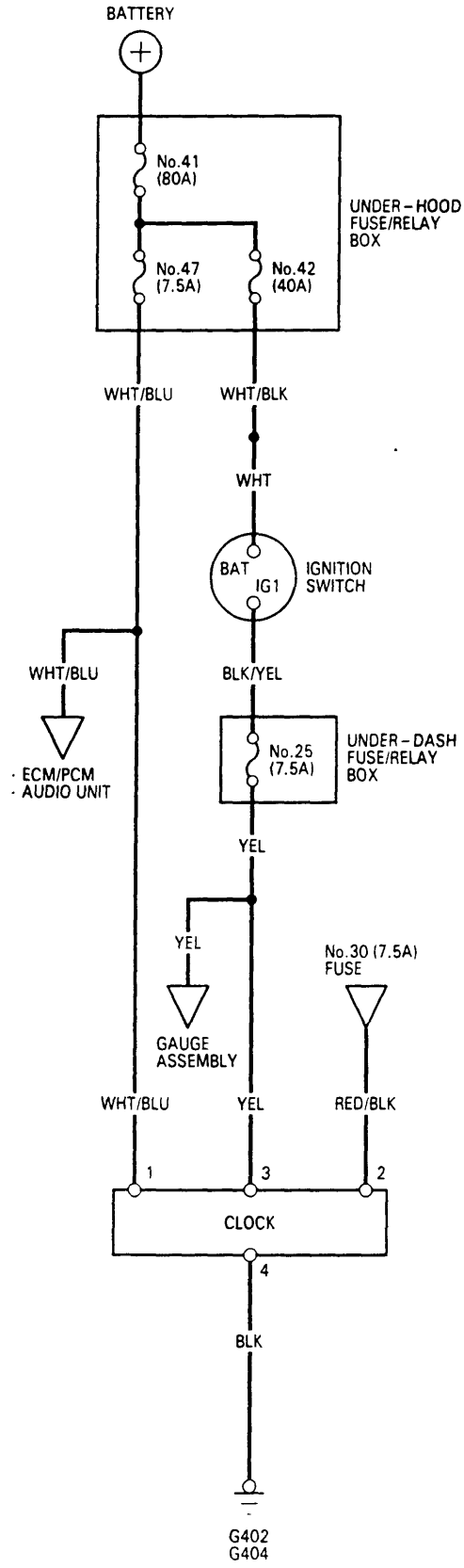
Rear speaker:

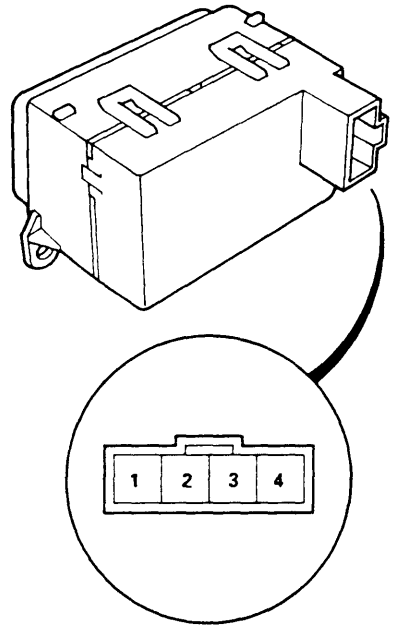
1. Remove the rear shelf (see section 20).
2. Disconnect the 2P or 4P connector from the speaker.
3. Remove the four screws, then remove the speaker.



Clock

Circuit Diagram



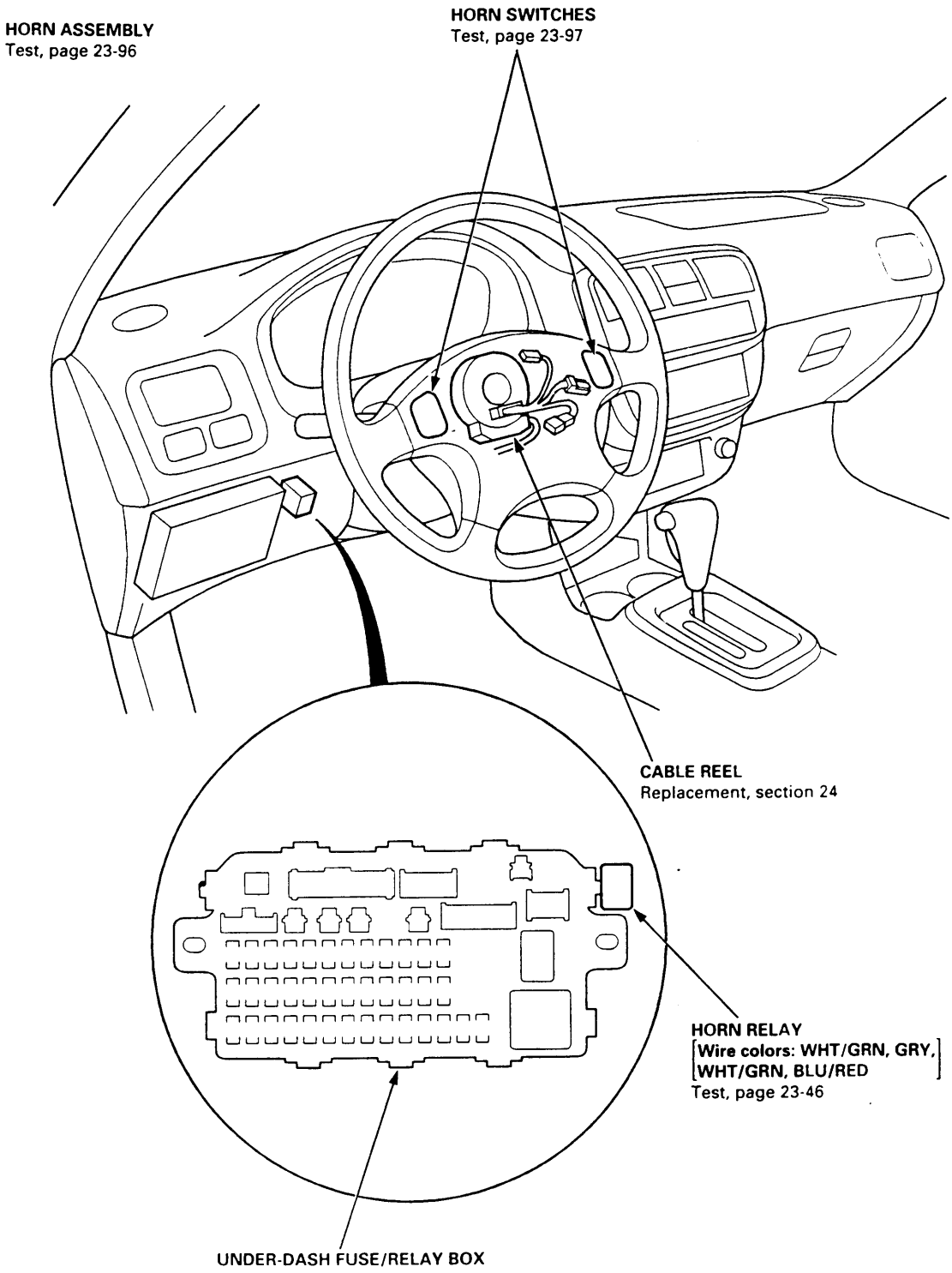


Cavity	Wire	Connect to
1	WHT/BLU	Constant power (Time memory)
2	RED/BLK	Light-on signal
3	YEL	IG1 (Main clock power supply)
4	BLK	Ground

Horns

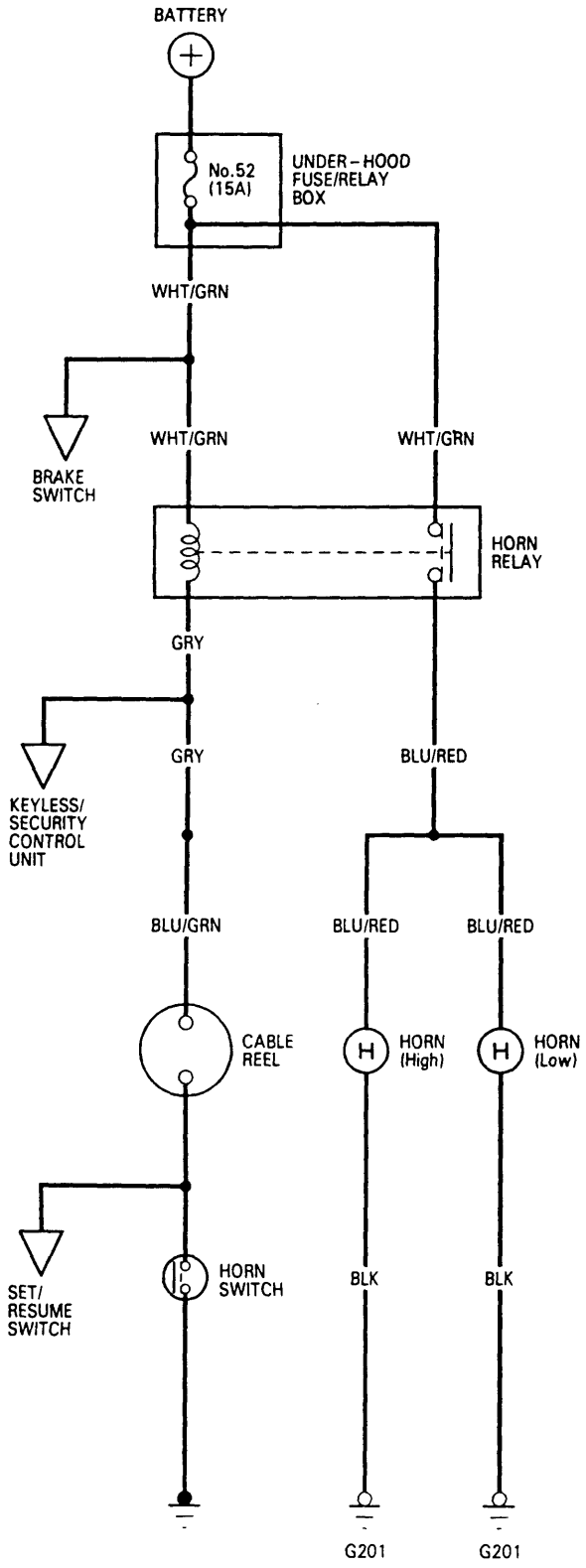
Component Location Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.



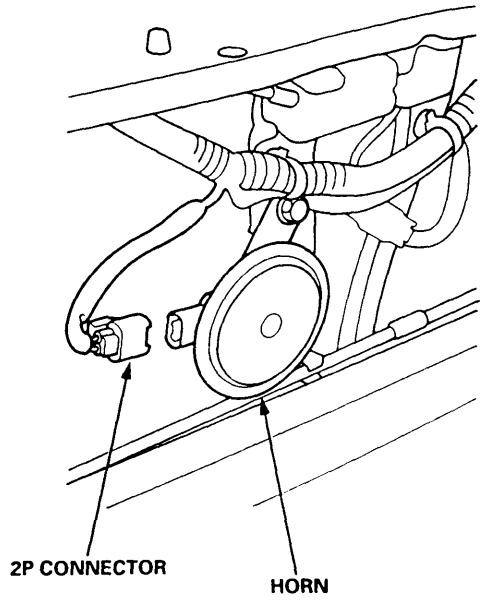
Horns

Circuit Diagram

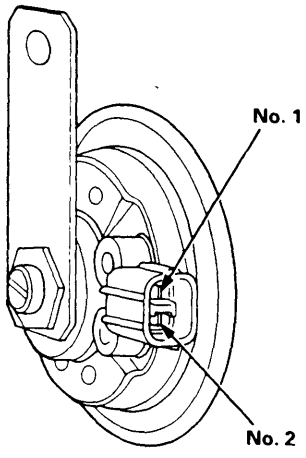


Horn Test

1. Remove the front bumper (see section 20).
2. Disconnect the 2P connector from the horn.
3. Remove the horn.



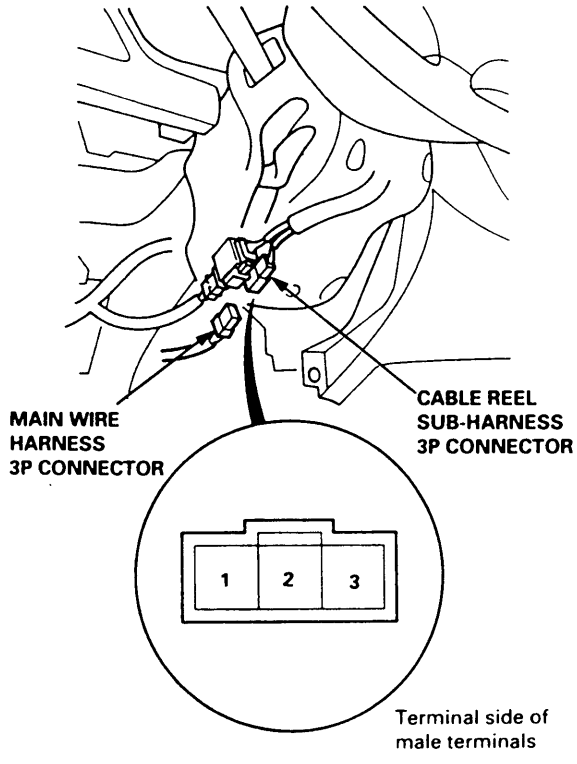
4. Test the horn by connecting battery power to one terminal and grounding the other. The horn should sound.



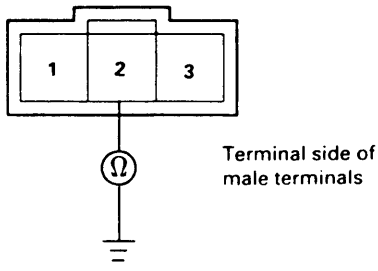
5. If the horn fails to sound, replace it.

Switch Test

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 battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Disconnect the driver's airbag connector (see section 24).
4. Remove the driver's dashboard lower cover (see section 20).
5. Disconnect the cable reel sub-harness 3P connector from the main wire harness.

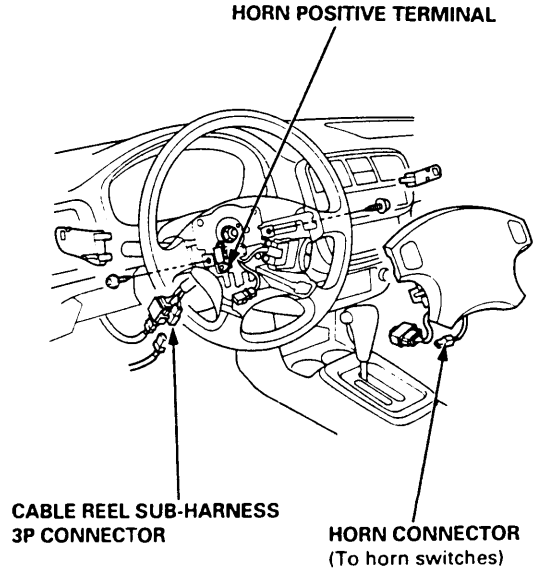


6. Check for continuity between the No. 2 terminal of the cable reel sub-harness and body ground with the horn switch pressed.



- If there is continuity, the horn switch is OK.
- If there is no continuity, go to step 6.

7. Remove the driver's airbag assembly (see section 24), then disconnect the horn connector from the steering wheel.
8. Check for continuity between the No. 2 terminal of the cable reel sub-harness 3P connector and horn positive terminal.

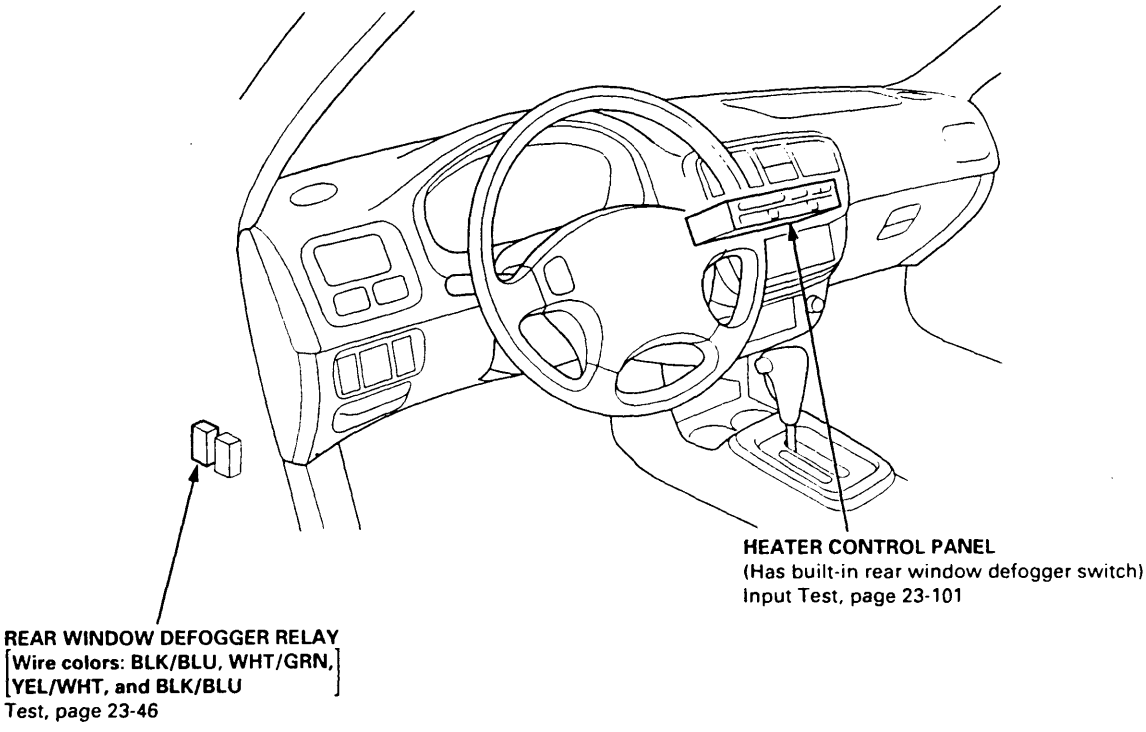


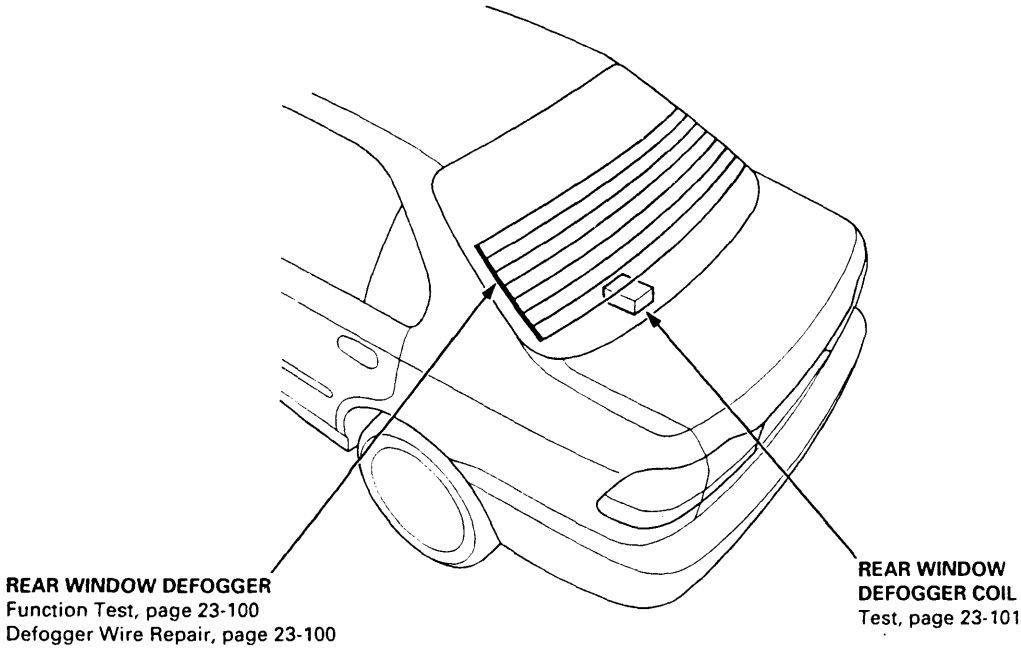
- If there is no continuity, replace the cable reel (see section 24).
- If there is continuity, repair or replace the horn switch.

9. If all tests prove OK, reinstall the driver's airbag assembly (see section 24), and reconnect the cable reel sub-harness connector.
10. Reconnect the driver's airbag connector, and reinstall the access panel on the steering wheel.
11. Reconnect the battery positive cable, then the negative terminal.
12. After installing the airbag assembly, confirm proper system operation:
    - Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
    - Make sure both horn buttons work.
13. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

Rear Window Defogger

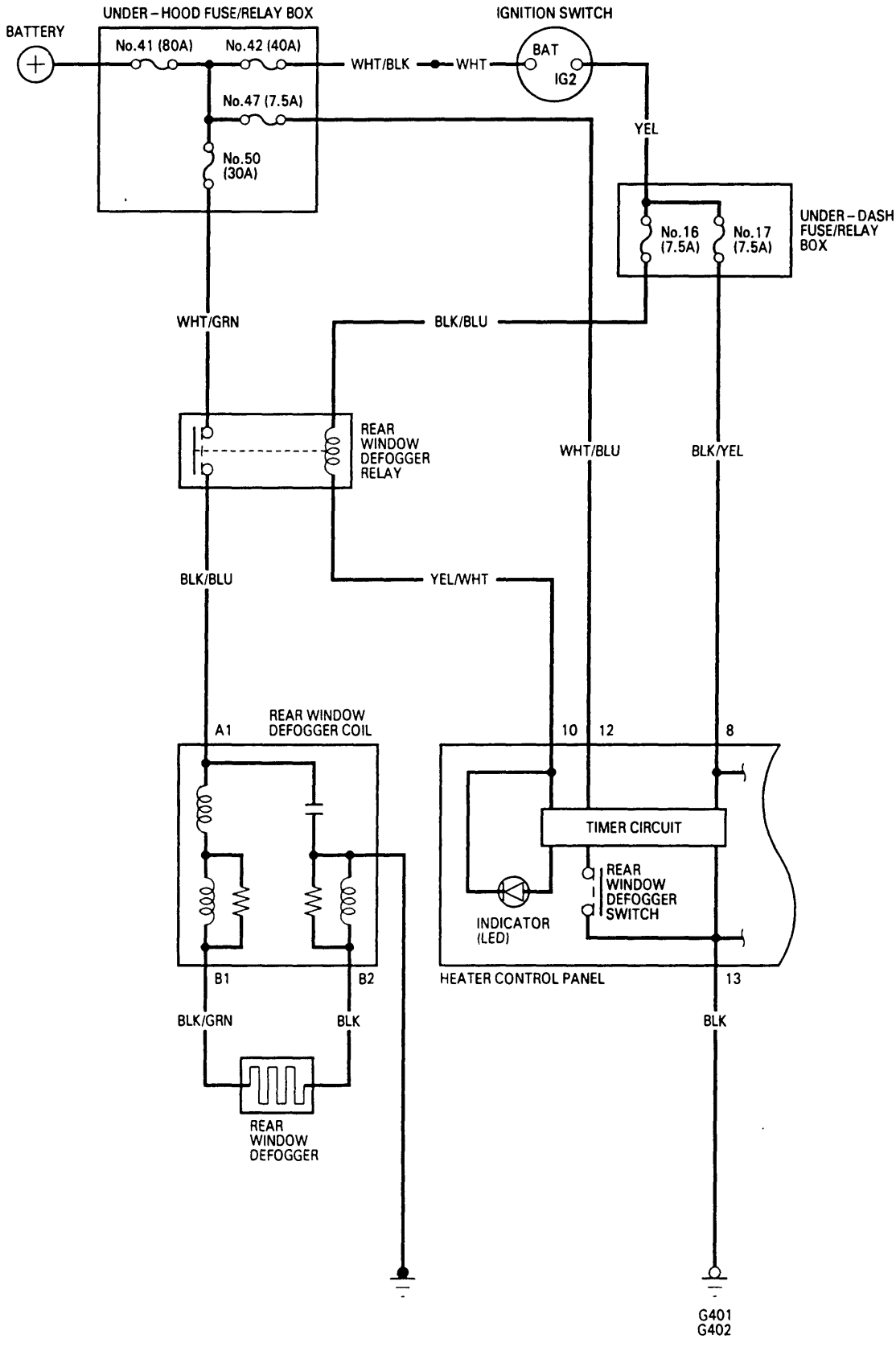
Component Location Index





Description:
The rear window defogger is controlled by the defogger timer in the heater control panel. When the defogger switch is pushed, it sends a signal to the defogger timer, and the defogger stays on for about 40 minutes. It shuts off when the ignition switch is turned off, or the defogger switch is pushed again. The indicator light in the switch comes on when the defogger is on.

Circuit Diagram



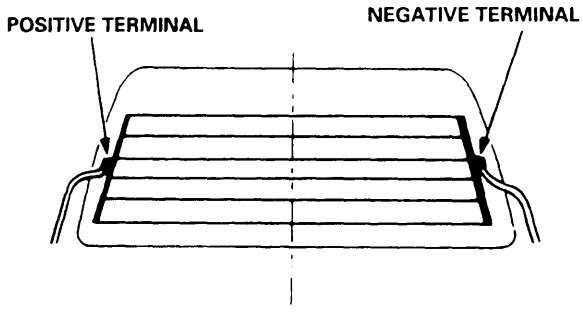
Rear Window Defogger

Function Test

CAUTION: Be careful not to scratch or damage the defogger wires with the tester probe.

1. Check for voltage between the positive terminal and body ground with the ignition switch and defogger switch ON.
   There should be battery voltage.

   - If there is no voltage, check for:
     — blown No. 50 (30 A) fuse in the under-hood fuse/relay box.
     — faulty defogger relay.
     — faulty defogger switch.
     — faulty defogger coil.
     — an open in the BLK/BLU (BLK/GRN) wire.
   - If there is battery voltage, go to step 2.



2. Check for continuity between the negative terminal and body ground.
   If there is no continuity, check for an open in the BLK wire and a faulty rear window defogger coil.

3. Touch the voltmeter positive probe to the halfway point of each defogger wire, and the negative probe to the negative terminal.
   There should be approximately 6 V with the ignition switch and the defogger switch ON.

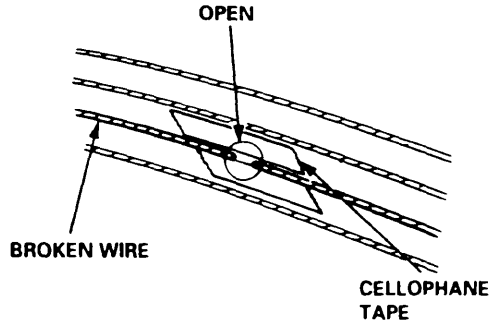
   - If the voltage is as specified, the defogger wire is OK.
   - If the voltage is not as specified, repair the defogger wire.
     — If it is more than 6 V, there is a break in the negative half of the wire.
     — If it is less than 6 V, there is a break in the positive half of the wire.

Defogger Wire Repair

NOTE: To make an effective repair, the broken section must be no longer than one inch.

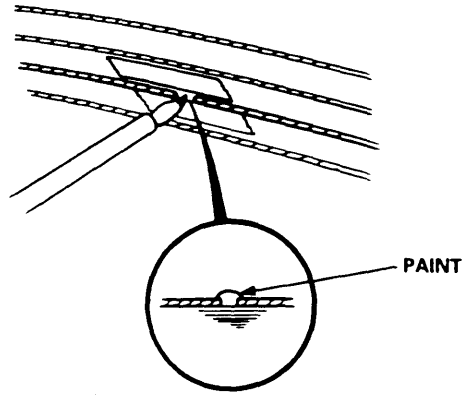
1. Lightly rub the area around the broken section with fine steel wool, then clean it with alcohol.

2. Carefully mask above and below the broken portion of the defogger wire with cellophane tape.



3. Using a small brush, apply a heavy coat of silver conductive paint extending about 1/8" on both sides of the break. Allow 30 minutes to dry.

   NOTE: Thoroughly mix the paint before use.



4. Check for continuity in the repaired wire.

5. Apply a second coat of paint in the same way. Let it dry three hours before removing the tape.

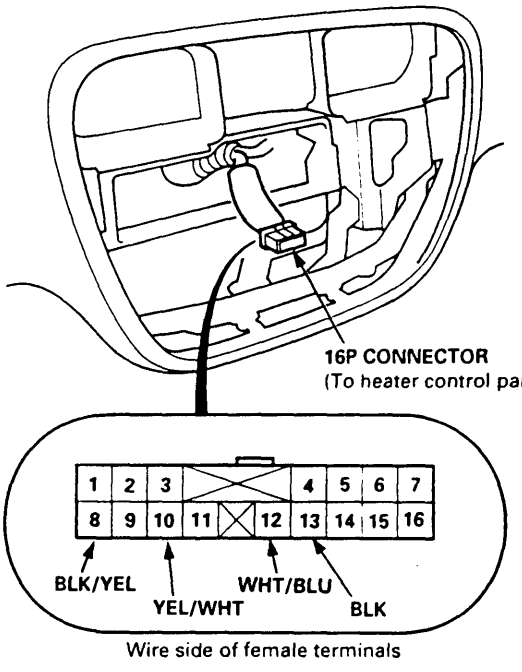
Switch Input Test

NOTE: Before testing, check for a blown No. 47 (7.5 A) fuse in the under-hood fuse/relay box and blown No.16 (7.5 A) and No. 17 (7.5 A) fuses in the under-dash fuse/relay box.

1. Remove the center panel (see section 21).

2. Check for continuity between the No. 13 (BLK) terminal and body ground.
   There should be continuity.
   - If there is no continuity, check for:
     — an open in the BLK wire.
     — poor ground (G401, G402).
   - If there is continuity, go to step 3.

3. Check for voltage between the No. 12 (WHT/BLU) terminal and body ground, and then check for voltage between the No. 8 (BLK/YEL) terminal and body ground and between the No. 10 (YEL/WHT) terminal and body ground with the ignition switch ON (II).
   There should be battery voltage.
   - If there are no voltage, check for:
     — an open in the wire.
     — faulty rear window defogger relay.
   - If there are battery voltage, go to step 4.



Wire side of female terminals

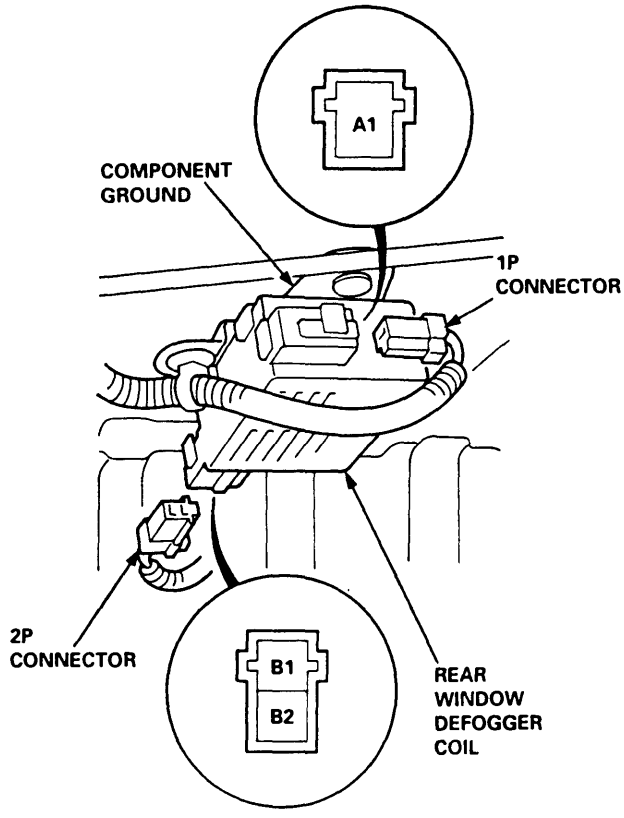
4. Connect a jumper wire between the No. 10 (YEL/WHT) and the No. 13 (BLK) terminals.

5. Turn the ignition switch ON (II), and check that the rear window defogger works; if it does, replace the heater control panel.

Rear Window Defogger Coil Test

1. Open the trunk lid.

2. Disconnect the 1P and 2P connectors from the rear window defogger coil.



3. Remove the rear window defogger coil.

4. Check for continuity between the A1 and B2 terminals. There should be continuity.

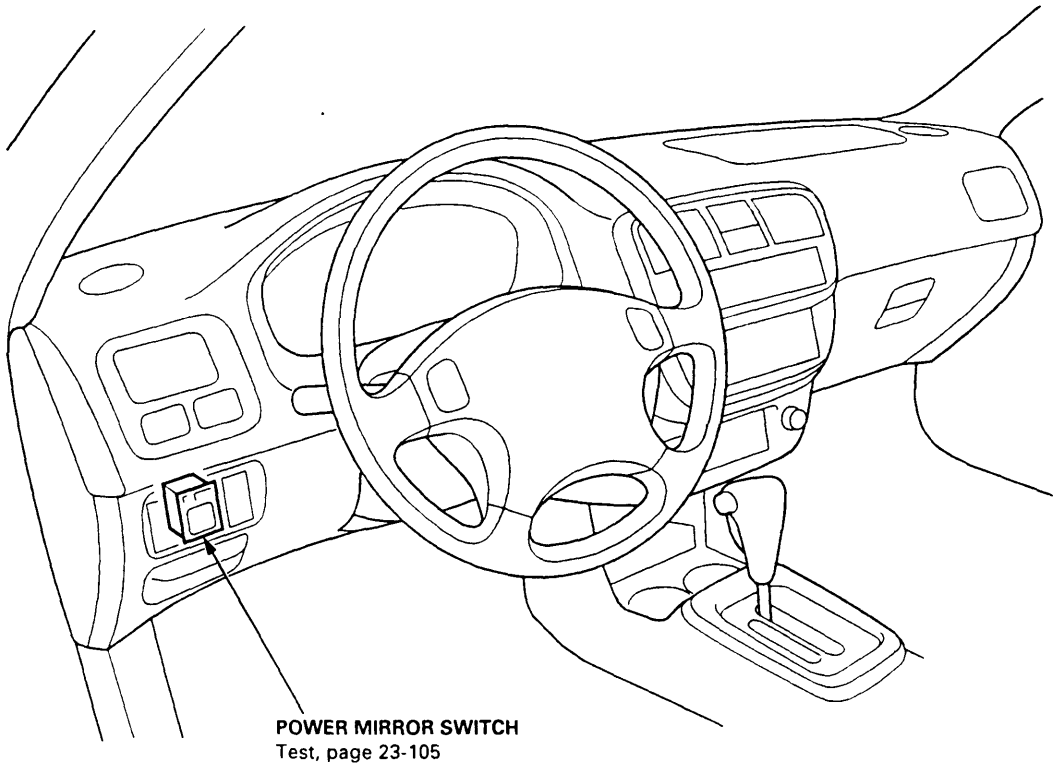
5. Check for continuity between the B2 terminal and component ground. There should be continuity.

6. If there is no continuity, replace the coil.

Power Mirrors

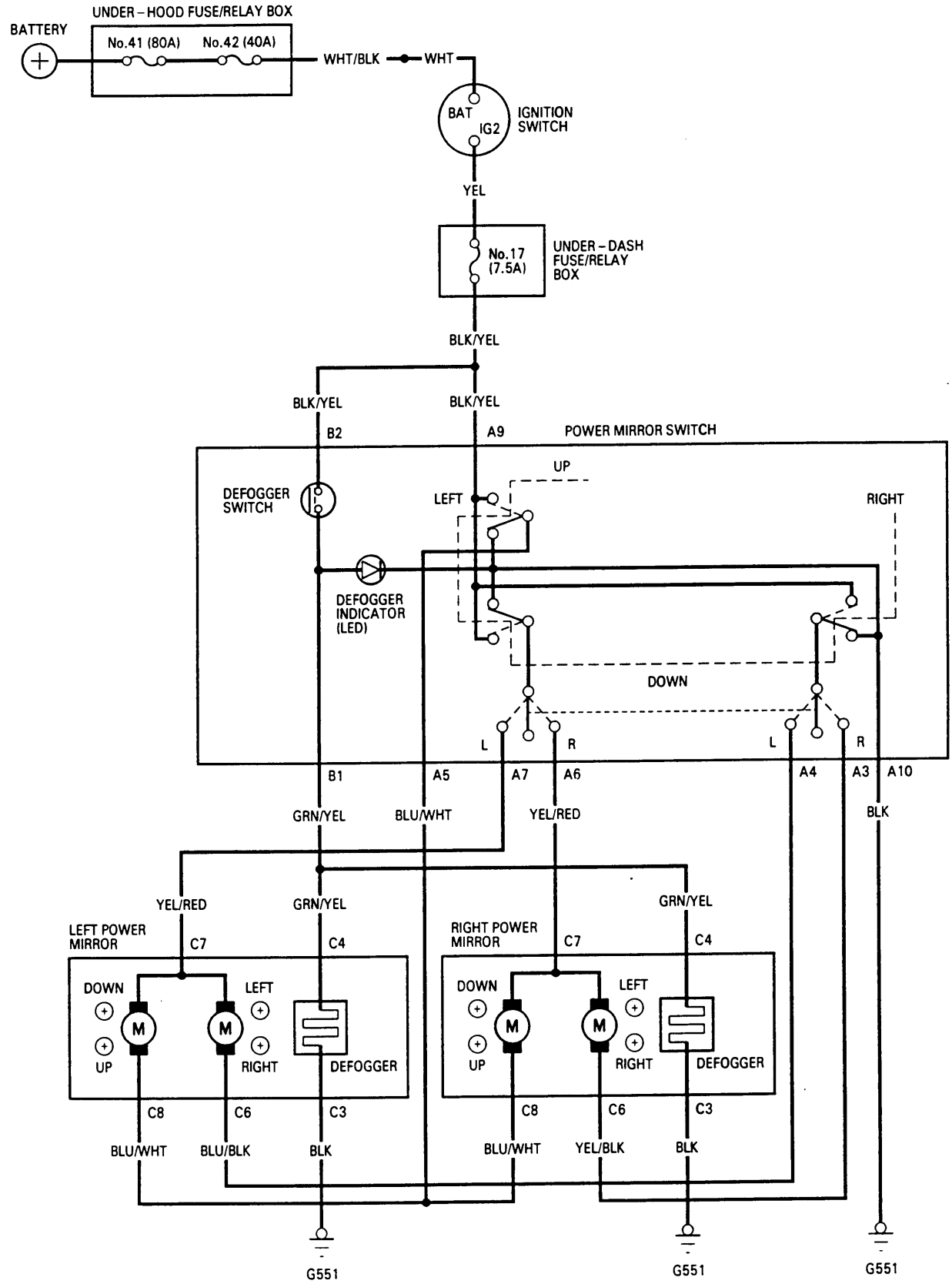
Component Location Index

- **POWER MIRROR**
  Function Test, page 23-104
  Power Mirror Test, 23-106
  Replacement, see section 20
- **POWER MIRROR HOLDER**
  Replacement, see section 20



POWER MIRROR SWITCH
Test, page 23-105

Circuit Diagram



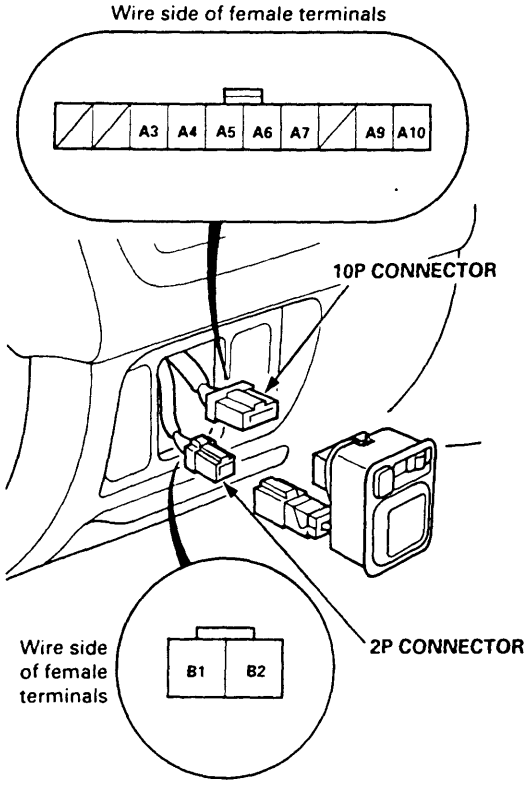
Power Mirrors

Function Test

CAUTION: Be careful not to damage the mirror switch or the dashboard driver's lower cover when prying the switch out.

1. Pry the switch out of the driver's dashboard lower cover.

2. Disconnect the 10P and 2P connectors from the switch.



Mirror Test

Both inoperative:

1. Check for voltage between the A9 (BLK/YEL) terminal and body ground with the ignition switch ON (II). There should be battery voltage.
   - If there is no voltage, check for:
     — blown No. 17 (7.5 A) fuse in the under-dash fuse/relay box.
     — an open in the BLK/YEL wire.
   - If there is battery voltage, go to step 2.

2. Check for continuity between the A10 (BLK) terminal and body ground.
   There should be continuity.
   If there is no continuity, check for:
   - an open in the BLK wire.
   - poor ground (G551).

Left mirror inoperative:

Connect the A9 (BLK/YEL) terminal of the 10P connector to the A7 (YEL/RED) terminal and the A5 (or A4) terminal to body ground with jumper wires. The left mirror should tilt down (or swing left) with the ignition switch turned ON (II).

- If the mirror does not tilt down (or does not swing left), remove the left door panel, and check for an open in the BLU/WHT (or BLU/BLK) wire between the left power mirror and the switch. If the wire is OK, check the left power mirror actuator.
- If the mirror neither tilts down nor swings left, repair the YEL/RED wire.
- If the mirror operates properly, check the mirror switch.

Right mirror inoperative:

Connect the A9 (BLK/YEL) terminal of the 10P connector to the A6 (YEL/RED) terminal and the A5 (or A3) terminal to body ground with jumper wires. The right mirror should tilt down (or swing left) with the ignition switch is turned ON (II).

- If the mirror does not tilt down (or does not swing left), remove the right door panel, and check for an open in the BLU/WHT (or YEL/BLK) wire between the right power mirror and the switch. If the wire is OK, check the right power mirror actuator.
- If the mirror neither tilts down nor swings left, repair the YEL/RED wire.
- If the mirror operates properly, check the mirror switch.

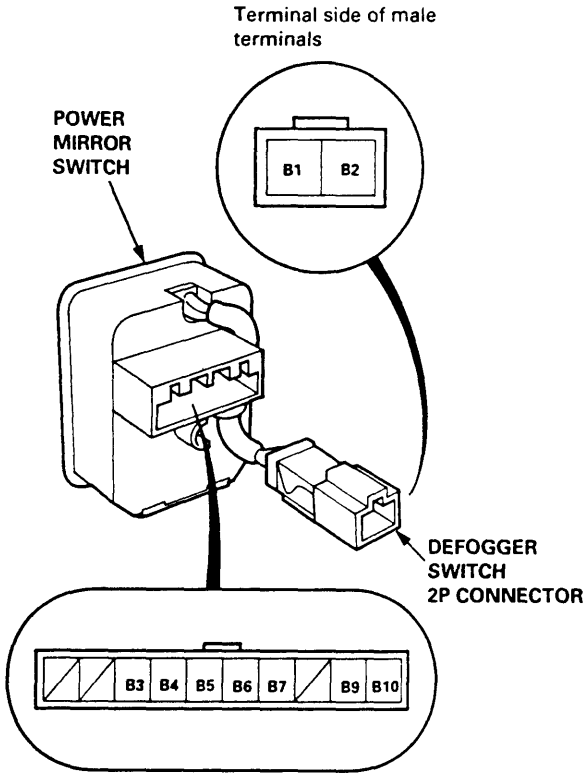
Defogger test:

Connect the B1 (GRN/YEL) and B2 (BLK/YEL) terminals with a jumper wire, and check for voltage between the B1 terminal and body ground. There should be battery voltage and both mirrors should warm up with the ignition switch ON (II).

- If there is no voltage or neither warms up, check for:
  — an open in the BLK/YEL or GRN/YEL wires.
  — blown No. 17 (7.5 A) fuse in the under dash fuse/relay box.
  — poor ground (G551).
- If only one fails to warm up, check its defogger.
- If both fail to warm up, check the defogger switch.

Switch Test

1. Remove the switch as described in Function Test (see page 23-104).



2. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch:

	Position \ Terminal	A3	A4	A5	A6	A7	A9	A10
R	OFF	○		○	○			○
	UP	○		○	○		○	
	DOWN	○			○		○	
	LEFT	○		○	○		○	
	RIGHT	○					○	
L	OFF		○	○		○		○
	UP		○	○		○	○	
	DOWN		○			○	○	
	LEFT		○	○		○	○	
	RIGHT		○			○	○	

Defogger Switch:

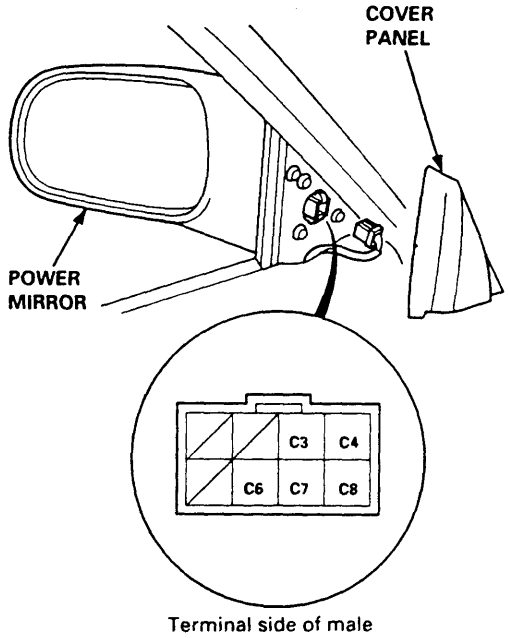
Position \ Terminal	B1	B2
ON	○	○
OFF		

Power Mirrors

Power Mirror Test

Actuator Test:

1. Remove the cover panel, then disconnect the 8P connector from the power mirror.



Terminal side of male terminals

2. Check actuator operation by connecting power and ground according to the table.

Terminal / Position	C6	C7	C8
TILT UP		⊖	⊕
TILT DOWN		⊕	⊖
SWING LEFT	⊖	⊕	
SWING RIGHT	⊕	⊖	

3. If the mirror actuator does not work properly, replace the power mirror assembly.

Defogger Test:

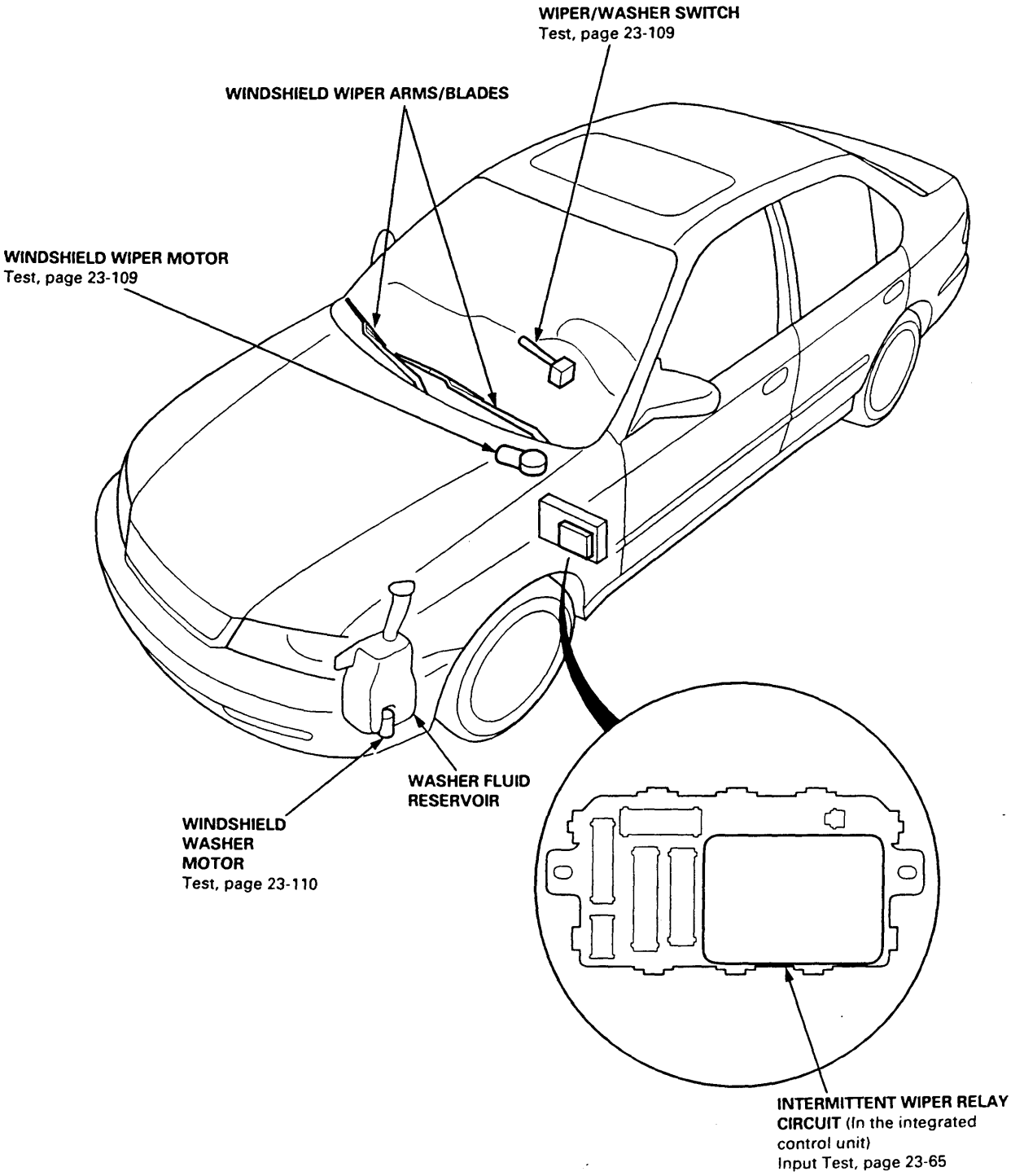
1. Check for continuity between the C3 and C4 terminals of the 8P connector. There should be continuity.

2. If there is no continuity, replace the mirror holder.

Wiper/Washer

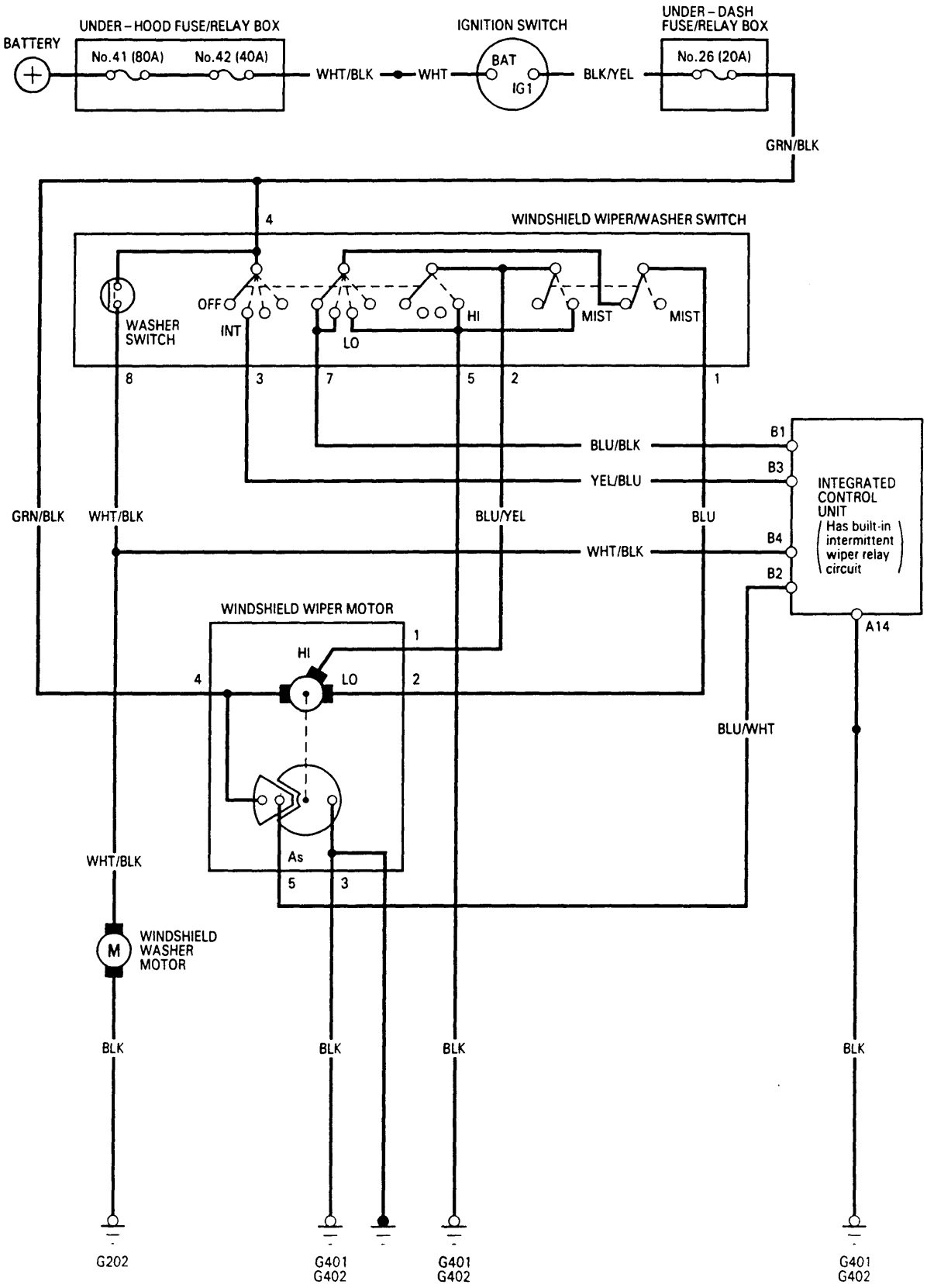
Component Location Index

SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.



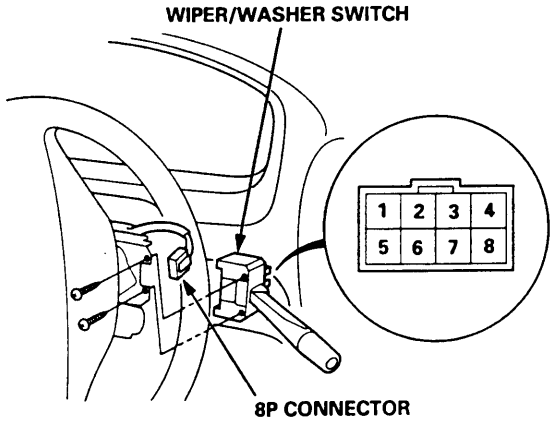
Wiper/Washer

Circuit Diagram



Wiper/Washer Switch Test

1. Remove the driver's dashboard lower cover (see section 20).
2. Remove the steering column covers.
3. Disconnect the 8P connector from the switch, remove the two screws, and pull out the switch.



4. Check for continuity between the terminals in each switch position according to the table.

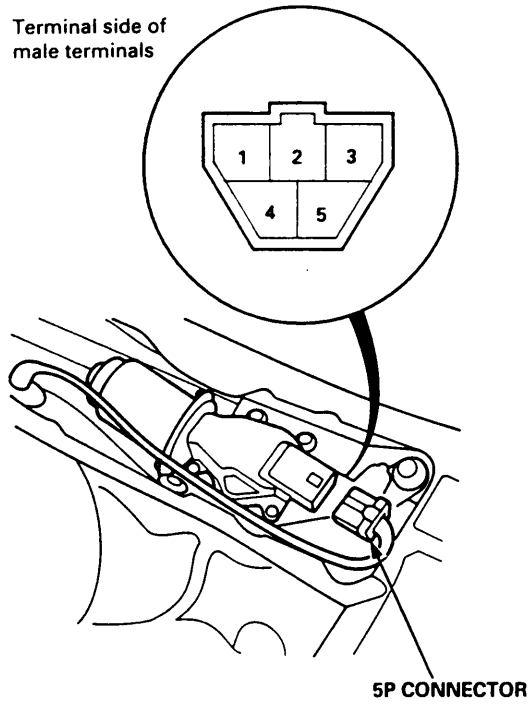
Position \ Terminal	1	2	3	4	5	7	8
OFF	○					○	
INT	○					○	
			○	○			
LO	○				○		
HI		○			○		
Mist switch "ON"		○			○		
Washer switch "ON"				○			○

Windshield Wiper Motor Test

1. Open the hood, and remove the cap nuts and the wiper arms.

   NOTE: Carefully remove the wiper arms, so that they do not touch the hood.

2. Remove the cowl cover by prying out the trim clips (see section 20).
3. Disconnect the 5P connector from the windshield wiper motor.



4. Test the motor by connecting battery power and ground according to the table.

Position \ Terminal	1	2	4
LOW SPEED		⊖	⊕
HIGH SPEED	⊖		⊕

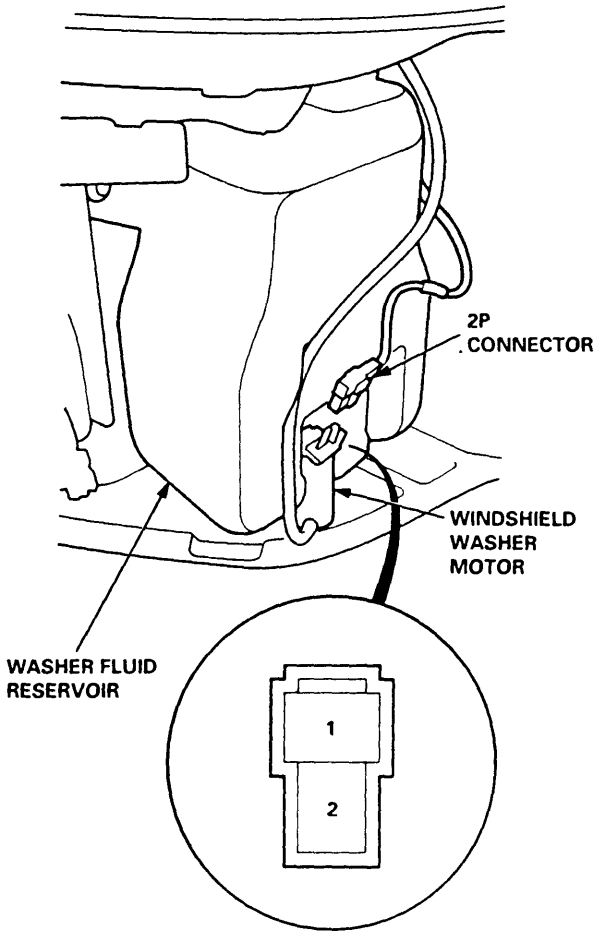
   If the motor does not run or fails to run smoothly, replace it.

5. Connect an analog voltmeter between the No. 5 (+) and No. 3 (–) terminals, and run the motor at low or high speed.

   The voltmeter should indicate 0 V and 4 V or less alternately.

Washer Motor Test

1. Remove the front bumper (see section 20).
2. Disconnect the 2P connector from the washer motor.



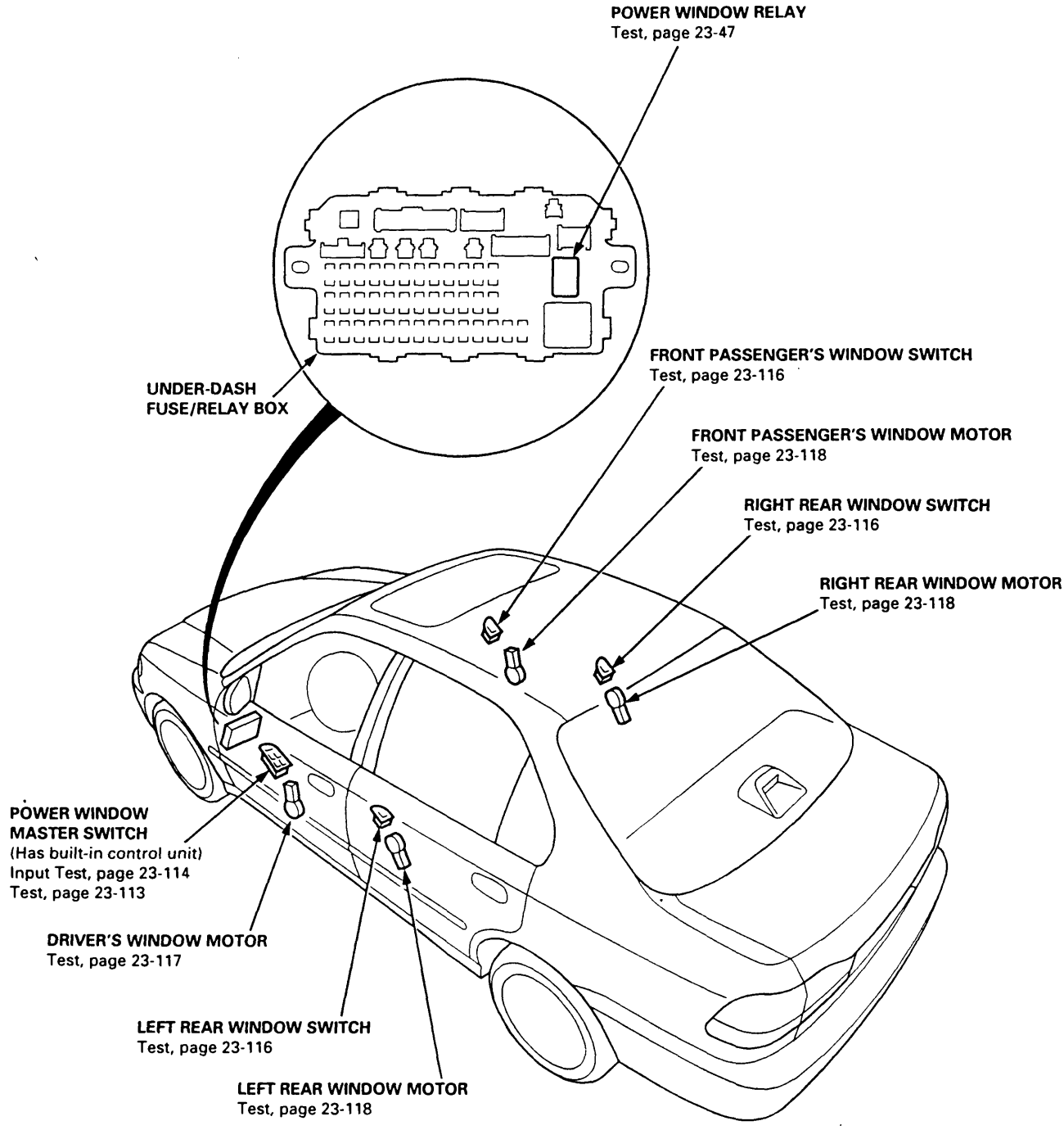
3. Test the washer motor by connecting battery power and ground according to the table.

Terminal / Battery	1	2
Disconnected		
Connected	⊕	⊖

- If the motor 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.

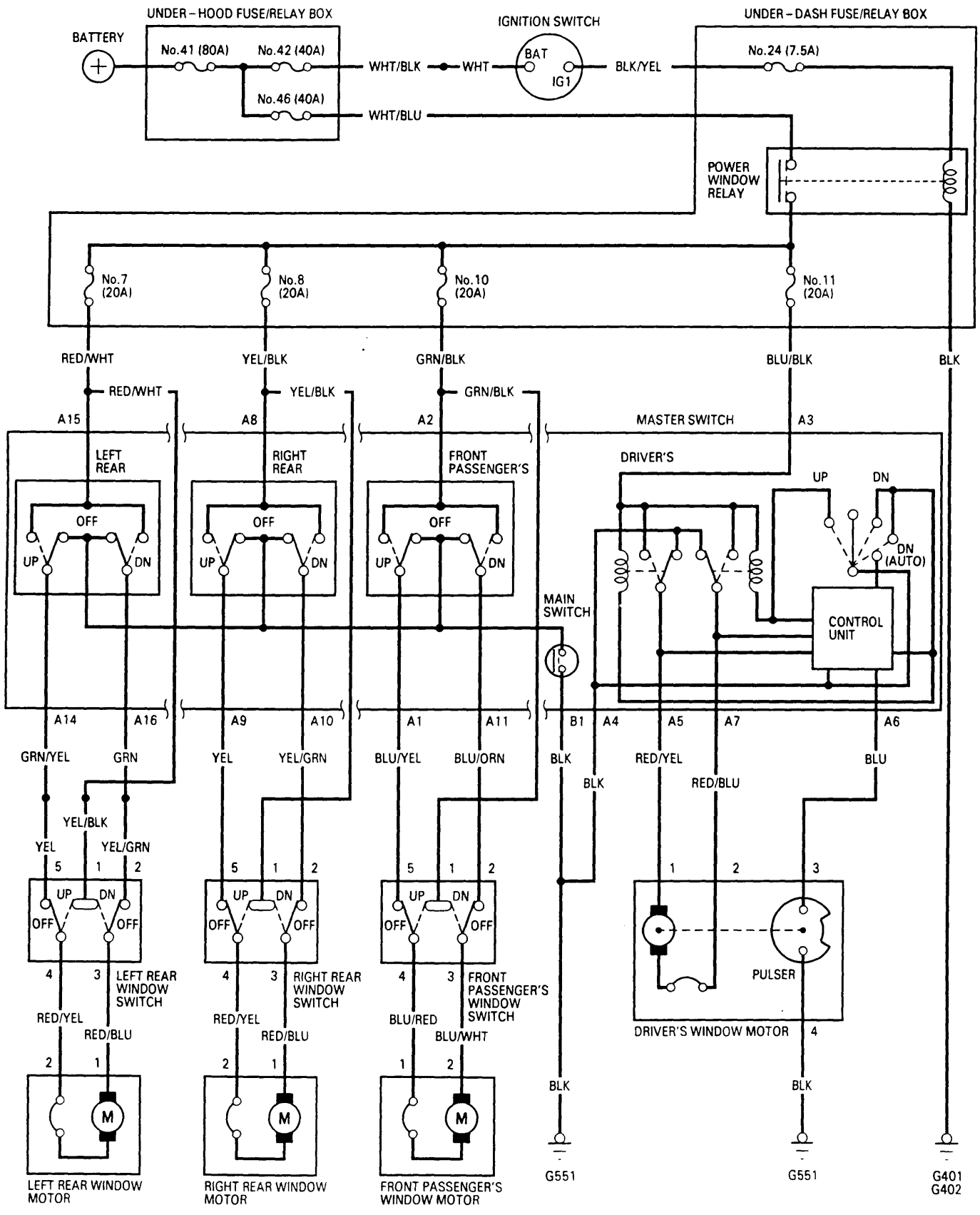
Power Windows

Component Location Index



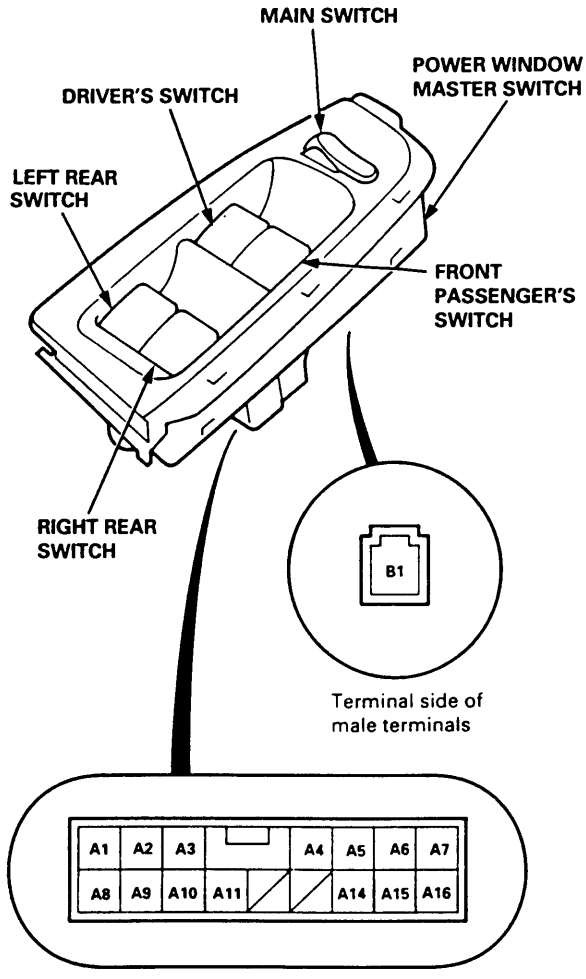
Power Windows

Circuit Diagram



Master Switch Test

1. Remove the armrest from the driver's door panel (see page 23-114).
2. Disconnect the 16P and 1P connectors from the master switch.
3. 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, run the master switch input test procedures at terminals A3, A4, A5, A6 and A7 on page 23-114. If the tests are normal, the driver's switch must be faulty.

Front Passenger's Switch:

Position \ Terminal / Main Switch		A1	A2	A11	B1
OFF	ON	○	○	○	○
	OFF	○	○	○	
UP	ON	○	○	○	○
	OFF	○	○		
DOWN	ON	○	○	○	○
	OFF		○	○	

Left Rear Switch:

Position \ Terminal / Main Switch		A14	A15	A16	B1
OFF	ON	○	○	○	○
	OFF	○	○	○	
UP	ON	○	○	○	○
	OFF	○	○		
DOWN	ON	○	○	○	○
	OFF		○	○	

Right Rear Switch:

Position \ Terminal / Main Switch		A8	A9	A10	B1
OFF	ON		○	○	○
	OFF		○	○	
UP	ON	○	○	○	○
	OFF	○	○		
DOWN	ON	○	○	○	○
	OFF	○		○	

Power Windows

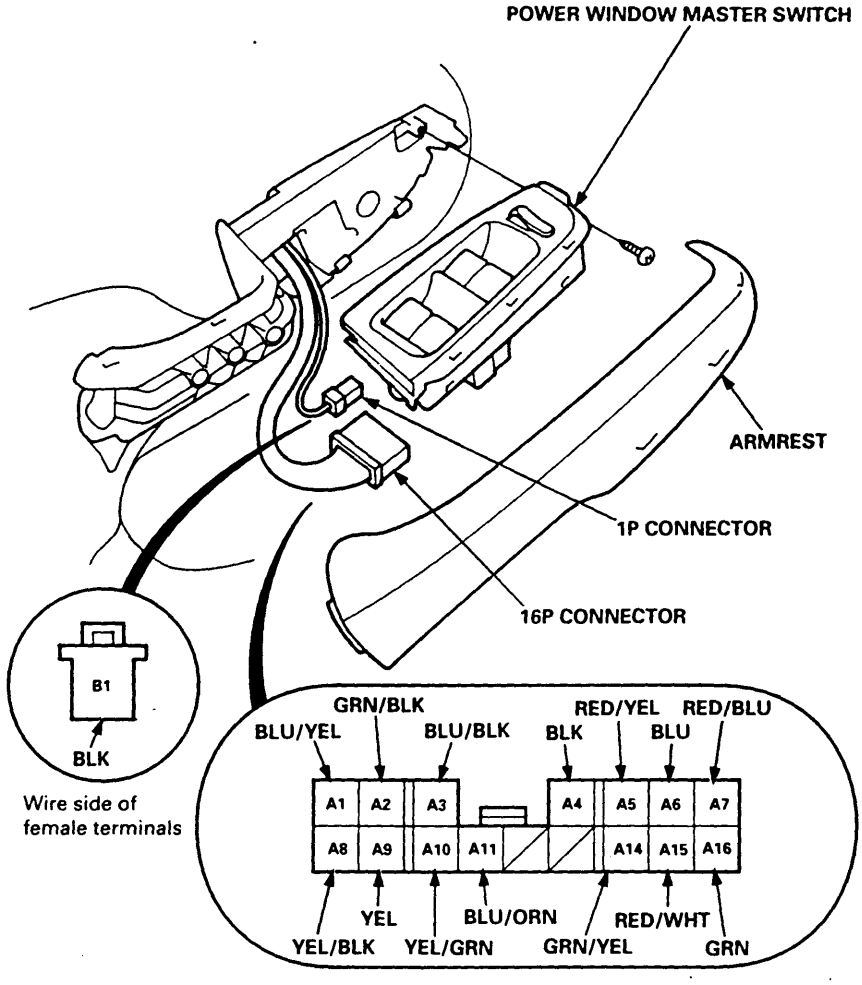
Master Switch Input Test

NOTE: The control unit is built into the power window master switch, and only controls driver's door window operations.

1. Remove the driver's armrest, and disconnect the 16P and 1P connectors from the master switch.

2. Inspect the connector and socket terminals to be sure they are all making good contact.

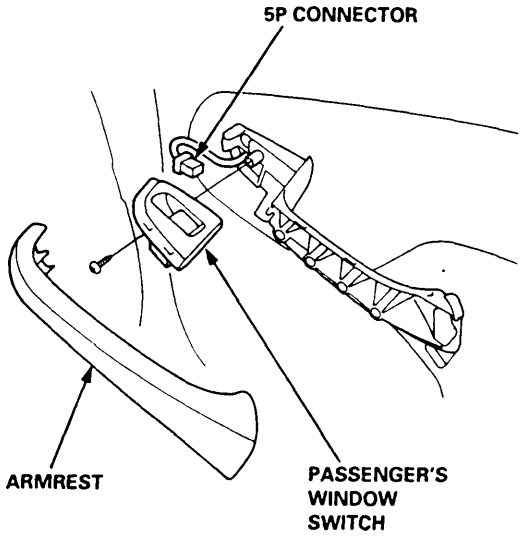
   - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
   - If the terminals look OK, make the following input tests at the connector.
     — If a test indicates a problem, find and correct the cause, then recheck the system.
     — If all the input tests prove OK, the power window maser switch must be faulty; replace it.



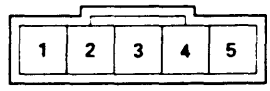
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A4 B1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G551) • An open in the wire
A3	BLU/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 7, 8, 10 or 11 (20 A) fuse in the under-dash fuse/relay box • Faulty power window relay • An open in the wire
A2	GRN/BLK			
A8	YEL/BLK			
A15	RED/WHT			
A7	RED/BLU	Connect the BLU/BLK terminal to the RED/YEL terminal, and the RED/BLU terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the driver's window motor: It should run (the window moves down).	• Faulty driver's window motor • An open in the wire
A5	RED/YEL			
A1	BLU/YEL	Connect the GRN/BLK terminal to the BLU/YEL terminal, and the BLU/ORN terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the front passenger's window motor: It should run (the window moves down).	• Faulty front passenger's window motor • Faulty front passenger's window switch • An open in the wire
A11	BLU/ORN			
A9	YEL	Connect the YEL/BLK terminal to the YEL terminal, and the YEL/GRN terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the right rear motor: It should run (the window moves down).	• Faulty right rear window motor • Faulty right window switch • An open in the wire
A10	YEL/GRN			
A14	GRN/YEL	Connect the RED/WHT terminal to the GRN/YEL terminal, and the GRN terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the left rear motor: It should run (the window moves down).	• Faulty left rear window motor • Faulty left rear window switch • An open in the wire
A16	GRN			
A6	BLU	Connect the BLU/BLK terminal to the RED/YEL terminal, and the BLK terminal to the RED/BLU terminal, then turn the ignition switch ON (II).	Check for voltage between the BLU and BLK terminals: Approx. 6 V should be indicated as the driver's window motor runs.	• Faulty pulser • Faulty driver's window motor • An open in the wire
A4	BLK			

Passenger's Window Switch Test

1. Remove the armrest (see section 20).
2. Disconnect the 5P connector, then remove the mounting screw from the passenger's switch.



Switch side of 5P terminal:



Terminal side of male terminals

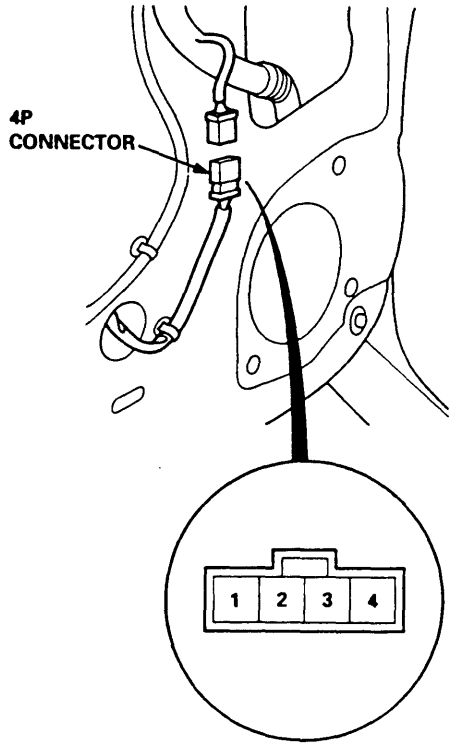
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3	4	5
UP	○			○	
		○	○		
OFF		○	○		
				○	○
DOWN	○		○		
				○	○

Driver's Window Motor Test

Motor Test:

1. Remove the driver's door panel (see section 20).
2. Disconnect the 4P connector from the motor.



Terminal side of male terminals

3. Test the motor in each direction by connecting battery power and ground according to the table.

Terminal / Direction	1	2
UP	⊖	⊕
DOWN	⊕	⊖

CAUTION: When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

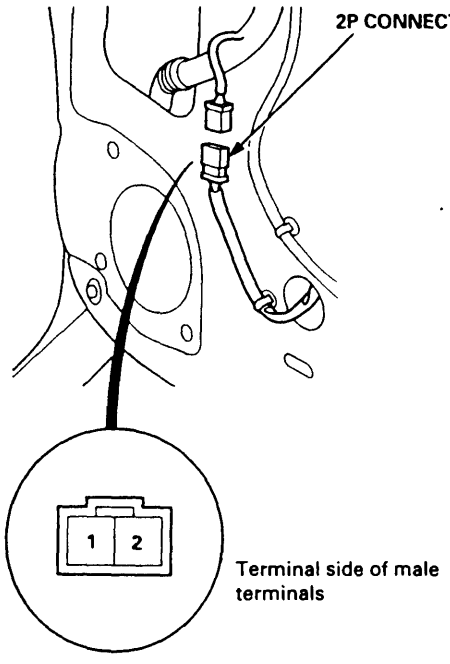
Pulser Test:

5. Connect the test leads of an analog ohmmeter to the No. 3 and No. 4 terminals.
6. Run the motor by connecting power and ground to the No. 1 and No. 2 terminals. The ohmmeter needle should move back and forth alternately.

Passenger's Window Motor Test

Front:

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P window motor connector.



3. Check window motor operation by connecting power and ground according to the table.

Terminal / Direction	1	2
UP	⊕	⊖
DOWN	⊖	⊕

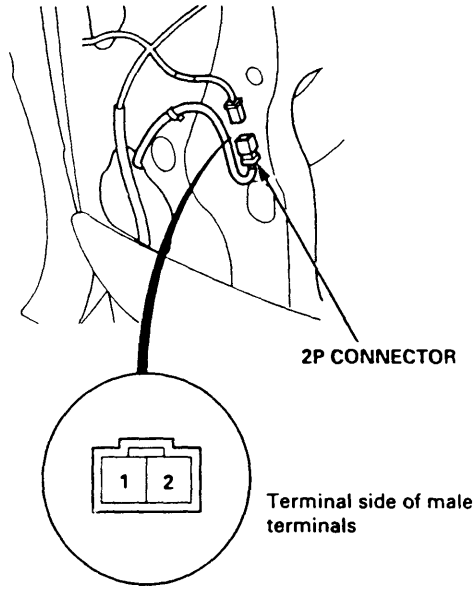
CAUTION: When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

Rear:

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P window motor connector.

   NOTE: The illustration shows the right rear window motor; the left rear window motor is symmetrical.



3. Check window motor operation by connecting power and ground according to the table.

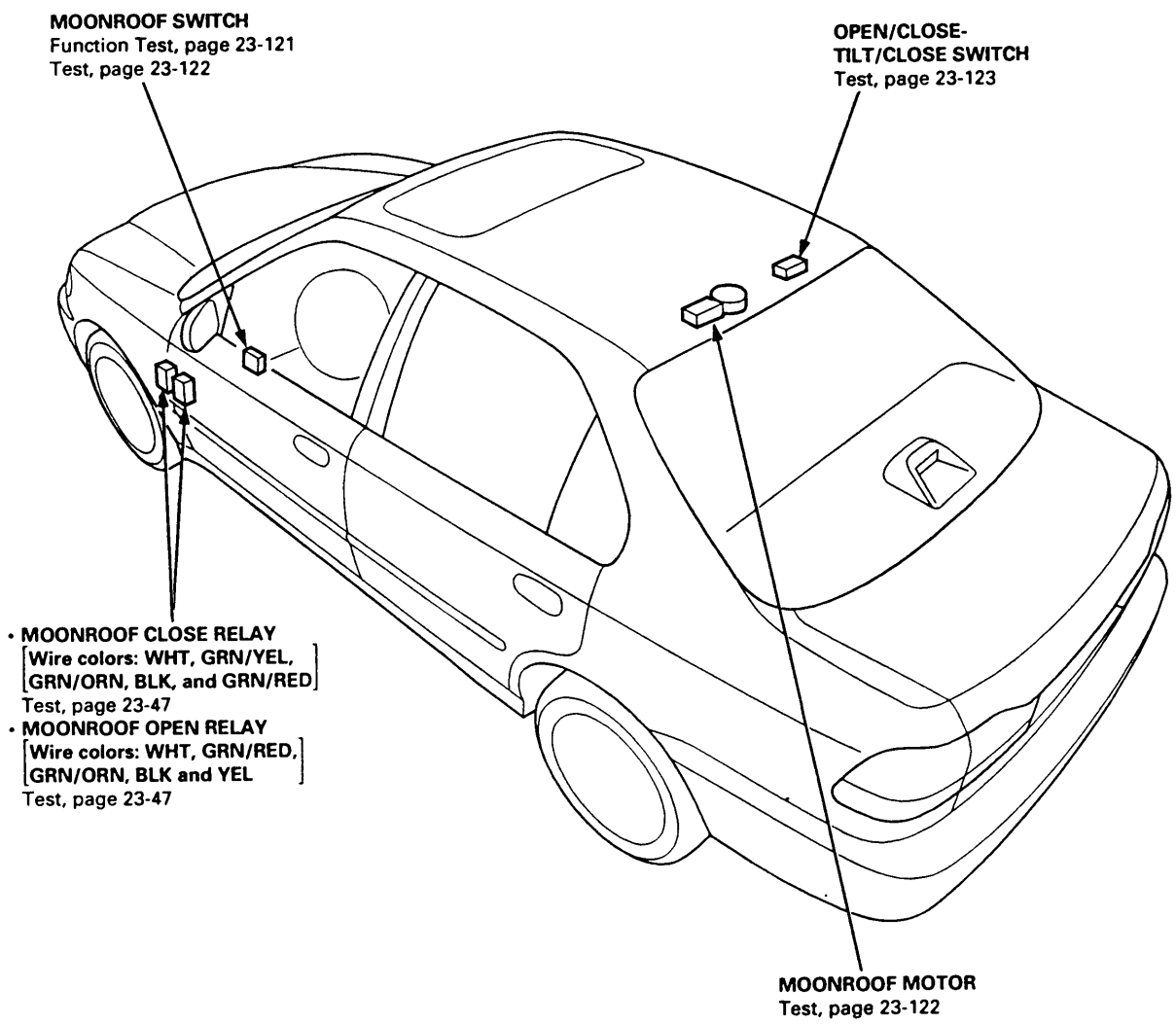
Terminal / Direction	1	2
UP	⊖	⊕
DOWN	⊕	⊖

CAUTION: When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

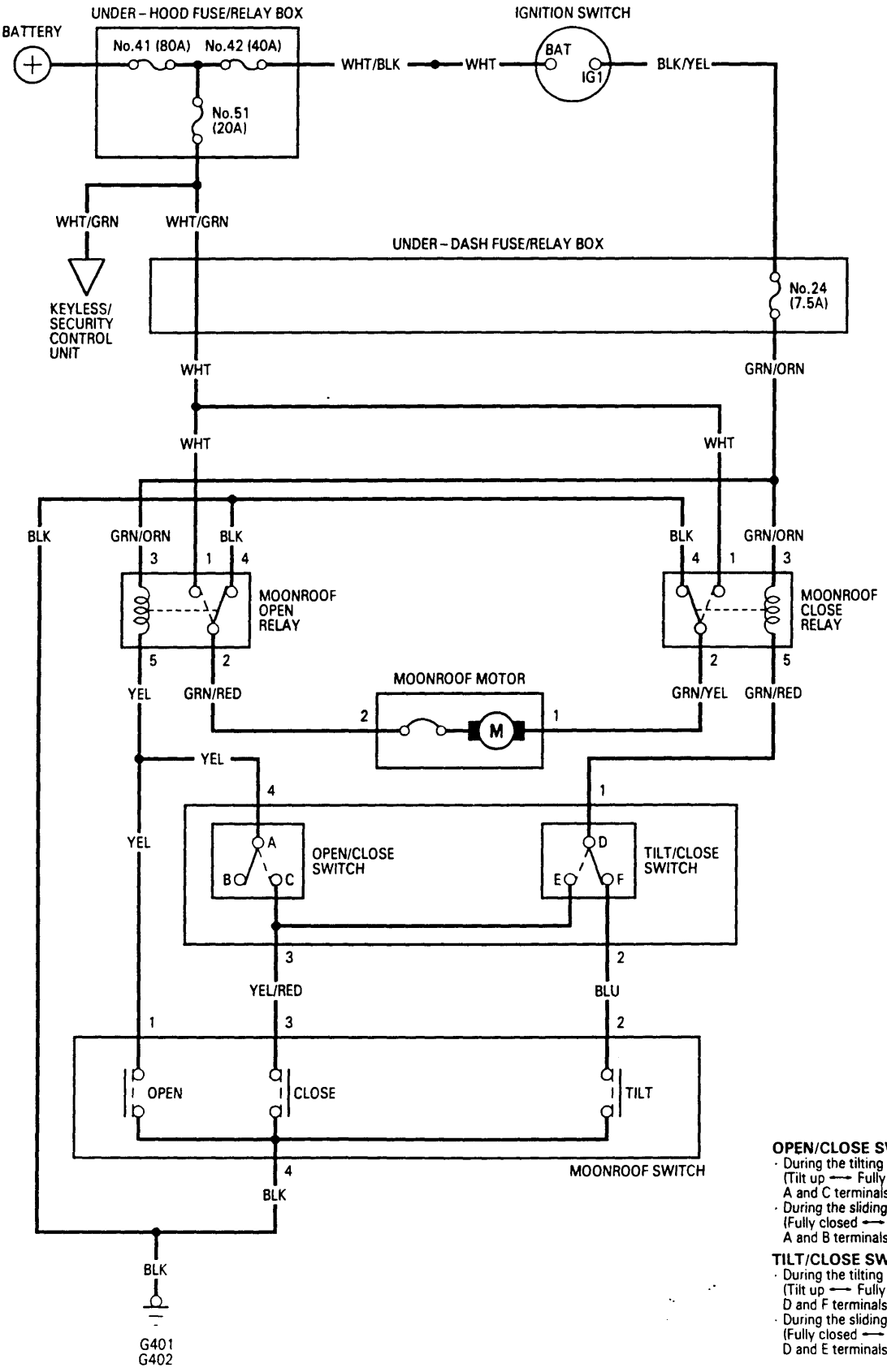
Moonroof

Component Location Index



Moonroof

Circuit Diagram



OPEN/CLOSE SWITCH:
- During the tilting operation (Tilt up ⟶ Fully closed) A and C terminals are connected.
- During the sliding operation (Fully closed ⟶ Fully open) A and B terminals are connected.

TILT/CLOSE SWITCH:
- During the tilting operation (Tilt up ⟶ Fully closed) D and F terminals are connected.
- During the sliding operation (Fully closed ⟶ Fully open) D and E terminals are connected.

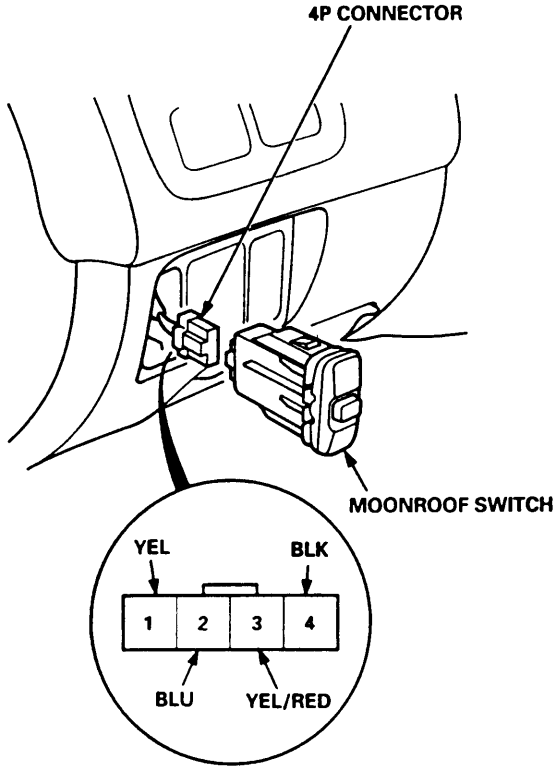
Function Test

CAUTION: Be careful not to damage the moonroof switch or the driver's dashboard lower cover when prying the switch out.

NOTE: Check the No. 51 (20 A) fuse in the under-hood fuse/relay box and No. 24 (7.5 A) fuse in the under-dash fuse/relay box, before testing.

1. Pry the switch out of the driver's dashboard lower cover.

2. Disconnect the 4P connector from the switch.



Wire side of female terminals

3. Connect the No. 1 (YEL) terminal to body ground with a jumper wire, then turn the ignition switch ON (II). The moonroof should open.

   - If the moonroof opens, check the switch.
   - If the moonroof does not open, check for:
     — an open in the YEL wire.
     — faulty moonroof open relay.
     — faulty moonroof close relay.
     — poor ground (G401, G402).

4. Connect the No. 3 (YEL/RED) terminal to body ground with a jumper wire, then turn the ignition switch ON (II). The moonroof should close.

   - If the moonroof closes, check the switch.
   - If the moonroof does not close, check for:
     — an open in the YEL/RED or GRN/RED wire.
     — faulty moonroof close relay.
     — faulty moonroof open relay.
     — faulty tilt/close switch.

5. Connect the No. 2 (BLU) terminal to body ground with a jumper wire, then turn the ignition switch ON (II). The moonroof should tilt up.

   - If the moonroof tilts up, check the switch.
   - If the moonroof does not tilt up, check for:
     — an open in the BLU wire.
     — faulty tilt/close switch.

6. Connect the No. 3 (YEL/RED) terminal to body ground with a jumper wire, then turn the ignition switch ON (II). The moonroof should tilt down.

   If the moonroof does not tilt down, the open/close relay must be faulty.

7. Check for continuity to body ground on the No. 4 (BLK) terminal.
   There should be continuity.

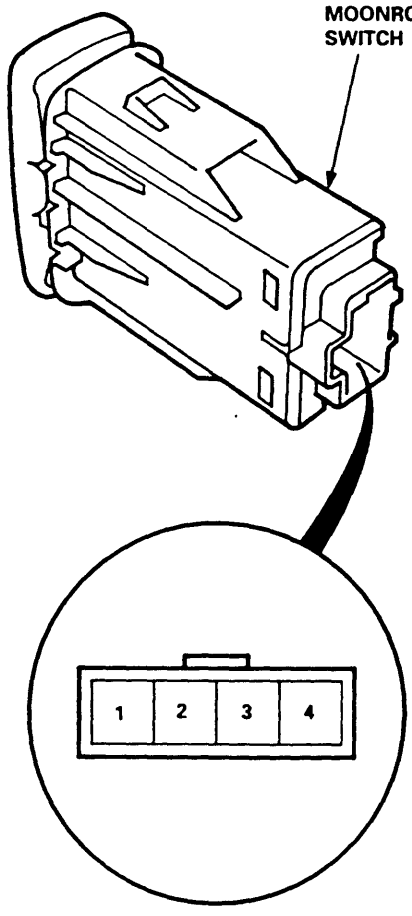
   - If there is continuity, check the switch.
   - If there is no continuity, check for:
     — an open in the BLK wire.
     — poor ground (G401, G402).

Moonroof

Switch Test

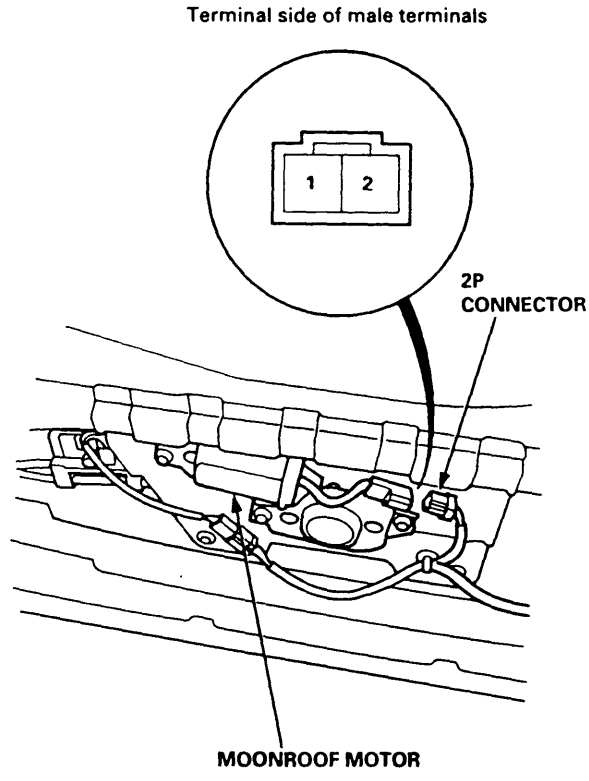
1. Carefully remove the switch from the driver's dashboard lower cover (see page 23-121).
2. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3	4
OFF				
OPEN	○			○
CLOSE			○	○
TILT		○		○



Motor Test

1. Remove the headliner (see section 20).
2. Disconnect the 2P connector from the moonroof motor.



3. Check the motor by connecting power and ground according to the table.

Position \ Terminal	1	2
OPEN	⊖	⊕
CLOSE	⊕	⊖

4. If the motor does not run, replace it (see section 20).

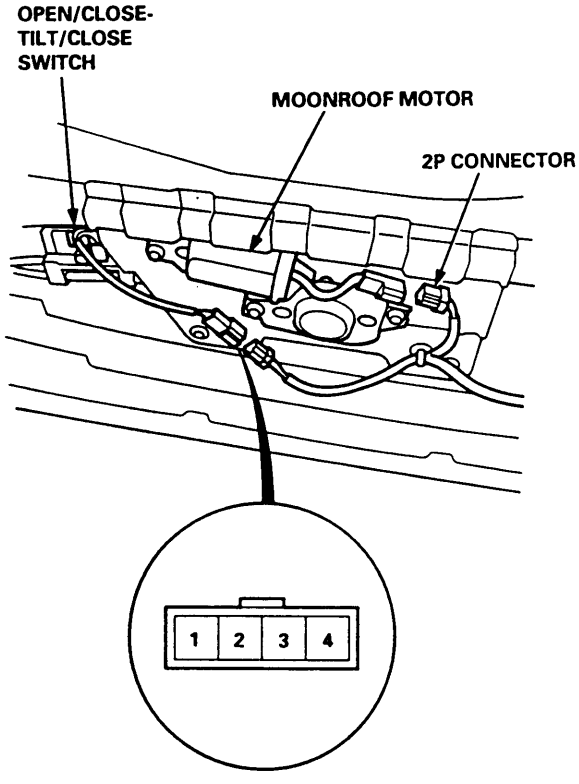
   NOTE: See Closing Force Check in section 20 for motor clutch test.

Open/Close-Tilt/Close Switch Test

1. Remove the headliner (see section 20).
2. Disconnect the 2P and 4P connectors from the moonroof motor and the switch.
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3	4
CLOSE ◄—► TILT	○—○		○—○	
CLOSE ◄—► OPEN	○—		—○	

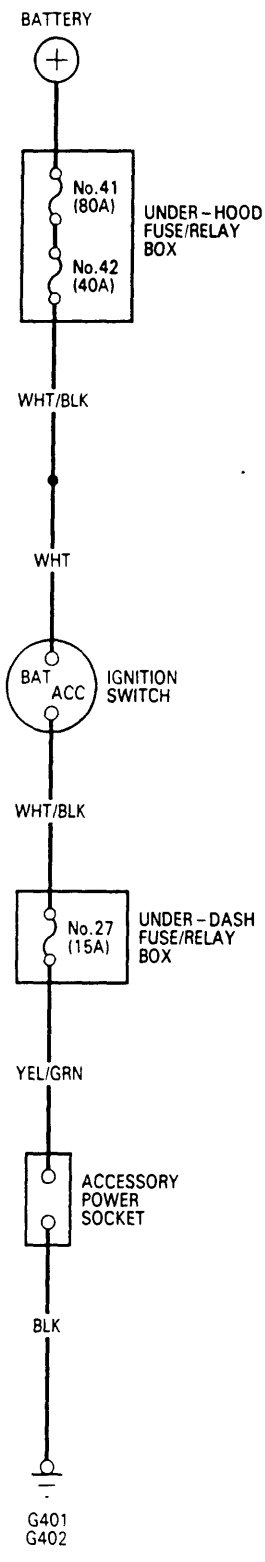
4. If there is no continuity, adjust or replace the switch.



Terminal side of male terminals

Accessory Power Socket

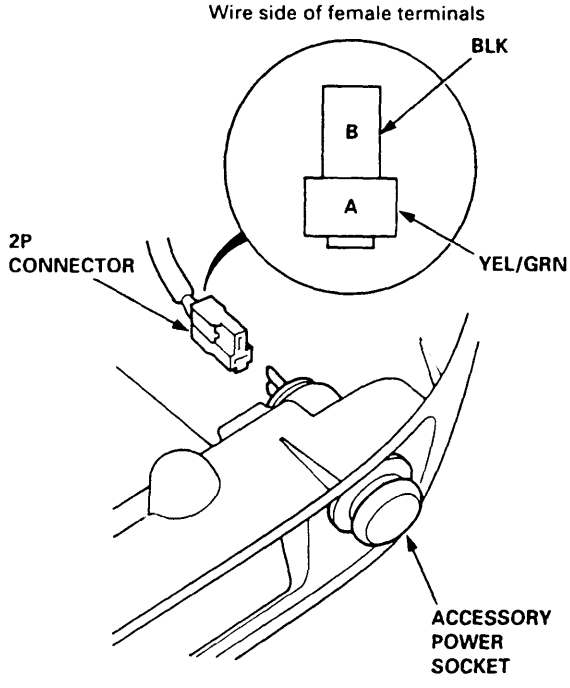
Circuit Diagram



Test

1. Disconnect the 2P connector from the accessory power socket.

2. 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.



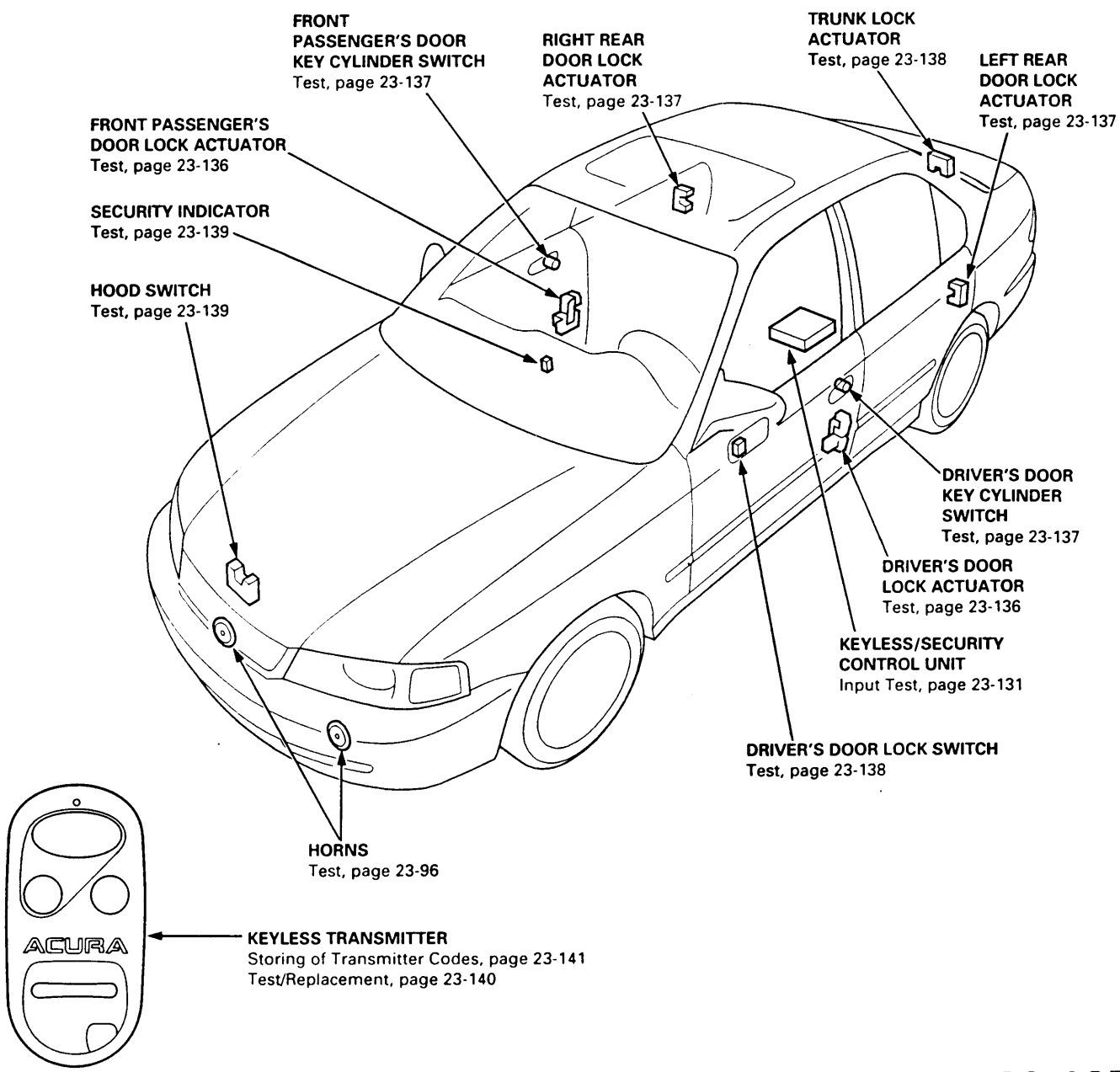
3. Turn the ignition switch ACC (I), and check for voltage between the A (+) and B (–) terminals.
   There should be battery voltage.
   - If there is no battery voltage, check for:
     — blown No. 27 (15 A) fuse in the under-dash fuse/relay box.
     — poor ground (G401, G402).
     — an open in the wire.
   - If there is battery voltage, replace the accessory power socket.

Keyless Entry/Security Alarm System

Component Location Index

NOTE (Keyless entry system):

- 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.
- When you unlock the doors with the transmitter, the ceiling light (middle position) comes on for 30 seconds.
- The horns sound only the first time you press a transmitter button. (Pressing repeatedly does not activate the horns again).
- If you unlock the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors will automatically relock and the security system will rearm.
- If any door is opened or half-latched when you lock the doors with the transmitter, the horns will chirp three times as a warning.
- The doors will not lock or unlock with the transmitter if the ignition key is in the ignition switch.
- If you press the PANIC button for more than two seconds, the horns sound for about 30 seconds, and the transmitter LED comes on. (The panic mode cannot be activated if the ignition key is in the ignition switch.) The panic mode is cancelled by pressing any of the tramsmitter buttons.
- After replacing the transmitter battery, press the lock and unlock buttons five or six times to activate the transmitter.



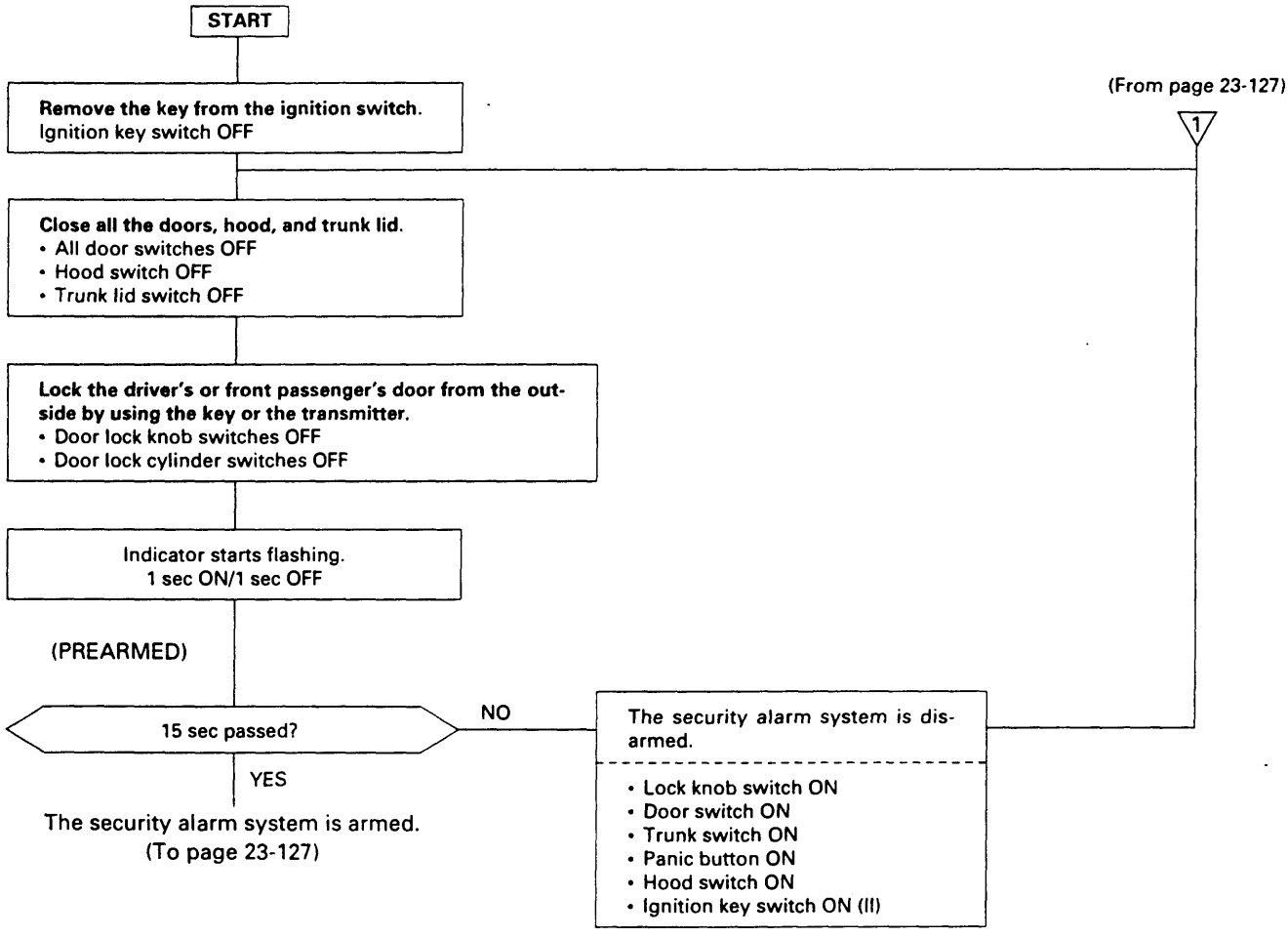
Keyless Entry/Security Alarm System

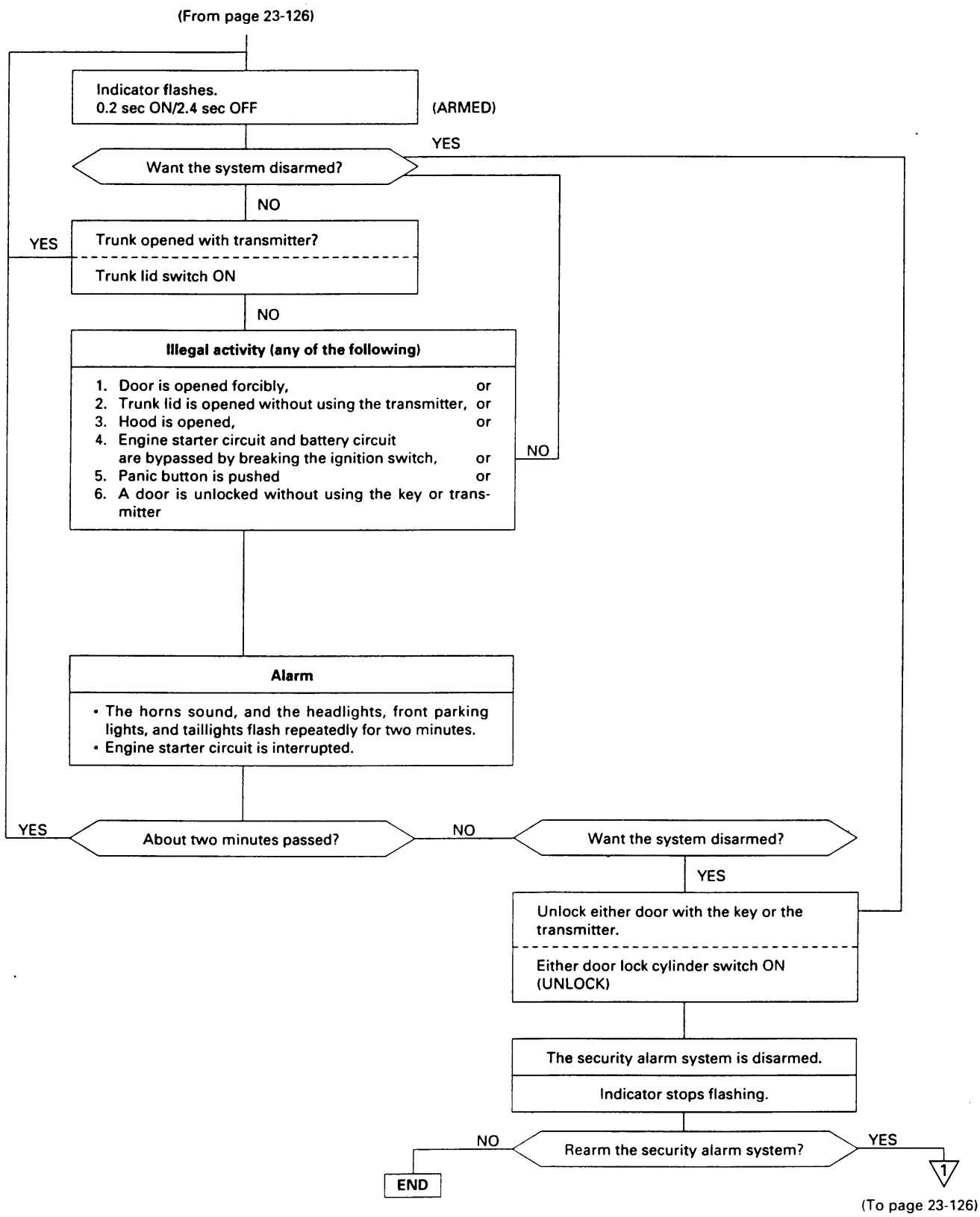
Description

This system is activated automatically 15 seconds after everything has been closed and locked. The security alarm system indicator light located next to the radio will flash after the doors are properly locked.
If any of the following conditions occur, the horns will sound, the headlights will flash, and the front parking lights and taillights will flash for about two minutes or until the system is disarmed by unlocking either door from the outside with the key or transmitter.

① Door is opened forcibly.
② Trunk lid is opened without using the transmitter.
③ Hood is opened.
④ Engine starter circuit and battery circuit are bypassed by breaking the ignition switch.
⑤ Panic button on the transmitter is pushed.
⑥ A door is unlocked without using the key or transmitter.

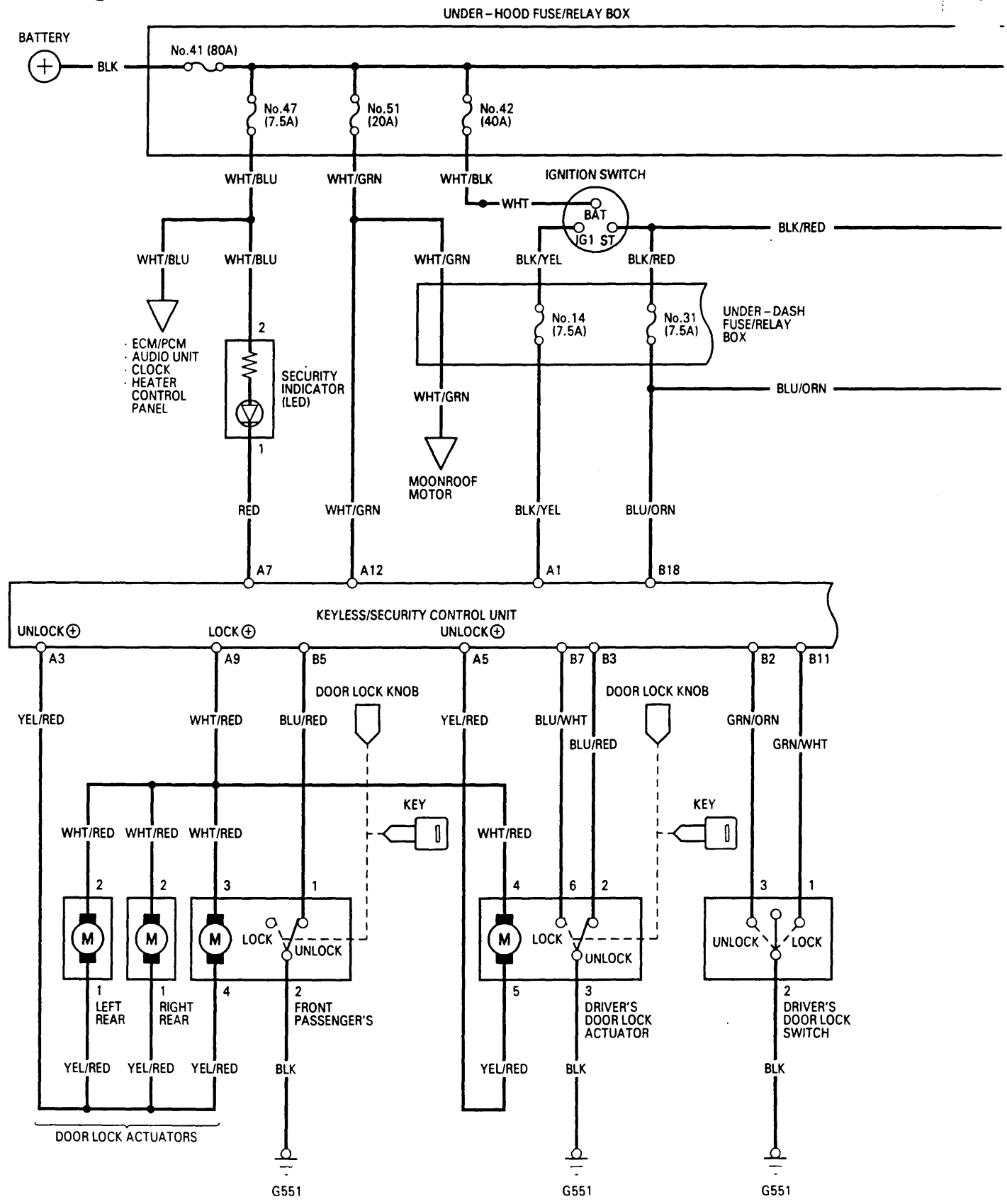
Flowchart of the security alarm system operation:

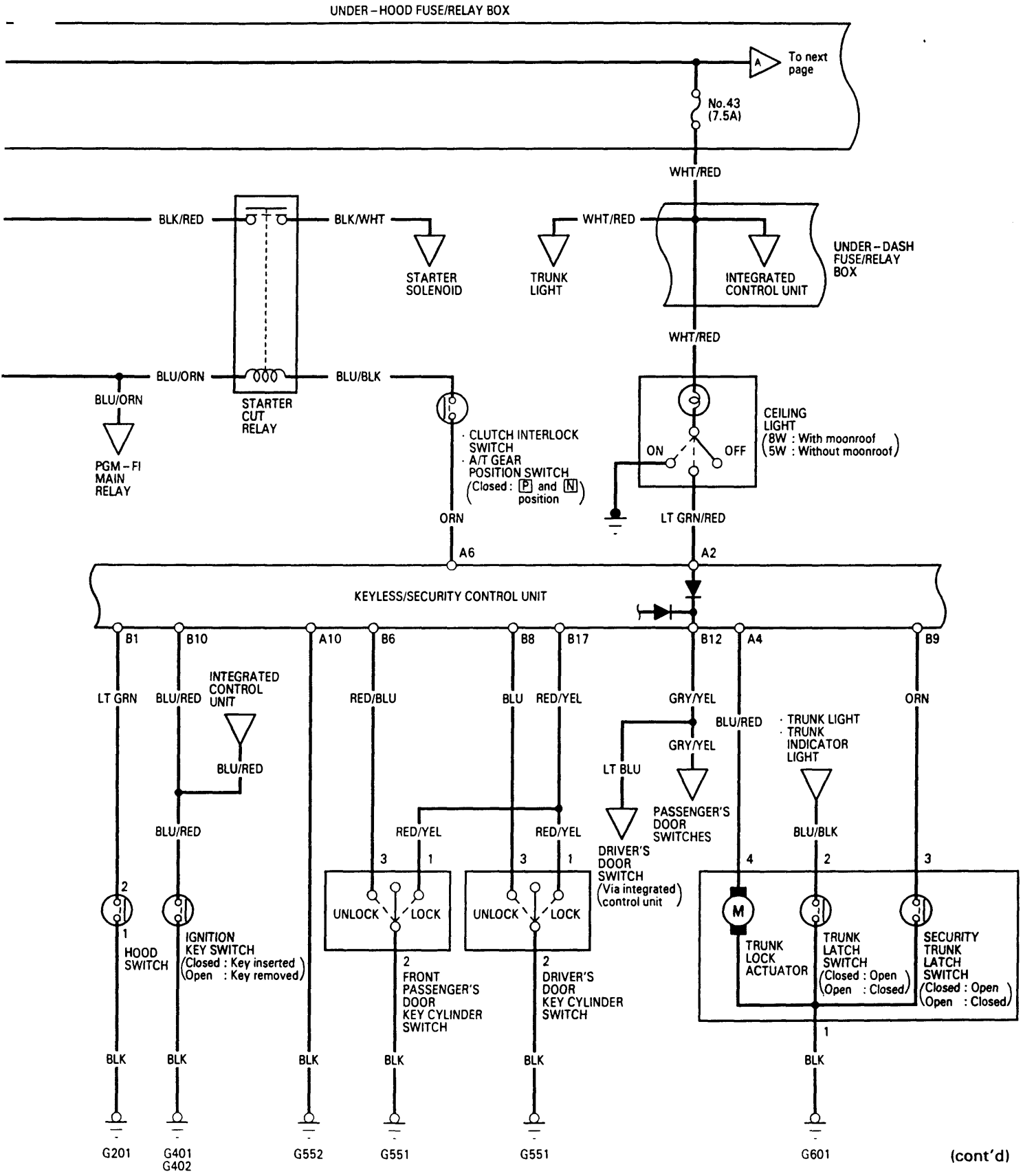



(From page 23-126)
Indicator flashes.
0.2 sec ON/2.4 sec OFF
(ARMED)
YES
Want the system disarmed?
NO
YES
Trunk opened with transmitter?
Trunk lid switch ON
NO
Illegal activity (any of the following)
1. Door is opened forcibly, or
2. Trunk lid is opened without using the transmitter, or
3. Hood is opened, or
4. Engine starter circuit and battery circuit are bypassed by breaking the ignition switch, or
5. Panic button is pushed or
6. A door is unlocked without using the key or transmitter
NO
Alarm
• The horns sound, and the headlights, front parking lights, and taillights flash repeatedly for two minutes.
• Engine starter circuit is interrupted.
YES
About two minutes passed?
NO
Want the system disarmed?
YES
Unlock either door with the key or the transmitter.
Either door lock cylinder switch ON (UNLOCK)
The security alarm system is disarmed.
Indicator stops flashing.
NO
Rearm the security alarm system?
YES
END
1
(To page 23-126)

Keyless Entry/Security Alarm System

Circuit Diagram

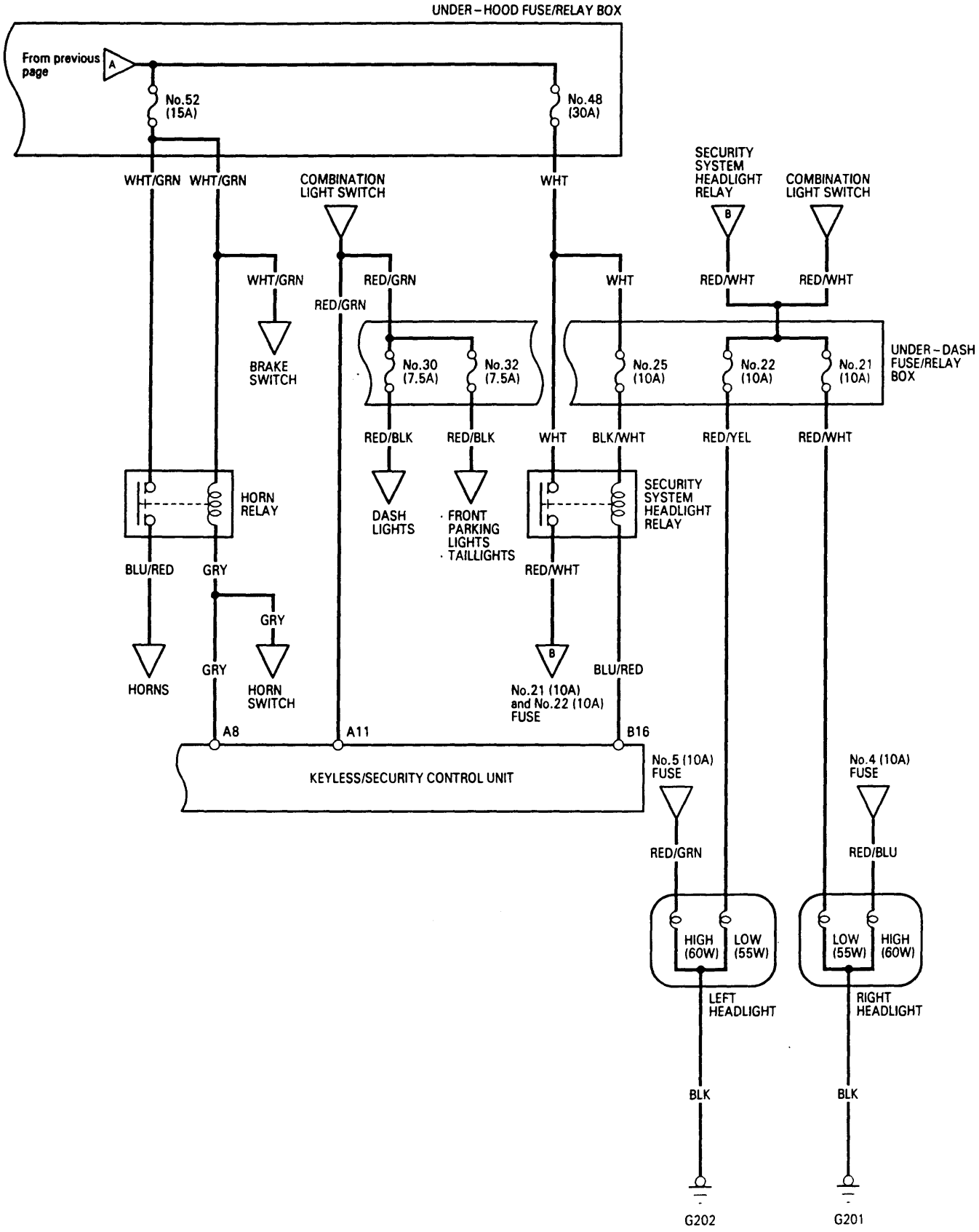



UNDER-HOOD FUSE/RELAY BOX
To next page
No.43 (7.5A)
WHT/RED
BLK/RED
BLK/WHT
STARTER SOLENOID
TRUNK LIGHT
WHT/RED
INTEGRATED CONTROL UNIT
UNDER-DASH FUSE/RELAY BOX
WHT/RED
BLU/ORN
BLU/BLK
BLU/ORN
STARTER CUT RELAY
PGM-FI MAIN RELAY
· CLUTCH INTERLOCK SWITCH
· A/T GEAR POSITION SWITCH
(Closed : P and N position)
CEILING LIGHT
(8W : With moonroof
5W : Without moonroof)
ON
OFF
ORN
LT GRN/RED
A6
A2
KEYLESS/SECURITY CONTROL UNIT
B1
B10
A10
B6
B8
B17
B12
A4
B9
LT GRN
BLU/RED
INTEGRATED CONTROL UNIT
BLU/RED
RED/BLU
BLU
RED/YEL
GRY/YEL
BLU/RED
· TRUNK LIGHT
· TRUNK INDICATOR LIGHT
ORN
GRY/YEL
LT BLU
PASSENGER'S DOOR SWITCHES
BLU/RED
BLU/BLK
RED/YEL
RED/YEL
DRIVER'S DOOR SWITCH
(Via integrated control unit)
UNLOCK
LOCK
UNLOCK
LOCK
HOOD SWITCH
IGNITION KEY SWITCH
(Closed : Key inserted
Open : Key removed)
FRONT PASSENGER'S DOOR KEY CYLINDER SWITCH
DRIVER'S DOOR KEY CYLINDER SWITCH
TRUNK LOCK ACTUATOR
TRUNK LATCH SWITCH
(Closed : Open
Open : Closed)
SECURITY TRUNK LATCH SWITCH
(Closed : Open
Open : Closed)
BLK
BLK
BLK
BLK
BLK
BLK
G201
G401
G402
G552
G551
G551
G601

(cont'd)

Keyless Entry/Security Alarm System

Circuit Diagram (cont'd)



Control Unit Input Test

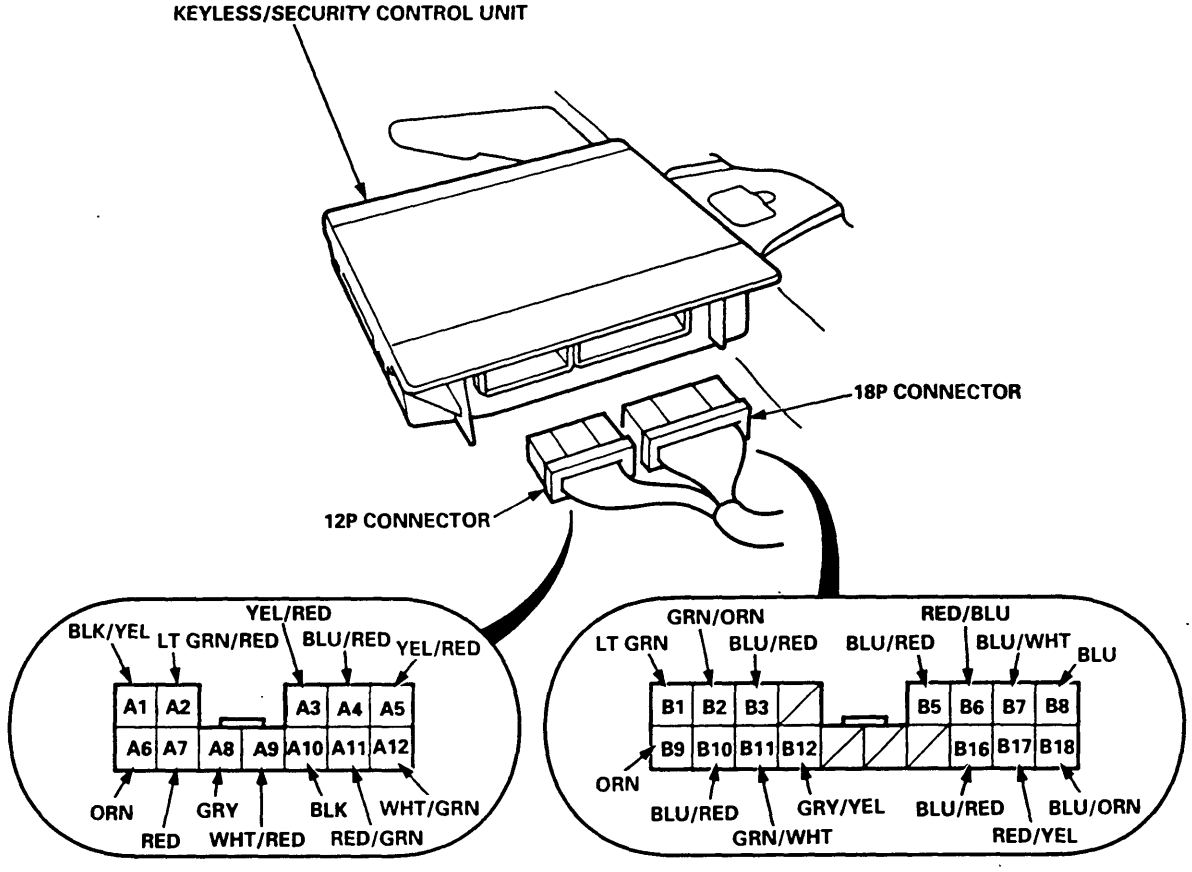
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

1. Slide the driver's seat fully forward so you can reach the control unit from behind the seat.

2. Disconnect the 12P and 18P connectors from the keyless/security control unit.

3. Inspect the connector and socket terminals to be sure they are all making good contact.

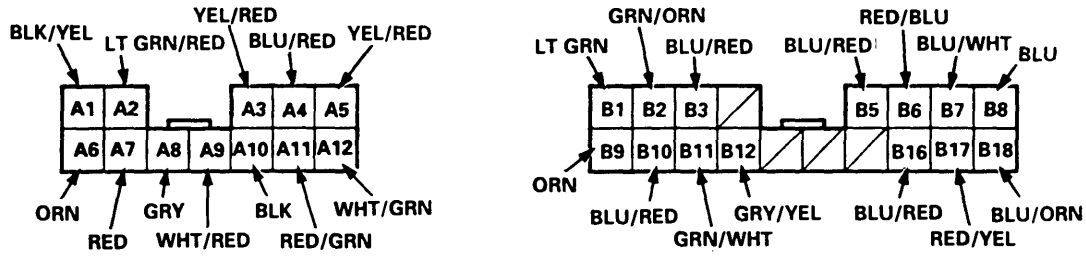
   If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
   If the terminals look OK, make the following input tests at the connector terminals.
   — If any test indicates a problem, find and correct the cause, then recheck the system.
   — If all the input tests prove OK, the control unit must be faulty; replace it.



(cont'd)

Keyless Entry/Security Alarm System

Control Unit Input Test (cont'd)



Wire side of female terminals

Keyless Entry System:
Disconnect the 12P and 18P connectors from the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A10	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G552) • An open in the wire
A12	WHT/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
A1	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
A2	LT GRN /RED	Ceiling light switch in "middle" position	Connect to ground: The ceiling light should come on.	• Blown No. 43 (7.5 A) fuse in the under-dash fuse box • Blown ceiling light bulb • Faulty ceiling light • An open in the wire
A3	YEL/RED	Connect the YEL/RED terminal to the A12 (WHT/GRN) terminal, and the WHT/RED terminal to the A10 (BLK) terminal momentarily.	Check door lock operation: Passenger's door should unlock.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • Faulty actuator • An open in the wire • Poor ground (G552)
A9	WHT/RED			
A4	BLU/RED	Connect the BLU/RED terminal to the A12 (WHT/GRN) terminal momentarily.	Check trunk lock operation: Trunk lid should open.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • Faulty actuator • An open in the wire • Poor ground (G601)
A5	YEL/RED	Connect the YEL/RED terminal to the A12 (WHT/GRN) terminal, and the WHT/RED terminal to the A10 (BLK) terminal momentarily.	Check door lock operation: Driver's door should unlock.	• Blown No. 52 (20 A) fuse in the under-hood fuse/relay box • Faulty actuator • An open in the wire • Poor ground (G552)
A9	WHT/RED			
B10	BLU/RED	Ignition key inserted into the ignition key switch	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G401, G402) • Faulty ignition key switch • An open in the wire • Short in the wire
		Ignition key removed from the ignition key switch.	Check for voltage to ground: There should be 4 V or more.	

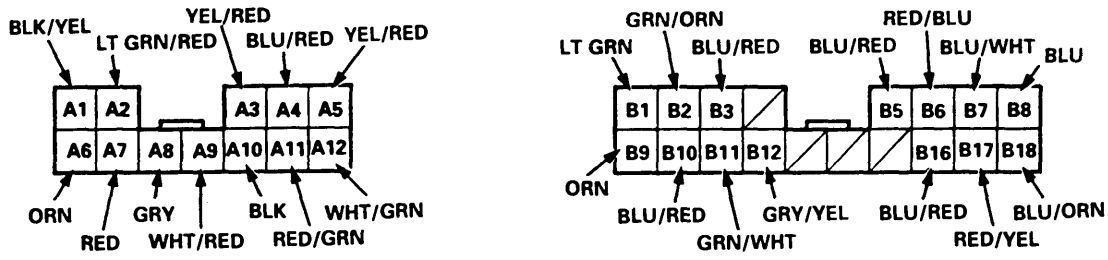
Reconnect the 12P and 18P connectors to the unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B2	GRN/ORN	Driver's door lock switch in UNLOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty driver's door lock switch • An open in the wire • Short in the wire
		Driver's door lock switch in neutral	Check for voltage to ground: There should be 4 V or more.	
B3	BLU/RED	Driver's door lock knob in UNLOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty driver's door lock knob switch • An open in the wire • Short in the wire
		Driver's door lock knob in LOCK	Check for voltage to ground: There should be 4 V or less.	
B5	BLU/RED	Passenger's door lock knob in UNLOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty passenger's door lock knob switch • An open in the wire • Short in the wire
		Passenger's door lock knob in LOCK	Check for voltage to ground: There should be 4 V or more.	
B7	BLU/WHT	Driver's door lock knob in UNLOCK	Check for voltage to ground: There should be 4 V or more.	• Poor ground (G551) • Faulty driver's door lock knob switch • An open in the wire • Short in the wire
		Driver's door lock knob in LOCK	Check for voltage to ground: There should be 1 V or less.	
B11	GRN/WHT	Driver's door lock switch in neutral	Check for voltage to ground: There should be 4 V or more.	• Poor ground (G551) • Faulty driver's door lock switch • An open in the wire • Short in the wire
		Driver's door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	
B12	GRY/YEL	All doors open	Check for voltage to ground: There should be 1 V or less.	• Faulty door switch • Faulty keyless/security control unit • An open in the wire
		All doors closed	Check for voltage to ground: There should be battery voltage.	

(cont'd)

Keyless Entry/Security Alarm System

Control Unit Input Test (cont'd)



Wire side of female terminals

Security System:
Disconnect the 12P and 18P connectors from the unit.

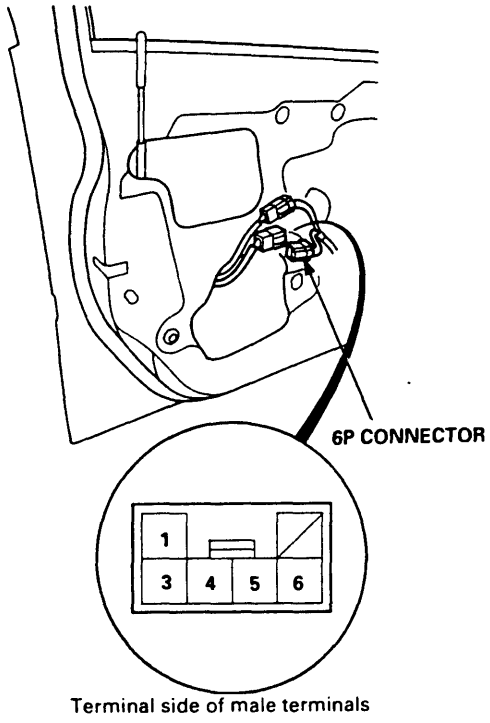
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A10	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	• Poor ground (G552) • An open in the wire
A12	WHT/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	• Blown No. 51 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
A1	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	• Blown No. 14 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
A6	ORN	Shift lever in [P] or [N] (A/T), or clutch pedal fully depressed (M/T) and ignition switch START (III)	Check for voltage to ground: There should be battery voltage.	• Faulty starter cut relay • Faulty clutch interlock switch (M/T) • Faulty A/T gear position switch (A/T) • Blown No. 31 (7.5 A) fuse in the under-dash fuse/relay box
A7	RED	Under all conditions	Connect to ground: The security indicator should come on.	• Blown No. 47 (7.5 A) fuse in the under-hood fuse/relay box • Faulty security indicator • An open in the wire
A8	GRY	Under all conditions	Connect to ground: The horns should sound.	• Blown No. 52 (15 A) fuse in the under-hood fuse/relay box • Faulty horn relay • Faulty horns • An open in the wire
A11	RED/GRN	Connect the RED/GRN terminal to the A12 (WHT/GRN) terminal	Check the taillights: The taillights should come on.	• Blown No. 32 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire • Faulty taillight system
B1	LT GRN	Hood open	Check for continuity to ground: There should be continuity.	• Faulty hood switch • Poor ground (G201) • An open in the wire
		Hood closed	Check for continuity to ground: There should be no continuity.	
B16	BLU/RED	Under all conditions	Connect to ground: The headlights should come on.	• Faulty security system headlight relay • Blown No. 25 (10 A) fuse in the under-dash fuse/relay box • Faulty headlight system • An open in the wire
B18	BLU/ORN	Ignition switch at START (III)	Check voltage to ground: There should be battery voltage.	• Blown No. 31 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire

Reconnect the 12P and 18P connectors to the unit.

Cavity	Wire	Test Condition	Test: Desired result	Possible cause if result is not obtained
B6	RED/BLU	Passenger's door key cylinder switch in UNLOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty passenger's door key cylinder switch • An open in the wire • Short in the wire
		Passenger's door key cylinder switch in NEUTRAL	Check for voltage to ground: There should be 4 V or more.	
B8	BLU	Driver's door key cylinder switch in UNLOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty driver's door key cylinder switch • An open in the wire • Short in the wire
		Driver's door key cylinder switch in NEUTRAL	Check for voltage to ground: There should be 4 V or more.	
B9	ORN	Trunk lid open	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G601) • Faulty driver's door lock knob switch • An open in the wire • Short in the wire
		Trunk lid closed	Check for voltage to ground: There should be 4 V or more.	
B17	RED/YEL	Passenger's door key cylinder switch in LOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty passenger's door key cylinder switch • An open in the wire • Short in the wire
		Passenger's door key cylinder switch in NEUTRAL	Check for voltage to ground: There should be 4 V or more.	
		Driver's door key cylinder switch in LOCK	Check for voltage to ground: There should be 1 V or less.	• Poor ground (G551) • Faulty driver's door key cylinder switch • An open in the wire • Short in the wire
		Driver's door key cylinder switch in NEUTRAL	Check for voltage to ground: There should be 4 V or more.	

Driver's Door Lock Actuator Test

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6P connector from the actuator.



Terminal side of male terminals

3. Check actuator operation by connecting power and ground according to the table.

Actuator test:

Position \ Terminal	4	5
LOCK	⊕	⊖
UNLOCK	⊕	⊕

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.

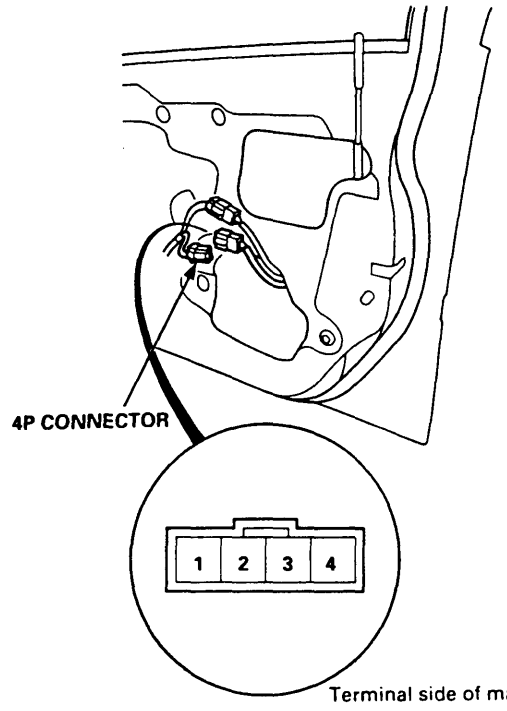
4. If the actuator fails to work properly, replace it.
5. Check for continuity between the terminals in each switch position according to the table.

Lock knob switch test:

Position \ Terminal	2	3	6
LOCK		○—○	
UNLOCK	○—○		

Front Passenger's Door Lock Actuator Test

1. Remove the door panel (see section 20).
2. Disconnect the 4P connector from the actuator.



Terminal side of male terminals

3. Check actuator operation by connecting power and ground according to the table.

Actuator test:

Position \ Terminal	3	4
LOCK	⊕	⊖
UNLOCK	⊖	⊕

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.

4. If the actuator fails to work properly, replace it.
5. Check for continuity between the terminals in each switch position according to the table.

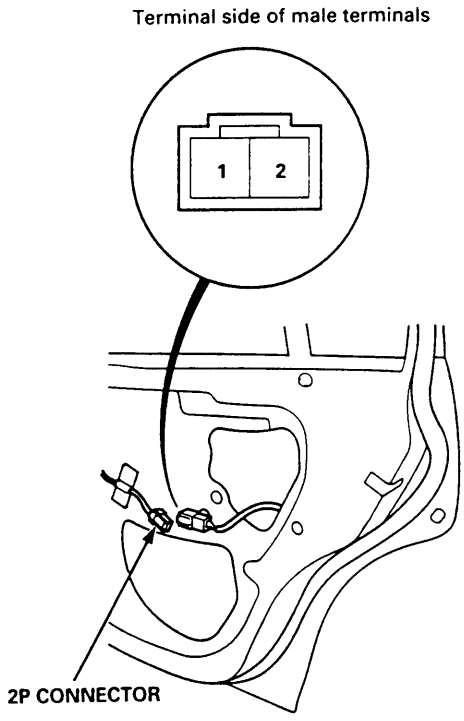
Lock knob switch test:

Position \ Terminal	1	2
LOCK		
UNLOCK	○—○	

Rear Door Lock Actuator Test

1. Remove the rear door panel (see section 20).
2. Disconnect the 2P connector from the actuator.

   NOTE: The right rear door lock actuator is shown; the left rear door actuator is similar.



3. Check actuator operation by connecting power and ground according to the table.

Position \ Terminal	1	2
LOCK	⊖	⊕
UNLOCK	⊕	⊖

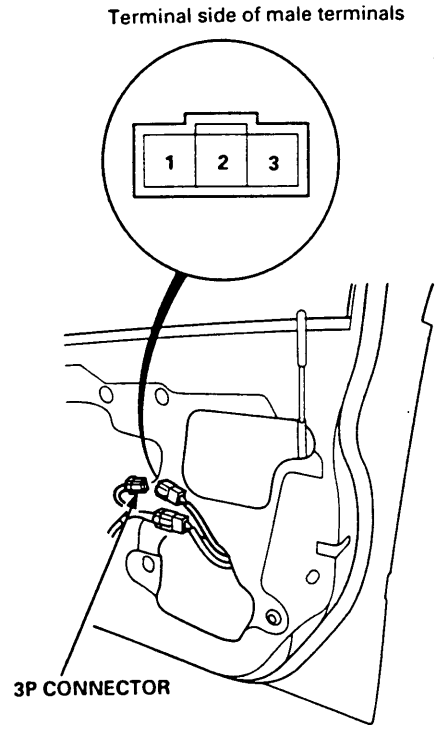
CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.

4. If the actuator fails to work properly, replace it.

Door Key Cylinder Switch Test

1. Remove the door panel (see section 20).
2. Disconnect the 3P connector from the switch.

   NOTE: The front passenger's door key cylinder switch shown; the driver's door key cylinder switch is similar.



3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3
LOCK	○—○		
NEUTRAL			
UNLOCK		○—○	

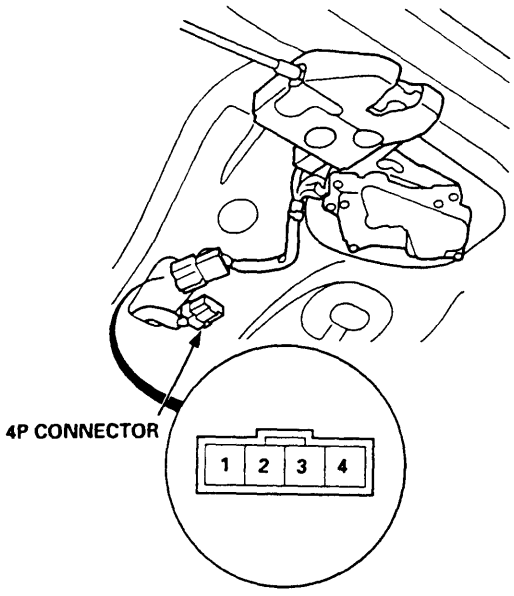
Trunk Lock Actuator/Trunk Latch Switch Test

1. Open the trunk lid.
2. Disconnect the 4P connector from the trunk lock actuator/trunk switch.
3. Check for continuity between the terminals in each switch position according to the table.

Latch Switch test:

Position \ Terminal	1	2	3
Trunk lid open (Trunk latch UNLOCKED)	○	○	
	○		○
Trunk lid closed (Trunk latch LOCKED)			

No.3 terminal : For security system



Terminal side of male terminals

4. Check actuator operation by connecting power and ground according to the table.

Actuator test:

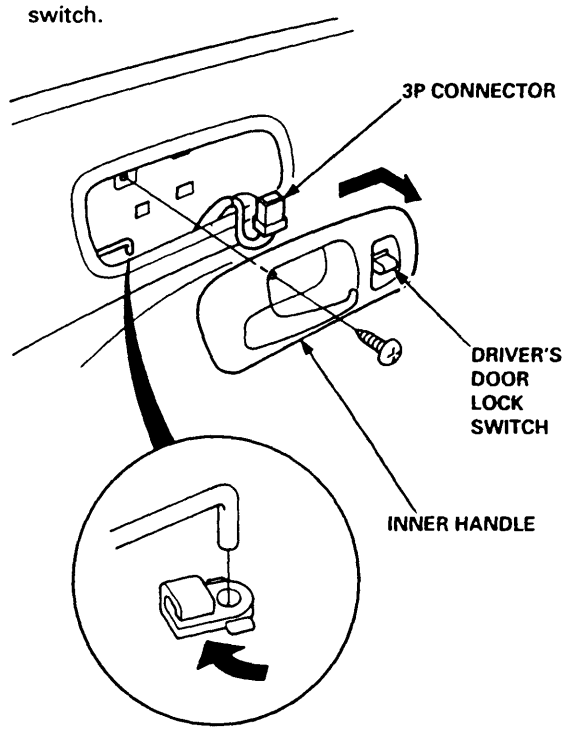
Position \ Terminal	1	4
UNLOCK	⊖	⊕

CAUTION: To prevent damage to the actuator, apply battery voltage only momentarily.

5. If the actuator fails to work properly, replace it.

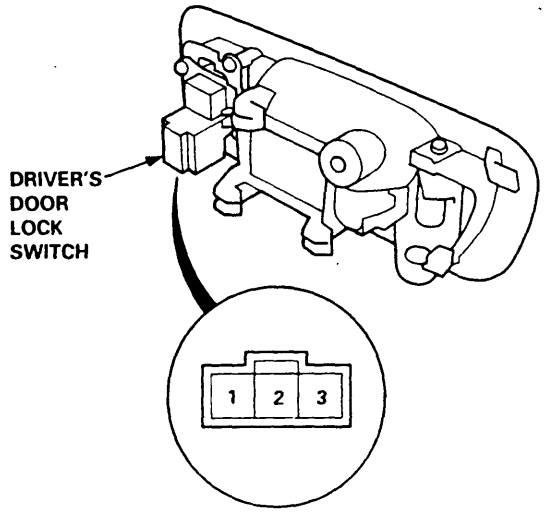
Driver's Door Lock Switch Test

1. Remove the inner handle (see section 20).
2. Disconnect the 3P connector from the door lock switch.



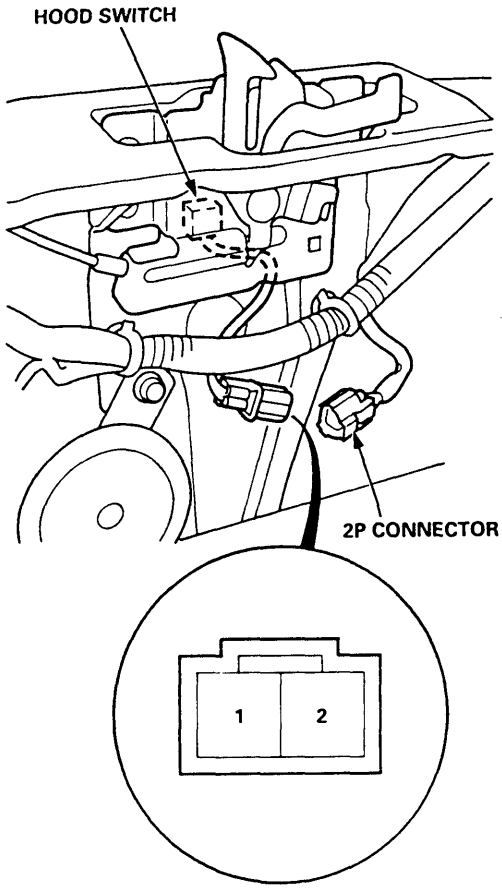
3. Check for continuity between the terminals in each switch position according to the table.

Position \ Terminal	1	2	3
LOCK	○	○	
OFF			
UNLOCK		○	○



Hood Switch Test

1. Open the hood.
2. Remove the front grille (see section 20).
3. Disconnect the 2P connector from the hood switch.



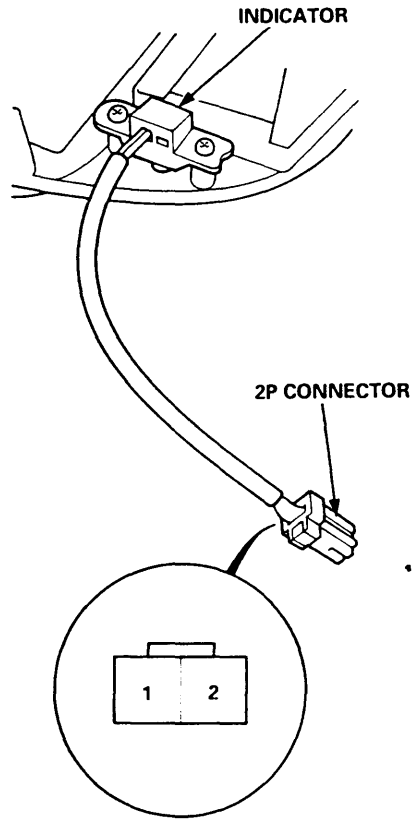
Terminal side of male terminals

4. Check for continuity between the terminals in each switch position according to the table.

Terminal / Position	1	2
Hood open	○	○
Hood closed		

Security Indicator Test

1. Remove the center outlet panel (see section 20).



Wire side of female terminals

2. Test the security indicator by connecting battery power to the No. 2 terminal, and ground to the No. 1 terminal.
3. If the security indicator does not come on, replace it.

Keyless Entry/Security Alarm System

Transmitter Inspection/Replacement

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 or unlock the doors 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 inserted in the ignition switch.

Doors cannot be locked or unlocked with the transmitter.

Press the lock or unlock button five or six times to reset the transmitter.

Did the locks operate? YES → **The transmitter is OK.**

NO

Check the transmitter for water damage.

Has water leaked into the transmitter? YES → **Replace the transmitter.**

NO

Replace the transmitter battery with a new one, and try to lock/unlock the doors with the transmitter. (Press the lock or unlock button five or six times.)

Do the doors lock/unlock? YES → **The transmitter is OK.**

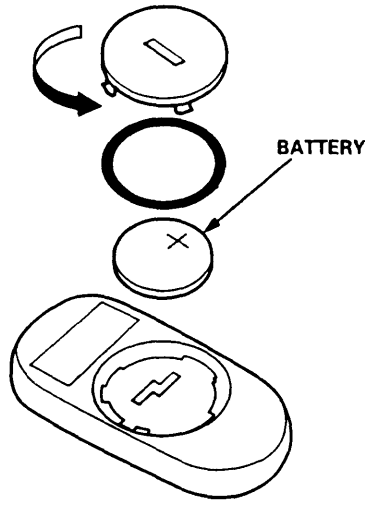
NO

Rewrite and register the transmitter code, then try to lock/unlock the doors (see page 23-141).

Do the doors lock/unlock? YES → **The transmitter is OK.**

NO

Replace the transmitter.



Keyless Transmitter Codes Input Procedure

Storing transmitter codes:
The codes of up to four transmitters can be read into the keyless receiver unit memory.
(If a fifth code is stored, the first code will be erased.)

NOTE: It is important to maintain the time limits between the steps.

1. Turn the ignition switch ON (II).
2. Within 1 to 4 sec, push the transmitter lock or unlock button with the transmitter aimed at the receiver (control unit).
3. Within 1 to 4 sec, turn the ignition switch OFF.
4. Within 1 to 4 sec, go to step 5.

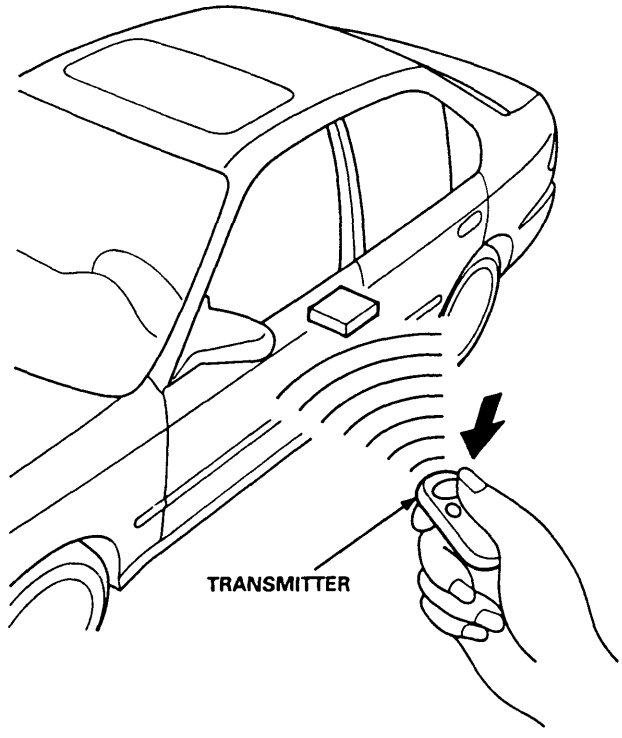
5. Turn the ignition switch ON (II).
6. Within 1 to 4 sec, push the transmitter lock or unlock button with the transmitter aimed at the receiver (control unit).
7. Within 1 to 4 sec, turn the ignition switch OFF.
8. Within 4 sec, go to step 9.

9. Turn the ignition switch ON (II).
10. Within 1 to 4 sec, push the transmitter lock or unlock button with the transmitter aimed at the receiver (control unit).
11. Within 1 to 4 sec, turn the ignition switch OFF.
12. Within 4 sec, go to step 13.

13. Turn the ignition switch ON (II).
14. Within 1 to 4 sec, push the transmitter lock or unlock button with the transmitter aimed at the receiver (control unit).
15. Confirm you can hear the sound of the door lock actuators.

16. Within 15 sec, aim the transmitters (up to four) whose codes you want to store at the receiver, and press the transmitter lock or unlock buttons.
    Confirm that you can hear the sound of the door lock actuators after each transmitter code is stored.

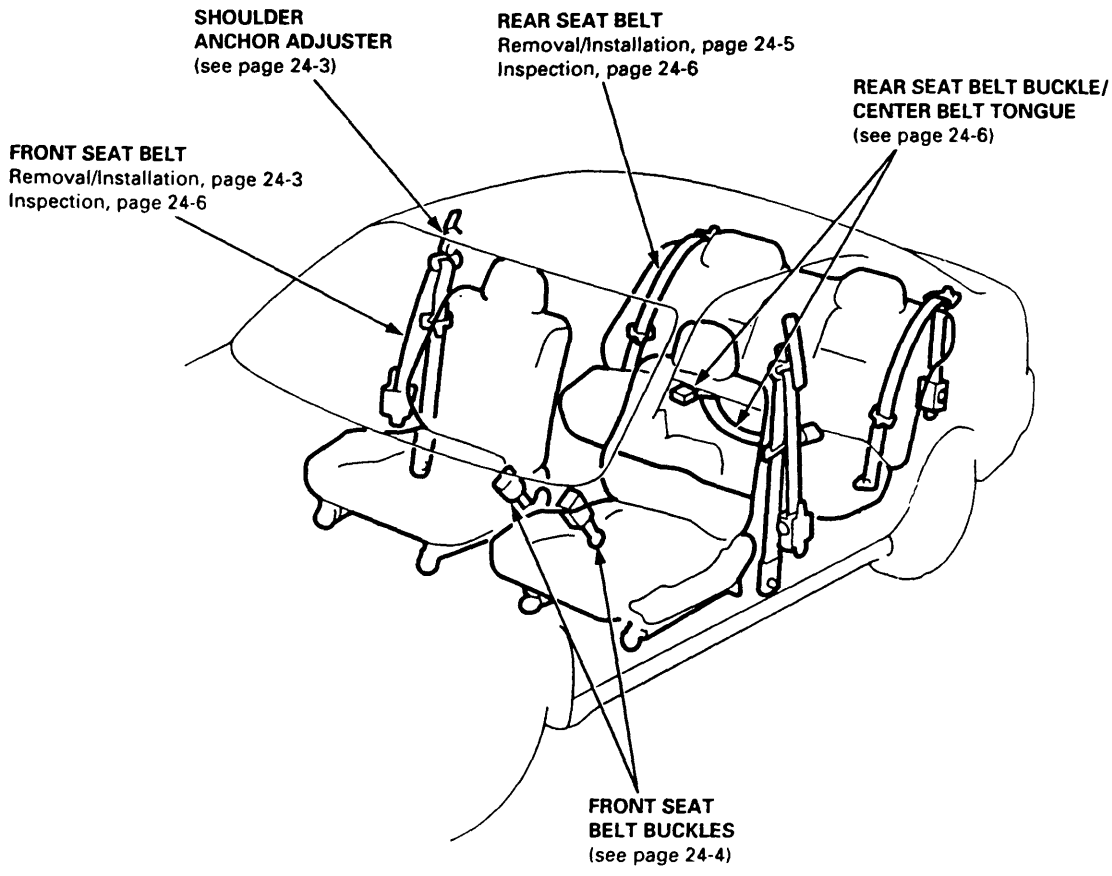
17. Turn the ignition switch OFF, and pull out the key.
18. Confirm proper operation with the new code(s).



Restraints

Seat Belts

Component Location Index



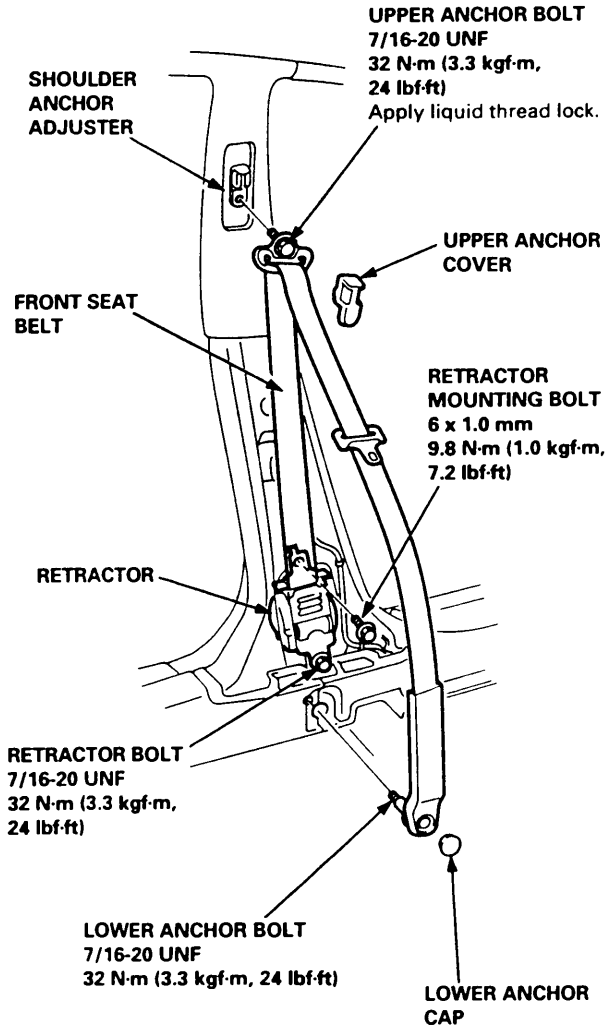
Front Seat Belt

Removal/Installation

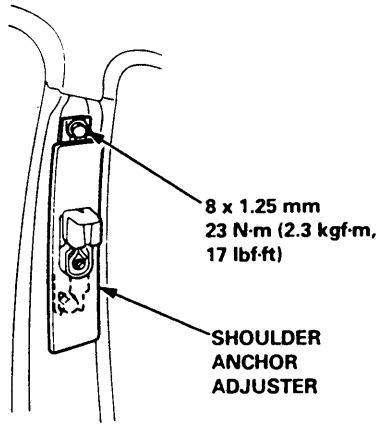
CAUTION: Check the front seat belts for damage, and replace then if necessary. Be careful not to damage then during removal and installation.

Front seat belt:

1. Slide the front seat forward fully.
2. Remove the center pillar lower trim panel (see section 20).
3. Remove the upper anchor cover and lower anchor cap.



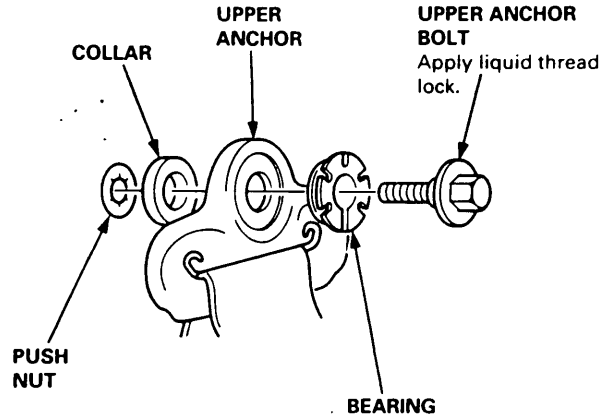
4. With a 14 mm socket or box-end wrench, remove all the anchor bolts and the retractor bolt, remove the retractor mounting bolt, then remove the front seat belt and retractor.
5. Remove the center pillar upper trim (see section 20).
6. Remove the shoulder anchor adjuster.



7. Installation is the reverse of the removal procedure.

NOTE:
- Check that the retractor locking mechanism functions as described on page 24-6.
- Make sure you assemble the washers and collars on the upper and lower anchor bolts as shown.
- Before installing the anchor bolts, make sure there are no twists or kinks in the front seat belt.

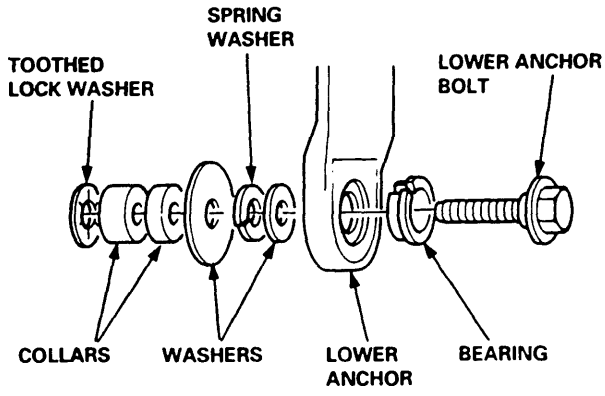
Upper anchor bolt construction:



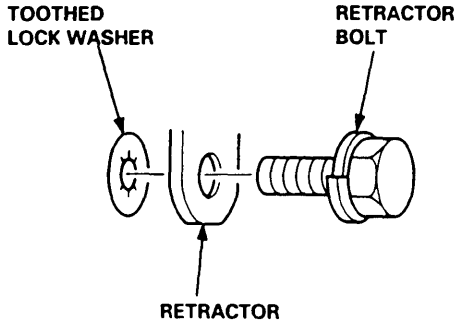
(cont'd)

Removal/Installation (cont'd)

Lower anchor bolt construction:

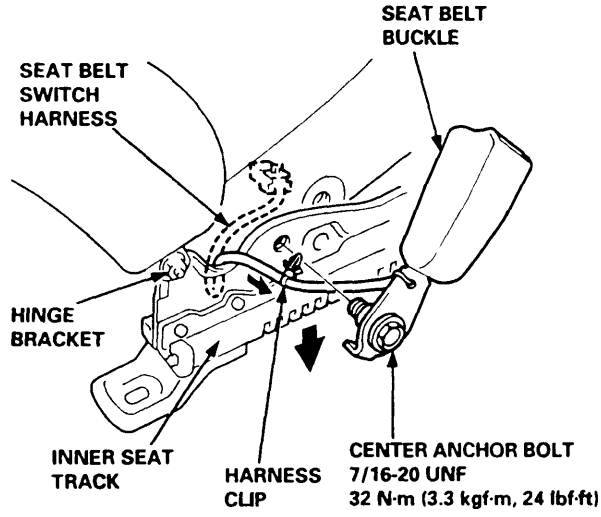


Retractor bolt construction:



Seat belt buckle removal:

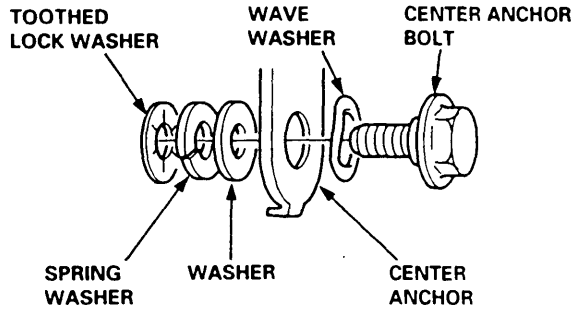
1. Remove the front seat through the door opening (see section 20).
2. Remove the center cover (see section 20).
3. With a 14 mm socket or box-end wrench, remove the center anchor bolt, then remove the seat belt buckle.



4. Driver's: Detach the seat belt switch connector and harness clip from the seat cushion (see section 20). Remove the seat cushion mounting bolts from the inner seat track (see section 20), and move the inner seat track, then pull the seat belt switch harness out.

   NOTE: Take care not to damage the hinge bracket.

Center anchor bolt construction:



5. Installation is the reverse of the removal procedure.

   NOTE: Make sure you assemble the washers and bearing on the center anchor bolt as shown.

Rear Seat Belt

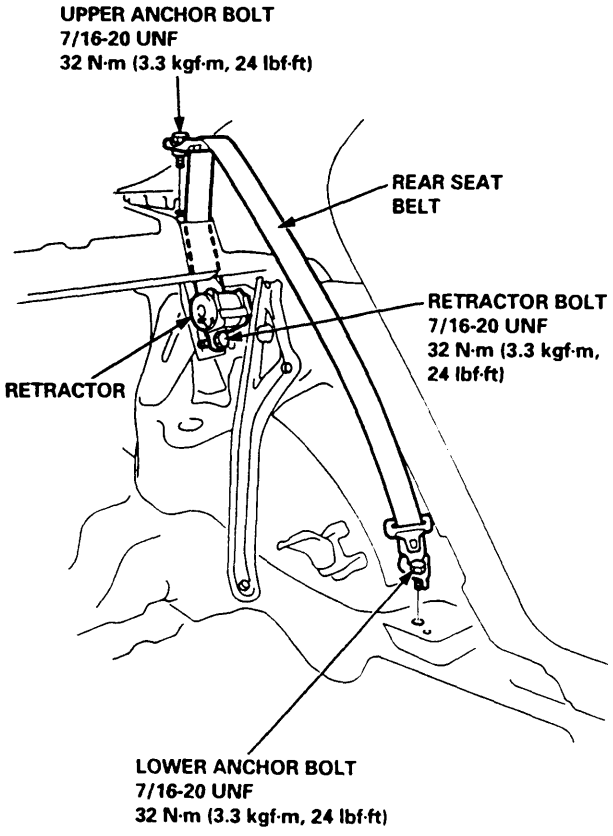
Removal/Installation

CAUTION: Check the rear seat belts for damage, and replace then if necessary. Be careful not to damage then during removal and installation.

Rear seat belt removal:

1. Remove:
   - Rear seat cushion (see section 20)
   - Rear shelf (see section 20)
   - Rear trim panel (see section 20)
   - Trunk trim panel (see section 20)

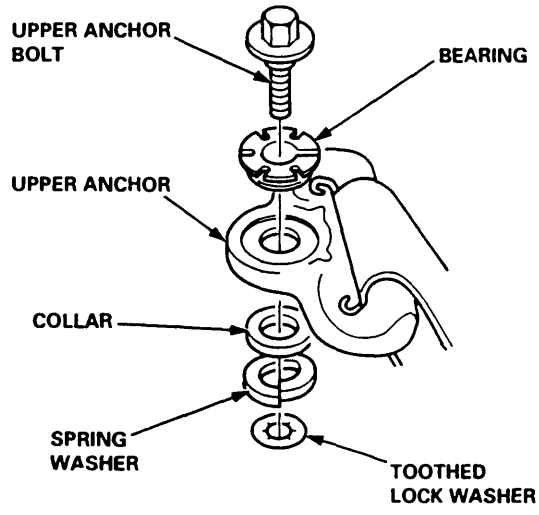
2. With a 14 mm socket or box-end wrench, remove all the anchor bolts and retractor bolt, then remove the rear seat belt and retractor.



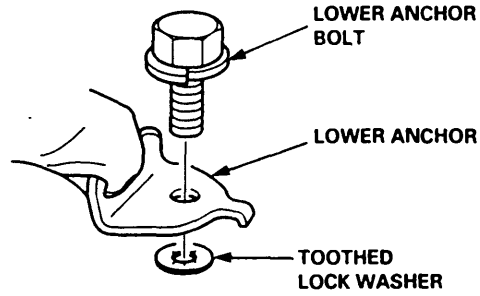
3. Installation is the reverse of the removal procedure.

   NOTE:
   - Check that the retractor locking mechanism functions as described on page 24-6.
   - Assemble the washers and collar on the upper anchor bolt as shown.
   - Before installing the anchor bolt, make sure there are no twists or kinks in the rear seat belt.

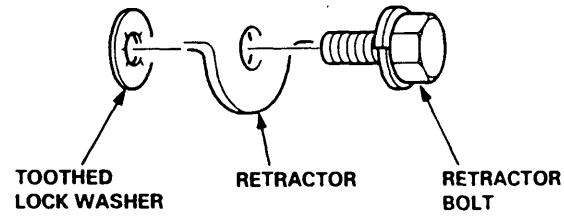
Upper anchor bolt construction:



Lower anchor bolt construction:



Retractor bolt construction:



(cont'd)

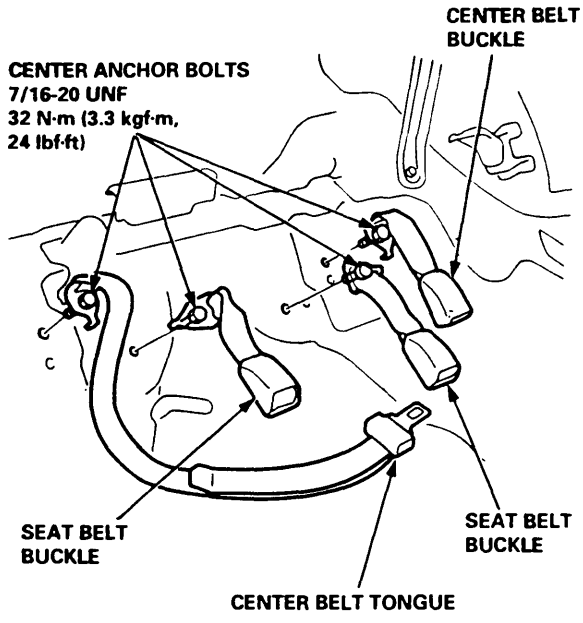
Rear Seat Belt

Removal/Installation (cont'd)

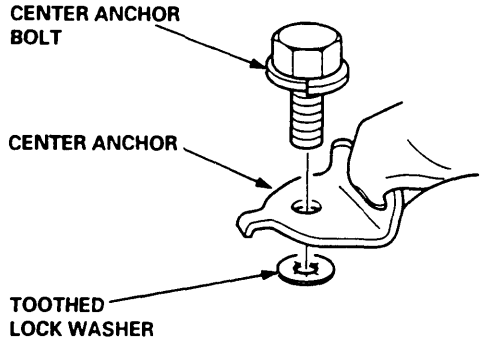
Seat belt buckle/Center belt tongue removal:

1. Remove the rear seat cushion (see section 20).

2. With a 14 mm socket or box-end wrench, remove the center anchor bolts, then remove the seat belt buckles and center belt tongue.



Center anchor bolt construction:



3. Installation is the reverse of the removal procedure.

   NOTE: Before attaching the seat-back and seat cushion, make sure there are no twists or kinks in the center belts.

Inspection

Retractor Inspection

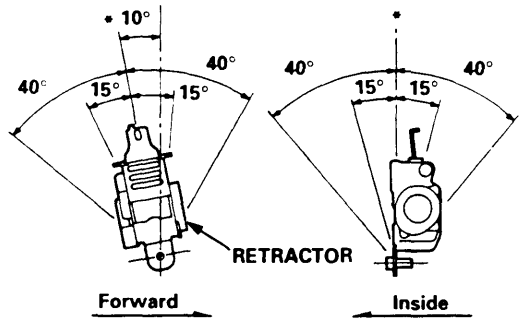
1. Before installing the retractor, check that the seat belt can be pulled out freely.

2. Make sure that the seat belt does not lock when the retractor is leaned slowly up to 15° from the mounted position. The seat belt should lock when the retractor is leaned over 40°.

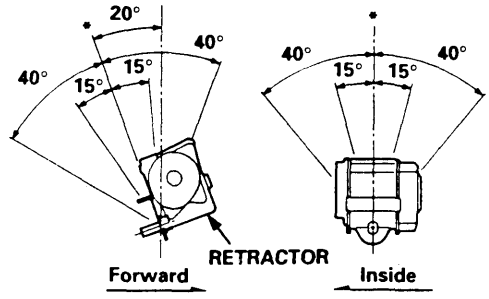
   CAUTION: Do not attempt to disassemble the retractor.

***: Mounted Position**

Front:



Rear:



3. Replace the seat belt with a new one if there is any abnormality.

On-the-Car Seat Belt Inspection

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.

   CAUTION: Use only soap and water to clean.

   NOTE: Dirt build-up in the metal 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.

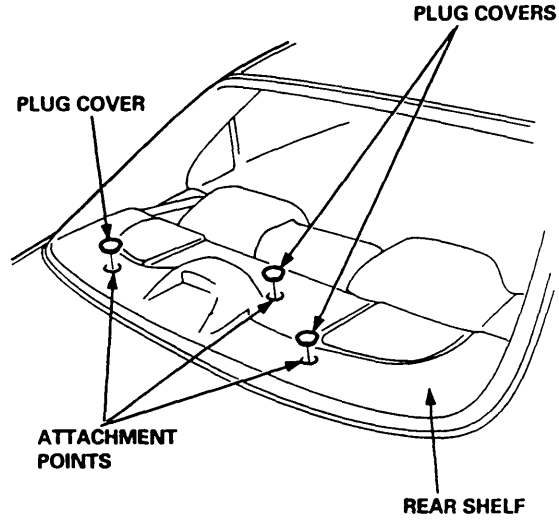
6. For each passenger's seat belt, make sure that the locking mechanism in the seat belt retractor will engage when the seat belt is pulled all the way out.

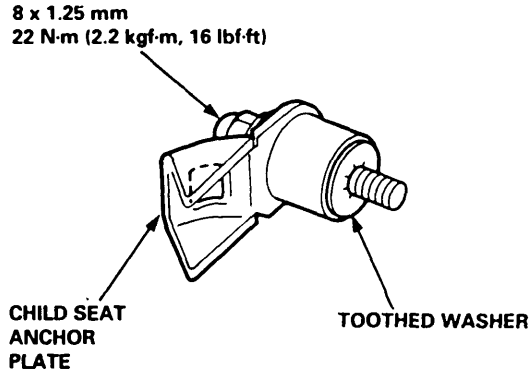
7. Replace the seat belt with a new one if there is any abnormality.

Child Seat Anchor Plate

Attachment points are provided for a rear seat mounted child restraint system which uses a top tether. The attachment points are located on the rear shelf or rear trim panel, just behind the rear seat-back. When using a child seat with a top tether, install the child seat anchor plates securely.

NOTE: Remove the plug covers from the attachment points of the rear shelf.





⚠ WARNING

- **Do not use the child seat anchor plate for any other purpose; it is designed exclusively for installation of a child seat.**
- **Make sure the rear seat-back is locked firmly when installing a child seat.**

NOTE:

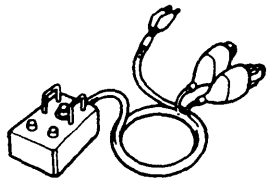
- Do not remove the toothed washer from the child seat anchor plate. Use the child seat anchor plate with the toothed washer attached to it.
- When installing a child seat on the rear seat, follow the instructions of the manufacturer of the child seat.
- Additional anchor plates are available.

Supplemental Restraint System (SRS)

Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①*1	07HAZ – SG00400	Deployment Tool	1	24-59
②*1	07PAZ– 0010100	SCS Service Connector	1	24-21
③	07SAZ – SW50200	SRS Service Connector	1	24-35
④	07TAZ – SZ50200	SRS Service Connector (2 Ω)	1	24-34
⑤*2	07TAZ – 001020A	Backprobe Adapter, 17 mm	2	24-30

*1: Included in SRS Tool Set 07HAZ – SG0000A
*2: Use with the stacking patch cords from T/N 07SAZ – 001000A, Backprobe Set.



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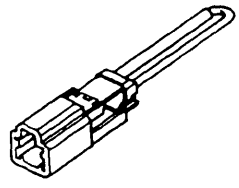

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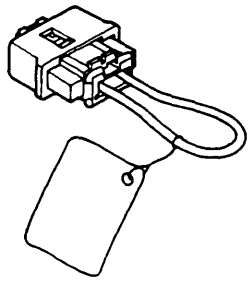
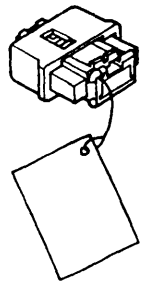


③



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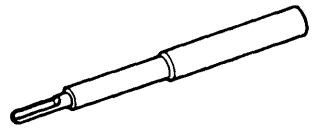
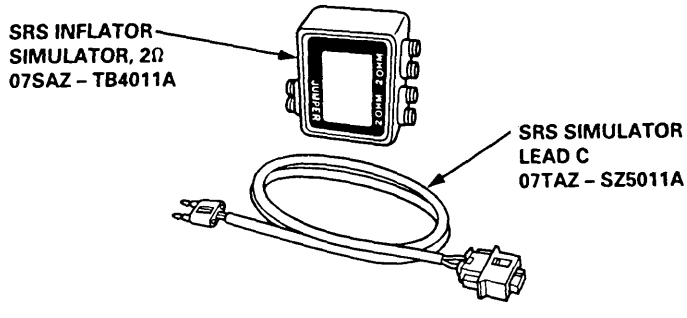
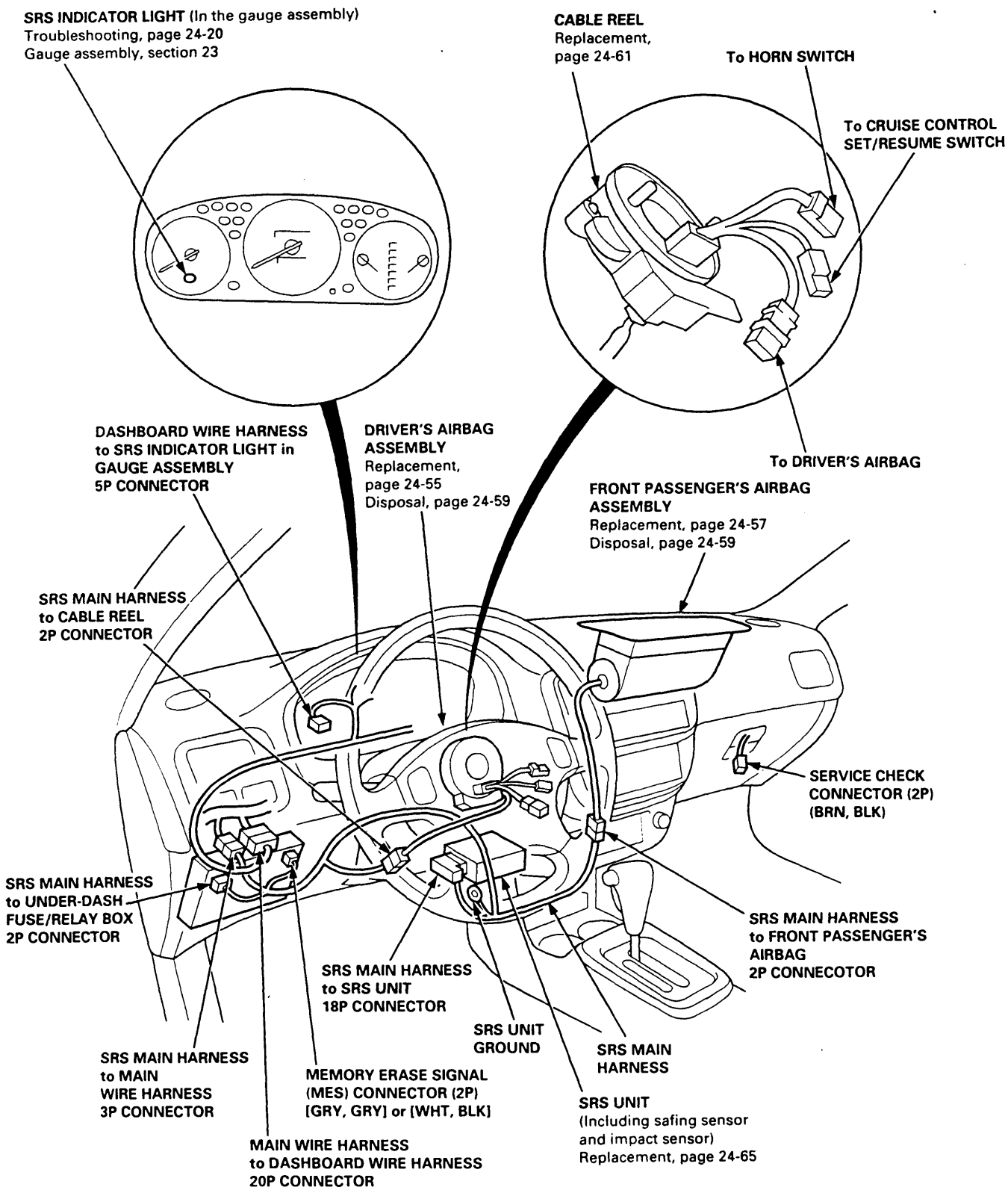


⑤



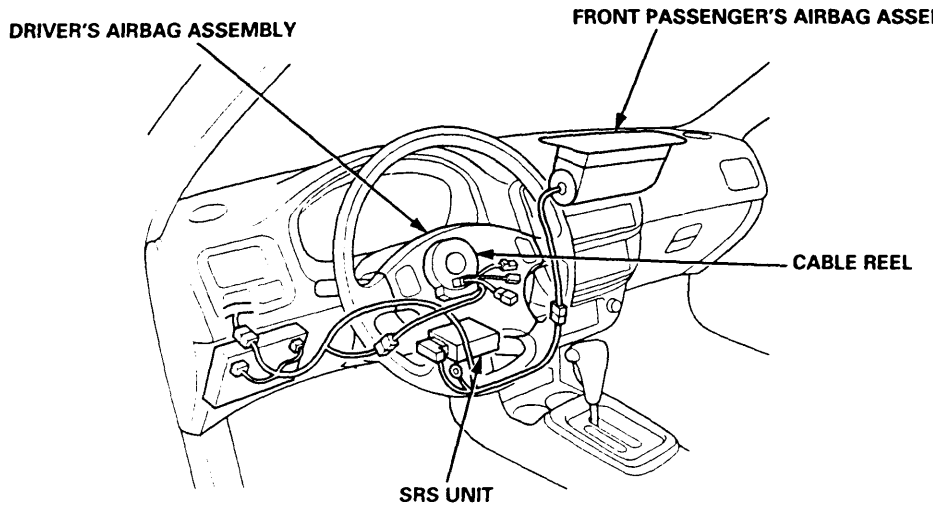
NOTE: The SRS Service Connector, T/N 07SAZ – SW50200, and the SRS Service Connector (2 Ω), T/N 07TAZ – SZ50200, are not available. Instead, use the SRS Inflator Simulator, 2 Ω, T/N 07SAZ – TB4011A, and the SRS Simulator Lead C, T/N 07TAZ – SZ5011A. When the SRS Service Connector, T/N 07SAZ – SW50200, is called for, connect the lead to the Simulator's "Jumper" jack. When the SRS Service Connector (2 Ω), T/N 07TAZ – SZ50200, is called for, connect the lead to one of the simulator's "2 Ω" jacks.

Component/Wiring Locations Index



Description

The SRS is a safety device which, when used in conjunction 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), the cable reel, the driver's airbag, and front passenger's airbag.

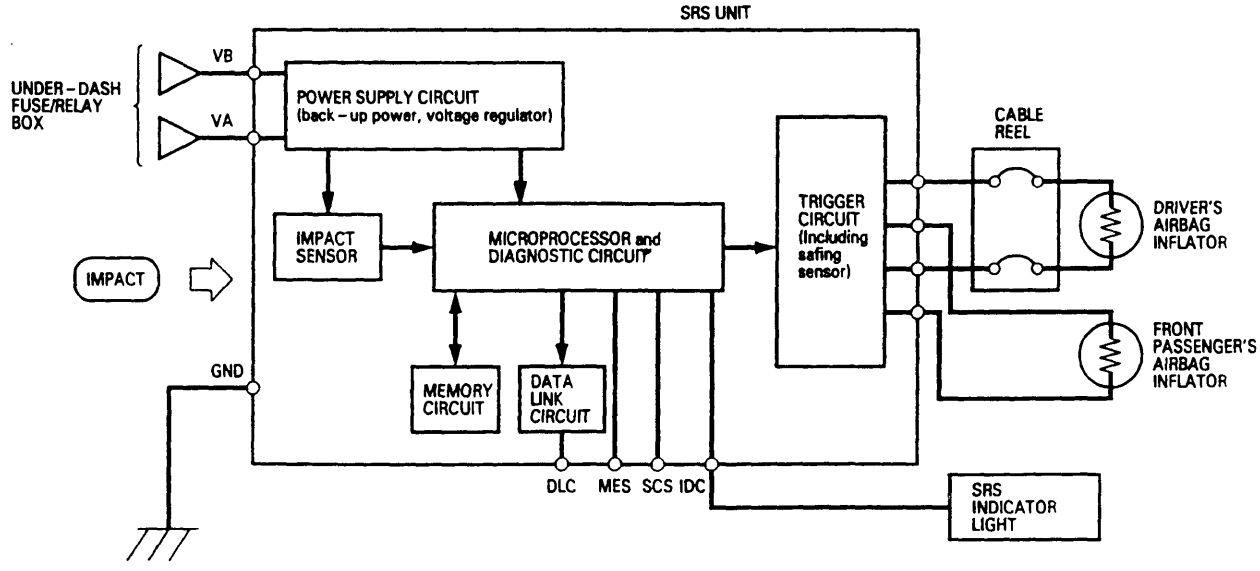


Operation

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 back-up power circuit will keep voltage at a constant level.

For the SRS to operate:

(1) The impact sensor and safing sensor must activate and send electric signals to the microprocessor.
(2) The microprocessor must compute the signals and send signals to the airbag inflators.
(3) The inflators must ignite and deploy the airbags.



Self-diagnosis System

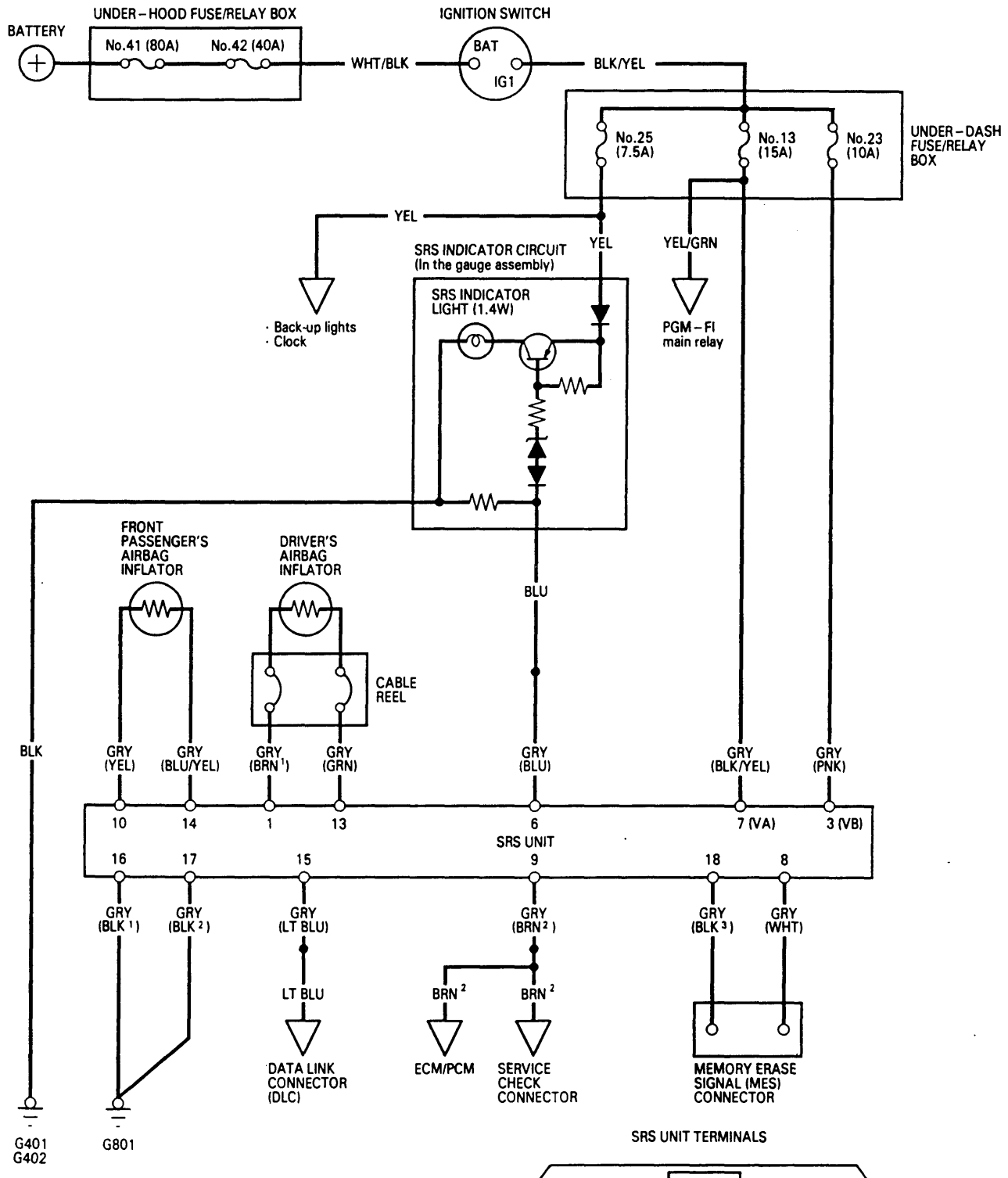
A self-diagnosis circuit is built into the SRS unit; when the ignition switch is turned ON (II), the SRS indicator light comes on and goes off after about six seconds if the system is operating normally.

If the light does not come on, or does not go off after six 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 memory will store the cause of the malfunction, and the data link circuit passes on the information from the memory to the data link connector (DLC). This information can be read with the Honda PGM Tester connected to the DLC (16P).

Circuit Diagram

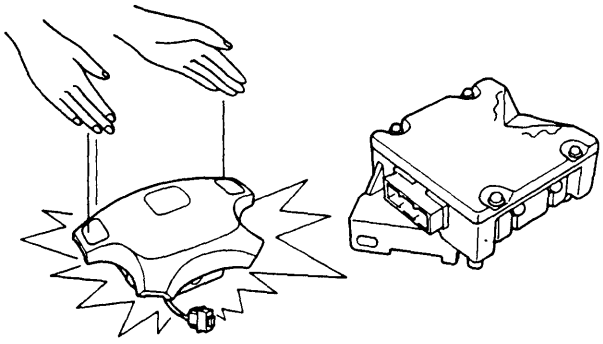
NOTE: The SRS main harness normally uses all GRY wires. However, the wire colors in parenthesis are the actual circuit colors, and wires with those colors may sometimes be used.



General Precautions

- 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:

  — Airbag assemblies
  — Cable reel
  — SRS unit



- 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 deployment and possible injury.

- Do not install used SRS parts from another vehicle. When making SRS repairs, use only new parts.

- Except when performing electrical inspections, always disconnect both the negative cable and positive cable from the battery, and wait at least three minutes before beginning work.

- Replacement of the combination light and wiper/washer switches and cruise control switch can be done without removing the steering wheel:

  — Combination light and wiper/washer switch replacement (see section 23).
  — Cruise control set/resume switch replacement (see section 4).

- Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

- Whenever the airbag has been activated, replace the SRS unit.

- The original radio has a coded theft protection circuit. Be sure to get the customer's code number before disconnecting the battery cables.

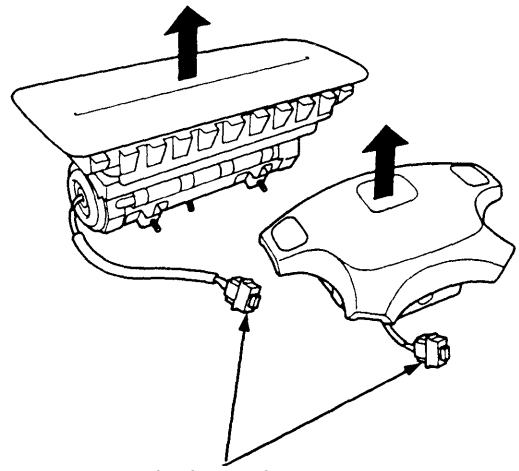
Airbag Handling and Storage

Do not try to disassemble the airbag assembly. It has no serviceable parts. Once an airbag has been operated (deployed), it cannot be repaired or reused.

For temporary storage of the airbag assembly during service, please observe the following precautions:

- Store the removed airbag assembly with the pad surface up. The driver's and front passenger's airbag connectors have a built-in short contact (see page 24-18).

⚠ WARNING If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.



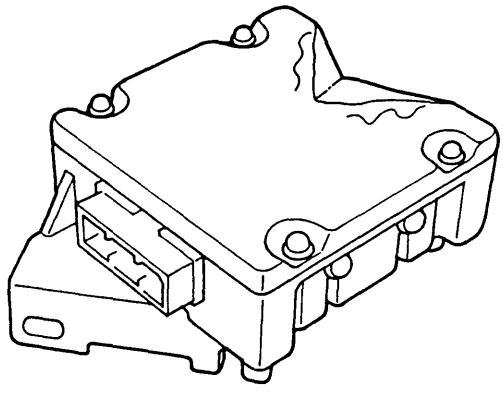
AIRBAG CONNECTORS
(With built-in short contact)

- Store the removed airbag assembly on a secure flat surface away from any high heat source (exceeding 212°F/100°C) and free of any oil, grease, detergent or water.

CAUTION: Improper handling or storage can internally damage the airbag assembly, making it inoperative. If you suspect the airbag assembly has been damaged, install a new unit and refer to the Deployment/Disposal Procedures for disposing of the damaged airbag.

SRS Unit Precautions

- Take extra care when painting or doing body work in the area below the dashboard. Avoid direct exposure of the SRS unit or wiring to heat guns, welding, or spraying equipment.
- Disconnect the driver's and front passenger's airbag connectors before working below the dashboard near the SRS unit.
- After any degree of frontal body damage, or after a collision without airbag deployment, inspect the SRS unit for physical damage. If it is dented, cracked, or deformed, replace it.



- Be sure the SRS unit is installed securely.
- Do not disassemble the SRS unit.
- Store the SRS unit in a cool (less than about 104°F/40°C) and dry (less than 80% humidity, no moisture) place. Do not spill water or oil on the SRS unit, and keep it away from dust.
- During installation or replacement, be careful not to bump (impact wrench, hammer, etc.) the area around the SRS unit. The airbags could accidentally deploy and cause damage or injuries.

Inspection After Deployment

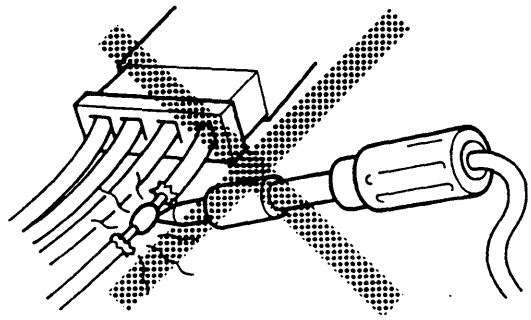
After a collision in which the airbags were deployed, replace the SRS unit, and inspect the following:

1. Inspect all the SRS wire harnesses. Replace, don't repair, any damaged harnesses.
2. Inspect the cable reel for heat damage. If there is any damage, replace the cable reel.
3. After the vehicle is completely repaired, turn the ignition switch ON (II). If the SRS indicator light comes on for about six seconds and then goes off, the SRS system is OK. If the indicator light does not function properly, go to SRS Troubleshooting.

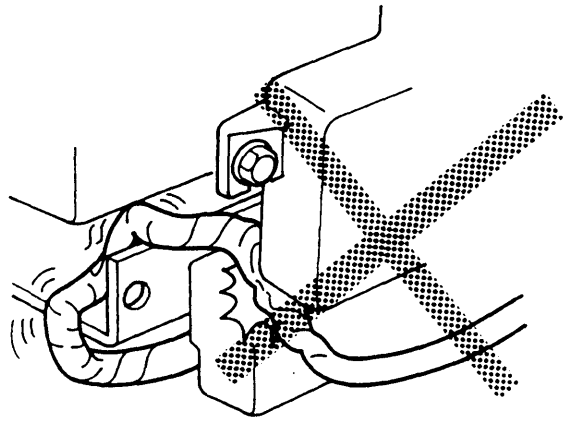
Wiring Precautions

- Never attempt to modify, splice or repair SRS wiring.

  NOTE: SRS wiring can be identified by special yellow outer covering.



- Be sure to install the harness wires so that they are not pinched or interfering with other parts.

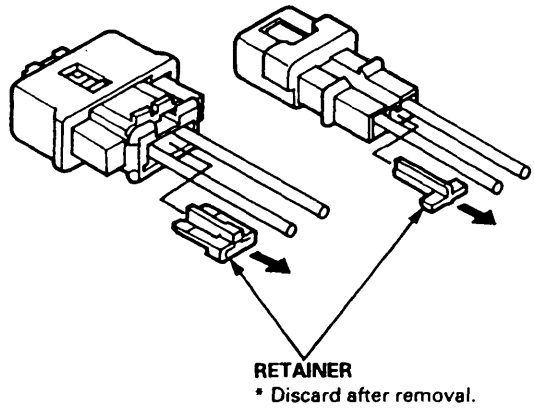


- Make sure all SRS ground locations are clean and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

Backprobing Spring-loaded Lock Connectors

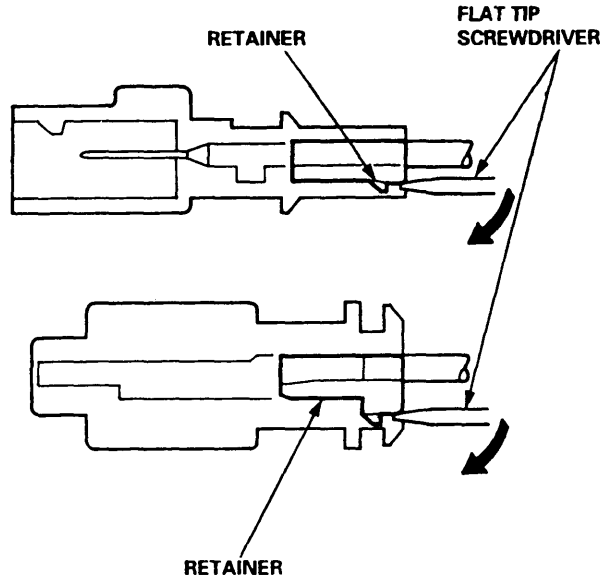
- When checking voltage or resistance on this type of connector the first time, it is necessary to remove the retainer to insert tester probes from the wire side.

  NOTE: It is not necessary to reinstall the removed retainer; the terminals will stay locked in the connector housing.



- To remove the retainer, insert a flat tip screwdriver between connector body and retainer, and carefully pry out the retainer.

  NOTE: Take care not to break the connector.



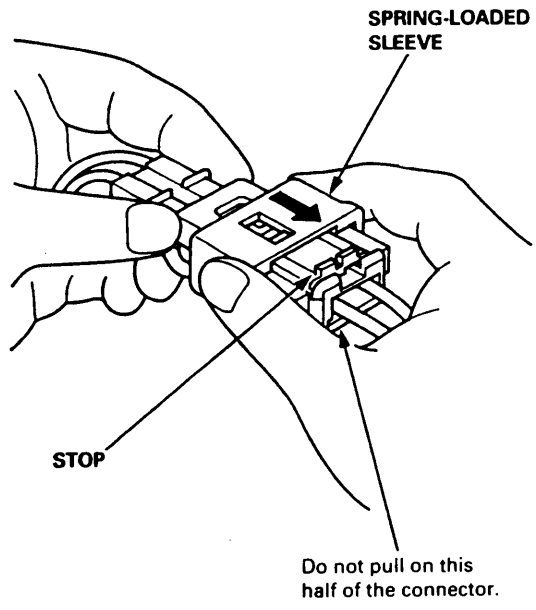
Spring-loaded Lock Connector

Some SRS system connectors have a spring-loaded lock.

Disconnecting

To release the lock, pull the spring-loaded sleeve toward the stop while holding the opposite half of the connector. Then pull the connector halves apart.

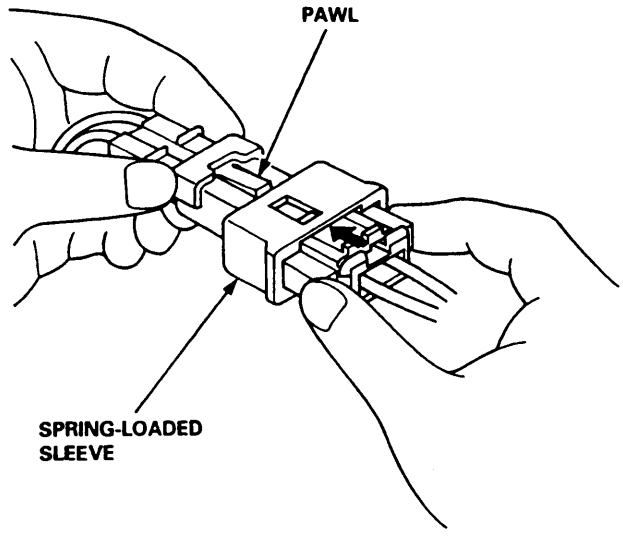
NOTE: Be sure to pull on the sleeve and not on the connector half itself.



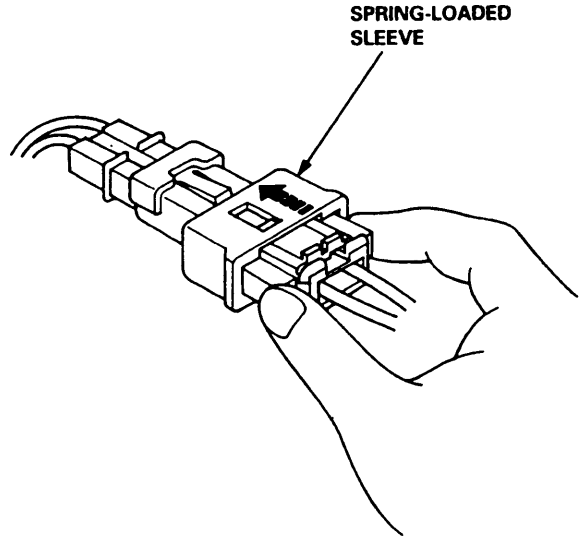
Connecting

1. Hold the pawl-side connector half, and press on the back of the sleeve-side connector half in the direction shown. As the two connector halves are pressed together, the sleeve is pushed back by the pawl.

   NOTE: 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.



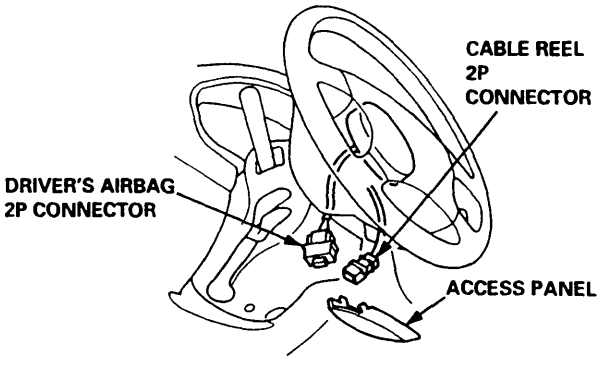
Disconnecting the Airbag Connectors

⚠ WARNING To avoid accidental deployment and possible injury, always disconnect the driver's and front passenger's airbag connectors (automatically shorted) before working near any SRS wiring.

1. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.
2. Disconnect the driver's airbag and front passenger's airbag connectors.
   NOTE: For disconnecting the spring-loaded lock type connector, refer to page 24-17.

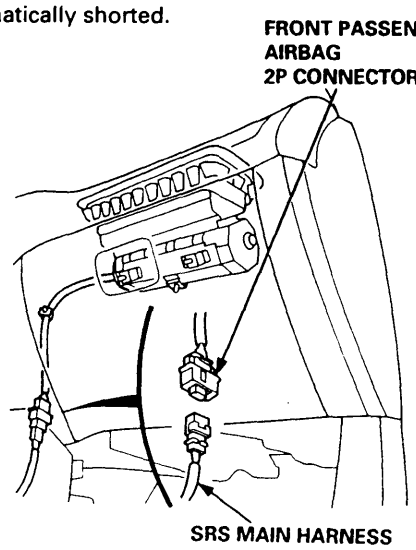
Driver's Side:

- Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.
  NOTE: When disconnected, the airbag connector is automatically shorted.



Front Passenger's Side:

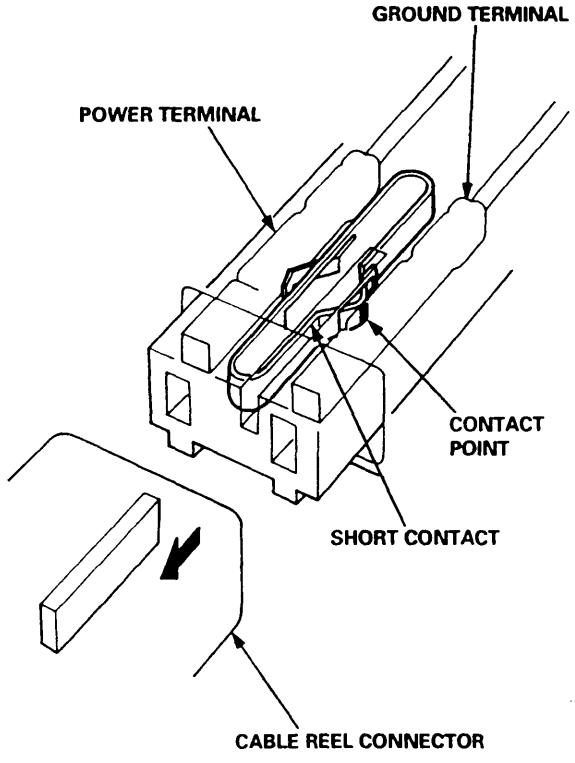
- Disconnect the 2P connector between the front passenger's airbag and SRS main harness.
  NOTE: When disconnected, the airbag connector is automatically shorted.



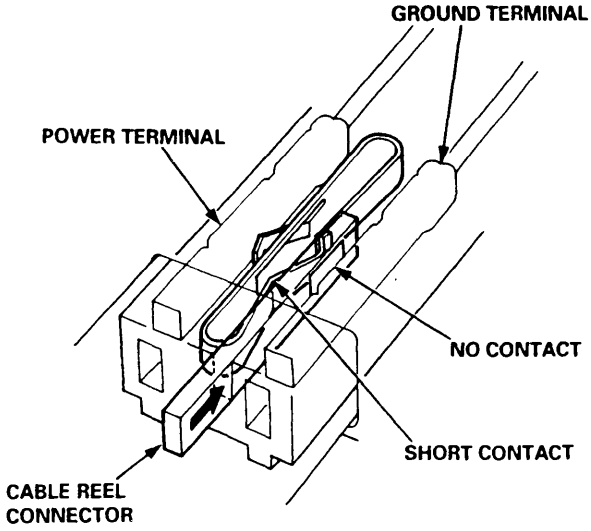
Spring-loaded Lock Connector with Built-in Short Contact

The driver's airbag and front passenger's airbag have a spring-loaded lock connector with a built-in short contact. When this connector is disconnected, the power terminal and the ground terminal in the airbag connector are automatically shorted.

Connector halves disconnected:



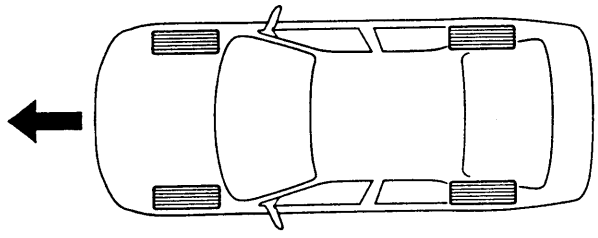
Connector halves connected:



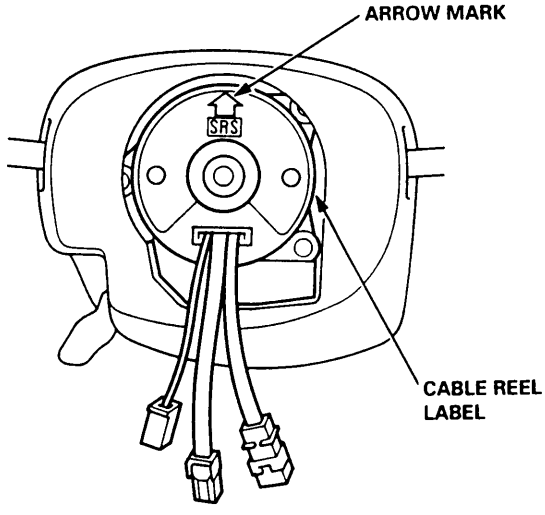
Steering-related Precautions

Steering Wheel and Cable Reel Alignment

NOTE: To avoid misalignment of the steering wheel on reassembly, make sure the wheels are turned straight ahead before removing the steering wheel.



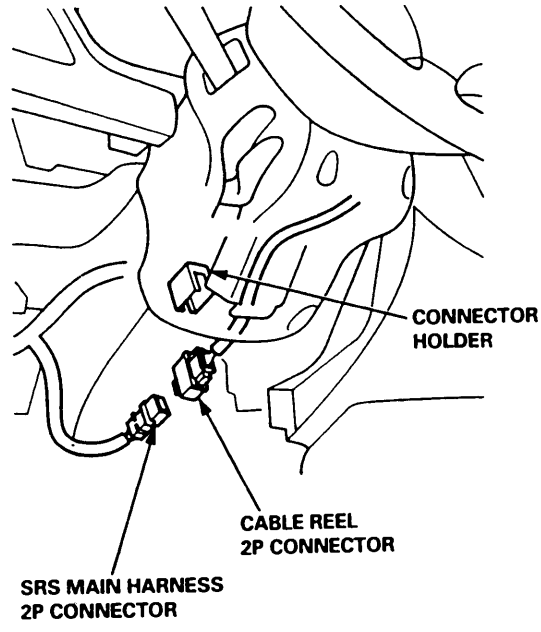
Rotate the cable reel clockwise until it stops.
Then rotate it counterclockwise (approximately two and a half turns) until the arrow mark on the cable reel label points straight up.



Steering Column Removal

CAUTION
- **Before removing the steering column, first disconnect the connector between the cable reel and the SRS main harness.**
- **If the steering column is going to be removed without dismounting the steering wheel, lock the steering by turning the ignition key to 0-LOCK position, or remove the key from the ignition so that the steering wheel will not turn.**

NOTE:
- When the airbag assembly and cable reel are disconnected, and the battery is reconnected and the ignition switch is turned ON (II), the SRS unit will store this as an open in the driver's airbag inflator, and the SRS indicator light will come on. In such a case, make sure to confirm the DTC, then clear the SRS unit memory.
- For disconnecting the spring-loaded lock type connector, refer to page 24-17.



Do not replace the original steering wheel with any other design because it will make it impossible to properly install the airbag (only use genuine Honda replacement parts).

After reassembly, confirm the wheels are still turned straight ahead and that the steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary, do so only by adjusting the tie-rods, not by removing and repositioning the steering wheel.

Troubleshooting

Self-diagnostic Procedures

The self-diagnostic function of the SRS system allows it to locate the causes of system problems and to 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 will come on. If it goes off after six 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 light on.

  NOTE: 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 SCS service connector to the service check connector (2P), and turn the ignition switch ON (II), the SRS indicator light will indicate the diagnostic trouble code (DTC) by the number of blinks.
- After reading and recording the DTC, proceed with the troubleshooting for this code.

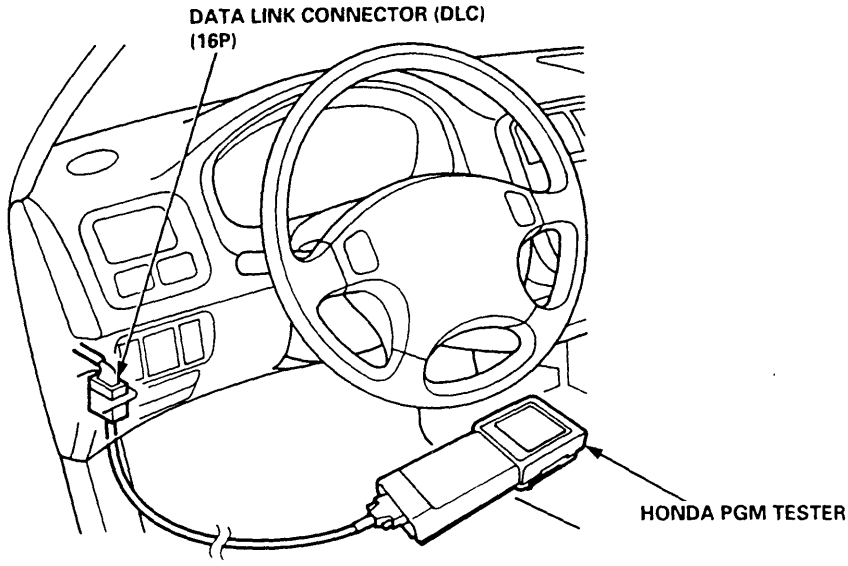
Precautions

- 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 three minutes, be careful not to bump the SRS unit; the airbag(s) could accidentally deploy and cause damage or injuries.
- Before you remove the SRS main harness, disconnect the driver's airbag connector (and the front passenger's airbag connector).
- Make sure the battery is sufficiently charged (see section 23). If the battery is dead or low, measuring values won't be correct.
- 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 SCS service connectors.
  For backprobing spring-loaded lock type connectors, refer to page 24-16.

Reading the DTC

When the SRS indicator light is on, read the DTC using one of these methods:

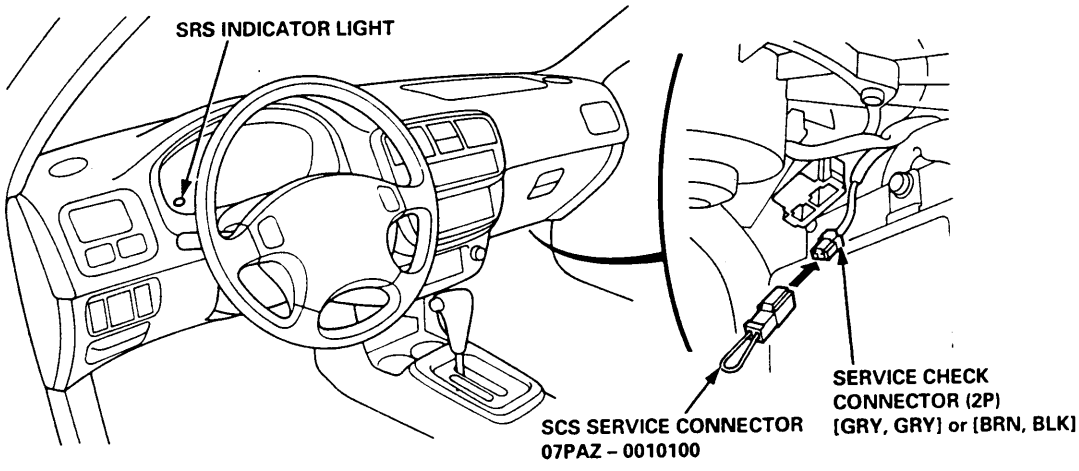
A. Connect the Honda PGM Tester to the 16P Data Link Connector (DLC), and follow the tester's prompts.



Reading the DTC

B. The SRS indicator light also indicates the DTC by the number of blinks when the SCS service connector is connected to the service check connector (2P).

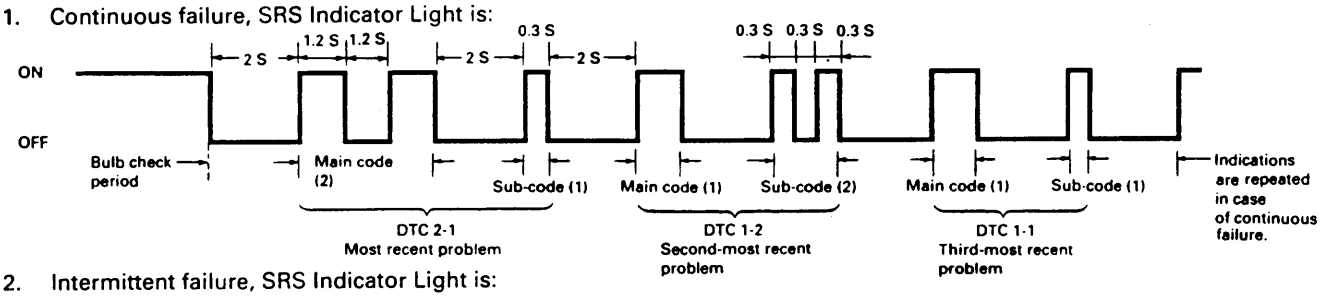
1. Turn the ignition switch OFF, and wait for ten seconds. Then connect the SCS service connector to the service check connector (2P).
   NOTE: If you do not wait ten seconds, the SRS unit will not be completely reset and will not output DTCs.



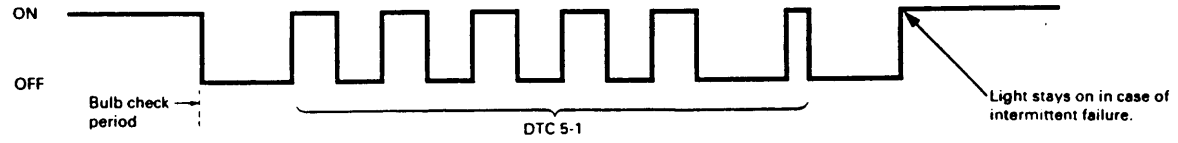
2. Turn the ignition switch ON (II). The SRS indicator light comes on for about six seconds and goes off. Then it will indicate the DTC:
   — The DTC consists of a main code and a sub-code.
   — Including the most recent problem, up to three different malfunctions can be indicated.
   — In case of a continuous failure, the DTC will be indicated repeatedly (see example 1 below).
   — In case of an intermittent failure, the SRS indicator light will indicate the DTC one time, then it will stay on (see example 2 below).
   — If both a continuous and an intermittent failure occur, both DTCs will be indicated as continuous failures.
   — In case the system is normal (no DTC), the SRS indicator light will stay on (see example 3).
3. Read the DTC.
4. Turn the ignition switch OFF, and wait for ten seconds. Then disconnect the SCS service connector from the service check connector (2P).

Examples of DTC Indications:

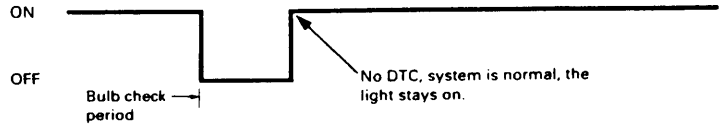
1. Continuous failure, SRS Indicator Light is:



2. Intermittent failure, SRS Indicator Light is:



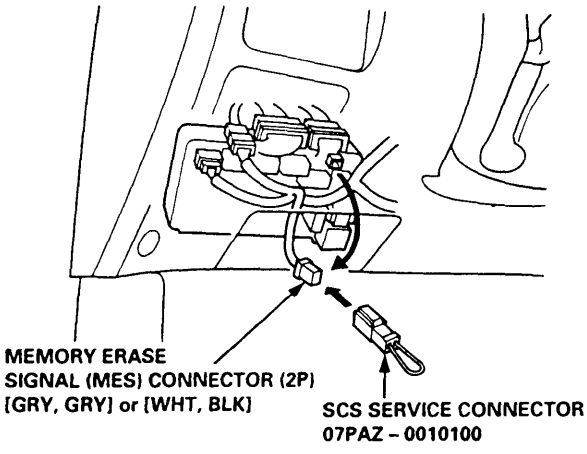
3. Normal (no failure), SRS Indicator Light is:



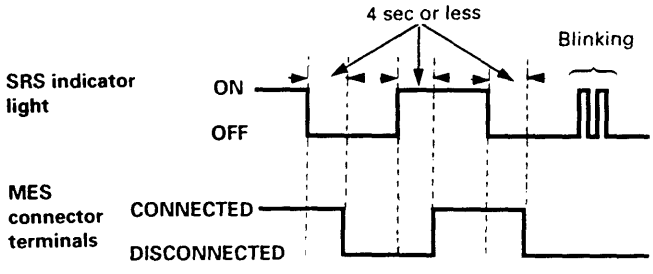
Erasing the DTC memory

To erase the DTC(s) from the SRS unit, use a Honda PGM Tester (see the Honda PGM Tester SRS vehicle System Supplement) or the following procedure.

NOTE: Use the SCS service connector instead of a jumper wire. Otherwise, you may not erase the memory because it is awkward to connect and disconnect a jumper wire quickly enough.



1. Make sure the ignition switch is OFF.
2. Connect the SCS service connector to the MES connector (2P).
3. Turn the ignition switch ON (II).
4. The SRS indicator light comes on for about six seconds and goes off. Remove the SCS service connector from the MES connector (2P) within four seconds after the SRS indicator light went off.
5. The SRS indicator light comes on again. Reconnect the SCS service connector to the MES connector (2P) within the four seconds after the SRS indicator light comes on.
6. The SRS indicator light goes off. Remove the SCS service connector from the MES connector (2P) within four seconds.
7. The SRS indicator light indicates that the memory is erased by blinking two times.
8. Turn the ignition switch OFF, and wait for ten seconds.

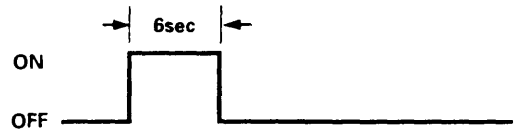


Troubleshooting of Intermittent Failures

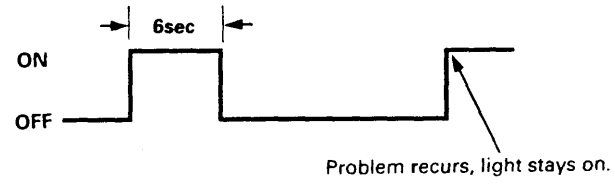
If there was a malfunction, but it doesn't recur, it will be stored in the memory as an intermittent failure, and the SRS indicator light comes on.

After checking the DTC, troubleshoot as follows:

1. Read the DTC (see "Reading the DTC").
2. Erase the DTC memory (see "Erasing the DTC Memory").
3. With the shift lever in neutral, turn the ignition switch ON (II), and let the engine idle.
4. The SRS indicator light comes on for about six seconds and goes off.



5. Shake the wire harness and the connector, take a test drive (quick acceleration, quick braking, cornering), and turn the steering wheel fully left and right, and hold it there for five to ten seconds to find the cause of the intermittent failure.
   If the problem recurs, the SRS indicator light will stay on.



6. If you can't duplicate the intermittent failure, the system is OK at this time.

Diagnostic Trouble Code (DTC) Chart

SRS indicator light	DTC	Possible cause	Corrective action	See page
doesn't come on	none (doesn't come on)	Faulty SRS indicator light circuit	Troubleshooting	24-26
comes on	none*2 (doesn't go off)	Faulty SRS indicator light circuit, internal failure of SRS unit, faulty SRS power supply	Troubleshooting	24-29
	1-1	Open in the driver's airbag inflator		24-34
	1-2	Increased resistance in the driver's airbag inflator		24-34
	1-3	Short to another wire in the driver's airbag inflator or decreased resistance		24-36
	1-4	Short to power in the driver's airbag inflator		24-38
	1-5	Short to ground in the driver's airbag inflator		24-40
	2-1	Open in the passenger's airbag inflator	Troubleshooting	24-42
	2-2	Increased resistance in the passenger's airbag inflator		24-42
	2-3	Short to another wire in the passenger's airbag inflator or decreased resistance		24-44
	2-4	Short to power in the passenger's airbag inflator		24-46
	2-5	Short to ground in the passenger's airbag inflator		24-48

(cont'd)

Diagnostic Trouble Code (DTC) Chart (cont'd)

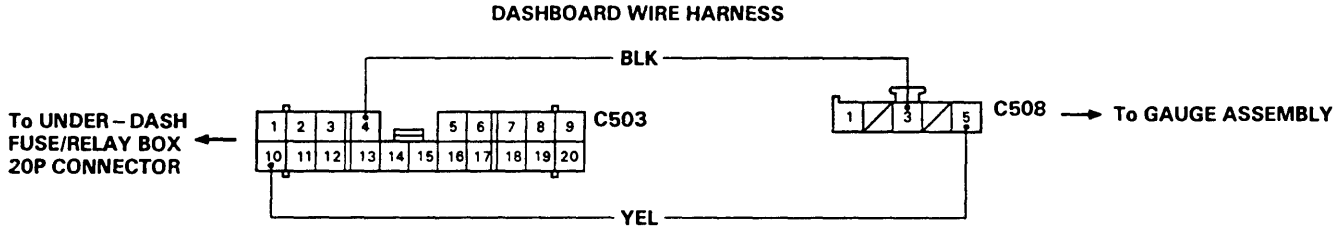
SRS indicator light	DTC	Possible cause	Corrective action	See page
comes on	5-1	Internal failure of the SRS unit	SRS unit replacement	24-65
	5-2			
	5-3			
	5-4			
	5-5			
	6-1	Internal failure of the SRS unit	SRS unit replacement	24-65
	6-2			
	6-3			
	6-4			
	7-1	Internal failure of the SRS unit	SRS unit replacement	24-65
	7-2			
	7-3			
	8-1	Internal failure of the SRS unit	SRS unit replacement	24-65
	8-2			
	8-5			
	8-6	Internal failure of the SRS unit or two failures at a time	Troubleshooting	24-50
	9-1*1*2	Internal failure of the SRS unit	SRS unit replacement	24-65
	9-2	Faulty SRS power supply (VB line)	Troubleshooting	24-52
	10-1	SRS airbags deployed (SRS unit must be replaced)	SRS unit replacement	24-65

*1: In case of an intermittent failure DTC 9-1, it means there was an internal failure of the SRS unit or a faulty SRS indicator light circuit. Do the troubleshooting for intermittent failures (see page 24-22).

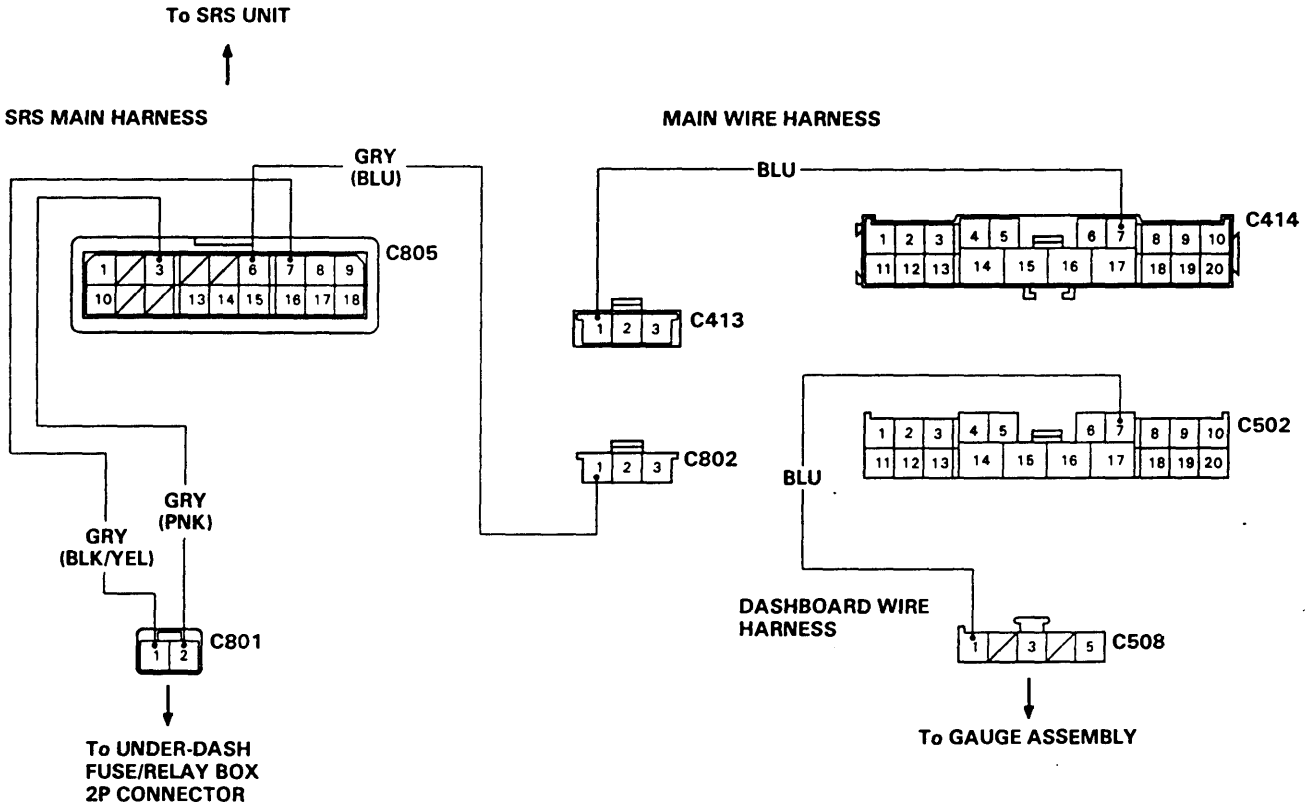
*2: DTC cannot be reed with a Honda PGM Tester; Check by jumping the SCS service connector.

SRS Indicator Light Wire Connections

SRS Indicator Light Power Circuit



SRS Indicator Light Control Circuit



C503 : DASHBOARD WIRE HARNESS 20P CONNECTOR
C508 : DASHBOARD WIRE HARNESS 5P CONNECTOR
C801 : SRS MAIN HARNESS 2P CONNECTOR
C805 : SRS MAIN HARNESS 18P CONNECTOR
C802 : SRS MAIN HARNESS 3P CONNECTOR
C413 : MAIN WIRE HARNESS 3P CONNECTOR
C414 : MAIN WIRE HARNESS 20P CONNECTOR
C502 : DASHBOARD WIRE HARNESS 20P CONNECTOR

The SRS Indicator Light Doesn't Come On

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Check the power supply (fuse):
Turn the ignition switch ON (II), and check whether the other indicator lights come on or not (brake system, etc.).

Do the other indicator lights come on?

YES — NO

Check the fuse:
Check the No. 25 (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES — NO

Check the bulb:
Replace the No. 25 (7.5 A) fuse, and check that the SRS indicator light comes on.

Does the SRS indicator light come on?

YES — NO

END

Check the wire harness between fuse and gauge assembly:
Check for an open in the wire harness between fuse No. 25 (7.5 A) and the gauge assembly, and repair. Check that the SRS indicator light comes on.

Does the SRS indicator light come on?

YES — NO

END

Check the SRS indicator light bulb:
1. Turn the ignition switch OFF.
2. Remove the gauge assembly.
3. Check for a blown SRS indicator light bulb.

Is the SRS indicator light bulb OK?

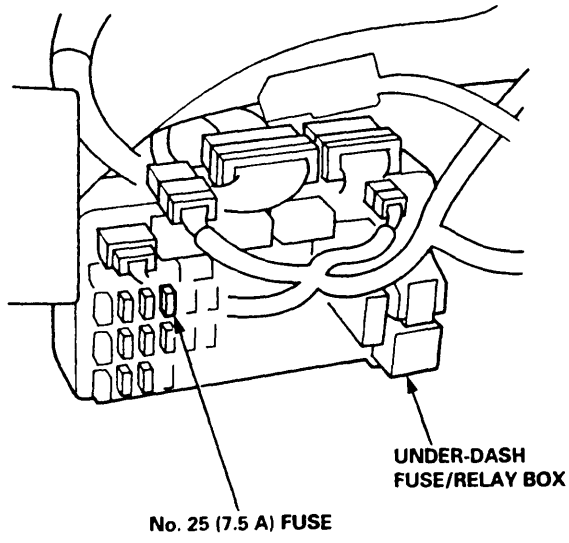
YES — NO

Check the SRS indicator light circuit:
Replace the bulb, and reconnect the gauge assembly connectors. Then turn the ignition switch ON (II).

Does the SRS indicator light come on?

YES — NO

END



(A) To page 24-27

(B) To page 24-27

From page 24-26 (A)

From page 24-26 (B)

Check the SRS indicator light circuit:
1. Disconnect the dashboard wire harness 5P connector from the gauge assembly.
2. Connect a voltmeter between the No. 1 terminal (+) of the 5P connector and ground.
3. Turn the ignition switch ON (II), and measure voltage.

Is there 8.5 V or less for six seconds after the ignition switch has been turned ON (II)?

YES

NO

Faulty SRS indicator light circuit in the gauge assembly; replace the SRS printed circuit board in the gauge assembly.

Check the wire harness of the SRS indicator light circuit (1):
1. Turn the ignition switch OFF.
2. Disconnect the main wire harness 20P connector from the dashboard wire harness.
3. Connect a voltmeter between the No. 7 terminal (+) of the main wire harness 20P connector and ground.
4. Turn the ignition ON (II), and measure voltage.

Is there 8.5 V or less for six seconds after the ignition switch has been turned ON (II)?

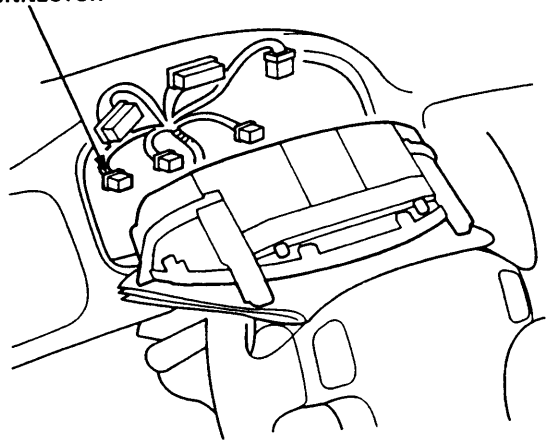
YES

NO

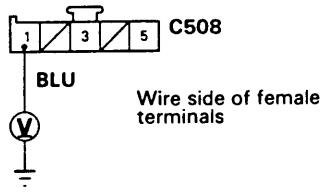
Short to power in the BLU wire of the dashboard wire harness; repair the harness.

To page 24-28

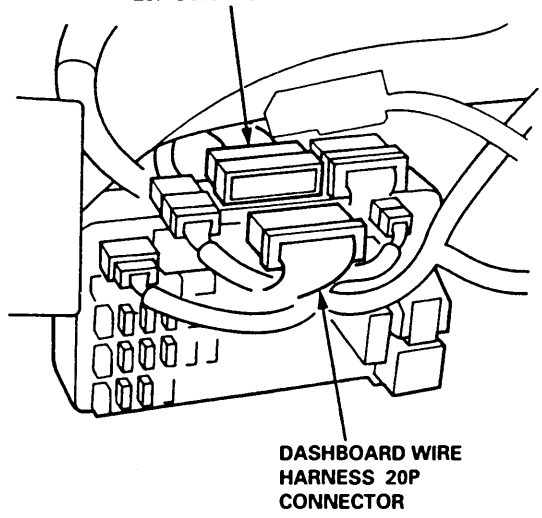
DASHBOARD WIRE HARNESS 5P CONNECTOR



DASHBOARD WIRE HARNESS 5P CONNECTOR

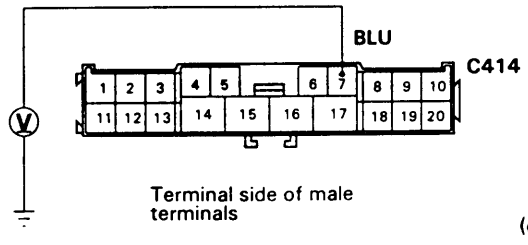


MAIN WIRE HARNESS 20P CONNECTOR



DASHBOARD WIRE HARNESS 20P CONNECTOR

MAIN WIRE HARNESS 20P CONNECTOR



(cont'd)

The SRS Indicator Light Doesn't Come On (cont'd)

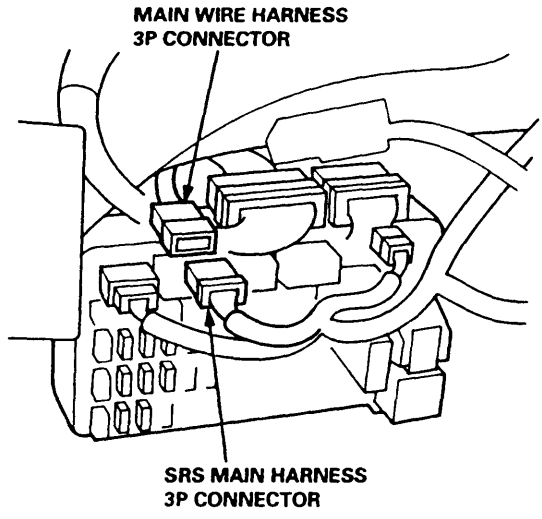
From page 24-27

Check the wire harness of the SRS indicator light circuit (2):
1. Turn the ignition switch OFF.
2. Disconnect the SRS main harness 3P connector from the main wire harness.
3. Connect a voltmeter between the No. 1 terminal (+) of the SRS main harness 3P connector and ground.
4. Turn the ignition switch ON (II), and measure voltage.

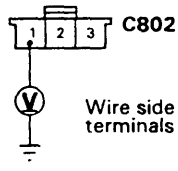
Is there 8.5 V or less for six seconds after the ignition switch has been turned ON (II)?

YES — NO

Short to power in the BLU wire of the main wire harness; repair the harness.



SRS MAIN HARNESS 3P CONNECTOR



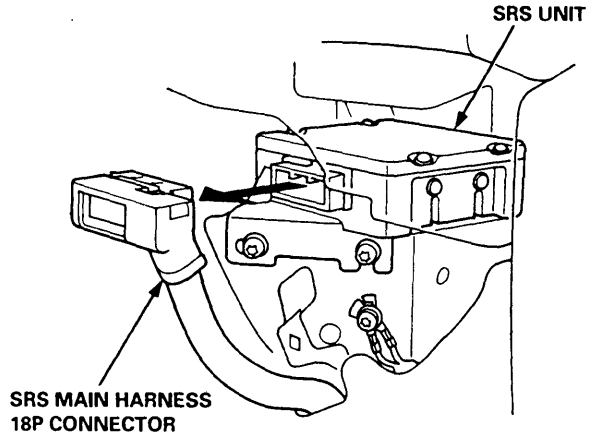
Check the wire harness of the SRS indicator circuit (3):
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then the positive cable, and wait three minutes.
3. Disconnect the driver's and front passenger's airbag connector (see page 24-18).
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Connect a voltmeter between the No. 6 terminal (+) of the SRS main harness 18P connector and ground.
6. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

Is voltage as specified?

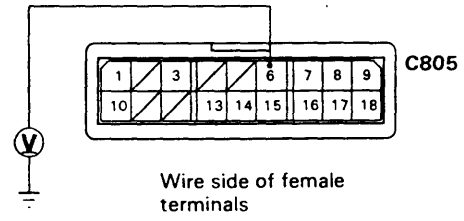
YES — NO

Faulty SRS unit; replace the unit (see page 24-65).

Short to power in the BLU wire of the SRS main harness; replace the harness.



SRS MAIN HARNESS 18P CONNECTOR



The SRS Indicator Light Doesn't Go Off

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See *Troubleshooting of Intermittent Failures on page 24-22.*

Check the No. 13 (15 A) fuse:
1. Turn the ignition switch ON (II).
2. Check for a blown No. 13 (15 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES — NO

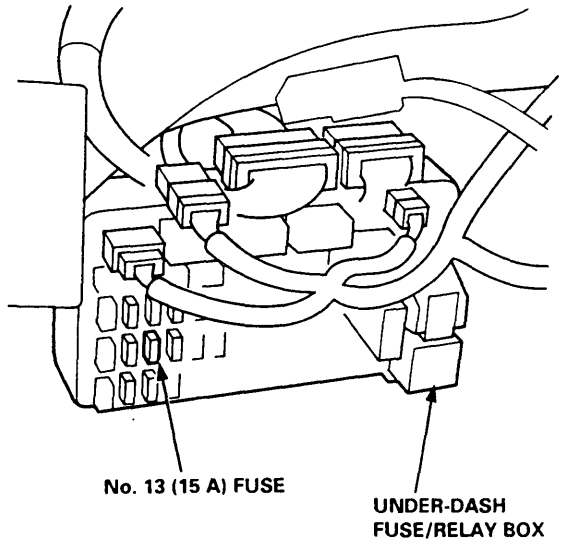
Replace the fuse, and erase the memory:
1. Replace the No. 13 (15 A) fuse.
2. Erase the DTC memory (see page 24-22).
3. Turn the ignition switch ON (II).

Does the SRS indicator light go off after six seconds?

YES — NO

END

Confirm the DTC, and continue troubleshooting

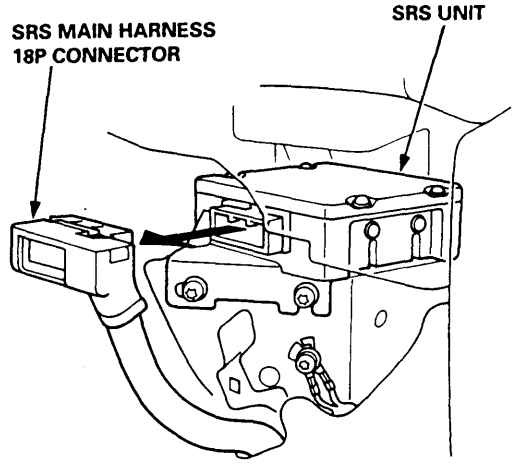


Check for an open in the SRS main harness (VA line):
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's and front passenger's airbag connectors (see page 24-18).
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Reconnect the battery positive cable, then reconnect the negative cable.
5. Connect a voltmeter between the No. 7 terminal (+) of the SRS main harness 18P connector and ground.
6. Turn the ignition switch ON (II).

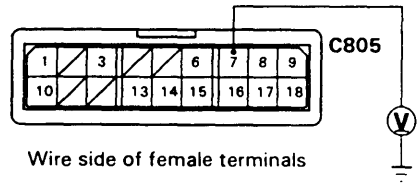
Is there battery voltage?

YES — NO

Open in the SRS main harness (VA line); replace the SRS main harness.



SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals

(cont'd)

(A) To page 24-30

From page 24-29

(A)

Check for a short to ground in the SRS indicator light circuit:
1. Turn the ignition switch OFF.
2. Disconnect the dashboard wire harness 5P connector from the gauge assembly.
3. Check resistance between the No. 1 terminal of the dashboard wire harness 5P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

YES — **NO**

To page 24-32 (B)

Check the SRS unit:
Connect the SRS main harness 18P connector terminals No. 6 and No. 7 with a jumper wire and backprobe adapters.

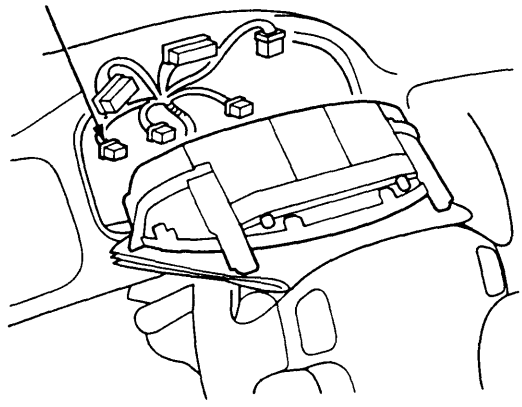
Does the SRS indicator light go off?

YES — **NO**

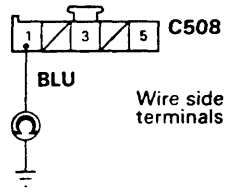
Faulty SRS unit or poor contact at the SRS main harness 18P connector; check the connector.
If the connector is OK, replace the SRS unit.

To page 24-31 (C)

DASHBOARD WIRE HARNESS 5P CONNECTOR

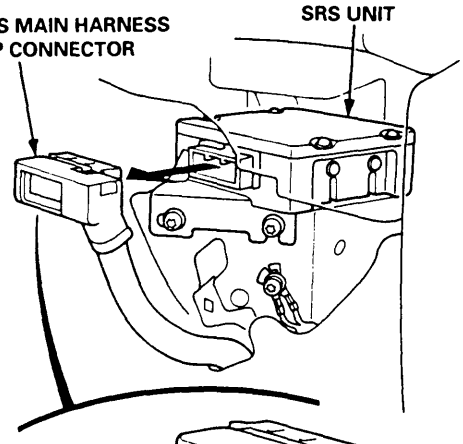


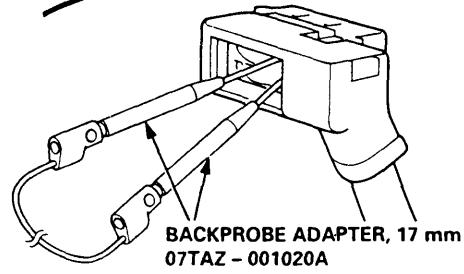
DASHBOARD WIRE HARNESS 5P CONNECTOR



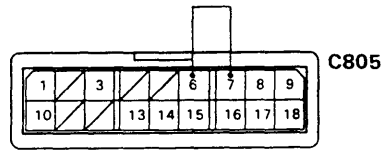
SRS MAIN HARNESS 18P CONNECTOR

SRS UNIT





JUMPER WIRE



Wire side of female terminals

From page 24-30

(C)

Check the SRS indicator circuit:
1. Turn the ignition switch OFF.
2. Remove the gauge assembly.
   NOTE: Do not disconnect the dashboard wire harness 5P connector from the gauge assembly.
3. Turn the ignition switch ON (II).
4. Connect the dashboard wire harness 5P connector terminals No. 1 and No. 5 with a jumper wire.

Does the SRS indicator light go off?

YES

NO

Faulty SRS unit or poor contact at the SRS main harness 18P connector; check the connector.
If the connector is OK, replace the SRS unit.

Check for an open in the SRS indicator light circuit:
Check resistance between the No. 6 terminal of the SRS main harness 18P connector and No. 1 terminal of the dashboard wire harness 5P connector; there should be 0 – 1.0 Ω.

Is the resistance as specified?

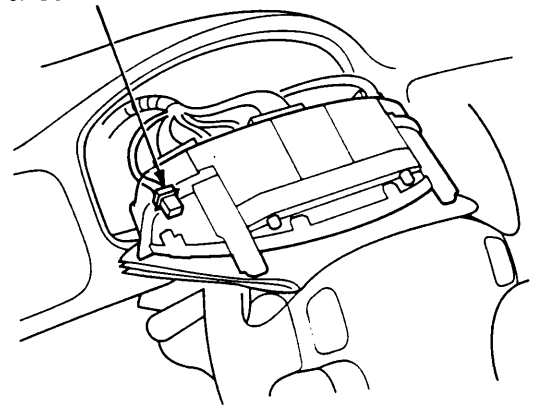
YES

NO

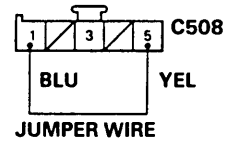
(D) To page 24-33

To page 24-33 (E)

DASHBOARD WIRE HARNESS 5P CONNECTOR

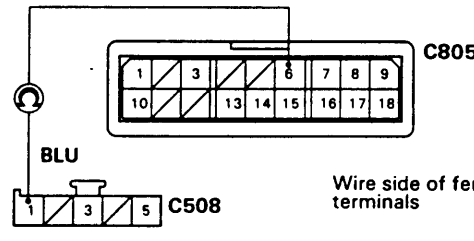


DASHBOARD WIRE HARNESS 5P CONNECTOR



Wire side of female terminals

SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals

DASHBOARD WIRE HARNESS 5P CONNECTOR

From page 24-30

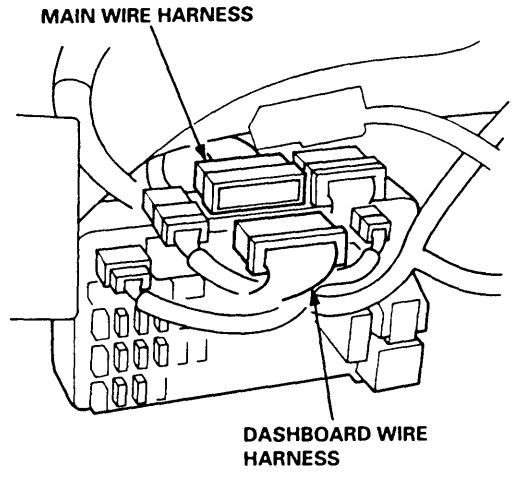
(B)

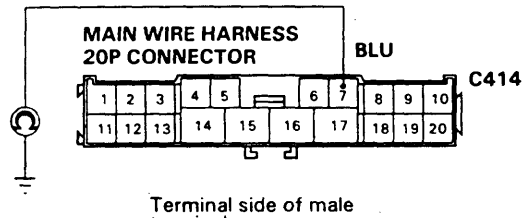
Check for a short to ground in the main wire harness:
1. Disconnect the dashboard wire harness 20P connector from the main wire harness.
2. Check resistance between the No. 7 terminal of the main wire harness 20P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

YES — **NO**

Short to ground in the dashboard wire harness; repair the dashboard wire harness.





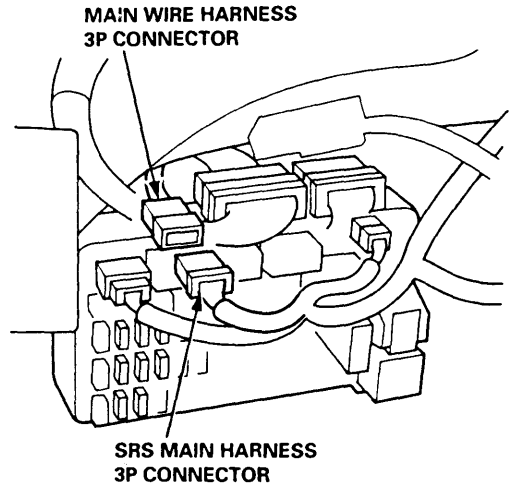
Terminal side of male terminals

Check for a short to ground in the SRS main harness:
1. Disconnect the SRS main harness 3P connector from the main wire harness.
2. Check resistance between the No. 1 terminal of the SRS main harness 3P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

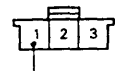
YES — **NO**

Short to ground in the main wire harness; replace the main wire harness.



Short to ground in the SRS main harness; replace the SRS main harness.

SRS MAIN HARNESS 3P CONNECTOR



Wire side of female terminals

From page 24-31

(D)

Check the SRS indicator circuit input voltage:
1. Reconnect the SRS main harness 18P connector to the SRS unit.
2. Connect a voltmeter between the No. 1 terminal (+) of the dashboard wire harness 5P connector and ground.
3. Turn the ignition switch ON (II), and measure voltage.

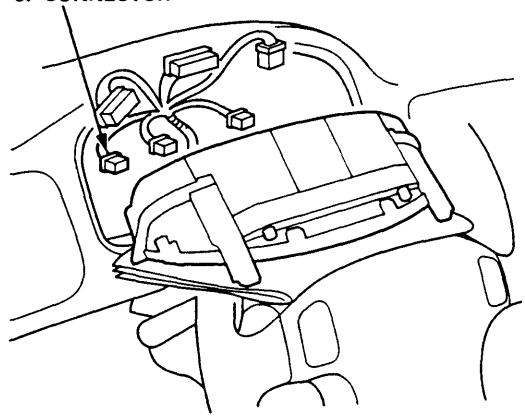
Is there 8.5 V or more six seconds after the ignition switch has been turned ON (II)?

YES — NO

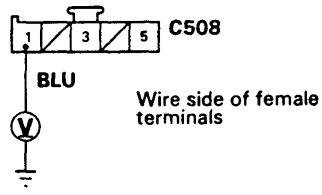
The problem has disappeared due to disconnecting and connecting the connectors. Be sure all terminals make good contact, and recheck the system (see Troubleshooting of Intermittent Failures on page 24-22).

Poor contact at the SRS main harness 18P connector; check the connector.
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

DASHBOARD WIRE HARNESS 5P CONNECTOR



DASHBOARD WIRE HARNESS 5P CONNECTOR



From page 24-31

(E)

Check for an open in the dashboard wire harness:
1. Disconnect the dashboard wire harness 24P connector from the main wire harness.
2. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and No. 7 terminal of the main wire harness 20P connector; there should be 0 – 1.0 Ω.

Is the resistance as specified?

YES — NO

Open in the BLU wire of the dashboard wire harness; repair the dashboard wire harness.

Check for an open in the main wire harness:
1. Disconnect the SRS main harness 3P connector from the main wire harness.
2. Check resistance between the No. 6 terminal of the SRS main harness 18P connector and No. 1 terminal of the SRS main harness 3P connector; there should be 0 – 1.0 Ω.

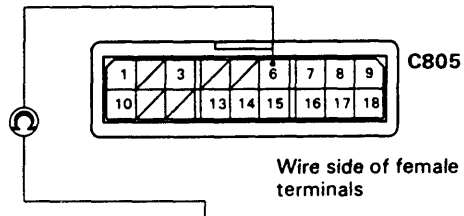
Is the resistance as specified?

YES — NO

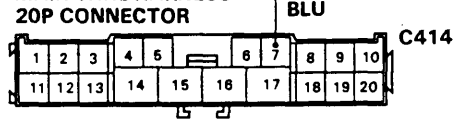
Open in the BLU wire of the main wire harness; repair the main wire harness.

Open in the SRS main harness; replace the SRS main harness.

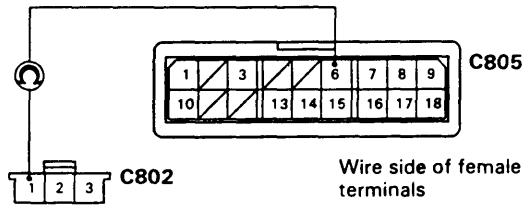
SRS MAIN HARNESS 18P CONNECTOR



MAIN WIRE HARNESS 20P CONNECTOR



SRS MAIN HARNESS 18P CONNECTOR



SRS MAIN HARNESS 3P CONNECTOR

DTC 1-1 and DTC 1-2

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for an open in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the front passenger's airbag connector.
4. Connect the SRS service connector (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

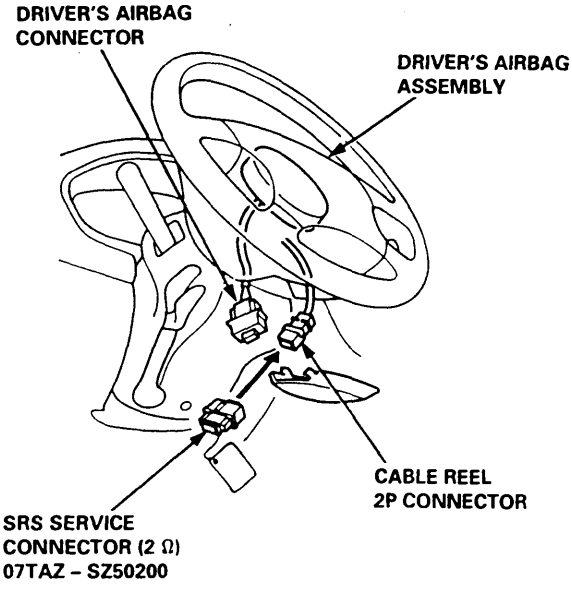
Is DTC 1-1 or DTC 1-2 indicated?

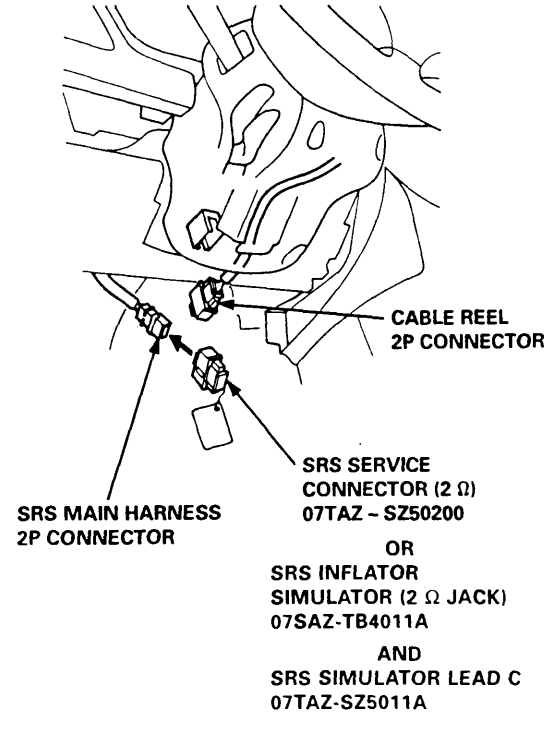
YES — NO

Open or increased resistance in the driver's airbag inflator; replace the driver's airbag assembly (see page 24-55).

Check for an open in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the SRS service connector (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector. (cont'd)

To page 24-35





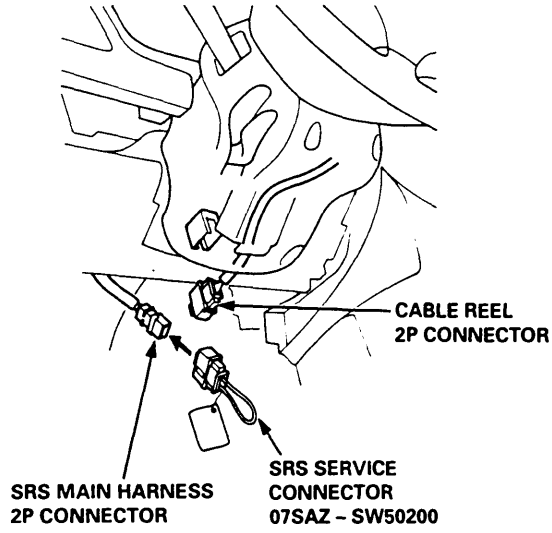
From page 24-34

Check for an open in the cable reel (cont'd):
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 1-1 or 1-2 indicated?

YES — **NO**

Open or increased resistance in the cable reel; replace the cable reel (see page 24-61).



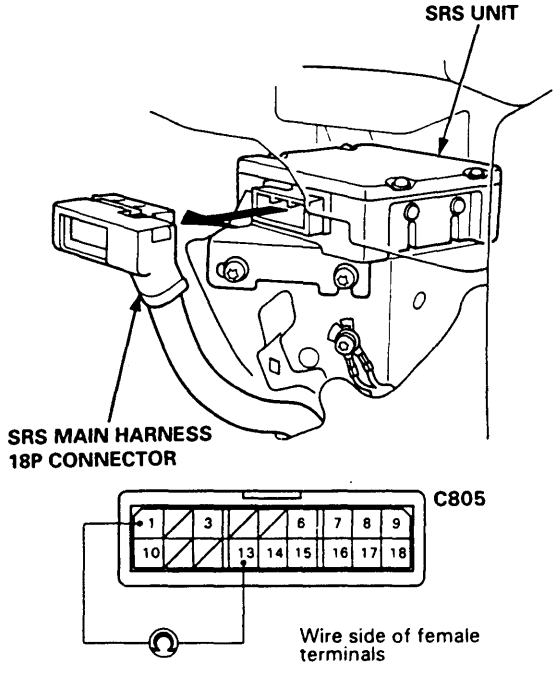
Check for an open in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Remove the special tool from the SRS main harness 2P connector, and connect the SRS service connector to the SRS main harness 2P connector.
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Check resistance between terminals No. 1 and No. 13 of the SRS main harness 18P connector. There should be 0 – 1.0 Ω.

Is the resistance as specified?

YES — **NO**

Poor contact at the SRS main harness 18P connector; check the connector.
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

Open or increased resistance in the SRS main harness; replace the SRS main harness.



DTC 1-3

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for a short to another wire in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the front passenger's airbag connector.
4. Connect the SRS service connector (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

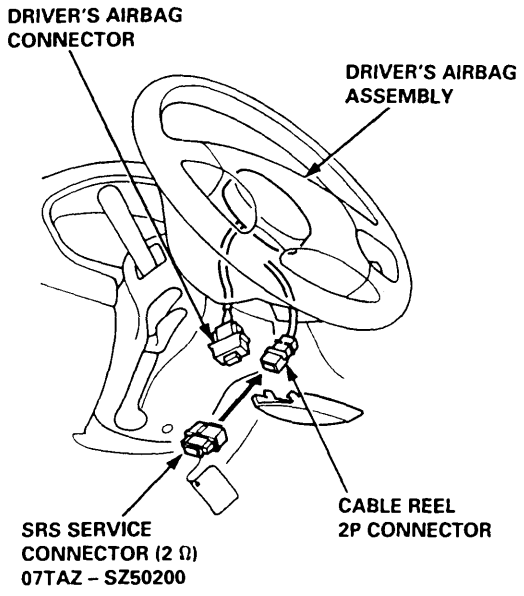
Is DTC 1-3 indicated?

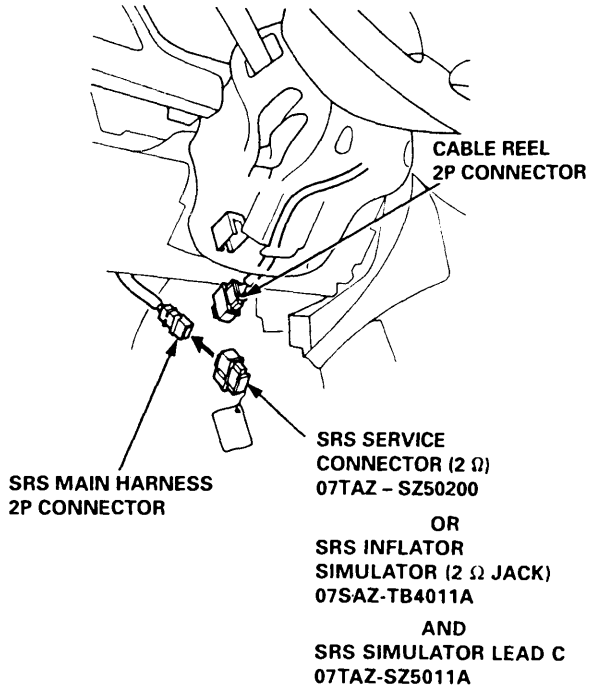
YES — NO

Short in the driver's airbag inflator; replace the driver's airbag assembly (see page 24-55).

Check for a short in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the SRS service connector (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector. (cont'd)

To page 24-37





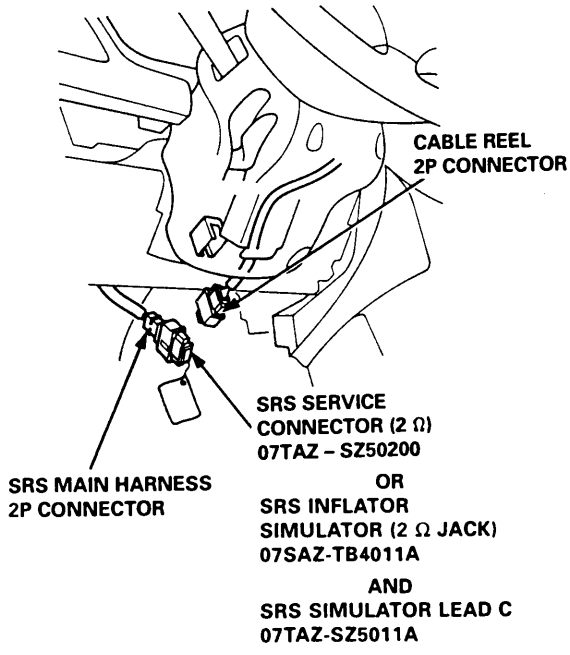
From page 24-36

Check for a short in the cable reel (cont'd):
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 1-3 indicated?

YES — NO

Short in the cable reel; replace the cable reel (see page 24-61).



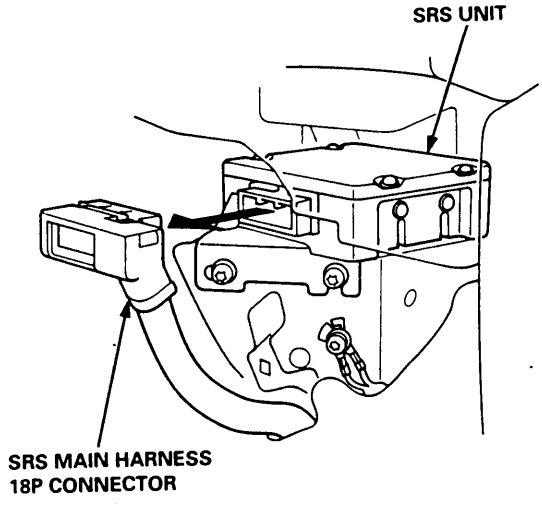
Check for a short in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Disconnect the SRS main harness 18P connector from the SRS unit.
   NOTE: Do not disconnect the SRS service connector (2 Ω).
4. Check resistance between terminals No. 1 and No. 13 of the SRS main harness 18P connector. There should be approx 2.0 – 3.0 Ω

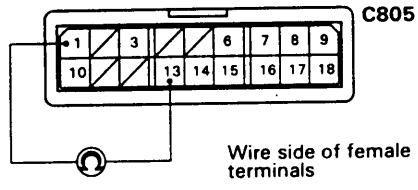
Is the resistance as specified?

YES — NO

Faulty SRS unit; replace the SRS unit (see page 24-65).

Short in the SRS main harness; replace the SRS harness.





DTC 1-4

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

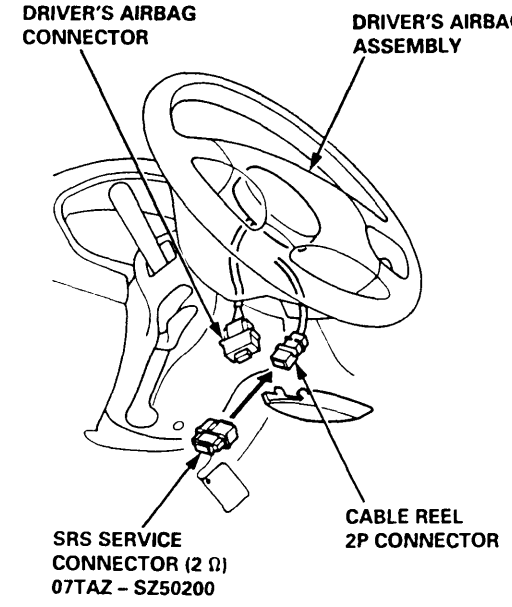
Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for a short to power in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the front passenger's airbag connector.
4. Connect the SRS service connector (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

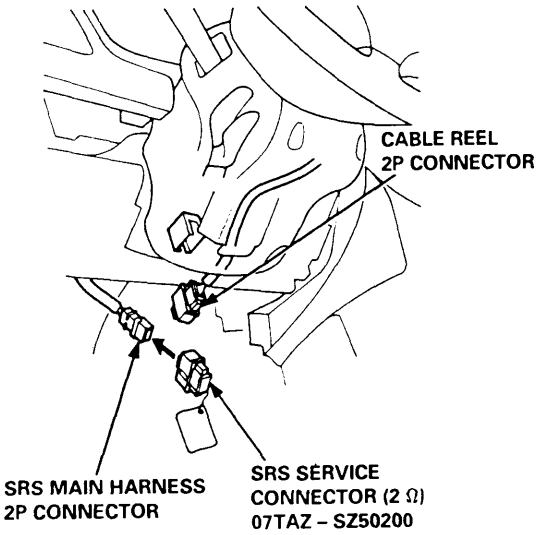
Is DTC 1-4 indicated?

YES — NO

Short to power in the driver's airbag inflator; replace the driver's airbag assembly (see page 24-55).



Check for a short to power in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the SRS service connector (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector. (cont'd)



To page 24-39

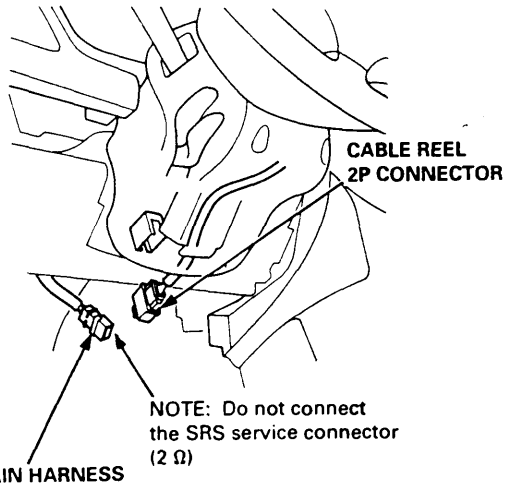
From page 24-38

Check for a short to power in the cable reel (cont'd):
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 1-4 indicated?

YES — **NO**

Short to power in the cable reel; replace the cable reel (see page 24-61).

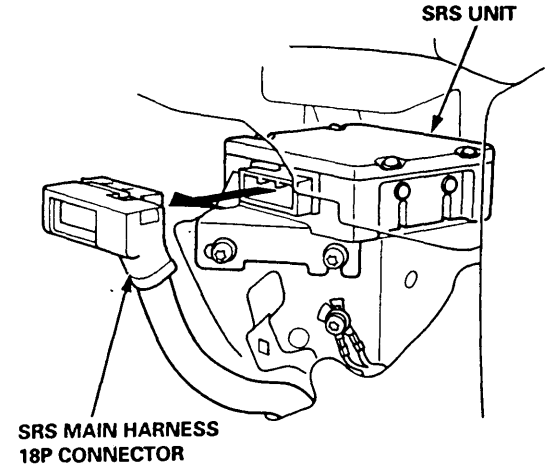


Check for a short to power in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Remove the SRS service connector (2 Ω) from the SRS main harness 2P connector.
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Connect a voltmeter between the No. 1 (+) terminal of the SRS main harness 18P connector and ground.
6. Turn the ignition switch ON (II), and measure the voltage. There should be 0.5 V or less.
7. Turn the ignition switch OFF.
8. Connect a voltmeter between the No. 13 (+) terminal of the SRS main harness 18P connector and ground.
9. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.

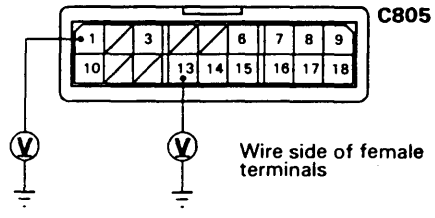
Are voltages as specified?

YES — **NO**

Faulty SRS unit; replace the SRS unit (see page 24-65).



Short to power in the SRS main harness; replace the SRS main harness.



DTC 1-5

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for a short to ground in the driver's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
   CAUTION: Do not disconnect the front passenger's airbag connector.
4. Connect the SRS service connector (2 Ω) to the cable reel 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

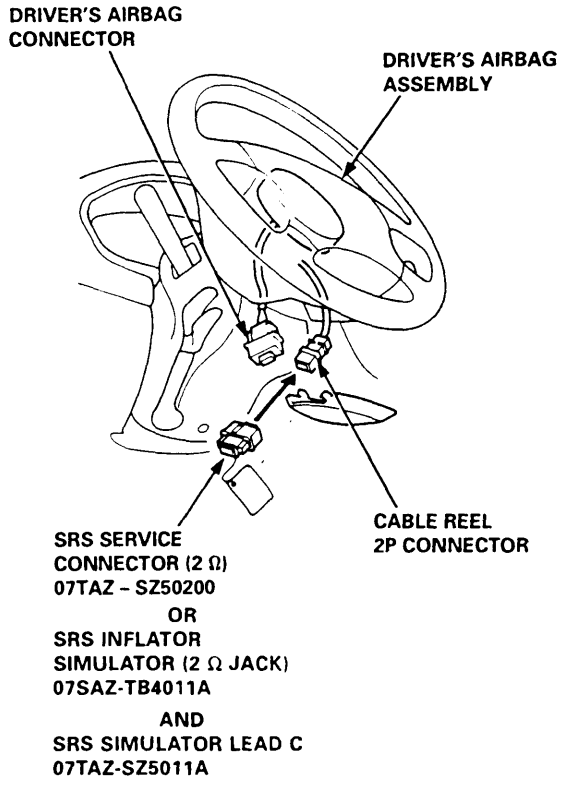
Is DTC 1-5 indicated?

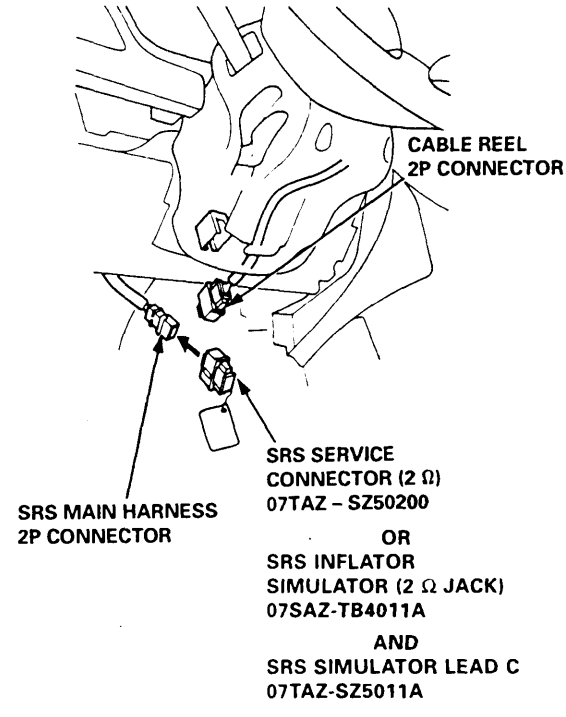
YES — NO

Short to ground in the driver's airbag inflator; replace the driver's airbag assembly (see page 24-55).

Check for a short to ground in the cable reel:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the SRS service connector (2 Ω) from the cable reel 2P connector.
3. Remove the dashboard lower cover, and disconnect the cable reel 2P connector from the SRS main harness.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector. (cont'd)

To page 24-41





From page 24-40

Check for a short to ground in the cable reel (cont'd):
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 1-5 indicated?

YES

Short to ground in the cable reel; replace the cable reel (see page 24-61).

NO

Check for a short to ground in the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the front passenger's airbag connector from the SRS main harness.
3. Remove the SRS service connector (2 Ω) from the SRS main harness 2P connector.
4. Check resistance between the No. 1 terminal of the SRS main harness 18P connector and ground, and between the No. 13 terminal of the SRS main harness 18P connector and ground.
   There should be 1 MΩ or more.

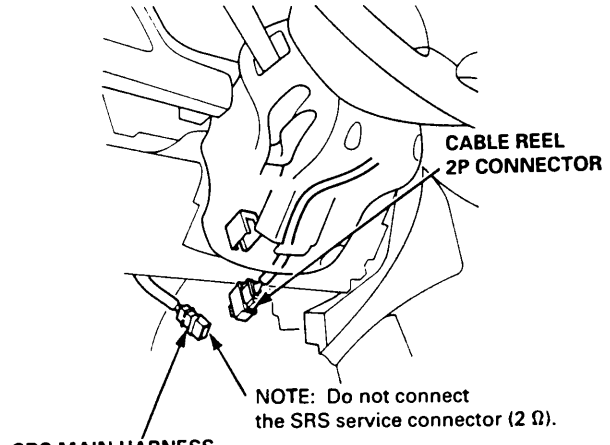
Is the resistance as specified?

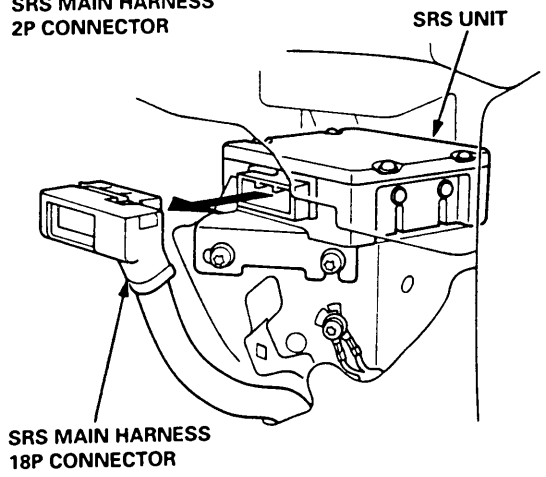
YES

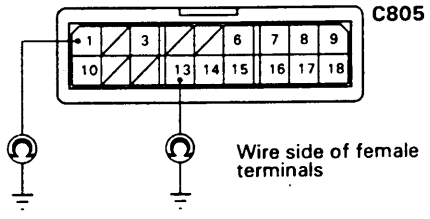
Faulty SRS unit; replace the SRS unit (see page 24-65).

NO

Short to ground in the SRS main harness; replace the SRS main harness.







DTC 2-1 and DTC 2-2

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for an open in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag 2P connector from the SRS main harness.
   CAUTION: Do not disconnect the driver's airbag connector.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 2-1 or DTC 2-2 indicated?

YES — NO

Open or increased resistance in the passenger's airbag inflator; replace the passenger's airbag assembly (see page 24-57).

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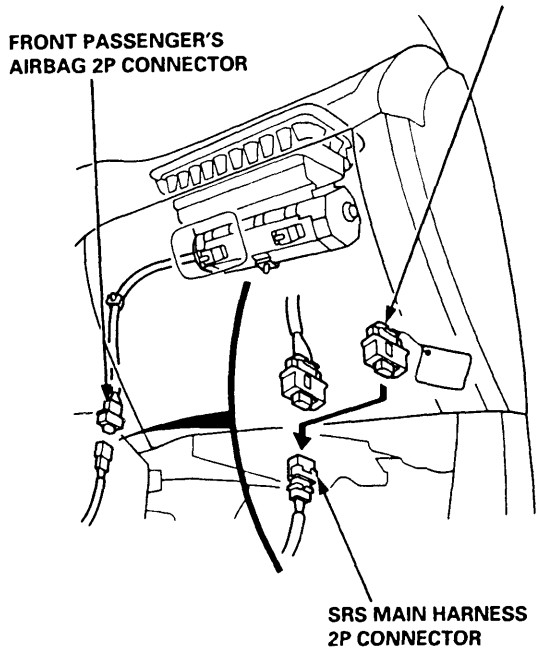
SRS SERVICE CONNECTOR (2 Ω) 07TAZ - SZ50200
OR
SRS INFLATOR SIMULATOR (2 Ω JACK) 07SAZ-TB4011A
AND
SRS SIMULATOR LEAD C 07TAZ-SZ5011A



From page 24-42

Check for an open in the SRS main harness:

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Remove the SRS service connector (2 Ω) from the SRS main harness 2P connector, then connect the SRS service connector to the SRS main harness 2P connector.
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Check resistance between the No. 10 terminal and No. 14 terminal of the SRS main harness 18P connector. There should be 0 – 1.0 Ω.

Is the resistance as specified?

YES

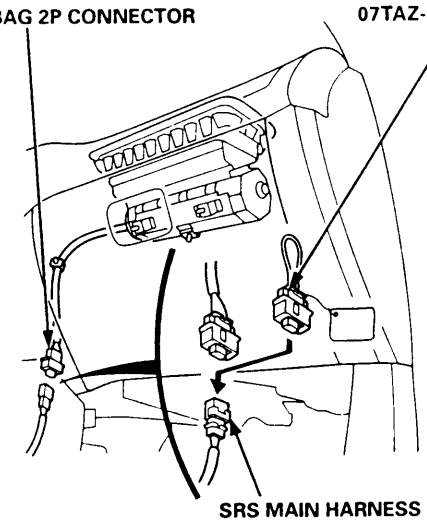
Poor contact at the SRS main harness 18P connector; check the connector.
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

NO

Open or increased resistance in the SRS main harness; replace the SRS main harness.

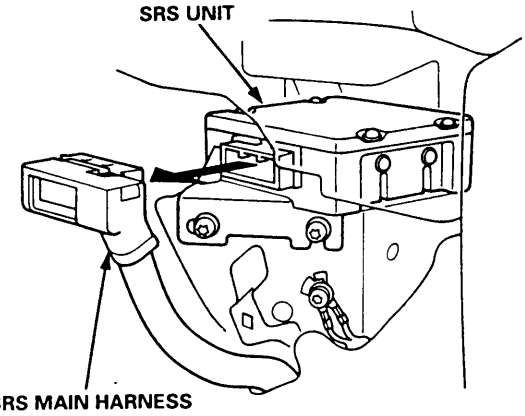
SRS SERVICE CONNECTOR
07SAZ – SW50200
OR
SRS INFLATOR SIMULATOR (JUMPER JACK)
07SAZ-TB4011A
AND
SRS SIMULATOR LEAD C
07TAZ-SZ5011A

FRONT PASSENGER'S AIRBAG 2P CONNECTOR

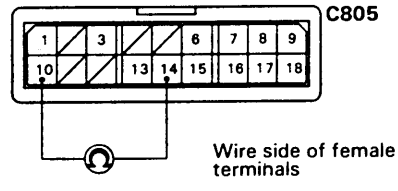


SRS MAIN HARNESS 2P CONNECTOR

SRS UNIT



SRS MAIN HARNESS 18P CONNECTOR



Wire side of female terminals

DTC 2-3

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for a short to another wire or decreased resistance in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag 2P connector from the SRS main harness.
   CAUTION: Do not disconnect the driver's airbag connector.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 2-3 indicated?

YES — NO

Short to another wire or decreased resistance in the passenger's airbag inflator; replace the passenger's airbag assembly (see page 24-57).

To page 24-45

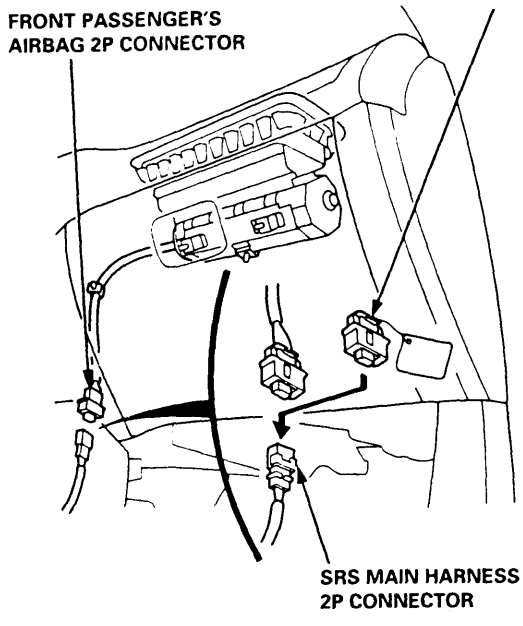
SRS SERVICE CONNECTOR (2 Ω) 07TAZ – SZ50200

OR

SRS INFLATOR SIMULATOR (2 Ω JACK) 07SAZ-TB4011A

AND

SRS SIMULATOR LEAD C 07TAZ-SZ5011A



From page 24-44

Check for a short to another wire or decreased resistance in the SRS main harness.

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Disconnect the SRS main harness 18P connector from the SRS unit.
   NOTE: Do not disconnect the SRS service connector (2 Ω).
4. Check resistance between the No. 10 terminal and No. 14 terminal of the SRS main harness 18P connector. There should be approx. 2.0 – 3.0 Ω.

Is the resistance as specified?

YES

Faulty SRS unit; replace the SRS unit (see page 24-65).

NO

Short to another wire or decreased resistance in the SRS main harness; replace the SRS main harness.

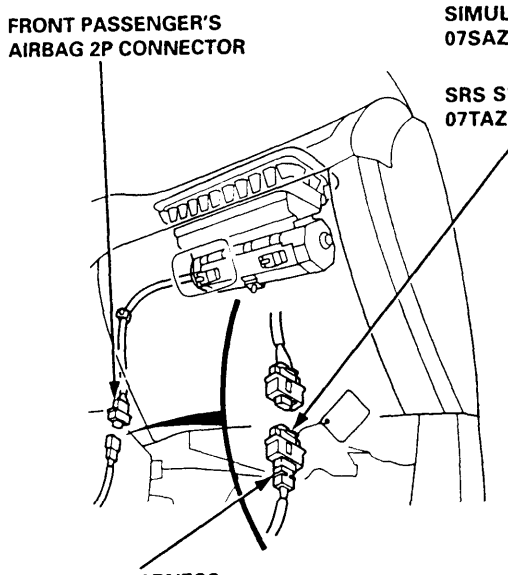
SRS SERVICE CONNECTOR (2 Ω) 07TAZ – SZ50200

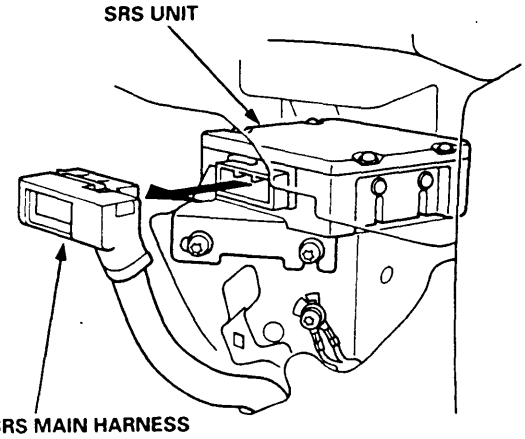
OR

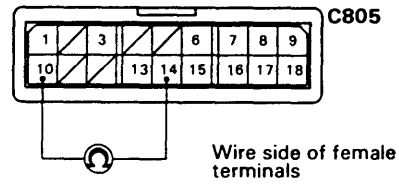
SRS INFLATOR SIMULATOR (2 Ω JACK) 07SAZ-TB4011A

AND

SRS SIMULATOR LEAD C 07TAZ-SZ5011A







DTC 2-4

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for a short to power in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the passenger's airbag 2P connector from the SRS main harness.
   CAUTION: Do not disconnect the driver's airbag connector.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 2-4 indicated?

YES — NO

Short to power in the passenger's airbag inflator; replace the front passenger's airbag assembly (see page 24-57).

To page 24-47

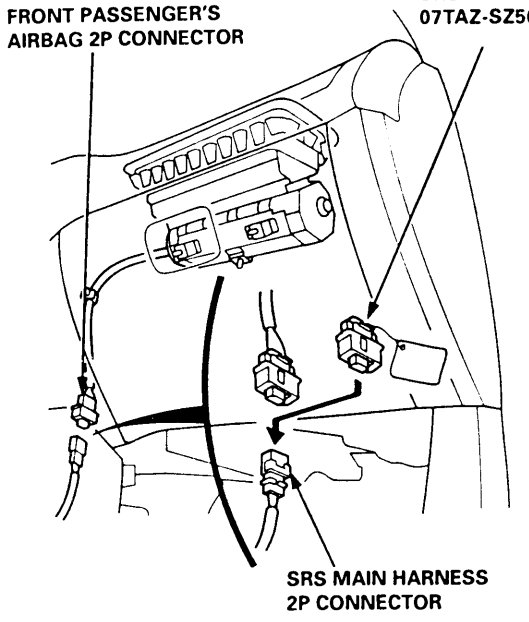
SRS SERVICE CONNECTOR (2 Ω) 07TAZ - SZ50200

OR

SRS INFLATOR SIMULATOR (2 Ω JACK) 07SAZ-TB4011A

AND

SRS SIMULATOR LEAD C 07TAZ-SZ5011A



From page 24-46

Check for a short to power in the SRS main harness:

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Remove the SRS service connector (2 Ω) from the SRS main harness 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Connect a voltmeter between the No. 10 (+) terminal of the SRS main harness 18P connector and ground.
7. Turn the ignition switch ON (II), and measure voltage. There should be 0.5 V or less.
8. Connect a voltmeter between the No. 14 (+) terminal of the SRS main harness 18P connector and ground, and measure voltage. There should be 0.5 V or less.

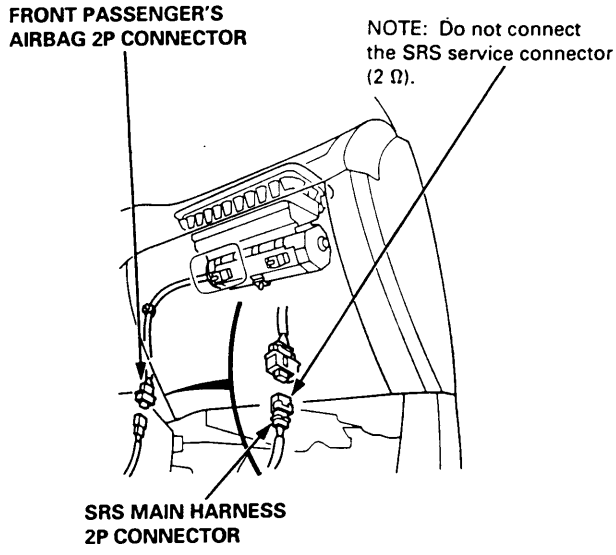
Are voltages as specified?

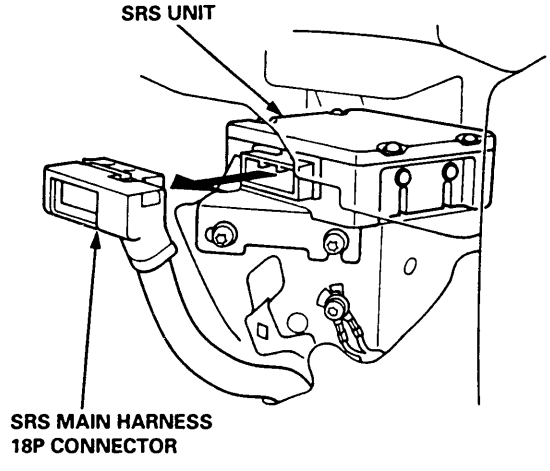
YES

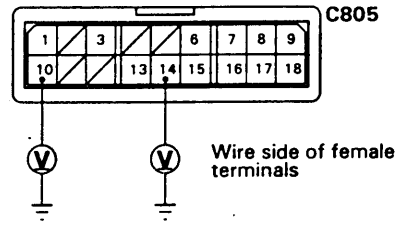
Faulty SRS unit; replace the SRS unit (see page 24-65).

NO

Short to power in the SRS main harness; replace the SRS main harness.







DTC 2-5

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Try to reproduce the SRS indicator light:
1. Erase the DTC memory (see page 24-22).
2. Turn the ignition switch ON (II), and check that the SRS indicator light comes on for about six seconds and goes off.

Does the SRS indicator light stay on?

YES — NO

Intermittent failure, system is OK at this time. See Troubleshooting of Intermittent Failures on page 24-22.

Check for a short to ground in the passenger's airbag inflator:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the front passenger's airbag 2P connector from the SRS main harness.
   CAUTION: Do not disconnect the driver's airbag connector.
4. Connect the SRS service connector (2 Ω) to the SRS main harness 2P connector.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Erase the DTC memory (see page 24-22).
7. Read the DTC (see page 24-20).

Is DTC 2-5 indicated?

YES — NO

Short to ground in the passenger's airbag inflator; replace the front passenger's airbag assembly (see page 24-57).

To page 24-49

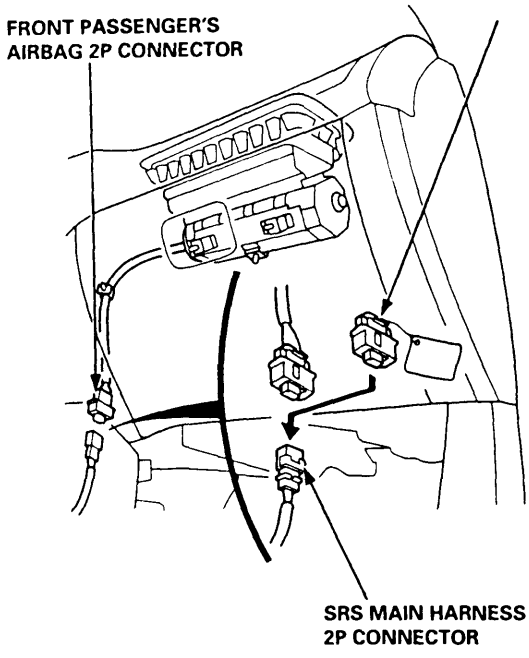
SRS SERVICE CONNECTOR (2 Ω) 07TAZ – SZ50200

OR

SRS INFLATOR SIMULATOR (2 Ω JACK) 07SAZ-TB4011A

AND

SRS SIMULATOR LEAD C 07TAZ-SZ5011A



From page 24-48

Check for a short to ground in the SRS main harness:

1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag 2P connector from the cable reel 2P connector.
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Remove the SRS service connector (2 Ω) from the SRS main harness 2P connector.
5. Check resistance between the No. 10 terminal of the SRS main harness 18P connector and ground, and between the No. 14 terminal of the SRS main harness 18P connector and ground.
   There should be 1 MΩ or more.

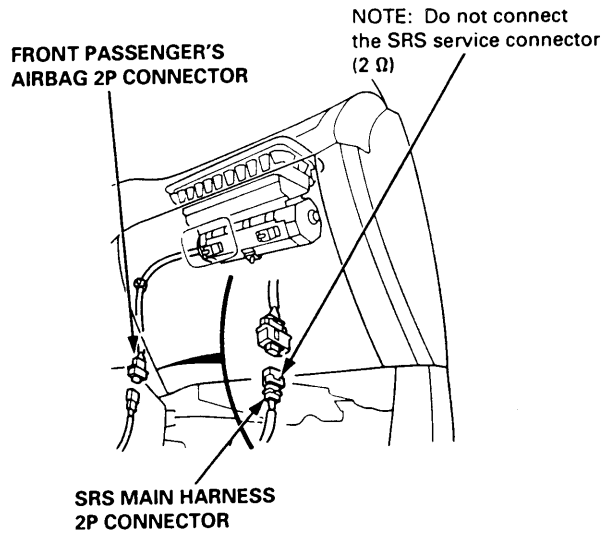
Is the resistance as specified?

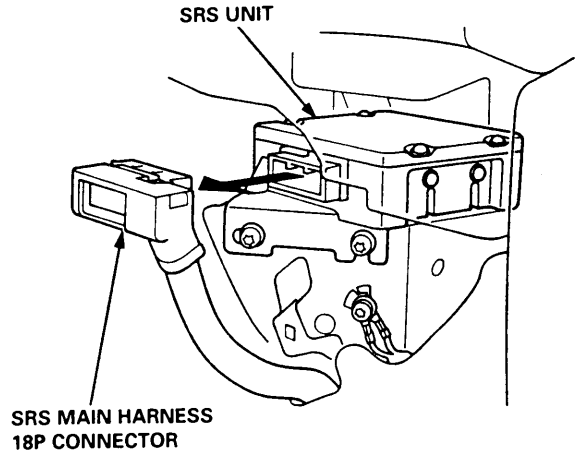
YES

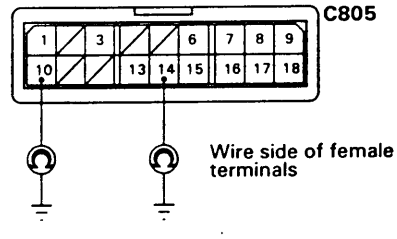
Faulty SRS unit; replace the SRS unit (see page 24-65).

NO

Short to ground in the SRS main harness; replace the SRS main harness.







DTC 8-6

CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Besides indicating an abnormality in the SRS unit, DTC 8-6 may also indicate that two problems equivalent to DTC 1-1 and 2-4, 1-4 and 2-1, or 1-4 and 2-4 occurred at the same time. Proceed in the order shown below.

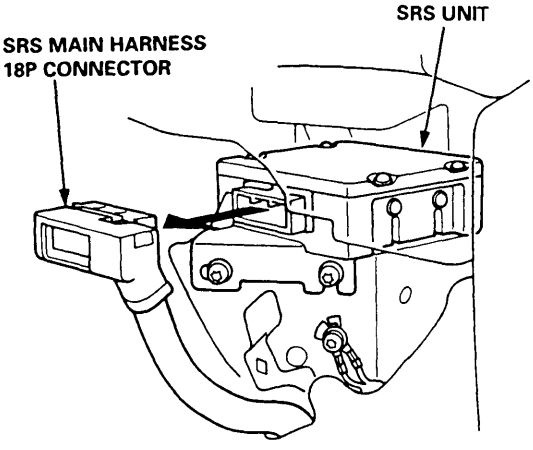
Check the SRS main harness:
1. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
2. Disconnect the driver's airbag and front passenger's airbag connectors (see page 24-18).
3. Disconnect the SRS main harness 18P connector from the SRS unit.
4. Reconnect the battery positive cable, then reconnect the negative cable.
5. Turn the ignition switch ON (II).
6. Connect a voltmeter and measure voltage between the No. 10 terminal of the SRS main harness 18P connector and ground, and between the No. 14 terminal of the SRS main harness 18P connector and ground. There should be approx. 0 – 0.5 V.

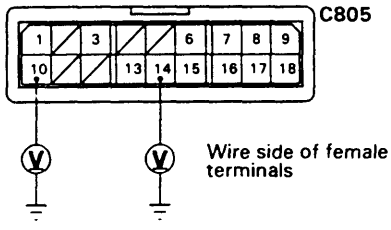
Are voltages as specified?

YES

NO

Short to power in the SRS main harness; replace the SRS main harness.





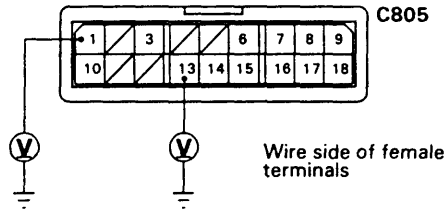
Check the SRS main harness and the cable reel:
1. Turn the ignition switch ON (II).
2. Connect a voltmeter and measure voltage between the No. 1 terminal of the SRS main harness 18P connector and ground, and between the No. 13 terminal and ground. There should be approx. 0 – 0.5 V.

Are voltages as specified?

YES

NO

Faulty SRS unit; replace the SRS unit (see page 24-65).



To page 24-51

From page 24-50

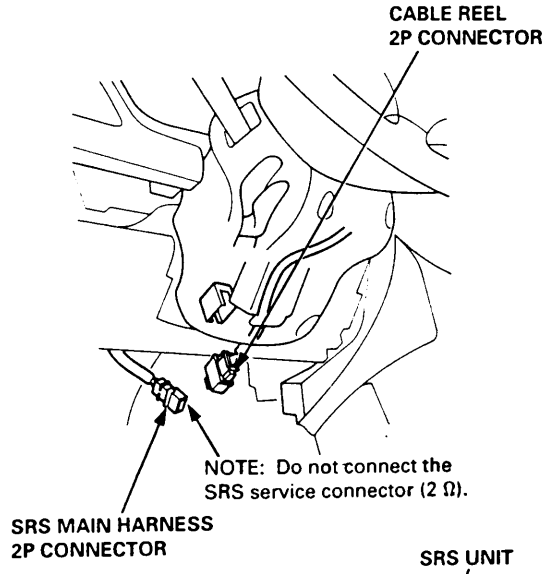
Check the cable reel:
1. Turn the ignition switch OFF.
2. Disconnect the cable reel 2P connector from the SRS main harness.
3. Turn the ignition switch ON (II).
4. Connect a voltmeter and meansure voltage between the No. 1 terminal of the SRS main harness 18P connector and ground, and between the No. 13 terminal of the SRS main harness 18P connector and ground.
   There should be approx. 0 – 0.5 V.

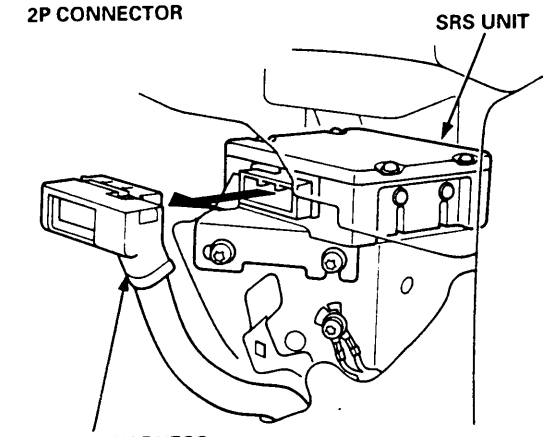
Are voltages as specified?

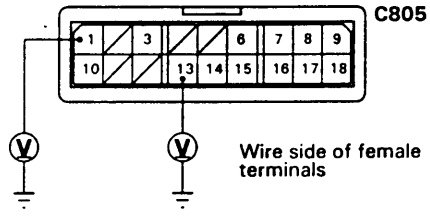
YES — NO

Short to power in the cable reel; replace the cable reel (see page 24-61).

Short to power in the SRS main harness; replace the SRS main harness.







DTC 9-2

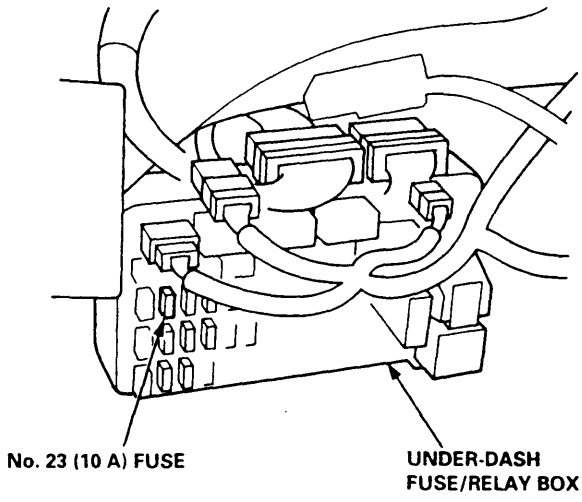
CAUTION: Whenever the ignition switch is ON (II), or has been turned OFF for less than three minutes, be careful not to bump the SRS unit; the airbags could accidentally deploy and cause damage or injuries.

Check the fuse:
1. Turn the ignition switch OFF.
2. Check for blown No. 23 (10 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

YES — NO

(F) To page 24-53

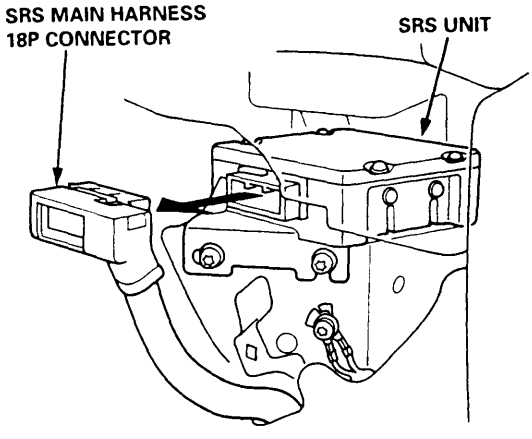


Replace the fuse. Turn the ignition switch ON (II) ; and check that the fuse doesn't blow.

Is the fuse OK?

YES — NO

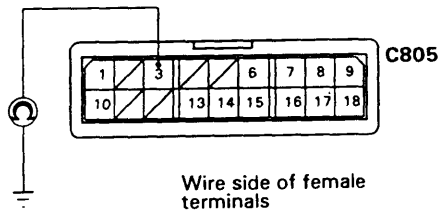
The problem has disappeared. Test-drive the vehicle and see Troubleshooting of Intermittent Failures on page 24-22.



Check for short to ground between the under-dash fuse/relay box and the SRS unit.
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's and front passenger's airbag connector (see page 24-18).
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Check resistance between the No. 3 terminal of the SRS main harness 18P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

YES — NO



Wire side of female terminals

Faulty SRS unit; replace the SRS unit (see page 24-65).

(G)
To page 24-53

(G) from page 24-52

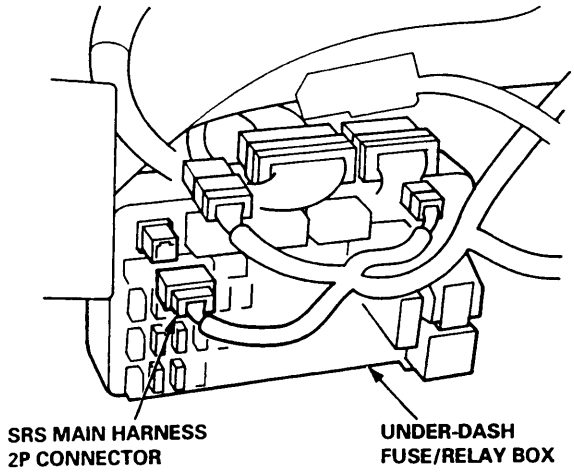
Check for short to ground in the SRS main harness:
1. Disconnect the SRS main harness 2P connector from the under-dash fuse/relay box.
2. Check resistance between the No. 3 terminal of the SRS main harness 18P connector and ground. There should be 1 MΩ or more.

Is the resistance as specified?

YES — **NO**

Short to ground in the under-dash fuse/relay box; replace the under-dash fuse/relay box.

Short to ground in the SRS main harness; replace the SRS main harness.



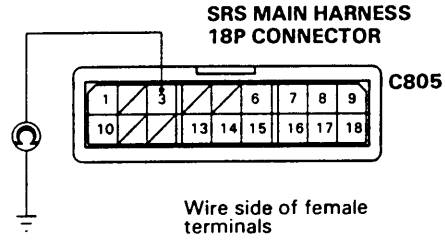
(F) From page 24-52

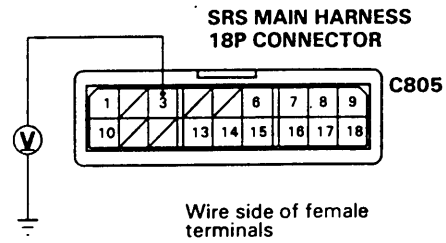
Check for an open in the SRS main harness:
1. Turn the ignition switch OFF.
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait for three minutes.
3. Disconnect the driver's and front passenger's airbag connector (see page 24-18).
4. Disconnect the SRS main harness 18P connector from the SRS unit.
5. Reconnect the battery positive cable, then reconnect the negative cable.
6. Connect a voltmeter between the No. 3 terminal of the SRS main harness 18P connector and ground.
7. Turn the ignition switch ON (II) , and measure voltage.

Is there battery voltage?

YES — **NO**

Poor contact at the SRS main harness 18P connector; check the connector.
- **If the connector is OK, substitute a known-good SRS unit, and recheck.**
- **If the problem is still present, replace the SRS main harness**





To page 24-54

(cont'd)

DTC 9-2 (cont'd)

From page 24-53

Check for an open in the SRS main harness:
1. Turn the ignition switch OFF.
2. Disconnect the SRS main harness 2P connector from the under-dash fuse/relay box.
3. Check resistance between the No. 2 terminal of the SRS main harness 2P connector and No. 3 terminal of the SRS main harness 18P connector.
   There should be 0 – 0.5 Ω.

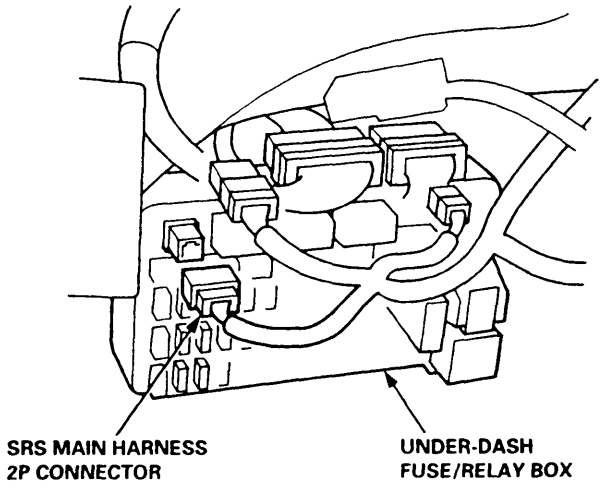
Is the resistance as specified?

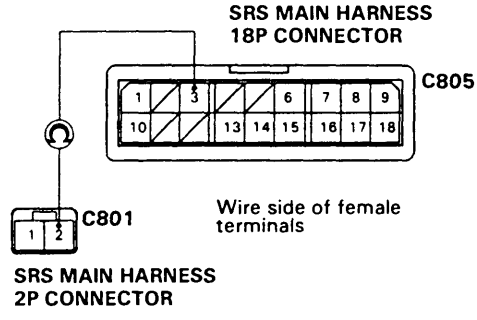
YES

Poor contact at the SRS main harness 2P connector; check the connector.
- **If the connector is OK, substitute a known-good under-dash fuse/relay box, and recheck.**
- **If the problem is still present, replace the SRS main harness.**

NO

Open in the SRS main harness; replace the SRS main harness.





Driver's Airbag Assembly

Replacement

After a collision in which the airbags were deployed, the airbag assemblies and the SRS unit must be replaced.

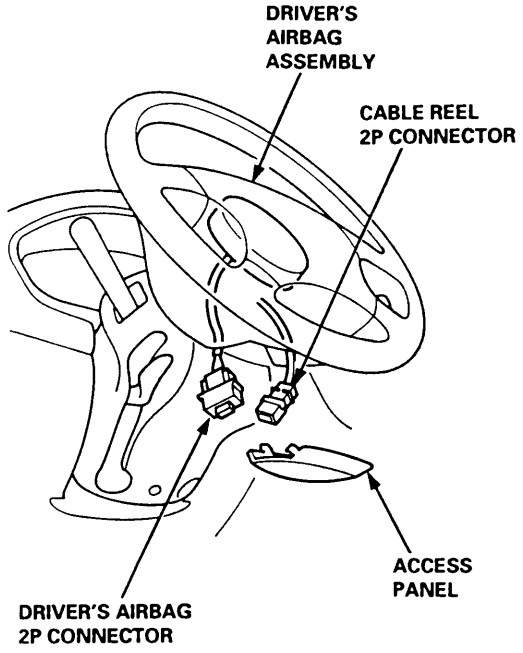
⚠ WARNING Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

CAUTION:
- **Do not install used SRS parts from another vehicle. When repairing, use only new SRS parts.**
- **Carefully inspect the airbag assembly before you install it. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Always disconnect the driver's airbag connector when the SRS main harness is disconnected.**
- **Do not disassemble or tamper with the airbag assembly.**

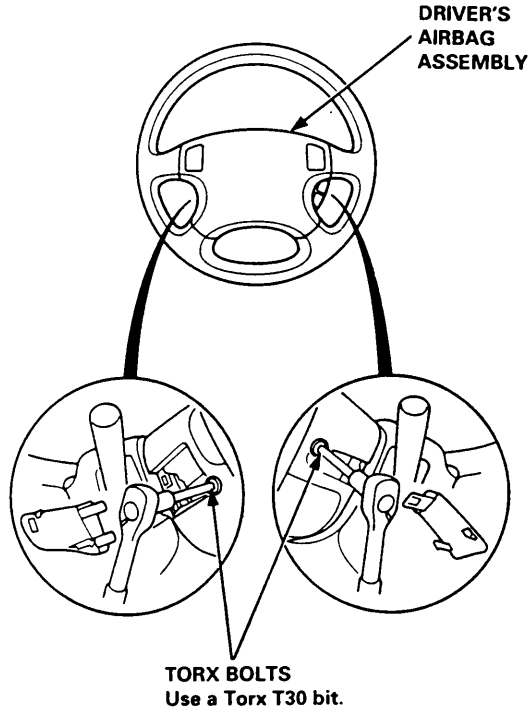
1. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.

2. Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.

   NOTE: When disconnected, the airbag connector is automatically shorted.



3. Remove the two Torx bolts using a Torx T30 bit, then remove the driver's airbag assembly.



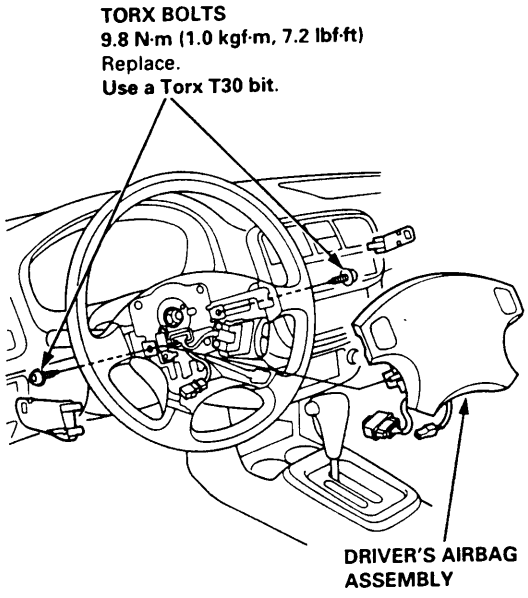
(cont'd)

Driver's Airbag Assembly

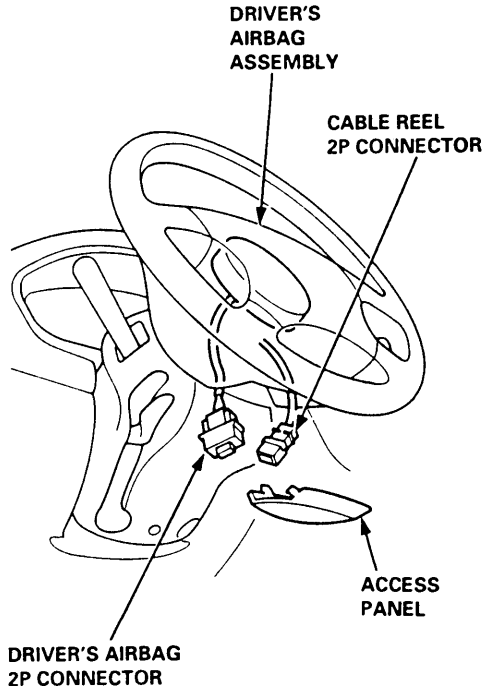
Replacement (cont'd)

CAUTION: Be sure to install the SRS wiring so that it is not pinched or interfering with other parts.

4. Place the new driver's airbag assembly into the steering wheel, and secure it with new Torx bolts.



5. Connect the driver's airbag 2P connector to the cable reel 2P connector, then install the access panel on the steering wheel.



6. Connect the battery positive cable, then connect the negative cable.

7. After installing the airbag assembly, confirm proper system operation:
   - Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
   - Make sure both horn buttons work.

Front Passenger's Airbag Assembly

Replacement

After a collision in which the airbags were deployed, the airbag assemblies and the SRS unit must be replaced.

⚠WARNING Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

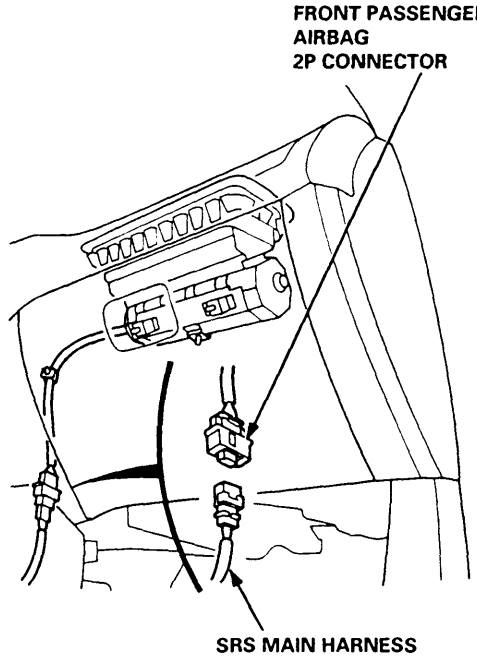
CAUTION:
- **Do not install used SRS parts from another vehicle. When repairing, use only new SRS parts.**
- **Carefully inspect the airbag assembly before you install it. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Always disconnect the front passenger's airbag connector when the SRS main harness is disconnected.**
- **Do not disassemble or tamper with the airbag assembly.**

1. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.

2. Remove the glove box (see section 20).

3. Disconnect the 2P connector between the front passenger's airbag and SRS main harness.

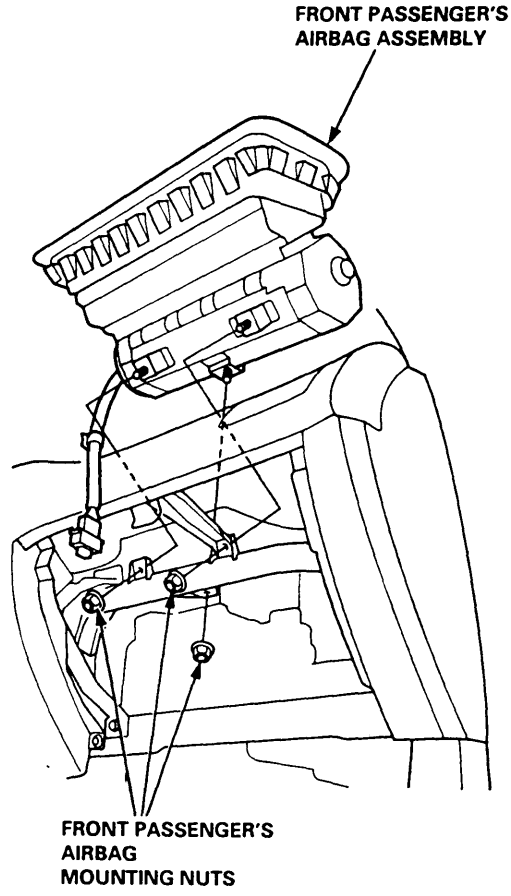
   NOTE: When disconnected, the airbag connector is automatically shorted.



4. Remove the three mounting nuts from the bracket, then remove the harness clip.

5. Lift the front passenger's airbag out of the dashboard.

   NOTE: The lid of the airbag assembly has pawls on its side which attach it to the dashboard. To remove the airbag assembly, cover the lid and dashboard with a cloth, and pry carefully with a flat tip screwdriver.



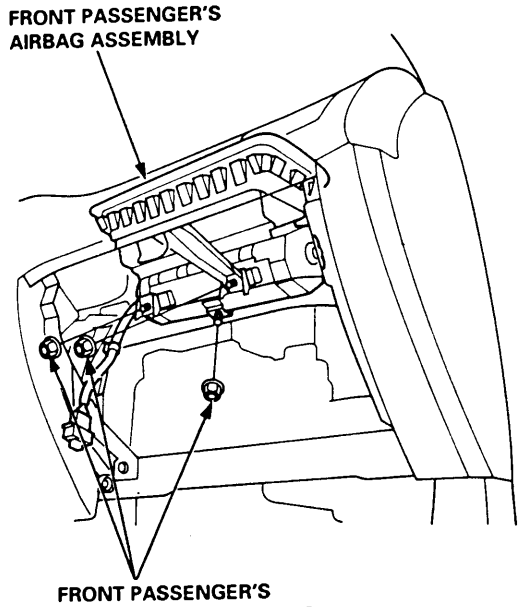
(cont'd)

Front Passenger's Airbag Assembly

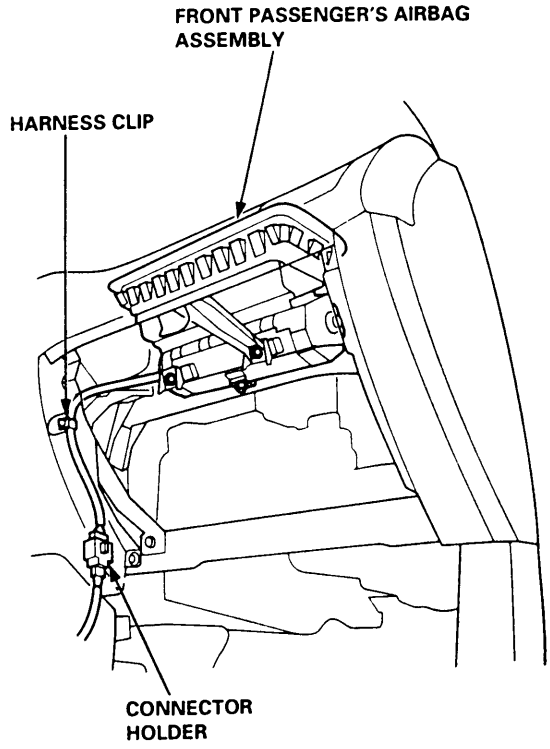
Replacement (cont'd)

CAUTION: Be sure to install the SRS wiring so that it is not pinched or interfering with other parts.

6. Place the new front passenger's airbag assembly into the dashboard. Tighten the front passenger's airbag mounting nuts.



7. Attach the airbag connector to the connector holder, then reinstall the glove box.



8. Connect the battery positive cable, then connect the negative cable.

9. After installing the airbag assembly, confirm proper system operation:
   Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.

Airbag Assembly

Disposal

Before scrapping any airbags (including those in a whole vehicle to be scrapped), the airbags must be deployed. If the vehicle is still within the warranty period, before you deploy the airbags, the Acura District Parts and Service Manager must give approval and/or special instructions. Only after the airbags have been deployed (as the result of vehicle collision, for example), can they be scrapped. If the airbags appear intact (not deployed), treat them with extreme caution.
Follow this procedure:

Deploying the Airbags: In-vehicle

NOTE: If an SRS vehicle is to be entirely scrapped, its air-bags should be deployed while still in the vehicle. The airbags should not be considered as salvageable parts and should never be installed in another vehicle.

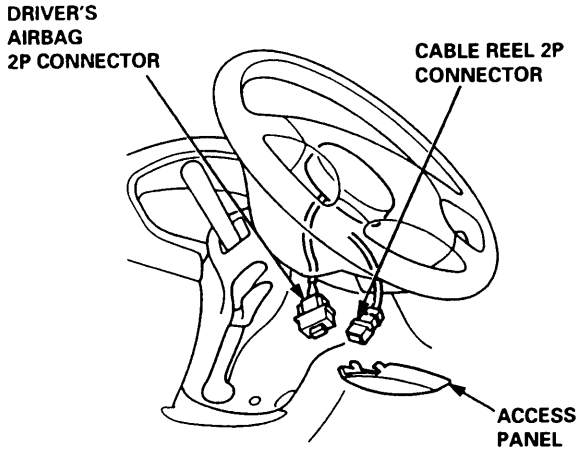
⚠WARNING Confirm that each airbag assembly is securely mounted; otherwise, severe personal injury could result from deployment.

1. Disconnect the battery negative cable, then disconnect the positive cable.

2. Confirm that the special tool is functioning properly by following the check procedure on the tool label or on page 24-60.

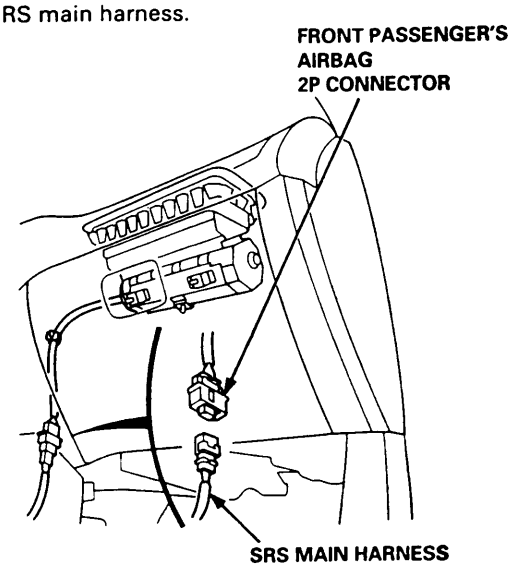
Driver's Airbag:

3. Remove the access panel, then disconnect the 2P connector between the driver's airbag and the cable reel.

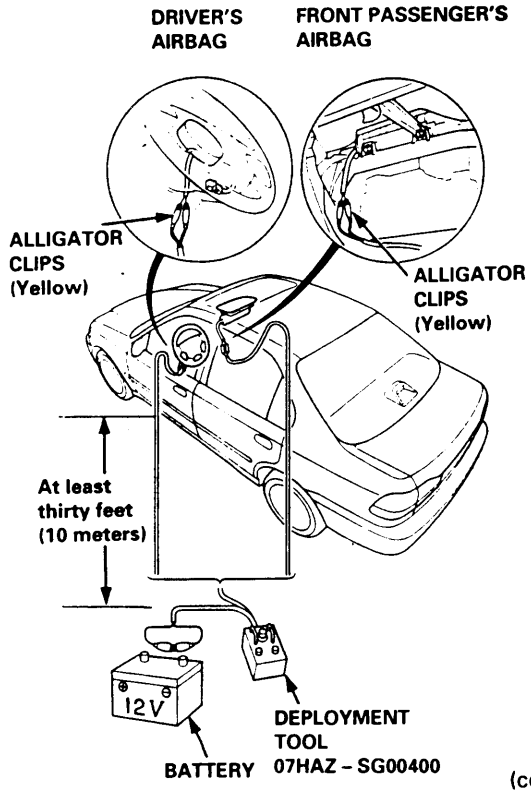


Front Passenger's Airbag:

4. Remove the glove box, then disconnect the 2P connector between the front passenger's airbag and SRS main harness.



5. Cut off the airbag connector, strip the ends of the airbag wires, and connect the deployment tool alligator clips to the airbag. Place the deployment tool at least thirty feet (10 meters) away from the airbag.



(cont'd)

Airbag Assembly

Disposal (cont'd)

6. Connect a 12 volt battery to the tool:

   - If the green light on the tool comes on, the airbag igniter circuit is defective and cannot deploy the airbag. Go to Damaged Airbag Special Procedure.
   - If the red light on the tool comes on, the airbag is ready to be deployed.

7. Push the tool's deployment switch. The airbag should deploy (deployment is both highly audible and visible; a loud noise and rapid inflation of the bag, followed by slow deflation).

   - If the airbags deploy and the green light on the tool comes on, continue with this procedure.
   - If an airbag doesn't deploy, yet the green light comes ON, its igniter is defective. Go to Damaged Airbag Special Procedure.

   ⚠WARNING During deployment, the airbag assembly can become hot enough to burn you. Wait thirty minutes after deployment before touching the assembly.

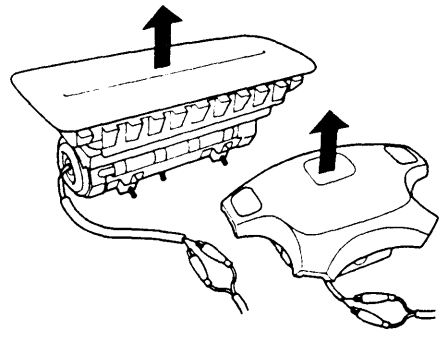
8. Dispose of the complete airbag assembly. No part of it can be reused. Place it in a sturdy plastic bag, and seal it securely.

   CAUTION:
   - **Wear a face shield and gloves when handling a deployed airbag.**
   - **Wash your hands and rinse them well with water after handling a deployed airbag.**

Deploying the Airbag: Out-of-vehicle

NOTE: If an intact airbag assembly 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:

⚠WARNING Position the airbag assembly face up, outdoors on flat ground at least thirty feet (10 m) from any obstacles or people.



1. Confirm that the special tool is functioning properly by following the check procedure on this page or on the tool label.
2. Follow steps 5, 6, 7, and 8 of the in-vehicle deployment procedure.

Damaged Airbag Special Procedure

⚠WARNING If an airbag cannot be deployed, it should not be treated as normal scrap; it should still be considered a potentially explosive device that can cause serious injury.

1. If installed in a vehicle, follow the removal procedure on page 24-55.
2. In all cases, make a short circuit by twisting together the two airbag inflator wires.
3. Package the airbag in exactly the same packaging that the new replacement part came in.
4. Mark the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" so it does not get confused with your parts stock.
5. Contact your Acura District Parts and Service Manager for how and where to return it for disposal.

Deployment Tool: Check Procedure

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 battery and the yellow clips.

Cable Reel

Replacement

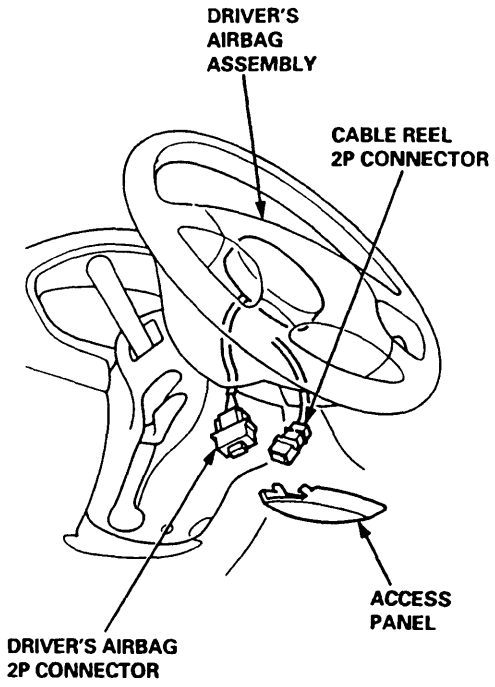
⚠WARNING Store a removed airbag assembly with the pad surface up. If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

CAUTION:
- **Carefully inspect the airbag assembly before installing it. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**
- **Always disconnect the airbag connector when the SRS main harness is disconnected.**
- **Do not disassemble or tamper with the airbag assembly.**

1. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.

2. Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel.

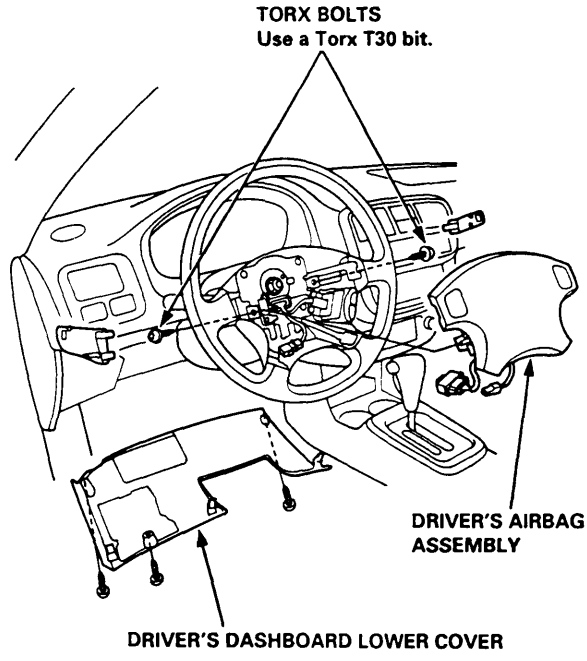
   NOTE: When disconnected, the airbag connector is automatically shorted.



3. Make sure the wheels are aligned straight ahead.

4. Remove the driver's dashboard lower cover.

5. Remove the two Torx bolts from the steering wheel, and disconnect the horn connector. Then remove the driver's airbag assembly.

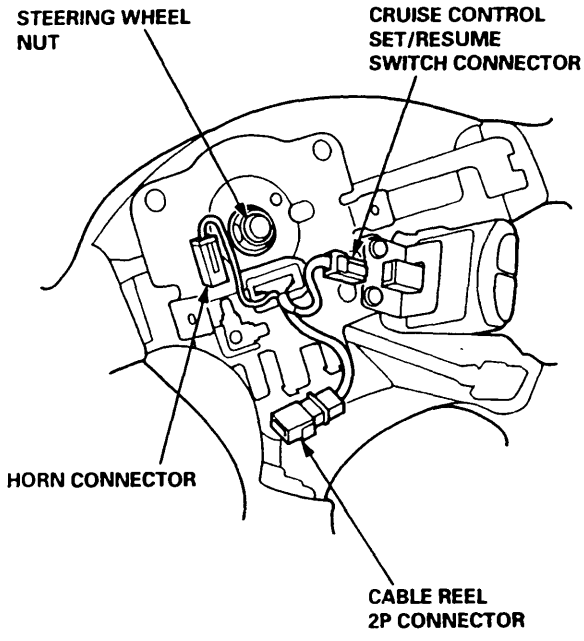


(cont'd)

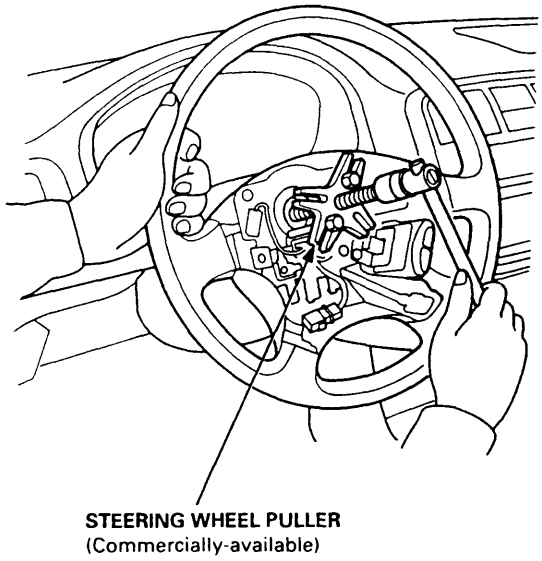
Cable Reel

Replacement (cont'd)

6. Disconnect the connectors from the horn and cruise control set/resume switches, then remove the steering wheel nut.

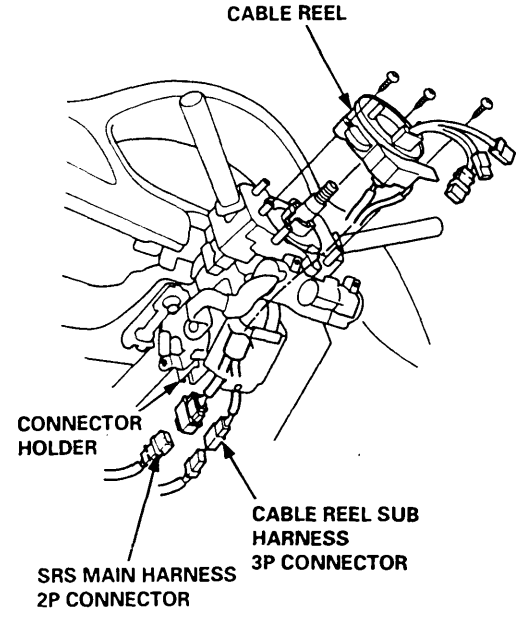


7. Remove the steering wheel with a steering wheel puller.



8. Remove the column covers.

9. Disconnect the 3P connector between the main wire harness and cable reel sub-harness, and the 2P connector between the cable reel and SRS main harness.

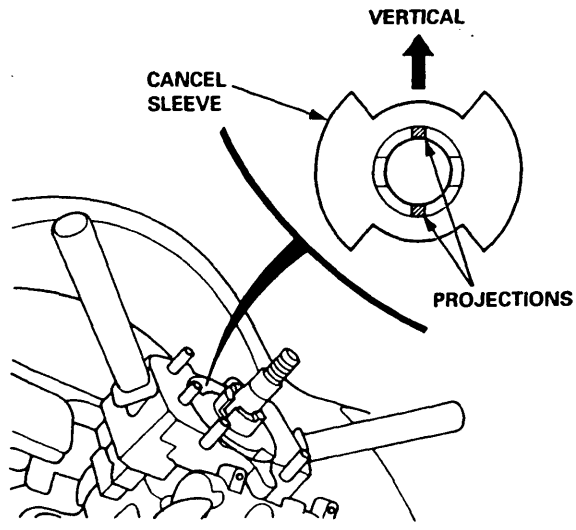


10. Remove the cable reel from the column.

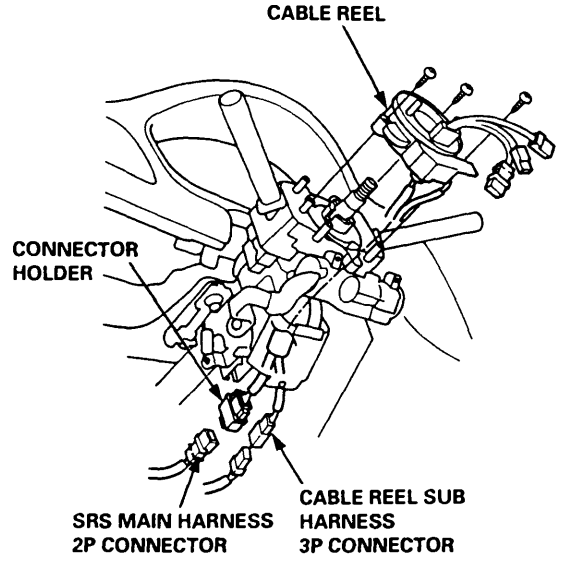
CAUTION:

- **Before installing the steering wheel, the front wheels should be aligned straight ahead.**
- **Be sure to install the harness wires so that they are not pinched or interfering with other parts.**
- **After reassembly, confirm that the wheels are still turned straight ahead and that the steering wheel spoke angle is correct (road test). If minor spoke angle adjustment is necessary, do so only by adjusting the tie-rods, not by removing and repositioning the steering wheel.**

11. Set the cancel sleeve so that the projections are aligned vertically.

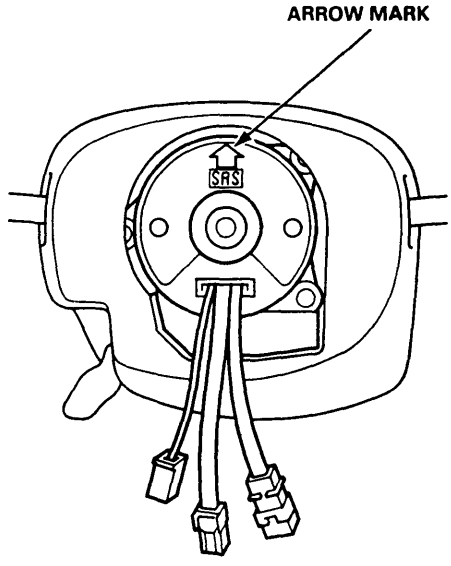


12. Carefully install the cable reel on the steering column shaft. Then connect the 3P connector to the cable reel sub harness, and connect the 2P connector to the SRS main harness.

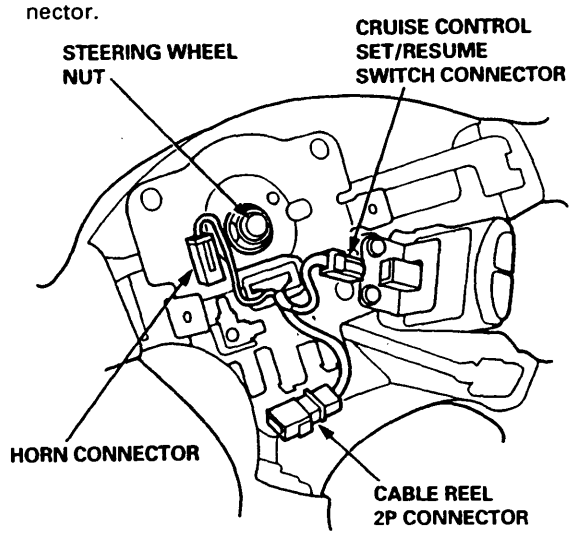


13. Install the steering column covers.

14. 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 (approximately two and a half turns) until the arrow mark on the cable reel label points straight up.



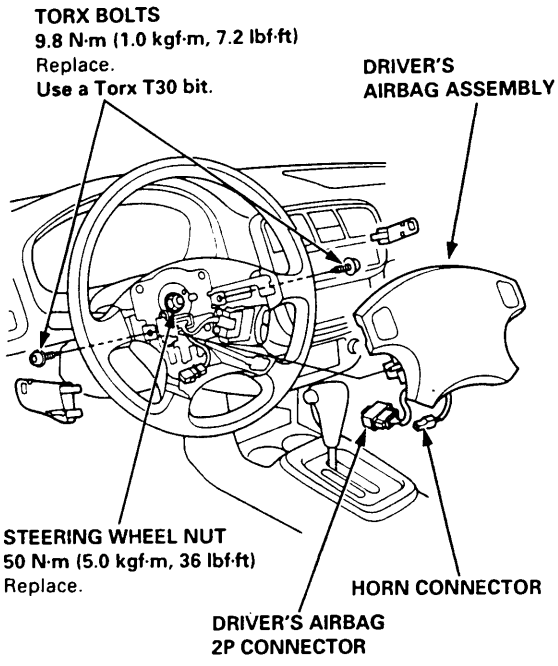
15. Install the steering wheel, then connect the horn connector and cruise control set/resume switch connector.



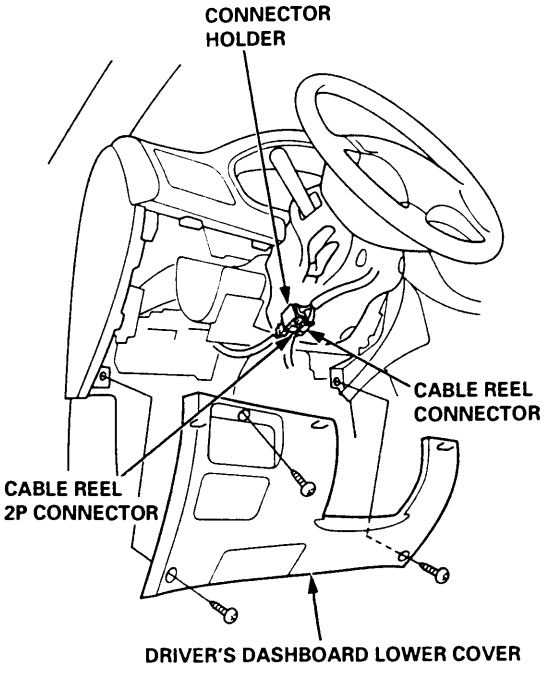
(cont'd)

Replacement (cont'd)

16. Install the steering wheel nut, and connect the horn connector to the steering wheel. Then install the driver's airbag assembly.



17. Attach the cable reel 2P and 3P connector to the connector holder. Then install the driver's dashboard lower cover.



18. Reconnect the driver's airbag 2P connector to the cable reel 2P connector. and reinstall the access panel on the steering wheel.

19. Reconnect the battery positive cable, then the negative cable.

20. After installing the cable reel, confirm proper system operation:

- Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
- Make sure both horn buttons work.
- Make sure the headlight and wiper switches work.
- Go for a test drive, and make sure the cruise control switches work.

SRS Unit

Replacement

CAUTION:
- **Before disconnecting any part of the SRS main harness, disconnect the airbag connectors.**
- **During installation or replacement, do not bump (impact wrench, hammer etc.) the area near the SRS unit.**
- **Do not damage the SRS unit terminals or connectors.**
- **Do not disassemble the SRS unit; it has no serviceable parts.**
- **Store the SRS unit in a clean, dry area.**
- **Do not use any SRS unit which has been subjected to water or shows signs of being dropped or improperly handled, such as dents, cracks or deformation.**

1. Disconnect the battery negative cable, then disconnect the positive cable from the battery, and wait at least three minutes.

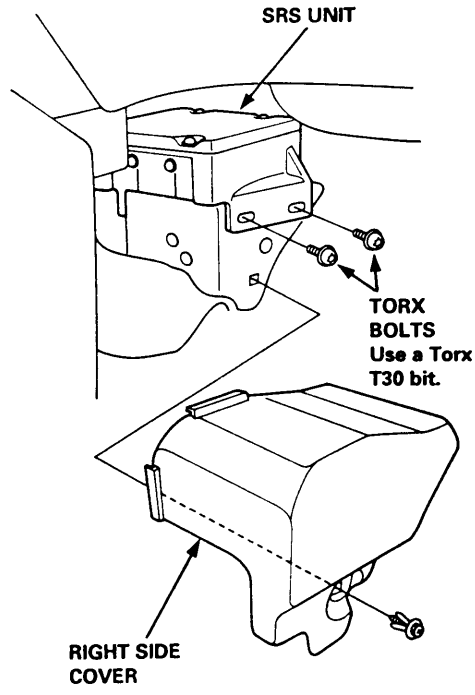
2. Disconnect the airbag connectors:

   NOTE: When disconnected, the airbag connectors are automatically shorted.

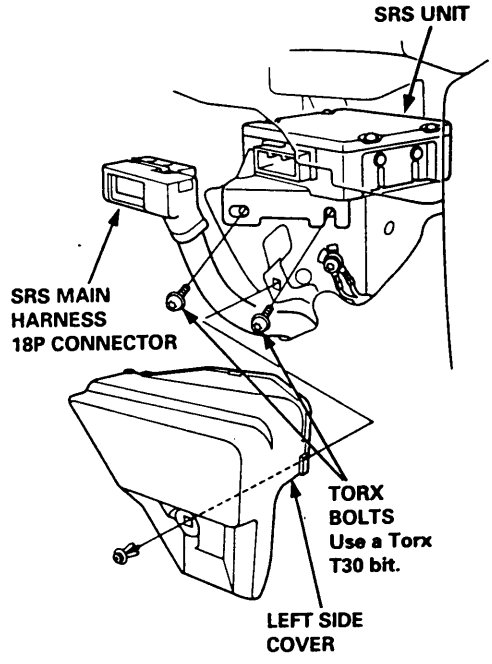
   Driver's Side:
   Remove the access panel from the steering wheel, then disconnect the 2P connector between the driver's airbag and cable reel (see page 24-18).

   Front Passenger's Side:
   Disconnect the 2P connector between the front passenger's airbag and SRS main harness (see page 24-18).

3. Remove the right side cover from the SRS unit.



4. Remove the left side cover from the SRS unit, then disconnect the SRS main harness 18P connector from the SRS unit.



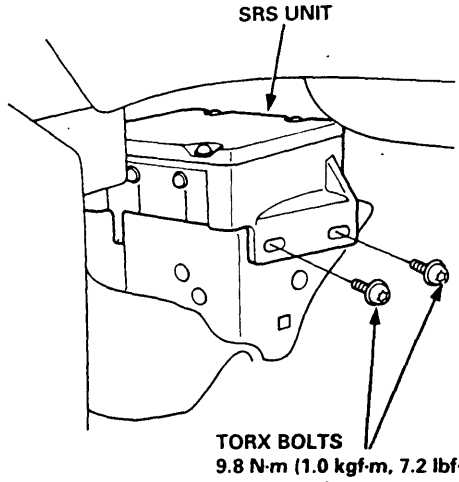
5. Remove the four Torx bolts from the SRS unit, then pull out the SRS unit from the driver's side.

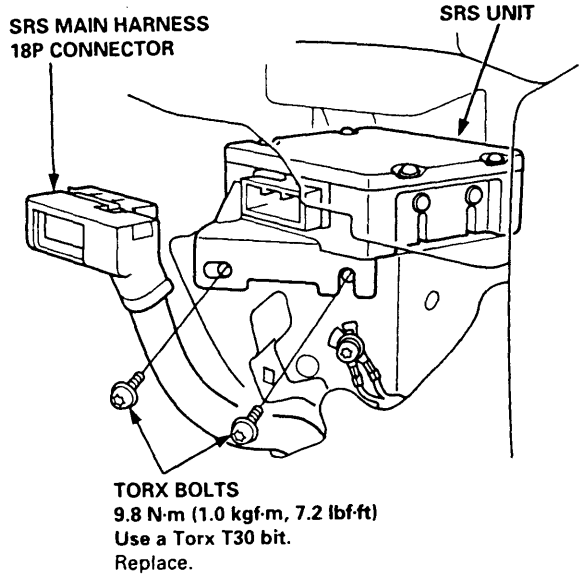
(cont'd)

Replacement (cont'd)

CAUTION:
- **Be sure to install the SRS wiring so that it is not pinched or interfering with other parts.**
- **When tightening the Torx bolts to the specified torque after replacement, be careful to turn them in so that their heads rest squarely on the brackets.**

6. Install the new SRS unit.





7. Connect the SRS main harness 18P connector to the SRS unit; push it into position until it clicks.

8. Install the SRS unit covers (right and left).

   NOTE: Make sure the covers snap together in the middle.

9. Reconnect the driver's airbag 2P connector to the cable reel 2P connector, then reinstall the access panel on the steering wheel.

10. Reconnect the front passenger's airbag connector to the SRS main harness.

11. Reconnect the battery positive cable, then the negative cable.

12. After installing the SRS unit, confirm proper system operation: Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.