

INTRODUCTION

How to Use This Manual

This manual is divided into 23 sections. The first page of each section is marked with a black tab that lines up with its corresponding thumb index tab on this page. You can quickly find the first page of each section without looking through a full table of contents. The symbols printed at the top corner of each page can also be used as a quick reference system.

Each section includes:

1. A table of contents, or an exploded view index showing:
 - Parts disassembly sequence.
 - Bolt torques and thread sizes.
 - Page references to descriptions in text.
2. Disassembly/assembly procedures and tools.
3. Inspection.
4. Testing/troubleshooting.
5. Repair.
6. Adjustments.

Special Information

⚠ WARNING Indicates a strong possibility of severe personal injury or loss of life if instructions are not followed.

CAUTION: Indicates a possibility of personal injury or equipment damage if instructions are not followed.

NOTE: Gives helpful information.

CAUTION: Detailed descriptions of *standard workshop* procedures, safety principles and service operations are not included. Please note that this manual contains warnings and cautions against some specific service methods which could cause **PERSONAL INJURY**, damage a vehicle or make it unsafe. Please understand that these warnings cannot cover all conceivable ways in which service, whether or not recommended by HONDA MOTOR might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA MOTOR investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA MOTOR, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

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HONDA MOTOR CO., LTD.
Service Publication Office

General Info



Special Tools



Specifications

specs

Maintenance



Engine



Cooling



Fuel and Emissions



Transaxle



* Steering



Suspension



Brakes
(Including ABS)



* Body



* Heater and
Air Conditioning



* Electrical
(Including SRS)



As sections with * include SRS components, special precautions are required when servicing.



General Information

Chassis and Engine Numbers	1-2
Identification Number Locations	1-3
Warning/Caution Label Locations	1-4
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Chassis and Engine Numbers

Vehicle Identification Number SHHCC75400U000001

Manufacturer, Make and Type of Vehicle _____
 SHH: HONDA OF THE U.K.MFG., LTD. England.
 HONDA Passenger car

Body Type _____
 CC7: ACCORD

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

Vehicle Grade _____
 4: 2.0i
 5: 2.0i S
 6: 2.0i LS
 7: 2.0i ES

Fixed Code _____

Auxiliary Number _____

Factory Code _____
 U: Honda of the U.K. Manufacturing in England

Model Year _____
 0: 1993

Serial Number _____

Engine Number F20Z1-1000101

Engine Type _____
 F20Z1: 2.0 l Sequential Multiport
 Fuel-injected 131 PS engine
 Unleaded gasoline with CATA
 F20Z2: 2.0 l Sequential Multiport
 Fuel-injected 115 PS engine
 Unleaded gasoline with CATA

Serial Number _____

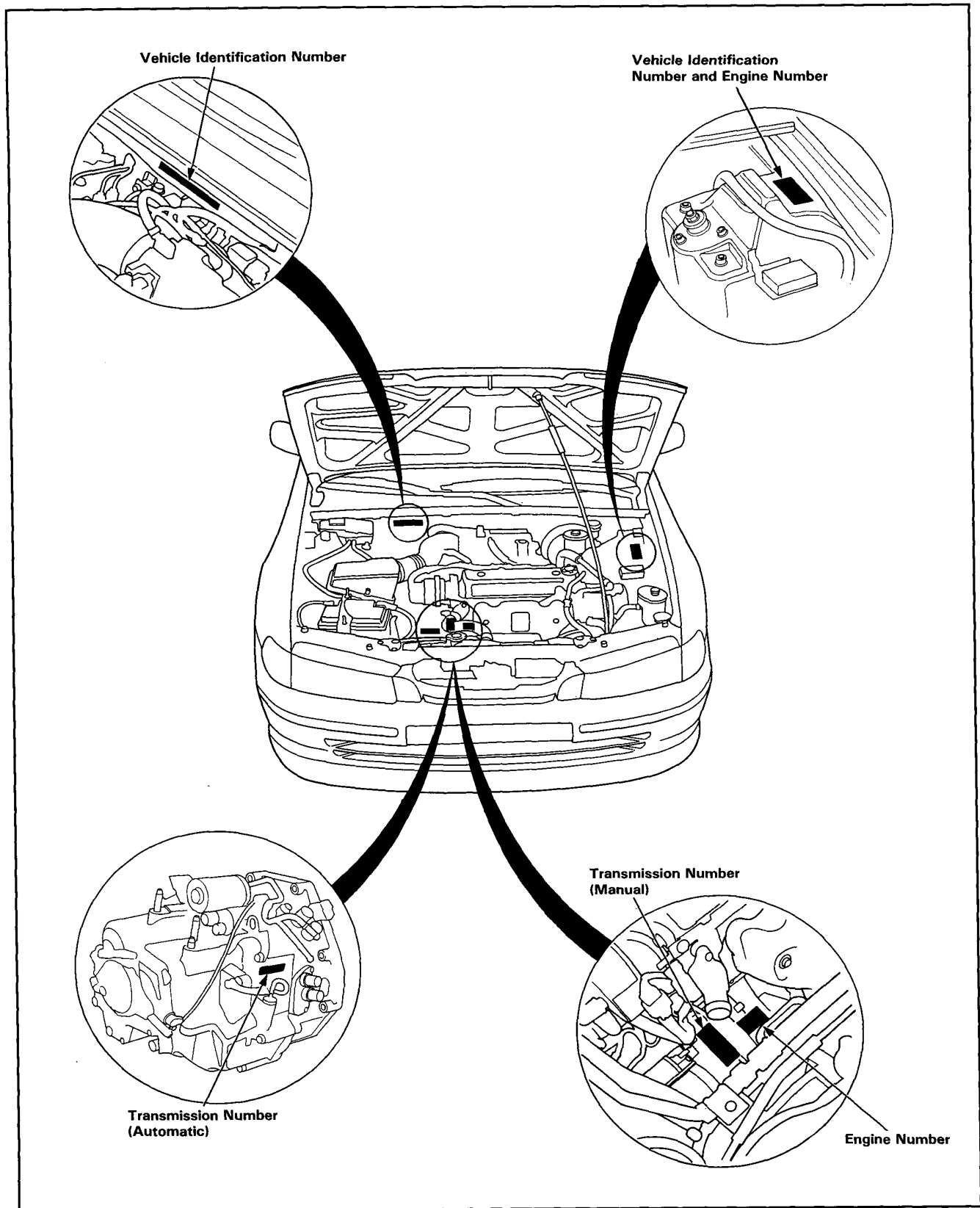
Transmission Number MP6A-2000001

Transmission Type _____
 MP6A: Automatic
 N2C4: Manual for F20Z2 engine
 N2S4: Manual for F20Z1 engine

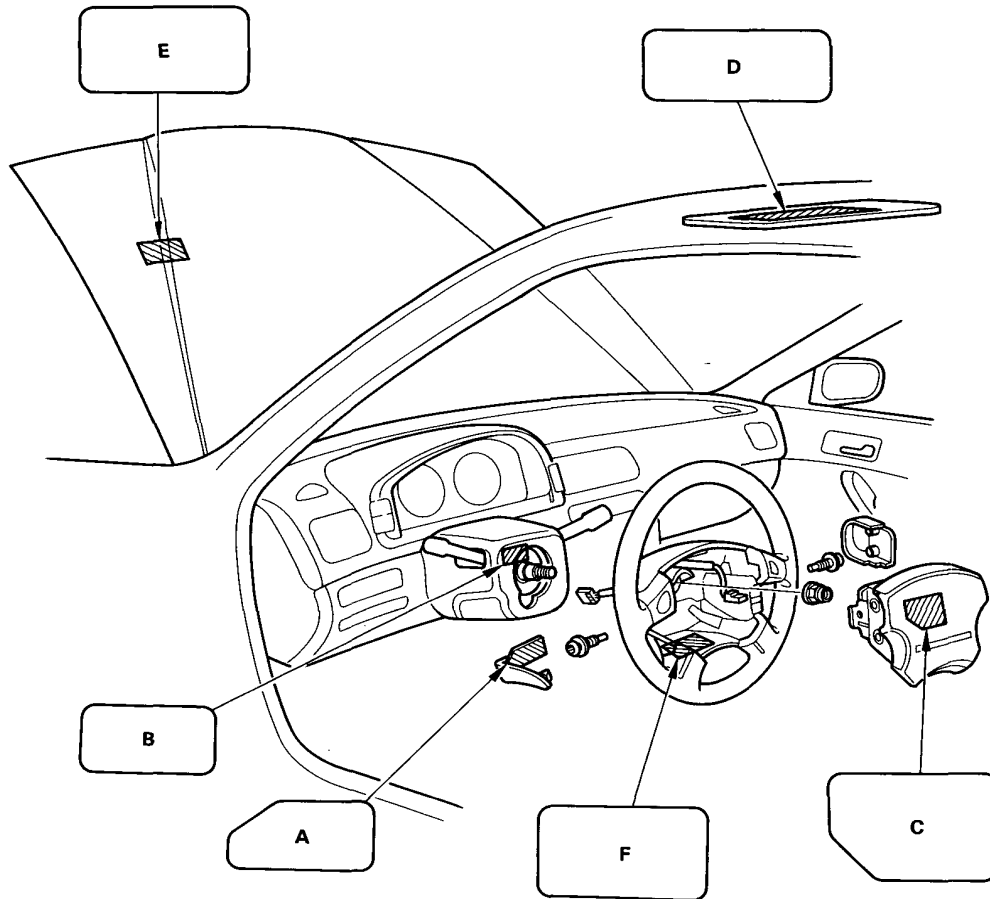
Serial Number _____
 Automatic: 2000001 –
 Manual: 1000001 –



Identification Number Locations



Warning/Caution Label Locations



A: MAINTENANCE LID CAUTION

CAUTION **SRS**
 BEFORE MAINTENANCE, SWITCH OFF THE IGNITION.
 ATTENTION
 AVANT TOUT ENTRETIEN, COUPER LE CONTACT.
 ACHTUNG
 VOR WARTUNG ZÜNDUNG AUSSCHALTEN.
 LET OP
 ZET HET KONTAKTSLOT AF ALVORENS MET HET
 ONDERHOUD TE BEGINNEN.

B: SLIP RING CAUTION

SRS
 ● CAUTION REFER TO THE SHOP MANUAL.
 ● ACHTUNG WERKSTATT HANDBUCH LESEN.
 ● ATTENTION SE REPORTER AU MANUEL
 D'ATELIER.
 ● WAARSCHUWING LEES HET WERKPLAATS
 HANDBOEK.

C: MONITOR CAUTION

CAUTION **SRS**
 REFER TO THE SHOP MANUAL
 ATTENTION
 SE REPORTER AU MANUEL D'ATELIER
 WAARSCHUWING
 LEES HET WERKPLAATS HANDBOEK
 ACHTUNG
 ● WERKSTATT HANDBUCH LESEN
 ● DER GASGENERATOR IN DIESEM GEHÄUSE
 DARF NUR FÜR INSASSEN-RÜCKHALTESYSTEME
 MIT LUFTSACK IN KRAFTFAHRZEUGE
 MONTIERT WERDEN.
 DIE MONTAGE UND DEMONTAGE
 DES GASGENERATORS
 DARF NUR VON DAFÜR
 GESCHULTEM PERRSONAL
 VORGENCHMEN VERDEN.



D: DRIVER INFORMATION (SUNVISOR)

SRS ALWAYS WEAR YOUR SEAT BELT

- THIS CAR IS EQUIPPED WITH A DRIVER AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (S.R.S.).
- IT IS DESIGNED TO SUPPLEMENT THE SEAT BELT.
- IF YOUR SRS INDICATOR LIGHTS WHILE DRIVING, SEE YOUR AUTHORIZED HONDA DEALER.

SRS ATTACHEZ TOUJOURS VOTRE CEINTURE

- CE VEHICULE EST ÉQUIPÉ D'UN COUSSIN D'AIR POUR LE CONDUCTEUR QUI CONSTITUE UN SYSTEME DE RETENUE COMPLEMENTAIRE (S.R.S.).
- CE COUSSIN D'AIR COMPLETE LA FONCTION DE LA CEINTURE DE SÉCURITÉ.
- SI LE TMOIN SRS S'ALLUME PENDANT LA CONDUITE, ADRESSEZ-VOUS A VOTRE CONCESSIONNAIRE HONDA OFFICIEL.

SRS SICHERHEITSGURTE
BEI JEDER FAHRT ANLEGEN

- DIESES FAHRZEUG BESITZT EINEN FAHRER-AIRBAG ALS ZUSÄTZLICHES RÜCKHALTESYSTEM (S.R.S.).
- ES IST EINE ERGÄNZUNG ZUM SICHERHEITGURT.
- WENN DUE SRS-KONTROLLEUCHTE WAHREND DER FAHRT AUFLEUCHTET, UMGEHEND FINEN HONDA HÄNDLER AUFsuchen.

SRS DRAAG ALTIJD UW VEILIGHEIDSGORDEL

- DIT VOERTUIG IS UITGERUST MET EEN LUCHTKUSSEN AAN DE BESTUURDESKANT ALTS EXTRA BESCHERMING (S.R.S.).
- DIT IS ONTWERPEN ALS EXTRA BESCHERMING BIJ DE VEILIGHEIDSGORDEL.
- ALS HEL SRS-WAARSCHUWINGSLAMPJE GAAT BRANDEN ONDER HET RIJDEN. NEEM DAN KONTAKT OP MET EEN HONDA DEALER.

E: WARNING (ENGINE HOOD)

WARNING **SRS**
THIS VEHICLE IS EQUIPPED WITH A AIRBAG AS A SUPPLEMENTAL RESTRAINT SYSTEM (SRS). ALL S.R.S. ELECTRICAL WIRING AND CONNECTORS ARE COLORED YELLOW. DO NOT USE ELECTRICAL TEST EQUIPMENT ON THESE CIRCUITS. TAMPERING WITH OR DISCONNECTING THE S.R.S. WIRING COULD RESULT IN ACCIDENTAL FIRING OF THE INFLATOR OR MAKE THE SYSTEM INOPERATIVE, WHICH MAY RESULT IN SERIOUS INJURY.

ATTENTION **SRS**
CE VEHICULE EST EQUIPE D'UN COUSSIN D'AIR QUI CONSTITUE UN SYSTEME DE RETENUE COMPLEMENTAIRE (S.R.S.)
TOUS LES FILS ET CONNECTEURS ELECTRIQUES DU SYSTEME DE RETENUE COMPLEMENTAIRE (S.R.S.) SONT DE COULEUR JAUNE. N'UTILISEZ PAS UN EQUIPEMENT D'ESSAIS ELECTRIQUES SUR CES CIRCUITS. NE TOUCHEZ PAS ET NE DEBRANCHEZ PAS LES FILS DU SYSTEME S.R.S. CAR CECI POURRAIT DE TRADUIRE PAR LE DECLENCHEMENT ACCIDENTEL DU GONFLEUR OU RENDRE LE SYSTEME INOPERANT ET VOUS EXPOSER AINSI A DE GRAVES BLESSURES.

WARNUNG **SRS**
DIESES FAHRZEUG IST MIT EINEM AIRBAG (SRS) ALS ZUSÄTZLICHEM RÜCKHALTESYSTEM AUSGERÜSTET. ALLE ELEKTRISCHEN KABEL, SOWIE DIE ZUGEHÖRIGEN STECKVERBINDER DES S.R.S. -SYSTEMS SIND IN GELBER FARBE AUSGEFÜHRT.
KEINE ELEKTRISCHEN PRÜGERÄTE AN DIE S.R.S. -VERKABELUNG ANSCHLIEßEN. VERÄNDERN ODER UNTERBRECHEN DER S.R.S. -VERKABELUNG KANN UNKONTROLLIERTES ZÜNDEN DES GASGENERATORS AUSLÖSEN. ODER DAS SYSTEM AUßER FUNKTION SETZEN. WAS ZU ERNSTHAFTEN VERLETZUNGEN FÜHREN KANN.

F: COVER CAUTION

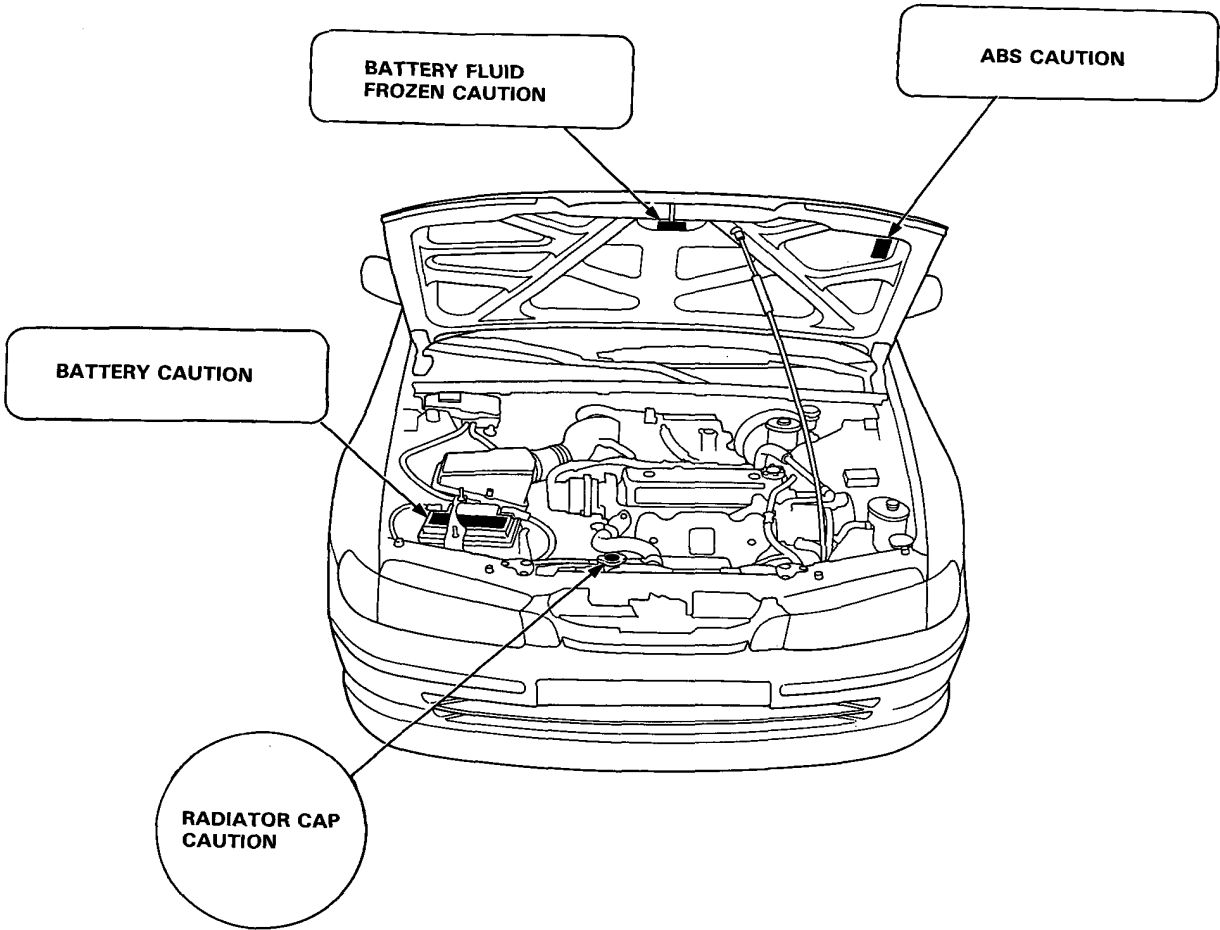
CAUTION **SRS**
ACHTUNG

- REFER TO THE SHOP MANUAL
- SE REPORTER AU MANUEL D'ATELIER.
- WERKSTATT HANDBUCH LESEN.
- LEES HET WERKPLAATSHANDBOEK.

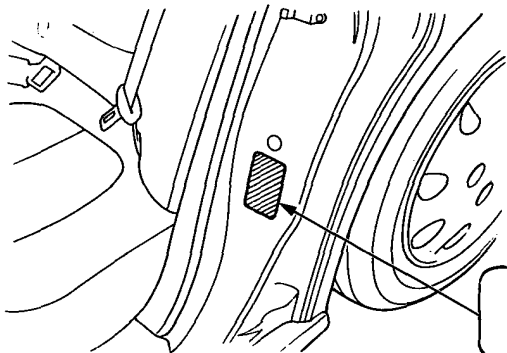
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Warning/Caution Label Locations

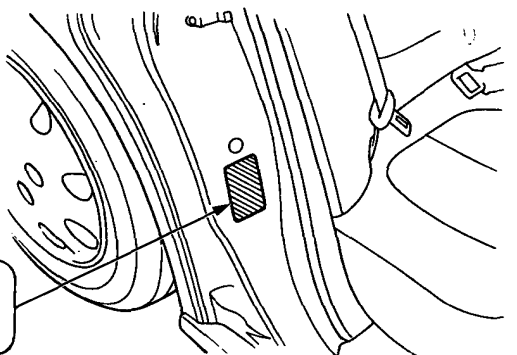
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LHD



RHD



TIRE INFORMATION



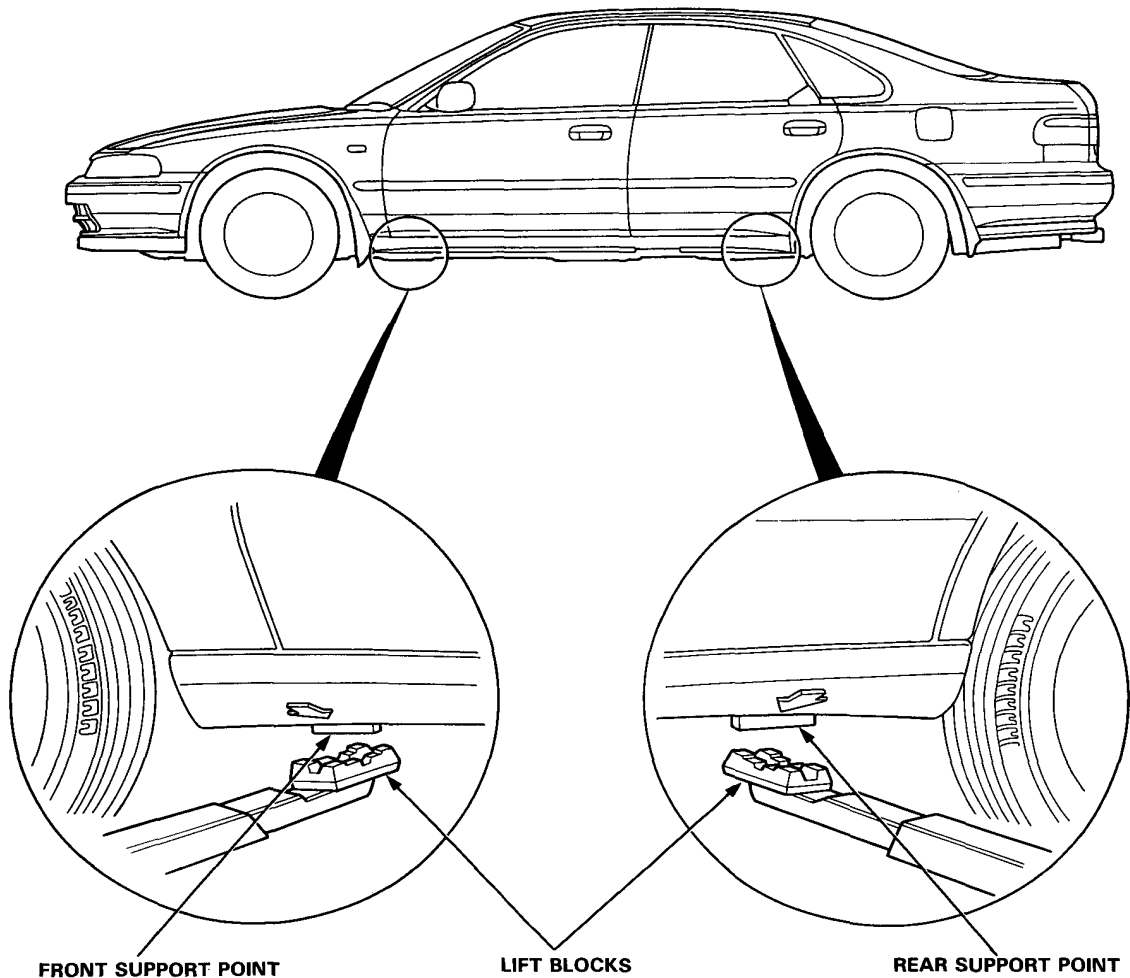
Lift and Support Points

Lift

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

NOTE: Since each tyre/wheel assembly weighs approximately 14 kg (30 lbs), placing the front wheels in the trunk can assist with weight distribution.

1. Place the lift blocks as shown.
2. Raise the hoist until the tyres are slightly off the ground and rock the car to be sure it is firmly supported.
3. Raise the hoist to full height and inspect lift points for solid support.



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Lift and Support Points

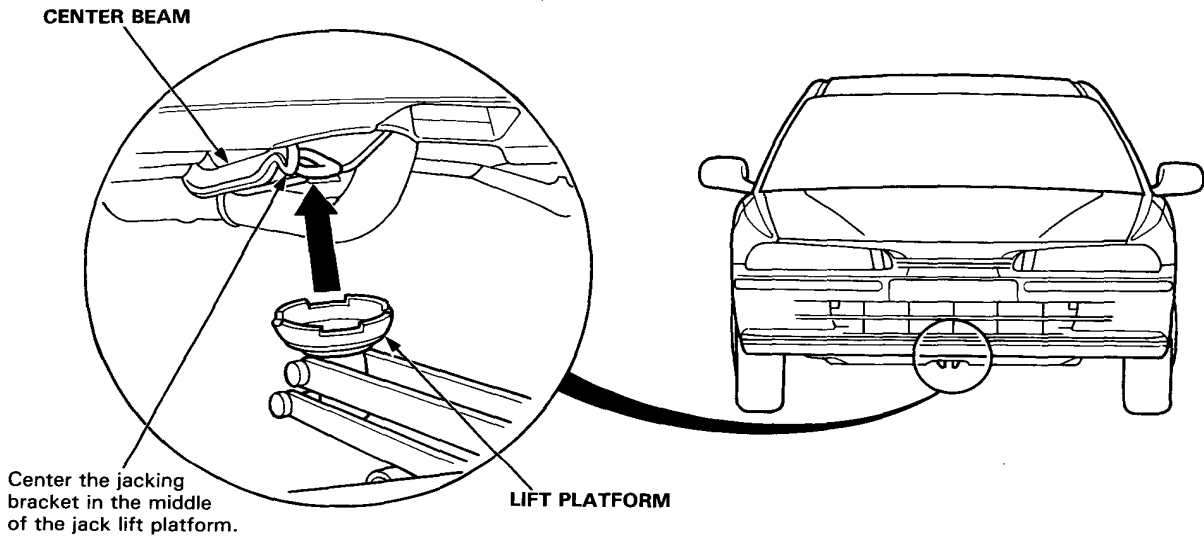
Floor Jack

1. Set the parking brake and block the wheels that are not being lifted.
2. When lifting the rear of the car, put the gearshift lever in reverse (Automatic transmission in **P** position).
3. Raise the car high enough to insert the safety stands.
4. Adjust and place the safety stands as shown on page 1-9 so the car will be approximately level, then lower the car onto them.

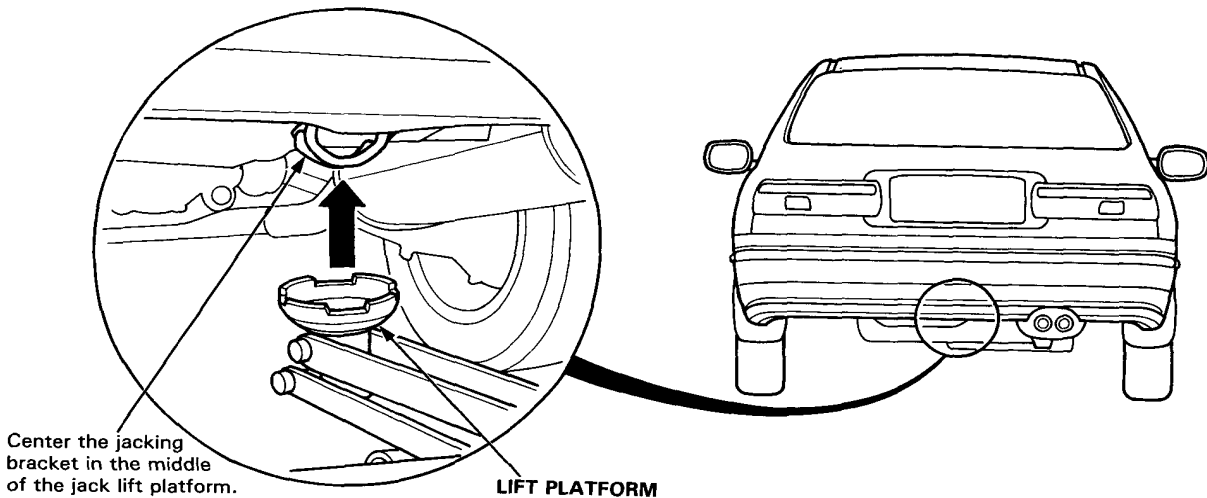
⚠ WARNING

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

Front

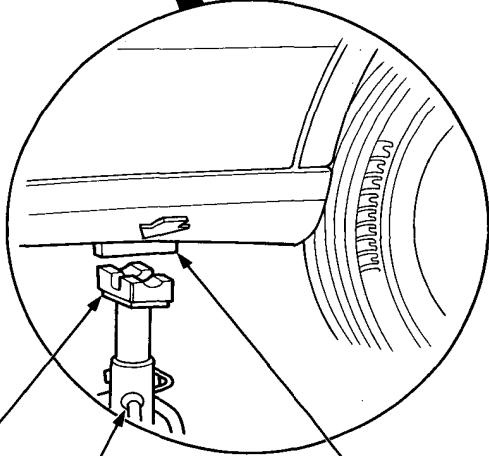
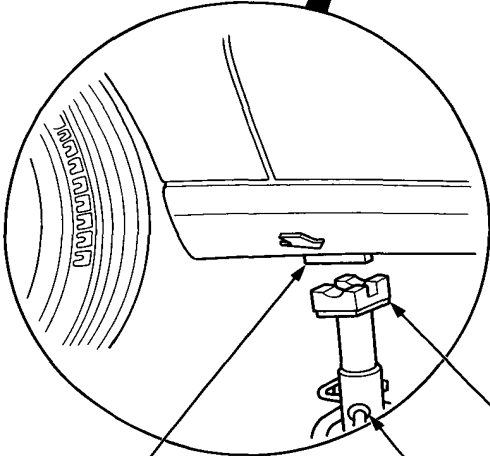
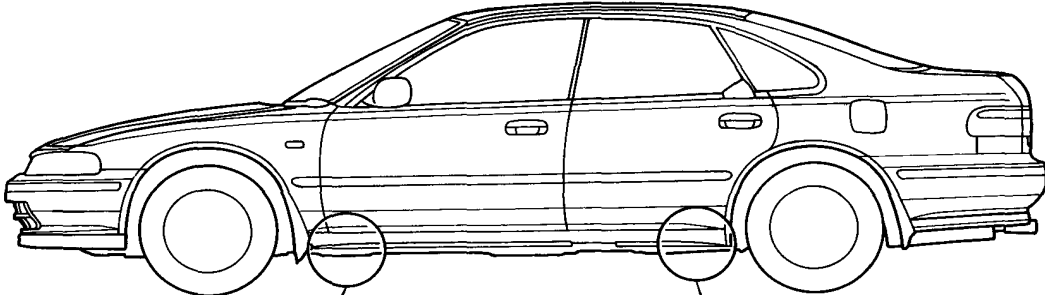


Rear





Safety Stands



FRONT SUPPORT POINT

RUBBER ATTACHMENTS

REAR SUPPORT POINT

SAFETY STANDS

Towing

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

Emergency Towing

There are three popular methods of towing a car:

Flat-bed Equipment — The operator loads the car on the back of a truck. This is the best way of towing the car.

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 car off the ground. The car's suspension and body can be seriously damaged if this method of towing is attempted.

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

5-Speed manual Transmission

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

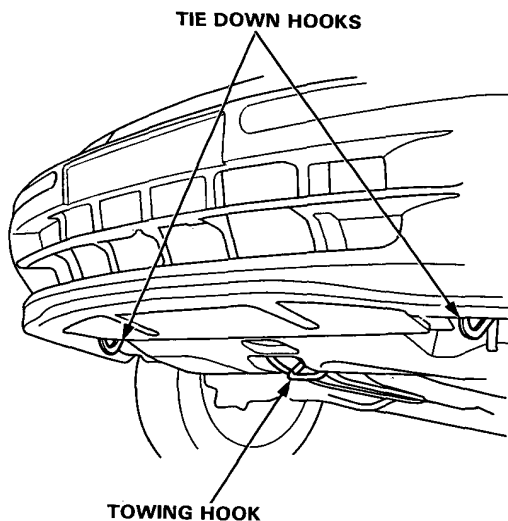
Automatic Transmission

- Release the parking brake.
- Start the engine.
- Shift to **[D4]** position, then to **[N]** position.
- Turn off the engine.

NOTICE: Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you can not shift the transmission or start the engine (automatic transmission), your car must be transported on a flat-bed.

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

NOTICE: Trying to lift or tow the car by the bumpers will cause serious damage. The bumpers are not designed to support the car's weight.



Abbreviations



List of automotive abbreviations which may be used in shop manual.

A/C	Air Conditioning, Air conditioner	F	Front
ACG	Alternator	FP	Fuel Pump
ABS	Anti-lock Brake System	FWD	Front Wheel Drive
A/T	Automatic Transmission	FR	Front Right
ATF	Automatic Transmission Fluid	FL	Front Left
A/F	Air Fuel Ratio	FSR	Fail Safe Relay
AMP	Ampere (s)		
ANT	Antenna	GAL	Gallon
ASSY	Assembly	GND	Ground
AUX	Auxiliary		
APPROX	Approximately	H/B	Hatchback
ATDC	After Top Dead Center	HO2S	Heated Oxygen Sensor
AUTO	Automatic	HC	Hydrocarbons
ATT	Attachment		
ACL	Air cleaner	IAC	Idle Air Control
API	American Petroleum Institute	ICM	Ignition Control Module
		IAT	Intake Air Temperature
BARO	Barometric	IMA	Idle Mixture Adjustment
BAT	Battery	IN	Intake
BTDC	Before Top Dead Center	IG, IGN	Ignition
BDC	Bottom Dead Center	ID	Identification
			Inside Diameter
CKP	Crankshaft Position	INJ	Injection
CYP	Cylinder Position	INT	Intermittent
CAT	Catalytic Converter		
CO	Carbon Monoxide	KS	Knock Sensor
CYL	Cylinder		
CPC	Clutch Pressure Control	L	Left
CARB	Carburetor	LH	Left Handle
COMP	Complete	LHD	Left Handle Drive
CPU	Central Processing Unit	L/C	Lock-up Clutch
CHG	Charge	LSD	Limited Slip Diff
		LF	Left Front
DI	Distributor Ignition	LR	Left Rear
DLC	Data Link Connector	L-4	In-line four cylinder (engine)
DTC	Diagnostic Trouble Code	LED	Light Emitting Diode
DIFF	Differential		
DOHC	Double Overhead Camshaft		
DPI	Dual Point Injection		
EVAP	Evaporative		
EGR	Exhaust Gas Recirculation		
ECM	Engine Control Module		
ECT	Engine Coolant Temperature		
EX	Exhaust		
ELD	Electrical Load Detector		
EFI	Electronic Fuel Injection		
EPS	Electronic Power Steering		

(cont'd)

Abbreviations

(cont'd)

M/S	Manual Steering	SCS	Service Check Signal
MAP	Manifold Absolute Pressure	SEC	Second
MIL	Malfunction Indicator Light		Secondary
M/T	Manual Transmission		
MCK	Motor Check	T	Torque
MAX	Maximum	TCM	Transmission Control Module
MIN	Minimum	TWC	Three Way Catalytic Converter
MPI	Multi Point Injection	TDC	Top Dead Center
		TB	Throttle Body
N	Neutral	TP	Throttle Position
NOx	Nitrogen. Oxides of	TC	Torque Converter
		T/B	Timing Belt
O2S	Oxygen Sensor	T/N	Tool Number
OBD	On Board Diagnostic	TCS	Traction Control System
OD	Outside Diameter		
		VSS	Vehicle Speed Sensor
P	Park	VTEC	Variable Valve Timing & Valve Lift Electronic Control
PAIR	Pulsed Secondary Air Injection	VC	Viscous Coupling
PSP	Power Steering Pressure	VIN	Vehicle Identification Number
PCV	Positive Crankcase Ventilation	VVIS	Variable Volume Intake System
	Proportioning Control Valve		
P/S	Power Steering	W	With
PGM-FI	Programmed-fuel Injection	W/O	Without
PGM-IG	Programmed Ignition	WOT	Wide Open Throttle
PRI	Primary		
P/N	Parts Number	2WD	Two Wheel Drive
PL	Pilot Light	4WD	Four Wheel Drive
PMR	Pump Motor Relay	2WS	Two Wheel Steering
PSW	Pressure Switch	4WS	Four Wheel Steering
PSF	Power Steering Fluid	4AT	4-speed Automatic Transmission
		5MT	5-speed Manual Transmission
Qty	Quantity	P	Park
		R	Reverse
R	Right	N	Neutral
	Reverse	D4	Drive (1st through 4th gear)
RR	Rear Right	D3	Drive (1st through 3rd gear)
RHD	Right Handle Drive	2	Second
REF	Reference	1	First
RL	Rear Left	1ST	Low (gear)
RON	Research Octane Number	2ND	Second (gear)
		3RD	Third (gear)
SAE	Society of Automotive Engineers	4TH	Fourth (gear)
SOHC	Single Overhead Camshaft	5TH	Fifth (gear)
SOL	Solenoid		
SPEC	Specification		
S/R	Sun Roof		
SRS	Supplemental Restraint System		
STD	Standard		
SW	Switch		



Special Tools

Individual tool lists are located at the front of each section.

Specifications

Standards and Service Limits	3-2
Design Specifications	3-13
Body Specifications	3-16

Standards and Service Limits

Cylinder Head/Valve Train — Section 6

	MEASUREMENT			STANDARD (NEW)	SERVICE LIMIT
Compression	250 min ⁻¹ (rpm) and wide open throttle kPa (kg/cm ² , psi)	Nominal Minimum Maximum variation		1,250 (12.5, 178) 950 (9.5, 135) 200 (2, 28)	
Cylinder head	Warpage Height			— 99.95-100.05 (3.935—3.939)	0.05 (0.002) —
Camshaft	End play Camshaft-to-holder oil clearance Total runout Cam lobe Height	F20Z1 engine F20Z2 engine	IN EX IN EX	0.05-0.15 (0.002-0.006) 0.050-0.089 (0.0020-0.0035) 0.03 (0.001) max. 38.741 (1.5252) 38.972 (1.5343) 38.085 (1.4998) 38.890 (1.4913)	0.5 (0.02) 0.15 (0.006) 0.04 (0.002) — — — —
Valve	Valve clearance Valve stem O.D. Stem-to-guide clearance		IN EX IN EX IN EX	0.23-0.28 (0.009-0.011) 0.27-0.32 (0.011-0.013) 5.485-5.495 (0.2159-0.2163) 5.450-5.460 (0.2146-0.2150) 0.020-0.045 (0.0008-0.0020) 0.055-0.080 (0.0022-0.0031)	— — 5.455 (0.2148) 5.420 (0.2134) 0.08 (0.003) 0.12 (0.005)
Valve seat	Width Stem installed height		IN EX IN EX	1.25-1.55 (0.049-0.061) 1.25-1.55 (0.049-0.061) 48.245-48.715 (1.8994-1.9179) 50.315-50.785 (1.9809-1.9994)	2.0 (0.08) 2.0 (0.08) 48.915 (1.9248) 51.035 (2.0092)
Valve spring	Free length	F20Z1 engine F20Z2 engine	IN EX IN EX	53.16 (2.093)*1 53.15 (2.093)*2 55.80 (2.197)*1 56.78 (2.196)*2 54.55 (2.148)*1 54.54 (2.147)*2 59.88 (2.357)	— — — — — — —
Valve guide	I.D. Installed height		IN EX IN EX	5.515-5.530 (0.2171-0.2177) 5.515-5.530 (0.2171-0.2177) 23.75-24.25 (0.935-0.955) 15.05-15.55 (0.593-0.612)	5.53 (0.218) 5.53 (0.218) — —
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)

*1: CHUO HATSUJO manufactured valve spring

*2: NIHON HATSUJO manufactured valve spring

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	A	85.010-85.020 (3.3468-3.3472)	85.07 (3.349)
		B	85.000-85.010 (3.3465-3.3468)	85.07 (3.349)
	Bore taper		—	0.05 (0.002)
	Reboring limit		—	0.5 (0.02)
Piston	Skirt O.D. { at 21 mm (0.8 in) from bottom of skirt }	No Letter (A)	84.980-84.990 (3.3457-3.3461)	84.970 (3.3453)
		Letter B	84.970-84.980 (3.3453-3.3457)	84.960 (3.3449)
	Clearance in cylinder		0.020-0.040 (0.0008-0.0016)	0.05 (0.002)
	Groove width (for ring)	Top	1.220-1.230 (0.0480-0.0484)	1.25 (0.049)
		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	0.20-0.35 (0.008-0.014)	0.60 (0.024)
		Second	0.40-0.55 (0.016-0.022)	0.70 (0.028)
		Oil	0.20-0.70 (0.008-0.028)	0.80 (0.031)
Piston Pin	O.D.		21.994-22.000 (0.8659-0.8661)	—
	Pin-to-piston clearance		0.012-0.024 (0.0005-0.0009)	—
Connecting rod	Pin-to-rod interference		0.013-0.032 (0.0005-0.0013)	—
	Small end bore diameter		21.968-21.981 (0.8649-0.8654)	—
	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)
	Small end bore-to-large end bore parallelism		0.12 (0.005)/100 max.	0.15 (0.006)/100
Crankshaft	Main journal diameter	No. 1 and 2 journals	49.976-50.000 (1.9676-1.9685)	—
		No. 3 journal	49.972-49.996 (1.9674-1.9683)	—
		No. 4 journal	49.984-50.008 (1.9679-1.9688)	—
		No. 5 journal	49.988-50.012 (1.9680-1.9690)	—
			44.976-45.000 (1.7707-1.7717)	—
	Rod journal diameter		0.005 (0.0002) max.	0.006 (0.0004)
	Taper		0.005 (0.0002) max.	0.006 (0.0004)
Out-of-round		0.10-0.35 (0.004-0.014)	0.45 (0.018)	
End play		0.03 (0.001) max.	0.04 (0.002)	
Total runout				
Bearings	Main bearing-to-journal oil clearance	No. 1 and 2 journals	0.021-0.045 (0.0008-0.0018)	0.050 (0.0020)
		No. 3 journal	0.025-0.049 (0.0010-0.0019)	0.055 (0.0022)
		No. 4 journal	0.013-0.037 (0.0005-0.0015)	0.050 (0.0020)
		No. 5 journal	0.009-0.033 (0.0004-0.0013)	0.040 (0.0016)
			0.015-0.043 (0.0006-0.0017)	0.050 (0.0020)
	Rod bearing-to-journal oil clearance			

Standards and Service Limits

Engine Block — Section 7 (cont'd)

		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Balancer shaft	Journal diameter	No. 1 front journal	42.722-42.734 (1.6820-1.6824)	42.71 (1.681)
		No. 1 rear journal	20.938-20.950 (0.8243-0.8248)	20.92 (0.824)
		No. 2 journal	38.712-38.724 (1.5241-1.5246)	38.70 (1.524)
	Journal taper	No. 3 journal	34.722-34.734 (1.3670-1.3675)	34.71 (1.367)
			0.005 (0.0002)	—
	End play	Front	0.10-0.35 (0.004-0.014)	—
		Rear	0.06-0.18 (0.002-0.007)	—
	Total runout		0.02 (0.001)	0.03 (0.002)
	Shaft-to-bearing oil clearance	No. 1 rear journal	0.050-0.075 (0.0020-0.0030)	0.09 (0.004)
		No. 1 front and		
No. 2 journal		0.076-0.108 (0.0030-0.0043)	0.13 (0.005)	
No. 3 journals		0.066-0.098 (0.0026-0.0039)	0.12 (0.005)	
Balancer shaft bearing	I.D.	No. 1 front journal	42.800-42.820 (1.6850-1.6958)	42.83 (1.686)
		No. 1 rear journal	21.000-21.013 (0.8268-0.8273)	21.02 (0.828)
		No. 2 journal	38.800-38.820 (1.5276-1.5283)	38.83 (1.529)
		No. 3 journal	34.800-34.820 (1.3701-1.3709)	34.83 (1.371)

Engine Lubrication — Section 8

		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Engine oil	Capacity ℓ (US qt, Imp qt)		4.9 (5.2, 4.3) for engine overhaul 3.8 (4.0, 3.3) for oil change, including filter 3.5 (3.7, 3.1) for oil change, without filter	
Oil pump	Inner-to-outer rotor clearance		0.02-0.16 (0.001-0.006)	0.20 (0.008)
	Pump body-to-outer rotor clearance		0.10-0.19 (0.004-0.007)	0.21 (0.008)
	Pump body-to-rotor axial clearance		0.02-0.07 (0.001-0.003)	0.12 (0.005)
Relief valve	Pressure setting 80°C (176°F) at idle kPa (kg/cm ² , psi) at 3,000 min ⁻¹ (rpm)		70 (0.7, 10) min.	
			350 (3.5, 50) min.	

Cooling — Section 10

		MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity ℓ (US qt, Imp qt) F20Z1 engine { including engine, heater, cooling } { line and reservoir } Reservoir capacity: 0.6 ℓ (0.63 US qt, 0.53 Imp qt) F20Z2 engine		M/T: 6.3 (6.7, 5.5) for overhaul 2.7 (2.9, 2.4) for coolant change A/T: 6.2 (6.6, 5.5) for overhaul 2.6 (2.7, 2.3) for coolant change
			M/T: 6.3 (6.7, 5.5) for overhaul 2.7 (2.9, 2.4) for coolant change
Radiator cap	Opening pressure kPa (kg/cm ² , psi)		95-125 (0.95-1.25, 13.5-17.8)
Thermostat	Start to open	°C (°F)	76-80 (169-176)
	Fully open	°C (°F)	90 (194)
	Valve lift at fully open		8.0 (0.31) min.
Cooling fan	Thermoswitch "ON" temperature	°C (°F)	90-96 (194-205)
	Thermoswitch "OFF" temperature	°C (°F)	Subtract 2-7 (4-13) from actual "ON" temperature
	Fan timer "ON" temperature	°C (°F)	103-109 (217-228)
	Fan timer "OFF" temperature	°C (°F)	Subtract 2-5 (4-9) from actual "ON" temperature

Fuel and Emissions – Section 11

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Fuel pump	Displacement ml (US oz, Imp oz) in 10 seconds	230 (7.8, 8.1)	110 (3.7, 3.9)
	Relief valve opening pressure kPa (kg/cm ² , psi)	450-600 (4.5-6.0, 64.0-85, 3)	
Pressure regulator	Pressure with regulator vacuum hose disconnected kPa (kg/cm ² , psi)	280-330 (2.8-3.3, 40-47)	
Fuel tank	Capacity ℓ (US gal, Imp gal)	65 (17.2, 14.3)	
Engine	Fast idle speed min ⁻¹ (rpm)	1,400 ± 200	
	Idle speed min ⁻¹ (rpm) (with headlights and cooling fan off)	770 ± 50 (M/T: neutral) 770 ± 50 (A/T: N or P position)	
	Idle CO %	0.2% max.	

Clutch – Section 12

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch pedal	Clutch pedal height to the floor	184 (7.2)	—
	Stroke at pedal	142 (5.8)	—
	Totral clutch pedal free play	9-15 (0.4-0.6)	—
	Disengagement height to the floor to the carpet	90 (3.5) min. 80 (3.1) min.	—
Flywheel	Clutch surface runout	0.05 (0.002) max.	0.15 (0.006)
Clutch disc	Rivet head depth	1.4 (0.06) min.	0.2 (0.01)
	Surface runout	0.6 (0.02) max.	1.0 (0.04)
	Thickness	8.5-9.2 (0.33-0.36)	6.5 (0.26)
Pressure plate	Finger height	0.6 (0.02) max	0.8 (0.03)
	Warpage	0.03 (0.001) max.	0.15 (0.006)

Manual Transmission – Section 13

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Transmission oil	Capacity ℓ (US qt, Imp qt)	1.9 (2.0, 1.7) for oil change 2.0 (2.1, 1.8) for overhaul	
Mainshaft	End play	0.10-0.16 (0.004-0.006)	Adjust with a shim.
	Diameter of ball bearing contact area	27.977-27.990 (1.1015-1.1020)	27.93 (1.100)
	Diameter of needle bearing contact area	37.984-38.000 (1.4954-1.4961)	37.93 (1.493)
	Diameter of ball bearing contact area Runout	27.987-28.000 (1.1018-1.1024) 0.02 (0.001) max.	27.94 (1.100) 0.05 (0.002)
Mainshaft 3rd and 4th gears	I.D.	43.009-43.025 (1.6933-1.6939)	43.080 (1.6961)
	End play	0.06-0.21 (0.002-0.008)	0.30 (0.012)
	Thickness 3rd gear 4th gear	32.42-32.47 (1.276-1.278) 30.92-30.97 (1.217-1.219)	32.3 (1.27) 30.8 (1.21)
Mainshaft 5th gear	I.D.	43.009-43.025 (1.6933-1.6939)	43.080 (1.6961)
	End play	0.06-0.21 (0.002-0.008)	0.30 (0.012)
	Thickness	30.92-30.97 (1.217-1.219)	30.8 (1.21)
Countershaft	End play	0.05-0.40 (0.0019-0.0157)	0.50 (0.02)
	Diameter of needle bearing contact area	38.000-38.015 (1.4961-1.4967)	37.95 (1.494)
	Diameter of ball bearing and needle bearing contact area	24.987-25.000 (0.9837-0.9845)	24.94 (0.982)
	Diameter of 1st gear contact area	39.984-40.000 (1.5742-1.5748)	39.93 (1.572)
	Runout	0.02 (0.001) max.	0.05 (0.002)
Countershaft 1st gear	I.D.	46.009-46.025 (1.8114-1.8120)	46.08 (1.814)
	End play	0.04-0.10 (0.002-0.004)	Adjust with a shim.
Countershaft 2nd gear	I.D.	47.009-47.025 (1.8507-1.8514)	47.08 (1.854)
	End play	0.04-0.10 (0.002-0.004)	Adjust with a collar.
	Thickness	34.62-34.67 (1.363-1.365)	34.5 (1.36)

(cont'd)

Standards and Service Limits

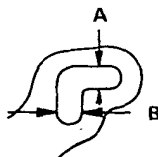
Manual Transmission — Section 13 (cont'd)

Unit: mm (in)

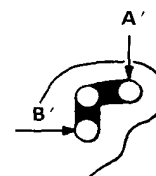
	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Spacer collar (Countershaft 2nd gear)	I.D.	36.48-36.49 (1.4362-1.4366)	36.50 (1.437)	
	O.D.	41.989-42.000 (1.6531-1.6535)	41.94 (1.652)	
	Length	A	29.02-29.04 (1.1425-1.1433)	—
		B	29.07-29.09 (1.1445-1.1453)	—
Spacer collar (Mainshaft 4th and 5th gears)	I.D.	31.002-31.012 (1.2205-1.2209)	31.06 (1.223)	
	O.D.	37.989-38.000 (1.4956-1.4961)	37.94 (1.494)	
	Length	A	56.45-56.55 (2.222-2.226)	—
		B	26.03-26.08 (1.025-1.027)	—
Reverse idler gear	I.D.	20.016-20.043 (0.7880-0.7891)	20.09 (0.7909)	
	Gear-to-reverse gear shaft clearance	0.036-0.084 (0.0014-0.0033)	0.160 (0.0006)	
Syncro ring	Ring-to-gear clearance (ring pushed against gear)	0.85-1.10 (0.033-0.043)	0.40 (0.016)	
Shift fork	Finger thickness	6.2-6.4 (0.24-0.25)	—	
	Fork-to-syncro sleeve clearance	0.35-0.65 (0.014-0.026)	1.0 (0.039)	
Reverse shift fork	Pawl groove width	13.0-13.3 (0.51-0.52)	—	
	Fork-to-reverse idler gear clearance	0.5-1.1 (0.02-0.04)	1.8 (0.07)	
	Groove width*1	at A	7.05-7.25 (0.278-0.285)	—
		at B	7.4-7.7 (0.29-0.30)	—
	Fork-to-5th/reverse shift shaft clearance*2	at A'	0.05-0.35 (0.002-0.014)	0.5 (0.02)
at B'		0.4-0.8 (0.02-0.03)	1.0 (0.04)	
Shift arm	I.D.	15.973-16.000 (0.6289-0.6299)	—	
	Shift arm-to-shaft clearance	0.005-0.059 (0.0002-0.0023)	—	
	Shift fork diameter at contact area	12.9-13.0 (0.508-0.512)	—	
	Shift-arm-to-shift fork shaft clearance	0.2-0.5 (0.008-0.019)	0.6 (0.024)	
Select lever	Shaft outer diameter	15.41-15.68 (0.607-0.617)	—	
	Shift arm cover clearance	0.032-0.102 (0.0013-0.0040)	—	
Shift lever	O.D.	15.941-15.968 (0.6276-0.6287)	—	
	Transmission housing clearance	0.027-0.139 (0.0011-0.0055)	—	
Interlock	Bore diameter	16.00-16.05 (0.630-0.632)	—	
	Shift arm clearance	0.032-0.109 (0.0013-0.0043)	—	



*1: Measuring points



*2: Measuring points



Automatic Transmission — Section 14

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Transmission fluid	Capacity ℓ (US qt, Imp qt)	6.0 (6.4, 5.2) for overhaul 2.4 (2.6, 2.1) for fluid change		
Hydraulic pressure kPa (kg/cm ² , psi)	Line pressure at 2,000 min ⁻¹ (rpm) in N or P position	800 (8.0, 114) throttle fully-closed 850 (8.5, 121) throttle more than 3/16 open	750 (7.5, 107) throttle more than 3/16 open	
	4th clutch pressure at 2,000 min ⁻¹ (rpm) in D4 position	530 (5.3, 75) throttle fully-closed 850 (8.5, 121) throttle more than 3/16 open	480 (4.8, 68) throttle fully-closed 750 (7.5, 107) throttle more than 3/16 open	
	3rd and 2nd clutch pressure at 2,000 min ⁻¹ (rpm) in D4 position	500 (5.0, 71) throttle fully-closed 850 (8.5, 121) throttle more than 3/16 open	450 (4.5, 64) throttle fully-closed 750 (7.5, 107) throttle more than 3/16 open	
	2nd clutch pressure at 2,000 min ⁻¹ (rpm) in 2 position	800-850 (8.0-8.5, 114-121)	750 (7.5, 107)	
	1st and 1st-hold clutch pressure at 2,000 min ⁻¹ (rpm) in 1 position	800-850 (8.0-8.5, 114-121)	750 (7.5, 107)	
	Throttle B pressure	Throttle fully closed Throttle fully open	0 (0, 0) 800-850 (8.0-8.5, 114-121)	— 750 (7.5, 107)
	Stall speed (check with car on level ground)		2,350-2,650 min ⁻¹ (rpm)	—

Standards and Service Limits

Automatic Transmission — Section 14 (cont'd)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Clutch	Clutch initial clearance	1st-hold 0.80-1.00 (0.031-0.039) 1st, 2nd 0.65-0.85 (0.026-0.033) 3rd, 4th 0.4-0.6 (0.016-0.024)	— — —
	Clutch return spring free length Clutch disc thickness Clutch plate thickness	1st, 2nd, 3rd, 4th 33.5 (1.32) 1.88-2.00 (0.074-0.079)	31.5 (1.24) Until grooves worn out.
	1st, 1st-hold 2nd 3rd, 4th	1.95-2.05 (0.077-0.081) 2.55-2.65 (0.100-0.104) 2.25-2.35 (0.089-0.093)	Discoloration ↑ Discoloration
	Clutch end plate thickness	Mark 1 2.05-2.10 (0.081-0.083) 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 ↑ ↓ Discoloration
Valve body	Stator shaft needle bearing contact I.D.	27.000-27.021 (1.0630-1.0638)	Wear or damage
	Torque converter side Oil pump side Oil pump gear side clearance Oil pump gear-to-body clearance	29.000-29.013 (1.1417-1.1422) 0.03-0.05 (0.001-0.002) 0.210-0.265 (0.0083-0.0104) 0.070-0.125 (0.0028-0.0049)	— 0.07 (0.003) — —
	Oil pump driven gear I.D. Oil pump shaft O.D.	14.016-14.034 (0.5518-0.5525) 13.980-13.990 (0.5504-0.5508)	Wear or damage Wear or damage
Shifting device, parking brake and throttle control system	Reverse shift fork finger thickness	5.90-6.00 (0.232-0.236)	5.40 (0.213)
	Parking brake ratchet pawl Parking brake gear Throttle cam stopper height	— — 17.0-17.1 (0.669-0.673)	Wear or other defect —
Servo body	Shift fork shaft bore I.D.	14.000-14.010 (0.5512-0.5516)	—
	Shift fork shaft valve bore I.D.	37.000-37.039 (1.4567-1.4582)	37.045 (1.4585)
Regurator valve body	Sealing ring contact I.D.	35.000-35.025 (1.3780-1.3789)	35.050 (1.3799)
Accumulator body	Sealing ring contact I.D.	32.000-32.013 (1.2598-1.2604)	32.050 (1.2618)
Stator shaft	Sealing ring contact I.D.	29.000-29.013 (1.1417-1.1422)	29.050 (1.1437)
Transmission	Diameter of needle bearing contact area		Wear or damage
	On mainshaft of stator shaft	22.984-23.000 (0.9049-0.9055)	↑ ↓ Wear or damage
	On mainshaft of 3rd gear collar	45.984-46.000 (1.8104-1.8110)	
	On mainshaft of 4th gear collar	31.984-32.000 (1.2592-1.2598)	
	On countershaft of 1st gear collar	40.984-41.000 (1.6135-1.6142)	
	On countershaft of 4th gear	31.975-31.991 (1.2589-1.2595)	
	On countershaft of parking gear	39.984-40.000 (1.5742-1.5748)	
	On countershaft of reverse gear	35.979-36.000 (1.4165-1.4173)	
	On secondary shaft of 1st gear	31.975-31.991 (1.2589-1.2595)	
	On secondary shaft of 2nd gear	31.975-31.991 (1.2589-1.2595)	
	On reverse idler gear shaft	13.990-14.000 (0.5508-0.5512)	
	Inside diameter		
	Mainshaft 3rd gear	52.000-52.019 (2.0472-2.0480)	
	Mainshaft 4th gear	38.005-38.021 (1.4963-1.4969)	
	Countershaft 1st gear	47.000-47.016 (1.8504-1.8510)	
	Countershaft 4th gear	38.000-38.016 (1.4961-1.4967)	
	Countershaft reverse gear	42.000-42.016 (1.6535-1.6542)	
Countershaft idler gear	48.000-48.016 (1.8898-1.8904)		
Secondary shaft 1st gear	37.000-37.016 (1.4567-1.4573)		
Secondary shaft 2nd gear	37.000-37.016 (1.4567-1.4573)		
Reverse idler gear shaft holder	14.416-14.434 (0.5676-0.5683)		

Automatic Transmission — Section 14 (cont'd)

	MEASUREMENT	STANDARD (NEW)				SERVICE LIMIT
		Wire Dia.	O.D.	Free Length	No. of Coils	
Transmission (cont'd)	Mainshaft 3rd gear collar length	19.50-19.55 (0.768-0.770)				—
	Mainshaft 4th gear collar length	47.50-47.55 (1.870-1.872)				Wear or damage
	Countershaft 1st gear collar length	27.50-27.55 (1.083-1.085)				Wear or damage
	Thrust washer thickness	1.45-1.50 (0.057-0.059)				Wear or damage
	Countershaft 1st gear	3.45-3.55 (0.136-0.140)				Wear or damage
	Countershaft idler gear	25.030-25.048 (0.9854-0.9861)				Wear or damage
	Countershaft parking gear length	4.95-5.00 (0.195-0.197)				Wear or damage
	Secondary shaft 1st gear distance collar length	4.02-4.05 (0.158-0.159)				—
	Secondary shaft 2nd gear spline washer thickness 35 x 53 mm	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)				—		
Springs	Regulator valve spring A	1.8 (0.071)	14.7 (0.579)	86.5 (3.406)	16.5	
	Regulator valve spring B	1.8 (0.071)	9.6 (0.378)	44.0 (1.732)	12.7	
	Stator reaction spring	4.5 (0.177)	35.4 (1.394)	30.3 (1.193)	1.92	
	Torque converter check valve spring	1.1 (0.043)	8.4 (0.331)	36.4 (1.433)	12.0	
	Relief valve spring	1.0 (0.039)	8.4 (0.331)	39.1 (1.539)	15.1	
	Cooler relief valve spring	1.1 (0.043)	8.4 (0.331)	46.8 (1.843)	17.0	
	2nd orifice control valve spring	0.6 (0.024)	6.6 (0.260)	58.3 (2.295)	15.8	
	Orifice control valve spring	0.8 (0.031)	6.6 (0.260)	52.5 (2.067)	33.0	
	4th exhaust valve spring	0.9 (0.035)	7.1 (0.280)	60.8 (2.394)	28.9	
	Throttle valve B adjusting spring	0.8 (0.031)	6.2 (0.244)	30.0 (1.181)	8.0	
	Throttle valve B spring	1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	10.5	
		1.4 (0.055)	8.5 (0.335)	41.5 (1.634)	11.2	
		1.4 (0.055)	8.5 (0.335)	41.6 (1.638)	12.4	
	1-2 shift valve spring	1.0 (0.039)	8.6 (0.339)	41.3 (1.626)	16.9	
	2-3/3-4 shift valve spring	0.9 (0.035)	7.6 (0.299)	57.0 (2.244)	26.8	
	1st-hold accumulator spring	4.0 (0.157)	25.0 (0.984)	64.7 (2.547)	7.3	
	1st accumulator spring	1.8 (0.071)	16.3 (0.642)	115.4 (4.543)	18.6	
	4th accumulator spring	2.9 (0.114)	22.0 (0.866)	90.1 (3.547)	10.9	
	2nd accumulator spring	3.5 (0.138)	22.0 (0.866)	77.1 (3.035)	17.0	
	3rd accumulator spring	2.8 (0.110)	17.5 (0.689)	94.2 (3.709)	16.1	
	Lock-up shift valve spring	0.9 (0.035)	7.6 (0.299)	73.7 (2.902)	32.0	
	Lock-up timing valve spring	0.8 (0.031)	6.6 (0.260)	51.1 (2.012)	14.7	
	Servo control valve spring	1.0 (0.039)	8.1 (0.319)	52.6 (2.071)	22.4	
	CPC valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5	
	Modulator valve spring	1.4 (0.055)	9.4 (0.370)	33.0 (1.299)	10.5	
	Lock-up control valve spring	0.7 (0.028)	6.6 (0.260)	38.0 (1.496)	14.1	
	3rd kick-down spring	1.1 (0.043)	7.6 (0.299)	48.3 (1.902)	23.3	
	3-2 kick-down spring	1.2 (0.047)	7.1 (0.280)	46.9 (1.846)	20.6	

Standards and Service Limits

Differential (Manual transmission) — Section 15

Unit of length: mm (in)

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Final driven gear	Backlash	0.085-0.145 (0.0033-0.0057)	0.20 (0.008)
Differential carrier	Pinion shaft contact area I.D.	18.000-18.018 (0.7087-0.7094)	—
	Carrier-to-pinion clearance	0.017-0.047 (0.0007-0.0019)	0.10 (0.004)
	Driveshaft contact area I.D.	28.005-28.025 (1.1026-1.1033)	—
	Carrier-to-driveshaft clearance	0.025-0.066 (0.0010-0.0026)	0.12 (0.005)
Differential pinion gear	Backlash	0.055-0.091 (0.0022-0.0036)	0.15 (0.006)
	I.D.	0.05-0.15 (0.002-0.006)	—
	Pinion gear-to-pinion shaft clearance	18.042-18.066 (0.7103-0.7113)	—
Tapered roller bearing preload	Starting torque N·m (kg·cm, lb·in)	0.059-0.095 (0.0023-0.0037)	0.15 (0.006)
		1.4-2.6 (14-26, 12-23)	Adjust with a shim

Differential (Automatic transmission) — Section 15

	MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Final driven gear	Backlash	0.085-0.142 (0.0033-0.0056)	0.20 (0.008)
Differential carrier	Pinion shaft contact area I.D.	18.000-18.018 (0.7087-0.7094)	—
	Carrier-to-pinion clearance	0.017-0.047 (0.0007-0.0019)	0.10 (0.004)
	Driveshaft contact area I.D.	28.005-28.025 (1.1026-1.1033)	—
	Carrier-to-driveshaft clearance	0.025-0.066 (0.0010-0.0026)	0.12 (0.005)
Differential pinion gear	Backlash	0.05-0.15 (0.002-0.006)	Adjust with a shim
	I.D.	18.042-18.066 (0.7103-0.7113)	—
	Pinion gear-to-pinion shaft clearance	0.059-0.095 (0.0023-0.0037)	0.12 (0.005)
Tapered roller bearing preload	Starting torque N·m (kg·cm, lb·in)	2.8-4.0 (28-40, 24-35)	Adjust with a shim
	New bearing Reused bearing	2.5-3.7 (25-37, 22-32)	

Steering — Section 17

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Rotational play at steering wheel circumference	0-10 (0-0.4)
Gearbox	Angle of rack-guide-screw loosened from locked position	20° ^{+5°} ₀
Pump	Pump pressure with shut-off valve closed kPa (kg/cm ² , psi)	8,000-9,000 (80-90, 1,138-1,280)
Power steering fluid	Recommended fluid	Honda power steering fluid
	Fluid capacity ℓ (US qt, Imp qt)	System Reservoir 1.8 (1.9, 1.6) 0.5 (0.5, 0.4)
Power steering belt*	Deflection with 100 N (10 kg, 22 lbs) between pulleys	12.5-16.0 (0.50-0.62) with used belt 9.5-11.5 (0.37-0.45) with new belt
	Belt tension N (kg, lbs) Measured with belt tension gauge	350-500 (35-50, 77-110) with used belt 700-900 (70-90, 154-198) 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.

Suspension — Section 18

		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT
Wheel alignment (2WS)	Camber	Front	$0^{\circ} 00' \pm 1^{\circ}$	
		Rear	$-0^{\circ} 30' \pm 30'$	
	Caster	Front	$3^{\circ} 00' \pm 1^{\circ}$	
		Total toe	Front	$0 \pm 3.0 (0 \pm 0.12)$
Front wheel turning angle	Inward wheel	Rear	$IN 2.0 \pm 2.0 (0.08 \pm 0.08)$	
	Outward wheel		$39^{\circ} 00' \pm 2^{\circ}$	
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)
	Rim runout (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 200 N (20 kg, 44 lbs) lever force		To be locked when pulled 7-11 notches	—	
Foot brake pedal	Pedal height (with floor mat removed)	M/T	195 (7.7) minimum	—	
	Free play	A/T	190 (7.5) minimum 1-5 (0.04-0.20)	—	
Master cylinder	Piston-to-pushrod clearance		0-0.04 (0-0.0016)	—	
Disc brake	Disc thickness	Front	23.0 (0.09)	21.0 (0.83)	
		Rear	10.0 (0.39)	8.0 (0.31)	
	Disc runout	Front	—	0.10 (0.004)	
		Rear	—	0.10 (0.004)	
	Disc parallelism	Front and rear	—	0.015 (0.0006)	
	Pad thickness	Front	12.5 (0.49)	1.6 (0.06)	
		M/T	11.0 (0.43)	1.6 (0.06)	
		A/T	9.0 (0.35)	1.6 (0.06)	
		Characteristics	Vacuum [mm (in) Hg]	Pedal Force kg (lbs)	Line Pressure kPa (kg/cm ² , psi)
	Without ABS		0 (0)	20 (44)	940 (9.4, 130) minimum
		300 (11.8)	20 (44)	5,600 (56, 800) minimum	
		500 (19.7)	20 (44)	8,700 (87, 1,200) minimum	
With ABS		0 (0)	20 (44)	810 (8.3/120) minimum	
		300 (11.8)	20 (44)	6,100 (62/880) minimum	
		500 (19.7)	20 (44)	8,200 (83.2/1,200) minimum	

Standards and Service Limits

Air Conditioning — Section 22

		MEASUREMENT	STANDARD (NEW)
Air conditioner system	Lubricant capacity mℓ (fl oz, Imp oz)	Condenser	10-20 (1/3-2/3, 0.4-0.7)
		Evaporator	20-30 (2/3-1, 0.7-1.1)
Compressor	Lubricant capacity mℓ (fl oz, Imp oz) Stator coil resistance at 20°C (68°F) Ω Pulley-to-pressure plate clearance	Line or hose	10 (1/3, 0.4)
		Receiver	10 (1/3, 0.4)
			160 ⁺¹⁵ ₋₀ (5-1/3 ^{+1/2} ₋₀ , 5.6 ^{+0.5} ₋₀)
Compressor belt	Deflection with 100 N (10 kg, 22 lbs) between the pulleys		3.4-3.8
			0.35-0.65 (0.014-0.026)
Compressor belt	Belt tension N (kg, lbs) Measured with belt tension gauge		10.0-12.0 (0.39-0.47) with used belt
			4.5-7.5 (0.18-0.30) with new belt
			450-600 (45-60, 99-132) with used belt
			950-1,150 (9.5-115, 209-254) with new belt

Electrical — Section 23

		MEASUREMENT	STANDARD (NEW)	
Ignition coil	Rated voltage V Primary winding resistance Ω at 20°C (68°F) Secondary winding resistance kΩ at 20°C (68°F)		12	
			0.6-0.8	
			13-19	
Spark Plug	Type Gap		See Section 23	
			1.0-1.1 (0.039-0.043)	
Ignition timing	At idling	° BTDC	15° ± 2° (Red)	
Alternator belt*	Without A/C	Deflection with 100 N (10 kg, 22 lbs) between pulleys	10-12 (0.39-0.47) with used belt	
			8.5-11 (0.33-0.43) with new belt	
		Belt tension N (kg, lbs) Measured with belt tension gauge	300-450 (30-45, 66-99) with used belt	
		450-650 (45-65, 99-143) with new belt		
	With A/C	Deflection with 100 N (10 kg, 22 lbs) between pulleys	10-12 (0.39-0.47) with used belt	
			4.5-7 (0.18-0.28) with new belt	
Belt tension N (kg, lbs) Measured with belt tension gauge		450-600 (45-60, 99-132) with used belt		
		950-1,150 (95-115, 209-254) with new belt		
Alternator	MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT
	Output 13.5 V at hot A		70/80	—
	Coil resistance (rotor) Ω		2.8-3.0	—
	Slip ring O.D.		14.4 (0.57)	14.0 (0.55)
	Brush length		10.5 (0.41)	5.5 (0.22)
	Brush spring tension g (oz)		300-360 (10.6-12.7)	—
Starter motor	Type		Spur gear reduction, Permanent magnet	
	Mica depth		0.4-0.5 (0.016-0.020)	0.15 (0.006)
	Commutator runout		0-0.02 (0-0.0008)	0.05 (0.002)
	Commutator O.D.		28.0-28.1 (1.102-1.106)	27.5 (1.08)
	Brush length		15.8-16.2 (0.62-0.64)	10.0 (0.39)
	Brush spring tension (new) N (kg, lbs)		16-18 (1.6-1.8, 3.5-4.0)	—

* 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

	ITEM	METRIC	ENGLISH	NOTES	
DIMENSIONS	Overall Length Overall Width Overall Height Wheelbase Track F/R Ground Clearance Seating Capacity	4,675 mm 1,715 mm 1,380 mm 2,720 mm 1,475/1,480 mm 160 mm	183.9 in 67.5 in 54.3 in 107.1 in 58.1/58.3 in 6.3 in		
WEIGHT	Curb Weight	2.0i M/T	1,240 kg	2,734 lbs	Without ABS With ABS
		2.0i S M/T	1,255 kg	2,767 lbs	
		2.0i S M/T	1,295 kg	2,855 lbs	
		2.0i S A/T	1,325 kg	2,921 lbs	
		2.0i LS M/T	1,300 kg	2,866 lbs	
		2.0i LS A/T	1,330 kg	2,932 lbs	
		2.0i ES M/T	1,335 kg	2,943 lbs	
		2.0i ES A/T	1,365 kg	3,009 lbs	
		Weight Distribution (Front/Rear)	2.0i M/T	745/495 kg	
	2.0i S M/T		755/500 kg	1,644/1,102 lbs	
	2.0i S M/T		780/515 kg	1,720/1,135 lbs	
	2.0i S A/T		810/515 kg	1,786/1,135 lbs	
	2.0i LS M/T		780/520 kg	1,720/1,146 lbs	
	2.0i LS A/T		810/520 kg	1,786/1,146 lbs	
	Max. Permissible Weight (European)	2.0i ES M/T	815/520 kg	1,797/1,146 lbs	
2.0i ES A/T		845/520 kg	1,863/1,146 lbs		
M/T		1,820 kg	4,012 lbs		
	A/T	1,880 kg	4,145 lbs		
ENGINE	Type Cylinder Arrangement Bore and Stroke Displacement Compression Ratio Valve Train Lubrication System Oil Pump Displacement [At oil temp. 36.5 °C (100 °F)] Fuel Required Water Pump Displacement [At coolant temp. 40 °C (104 °F)]	F20Z1 engine F20Z2 engine	Water-cooled, 4-stroke SOHC gasoline engine 4-cylinder In-line, transverse 85.0 × 88.0 mm 3.35 × 3.46 in 1,997 cm ³ (cc) 121.8 cu in 9.5 : 1 9.0 : 1 Belt driven, 4 valves per cylinder, single over head camshaft Forced and wet sump, torochoid pump 53.7 l/min at 6,000 pump min ⁻¹ (rpm) Premium UNLEADED grade gasoline with 95 Research Octane Number or higher 150 l/min at 6,000 pump min ⁻¹ (rpm)		
STARTER	Type Normal Output Nominal Voltage Hour Rating Direction of Rotation Weight	1.4 kW 1.6 kW	Spur gear reduction, permanent magnet M/T: 1.4 kW, A/T: 1.6 kW 12 V 30 seconds Lockwise as viewed from gear end 3.5 kg 7.7 lbs 3.7 kg 8.2 lbs		
CLUTCH	Clutch Type Clutch Facing Area	M/T A/T M/T	Single plate dry, diaphragm spring Torque converter 217 cm ² 33.6 sq-in		

Design Specifications

(cont'd)

	ITEM	METRIC	ENGLISH	NOTES	
TRANSMISSION	Transmission	M/T A/T	Synchronized 5-speed forward, 1 reverse Electronically controlled dual range 4-speed forward automatic, 1 reverse Direct 1 : 1		
	Primary Reduction				
	Type		Manual	Automatic	
	Gear Ratio	1st 2nd 3rd 4th 5th Reverse	3.307 1.809 1.230*1, 1.185*2 0.933*1, 0.903*2 0.757*1, 0.735*2 3.000	2.705 1.366 1.028 0.731 — 2.047	*1: F20Z1 engine *2: F20Z2 engine
	Final Reduction	Gear type Gear ratio	Single helical gear 4.266		4.285
	AIR CONDITIONER	Cooling Capacity		4,100 Kcal/h	16,269 BTU/h
Conditions:					
Compressor Speed			1,800 min ⁻¹ (rpm)		
Outside Air Temperature			27 °C	81 °F	
Outside Air Humidity			50 %		
Condenser Air Temperature			35 °C	95 °F	
Condenser Air Velocity			2.5 m/sec	8.2 ft/sec	
Blower Capacity			450 m ³ /h	15,894 cu-ft	
Compressor	Type/Makes No. of Cylinder Capacity Max. Speed Lubricant Capacity		Swach-plate type/NIPPONDENSO 10 178 cm ² /rev 8,800 min ⁻¹ (rpm) 160 ml	10.9 cu-in/rev 5 1/3 fl oz, 5.6 Imp oz ND-OIL8	
Condenser	Type	Corrugated fin type			
Evaporator	Type	Corrugated fin type			
Blower	Type Motor Input Speed Control Max. Capacity		Sirocco fan 209 W/12 V max. 5-speed 420 m ³ /h	14,834 cu-ft/h	
Temp. Control		Air-mix type			
Comp. Clutch	Type Power Consumption	Dry, single plate, V ribbed belt drive 40 W max./12 V			
Refrigerant	Type Quantity		R-134a 750-50 g	26.5-1.80 oz	
STEERING SYSTEM	Type Overall Ratio Turns, Lock-to-Lock Steering Wheel Diameter		Power assisted, rack and pinion 16.4 3.13 380 mm	15.0 in	
SUSPENSION	Type, Front	Independent double wishbone, coil spring with stabilizer			
	Type, Rear	Independent double wishbone, coil spring with stabilizer			
	Shock Absorber, Front and Rear	Telescopic, hydraulic nitrogen gas-filled			

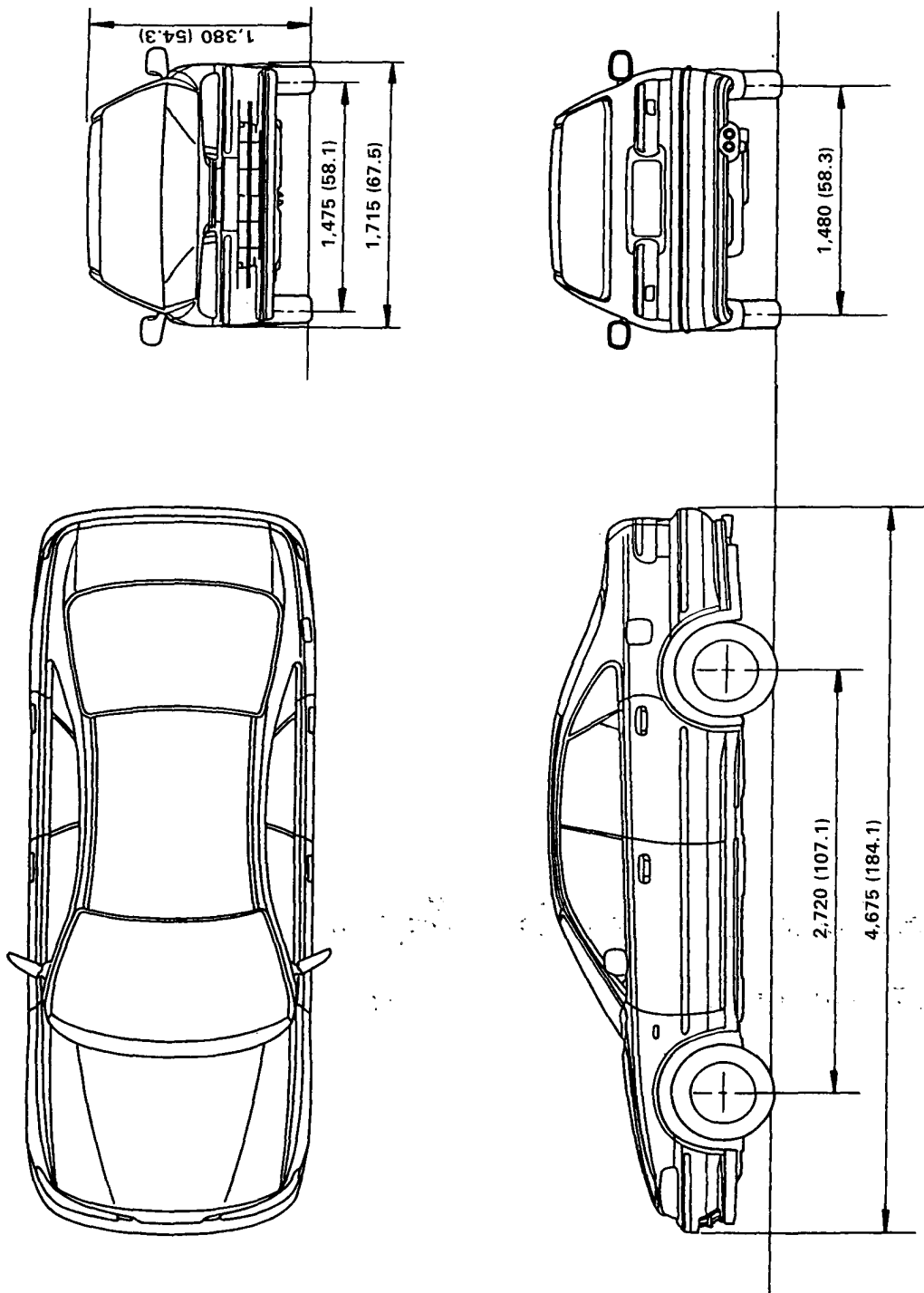
	ITEM	METRIC	ENGLISH	NOTES
WHEEL ALIGNMENT	Camber Front Rear Caster Total Toe Front Rear	0° 00' -0° 30' 3° 00'	0 in In 0.08 in	
BRAKE SYSTEM	Type, Front Rear Pad and Lining Surface Area: Front A/T M/T Rear Parking Brake Kind and Type	Power-assisted self-adjusting ventilated disc Power-assisted self-adjusting solid disc 58.0 cm ² x 2 49.4 cm ² x 2 29.7 cm ² x 2	8.99 sq-in x 2 7.66 sq-in x 2 4.60 sq-in x 2 Mechanical actuating, rear two wheel brakes	
TYRE	Size and Pressure	See tyre information label (see page 1-7)		
ELECTRICAL	Battery Starter Alternator Fuses In the under-dash fuse/relay box In the under-hood fuse/relay box In the under-hood ABS fuse/relay box Headlights Front Turn Signal Lights Front Position Lights Side Turn Signal Lights Rear Turn Signal Lights Stop/Taillights Back-up Lights Rear Fog Light License Plate Lights Interior Lights Front Rear Boot Lights Door Courtesy Lights Glove Box Light Gauge Lights Indicator Lights/Lamp Warning Lights Illumination and Pilot Lights Heater Illumination Light	12 V-57AH/20HR (KG), 12 V-47AH/20HR (KE) 12 V-1.4 kW, 1.6 kW 12V-80 A, 70 A 7.5 A, 10 A, 15 A, 30 A 7.5A, 10 A, 15 A, 20 A, 30 A, 40A, 50A, 80A 7.5 A, 15 A, 50 A 12 V-55 W (HI) 12 V-21 W (AMBER) 12 V-5 W 12 V-5W 12 V-21 W 12 V-21/5 W 12 V-21 W 12 V-21 W 12 V-5 W 12 V-5 W 12 V-3.4 W 12 V-3.4 W 12 V-5 W 12 V-5 W 12 V-5 W 12 V-0.84, 1.12, 1.4 W, LED 12 V-1.4 W 12 V-0.56, 0.84, 1.2, 1.4 W 12 V-1.4 W		

Rozteč kolových šroubů: 114,3 mm

Počet šroubů: 4

Body Specifications

Unit: mm (in)



Maintenance

Lubrication Points	4-2
Maintenance Schedule	4-4

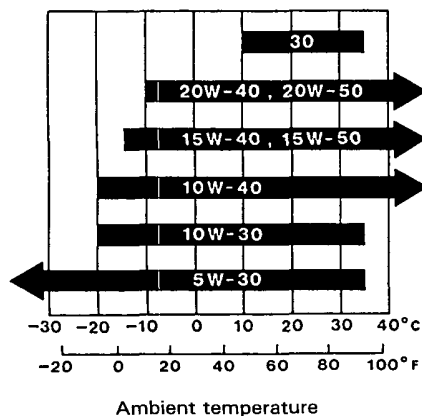


Lubrication Points

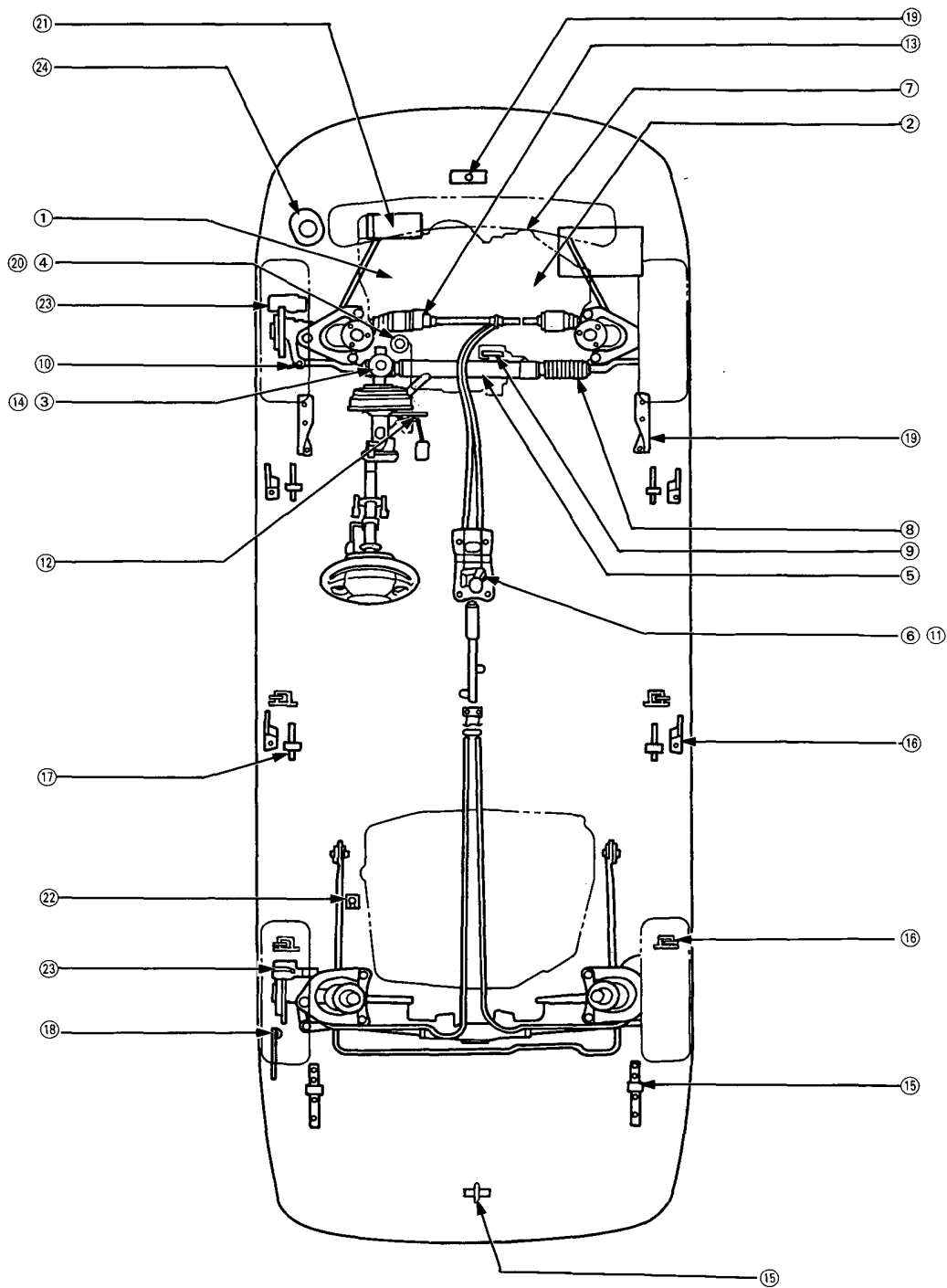
For the details of lubrication points and types of lubricants to be applied, refer to the Illustrated Index and various work procedures (such as Assembly/Reassembly, Replacement, Overhaul, Installation, etc.) contained in each section.

No.	LUBRICATION POINTS	LUBRICANT
1	Engine	Always use a fuel-efficient oil is that says "API Service SF or SG." SAE Viscosity: See chart below.
2	Transmission Manual Automatic	API Service Grade: SF or SG SAE Viscosity: 10 W-30 or 10 W-40 Honda Premium Formula Automatic Transmission Fluid or an equivalent DEXRON® II Automatic transmission fluid
3	Brake Line	Brake fluid DOT3 or DOT4
4	Clutch Line	Brake fluid DOT3 or DOT4
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)	Multi-purpose grease
8	Steering boots	
9	Throttle cable end	
10	Steering ball joints	
11	Select lever (Automatic Transmission)	
12	Pedal linkage	
13	Intermediate shaft	
14	Brake master cylinder pushrod	
15	Trunk hinges and latches	
16	Door hinges upper/lower and latches	
17	Door opening detents	
18	Fuel fill lid	
19	Engine hood hinges and engine hood latch	
20	Clutch master cylinder pushrod	
21	A/C Compressor	Compressor oil ND-OIL8 P/N 38899-PR7-003
22	Brake pipe joint (Front and rear wheel house)	Rust-preventive agent
23	Caliper Piston seal, Dust seal, Caliper pin, Piston	Silicone grease
24	Power steering system	Honda power steering fluid

Select the oil for the car according to this chart:



CAUTION: Used engine oil may cause skin cancer if repeatedly left in contact with the skin for prolonged periods. Although this is unlikely unless you handle used oil on a daily basis, it is still advisable to thoroughly wash your hands with soap and water as soon as possible after handling used oil.



Maintenance Schedule

R—Replace I—Inspect After inspection, clean, adjust, fill up, repair or replace if necessary.

Service at the interval listed x 1,000 km (or miles) or after that number of months, whichever comes first.	x 1,000 km	20	40	60	80	100	120	140	160	180	200
	x 1,000 miles	12	24	36	48	60	72	84	96	108	120
Maintenance item	months	12	24	36	48	60	72	84	96	108	120
Replace every 10,000 km (6,000 miles) or 12 months											
• Engine oil and oil filter				R			R			R	
• Transmission oil											R
Valve clearance		I	I	I	I	I	I	I	I	I	I
Belt tension and conditions (Alternator, P/S pump, A/C compressor)		I	I	I	I	I	I	I	I	I	I
Timing belt and timing balancer belt						R					R
Water pump						I					I
Cooling system hoses and connections		I	I	I	I	I	I	I	I	I	I
• Engine coolant					R	R	R	R	R	R	R
Spark plugs			R	R	R	R	R	R	R	R	R
Air cleaner element			R	R	R	R	R	R	R	R	R
Tank, fuel lines and connections			I	I	I	I	I	I	I	I	I
Fuel filter			R	R	R	R	R	R	R	R	R
Positive crankcase ventilation valve						I					
Idle speed and idle CO		I	I	I	I	I	I	I	I	I	I
Front brake pads											
Inspect every 10,000 km (6,000 miles) or 12 months											
Front brake discs and calipers		I	I	I	I	I	I	I	I	I	I
Rear brake discs, calipers and pads		I	I	I	I	I	I	I	I	I	I
Parking brake operation		I	I	I	I	I	I	I	I	I	I
Brake fluid (Including ABS)			R	R	R	R	R	R	R	R	R
Brake hoses and lines (Including ABS)		I	I	I	I	I	I	I	I	I	I
Anti-lock brake system operation (Equipped for ABS)		I	I	I	I	I	I	I	I	I	I
Anti-lock brake system high pressure hose (Equipped for ABS)					R	R	R	R	R	R	R
Exhaust system and condition		I	I	I	I	I	I	I	I	I	I
Catalytic converter heat shield						I					I

• Day to day care (engine oil, ATF and coolant level) should be done practically according to the owner's manual by the customer.



R – Replace I – Inspect After inspection, clean, adjust, fill up, repair or replace if necessary.

Maintenance item	x 1,000 km			x 1,000 miles			months			
	20	40	60	80	100	120	140	160	180	200
Suspension components	I	I	I	I	I	I	I	I	I	I
Steering function, tie rod ends, gearbox and boots	I	I	I	I	I	I	I	I	I	I
Power steering function, hoses and connections	I	I	I	I	I	I	I	I	I	I
All fluid levels	Inspect every 10,000 km (6,000 miles) or 12 months									
Battery condition	I	I	I	I	I	I	I	I	I	I
Tyres condition, wear and pressure (Including spare)	Inspect every 10,000 km (6,000 miles) or 12 months									
Lights operation and head light beam	Inspect every 10,000 km (6,000 miles) or 12 months									
Paint damages and body work	I	I	I	I	I	I	I	I	I	I
Test drive (Noise, stability, dashboard operations)	I	I	I	I	I	I	I	I	I	I
Cleanliness of controls, door handles etc.	Inspect after every service									
Supplemental Restraint System	Inspect system and replace slip ring 10 years first registration									

Sever Driving Conditions

The following items must be serviced more frequently on cars normally used under severe driving conditions. Refer to the chart below for the appropriate maintenance intervals.

Severe driving conditions include:

- A: Repeated short distance driving.
- B: Driving in dusty conditions.
- C: Driving in severe cold weather.
- D: Driving in areas using road salt or other corrosive materials.
- E: Driving in rough and/or muddy roads.
- F: Towing trailer.

Condition	Maintenance Item	Operation	Interval
A B • • F	Engine oil and oil filter	R	Every 5,000 km (3,000 miles) or 6 months
• • • • F	Transmission oil	R	Every 20,000 km (12,000 miles) or 12 months
• B • • E •	Air cleaner element	R	Every 20,000 km (12,000 miles) or 12 months
A B • D E F	Front brake discs and callipers	I	Every 10,000 km (6,000 miles) or 6 months
A B • D E F	Rear brake discs, callipers and pads	I	Every 20,000 km (12,000 miles) or 12 months
• B C • E •	Power steering system	I	Every 10,000 km (6,000 miles) or 6 months

R = Replace

I = Inspect: After inspection, adjust, clean, fill up, repair or replace if necessary.

Engine

Engine Removal/Installation	5-1
Cylinder Head/Valve Train	6-1
Engine Block	7-1
Engine Lubrication	8-1
Intake Manifold/Exhaust System	9-1
Cooling	10-1



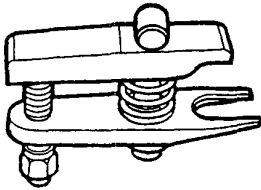
Engine Removal/Installation

Special Tools	5-2
Engine Removal/Installation	5-3

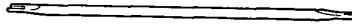


Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07MAC-SL00100	Ball Joint Remover, 32 mm	1	5-9
②	07KAK-SL40101	Engine Tilt Hanger Set	1	5-10



①



②

Engine Removal/Installation



⚠ 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 car will not roll off stands and fall while you are working under it.

CAUTION:

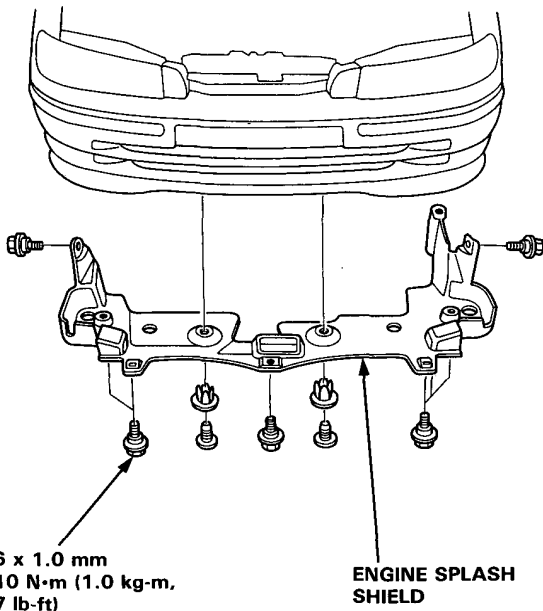
- Use fender covers to avoid damaging painted surface.
- Unspecified items are common.
- Unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- Make all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses or interference with other parts.

1. Secure the hood as far open as possible.
2. Disconnect the battery negative terminal first, then the positive terminal.

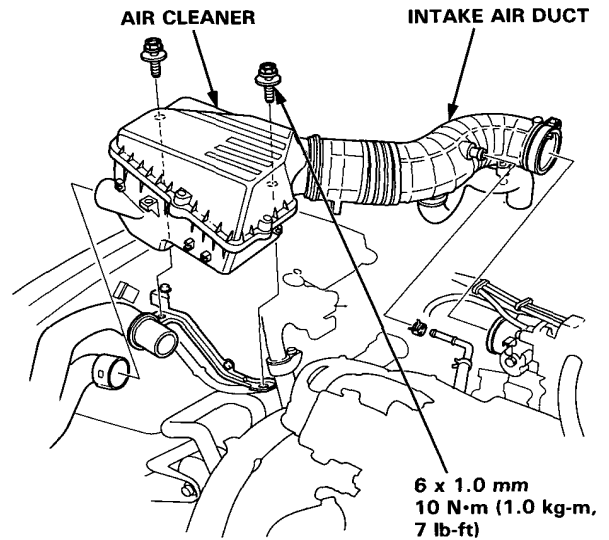
3. Remove the radiator cap.

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

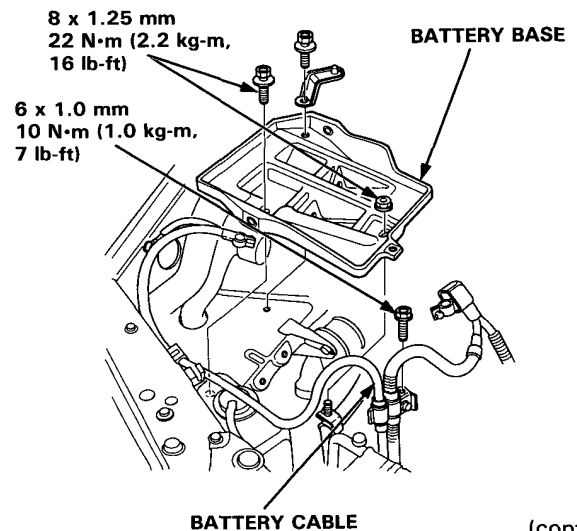
4. Raise the hoist to full height.
5. Remove the front wheels and the engine splash shield.



6. Loosen the drain plug from the radiator.
 7. Drain the transmission oil or fluid. Reinstall the drain plug using a new washer.
 8. Drain the engine oil. Reinstall the drain bolt using a new washer, then lower the hoist.
- CAUTION: Do not overtighten the drain bolt.
9. Remove the intake air duct and air cleaner.



10. Remove the battery, battery base, battery cable.

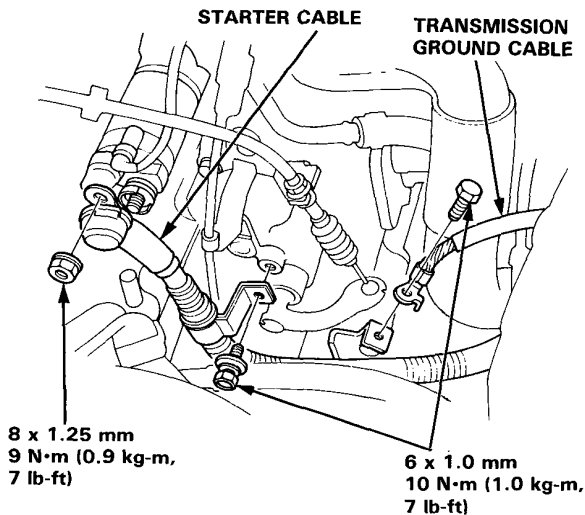


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Engine Removal/Installation

(cont'd)

11. Remove the starter cable and transmission ground cable.



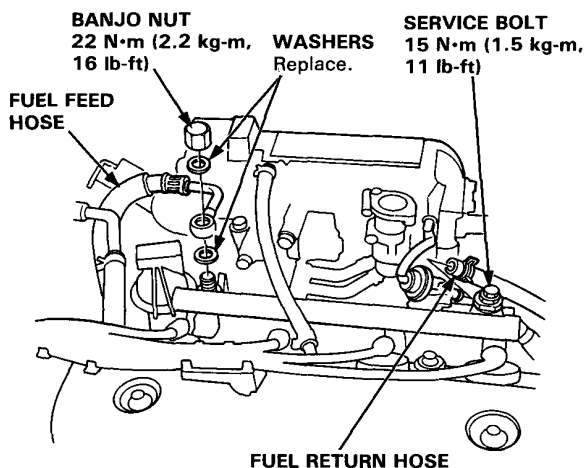
12. Relieve fuel pressure by slowly loosening the service bolt on the fuel rail about one turn (see section 11).

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

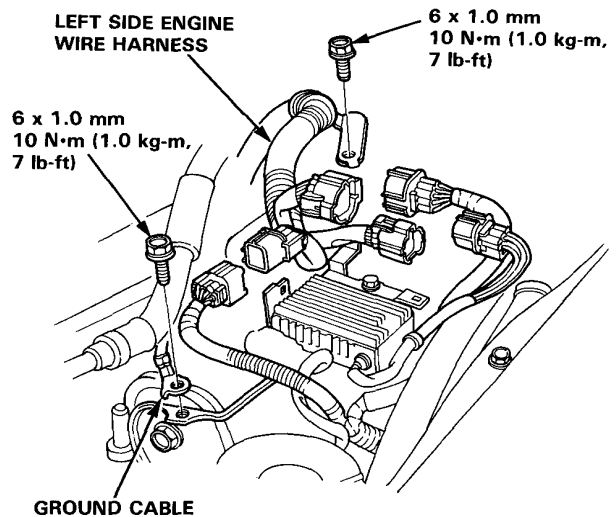
CAUTION:

- Before disconnecting any fuel line, relieve the fuel pressure as described above.
- Place a shop towel over the fuel rail to prevent pressurized fuel from splaying over the engine.

13. Remove the fuel feed hose and fuel return hose.



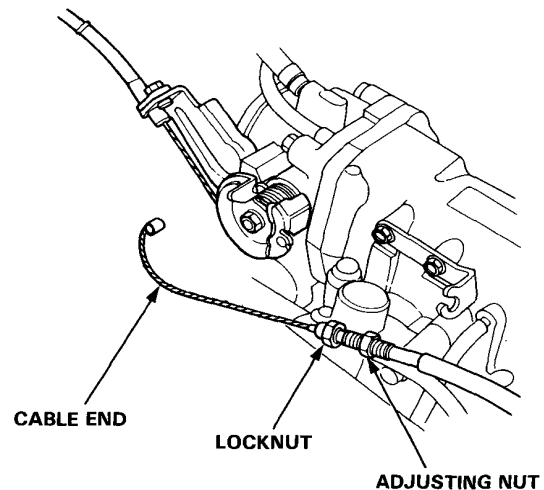
14. Remove the left side engine wire harness and ground cable.



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

NOTE:

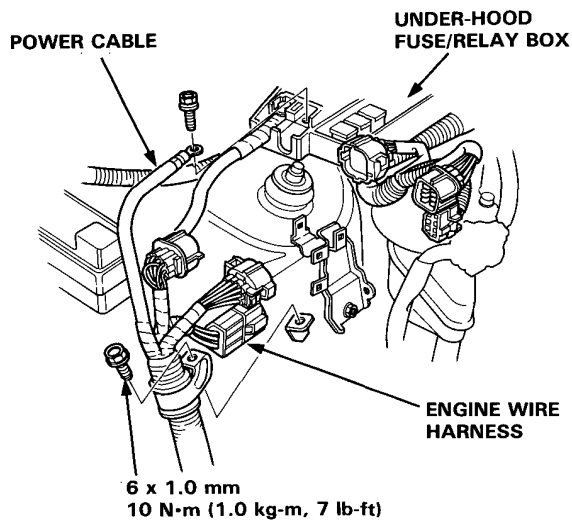
- Do not loosen the adjusting nut.
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the throttle cable when installing (see section 11).



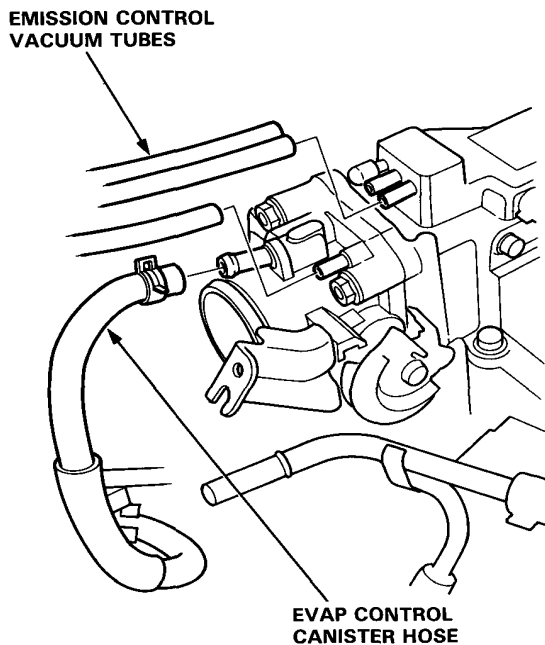
16. Remove the engine wire harness connectors, terminal and clamps on the right side of engine compartment.



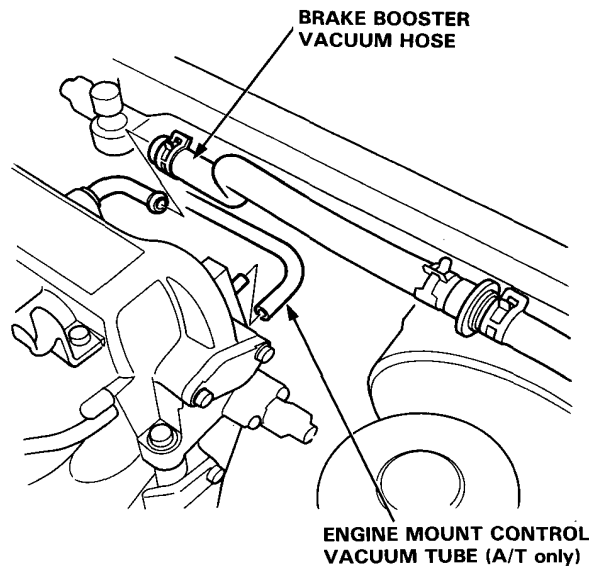
17. Remove the power cable from the under-hood fuse/relay box.



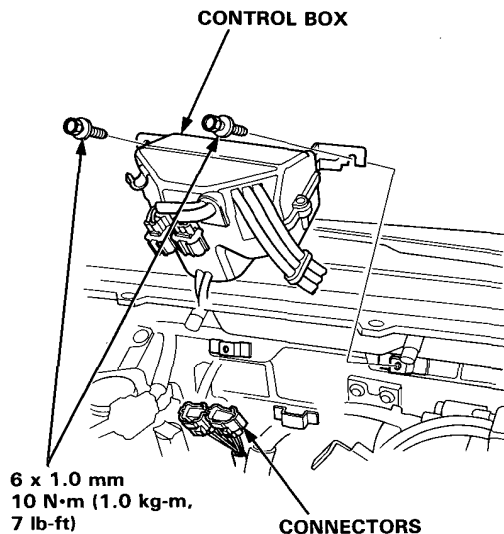
18. Remove the evaporative emission (EVAP) control canister hose and emission control vacuum tubes from the intake manifold.



19. Remove the brake booster vacuum hose and engine mount control vacuum tube (A/T only) from the intake manifold.



20. Remove the connectors and the control box.



(cont'd)

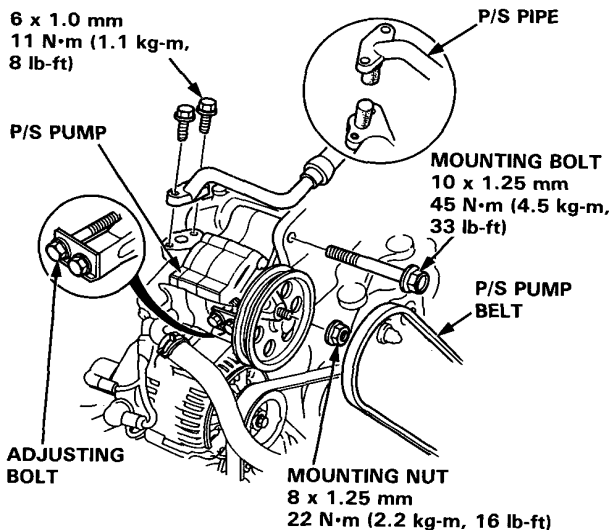
Engine Removal/Installation

(cont'd)

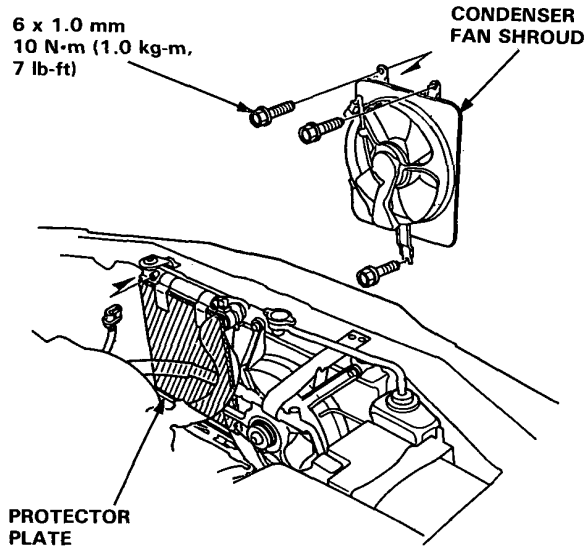
21. Remove the engine ground cable on the cylinder head.
22. Remove the power steering (P/S) pipe and mounting bolt/nut. Loosen the adjusting bolt, then remove the P/S pump belt and pump.

NOTE:

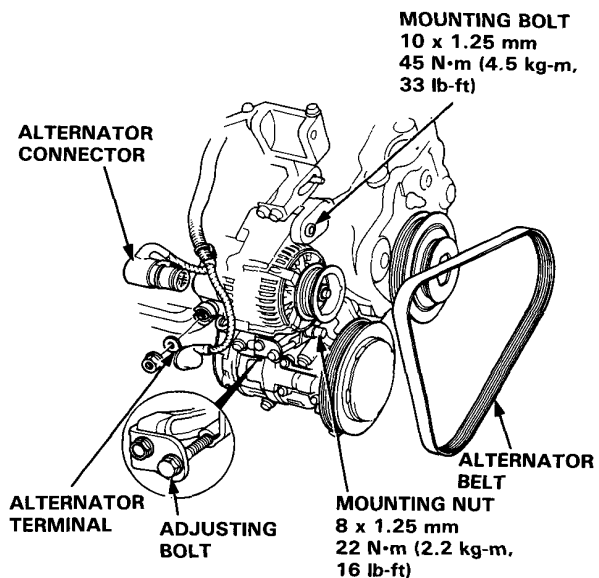
- Plug the pipe and the pump port.
- Do not disconnect the hose.



23. Remove the condenser fan shroud then install a protector plate to the radiator.



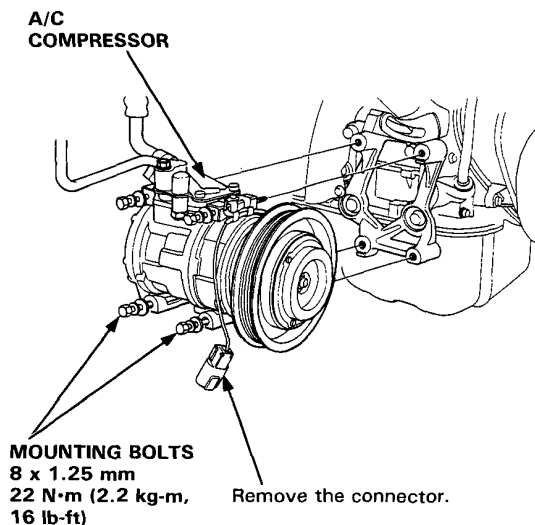
24. Loosen the adjusting bolt and mounting bolt/nut from the alternator, then remove the alternator belt.



25. Loosen the mounting bolt, then remove the air conditioning (A/C) compressor.

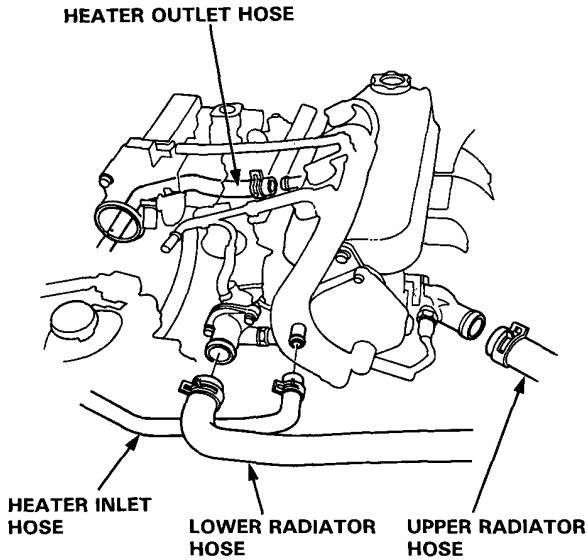
NOTE:

- Do not disconnect the A/C hose.
- Disconnect the connector.

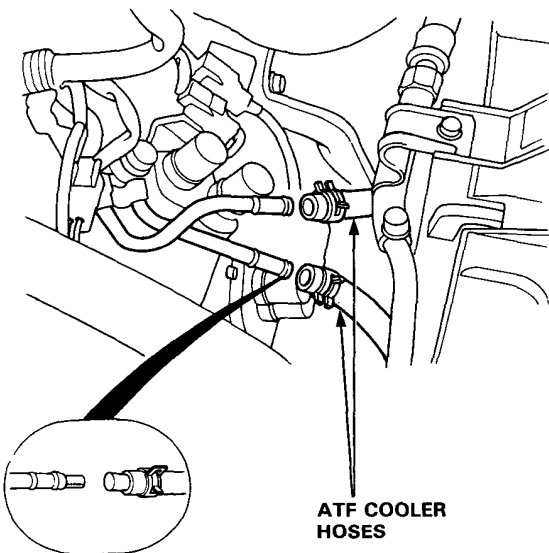




26. Remove the upper and lower radiator hoses and the heater hoses.



27. Remove the automatic transmission fluid (ATF) cooler hoses (A/T).

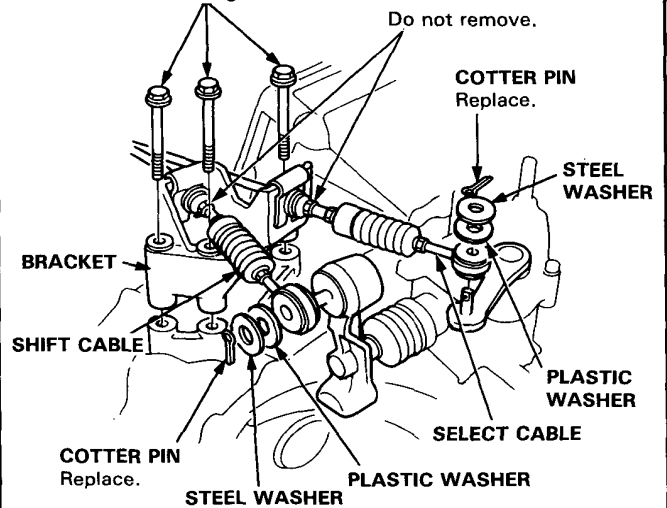


28. Remove the shift cable and select cable (M/T).

NOTE:

- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the shift cable and select cable when installing (see section 13).

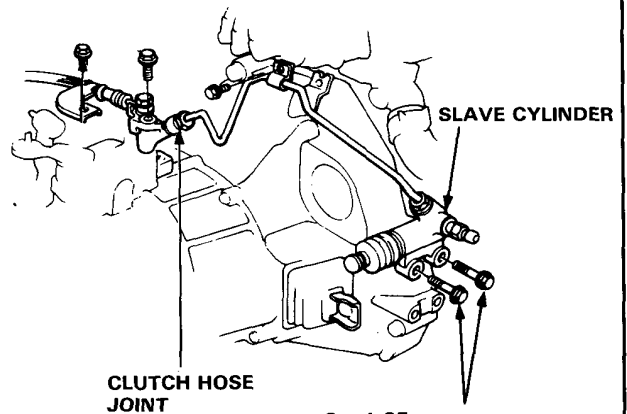
8 x 1.25 mm
22 N·m (2.2 kg-m, 16 lb-ft)



29. Remove the clutch slave cylinder and the pipe/hose assembly (M/T).

NOTE:

- Do not operate the clutch pedal once the slave cylinder has been removed.
- Take care, not to bend the pipe.



8 x 1.25 mm
22 N·m (2.2 kg-m,
16 lb-ft)

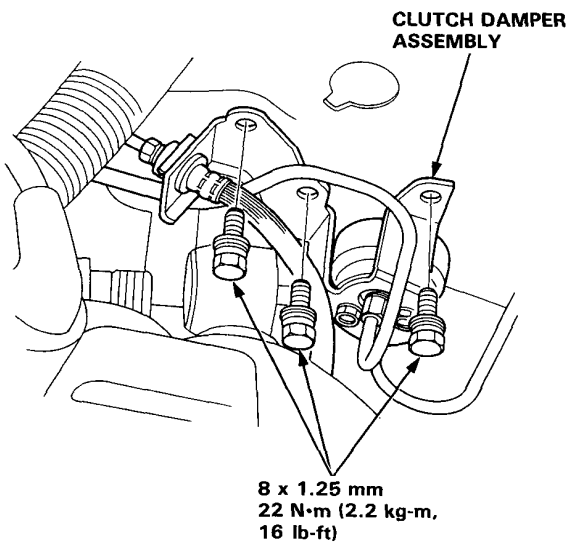
(cont'd)

Engine Removal/Installation

(cont'd)

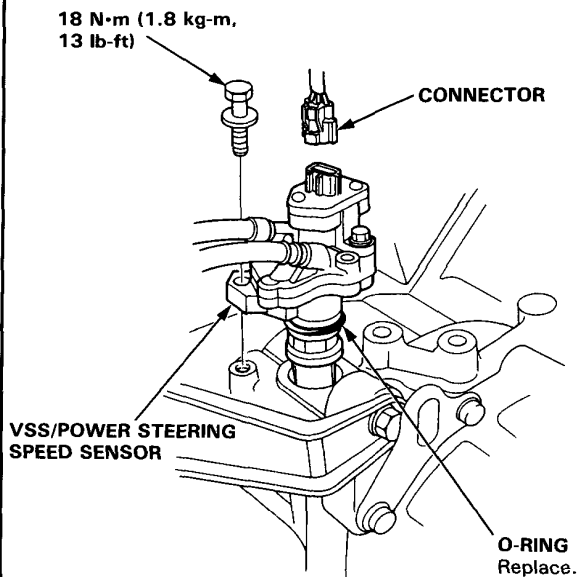
30. Remove the clutch damper assembly (M/T).

NOTE: Take care, not to bend the pipe.



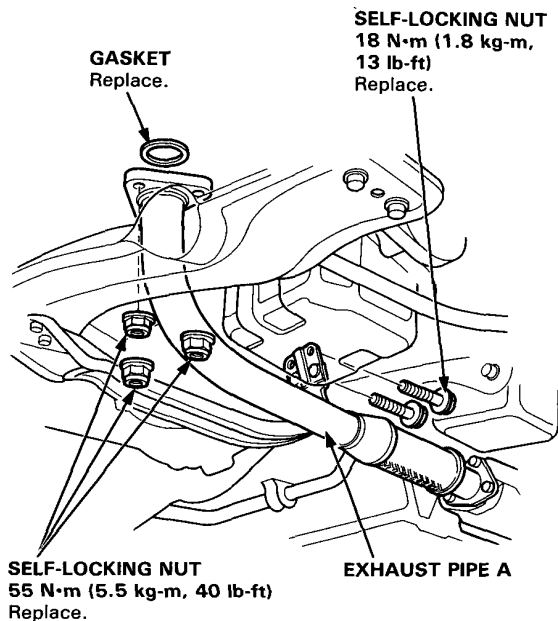
31. Remove the vehicle speed sensor (VSS)/power steering speed sensor assembly.

NOTE: Do not disconnect the hoses.



32. Raise the hoist to full height.

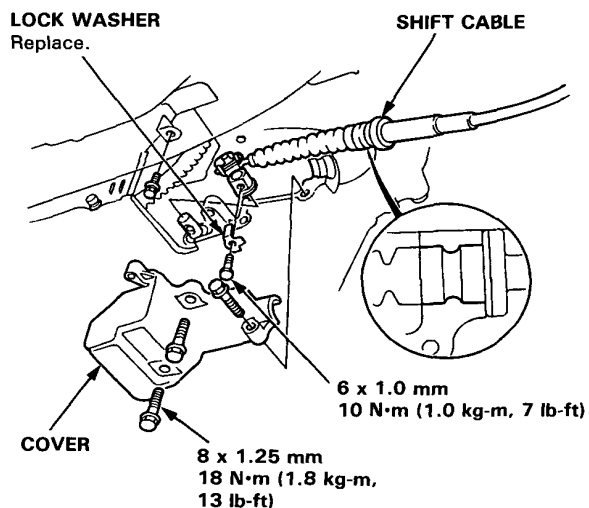
33. Remove the exhaust pipe A.



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

NOTE:

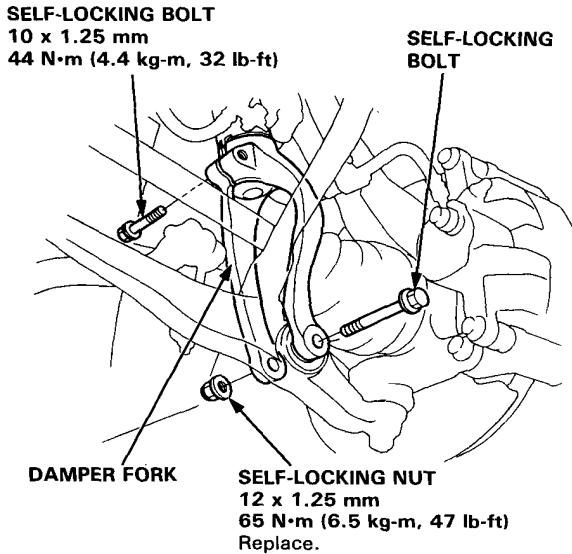
- Take care not to bend the cable when removing it. Always replace any kinked cable with a new one.
- Adjust the shift cable when installing (see section 14).



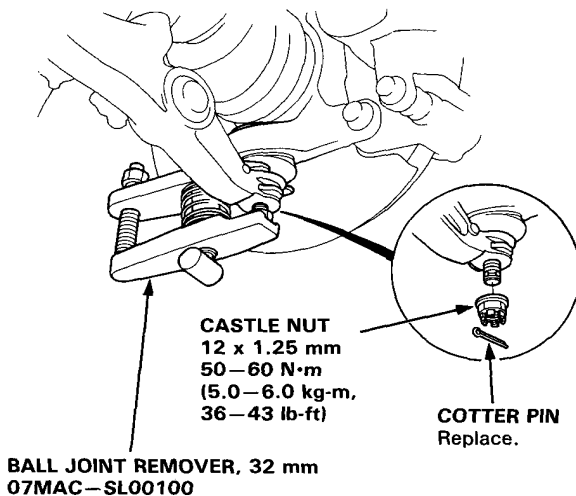


35. Remove the damper fork.

CAUTION: Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts (It should require 1 N·m (0.1 kg·m, 0.7 lb-ft) of torque to turn the nut on the bolt).



36. Disconnect the suspension lower arm ball joint with the special tool. Refer to section 18 for the procedure.

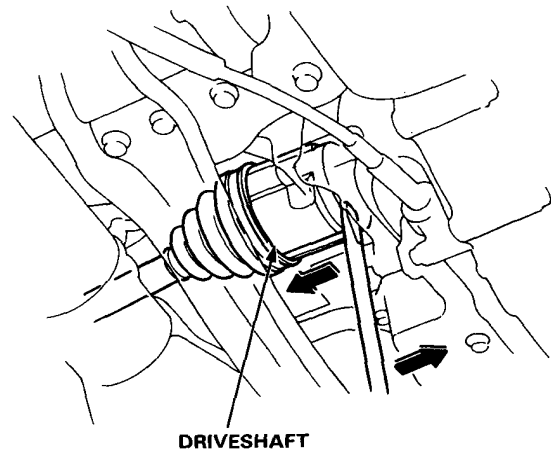


37. Remove the driveshafts.

CAUTION: Take care not to damage the oil seal when removing the driveshaft.

NOTE:

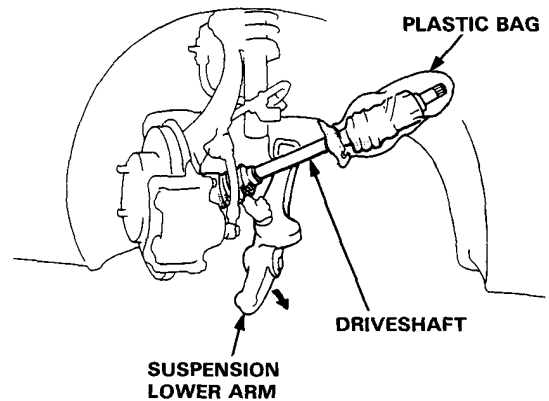
- Coat all precision finished surfaces with clean engine oil or grease.
- Tie plastic bags over the driveshaft ends.



38. Swing the driveshaft under the fender.

NOTE:

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

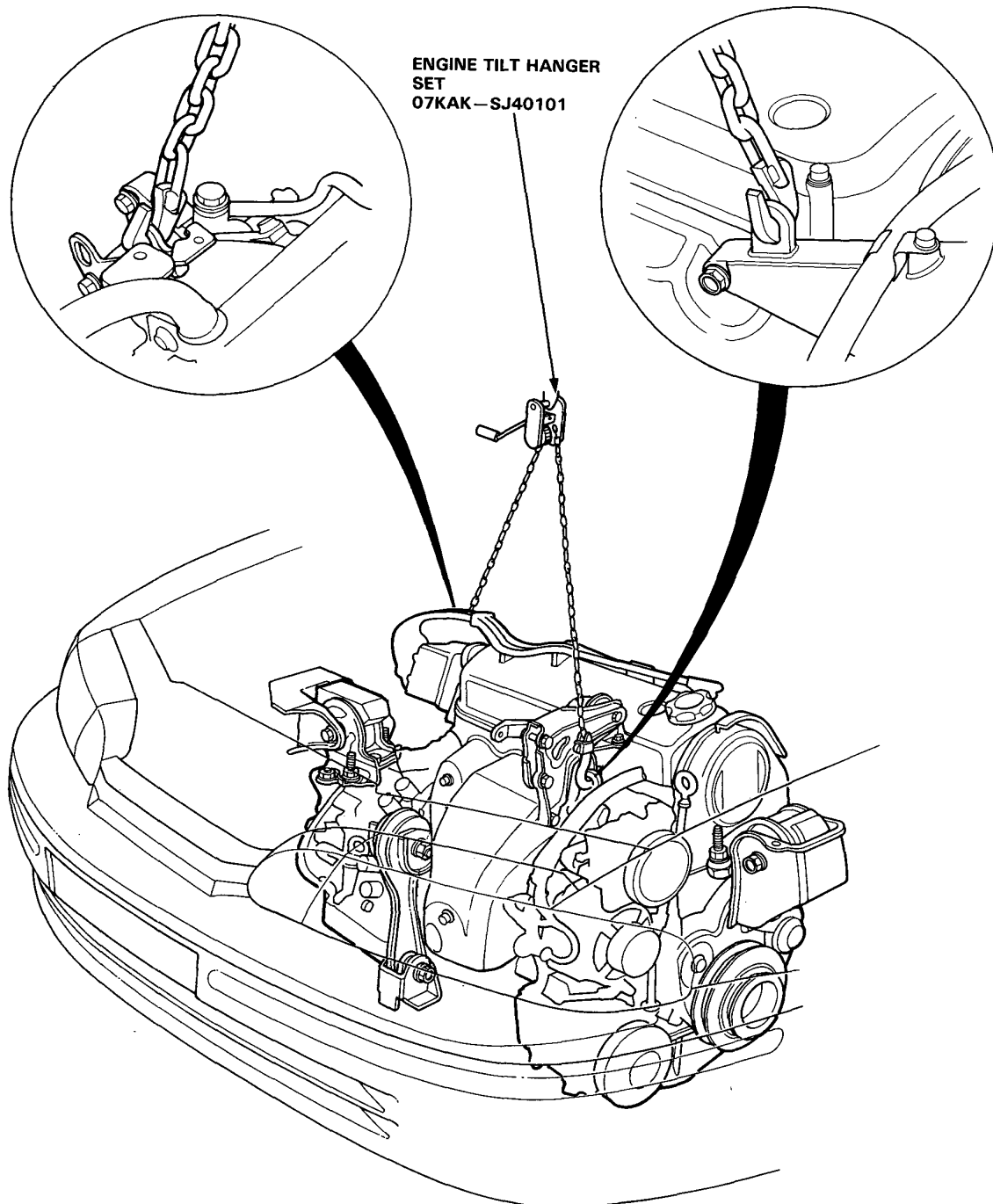


(cont'd)

Engine Removal/Installation

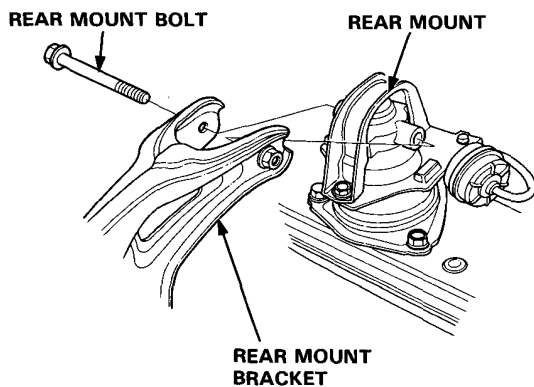
(cont'd)

- 39. Lower the hoist.
- 40. Attach the chain hoist to the engine.

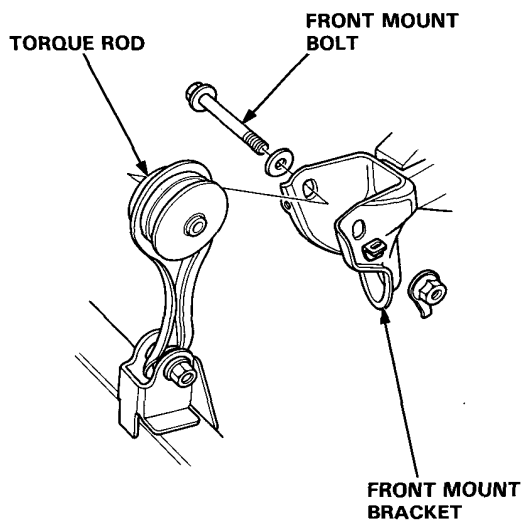




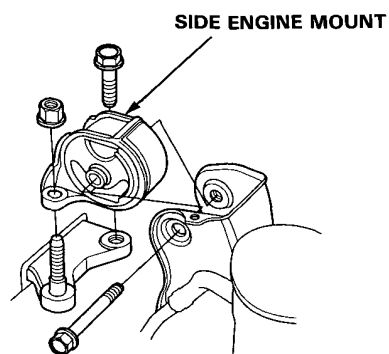
41. Remove the rear mount bolt.



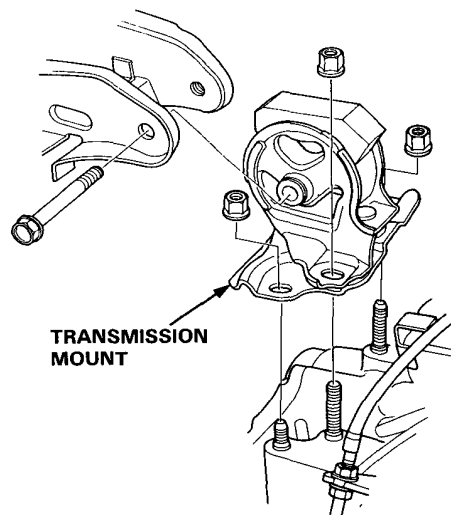
42. Remove the front mount bolt.



43. Remove the left side engine mount.



44. Remove the transmission mount.



45. Raise the chain hoist to remove all slack from the chain.

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

47. Slowly raise the engine approximately 150 mm (6 in).
Check once again that all hoses and wires have been disconnected from the engine.

48. Raise the engine all the way and remove it from the car.

(cont'd)

Engine Removal/Installation

(cont'd)

49. Install the engine in the reverse order of removal.

NOTE:

After the engine is in place:

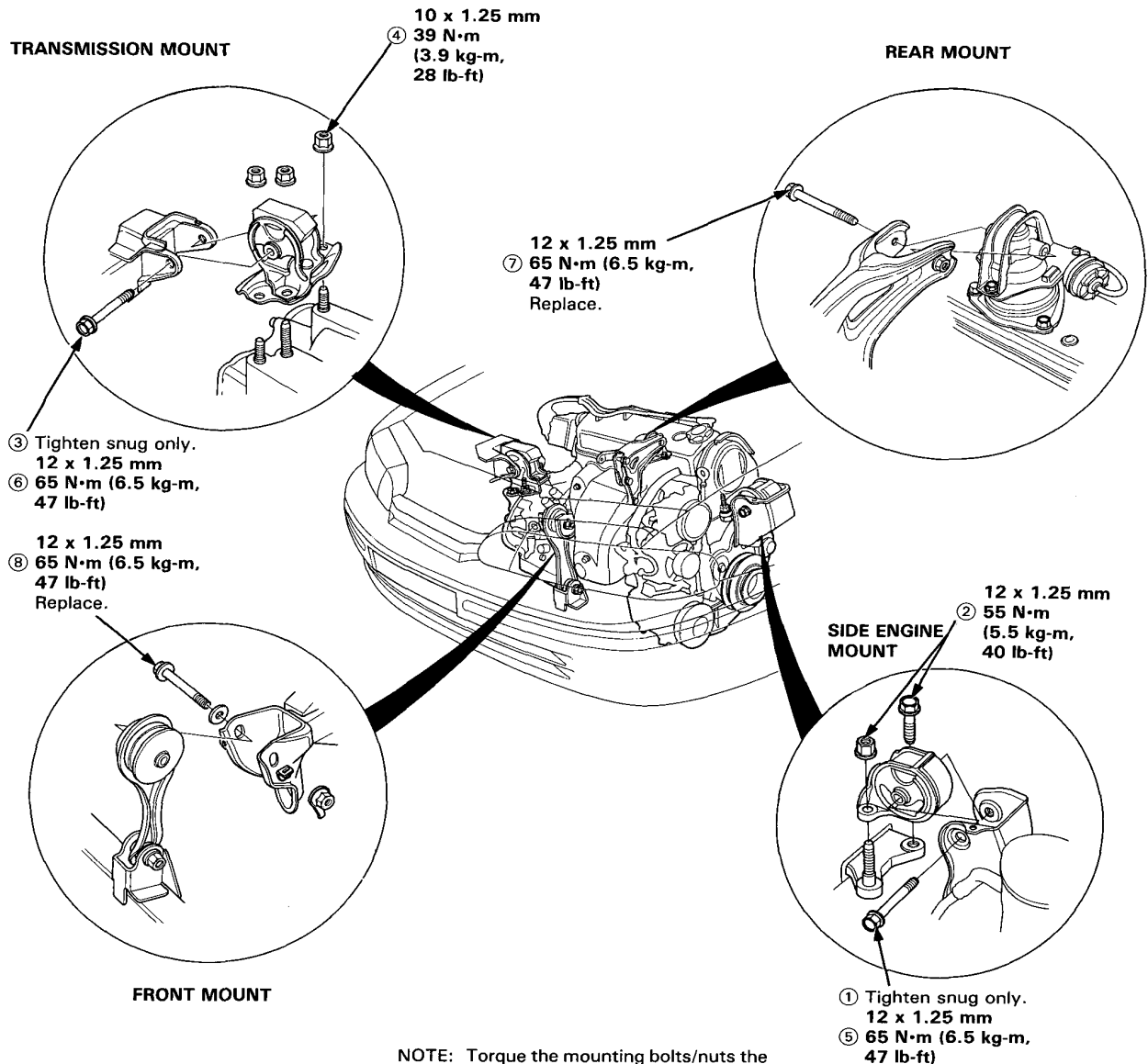
- Torque the engine mount bolts/nuts in the sequence shown below.

CAUTION: Failure to tighten the bolts/nuts in the proper sequence can cause excessive noise and vibration, and reduce bushing life; check that the bushings are not twisted or offset.

- Check that the spring clip on the end of each driveshaft clicks in to place.

CAUTION: Install new spring clips.

- Bleed air from the cooling system at the bleed bolt with the heater valve open.
- Adjust the throttle cable tension.
- Check the clutch pedal freeplay (M/T).
- Check that the transmission shift into gear smoothly.

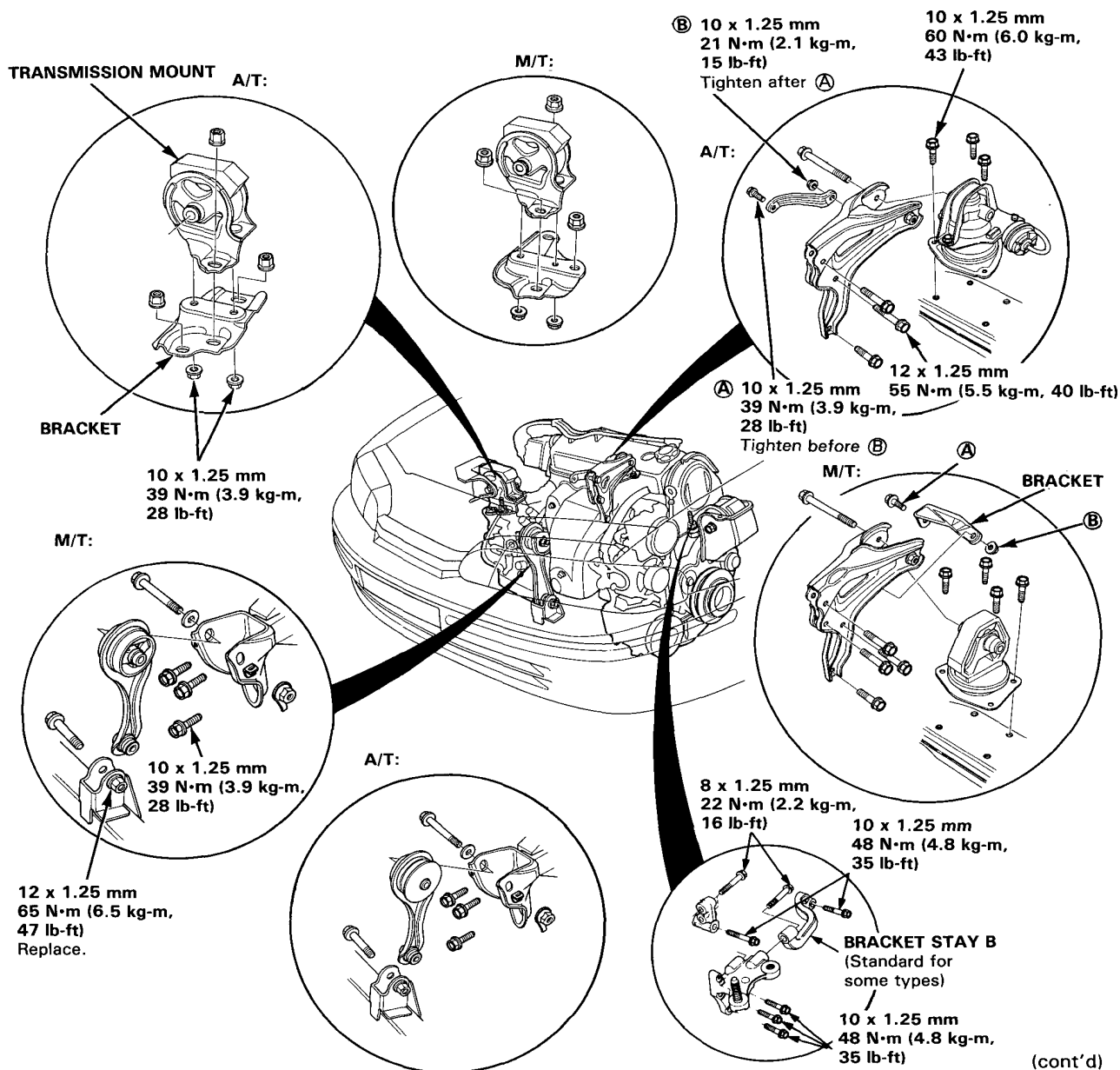




- Adjust the tension of the following drive belts:
Alternator belt (see section 23).
Power steering pump belt (see section 17).
Air conditioning compressor belt (see section 22).
- Clean battery posts and cable terminals with sandpaper, assemble, then apply grease to prevent corrosion.

- Inspect for fuel leakage.
After connecting all fuel line parts, turn on the ignition switch (do not operate the starter) so that the fuel pump operates for approximately two seconds and the fuel line is pressurized. Repeat this operation two or three times and check whether any fuel leakage has occurred at any point in the fuel line.

Mount and Bracket Bolts/Nuts Torque Value Specifications:

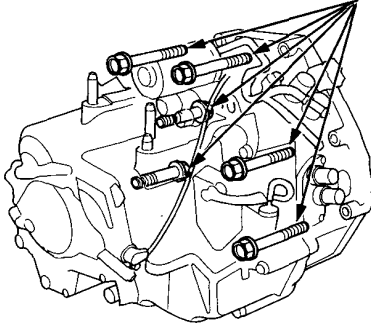


Engine Removal/Installation

(cont'd)

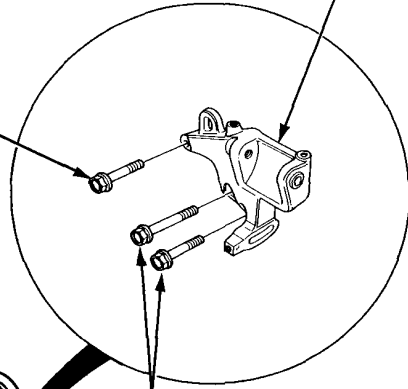
Transmission Mount Bolts and Bracket Bolts/Nuts Torque Value Specifications;

TRANSMISSION MOUNT BOLTS
65 N·m (6.5 kg-m, 47 lb-ft)

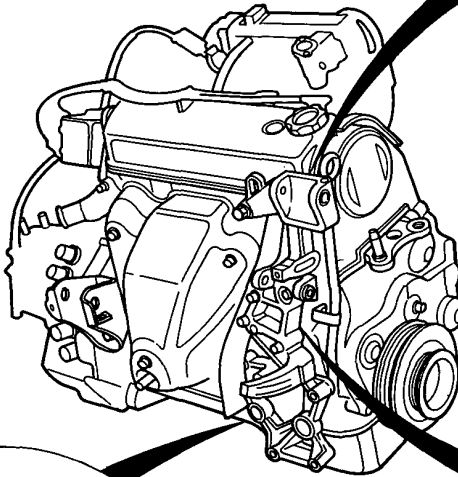


P/S BRACKET

8 x 1.25 mm
22 N·m (2.2 kg-m,
16 lb-ft)



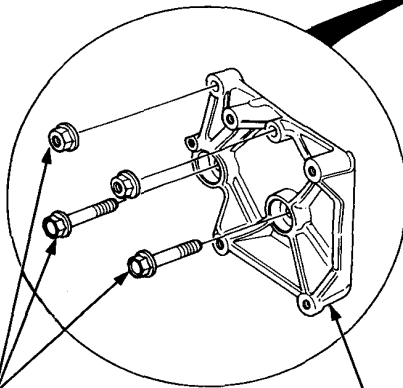
10 x 1.25 mm
50 N·m (5.0 kg-m,
36 lb-ft)



ALTERNATOR BRACKET

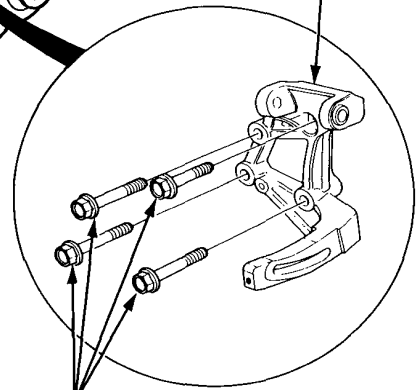
10 x 1.25 mm
50 N·m (5.0 kg-m,
36 lb-ft)

A/C BRACKET



10 x 1.25 mm
50 N·m (5.0 kg-m,
36 lb-ft)

Apply liquid gasket
to the bolt threads.



Cylinder Head/Valve Train

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Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAD-PJ70200	Valve Seal Installer	1	6-17
②	07HAH-PJ70100	Valve Guide Reamer, 5.5 mm	1	6-16
③	07JAA-0010200	Socket Wrench, 19 mm	1	6-26, 29
④	07JAB-0010200	Handle	1	6-26, 29
⑤	07LAG-PT20100	Balancer Shaft Lock Pin	1	6-28
⑥	07MAB-PY30100	Pulley Holder Attachment, HEX 50 mm	1	6-26, 29
⑦	07742-0010100	Valve Guide Driver, 5.5 mm	1	6-16
⑧	07757-0010000	Valve Spring Compressor	1	6-13



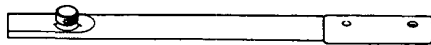
①



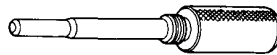
②



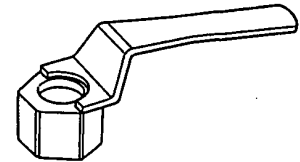
③



④



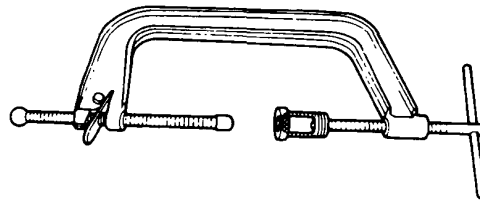
⑤



⑥



⑦



⑧

Illustrated Index

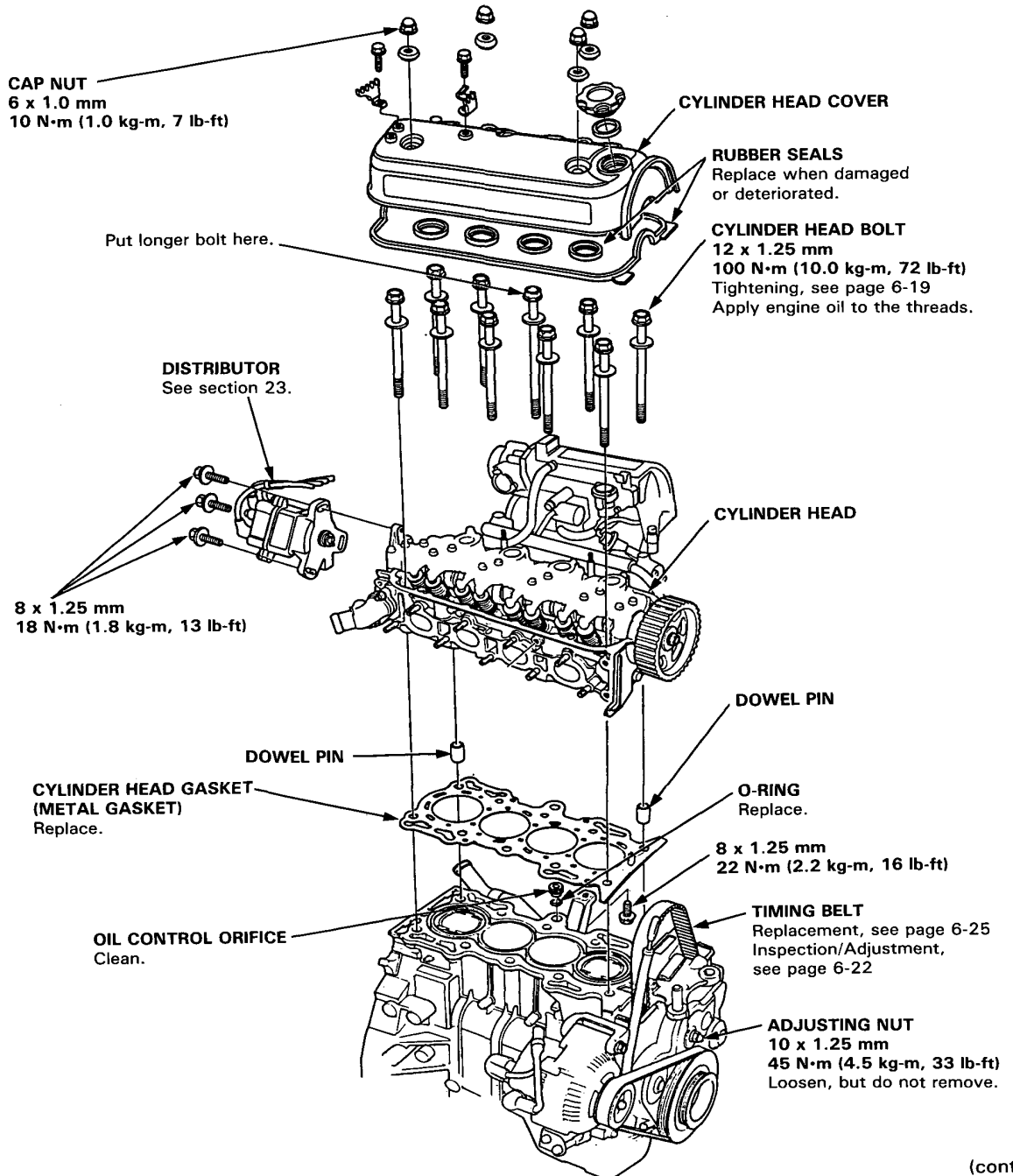


CAUTION:

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

NOTE:

- Use new O-rings and gaskets when reassembling.
- Clean the oil control orifice before installing.



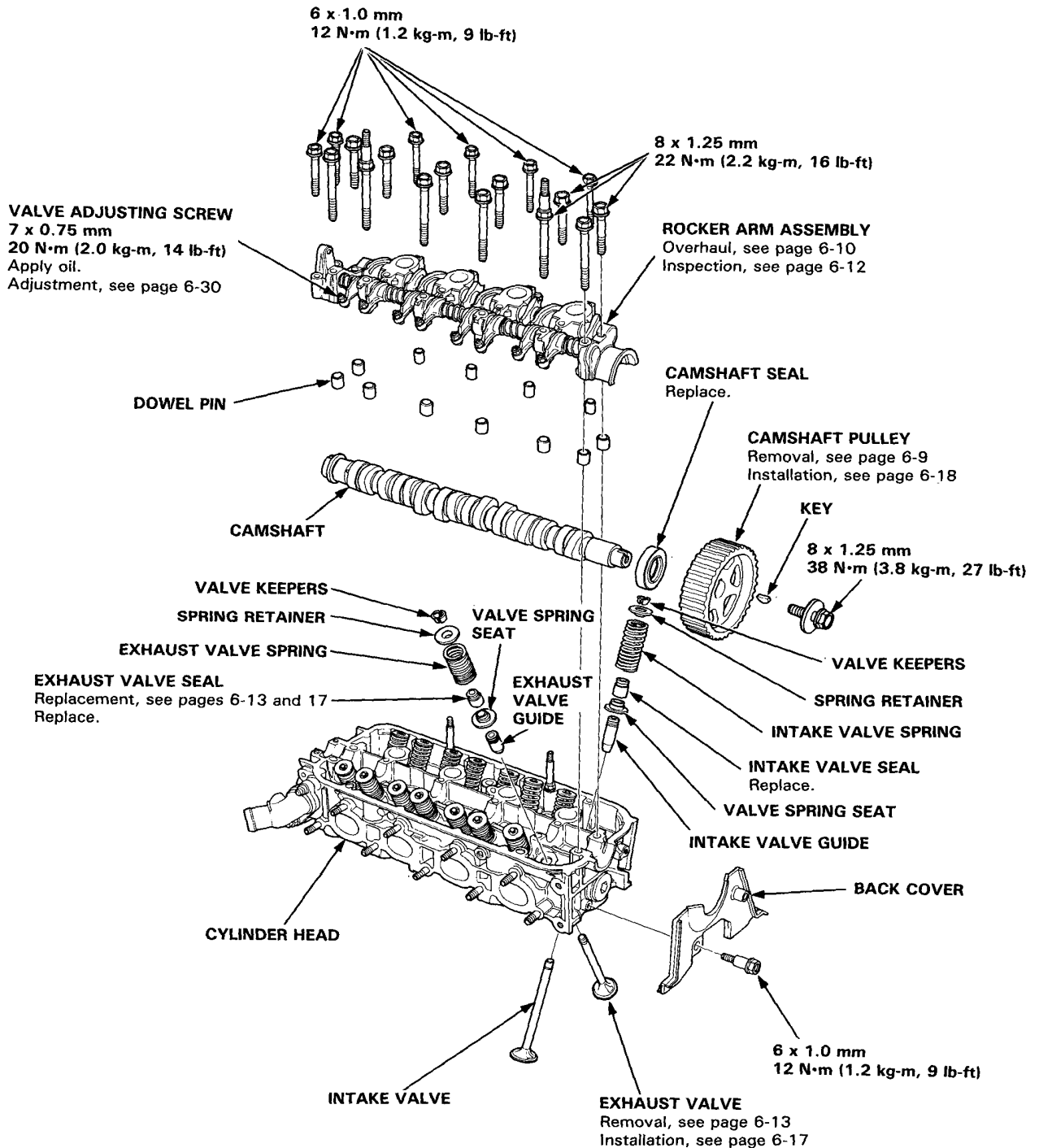
(cont'd)

Illustrated Index

(cont'd)



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





Cylinder Head

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.
- Make sure the car 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.
- Unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- 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.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 38°C (100°F) before loosening the retaining bolts.

NOTE:

- 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 6-24).
- Mark all emission hoses before disconnecting them.

1. Disconnect the negative terminal from the battery.
2. Drain the engine coolant (see page 10-5).
 - Remove the radiator cap to speed draining.
3. Relieve the fuel pressure (see section 11).

▲ WARNING

Do not smoke while working on fuel system, keep open flame or spark away from work area. Drain fuel only into an approved container.

4. Remove the fuel feed hose and fuel return hose.

BANJO NUT

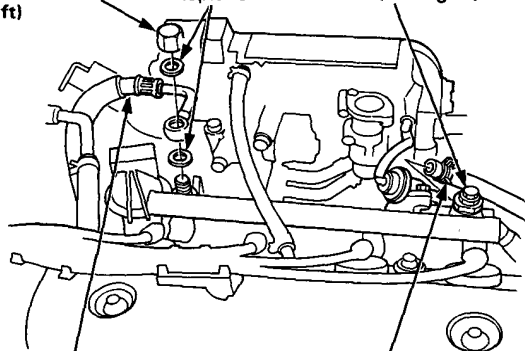
22 N·m (2.2 kg-m, 16 lb-ft)

WASHERS

Replace.

SERVICE BOLT

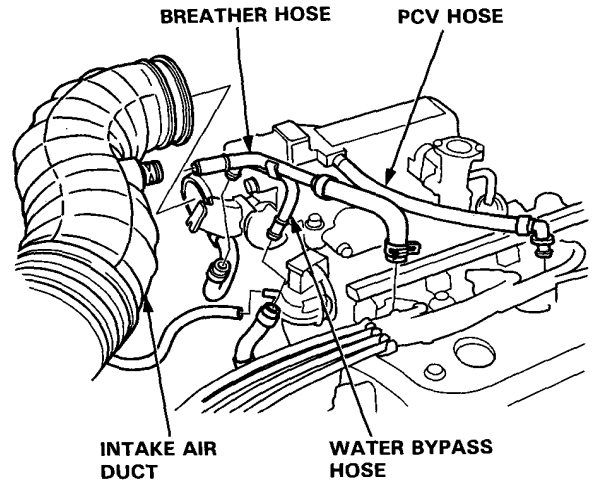
15 N·m (1.5 kg-m, 11 lb-ft)



FUEL FEED HOSE

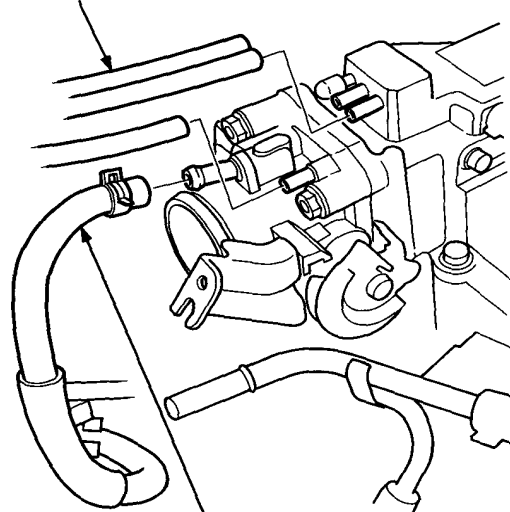
FUEL RETURN HOSE

5. Remove the water bypass hose, breather hose and intake air duct.
6. Remove the positive crankcase ventilation (PCV) hose.



7. Remove the evaporative emission (EVAP) control canister hose and emission control vacuum tubes from the intake manifold.

EMISSION CONTROL VACUUM TUBES



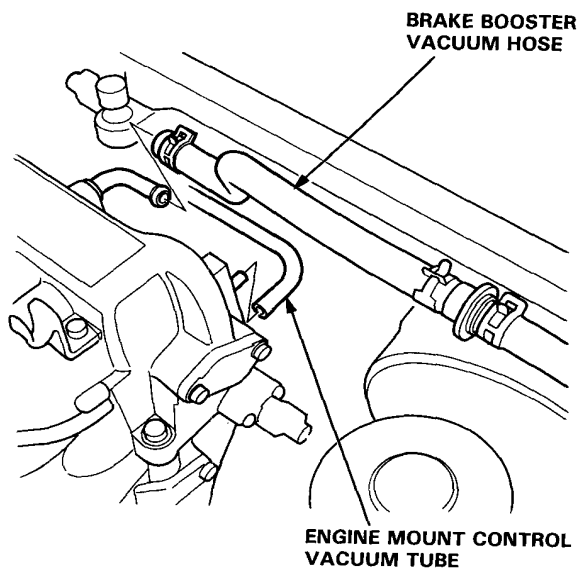
EVAP HOSE

(cont'd)

Cylinder Head

Removal (cont'd)

8. Remove the brake booster vacuum hose and engine mount control vacuum tube (A/T only) from the intake manifold.

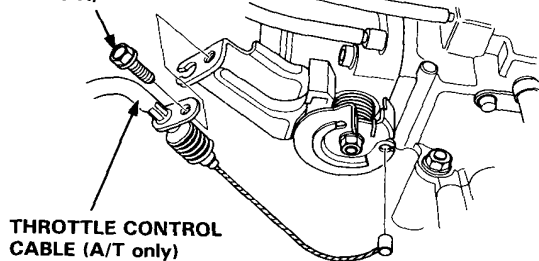


9. Remove the throttle cable (see page 5-4) and the throttle control cable (A/T only) from the throttle body.

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).

6 x 1.0 mm
12 N·m (1.2 kg-m,
9 lb-ft)



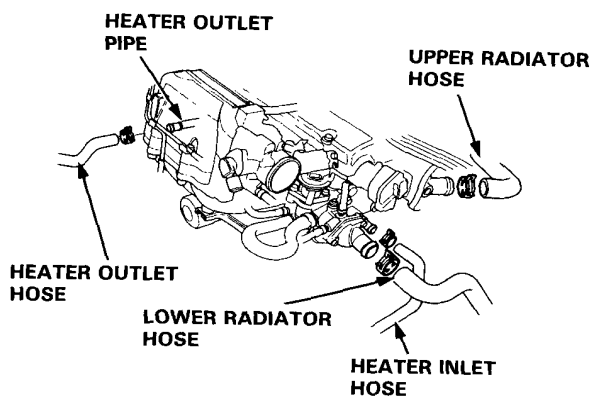
10. Remove the spark plug caps and the distributor.

11. Remove the connector and the terminal from the alternator, then remove the engine wire harness from the cylinder head cover.

12. Remove the following engine wire harness connectors and clamps from the cylinder head and the intake manifold:

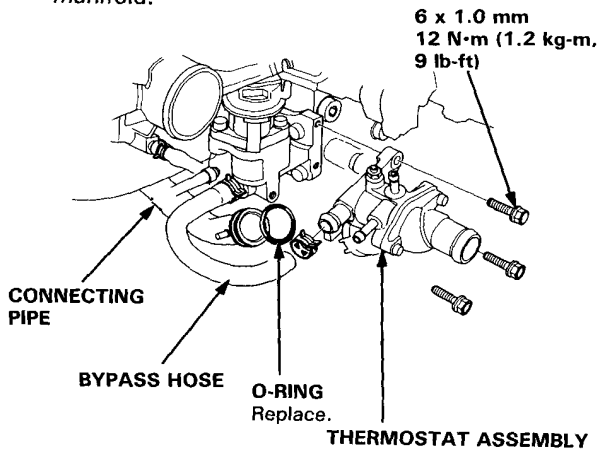
- Four injector connectors
- Intake air temperature (IAT) sensor connector
- Idle air control (IAC) valve connector
- Throttle position (TP) sensor connector
- Exhaust gas recirculation (EGR) valve lift sensor connector
- Ground cable terminals
- Engine coolant temperature (ECT) sensor connector
- Heated oxygen sensor (HO2S) connector
- ECT switch A connector
- ECT gauge sending unit connector
- Ignition coil connector
- CKP/TDC/CYP sensor connector
- Vehicle speed sensor (VSS) connector

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





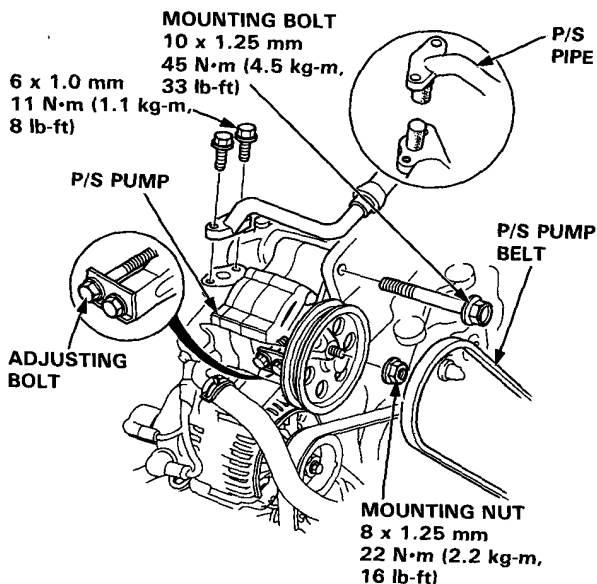
14. Remove the emission vacuum hoses and water bypass hoses from the intake manifold assembly.
15. Remove the water bypass hose from thermostat housing.
16. Remove the thermostat assembly from intake manifold.



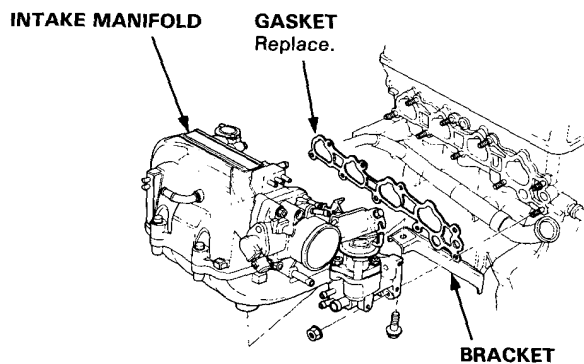
17. Remove the engine ground cable from the cylinder head cover.
18. Remove the power steering (P/S) pipe and mounting bolt/nut. Loosen the adjusting bolt, then remove the P/S pump belt and pump.

NOTE:

- Plug the pipe and the pump port.
- Do not disconnect the hose.
- After installing, adjust the tension of the P/S pump belt (see section 17).



19. Remove the intake manifold bracket and intake manifold.

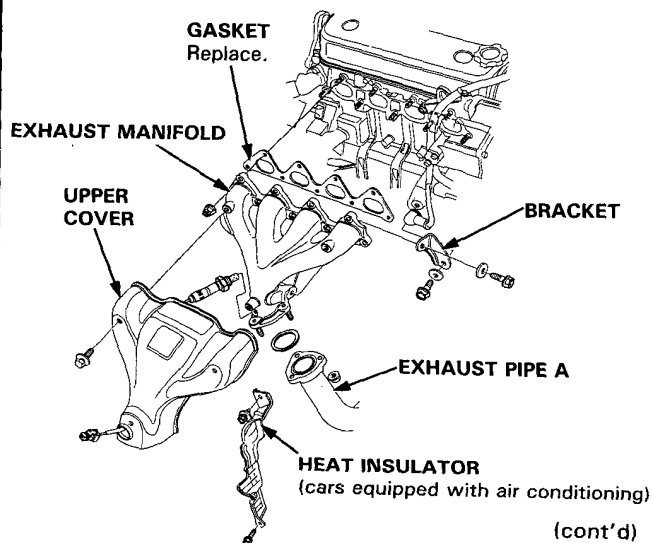


20. Lift the front of the car up and place it on safety stands.

▲ WARNING

- Make sure jacks and safety stands are placed properly.
- Apply the parking brake and block the rear wheels so the car will not roll off stands and fall while you are working under it.

21. Remove the front wheels and the engine splash shield (see page 5-2).
22. Remove the heat insulator (cars equipped with air conditioning only).
23. Remove the self-locking nuts and disconnect the exhaust manifold and exhaust pipe A.
24. Remove the exhaust manifold bracket and exhaust manifold.

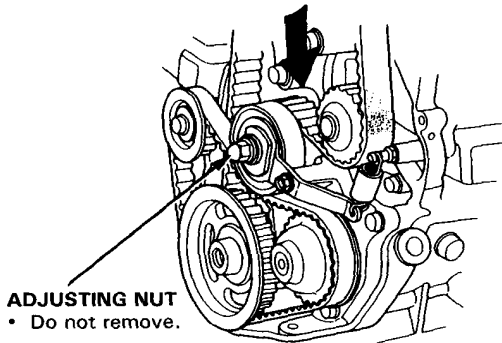


(cont'd)

Cylinder Head

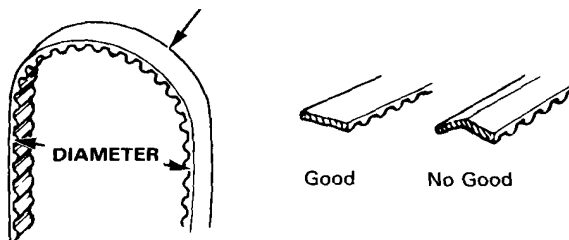
Removal (cont'd)

25. Remove the upper cover.
26. Loosen the adjusting nut 270–360°.
27. Push the tensioner to release tension from the timing belt, then retighten the adjusting nut.



28. Remove the timing belt from the camshaft pulley.

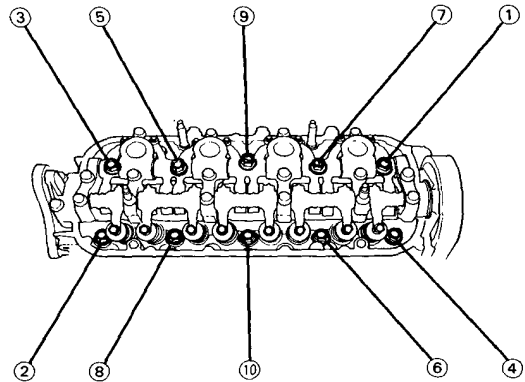
CAUTION: Do not crimp or bend the timing belt more than 90° or less than 25 mm (1 in) in diameter.



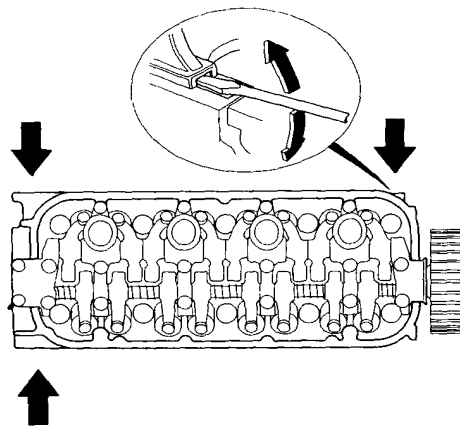
29. Remove the cylinder head bolts, then remove the cylinder head.

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

CYLINDER HEAD BOLT LOOSENING SEQUENCE



NOTE: Separate the cylinder head from the block with a flat blade screwdriver as shown.

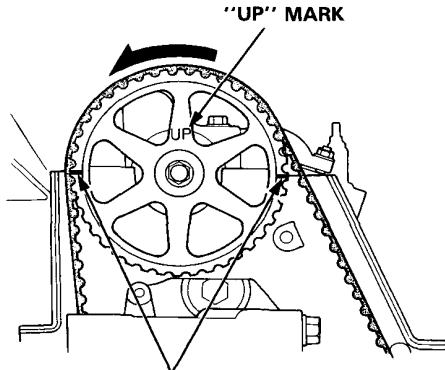




Camshaft Pulley

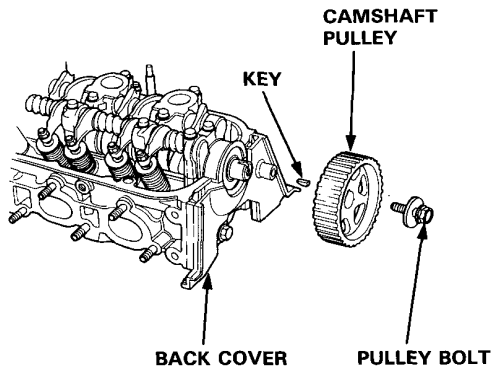
Removal

1. To ease reassembly, turn the camshaft pulley until the "UP" mark faces up, and the front timing mark is aligned with the cylinder head upper surface.



TDC GROOVES
Align front timing mark on pulley with the cylinder head upper surface.

2. Remove the timing belt.
3. Remove the pulley bolt, the camshaft pulley and the key, then remove the back cover.



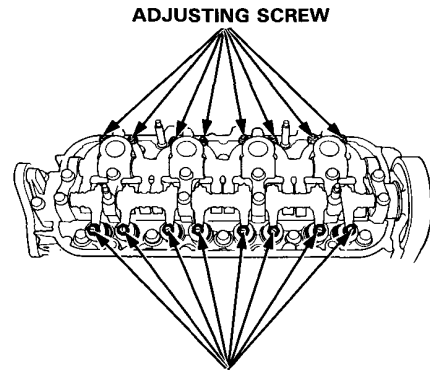
Rocker Arm Assembly

Removal

1. Loosen the adjusting screws, then remove the bolts and the rocker arm assembly.

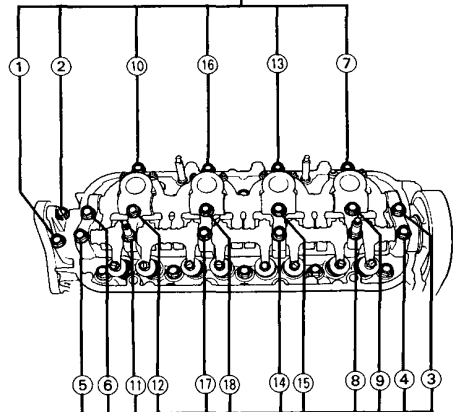
NOTE:

- 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 shafts.



ADJUSTING SCREW

6 mm BOLTS



8 mm BOLTS

Rocker Arms

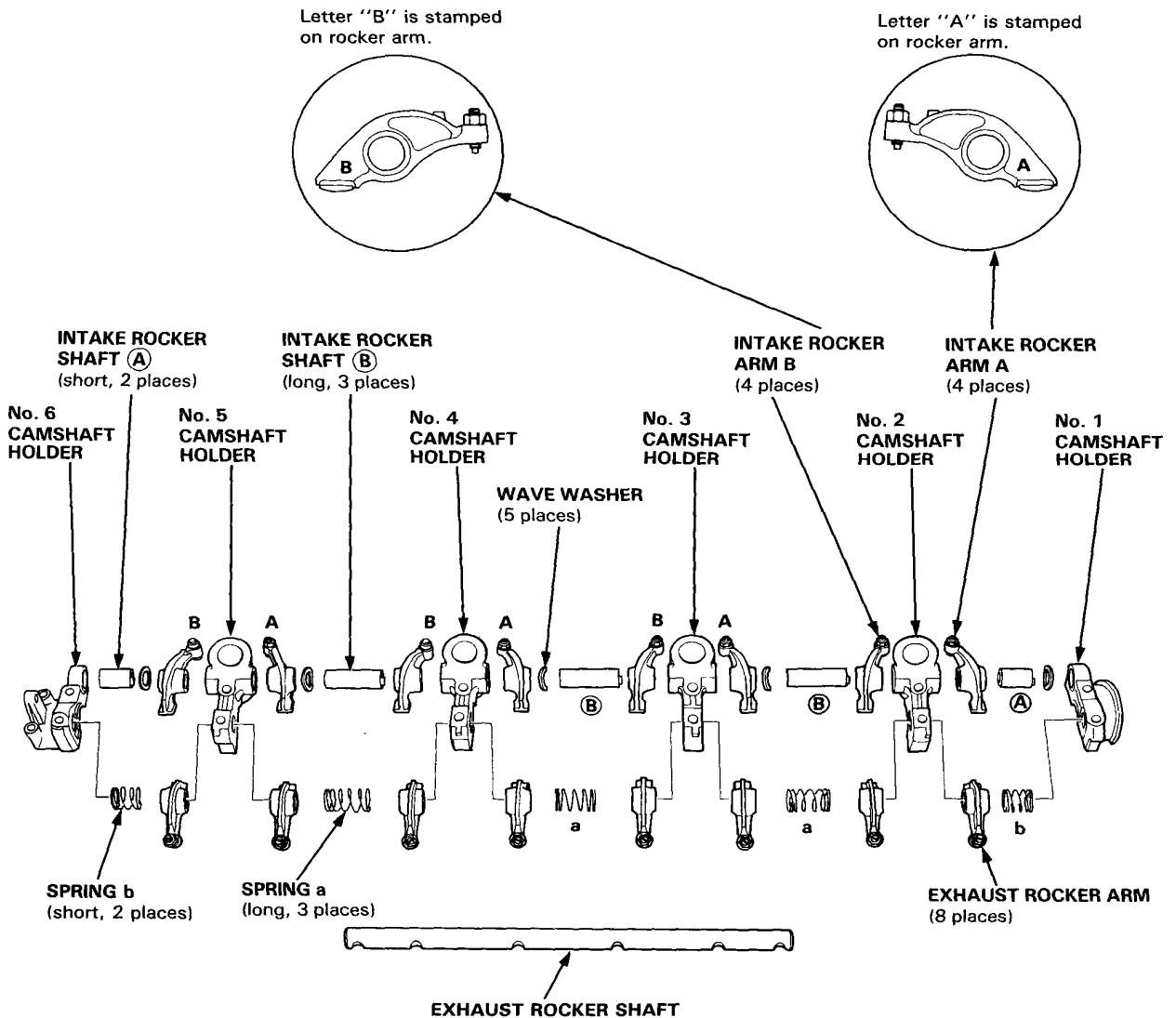
Overhaul

NOTE:

- Identify parts as they are removed to ensure reinstallation in original locations.
- Inspect rocker shafts and rocker arms (see page 6-12).
- Rocker arms must be installed in the same position if reused.
- When removing or installing rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.
- When reassembling, fit the projection of the intake rocker shaft to the notch in the camshaft holder.



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





Camshaft

Inspection

NOTE:

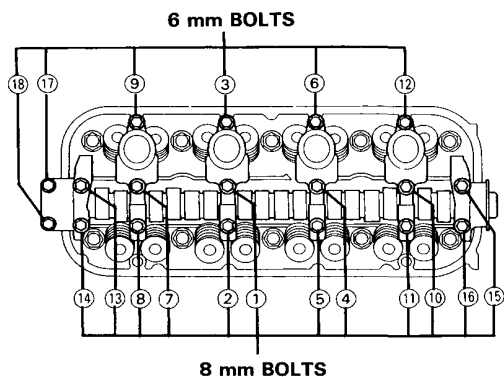
- Do not rotate the camshaft during inspection.
- Remove the rocker arms and rocker shafts.

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: 22 N·m (2.2 kg-m, 16 lb-ft)

6 mm bolts: 12 N·m (1.2 kg-m, 9 lb-ft)

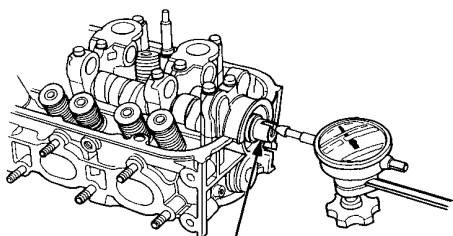


2. Seat the camshaft by pushing it toward distributor end of cylinder head.
3. Zero the dial indicator against end of distributor drive, then push the camshaft back and forth and read the end play.

Camshaft End Play:

Standard (New): 0.05–0.15 mm
(0.002–0.006 in)

Service Limit: 0.5 mm (0.02 in)



CAMSHAFT

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

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

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

- Insert plastigage strip across each journal.

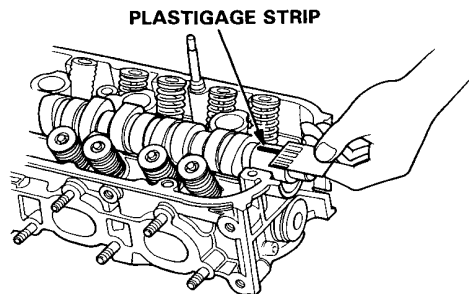
5. Install the camshaft holders, then tighten the bolts to the specified torque as shown in the left column on this page.

6. Measure widest portion of plastigage on each journal.

Camshaft-to-Holder Oil Clearance:

Standard (New): 0.050–0.089 mm
(0.0020–0.0035 in)

Service Limit: 0.15 mm (0.006 in)



(cont'd)

Camshaft

Inspection (cont'd)

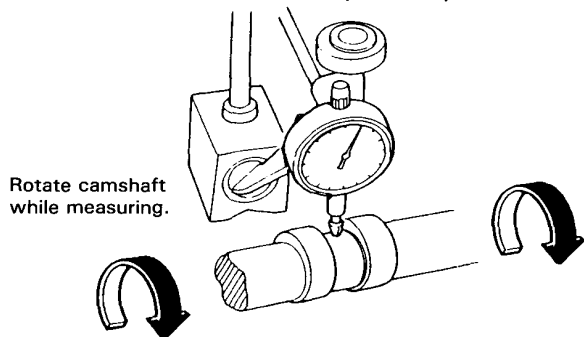
7. If camshaft-to-holder oil clearance is out of tolerance:

- And the camshaft has already been replaced, you must replace the cylinder head.
- If camshaft has not been replaced, first check total runout with the camshaft supported on V-blocks.

Camshaft Total Runout:

Standard (New): 0.03 mm (0.001 in)

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 oil clearance is still out of tolerance, replace the cylinder head.

8. Check cam lobe height wear.

Cam lobe height standard (New):

F2021 engine

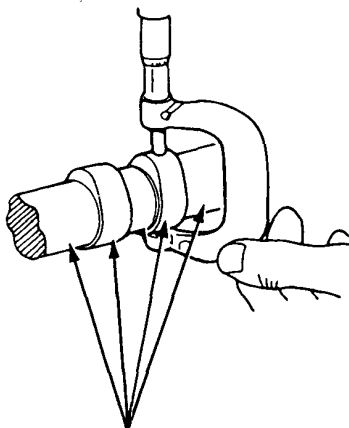
INTAKE 38.741 mm (1.5252 in)

EXHAUST 38.972 mm (1.5343 in)

F2022 engine

INTAKE 38.095 mm (1.4998 in)

EXHAUST 37.890 mm (1.4913 in)



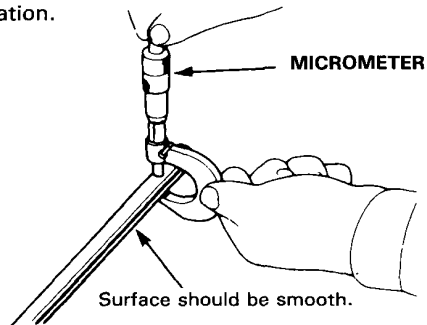
Check this area for wear.

Rocker Arms

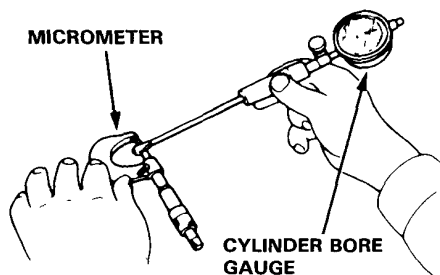
Clearance

Measure both the intake rocker shafts 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 out-of-round condition.

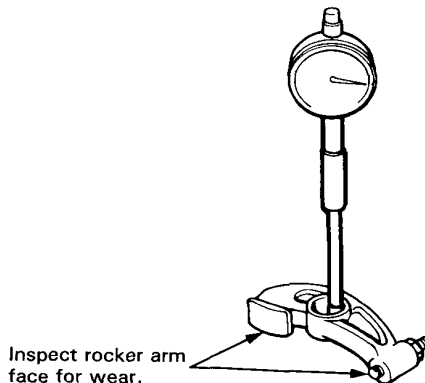
Rocker Arm-to-Shaft Clearance:

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)



Repeat for all rockers. If over limit, replace the rocker shaft and all over-tolerance rocker arms.



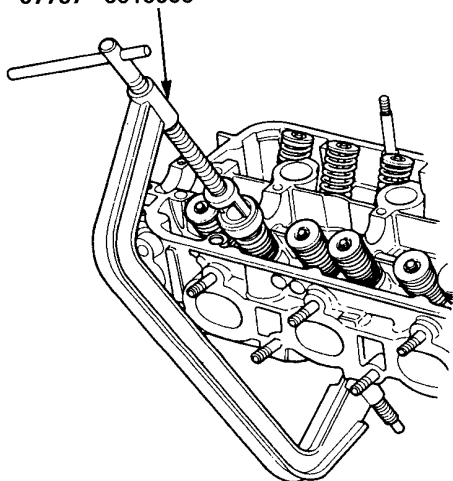
Valves, Valve Springs and Valve Seals

Removal

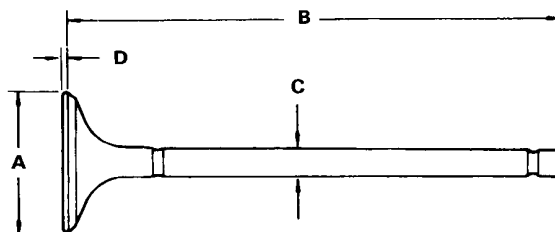
NOTE: Identify valves and valve springs as they are removed so that each item can be reinstalled in its original position.

1. Tap each valve stem with a plastic mallet to loosen valve keepers before installing the spring compressor.
2. Install the spring compressor. Compress the spring and remove the valve keepers.

VALVE SPRING COMPRESSOR
07757-0010000



3. Install the special tool as shown.
4. Remove the valve guide seal.



Intake Valve Dimensions

- A Standard (New): 33.90–34.10 mm
(1.335–1.343 in)
B Standard (New): 110.88–111.18 mm
(4.365–4.377 in)
C Standard (New): 5.485–5.495 mm
(0.2159–0.2163 in)
C Service Limit: 5.455 mm (0.2148 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

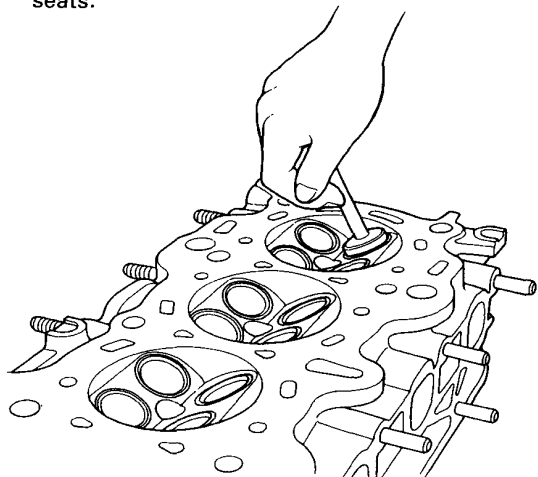
- A Standard (New): 28.90–29.10 mm
(1.138–1.146 in)
B Standard (New): 122.15–122.45 mm
(4.809–4.821 in)
C Standard (New): 5.450–5.460 mm
(0.2146–0.2150 in)
C Service Limit: 5.420 mm (0.2134 in)
D Standard (New): 1.05–1.35 mm
(0.041–0.053 in)
D Service Limit: 0.95 mm (0.037 in)

Valve Seats

Reconditioning

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

NOTE: If guides are worn (see page 6-15), replace them (see page 6-16) before cutting the valve seats.

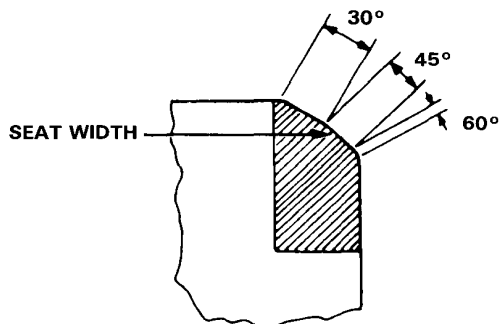


2. Carefully cut a 45° seat, removing only enough material to ensure a smooth and concentric seat.
3. Bevel the upper edge of the seat with the 30° cutter and the lower edge of the seat with the 60° cutter. Check width of seat and adjust accordingly.
4. Make one more very light pass with the 45° cutter to remove any possible burrs caused by the other cutter.

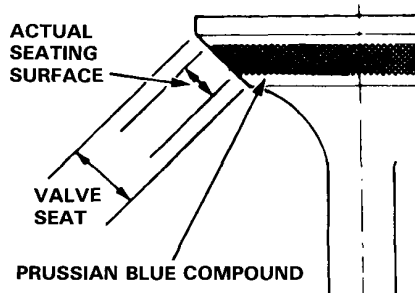
Valve Seat Width (Intake and exhaust):

Standard (New): 1.25–1.55 mm
(0.049–0.061 in)

Service Limit: 2.00 mm (0.079 in)



5. After resurfacing the seat, inspect for even valve seating: Apply Prussian Blue compound to the valve face, and insert valve in original location in the head, then lift it 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 intake and exhaust valves in the head and measure valve stem installed height.

Intake Valve Stem Installed Height:

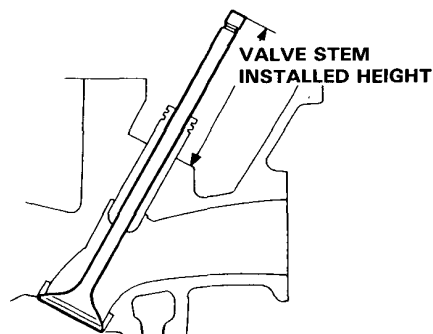
Standard (New): 48.245–48.715 mm
(1.8994–1.9179 in)

Service Limit: 48.965 mm (1.9278 in)

Exhaust Valve Stem Installed Height:

Standard (New): 50.315–50.785 mm
(1.9809–1.9994 in)

Service Limit: 51.035 mm (2.0092 in)



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



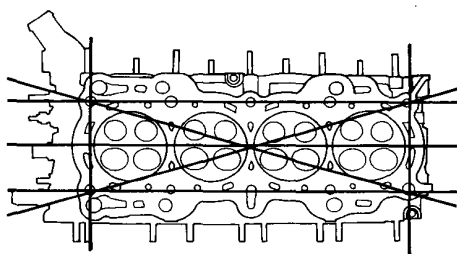
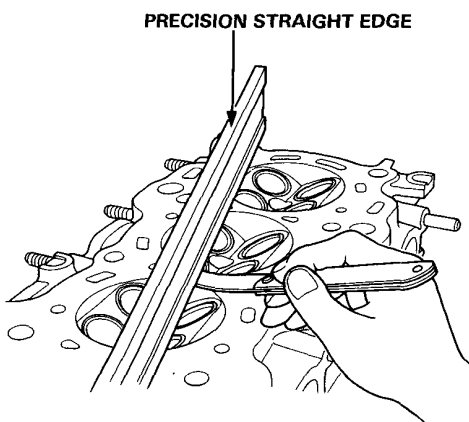
Cylinder Head

Warpage

NOTE: If camshaft-to-holder oil clearance (see page 6-11) are not within specification, the cylinder head cannot be resurfaced.

If 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 (0.01 in), resurface cylinder head.
- Maximum resurface limit is 0.2 mm (0.01 in) based on a height of 100 mm (3.9 in).



Measure along edges, and 3 ways across centre.

Cylinder Head Height:

Standard (New): 99.95–100.05 mm
(3.935–3.939 in)

Valve Guides

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): 0.04–0.09 mm
(0.002–0.004 in)

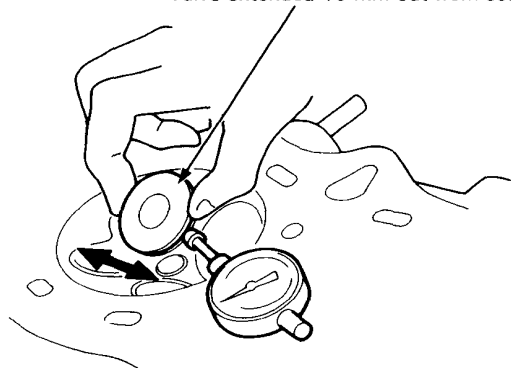
Service Limit: 0.16 mm (0.006 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.11–0.16 mm
(0.004–0.006 in)

Service Limit: 0.24 mm (0.009 in)

Valve extended 10 mm out from seat.



- If measurement exceeds the service limit, recheck using a new valve.
- If measurement is now within service limit, reassemble using a new valve.
- If measurement still exceeds limit, recheck using alternate method below, then replace 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): 0.020–0.045 mm
(0.0008–0.0018 in)

Service Limit: 0.08 mm (0.003 in)

Exhaust Valve Stem-to-Guide Clearance:

Standard (New): 0.055–0.080 mm
(0.0022–0.0031 in)

Service Limit: 0.12 mm (0.005 in)

Valve Guides

Replacement

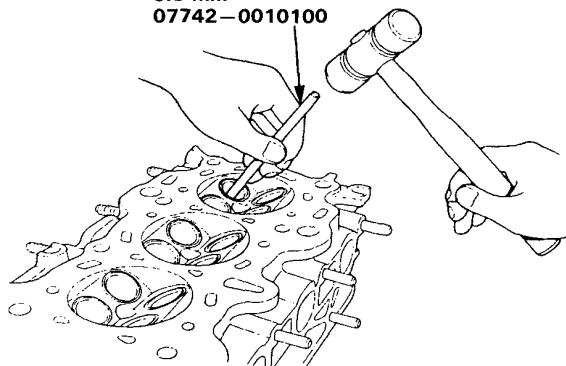
NOTE:

- For best results, heat cylinder head to 150°C (300°F) before removing or installing guides.
- It may be necessary to use an air hammer to remove some valve guides.

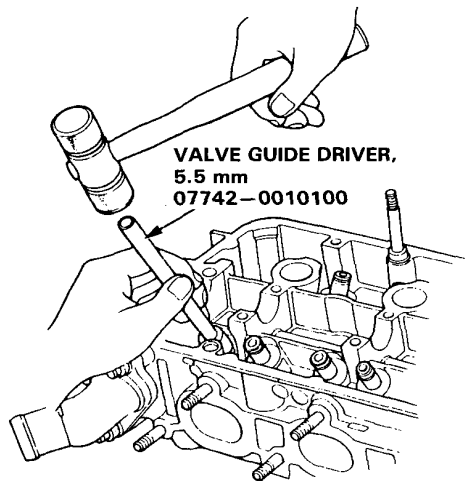
CAUTION: To avoid burns, use heavy gloves when handling heated cylinder head.

1. Drive the valve guide out from the bottom of the cylinder head.

VALVE GUIDE DRIVER,
5.5 mm
07742-0010100



2. Drive in a new valve guide to the specified depth.

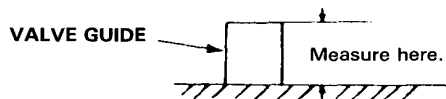


VALVE GUIDE DRIVER,
5.5 mm
07742-0010100

Valve Guide Installed Height:

Intake: 24.0 mm (0.94 in)

Exhaust: 15.3 mm (0.60 in)



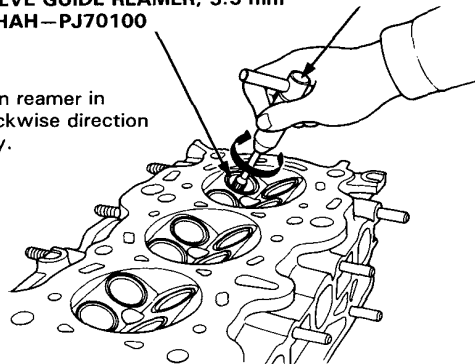
Reaming

NOTE: For new valve guides only.

1. Coat both 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 clearance with a valve (see page 6-15).
— Verify that the valve slides in the intake and exhaust valve guides without exerting pressure.

VALVE GUIDE REAMER, 5.5 mm REAMER HANDLE
07HAH-PJ70100

Turn reamer in
clockwise direction
only.





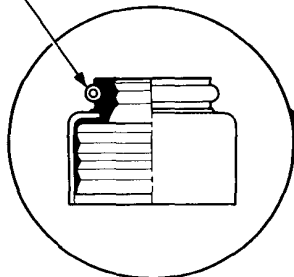
Valves, Valve Springs and Valve Seals

Installation Sequence

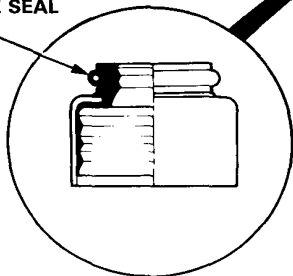
NOTE: Exhaust and intake valve seals are NOT interchangeable.

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

INTAKE VALVE SEAL (WHITE SPRING)
Replace.



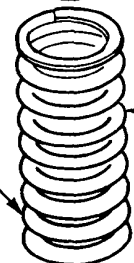
EXHAUST VALVE SEAL (BLACK SPRING)
Replace.



VALVE KEEPERS

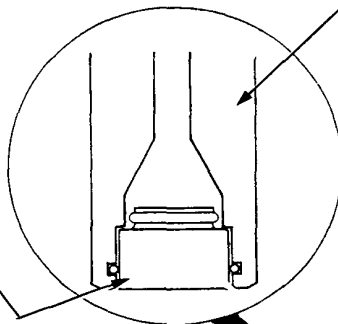


VALVE RETAINER



VALVE SPRING

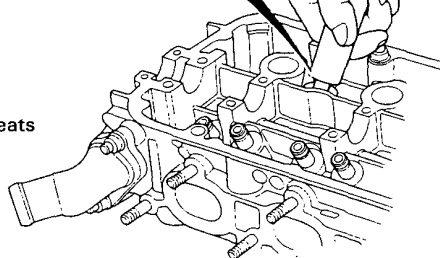
VALVE SEAL INSTALLER 07HAD-PJ70200



VALVE SEAL
Replace.

SPRING SEAT

NOTE: Install the valve spring seats before installing the valve seals.



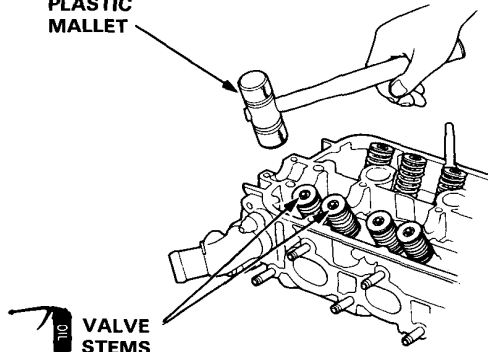
Valve Installation

When installing valves in cylinder head, coat valve stems with oil before inserting into valve guides, and make sure valves move up and down smoothly.

When valves and springs are in place, lightly tap the end of each valve stem two or three times with a plastic mallet to ensure proper seating of valve and valve keepers.

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

PLASTIC MALLET



VALVE STEMS


Camshaft/Rocker Arms and Camshaft Seal/Pulley

Installation

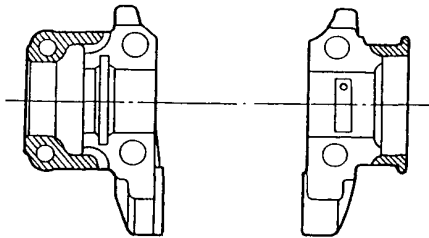
CAUTION:

- Make sure that all rockers are in alignment with valves when torquing rocker assembly bolts.
- Valve locknuts should be loosened and adjust screws backed off before installation.
- To prevent rocker arm assembly from coming apart, leave cam holder holding bolts in the holes.

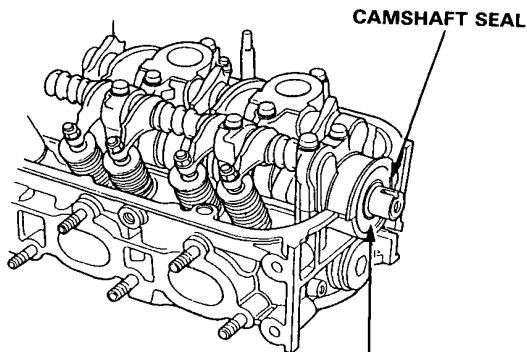
1. After wiping down camshaft and journals in cylinder head, lubricate both surfaces and install camshaft.

 Lubricate cam lobes when reassembly.

2. Turn the camshaft until its keyway is facing up. (No. 1 piston TDC).
3. Apply liquid gasket to the head mating surfaces of the No. 1 and the No. 6 camshaft holders.
 - Apply liquid gasket to the shaded areas.



4. 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.
5. Press in the camshaft seal.



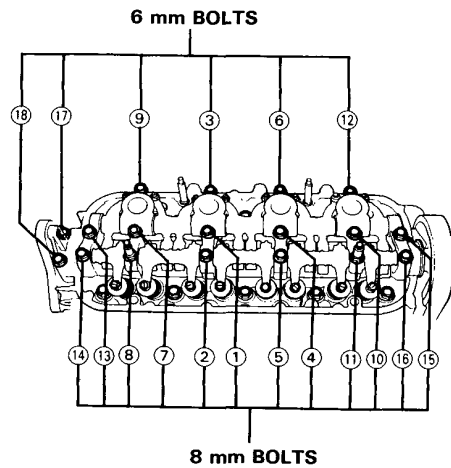
Seal housing surface should be dry. Apply a light coat of oil to camshaft and inner lip of seal.

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

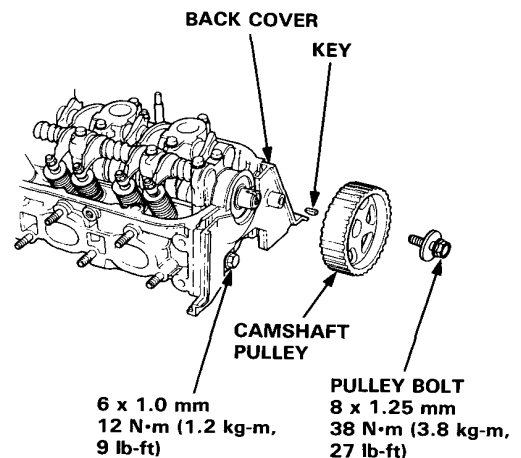
Specified torque:

8 mm bolts: 22 N·m (2.2 kg-m, 16 lb-ft)

6 mm bolts: 12 N·m (1.2 kg-m, 9 lb-ft)



7. Install the back cover.
8. Install the key and the camshaft pulley onto the camshaft, then tighten the pulley bolt to the torque shown.





Cylinder Head

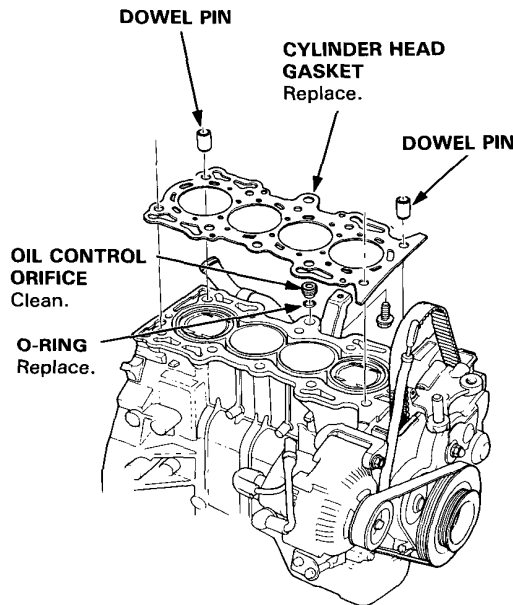
Installation

Install the cylinder head in the reverse order of removal:

NOTE:

- Always use a new head gasket.
- Cylinder head and engine block surface must be clean.
- "UP" mark on camshaft pulley should be at the top.
- Turn the crankshaft so the No. 1 piston is at TDC (see page 6-24).
- Clean the oil control orifice before installing.

1. Cylinder head dowel pins and oil control orifice must be aligned.



2. Install the bolts that secure the intake manifold to its bracket but do not tighten them yet.
3. Position the camshaft correctly (see page 6-24).
4. Tighten the cylinder head bolts sequentially in three steps.

1st step torque: 40 N·m (4.0 kg-m, 29 lb-ft)

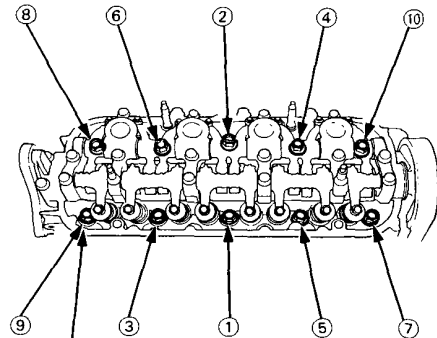
2nd step torque: 70 N·m (7.0 kg-m, 51 lb-ft)

3rd step torque: 100 N·m (10.0 kg-m, 72 lb-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



CYLINDER HEAD BOLTS

12 x 1.25 mm

100 N·m (10.0 kg-m, 72 lb-ft)

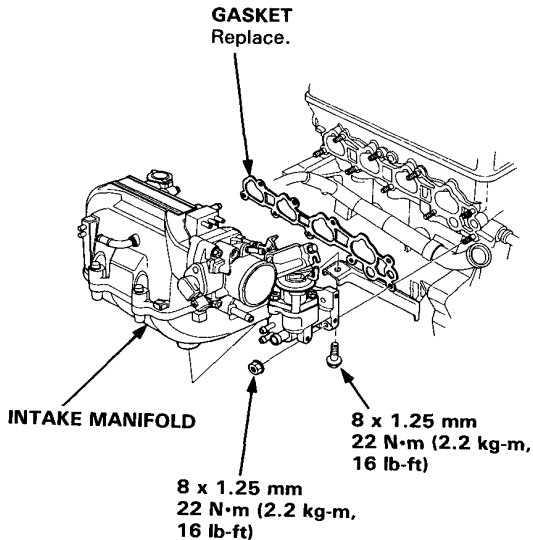
Apply engine oil to bolt threads and under bolt heads.

(cont'd)

Cylinder Head

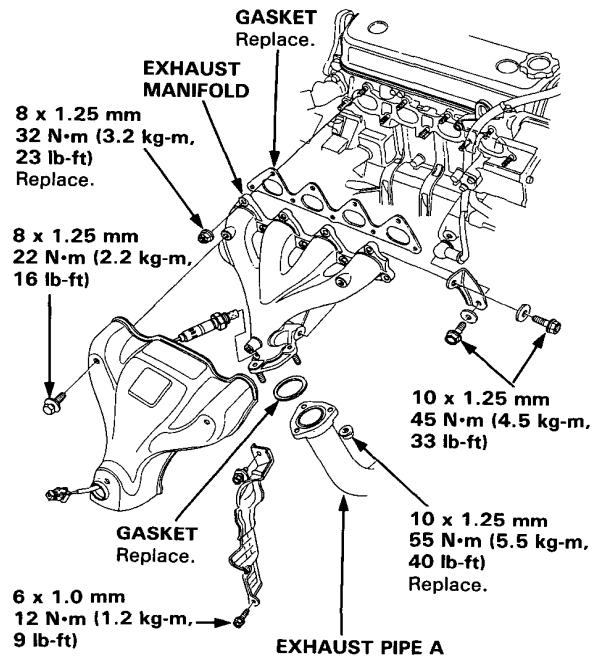
Installation (cont'd)

5. Install the intake manifold and tighten the nuts in a crisscross pattern in 2 or 3 steps, beginning with the inner nuts.
 - Always use a new intake manifold gasket.



6. Install the heat insulator to the cylinder head and the block.

7. Install the exhaust manifold and tighten the nuts in a crisscross pattern in 2 or 3 steps, beginning with the inner nut.
 - Always use a new intake manifold gasket.
8. Install the exhaust manifold bracket, then install the exhaust pipe A and the bracket, and then install the cover.



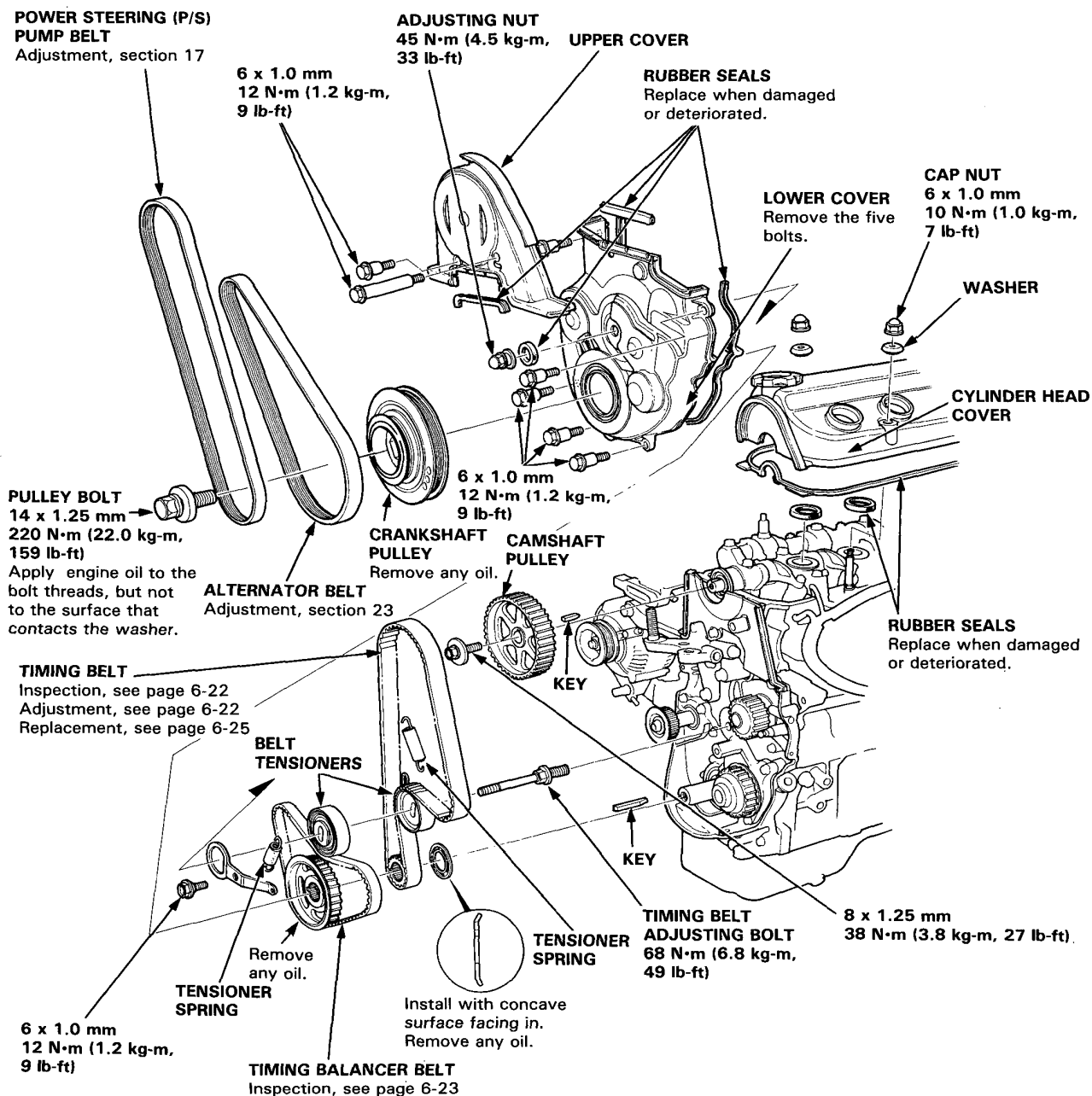


Timing Belt and Timing Balancer Belt

Illustrated Index

NOTE:

- Refer to page 6-24 for positioning crankshaft and pulley before installing timing belt.
- Before removing, mark direction of rotation.



Timing Belt

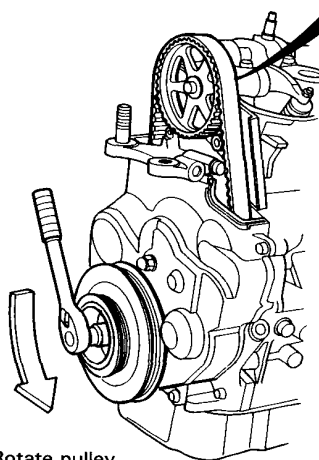
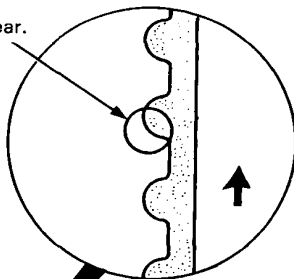
Inspection

1. Disconnect the alternator terminal and the connector, Then remove the engine wire harness from the cylinder head cover.
2. Remove the cylinder head cover.
3. Remove the upper cover.
4. Inspect the timing belt for cracks and oil or coolant soaking.

NOTE:

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

Inspect this area for wear.



Rotate pulley and inspect belt.

5. After inspecting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).

Tension Adjustment

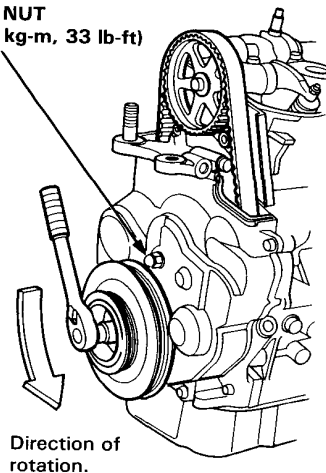
CAUTION: Always adjust timing belt tension with the engine cold.

NOTE:

- The tensioner is spring-loaded to apply proper 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 balancer belt before adjusting the belt tension.
- Do not loosen the adjusting nut more than one full turn.

1. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
2. Remove the cylinder head cover.
3. Set the No. 1 piston at TDC (see page 6-24).
4. Loosen the adjusting nut 2/3-1 turn, then tighten it.

ADJUSTING NUT
45 N·m (4.5 kg-m, 33 lb-ft)



Direction of rotation.

5. Rotate the crankshaft counterclockwise 3-teeth on the camshaft pulley, then reloosen the adjusting nut to create tension on the timing belt.
6. Tighten the adjusting nut.
7. After adjusting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).



Timing Balancer Belt

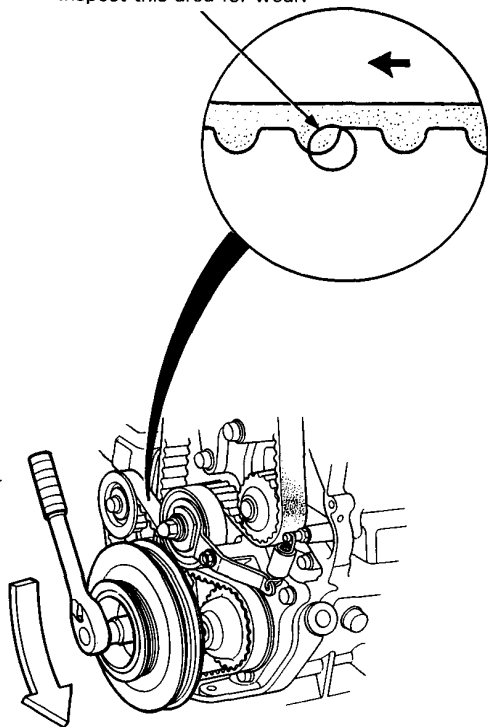
Inspection

1. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
2. Remove the cylinder head cover.
3. Remove the upper cover.
4. Remove the crankshaft pulley.
5. Remove the lower cover.
6. Install the crankshaft pulley.
7. Inspect the timing balancer belt for cracks and oil or coolant soaking.

NOTE:

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

Inspect this area for wear.



Rotate pulley
and inspect belt.

8. After inspecting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg·m, 159 lb·ft).

NOTE: Refer to page 6-28 for timing balancer belt tension adjustment.

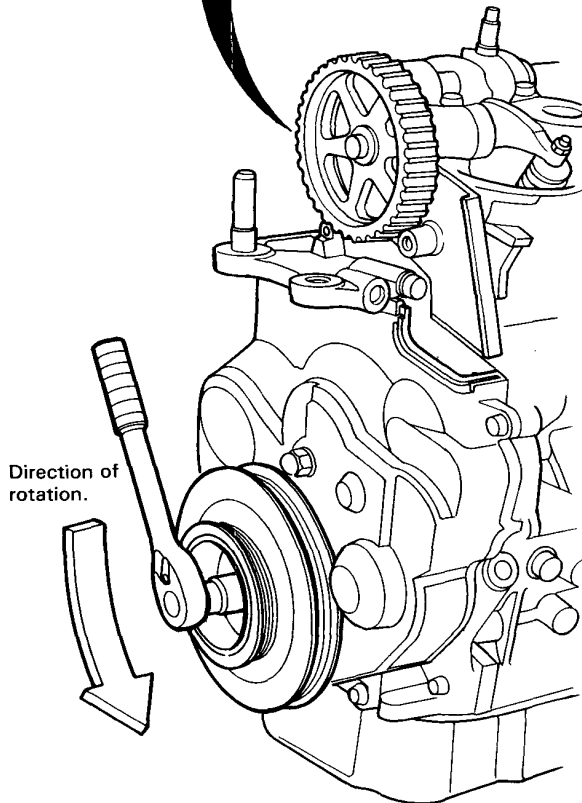
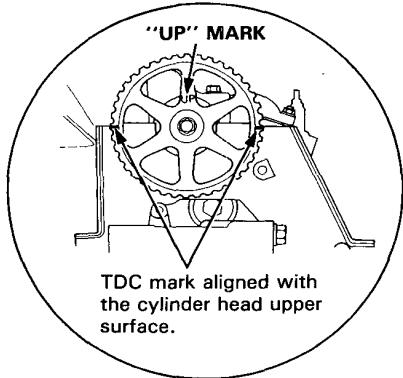
Timing Belt

Positioning Crankshaft Before Installing Timing Belt

NOTE:

- Install the timing belt with the No. 1 piston at TDC.
- After installing retorque the crankshaft pulley bolt to 220 N·m (22.0 kg·m, 159 lb-ft).

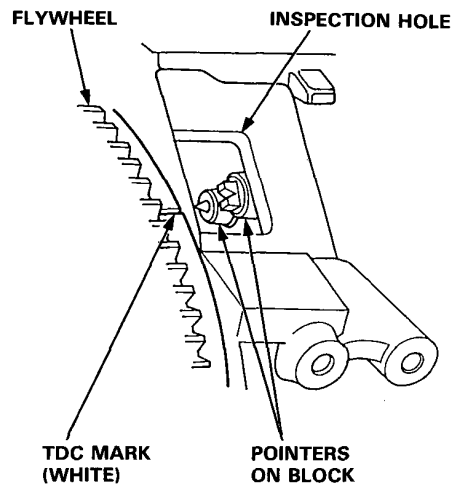
CAMSHAFT TDC POSITION:



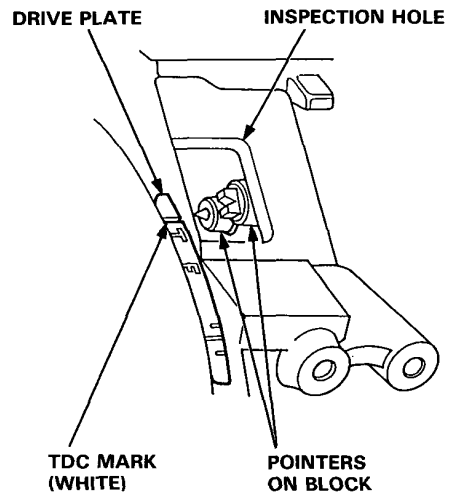
NOTE: When turning the crankshaft with a socket wrench, install the crankshaft pulley and the pulley bolt.

CRANKSHAFT TDC POSITION:

MANUAL TRANSMISSION:



AUTOMATIC TRANSMISSION:





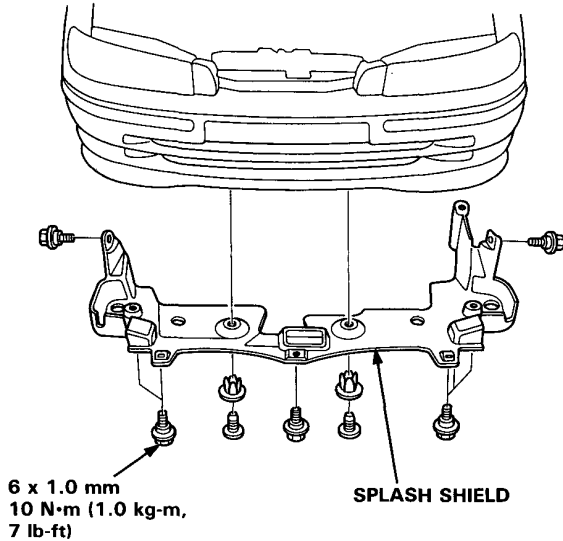
Timing Belt and Timing Balancer Belt

Replacement

CAUTION: Inspect the water pump when replacing the timing belt (see page 10-9).

NOTE: Turn the crankshaft so that the No. 1 piston is at TDC (see page 6-24).

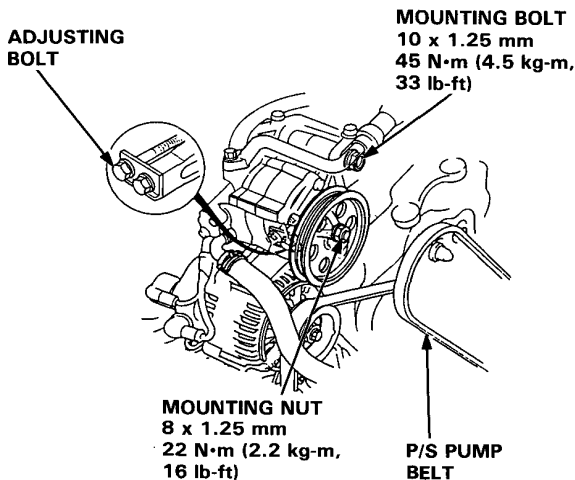
1. Remove the splash shield.



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

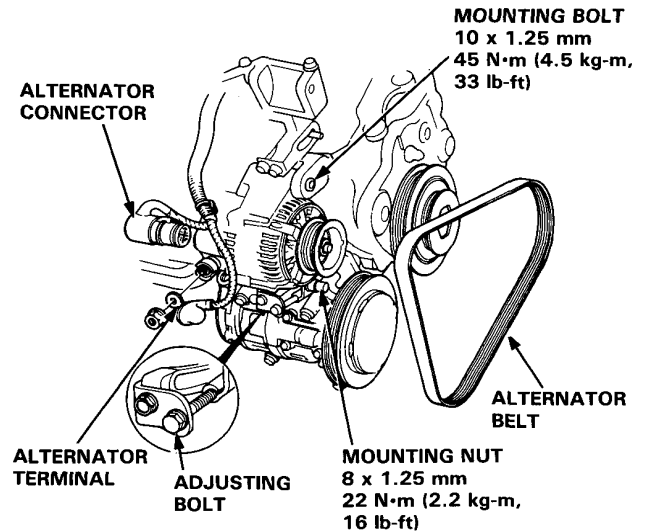
NOTE:

- Do not disconnect the P/S pipe and hose.
- After installing, adjust the tension of the P/S pump belt (see section 17).



3. Disconnect the alternator terminal and the connector, then remove the engine wire harness from the cylinder head cover.
4. Loosen the mounting bolt/nut and the adjusting bolt then remove the alternator belt.

NOTE: After installing, adjust the tension of the alternator belt (see section 23).



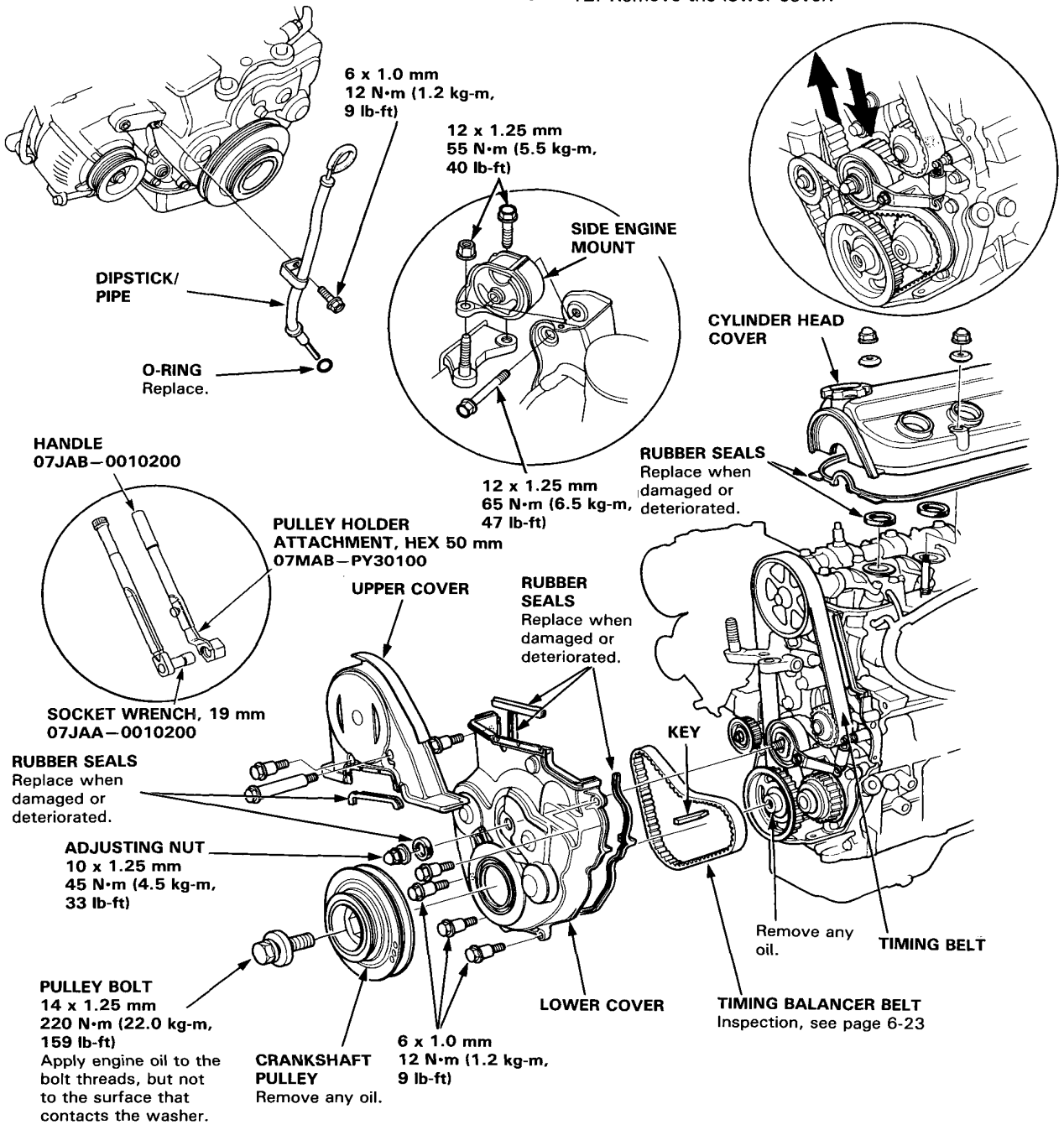
(cont'd)

Timing Belt and Timing Balancer Belt

Replacement (cont'd)

5. Remove the cylinder head cover.
6. Remove the side engine mount bracket B (standard for some types).
7. Remove the upper cover.
8. Remove the side engine mount.
9. Remove the dipstick and the pipe.

10. Remove the pulley bolt and the crankshaft pulley. Remove the two rear bolts from the center beam to allow the engine to drop down and give clearance to remove the lower cover.
11. Remove the rubber seal around the adjusting nut. Do not loosen the adjusting nut.
12. Remove the lower cover.

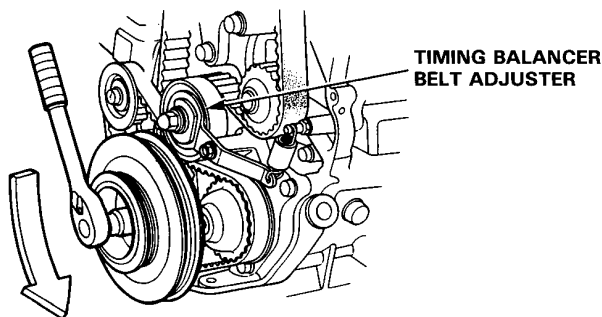
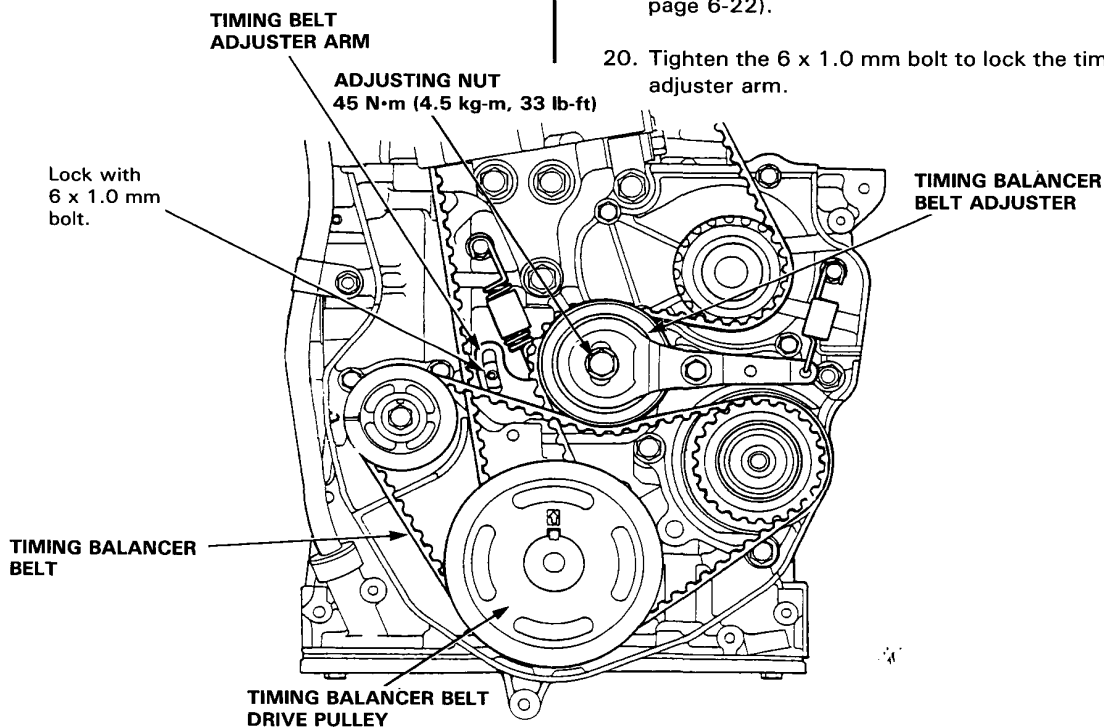




13. Lock the timing belt adjuster arm in place by installing one of the 6 x 1.0 mm lower cover mounting bolts.
14. Loosen the timing belt adjusting nut. Push on the pulley to remove tension from the timing balancer belt, then tighten the adjusting nut.
15. Remove the timing balancer belt.

NOTE: If you are removing only the timing balancer belt, go to step 21. If you are removing both belts, continue with this procedure.

16. Loosen the 6 x 1.0 mm lock bolt and the adjusting nut. Push on the timing belt adjuster pulley to remove tension from the belt, then tighten the adjusting nut.
17. Remove the timing belt.
18. Install the timing belt in the reverse order of removal. Adjust the valve clearances (see page 6-30)
 - Before installing the timing belt, position the crankshaft and camshaft pulleys as shown on page 6-24.
19. Perform the timing belt tension adjustment (see page 6-22).
20. Tighten the 6 x 1.0 mm bolt to lock the timing belt adjuster arm.



(cont'd)

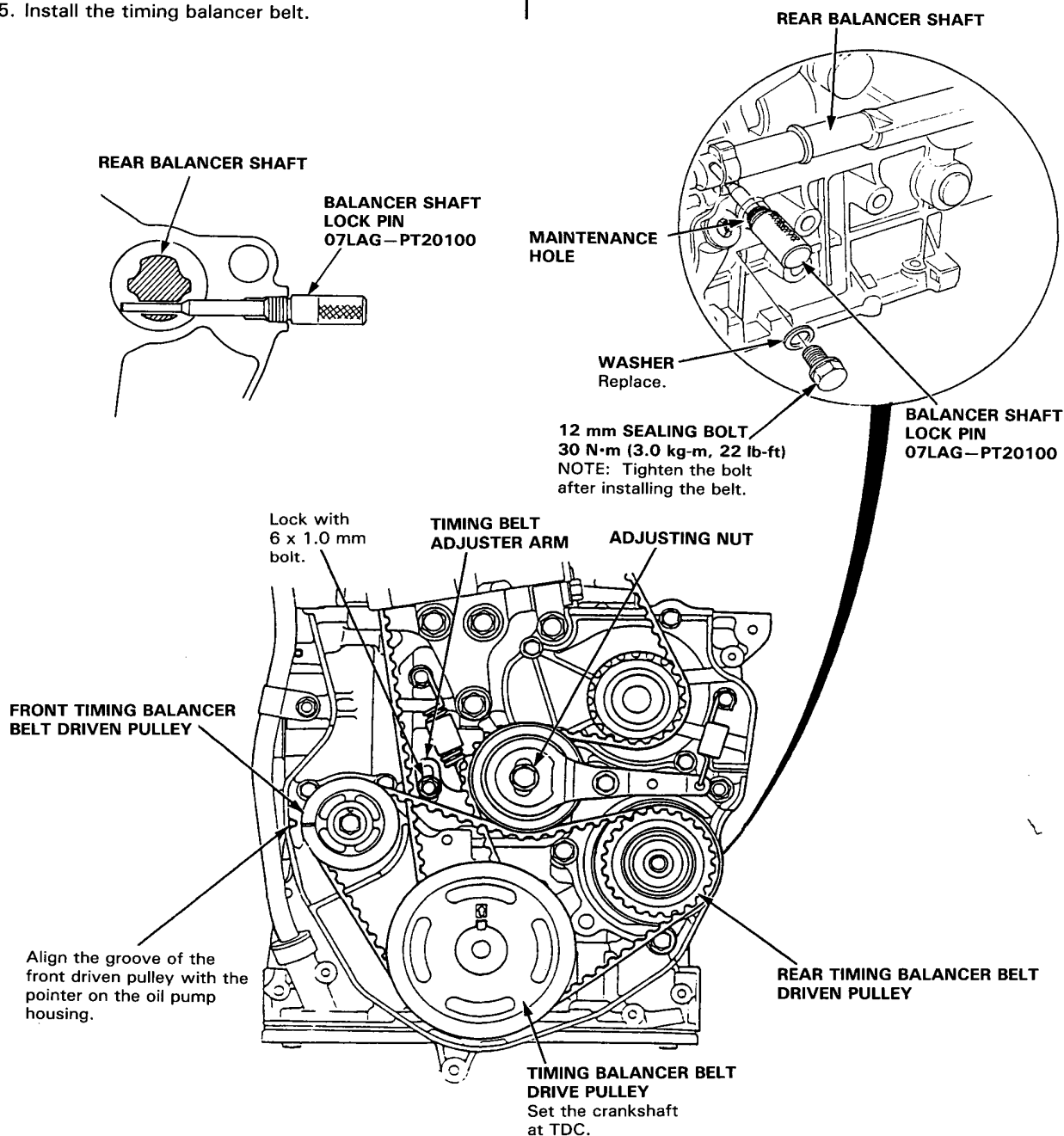
Timing Belt and Timing Balancer Belt

Replacement (cont'd)

21. Make sure the crankshaft is positioned with the No. 1 piston at TDC.
22. Align the groove on the front balancer shaft pulley with the pointer on the oil pump housing as shown.
23. Align the rear balancer shaft pulley by inserting the special tool through the maintenance hole.
24. Loosen the adjusting nut and verify that the timing balancer belt adjuster moves freely.
25. Install the timing balancer belt.

26. Turn the crankshaft pulley about one turn counterclockwise, then tighten the adjusting nut to the specified torque.

NOTE: Both belt adjusters are spring-loaded to properly tension the belts. Do not apply any extra pressure to the pulleys or tensioners while performing the adjustment.

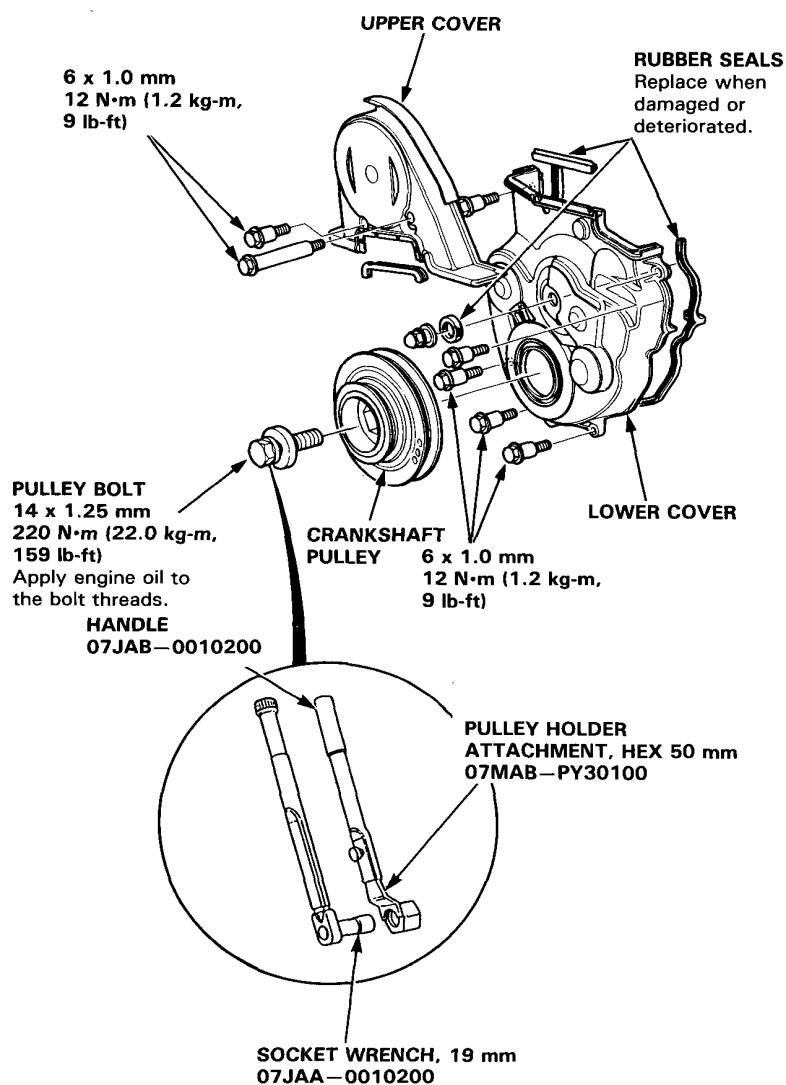




27. Remove the 6 x 1.0 mm bolt from the timing belt adjuster arm.
28. Remove the crankshaft pulley.
29. Install the lower cover.
30. Install a rubber seal around the adjusting nut. Do not loosen the nut.

31. Install the upper cover.
32. Install the crankshaft pulley.
33. Coat the threads and seating face of the pulley bolt with engine oil. Install and tighten to the specified torque.

Specified torque: 220 N·m (22.0 kg·m, 159 lb-ft)



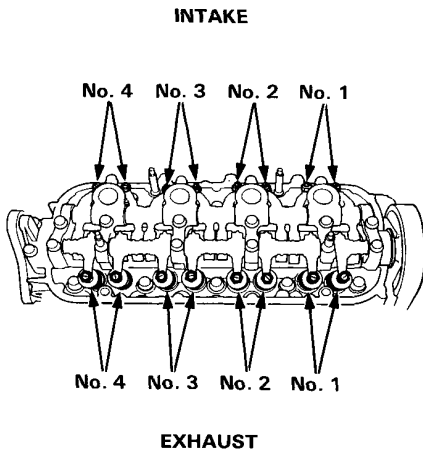
Valve Clearance

Adjustment

NOTE:

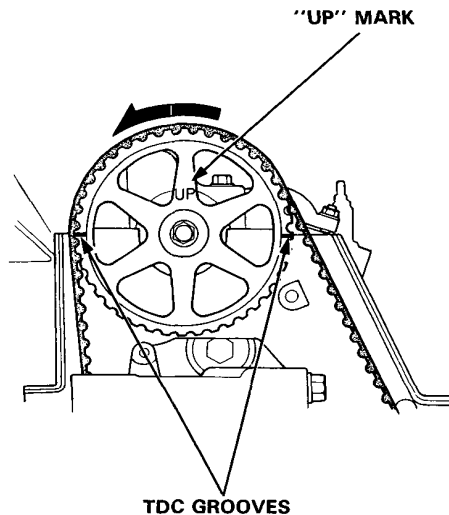
- Valves should be adjusted cold when the cylinder head temperature is less than 38°C (100°F).
- After adjusting, retorque the crankshaft pulley bolt to 220 N·m (22.0 kg-m, 159 lb-ft).

1. Remove the cylinder head cover.



2. Set No.1 piston at TDC. "UP" mark on the camshaft pulley should be at top, and TDC grooves on the camshaft pulley should align with cylinder head surface.

Number 1 piston at TDC:

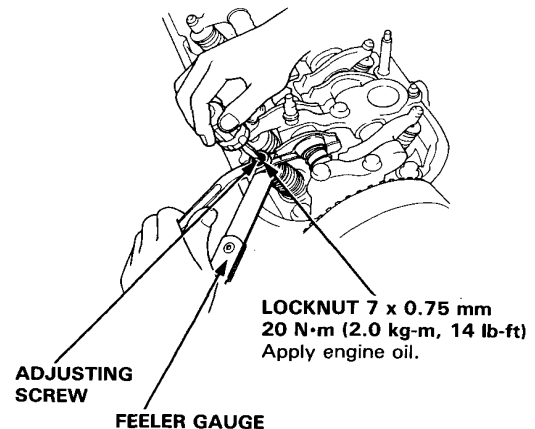


3. Adjust the valves on No. 1 cylinder.

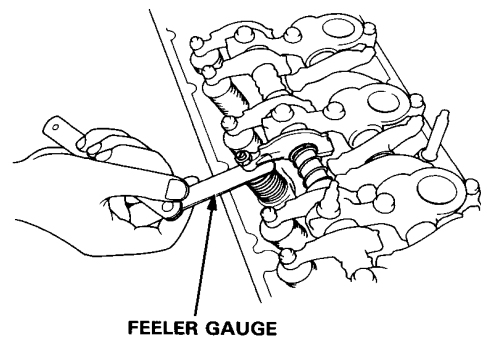
Intake: 0.26 mm (0.010 in) $+ 0.02$ mm (0.0008 in)
 $- 0.03$ mm (0.0012 in)

Exhaust: 0.30 mm (0.012 in) $+ 0.02$ mm (0.0008 in)
 $- 0.03$ mm (0.0012 in)

4. Loosen locknut and turn adjusting screw until feeler gauge slides back and forth with slight amount of drag.



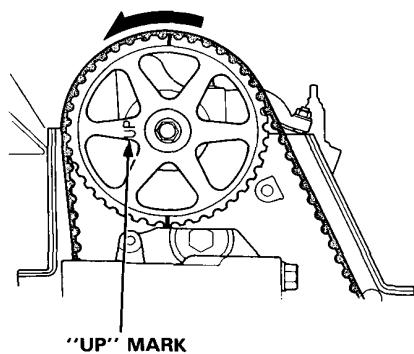
5. Tighten locknut and check clearance again. Repeat adjustment if necessary.





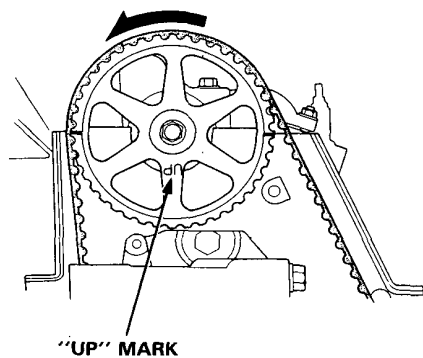
6. Rotate crankshaft 180° counterclockwise (Camshaft pulley turns 90°). The "UP" mark should be at exhaust side. Adjust the valves on No. 3 cylinder.

Number 3 piston at TDC:



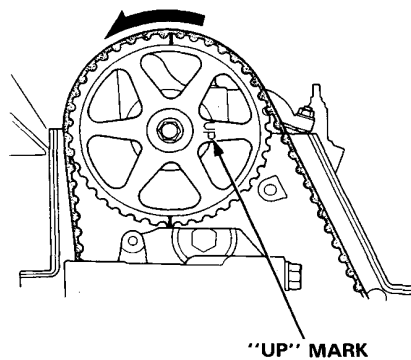
7. Rotate crankshaft 180° counterclockwise to bring No. 4 piston to TDC. Both TDC grooves are once again visible. Adjust valves on No. 4 cylinder.

Number 4 piston at TDC:



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

Number 2 piston at TDC:



Engine Block

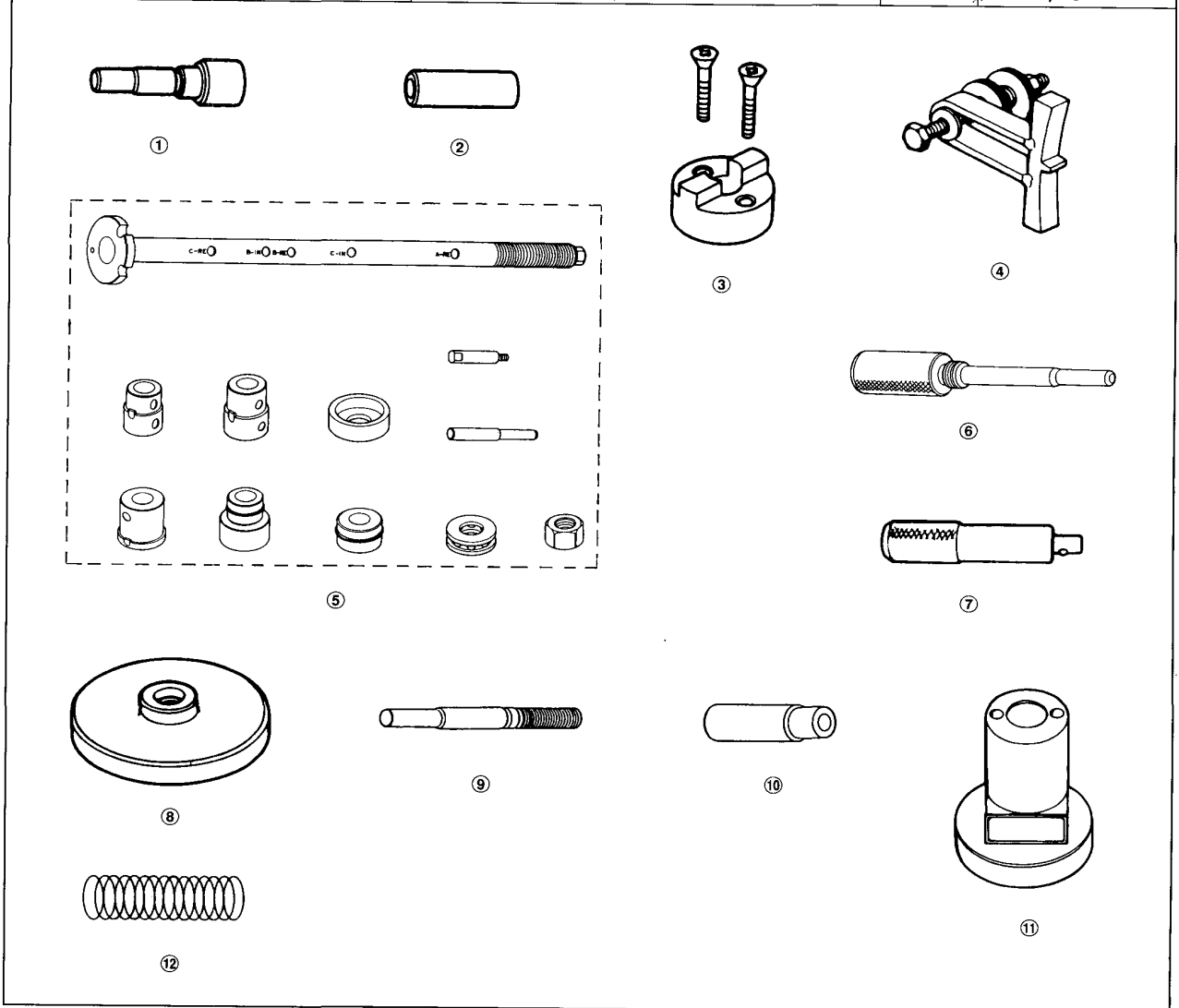
Special Tools	7-2
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Flywheel and Drive Plate	
Replacement	7-6
Connecting Rod and Crankshaft	
End Play	7-6
Main Bearings	
Clearance	7-7
Selection	7-8
Connecting Rod Bearings	
Clearance	7-9
Selection	7-10
Crankshaft, Balancer Shafts and Pistons	
Removal	7-11
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Inspection	7-14
Pistons	
Inspection	7-15
Installation	7-22
Cylinder Block	
Inspection	7-16
Bore Honing	7-17

Piston Pins	
Removal	7-17
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Connecting Rods	
Selection	7-18
Piston Rings	
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Replacement	7-20
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Crankshaft Oil Seal	
Installation	7-22
Crankshaft and Balancer Shafts	
Installation	7-23
Balancer Shafts	
Inspection	7-27
Balancer Shaft Bearings	
Replacement	7-30




Special Tools

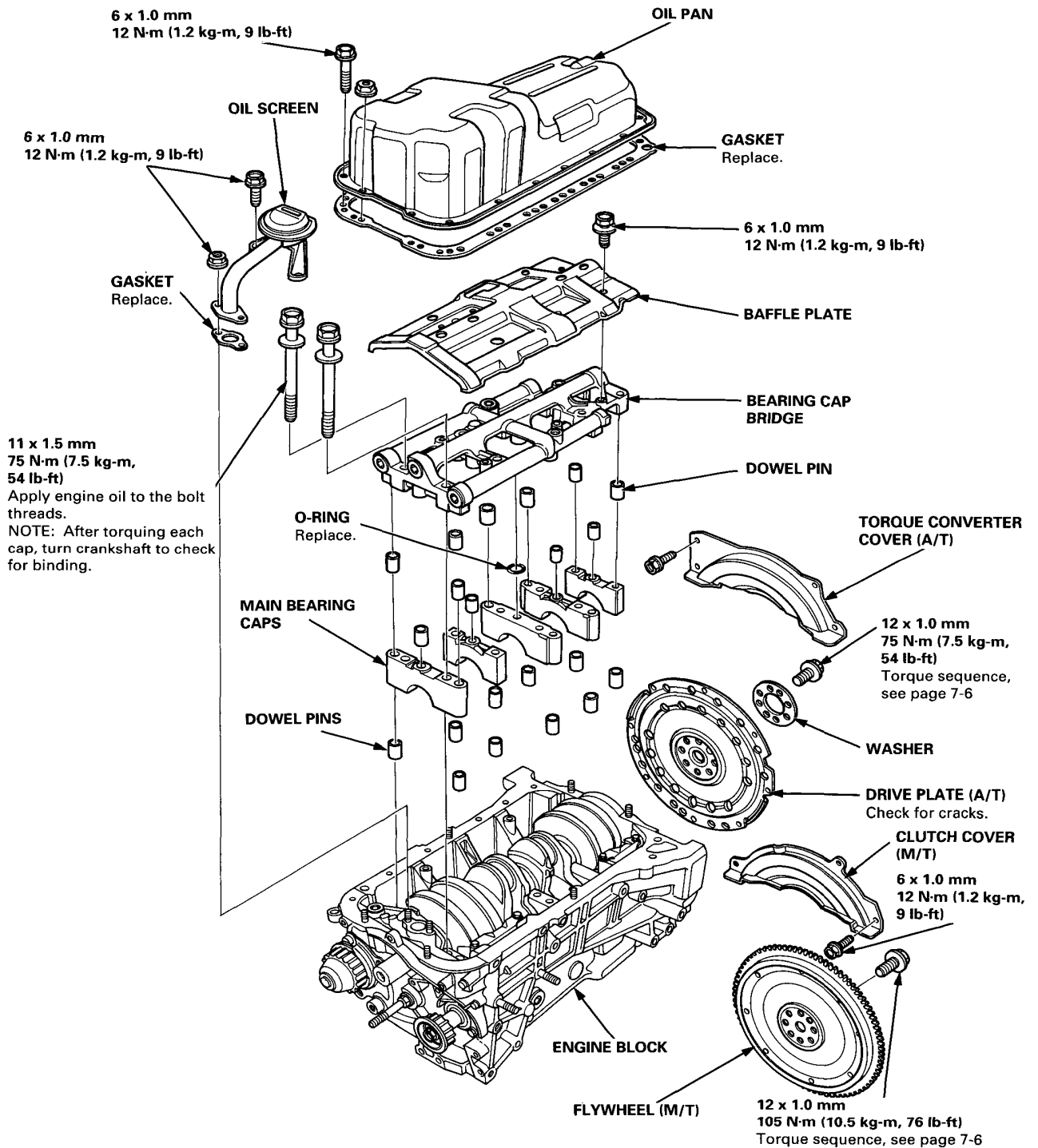
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAF — PH60300	Piston Pin Base Insert	1	7-17, 18
②	07GAF — PH70100	Pilot Collar	1	7-17, 18
③	07HAF — PL20102	Piston Base Head	1	7-17, 18
④	07LAB — PV00100 or 07924 — PD20003	Ring Gear Holder	1	7-6
⑤	07LAF — PT20100	Bearing Replacement Tool Set	1	7-30
⑥	07LAG — PT20100	Balancer Shaft Lock pin	1	7-11, 25
⑦	07749 — 0010000	Driver	1	7-22
⑧	07948 — SB00101	Attachment	1	7-22
⑨	07973 — PE00310	Piston Pin Driver Shaft	1	7-17, 18
⑩	07973 — PE00320	Piston Pin Driver Head	1	7-17, 18
⑪	07973 — 6570500	Piston Base	1	7-17, 18
⑫	07973 — 6570600	Piston Base Spring	1	7-17, 18



Illustrated Index



 Lubricate all internal parts with engine oil during reassembly.



(cont'd)

Illustrated Index

(cont'd)



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 housing before installing them.
- Use liquid gasket, part No. 0Y740 — 99986.

MAIN BEARINGS

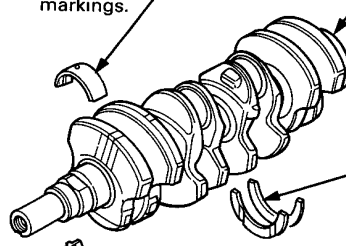
Oil clearance, see page 7-7
 Selection, see page 7-8
 NOTE: New main bearings must be selected by matching crank and block identification markings.

CRANKSHAFT

End play, see page 7-6
 Runout, Taper and Out-of-Round, see page 7-14
 Installation, see page 7-23

THRUST WASHERS

Grooved sides face outward.
 NOTE: Thrust washer thickness is fixed and must not be changed by grinding or shimming.



REAR BALANCER SHAFT

End play, see page 7-27
 Runout, Taper and Out-of-Round, see page 7-27
 Installation, see page 7-23

BALANCER SHAFT BEARINGS

Inspection, see page 7-29
 Replacement, see page 7-30

RETAINER

NOTE: Retainer thickness is fixed and must not be changed by grinding or shimming.

6 x 1.0 mm
 12 N-m (1.2 kg-m, 14 lb-ft)

FRONT BALANCER SHAFT

BALANCER GEAR CASE

CRANKSHAFT OIL SEAL
 Installation, see page 8-11
 Replace.

THRUST WASHER
BALANCER DRIVEN GEAR

8 x 1.25 mm
 25 N-m (2.5 kg-m, 18 lb-ft)

8 x 1.25 mm
 30 N-m (3.0 kg-m, 22 lb-ft)

TIMING BALANCER BELT DRIVEN PULLEY

BALANCER SHAFT OIL SEAL

Installation, see page 8-11
 Replace.

O-RINGS
 Replace.

CRANKSHAFT OIL SEAL
 Installation, see page 7-22

6 x 1.0 mm
 12 N-m (1.2 kg-m, 9 lb-ft)
 Apply liquid gasket to the bolt threads.

RIGHT SIDE COVER
 Apply liquid gasket to block mating surface.

O-RINGS
 Replace.

OIL PUMP
 See page 8-9
 Apply liquid gasket to block mating surface.

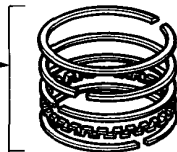
6 x 1.0 mm
 12 N-m (1.2 kg-m, 9 lb-ft)
 Apply liquid gasket to the bolt threads.



NOTE: New rod bearings must be selected by matching connecting rod and crankshaft identification markings (see pages 7-9, 10).

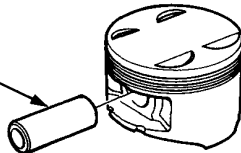
PISTON RINGS

Replacement, see page 7-20
Measurement, see pages 7-20, 21
Alignment, see page 7-21



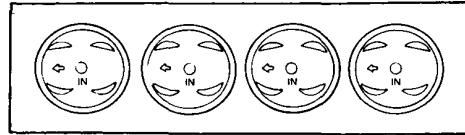
PISTON PIN

Removal, see page 7-17
Installation see page 7-18
Inspection, see page 7-19



PISTON INSTALLATION DIRECTION

EXHAUST



INTAKE

PISTON

Removal, see page 7-11
Measurement, see page 7-15
NOTE: To maintain proper clearance, match the letter on the piston top with the letter for each cylinder stamped on the block.

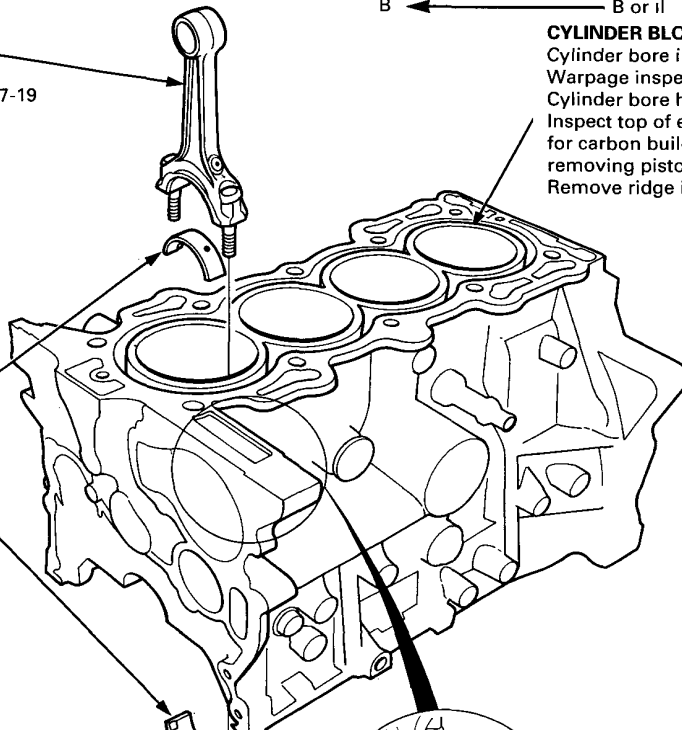
On the piston top	On the block
No letter	A or I
B	B or II

CYLINDER BLOCK

Cylinder bore inspection, see page 7-16
Warpage inspection, see page 7-16
Cylinder bore honing, see page 7-17
Inspect top of each cylinder bore for carbon build-up or ridge before removing piston.
Remove ridge if necessary, see page 7-13

CONNECTING ROD

End play, see page 7-6
Selection, see page 7-18
Small end measurement, see page 7-19



CONNECTING ROD BEARINGS

Clearance, see page 7-9
Selection, see page 7-10

CONNECTING ROD BEARING CAP

Installation, see page 7-23
NOTE: Install cap so the bearing recess is on the same side as the recess in the rod.

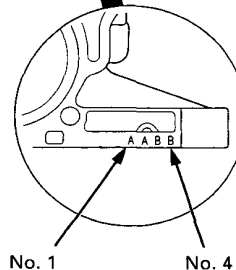
CONNECTING ROD NUT

9 x 0.75 mm
32 N-m (3.2 kg-m, 23 lb-ft)
After torquing each bearing cap, rotate crankshaft to check for binding.

CYLINDER BORE SIZES

(A or I, B or II)
NOTE: To maintain proper piston clearance, match these letters with the letters on the pistons. The letters on the block read from left to right, No. 1 through No. 4 cylinders.

On the block	On the piston top
A or I	No letter
B or II	B



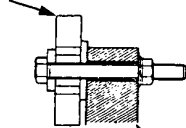
Flywheel and Drive Plate

Replacement

Manual Transmission:

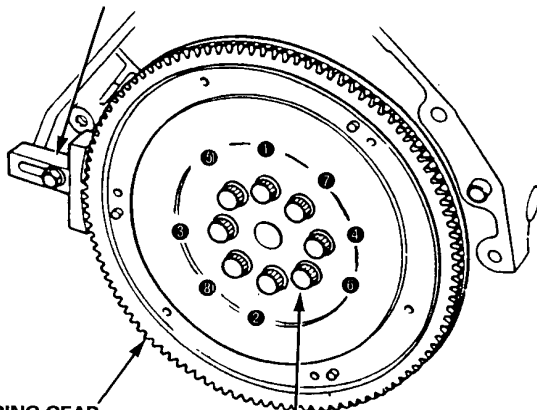
Remove the eight flywheel bolts, then separate the flywheel from the crankshaft flange. After installation, tighten the bolts in the sequence shown.

RING GEAR HOLDER
07LAB — PV00100
or 07924 — PD20003



RING GEAR HOLDER
07LAB — PV00100
or 07924 — PD20003

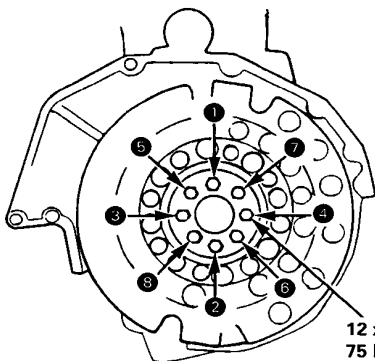
ENGINE BLOCK



RING GEAR
Inspect ring gear teeth for wear or damage. **12 x 1.0 mm**
105 N·m (10.5 kg·m, 76 lb·ft)

Automatic Transmission:

Remove the eight drive plate bolts, then separate the drive plate from the crankshaft flange. After installation, tighten the bolts in the sequence shown.



12 x 1.0 mm
75 N·m (7.5 kg·m, 54 lb·ft)

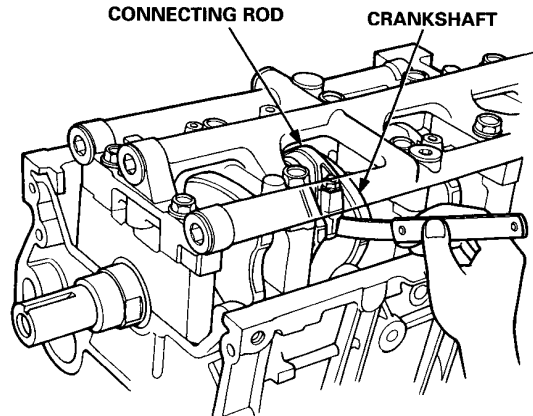
Connecting Rod and Crankshaft

End Play

Connecting Rod End Play:

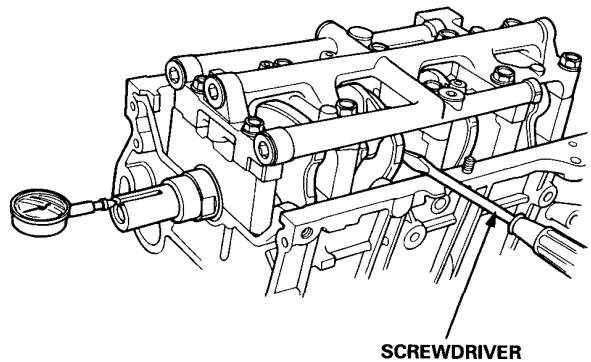
Standard (New): 0.15 — 0.30 mm
(0.006 — 0.012 in)

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 7-11 and 7-23).

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 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 than the service limit, 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 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.

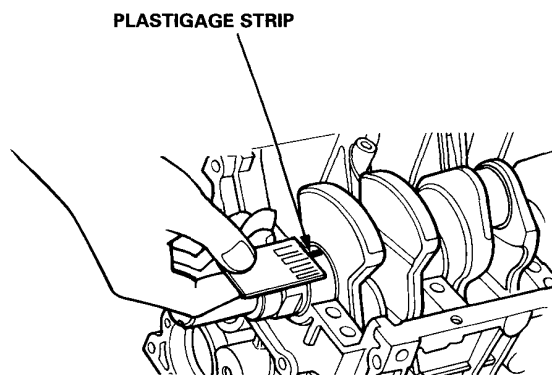
4. Reinstall the bearings and caps, then torque the bolts to 75 N·m (7.5 kg·m, 54 lb·ft).

NOTE: Do not rotate the crankshaft during inspection.

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

Main Bearing-to-Journal Oil Clearance: Standard (New):

No. 1, 2:	0.021 — 0.045 mm (0.0008 — 0.0018 in)
Service Limit:	0.050 mm (0.0020 in)
No. 3	0.025 — 0.049 mm (0.0010 — 0.0019 in)
Service Limit:	0.055 mm (0.0022 in)
No. 4	0.013 — 0.037 mm (0.0005 — 0.0015 in)
Service Limit:	0.050 mm (0.0020 in)
No. 5	0.009 — 0.033 mm (0.0004 — 0.0013 in)
Service Limit:	0.040 mm (0.0016 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.

Main Bearings

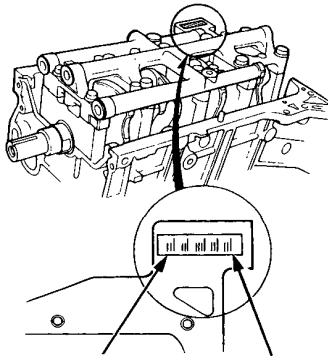
Selection

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 (Numbers, Letters or Bars)

Numbers or Letters or Bars have been stamped on the end of the block as a code for the size of each of the 5 main journal bores.

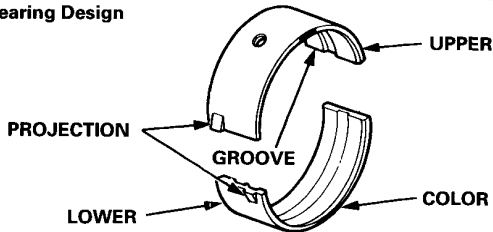
Use them, and the numbers stamped on the crankshaft (codes for main journal size), to choose the correct bearings.



No. 1 JOURNAL
(PULLEY END)

No. 5 JOURNAL
(FLYWHEEL END)

Bearing Design



Bearing Identification

Color code is on the edge of the bearing.

→ Larger crank bore

1 or A or I	2 or B or II	3 or C or III	4 or D or IIII
-------------	--------------	---------------	----------------

→ Smaller bearing (Thicker)

Pink	Pink/ Yellow	Yellow	Yellow/ Green
Pink/ Yellow	Yellow	Yellow/ Green	Green
Yellow	Yellow/ Green	Green	Green/ Brown
Yellow/ Green	Green	Green/ Brown	Brown
Green	Green/ Brown	Brown	Brown/ Black
Green/ Brown	Brown	Brown/ Black	Black

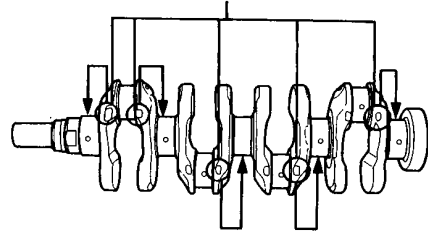
↓ Smaller main journal ↓ Smaller bearing (Thicker)

1 or I
2 or II
3 or III
4 or IIII
5 or IIIII
6 or IIIIII

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

Main Journal Code Locations (Numbers or Bars)

Main Journal Code Locations (Numbers or Bars)





Connecting Rod Bearings

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 the plastigage across the rod journal.
4. Reinstall the bearing half and cap, and torque the nuts to 32 N·m (3.2 kg-m, 23 lb-ft).

NOTE: Do not rotate the crankshaft during inspection.

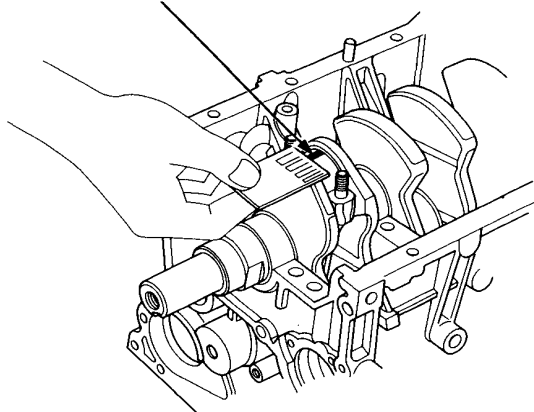
5. Remove the rod cap and bearing half and measure the widest part of the plastigage.

Connecting Rod Bearing-to-Journal Oil Clearance:

Standard (New): 0.015 — 0.043 mm
(0.0006 — 0.0017 in)

Service Limit: 0.050 mm (0.0020 in)

PLASTIGAGE STRIP



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.

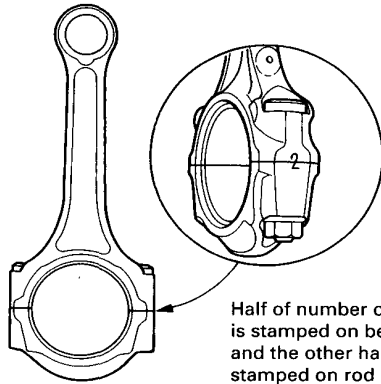
Connecting Rod Bearings

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.

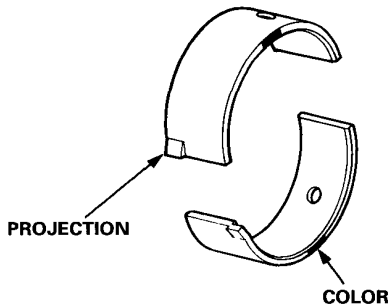
Connecting Rod Journal Code Locations (Numbers or Bars)

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



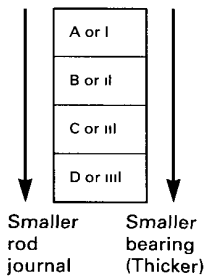
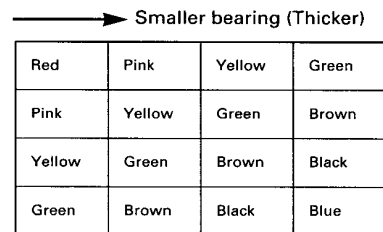
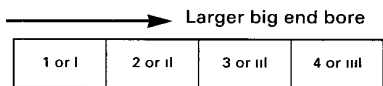
Half of number or bar is stamped on bearing cap and the other half is stamped on rod

Bearing Design



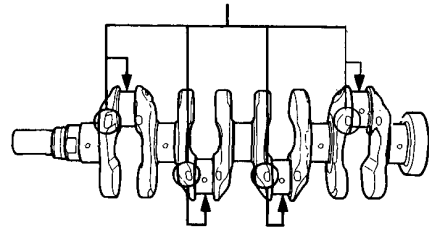
Bearing Identification

Color code is on the edge of the bearing.



Connecting Rod Journal Code Locations (Letters or Bars)

Connecting Rod Journal Code Locations (Letters or Bars)

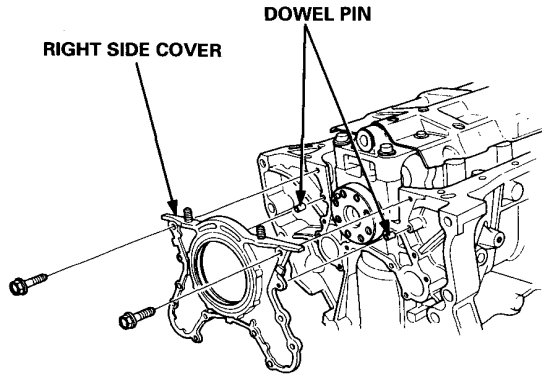


Crankshaft, Balancer Shafts and Pistons

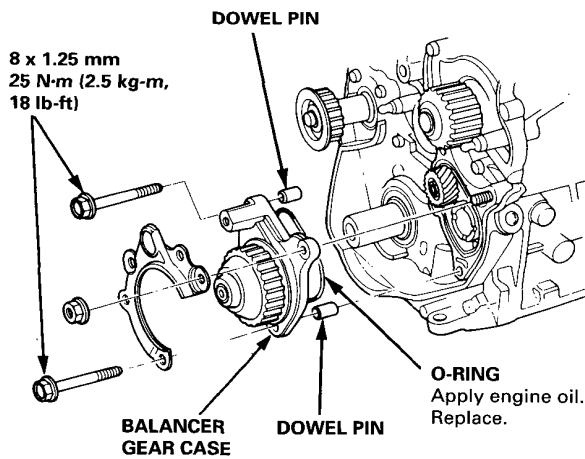


Removal

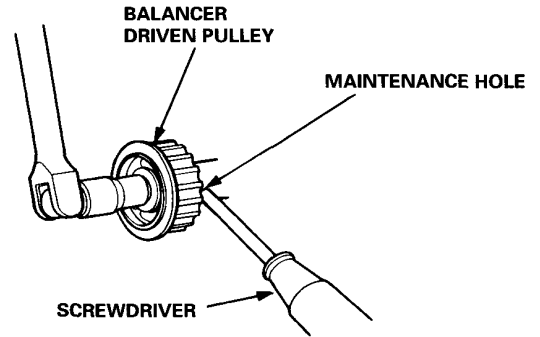
1. Remove the right side cover.



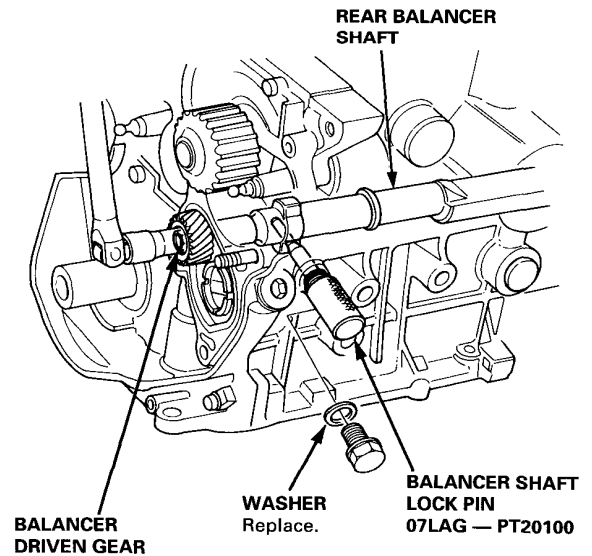
2. Remove the balancer gear case.



3. Remove the front balancer driven pulley as shown.



4. Align the bolt hole and the balancer shaft hole, then insert a special tool to hold the rear balancer shaft.
5. Remove the bolt and the balancer driven gear.

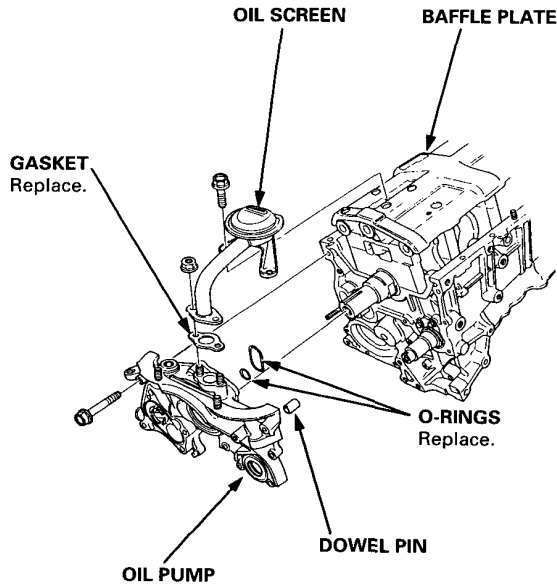


(cont'd)

Crankshaft, Balancer Shafts and Pistons

Removal (cont'd)

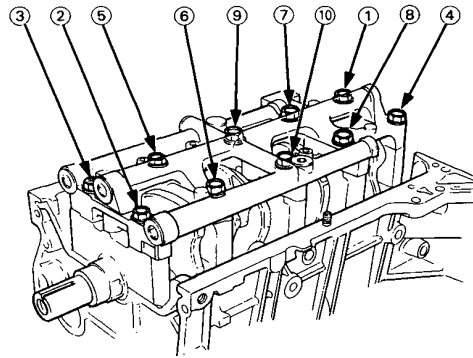
6. Remove the oil screen and the oil pump.
7. Remove the baffle plate.



8. Remove the bolts and the bearing cap bridge, then remove the bearing caps.

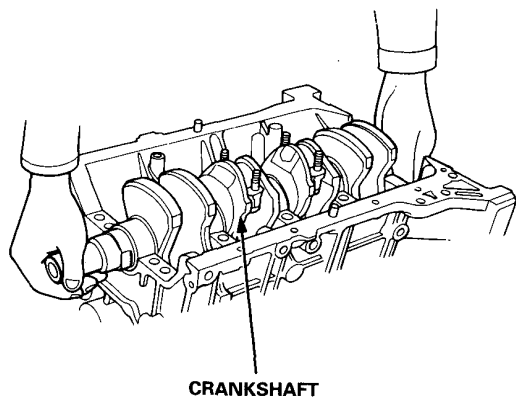
CAUTION: To prevent warpage, unscrew the bolts in sequence 1/3 turn at a time; repeat the sequence until all bolts are loosened.

MAIN BEARING CAP BOLTS LOOSENING SEQUENCE

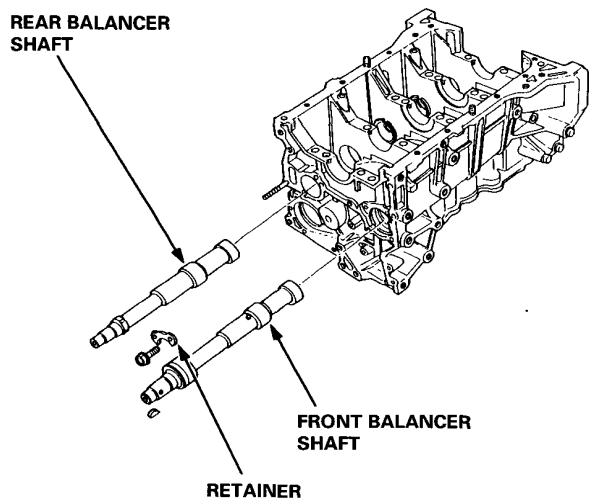




9. Turn the crankshaft so No. 2 and 3 crankpins are at the top.
10. Remove the rod caps/bearings and main caps/bearings. Keep all caps/bearings in order.
11. Lift the crankshaft out of the engine, being careful not to damage journals.

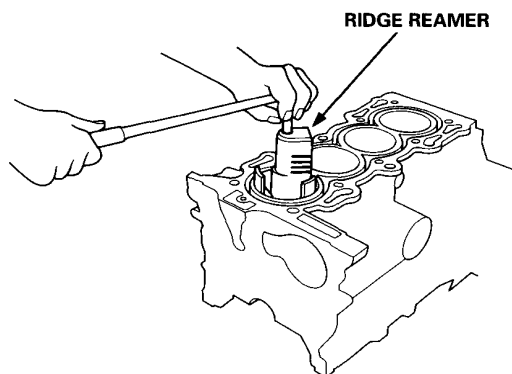


12. Remove the bolts and the retainer, then remove the front balancer shaft and the rear balancer shaft.

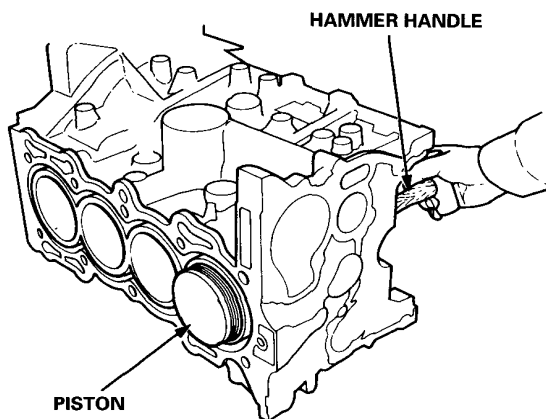


13. Remove the upper bearing halves from the connecting rods and set them aside with their respective caps.
14. Reinstall the main caps and bearings on the engine in proper order.
15. If you can feel a ridge of metal or hard carbon around the top of each cylinder, remove it with a ridge reamer. Follow the reamer manufacturer's instructions.

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



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



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

Crankshaft

Inspection

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

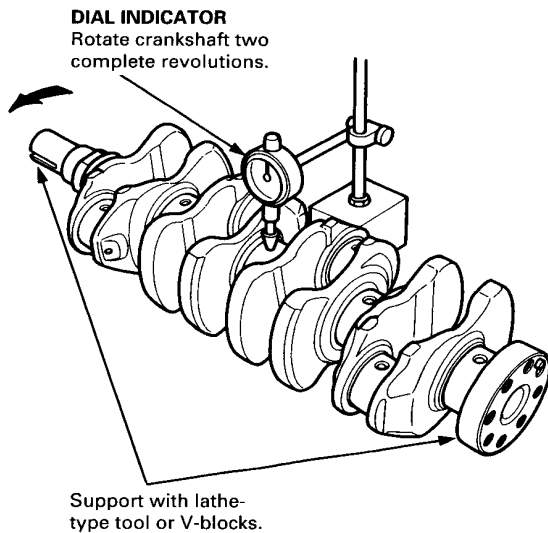
Alignment

- Measure runout on all main journals to make sure the crankshaft 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)

Service Limit: 0.04 mm (0.002 in)



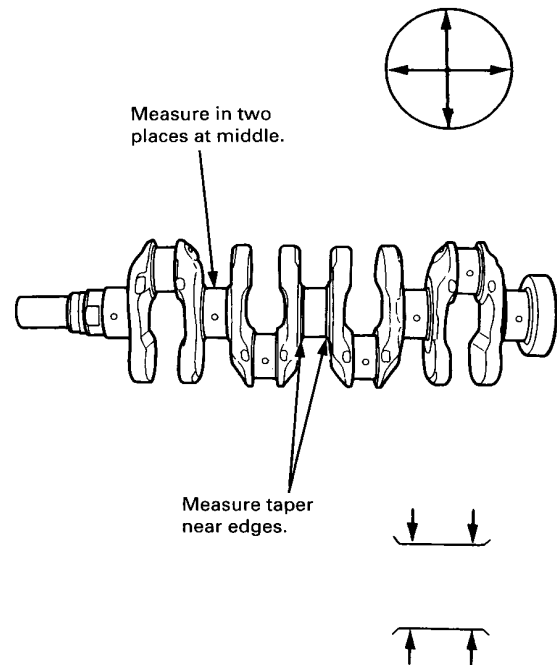
Out-of-Round and Taper

- 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): 0.005 mm (0.0002 in)

Service Limit: 0.006 mm (0.0002 in)



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

Journal Taper:

Standard (New): 0.005 mm (0.0002 in) max.

Service Limit: 0.006 mm (0.0002 in)

Pistons



Inspection

1. Check the piston for distortion or cracks.

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

2. Measure the piston diameter at a point: 21 mm (0.8 in) from the bottom of the skirt.

NOTE: There are two standard-size pistons (No Letter (A) or B). The letter is stamped on the top of the piston. There letters are also stamped on the block as cylinder bore sizes.

Piston Diameter:

Standard (New):

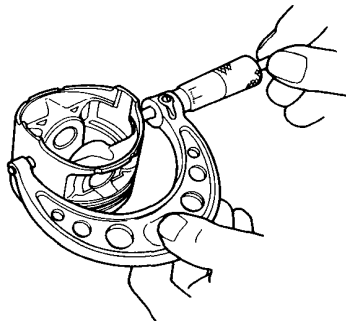
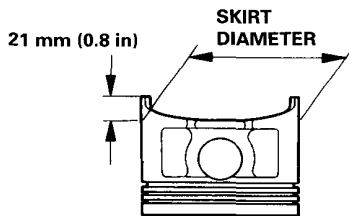
No Letter (A): 84.980 — 84.990 mm
(3.3457 — 3.3461 in)

B: 84.970 — 84.980 mm
(3.3453 — 3.3457 in)

Service Limit:

No Letter (A): 84.970 mm (3.3453 in)

B: 84.960 mm (3.3449 in)

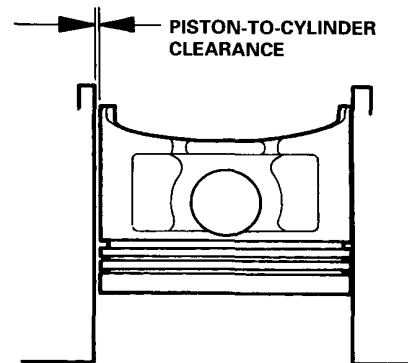


3. Calculate the difference between cylinder bore diameter on (see page 7-16) and piston diameter.

Piston-to-Cylinder Clearance:

Standard (New): 0.020 — 0.040 mm
(0.0008 — 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: 85.230 — 85.240 mm (3.3555 — 3.3559 in)

0.50: 85.480 — 85.490 mm (3.3653 — 3.3657 in)

4. Check the piston pin-to-piston clearance. Coat the piston pin with engine oil. It should then be possible to push the piston pin into the piston hole with thumb pressure.

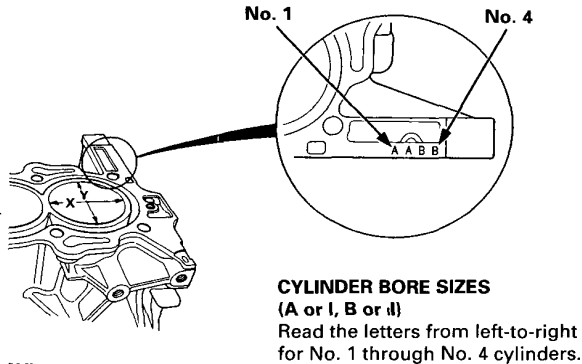
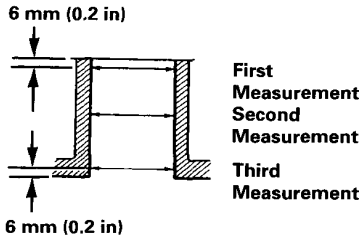
Piston Pin-to Piston Clearance:

Standard (New): 0.012 — 0.024 mm
(0.0005 — 0.0009 in)

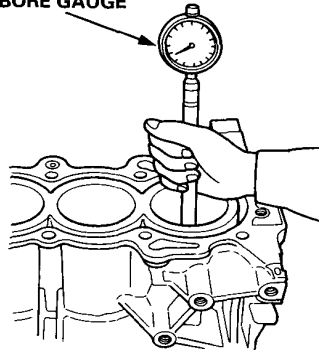
Cylinder Block

Inspection

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



CYLINDER BORE GAUGE



Cylinder Bore Size:

Standard (New):

A or I: 85.010 — 85.020 mm (3.3468 — 3.3472 in)

B or II: 85.000 — 85.010 mm (3.3465 — 3.3468 in)

Service Limit: 85.070 mm (3.3492 in)

Oversize:

0.25: 85.250 — 85.260 mm (3.3563 — 3.3569 in)

0.50: 85.500 — 85.510 mm (3.3661 — 3.3665 in)

Bore Taper:

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

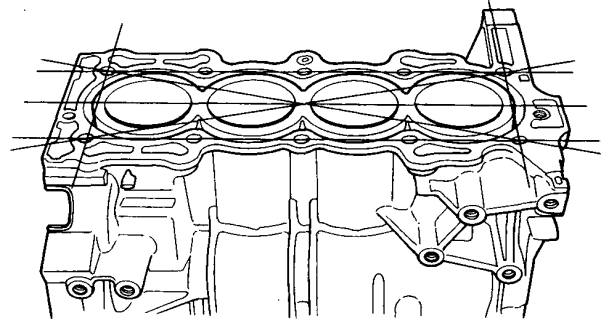
- If measurements in any cylinder are beyond Oversize Bore Service Limit, replace the block.
- If the block is to be rebored, refer to Piston Clearance Inspection (see page 7-15) after reboring.

NOTE: Scored or scratched cylinder bores must be honed.

Reboring Limit: 0.5 mm (0.02 in)

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

SURFACES TO BE MEASURED

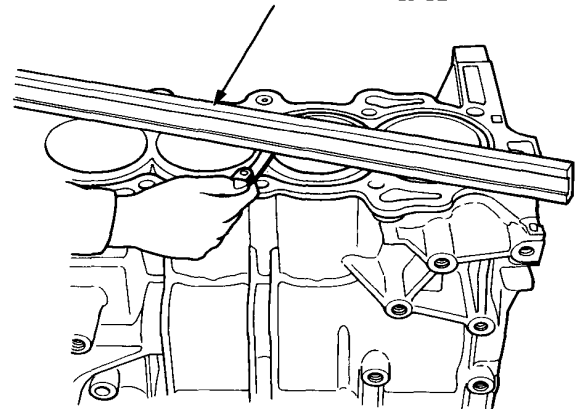


Cylinder Block Warpage:

Standard (New): below 0.07 mm (0.003 in)

Service Limit: 0.10 mm (0.004 in)

PRECISION STRAIGHT EDGE





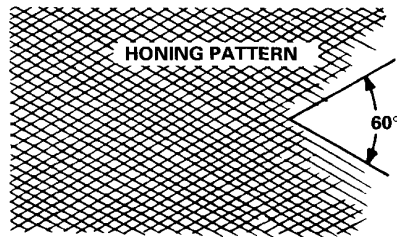
Piston Pins

Bore Honing

1. Measure cylinder bores as shown on page 7-16. If the block is to be reused, hone the cylinders and remeasure the bores.
2. Hone cylinder bores with honing oil and a fine (400 grit) stone in a 60 degree 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.

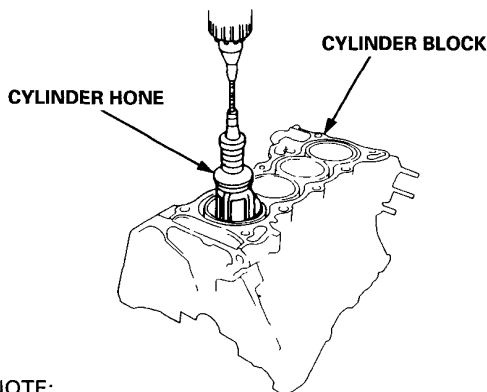


3. When honing is complete, thoroughly clean the cylinder block of all metal particles. Wash the cylinder bores with hot soapy water, then dry and oil immediately to prevent rusting.

NOTE: Never use solvent, it will only redistribute the grit on the cylinder walls.

4. If scoring or scratches are still present in 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.

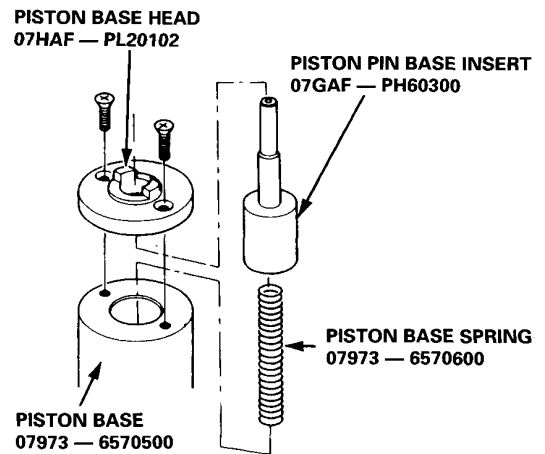


NOTE:

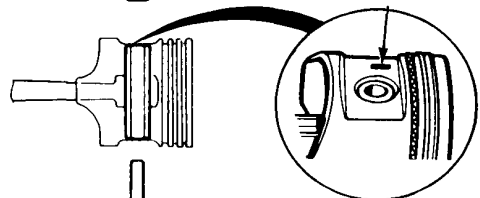
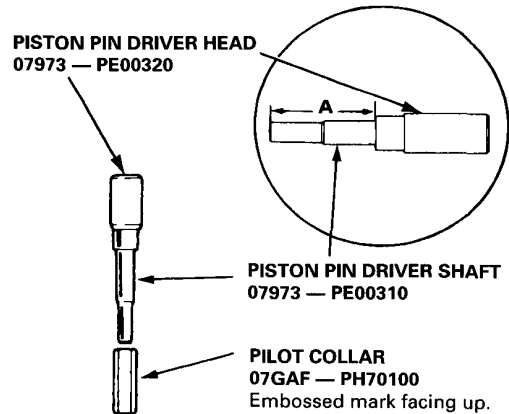
- After honing, clean the cylinder thoroughly with soapy water.
- Only a scored or scratched cylinder bore must be honed.

Removal

1. Assemble the Piston Pin Tools as shown.



2. Adjust the length A of the piston pin driver.
A: 51.5 mm (2.03 in)



NOTE: Use a hydraulic press. When pressing pin in or out, make sure that the recessed portion of the piston aligns with the lips on the collar.

3. Place the piston on the piston base and press the pin out with a hydraulic press.

Connecting Rods

Selection

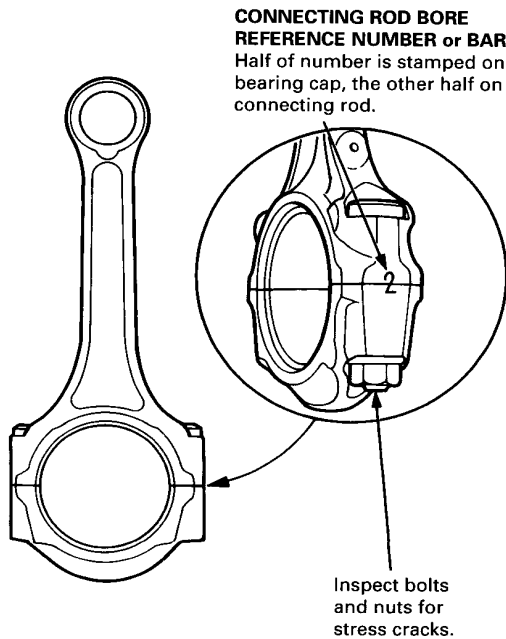
Each rod falls into one of four tolerance ranges (from 0 to 0.024 mm (0.0009 in) in 0.006 mm (0.0002 in) increments) depending on the size of its big end bore. It's then stamped with a number or bar (1, 2, 3, or 4/l, il, iil, or iiii) indicating the range.

You may find any combination of 1, 2, 3, or 4/l, il, iil, or iiii in any engine.

Normal Bore Size: 48.0 mm (1.89 in)

NOTE

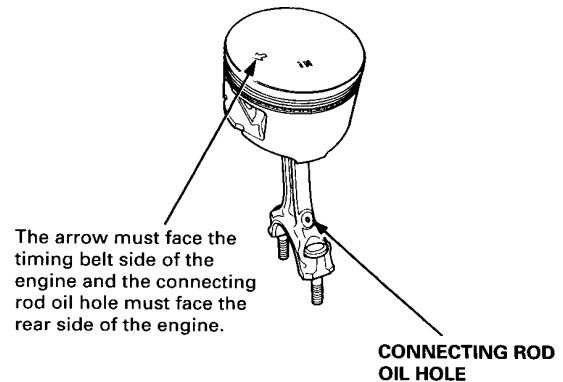
- Reference numbers or bars are for big end bore size and do not indicate the position of the rod in the engine.
- Inspect connecting rod for cracks and heat damage.



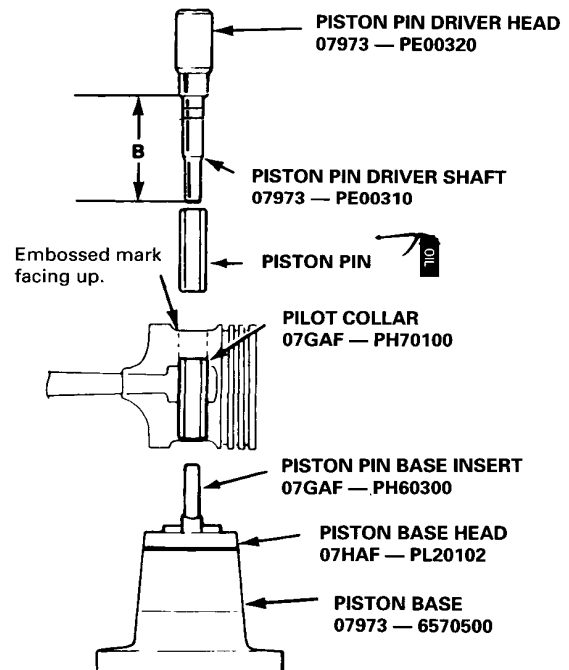
Piston Pins

Installation

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



2. Adjust the length B of the piston pin driver.
B: 51.5 mm (2.03 in.)



NOTE: Install the assembled piston and rod with the oil hole facing the intake manifold.



Inspection

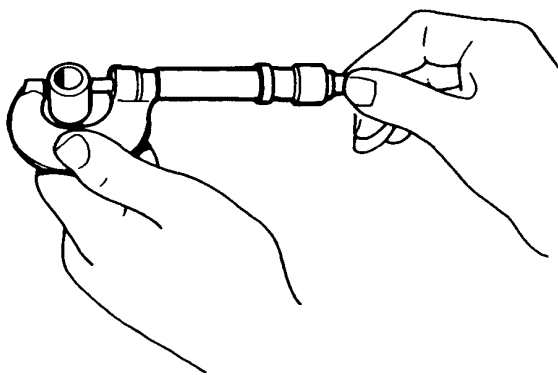
1. Measure the diameter of the piston pin.

Piston Pin Diameter:

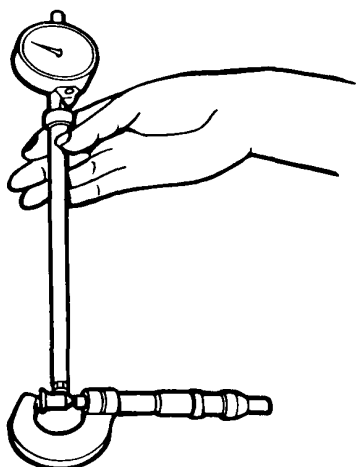
Standard (New): 21.994 — 22.000 mm
(0.8659 — 0.8661 in)

Oversize: 21.997 — 22.003 mm
(0.8660 — 0.8663 in)

NOTE: All replacement piston pins are oversize.



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



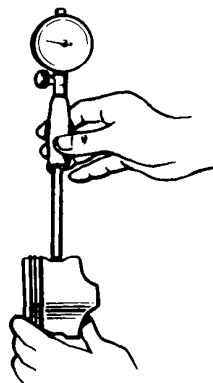
3. Measure the piston pin-to-piston clearance.

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 oversize piston pin.

Piston Pin-to-Piston Clearance:

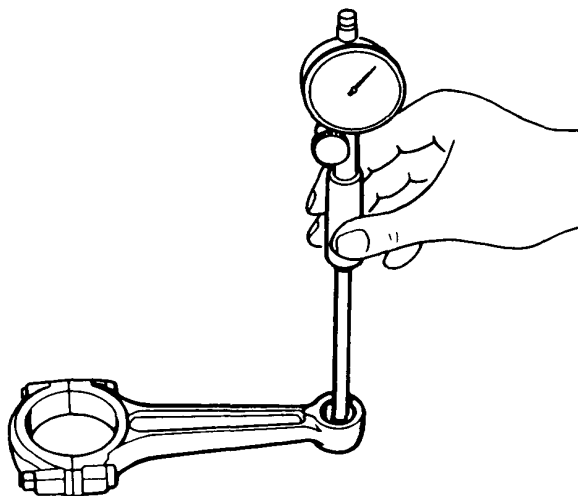
Standard (New): 0.012 — 0.024 mm
(0.0005 — 0.0009 in)



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

Piston Pin-to-Connecting Rod Interference:

Standard (New): 0.013 — 0.032 mm
(0.0005 — 0.0013 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 7-16. If the bore is over the service limit, the cylinder block must be rebored.

Piston Ring End-Gap:

Top Ring

Standard (New): 0.20 — 0.35 mm
(0.008 — 0.014 in)

Service Limit: 0.60 mm (0.024 in)

Second Ring

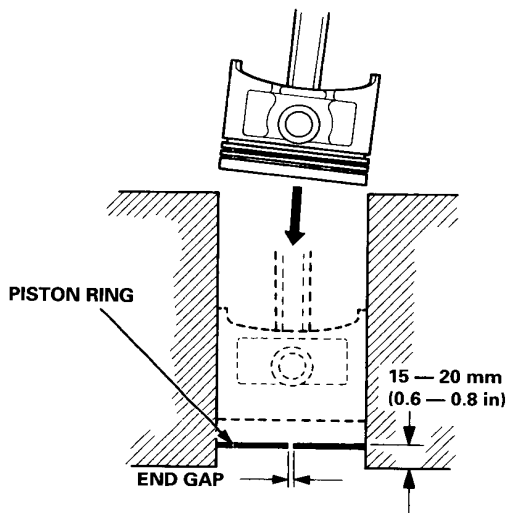
Standard (New): 0.40 — 0.55 mm
(0.016 — 0.022 in)

Service Limit: 0.70 mm (0.028 in)

Oil Ring

Standard (New): 0.20 — 0.70 mm
(0.008 — 0.028 in)

Service Limit: 0.80 mm (0.031 in)



Oversize:

0.25: 85.25 mm (3.356 in)

0.50: 85.50 mm (3.366 in)

Replacement

1. Using a ring expander, remove the old piston rings.
2. Clean all ring grooves thoroughly.

NOTE:

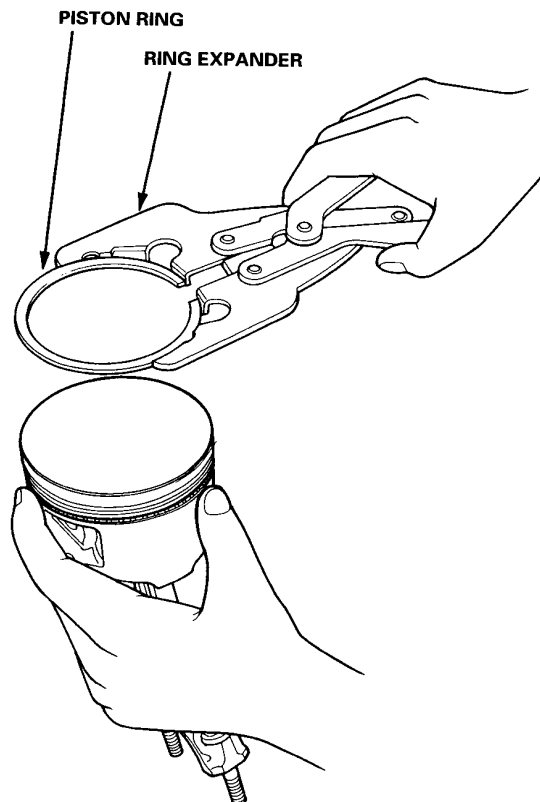
- Use a squared-off broken ring or ring groove cleaner with blade to fit piston grooves.
- Top and 2nd ring grooves are 1.2 mm (0.05 in) wide and the oil ring groove is 2.8 mm (0.11 in) wide.
- File down blade if necessary.

CAUTION: Do not use a wire brush to clean the ring grooves, or cut ring grooves deeper with cleaning tools.

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 page 7-21).

NOTE: Do not use old piston rings.





Ring-to-Groove Clearance

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

Top Ring Clearance

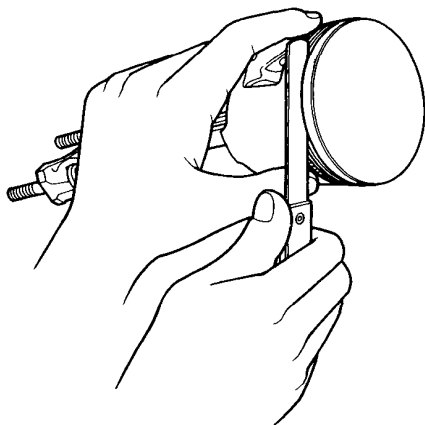
Standard (New): 0.035 — 0.060 mm
(0.0014 — 0.0024 in)

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)

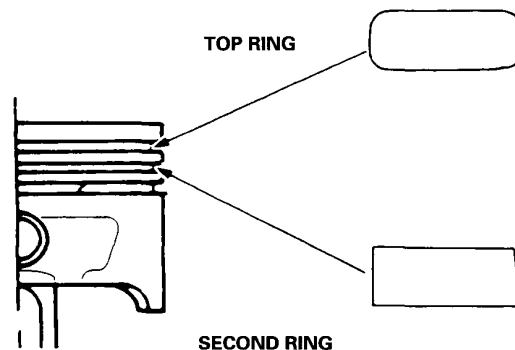


Alignment

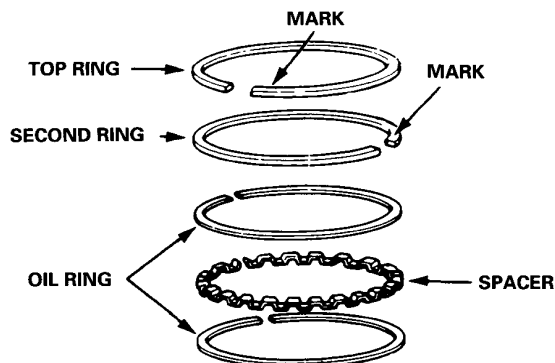
1. Install the rings as shown.

Identify top and second rings by the chamfer on the edge. Make sure they are in their proper grooves on the piston.

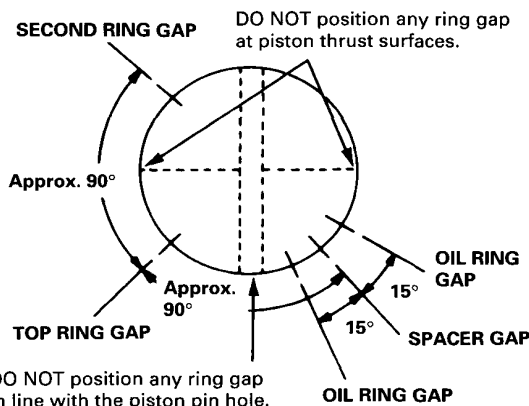
NOTE: The manufacturing marks must be facing upward.



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




3. Position the ring end gaps as shown:



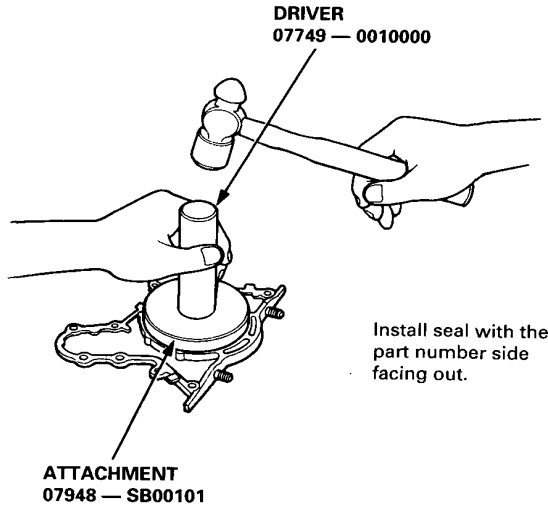
Crankshaft Oil Seal

Installation

 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.

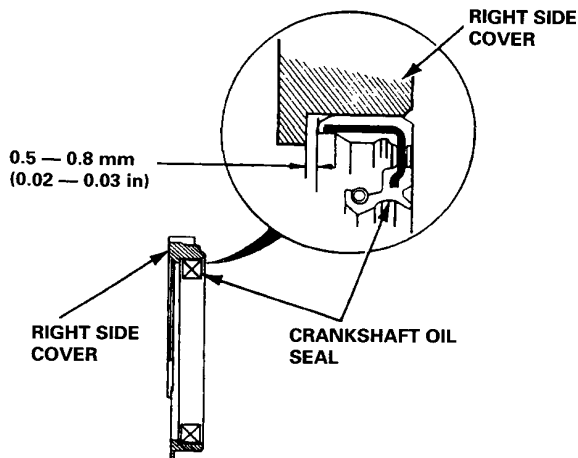
1. Drive in crankshaft oil seal against R. side cover.

NOTE: Drive the crankshaft oil seal in squarely.



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


Clearance: 0.5 — 0.8 mm (0.02 — 0.003 in)



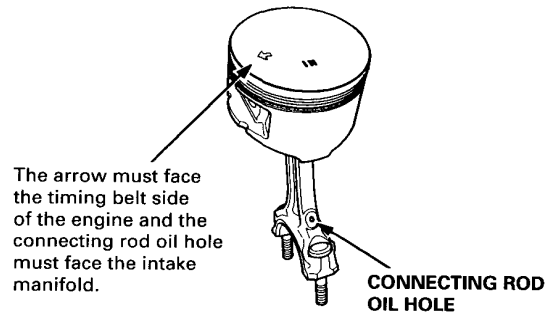
NOTE: Refer to page 8-11 for installation of the oil pump side crankshaft oil seal.

Pistons

Installation

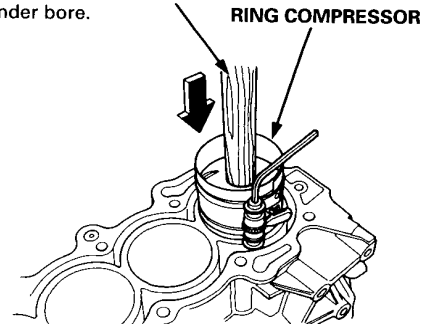
 Before installing the piston, apply a coat of engine oil to the ring grooves and cylinder bores.

1. If the crankshaft is already installed:
 - 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 piston into place.
 - Install the rod caps with bearings, and torque the nuts to 47 N·m (4.7 kg·m, 34 lb·ft).
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 rings from expanding before entering the cylinder bore.


Use the wooden handle of a hammer to push, or tap the piston into the cylinder bore.



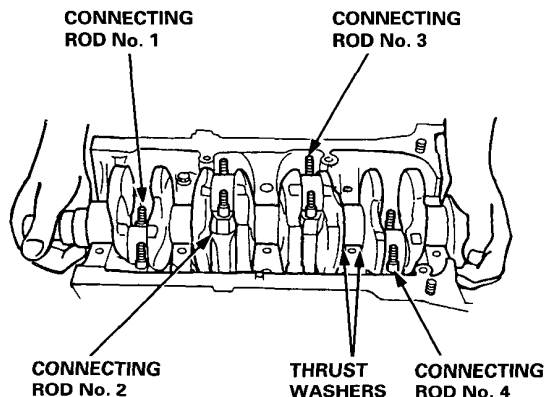


Crankshaft and Balancer Shafts

Installation

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

1. Insert bearing halves in the cylinder block and connecting rods.
2. Hold the crankshaft so rod journals for cylinders No. 2 and No. 3 are straight up.
3. Lower the crankshaft into the block, seating the rod journals into connecting rods No. 1 and No. 4. Install the rod caps and nuts finger tight.



4. Rotate the crankshaft clockwise, seat journals into connecting rods No. 2 and No. 3, and install the rod caps and nuts finger tight.

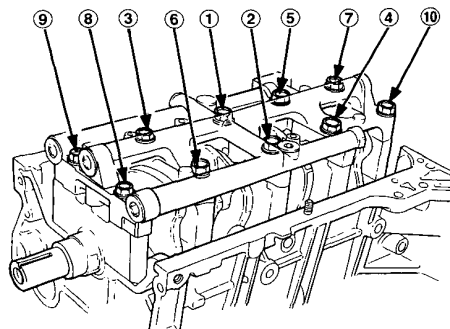
NOTE: Install caps so the bearing recess is on the same side as the recess in the rod.

5. Check rod bearing clearance with plastigage (see page 7-9), then torque the capnuts. 32 N·m (3.2 kg·m, 23 lb-ft)

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

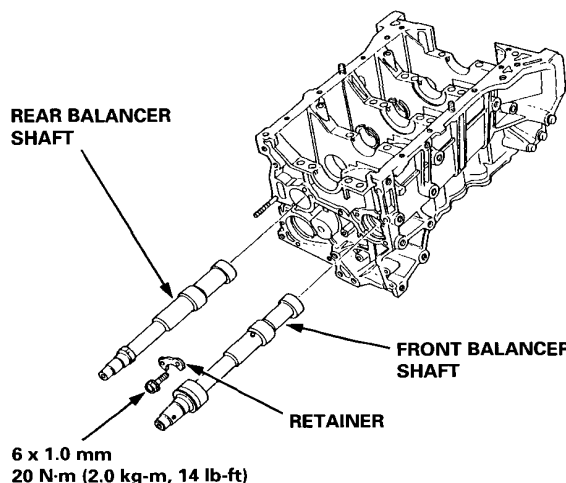
6. Install the thrust washers, main bearing caps and bearing cap bridge. Check clearance with plastigage (see page 7-7), then tighten the bearing cap bolts in 2 steps. In the first step tighten all bolts in sequence, to about 30 N·m (3.0 kg·m, 22 lb-ft); in the final step tighten in same sequence, to 75 N·m (7.5 kg·m, 54 lb-ft).

NOTE: Coat the bolt threads with engine oil.



CAUTION: Whenever any crankshaft or connecting rod bearing is replaced, it is necessary after reassembly to run the engine at idling speed until it reaches normal operating temperature, then continue to run it for approximately 15 minutes.

7. Insert the balancer shafts into the block, then install the retainer to the front balancer shaft and block.



(cont'd)

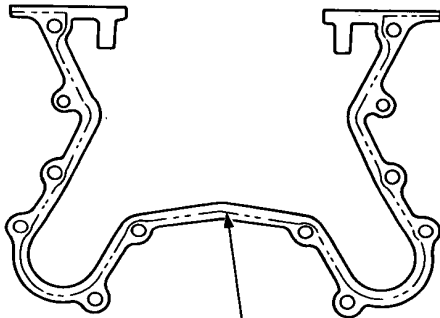
Crankshaft and Balancer Shafts

Installation (cont'd)

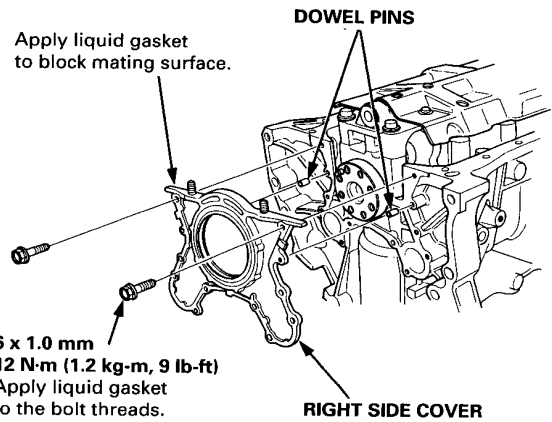
NOTE:

- Use liquid gasket, part No. 0Y740 — 99986.
 - 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 leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
 - Do not install the parts if 20 minutes or more have elapsed since applying the liquid gasket. Instead reapply liquid gasket after removing the old residue.
 - After assembly, wait at least 30 minutes before filling the engine with oil.
8. Apply liquid gasket to the block mating surface of the right side cover, then install it on the cylinder block.

RIGHT SIDE COVER:



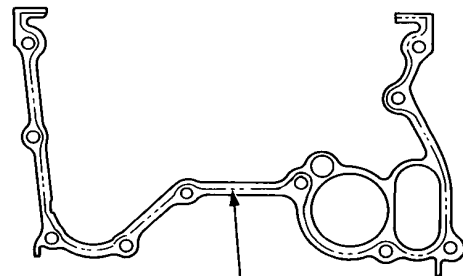
Apply liquid gasket along the broken line.



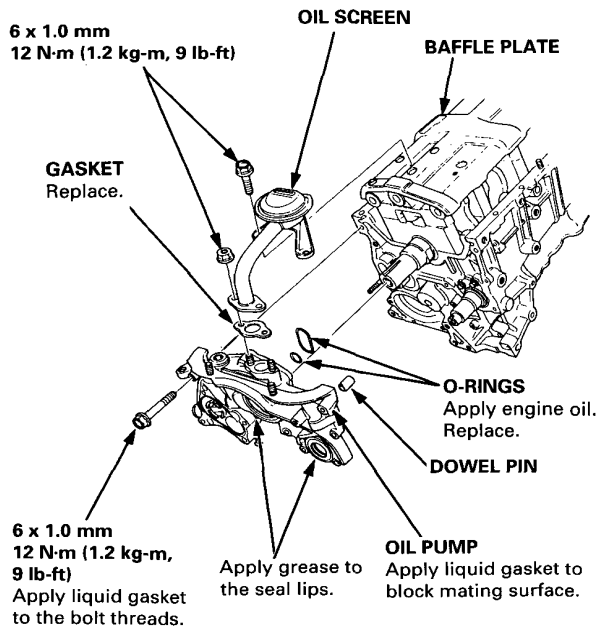
9. Apply liquid gasket to the oil pump mating surface of the block, then install the oil pump on the cylinder block.

- 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 and the balancer shaft, then check that the oil seal lips are not distorted.

OIL PUMP:

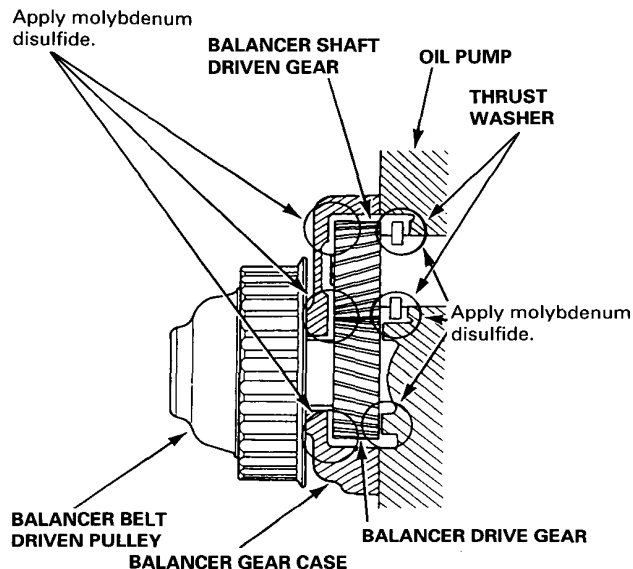


Apply liquid gasket along the broken line.



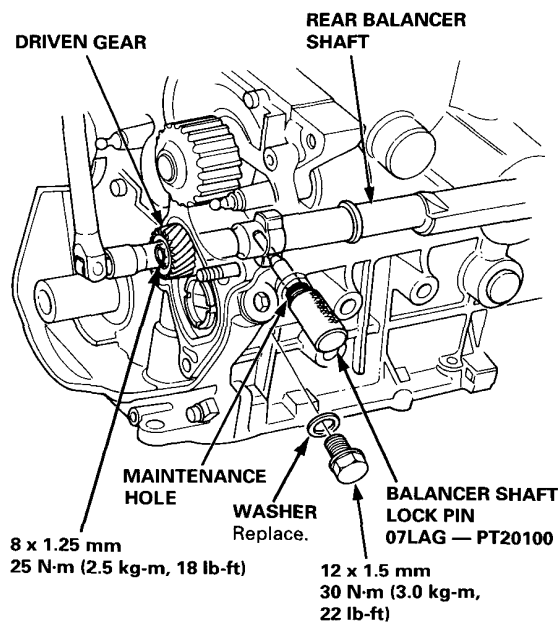
10. Install the baffle plate, then install the oil screen.

11. Apply the molybdenum disulfide to the thrust surfaces of the balancer gears as shown, before installing the balancer driven gear and the balancer gear case.



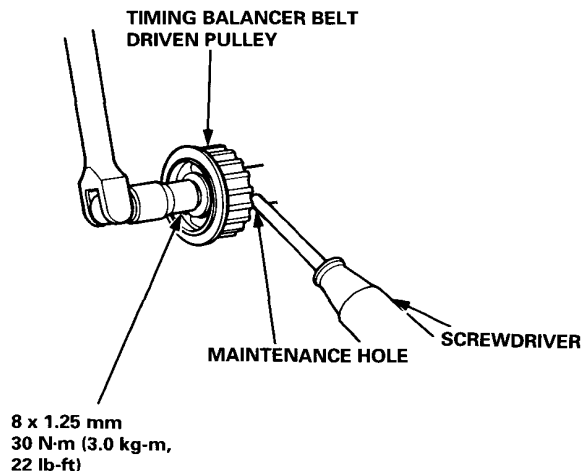
12. Hold the rear balancer shaft with the special tool, then install the balancer driven gear and the timing balancer belt driven pulley.

REAR BALANCER:



13. Hold the front balancer shaft with a screwdriver, then install the timing balancer belt driven pulley.

FRONT BALANCER:



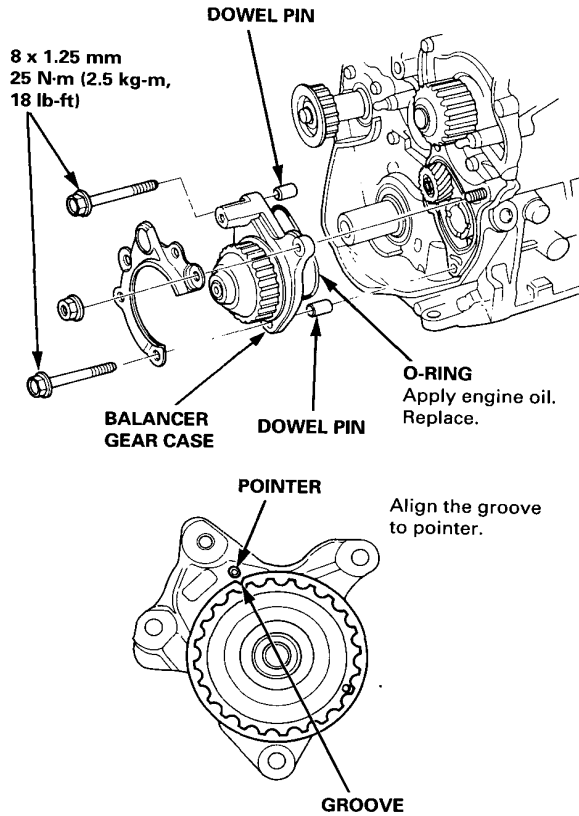
(cont'd)

Crankshaft and Balancer Shafts

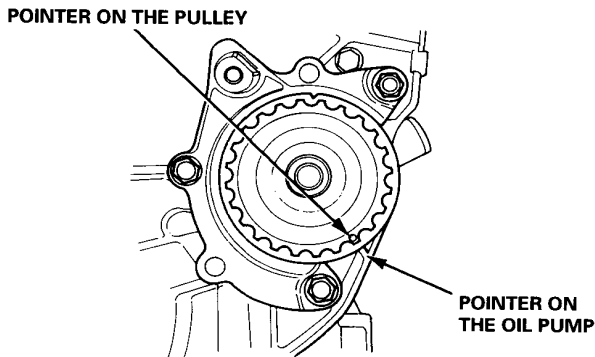
Installation (cont'd)

14. Install the balancer gear case to the oil pump.

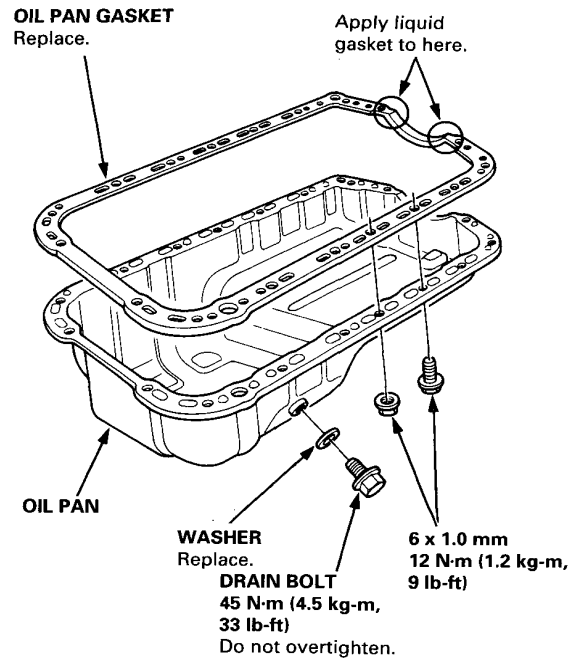
NOTE: Align the groove on the pulley edge to the pointer on the gear case while holding the rear balancer with the special tool, then install the gear case.



15. Check alignment of pointers after installing the gear case.

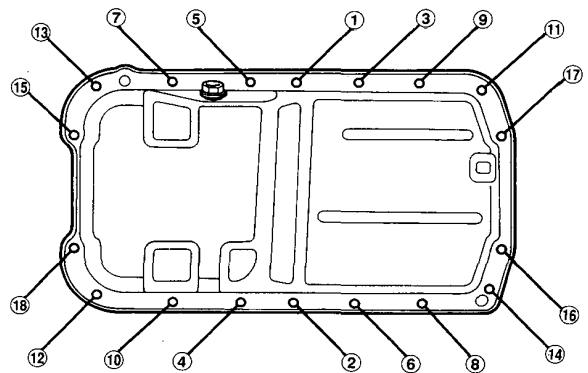


16. Install the oil pan.



17. Tighten the bolts and nuts as shown below.

Torque: 12 N-m (1.2 kg-m, 9 lb-ft)



NOTE: Tighten the bolts and nuts in two steps and torque them in a crisscross pattern.



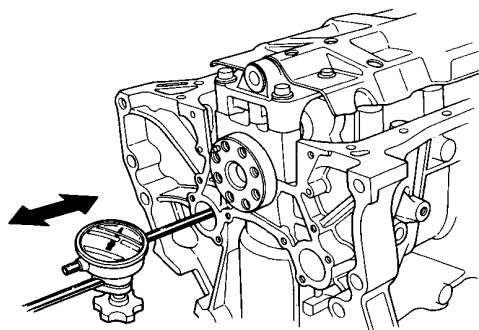
Balancer Shafts

Inspection

NOTE: Inspect the balancer shaft before removing the right side cover and the balancer gear case (see page 7-11).

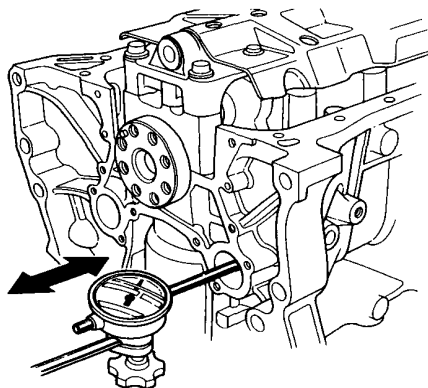
1. Push the balancer shaft firmly away from the dial indicator, and zero the dial against the front end of the balancer shaft, then pull the balancer shaft firmly back toward the indicator.

Front Balancer Shaft End Play
Standard (New): 0.10 — 0.35 mm
(0.004 — 0.014 in)



- If end play is excessive, inspect the retainer and thrust surfaces on the balancer shaft.

Rear Balancer Shaft End Play
Standard (New): 0.06 — 0.18 mm
(0.002 — 0.007 in)



- If end play is excessive, inspect the thrust washer and thrust surfaces on the driven gear and oil pump housing.

NOTE: The thickness of the retainer (front) and thrust washer (rear) are fixed and must not be changed either by grinding or shimming.

2. Remove the balancer shafts (see page 7-11).

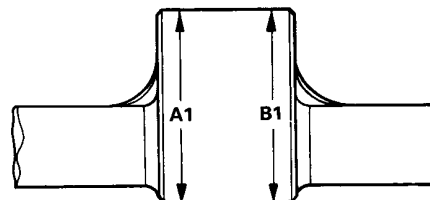
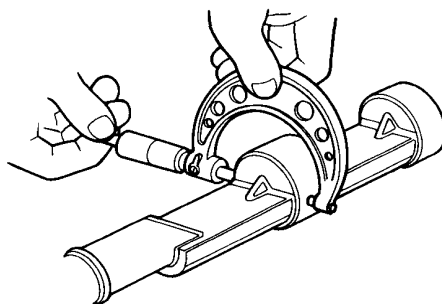
NOTE: Clean the balancer shafts.

3. Inspect the surface of the balancer shaft journal and balancer bearing.
4. Replace if there is wear, damage or discoloration on the surface of the bearing or the balancer shaft journal. When replacing the rear No. 1 bearing be sure to replace the oil pump housing with a new one.

NOTE: A mirror-like surface is normal.

5. Measure the taper at the edges of each journal.
 - The difference between measurements on each journal.

Journal Taper
Standard (New): 0.005 mm (0.0002 in)



(cont'd)

Balancer Shafts

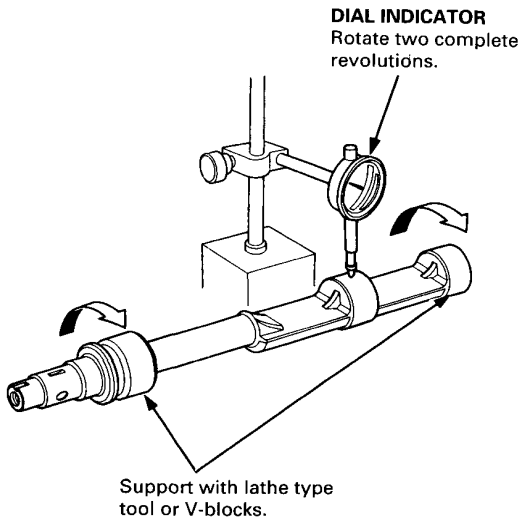
Inspection (cont'd)

- Measure the runout on the No. 2 journal of each balancer shaft to make sure the balancer shafts are not bent.

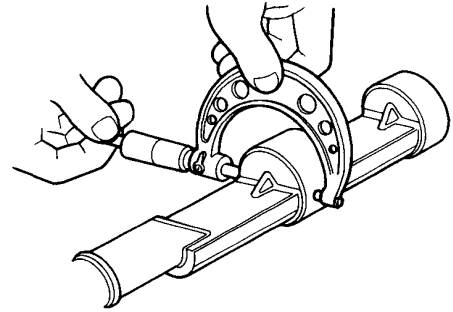
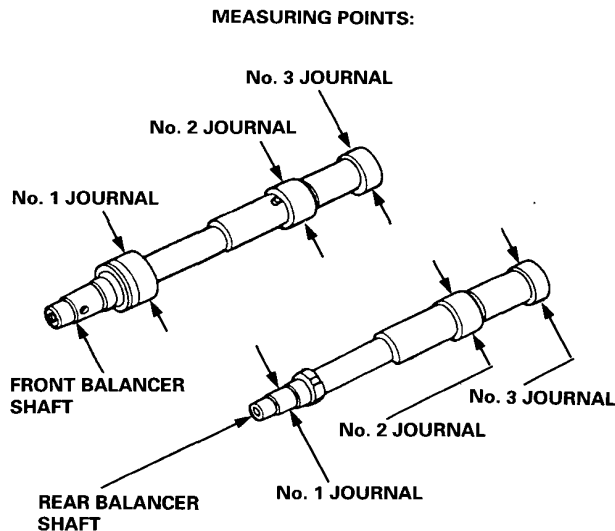
Balancer Shaft Total Indicated Runout

Standard (New): 0.02 mm (0.001 in)

Service Limit: 0.03 mm (0.001 in)



- Measure the diameters of the balancer shaft journals.



Journal Diameter

Standard (New)

No. 1 journal:

Front: 42.722 — 42.734 mm
(1.6820 — 1.6824 in)

Rear: 20.938 — 20.950 mm
(0.8243 — 0.8248 in)

No. 2 journal: 38.712 — 38.724 mm
(1.5241 — 1.5246 in)

No. 3 journal: 34.722 — 34.734 mm
(1.3670 — 1.3675 in)

Service Limit:

No. 1 journal:

Front: 42.71 mm (1.681 in)

Rear: 20.92 mm (0.824 in)

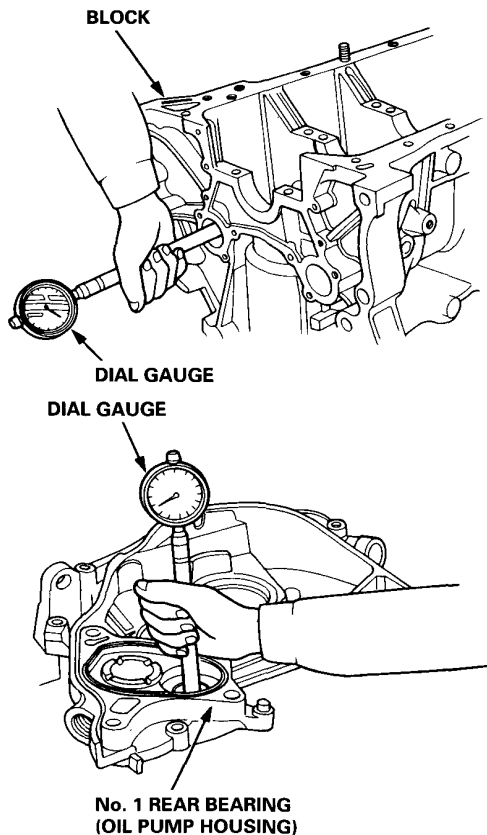
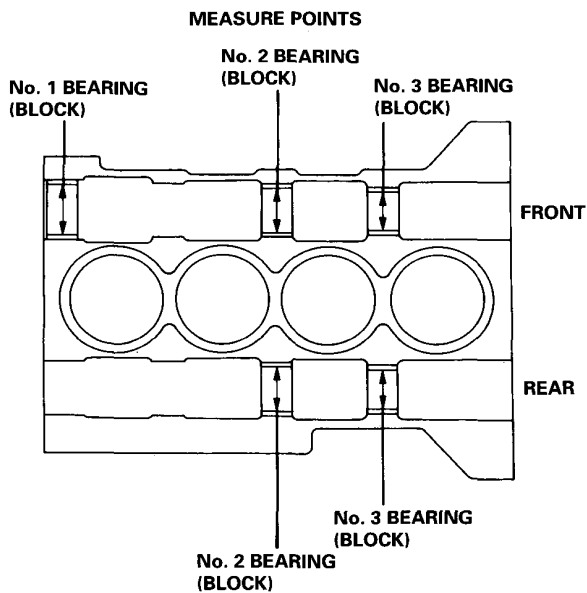
No. 2 journal: 38.70 mm (1.524 in)

No. 3 journal: 34.71 mm (1.367 in)

- Remove the crankshaft, the pistons and the other parts from the block, then clean the balancer shaft journal bearings of the block and the oil pump housing with a clean shop towel.
- Check the surface of the bearings, if there is wear, damage or discoloration, replace the bearings or the oil pump housing.



10. Measure the inner diameters of the balancer shaft journal bearings.



Bearing Inner Diameter

Standard (New):

No. 1 journals:

Front: 42.800 — 42.820 mm

(1.6850 — 1.6858 in)

Rear: 21.000 — 21.013 mm

(0.8268 — 0.8273 in)

No. 2 journals: 38.800 — 38.820 mm

(1.5276 — 1.5283 in)

No. 3 journals: 34.800 — 34.820 mm

(1.3701 — 1.3709 in)

Service Limit:

No. 1 journals:

Front: 42.83 mm (1.686 in)

Rear: 21.02 mm (0.828 in)

No. 2 journals: 38.83 mm (1.529 in)

No. 3 journals: 34.83 mm (1.371 in)

11. Calculate the shaft-to-bearings oil clearances.

BEARING I.D. - JOURNAL O.D. = OIL CLEARANCE

Bearing-to-shaft Oil Clearance

Standard (New)

No. 1 journal front and No. 3 journals:

0.066 — 0.098 mm (0.0026 — 0.00439 in)

No. 2 journals:

0.076 — 0.108 mm (0.0030 — 0.0043 in)

No. 1 journal rear:

0.050 — 0.075 mm (0.0020 — 0.0030 in)

Service Limit:

No. 1 journal front and No. 3 journals:

0.12 mm (0.005 in)

No. 2 journals: 0.13 mm (0.005 in)

No. 1 journal rear: 0.09 mm (0.004 in)

Balancer Shaft Bearings

Replacement

The procedure shown below is used when using the bearing replacement tool set (07LAF — PT20100).

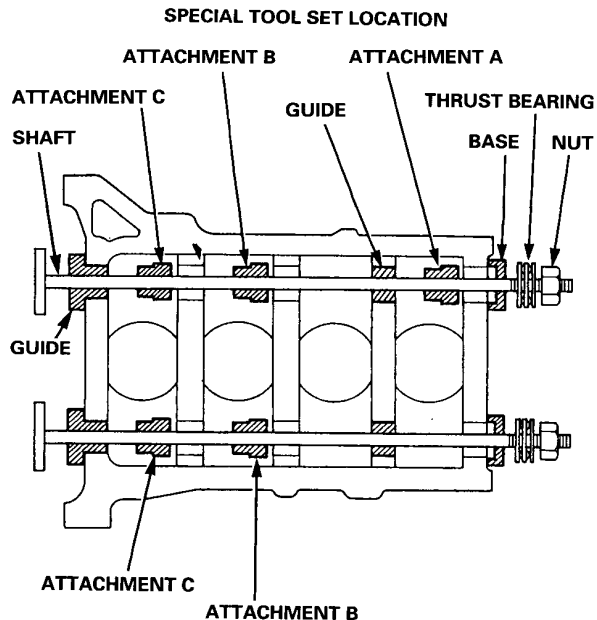
CAUTION:

- Remove all attachment parts from the cylinder block and lay it with its oil pan side up.
- Remove or reinstall bearings one at a time.
- Remove bearings from the transmission side to the timing belt side and reinstall them in reverse sequence.

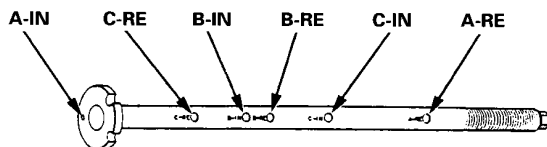
Removal:

NOTE:

- By changing the size and attachment point of the attachment, all balancer bearings can be removed from the cylinder block in the same procedure.
- The illustration shows the attachment points of each special tool.
- When removing bearings successively, put the corresponding attachment through the shaft without fixing them in advance.

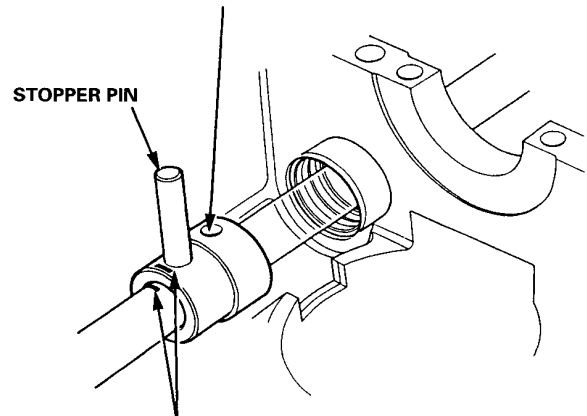


- Position of attachment fixing holes and guide marks on the shaft.

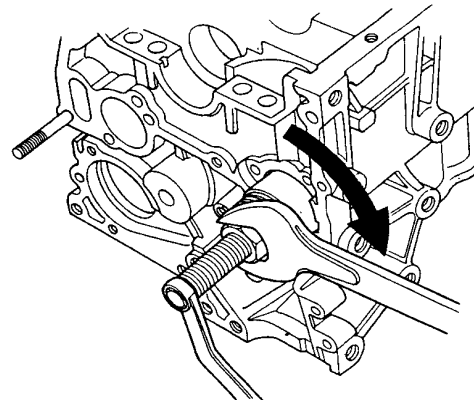


1. Put the attachment with the side having larger diameter facing the bearing. Align the stopper pin holes of the attachment and the shaft. Insert the stopper pin to fix the attachment.

FRONT No. 1 BEARING: ATTACHMENT A
No. 2 BEARINGS: ATTACHMENT B
No. 3 BEARINGS: ATTACHMENT C



2. Hold the shaft end with a wrench and turn the nut clockwise until the bearing comes off.
 - Do not rotate the shaft.



3. When removing bearings in succession, loosen the nut, remove the stopper pin from the pin hole you have finished and repeat above step 1 and 2 on the next bearing.

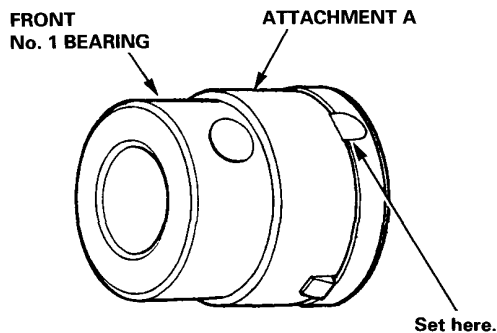


Installation:

Front No. 1 bearing

NOTE: Always use new bearings.

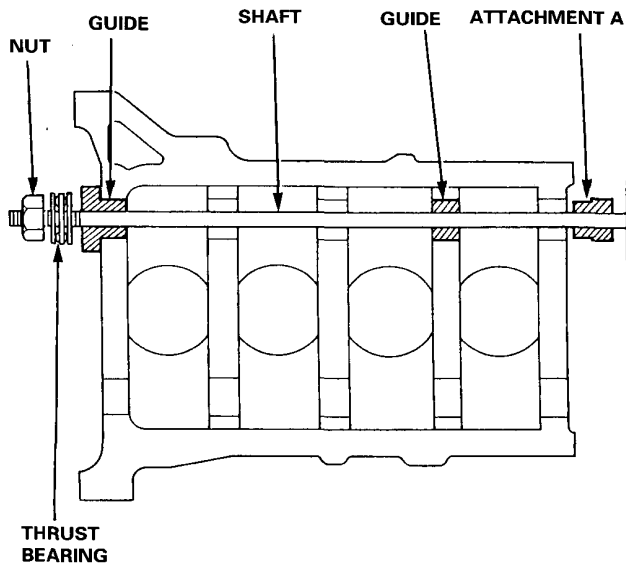
1. Set the resess of the bearing to the detent of the attachment.



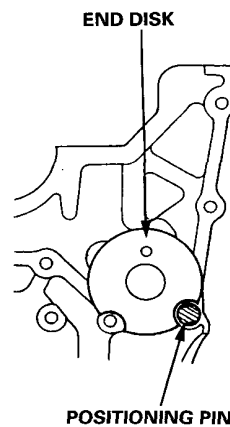
Attachment

Front No. 1 bearing: Attachment No. 1

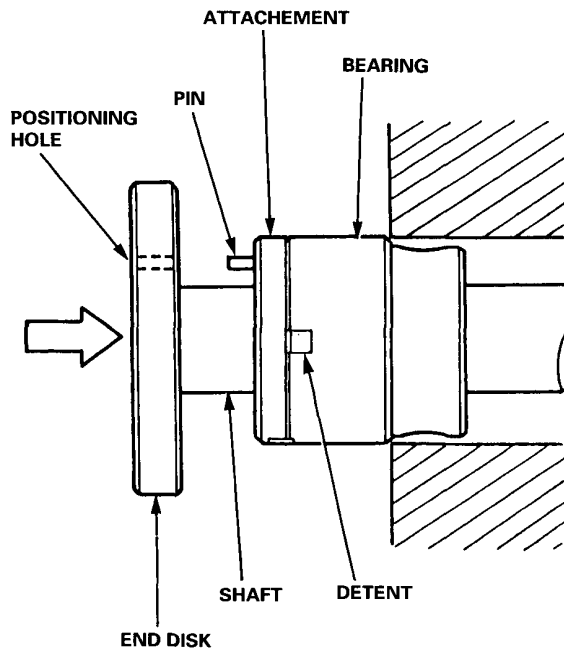
- The illustration shows the attachment points of the special tools.



2. Install the shaft positioning pin.



3. Set the shaft so that the attachment pin is aligned with the positioning hole in the end disc.

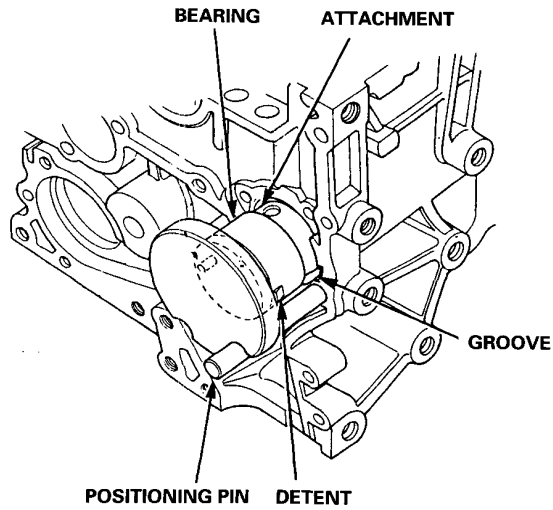


(cont'd)

Balancer Shaft Bearings

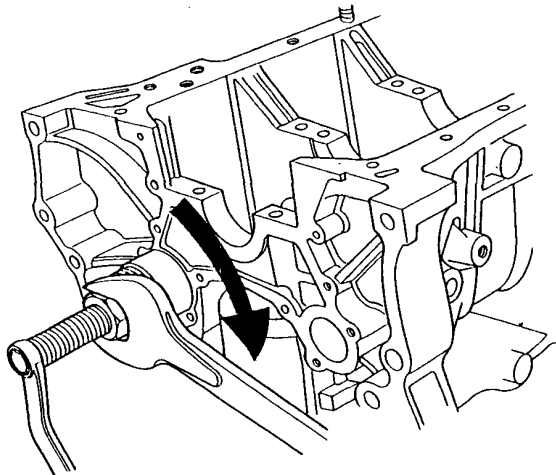
Replacement (cont'd)

4. Set the detent of the bearing to the groove of the cylinder block.



5. Hold the end of the shaft with wrench and install the bearing by turning the nut clockwise.

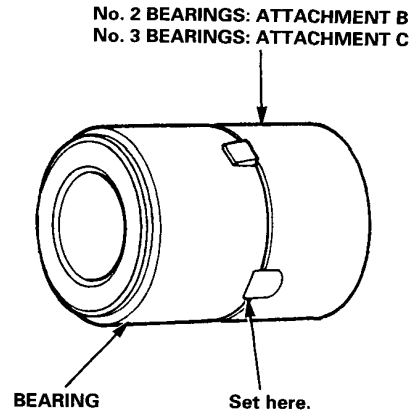
- Do not rotate the shaft.



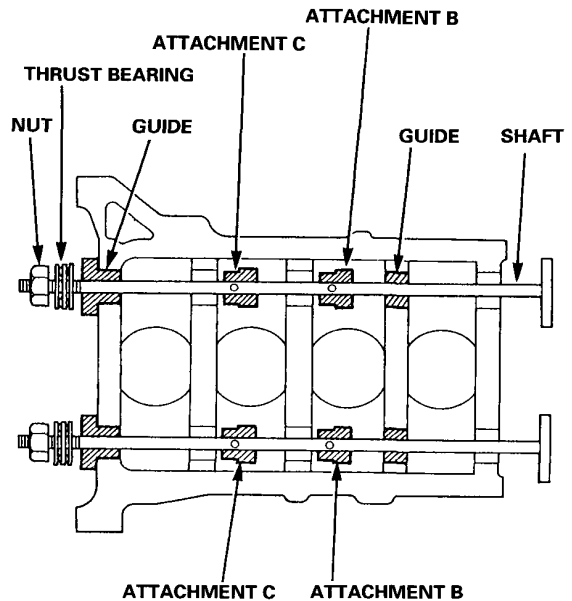
Installation:

No. 2 and No. 3 Bearings

1. Set the recess of the bearing to the detent of the attachment.

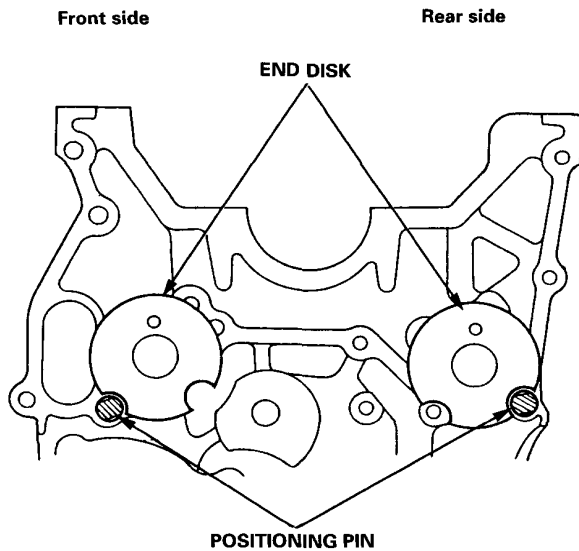


- The illustration shows attachment points of each special tool.
- When installing bearings successively, set the bearings to the attachment and put them through the shaft without fixing them in advance.

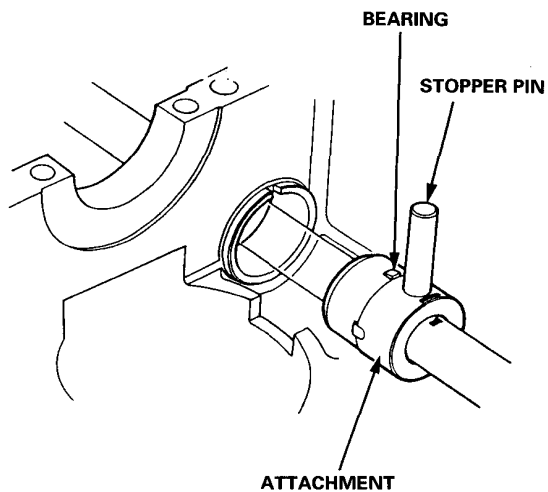




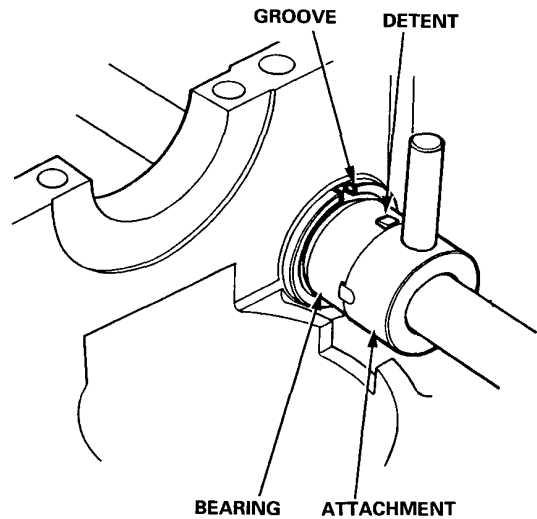
2. Install the shaft positioning pin.



3. Align the attachment with the guide mark. Applicable bearing No. is indicated at the guide mark. Align the pin holes of the attachment and the shaft. Insert the stopper pin to fix the attachment (for No. 2, and No. 3 bearings).

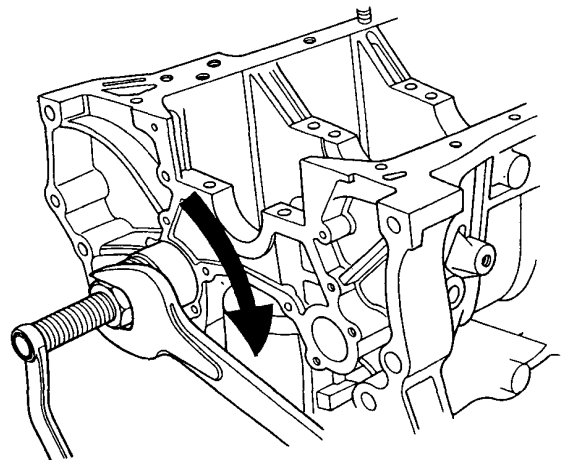


4. Set the detent of the bearing to the groove of the cylinder block.



5. Hold the end of the shaft with wrench and install the bearing by turning the nut clockwise.

- Do not rotate the shaft.



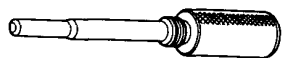
Engine Lubrication

Special Tools	8-2
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Replacement	8-5
Oil Pressure	
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Special Tools

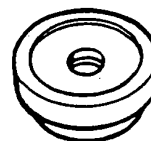
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07LAG — PT20100	Balancer Shaft Lock Pin	1	8-12
②	07406 — 0030000	Oil Pressure Gauge Adapter	1	8-8
③	07746 — 0010300	Attachment, 42 x 47 mm	1	8-11
④	07746 — 0010400	Attachment, 52 x 55 mm	1	8-11
⑤	07749 — 0010000	Driver	1	8-11
⑥	07912 — 6110001	Oil Filter Wrench	1	8-5
⑦		RABINAL-Purflux 76	1	8-7



①



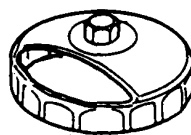
②



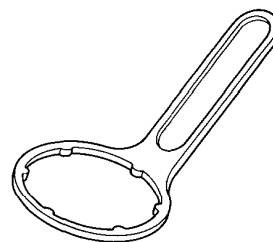
③ ④



⑤



⑥



⑦

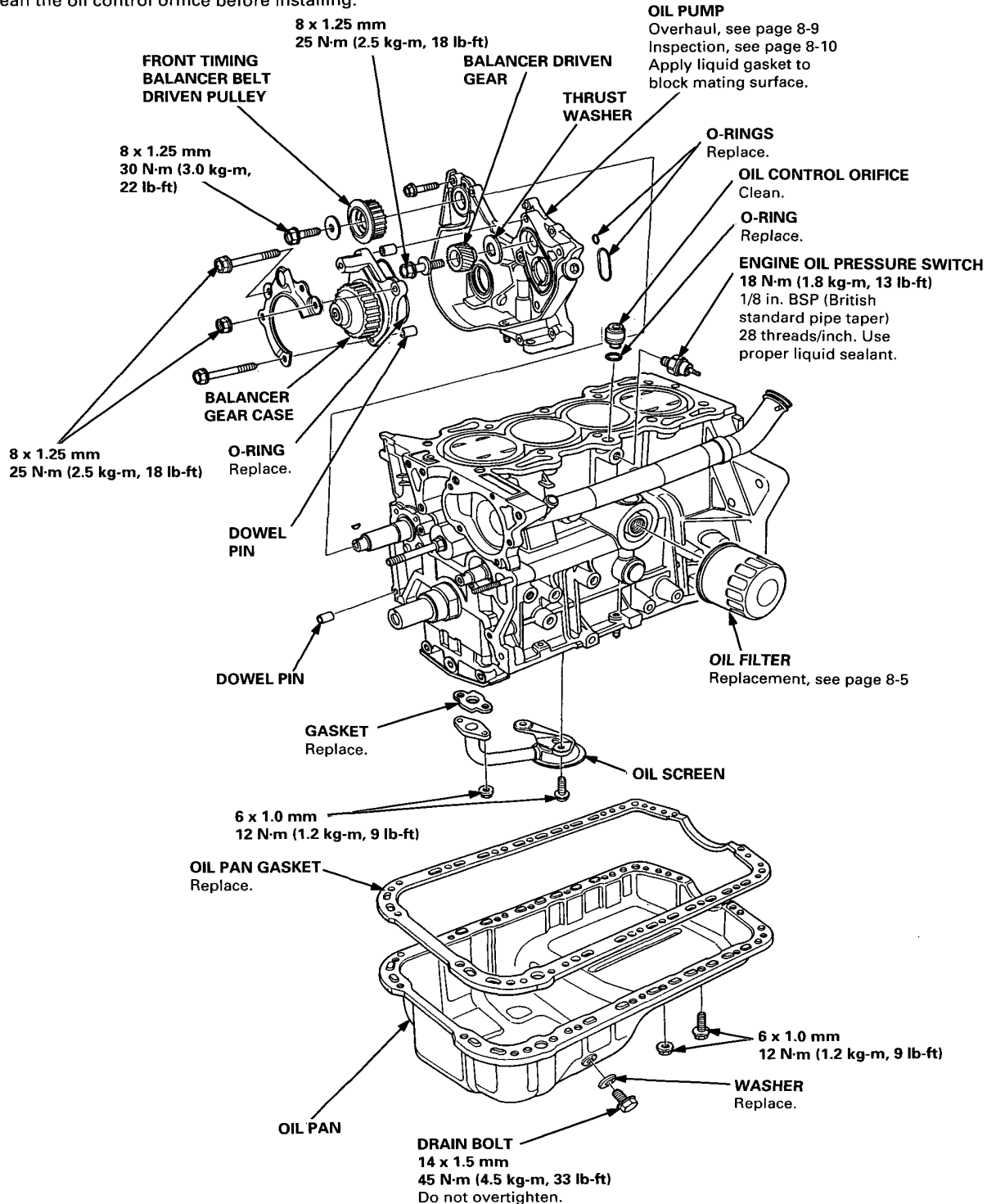
Illustrated Index



NOTE:

- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 0Y740 — 99986.
- Clean the oil control orifice before installing.

CAUTION: Do not overtighten the drain bolt.

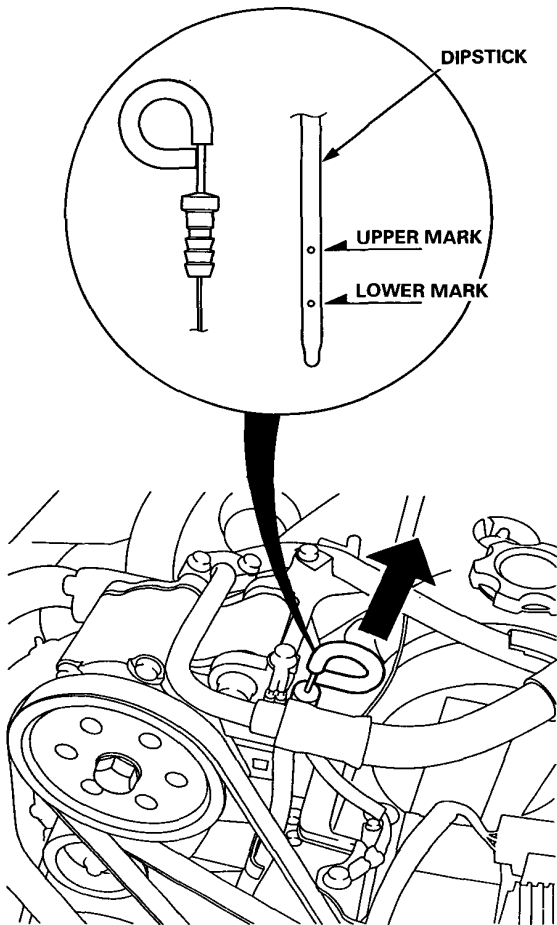


Engine Oil

Inspection

1. Check engine oil 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.

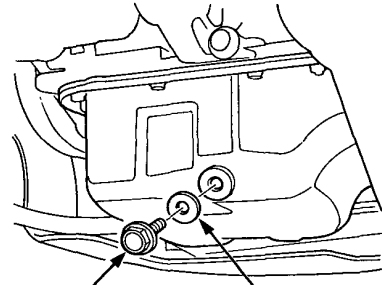
CAUTION: Insert the dipstick carefully to avoid bending it.



Replacement

WARNING Remove the drain bolt carefully. Hot oil may cause scalding.

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



OIL DRAIN BOLT
45 N·m (4.5 kg·m, 33 lb·ft)
Do not overtighten.

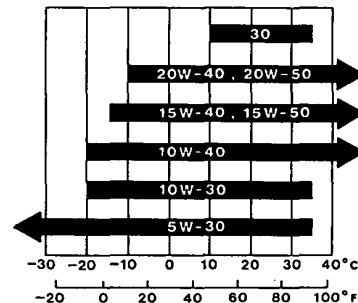
WASHER
Replace.

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

CAUTION: Do not overtighten the drain bolt.

Requirement	Always use a fuel-efficient oil is that says "API Service SF or SG". SAE Viscosity: See chart below.
Capacity	3.5 ℓ (3.7 US qt, 3.1 Imp qt) at change, including filter. 4.9 ℓ (5.2 US qt, 4.3 Imp qt) after engine overhaul.
Change	Every 10,000 km (6,000 miles) or 12 months

Select the oil for the car according to this chart:



Oil Filter



Replacement

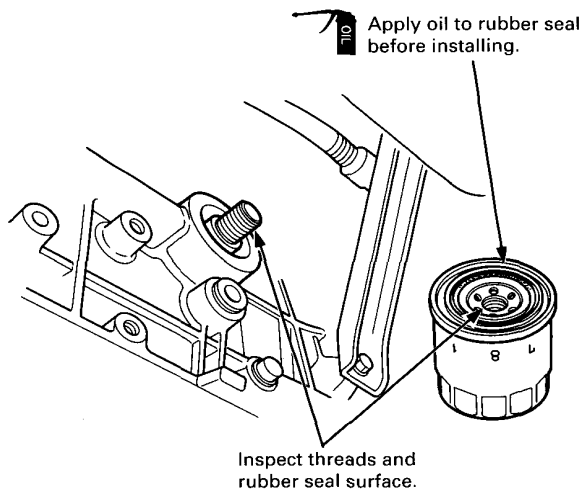
JAPAN-MADE oil filter:

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

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

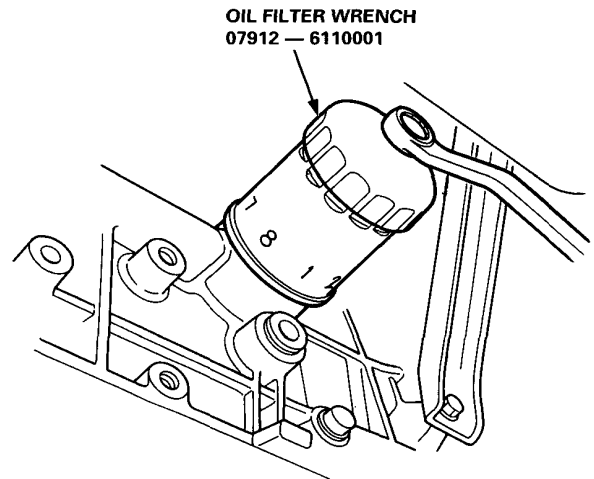


3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: 7/8 turn clockwise.

Tightening torque: 22 N-m (2.2 kg-m, 16 lb-ft)

CAUTION: Installation using other than the above procedure could result in serious engine damage due to oil leakage.



(cont'd)

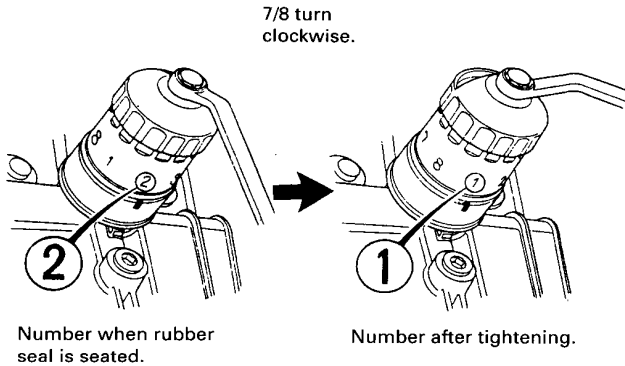
Oil Filter

Replacement (cont'd)

Eight numbers (1 to 8) are printed on the surface of the filter.

The following explains the procedure for tightening filters using these numbers.

- 1) Make a mark on the engine block 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.



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

5. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

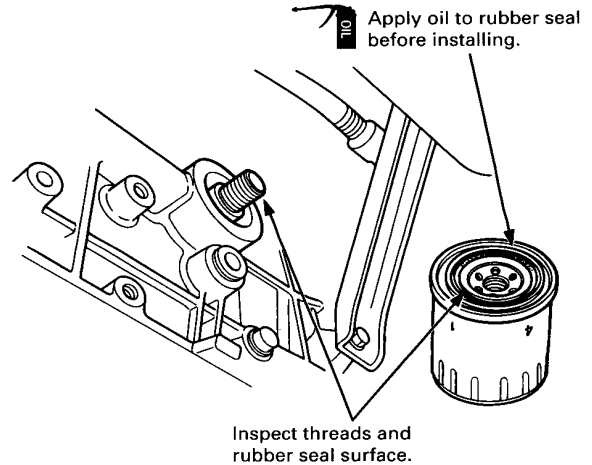
FRANCE-MADE oil filter:

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

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

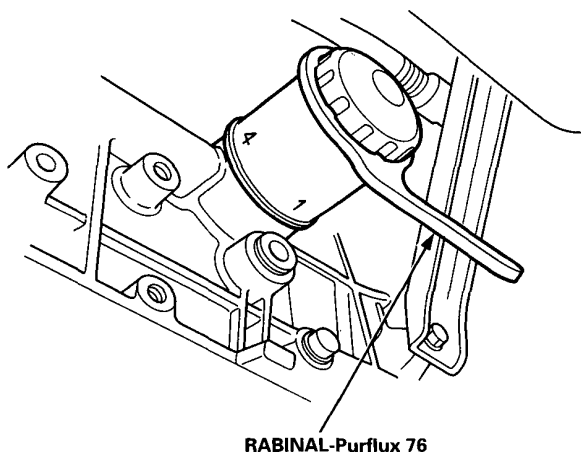




3. Install the oil filter by hand.
4. After the rubber seal seats, tighten the oil filter clockwise with the special tool.

Tighten: three quarter turn clockwise.
Tightening torque: 22 N·m (2.2 kg·m, 16 lb·ft)

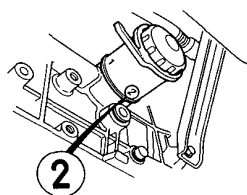
CAUTION: Installation using other than the above procedure could result in serious engine damage due to oil leakage.



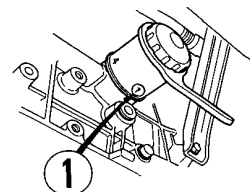
Four numbers (1 to 4) are printed on the surface of the filter.

The following explains the procedure for tightening filters using these numbers.

- 1) Make a mark on the engine block 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 three 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.



Number when rubber seal is seated.



Number after tightening.

Number when rubber seal is seated	1	2	3	4
Number after tightening	4	1	2	3

5. After installation, fill the engine with oil up to the specified level, run the engine for more than 3 minutes, then check for oil leakage.

Oil 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: 80°C (176°F)

Engine Oil Pressure:

**At Idle: 70 kPa (0.7 kg/cm², 10 psi)
minimum**

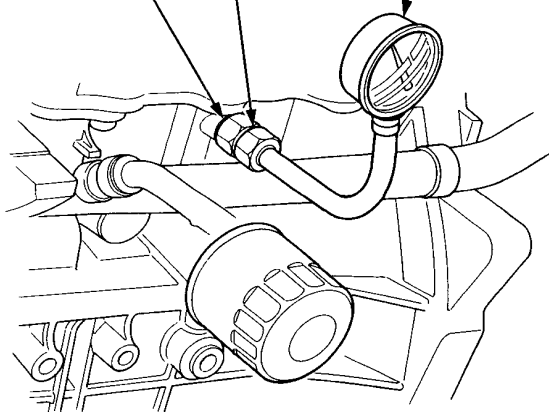
**At 3,000 rpm: 350 kPa (3.5 kg/cm², 50 psi)
minimum**

- If oil pressure is within specifications, replace the oil pressure switch and recheck.
- If oil pressure is NOT within specifications, inspect the oil pump (pages 8-10).

ENGINE OIL PRESSURE SWITCH
MOUNTING HOLE

OIL PRESSURE GAUGE

OIL PRESSURE GAUGE
ADAPTER
07406 — 0030000



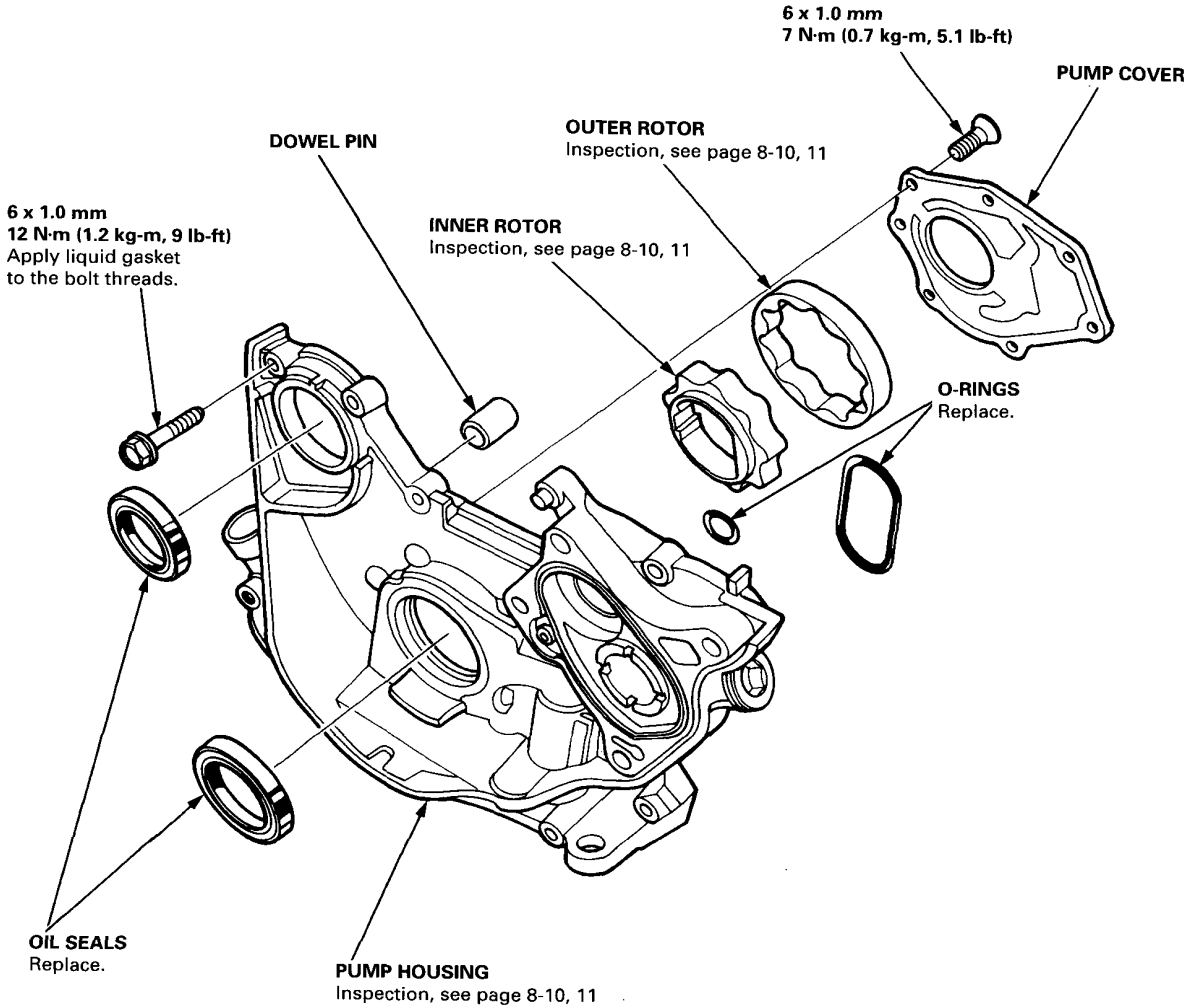


Oil Pump

Overhaul

NOTE:

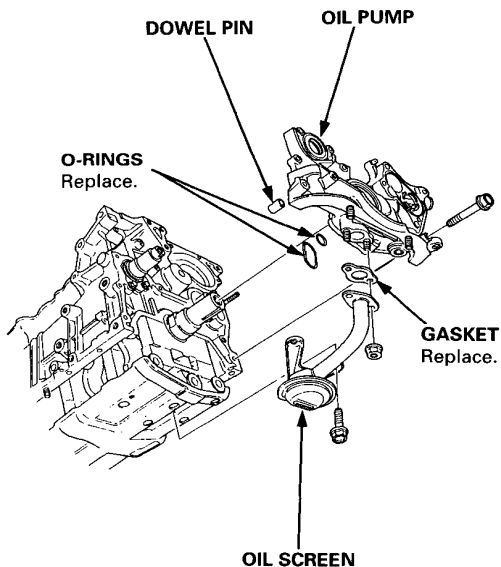
- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 0Y740 — 99986.



Oil Pump

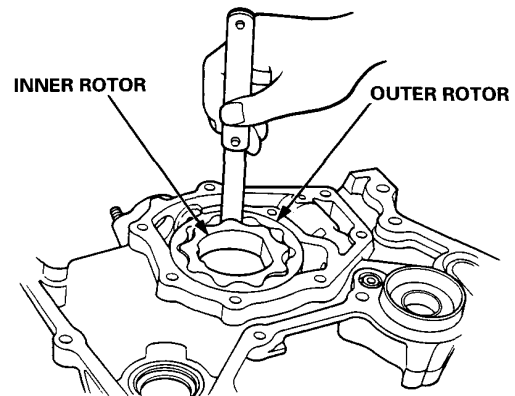
Removal/Inspection/Installation

1. Drain the engine oil.
2. Turn the crankshaft so that the No. 1 piston is at top dead center (see page 6-24).
3. Remove the timing belt and the timing balancer belt (see page 6-25).
4. Remove the timing belt tensioner and the timing balancer belt tensioner.
5. Remove the timing belt drive pulley and the timing balancer belt driven pulley (see page 7-11).
6. Remove the balancer gear case and the balancer driven gear (see page 7-11).
7. Remove the oil pan and the oil screen.
8. Remove the mounting bolts and the oil pump assembly.



9. Remove the screws from the pump housing, then separate the housing and cover.
10. Check the inner-to-outer rotor radial clearance on the pump rotor.

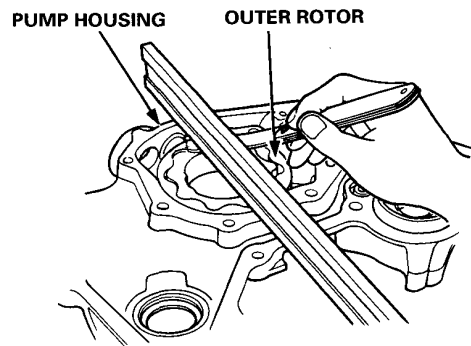
Inner Rotor-to-Outer Rotor Radial Clearance
Standard (New): 0.02 — 0.16 mm (0.001 — 0.006 in)
Service Limit: 0.20 mm (0.008 in)



— If the inner-to-outer rotor radial clearance exceeds the service limit, replace the inner and outer rotors.

11. Check the housing-to-rotor axial clearance on the pump rotor.

Housing-to-Rotor Axial Clearance
Standard (New): 0.02 — 0.07 mm (0.001 — 0.003 in)
Service Limit: 0.12 mm (0.005 in)

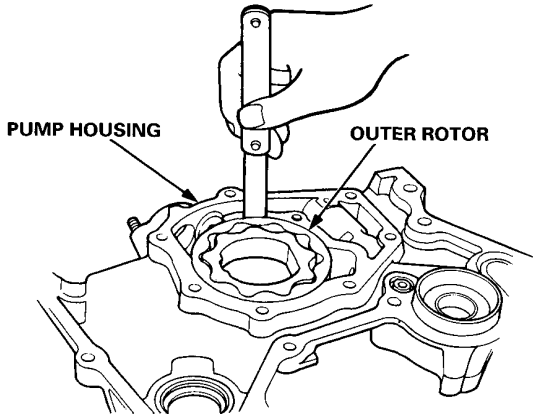


— If the housing-to-rotor axial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.



12. Check the housing-to-outer rotor radial clearance.

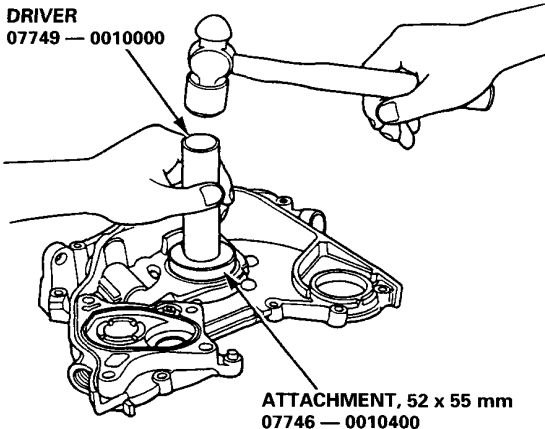
Housing-to-Outer Rotor Radial Clearance
Standard (New): 0.10 — 0.19 mm (0.004 — 0.007 in)
Service Limit: 0.21 mm (0.008 in)



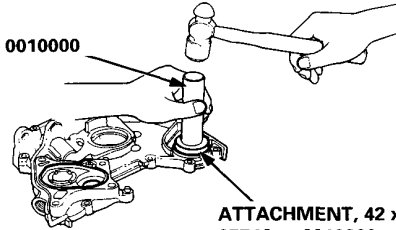
— If the housing-to-outer rotor radial clearance exceeds the service limit, replace the set of inner and outer rotors and/or the pump housing.

13. Inspect both rotors and the pump housing for scoring or other damage. Replace parts if necessary.
14. Remove the old oil seals from the oil pump.
15. Gently tap in the new oil seals until the special tool bottoms on the pump.

NOTE: The oil seals alone can be replaced without removing the oil pump using the special tool.



DRIVER
07749 — 0010000



ATTACHMENT, 42 x 47 mm
07746 — 0010300

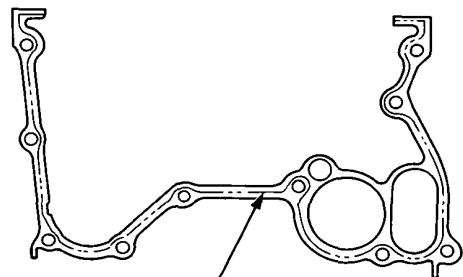
16. Reassemble the oil pump, applying liquid thread lock to the pump housing screws.
17. Check that the oil pump turns freely.
18. Install a dowel pin and the new O-ring on the pump.

NOTE:

- Use liquid gasket, Part No. 0Y740 — 99986.
- 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 leakage of oil, apply liquid gasket to the inner threads of the bolt holes.
- Do not install the parts if 20 minutes or more have elapsed since applying liquid gasket. Instead reapply liquid gasket after removing the old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.

19. Apply liquid gasket to the oil pump and install it.

- Apply grease to the lips of the crankshaft oil seal and the balancer shaft seal. Then, install the oil pump inner rotor onto the crankshaft. When the pump is in place, clean any excess grease off the crankshaft and the balancer shaft, then check that the oil seal lips are not distorted.



Apply liquid gasket
along the broken line.

(cont'd)

Oil Pump

Removal/Inspection/Installation (cont'd)

OIL PUMP

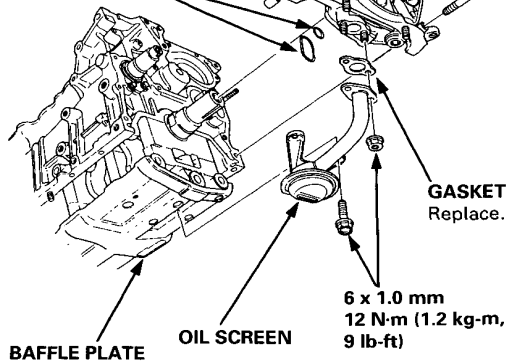
Apply liquid gasket to block mating surface.

Apply grease to the seal lips.

6 x 1.0 mm
12 N·m (1.2 kg-m, 9 lb-ft)
Apply liquid gasket to the bolt threads.

O-RINGS

Apply engine oil. Replace.

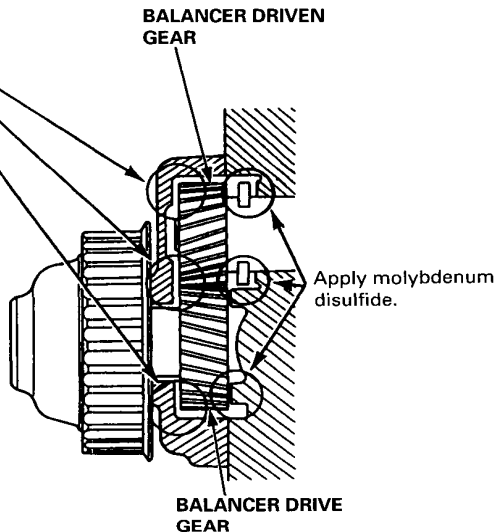


20. Install the baffle plate.

21. Install the oil screen.

22. Apply molybdenum disulfide to the thrust surfaces of the balancer gears, as shown, before installing the balancer driven gear and the balancer gear case.

Apply molybdenum disulfide.

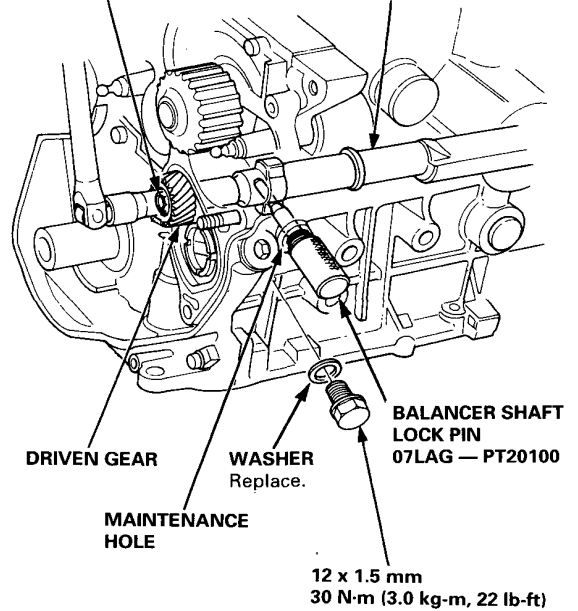


23. Hold the balancer shaft with the special tool, then install the balancer driven gear and the timing balancer belt driven pulley.

REAR BALANCER:

8 x 1.25 mm
25 N·m (2.5 kg-m, 18 lb-ft)

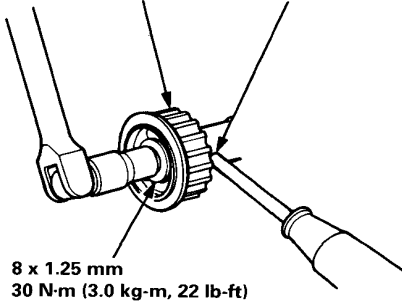
REAR BALANCER SHAFT



FRONT BALANCER:

TIMING BALANCER BELT DRIVEN PULLEY

MAINTENANCE HOLE

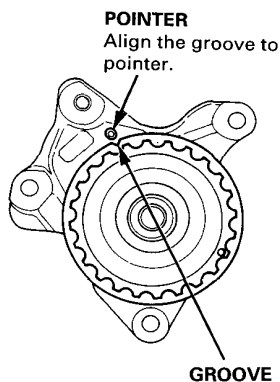
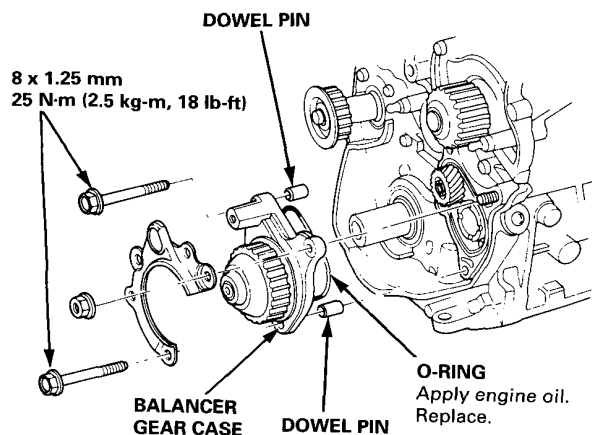


8 x 1.25 mm
30 N·m (3.0 kg-m, 22 lb-ft)

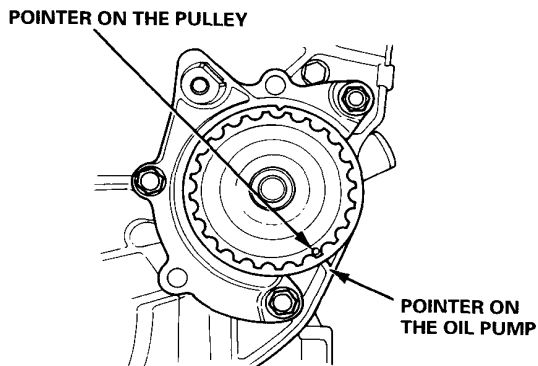


24. Install the balancer gear case on the oil pump.

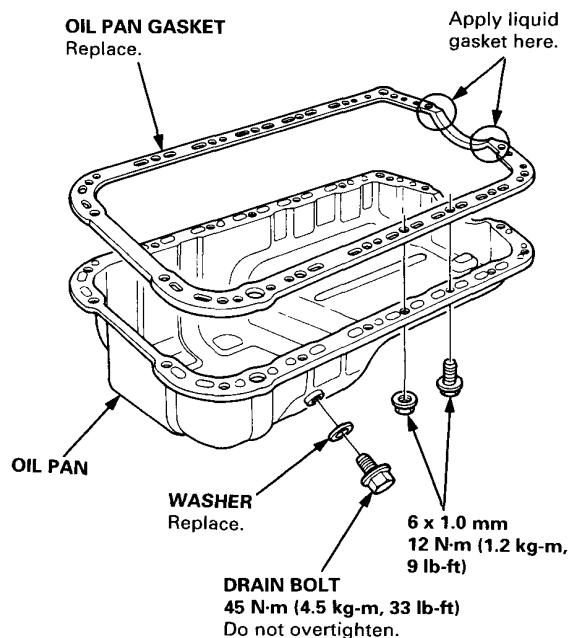
NOTE: Align the groove on the pulley edge to the pointer on the gear case while holding the rear balancer with the special tool, then install the gear case.



25. Check alignment of pointers after installing the gear case.

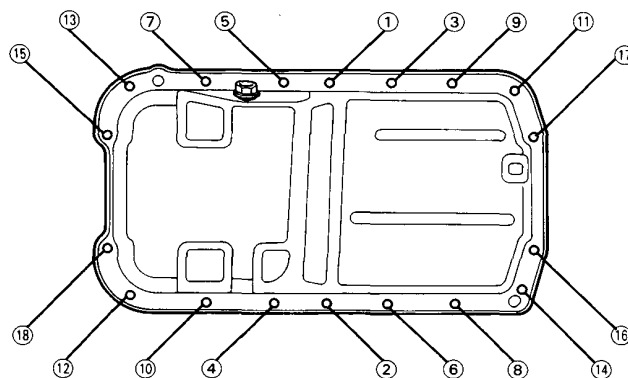


26. Install the oil pan.



27. Tighten the bolts and nuts as shown below.

Torque: 12 N-m (1.2 kg-m, 9 lb-ft)



NOTE: Tighten the bolts and nuts in two steps and torque them in a crisscross pattern.

Intake Manifold/Exhaust System

Intake Manifold

Replacement 9-2

Exhaust Manifold

Replacement 9-3

Exhaust Pipe and Muffler

Replacement 9-4



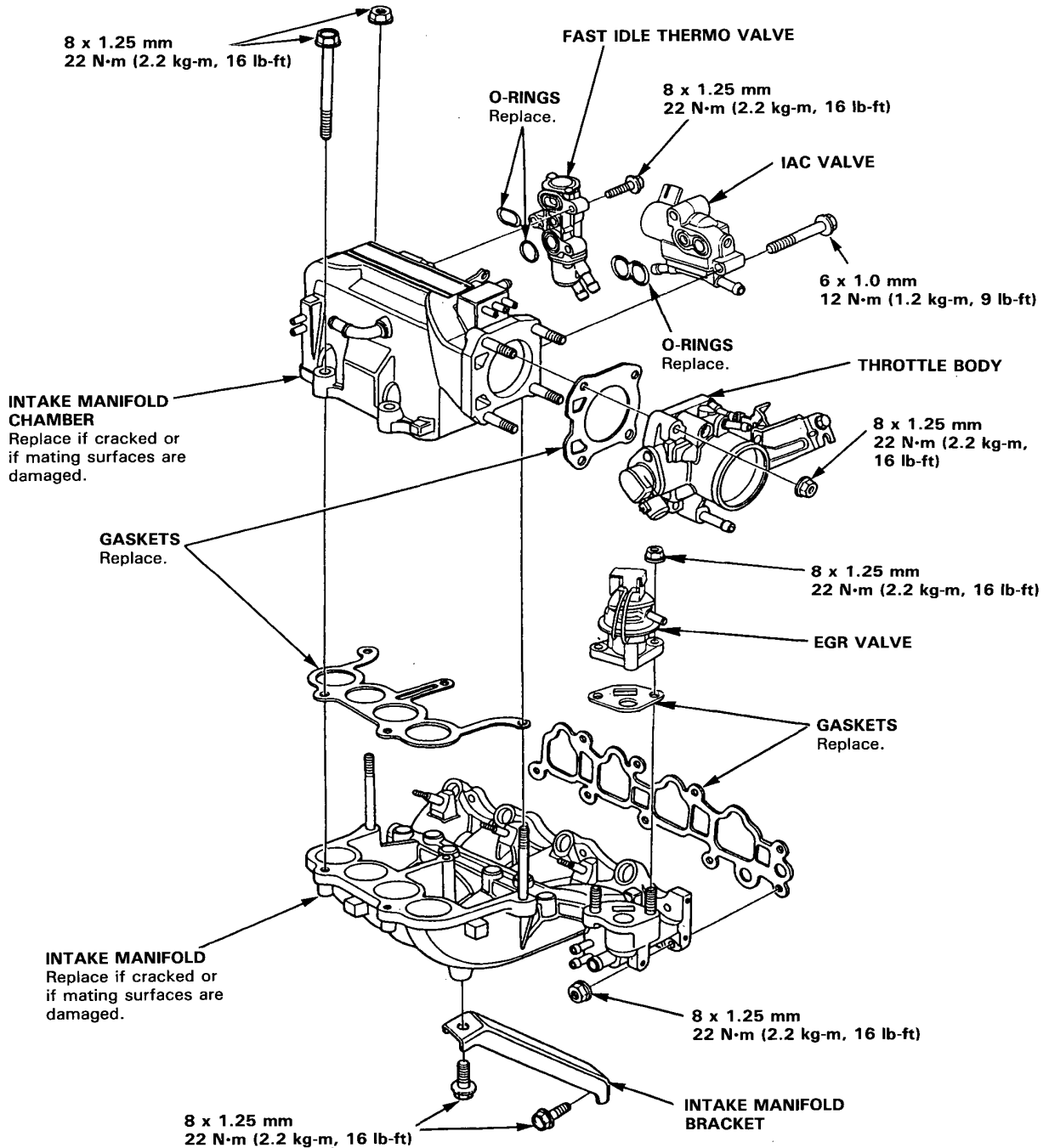
Intake Manifold

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.





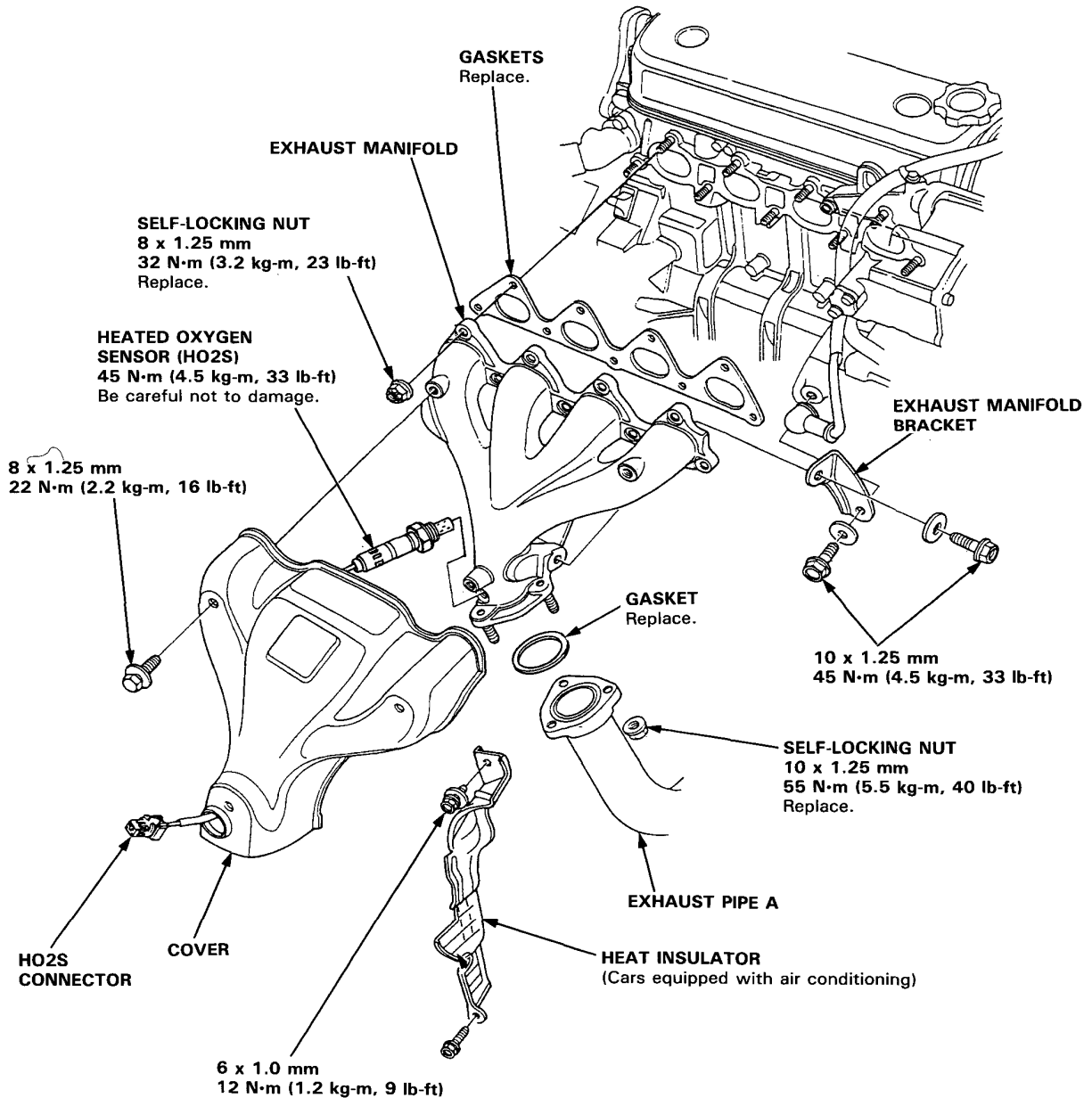
Exhaust Manifold

Replacement

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

CAUTION:

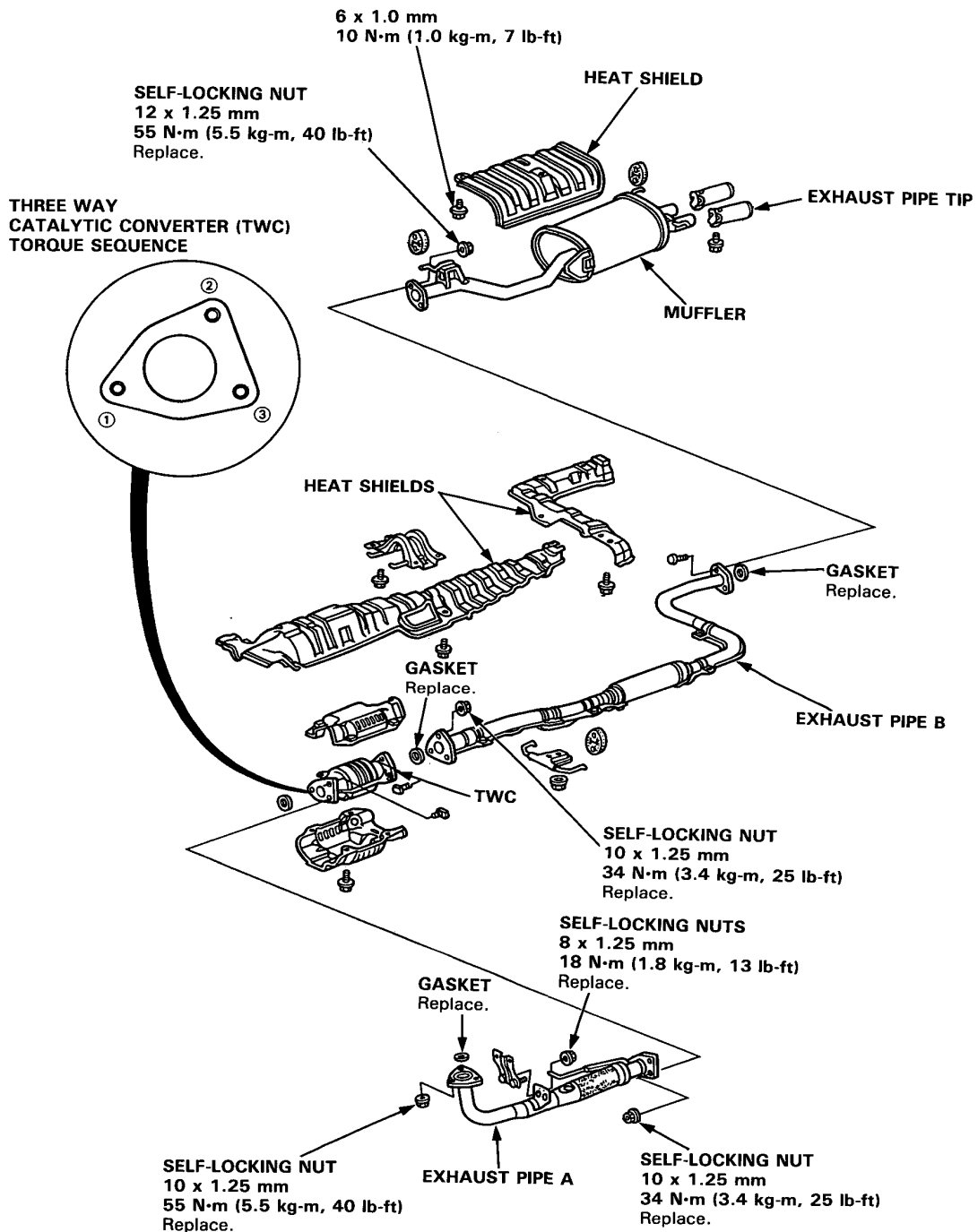
- Check for folds or scratches on the surface of the gasket.
- Replace with a new gasket if damaged.



Exhaust Pipe and Muffler

Replacement

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



Cooling

Radiator

Illustrated Index	10-2
Replacement	10-4
Engine Coolant Refilling and Bleeding	10-5
Cap Testing	10-6
Testing	10-6

Thermostat

Replacement	10-7
Testing	10-7

Water Pump

Illustrated Index	10-8
Inspection	10-9
Replacement	10-9



Radiator

Illustrated Index

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

Total Cooling System Capacity (Including heater and reservoir)

M/T: 6.3 ℓ (6.7 US qt, 5.5 Imp qt)

A/T: 6.2 ℓ (6.6 US qt, 5.5 Imp qt)

Reservoir capacity: 0.6 ℓ (0.6 US qt, 0.5 Imp qt)

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.

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.

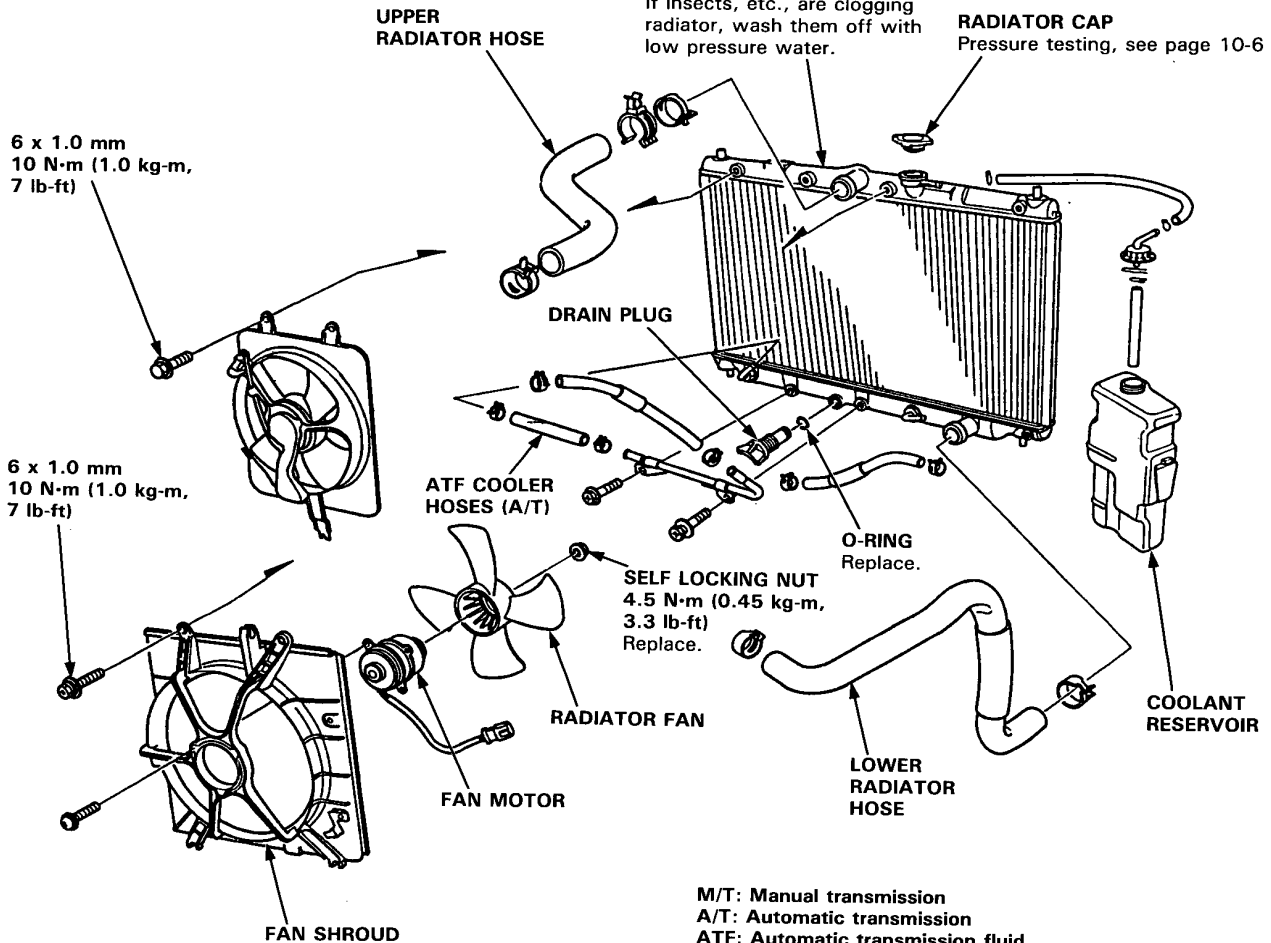
RADIATOR

Engine coolant refilling and bleeding, see page 10-5
Leak testing, see page 10-6
Inspect soldered joints and seams for leaks.

Blow out dirt from between core fins with compressed air. If insects, etc., are clogging radiator, wash them off with low pressure water.

RADIATOR CAP

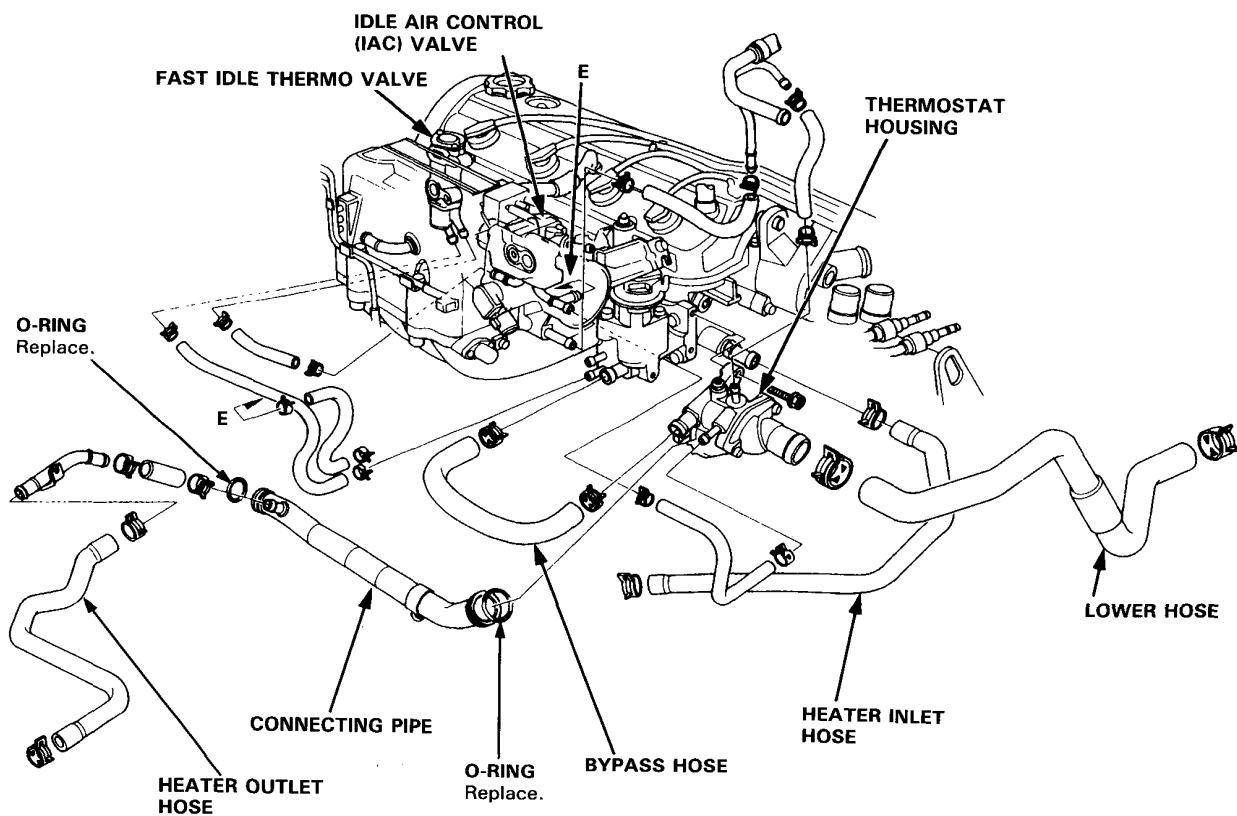
Pressure testing, see page 10-6



M/T: Manual transmission
A/T: Automatic transmission
ATF: Automatic transmission fluid



Engine Hose Connections:



Radiator

Repalcement

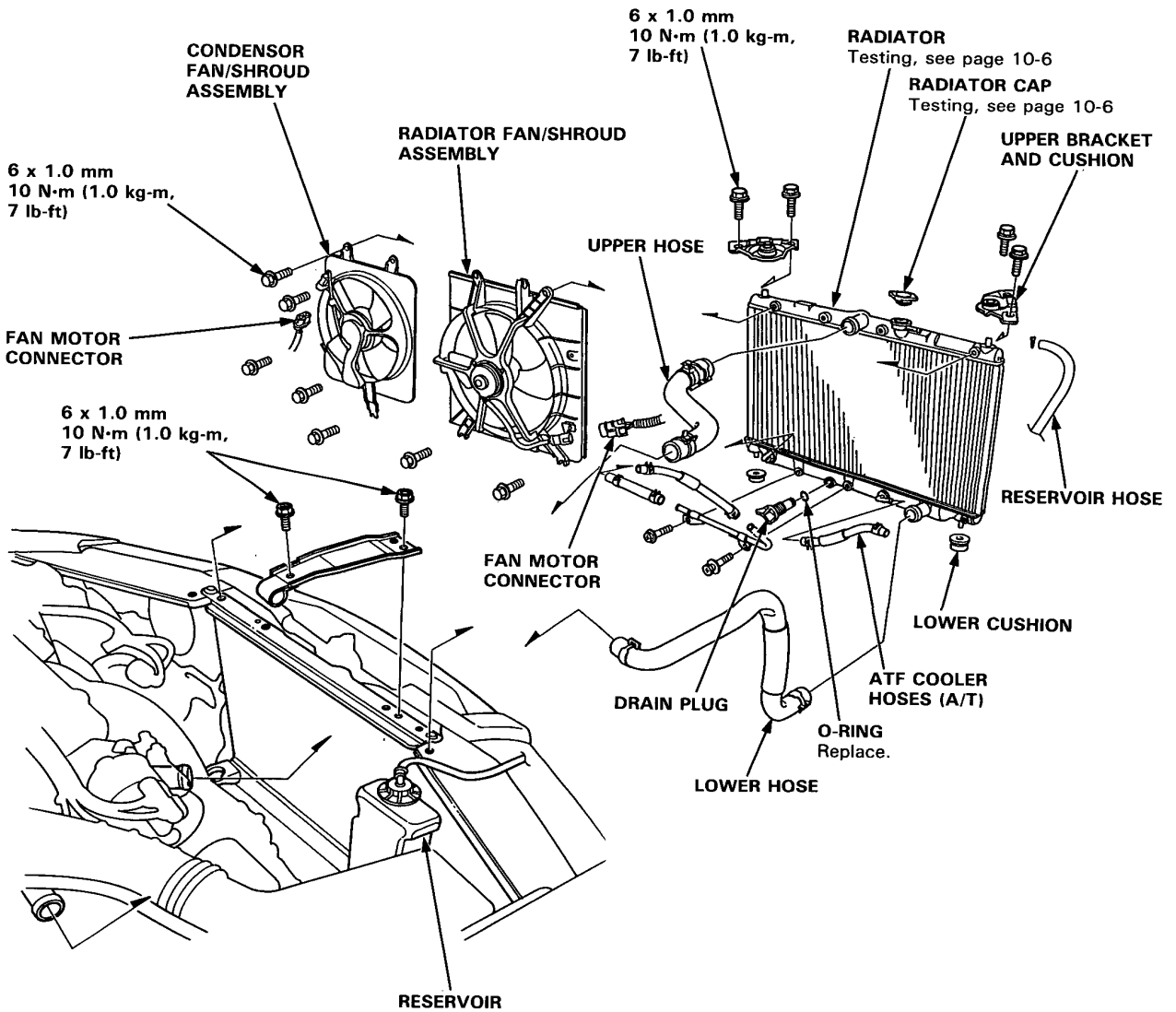
1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses, and ATF cooler hoses.
3. Disconnect the fan motor connectors.
4. Remove the radiator upper brackets, then pull up the radiator.

5. Remove the fan shroud assemblies and other parts from radiator.

Install the radiator in the reverse order of removal:

NOTE:

- Set the upper and lower cushions securely.
- Fill the 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 spill coolant on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

1. Set the heater temperature lever or control dial to maximum heat.
2. When the radiator is cool, remove the radiator cap. Loosen the drain plug, and drain the coolant.
3. Remove the drain bolt from the rear side of the cylinder block to drain the block and heater.
4. Apply liquid gasket to the drain bolt threads, then reinstall the bolt with a new washer and tighten it securely.
5. Tighten the radiator drain plug securely.
6. Remove, drain and reinstall the reservoir. Fill the tank halfway to the MAX mark with water, then up to the MAX mark with anti-freeze.
7. Mix the recommended anti-freeze with an equal amount of water in a clean container.

NOTE:

- Use only genuine HONDA anti-freeze/coolant.
- 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 anti-freeze/coolants.
- Do not use additional rust inhibitors or anti-rust products; they may not be compatible with the genuine coolant.

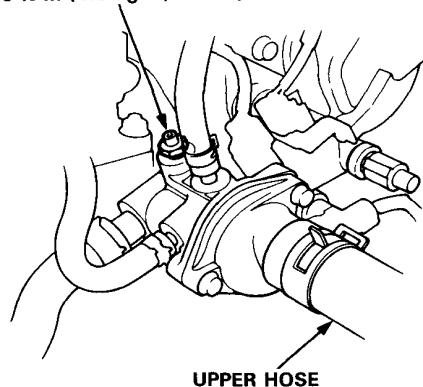
Engine Coolant Refill Capacity: including reservoir (0.6 ℓ (0.6 US qt, 0.5 Imp qt)) and heater (0.6 ℓ (0.6 US qt, 0.5 Imp qt)).

M/T: 2.7 ℓ (2.9 US qt, 2.4 Imp qt)

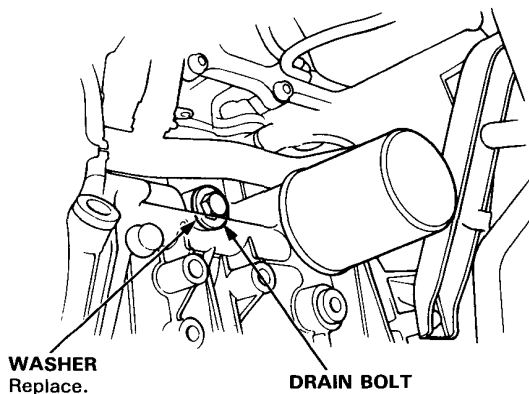
A/T: 2.6 ℓ (2.7 US qt, 2.3 Imp qt)

8. Loosen the air bleed bolt in the water outlet, then fill the radiator to the bottom of the filler neck with the coolant mixture. Tighten the bleed bolt as soon as coolant starts to run out in a steady stream without bubbles.

BLEED BOLT
10 N·m (1.0 kg-m, 7 lb-ft)



UPPER HOSE



WASHER
Replace.

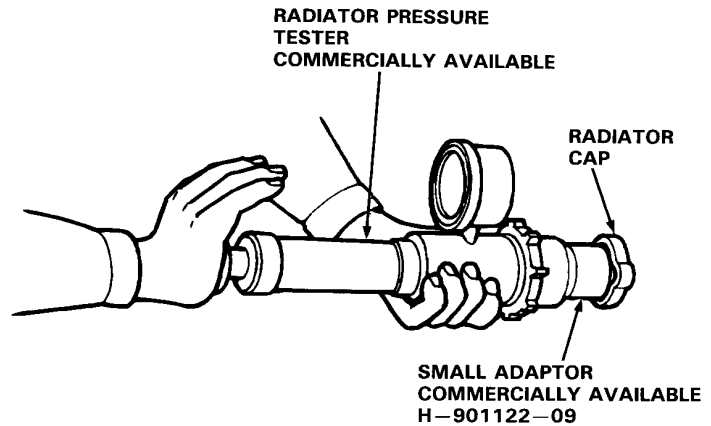
DRAIN BOLT
60 N·m (6.0 kg-m, 43 lb-ft)
Apply liquid gasket to the bolt threads when installing.

9. With the radiator cap off, start the engine and let it run until warmed up (fan goes on at least twice). Then, if necessary, add more coolant mix to bring the level back up to the bottom of the filler neck.
10. Put the radiator cap on tightly, then run the engine again and check for leaks.

Radiator

Cap Testing

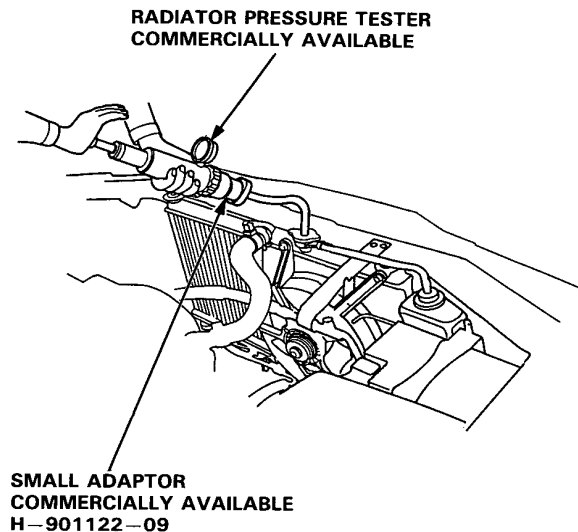
1. Remove the radiator cap, wet its seal with coolant, then install it on the pressure tester.
2. Apply a pressure of 95–125 kPa (0.95–1.25 kg/cm², 13.5–17.8 psi).
3. Check for a drop in pressure.
4. If the pressure drops, replace the cap.



Testing

1. Wait until the engine is cool, then carefully remove the radiator cap and fill the radiator with coolant to the top of the filler neck.
2. Attach the pressure tester to the radiator and apply a pressure of 95–125 kPa (0.95–1.25 kg/cm², 13.5–17.8 psi).
3. Inspect for coolant leaks and a drop in pressure.
4. Remove the tester and reinstall the radiator cap.

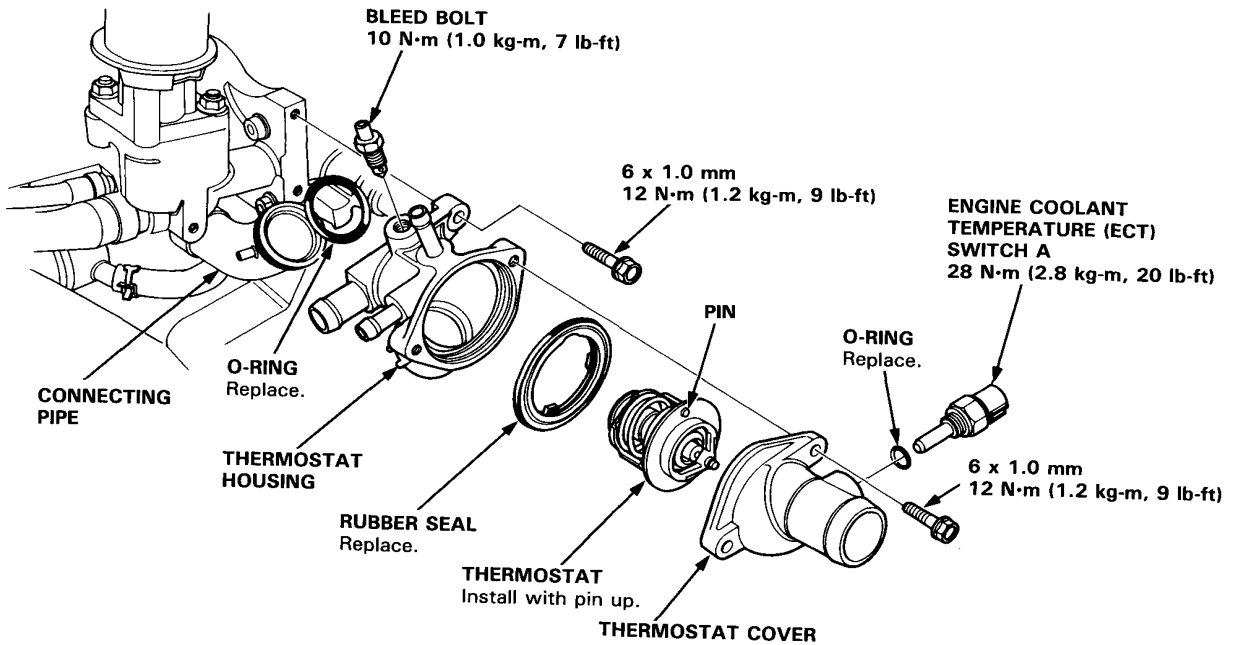
NOTE: Check for engine oil in the coolant and/or coolant in engine oil.





Thermostat Replacement

NOTE: Use new O-rings 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 hot container.

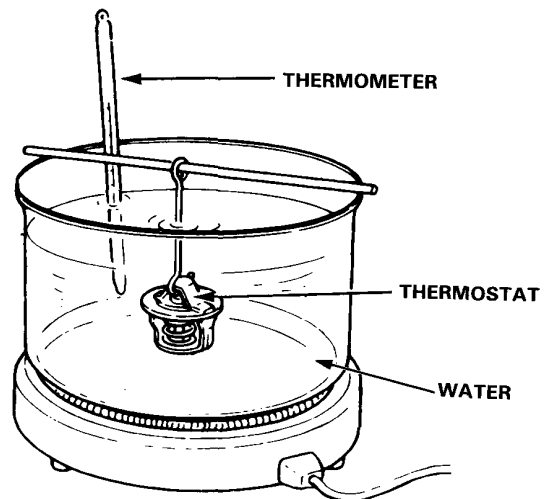
3. Measure lift height of the thermostat when fully open.

STANDARD THERMOSTAT

Lift height: above 8.0 mm (0.31 in)

Starts opening: 76–80°C (169–176°F)

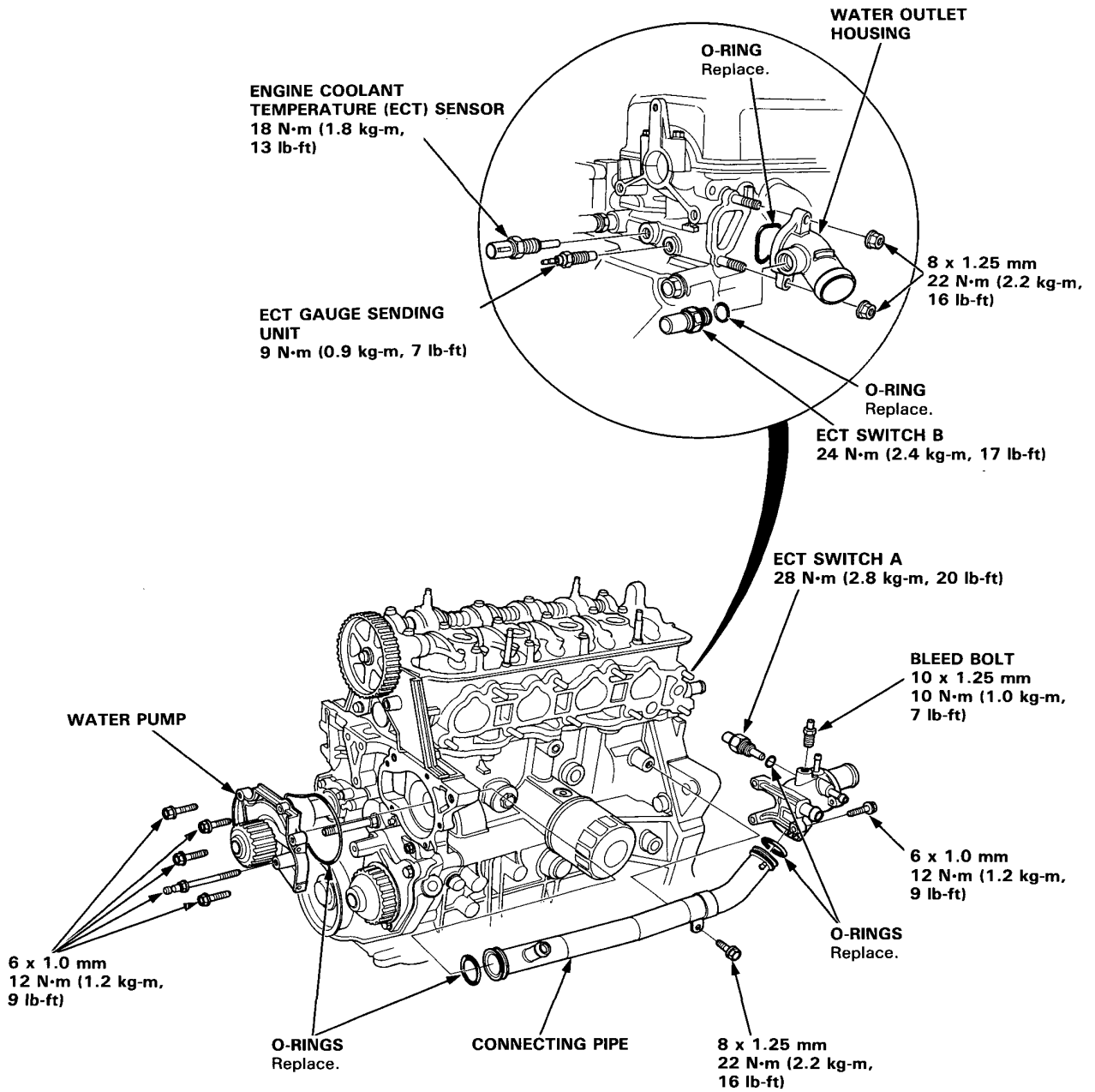
Fully open: 90°C (194°F)



Water Pump

Illustrated Index

NOTE: Use new O-rings when reassembling.

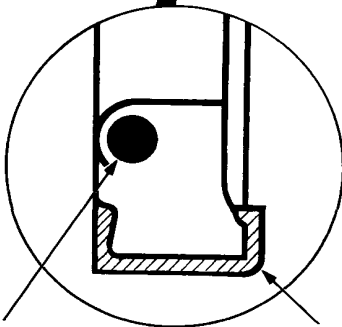
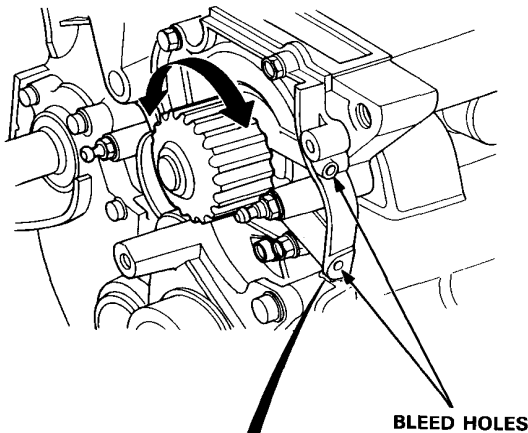




Inspection

1. Remove the timing balancer belt and timing belt (see page 6-25).
2. Check that the water pump pulley turns freely.
3. Check for signs of seal leakage.

NOTE: Small amount of "weeping" from bleed hole is normal.

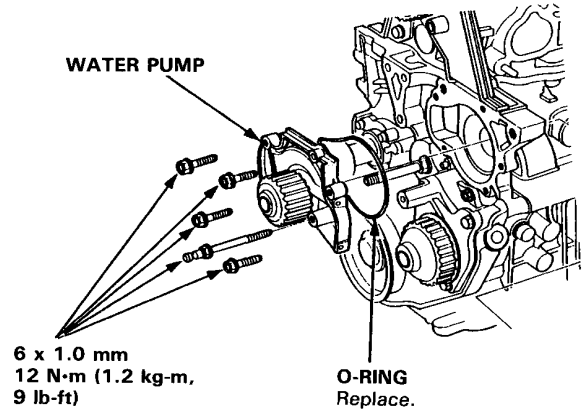


BLEED HOLE

RUBBER SEAL
Apply liquid gasket to the water pump mating surface.

Replacement

1. Remove the timing balancer belt and timing belt (see page 6-25).
2. Unscrew the bolts, then remove the water pump.
3. Install the water pump in the reverse order of removal.



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (if Fuel and Emissions maintenance is required)

Some models of the Accord include a driver's side airbag, located in the steering wheel hub, as part of a supplemental restraint system (SRS). Information necessary to safely service the SRS is included in this shop 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 only by an authorized HONDA dealer.

⚠ WARNING

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, could lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse/relay box may affect the SRS and must therefore be performed by an authorized HONDA dealer.

Fuel and Emissions

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Intake Air System


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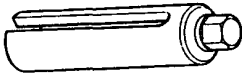
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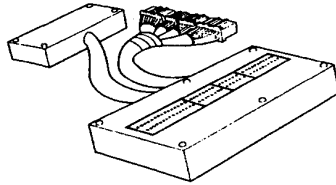


Special Tools

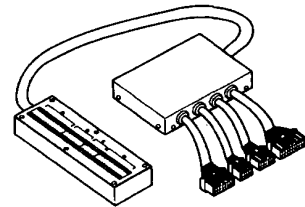
Ref. No.	Tool Number	Description	Q'ty	Remarks
①	07LAA - PT50101	Oxygen Sensor Socket Wrench	1	 Component Tools
②	07LAJ - PT30100	Test Harness	1	
	or			
	07LAJ - PT3010A		1	
③	07406 - 0040001	Fuel Pressure Gauge Set	1	
③-1	07406 - 0040100	Pressure Gauge	(1)	
③-2	07406 - 0040201	Hose Assy	(1)	
④	07411 - 0020000	Digital Circuit Tester	1	



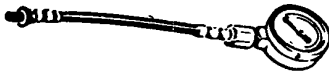
①



②



②



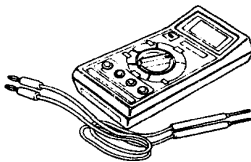
③



③-1



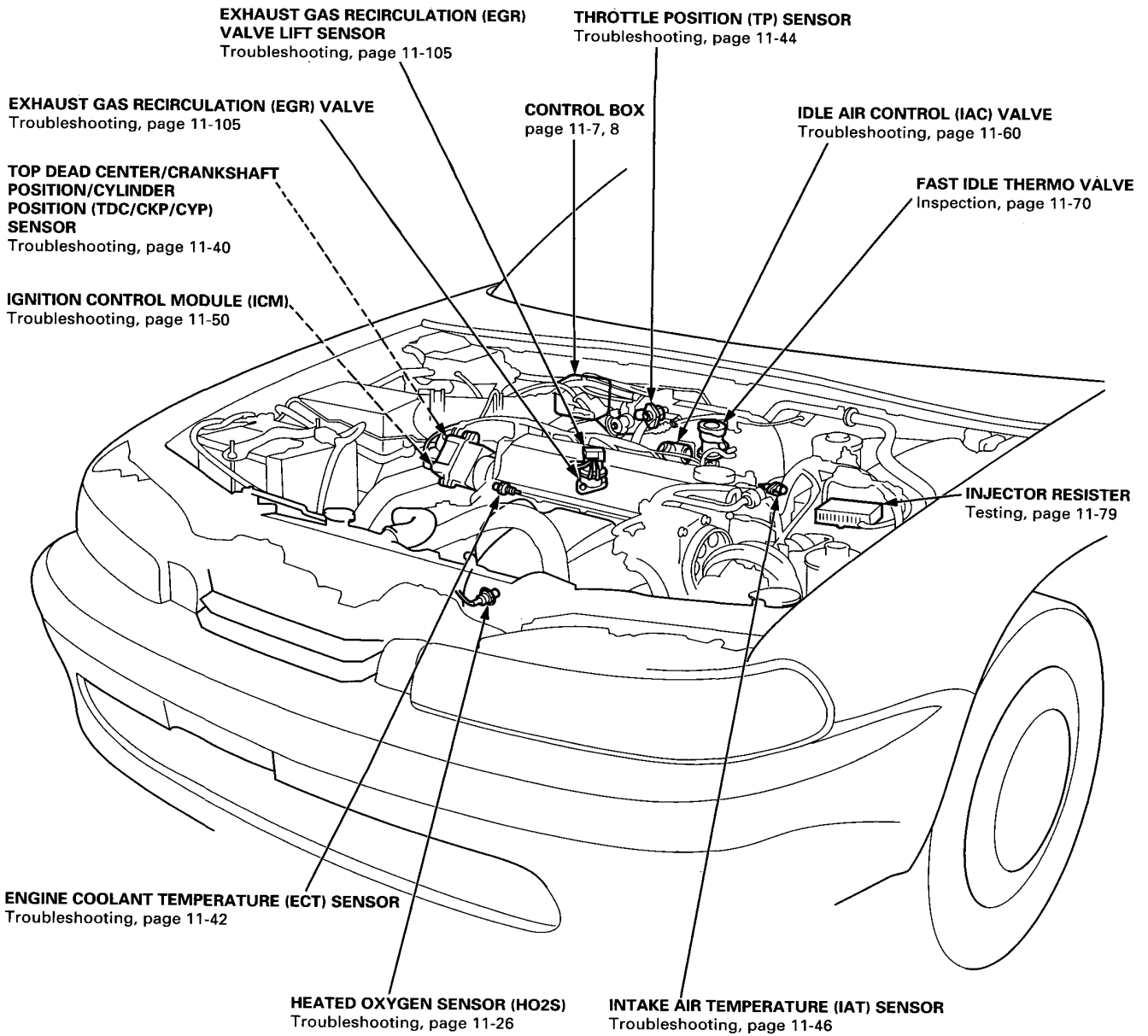
③-2



④

Component Locations

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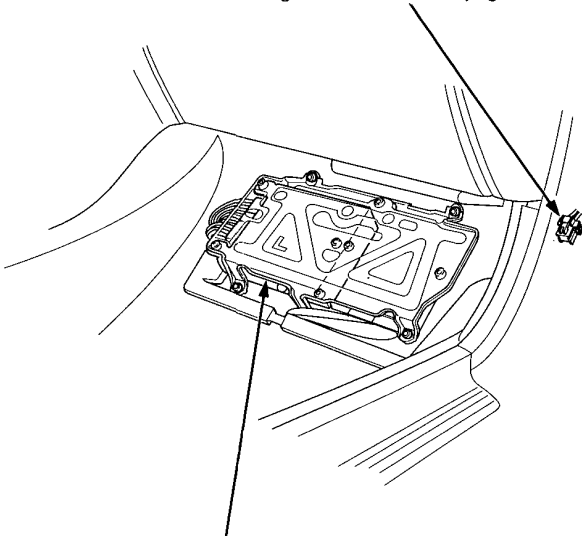


Component Locations

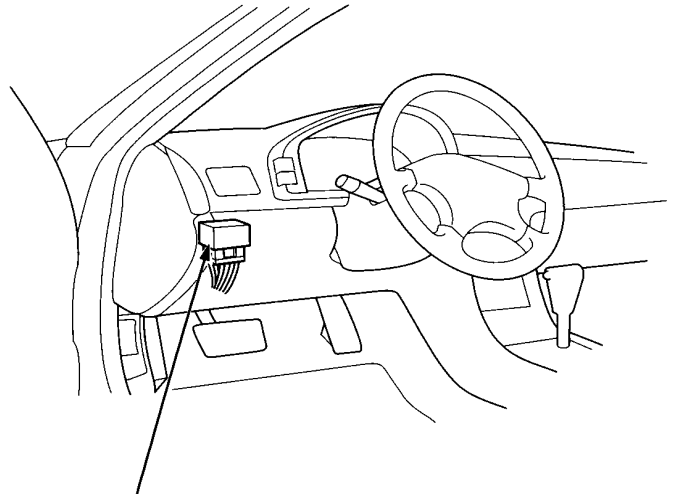
Index

LHD:

SERVICE CHECK CONNECTOR (2P)
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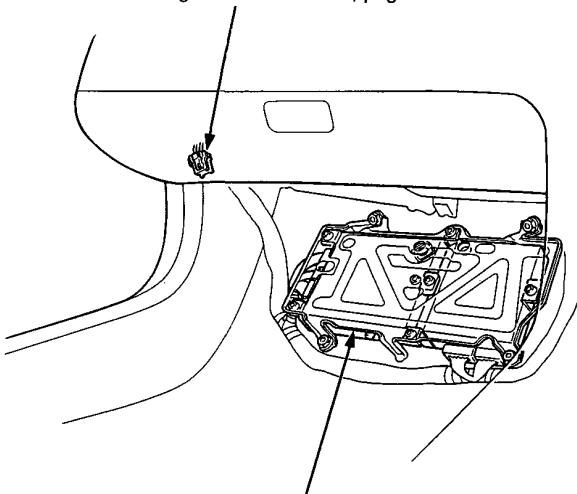
ENGINE CONTROL MODULE (ECM)
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Troubleshooting, page 11-22



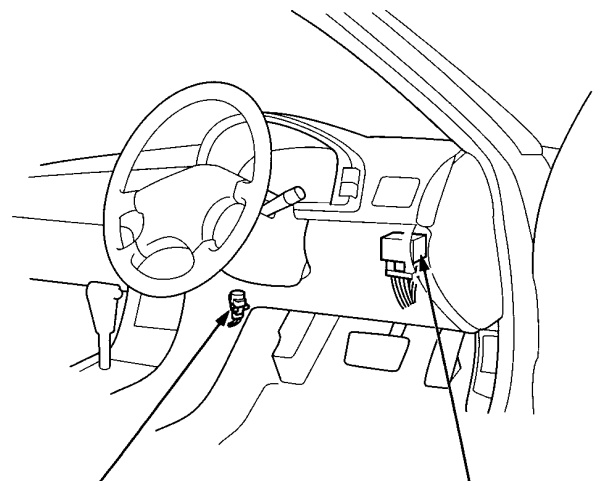
PGM-FI MAIN RELAY
Relay Testing, page 11-86
Troubleshooting, page 11-88

RHD:

SERVICE CHECK CONNECTOR (2P)
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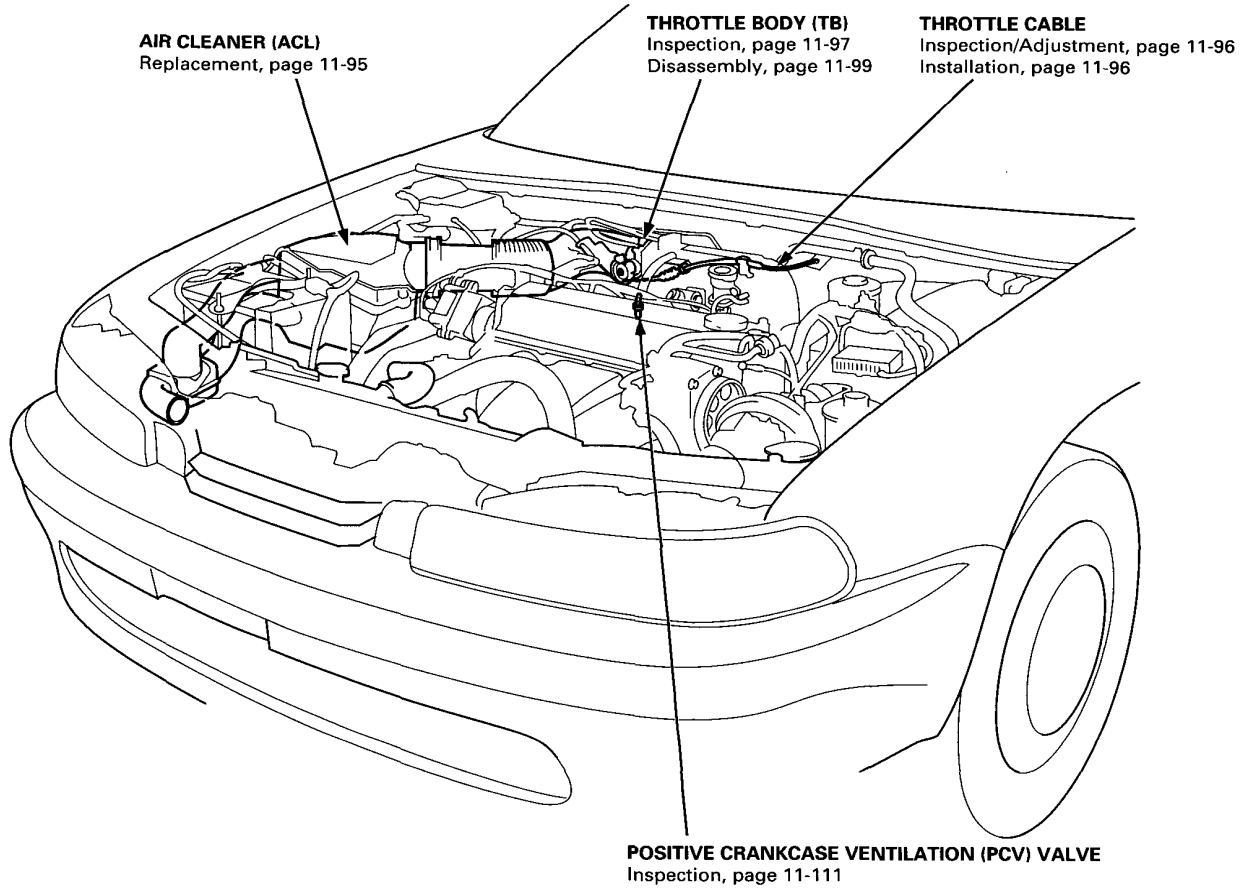
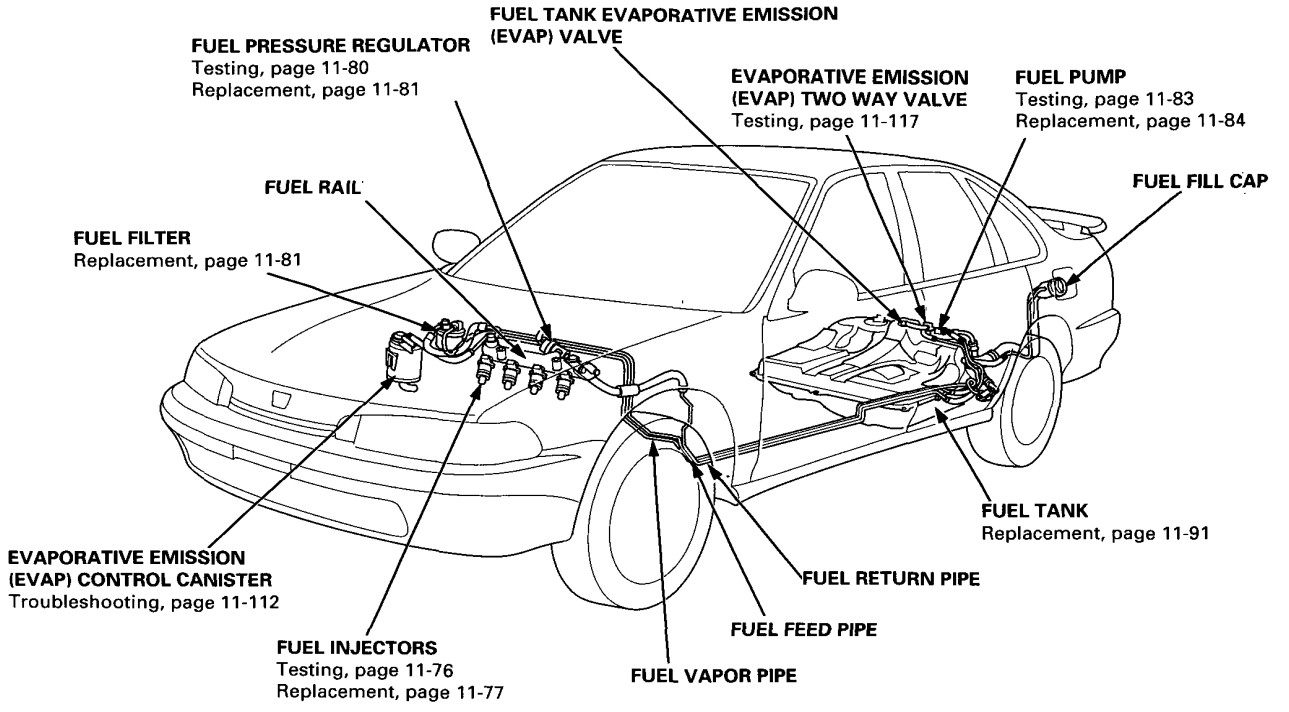


ENGINE CONTROL MODULE (ECM)
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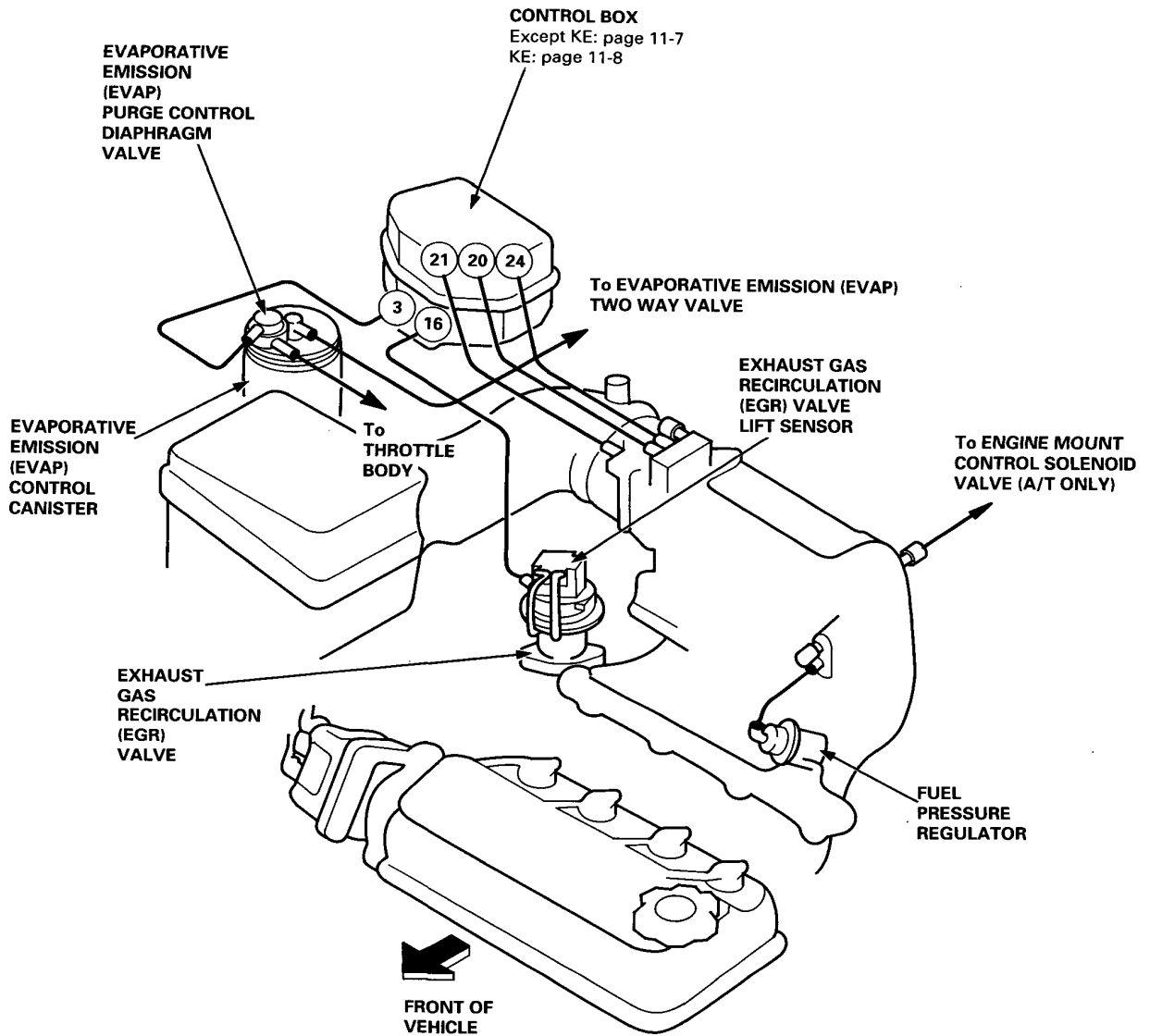
INERTIA SWITCH (KE only)
Replacement, page 11-85

PGM-FI MAIN RELAY
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System Description

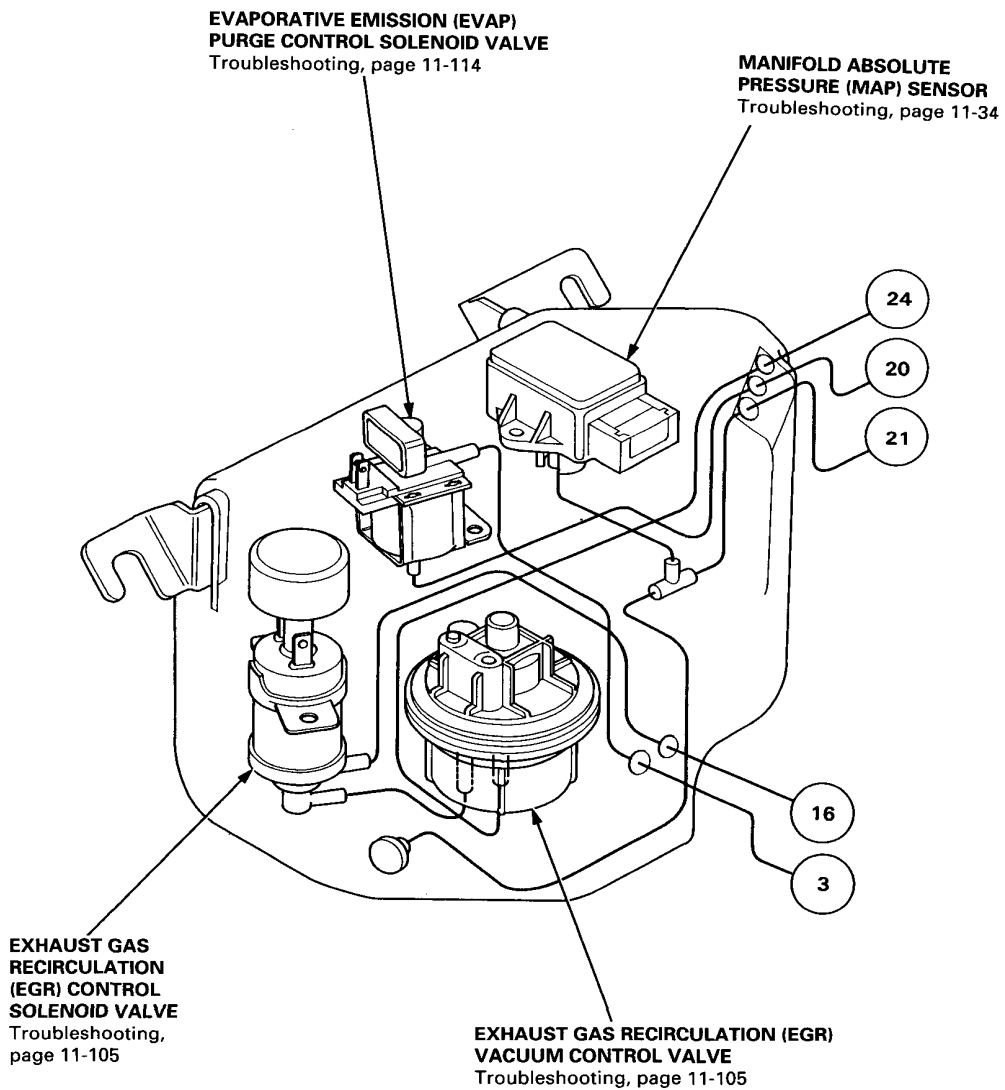
Vacuum Connections





Control Box

Except KE:



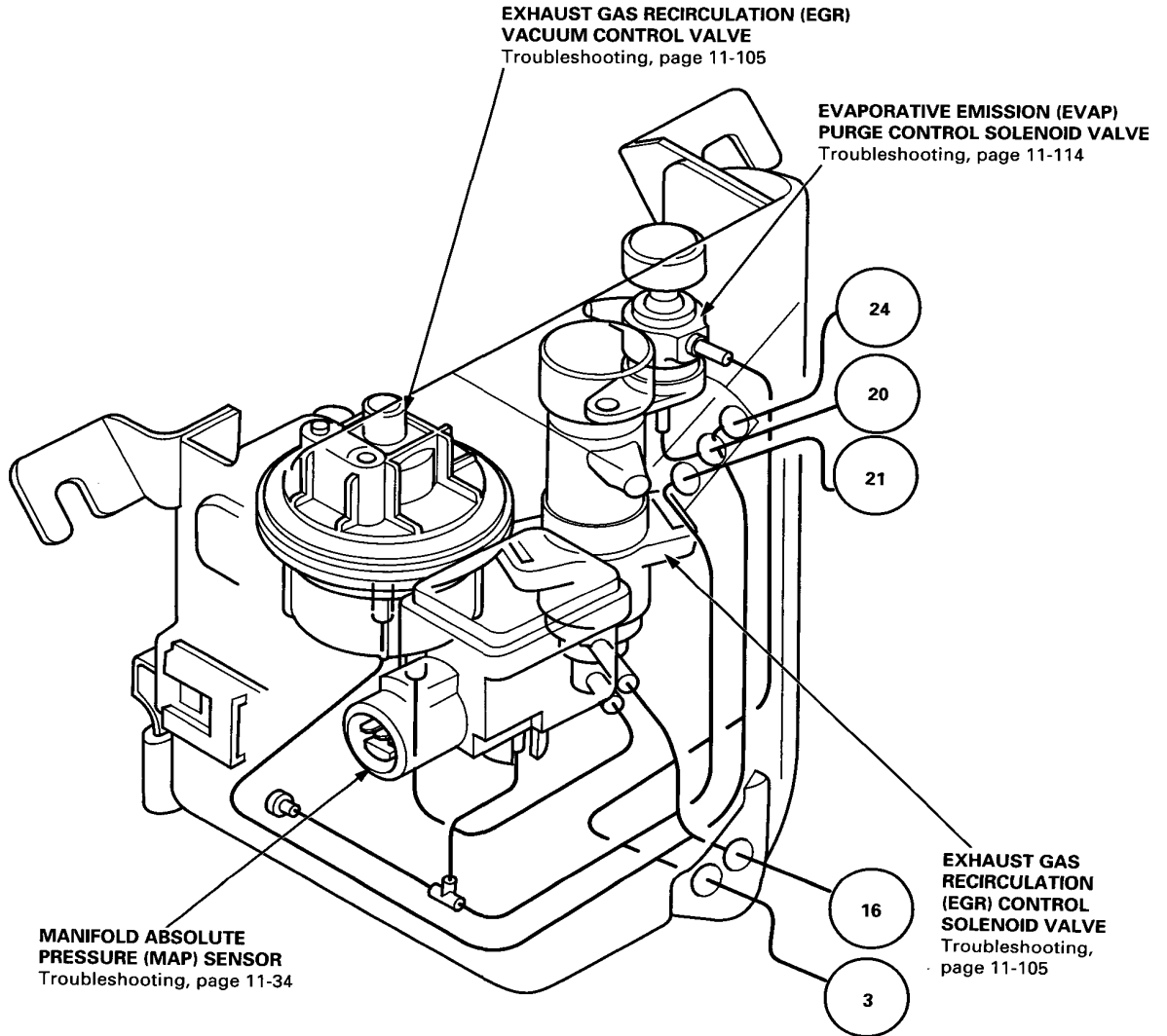
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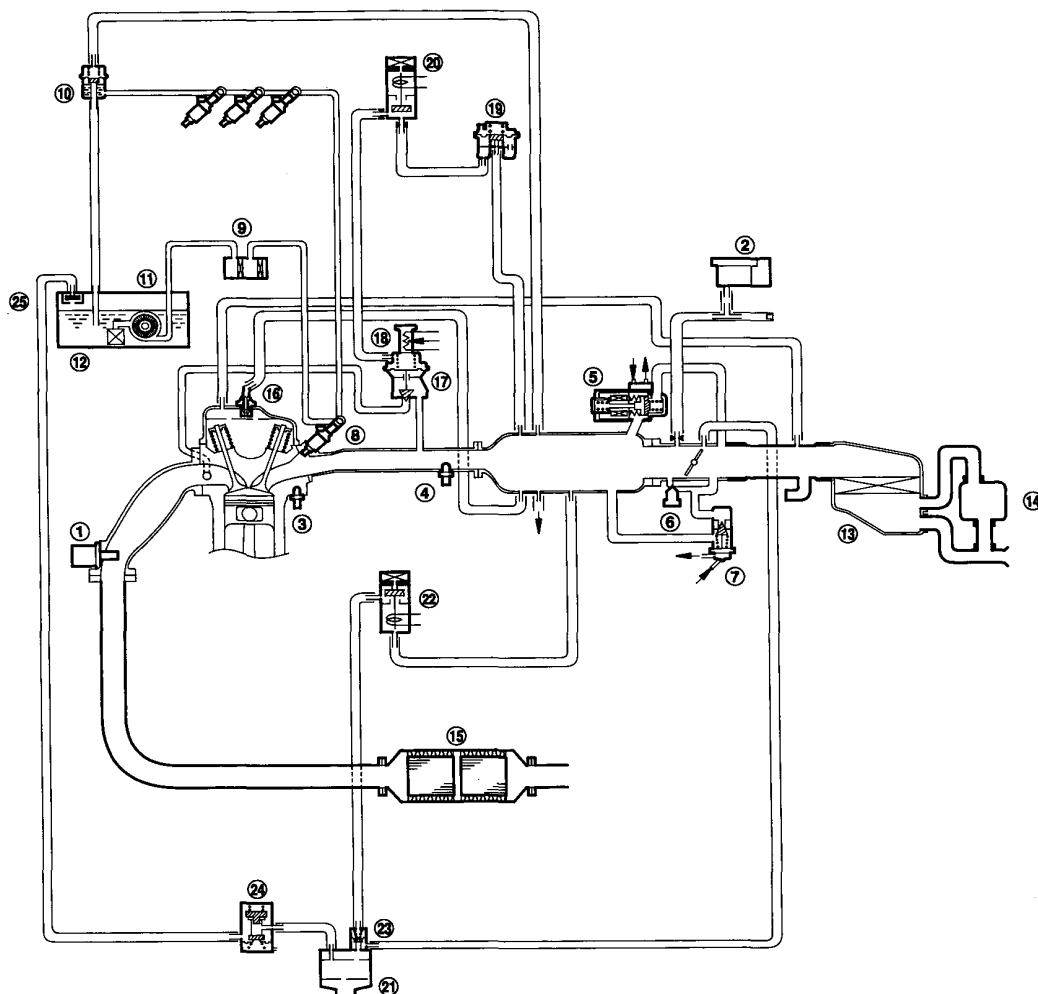
System Description

Vacuum Connections (cont'd)

Control Box

KE:

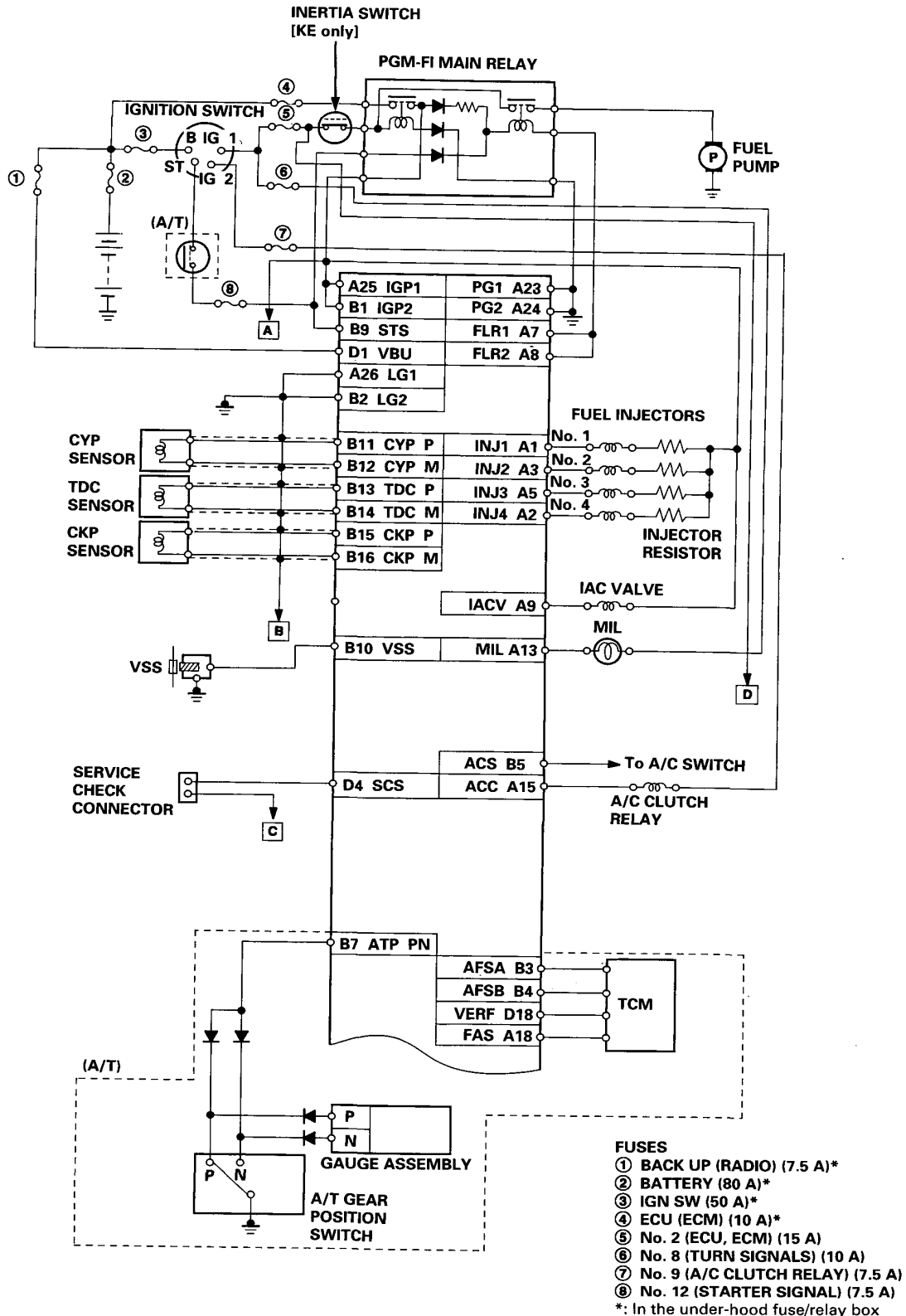


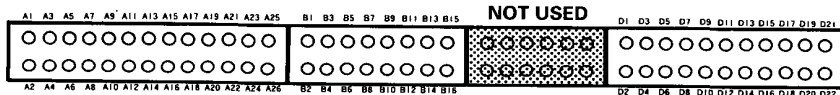
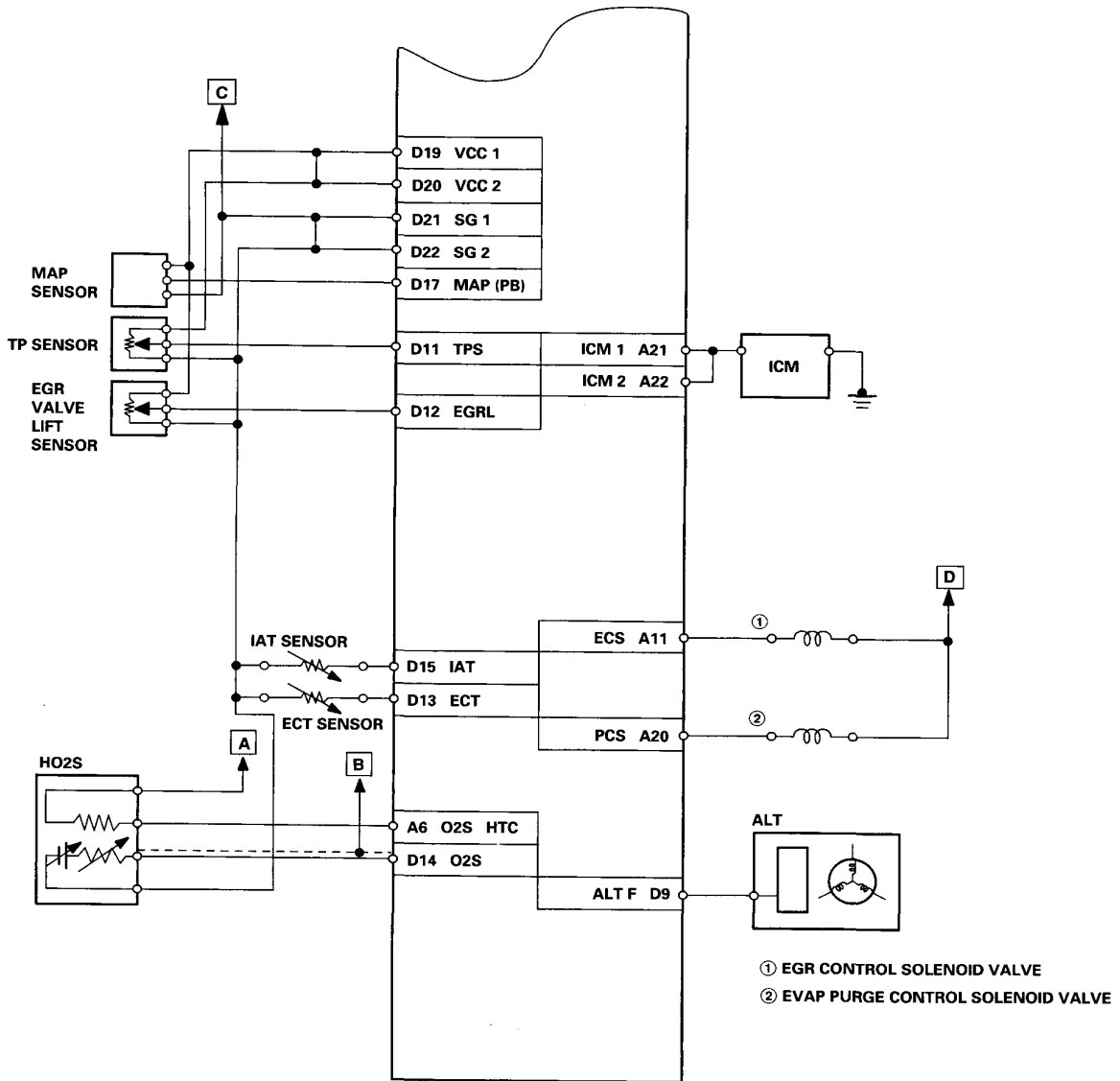


- | | |
|--|--|
| ① HEATED OXYGEN SENSOR (HO2S) | ⑱ EXHAUST GAS RECIRCULATION (EGR) VALVE VACUUM CONTROL VALVE |
| ② MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR | ⑳ EXHAUST GAS RECIRCULATION (EGR) CONTROL SOLENOID VALVE |
| ③ ENGINE COOLANT TEMPERATURE (ECT) SENSOR | ㉑ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER |
| ④ INTAKE AIR TEMPERATURE (IAT) SENSOR | ㉒ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE |
| ⑤ IDLE AIR CONTROL (IAC) VALVE | ㉓ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL DIAPHRAGM VALVE |
| ⑥ IDLE ADJUSTING SCREW | ㉔ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE* |
| ⑦ FAST IDLE THERMO VALVE | ㉕ FUEL TANK EVAPORATIVE EMISSION (EVAP) VALVE |
| ⑧ FUEL INJECTOR | |
| ⑨ FUEL FILTER | |
| ⑩ FUEL PRESSURE REGULATOR | |
| ⑪ FUEL PUMP (FP) | |
| ⑫ FUEL TANK | |
| ⑬ AIR CLEANER (ACL) | |
| ⑭ RESONATOR | |
| ⑮ THREE WAY CATALYTIC CONVERTER (TWC) | |
| ⑯ POSITIVE CRANKCASE VENTILATION (PCV) VALVE | |
| | ⑰ EXHAUST GAS RECIRCULATION (EGR) VALVE |
| | ⑱ EXHAUST GAS RECIRCULATION (EGR) VALVE LIFT SENSOR |

System Description

Electrical Connections





TERMINAL LOCATIONS

Troubleshooting

Troubleshooting Guide

NOTE: Across each row in the chart, the systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SYSTEM	PGM-FI							
		ENGINE CONTROL MODULE	HEATED OXYGEN SENSOR	MANIFOLD ABSOLUTE PRESSURE SENSOR	TOP DEAD CENTER/ CRANKSHAFT POSITION/ CYLINDER POSITION SENSOR	ENGINE COOLANT TEMPERATURE SENSOR	THROTTLE POSITION SENSOR	INTAKE AIR TEMPERATURE SENSOR	BAROMETRIC PRESSURE SENSOR
SYMPTOM		11-22	11-26, 28, 32	11-34, 38	11-40	11-42	11-44	11-46	11-48
MALFUNCTION INDICATOR LAMP (MIL) TURNS ON									
MALFUNCTION INDICATOR LAMP (MIL) BLINKS									
ENGINE WON'T START		③			③				
DIFFICULT TO START ENGINE WHEN COLD		Ⓚ		③	③	①			③
IRREGULAR IDLING	WHEN COLD FAST IDLE OUT OF SPEC	Ⓚ				③			
	ROUGH IDLE	Ⓚ		③					
	WHEN WARM ENGINE SPEED TOO HIGH	Ⓚ							
	WHEN WARM ENGINE SPEED TOO LOW	Ⓚ							
FREQUENT STALLING	WHILE WARMING UP	Ⓚ				③			
	AFTER WARMING UP	Ⓚ							③
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	Ⓚ		②	③				
	FAILS EMISSION TEST	Ⓚ	③	②					
	LOSS OF POWER	Ⓚ		③			②		

* If codes other than those listed above are indicated, count the number of blinks again. If the MIL is in fact blinking these codes, replace the ECM.

Ⓚ If the MIL is on while the engine is running, jump the service check connector. If no code is displayed (MIL stays on steady), the back-up system is in operation.

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



PGM-FI				IDLE CONTROL		FUEL SUPPLY		INTAKE AIR	EMISSION CONTROL	
IGNITION OUTPUT SIGNAL	VEHICLE SPEED SENSOR	A/T FI SIGNAL A	A/T FI SIGNAL B	IDLE AIR CONTROL VALVE	OTHER IDLE CONTROLS	FUEL INJECTOR	OTHER FUEL SUPPLY		EXHAUST GAS RECIRCULATION CONTROL SYSTEM	OTHER EMISSION CONTROL SYSTEM
11-50	11-52	11-54	11-54	11-60	11-56	11-75	11-73	11-93	11-105	11-101
①						②	③			
					②					
				①	②					
				①		②			③	
				①	②					
				①		②				
				①	②		③			
				③	①		②		③	
				③		①			③	
						②	③			①
						③	①	③		③

Troubleshooting

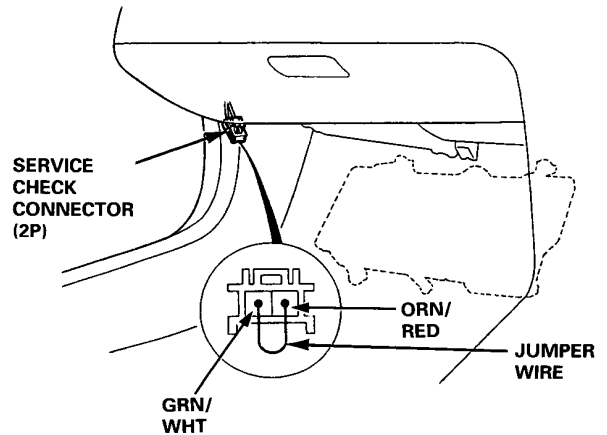
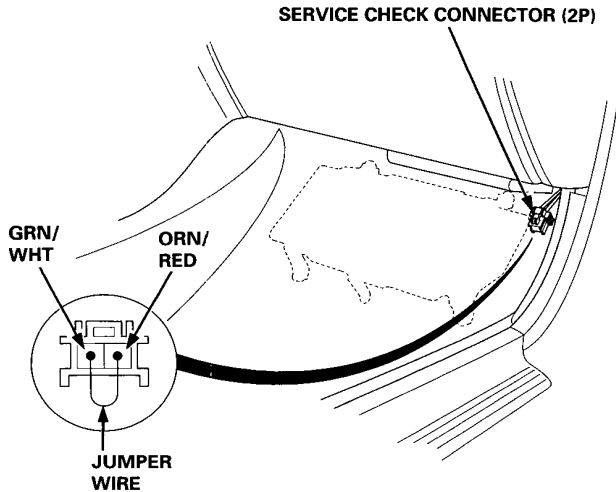
Self-diagnostic Procedures

I. When the Malfunction Indicator Lamp (MIL) has been reported on, do the following:

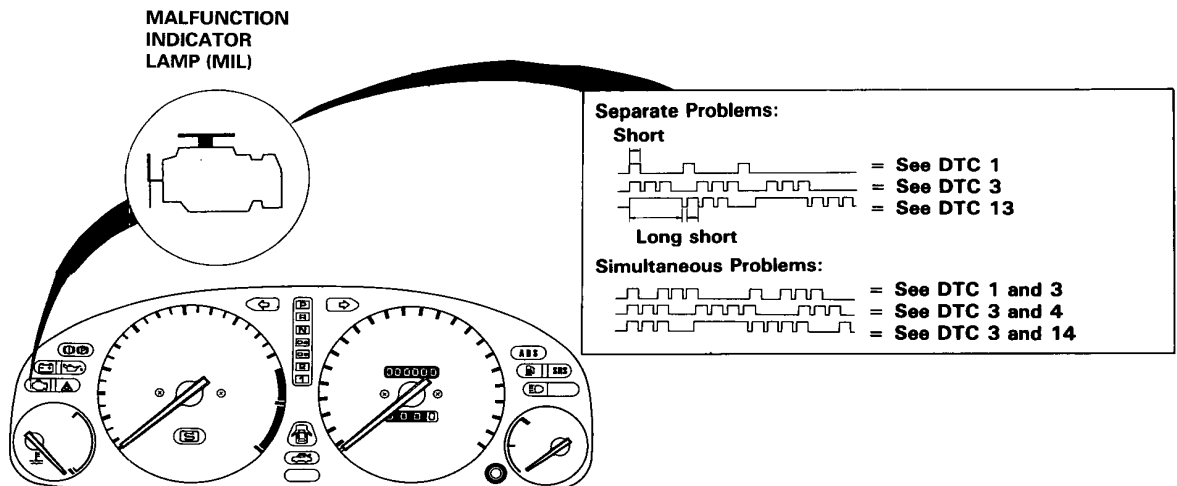
1. Connect the service check connector terminals with a jumper wire as shown (the service check connector (2P) is located under the dash on the passenger side of the car). Turn the ignition switch on.

LHD:

RHD:



2. Note the Diagnostic Trouble Code (DTC): the MIL indicates a failure code by the length and number of blinks. The MIL can indicate simultaneous component problems by blinking separate codes, one after another. Codes 1 through 9 are indicated by individual short blinks. Codes 10 through 43 are indicated by a series of long and short blinks. The number of long blinks equals the first digit, the number of short blinks equals the second digit.

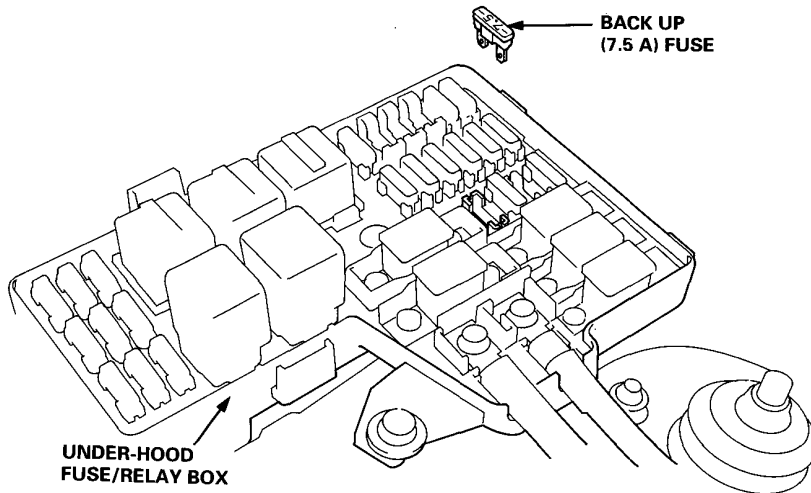




II. Engine Control Module (ECM) Reset Procedure

1. Turn the ignition switch off.
2. Remove the BACK UP (7.5 A) fuse from the under-hood fuse/relay box for 10 seconds to reset ECM.

NOTE: Disconnecting the BACK UP fuse also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you reset them.



III. Final Procedure (this procedure must be done after any troubleshooting)

1. Remove the jumper wire.

NOTE: If the service check connector is jumped the MIL will stay on.

2. Do the ECM Reset Procedure.
3. Set the radio preset stations and the clock setting.

(cont'd)

Troubleshooting

Self-diagnostic Procedures (cont'd)

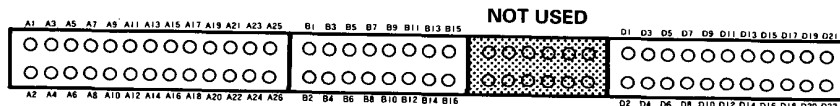
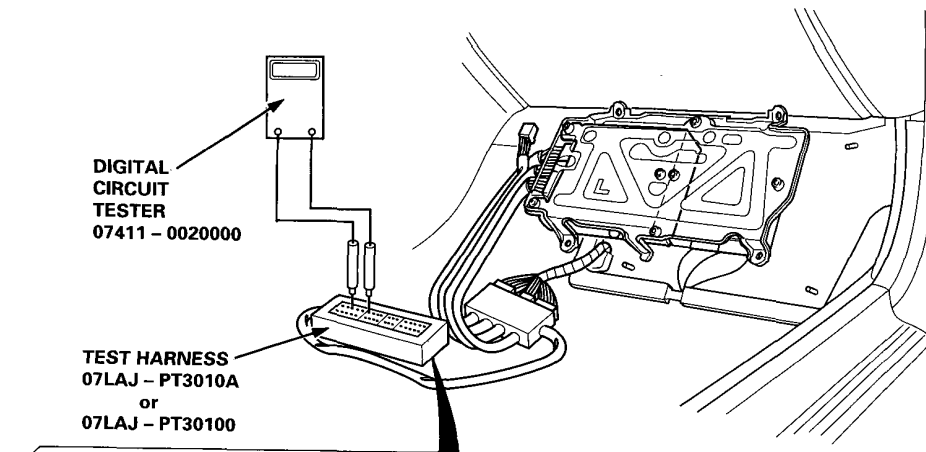
DIAGNOSTIC TROUBLE CODE (DTC)	SYSTEM INDICATED	Page
0	ENGINE CONTROL MODULE (ECM)	11-22
1	HEATED OXYGEN SENSOR (HO2S)	11-26
3	MANIFOLD ABSOLUTE PRESSURE (MAP SENSOR)	11-34, 38
5		
4	CRANKSHAFT POSITION (CKP SENSOR)	11-40
6	ENGINE COOLANT TEMPERATURE (ECT SENSOR)	11-42
7	THROTTLE POSITION (TP SENSOR)	11-44
8	TOP DEAD CENTER POSITION (TDC SENSOR)	11-40
9	No. 1 CYLINDER POSITION (CYP SENSOR)	11-40
10	INTAKE AIR TEMPERATURE (IAT SENSOR)	11-46
12	EXHAUST GAS RECIRCULATION (EGR) SYSTEM	11-105
13	BAROMETRIC PRESSURE (BARO SENSOR)	11-48
14	IDLE AIR CONTROL (IAC VALVE)	11-60
15	IGNITION OUTPUT SIGNAL	11-50
17	VEHICLE SPEED SENSOR (VSS)	11-52
30	A/T FI SIGNAL A	11-54
31	A/T FI SIGNAL B	11-54
41	HEATED OXYGEN SENSOR (HO2S) HEATER	11-28
43	FUEL SUPPLY SYSTEM	11-32

- If codes other than those listed above are indicated, verify the code. If the code indicated is not listed above, replace the ECM.
- The Malfunction Indicator Lamp (MIL) may come on, indicating a system problem when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair connections if necessary.
- The MIL and **S** indicator light may light simultaneously when the Diagnostic Trouble Code (DTC) 6, 7 or 17. Check the PGM-FI system according to the PGM-FI system troubleshooting, then recheck the **S** indicator light. If it comes on, see page 14-36, 37.
- The MIL does not come on when there is a malfunction in the A/T FI signal circuits. However, it will indicate the codes when the service check connector is jumped.



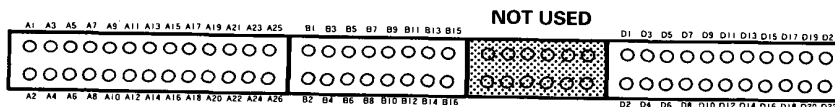
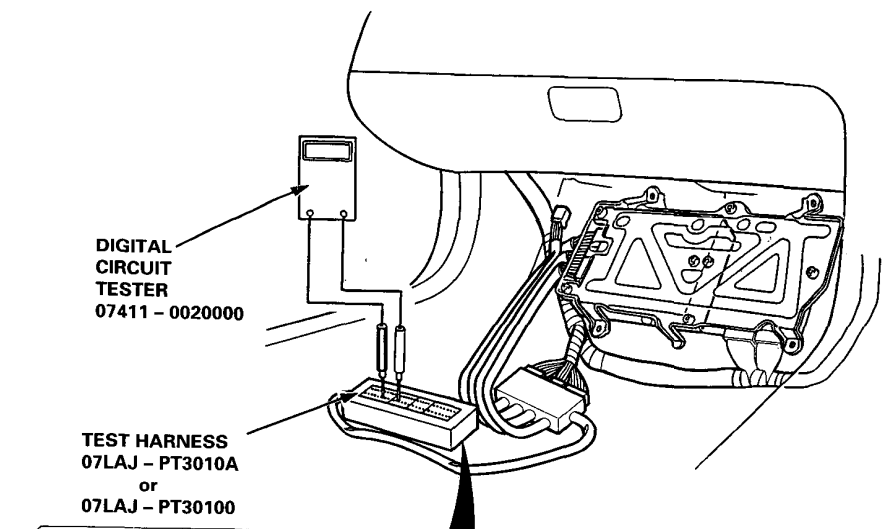
If the inspection for a particular failure code requires the test harness, remove the right (RHD: left) door sill molding, the small cover on the right (RHD: left) kick panel, and pull the carpet back to expose the ECM. Unbolt the ECM cover. Connect the test harness. Then check the system according to the procedure described for the appropriate code(s) listed on the following pages.

LHD:



TERMINAL LOCATIONS

RHD:



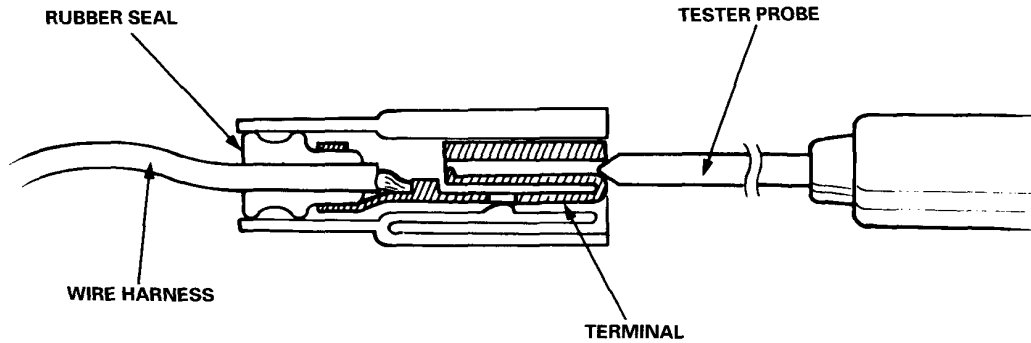
TERMINAL LOCATIONS

Troubleshooting

Self-diagnostic Procedures (cont'd)

CAUTION:

- Puncturing the insulation on a wire can cause poor or intermittent electrical connections.
- For testing at connectors other than the test harness, bring the tester probe into contact with the terminal from the connector 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.





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.

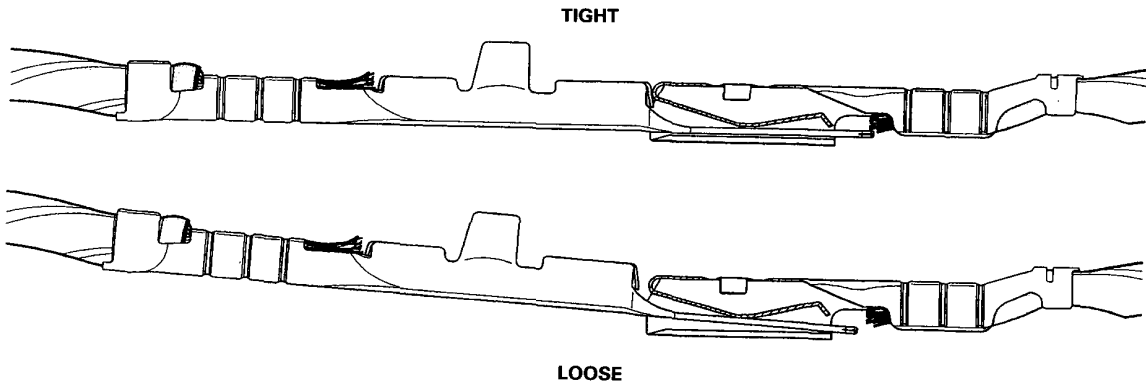
STOP

(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.

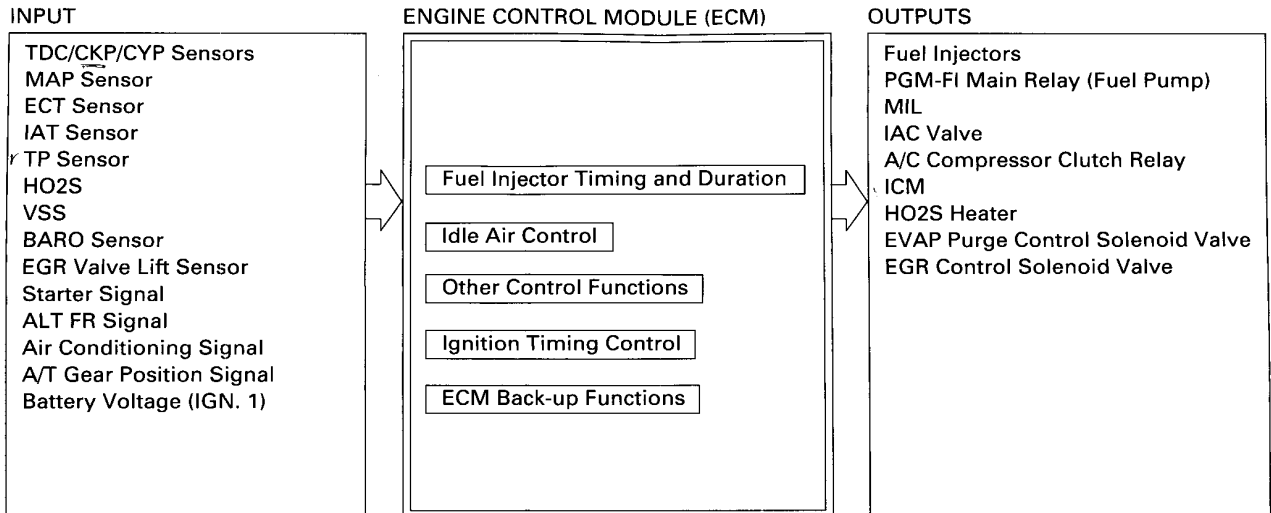
NOTE:

- 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) and try to duplicate the Diagnostic Trouble Code (DTC). If the problem is intermittent and you can't duplicate the code, do not continue through the flowchart. To do so will only result in confusion, and possibly, a needlessly replaced ECM.
- "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), this can sometimes mean something works, but not the way it's supposed to.
- If the electrical readings are not as specified when using the test harness, check the test harness connections before proceeding.



PGM-FI System

System Description



PGM-FI System

The PGM-FI system on this model is a sequential multiport fuel injection system.

Fuel Injector Timing and Duration

The ECM contains memories for the basic discharge durations at various engine speeds and manifold pressures. The basic discharge duration, after being read out from the memory, is further modified by signals sent from various sensors to obtain the final discharge duration.

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 (A/T only) or the alternator (ALT) is charging, the ECM controls current to the IAC valve to maintain correct idle speed.

Ignition Timing Control

The ECM contains memories for basic ignition timing at various engine speeds and manifold pressures. Ignition timing is also adjusted for engine coolant temperature.

Other Control Functions

1. Starting Control
When the engine is started, the ECM provides a rich mixture by increasing injector duration.
2. Fuel Pump Control
 - When the ignition switch is initially turned on, the ECM 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 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 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 $1,500 \text{ min}^{-1}$ (rpm).
 - Fuel cut-off action also takes place when engine speed exceeds, $6,600 \text{ min}^{-1}$ (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 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 below 167°F (75°C), the ECM supplies a ground to the EVAP purge control solenoid valve which cuts vacuum to the EVAP purge control diaphragm valve.
6. Exhaust Gas Recirculation (EGR) Control Solenoid Valve

When the EGR is required for control of oxides of nitrogen (NO_x) emissions, the ECM supplies ground to the EGR control solenoid valve which supplies regulated vacuum to the EGR valve.

ECM Fail-safe/Back-up Functions

1. Fail-safe Function

When an abnormality occurs in a signal from a sensor, the ECM 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 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 lights the MIL and stores the Diagnostic Trouble Code (DTC) in erasable memory. When the ignition is initially turned on, the ECM supplies ground for the MIL for two seconds to check MIL bulb condition.

PGM-FI System

Troubleshooting Flowchart — Engine Control Module (ECM)

The Malfunction Indicator Lamp (MIL) never comes on (even for two seconds) after ignition is turned on.

Is the low oil pressure light on?
 YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17).

Connect A13 terminal to body ground.

Turn the ignition switch ON.

Is the MIL on?
 YES

Measure voltage between body ground and the following terminals individually A23, A24.

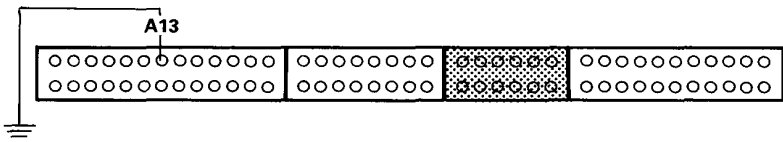
Is there less than 1.0 V?
 YES

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

NO
 Inspect No. 8 TURN SIGNALS (10 A) fuse in the under-dash fuse/relay box.

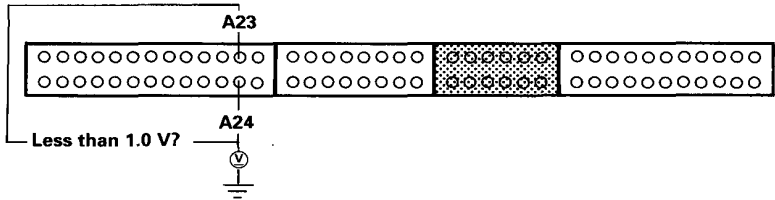
Is the fuse OK?
 YES

Repair open in YEL wire between No. 8 TURN SIGNALS (10 A) fuse and gauge assembly.

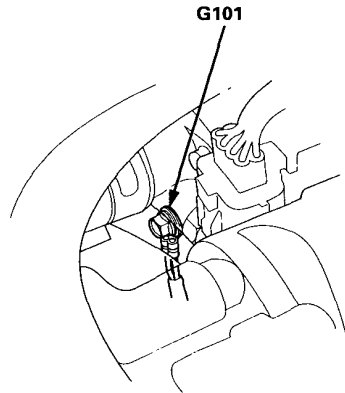


NO
 Replace the fuse.

NO
 — Replace the MIL bulb.
 — Repair open in GRN/RED wire between ECM (A13) and gauge assembly.



NO
 Repair open in wire(s) between ECM and G101 (located at thermostat housing) that had more than 1.0 V.





The Malfunction Indicator Lamp (MIL) stays on or comes on after two seconds.

Connect the service check connector terminals with a jumper wire (see page 11-14).

Turn the ignition switch ON.

Does the MIL indicate any Diagnostic Trouble Code (DTC)?

YES

Go to self-diagnostic procedures (see page 11-12).

NO

Remove the jumper wire from the service check connector terminals.

Try to start the engine.

Did the engine start?

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D4 (+) terminal and D22 (-) terminal.

Is there approx. 5 V?
(A/T models: 11 V?)

YES

Connect the service check connector terminals with a jumper wire.

Measure voltage between D4 (+) terminal and D22 (-) terminal.

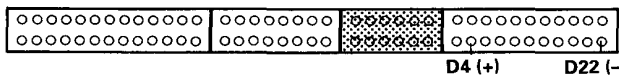
Is there approx. 5 V?
(A/T models: 11 V?)

NO

Remove the jumper wire from the service check connector terminals.

(To page 11-24)

NOTE When there is no code stored, the MIL will stay on if the service check connector is jumped.



(A/T: 11 V?)

Repair short to body ground in ORN/RED wire between the ECM (D4), Transmission Control Module (TCM), ABS control unit and service check connector.

- Repair open in ORN/RED wire between ECM (D4) and service check connector.
- Repair open in GRN/WHT wire between service check connector and ECM (D22).

YES

Remove and inspect the ECU (ECM) (10 A) fuse in the under-hood fuse/relay box.

Is the fuse OK?

NO

Replace the fuse.

YES

(To page 11-24)

NOTE: After repair, remove the jumper wire from the service check connector, test drive the car, and recheck the MIL for a code.

(cont'd)

PGM-FI System

Troubleshooting Flowchart — Engine Control Module (ECM) (cont'd)

(From page 11-23)

(From page 11-23)

Inspect the No. 2 ECU (ECM) (15 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

NO

Replace the fuse.

YES

Turn the ignition switch ON.

Disconnect the 3P connector of each sensor one at a time:

- MAP sensor
- Throttle Position (TP) sensor
- Exhaust Gas Recirculation (EGR) valve lift sensor

Does the MIL remain ON?

NO

Replace the sensor that caused the light to go out.

YES

Turn the ignition switch OFF.

Connect the test harness. Disconnect the "D" connector from the ECM only, not the main wire harness (see page 11-17).

Check for continuity between body ground and the following terminals; D19, D20.

(To page 11-25)

Turn the ignition switch OFF.

Disconnect "A" connector from the ECM.

Turn the ignition switch ON.

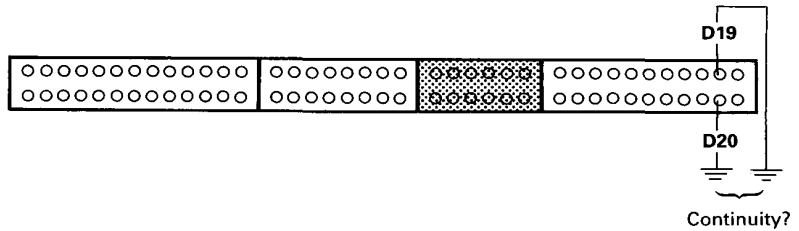
Is the MIL ON?

NO

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

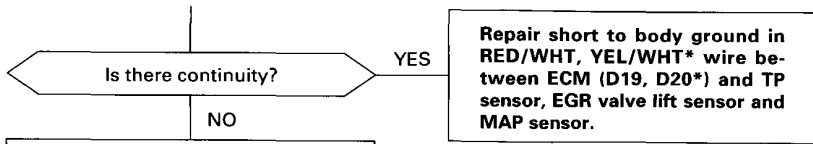
YES

Repair short to body ground in GRN/RED wire between the ECM (A13) and the MIL.





(From page 11-24)

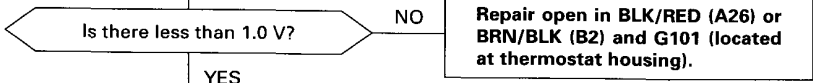
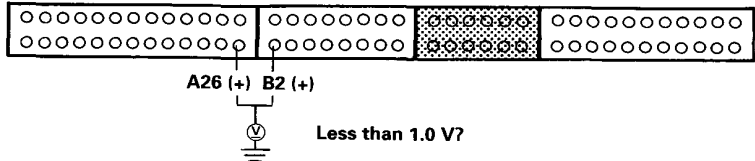


NO

Reconnect all the sensor connectors. Reconnect the "D" connector to the ECM.

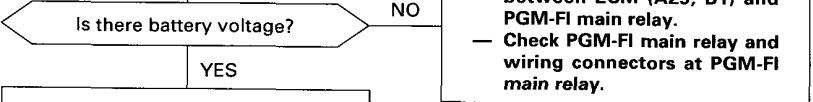
Turn the ignition switch ON.

Measure voltage between body ground and the following terminals individually: A26, B2.



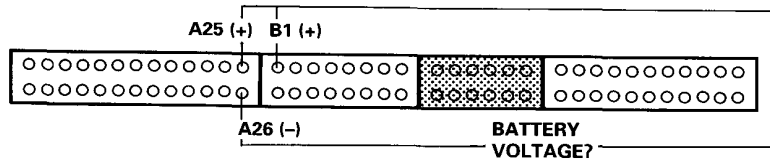
YES

Measure voltage between A26 (-) and the following: B1 (+) and A25 (+).



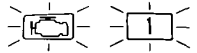
YES

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



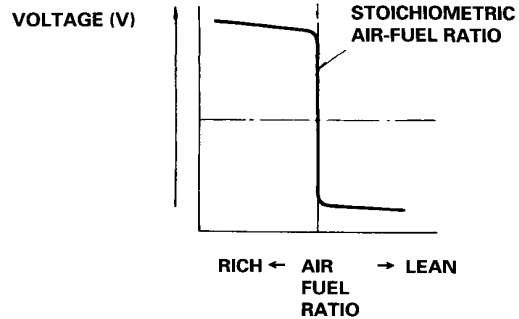
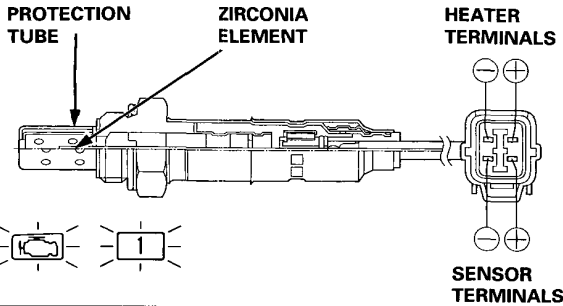
PGM-FI System

Troubleshooting Flowchart — Heated Oxygen Sensor (HO2S)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 1: A problem in the Heated Oxygen Sensor (HO2S) circuit.

The heated oxygen sensor detects the oxygen content in the exhaust gas and signals the ECM. In operation, the ECM receives the signals from the sensor and varies the duration during which fuel is injected. The heated oxygen sensor has an internal heater. The heater stabilizes the sensor's output. The heated oxygen sensor is installed on the exhaust manifold.



— The MIL has been reported on.
 — With service check connector jumped (see page 11-14), code 1 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Warm up engine to normal operating temperature (the radiator fan comes on).

Run engine for 60 seconds.

Road test with the automatic transmission in **2** position (M/T: 4th gear). Starting at 1,600 min⁻¹ (rpm), accelerate using wide open throttle for at least 5 seconds. Then decelerate for at least 5 seconds with the throttle completely closed.

Is the MIL on and does it indicate code 1?

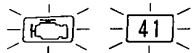
NO
 Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the HO2S and ECM.

YES
 Go to page 11-32 and perform test for code 43.

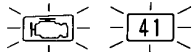


PGM-FI System

Troubleshooting Flowchart — Heated Oxygen Sensor Heater



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 41: A problem in the Heated Oxygen Sensor (HO2S) Heater circuit.



— Engine is running.
 — The MIL has been reported on.
 With service check connector jumped (see page 11-14), code 41 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine.

Is the MIL on and does it indicate code 41?

NO: Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between the HO2S and ECM.

YES: Proceed to next step.

Turn the ignition switch OFF.

Disconnect the 4P connector from the HO2S.

Measure resistance between terminals C and D on the HO2S.

Is there 10 — 40 Ω?

NO: Replace the HO2S.

YES: Proceed to next step.

Check for continuity to body ground on each terminal on the HO2S.

Is there continuity?

YES: Replace the HO2S.

NO: Proceed to next step.

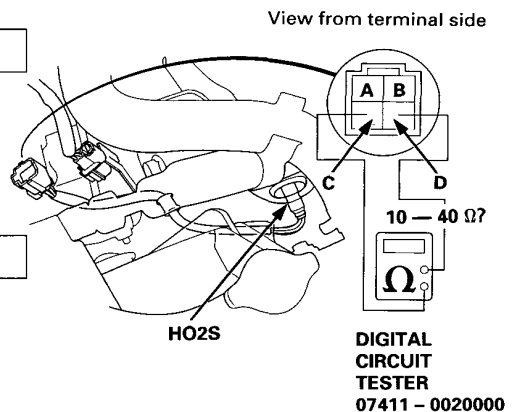
Check for continuity between terminal A and terminals C and D individually.

Is there continuity?

YES: Replace the HO2S.

NO: Proceed to next step.

(To page 11-29)





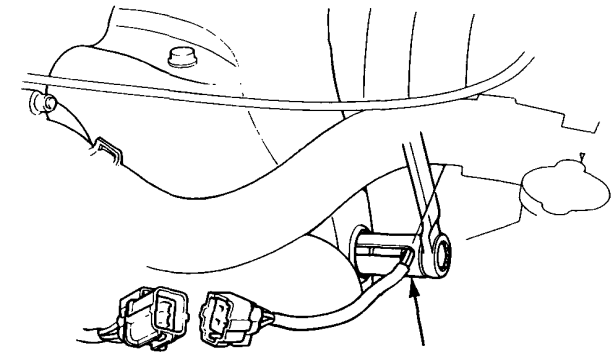
(From page 11-28)

Turn the ignition switch ON.

At HO2S harness, measure voltage between YEL/BLK (+) terminal and ORN/BLK (-) terminal.

Is there battery voltage?

YES



OXYGEN SENSOR SOCKET WRENCH
07LAA - PT50100
45 N-m (4.5 kg-m, 33 lb-ft)

Turn the ignition switch OFF.

Disconnect the "A" connector from the ECM.

Turn the ignition switch ON.

At HO2S harness, measure voltage between YEL/BLK (+) terminal and ORN/BLK (-) terminal.

Is there battery voltage?

YES

Repair short in ORN/BLK wire between ECM (A6) and HO2S.

NO

Is there battery voltage?

NO

Repair open in YEL/BLK wire between HO2S and PGM-FI main relay.

YES

Turn the ignition switch OFF.

Reconnect the 4P connector to the HO2S.

Connect the test harness "A" connector to the main wire harness only, not the ECM (see page 11-17).

Turn the ignition switch OFF.

Reconnect the HO2S connector.

Connect the test harness "A" connector to the main wire harness only, not the ECM (see page 11-17).

Connect an ammeter between terminals A6 (+) and A26 (-).

*Monitor over a 5 minutes period.

Turn the ignition switch ON.

Is the current less than 0.1 A?*

YES

Replace the HO2S.

NO

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

(To page 11-30)

(cont'd)

PGM-FI System

Troubleshooting Flowchart — Heated Oxygen Sensor Heater (cont'd)

(From page 11-29)

Turn the ignition switch ON.

Measure voltage between A6 (+) terminal and A23 (-) terminal.

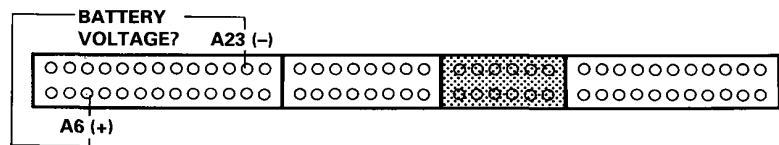
Is there battery voltage?

NO

Repair open in ORN/BLK wire between ECM (A6) and the HO2S.

YES

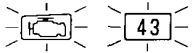
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.





PGM-FI System

Troubleshooting Flowchart — Fuel Supply System



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 43: A problem in the Heated Oxygen Sensor (HO2S) circuit or a problem in the Fuel Supply System.



— The MIL has been reported on.
— With service check connector jumped (see page 11-14), code 43 is indicated.

From code 1 troubleshooting (page 11-26).

Is the 43 code accompanied by the MIL and poor driveability?

YES
Go to Fuel Supply System (see page 11-73).

NO

Do the ECM Reset Procedure (see page 11-15).

Warm up engine to normal operating temperature (the radiator fan comes on).

Hold engine at 3,000 min⁻¹ (rpm) for 2 minutes (A/T: Transmission in **N** or **P** position).

Is the MIL on and does it indicate code 43?

NO
Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the HO2S and ECM.

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17).

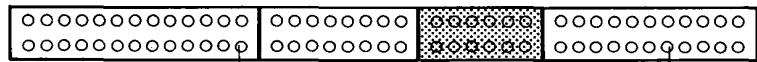
With the ignition switch OFF, wait for at least 2 minutes.

Turn the ignition switch ON.

Measure voltage between D14 (+) terminal and A26 (-) terminal as soon as the ignition switch is turned on.

NOTE

- Use DIGITAL CIRCUIT TESTER (07411 - 0020000) or equivalent.
- Use 2 Volt range.

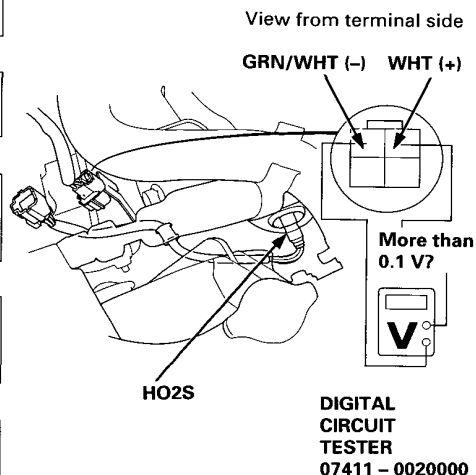
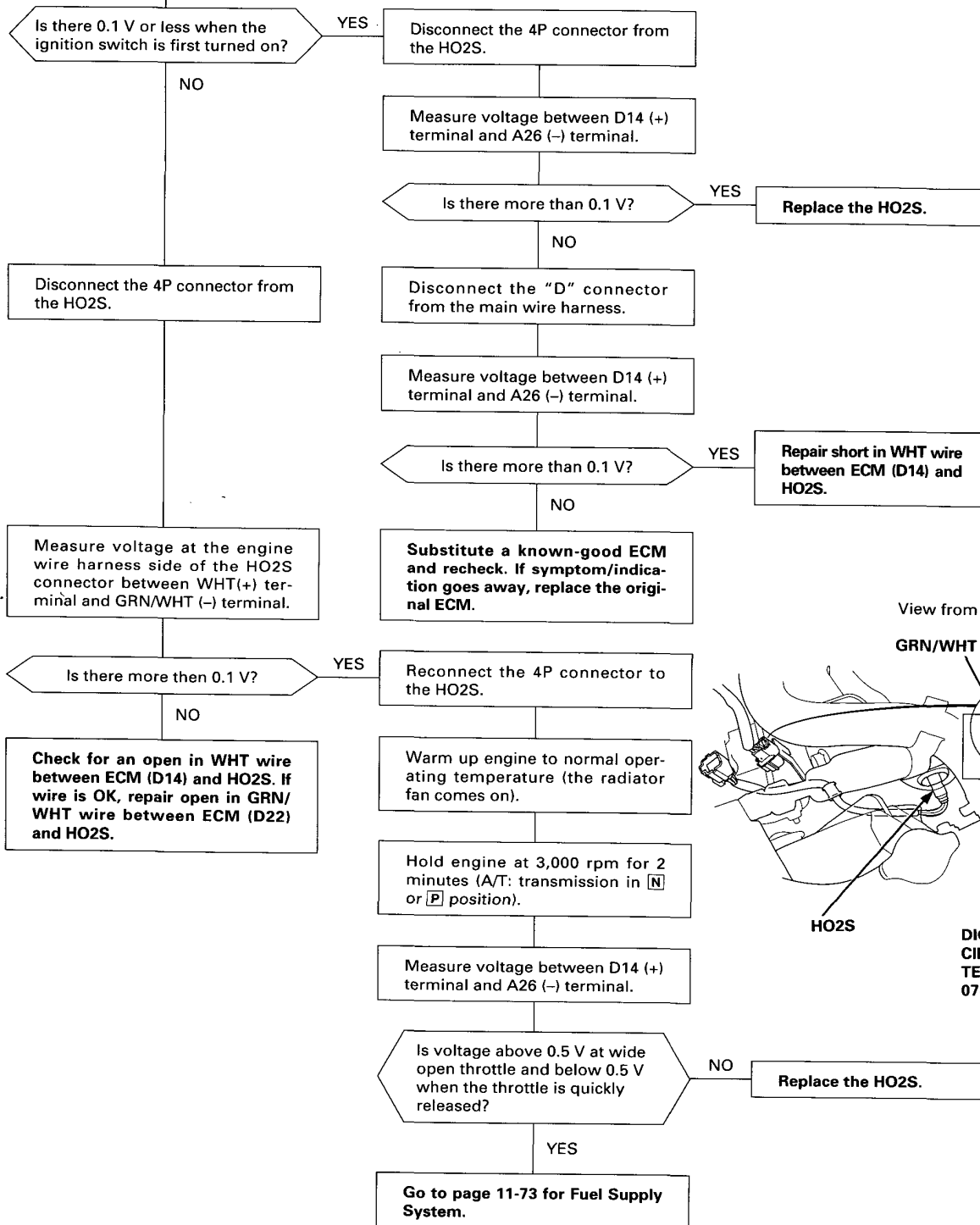


A26 (-) Voltage should start at 0.4 — 0.5 V when the ignition switch is first turned on, and decrease to below 0.1 V in less than 2 minutes. D14 (+)

(To page 11-33)

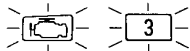


(From page 11-32)

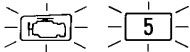


PGM-FI System

Troubleshooting Flowchart — Manifold Absolute Pressure (MAP) Sensor



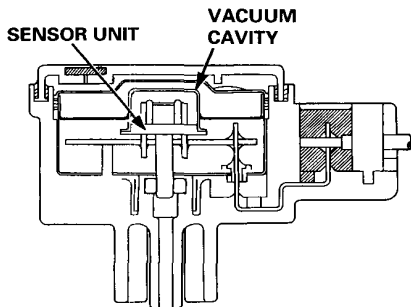
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 3: An electrical problem in the Manifold Absolute Pressure (MAP) Sensor System.



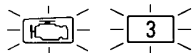
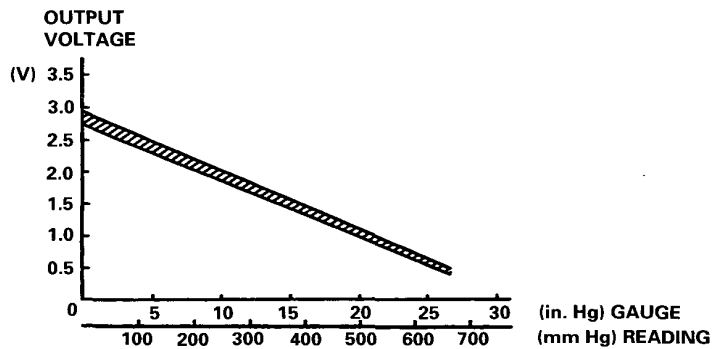
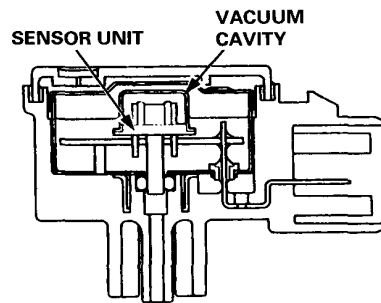
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 5: A mechanical problem (vacuum leak) in the Manifold Absolute Pressure (MAP) Sensor System.

The MAP sensor converts manifold absolute pressure into electrical signals inputs the ECM.

[Except KE]



[KE]



— Engine is warm and running.
 — The MIL has been reported on.
 — With service check connector jumped (see page 11-14), code 3 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine and allow it to idle.

Is the MIL on and does it indicate code 3?

NO

**Intermittent failure, system is OK at this time (test drive may be necessary).
 Check for poor connections or loose wires between the MAP sensor and ECM.**

YES

Turn the ignition switch OFF.

(To page 11-35)

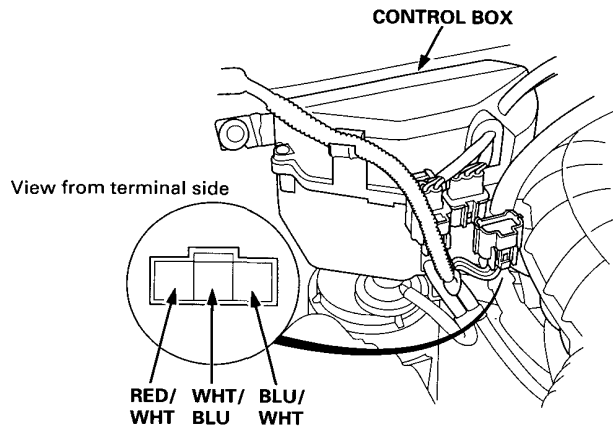


(From page 11-34)

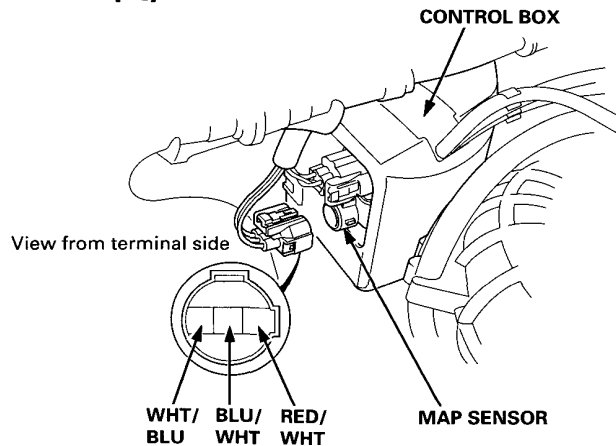
Disconnect the 3P connector from the MAP sensor.

Turn the ignition switch ON.

[Except KE]



[KE]



Measure voltage between RED/WHT (+) terminal and body ground.

Is there approx. 5 V?

NO

Turn the ignition switch OFF.

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-17).

Turn the ignition switch ON.

(To page 11-36)

YES

Measure voltage between RED/WHT (+) terminal and BLU/WHT (-) terminal.

Is there approx. 5 V?

YES

(To page 11-36)

NO

Repair open in BLU/WHT wire between ECM (D21) and MAP sensor.

(cont'd)

PGM-FI System

Troubleshooting Flowchart — Manifold Absolute Pressure (MAP) Sensor (cont'd)

(From page 11-35)

(From page 11-35)

Measure voltage between D19 (+) terminal and D21 (-) terminal.

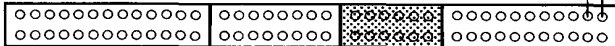
Is there approx. 5 V?

YES

NO

Repair open in RED/WHT wire between ECM (D19) and MAP sensor.

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



Measure voltage between WHT/BLU (+) terminal and BLU/WHT (-) terminal.

Is there approx. 5 V?

YES

NO

Turn the ignition switch OFF.

Reconnect the 3P connector to the MAP sensor.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

Turn the ignition switch OFF.

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D17 (+) terminal and D21 (-) terminal.

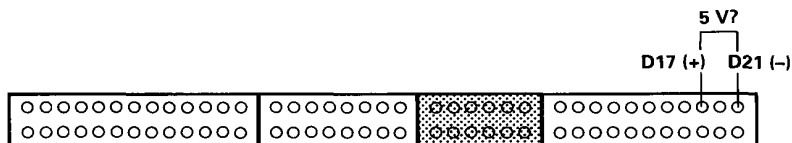
Is there approx. 5 V?

YES

NO

— Repair short in WHT/BLU wire between ECM (D17) and MAP sensor.
— Repair open in WHT/BLU wire between ECM (D17) and MAP sensor.

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

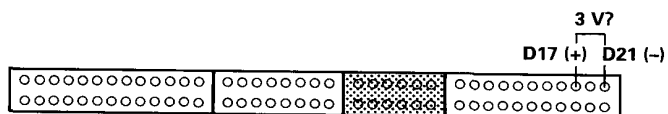


(To page 11-37)



(From page 11-36)

Measure voltage between D17 (+) terminal and D21 (-) terminal.



Is there approx. 3 V?

NO

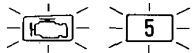
Replace the MAP sensor.

YES

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

PGM-FI System

Troubleshooting Flowchart — Manifold Absolute Pressure (MAP) Sensor (cont'd)



— The MIL has been reported on.
 — With service check connector jumped (see page 11-14), code 5 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine and keep engine speed at 2,000 min⁻¹ (rpm) for one minute with manual transmission in neutral (A/T: **N** or **P** position).

Is the MIL on and does it indicate code 5?

NO

— Intermittent failure, system is OK at this time (test drive may be necessary).
 — Check vacuum hoses, pipes and connections.
 — Make sure all connectors are secure.

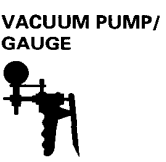
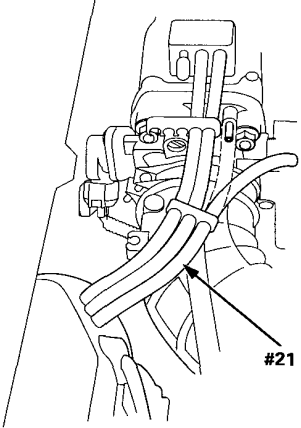
YES

Turn the ignition switch OFF.

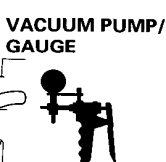
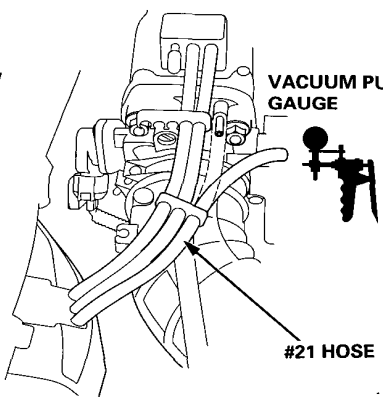
Disconnect #21 hose from the throttle body, connect vacuum pump to the hose and apply vacuum.

[Except KE]

[KE]



#21 HOSE



#21 HOSE

Does it hold vacuum?

NO

Connect a vacuum pump to the MAP sensor and apply vacuum.

YES

Does it hold vacuum?

NO

Replace the MAP sensor.

YES

Repair vacuum leak in hose routing between MAP sensor and throttle body.

(To page 11-39)

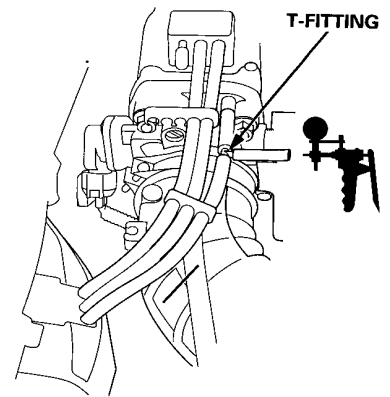
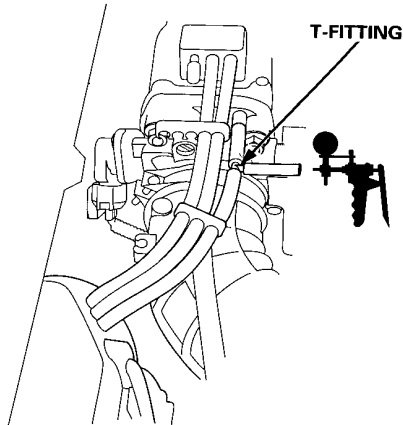


(From page 11-38)

Connect a T-fitting from a vacuum pump gauge between the throttle body and MAP sensor.

[Except KE]

[KE]



Start the engine.

Is there manifold vacuum?

NO

- Remove restriction from throttle body.
- Replace throttle body.

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D17 (+) terminal and D21 (-) terminal.

Is there approx. 3 V?

NO

Replace the MAP sensor.

YES

Start the engine and allow it to idle.

Is there approx. 1 V?

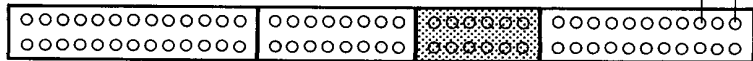
NO

Replace the MAP sensor.

YES

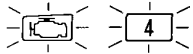
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

3 V?
D17 (+) D21 (-)

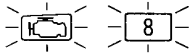


PGM-FI System

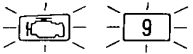
Troubleshooting Flowchart — TDC/CKP/CYP Sensor



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 4: A problem in the Crankshaft Position (CKP) Sensor circuit.

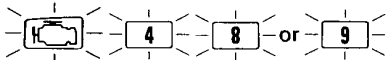
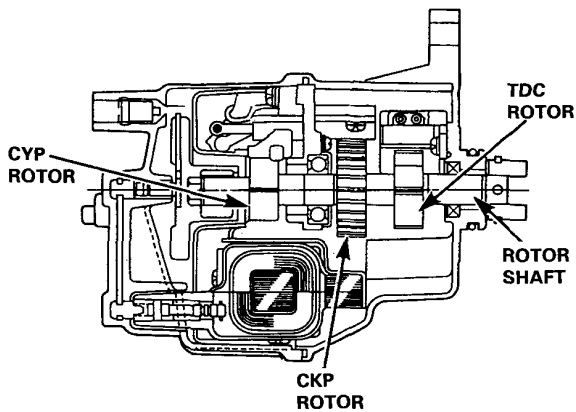


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 8: A problem in the Top Dead Center (TDC) Sensor circuit.



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 9: A problem in the Cylinder Position (CYP) Sensor circuit.

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 MIL has been reported on.
— With service check connector jumped (see page 11-14), code 4, 8 and/or 9 are indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine.

Is the MIL on and does it indicate code 4, 8 and/or 9?

NO

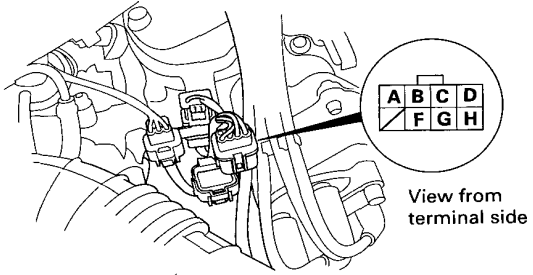
Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the TDC/CKP/CYP sensor and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 8P connector from the TDC/CKP/CYP sensor.

(To page 11-41)



View from terminal side



(From page 11-40)

Measure resistance between terminals of the indicated sensor (see table).

Is there 260 — 500 Ω?

NO
Replace the distributor housing (see section 23).

YES

Check for continuity to body ground on both terminals of the indicated sensor.

Is there continuity?

YES
Replace the distributor housing (see section 23).

NO

Reconnect the connector.

Connect the test harness to the main wire harness only, not to the ECM (see page 11-17).

Measure resistance between terminals of the indicated sensor on test harness (see table).

Is there 260 — 500 Ω?

NO
Repair open in the indicated sensor wires (see table).

YES

Check for continuity to body ground on B15, B13 and B11 terminals.

Is there continuity?

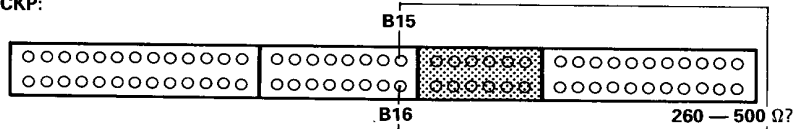
NO
Repair short to body ground in the indicated sensor wires (see table).

YES

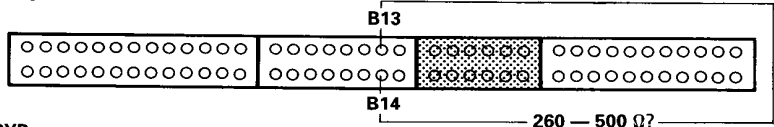
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

SENSOR	DTC	SENSOR TERMINAL	ECM TERMINAL	WIRE COLOR
CKP	4	B	B15	BLU/GRN
		F	B16	BLU/YEL
TDC	8	C	B13	ORN/BLU
		G	B14	WHT/BLU
CYP	9	D	B11	ORN
		H	B12	WHT

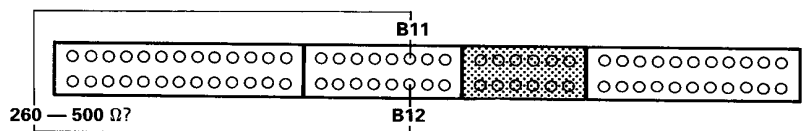
CKP:



TDC:

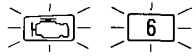


CYP:



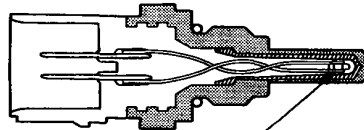
PGM-FI System

Troubleshooting Flowchart — Engine Coolant Temperature (ECT) Sensor



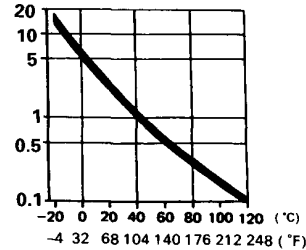
The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 6: A problem in the Engine Coolant Temperature (ECT) Sensor circuit.

The ECT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the engine coolant temperature increases as shown below.

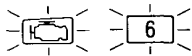


THERMISTOR

RESISTANCE
(k Ω)



ENGINE COOLANT TEMPERATURE



— The MIL has been reported on.
— With service check connector jumped (see page 11-14), code 6 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Turn the ignition switch ON.

Is the MIL on and does it indicate code 6?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the ECT sensor and ECM.

YES

Warm up engine to normal operating temperature (the radiator fan comes on).

Turn the ignition switch OFF.

Disconnect the 2P connector from the ECT sensor.

Measure resistance between the 2 terminals on the ECT sensor.

Is there 200 — 400 Ω ?

NO

Replace the ECT sensor.

YES

(To page 11-43)



(From page 11-42)

Turn the ignition switch ON.

Measure voltage between YEL/GRN (+) terminal and body ground.

Is there approx. 5V?

YES

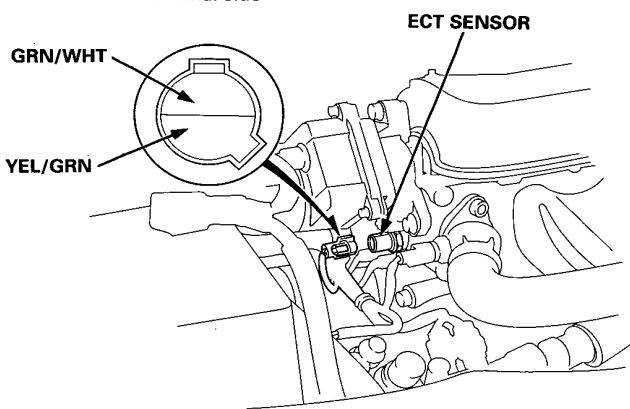
Measure voltage between YEL/GRN (+) terminal and GRN/WHT (-) terminal.

Is there approx. 5V?

NO

Repair open in GRN/WHT wire between ECM (D22) and ECT sensor.

View from terminal side



NO

Turn the ignition switch OFF.

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

A/T only

Disconnect the 22P connector from the Transmission Control Module (TCM).

Turn the ignition switch ON.

Is there approx. 5V?

YES

Replace the TCM.

NO

Turn the ignition switch OFF.

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D13 (+) terminal and D22 (-) terminal.

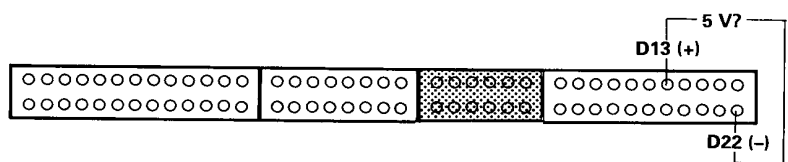
Is there approx. 5V?

NO

Repair open in YEL/GRN wire between ECM (D13) and ECT sensor.

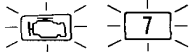
YES

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



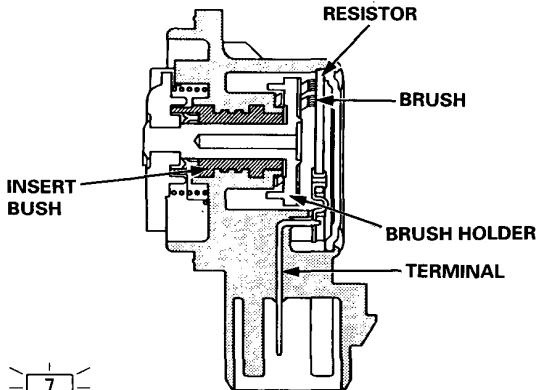
PGM-FI System

Troubleshooting Flowchart — Throttle Position (TP) Sensor

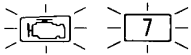
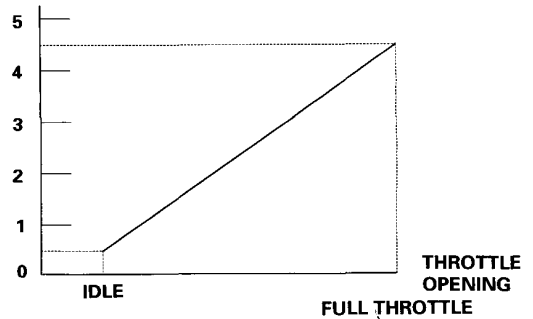


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 7: A problem in the Throttle Position (TP) Sensor circuit.

The TP sensor is a potentiometer. It is connected to the throttle valve shaft. As the throttle position changes, the TP sensor varies the voltage signal to the ECM.



OUTPUT VOLTAGE (V)



- Engine is running.
- The MIL has been reported on.
- With service check connector jumped (see page 11-14), code 7 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine.

Is the MIL on and does it indicate code 7?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the TP sensor and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 3P connector from the TP sensor.

Turn the ignition switch ON.

Measure voltage between YEL/WHT (+) terminal and GRN/WHT (-) terminal.

Is there approx. 5V?

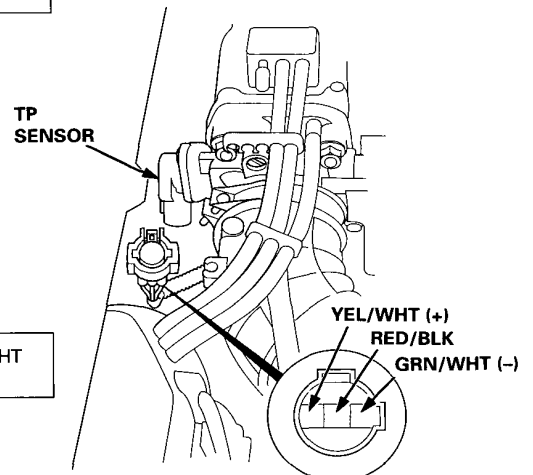
NO

Measure voltage between YEL/WHT (+) terminal and body ground.

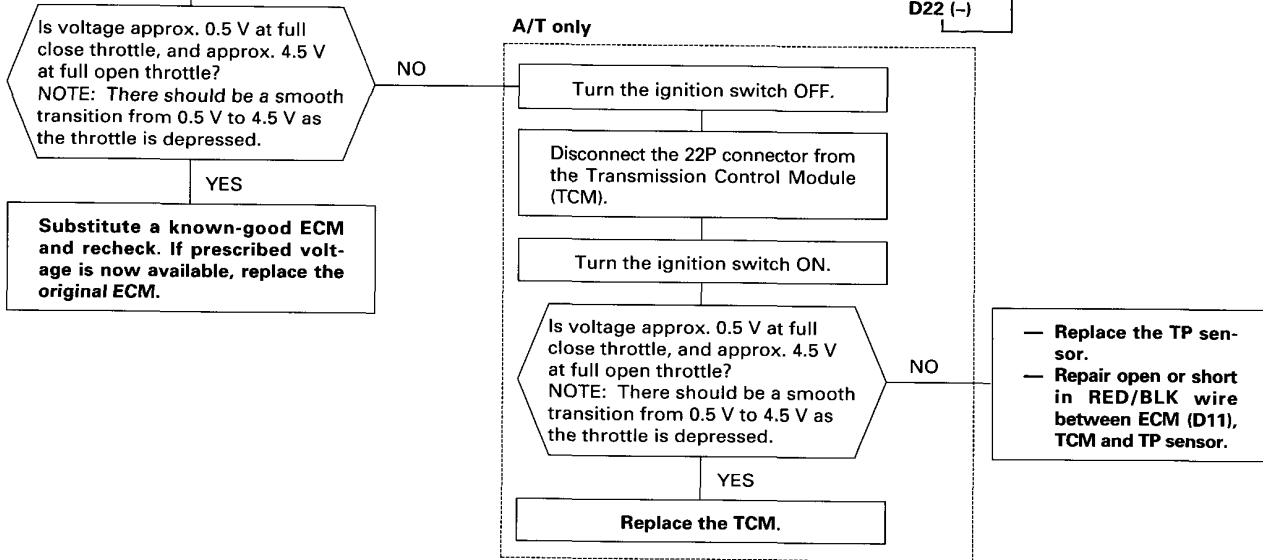
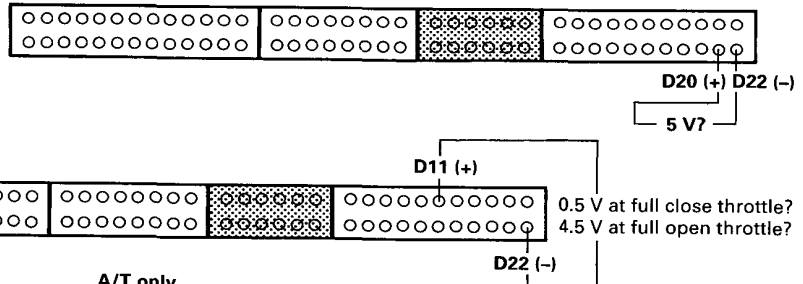
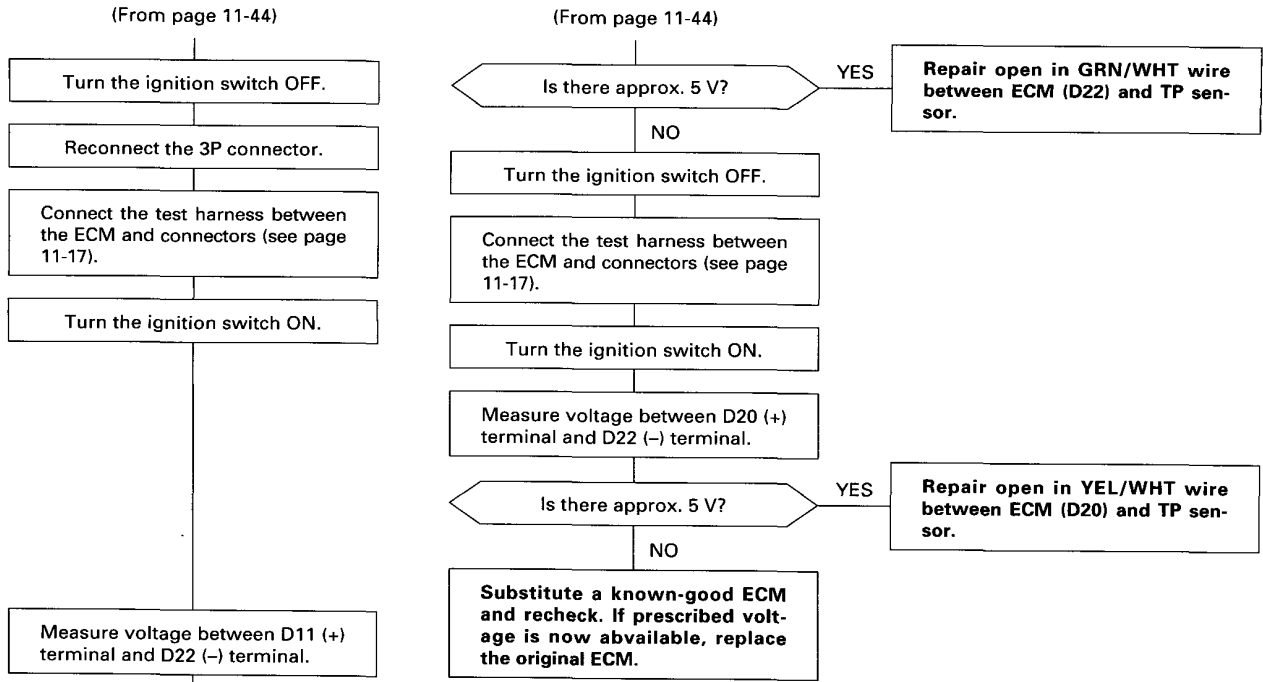
YES

(To page 11-45)

(To page 11-45)

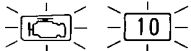


View from terminal side



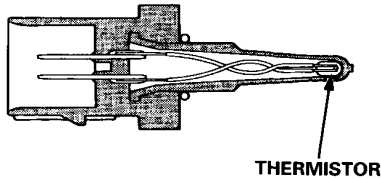
PGM-FI System

Troubleshooting Flowchart — Intake Air Temperature (IAT) Sensor

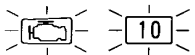
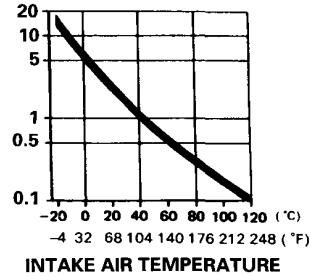


The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 10: A problem in the Intake Air Temperature (IAT) Sensor circuit.

The IAT sensor is a temperature dependant resistor (thermistor). The resistance of the thermistor decreases as the intake air temperature increases as shown below.



RESISTANCE (kΩ)



— The MIL has been reported on.
 — With service check connector jumped (see page 11-14), code 10 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Turn the ignition switch ON.

Is the MIL on and does it indicate code 10?

NO

Intermittent failure, system is OK at this time (test drive may be necessary). Check for poor connections or loose wires between the IAT sensor and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 2P connector from the IAT sensor.

Measure resistance between the 2 terminals on the IAT sensor.

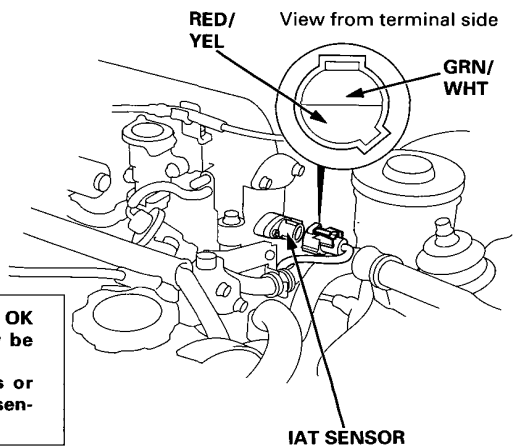
Is there 0.4 — 4.0 kΩ ?

NO

Replace the IAT sensor.

YES

(To page 11-47)





(From page 11-46)

Turn the ignition switch ON.

Measure voltage between RED/YEL (+) terminal and body ground.

Is there approx. 5 V?

YES

Measure voltage between RED/YEL (+) terminal and GRN/WHT (-) terminal.

Is there approx. 5 V?

NO

Repair open in GRN/WHT wire between ECM (D22) and IAT sensor.

NO

Turn the ignition switch OFF.

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-17).

Turn the ignition switch ON.

Measure voltage between D15 (+) terminal and D22 (-) terminal.

Is there approx. 5 V?

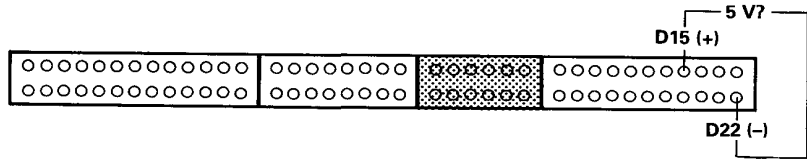
YES

Repair open in RED/YEL wire between ECM (D15) and IAT sensor.

NO

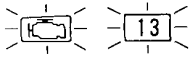
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.

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



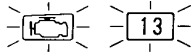
PGM-FI System

Troubleshooting Flowchart — Barometric Pressure (BARO) Sensor



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 13: A problem in the Barometric Pressure (BARO) Sensor.

The BARO sensor is built into the ECM.



- The MIL has been reported on.
- With service check connector jumped (see page 11-14), code 13 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Turn the ignition switch ON.

Is the MIL on and does it indicate code 13?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).

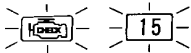
YES

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



PGM-FI System

Troubleshooting Flowchart — Ignition Output Signal



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 15: A problem in the Ignition Output Signal circuit.

— The MIL has been reported on.
— With service check connector jumped (see page 11-14), code 15 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine.

Is the MIL on and does it indicate code 15?

NO

Intermittent failure, system is OK at this time (test drive may be necessary).
Check for poor connections or loose wires between the distributor and ECM.

YES

Turn the ignition switch OFF.

Disconnect the 2P connector from the distributor.

Turn the ignition switch ON.

Measure voltage between BLK/YEL (+) terminal and body ground.

Is there battery voltage?

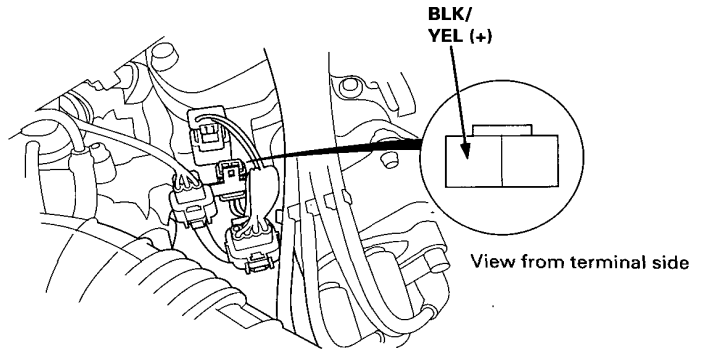
NO

Repair open in BLK/YEL wire between 2P connector and ignition switch.

YES

Turn the ignition switch OFF.

Reconnect the 2P connector.



(To page 11-51)

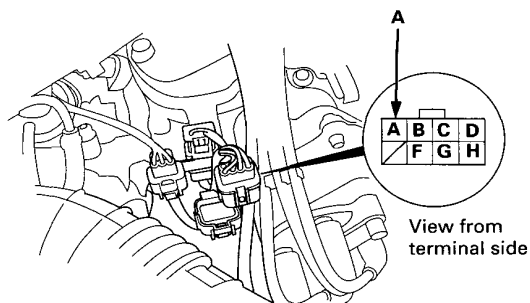


(From page 11-50)

Disconnect the 8P connector from the distributor.

Turn the ignition switch ON.

Measure voltage between terminal A and body ground.



Is there approx. 10 V?

NO

Replace the ICM.

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

Measure voltage individually between A21 (+), A22 (+) terminals and A26 (-) terminal.

Is there approx. 10 V?

NO

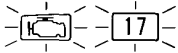
Repair open or short YEL/GRN wires between distributor and ECM (A21 or A22).

YES

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

PGM-FI System

Troubleshooting Flowchart — Vehicle Speed Sensor (VSS)



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 17: A problem in the Vehicle Speed Sensor (VSS) circuit.

The signal generated by the VSS, produces pulses when the front wheels turn.

- The MIL has been reported on.
- With service check connector jumped (see page 11-14), code 17 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Road test necessary.
With the manual transmission in 2nd gear (A/T: in **2** position) accelerate to 3,500 min⁻¹ (rpm), then decelerate to 1,500 min⁻¹ (rpm) with throttle fully closed.

Is the MIL on and does it indicate code 17?

NO

Intermittent failure, system is OK at this time.
Check for poor connections or loose wires between the VSS and ECM.

YES

Block rear wheels and set the parking brake. Jack up the front of the car and support with safety stands.

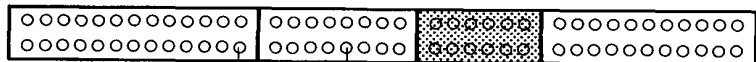
⚠ WARNING Block rear wheels before jacking up front of car.

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

Block the right front wheel and slowly rotate left front wheel and measure voltage between B10 (+) terminal and A26 (-) terminal.



0 → more than 5 V?

Does voltage pulse 0 V and more than 5 V?

NO

Turn the ignition switch OFF.

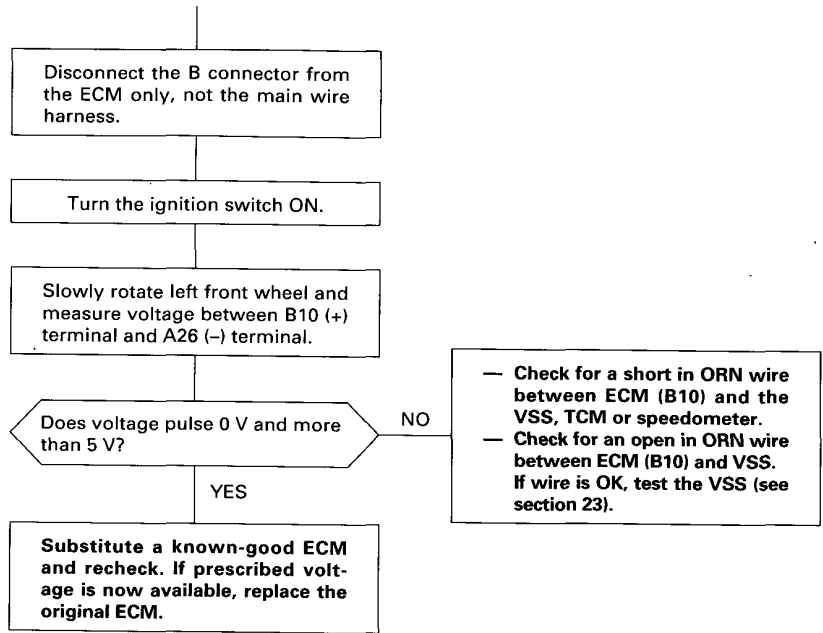
YES

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

(To page 11-53)

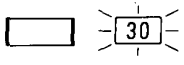


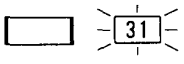
(From page 11-52)

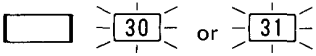


PGM-FI System

Troubleshooting Flowchart — A/T FI Signal A/B

 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 30: A problem in the A/T FI Signal A circuit between Transmission Control Module (TCM) and ECM.

 The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 31: A problem in the A/T FI Signal B circuit between Transmission Control Module (TCM) and ECM.

 or

With service check connector jumped (see page 11-14), code 30 and/or 31 are indicated.

Do the ECM Reset Procedure (see page 11-15).

Test drive necessary.
Drive the car for several kilometers (miles) so that the transmission upshifts and downshifts several times.

Does the MIL indicate code 30 and/or 31? NO

**Intermittent failure, system is OK at this time.
Check for poor connections or loose wires at the TCM and ECM.**

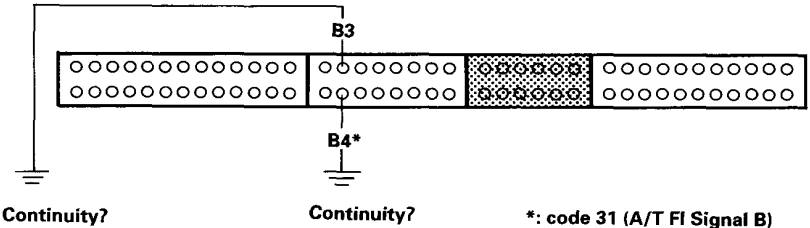
YES

Turn the ignition switch OFF.

Connect the test harness to the main harness only, not to the ECM (see page 11-17).

Disconnect the 22P connector from the TCM (see page 14-35).

Check for continuity between B3, B4* terminal and body ground.



Is there continuity? YES

Repair short in WHT/RED, GRN* wire between ECM (B3, B4*) and the TCM.

NO

(To page 11-55)



(From page 11-54)

Check for continuity on WHT/RED, GRN* wire between B3, B4* and 22P connector of the TCM.

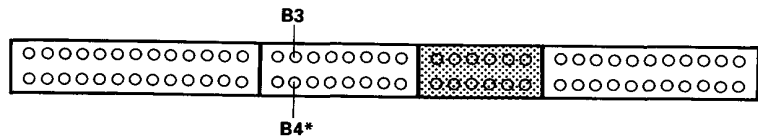
Is there continuity?

YES

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

NO

Repair open in WHT/RED, GRN* wire between ECM (B3, B4*) and the TCM.



Idle Control System

System Troubleshooting Guide

NOTE:

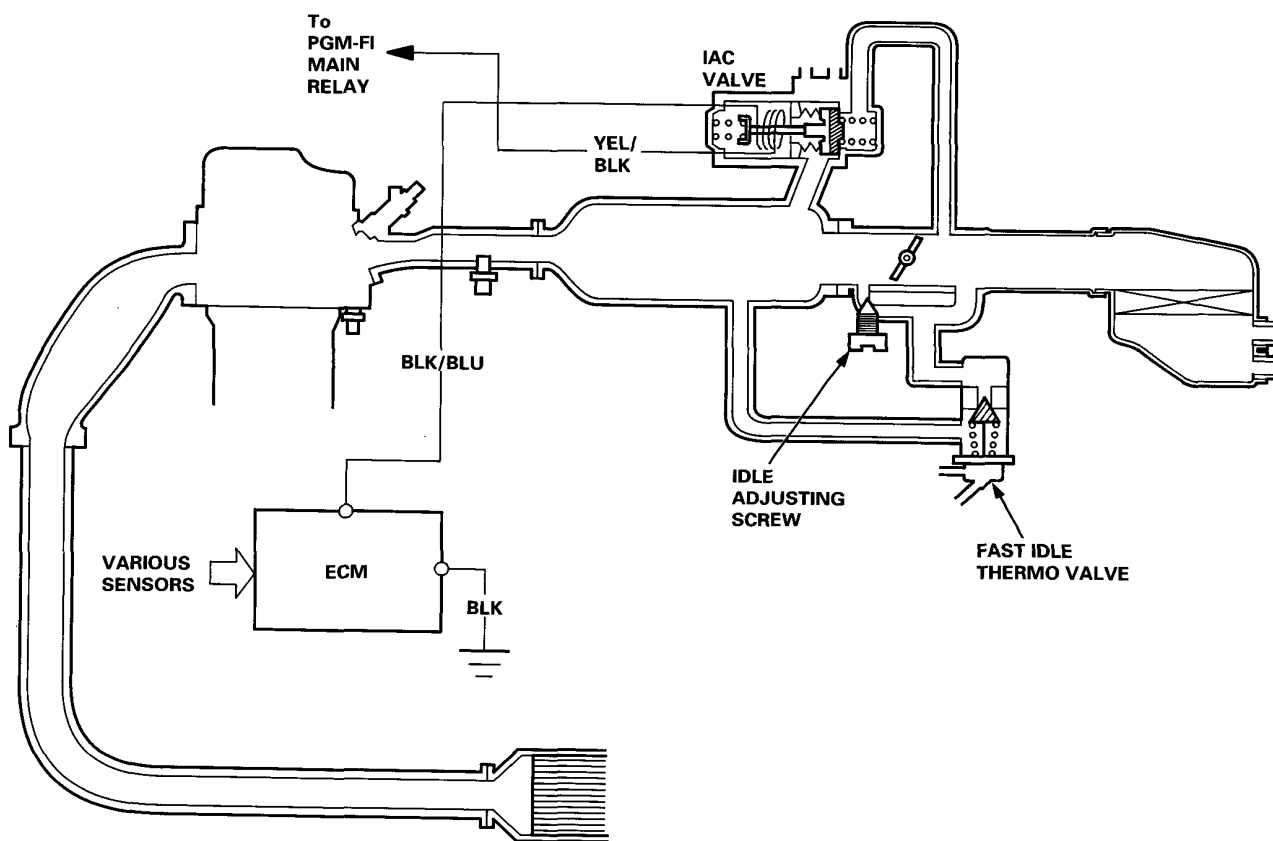
- Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected, starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.
- If the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not blink Diagnostic Trouble Code (DTC) 14, go to inspection described on page 11-59.

PAGE	SUB-SYSTEM	IDLE ADJUSTING SCREW	IDLE AIR CONTROL VALVE	AIR CONDITIONING SIGNAL	ALTERNATOR FR SIGNAL	AUTOMATIC TRANSAXLE GEAR POSITION SIGNAL	STARTER SWITCH SIGNAL	FAST IDLE THERMO VALVE	HOSES AND CONNECTIONS
SYMPTOM		11-71	11-60	11-62	11-64	11-66	11-68	11-70	*
	DIFFICULT TO START ENGINE WHEN COLD							①	
	WHEN COLD FAST IDLE OUT OF SPEC (1,000 — 2,000 min ⁻¹ , rpm)	③	②					①	
	ROUGH IDLE		②						①
	WHEN WARM ENGINE SPEED TOO HIGH	③	①					②	③
WHEN WARM ENGINE SPEED TOO LOW	Idle speed is below specified engine speed (no load)	②	①						
	Idle speed does not increase after initial start up		①						
	On models with automatic transmission, the idle speed drops in gear		②			①			
	Idle speeds drops when air conditioner is ON		②	①					
	Idle speed fluctuates with electrical load		②						①
FREQUENT STALLING	WHILE WARMING UP		①						
	AFTER WARMING UP	①							
	FAILS EMISSION TEST								①



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. When the IAC Valve is activated, the valve opens to maintain the proper idle speed.

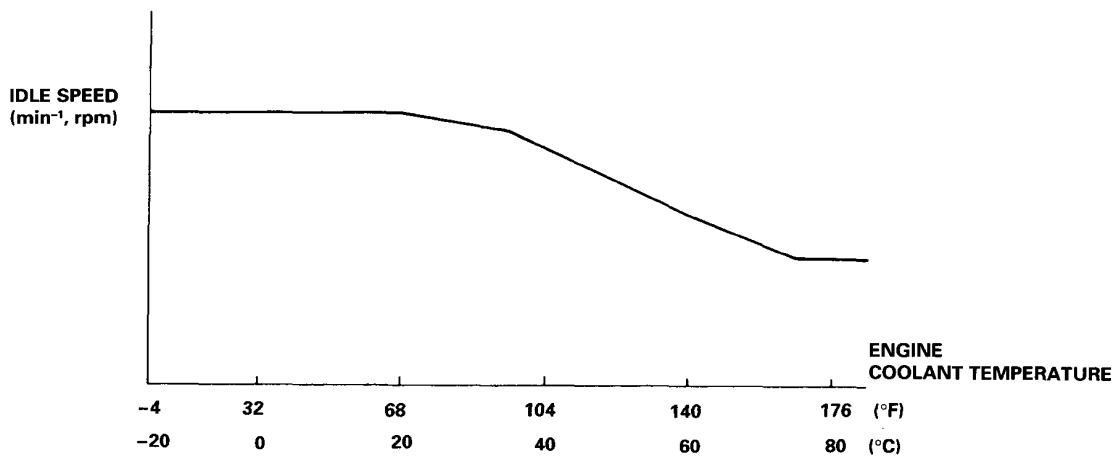


(cont'd)

Idle Control System

System Description (cont'd)

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 $150 - 300 \text{ min}^{-1}$ (rpm).
2. When the engine coolant temperature is low, the IAC valve is opened to obtain the proper fast idle speed. The amount of bypassed air is thus controlled in relation to the engine coolant temperature.



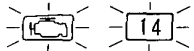


1. When the idle speed is out of specification and the Malfunction Indicator Lamp (MIL) does not blink Diagnostic Trouble Code (DTC) 14, check the following items:
 - Adjust the idle speed (see page 11-71).
 - Air conditioning signal (see page 11-62).
 - Alternator FR signal (see page 11-64).
 - A/T gear position signal (see page 11-66).
 - Starter switch signal (see page 11-68).
 - Fast idle thermo valve (see page 11-70).
 - Hoses and connections
 - IAC valve and its mounting O-rings

2. If the above items are normal, substitute a known-good IAC valve and readjust the idle speed (see page 11-71).
 - If the idle speed still cannot be adjusted to specification (and the MIL does not blink code 14) after IAC valve replacement, substitute a known-good ECM and recheck. If symptom goes away, replace the original ECM.

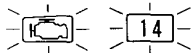
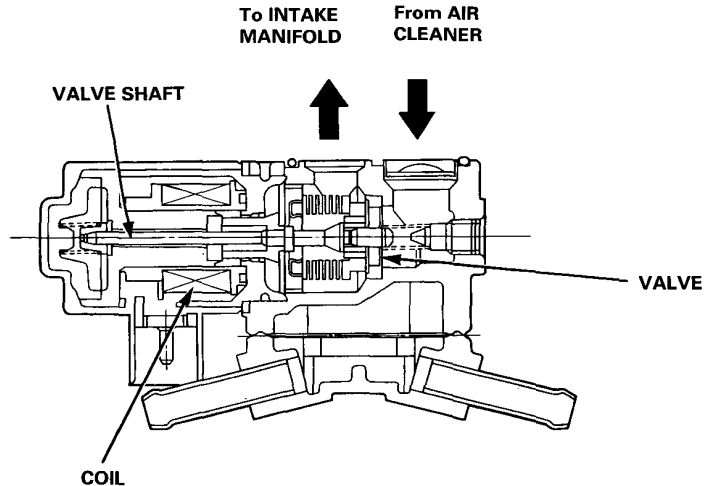
Idle Control System

Troubleshooting Flowchart — Idle Air Control (IAC) Valve



The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 14: 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.
— With service check connector jumped (see page 11-14), code 14 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Start the engine.

Is the MIL on and does it indicate code 14?

YES

Remove the 2P connector from the IAC valve.

NO
With the engine running and the accelerator pedal released, disconnect the 2P connector from the IAC valve.

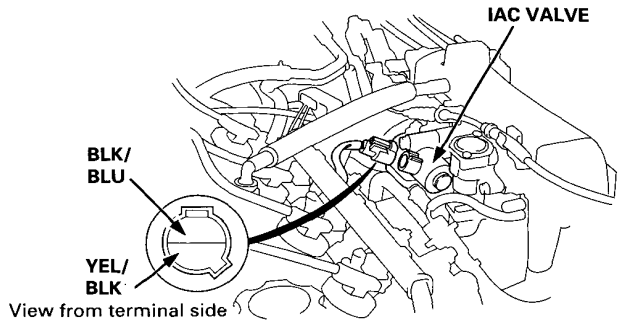
Is there a reduction in engine speed?

YES

Substitute a known-good IAC valve and retest. If symptom goes away, replace the original IAC valve.

NO

Intermittent failure, system is OK at this time (test driving may be necessary). Check for poor connections or loose wires between the IAC valve and ECM.



(To page 11-61)



(From page 11-60)

Measure voltage between the YEL/
BLK (+) terminal and body ground.

Is there battery voltage?

NO

Repair open in YEL/BLK wire be-
tween IAC valve and PGM-FI main
relay.

YES

Turn the ignition switch off and
reconnect the 2P connector to the
IAC valve.

Connect the test harness "A"
connector to the main wire harness
only, not the ECM (see page 11-
17).

Turn the ignition switch ON.

Momentarily connect A9 terminal
to A26 terminal several times.

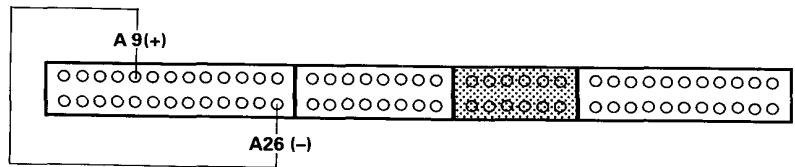
Does the IAC valve click?

YES

Substitute a known-good ECM
and retest. If symptom/indica-
tion goes away, replace the origi-
nal ECM.

NO

Check for an open or short in BLK/
BLU wire between IAC valve and
ECM (A9). If the wire is OK, replace
the IAC valve.



Idle Control System

Troubleshooting Flowchart — Air Conditioning Signal

This signals the ECM when there is a demand for cooling from the air conditioning system.

Inspection of Air Conditioning Signal.

Connect the test harness between the ECM and connectors (see page 11-17). Disconnect "B" connector from the main wire harness only, not the ECM.

Turn the ignition switch ON.

Measure voltage between B5 (+) terminal and A26 (-) terminal.

Is there approx. 5 V?

NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

YES

Turn the ignition switch OFF.

Reconnect "B" connector to the main wire harness.

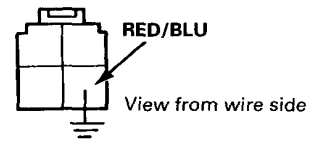
Turn the ignition switch ON.

Momentarily connect A15 terminal to A26 terminal several times.

Is there a clicking noise from the A/C compressor clutch?

NO

Connect the RED/BLU terminal of the 4P connector on the A/C clutch relay to body ground.



YES

Start the engine.

Blower switch ON.

Is there a clicking noise from the A/C compressor clutch?

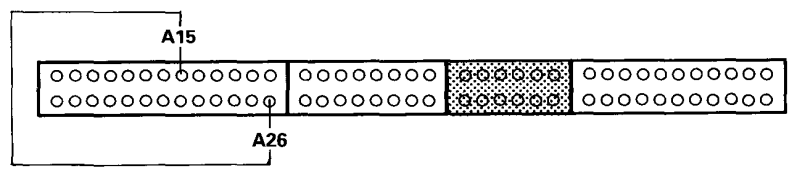
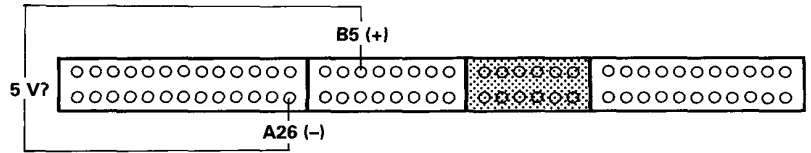
NO

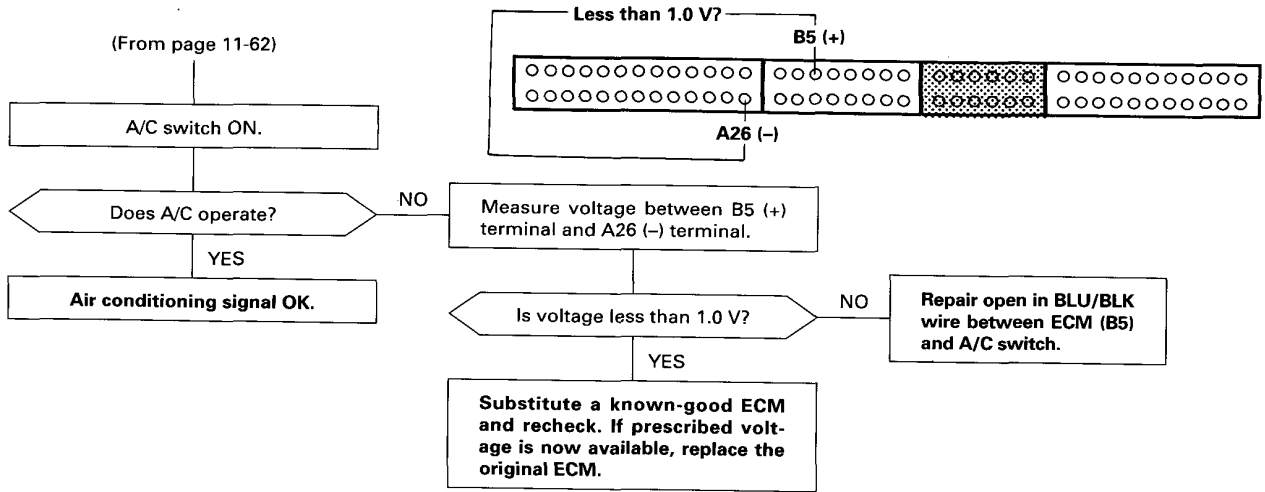
See air conditioner inspection (section 22).

YES

Repair open in RED/BLU wire between ECM (A15) and A/C clutch relay.

(To page 11-63)





Idle Control System

Troubleshooting Flowchart — Alternator (ALT) FR Signal

This signals the ECM when the alternator is charging.

Inspection of ALT FR signal.

Connect the test harness between the ECM and connectors (see page 11-17). Disconnect "D" connector from the main wire harness only, not the ECM.

Turn the ignition switch ON.

Measure voltage between D9 (+) terminal and A26 (-) terminal.

Is there approx. 5 V?

NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

YES

Turn the ignition switch OFF.

Reconnect "D" connector to the main wire harness.

Warm up engine to normal operating temperature (the radiator fan comes on).

Measure voltage between D9 (+) terminal and A26 (-) terminal.

Does the voltage decrease when headlights and rear defogger are turned on?

NO

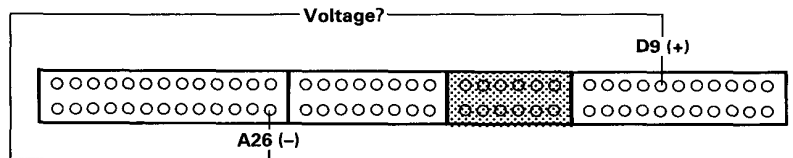
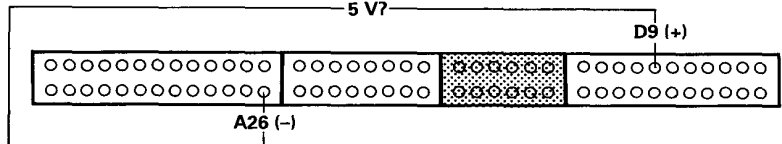
Turn the ignition switch OFF.

YES

Do the ECM Reset Procedure (see page 11-15).

ALT FR signal is OK.

(To page 11-65)



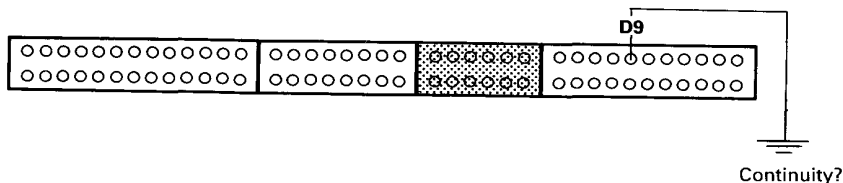


(From page 11-64)

Disconnect "D" connector from ECM only, not the main wire harness.

Disconnect the negative battery cable from the battery.

Check for continuity between D9 terminal and body ground.



Is there continuity?

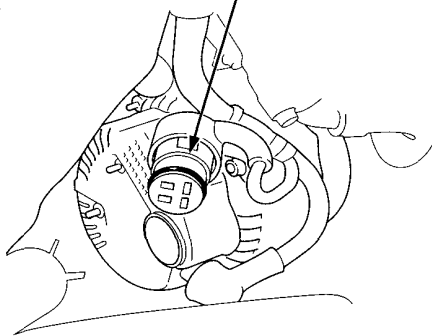
YES

Disconnect GRN connector from the ALT.

NO

Disconnect GRN connector from the ALT.

GRN CONNECTOR



Connect WHT/RED wire to body ground.

Check for continuity between D9 terminal and body ground.

Check for continuity between D9 terminal and body ground.

Is there continuity?

NO

See ALT inspection (section 23).

YES

Repair short in WHT/RED wire between ECM (D9) and ALT.

Is there continuity?

YES

NO

Repair open in WHT/RED wire between ECM (D9) and ALT.

See ALT inspection (section 23).

Idle Control System

Troubleshooting Flowchart — Automatic Transaxle (A/T) Gear Position Signal

This signals the ECM when the transmission is in **N** or **P** position.

Inspection of A/T Gear Position Signal.

Turn the ignition switch ON.

Observe the A/T gear position indicator and select each position separately.

Does the indicator light properly?

NO

See A/T gear position indicator inspection (section 23).

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors (see page 11-17). Disconnect "B" connector from the main wire harness only, not the ECM.

Turn the ignition switch ON.

Measure voltage between B7 (+) terminal and A26 (-) terminal.

Is there approx. 5 V?

NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.

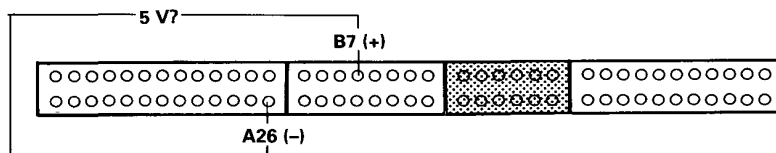
YES

Turn the ignition switch OFF.

Reconnect "B" connector to the main wire harness.

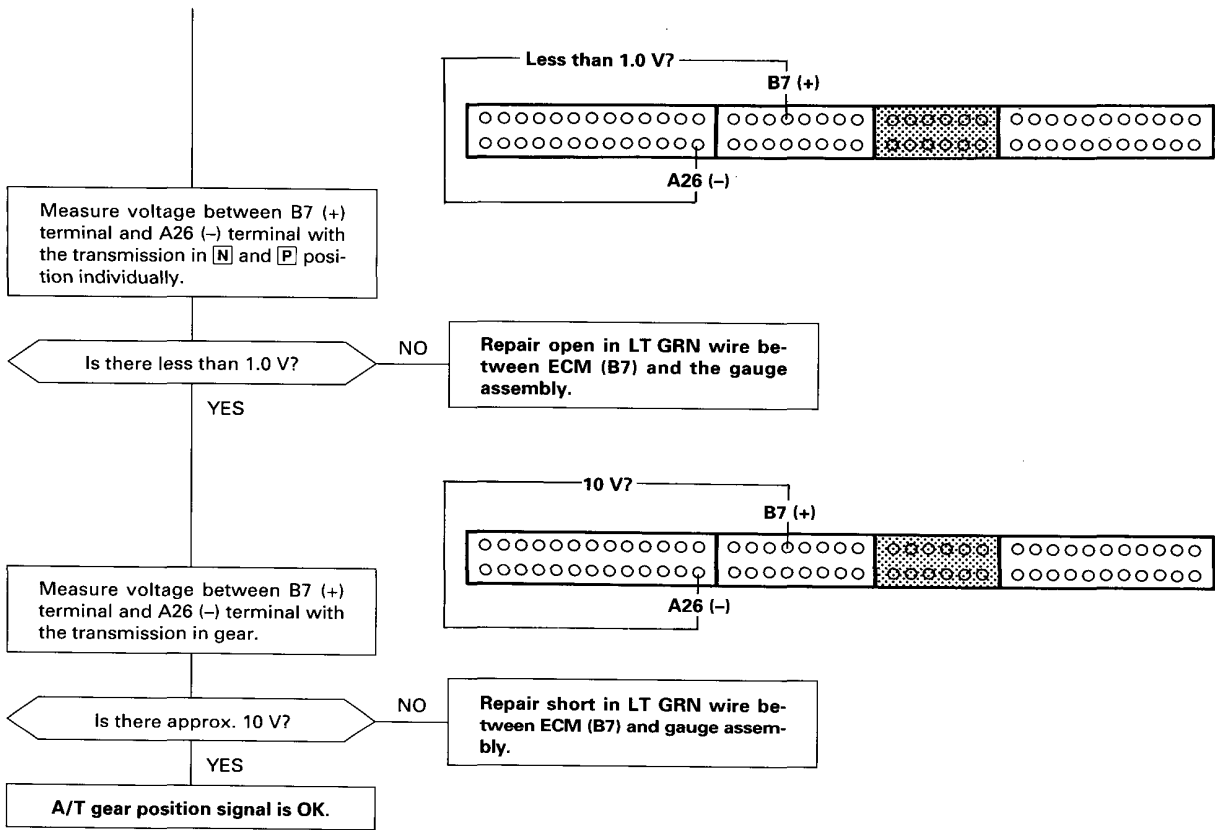
Turn the ignition switch ON.

(To page 11-67)





(From page 11-66)



Idle Control System

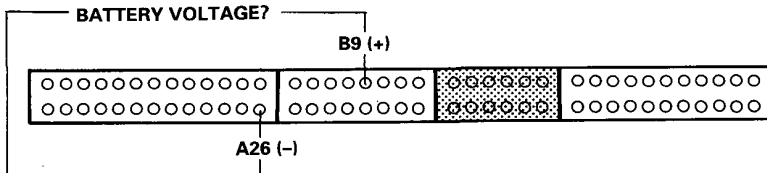
Troubleshooting Flowchart — Starter Switch Signal

This signals the ECM when the engine is cranking.

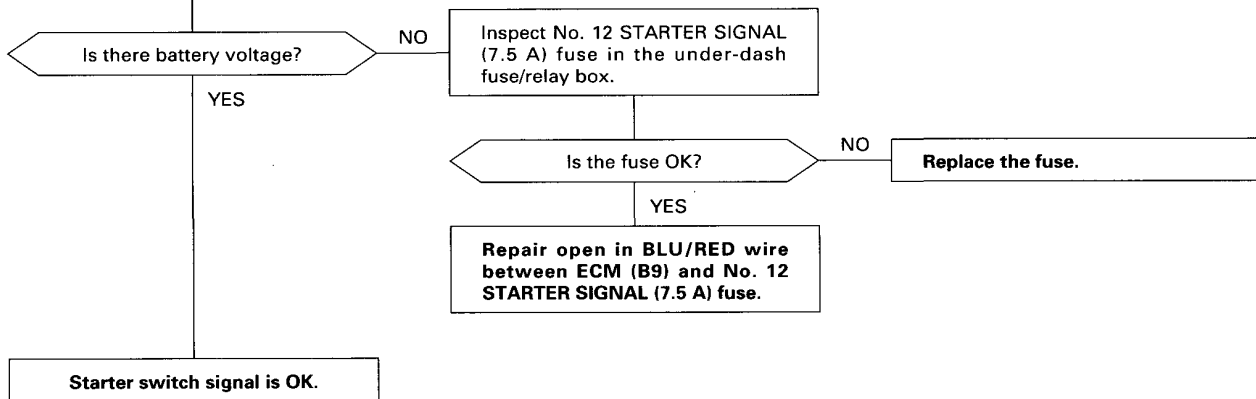
Inspection of Starter Switch Signal.

Connect the test harness between the ECM and connectors (see page 11-17).

Measure voltage between B9 (+) terminal and A26 (-) terminal with the ignition switch in the start position.



NOTE: Transmission in **N** or **P** position (A/T).



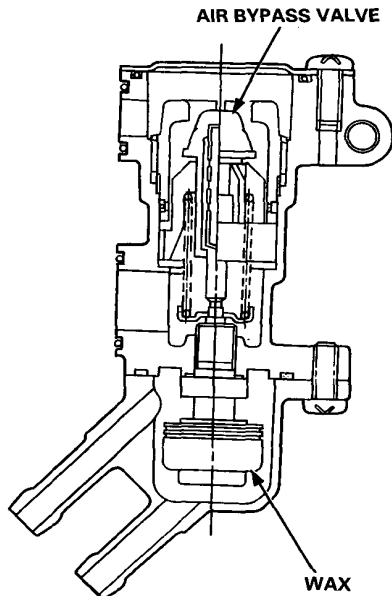
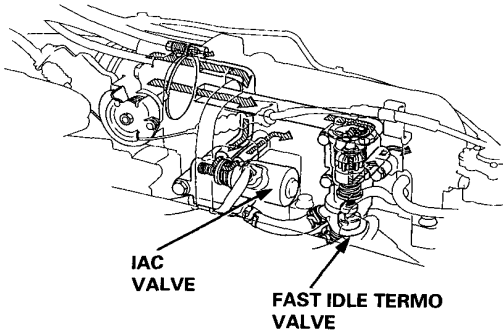


Idle Control System

Fast Idle Thermo Valve

Description

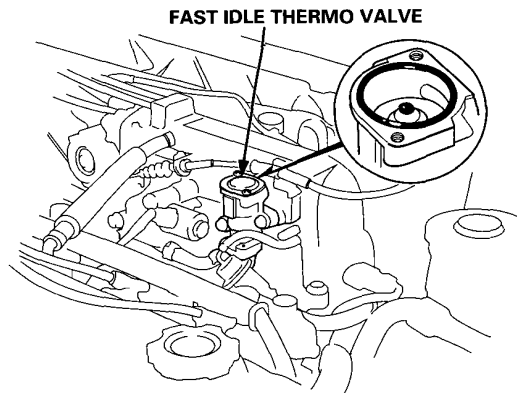
To prevent erratic running when the engine is warming up, it is necessary to raise the idle speed. The fast idle thermo valve is controlled by a thermowax plunger. When the engine is cold, the engine coolant surrounding the thermowax contracts the plunger, allowing additional air to be bypassed into the intake manifold so that the engine idles faster. When the engine reaches operating temperature, the valve closes, reducing the amount of air bypassing into the intake manifold.



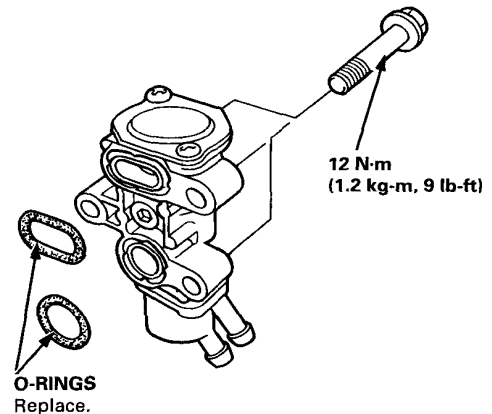
Inspection

NOTE: The fast idle thermo valve is factory adjusted; it should not be disassembled.

1. Start the engine.
2. Remove the cover of the fast idle thermo valve.
3. Put your finger on the valve seat area and make sure that there is air flow with the engine cold (engine coolant temperature below 86°F, 30°C) and idling.



- If not vacuum is felt, replace the fast idle thermo valve and retest.



4. Warm up the engine (the radiator fan comes on).
5. Check that the valve is completely closed. If not, air suction can be felt in the valve seat area.
 - If any suction is felt, the valve is leaking. Check engine coolant level and for air in the cooling system (see section 10). If OK, replace the fast idle thermo valve and recheck.

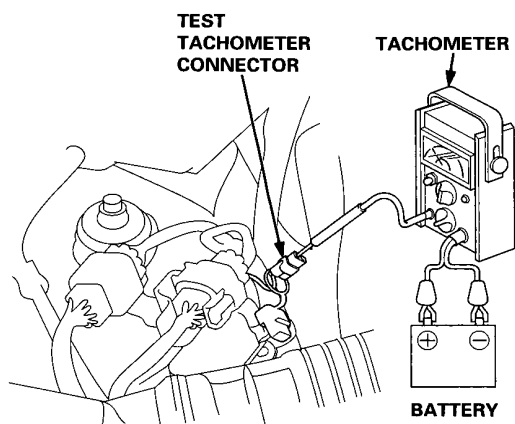


Idle Speed Setting

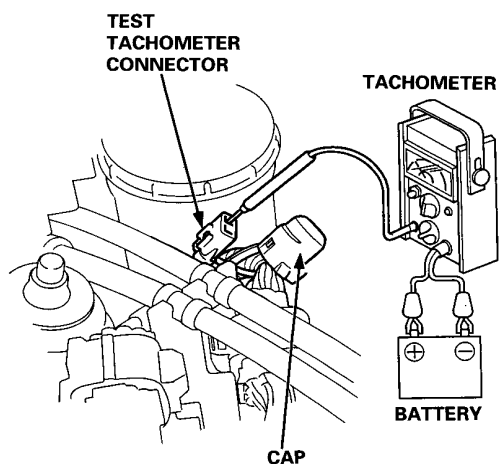
Inspection/Adjustment

1. Start the engine and warm it up to normal operating temperature (the radiator fan comes on).
2. Connect a tachometer.

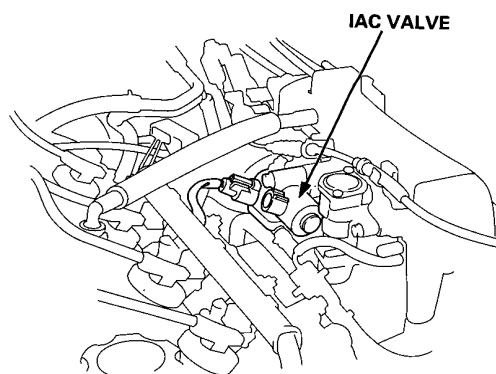
LHD:



RHD:



3. Disconnect the 2P connector from the Idle Air Control (IAC) valve.



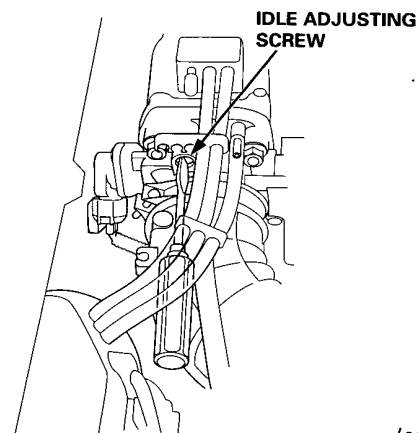
4. Start the engine with the accelerator pedal slightly depressed. Stabilize the engine speed at 1000 min⁻¹ (rpm), then slowly release the pedal until the engine idles.
5. Check idling in no-load conditions in which the headlights, blower fan, rear defogger, radiator fan, and air conditioner are not operating.

NOTE: (KS) Remove No. 10 (7.5 A) fuse in the under-dash fuse/relay box, then check that the headlights and side marker lights are off.

Idle speed should be:

M/T	620 ± 50 min ⁻¹ (rpm)
A/T	620 ± 50 min ⁻¹ (rpm) (in N or P position)

Adjust the idle speed, if necessary, by turning the idle adjusting screw.



(cont'd)

Idle Control System

Idle Speed Setting (cont'd)

6. Turn the ignition switch OFF.
7. Reconnect the 2P connector on the IAC valve, then remove BACK UP (7.5 A) fuse in the under-hood fuse/relay box for 10 seconds to reset ECM.
8. Restart and idle the engine with no-load conditions in which the headlights, blower fan, rear defogger, cooling fan, and air conditioner are not operating for one minute, then check the idle speed.

NOTE: (KS) Remove No. 10 (7.5 A) fuse in the under-dash fuse/relay box, then check that the headlights and side marker lights are off.

Idle speed should be:

M/T	770 ± 50 min ⁻¹ (rpm)
A/T	770 ± 50 min ⁻¹ (rpm) (in N or P position)

9. Idle the engine for one minute with headlights (Hi) and rear defogger ON and check the idle speed.

Idle speed should be:

M/T	770 ± 50 min ⁻¹ (rpm)
A/T	770 ± 50 min ⁻¹ (rpm) (in N or P position)

10. 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:

M/T	770 ± 50 min ⁻¹ (rpm)
A/T	770 ± 50 min ⁻¹ (rpm) (in N or P position)

NOTE: If the idle speed is not within specification, see System Troubleshooting Guide on page 11-56.

Fuel Supply System

System Troubleshooting Guide



NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SUB-SYSTEM	FUEL INJECTOR	INJECTOR RESISTOR	FUEL PRESSURE REGULATOR	FUEL FILTER	FUEL PUMP	PGM-FI MAIN RELAY	CONTAMINATED FUEL
	SYMPTOM	11-75	11-79	11-80	11-81	11-82	11-86	*
	ENGINE WON'T START	③	③		③	①	②	③
	DIFFICULT TO START ENGINE WHEN COLD OR HOT			③	②			①
	ROUGH IDLE	①	②					③
FREQUENT STALLING	WHILE WARMING UP			①				
	AFTER WARMING UP			①				
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING	①	②	③				③
	FAILS EMISSION TEST	②	③	①				
	LOSS OF POWER	③	③		①	③		②

*Fuel with dirt, water or a high percentage of alcohol is considered contaminated.

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, injector resistor, fuel hoses and fuel pipes.

This system delivers pressure-regulated fuel to the fuel injectors and cuts the fuel delivery when the engine is not fuel running.

Fuel Pressure

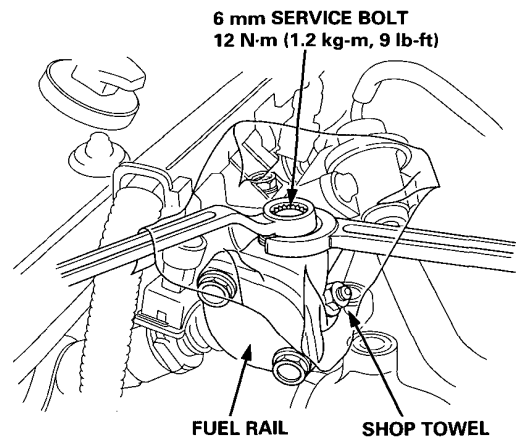
Relieving

⚠ 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 engine is off.**

NOTE: Before disconnecting fuel pipes or hoses, release pressure from the system by loosening the 6 mm service bolt at the fuel rail.

1. Disconnect the battery negative cable from the battery negative terminal.
2. Remove fuel fill cap.
3. Use a box end wrench on the 6 mm service bolt at the fuel rail, while holding the special banjo bolt with another wrench.
4. Place a rag or shop towel over the 6 mm service bolt.
5. Slowly loosen the 6 mm service bolt one complete turn.



NOTE:

- A fuel pressure gauge can be attached at the 6 mm service bolt hole.
- Always replace the washer between the service bolt and the special banjo bolt, whenever the service bolt is loosened to relieve fuel pressure.
- Replace all washers whenever the bolts are removed to disassemble parts.



Fuel Injectors

Inspection

1. Relieve fuel pressure (see page 11-74).
2. Remove the service bolt on the fuel rail while holding the banjo bolt with another wrench and attach the fuel pressure gauge.
3. Start the engine*. Measure the fuel pressure with the engine idling and vacuum hose of the pressure regulator disconnected from the fuel pressure regulator and pinched.

Pressure should be:

280 — 330 kPa (2.8 — 3.3 kg/cm², 40 — 47 psi)

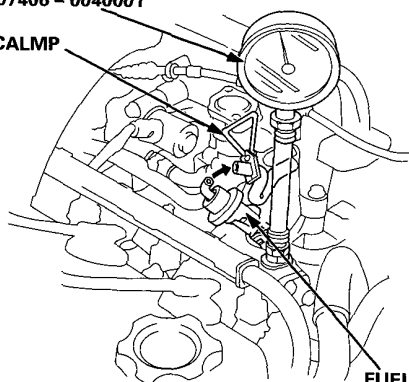
4. Reconnect vacuum hose to the fuel pressure regulator.

Pressure should be:

220 — 270 kPa (2.2 — 2.7 kg/cm², 30 — 38 psi)

FUEL PRESSURE GAUGE
07406 - 0040001

CALMP



FUEL
PRESSURE
REGULATOR

*: If the engine will not start, turn the ignition switch on, wait for two seconds, turn it off, then back on again and read the fuel pressure.

- If the fuel pressure is not as specified, first check the fuel pump (see page 11-83). If the fuel pump is OK, check the following.

— If the pressure is higher than specified, inspect for:

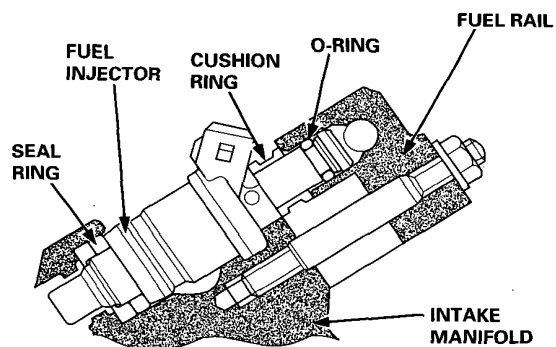
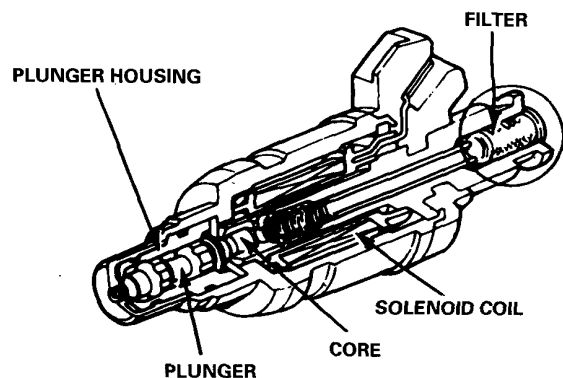
- Pinched or clogged fuel return hose or piping.
- Faulty fuel pressure regulator (see page 11-80).

— If the fuel pressure is lower than specified, inspect for:

- Clogged fuel filter.
- Faulty fuel pressure regulator (see page 11-80).
- Leakage in the fuel hoses or pipes.

Description

The fuel injectors are a solenoid-actuated constant-stroke pintle type consisting of a solenoid, plunger needle valve and housing. When current is applied to the solenoid coil, the valve lifts up and pressurized fuel is injected. Because the needle valve lift and the fuel pressure are constant, the injection quantity is determined by the length of time that the valve is open (i.e., the duration the current is supplied to the solenoid coil). The fuel injector is sealed by an O-ring and seal ring at the top and bottom. These seals also reduce operating noise.



(cont'd)

Fuel Supply System

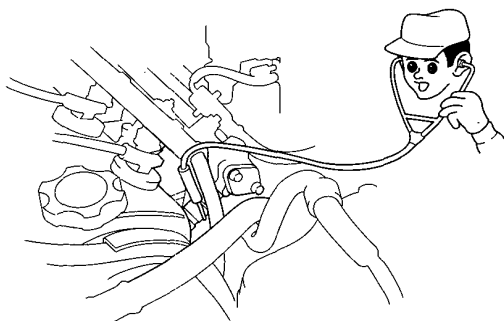
Fuel Injectors (cont'd)

Testing

NOTE: Check the following items before testing: idle speed, ignition timing and idle CO %

If the engine will run:

1. With the engine idling, disconnect each fuel injector connector individually and inspect the change in the idle speed.
 - If the idle speed drop is almost the same for each cylinder, the fuel injectors are normal.
 - If the idle speed or quality remains the same when you disconnect a particular fuel injector, replace the fuel injector and retest.
2. Check the clicking sound of each fuel injector by means of a stethoscope when the engine is idling.



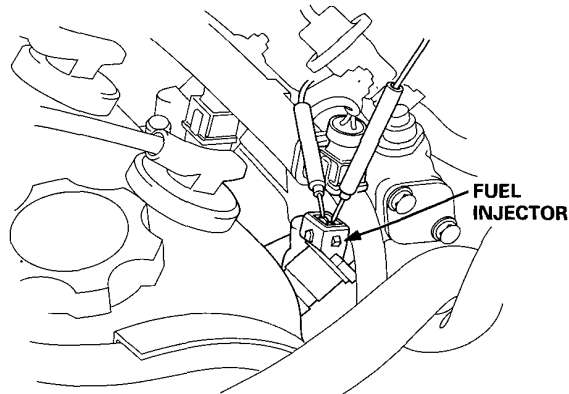
- If any fuel injector fails to make the typical clicking sound, check the sound again after replacing the fuel injector.
- If clicking sound is still absent, check the following.
- Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and the fuel injector.
 - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM.

If all is OK, check the ECM (see page 11-22) and PGM-FI main relay (see page 11-86).

If the engine cannot be started:

1. Remove the connector of the fuel injector, and measure the resistance between the 2 terminals of the fuel injector.

Resistance should be: 1.5 — 2.5 Ω



- If the resistance is not as specified, replace the fuel injector.
- If the resistance is as specified, check the pressure (see page 11-75).
 - If the fuel pressure is as specified, check the following:
 - Whether there is any short-circuiting, wire breakage or poor connection in the YEL/BLK wire between the PGM-FI main relay and the fuel injector.
 - Whether there is any short-circuiting, wire breakage or poor connection in the wire between the fuel injector and the ECM.

If all is OK, check the ECM (see page 11-22).



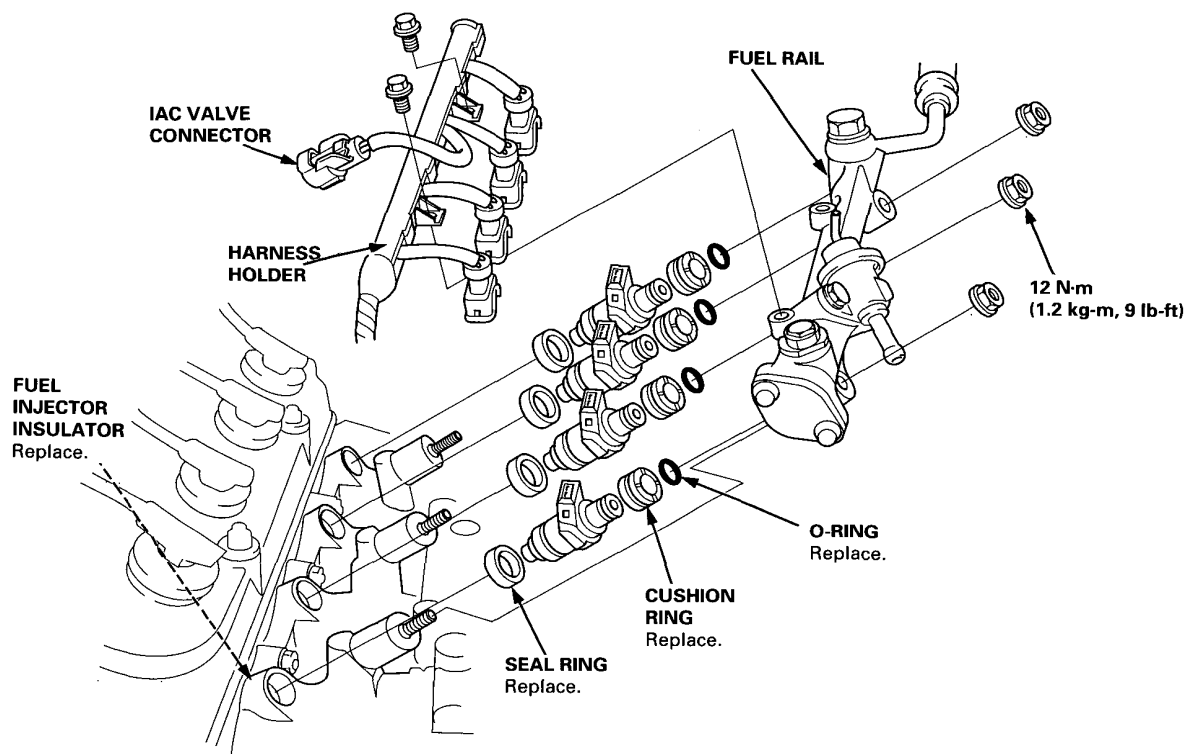
Replacement

▲ WARNING Do not smoke when working on the fuel system. Keep open flames away from your work area.

1. Relieve fuel pressure (see page 11-74).
2. Disconnect the connectors from the fuel injectors and IAC valve.
3. Disconnect the vacuum hose and fuel return hose from the fuel pressure regulator.

NOTE: Place a rag or shop towel over the hoses before disconnecting them.

4. Disconnect the fuel hose from the fuel rail.
5. Loosen the retainer nuts on the fuel rail and harness holder.
6. Disconnect the fuel rail.
7. Remove the fuel injectors from the intake manifold.



8. Slide new cushion rings onto the fuel injectors.
9. Coat new O-rings with clean engine oil and put them on the fuel injectors.
10. Insert the fuel injectors into the fuel rail first.
11. Coat new seal rings with clean engine oil and press them into the intake manifold.

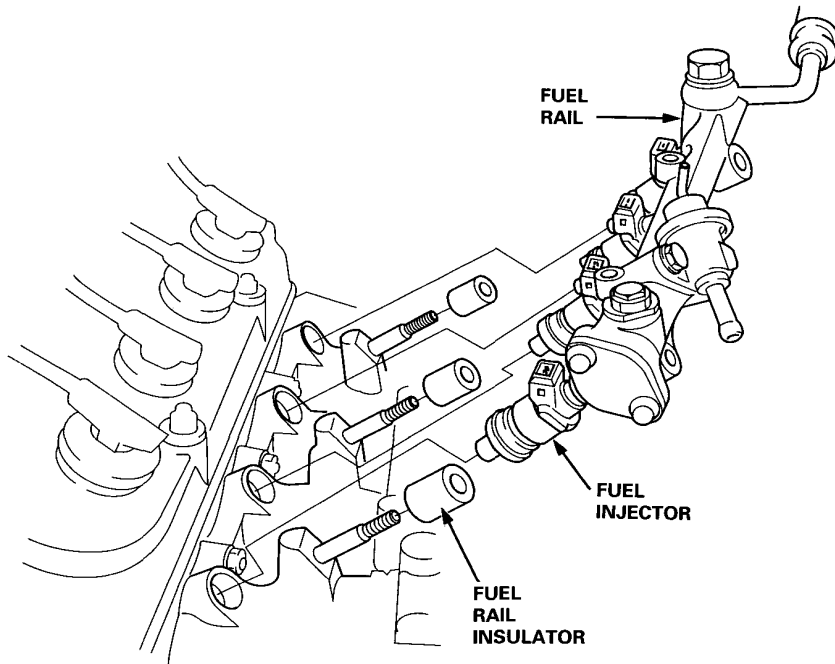
(cont'd)

Fuel Supply System

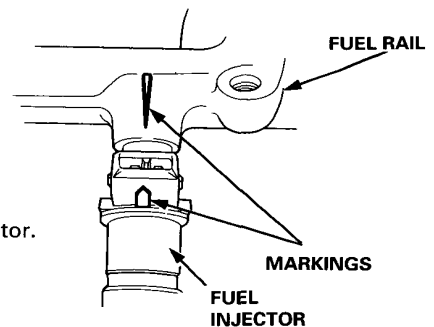
Fuel Injectors (cont'd)

12. 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.



13. Align the center line on the connector with the mark on the fuel rail.
14. Install and tighten the retainer nuts.
15. Connect the fuel hose to the fuel rail with new washers.
16. Connect the vacuum hose and fuel return hose to the fuel pressure regulator.
17. Install the connectors on the fuel injectors and IAC valve.
18. Replace the 6 mm service bolt washer and tighten the bolt.



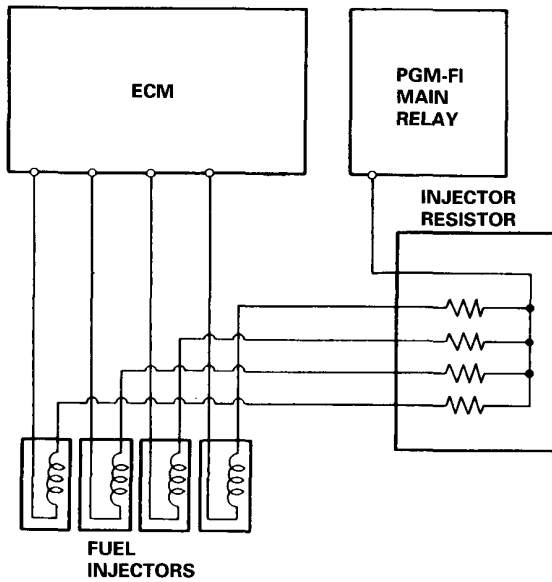
19. Turn the ignition switch ON, but do not operate the starter. After the fuel pump runs for approximately two seconds, the fuel pressure in the fuel line rises. Repeat this two or three times, then check whether there is any fuel leakage.



Injector Resistor

Description

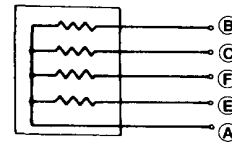
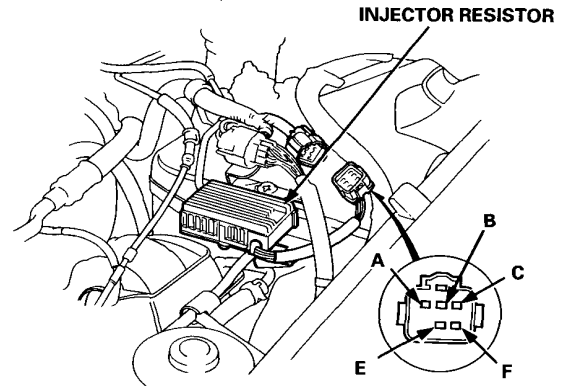
The injector resistor lowers the current supplied to the fuel injectors to prevent damage to the fuel injector coils. This allows a faster response time of the fuel injectors.



Testing

1. Disconnect the injector resistor connector.
2. Check for resistance between each of the injector resistor terminals (F, E, C and B) and the power terminal (A).

Resistance should be: 5 — 7 Ω



- Replace the injector resistor with a new one if any of the resistances are outside of the specification.

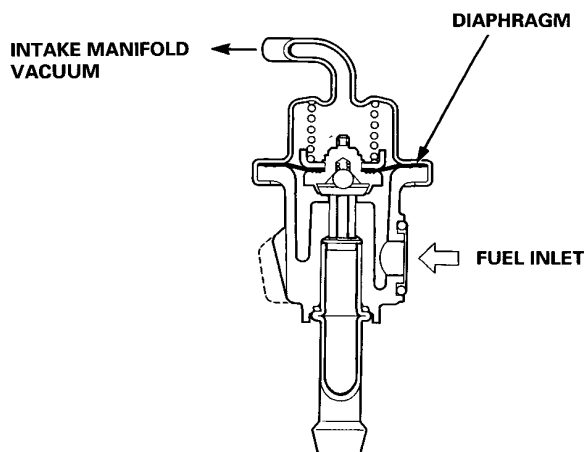
Fuel Supply System

Fuel Pressure Regulator

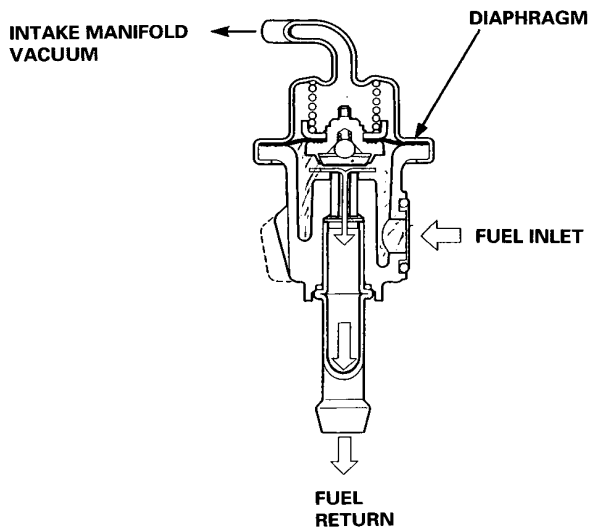
Description

The fuel pressure regulator maintains a constant fuel pressure to the fuel injectors. When the difference between the fuel pressure and manifold pressure exceeds 300 kPa (3.0 kg/cm², 43 psi) the diaphragm is pushed upward, and the excess fuel is fed back into the fuel tank through the return line.

CLOSED:



OPEN:



Testing

⚠ WARNING Do not smoke during the test. Keep open flames away from your work area.

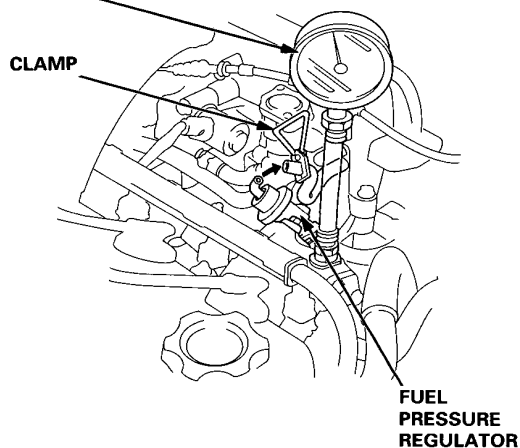
1. Attach a fuel pressure gauge to the service port of the fuel rail (see page 11-74). Start the engine and allow it to idle.

Pressure should be:

280 — 330 kPa (2.8 — 3.3 kg/cm², 40 — 47 psi)

(with the fuel regulator vacuum hose disconnected and pinched)

**FUEL PRESSURE GAUGE
07406 - 0040001**



2. Reconnect the vacuum hose to the fuel pressure regulator.
3. Check that the fuel pressure rises when the vacuum hose from the fuel regulator is disconnected again.
 - If the fuel pressure did not rise, replace the fuel pressure regulator.



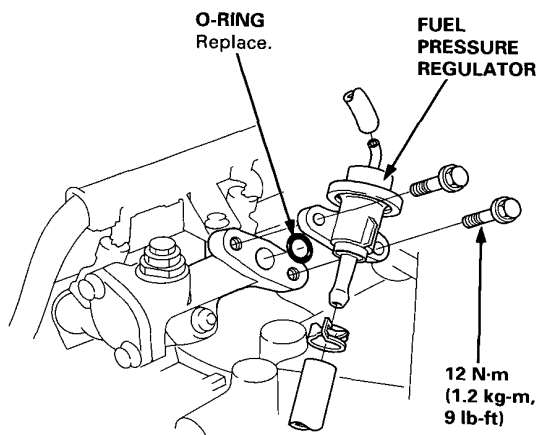
Replacement

⚠ WARNING Do not smoke while working on fuel system. Keep open flame away from your work area.

1. Place a shop towel under fuel pressure regulator, then relieve fuel pressure (see page 11-74).
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.



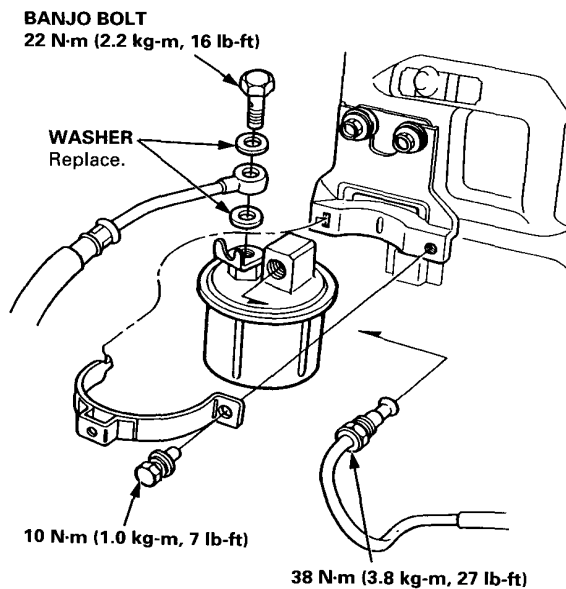
Fuel Filter

Replacement

⚠ WARNING Do not smoke while working on fuel system. Keep open flame away from your work area.

The filter should be replaced: every 2 years or 40,000 km (24,000 miles), whichever comes first or whenever the fuel pressure drops below the specified value (280 — 330 kPa, 2.8 — 3.3 kg/cm², 40 — 48 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. Disconnect the battery negative cable from the battery negative terminal.
2. Place a shop towel under and around the fuel filter.
3. Relieve fuel pressure (see page 11-74).
4. Remove the 12 mm banjo bolt and the fuel feed pipe from the fuel filter.
5. Remove the fuel filter clamp and fuel filter.
6. When assembling, use new washers, as shown.



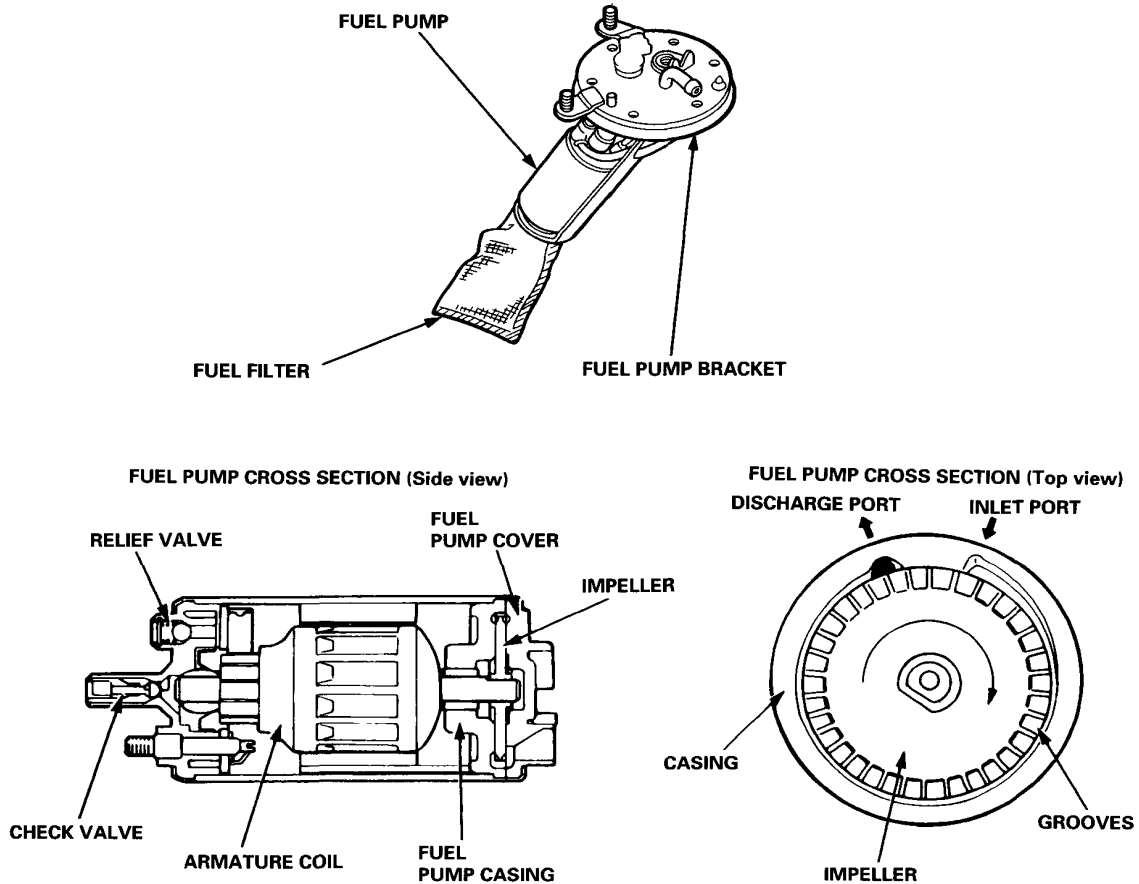
CAUTION: Clean the flared joint of high pressure hoses thoroughly before reconnecting them.

Fuel Supply System

Fuel Pump

Description

Because of its compact impeller design, the fuel pump (FP) is installed inside the fuel tank, thereby saving space and simplifying the fuel line system.



The fuel pump is comprised of a DC motor, a circumference flow pump, a relief valve for protecting the fuel line systems, a check valve for retaining residual pressure, an inlet port, and a discharge port. The fuel pump assembly consists of the impeller (driven by the motor), the fuel pump casing (which forms the pumping chamber), and the fuel pump cover.

OPERATION

- (1) When the engine is started, the PGM-FI main relay actuates the fuel pump, and the motor turns together with the impeller. Differential pressure is generated by the numerous grooves around the impeller.
- (2) Fuel entering the inlet port flows inside the motor from the pumping chamber and is forced through the discharge port via the check valve. If fuel flow is obstructed at the discharge side of the fuel line, the relief valve will open to bypass the fuel to the inlet port and prevent excessive fuel pressure.
- (3) When the engine stops, the fuel pump stops automatically. However, a check valve closes by spring action to retain the residual pressure in the line, helping the engine to restart more easily.



Testing

⚠ WARNING Do not smoke during the test. Keep open flame away from your work area.

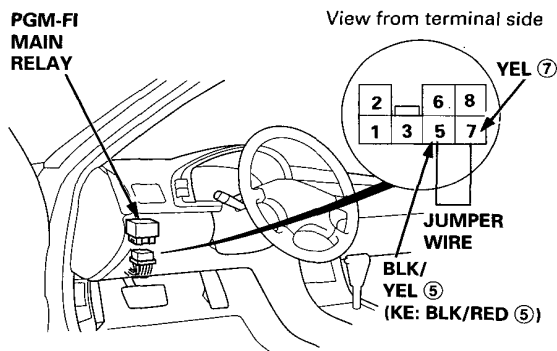
If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON, you will hear some noise if you hold your ear to the fuel fill port with the fuel fill cap removed. The fuel pump should run for two seconds, when ignition switch is first turned on. If there is no noise at the fuel fill pipe, check as follows:

NOTE: (KE) After an impact, the inertia switch must be reset by pressing the button before the testing.

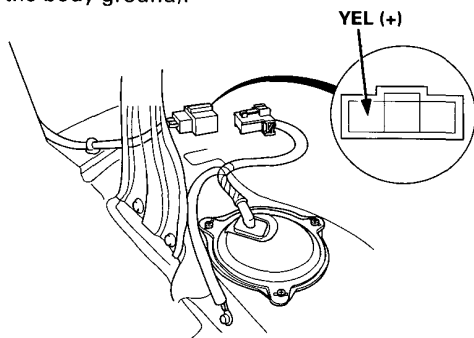
1. Remove the rear seat (see section 20).
2. Disconnect the 3P connector in the trunk or the cargo area.

CAUTION: Be sure to turn the ignition switch OFF before disconnecting the wires.

3. Disconnect the PGM-FI main relay connector and connect the BLK/YEL ⑤ (KE: BLK/RED ⑤) wire and YEL ⑦ wire with a jumper wire.



4. Check that battery voltage is available at the fuel pump connector when the ignition switch is turned ON (positive probe to the YEL wire, negative probe to the body ground).



[Except KE]:

- If battery voltage is available, replace the fuel pump.
- If there is no voltage, check the fuel pump ground and wire harness (see page 11-88).

[KE]:

- If battery voltage is available, replace the fuel pump.
 - If there is no voltage, replace the inertia switch.
- If there is voltage is available, replace the fuel pump.
- If there is no voltage, check the fuel pump ground and wire harness (see page 11-88).

(cont'd)

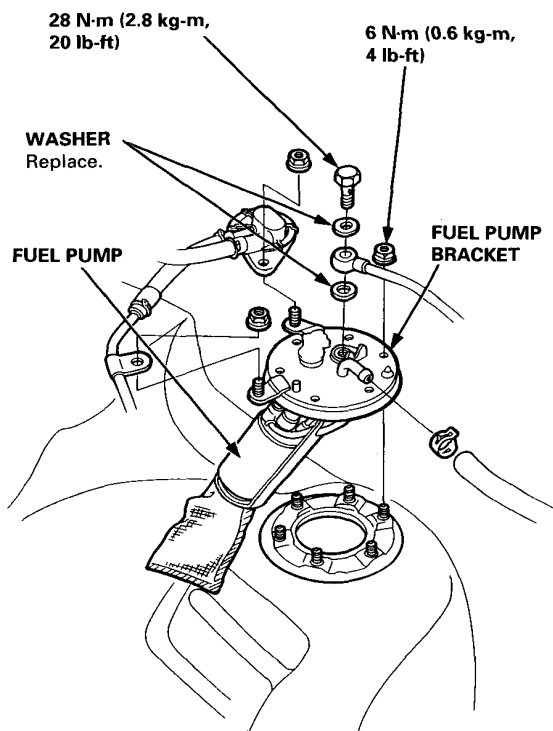
Fuel Supply System

Fuel Pump (cont'd)

Replacement

⚠ WARNING Do not smoke while working on fuel system. Keep open flames away from your work area.

1. Remove the fuel tank (see page 11-91).
2. Remove the fuel pump mounting nuts.
3. Remove the fuel pump from the fuel tank.



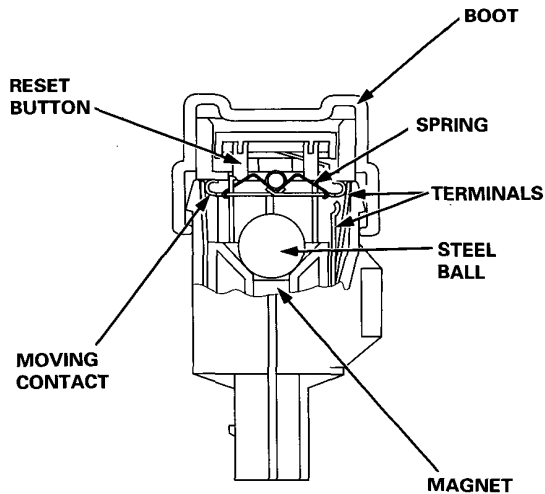


Inertia Switch [KE only]

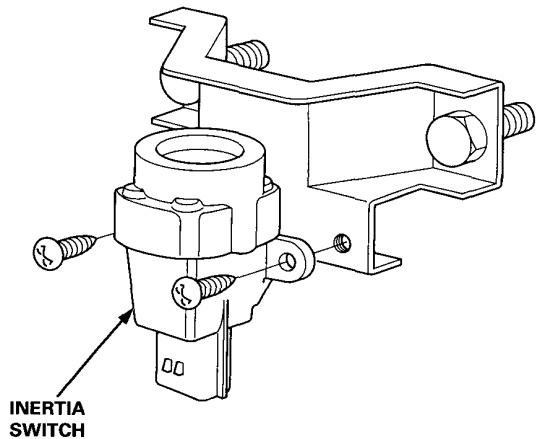
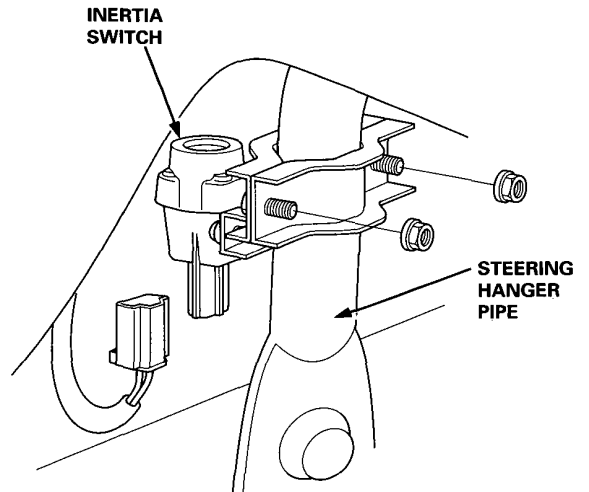
Description

The inertia switch is a safety device which automatically cuts off the fuel supply in the event of a collision or sudden impact.

The switch is located behind the front ashtray on the right-hand side. After an impact, the switch must be reset by pressing the button before the engine can be restarted.



Replacement



Fuel Supply System

PGM-FI Main Relay

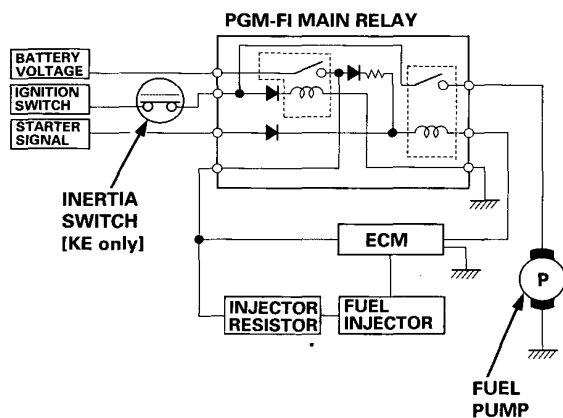
Description

This relay is located at the left side (RHD: right side) of the cowl.

The PGM-FI main relay actually contains two individual relays.

One relay is energized whenever the ignition is on which supplies the battery voltage to the ECM, power to the fuel injectors, and power for the second relay.

The second relay is energized for 2 seconds when the ignition is switched on, and when the engine is running which supplies power to the fuel pump.

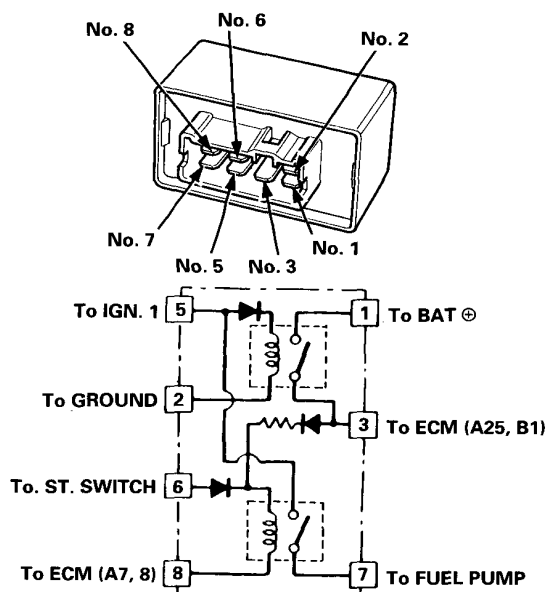


Relay Testing

NOTE: If the car starts and continues to run, the PGM-FI main relay is OK.

1. Remove the PGM-FI main relay.
2. Attach the battery positive terminal to the No. 6 terminal and the battery negative terminal to the No. 8 terminal of the PGM-FI main relay. Then check for continuity between the No. 5 terminal and No. 7 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. 2 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 1 terminal and No. 3 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. 3 terminal and the battery negative terminal to the No. 8 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 5 terminal and No. 7 terminal of the PGM-FI main relay.

- If there is continuity, the PGM-FI main relay is OK.
- If there is no continuity, replace the PGM-FI main relay and retest.

(cont'd)



Fuel Supply System

PGM-FI Main Relay (cont'd)

Troubleshooting Flowchart

— Engine will not start.
— Inspection of PGM-FI main relay and relay harness.

NOTE: The inertia switch must be reset by pressing the button (KE only).

Disconnect the PGM-FI main relay connector.

Check for continuity between BLK terminal ② and body ground.

Is there continuity?

NO
Repair open in BLK wire between PGM-FI main relay and G101 (located at thermostat housing).

YES
Measure the voltage between YEL/BLU (+) terminal ① and body ground.

Is there battery voltage?

NO
— Replace the ECM (ECM) (10 A) fuse in the under-hood fuse/relay box.
— Repair open in the YEL/BLU wire between the PGM-FI main relay and the ECM (ECM) (10 A) fuse.

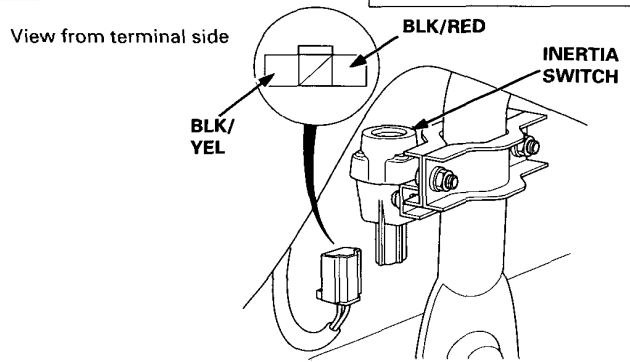
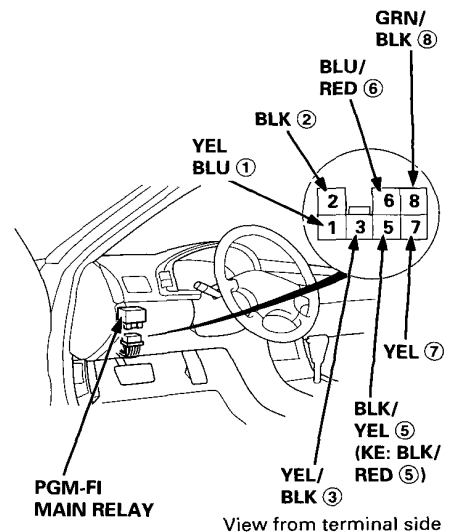
YES
Turn the ignition switch ON.

Measure the voltage between BLK/YEL (+) terminal ⑤ and body ground.

Is there battery voltage?

KE only:
Disconnect the 3P connector from the inertia switch.
Measure the voltage between BLK/YEL (+) terminal and BLK/RED (-) terminal.
Is there voltage?
YES
Replace the inertia switch.

— Replace the No. 2 ECU (ECM) (15 A) fuse in the under-dash fuse/relay box.
— Repair open in the BLK/YEL wire between the PGM-FI main relay (KE: inertia switch) and the No. 2 ECU (ECM) (15 A) fuse.
— Repair open in the BLK/RED wire between the PGM-FI main relay and inertia switch (KE only).



(To page 11-89)



(From page 11-88)

Turn the ignition switch to the START position.

Measure the voltage between BLU/RED (+) terminal ⑥ and body ground.

Is there battery voltage?

NO

NOTE: A/T: Transmission in **N** or **P** position.

- Replace the No. 12 STARTER SIGNAL (7.5 A) fuse in the under-dash fuse/relay box.
- Repair open in the BLU/RED wire between the PGM-FI main relay and the No. 12 STARTER SIGNAL (7.5 A) fuse.

YES

Turn the ignition switch OFF.

Connect the test harness between the ECM and connectors. Disconnect "A" connector from the ECM only, not the main wire harness (see page 11-17).

Check for continuity between GRN/BLK terminal ⑧ and the following terminals; A7, A8.

Is there continuity?

NO

- Repair open in GRN/BLK wire between ECM (A7, A8) and PGM-FI main relay.

YES

Reconnect "A" connector to the ECM.

Connect the PGM-FI main relay connector.

Turn the ignition switch ON.

Measure the voltage between A23 (-) terminal and the following terminals; A25 (+), B1 (+).

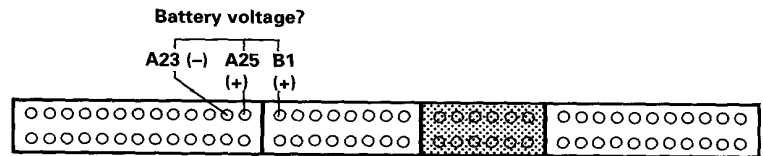
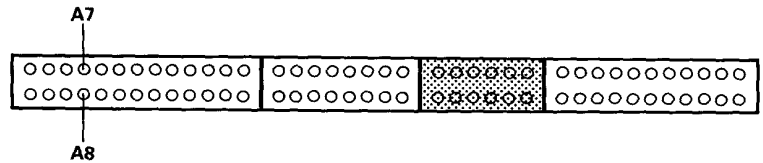
Is there battery voltage?

NO

- Repair open in the YEL/BLK wire ③ between the ECM (A25, B1) and PGM-FI main relay.
- Replace the PGM-FI main relay.

YES

(To page 11-90)

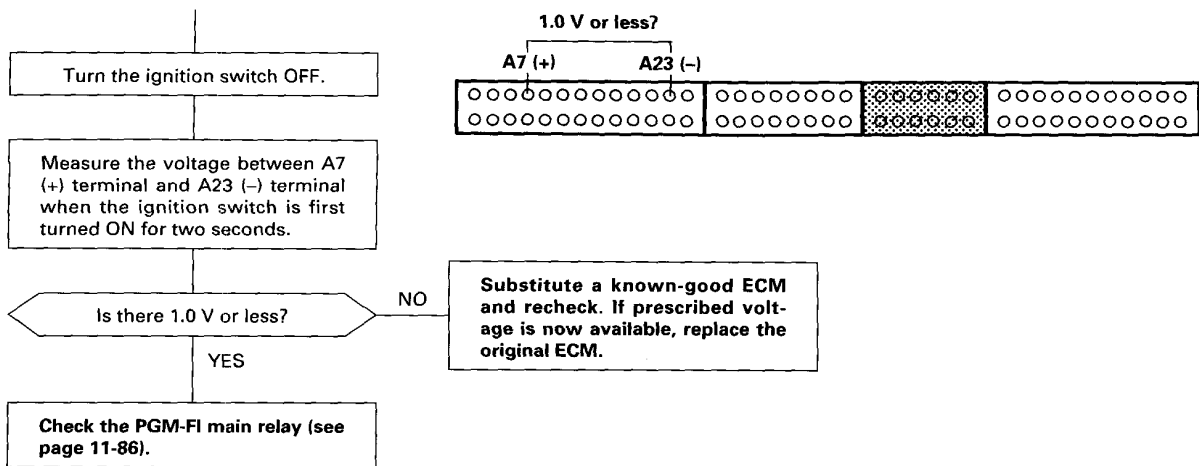


(cont'd)

Fuel Supply System

PGM-FI Main Relay (cont'd)

(From page 11-89)





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 11-74).
2. Block front wheels. Jack up the rear of the car and support with jackstands.
3. Remove the drain bolt and drain the fuel into an approved container.
4. Disconnect the 3P connector in the trunk.
5. Remove the evaporative emission (EVAP) two way valve cover and fuel hose protector.
6. Disconnect the hoses.

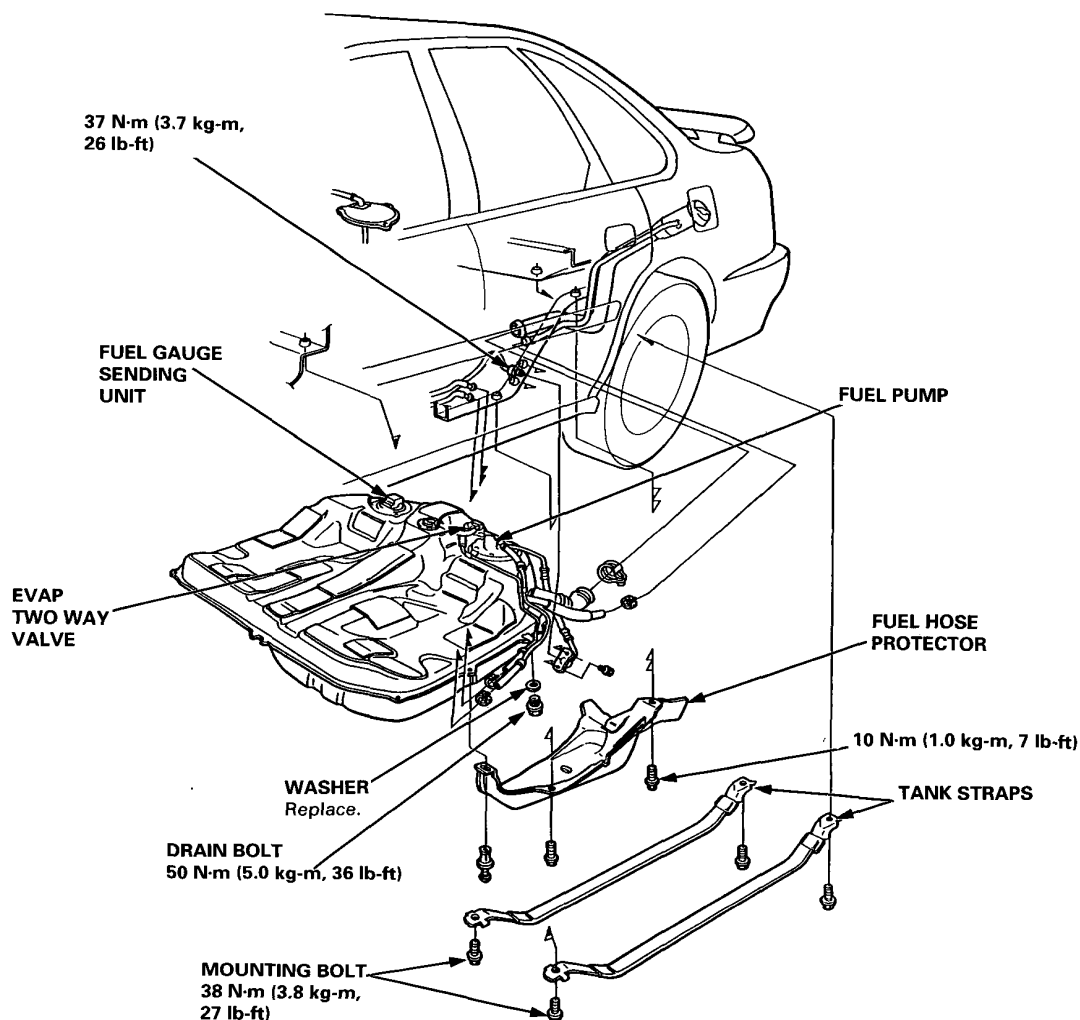
CAUTION:

- 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.

7. Place jack, or other support, under the tank.
8. Remove the mounting bolts and let the straps fall free.
9. Remove the fuel tank.

NOTE: The tank may stick on the undercoat applied to its mount. To remove, carefully pry it off the mount.

10. Install a new washer on the drain bolt, then install parts in the reverse order of removal.



Fuel Supply System

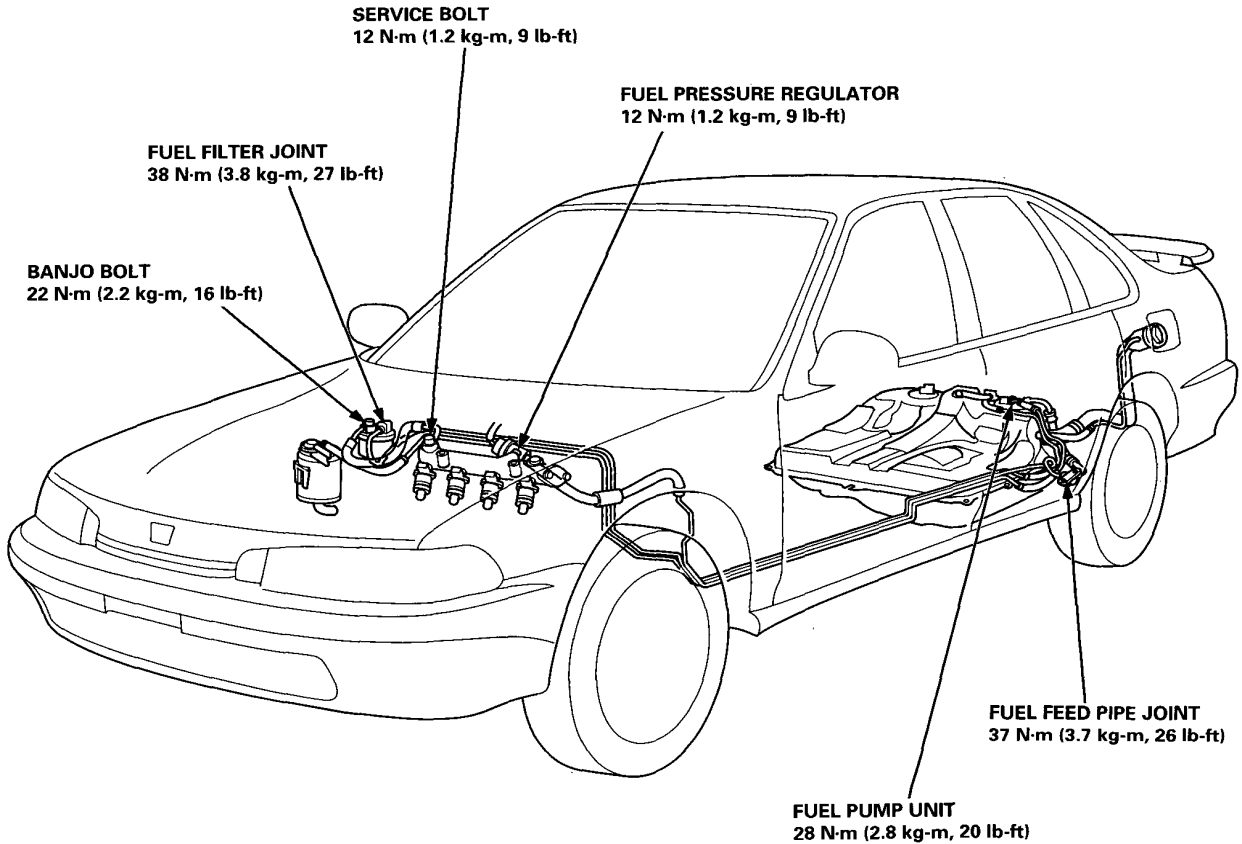
Fuel Hoses and Fuel Pipes

Inspection

1. Inspect the fuel hoses for damage, leaks, interference or twisting.
2. Check the fuel lines for damage, tipping, rusting or leakage. Also check for bent fuel lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.

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.



Intake Air System



System Troubleshooting Guide

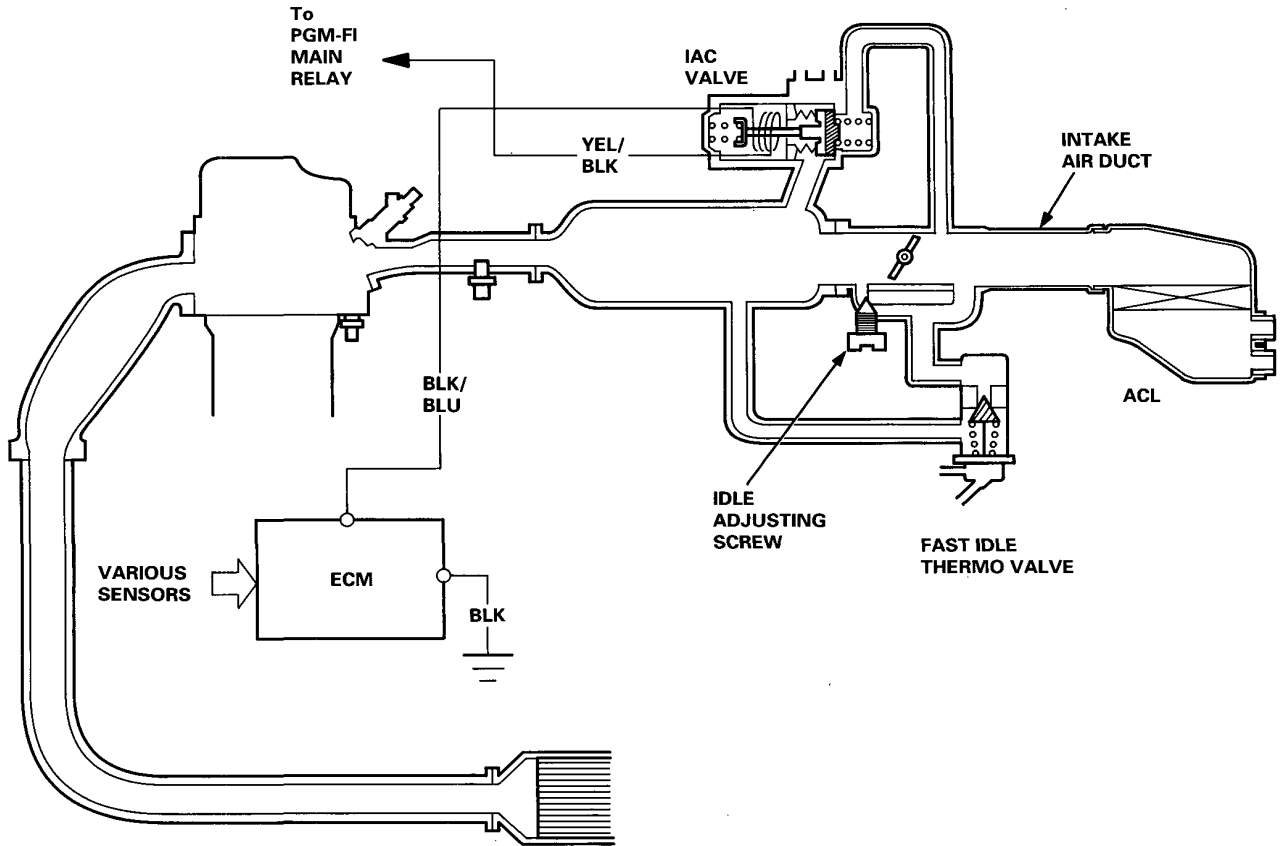
NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are ranked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of that column. If inspection shows the system is OK, try the next system ②, etc.

PAGE	SUB-SYSTEM	THROTTLE CABLE	THROTTLE BODY	AIR CLEANER AND INTAKE AIR DUCT
		11-96	11-97	11-95
	WHEN WARM IDLE SPEED TOO HIGH	②	①	
	LOSS OF POWER		①	②

Intake Air System

System Description

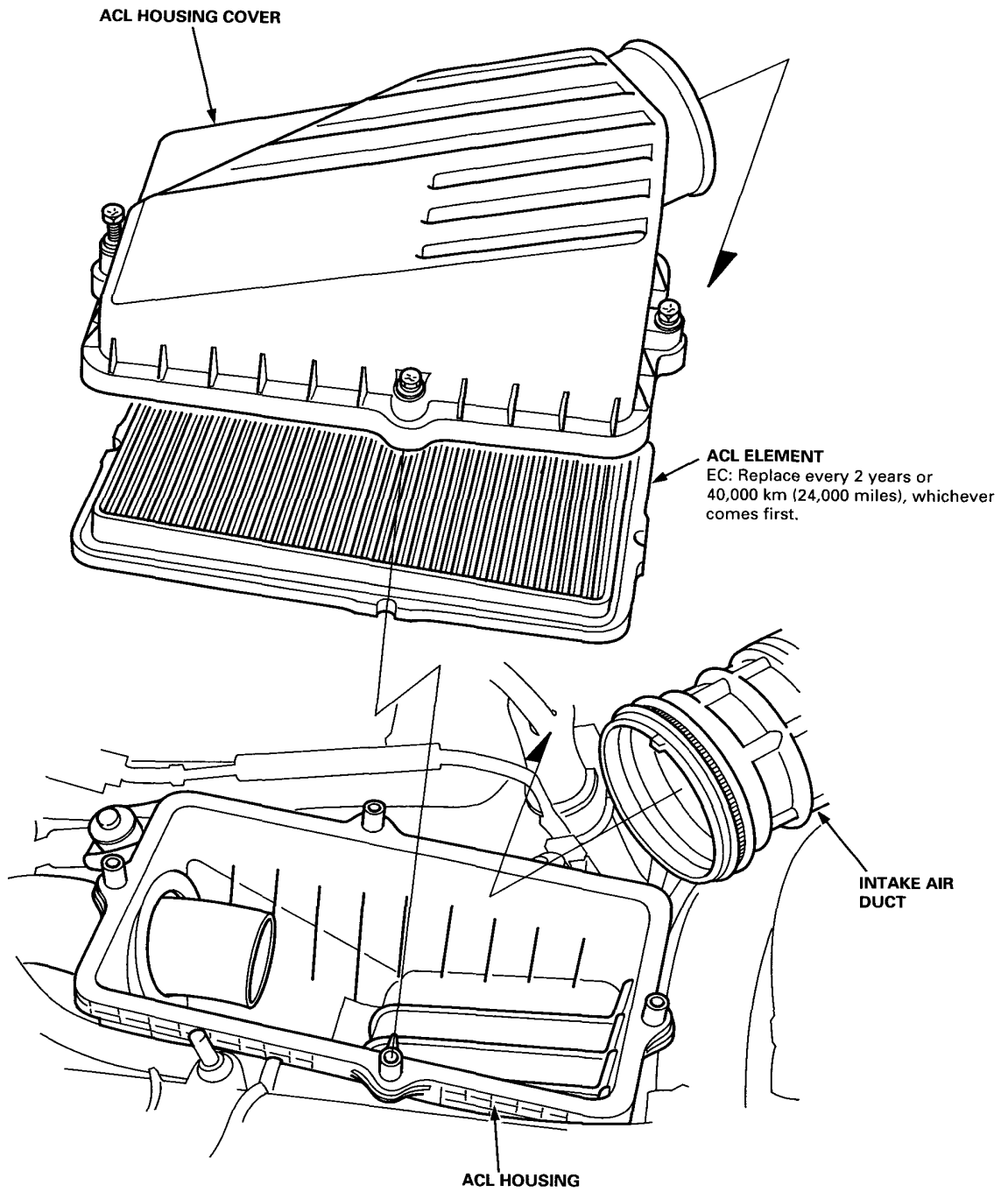
The system supplies air for all engine needs. It consists of the Air Cleaner (ACL), air intake duct, Throttle Body (TB), Idle Air Control (IAC) valve, fast idle thermo valve and intake manifold. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.





Air Cleaner (ACL)

Air Cleaner (ACL) Element Replacement

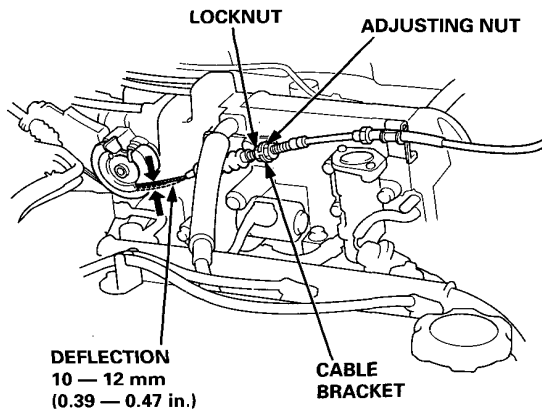


Intake Air System

Throttle Cable

Inspection/Adjustment

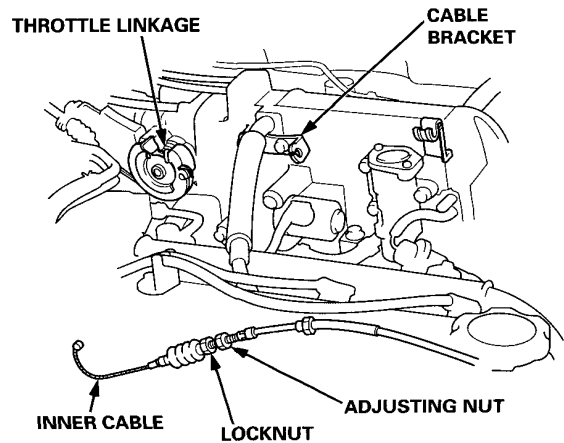
1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Check cable free play at the throttle linkage. Cable deflection should be 10 — 12 mm (0.39 — 0.47 in.)



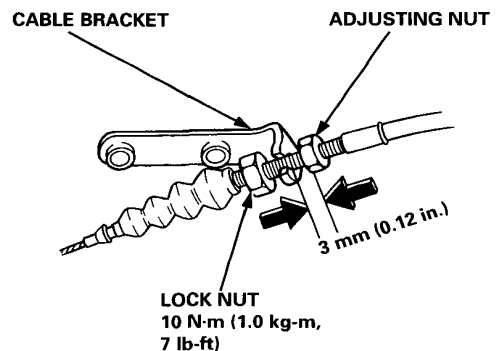
4. If deflection is not within specs, loosen the locknut, turn the adjusting nut until the deflection is as specified, then retighten the locknut.
5. With the cable properly adjusted, check the throttle valve to be sure it opens fully when you push the accelerator pedal to the floor. Also check the throttle valve to be sure it returns to the idle position whenever you release the accelerator pedal.

Installation

1. Fully open the throttle valve, then install the throttle cable in the throttle linkage and install the cable housing in the cable bracket.
2. Warm up the engine to normal operating temperature (the radiator fan comes on).



3. Hold the cable sheath, removing all slack from the cable.
4. Turn the adjusting nut until it is 3 mm (0.12 in.) away from the cable bracket.
5. Tighten the locknut. The cable deflection should now be 10 — 12 mm (0.39 — 0.47 in.). If not, see inspection/adjustment.

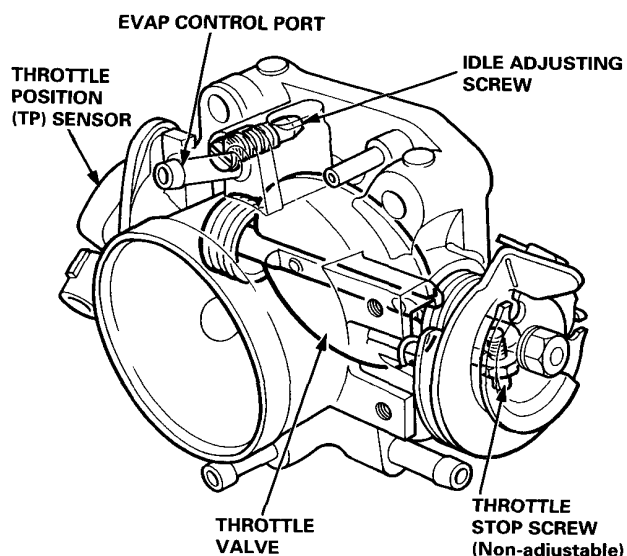




Throttle Body

Description

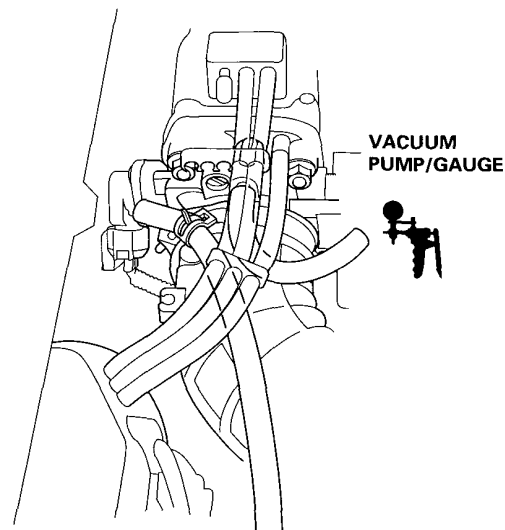
The throttle body is of the single-barrel side-draft type. The lower portion of the throttle valve is heated by engine coolant which is fed from the cylinder head. The idle adjusting screw which increases/decreases bypass air and the evaporative emission (EVAP) control canister port are located on the top of the throttle body.



Inspection

CAUTION: Do not adjust the throttle stop screw. It is preset at the factory.

1. Start the engine and allow to reach normal operating temperature (the radiator fan comes on).
2. Disconnect the vacuum hose (to the EVAP control canister) from the top of the throttle body; connect a vacuum pump/gauge to the throttle body.



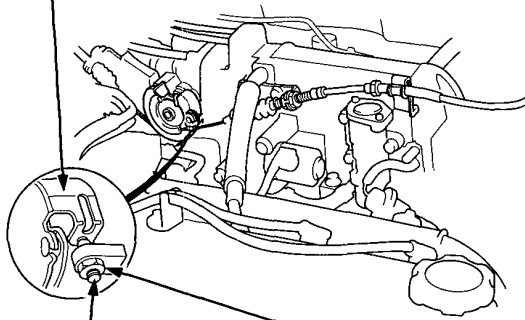
3. Allow the engine to idle and check that the gauge indicates no vacuum.
 - If there is vacuum, check the throttle cable (see page 11-96).
4. Check that vacuum is indicated on the gauge when the throttle is opened slightly from idle.
 - If the gauge indicates no vacuum, check the throttle body port. If the throttle body port is clogged, clean it with carburetor cleaner.
5. Stop the engine and check that the throttle cable operates smoothly without binding or sticking.
 - If there are any abnormalities in the above steps, check for:
 - Excessive wear or play in the throttle valve shaft.
 - Sticky or binding throttle lever at full close position.
 - Clearance between throttle stop screw and throttle lever at full close position.

(cont'd)

Intake Air System

Throttle Body (cont'd)

THROTTLE LEVER



THROTTLE STOP SCREW
(Non-adjustable)

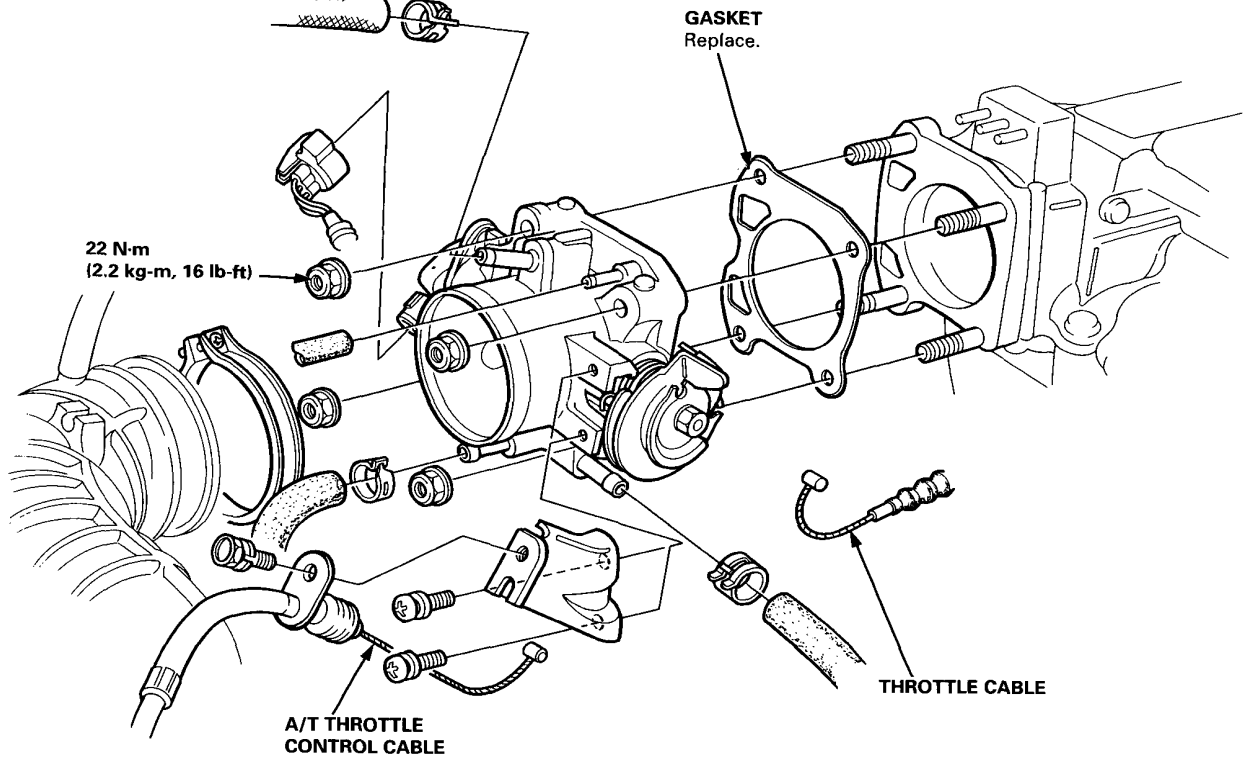
There should be
no clearance.

Replace the throttle body if there is excessive play in the throttle valve shaft or if the shaft is binding or sticking.



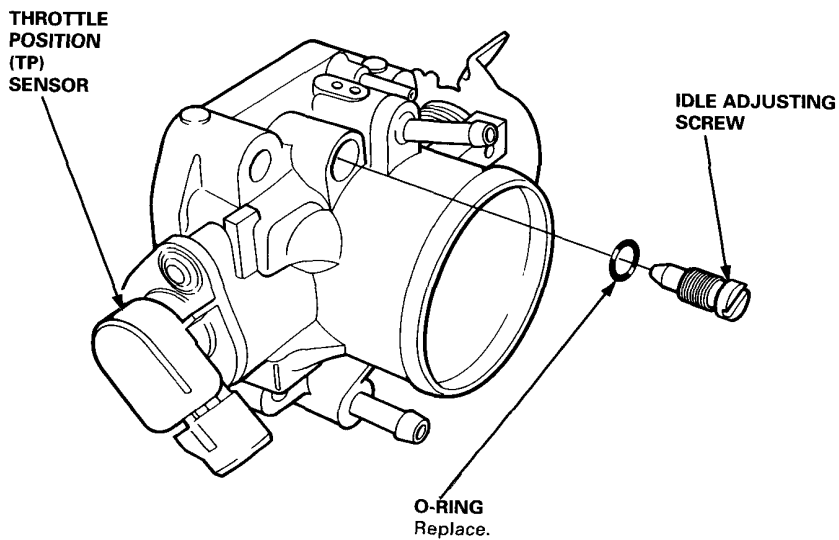
Throttle Body

Disassembly



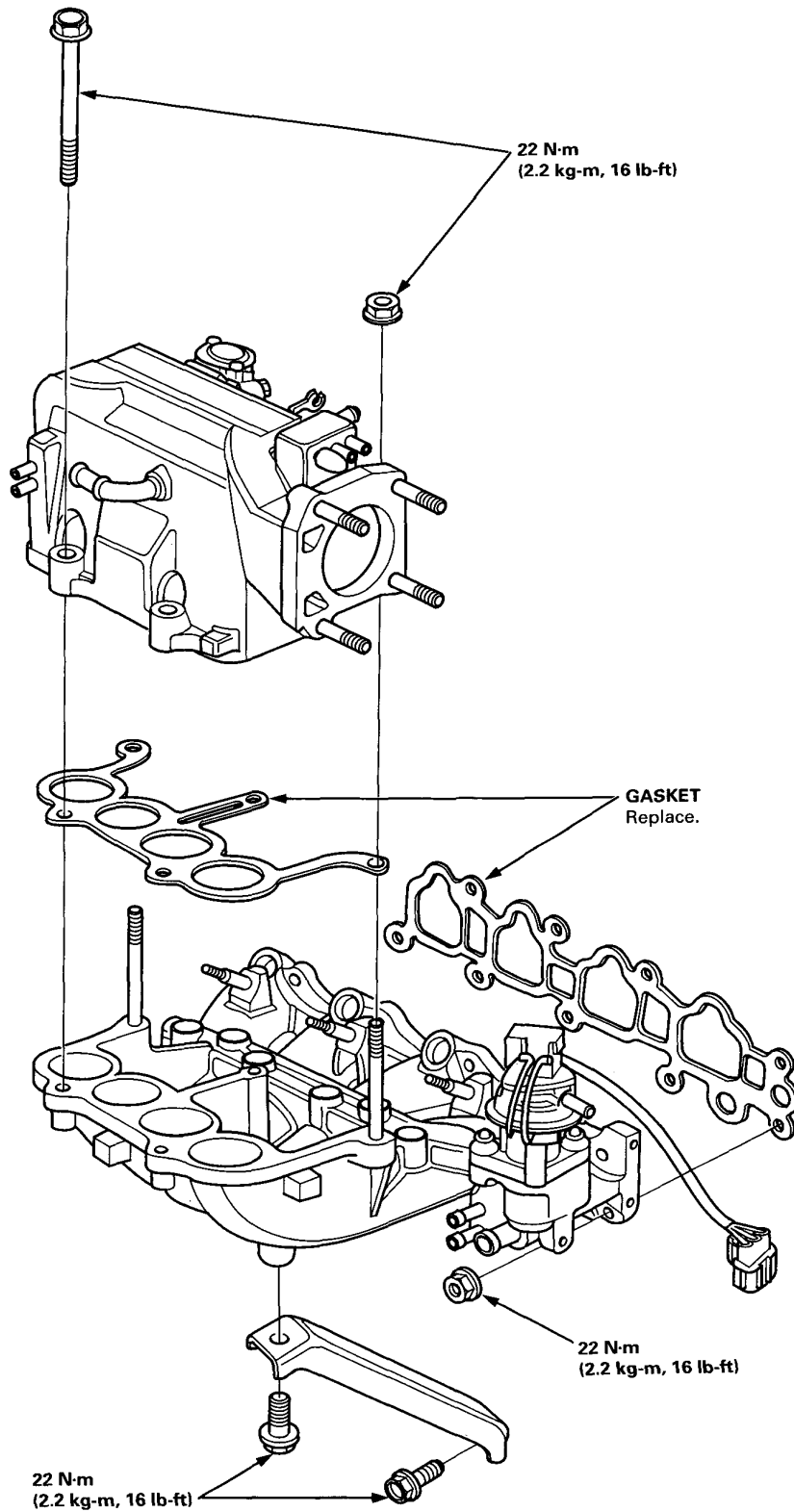
CAUTION:

- The throttle stop screw is non-adjustable.
- After reassembly, adjust the throttle cable (see page 11-96), and A/T throttle control cable (see section 14) for cars with A/T.



Fuel Supply System

Intake Manifold



Emission Control System

System Troubleshooting Guide



NOTE: Across each row in the chart, the sub-systems that could be sources of a symptom are raked in the order they should be inspected starting with ①. Find the symptom in the left column, read across to the most likely source, then refer to the page listed at the top of the column. If inspection shows the system is OK, try the next most likely system ②, etc.

PAGE	SUB-SYSTEM	THREE WAY CATALYTIC CONVERTER	EXHAUST GAS RECIRCULATION SYSTEM	POSITIVE CRANKCASE VENTILATION SYSTEM	EVAPORATIVE EMISSION CONTROLS
		11-103	11-105	11-111	11-112
	ROUGH IDLE		①	②	
FREQUENT STALLING	AFTER WARM-ING UP		①		
POOR PERFORMANCE	MISFIRE OR ROUGH RUNNING		①		
	FAILS EMISSION TEST	①	③		②
	LOSS OF POWER	①	②		

Emission Control System

System Description

The emission control system includes a Three Way Catalytic Converter (TWC), Exhaust Gas Recirculation (EGR) system, 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. Warm up and calibrate the CO meter according to the meter manufacturer's instructions.
2. Start the engine and warm it up to normal operating temperature (the radiator fan comes on twice).
3. Connect a tachometer.
4. Check idle speed and adjust the idle speed, if necessary (see page 11-71).
5. Start the engine and hold engine at 2,500 — 3,000 min⁻¹ (rpm) for 2 minutes.
6. Check idle CO with the headlights, blower fan, rear window defogger, radiator fan, and air conditioner off.

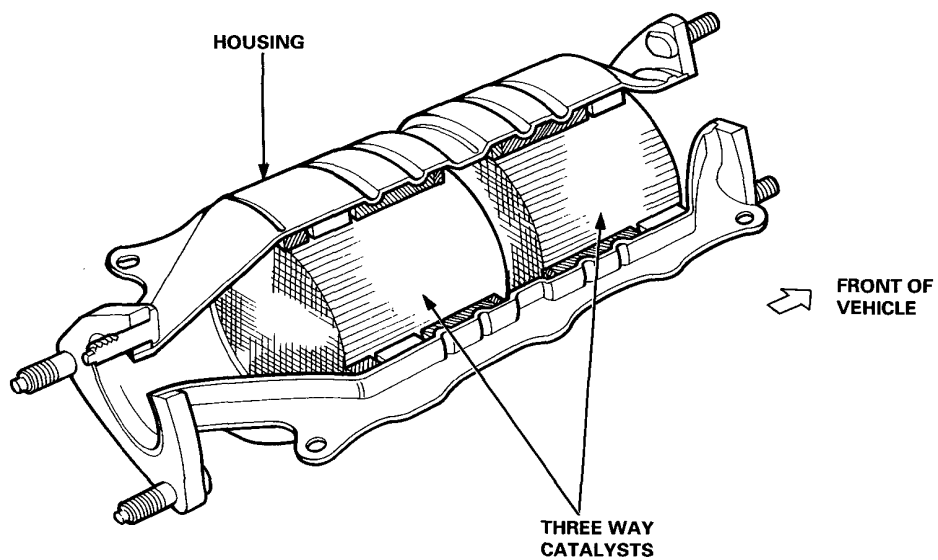
CO meter should indicate 0.2% maximum.



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 (CO₂), dinitrogen (N₂) and water vapor.



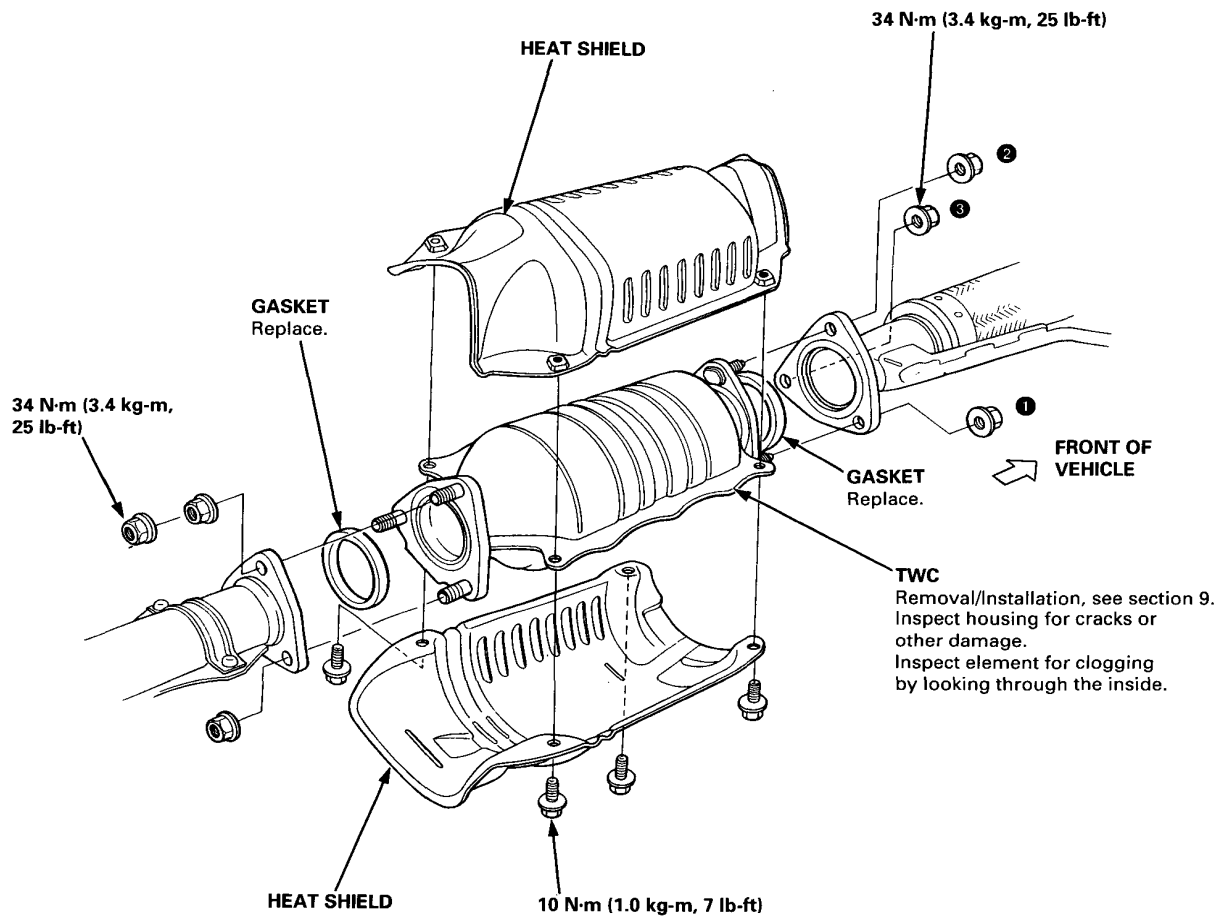
(cont'd)

Emission Control System

Three Way Catalytic Converter (TWC) (cont'd)

Inspection

If excessive exhaust system back-pressure is suspected, remove the TWC from the car and make a visual check for plugging, melting or cracking of the three way catalyst. Replace the TWC if any of the visible area is damaged or plugged.





Exhaust Gas Recirculation (EGR) System

Troubleshooting Flowchart

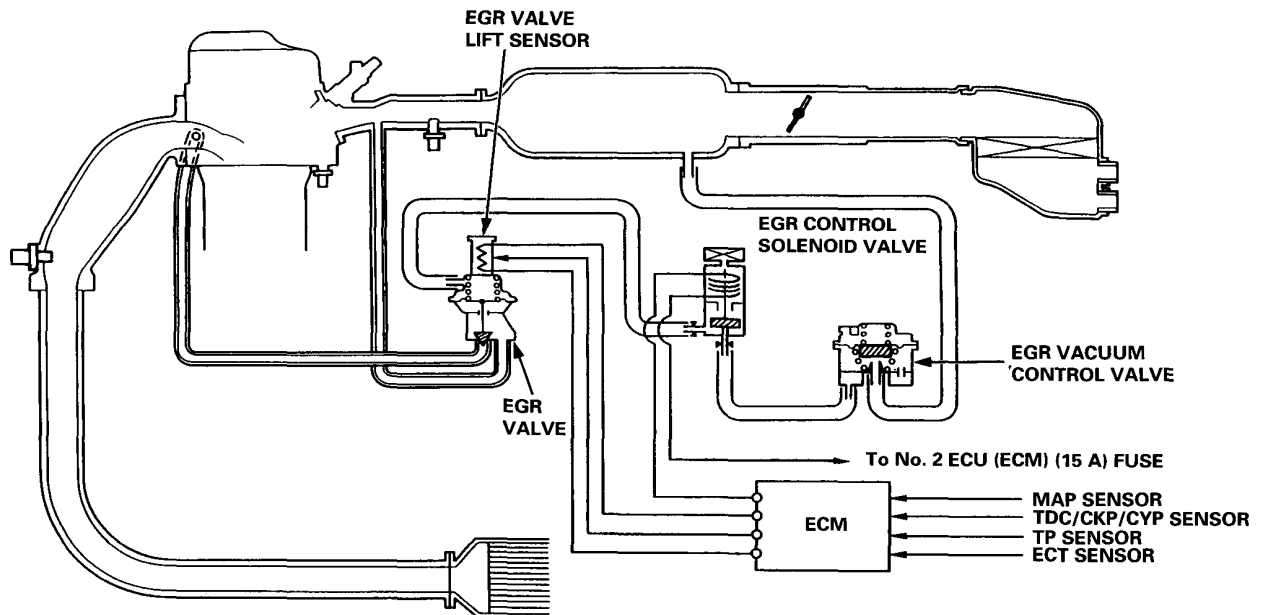


12

The Malfunction Indicator Lamp (MIL) indicates Diagnostic Trouble Code (DTC) 12: A problem in the Exhaust Gas Recirculation (EGR) system.

The EGR system is designed to reduce oxides of nitrogen emissions (NOx) by recirculating exhaust gas through the EGR valve and the intake manifold into the combustion chambers. It is composed of the EGR valve, EGR vacuum control valve, EGR control solenoid valve, ECM and various sensors.

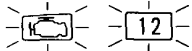
The ECM memory contains for ideal EGR valve lifts for varying operating conditions. The EGR valve lift sensor detects the amount of EGR valve lift and sends the information to the ECM. The ECM then compares it with the ideal EGR valve lift which is determined by signals sent from the other sensor. If there is any difference between the two, the ECM cuts current to the EGR control solenoid valve to reduce vacuum applied to the EGR valve.



(cont'd)

Emission Control System

Exhaust Gas Recirculation (EGR) System (cont'd)



- The MIL has been reported on.
- With service check connector jumped (see page 11-14), code 12 is indicated.

Do the ECM Reset Procedure (see page 11-15).

Road test necessary: Warm up the engine to normal operating temperature (the radiator fan comes on). Drive the car on the road for approx. 10 minutes. Keep the engine speed in the 1,700 — 2,500 min⁻¹ (rpm) range.

Is the MIL on and does it indicate code 12?

NO

Intermittent failure, system is OK at this time. Check for poor connections or loose wires between the EGR valve lift sensor, control box and ECM.

YES

With the engine at idle, disconnect the #16 hose from the EGR valve and connect a vacuum pump/gauge to the hose.

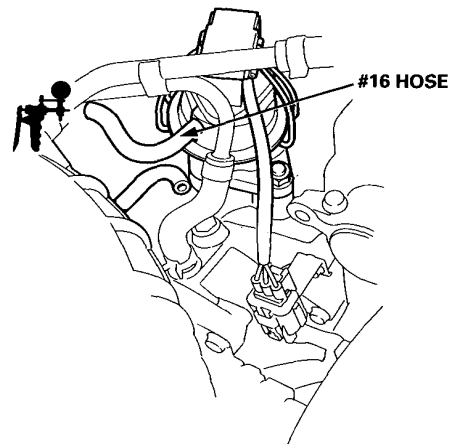
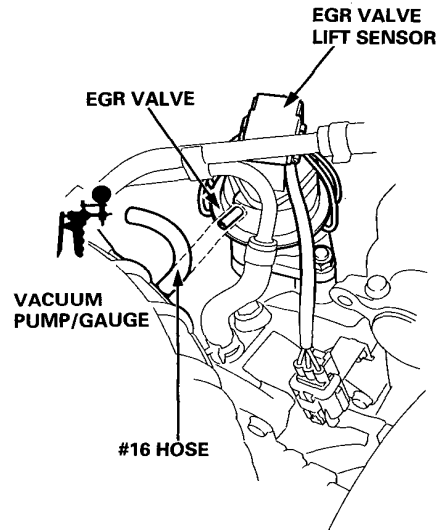
Is there any vacuum?

YES

Disconnect 4P connector from the control box and check the #16 hose for vacuum again.

NO

Move the vacuum pump/gauge to the EGR valve.



(To page 11-107)

(To page 11-107)



(From page 11-106)

With the engine at idle, apply 200 mm Hg (8 in. Hg) of vacuum to the EGR valve.

Does the engine stall or run rough and does the EGR valve hold vacuum?

YES

Turn the ignition switch OFF.

Disconnect the 4P connector from the control box.

Turn the ignition switch ON.

Measure voltage between BLK/YEL (+) terminal on the main wire harness and body ground.

Is there battery voltage?

YES

Reconnect the vacuum pump/gauge to the #16 hose.

Start the engine and allow it to idle.

(To page 11-108)

(From page 11-106)

Is there any vacuum?

YES

Check vacuum hose routing of the entire EGR system. If hose routing is OK, replace EGR control solenoid valve.

NO

Turn the ignition switch OFF and disconnect the "A" connector from the ECM.

Check for continuity to ground on PNK wire of 4P connector.

Is there continuity?

YES

Repair short in PNK wire between EGR control solenoid valve and ECM (A11).

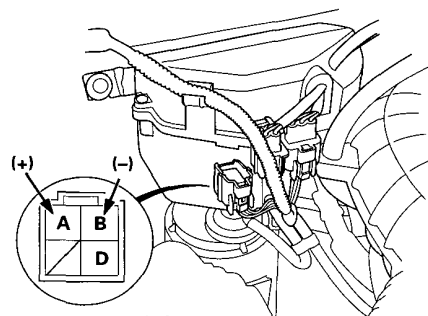
NO

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

NO

Replace the EGR valve.

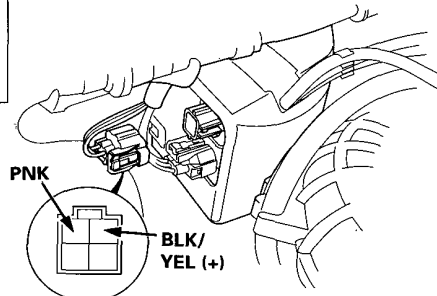
[Except KE]:



View from terminal side

[KE]:

Repair open in BLK/YEL wire between the EGR control solenoid valve and No. 2 ECU (ECM) (15 A) fuse in the under-dash fuse/relay box.



View from terminal side

(cont'd)

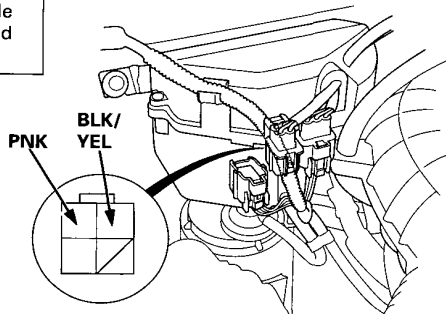
Emission Control System

Exhaust Gas Recirculation (EGR) System (cont'd)

(From page 11-107)

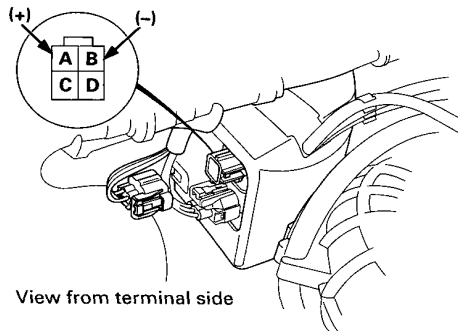
Connect battery power to the A terminal of the 4P connector. While watching the vacuum gauge, ground the B terminal.

[Except KE]:



View from terminal side

[KE]:



View from terminal side

Is there approx. 200 mm Hg (8 in. Hg) within 1 second?

NO

Turn the ignition switch OFF and inspect the #16 and #24 hoses for leaks, restrictions, or misrouting.

YES

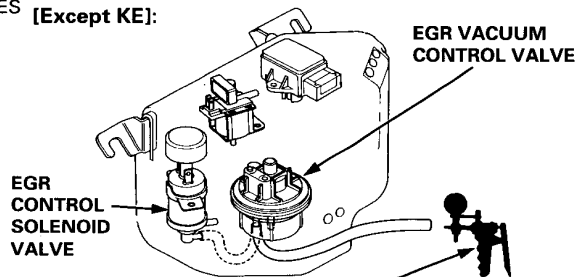
Turn the ignition switch OFF and reconnect the 4P connector to the control box.

Are the hoses OK?

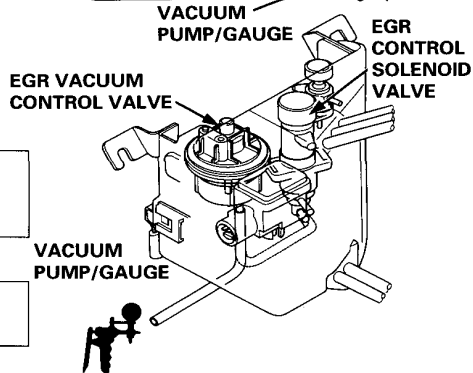
NO

Correct as necessary.

YES [Except KE]:



[KE]:



Disconnect the lower hose on EGR control solenoid valve and connect a vacuum gauge to the hose.

Start the engine and allow it to idle.

Is there 150 — 250 mm Hg (6 — 10 in. Hg) of vacuum?

NO

Replace the EGR vacuum control valve.

YES

Replace the EGR control solenoid valve.

(To page 11-109)



(From page 11-108)

Disconnect 3P connector from the EGR valve lift sensor.

Turn the ignition switch ON.

Measure voltage between YEL/WHT (+) terminal and GRN/WHT (-) terminal.

Is there approx. 5 V?

YES

Turn the ignition switch OFF.

Reconnect the 3P connector to the EGR valve lift sensor.

Connect the test harness between the ECM and connectors (see page 11-17).

Turn the ignition switch ON.

(To page 11-110)

NO

Measure voltage between YEL/WHT (+) terminal and body ground.

Is there approx. 5 V?

NO

Turn the ignition switch OFF.

Connect the test harness "D" connector to the ECM only, not to the main wire harness (see page 11-17).

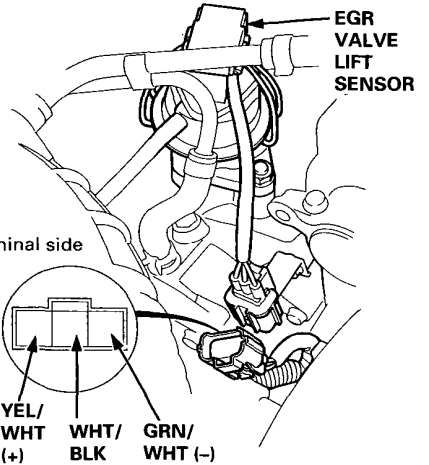
Turn the ignition switch ON.

Measure voltage between D20 (+) terminal and D22 (-) terminal.

Is there approx. 5 V?

NO

Substitute a known-good ECM and recheck. If prescribed voltage is now available, replace the original ECM.



Repair open in GRN/WHT wire between EGR valve lift sensor and ECM (D22).

Repair open in YEL/WHT wire between EGR valve lift sensor and ECM (D20).

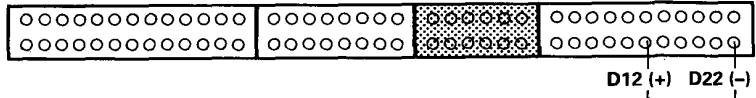
(cont'd)

Emission Control System

Exhaust Gas Recirculation (EGR) System (cont'd)

(From page 11-109)

Measure voltage between D12 (+) terminal and D22 (-) terminal.



Is the voltage approx. 1.2 V with no vacuum applied and approx. 4.3 V with 200 mm Hg (8 in. Hg) of vacuum applied to the EGR valve?

NO

— Repair open or short in WHT/BLK wire between EGR valve lift sensor and ECM (D12).
— If wire is OK, replace the EGR valve.

1.2 V with no vacuum applied?
4.3 V with 200 mm Hg (8 in. Hg) of vacuum applied?

YES

Does the voltage consistently increase/decrease as the vacuum increases/decreases?

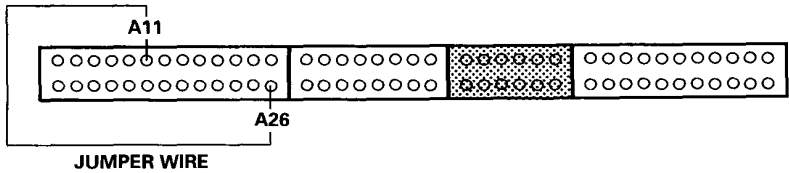
NO

Replace the EGR valve.

YES

Reconnect the #16 hose to the EGR valve.

Start the engine and allow it to idle.



Connect A11 terminal to A26 terminal with a jumper wire.

Did the engine stall or run rough?

NO

Repair open in PNK wire between ECM (A11) and EGR control solenoid valve.

YES

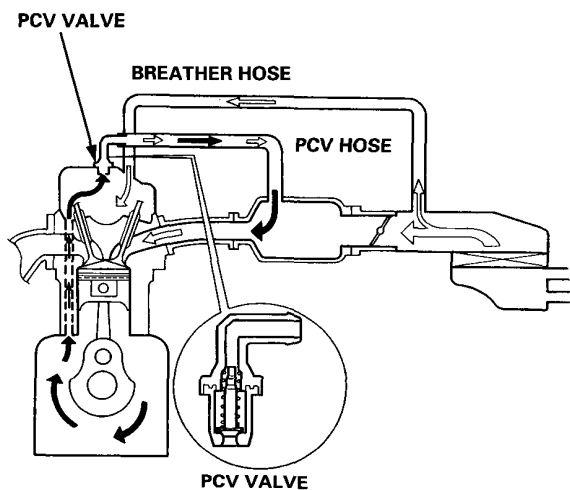
Substitute a known-good ECM and recheck. If symptom/indication goes away, replace the original ECM.



Positive Crankcase Ventilation (PCV) System

Description

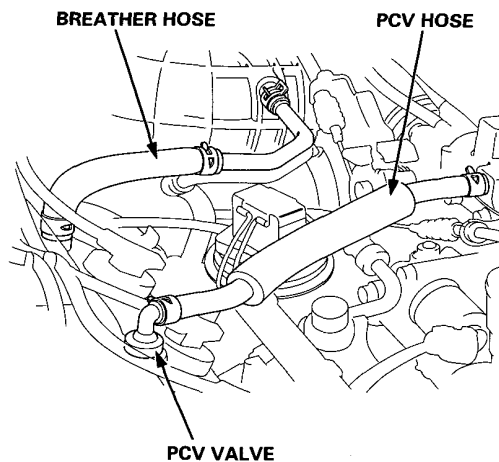
The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.



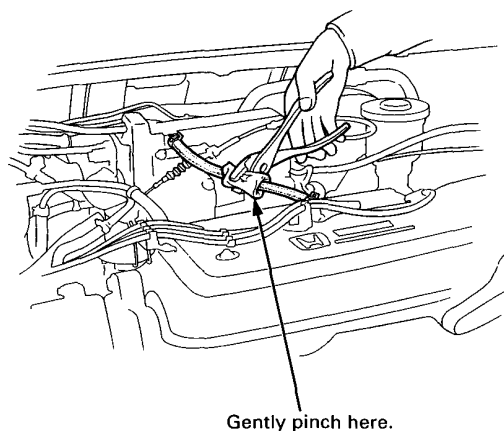
← : BLOW-BY VAPOR
⇄ : FRESH AIR

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 is lightly pinched with your fingers or pliers.



- If there is no clicking sound, check the PCV valve grommet for cracks or damage. If the grommet is OK, replace the PCV valve and recheck.

Emission Control System

Evaporative Emission 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

The 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 diaphragm valve and the EVAP purge control solenoid valve.

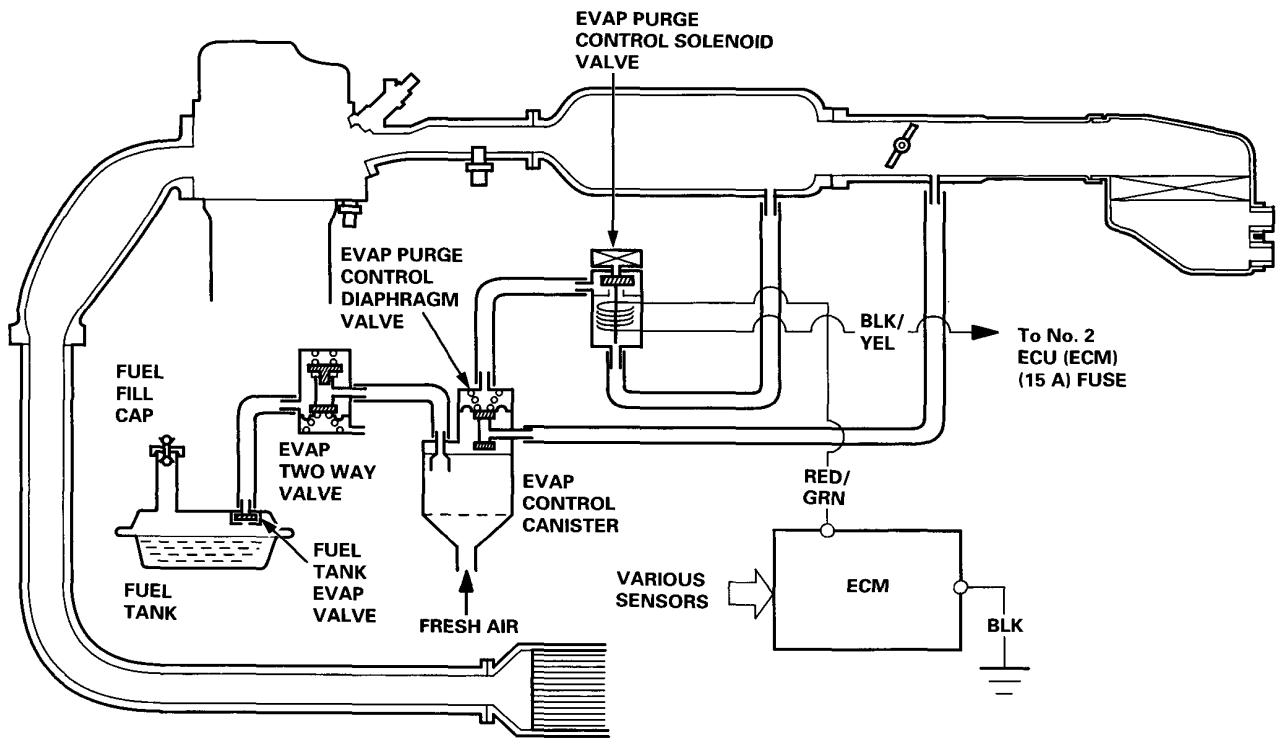
EVAP PURGE CONTROL SOLENOID VALVE OFF AFTER STARTING ENGINE



ENGINE COOLANT TEMPERATURE ABOVE 167°F (75°C)

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 Controls (cont'd)

Troubleshooting Flowchart

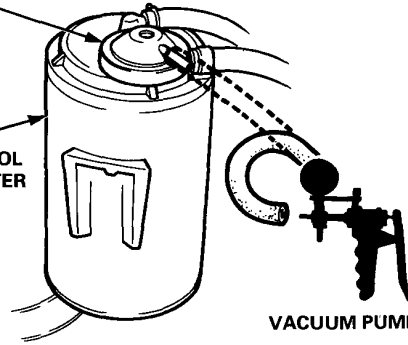
Inspection of Evaporative Emission Controls

Disconnect vacuum hose from the EVAP purge control diaphragm valve (on the EVAP control canister) and connect a vacuum pump/gauge to the hose.

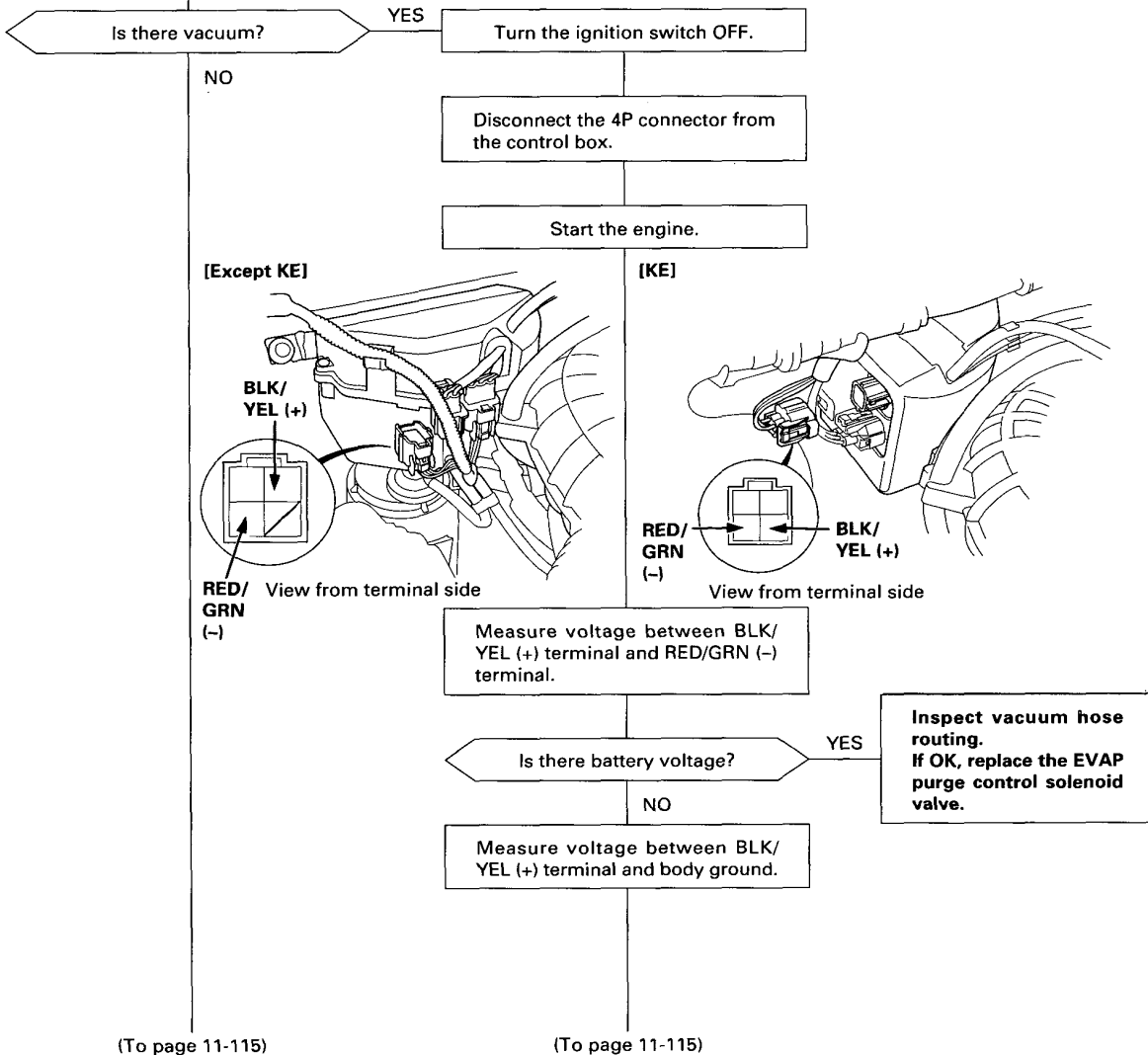
Start the engine and allow to idle.
NOTE: Engine coolant temperature must be below 167°F (75°C).

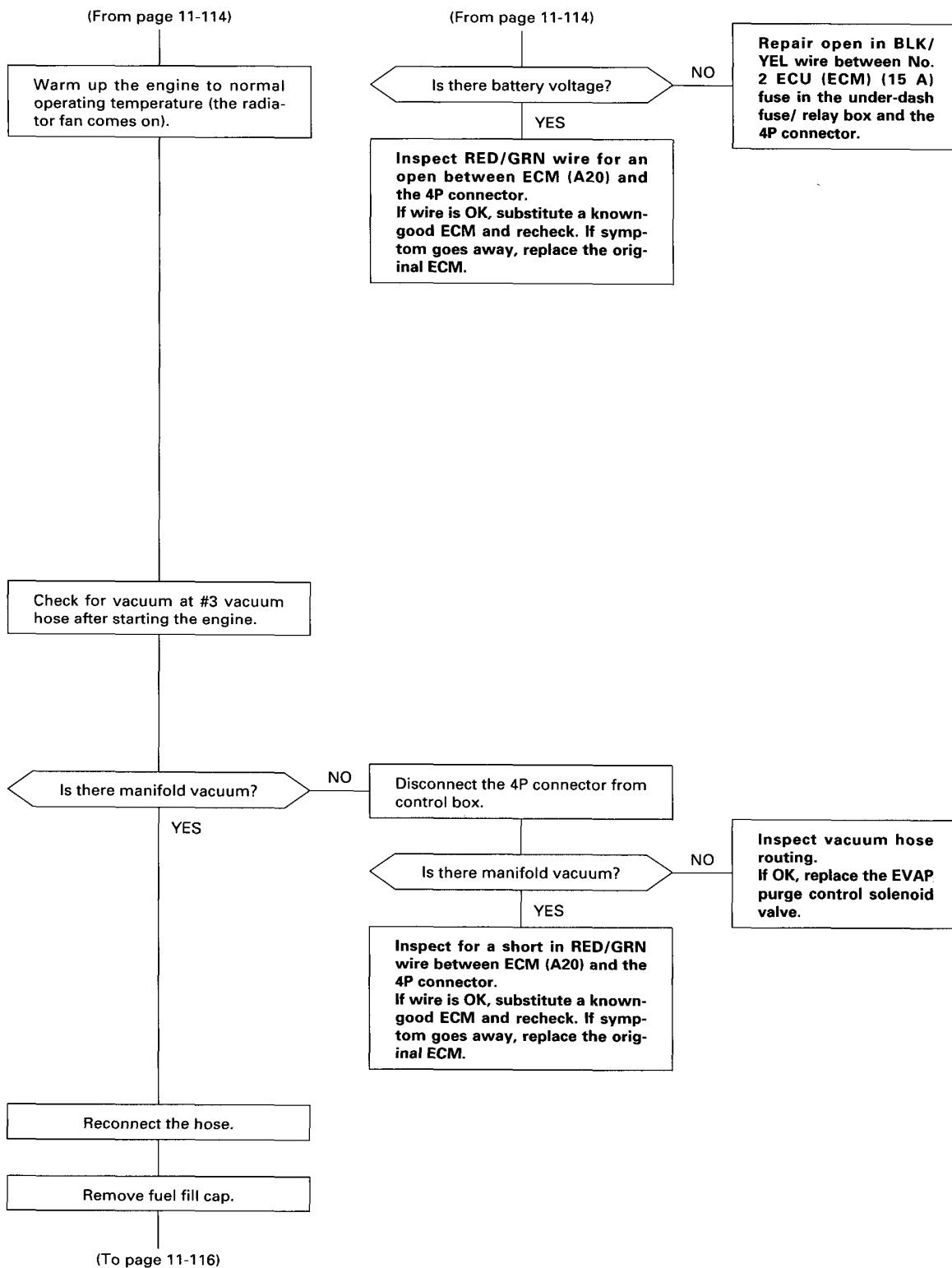
EVAP PURGE CONTROL DIAPHRAGM VALVE

EVAP CONTROL CANISTER



VACUUM PUMP/GAUGE





(cont'd)

Emission Control System

Evaporative Emission Controls (cont'd)

(From page 11-115)

Connect a vacuum gauge to purge air hose.

Start the engine and raise speed to 3,500 min⁻¹ (rpm).

Does vacuum appear on gauge within 1 minute?

YES

See EVAP two way valve test to complete. Evaporative emission control are OK.

NO

Connect a vacuum gauge to the purge hose and raise the engine speed to 3,500 min⁻¹ (rpm).

Does vacuum appear on the gauge?

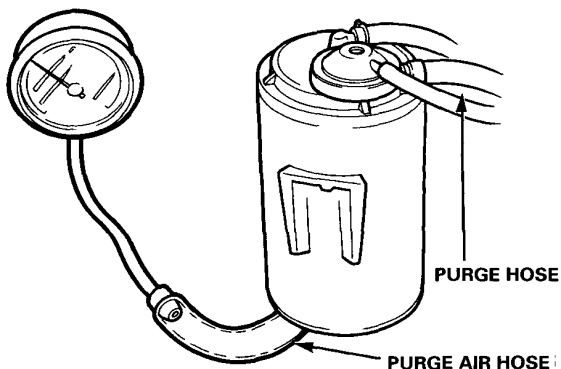
YES

Replace the EVAP control canister.

NO

Inspect the purge hose and throttle body port for pinch or blockage.

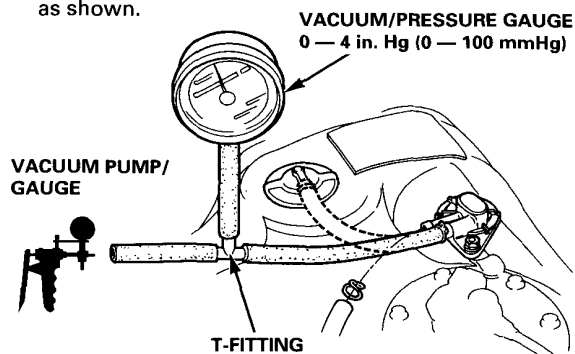
VACUUM/PRESSURE GAUGE, 0 — 4 in. Hg (0 — 100 mmHg)





Evaporative Emission (EVAP) Two Way Valve Testing

1. Remove the fuel fill cap.
2. Remove vapor line from the fuel tank and connect to T-fitting from vacuum gauge and vacuum pump as shown.

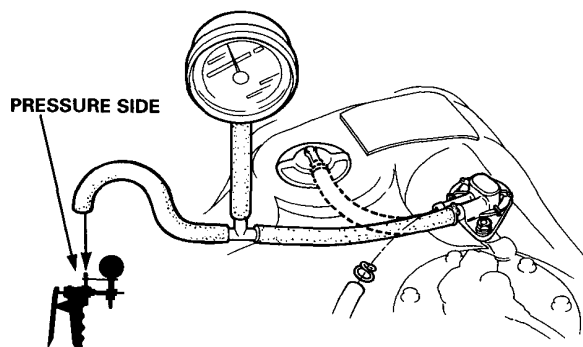


3. Apply vacuum slowly and continuously while watching the gauge.

Vacuum should stabilize momentarily at 5 to 15 mmHg (0.2 to 0.6 in. Hg).

- If vacuum stabilizes (valve opens) below 5 mmHg (0.2 in. Hg) or above 15 mmHg (0.6 in. Hg), install new valve and retest.

4. Move vacuum pump hose from vacuum to pressure fitting, and move vacuum gauge hose from vacuum to pressure side as shown.



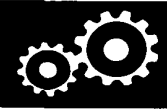
5. Slowly pressurize the vapor line while watching the gauge.

Pressure should stabilize at 10 to 35 mmHg (0.4 to 1.4 in. Hg).

- If pressure momentarily stabilizes (valve opens) at 10 to 35 mmHg (0.4 to 1.4 in. Hg), the valve is OK.
- If pressure stabilizes below 10 mmHg (0.4 in. Hg) or above 35 mmHg (1.4 in. Hg), install a new valve and retest.

Transaxle

Clutch	12-1
Manual Transmission	13-1
Automatic Transmission	14-1
Differential	
Manual Transmission	15-1
Automatic Transmission	15-13
Driveshafts	16-1



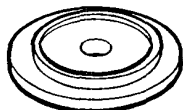
Clutch

Special Tools	12-2
Illustrated Index	12-3
Clutch Pedal	
Adjustment	12-4
Clutch Master Cylinder	
Overhaul/Inspection	12-5
Removal/Installation	12-6
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Reassembly	12-7
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Overhaul/Inspection	12-8
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Pressure Plate, Clutch Disc	
Removal	12-10
Pressure Plate	
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Flywheel	
Inspection/Replacement	12-13
Pressure Plate, Clutch Disc	
Installation	12-14
Release Bearing	
Disassembly/Inspection	12-15
Installation	12-15

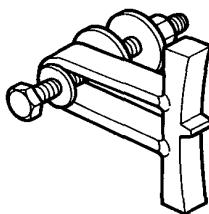


Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07JAF-PM7011A	Clutch Alignment Disc	1	12-11
②	07LAB-PV00100 or 07924-PD20003	Ring Gear Holder	1	12-10, 13, 14
③	07LAF-PT00110	Clutch Alignment Shaft	1	12-10, 14
④	07936-3710100	Handle	1	12-10, 14



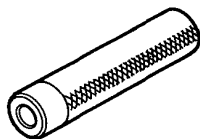
①



②



③



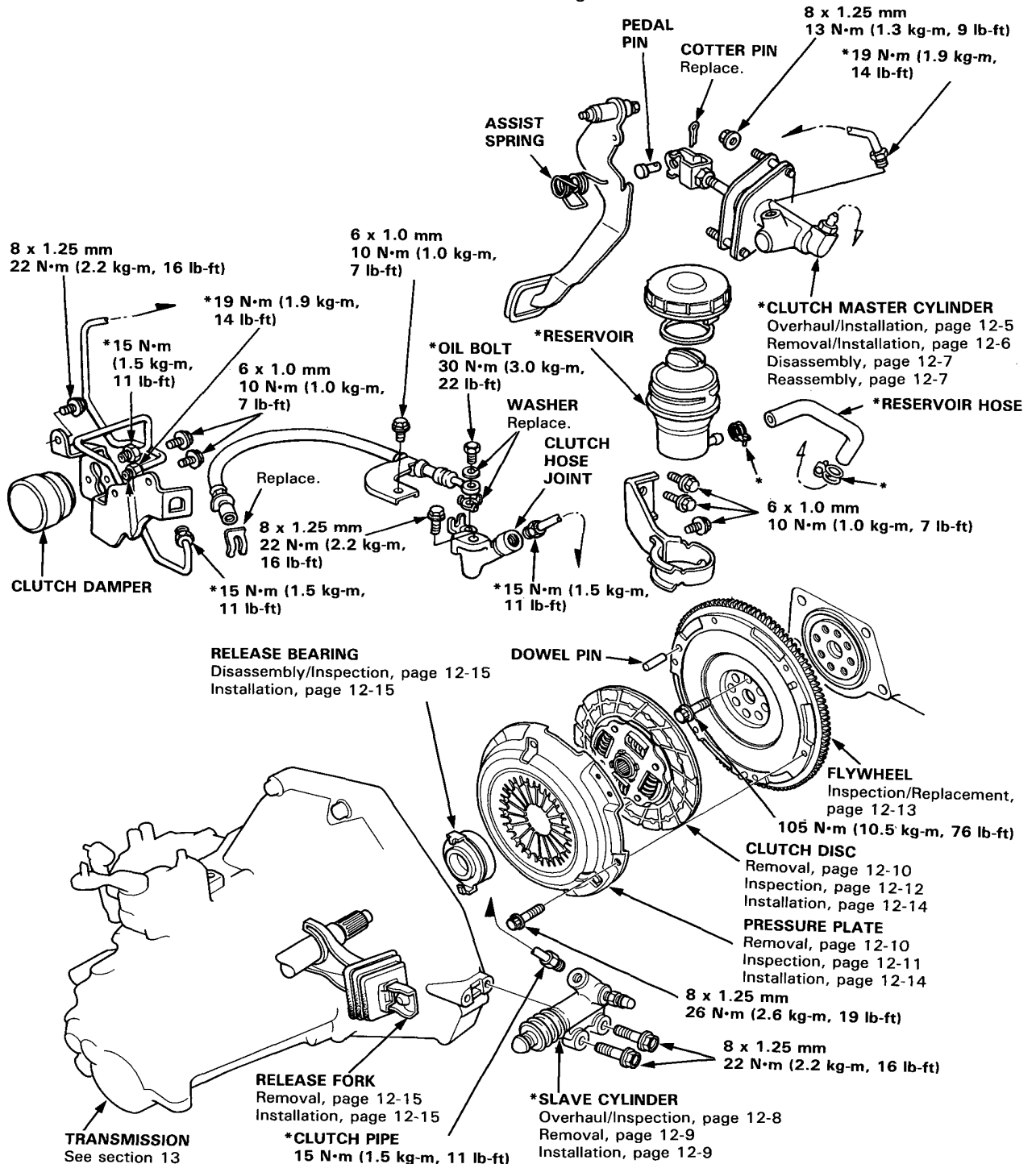
④

Illustrated Index



NOTE:

- Whenever the transmission is removed, clean and grease the release bearing sliding surface.
- If the parts marked "*" are removed, the clutch hydraulic system must be bled.
- Bleed the clutch hydraulic system (see page 12-9).
- Inspect the hoses for damage, leaks, interference, and twisting.



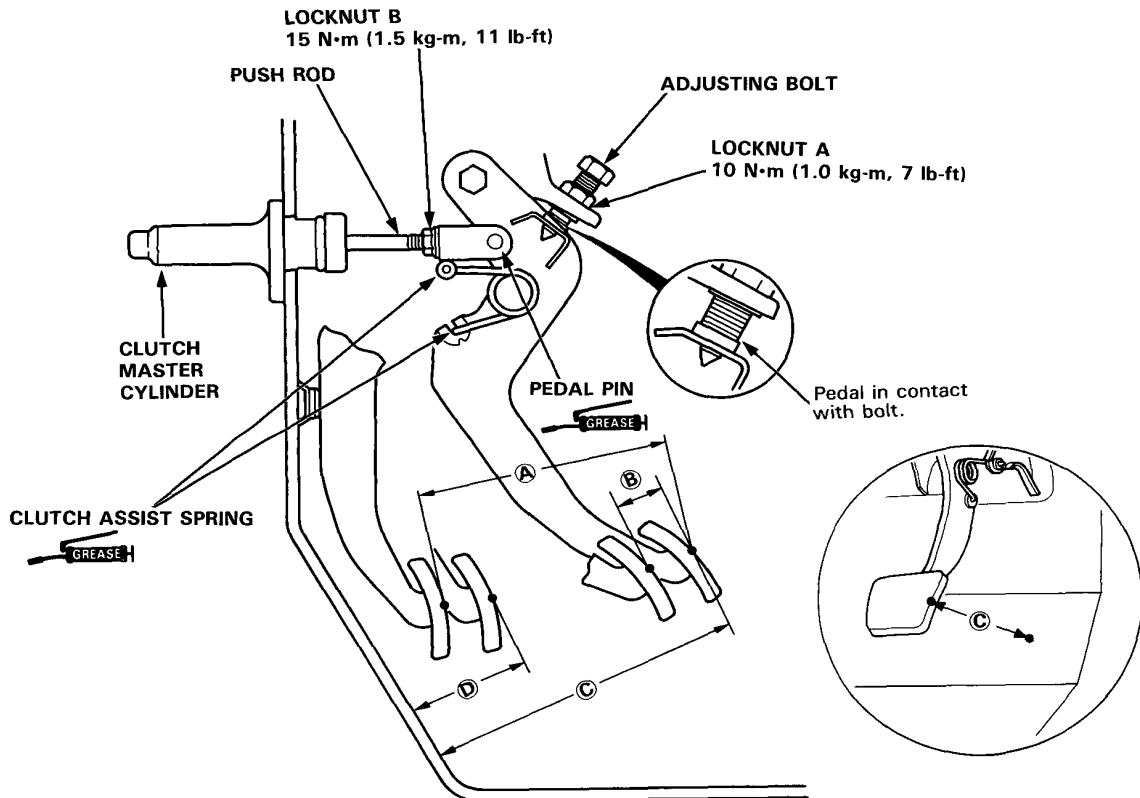
Clutch Pedal

Adjustment

NOTE: 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 adjusting bolt until it no longer touches the clutch pedal.
2. Loosen locknut B, and turn the push rod in or out to get the specified stroke and height at the clutch pedal.
3. Tighten locknut B.
4. Thread the adjusting bolt in until it contacts the clutch pedal.
5. Turn the adjusting bolt in 1/4–1/2 turn further.
6. Tighten locknut A.



Ⓐ STROKE at PEDAL: 142 mm (5.59 in)

Ⓑ TOTAL CLUTCH PEDAL FREE PLAY: 9.0–15.0 mm (0.35–0.59 in) including the pedal play 1–7 mm (0.04–0.28 in).

Ⓒ CLUTCH PEDAL HEIGHT: 210 mm (8.27 in) to the floor.

Ⓓ CLUTCH PEDAL DISENGAGEMENT HEIGHT: 90 mm (3.54 in) minimum to the floor.



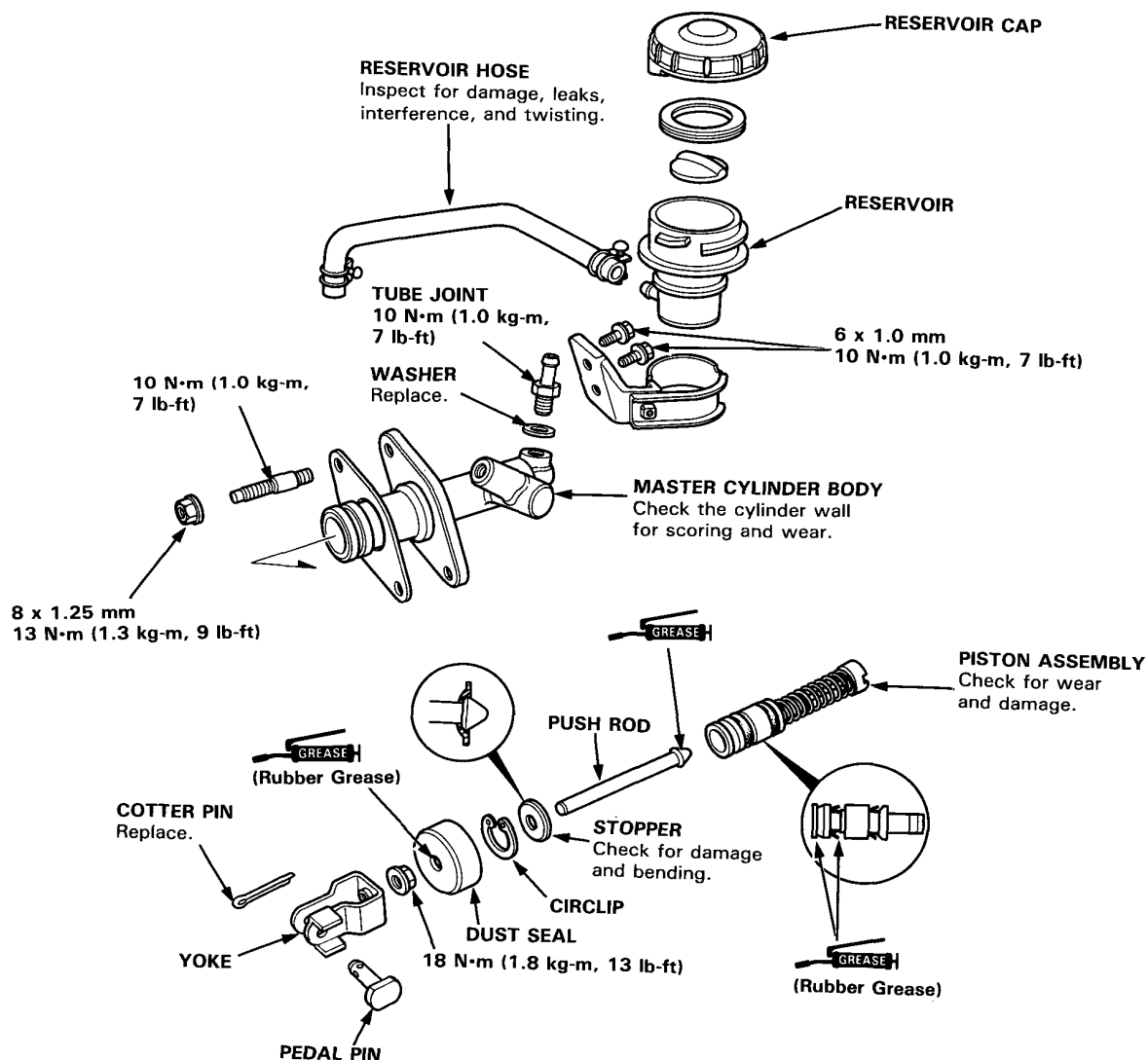
Clutch Master Cylinder

Overhaul/Inspection

CAUTION:

- Do not spill brake fluid on the car; 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE: LHD type is shown. RHD type is similar.



Clutch Master Cylinder

Removal/Installation

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Plug the end of the clutch pipe and reservoir hose with a shop towel to prevent fluid from flowing out of the clutch pipe and reservoir hose after disconnecting

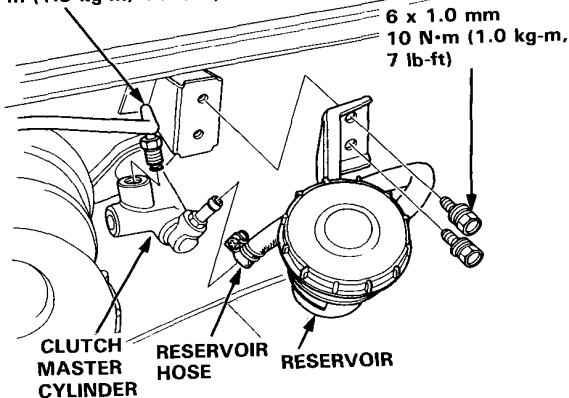
1. Remove the reservoir hose from the clutch master cylinder, and drain the brake fluid into a suitable container.

NOTE: The brake fluid can be sucked out through the top of the reservoir with a syringe.

2. Remove the reservoir from the engine compartment bulkhead.
3. Disconnect the clutch pipe from the clutch master cylinder.

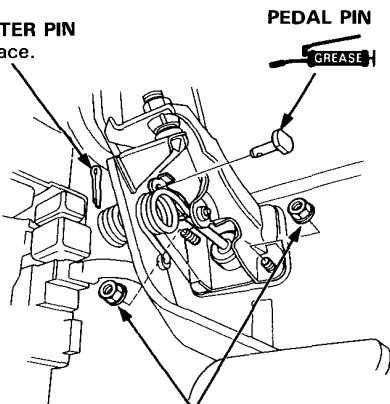
CLUTCH PIPE

19 N·m (1.9 kg-m, 14 lb-ft)



4. Pry out the cotter pin, and pull the pedal pin out of the yoke. Remove the nuts.

COTTER PIN
Replace.

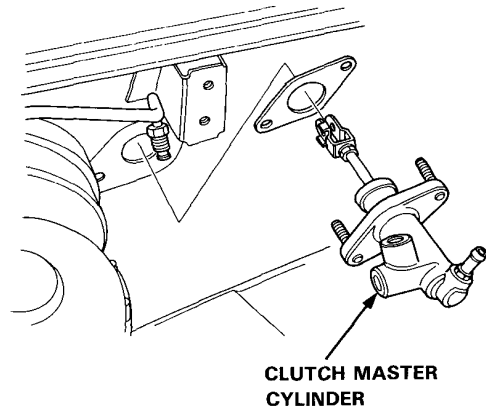


NUTS

8 x 1.25 mm

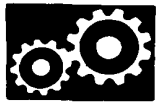
13 N·m (1.3 kg-m, 9 lb-ft)

5. Remove the clutch master cylinder.



6. Install the clutch master cylinder in the reverse order of removal.

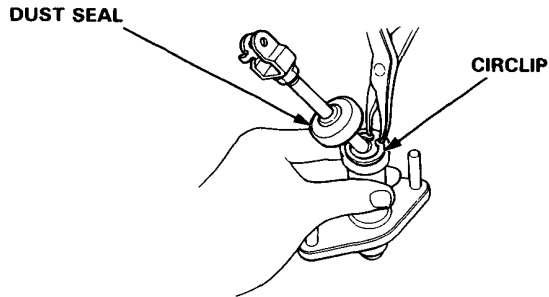
NOTE: Bleed the clutch hydraulic system (see page 12-9).



Disassembly

CAUTION: Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

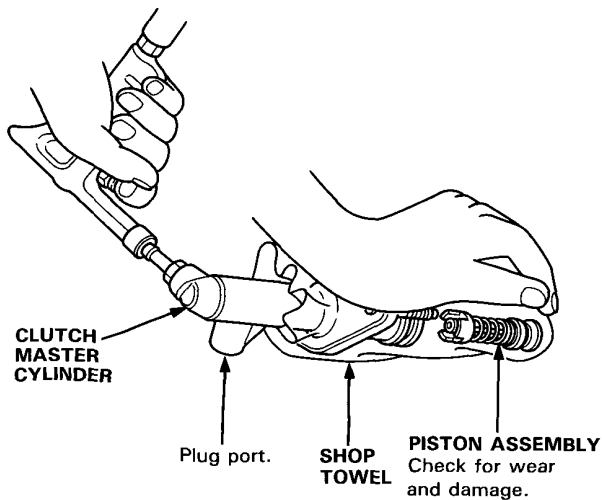
1. Remove the dust seal from the clutch master cylinder.
2. Pry the circlip off the clutch master cylinder.



3. Carefully remove the piston by applying air pressure through the clutch line hole.

CAUTION:

- Hold a shop towel over the clutch master cylinder, to stop the piston in case it comes out suddenly.
- Plug the end of the clutch hose port with a shop towel to prevent fluid from coming out.
- Clean all disassembled parts in solvent and blow through all ports and passages with compressed air.

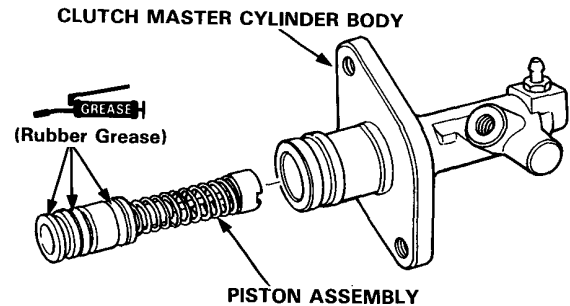


Reassembly

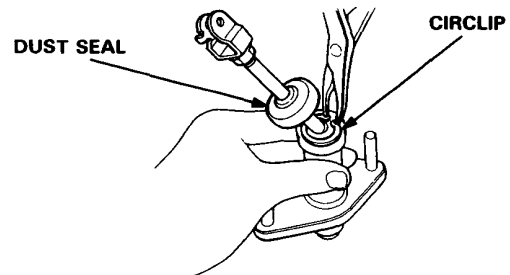
CAUTION:

- Do not spill brake fluid on the car; 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.
- 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

1. Assemble the piston noting the proper direction of the parts (see page 12-5).



2. Slide the piston assembly into the clutch master cylinder.
3. Install the circlip in the groove of the clutch master cylinder.



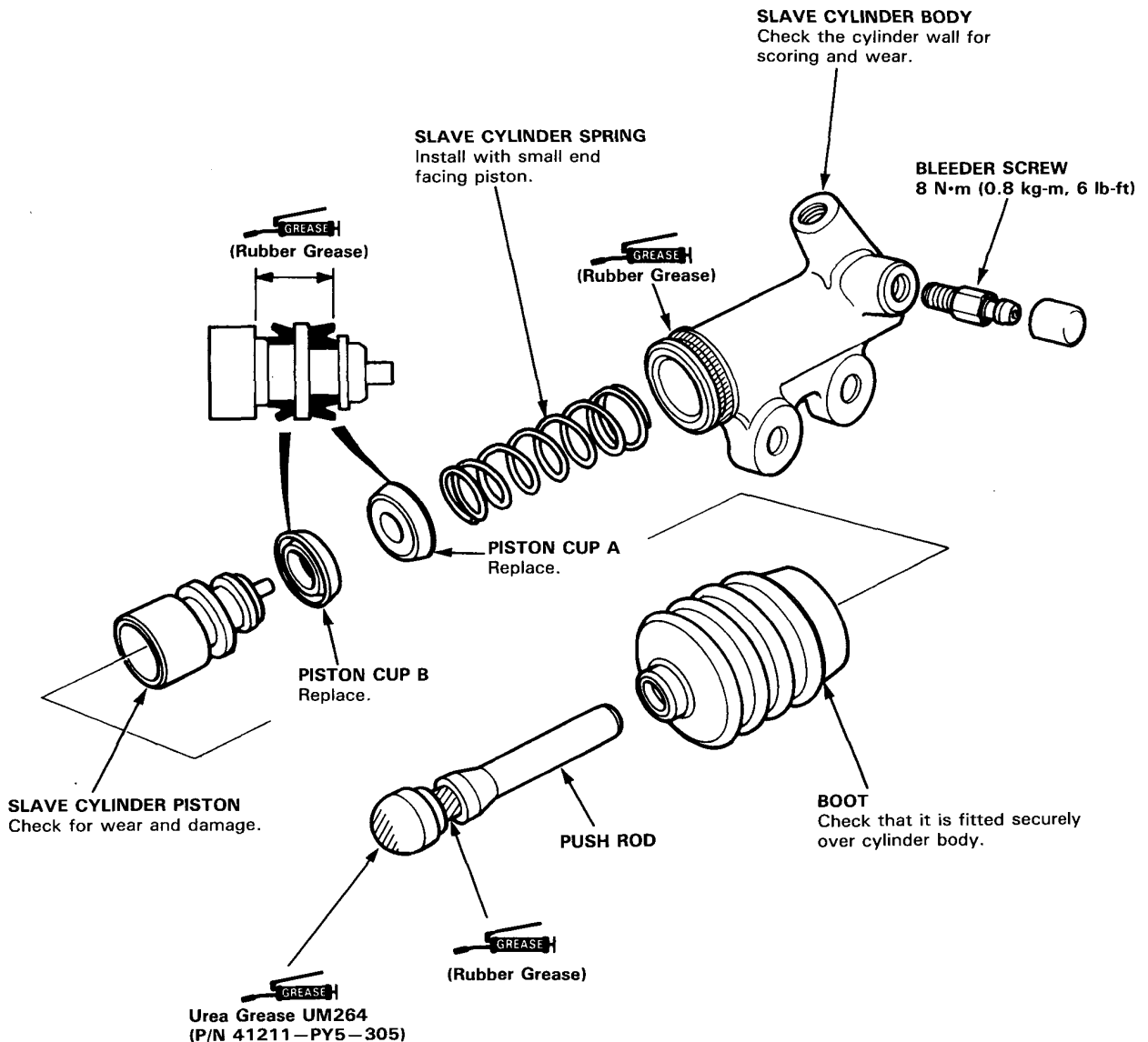
4. Install the dust seal.

Slave Cylinder

Overhaul/Inspection

CAUTION:

- Do not spill brake fluid on the car; 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.



Slave Cylinder



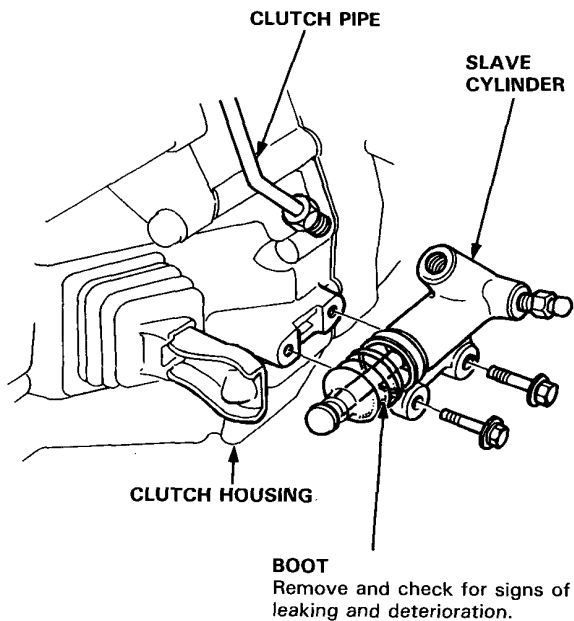
Removal

1. Disconnect the clutch pipe from the slave cylinder.

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Plug the end of the clutch pipe with a shop towel to prevent brake fluid from coming out.

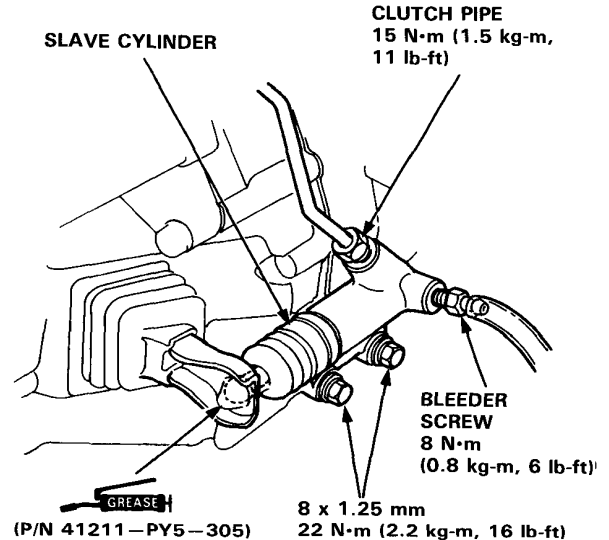
2. Remove the slave cylinder from the clutch housing.



Installation

NOTE: Use only HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305).

1. Install the slave cylinder on the clutch housing.
2. Connect the clutch pipe.



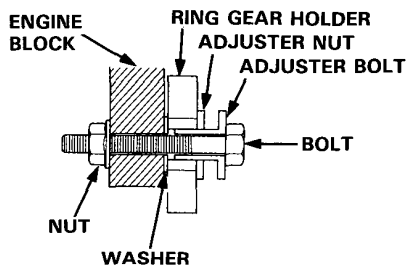
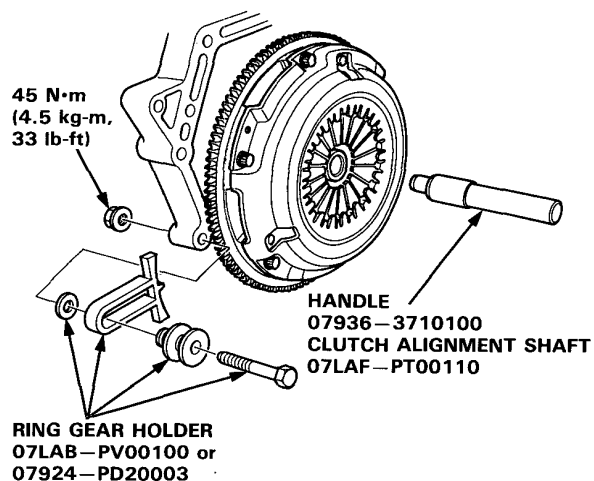
3. Bleed the clutch hydraulic system:

- 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 fluid when done.
- Use only DOT 3 or 4 brake fluid.

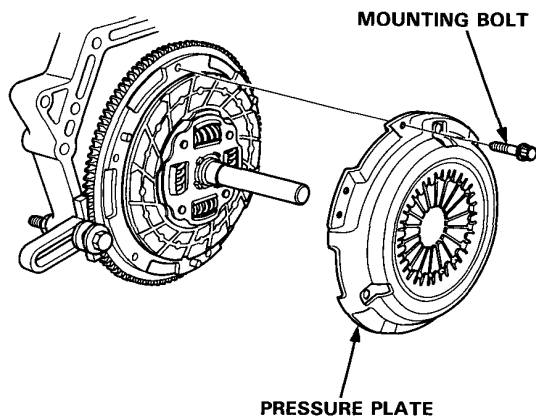
Pressure Plate, Clutch Disc

Removal

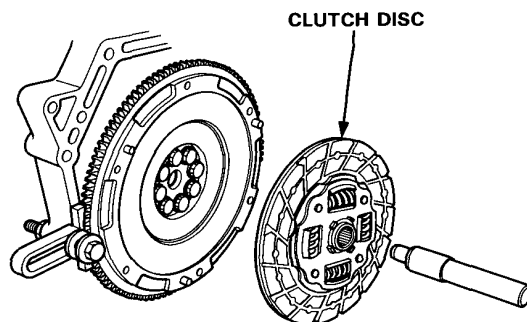
1. Install the special tools as shown.



2. To prevent warping, unscrew the pressure plate mounting bolts in a crisscross pattern in several steps, then remove the pressure plate.



3. Remove the clutch disc and special tools.





Pressure Plate

Inspection

1. Inspect the fingers of the diaphragm spring for wear at the release bearing contact area.

2. Assemble the special tools as shown.

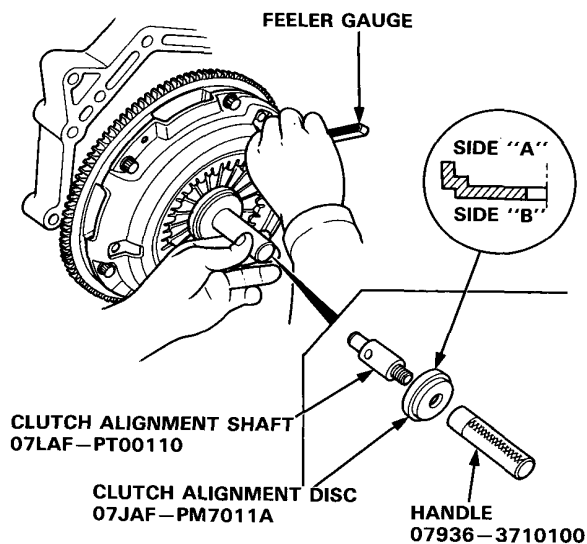
NOTE: Assemble the Clutch Alignment Disc with side "A" facing the diaphragm spring as shown.

3. Check the diaphragm spring fingers for run out using the special tools and a feeler gauge.

Standard (New): 0.6 mm (0.02 in) max.

Service Limit: 0.8 mm (0.03 in)

If the run out exceeds the service limit, replace the pressure plate.



4. Inspect the pressure plate surface for wear, cracks, and burning.

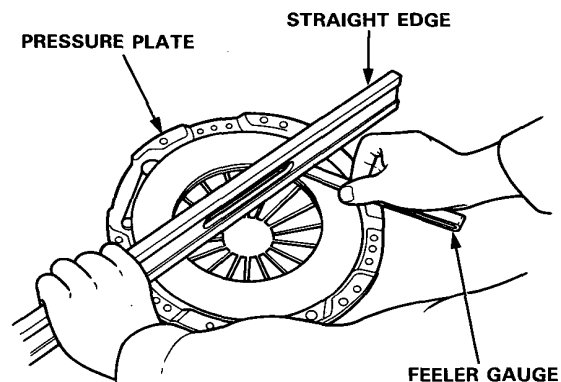
5. Inspect for warpage using a straight edge and a feeler gauge.

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

Inspection

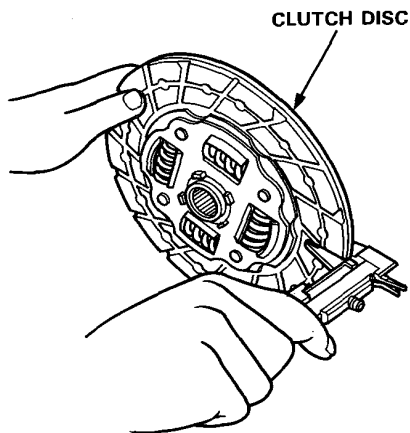
1. Inspect the lining of the clutch disc for signs of slipping or oil. Replace it if it is burned black or oil soaked.
2. Measure the clutch disc thickness.

Clutch Disc Thickness:

Standard (New): 8.5–9.2 mm (0.33–0.36 in)

Service Limit: 6.5 mm (0.27 in)

If the thickness is less than the service limit, replace the clutch disc.



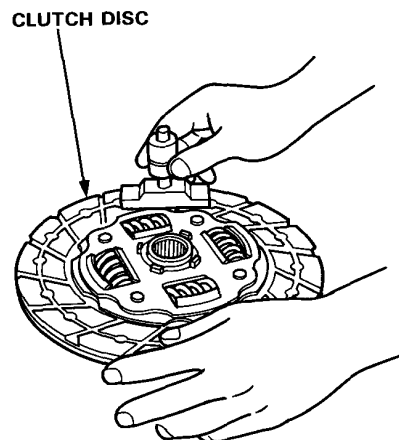
3. Measure the depth from the lining surface to the rivets, on both sides.

Rivet Depth:

Standard (New): 1.4 mm (0.06 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/Replacement

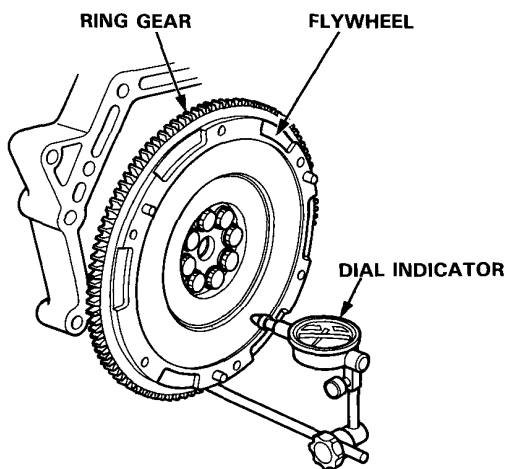
1. Inspect the ring gear teeth of the flywheel for wear and damage.
2. Inspect the clutch disc mating surface on the flywheel for wear, cracks, and burning.
3. Measure the flywheel runout using a dial indicator through at least two full turns. Push the flywheel towards the engine to take up the crankshaft thrust washer clearance.

NOTE: The runout can be measured with engine installed.

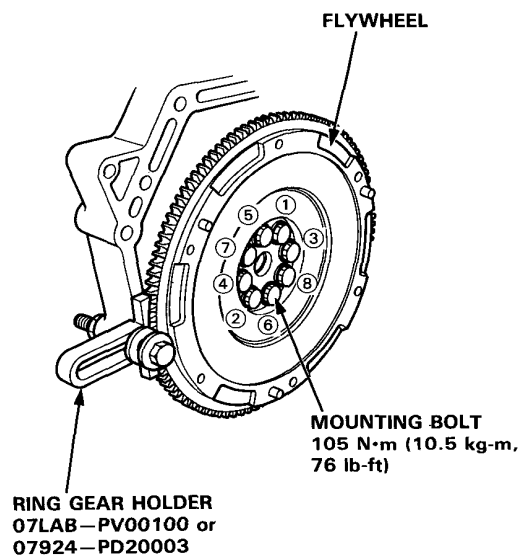
Standard (New): 0.05 mm (0.002 in) max.

Service Limit: 0.15 mm (0.006 in)

If the runout exceeds the service limit, replace the flywheel.



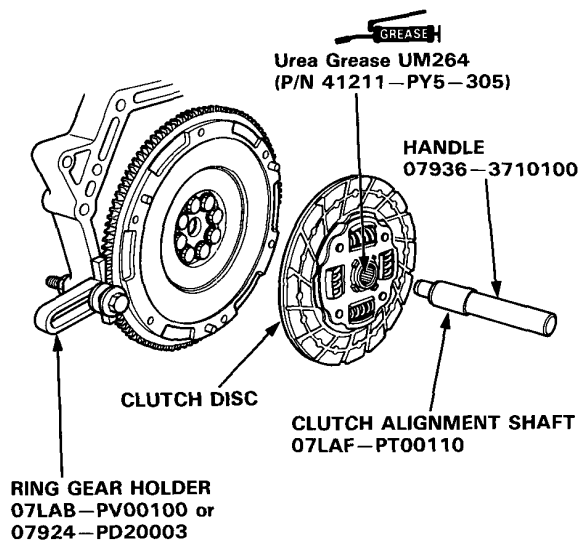
4. Install the special tool as shown.
5. Remove the eight flywheel mounting bolts in a criss-cross pattern in several steps as shown, and remove the flywheel.
6. Install the flywheel in the reverse order of removal.



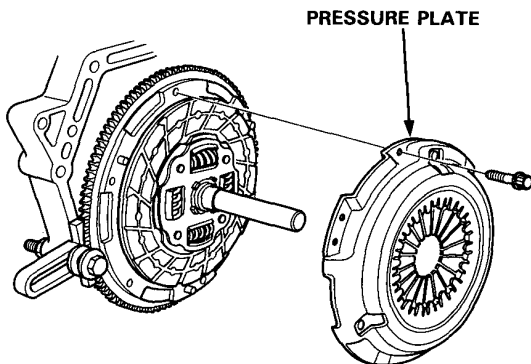
Pressure Plate, Clutch Disc

Installation

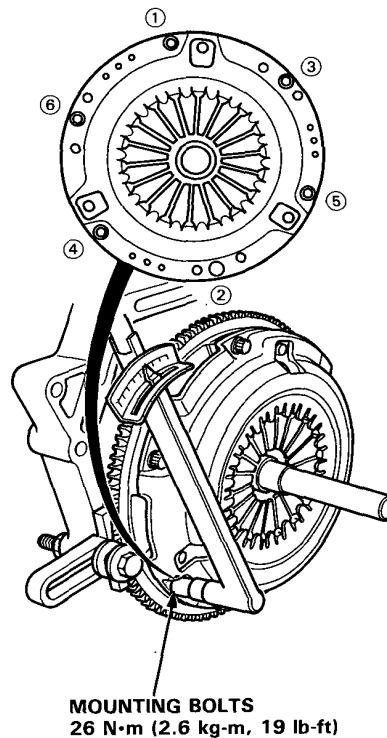
1. Install the clutch disc using the special tools as shown.



2. Install the pressure plate.



3. Torque the mounting bolts in a crisscross pattern as shown. Tighten them several steps to prevent warping the diaphragm spring.



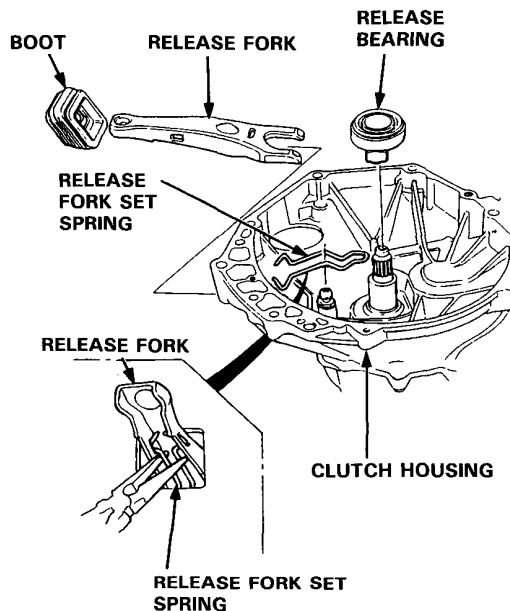
4. Remove the special tools.



Release Bearing

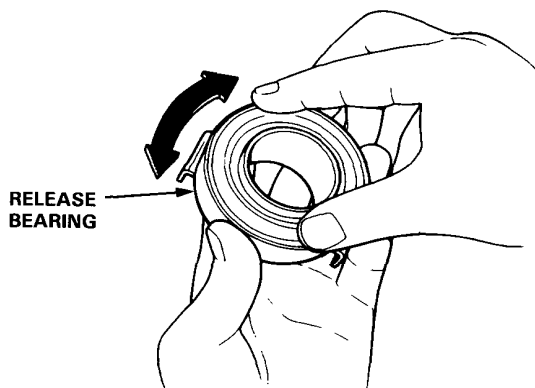
Disassembly/Inspection

1. Remove the 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 excessive play by spinning it by hand.

CAUTION: The release bearing is packed with grease. Do not wash it in solvent.

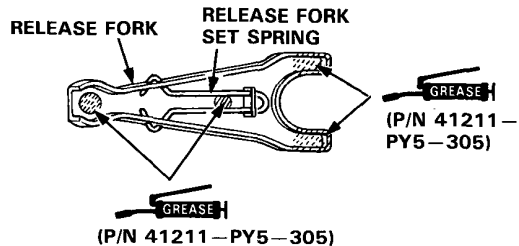


4. If there is excessive play, replace the release bearing with a new one.

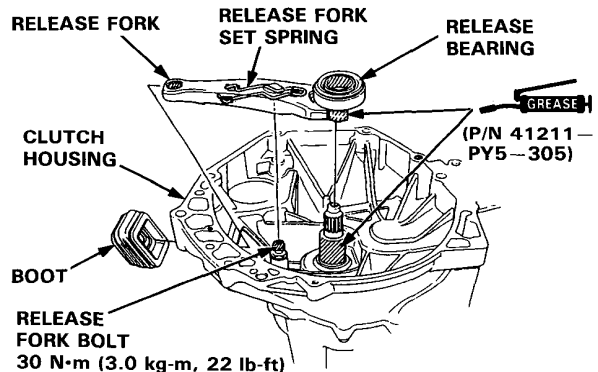
Installation

NOTE: Use only HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305).

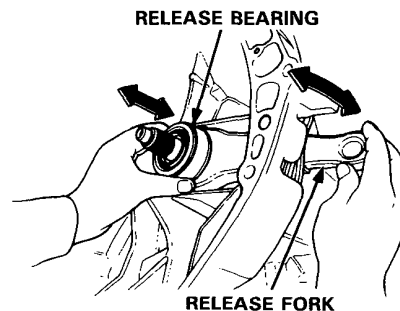
1. Install the release fork set spring on the release fork.



2. 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 clutch housing.
3. Align the detent of the release fork with the release fork bolt, then press the release fork over the release fork bolt squarely.



4. Install the boot, being sure that there is no clearance: release fork-to-boot, and boot-to-clutch housing.
5. Move the release fork right and left to make sure that the release fork fits properly against the release bearing, and that the release bearing slides smoothly.



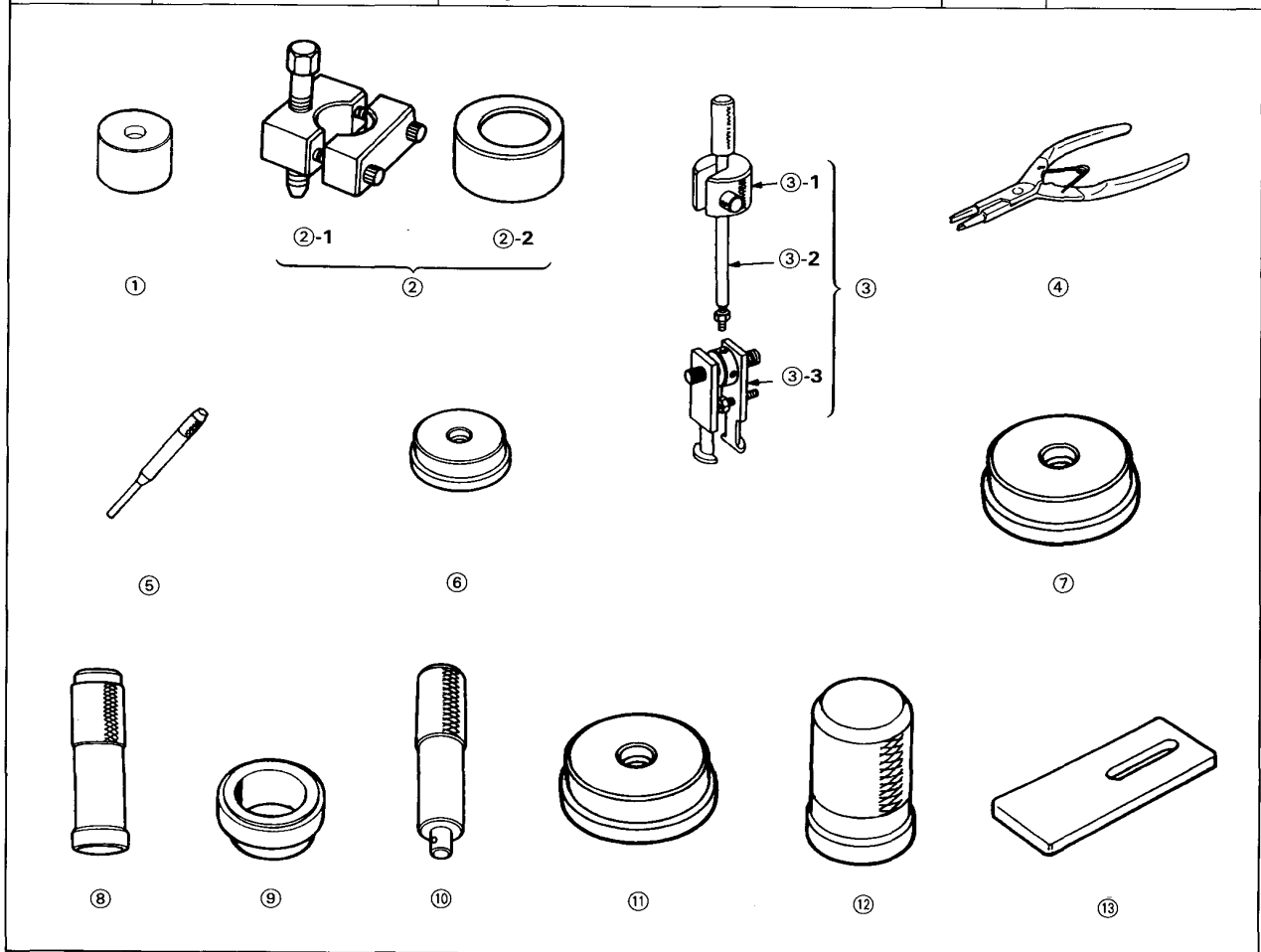
Manual Transmission

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Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAF—SD40200	Attachment	1	13-25
②	07GAJ—PG20102	Mainshaft Clearance Inspection Tool Set	1	13-36, 37
②-1	07GAJ—PG20110	Mainshaft Holder	(1)	
②-2	07GAJ—PG20130	Mainshaft Base	(1)	
③	07JAC—PH80000	Adjustable Bearing Remover Set	1	13-32, 33
③-1	07JAC—PH80100	Bearing Remover Attachment	(1)	
③-2	07JAC—PH80200	Remover Handle Assembly	(1)	
③-3	07741—0010201	Remover Weight	(1)	
④	07LGC—0010100	Snap Ring Plier	1	13-15, 39
⑤	07744—0010400	Pin Driver, 5.0 mm	1	13-28
⑥	07746—0010300	Outer Driver, 42 x 47 mm	1	13-22, 27, 32
⑦	07746—0010500	Outer Driver, 62 x 68 mm	1	13-32
⑧	07746—0030100	Inner Handle C	1	13-22
⑨	07746—0030400	Inner Driver, 35 mm	1	13-22
⑩	07749—0010000	Outer Handle A	1	13-22, 27, 32, 33
⑪	07947—6340400	Driver Attachment	1	13-33
⑫	07947—6890100	Seal Driver	1	13-27
⑬	07979—PJ40001	Magnet Stand Base	1	13-37

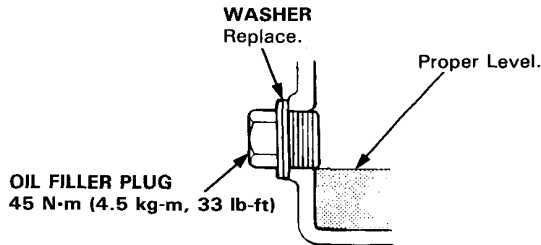


Maintenance

Transmission Oil

NOTE: Check the oil with engine OFF, and car 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 fill 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 oil to the proper level.

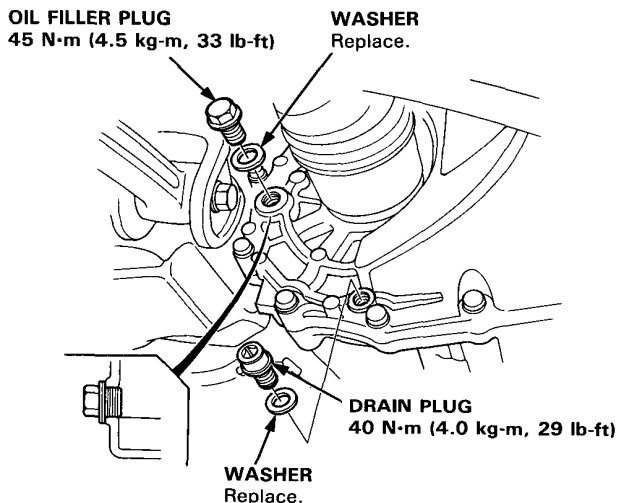
NOTE: The drain plug washer should be replaced at every oil change.

5. Reinstall the oil filler plug with a new washer.

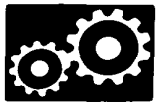
Oil Capacity

1.9 ℓ (2.0 US qt, 1.7 Imp qt) for oil change.
2.0 ℓ (2.1 US qt, 1.8 Imp qt) for overhaul.

Use only SAE 10 W-30 or 10 W-40, API service SF or SG grade.



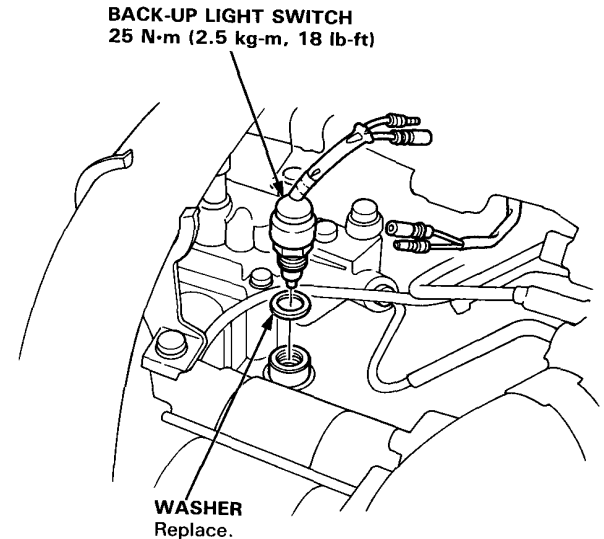
Back-up Light Switch



Replacement

NOTE: To test the back-up light switch see section 23.

1. Disconnect the back-up light switch connectors.
2. Remove the back-up light switch.



3. Install the new washer and back-up light switch.
4. Connect the back-up light switch connectors.

Transmission Assembly

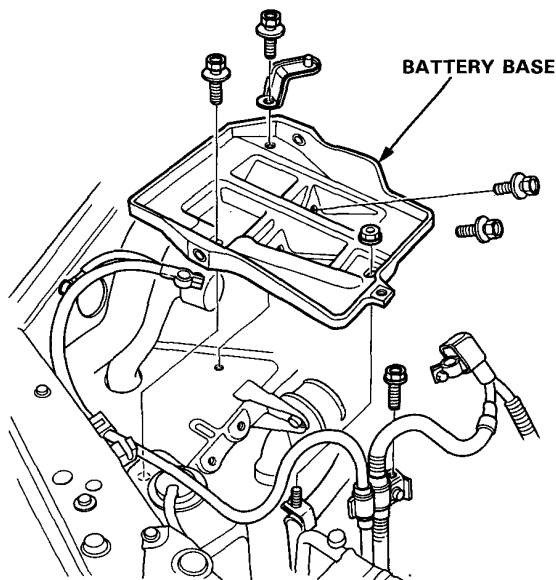
Removal

⚠ WARNING

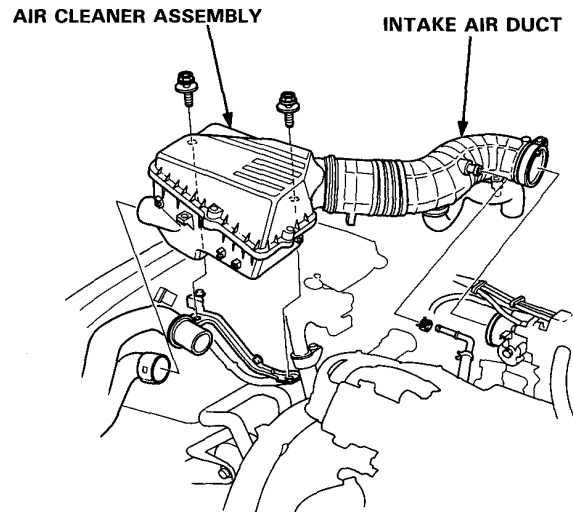
- Make sure jacks and safety stands are placed properly, and hoist brackets are attached to correct position on the engine.
- Apply parking brake and block rear wheels so car will not roll off stands and fall on you while working under it.

CAUTION: Use fender covers to avoid damaging painted surfaces.

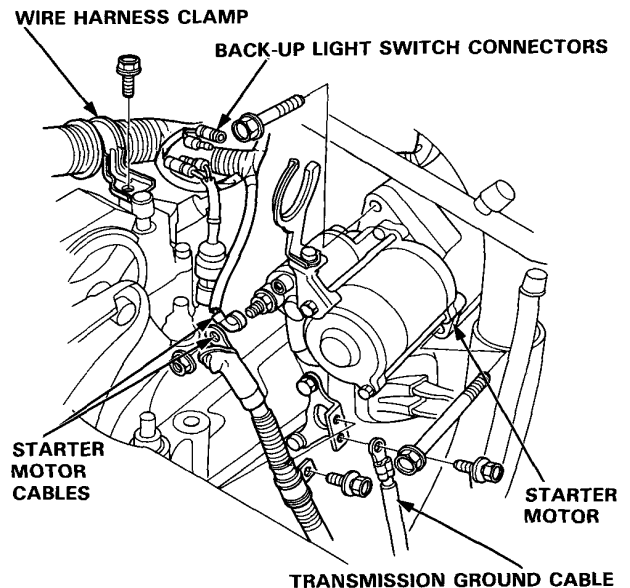
1. Disconnect the negative (–) and positive (+) cables from the battery, then remove the battery.
2. Drain the transmission oil (see page 13-3).
3. Remove the battery base.



4. Remove the intake air duct and air cleaner assembly.



5. Disconnect the starter motor cables, then remove the starter motor.
6. Disconnect the back-up light switch connectors and transmission ground cable.
7. Remove the wire harness clamp.

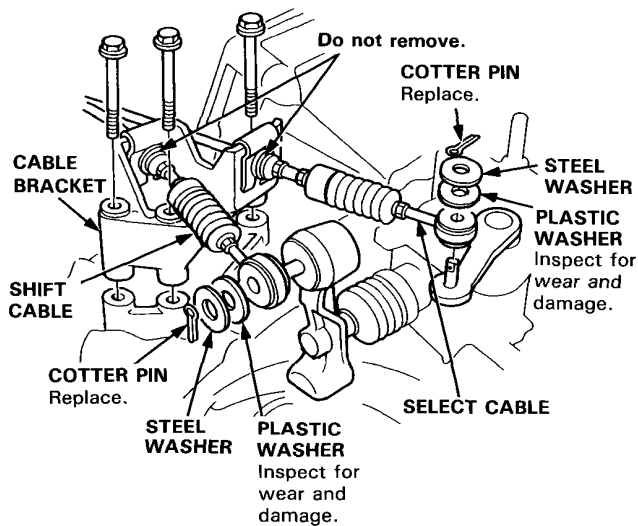




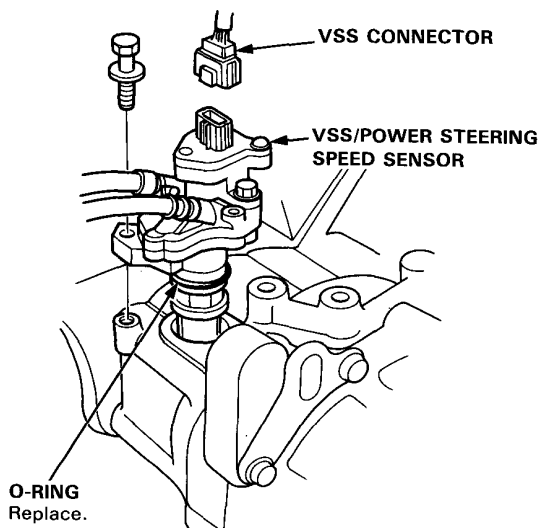
8. Shift the transmission into reverse.
9. First remove the cable bracket, then disconnect the cables from the top housing of the transmission.

NOTE: Remove both cables and the bracket together.

CAUTION: Take care not to bend the cables.



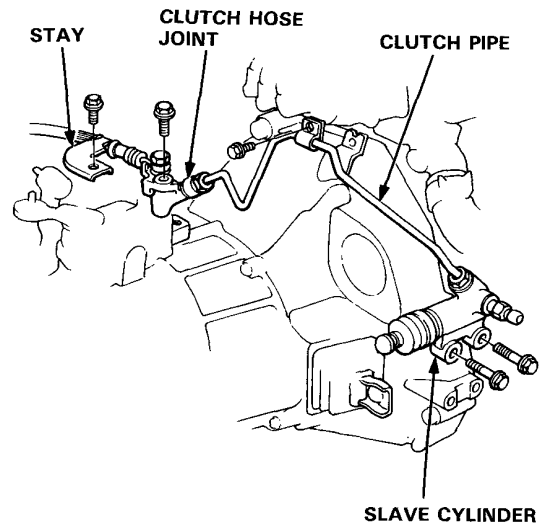
10. Disconnect the vehicle speed sensor (VSS) connector and remove the VSS/power steering speed sensor, but leave its hoses connected.



11. Remove the slave cylinder, clutch pipe, clutch hose joint, stay from the transmission.

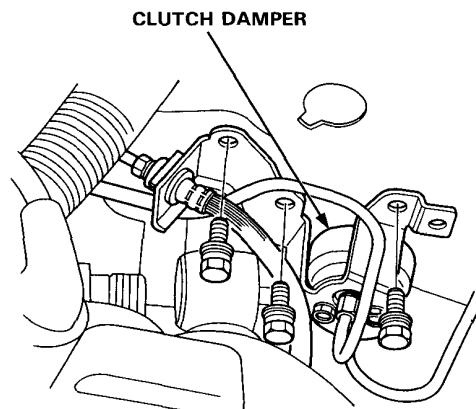
NOTE:

- Do not operate the clutch pedal once the slave cylinder has been removed.
- Take care not to bend the clutch pipe.



12. Remove the clutch damper mounting bolts, and raise the clutch damper.

NOTE: Do not disconnect the clutch pipe.

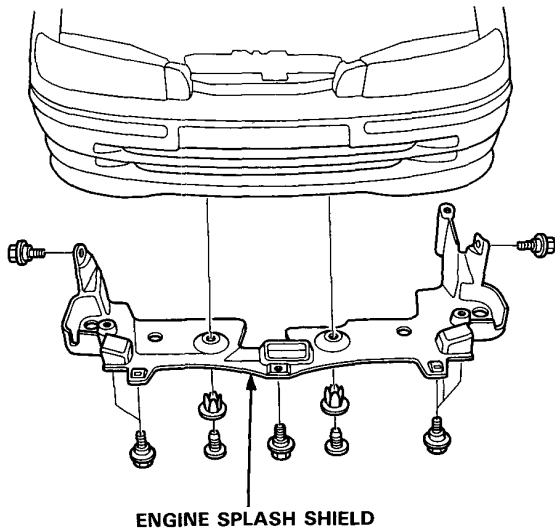


(cont'd)

Transmission Assembly

Removal (cont'd)

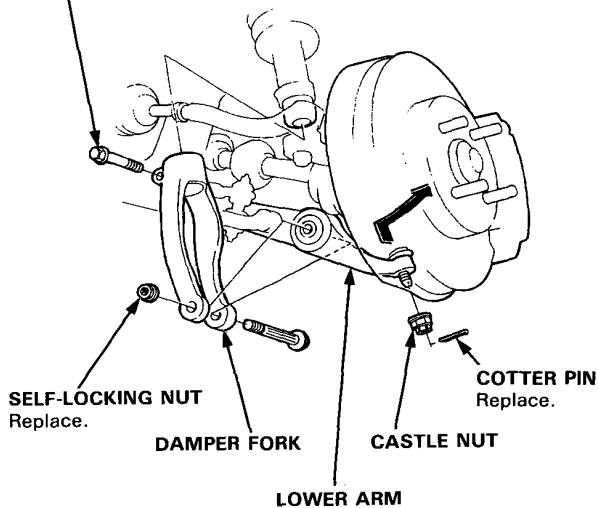
13. Remove the engine splash shield.



14. Remove the cotter pins and ball joint nuts, then separate the ball joints and lower arms on both sides (see section 18).

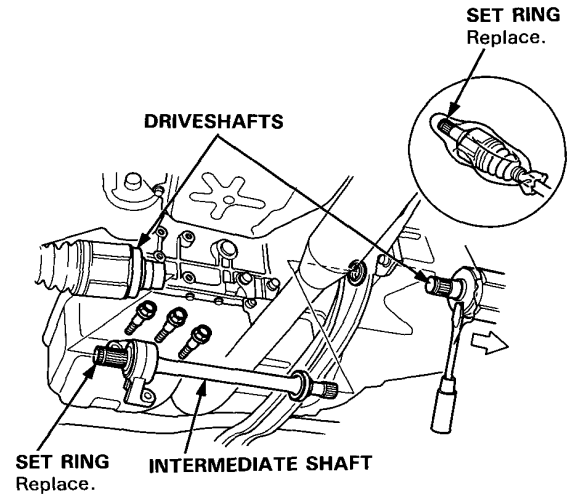
15. Remove the damper fork.

SELF-LOCKING BOLT
Replace.

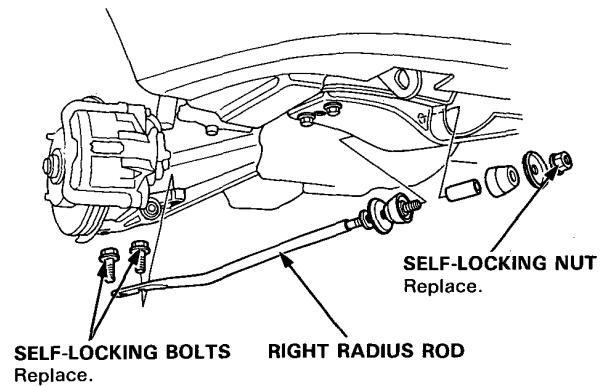


16. Remove the driveshafts and intermediate shaft (see section 16).

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

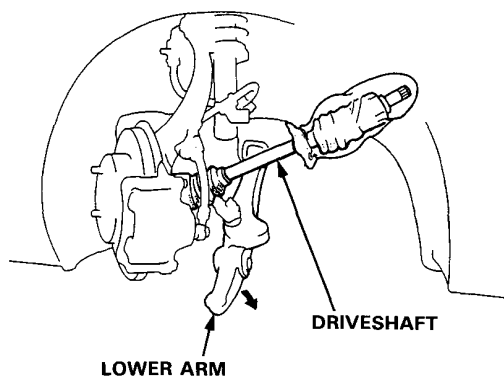


17. Remove the right radius rod.

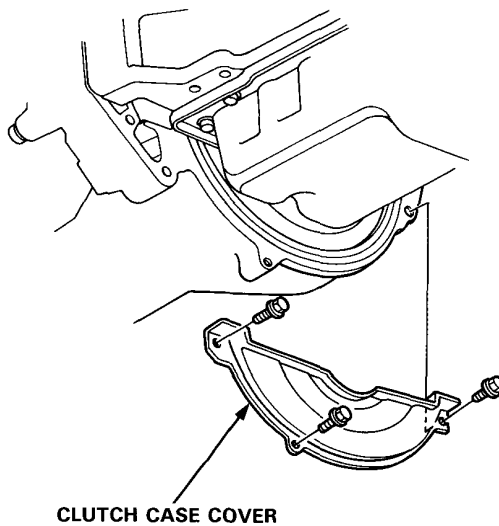




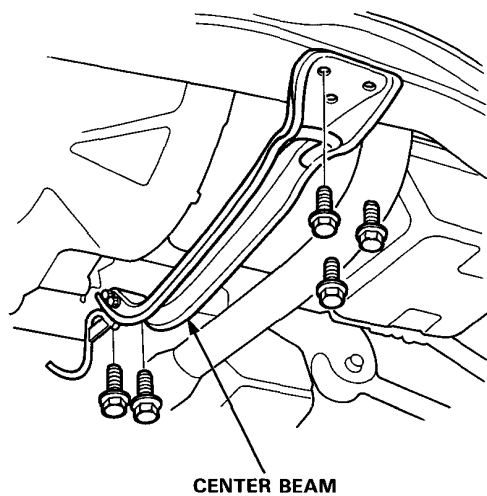
18. Swing the right driveshaft to the inner fender.



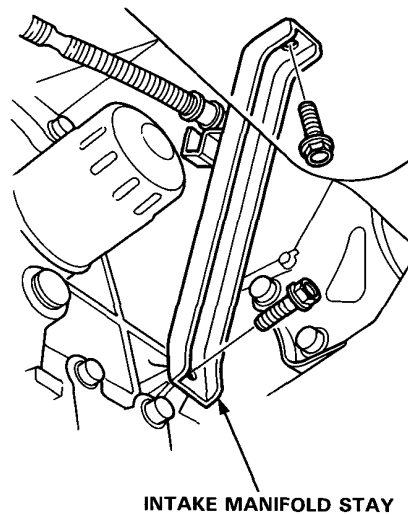
20. Remove the clutch case cover.



19. Remove the center beam.



21. Remove the intake manifold stay.

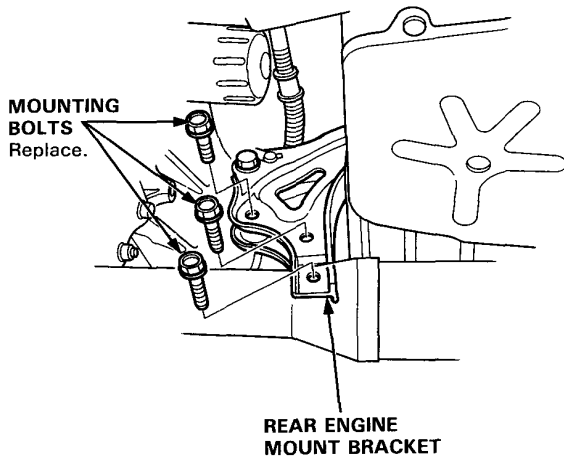


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Transmission Assembly

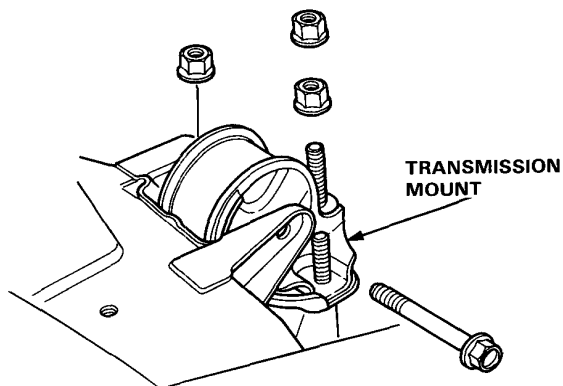
Removal (cont'd)

22. Remove the three rear engine mount bracket mounting bolts.

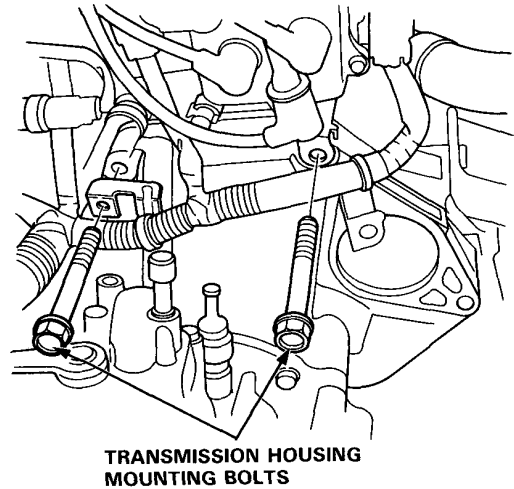


23. Place a floor jack under the transmission and raise the transmission just enough to take weight off of the mounts.

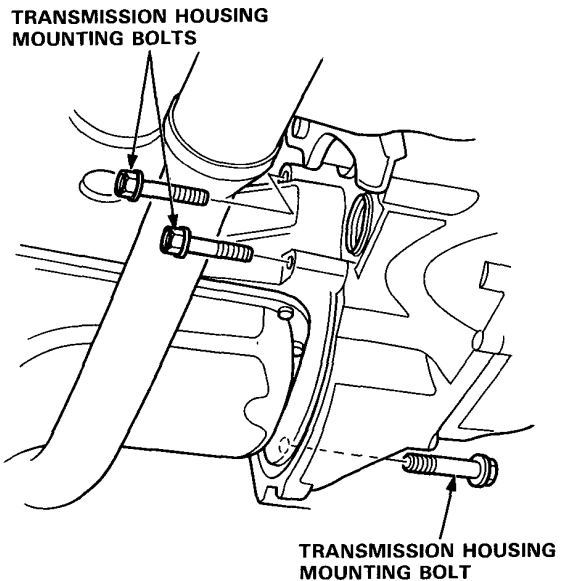
24. Remove the transmission mount.



25. Remove the two upper transmission housing mounting bolts.



26. Remove the three lower transmission housing mounting bolts.



27. Pull the transmission away from the engine until it clears the mainshaft, then lower it on the transmission jack.

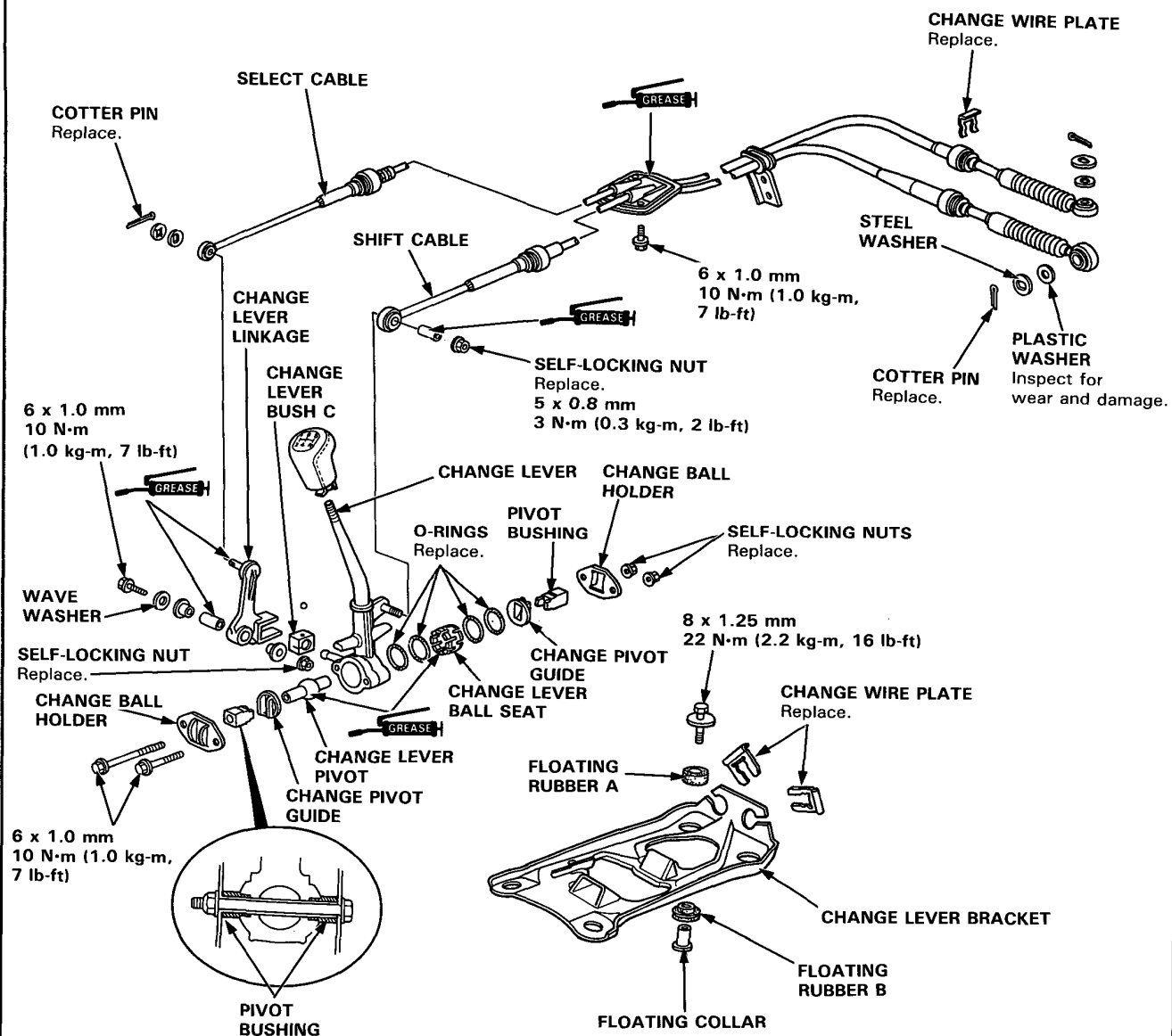


Gearshift Mechanism

Overhaul


NOTE:

- Inspect rubber parts for wear and damage when disassembling.
- Check that the new cotter pin is seated firmly.



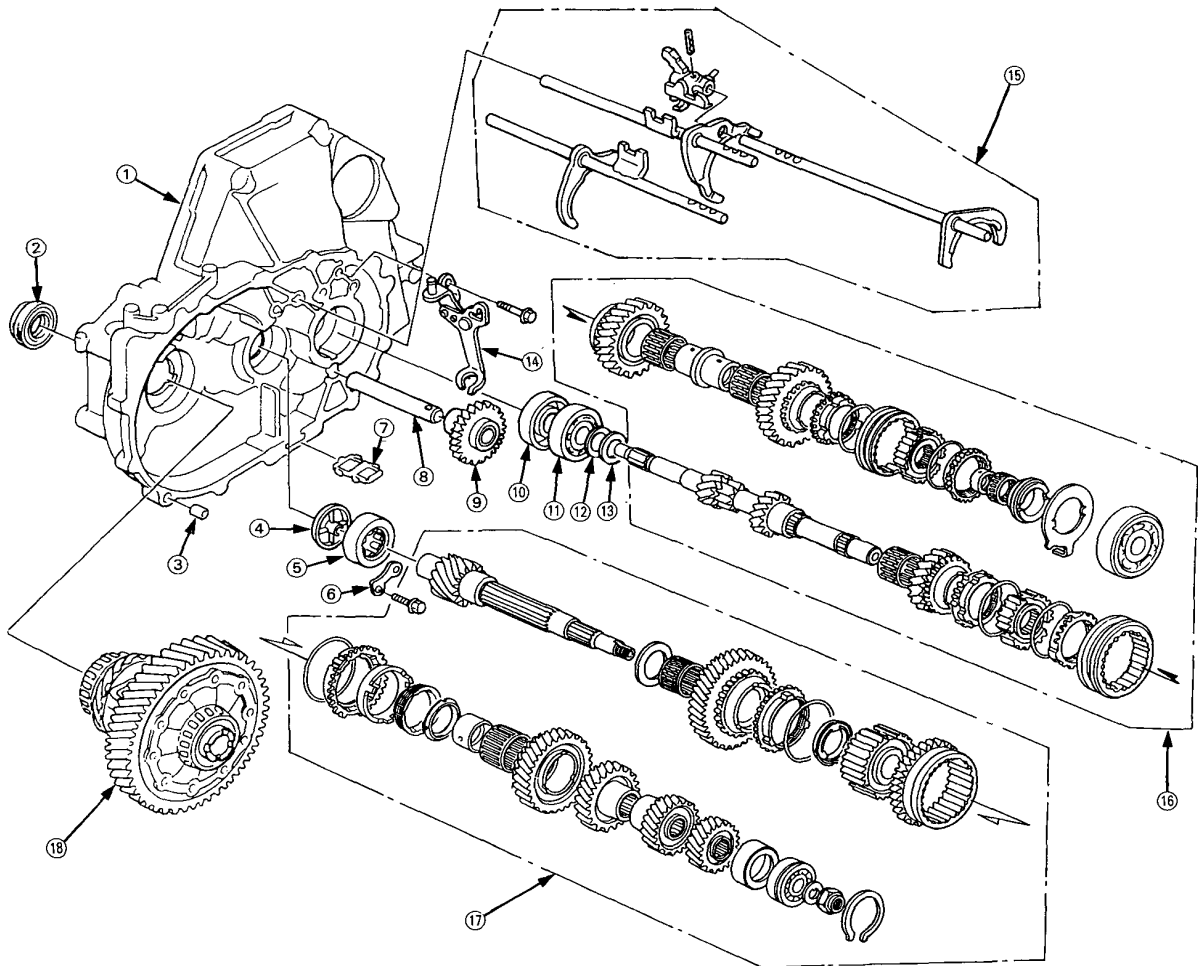
Illustrated Index

Refer to the drawing below for the transmission disassembly.
Clean all parts thoroughly in solvent and dry with compressed air.

 Lubricate all parts with oil before reassembly.

NOTE:

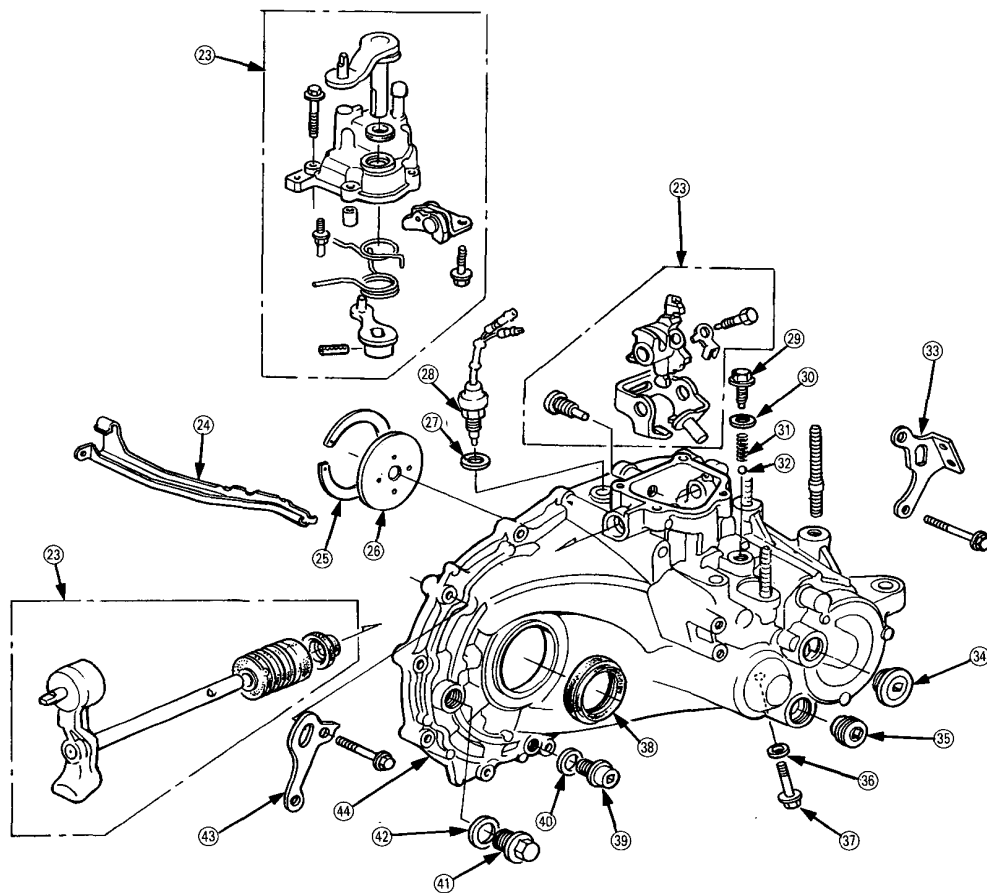
- This transmission uses no gaskets between the major housings; use liquid gasket (P/N OY740-99986) (see page 13-14, 39).
- Always clean the magnet ⑦ whenever the transmission housing is disassembled.
- Inspect the ball bearings for wear and operation.



- ① CLUTCH HOUSING
- ② OIL SEAL Replace.
• See section 15
- ③ 14 x 20 mm DOWEL PIN
- ④ OIL GUIDE PLATE
- ⑤ NEEDLE BEARING
- ⑥ RETAINING PLATE
- ⑦ MAGNET

- ⑧ REVERSE IDLER GEAR SHAFT
- ⑨ REVERSE IDLER GEAR
- ⑩ OIL SEAL Replace.
- ⑪ BALL BEARING
- ⑫ SPRING WASHER
- ⑬ WASHER
- ⑭ REVERSE SHIFT FORK

- ⑮ SHIFT FORK ASSEMBLY
• Index, page 13-28
- ⑯ MAINSHAFT ASSEMBLY
• Index, page 13-18
- ⑰ COUNTERSHAFT ASSEMBLY
• Index, page 13-23
- ⑱ DIFFERENTIAL ASSEMBLY
• See section 15



23 SHIFT ARM ASSEMBLY

• Index, page 13-12

24 OIL GUTTER PLATE

25 78 mm THRUST SHIM

• Selection, page 13-34

26 OIL GUIDE PLATE

WASHER Replace.

28 BACK-UP LIGHT SWITCH

29 SETTING SCREW

WASHER Replace.

31 SPRING L. 25 mm (0.98 in)

32 STEEL BALL D. 5/16 in

33 TRANSMISSION HANGER

34 28 mm SEALING BOLT

35 32 mm SEALING BOLT

36 WASHER Replace.

37 REVERSE IDLER GEAR

SHAFT BOLT

38 OIL SEAL

• See section 15

39 OIL DRAIN PLUG

40 WASHER Replace.

41 OIL FILLER BOLT

42 WASHER Replace.

43 TRANSMISSION HANGER

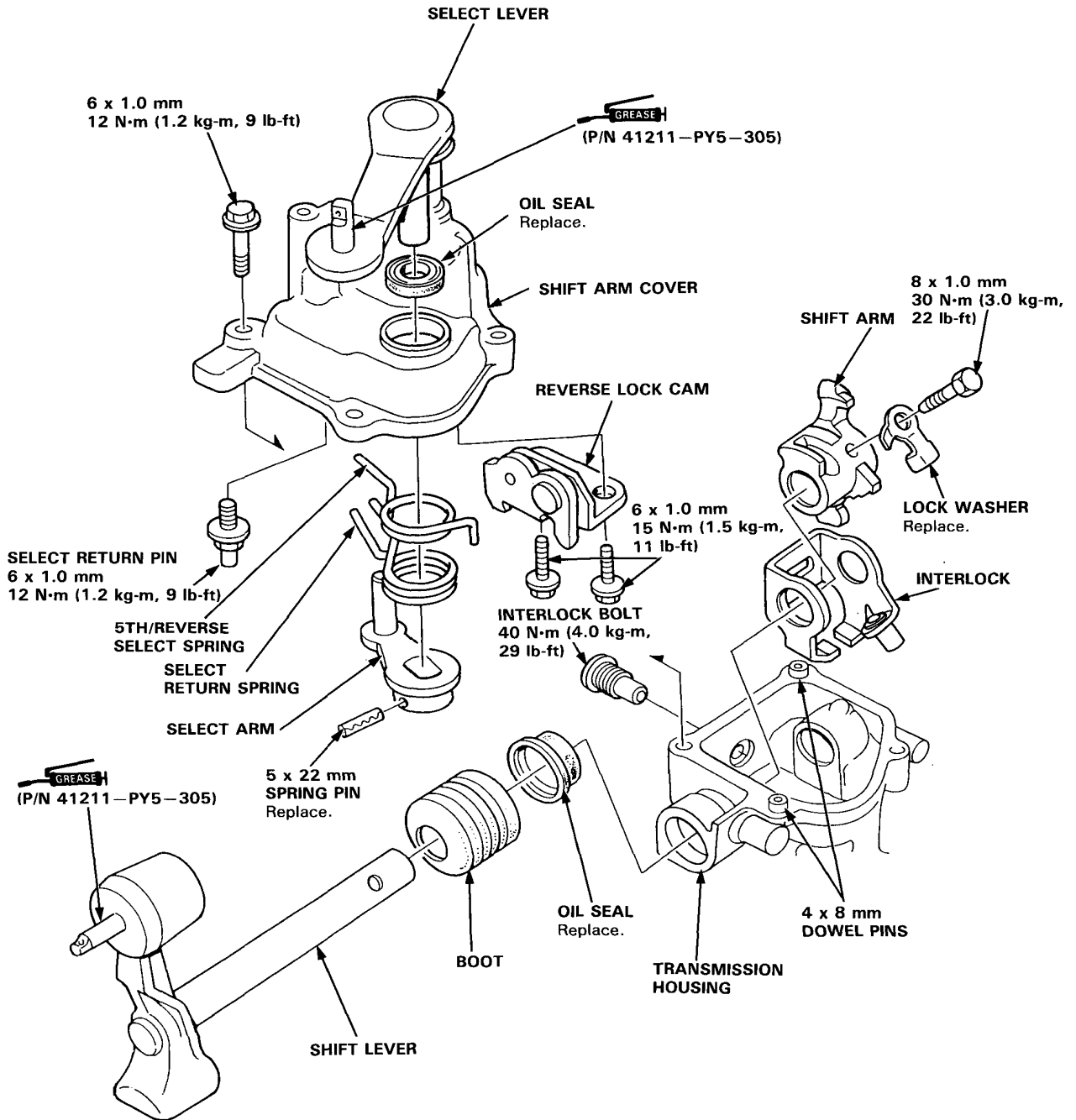
44 TRANSMISSION HOUSING

Shift Arm Assembly

Index

NOTE:

- The shift arm cover can be removed and installed with the transmission in the car.
- Lubricate all moving and sliding surfaces with grease.
- Turn the boot so the hole is facing down.



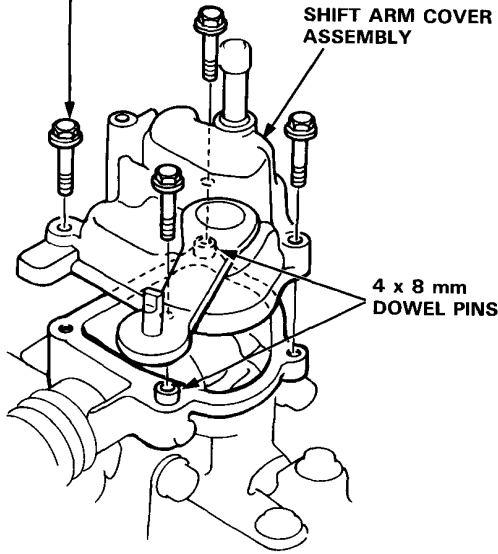


Disassembly/Reassembly

NOTE: During reassembly, grease all sliding parts.

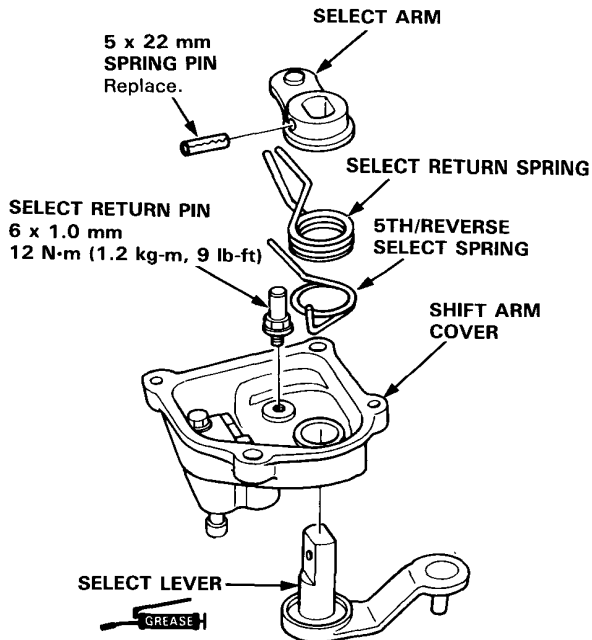
1. Remove the shift arm cover assembly.

6 x 1.0 mm
12 N·m (1.2 kg·m, 9 lb-ft)

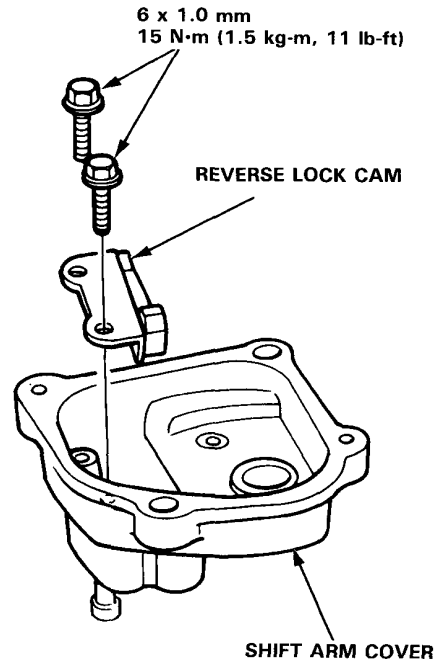


2. Remove the spring pin, then remove the select lever, select arm, and springs.

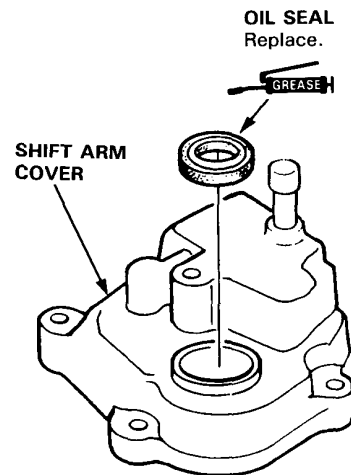
3. Remove the select return pin.



4. Remove the reverse lock cam.



5. Remove the oil seal.



(cont'd)

Shift Arm Assembly

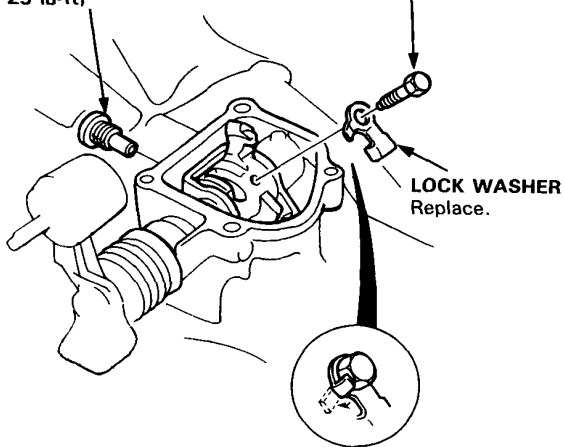
Disassembly/Reassembly (cont'd)

6. Bend the tab of the lock washer, then remove the bolt.
7. Remove the interlock bolt.

NOTE: Apply liquid gasket (P/N OY740-99986) to the threads before reassembly.

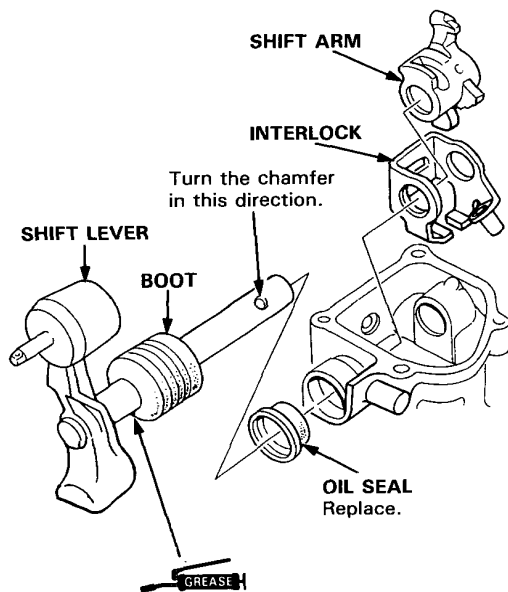
INTERLOCK BOLT
40 N·m (4.0 kg·m,
29 lb·ft)

8 x 1.0 mm
30 N·m
(3.0 kg·m, 22 lb·ft)



8. Remove the shift lever, shift arm, and interlock.

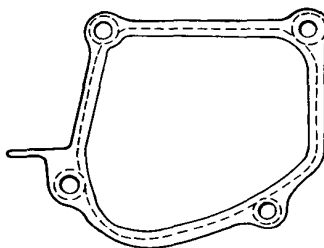
NOTE: Turn the boot so the hole is facing down.



9. Install the shift arm assembly in the reverse order of removal.

NOTE:

- Apply liquid gasket to the shift arm cover mating surface of the transmission housing.
- Use liquid gasket (P/N OY740-99986).
- Remove the dirt and oil from the sealing surface.
- Seal the entire circumference of the bolt hole to prevent oil leakage.
- If 20 minutes have passed after applying liquid gasket, reapply it and assemble the housings and allow it to cure at least 30 minutes after assembly before filling transmission with oil.



---: LIQUID GASKET



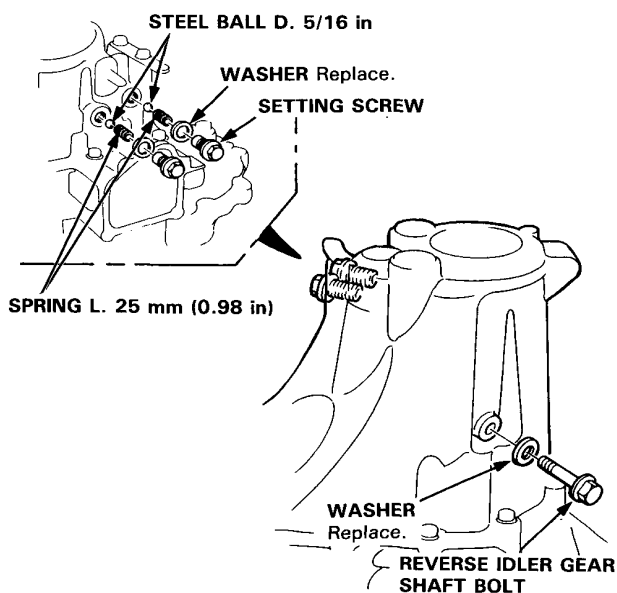
Transmission Housing

Removal

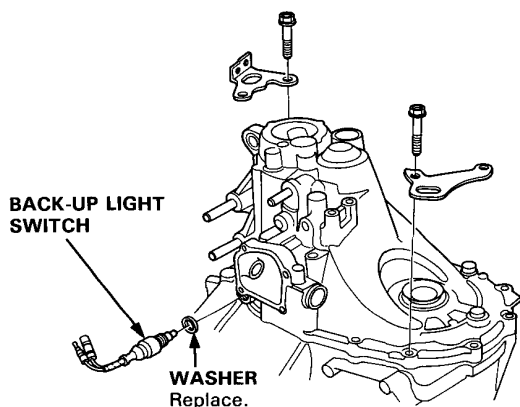
NOTE:

- If the transmission housing or clutch housing were replaced, the tapered roller bearing preload must be adjusted.
- Place the clutch housing on two pieces of wood thick enough to keep the mainshaft from hitting the workbench.

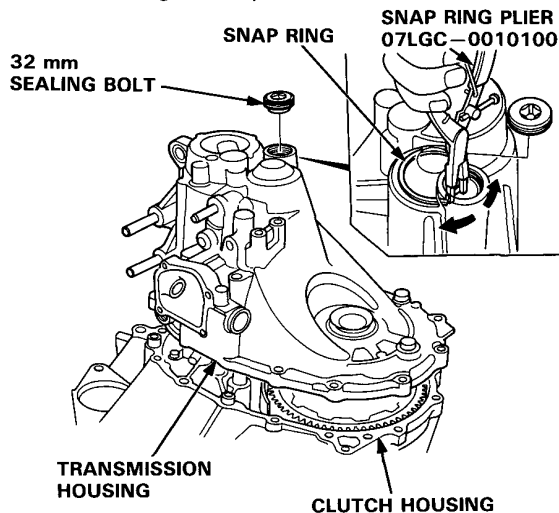
1. Remove the shift arm assembly (see page 13-13).
2. Remove the reverse idler gear shaft bolt.
3. Remove the setting screws, then remove the washers, springs, and steel balls.



4. Remove the back-up light switch.
5. Remove the 10 mm bolts and 8 mm bolts in a criss-cross pattern in several steps.

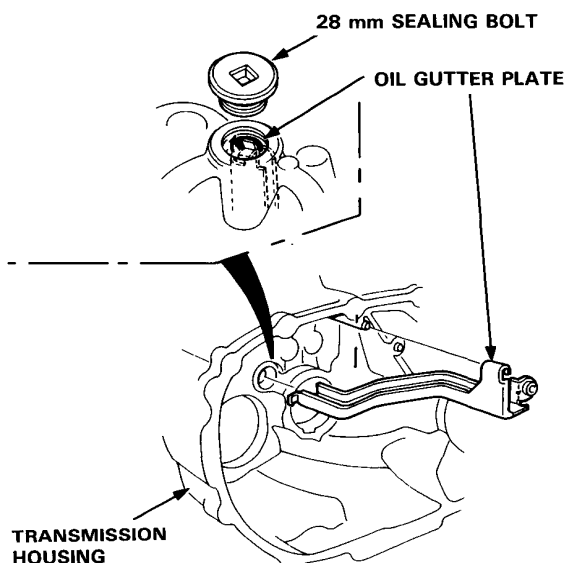


6. Remove the 32 mm sealing bolt.
7. Expand the snap ring on the countershaft ball bearing and remove it from the groove using a pair of snap ring pliers.
8. Separate the transmission housing from the clutch housing and wipe it clean of the sealant.



9. Remove the 28 mm sealing bolt, then remove the oil gutter plate.

NOTE: The transmission housing can be removed with the oil gutter plate in the transmission housing.

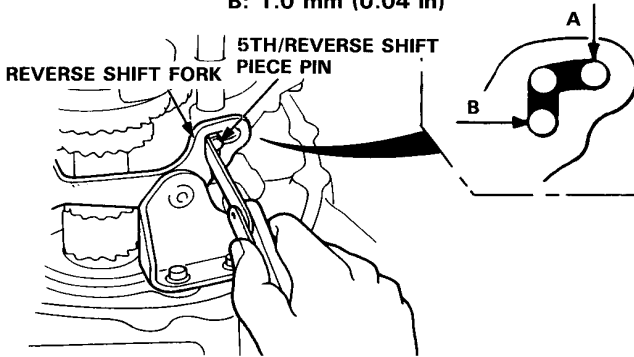


Reverse Shift Fork

Clearance Inspection

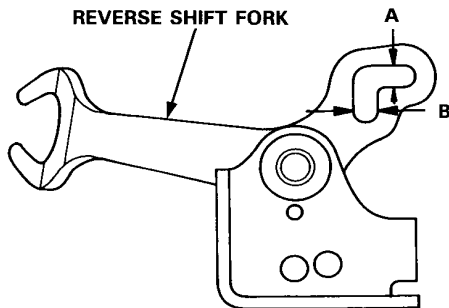
1. Measure the clearance between the reverse shift fork and 5th/reverse shift piece pin.

Standard: A: 0.05–0.35 mm (0.002–0.014 in)
 B: 0.4–0.8 mm (0.02–0.03 in)
Service Limit: A: 0.5 mm (0.02 in)
 B: 1.0 mm (0.04 in)



2. If the clearance exceeds the service limit, measure the width of the groove in the reverse shift fork.

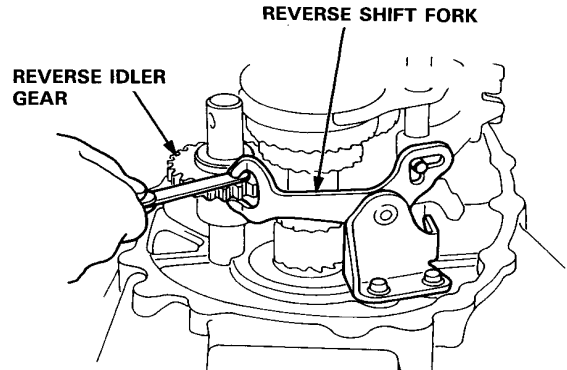
Standard: A: 7.05–7.25 mm (0.278–0.285 in)
 B: 7.4–7.7 mm (0.29–0.30 in)



If the width of the groove exceeds the standard, replace the reverse shift fork with a new one.
 If the width of the groove are within the standard, replace the 5th/reverse shift piece with a new one.

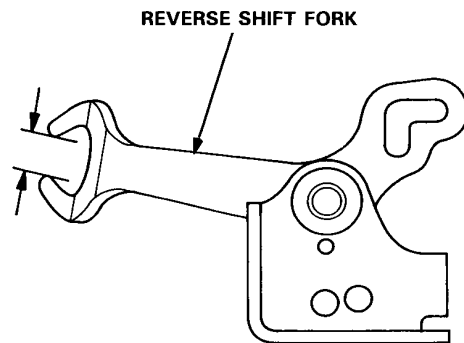
3. Measure the clearance between the reverse idler gear and reverse shift fork.

Standard: 0.5–1.1 mm (0.02–0.04 in)
Service Limit: 1.8 mm (0.07 in)



4. If the clearance exceeds the service limit, measure the width of the reverse shift fork.

Standard: 13.0–13.3 mm (0.51–0.52 in)

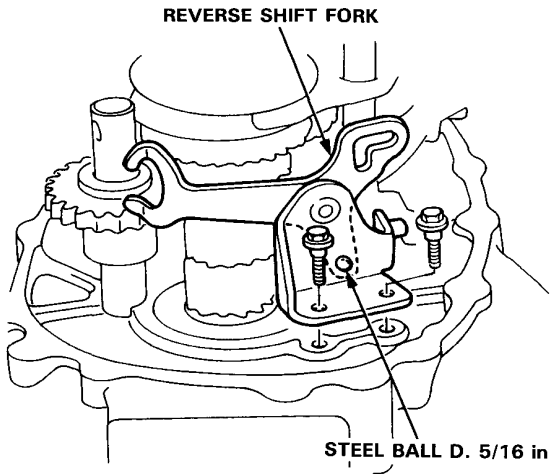


If the width exceeds the standard, replace the reverse shift fork with a new one.
 If the width is within the standard, replace the reverse idler gear with a new one.

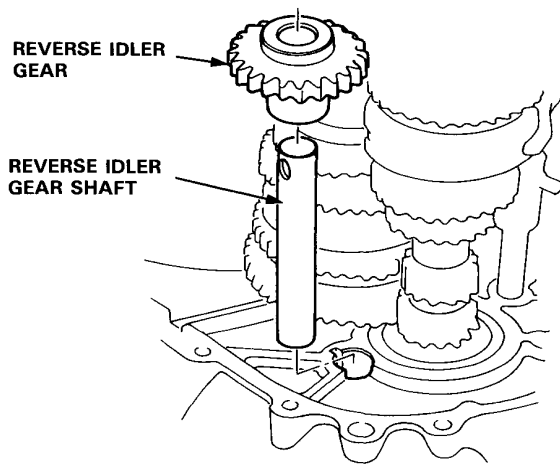
Reverse Idler Gear

Removal

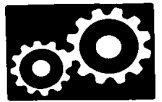
1. Remove the reverse shift fork.



2. Remove the reverse idler gear shaft and the reverse idler gear.



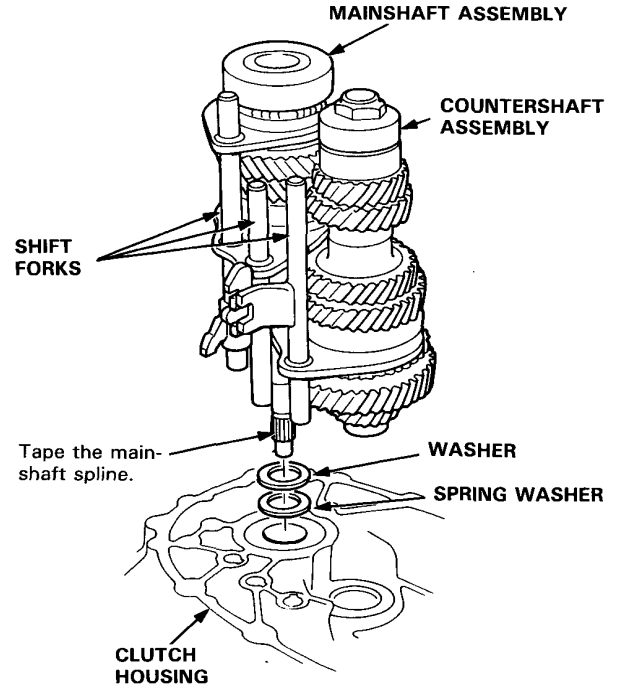
Mainshaft, Countershaft



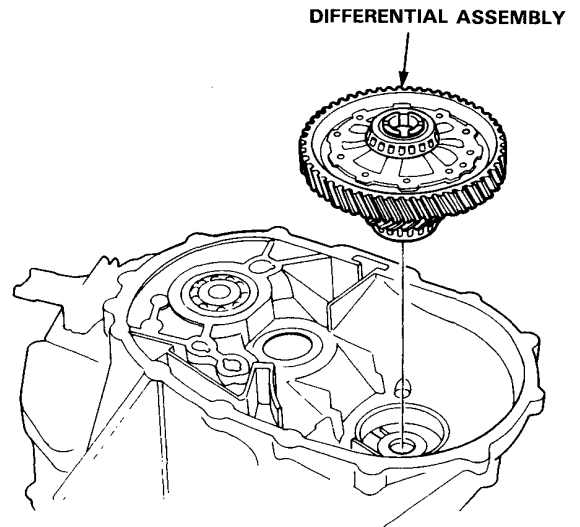
Removal

1. Remove the mainshaft and countershaft assemblies with the shift forks from the clutch housing.

NOTE: Tape the mainshaft spline before removing the mainshaft and countershaft assemblies.



2. Remove the differential assembly.

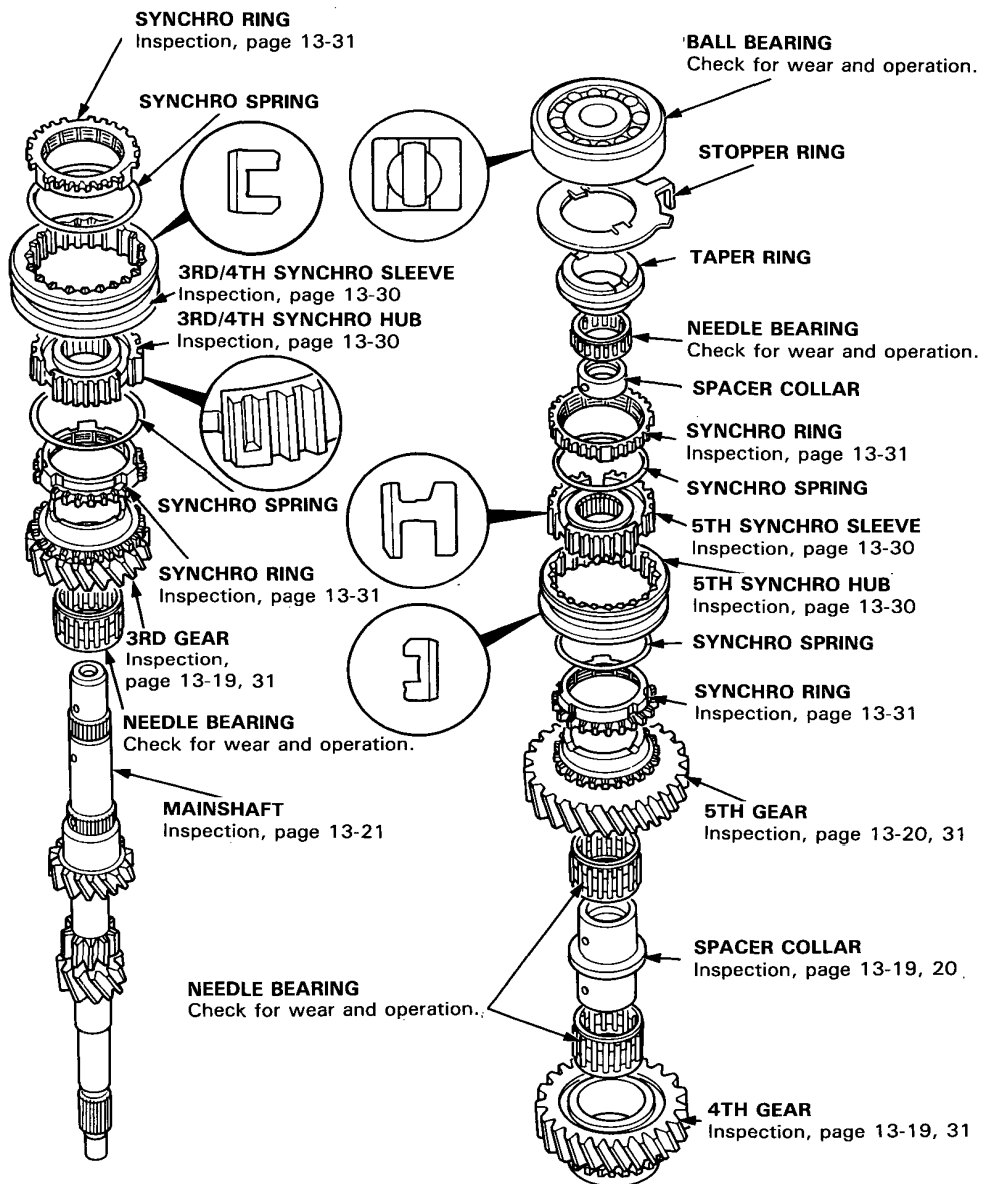


Mainshaft

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Before assembling, clean all parts in solvent, dry them with compressed air, then coat them with clean oil.



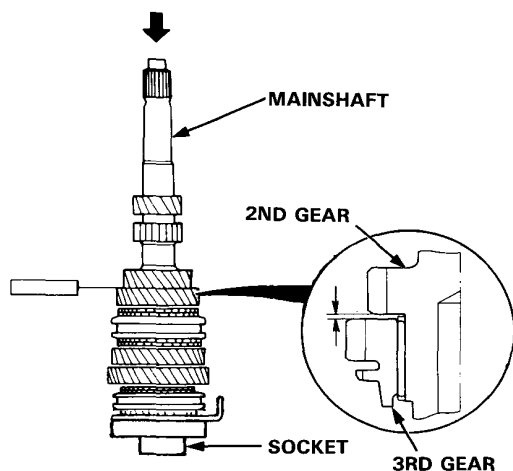


Clearance Inspection

NOTE: If replacement is required, always replace the synchro sleeve and hub as a set.

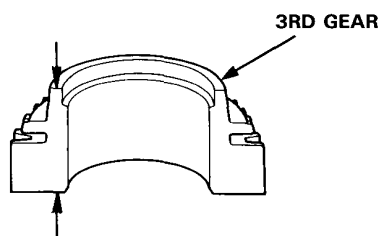
1. Support the bearing inner race with a socket and push down on the mainshaft.
2. Measure the clearance between 2nd and 3rd gears.

Standard: 0.06–0.21 mm
(0.002–0.008 in)
Service Limit: 0.3 mm (0.01 in)



3. If the clearance exceeds the service limit, measure the thickness of 3rd gear.

Standard: 32.42–32.47 mm
(1.276–1.278 in)
Service Limit: 32.3 mm (1.27 in)

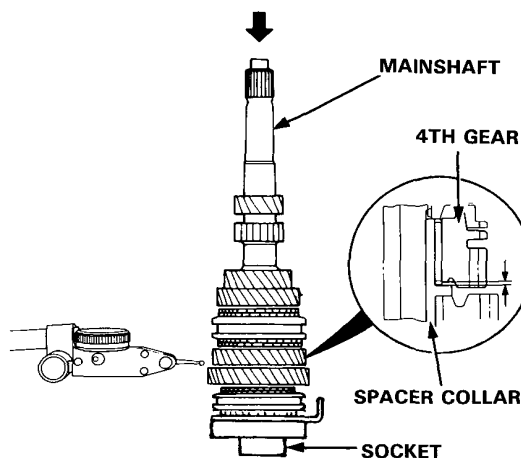


If the thickness of 3rd gear is less than the service limit, replace 3rd gear with a new one.

If the thickness of 3rd gear is within the service limit, replace the 3rd/4th synchro hub with a new one.

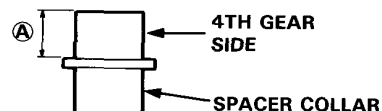
4. Measure the clearance between 4th gear and the spacer collar.

Standard: 0.06–0.21 mm (0.002–0.008 in)
Service Limit: 0.3 mm (0.01 in)



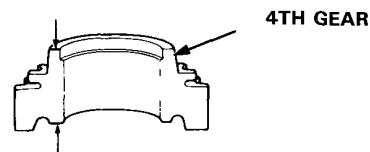
5. If the clearance exceeds the service limit, measure distance A on the spacer collar.

Standard: 26.03–26.08 mm
(1.025–1.027 in)
Service Limit: 26.01 mm (1.024 in)



6. If distance A is less than the service limit, replace the spacer collar with a new one. If distance A is within the service limit, measure the thickness of 4th gear.

Standard: 30.92–30.97 mm
(1.217–1.219 in)
Service Limit: 30.8 mm (1.21 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.

(cont'd)

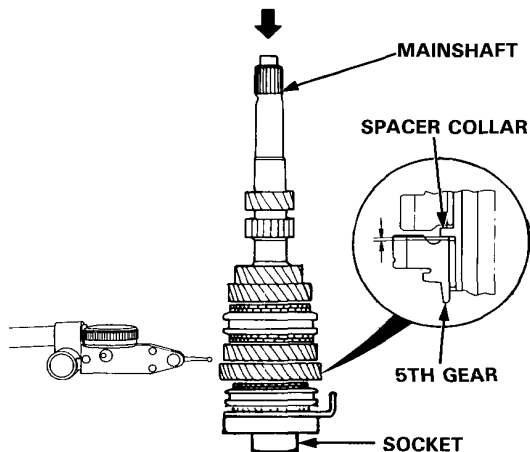
Mainshaft

Clearance Inspection (cont'd)

7. Measure the clearance between the spacer collar and 5th gear.

Standard: 0.06–0.21 mm
(0.002–0.008 in)

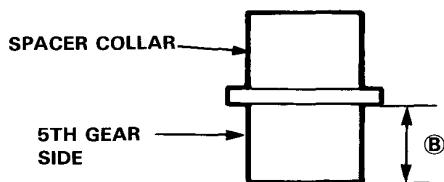
Service Limit: 0.3 mm (0.01 in)



8. If the clearance exceeds the service limit, measure distance \textcircled{B} on the spacer collar.

Standard: 26.03–26.08 mm
(1.025–1.027 in)

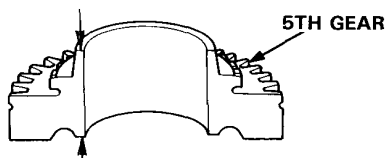
Service Limit: 26.01 mm (1.024 in)



9. If distance \textcircled{B} is less than the service limit, replace the spacer collar with a new one. If distance \textcircled{B} is within the service limit, measure thickness of 5th gear.

Standard: 30.92–30.97 mm
(1.217–1.219 in)

Service Limit: 30.8 mm (1.21 in)



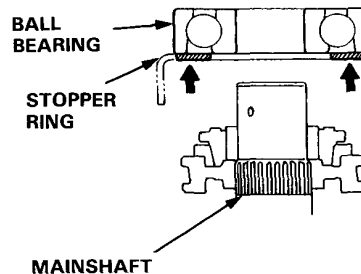
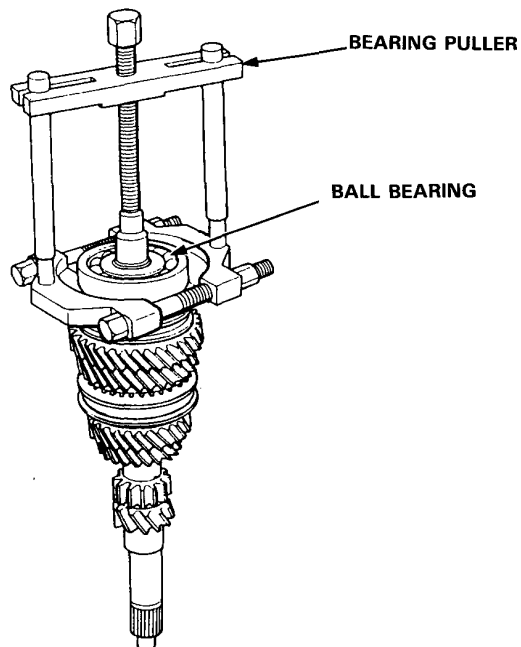
If the thickness of 5th gear is less than the service limit, replace 5th gear with a new one.

If the thickness of 5th gear is within the service limit, replace the 5th synchro hub with a new one.

Disassembly

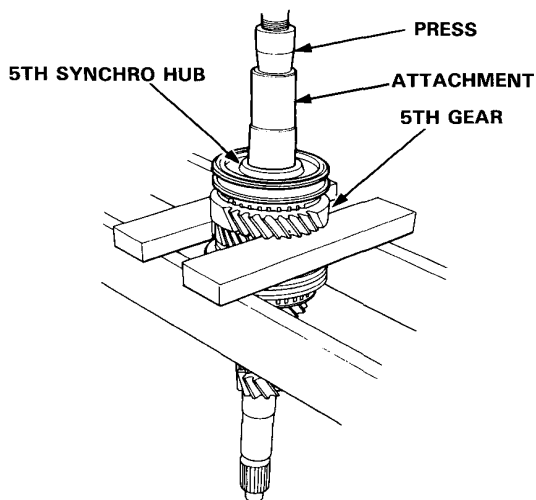
CAUTION: Remove the synchro hubs using a press and steel blocks as shown. Use of a jaw-type puller can damage the gear teeth.

1. Remove the ball bearing using a bearing puller as shown.

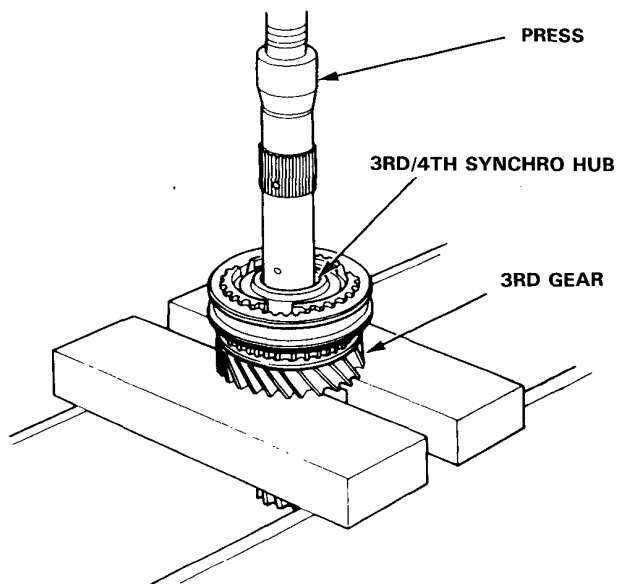




2. Support 5th gear on steel blocks as shown and press the shaft out of the 5th synchro hub.



3. In the same manner as above, support the 3rd gear on steel blocks and press the shaft 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, and C.

Standard:

A (Ball bearing surface): 27.987–28.000 mm
(1.1018–1.1024 in)

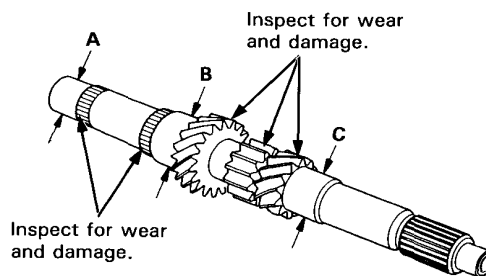
B (Needle bearing surface): 37.984–38.000 mm
(1.4954–1.4961 in)

C (Ball bearing surface): 27.977–27.990 mm
(1.1015–1.1020 in)

Service Limit: A: 27.94 mm (1.100 in)

B: 37.93 mm (1.493 in)

C: 27.94 mm (1.100 in)



Inspect oil passages for clogging.

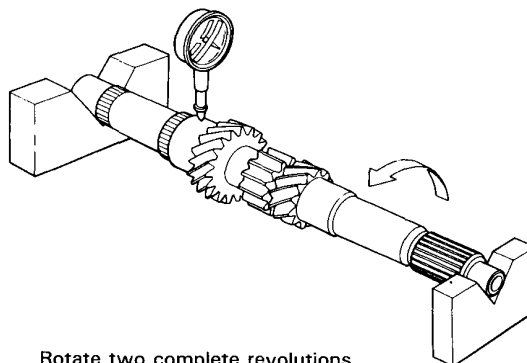
If any part of the mainshaft is less than the service limit, replace it with a new one.

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 exceeds the service limit, replace the mainshaft with a new one.

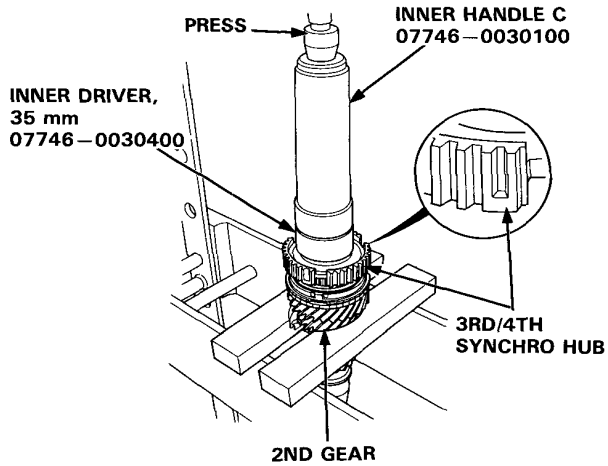
Mainshaft

Reassembly

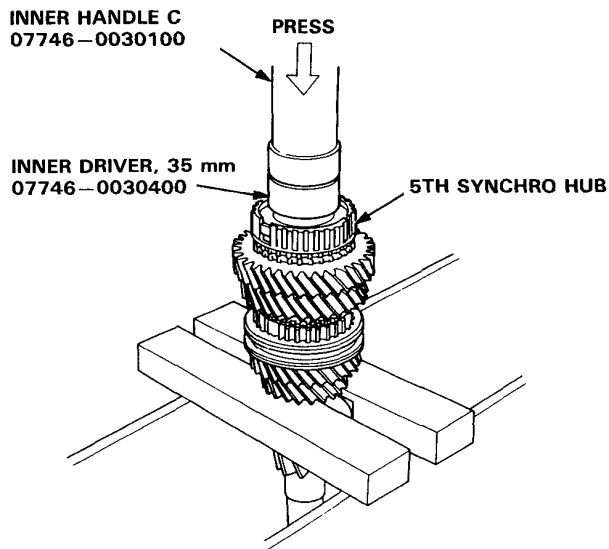
NOTE: Refer to page 13-18 for reassembly sequence.

1. Support 2nd gear on steel blocks as shown, then install the 3rd/4th synchro hub using the special tools and a press as shown.

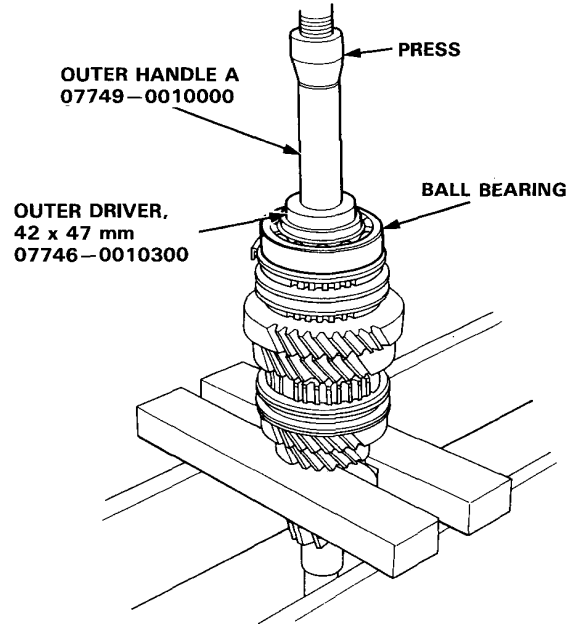
NOTE: After installing, check the operation of the 3rd/4th synchro hub set.



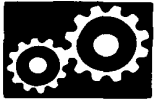
2. Install the 5th synchro hub using the special tools and a press as shown.




3. Install the ball bearing using the special tools and a press as shown.

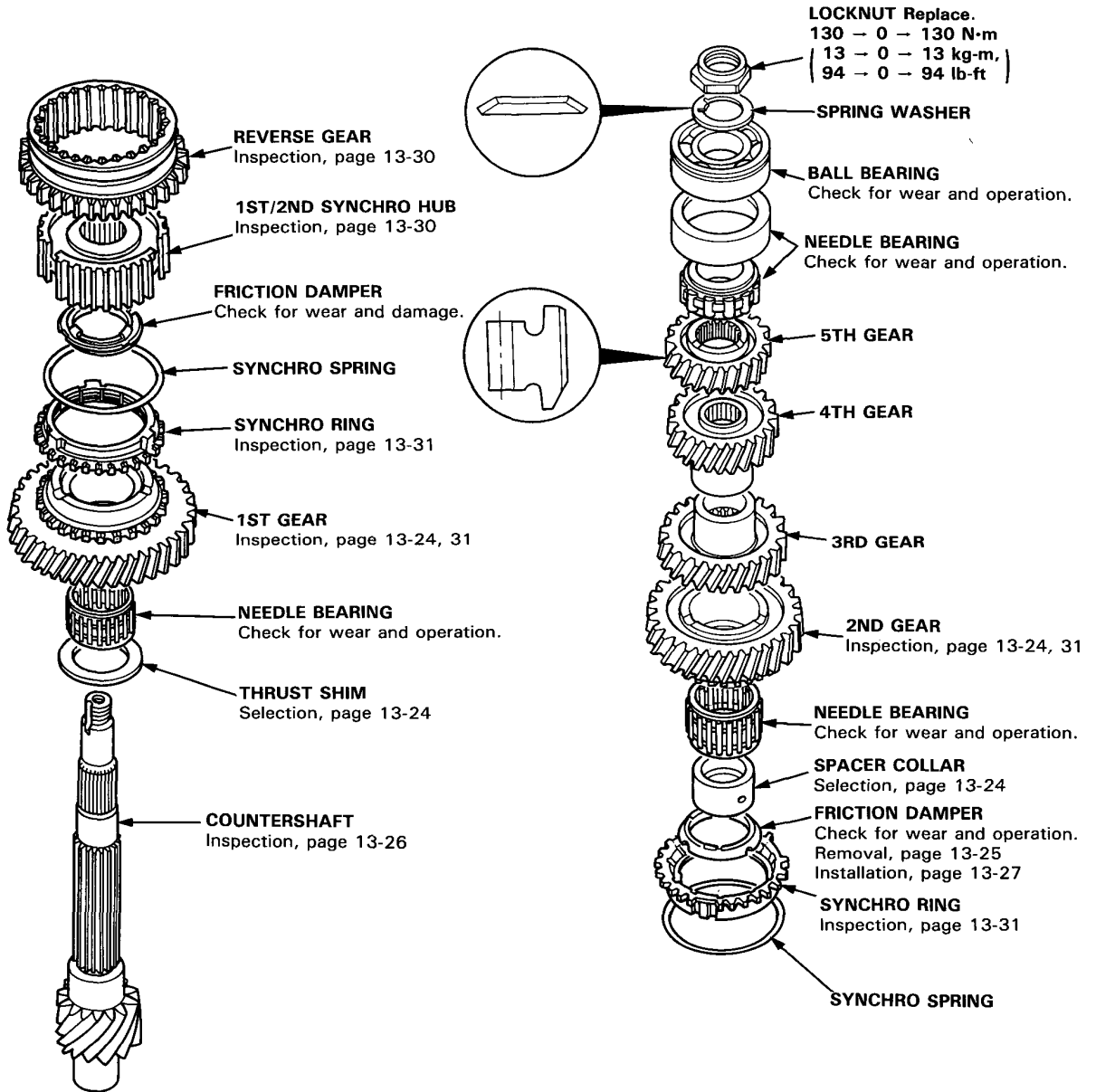


Countershaft



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 Before assembling, clean all parts in solvent, dry them with compressed air, then coat them with clean oil.

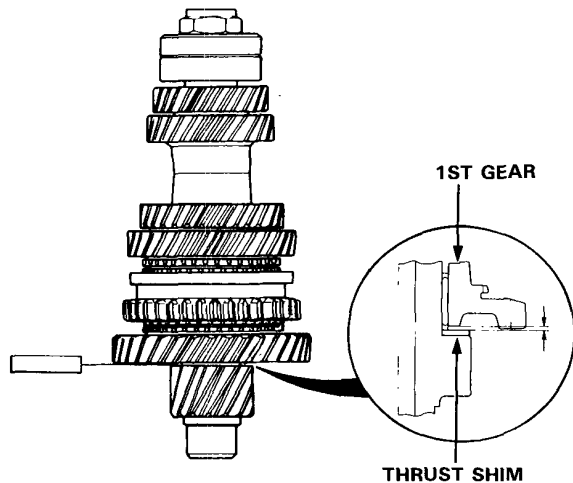


Countershaft

Clearance Inspection

1. Measure the clearance between the 1st gear and thrust shim.

Standard: 0.04–0.10 mm
(0.002–0.004 in)



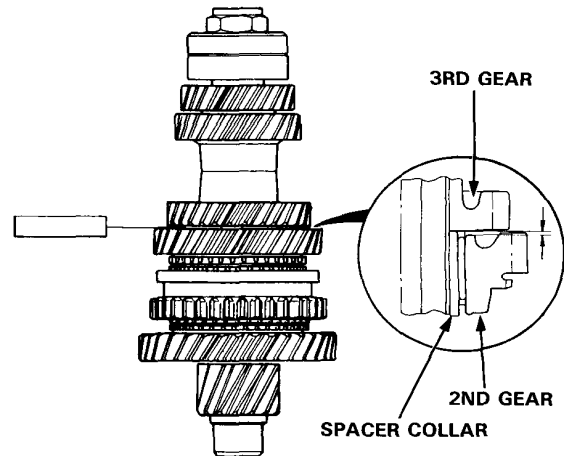
2. If the clearance exceeds the standard, select the appropriate thrust shim for the correct clearance from the chart below.

THRUST SHIM

	Part Number	Thickness
A	23921-PG1-000	1.96 mm (0.0771 in)
B	23922-PG1-000	1.99 mm (0.0783 in)
C	23923-PG1-000	2.02 mm (0.0795 in)
D	23924-PG1-000	2.05 mm (0.0807 in)
E	23925-PG1-000	2.08 mm (0.0819 in)

3. Measure the clearance between the 2nd gear and 3rd gear.

Standard: 0.04–0.10 mm
(0.002–0.004 in)



4. If the clearance exceeds the standard, select the appropriate spacer collar for the correct clearance from the chart below.

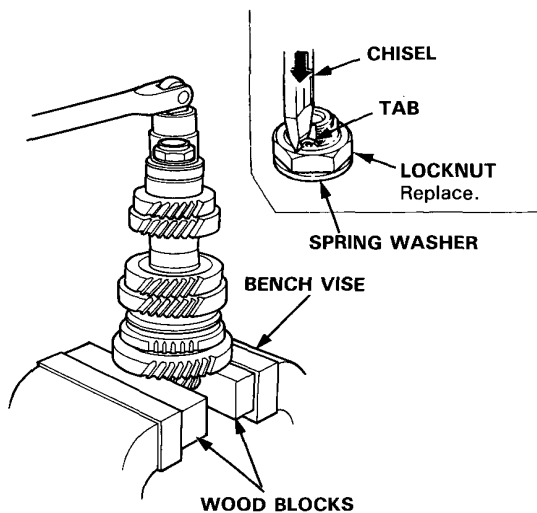
SPACER COLLAR

	Part Number	Thickness
A	23917-P21-010	29.02–29.04 mm 1.1425–1.1433 in
B	23918-P21-010	29.07–29.09 mm 1.1445–1.1453 in

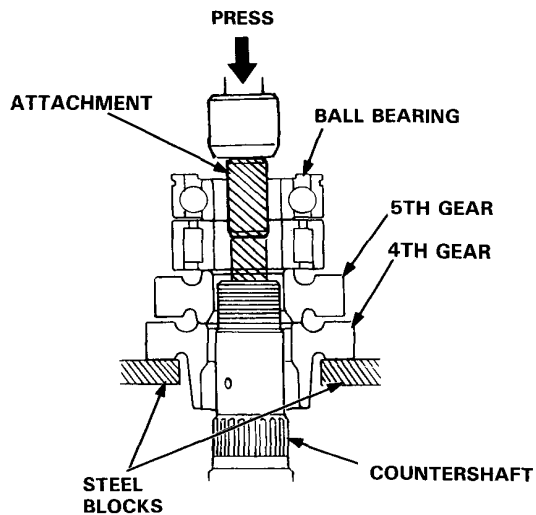


Disassembly

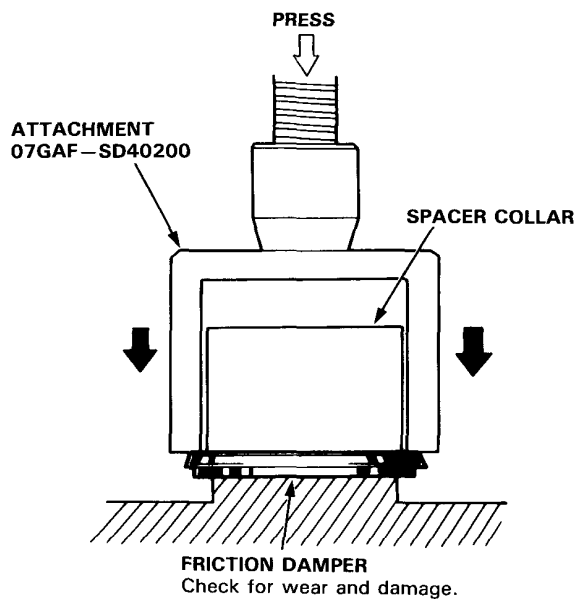
1. Securely clamp the countershaft assembly in a bench vise with wood blocks.
2. Raise the locknut tab from the groove of the shaft, then remove the locknut and the spring washer.



3. Remove the ball bearing using a press as shown.



4. Remove the friction damper from the spacer collar using the press and a special tool as shown.



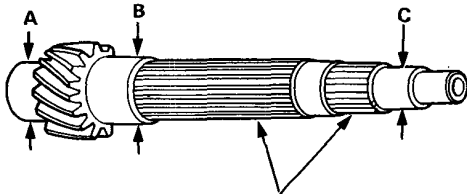
Countershaft

Inspection

1. Inspect the gear surface and bearing surface for wear and damage, then measure the countershaft at points A, B, and C.

Standard: A: 38.000–38.015 mm (1.4961–1.4967 in)
B: 39.984–40.000 mm (1.5742–1.5748 in)
C: 24.987–25.000 mm (0.9837–0.9843 in)

Service Limit: A: 37.95 mm (1.494 in)
B: 39.93 mm (1.572 in)
C: 24.94 mm (0.982 in)



Inspect for wear and damage.

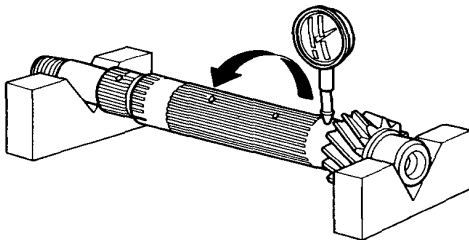
If any part of the countershaft is less than the service limit, replace it with a new one.

2. Inspect for runout.

Standard: 0.02 mm (0.001 in)
Service Limit: 0.05 mm (0.002 in)

NOTE: Support the countershaft at both ends as shown.

Rotate two complete revolutions.



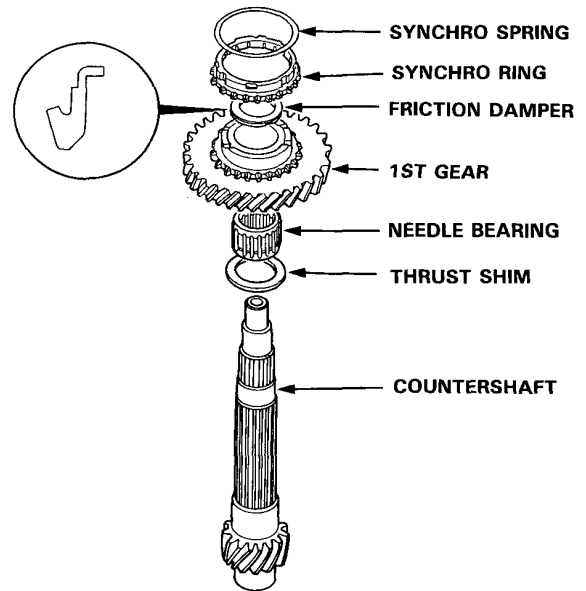
If the runout exceeds the service limit, replace the countershaft with a new one.

Reassembly

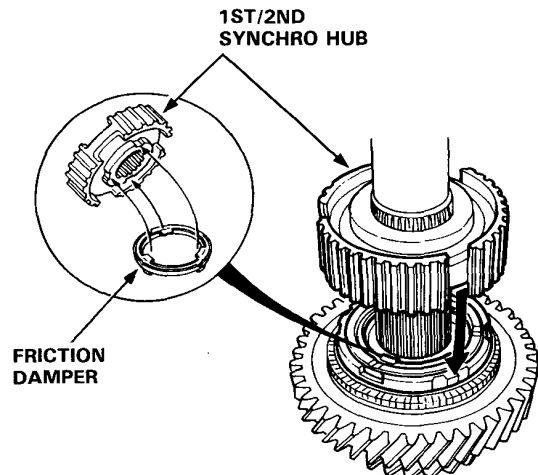
NOTE: Refer to page 13-23 for reassembly sequence.

1. Install the thrust shim, needle bearing, 1st gear, friction damper, synchro ring, and synchro spring.

NOTE: Reassemble the 1st gear and friction damper before installation.

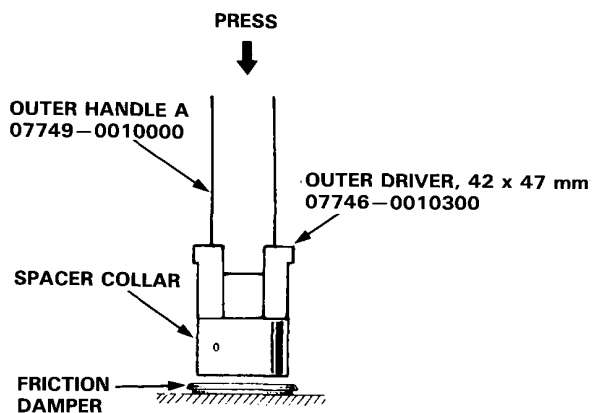


2. Install the 1st/2nd synchro hub by aligning the friction damper fingers with 1st/2nd synchro hub grooves.

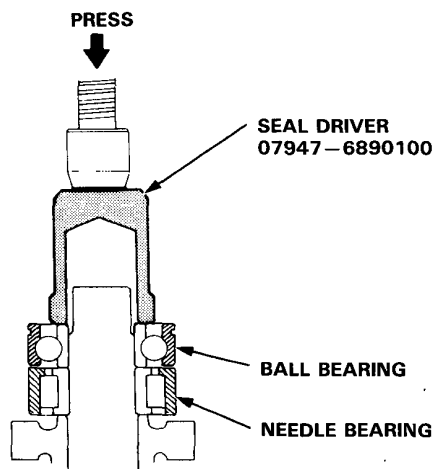




3. Install the friction damper on the spacer collar using the special tools and a press as shown.

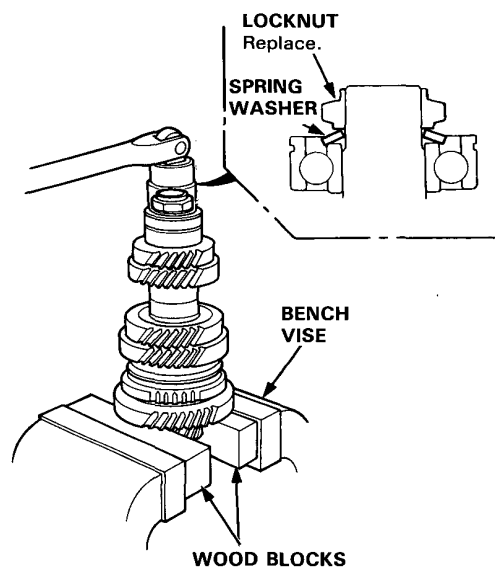


4. Install the needle bearing.
5. Install the ball bearing using a special tool and a press as shown.



6. Install the spring washer.
7. Securely clamp the countershaft assembly in a bench vise with wood blocks.
8. Tighten the new locknut to the correct torque, then stake the locknut tab into the groove.

**Torque: 130 - 0 - 130 N·m (13 - 0 - 13 kg-m,
94 - 0 - 94 lb-ft)**

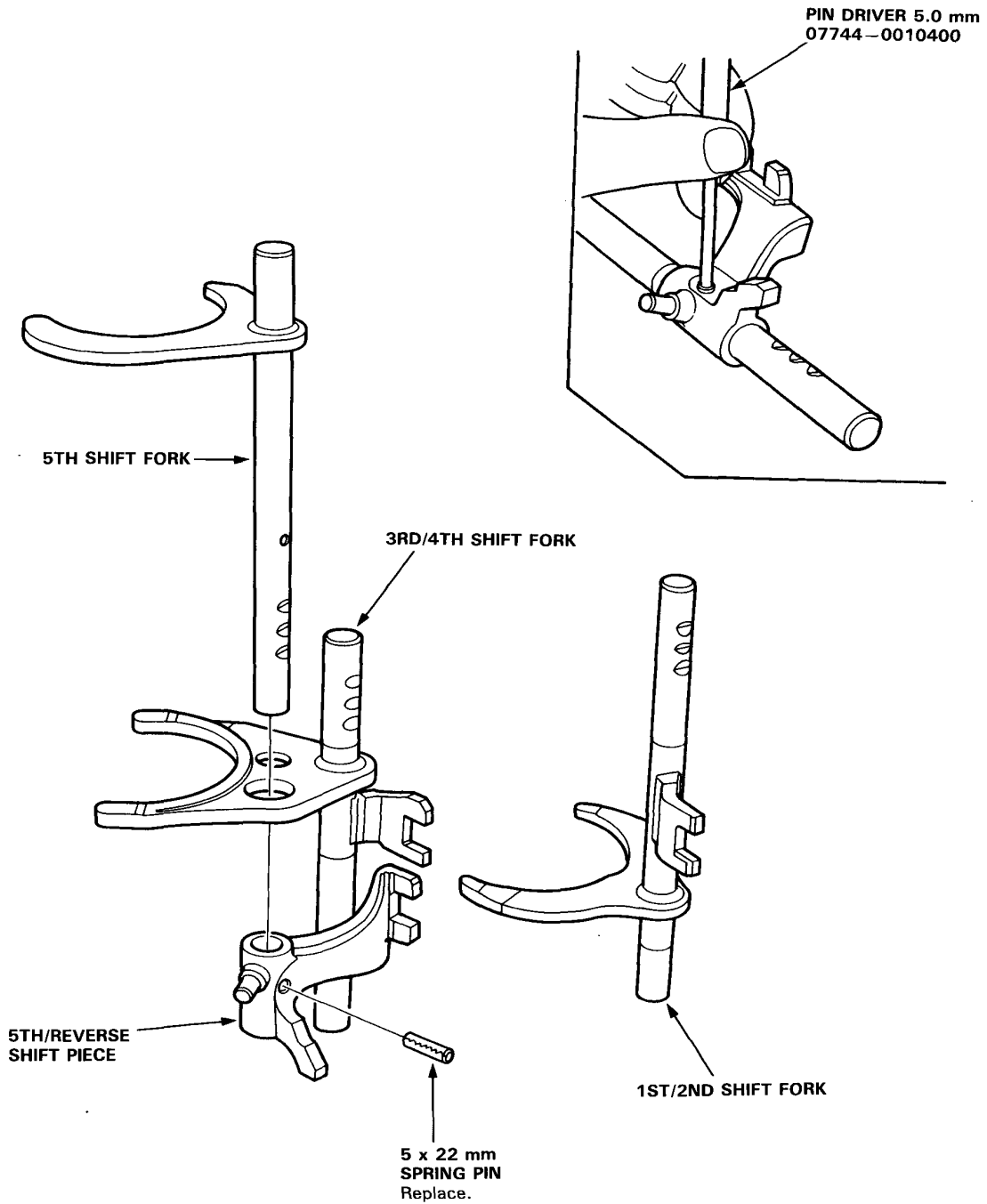


Shift Fork Assembly

Disassembly/Reassembly



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



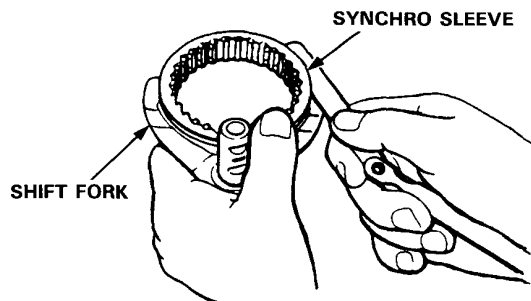


Clearance Inspection

NOTE: The synchro sleeve and synchro hub should be replaced as a set.

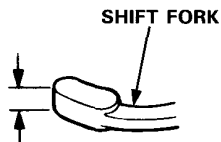
1. Measure the clearance between each shift fork and its matching synchro sleeve.

Standard: 0.35–0.65 mm (0.014–0.026 in)
Service Limit: 1.00 mm (0.039 in)



2. If the clearance exceeds the service limit, measure the thickness of the shift fork fingers.

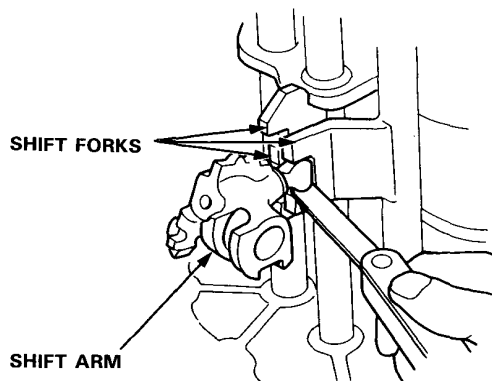
Standard: 6.2–6.4 mm (0.24–0.25 in)



If the thickness of the shift fork finger is less than the standard, replace the shift fork with a new one.
If the thickness of the shift fork finger is within the standard, replace the synchro sleeve with a new one.

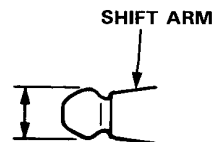
3. Measure the clearance between the shift fork and the shift arm.

Standard: 0.2–0.5 mm (0.008–0.019 in)
Service Limit: 0.6 mm (0.024 in)



4. If the clearance exceeds the service limit, measure the width of the shift arm.

Standard: 12.9–13.0 mm (0.508–0.512 in)



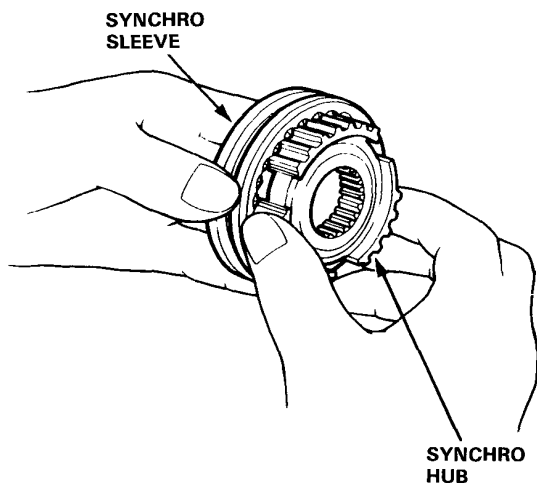
If the width of the shift arm is less than the standard, replace the shift arm with a new one.
If the width of the shift arm is within the standard, replace the shift fork or shift piece with a new ones.

Synchro Sleeve, Synchro Hub

Inspection

1. Inspect gear teeth on all synchro hubs and synchro sleeves for rounded off corners, which indicates wear.
2. Install each synchro hub in its mating synchro sleeve and check for freedom of movement.

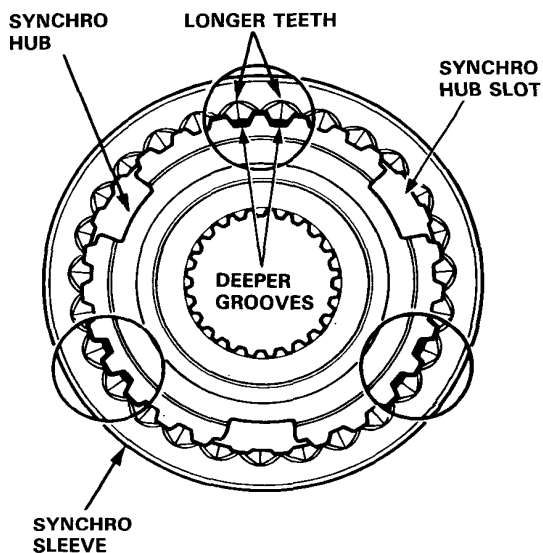
NOTE: If replacement is required, always replace the synchro sleeve and synchro hub as a set.



Installation

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 1st/2nd 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.

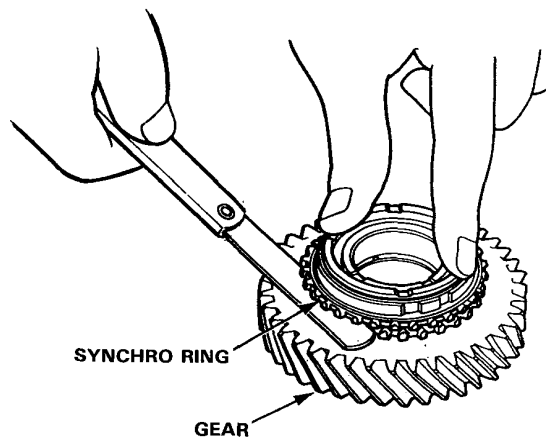
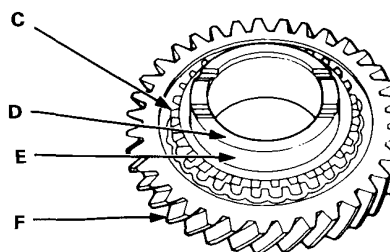
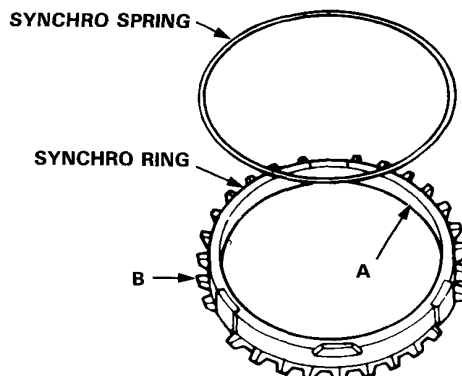
NOTE: Hold the synchro ring against the gear evenly while measuring the clearance.

Synchro Ring-to-Gear Clearance

Standard: 0.85–1.10 mm
(0.033–0.043 in)

Service Limit: 0.4 mm (0.016 in)

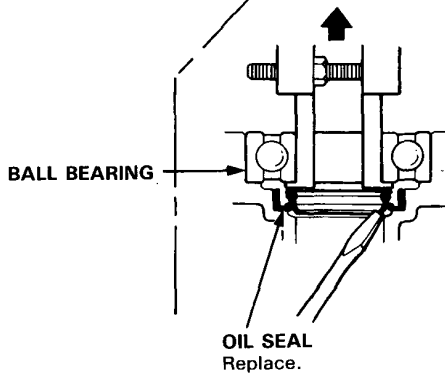
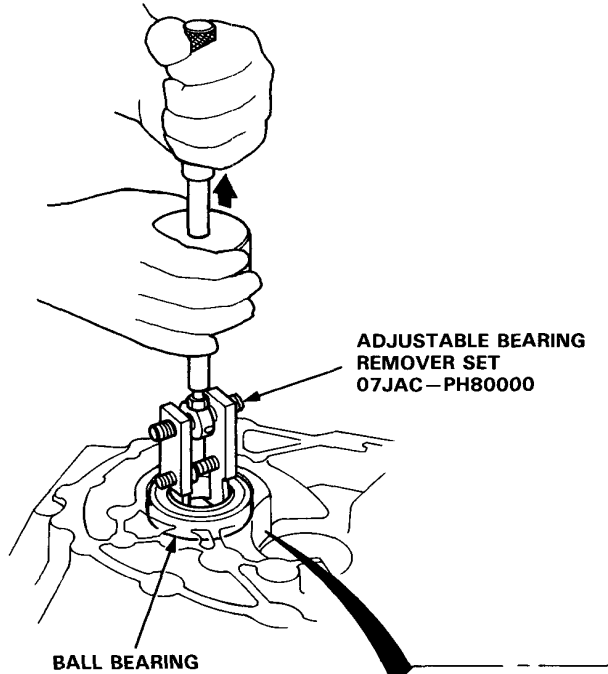
If the clearance is less than the service limit, replace the synchro sleeve set.



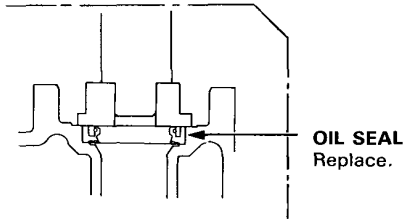
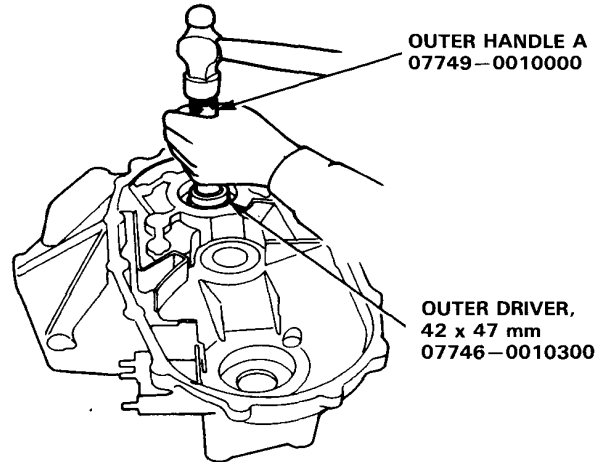
Mainshaft Bearing/Oil Seal

Replacement

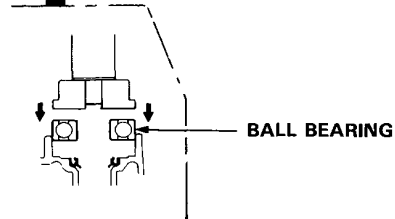
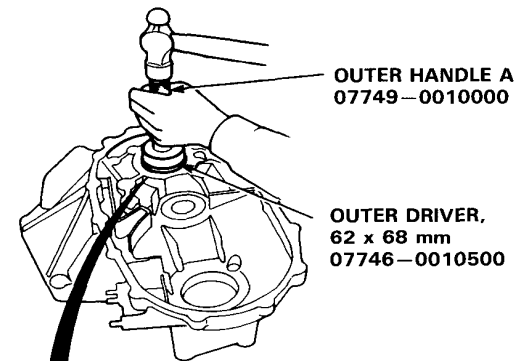
1. Remove the ball bearing with the special tool as shown.
2. Remove the oil seal from the clutch side.



3. Drive the new oil seal in from the transmission side using the special tools as shown.



4. Drive the new ball bearing in from the transmission side using the special tools as shown.

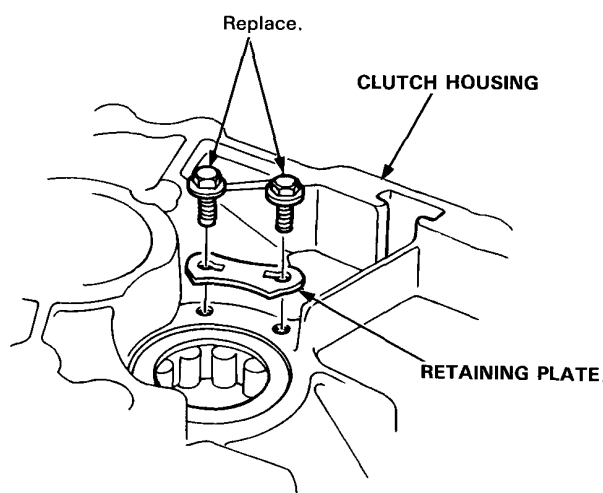




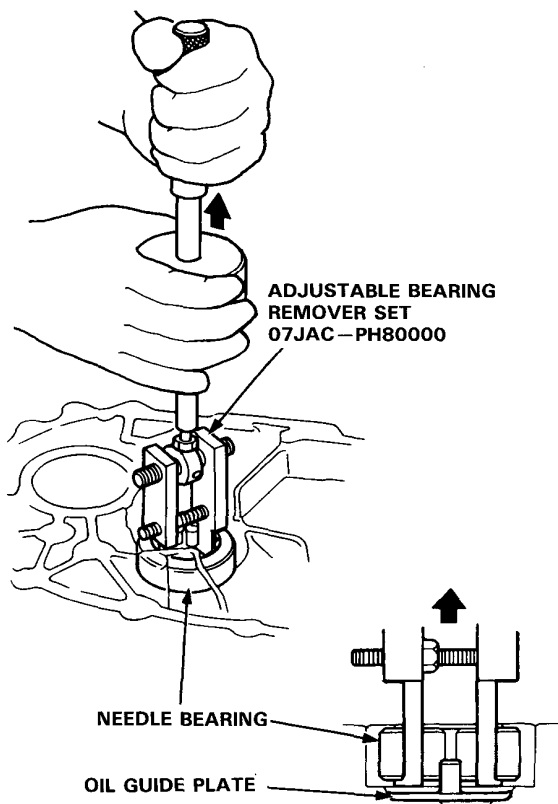
Countershaft Bearing

Replacement

1. Remove the retaining plate from the clutch housing.

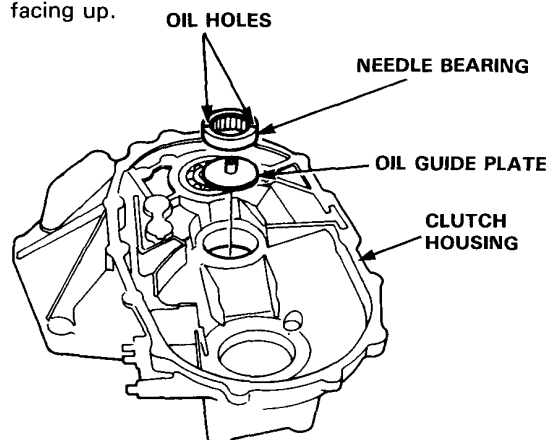


2. Remove the needle bearing with the special tool, then remove the oil guide plate.

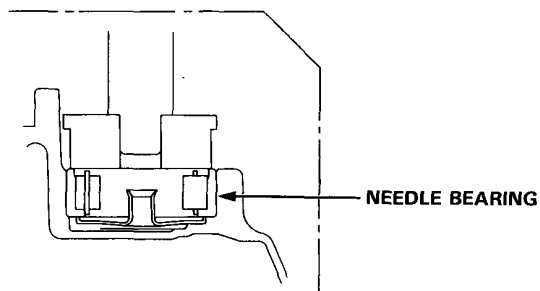
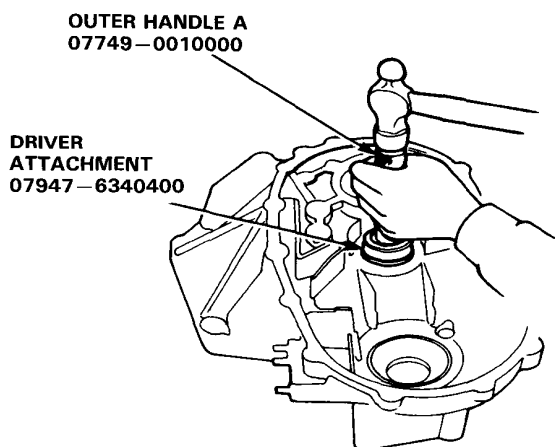


3. Position the oil guide plate and new needle bearing in the bore of the clutch housing.

NOTE: Position the needle bearing with the oil hole facing up.



4. Drive the needle bearing in using the special tools as shown.



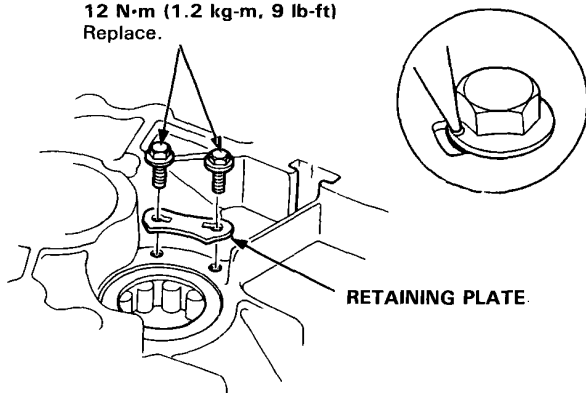
(cont'd)

Countershaft Bearing

Replacement (cont'd)

5. Install the retaining plate and stake the bolt heads in the groove in the retaining plate.

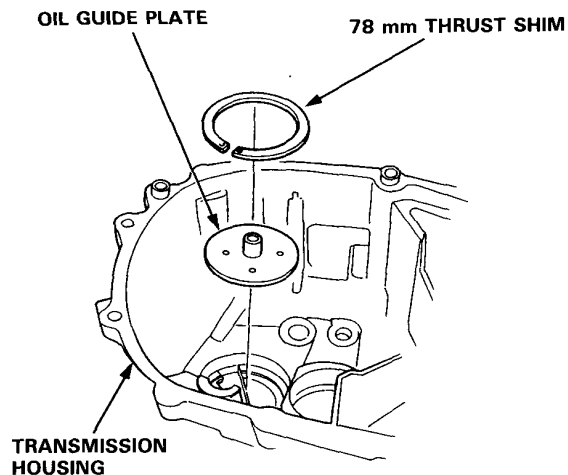
6 x 1.0 mm
12 N·m (1.2 kg-m, 9 lb-ft)
Replace.



Mainshaft Thrust Shim

Adjustment

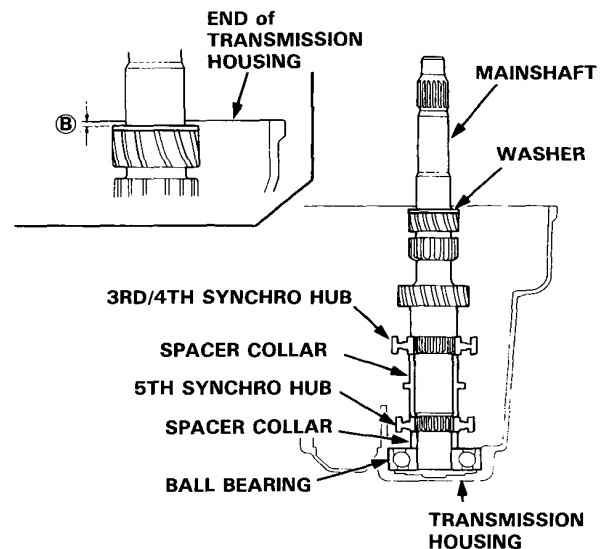
1. Remove the 78 mm thrust shim and oil guide plate from the transmission housing.



2. Install the 3rd/4th synchro hub, spacer collars, 5th synchro hub, and ball bearing on the mainshaft, then install the above assembly in the transmission housing.
3. Install the washer on the mainshaft.
4. Measure distance \textcircled{B} between the end of the transmission housing and washer.

NOTE:

- Use a straight edge and vernier caliper.
- Measure at three locations and average the reading.

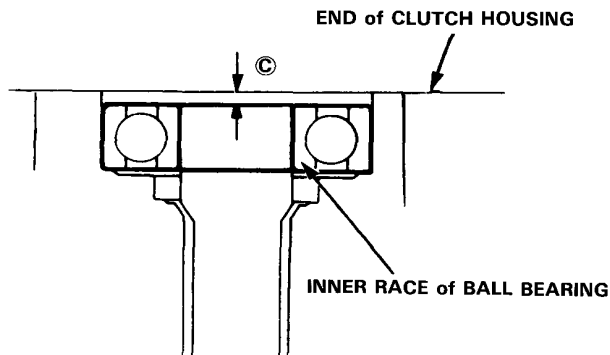




5. Measure distance © between the end of the clutch housing and bearing inner race.

NOTE:

- Use a straight edge and depth gauge.
- Measure at three locations and average the readings.



6. Select the proper 78 mm thrust shim from the chart by using the formula below.

NOTE: Use only one 78 mm thrust shim.

Shim Selection Formula:

From the measurements you made in steps 4 and 5:

1. Add distance © (step 5) to distance © (step 4).
2. From this number, subtract 0.93 (which is the mid-point of the flex range of the clutch housing bearing spring washer).
3. Take this number and compare it to the available shim sizes in the chart.

(For example)

$$\begin{array}{r}
 \text{B: } 2.39 \text{ mm (0.0941 in)} \\
 + \text{ C: } 0.22 \text{ mm (0.0087 in)} \\
 \hline
 = 2.61 \text{ mm (0.1028 in)}
 \end{array}
 \begin{array}{r}
 \text{---} 2.61 \text{ mm (0.1028 in)} \\
 \text{---} 0.93 \text{ mm (0.0366 in)} \\
 \hline
 = 1.68 \text{ mm (0.0661 in)}
 \end{array}$$

- Try the 1.68 mm (0.0661 in) shim.

78 mm THRUST SHIM

	Part Number	Thickness
A	23941-PK5-000	1.20 mm (0.0472 in)
B	23942-PK5-000	1.23 mm (0.0484 in)
C	23943-PK5-000	1.26 mm (0.0496 in)
D	23944-PK5-000	1.29 mm (0.0508 in)
E	23945-PK5-000	1.32 mm (0.0520 in)
F	23946-PK5-000	1.35 mm (0.0531 in)
G	23947-PK5-000	1.38 mm (0.0543 in)
H	23948-PK5-000	1.41 mm (0.0555 in)
I	23949-PK5-000	1.44 mm (0.0567 in)
J	23950-PK5-000	1.47 mm (0.0579 in)
K	23951-PK5-000	1.50 mm (0.0591 in)
L	23952-PK5-000	1.53 mm (0.0602 in)
M	23953-PK5-000	1.56 mm (0.0614 in)
N	23954-PK5-000	1.59 mm (0.0626 in)
O	23955-PK5-000	1.62 mm (0.0638 in)
P	23956-PK5-000	1.65 mm (0.0650 in)
Q	23957-PK5-000	1.68 mm (0.0661 in)
R	23958-PK5-000	1.71 mm (0.0673 in)
S	23959-PK5-000	1.74 mm (0.0685 in)
T	23960-PK5-000	1.77 mm (0.0697 in)
U	23961-PK5-000	1.80 mm (0.0709 in)
V	23962-PK5-000	1.83 mm (0.0720 in)
W	23963-PK5-000	1.86 mm (0.0732 in)
X	23964-PK5-000	1.89 mm (0.0744 in)
Y	23965-PK5-000	1.92 mm (0.0756 in)
Z	23966-PK5-000	1.95 mm (0.0768 in)
AA	23967-PK5-000	1.98 mm (0.0780 in)
AB	23968-PK5-000	2.01 mm (0.0791 in)
AC	23969-PK5-000	2.04 mm (0.0803 in)
AD	23970-PK5-000	2.07 mm (0.0815 in)
AE	23971-PK5-000	2.10 mm (0.0827 in)
AF	23972-PK5-000	2.13 mm (0.0839 in)
AG	23973-PK5-000	2.16 mm (0.0850 in)
AH	23974-PK5-000	2.19 mm (0.0862 in)
AI	23975-PK5-000	2.22 mm (0.0874 in)
AJ	23976-PK5-000	2.25 mm (0.0886 in)
AK	23977-PK5-000	2.28 mm (0.0898 in)
AL	23978-PK5-000	2.31 mm (0.0909 in)
AM	23979-PK5-000	2.34 mm (0.0921 in)
AN	23980-PK5-000	2.37 mm (0.0933 in)

(cont'd)

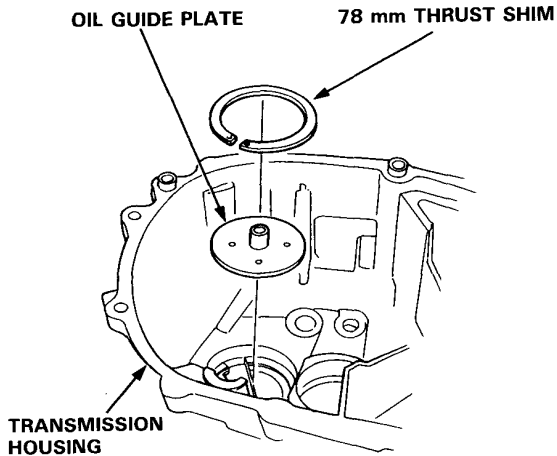
Mainshaft Thrust Shim

Adjustment (cont'd)

7. Check the thrust clearance in the manner described below.

NOTE: Carry out the measurement at normal room temperature.

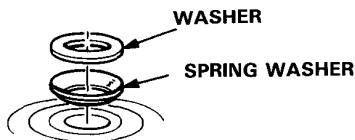
- 1. Install the 78 mm thrust shim selected and oil guide plate in the transmission housing.



- 2. Install the spring washer and washer on the ball bearing.

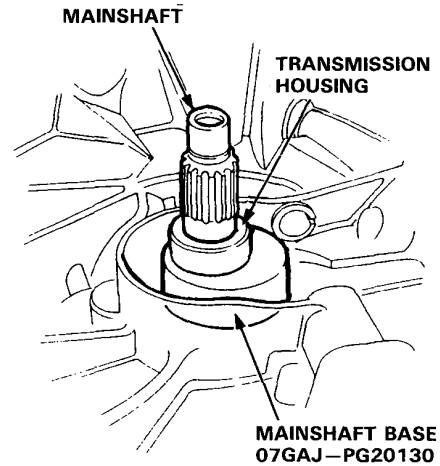
NOTE:

- Clean the spring washer, washer and 78 mm thrust shim thoroughly before installation.
- Install the spring washer, washer and 78 mm thrust shim properly.



- 3. Install the mainshaft in the clutch housing.
- 4. Place the transmission housing over the mainshaft and onto the clutch housing.
- 5. Tighten the clutch and transmission housings with several 8 mm and 10 mm bolts.
- 6. Tap the mainshaft with a plastic hammer.

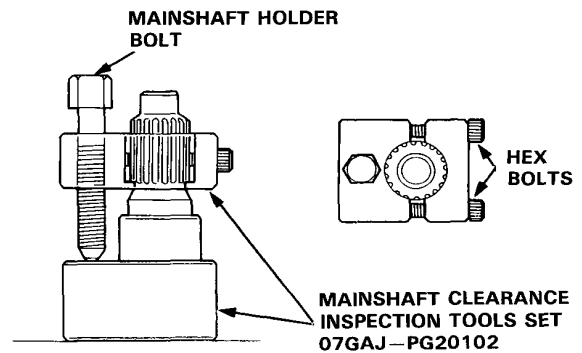
- 7. Slide the mainshaft base over the mainshaft.



- 8. 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 towards the transmission.
- Align the mainshaft holder's lip around the groove at the inside of the mainshaft splines, then tighten the hex bolts.



- 9. Seat the mainshaft fully by tapping its end with a plastic hammer.
- 10. Thread the mainshaft holder bolt in until it just contacts the wide surface of the mainshaft base.
- 11. Zero a dial gauge on the end of the mainshaft.

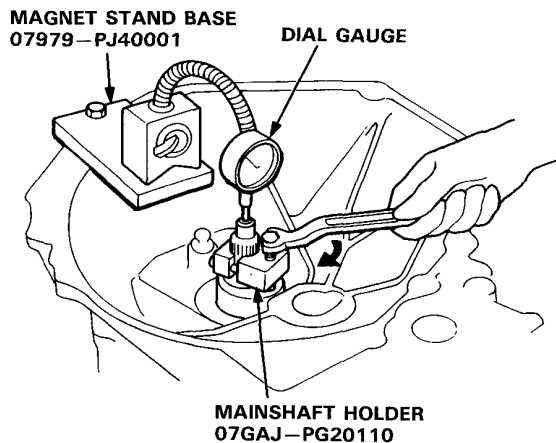


Transmission

Reassembly

- 12. 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.

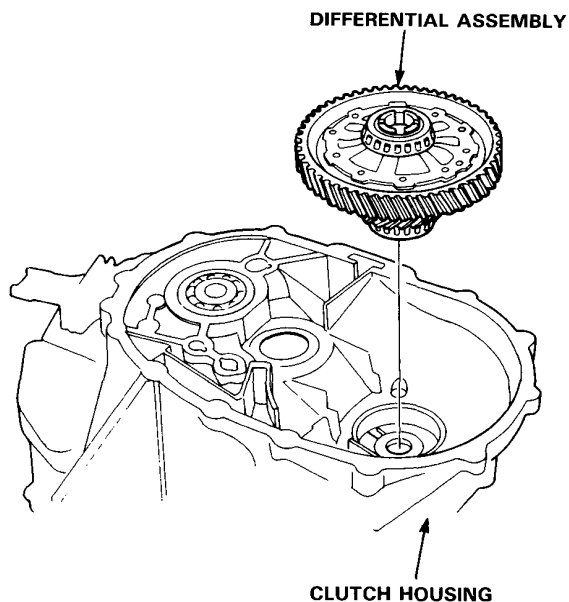
CAUTION: Turning the mainshaft holder bolt more than 60 degrees after the needle of the dial gauge stops moving may damage the transmission.



- 13. If the reading is within the standard, the clearance is correct. If the reading is not within the standard, recheck the thrust shim thickness.

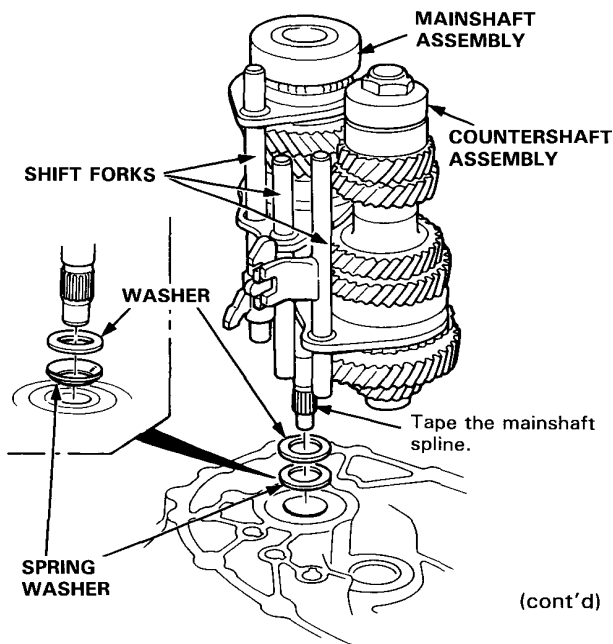
Standard: 0.10—0.16 mm (0.004—0.006 in)

1. Install the differential assembly in the clutch housing.



2. Install the spring washer and washer with the angle against the clutch housing as shown.
3. Insert the mainshaft and countershaft into the shift forks and install them as an assembly.

NOTE: Before installing the mainshaft and countershaft assemblies, tape the mainshaft splines to protect them.

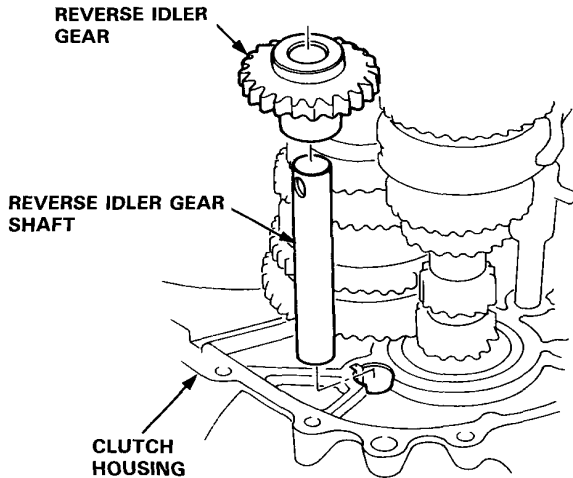


(cont'd)

Transmission

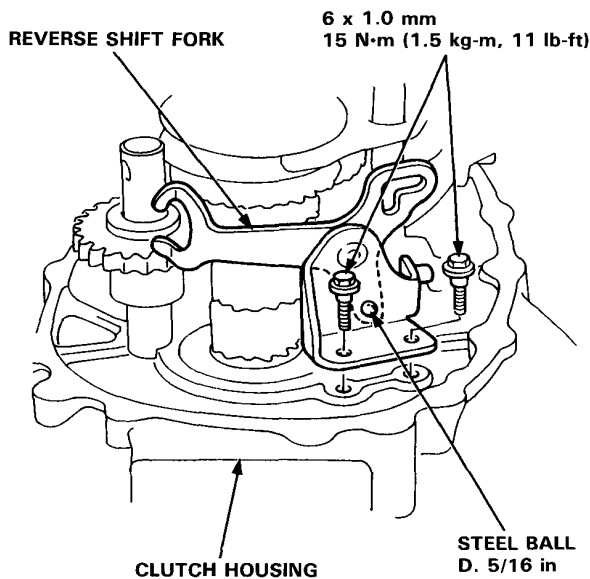
Reassembly (cont'd)

4. Install the reverse idler gear and reverse idler gear shaft in the clutch housing.



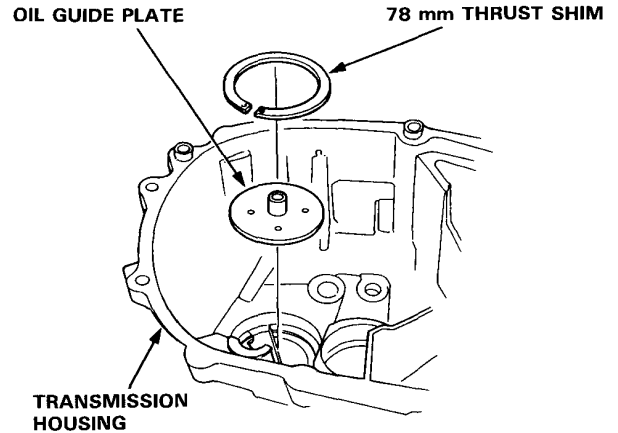
5. Install the reverse shift fork in the clutch housing with the 5th/reverse shift piece pin positioned in the slot of the reverse shift fork.

NOTE: Check that the steel ball is in the proper position.



NOTE: Select the thrust shim according to the measurements made on page 13-34.

6. Install the oil guide plate and 78 mm thrust shim into the transmission housing.

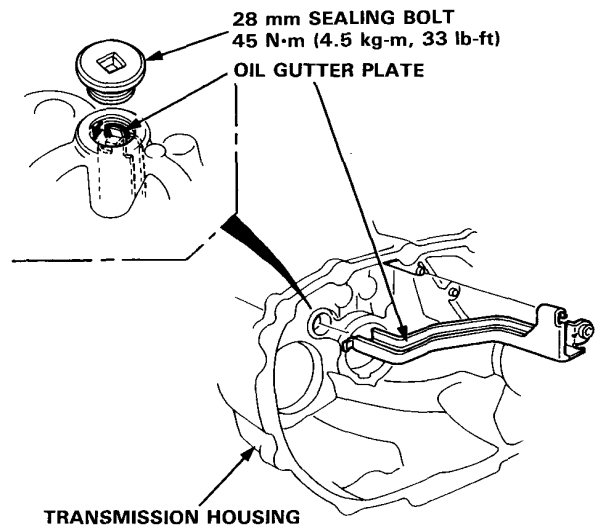


7. Install the oil gutter plate in the transmission housing.

NOTE: Bend the hook of the oil gutter plate into the hole on the transmission housing.

8. Install the 28 mm sealing bolt.

NOTE: Apply liquid gasket (P/N OY740-99986) to the threads.

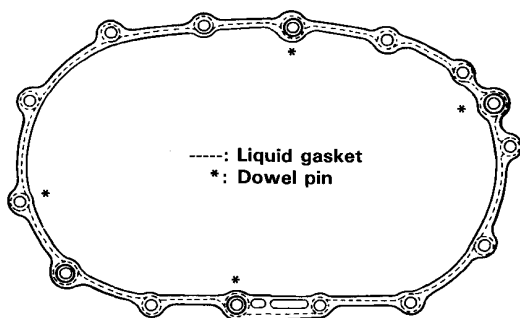




9. Apply liquid gasket to the transmission housing mating surface as shown.

NOTE:

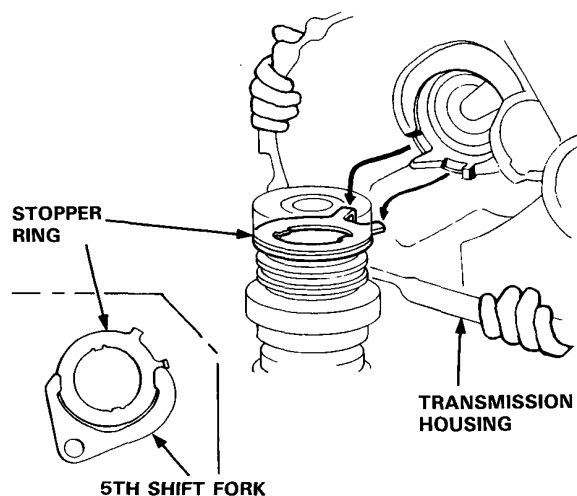
- Use liquid gasket (P/N OY740-99986).
- Remove the dirt and oil from the sealing surface.
- Seal the entire circumference of the bolt hole to prevent oil leakage.
- If 20 minutes have passed after applying liquid gasket, reapply it and assemble the housings and allow it to cure at least 30 minutes after assembly before filling transmission with oil.



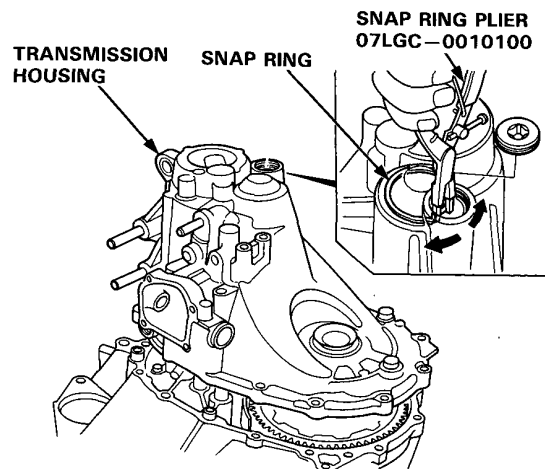
10. Install the 14 x 20 mm dowel pins.

11. Set the stopper ring as shown. Place the transmission housing over the clutch housing, being careful to line up the shafts.

NOTE: Align the long arm of 5th shift fork with the hook on the stopper ring.



12. Lower the transmission housing with the snap ring pliers and set the snap ring in the groove of the countershaft bearing.



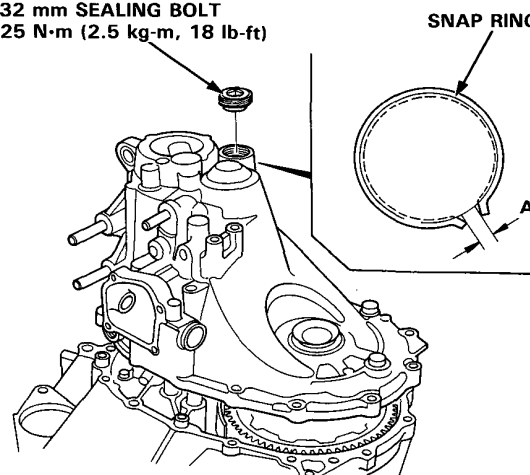
13. Check that the snap ring is securely seated in the groove of the countershaft bearing.

**Dimension A as installed: 3.60-6.32 mm
(0.142-0.249 in)**

14. Install the 32 mm sealing bolt.

NOTE: Apply liquid gasket (P/N OY740-99986) to the threads.

**32 mm SEALING BOLT
25 N·m (2.5 kg·m, 18 lb·ft)**



(cont'd)

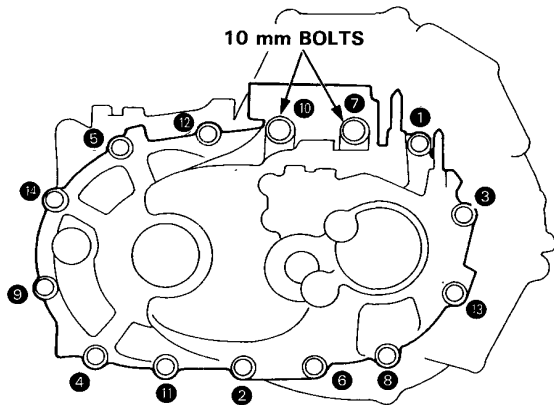
Transmission

Reassembly (cont'd)

15. Torque the bolts in a crisscross pattern in several steps as shown.

8 x 1.25 mm bolts: 28 N·m (2.8 kg-m, 20 lb-ft)

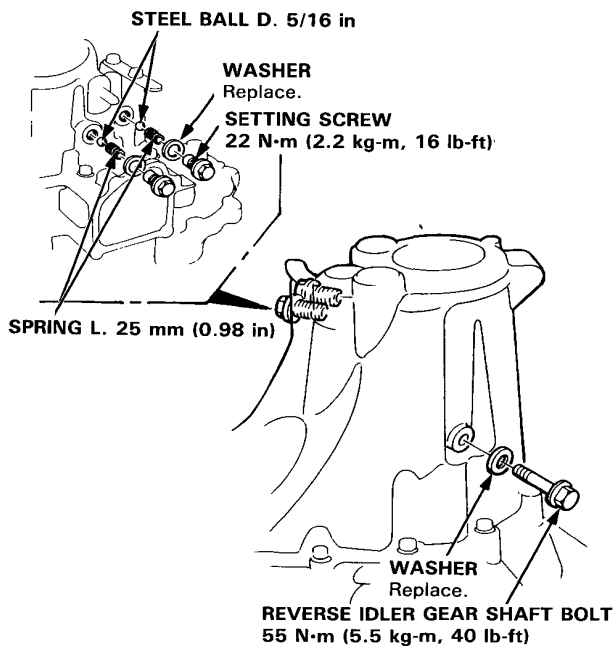
10 x 1.25 mm bolts: 45 N·m (4.5 kg-m, 33 lb-ft)



- ②, ④: 8 x 50 mm bolts
Other: 8 x 40 mm bolts

16. Install the reverse idler gear shaft bolt.

17. Install the steel balls, springs, washers, and setting screws.



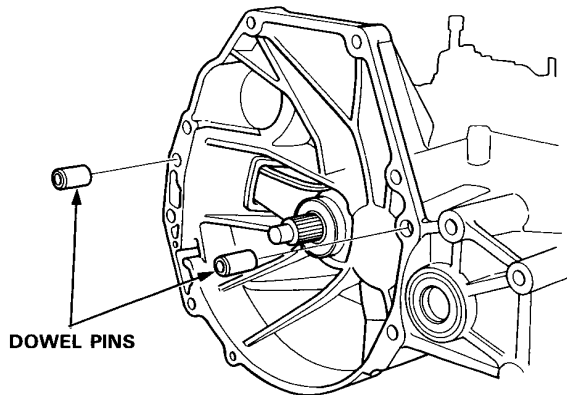
18. Install the shift arm assembly (see page 13-13).

19. Shift the transmission through all the gears before installing it.

Transmission Assembly

Installation

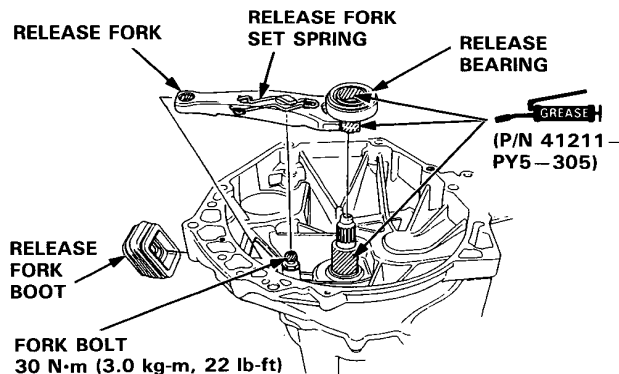
1. Install the dowel pins.



2. Apply grease to the parts as shown, then install the release bearing and release fork (see page 12-15).

NOTE: Use only HONDA Genuine Urea Grease UM264 (P/N 41211-PY5-305).

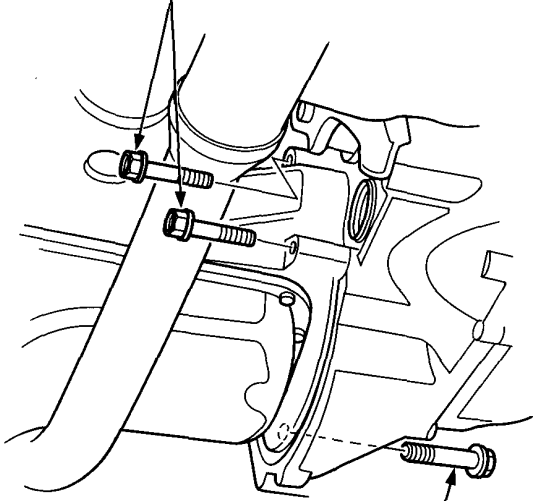
3. Install the release fork boot.





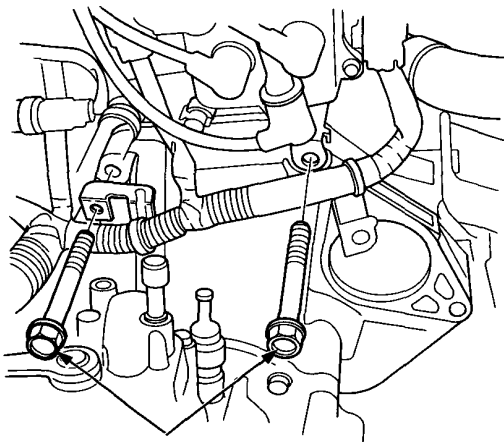
- Place the transmission on the transmission jack, and raise it to the engine level.
- Install the three lower transmission housing mounting bolts.

TRANSMISSION HOUSING MOUNTING BOLTS
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)



TRANSMISSION HOUSING MOUNTING BOLT
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

- Install the two upper transmission housing mounting bolts.



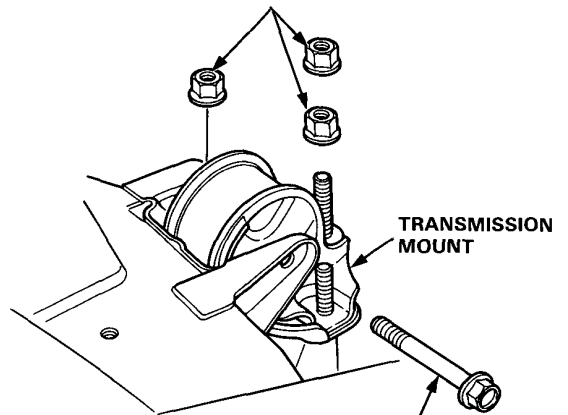
TRANSMISSION HOUSING MOUNTING BOLTS
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

- Raise the transmission, then install the transmission mount.

NOTE:

- Torque mounting bolts and nuts in sequence shown.
- Make sure the bushings are not twisted or offset.

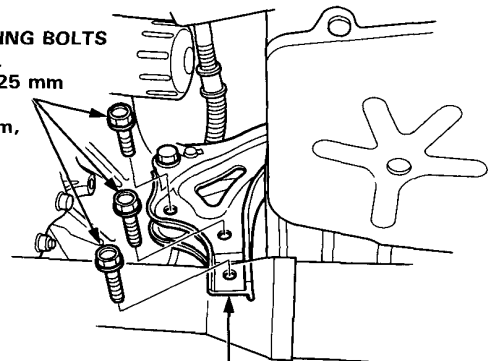
② Tighten
10 x 1.25 mm
39 N·m (3.9 kg-m, 28 lb-ft)



① Tighten temporarily
③ Tighten
12 x 1.25 mm
65 N·m (6.5 kg-m, 47 lb-ft)

- Install the three rear engine mount bracket mounting bolts.

MOUNTING BOLTS
Replace.
12 x 1.25 mm
55 N·m
(5.5 kg-m,
40 lb-ft)



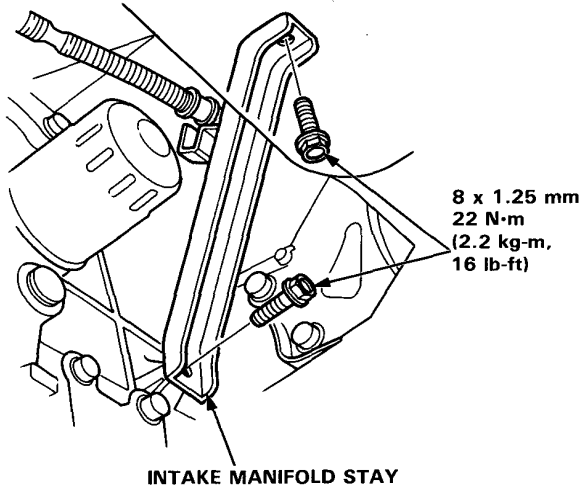
REAR ENGINE MOUNT BRACKET

(cont'd)

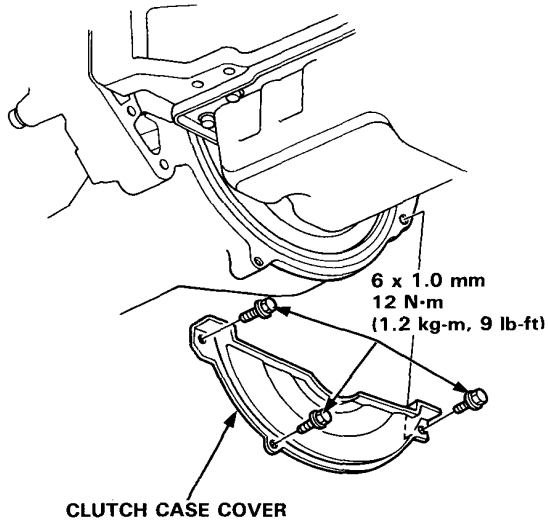
Transmission Assembly

Installation (cont'd)

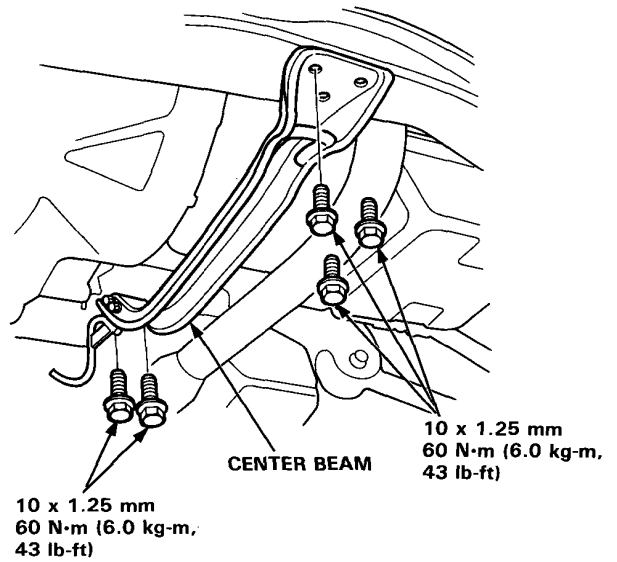
9. Install the intake manifold stay.



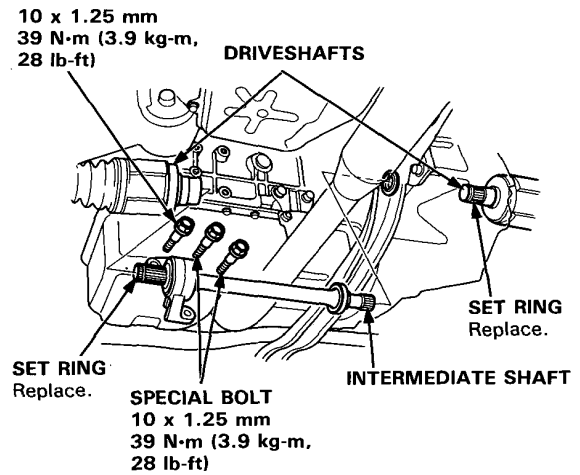
10. Install the clutch case cover.



11. Install the center beam.



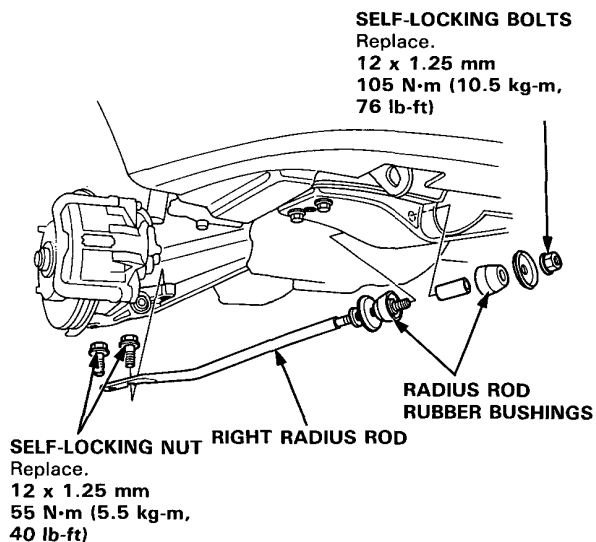
12. Install the intermediate shaft and driveshafts (see section 16).





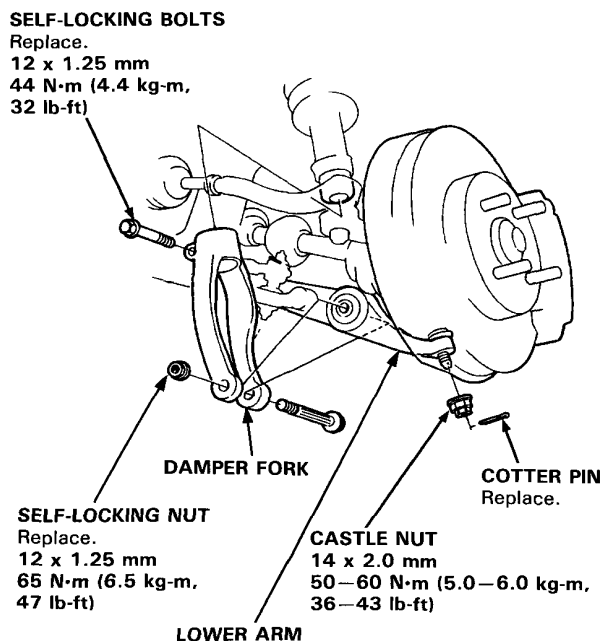
13. Install the right radius rod (see section 18).

NOTE: Check for deterioration or damage of the radius rod rubber bushings.

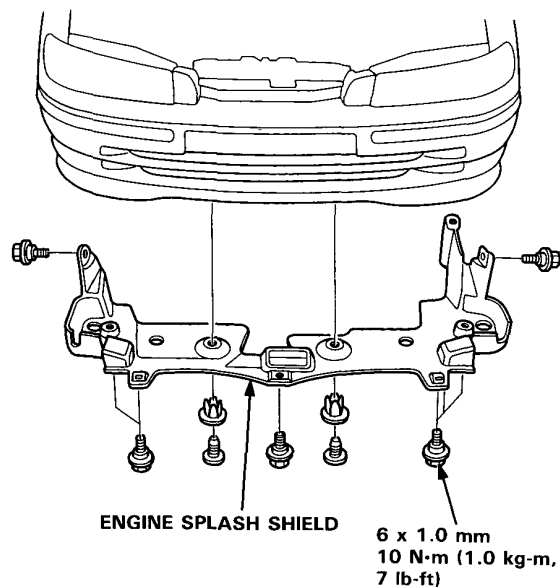


14. Connect the ball joint to the lower arm, then install the castle nut.

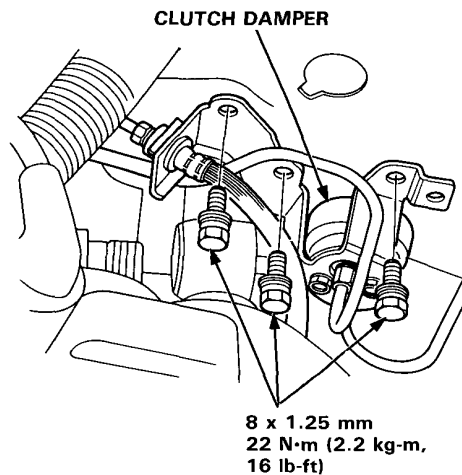
15. Install the damper fork.



16. Install the engine splash shield.



17. Install the clutch damper.



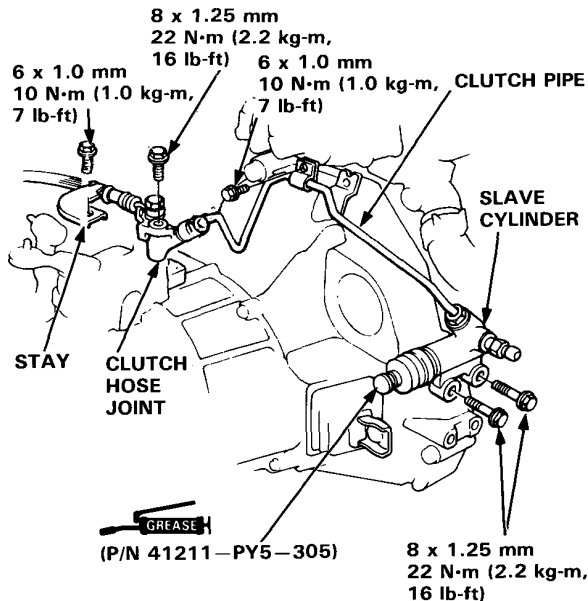
(cont'd)

Transmission Assembly

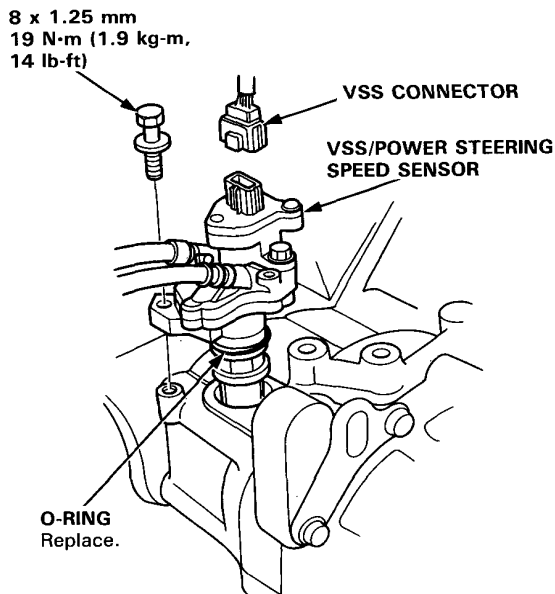
Installation (cont'd)

18. Install the slave cylinder, then install the clutch hose joint and stay.

CAUTION: Take care not to bend the clutch pipe.



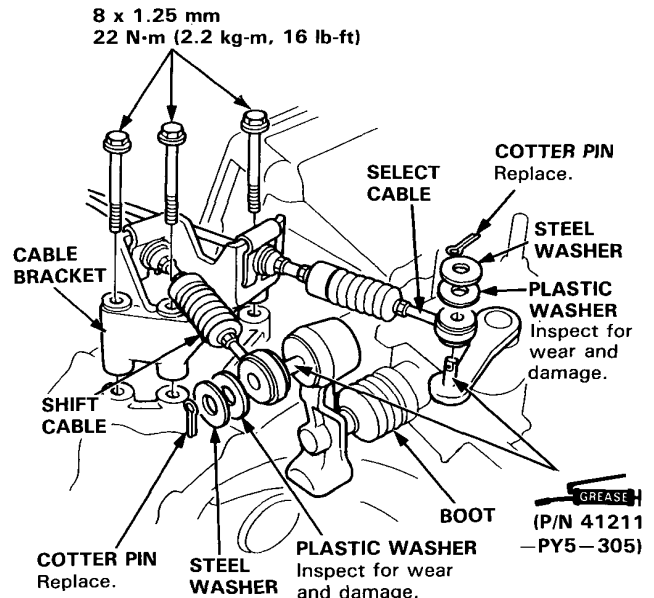
19. Install the vehicle speed sensor (VSS)/power steering speed sensor, then connect the VSS connector.



20. Install the shift cable and select cable to the shift lever and to select lever respectively.

CAUTION: Take care not to bend the cables.

NOTE: Turn the boot of the shift lever so the hole is facing down.

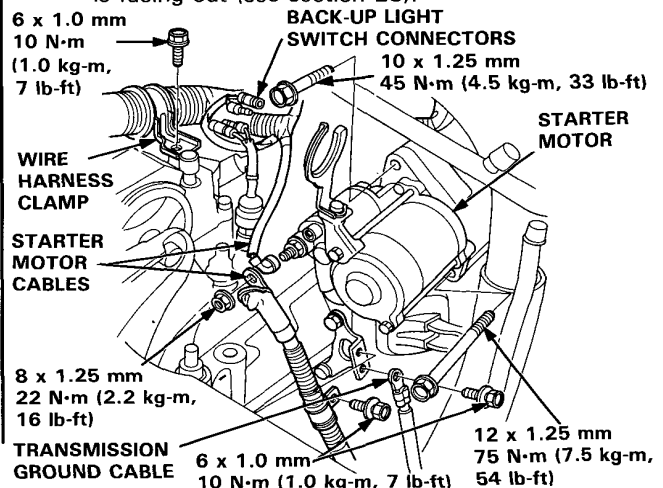


21. Connect the transmission ground cable and back-up light switch connectors.

22. Install the wire harness clamp.

23. Install the starter motor, then connect the starter motor cables.

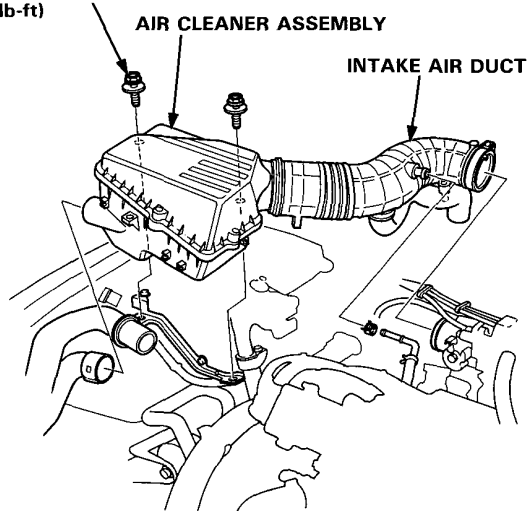
NOTE: When installing the starter motor cable, make sure that the crimped side of the ring terminal is facing out (see section 23).





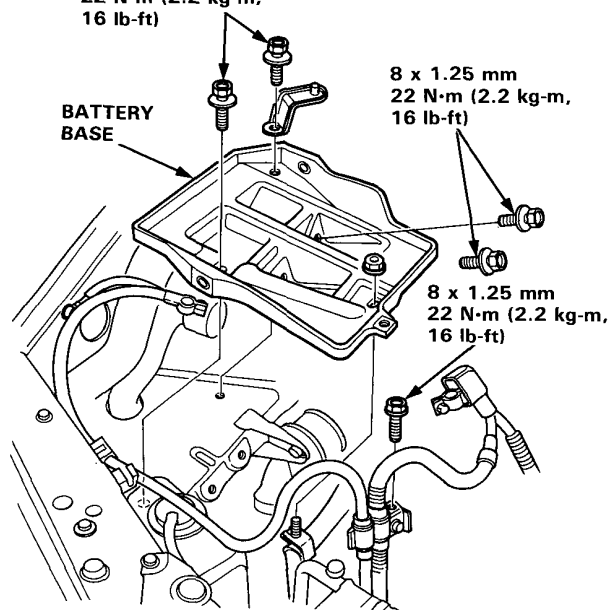
24. Install the air cleaner assembly and intake air duct.

6 x 1.0 mm
10 N·m (1.0 kg·m,
7 lb-ft)



25. Install the battery base.

8 x 1.25 mm
22 N·m (2.2 kg·m,
16 lb-ft)



26. Refill the transmission with oil (see page 13-2).

27. Install the battery, then connect the battery positive (+) and negative (-) cables to the battery.

28. Check the clutch operation.

29. Shift the transmission and check for smooth operation.

30. Check the front wheel alignment (see section 18).

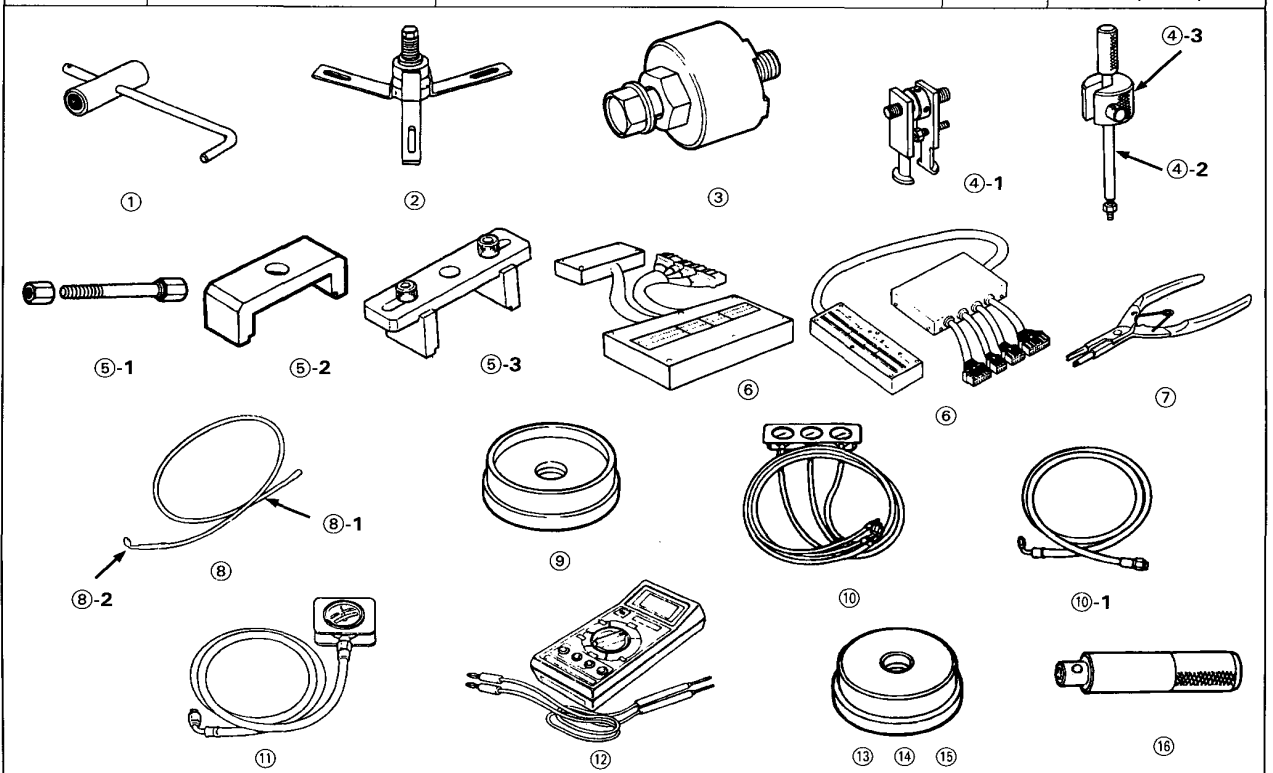
Automatic Transmission

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Special Tools

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①	07GAB—PF50101	Mainshaft Holder	1	14-96, 138
②	07HAC—PK40101	Housing Puller	1	14-97
③	07HAF—PK40100	Gear Installer	1	14-138
④	07JAC—PH80000	Ajustable Bearing Remover Set	1	14-130, 131
④-1	07JAC—PH80100	Bearing Remover Attachment	(1)	14-130, 131
④-2	07JAC—PH80200	Remover Handle Assembly	(1)	14-130, 131
④-3	07741—0010201	Remover Weight	(1)	14-130, 131
⑤	07LAE—PX40000	Clutch Spring Compressor Set	1	14-124, 127
⑤-1	07GAE—PG40200	Clutch Spring Compressor Bolt Assembly	(1)	14-124, 127
⑤-2	07HAE—PL50100	Clutch Spring Compressor Attachment	(1)	14-124, 127
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⑥	07LAJ—PT30100 or 07LAJ—PT3010A	Test Harness	1	14-35, 74
⑦	07LGC—0010100	Snap Ring Pliers	1	14-125, 128, 132
⑧	07MAJ—PY40100	A/T Oil Pressure Gauge Hose Assembly	1	14-79
⑧-1	07MAJ—PY40110	Oil Pressure Gauge Hose	(1)	14-79
⑧-2	07MAJ—PY40120	Oil Pressure Joint	(1)	14-79
⑨	07NAD—PX40100	Attachment, 78 x 80 mm	1	14-132
⑩	07406—0020003	A/T Oil Pressure Gauge Set	1	14-79
⑩-1	07406—0020201	A/T Oil Pressure Gauge Hose	(1)	14-79
⑪	07406—0070000	A/T Low Pressure Gauge	1	14-79
⑫	07411—6020000	Digital Circuit Tester	1	14-74
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⑭	07746—0010500	Attachment, 62 x 68 mm	1	14-130, 131
⑮	07746—0010600	Attachment, 72 x 75 mm	1	14-130, 132
⑯	07749—0010000	Driver	1	14-130, 131, 132



Description



The Automatic Transmission is a combination of a 3-element torque converter and triple-shaft electronically controlled automatic transmission which provides 4 speeds forward and 1 speed reverse. The entire unit is positioned in line with the engine.

Torque Converter, Gears and Clutches

The torque converter consists of a pump, turbine and stator 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 three parallel shafts: the mainshaft, the countershaft, and the secondary shaft. The mainshaft is in line with the engine crankshaft.

The mainshaft includes the clutches for 3rd, and 4th, and gears for 3rd, 4th, Reverse and Idler (Reverse gear is integral with 4th gear).

The countershaft includes the 1st-hold clutch and gears for 2nd, 3rd, 4th Reverse, 1st, Idler and parking.

The secondary shaft includes the 1st and 2nd clutches, and gears for 2nd, 1st and Idler.

The 4th and reverse gears can be locked to the countershaft at its center, providing 4th gear or Reverse, depending on which way the selector is moved.

The gears on the mainshaft are in constant mesh with those on the countershaft and the secondary shaft. When certain combinations of gears in the transmission are engaged by the clutches, power is transmitted from the mainshaft to the countershaft to provide **D₄**, **D₃**, **2**, **1** and **R** positions.

Electronic Control

The electronic control system consists of the Transmission Control Module (TCM), sensors, and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The TCM is located below the dashboard, behind the right side kick panel on the passenger's side.

Hydraulic Control

The valve bodies include the main valve body, secondary valve body, servo valve body, regulator valve body, throttle valve body and 1st/2nd accumulator body. They are bolted to the torque converter housing as an assembly.

The main valve body contains the manual valve, 1-2 shift valve, 2-3 shift valve, cooler relief valve, lock-up shift valve, lock-up control valve, 3-2 kick-down valve, modulator valve, CPC valve and oil pump gears.

The secondary valve body includes the 4th exhaust valve, 3rd kick-down valve, 3-4 shift valve, servo control valve, orifice control valve and the 2nd orifice control valve.

The servo valve body contains the accumulator pistons and servo valve. The regulator valve body contains the regulator valve, torque converter check valve, and lock-up timing valve. The throttle valve body contains the throttle valve B and relief valve.

Fluid from the regulator passes through the manual valve to the various control valves.

The clutches receive oil from their respective feed pipes or internal hydraulic circuit.

Shift Control Mechanism

Input from various sensors located throughout the car determines which shift control solenoid valve the TCM 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.

Lock-up Mechanism

In **D₄** position, in 2nd, 3rd and 4th, and **D₃** position in 3rd, pressurized fluid is drained from the back of the torque converter through an oil 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 TCM 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 throttle valve B.

When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B are mounted on the torque converter housing, and are controlled by the TCM.

(cont'd)

Description

(cont'd)

Gear Selection

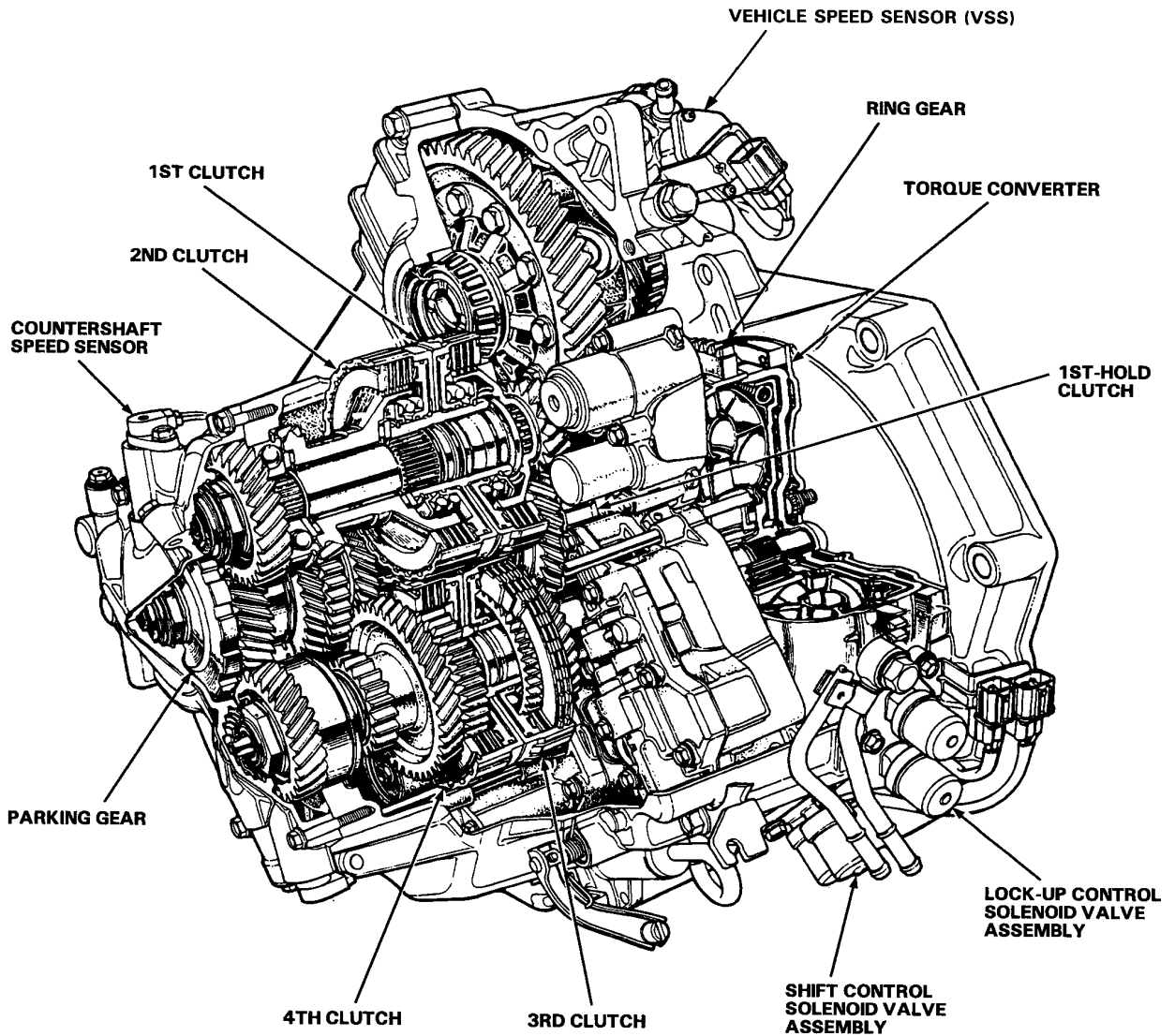
The selector lever has seven positions: **P** PARK, **R** REVERSE, **N** NEUTRAL, **D4** 1st through 4th gear ranges, **D3** 1st through 3rd gear ranges, **2** 2nd gear and **1** 1st gear.

Position	Description
P PARK	Front wheels locked; parking pawl engaged with parking gear on countershaft. All clutches released.
R REVERSE	Reverse; reverse selector engaged with countershaft reverse gear and 4th gear 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. Downshifts through 3rd, 2nd and 1st on deceleration to stop. The lock-up mechanism comes into operation in 2nd, 3rd and 4th speed when the transmission in D4 position.
D3 DRIVE (1st through 3rd)	For rapid acceleration at highway speeds and general driving; up-hill and down-hill driving; starts off in 1st, shifts automatically to 2nd, then 3rd, depending on vehicle speed and throttle position. Downshifts through 2nd to 1st on deceleration to stop. The lock-up mechanism comes into operation in 3rd speed when the transmission in D3 position.
2 SECOND	For engine braking or better traction starting off on loose or slippery surfaces; stays in 2nd gear, does not shift up or down.
1 FIRST	For engine braking; stays in 1st gear, does not shift up.

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

A/T gear position indicator in the instrument panel shows what gear has been selected without having to look down at the console.



Description

Clutches

The four-speed automatic transmission uses hydraulically actuated clutches to engage or disengage the transmission gears. When clutch pressure is introduced into the clutch drum, the clutch piston is applied. 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 clutch pressure is bled from the clutch pack, the piston releases the friction discs and steel plates, and they are free to slide past each other while disengaged. This allows the gear to spin independently of its shaft, transmitting no power.

1st Clutch

The 1st clutch engages/disengages 1st gear, and is located at the center of the secondary shaft.

The 1st clutch is joined back-to-back to the 2nd clutch.

The 1st clutch is supplied clutch pressure by its oil feed pipe within the secondary shaft.

1st-hold Clutch

The 1st-hold clutch engages/disengages 1st-hold or 1 position, and is located at the end of the countershaft, just behind the torque converter housing. The 1st-hold clutch is supplied clutch pressure by its oil feed pipe within the countershaft.

2nd Clutch

The 2nd clutch engages/disengages 2nd gear, and is located at the center of the secondary shaft. The 2nd clutch is joined back-to-back to the 1st clutch. The 2nd clutch is supplied clutch pressure through the secondary shaft by a circuit connected to the internal hydraulic circuit.

3rd Clutch

The 3rd clutch engages/disengages 3rd gear, and is located at the center of the mainshaft.

The 3rd clutch is joined back-to-back to the 4th clutch.

The 3rd clutch is supplied clutch pressure through the mainshaft by a circuit connected to the regulator valve body.

4th Clutch

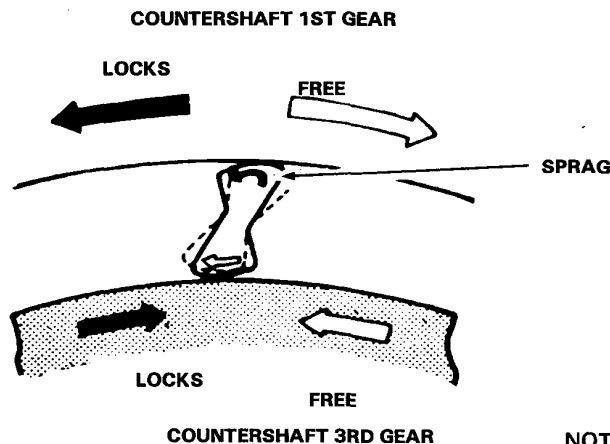
The 4th clutch engages/disengages 4th gear, as well as reverse gear, and is located at the center of the mainshaft. The 4th clutch is joined back-to-back to the 3rd clutch. The 4th clutch is supplied clutch pressure by its oil feed pipe within the mainshaft.

One-way Clutch

The one-way clutch is positioned between the countershaft 1st gear and 3rd gear, with the 3rd gear splined to the countershaft. The 1st gear provides the outer race surface, and the 3rd 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.

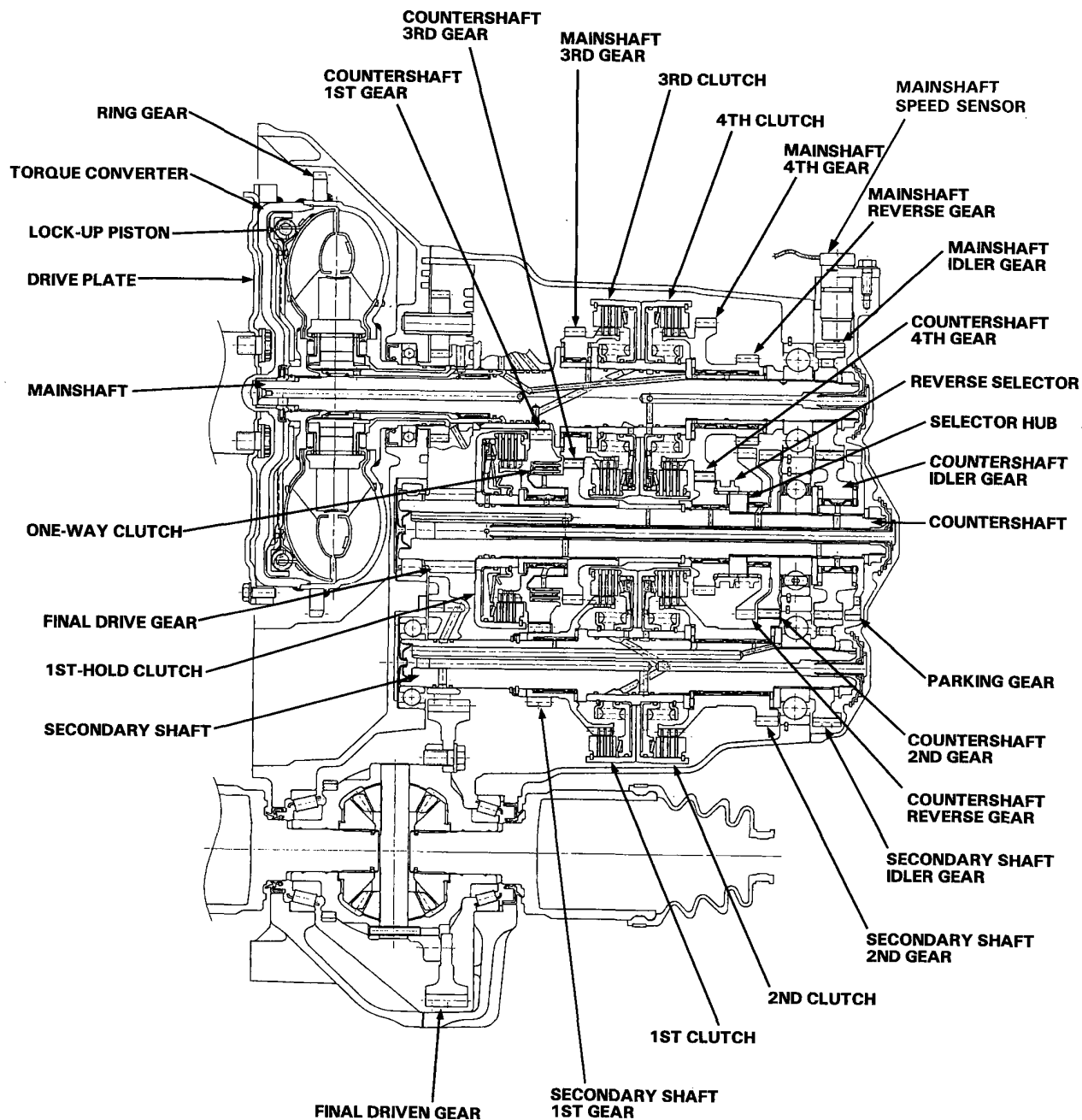
The 1st clutch and gears remain engaged in the 1st, 2nd, 3rd, and 4th gear ranges in the D₄, D₃ or 2 position.

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 freewheels with the 1st clutch still engaged.



NOTE:

View from right side cover side.



(cont'd)

Description

Clutches (cont'd)

Lock-up Clutch

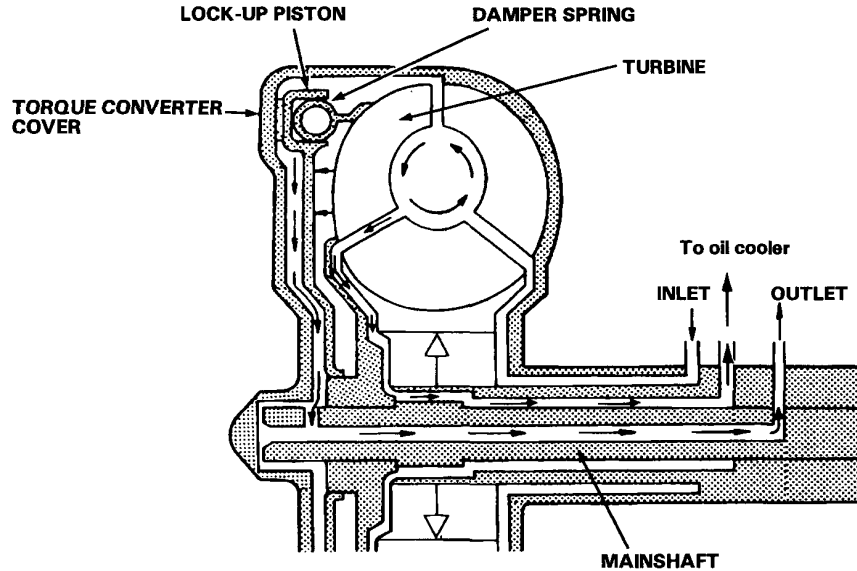
1. Operation (clutch on)

With the lock-up clutch on, the oil in the chamber between the converter cover and lock-up piston is drained off, and the converter oil exerts pressure through the piston against the converter cover. As a result, the converter turbine is locked to the converter cover. The effect is to bypass the converter, thereby placing the car in direct drive.

Power flow

The power flows by way of:

Engine
 ↓
 Drive plate
 ↓
 Torque converter cover
 ↓
 Lock-up piston
 ↓
 Damper spring
 ↓
 Turbine
 ↓
 Mainshaft

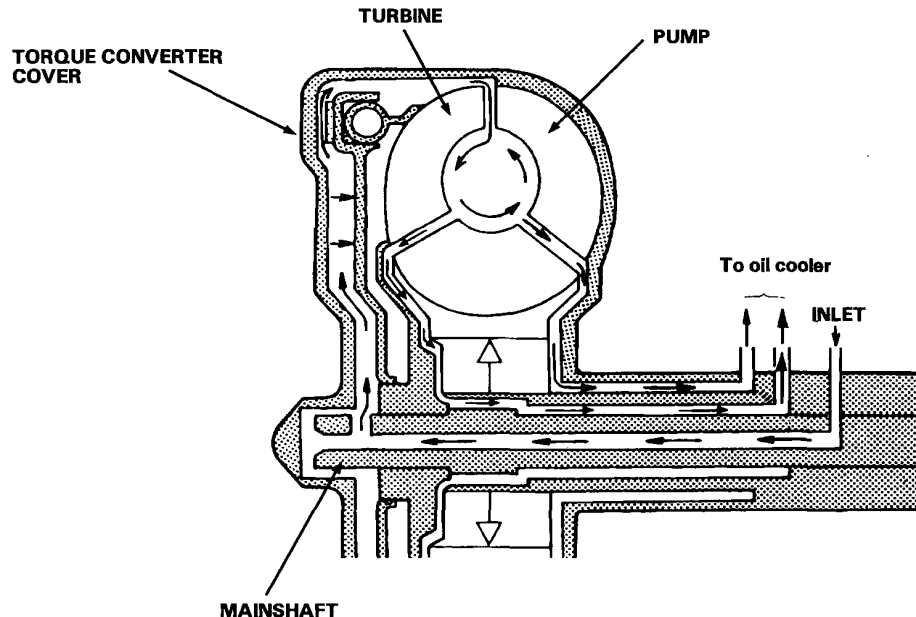


2. Operation (clutch off)

With the lock-up clutch off, the oil 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

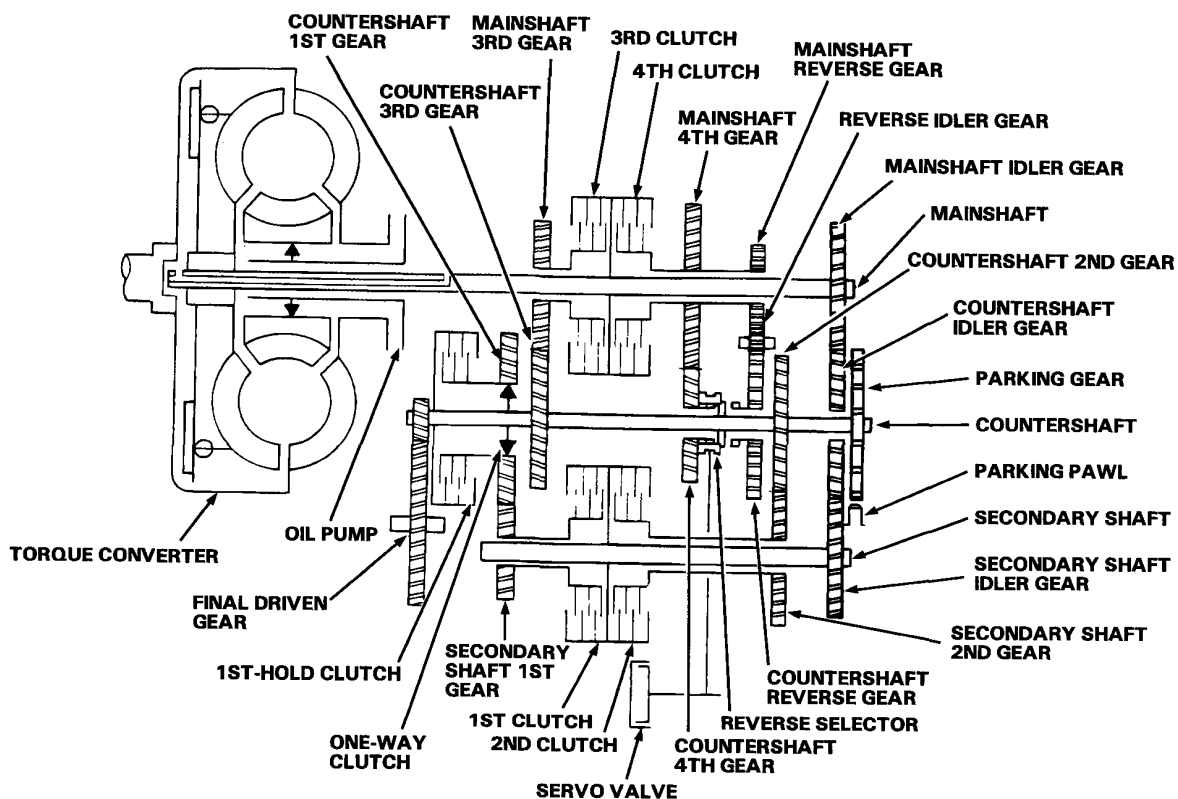




Power Flow

PART POSITION	TORQUE CON-VERTER	1ST GEAR 1ST-HOLD CLUTCH	1ST GEAR 1ST CLUTCH	1ST GEAR ONE-WAY CLUTCH	2ND GEAR 2ND CLUTCH	3RD GEAR 3RD CLUTCH	4TH		REVERSE GEAR	PARKING GEAR
							GEAR	CLUTCH		
P	○	×	×	×	×	×	×	×	×	○
R	○	×	×	×	×	×	×	○	○	×
N	○	×	×	×	×	×	×	×	×	×
D ₄	1ST	○	×	○	○	×	×	×	×	×
	2ND	○	×	*○	×	○	×	×	×	×
	3RD	○	×	*○	×	○	×	×	×	×
	4TH	○	×	*○	×	×	○	○	×	×
D ₃	1ST	○	×	○	○	×	×	×	×	×
	2ND	○	×	*○	×	○	×	×	×	×
	3RD	○	×	*○	×	○	×	×	×	×
2	○	×	*○	×	○	×	×	×	×	×
1	○	⊙	⊙	○	×	×	×	×	×	×

○: Operates, ×: Doesn't operate, *: Although the 1st clutch engages, driving power is not transmitted as the one-way clutch slips.



Description

Electronic Control System

Electronic Control System

The electronic control system consists of the Transmission Control Module (TCM), sensors, and 4 solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions.

The TCM is located below the dashboard, behind the right side kick panel on the passenger's side.

Shift Control

Getting a signal from each sensor, the TCM determines the appropriate gear and activates shift control solenoid valves A and/or B.

The combination of driving signals to shift control solenoid valves A and B is shown in the table below.

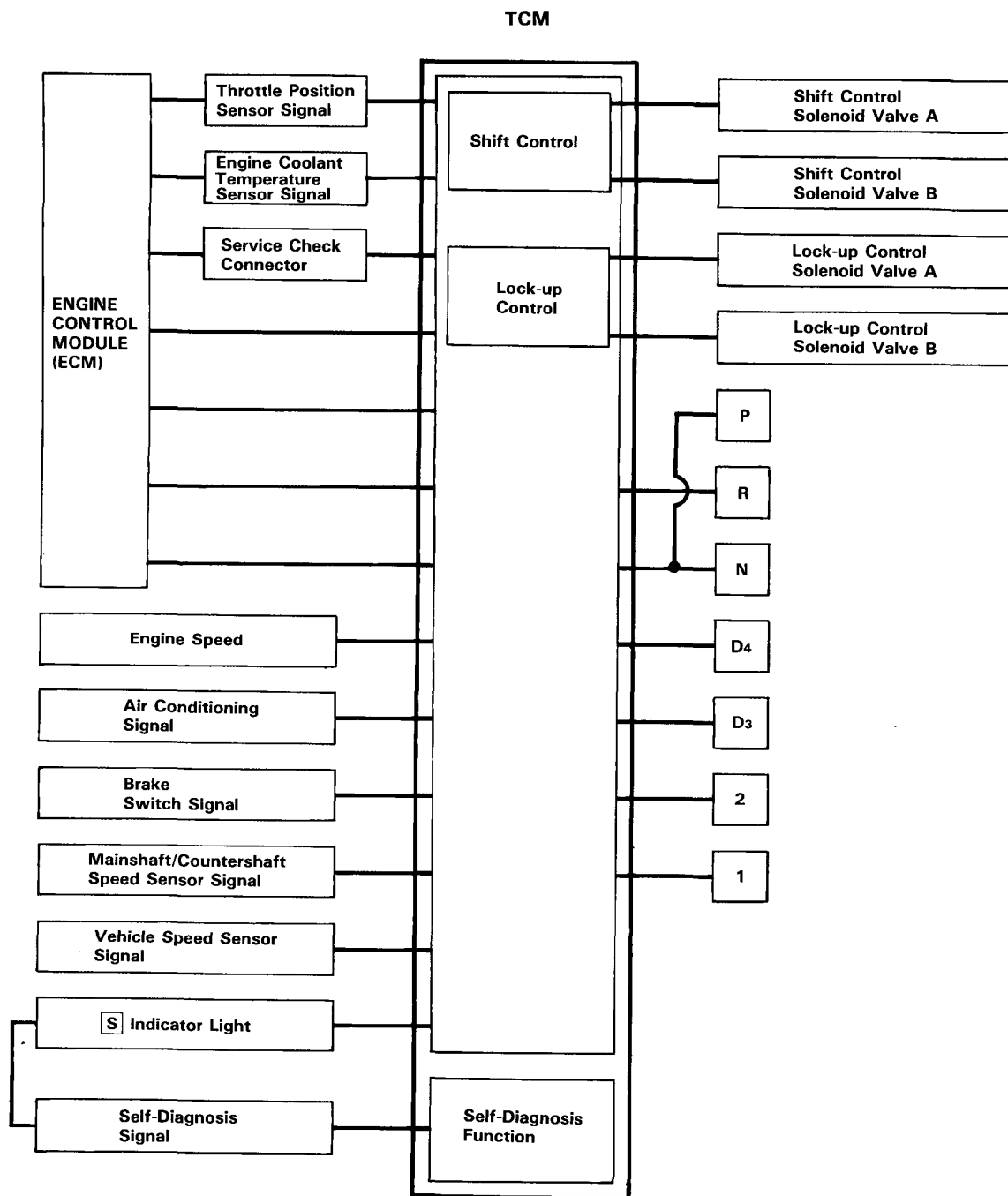
Shift control solenoid valve Position (gear)	A	B
1 (1st)	ON	OFF
2 (2nd)	ON	ON
D4 D3 (1st)	OFF	ON
D4 D3 (2nd)	ON	ON
D4 D3 (3rd)	ON	OFF
D4 (4th)	OFF	OFF
R	ON	OFF

Lock-up Control

From sensor input signals, the TCM 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 is shown in the table below.

Solenoid valve Lock-up condition	A	B
Lock-up OFF	OFF	OFF
Lock-up, slight	ON	Duty operation OFF ↔ ON
Lock-up, half	ON	ON
Lock-up, full	ON	ON
Lock-up during deceleration	ON	Duty operation OFF ↔ ON

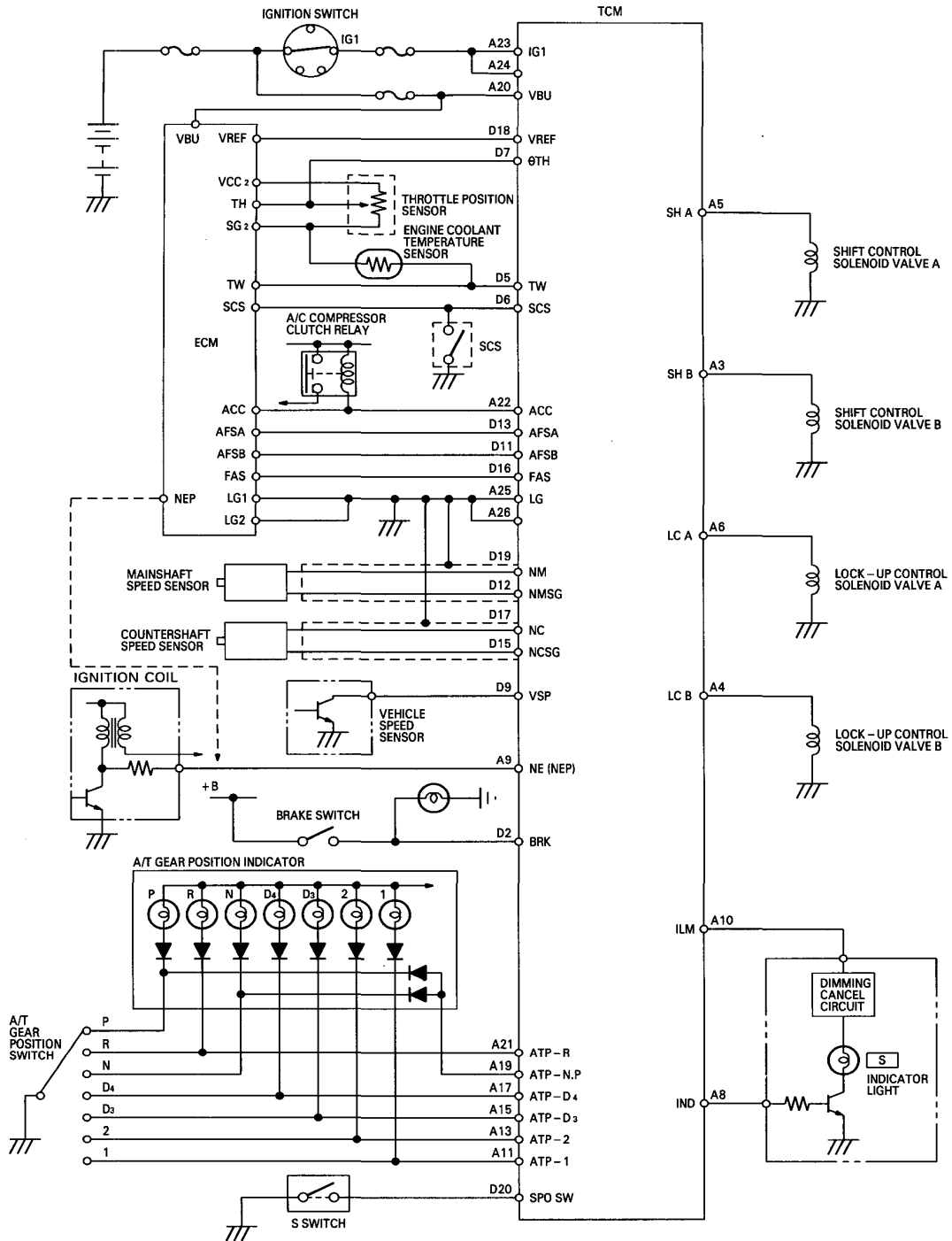


(cont'd)

Description

Electronic Control System (cont'd)

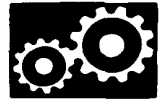
Circuit Diagram and Terminal Location



A3	A5	A9	A11	A13	A15	A17	A19	A21	A23	A25
A4	A6	A8	A10				A20	A22	A24	A26

D5	D7	D9	D11	D13	D15	D17	D19
D2	D6		D12	D16	D18	D20	

TCM Terminal Location



Hydraulic Flow

No.	DESCRIPTION OF PRESSURE	No.	DESCRIPTION OF PRESSURE	No.	DESCRIPTION OF PRESSURE	No.	DESCRIPTION OF PRESSURE
1	LINE	6'	MODULATE (DUTY CONTROL)	30	3RD CLUTCH	93	OIL COOLER
2	LINE	9	LINE	31	3RD CLUTCH	94	TORQUE CONVERTER
3	LINE	10	1ST CLUTCH	40	4TH CLUTCH	95	LUBRICATION
3'	LINE	15	1ST-HOLD CLUTCH	41	4TH CLUTCH	96	TORQUE CONVERTER
3''	LINE	16	1ST-HOLD CLUTCH	55	THROTTLE B	99	SUCTION
4	LINE	18	LINE	56	THROTTLE B	X	BLEED
4'	LINE	20	2ND CLUTCH	90	TORQUE CONVERTER		
5	LINE	21	2ND CLUTCH	91	TORQUE CONVERTER		
6	MODULATE	25	LINE	92	TORQUE CONVERTER		

N Position

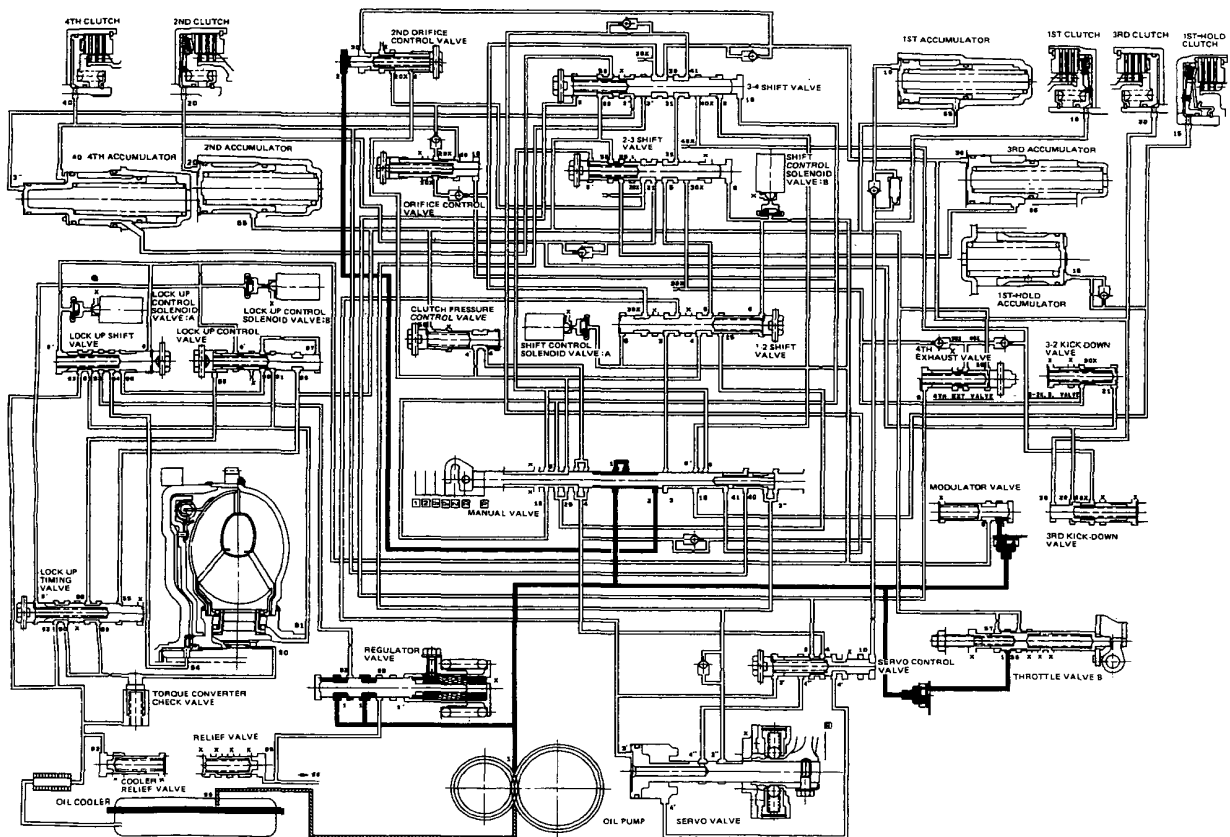
As the engine turns, the oil pump also starts to operate. Automatic transmission fluid (ATF) is drawn from (99) and discharged into (1). Then, ATF pressure is controlled by the regulator valve and becomes the line pressure (1). The torque converter inlet pressure (92) enters (94) of torque converter through the orifice and discharges into (90).

The torque converter check valve prevents the torque converter pressure from rising.

Under this condition, the hydraulic pressure is not applied to the clutches as the manual valve stops line pressure (1).

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



(cont'd)

Description

Hydraulic Flow (cont'd)

1 Position

The line pressure (1) becomes line pressure (4) at the manual valve and passes to the 1st clutch and 1st accumulator. Then line pressure (4) flows through the 1st-hold clutch and 1st-hold accumulator. The power is transmitted only during deceleration through the 1st-hold clutch.

Fluid flows by way of:

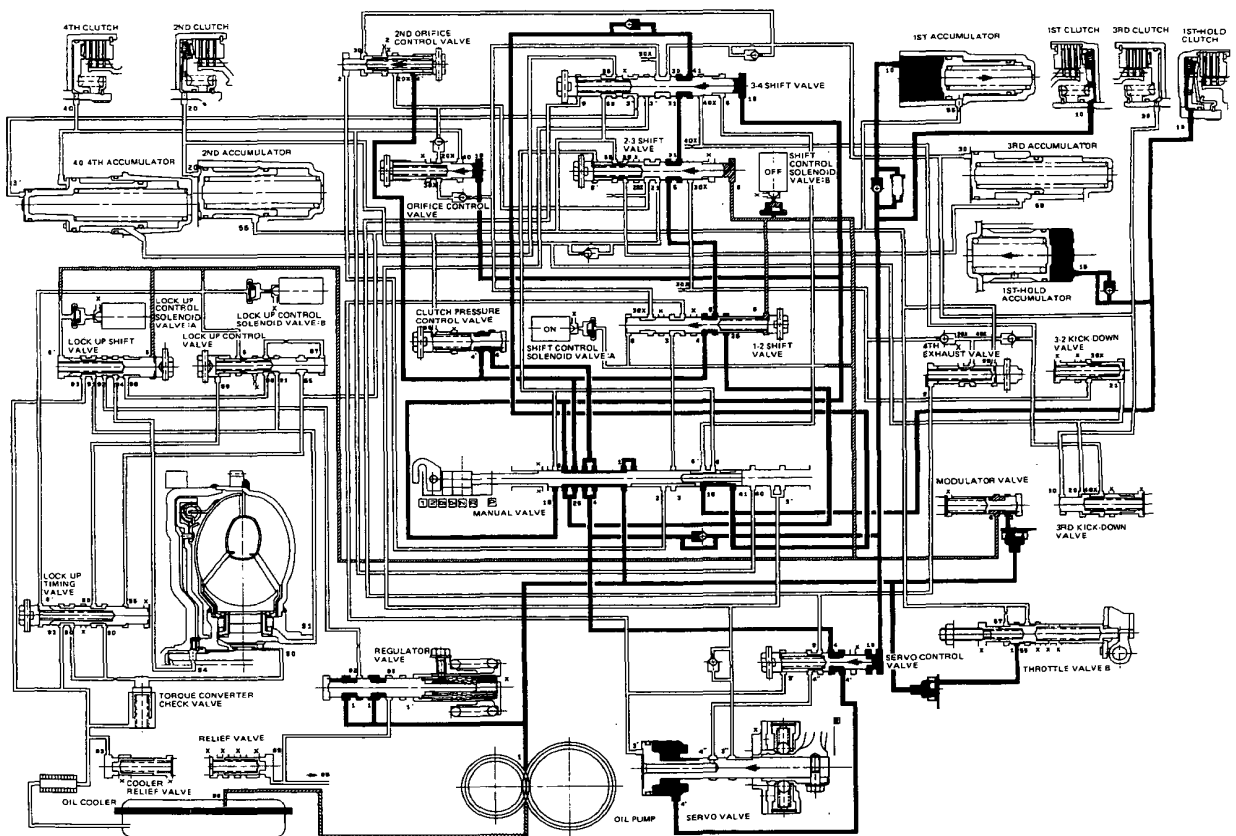
— Line Pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve — 3rd Clutch Pressure (31) → 3-4 Shift Valve — 4th Clutch Pressure (41) → Manual Valve — 1st-hold Clutch Pressure (16) → 1st-hold Clutch

The modulator pressure (6) is supplied to the 1-2 and 2-3 shift valves.

The line pressure (1) also flows to throttle valve B.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



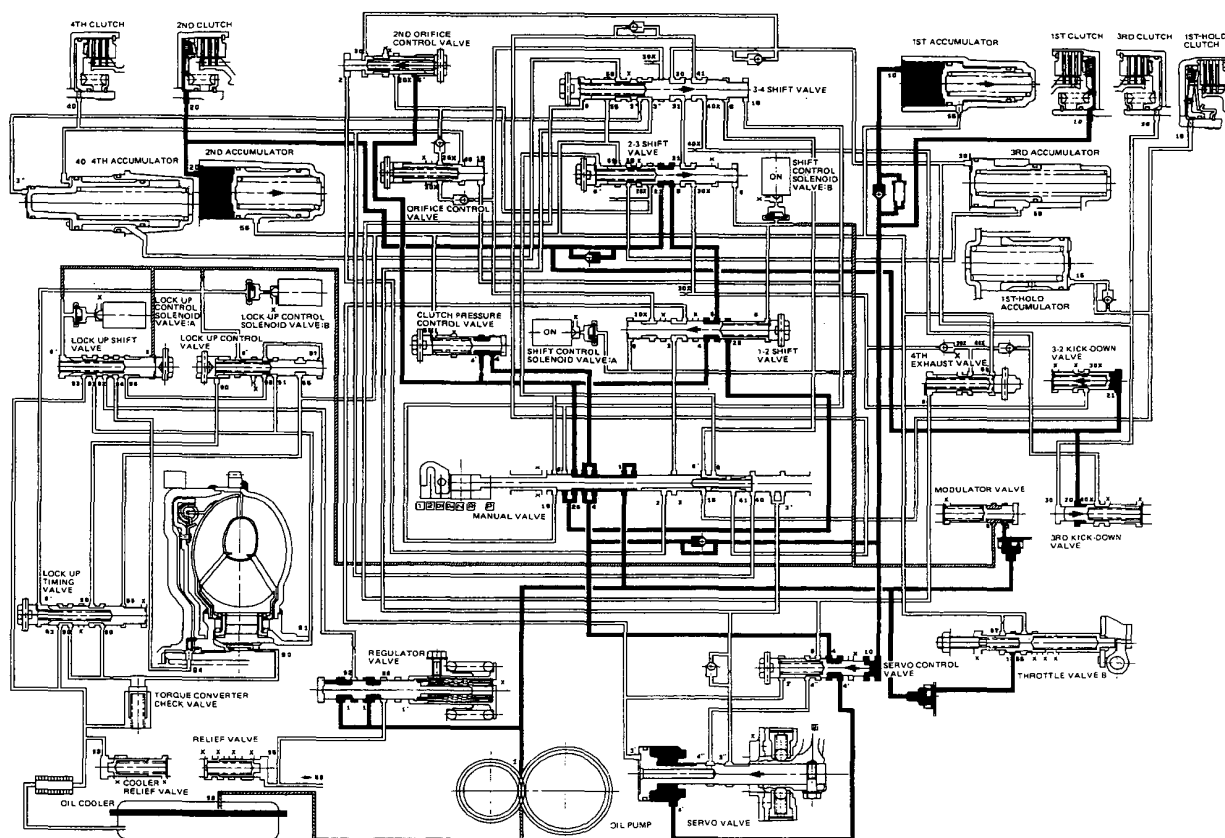


2 Position

The line pressure (1) becomes line pressure (4) as it passes through the manual valve. It then goes through line (20) to the 2nd clutch. Also, line pressure (1) goes to the modulator valve through the filter and becomes the modulator pressure (6). Modulator pressure (6) is not supplied to the 1-2, 2-3 and 3-4 shift valves. Line pressure (1) also flows to throttle valve B.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



(cont'd)

Description

Hydraulic Flow (cont'd)

D3 or **D4** Position

1. 1st Speed

The flow of fluid through the torque converter circuit is the same as in **N** position.

The line pressure (1) becomes line pressure (4) and it becomes the 1st clutch pressure (10). The 1st clutch pressure is applied to the 1st clutch and 1st accumulator; consequently, the vehicle will move as the engine power is transmitted.

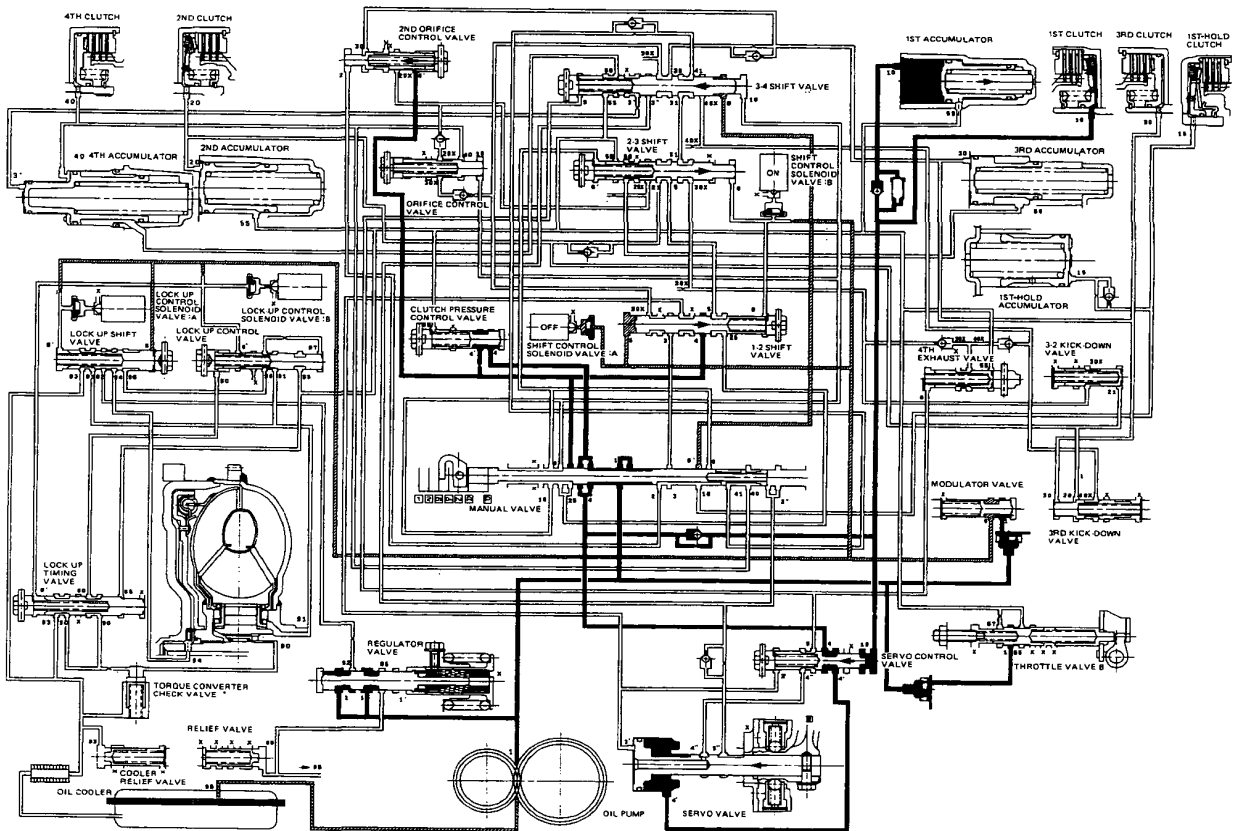
The line pressure (1) becomes the modulator pressure (6) by the modulator valve and travels to 1-2 and 3-4 shift valves.

The 1-2 shift valve is moved to the right side because the shift control solenoid valve A is turned off and B is turned on by the TCM. This valve stops 2nd clutch pressure and the power is not transmitted to the 2nd clutch.

Line pressure (4) also flows to the servo valve and line pressure (1) also flows to throttle valve B.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.





2. 2nd Speed

The flow of fluid up the 1-2 and 2-3 shift valves is the same as in the 1st speed. As the speed of the car reaches the prescribed value, the solenoid valve A is turned on by means of the TCM. As a result, the 1-2 shift valve is moved to the left and uncovers the port leading to the 2nd clutch; the 2nd clutch is engaged.

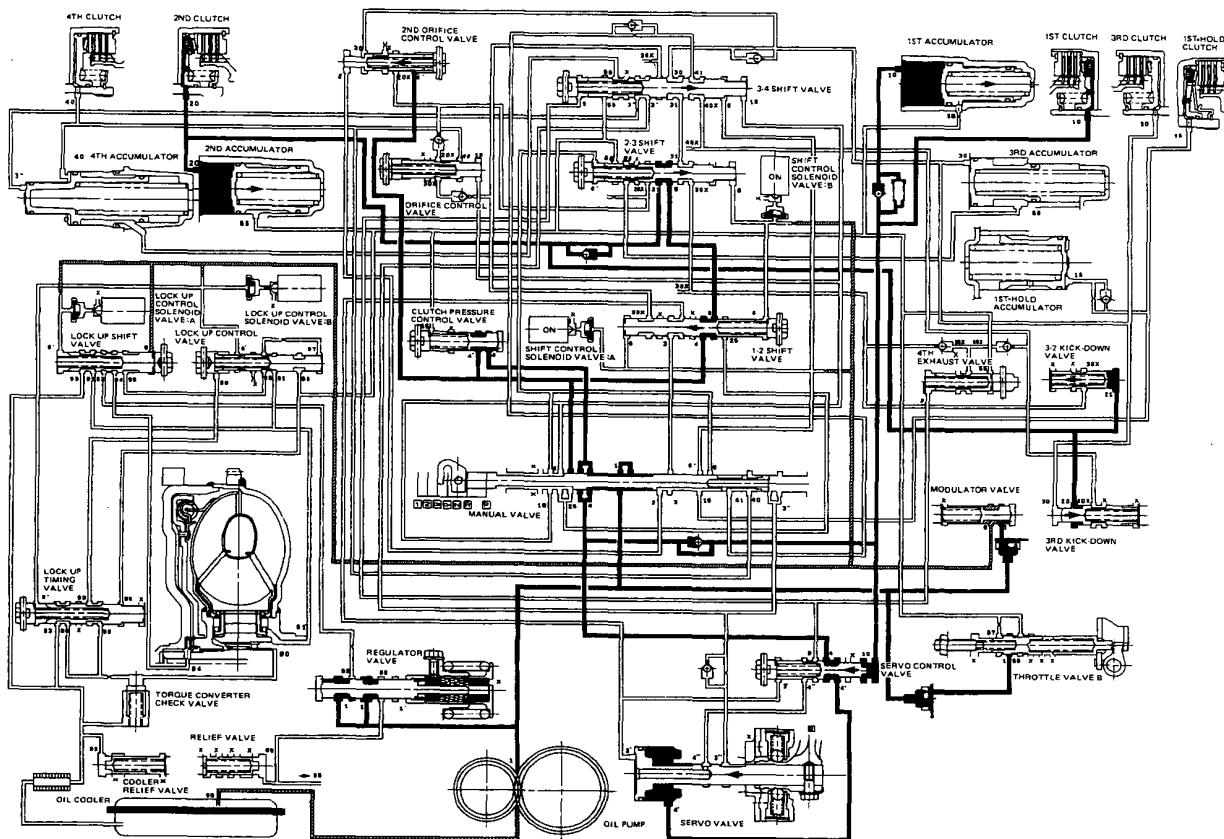
Fluid flows by way of:

— Line pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve — 2nd Clutch Pressure (21) → Orifice — 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 flowchart.



(cont'd)

Description

Hydraulic Flow (cont'd)

3. 3rd Speed

The flow of fluid up to the 1-2, 2-3 and 3-4 shift valves is the same as in the 2nd speed. As the speed of the car reaches the prescribed value, the shift control solenoid valve B is turned off (shift control solenoid valve A remains on). The 2-3 shift valve is then moved to the left, uncovering the oil port leading to the 3rd clutch. Since the 3-4 shift valve is moved to the right to cover the oil port to the 4th clutch, the 3rd clutch is turned on.

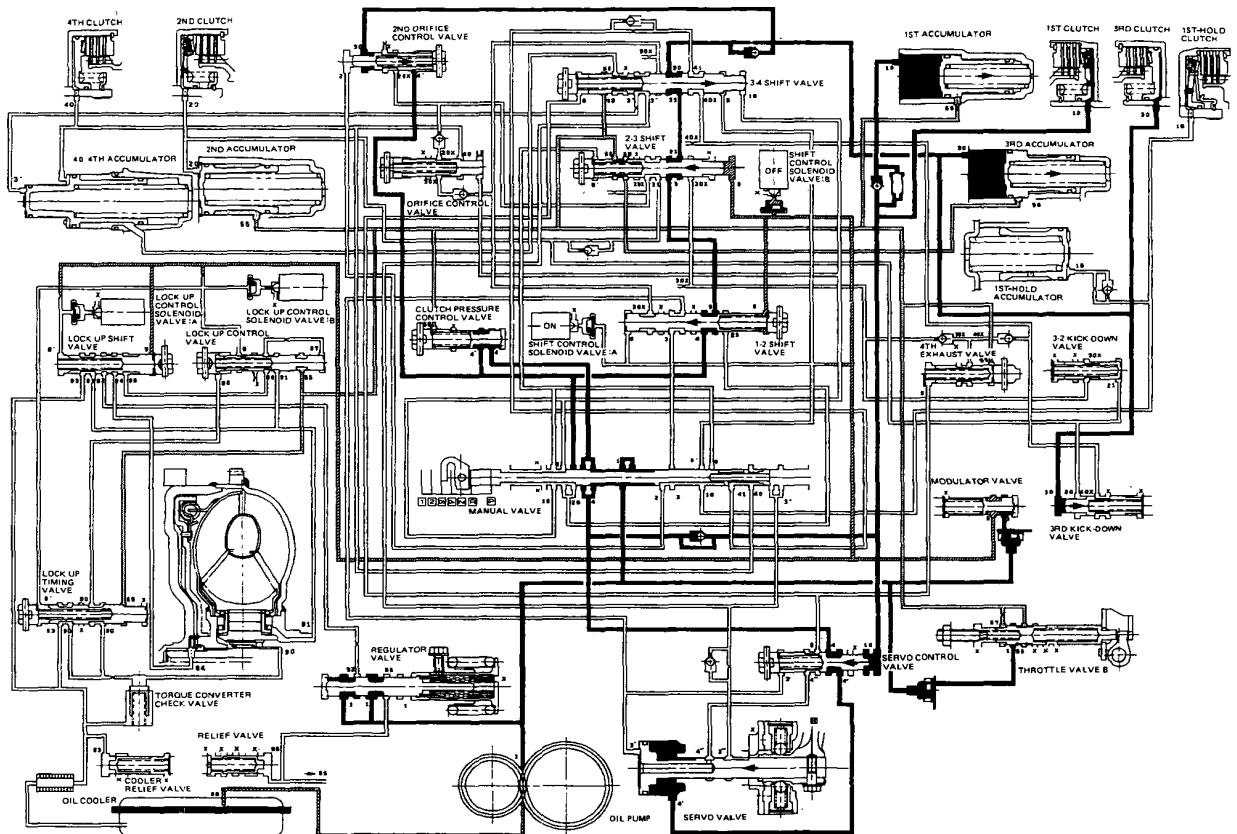
Fluid flows by way of:

- Line Pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve — 3rd Clutch Pressure (31) → 3-4 Shift Valve (not controlled)
- 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 the 2nd speed.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.





D4 Position
4th Speed

The flow of fluid up to the 1-2, 2-3 and 3-4 shift valves is the same as in the 3rd speed. As the speed of the car reaches the prescribed value, the shift control solenoid valve A is turned off (shift control solenoid valve B remains off).

As this takes place, 3-4 shift valve is moved to the left and uncovers the oil port leading to the 4th clutch. Since the 1-2 and 2-3 shift valves are kept on the left side, the fluid flows through the 4th clutch; the power is transmitted through the 4th clutch.

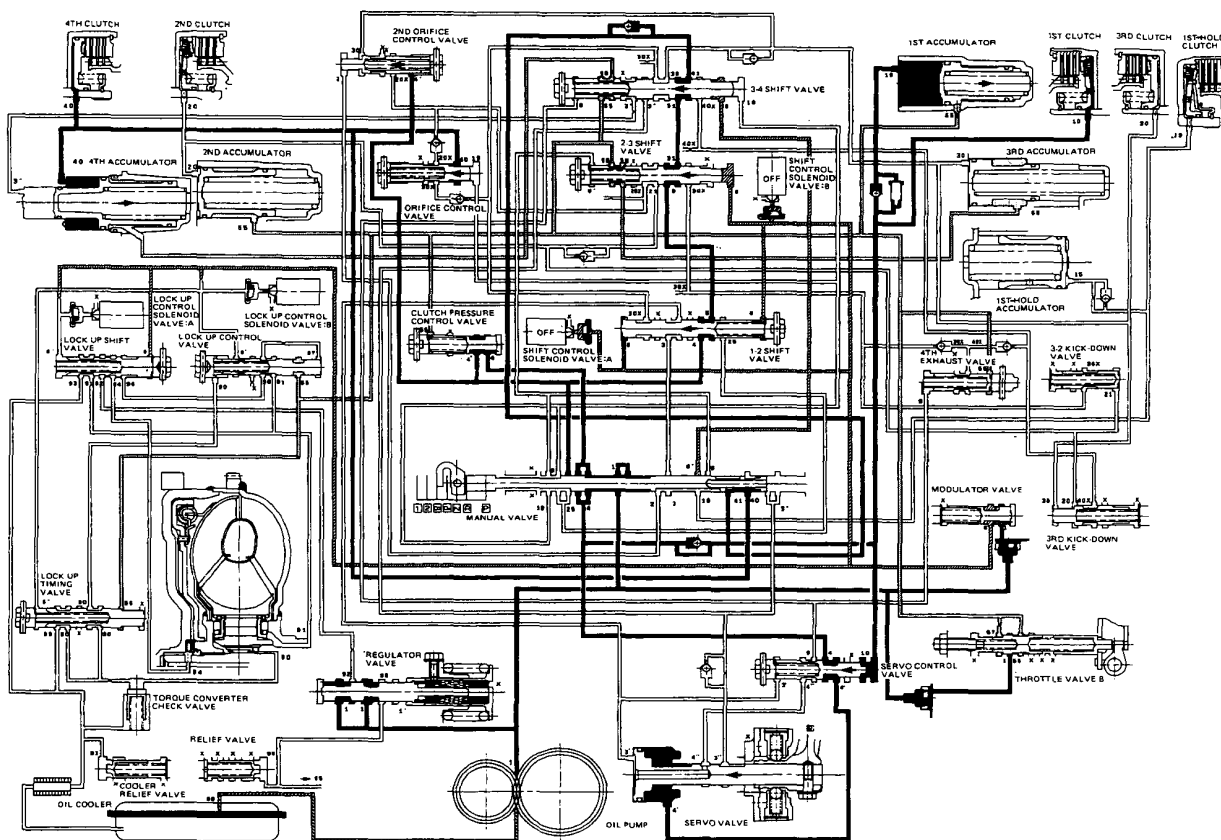
Fluid flows by way of:

- Line Pressure (4) → 1-2 Shift Valve → 2-3 Shift Valve—3rd Clutch Pressure (31) → 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 speed.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



(cont'd)

Description

Hydraulic Flow (cont'd)

R Position

The flow of fluid through the torque converter circuit is the same as in the **N** position. The fluid (1) from the oil pump flows through the manual valve and becomes line pressure (3). It then flows through the 1-2 shift valve to the servo valve (3), causing the shift fork shaft to be moved in the reverse direction.

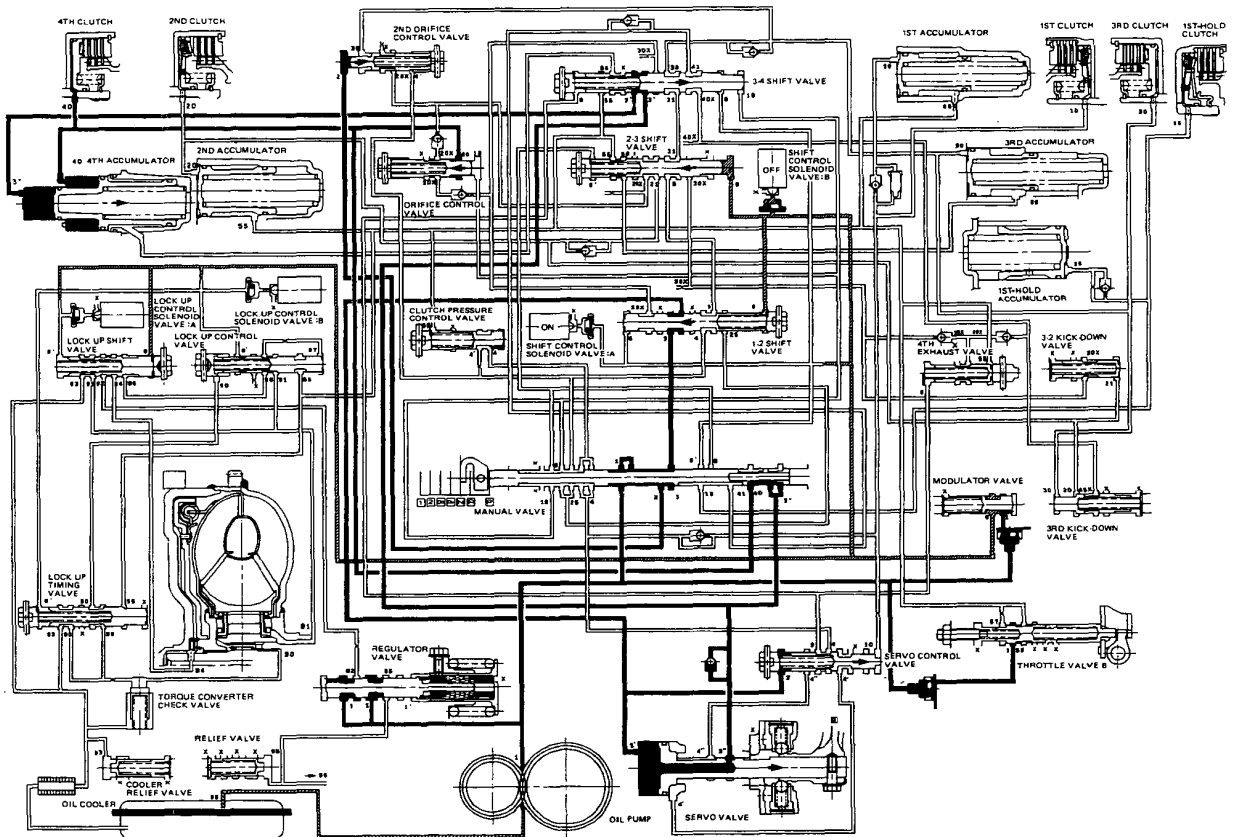
Under this condition, the shift control solenoid valve A is turned on whereas the valve B is turned off as in 3rd speed in **D4** or **D3** position. As a result, the 1-2 shift valve is also moved to the left. The fluid (3') will flow through the servo valve and manual valve to the 4th clutch; power is transmitted through the 4th clutch.

Reverse Inhibitor Control

When the **R** position is selected while the vehicle is moving forward at a speed over 6 mph (10 km/h), the TCM outputs 1st signal (A: OFF, B: ON), and the 1-2 shift valve is moved to the right side. The line pressure (3) is intercepted by the 1-2 shift valve; consequently, power is not transmitted as the 4th clutch and servo valve are not operated.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



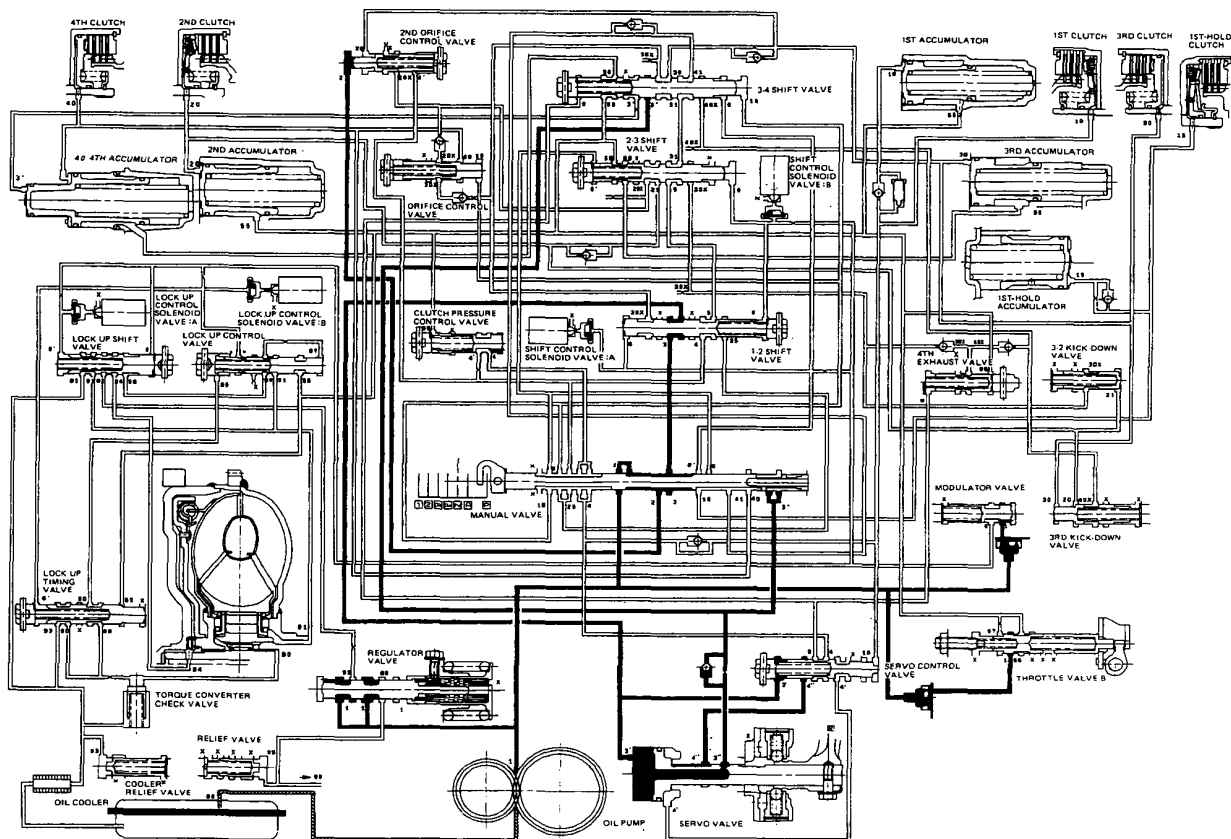


P Position

The flow of fluid through the torque converter circuit is the same as in **N** position. The line pressure (1) becomes the line pressure (3) as it passes through the manual valve. Then line pressure (3) flows through the 1-2 shift valve to the servo valve and the servo control valve, causing the shift fork shaft to be moved to the reverse position as in the **R** position. However, the hydraulic pressure is not supplied to the clutches. The power is not transmitted.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



Description

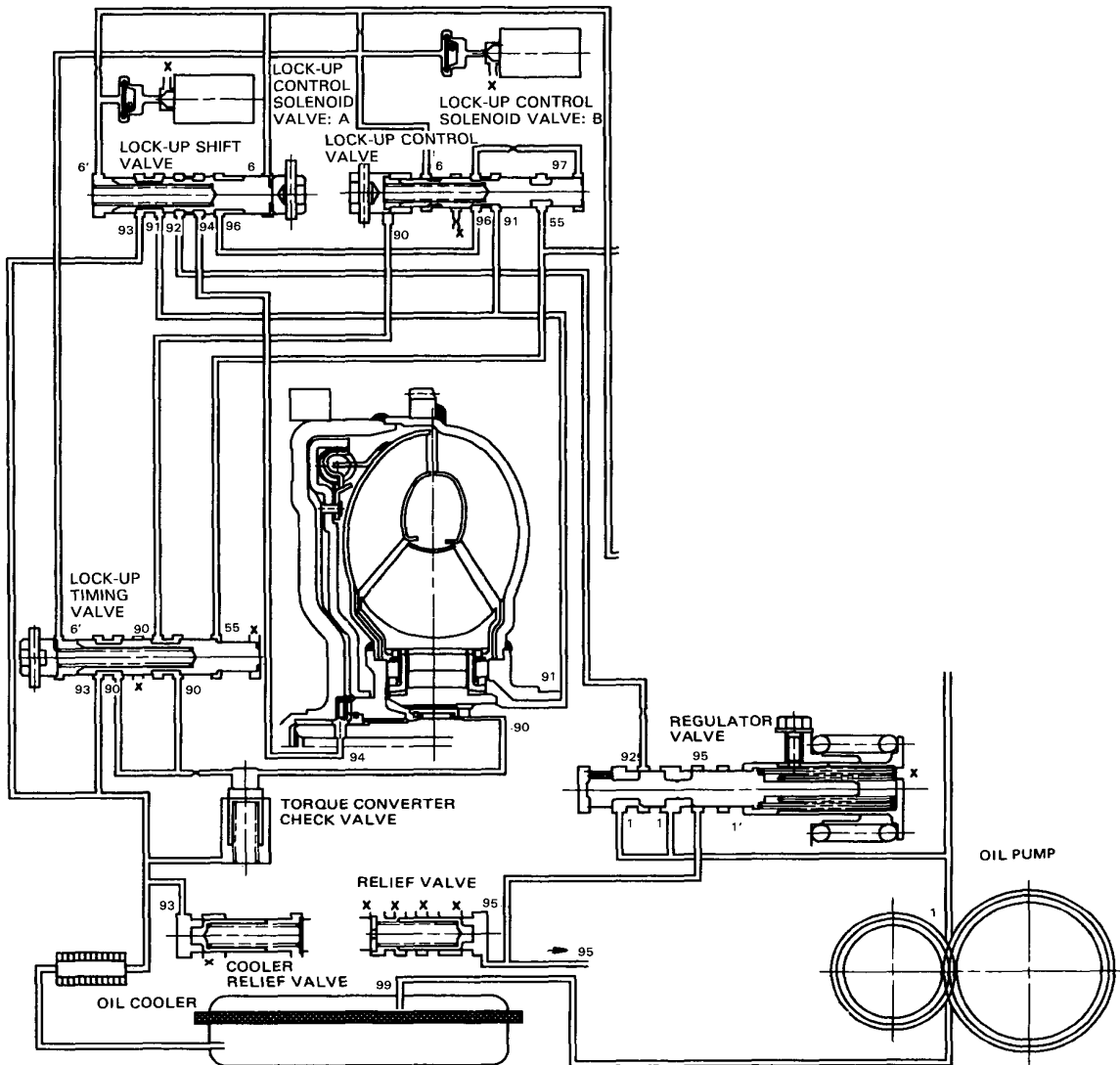
Lock-up System

In **D₄** position in 2nd, 3rd and 4th, and **D₃** position in 3rd, pressurized fluid is drained from the back of the torque converter through an oil 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 TCM optimizes the timing of the lock-up system. Under certain conditions, the lock-up clutch is applied during deceleration, in 3rd and 4th speed.

The lock-up system controls the range of lock-up according to lock-up control solenoid valves A and B, and throttle valve B. When lock-up control solenoid valves A and B activate, modulator pressure changes. Lock-up control solenoid valves A and B are mounted on the torque converter housing, and are controlled by the TCM.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



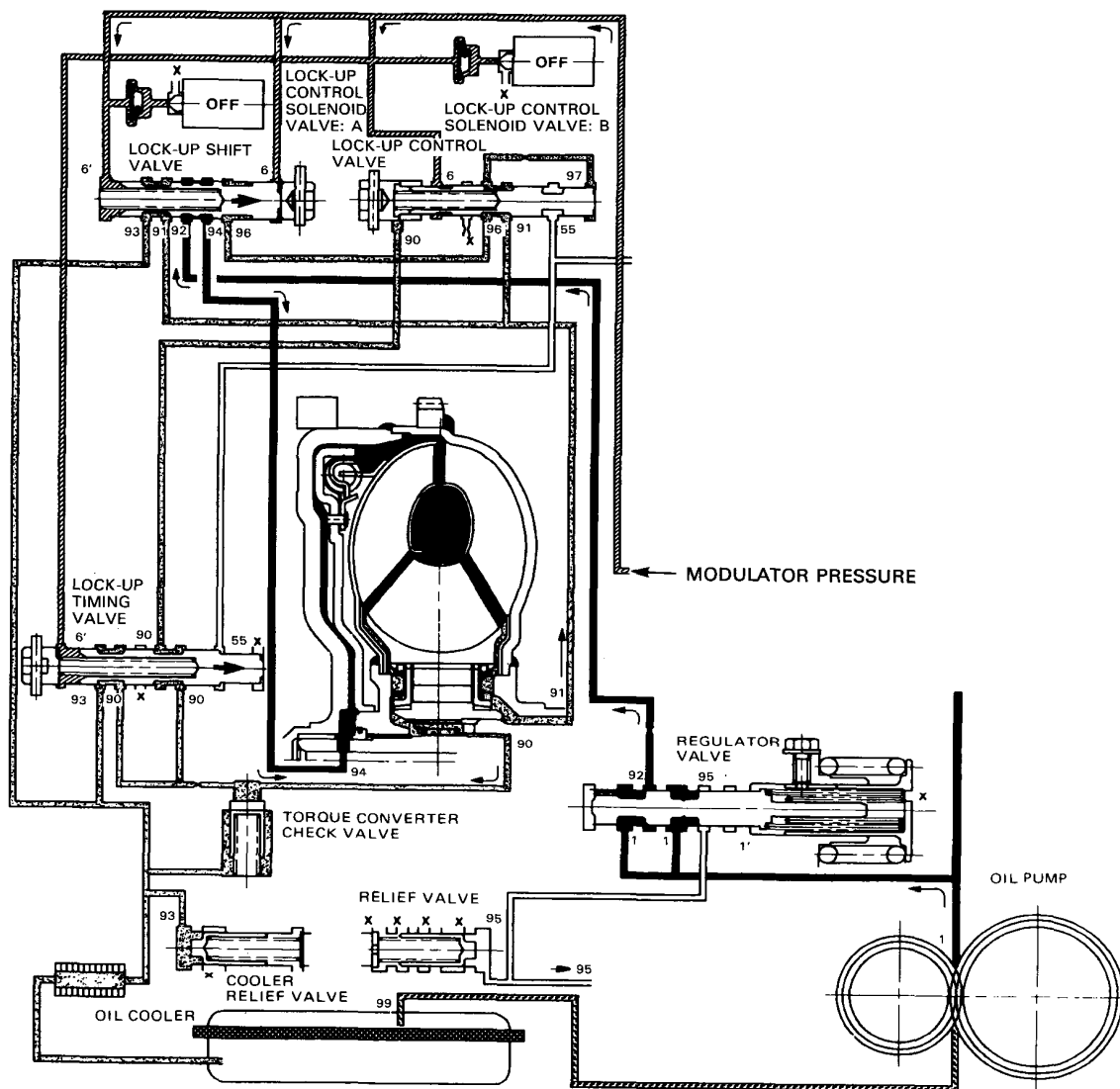


No Lock-up

The pressurized fluid regulated by the modulator works on both ends of the lock-up shift valve and on the left side of the lock-up control valve. Under this condition, the pressures working on both ends of the lock-up shift valve are equal, the shift valve is moved to the right side by the tension of the valve spring alone. The fluid from the oil pump will flow through the left side of the lock-up clutch to the torque converter; i.e., the lock-up clutch is in OFF condition.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



(cont'd)

Description

Lock-up System (cont'd)

Partial Lock-up

Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: OFF

The TCM 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 modulator pressure is separated to the two passages:

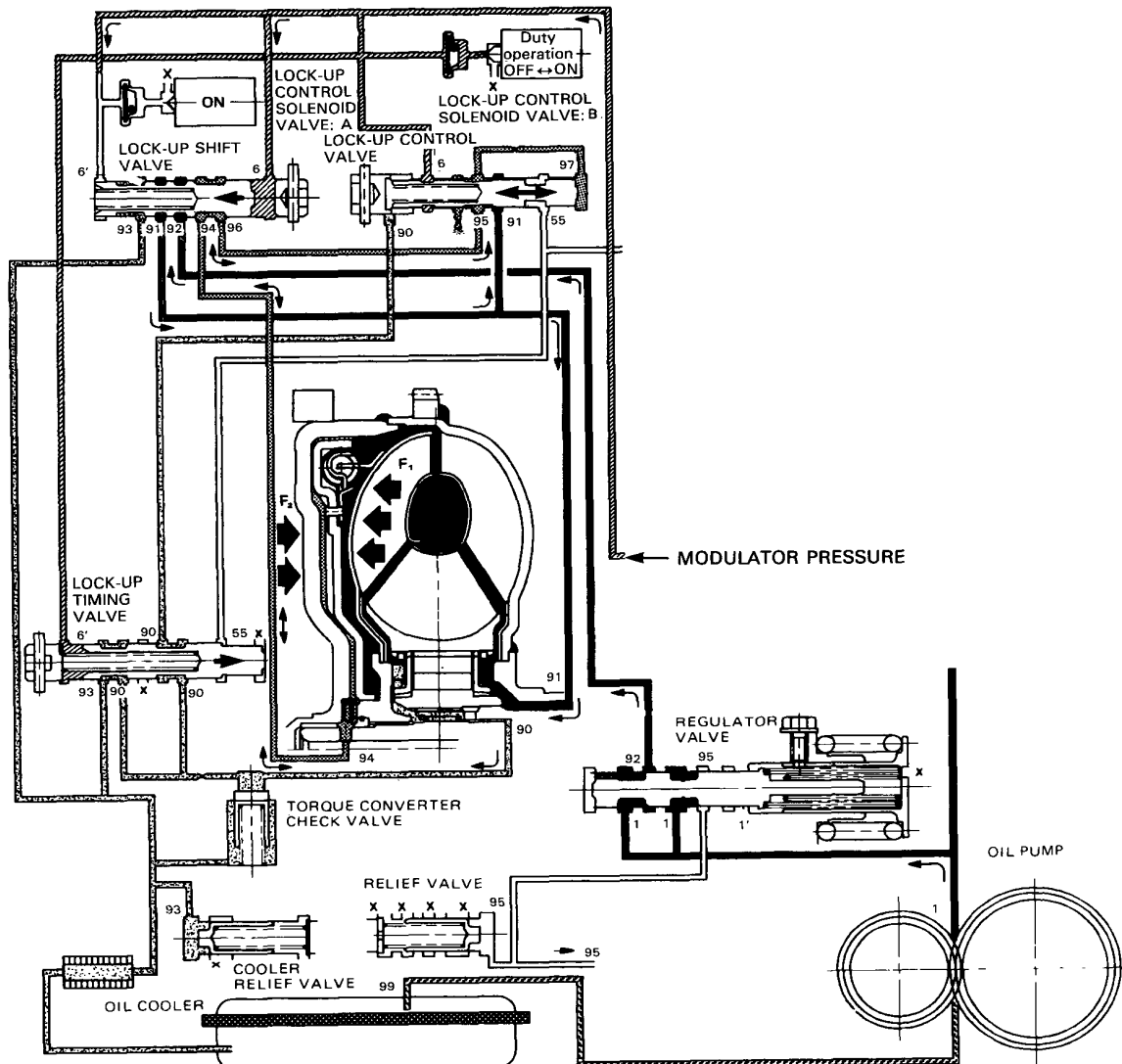
Torque Converter Inner Pressure: enters into right side-to engage lock-up clutch

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 throttle B pressure, tension of the valve spring and pressure regulated by the modulator. Also the position of the lock-up control valve is determined by the back pressure of the lock-up control valve and torque converter pressure regulated by the check valve. With the lock-up control solenoid valve B kept off, the modulator pressure is maintained in the left end of the lock-up control valve; in other words, the lock-up control valve is moved slightly to the left side. This slight movement of the lock-up control valve causes the back pressure to be lowered slightly, resulting in partial lock-up.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.





Half Lock-up

Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: ON

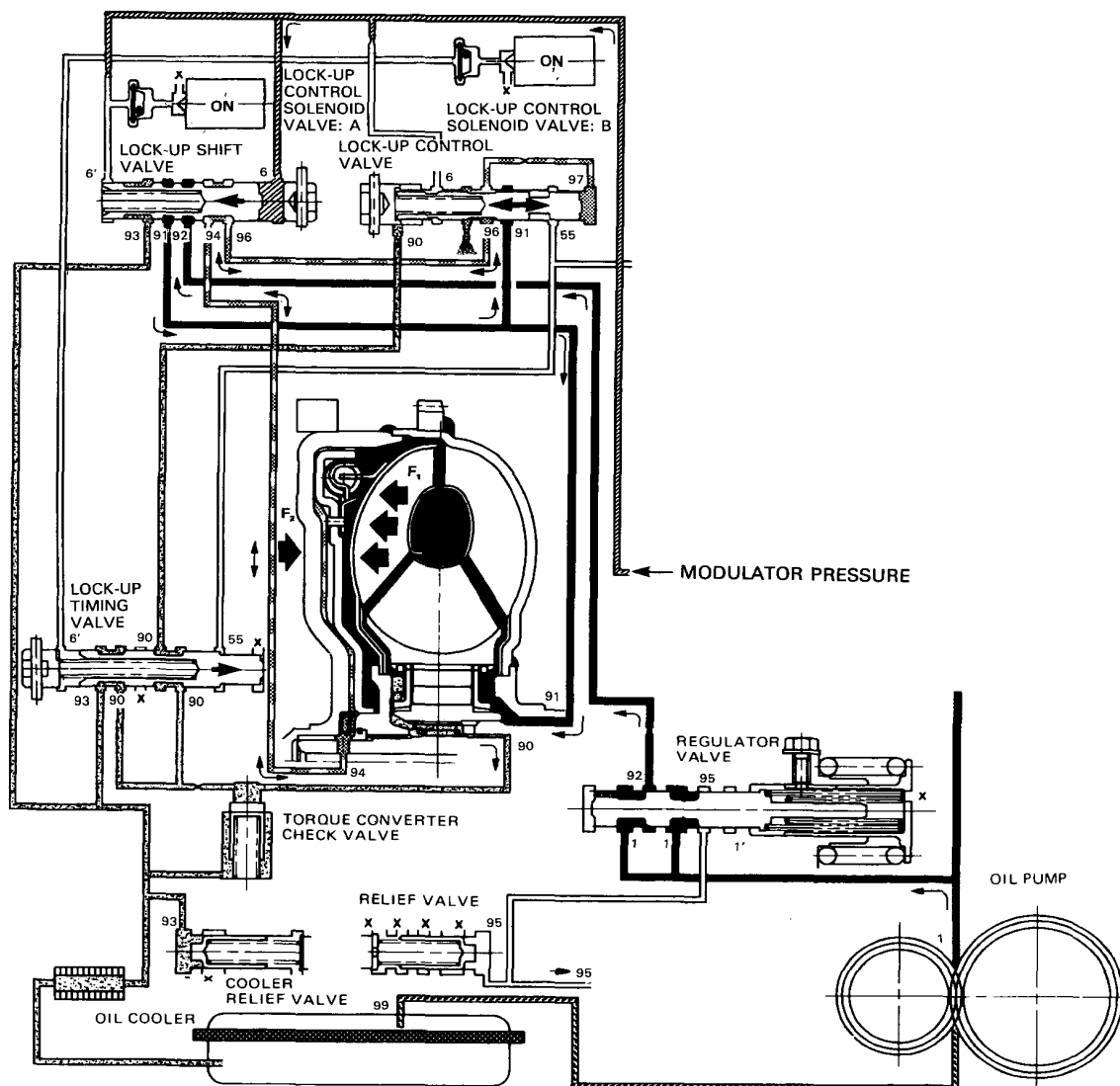
The modulator pressure is released by the solenoid valve B, causing the modulator pressure in the left cavity of the lock-up control valve to lower.

Also the modulator pressure in the left cavity of the lock-up timing valve is low. However the throttle B pressure is still low at this time; consequently, the lock-up timing valve is kept on the right side by the spring force.

With the lock-up control solenoid valve B turned on, the lock-up control valve is moved somewhat to the left side, causing the back pressure (F2) to lower. This allows a greater amount of the fluid (F1) to work on the lock-up clutch so as to engage the clutch. The back pressure (F2) which still exists prevents the clutch from engaging fully.

NOTE:

When used, "left" or "right" indicates direction on the flowchart.



(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

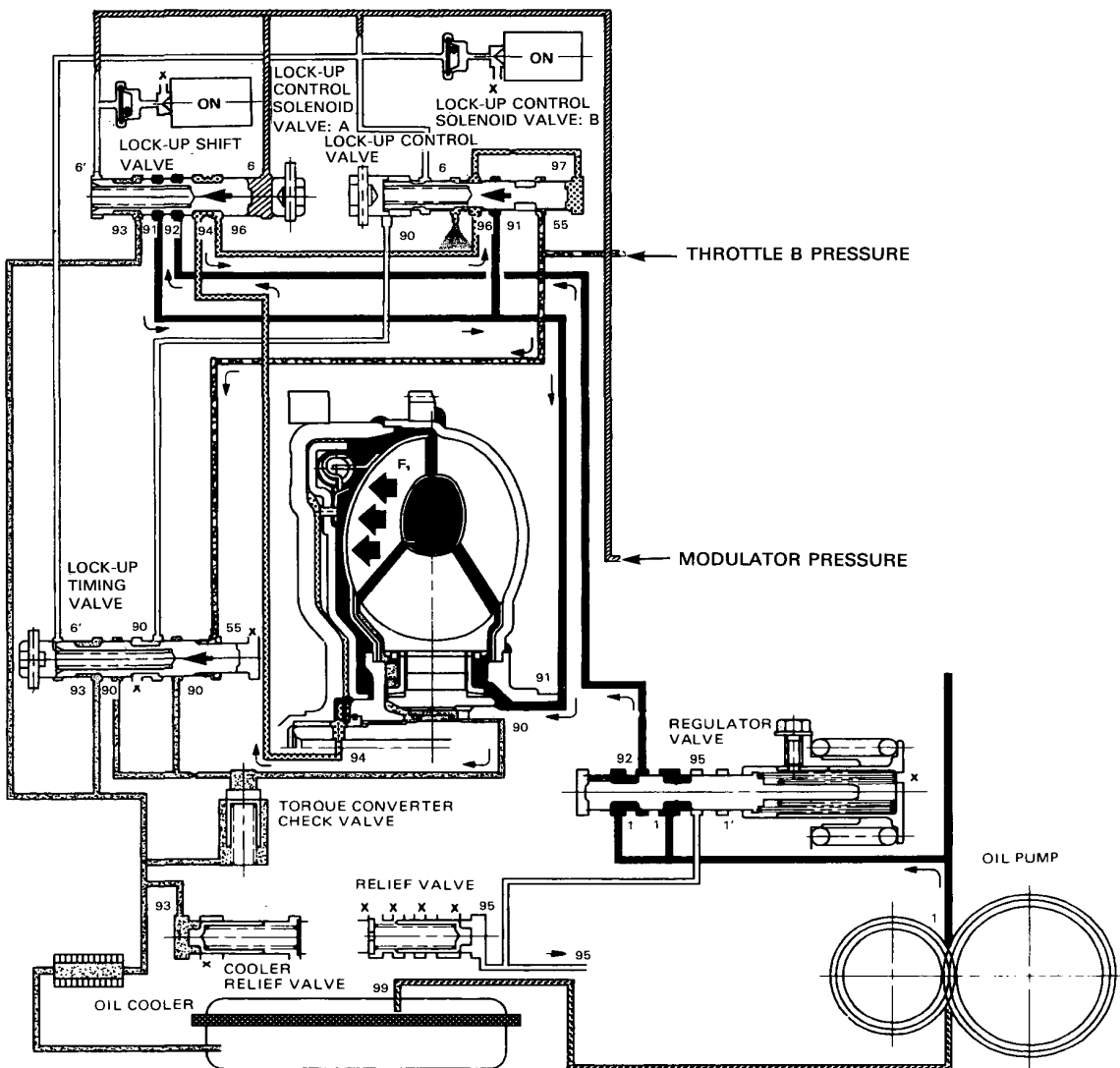
When the vehicle speed further increases, the throttle B pressure is increased in accordance with the throttle opening.

The lock-up timing valve overcomes the spring force and moves to the left side. Also, this valve closes the oil port leading to the torque converter check valve.

Under this condition, the throttle B pressure working on the right end of the lock-up control valve becomes greater than that on the left end (modulator pressure in the left end has already been released by the solenoid valve B); i.e., the lock-up control valve is moved to the left. As this happens, 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 flowchart.





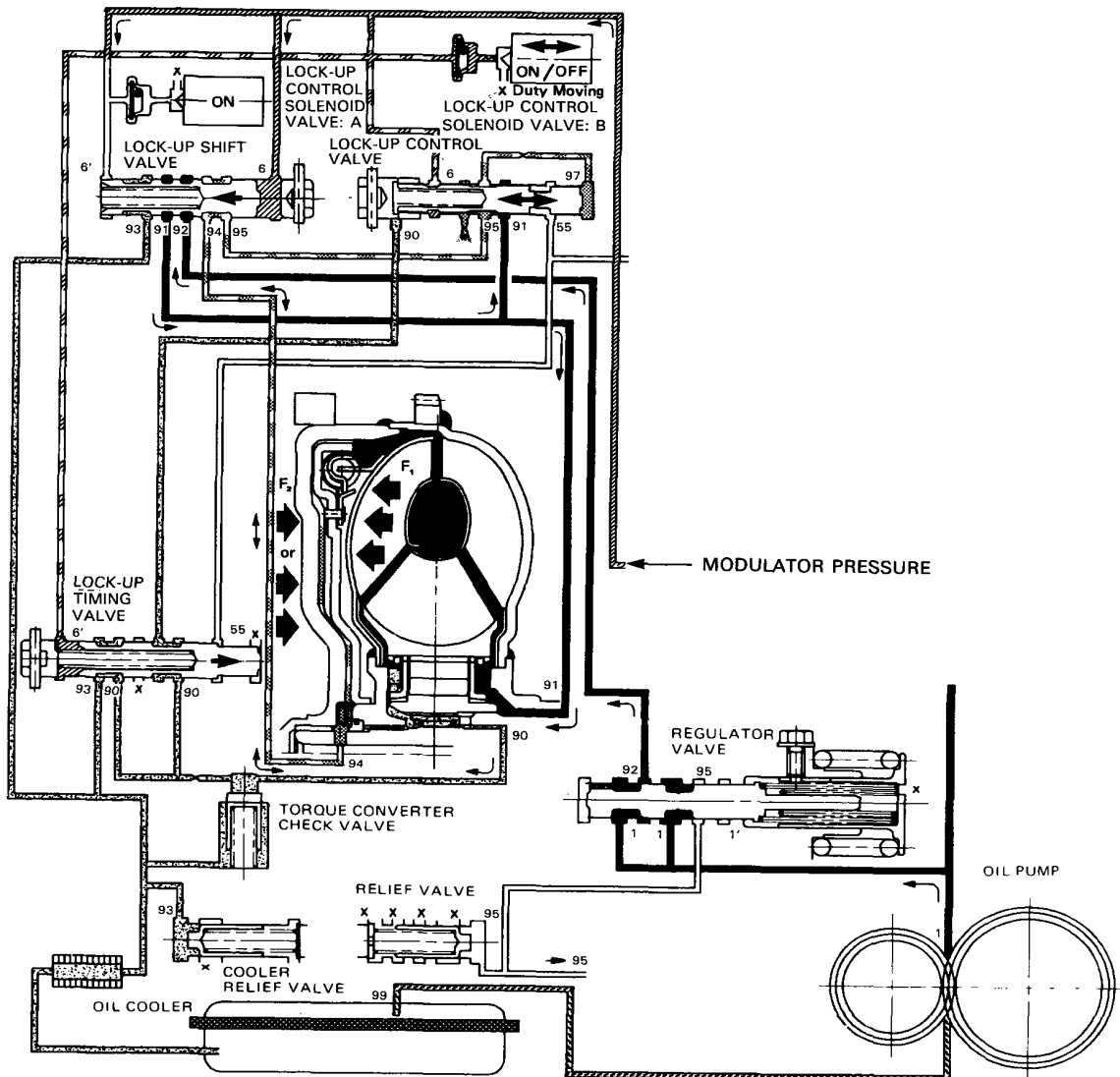
Deceleration Lock-up

Lock-up Control Solenoid Valve A: ON Lock-up Control Solenoid Valve B: Duty Operation (ON↔OFF)

The TCM 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 flowchart.



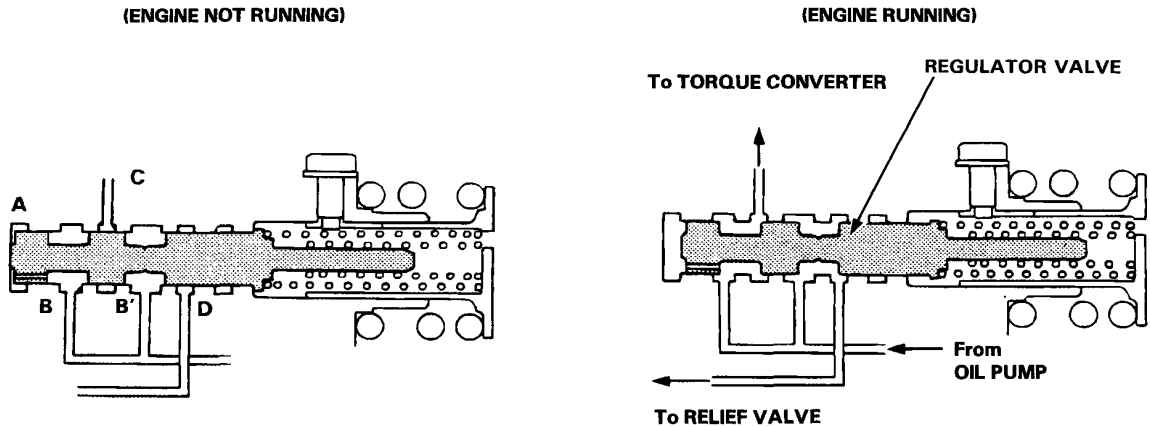
Description

Hydraulic Control

Regulator Valve

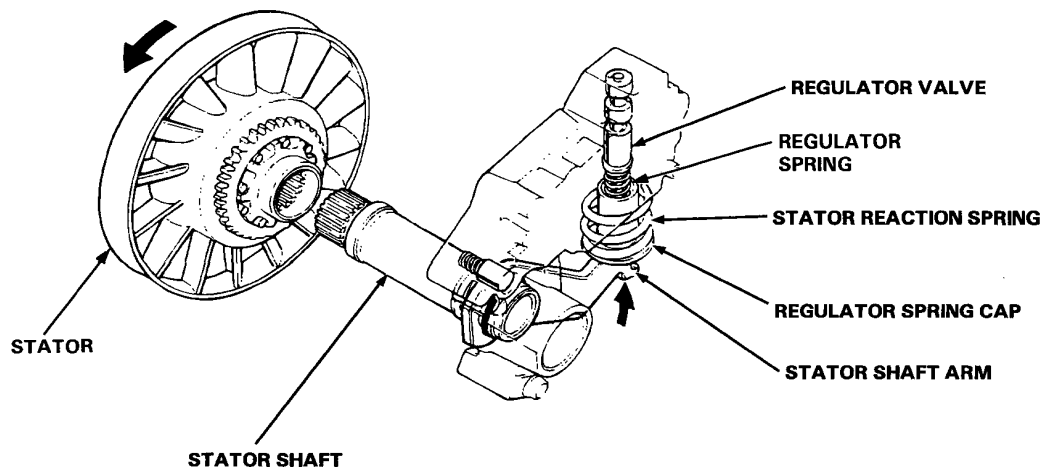
The regulator valve maintains a constant hydraulic pressure sent from the oil pump to the hydraulic control system, while also furnishing oil to the lubricating system and torque converter.

Oil flows through B and B'. The oil which enters through B flows through the valve orifice to A, pushing the regulator valve to the right. According to the level of hydraulic pressure through B, the position of the valve changes, and the amount of the oil through B' from D also changes. This operation is continued, maintaining line pressure.



Stator Reaction Hydraulic Pressure Control

Hydraulic pressure increase according to torque is performed by the regulator valve using stator torque reaction. The stator shaft is splined in the stator, and its arm end contacts the regulator spring cap. When the car is accelerating or climbing (Torque Converter Range), stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the → direction in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the regulated control pressure or line pressure. Line pressure is maximum when the stator reaction is maximum.





Throttle Valve B

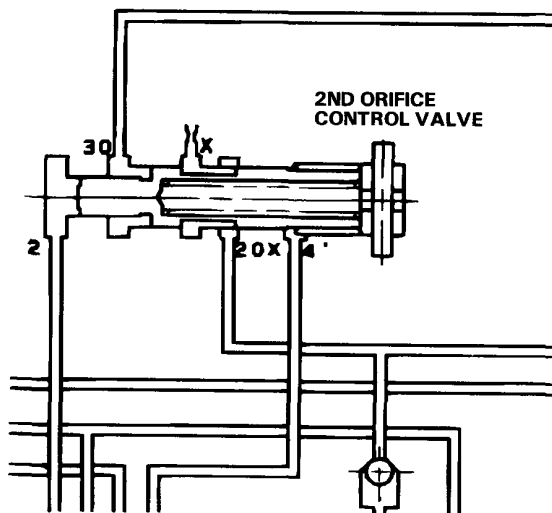
Throttle valve B converts changes in the throttle opening to changes in transmission hydraulic pressure. The end of throttle valve B contacts the throttle cam which is connected by a cable to the throttle body. The cable pulls the cam which, in turn, moves the throttle valve B. The throttle valve B-to-cam engagement is adjustable for shift smoothness and lock-up. Throttle valve B controls the accumulators, to make smooth changes from one gear to another. An assist function is used to lessen the throttle load.

Modulator Valve

The modulator valve maintains line pressure from the regulator, to the pressure shift control solenoid valves A/B and lock-up control solenoid valves A/B, thus maintaining accurate shift and lock-up characteristics.

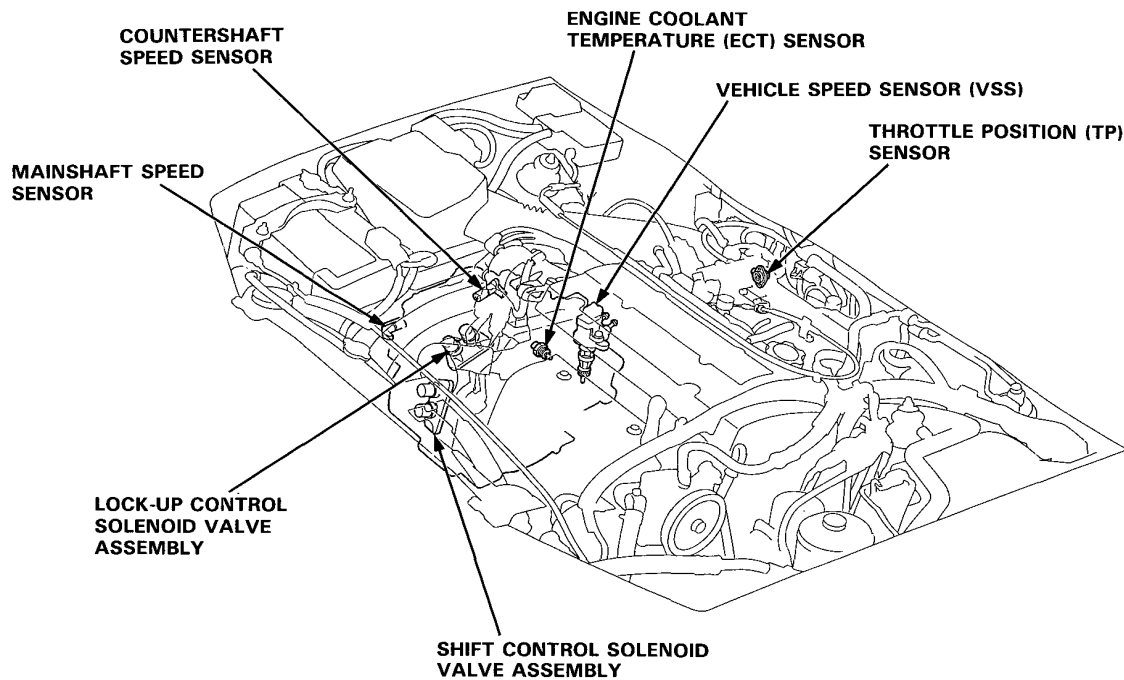
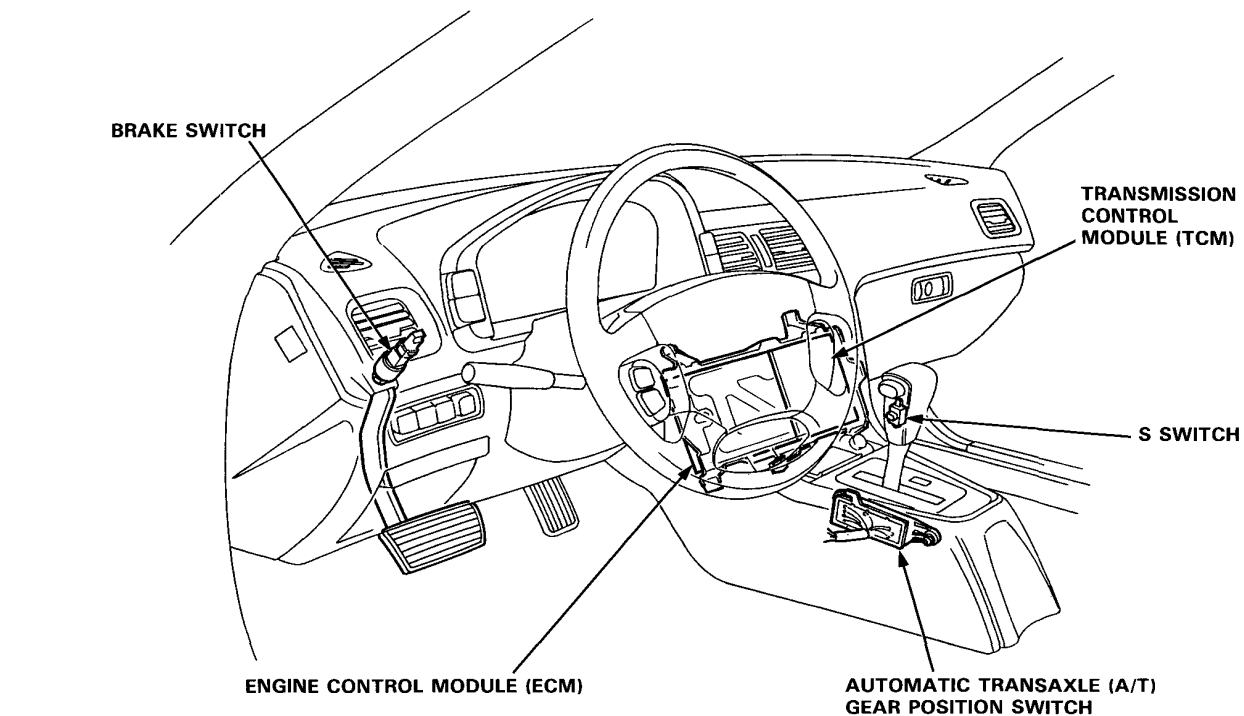
2nd Orifice Control Valve

For smooth shifting between 2nd and 3rd, the 2nd orifice control valve relieves the 2nd clutch pressure. As 3rd clutch pressure is increased, the 2nd orifice control valve moves to uncover the oil port relieving the 2nd clutch pressure.



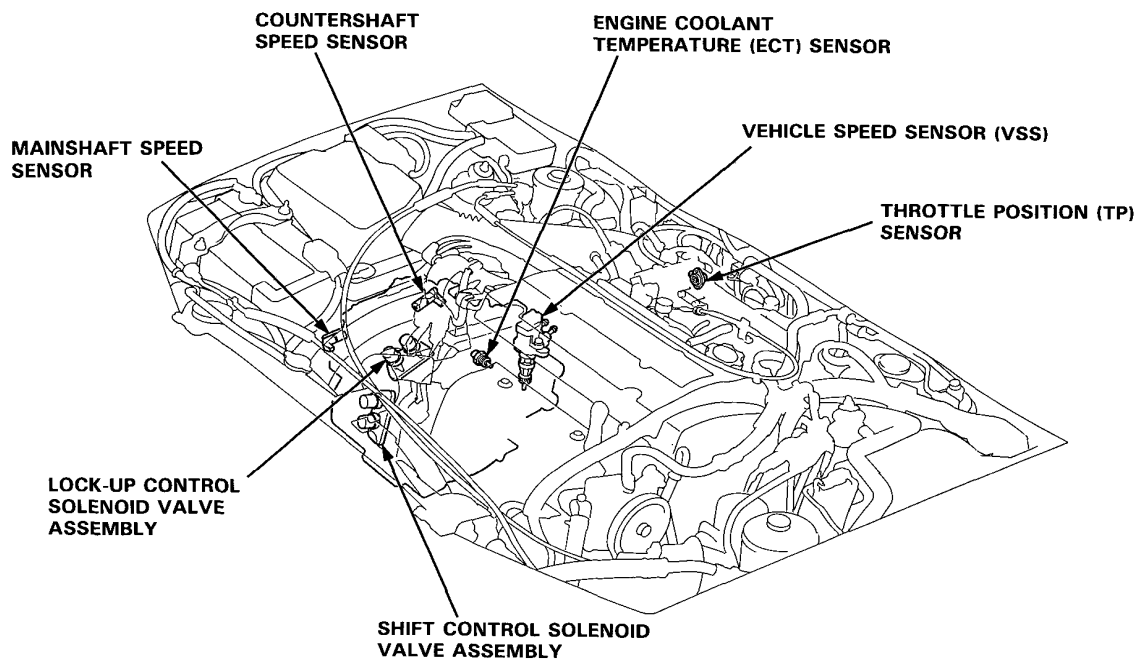
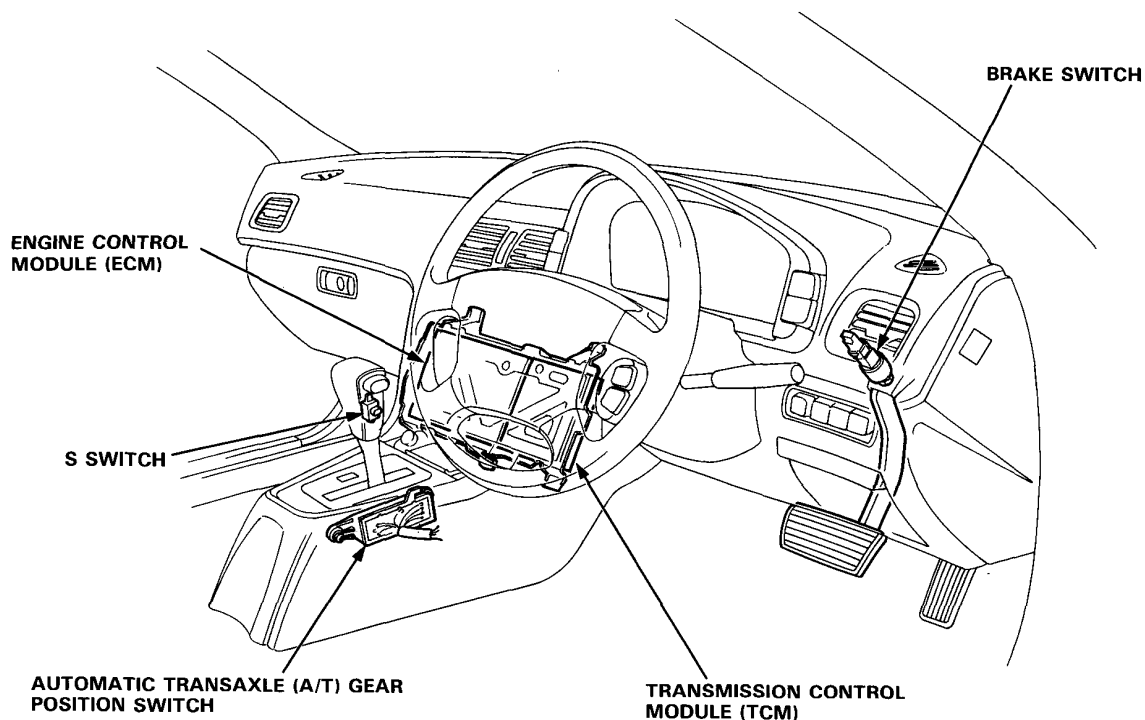
Component Location

LHD:

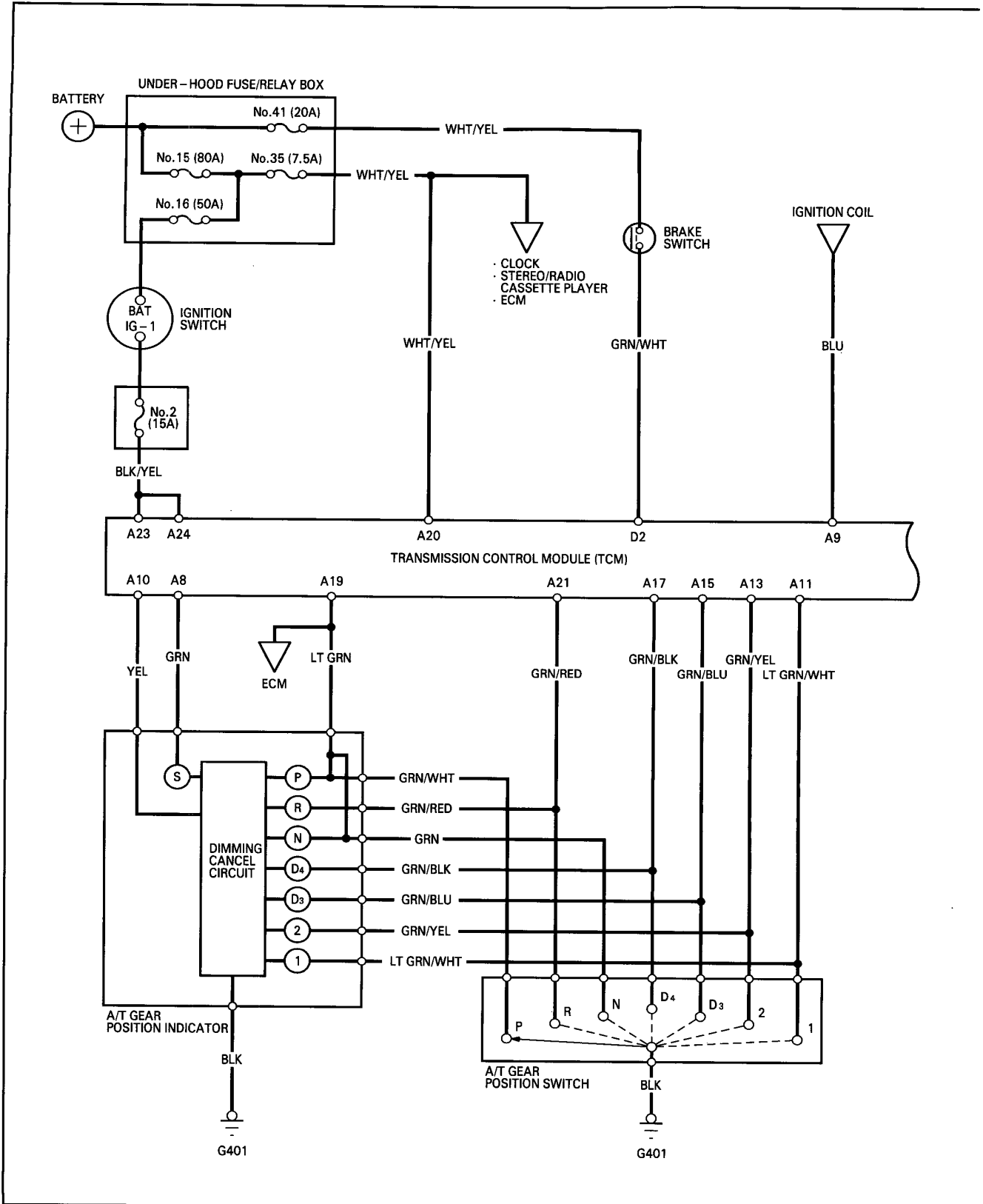


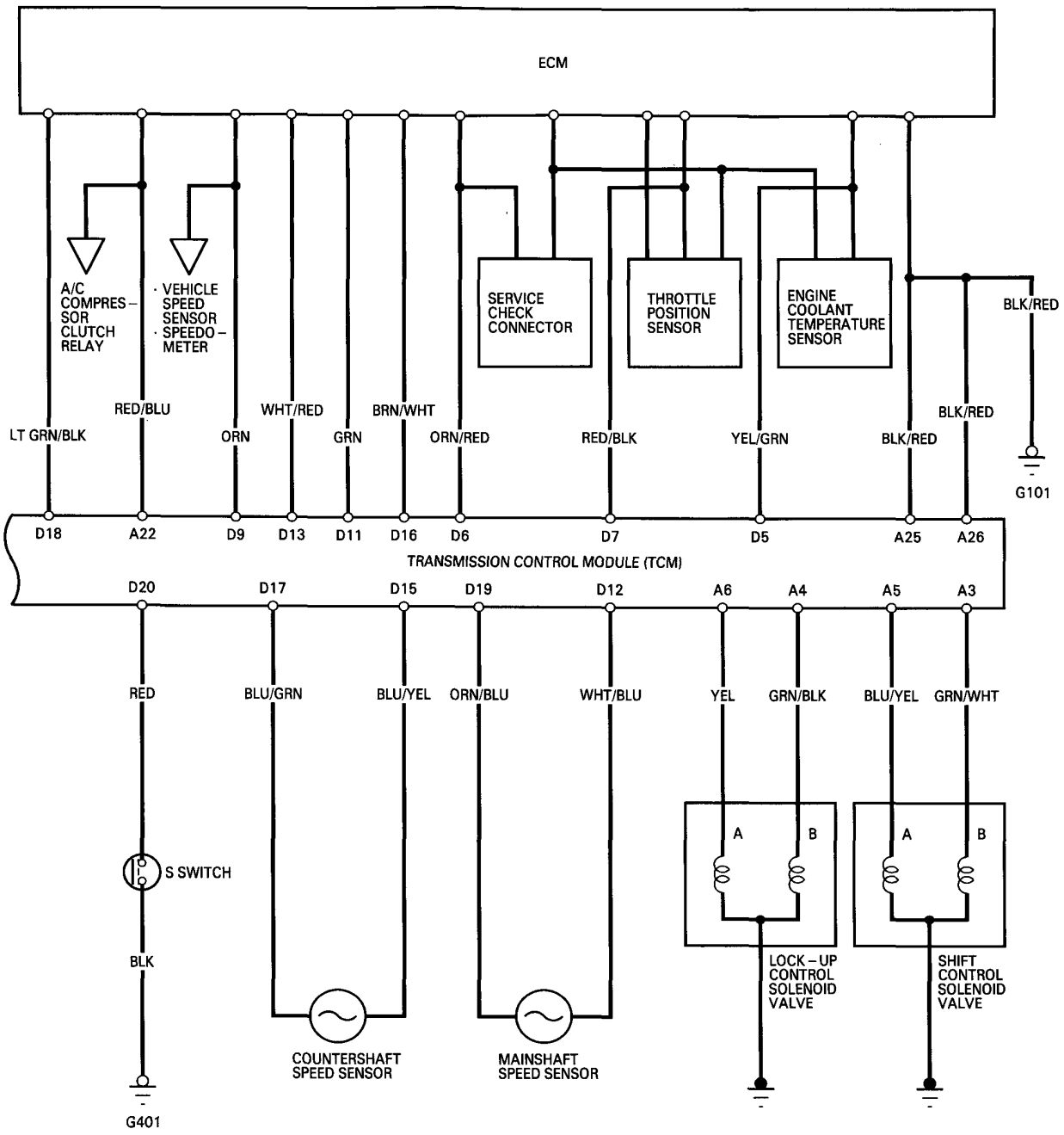


RHD:



Circuit Diagram





A3	A5	A9	A11	A13	A15	A17	A19	A21	A23	A25
A4	A6	A8	A10				A20	A22	A24	A26

D5	D7	D9	D11	D13	D15	D17	D19
D2	D6		D12	D16	D20		

TCM Terminal Location

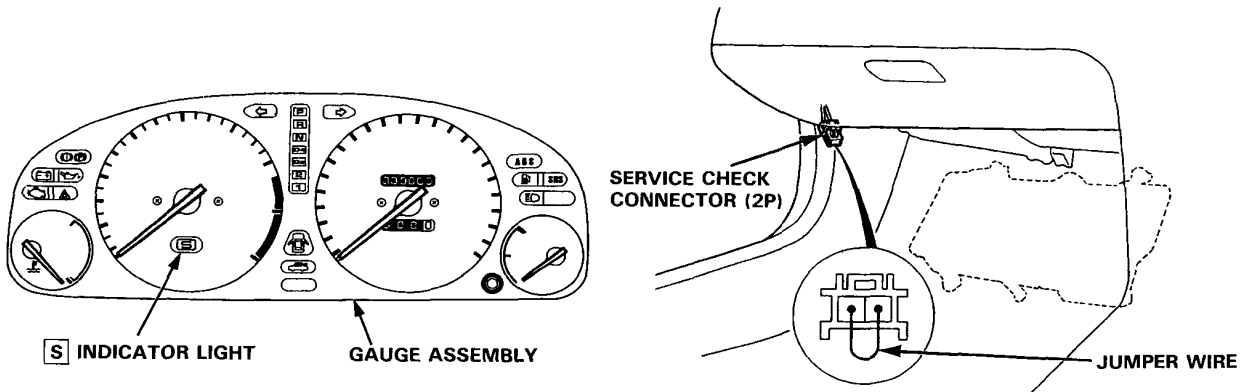
Troubleshooting Procedures

When the transmission control module (TCM) senses an abnormality or output system, the **S** indicator light in the gauge assembly will blink. When the Service Check Connector (located under the dashboard on the passenger's side) is connected with a jumper wire, the **S** indicator light will blink the Diagnostic Trouble Code (DTC) when the ignition switch is turned on.

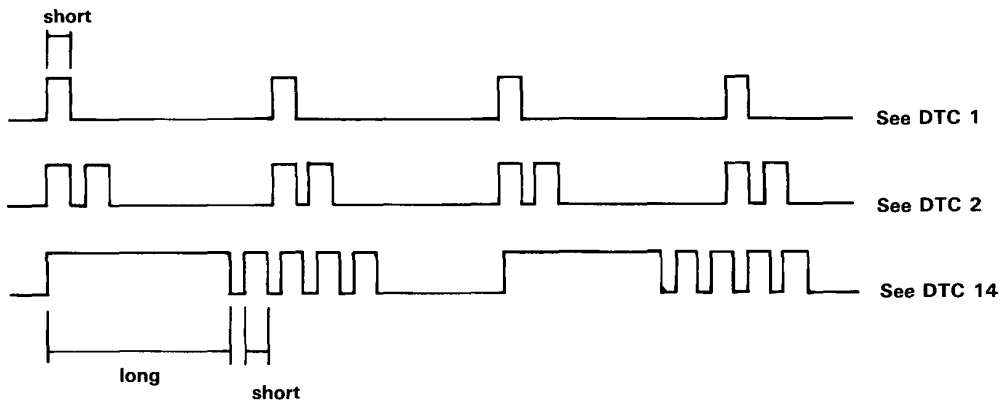
When the **S** indicator light has been reported on, connect the two terminals of the Service Check Connector with a jumper wire.

Then turn the ignition switch and observe the **S** indicator light.

LHD is shown; RHD is similar.



Codes 1 through 9 are indicated by individual short blinks, codes 10 through 15 are indicated by 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 14-36 and 37.



Some PGM-FI problems will also make the **S** indicator light come on. After the PGM-FI system, disconnect the BACK UP (RADIO) fuse (7.5A) in the under-hood fuse/relay box for more than 10 seconds to reset the TCM memory.

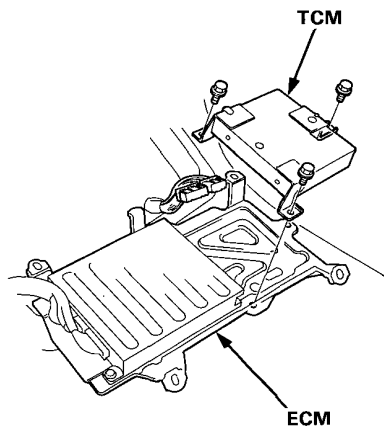
NOTE:

- PGM-FI system
The PGM-FI system on this model is a sequential multiport fuel injection system.
- The **S** indicator light may come on, indicating a system problem, when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair if necessary.
- If the electrical readings are not as specified when using the test harness, check the test harness connection before proceeding.
- Disconnecting the BACK UP (RADIO) fuse (7.5A) also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.



If the inspection for a particular DTC requires the use of the Test Harness (07LAJ-PT30100 or 07LAJ-PT3010A):

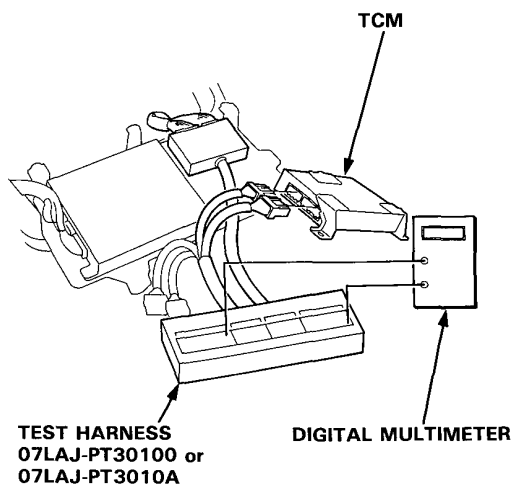
1. Pull the carpet back to expose the ECM and TCM cover.
2. Remove four nuts securing the ECM and TCM cover then turn them over.
3. Remove the TCM from the cover.



4. Connect the wire harness to the Test Harness, and/or connect the Test Harness to the TCM according to the troubleshooting flowchart.

NOTE:

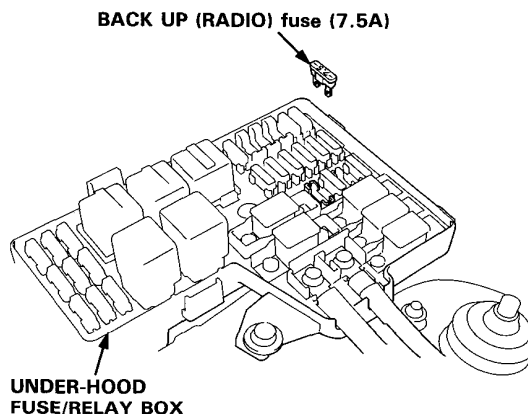
- Only the A and D terminals of the Test Harness are used for A/T troubleshooting.
- Unless otherwise notes, use only the Digital Multimeter for testing.



TCM Reset Procedure

1. Turn the ignition switch off.
2. Remove the BACK UP (RADIO) fuse (7.5A) from the under-hood fuse/relay box for 10 seconds to reset the TCM.

NOTE: Disconnecting the BACK UP (RADIO) fuse (7.5A) also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.





Final Procedure

NOTE: This procedure must be done after any troubleshooting.

1. Remove the jumper wire from the Service Check Connector.
2. Reset the TCM.
3. Set the radio preset stations and clock setting.

Symptom-to-Component Chart

Electrical System

Number of  indicator light blinks while Service Check Connector is jumped.	 indicator light	Possible Cause	Symptom	Refer to page
1	Blinks	<ul style="list-style-type: none"> • Disconnected lock-up control solenoid valve A connector • Short or open in lock-up control solenoid valve A wire • Faulty lock-up control solenoid valve A 	<ul style="list-style-type: none"> • Lock-up clutch does not engage. • Lock-up clutch does not disengage. • Unstable idle speed. 	14-38
2	Blinks	<ul style="list-style-type: none"> • Disconnected lock-up control solenoid valve B connector • Short or open in lock-up control solenoid valve B wire • Faulty lock-up control solenoid valve B 	<ul style="list-style-type: none"> • Lock-up clutch does not engage. 	14-40
3	Blinks or OFF	<ul style="list-style-type: none"> • Disconnected throttle position (TP) sensor connector • Short or open in TP sensor wire • Faulty TP sensor 	<ul style="list-style-type: none"> • Lock-up clutch does not engage. 	14-42
4	Blinks	<ul style="list-style-type: none"> • Disconnected vehicle speed sensor (VSS) connector • Short or open in VSS wire • Faulty VSS 	<ul style="list-style-type: none"> • Lock-up clutch does not engage. 	14-43
5	Blinks	<ul style="list-style-type: none"> • Short in A/T gear position switch wire • Faulty A/T gear position switch 	<ul style="list-style-type: none"> • Fails to shift other than 2nd↔4th gears. • Lock-up clutch does not engage. 	14-44
6	OFF	<ul style="list-style-type: none"> • Disconnected A/T gear position switch connector • Open in A/T gear position switch wire • Faulty A/T gear position switch 	<ul style="list-style-type: none"> • Fails to shift other than 2nd↔4th gears. • Lock-up clutch does not engage. • Lock-up clutch engages and disengages alternately. 	14-46
✓ 7	Blinks	<ul style="list-style-type: none"> • Disconnected shift control solenoid valve A connector • Short or open in shift control solenoid valve A wire ✓ Faulty shift control solenoid valve A 	<ul style="list-style-type: none"> • Fails to shift (between 1st↔4th, 2nd↔4th or 2nd↔3rd gears only). • Fails to shift (stuck in 4th gear) 	14-48
8	Blinks	<ul style="list-style-type: none"> • Disconnected shift control solenoid valve B connector • Short or open in shift control solenoid valve B wire • Faulty shift control solenoid valve B 	<ul style="list-style-type: none"> • Fails to shift (stuck in 1st or 4th gears). 	14-50
9	Blinks	<ul style="list-style-type: none"> • Disconnected countershaft speed sensor connector • Short or open in the countershaft speed sensor wire • Faulty countershaft speed sensor 	<ul style="list-style-type: none"> • Lock-up clutch does not engage. 	14-52



Number of [S] indicator light blinks while Service Check Connector is jumped.	[S] indicator light	Possible Cause	Symptom	Refer to page
10	Blinks	<ul style="list-style-type: none"> • Disconnected engine coolant temperature (ECT) sensor connector • Short or open in ECT sensor wire • Faulty ECT sensor 	• Lock-up clutch does not engage.	14-54
11	OFF	<ul style="list-style-type: none"> • Disconnected ignition coil connector • Short or open in ignition coil wire • Faulty ignition coil 	• Lock-up clutch does not engage.	14-55
14	OFF	<ul style="list-style-type: none"> • Short or open in FAS (BRN/WHT) wire between the D16 terminal and ECM • Trouble in ECM 	• Transmission jerks hard when shifting.	14-56
15	OFF	<ul style="list-style-type: none"> • Disconnected mainshaft speed sensor connector • Short or open in mainshaft speed sensor wire • Faulty mainshaft speed sensor 	• Transmission jerks hard when shifting.	14-58

If the self-diagnosis **[S]** indicator light does not blink, perform an inspection according to the table below.

Symptom	Probable Cause	Ref. page
[S] indicator light does not come on for 2 seconds after ignition is first turned on.	_____	14-60
[S] indicator light is on steady, not blinking whenever the ignition is on.	_____	14-63
Lock-up clutch does not have duty operation (ON ↔ OFF).	Check A/C signal with A/C on.	14-65
Lock-up clutch does not engage.		
Shift lever cannot be moved from [P] position with the brake pedal depressed.	Check brake switch signal.	14-66

- If a customer describes the symptoms for codes 3, 6, or 11, yet the **[S]** indicator light is not blinking, it will be necessary to recreate the symptom by test driving, and then checking the **[S]** indicator light with the ignition still ON.
- If the **[S]** indicator light displays codes other than those listed above or stays lit continuously, the TCM is faulty.
- Sometimes the **[S]** indicator light and the Malfunction Indicator Lamp (MIL) may come on simultaneously. If so, check the PGM-FI system according to the number of blinks on the MIL, then reset the memory by removing the BACK UP (RADIO) fuse (7.5A) in the under-hood fuse/relay box for more than 10 seconds. Drive the vehicle for several minutes at speed over 30 mph (50 km/h), then recheck the MIL.

NOTE:

- PGM-FI system
The PGM-FI system on this model is a sequential multiport fuel injection system.
- The **[S]** indicator light may come on, indicating a system problem, when, in fact, there is a poor or intermittent electrical connection. First, check the electrical connections, clean or repair if necessary.
- If the electrical readings are not as specified when using the test harness, check the test harness connections before proceeding.
- Disconnecting the BACK UP (RADIO) fuse (7.5A) also cancels the radio preset stations and the clock setting. Make note of the radio presets before removing the fuse so you can reset them.

Electrical Troubleshooting

Troubleshooting Flowchart

Self-diagnosis **S** indicator light blinks once.

Disconnect the 26P connector from the TCM.

Turn the ignition switch ON.

Measure the voltage between the A6 (YEL) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

Is there voltage?

NO

Turn the ignition switch OFF.

Measure the resistance between the A6 (YEL) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

Is the resistance 14–16 Ω ?
(at 25°C, 77°F)

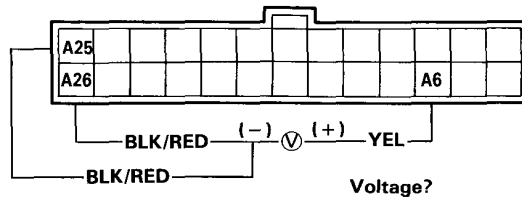
NO

To page 14-39

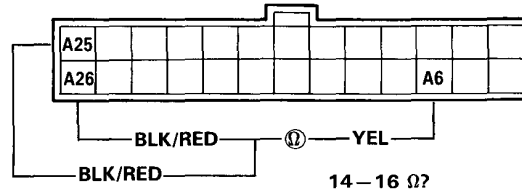
Possible Cause

- Disconnected lock-up control solenoid valve A connector
- Short or open in lock-up control solenoid valve A wire
- Faulty lock-up control solenoid valve A

View from terminal side.



YES
Repair short to power source in YEL wire between the A6 terminal and the lock-up control solenoid valve A.



YES
Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.

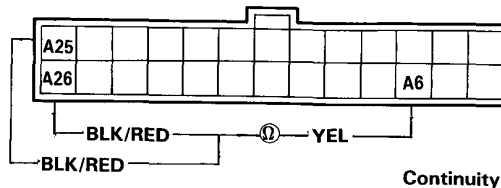


From page 14-38

Disconnect the 2P connector from the lock-up control solenoid valve assembly.

Check for continuity between the A6 (YEL) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

View from terminal side.



Is there continuity?

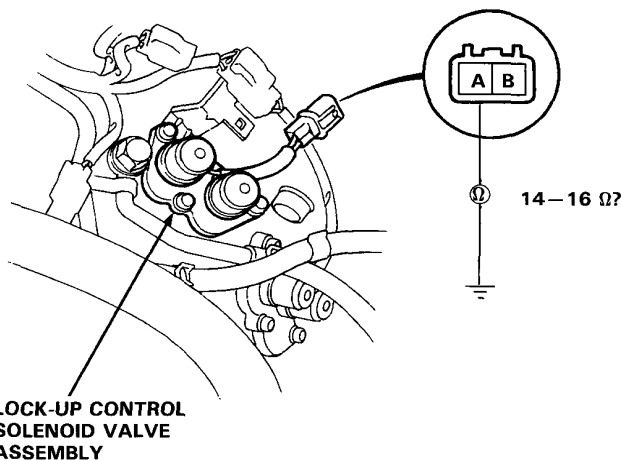
YES

Repair short to ground in YEL wire between the A6 terminal and the lock-up control solenoid valve A.

NO

Measure the resistance of the solenoid at the 2P connector.

View from terminal side.



Is the resistance 14-16 Ω ? (at 25°C, 77°F)

YES

Check for open in YEL wire between the A6 terminal and the lock-up control solenoid valve A.

NO

Replace the lock-up control solenoid valve assembly.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks twice.

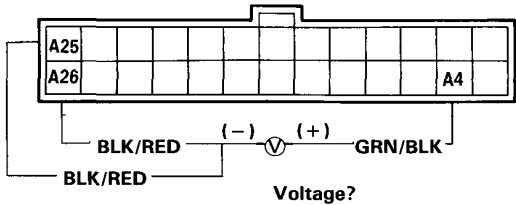
Disconnect the 26P connector from the TCM.

Turn the ignition switch ON.

Measure the voltage between the A4 (GRN/BLK) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

- Possible Cause**
- Disconnected lock-up control solenoid valve B connector
 - Short or open in lock-up control solenoid valve B wire
 - Faulty lock-up control solenoid valve B

View from terminal side.



Is there voltage?

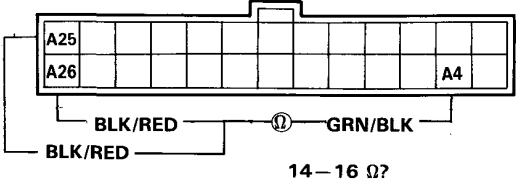
YES

Repair short to power source in GRN/BLK wire between the A4 terminal and the lock-up control solenoid valve B.

NO

Turn the ignition switch OFF.

Measure the resistance between the A4 (GRN/BLK) and A25 (BLK/RED) or A26 (BLK/RED) terminals.



Is the resistance 14–16 Ω? (at 25°C, 77°F)

YES

Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.

NO

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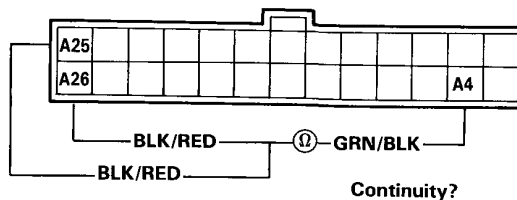


From page 14-40

Disconnect the 2P connector from the lock-up control solenoid valve assembly.

Check for continuity between the A4 (GRN/BLK) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

View from terminal side.



Is there continuity?

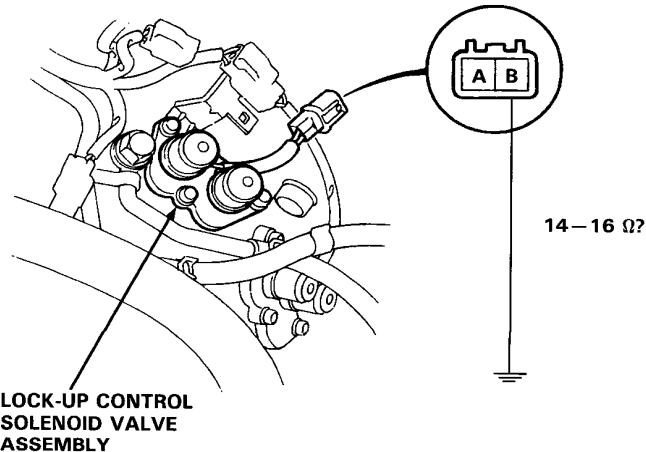
YES

Repair short to ground in GRN/BLK wire between the A4 terminal and the lock-up control solenoid valve B.

NO

Measure the resistance of the solenoid at the 2P connector.

View from terminal side.



Is the resistance 14–16 Ω ? (at 25°C, 77°F)

YES

Check for open in GRN/BLK wire between the A4 terminal and the lock-up control solenoid valve B.

NO

Replace the lock-up control solenoid valve assembly.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks three times.

Possible Cause
• Disconnected throttle position (TP) sensor connector
• Short or open in TP sensor wire
• Faulty TP sensor

Turn the ignition switch ON.

Check whether the Malfunction Indicator Lamp (MIL) blinks (see section 11).

Is the MIL blinking?

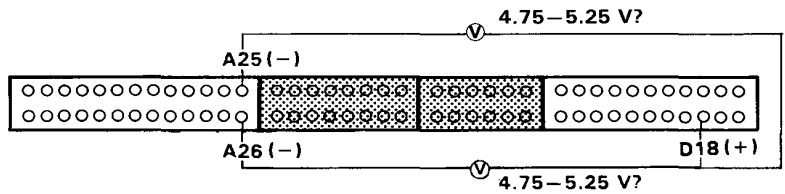
Repair the PGM-FI System (see section 11).

Turn the ignition switch OFF.

Disconnect the 26P and 22P connectors from the TCM. Connect the Test Harness "A" and "D" connectors to the wire harness only, not to the TCM (see page 14-35).

Turn the ignition switch ON.

Measure the voltage between the D18 and A25 or A26 terminals.



Is the voltage 4.75-5.25 V?

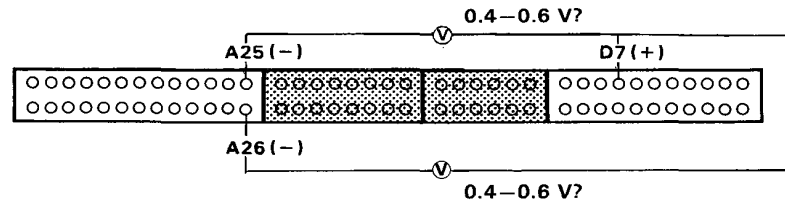
Repair open or short in LT GRN/BLK wire between the D 18 terminal and the ECM.

Turn the ignition switch OFF.

Connect the Test Harness "A" and "D" connectors to the TCM.

Turn the ignition switch ON.

Measure the voltage between the D7 and A25 or A26 terminals.



Is the voltage 0.4-0.6 V?

Repair open or short in RED/BLK wire between the D7 terminal and the TP sensor.

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.



Self-diagnosis **S** indicator light blinks four times.

- | Possible Cause |
|---|
| • Disconnected vehicle speed sensor (VSS) connector |
| • Short or open in VSS wire |
| • Faulty VSS |

Does the speedometer operate?

NO

Refer to Section 23 for vehicle speed sensor (VSS) test.

YES

Raise the car.

Shift transmission to **N** position.

Disconnect the 26P and 22P connectors from the TCM. Connect the Test Harness "A" and "D" connectors to the wire harness only, not to the TCM (see page 14-35).

Turn the ignition switch ON.

Rotate the front wheel and check for voltage between the D9 and A25 or A26 terminals. Block the other wheel so it does not turn.

Does the voltage 0 V and more than 5 V appear alternately?

NO

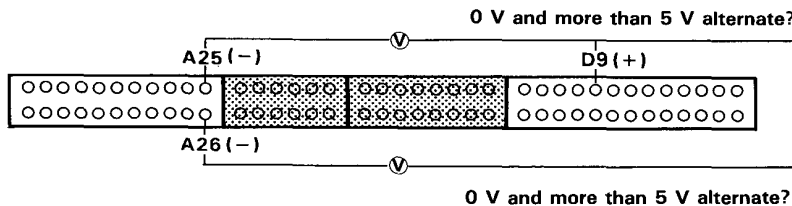
Check for short or open in ORN wire between the D9 terminal and the VSS. If wire is OK, check the VSS (see section 23).

YES

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

▲ WARNING

- Make sure lifts, jacks, and safety stands are placed properly (see section 1).
- Set the parking brake securely and block the rear wheels.
- Jack up the front of the car and support with safety stands.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks five times.

Turn the ignition switch ON.

Observe the A/T gear position indicator, and select each position separately.

YES

Do any indicators fail to light when shifted through all positions?

See A/T gear position indicator inspection (see section 23).

NO

Turn the ignition switch OFF.

Connect the Test Harness between the TCM and connectors (see page 14-35).

Turn the ignition switch ON.

Shift to other than **R** position.

Measure the voltage between the A21 and A25 or A26 terminals.

NO

Is there battery voltage?

Check for short in GRN/RED wire between the A21 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

YES

Shift to other than **N** and **P** position.

Measure the voltage between the A19 and A25 or A26 terminals.

NO

Is there battery voltage?

Check for short in LT GRN wire between the A19 terminal and the A/T gear position indicator or a short in GRN/WHT or GRN wires between the A/T gear position indicator and the A/T gear position switch. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

YES

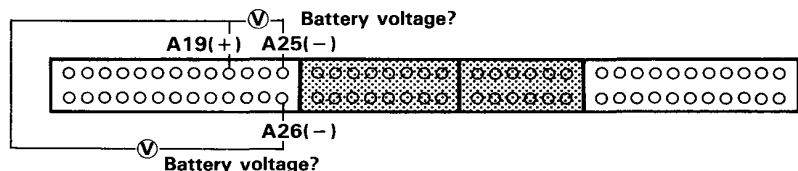
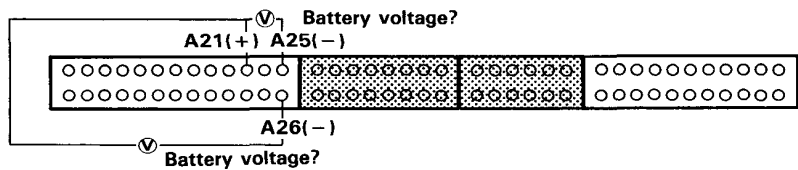
To page 14-45

Possible Cause

- Short in A/T gear position switch wire
- Faulty A/T gear position switch

NOTE:

Code 5 is caused when the TCM receives two gear position inputs at the same time.

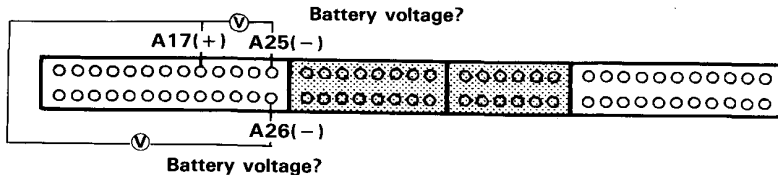




From page 14-44

Shift to other than **D4** position.

Measure the voltage between the A17 and A25 or A26 terminals.

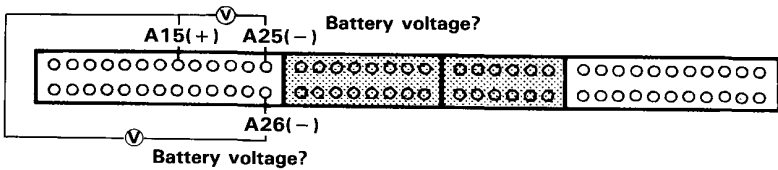


Is there battery voltage? YES

Check for short in GRN/BLK wire between the A17 terminal and the A/T gear position switch. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Shift to other than **D3** position.

Measure the voltage between the A15 and A25 or A26 terminals.

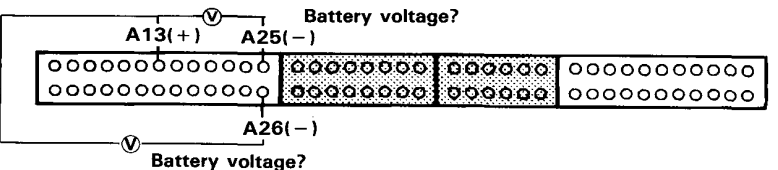


Is there battery voltage? YES

Check for short in GRN/BLU wire between the A15 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Shift to other than **2** position.

Measure the voltage between the A13 and A25 or A26 terminals.

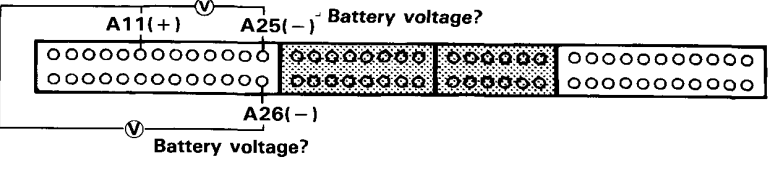


Is there battery voltage? YES

Check for short in GRN/YEL wire between the A13 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Shift to other than **1** position.

Measure the voltage between the A11 and A25 or A26 terminals.



Is there battery voltage? YES

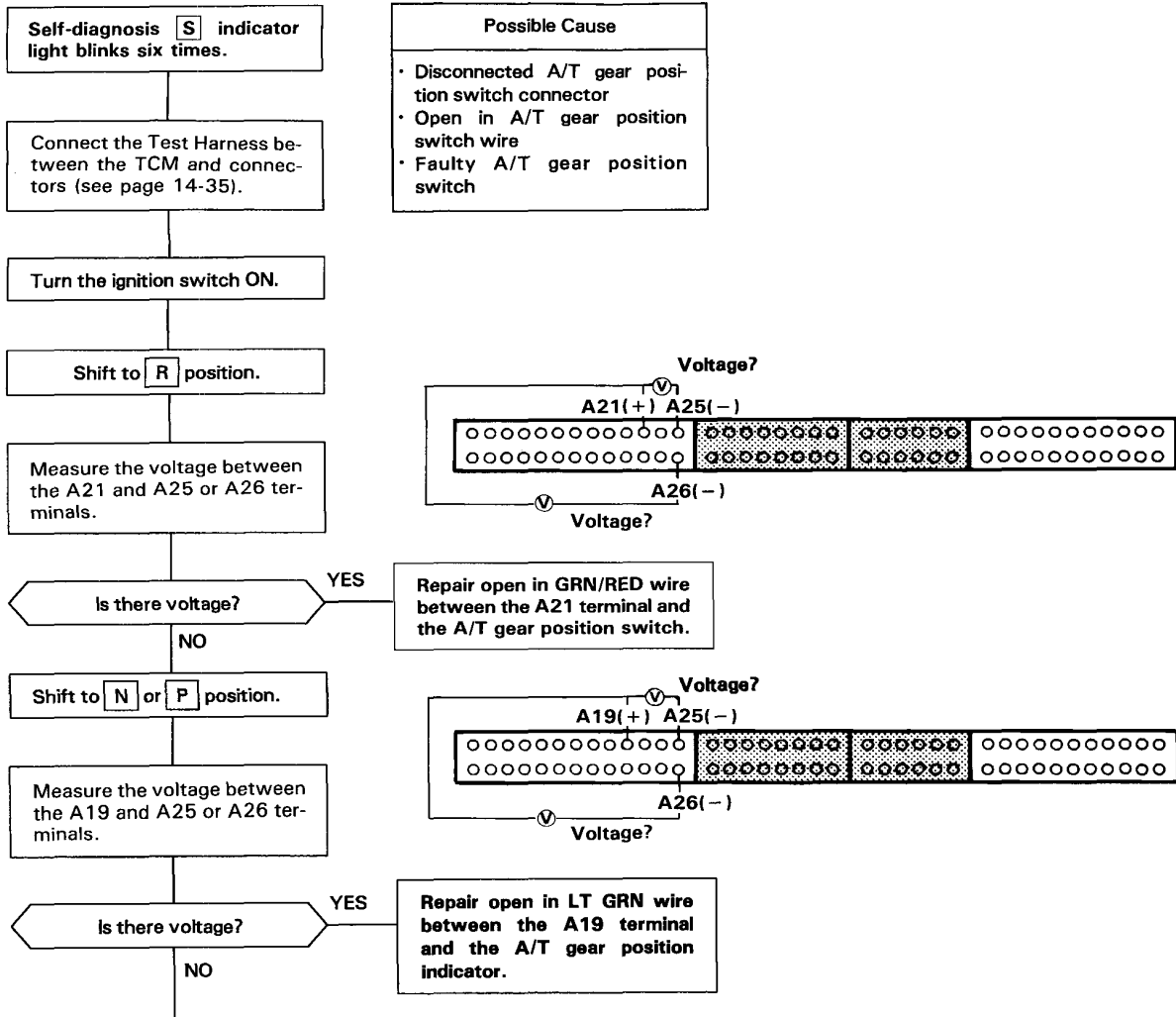
Check for short in LT GRN/WHT wire between the A11 terminal and the A/T gear position switch or A/T gear position indicator. If wire is OK, check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)



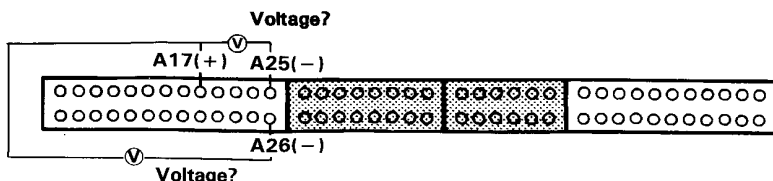
To page 14-47



From page 14-46

Shift to **D4** position.

Measure the voltage between the A17 and A25 or A26 terminals.



Is there voltage?

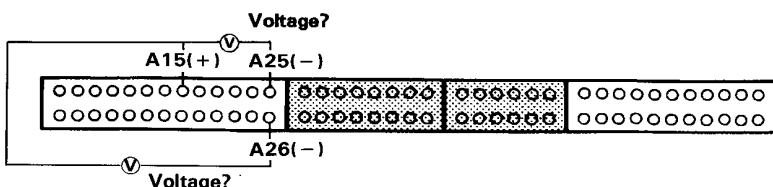
YES

Repair open in GRN/BLK wire between the A17 terminal and the A/T gear position switch.

NO

Shift to **D3** position.

Measure the voltage between the A15 and A25 or A26 terminals.



Is there voltage?

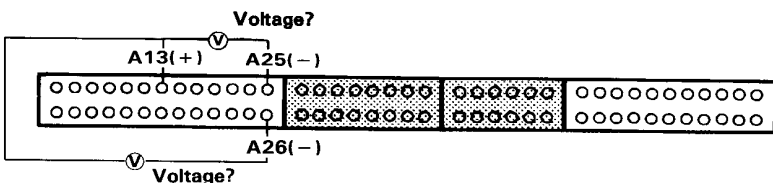
YES

Repair open in GRN/BLU wire between the A15 terminal and the A/T gear position switch.

NO

Shift to **2** position.

Measure the voltage between the A13 and A25 or A26 terminals.



Is there voltage?

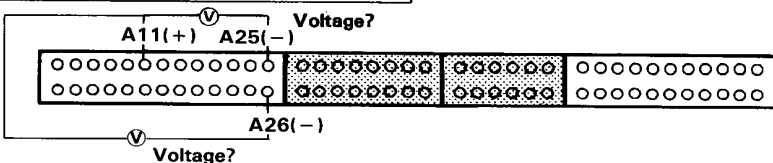
YES

Repair open in GRN/YEL wire between the A13 terminal and the A/T gear position switch.

NO

Shift to **1** position.

Measure the voltage between the A11 and A25 or A26 terminals.



Is there voltage?

YES

Repair open in LT GRN/WHT wire between the A11 terminal and the A/T gear position switch.

NO

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks seven times.

Disconnect the 26P connector from the TCM.

Turn the ignition switch ON.

Measure the voltage between the A5 (BLU/YEL) and A 25 (BLK/RED) or A26 (BLK/RED) terminals.

Is there voltage?

YES

Repair short to power source in BLU/YEL wire between the A5 terminal and the shift control solenoid valve A.

NO

Turn the ignition switch OFF.

Measure the resistance between the A5 (BLU/YEL) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

Is the resistance 14–16 Ω?
(at 25°C, 77°F)

YES

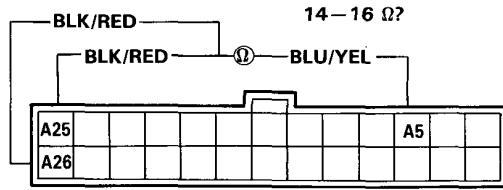
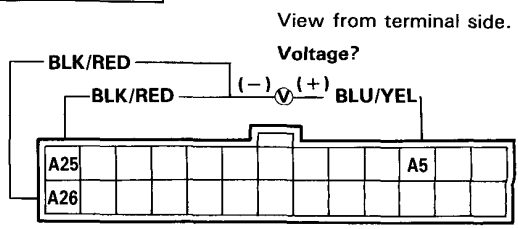
Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.

NO

To page 14-49

Possible Cause

- Disconnected shift control solenoid valve A connector
- Short or open in shift control solenoid valve A wire
- Faulty shift control solenoid valve A

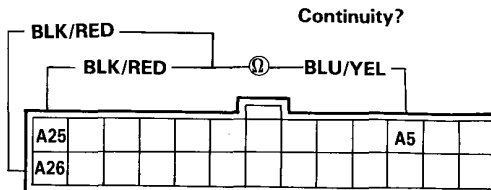




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Disconnect the 3P connector from the shift control solenoid valve assembly.

Check for continuity between the A5 (BLU/YEL) and A25 (BLK/RED) or A26 (BLK/RED) terminals.



View from terminal side.

Is there continuity?

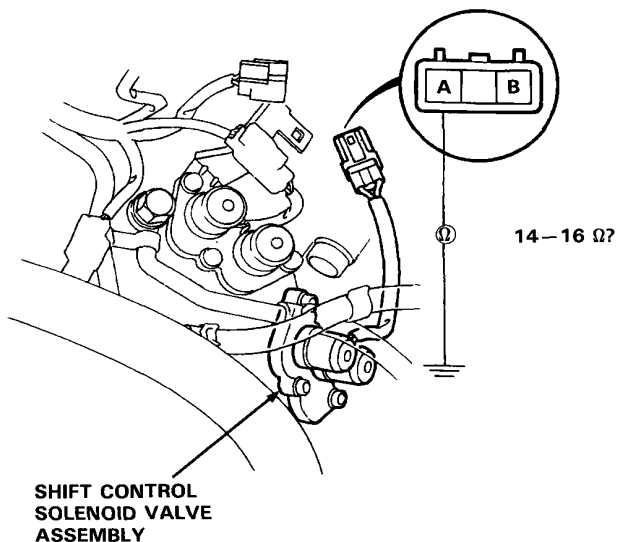
YES

Repair short to ground in BLU/YEL wire between the A5 terminal and the shift control solenoid valve A.

NO

Measure the resistance of the solenoid at the 3P connector.

View from terminal side.



Is the resistance 14-16 Ω ? (at 25°C, 77°F)

YES

Check for open in BLU/YEL wire between the A5 terminal and the shift control solenoid valve A.

NO

Replace the shift control solenoid valve assembly.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks eight times.

Disconnect the 26P connector from the TCM.

Turn the ignition switch ON.

Measure the voltage between the A3 (GRN/WHT) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

Is there voltage?

NO

Turn the ignition switch OFF.

Measure the resistance between the A3 (GRN/WHT) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

Is the resistance 14–16 Ω (at 25°C, 77°F)

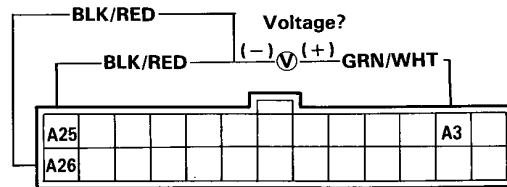
NO

To page 14-51

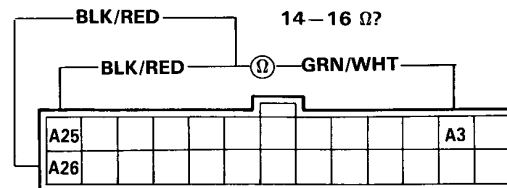
Possible Cause

- Disconnected shift control solenoid valve B connector
- Short or open in shift control solenoid valve B wire
- Faulty shift control solenoid valve B

View from terminal side.



Repair short to power source in GRN/WHT wire between the A3 terminal and shift control solenoid valve B.



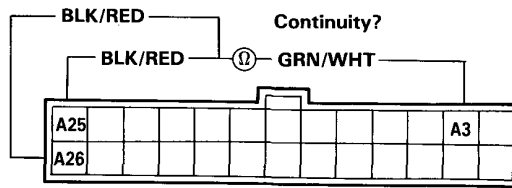
Check for loose TCM connectors. If necessary, substitute a known-good solenoid valve assembly or TCM and recheck.



From page 14-50

Disconnect the 3P connector from the shift control solenoid valve assembly.

Check for continuity between the A3 (GRN/WHT) and A25 (BLK/RED) or A26 (BLK/RED) terminals.



View from terminal side.

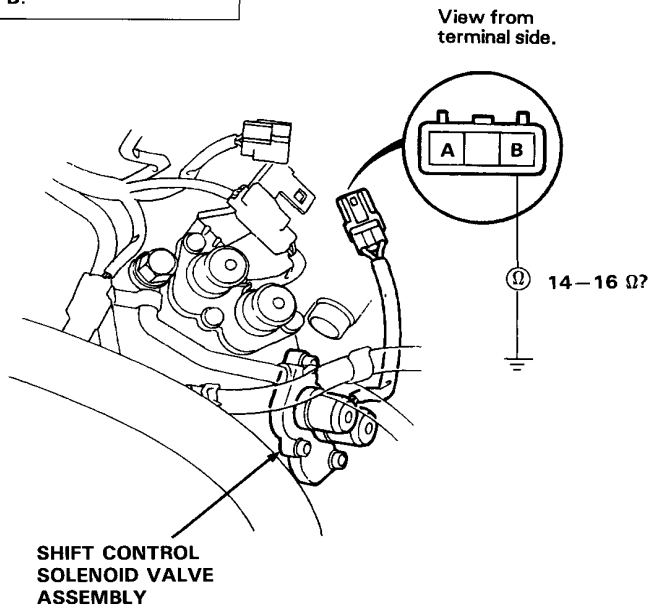
Is there continuity?

YES

Repair short to ground in GRN/WHT wire between the A3 terminal and the shift control solenoid valve B.

NO

Measure the resistance of the solenoid at the 3P connector.



SHIFT CONTROL SOLENOID VALVE ASSEMBLY

Is the resistance 14-16 Ω? (at 25°C, 77°F)

YES

Check for open in GRN/WHT wire between the A3 terminal and the shift control solenoid valve B.

NO

Replace the shift control solenoid valve assembly.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks nine times.

Possible Cause

- Loose or faulty connection between the TCM and car harness.
- Disconnected countershaft speed sensor connector
- Short or open in the countershaft speed sensor wire
- Faulty countershaft speed sensor

Is the countershaft speed sensor installed properly?

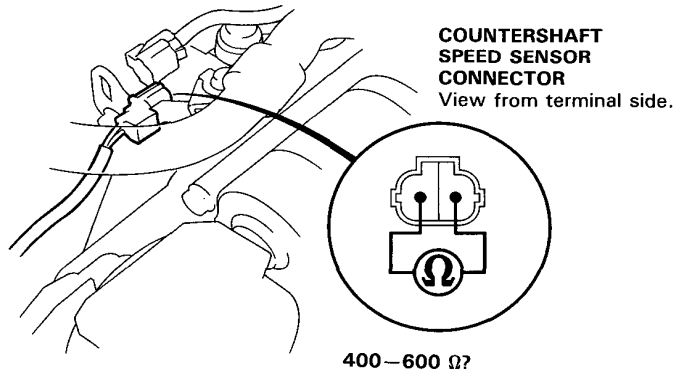
NO

Reinstall and recheck.

YES

Disconnect the 2P connector from the countershaft speed sensor connector.

Measure the resistance of the countershaft speed sensor.



Is the resistance 400-600 Ω (at 20°C, 70°F)?

NO

Replace the countershaft speed sensor.

YES

To page 14-53



From page 14-52

Disconnect the 22P connector from the TCM. Connect the Test Harness "D" connector to the wire harness only, not to the TCM (see page 14-35).

Check for continuity between body ground and D17 terminal and D15 terminal individually.

Is there continuity?

YES

Repair short in BLU/GRN or BLU/YEL wire between D17 and D15 terminals and the countershaft speed sensor.

NO

Reconnect the countershaft speed sensor connector.

Measure the resistance between D17 and D15 terminals.

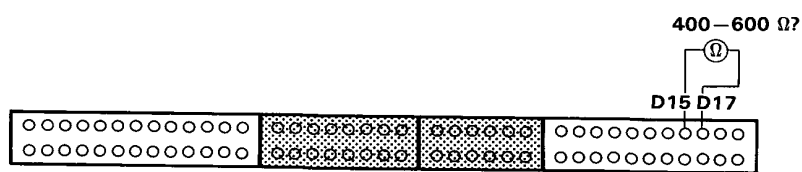
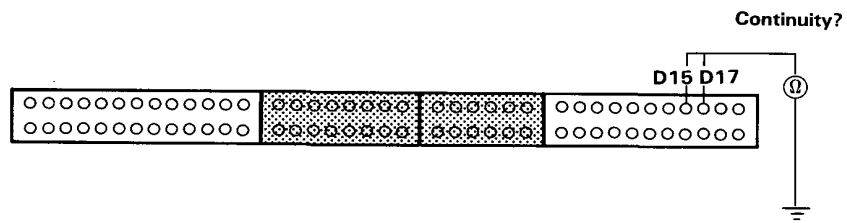
Is the resistance 400–600 Ω (at 20°C, 70°F)?

NO

Repair loose terminal or open in BLU/GRN or BLU/YEL wire between D17 and D15 terminals and the countershaft speed sensor.

YES

Check for loose TCM connector. If necessary, substitute a known-good TCM and recheck.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks ten times.

Turn the ignition switch ON.

Check whether the Malfunction Indicator Lamp (MIL) blinks (see section 11).

Is the MIL blinking?
 YES
 NO

- Possible Cause
- Disconnected engine coolant temperature (ECT) sensor connector
 - Short or open in the ECT sensor wire
 - Faulty ECT sensor

Repair the PGM-FI System (see section 11).

Turn the ignition switch OFF.

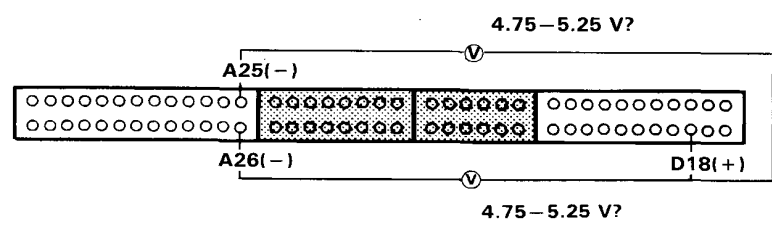
Disconnect the 26P and 22P connectors from the TCM. Connect the Test Harness "A" and "D" connectors to the wire harness only, not to the TCM (see page 14-35).

Turn the ignition switch ON.

Measure the voltage between the D18 and A25 or A26 terminals.

Is the voltage 4.75–5.25 V?
 YES
 NO

Repair open or short in LT GRN/BLK wire between the D18 terminal and the ECM.



Turn the ignition switch OFF.

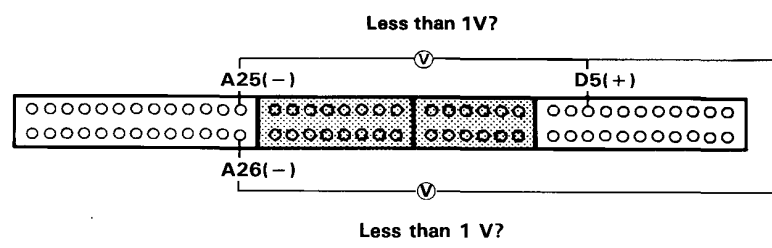
Connect the Test Harness "A" and "D" connectors to the TCM.

Start the engine and warm it up to normal operating temperature (the radiator fan comes on).

Measure the voltage between the D5 and A25 or A26 terminals.

Is the voltage less than 1V?
 YES
 NO

Repair open or short in YEL/GRN wire between the D5 terminal and the ECT sensor.



Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.



Self-diagnosis **S** indicator light blinks eleven times.

Disconnect the 26P connector from the TCM.

Turn the ignition switch ON.

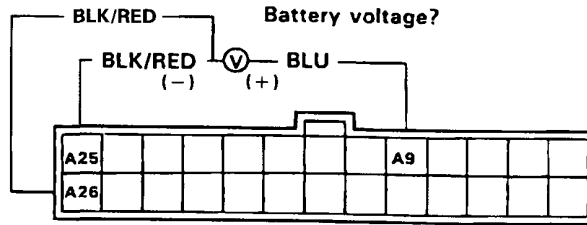
Measure the voltage between the A9 (BLU) and A25 (BLK/RED) or A26 (BLK/RED) terminals.

Is there battery voltage?

YES

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

- Possible Cause**
- Disconnected ignition coil connector
 - Short or open in ignition coil wire
 - Faulty ignition coil



NOTE: View from terminal side.

NO

Repair open or short in BLU wire between the A9 terminal and the ignition coil.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks fourteen times.

Possible Cause
• Short or open in FAS (BRN/WHT) wire
• Trouble in ECM

▲ WARNING

- Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (see section 1).
- While testing, be careful of the rotating front wheels.

Is the Malfunction Indicator Lamp (MIL) on? **YES**

Repair the PGM-FI System (see section 11).

NO

Start the engine and warm it up to normal operating temperature (the radiator fan comes on).

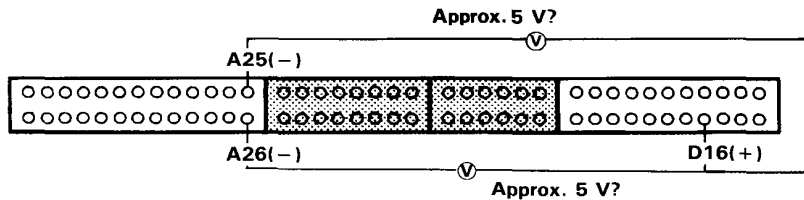
Shift to **P** position.

Turn the ignition switch OFF.

Connect the Test Harness between the TCM and connectors (see page 14-35).

Turn the ignition switch ON and wait for at least two seconds.

Measure the voltage between the D16 (+) and A25 or A26 (-) terminals.



Is there approx. 5V? **YES**

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

NO

Turn the ignition switch OFF.

Disconnect the Test Harness from the TCM. Leave connected to car harness.

Turn the ignition switch ON.

To page 14-57



From page 14-56

Measure the voltage between the D16 (+) and A25 or A26 (-) terminals.

Is there approx. 5 V?

YES

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

NO

Disconnect the 26P connector from the ECM.

Check for continuity between the D16 and A25 or A26 terminals of the Test Harness.

Is there continuity?

YES

Repair short in BRN/WHT (FAS) wire between TCM and ECM.

NO

Disconnect the 26P connector of the TCM from the Test Harness.

Connect the 26P connector of the ECM to the Test Harness.

Check for continuity between the D16 and A18 terminals of the Test Harness.

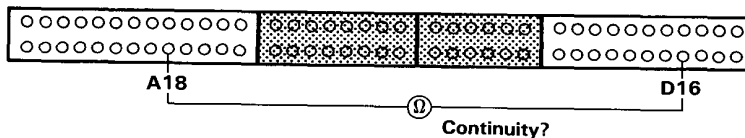
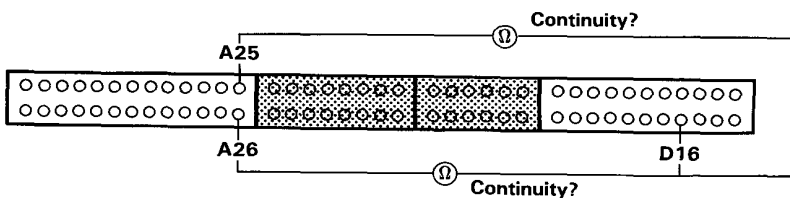
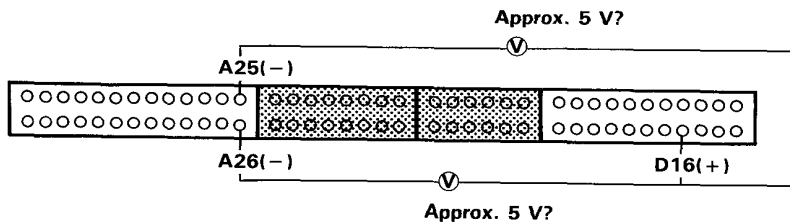
Is there continuity?

YES

Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

NO

Repair short in BRN/WHT (FAS) wire between TCM and ECM.



(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Self-diagnosis **S** indicator light blinks fifteen times.

Possible Cause

- Disconnected mainshaft speed sensor connector
- Short or open in mainshaft speed sensor wire
- Faulty mainshaft speed sensor

NOTE:

A code 15 on the TCM doesn't always mean there's an electrical problem in the mainshaft or countershaft speed sensor circuit; code 15 may also indicate a mechanical problem in the transmission.

Are the mainshaft and countershaft speed sensors installed properly?

NO

Reinstall and recheck.

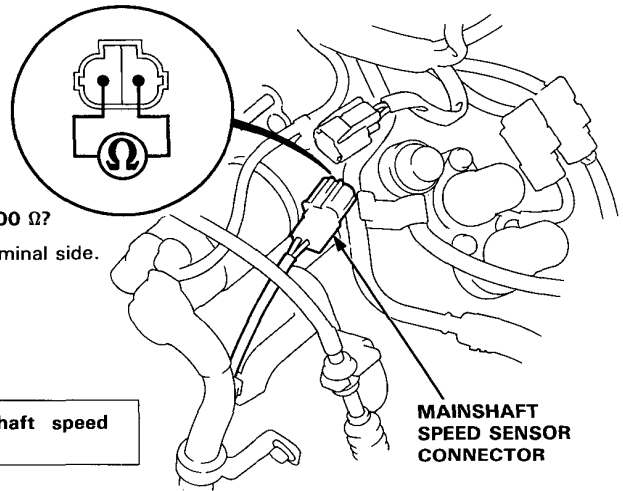
YES

Disconnect the 2P connector from the mainshaft speed sensor.

Measure the resistance of the mainshaft speed sensor.

400–600 Ω

View from terminal side.



Is the resistance 400–600 Ω? (at 20°C, 70°F)

NO

Replace the mainshaft speed sensor.

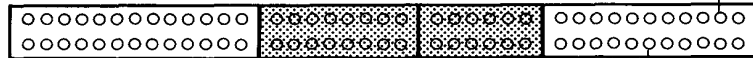
YES

Disconnect the 22P connector from the TCM. Connect the Test Harness "D" connector to the wire harness only, not to the TCM (see page 14-35).

Check the continuity between D19 and D12 terminals and body ground.

Continuity?

D19



D12

Continuity?

Is there continuity?

YES

Repair short in ORN/BLU or WHT/BLU wires between D19 and D12 terminals and the mainshaft speed sensor.

NO

Reconnect the 2P connector to the mainshaft speed sensor.

To page 14-59



From page 14-58

Measure the resistance between D19 and D12 terminals.

Is the resistance 400–600 Ω?
(at 20°C, 70°F)

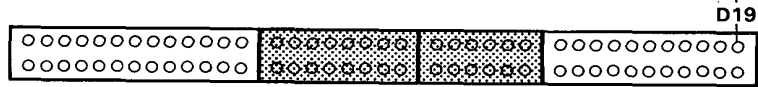
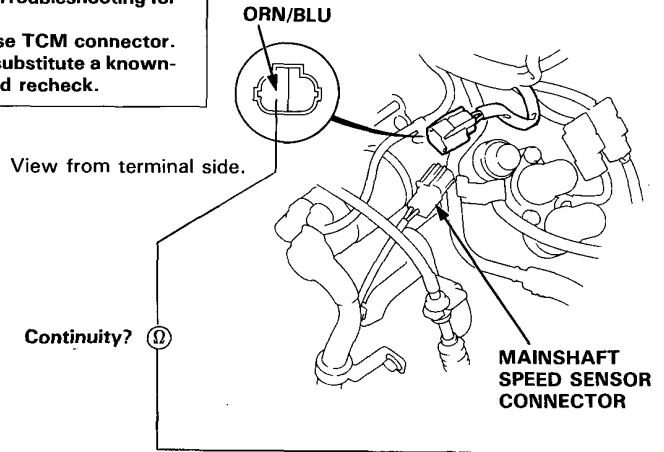
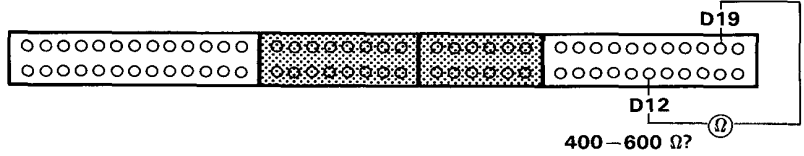
YES

Run Electrical Troubleshooting for code 9.
Check for loose TCM connector.
If necessary, substitute a known-good TCM and recheck.

NO

Disconnect the 2P connector from the mainshaft speed sensor.

Check for continuity between D19 terminal and the mainshaft speed sensor connector.



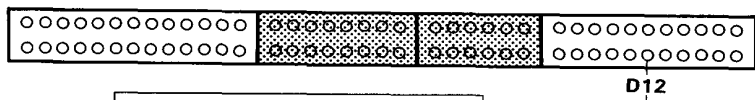
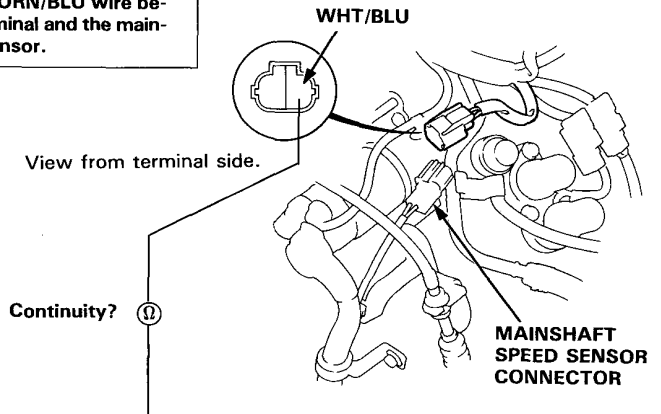
Is there continuity?

NO

Repair open in ORN/BLU wire between D19 terminal and the mainshaft speed sensor.

YES

Check for continuity between D12 terminal and the mainshaft speed sensor connector.



Is there continuity?

NO

Repair open in WHT/BLU wire between D12 terminal and the mainshaft speed sensor.

YES

Check for loose TCM connectors.
If necessary, substitute a known-good TCM and recheck.

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

S indicator light does not come on with the ignition switch ON. (It should come on for about 2 seconds.)

Is the service check connector jumped?

YES
Disconnect the jumper wire and recheck.

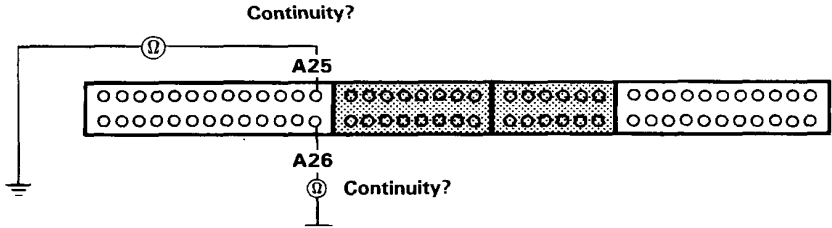
NO
Shift to **D3** or **D4** and depress the **S** switch.

Does the **S** indicator light come on?

YES
Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.

NO
Turn the ignition switch OFF.

Disconnect the 26P and 22P connectors from the TCM. Connect the Test Harness "A" and "D" connectors to the wire harness only, not to the TCM (see page 14-35).



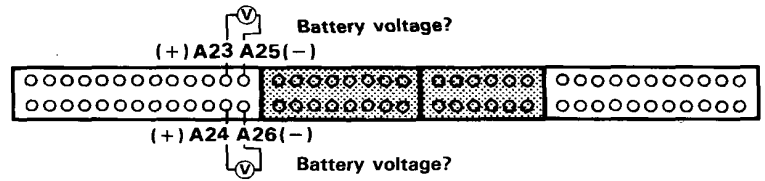
Check for continuity between the A25 terminal and body ground and A26 and body ground.

Is there continuity?

NO
Repair open BLK/RED wire(s) between A25 or A26 terminal and G101.

YES
Turn the ignition switch ON.

Measure the voltage between the A23 or A24 and A25 or A26 terminals.



Is there battery voltage?

NO
Repair open or short in BLK/YEL wire between the A23 and/or A24 terminals and under-dash fuse/relay box.

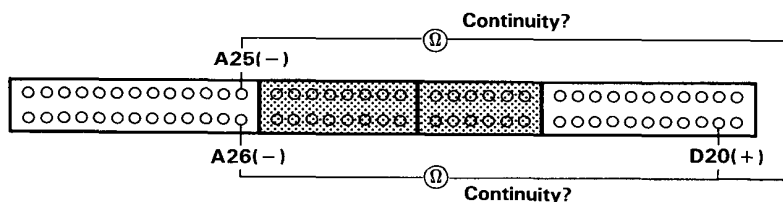
YES
Turn the ignition switch OFF.

To page 14-61



From page 14-60

Check for continuity between the D20 and A25 or A26 terminals.



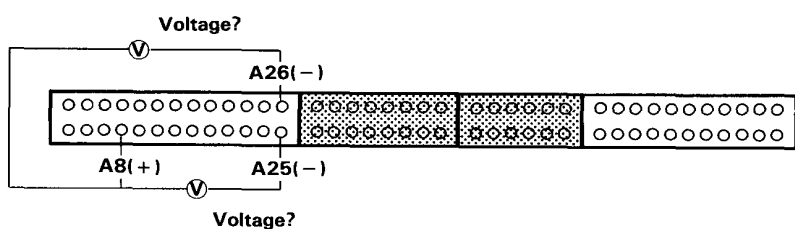
Is there continuity? NO

To page 14-62

YES

Connect the Test Harness "A" and "D" connectors to the TCM.

Turn the ignition switch ON. Be sure that voltage is available for 2 seconds between the A8 terminal and A25 or A26 terminal.



Is there voltage? YES

Check for open or short in GRN wire between the A8 terminal and the gauge assembly.

NO

Turn the ignition switch OFF.

Disconnect the Test Harness "A" connector from the TCM.

Check for continuity between the A8 terminal and the GRN wire at the gauge assembly (see section 23).

Is there continuity? NO

Repair open in GRN wire between the A8 terminal and the gauge assembly.

YES

Check for loose TCM connectors. Check the A/T gear position switch. If necessary, substitute a known-good TCM and recheck.

(cont'd)

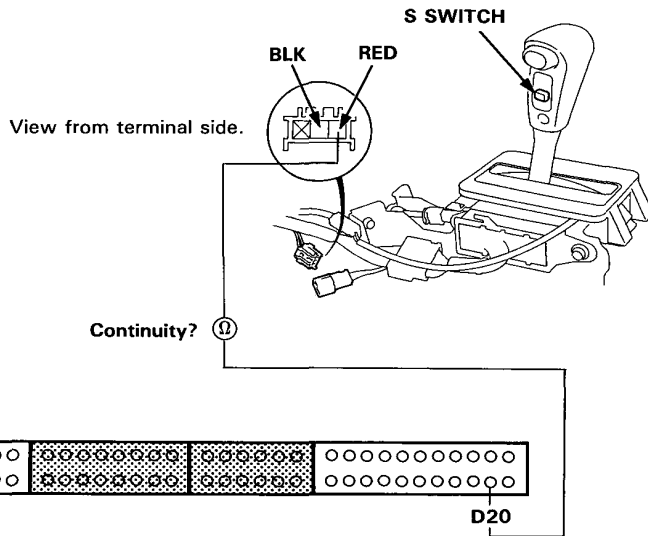
Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

From page 14-61

Disconnect the 2P connector from the S switch.

Check for continuity on the RED wire between D20 terminal and the S switch connector.

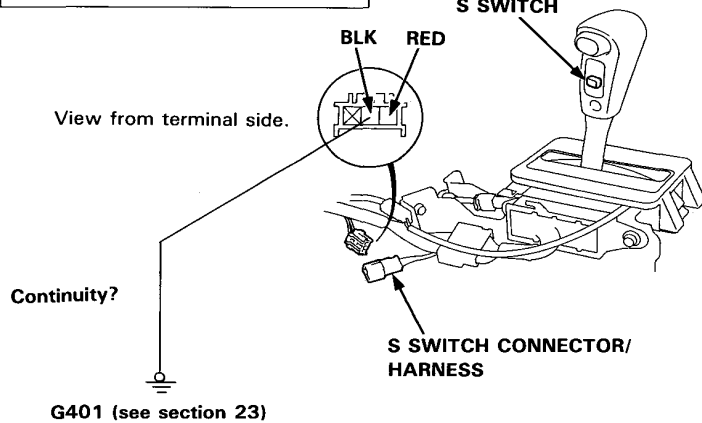


Is there continuity? NO

Repair open in RED wire between D20 terminal and S switch.

YES

Check for continuity on BLK wire between S switch connector and G401 (see section 23).



Is there continuity? YES

Replace the S switch.

NO

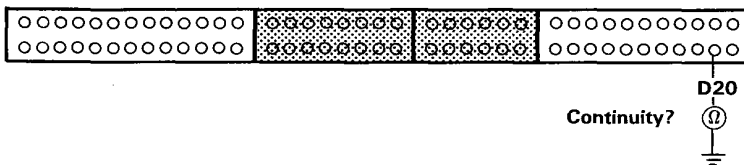
Repair open in BLK wire between S switch and G401.



S indicator light is on steady (not blinking) whenever the ignition switch is ON.

Turn the ignition switch OFF.

Disconnect the 26P and 22P connectors from the TCM. Connect the Test Harness "A" and "D" connectors to the wire harness only, not to the TCM (see page 14-35).



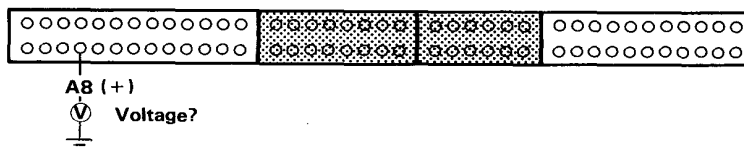
Check for continuity between the D20 terminal and body ground.

Is there continuity? YES

To page 14-64

NO

Turn the ignition switch ON.



Measure the voltage between the A8 terminal and body ground.

Is there voltage? YES

Replace the TCM.

NO

Connect the Test Harness "A" connector to the TCM.

Measure the voltage between the GRN wire at the gauge assembly and to body ground.

Is there voltage? NO

Replace faulty A/T gear position indicator.

YES

Repair short to power source on GRN wire between A8 terminal and gauge assembly.

(cont'd)

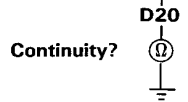
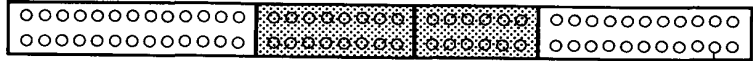
Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

From page 14-63

Disconnect the 3P connector from the S switch.

Check for continuity between the D20 terminal and body ground.



Is there continuity?

YES

Repair short in RED wire between D20 terminal and S switch.

NO

Replace the S switch.



Inspection of the A/C signal.

Start the engine.

Turn the blower switch ON.

Push the A/C switch ON.

Does A/C compressor clutch engage?

NO

See air conditioning inspection (see section 22).

YES

Stop the engine.

Disconnect the 26P connector from the TCM.

Start the engine.

Measure the voltage between the A22 (RED/BLU) and A25 (BLK/RED) or A26 (BLK/RED) terminals. (A/C compressor OFF)

Is there battery voltage?

NO

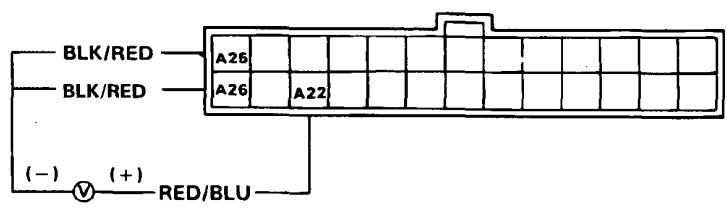
Repair open in RED/BLU wire between the A22 terminal and A/C compressor clutch relay.

YES

• A/C signal is OK.
• Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.
• Inspect the air conditioning (see section 22).

Symptom:
• Lock-up clutch does not have duty operation (ON⇌OFF).
• Lock-up clutch does not engage.

NOTE: View from terminal side.



Battery voltage?

(cont'd)

Electrical Troubleshooting

Troubleshooting Flowchart (cont'd)

Symptom:
Shift lever cannot be moved from **P** position with the brake pedal depressed.

Inspection of the brake switch signal.

Check that the brake lights come on with the brake pedal depressed.

Are brake lights ON?

NO

Repair faulty brake switch circuits.

YES

Disconnect the 26P and 22P connectors from the TCM. Connect the Test Harness "A" and "D" connectors to the wire harness only, not to the TCM (see page 14-35).

Measure the voltage between the D2 and A25 or A26 terminals with the brake pedal depressed.

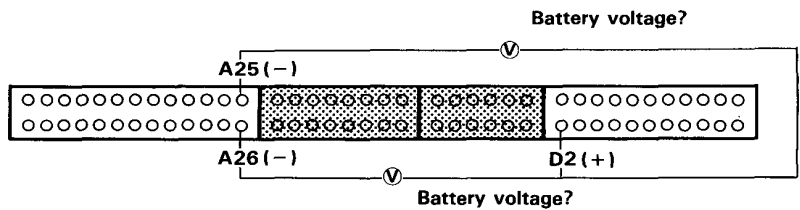
Is there battery voltage?

NO

Repair open in GRN/WHT wire between the D2 terminal and brake switch.

YES

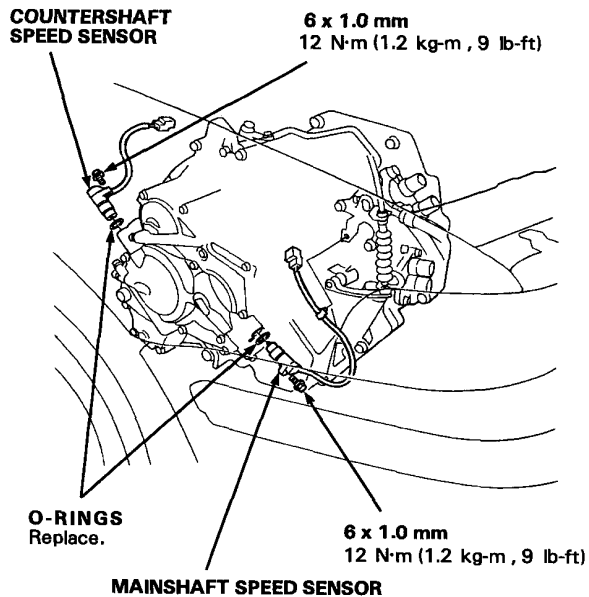
- Brake switch signal is OK.
- Check for loose TCM connectors. If necessary, substitute a known-good TCM and recheck.
- Inspect the brake switch circuit (see section 23).



Mainshaft/Countershaft Speed Sensors

Replacement

1. Remove the 6 mm bolt from the transmission housing and remove the mainshaft and countershaft speed sensors.



2. Replace the O-rings with a new one before reassembling the mainshaft and countershaft speed sensors.

S Switch

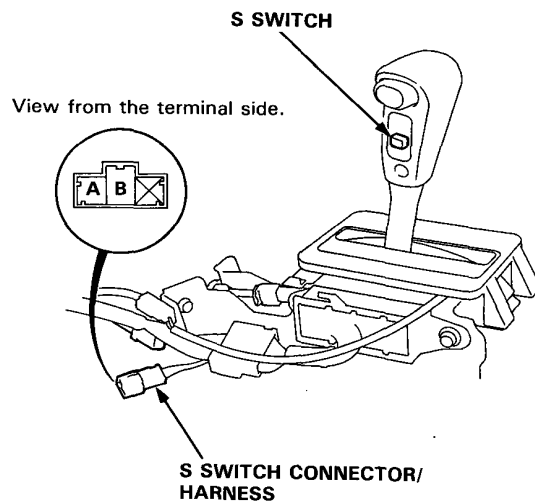


Test/Replacement

Test

1. Remove the front console (see section 20).
2. Disconnect the switch connector.
3. Check for continuity between A and B terminals. There should be continuity when the switch is pressed.

LHD is shown; RHD is similar.



Replacement

1. Remove the screws securing the A/T gear position indicator panel.
2. Remove the lock tabs securing the S switch harness, then remove the connector from the harness (see page 14-147).
3. Remove the S switch cover from the select lever, then remove the S switch (see page 14-147).
4. Replace the S switch.

Lock-up Control Solenoid Valve A/B

Test

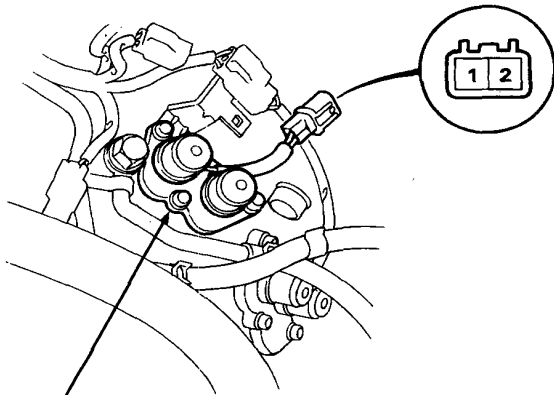
NOTE:

Lock-up control solenoid valves A and B must be removed/replaced as an assembly.

1. Disconnect the connector from the lock-up control solenoid valve A/B.
2. Measure the resistance between the No. 1 terminal (solenoid valve A) of the lock-up control solenoid valve connector and body ground, and between the No. 2 terminal (solenoid valve B) and body ground.

STANDARD: 14–16 Ω (at 25°C, 77°F)

View from terminal side.



LOCK-UP CONTROL SOLENOID VALVE ASSEMBLY

3. Replace the lock-up control solenoid valve 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

1. Remove the mounting bolts and lock-up control solenoid valve assembly.

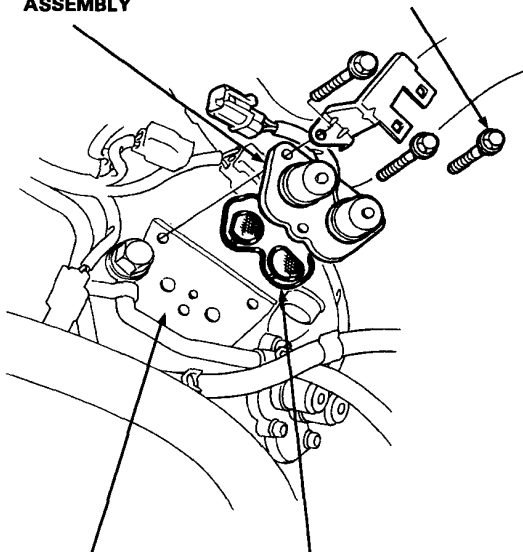
NOTE:

Be sure to remove or replace the lock-up control solenoid valves A and B as an assembly.

2. Check the lock-up control solenoid valve oil passages for dust or dirt, and replace as an assembly, if necessary.

LOCK-UP CONTROL SOLENOID VALVE ASSEMBLY

6 x 1.0 mm
12 N·m (1.2 kg·m, 9 lb-ft)



Clean the mounting surface and oil passages.

FILTER/GASKET
Replace.

3. Clean the mounting surface and oil passages of the lock-up control solenoid valve assembly, and install a new filter/gasket.
4. Check the connector for rust, dirt or oil, and reconnect it securely.

Shift Control Solenoid Valve A/B



Test

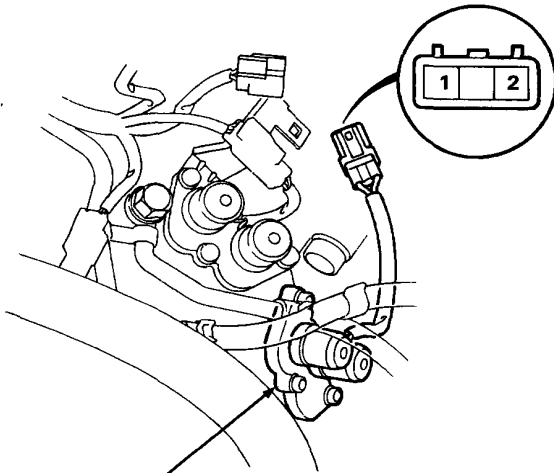
NOTE:

Shift control solenoid valves A and B must be removed/replaced as an assembly.

1. Disconnect the connector from the shift control solenoid valve A/B.
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: 14–16 Ω (at 25°C, 77°F)

View from terminal side.



SHIFT CONTROL SOLENOID VALVE ASSEMBLY

3. Replace the shift control solenoid valve 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.

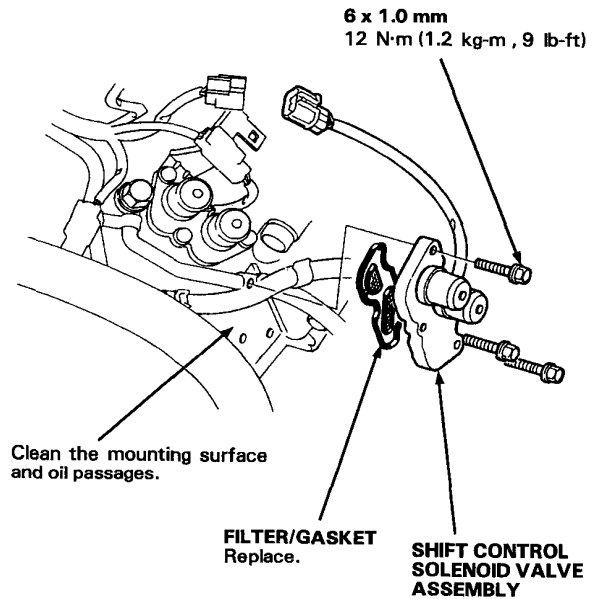
Replacement

1. Remove the mounting bolts and shift control solenoid valve assembly.

NOTE:

Be sure to remove or replace the shift control solenoid valves A and B as an assembly.

2. Check the shift control solenoid valve oil passages for dust or dirt, and replace as an assembly, if necessary.



3. Clean the mounting surface and oil passages of the shift control solenoid valve assembly, and install a new filter/gasket.
4. Check the connector for rust, dirt or oil, and reconnect it securely.

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 car does not move in any gear.	1, 6, 7, 16	K, L, R, S
Car moves in "R" and "2", but not in "D3", "D4" or "1" position.	8, 29, 44, 48	C, M, O
Car moves in "D3", "D4", "1", "R", but not in "2" position.	9, 30, 49	C, L
Car moves in "D3", "D4", "2", "1", but not in "R" position.	1, 11, 22, 34, 38, 39, 40	C, L, Q
Car moves in "N" position.	1, 8, 9, 10, 11, 46, 47	C, D
Excessive idle vibration.	5, 17	B, K, L
Slips in all gears.	6, 7, 16	C, L
No engine braking in "1" position.	12	C, D, L
Slips in 1st gear.	8, 29, 44, 48	C, N, O
Slips in 2nd gear.	9, 20, 23, 30, 49	C, L
Slips in 3rd gear.	10, 21, 23, 31, 49	C, L
Slips in 4th gear.	11, 23, 32, 44	C, L, N
Slips in reverse gear.	11, 32, 34, 44	C, N
Flares on 1-2 upshift.	3, 15, 23	E, L, V
Flares on 2-3 upshift.	3, 15, 23, 24, 49	E, L, V
Flares on 3-4 upshift.	3, 15, 23, 25, 49	E, L, N, V
No upshift; transmission stays in 1st gear.	14, 19, 23	G, L
No downshift to 1st gear.	12, 19	G, L
Late upshift.	14	L, V
Erratic shifting.	2, 14, 26	V
Harsh shift (up and down shifting).	2, 4, 15, 23, 24, 25, 26, 27, 47	E, H, I, L, V
Harsh shift (1-2).	2, 9, 15, 23	C, D, E, V
Harsh shift (2-3).	2, 10, 15, 23, 24	C, D, E, H, L, V
Harsh shift (3-4).	2, 11, 15, 23, 25	C, D, E, I, L, V
Harsh kick-down shifts.	2, 15, 23, 26, 27, 28	E, L, V, Q
Harsh kick-down shift (2-1).	48	O
Harsh downshift at closed throttle.	2, 15, 23	E, T
Harsh shift when manually shifting to "1" position.	33	L
Axle(s) slips out of transmission on turns.	43, 50	L, P, Q
Axle(s) stuck in transmission.	43	L, Q
Ratcheting noise when shifting into "R" position.	6, 7, 38, 39, 40	K, L, Q
Loud popping noise when taking off in "R" position.	38, 39, 40	L, Q
Ratcheting noise when shifting from "R" to "P" position or from "R" to "N" position.	38, 39, 40, 45	L, Q
Noise from transmission in all selector lever positions.	6, 17	K, L, Q
Noise from transmission only when wheels are rolling.	39, 42	L, Q
Gear whine, rpm related (pitch changes with shifts).	8, 13, 41	K, L, Q
Gear whine, speed related (pitch changes with speed).	38, 42	L, Q
Transmission will not shift into 4th gear in "D4" position.	1, 21, 28, 32	L
Lock-up clutch does not lock-up smoothly.	17, 36, 37	L
Lock-up clutch does not operate properly.	2, 3, 15, 18, 35, 36, 37	E, L, V
Transmission has multitude of problems shifting. At disassembly, large particles of metal are found on magnet.	43	L, Q



PROBABLE CAUSE

1.	Shift cable broken/out of adjustment.
2.	Throttle cable too short.
3.	Throttle cable too long.
4.	Wrong type ATF.
5.	Idle rpm too low/high.
6.	Oil pump worn or binding.
7.	Pressure regulator stuck.
8.	1st clutch defective.
9.	2nd clutch defective.
10.	3rd clutch defective.
11.	4th clutch defective.
12.	1st-hold clutch defective.
13.	Mainshaft, countershaft, and secondary shaft idler gears worn/damaged.
14.	Modulator valve stuck.
15.	Throttle valve B stuck.
16.	ATF strainer clogged.
17.	Torque converter defective.
18.	Torque converter check valve stuck.
19.	1-2 shift valve stuck.
20.	2-3 shift valve stuck.
21.	3-4 shift valve stuck.
22.	Servo control valve stuck.
23.	Clutch pressure control (CPC) valve stuck.
24.	2nd orifice control valve stuck.
25.	Orifice control valve stuck.
26.	3-2 kick-down valve stuck.
27.	3rd kick-down valve stuck.
28.	4th exhaust valve stuck.
29.	1st accumulator defective.
30.	2nd accumulator defective.
31.	3rd accumulator defective.
32.	4th accumulator defective.
33.	1st-hold accumulator defective.
34.	Servo valve stuck.
35.	Lock-up timing valve stuck.
36.	Lock-up shift valve stuck.
37.	Lock-up control valve stuck.
38.	Shift fork bent.
39.	Reverse gears worn/damaged (3 gears).
40.	Reverse selector worn.
41.	3rd gears worn/damaged (2 gears).
42.	Final gears worn/damaged (2 gears).
43.	Differential pinion shaft worn.
44.	Feedpipe O-ring broken.
45.	4th gears worn/damaged (2 gears).
46.	Gear clearance incorrect.
47.	Clutch clearance incorrect.
48.	One-way (sprag) clutch defective.
49.	Sealing rings/guide worn.
50.	Axle-inboard joint clip missing.

(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
Car creeps in "N" position.	R1, R2	
Car does not move in "D3" or "D4" position.	R4	
Transmission locks up in "R" position.	R3, R12	
Excessive drag in transmission.	R6	R, K
Excessive vibration, rpm related.	R7	
Noise with wheels moving only.	R5	
Main seal pops out.	R8	S
Various shifting problems.	R9, R10	
Harsh upshifts.	R11	

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.	Oil pump binding.
R7.	Torque converter not fully seated in oil pump.
R8.	Main seal improperly installed.
R9.	Springs improperly installed.
R10.	Valves improperly installed.
R11.	Ball check valves not installed.
R12.	Shift fork bolt not installed.



NOTES

B.	Set idle rpm in gear to specified idle speed. If still no good, adjust motor mounts as outlined in engine section of shop 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 and throttle valves for free movement.
E.	If throttle valve B 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 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 or main valve body and torque converter housing may cause oil 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 oil 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 feedpipe guide in the right side cover is scored by the secondary shaft, 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.	<ul style="list-style-type: none">• Replace the mainshaft if the bushing for the 4th feedpipe is loose or damaged. If the 4th feedpipe is damaged or out of round, replace it.• Replace the countershaft if the bushing for the 1st-hold feedpipe is loose or damaged. If the 1st-hold feedpipe is damaged or out of round, replace it.• Replace the secondary shaft if the bushing for the 1st feedpipe is loose or damaged. If the 1st feedpipe 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 car in snow.
P.	Inspect the frame for collision damage.
Q.	Inspect for damage or wear: <ol style="list-style-type: none">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 1st-hold clutch for swirl marks. Replace items 1, 2, 3 and 4 if worn or damaged. If transmission makes clicking, grinding or whirring noise, also replace mainshaft 4th gear and reverse idler gear and countershaft 4th gear in addition to 1, 2, 3 or 4. If differential pinion shaft is worn, overhaul differential assembly, and replace ATF strainer, and thoroughly clean transmission, flush torque converter, cooler and lines. If bottom of 1st-hold 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 oil pump when you torque down the main valve body. This will result in oil pump seizure if not detected. Use 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 oil return passage and result in damage.
T.	Harsh downshifts when coasting to a stop with zero throttle may be caused by a bent-in throttle valve retainer/cam stopper. Throttle cable adjustment may clear this problem.
U.	Check if servo valve stopper cap is installed. If it was not installed, the check valve may have been pushed out by hydraulic pressure causing a leak (internal) affecting all forward gears.
V.	Throttle cable adjustment is essential for proper operation of the transmission. Not only does it affect the shift points if misadjusted, but also the shift quality and lock-up clutch operation. A cable adjusted too long will result in throttle pressure being too low for the amount of engine torque input into the transmission and may cause clutch slippage. A cable adjusted too short will result in too high throttle pressure which may cause harsh shifts, erratic shifts and torque converter hunting.

Road Test

NOTE:

Warm up the engine to normal operating temperature (the radiator fan comes on).

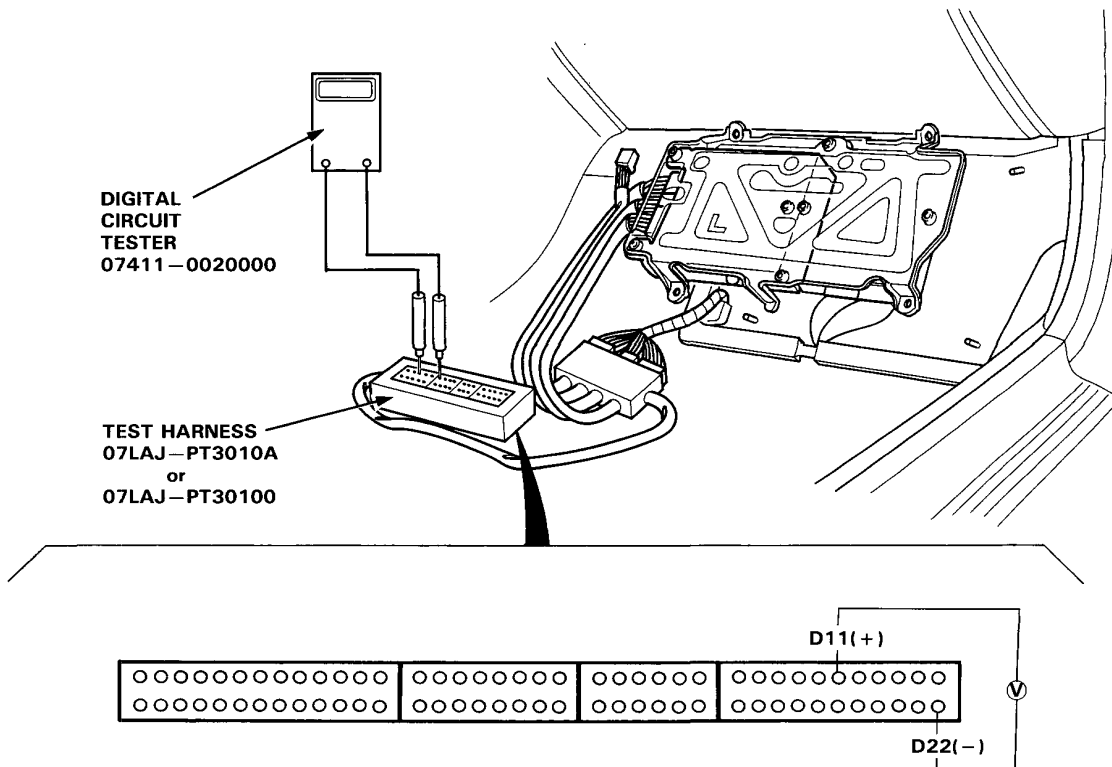
1. Apply parking brake and block the wheels. Start the engine, then move the selector lever to **D₄** position while depressing the brake pedal. Depress the accelerator pedal and release it suddenly. Engine should not stall.
2. Repeat same test in **D₃** position.
3. Shift the selector lever to **D₄** position and check that the shift points occur at approximate speeds shown. Also check for abnormal noise and clutch slippage.

NOTE:

Throttle position sensor voltage represents the throttle opening.

- 1. Connect the Test Harness between the ECM and connector (see section 11).
- 2. Set the digital multimeter to check voltage between D11 (+) terminal and D22 (-) terminal for the throttle position sensor.

LHD is shown; RHD is similar.





D₄ Position: Normal Mode (S Switch OFF)

• Upshift

		1st → 2nd	2nd → 3rd	3rd → 4th	Lock-up Clutch ON
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting down-hill from a stop	km/h	22–24	41–45	58–64	22–26
	mph	14–15	25–28	36–40	14–16
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) Acceleration from a stop	km/h	28–34	62–68	87–95	95–103
	mph	17–21	39–42	54–59	59–64
Full-throttle Acceleration from a stop	km/h	46–53	104–112	141–150	132–140
	mph	29–33	65–70	88–93	82–87

• Downshift

		Lock-up Clutch OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting or braking to a stop	km/h	21–25	—	24–30 (4th → 2nd)	10–16
	mph	13–16	—	15–19 (4th → 2nd)	6–10
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	77–85	—	—	—
	mph	48–53	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	126–134	121–130	86–94	39–46
	mph	78–83	75–81	53–58	24–29

D₅ Position: S Mode (S Switch ON)

• Upshift

		1st → 2nd	2nd → 3rd	3rd → 4th	Lock-up Clutch ON
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting down-hill from a stop	km/h	23–25	46–50	77–83	37–41
	mph	14–16	29–31	48–52	23–25
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) Acceleration from a stop	km/h	32–38	70–76	97–105	103–111
	mph	20–24	43–47	60–65	64–69
Full-throttle Acceleration from a stop	km/h	46–53	104–112	141–150	132–140
	mph	29–33	65–70	88–93	82–87

• Downshift

		Lock-up Clutch OFF	4th → 3rd	3rd → 2nd	2nd → 1st
Throttle position sensor voltage: 0.836 V (0.7/8 throttle) Coasting or braking to a stop	km/h	35–39	—	28–34 (4th → 2nd)	10–16
	mph	22–24	—	17–21 (4th → 2nd)	6–10
Throttle position sensor voltage: 2.184 V (3.5/8 throttle) When car is slowed by increased grade, wind, etc.	km/h	83–91	—	—	—
	mph	52–57	—	—	—
Full-throttle When car is slowed by increased grade, wind, etc.	km/h	126–134	121–130	86–94	39–46
	mph	78–83	75–81	53–58	24–29

(cont'd)

Road Test

(cont'd)

4. Accelerate to about 35 mph (57 km/h) so the transmission is in 4th, then shift **D₄** to **2** position. The car should immediately begin slowing down from engine braking.

CAUTION: Do not shift from **D₄ or **D₃** position to **2** or **1** position at speeds over 62 mph (100 km/h); you may damage the transmission.**

5. Check for abnormal noise and clutch slippage in the following positions.

1 (1st Gear) Position

- 1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- 2. Upshifts should not occur with the selector in this position.

2 (2nd Gear) Position

- 1. Accelerate from a stop at full throttle. Check that there is no abnormal noise or clutch slippage.
- 2. 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 car on slope (approx. 16°), apply the parking brake, and shift into **P** position. Release the brake; the car 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 parking brake and block the front wheels.
2. Connect tachometer, 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 2 minutes for cooling, then repeat same test in **[D₄]**, **[1]**, and **[R]** positions.

NOTE:

- Stall speed tests should be used for diagnostic purposes only.
- Stall speed should be the same in **[D₄]**, **[2]**, **[1]**, and **[R]** positions.

Stall Speed RPM: 2,350–2,650 min⁻¹ (rpm)

TROUBLE	PROBABLE CAUSE
Stall rpm high in [D₄] , [2] , [1] and [R] positions	<ul style="list-style-type: none">• Low fluid level or oil pump output• Clogged ATF strainer• Pressure regulator valve stuck closed• Slipping clutch
Stall rpm high in [R] position	<ul style="list-style-type: none">• Slippage of 4th clutch
Stall rpm high in [2] and [D₄] positions	<ul style="list-style-type: none">• Slippage of 2nd clutch
Stall rpm high in [1] position	<ul style="list-style-type: none">• Slippage of 1st clutch or 1st gear one-way clutch
Stall rpm low in [D₄] , [2] , [1] and [R] positions	<ul style="list-style-type: none">• Engine output low• Torque converter one-way clutch slipping

Fluid Level

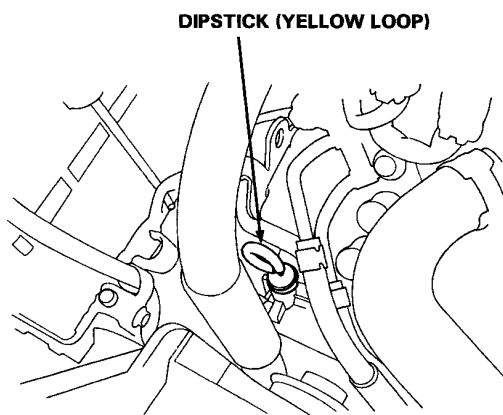
Checking/Changing

Checking

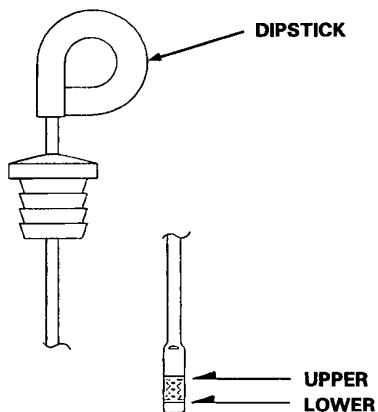
NOTE:

Check the fluid level with the engine at normal operating temperature (the radiator fan comes on).

1. Park the car on level ground. Shut 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.



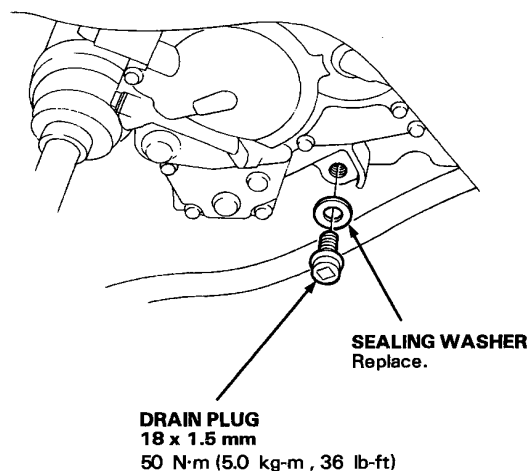
5. If the level is below the lower mark, add fluid into the tube to bring it to the upper mark. Use Honda Premium Formula Automatic Transmission Fluid or an equivalent DEXRON® II Automatic Transmission Fluid (ATF) only.
6. Insert the dipstick back in the transmission.

Changing

1. Bring the transmission up to normal operating temperature (the radiator fan comes on) by driving the car. Park the car on level ground, turn the engine off, and then remove the drain plug.
2. Reinstall the drain plug with a new sealing washer; then refill the transmission to the upper mark on the dipstick.

Automatic Transmission Fluid Capacity:

2.4 l (2.5 US qt, 2.1 Imp qt) at changing
6.0 l (6.3 US qt, 5.3 Imp qt) after overhaul





▲ WARNING

- While testing, be careful of the rotating front wheels.
- Make sure lifts, jacks, and safety stands are placed properly (see section 1).

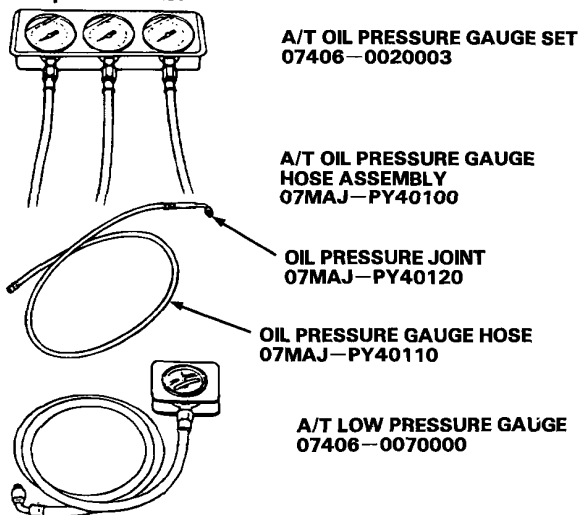
CAUTION: Before testing, be sure the transmission fluid is filled to the proper level.

1. Raise the car. (see section 1).
2. Warm up the engine (the radiator fan comes on), then stop the engine and connect a tachometer.
3. Connect the oil pressure gauge to each inspection hole.

TORQUE: 18 N·m (1.8 kg-m, 13 lb-ft)

CAUTION:

Connect the oil pressure gauge securely; be sure not to allow dust and other foreign particles to enter the inspection hole.



NOTE:

- Use the A/T Oil Pressure Gauge Set (07406-0020003) or A/T Low Pressure Gauge (07406-0070000), and the oil pressure gauge hoses and joints shown above.
- The A/T Oil Pressure Gauge Hose (07746-0020201) may also be used.

4. Start the engine, and measure the respective pressure as follows:
 - Line Pressure
 - Clutch Pressure
 - Throttle B Pressure
 - Clutch Low/High Pressure
5. Install a new washer and the sealing bolt in the inspection hole, and tighten to the specified torque.

TORQUE: 18 N·m (1.8 kg-m, 13 lb-ft)

NOTE:

Do not reuse old aluminum washers.

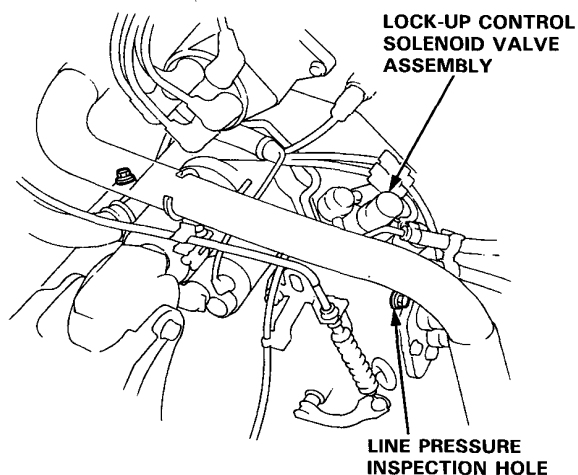
● **Line Pressure Measurement**

- 1. Set the parking brake and block both rear wheels securely.
- 2. Run the engine at 2,000 min⁻¹ (rpm).
- 3. Shift the select lever to **N** or **P** position.

NOTE:

Higher pressures may be indicated if measurements are made in selector positions other than **N** or **P** position.

- 4. Measure line pressure.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Line	N or P	No (or low) line pressure	Torque converter, oil pump, pressure regulator, torque converter check valve	800–850 kPa (8.0–8.5 kg/cm ² , 114–121 psi)	750 kPa (7.5 kg/cm ² , 107 psi)

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Pressure Testing

(cont'd)

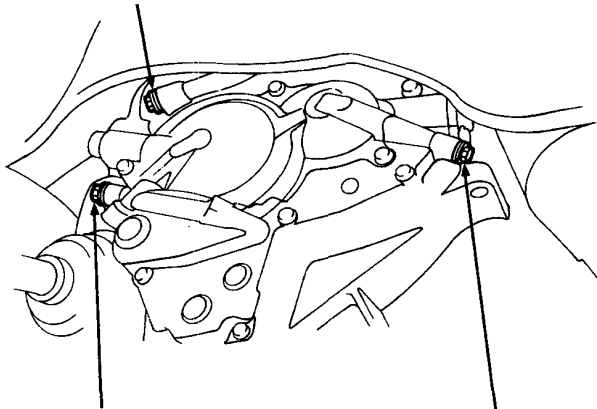
• Clutch Pressure Measurement

▲ WARNING

While testing, be careful of the rotating front wheels.

- 1. Set the parking brake and block both rear wheels securely.
- 2. Raise the front of the car and support it with safety stands.
- 3. Allow the front wheels to rotate freely.
- 4. Run the engine at 2,000 min⁻¹ (rpm).
- 5. Measure each clutch pressure.

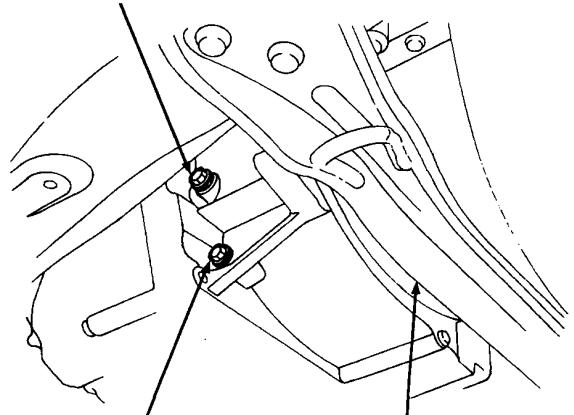
1ST CLUTCH PRESSURE INSPECTION HOLE



1ST-HOLD CLUTCH PRESSURE INSPECTION HOLE

4TH CLUTCH PRESSURE INSPECTION HOLE

2ND CLUTCH PRESSURE INSPECTION HOLE



3RD CLUTCH PRESSURE INSPECTION HOLE

CENTER BEAM

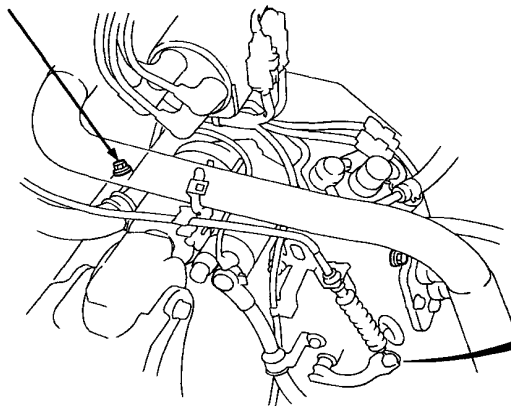
PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
1st Clutch	1 or D ₄	No or low 1st pressure	1st Clutch	800–850 kPa (8.0–8.5 kg/cm ² , 114–121 psi)	750 kPa (7.5 kg/cm ² , 107 psi)
1st-hold Clutch	1	No or low 1st-hold pressure	1st-hold Clutch		
2nd Clutch	2	No or low 2nd pressure	2nd Clutch		
2nd Clutch	D ₄ or D ₃	No or low 2nd pressure	2nd Clutch	500 kPa (5.0 kg/cm ² , 71 psi) (Throttle fully closed)	450 kPa (4.5 kg/cm ² , 64 psi) (Throttle fully closed)
3rd Clutch		No or low 3rd pressure	3rd Clutch	850 kPa (8.5 kg/cm ² , 121 psi) (Throttle more than 3/16 opened)	750 kPa (7.5 kg/cm ² , 107 psi) (Throttle more than 3/16 opened)
4th Clutch	D ₄	No or low 4th pressure	4th Clutch	530 kPa (5.3 kg/cm ² , 75 psi) (Throttle fully closed)	480 kPa (4.8 kg/cm ² , 68 psi) (Throttle fully closed)
	R		Servo Valve or 4th Clutch	850 kPa (8.5 kg/cm ² , 121 psi) (Throttle more than 3/16 opened)	750 kPa (7.5 kg/cm ² , 107 psi) (Throttle more than 3/16 opened)
				800–850 kPa (8.0–8.5 kg/cm ² , 114–121 psi)	750 kPa (7.5 kg/cm ² , 107 psi)



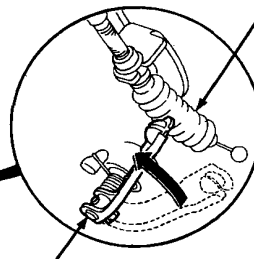
● **Throttle B Pressure Measurement**

1. Set the parking brake securely and block the wheels.
2. Run the engine at 1,000 min⁻¹ (rpm).
3. Disconnect the throttle control cable from the throttle control lever and set the throttle control lever in full throttle position.

**THROTTLE B PRESSURE
INSPECTION HOLE**



**THROTTLE CONTROL
CABLE**



**THROTTLE CONTROL
LEVER**

PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
Throttle B	D4	Pressure too high	Throttle Valve B	0 kPa (0 kg/cm ² , 0.0 psi) throttle lever fully-closed	—
		No or low pressure		800–850 kPa (8.0–8.5 kg/cm ² , 114–121 psi) throttle lever fully-opened	750 kPa (7.5 kg/cm ² , 107 psi) throttle lever fully-opened

Pressure Testing

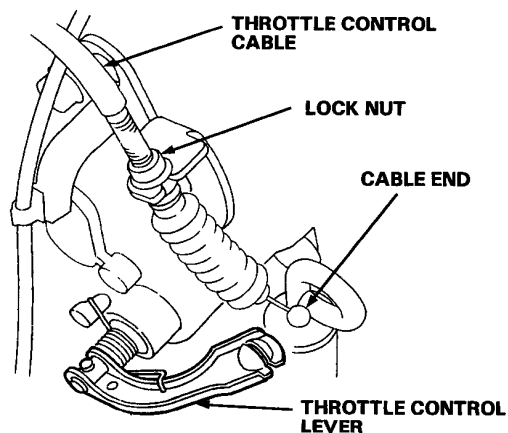
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• Low/High Pressure Test

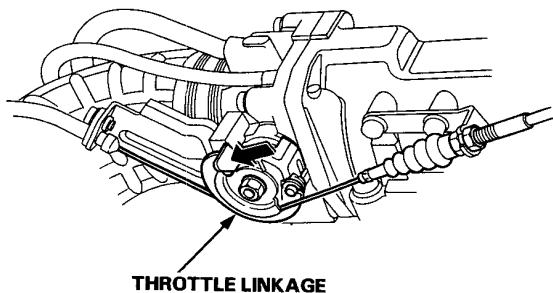
1. Set the parking brake and block the rear wheels securely.
2. Raise the car and support with safety stands.
3. Attach the gauge set to the appropriate pressure inspection holes.
4. Remove the throttle control cable end of the throttle control lever.

NOTE:

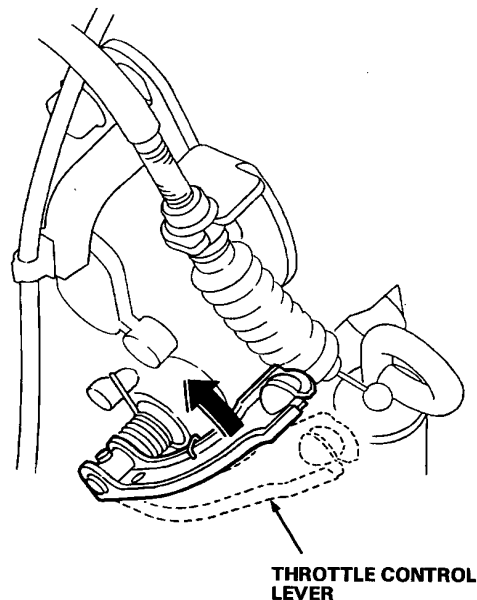
Do not loosen the locknuts; simply unhook the throttle control cable end.



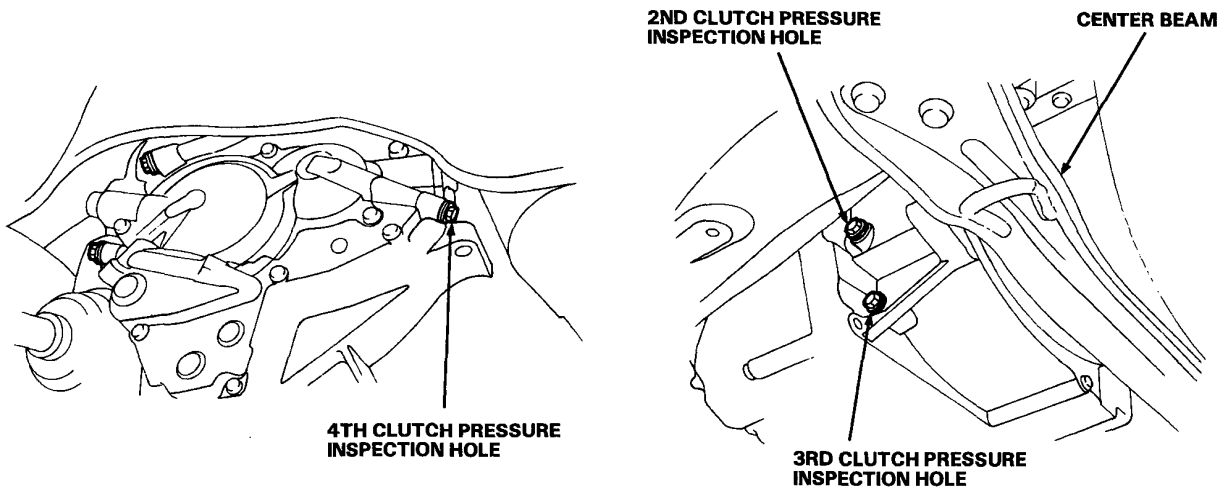
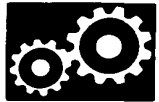
5. Warm up the engine to normal operating temperature (the radiator fan comes on).
6. With the engine idling, move the selector lever to **D₄** position.
7. Slowly move the throttle linkage to increase engine rpm until pressure is indicated on the appropriate gauge. Then release the throttle linkage, allowing the engine to return to an idle, and record the pressure reading.



8. With the engine idling, lift the throttle control lever up approximately 1/2 of its possible travel and increase the engine rpm until pressure is indicated on the appropriate gauge. Record the highest pressure reading obtained.



9. Repeat steps 7 and 8 for each clutch pressure being inspected.



PRESSURE	SELECTOR POSITION	SYMPTOM	PROBABLE CAUSE	FLUID PRESSURE	
				Standard	Service Limit
2nd Clutch	D ₄	No or low 2nd pressure	2nd Clutch	500–850 kPa (5.0–8.5 kg/cm ² , 71–128 psi) varies with throttle opening	450kPa (4.5 kg/cm ² , 64 psi) (Throttle fully closed) 750 kPa (7.5 kg/cm ² , 107 psi) (Throttle more than 3/16 opened)
3rd Clutch		No or low 3rd pressure	3rd Clutch		
4th Clutch		No or low 4th pressure	4th Clutch		

Transmission

Removal

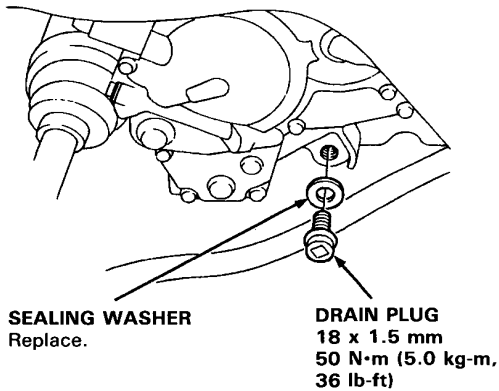
⚠ WARNING

- Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (see section 1).
- Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.

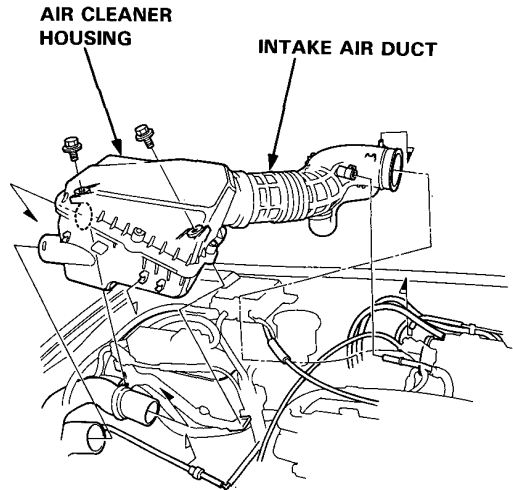
CAUTION: Use fender covers to avoid damaging painted surfaces.

1. Disconnect the battery negative (-) cable first, then disconnect the positive (+) cable from the battery.
2. Remove the battery set plate, then remove the battery.
3. Remove the drain plug, and drain the automatic transmission fluid (ATF). Reinstall the drain plug with a new sealing washer (see page 14-78).

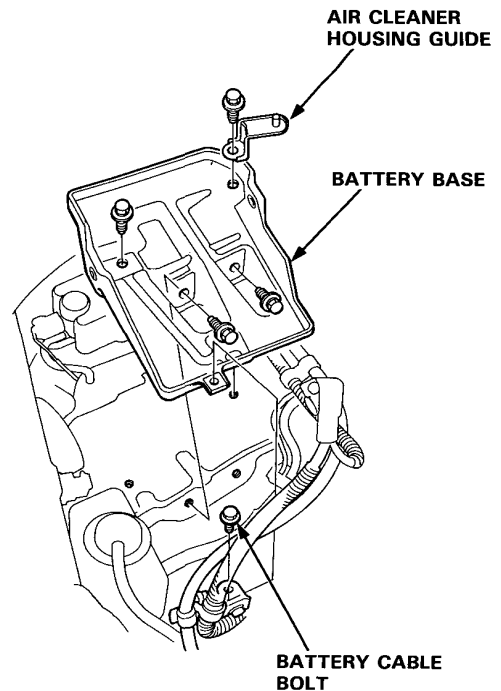
TORQUE: 50 N·m (5.0 kg-m, 36 lb-ft)



4. Remove the air cleaner housing and intake air duct.



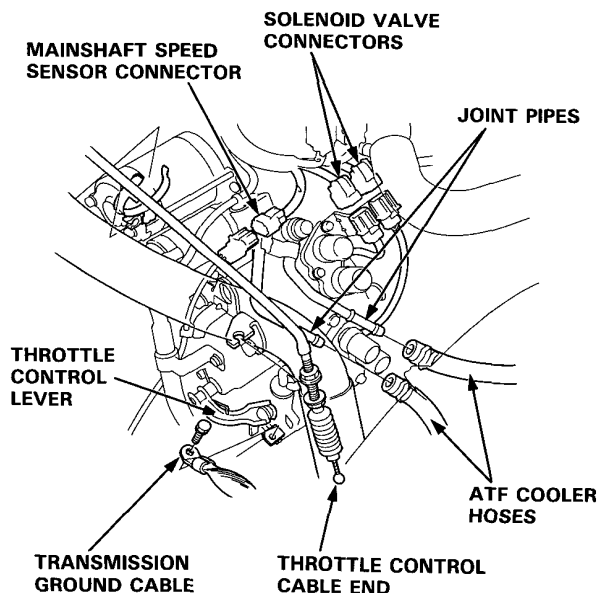
5. Remove the bolts securing the battery base and battery cable, then remove the battery base.





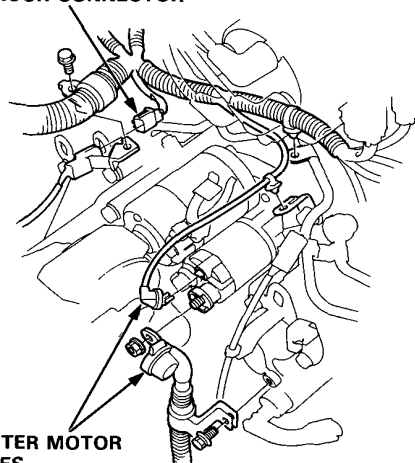
6. Disconnect the ground cable from the transmission.
7. Disconnect the lock-up control solenoid valve and shift control solenoid valve connectors.
8. Disconnect the throttle control cable from the throttle control lever.
9. Disconnect the mainshaft speed sensor connector.
10. Remove the ATF cooler hoses at the joint pipes. Turn the ends of the hoses up to prevent ATF from flowing out, then plug the joint pipes.

NOTE: Check for any signs of leakage at the hose joints.



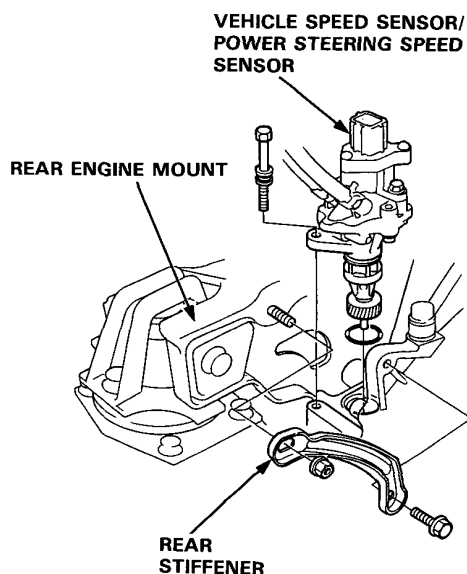
11. Remove the starter motor cables.
12. Disconnect the countershaft speed sensor connector.
13. Remove the harness stay and clamp.

COUNTERSHAFT SPEED SENSOR CONNECTOR



14. Remove the rear stiffener, then remove the vehicle speed sensor/power steering speed sensor.

NOTE: Do not disconnect the power steering pressure hoses from the vehicle speed sensor/power steering speed sensor.

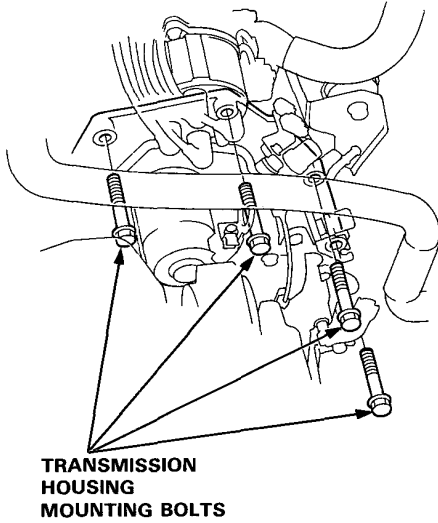


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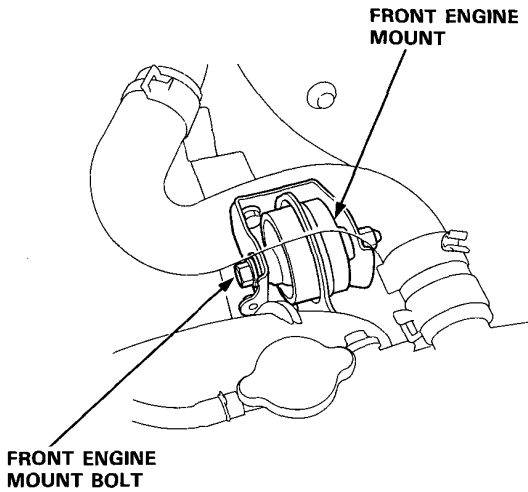
Transmission

Removal (cont'd)

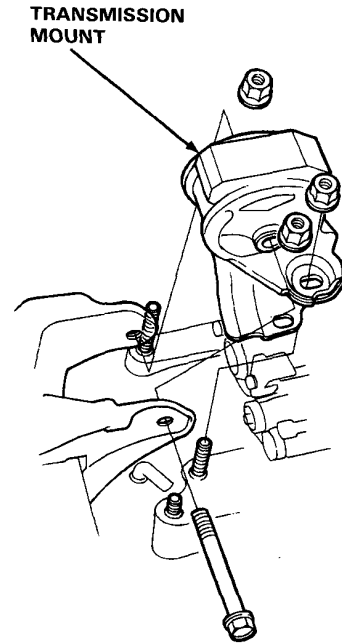
15. Remove the transmission housing mounting bolts.



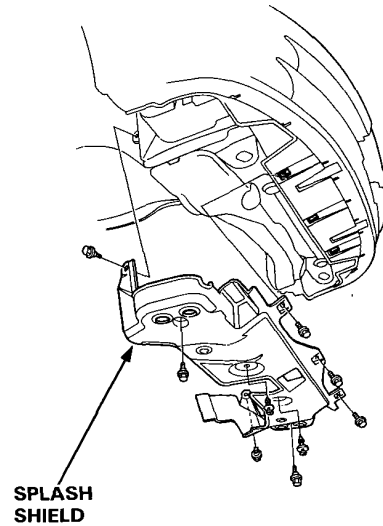
16. Loosen the front engine mount bolt.



17. Remove the transmission mount.

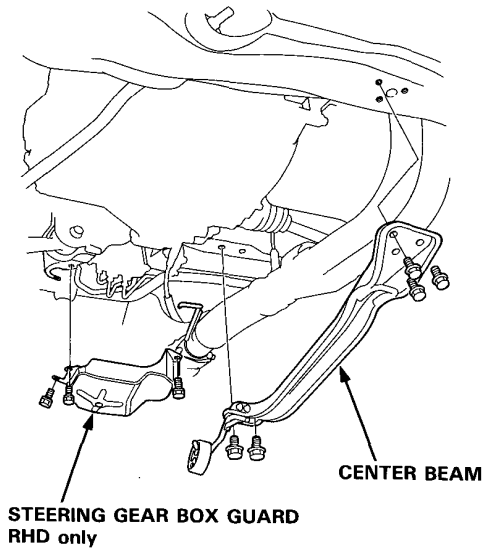


18. Remove the splash shield.

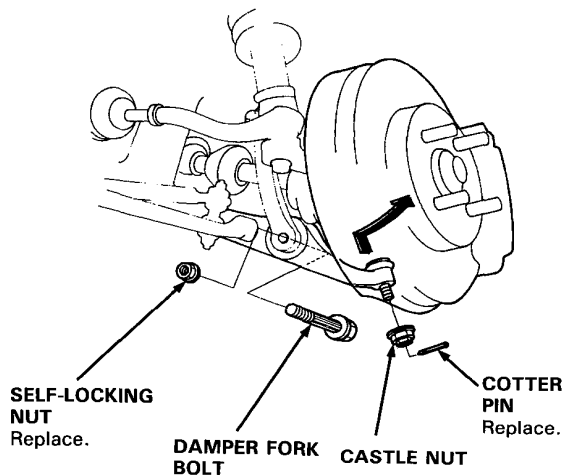




19. LHD: Remove the center beam.
RHD: Remove the center beam and steering gear box guard.

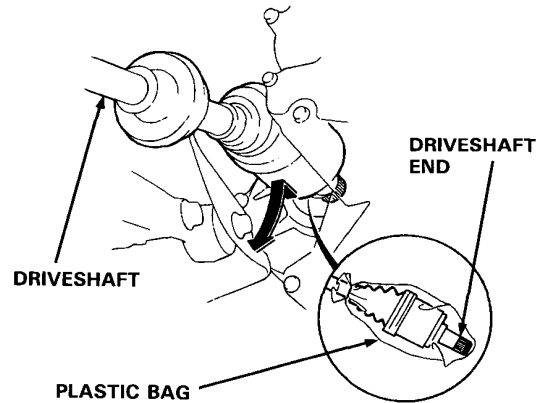


20. Remove the cotter pins and castle nuts, then separate the ball joints from the lower arm (see section 18).
21. Remove the damper fork bolts, then separate the damper fork and lower arm.

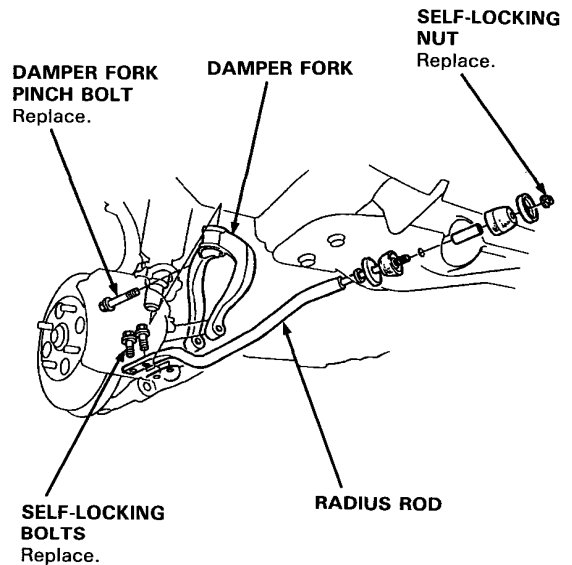


22. Pry the driveshafts out of the differential.
23. Pull on the inboard joint and the right and left driveshafts (see section 16).
24. Tie plastic bags over the driveshaft ends.

NOTE: Coat all precision finished surfaces with clean engine oil or grease.



25. Remove the right damper pinch bolt, then separate the damper fork and damper.
26. Remove the self-locking bolts and self-locking nuts, then remove the right radius rod.

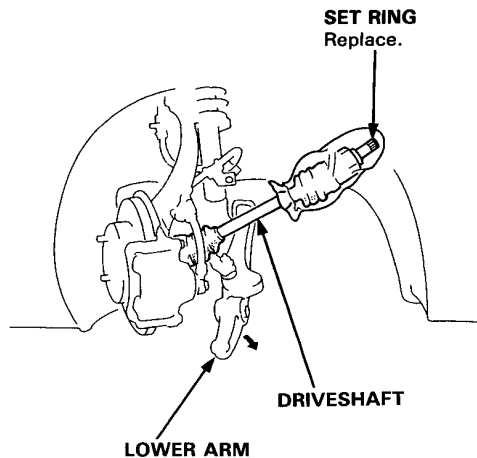


(cont'd)

Transmission

Removal (cont'd)

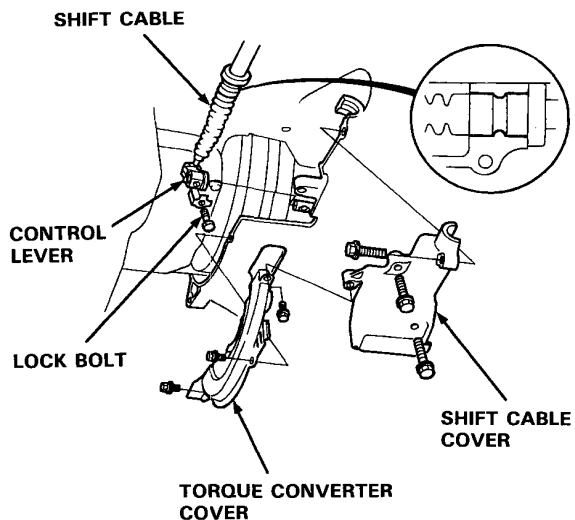
27. Lower the right lower arm and move the right driveshaft to front side of the car as shown.



28. Remove the torque converter cover and shift cable cover.

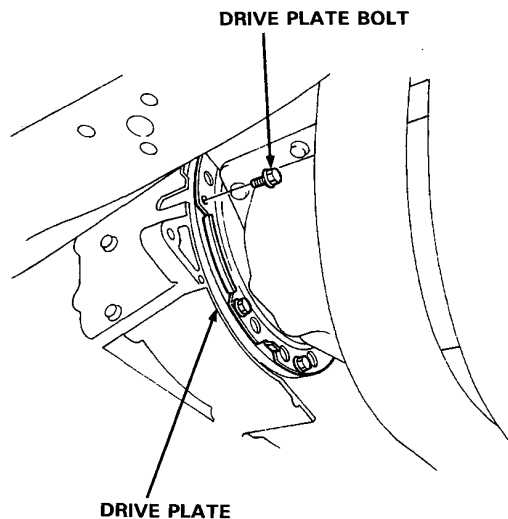
29. Remove the lock bolt securing the control lever, then remove the shift cable with the control lever.

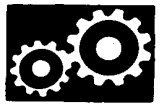
CAUTION: Take care not to bend the shift cable when removing it.



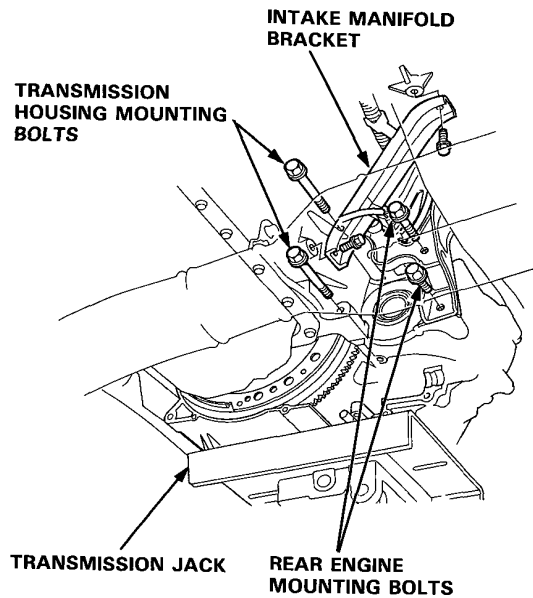
30. Remove the eight drive plate bolts one at a time while rotating the crankshaft pulley.

NOTE: If necessary, remove the spark plugs when rotating the crankshaft pulley.



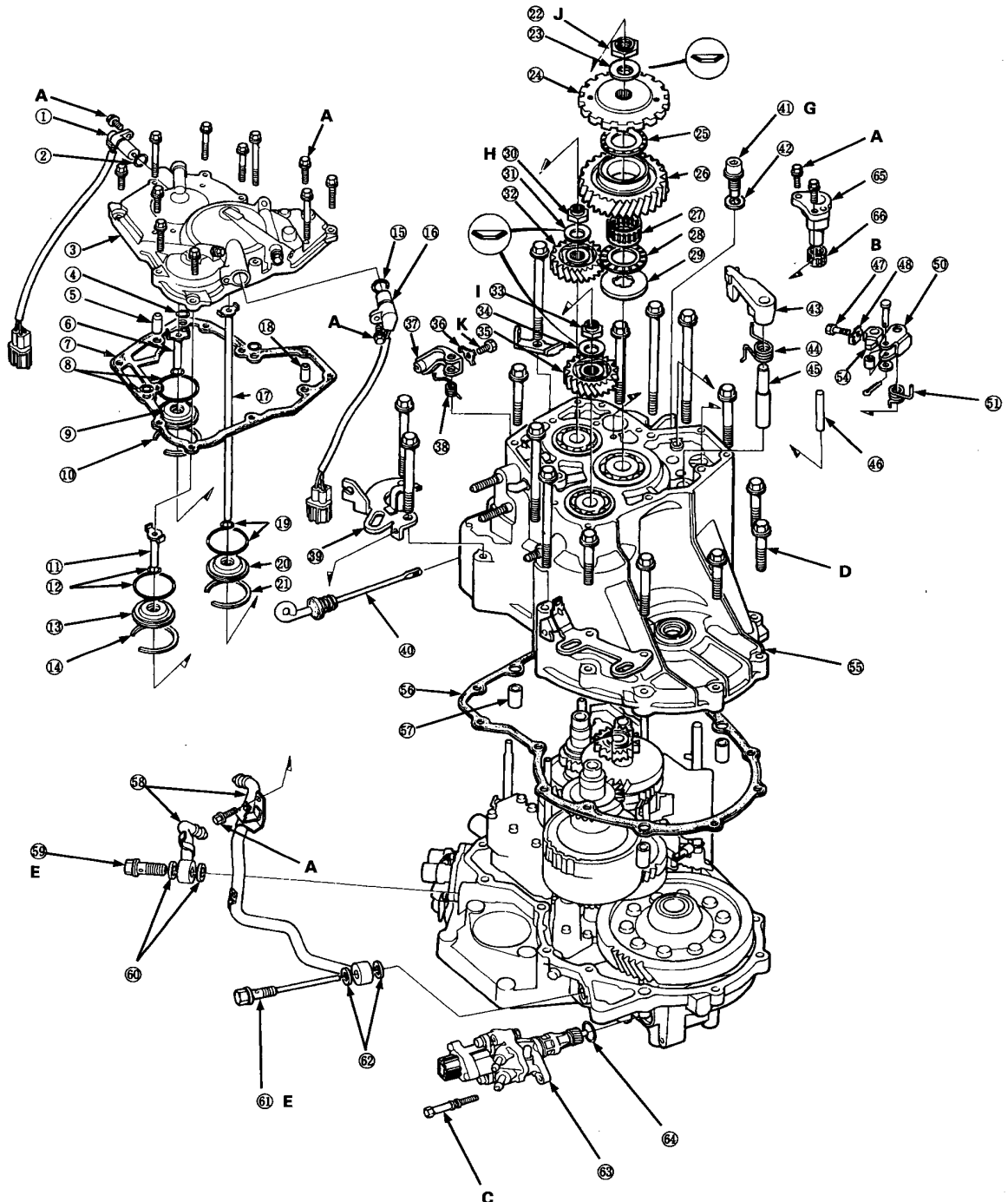


31. Place a transmission jack under the transmission, and raise the transmission just enough to take weight off of the mount.
32. Remove the intake manifold bracket.
33. Remove the transmission housing mounting bolts and rear engine mounting bolts.
34. Pull the transmission away from the engine until it clears the 14 mm dowel pins, then lower it on the transmission jack.



Illustrated Index

Right Side Cover





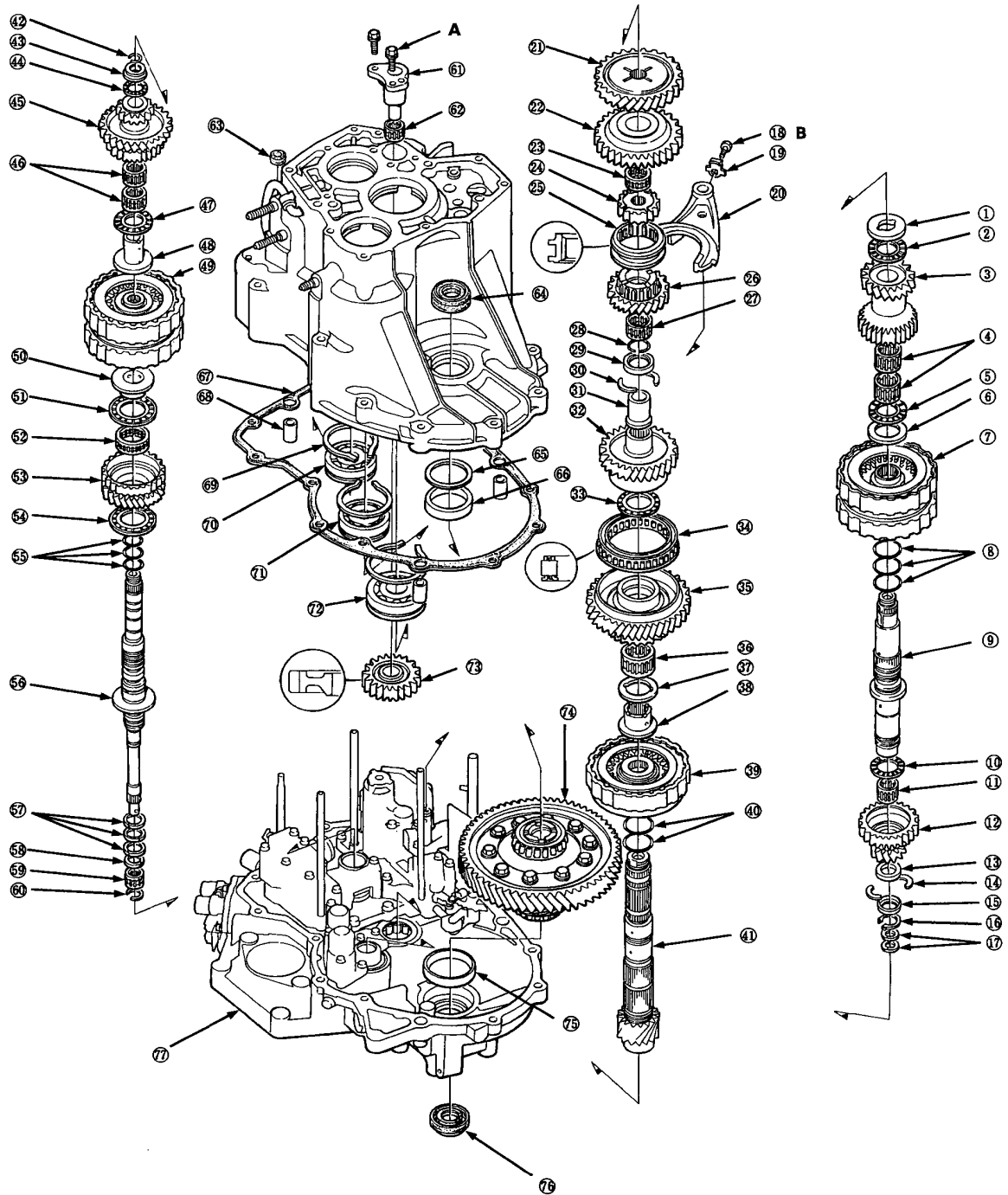
- ① MAINSHAFT SPEED SENSOR
- ② O-RING Replace.
- ③ RIGHT SIDE COVER
- ④ O-RING Replace.
- ⑤ DOWEL PIN
- ⑥ 4TH CLUTCH FEED PIPE
- ⑦ RIGHT SIDE COVER GASKET Replace.
- ⑧ O-RINGS Replace.
- ⑨ FEED PIPE GUIDE
- ⑩ SNAP RING
- ⑪ 1ST CLUTCH FEED PIPE
- ⑫ O-RINGS Replace.
- ⑬ FEED PIPE GUIDE
- ⑭ SNAP RING
- ⑮ O-RING Replace.
- ⑯ COUNTERSHAFT SPEED SENSOR
- ⑰ 1ST-HOLD CLUTCH FEED PIPE
- ⑱ DOWEL PIN
- ⑲ O-RINGS Replace.
- ⑳ FEED PIPE GUIDE
- ㉑ SNAP RING
- ㉒ COUNTERSHAFT LOCKNUT, 24 x 1.25 mm
(Flange nut) Replace.
- ㉓ CONICAL SPRING WASHER Replace.
- ㉔ PARKING GEAR
- ㉕ THRUST NEEDLE BEARING
- ㉖ COUNTERSHAFT IDLER GEAR
- ㉗ NEEDLE BEARING
- ㉘ THRUST NEEDLE BEARING
- ㉙ THRUST WASHER
- ㉚ MAINSHAFT LOCKNUT, 24 x 1.25 mm
(Flange nut) Replace.
- NOTE: Left-hand threads
- ㉛ CONICAL SPRING WASHER Replace.
- ㉜ MAINSHAFT IDLER GEAR
- ㉝ SECONDARY SHAFT LOCKNUT, 24 x 1.25 mm
(Flange nut) Replace.
- ㉞ CONICAL SPRING WASHER Replace.
- ㉟ SECONDARY SHAFT IDLER GEAR
- ㊱ LOCK WASHER Replace.
- ㊲ THROTTLE CONTROL LEVER
- ㊳ THROTTLE CONTROL LEVER SPRING
- ㊴ TRANSMISSION HANGER
- ㊵ ATF LEVEL GAUGE
- ㊶ DRAIN PLUG
- ㊷ SEALING WASHER Replace.
- ㊸ PARKING BRAKE PAWL
- ㊹ PARKING BRAKE PAWL SPRING
- ㊺ PARKING BRAKE PAWL SHAFT
- ㊻ PARKING BRAKE PAWL STOPPER
- ㊼ LOCK BOLT
- ㊽ LOCK WASHER Replace.
- ㊾ PARKING BRAKE LEVER
- ㊿ PARKING BRAKE SPRING
- ① PARKING BRAKE STOPPER
- ② TRANSMISSION HOUSING
- ③ TRANSMISSION HOUSING GASKET Replace.
- ④ DOWEL PIN
- ⑤ ATF COOLER PIPES
- ⑥ JOINT BOLT
- ⑦ SEALING WASHERS Replace.
- ⑧ JOINT BOLT
- ⑨ SEALING WASHERS Replace.
- ⑩ VEHICLE SPEED SENSOR/POWER STEERING SPEED SENSOR
- ⑪ O-RING Replace.
- ⑫ REVERSE IDLER GEAR SHAFT HOLDER
- ⑬ NEEDLE BEARING

TORQUE SPECIFICATIONS

Ref No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m, 9 lb-ft)	6 x 1.0 mm	
B	14 N·m (1.4 kg-m, 10 lb-ft)	6 x 1.0 mm	
C	18 N·m (1.8 kg-m, 13 lb-ft)	8 x 1.25 mm	
D	55 N·m (5.5 kg-m, 40 lb-ft)	10 x 1.25 mm	
E	29 N·m (2.9 kg-m, 21 lb-ft)	12 x 1.25 mm	
G	50 N·m (5.0 kg-m, 36 lb-ft)	18 x 1.5 mm	
H	230 N·m (23.0 kg-m, 166 lb-ft) → 0 → 170 N·m (17.0 kg-m, 123 lb-ft)	24 x 1.25 mm	Joint Bolt Drain Plug Mainshaft Locknut
I	230 N·m (23.0 kg-m, 166 lb-ft) → 0 → 170 N·m (17.0 kg-m, 123 lb-ft)	24 x 1.25 mm	Left-hand threads Secondary Shaft Locknut
J	230 N·m (23.0 kg-m, 166 lb-ft) → 0 → 170 N·m (17.0 kg-m, 123 lb-ft)	24 x 1.25 mm	Countershaft Locknut
K	8 N·m (0.8 kg-m, 5.8 lb-ft)	5 x 0.8 mm	

Illustrated Index

Transmission Housing





- ① THRUST WASHER
- ② THRUST NEEDLE BEARING
- ③ SECONDARY SHAFT 2ND GEAR
- ④ NEEDLE BEARINGS
- ⑤ THRUST NEEDLE BEARING
- ⑥ SPLINED WASHER Selective part
- ⑦ 1ST/2ND CLUTCH ASSEMBLY
- ⑧ O-RINGS Replace.
- ⑨ SECONDARY SHAFT
- ⑩ THRUST NEEDLE BEARING
- ⑪ NEEDLE BEARING
- ⑫ SECONDARY SHAFT 1ST GEAR
- ⑬ DISTANCE COLLAR, 5.0 mm
- ⑭ COTTERS, 29 mm
- ⑮ COTTER RETAINER
- ⑯ SNAP RING
- ⑰ SEALING RINGS, 32 mm
- ⑱ LOCK BOLT
- ⑲ LOCK WASHER Replace.
- ⑳ SHIFT FORK
- ㉑ COUNTERSHAFT 2ND GEAR
- ㉒ COUNTERSHAFT REVERSE GEAR
- ㉓ NEEDLE BEARING
- ㉔ REVERSE SELECTOR HUB
- ㉕ REVERSE SELECTOR
- ㉖ COUNTERSHAFT 4TH GEAR
- ㉗ NEEDLE BEARING
- ㉘ SNAP RING
- ㉙ COLLAR, 32 mm
- ㉚ COTTERS, 29 mm
- ㉛ DISTANCE COLLAR
- ㉜ COUNTERSHAFT 3RD GEAR
- ㉝ THRUST NEEDLE BEARING
- ㉞ ONE-WAY CLUTCH
- ㉟ COUNTERSHAFT 1ST GEAR
- ㊱ NEEDLE BEARING
- ㊲ THRUST WASHER
- ㊳ COUNTERSHAFT 1ST GEAR COLLAR
- ㊴ 1ST-HOLD CLUTCH ASSEMBLY

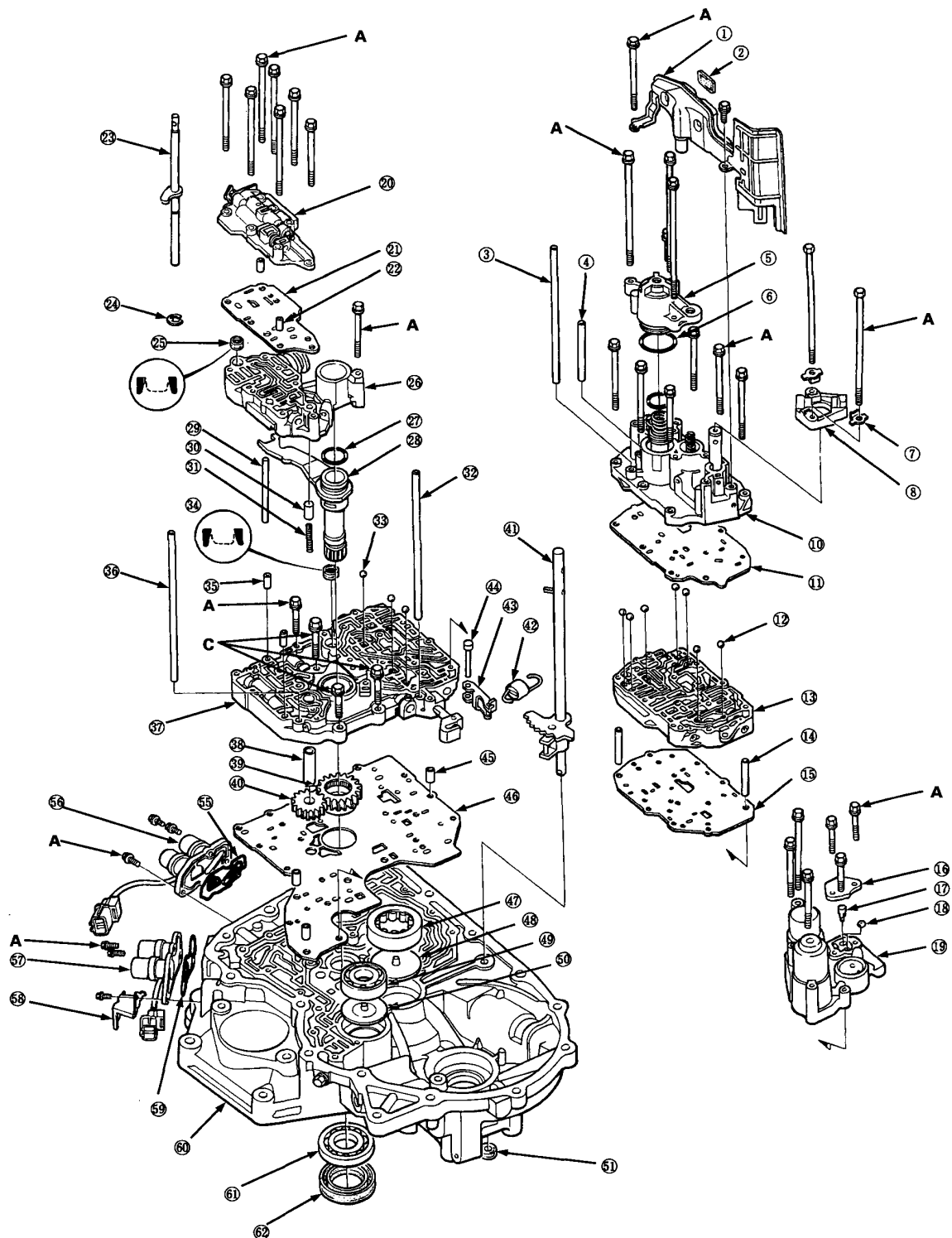
- ㊵ O-RINGS Replace.
- ㊶ COUNTERSHAFT
- ㊷ SNAP RING
- ㊸ COLLAR
- ㊹ THRUST NEEDLE BEARING
- ㊺ MAINSHAFT 4TH/REVERSE GEAR
- ㊻ NEEDLE BEARINGS
- ㊼ THRUST NEEDLE BEARING
- ㊽ 4TH GEAR COLLAR
- ㊾ 3RD/4TH CLUTCH ASSEMBLY
- ㊿ 3RD GEAR COLLAR
- ① THRUST NEEDLE BEARING
- ② NEEDLE BEARING
- ③ MAINSHAFT 3RD GEAR
- ④ THRUST NEEDLE BEARING
- ⑤ O-RINGS Replace.
- ⑥ MAINSHAFT
- ⑦ SEALING RINGS, 35 mm
- ⑧ SEALING RING, 29 mm
- ⑨ NEEDLE BEARING
- ⑩ SET RING
- ⑪ REVERSE IDLER GEAR SHAFT HOLDER
- ⑫ NEEDLE BEARING
- ⑬ OIL SEAL Replace.
- ⑭ TRANSMISSION HOUSING OIL SEAL Replace.
- ⑮ THRUST SHIM Selective part
- ⑯ BEARING OUTER RACE
- ⑰ TRANSMISSION HOUSING GASKET Replace.
- ⑱ DOWEL PIN
- ⑲ SNAP RING
- ㉑ TRANSMISSION HOUSING MAINSHAFT BEARING
- ㉒ TRANSMISSION HOUSING SECONDARY SHAFT BEARING
- ㉓ TRANSMISSION HOUSING COUNTERSHAFT BEARING
- ㉔ REVERSE IDLER GEAR
- ㉕ DIFFERENTIAL ASSEMBLY
- ㉖ BEARING OUTER RACE
- ㉗ TORQUE CONVERTER HOUSING OIL SEAL Replace.
- ㉘ TORQUE CONVERTER HOUSING

TORQUE SPECIFICATIONS

Ref No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg·m , 9 lb-ft)	6 x 1.0 mm	
B	14 N·m (1.4 kg·m , 10 lb-ft)	6 x 1.0 mm	

Illustrated Index

Torque Converter Housing





- ① ATF STRAINER
- ② MAGNET
- ③ OIL FEED PIPE
- ④ OIL FEED PIPE
- ⑤ 4TH ACCUMULATOR COVER
- ⑥ O-RING Replace.
- ⑦ LOCK WASHER Replace.
- ⑧ SERVO DETENT BASE
- ⑨ SERVO BODY
- ⑩ SERVO SEPARATOR PLATE
- ⑪ CHECK BALL
- ⑫ SECONDARY VALVE BODY
- ⑬ DOWEL PIN
- ⑭ SECONDARY SEPARATOR PLATE
- ⑮ ACCUMULATOR BODY COVER
- ⑯ 1ST ACCUMULATOR CHOKE
- ⑰ CHECK BALL
- ⑱ 1ST/2ND ACCUMULATOR BODY
- ⑲ THROTTLE VALVE BODY
- ⑳ THROTTLE SEPARATOR PLATE
- ㉑ DOWEL PIN
- ㉒ THROTTLE CONTROL SHAFT
- ㉓ E RING Replace.
- ㉔ FILTER Replace.
- ㉕ REGULATOR VALVE BODY
- ㉖ O-RING Replace.
- ㉗ STATOR SHAFT
- ㉘ STOPPER SHAFT
- ㉙ TORQUE CONVERTER CHECK VALVE
- ㉚ TORQUE CONVERTER CHECK VALVE SPRING

- ㉛ OIL FEED PIPE
- ㉜ CHECK BALL
- ㉝ FILTER Replace.
- ㉞ DOWEL PIN
- ㉟ OIL FEED PIPE
- ㊱ MAIN VALVE BODY
- ㊲ OIL PUMP DRIVEN GEAR SHAFT
- ㊳ OIL PUMP DRIVE GEAR
- ㊴ OIL PUMP DRIVEN GEAR
- ㊵ CONTROL SHAFT
- ㊶ DETENT SPRING
- ㊷ DETENT ARM
- ㊸ DETENT ARM SHAFT
- ㊹ DOWEL PIN
- ㊺ MAIN SEPARATOR PLATE
- ㊻ COUNTERSHAFT NEEDLE BEARING
- ㊼ OIL GUIDE PLATE
- ㊽ SECONDARY SHAFT BALL BEARING
- ㊾ OIL GUIDE PLATE
- ㊿ OIL SEAL
- ⑥⑤ SHIFT CONTROL SOLENOID FILTER/GASKET Replace.
- ⑥⑥ SHIFT CONTROL SOLENOID VALVE ASSEMBLY
- ⑥⑦ LOCK-UP CONTROL SOLENOID VALVE ASSEMBLY
- ⑥⑧ CONNECTOR HOLDER
- ⑥⑨ LOCK-UP CONTROL SOLENOID FILTER/GASKET Replace.
- ⑥⑩ TORQUE CONVERTER HOUSING
- ⑥⑪ MAINSHAFT BALL BEARING
- ⑥⑫ OIL SEAL Replace.

TORQUE SPECIFICATIONS

Ref No.	Torque Value	Bolt Size	Remarks
A	12 N·m (1.2 kg-m , 9 lb-ft)	6 x 1.0 mm	
C	18 N·m (1.8 kg-m , 13 lb-ft)	8 x 1.25 mm	

Right Side Cover

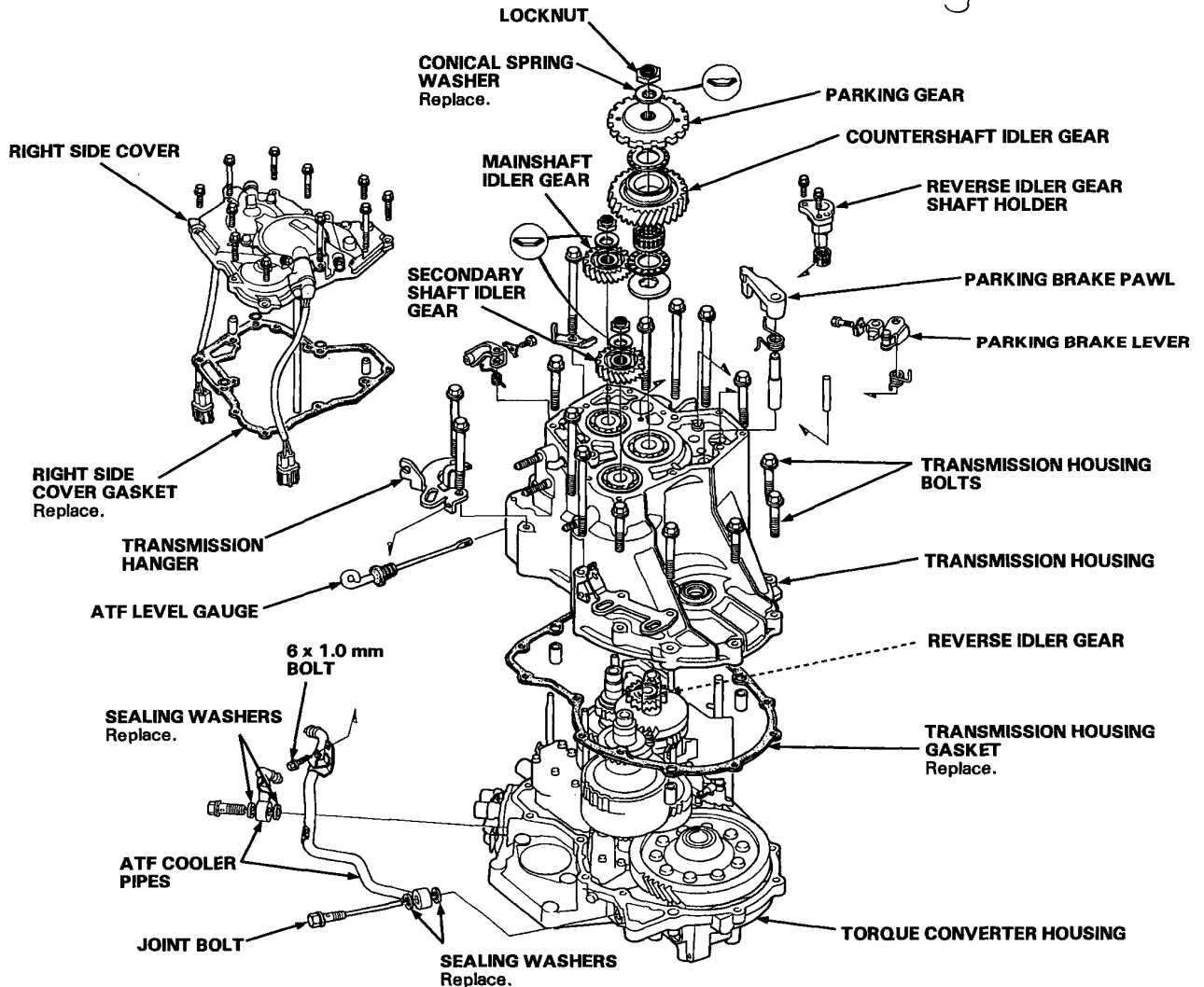
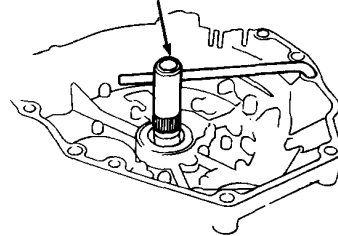
Removal

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner and dry with compressed air.
- Blow out all passages.
- When removing the transmission right side cover, replace the following:
 - Right side cover gasket
 - Lock washers
 - Transmission housing gasket
 - O-rings
 - Each shaft locknut and conical spring washer
 - Sealing washers

1. Remove the eleven bolts securing the right side cover, then remove the right side cover.
2. Slip the special tool onto the mainshaft.

**MAINSHAFT HOLDER
07GAB-PF50101**



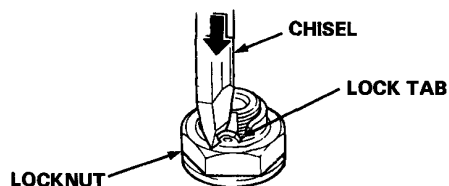


- Engage the parking brake pawl with the parking gear.
- Cut the lock tabs of each shaft locknut using a chisel as shown. Then remove the locknuts and conical spring washers from each shaft.

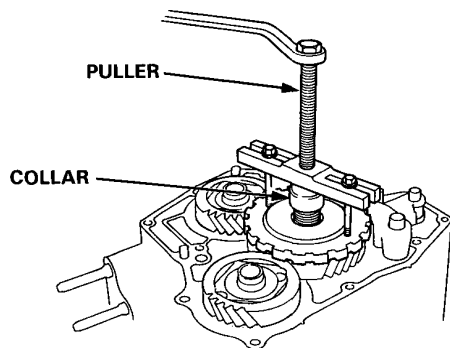
NOTE:

- Mainshaft locknut has left-hand threads.
- Clean the old locknuts; they are used to install the press fit idler gears on the mainshaft and secondary shaft and the parking gear on the countershaft.
- Keep all of the chiseled particles out of the transmission.

CAUTION: Always wear safety glasses.



- Remove the special tool from the mainshaft after removing the locknuts.
- Remove the parking gear using a puller from the countershaft as shown. Then remove the idler gears using a puller from the mainshaft and secondary shaft.



- Remove the countershaft idler gear, needle bearing, thrust needle bearing, and thrust washer from the countershaft.
- Remove the parking brake pawl, spring, shaft, and stopper from the housing.
- Remove the throttle control lever and spring from the throttle control shaft.
- Remove the ATF cooler pipe mounting bolt from the transmission hanger.
- Remove the transmission housing mounting bolts.

- Remove the reverse idler gear shaft holder.

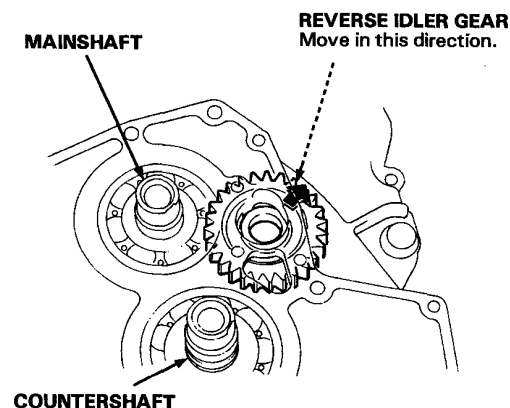
NOTE:

The steel ball does not pop out because it is staked in the shaft.

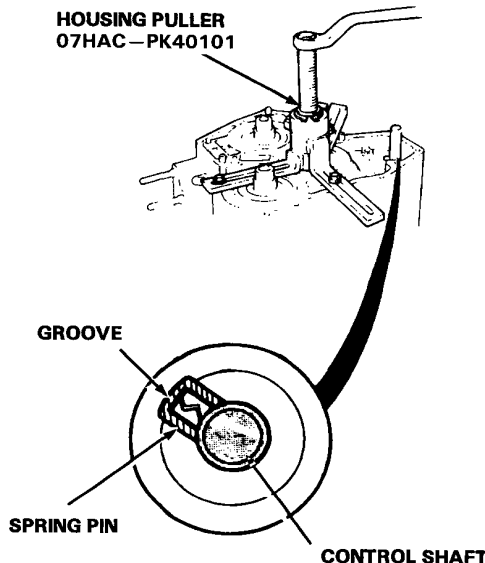
- Move the reverse idler gear to disengage it from the countershaft and mainshaft reverse gears as shown.

NOTE:

The transmission housing will not separate from the torque converter housing if the reverse idler gear is not removed.

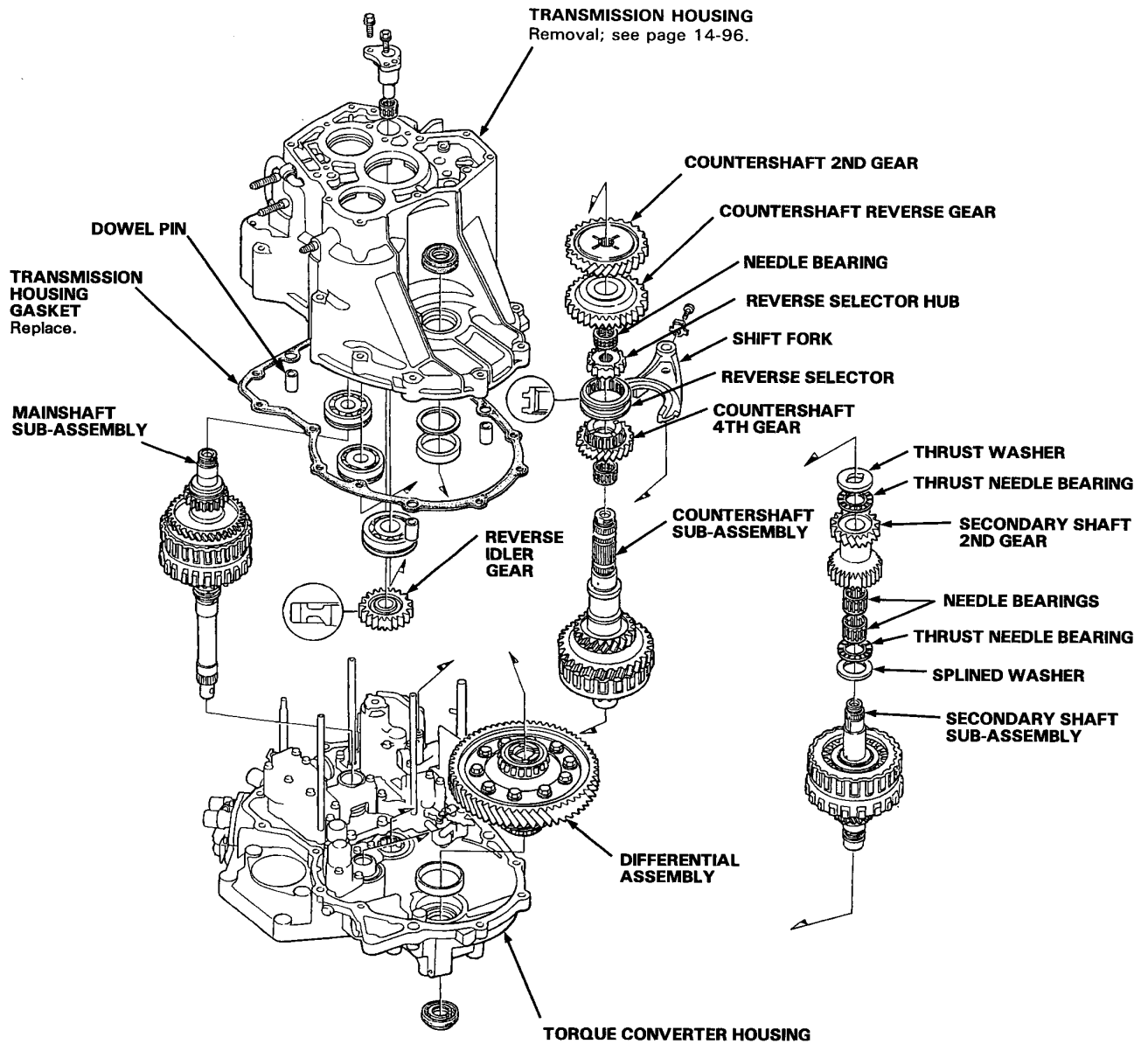


- Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.
- Install the special tool on the transmission housing, then remove the housing as shown.



Transmission Housing

Removal



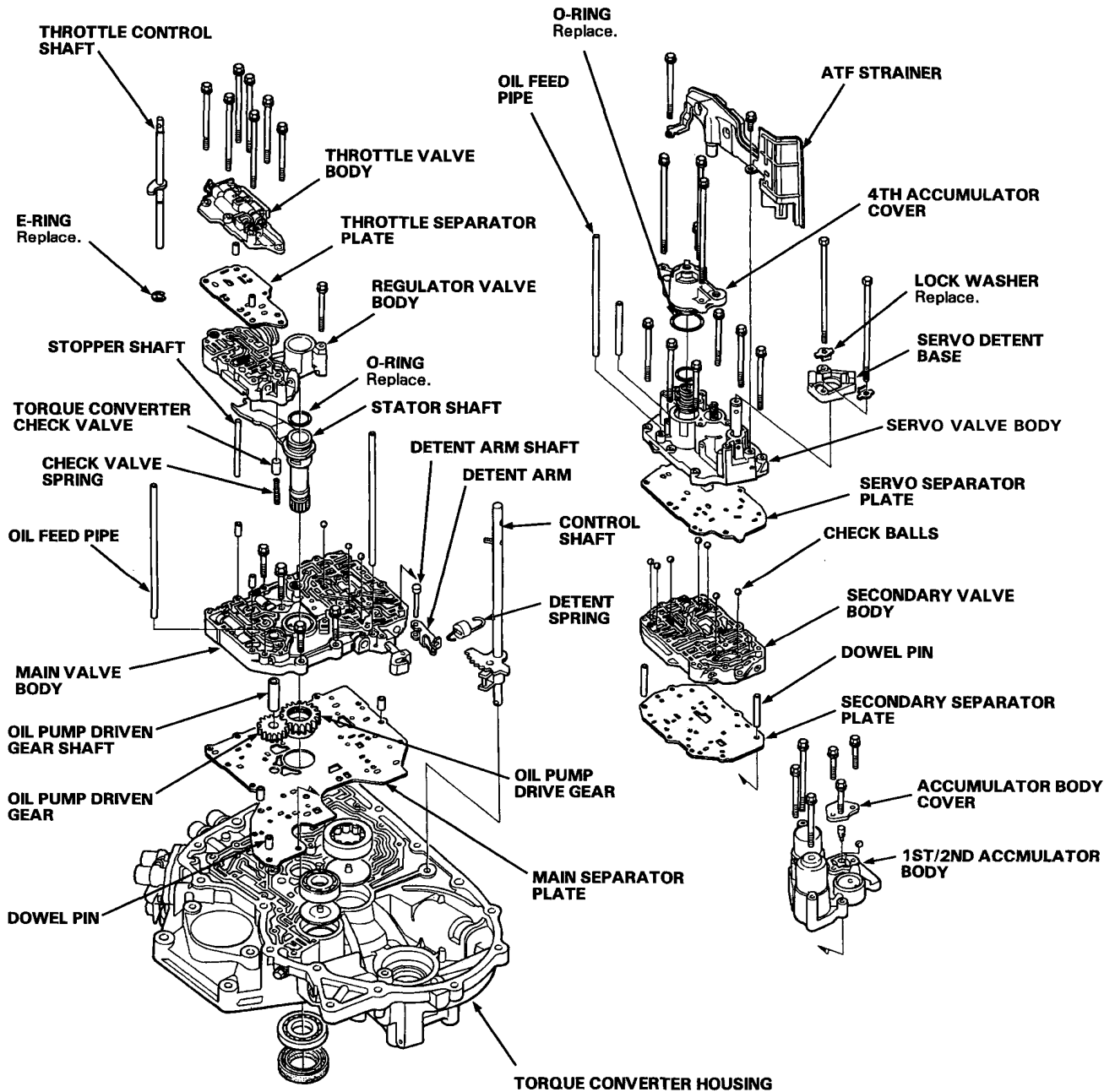


NOTE:

- 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:
 - Transmission housing gasket
 - Lock washer
1. Remove the transmission housing (see page 14-96).
 2. Remove the reverse idler gear from the transmission housing.
 3. Remove the countershaft 2nd gear, reverse gear, secondary shaft 2nd gear, thrust washer, and thrust needle bearing together from the countershaft and secondary shaft.
 4. Remove the lock bolt securing the shift fork, then remove the fork with the reverse selector from the countershaft.
 5. Remove the needle bearings, thrust needle bearing, and splined washer from the secondary shaft.
 6. Remove the secondary shaft sub-assembly.
 7. Remove the mainshaft sub-assembly.
 8. Remove the countershaft sub-assembly.
 9. Remove the differential assembly.

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 following:
 - O-rings
 - Lock washers

1. Remove the two bolts securing the servo detent base, then remove the servo detent base.
2. Remove the two bolts securing the ATF strainer, then remove the ATF strainer.
3. Remove the oil feed pipes from the servo body and main valve body.
4. Remove the three bolts securing the 4th accumulator cover, then remove the 4th accumulator cover.

NOTE:

The 4th accumulator cover is spring loaded, to prevent stripping the threads in the servo valve body, press down on the accumulator cover while unscrewing the bolts in a crisscross pattern.

5. Remove the seven bolts securing the servo valve body, then remove the servo valve body and separator plate.
6. Remove the secondary valve body and separator plate.
7. Remove the seven bolts securing the throttle valve body, then remove the throttle valve body and separator plate.
8. Remove the bolt securing the regulator valve body, then remove the regulator valve body.

9. Remove the stator shaft and stopper shaft.
10. Remove the detent spring from the detent arm, then remove the control shaft from the torque converter housing.
11. Remove the detent arm and detent arm shaft from the main valve body.
12. Remove the four bolts securing the main valve body, then remove the main valve body.
13. Remove the six bolts securing the 1st/2nd accumulator body, then remove the 1st/2nd accumulator body.
14. Remove the oil pump driven gear shaft, then remove the oil pump gears.
15. Remove the main separator plate with three dowel pins.

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:

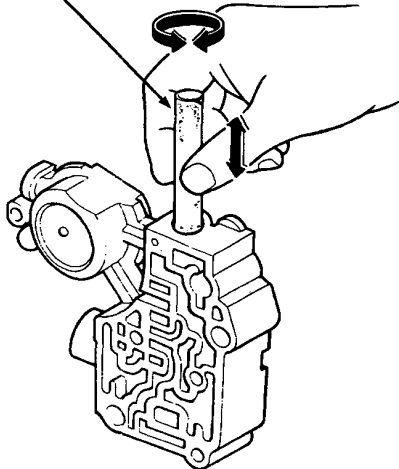
It may be necessary to use a small screwdriver to pry the valve free. Be careful not to scratch the bore with the screwdriver.

3. Inspect the valve for any scuff marks. Use the ATF-soaked #600 abrasive paper to polish off any burrs that are on the valve, then wash the valve in solvent and dry it with compressed air.
4. Roll up half a sheet of ATF-soaked #600 abrasive 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.

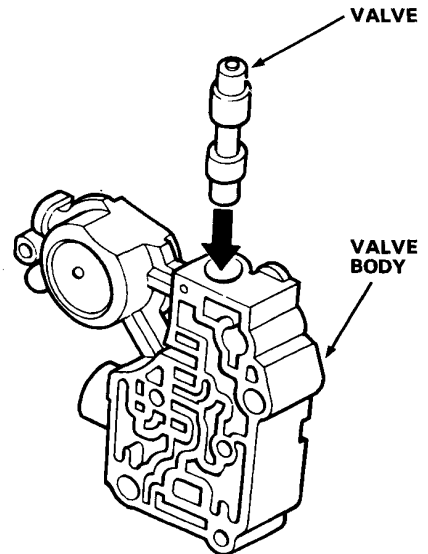
CAUTION:

The valve body is aluminum and doesn't require much polishing to remove any burrs.

ATF-soaked
600 abrasive
paper



5. Remove the ATF-soaked #600 abrasive paper. Thoroughly wash the entire valve body in solvent, then dry 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.



7. Remove the valve and thoroughly clean it and the valve body with solvent. Dry all parts with compressed air, then reassemble using ATF as a lubricant.



Valve

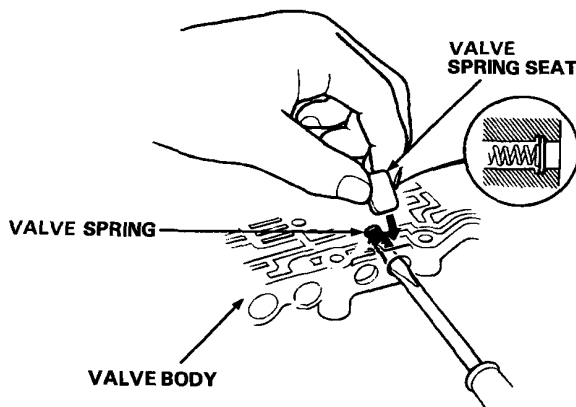
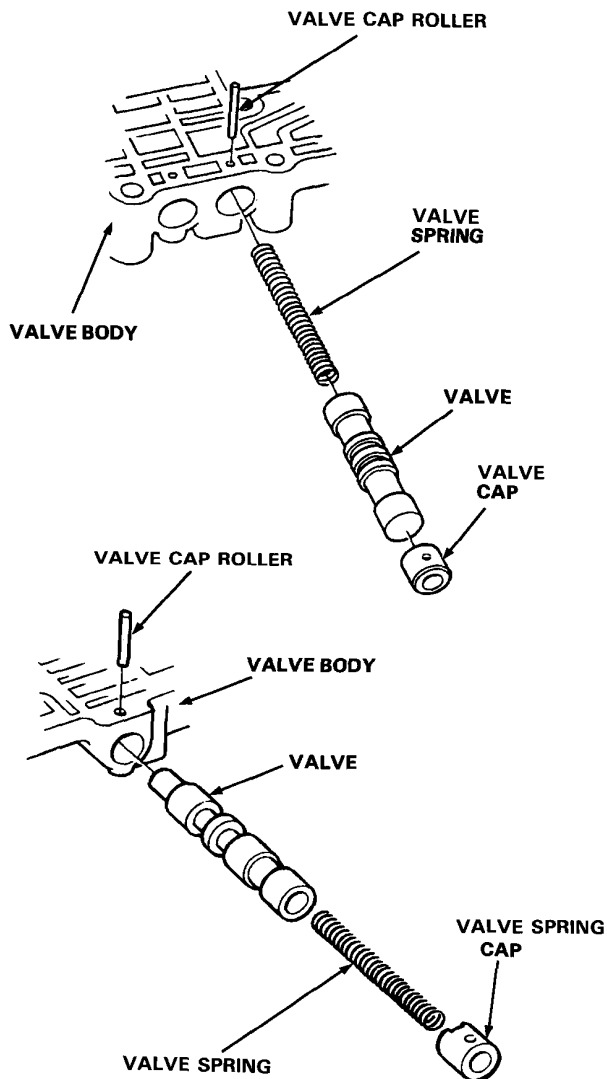
Assembly

NOTE:

Coat all parts with ATF before assembly.

Install the valve, valve spring, and valve cap or valve spring cap in the valve body, and secure with the valve cap roller.

Set the valve spring in the valve and install them in the valve body. Push the valve spring in with a screwdriver, then install the valve spring seat.



Valve Cap/Valve Spring Cap

Description

- Valve caps or valve spring caps with one projected tip and one flat end are installed with the flat end toward the inside of the valve body.
- Valve caps or valve spring 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.

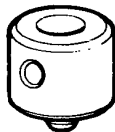
TOWARD OUTSIDE OF VALVE BODY



TOWARD INSIDE OF VALVE BODY

- Valve caps or valve spring 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.

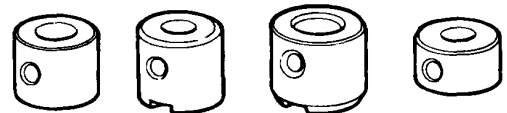
TOWARD OUTSIDE OF VALVE BODY



TOWARD INSIDE OF VALVE BODY

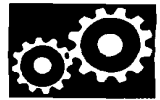
- Valve caps or valve spring caps with hollow ends are installed with the hollow away from the inside of the valve body.
- Valve caps or valve spring caps with notched ends are installed with the notch toward the inside of the valve body.
- Valve caps or valve spring caps with flat ends and a hole through the center are installed with the smaller hole toward the inside of the valve body.

TOWARD OUTSIDE OF VALVE BODY



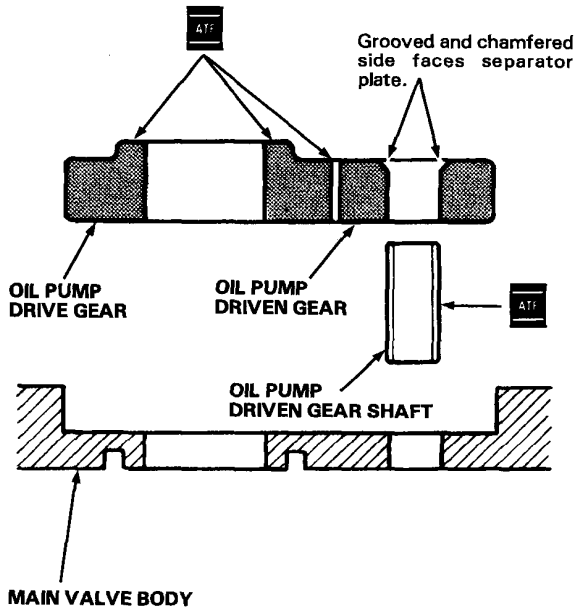
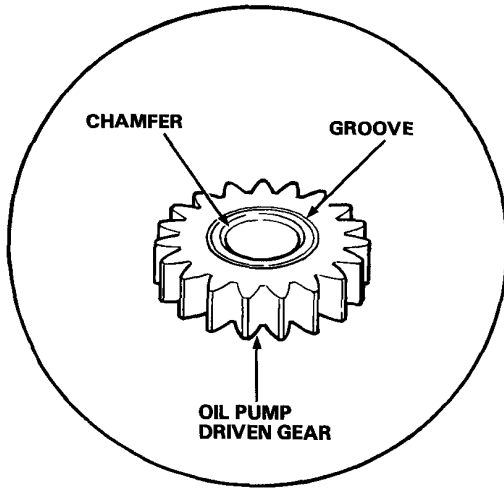
TOWARD INSIDE OF VALVE BODY

Oil Pump



Inspection

1. Install the oil pump drive gear, oil pump driven gear and oil pump driven gear shaft in the main valve body.



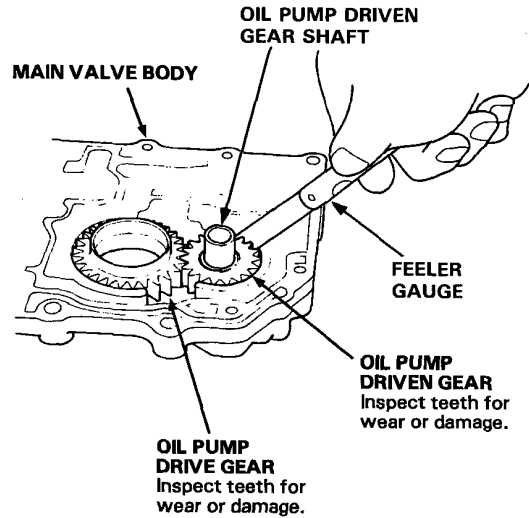
2. Measure the side clearance of the oil pump drive gear and oil pump driven gear.

Oil Pump Gears Side (Radial) Clearance:

Standard (New):

Oil Pump Drive gear
0.210—0.265 mm (0.0083—0.0104 in)

Oil Pump Driven gear
0.035—0.063 mm (0.0014—0.0025 in)

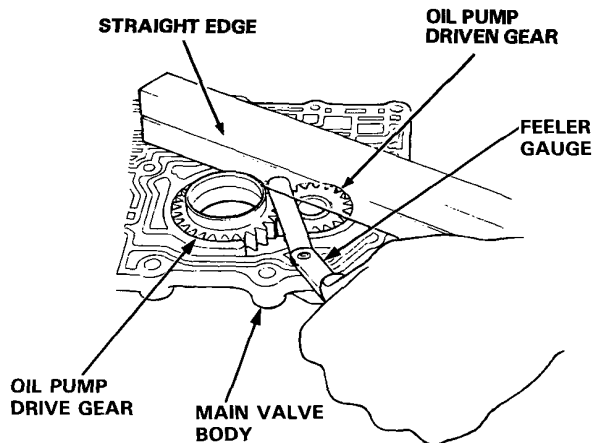


3. Remove the oil pump driven gear shaft. Measure the thrust clearance of the oil pump driven gear and oil pump drive gear-to-valve body.

Oil 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

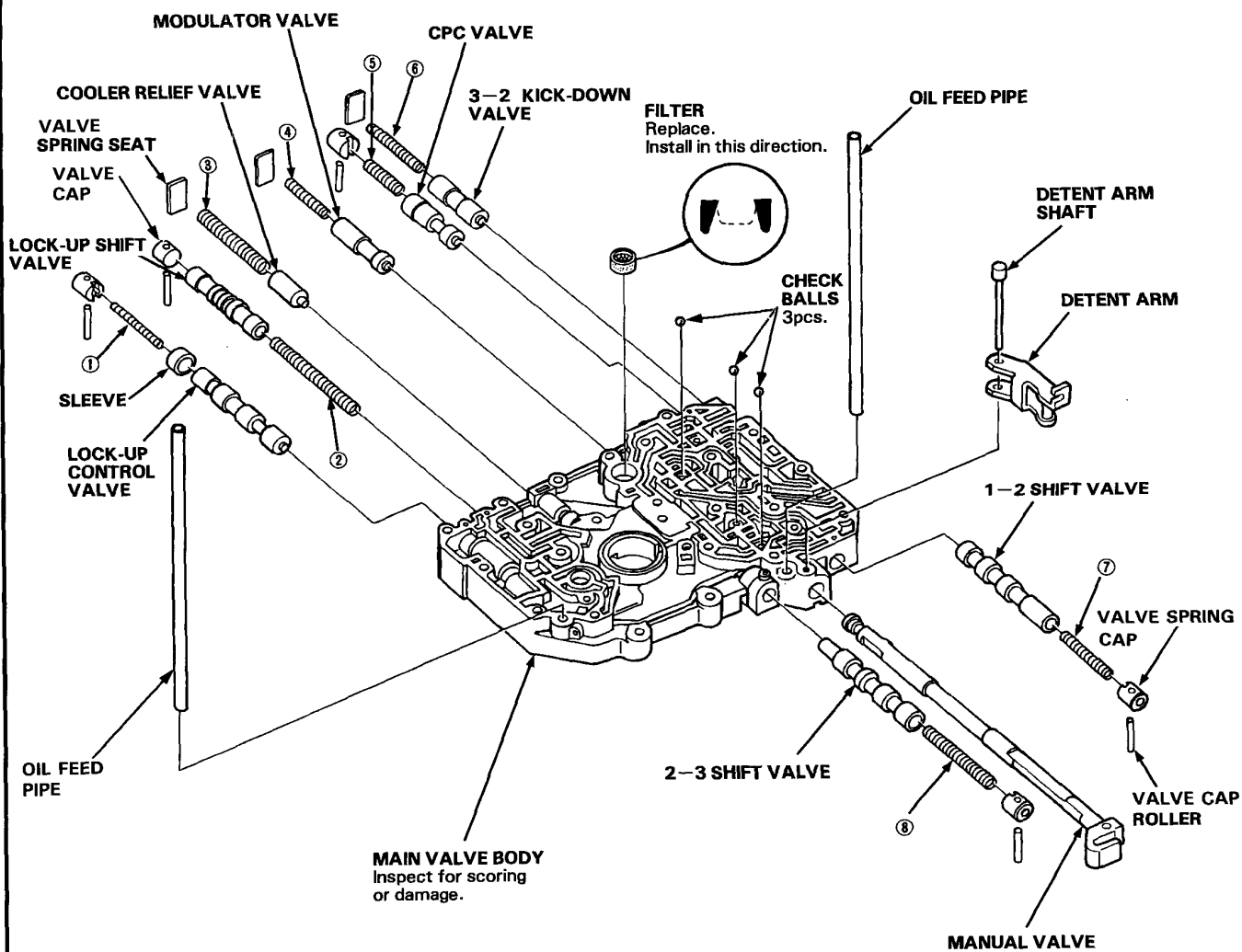
Disassembly/Inspection/Reassembly

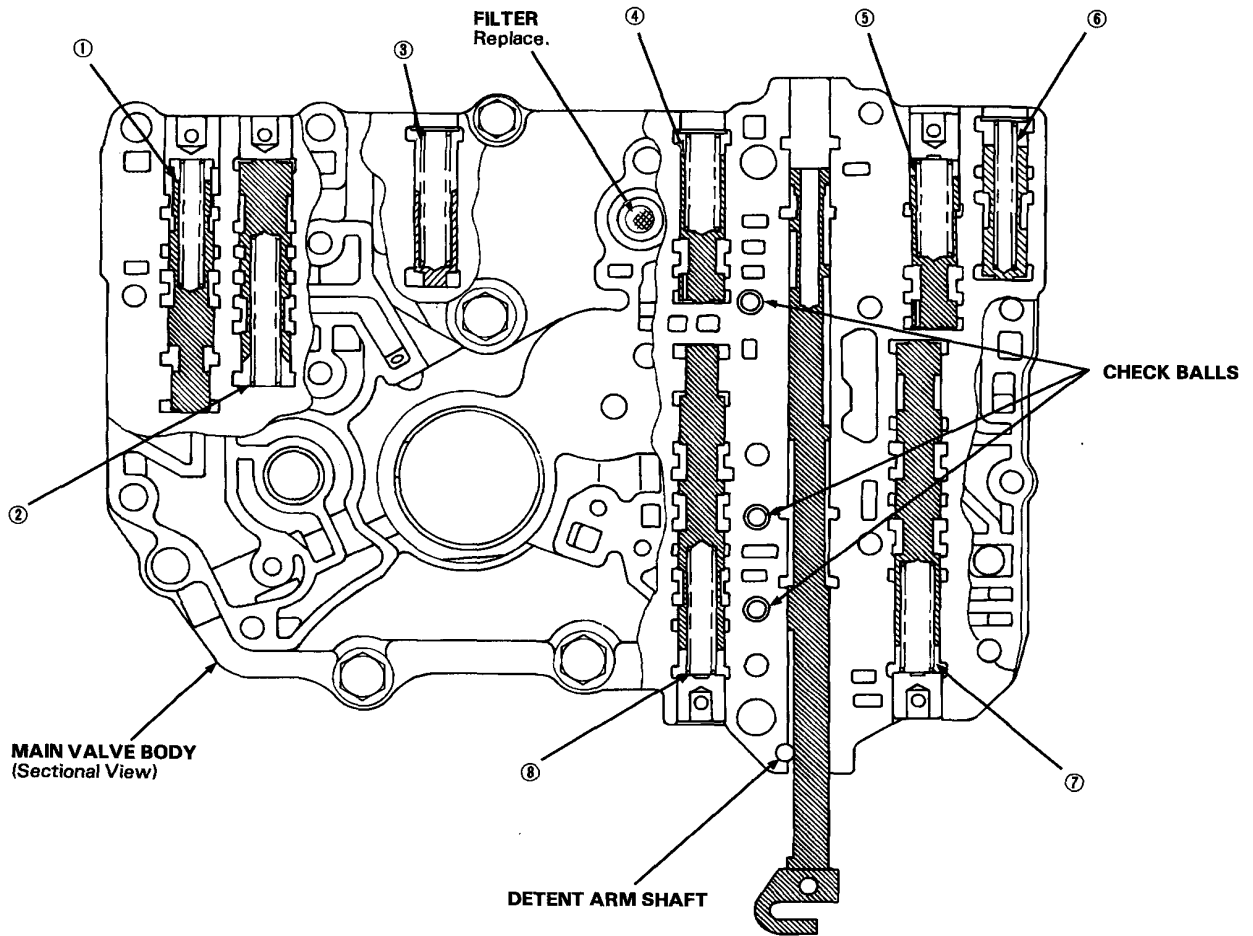
NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Replace 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 14-102.

CAUTION:

Do not use a magnet to remove the check balls; it may magnetize the balls.





VALVE SPRING SPECIFICATIONS

Unit: mm (in)

No.	Valve Springs	Standard (New)			
		Wire Diameter	Outside Diameter	Free Length	Number of Coils
①	Lock-up control valve spring	0.70 (0.028)	6.60 (0.260)	38.00 (1.496)	14.1
②	Lock-up shift valve spring	0.90 (0.035)	7.60 (0.299)	73.70 (2.902)	32.0
③	Cooler relief valve spring	1.10 (0.043)	8.40 (0.331)	46.80 (1.843)	17.0
④	Modulator valve spring	1.40 (0.055)	9.40 (0.370)	33.00 (1.299)	10.5
⑤	CPC valve spring	1.40 (0.055)	9.40 (0.370)	33.00 (1.299)	10.5
⑥	3-2 kick-down valve spring	1.20 (0.047)	7.10 (0.280)	46.90 (1.846)	20.6
⑦	1-2 shift valve spring	1.00 (0.039)	8.60 (0.339)	41.30 (1.626)	16.9
⑧	2-3 shift valve spring	0.90 (0.035)	7.60 (0.299)	57.00 (2.244)	26.8

Secondary Valve Body

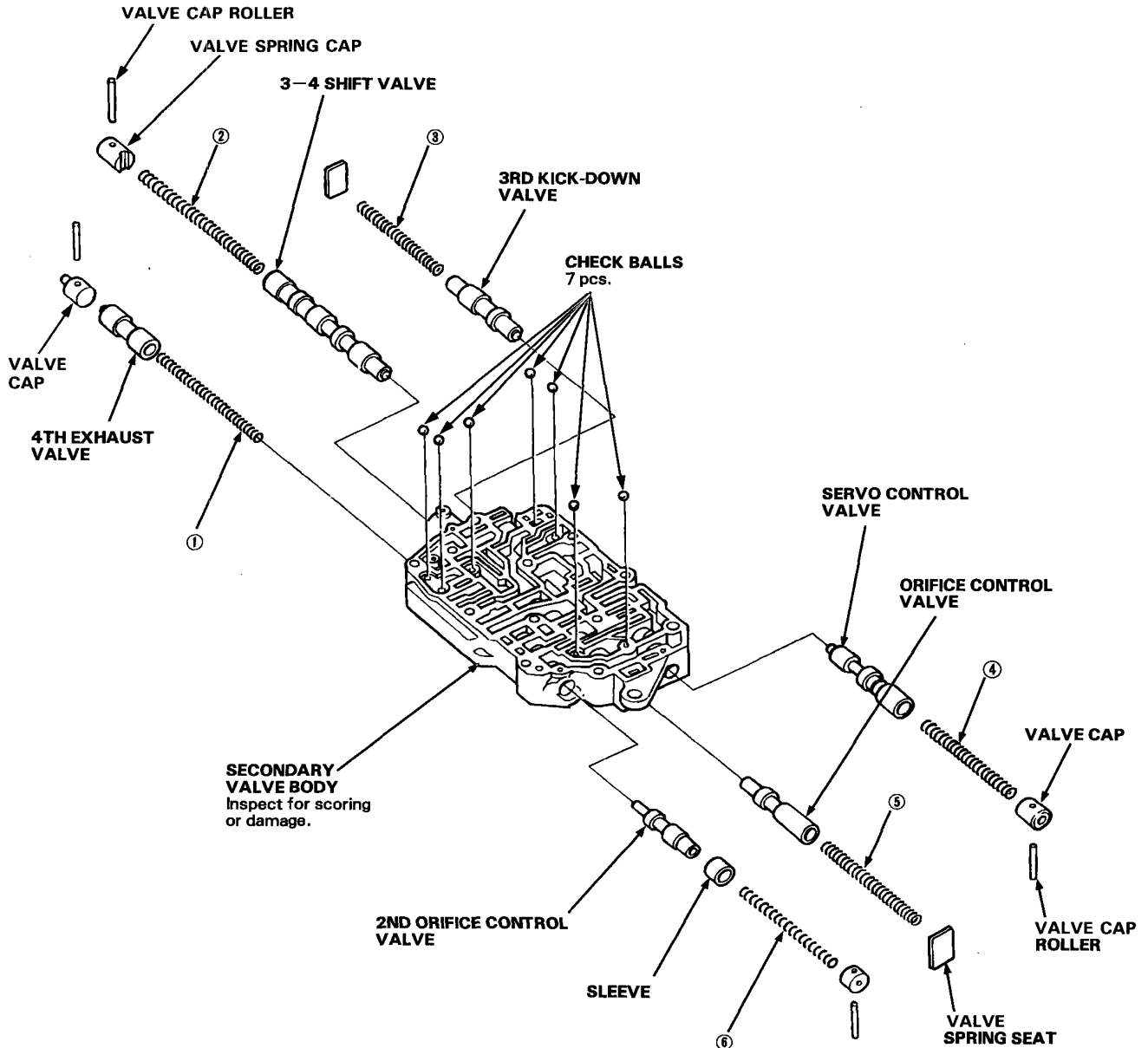
Disassembly/Inspection/Reassembly

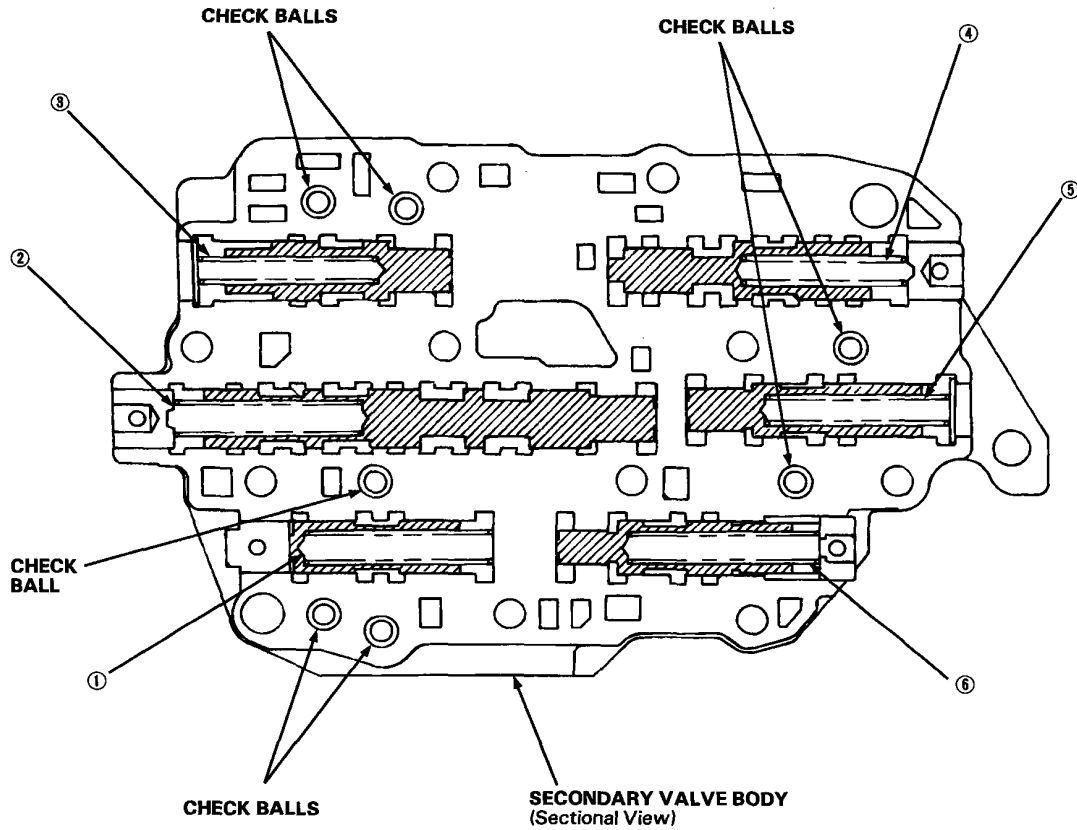
NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-102.
- Coat all parts with ATF before assembling.
- Replace the valve body as an assembly if any parts are worn or damaged.

CAUTION:

Do not use a magnet to remove the check balls; it may magnetize the balls.





VALVE SPRING SPECIFICATIONS

Unit: mm (in)

No.	Valve Springs	Standard (New)			
		Wire Diameter	Outside Diameter	Free Length	Number of Coils
①	4th exhaust valve spring	0.90 (0.035)	7.10 (0.280)	60.80 (2.394)	28.9
②	3-4 shift valve spring	0.90 (0.035)	7.60 (0.299)	57.00 (2.244)	26.8
③	3rd kick-down valve spring	1.10 (0.043)	7.60 (0.299)	48.30 (1.902)	23.3
④	Servo control valve spring	1.00 (0.039)	8.10 (0.319)	52.60 (2.071)	22.4
⑤	Orifice control valve spring	0.80 (0.031)	6.60 (0.260)	52.50 (2.067)	33.0
⑥	2nd orifice control valve spring	0.60 (0.024)	6.60 (0.260)	58.30 (2.295)	15.8

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 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 14-102.

1. Hold the regulator spring cap in place while removing the stopper bolt. Once the stopper bolt is removed, release the spring cap slowly.

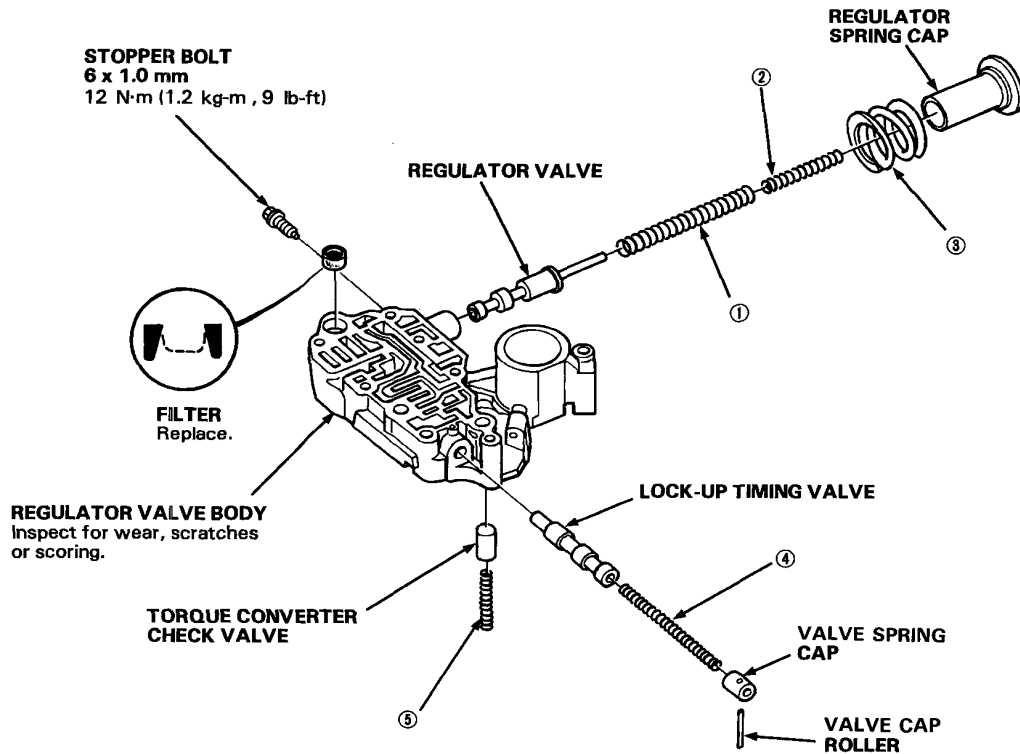
CAUTION:

The regulator spring cap can pop out when the lock bolt is removed.

2. Reassembly is the reverse order of disassembly.

NOTE:

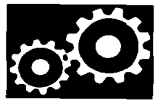
- Coat all parts with ATF.
- Align the hole in the regulator spring cap with the hole in the valve body; then press the spring cap into the valve body and tighten the stopper bolt.



VALVE SPRING SPECIFICATIONS

Unit: mm (in)

No.	Valve Springs	Standard (New)			
		Wire Diameter	Outside Diameter	Free Length	Number of Coils
①	Regulator valve spring A	1.80 (0.071)	14.70 (0.579)	86.50 (3.406)	16.5
②	Regulator valve spring B	1.80 (0.071)	9.60 (0.378)	44.00 (1.732)	12.7
③	Stator reaction spring	4.50 (0.177)	35.40 (1.394)	30.30 (1.193)	1.92
④	Lock-up timing valve spring	0.80 (0.031)	6.60 (0.260)	51.10 (2.012)	14.7
⑤	Torque converter check valve spring	1.10 (0.043)	8.40 (0.331)	36.40 (1.433)	12.0

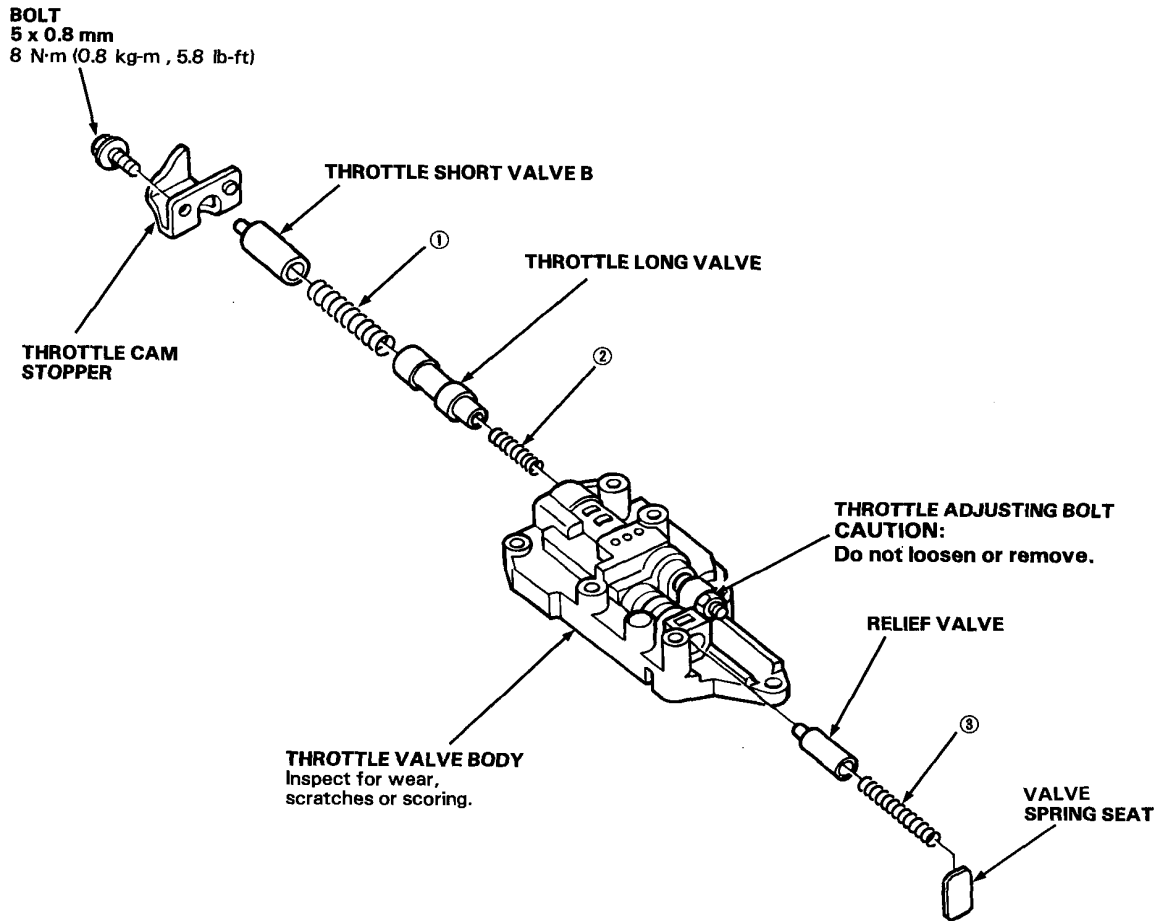


Throttle Valve Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Check all valves for free movement. If any fail to slide freely, see Valve Body Repair on page 14-102.
- Coat all parts with ATF before assembling.
- Replace the valve body as an assembly if any parts are worn or damaged.



VALVE SPRING SPECIFICATIONS

Unit: mm (in)

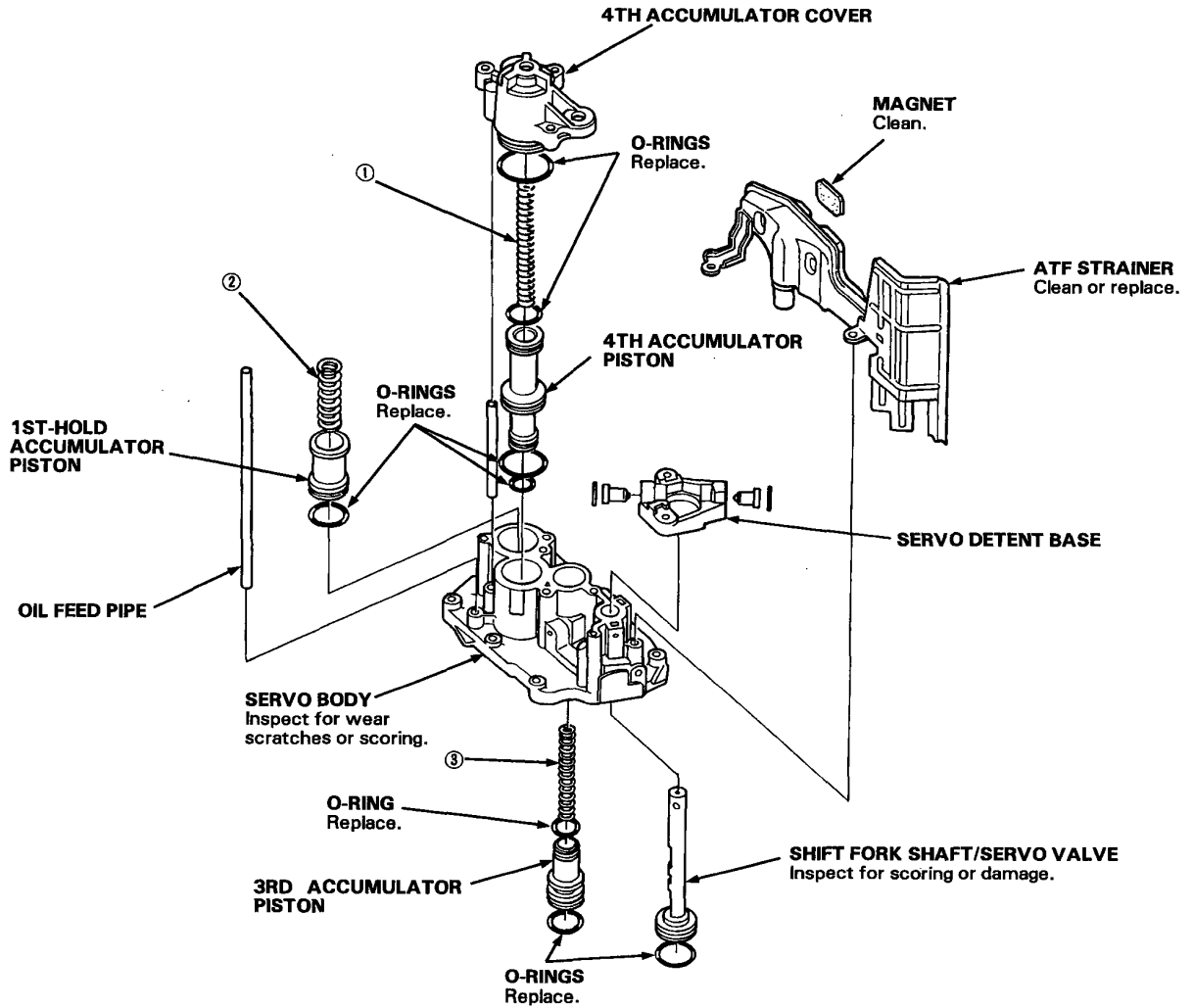
No.	Valve Springs	Standard (New)			
		Wire Diameter	Outside Diameter	Free Length	Number of Coils
①	Throttle valve B spring	1.40 (0.055)	8.50 (0.335)	41.50 (1.634)	10.5
		1.40 (0.055)	8.50 (0.335)	41.50 (1.634)	11.2
		1.40 (0.055)	8.50 (0.335)	41.60 (1.638)	12.4
②	Throttle valve B adjusting spring	0.80 (0.031)	6.20 (0.244)	30.00 (1.181)	8.0
		1.00 (0.039)	8.40 (0.331)	39.10 (1.539)	15.1
③	Relief valve spring				

Servo 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 servo valve body as an assembly if any parts are worn or damaged.
- Replace ATF strainer if its inlet opening is clogged.
- Coat all parts with ATF before assembly.



VALVE SPRING SPECIFICATIONS

Unit: mm (in)

No.	Valve Springs	Standard (New)			
		Wire Diameter	Outside Diameter	Free Length	Number of Coils
①	4th accumulator spring	2.90 (0.114)	22.00 (0.866)	90.10 (3.547)	10.9
②	1st-hold accumulator spring	4.00 (0.157)	25.00 (0.984)	64.70 (2.547)	7.3
③	3rd accumulator spring	2.60 (0.102)	17.50 (0.689)	104.50 (4.114)	18.0



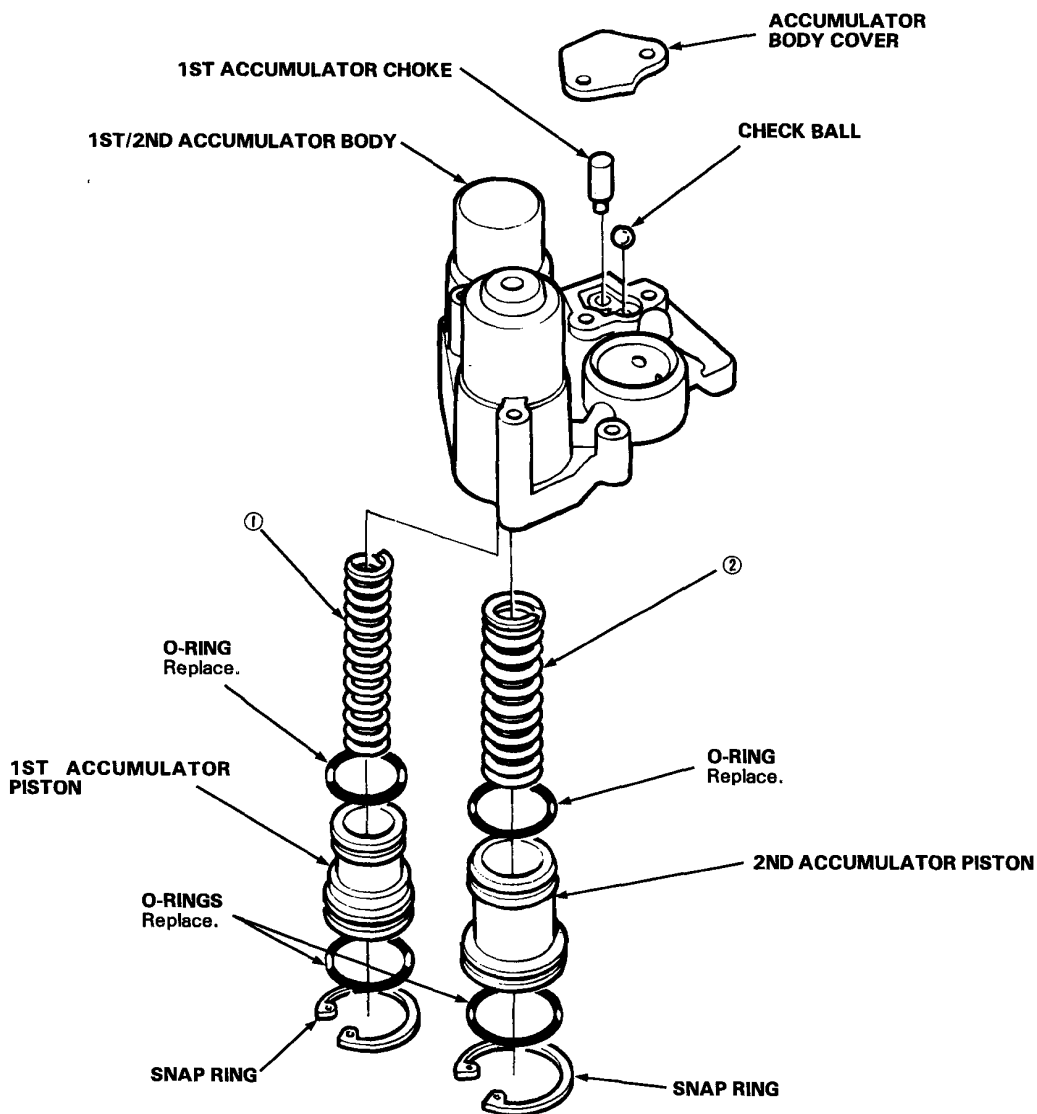
1st/2nd Accumulator Body

Disassembly/Inspection/Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air. Blow out all passages.
- Coat all parts with ATF before assembly.

CAUTION: Do not use a magnet to remove the check balls; it may magnetize the balls.



ACCUMULATOR SPRING SPECIFICATIONS

Unit: mm (in)

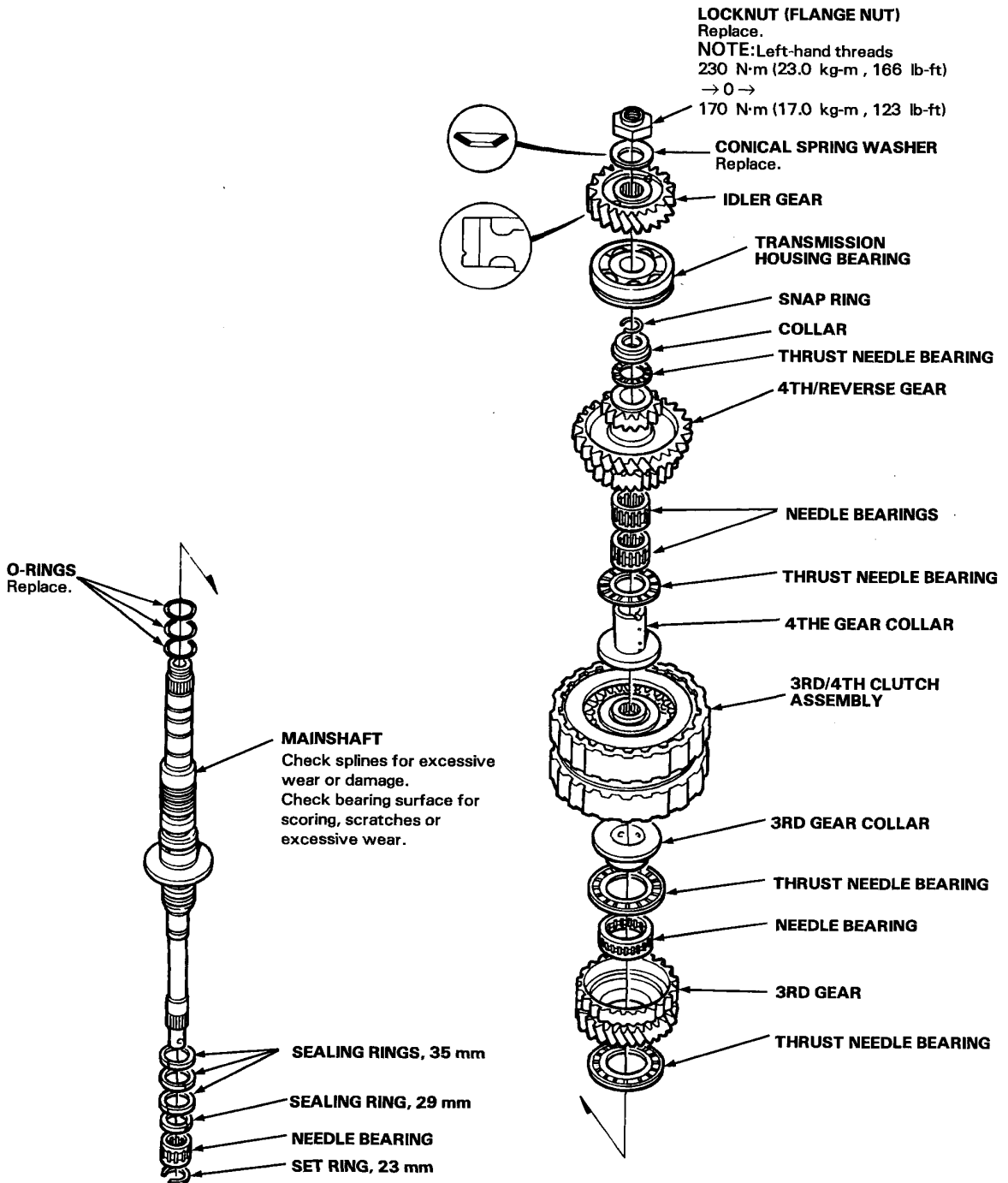
No.	Accumulator Springs	Standard (New)			
		Wire Diameter	Outside Diameter	Free Length	Number of Coils
①	1st accumulator spring	1.80 (0.071)	16.30 (0.642)	115.40 (4.543)	18.6
②	2nd accumulator spring	3.30 (0.130)	22.00 (0.866)	84.90 (3.343)	11.1

Mainshaft

Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install the thrust needle bearings with unrolled edge of bearing retainer facing washer.
- 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 damage to the O-rings.



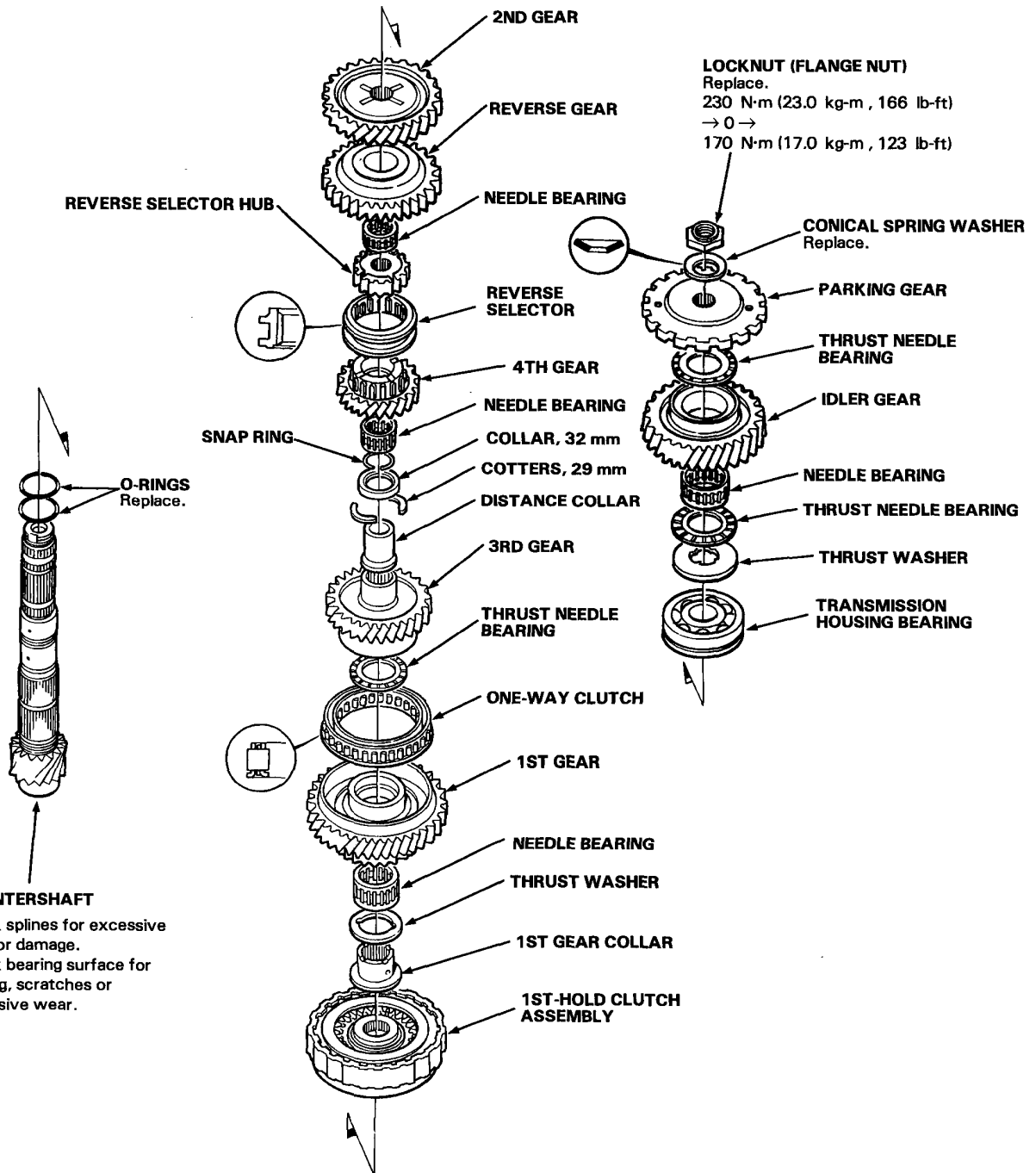


Countershaft

Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install the thrust needle bearings with unrolled edge of bearing retainer facing rough.
- 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 damage to the O-rings.



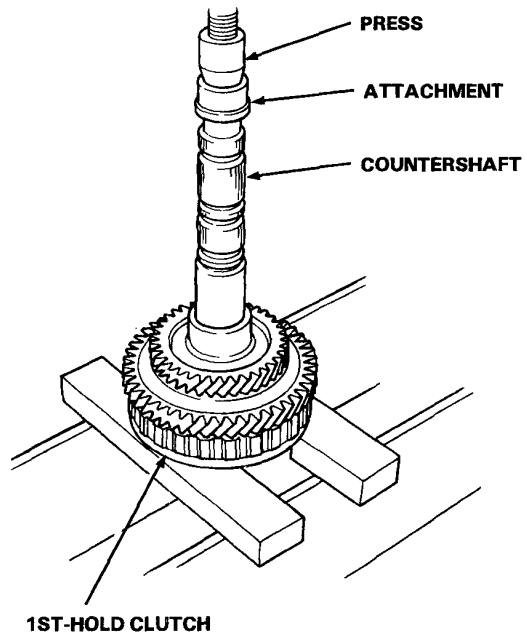
Countershaft

Removal

1. Using a press, press out the countershaft while supporting the 1st-hold clutch.

NOTE:

Place an attachment between a press and countershaft to prevent damage to the shaft.





Installation

NOTE:

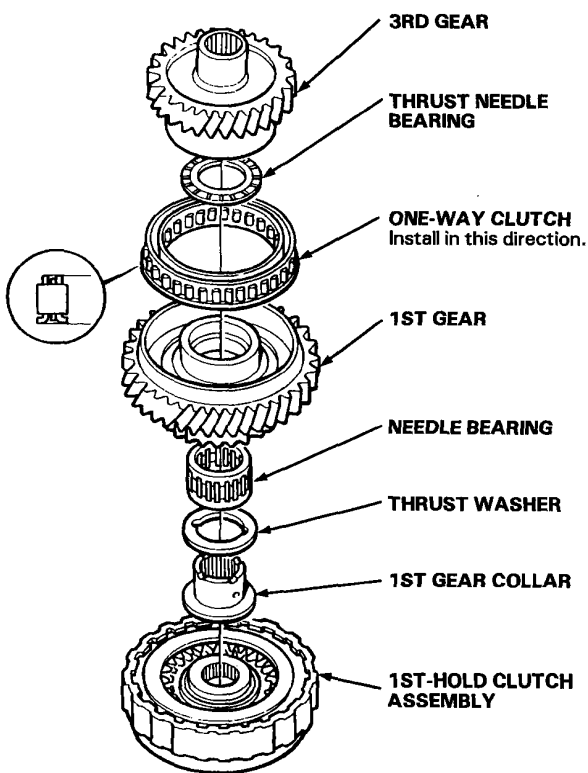
Lubricate all parts with ATF during assembly.

1. Install two new O-rings on the countershaft.

NOTE:

Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.

2. Assemble the 1st-hold clutch assembly, 1st gear collar, thrust washer, needle bearing, 1st gear, one-way clutch, thrust needle bearing and 3rd gear.

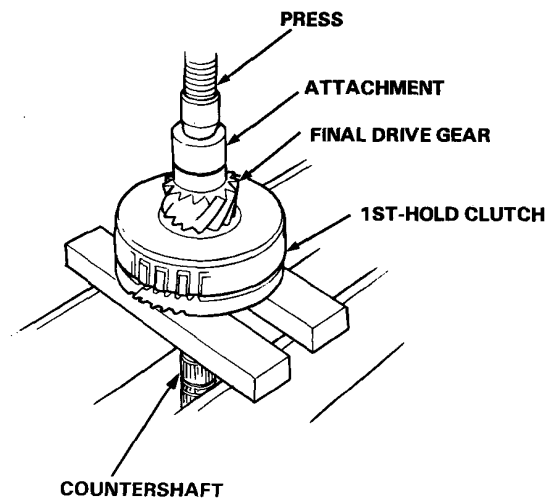


3. Install the above assembly on the countershaft.

4. Align the shaft splines with those of 3rd gear, then press the countershaft into 3rd gear with a press.

NOTE:

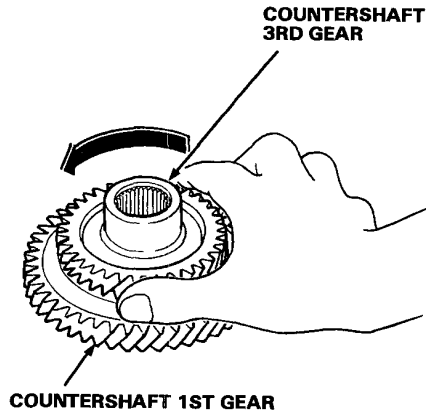
- Also align the shaft splines with those of the 1st-hold clutch when pressing the countershaft into the 3rd gear.
- Use an attachment between the shaft and a press to prevent damage to the countershaft.
- Stop pressing the countershaft when the 1st-hold clutch contacts the final drive gear.



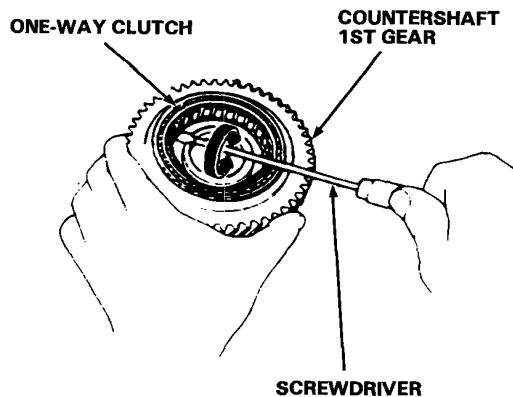
One-way Clutch

Disassembly/Inspection/Reassembly

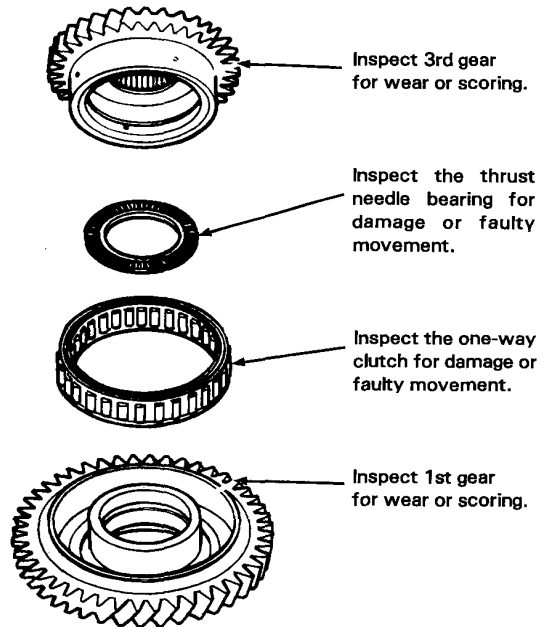
1. Separate countershaft 3rd gear from countershaft 1st gear by turning 3rd gear in the direction shown.



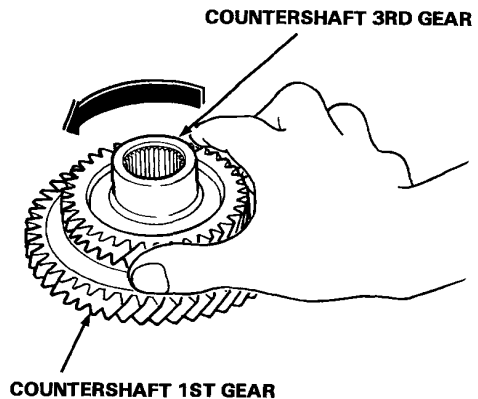
2. Remove the one-way clutch by prying it up with the end of a screwdriver.



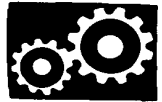
3. Inspect the parts as follows:



4. After the parts are assembled, hold countershaft 1st gear and turn countershaft 3rd gear in the direction shown to be sure it turns freely.



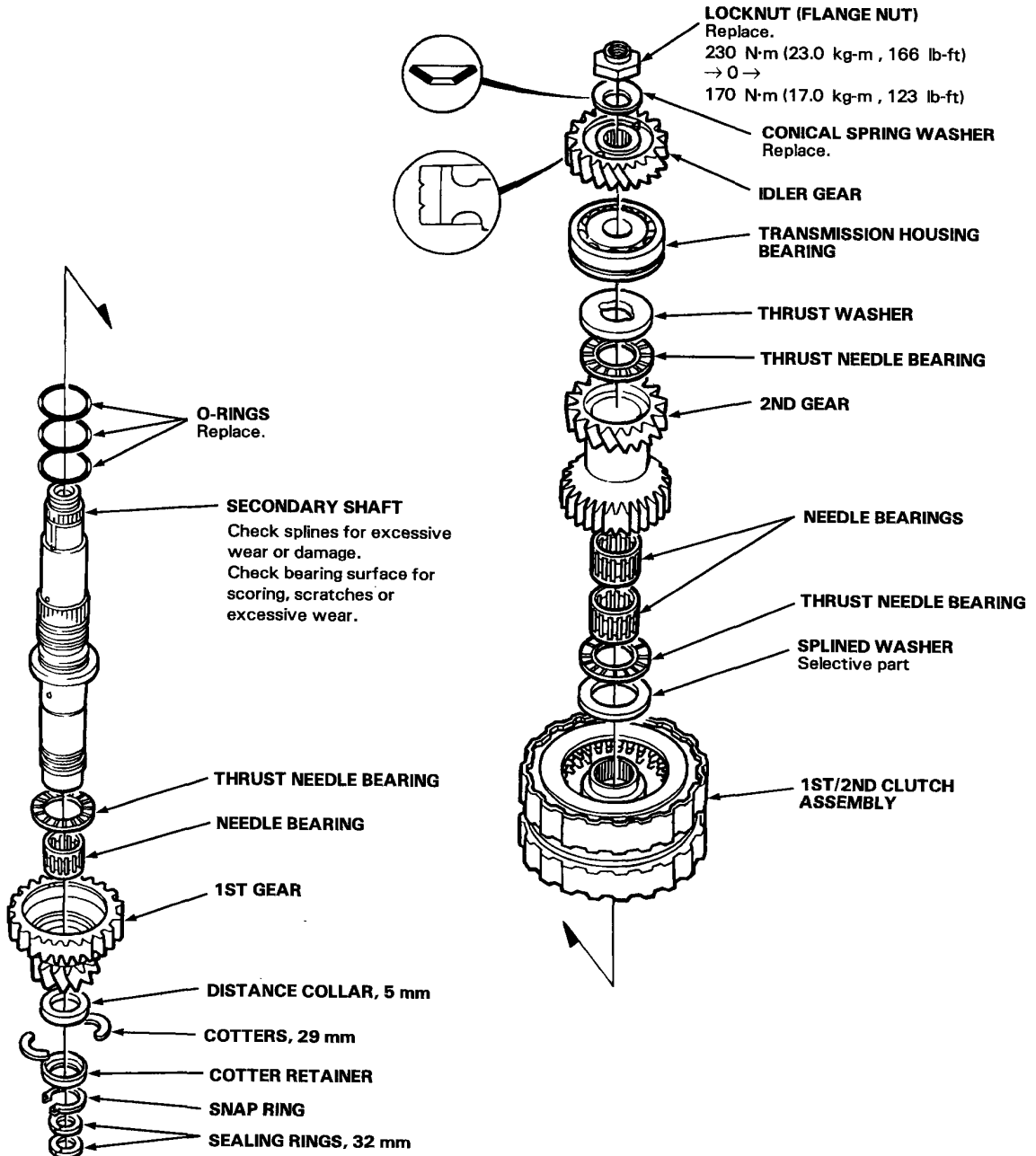
Secondary Shaft



Disassembly/Inspection/Reassembly

NOTE:

- Lubricate all parts with ATF during reassembly.
- Install the thrust needle bearings with unrolled edge of bearing retainer facing washer.
- Inspect the thrust needle bearings and needle bearings for galling and rough movement.
- Before installing the O-rings, wrap the shaft splines with tape to prevent damage to the O-rings.



Secondary Shaft

Inspection

- Clearance Measurement

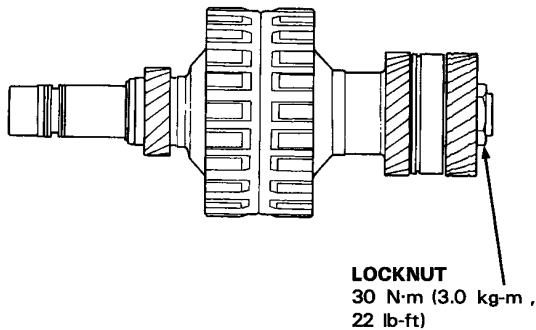
NOTE:

Lubricate all parts with ATF during assembly.

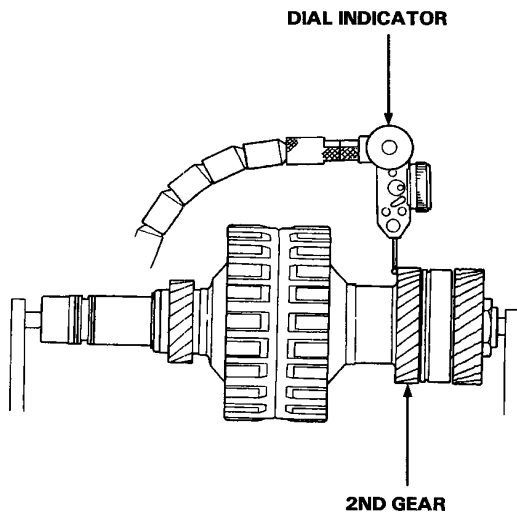
1. Remove the secondary shaft bearing from the transmission housing (see page 14-132).
2. Assemble the secondary shaft assembly without O-rings. Install the idler gear using a press, then torque the secondary shaft locknut to 30 N·m (3.0 kg·m, 22 lb-ft)

NOTE:

Do not install the O-rings during inspection.



3. Attach the dial indicator to 2nd gear as shown.

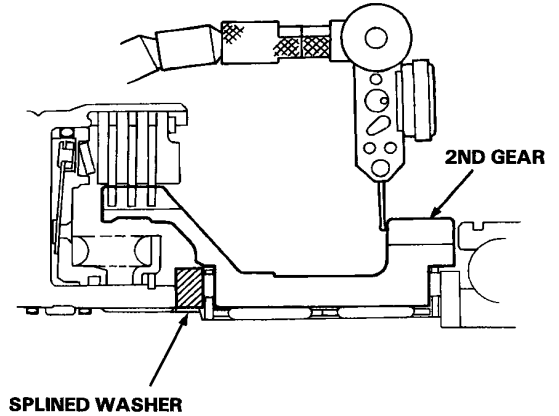


4. Measure 2nd gears axial clearance while moving 2nd gear.

STANDARD: 0.04–0.12 mm (0.002–0.005 in)

NOTE:

Take measurements in at least three places, and use the average as the actual clearance.



5. If the clearance is out of tolerance, remove the splined washer and measure the thickness.

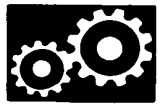
SPLINED WASHER

No.	Part Number	Thickness
1	90406—PX4—700	4.05 mm (0.159 in)
2	90407—PX4—700	4.10 mm (0.161 in)
3	90408—PX4—700	4.15 mm (0.163 in)
4	90409—PX4—700	4.20 mm (0.165 in)
5	90410—PX4—700	4.25 mm (0.167 in)
6	90411—PX4—700	4.30 mm (0.169 in)
7	90412—PX4—700	4.35 mm (0.171 in)
8	90413—PX4—700	4.40 mm (0.173 in)
9	90414—PX4—700	4.45 mm (0.175 in)

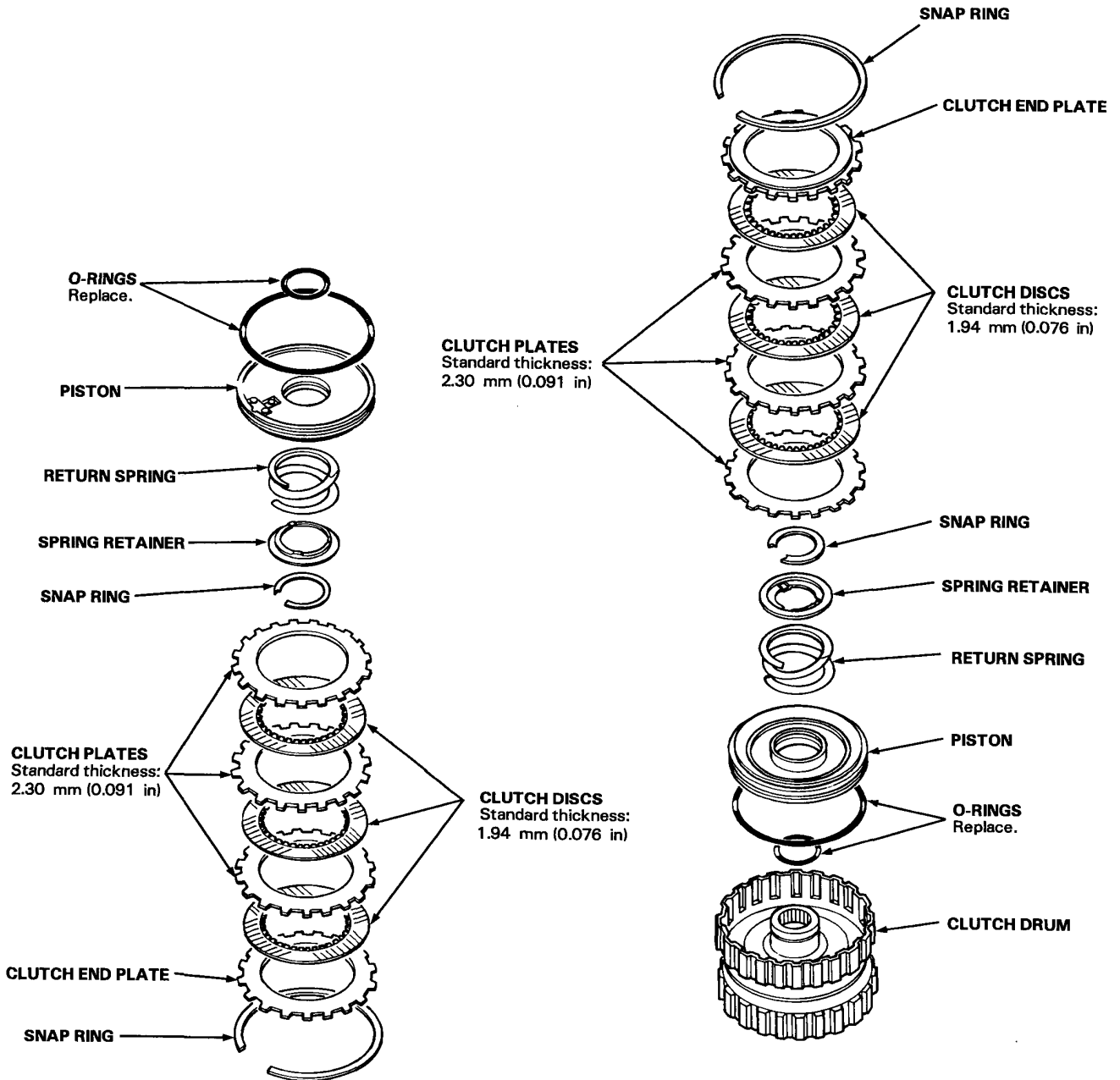
6. After replacing the splined washer, make sure that the clearance is within tolerance.

Clutch

Illustrated Index



3RD/4TH CLUTCH ASSEMBLY

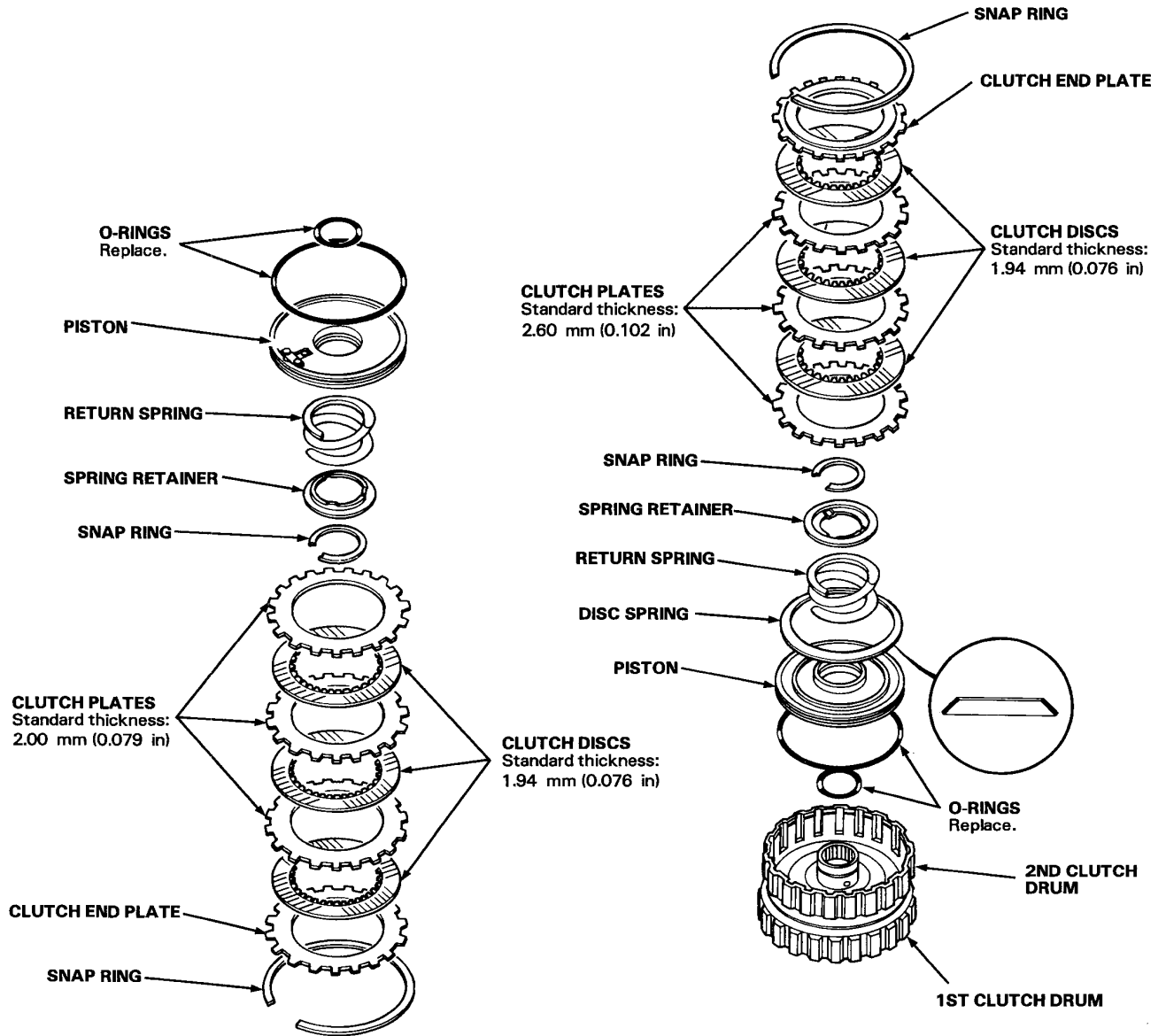


(cont'd)

Clutch

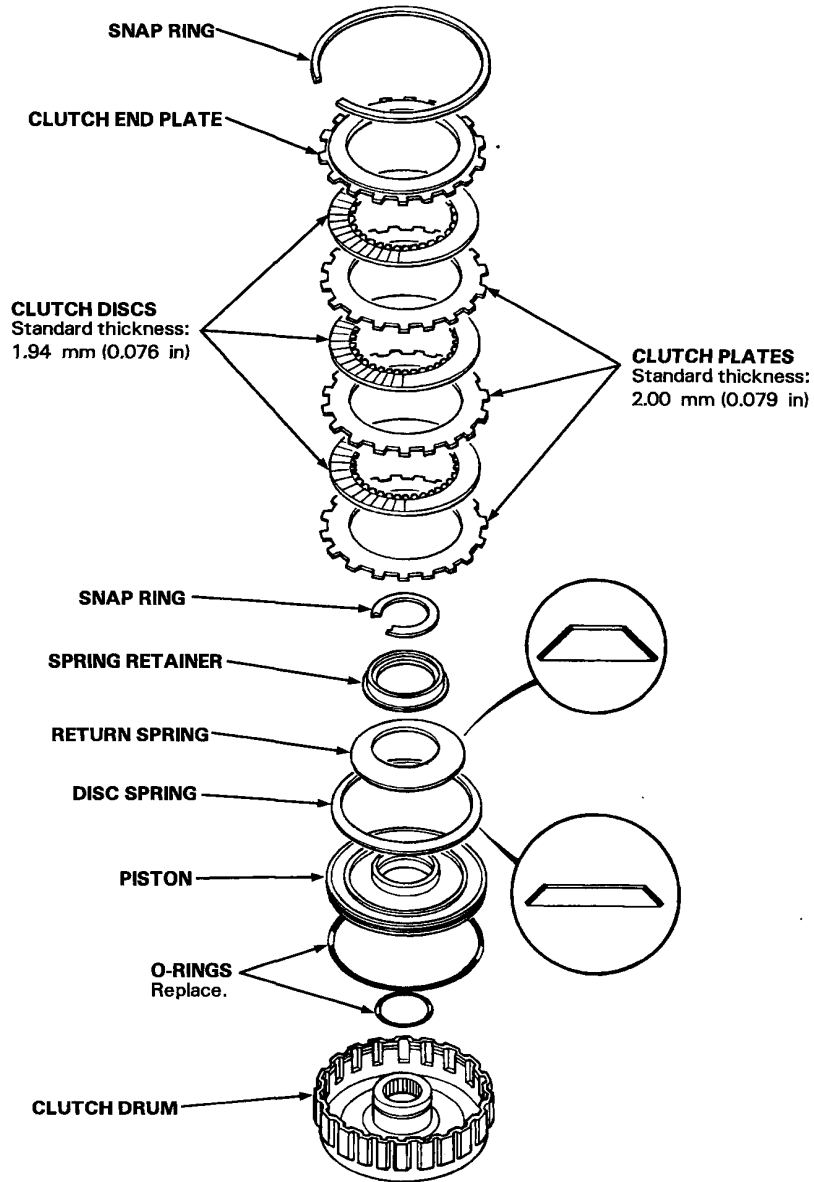
Illustrated Index (cont'd)

1ST/2ND CLUTCH ASSEMBLY





1ST-HOLD CLUTCH ASSEMBLY

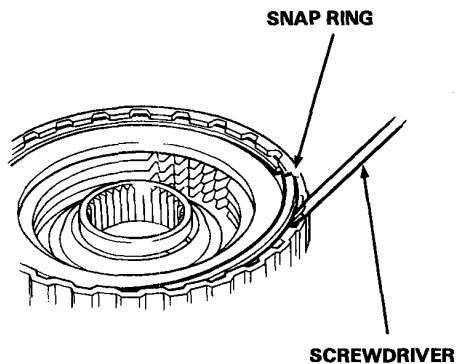


Clutch

Disassembly

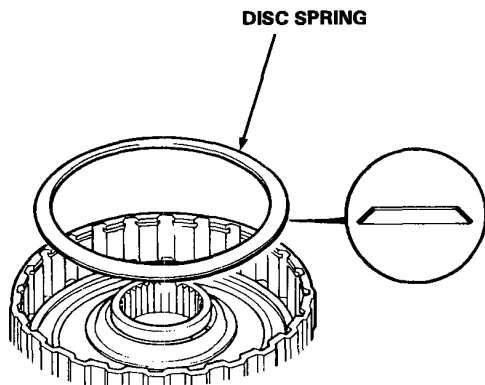
1. Remove the snap ring, then remove the clutch end plate, clutch discs and plates.

NOTE: For all clutches



2. Remove the disc spring.

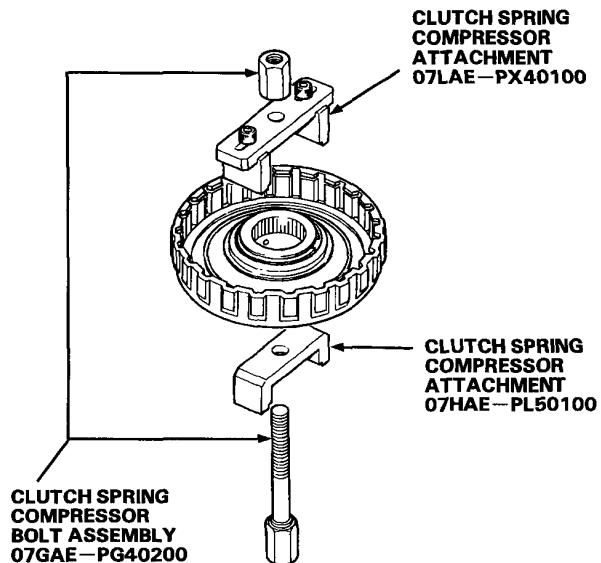
NOTE: For 1st-hold and 2nd clutches



3. Install the special tools as shown.

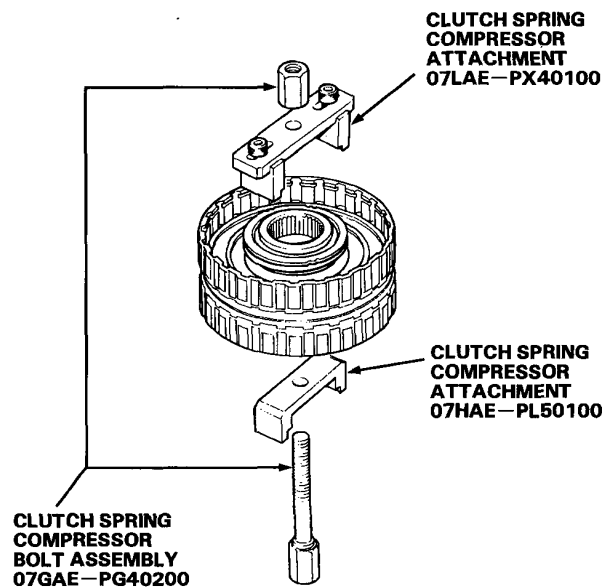
NOTE: For 1st-hold clutch

**CLUTCH SPRING COMPRESSOR SET
07LAE-PX40000**



NOTE: For 1st, 2nd, 3rd and 4th clutches.

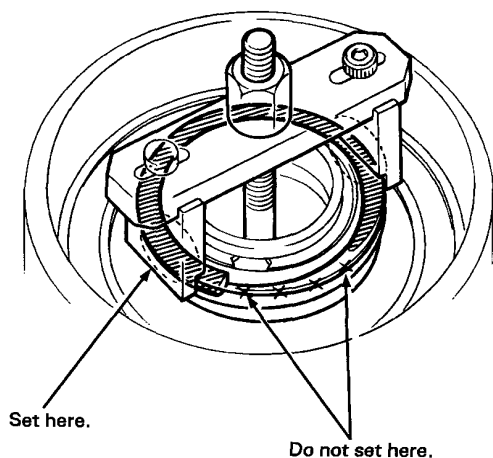
**CLUTCH SPRING COMPRESSOR SET
07LAE-PX40000**





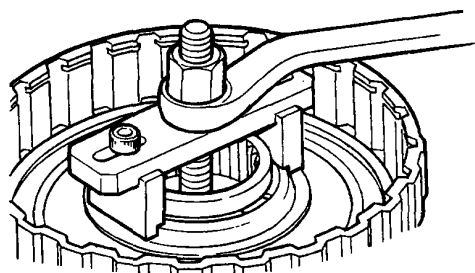
CAUTION:

If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



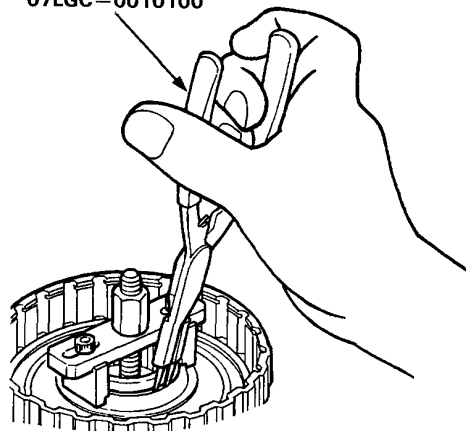
NOTE: Steps 4 thru 6 are for all clutches.

4. Compress the return spring.

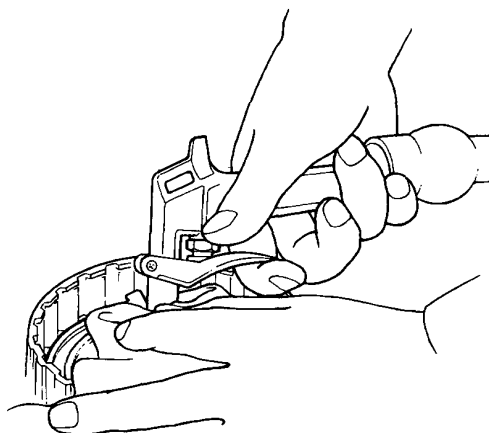


5. Remove the snap ring. Then remove the special tools, spring retainer and return spring.

SNAP RING PLIERS
07LGC-0010100



6. Wrap a shop rag around the clutch drum and apply air pressure to the oil passage to remove the piston. Place a finger tip on the other end while applying air pressure.



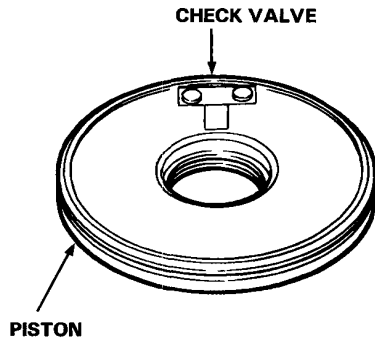
Clutch

Reassembly

NOTE:

- Clean all parts thoroughly in solvent or carburetor cleaner, and dry with compressed air.
- Blow out all passages.
- Lubricate all parts with ATF before assembly.

1. Inspect the piston for a loose check valve, if the check valve is loose, replace the piston.

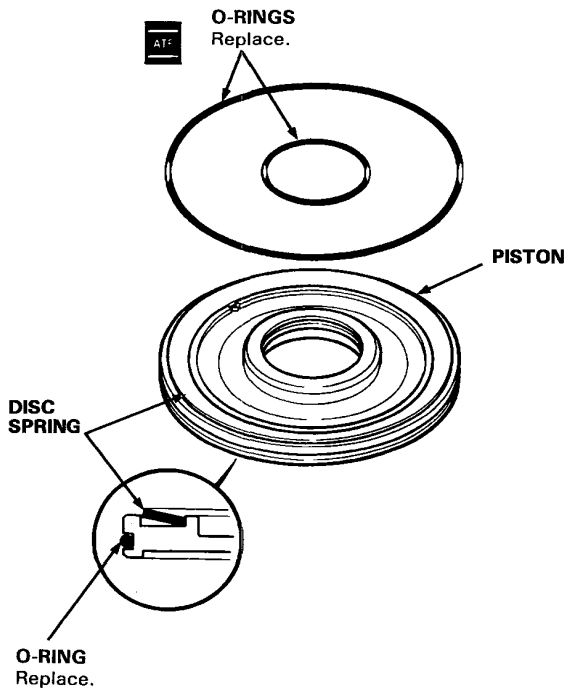


2. Be sure that the disc spring is securely staked.

NOTE:

For 1st, 3rd and 4th clutches

3. Install new O-rings on the piston.



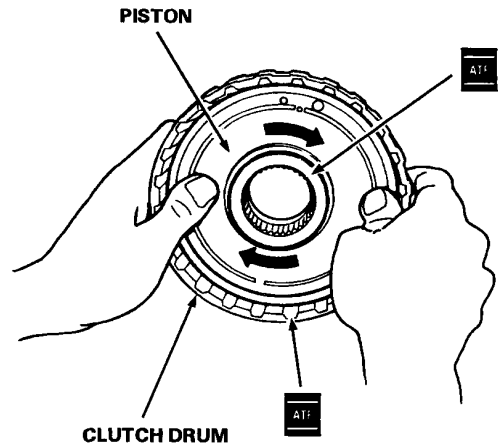
4. Install the piston in the clutch drum. Apply pressure and rotate to ensure proper seating.

NOTE:

- For all clutches
- Lubricate the piston O-ring with ATF before installing.

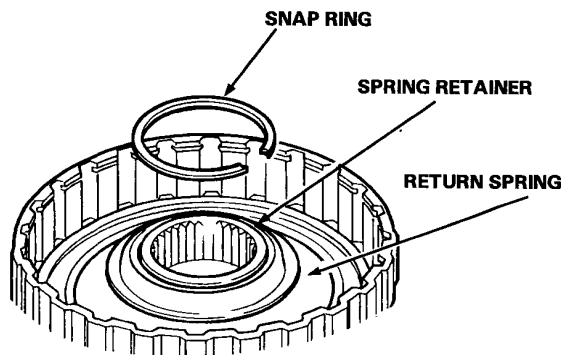
CAUTION:

Do not pinch O-ring by installing the piston with force.



5. Install the return spring and spring retainer and position the snap ring on the retainer.

NOTE: For all clutches

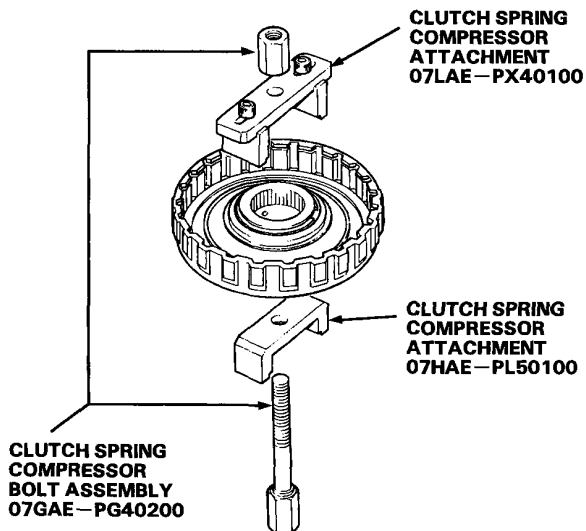




6. Install the special tools as shown.

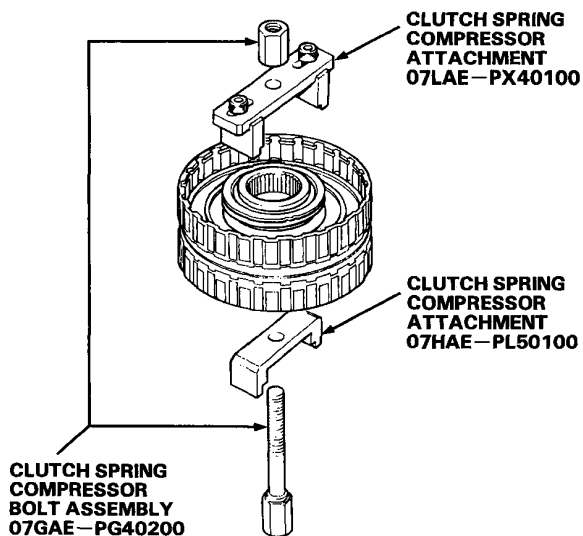
NOTE: For 1st-hold clutch

**CLUTCH SPRING COMPRESSOR SET
07LAE—PX40000**



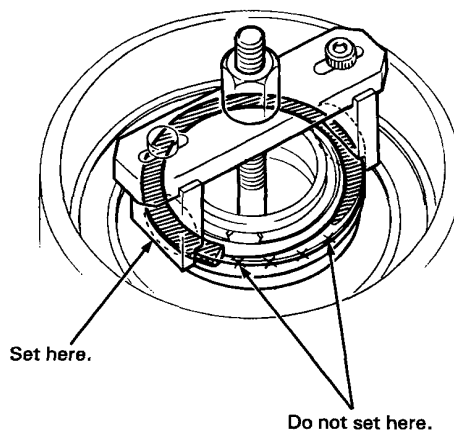
NOTE: For 1st, 2nd, 3rd and 4th clutches

**CLUTCH SPRING COMPRESSOR SET
07LAE—PX40000**



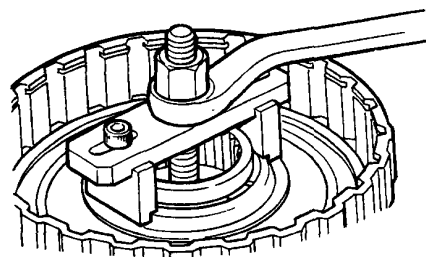
CAUTION:

If either end of the compressor attachment is set over an area of the spring retainer which is unsupported by the return spring, the retainer may be damaged.



NOTE: Steps 7 thru 9 are for all clutches.

7. Compress the return spring.



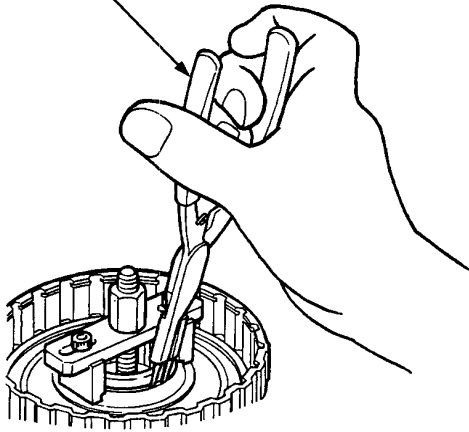
(cont'd)

Clutch

Reassembly (cont'd)

8. Install the snap ring.

SNAP RING PLIERS
07LGC-0010100

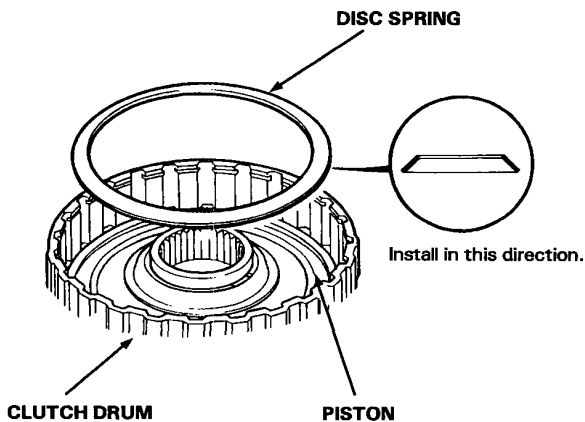


9. Remove the special tools.

10. Install the disc spring.

NOTE:

- For 1st-hold and 2nd clutches
- Install the disc spring in the direction shown.



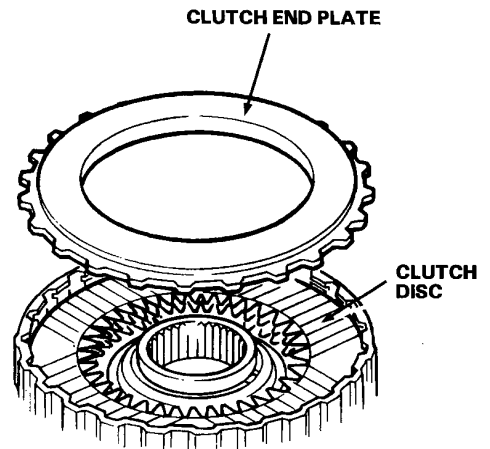
NOTE: Steps 11 thru 15 are for all clutches.

11. Soak the clutch discs thoroughly in ATF for a minimum of 30 minutes.

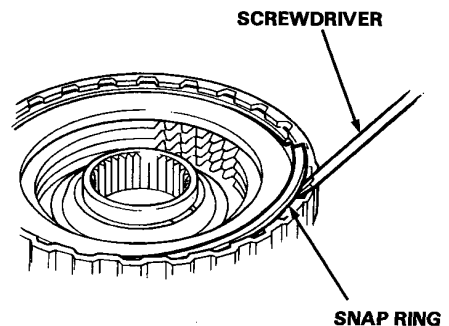
12. Starting with a clutch plate, alternately install the clutch plates and discs. Install the clutch end plate with flat side toward the disc.

NOTE:

Before installing the plates and discs, make sure the inside of the clutch drum is free of dirt or other foreign matter.



13. Install the snap ring.





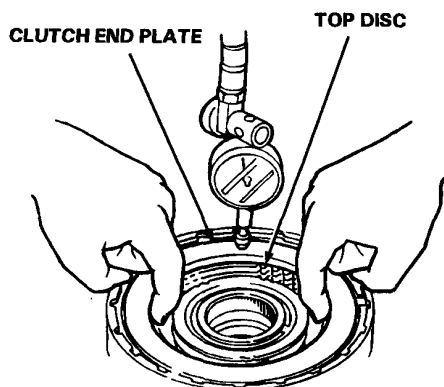
14. Measure the clearance between the clutch end plate and top disc with a dial indicator. Zero the dial indicator with the clutch end plate lowered and lift it up to the snap ring. The distance that the clutch end plate moves is the clearance between the clutch end plate and top disc.

NOTE:

Measure at three locations.

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)
1st-Hold	0.80—1.00 mm (0.031—0.039 in)



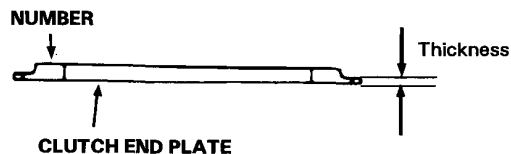
15. If the clearance is not within the service limits, select a new clutch end plate from the following table.

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 mm (in)
1	22551—PX4—003	2.10 (0.083)
2	22552—PX4—003	2.20 (0.087)
3	22553—PX4—003	2.30 (0.091)
4	22554—PX4—003	2.40 (0.094)
5	22555—PX4—003	2.50 (0.098)
6	22556—PX4—003	2.60 (0.102)
7	22557—PX4—003	2.70 (0.106)
8	22558—PX4—003	2.80 (0.110)
9	22559—PX4—003	2.90 (0.114)

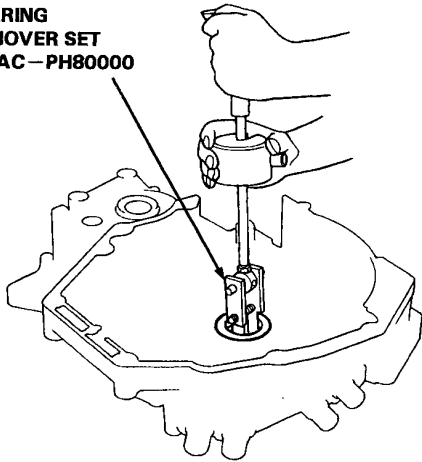


Torque Converter Housing Bearings

Mainshaft Bearing/Oil Seal Replacement

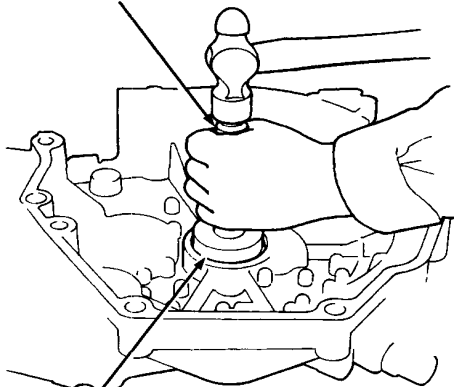
1. Remove the mainshaft bearing and oil seal, using the special tools as shown.

**ADJUSTABLE
BEARING
REMOVER SET
07JAC-PH80000**



2. Drive in the new mainshaft bearing until it bottoms in the housing, using the special tools as shown.

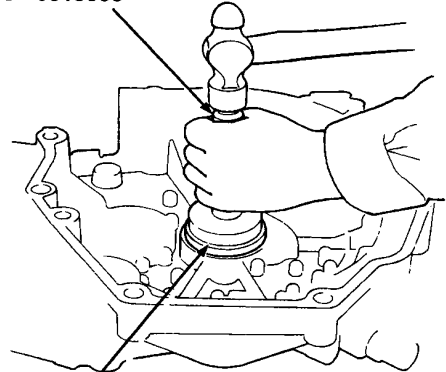
**DRIVER
07749-0010000**



**ATTACHMENT,
62 x 68 mm
07746-0010500**

3. Install the new oil seal flush with the housing, using the special tools as shown.

**DRIVER
07749-0010000**

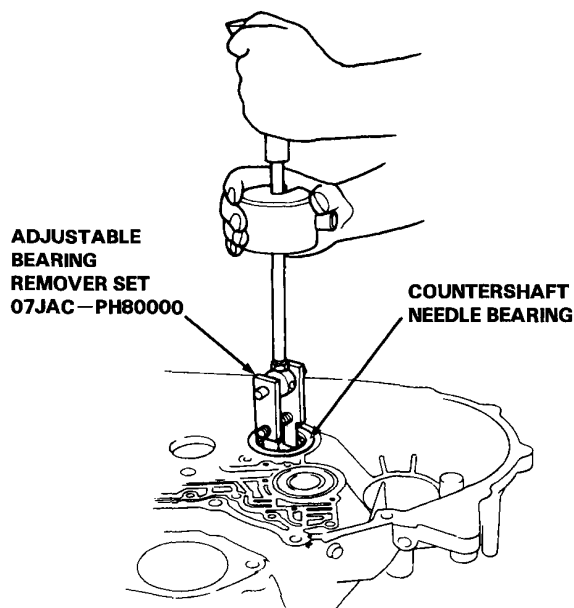


**ATTACHMENT,
72 x 75 mm
07746-0010600**

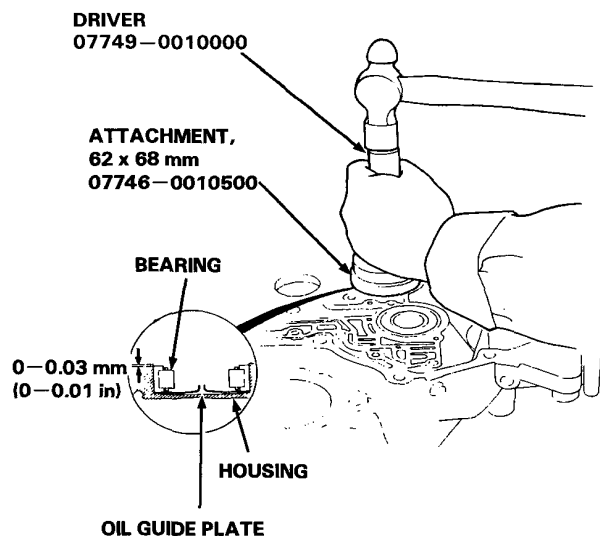


Countershaft Bearing Replacement

1. Remove the countershaft needle bearing using the special tools as shown.



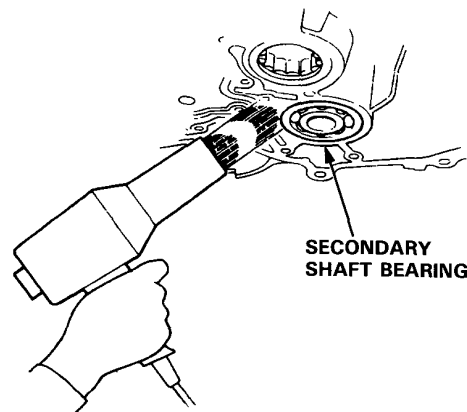
2. Install the oil guide plate.
3. Drive the new bearing into the housing, using the special tools as shown.



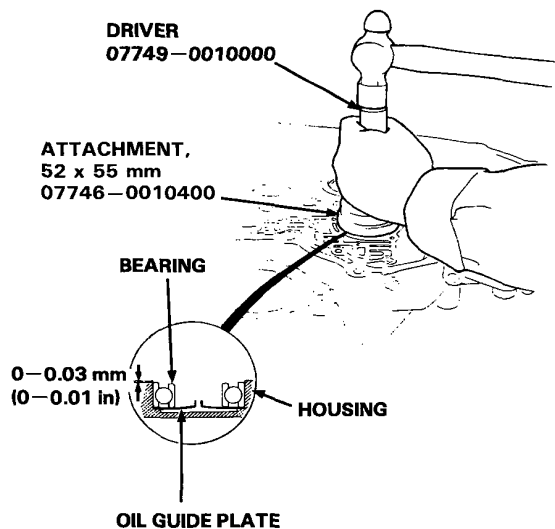
Secondary Shaft Bearing Replacement

1. Remove the secondary shaft bearing by heating the torque converter housing to 100°C (212°F) with a heat gun, then tap the housing until the bearing falls out.

CAUTION:
Do not heat the case in excess of 100°C (212°F).



2. Install the oil guide plate.
3. Drive the new bearing into the housing, using the special tools as shown.



Transmission Housing Bearings

Removal/Installation

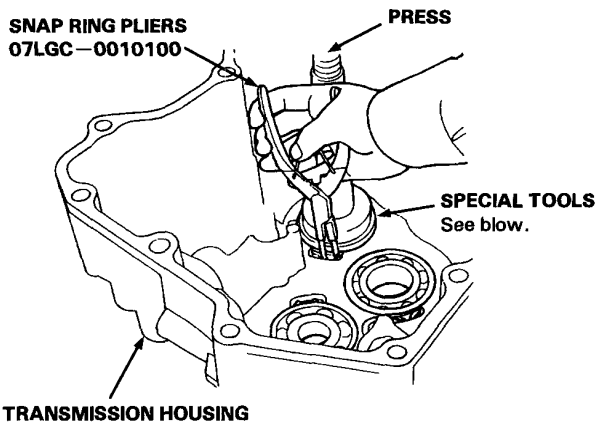
NOTE:

Lubricate all parts with ATF before assembly.

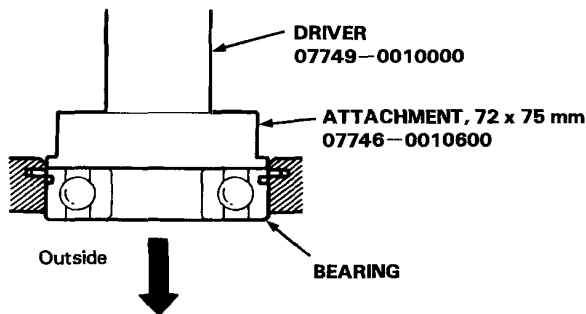
- To remove the mainshaft, countershaft and secondary shaft bearings from the transmission housing, expand each snap ring with snap ring pliers, then push the bearing out using the special tool and a press as shown.

NOTE:

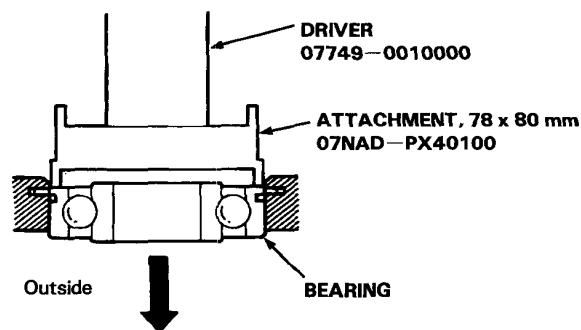
Do not remove the snap rings unless it's necessary to clean the grooves in the housing.



• Mainshaft and Secondary Shaft Bearings

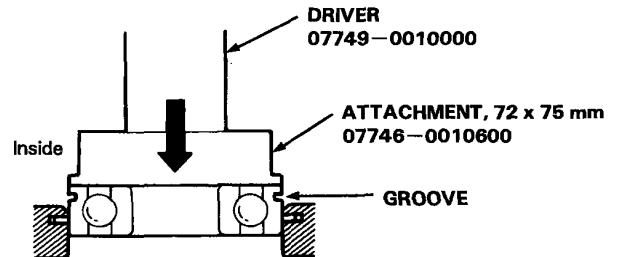


• Countershaft Bearing

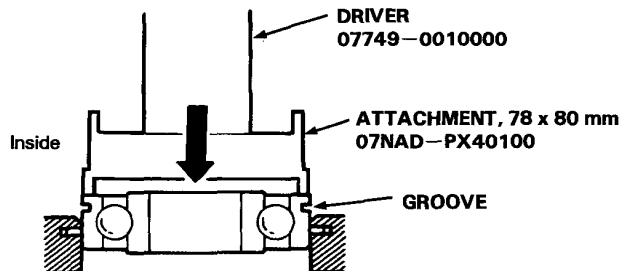


- Expand each snap ring with snap ring pliers, and insert the new bearing part-way into the housing, using the special tool and a press as shown. Install with groove side of the bearing facing inside the housing.
- Release the pliers, then push the bearing down into the housing until the snap ring snaps in place around it.

• Mainshaft and Secondary Shaft Bearings

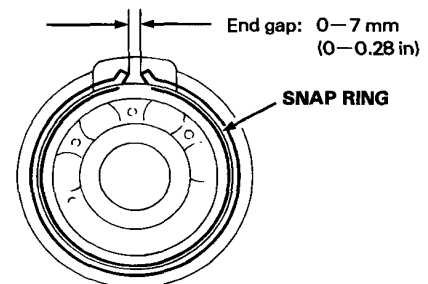


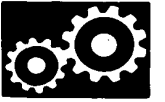
• Countershaft Bearing



- After installing the ball 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.



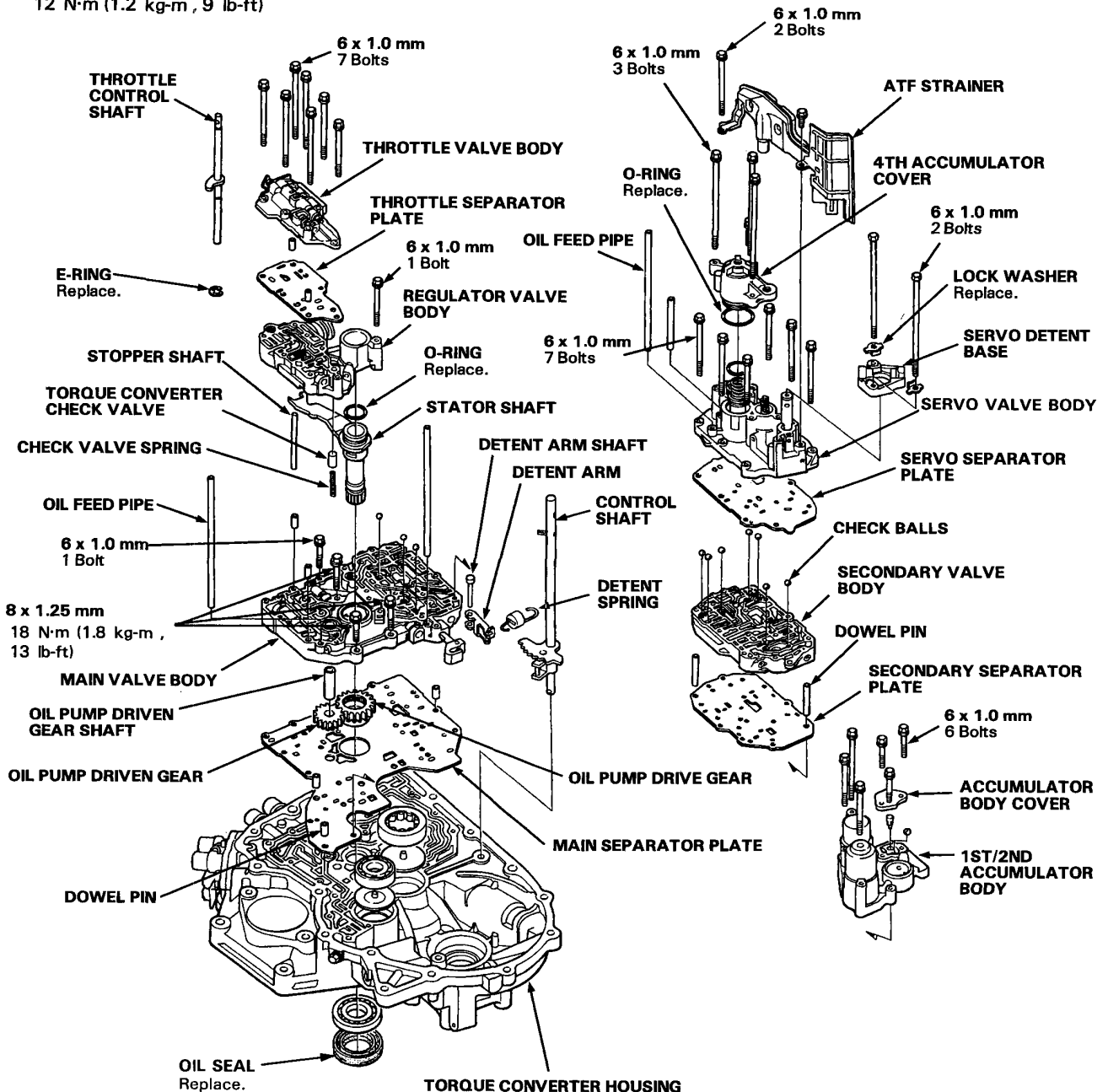


Transmission

Reassembly

NOTE:

- Coat all parts with ATF.
- Replace the parts below:
 - O-rings
 - Lock washers
 - Gaskets
 - Locknuts and conical spring washers
 - Sealing washer
- Torque the 6 x 1.0 mm Bolts:
12 N·m (1.2 kg·m , 9 lb-ft)

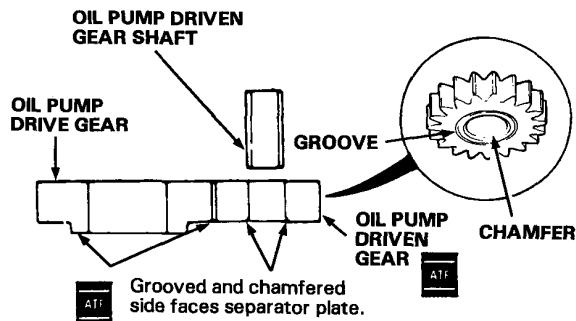




1. Install the main separator plate with three dowel pins on the torque converter housing. Then install the oil pump gears and oil pump driven gear shaft.

NOTE:

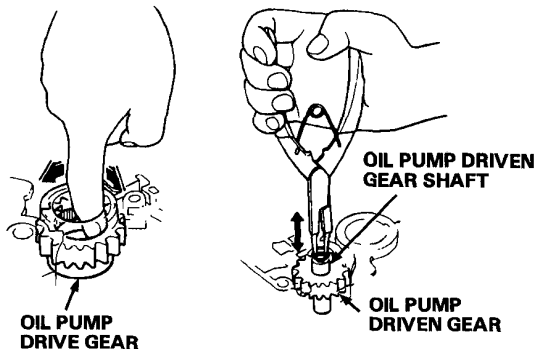
Install the oil pump driven gear with its grooved and chamfered side facing down.



2. Install the main valve body with four bolts. Make sure the oil pump drive gear rotates smoothly in the normal operating direction and oil pump driven gear shaft moves smoothly in the axial and normal operating directions.
3. If the oil pump drive gear and oil pump driven gear shaft do not move freely, loosen the main valve body bolts, realign the oil pump driven gear shaft, and then retighten to the specified torque.

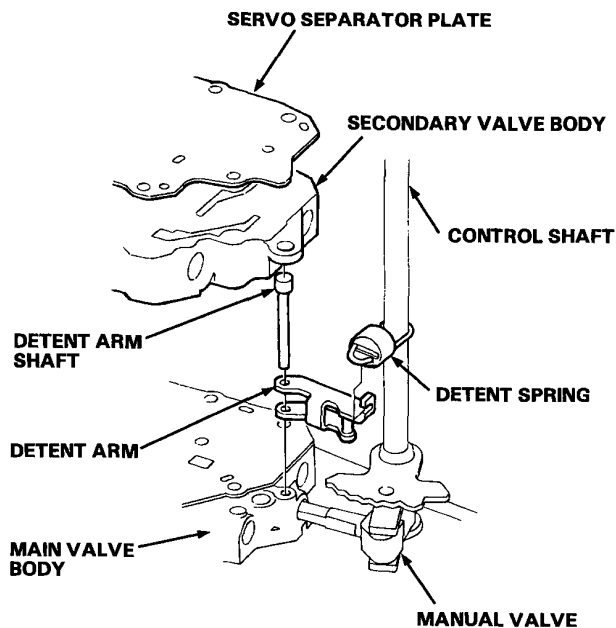
CAUTION:

Failure to align the oil pump driven gear shaft correctly will result in a seized oil pump drive gear or oil pump driven gear shaft.



4. Install the stator shaft and stopper shaft.
5. Install the two dowel pins, torque converter check valve and torque converter check valve spring in the main valve body.
6. Install the regulator valve body with the bolt on the main valve body.
7. Install the two dowel pins and throttle separator plate on the regulator valve body, then install the throttle valve body with seven bolts.

8. Install the secondary separator plate with two dowel pins on the main valve body.
9. Install the control shaft in the housing with the control shaft and manual valve together.
10. Install the detent arm and arm shaft in the main valve body, then hook the detent spring to the detent arm.



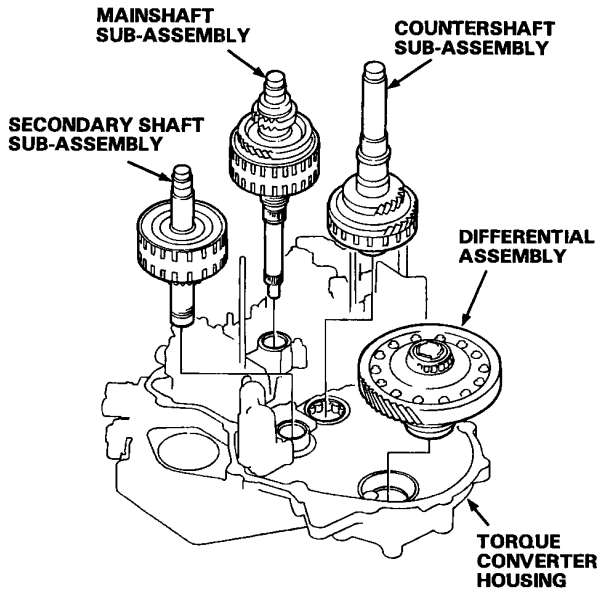
11. Install the secondary valve body, servo separator plate and servo valve body with seven bolts.
12. Install the oil feed pipe in the servo valve body, then install the 4th accumulator cover with three bolts.
13. Install the ATF strainer with two bolts.
14. Install the servo detent base with two bolts and new lock washers.
15. Install the 1st/2nd accumulator body and accumulator body cover with six bolts.
16. Install two oil feed pipes in the main valve body and the pipe in the servo body.

(cont'd)

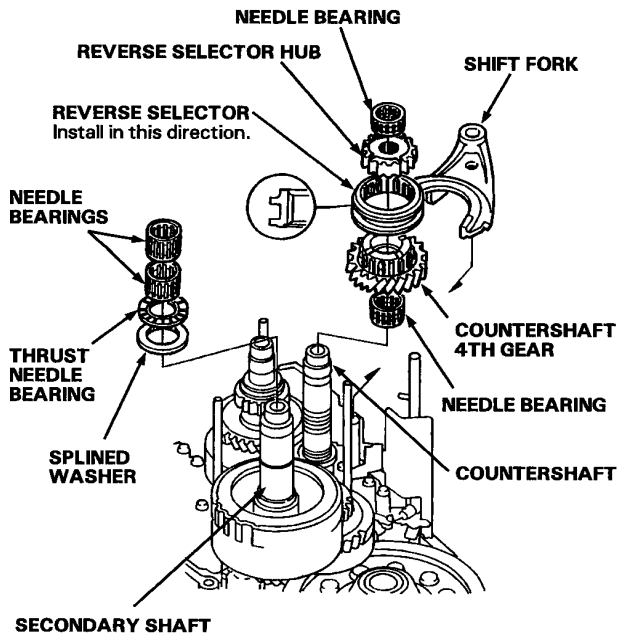
Transmission

Reassembly (cont'd)

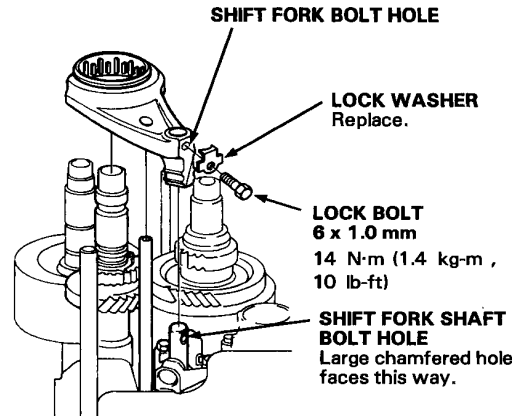
17. Install the differential assembly, countershaft sub-assembly, mainshaft sub-assembly, and secondary shaft sub-assembly in the torque converter housing.



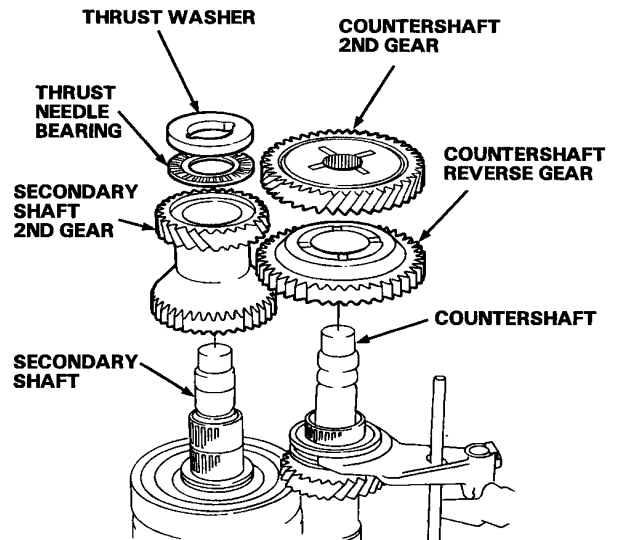
18. Install the splined washer, thrust needle bearing and needle bearings on the secondary shaft.
19. Install the needle bearings, countershaft 4th gear, reverse selector hub, and reverse selector with the shift fork on the countershaft.



20. Turn the shift fork shaft so the large chamfered hole is facing the fork bolt hole. Then install the shift fork and the lock bolt with a new lock washer, and torque. Bend the lock tab against the bolt head.

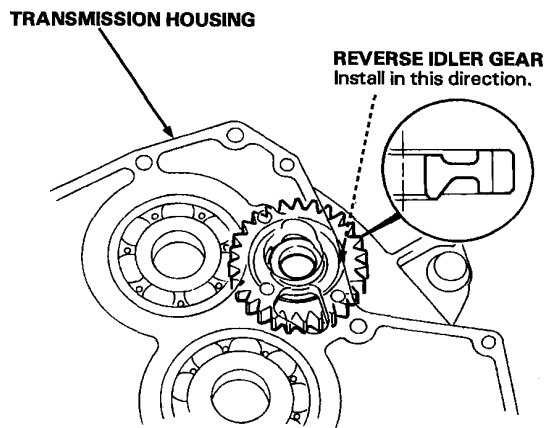


21. Install the secondary shaft 2nd gear, thrust needle bearing and thrust washer on the secondary shaft. Install the countershaft reverse gear and 2nd gear on the countershaft as shown.

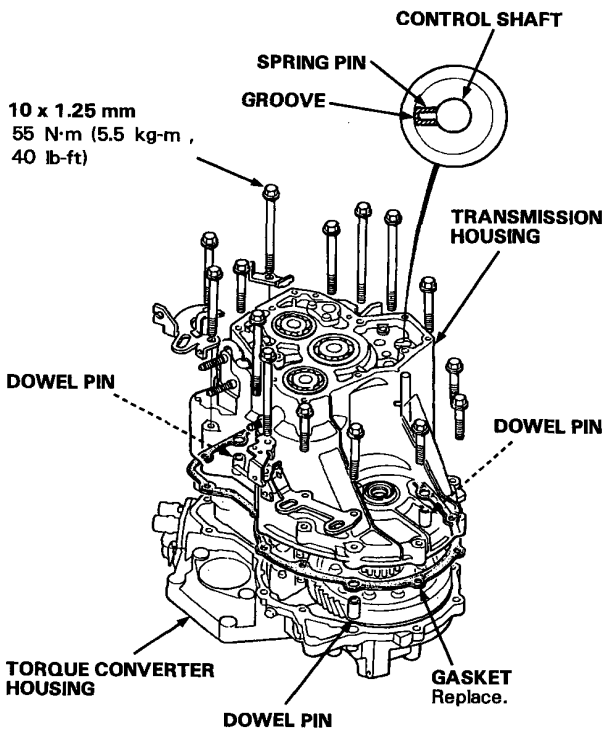




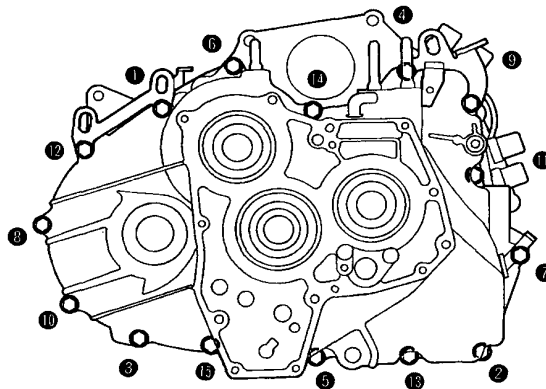
22. Slip the reverse idler gear into the transmission housing as shown.



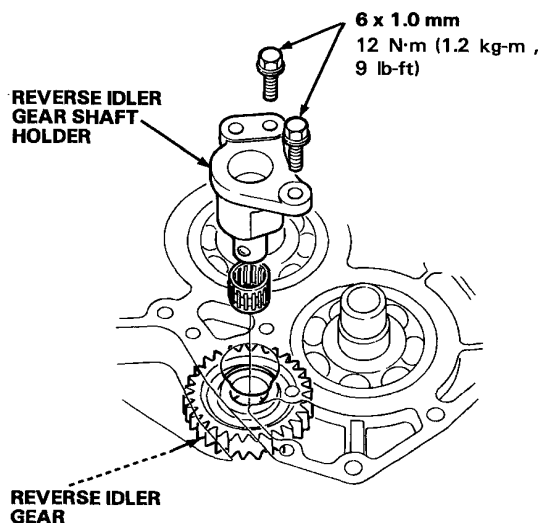
23. Align the spring pin of the control shaft with the transmission housing groove by turning the control shaft.
24. Install three dowel pins and a new gasket on the torque converter housing.
25. Place the transmission housing on the torque converter housing.



26. Install the transmission housing bolts and transmission hanger, then torque the bolts to 55 N·m (5.5 kg-m, 40 lb-ft) in two or more steps in the pattern shown.



27. Engage the reverse idler gear to the countershaft and mainshaft reverse gears, then install the reverse idler gear shaft holder on the transmission housing.



28. Install the parking brake lever on the control shaft, then torque the lock bolt loosely with a new lock washer.

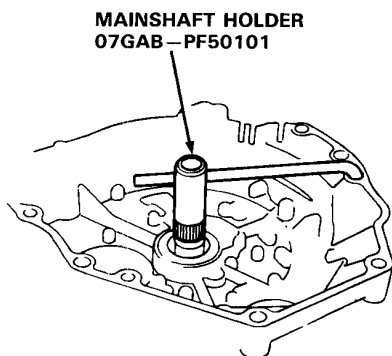
NOTE:
Do not tighten the lock bolt to the specified torque and bend the lock tab in this step.

(cont'd)

Transmission

Reassembly (cont'd)

29. Slip the special tool onto the mainshaft.



30. Install the mainshaft idler gear.
31. Install the old locknut on the mainshaft to seat the idler gear.

NOTE:

- The mainshaft locknut has left-hand threads.
- Do not drive the idler gear on with a hammer.

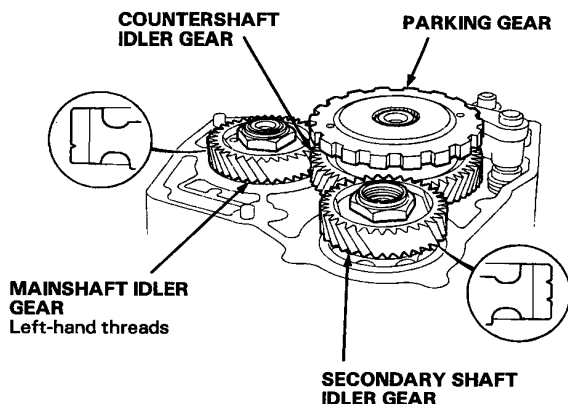
TORQUE: 230 N·m (23.0 kg·m , 166 lb-ft)

32. Install the secondary shaft idler gear on the secondary shaft.
33. Install the thrust washer, thrust needle bearing, needle bearing, countershaft idler gear and parking gear on the countershaft.
34. Install the old locknut on the secondary shaft. Tighten the old locknut to seat the secondary shaft idler gear while holding the countershaft idler gear.

NOTE:

Do not drive the idler gear on with a hammer.

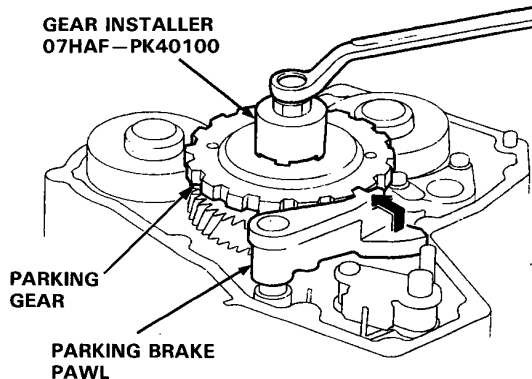
TORQUE: 230 N·m (23.0 kg·m , 166 lb-ft)



35. Install the special tool on the countershaft, and engage the parking brake pawl with the parking gear by moving up the parking brake pawl.

36. Tightening the special tool and lightly seat the parking gear.

NOTE: Do not drive the parking gear on with a hammer.



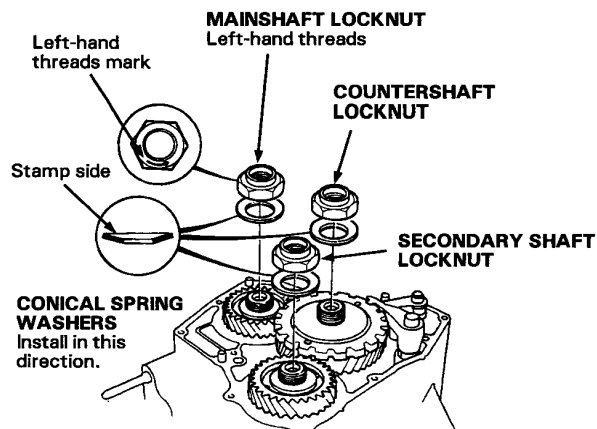
37. Remove the special tool.
38. Use the old locknut to tighten the press fit parking gear to the specified torque, then loosen it.

TORQUE: 230 N·m (23.0 kg·m , 166 lb-ft)

39. Remove the old locknuts, then install new conical spring washers and new locknuts on each shaft.

CAUTION:

Install the conical spring washers in the direction shown.





40. Tighten the locknuts to specified torque.

TORQUE:

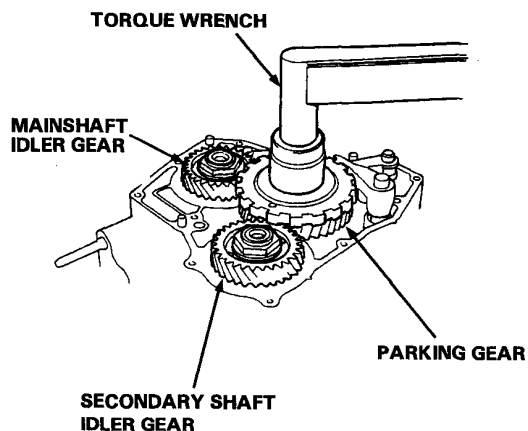
Mainshaft 170 N·m (17.0 kg-m, 123 lb-ft)

Countershaft 170 N·m (17.0 kg-m, 123 lb-ft)

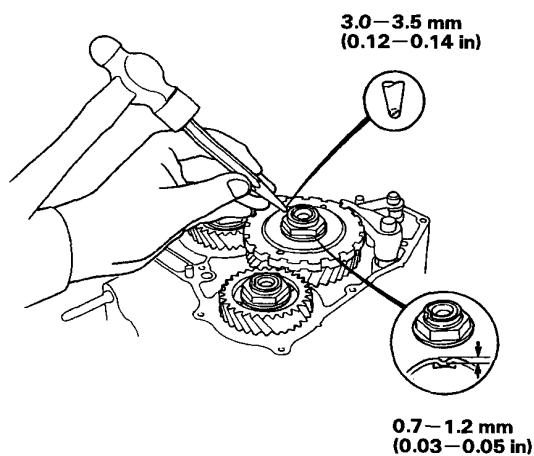
Secondary shaft 170 N·m (17.0 kg-m, 123 lb-ft)

NOTE:

The mainshaft locknut has left-hand threads.



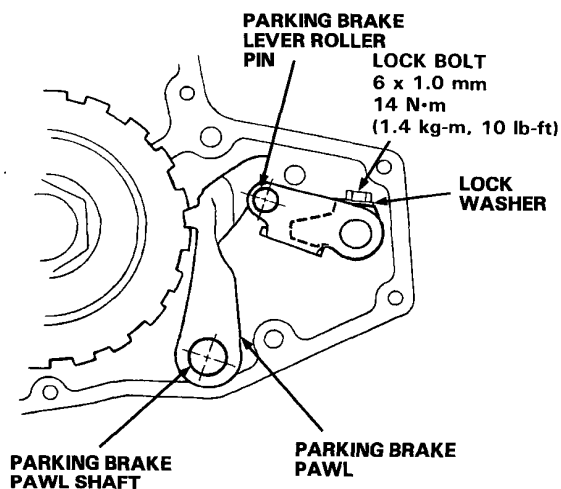
41. Stake each locknut into its shaft using a 3.5 mm punch.



42. Set the parking brake lever in the **P** position, then verify that the parking brake pawl engages the parking gear.

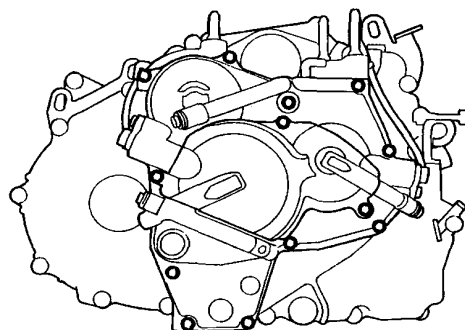
43. If the pawl does not engage fully, check the parking brake pawl stopper clearance as described on page 14-140.

44. Tighten the lock bolt, and bend the lock tab against the bolt head.



45. Install the right side cover.

TORQUE: 12 N·m (1.2 kg-m, 9 lb-ft)



46. Install the ATF cooler pipes with new sealing washers.

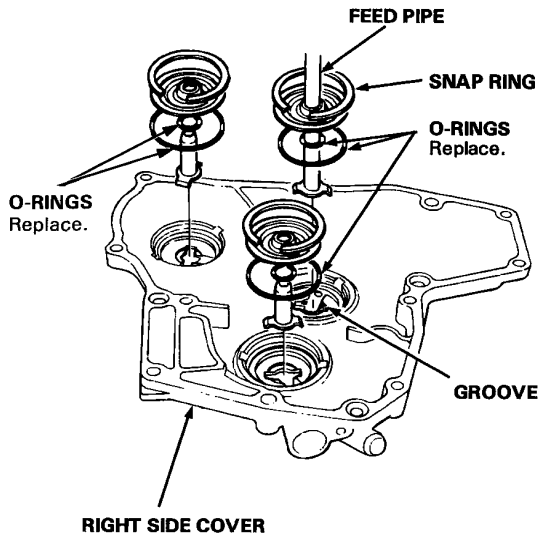
TORQUE: 29 N·m (2.9 kg-m, 21 lb-ft)

47. Install the ATF level gauge.

Right Side Cover

Feed Pipe Installation

1. Install the feed pipes in the right side cover with new O-rings, aligning the lugs with the grooves in the right side over.
2. Install the snap rings.

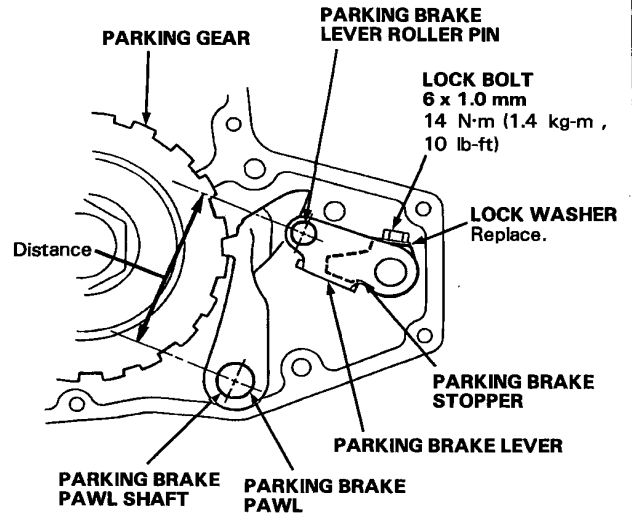


Parking Brake Stopper

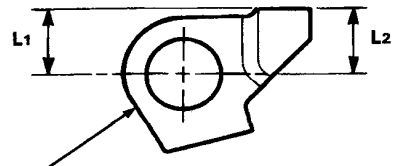
Inspection/Adjustment

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: 64.5—65.5 mm (2.54—2.58 in)



3. If the measurement is out of tolerance, select and install the appropriate parking brake stopper from the table below.

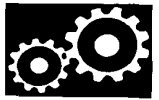


PARKING BRAKE STOPPER

PARKING BRAKE STOPPER

Mark	Part Number	L1	L2
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 stopper, make sure the distance is within tolerance.

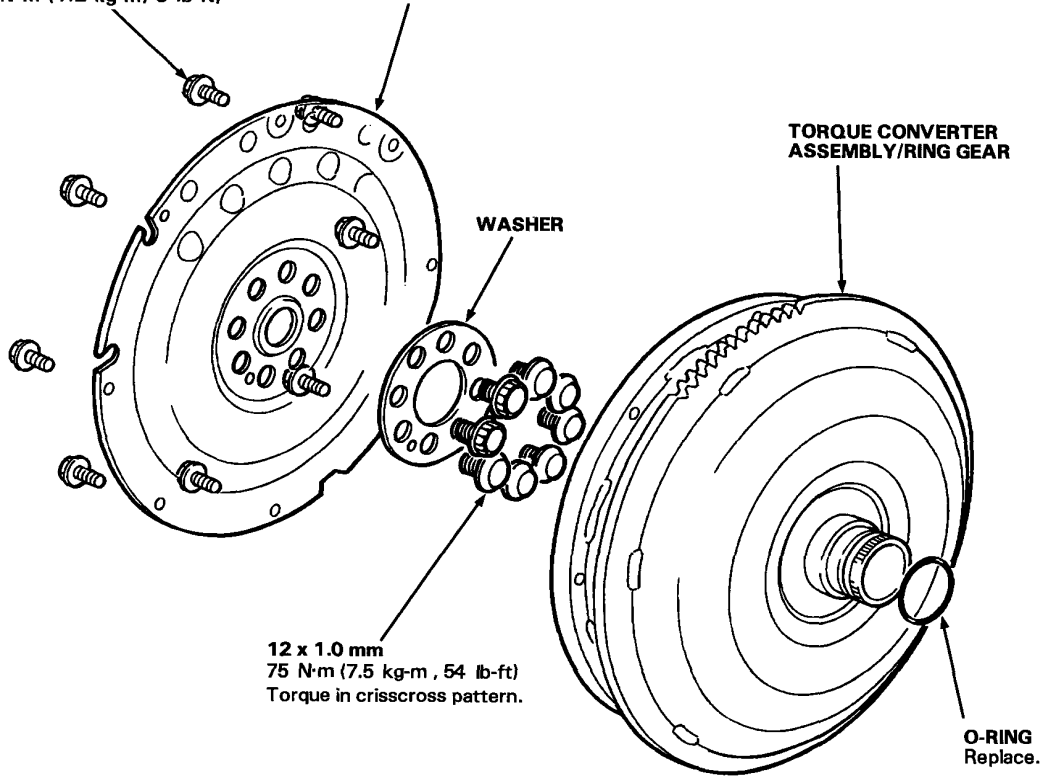


Torque Converter

Disassembly

6 x 1.0 mm
12 N·m (1.2 kg-m, 9 lb-ft)

DRIVE PLATE
Inspect for cracks.



WASHER

**TORQUE CONVERTER
ASSEMBLY/RING GEAR**

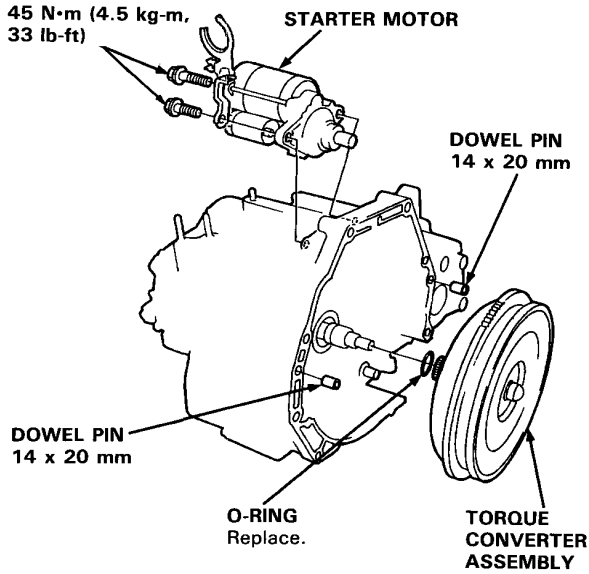
12 x 1.0 mm
75 N·m (7.5 kg-m, 54 lb-ft)
Torque in crisscross pattern.

O-RING
Replace.

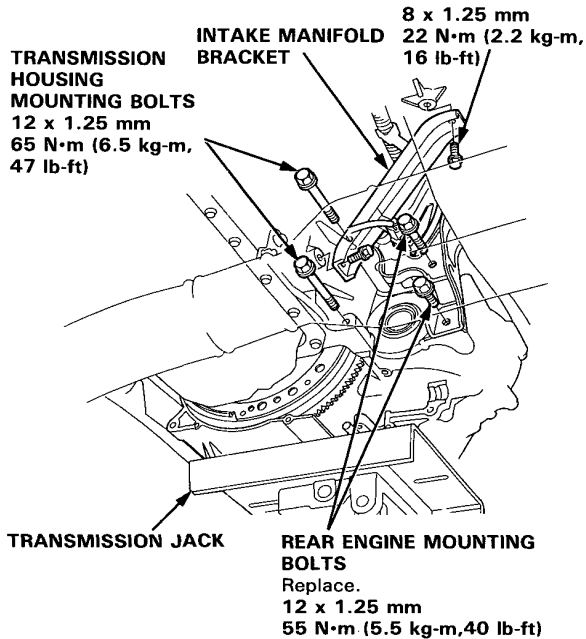
Transmission

Installation

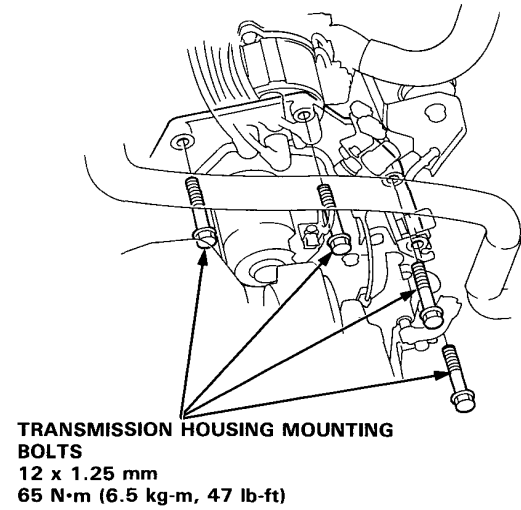
1. Install the starter motor on the torque converter housing, and install the 14 x 20 mm dowel pins and torque converter with a new O-ring in the torque converter housing.



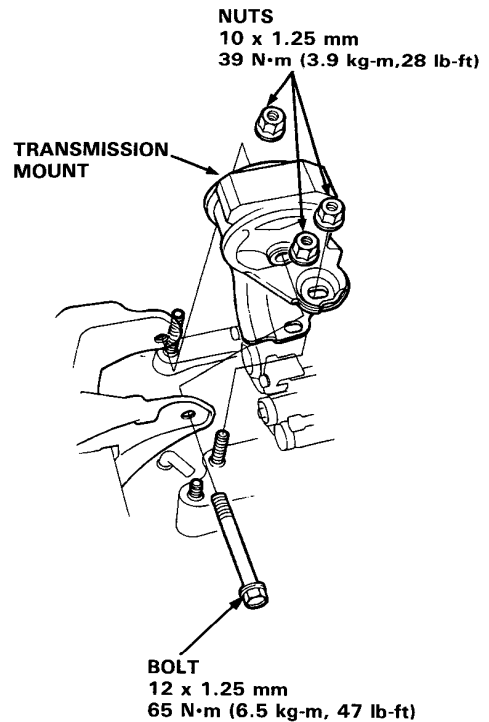
2. Place the transmission on the jack, and raise to the engine assembly level.
3. Attach the transmission on the engine, then install the transmission housing mounting bolts, rear engine mounting bolts and intake manifold bracket bolts.



4. Install the transmission housing mounting bolts.

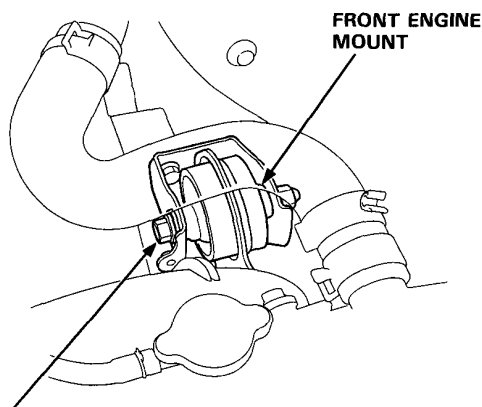


5. Install the transmission mount. Tighten the bolt then tighten the nuts to the specified torque, and retighten the bolt to the specified torque.





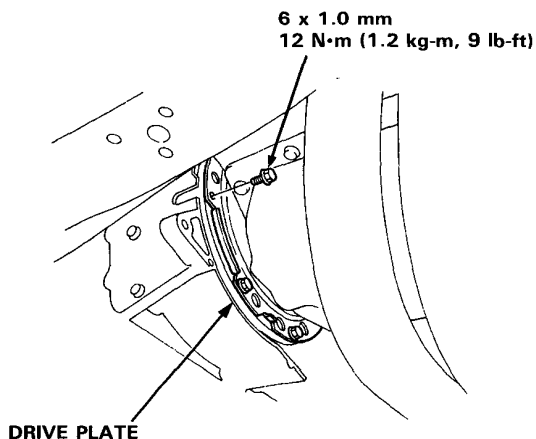
6. Tighten the front engine mount bolt to specified torque.



FRONT ENGINE MOUNT BOLT
65 N·m (6.5 kg-m, 47 lb-ft)

7. Remove the transmission jack.
8. Attach the torque converter to the drive plate eight bolts, and torque to 12 N·m (1.2 kg-m, 9 lb-ft). Rotate the crankshaft pulley as necessary to tighten the bolts to 1/2 of the specified torque, then final torque, in a crisscross pattern. After tightening the last bolt, check that the crankshaft rotates freely.

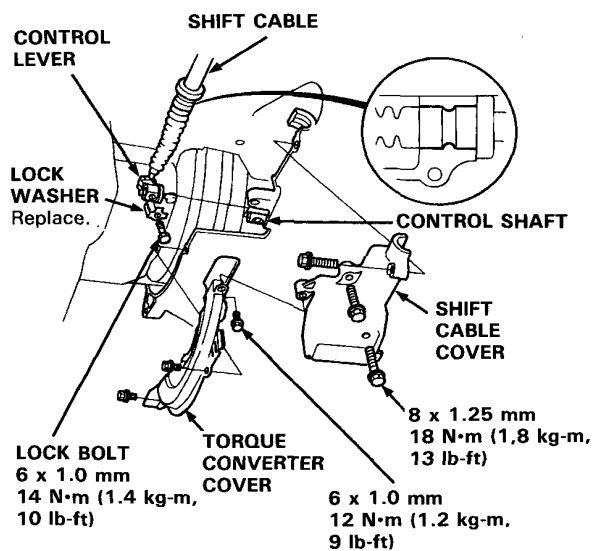
NOTE: Tighten the crankshaft pulley bolt, if it is loosened when rotating the crankshaft pulley.



9. Install the control lever with the shift cable on the control shaft.

CAUTION: Take care not to bend the shift cable when installing it.

10. Install the lock bolt with a new lock washer, then bend the lock tab.
11. Install the torque converter cover and shift cable cover.



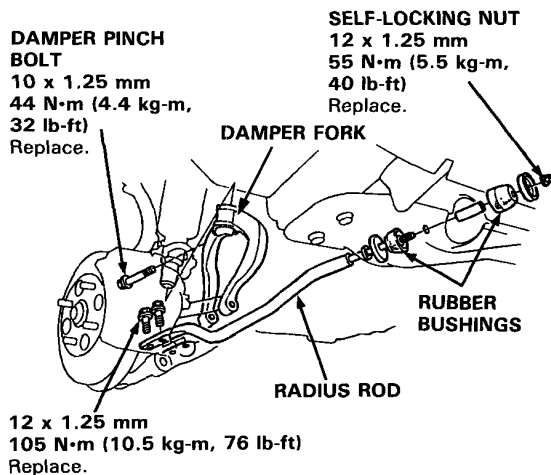
(cont'd)

Transmission

Installation (cont'd)

12. Install the right radius rod and damper fork.

NOTE: Check for deterioration or damage of the radius rod rubber bushings.

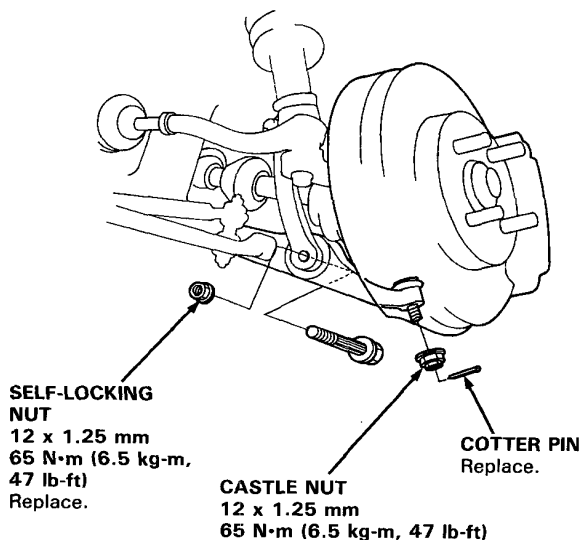


13. Install new set rings on the ends of the driveshaft.

14. Install the right and left driveshafts.

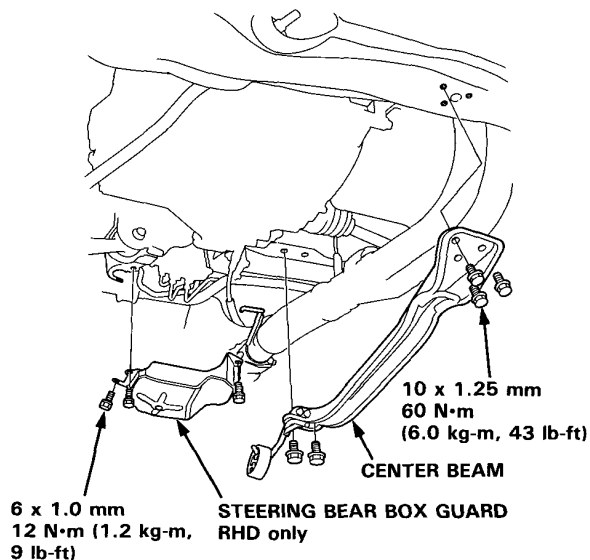
NOTE: Turn the right and left steering knuckles fully outward, and axially into the differential until you feel the set ring engage the side gear.

15. Install the damper fork to the lower arm. Then install the ball joint to the lower arm using the castle nuts and new cotter pins.

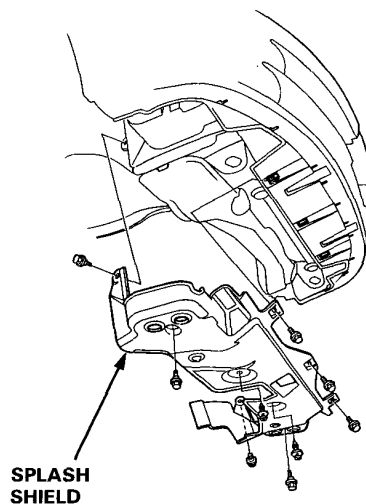


16. LHD: Install the center beam.

RHD: Install the steering gear box guard and center beam.

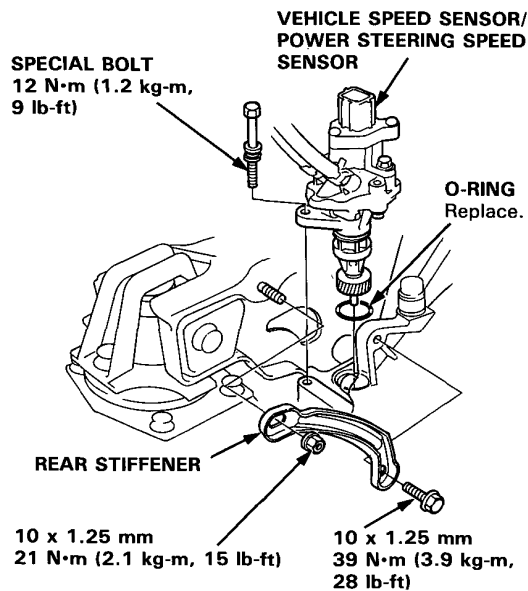


17. Install the splash shield.

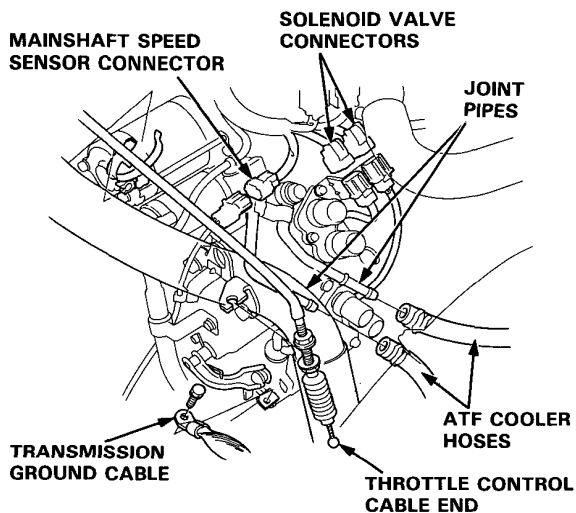




18. Install the vehicle speed sensor/power steering speed sensor and rear stiffener.

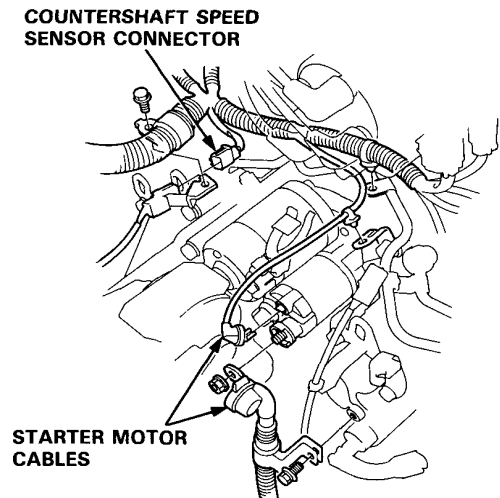


19. Connect the ATF cooler hoses to the joint pipes.
20. Connect the lock-up control solenoid valve, shift control solenoid valve connectors and the throttle control cable.
21. Connect the mainshaft speed sensor connector.
22. Install the ground cable on the transmission housing.

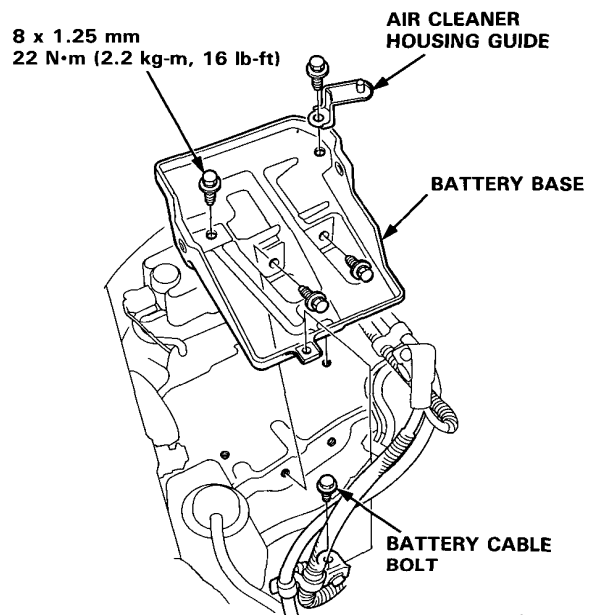


23. Connect the countershaft speed sensor connector.
24. Connect the starter motor cables.

NOTE: When installing the starter motor cable, make sure that the crimped side of the ring terminal is facing out (see section 23).



25. Install the harness stay and clamp.
26. Install the battery base with the air cleaner housing guide, then install the battery cable on the base.

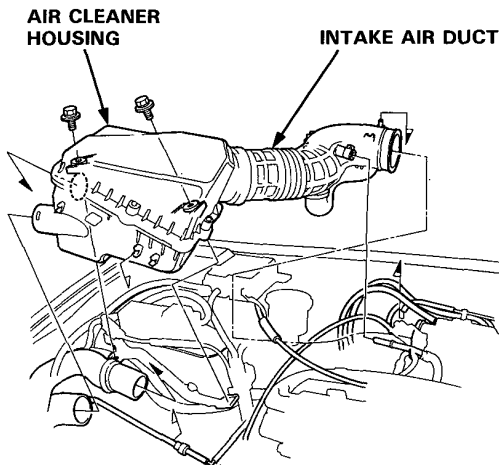


(cont'd)

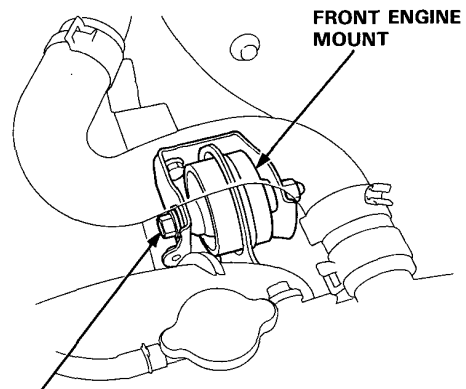
Transmission

Installation (cont'd)

27. Install the air cleaner housing and intake air duct.

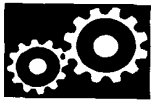


28. Refill the transmission with ATF (see page 14-78).
29. Connect the battery positive (+) and negative (-) cables to the battery.
30. Start the engine. Set the parking brake, and shift the transmission through all gears three times. Check for proper shift cable adjustment.
31. Check and adjust the front wheel alignment (see section 18).
32. Let the engine reach operating temperature (the radiator fan comes on) with the transmission in **N** or **P** position, then turn it off and check fluid level.
33. Road test as described on pages 14-70 thru 14-73.
34. Loosen the front engine mount bolt after the road test, and retighten it to the specified torque.

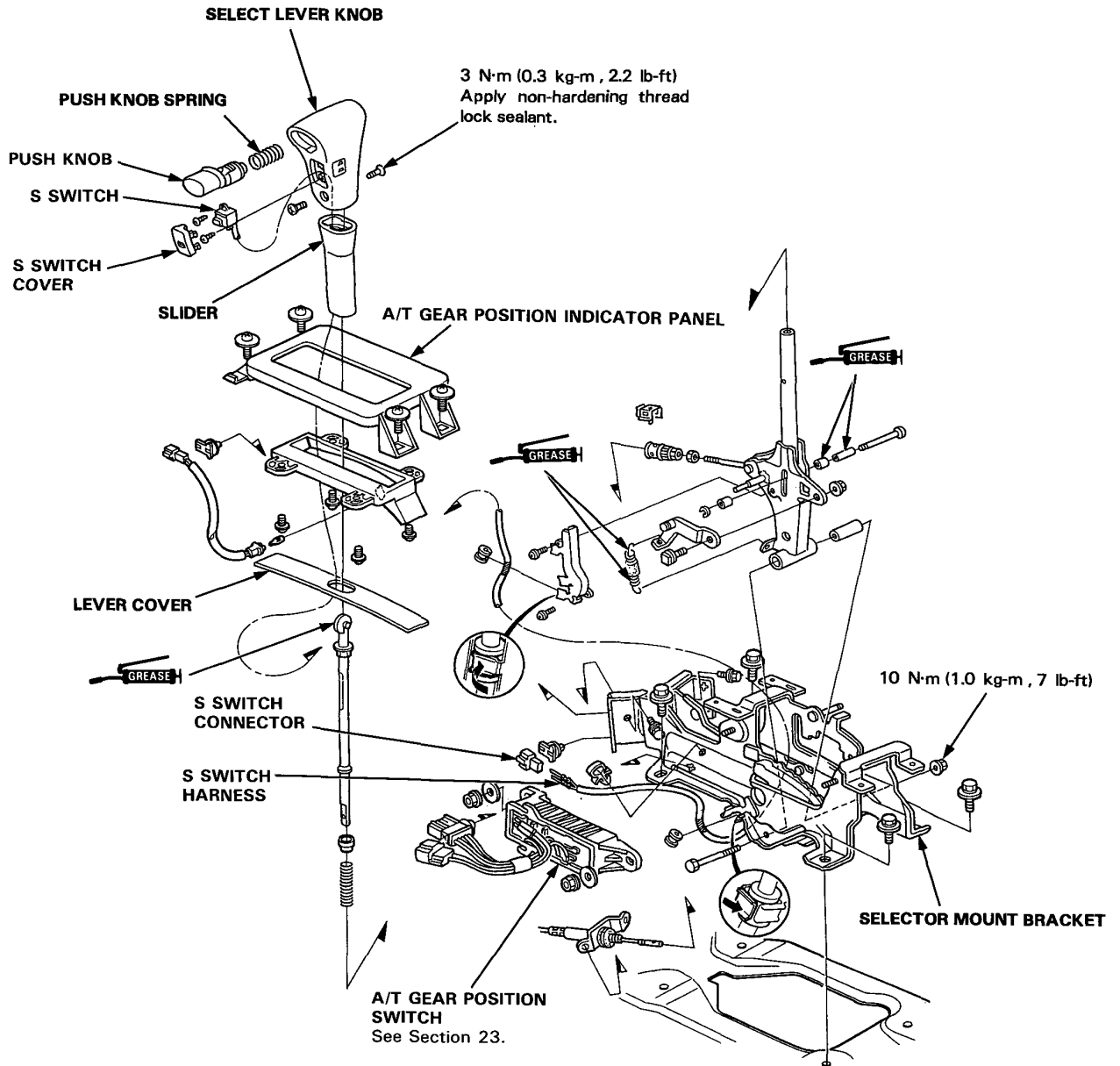


**FRONT ENGINE MOUNT
BOLT**
65 N·m (6.5 kg-m, 47 lb-ft)

Gearshift Selector



NOTE: LHD is shown; RHD is symmetrical.



A/T Gear Position Indicator Panel

Adjustment

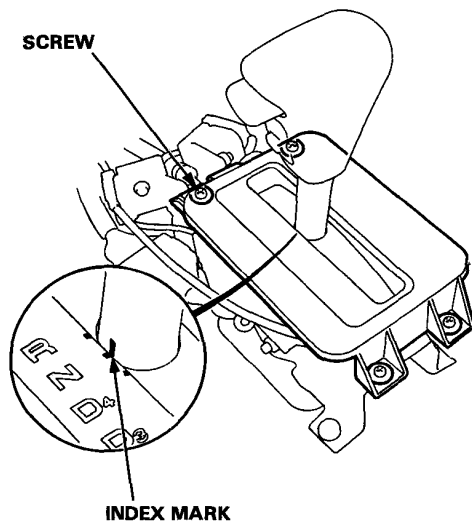
NOTE:

LHD is shown; RHD is similar.

1. With the transmission in NEUTRAL, check that the index mark of the indicator aligns with the N mark of the A/T gear position indicator panel.
2. If not aligned, remove the front console (see section 20).
3. Remove the A/T gear position indicator panel mounting screws, and adjust by moving the panel.

NOTE:

Whenever the A/T gear position indicator panel is removed, reinstall the panel as described above.



Shift Cable

Removal/Installation

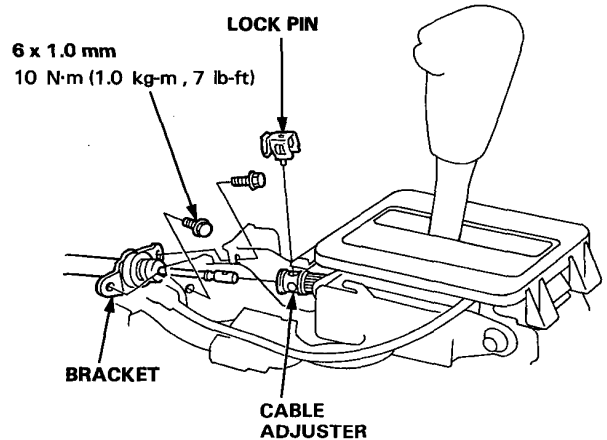
⚠ WARNING

- Make sure lifts, jacks and safety stands are placed properly, and hoist brackets are attached to the correct position on the engine (see section 1).
- Apply parking brake and block rear wheels, so car will not roll off stands and fall on you while working under it.

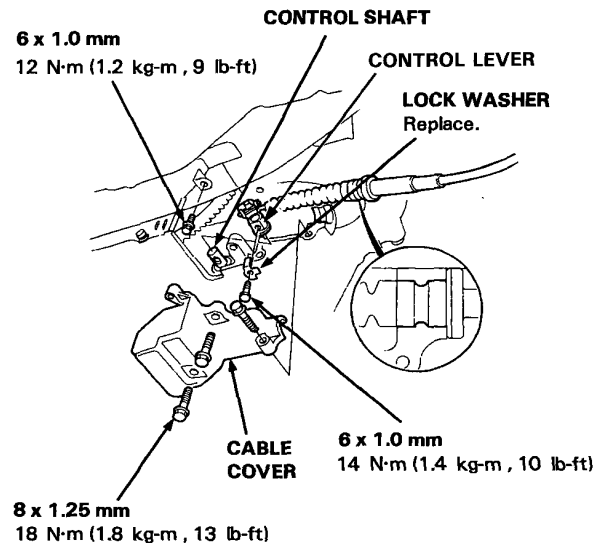
NOTE:

LHD is shown; RHD is similar.

1. Remove the front console (see section 20).
2. Shift to **N** position, then remove the lock pin from the cable adjuster.
3. Remove the bolts securing the bracket.

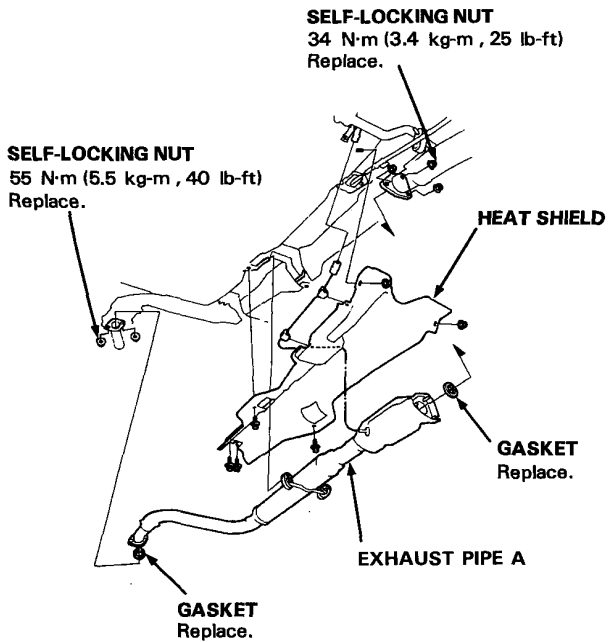


4. Remove the cable cover.
5. Remove the lock bolt securing the control lever, then remove the control lever with the shift cable.

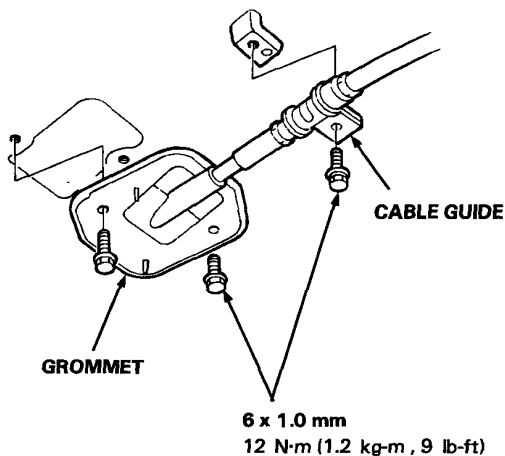




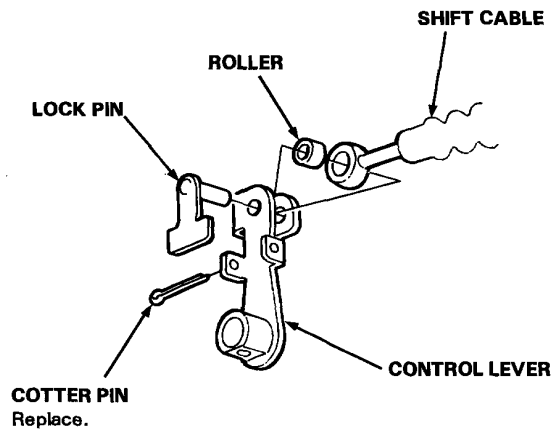
6. Remove the exhaust pipe A and heat shield.



7. Remove the cable guide and grommet.



8. Remove the cotter pin and lock pin, then separate the control lever from the shift cable.



9. Install the shift cable in the reverse order of removal.

10. Check the cable adjustment after installing the shift cable (see page 14-150).

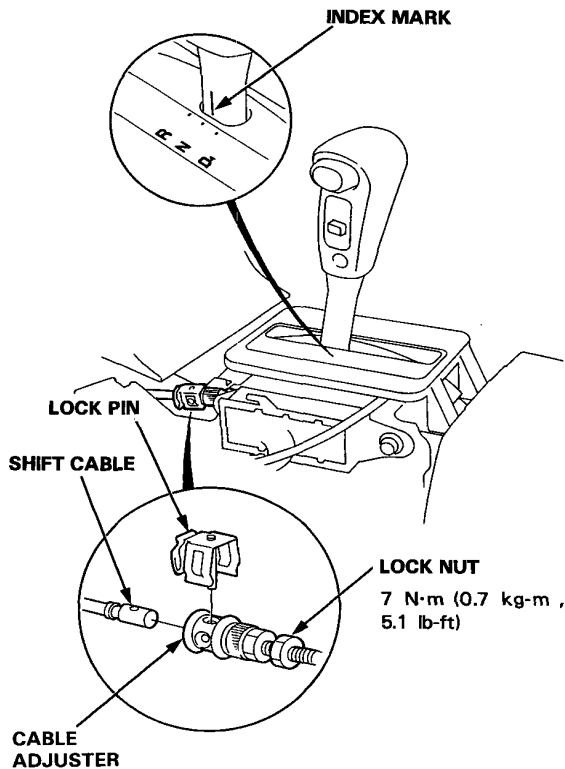
Shift Cable

Adjustment

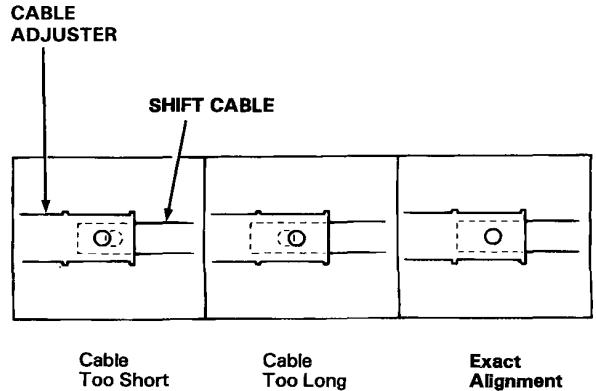
NOTE:

LHD is shown; RHD is similar.

1. Start the engine. Shift to reverse to see if the reverse gear engages. If not, refer to Troubleshooting on page 14-70 thru 73.
2. With the engine off, remove the front console (see section 20).
3. Shift to **N** position, then remove the lock pin from the cable adjuster.



4. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable.

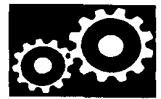


NOTE:

There are two holes in the end of the shift cable. They are positioned 90° apart to allow cable adjustments in 1/4 turn increments.

5. If not perfectly aligned, loosen the locknut on the shift cable, and adjust as required.
6. Tighten the locknut.
7. 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.
8. Move the shift lever to each gear and verify that the A/T gear position indicator follows the A/T 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 on page 14-70 thru 73.

Throttle Control Cable



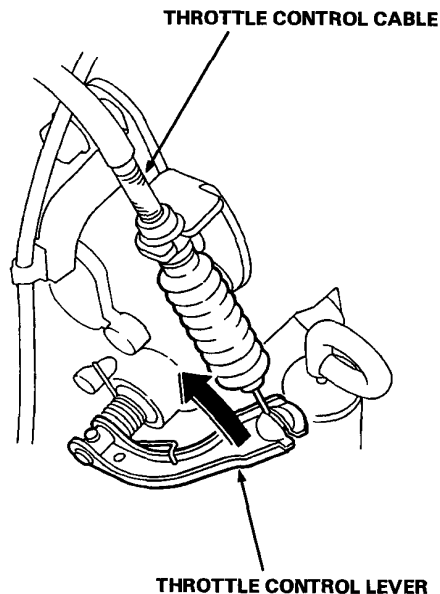
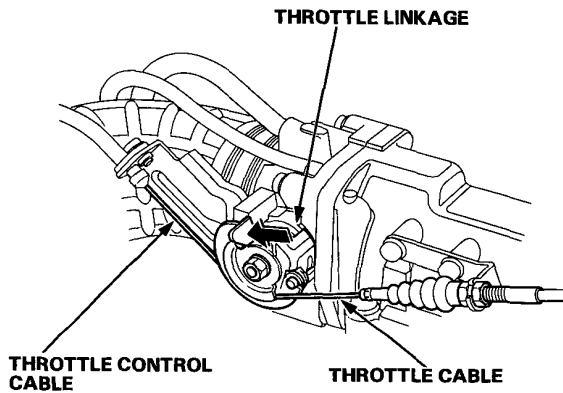
Inspection

NOTE:

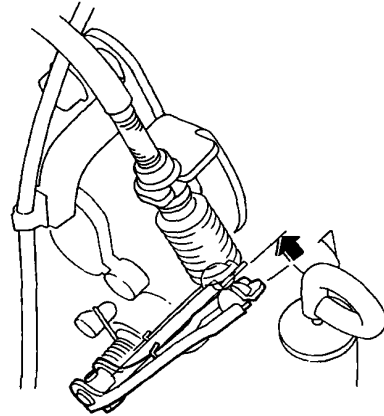
Before inspecting the throttle control cable, make sure that:

- Throttle cable free play is correct (see section 11).
- Idle speed is correct (see section 11).
- You warm up the engine to normal operating temperature (the radiator fan comes on).

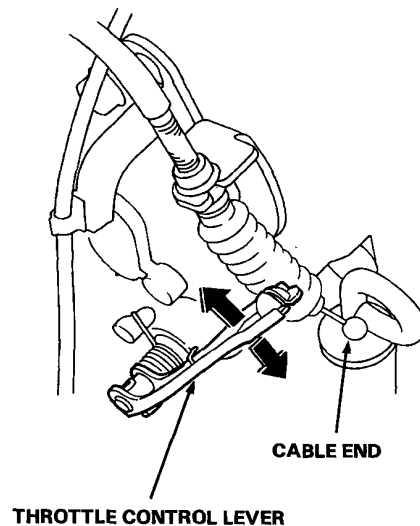
1. Verify that the throttle control lever is synchronized with the throttle linkage while depressing and releasing the accelerator pedal.
2. If the throttle control lever is not synchronized with the throttle linkage, adjust the throttle control cable.



3. Check that there is play in the throttle control lever while depressing the accelerator pedal to the full-throttle position.



4. Remove the cable end of the throttle control cable from the throttle control lever.
5. Check that the throttle control lever moves smoothly.



Throttle Control Cable

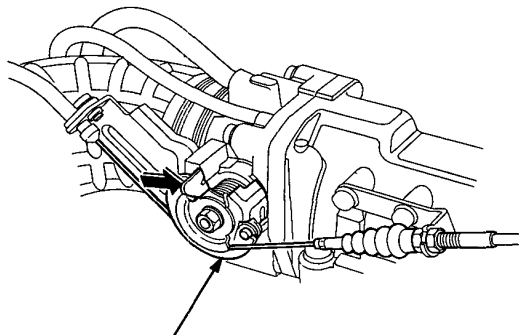
Adjustment

NOTE:

Before adjusting the throttle control cable, make sure that:

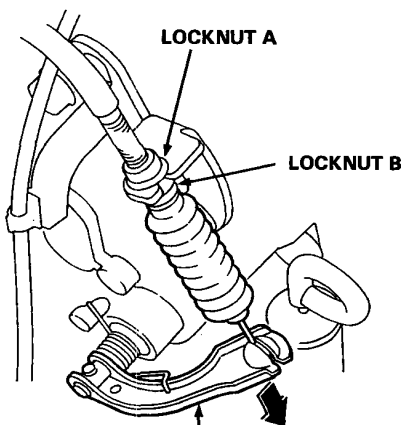
- Throttle cable free play is correct (see section 11).
- Idle speed is correct (see section 11).
- You warm up the engine to normal operating temperature (the radiator fan comes on).

1. Verify that the throttle linkage is in the fully-closed position.



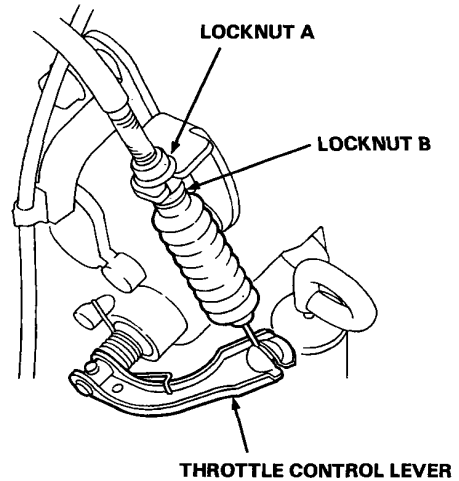
THROTTLE LINKAGE

2. Loosen the locknut on the throttle control cable at the throttle control lever.
3. Remove the free play in the throttle control cable with the locknut, while pushing the throttle control lever to the fully-closed position as shown.



THROTTLE CONTROL LEVER
Push in this direction.

4. Tighten the locknuts.



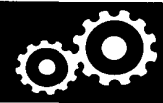
5. After tightening the locknuts, inspect the synchronization and throttle control lever movement.

NOTE:

To tailor the shift/lock-up characteristics to a particular customer's driving expectations, you can adjust the throttle control cable up to 2mm (0.078 in) shorter than the "synchronized" point.

Differential

Manual Transmission	15-1
Automatic Transmission	15-13



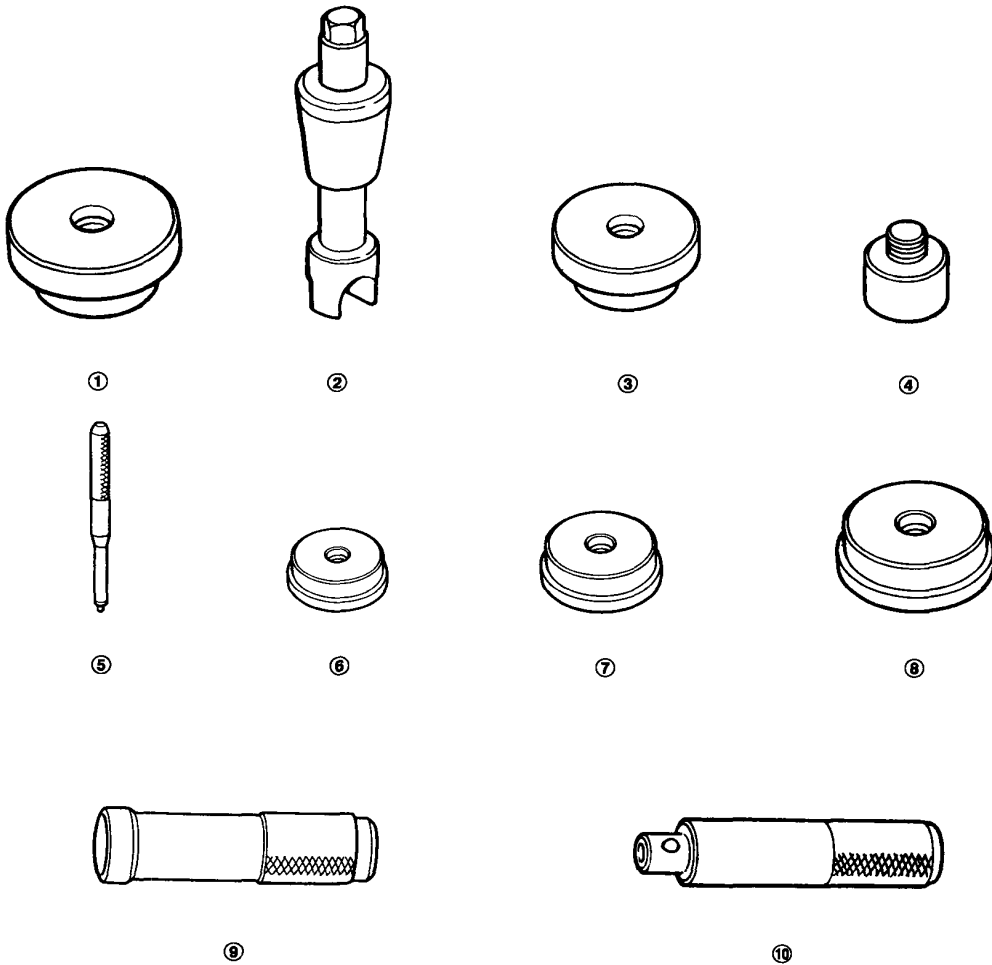
Differential (Manual Transmission)

Special Tools.....	15-2
Differential	
Illustrated Index	15-3
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Tapered Roller Bearing	
Replacement.....	15-4
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Reassembly.....	15-6
Oil Seal Removal.....	15-7
Bearing Outer Race Replacement.....	15-8
Tapered Roller Bearing Preload	
Adjustment.....	15-9
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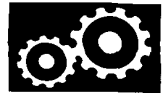


Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD - PG40100	Oil Seal Driver	1	15-11
②	07HAJ - PK40201	Preload Inspection Tool	1	15-9
③	07JAD - PH80101	Oil Seal Driver	1	15-11
④	07JAD - PH80400	Pilot Driver, 28 x 30 mm	1	15-11
⑤	07744 - 0010400	Pin Driver, 5.0 mm	1	15-5, 6
⑥	07746 - 0010400	Outer Driver, 52 x 55 mm	1	15-8
⑦	07746 - 0010500	Outer Driver, 62 x 68 mm	1	15-8
⑧	07746 - 0010600	Outer Driver, 72 x 75 mm	1	15-8
⑨	07746-0030100	Inner Handle C	1	15-4
⑩	07749-0010000	Outer Handle A	1	15-8, 11

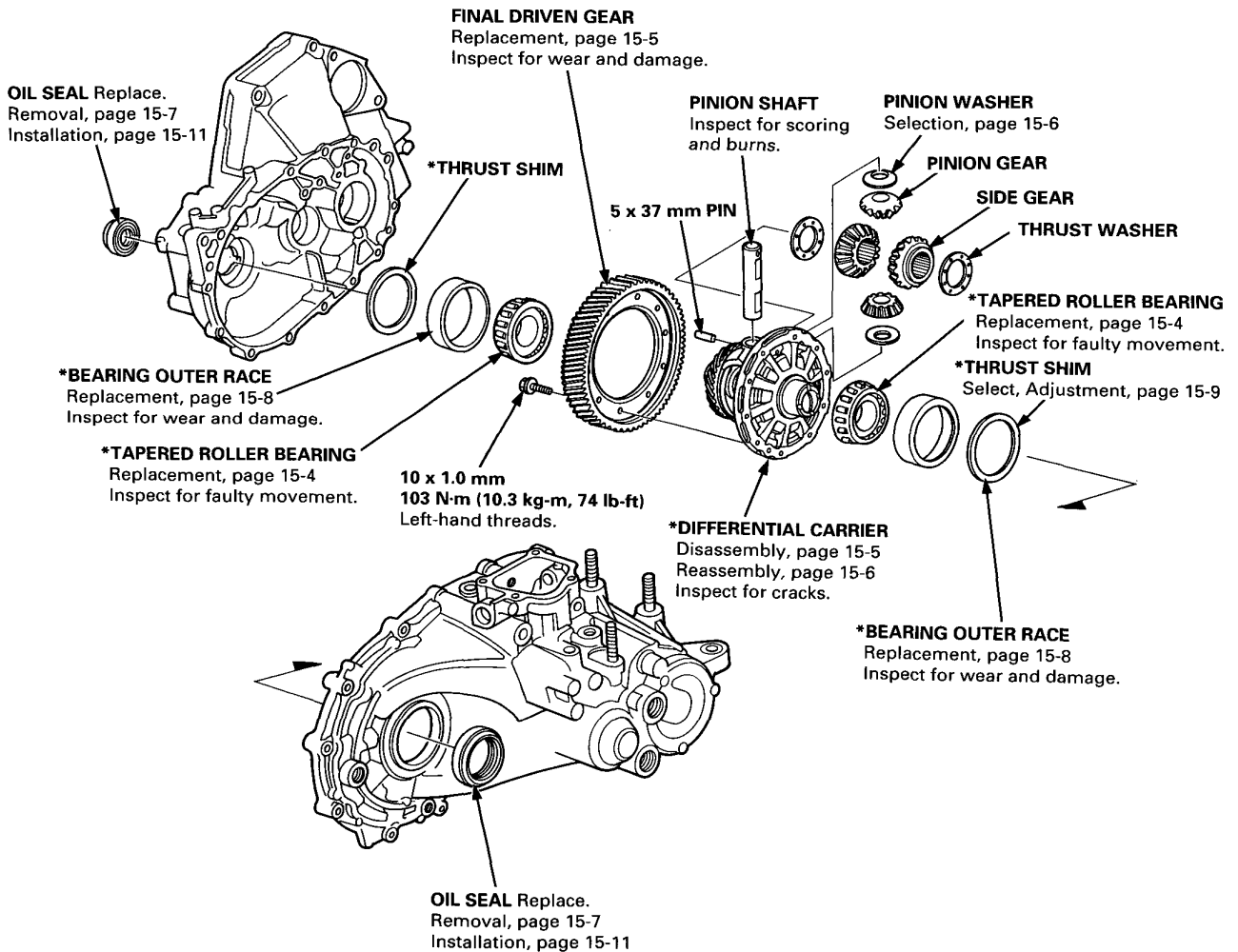


Differential (Manual Transmission)



Illustrated Index

NOTE: If the * mark parts were replaced, the tapered roller bearing preload must be adjusted (see page 15-9).

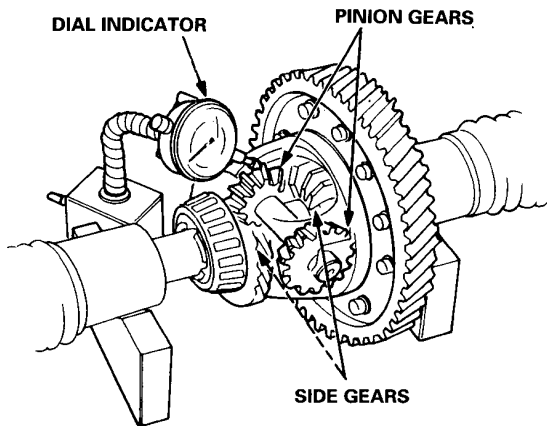


Differential (Manual Transmission)

Backlash Inspection

1. Place differential assembly on V-blocks and install both driveshafts.
2. Measure the backlash of both pinion gears.

Standard (New): 0.05 — 0.15 mm (0.002 — 0.006 in)



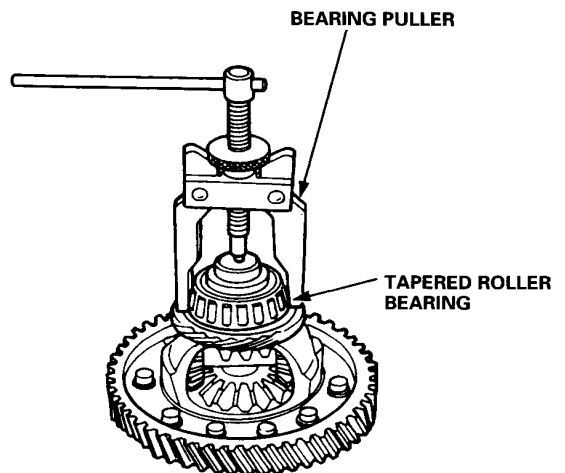
If the backlash is not within the standard, disassemble the differential carrier and select new pinion washers (see page 15-6).

Tapered Roller Bearing Replacement

NOTE:

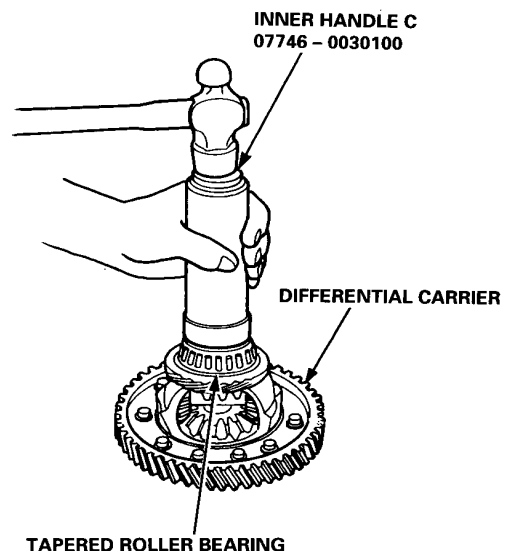
- The tapered roller bearing and bearing outer race should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.
- Check the tapered roller bearings for wear and rough rotation. If tapered roller bearings are OK, removal is not necessary.

1. Remove the tapered roller bearings using a bearing puller.



2. Install new tapered roller bearings using the special tool as shown.

NOTE: Drive the tapered roller bearings on until they bottom against the differential carrier.



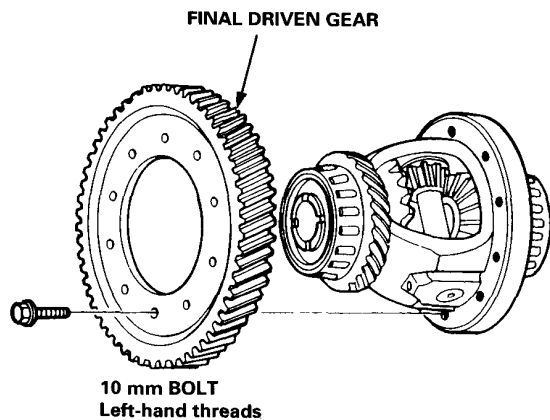


Final Driven Gear Replacement

1. Remove the bolts in a crisscross pattern in several steps, then remove the final driven gear.

NOTE: Final driven gear bolts have left-hand threads.

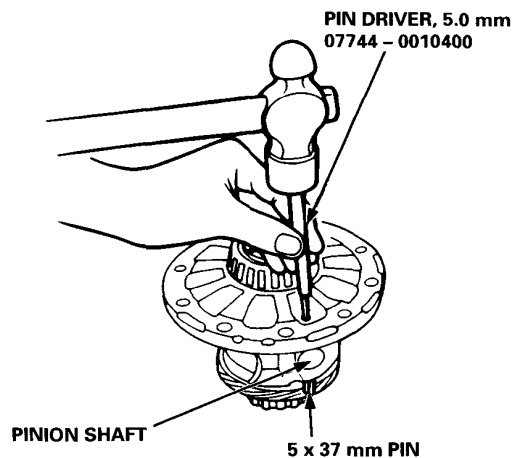
2. Inspect teeth for wear and damage.



3. Install the final driven gear.

Disassembly

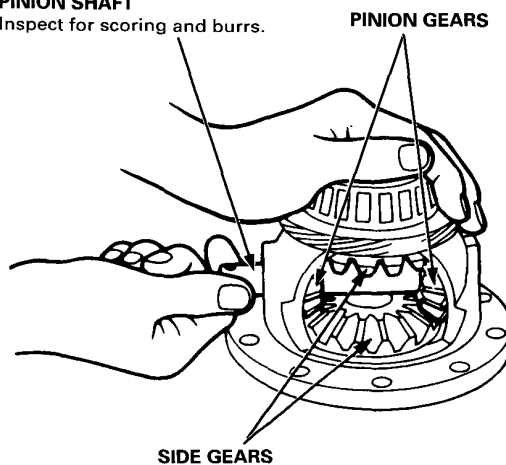
1. Remove the final driven gear.
2. Drive out the 5 x 37 mm pin using the special tool.



3. Remove the pinion shaft, gears, and washers.

PINION SHAFT

Inspect for scoring and burrs.



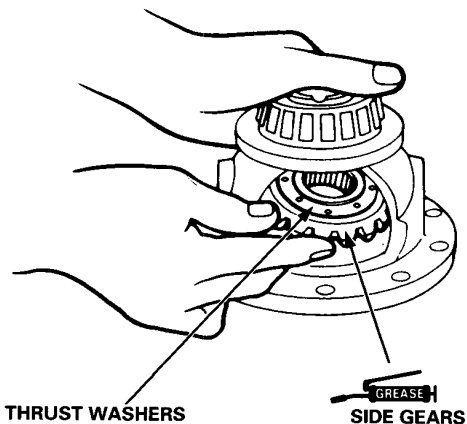
4. Wash parts thoroughly in solvent and dry with compressed air. Inspect all parts for wear and damage, and replace any that are defective.

Differential (Manual Transmission)

Reassembly

1. Install the side gears with thrust washers in differential carrier.

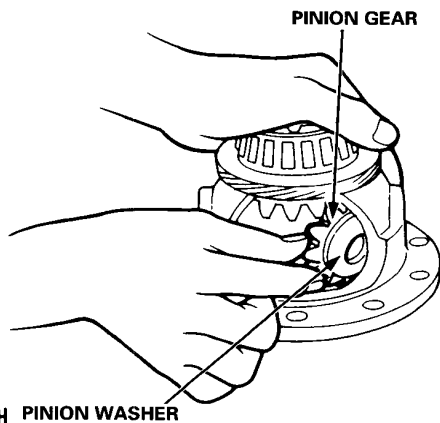
CAUTION: Coat all gears with molybdenum disulfide grease on all sides.



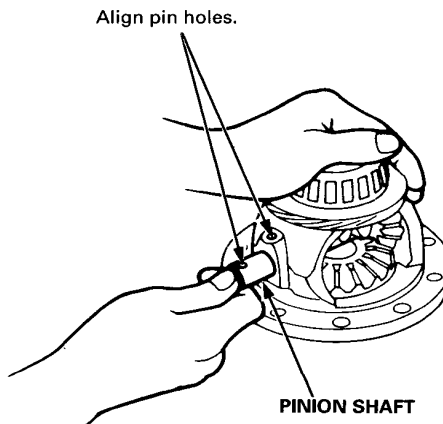
2. Set pinion gears in place exactly opposite each other in mesh with side gears, then install a pinion washer behind each one. Washers must be of equal thickness.

PINION WASHER

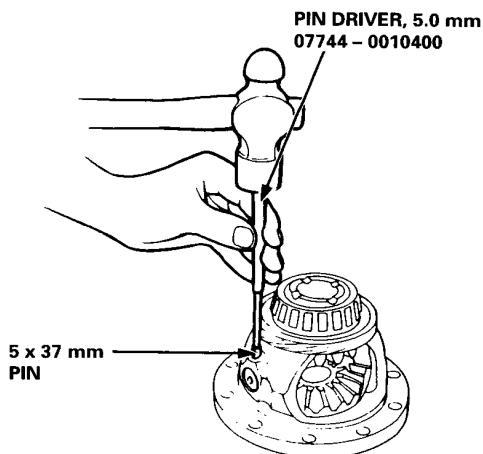
	Part Number	Thickness
A	41351 - PG1 - 000	0.7 mm (0.028 in)
B	41352 - PG1 - 000	0.75 mm (0.030 in)
C	41353 - PG1 - 000	0.8 mm (0.031 in)
D	41354 - PG1 - 000	0.85 mm (0.033 in)
E	41355 - PG1 - 000	0.9 mm (0.035 in)
F	41356 - PG1 - 000	0.95 mm (0.037 in)
G	41357 - PG1 - 000	1.0 mm (0.039 in)
H	41358 - PG1 - 000	1.05 mm (0.041 in)



3. Rotate gears as shown until shaft holes in pinion gears line up with shaft holes in carrier.
4. Insert pinion shaft and align pin hole in one end with matching hole in carrier.

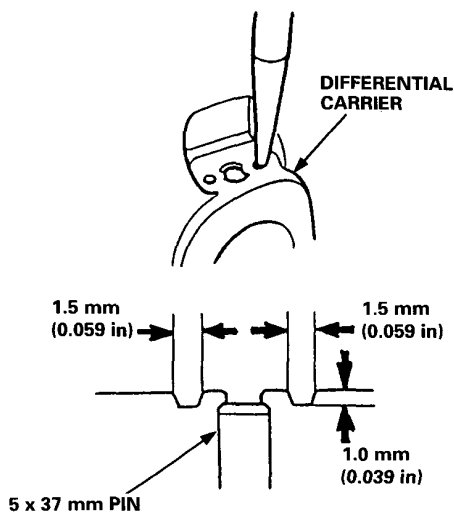


5. Check the backlash of both pinion gears again (see page 15-4).
6. Drive the 5 x 37 mm pin using the special tool.



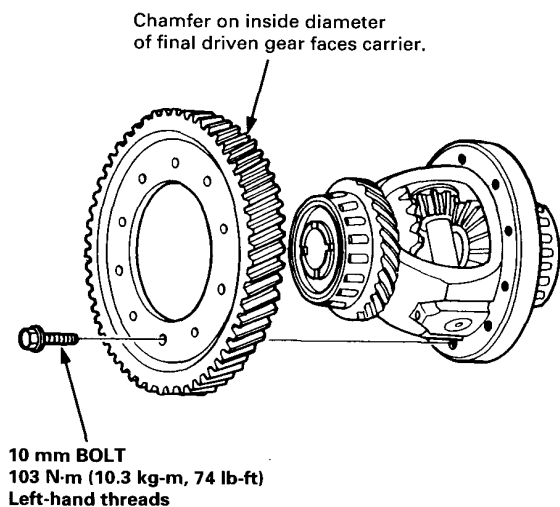


7. Stake the differential carrier at two points.



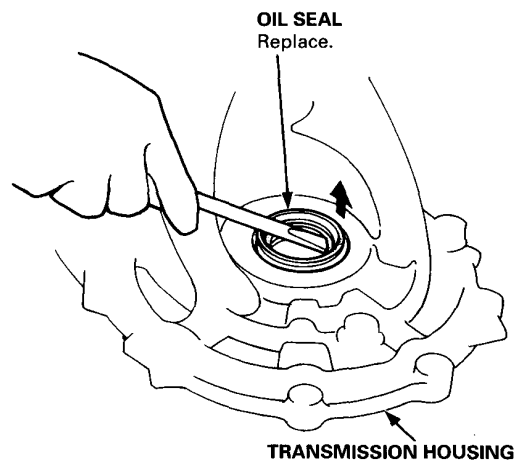
8. Install the final driven gear. Torque the bolts in a crisscross pattern in several steps.

NOTE: Final driven gear bolts have left-hand threads.

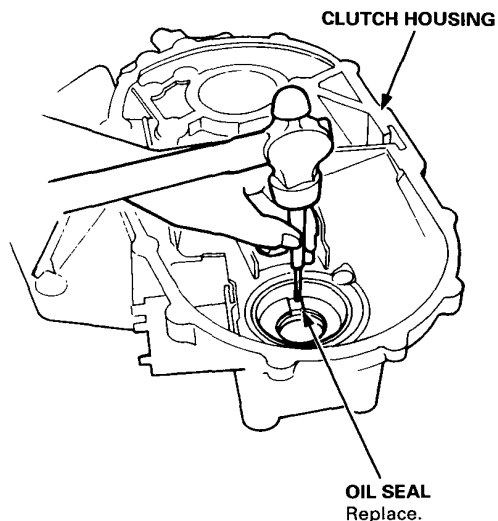


Oil Seal Removal

1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



3. Remove the oil seal from the clutch housing.



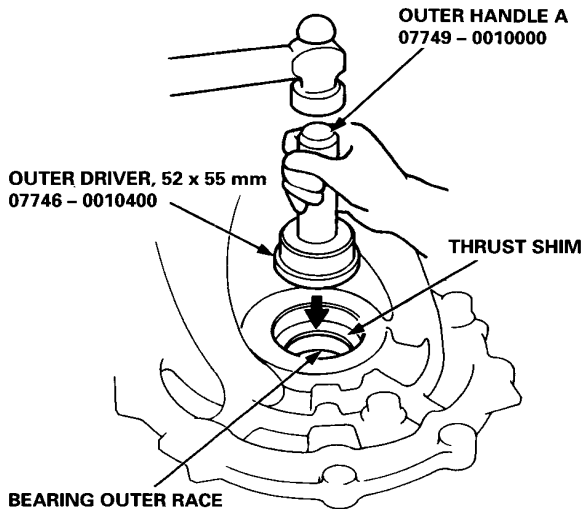
Differential (Manual Transmission)

Bearing Outer Race Replacement

NOTE:

- The bearing outer race and tapered roller bearing should be replaced as a set.
- Inspect and adjust the tapered roller bearing preload whenever the tapered roller bearing is replaced.

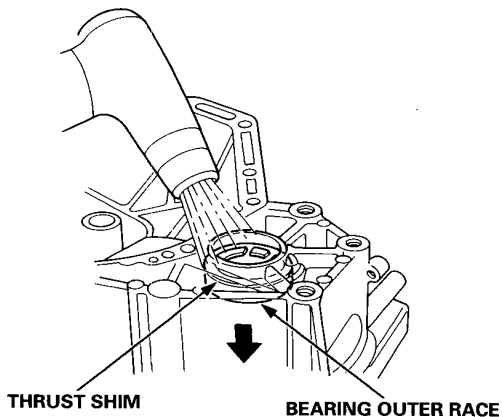
1. Remove the oil seals from the transmission housing and clutch housing (see page 15-7).
2. Remove the bearing outer race from the transmission housing using the special tools as shown.



3. Remove the bearing outer race and thrust shim from the clutch housing by heating the clutch housing to about 100°C (212°F) with a heat gun.

CAUTION: Do not reuse the thrust shim if the bearing outer race was driven out.

NOTE: Do not heat the clutch housing in excess of 100°C (212°F).

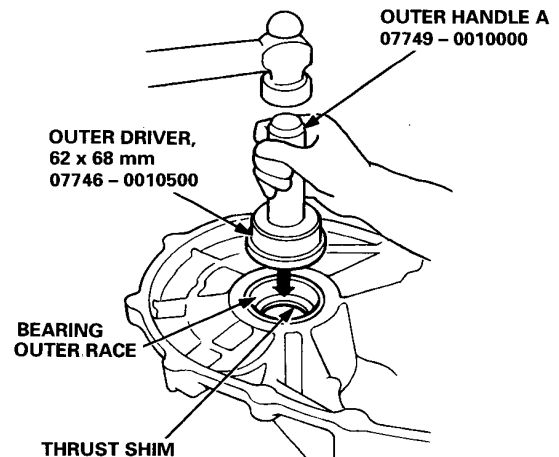


4. After installing the thrust shim, install a bearing outer race in the transmission housing and clutch housing using the special tools as shown.

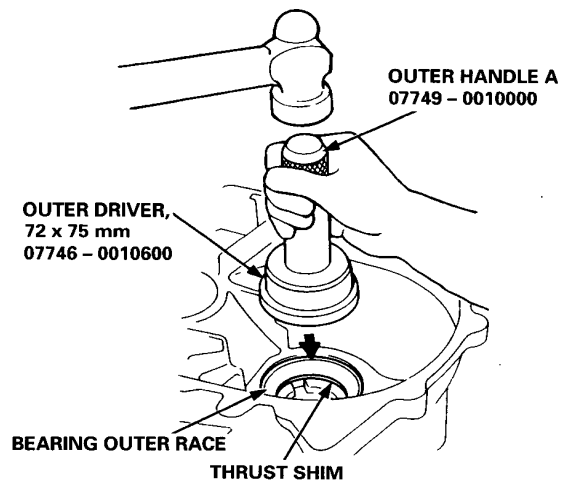
NOTE:

- Install the bearing outer race squarely.
- Check that there is no clearance between the bearing outer race, thrust shim, and housings.

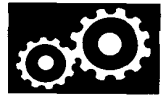
TRANSMISSION HOUSING:



CLUTCH HOUSING:



5. Install the oil seal (see page 15-11).



Tapered Roller Bearing Preload Adjustment

NOTE: If any of the items listed below were replaced, the tapered roller bearing preload must be adjusted.

- Transmission housing
- Clutch housing
- Differential carrier
- Tapered roller bearing and bearing outer race
- Thrust shim

1. Remove the bearing outer race and thrust shim from the transmission housing (see page 15-8).

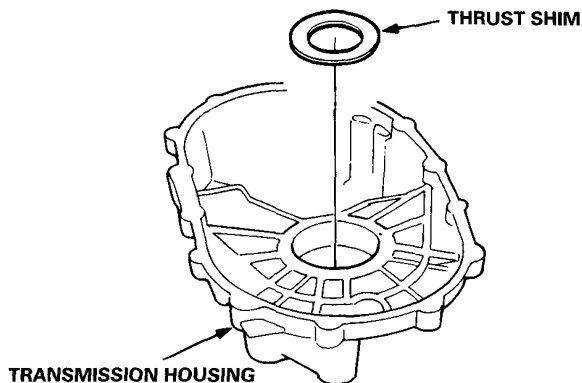
NOTE: Install the thrust shim only on the transmission housing side.

CAUTION: Do not reuse the thrust shim if the bearing outer race was driven out.

NOTE: Let the transmission cool to the room temperature if the bearing outer race was removed by heating the transmission housing before adjusting the tapered roller bearing preload.

2. First try the same size thrust shim that was removed.

CAUTION: Use only one thrust shim.



3. After installing the thrust shim, install the bearing outer race in the transmission housing (see page 15-8).

NOTE:

- Install the bearing outer race squarely.
- Check that there is no clearance between the bearing outer race, thrust shim and transmission housing.

4. With the mainshaft and countershaft removed, install the differential assembly, and torque the clutch housing and transmission housing (see section 13).

TORQUE: 10 x 1.25 mm: 45 N·m (4.5 kg-m, 33 lb-ft)
8 x 1.25 mm: 28 N·m (2.8 kg-m, 20 lb-ft)

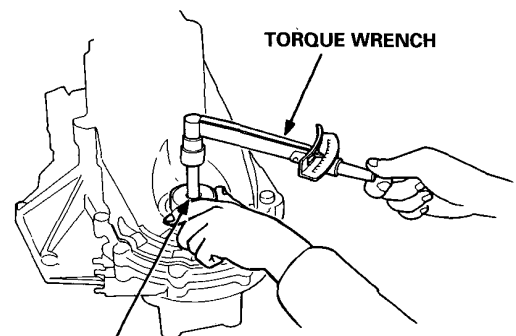
NOTE: It is not necessary to use sealing agent between the housings.

5. Rotate the differential assembly in both directions to seat the tapered roller bearings.
6. Measure the starting torque of the differential assembly with the special tool and a torque wrench.

STANDARD: 1.4 — 2.6 N·m (14 — 26 kg-cm,
12 — 23 lb-in)

NOTE:

- Measure the tapered roller bearing preload at normal room temperature.
- Measure the tapered roller bearing preload in both directions.



PRELOAD INSPECTION TOOL
07HAJ - PK40201

(cont'd)

Differential (Manual Transmission)

Tapered Roller Bearing Preload Adjustment (cont'd)

7. If the tapered roller bearing preload is not within the standard, select the thrust shim which will give the correct tapered roller bearing preload from the following table.

NOTE: Changing the thrust shim to the next size will increase or decrease tapered roller bearing preload about 0.3 – 0.4 N·m (3 – 4 kg-cm, 2.6 – 3.5 lb-in).

THRUST SHIM

	Part Number	Thickness
A	41381 – PX5 – 000	1.90 mm (0.075 in)
B	41382 – PX5 – 000	1.93 mm (0.076 in)
C	41383 – PX5 – 000	1.96 mm (0.077 in)
D	41384 – PX5 – 000	1.99 mm (0.078 in)
E	41385 – PX5 – 000	2.02 mm (0.079 in)
F	41386 – PX5 – 000	2.05mm (0.081 in)
G	41387 – PX5 – 000	2.08 mm (0.082 in)
H	41388 – PX5 – 000	2.11 mm (0.083 in)
I	41389 – PX5 – 000	2.14 mm (0.084 in)
J	41390 – PX5 – 000	2.17 mm (0.085 in)
K	41391 – PX5 – 000	2.20 mm (0.087 in)
L	41392 – PX5 – 000	2.23 mm (0.088 in)
M	41393 – PX5 – 000	2.26 mm (0.089 in)
N	41394 – PX5 – 000	2.29 mm (0.090 in)
O	41395 – PX5 – 000	2.32 mm (0.091 in)
P	41396 – PX5 – 000	2.35 mm (0.092 in)
Q	41397 – PX5 – 000	2.38 mm (0.094 in)
R	41398 – PX5 – 000	2.41 mm (0.095 in)
S	41399 – PX5 – 000	2.44 mm (0.096 in)
T	41400 – PX5 – 000	2.47 mm (0.097 in)

8. Recheck the tapered roller bearing preload.

9. How to select the correct thrust shim:
- 1) Compare the tapered roller bearing preload you get with the thrust shim that was removed, with the specified preload of 1.4 – 2.6 N·m (14 – 26 kg-cm, 12 – 23 lb-in).
 - 2) If your measured tapered roller bearing preload is less than specified, subtract your's from the specified.
If your's is more than specified, subtract the specified from your measurement.

For example with a 2.17 mm (0.085 in) thrust shim:

$$\begin{array}{r} \textcircled{A} \text{ specified} \quad 2.6 \text{ N}\cdot\text{m} \text{ (26 kg-cm, 23 lb-in)} \\ \text{—your measure} \quad 0.6 \text{ N}\cdot\text{m} \text{ (6 kg-cm, 5 lb-in)} \\ \hline 2.0 \text{ N}\cdot\text{m} \text{ (20 kg-cm, 18 lb-in) less} \end{array}$$

$$\begin{array}{r} \textcircled{B} \text{ you measure} \quad 3.4 \text{ N}\cdot\text{m} \text{ (34 kg-cm, 30 lb-in)} \\ \text{—specified} \quad 2.6 \text{ N}\cdot\text{m} \text{ (26 kg-cm, 23 lb-in)} \\ \hline 0.8 \text{ N}\cdot\text{m} \text{ (8 kg-cm, 7 lb-in) more} \end{array}$$

- 3) Each shim size up or down from standard makes about 0.3 – 0.4 N·m (3 – 4 kg-cm, 2.6 – 3.5 lb-in) difference in tapered roller bearing preload.

- In example A, your measured tapered roller bearing preload was 2 N·m (20 kg-cm, 17 lb-in) less than standard so you need a thrust shim five sizes thicker than standard try the 2.32 mm (0.091 in) thrust shim, and recheck.
- In example B, your's was 0.8 N·m (8 kg-cm, 7 lb-in) more than standard, so you need a thrust shim two sizes thinner try the 2.11 mm (0.083 in) thrust shim, and recheck.

10. After adjusting the tapered roller bearing preload, assemble the transmission and install the transmission housing (see section 13).

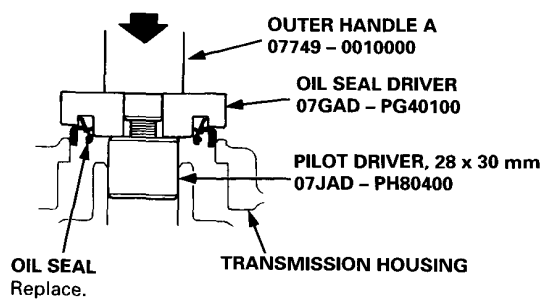
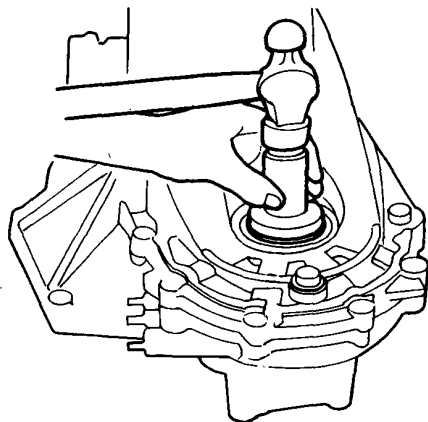
TORQUE: 10 x 1.25 mm: 45 N·m (4.5 kg-m, 33 lb-ft)
8 x 1.25 mm: 28 N·m (2.8 kg-m, 20 lb-ft)

11. Rotate the differential assembly in both directions to seat the tapered roller bearings.

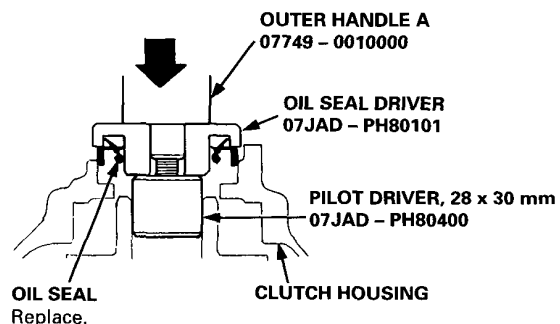
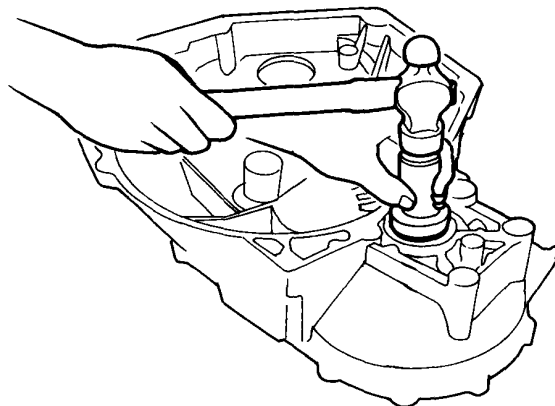


Oil Seal Installation

1. Install the new oil seal flush with the transmission housing using the special tools as shown.



2. Install the new oil seal into the clutch housing using the special tools as shown.



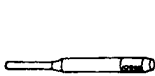
Differential (Automatic Transmission)

Special Tools	15-14
Differential (Automatic Transmission)	
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Reassembly	15-18
Oil Seal Removal	15-19
Tapered Roller Bearing Preload Adjustment	15-20
Bearing Outer Race Replacement	15-22
Oil Seal Installation	15-22



Special Tools

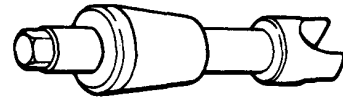
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD – PG20100	Pin Driver, 5.0 mm	1	15-17, 18
②	07GAD – SD40101 or 07GAD – SD40100	Driver Attachment	1	15-22
③	07HAJ – PK40201	Preload Inspection Tool	1	15-21
④	07HAD – SF10100	Driver Attachment	1	15-21
⑤	07JAD – PH80101	Driver Attachment	1	15-22
⑥	07JAD – PH80400	Pilot, 28 x 30 mm	1	15-22
⑦	07LAD – PW50601	Attachment, 40 x 50 mm	1	15-16
⑧	07749 – 0010000	Driver	1	15-21, 22
⑨	07947 – SD90200	Driver Attachment	1	15-22



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⑦

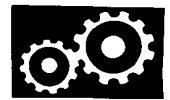


⑧

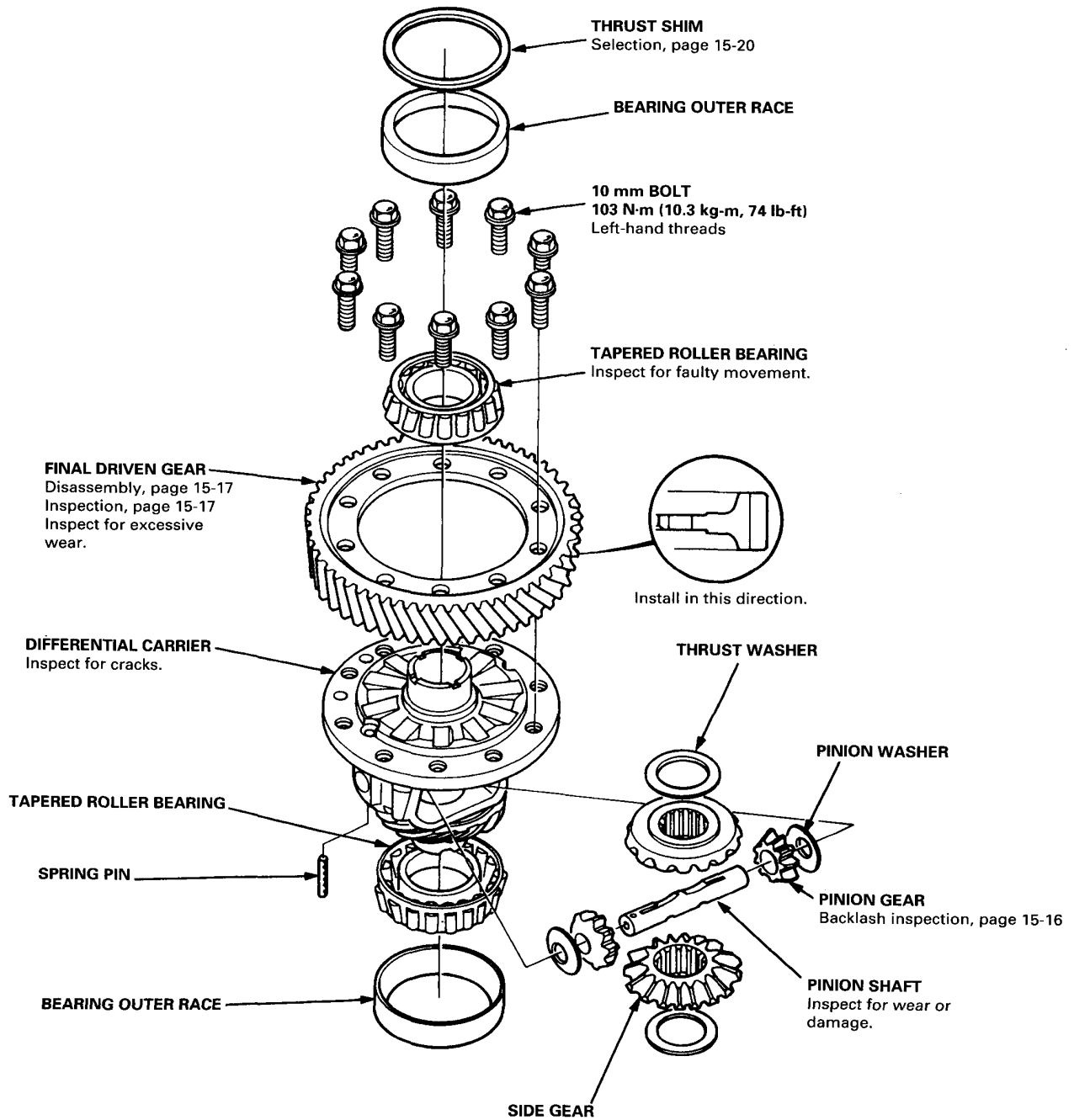


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Differential (Automatic Transmission)



Illustrated Index

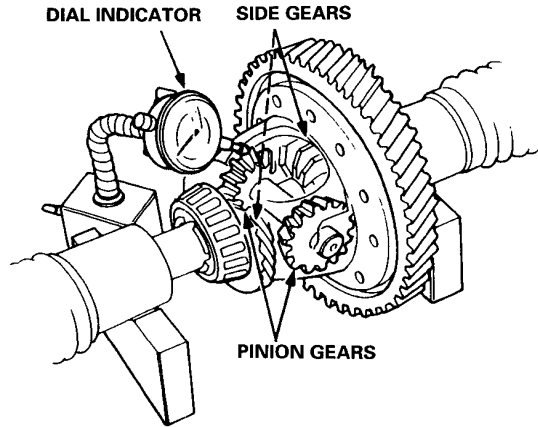


Differential (Automatic Transmission)

Backlash Inspection

1. Place the differential assembly on V-blocks and install both axles.
2. Check backlash of both side gears.

**Standard (New): 0.05 — 0.15 mm
(0.002 — 0.006 in.)**



3. If out of tolerance, disassemble the differential and select new pinion washers from the table below.

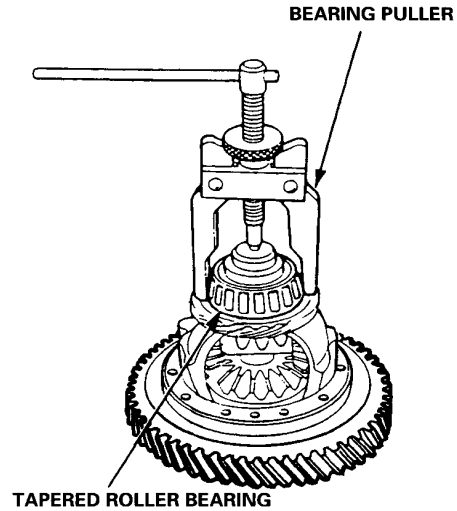
PINION WASHER

Part Number	Thickness
41351 - PG1 - 000	0.70 mm (0.028 in)
41352 - PG1 - 000	0.75 mm (0.029 in)
41353 - PG1 - 000	0.80 mm (0.031 in)
41354 - PG1 - 000	0.85 mm (0.032 in)
41355 - PG1 - 000	0.90 mm (0.035 in)
41356 - PG1 - 000	0.95 mm (0.036 in)
41357 - PG1 - 000	1.00 mm (0.039 in)
41358 - PG1 - 000	1.05 mm (0.041 in)

Bearing Replacement

NOTE: Check the bearings for wear and rough rotation. If the bearings are OK, removal is not necessary.

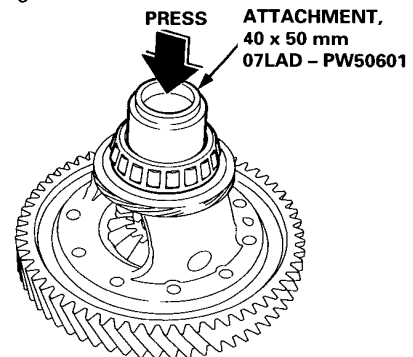
1. Remove the tapered roller bearings using a bearing puller.



2. Install the new tapered roller bearings, using the special tool and a press as shown.

NOTE:

- Drive the bearings on until they bottom.
- Use the special tool:
 - large end for torque converter housing side bearing.
 - small end for transmission housing side bearing.



NOTE:

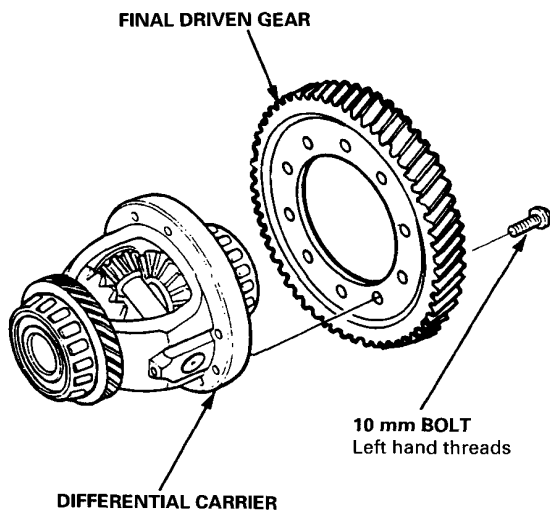
- The bearing and outer race should be replaced as a set.
- Inspect and adjust the bearing preload whenever a bearing is replaced.
- Drive in the bearings securely so that there is no clearance between the bearings and differential carrier.



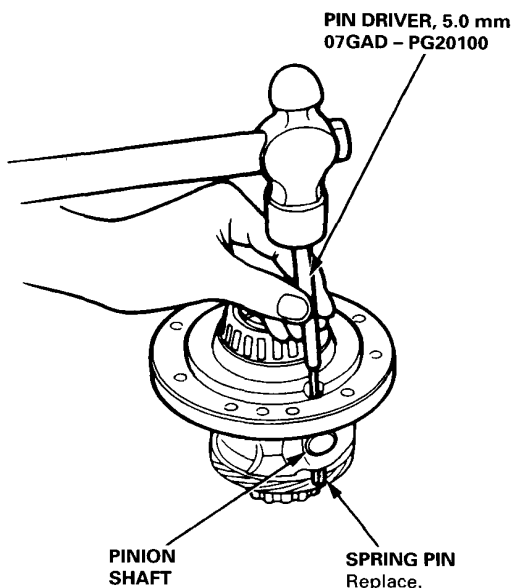
Inspection/Disassembly

1. Remove the final driven gear and inspect teeth for wear or damage.

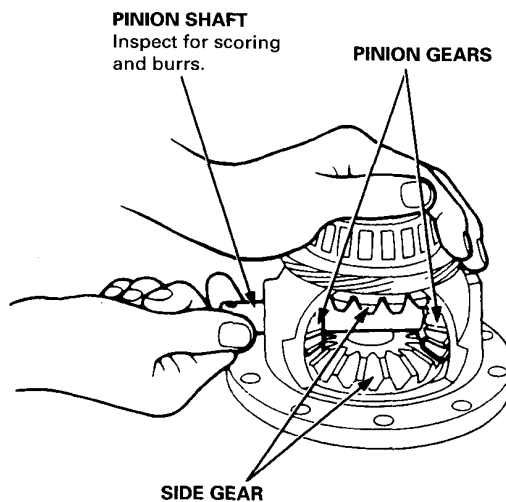
NOTE: The final driven gear bolts have left-hand threads.



2. Drive out the spring pin with the special tool.



3. Remove the pinion shaft, pinion gears, washers, thrust washers, and side gears.



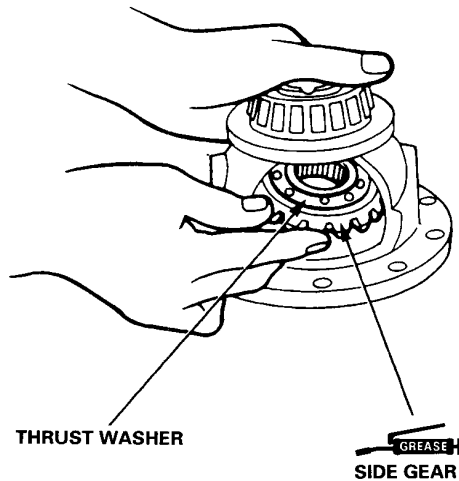
4. Wash the parts thoroughly in solvent and dry them with compressed air. Inspect all parts for wear or damage and replace any that are defective.

Differential (Automatic Transmission)

Reassembly

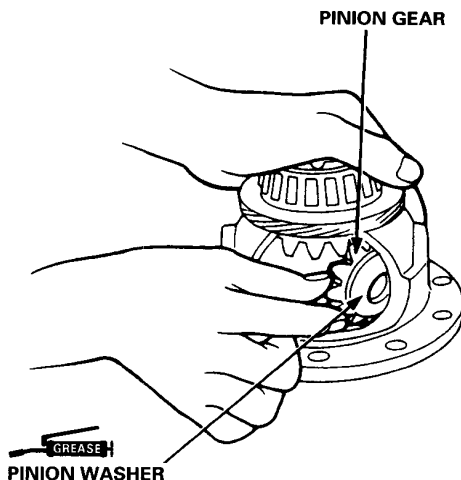
1. Install the side gears, with thrust washers in the differential carrier.

NOTE: Coat all gears with molybdenum disulfide grease on all sides.

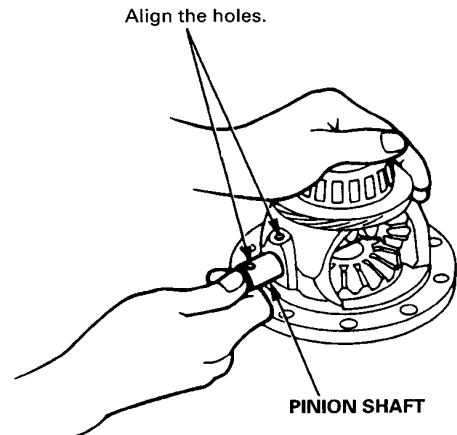


2. Set the pinion gears in the place exactly opposite each other in mesh with side gears, then install a pinion washer behind each one. Washers must be of equal thickness.

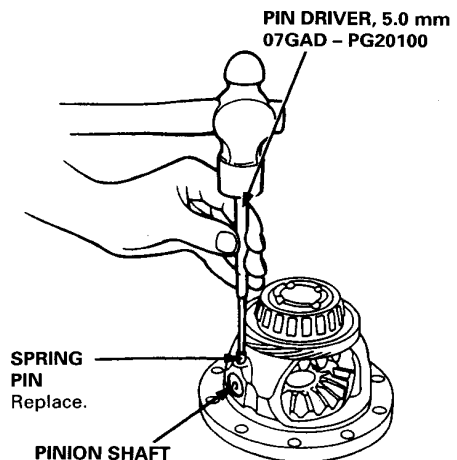
NOTE: Select the correct pinion washer from the table on page 15-16.



3. Rotate the gears until the shaft holes in the pinion gears line up with the shaft holes in carrier.
4. Insert the pinion shaft and align the spring pin holes in one end with the matching hole in the carrier.



5. Drive in the spring pin with the special tool.



6. Check backlash of both pinion gears again.

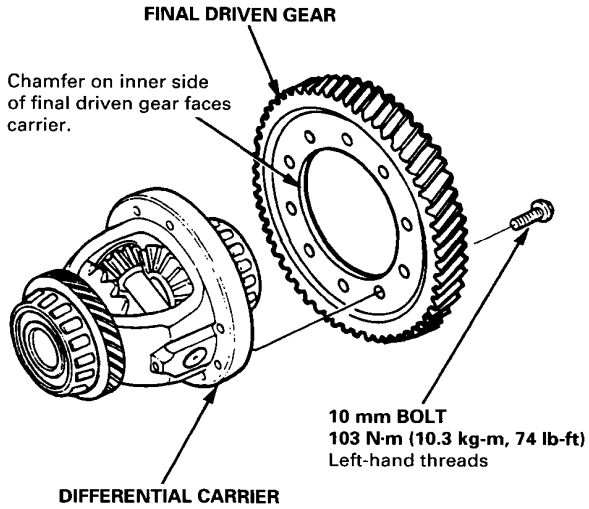
Standard (New): 0.05 — 0.15 mm
(0.002 — 0.006 in)

- If still out of tolerance, replace both thrust washers.
- If still out of tolerance, replace the side and pinion gears, and recheck backlash.
- If still out of tolerance, replace the carrier complete.



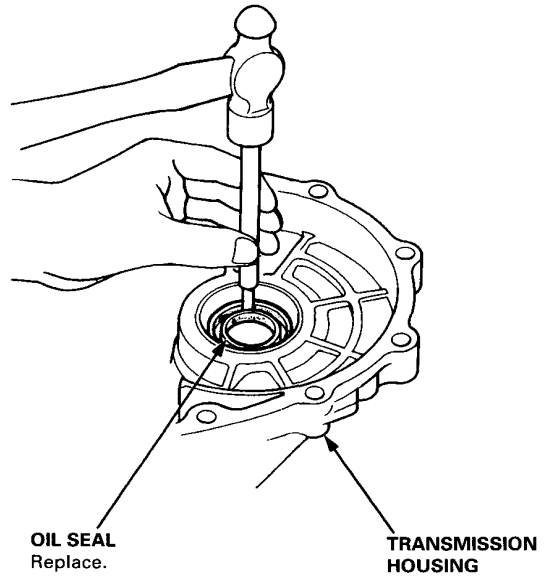
7. Install the final driven gear. Torque the bolts to 103 N-m (10.3 kg-m, 74 lb-ft).

NOTE: The final driven gear bolts have left-hand threads.

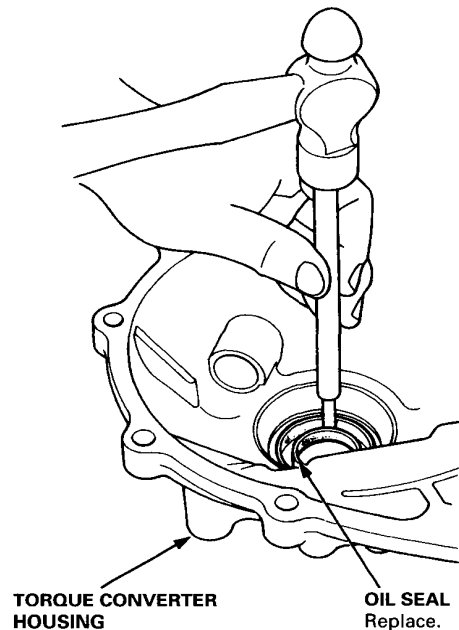


Oil Seal Removal

1. Remove the differential assembly.
2. Remove the oil seal from the transmission housing.



3. Remove the oil seal from the torque converter housing.



Differential (Automatic Transmission)

Tapered Roller Bearing Preload Adjustment

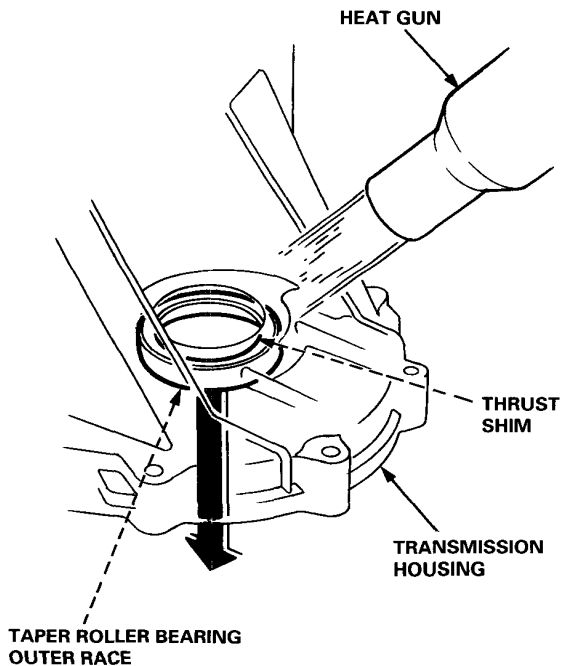
NOTE: If the transmission housing, torque converter housing, differential carrier, taper roller bearing, outer race or thrust shim were replaced, the bearing preload must be adjusted.

1. Remove the bearing outer race and thrust shim from the transmission housing by heating the housing to about 100°C (212°F) with a heat gun.

CAUTION:

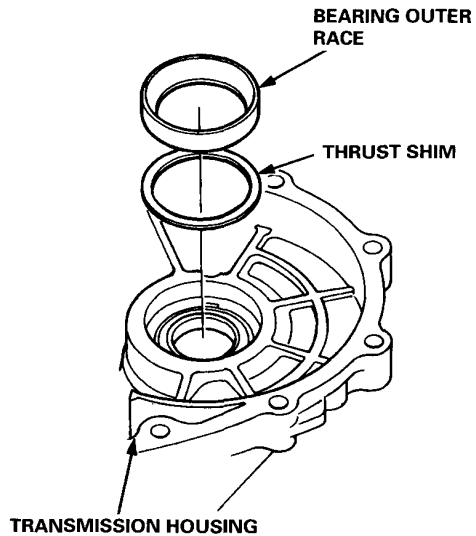
- Do not heat the housing in excess of 100°C (212°F).
- Replace the taper roller bearing when the outer race is to be replaced.
- Do not use a shim on the torque converter housing side.

NOTE: Let the transmission housing cool to the room temperature before adjusting the bearing preload.



2. Select the thrust shim from the table below so that their total thickness is 2.60 mm (0.102 in).

CAUTION: Do not use more than two shims to adjust the bearing preload.



THRUST SHIM

No.	Part Number	Thickness
A	41441 - PK4 - 000	2.20 mm (0.087 in)
B	41442 - PK4 - 000	2.25 mm (0.089 in)
C	41443 - PK4 - 000	2.30 mm (0.091 in)
D	41444 - PK4 - 000	2.35 mm (0.093 in)
E	41445 - PK4 - 000	2.40 mm (0.094 in)
F	41446 - PK4 - 000	2.45 mm (0.096 in)
G	41447 - PK4 - 000	2.50 mm (0.098 in)
H	41448 - PK4 - 000	2.55 mm (0.100 in)
*I	41449 - PK4 - 000	2.60 mm (0.102 in)
J	41450 - PK4 - 000	2.65 mm (0.104 in)
K	41451 - PK4 - 000	2.70 mm (0.106 in)
L	41452 - PK4 - 000	2.75 mm (0.108 in)
M	41453 - PK4 - 000	2.80 mm (0.110 in)
N	41454 - PK4 - 000	2.85 mm (0.112 in)
O	41455 - PK4 - 000	2.90 mm (0.114 in)
P	41456 - PK4 - 000	2.95 mm (0.116 in)
Q	41457 - PK4 - 000	3.00 mm (0.118 in)
R	41458 - PK4 - 000	3.05 mm (0.120 in)

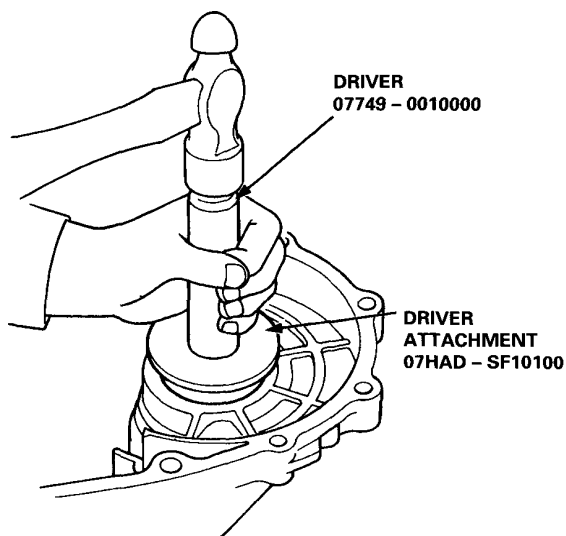
* Standard shim



3. After installing the thrust shim, install the outer race in the transmission housing, using the special tools as shown.

CAUTION:

- Install the outer race squarely in the transmission housing.
- Check that there is no clearance between the outer race, shim and transmission housing.
- Install the gasket when checking preload.



4. With the mainshaft, countershaft and secondary shaft removed, install the differential assembly and torque the transmission housing.

TORQUE: 55 N-m (5.5 kg-m, 40 lb-ft)

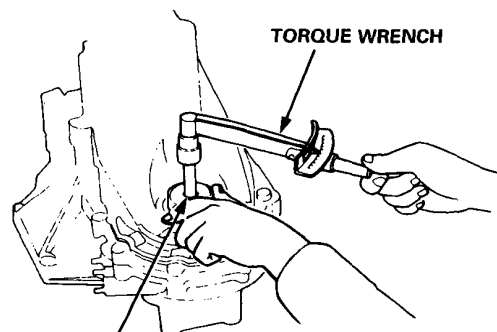
5. Rotate the differential assembly in both directions to seat the bearings.

6. Measure the starting torque of the differential assembly with the special tool and a torque wrench.

STANDARD:

New bearings: 2.8 — 4.0 N-m
(28 — 40 kg-cm, 24 — 35 lb-in)

Reused bearings: 2.5 — 3.7 N-m
(25 — 37 kg-cm, 22 — 32 lb-in)



**PRELOAD INSPECTION TOOL
07HAJ - PK40201**

NOTE:

- Measure the starting torque at normal room temperature in both directions.
- If out of spec, select two thrust shims which will give the correct preload, and repeat steps 1 — 6.
- Changing one of the shims to the next size will increase or decrease starting torque about 3 — 4 kg-cm (2.60 — 3.47 lb-in).
- To increase the starting torque, increase the thickness of shims. To decrease the starting torque, decrease the thickness of shims.

Differential (Automatic Transmission)

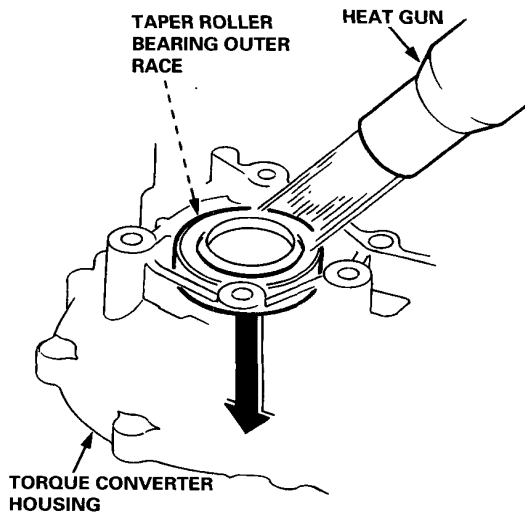
Bearing Outer Race Replacement

1. Remove the bearing outer race from the torque converter housing by heating the housing to about 100°C (212°F) with a heat gun.

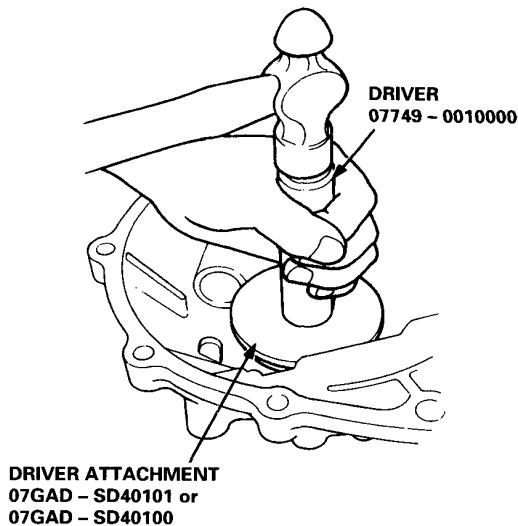
CAUTION: Do not heat the housing in excess of 100°C (212°F).

NOTE:

- Replace the bearing with a new one whenever the outer race is to be replaced.
- Do not use shims on the torque converter housing side.
- Adjust preload after replacing the bearing outer race and bearing.

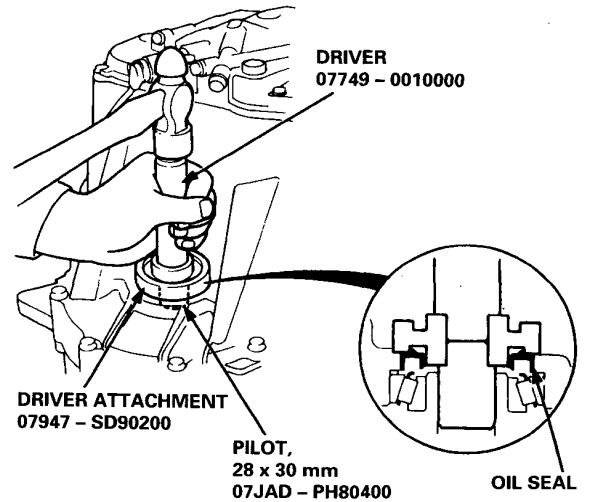


2. Install the new bearing outer race flush with the housing using the special tools.

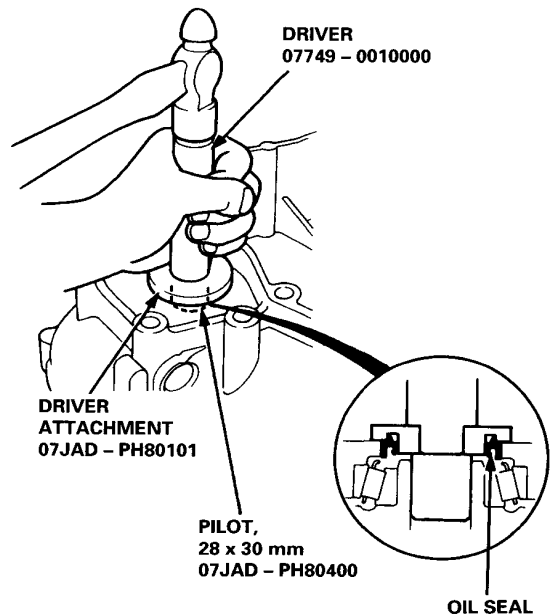


Oil Seal Installation

1. Install the oil seal in the transmission housing, using the special tools as shown.



2. Drive the oil seal into the torque converter housing, using the special tools as shown.



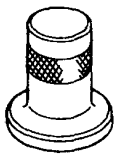
Driveshafts

Special Tools	16-2
Driveshafts	
Inspection	16-3
Removal	16-3
Disassembly	16-5
Reassembly	16-9
Installation	16-13
Intermediate Shaft	
Removal	16-15
Disassembly	16-16
Reassembly	16-18
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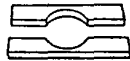


Special Tools

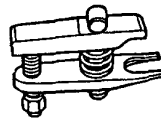
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAD - PH70201	Oil Seal Driver	1	16-19
②	07GAF - SD40700	Hub Dis/Assembly Base	2	16-16, 17, 19
③	07MAC - SL00100	Ball Joint Remover, 32 mm	1	16-4
④	07746 - 0010200	Attachment, 37 x 40 mm	1	16-17
⑤	07746 - 0010400	Attachment, 52 x 55 mm	1	16-19
⑥	07746 - 0030400	Attachment, 35 mm I.D.	1	16-19
⑦	07749 - 0010000	Driver	1	16-17, 19



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Driveshafts



Inspection

Driveshaft Boot

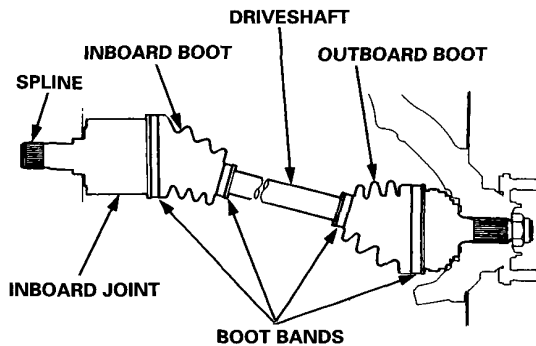
Check the boots on the driveshaft for cracks, damage, leaking grease or loose boot bands. If any damage is found, replace the boot and boot bands.

Spline Looseness

Turn the driveshaft by hand and make sure the spline and joint are not excessively loose. If damage is found, replace the inboard joint.

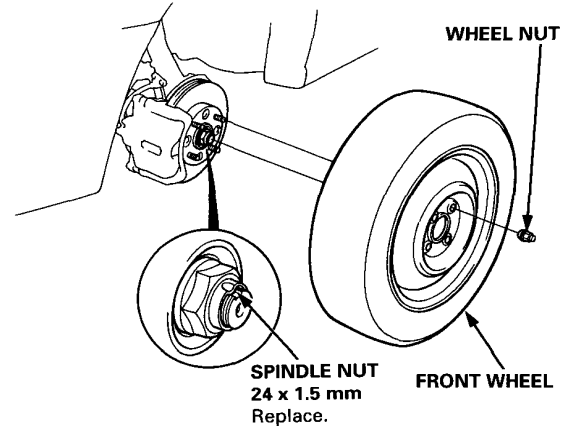
Twisted or Cracked

Make sure the driveshaft is not twisted or cracked. Replace if necessary.



Removal

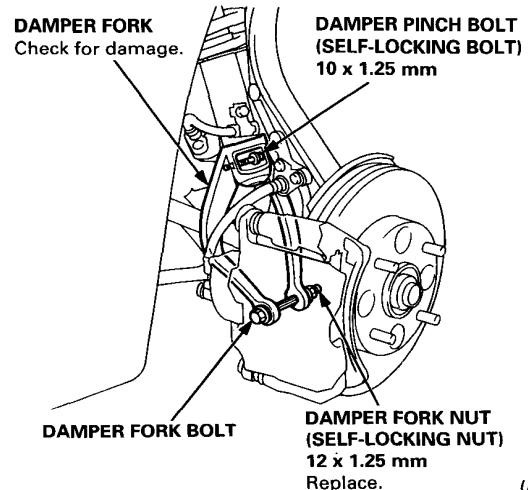
1. Loosen the wheel nuts slightly.
2. Raise the front of car, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and front wheels.
4. Drain the transmission oil or fluid.
5. Raise the locking tab on the spindle nut, then remove the nut.



6. Remove the damper fork nut, bolt and damper pinch bolt.

CAUTION: Replace the damper pinch bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N-m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).

7. Remove the damper fork.



(cont'd)

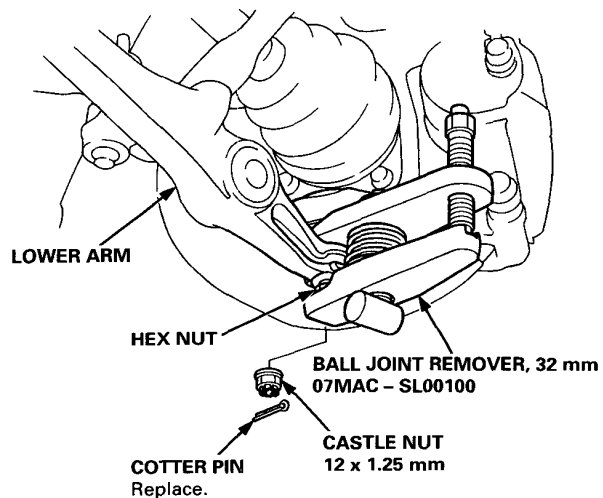
Driveshafts

Removal (cont'd)

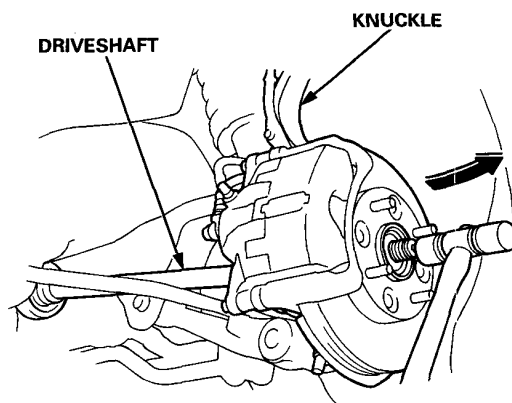
8. Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.
9. Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.
10. Use the ball joint remover, 32 mm as shown on page 18-11 to separate the ball joint and lower arm.

CAUTION: Be careful not to damage the ball joint boot.

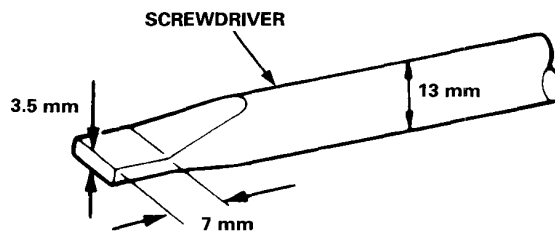
NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



11. Pull the knuckle outward and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



12. Pry the driveshaft assembly with a screwdriver as shown to force the set ring at the driveshaft end past the groove.

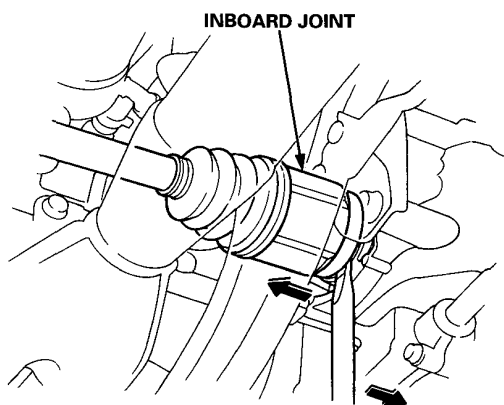




13. Pull the inboard joint and remove the driveshaft from the differential case as an assembly.

CAUTION:

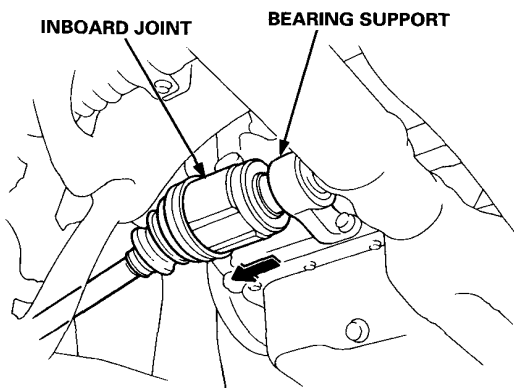
- Do not pull on the driveshaft, as the inboard joint may come apart.
- Use care when prying out the assembly and pull it straight to avoid damaging the differential oil seal.



- With Intermediate Shaft:
Remove the left driveshaft from the bearing support by tapping the inboard joint of the driveshaft with a plastic hammer.

CAUTION:

- Do not pull on the driveshaft, as the inboard joint may come apart.
- Use care when prying out the assembly and pull it straight to avoid damaging the intermediate shaft outer seal.

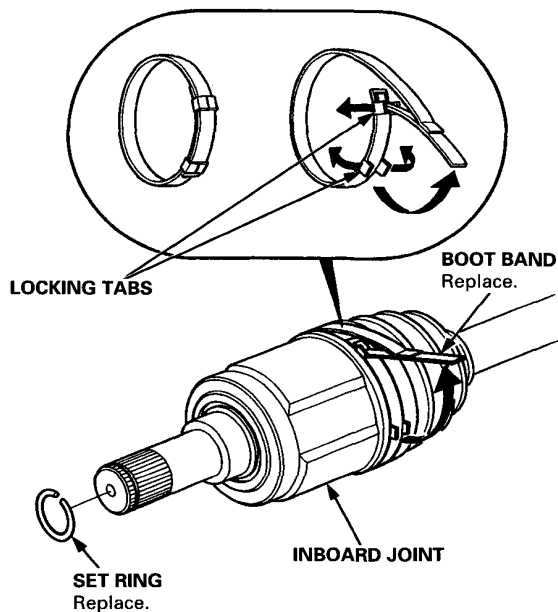


Disassembly

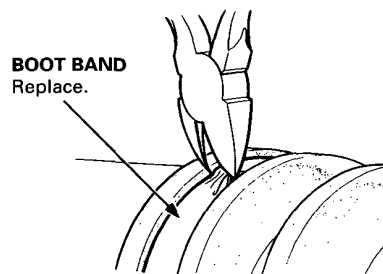
1. Remove the set ring from the inboard joint.
2. To remove the boot band, pry up the locking tabs with a screwdriver and raise the end of the band.

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.



(cont'd)

Driveshafts

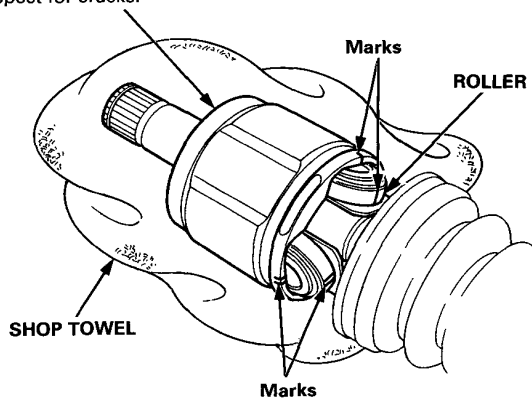
Disassembly (cont'd)

3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint with paint. Then remove the inboard joint on the shop towel.

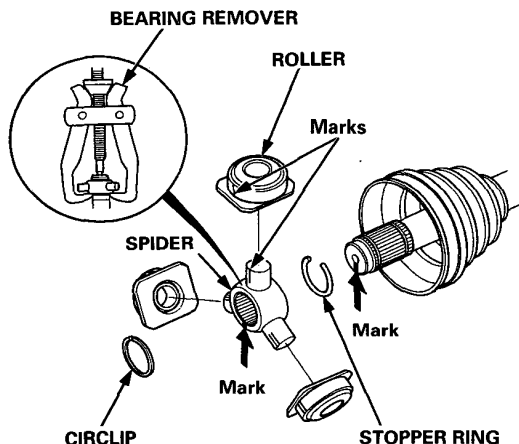
NOTE: Be careful not to drop the rollers when separating them from the inboard joint.

INBOARD JOINT

Check splines for wear or damage.
Check inside bore for wear.
Inspect for cracks.



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 commercially available bearing remover.
8. Remove the stopper ring.



9. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the inboard boot and dynamic damper.

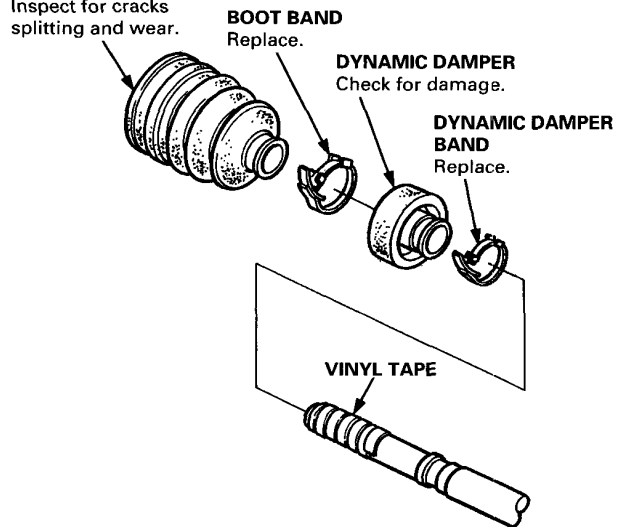
10. Remove the boot band and inboard boot.

CAUTION: Take care not to damage the boot.

11. Remove the dynamic damper band and dynamic damper, if equipped.

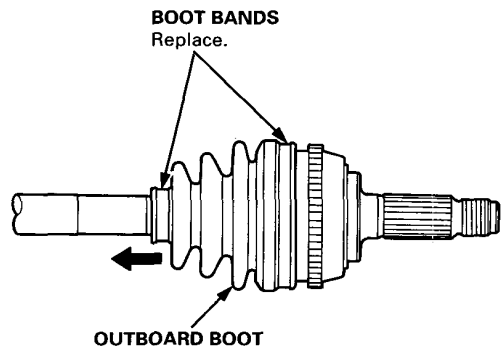
INBOARD BOOT

Inspect for cracks splitting and wear.



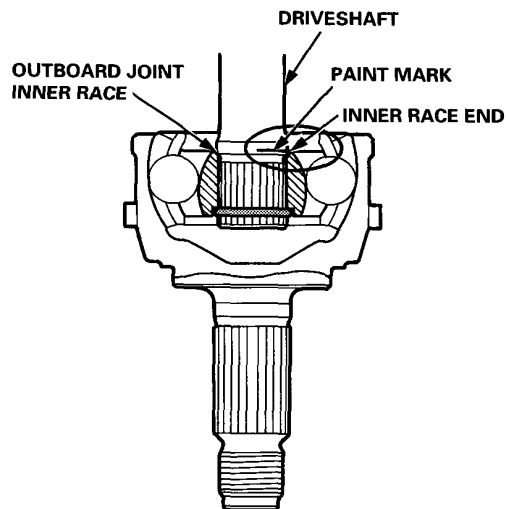
12. Remove the outboard boot bands, then slide the outboard boot to the inboard joint side.

CAUTION: Take care not to damage the boot.

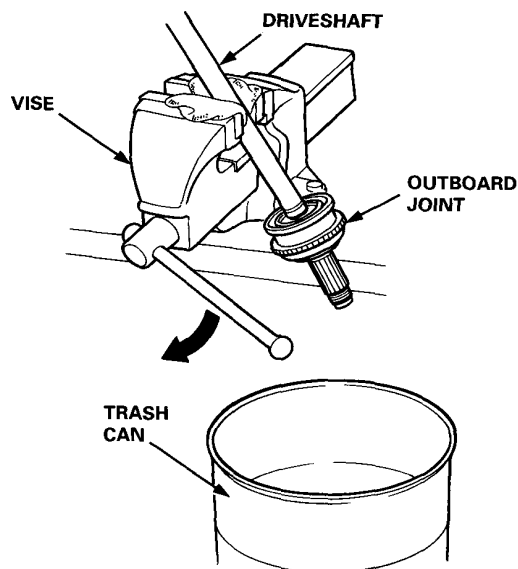




13. Wipe off the grease to expose the driveshaft and the outboard joint inner race.
14. Mark the driveshaft at the same position of the inner race end with paint.

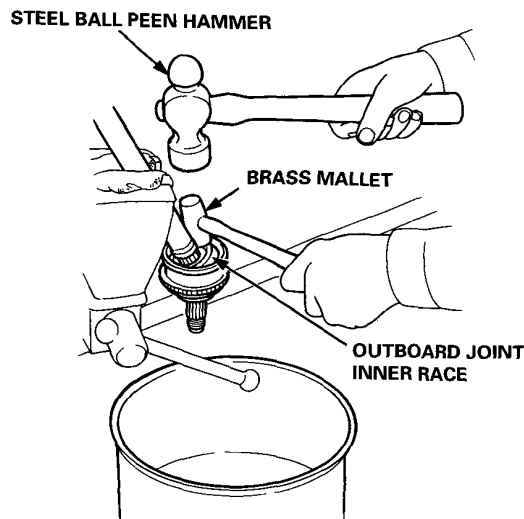


15. Carefully clamp the driveshaft in a vise with the outboard joint facing down. Clamp the driveshaft tight enough to prevent it from moving but not so tight as to damage or distort it.
16. Position a trash can underneath the driveshaft to catch the outboard joint.

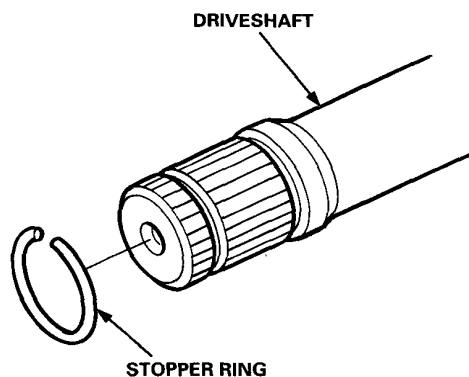


17. Place the head of a brass mallet on the outboard joint inner race. Using a large steel ball peen hammer, strike the head of the brass mallet sharply two or three times.

NOTE: If the outboard boot disturbs you, cut off the outboard boot.



18. If the outboard joint does not come loose after two or three hits, rotate the driveshaft 180° and try again from the opposite side. If the joint still will not come loose, replace the driveshaft assembly.
19. Remove the driveshaft from the vise.
20. Remove the stopper ring from the driveshaft.



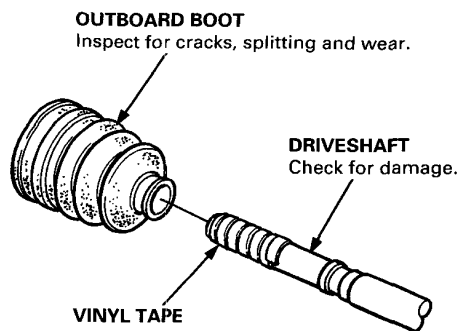
(cont'd)

Driveshafts

Disassembly (cont'd)

21. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the outboard boot.
22. Remove the outboard boot.


CAUTION: Take care not to damage the boot.





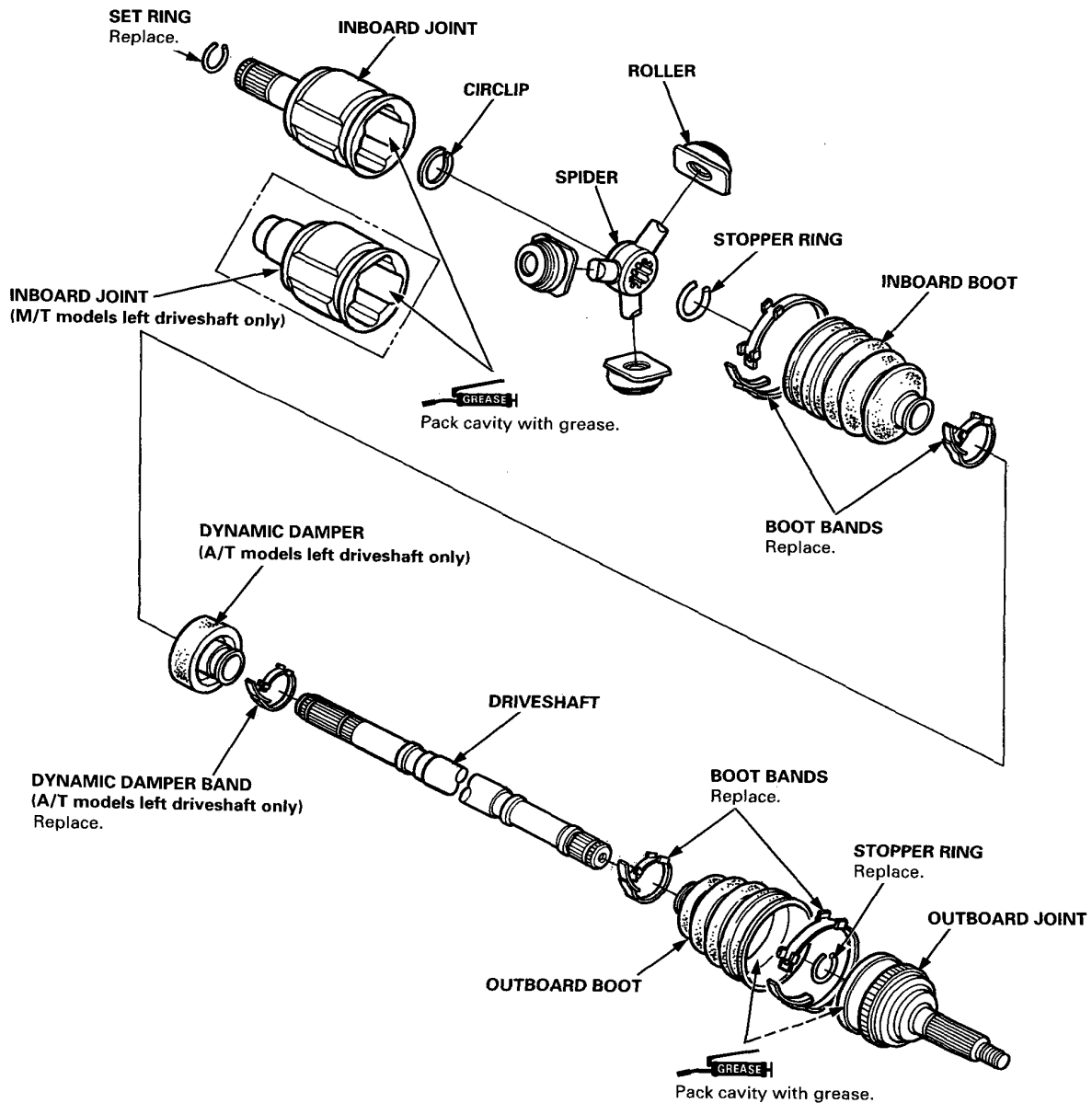
Reassembly

NOTE:

- Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
-  : Thoroughly pack the inboard joint, outboard joint and outboard boot with joint grease included in the new driveshaft set.

Grease quantity:

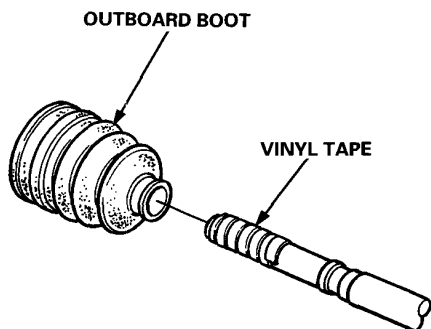
Inboard Joint	120 — 130 g (4.2 — 4.6 oz)
Outboard Joint	80 — 100 g (2.8 — 3.5 oz)



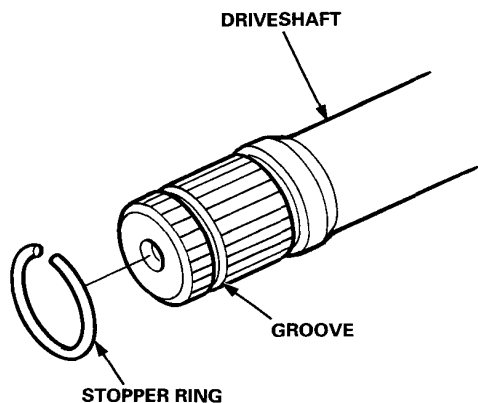
Driveshafts

Reassembly (cont'd)

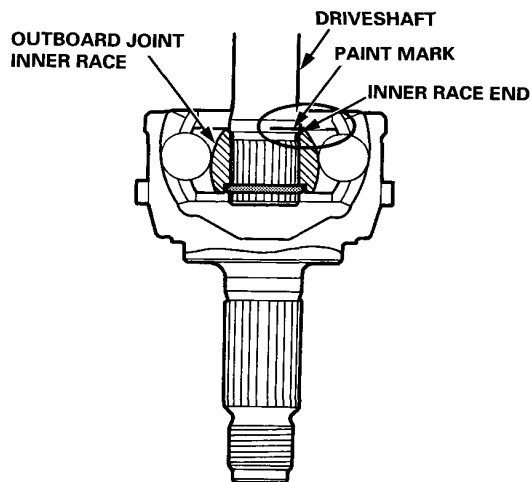
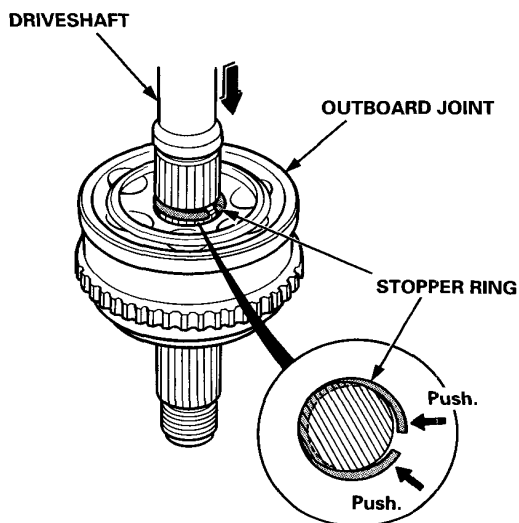
1. Wrap the splines with vinyl tape to prevent damage to the outboard boot.
2. Install the outboard boot, then remove the vinyl tape.



3. Install the stopper ring into the driveshaft groove.

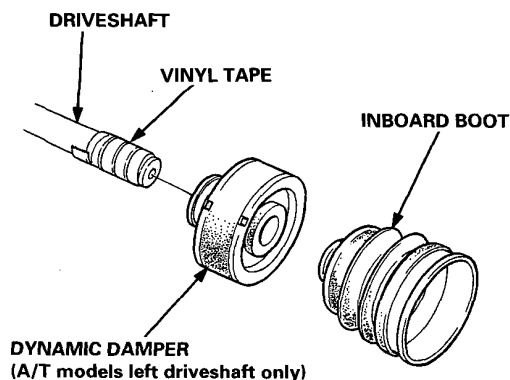


4. Insert the driveshaft in the outboard joint until the stopper ring is close on the joint.
5. Push the stopper ring into the groove and insert the driveshaft until the paint mark of the driveshaft is aligned the outboard joint inner race end.
6. Lightly tap on the inner race with a plastic hammer to make sure the joint does not move on the drive-shaft.





7. Wrap the splines with vinyl tape to prevent damage to the inboard boot and dynamic damper.
8. Install the dynamic damper and inboard boot to the driveshaft, then remove the vinyl tape.

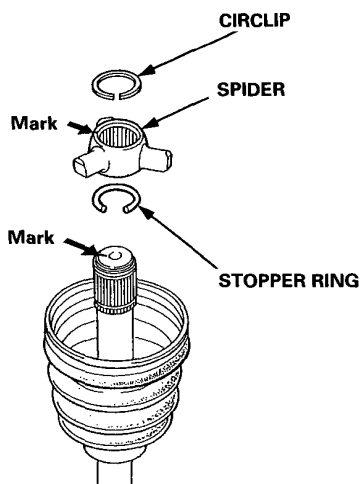


9. Install the stopper ring into the driveshaft groove.

NOTE: Always rotate the stopper ring in its groove to be sure it is fully seated.

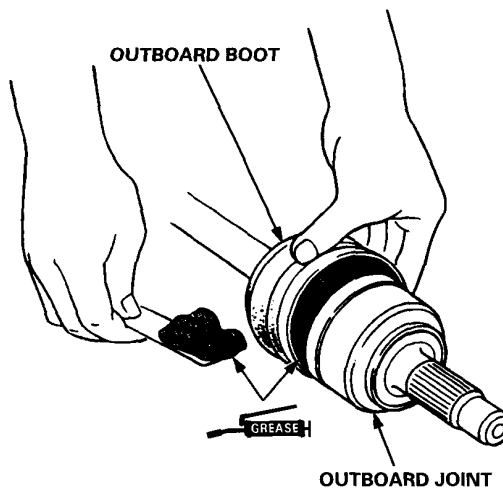
10. Install the spider on the driveshaft by aligning the marks on the spider and end of the driveshaft.
11. Fit the circlip into the driveshaft groove.

NOTE: Always rotate the circlip in its groove to be sure it is fully seated.



12. Pack the outboard joint and outboard boot with the joint grease included in the new driveshaft set.

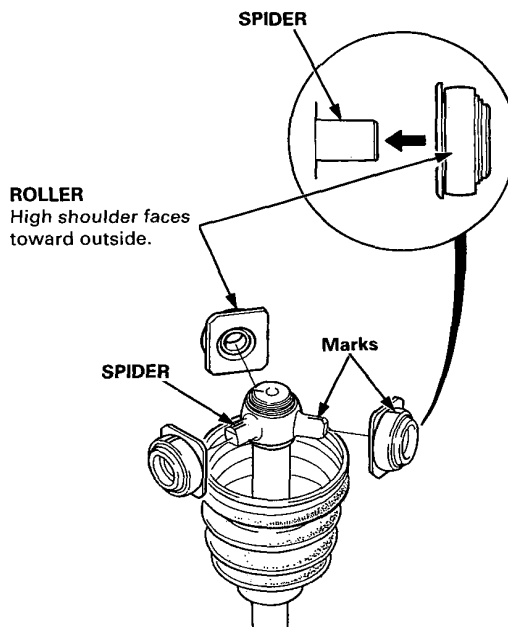
Grease Quantity: 80 — 100 g (2.8 — 3.5 oz)



13. 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.
- To prevent it falling off, hold the driveshaft so the spider and roller point up.



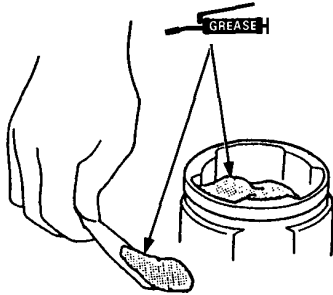
(cont'd)

Driveshafts

Reassembly (cont'd)

14. Pack the inboard joint with the joint grease included in the new driveshaft set.

Grease Quantity: 120 — 130 g (4.2 — 4.6 oz)

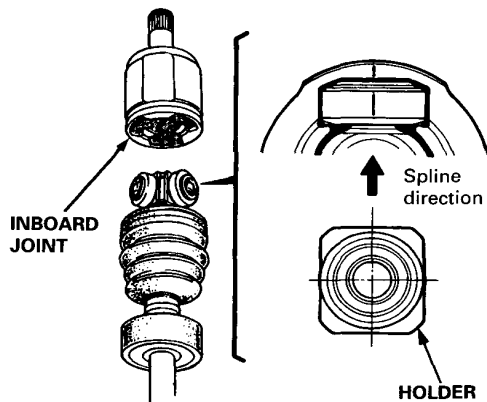


15. Fit the inboard joint onto the driveshaft.

CAUTION:

- Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint and the rollers.
- Hold the driveshaft assembly so the inboard joint points up, to prevent it falling off.

NOTE: Align the holder direction of the rollers toward the slot of inboard joint as shown below.

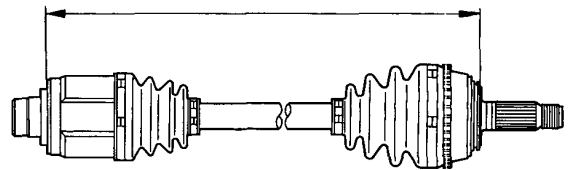


16. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension.

NOTE: The ends of boots seat in the groove of the driveshaft and joint.

M/T:

Left: 456 — 461 mm (18.0 — 18.1 in)



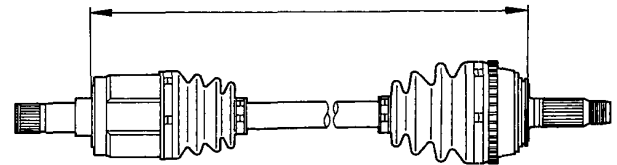
M/T

Right: 466 — 471 mm (18.3 — 18.5 in)

A/T:

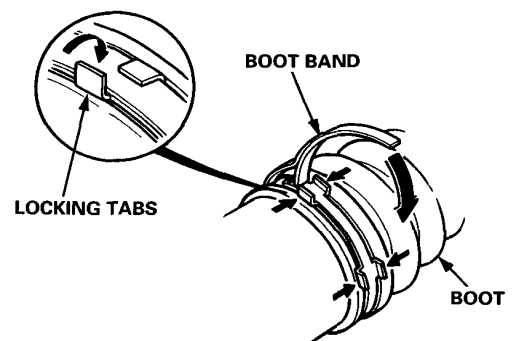
Left: 824 — 829 mm (32.4 — 32.6 in)

Right: 466 — 471 mm (18.3 — 18.5 in)



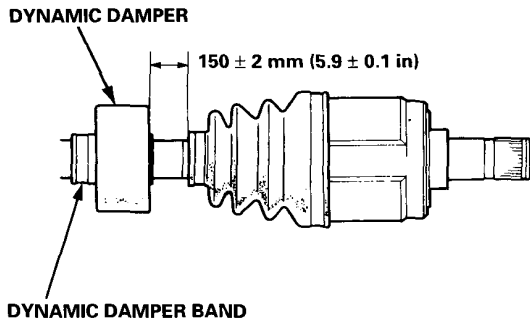
17. Install new boot bands on the boots and bend both sets of locking tabs.

18. Lightly tap on the doubled-over portions to reduce their height.



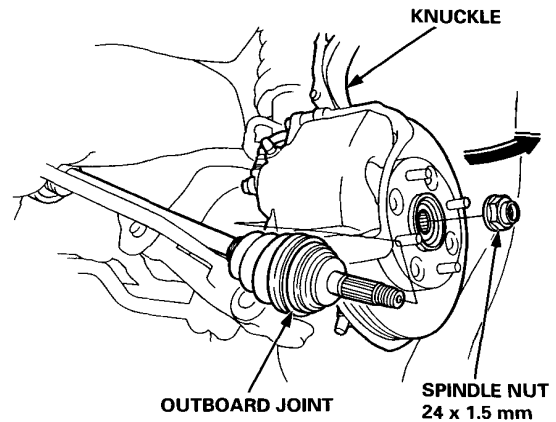


19. Position the dynamic damper as shown below.
- Install a new dynamic damper band and bend down both sets of locking tabs.
 - Lightly tap on the doubled-over portion of the band to reduce its height.



Installation

1. Install the outboard joint in the knuckle, then loosely install the new spindle nut.

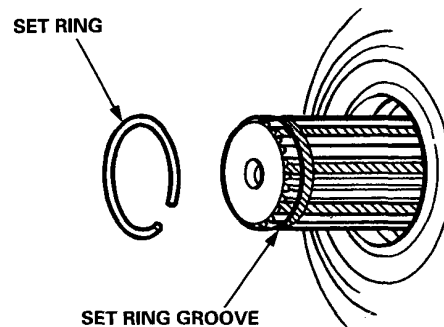


2. Apply 1.0 — 1.5 g (0.04 — 0.05 oz) of specified grease to the whole spline surface of the intermediate shaft.

NOTE: After applying grease, remove the grease from the spline grooves at intervals of 2 — 3 splines and from the set ring groove so air can bleed from the inboard joint.

3. Install the new set ring onto the driveshaft or intermediate shaft groove.

CAUTION: Always use a new set ring whenever the driveshaft is being installed.

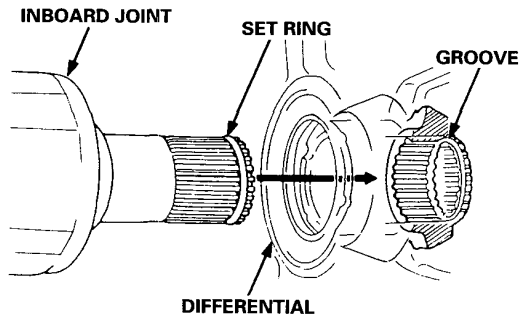
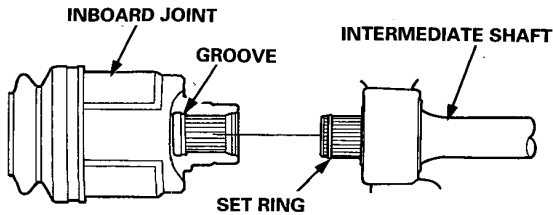


(cont'd)

Driveshafts

Installation (cont'd)

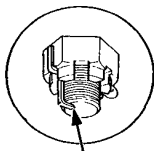
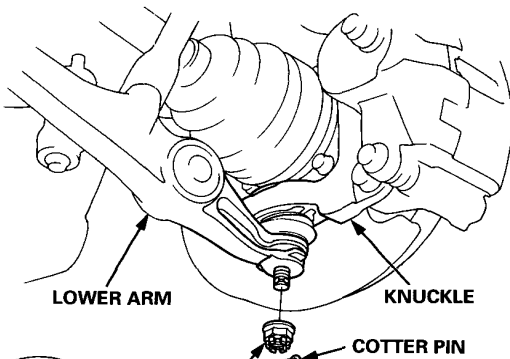
4. Insert the inboard end of the driveshaft into the differential or intermediate shaft until the set ring locks in the groove.



5. Install the knuckle on the lower arm, then tighten the castle nut and install a new cotter pin.

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.

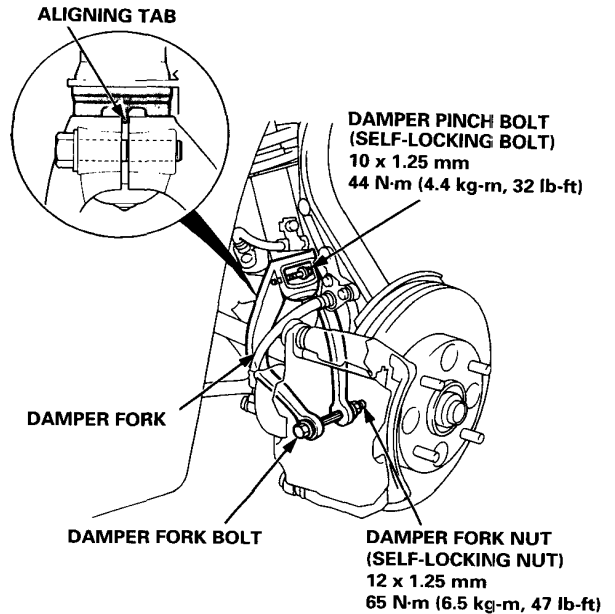


CASTLE NUT
12 x 1.25 mm
50 — 60 N·m (5.0 — 6.0 kg·m, 36 — 43 lb·ft)

On reassembly, bend the cotter pin as shown.

6. 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.
7. Loosely install the damper pinch bolt, damper fork bolt and a new damper fork nut.

CAUTION: The bolts and nut should be tightened with the vehicle's weight on the damper.



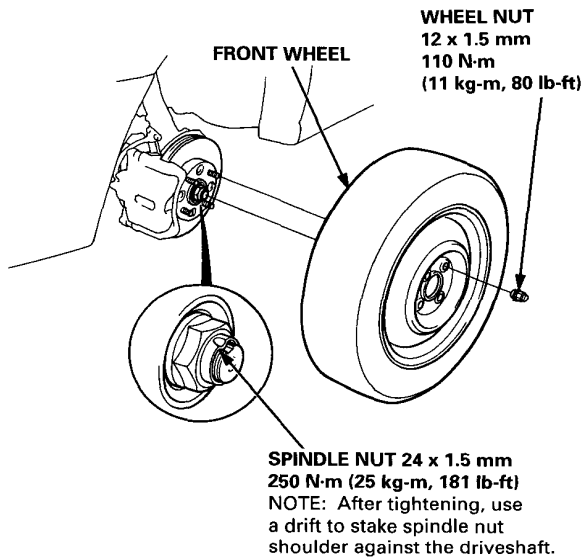


Intermediate Shaft

Removal

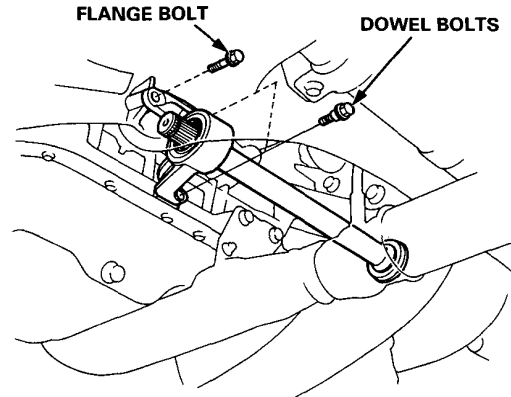
8. Tighten the new spindle nut.
9. Install the front wheels with the wheel nuts.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.



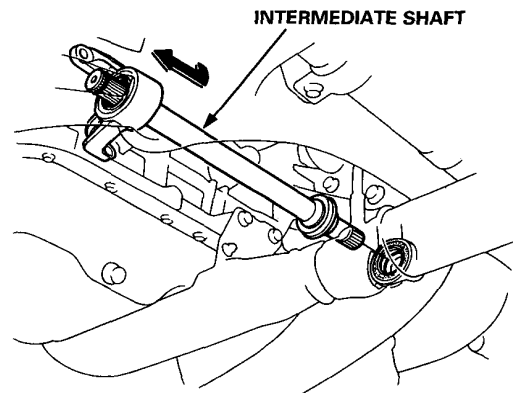
10. Tighten the damper pinch bolt and the new damper fork nut (see step 7).
11. Refill the transmission with recommended oil or fluid.
12. Check the front wheel alignment and adjust if necessary (see page 18-4).

1. Drain the transmission oil or fluid.
2. Remove the left driveshaft assembly (see page 16-3).
3. Remove the flange bolt and dowel bolts.



4. Remove the intermediate shaft assembly from the differential.

CAUTION: To prevent damage to the differential oil seal, hold the intermediate shaft horizontal until it is clear of the differential.

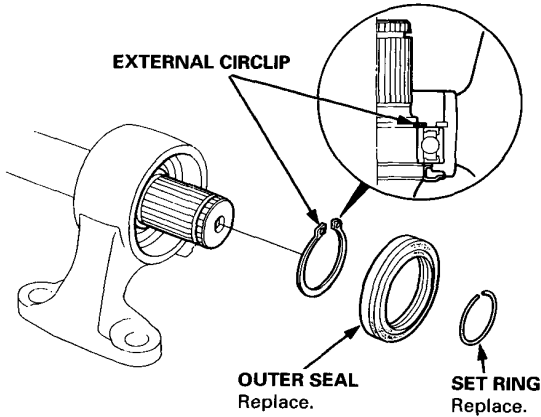


Intermediate Shaft

Disassembly

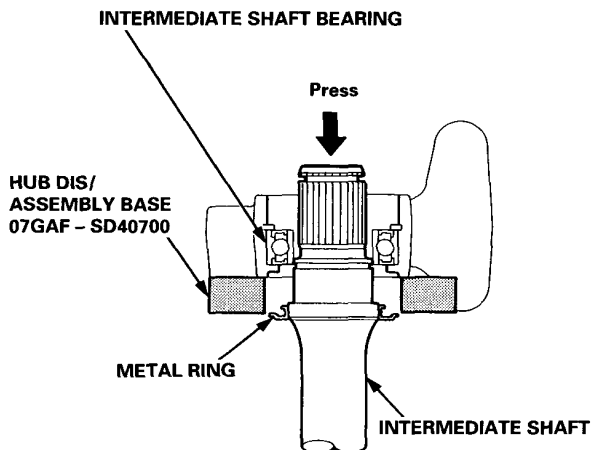
NOTE: Be careful not to damage the metal rings on the intermediate shaft during disassembly.

1. Remove the set ring.
2. Remove the intermediate shaft outer seal from the bearing support.
3. Remove the external circlip.

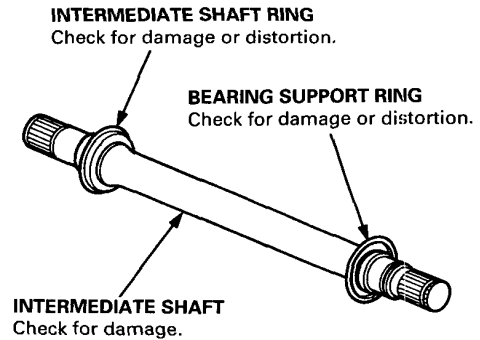


4. Press the intermediate shaft out to the shaft bearing using the special tools and a press.

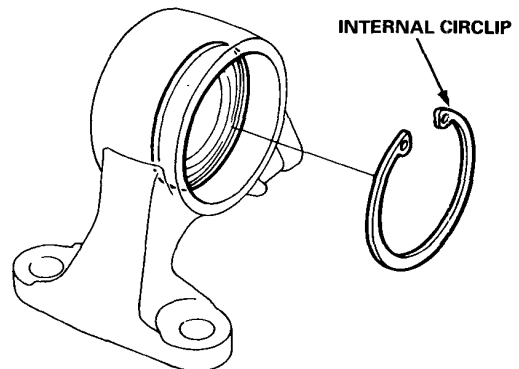
NOTE: Position the special tools so they do not damage the metal ring on the shaft.



5. Check the intermediate shaft for damage.
6. Check the intermediate shaft ring for damage or distortion.
7. Check the bearing support ring for damage or distortion.

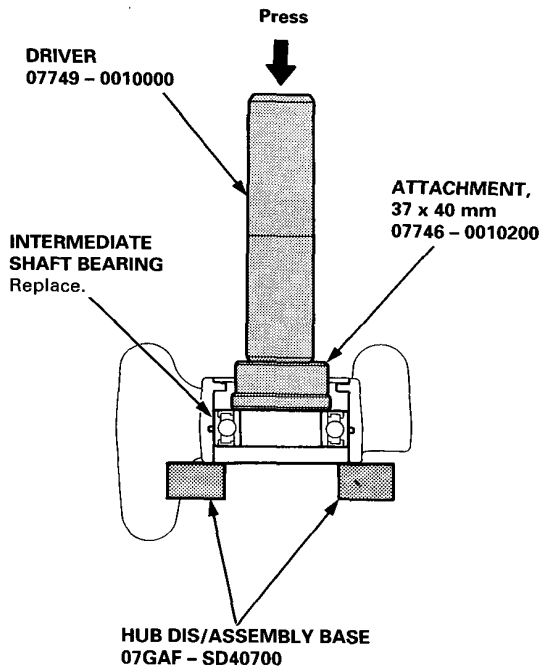


8. Remove the internal circlip.

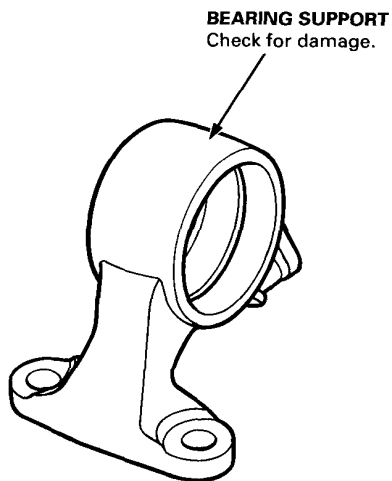




9. Press the intermediate shaft bearing out of the bearing support using the special tools and a press.



10. Check the bearing support for damage.

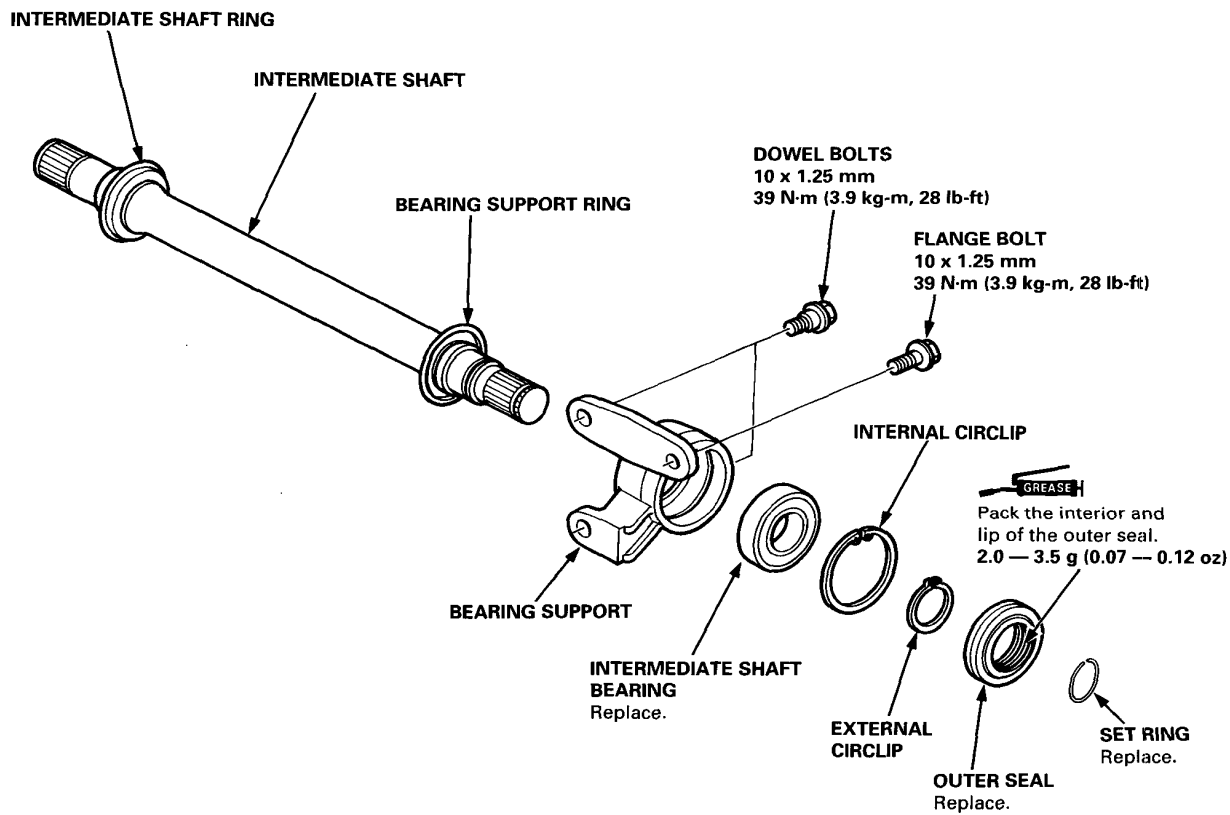


Intermediate Shaft

Reassembly

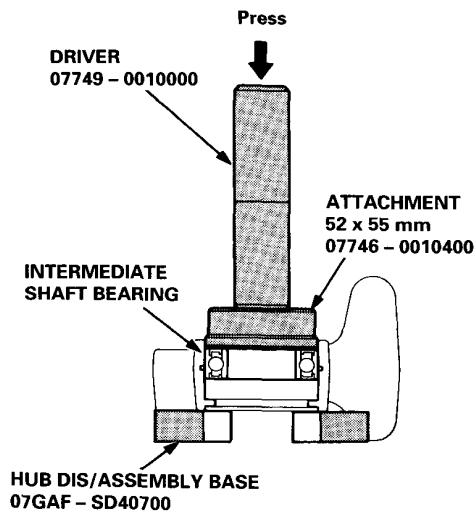
NOTE:

- Clean the disassembled parts with solvent, and dry them thoroughly with compressed air.
- Be careful not to damage the metal rings on the intermediate shaft during reassembly.

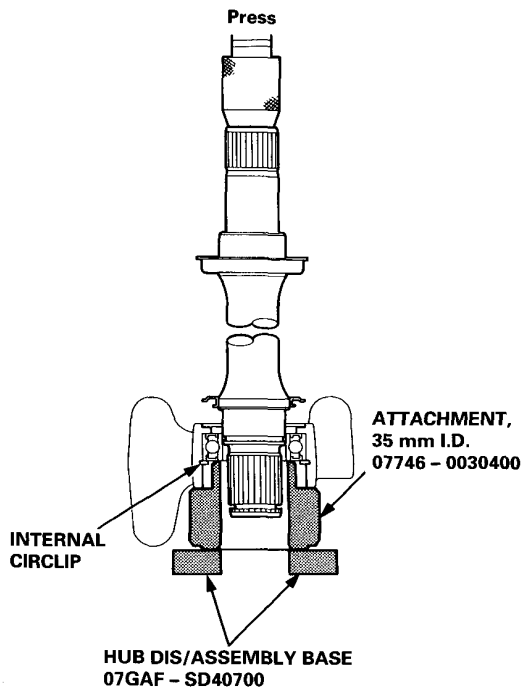




1. Press the intermediate shaft bearing into the bearing support using the special tools and a press.



2. Seat the internal circlip in the groove of the bearing support.
3. Press the intermediate shaft into the shaft bearing using the special tools and a press.



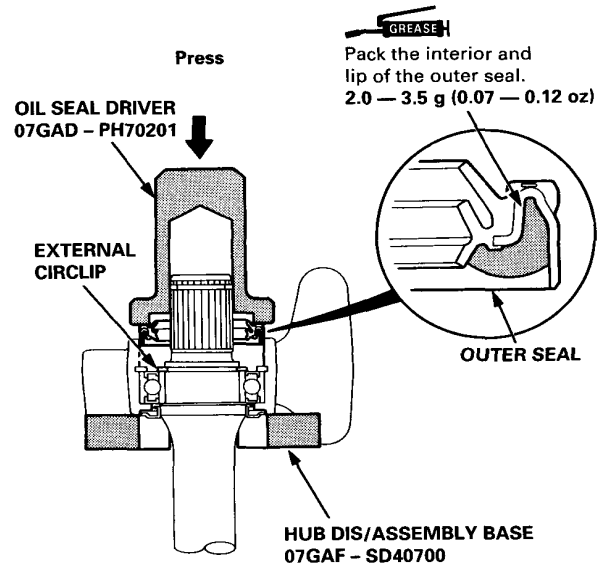
4. Seat the external circlip in the groove of the intermediate shaft.

CAUTION: Install the circlip with the tapered end facing out.

5. Press the outer seal into the bearing support using the special tools and a press.

CAUTION: Do not damage the lip on outer seal during installation.

NOTE: Press the seal flush with the bearing support.



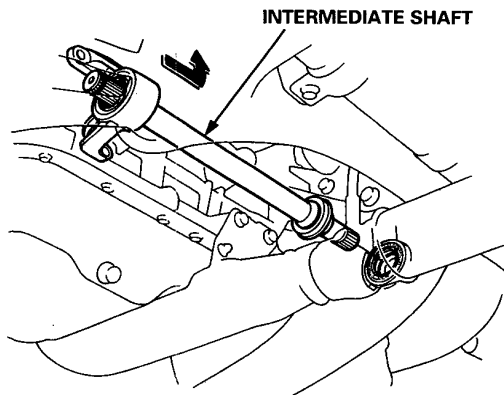
6. Install the new set ring in the intermediate shaft groove.

Intermediate Shaft

Installation

1. Insert the intermediate shaft assembly into the differential.

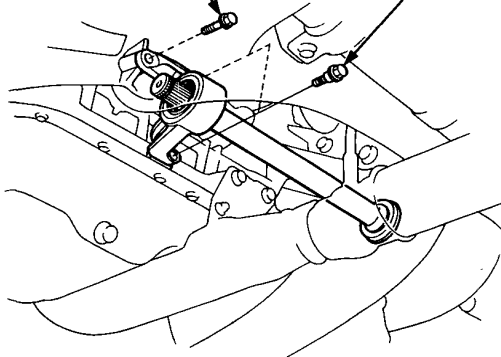
CAUTION: Hold the intermediate shaft horizontal, to prevent damage to the differential oil seal.



2. Install the flange bolt and dowel bolts, then tighten them.

FLANGE BOLT
10 x 1.25 mm
39 N·m (3.9 kg·m, 28 lb·ft)

DOWEL BOLTS
10 x 1.25 mm
39 N·m (3.9 kg·m, 28 lb·ft)



Power Steering

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Rack Guide Adjustment	17-21	Valve Body Unit Overhaul	17-53
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Pump Pressure Check	17-22	Installation	17-67
Fluid Leakage Inspection	17-23		

SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (If steering wheel and steering column service are required)

Some models of the Accord include a driver's side airbag, located in the steering wheel hub, as part of a supplemental restraint system (SRS). Information necessary to safely service the SRS is included in this shop 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 only by an authorized HONDA dealer.

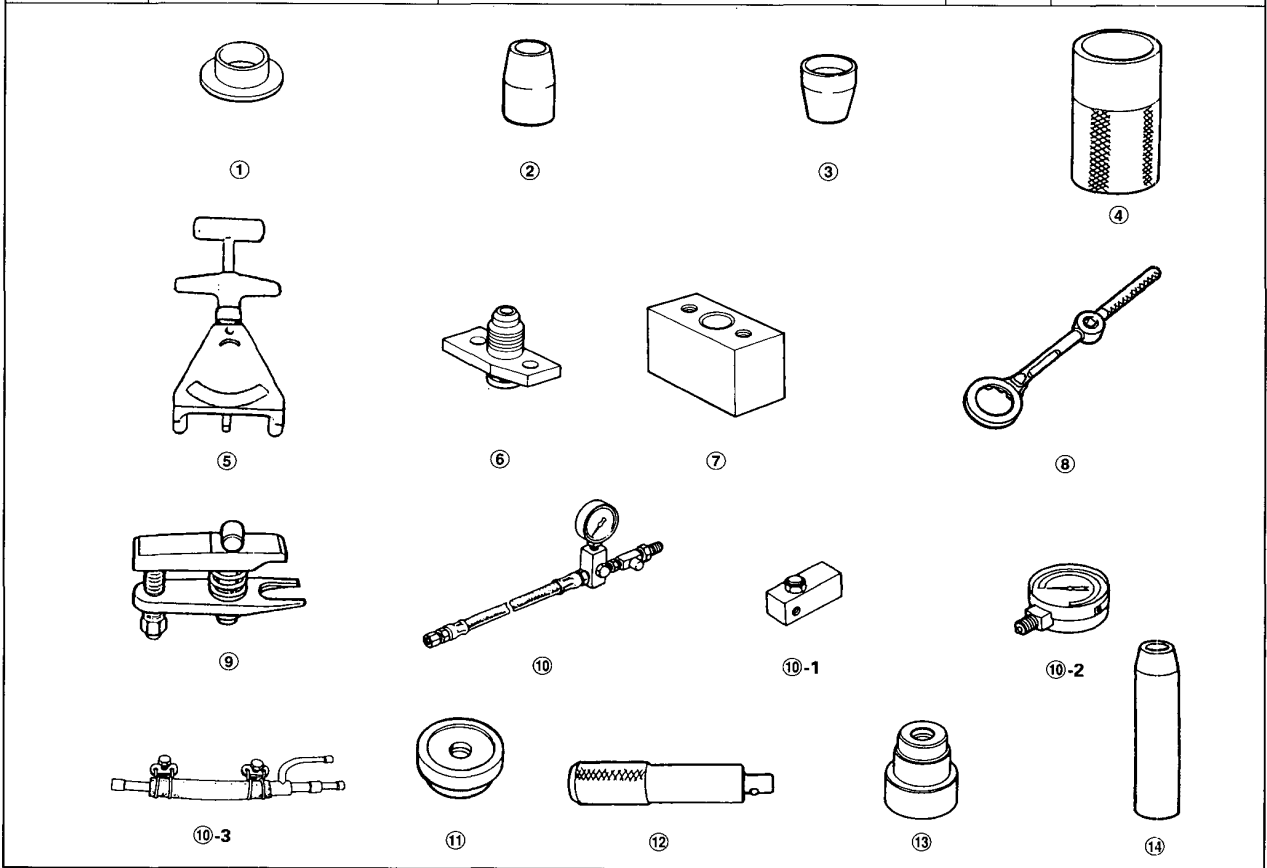
▲ WARNING

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, could lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse/relay box may affect the SRS and must therefore be performed by an authorized HONDA dealer.



Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
**①	07GAG - SD40300	Cylinder End Seal Slider	1	17-60
**②	07GAG - SD40400	Cylinder End Seal Guide	1	17-62
*③	07HAG - SF10100	Piston Seal Ring Guide	1	17-59
*④	07HAG - SF10200	Piston Seal Ring Sizing Tool	1	17-59
⑤	07JGG - 0010100	Belt Tension Gauge	1	17-20
⑥	07LAK - SM40110	P/S Joint Adapter (Pump)	1	17-22
⑦	07LAK - SM40120	P/S Joint Adapter (Hose)	1	17-22
⑧	07MAA - SL00100	Locknut Wrench, 40 mm	1	17-21
⑨	07MAC - SL00200	Ball Joint Remover, 28 mm	1	17-44
⑩	07406 - 0010001	P/S Pressure Gauge Set	1	17-22
⑩-1	07406 - 0010300	Pressure Control Valve	1	17-22
⑩-2	07406 - 0010400	Pressure Gauge	1	17-22
⑩-3	07406 - 0010101	Bypass Tube Joint (included with 07406 - 0010001)	1	17-18
⑪	07746 - 0010300	Attachment, 42 x 47 mm	1	17-48, 17-51, 17-63
⑫	07749 - 0010000	Driver	1	17-51, 17-63
⑬	07947 - 6340300	Driver Attachment	1	17-63
⑭	07974 - SA50600	Pinion Seal Guide	1	17-64



** Included in P/S Seal Tool Kit 07HAG - SF10000
 * Included in P/S Seal Tool Kit 07GAG - SD40000

Component Location



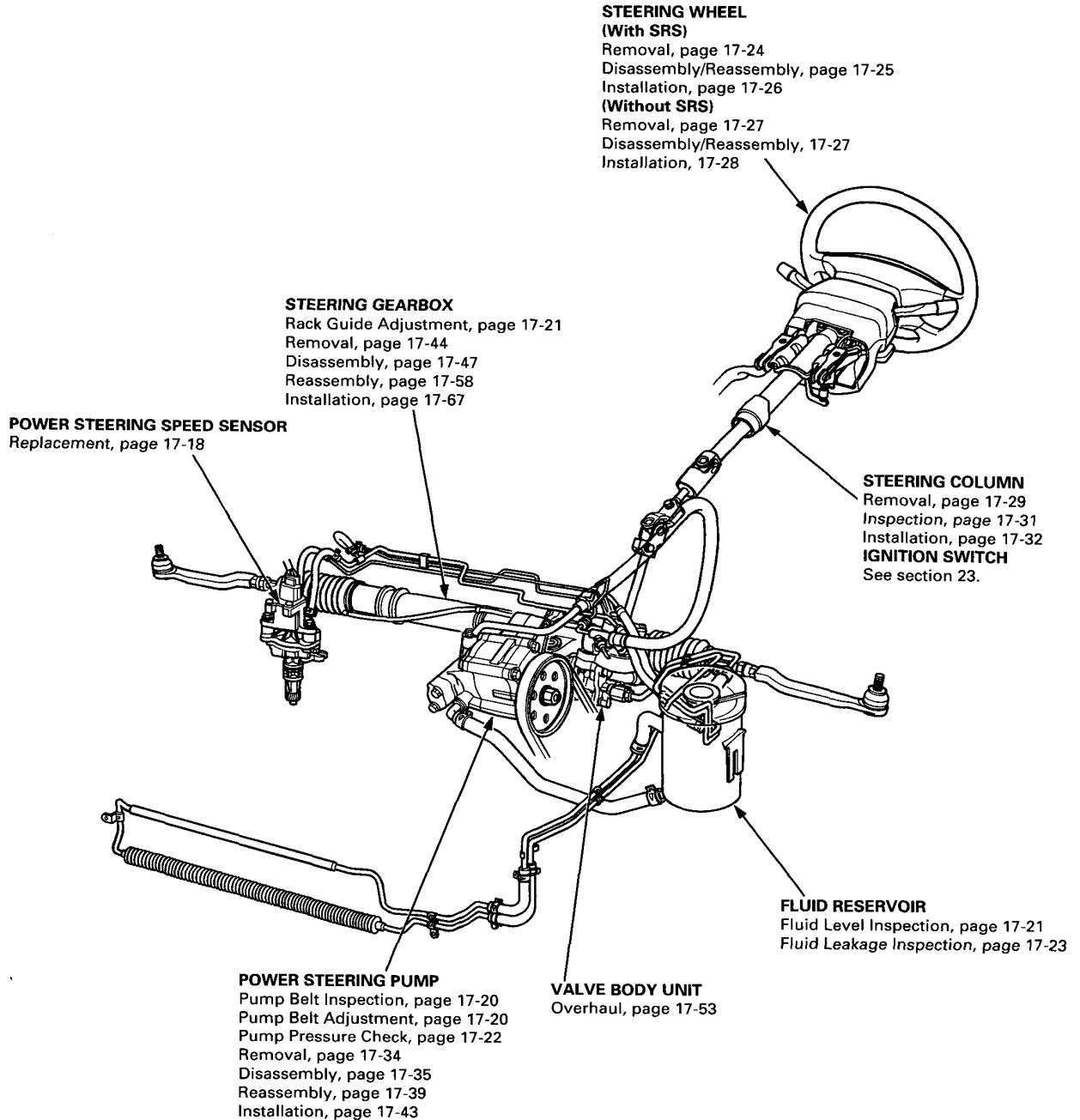
Index

NOTE:

- If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 23).
- Before removing the gearbox, remove the ignition key to keep the steering shaft from turning.
- After installing the gearbox, check the wheel alignment and adjust if necessary.

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if there is an open circuit or damage to the wiring.



System Description

Fluid Flow Diagram

The reservoir supplies power steering fluid to the pump; the pump pressurizes the fluid to about 8,000 kPa (80 kg/cm², 1,138 psi), and delivers it through a high pressure hose to the control unit on the gearbox.

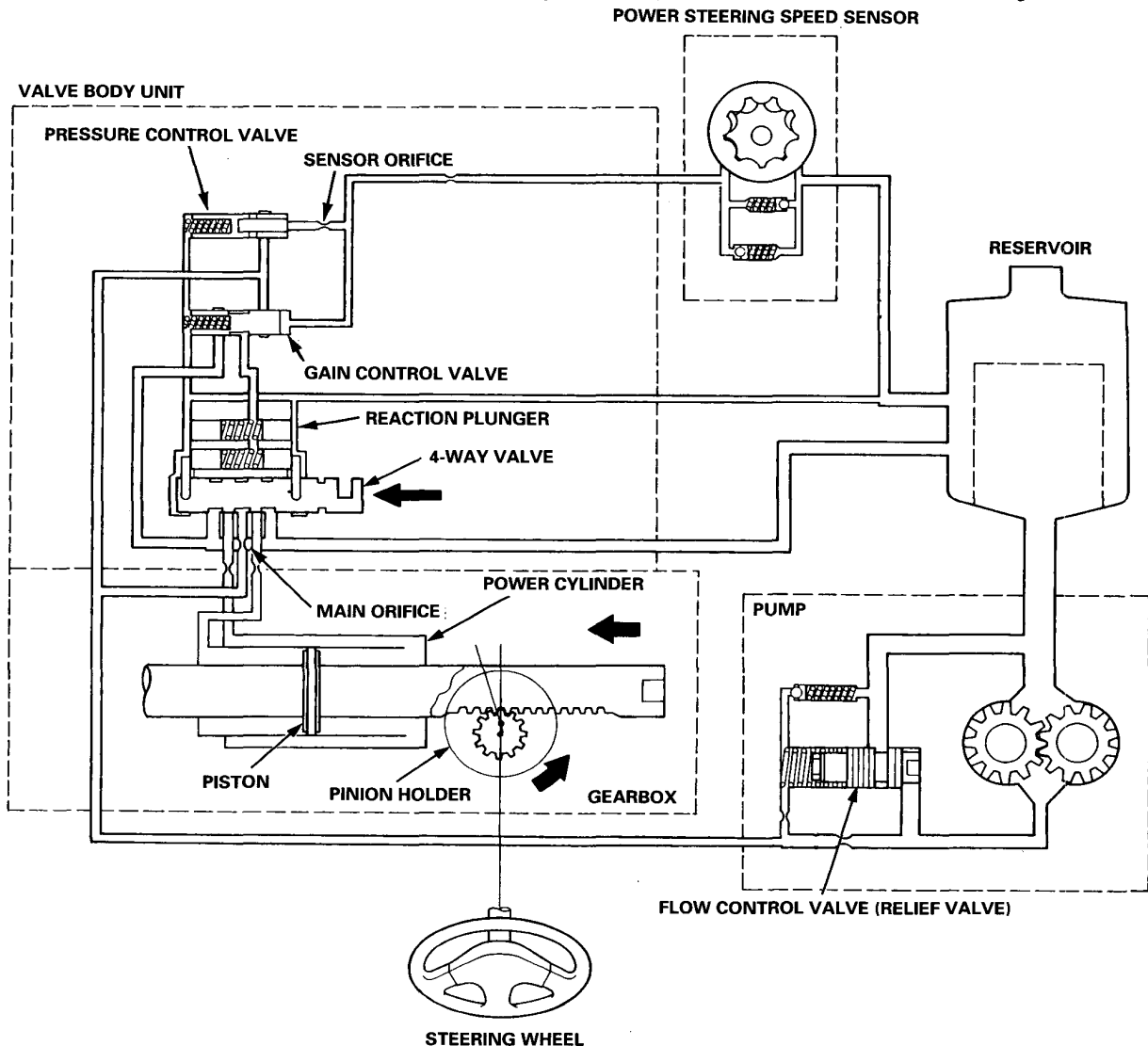
The 4-way valve (in the valve body unit) controls the direction of the turn by shifting fluid to the left or right side of the piston on the rack (in the power cylinder).

The gain control valve, in the valve body unit controls the amount of the assist by regulating the stroke of the 4-way valve. The operation of the gain control valve is effected by the fluid pressure, which is regulated by the pressure control valve, sensor orifice and power steering speed sensor.

The constant pressure is generated by the pressure control valve. This pressure is used as a reference pressure for the response to the car speed. By introducing this pressure to the power steering speed sensor through the sensor orifice, the pressure downstream of the orifice is changed according to the speed of car. This pressure is then used to operate the gain control valve.

Two orifices are provided around the circumference of the gain control valve. These orifices provide the stepless reduction of the pressure from the pump according to the changes in the car speed. The reduced pressure is then sent to the reaction chambers. Therefore the assist varies by regulating the fluid pressure in the valve body unit according to the speed of car.

Fluid returning from the power cylinder flows back through the 4-way valve and out to the reservoir through the cooler.

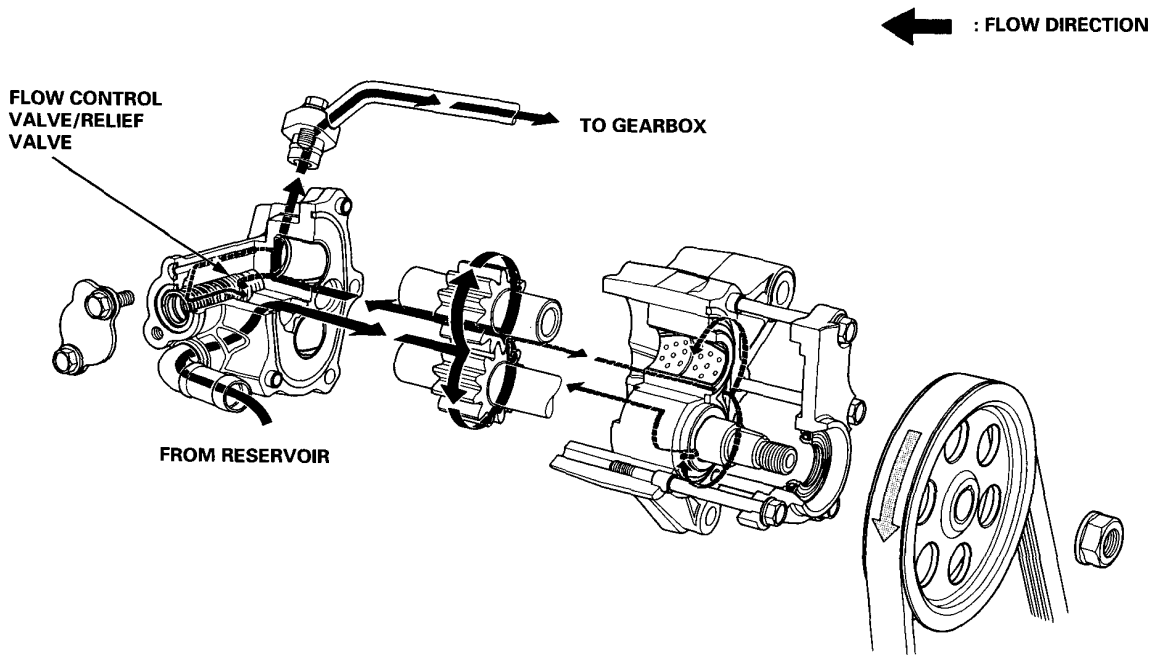




Steering Pump

Construction

The power steering pump is mounted at the right front corner of the engine and is driven by a V-belt from the crankshaft pulley. It uses a combination flow control valve/relief valve to keep output pressure between 8,000 — 9,000 kPa (80 — 90 kg/cm², 1,135 — 1,280 psi). The pump is made of aluminum to reduce its weight and help it run cooler. It uses a pressure balance system which allows fluid pressurized by the pump to flow behind two “floating” plungers, automatically maintaining the correct clearance between the other ends of the plungers, and the pump gears. This not only increases pump efficiency, but also improves durability, since the plungers can move to compensate for the expansion caused by high temperatures; otherwise the clearance would decrease, allowing more rapid pump wear.



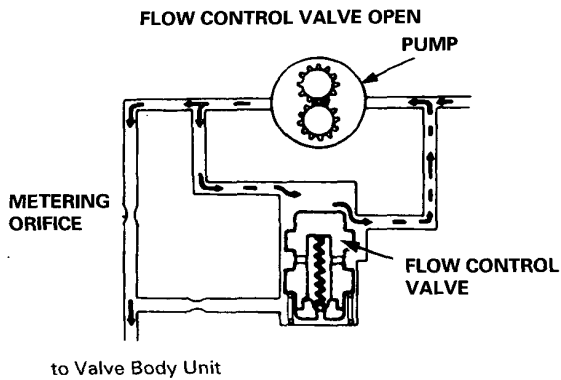
(cont'd)

System Description

Steering Pump (cont'd)

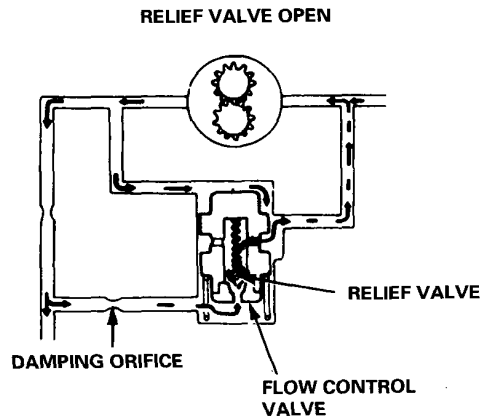
Flow Control Valve

Fluid from the pump runs through a metering orifice to the valve body unit. This creates a pressure difference between the pump and valve body unit sides of the orifice. When pressure in the pump side is higher than the force of the spring holding the flow control valve closed, it pushes the valve down (open), and excess fluid returns to the pump inlet. The combined effect of the metering orifice and the flow control valve provides a relatively constant flow of fluid to the valve body unit.



Pressure Relief Valve

As pressure on the valve body unit side builds up it pushes the relief valve ball (inside the flow control valve) up against its spring, and excess fluid returns to the pump inlet. As the pressure under the flow control valve drops, the relief valve ball is closed by its spring, and the flow control valve is forced down again, allowing excess fluid from the pump side to return to the inlet. This flow control valve/relief valve cylinder keeps pump output pressure between 8,000 — 9,000 kPa (80 — 90 kg/cm², 1,138 — 1,280 psi).

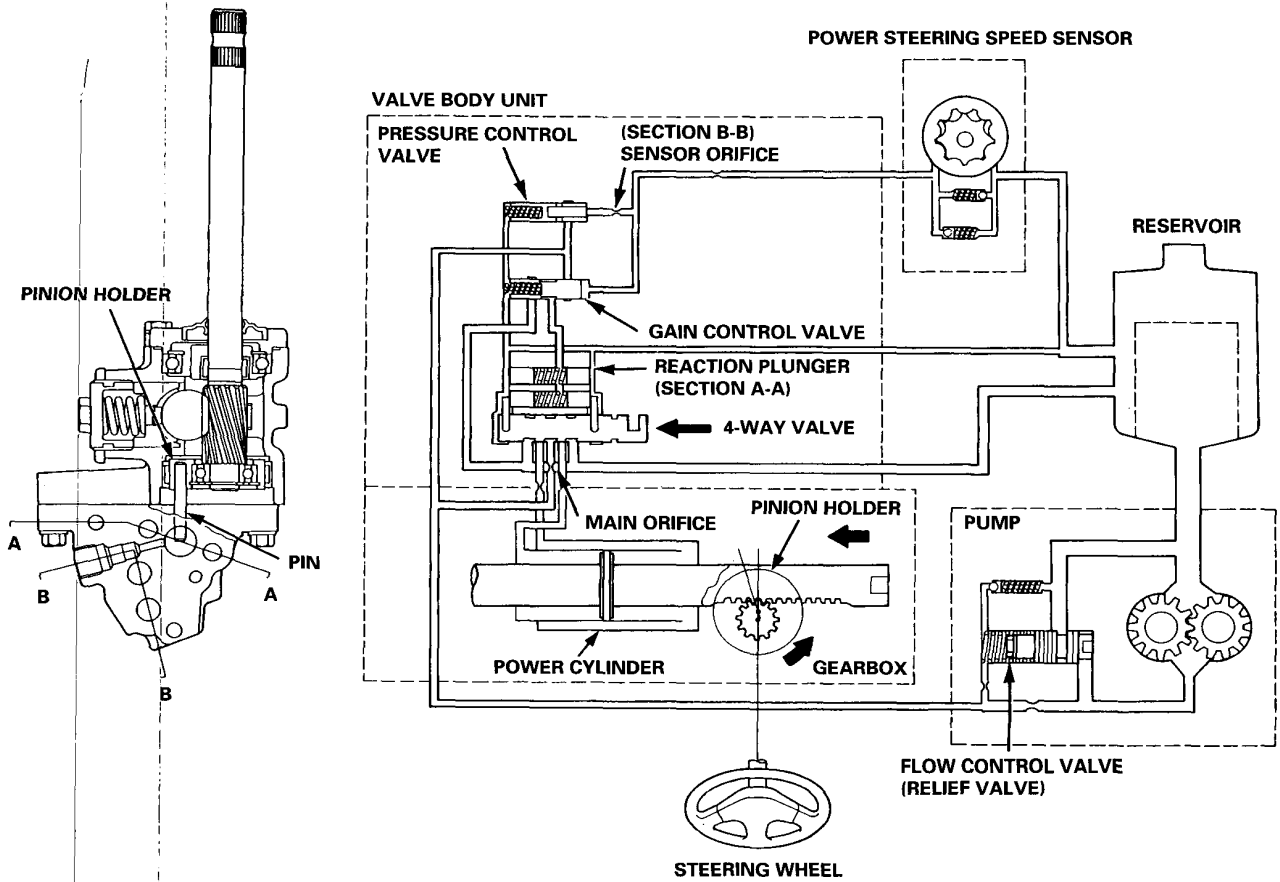




Steering Gearbox

Construction

Mounted on the lower side of the gearbox is a 4-way valve that is moved horizontally by a pin on the pinion holder to shift fluid pressure to the right or left side of the power cylinder when the steering wheel is turned. It has thrust pins at both ends, and two inter-connected reaction chambers, one on each side. Each reaction chamber contains a pair of spring loaded plungers that rise against right and left thrust pins. The valve body fluid passages are controlled by the 4-way valve. Fluid pressure in the reaction chambers is reduced by the gain control valve in order to change the amount of the assist in accordance with the change of car speed.



(cont'd)

System Description

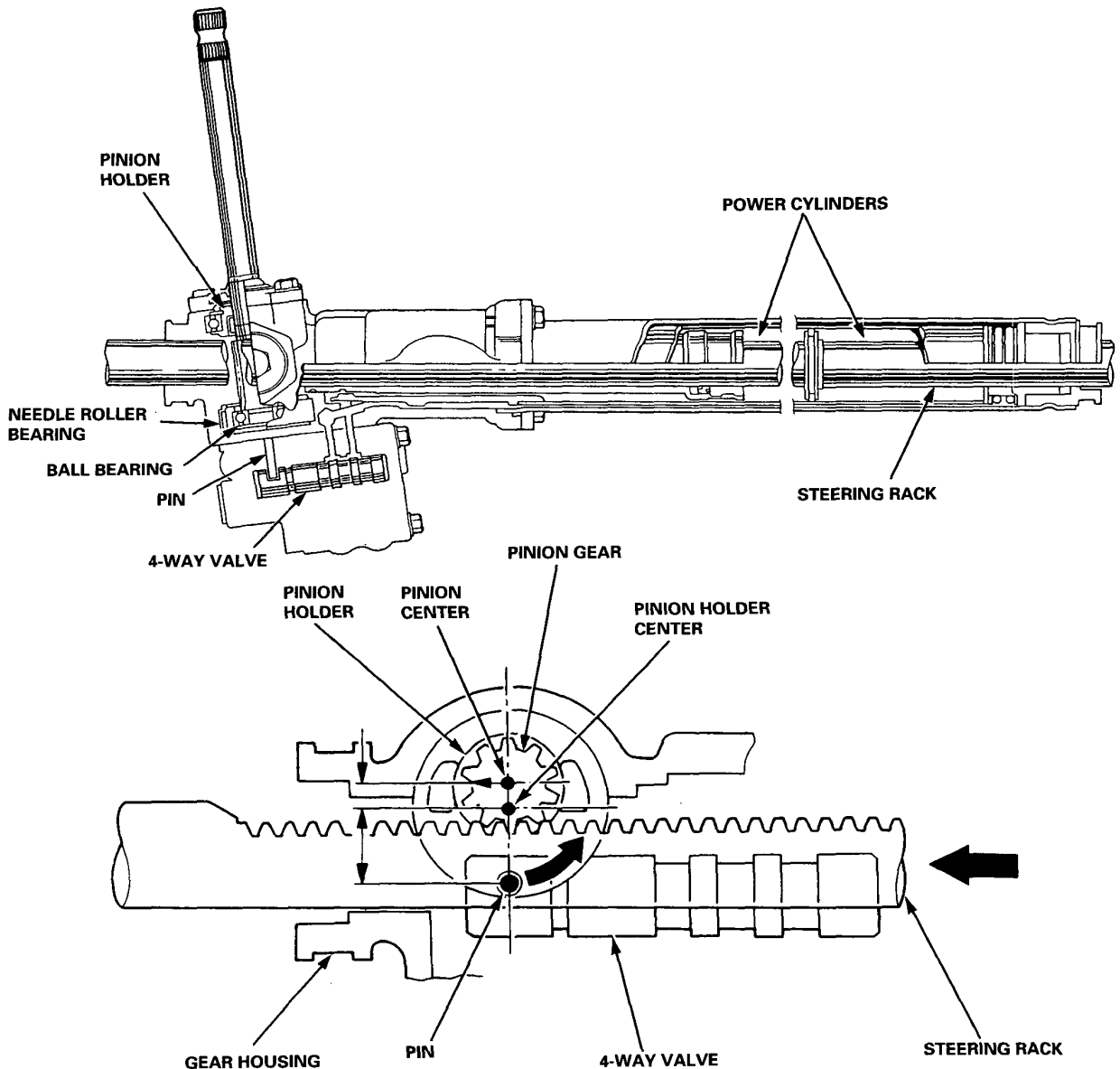
Steering Gearbox (cont'd)

4-way Valve

In the power steering unit, the method used to direct a single source of fluid pressure in either of two directions (for left or right turns) involves the pinion gear transferring a "message" of direction to the fluid in the 4-way valve.

The pinion is mounted slightly off-center in a pair of bearings, which are in turn mounted in a pinion holder cylinder that rotates, centered in its own outer bearings. At the bottom of the pinion holder is a pin, which fits in a slot in the 4-way valve. As the pinion is turned (to turn left or right), because it is off-center, it also moves slightly along the rack. This movement is transferred to the holder. The pin in the holder then moves the 4-way valve, to direct fluid pressure to either side of the rack in the power cylinder.

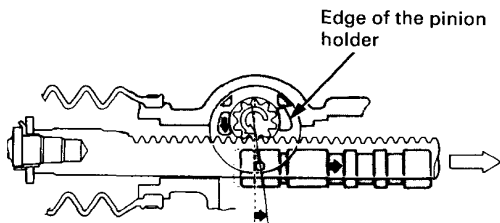
The back edges of the pinion holder (facing away from the rack) hit the stops cast into both sides of the gear housing to avoid pushing the 4-way valve too far in either direction. The front edge of the pinion holder cuts off assist at full lock as described on the next page.



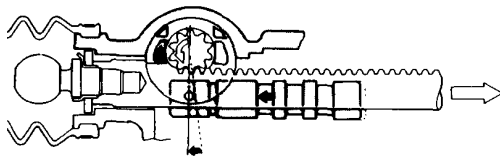


Full-Lock Unloader System

The 4-way valve shifts the direction of fluid flow when the steering wheel is turned, right or left. However, when the wheel is turned to the right or left lock at parking speed, the edge of the pinion holder rides up on the end of the rack, moving the pin in the opposite direction which pulls the 4-way valve back to neutral. This keeps pump pressure from building up (which could cause idle speed to drop), and improves steering feel by increasing resistance at left and right lock.



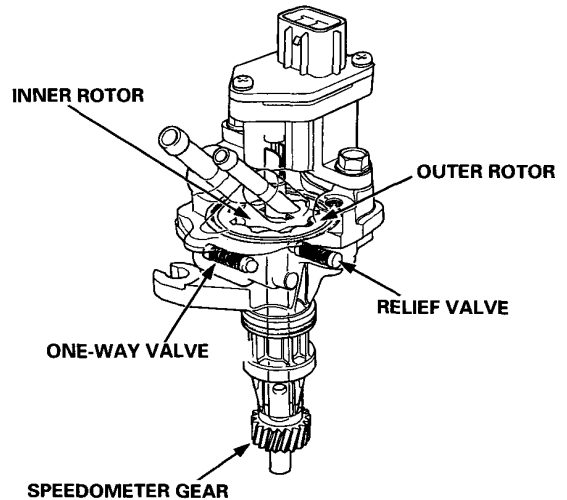
Control in "assist" position



4-way valve moves back to "neutral" position

Power Steering Speed Sensor

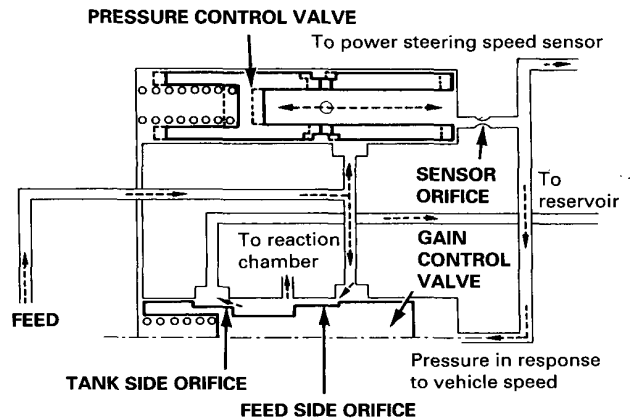
The power steering speed sensor is a trochoid-rotor, hydraulic pump combined with a relief valve and a one-way valve. It is driven by the speedometer gear shaft which in turn is driven by a helical gear on the differential.



The power steering speed sensor turns only when the car is moving, controlling the gain control valve. The constant pressure is generated by the pressure control valve.

This pressure is used as a reference pressure for the response to the car speed. By introducing this pressure to the power steering speed sensor through the sensor orifice, the pressure downstream of the orifice is changed according to the speed of the car.

This pressure is then used to operate the gain control valve.



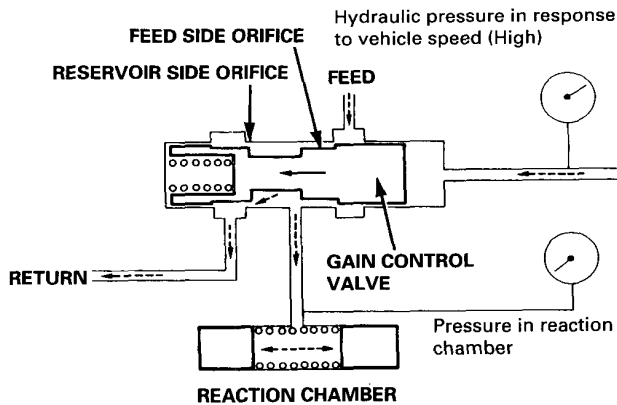
(cont'd)

System Description

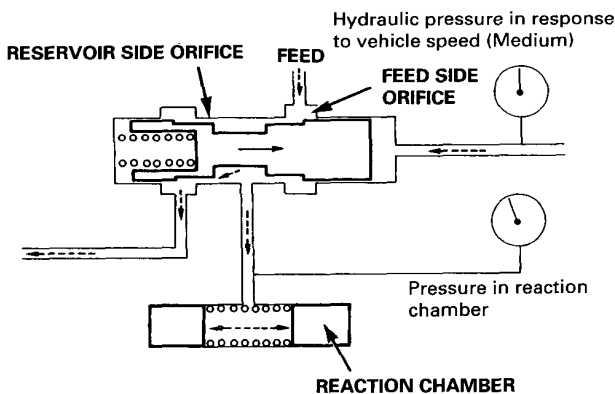
Power Steering Speed Sensor (cont'd)

With the engine running at idle in a parked car, fluid flow through the sensor rotors is blocked because the rotors are not turning. Therefore the gain control valve moves left.

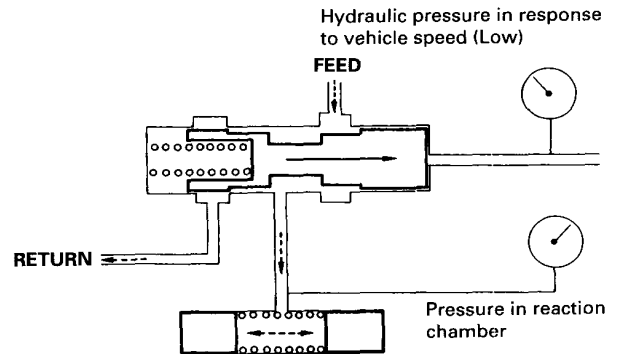
On the gain control valve, the orifice resistance is high on pump side, while it is low on the reservoir side, with the result that pressure in the reaction chamber is lowered and steering wheel operation with easily.



As the car is driven, the rotors start turning and the fluid returns to the reservoir, reducing the fluid pressure at the gain control valve. Therefore, the gain control valve moves right, the orifice resistance on the pump and reservoir sides is appropriately balanced, with the result that the reaction chamber is in the medium range and the steering resistance is moderate.



When the car is moving at high speed, the sensor reduces the pressure further and the gain control valve moves right. The orifice pressure on the pump side is low and the pressure on the reservoir side is high, the fluid pressure in the reaction chamber is also high giving the steering wheel less assist.

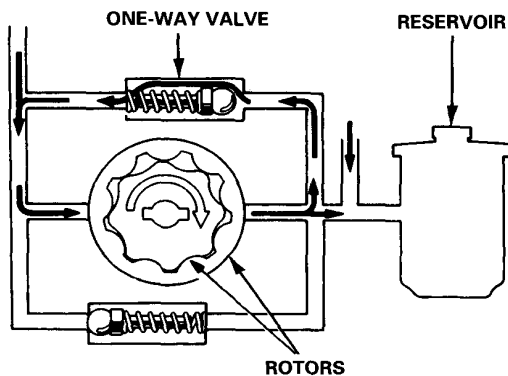
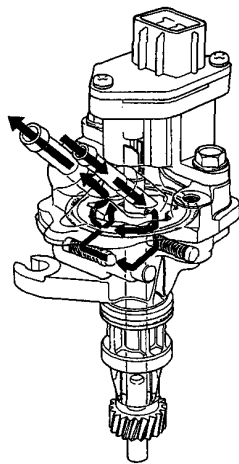




One-way Valve (In Power Steering Speed Sensor)

pressure develops at the power steering speed sensor inlet because the power steering speed sensor is pumping faster than the fluid can be supplied. To compensate for this, the outlet and inlet ports are connected internally by a passage containing a one-way valve that lets output fluid recirculate to the inlet port to equalize pressure.

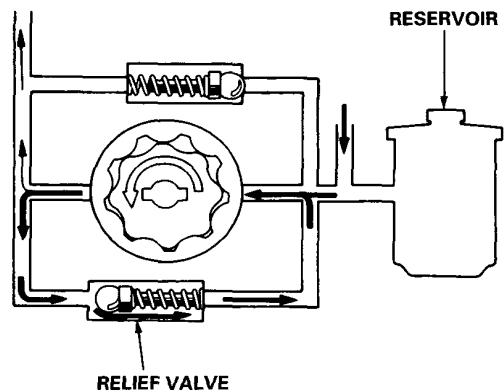
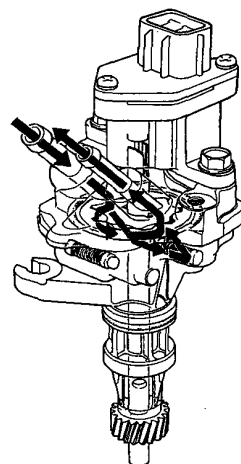
Driving at High Speed:



Relief Valve (In Power Steering Speed Sensor)

When the car is moving in reverse, the power steering speed sensor also turns backward and pumps fluid in the opposite direction. To avoid building up pressure in the reaction chambers that would increase steering effort while driving in reverse, the inlet and outlet-ports are connected by a second internal passage containing a relief valve that allows the fluid to recirculate.

Driving in Reverse:



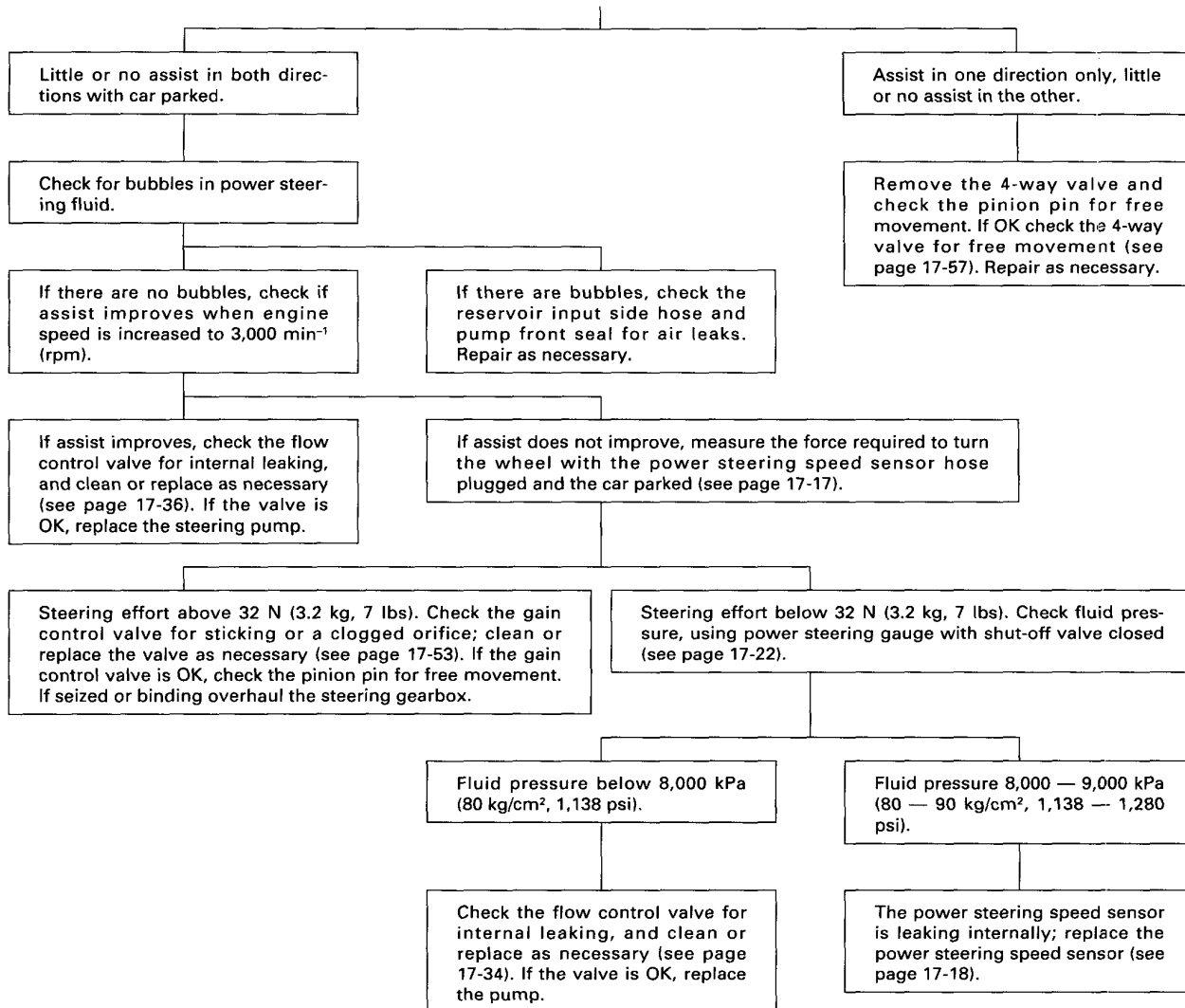
Troubleshooting

General Troubleshooting

Check the following before you begin:

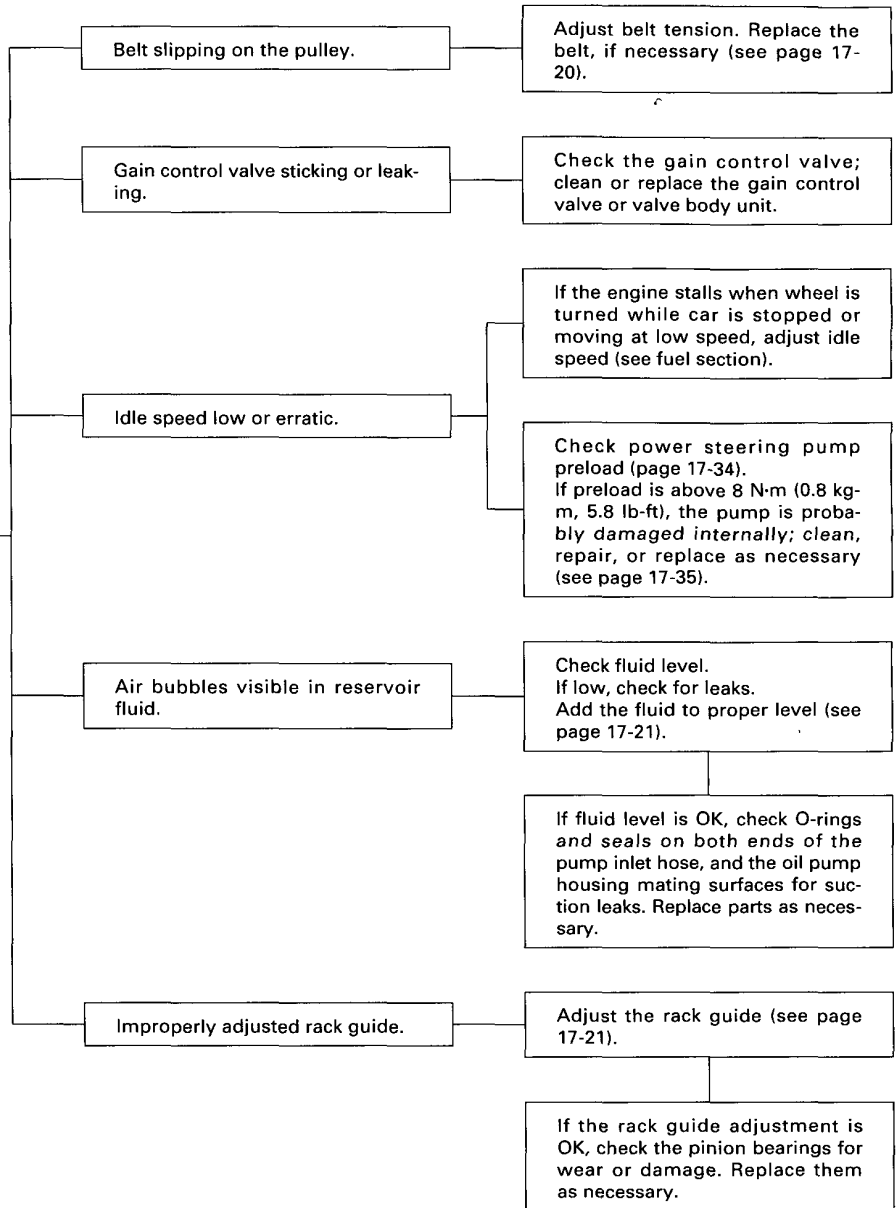
- Has the suspension been modified in a way that would affect steering?
- Are tire sizes and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?

Hard Steering





Uneven or rough steering.



(cont'd)

Troubleshooting

General Troubleshooting (cont'd)

Shock or vibration when wheel is turned to full lock.

Pump belt slipping on pulley (pump stops momentarily).

Adjust the belt tension (see page 17-20) or replace belt.

Install the power steering pressure gauge. Close the shut-off valve fully and measure the pump pressure (see page 17-22).

The pump pressure should be 8,000 — 9,000 kPa (80 — 90 kg/cm², 1,138 — 1,280 psi) and needle fluctuation is ± 5 kPa (± 5 kg/cm², ± 70 psi) or less. If the needle fluctuation exceeds ± 500 kPa (± 5 kg/cm², ± 70 psi) check the flow control valve. If the flow control valve is OK, replace the pump.

Assist (excessively light steering) at high speed.

Measure force required to turn wheel with bypass tube joint installed, and car parked on dry paved surface (see page 17-18).

If below 50 N (5.0 kg, 11 lbs), check gain control/pressure control valves and valve body unit and replace parts as necessary.

Steering kicks back during wide turns.

Pump belt slipping.

Adjust the belt tension (see page 17-20) or replace belt.

Sticking gain control valve or 4-way valve.

Replace gain control valve or valve body unit.

Rack guide adjusted too loose.

Adjust the rack guide (see page 17-21).

Wheel will not return smoothly.

Tire pressure too low.

Inflate to correct pressure.

Improper front wheel alignment.

Readjust the front wheel alignment or replace parts as necessary.

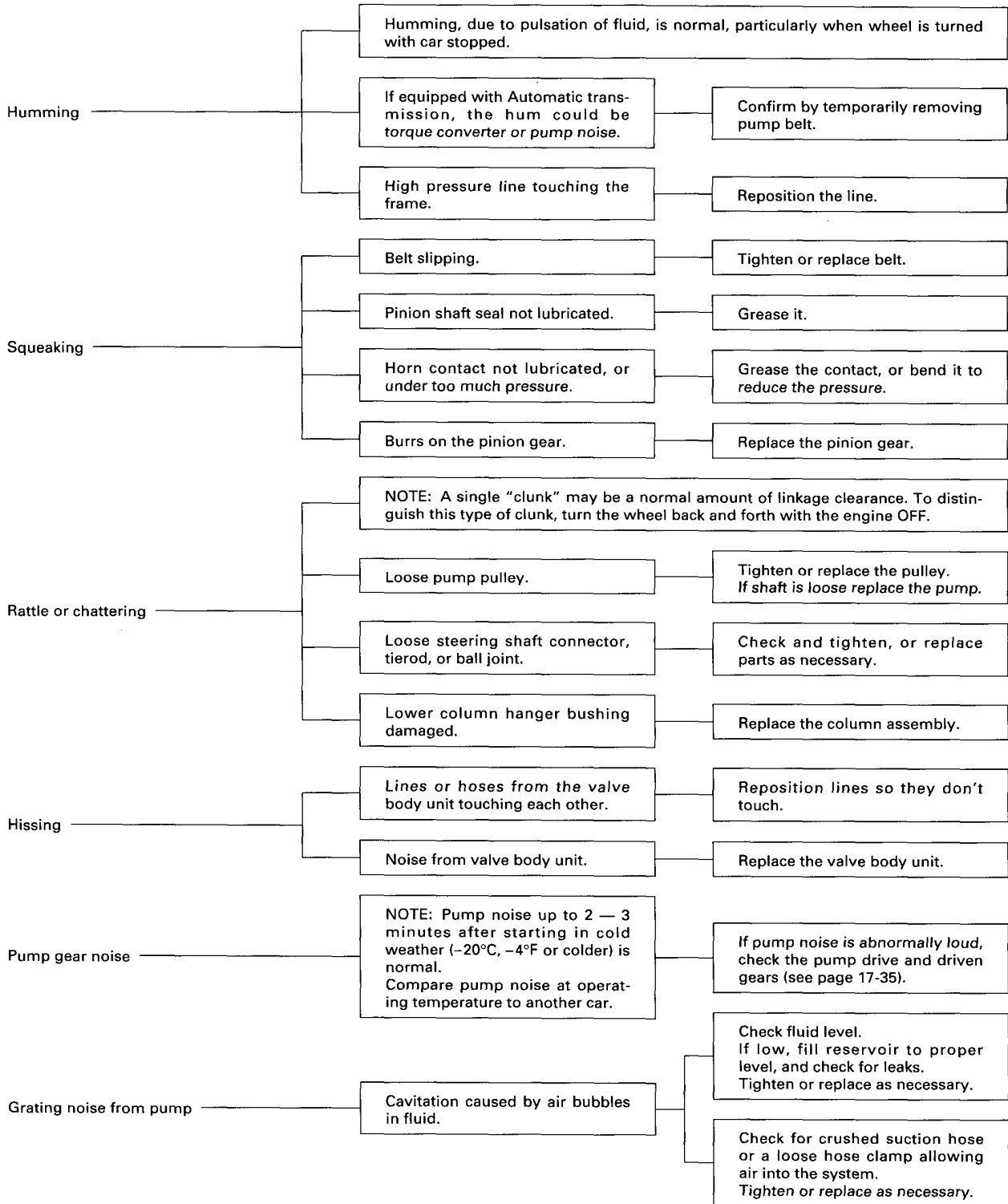
Improperly adjusted rack guide.

Adjust the rack guide (see page 17-21).



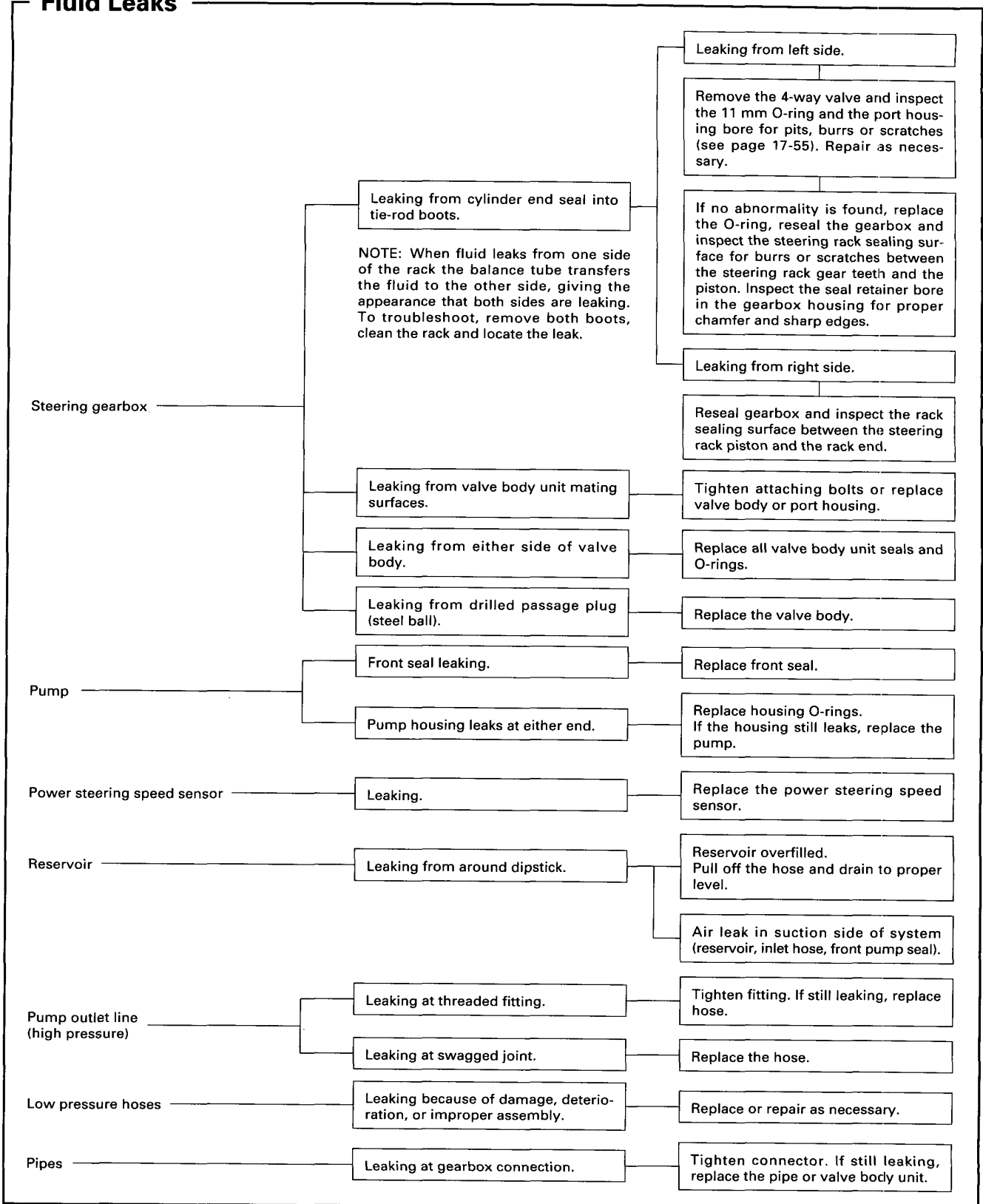
Noise and Vibration

NOTE: Pump noise in first 2 — 3 minutes after starting in cold weather (-20°C, -4°F or colder) is normal.



Troubleshooting

Fluid Leaks





Inspection and Adjustment

Steering Wheel Rotation Play

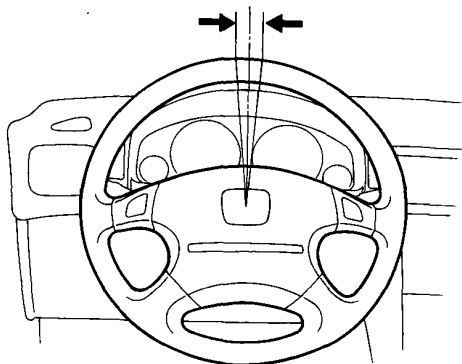
Place the front wheels in the straight ahead position and measure the distance the steering wheel can be turned without moving the front wheels.

ROTATIONAL PLAY: 0 — 10 mm (0 — 0.4 in)

If the play exceeds the limit, perform rack guide adjustment (see page 17-21).

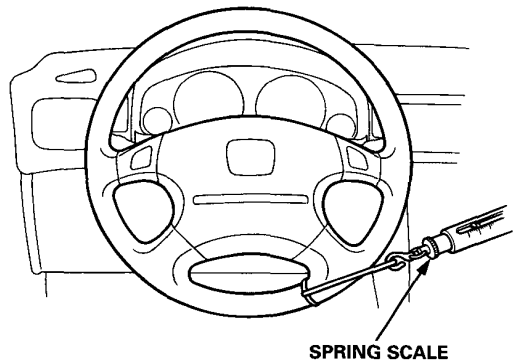
If the play still excessively after rack guide adjustment, inspect the steering linkage and gearbox as described see page 17-19.

ROTATIONAL PLAY



Power Assist Check with Car Parked

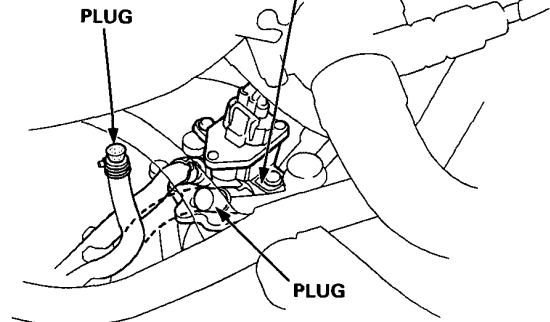
1. Check the power steering fluid level and pump belt tension.
2. Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid.
3. Attach a spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



SPRING SCALE

4. The scale should read no more than 32 N (3.2 kg, 7 lbs). If it reads more or less, go on step 5.
5. Stop the engine. Disconnect the hose from the power steering speed sensor and plug the hose and the sensor fitting as shown.

POWER STEERING SPEED SENSOR



PLUG

PLUG

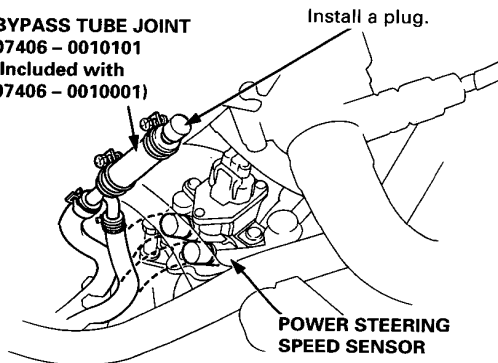
6. Start the engine and let it idle.
 - If the reading is now 32 N (3.2 kg, 7 lbs) or less, replace the power steering speed sensor, see page 17-18).
 - If the reading is still more than 32 N (3.2 kg, 7 lbs), check the gearbox and pump.

Inspection and Adjustment

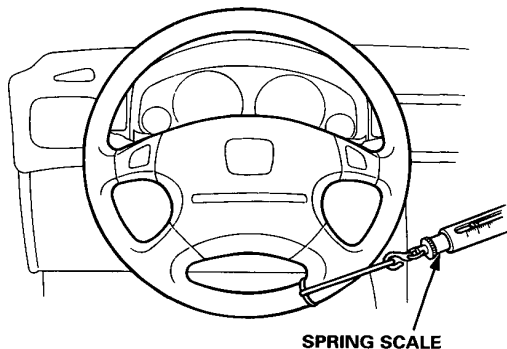
Assist Check at Road Speed

1. Check the power steering fluid level and pump belt tension.
2. Start the engine, let it warm up to normal operating temperature (the cooling fan comes on) and turn the steering wheel lock-to-lock a few times to warm up the fluid.
3. Stop the engine. To simulate speeds above 30 mph (50 km/h), disconnect the hoses from the power steering speed sensor and connect them to the bypass tube joint. Plug the end of the bypass tube joint.

BYPASS TUBE JOINT
07406 - 0010101
(Included with
07406 - 0010001)



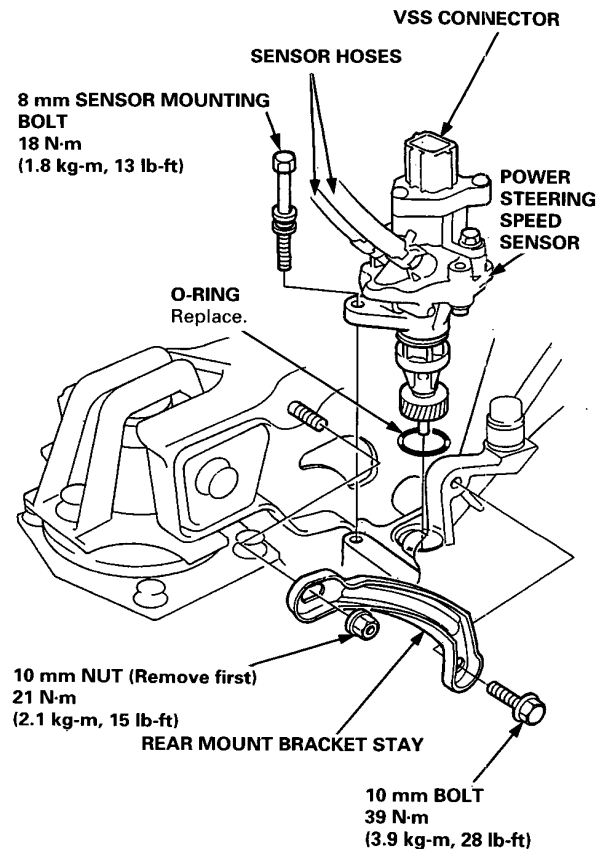
4. Attach the spring scale to the steering wheel. With the engine idling and the car on a clean, dry floor, pull the scale as shown and read it as soon as the tires begin to turn.



- If the scale reads a normal 50 N (5.0 kg, 11 lbs), or more, the assist problem at high speeds is being caused by reduced power steering speed sensor output. Replace the power steering speed sensor.
- If the scale reads less than 50 N (5.0 kg, 11 lbs), the power steering speed sensor is OK, and the problem is in the sensor feed line, the pump, or the valve body unit. See if the feed line is pinched or bent the check pump.
- See General Troubleshooting (see page 17-12).

Power Steering Speed Sensor Replacement

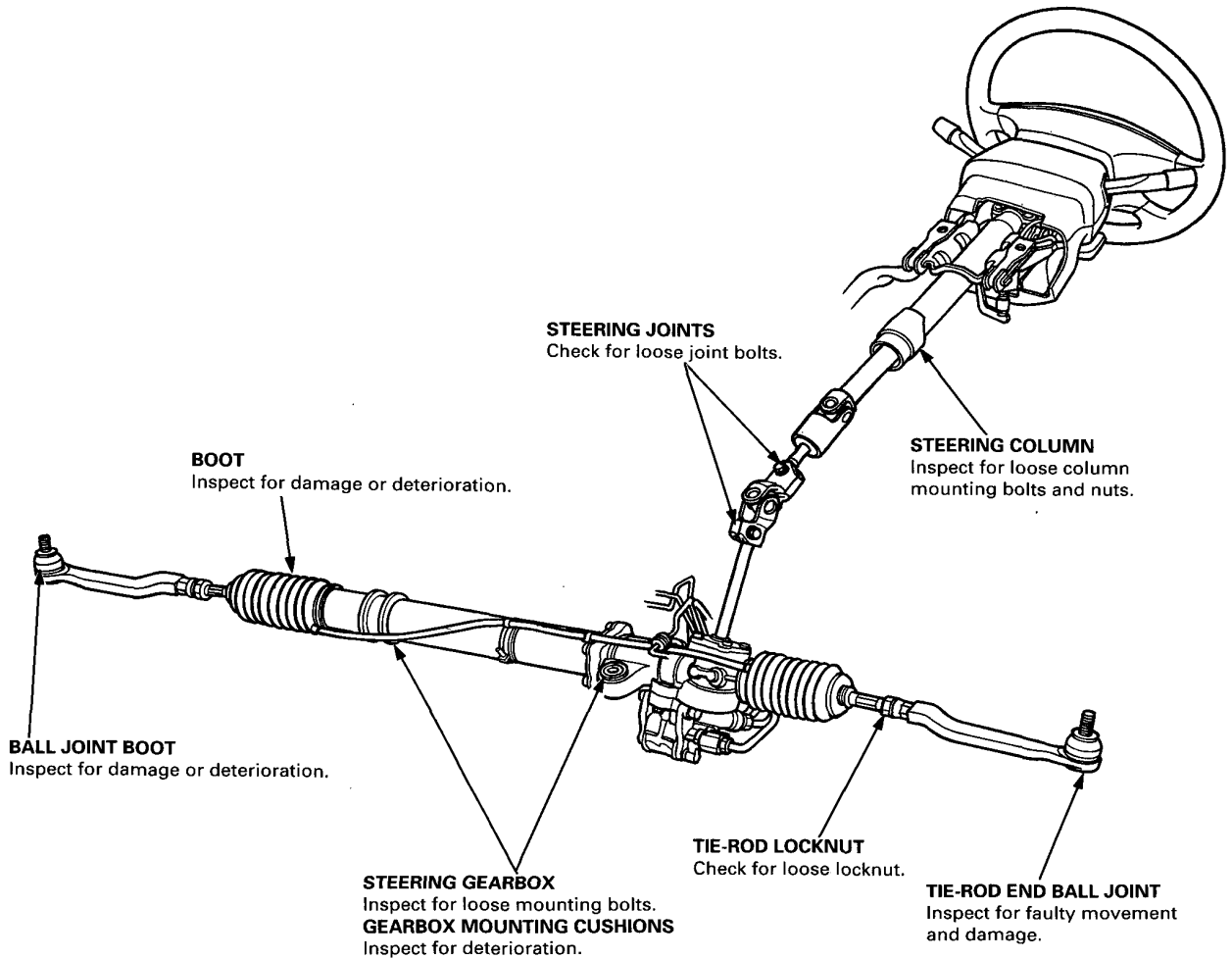
1. Remove the rear mount bracket stay.
2. Disconnect the vehicle speed sensor (VSS) connector.
3. Remove the 8 mm sensor mounting bolt and pull the power steering speed sensor from the transmission housing.
4. Disconnect the sensor hoses and plug the fittings.



5. After installing a new power steering speed sensor, turn the steering wheel lock-to-lock with the engine idling to bleed air from the system.
6. Check the reservoir and add fluid if necessary.



Steering Linkage and Gearbox



Inspection and Adjustment

Pump Belt

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

Inspection

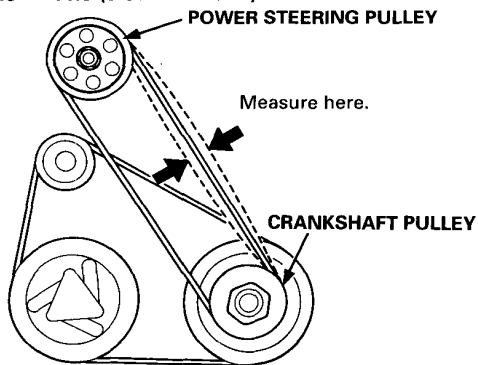
Inspect the pump belt for cracks or any damage. Replace the belt with a new one if necessary.

Apply a force of 100 N (10 kg, 22 lbs) and measure the deflection between the power steering pump and the crankshaft pulleys.

Deflection:

Used Belt: 12.5 — 16.0 mm (0.50 — 0.62 in)

New Belt: 9.5 — 11.5 (0.37 — 0.45 in)



(Measure with Belt Tension Gauge:)

Attach the belt tension gauge to the pump belt and measure the tension of the pump belt.

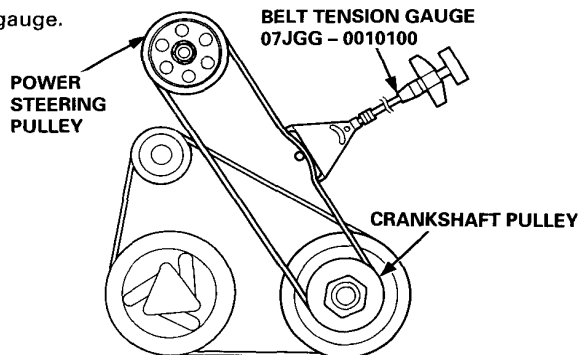
Tension:

Used Belt: 350 — 500 N (35 — 50 kg, 77 — 110 lbs)

New Belt: 700 — 900 N (70 — 90 kg, 150 — 200 lbs)

NOTE:

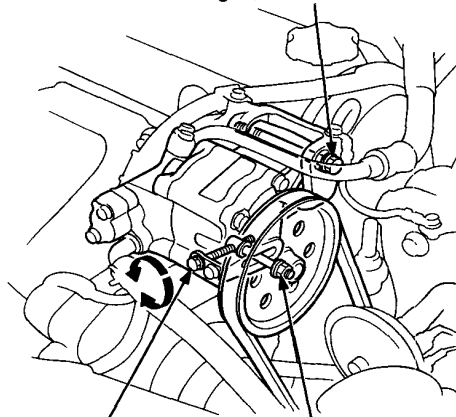
- If there are cracks or any damage evident on the belt, replace it with a new one.
- Follow the manufacturer's instructions for the tension gauge.



Adjustment

1. Loosen the pump mounting bolt and nut.
2. Turn the adjusting bolt to get the proper belt tension, then retighten the bolt and nut.
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 pump belt.

PUMP MOUNTING BOLT
45 N·m
(4.5 kg·m, 33 lb-ft)



ADJUSTING BOLT

PUMP MOUNTING NUT
22 N·m
(2.2 kg·m, 16 lb-ft)



Rack Guide Adjustment

NOTE: Perform rack guide adjustment with the wheels straight in the ahead position.

1. Remove the gearbox shield.
2. Loosen the rack guide screw locknut with the special tool, then loosen the rack guide screw.
3. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.
4. Retighten the rack guide screw to 4 N·m (0.4 kg·m, 2.9 lb·ft), then back it off to specified angle.

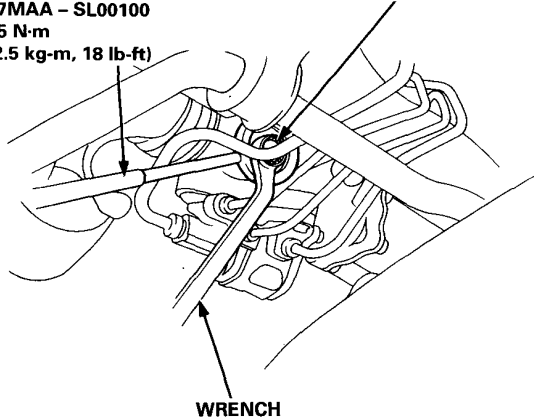
Specified Return Angle: 20°

5. Tighten the locknut while holding the rack guide screw.

CAUTION: When servicing, be careful not to damage power steering fluid lines with the special tool.

LOCKNUT WRENCH, 40 mm
07MAA - SL00100
25 N·m
(2.5 kg·m, 18 lb·ft)

RACK GUIDE SCREW



6. Check for tight or loose steering through the complete turning travel.
7. Install the gearbox shield.
8. Perform following inspections:
 - Steering wheel rotational play (see page 17-17).
 - Power assist with car parked (see page 17-17).

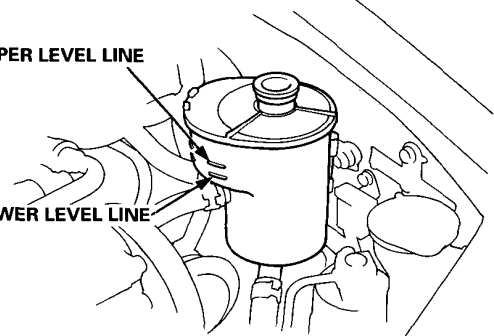
Fluid Replacement

Fluid Level Inspection

Check the power steering fluid level with the engine cold and the car parked on level ground. Make sure the fluid level is between the UPPER and LOWER level lines on the reservoir. If the level is near or below the lower level line, check the system for leaks. If the system is not leak, and fluid level is low, add fluid to the upper level line.

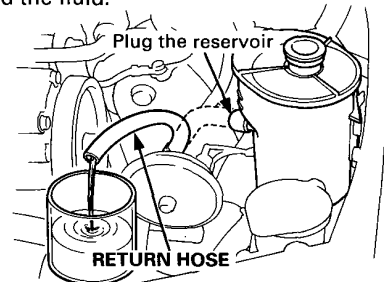
UPPER LEVEL LINE

LOWER LEVEL LINE



Fluid Replacement

1. Disconnect the return hose at the reservoir, and put the end in a suitable container.
2. 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.



3. Refit the return hose on the reservoir.
4. Fill the reservoir to the upper level line.

NOTE: Take care not to spill the fluid on the body and parts. Wipe off the spilled fluid at once.

CAUTION: Use only Genuine Honda Power Steering Fluid. Using other fluids such as ATF or other manufacturer's power steering fluid will damage the system.

SYSTEM CAPACITY: 1.8 liter
(1.9 US qt., 1.6 Imp qt.)

RESERVOIR CAPACITY: 0.5 liter
(0.5 US qt., 0.4 Imp qt.)

5. Start the engine and run it at idle, then turn the steering from lock-to-lock several times to bleed air from the system.
6. Recheck the fluid level and add some if necessary.

CAUTION: Do not fill the reservoir beyond the upper level line.

Inspection and Adjustment

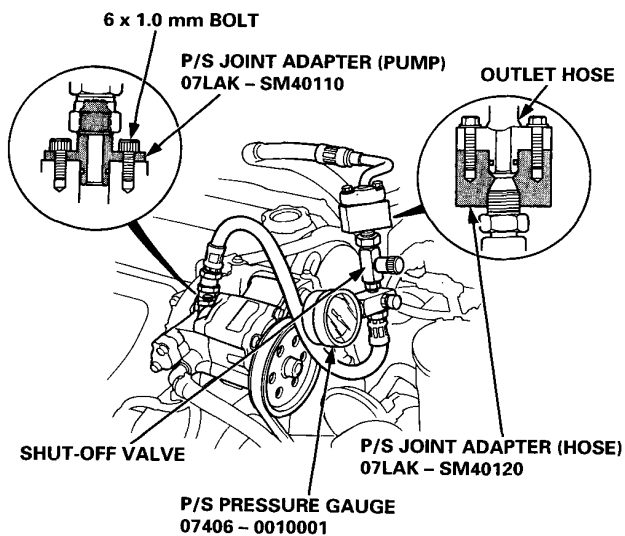
Pump Pressure Check

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 outlet hose with care so as not to spill the power steering fluid on the frame and other parts.

1. Disconnect the outlet hose from the pump outlet fitting, and install the pump joint adaptor on the pump outlet.
2. Connect the hose joint adaptor to the power steering pressure gauge, then connect the outlet hose to the adaptor.
3. Install the power steering pressure gauge to the pump joint adaptor as shown.

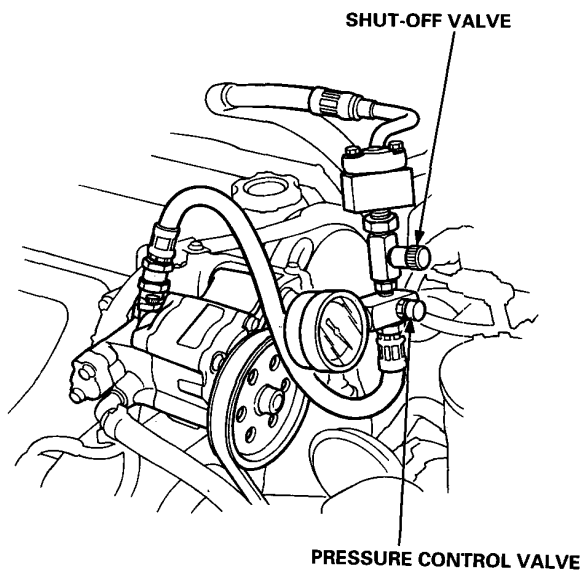


4. Open the shut-off valve fully.
5. Open the pressure control valve fully.

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. Close the shut-off valve, then close the pressure control valve gradually until the pressure gauge needle is stable. Read the pressure.
9. Immediately open the shut-off valve fully.

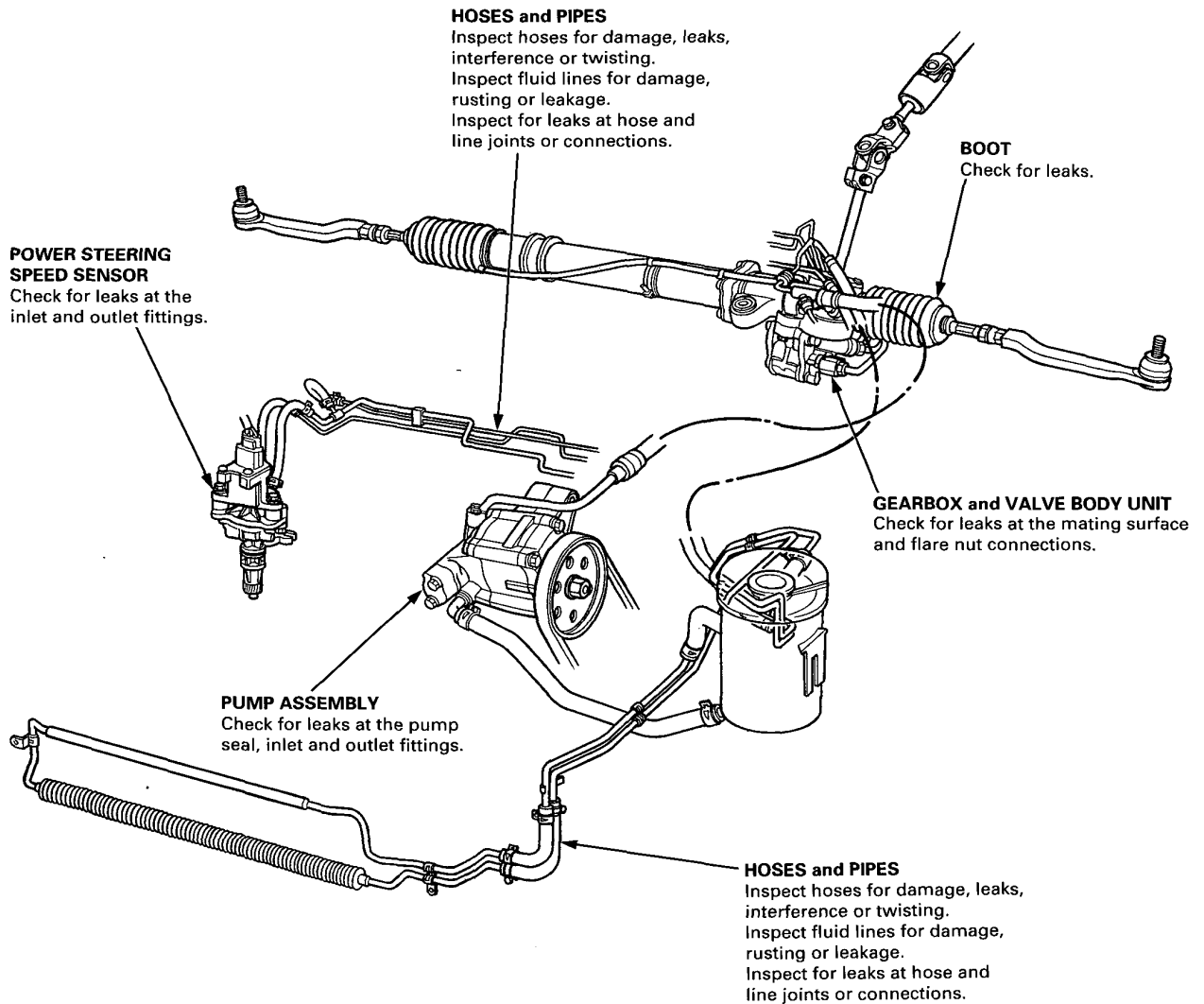
CAUTION: Do not keep the shut-off valve closed more than 5 seconds or the pump could be damaged by over-heating.

If the pump is in good condition, the gauge should read at least 8,000 — 9,000 kPa (80 — 90 kg/cm², 1,138 — 1,280 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.





Fluid Leakage Inspection



Steering Wheel (With SRS)

Removal

Airbag Removal

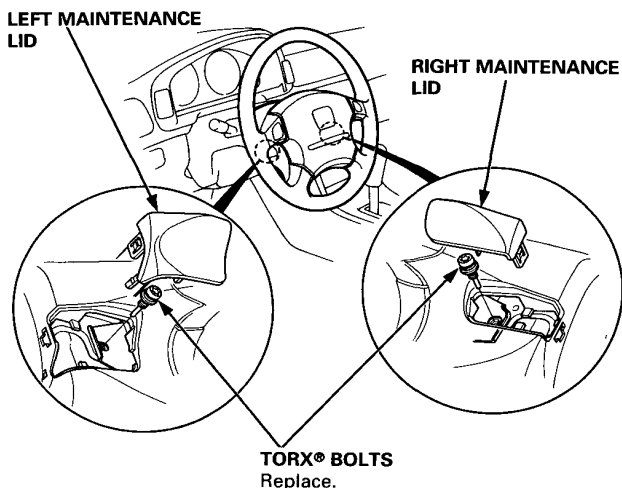
⚠ WARNING Store a removed airbag assembly with the pad surface up, if the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

CAUTION:

- Before removing the steering wheel, align the front wheels straight ahead.
- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- 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.
- Do not disassemble or temper with the airbag assembly.
- Special bolts are necessary for installing the airbag assembly. Do not use other bolts.

1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
2. Remove the left and right maintenance lids.
3. Remove the left TORX® bolt first (the safety switch will automatically turn off).
4. Remove the right TORX® bolt.

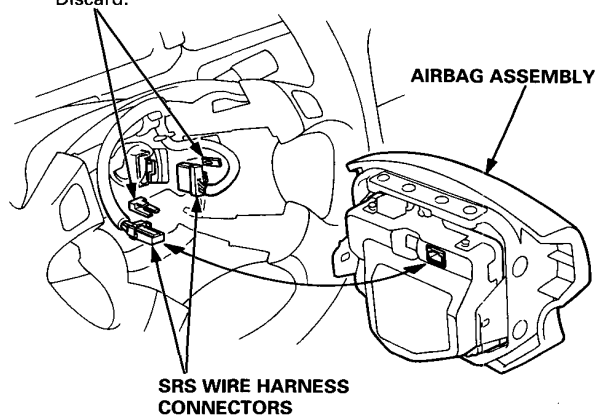
NOTE: Use a TORX T30 bit.



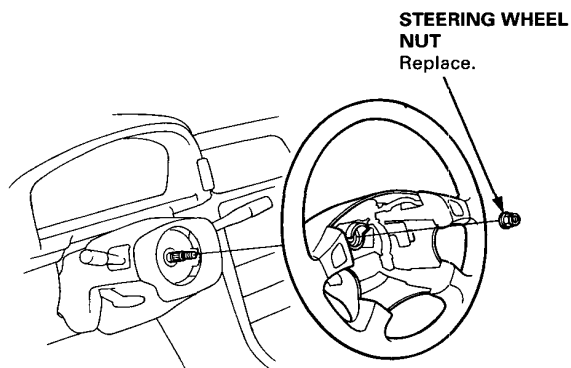
5. Remove the airbag assembly from the steering wheel.
6. Pull out the connector locks, then disconnect the SRS wire harness connectors from the slip ring and airbag assembly.

NOTE: Dispose of the connector locks, it are not to be reused.

CONNECTOR LOCKS Discard.



7. Remove the steering wheel locknut.
8. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.





Disassembly/Reassembly

⚠ 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.

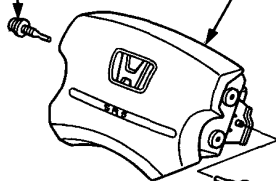
NOTE: If an intact airbag assembly has been removed from a scrapped car or has been found defective or damaged during transit, storage or service, it should be deployed (see section 23).

CAUTION:

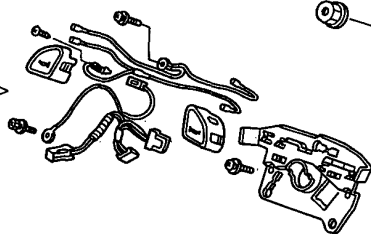
- Carefully inspect the airbag assembly before installing. Do not install an airbag assembly that shows signs of being dropped or improperly handled, such as dents, cracks or deformation.
- Do not disassemble or tamper with the airbag assembly.

TORX® BOLT
10 N·m
(1.0 kg·m, 7 lb·ft)

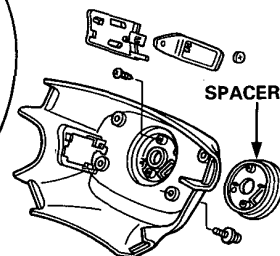
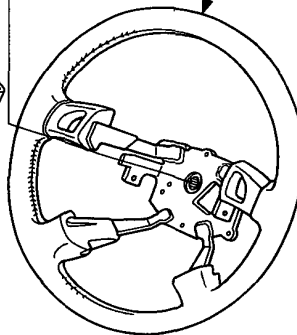
AIRBAG ASSEMBLY



TORX® BOLT
10 N·m
(1.0 kg·m, 7 lb·ft)



STEERING WHEEL



SPACER

WHEEL LOWER COVER

Steering Wheel (With SRS)

Installation

Airbag installation

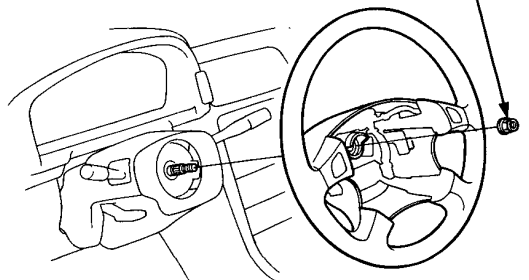
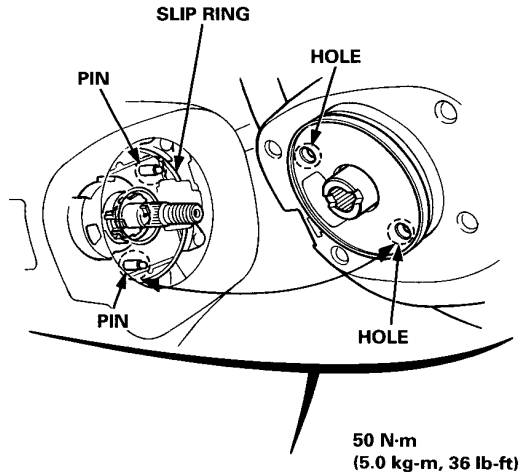
CAUTION:

- Before installing the steering wheel, align the front wheels straight ahead.
- Be sure to install the harness wires so that they are not pinched or interfering with other car parts.
- Do not replace the original steering wheel with any other design, since it will make it impossible to properly install the airbag. (Only use genuine HONDA replacement parts)
- After reassembly, confirm that the wheels are still straight ahead and that steering wheel spoke angle is correct. If minor spoke angle adjustment is necessary, do so only by adjustment of the tie-roads, not by removing and repositioning the steering wheel.

▲ WARNING Confirm that the airbag assembly is securely attached to the steering wheel; otherwise, severe personal injury could result during airbag deployment.

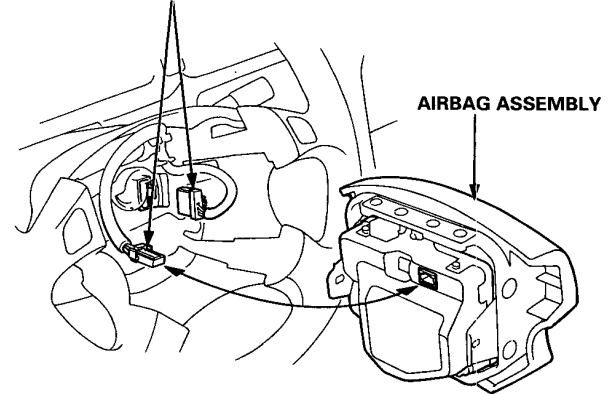
1. Install the steering wheel on the column shaft with a new steering wheel locknut.

NOTE: Align the holes on the steering wheel and pins on the slip ring.



2. Connect the SRS wire harness connectors on the slip ring and airbag assembly.

SRS WIRE HARNESS CONNECTORS



3. Install the airbag assembly with new TORX® bolts.

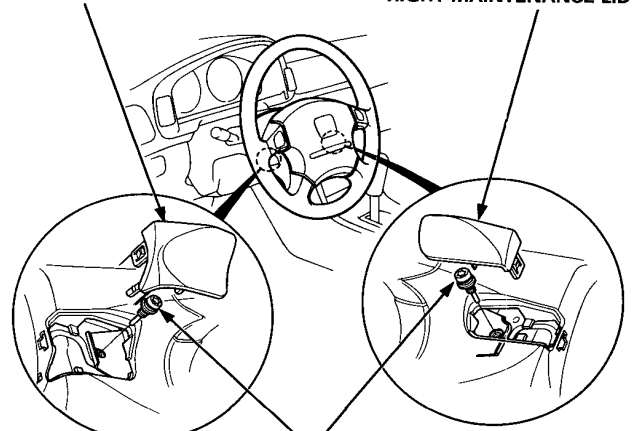
NOTE: Use a TORX T30 bit.

4. Install the maintenance lids.
5. Connect the battery positive terminal and then connect the negative terminal.
6. After installing the airbag assembly, confirm proper system operation:

- Turn the ignition to ON: The instrument panel SRS indicator light should go on for about six seconds and then go off.
- The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.

LEFT MAINTENANCE LID

RIGHT MAINTENANCE LID



TORX® BOLTS
10 N·m (1.0 kg·m, 7 lb·ft)



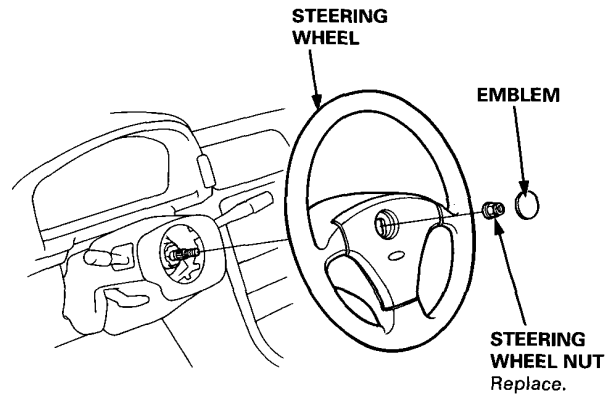
Steering Wheel (Without SRS)

Removal

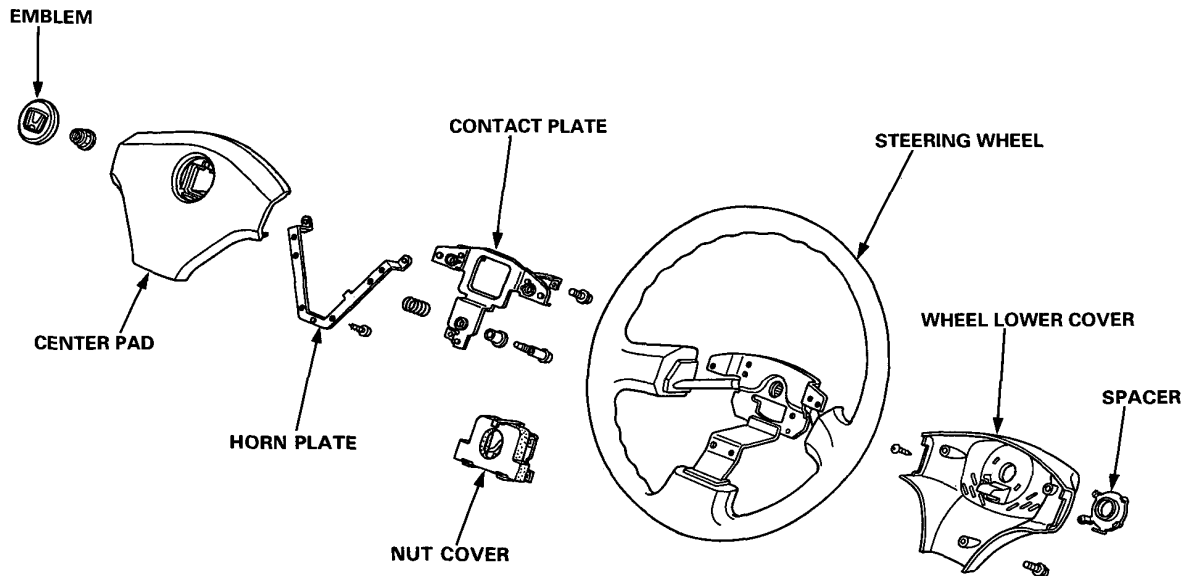
1. Remove the emblem with small screw driver.

NOTE: Be careful not to damage the emblem and steering wheel.
2. Remove the steering wheel nut.
3. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.

NOTE: Remove the steering wheel with the front wheels in the straight ahead position.



Disassembly/Reassembly



Steering Wheel (Without SRS)

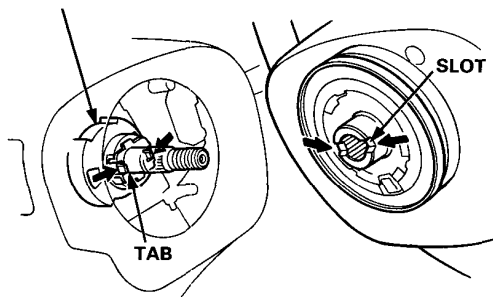
Installation

1. Install the steering wheel with the front wheels straight in the ahead position.

NOTE: Align the slots on steering wheel and tabs on the turn signal canceling sleeve.

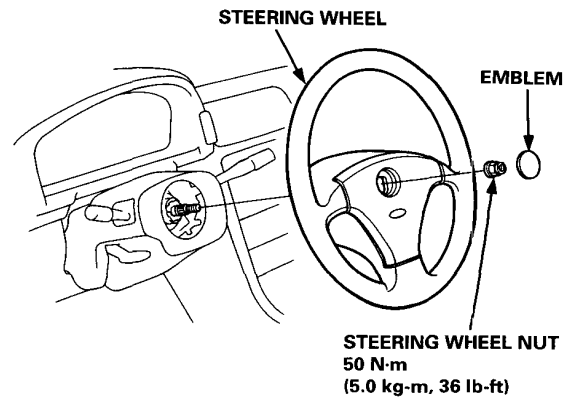
2. Make sure that the steering wheel is positioned correctly. Reposition the steering wheel if necessary.

TURN SIGNAL
CANCELING SLEEVE



NOTE: If you can not obtain straight ahead position completely, turn the tie-rods equally to adjust the front wheel direction with the steering wheel straight ahead position. Refer to page 18-6 for front toe adjustment.

3. Tighten the new steering wheel nut and install the emblem.



4. After installing the steering wheel, check the horn buttons for proper operation.

Steering Column

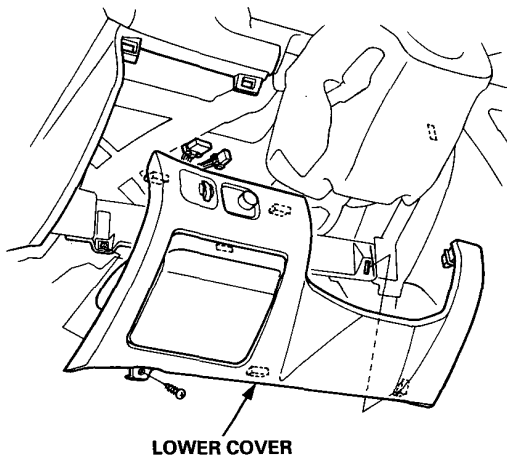


Removal

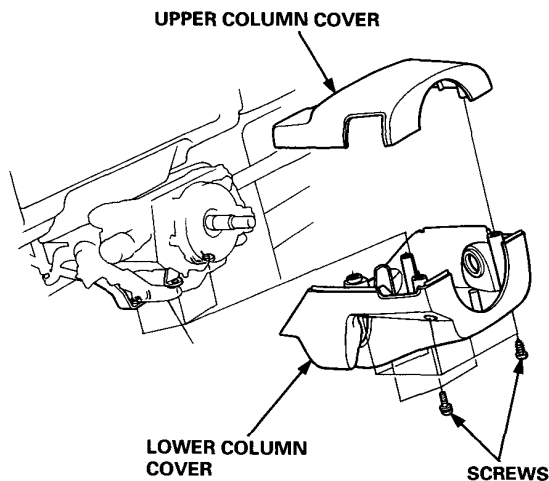
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if there is an open circuit or damage to the wiring.

1. Remove the airbag assembly and steering wheel (see page 17-24 or 27).
2. Remove the lower cover.

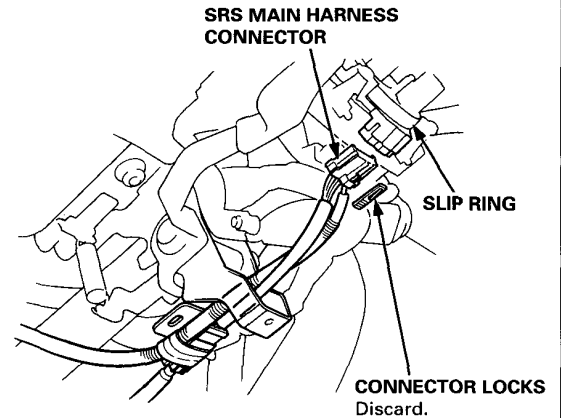


3. Remove the upper and lower column cover.

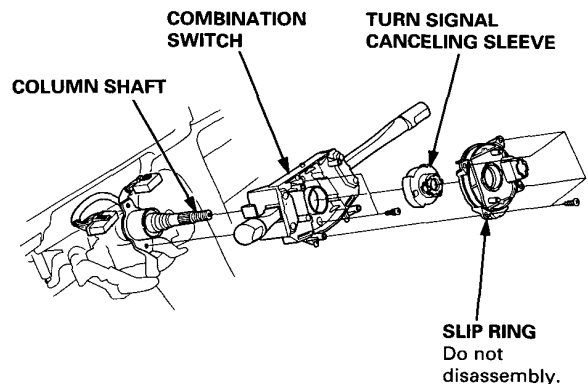


4. Pull out the connector lock, then disconnect the SRS main harness connector from the slip ring.

NOTE: Dispose of the connector lock, it is not to be reused.



5. Remove the slip ring and turn signal canceling sleeve.
6. Disconnect the connectors from the combination switch, then remove the combination switch from the column shaft.

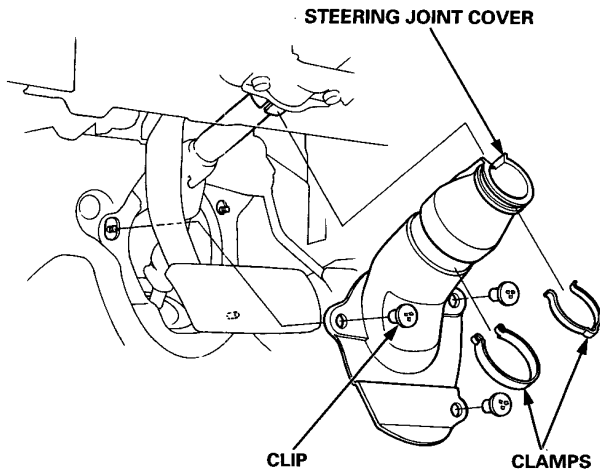


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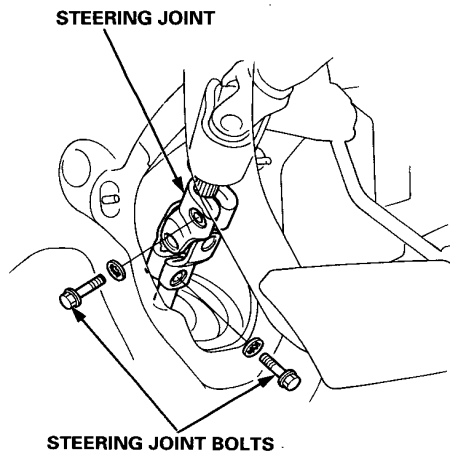
Steering Column

Removal (cont'd)

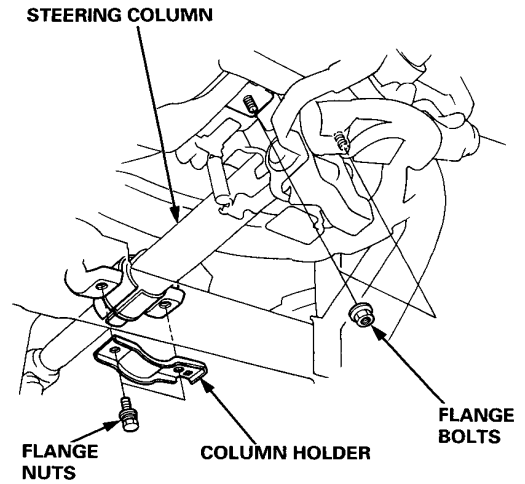
7. Remove the steering joint cover.



8. Remove the steering joint bolts, and move the joint toward the column.



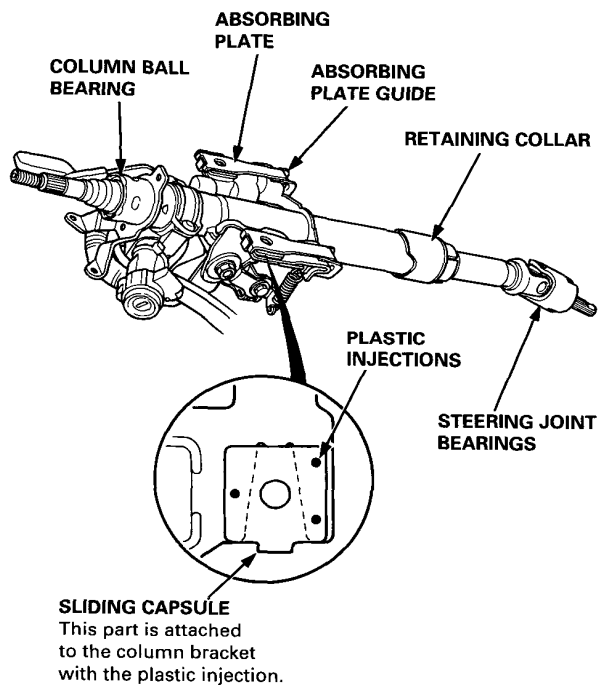
9. Remove the steering column by removing the attaching nuts and bolts.





Inspection

- Check the steering column ball bearing and steering joint bearings for play and proper movement. If they are noisy or have excessive play, replace the joint or column assembly.
- Check the retaining collar for damage. If it is damaged, replace the retaining collar.
- 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.

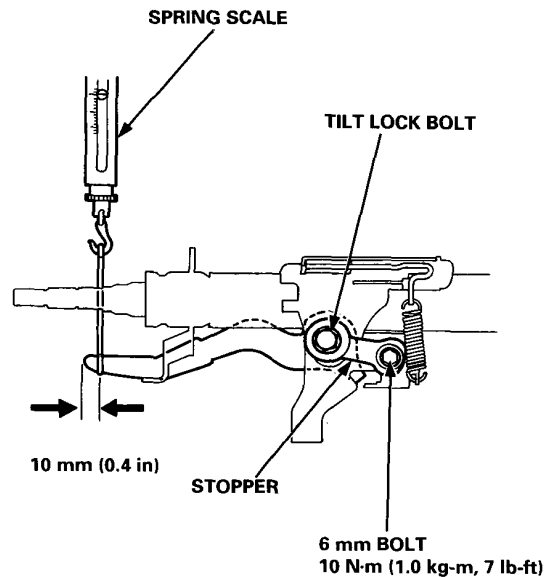


- Check the tilt mechanism for proper movement and damage.

— Attach a spring scale to the knob of the tilt lever. Measure the preload required to move the lever.

Preload: 70 — 90 N (7 — 9 kg, 15 — 20 lbs)

- If the preload measured is not within the specification, remove the 6 mm bolt and stopper. Adjust the preload by retightening the tilt lock bolt until the correct force can be obtained.
- Reinstall the stopper and 6 mm bolt and recheck the preload.



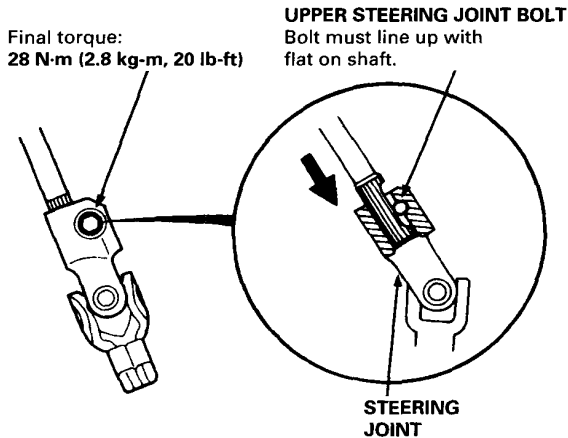
Steering Column

Installation

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if there is an open circuit or damage to the wiring.

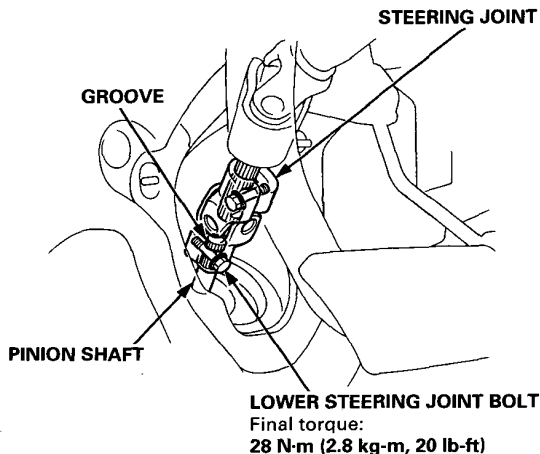
1. Slip the upper end of the steering joint onto the column shaft (line up the bolt hole with the flat on the shaft) and loosely install the upper steering joint bolt.



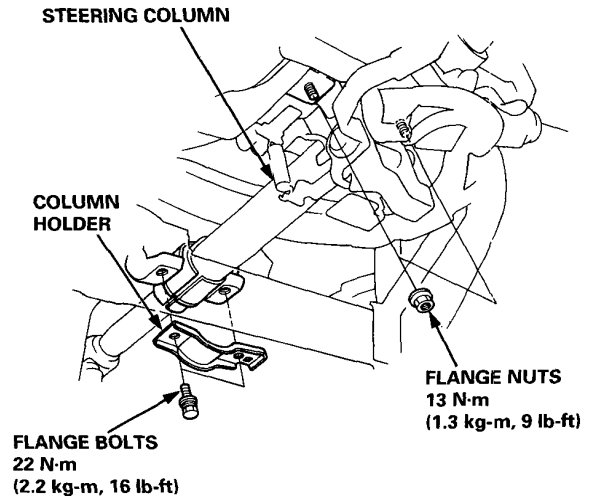
2. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft) and loosely install the steering joint bolts.

NOTE:

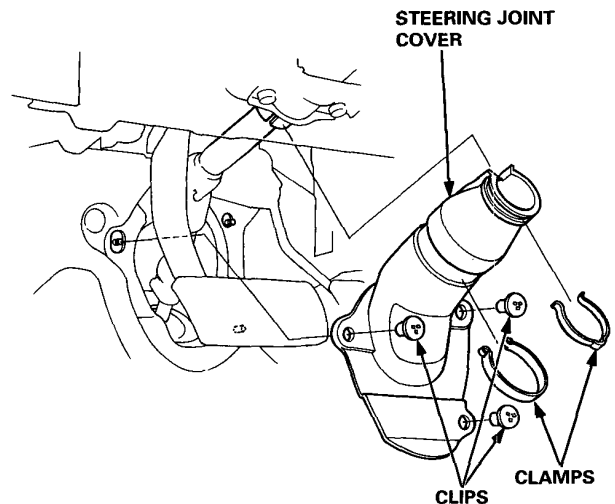
- Be sure that the lower steering joint bolt is securely in the groove in the pinion shaft.
- Before tightening the steering joint bolts pull on the steering joint to make sure that the steering joint is fully seated.



3. Install the steering column with the flange nuts then install the column holder and flange bolts.
4. Tighten the upper and lower steering joint bolts loosely installed in step 2.



5. Install the steering joint cover with the clamps and clips.

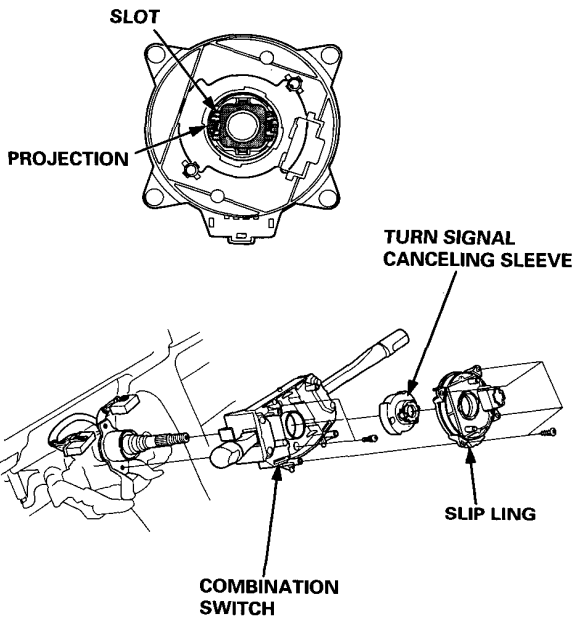


6. Connect the ignition switch wire connectors to the under-dash fuse/relay box.

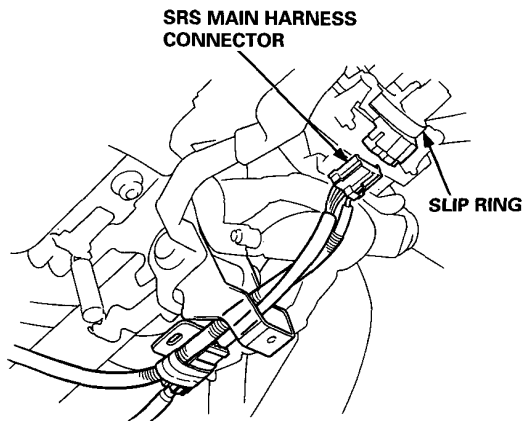


7. Install the combination switch and turn signal canceling sleeve.
8. Install the slip ring on the combination switch.

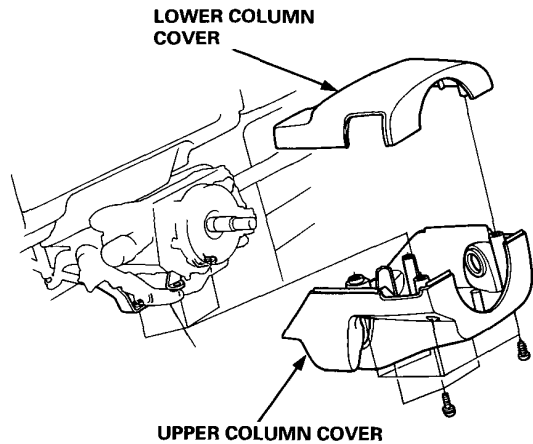
NOTE: Align the slot in the canceling sleeve with the projection on the slip ring.



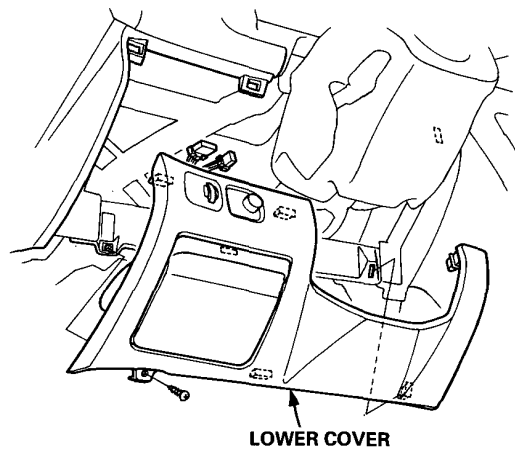
9. Connect the SRS main harness connector to the slip ring.



10. Install the upper and lower column covers.



11. Install the lower cover.



12. Install the steering wheel.
 - With SRS (see page 17-26)
 - Without SRS (see page 17-28)

Power Steering Pump

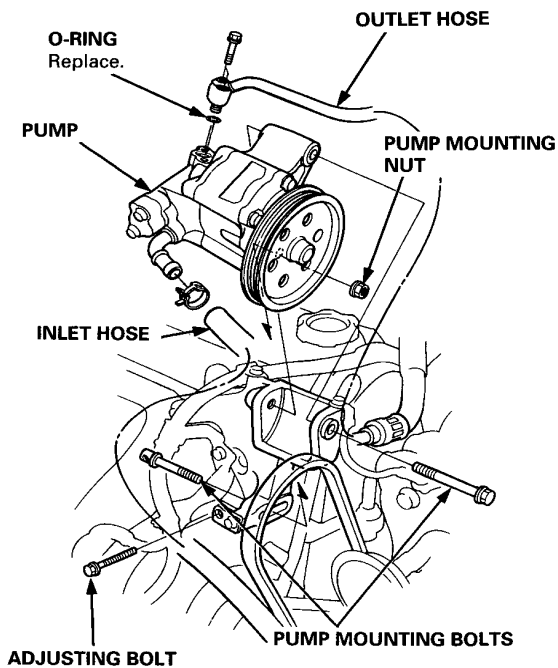
Removal

NOTE: Before disconnecting the hoses from the pump, place a suitable container under the car.

1. Drain the fluid from the system (see page 17-21).
2. Disconnect the inlet and outlet hoses from the pump and plug them.
3. Remove the pump belt by loosening the pump mounting bolt, nut and adjusting bolt.

NOTE: Take care not to spill the fluid on the body and parts. Wipe off the spilled fluid at once.

4. Remove the pump mounting bolts and nut, then remove the pump.



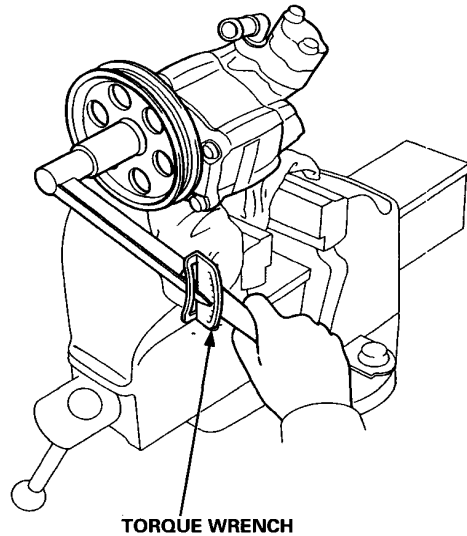
NOTE: Do not turn the steering wheel while the pump removed.

5. Wrap the opening of the pump with a piece of tape to prevent any foreign material. See page 17-43 for pump installation.

Preload Inspection

Check the pump preload with a torque wrench after overhauling a pump or installing a replacement pump.

Preload: 8 N·m (0.8 kg·m, 5.8 lb-ft) max.





Disassembly

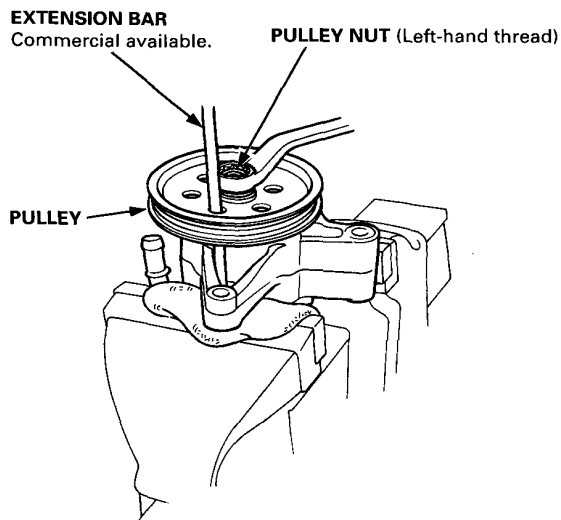
Pulley Removal

1. Drain the fluid from the pump.
2. 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.

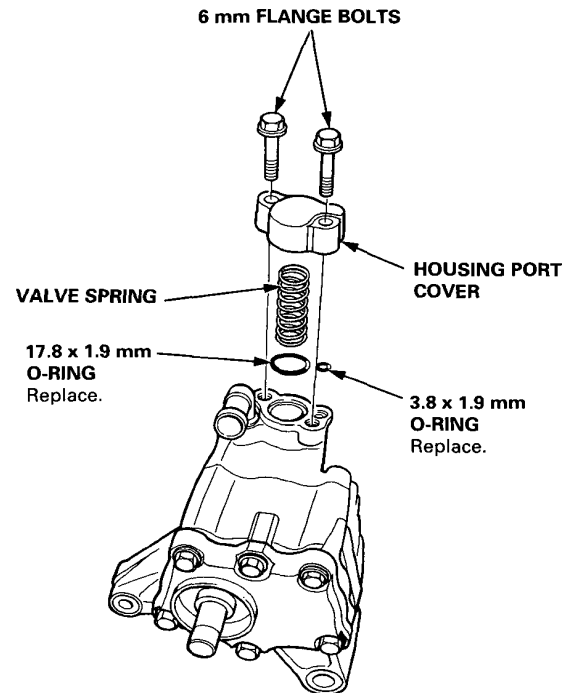
3. Hold the steering pump pulley with a extension bar and remove the pulley nut.
4. Remove the pulley.

NOTE: Pulley nut has left hand thread.

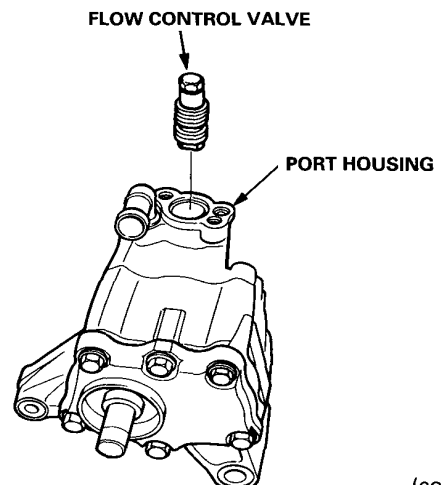


Flow Control Valve Removal/Inspection

1. Remove the two 6 mm flange bolts, then remove the housing port cover, valve spring and O-rings.



2. Remove the flow control valve from the port housing.

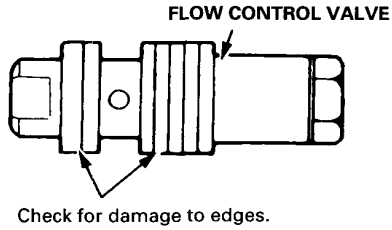


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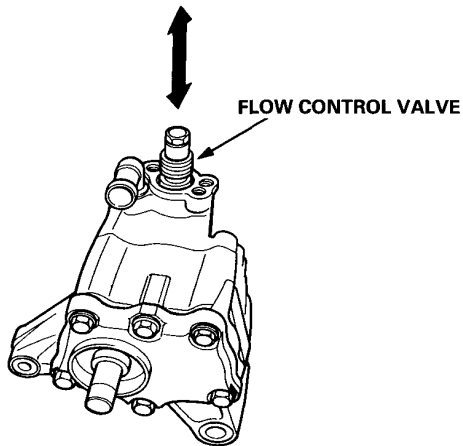
Power Steering Pump

Disassembly (cont'd)

3. Check for wear, burrs, and other damage to the edges of the grooves in the flow control valve.

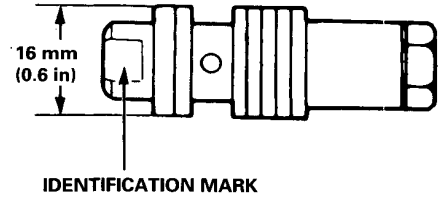


4. Slip the flow control valve back in the pump and check that it moves in and out smoothly.



If OK, go on to step 5, if not, replace the flow control valve:

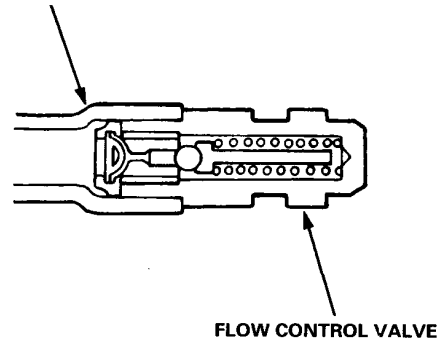
- The original valve was selected for a precise fit in the pump housing bore, so make sure the new one has the same identification mark.



Mark	Part Name	Size mm (in)
A	FLOW CONTROL VALVE A	15.995 — 16.000 (0.6297 — 0.6299)
Without mark	FLOW CONTROL VALVE B	16.000 — 16.006 (0.6299 — 0.6302)

5. Attach a hose to the end of the flow control valve as shown.

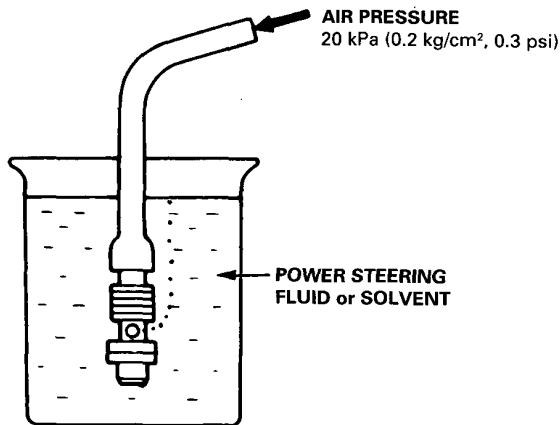
HOSE
9.5 mm ID (0.37 in)
(The power steering return hose is recommended)



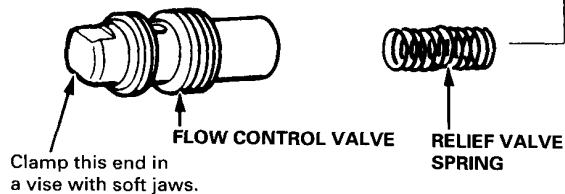
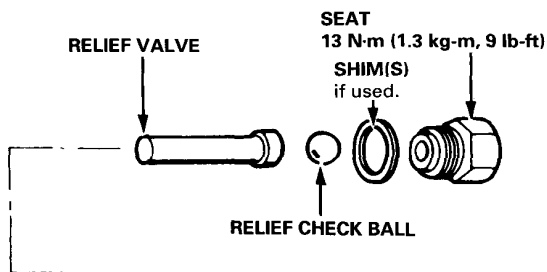


- Then submerge the flow control valve in a container of power steering fluid or solvent, and blow gently on the hose. If air bubbles leak through the flow control valve, replace or repair it as follows.

NOTE: Do not use compressed air.



- Clamp the bottom end of the flow control valve in a vise with soft jaws.
- Unscrew the seat in the top end of the flow control valve, and remove any shims, the relief check ball, relief valve and relief valve spring.



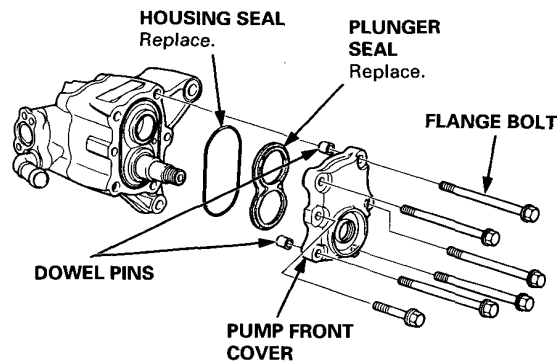
- Clean all the parts in solvent, dry them off, then reassemble and retest the flow control valve.

NOTE: If necessary, relief pressure is adjusted at the factory by adding shims under the seat. If you found shims in your valve, be sure you reinstall as many as you took out.

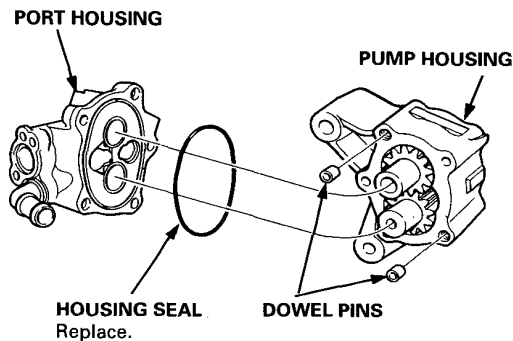
Drive and Driven Gears Removal

CAUTION: The pump components are made of aluminum. Be careful not to damage them when servicing.

- Remove the flange bolts, then remove the pump front cover, housing seal, plunger seal and dowel pins.



- Separate the port housing from the pump housing.
- Remove the dowel pins and housing seal from the port housing.

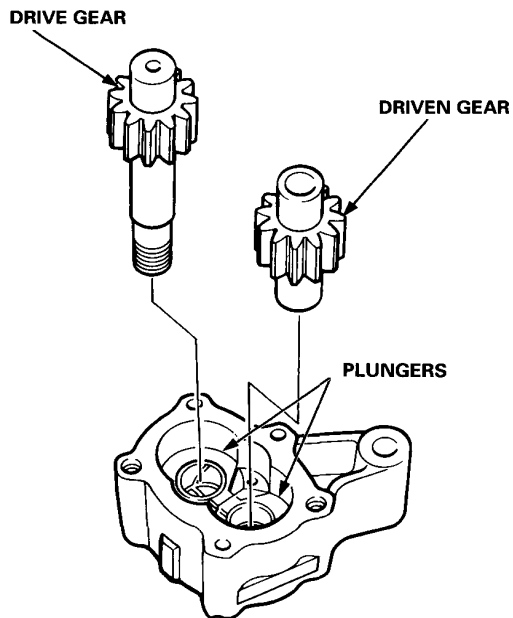


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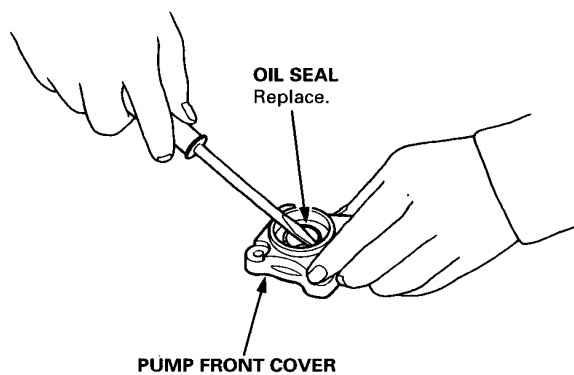
Power Steering Pump

Disassembly (cont'd)

13. Remove the pump drive and driven gears from the pump housing.
14. Remove the plungers from the pump housing.



15. Pry the oil seal out from the pump front cover.

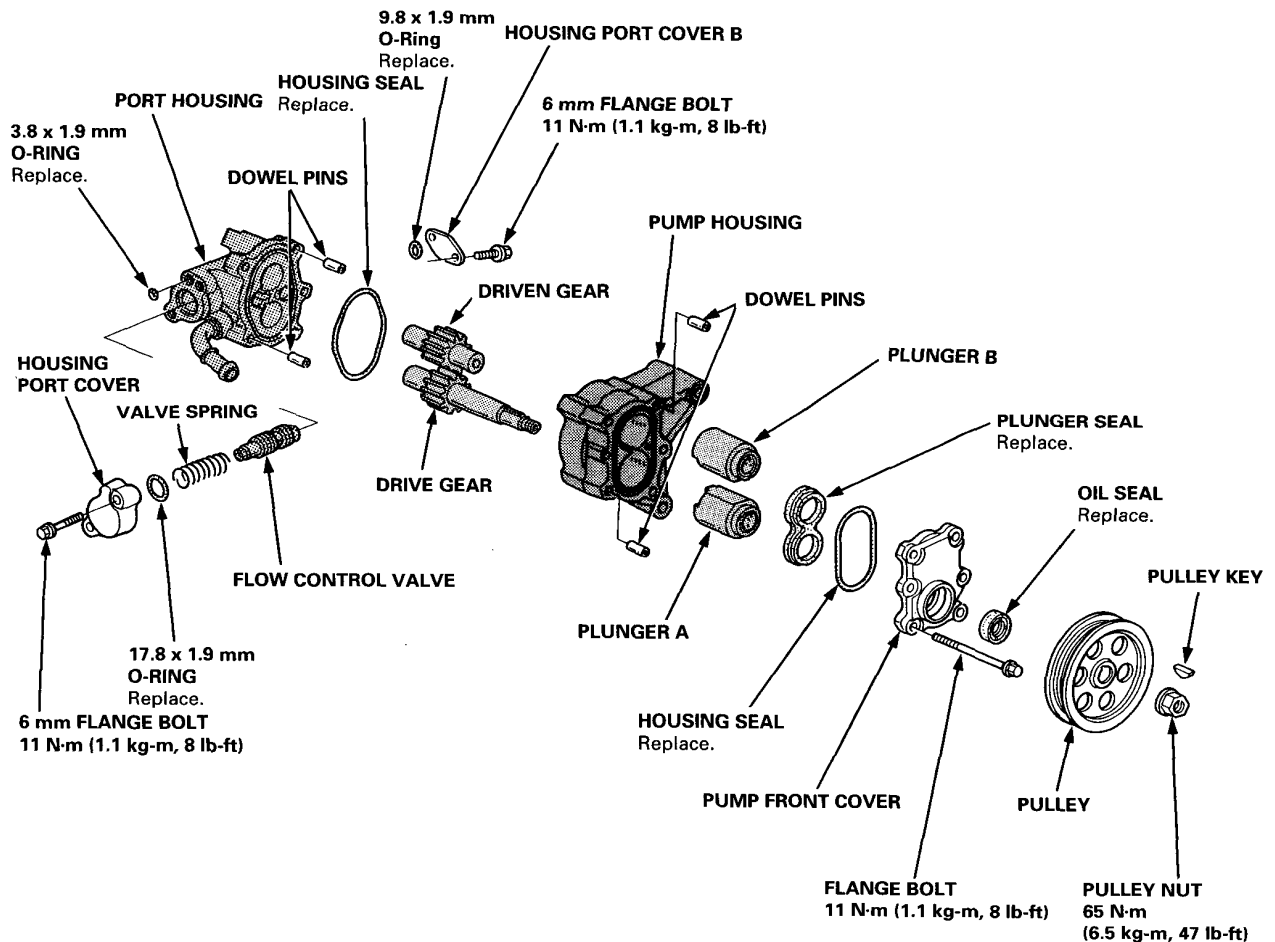




Reassembly

CAUTION: Pump components are made of aluminum. Be careful not to damage them when servicing.

- Clean all of the disassembled parts thoroughly.
- Replace all O-rings and seals. Do not dip new O-rings and seals in solvent; coat O-rings with steering grease before installation, and make sure they stay in place during reassembly.
- The shaded parts are selectively fitted, and should not be disassembled except to replace seals. If any one of them is faulty, replace the whole pump as an assembly.



(cont'd)

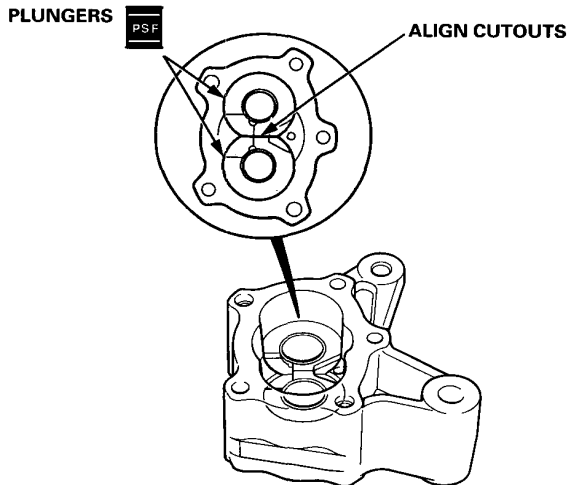
Power Steering Pump

Reassembly (cont'd)

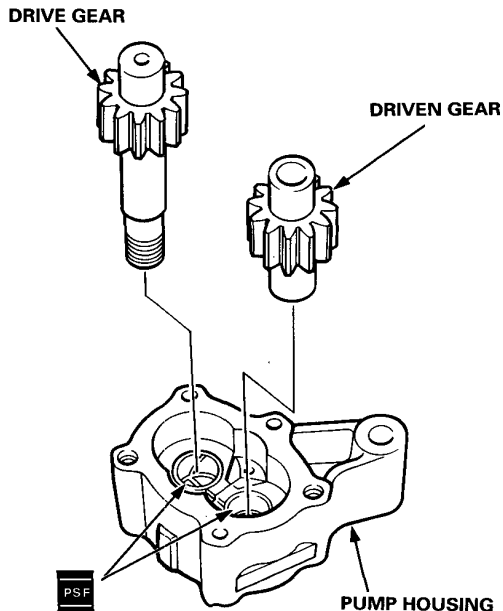
Drive and Driven Gears Installation

1. Coat the outer surfaces of the plungers with power steering fluid, then install them in the pump housing. Make sure the plunger holes are positioned as shown.

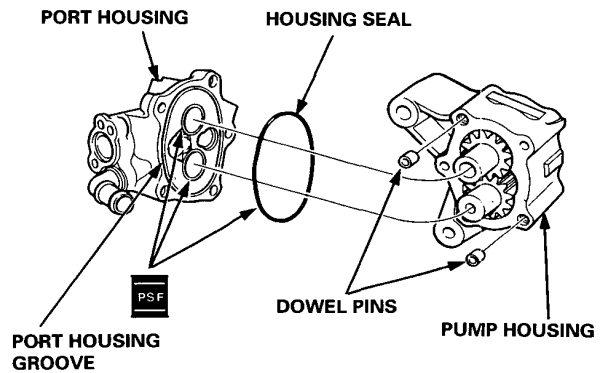
NOTE: Install the plungers so the cutouts are aligned as shown.



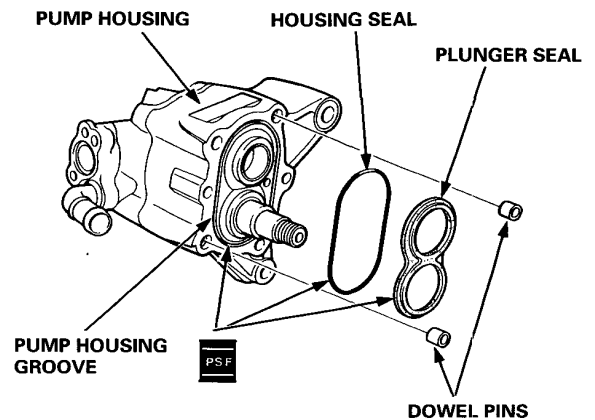
2. Coat the inside of the plungers with power steering fluid.
3. Install the drive and driven gears in the pump housing.



4. Coat the port housing groove with power steering fluid first, then position a new housing seal on the port housing.
5. Coat the bushings on the port housing with power steering fluid.
6. Install the dowel pins in the pump housing.
7. Install the port housing on the pump housing.

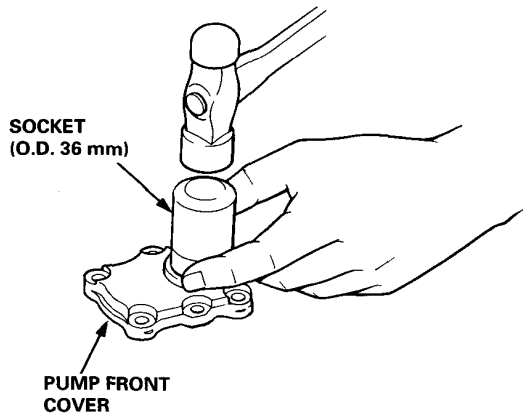


8. Coat the pump housing groove with power steering fluid, then position a new housing seal on the pump housing.
9. Coat the new plunger seal with power steering fluid install it over the plungers.
10. Install the dowel pins in the pump housing.

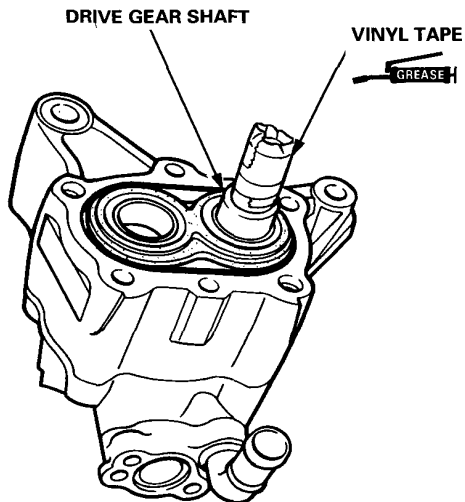




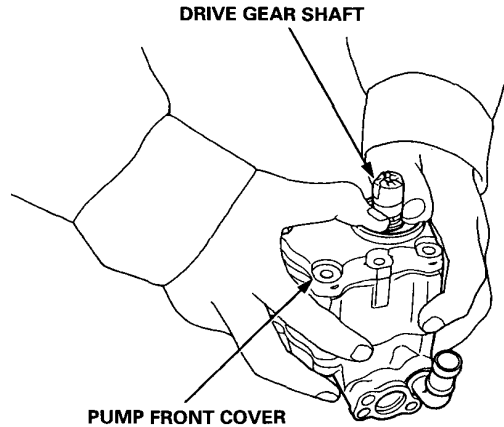
11. Install the new oil seal in the pump front cover; get it started by hand, then use a socket to push it in the rest of the way.
12. Coat the lip of the seal with steering grease (Honda P/N 08733 – B070E).



13. Wrap the splined area of the drive gear shaft with vinyl tape and grease the surface of the tape.

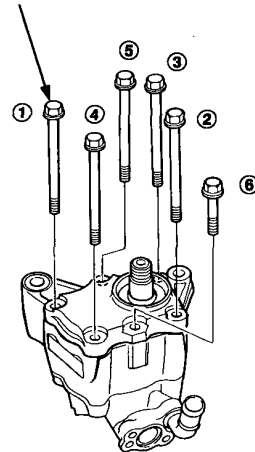


14. Slide the pump front cover over the drive gear shaft, being careful not to damage the sealing lip or dislodge the spring of the oil seal, then remove the vinyl tape.



15. Install the flange bolts. Torque them to the specified torque in the order shown.

FLANGE BOLT
11 N·m (1.1 kg·m, 8 lb-ft)



(cont'd)

Power Steering Pump

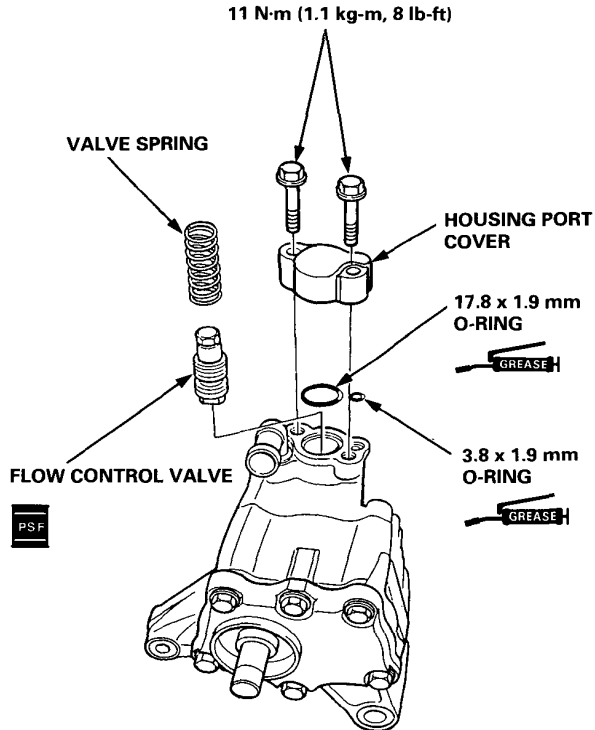
Reassembly (cont'd)

Flow Control Valve Installation

16. Install the flow control valve in the reverse order of removal.

- Apply steering grease (Honda P/N 08733 - B070E) to new O-rings.
- Coat the flow control valve with power steering fluid then install it and valve spring.

NOTE: When replacing the flow control valve, be sure the replacement flow control valve has the same identification letter as the original flow control valve.

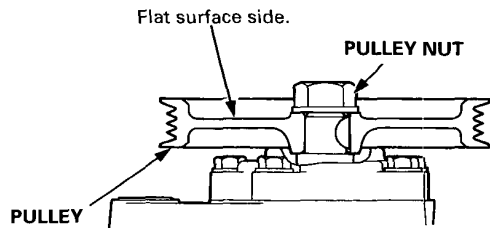


Pulley Installation

1. 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.

2. Install the pump pulley with its flat surface toward out as shown. Then install the pulley nut.

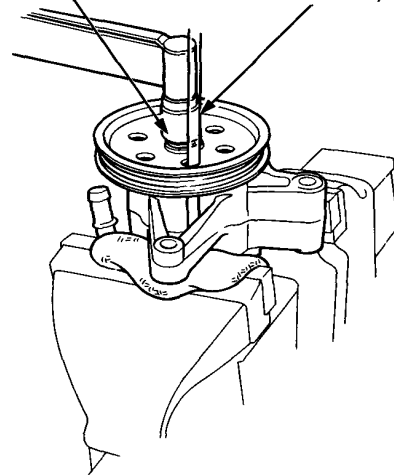


3. Hold the pulley with an extension bar and tighten the pulley nut.

4. Check that the pump turns smoothly by turning the pulley.

PULLEY NUT
(Left hand threads)
65 N-m (6.5 kg-m, 47 lb-ft)

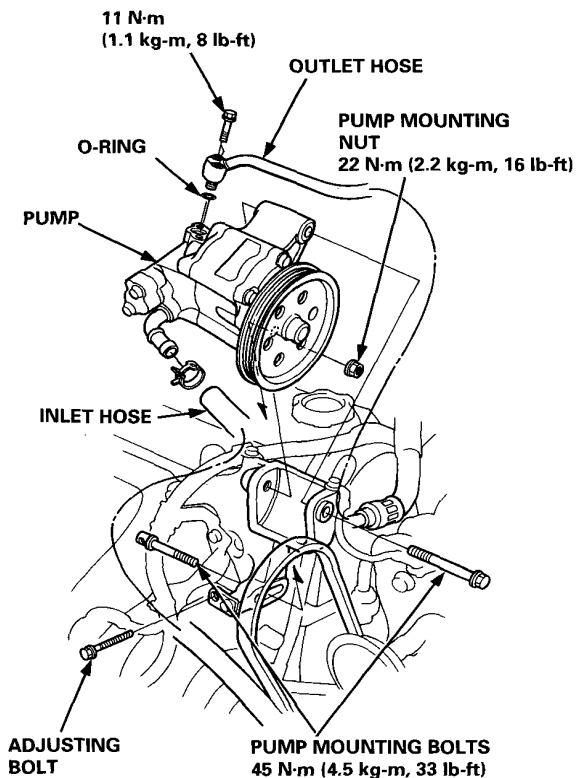
EXTENSION BAR
Commercially available.





Installation

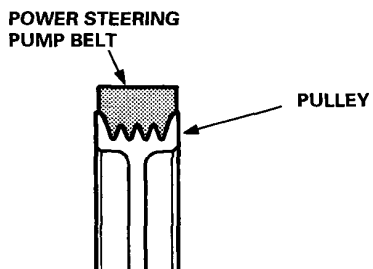
1. Connect the inlet and outlet hoses the pump fittings securely.
2. Loosely install the pump in the pump bracket with mounting bolts.



3. Install the pump belt.

CAUTION:

- Make sure that the power steering pump belt is securely on the groove of the pulleys.
- Do not get power steering fluid or grease in the pump belt or pulley faces. Clean off any fluid or grease before installation.



4. Adjust the pump belt (see page 17-20).
5. Fill the reservoir to the upper level line.

NOTE: Take care not to spill the fluid on the body and parts. Wipe off the spilled fluid at once.

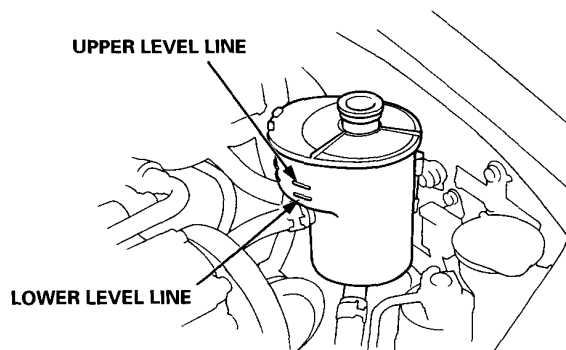
CAUTION: Use only Genuine Honda Power Steering Fluid. Using other fluids such as ATF or other manufacturer's power steering fluid will damage the system.

SYSTEM CAPACITY:

1.8 liter (1.9 U.S. qt., 1.6 Imp. qt.)

RESERVOIR CAPACITY:

0.5 liter (0.5 U.S. qt., 0.4 Imp. qt.)



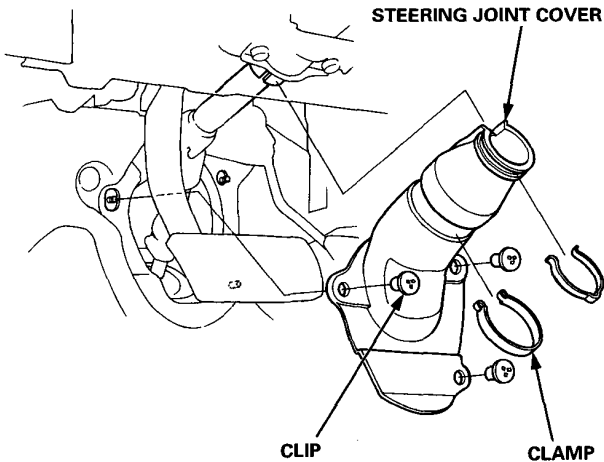
- Start the engine, let it run at idle, then turn the steering wheel lock-to-lock several times to bleed air from the system.
- Recheck the fluid level and add some if necessary.

CAUTION: Do not fill the reservoir beyond the upper level line.

Steering Gearbox

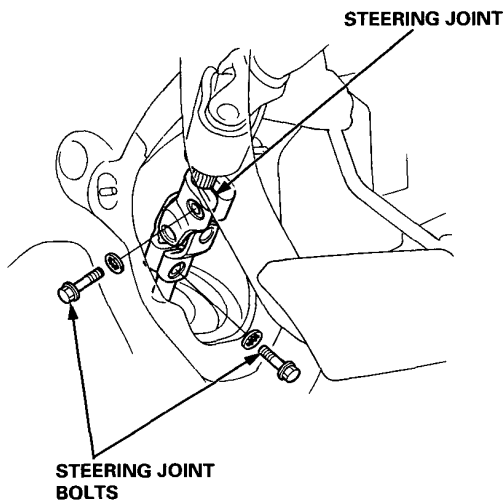
Removal

1. Drain the power steering fluid as described on page 17-21.
2. Raise the front of car and support on safety stands in the proper locations (see section 1).
3. Remove the front wheels.
4. Remove the steering joint cover.



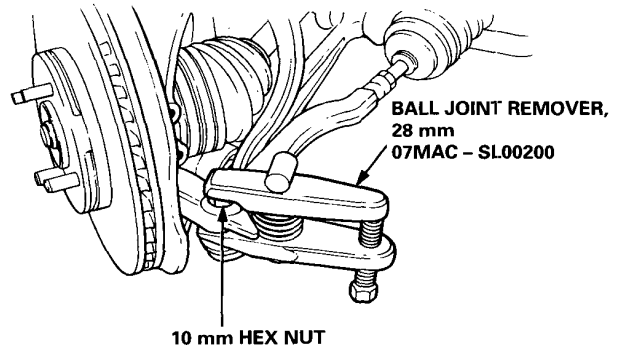
5. Remove the steering joint bolts, and move the joint toward the column.

NOTE: Lock the steering shaft with ignition key to keep the steering shaft in position.

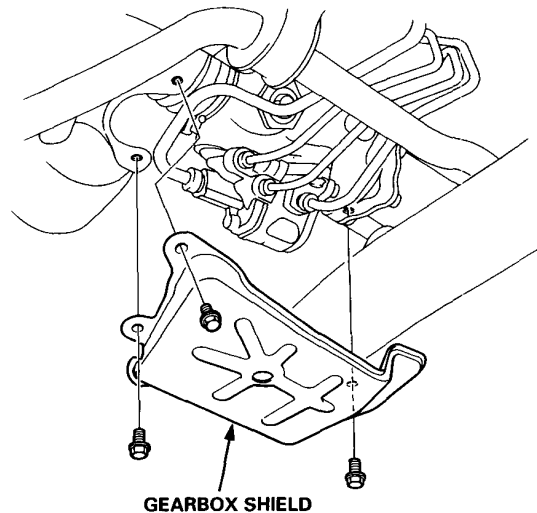


6. Remove the cotter pin from the castle nut and remove the nut.
7. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.
8. Separate the tie-rod ball joint and knuckle using the special tool.

CAUTION: Avoid damaging the ball joint boot.



9. Remove the gearbox shield.

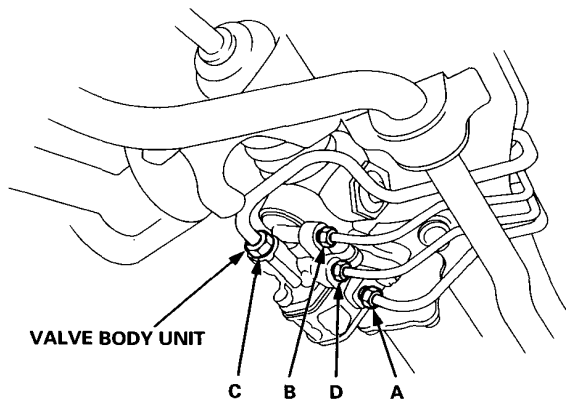




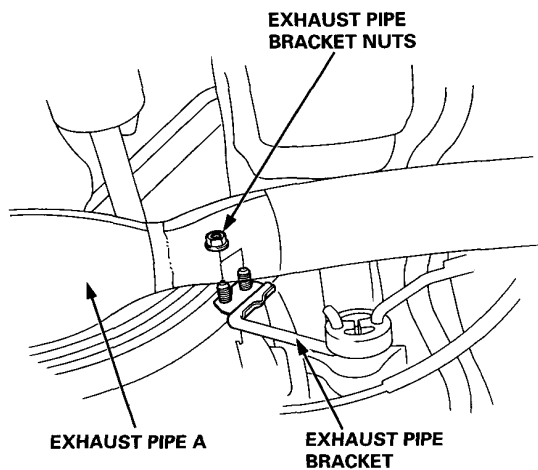
10. Using solvent and a brush, wash any oil and dirt of the valve body unit, its lines, and that end of the gearbox, blow them dry with compressed air.

11. Using flare nut wrenches, disconnect the four lines from the valve body unit.

- A: From pump: 14 mm wrench
- B: To oil cooler: 12 mm wrench
- C: To reservoir: 17 mm wrench
- D: To power steering speed sensor: 12 mm wrench



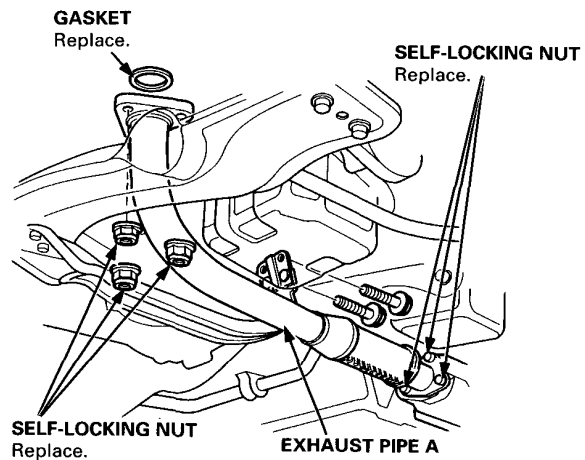
12. Remove the exhaust pipe bracket.



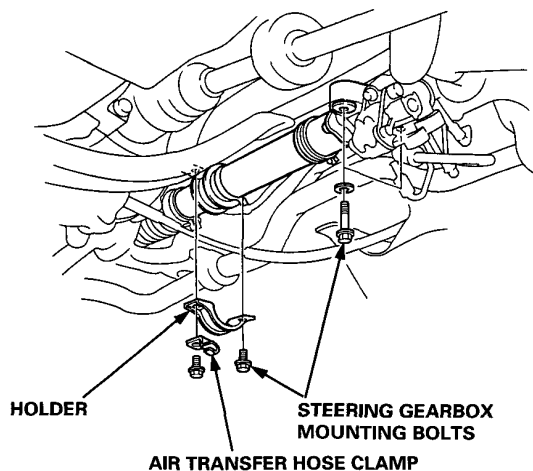
13. Remove the self-locking nuts that connect the exhaust pipe A to the three way catalytic converter, and the exhaust pipe A to the exhaust manifold.

14. Remove the exhaust pipe A.

CAUTION: Replace the exhaust gasket and self-locking nuts when you reinstall the exhaust pipe A.



15. Remove the steering gearbox mounting bolts, holder and air transfer hose clamp.



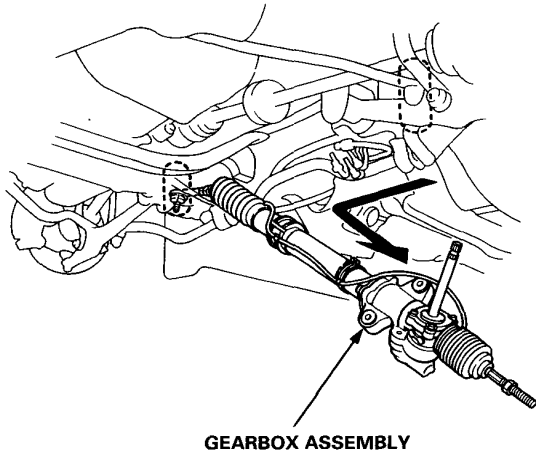
(cont'd)

Steering Gearbox

Removal (cont'd)

16. Remove the left tie-rod end, then slide the tie rod all the way to the right side.
17. Slide the gearbox right so that the left tie rod clears the bottom of the rear beam, then remove the gearbox assembly.

CAUTION: Be careful not to bend or damage the four power steering lines when removing the gearbox assembly.



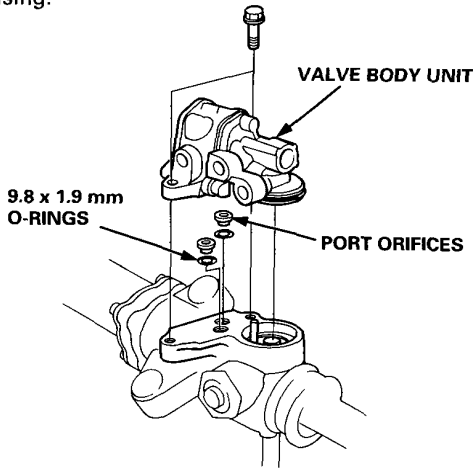


Disassembly

Steering Rack Removal

NOTE: Before disassemble the gearbox, wash it off with solvent and a brush.

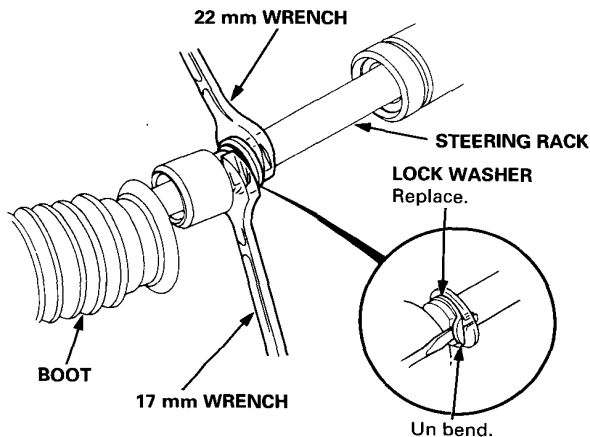
1. Remove the steering gearbox (see page 17-44).
2. Remove the valve body unit from the gearbox.
3. Remove the port orifices and O-ring from the gear housing.



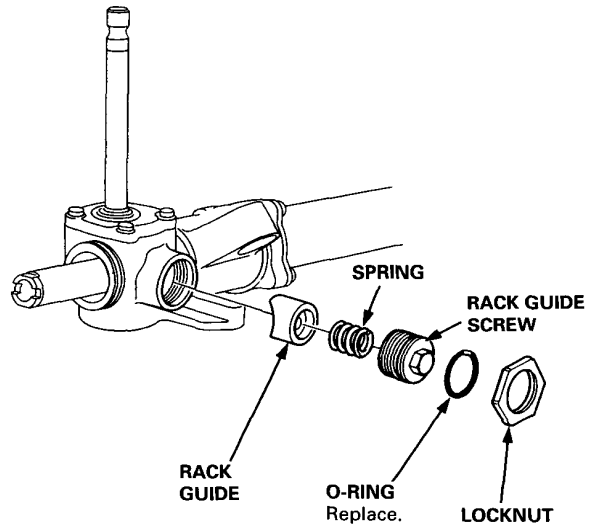
4. Place the gearbox in a vise, with a soft jaws clamp the gearbox at the mount bracket or gear housing.

CAUTION: Be careful not to distort the gear housing by clamping it too tight in the vise incorrectly.

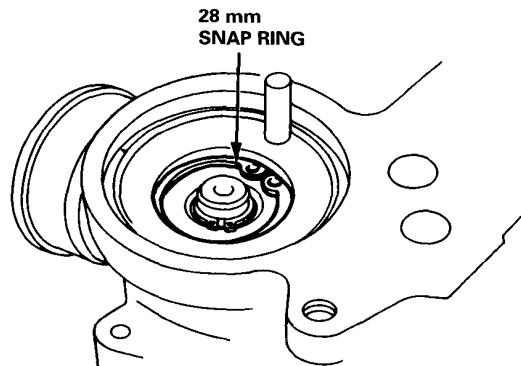
5. Remove the tie-rod end and locknut.
6. Remove the boot bands and tube clamps. Pull the boots away from the ends of the gearbox.
7. Hold the rack with a 22 mm wrench, and unscrew the tie-rods with a 17 mm wrench.



8. Loosen the locknut, and remove the rack guide screw, spring and rack guide.



9. Remove the 28 mm snap ring from the bottom of the gear housing.

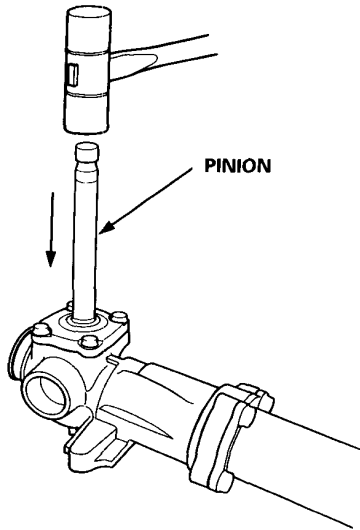


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Steering Gearbox

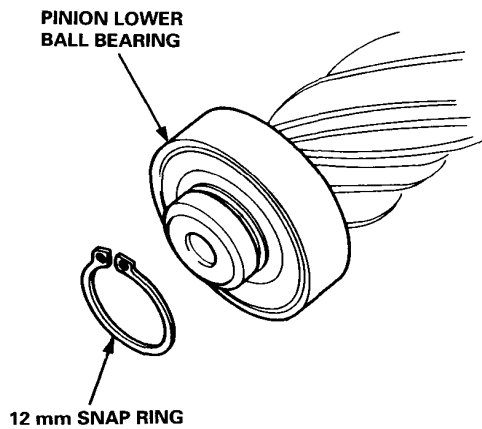
Disassembly (cont'd)

10. Remove the pinion from the gear housing by tapping it lightly.

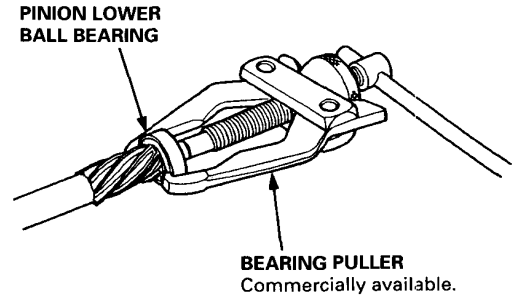


11. Check the pinion lower ball bearing for play; if it is good, go on step 12. If the bearing is noisy or has excessive play, replace the bearing.

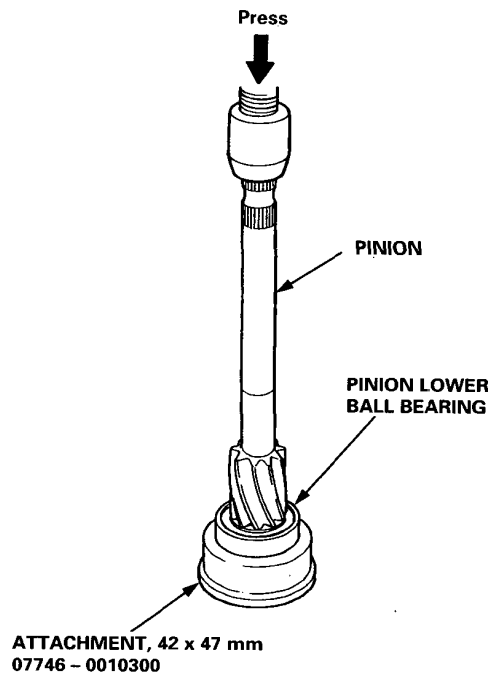
- Remove the 12 mm snap ring.



- Remove the pinion lower ball bearing using a commercially available bearing puller.

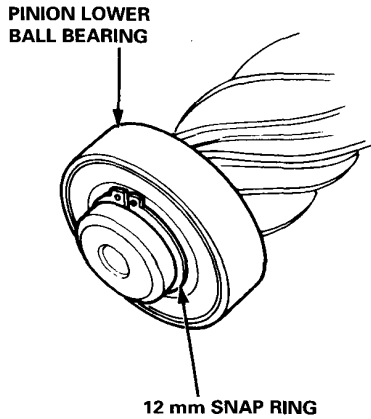


- Using a press, install the pinion lower ball bearing on the pinion.

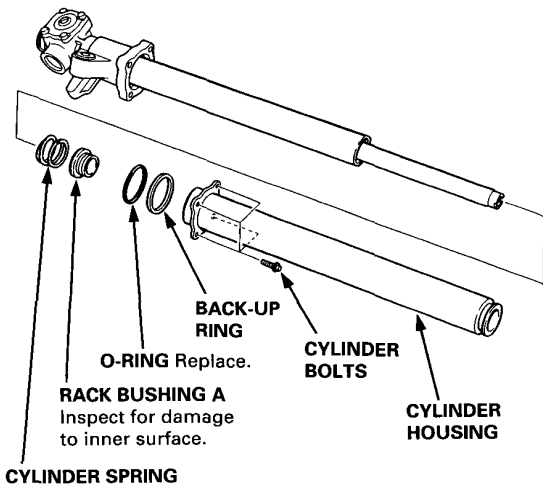




- Check the pinion lower ball bearing for smooth operation and install the 12 mm snap ring.

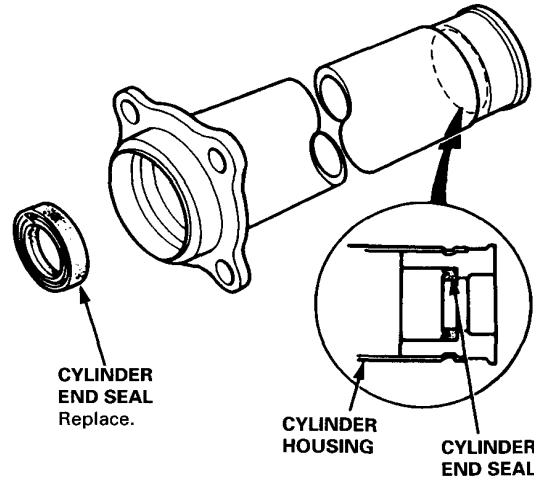


12. Remove the four cylinder bolts from the end of the cylinder housing, then slide the housing off the rack.
13. Remove the cylinder housing.
14. Remove the O-ring, back-up ring, steering rack bushing A and cylinder spring.

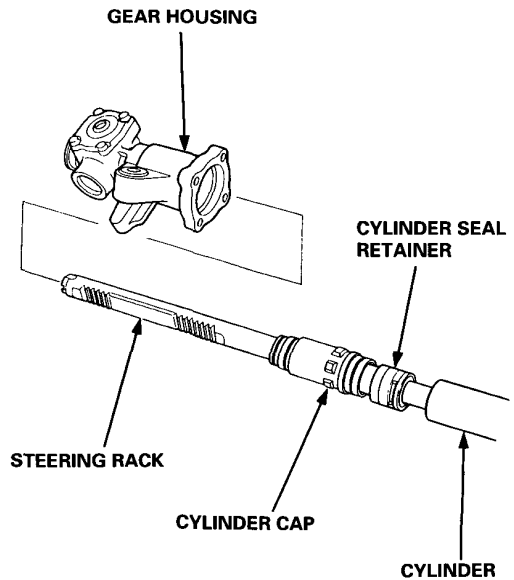


15. Remove the cylinder end seal from the cylinder housing.

NOTE: Use your fingers or a wooden stick to avoid damaging the housing.



16. Remove the cylinder, cylinder seal retainer, cylinder cap and steering rack from the gear housing.

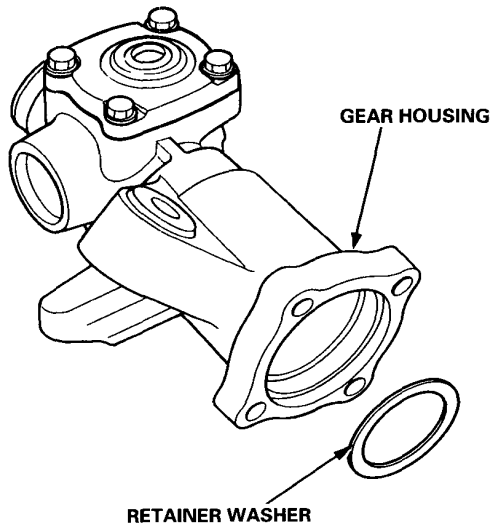


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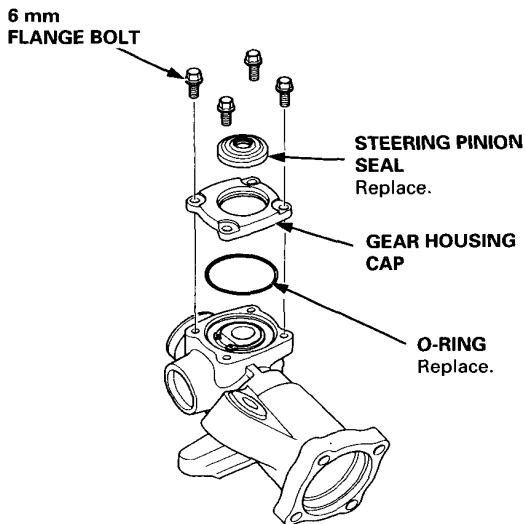
Steering Gearbox

Disassembly (cont'd)

17. Remove the retainer washer from the gear housing.

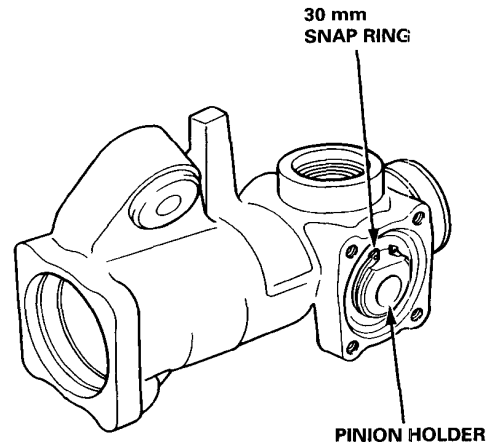


18. Remove the gear housing cap from the gear housing by removing the four 6 mm flange bolts.
19. Remove the steering pinion seal from the gear housing cap.
20. Remove the O-ring from the gear housing.

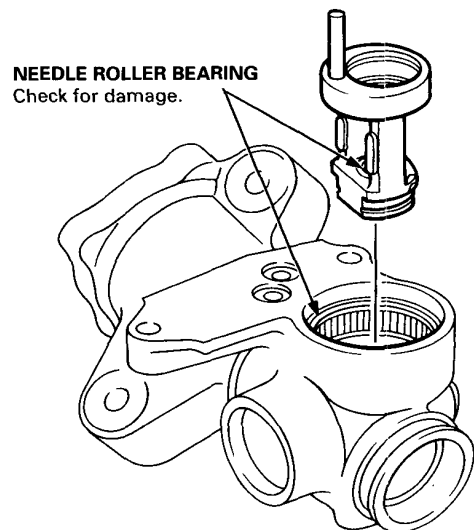


21. Check the pinion holder for free movement, excessive play and rough movement; if it is in good condition go on step 22. If it is damaged, or if dirt has gone past the seal into the grease, replace the bearing.

- Remove the 30 mm snap ring from the pinion holder.

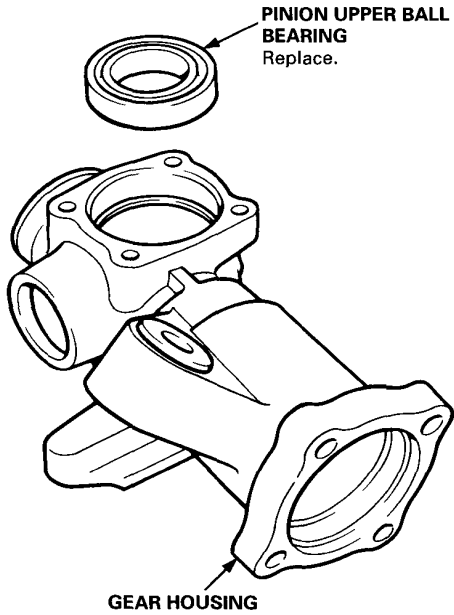


- Remove the pinion holder from the gear housing.
- Check the needle roller bearing in the pinion holder and in the gear housing for damage. If the bearings are damaged, replace them as a set.

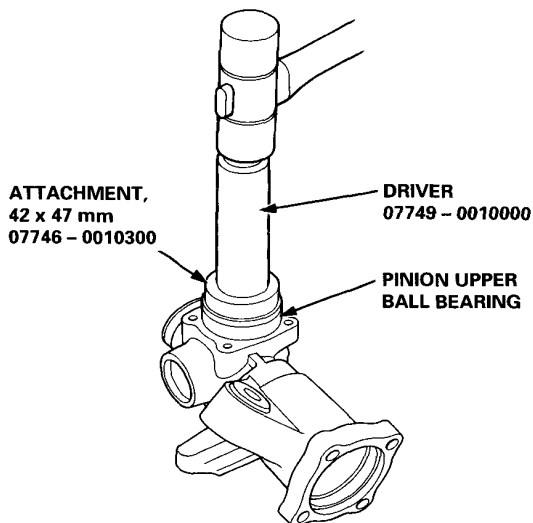




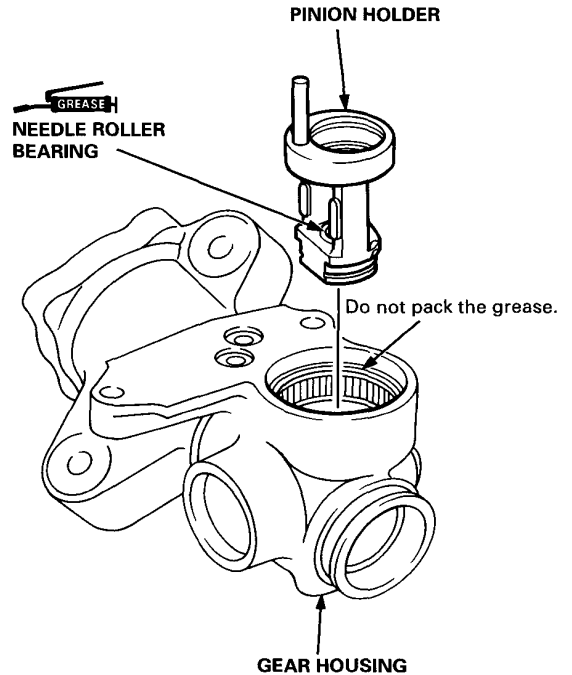
- Remove the pinion upper ball bearing from the gear housing.



- Drive the new pinion upper ball bearing into the gear housing using the special tools.

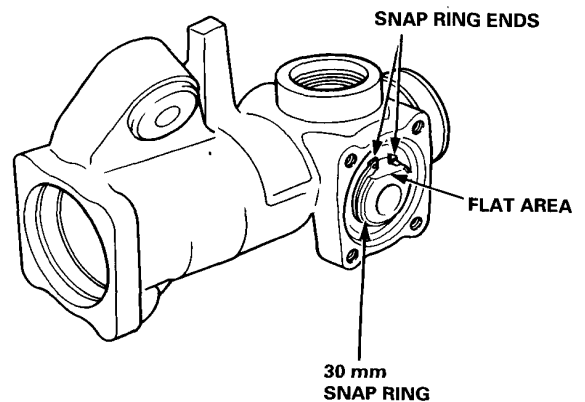


- Pack the needle roller bearing in the pinion holder with grease and install the pinion holder in the gear housing.



- Reinstall the 30 mm snap ring with its tapered side facing out.

NOTE: Snap ring ends must be aligned with the flat area.

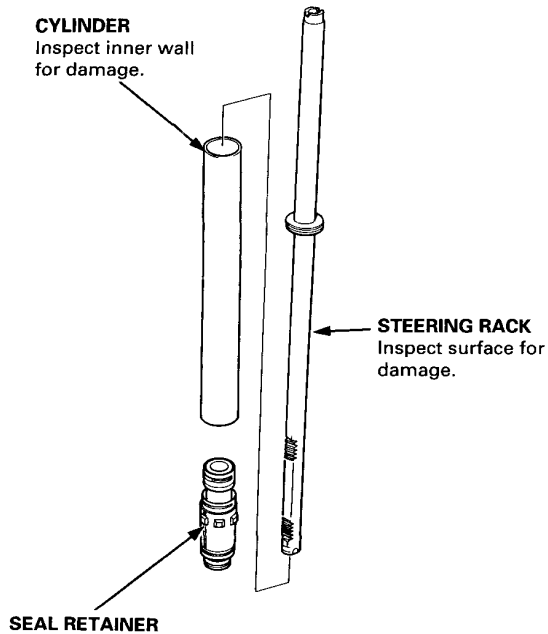


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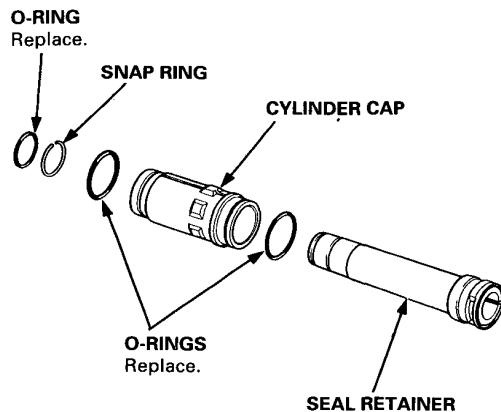
Steering Gearbox

Disassembly (cont'd)

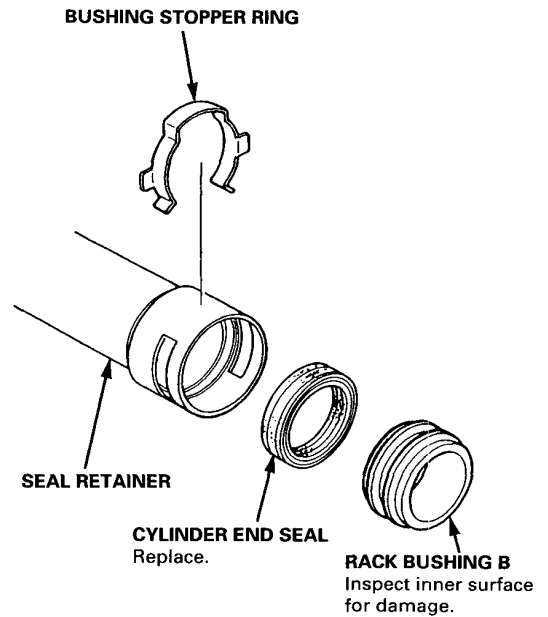
22. Remove the cylinder and seal retainer from the steering rack.



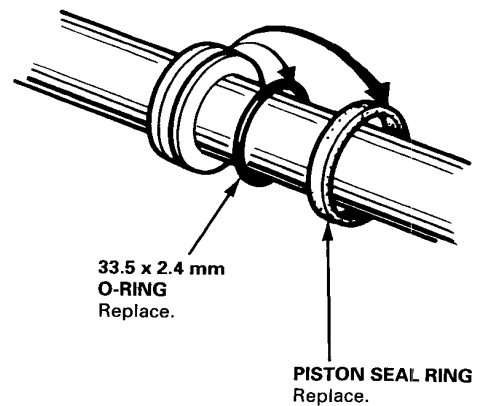
23. Remove the O-ring and snap ring from the seal retainer.
24. Remove the cylinder cap from the seal retainer.
25. Remove the O-rings from the cylinder cap.



26. Remove the bushing stopper ring from the seal retainer.
27. Remove the cylinder end seal and rack bushing B.



28. Carefully pry the piston seal ring and O-ring off the rack.

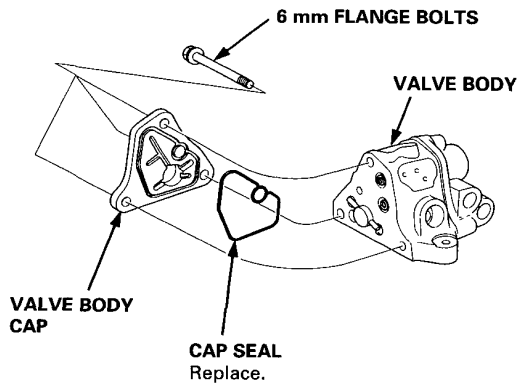




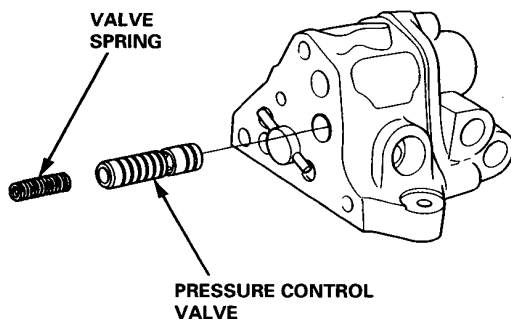
Valve Body Unit Overhaul

Disassembly

1. Remove the valve body cap from the valve body.
2. Remove the cap seal from the valve body cap.

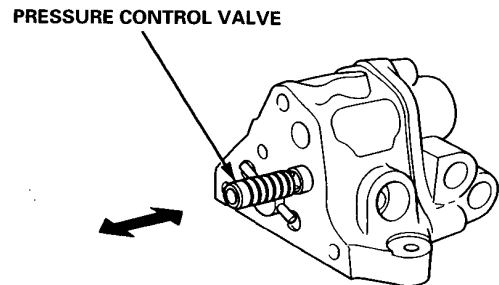


3. Remove the pressure control valve and spring from the valve body.



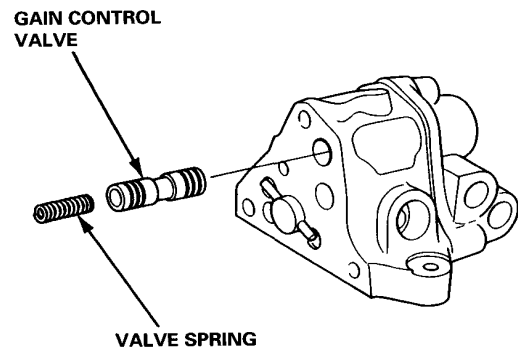
4. Check the pressure control valve:

- Inspect its surface for scoring or scratches.
- Slip it back into the valve body, and make sure it slides smoothly without drag and without side play.



NOTE: If the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, 4-way valve) as an assembly.

5. Remove the gain control valve and spring from the valve body.

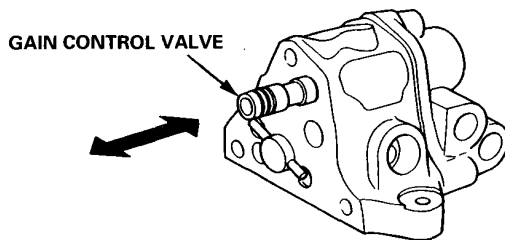


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Steering Gearbox

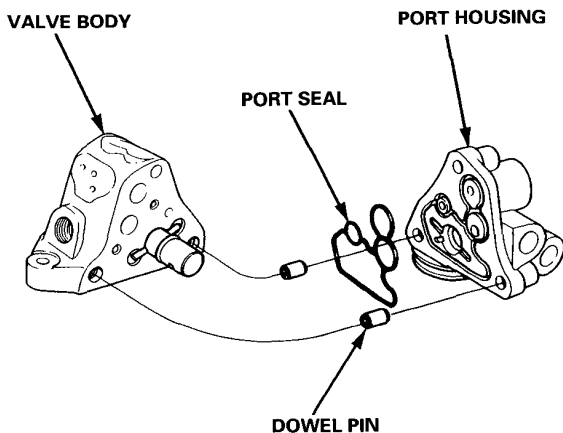
Valve Body Unit Overhaul (cont'd)

6. Check the gain control valve:
 - Inspect its surface for scoring or scratches.
 - Slip it back into the valve body and make sure it slides smoothly without drag and without side play.



NOTE: If the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, 4-way valve) as an assembly.

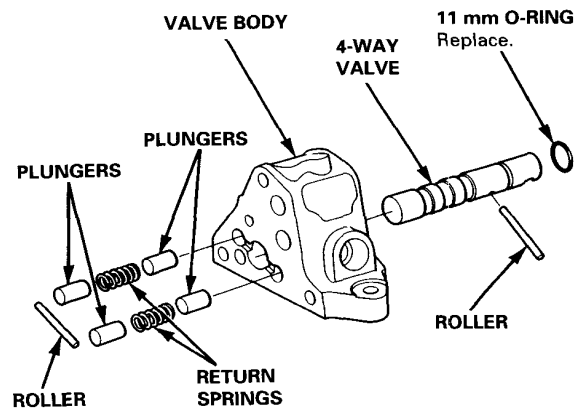
7. Separate the valve body and port housing.
8. Remove the port seal and dowel pins from the port housing.



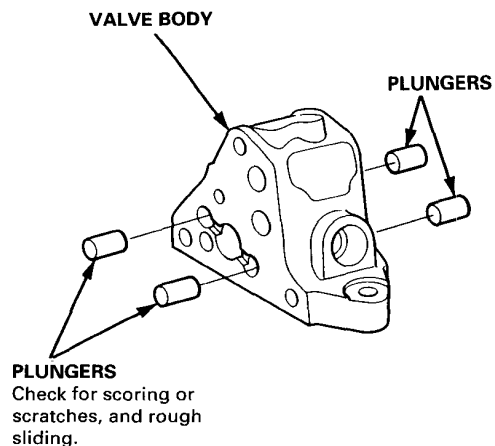
9. Remove the rollers from the 4-way valve by pushing the valve out one side of the valve body, and then the other.

NOTE: When removing the rollers, hold the plungers with your fingers to keep them from popping out.

10. Remove the plungers, return springs and 4-way valve from the valve body.
11. Remove the 11 mm O-ring from the 4-way valve.



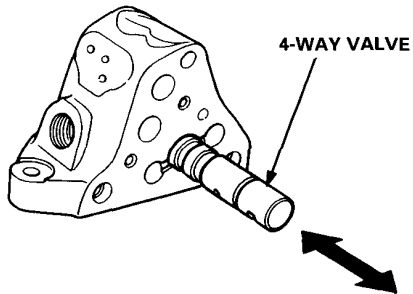
12. Check the plungers.
 - Inspect their surface for scoring or scratches.
 - Slip each plunger into the valve body, and make sure it slides smoothly, without drag or side play. If any plunger is damaged, replace it.





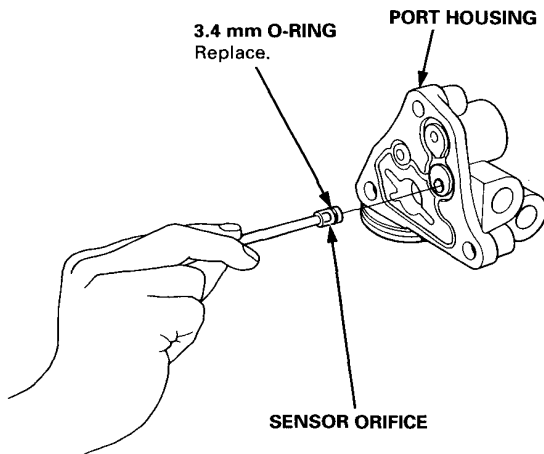
13. Check the 4-way valve.

- Inspect its surface for scoring or scratches.
- Slip it into the valve body, and make sure it slides smoothly, without drag or side play.



NOTE: If the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, control valve) as an assembly.

14. Using a 3 mm (1/64") drill bit, remove the sensor orifice and 3.4 mm O-ring.



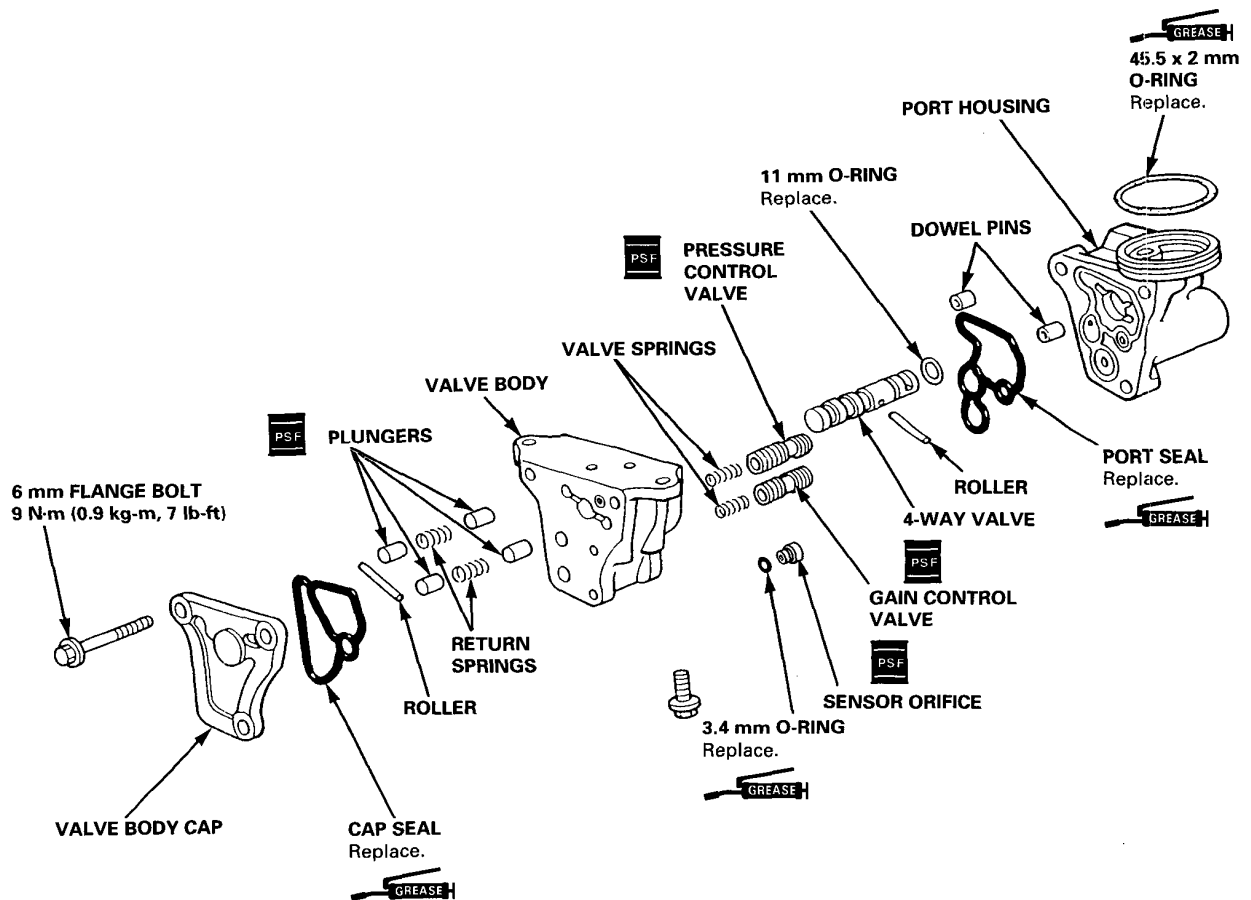
Steering Gearbox

Valve Body Unit Overhaul

Assembly

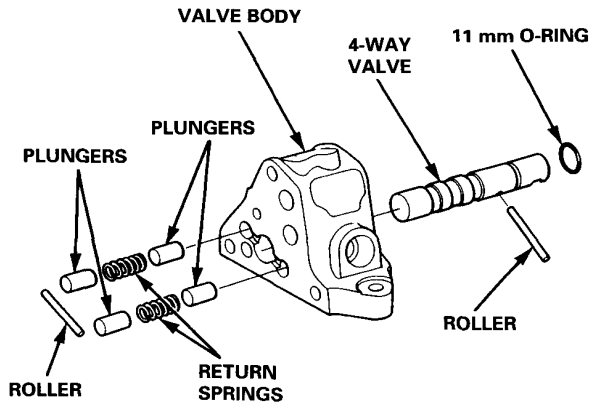
NOTE:

- 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 or steering grease (Honda P/N: 08733 – B070E) to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- If the valve body is damaged, replace the valve body unit (valve body, pressure control valve, gain control valve, gain control valve, 4-way valve) as an assembly.

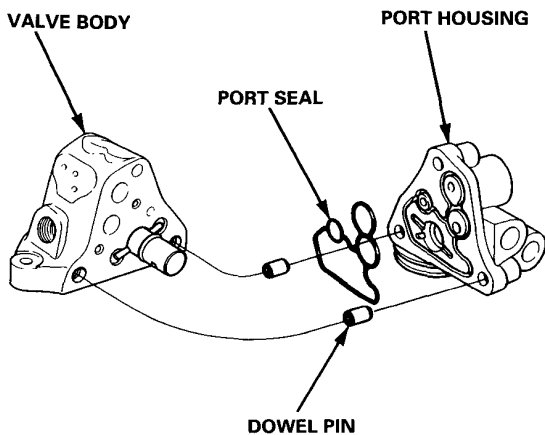




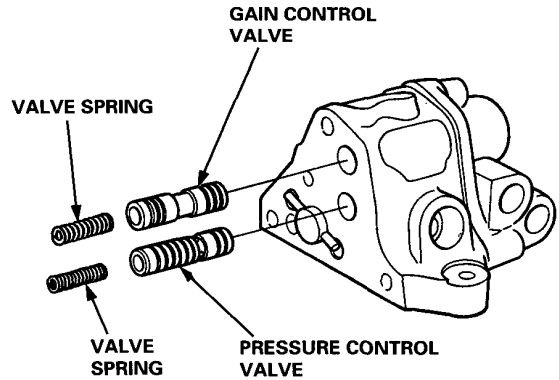
1. Coat the O-ring with grease, and install it on the 4-way valve.
2. Install the 4-way valve, plungers, return springs and rollers into the valve body.



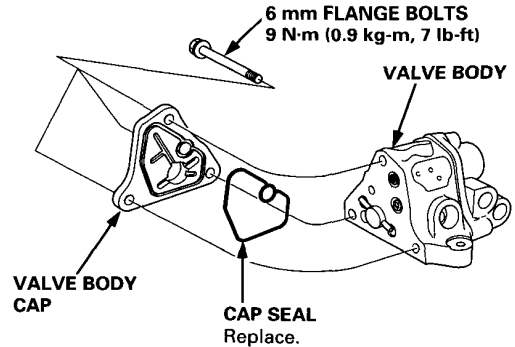
3. Coat the new port seal with grease to keep it in place and install it on the port housing.
4. Install the dowel pins and port housing on the valve body.



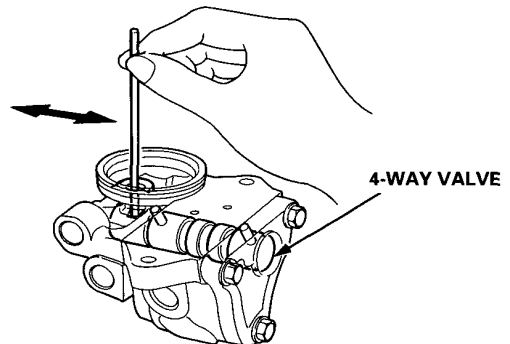
5. Coat the gain control valve and pressure control valve with power steering fluid and install them into the valve body.
6. Install the valve springs.



7. Coat the new cap seal with the grease to keep it in place and install it on the valve body cap.
8. Install the valve body cap on the valve body.



9. Make sure the 4-way valve moves smoothly, and returns to neutral position.

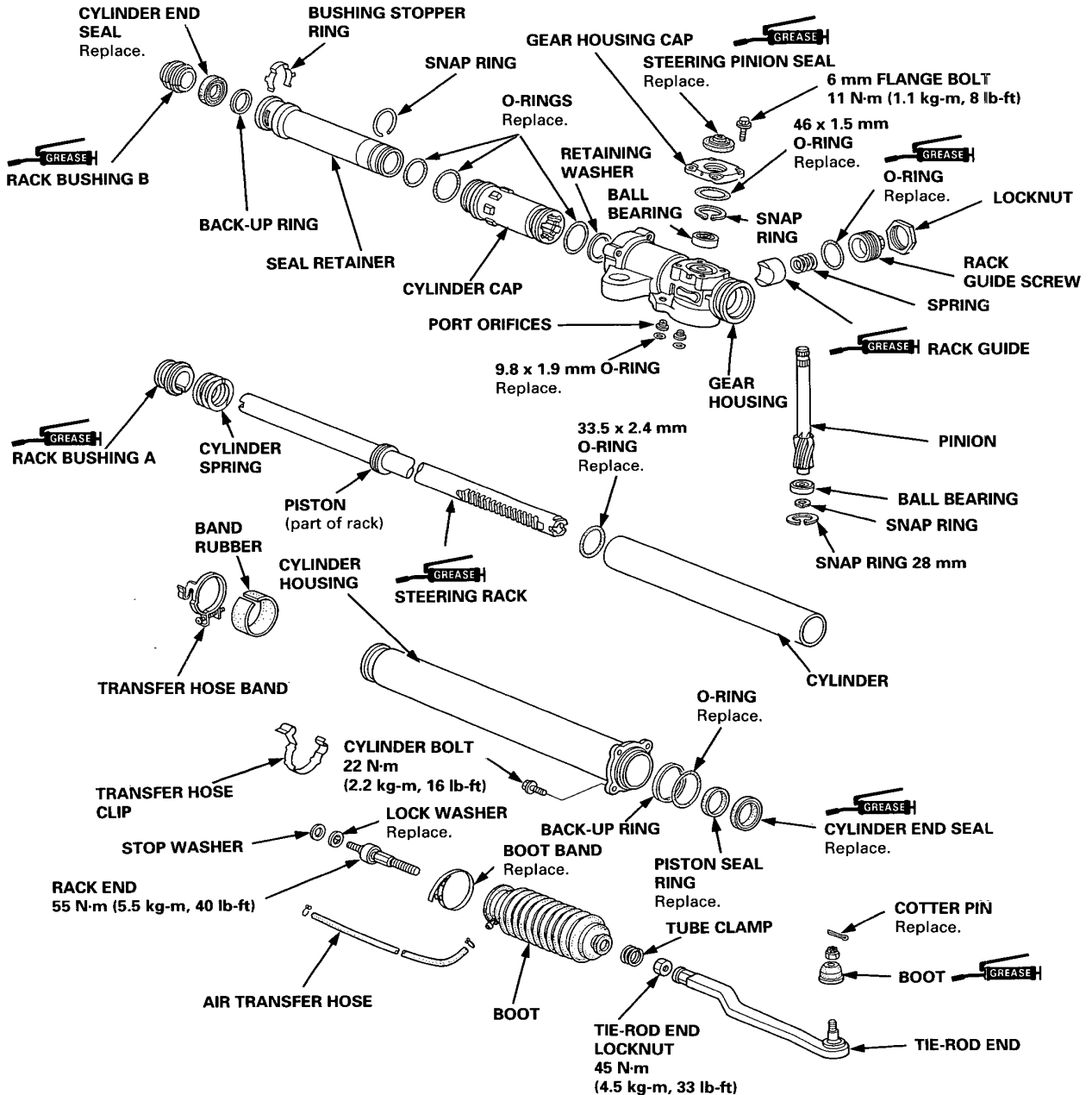


Steering Gearbox

Reassembly

NOTE:

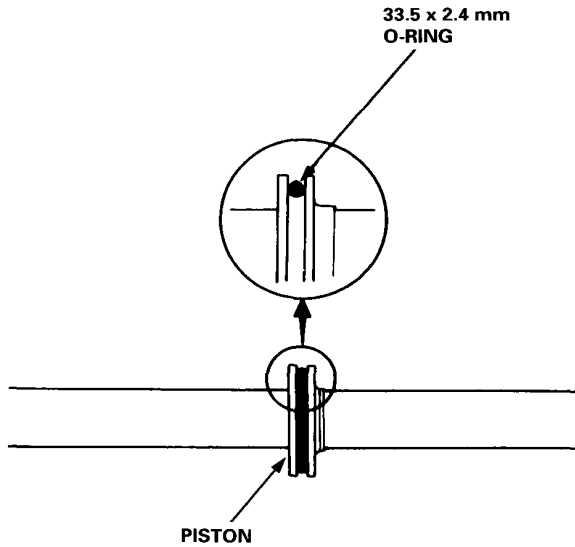
- Clean the disassembled parts with a solvent and dry them with compressed air. Do not dip the rubber parts in a solvent.
- Always replace the O-rings and rubber seals with new ones before assembly.
- Apply recommended power steering fluid or steering grease (HONDA P/N: 08733 - B070E) to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- Use the appropriate special tools to install them where necessary.



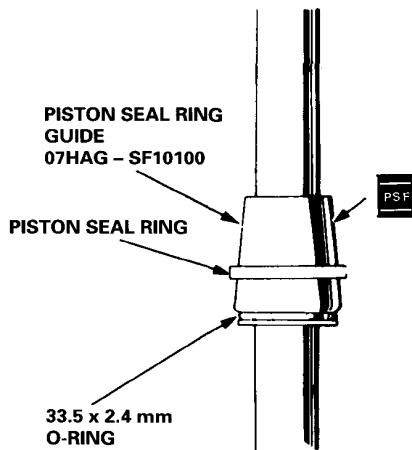


Steering Rack Installation

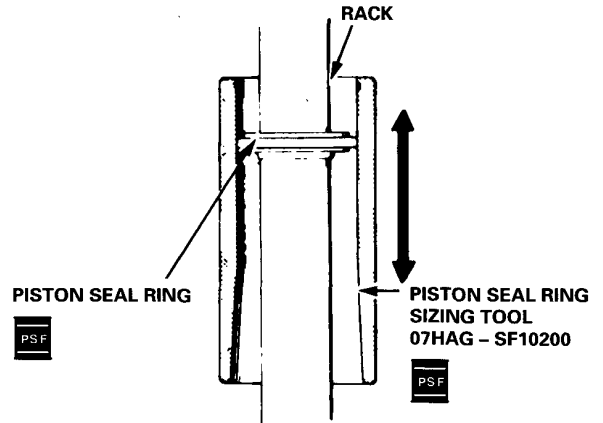
1. Install a new O-ring on the piston with its narrow edge facing out.



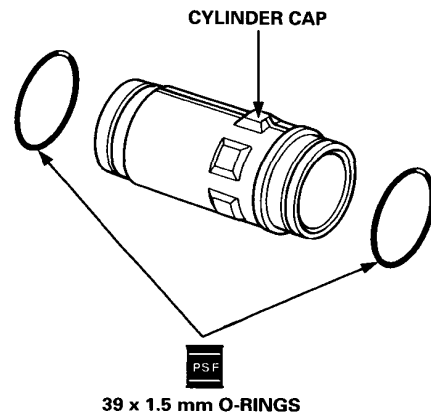
2. Coat the piston seal ring guide with power steering fluid, then slide it onto the rack, big end first.
3. Position the new piston seal ring on the special tool, slide it down onto the big end of the tool, then pull it off into the piston groove on top of the O-ring.



4. Coat the piston seal ring and the inside of the special tool with power steering fluid. Carefully slide the tool onto the rack and over the piston ring, then rotate the tool as you move it up and down to seat the piston ring.



5. Coat new O-ring with power steering fluid and install them on the cylinder cap.

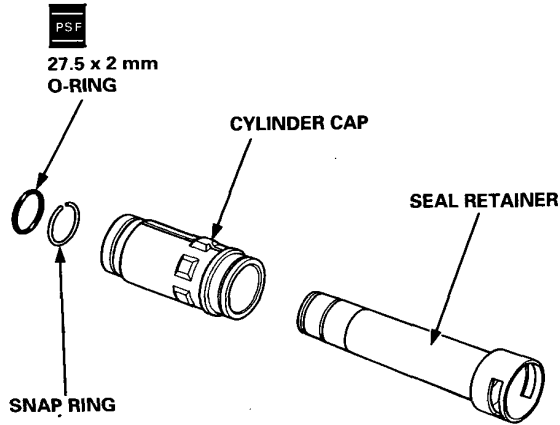


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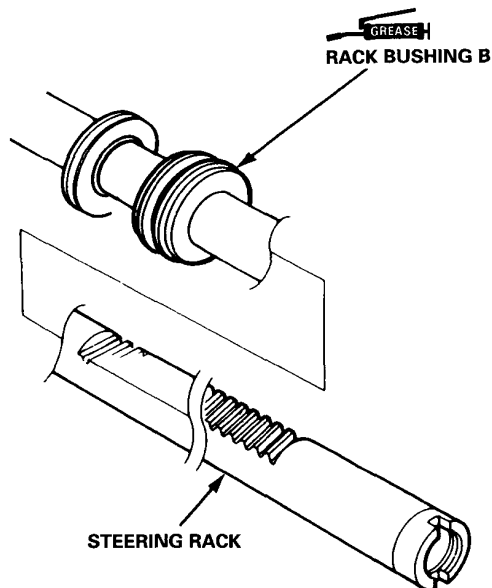
Steering Gearbox

Reassembly (cont'd)

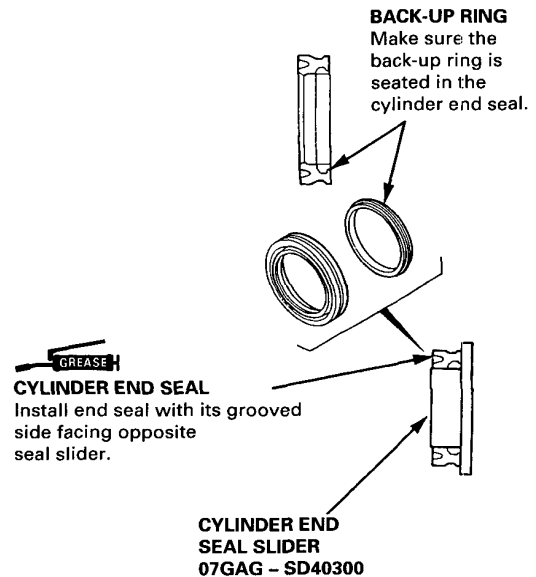
- Slide the cylinder cap onto the seal retainer and install the snap ring.
- Coat the new O-ring with power steering fluid and install it on the seal retainer.



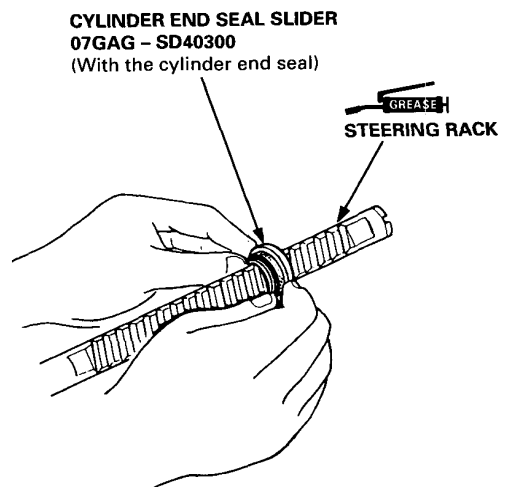
- Grease the sliding surface of the rack bushing B, and install the bushing on the steering rack.



- Grease the sliding surfaces of the new cylinder end seal and the special tool, then place the seal on the special tool with its grooved side facing opposite the slider.

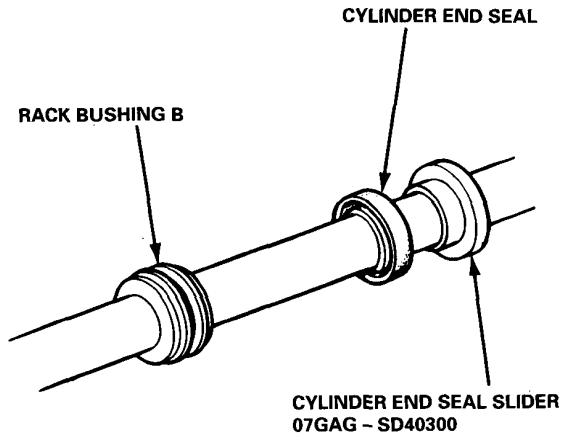


- Grease the steering rack, and install the special tool.

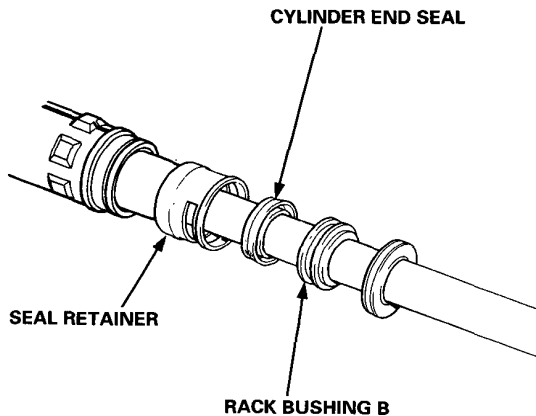




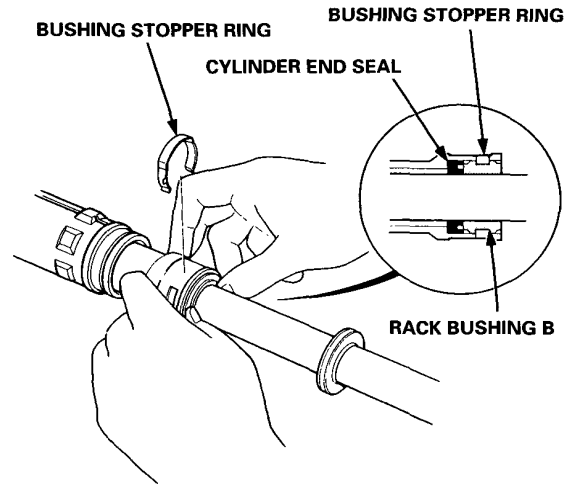
11. Separate the special tool from the cylinder end seal, and remove the tool from the rack.



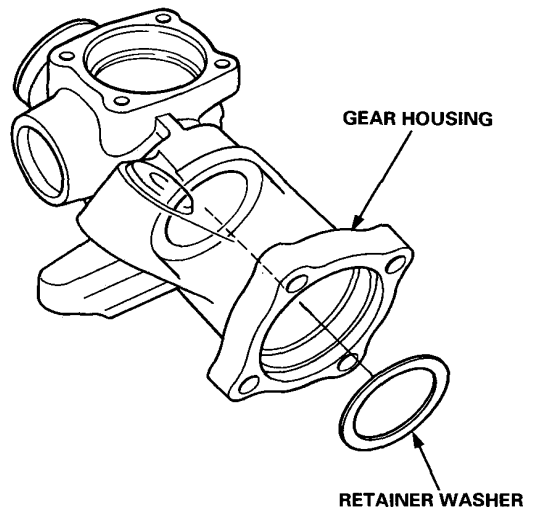
12. Fit the seal retainer on the steering rack.



13. Push the rack bushing B toward the seal retainer by hand until the cylinder end seal is seated in the retainer. Fit the bushing stopper ring in the groove of the seal retainer securely.



14. Install the retainer washer on the gear housing.

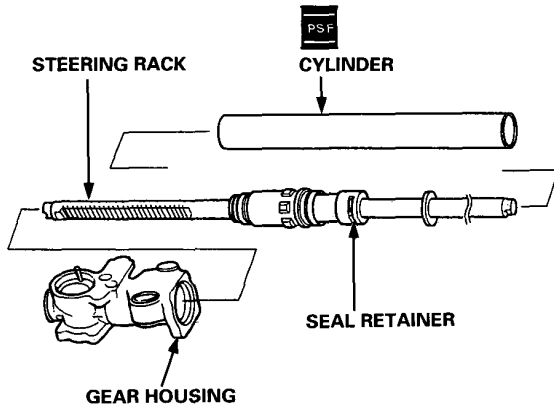


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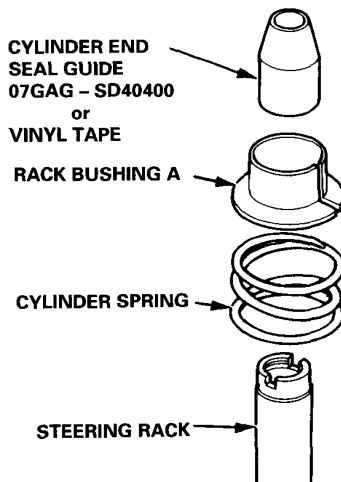
Steering Gearbox

Reassembly (cont'd)

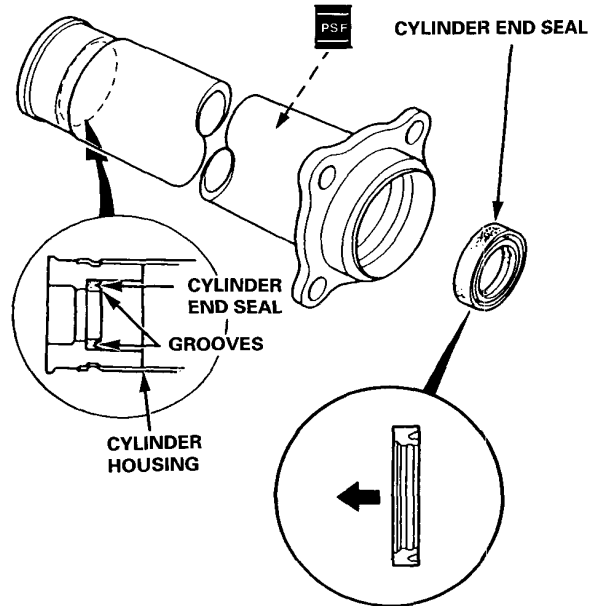
- Place the gear housing on the work bench and insert the seal retainer and steering rack into the gear housing.
- Coat the inside surface of the cylinder with power steering fluid, slide it over the rack and into the gear housing; press it into the housing until it seats.



- Install the cylinder spring over the rack, then coat the rack bushing A with the recommended power steering fluid and install it on the spring.
- Wrap the end of the steering rack with vinyl tape or use the special tool. Coat the tape or tool with grease.



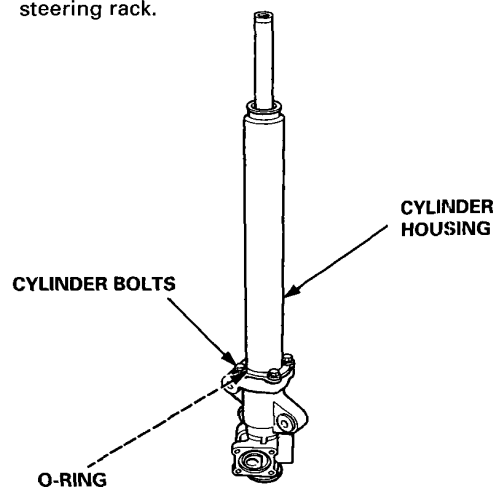
- Coat the inside surface of the cylinder with power steering fluid and install the cylinder end seal with its grooved side facing out.



- Install the O-ring and back-up ring on the gear housing.
- Carefully position the cylinder on the gear housing and loosely install with four cylinder bolts.

CAUTION: Be careful not to damage the end seal in the cylinder housing.

- Remove the vinyl tape or special tool from the steering rack.

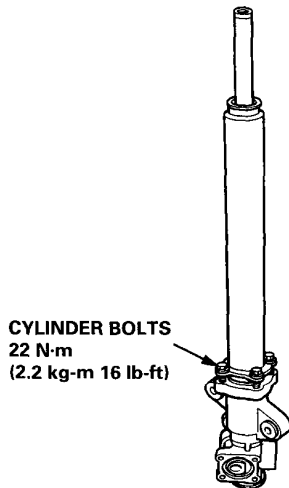




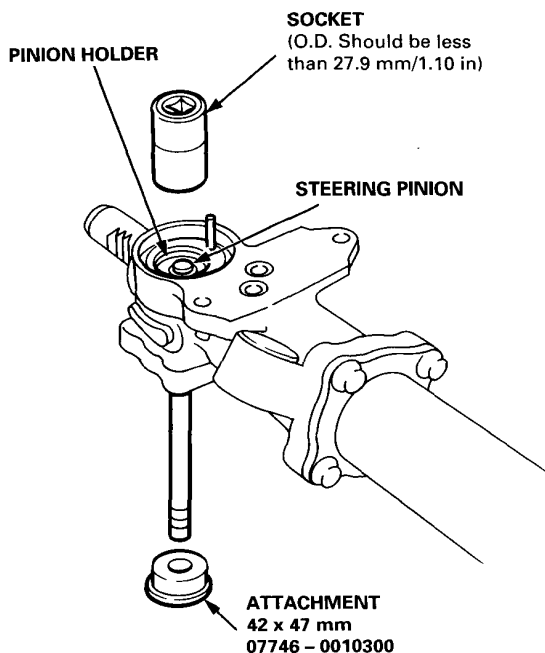
23. Insert the steering rack into the cylinder housing, being careful not to damage the steering rack sliding surface.

24. Tighten the four cylinder bolts.

NOTE: Before tightening the bolts, make sure the mating surfaces of the cylinder and gear housings fit properly by pushing them together; hold them together while tightening the bolts.

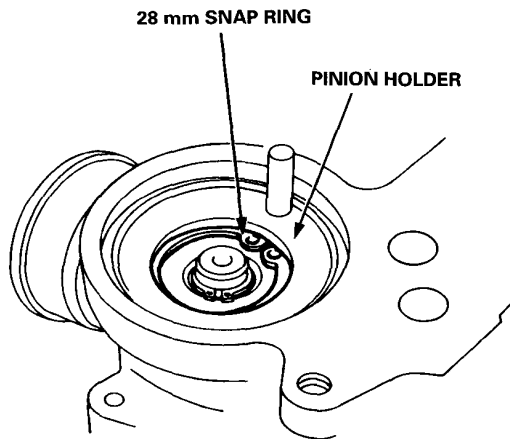


25. Install the steering pinion in the pinion holder.

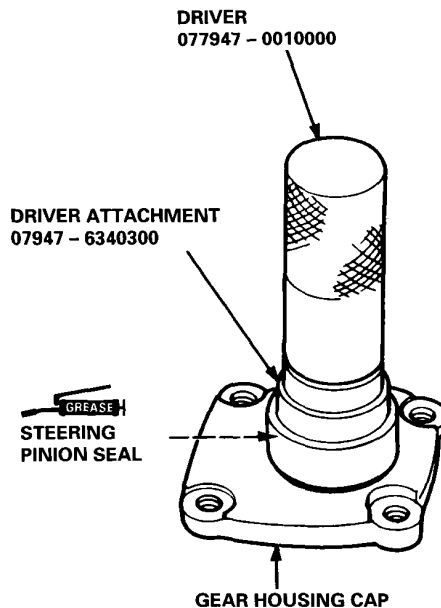


26. Install the 28 mm snap ring securely in the pinion holder groove.

NOTE: Install the snap ring with its tapered side facing out.



27. Grease the steering pinion seal, and install it on the gear housing cap using the special tools.

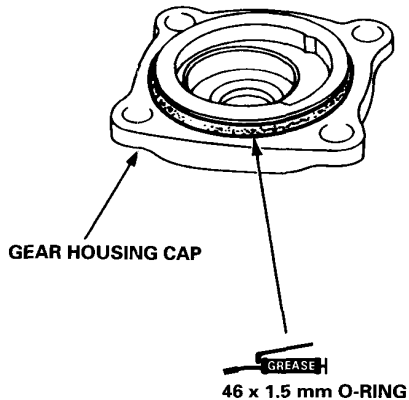


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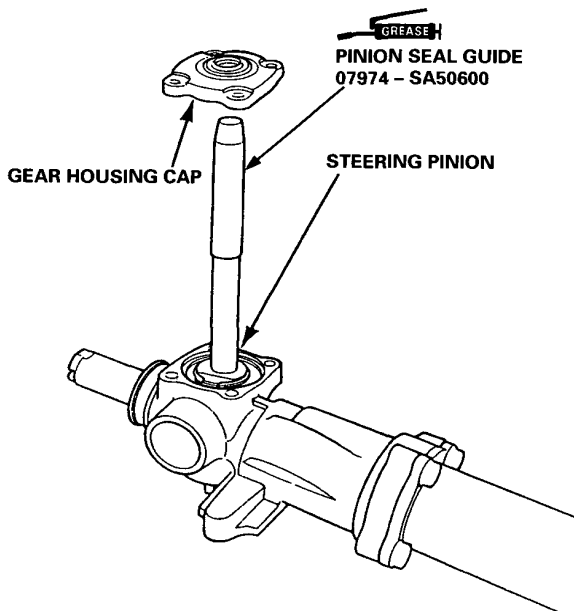
Steering Gearbox

Reassembly (cont'd)

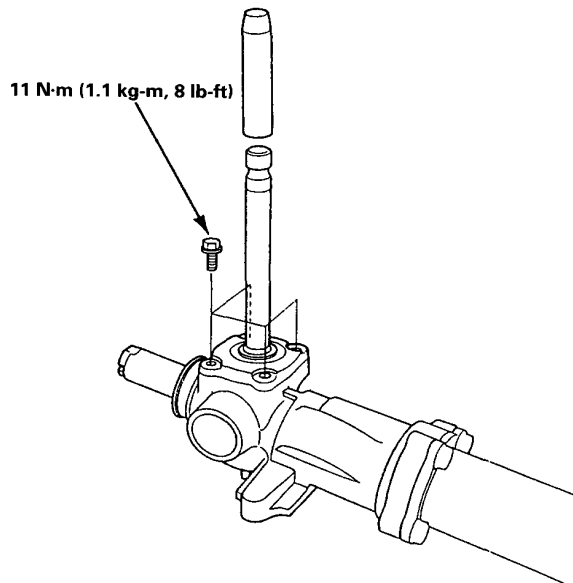
28. Grease the new O-ring and install it in the groove in the gear housing cap.



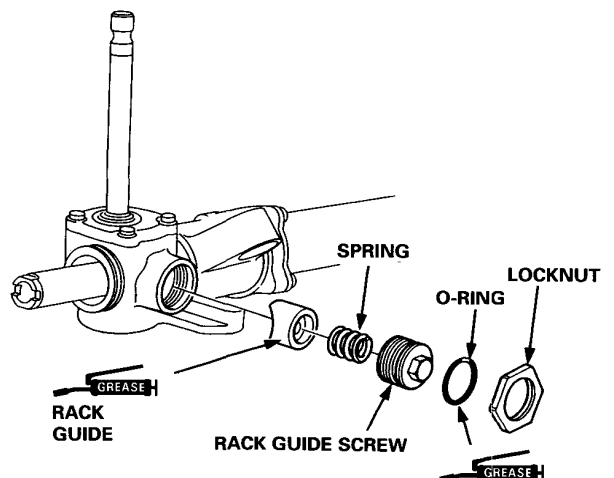
29. Install the special tool onto the steering pinion and coat the special tool with grease.
30. Install the gear housing cap carefully to avoid damaging or distorting the lip of the seal or the seal spring.



31. Remove the special tool.
32. Tighten the four flange bolts.



33. Install the O-ring on the rack guide screw.
34. Coat the rack guide with grease.
35. Install the rack guide, spring and rack guide screw on the gear housing.

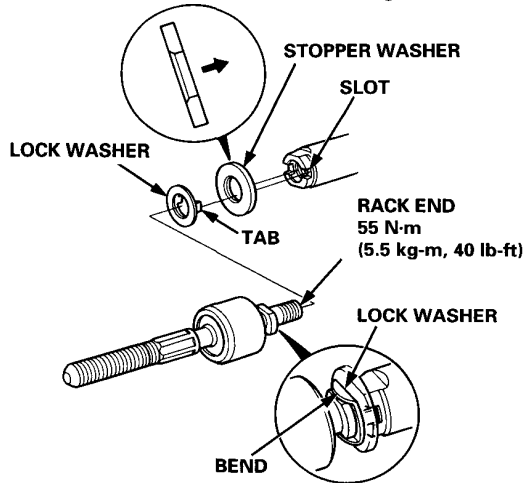




- Screw each rack end into the rack while holding the lock washer so its tabs are in the slots in the end of the rack.

NOTE: Install the stopper washer with the chamfered side facing out.

- Tighten the rack end securely, then bend the lock washer back against the flat on the flange as shown.



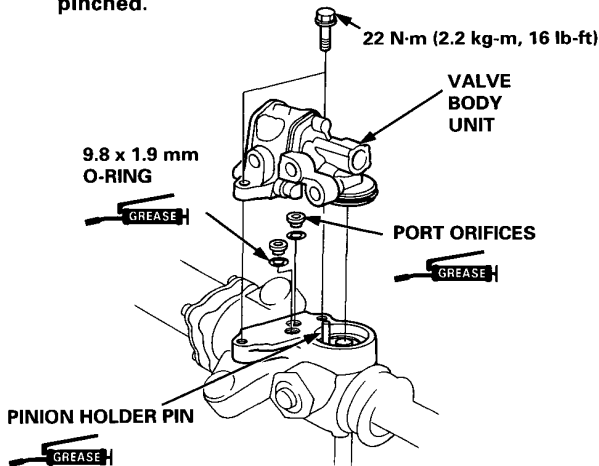
- Coat the 9.8 x 1.9 mm O-rings with grease, and install them together with the orifices on the gear housing.

- Apply grease to the pinion holder pin.

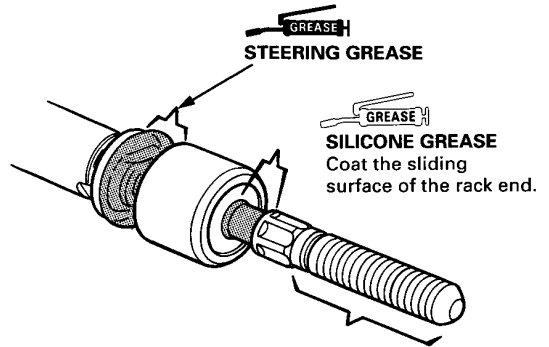
- Install the valve body unit on the gear housing with the two 8 mm bolts.

CAUTION:

- Be careful not to hit the pinion holder pin.
- Make sure the O-rings are in place and not pinched.

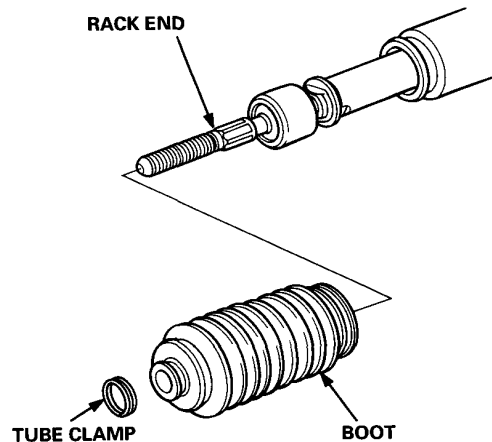


- Apply grease to the inside of the rack end housing.
- Coat the rack end groove and inside of the boot with silicone grease.



- Install the boots in the rack end with the tube clamps.

NOTE: Install the boots with the rack in the straight ahead position (i.e. right and left tie-rods are equal in length).



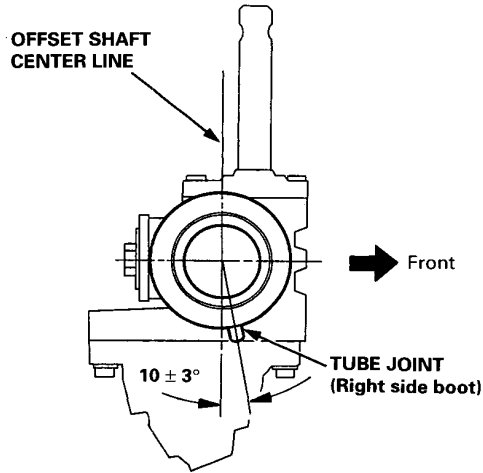
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Steering Gearbox

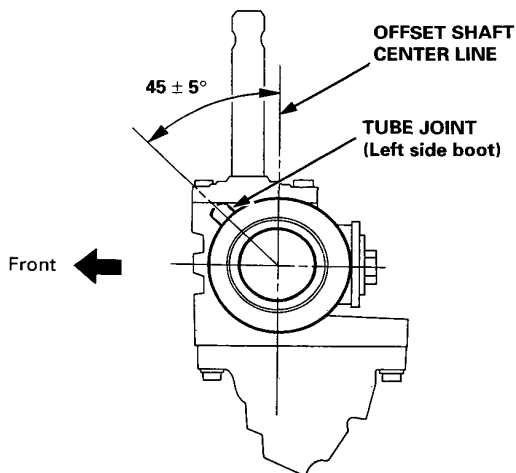
Reassembly (cont'd)

44. Install the boots so that the angle of the offset shaft center line is as shown.

⟨CYLINDER SIDE⟩

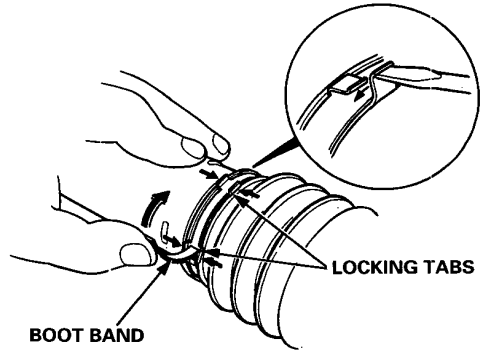


⟨GEAR HOUSING SIDE⟩

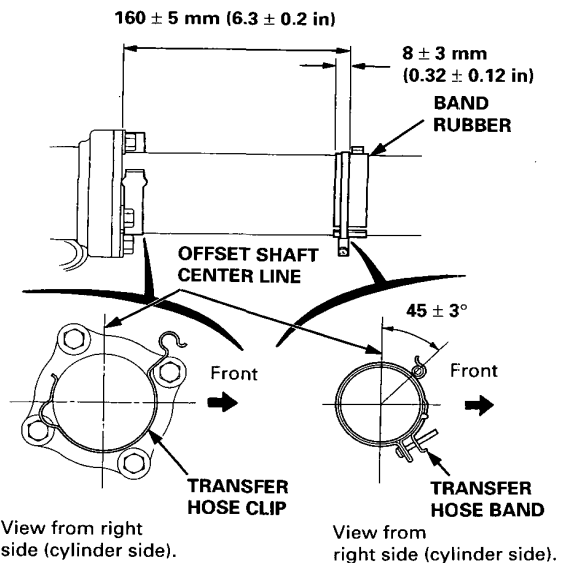


45. Install new boot bands on the boot and bend both sets of locking tabs.
46. Lightly tap on the doubled-over portions to reduce their height.

CAUTION: Stake the band locking tabs firmly.



47. Slide the rack right and left to be certain that the boots are not deformed or twisted.
48. Install the right and left tie-rod ends on the rack ends.
49. Install the transfer hose clip as shown.
50. Install the band rubber and transfer hose band; position the band as shown and tighten it.



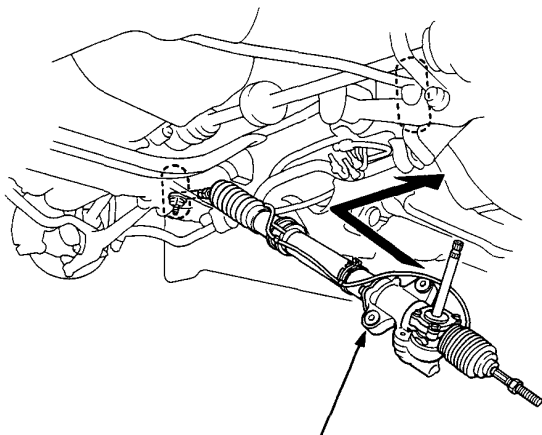
51. Install the air transfer hose.



Installation

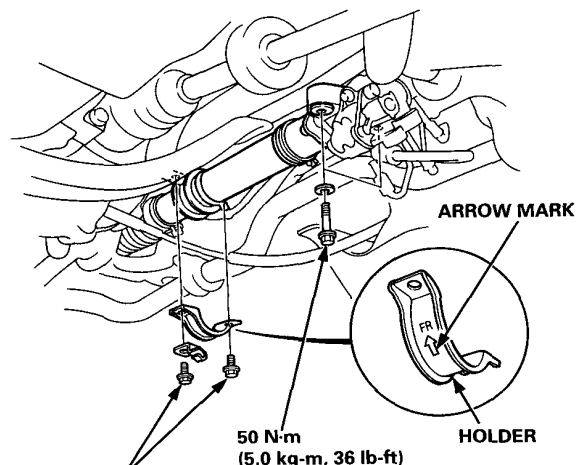
CAUTION: Be careful not to bend or damage the four power steering lines when installing the gearbox assembly.

1. Slide the rack all the way to the right.
2. Pass the right side of the steering gearbox assembly above and through the right side of the rear beam.
3. Raise the left side of the steering gearbox assembly above the through the left side of the rear beam.
4. Insert the pinion shaft up through the bulkhead.



STEERING GEARBOX ASSEMBLY

5. Install the holder with arrow mark facing forward and tighten the gearbox mounting bolts.



39 N·m
(3.9 kg·m, 28 lb·ft)

50 N·m
(5.0 kg·m, 36 lb·ft)

ARROW MARK

HOLDER

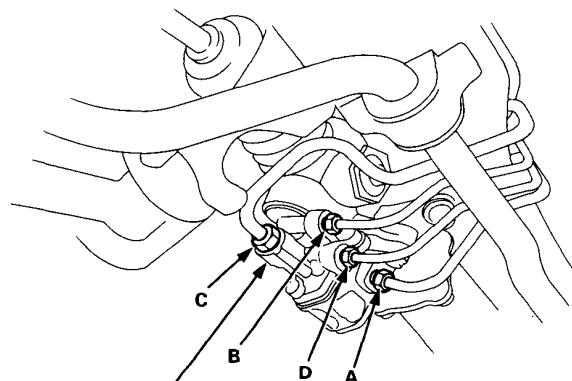
6. Connect the four lines to the valve body unit, using flare nut wrenches.

A: From pump: 14 mm wrench
38 N·m (3.8 kg·m, 28 lb·ft)

B: To oil cooler: 12 mm wrench
13 N·m (1.3 kg·m, 9 lb·ft)

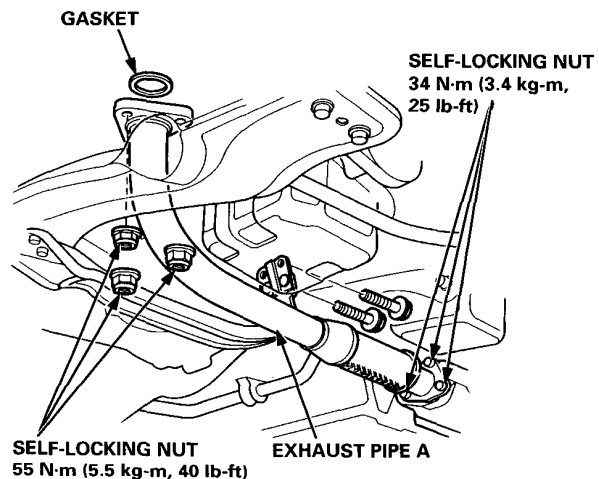
C: To reservoir: 17 mm wrench
29 N·m (2.9 kg·m, 21 lb·ft)

D: To power steering speed sensor: 12 mm wrench
13 N·m (1.3 kg·m, 9 lb·ft)



VALVE BODY UNIT

7. Install the exhaust pipe A with a new gasket, then tighten the new self-locking nuts and bolts.



GASKET

SELF-LOCKING NUT
34 N·m (3.4 kg·m,
25 lb·ft)

SELF-LOCKING NUT
55 N·m (5.5 kg·m, 40 lb·ft)

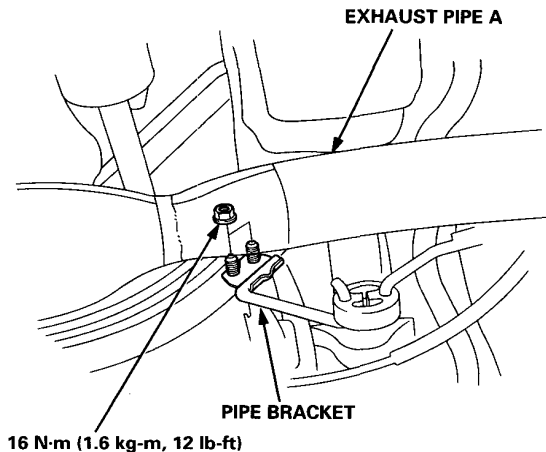
EXHAUST PIPE A

(cont'd)

Steering Gearbox

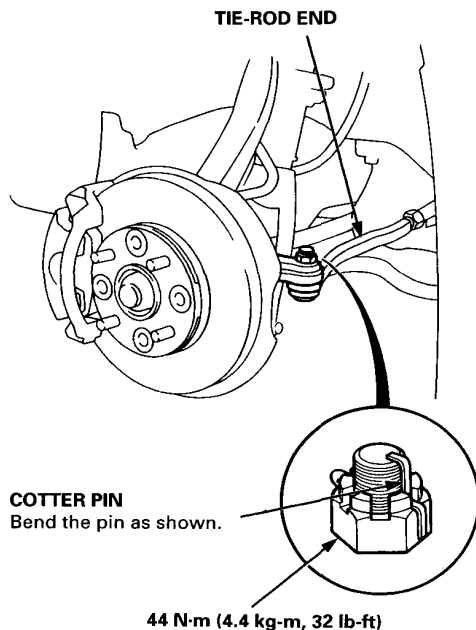
Installation (cont'd)

8. Install the exhaust pipe bracket.



9. Reconnect the tie-rod ends to the steering knuckles, tighten the castle nut to the specified torque, and install new cotter pins.

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.

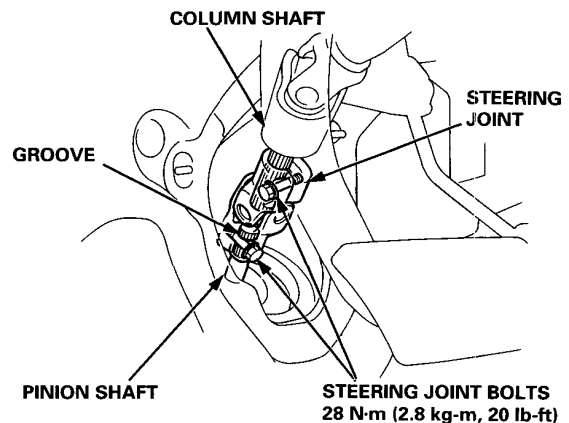


10. Center the steering rack with its strokes.

11. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft) and install the steering joint bolts.

NOTE:

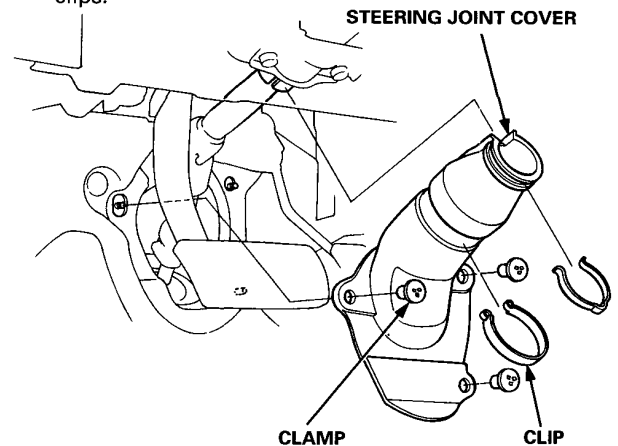
- Connect the column shaft and pinion with the steering rack centered.
- Be sure that the lower steering joint bolt is securely in the groove on the pinion shaft.
- Before tightening the steering joint bolts pull on the steering joint to make sure that the steering joint is fully seated.



12. Adjust the front toe (see section 18).

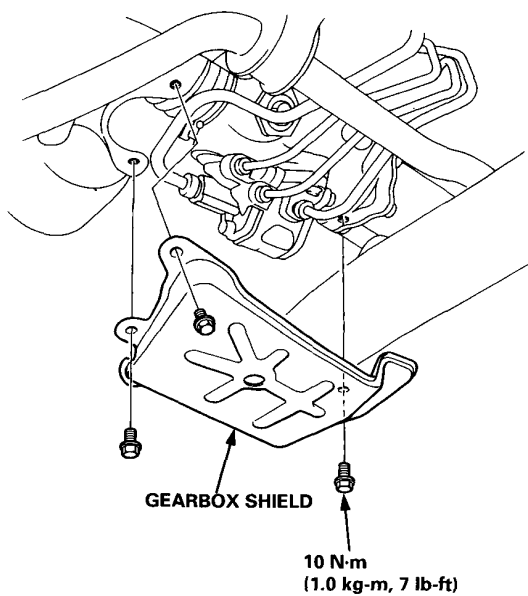
NOTE: If the steering wheel and rack are not centered, reposition the serrations at lower end side of the steering joint.

13. Install the steering joint cover with the clamps and clips.





14. Fill the system:
 - Fill the reservoir with new power steering fluid (see page 17-21).
 - Start the engine and let it run at idle, then turn the steering wheel from lock-to-lock several times to bleed air from the system.
 - Check the fluid again, and add more if necessary.
15. Check the gearbox for leaks, then reinstall the gearbox shield.
16. Reinstall the front wheels.



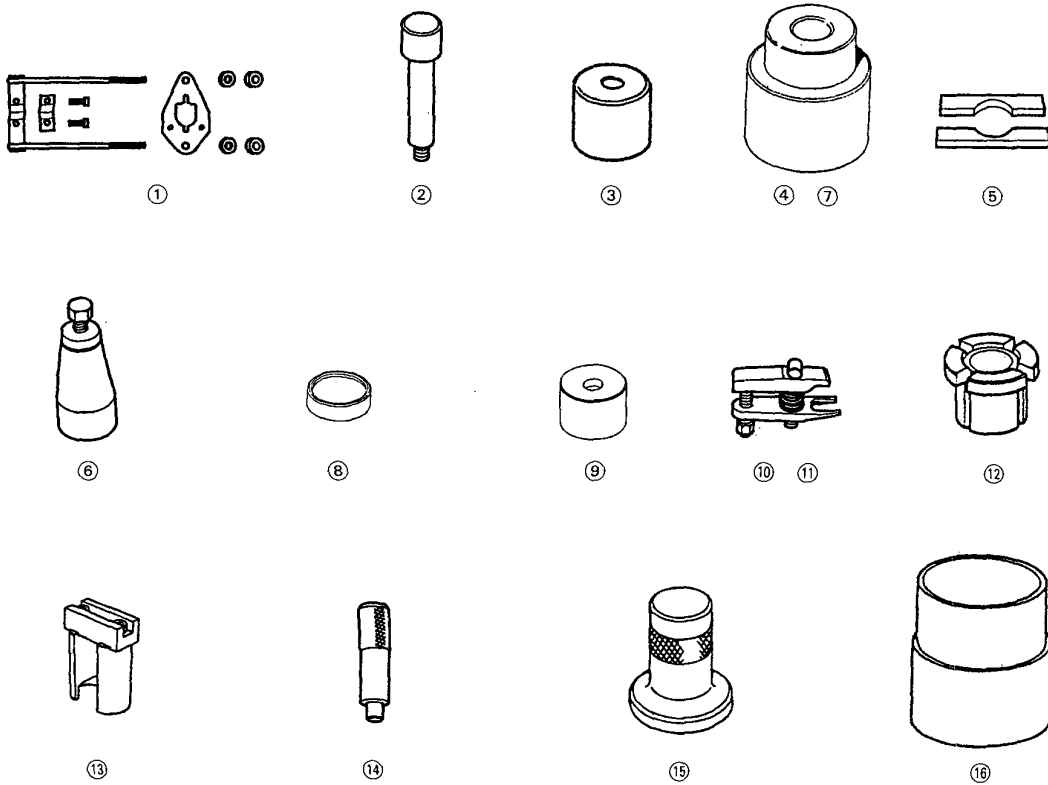
Suspension

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Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07GAE—SE00101	Spring Compressor	1	18-21, 23, 33, 35
②	07GAF—SD40100	Hub/Dis/Assembly Tool	1	18-14, 15
③	07GAF—SD40200	Hub Assembly Guide Attachment	1	18-15
④	07GAF—SD40330	Ball Joint Remover/Installer	1	18-31
⑤	07GAF—SD40700	Hub Dis/Assembly Base	2	18-14
⑥	07GAG—SD40700	Ball Joint Boot Clip Guide	1	18-17
⑦	07HAF—SF10110	Ball Joint Remover/Installer	1	18-17
⑧	07HAF—SF10120	Ball Joint Installer Base	1	18-17
⑨	07HAF—SF10130	Ball Joint Remover Base	1	18-17
⑩	07MAC—SL00100	Ball Joint Remover, 32 mm	1	18-11, 12
⑪	07MAC—SL00200	Ball Joint Remover, 28 mm	1	18-11, 12, 13
⑫	07MGK—0010100	Wheel Alignment Gauge Attachment	1	18-4, 5
⑬	07NAD—SS00100	Bushing Driver	1	18-20
⑭	07749—0010000	Driver	1	18-15
⑮	07947—SB00100	Oil Seal Driver	1	18-31
⑯	07965—SD90100	Support Base	1	18-14, 15





Component Location

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⚠ WARNING The front and rear dampers contain nitrogen gas and oil under pressure. The pressure must be relieved before disposal to prevent explosion and possible injury when scrapping.

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< Rear Suspension: >

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UPPER ARM

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LOWER ARM B

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LOWER ARM A

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HUB BEARING UNIT

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TRAILING ARM

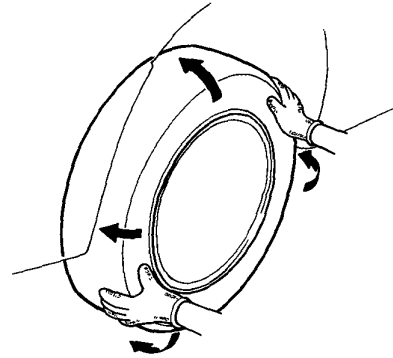
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Wheel Alignment

Service Information

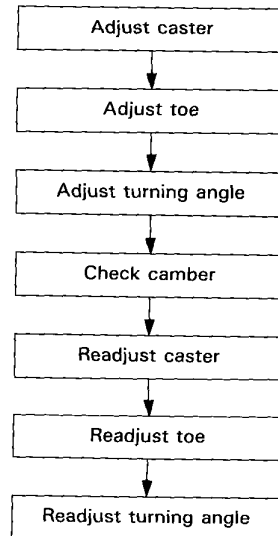
NOTE: For proper inspection/adjustment of the wheel alignment, check and adjust the following before checking the alignment.

- 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.)



Wheel alignment adjustment procedure

Each of the wheel alignment elements relates to the other. Therefore, the total adjustment of the front/rear wheel alignment is required whenever either one of elements (i.e. caster, toe, and/or turning angle) is adjusted.



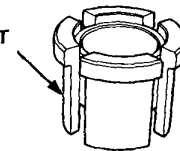
Special Tools Information

Wheel alignment gauge attachment:

NOTE:

- As the wheel alignment gauge attachment can be installed by magnetic force of camber/caster gauge, make sure the wheel hubs are clean and rust-free before installing the wheel alignment gauge attachment.
- When installing the special tool, align the special tool groove and mating surface groove of the camber/caster gauge, to make the most of the magnetic force of the camber/caster gauge.
- For accurate readings, measure the wheel alignment at the car must be level.

**WHEEL ALIGNMENT
GAUGE ATTACHMENT
07MGK-0010100**





Camber

Inspection

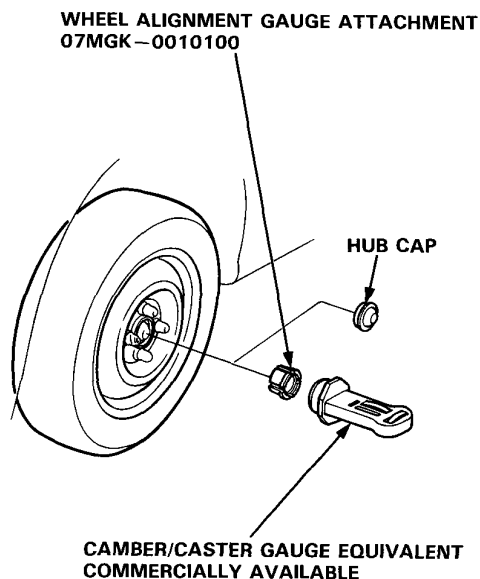
1. Remove the wheel cap.
2. Remove the hub cap from the rear wheel hub (see page 18-27).
3. Install the wheel alignment gauge attachment and camber/caster gauge on the wheel hub.
4. Turn the front wheels to the straight ahead position.
5. Read the camber on the gauge with the bubble at the center of the gauge.

Camber angle:

Front: $0^{\circ}00' \pm 1^{\circ}$

Rear: $-0^{\circ}30' \pm 30'$

6. If out of specification, check for bent or damaged suspension components.



Caster

Inspection

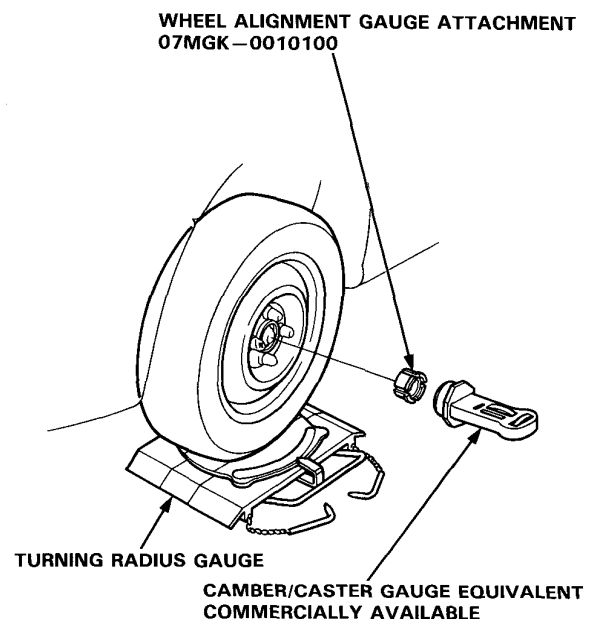
1. Remove the wheel cap.
2. Raise the car and set the turning radius gauges beneath the front wheels, and place boards under the rear wheels the same thickness as one of the turning radius gauges, then lower the car.

NOTE: Be sure that the car is parallel to the ground with the wheels on the turning radius gauges and boards.

3. Install the wheel alignment gauge attachment and camber/caster gauge on the wheel hub, and apply the front brake.
4. Turn the front wheel 20° outward, then turn the adjust screw so that the bubble in the camber/caster gauge is at 0° .
5. Turn the wheel 20° inward and read the caster on the gauge with the bubble at the center of the gauge.

Caster angle: $3^{\circ}00' \pm 1^{\circ}$

6. If out of specification, record the caster reading, then adjust the caster.



(cont'd)

Wheel Alignment

Caster (cont'd)

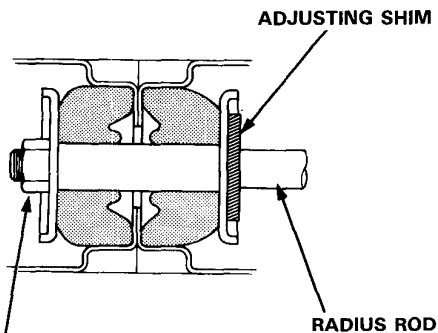
Adjustment

NOTE: Caster angle can be adjusted by increasing/decreasing the number of the adjusting shims. Remove and install the radius rod each time the caster angle is adjusted.

1. Raise the front of the car, and support it with safety stands in the proper locations (see section 1).
2. Remove the self-locking nut on the end of the radius rod.
3. Remove the self-locking bolts at the radius rod on the lower arm, and remove the radius rod (see page 18-18).
4. Adjust the caster angle by increasing/decreasing the adjusting shims.

NOTE:

- Do not use more than two adjusting shims.
- One adjusting shim changes the caster angle by 25' and the caster angle can be adjusted by 50' maximum.
- One adjusting shim is 3.2 mm (0.13 in) in thickness.



SELF-LOCKING NUT
68 N·m (6.8 kg-m, 49 lb-ft)
Replace.

5. After the adjustment, install the radius rod onto the lower arm, and tighten the self-locking bolts (see page 18-19).
6. Tighten the new self-locking nut to specified torque.

Front Toe Inspection/Adjustment

Inspection

1. Center steering wheel spokes.

NOTE: Measure difference in toe measurements with the wheels pointed straight ahead.

2. Check the front toe.

Front toe: 0 ± 3.0 mm (0 ± 0.12 in)

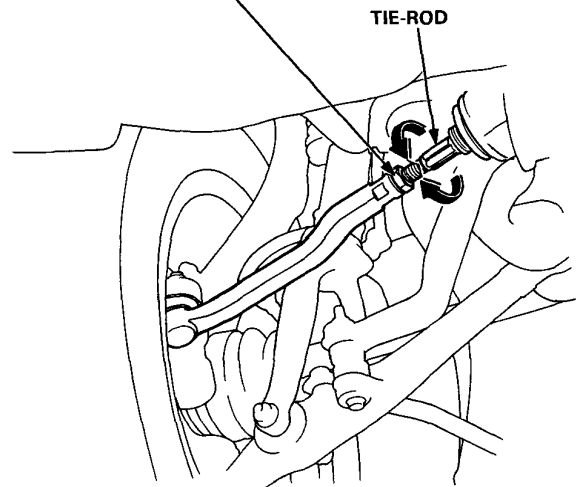
3. If out of specification, adjust the front toe.

Adjustment

1. Loosen the tie-rod locknuts and turn both tie-rods in the same direction until the front wheels are in straight ahead position.
2. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.
3. After adjusting, tighten the tie-rod locknuts.

NOTE: Reposition the tie-rod boot if it is twisted or displaced.

TIE-ROD LOCKNUT
14 x 1.5 mm
45 N·m (4.5 kg-m, 33 lb-ft)





Rear Toe Inspection/Adjustment

Inspection

1. Release parking brake.

NOTE: If the parking brake is engaged, you may get an incorrect reading.

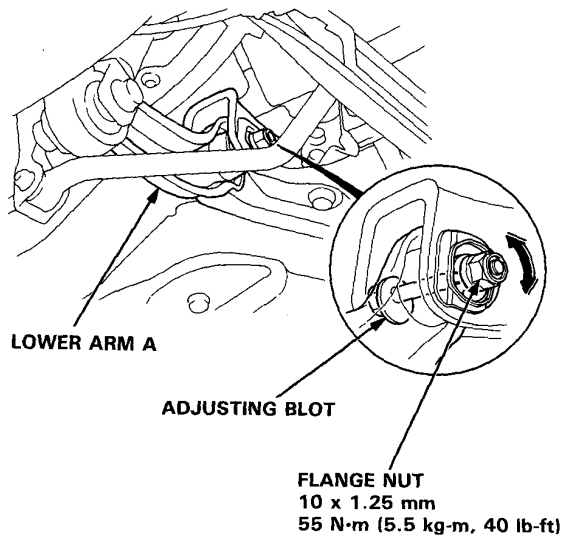
2. Check the rear toe.

Rear toe-in: 2.0 ± 2.0 mm (0.08 ± 0.08 in)

3. If out of specification, adjust the rear toe.

Adjustment

1. Hold the adjusting bolt on the rear lower arm A and loosen the flange nut.
2. Adjust the rear toe by turning the adjusting bolt until toe is correct.
3. Install the flange nut and tighten while holding the adjusting bolt.



Turning Angle Inspection/Adjustment

1. Jack up the front of the car. Set the turning radius gauges beneath the front wheels, then lower the car.
2. Jack up the rear of the car. Place boards that are the same thickness as the turning radius gauges under the rear wheels, then lower the car.

NOTE: For accurate readings, the car must be level.

3. Turn the wheel right and left while applying the brake, and measure the turning angle of both wheels.

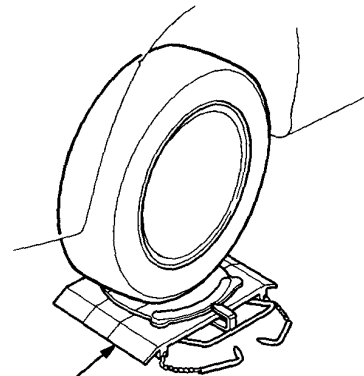
Turning angle:

Inward wheel: $39^{\circ}00' \pm 2^{\circ}$

Outward wheel: $30^{\circ}00'$ (reference)

4. If the measurements are not within the specifications, adjust as required by turning the tie-rods.

NOTE: After adjusting, recheck the front wheel toe and readjust if necessary. Reposition the tie rod boot if twisted or displaced.

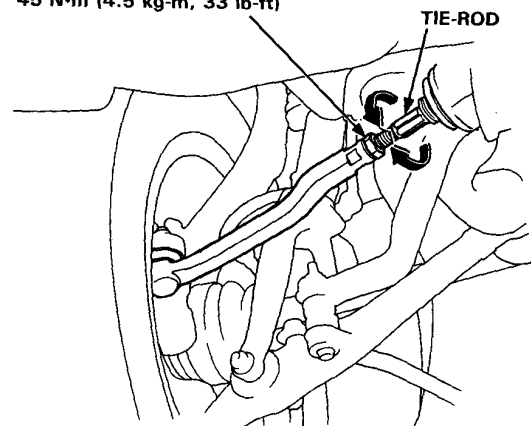


TURNING RADIUS GAUGE

TIE-ROD LOCKNUT

14 x 1.5 mm

45 N·m (4.5 kg-m, 33 lb-ft)



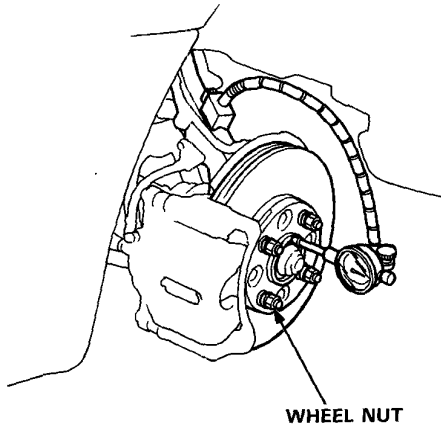
Wheel Measurements

Bearing End Play

1. Raise the car, 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 and out.

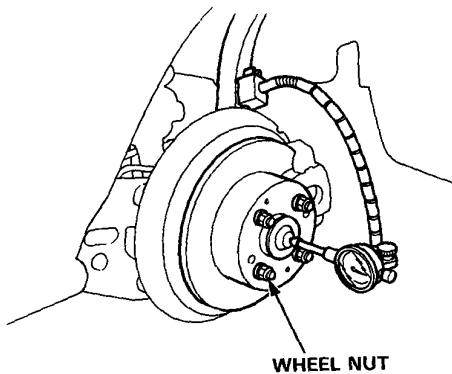
Front Wheel End Play:

Standard: 0–0.05 mm (0–0.002 in)



Rear Wheel End Play:

Standard: 0–0.05 mm (0–0.002 in)



5. If the bearing end play measurement is more than the standard, replace the wheel bearing.

Runout

1. Raise the car, 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.

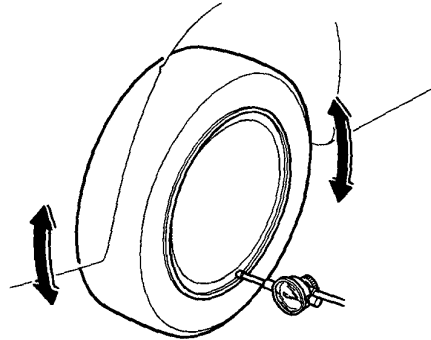
Front and Rear Wheel Axial Runout:

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)



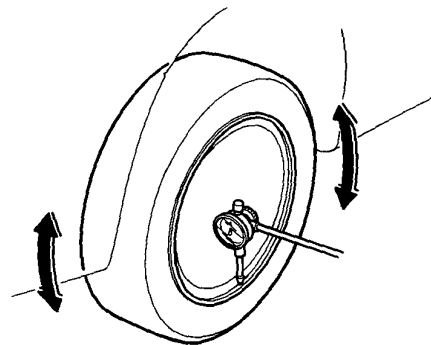
Front and Rear Wheel Radial Runout:

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.



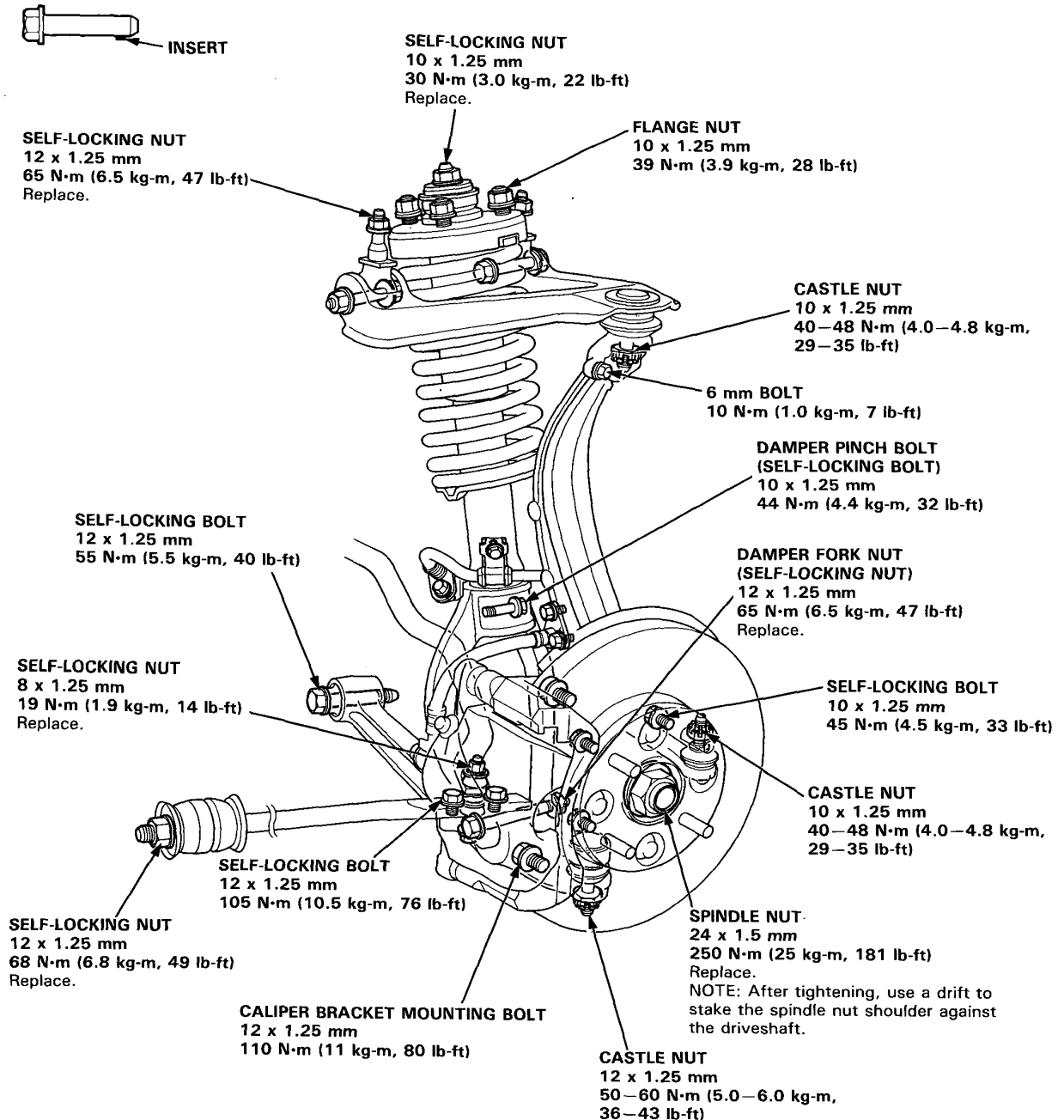
Front Suspension

Torque Specifications

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushing 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: Wipe off the grease before tightening the nut at the ball joint.



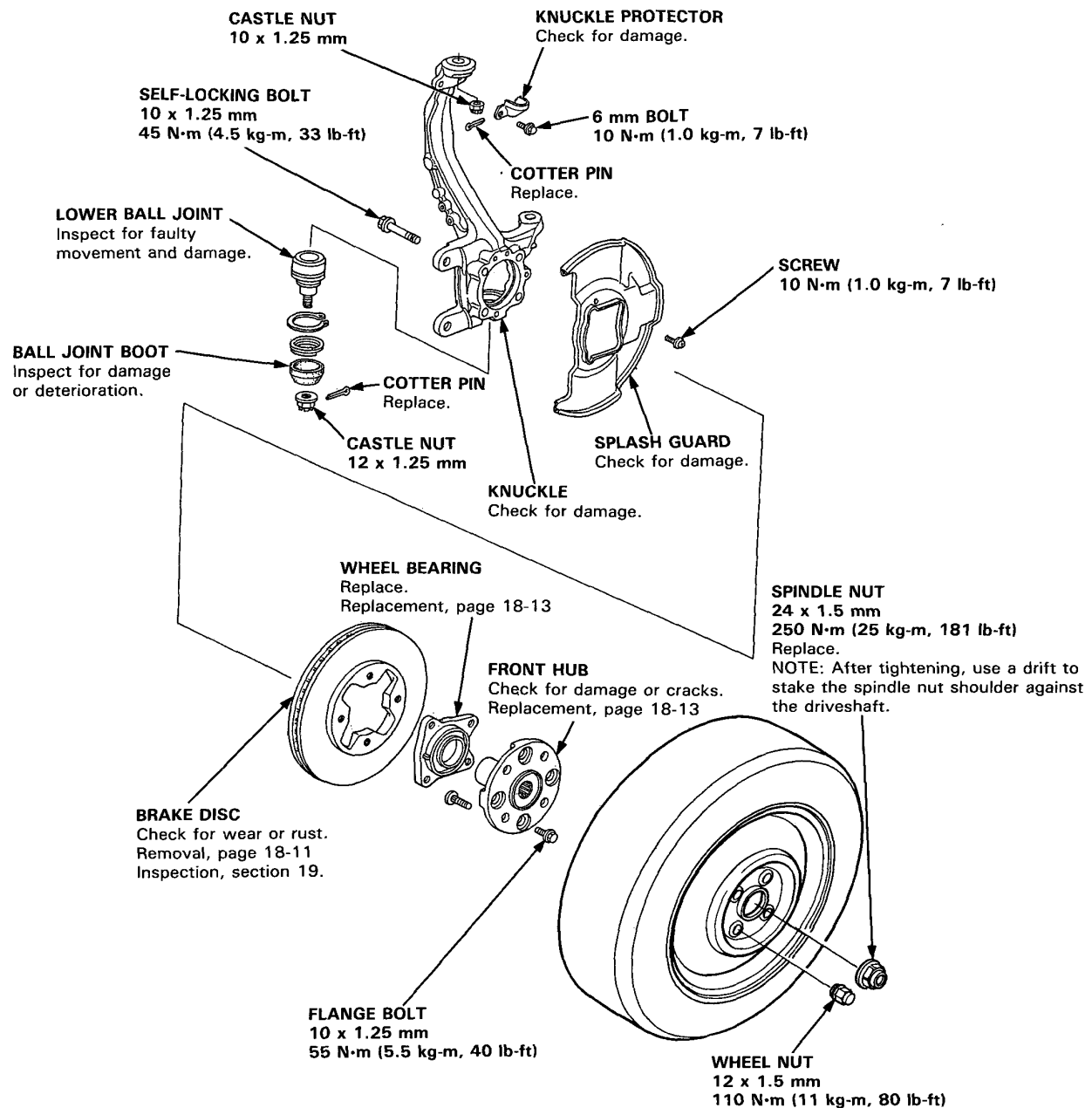
Front Suspension

Knuckle/Hub

Illustrated Index

NOTE:

- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- For aluminum wheels, remove the center cap by prying it out with a flat screwdriver. Use a rag at the point you are going to pry because aluminum alloy wheels can be easily damaged. Avoid damage to the cap by not allowing it to fall during removal.
- Before installing the brake disc, clean the mating surfaces of the front hub and inside of the brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and inside of the wheel.

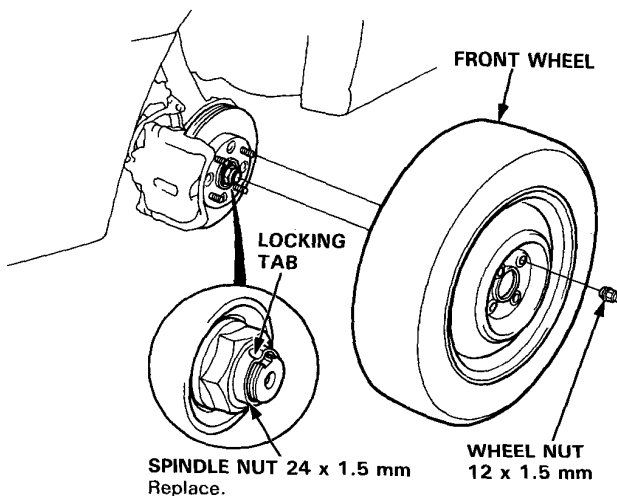




Knuckle/Hub

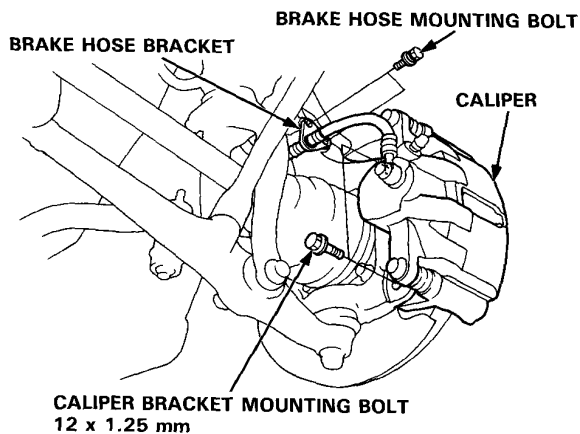
Knuckle Removal

1. Raise the locking tab on the spindle nut, then remove the nut.
2. Loosen the wheel nuts slightly.
3. Raise the front of the car, and support it with safety stands in the proper locations (see section 1).
4. Remove the wheel nuts and front wheel.



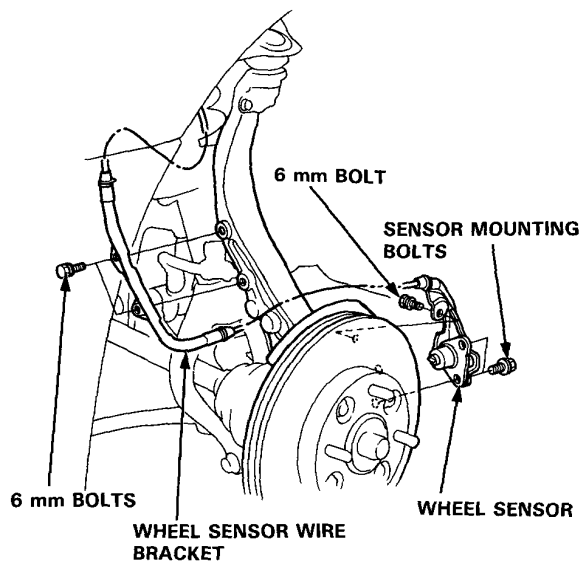
5. Remove the mounting bolt for the brake hose bracket.
6. Remove the caliper bracket mounting bolts and hang the caliper to one side.

CAUTION: To prevent accidental damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.



7. Remove the wheel sensor wire bracket, then remove the wheel sensor from the knuckle.

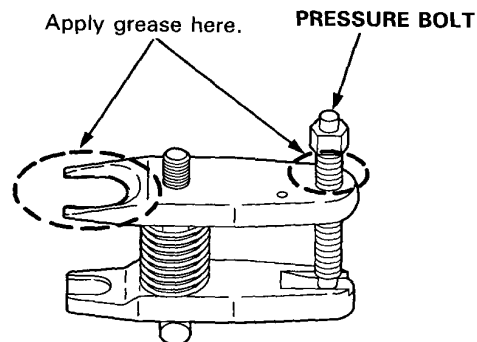
NOTE: Do not disconnect the wheel sensor wire.



8. Clean any dirt or grease off the ball joint.
9. Remove the cotter pin from the castle nut and remove the nut.
10. 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.

CAUTION: Be careful not to damage the ball joint boot.

NOTE: Use ball joint removers, to separate the ball joints from the suspension or steering arm.



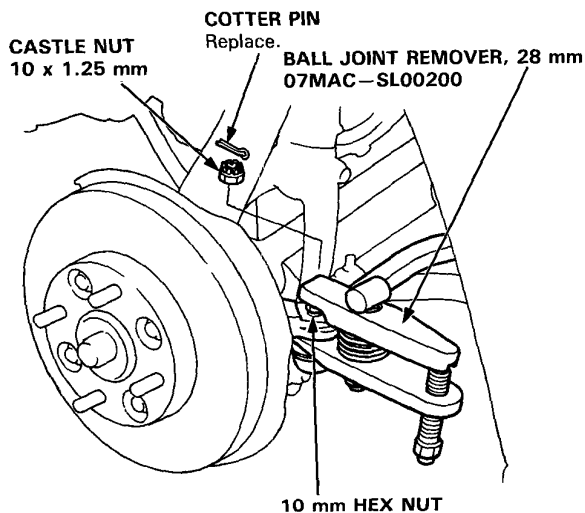
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Front Suspension

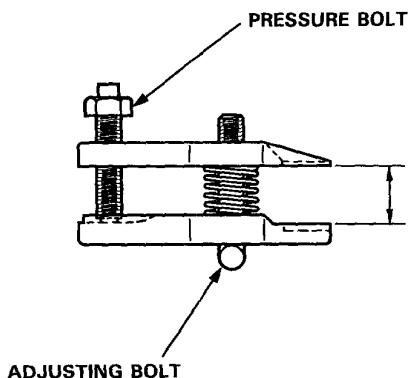
Knuckle/Hub (cont'd)

11. 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.
12. Use the ball joint remover 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.



13. Once the 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.



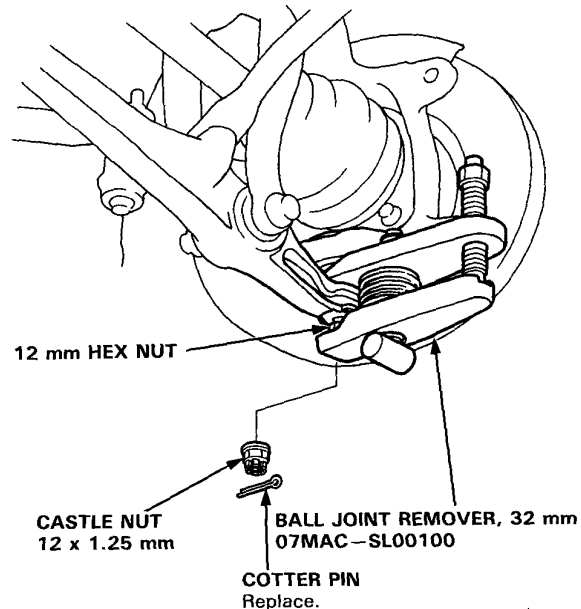
14. With a wrench, tighten the pressure bolt until the ball joint shaft pops loose from the steering arm.

⚠ WARNING Wear eye protection. The ball joint can break loose suddenly and scatter dirt or other debris in your eyes.

15. 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.
16. Remove the cotter pin and castle nut.
17. 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.

18. Use the ball joint remover as shown on step 10 to separate the lower ball joint and lower arm.

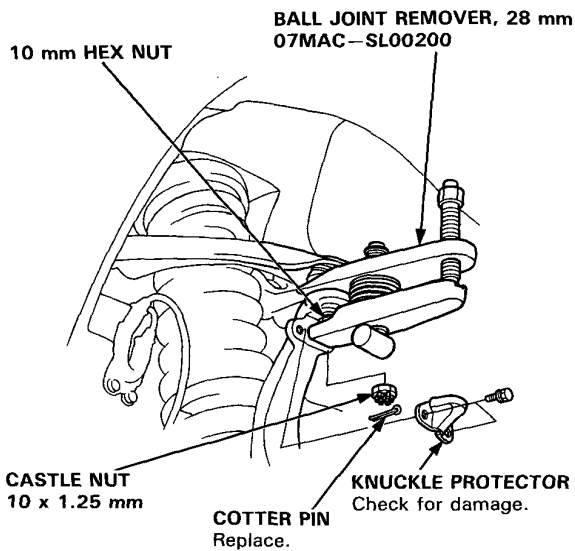
NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.



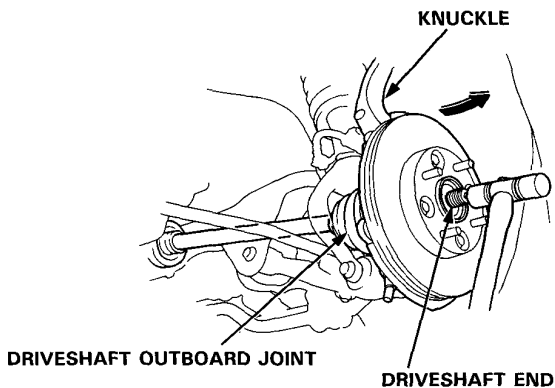


19. Remove the knuckle protector.
20. Remove the cotter pin and the castle nut.
21. Install a 10 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.
22. Use the ball joint remover as shown on step 10 to separate the upper ball joint and knuckle.

NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

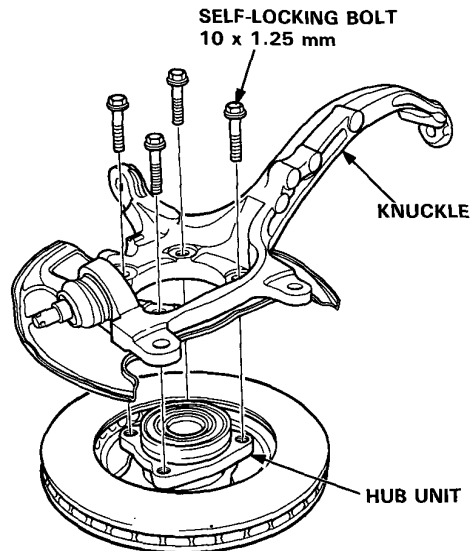


23. Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle by tapping the driveshaft end using a plastic hammer, then remove the knuckle.

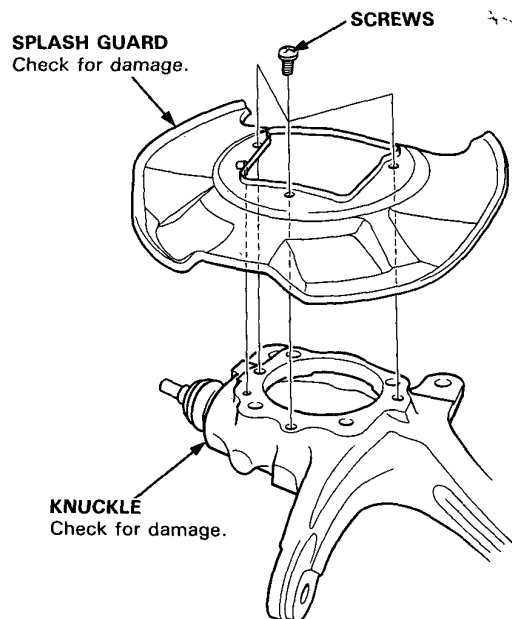


Hub Unit Removal and Wheel Bearing Replacement

1. Remove the knuckle from the hub unit.



2. Remove the splash guard from the knuckle.

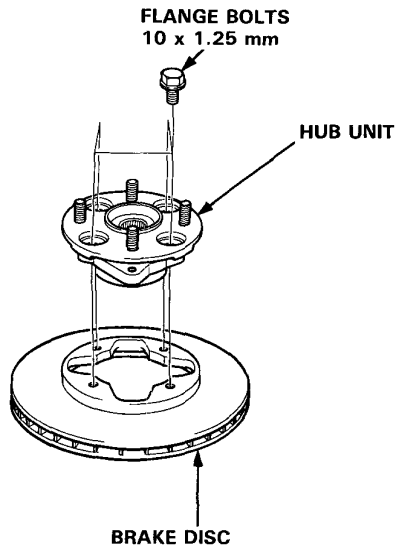


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Front Suspension

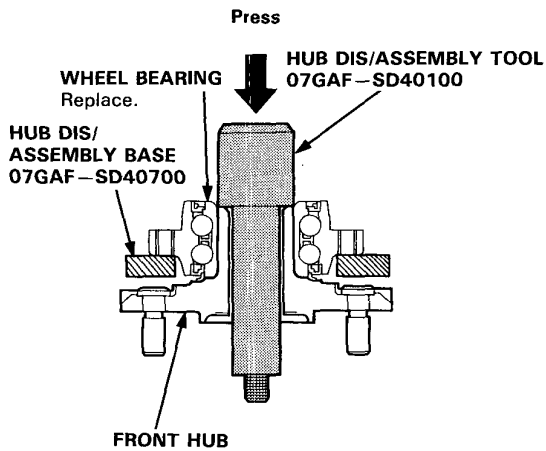
Knuckle/Hub (cont'd)

3. Remove the four flange bolts, then separate the hub unit from the brake disc.

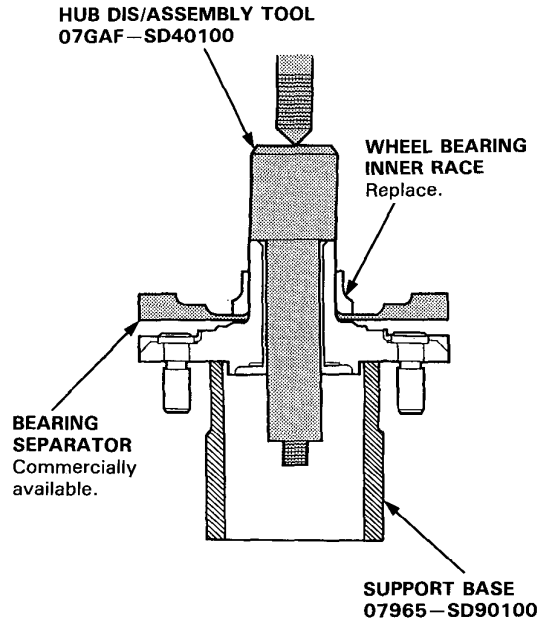


4. Separate the wheel bearing from the front hub using the special tools and a press.

CAUTION: Hold onto the hub to keep it from falling when pressed clear.



5. Press the wheel bearing inner race from the hub using the special tools and a commercially available bearing separator.

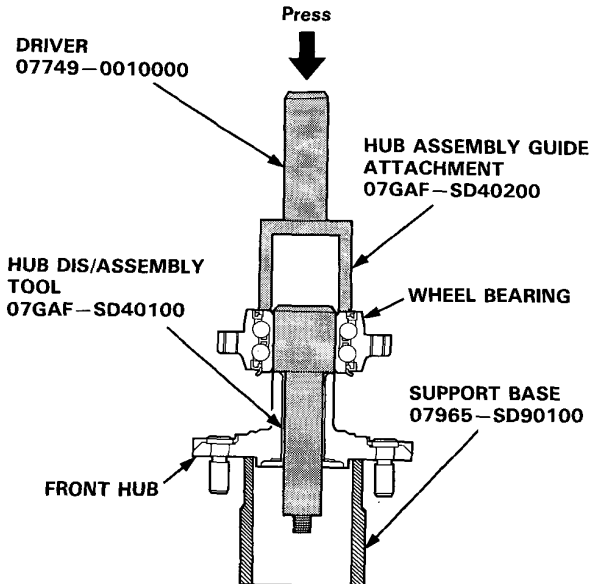


6. Replace the bearing with a new one after removal.



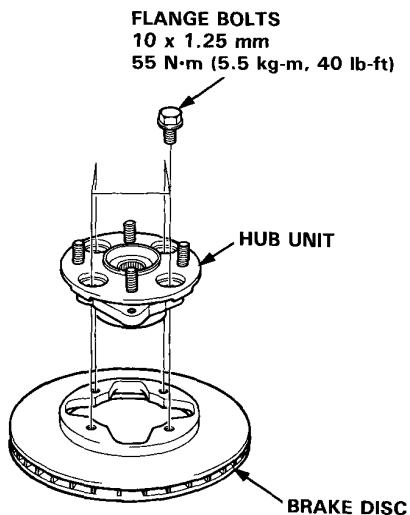
NOTE: Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

7. Press a new wheel bearing into the hub using the special tools and a press.



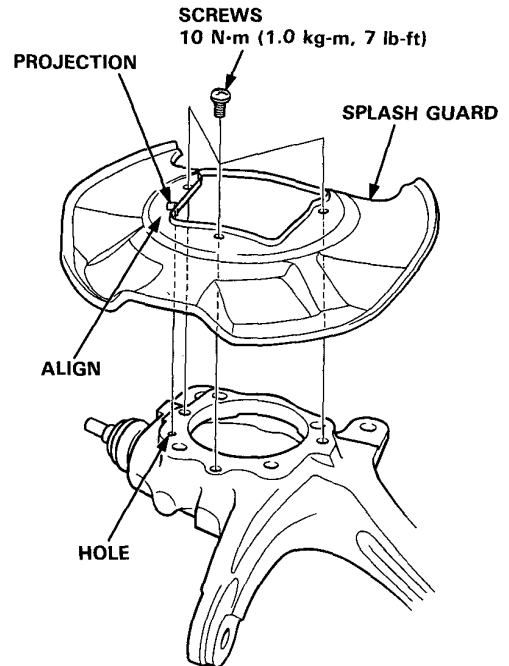
8. Install the hub unit on the brake disc and tighten the flange bolts.

NOTE: Before installing the hub unit, clean the mating surfaces of the hub unit and brake disc.

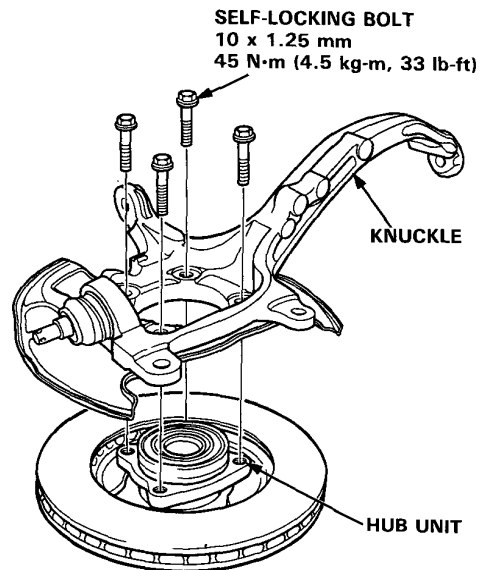


9. Install the splash guard and tighten the screws.

NOTE: Align the projection in the splash guard with the hole on the knuckle.



10. Install the knuckle on the hub unit and tighten the self-locking bolts.



(cont'd)

Front Suspension

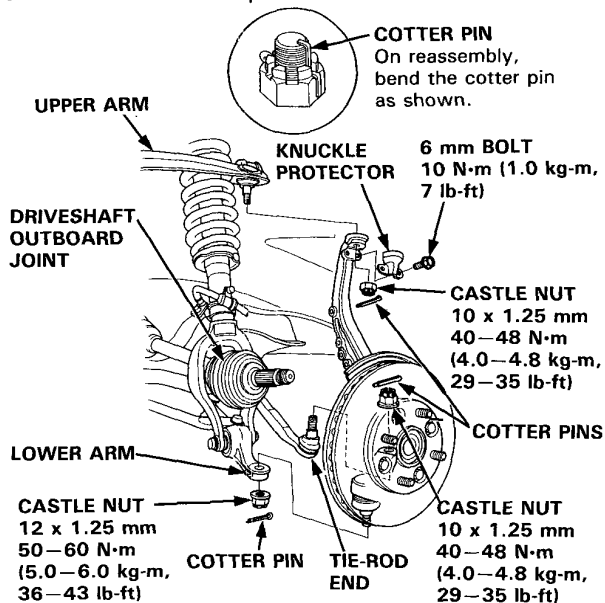
Knuckle/Hub (cont'd)

Knuckle Installation

1. Install the knuckle on the driveshaft outboard joint.
2. Install the knuckle on the tie-rod end, upper arm and lower arm, then tighten the castle nuts and install the new cotter pins.

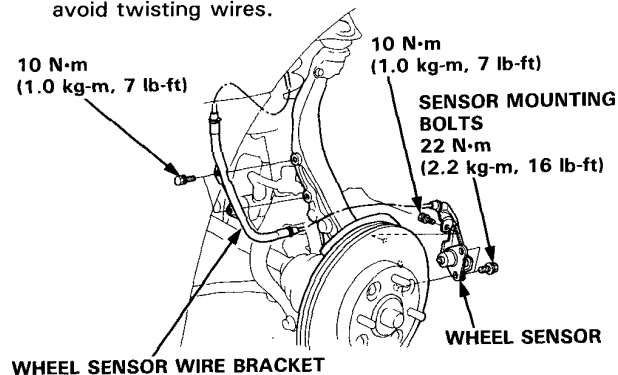
CAUTION: Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

3. Install the knuckle protector with the 6 mm bolt.

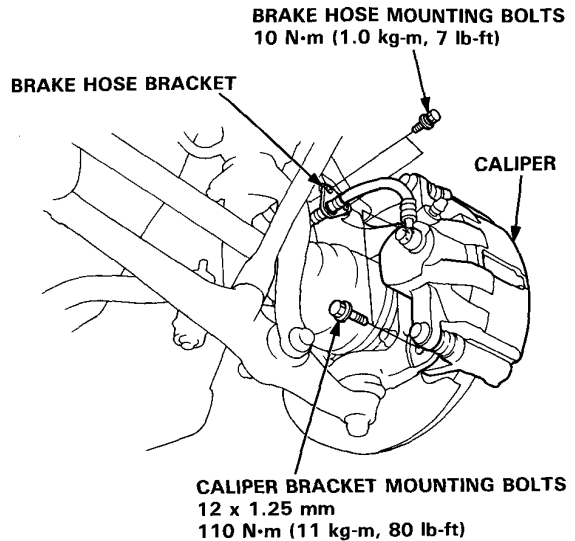


4. Install the wheel sensor with the sensor mounting bolts.
5. Install the wheel sensor wire bracket with the two flange bolts.

NOTE: Be careful when installing the sensors to avoid twisting wires.



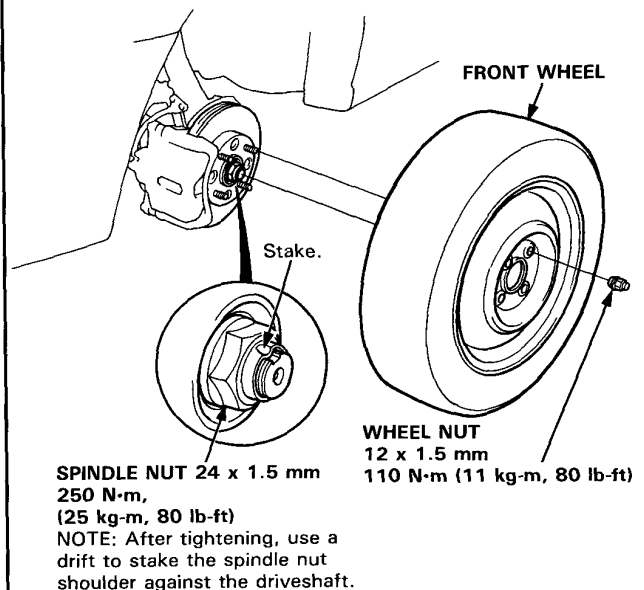
6. Install the caliper with the caliper bracket mounting bolts.
7. Install the brake hose bracket with the brake hose mounting bolts.



8. Tighten the new spindle nut.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

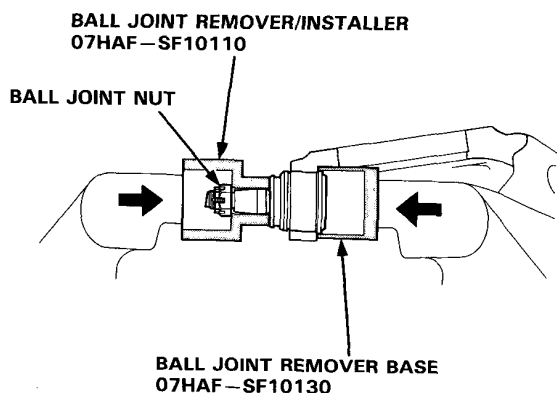
9. Install the front wheel with the wheel nuts.



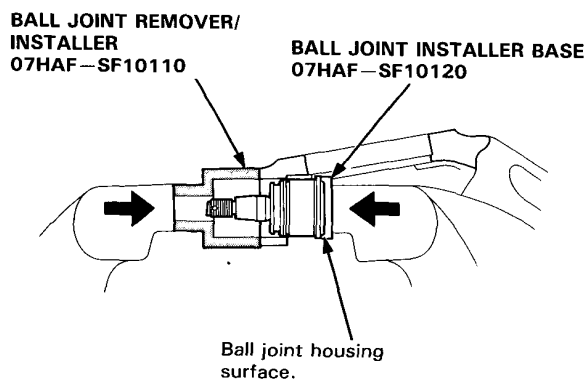


Lower Ball Joint Replacement

1. Remove the knuckle (see page 18-11), and hub unit from the knuckle (see page 18-13).
2. Remove the boot by prying the set ring off.
3. Remove the 40 mm circlip.
4. Install the special tool on the ball joint and tighten the ball joint nut.
5. Position the special tool over the ball joint, 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.



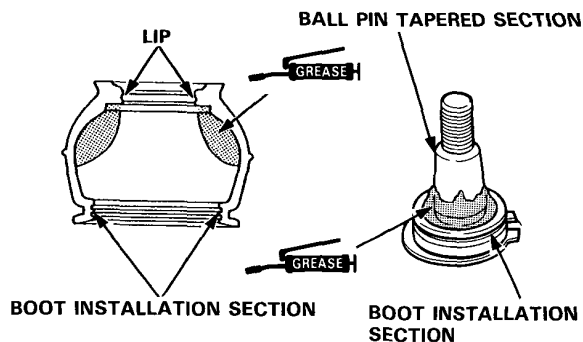
8. Install the 40 mm circlip.

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.

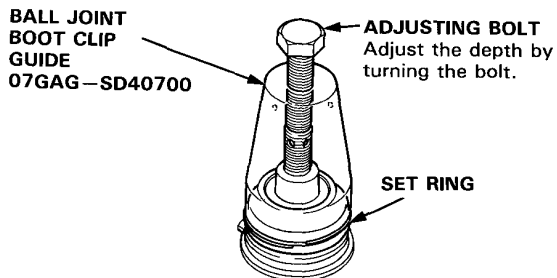
CAUTION:

- 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 clips 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.

Upper ball joint: Hold the tool over the ball joint, then 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.

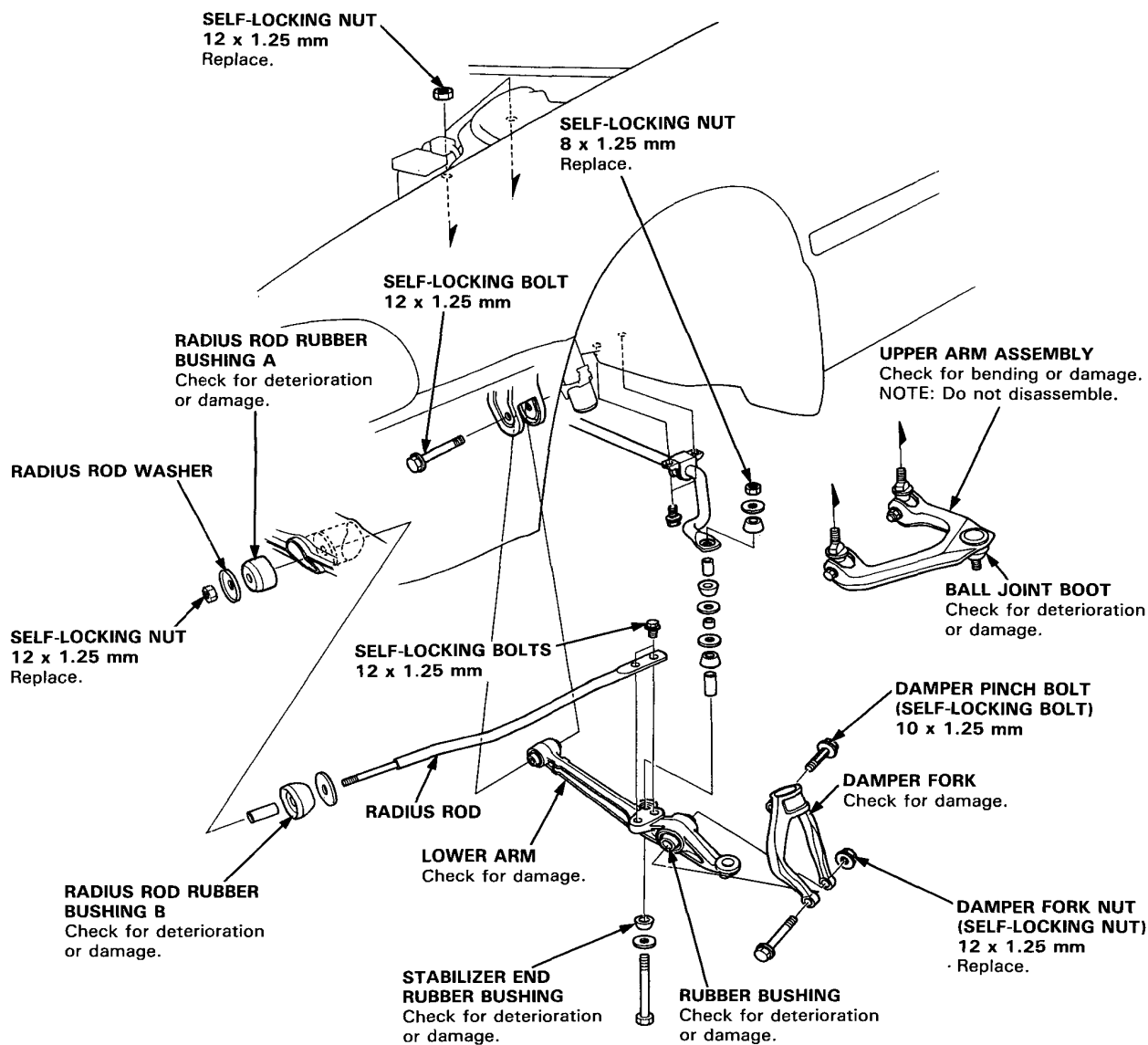
Front Suspension

Suspension Arms

Removal/Inspection

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg·m, 0.7 lb·ft) of torque to turn the nut on the bolt).
- Be careful not to damage the ball joint boot.



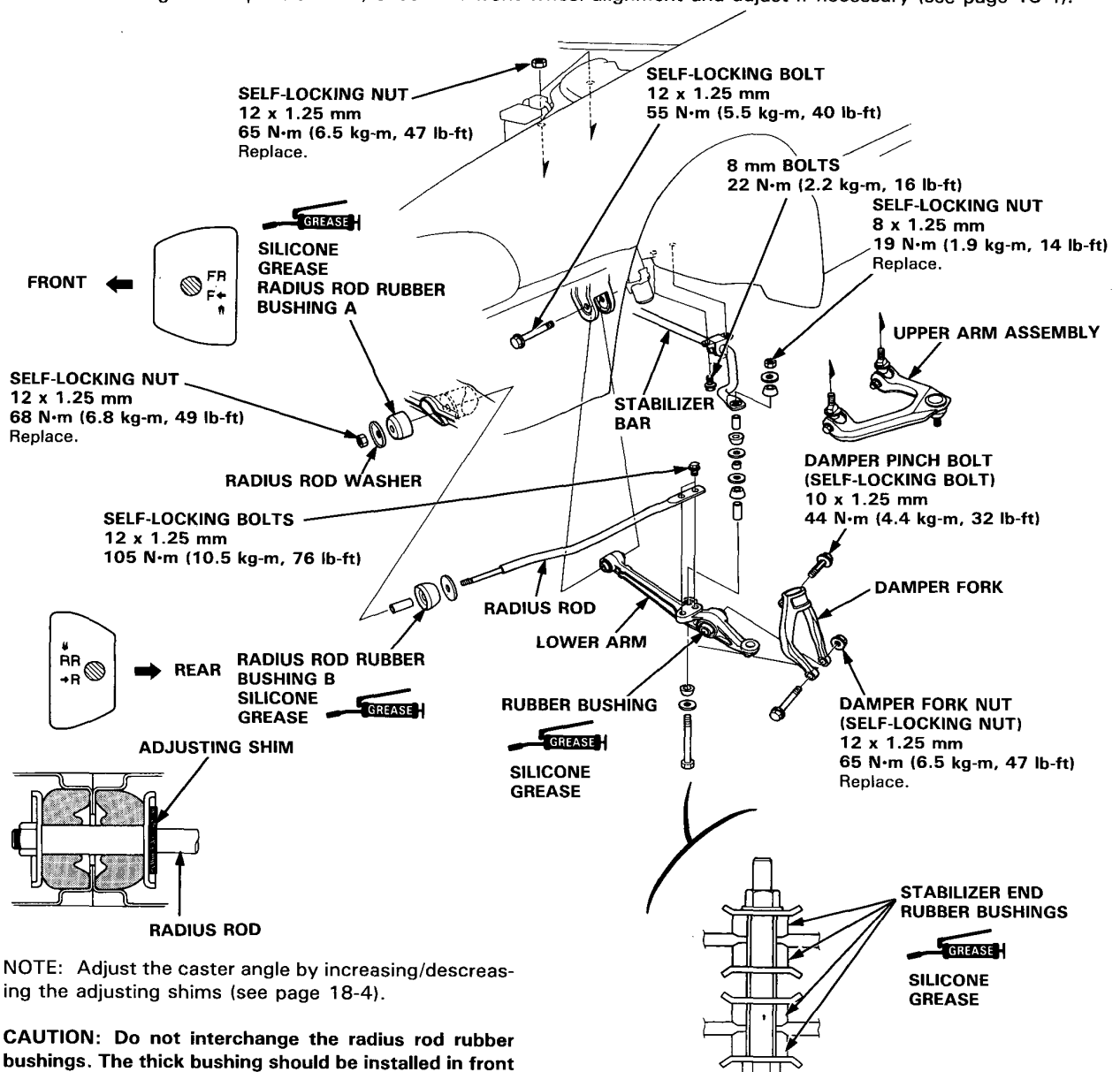


Installation

CAUTION: The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushing are tightened.

NOTE:

- Wipe off the grease before tightening the nut at the ball joint.
- The stabilizer bar is symmetrical. Install with the paint mark facing rear of the car.
- The right and left damper forks are not symmetrical. The left damper fork is marked with "ML" while the right damper fork is marked with "MR". Do not interchange them.
- The right and left upper arms are not symmetrical. The left upper arm is marked with "ML" or "MLG" while the right upper arm is marked with "MR" or "MRG". Do not interchange them.
- After installing the suspension arm, check the front wheel alignment and adjust if necessary (see page 18-4).



NOTE: Adjust the caster angle by increasing/decreasing the adjusting shims (see page 18-4).

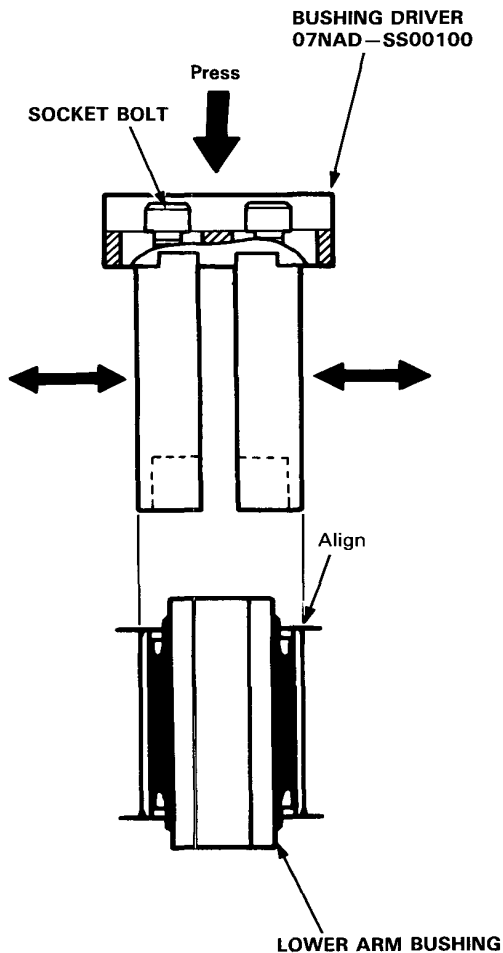
CAUTION: Do not interchange the radius rod rubber bushings. The thick bushing should be installed in front position.

Front Suspension

Lower Arm Bushing Replacement

Adjust the bushing driver so that it matches the outside dimension of the lower arm bushing. Press the lower arm bushing using the special tool and a press.

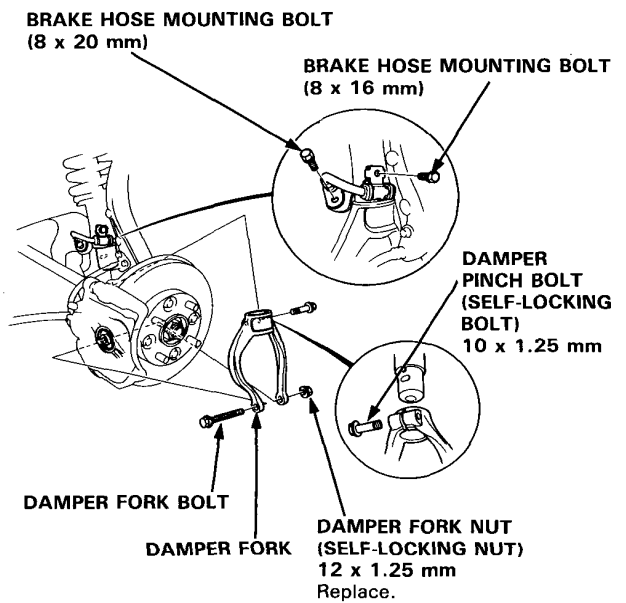
NOTE: When installing the lower arm bushing, press it so that its leading edges are flush with the lower arm.



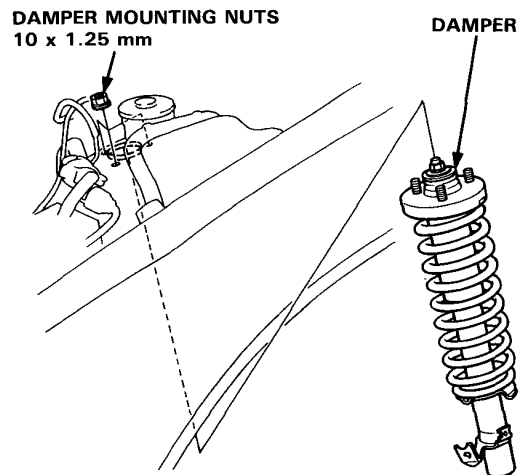
Front Damper

Removal

1. Remove the front wheels (see page 18-11).
2. Remove the brake hose mounting bolts from the damper.
3. Remove the damper pinch bolt.
4. Remove the damper fork nut, bolt and remove the damper fork.



5. Remove the damper by removing the damper mounting nuts.



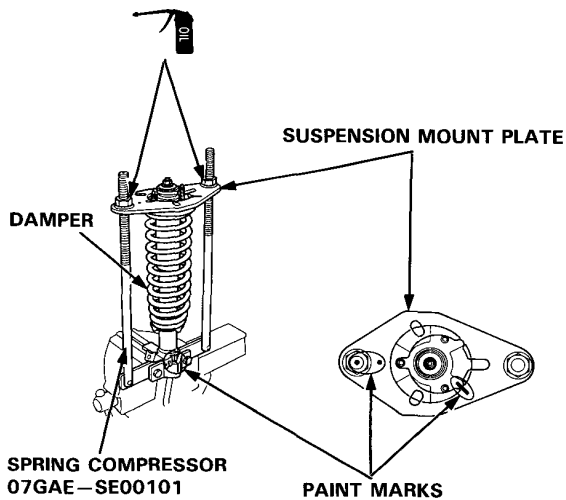


Disassembly

1. Install the damper on the spring compressor by holding the bottom of the damper, and loosely install the holder and bolts.
2. Install the suspension mount plate on the spring compressor.
3. Support the spring compressor with damper on the vise, then tighten the damper holder bolts securely.

CAUTION: Do not over tighten the bolts.

4. Mark the damper case and the spring compressor holder with paint as shown.
5. Mark the mount plate and the spring compressor, and mount plate and damper mounting base with paint as shown.

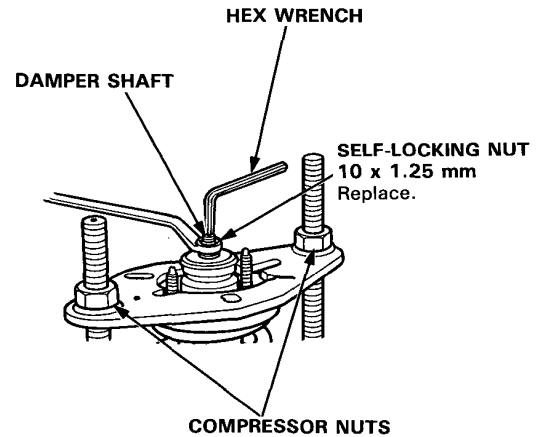


6. Compress the damper by tightening the compressor nuts until the self-locking nut is lift from the seated washer.

NOTE:

- The self-locking nut can not be lift when the mount plate is tilted during compressing the damper.
- Turn each compressor nut gradually and equally.

7. Hold the damper shaft by hex wrench and remove the self-locking nut.
8. Loosen the compressor nuts, then remove the suspension mount plate.
9. Disassemble the damper on the next page.



Front Damper

Inspection

SELF-LOCKING NUT
10 x 1.25 mm
30 N·m (3.0 kg-m, 22 lb-ft)
Replace.

DAMPER MOUNTING WASHER
Check for weakness.

DAMPER MOUNTING RUBBER

DAMPER MOUNTING COLLAR

DAMPER SPRING
Check for weakness, compression or damage.

DAMPER MOUNTING BASE

DAMPER MOUNTING RUBBER

SPRING MOUNTING RUBBER
Check for damage.

BUMP STOP PLATE

BUMP STOP
Check for weakness or damage.

DUST COVER
Check for bending or damage.

SOCKET WRENCH

10 mm NUT

DAMPER UNIT

- Check for oil leaks or rust.
- Check for smooth operation through a full stroke, both compression and extension. If it does not extend, the gas is leaking, and the damper should be replaced.



Reassembly

1. Install the damper unit on the spring compressor by aligning the marks on the damper case and the spring compressor holder.

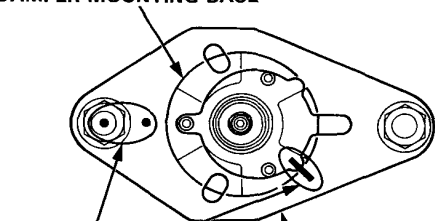
NOTE: If a new damper is to be installed, mark it on the same position as on the old damper.

2. Reassemble 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.

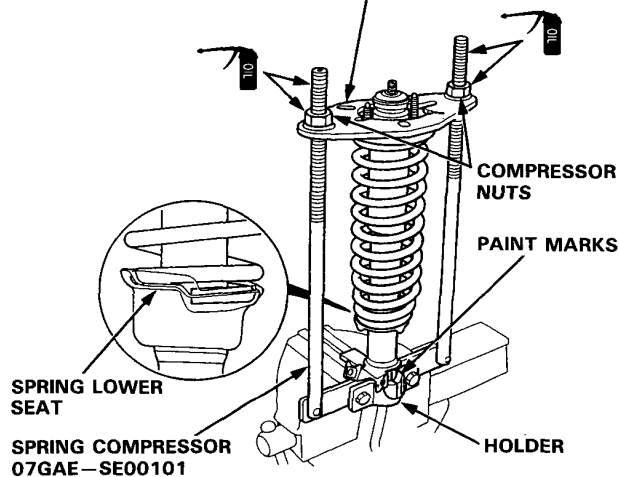
3. Install the suspension mount plate on the damper with the mark on the plate facing painted threads.
4. Position the damper mounting base by aligning the marks on the damper mounting base and mount plate.
5. Apply oil to the seating surfaces of the compressor nuts and threads of the spring compressor, then loosely install the nuts.

DAMPER MOUNTING BASE



PAINT MARKS

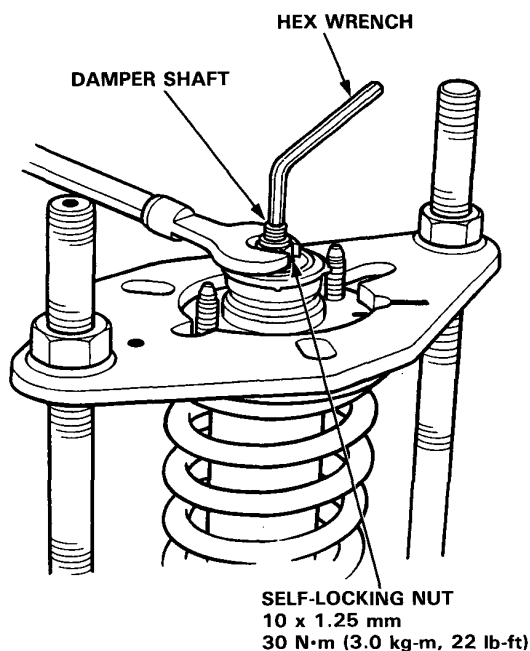
SUSPENSION MOUNT PLATE



6. Compress the damper spring by turning the compressor nuts.

NOTE: Turn each compressor nut gradually and equally.

7. Install the damper mounting washer, then loosely install the new self-locking nut.
8. Hold the damper shaft by hex wrench and tighten the self-locking nut.



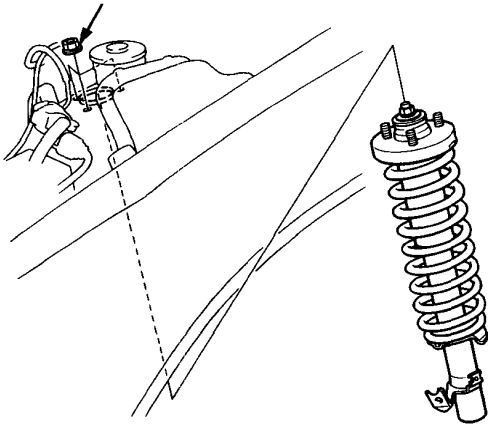
9. Remove the damper from the spring compressor.

Front Damper

Installation

1. Loosely install the damper on the frame with the aligning tab facing inside.

DAMPER MOUNTING NUTS
10 x 1.25 mm
39 N·m (3.9 kg-m, 28 lb-ft)



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.

4. Loosely install a new damper fork nut with the damper fork bolt.

5. Raise the knuckle with a floor jack until the car 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.

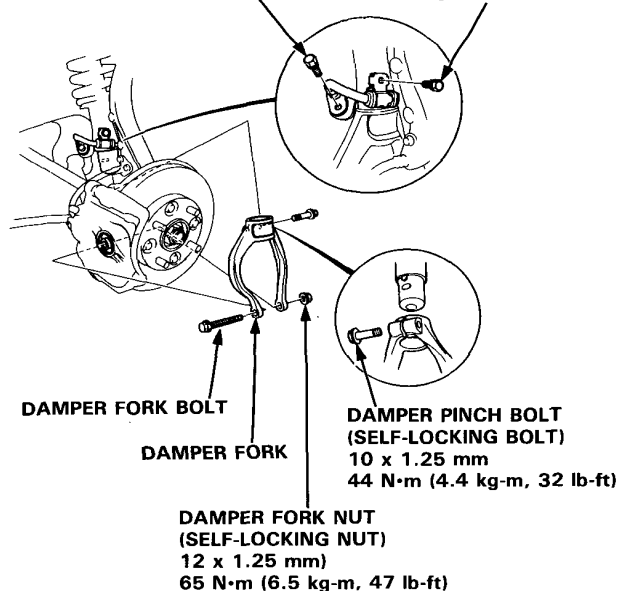
7. Tighten the damper fork nut.

8. Tighten the flange nuts on the damper.

9. Install the brake hose mounts with the brake hose mounting bolts.

BRAKE HOSE MOUNTING BOLT
(8 x 20 mm)
22 N·m (2.2 kg-m, 16 lb-ft)

BRAKE HOSE MOUNTING BOLT
(8 x 16 mm)
22 N·m (2.2 kg-m, 16 lb-ft)



10. Install the front wheels (see page 18-16).



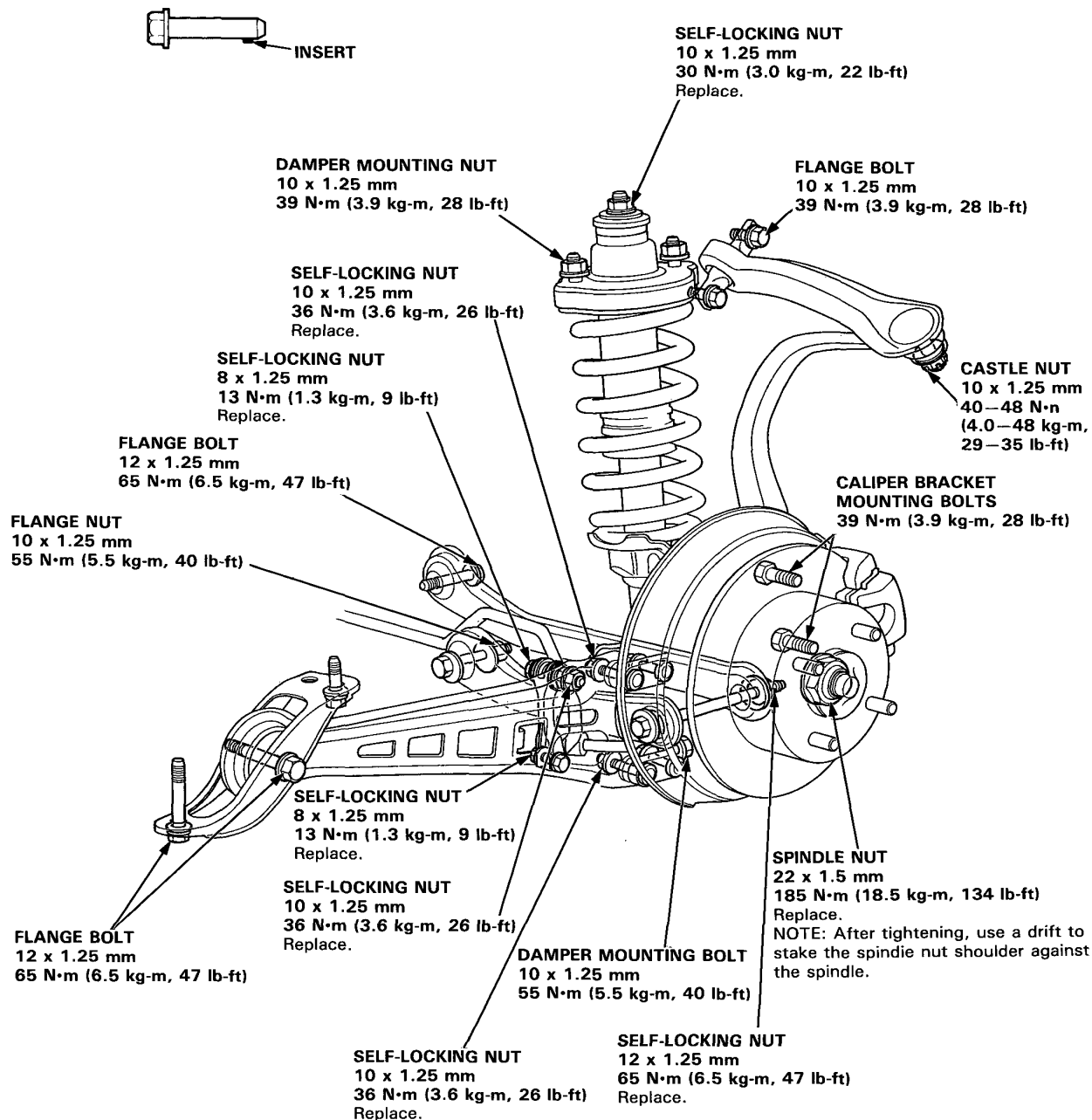
Rear Suspension

Torque Specifications

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self locking nut past their nylon locking inserts. (If should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).
- 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: Wipe off the grease before tightening the nut at the ball joint.



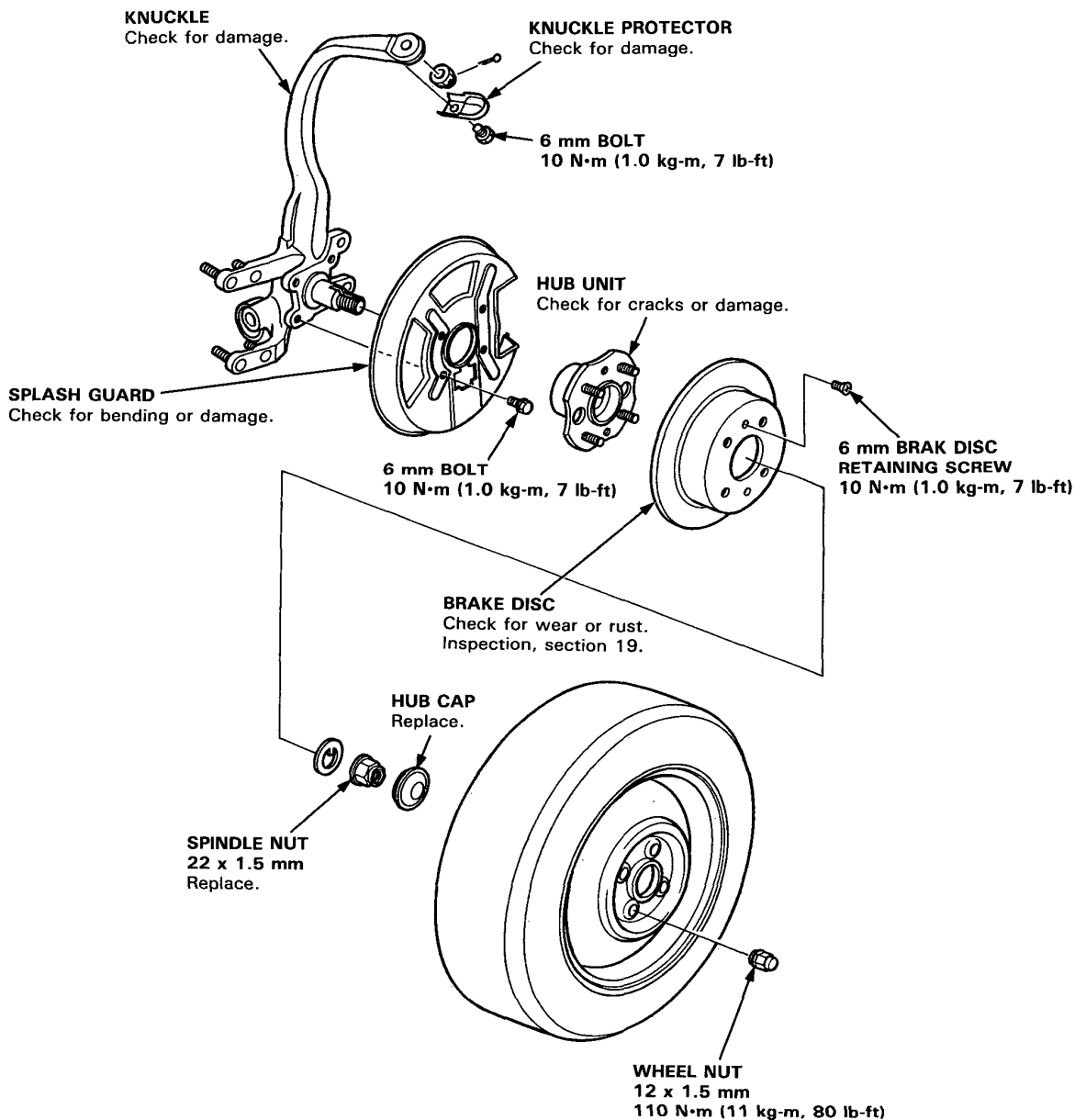
Rear Suspension

Hub Bearing Unit

Illustrated Index

NOTE:

- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- For aluminum wheels, remove the center cap by prying it out with a flat screwdriver. Use a rag at the point you are going to pry because aluminum alloy wheels can be easily damaged. Avoid damage to the cap by not allowing it to fall during removal.
- Before installing the brake disc, clean the mating surfaces of the rear hub and inside of the brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and inside of the wheel.

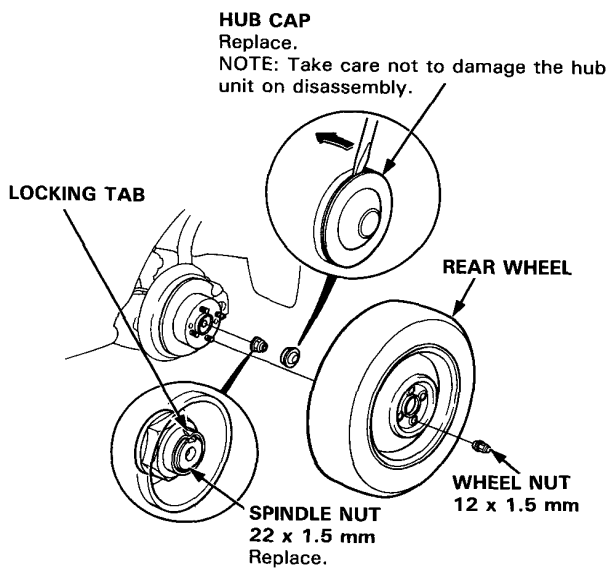




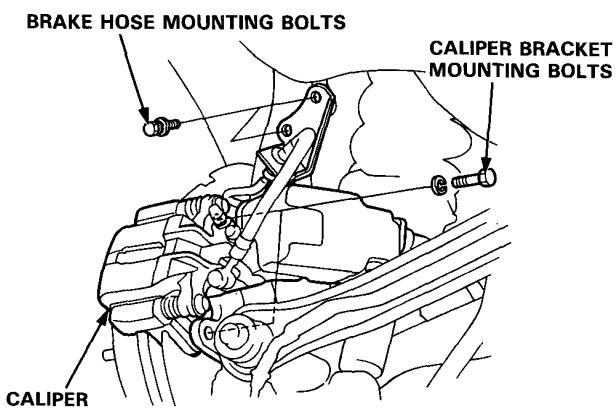
Hub Bearing Unit

Removal

1. Loosen the wheel nuts slightly.
2. Raise the rear of car, 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 hose mounting bolt.

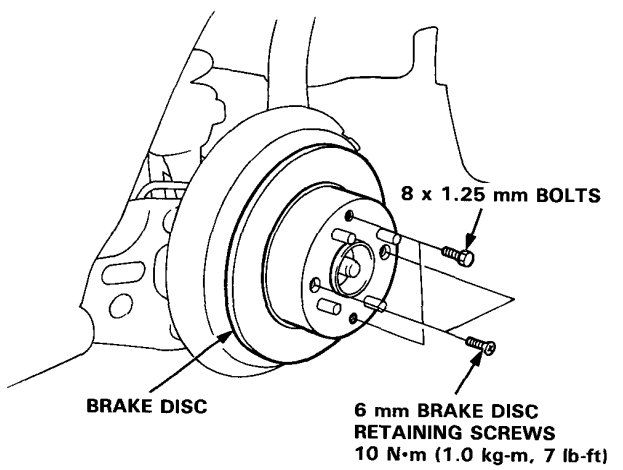


9. Remove the caliper bracket mounting bolts and hang the caliper to one side.

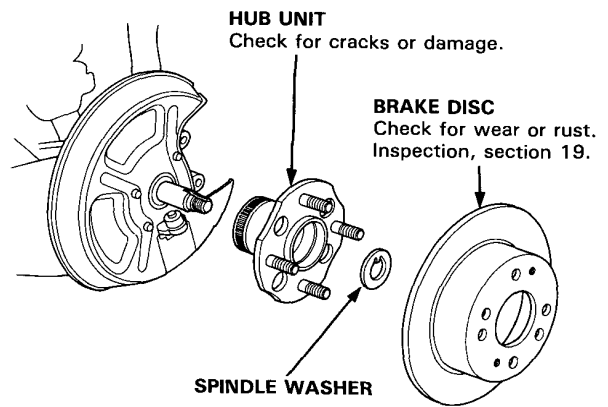
CAUTION: To prevent accidental damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the under carriage.

10. Remove the 6 mm brake disc retaining screws.
11. 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.



12. Remove the brake disc.
13. Remove the hub unit from the knuckle.



(cont'd)

Rear Suspension

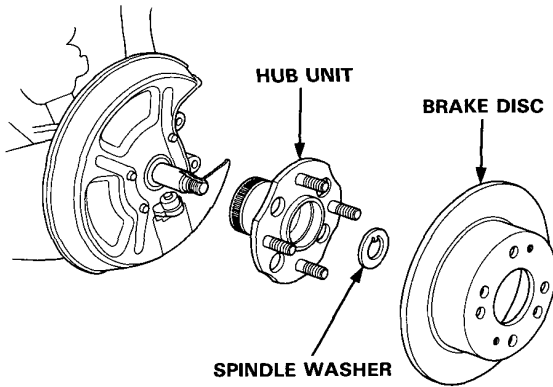
Hub Bearing Unit (cont'd)

Installation

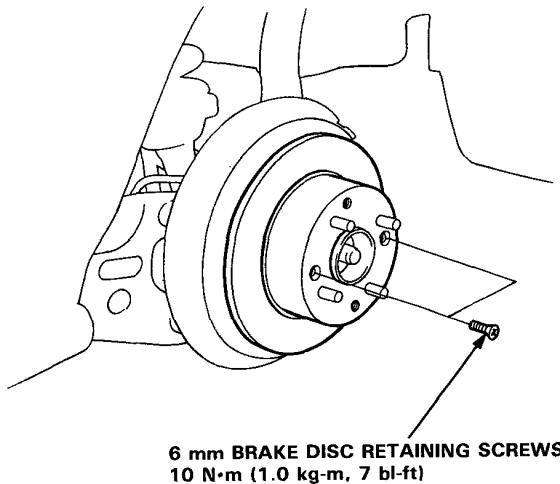
NOTE: Wash the bearing and spindle thoroughly in high flash point solvent before reassembly.

1. Install the hub unit, spindle washer and brake disc.

NOTE: Before installing the brake disc, clean the mating surfaces of the rear hub and inside of the brake disc.



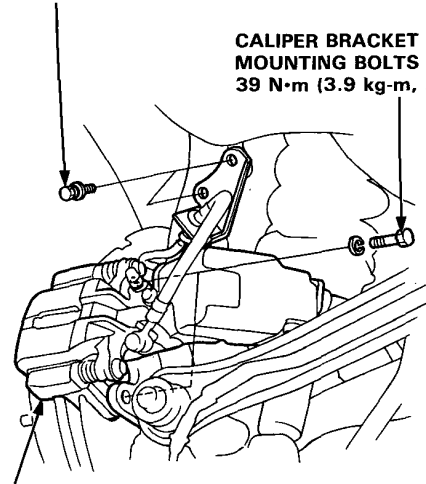
2. Tighten the 6 mm brake disc retaining screws.



3. Install the caliper with the caliper bracket mounting bolts.
4. Install the brake hose with the brake hose mounting bolts.

BRAKE HOSE MOUNTING BOLTS
22 N·m (2.2 kg-m, 16 lb-ft)

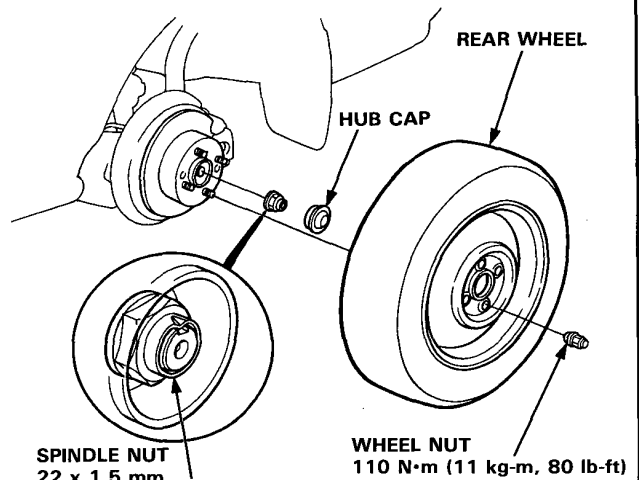
CALIPER BRACKET MOUNTING BOLTS
39 N·m (3.9 kg-m, 28 lb-ft)



5. Tighten the new spindle nut.
6. Install the new hub cap.

NOTE: Before installing the wheel, clean the mating surface of the brake disc and inside of the wheel.

7. Install the rear wheel with the wheel nut.



NOTE: After tightening, use a drift to stake the spindle nut shoulder against the spindle.



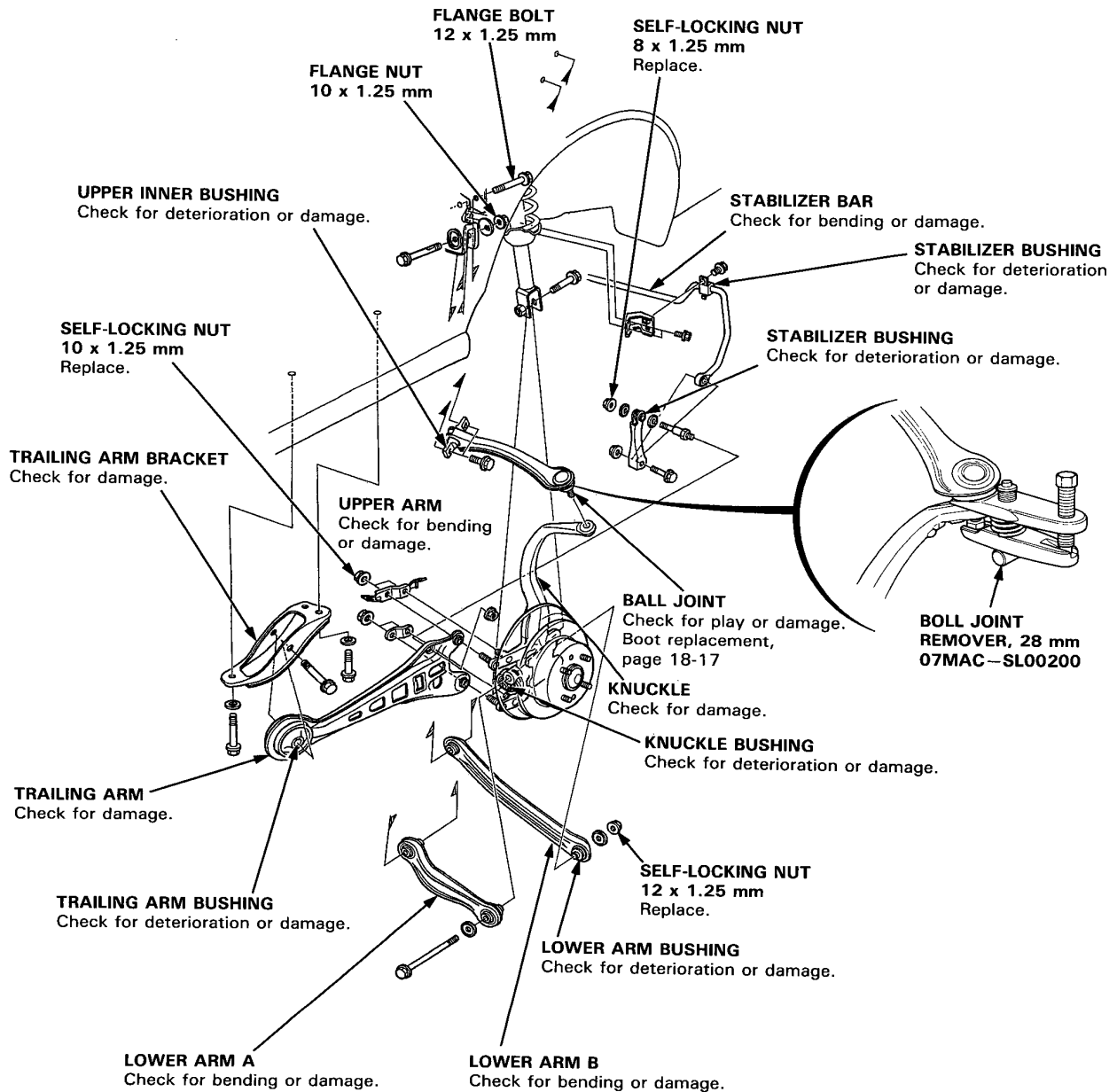
Knuckle/Suspension Arms

Removal/Inspection

⚠ 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 car, the center of gravity may change causing the car to tip forward.

CAUTION:

- Replace the self-locking nuts after removal.
- Replace the self-locking bolts if you can easily thread a non-self-locking nut past their nylon locking inserts. (It should require 1 N·m (0.1 kg-m, 0.7 lb-ft) of torque to turn the nut on the bolt).
- Be careful not to damage the ball joint boots.



(cont'd)

Rear Suspension

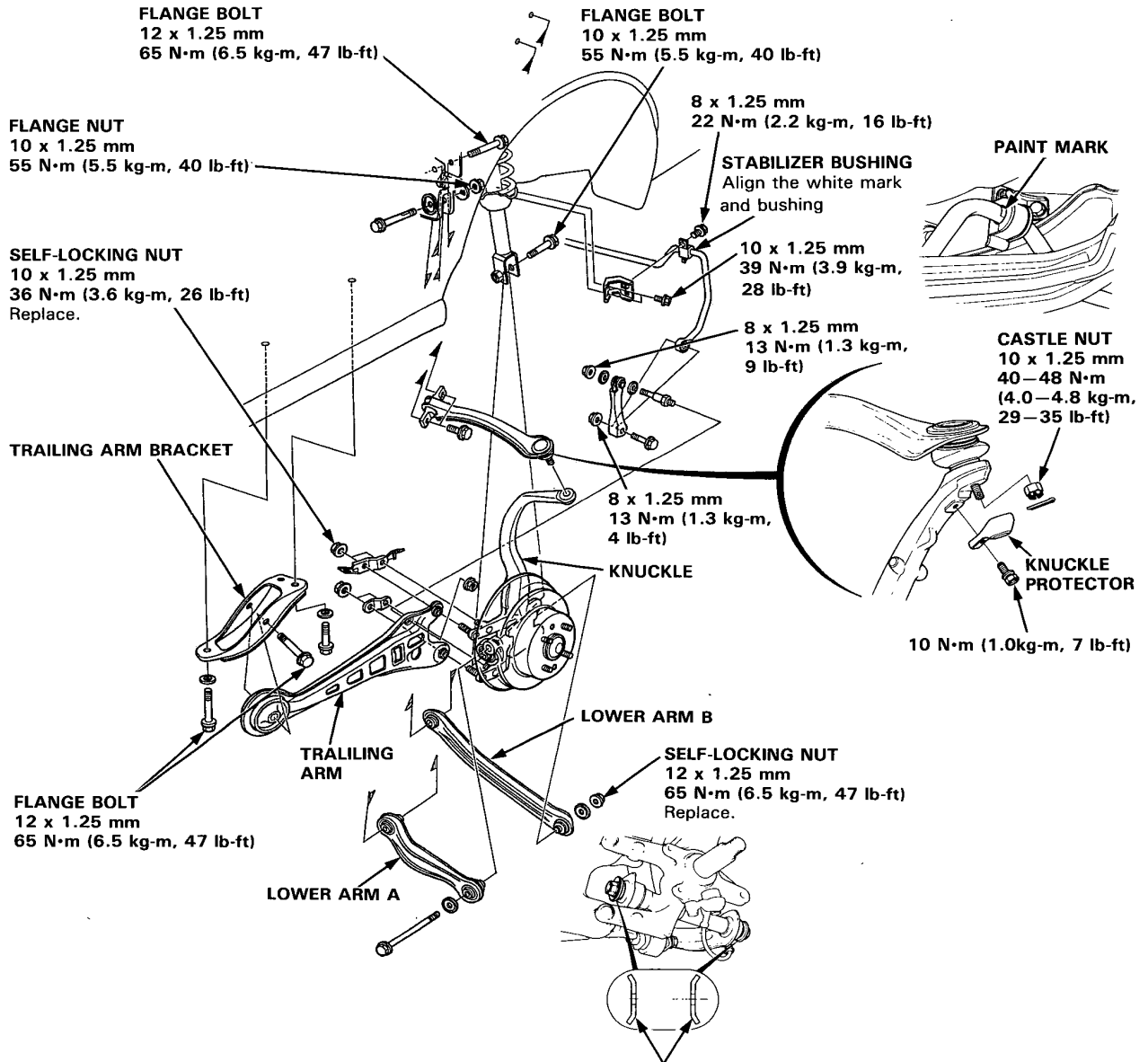
Knuckle/Suspension Arms (cont'd)

Installation

CAUTION: The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.

NOTE:

- Wipe off the grease before tightening the nut at the ball joint.
- Make sure the toe adjuster cams on lower arm A are installed in the same direction.
- The right and left lower arm B are symmetrical. Install so the paint mark of "SN7↑R UP↑" and SN7↑L UP↑" point to the front.
- "SN7↑L UP↑" is stamped on the left lower arm A and "SN7↑R UP↑" on the right lower arm A.
- The left upper arm is stamped with "L" while the right upper arm is stamped with "R".
- After installing the suspension arm, check the rear wheel alignment and adjust if necessary (see page 18-4).

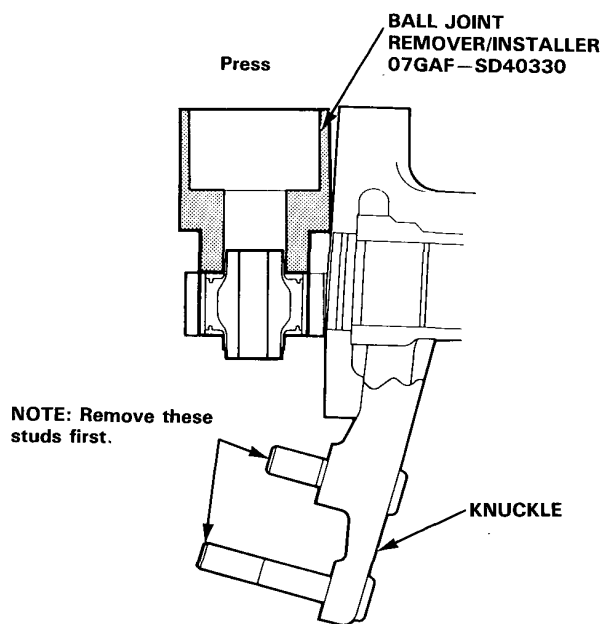


NOTE: Install the washers as shown.

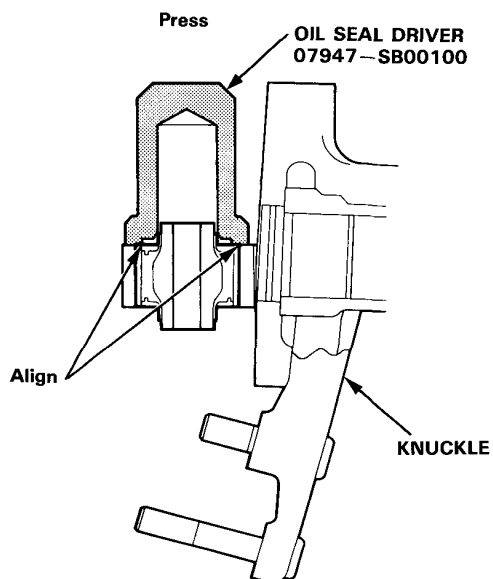


Knuckle Bushing Replacement

Removal:



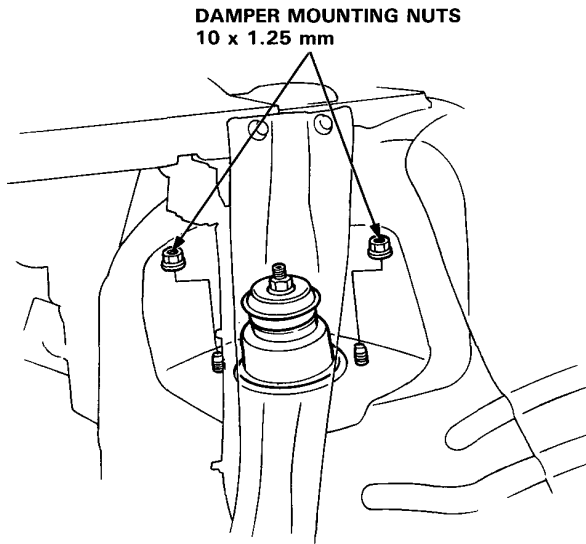
Installation:



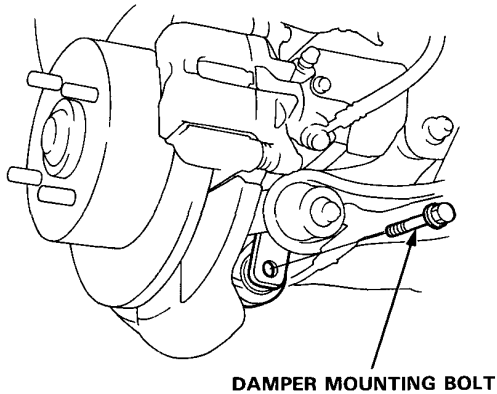
Rear Damper

Removal

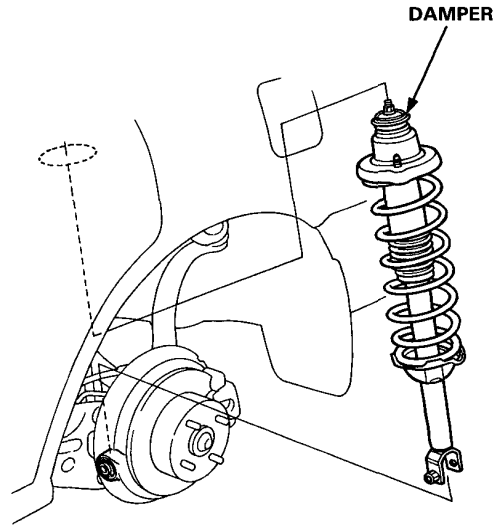
1. Raise the rear of the car, and support it with safety stands in the proper locations (see section 1).
2. Remove the rear wheel (see page 18-27).
3. Remove the rear seat.
4. Remove the damper mounting nuts.



5. Remove the damper mounting bolt.



6. Lower the rear suspension and remove the damper.



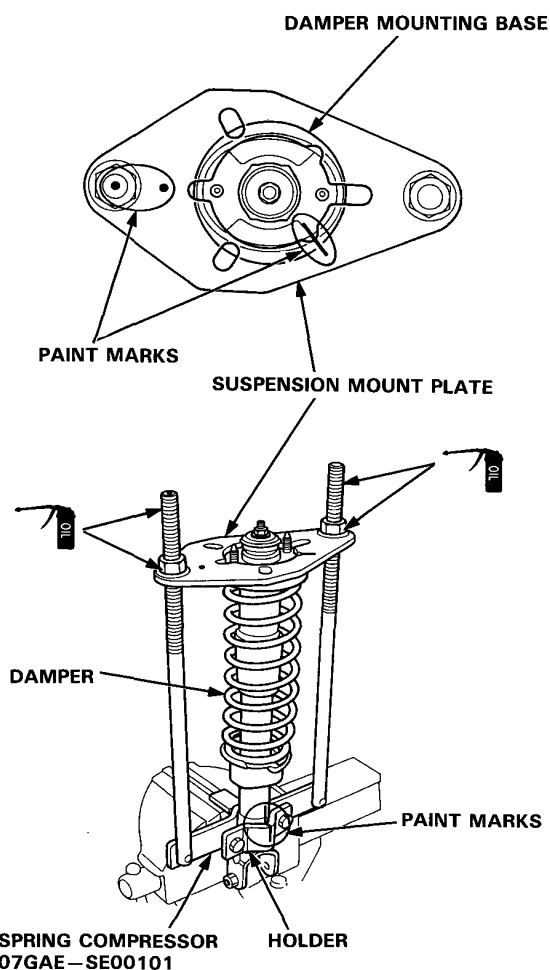


Disassembly

1. Install the damper on the spring compressor by holding the bottom of the damper, and loosely install the holder and bolts.
2. Install the suspension mount plate on the spring compressor.
3. Support the spring compressor with damper on the vise, then tighten the damper holder bolts securely.

CAUTION: Do not over tighten the bolts.

4. Mark the damper case and the spring compressor holder with paint as shown.
5. Mark the mount plate and the spring compressor, and mount plate and damper mounting base with paint as shown.

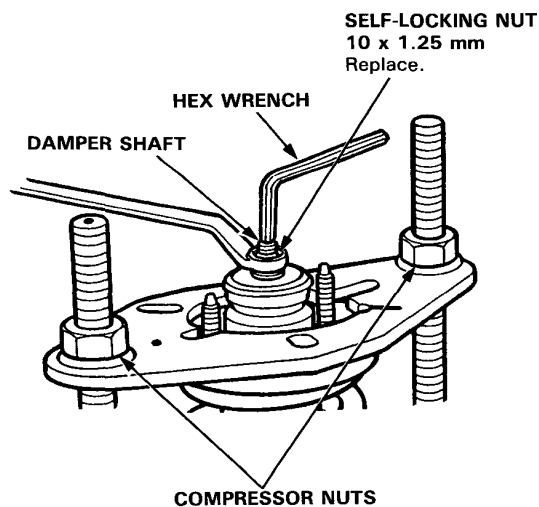


6. Compress the damper by tightening the compressor nuts until the self-locking nut is lift from the seated washer.

NOTE:

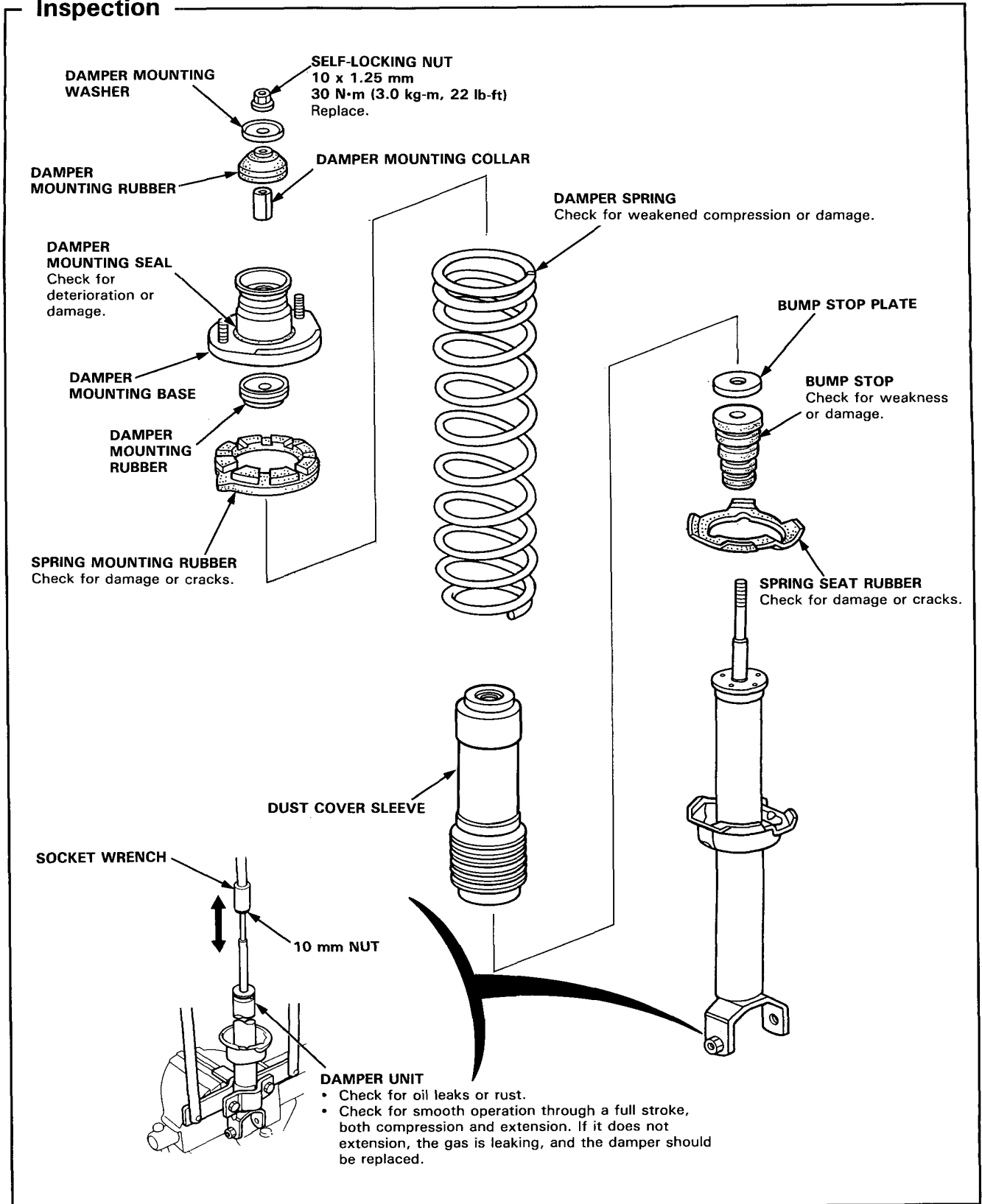
- The self-locking nut can not be lift when the mount plate is tilted during compressing the damper.
- Turn each compressor nut gradually and equally.

7. Hold the damper shaft by hex wrench and remove the self-locking nut.
8. Loosen the compressor nuts, then remove the suspension mount plate.
9. Disassemble the damper on the next page.



Rear Damper

Inspection





Reassembly

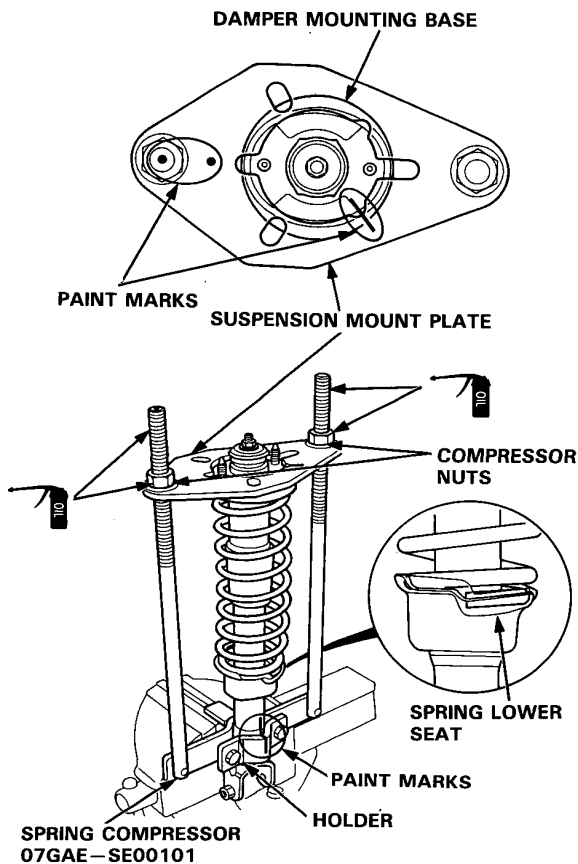
1. Install the damper unit on the spring compressor by aligning the marks on the damper case and the spring compressor holder.

NOTE: If a new damper is to be installed, mark it on the same position as on the old damper.

2. Reassemble 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.

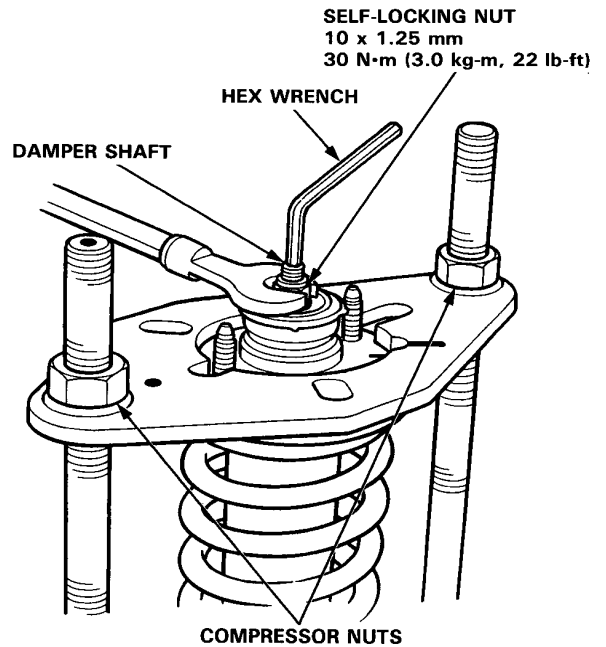
3. Install the mount plate on the damper with the mark on the plate facing painted threads.
4. Position the damper mounting base by aligning the marks on the damper mounting base and mount plate.
5. Apply oil to the seating surfaces of the compressor nuts and threads of the spring compressor, then loosely install the nuts.



6. Compress the damper spring by turning the compressor nuts.

NOTE: Turn each compressor nut gradually and equally.

7. Install the damper mounting washer, then loosely install the new self-locking nut.
8. Hold the damper shaft by hex wrench and tighten the self-locking nut.

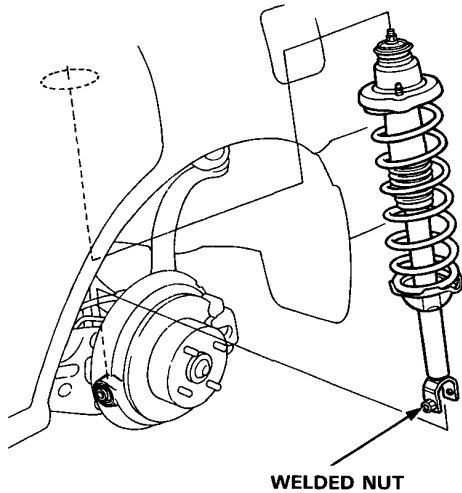


9. Remove the damper from the spring compressor.

Rear Damper

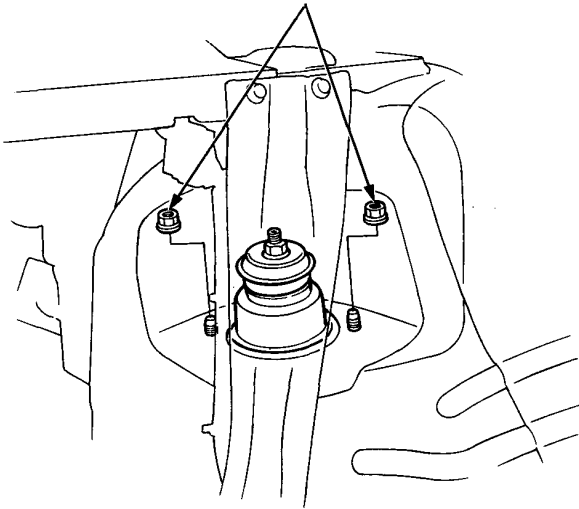
Installation

1. Lower the rear suspension and set the damper with the welded nut points to the front of the car.



2. Loosely install the damper mounting nuts.

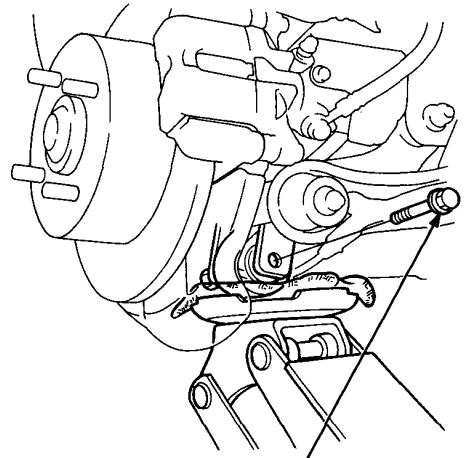
DAMPER MOUNTING NUTS
Tighten to this torque in step 5.
39 N·m (3.9 kg-m, 28 lb-ft)



3. Loosely install the damper mounting bolts.
4. Raise the rear suspension with a floor jack until the weight of the car is on the damper.

⚠ WARNING The floor jack must be securely positioned or personal injury may result.

5. Tighten the damper mounting bolt and nuts.



DAMPER MOUNTING BOLT
10 x 1.25 mm
5.5 N·m (5.5 kg-m, 40 lb-ft)

6. Install the rear seat.
7. Install the rear wheel (see page 18-28).

Damper Disposal

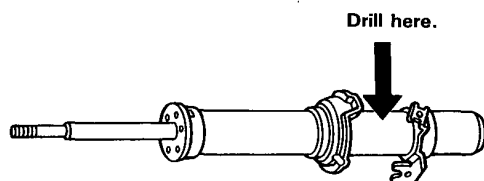


⚠ WARNING

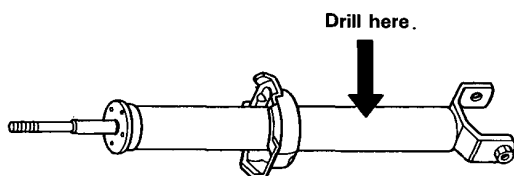
- The dampers contain nitrogen gas and oil under pressure. The pressure must be relieved before disposal to prevent explosion and possible injury when scrapping.
- Always wear eye protection to avoid getting metal shavings in your eyes when the gas damper pressure is relieved.

Place the damper on a level surface with its rod extended and drill a hole of 2.0–3.0 mm (0.08–0.12 in) diameter in the body to release the gas.

<Front Damper:>



<Rear Damper:>



Brakes

Conventional Brakes	19-1
Anti-lock Brake System	19-39



Conventional Brakes

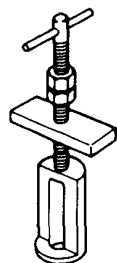
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Brake Pedal	19-4	Inspection and Replacement	19-24
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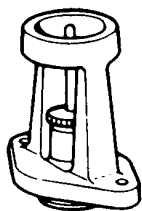
Special Tools

* Cars with ABS

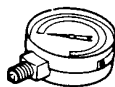
Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAE—SG00100	Brake Spring Compressor	1	19-28, 29, 33
②	07JAG—SD40100	Pushrod Adjustment Gauge	1	19-19
③	07404—5790300	Vacuum Gauge	1	19-20, 21
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⑥	07410—5790500	Tube Joint Adaptor	1	19-21
⑦	07510—6340101	Pressure Gauge Joint Pipe	2 (*1)	19-21
	*07HAK—SG00110	Pressure Gauge Joint Pipe	1	19-21
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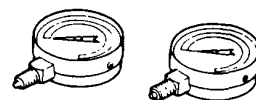
①



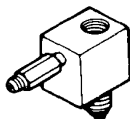
②



③



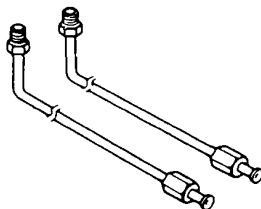
④



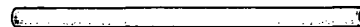
⑤



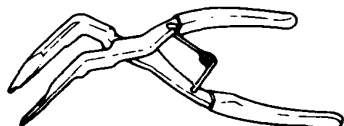
⑥



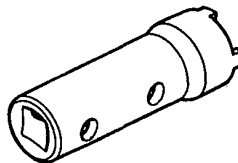
⑦



⑧



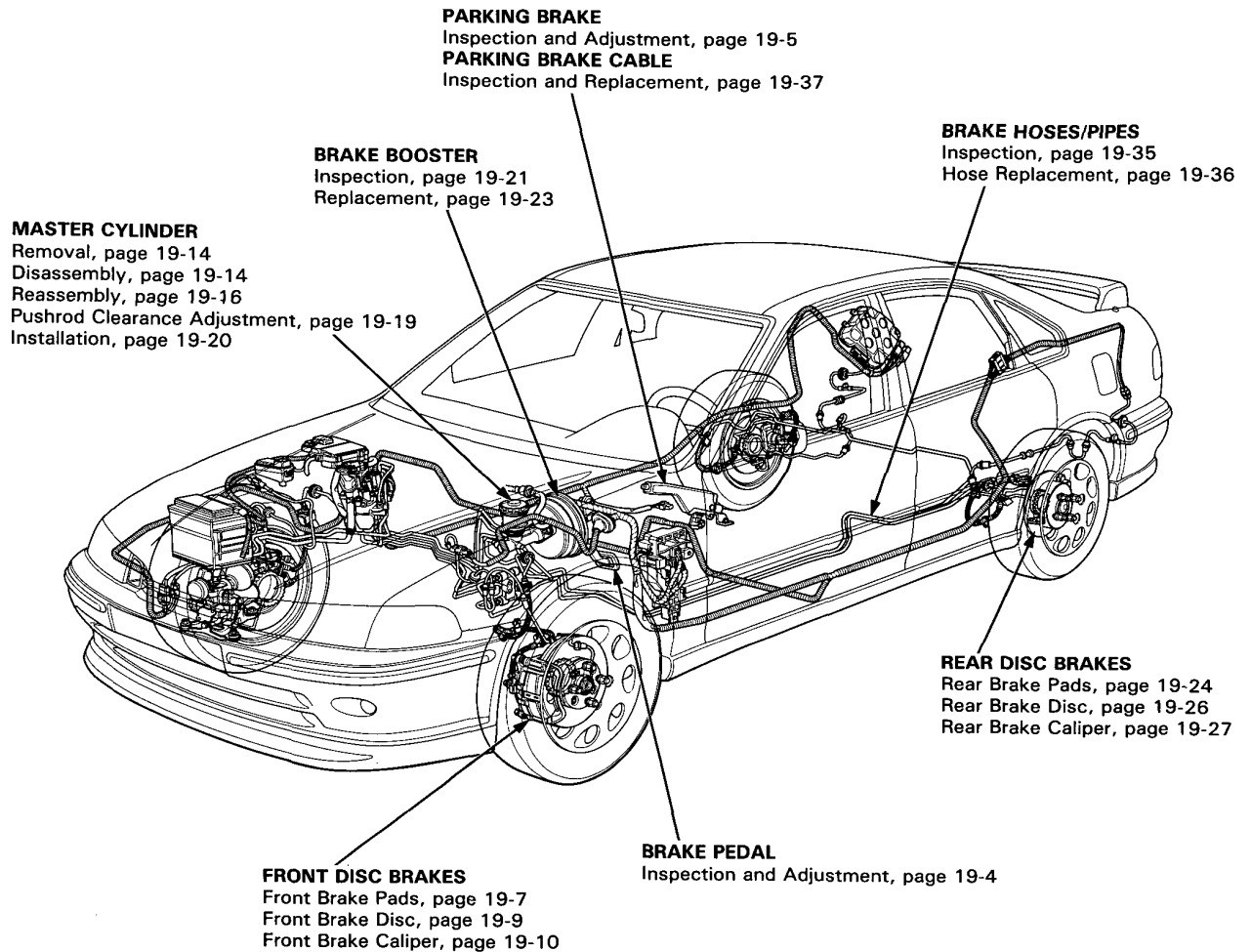
⑨



⑩

Component Location

Index

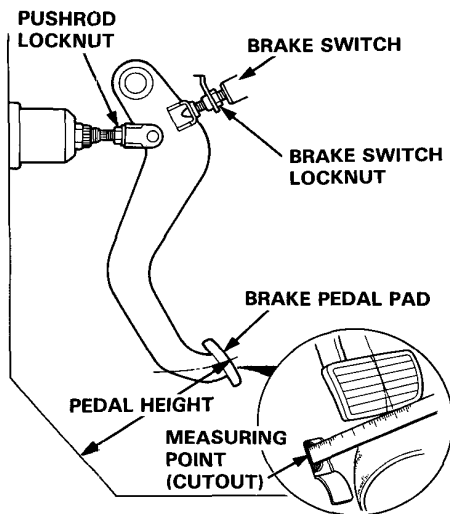


Inspection and Adjustment

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. Measure the pedal height from the lower side center of the pedal pad.

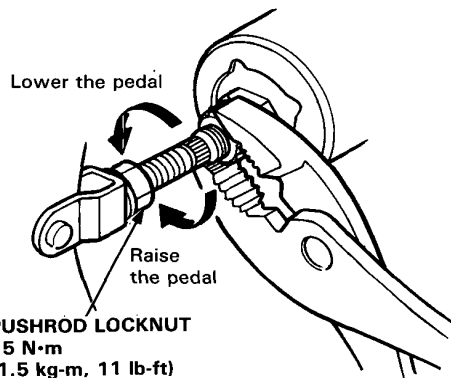


Standard Pedal Height (with floor mat removed):

M/T: 190 mm (7.5 in) minimum
A/T: 195 mm (7.7 in) minimum

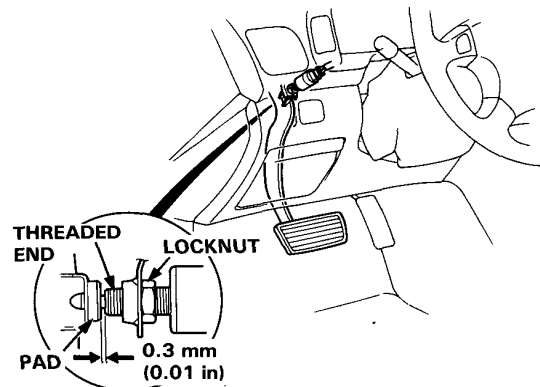
3. Loosen the pushrod locknut and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly.

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.

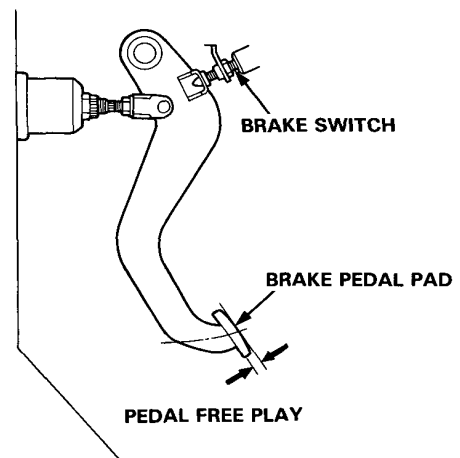
Pedal Free Play

1. Stop the engine and inspect the play on the pedal pad by pushing the pedal by hand.

Free Play: 1–5 mm (1/16–13/64 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.



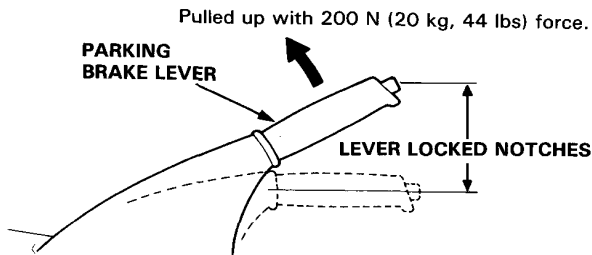


Parking Brake

Inspection

1. Pull the parking brake lever with 200 N (20 kg, 44 lbs) force, to fully applied the parking brake. The parking brake lever should be locked within the specified notches.

Lever Locked Notches: 7–11



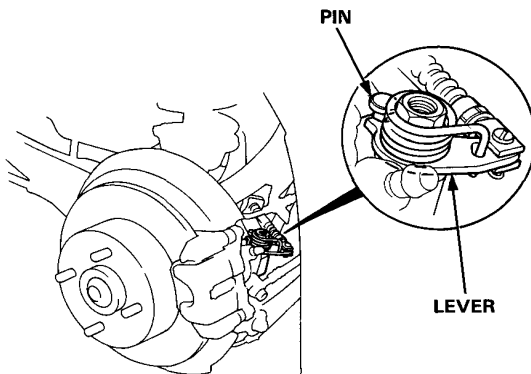
2. Adjust the parking brake if the lever notches are out of specification.

Adjustment

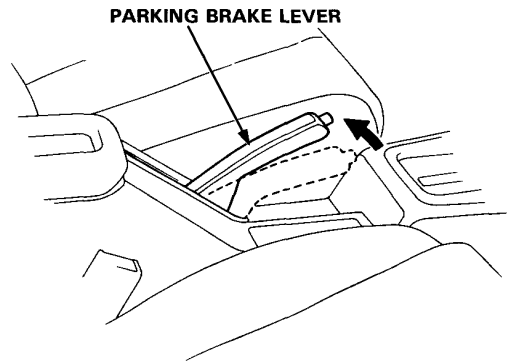
NOTE: After rear brake caliper servicing, loosen the parking brake adjusting nut, start the engine and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

⚠ WARNING Block the front wheels before jacking up the rear of the car.

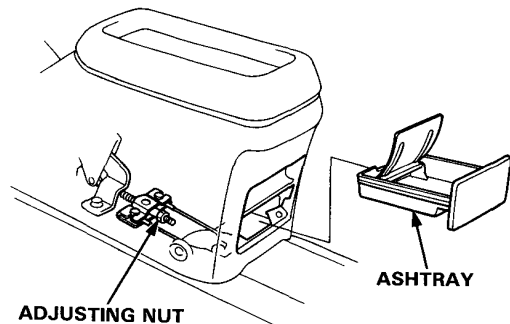
1. Raise the rear wheels off the ground.
2. Make sure the lever of the rear brake caliper contacts the brake caliper pin.



3. Pull the parking brake lever up one notch.



4. Remove the ashtray from the center console.
5. Tighten the adjusting nut until the rear wheels drag slightly when turned.



6. Release the parking brake lever fully and check that the rear wheels do not drag when turned. Readjust if necessary.
7. Make sure that the parking brakes are fully applied with the parking brake lever is pulled up fully.
8. Install the ashtray to its original position.

Inspection and Adjustment

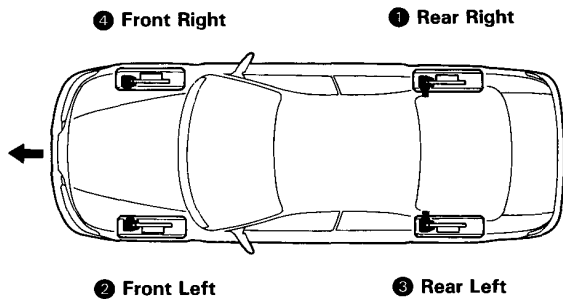
Bleeding

CAUTION:

- Use only clean DOT 3 or 4 brake fluid.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

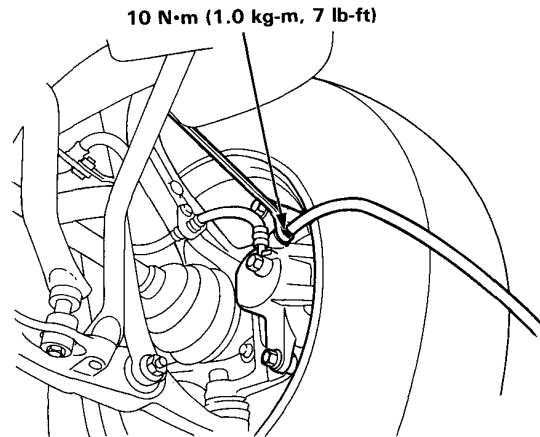
NOTE: The reservoir on the master cylinder must be full at the start of bleeding procedure, and checked after bleeding each brake caliper. Add fluid as required. Use only clean DOT 3 or 4 brake fluid.

BLEEDING SEQUENCE

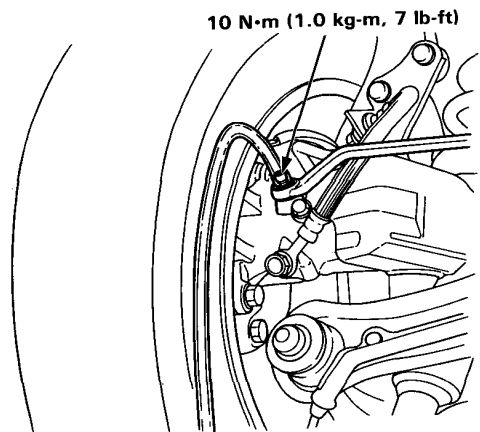


1. Have someone slowly pump the brake pedal several times, then apply steady pressure.
2. Loosen the brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
3. Repeat the procedure for each wheel in the sequence shown above, until air bubbles no longer appear in the fluid.

FRONT:



REAR:





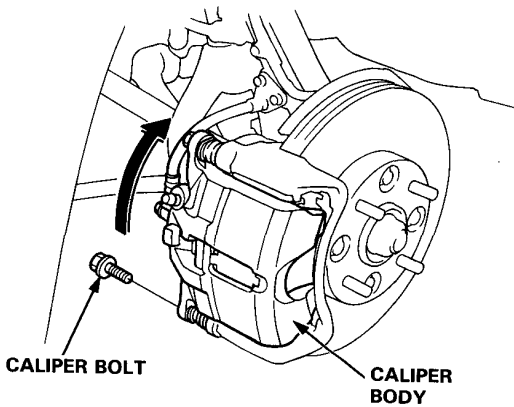
Front Brake Pads

Inspection and Replacement

⚠ WARNING

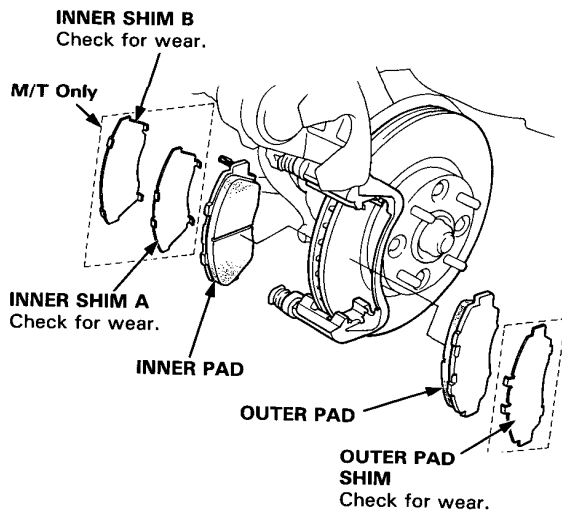
- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.

1. Loosen the front wheel nuts slightly, then raise the car and support on safety stands. Remove the front wheels.
2. Remove the caliper bolt and pivot the caliper body up out of the way.



NOTE: Check the hoses and pin boots for damage or deterioration.

3. Remove the pad shims (M/T only), inner and outer pads.



4. Using vernier calipers, measure the thickness of each brake pad lining.

Brake Pad Thickness:

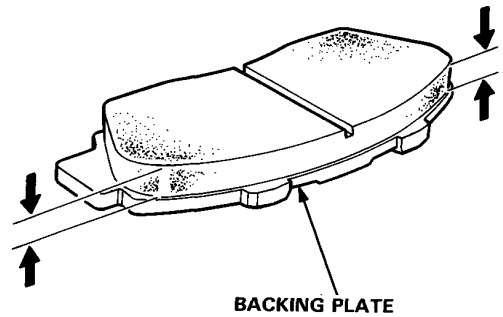
Standard:

A/T: 11.0 mm (0.43 in)

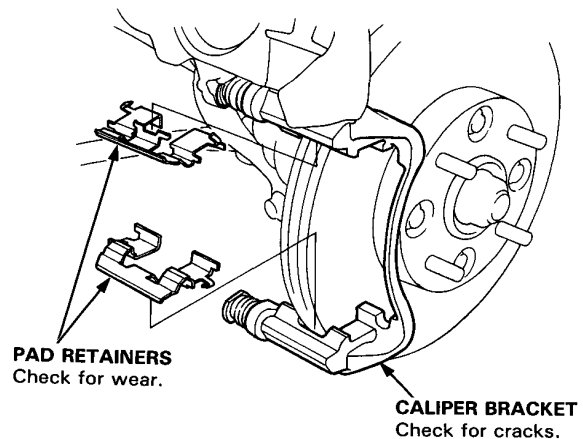
M/T: 12.5 mm (0.49 in)

Service Limit: 1.6 mm (0.06 in)

NOTE: Measurement does not include pad backing plate thickness.



5. If the brake pad thickness is less than service limit, replace the front pads as a set.
6. Remove the pad retainers.
7. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
8. Check the brake disc for damage or cracks.
9. Install the pad retainers.



(cont'd)

Front Brake Pads

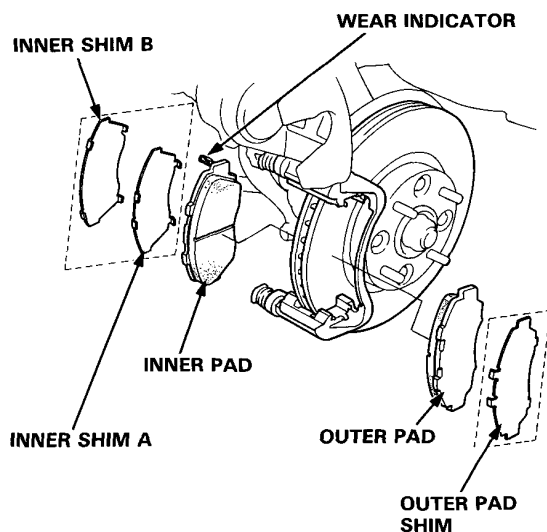
Inspection and Replacement (cont'd)

10. Install the brake pads and pad shim correctly.

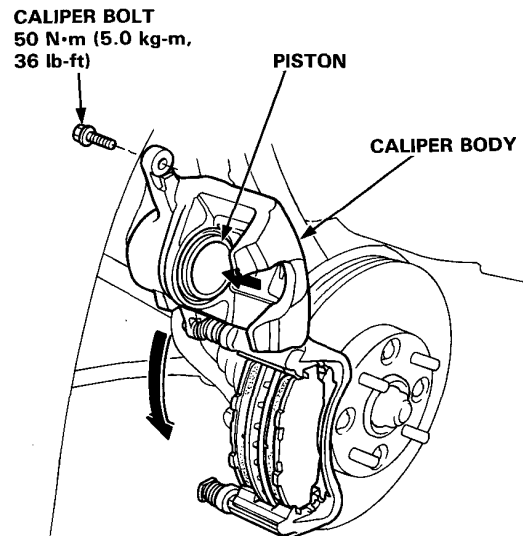
⚠ WARNING

- 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 inner pad with the wear indicator on the inside.



11. 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.
12. Pivot the caliper down into position, then install caliper bolt and tighten it.



13. Depress the brake pedal several times to make sure the brakes work, then road-test.

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.

14. 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 car and support on safety stands. Remove the front wheels.
2. Remove the brake pads (see page 19-7).
3. Inspect the disc surface for damage or 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.

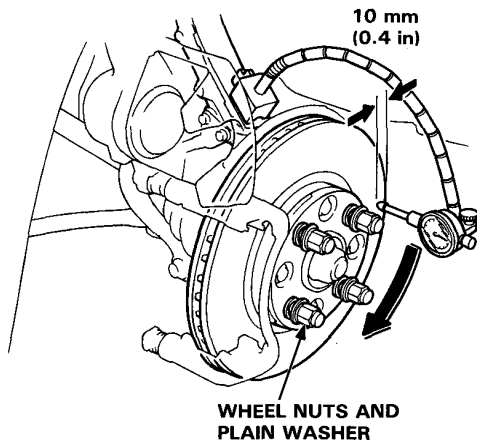
Brake Disc Runout:

Service Limit: 0.10 mm (0.004 in)

5. If the disc is beyond the service limit, refinish the rotor with a 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.

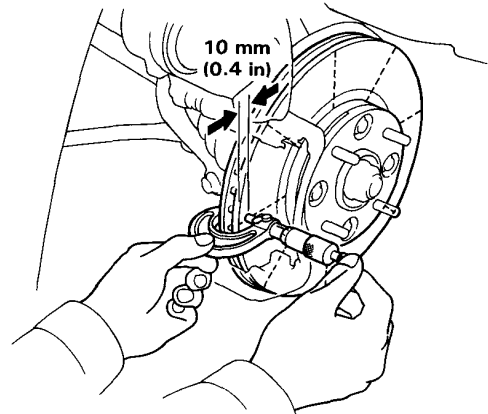
Max. Refinishing Limit: 21.0 mm (0.83 in)

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 car and support on safety stands. Remove the front wheels.
2. Remove the brake pads (see page 19-7).
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: 23.0 mm (0.91 in)

Max. Refinishing Limit: 21.0 mm (0.83 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: The maximum difference between any thickness measurements should specification.

4. If the disc is beyond the service limit for parallelism, refinish the rotor 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 page 18-11 for brake disc replacement.

Front Brake Caliper

Disassembly

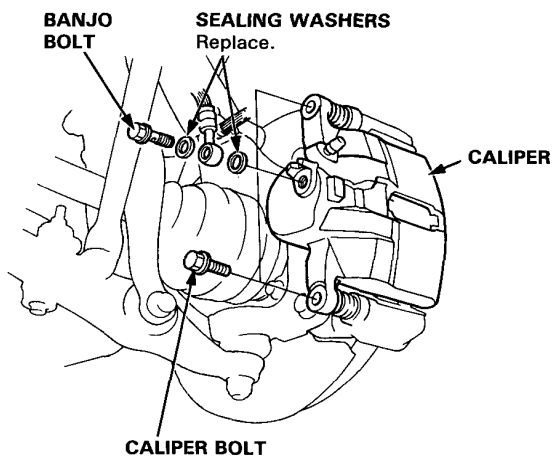
⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.

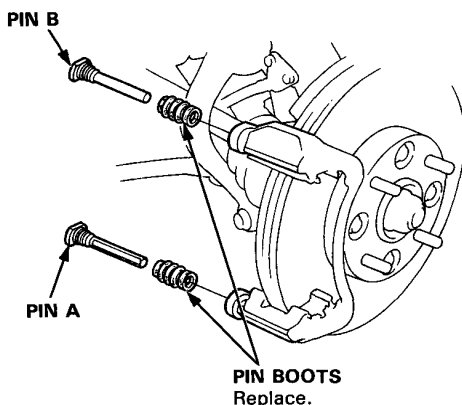
CAUTION:

- Do not spill brake fluid on the car; 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; below out all passages with compressed air.

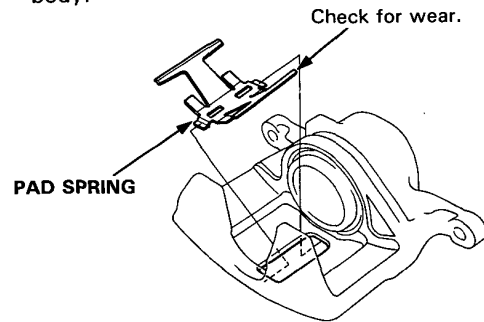
1. Remove the banjo bolt and disconnect the brake hose from the caliper.
2. Remove the caliper bolts, then remove the caliper.



3. Remove the pins and pin boots from the caliper bracket.



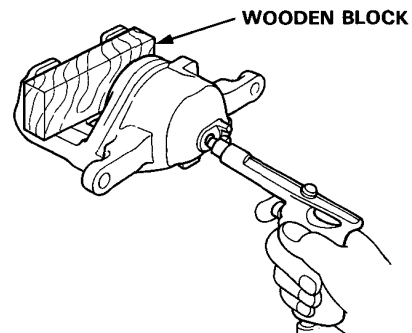
4. A/T only: Remove the pad spring from the caliper body.



5. 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.

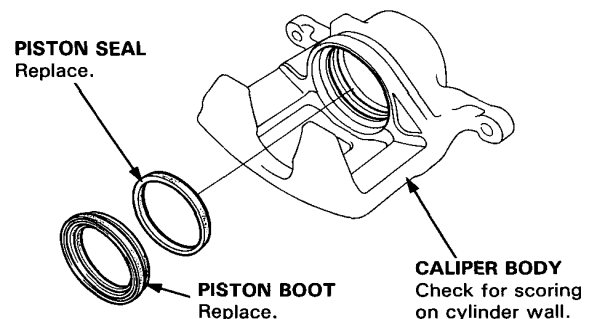
⚠ WARNING

- Do not place your fingers in front of the piston.
- Do not use high air pressure.



6. Remove the piston from the caliper and check the piston for scoring on surface.
7. Remove the 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 a vacuum cleaner, to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.
- When reusing the pads, always reinstall the brake pads to their original positions to prevent loss of braking efficiency.

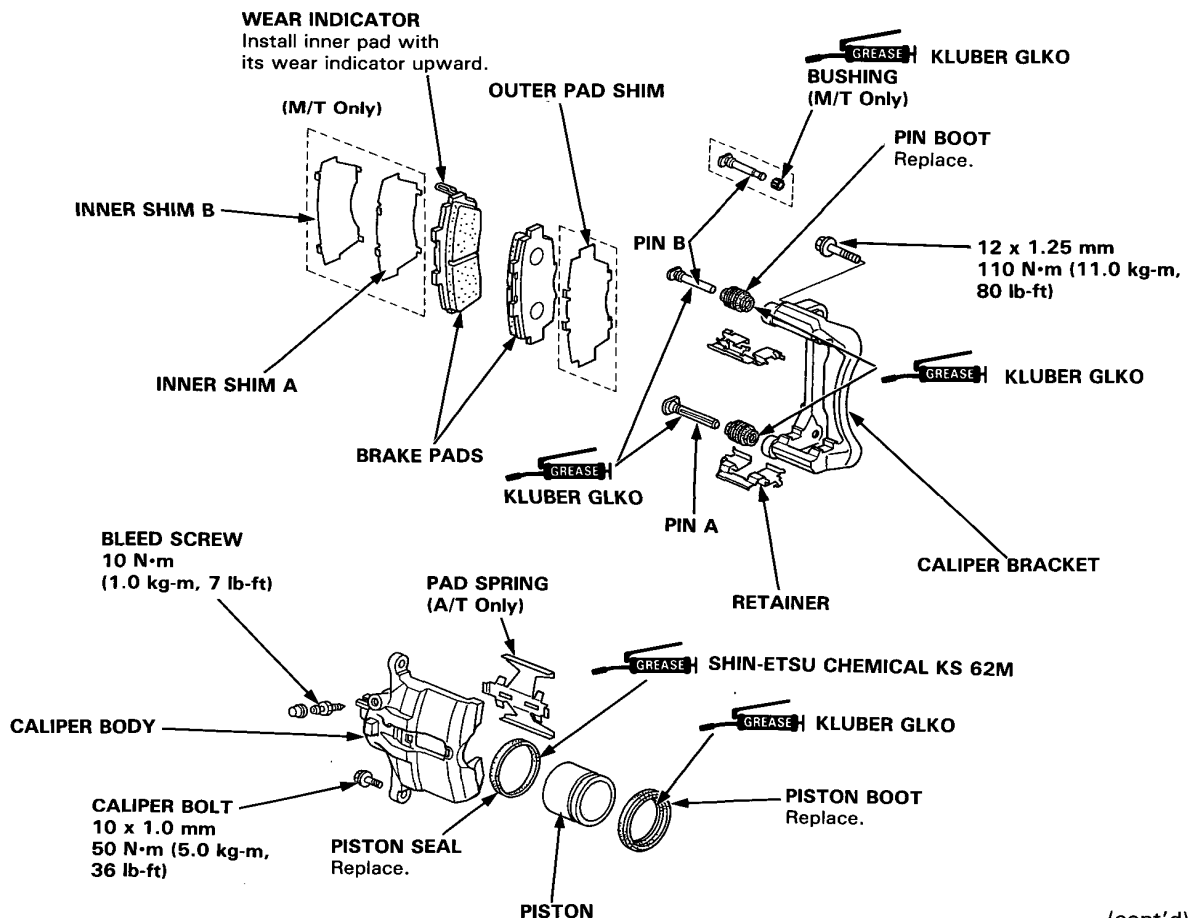
CAUTION:

- Do not spill brake fluid on the car; 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.
- 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE:

- Coat piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

-  : Use recommended grease in the caliper seal set.



(cont'd)

Front Brake Caliper

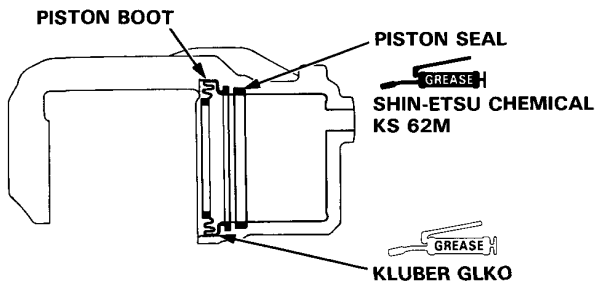
Reassembly (cont'd)

CAUTION:

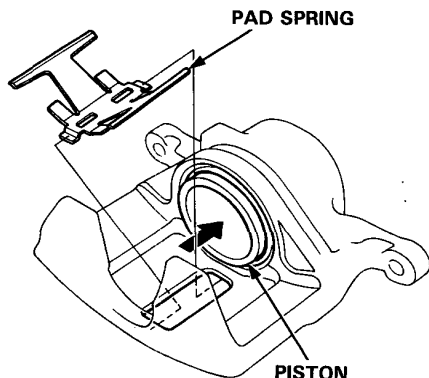
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

1. Clean the piston and caliper bore with brake fluid and inspect for wear or damage.
2. Coat a new piston seal with recommended grease in the caliper seal set and install the seal in the cylinder groove.

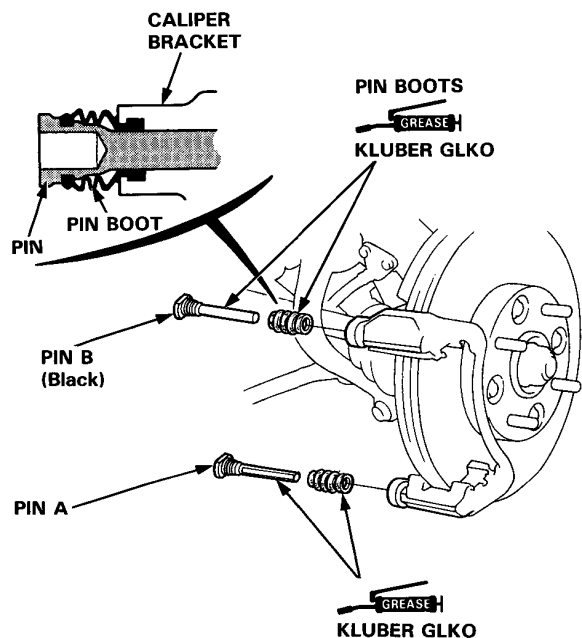
3. Apply recommended grease in the caliper seal set to the sealing lips and inside of a new piston boot, and install the boot in the cylinder groove.



4. Lubricate the caliper cylinder and piston with brake fluid, then install the piston in the cylinder with the dished end facing in.
5. A/T only: Install the pad spring on the caliper body.

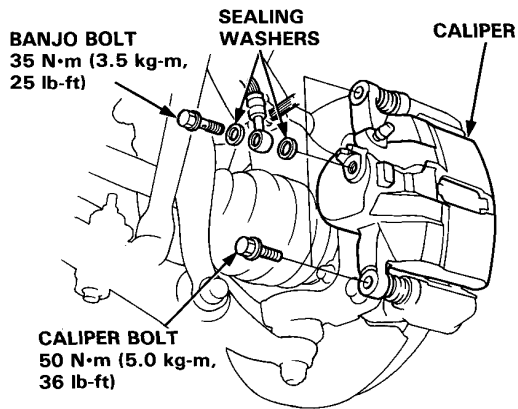


6. Apply recommended grease in the caliper seal set to sliding surface of the pins and inside of the new pin boots.
7. Install the pin boots into the groove in the caliper bracket properly.
8. Insert the pin A and pin B into the caliper bracket.
9. Install the pin boots into the groove in pins properly.





10. Install the brake pad retainers and brake pads in their original positions (see page 19-8).
11. Install the caliper on the caliper bracket and 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 up and bleed the brake system (see page 19-6).
14. After installation, check for leaks at hose and line joints or connection, and retighten if necessary.

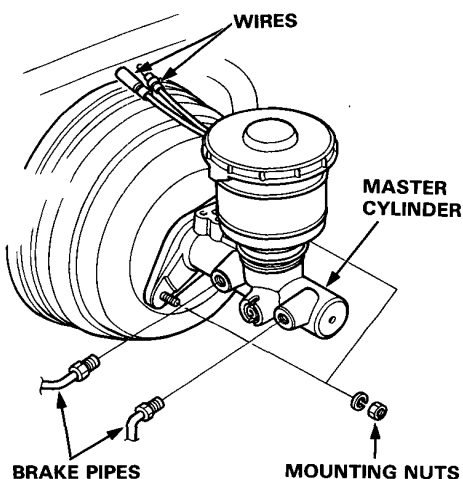
Master Cylinder

Removal

CAUTION:

- Be careful not to bend or damage the brake pipes when removing master cylinder or booster.
- Do not spill brake fluid on the car; 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.

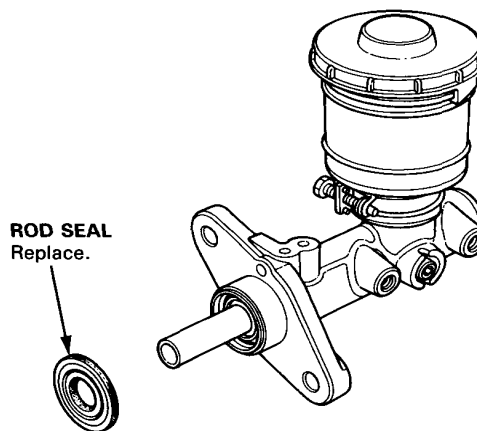
1. Drain the brake fluid from the master cylinder.
2. Disconnect the brake fluid level switch wires.
3. Disconnect the brake pipes from the master cylinder.
4. Remove the master cylinder mounting nuts and the master cylinder.



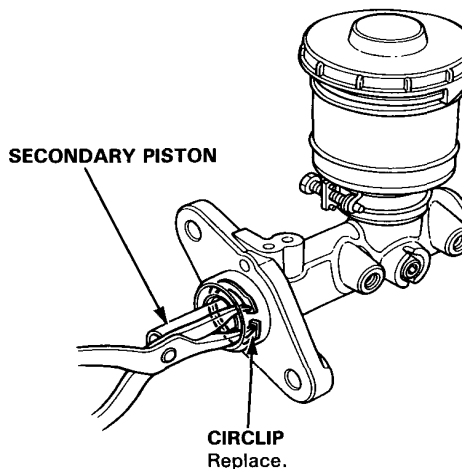
Disassembly

CAUTION:

- Do not spill brake fluid on the car; 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.

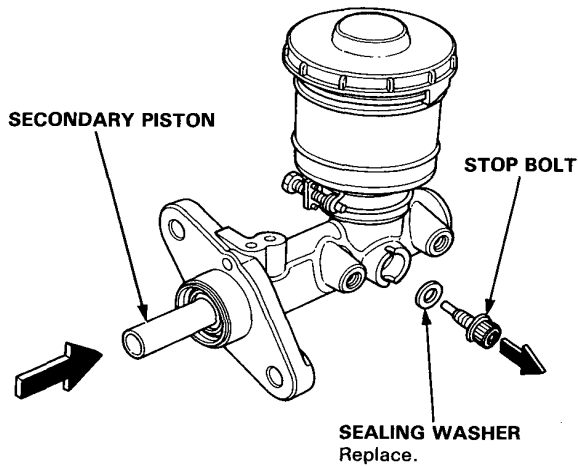


1. Remove the circlip while pushing in the secondary piston.





2. Remove the stop bolt while pushing in the secondary piston.

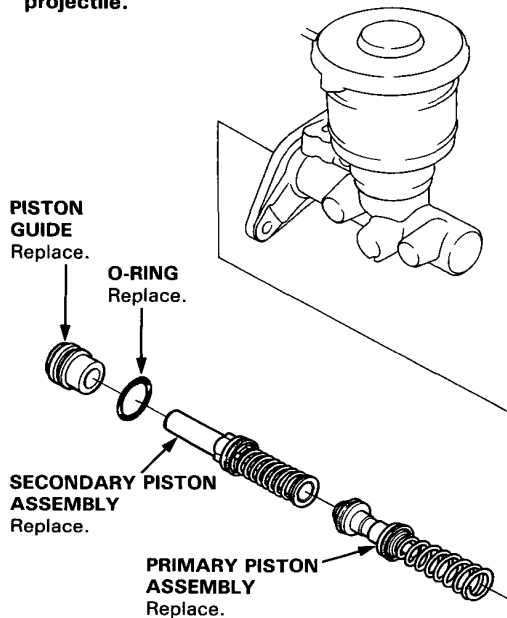


3. Remove the piston guide, secondary piston assembly and primary piston assembly.

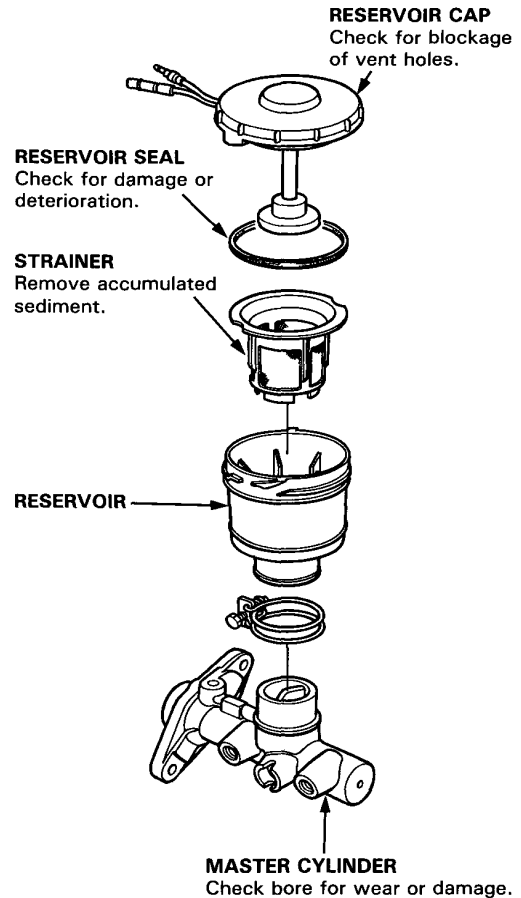
NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side port.

CAUTION:

- Do not use high pressure air or bring the nozzle too close to the port.
- Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.



4. Remove the reservoir cap, strainer and reservoir from the master cylinder.
5. Remove the reservoir seal from the reservoir cap.



Master Cylinder

Reassembly


CAUTION:

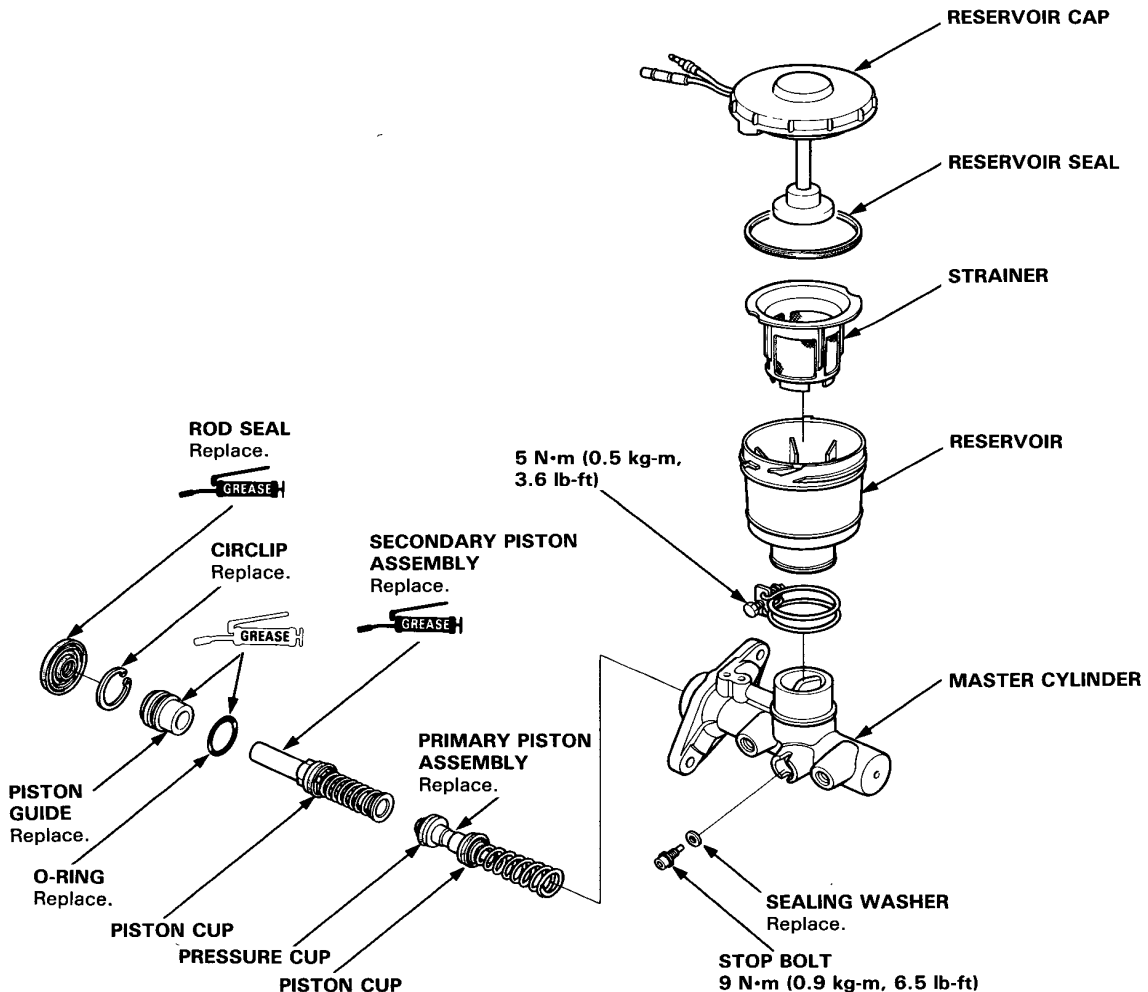
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- Replace the master cylinder if the bore is damaged or worn. Do not hone or attempt to refinish the bore.

NOTE:

- Coat piston cups, pressure cup and master cylinder bore with clean brake fluid.
- Use recommended greases in the master cylinder seal set.

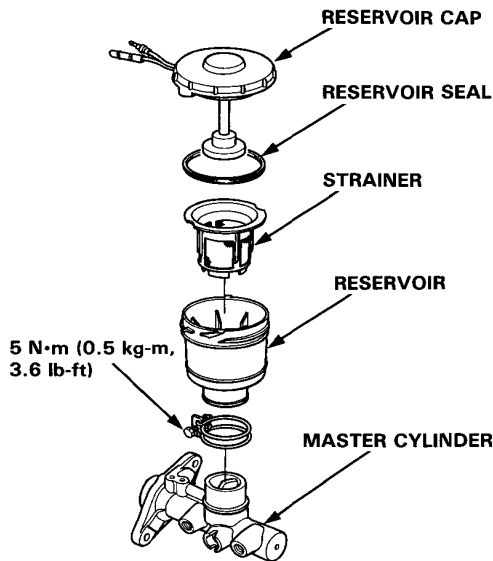
 GREASE: KLUBER GLKO

 GREASE: SHIN-ETSU CHEMICAL KS 62M

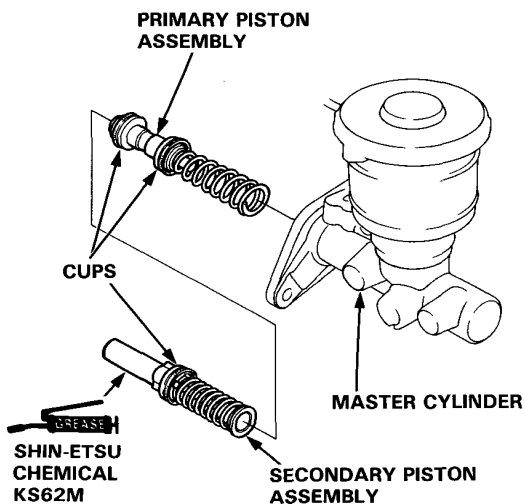




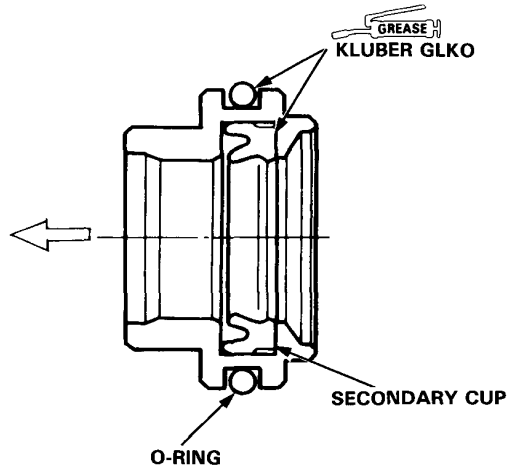
1. Install the reservoir on the master cylinder with a clamp as shown.
2. Install the reservoir seal in the groove of the reservoir cap.
3. Install the strainer and reservoir cap on the reservoir.



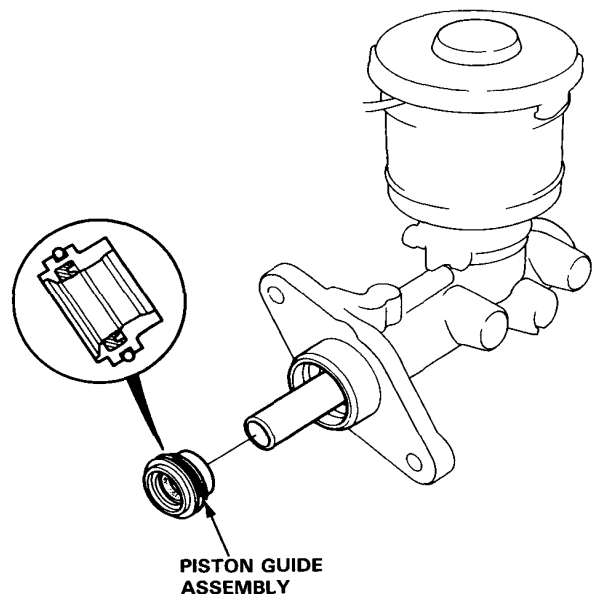
4. Apply recommended grease in the master cylinder seal set to a new secondary piston.
5. Lubricate the cups of new primary and secondary piston assemblies with clean brake fluid, and install them into the master cylinder.



6. Apply recommended grease in the master cylinder seal set to a new O-ring and the secondary cup in a new piston guide and install the O-ring onto the piston guide.



7. Install the piston guide assembly into the master cylinder.

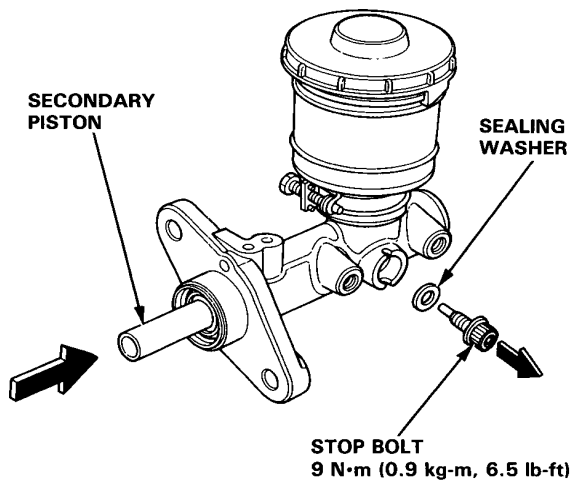


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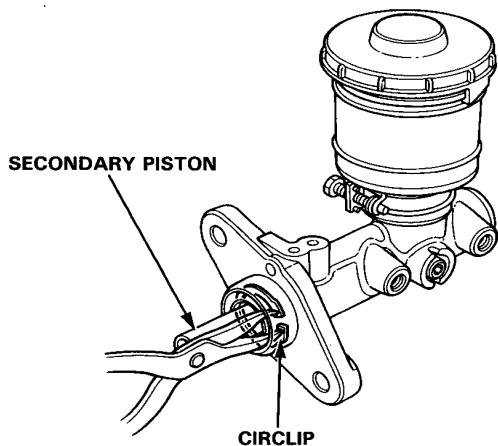
Master Cylinder

Reassembly (cont'd)

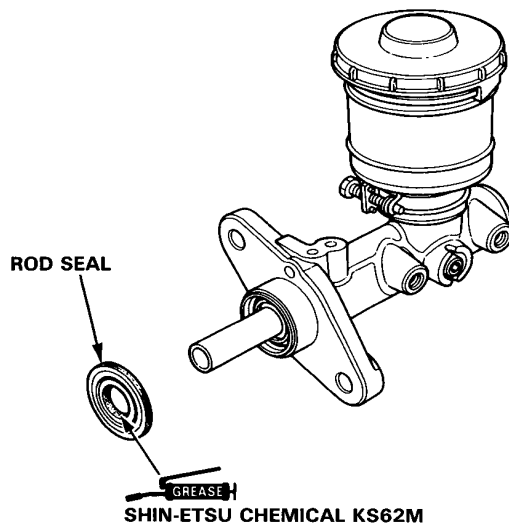
8. Install the stop bolt with a new sealing washer while pushing in the secondary piston, and tighten the stop bolt.



9. Install a new circlip while pushing in the secondary piston.



10. Apply recommended grease in the master cylinder seal set to a new rod seal and install the seal onto the master cylinder.

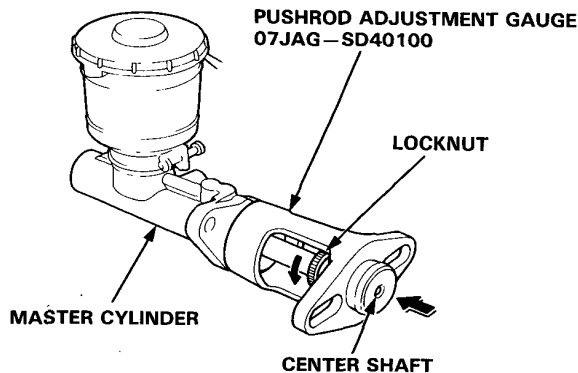




Pushrod Clearance Adjustment

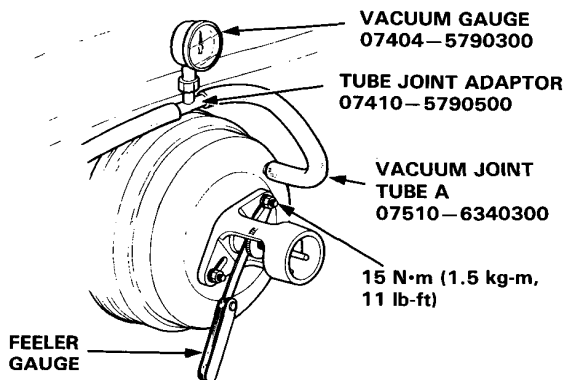
NOTE: Master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing master cylinder.

1. Set the special tool on the master cylinder body; push in the center shaft until the top of it contacts with the end of the secondary piston and lock it with locknut.



2. Install the special tool upside down on the booster without disturbing the adjusting bolt's position.
3. Install the master cylinder nuts and tighten to the specified torque.
4. Connect the booster in-line with the Brake Power Kit (07504-6340100) to the booster's engine vacuum supply, and maintain a engine speed that will deliver 500 mm Hg (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 (0-0.016 in)



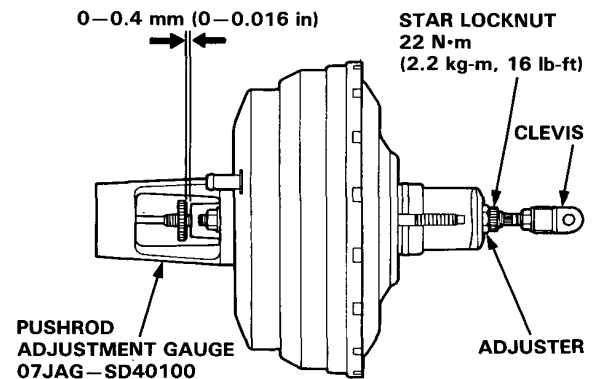
NOTE: If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in), the pushrod-to-piston clearance is 0 mm. However, the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in) or more. Therefore, it must be adjusted and rechecked.

6. If clearance is incorrect, loosen the star locknut and turn the adjuster in or out to adjust.

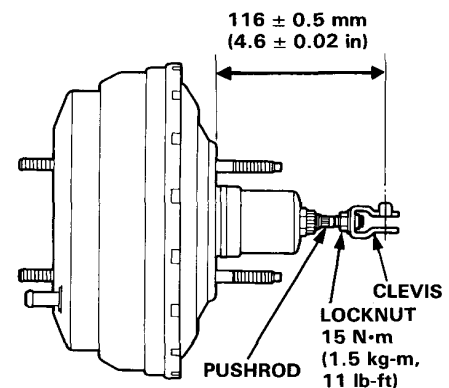
NOTE:

- Adjust the clearance while the specified vacuum is applied to the booster.
- Hold the clevis while adjusting.

7. Tighten the star locknut securely.



8. Adjust the pushrod length as shown if the booster is removed.



9. Install the master cylinder (see page 19-20).

Master Cylinder

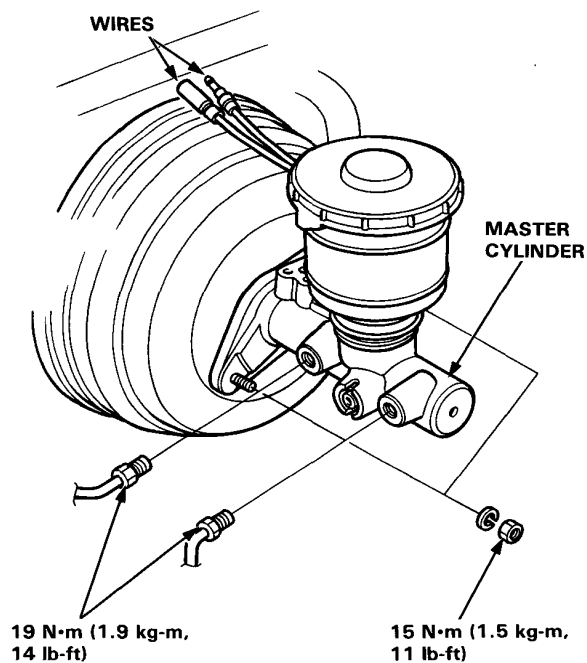
Installation

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Be careful not to bend or damage the brake pipes when installing the master cylinder.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- When connecting the brake pipes, make sure that there is no interference between the brake pipes and other parts.

NOTE: Before installing the master cylinder, check and adjust the pushrod clearance (see page 19-19).

1. Install the master cylinder on the brake booster with the mounting nuts.
2. Connect the brake pipes to the master cylinder.
3. Fill the master cylinder reservoir up and bleed the brake system (see page 19-6).
4. Install the reservoir cap and connect the fluid level switch wires.
5. Perform the following inspections and adjust if necessary.
 - Brake pedal height (see page 19-4)
 - Brake pedal free play (see page 19-4)



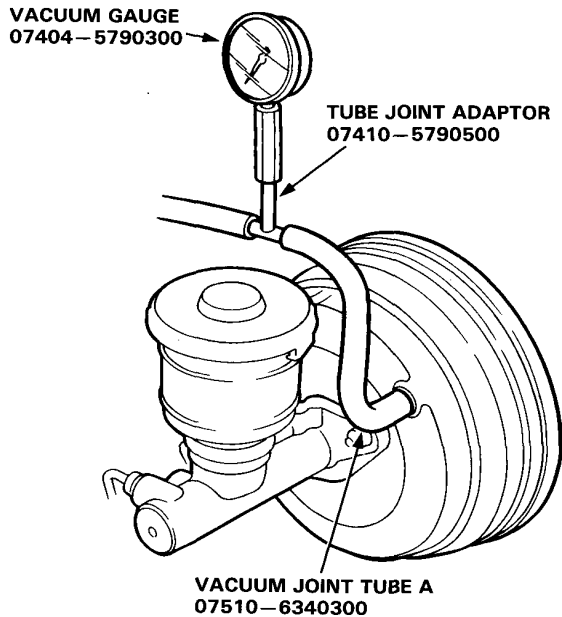
Brake Booster



Inspection

Leak Test

1. Install the Brake Power Kit (07504-6340100) as shown.



2. Start the engine, adjust the engine speed with the accelerator pedal so that the vacuum gauge readings show 300-500 mmHg (11.8-19.7 in-Hg), then stop the engine.
3. Read the vacuum gauge.

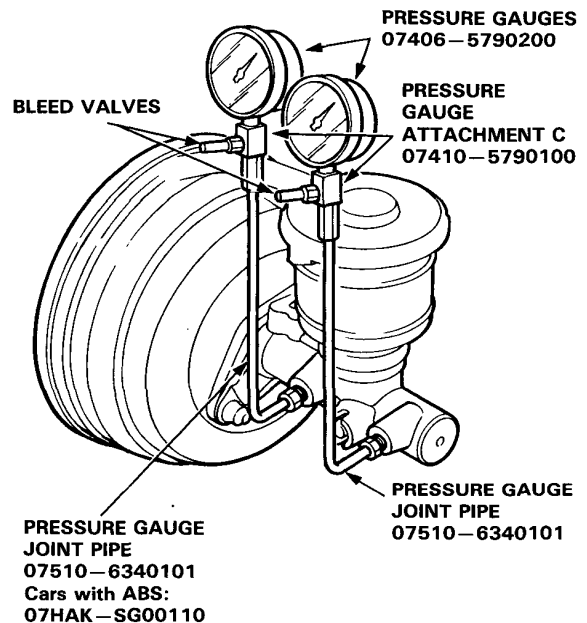
If the vacuum reading decreases 20 mmHg (0.8 in-Hg) or more after 30 seconds, check following parts for leaks.

- Check valve
- Vacuum hose, pipe
- Seals
- Brake booster
- Master cylinder

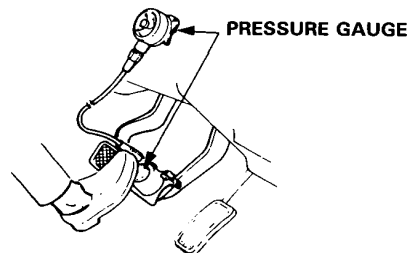
CAUTION: Do not try to disassemble the brake booster. Replace the brake booster as an assembly with new one.

Function Test

1. Install the vacuum gauge as same the leak test.
2. Connect the oil pressure gauges to the master cylinder using the attachments as shown.
3. Bleed air through the valves.



4. Start the engine.
5. Depress the brake pedal with a 200 N (20 kg, 44 lbs) of pressure. The following pressures should be observed at the pressure gauges in each vacuum.



(cont'd)

Brake Booster

Inspection (cont'd)

Cars Without ABS

Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm ² , psi)
0 (0)	920 (9.4, 130)
300 (11.8)	5500 (56.0, 800)
500 (19.7)	8500 (87.0, 1200)

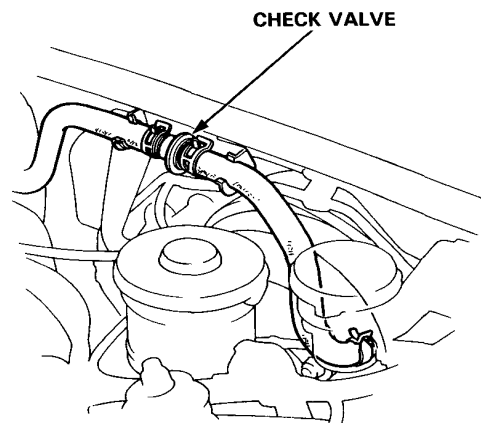
Cars With ABS

Vacuum mm (in) Hg	Mim. Line Pressure kPa (kg/cm ² , psi)
0 (0)	810 (8.3, 120)
300 (11.8)	6100 (62.0, 880)
500 (19.7)	8200 (83.2, 1200)

6. Inspect the master cylinder for leaks if the readings do not fall within the limits shown above.

Check Valve Test

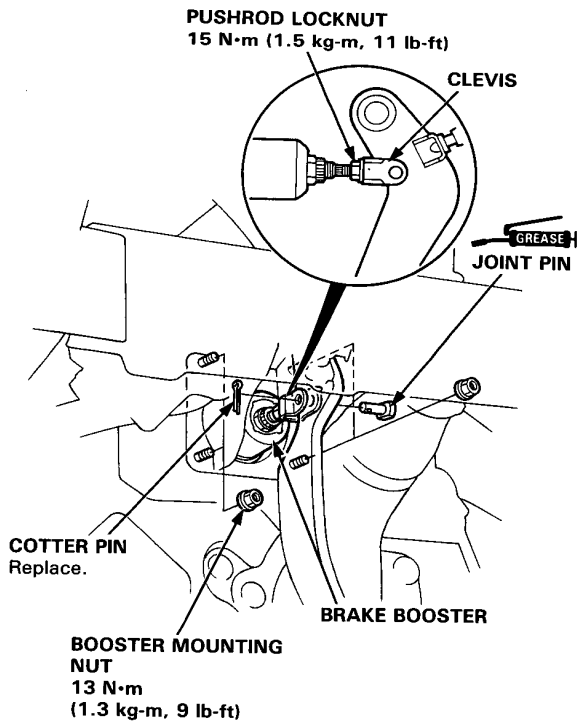
1. Disconnect the brake booster vacuum hose at the booster.
2. Start the engine and let it idle. There should be vacuum available. If no vacuum is available, the check valve is not working correctly. Replace the check valve and retest.



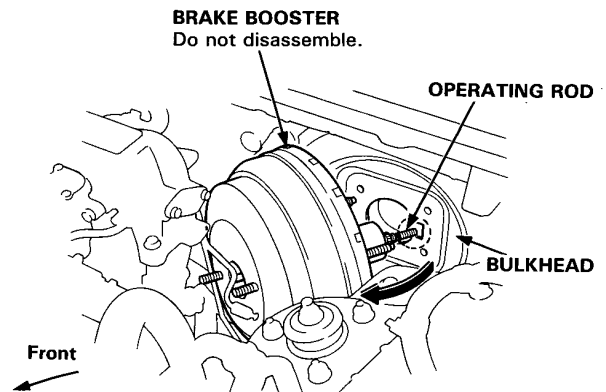


Replacement

1. Remove the master cylinder (see page 19-14).
2. RHD only: Remove the under-hood fuse/relay box.
3. M/T only: Remove the clutch reservoir and reservoir bracket. Do not disconnect the clutch hose from the reservoir.
4. Disconnect the vacuum hose from the booster and remove the vacuum hose bracket.
5. Remove the throttle/cruise control cable bracket, then remove the throttle cable grommet from the engine compartment bulkhead.
6. Remove the intake air temperature sensor from the intake manifold.
7. Loosen the pushrod locknut.
8. Remove the cotter pin and joint pin.
9. Remove the clevis from the operating rod.
10. Remove the four booster mounting nuts.



11. Pull the brake booster forward, then turn it to the right (RHD: left) until the operating rod is clear of the bulkhead as shown below.
12. Remove the brake booster from the engine compartment.



NOTE: Adjust the pushrod clearance before installing the booster (see page 19-19).

13. Install the brake booster in the reverse order of removal.
14. Install the master cylinder (see page 19-20).
15. After installation, perform the following inspections and adjust if necessary.
 - Brake pedal height (see page 19-4)
 - Brake pedal free play (see page 19-4)

Rear Brake Pads

Inspection and Replacement

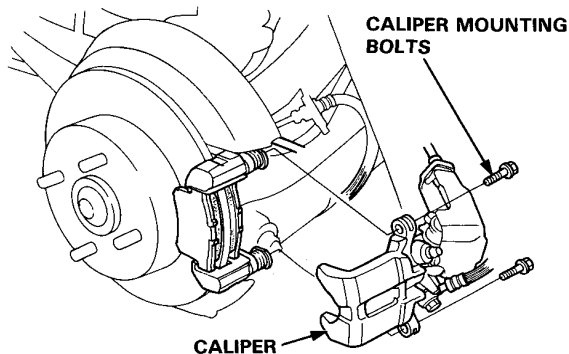
⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.

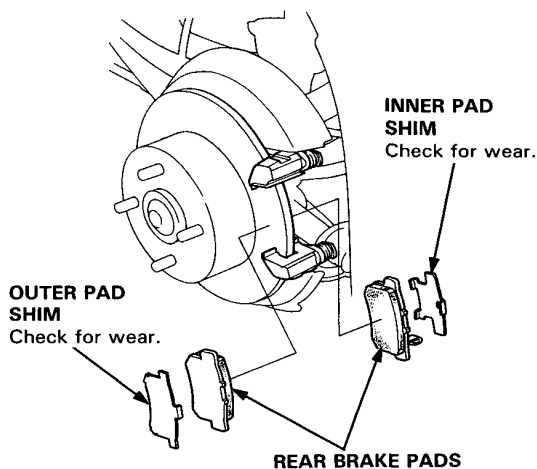
1. Block the front wheels, loosen the rear wheel nuts slightly, support the rear of car on safety stands, then remove the rear wheels.
2. Release the parking brake.
3. Remove the two caliper mounting bolts and the caliper from the bracket.

CAUTION:

- Thoroughly clean the outside of the caliper to prevent dust and dirt from entering inside.
- Support the caliper with a piece of wire so that it does not hang from the brake hose.



4. Remove the pad shims and brake pads.

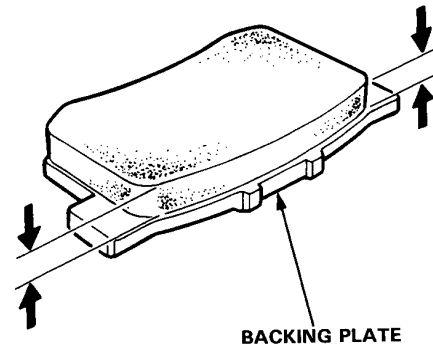


5. Using vernier calipers, measure the thickness of each brake pad lining.

Brake Pad Thickness:

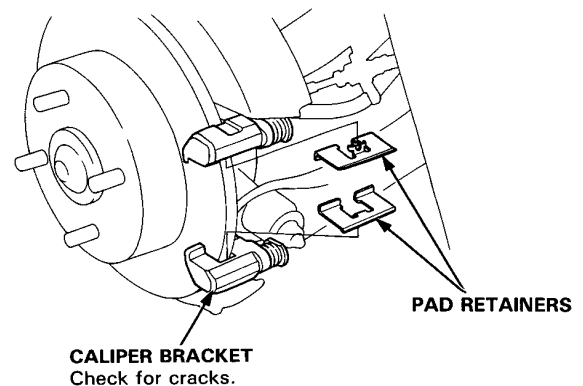
Standard: 9.0 mm (0.35 in)

Service Limit: 1.6 mm (0.06 in)



NOTE: Measurement does not include pad backing plate thickness.

6. Remove the pad retainers.
7. Clean the caliper thoroughly; remove any rust, and check for grooves or cracks.
8. Check the brake disc for damage or cracks.
9. Make sure that the pad retainers are installed in the correct positions.



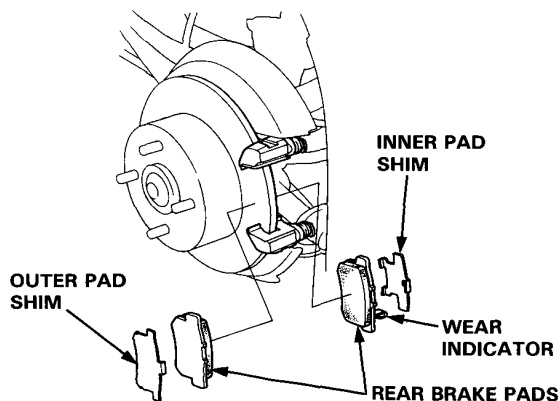


10. Install the brake pads and pad shims on caliper bracket.

⚠ 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 inner pad with its wear indicator facing downward.

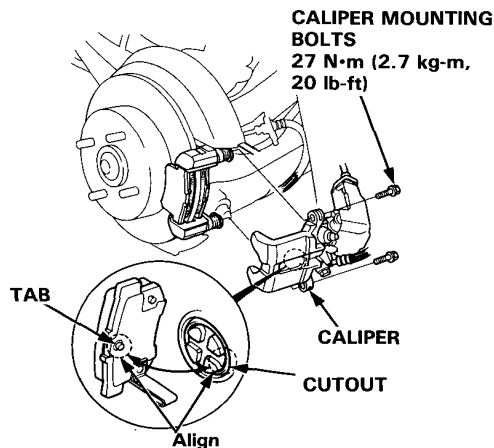


11. Rotate the caliper piston clockwise into place in the cylinder, then align the cutout in the piston with the tab on the inner pad by turning the piston back.

CAUTION: Lubricate the boot with rubber grease to avoid twisting the piston boot. If piston boot is twisted, back it out so it sits properly.

12. Install the brake caliper.

13. Install and tighten the caliper mounting bolts.



14. After installations, check for leaks at hose and line joints or connections, and retighten if necessary.

15. Depress the brake pedal several times to make sure the brakes work, then road-test.

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.

Rear Brake Disc

Disc Runout Inspection

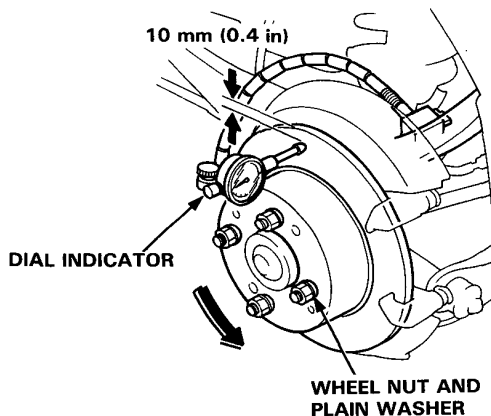
1. Loosen the rear wheel nuts slightly, then raise the car and support on safety stands. Remove the rear wheels.
2. Remove the brake pads (see page 19-24).
3. Inspect the disc surface for damage or cracks. Clean the disc thoroughly and remove all rust.
4. Use wheel nuts and suitable plain washers to 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 rotor.

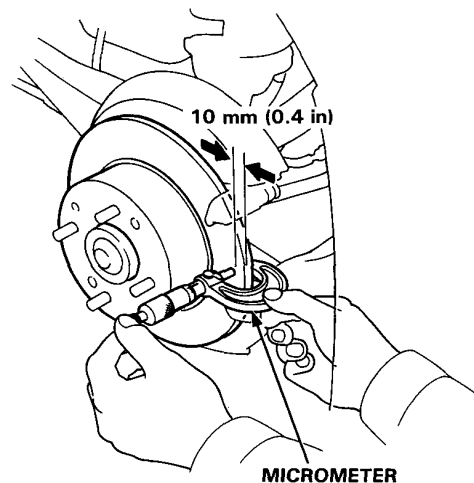
Max. Refinishing Limit: 8.0 mm (0.32 in)



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 rear wheel nuts slightly, then raise the car and support on safety stands. Remove the rear wheels.
2. Remove the brake pads (see page 19-24).
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: 10 mm (0.4 in)

Max. Refinishing Limit: 8 mm (0.32 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.

The difference between any thickness measurements should not be more than specification.

4. If the disc is beyond the service limit for parallelism, refinish the rotor.

NOTE: See page 18-27 for brake disc replacement.

Rear Brake Caliper



Disassembly

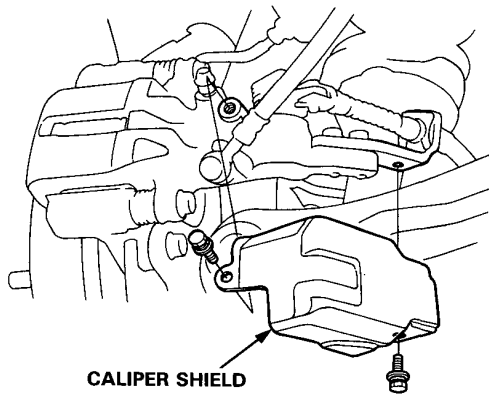
⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.

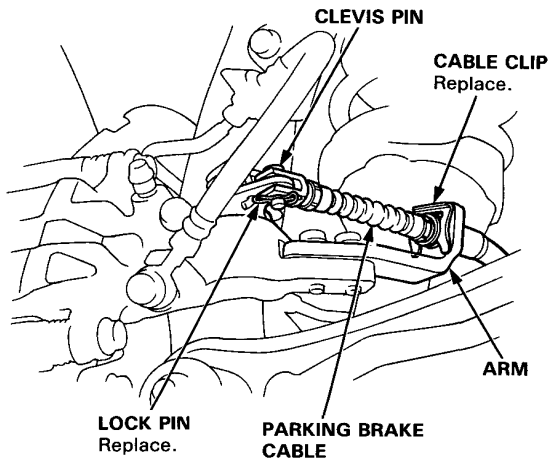
CAUTION:

- Do not spill brake fluid on the car; 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.

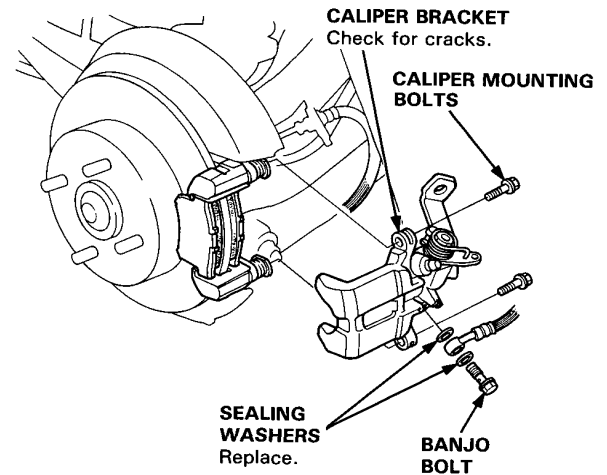
1. Remove the caliper shield.



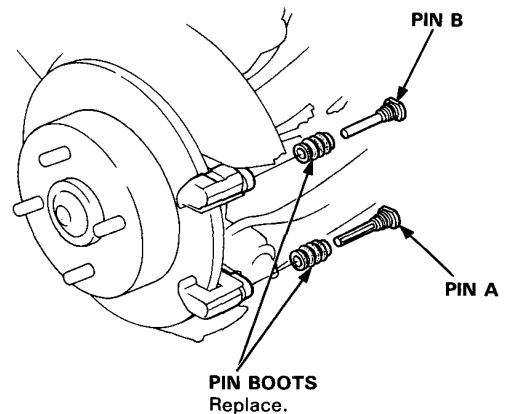
2. Remove the lock pin and clevis pin. Remove the cable clip and disconnect the cable from the arm.



3. Remove the banjo bolt and two sealing washers.
4. Remove the two caliper mounting bolts and caliper body from the bracket.



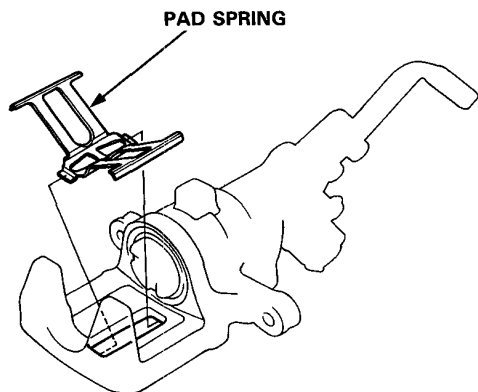
5. Remove the pins and pin boots from the caliper bracket.



(cont'd)

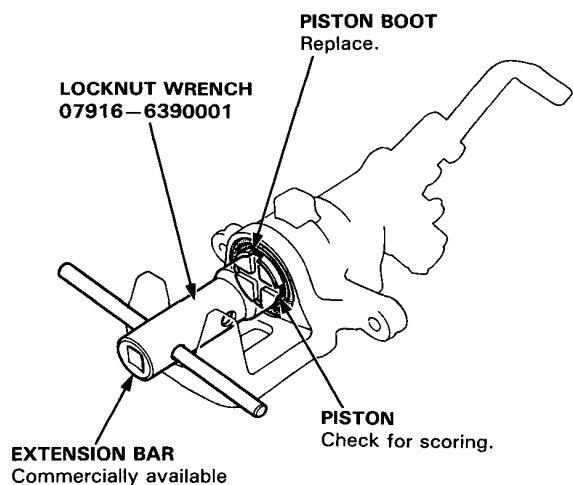
Rear Brake Caliper Disassembly (cont'd)

6. Remove the pad spring from the caliper body.



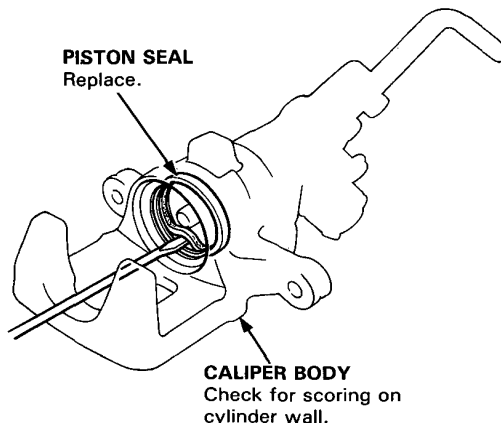
7. Remove the piston by rotating the piston counterclockwise with the special tool and remove the piston boot.

CAUTION: Avoid damaging the piston.



8. Remove the piston seal.

CAUTION: Take care not to damage the cylinder bore.

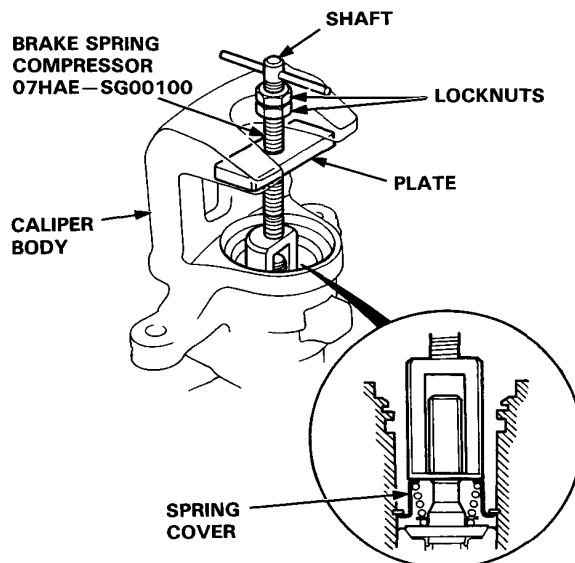


9. Install the special tool between the caliper body and spring cover.

CAUTION: Be careful not to damage the inside of the caliper cylinder during caliper disassembly.

10. Position the locknuts as shown, then turn the shaft until the plate just contacts the caliper body.

NOTE: Do not compress the spring under the spring cover.



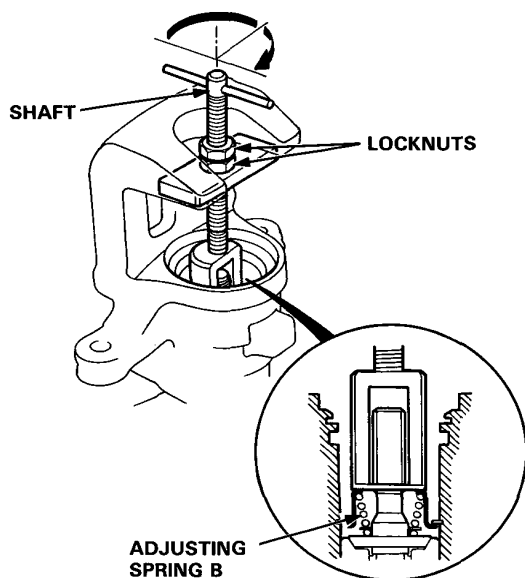


11. Turn the shaft clockwise $1/4$ – $1/2$ turn to compress the adjusting spring B in the caliper body.

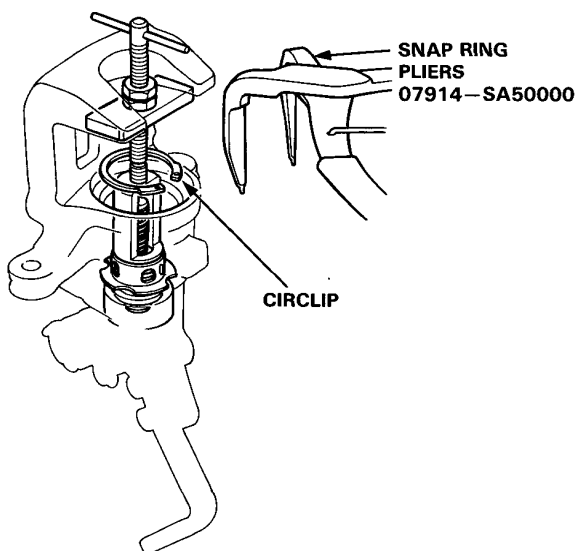
CAUTION: To prevent damage to the inner components, do not turn the shaft more than $1/2$ turn.

12. Lower the locknuts fully and tighten the locknuts securely.

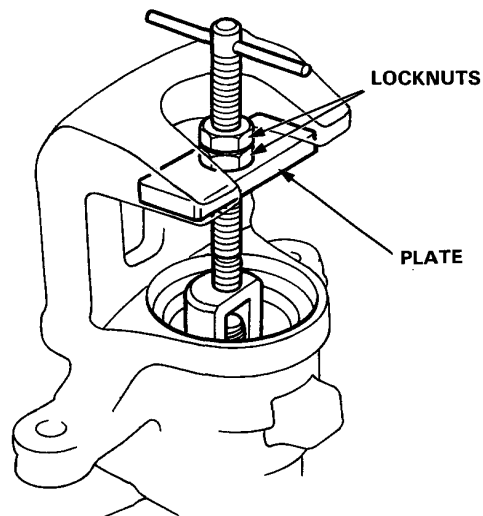
NOTE: Keep the locknuts in this position until you reinstall the circlip.



13. Remove the circlip with snap ring pliers.

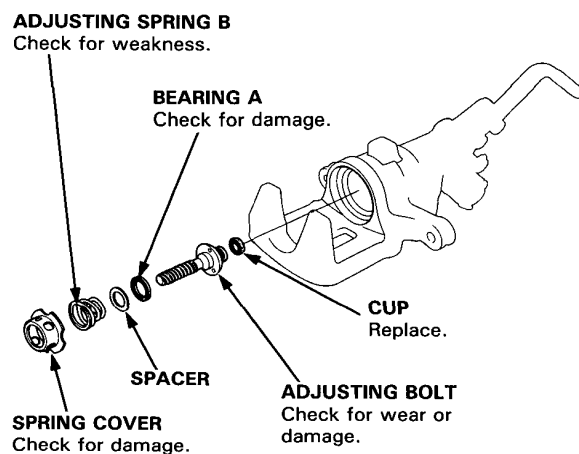


14. Hold the plate with your fingers and turn the shaft counterclockwise. Remove the special tool from the caliper.



15. Remove the adjusting bolt.

16. Remove the spring cover, adjusting spring B, spacer, bearing A and cup from the adjusting bolt.

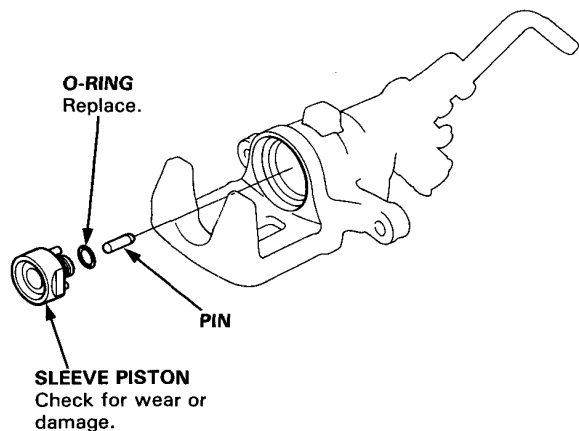


(cont'd)

Rear Brake Caliper

Disassembly (cont'd)

17. Remove the sleeve piston, and remove the pin from the cam in the caliper body.

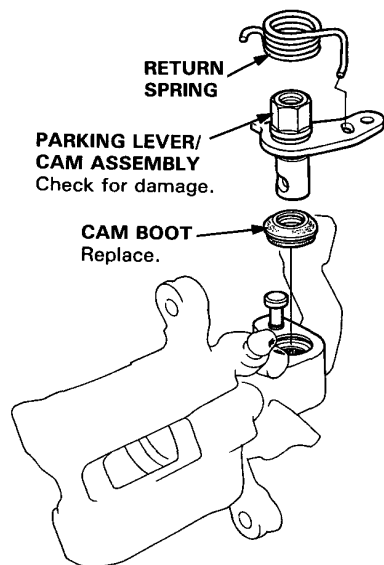


18. Remove the return spring.

19. Remove the parking lever and cam as an assembly from the caliper body.

CAUTION: Do not loosen the parking nut with the cam installed in the caliper body. If the lever and shaft must be separated, hold the lever in a vise and loosen the parking nut.

20. Remove the cam boot.





Reassembly

⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use a vacuum cleaner, to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.
- When reusing the pads, install them in their original positions to prevent loss of braking efficiency.

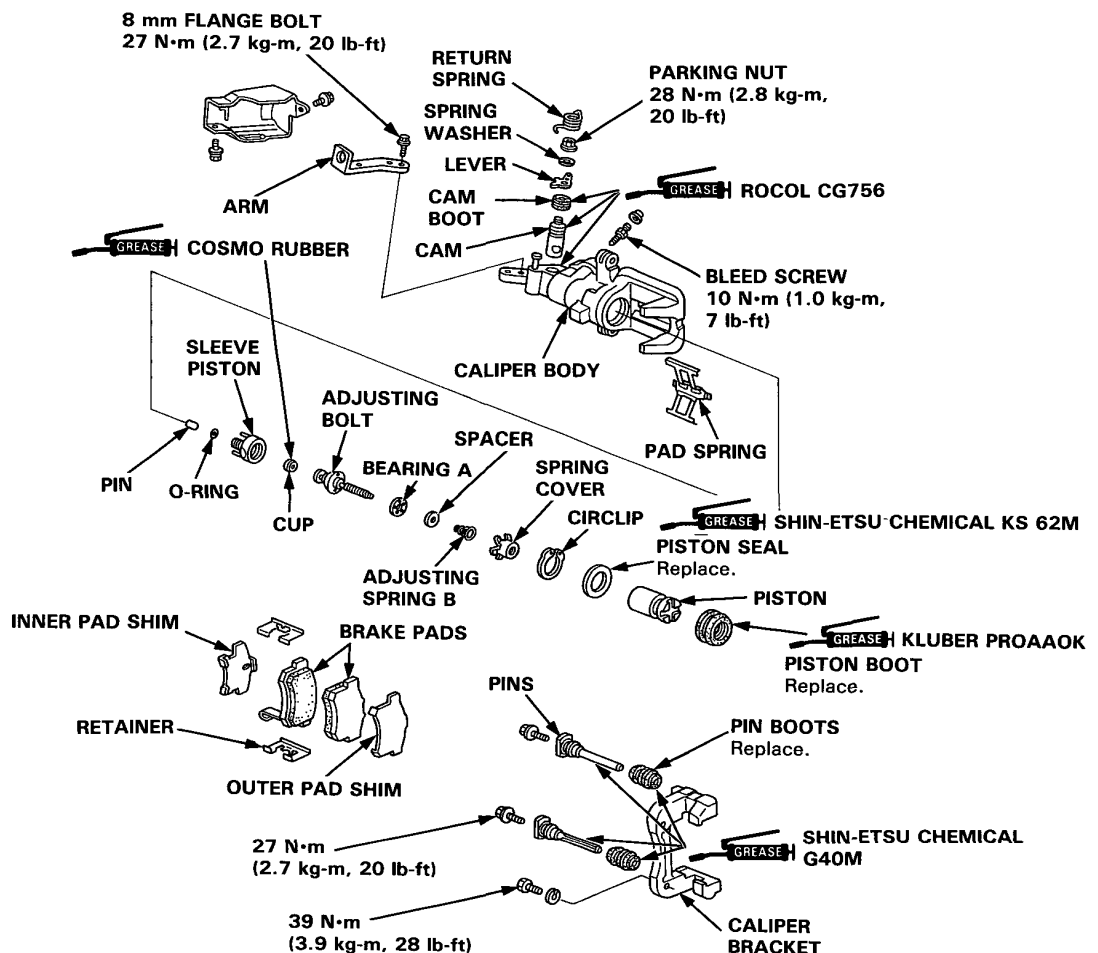
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joint with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passage 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE:

- Coat piston, piston seal groove, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

-  : Use recommended greases in the caliper seal set.



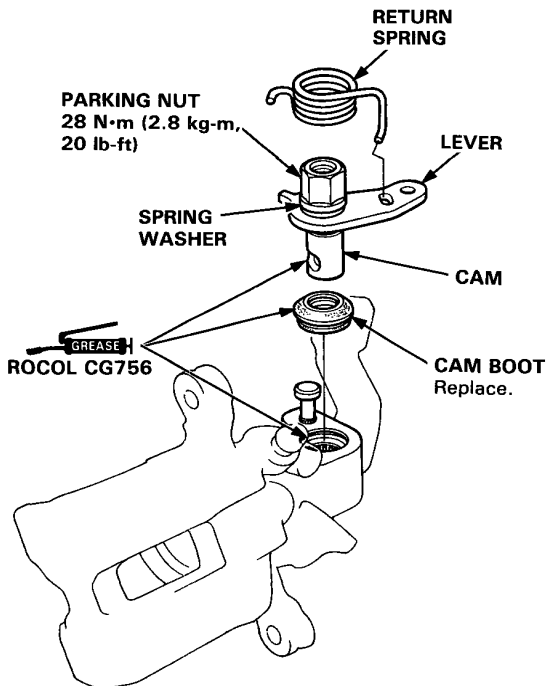
Rear Brake Caliper

Reassembly

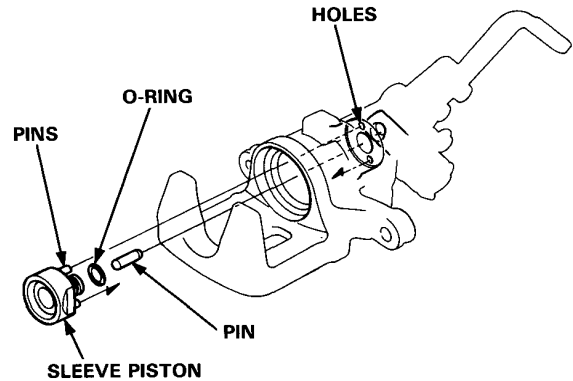
1. Pack all cavities of the needle bearing with recommended grease in the caliper seal set.
2. Coat a new cam boot with recommended grease in the caliper seal set and install it in the caliper body.
3. Apply recommended grease in the caliper seal set to the pin contacting area of the cam, and install the cam and lever assembly into the caliper body.
4. Install the return spring.

CAUTION:

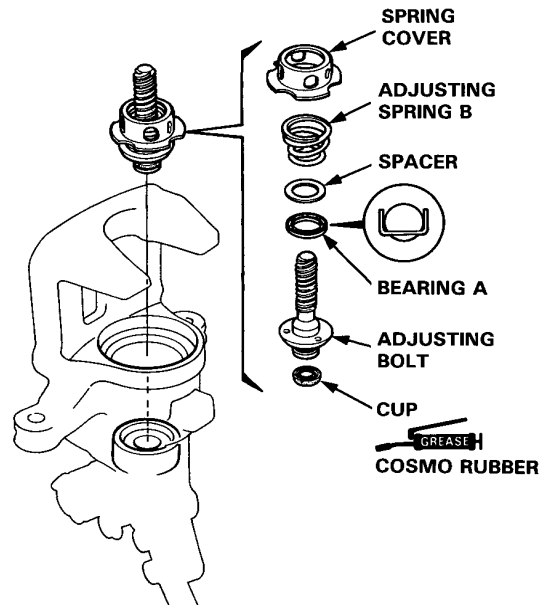
- When the cam and lever were separated, be sure to assemble them before installing the cam in the caliper body. Install the lever and spring washer, apply locking agent to the threads, and tighten the parking nut while holding the lever with a vise.
- Avoid damaging the cam boot since it must be installed before the cam.
- When installing the cam, do not allow the cam boot lips to turn outside in.



5. Install the pin in the cam.
6. Install a new O-ring on the sleeve piston.
7. Install the sleeve piston so the hole in the bottom of the piston is aligned with the pin in the cam, and two pins on the piston are aligned with the holes in the caliper.

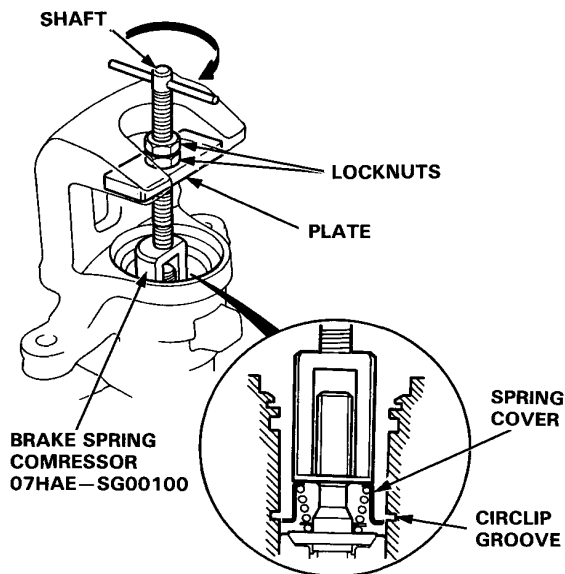


8. Coat a new cup with recommended grease in the caliper seal set, and install it with its groove facing the bearing A side of the adjusting bolt.
9. Fit the bearing A, spacer, adjusting spring B and spring cover on the adjusting bolt, and install them in the caliper cylinder.



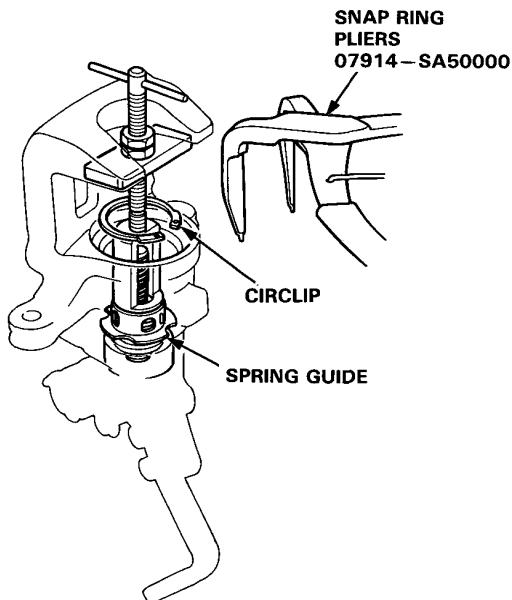


10. Install the special tool on the spring cover and turn the shaft until the locknut contacts the plate.



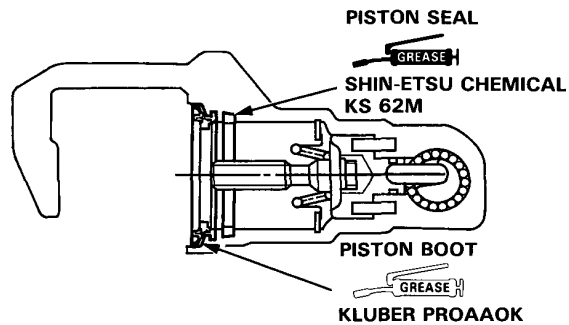
11. Check that the flared end of the spring cover is below the circlip groove.
12. Install the circlip in the groove, then remove the special tool.

NOTE: Check that the circlip is seated in the groove properly.



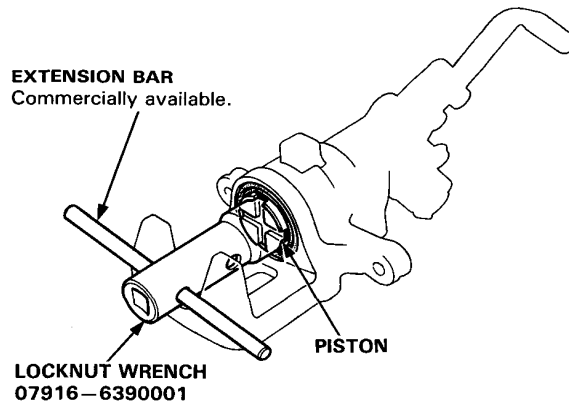
13. Coat a new piston seal with recommended grease in the caliper seal set and install it in the caliper.

14. Apply brake recommended grease in the caliper seal set to the sealing lips and inside of a new piston boot, and install it in the caliper.

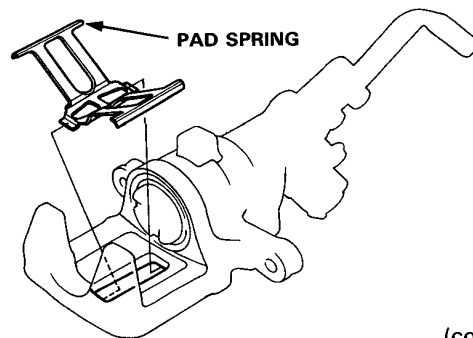


15. Coat the outside of the piston with brake fluid and install it on the adjusting bolt while rotating it clockwise with the special tool.

CAUTION: Avoid damaging the piston and piston boot.



16. Install the pad spring on the caliper.

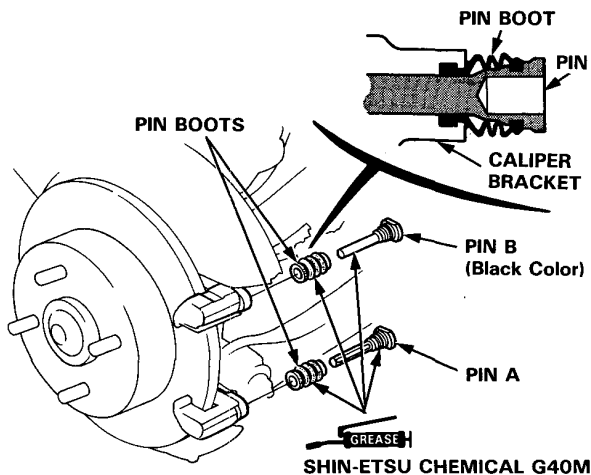


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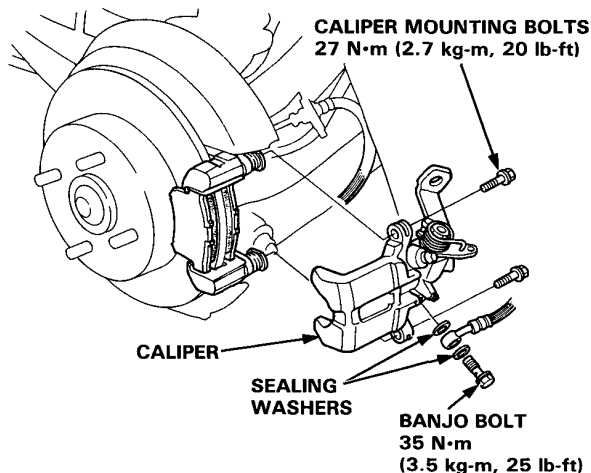
Rear Brake Caliper

Reassembly (cont'd)

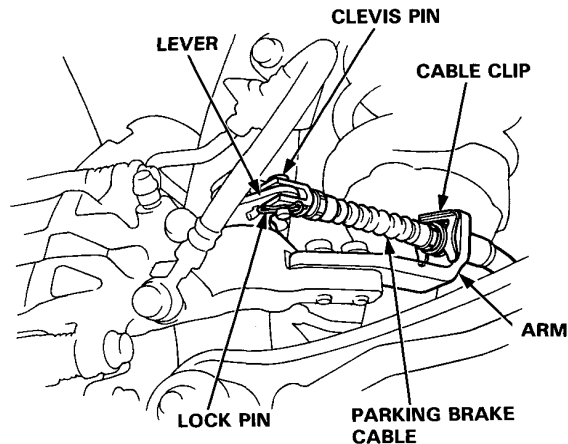
17. Apply recommended grease in the caliper seal set to sliding surface of the pins and inside of the new pin boots.
18. Install the pin boots into the groove in the caliper bracket properly.
19. Insert the pin A and pin B into the caliper bracket.
20. Install the pin boots into the groove in pins properly.



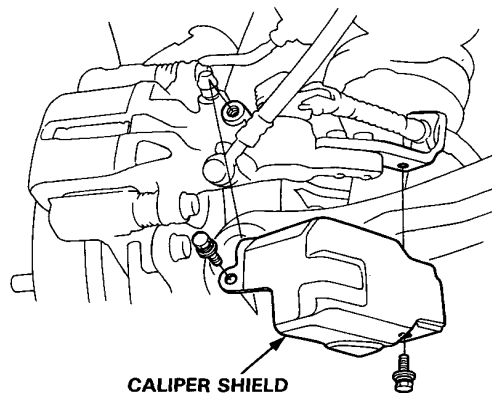
21. Install the brake pad retainers and brake pads.
22. Align the cutout in the piston with the tab on the inner pad (see page 19-25).
23. Install the caliper on the caliper bracket and tighten the caliper mounting bolts.
24. Connect the brake hose to the caliper with new sealing washers and tighten the banjo bolt.



25. Insert the cable through the arm and connect the cable to the lever with the clevis pin and lock pin. Install the cable clip securely.



26. Install the caliper shield.



27. Fill the brake reservoir up and bleed the brake system (see page 19-6).
28. Operate the brake pedal several times, then adjust the parking brake (see page 19-5).
29. After installation, perform the following checks.
 - Check for leaks at hose and line joints or connections, and retighten if necessary.
 - Check the parking brake lever for operation and adjust if necessary.

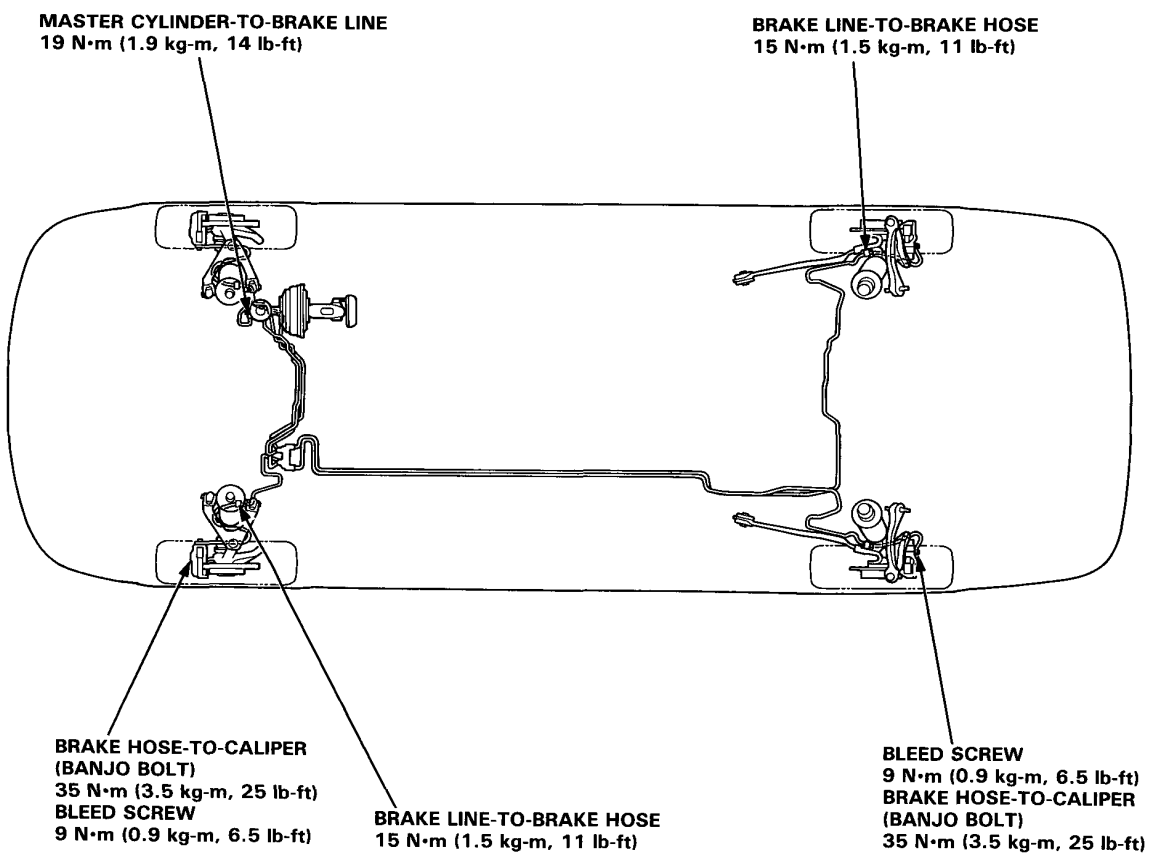


Brake Hoses/Pipes

Inspection

1. Inspect the brake hoses for damage, deterioration, leaks, interference or twisting.
2. Check the brake lines for damage, tipping, rusting or leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints or connections, and retighten if necessary.

CAUTION: Replace the brake hose clip whenever the brake hose is serviced.



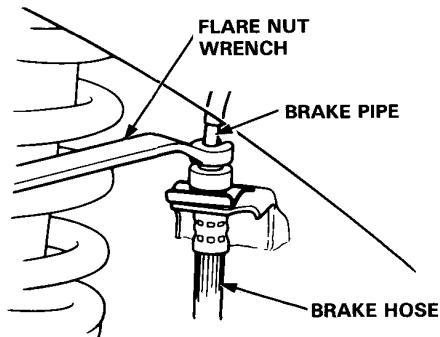
Brake Hoses/Pipes

Hose Replacement

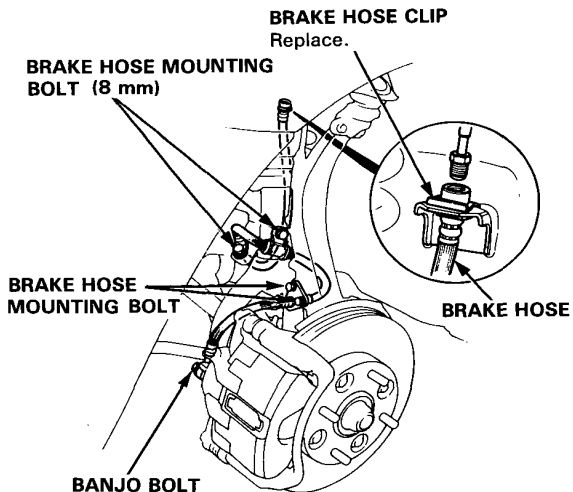
CAUTION:

- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Use only clean DOT 3 or DOT 4 brake fluid.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

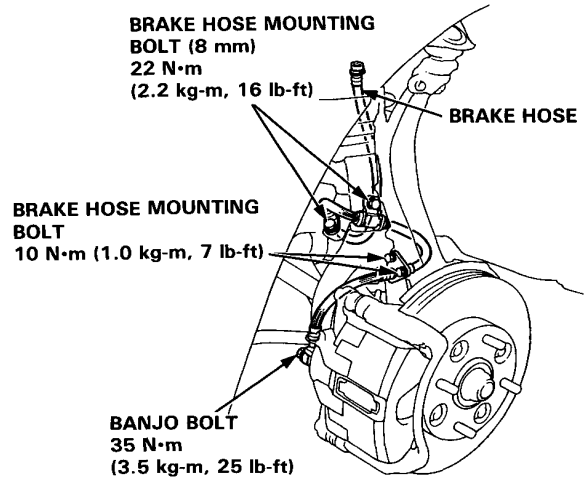
1. Replace the brake hose if the hose is twisted, cracked or if it leaks.
2. Disconnect the brake hose from the brake pipe using a 10 mm flare nut wrench.



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.

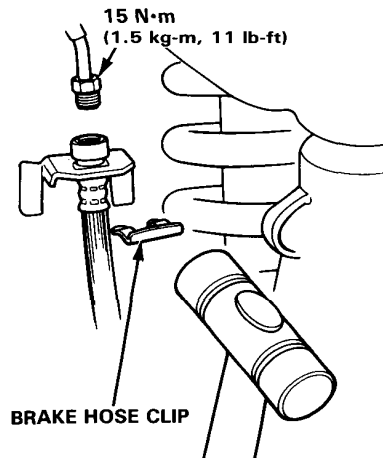


5. Install the brake hose on the knuckle and damper first. Then connect the brake hose to the caliper with banjo bolt and new sealing washers.



CAUTION: Do not twist the brake hose excessively.

6. Install a new brake hose clip on the brake hose.
7. Connect the brake pipe to the brake hose.

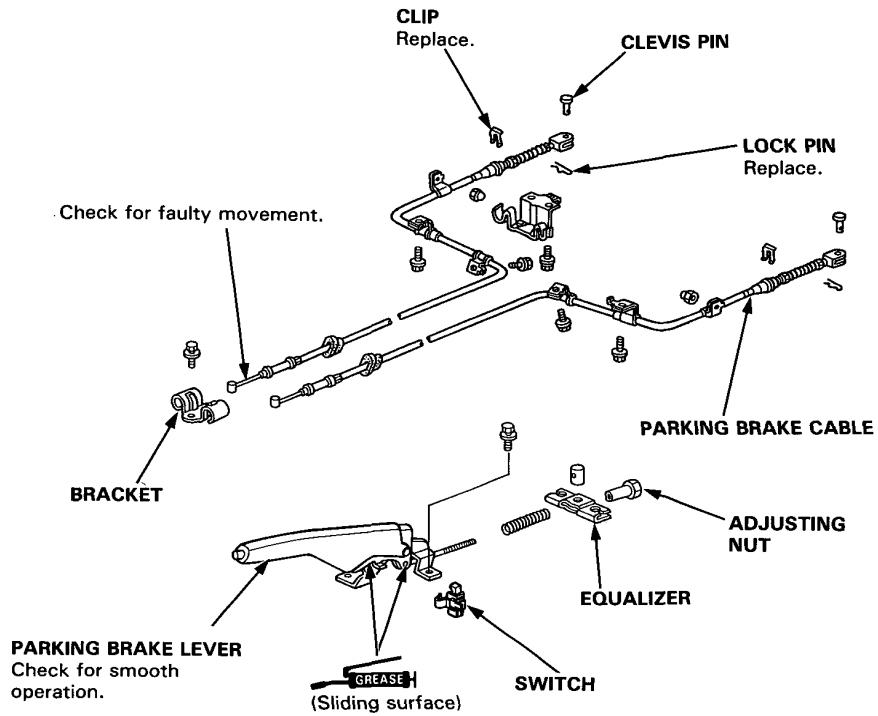


8. After installing the brake hose, bleed the brake system (see page 19-6).
9. Perform the following checks.
 - Check the brake hose and line joint for leaks, and tighten if necessary.
 - Check the brake hoses for interference or twisting.

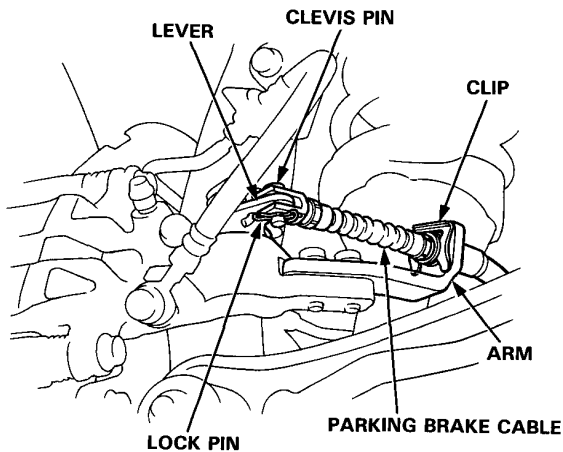
Parking Brake Cable

Inspection and Replacement

CAUTION: The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature cable failure.



Disconnect the parking brake cable from the lever on the caliper by removing the lock pin and clevis pin, and remove the cable from the arm by removing the clip.



Anti-lock Brake System (ABS)

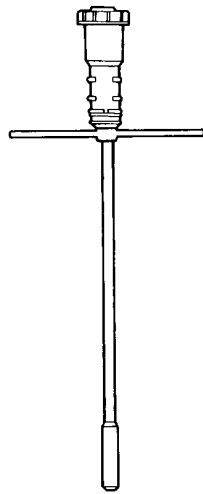
Special Tools	19-40	Solenoids	
Illustrated Index	19-41	Leak Test	19-89
Anti-lock Brake System (ABS)		Modulator Unit	
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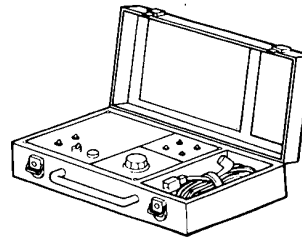
Special Tools

Ref. No.	Tool Number	Description	Qty	Page Reference
①	07HAA-SG00101 or 07HAA-SG00100	Bleeder T-wrench	1	19-70, 88, 101
②	*07HAJ-SG00602	ALB Checker	1	19-57, 59, 101

*: The ALB checker 07HAJ-SG00XXX can be used. (XXX: unspecified number) The ALB checker 07508-SB00000 can be used together with ALB checker adaptor 07HAJ-SG00400.

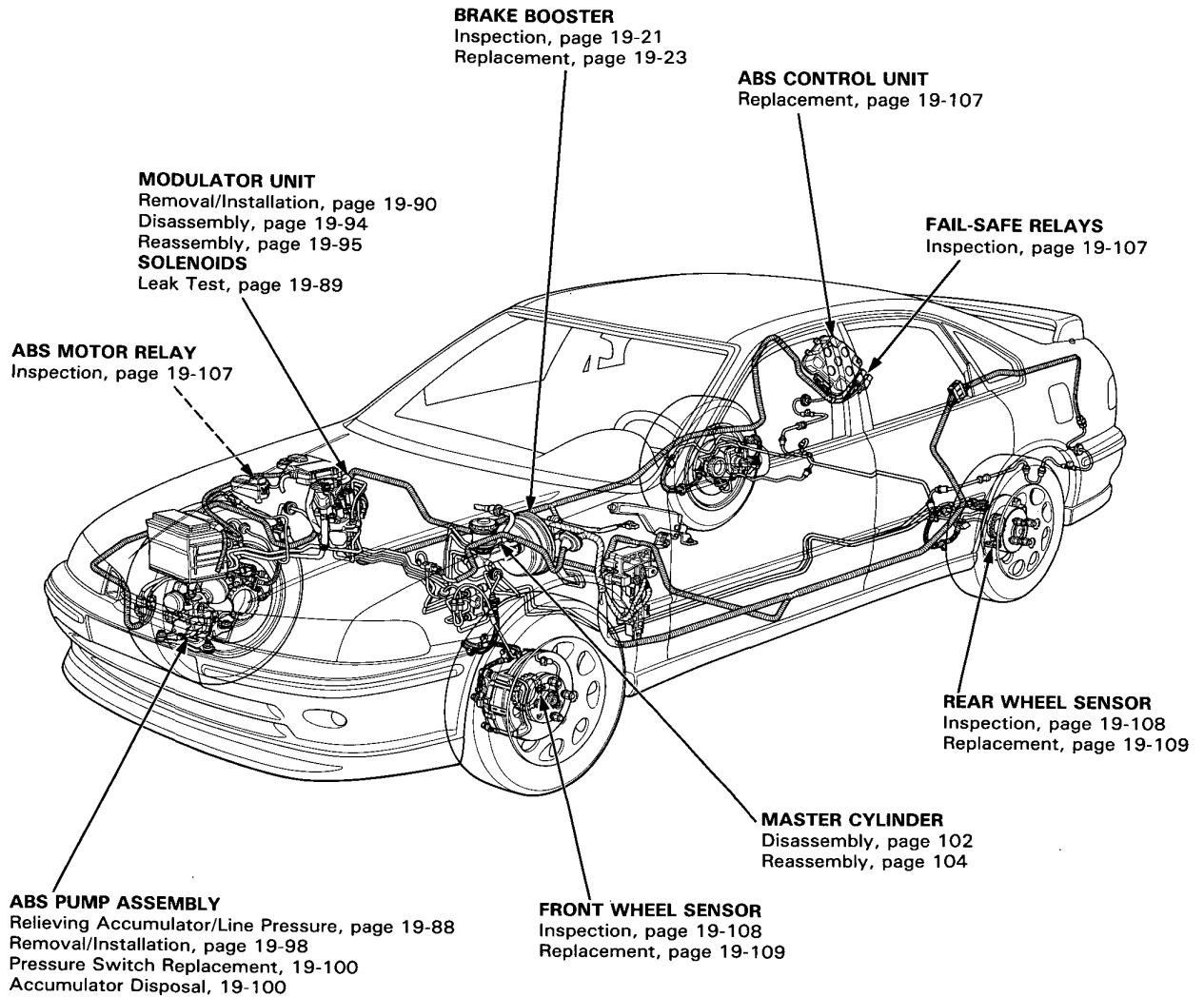


①



②

⚠ WARNING The accumulator contains high pressure nitrogen gas, do not puncture, expose to flame or attempt to disassemble the accumulator or it may explode; severe personal injury may result.



Anti-lock Brake System (ABS)

Features/Construction/Operation

In a conventional brake system, if the brake pedal is depressed very hard, the wheels can lock before the vehicle comes to a stop. In such a case, the stability of the vehicle is reduced if the rear wheels are locked, and maneuverability of the vehicle is reduced if the front wheels are locked, creating an extremely unstable condition.

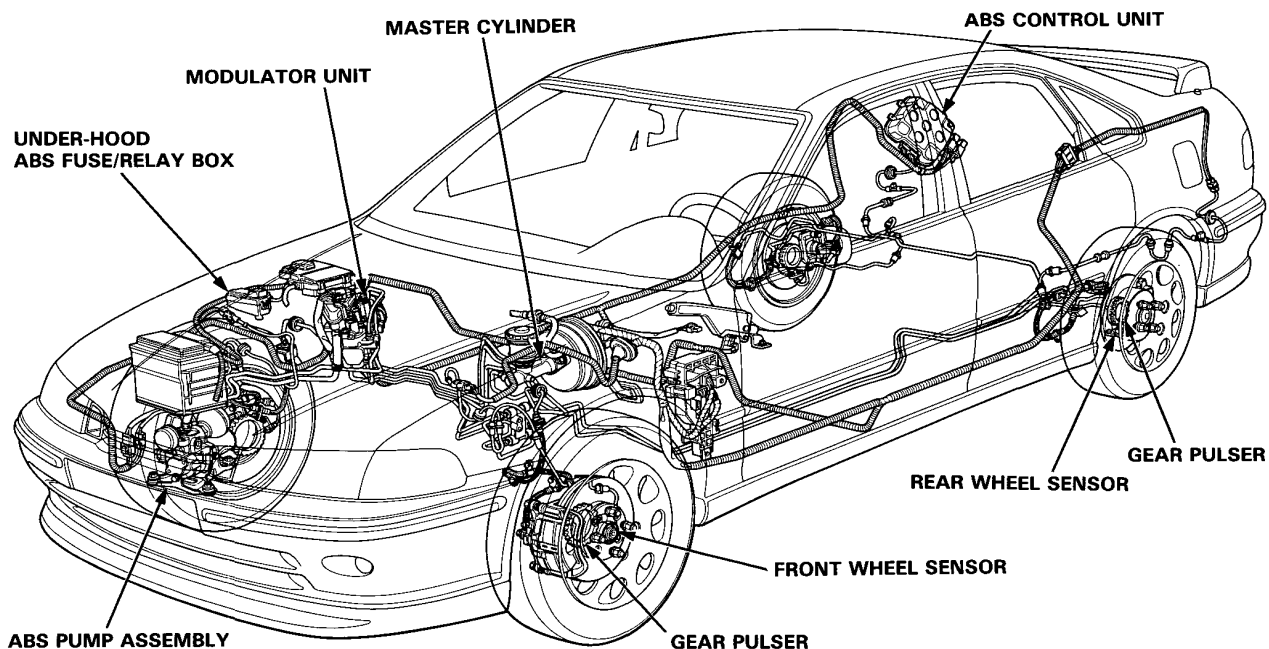
The Anti-lock Brake System (ABS) modulates the pressure of the brake fluid applied to each front caliper or both rear calipers, thereby preventing the locking of the wheels, whenever the wheels are likely to be locked due to hard braking. It then restores normal hydraulic pressure when there is no longer any possibility of wheel locking.

Features

- Increased braking stability can be achieved regardless of changing driving condition.
- The maneuverability of the vehicle is improved as the system prevents the front wheels from locking.
- When the anti-lock brake system goes into action, a kickback is felt on the brake pedal.
- The system is equipped with a self-diagnosis function. When an abnormality is detected, the ABS indicator light comes on. The location of the system's trouble can be diagnosed from the frequency of the system indicator light blinks.
- This system has individual control of the front wheels and common control ("Select Low") for the rear wheels. "Select Low" means that the rear wheel that would lock first (the one with lowest resistance to lock-up) determines anti-lock brake system activation for both rear wheels.
- The system has a fail-safe function that allows normal braking if there's a problem with the anti-lock brake system.

Construction

In addition to the conventional braking system, the anti-lock brake system consists of: gear pulsers attached to the rotating part of individual wheels; wheel sensors, which generate pulse signals corresponding to the revolution of the gear pulsers; ABS control unit, which controls the working of the anti-lock brake system by performing calculations based on the signals from the individual wheel sensors and the individual switches; modulator unit, which adjusts the hydraulic pressure applied to each caliper on the basis of the signals received from the ABS control unit; an accumulator, in which high-pressure brake fluid is stored, a pressure switch, which detects the pressure in the accumulator and transmits signals to the ABS control unit; an ABS pump assembly, which supplies the high-pressure working fluid to the accumulator by means of a pump; a motor relay for driving the ABS pump assembly; fail-safe relays, which cut off the solenoid valve ground circuit when the fail-safe device is at work; and, an ABS indicator light.



Master Cylinder

1. Construction

A tandem master cylinder is used to improve the safety of the braking system. In addition, center valves are used so as to match the anti-lock brake system operation.

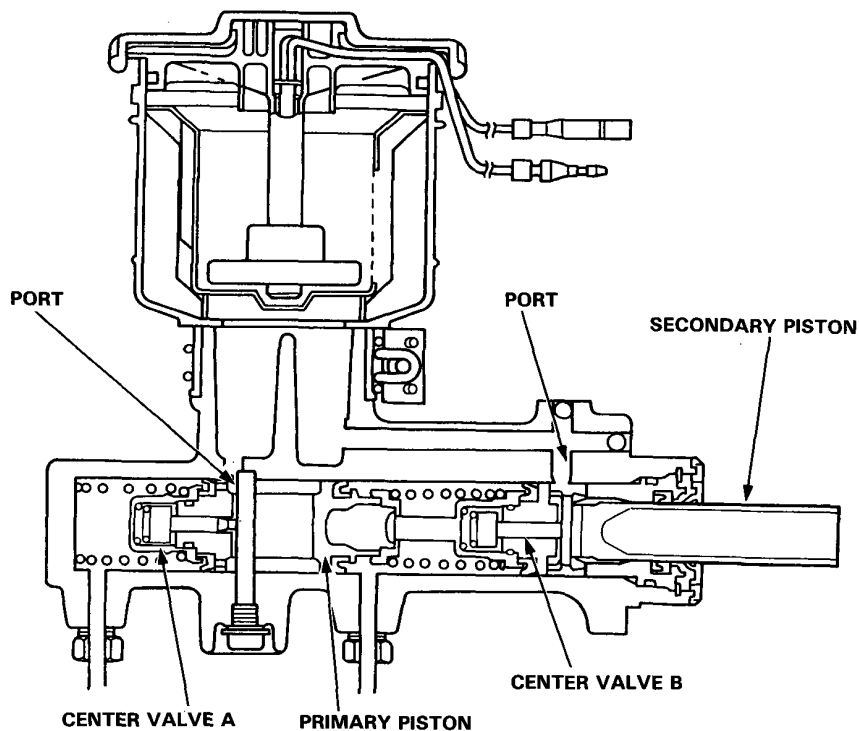
The master cylinder has one reservoir tank which is connected to the cylinder sections by two small holes. It has two pistons: primary and secondary, which are crisscross connected with the calipers so that the fluid pressure works separately on each system (front right wheel & rear left wheel, and front left wheel & rear right wheel).

A stop bolt for controlling movement of the primary piston is provided at the side of the master cylinder body. A reed switch for detecting the brake fluid volume is also provided in the cap of the reservoir tank.

2. Operation

When the brake pedal is depressed, the secondary piston is pushed through the brake booster and the center valve B is closed so that fluid pressure is generated on the secondary side. At the same time, the primary piston is pushed by the secondary fluid pressure and the center valve A is closed so that braking fluid pressure is generated both on the primary and secondary sides.

When the brake pedal is released, the primary and secondary pistons are returned to the original position by the brake fluid pressure and piston spring.



(cont'd)

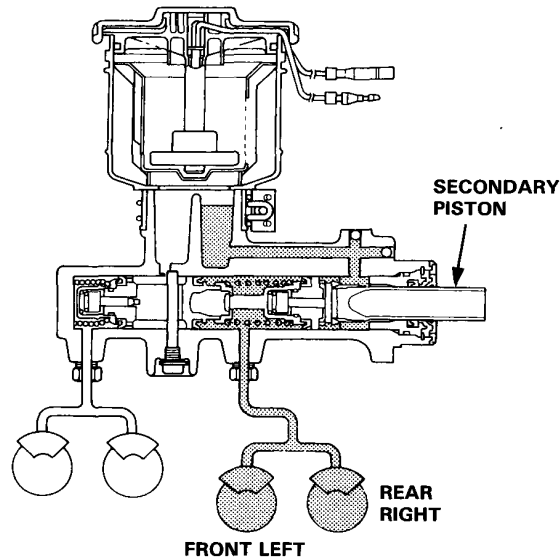
Anti-lock Brake System (ABS)

Features/Construction/Operation (cont'd)

3. Responses when fluid is leaking

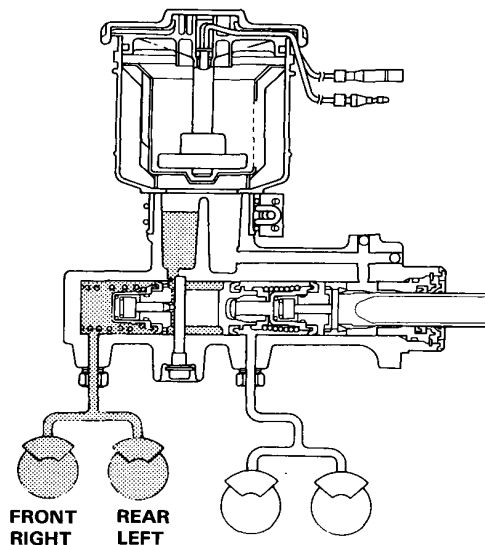
(1) In case of leaking from the primary system:

Since the fluid pressure on the primary side does not rise, the primary piston is pushed by the fluid pressure of the secondary piston and the tension of the piston spring until the end hits on the cylinder. The braking is performed by the fluid pressure on the secondary side.



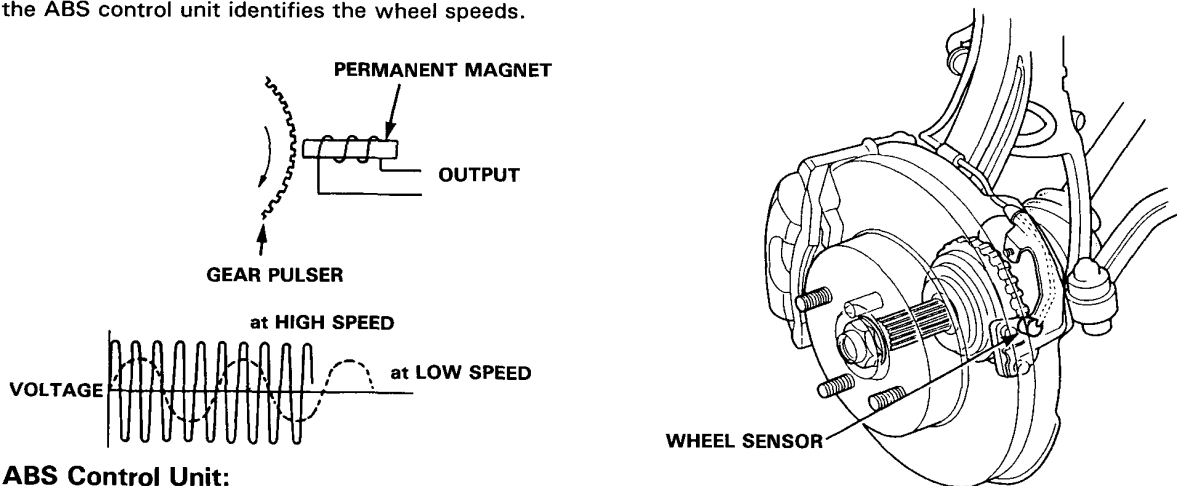
(2) In case of leaking from the secondary system:

The secondary piston does not produce fluid pressure, keeps moving ahead, hits on the end surface of the primary piston so that the primary piston is pushed under the same condition as an ordinary rod. Therefore, the braking is conducted by the fluid pressure on the primary side.



Wheel Sensor

The wheel sensor is a contactless type and it detects the rotating speeds of a wheel. It is composed of a permanent magnet and coil. When the gear pulsers attached to the rotatory parts of each wheel (front wheel: outboard joint of the driveshaft, rear: hub bearing unit) turn, the magnetic flux around the coil in the wheel sensor alternates, generating voltages with frequency in proportion to wheel rotating speed. These pulses are inputted into the ABS control unit and the ABS control unit identifies the wheel speeds.



ABS Control Unit:

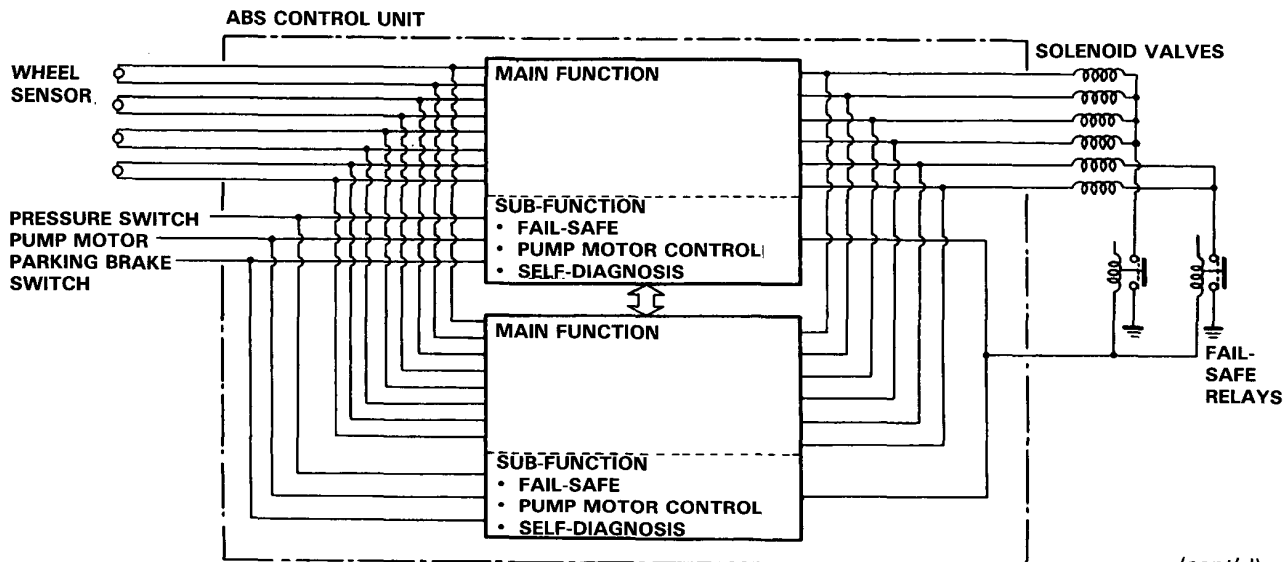
The ABS control unit consists of a main function section, which controls the operation of the anti-lock brake system, and sub-function, which controls the pump motor and "self-diagnosis."

1. Main Function

The main function section of the ABS control unit performs calculations on the basis of the signals from each wheel sensor and controls the operation of the anti-lock brake system by putting into action the solenoid valves in the modulator unit for each front brake and for the two rear brakes.

2. Sub-function

The sub-function section gives driving signals to the pump motor and also gives "self-diagnosis" signals, necessary for backing up the anti-lock brake system.



(cont'd)

Anti-lock Brake System (ABS)

Features/Construction/Operation (cont'd)

1. Self-Diagnostic Function

Since the anti-lock brake system modulates the braking pressure when a wheel is about to lock, regardless of the driver's intention, the system operation and the braking power will be impaired if there is a malfunction in the system. To prevent this possibility, at speeds above 10 km/h (6 mph) the self-diagnosis function, provided in the sub-function of the ABS control unit, monitors the main system functions. When an abnormality is detected, the ABS indicator light goes on. There is also a check mode of the self-diagnosis system itself; when the ignition switch is first turned on, the ABS indicator light comes on and stays on for a few seconds after the engine starts, to signify that the self-diagnosis system is functional.

2. Fail-Safe Function

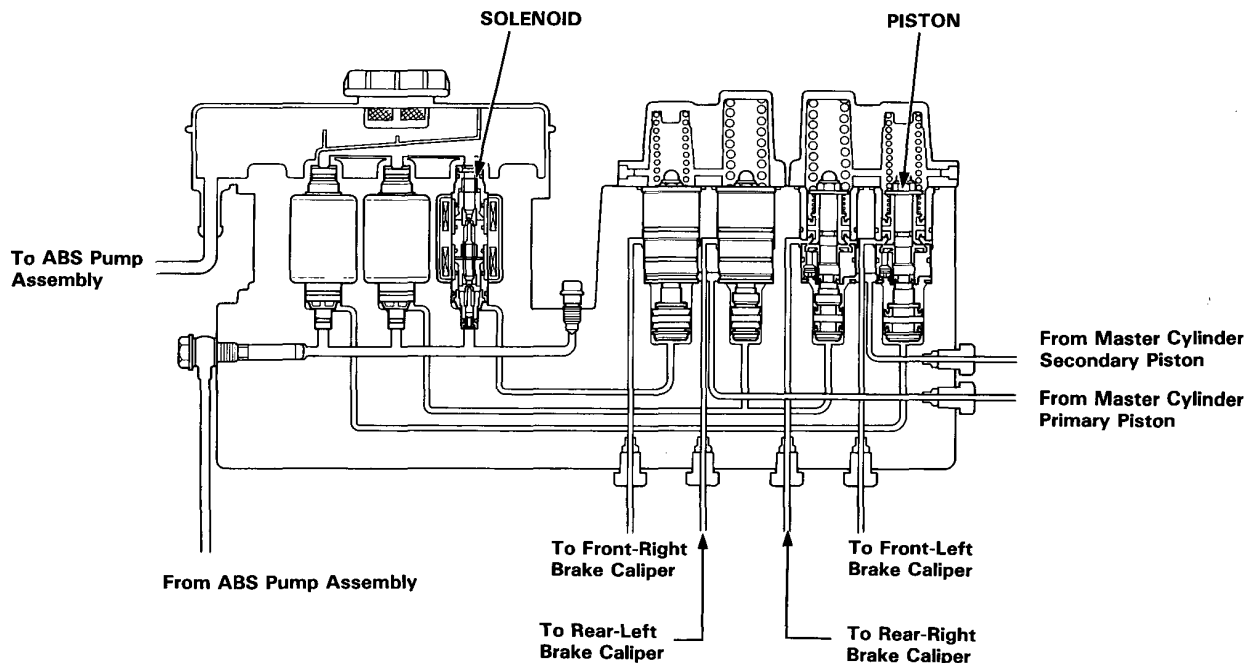
When abnormality is detected in the control system by the self-diagnosis, the solenoid operations are suspended by turning off the relay (fail-safe relay) which disconnects the ground lines of all the solenoid valves to inhibit anti-lock brake system operations. Under these conditions, the braking system functions just as an ordinary one, maintaining the necessary braking function. When the ABS indicator light is turned on, it means the fail-safe is functioning.

Modulator Unit

Modulators for each wheel and solenoid valves are integrated in the modulator unit.

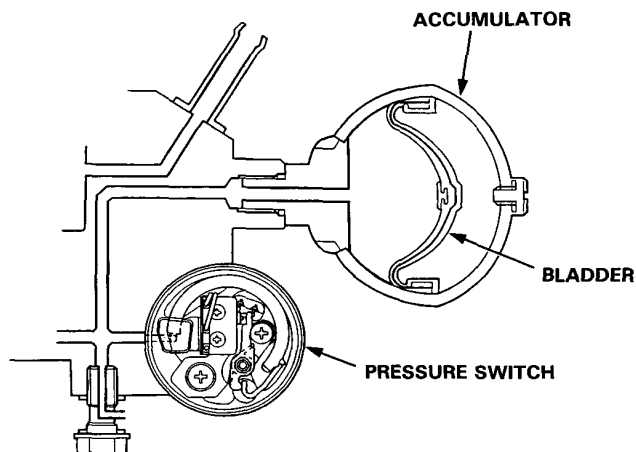
The modulators for front and rear brakes are of independent construction and are positioned vertically for improved maintainability. The modulators for rear brakes are provided with a proportioning control valve function in order to prevent the rear wheel from locking when the anti-lock brake system is malfunctioning or the anti-lock brake system is not activated. The solenoid valve features quick response (5 ms or less).

The inlet and outlet valves are integrated in the solenoid valve unit. There are three solenoid valves, one for each front wheel, and one for both rear wheels.



Accumulator

The accumulator is a pneumatic type which accumulates high-pressure brake fluid fed from the pump incorporated in the ABS pump assembly. When the anti-lock brake system operates, the accumulator and the ABS pump assembly supply high-pressure brake fluid to the modulator valve via the inlet side of the solenoid valve.

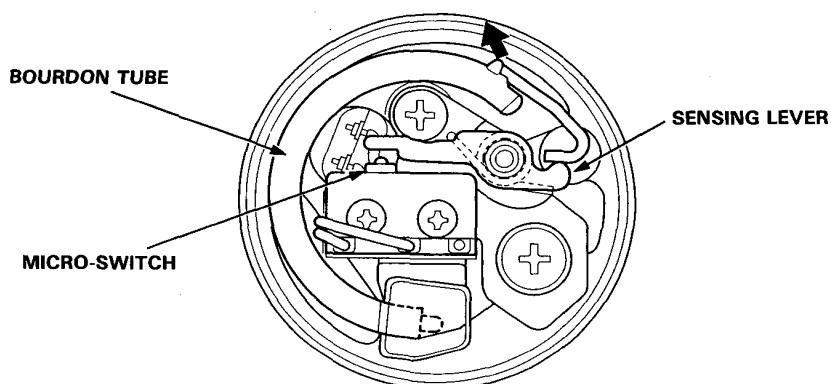


Pressure Switch

The pressure switch monitors the pressure accumulation (pressure from the pump) in the accumulator and is turned off when the pressure becomes lower than a prescribed level. When the pressure switch is turned off, the switching signal is sent to the ABS control unit. Upon receiving the signal, the ABS control unit activates the pump motor relay to operate the motor. If the pressure doesn't reach the prescribed value, the ABS indicator light comes on.

Operation

When the pressure in the accumulator rises, the Bourdon tube in the pressure switch deforms outwards. When the free end of the Bourdon tube moves more than the prescribed amount, the micro-switch is activated by the force of the spring attached to the sensing lever. When the pressure in the accumulator decreases due to anti-lock brake system operations, the Bourdon tube moves in the direction opposite to the one described above, and the micro-switch is eventually turned off. Upon receiving this signal, the ABS control unit activates the motor relay to operate the motor.



(cont'd)

Anti-lock Brake System (ABS)

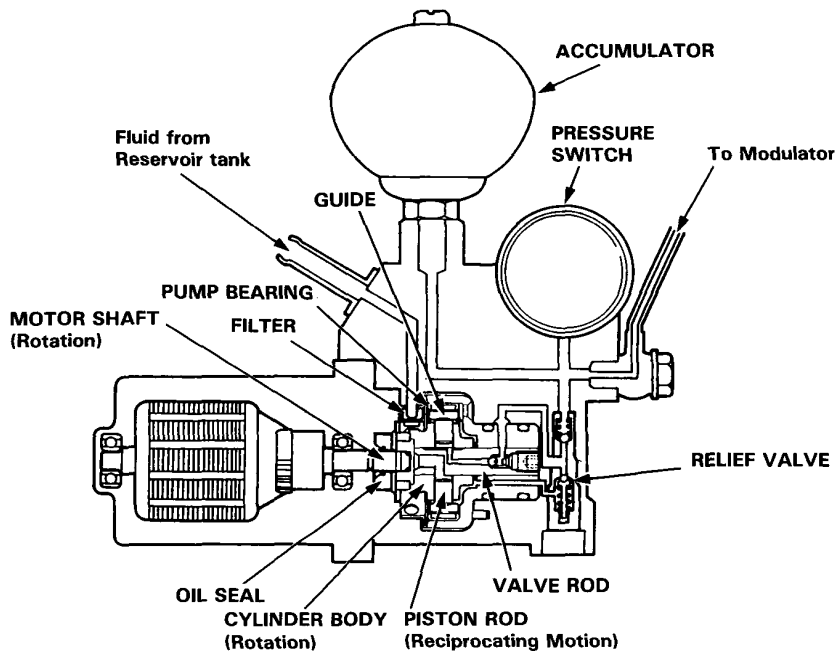
Features/Construction/Operation (cont'd)

ABS Pump Assembly

The ABS pump assembly consists of a motor, filter, guide, piston rod and cylinder body. Since a guide is positioned off-set to the center of the motor shaft, the rotation of the motor and cylinder body provides the reciprocating motion to the piston rod. The brake fluid is thus pressurized and fed to the relief valve, accumulator and modulator.

As the pressure in the accumulator exceeds the prescribed level, the pressure switch is turned on. Approx. 0.5 seconds after receiving the ON-signal, the ABS control unit stops the motor relay operation. In this state, the pressure in the accumulator reaches 23,000 kPa (230 kg/cm², 3,270 psi).

If the pressure doesn't reach the prescribed value after the motor has operated continuously for a specified period, the ABS control unit stops the motor and activates the ABS indicator light.



Anti-lock Brake System (ABS) Indicator Light

The ABS control unit turns on the ABS indicator light when one or more of the below described abnormalities is detected. This is only a partial list.

- When the operating time of the motor in the ABS pump assembly exceeds the specified period.
- When vehicle running time exceeds 30 seconds without releasing the parking brake lever.
- When one of the rear wheels is locked during running.
- When absence of speed signals from any of the four wheel sensors is detected.
- When the activation time of all solenoids exceeds a given time or an open circuit is detected in the solenoid system.
- When solenoid output is not detected in the simulated anti-lock brake system operation carried out during running at speeds of 10 km/h (6 mph) or more.

To check the ABS indicator light bulb, the light is activated when the ignition switch is turned on. It is turned off after the engine is started if there is no abnormality in the system.

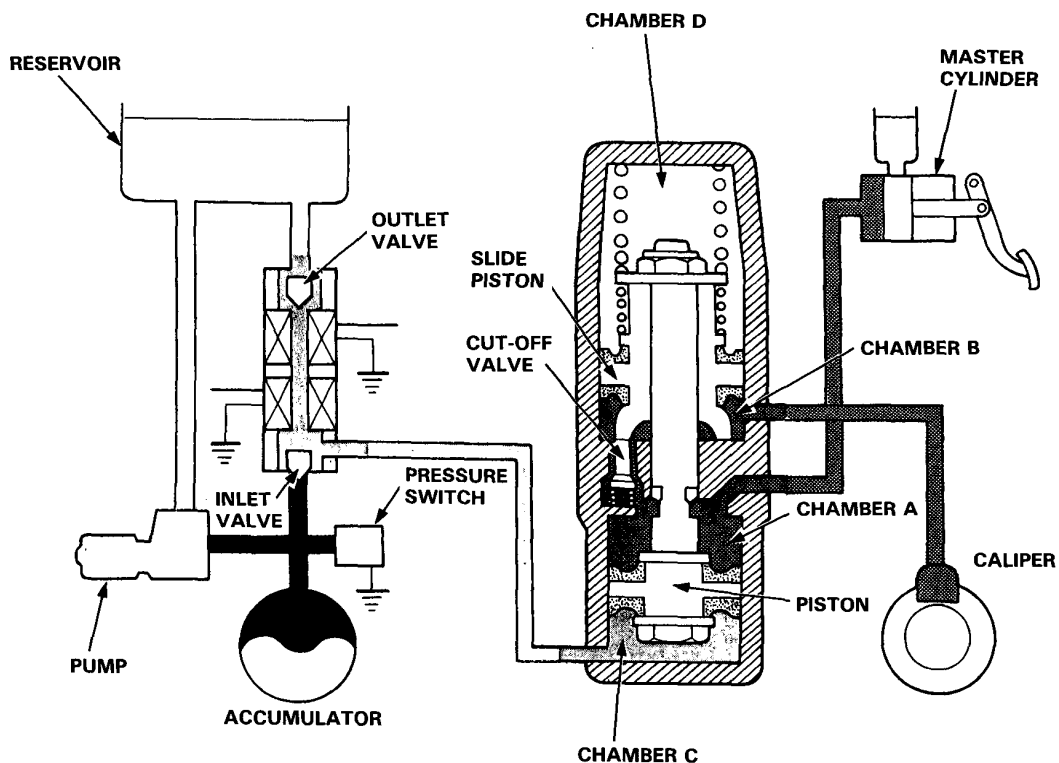
Operation

1. Ordinary Braking Function

In ordinary brake operations, the cut-off valve in the modulator is open, transmitting the hydraulic pressure from the master cylinder to the brake calipers via chamber A and chamber B.

Chamber C is connected to the reservoir through the outlet valve, which is normally open. It is also connected to the hydraulic pressure source (pump, accumulator, pressure switch, etc.) via the inlet valve, which is normally closed.

Chamber D serves as an air chamber. Under these conditions, the pressures of chambers C and D are maintained at about atmospheric pressure, permitting regular braking operations.



(cont'd)

Anti-lock Brake System (ABS)

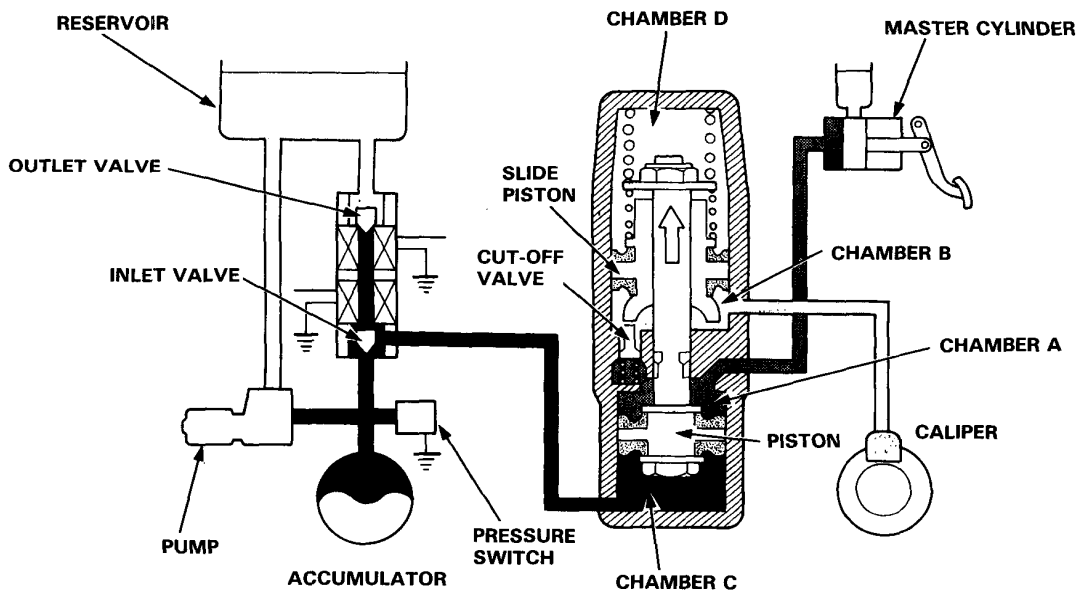
Features/Construction/Operation (cont'd)

If brake inputs (force exerted on brake pedal) are excessively large and a possibility of wheel locking occurs, the ABS control unit operates the solenoid valve, closing the outlet valve and opening the inlet valve. As a result, the high pressure is directed into chamber C, the piston is pushed upward, causing the slide piston to move upward and the cut-off valve to close. As the cut-off valve closes, the flow from the master cylinder to the caliper is interrupted, the volume of chamber B, which is connected to the caliper, increases, and the fluid pressure in the caliper declines.

When both of the valves, inlet and outlet, are closed (when only the outlet valve is activated) the pressure in the caliper is maintained constant.

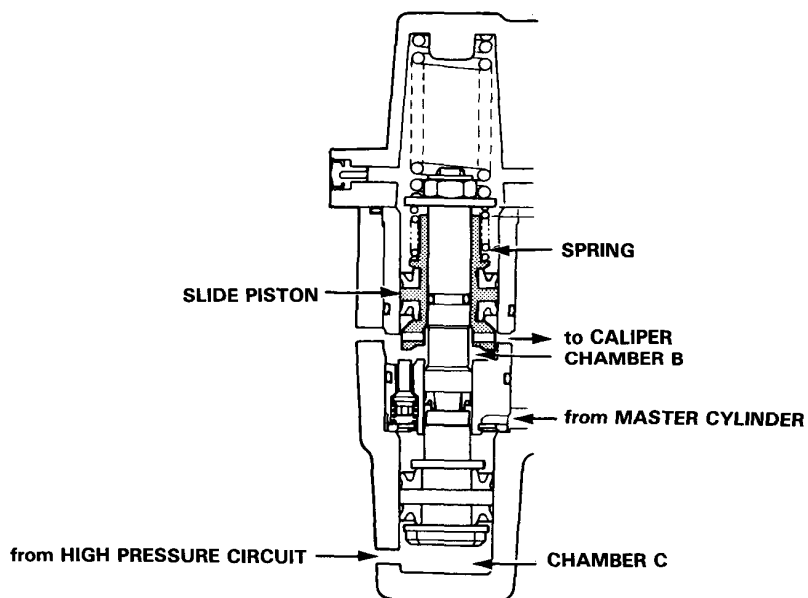
When the possibility of wheel locking ceases, it is necessary to restore the pressure in the caliper. The solenoid valve is therefore turned off (outlet valve: open, inlet valve closed).

Process	Caliper Pressure	Outlet Valve		Inlet Valve	
		Electric Power	Hydraulic Circuit	Electric Power	Hydraulic Circuit
Caliper pressure declining	→	ON	Close	ON	Open
Caliper pressure constant	→	ON	Close	OFF	Close
Caliper pressure increasing	→	OFF	Open	OFF	Close



2. Slide Piston Function

When the car is used on rough roads where the tires sometimes lose adhesion, the anti-lock brake system may function excessively, causing a very large volume of brake fluid to flow into chamber C. When this occurs, the piston is moved excessively, resulting in an abnormal loss of pressure in the chamber B. In order to overcome this problem, the slide piston is kept in a proper position by spring force to prevent the pressure in chamber B from becoming negative.



(cont'd)

Anti-lock Brake System (ABS)

Features/Construction/Operation (cont'd)

3. Kickback

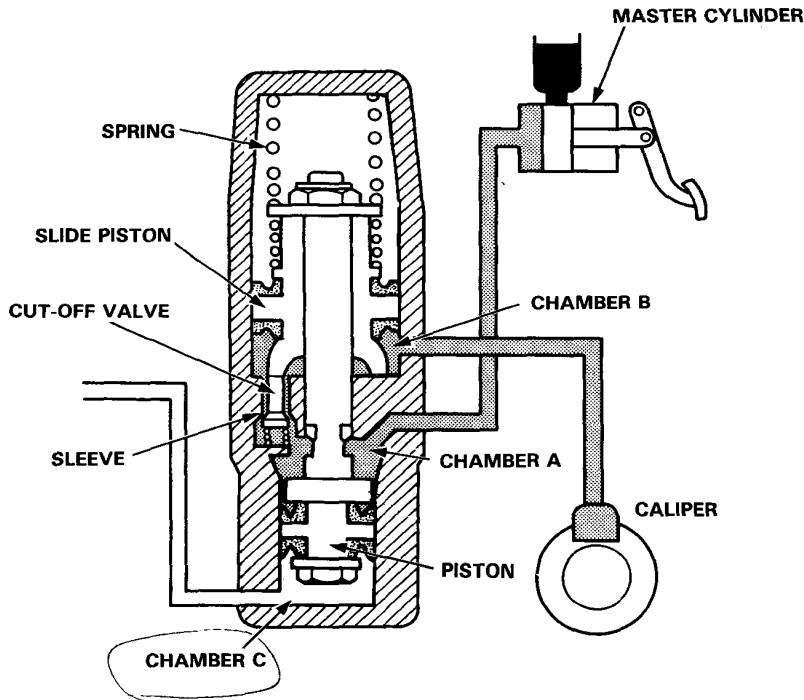
When the anti-lock brake system is functioning, the piston moves upward, the volume of chamber B increases, and the fluid pressure on the caliper side is reduced. At the same time, the volume of chamber A is reduced and the brake fluid is returned to the master cylinder. When the brake fluid is pushed back to the master cylinder, the driver can feel the functioning of the anti-lock brake system because the brake pedal is kicked back.

4. Proportioning Control Valve Function

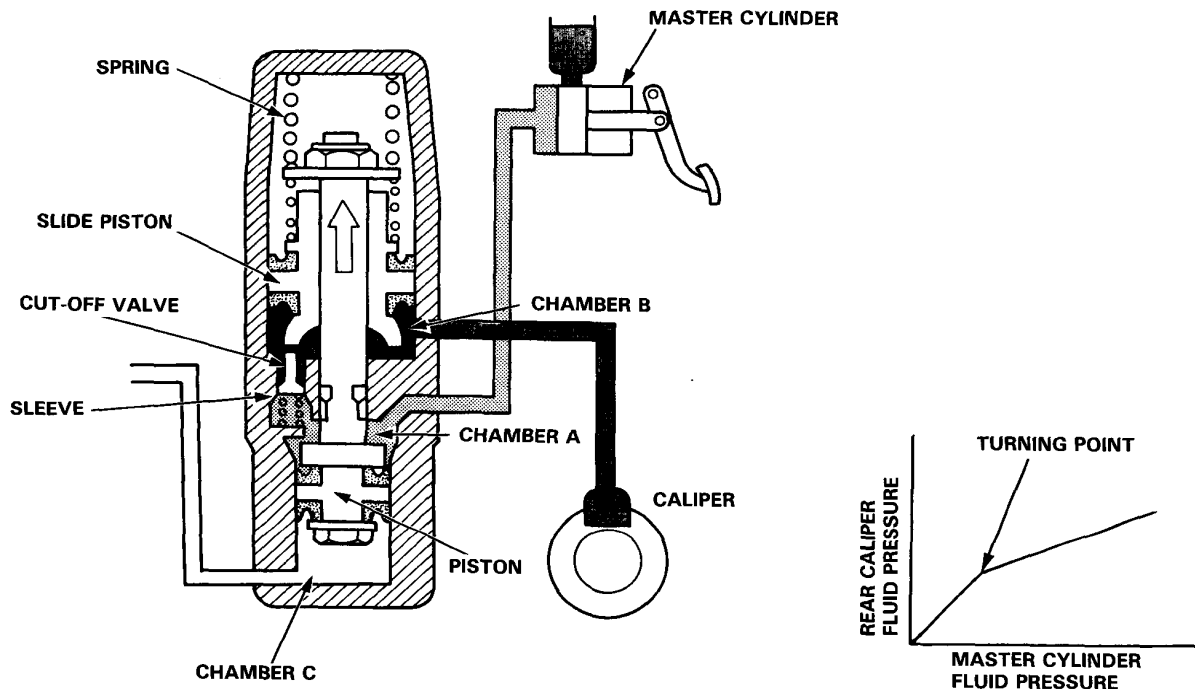
In the modulator for the rear wheels, the diameters of the piston and the slide piston are distinctly different. This provides a proportioning control valve function to prevent the rear wheels from locking during an emergency stop.

(1) Before the Turning Point:

- 1) When the fluid pressure from the master cylinder is below the turning point, the cut-off valve is always pushed downward by the force of the slide piston and its spring. Under these conditions, there is a gap between the cut-off valve shoulder and the sleeve. Chamber A and Chamber B are therefore connected through the gap. The pressure from the master cylinder flows into the rear calipers through chamber A and chamber B.



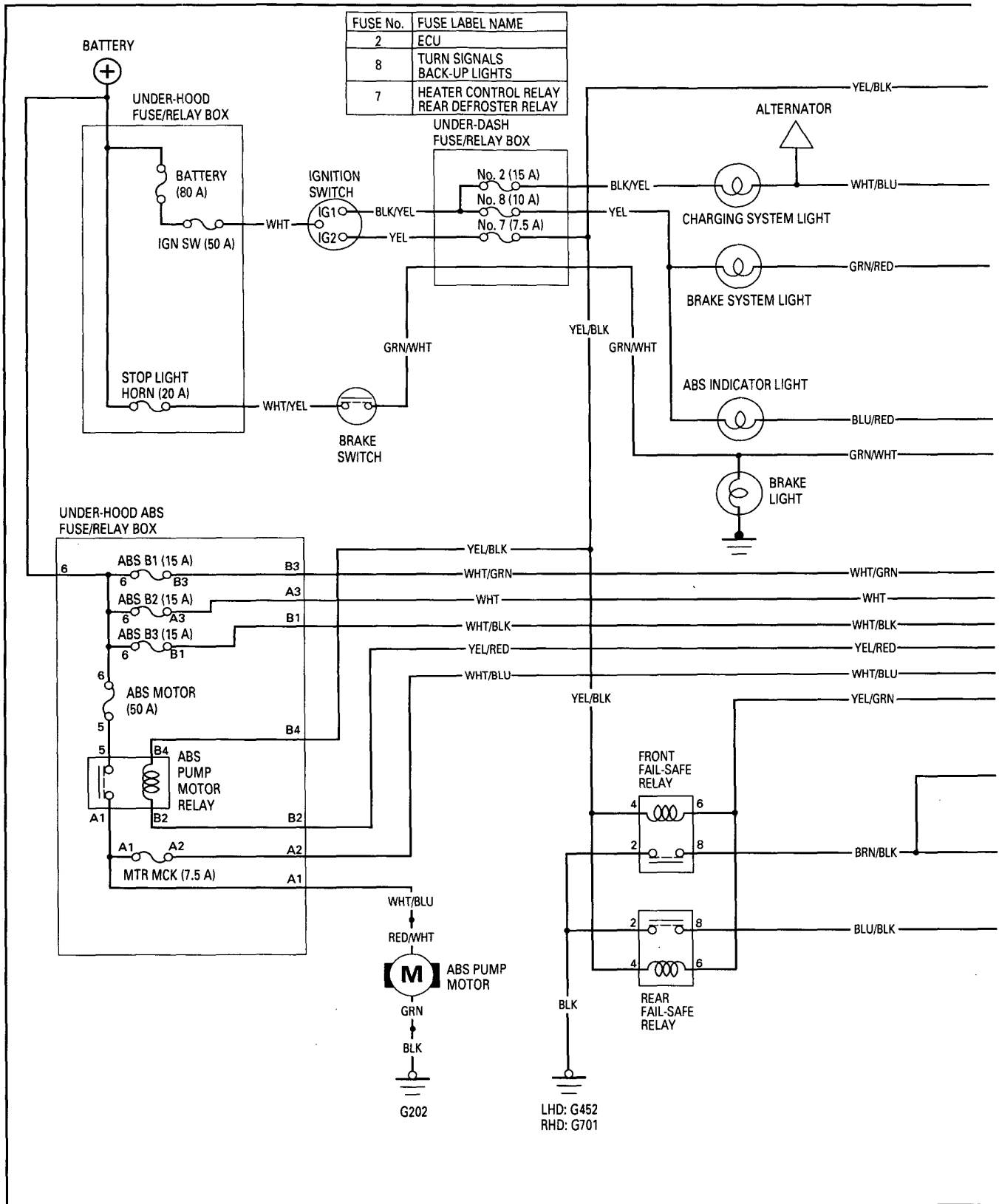
- 2) When the fluid pressure from the master cylinder reaches the turning point, the force on the slide piston overcomes the force of spring, causing the slide piston to travel upward. The cut-off valve, previously being in contact with the bottom of the slide piston, then moves upward and the cut-off valve shoulder hits the sleeve, blocking the fluid passages (the fluid pressure at this point is called the turning point).

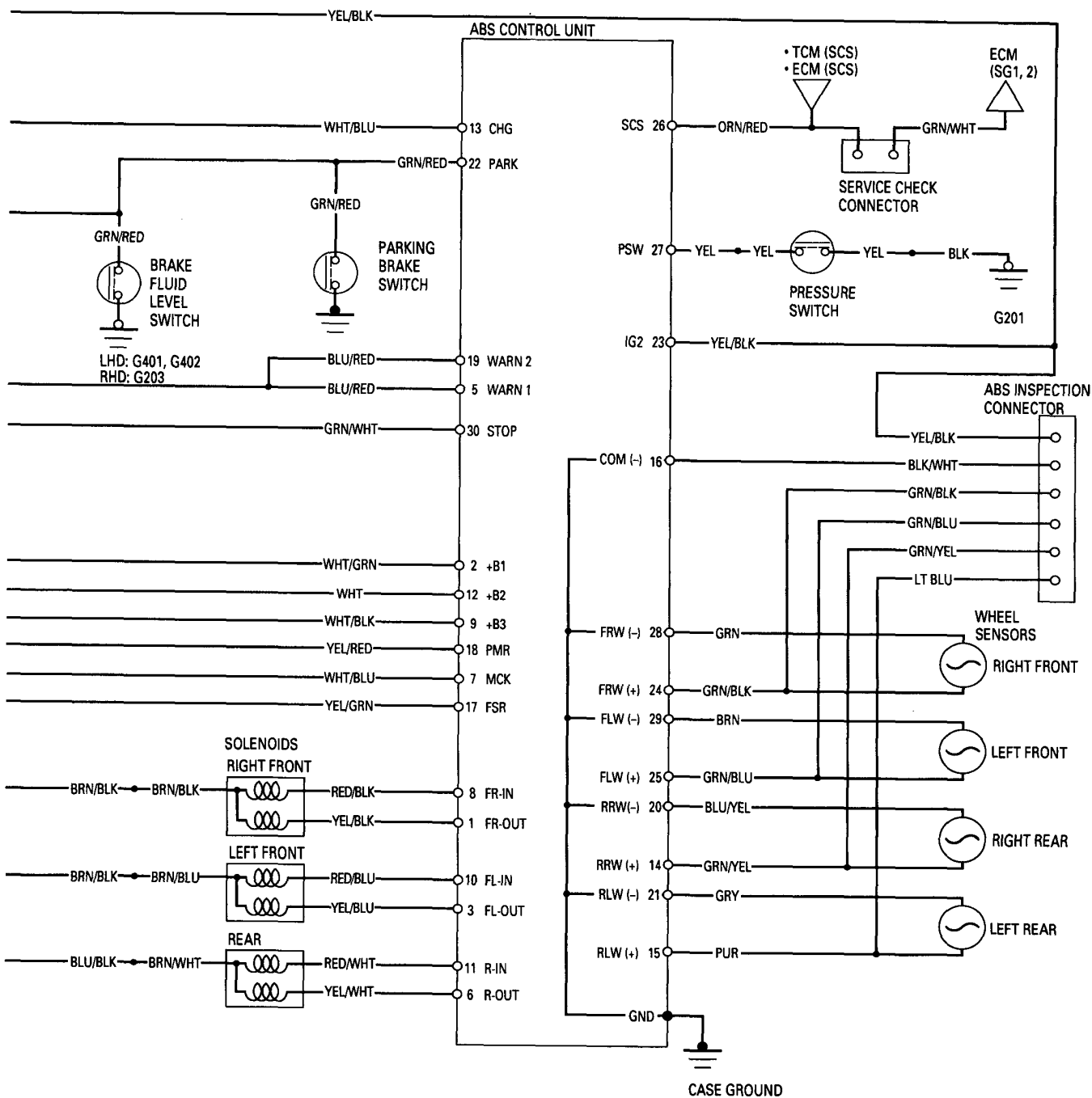


- (2) After the turning point:

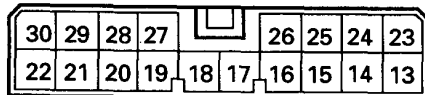
As the fluid pressure from the master cylinder further increases, the pressure in chamber A becomes higher, causing a force to push down the large diameter portion of the piston. Consequently, the slide piston comes down, the cut-off valve is pushed downward by the bottom of the slide piston, allowing chambers A and B to connect momentarily. As this occurs, pressure in chamber B increases, the slide piston is pushed upward, the cut-off valve goes up, and the connection between chamber A and chamber B is blocked again. As described above, when the pressure in the master cylinder is above the turning point, the slide piston reduces the pressure in the rear caliper to the prescribed pressure by repeating these processes.

Circuit Diagram



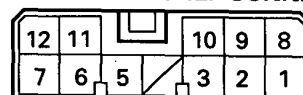


ABS CONTROL UNIT 18P CONNECTOR



View from terminal side.

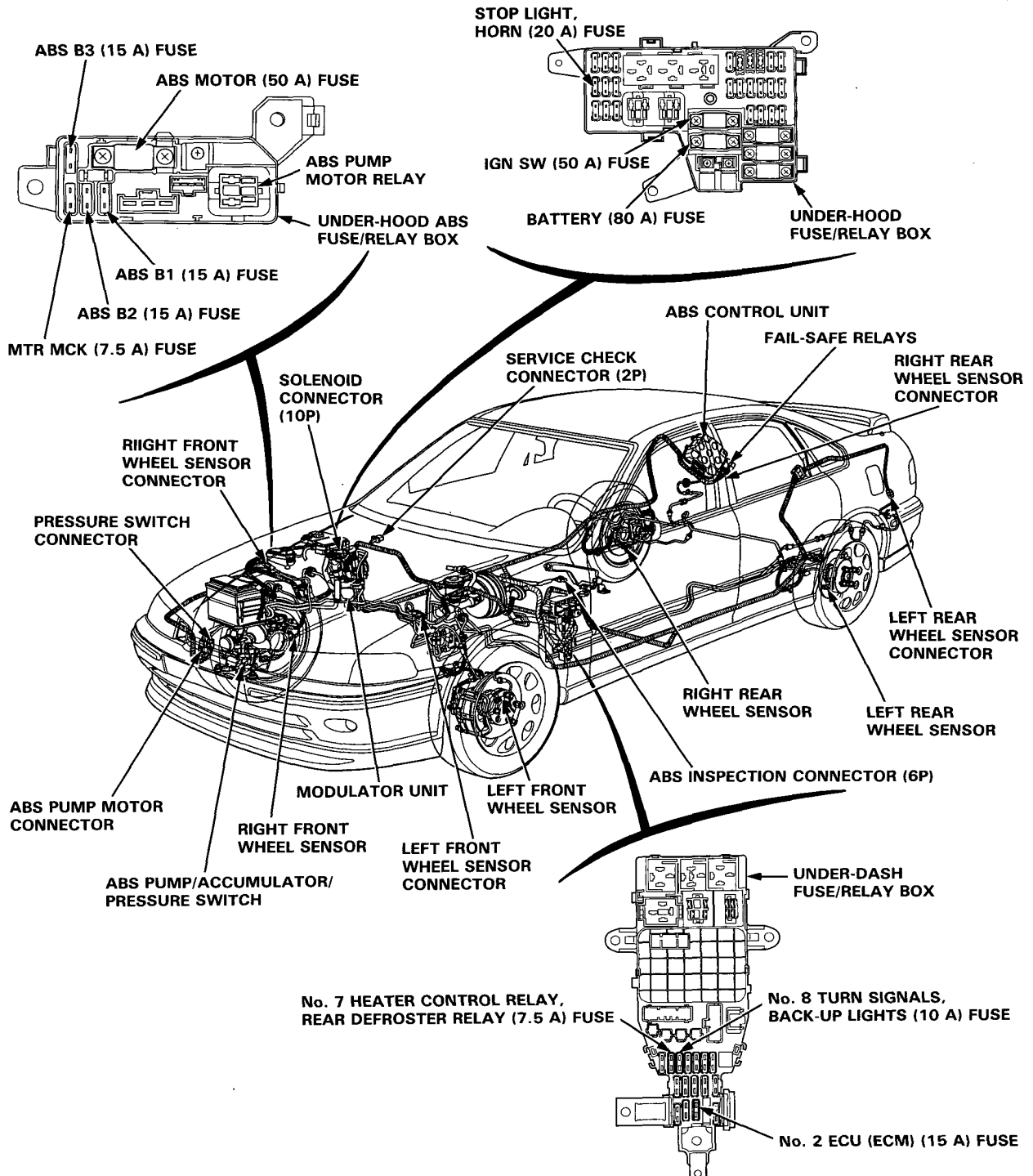
ABS CONTROL UNIT 12P CONNECTOR



View from terminal side.

Wiring/Connector Location

- The ABS inspection connector (6P) is located on the cross-member under the passenger's seat.
- The service check connector (2P) is located under the dash on the passenger side of car.
- The under-dash fuse/relay box is located under the dash on the driver side of car.



ALB Checker

Function Test

NOTE:

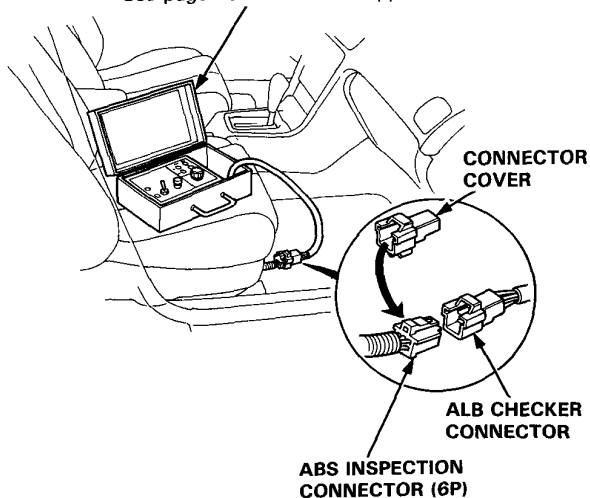
- The ALB checker is designed to confirm proper operation of the anti-lock brake system (ABS) by simulating each system function and operating condition. Before using the checker, confirm that the anti-lock brake system (ABS) indicator light is not indicating some other problem with the system. The light should go on when the ignition is first turned on and then go off and stay off one second after the engine is started.
- The checker should be used through modes 1–5 to confirm proper operation of the system in any one of the following situations:
 - After replacing any ABS component.
 - After replacing or bleeding the system fluid (0 mode not necessary).
 - After any body or suspension repair that may have affected the sensors or their wiring.
- The procedure for modes 1–5 are on this page and 19-58, mode "0" (wheel sensor signal) is on page 19-59.

⚠ WARNING Disconnect the ALB checker before driving the car. A collision can result from a reduction, or complete loss, of braking ability causing severe personal injury or death.

1. With the ignition switch off, disconnect the ABS inspection connector (6P) from the connector cover located on the cross-member under the passenger's seat and connect the ABS inspection connector (6P) to the ALB checker.

ALB CHECKER
07HAJ-SG00602

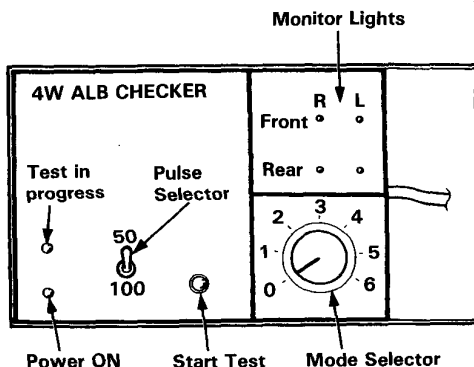
See page 19-40 for other applicable checkers.



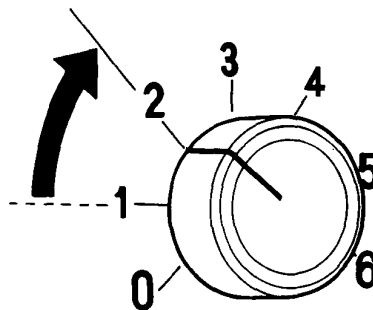
NOTE: Place the vehicle on level ground with the wheels blocked, put the transmission in neutral for manual transmission models, and in **P** position for automatic transmission models.

2. Start the engine and release the parking brake.
3. Operate the ALB checker as follows:
 - (1) Set the pulse selector switch to "50".
 - (2) Turn the Mode Selector switch to "1".
 - (3) Push the Start Test switch:
 - The test in progress light should come ON.
 - In one or two more seconds, all four monitor lights should come on (If not the checker is faulty).
 - The ABS indicator light should not come ON.

NOTE: When the test in progress indicator light is ON, don't turn the Mode Selector switch.



4. Turn the Mode Selector Switch to "2".



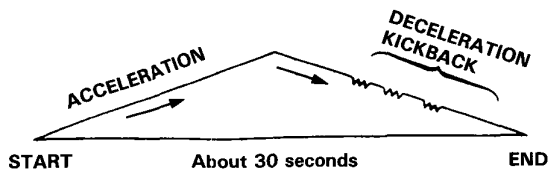
(cont'd)

ALB Checker

Function Test (cont'd)

- Depress the brake pedal firmly and push the Start Test switch.
The ABS indicator light should not go on while the Test in Progress light is ON. There should be kickback on the brake pedal.

NOTE: The operation sequence simulated by Modes 2, 3, 4 and 5:



- Turn the Mode Selector switch to "3", "4" and "5".
Perform step 5 for each of the test mode positions.

Mode 1:

Sends the simulated driving signal 0 km/h (0 mph) → 180 km/h (113 mph) → 0 km/h (0 mph) of each wheel to the ABS control unit. There should be NO kickback.

Mode 2:

Sends the driving signal of each wheel, then sends the lock signal of the left rear wheel to the ABS control unit. There should be kickback.

Mode 3:

Sends the driving signal of each wheel, then sends the lock signal of the right rear wheel to the ABS control unit. There should be kickback.

Mode 4:

Sends the driving signal of each wheel, then sends the lock signal of the left front wheel to the ABS control unit. There should be kickback.

Mode 5:

Sends the driving signal of each wheel, then sends the lock signal of the right front wheel to the ABS control unit. There should be kickback.

Mode 6:

Not used on this model.

Inspection points:

- The ABS indicator light comes ON.
 - Check the Diagnostic Trouble Code and go to the troubleshooting, see page 19-61.
- There is no or little kickback in modes 2 through 5 and the ABS indicator light does not come ON.
 - Air in the high pressure line.
 - Restricted high pressure line.
 - Faulty modulator unit.

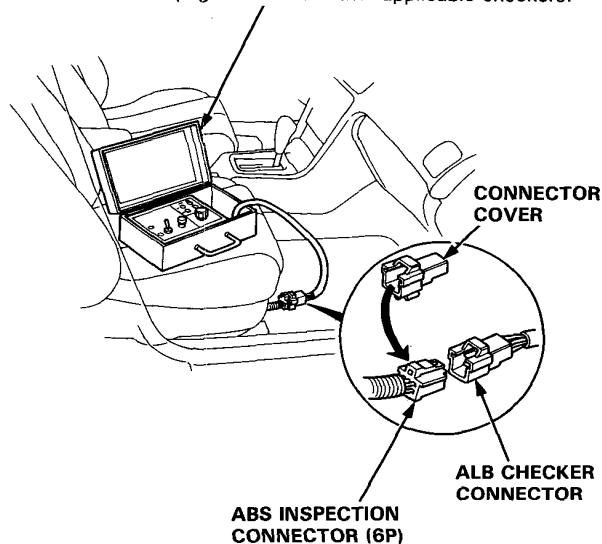
Wheel Sensor Signal Confirmation

NOTE: Use the ALB checker (mode "0") to confirm proper wheel sensor operation.

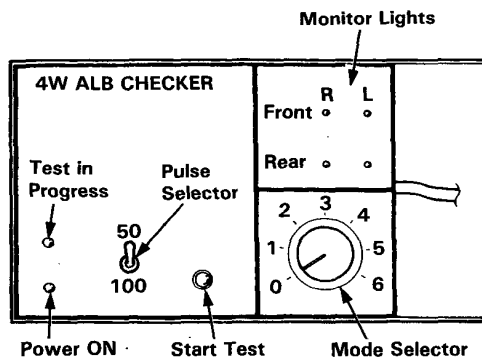
1. Disconnect the ABS inspection connector (6P) from the connector cover located on the cross-member under the passenger's seat and connect the ABS inspection connector (6P) to the ALB checker.

ALB CHECKER
07HAJ-SG00602

See page 19-40 for other applicable checkers.



2. Raise the car so that all four wheels are off the ground and support on safety stands.
3. Set the pulse selector switch to "50".
4. Turn the Mode Selector switch to "0".
5. Turn the ignition switch ON.



6. With the transmission in neutral, rotate each wheel briskly (one revolution per second) by hand, and confirm that its respective monitor light on the checker blinks as the wheel rotates.

NOTE:

- Rotating a wheel too slowly will produce only a weak blink of its monitor light that may be difficult to see.
- In bright sunlight, the monitor light may be difficult to see. Perform tests in a shaded area.
- In some instances, it may not be possible to spin the front wheels fast enough to get a monitor indication. If necessary, start the engine and slowly accelerate and decelerate the front wheels. The monitor lights should blink, indicating a good wheel sensor signal.

If any monitor light fails to blink, check the suspected sensor, its air gap and its wiring/connectors.

Troubleshooting

Anti-lock Brake System (ABS) Indicator Light

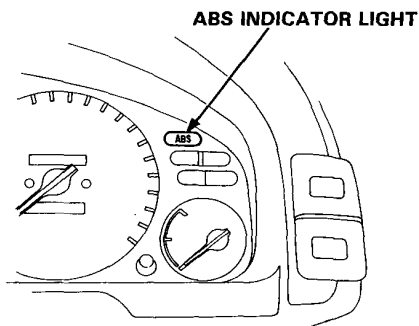
Temporary Driving Conditions:

1. The ABS indicator light comes on and the ABS control unit memorizes the diagnostic trouble code (DTC) under certain conditions.

NOTE: The DTCs are explained on page 19-62.

- The tire(s) adhesion is lost due to excessive cornering speed.
DTC: 5, 5-4, 5-8.
- The vehicle loses traction when starting from a stuck condition on a muddy, snowy, or sandy road.
DTC: 4-1, 4-2, 4-4, 4-8.
- When the parking brake is applied for more than 30 seconds while the vehicle is being driven.
DTC: 2-1.
- The vehicle is driven on an extremely rough road.

The ABS is OK, if the ABS indicator light goes off after the engine is restarted.



2. If you receive a customer's report that the ABS indicator light sometimes comes on, check the system using the ALB checker to confirm whether there is any trouble in the system.
See page 19-57.
3. The ABS indicator light will come on and the ABS control unit will memorize a DTC when there is insufficient battery voltage to the ABS control unit. An example would be when the battery is so weak that the car must be jump-started. After the battery is sufficiently recharged, the ABS indicator light will work normally after the engine is stopped and restarted.

However, after recharging the battery, the DTC must be cleared from the ABS control unit's memory by disconnecting the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box for at least three seconds.

ABS Indicator Light Circuit:

CAUTION: Use only the digital multimeter to check the system.

1. The ABS indicator light does not go on when the ignition switch is turned on.

Check the following items. If they are OK, check the ABS control unit connectors. If not loose or disconnected, substitute a known-good ABS control unit and recheck:

- Blown ABS indicator light bulb.
- Open circuit in YEL wire between the No. 8 TURN SIGNALS, BACK-UP LIGHTS (10 A) fuse in the under-dash fuse/relay box and gauge assembly.
- Open circuit in BLU/RED wire between the gauge assembly and ABS control unit.
- Poor ground connection between the ABS control unit and the body.

2. The ABS indicator light remains ON after the engine is started, however the ABS indicator light does not blink any DTC. Check the following items:

- Loose or poor connection of the wire harness at the ABS control unit.
- Faulty ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box.
- Open circuit in WHT wire between the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box and ABS control unit.
- Open circuit in YEL/BLK wire between the No. 7 HEATER CONTROL RELAY, REAR DEFROSTER RELAY (7.5 A) fuse in the under-dash fuse/relay box and ABS control unit.
- Short circuit in BLU/RED wire between gauge assembly and ABS control unit.
- Open circuit in WHT/BLU wire between alternator and ABS control unit.

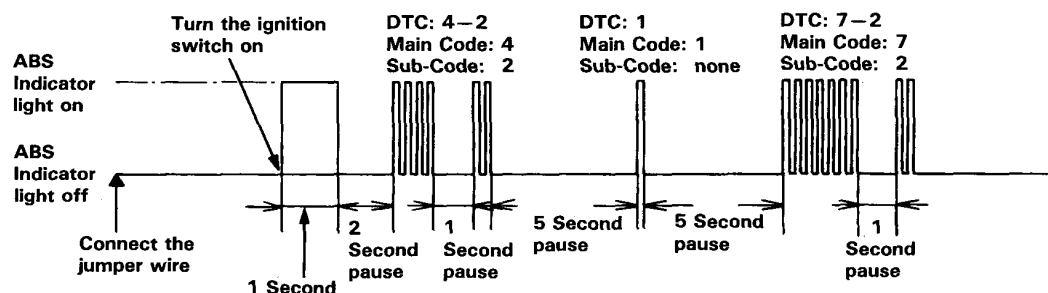
If the problem is not found, substitute a known-good ABS control unit and recheck whether the ABS indicator light remains ON.

Diagnostic Trouble Code (DTC):

1. Disconnect the service check connector (2P) from the connector cover located under dash of the passenger's seat side.
Connect the two terminals of the service check connector with a jumper wire.
2. Turn the ignition switch on, but do not start the engine.
3. Record the blinking frequency of the ABS indicator light.
The blinking frequency indicates the diagnostic trouble code (DTC).

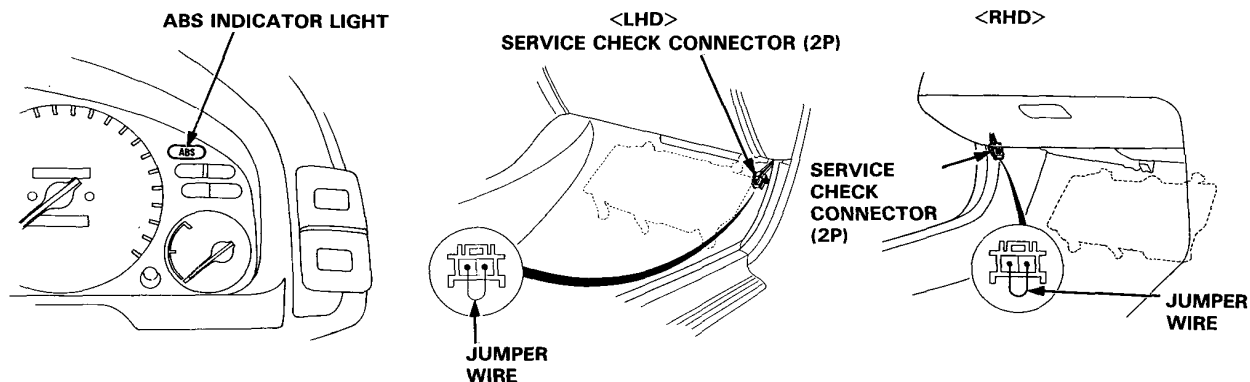
CAUTION: Before starting the engine, disconnect the jumper wire from the service check connector, or else the Malfunction Indicator Lamp (MIL) will stay on with the engine running.

DTC indication pattern



NOTE:

- The ABS control unit can indicate three DTCs (one, two or three problems).
- If the ABS indicator light does not light, see Troubleshooting of ABS Indicator Light Circuit page 19-60.
- If you miscount the blinking frequency, turn the ignition switch off then on to cycle the ABS indicator light again.
- After the repair is completed, disconnect the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box for at least three seconds to erase the ABS control unit's memory. Then turn the ignition key on again and recheck.
- The memory is erased if the connector is disconnected from the ABS control unit or the ABS control unit is removed from the body.
- After recording the DTC (if applicable), refer to the Symptom-to-System Chart.



Troubleshooting

Symptom-to-System Chart

DIAGNOSTIC TROUBLE CODE (DTC)		PROBLEMATIC COMPONENT/ SYSTEM	AFFECTED				PAGE	OTHER COMPONENT	PAGE
MAIN CODE	SUB-CODE		FRONT RIGHT	FRONT LEFT	REAR RIGHT	REAR LEFT			
①	—	ABS pump motor over-run	—	—	—	—	19-63	Solenoid ABS pump motor Pressure switch	
	②	ABS pump motor circuit problem	—	—	—	—	19-65	ABS motor relay ABS unit fuse ABS motor fuse	19-107
	③	High pressure leakage	—	—	—	—	19-68	Solenoid(s)	19-89
	④	Pressure switch	—	—	—	—	19-69		
	⑧	Accumulator gas leakage	—	—	—	—	19-70		
②	①	Parking brake switch-related problem	—	—	—	—	19-70	Brake fluid level switch, Brake system light	
③	①	Pulser(s)	○				19-108	Wheel sensor installation	
	②			○					
	④				○	○			
④	①	Wheel sensor	○				19-71		
	②			○					
	④				○				
	⑧					○			
⑤	—	Wheel sensor(s)			○	○	19-73	Modulator Rear brake drag	
	④				○				
	⑧					○			
⑥	—	Fail-safe relay		○		○	19-75		19-107 (Function Test)
	①			○					
	④					○			
⑦	①	Solenoid related problem	○				19-81	ABS B1 fuse Front fail-safe relay	
	②			○					
	④					○	○	19-84	

Flowcharts

Diagnostic Trouble Code (DTC) 1: ABS Pump Motor Over-run (20 seconds)

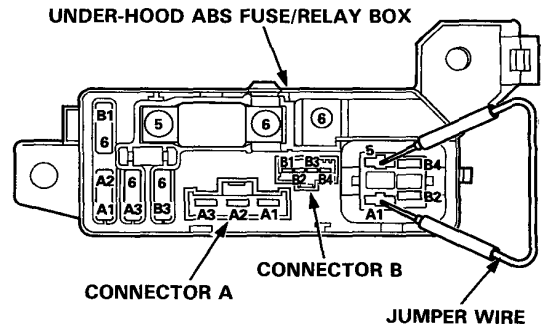
CAUTION: Use only the digital multimeter to check the system.

Pre-test step:

- Check for fluid leaks from the functional parts and replace the faulty parts if there is a leak.

Functional parts:

- Modulator unit
- ABS Pump assembly
- High pressure hose/pipe



— With engine running, ABS indicator light is ON.
 — With service check connector jumped (see page 19-61), DTC 1 is indicated.

Bleed high pressure fluid from the maintenance bleeder with the Bleeder T-wrench (see page 19-88).

Remove the ABS pump motor relay.

Connect the No. 5 and A1 terminals using a jumper wire for about eight seconds.

Does the ABS pump motor run with an increasingly loud, raspy sound?

NO Pump runs with a constant soft sound:
 Bleed air from anti-lock brake system using the procedure on page 19-101 and check the pump sound again.

YES

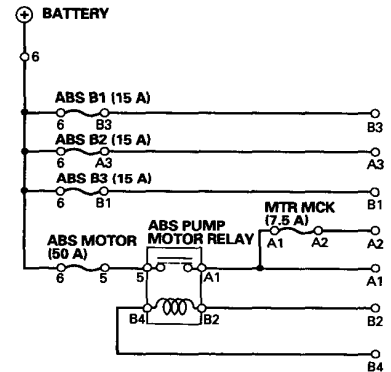
Check the accumulator fluid quantity by bleeding the high pressure line with the Bleeder T-wrench.

Is there 40–70 ml?

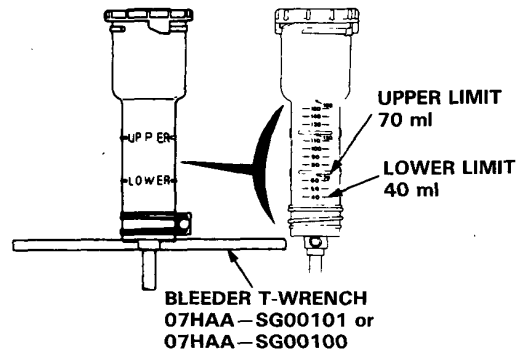
NO (To page 19-64)

YES

(To page 19-64)



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM



BLEEDER T-WRENCH
 07HAA – SG00101 or
 07HAA – SG00100

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-63)

(From page 19-63)

Connect the No. 5 and A1 terminals using a jumper wire for about 10 seconds.

Check if there is any change in the fluid level in the reservoir tank.

Is there any change?

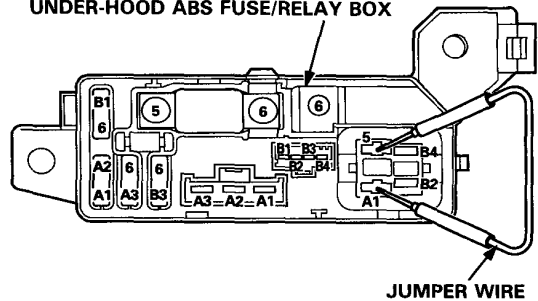
NO

Faulty ABS pump motor (Relief valve is defective and open).
Replace the ABS pump assembly.

YES

Faulty solenoid (leakage).
Replace the modulator unit.

UNDER-HOOD ABS FUSE/RELAY BOX



Connect the No. 5 and A1 terminals using a jumper wire for about 10 seconds.

Disconnect the pressure switch connector and check the continuity between the No. 1 (YEL) and No. 2 (YEL) terminals.

Is there continuity?

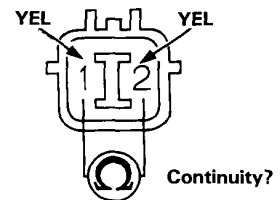
NO

Replace the pressure switch.

YES

The vehicle is OK at this time.

PRESSURE SWITCH CONNECTOR



View from terminal side.

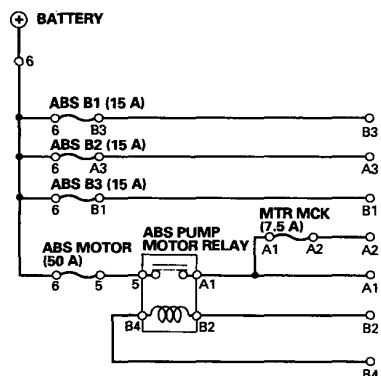
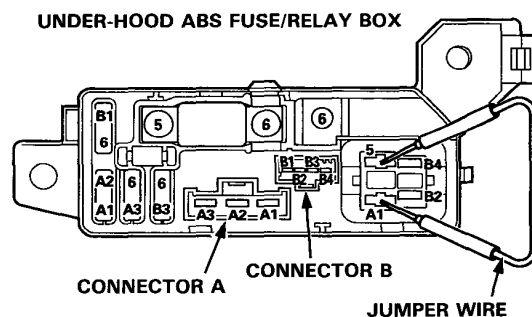
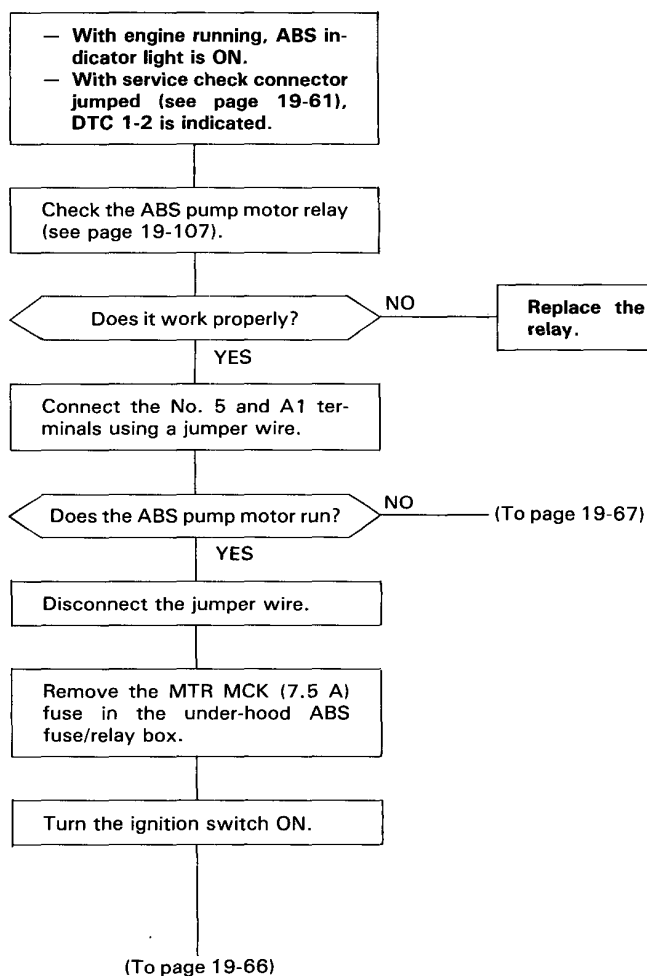
Diagnostic Trouble Code (DTC) 1-2: ABS Pump Motor Circuit Problem

CAUTION: Use only the digital multimeter to check the system.

NOTE: If a malfunction is detected, this code appears and the fail-safe function is activated. The ABS indicator light comes ON after restarting the engine until the DTC is erased (by disconnecting the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box for three seconds).

Pre-test steps:

- Check ABS MOTOR (50 A) fuse in the under-hood ABS fuse/relay box.
- Check ABS UNIT (7.5 A) fuse in the under-hood ABS fuse/relay box.
- Check for loose under-hood ABS fuse/relay box connectors.



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-65)

Check for voltage between the under-hood ABS fuse/relay box MTR MCK (7.5 A) fuse A2 terminal and body ground.

Is there battery voltage?

NO

Repair open in WHT/BLK wire between the MTR MCK (7.5 A) fuse in the under-hood ABS fuse/relay box and ABS control unit.

YES

Reinstall the fuse in the under-hood ABS fuse/relay box.

Disconnect the ABS pump motor connector.

Check for voltage between the ABS fuse/relay box A1 terminal and body ground.

Is there battery voltage?

NO

Replace the under-hood ABS fuse/relay box.

YES

Check for voltage between the B4 terminal and body ground.

Is there battery voltage?

NO

Repair open in YEL/BLK wire between the No. 7 HEATER CONTROL RELAY, REAR DEFROSTER RELAY (7.5 A) fuse in the under-dash ABS fuse/relay box and ABS pump motor relay.

YES

Reinstall the ABS pump motor relay.

Disconnect the ABS control unit 18P connector.

Check for voltage between the ABS control unit 18P connector No. 18 (YEL/RED) terminal and body ground.

Is there battery voltage?

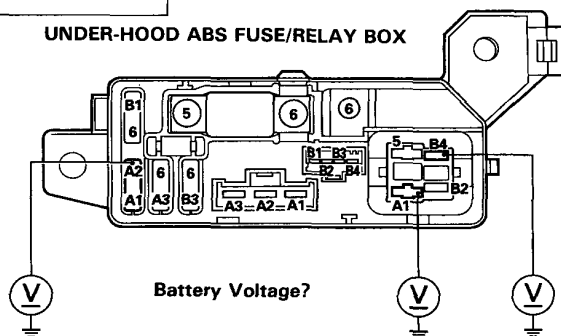
NO

Repair open in YEL/RED wire between the ABS pump motor relay and ABS control unit.

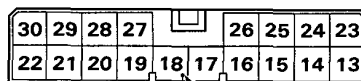
YES

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

UNDER-HOOD ABS FUSE/RELAY BOX



ABS CONTROL UNIT 18P CONNECTOR



View from terminal side.

(From page 19-65)

Disconnect the jumper wire.

Check for voltage between the under-hood ABS fuse box No. 5 terminal and body ground.

Is there battery voltage?

NO

Replace the under-hood ABS fuse/relay box.

YES

Connect the No. 5 and A1 terminals using a jumper wire.

Disconnect the ABS pump motor connector.

Check for voltage between the No. 1 (WHT/BLU) terminal and body ground.

Is there battery voltage?

NO

Repair open in WHT/BLU wire between the ABS pump motor relay and ABS pump motor.

YES

Check for voltage between the No. 1 (WHT/BLU) terminal and No. 2 (BLK) terminal.

Is there battery voltage?

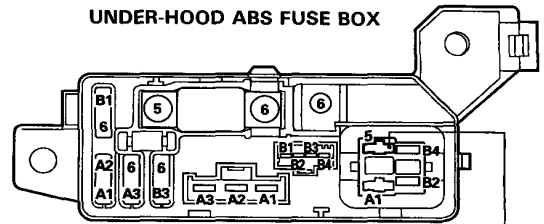
NO

Repair open in BLK wire between the ABS pump motor and ground or poor ground (G202).

YES

Faulty ABS pump motor. Replace the ABS pump assembly.

UNDER-HOOD ABS FUSE BOX

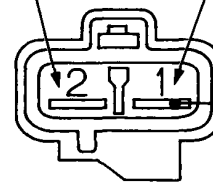


Battery Voltage?



ABS PUMP MOTOR CONNECTOR

BLK (GROUND) WHT/BLU (MOTOR RELAY)



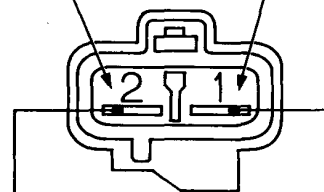
Battery Voltage?



View from terminal side.

ABS PUMP MOTOR CONNECTOR

BLK (GROUND) WHT/BLU (MOTOR RELAY)



Battery Voltage?



View from terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Diagnostic Trouble Code (DTC) 1-3: High Pressure Leakage

CAUTION: Use only the digital multimeter to check the system.

Pre-test steps:

- Check reservoir fluid level, and if necessary, fill to the MAX level line.
- Check for fluid leaks from the functional parts and replace the faulty parts if there is a leak.

Functional parts:

- Modulator unit
- ABS Pump assembly
- High pressure hose/pipe

— With engine running, ABS indicator light is ON.
 — With service check connector jumped (see page 19-61), DTC 1-3 is indicated.

Bleed high pressure fluid from the maintenance bleeder with the Bleeder T-wrench (see page 19-88).

Remove the ABS pump motor relay.

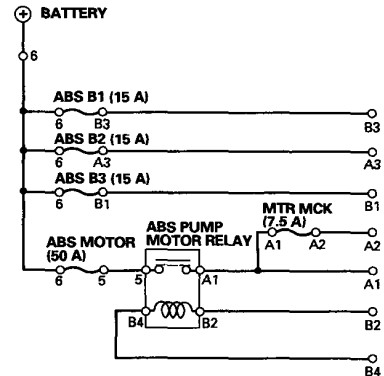
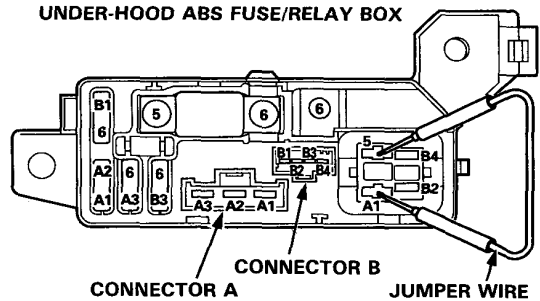
Connect the No. 5 and A1 terminals using a jumper wire for about 10 seconds.

Disconnect the pressure switch connector.

After 30 minutes, check for continuity between the No. 1 (YEL) and No. 2 (YEL) terminals.

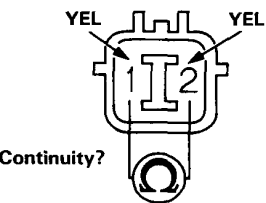
Is there continuity? **YES** → The vehicle is OK at this time.

NO
 Faulty solenoid (leakage).
 Replace the modulator unit.



UNDER-HOOD ABS FUSE/RELAY BOX CIRCUIT DIAGRAM

PRESSURE SWITCH CONNECTOR



View from terminal side.

Diagnostic Trouble Code (DTC) 1-4: Pressure Switch Circuit

CAUTION: Use only the digital multimeter to check the system.

- With engine running, ABS indicator light is ON.
 - With service check connector jumped (see page 19-61), DTC 1-4 is indicated.

Bleed high pressure fluid from the maintenance bleeder with the Bleeder T-wrench (see page 19-88).

Disconnect the pressure switch connector.

Check the continuity between the No. 1 (YEL) and No. 2 (YEL) terminals.

Is there continuity?

YES → Replace the pressure switch (closed).
 NO →

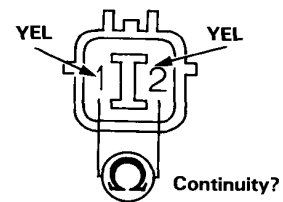
Check for continuity between the No. 1 (YEL) terminal and body ground.

Is there continuity?

YES → Repair short in YEL wire between the ABS control unit and pressure switch.
 NO →

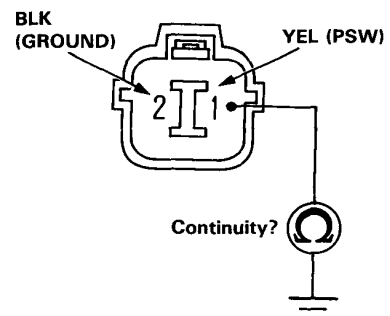
Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

PRESSURE SWITCH CONNECTOR



View from terminal side.

PRESSURE SWITCH CONNECTOR



View from terminal side.

(cont'd)

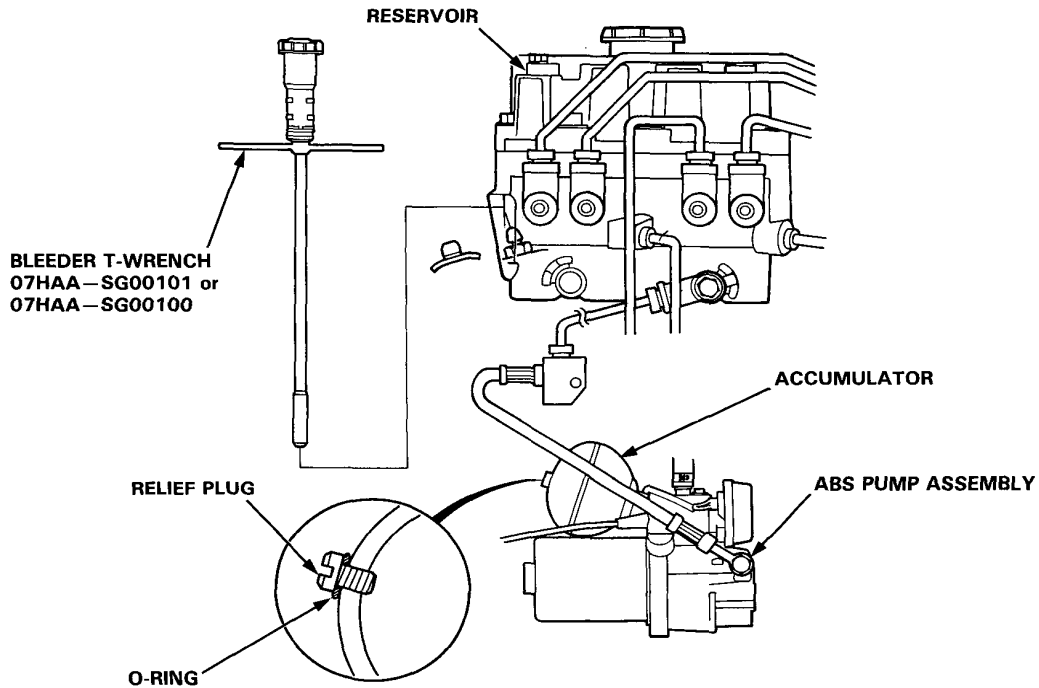
Troubleshooting

Flowcharts (cont'd)

Diagnostic Trouble Code (DTC) 1-8: Accumulator Gas Leakage

Check the following items:

- The relief plug is loose.
- The relief plug O-ring is out of place.
- Bleed the high pressure line with the Bleeder T-wrench. Operate the ABS pump motor for 10 seconds and bleed the high pressure line again with the Bleeder T-wrench. If no fluid or more than 70 ml of fluid come out, replace the ABS pump assembly.



Diagnostic Trouble Code (DTC) 2-1: Parking Brake Switch Related Problem

If the parking brake has been released, the following items are possible causes. If they are OK, check the ABS control unit connectors for good connection. If not loose or disconnected, substitute a known-good ABS control unit and recheck.

NOTE: Before troubleshooting DTC 2-1, remove the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box for three seconds to clear the ABS control unit's memory, then test drive the car.

If the ABS indicator light stays off, the probability is that the car was driven with the parking brake applied.

- The parking brake is applied for more than 30 seconds while driving.
- The brake fluid level in the master cylinder is too low.
- GRN/RED wire is shorted between the brake system light and parking brake switch.
- GRN/RED wire is shorted between the brake system light and brake fluid level switch.
- The brake system light is blown.
- GRN/RED wire has an open between the brake system light and the ABS control unit.

Diagnostic Trouble Code (DTC) 4-1 to 4-8: Wheel Sensor

CAUTION: Use only the digital multimeter to check the system.

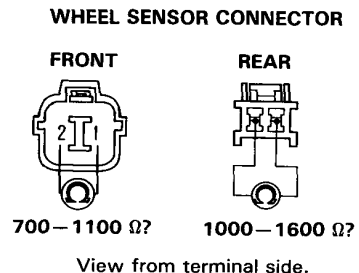
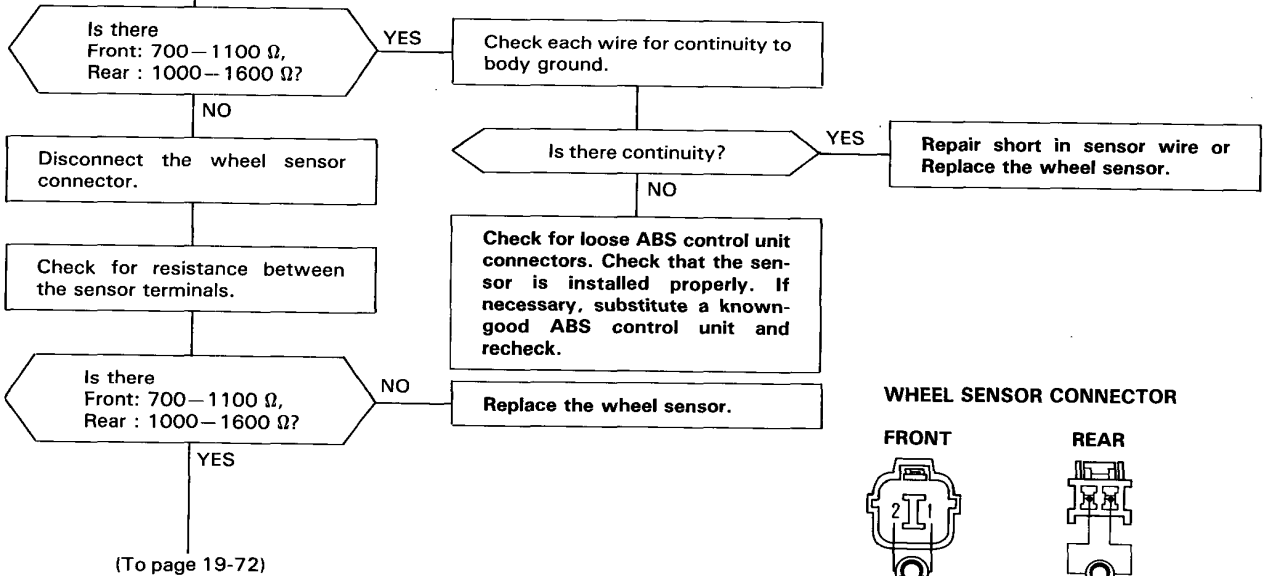
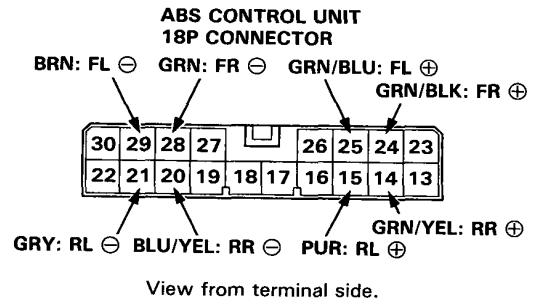
NOTE: If a malfunction is detected, this code appears and the fail-safe function is activated. The ABS indicator light may come ON after restarting the engine until the DTC is erased (by disconnecting the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box for three seconds).

- With engine running, ABS indicator light is ON.
- With service check connector jumped (see page 19-61), DTCs 4-1, 4-2, 4-4 and/or 4-8 are indicated.

Disconnect the ABS control unit 18P connector.

Check the resistance of each sensor between the positive and negative:

- GRN/BLK: Front Right Positive
GRN: Front Right Negative
- GRN/BLU: Front Left Positive
BRN: Front Left Negative
- GRN/YEL: Rear Right Positive
BLU/YEL: Rear Right Negative
- PUR: Rear Left Positive
GRY: Rear Left Negative



(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-71)

Reconnect the ABS control unit 18P connector.

Check each wire for continuity between the wheel sensor connector ⊕, ⊖ terminals and body ground.

Is there continuity?

NO

Repair open in wire harness.

YES

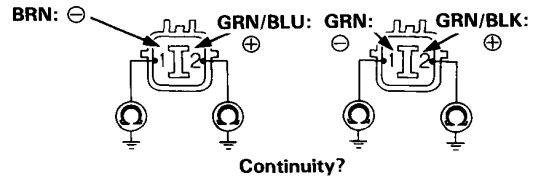
Check for loose wheel sensor connectors. If necessary, substitute a known-good ABS control unit and recheck.

Positive: $3.3\text{ k}\Omega \pm 15\%$ is OK.
Negative: Less than $1\ \Omega$ is OK.

WHEEL SENSOR CONNECTOR

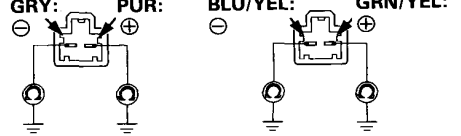
LEFT FRONT

RIGHT FRONT



LEFT REAR

RIGHT REAR



View from terminal side.

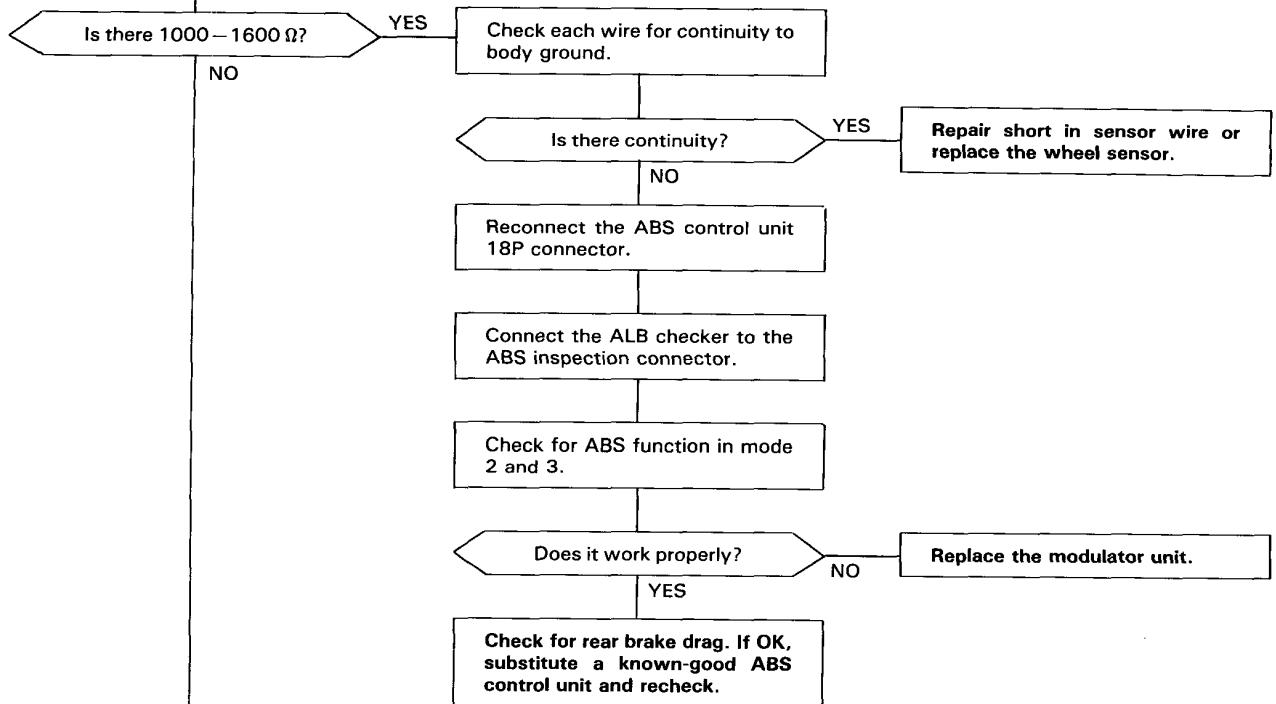
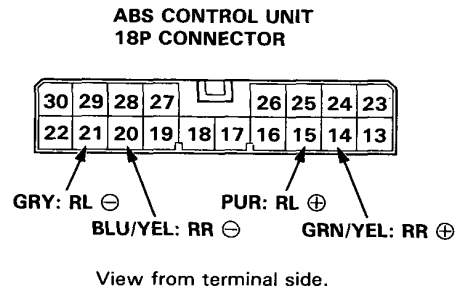
Diagnostic Trouble Code (DTC) 5 to 5-8: Wheel Sensor(s)
CAUTION: Use only the digital multimeter to check the system.

NOTE: If a malfunction is detected, this code appears and the fail-safe function is activated. The ABS indicator light may come ON after restarting the engine until the DTC is erased (by disconnecting the ABS B2 (15 A) fuse in the under-hood ABS fuse/relay box for three seconds.)

- With engine running, ABS indicator light is ON.
- With service check connector jumped (see page 19-61), DTCs 5, 5-4 or 5-8 is indicated.

Disconnect the ABS control unit 18P connector.

- Check the resistance of each sensor between the positive and negative:
- GRN/YEL: Rear Right Positive
 - BLU/YEL: Rear Right Negative
 - PUR: Rear Left Positive
 - GRY: Rear Left Negative



(To page 19-74)

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-73)

Disconnect the wheel sensor connector.

Check for resistance between the sensor terminals.

Is there 1000–1600 Ω ?

NO

Replace the wheel sensor.

YES

Reconnect the ABS control unit 18P connector.

Check each wire for continuity between the wheel sensor connector \oplus , \ominus terminals and body ground.

Is there continuity?

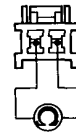
NO

Repair open in wire harness.

YES

Check for loose wheel sensor connectors. If necessary, substitute a known-good ABS control unit and recheck.

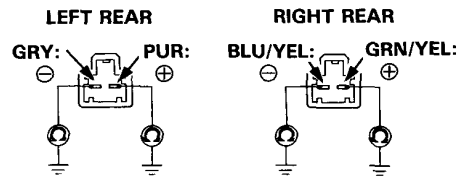
WHEEL SENSOR CONNECTOR REAR



1000–1600 Ω ?

View from terminal side.

WHEEL SENSOR CONNECTOR



Continuity?

View from terminal side.

Positive: 3.3 k Ω \pm 15% is OK.
Negative: Less than 1 Ω is OK.

Diagnostic Trouble Code (DTC) 6-1: Front Fail-Safe Relay Circuit

CAUTION: Use only the digital multimeter to check the system.

Pre-test steps:

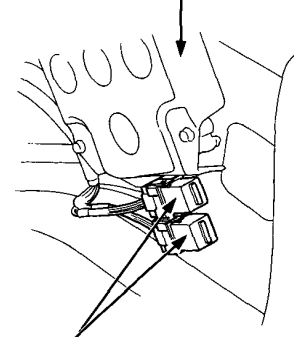
- Check ABS B1 (15 A) fuse in the under-hood ABS fuse/relay box.
- Check for loose under-hood ABS fuse/relay box connectors.

— With engine running, ABS indicator light is ON.
 — With service check connector jumped (see page 19-61), DTC 6-1 is indicated.

Remove the front fail-safe relay from the ABS control unit protector.

Wire colors of the fail-safe relay connector
 Front: BRN/BLK, YEL/BLK, YEL/GRN, BLK
 Rear: BLU/BLK, YEL/BLK, YEL/GRN, BLK

ABS CONTROL UNIT PROTECTOR



FAIL-SAFE RELAYS

Check relay function (see page 19-107).

Does it work properly?

NO

Replace the front fail-safe relay.

YES

Turn the ignition switch ON.

Check for voltage between the front fail-safe relay connector No. 4 (YEL/BLK) terminal and body ground.

Is there battery voltage?

NO

Repair open in YEL/BLK wire between the No. 7 HEATER CONTROL RELAY, REAR DEFROSTER RELAY (7.5 A) fuse in the under-dash fuse/relay box and front fail-safe relay.

YES

Turn the ignition switch OFF.

Disconnect the solenoid connector (10P).

Check for continuity between the front fail-safe relay connector No. 8 (BRN/BLK) terminal and body ground.

Is there continuity?

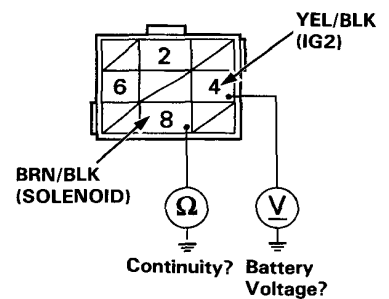
YES

Repair short in BRN/BLK wire between the solenoid and front fail-safe relay.

NO

(To page 19-76)

FRONT FAIL-SAFE RELAY CONNECTOR



View from terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-75)

Check each wire for continuity between the solenoid connector (10P) terminals and body ground
 No. 4 (BRN/BLK): Front Right
 No. 6 (BRN/BLU): Front Left

Is there continuity?

YES
 Faulty solenoid (short).
 Replace the modulator unit.

NO
 Disconnect the ABS control unit 12P connector.

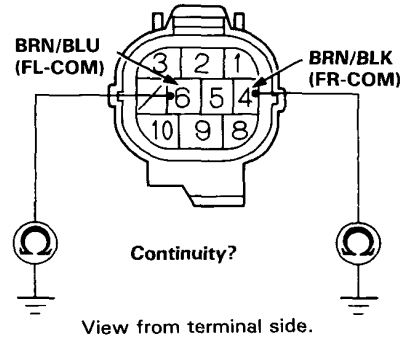
Check each wire for continuity between the ABS control unit 12P connector and body ground.
 RED/BLK: Front Right Inlet
 YEL/BLK: Front Right Outlet
 RED/BLU: Front Left Inlet
 YEL/BLU: Front Left Outlet

Is there continuity?

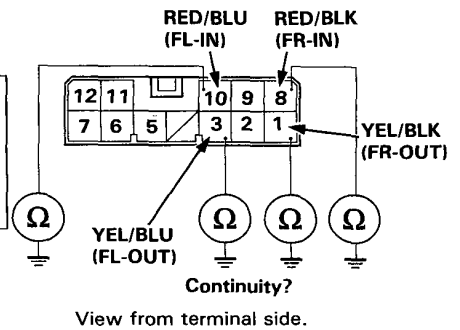
YES
 Repair short in wire between the solenoid and ABS control unit:
 RED/BLK: Front Right Inlet
 YEL/BLK: Front Right Outlet
 RED/BLU: Front Left Inlet
 YEL/BLU: Front Left Outlet

NO
 (To page 19-77)

SOLENOID CONNECTOR (10P)



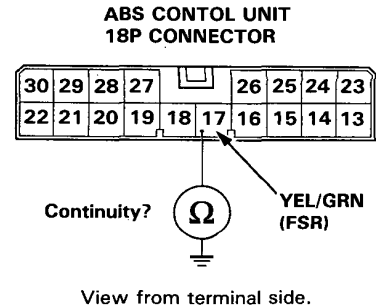
ABS CONTROL UNIT 12P CONNECTOR



(From page 19-76)

Remove the rear fail-safe relay.

Check for continuity between the ABS control unit 18P connector No. 17 (YEL/GRN) terminal and body ground.



Is there continuity?

YES

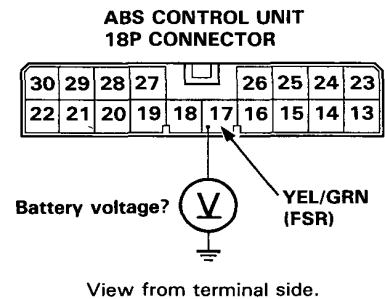
Repair short in YEL/GRN wire between the ABS control unit and front fail-safe relay.

NO

Reinstall the front fail-safe relay.

Turn the ignition switch ON.

Check for voltage between the ABS control unit 18P connector No. 17 (YEL/GRN) terminal and body ground.



Is there battery voltage?

NO

Repair open in YEL/GRN wire between the front fail-safe relay and ABS control unit.

YES

Check for loose ABS control unit 18P connector. If necessary, substitute a known-good ABS control unit and recheck.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Diagnostic Trouble Code (DTC) 6-4: Rear Fail-Safe Relay Circuit

CAUTION: Use only digital multimeter to check the system.

— With engine running, ABS indicator light is ON.
— With service check connector jumped (see page 19-61), DTC 6-4 is indicated.

Remove the rear fail-safe relay from the ABS control unit protector.

Wire colors of the fail-safe relay connector
Front: BRN/BLK, YEL/BLK, YEL/GRN, BLK
Rear: BLU/BLK, YEL/BLK, YEL/GRN, BLK

Check relay function (see page 19-107).

Does it work properly? **NO** → Replace the rear fail-safe relay.

YES
Turn the ignition switch ON.

Check for voltage between the rear fail-safe relay connector No. 4 (YEL/BLK) terminal and body ground.

Is there battery voltage? **NO** → Repair open in YEL/BLK wire between the No. 7 HEATER CONTROL RELAY, REAR DEFROSTER RELAY (7.5 A) fuse in the under-dash fuse/relay box and front fail-safe relay.

YES
Turn the ignition switch OFF.

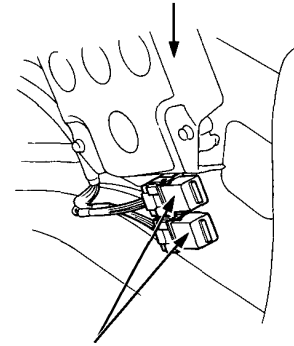
Disconnect the solenoid connector (10P).

Check for continuity between the rear fail-safe relay connector No. 8 (BLU/BLK) terminal and body ground.

Is there continuity? **NO** → Repair short in BLU/BLK wire between the solenoid and rear fail-safe relay.

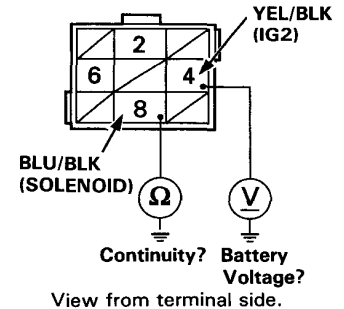
YES
(To page 19-79)

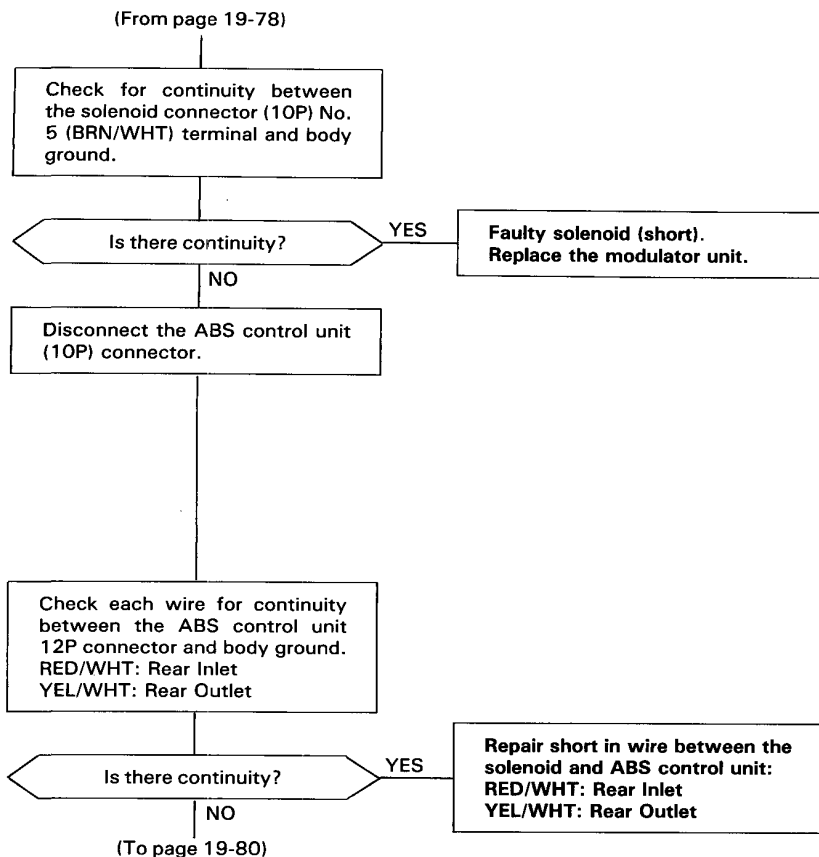
ABS CONTROL UNIT PROTECTOR



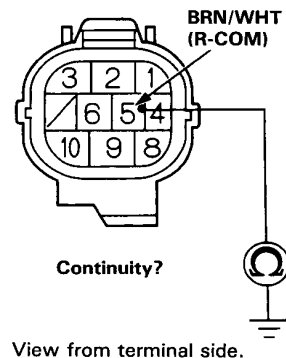
FAIL-SAFE RELAYS

REAR FAIL-SAFE RELAY CONNECTOR

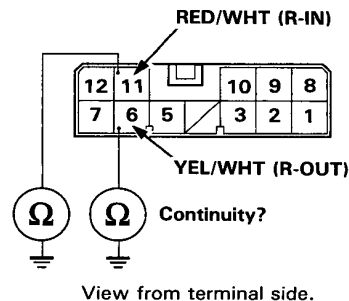




SOLENOID CONNECTOR (10P)



ABS CONTROL UNIT 12P CONNECTOR



(cont'd)

Troubleshooting

Flowcharts (cont'd)

(From page 19-79)

Remove the front fail-safe relay.

Check for continuity between the ABS control unit 18P connector No. 17 (YEL/GRN) terminal and body ground.

Is there continuity?

YES

Repair short in YEL/GRN wire between the ABS control unit and rear fail-safe relay.

NO

Reinstall the rear fail-safe relay.

Turn the ignition switch ON.

Check for voltage between the ABS control unit 18P connector No. 17 (YEL/GRN) terminal and body ground.

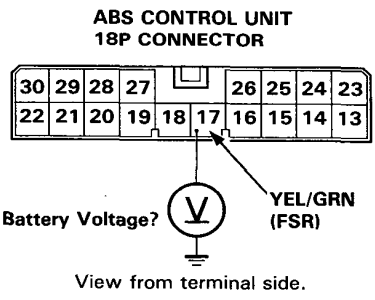
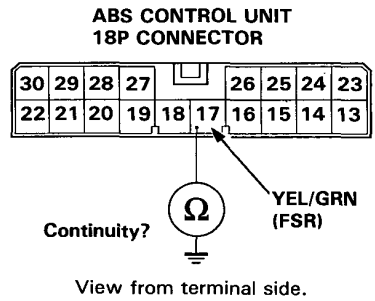
Is there battery voltage?

NO

Repair open in YEL/GRN wire between the rear fail-safe relay and ABS control unit.

YES

Check for loose ABS control unit 18P connector. If necessary, substitute a known-good ABS control unit and recheck.



Diagnostic Trouble Code (DTC) 7-1 and 7-2: Front Solenoid Related Problem

CAUTION: Use only the digital multimeter to check the system.

Pre-test steps:

- Check ABS B1 (15 A) fuse in the under-hood ABS fuse/relay box.
- Check for loose under-hood ABS fuse/relay box connectors.

— With engine running, ABS indicator light is ON.
 — With service check connector jumped (see page 19-61), DTCs 7-1 and/or 7-2 is indicated.

Disconnect the solenoid connector 10P.

Check for resistance between the solenoid connector (10P) terminals:
 No. 1 (RED/BLK) and No. 4 (BRN/BLK): Front Right Inlet
 No. 3 (RED/BLU) and No. 6 (BRN/BLU): Front Left Inlet

Is there 1–3 Ω?

NO
Faulty solenoid
Replace the modulator unit.

YES

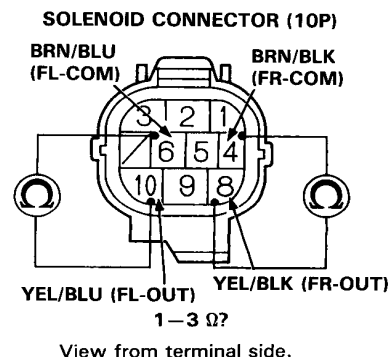
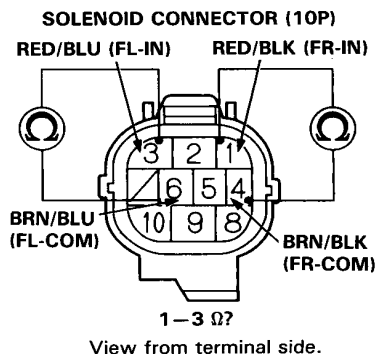
Check for resistance between the solenoid connector (10P) terminals:
 No. 8 (YEL/BLK) and No. 4 (BRN/BLK): Front Right Outlet
 No. 10 (YEL/BLU) and No. 6 (BRN/BLU): Front Left Outlet

Is there 1–3 Ω?

NO
Faulty solenoid
Replace the modulator unit.

YES

(To page 19-82)



Troubleshooting

Flowcharts (cont'd)

(From page 19-81)

Disconnect the ABS control unit 12P connector.

Check each wire for continuity between the ABS control unit 12P connector and solenoid connector (10P).
 RED/BLK: Front Right Inlet
 YEL/BLK: Front Right Outlet
 RED/BLU: Front Left Inlet
 YEL/BLU: Front Left Outlet

Is there continuity? NO

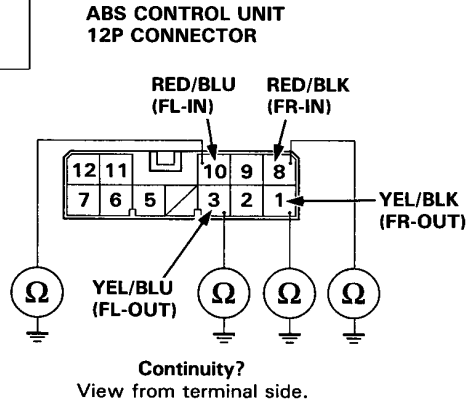
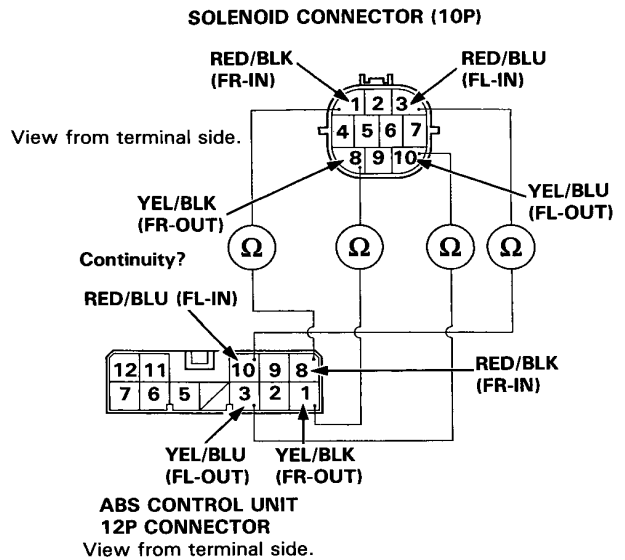
Repair open in wire between the solenoid and ABS control unit:
 RED/BLK: Front Right Inlet
 YEL/BLK: Front Right Outlet
 RED/BLU: Front Left Inlet
 YEL/BLU: Front Left Outlet

Check each wire for continuity between the ABS control unit 12P connector and body ground.
 RED/BLK: Front Right Inlet
 YEL/BLK: Front Right Outlet
 RED/BLU: Front Left Inlet
 YEL/BLU: Front Left Outlet

Is there continuity? NO

Repair short in wire between the solenoid and ABS control unit:
 RED/BLK: Front Right Inlet
 YEL/BLK: Front Right Outlet
 RED/BLU: Front Left Inlet
 YEL/BLU: Front Left Outlet

(To page 19-83)



(From page 19-82)

Remove the front fail-safe relay from the ABS control unit protector.

Wire colors of the fail-safe relay connector
 Front: BRN/BLK, YEL/BLK, YEL/GRN, BLK
 Rear: BLU/BLK, YEL/BLK, YEL/GRN, BLK

Check for relay function (see page 19-107).

Does it work properly?

NO → Replace the front fail-safe relay.

YES

Check for continuity between the fail-safe relay connector No. 2 terminal and body ground.

Is there continuity?

NO → Repair open in BLK wire between the fail-safe relay and body ground or poor ground (LHD: G452; RHD: G701).

YES

Check for continuity between the solenoid connector (10P) No. 4 (BRN/BLK) terminal and front fail-safe relay connector No. 8 (BRN/BLK) terminal.

Is there continuity?

NO → Repair open in BRN/BLK wire between the solenoid and front fail-safe relay.

YES

Check for continuity between the solenoid connector (10P) No. 6 (BRN/BLK) terminal and front fail-safe relay connector No. 8 (BRN/BLK) terminal.

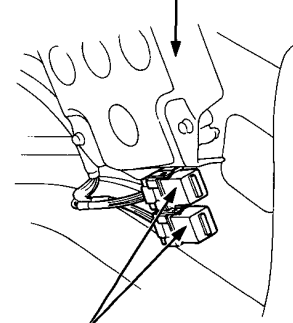
Is there continuity?

NO → Repair open in BRN/BLK wire between the solenoid and front fail-safe relay.

YES

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

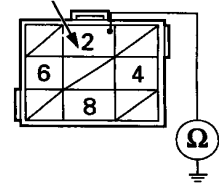
ABS CONTROL UNIT PROTECTOR



FAIL-SAFE RELAYS

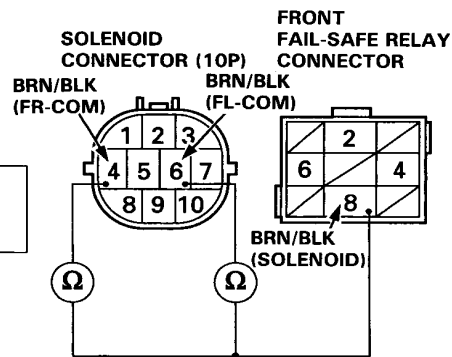
FRONT FAIL-SAFE RELAY CONNECTOR

BLK (GND)



Continuity?

View from terminal side.



Continuity?

View from terminal side.

(cont'd)

Troubleshooting

Flowcharts (cont'd)

Diagnostic Trouble Code (DTC) 7-4: Rear Solenoid Problem

CAUTION: Use only the digital multimeter to check the system.

— With engine running, ABS indicator light is ON.
 — With service check connector jumped (see page 19-61), DTC 7-4 is indicated.

Disconnect the solenoid connector (10P).

Check for resistance between the solenoid connector (10P) terminals:
 No. 2 (RED/WHT): Rear Inlet
 No. 9 (YEL/WHT) and No. 5 (BRN/WHT): Rear Outlet

Is there 1–3 Ω?

NO
**Faulty solenoid.
 Replace the modulator unit.**

YES
 Disconnect the ABS control unit 12P connector.

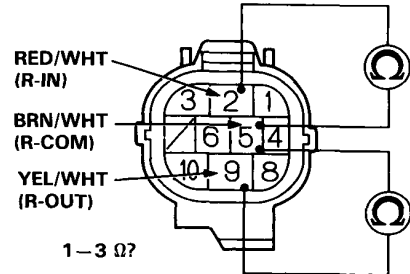
Check each wire for continuity between the ABS control unit 12P connector and solenoid connector (10P).
 RED/WHT: Rear Inlet
 YEL/WHT: Rear Outlet

Is there continuity?

NO
**Repair open in wire between the solenoid and ABS control unit:
 RED/WHT: Rear Inlet
 YEL/WHT: Rear Outlet**

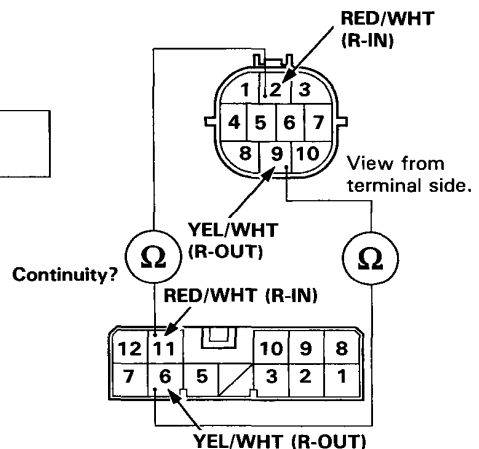
(To page 19-85)

SOLENOID CONNECTOR (10P)



View from terminal side.

SOLENOID CONNECTOR (10P)



ABS CONTROL UNIT 12P CONNECTOR

View from terminal side.

(From page 19-84)

Check each wire for continuity between the ABS control unit 12P connector and body ground.
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

Is there continuity?

YES
Repair short in wire between the solenoid and ABS control unit:
RED/WHT: Rear Inlet
YEL/WHT: Rear Outlet

NO

Remove the rear fail-safe relay from the ABS control unit protector.

Wire colors of the fail-safe relay connector
Front: BRN/BLK, YEL/BLK, YEL/GRN, BLK
Rear: BLU/BLK, YEL/BLK, YEL/GRN, BLK

Check for relay function (see page 19-107).

Does it work properly?

NO
Replace the rear fail-safe relay.

YES

Check for continuity between the rear fail-safe relay connector No. 2 (BLK) terminal and body ground.

Is there continuity?

NO
Repair open in BLK wire between the fail-safe relay and ground or poor ground (LHD: G452; RHD: G701).

YES

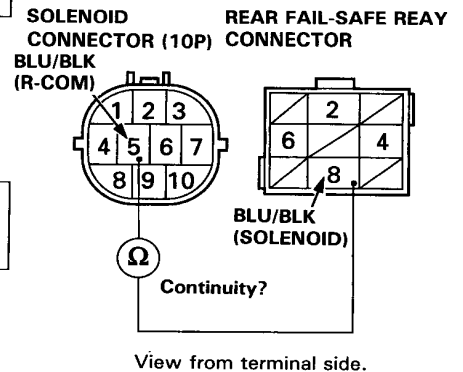
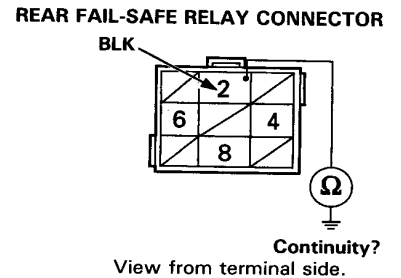
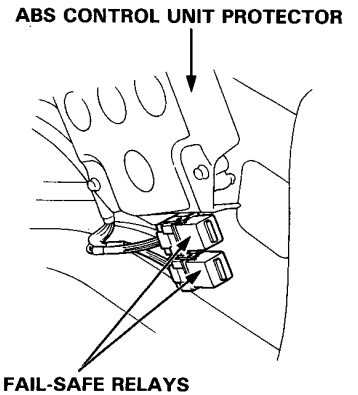
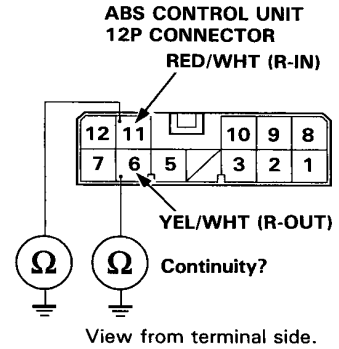
Check for continuity between the solenoid connector (10P) No. 5 (BLU/BLK) terminal and rear fail-safe relay connector No. 8 (BLU/BLK) terminal.

Is there continuity?

NO
Repair open in BLU/BLK wire between the solenoid and rear fail-safe relay.

YES

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

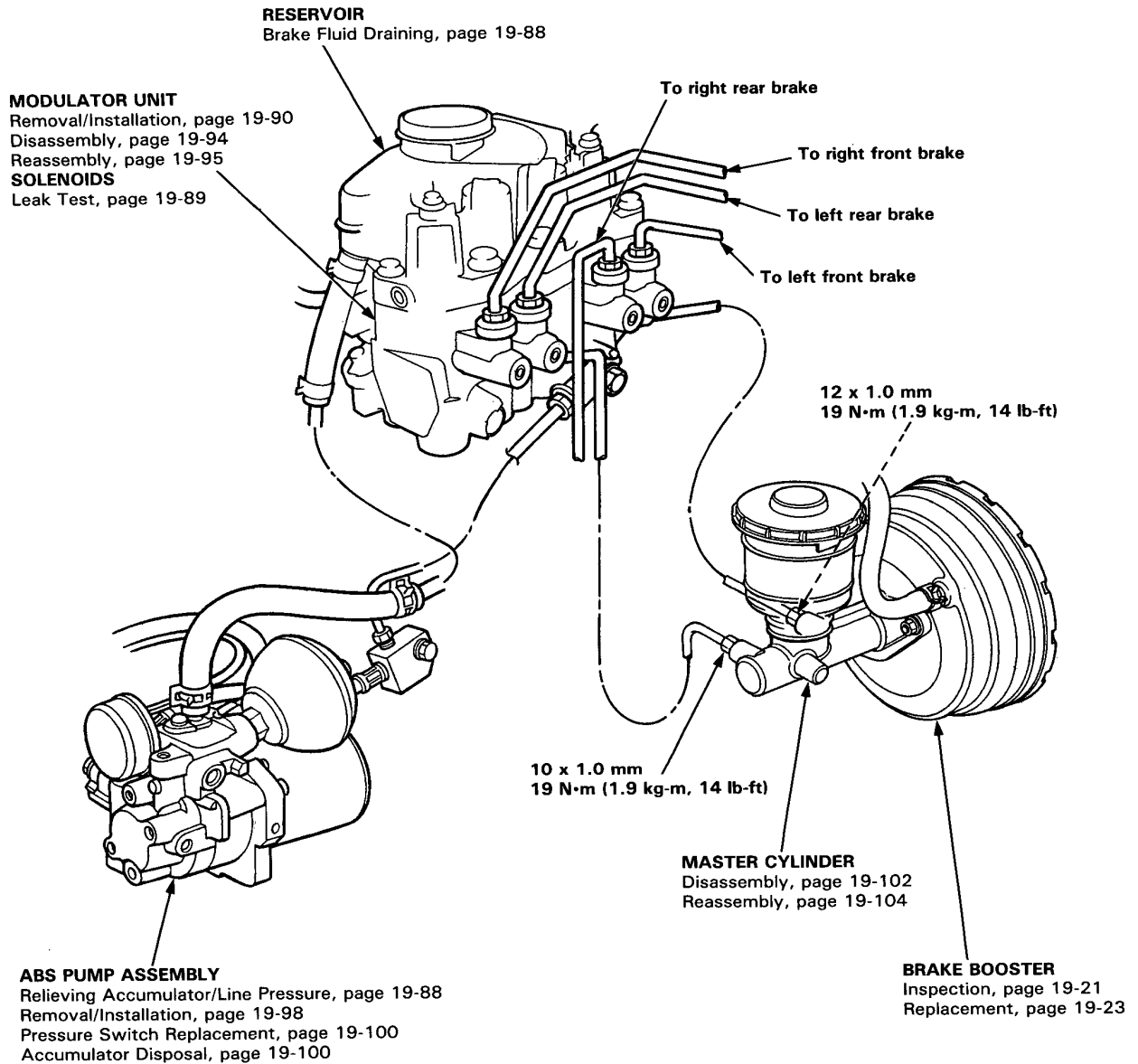


Hydraulic System

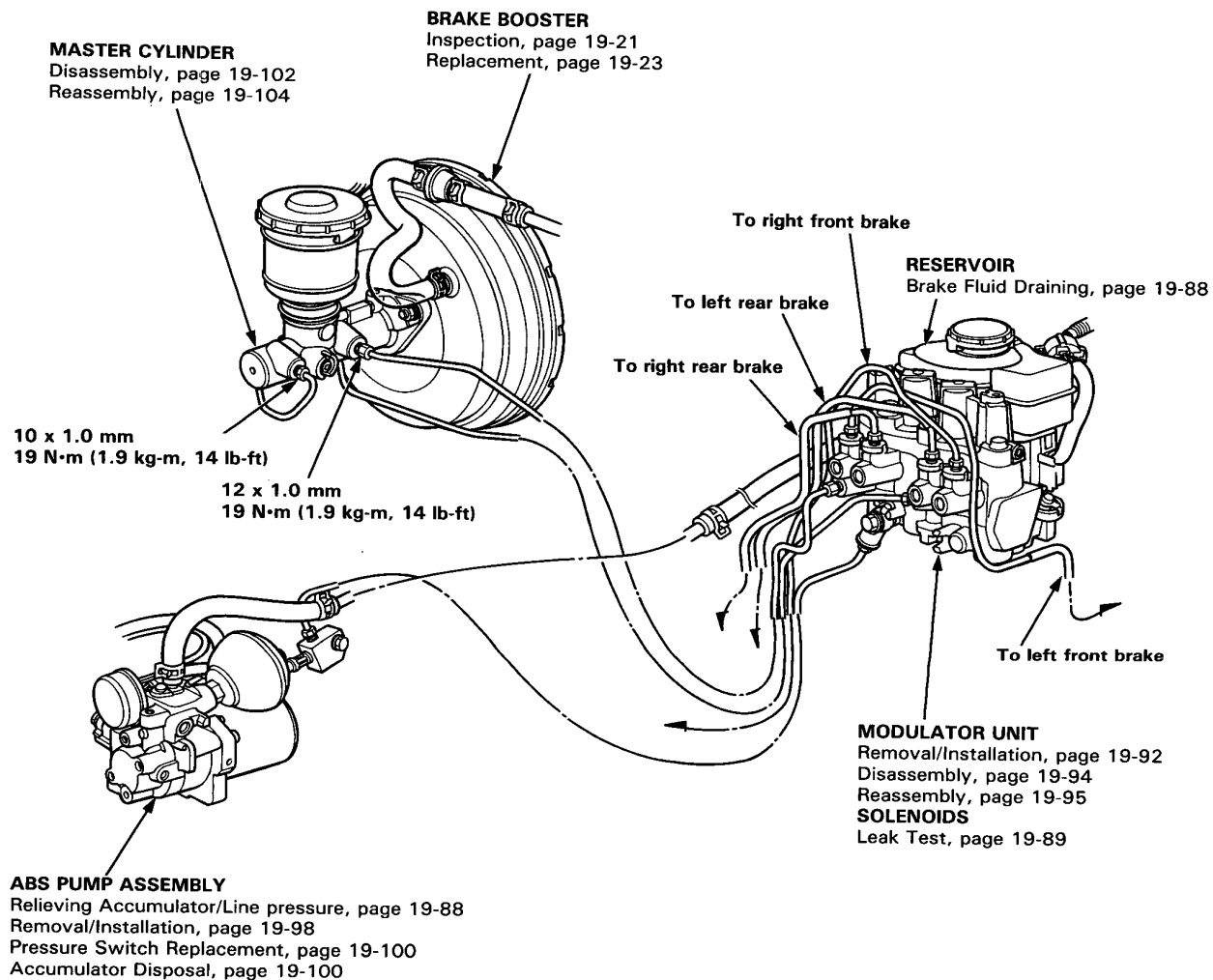
Index/Hydraulic Connections

CAUTION: Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

<LHD:>



<RHD:>



Hydraulic System

Relieving Accumulator/Line Pressure

▲ WARNING Use the Bleeder T-wrench before disassembling the parts shaded in the illustration.

1. Open the hood.
2. Remove the red cap from the bleeder on the modulator.
3. Install the special tool on the maintenance bleeder and turn it out slowly 90° to collect high-pressure fluid into the reservoir. Turn the special tool out one complete turn to drain the brake fluid thoroughly.
4. Retighten the maintenance bleeder and discard the fluid.
5. Reinstall the red cap.

Reservoir Brake Fluid Draining

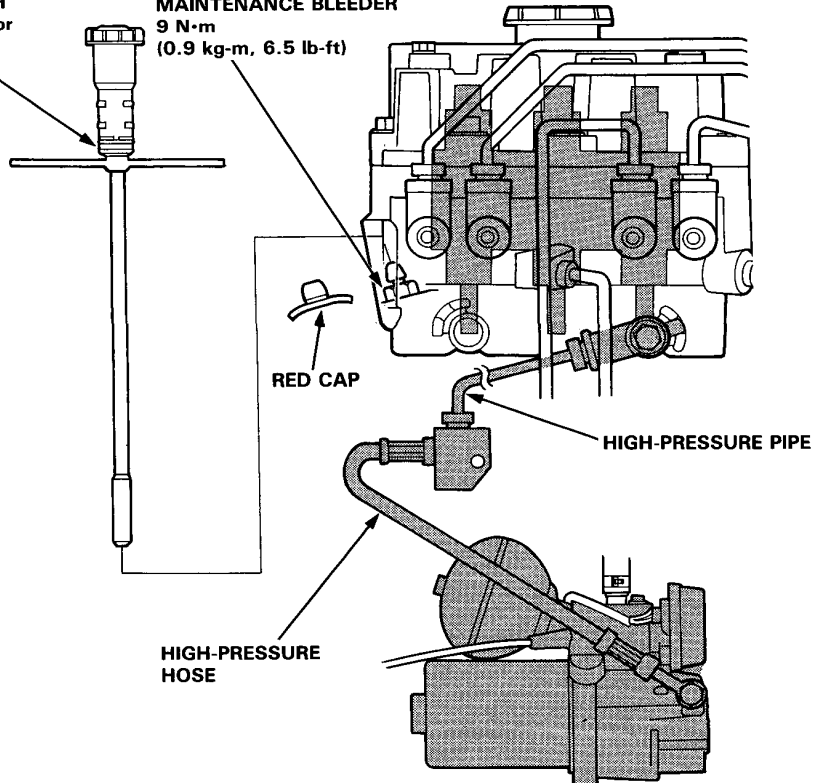
1. Draining brake fluid from modulator reservoir:
The brake fluid may be sucked out through the top of the modulator reservoir with a syringe. It may also be drained through the pump joint after disconnecting the pump hose.
2. Draining brake fluid from master cylinder:
Loosen the bleed screw and pump the brake pedal to drain the brake fluid from the master cylinder.

▲ WARNING

- High-pressure fluid will squirt out if the shaded pipe/hose is removed.
- To drain high-pressure brake fluid, follow the procedure on this page.

BLEEDER T-WRENCH
07HAA-SG00101 or
07HAA-SG00100

MAINTENANCE BLEEDER
9 N·m
(0.9 kg-m, 6.5 lb-ft)



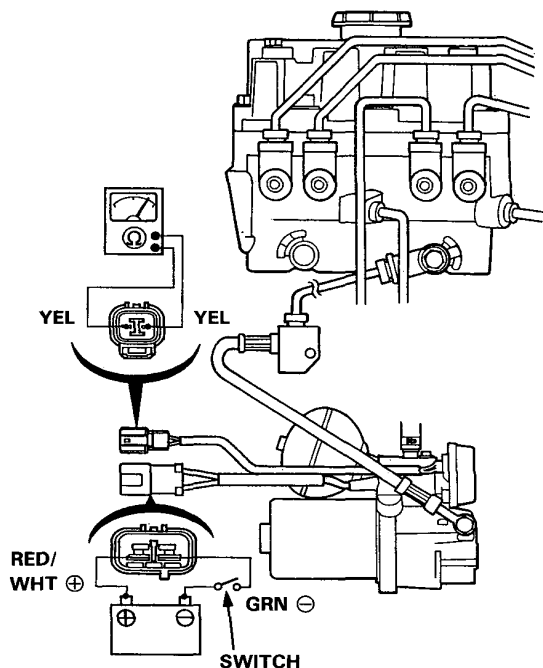
Solenoids

Leak Test

NOTE: If a solenoid leaks excessively, the brake fluid level in the modulator reservoir will rise when operating the ABS motor. The modulator reservoir may also overflow.

1. Disconnect the pump motor and pressure switch connectors.
2. Connect an ohmmeter between the YEL and YEL terminals of the pressure switch connector.
3. Attach the positive (+) lead of a fully charged 12 V battery to the RED/WHT terminal of the motor connector and negative (-) lead to the GRN terminal, and install a switch between negative lead and GRN terminal as shown.
4. Turn the switch on to allow sufficient pressure to build up within the accumulator and check for continuity. If the ohmmeter shows continuity (pressure switch turned on), run the motor for 10 seconds more, then turn the switch off.

- Check if the solenoid hisses or squeaks. Replace the modulator if the solenoid hisses or squeaks.
- Check the pressure switch for continuity within 30 minutes. It is normal if there is continuity. If there is no continuity, a solenoid is faulty or high-pressure line leaks.



Modulator Unit

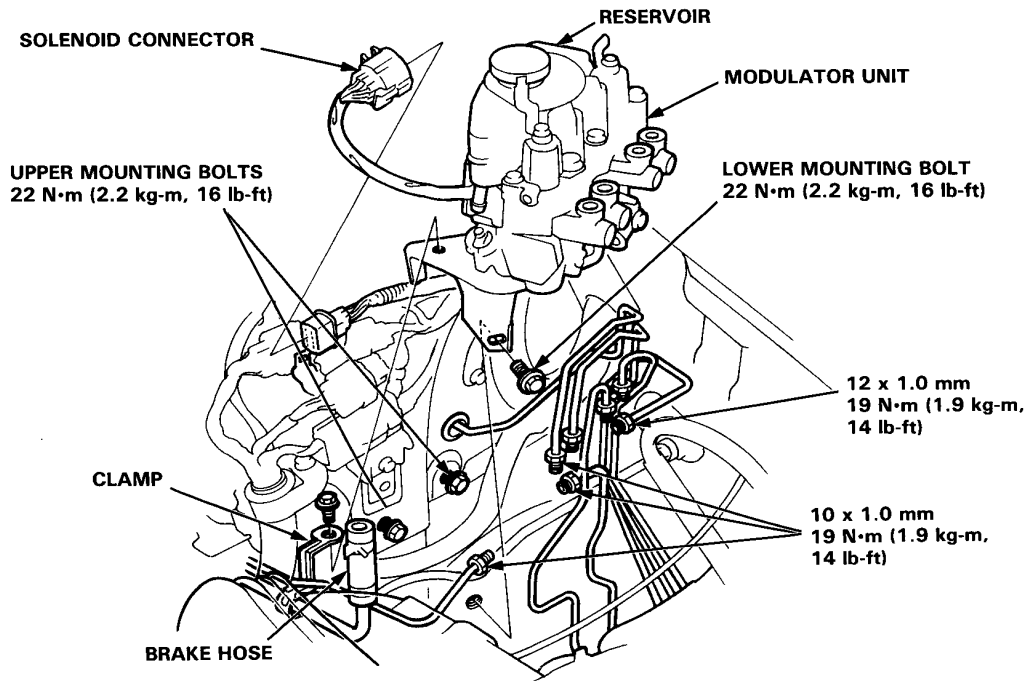
Removal/Installation (for LHD)

▲ WARNING Before removing the modulator-to-ABS pump assembly high-pressure line, be sure to relieve the high pressure fluid from the maintenance bleeder (see page 19-88).

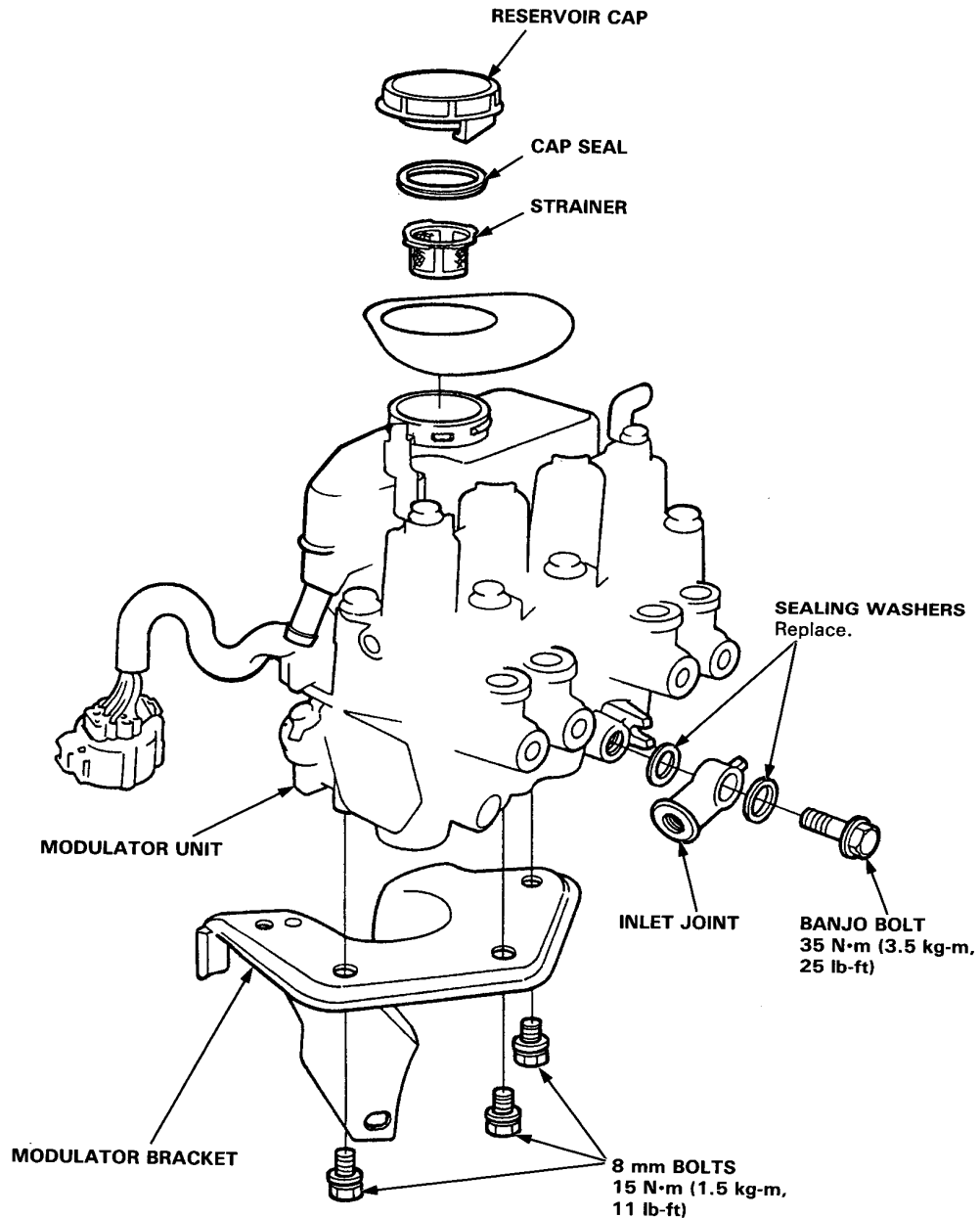
CAUTION:

- Be careful not to bend or damage the brake pipes when removing the modulator unit.
- Do not spill brake fluid on the car; 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.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- When connecting the brake pipes, make sure that there is no interference between the brake pipes and other parts.

1. Drain the brake fluid from the master cylinder.
2. Drain the brake fluid from the modulator reservoir (see page 19-88).
3. Relieve the high pressure fluid (see page 19-88).
4. Remove the intake air duct.
5. Remove the emission control box.
6. Disconnect the solenoid connector.
7. Disconnect the seven brake pipes from the modulator unit.
8. Disconnect the brake hose from the modulator reservoir.
9. Remove the clamp from the modulator bracket.
10. Loosen the two upper mounting bolts, and remove the one lower mounting bolt and the modulator unit.



11. Remove the modulator bracket from the modulator unit.
12. Install the modulator unit in the reverse order of removal.
13. After installation, fill and bleed the conventional brake system (see page 19-6) and ABS (see page 19-101).



Modulator Unit

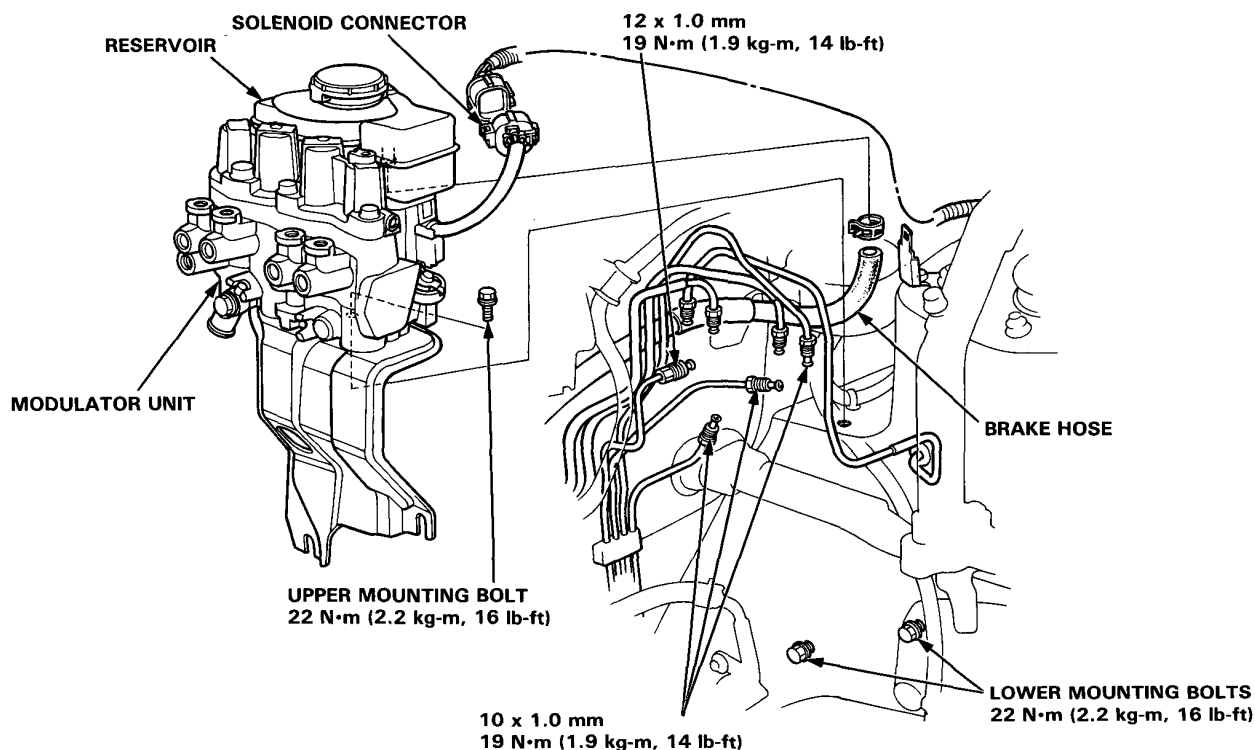
Removal/Installation (for RHD)

⚠ WARNING Before removing the modulator-to-ABS pump assembly high-pressure line, be sure to relieve the fluid pressure from the maintenance bleeder (see page 19-88).

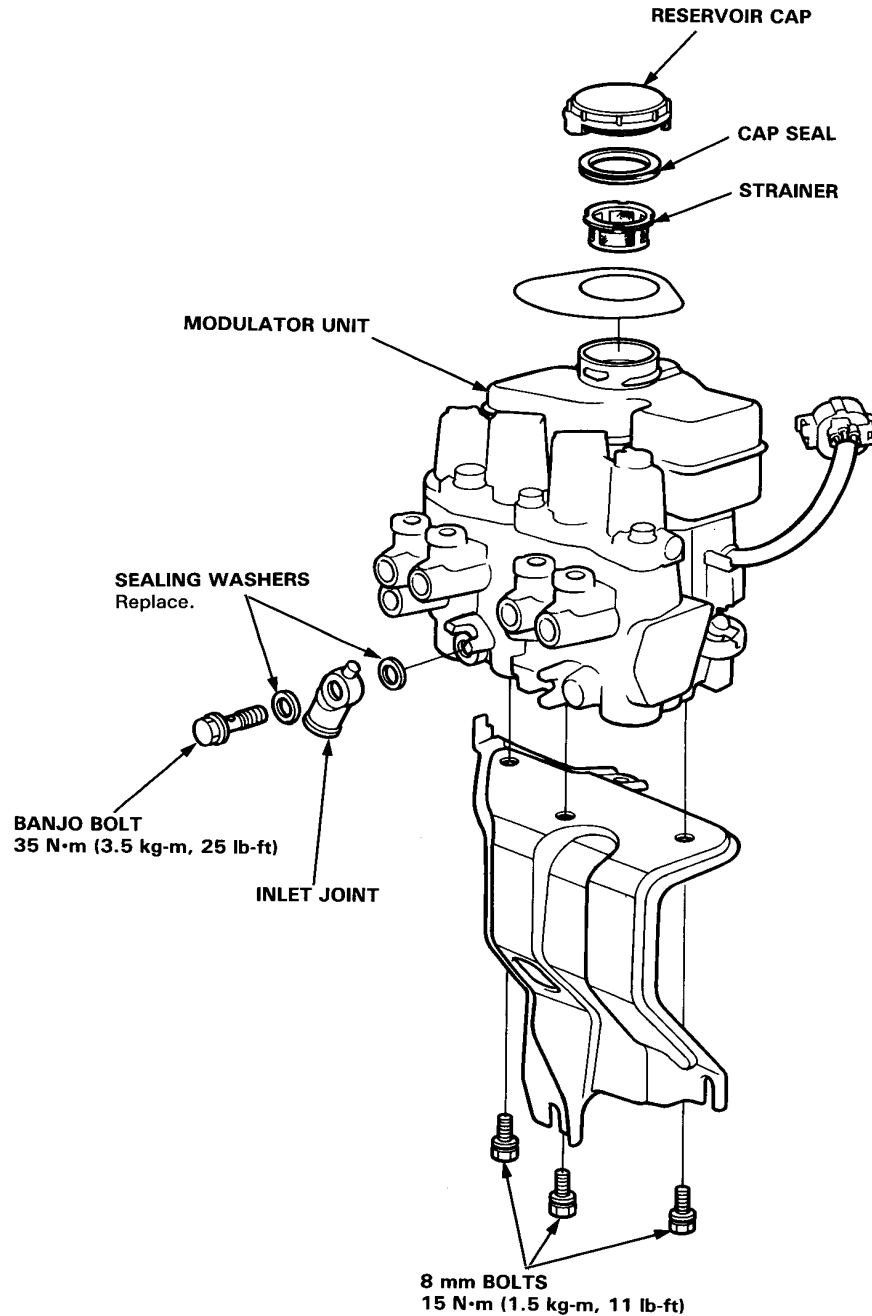
CAUTION:

- Be careful not to bend or damage the brake pipes when removing the modulator unit.
- Do not spill brake fluid on the car; 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.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- When connecting the brake pipes, make sure that there is no interference between the brake pipes and other parts.

1. Drain the brake fluid from the master cylinder.
2. Drain the brake fluid from the modulator reservoir (see page 19-88).
3. Relieve the high pressure fluid (see page 19-88).
4. Disconnect the solenoid connector.
5. Disconnect the seven brake pipes from the modulator unit.
6. Disconnect the brake hose from the modulator reservoir.
7. Relieve fuel pressure, then disconnect the fuel pipe from the fuel filter (see section 11).
8. Loosen the two lower mounting bolts, and remove the one upper mounting bolt and the modulator unit.



9. Remove the modulator bracket from the modulator unit.
10. Install the modulator unit in the reverse order of removal.
11. After installation, fill and bleed the conventional brake system (see page 19-6) and ABS (see page 19-101).



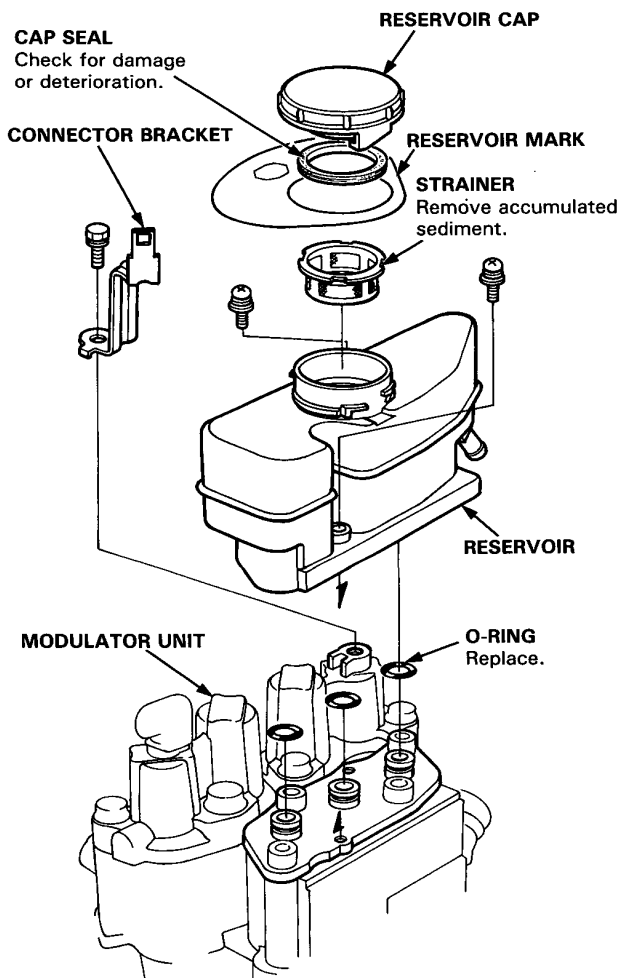
Modulator Unit

Disassembly

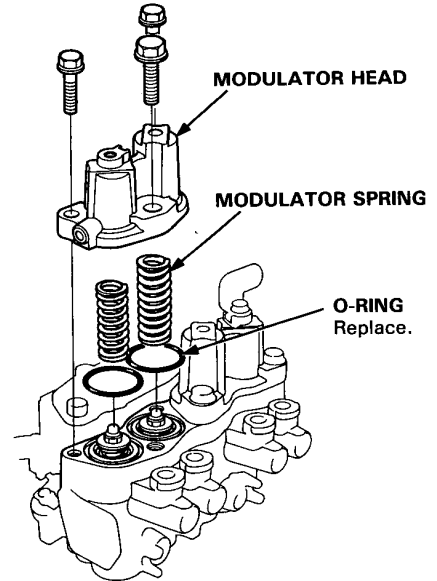
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Replace parts with new ones whenever specified to do so.

1. For LHD, remove the connector bracket from the modulator unit.
2. Remove the reservoir cap, reservoir mark and strainer from the reservoir.
3. Remove the cap seal from the reservoir cap.
4. Remove the reservoir from the modulator unit.
5. Remove the O-rings.



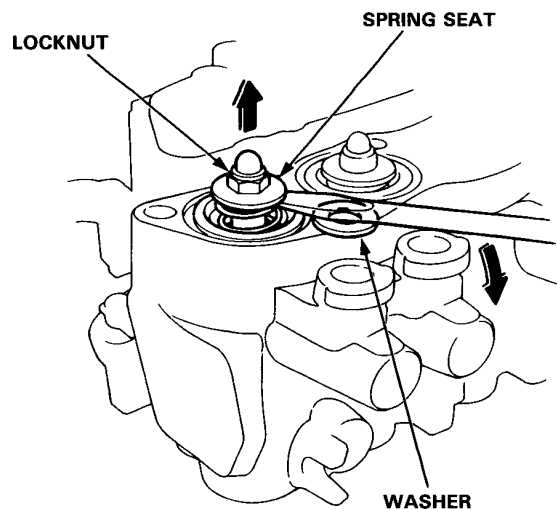
6. Remove the modulator head.
7. Remove the modulator springs and O-rings.



8. Insert the screwdriver under the spring seat, pry the piston assembly off slightly, then pull the piston assembly while grasping the locknut with pliers.

NOTE:

- Place a suitable washer between the screwdriver and modulator body to prevent damage to the modulator body.
- Be careful not to damage the piston sleeve.

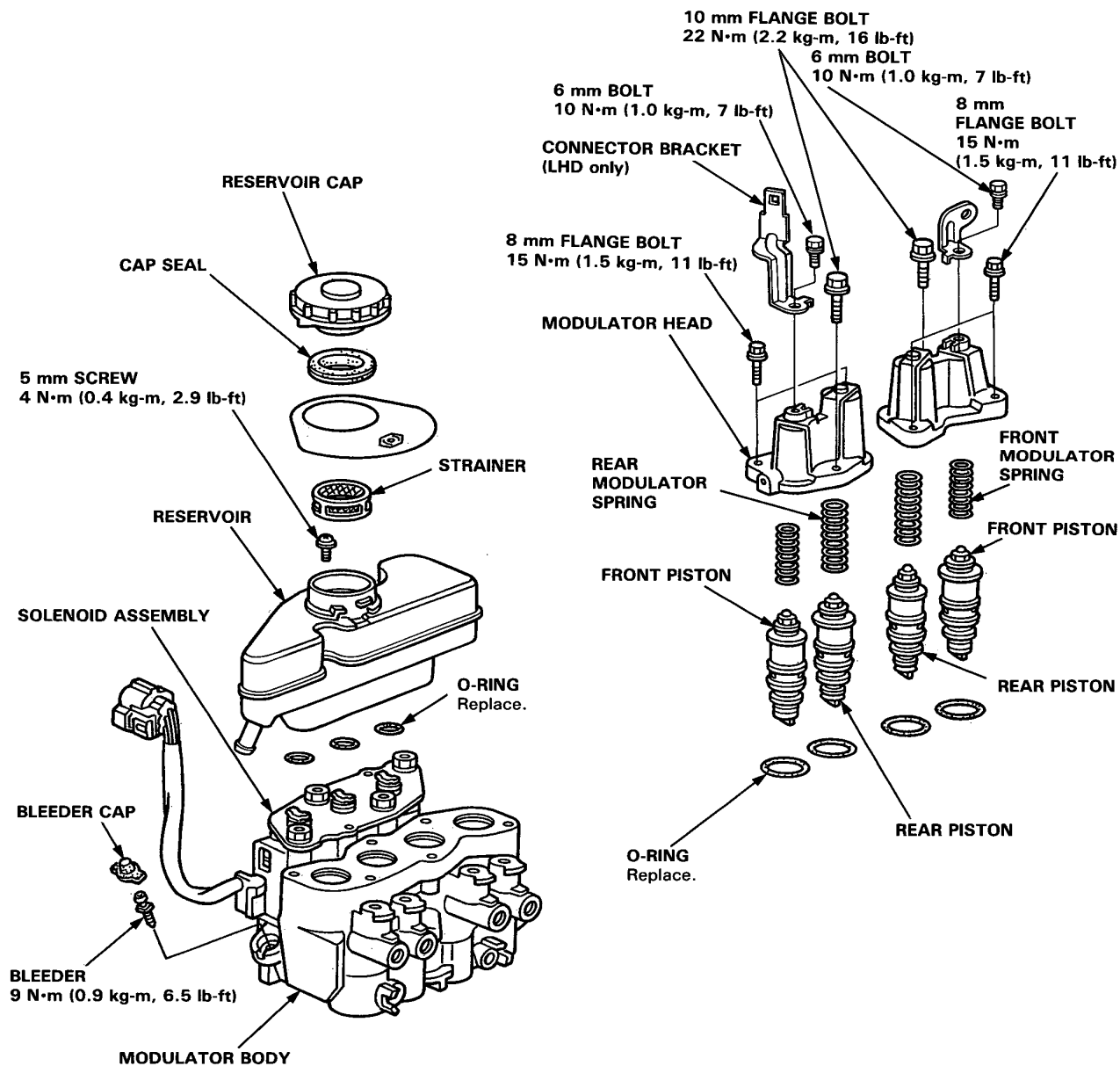


Reassembly

CAUTION:

- Do not spill brake fluid on the car; 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.
- 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

NOTE: Do not interchange the front and rear modulator springs. The longer spring is the rear modulator spring.

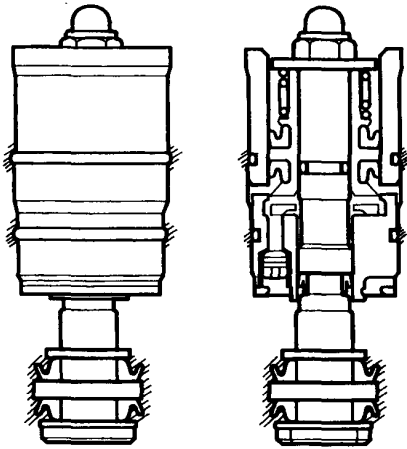


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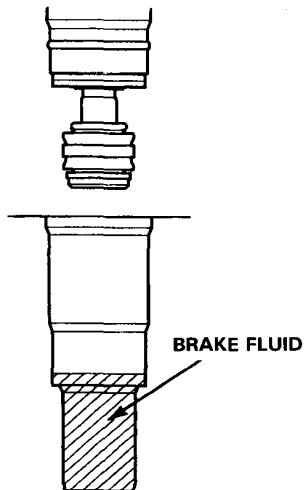
Modulator Unit

Reassembly (cont'd)

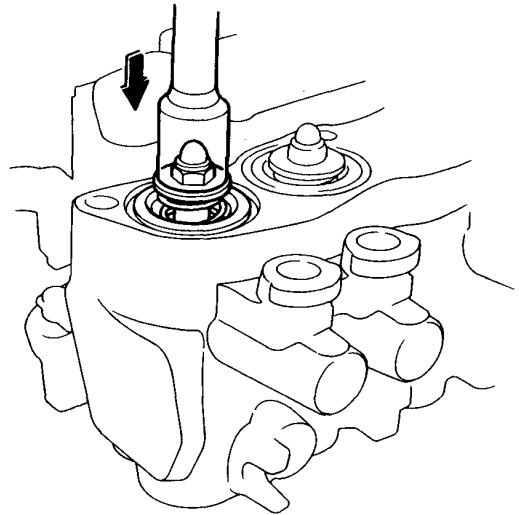
1. Apply rubber grease to the shaded areas of a new piston assembly as shown.



2. Pour brake fluid into the piston hole in the modulator body.
3. Coat the sliding surface of the piston with brake fluid and install the piston assembly into the modulator body.

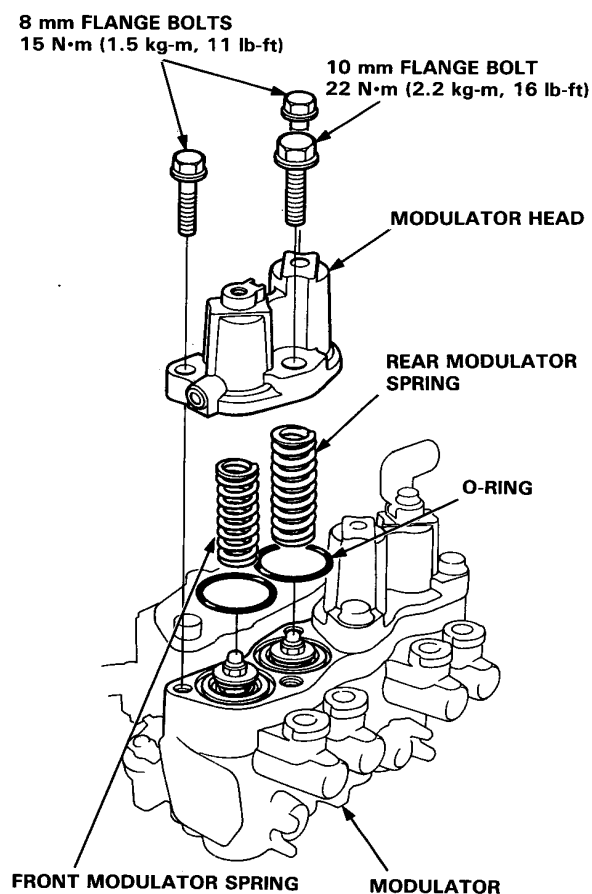


4. Push down the piston several times until no bubbles come out from the solenoid side.

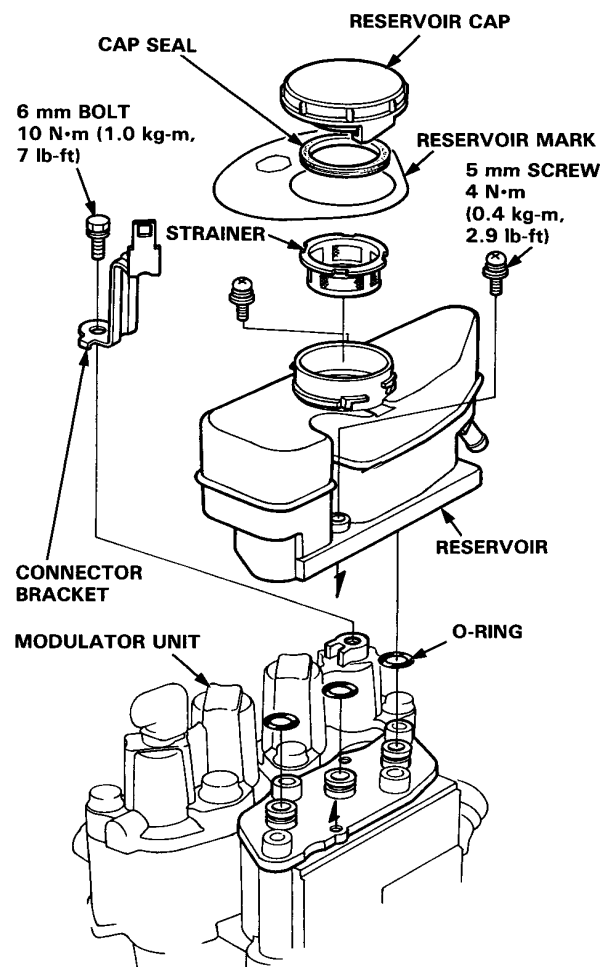


5. Install new O-rings into the grooves in the modulator body.
6. Install the modulator springs.

NOTE: Do not interchange the front and rear modulator springs. The longer spring is the rear modulator spring.
7. Install the modulator head onto the body, being careful not to bind O-rings.



8. Install new O-rings into the grooves in the solenoids.
9. Install the reservoir onto the modulator unit.
10. Install the cap seal into the reservoir cap.
11. Install the strainer, reservoir mark and reservoir cap to the reservoir.
12. For LHD, install the connector bracket onto the modulator unit.



ABS Pump Assembly

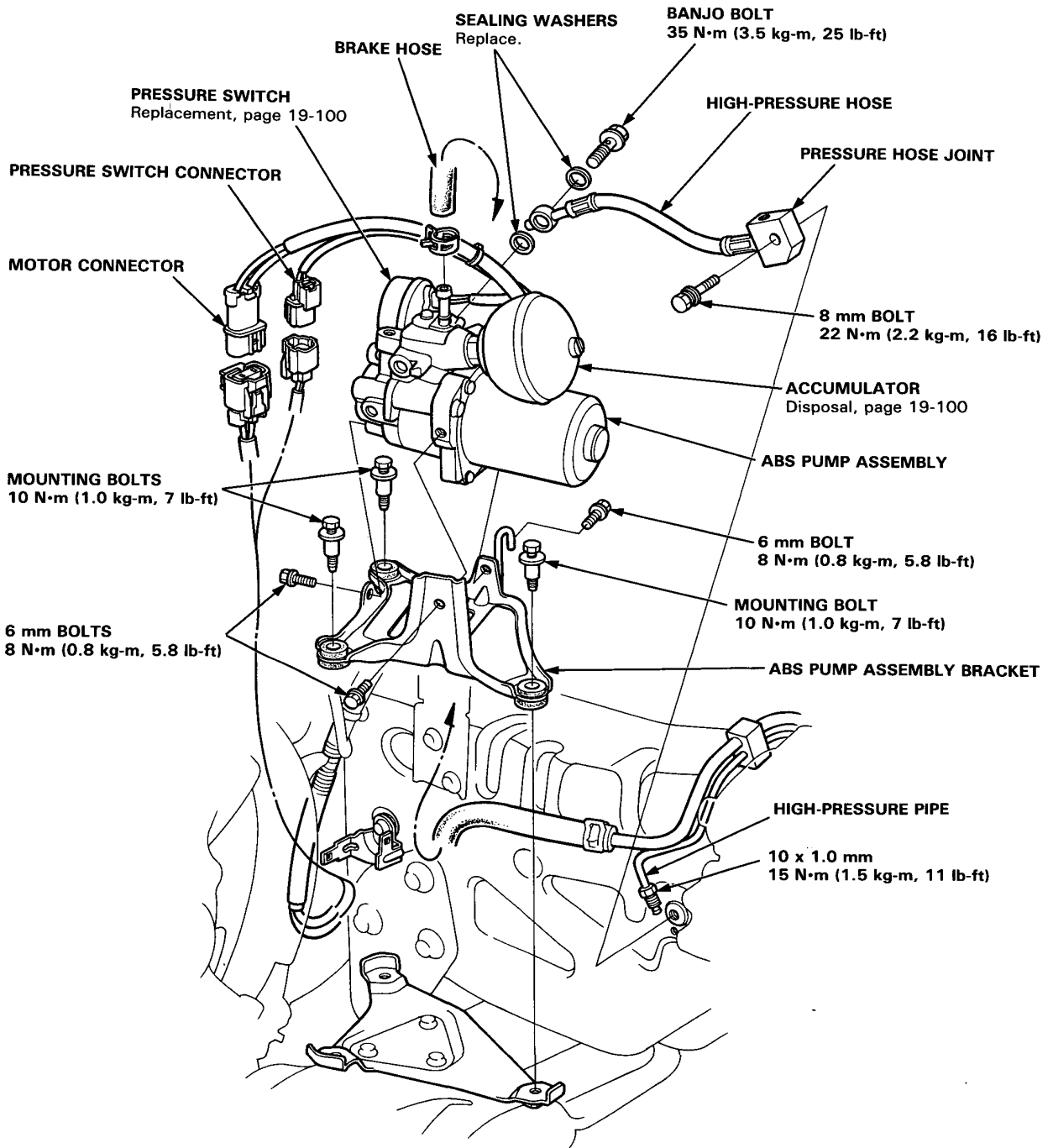
Removal/Installation

▲ WARNING Before removing the modulator-to-ABS pump assembly high-pressure line, be sure to relieve the high pressure fluid from the maintenance bleeder (see page 19-88).

CAUTION:

- Be careful not to bend or damage the brake pipes when removing the ABS pump assembly.
- Do not spill brake fluid on the car; 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.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- When connecting the brake pipes, make sure that there is no interference between the brake pipes and other parts.
- Do not disassemble the ABS pump assembly except the pressure switch.

1. Drain the brake fluid from the modulator reservoir (see page 19-88).
2. Relieve the high pressure fluid (see page 19-88).
3. Remove the battery tray.
4. Disconnect the motor and pressure switch connectors.
5. Disconnect the high pressure pipe from the pressure hose joint.
6. Disconnect the brake hose from the ABS pump assembly.
7. Remove the three mounting bolts, and the ABS pump assembly.
8. Remove the ABS pump assembly bracket.
9. Remove the high-pressure hose from the ABS pump assembly.
10. Install the ABS pump assembly in the reverse order of removal.
11. After installation, fill and bleed the ABS (see page 19-101).

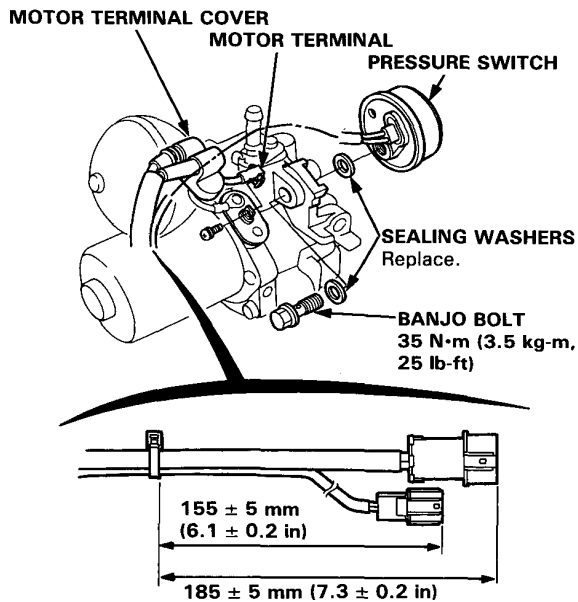


ABS Pump Assembly

Pressure Switch Replacement

1. Secure the pump assembly in a vise.
2. Remove the harness band.
3. Slide the motor terminal cover off, then remove the motor terminal.
4. Remove the pressure switch.
5. Install the pressure switch in the reverse order of removal.

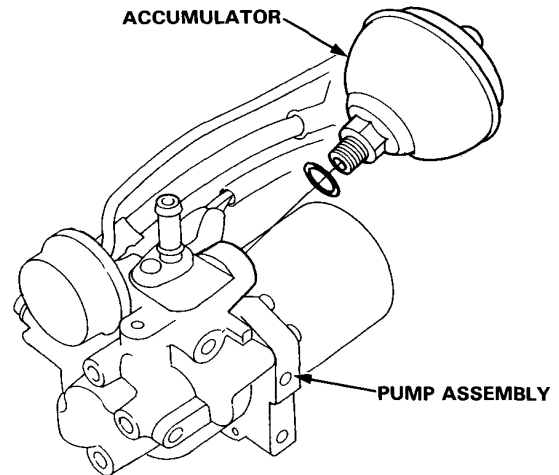
NOTE: Install the harness band at the correct position as shown below.



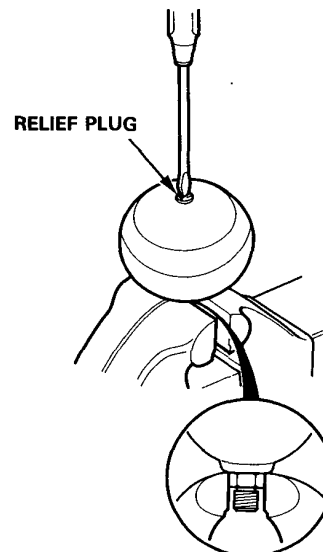
Accumulator Disposal

⚠ WARNING The accumulator contains high pressure nitrogen gas. Do not puncture, expose to the flame, or attempt to disassemble the accumulator or it may explode and severe personal injury may result.

1. Secure the pump assembly in a vise and remove the accumulator, by turning it counterclockwise with a 19 mm open-end wrench.



2. Secure the accumulator in a vise so that the relief plug points straight up.
3. Slowly turn the plug 3-1/2 turns and then wait 3 minutes for all pressure to escape.
4. Remove the plug completely and dispose of the accumulator.



Bleeding

Air Bleeding with ALB Checker

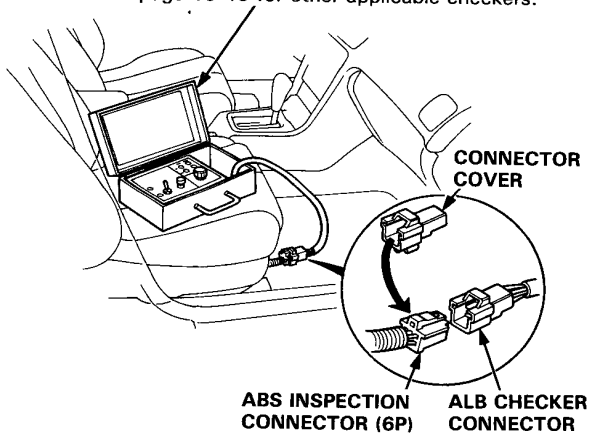
CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.

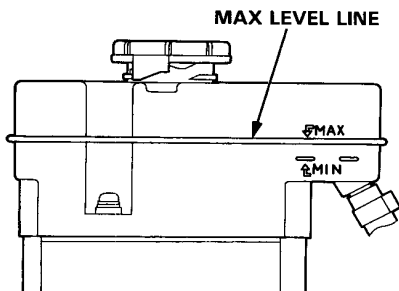
1. Place the vehicle on level ground with the wheels blocked. Put the transmission in neutral for manual transmission models, and in **P** position for automatic transmission models. Release the parking brake.
2. Disconnect the ABS inspection connector (6P) from the cross-member under the passenger's seat and connect the ABS inspection connector (6P) to the ALB checker.

ALB CHECKER 07HAJ-SG00602

See page 19-40 for other applicable checkers.



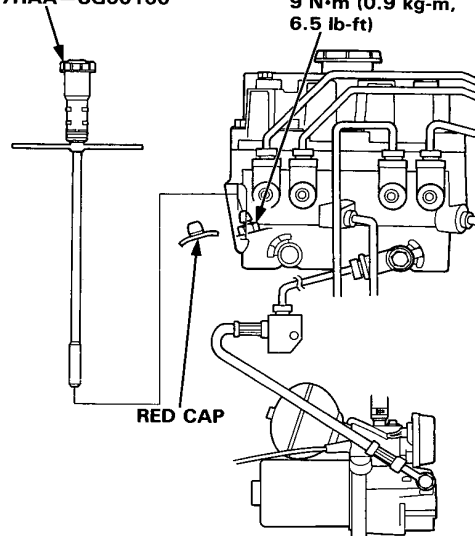
3. Fill the modulator reservoir to the MAX level line and install the reservoir cap.



4. Start the engine and allow it to idle for a few minutes, then stop it. Check the fluid level in the modulator reservoir and refill to the MAX level line if necessary.
5. Bleed high-pressure fluid from the maintenance bleeder with the special tool.

BLEEDER T-WRENCH 07HAA-SG00101 or 07HAA-SG00100

MAINTENANCE BLEEDER 9 N·m (0.9 kg-m, 6.5 lb-ft)



6. Start the engine and allow it to idle for a few minutes, then stop it. Check the fluid level in the modulator reservoir and refill to the MAX level line if necessary.
 7. Turn the Mode Selector switch of the checker to 2.
 8. While depressing the brake pedal ^{pevně} firmly, push the Start Test switch to operate the modulator. There should be kickback on the brake pedal. If not, repeat steps 5 to 8.
- NOTE: Continue to depress the brake pedal firmly when operating the checker.
9. Turn the Mode Selector to 3, 4, and 5. Perform step 8 for each of the test mode positions.
 10. Refill the modulator reservoir to the MAX level line and install the reservoir cap.

▲ WARNING Disconnect the ALB Checker before driving the car. A collision can result from a reduction or complete loss of braking ability, causing severe personal injury or death.

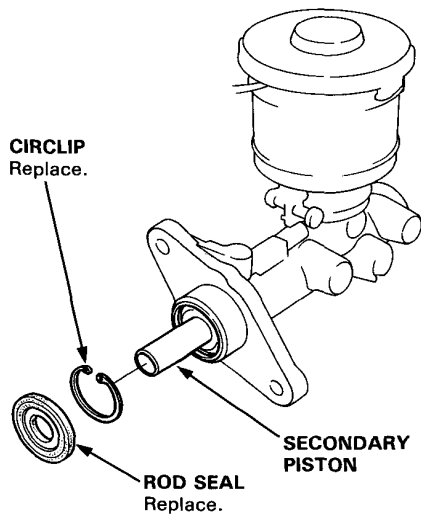
Master Cylinder

Disassembly

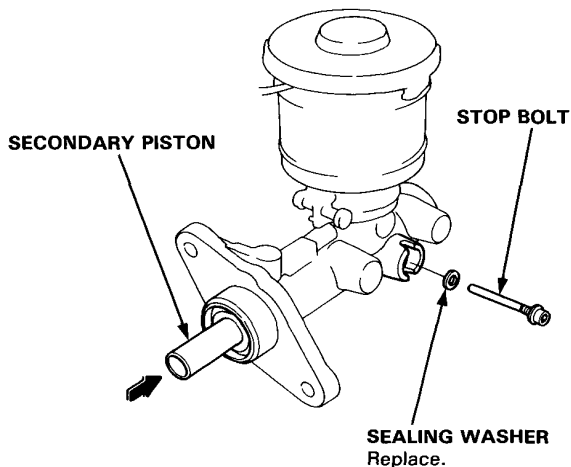
CAUTION:

- Do not spill brake fluid on the car; 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

1. Remove the master cylinder (see page 19-14).
2. Remove the rod seal.
3. Remove the circlip while pushing in the secondary piston.



4. Remove the stop bolt while pushing in the secondary piston.

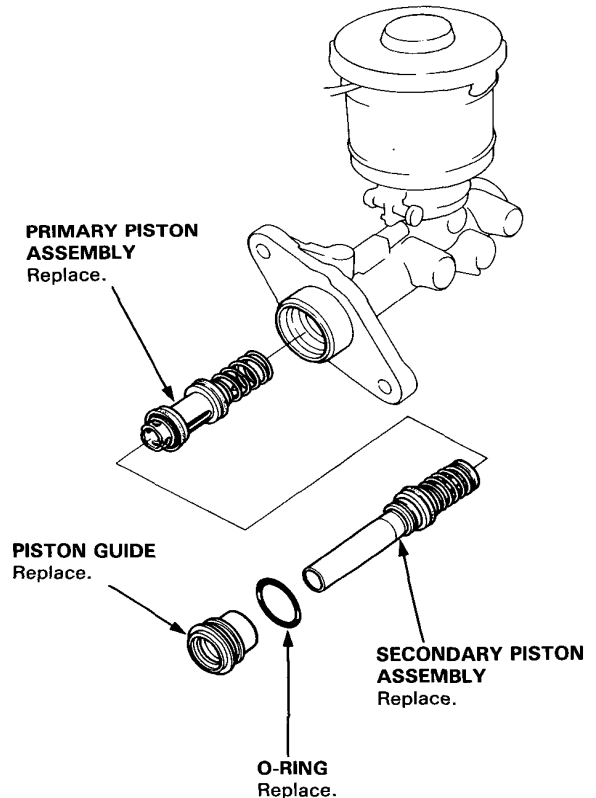


5. Remove the piston guide, secondary piston assembly and primary piston assembly.

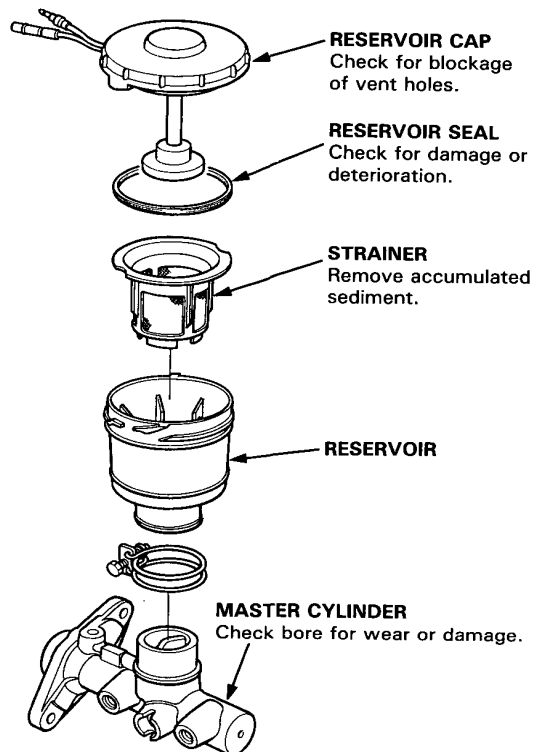
NOTE: If the primary piston assembly is difficult to remove, apply compressed air from the primary piston side port.

CAUTION:

- Do not use high pressure air or bring the nozzle too close to the port.
- Place a shop rag over the master cylinder to prevent the primary piston from becoming a projectile.



6. Remove the reservoir cap, strainer and reservoir from the master cylinder.
7. Remove the reservoir seal from the reservoir cap.



Master Cylinder

Reassembly

CAUTION:

- Do not spill brake fluid on the car; it may damage the paint; if brake 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.
- Do not mix different brands of brake fluid as they may not be compatible.
- Do not reuse the drained fluid. Use only clean DOT 3 or 4 brake fluid.
- Replace the master cylinder if the bore is damaged or worn. Do not hone or attempt to refinish the bore.

NOTE:

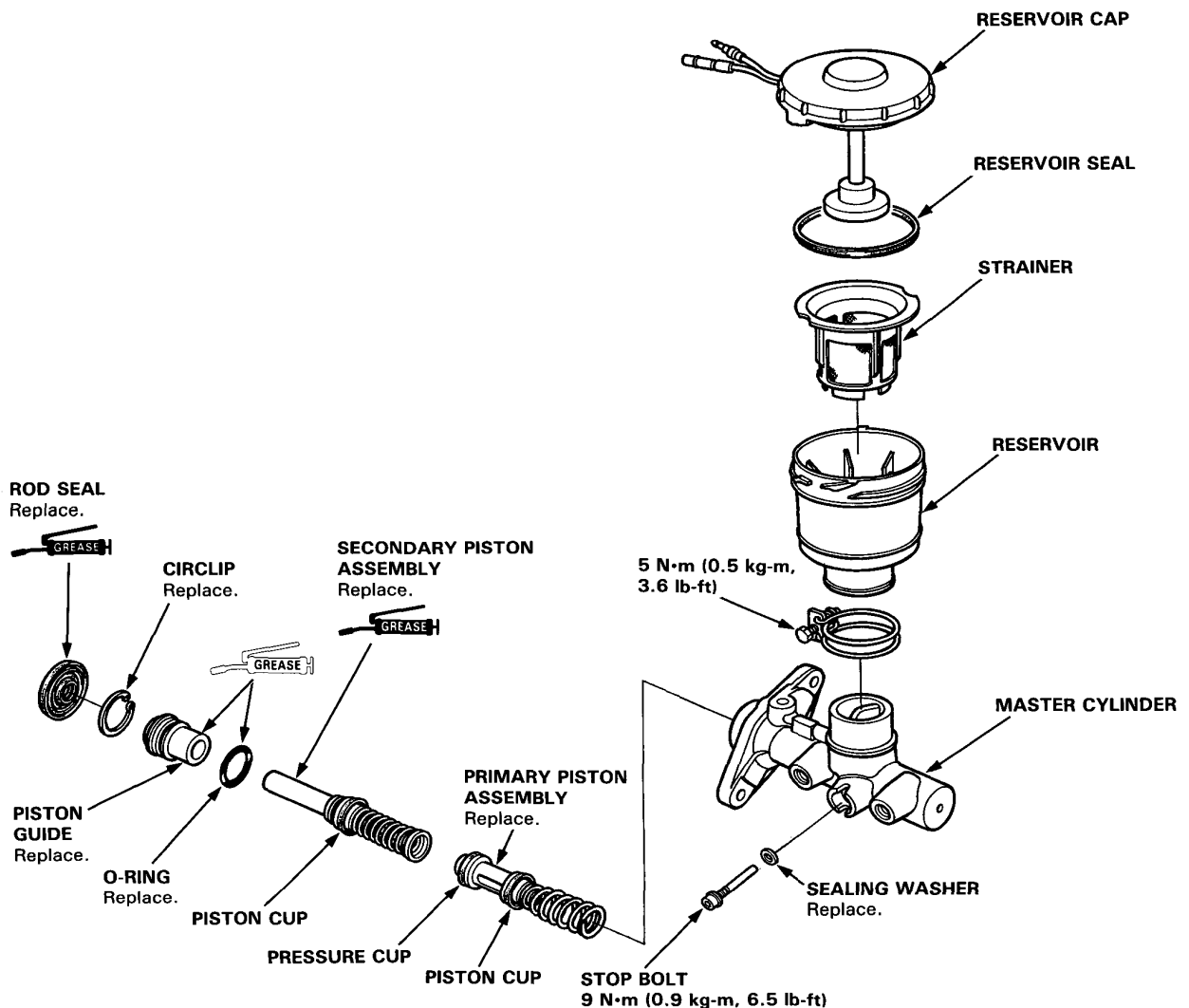
- Coat piston cups, pressure cup and master cylinder bore with clean brake fluid.
- Use recommended greases in the master cylinder seal set.



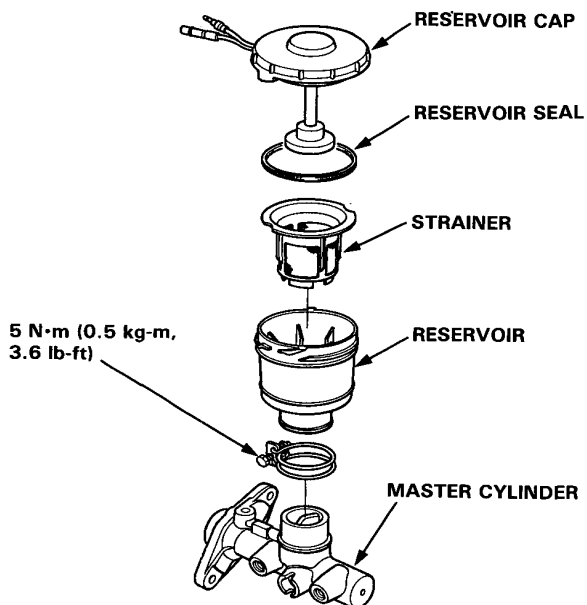
: KLUBER GLKO



: SHIN-ETSU CHEMICAL KS62M



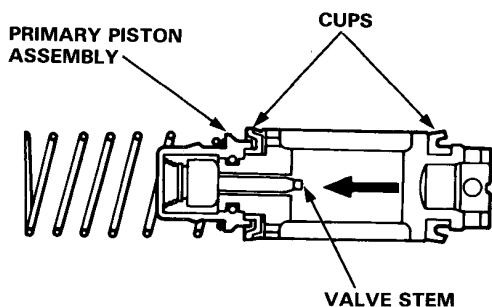
1. Install the reservoir on the master cylinder with a clamp as shown.
2. Install the reservoir seal in the groove of the reservoir cap.
3. Install the strainer and reservoir cap on the reservoir.



4. Coat the cups of a new primary piston assembly with clean brake fluid, then install the primary piston assembly into the master cylinder.

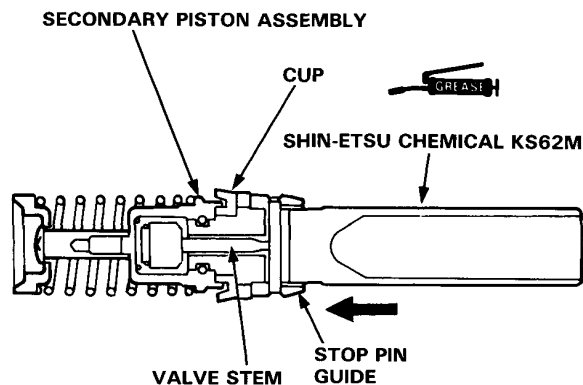
NOTE:

- Before installation, check that the valve stem moves smoothly by lightly pushing it through the slot in the piston.
- Install the piston so that the slot in the piston aligns with the stop bolt hole in the master cylinder.

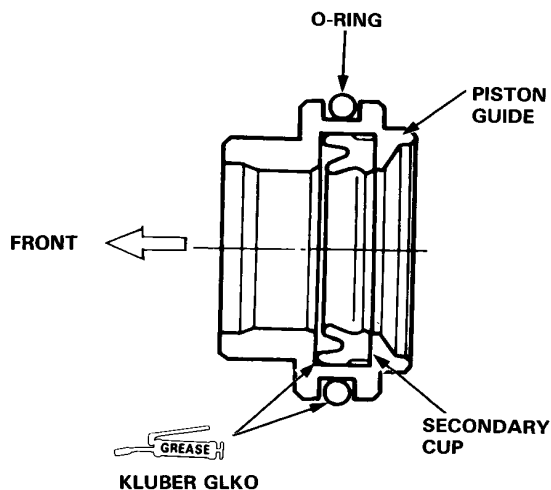


5. Coat the cup of a new secondary piston assembly with clean brake fluid.
6. Apply recommended grease in the master cylinder seal set to the piston and install the piston into the master cylinder.

NOTE: Check that the valve stem moves smoothly by pushing the stop pin guide.



7. Apply recommended grease in the master cylinder seal set to a new O-ring and the secondary cup in a new piston guide, and install the O-ring onto the piston guide.

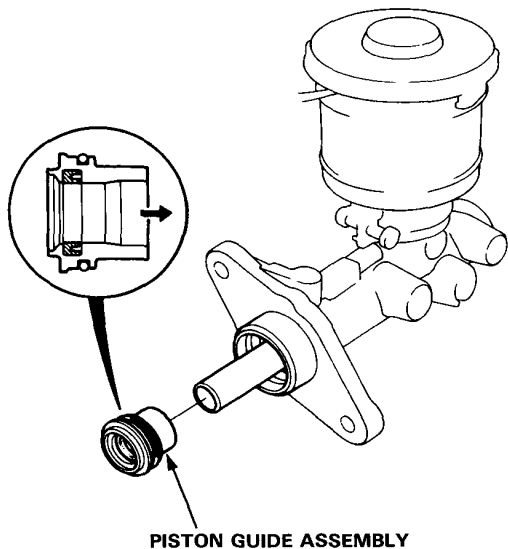


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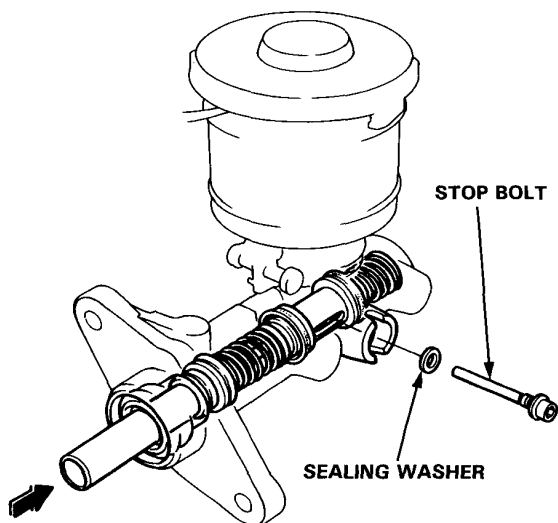
Master Cylinder

Reassembly (cont'd)

7. Install the piston guide assembly into the master cylinder.

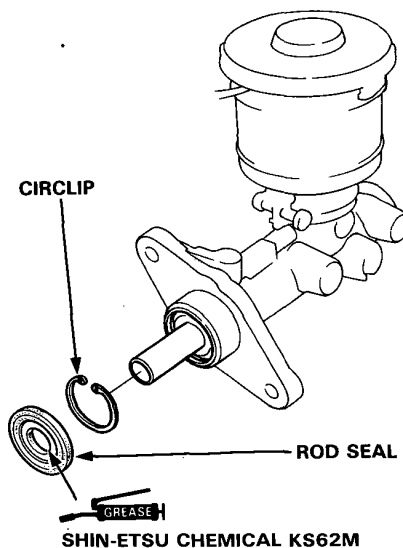


8. Align the slot in the primary piston with the stop bolt hole by pushing the secondary piston in, and install the stop bolt with a new sealing washer.



9. Install a new circlip while pushing in the secondary piston.

10. Apply recommended grease in the master cylinder set to a new rod seal, and install the seal onto the master cylinder.



11. Adjust the pushrod clearance (see page 19-19).

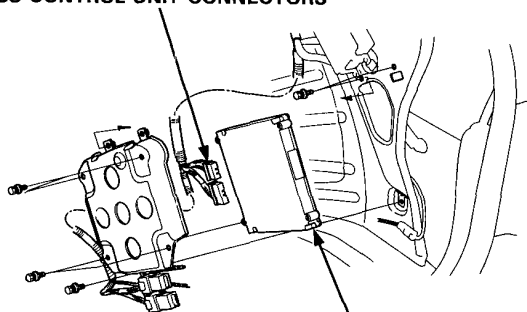
12. Install the master cylinder (see page 19-20).

Electronic Components

ABS Control Unit Replacement

1. Remove the right quarter trim panel.
2. Disconnect the ABS control unit connectors.
3. Remove the ABS control unit mounting bolts, then remove the control unit.

ABS CONTROL UNIT CONNECTORS



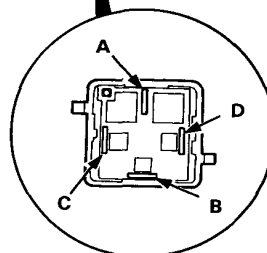
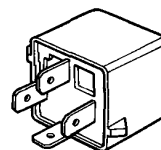
ABS CONTROL UNIT

4. Install the ABS control unit in the reverse order of removal.

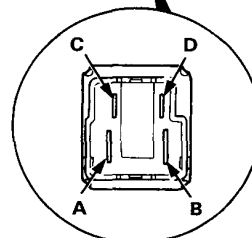
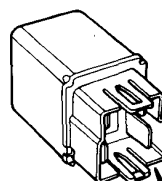
Relay Inspection

1. Remove the fail-safe relays and motor relay (location: page 19-41).
2. Check for continuity between the terminals C and D.
There should be continuity.
3. Check for continuity between the terminals A and B.
There should be continuity when the battery is connected between the terminals C and D.
There should be no continuity when the battery is disconnected.

<Fail-safe Relay:>



<Motor Relay:>

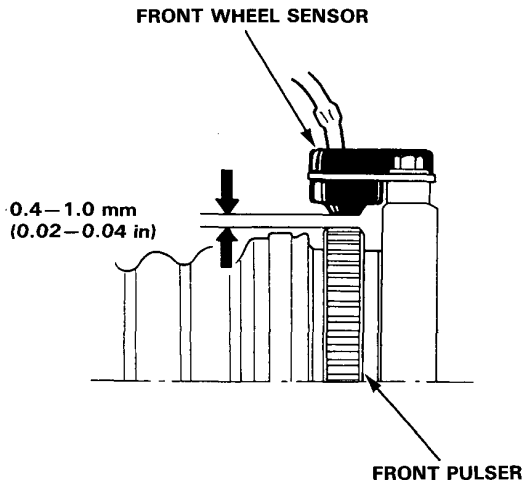


Electronic Components

Wheel Sensor Inspection

Front

1. Check the front pulser for chipped or damaged teeth.



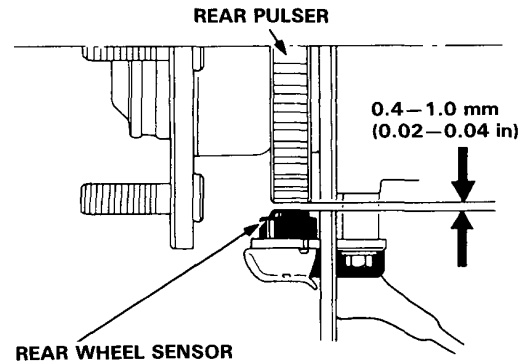
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the driveshaft by hand.

Standard: 0.4-0.1 mm (0.02-0.04 in)

NOTE: If the gap exceeds 1.0 mm (0.04 in), the probability is a distorted knuckle which should be replaced.

Rear

1. Check the 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 hub bearing unit by hand.

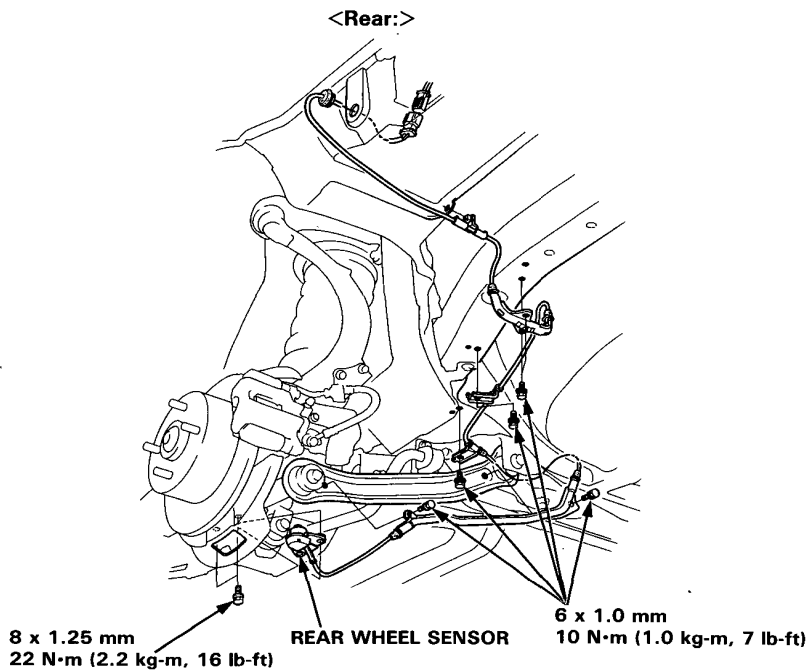
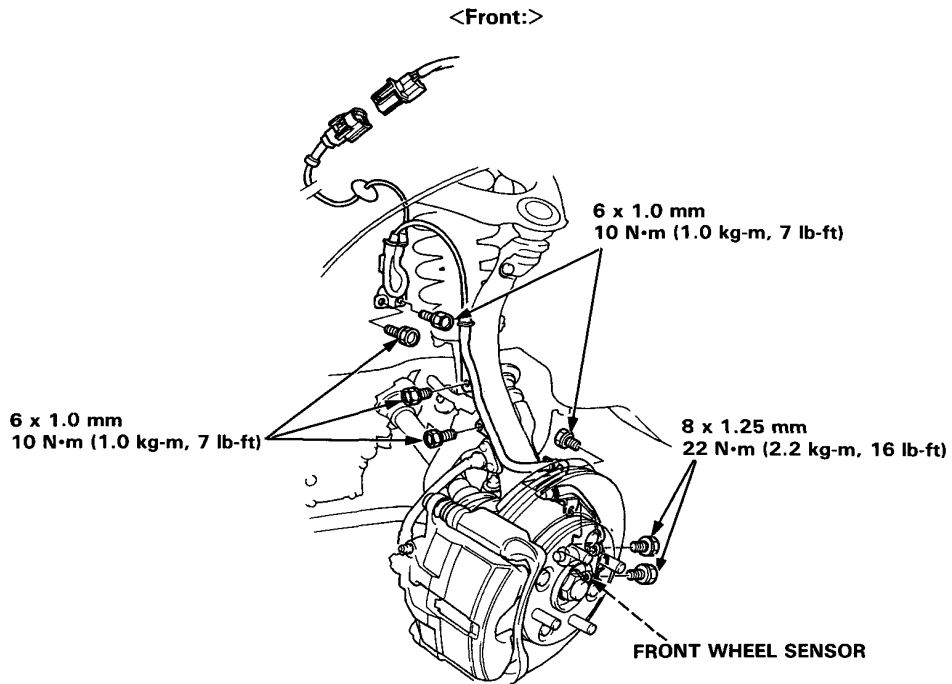
Standard: 0.4-0.1 mm (0.02-0.04 in)

NOTE: If the gap exceeds 1.0 mm (0.04 in), the probability is a distorted knuckle which should be replaced.

Wheel Sensor Replacement

NOTE:

- Be careful when installing the sensors to avoid twisting the wires.
- After sensor replacement, confirm proper operation (see page 19-59).



SUPPLEMENTAL RESTRAINT SYSTEM (SRS) (if body maintenance is required)

Some models of the Accord include a driver's side airbag, located in the steering wheel hub, as part of a supplemental restraint system (SRS). Information necessary to safely service the SRS is included in this shop 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 only by an authorized HONDA dealer.

▲ WARNING

- **To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.**
- **Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, could lead to personal injury caused by unintentional activation of the airbag.**
- **All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.**
- **Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse/relay box may affect the SRS and must therefore be performed by an authorized HONDA dealer.**

Body

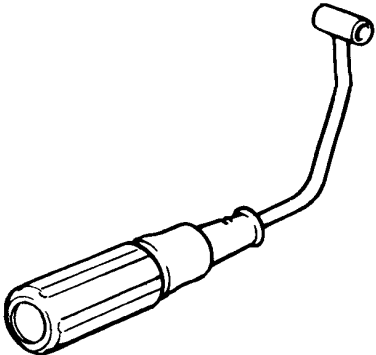
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Special Tool

Special Tool

Ref. No.	Tool Number	Description	Qty	Remarks
①	07GAZ-SE30100	Torsion Bar Assembly Tool	1	

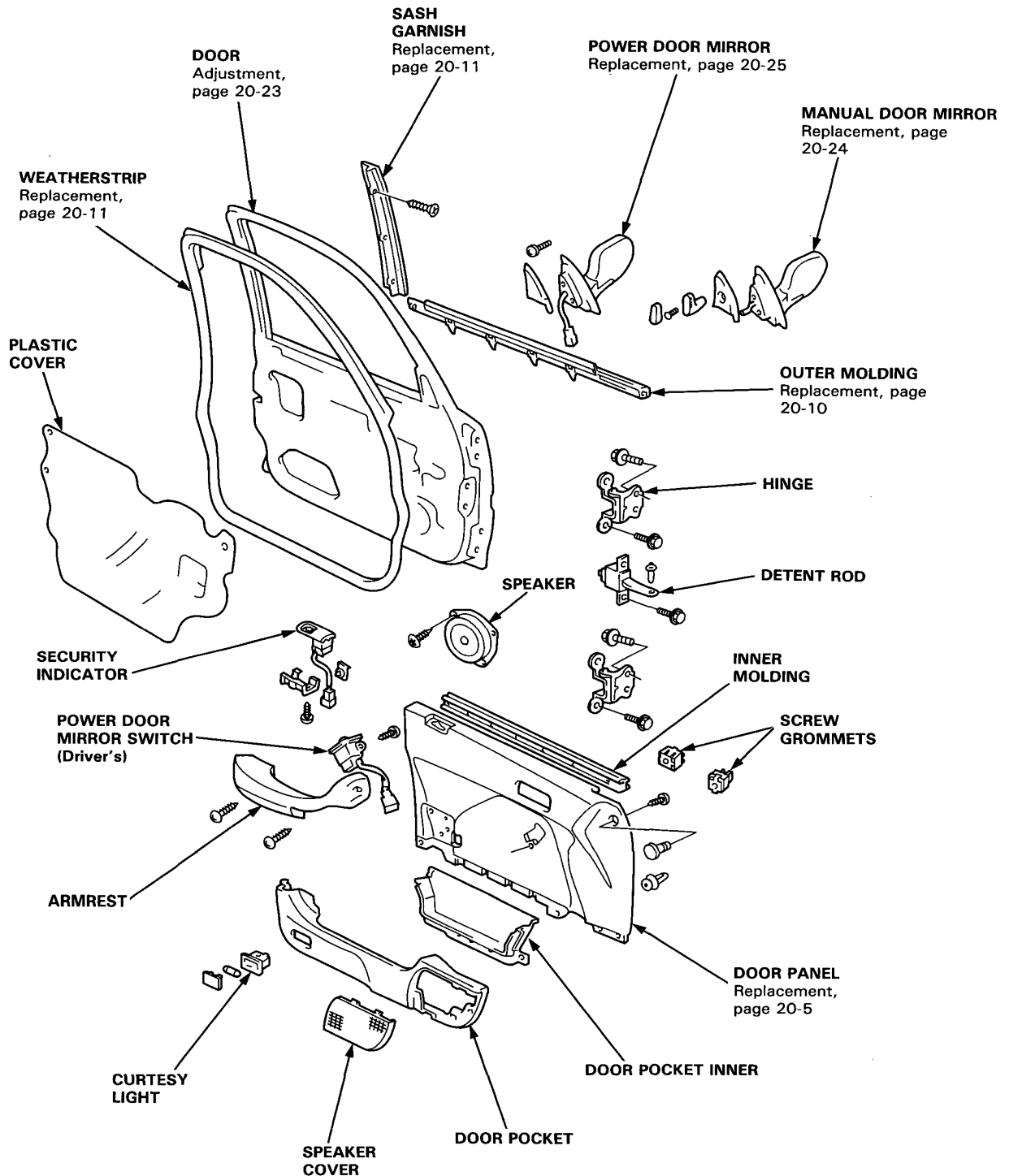


①



Doors

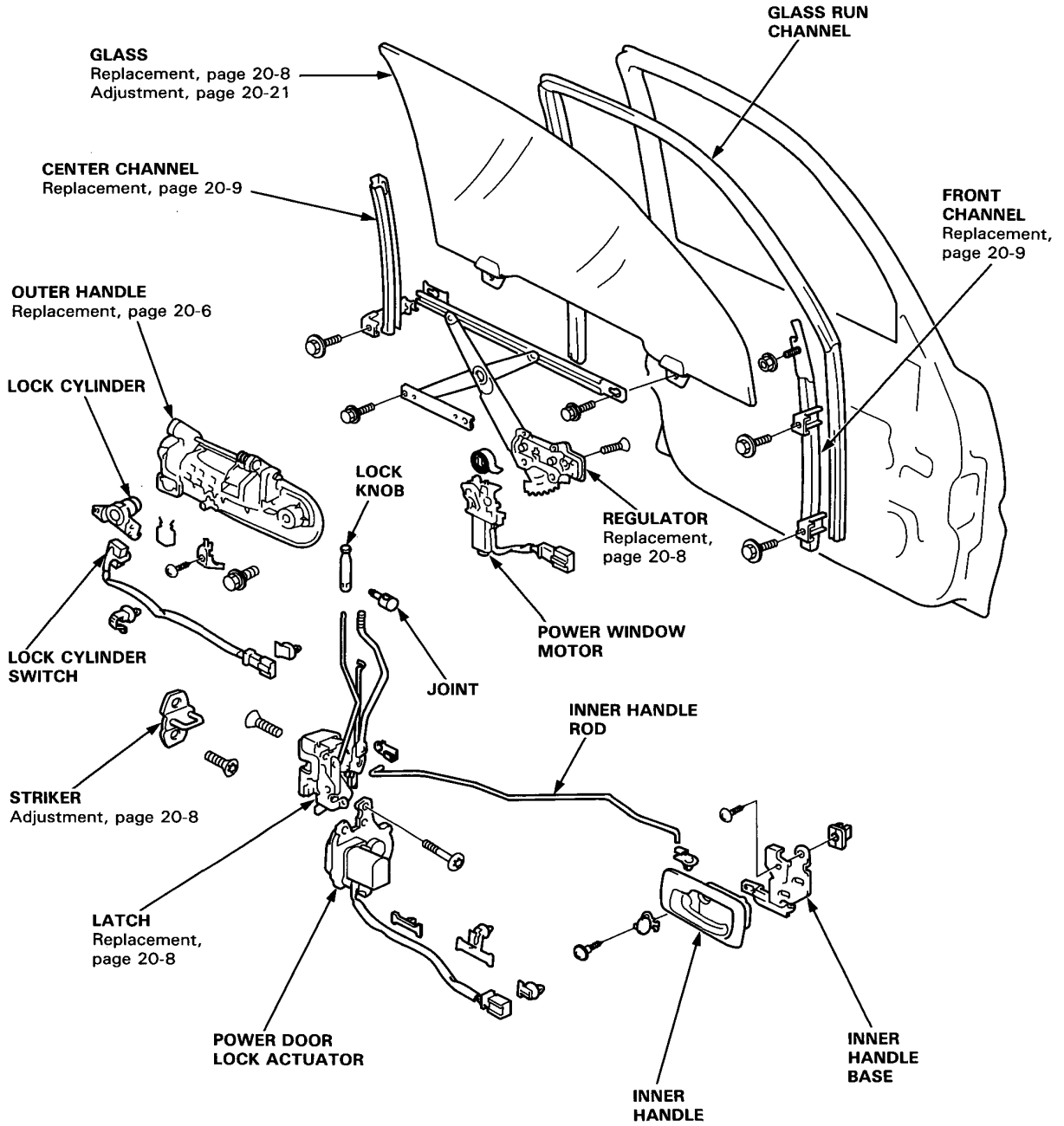
Front Door Index



(cont'd)

Doors

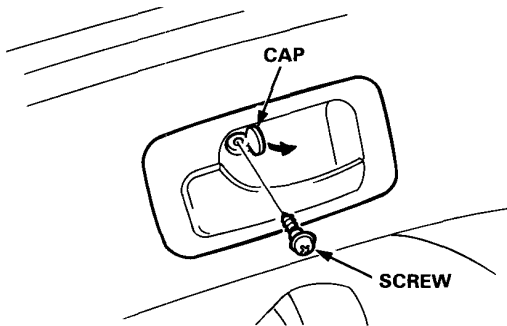
Front Door Index (cont'd)



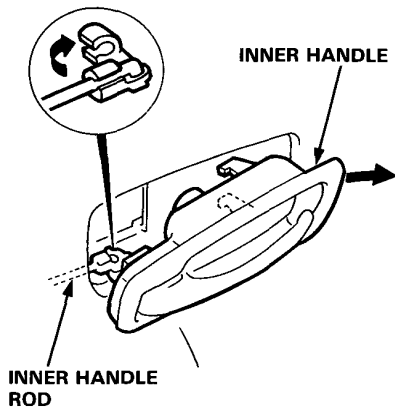


Door Panel/Plastic Cover Replacement

1. Pry the cap and remove the screw.

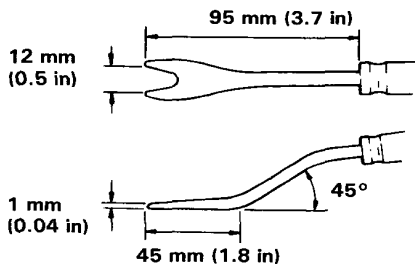


2. Pull the inner handle out half-way and disconnect the inner handle rod, then remove the inner handle.

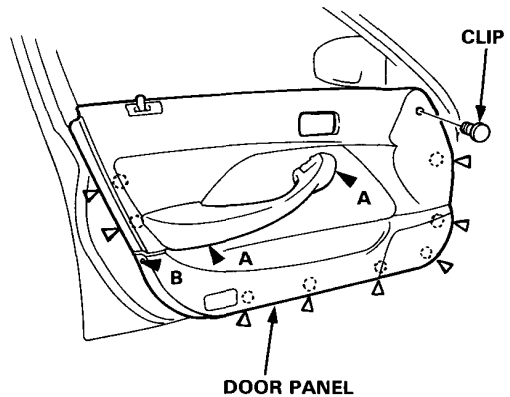
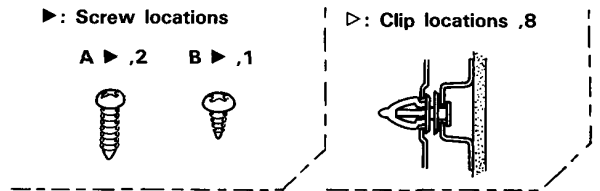


NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking.

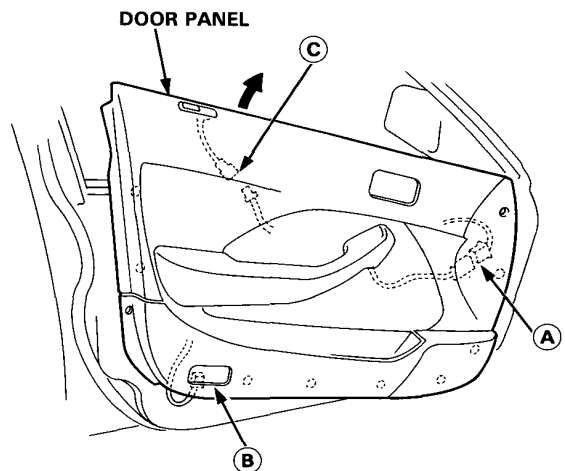
TRIM PAD REMOVER
SNAP-ON
#A177



3. Remove the screws and clips attaching the door panel (see trim pad remover).



4. Remove the door panel by pulling it upward. If applicable, disconnect the following:
 - (A) Power door mirror switch connector
 - (B) Courtesy light connector
 - (C) Security indicator connector (for some types)



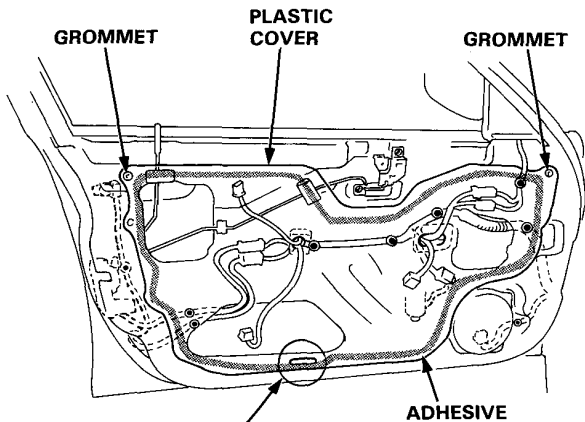
(cont'd)

Doors

Door Panel/Plastic cover Replacement (cont'd)

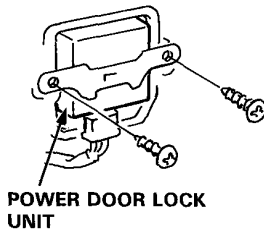
5. Remove the grommets, power door lock unit and harness clips, then carefully remove the plastic cover.

●: Harness clip locations



Do not fill up to the slot.

Except security system



6. Installation is the reverse of the removal procedure.

NOTE:

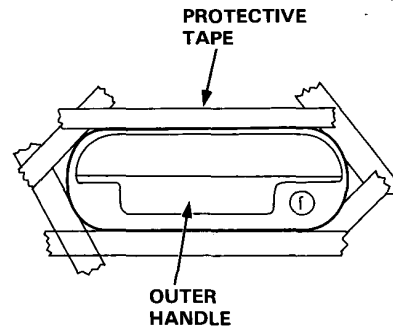
- Make sure the door harness and connectors are fastened correctly on the door.
- Apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks.
- Before fastening the door panel, make sure the door harness is not pinched.

Outer Handle Replacement

NOTE: Raise the glass fully.

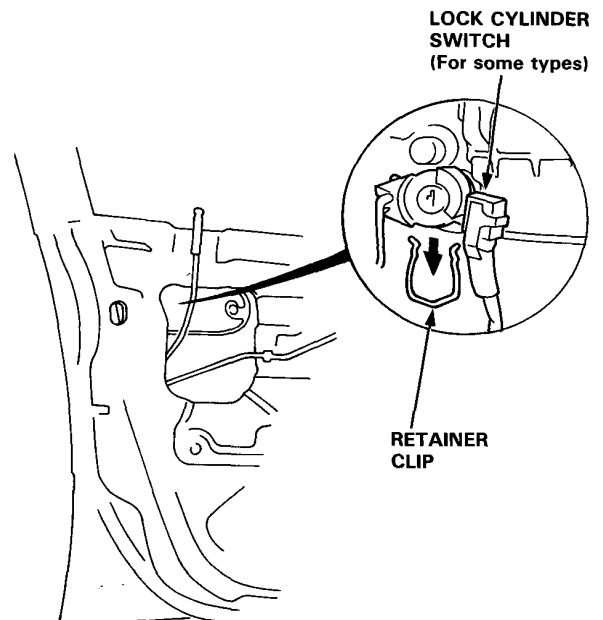
1. Remove:
 - Door panel (see page 20-5)
 - Plastic cover

CAUTION: Use protective tape around the outer handle to prevent damage.



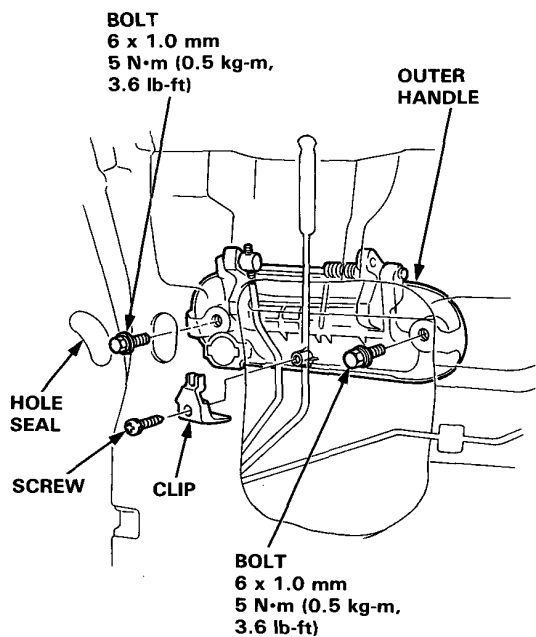
2. Pull out the retainer clip, then remove the lock cylinder.

NOTE: Be careful not to damage the lock cylinder switch.



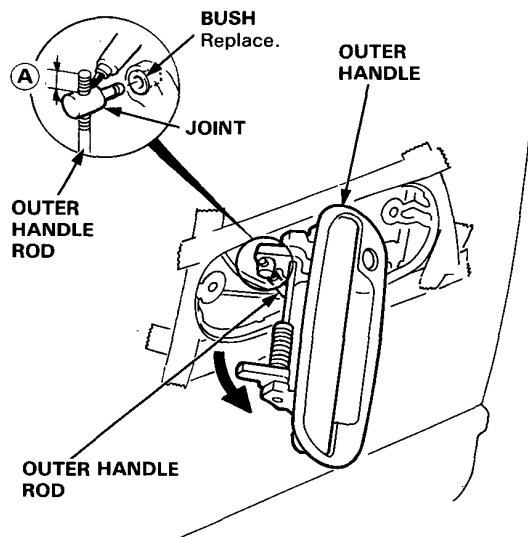


3. Remove the bolts, screw and clip.

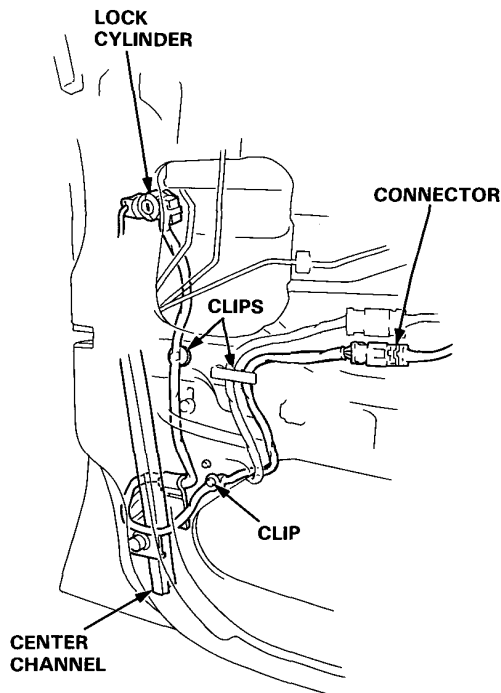


4. Pull out the outer handle.
Pry the outer handle rod out of its joint using a flat tip screwdriver.

NOTE: To ease reassembly, note the location (A) of the outer handle rod on the joint before disconnecting it.



5. Remove the clips and disconnect the connector, then remove the lock cylinder.



6. Installation is the reverse of the removal procedure.

NOTE: Check the door lock operation.

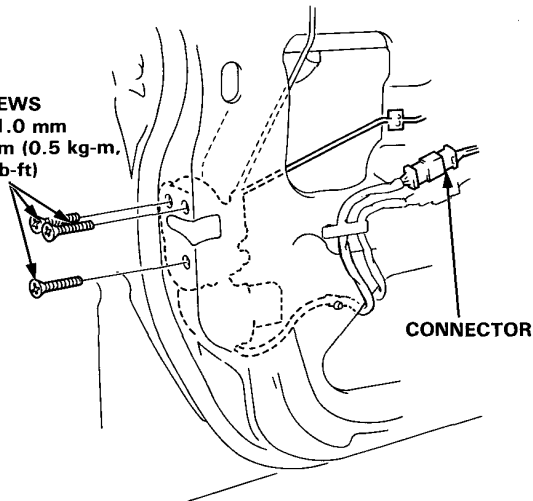
Doors

Latch Replacement

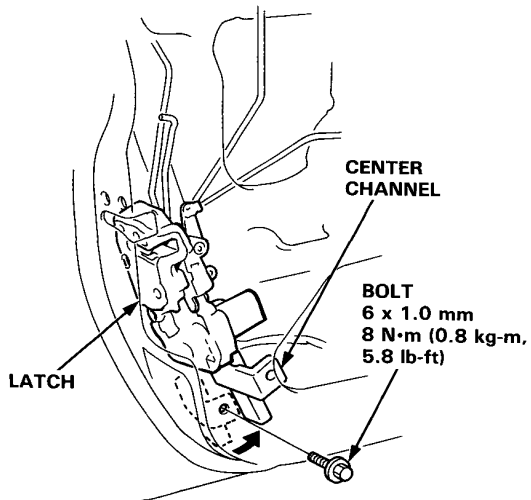
NOTE: Raise the glass fully.

1. Remove:
 - Door panel (see page 20-5)
 - Plastic cover (see page 20-6)
 - Outer handle (see page 20-6)
2. Remove the screws, and disconnect the connector.

SCREWS
6 x 1.0 mm
5 N·m (0.5 kg-m,
3.6 lb-ft)



3. Remove the bolt and slide the center channel toward the end of the door, then remove the latch through the hole in the door.



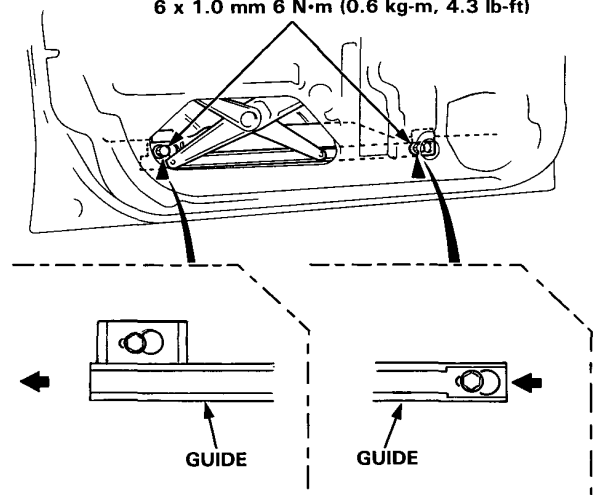
4. Installation is the reverse of the removal procedure.

NOTE: Check the door lock operation.

Glass/Regulator Replacement

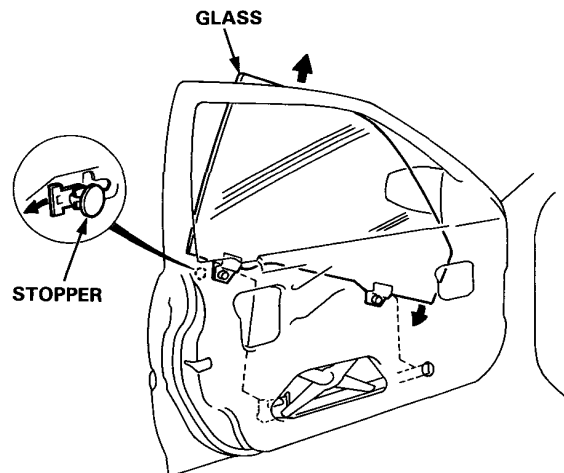
1. Remove:
 - Door panel (see page 20-5)
 - Plastic cover (see page 20-6)
2. Carefully move the glass until you can see the bolts, then loosen them.
Slide the guide to the rear, then remove the glass.

BOLTS
6 x 1.0 mm 6 N·m (0.6 kg-m, 4.3 lb-ft)



3. Carefully pull the glass out through the window slot.

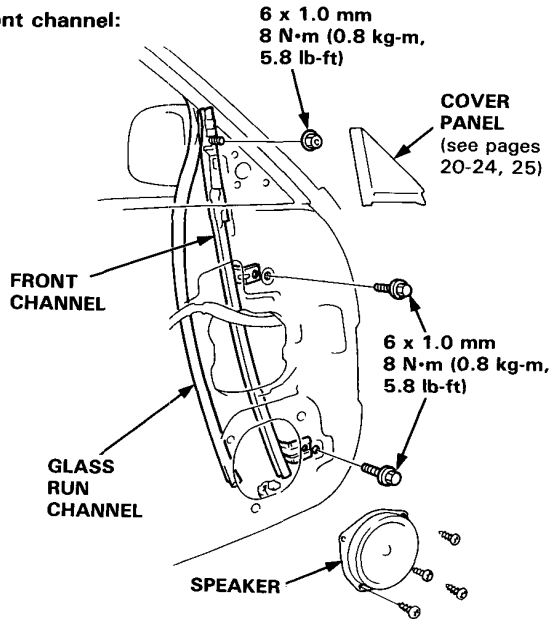
NOTE: Take care not to drop the glass inside the door.



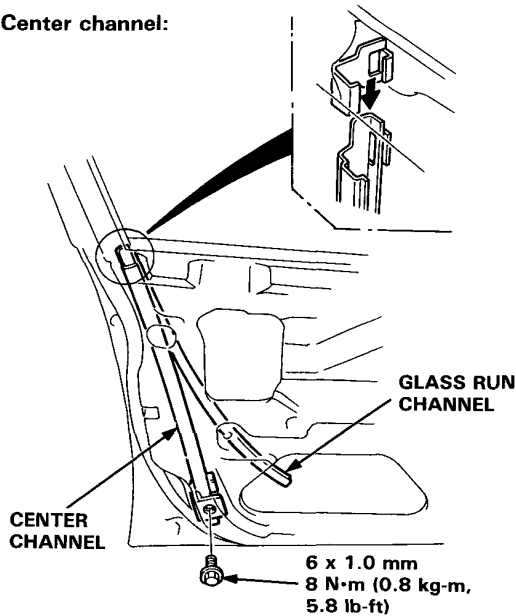


- Remove the speaker and cover panel.
- Peel the glass run channel out of the front and center channels.
- Remove the front and center channels.

Front channel:



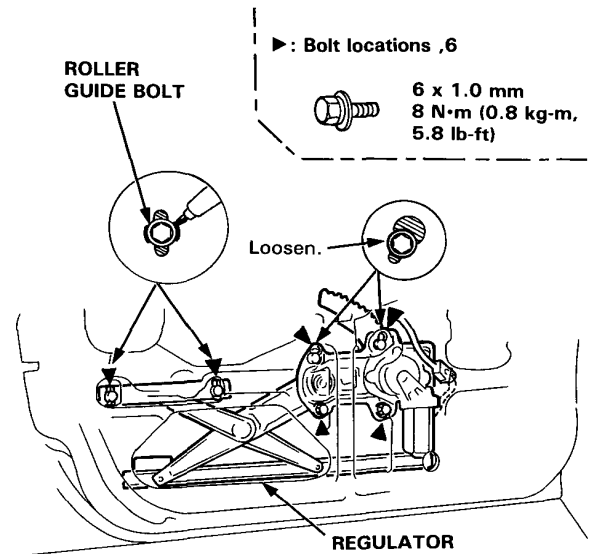
Center channel:



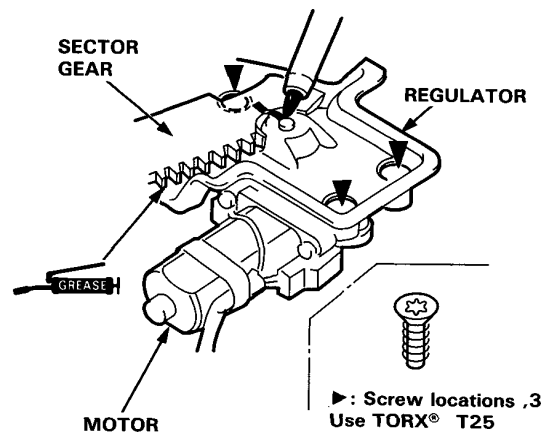
NOTE: To install, fit the glass run channel into the front and rear channels as shown.

- Remove the two bolts and loosen the two bolts. Loosen the roller guide bolts and disconnect the connector. Take out the regulator through the center hole in the door.

NOTE: Scribe a line around the roller guide bolts to show the original adjustment.



- Before removing the power window motor, mark the location by scribing a line across the sector gear and regulator. Install using the motor bolts. Move the regulator to the original position by connecting a 12 V battery to the power window motor (see section 23).

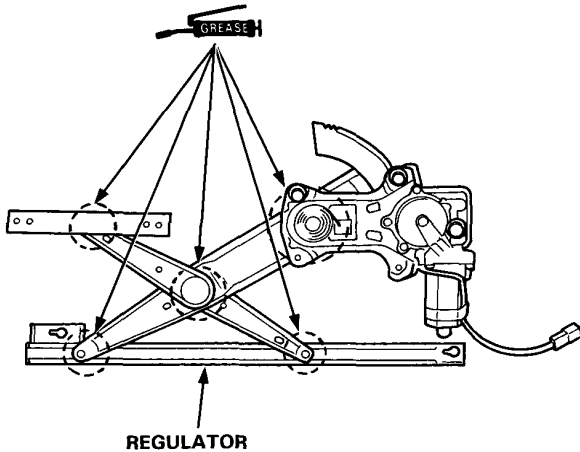


(cont'd)

Doors

Glass/Regulator Replacement (cont'd)

9. Grease all the sliding surfaces of the regulator where shown.



10. Installation is the reverse of the removal procedure.

11. 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 if necessary (see page 20-21).

12. Attach the door harness to the door correctly (see page 20-6).

13. When reinstalling the plastic cover, apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks (see page 20-6).

Outer molding Replacement

CAUTION: Wear gloves to remove the outer molding.

1. Remove:
 - Door panel (see page 20-5)
 - Door mirror (see pages 20-24, 25)
2. Lower the glass and remove the screw.
3. Starting at the rear, pry the outer molding up and detach the clips, then remove the outer molding.

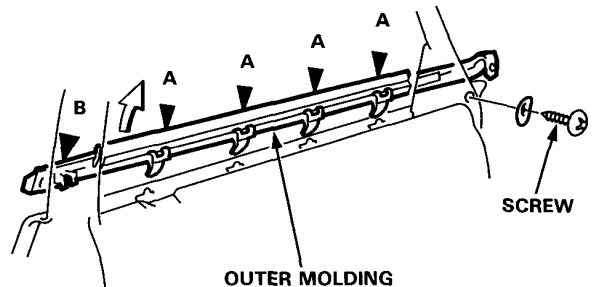
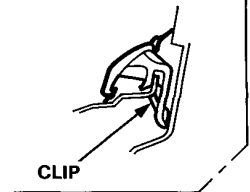
NOTE: Take care not to twist or scratch the outer molding.

▶: Clip locations

A ▶ ,4



B ▶ ,1



4. Installation is the reverse of the removal procedure.

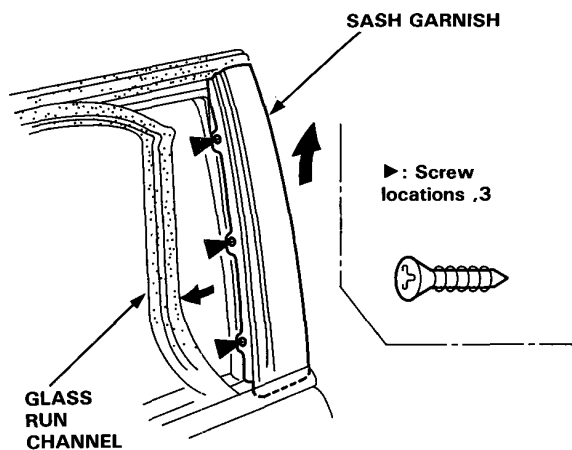
NOTE: If necessary, replace any damaged clips.



Sash Garnish Replacement

NOTE: Take care not to scratch the sash garnish.

1. Lower the glass and peel the glass run channel.
2. Remove the screw, then remove the sash garnish by hand.



3. Installation is the reverse of the removal procedure.

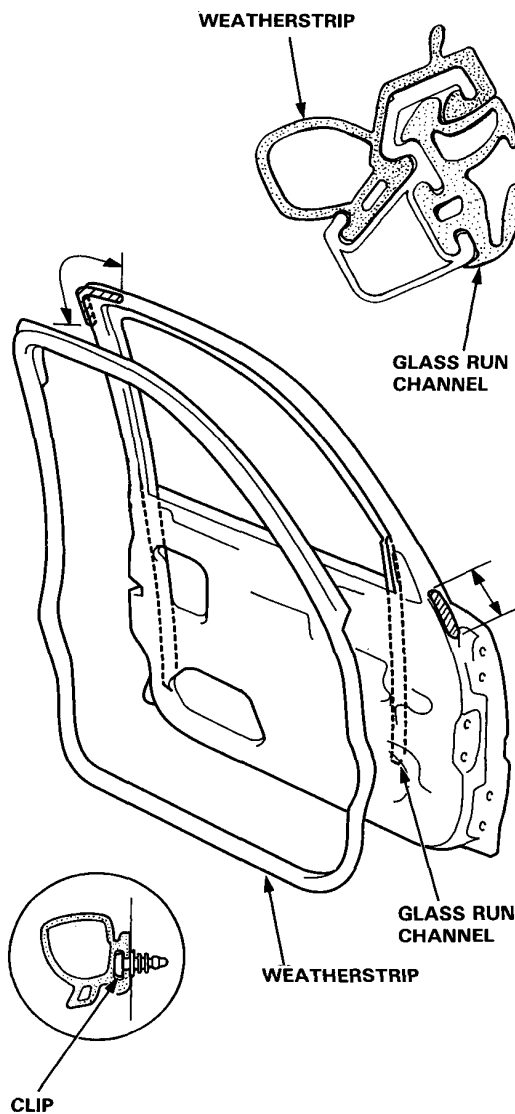
NOTE: To install, fit the glass run channel into the door sash.

Weatherstrip Replacement

NOTE:

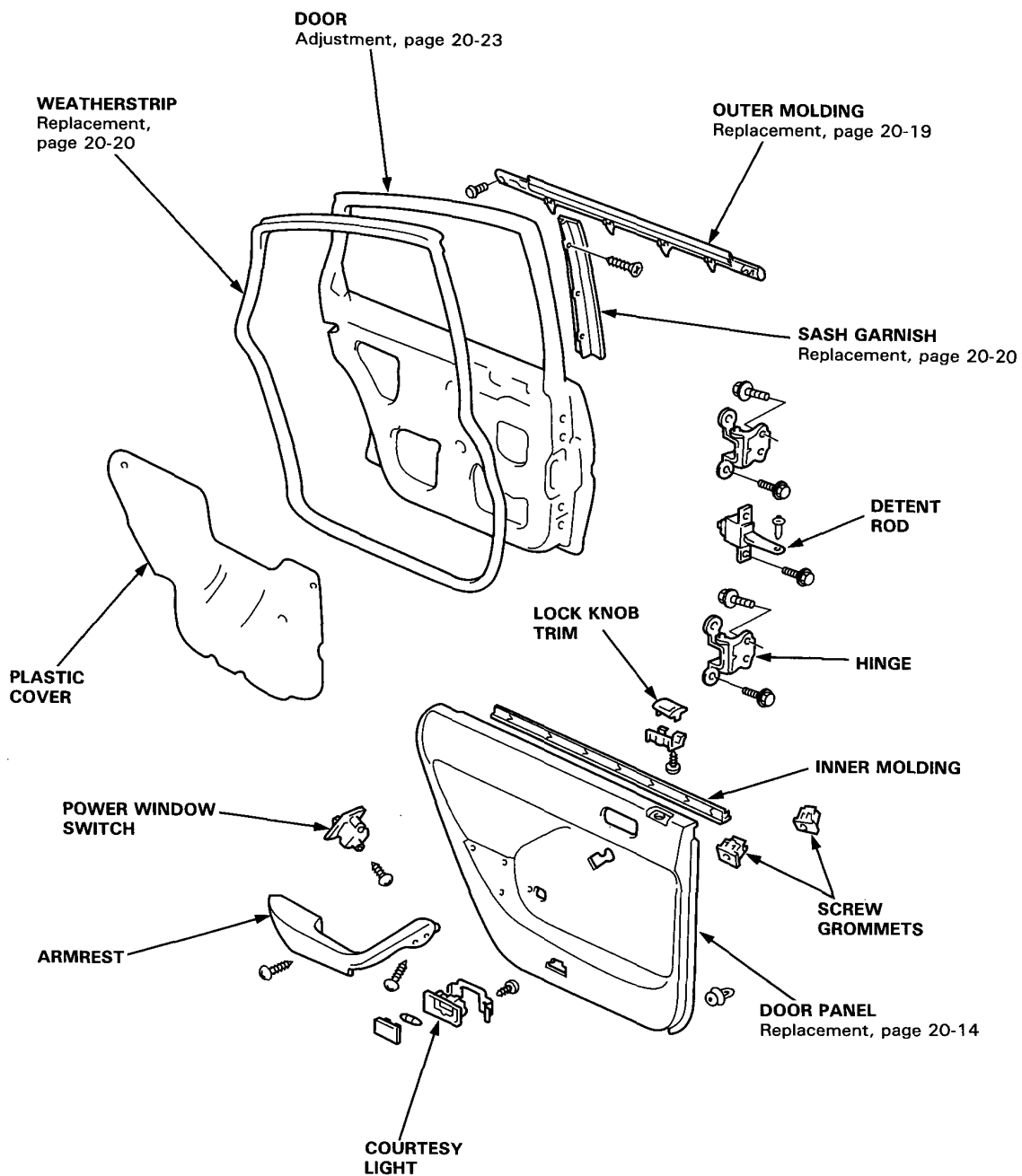
- Before installing the weatherstrip, apply clear sealant to the shadowed areas of the door as shown.
- If necessary, replace any damaged clips.

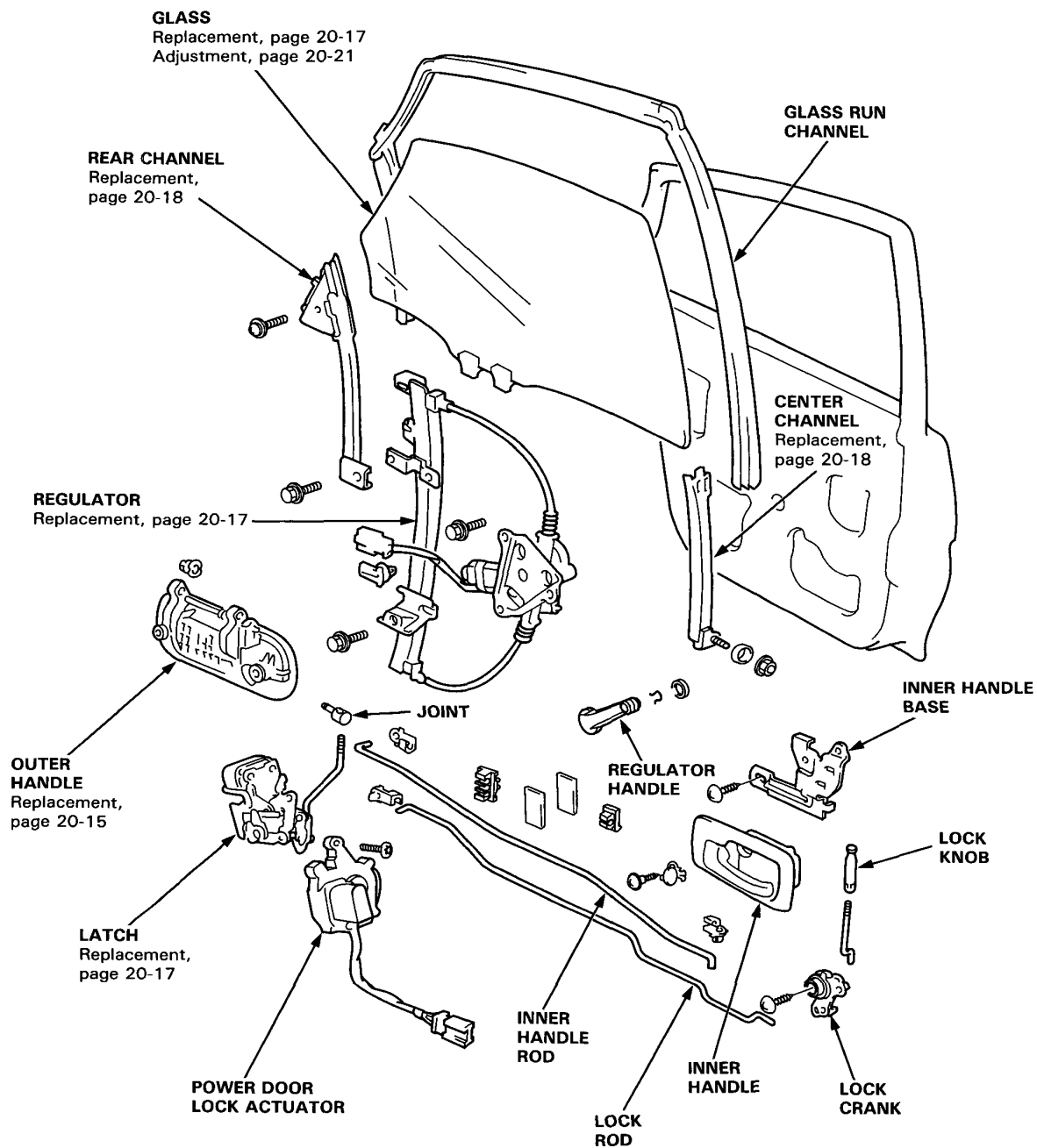
Sealant: Cemedine #8500



Doors

Rear Door Index

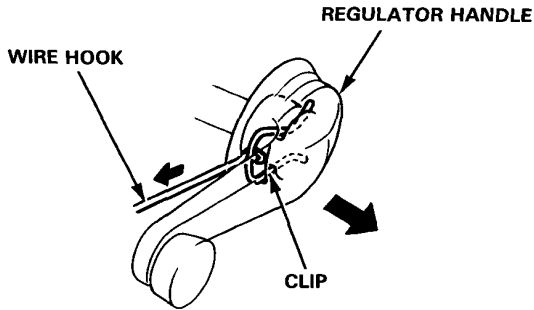




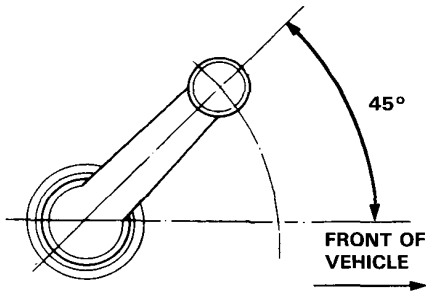
Doors

Door Panel/Plastic Cover Replacement

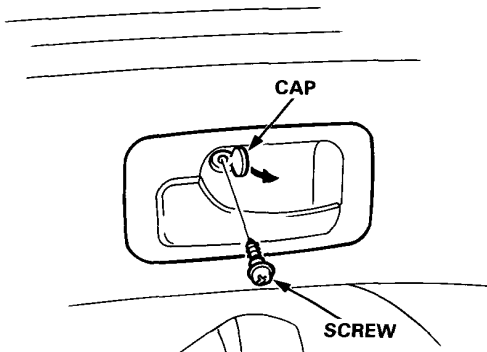
1. If applicable, remove the regulator handle by pulling the clip out a wire hook.



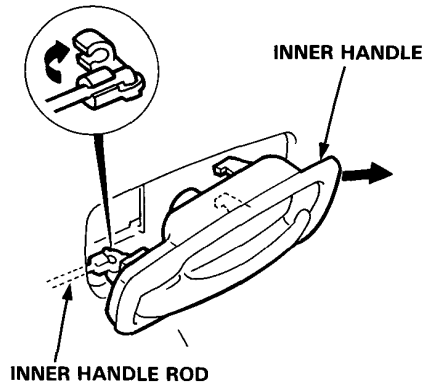
NOTE: Install the regulator handle so it point forward and up at a 45 degree angle with the glass closed.



2. Pry the cap and remove the screw.

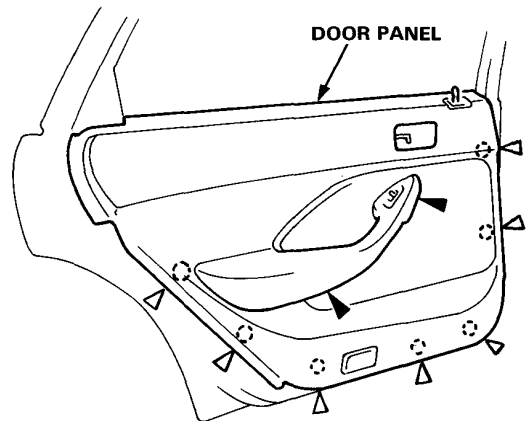
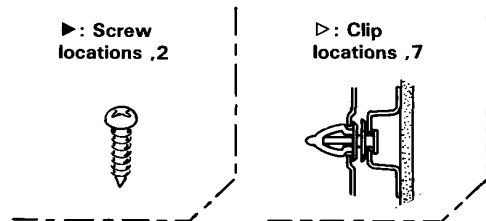


3. Pull the inner handle out half-way and disconnect the inner handle rod, then remove the inner handle.



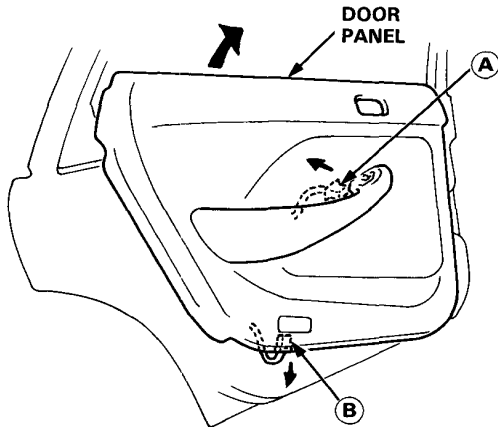
4. Remove the screws and clips attaching the door panel (see trim pad remover).

NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking (see page 20-5).



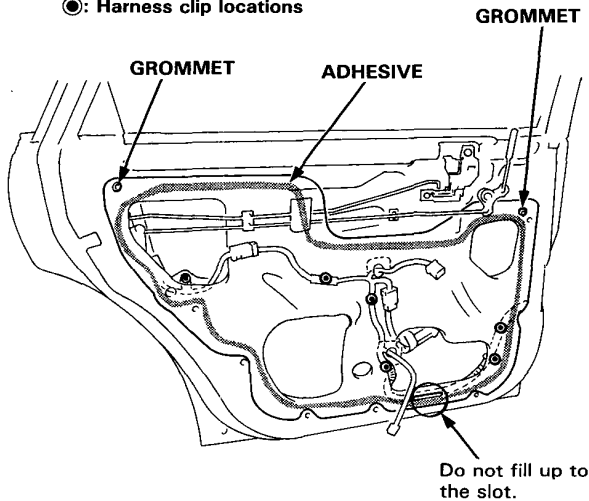


5. Remove the door panel by pulling it upward. If applicable, disconnect the following:
- Ⓐ Power window switch connector
 - Ⓑ Courtesy light connector



6. Remove the grommets, then carefully remove the plastic cover.

●: Harness clip locations



7. Installation is the reverse of the removal procedure.

NOTE:

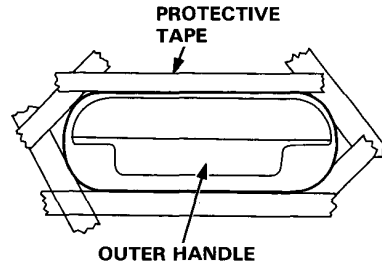
- Make sure the door harness and connectors are fastened correctly on the door.
- Apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks.
- Before fastening the door panel, make sure the door harness is not pinched.

Outer Handle Replacement

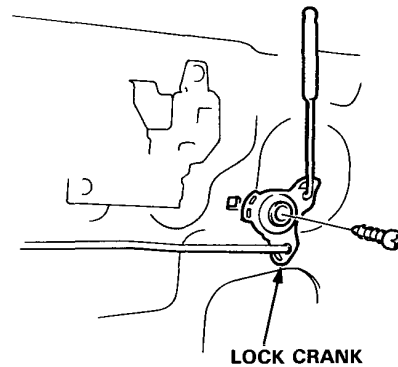
NOTE: Raise the glass fully.

1. Remove:
- Door panel (see page 20-14)
 - Plastic cover

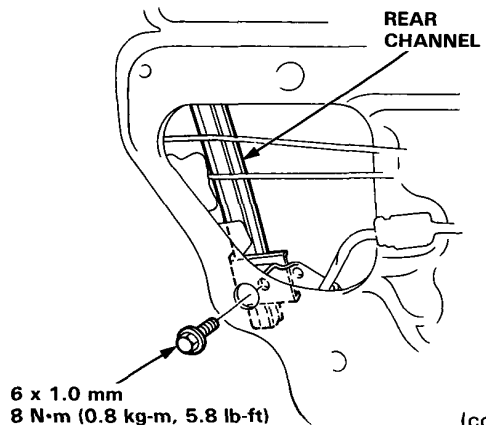
CAUTION: Use protective tape around the outer handle to prevent damage.



2. Remove the lock crank.



3. Remove the rear channel bolt.

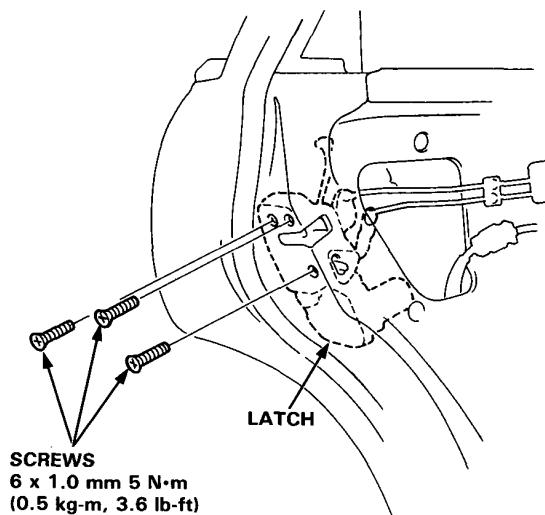


(cont'd)

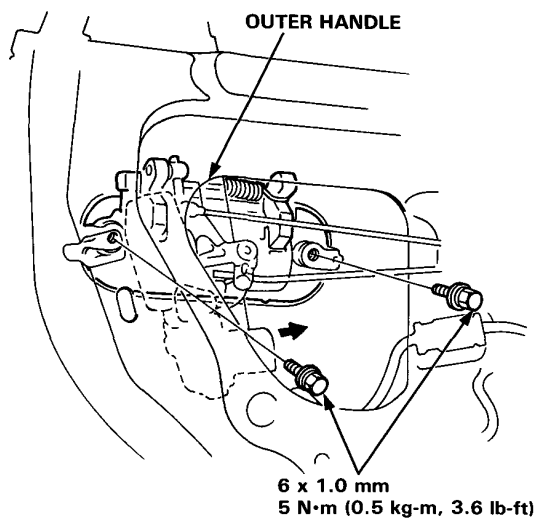
Doors

Outer Handle Replacement (cont'd)

4. Remove the screws of the latch.

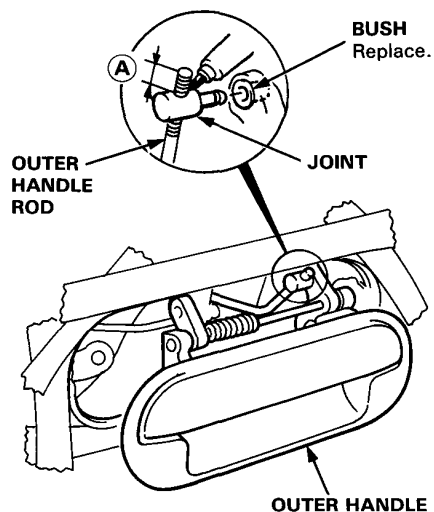


5. Move the rear channel and latch, then remove the outer handle bolts.



6. Pull out the outer handle.
Pry the outer handle rod out of its joint using a flat tip screwdriver.

NOTE: To ease reassembly, note the location (A) of the outer handle rod on the joint before disconnecting it.



7. Installation is the reverse of the removal procedure.

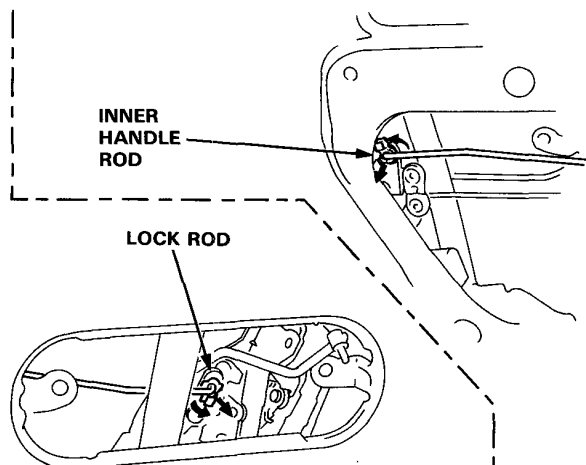
NOTE: Check the door lock operation.



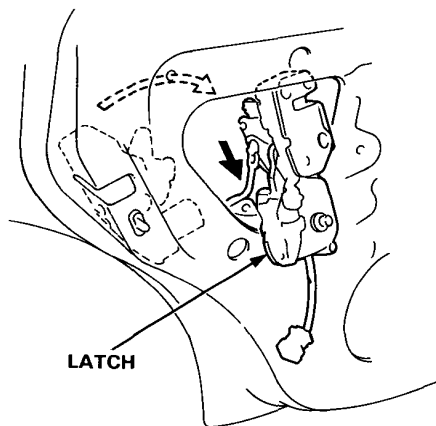
Latch Replacement

NOTE: Raise the glass fully.

1. Remove:
 - Door panel (see page 20-14)
 - Plastic cover (see page 20-15)
 - Outer handle (see page 20-15)
2. Disconnect the inner handle rod and lock rod.



3. Turn the latch, then remove it through the hole in the door.

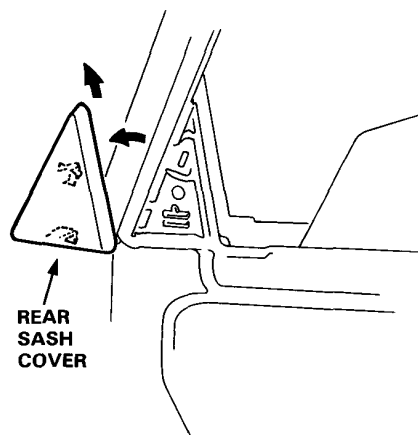


4. Installation is the reverse of the removal procedure.

NOTE: Check the door lock operation.

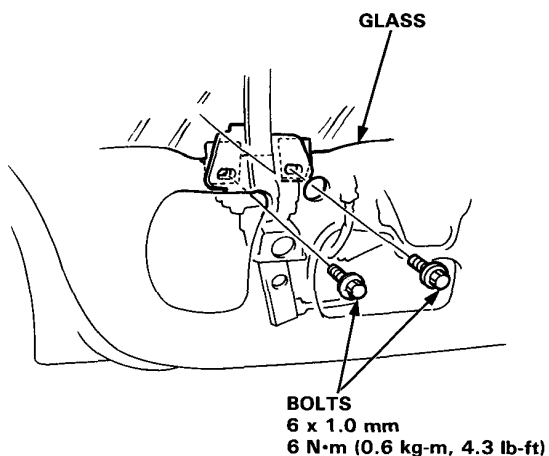
Glass/Regulator Replacement

1. Remove:
 - Door panel (see page 20-14)
 - Plastic cover (see page 20-15)
2. Remove the rear sash cover.



3. Carefully move the glass until you can see the bolts, then remove them.

NOTE: Take care not to drop the glass inside the door.

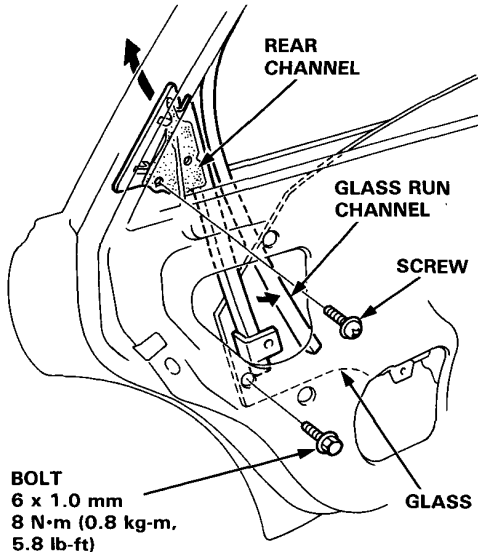


(cont'd)

Doors

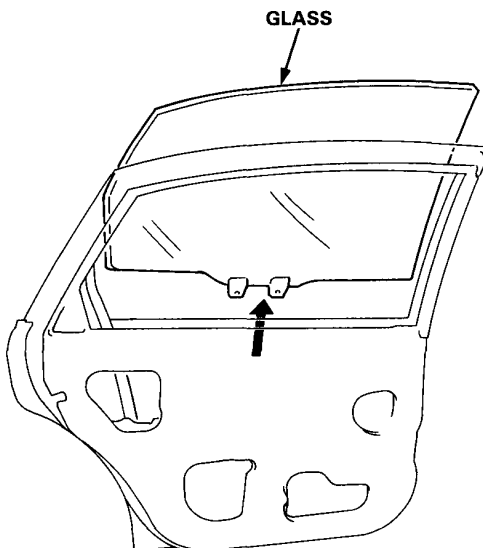
Glass/Regulator Replacement (cont'd)

4. Remove the screw and bolt, then remove the rear channel from the glass.
5. Peel the glass run channel out of the rear channel, then pull the rear channel out through the window slot.

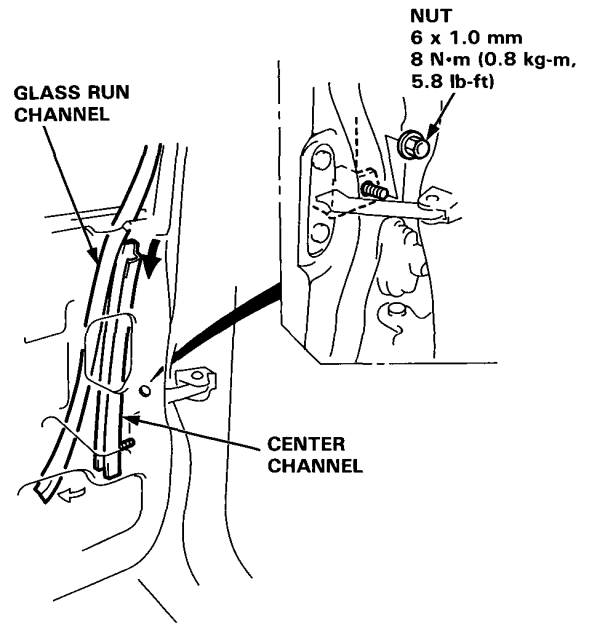


6. Carefully pull the glass out through the window slot.

NOTE: Take care not to drop the glass inside the door.



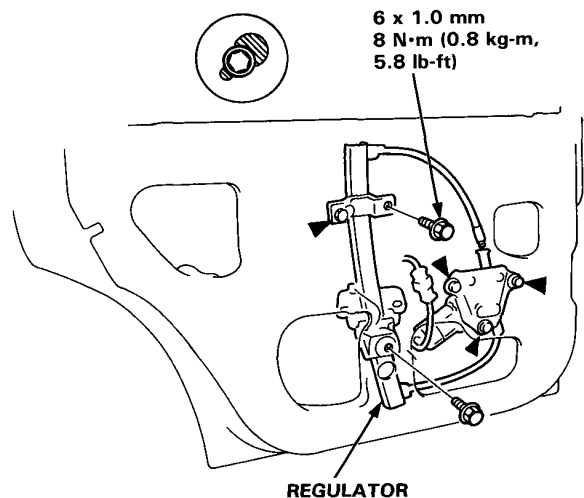
7. Peel the glass run channel and remove the nut, then remove the center channel.



NOTE: To install, fit the glass run channel into the front and rear channels.

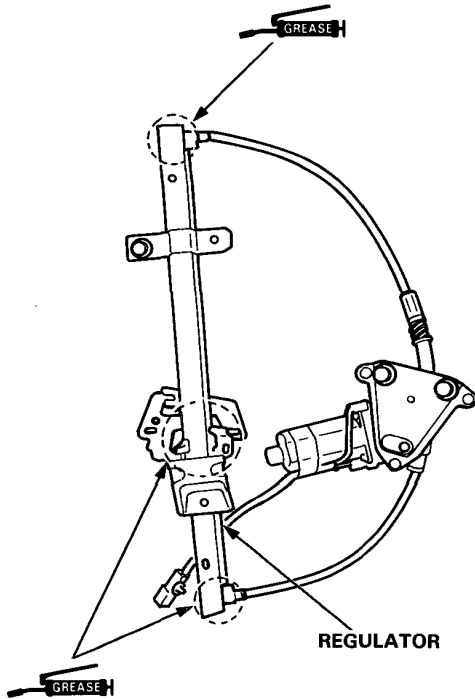
8. Remove the two bolts and loosen the four bolts. Disconnect the connector (power window model). Take out the regulator through the hole in the door.

►: Loosen the bolts ,4





9. Grease all the sliding surfaces of the regulator where shown.
Check that the regulator moves smoothly connecting the regulator handle or a 12 V battery to the power window motor (see section 23).



10. Installation is the reverse of the removal procedure.
11. 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 if necessary (see page 20-21).
12. Attach the door harness to the door correctly (see page 20-15).
13. When reinstalling the plastic cover, apply adhesive along the edge where necessary to maintain a continuous seal and prevent water leaks (see page 20-15).

Outer molding Replacement

CAUTION: Wear gloves to remove the outer molding.

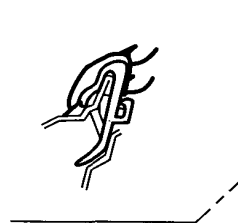
NOTE: Lower the glass.

1. Remove the door panel (see page 20-14).
2. Remove the screw.
3. Starting at the rear, pry the outer molding up and detach the clips, then remove the outer molding.

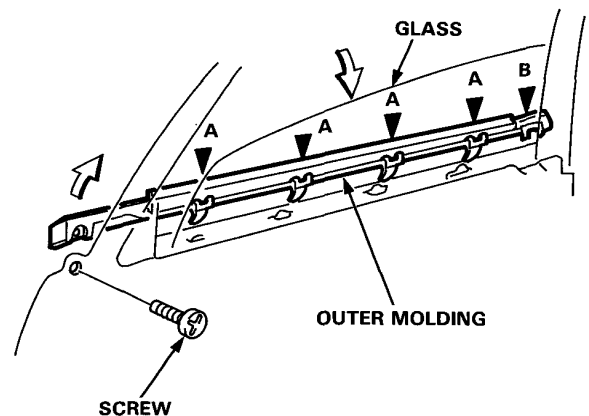
NOTE: Take care not to twist or scratch outer molding.

►: Clip locations

A ► ,4



B ► ,1



4. Installation is the reverse of the removal procedure.

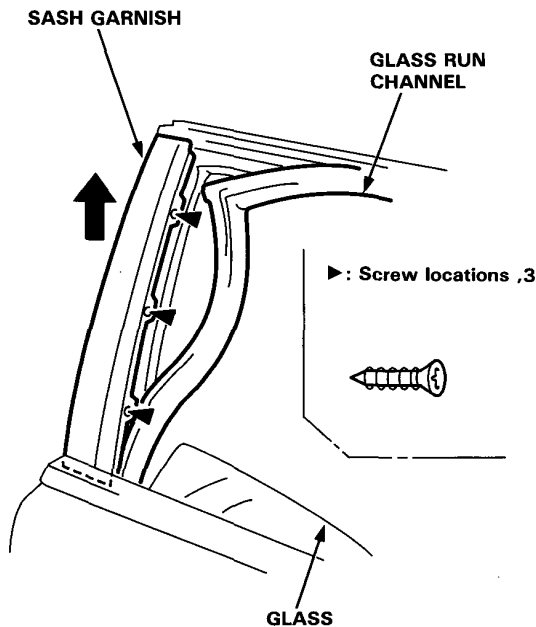
NOTE: If necessary, replace any damaged clips.

Doors

Sash Garnish Replacement

NOTE: Take care not to scratch the sash garnish.

1. Remove:
 - Door panel (see page 20-14)
 - Plastic cover (see page 20-15)
2. Remove the bolts, move the rear channel and glass (see pages, 20-17, 18).
3. Peel the glass run channel and remove the screw, then remove the sash garnish by hand.



4. Installation is the reverse of the removal procedure.

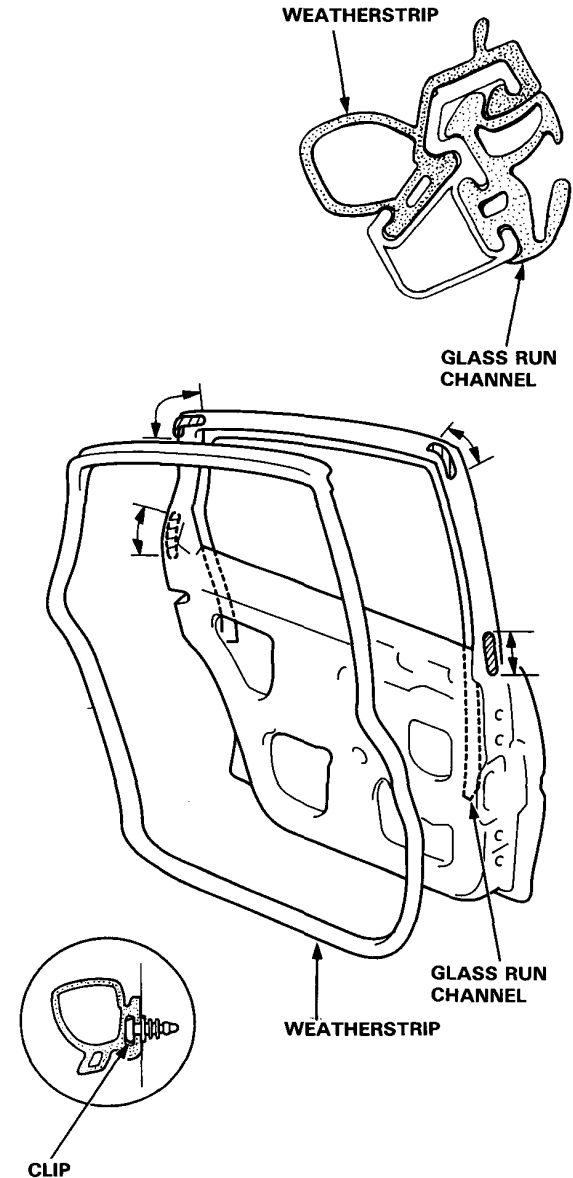
NOTE: To install, fit the glass run channel into the door sash.

Weatherstrip Replacement

NOTE:

- Before installing the weatherstrip, apply clear sealant to the shadowed areas of the door as shown.
- If necessary, replace any damaged clips.

Sealant: Cemedine #8500



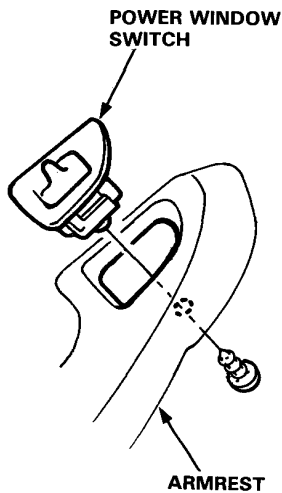


Glass Adjustment

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 if necessary.

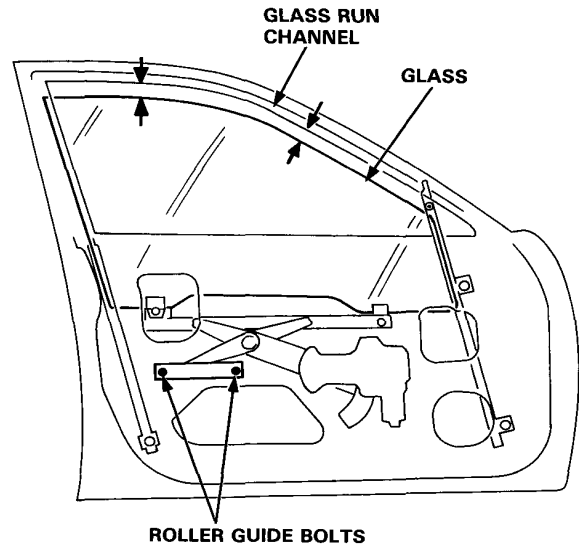
1. Remove the door panel and peel off the plastic cover (see pages 20-5, 14).
2. Rear Door:
Remove the power window switch from the armrest (power window model).



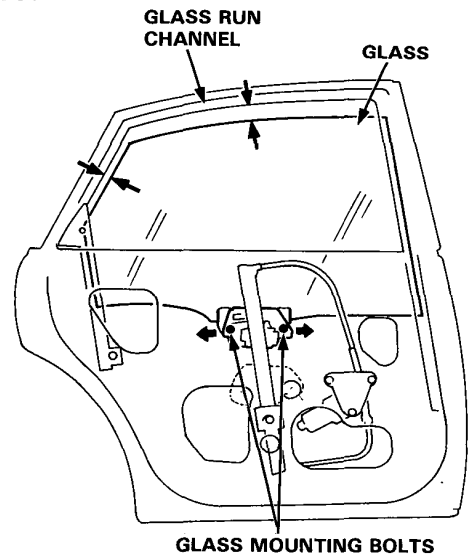
Connect the power window switch to the power window motor connector (power window model). Install the regulator handle on the door regulator (manual window model).

3. Loosen the roller guide bolts (front door) and glass mounting bolts (rear door) and adjust the glass so it is parallel with the glass run channel.

Front Door:



Rear Door:



4. Raise the glass as far up as possible and hold it against the glass run channel. Then tighten the roller guide bolts (front door) and glass mounting bolts (rear door).

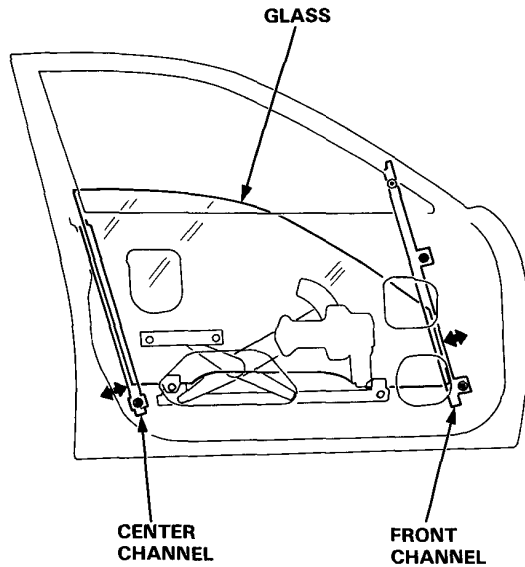
(cont'd)

Doors

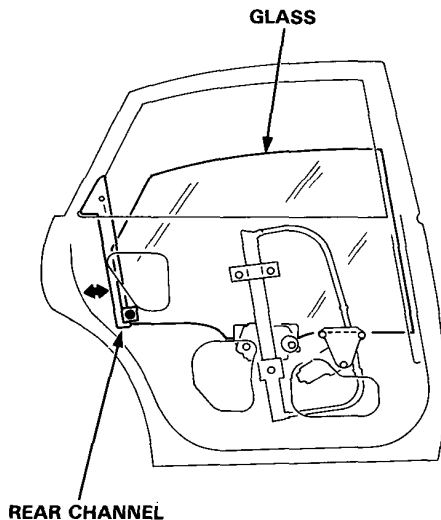
Glass Adjustment (cont'd)

5. Check that the glass moves smoothly.
6. If necessary, adjust the front and center channels (front door) and rear channel (rear door).

Front Door:

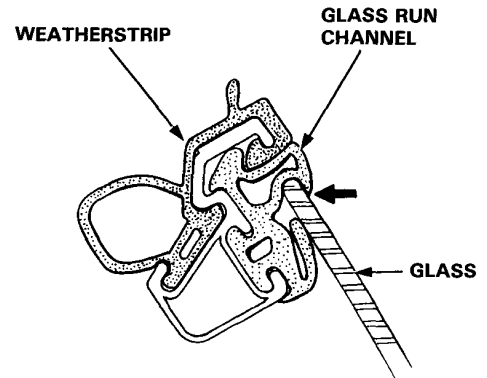


Rear Door:



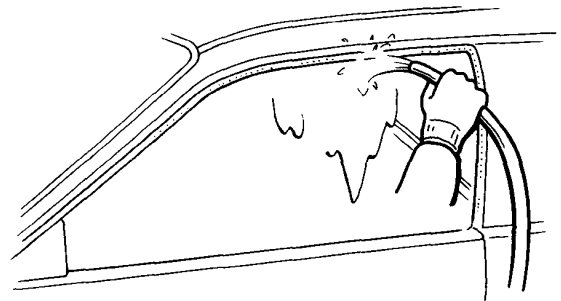
7. Raise the glass fully and check for gap.
8. Check the glass operation.

NOTE: Check that the glass contacts the glass run channel evenly.



9. Check for water leaks.

NOTE: Do not use high pressure water.



10. Route the door harness and connectors and fasten them to the door (see pages 20-6, 15).
11. Attach the plastic cover, then install the door panel (see pages 20-5, 14).



Doors

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 gap between the front, rear, and bottom door edges and the body.

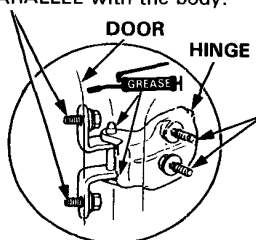
The door and body edges should also be parallel. Adjust at the hinges as shown.

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 30 N·m (3.0 kg-m, 22 lb-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.

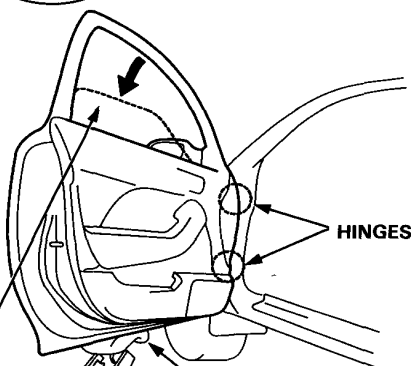


HINGE MOUNTING BOLTS

8 x 1.25 mm

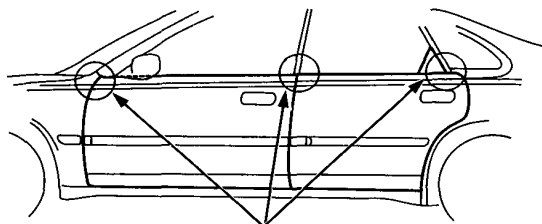
30 N·m (3.0 kg-m, 22 lb-ft)

Loosen the hinge mounting bolts, and move the door BACKWARD or FORWARD, UP or DOWN as necessary to equalize the gaps.



Lower the glass.

SHOP TOWEL



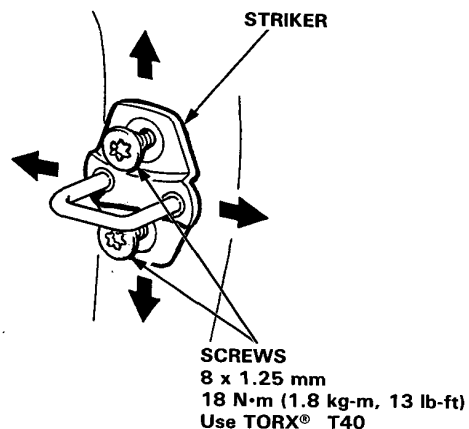
The door and body edges should be parallel.

NOTE: Check for water leaks.

Striker Adjustment

Make sure the door latches securely without slamming. If it needs adjustment:

1. Draw a line around the striker for reference.
2. Loosen the screws and move the striker IN or OUT to make the latch fit tighter or looser. Move the striker UP or DOWN to align it with the latch opening. Then lightly tighten the screws and recheck.



NOTE: Hold the outer handle out and push the door against the body to be sure the striker allows a flush fit.

3. If the door latches properly, tighten the screws and recheck.

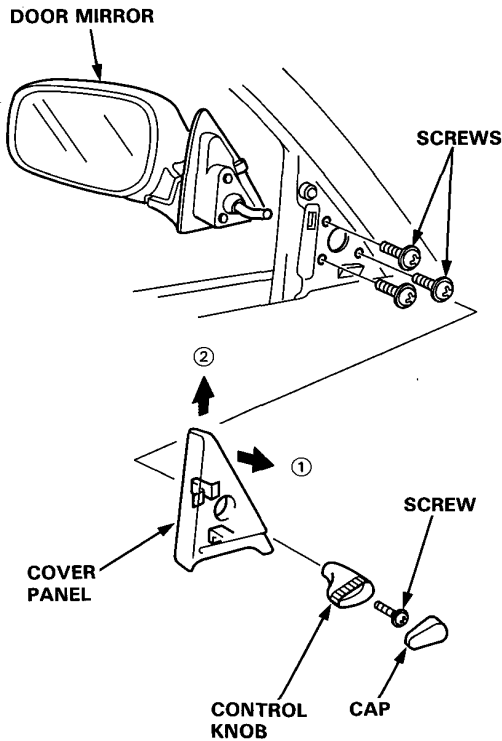
Mirrors

Manual Door Mirror Replacement

1. Remove the cap and screw, then remove the control knob.
2. Pry the cover panel out with a flat tip screwdriver, then remove it.

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

3. Remove the screws while holding the door mirror.

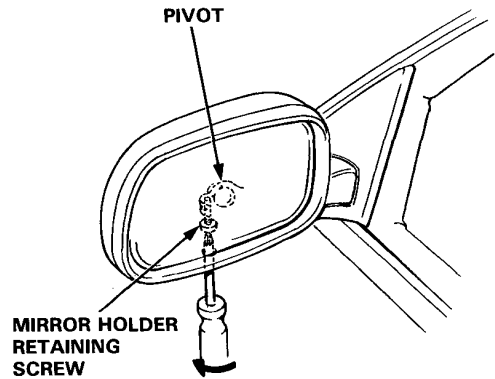


4. Installation is the reverse of the removal procedure.
5. Check for water leaks.

NOTE: Do not use high pressure water.

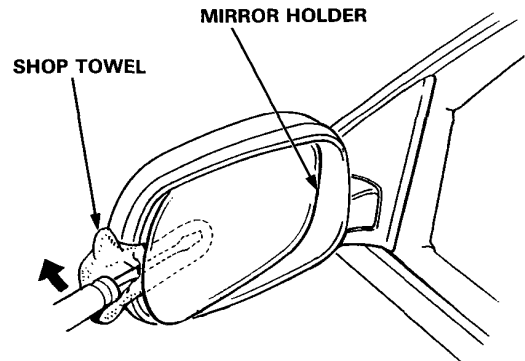
Mirror Holder Replacement

1. Insert a screwdriver in the mirror through the service hole, then loosen the mirror holder retaining screw.



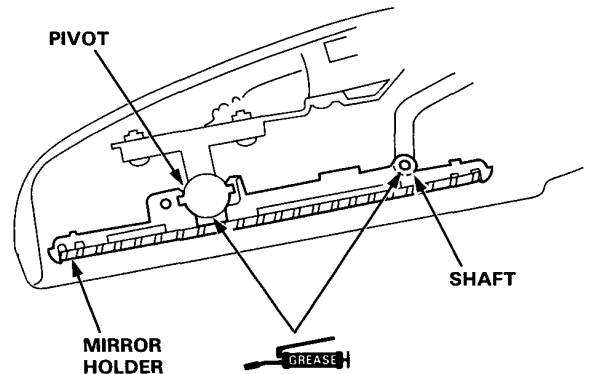
2. Carefully pry out the mirror holder with a flat tip screwdriver as shown.

CAUTION: To prevent damage to the mirror, wrap the end of the screwdriver with a shop towel.



3. Installation is the reverse of the removal procedure.

NOTE: Apply grease to the location indicated by the arrows.



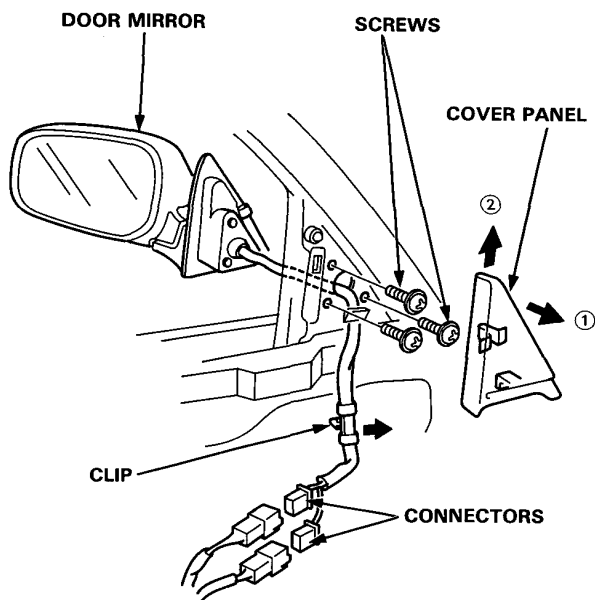


Power Door Mirror Replacement

1. Remove the door panel (see page 20-5).
2. Pry out the cover panel with a flat tip screwdriver, then remove it.
Disconnect the connector.

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

3. Remove the screws while holding the door mirror.

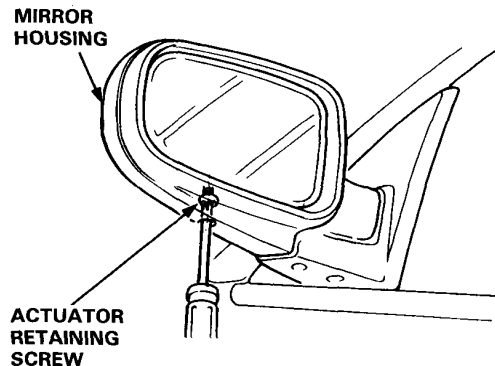


4. Installation is the reverse of the removal procedure.
5. Check for water leaks.

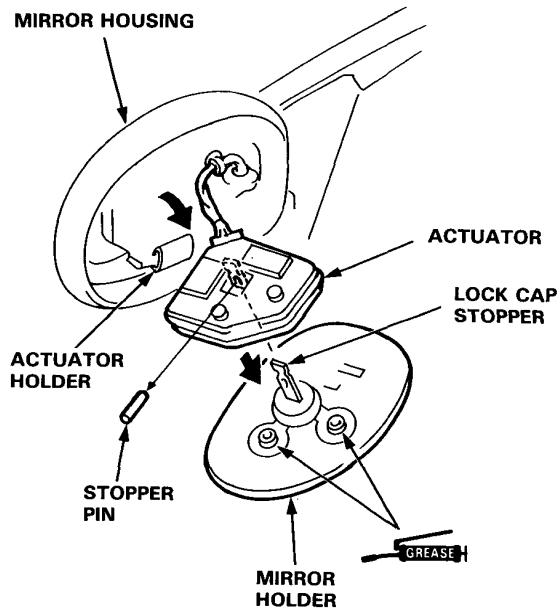
NOTE: Do not use high pressure water.

Mirror Holder Replacement (Except Heated Type)

1. Insert a screwdriver in the mirror housing through the service hole, and loosen the actuator retaining screw.



2. Pull the mirror holder out from the mirror housing.
3. Pull the lock cap stopper and remove the stopper pin, then separate the actuator and mirror holder.



4. Installation is the reverse of the removal procedure.

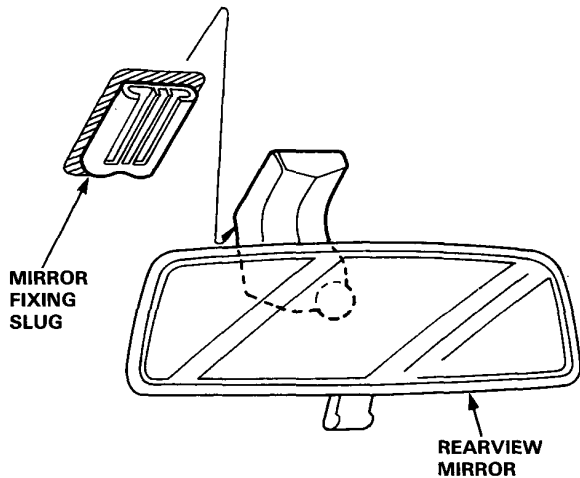
NOTE: Apply grease to the locations indicated by the arrows.

Mirrors

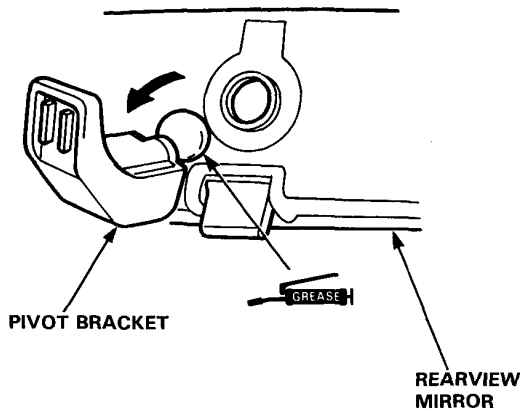
Rearview Mirror Replacement

1. Carefully slide up the rearview mirror pivot bracket from the slug.

NOTE: Take care not to scratch the windshield.



2. Install the rearview mirror, heat the pivot and mirror side with a low powered heater gun for several minutes.

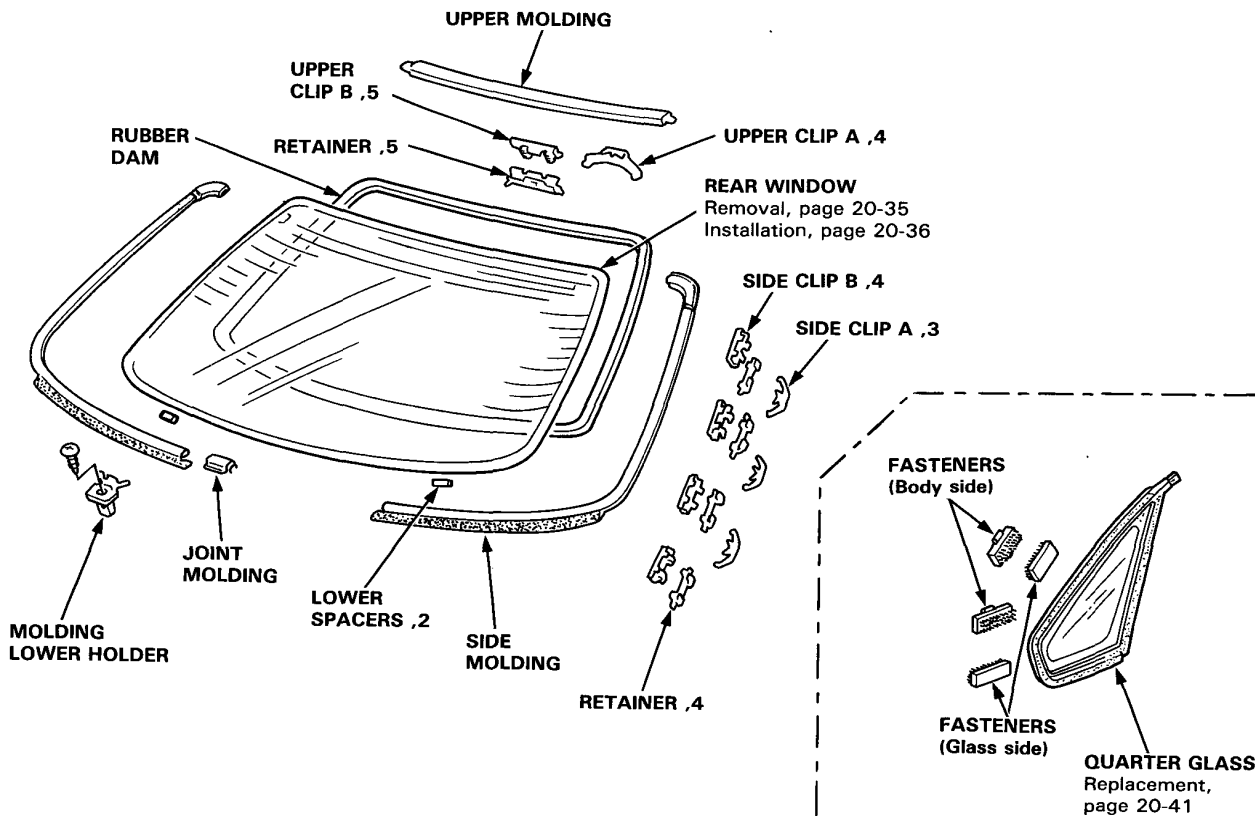
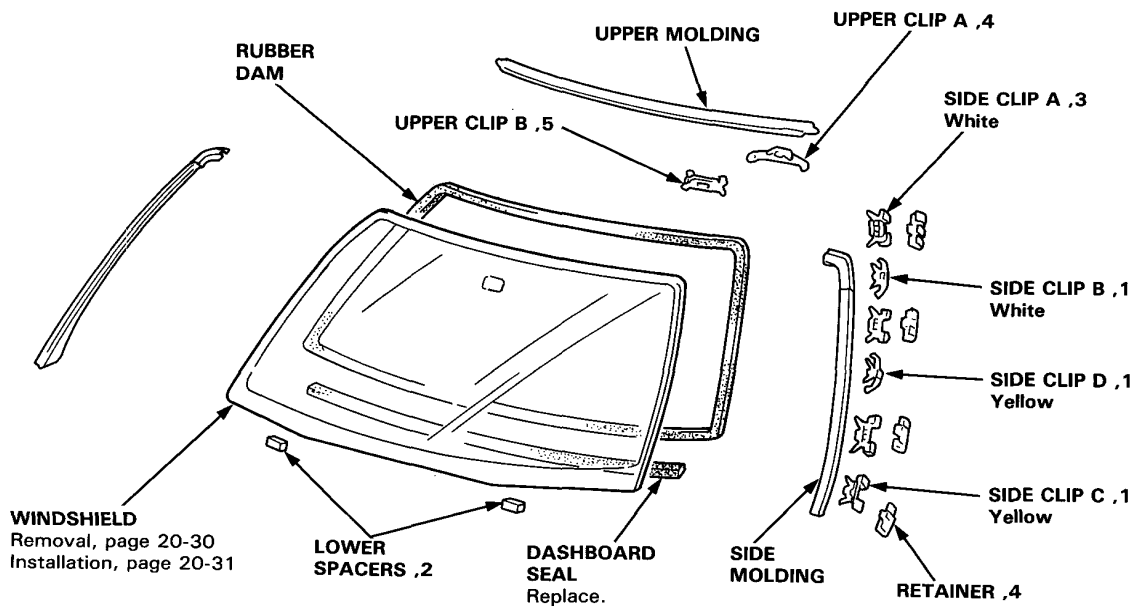




Windshield, Rear Window, Quarter Glass

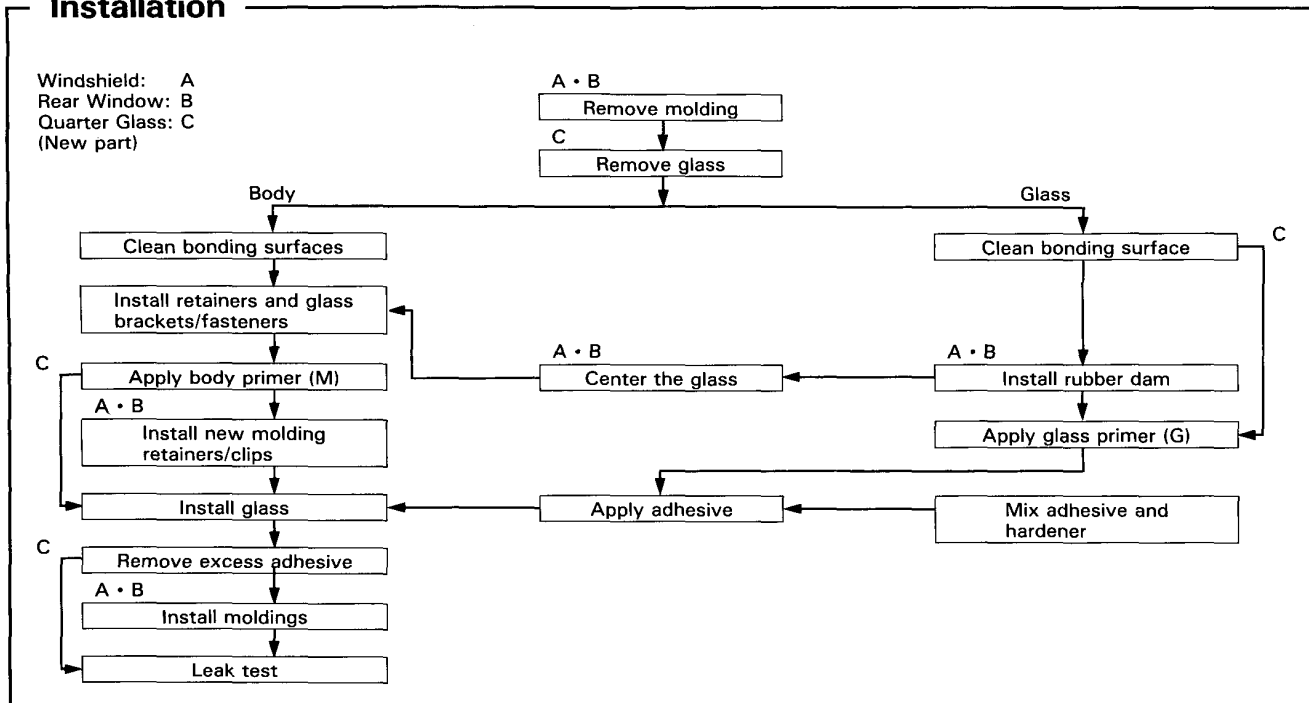
Index

NOTE: The numbers after the part names show the quantities of the parts used.



Windshield, Rear Window, Quarter Glass

Installation



Parts

Part Number	Contents	Comment
Adhesive kit – Low temperature 08718–99960 High temperature 08718–99961	<ul style="list-style-type: none"> Adhesive sealant (500 g) Hardener (75 g) Glass primer G (20 g) Body primer M (20 g) Piano wire (0.6 ø x 1 m (3f)) Gauze Cartridge Sponge 	<ul style="list-style-type: none"> For glass primer (G) For applying primers
<p>NOTE:</p> <ul style="list-style-type: none"> ● Both kits have two types of adhesive primer: one for the body (metal), and one for glass. ● Always use new genuine Honda adhesive, or equivalent. ● Do not use the adhesive if 6 months have elapsed since date of manufacture. ● Store adhesive in a cool, dry place. ● Open only immediately before you are going to use it. 		

Tools

Tool/Material	Remarks
Glass or steel plate	To mix adhesive and hardener on
Putty knife	To mix adhesive and remove excess
Caulking gun	To apply bead of adhesive to windshield
Suction cups	To install windshield
Knife	To scrape bonding surface around window opening
Awl	To make hole through existing adhesive for piano wire
Two wood sticks	To hold piano wire
Toluene or alcohol	To clean bonding surfaces



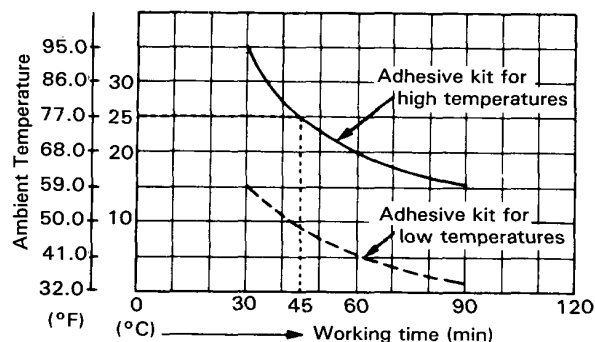
Workable Time

Adhesive workable time varies widely according to temperature, so choose the correct adhesive kit for the temperature range you will be working in.

After mixing and applying adhesive, you should install the windshield within the time shown on the chart.

For example, when the ambient temperature is 25°C (77°F), the glass should be installed within 45 minutes using the high temperature type adhesive.

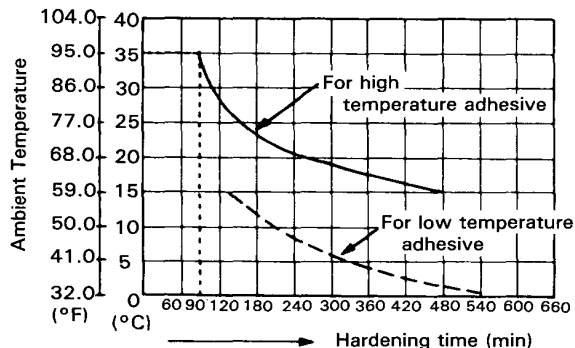
Kit part numbers and contents are listed on the page before.



Hardening Time

Hardening time can be shortened by heating with infrared light.

For example, the adhesive will start to harden within 270 minutes mixing at 20°C (63°F). If however, it is heated to 35°C (95°F), it will start to harden within 90 minutes.

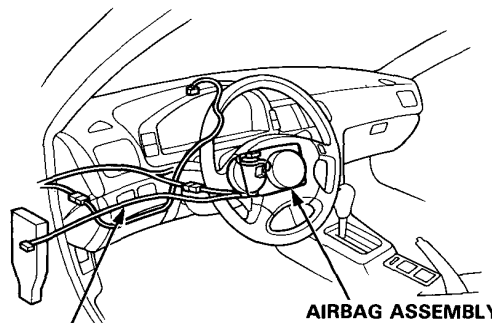


Broken Windshield Removal

SRS wire harnesses are routed near the dashboard and steering column.

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.




SRS MAIN HARNESS
(Covered with yellow outer insulation)

Remove as much broken windshield as possible with a vacuum cleaner.

Blow out the glass in the heater and behind the dashboard with low pressure compressed air.

⚠ WARNING Wear eye protection while using the air gun.

1. Set the temperature control dial to COLD.
2. Select the  to the mode control dial.
3. Make sure the recirculation button is OFF.
4. Blow compressed air through the defroster center vent outlet.
5. Remove the blower duct, and remove any glass from the air mix chamber.
6. Remove the any glass from the top of the vent/defrost door.
7. Remove any glass from top and bottom of carpet and seats with a vacuum cleaner.

NOTE: It is recommended to remove the front seats to shake off any glass (see page 20-55).

Windshield

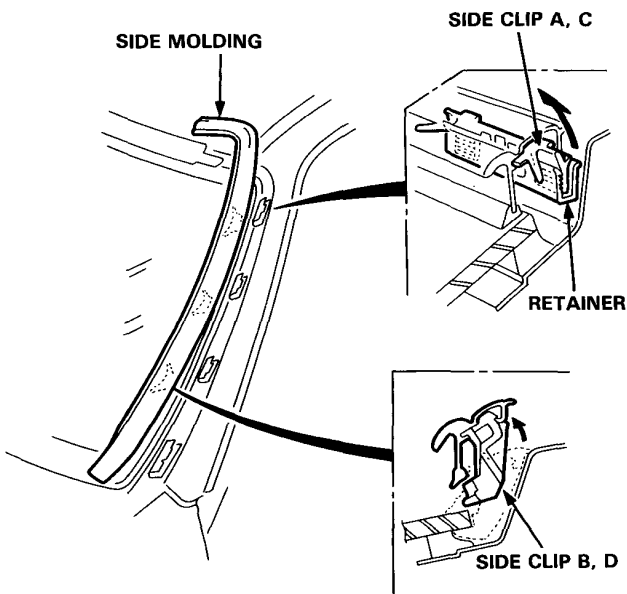
Removal

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 20-26)
 - Sunvisors, center visor (see page 20-53)
 - Front pillar trim (see page 20-51)
 - Front wipers and air scoop (see section 23)
2. Detach the clips from the retainers, then remove both side moldings as shown.

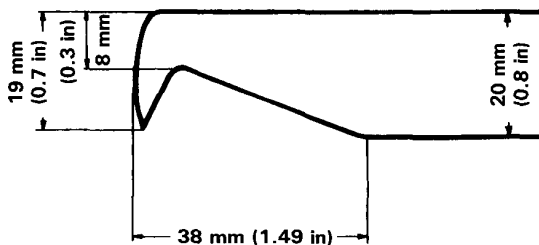
NOTE: If necessary, replace any damaged clips.



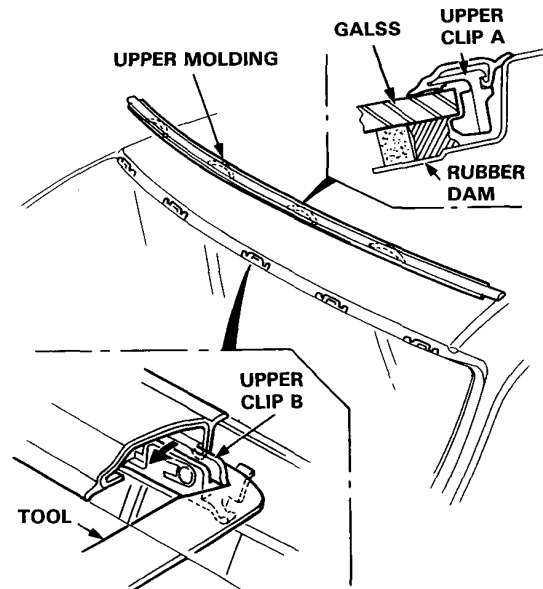
NOTE: You will need a molding clip release tool to remove some moldings. If necessary, make one that has the dimensions shown.

Molding Clip Release Tool:

Thickness: 2 mm (0.08 in), pointed at the end.



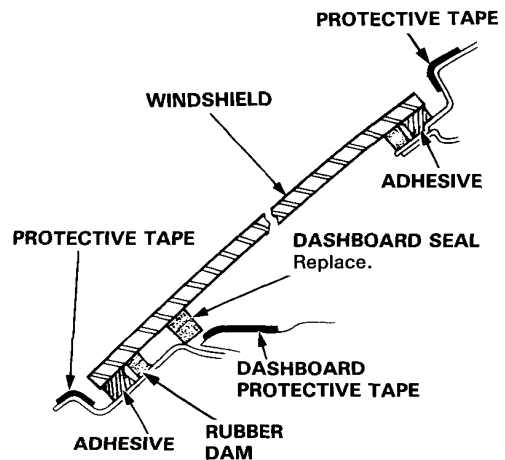
3. Remove the upper molding with a molding clip release tool.
4. Detach the upper clips and remove the upper molding.



5. Pull down the front of headliner (see page 20-53).

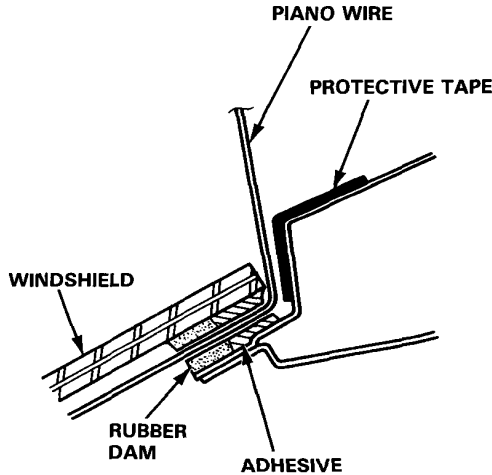
CAUTION: Take care not to bend the headliner excessively.

6. Apply protective tape to along the edge of the dashboard and body as shown.



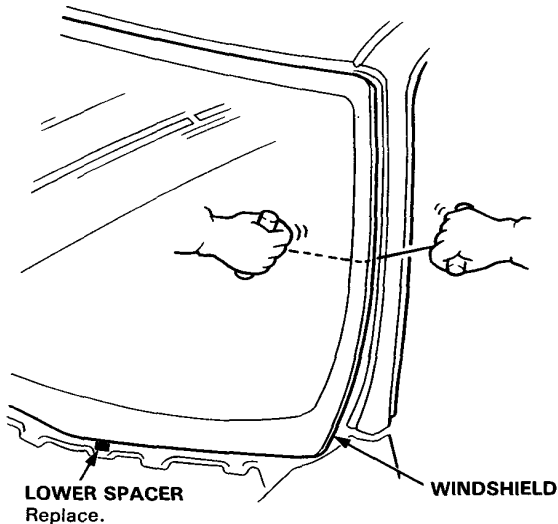


- Using an awl, make a hole through the rubber dam and adhesive from inside the car. Push the piano wire through the hole and wrap each end around a piece of wood.



- 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.

CAUTION: Hold the piano wire as close to the windshield as possible to prevent damage to the body and dashboard.



- Carefully remove the windshield.
- Remove the other retainers from the body.

Installation

- Scrape the old adhesive smooth with a knife, 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 dam from the body.
- Mask off surrounding surfaces before painting.

- Clean the body bonding surface with a sponge dampened in alcohol.

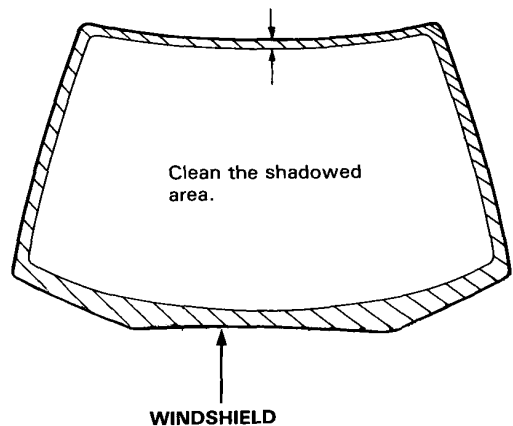
NOTE: After cleaning, keep oil, grease and water from getting on the surface.

- If the old windshield is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, 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.



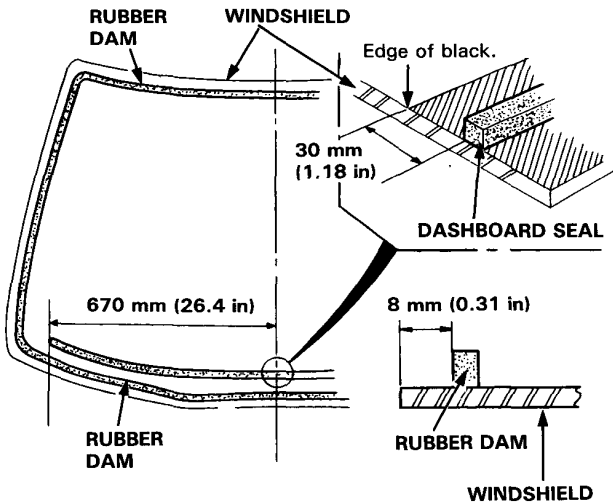
(cont'd)

Windshield

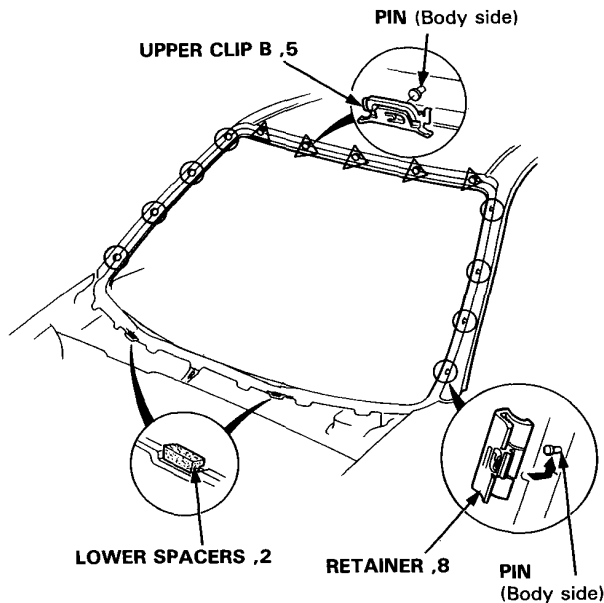
Installation (cont'd)

- Glue the dashboard seal and rubber dam to the inside face of the windshield as shown, to contain the adhesive during installation.

NOTE: Be careful not to touch the windshield where adhesive will be applied.

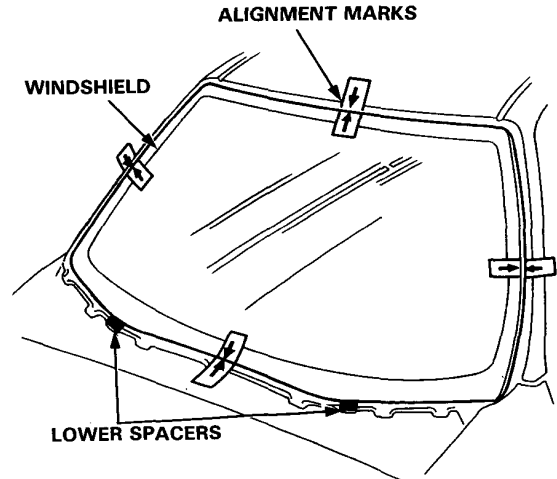


- Install the clips and retainers as shown. Glue the lower spacers to the body.



NOTE: The numbers after the part names shown the quantities of the parts used.

- Set the windshield upright on the lower spacers, then center it in the opening. Make alignment marks across the windshield and body with a grease pencil at the four points shown.

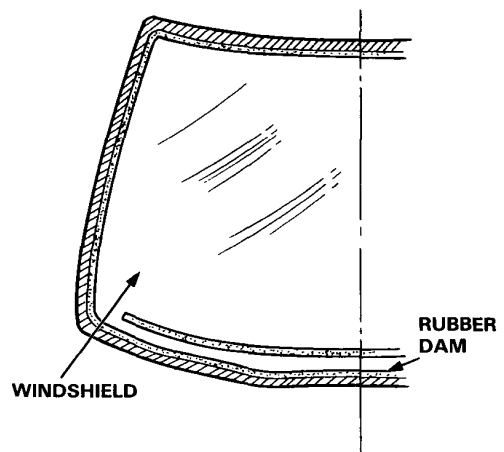


- With a sponge, apply a light coat of glass primer around the edge of the windshield as shown, then lightly wipe it off with gauze or cheesecloth.

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.



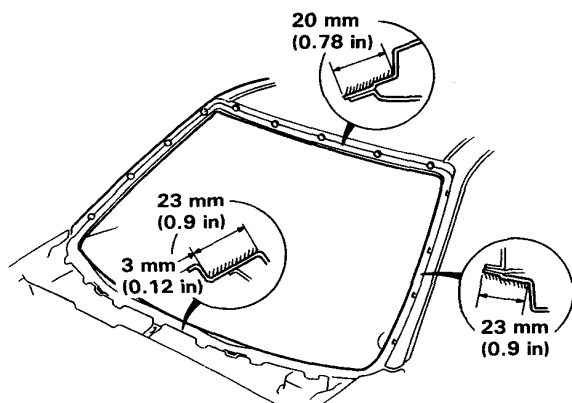


8. With a sponge, apply a light coat of body primer to the original adhesive remaining around the windshield opening flange. Let the body primer dry for at least 10 minutes.

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.



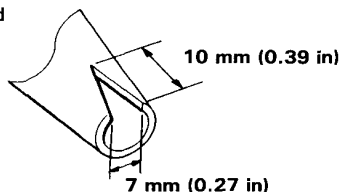
9. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE:

- Clean the plate with a sponge and alcohol before mixing.
- Follow the instructions that come with the adhesive.

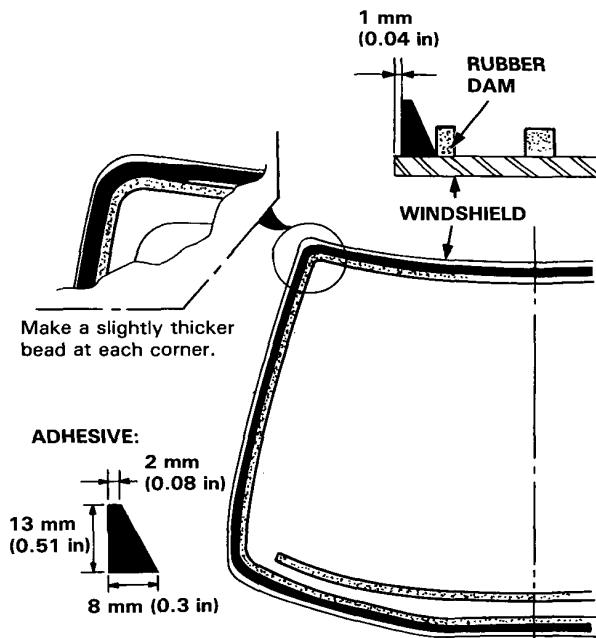
10. Before filling a cartridge, cut the end of the nozzle as shown.

Cut nozzle end as shown.



11. 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.

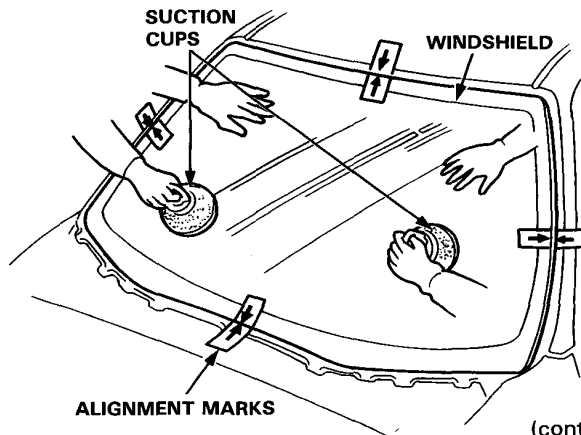
NOTE: Apply the adhesive within 30 minutes after applying the glass primer.



Make a slightly thicker bead at each corner.

12. Use suction cups to hold the windshield over the opening, align it with the alignment marks made in step 6 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 close or open the doors until adhesive is dry.



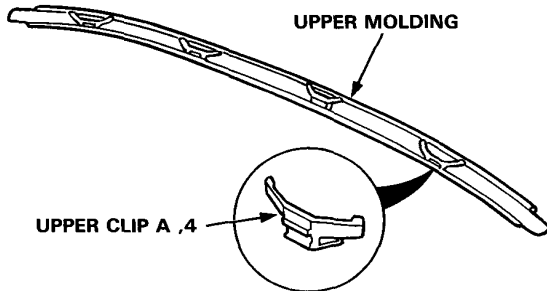
(cont'd)

Windshield

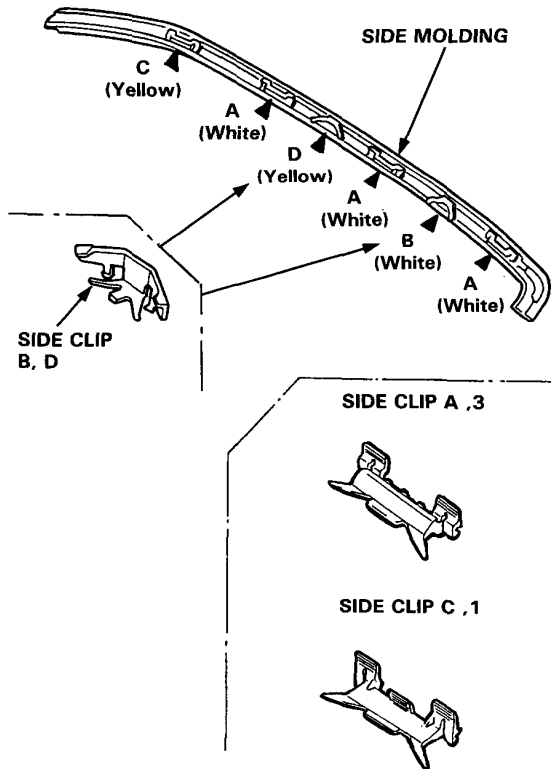
Installation (cont'd)

13. Install the clips on the upper molding and side molding.

NOTE: The numbers after the part names show the quantities of the parts used.



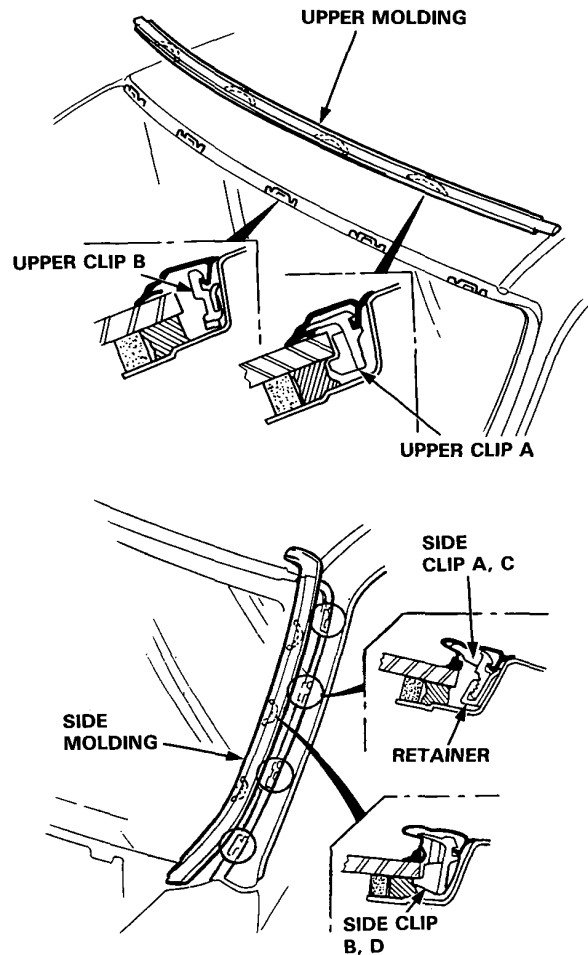
NOTE: Check the proper application of side clips (A, C, D).



14. 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.

15. Install the upper molding and side molding.



16. Let the adhesive dry for at least one hour, then spray water over the windshield and check for leaks. Mark leaking areas and let the windshield dry, then seal with sealant.

NOTE:

- Let the car stand for at least four hours after windshield installation. If the car 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.

17. Reassemble all removed parts.

NOTE: Install the rearview mirror after the adhesive has dried thoroughly.



Rear Window

Removal

CAUTION:

- Wear gloves to remove and install the rear window.
- Do not damage the defroster grid lines.

1. To remove the rear window, first remove:

- Trunk lid (see page 20-81)
- Rear seat-back (see pages 20-61, 62)
- Rear shelf (see page 20-52)
- Rear pillar trim panel (see page 20-51)

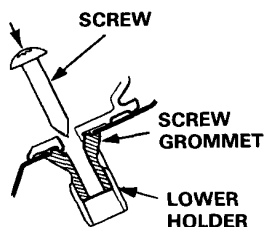
2. Disconnect the defroster leads, and remove their holders.

NOTE: Avoid scratching the rear window with the cutter blade.

3. Remove the molding lower holder and clips, then remove the side molding and upper molding.

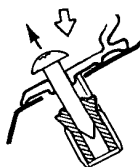
Molding Lower Holder Removal:

-1) Remove or loosen the screw.

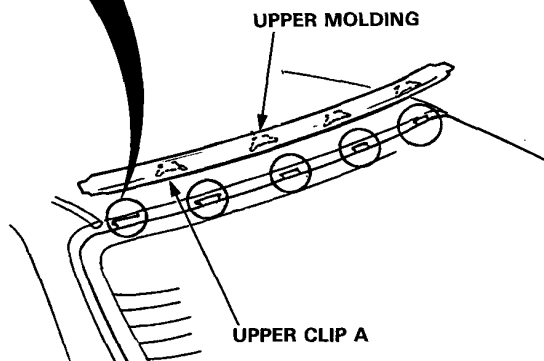
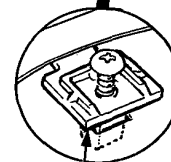
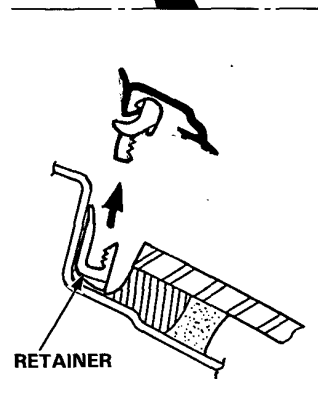
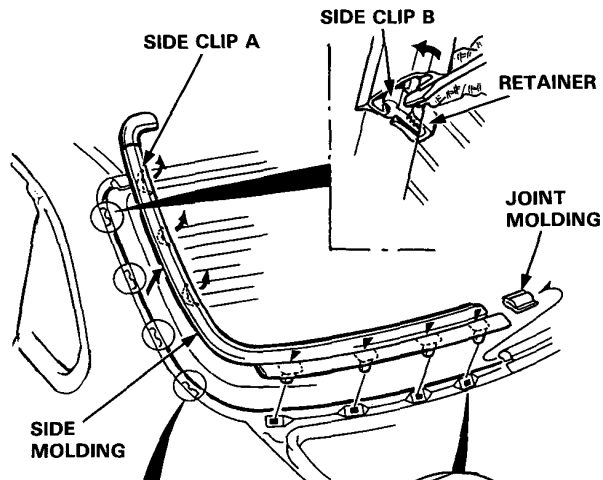


-2) Place the screw in the screw grommet again (do not screw it in) and press it down.

-3) Pull the screw with the molding lower holder out of the body.



4. Detach the clips, remove the side molding and upper molding.



(cont'd)

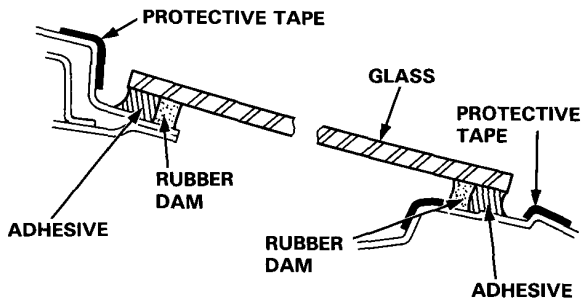
Rear Window

Removal (cont'd)

5. Pull down the rear of the headliner (see page 20-53).

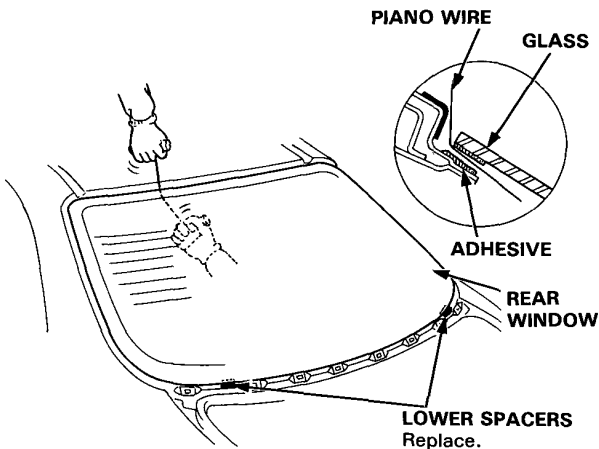
CAUTION: Take care not to bend the headliner excessively.

6. Apply protective tape to the edge of the body as shown.



7. Using an awl, make a hole through the adhesive from inside the car. Push the piano wire through the hole and wrap each end around a piece of wood.
8. 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.

CAUTION: Hold the piano wire as close to the rear window as possible to prevent damage to the body.



9. Carefully remove the rear window.

Installation

1. Scrape the old adhesive smooth with a knife, 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.
- Remove the upper and lower fasteners from the body.
- Mask off surrounding surfaces before applying primer.

2. Clean the body bonding surface with a sponge dampened in alcohol.

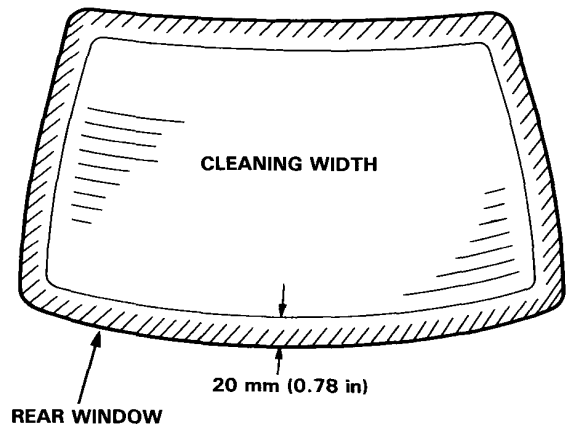
NOTE: After cleaning, keep oil, grease and water from getting on the surface.

3. If the old rear window is to be reinstalled, use a putty knife to scrape off all traces of old adhesive, 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.

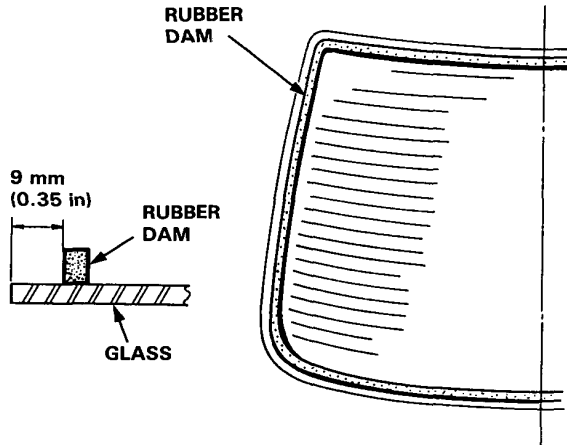
NOTE: Clean the shadowed area.





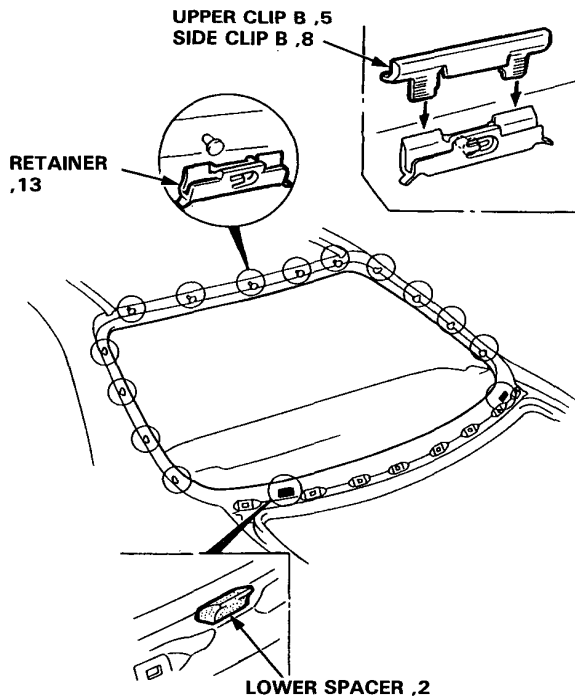
4. Glue the rubber dam to the inside face of the rear window as shown to contain the adhesive during installation.

NOTE: Be careful not to touch the rear window where adhesive will be applied.

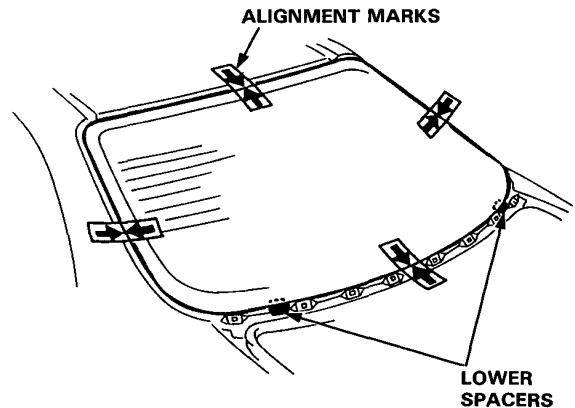


5. Install the clips and retainers as shown. Glue the lower spacers to the body.

NOTE: The numbers after the part names shown the quantities of the parts used.



6. Set the rear window on the lower spacers, then center it in the opening. Make alignment marks across the rear window and body with a grease pencil at the four points shown.

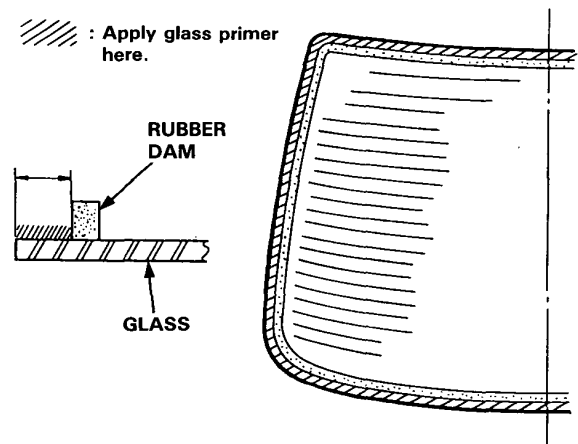


7. With a sponge, apply a light coat of glass primer around the edge of the rear window as shown, then lightly wipe it off with gauze or cheesecloth.

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.



(cont'd)


Rear Window

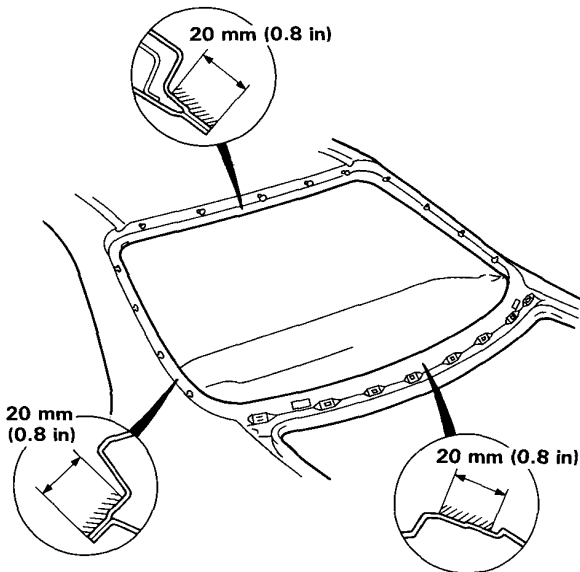
Installation (cont'd)

8. 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.

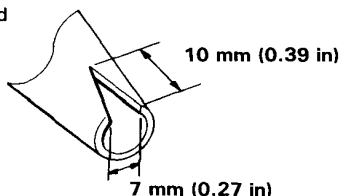


9. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife. Follow the instructions that came with the adhesive.

NOTE: Clean the plate with a sponge and alcohol before mixing.

10. Before filling a cartridge, cut the end of the nozzle as shown.

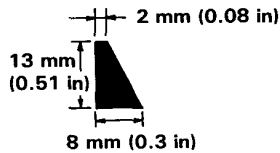
Cut nozzle end as shown.



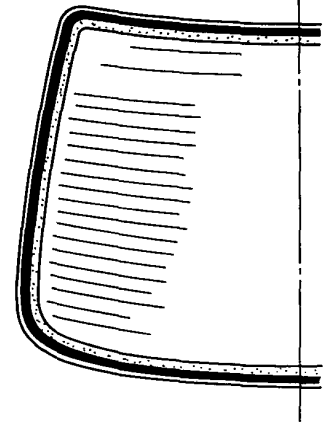
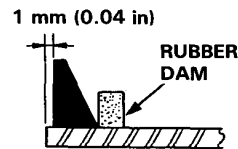
11. Pack adhesive into the cartridge without air pockets to ensure continuous delivery. Put the cartridge in a caulking gun and run a bead of adhesive around the edge of the rear window as shown.

NOTE: Apply the adhesive within 30 minutes after applying the glass primer.

ADHESIVE:

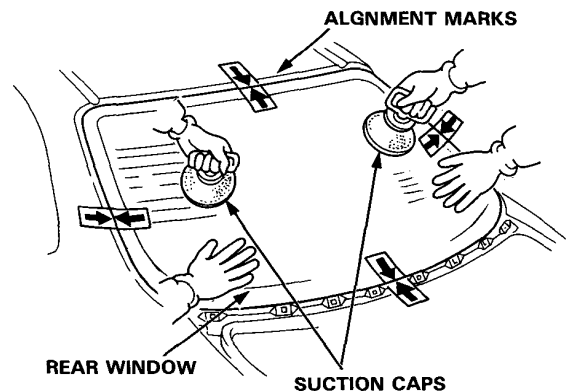


Make a slightly thicker bead at each corner.



12. Use suction cups to hold the rear window over the opening, align it with the alignment marks made in step 6 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.

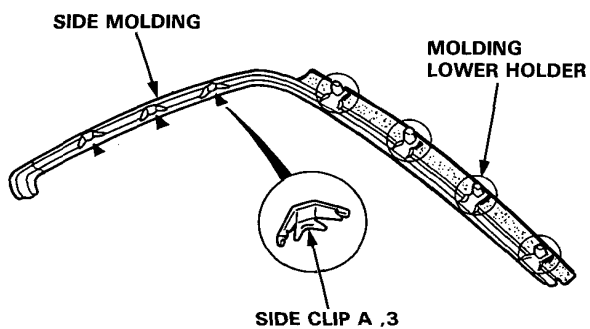
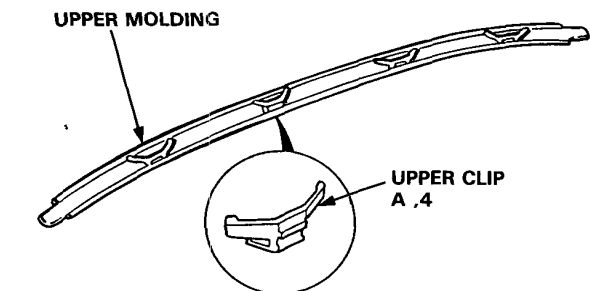
NOTE: Do not close or open the doors until adhesive is dry.





13. Install the clips on the upper molding and side molding.

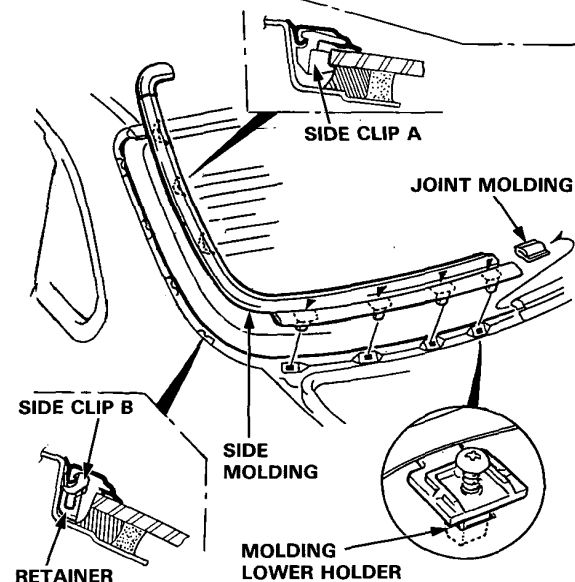
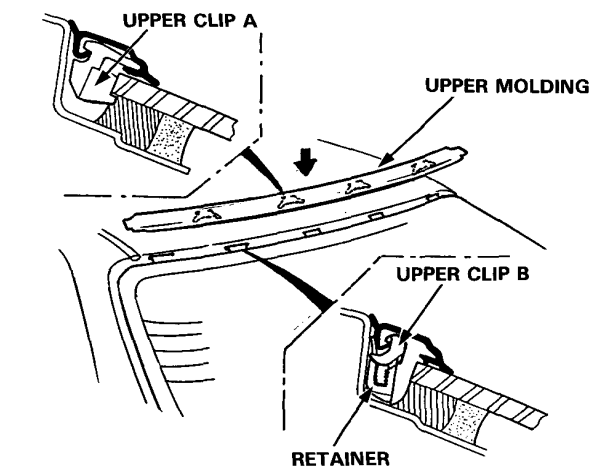
NOTE: The numbers after the part names show the quantities of the part used.



14. 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.

15. Install the upper molding and side molding.



16. Let the adhesive dry for at least one hour, then spray water over the rear window and check for leaks. Mark leaking areas and let the rear window dry, then seal with sealant.

NOTE: Let the car stand for at least four hours after rear window installation. If the car has to be used within the first four hours, it must be driven slowly.

17. Raise the headliner back up into position then install:

- Rear pillar trim panel
- Rear shelf
- Rear seat-back

Quarter Glass

Replacement

CAUTION:

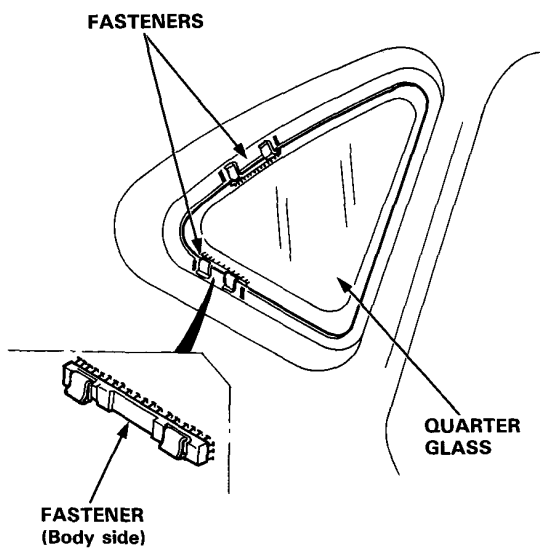
- Wear gloves to remove and install the quarter glass.
- Use seat covers to avoid damaging any surfaces.

NOTE: Replace the quarter glass with new one when removing it.

1. To remove the quarter glass, first remove the:
 - Rear seat (see pages 20-61, 62)
 - Rear pillar trim panel (see page 20-51)

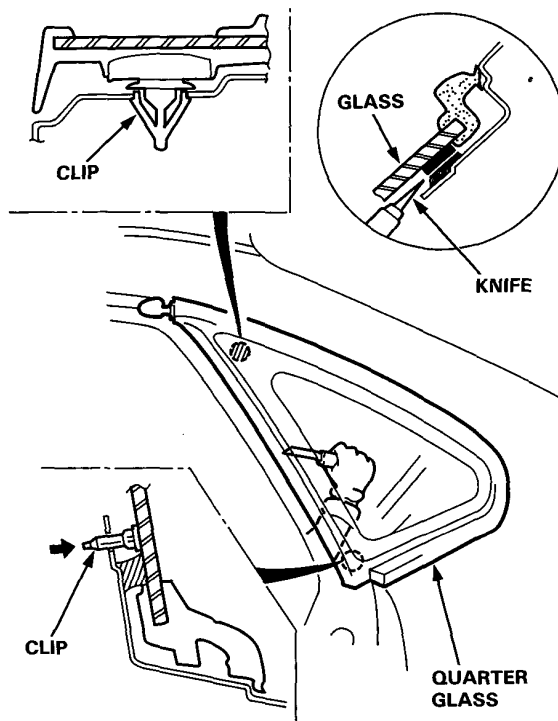
2. Remove the fasteners.

NOTE: Scribe a line around the fastener to show the original position.



3. Use a knife to cut through the adhesive from inside the car, all the way around.

NOTE: Take care not to scratch the quarter glass.



4. Remove the quarter glass.



- Scrape the old adhesive smooth with a knife, to a thickness of about 2 mm (0.08 in) on the bonding surface around the entire quarter glass 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 applying primer.

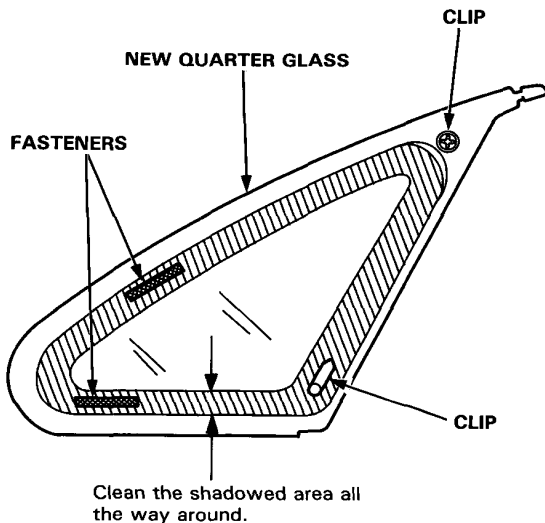
- Clean the body bonding surface with a sponge dampened in alcohol.

NOTE: After cleaning, keep oil, grease and water from getting on the surface.

- Clean the new quarter glass surface with alcohol where adhesive is to be applied.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.

CAUTION: Avoid setting the quarter glass on its edges; small chips may later develop into cracks.

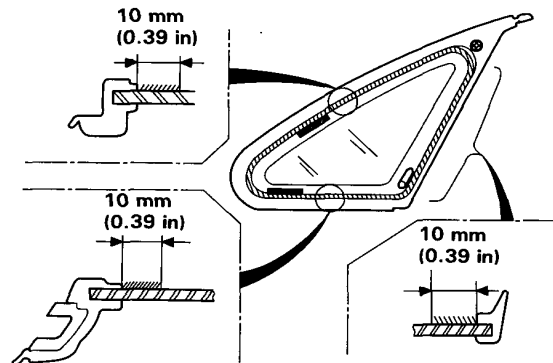


- With a sponge, apply a light coat of glass primer to the inside face of the quarter glass as shown, then lightly wipe it off with gauze or cheesecloth.

NOTE:

- Do not apply body primer to the quarter glass, and do not get body and glass primer sponges mixed up.
- Never touch the primed surfaces with your hands. If you do, the adhesive may not bond to the quarter glass properly, causing a leak after the quarter glass is installed.
- Keep water, dust, and abrasive materials away from the primed surface.


 : Apply glass primer here.

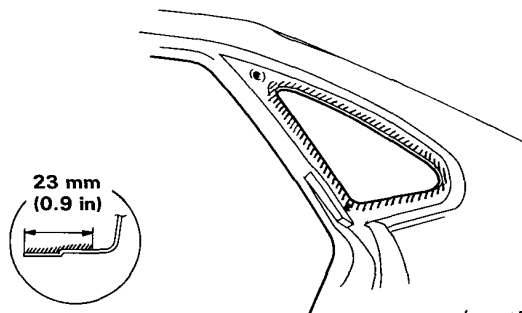


- With a sponge, apply a light coat of body primer to the original adhesive remaining around the quarter glass opening flange. Let the body primer dry for at least 10 minutes.

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.



(cont'd)

Quarter Glass

Replacement (cont'd)

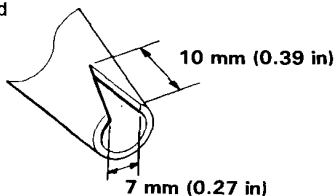
10. Thoroughly mix the adhesive and hardener together on a glass or metal plate with a putty knife.

NOTE:

- Clean the plate with a sponge and alcohol before mixing.
- Follow the instructions that came with the adhesive.

11. Before filling a cartridge, cut the end of the nozzle as shown.

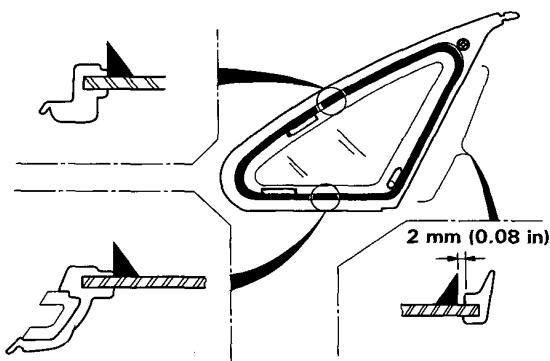
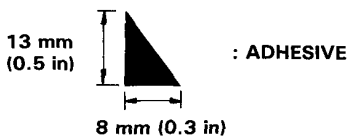
Cut nozzle end as shown.



12. 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 quarter glass as shown.

NOTE:

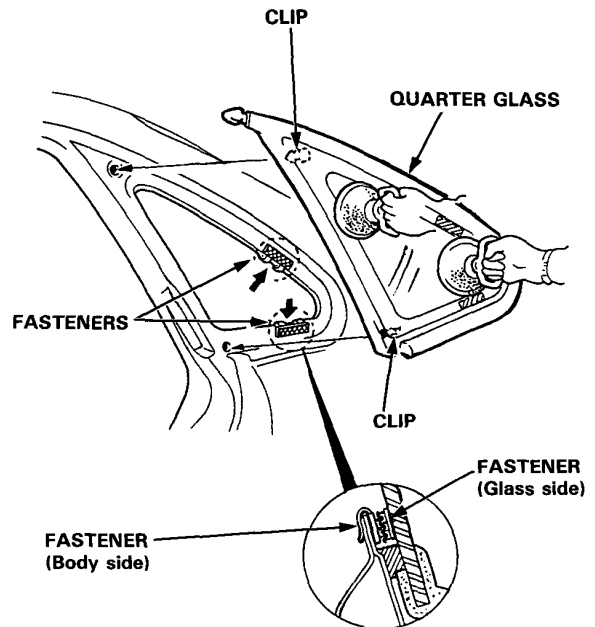
- After applying the adhesive, peel the separator off the double-faced adhesive tapes.
- Apply the adhesive primer within 30 minutes after applying the glass primer.



13. Install the fasteners to the body as shown.

14. Use suction cups to hold the quarter glass over the opening, align it with the clip setting points and set it down on the adhesive. Lightly push on the quarter glass until its edges are fully seated on the adhesive all the way around.

NOTE: Do not open or close the doors until the adhesive is dry.



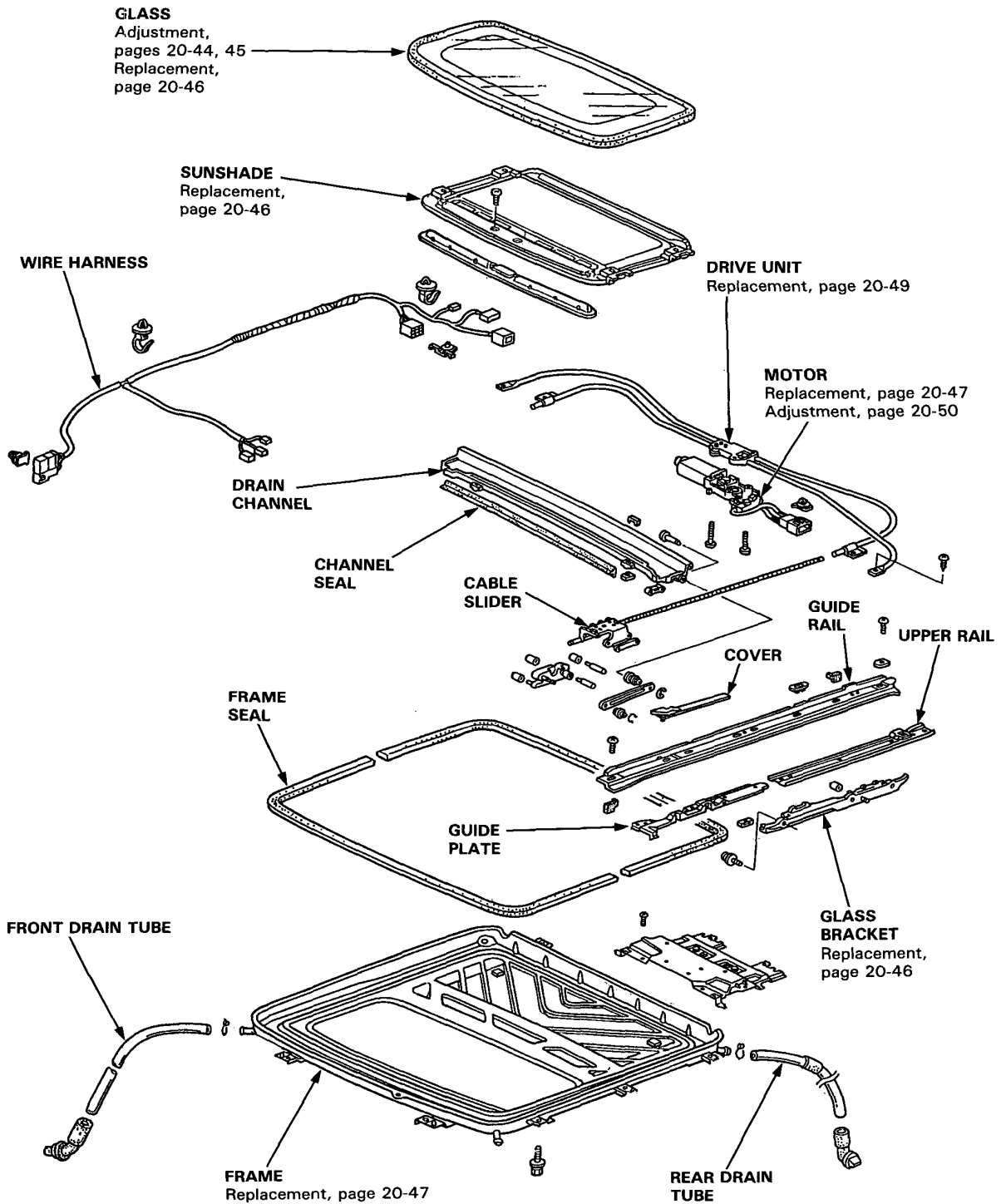
15. Scrape or wipe the excess adhesive off with a putty knife or towel.

NOTE: Use a soft shop towel dampened with alcohol to remove adhesive from a painted surface or the quarter glass.

16. Let the adhesive dry for at least one hour, then spray water over the quarter glass and check for leaks. Mark leaking areas and let the quarter glass dry, then seal with sealant.

NOTE: Let the car stand for at least four hours after quarter glass installation. If the car has to be used within the first four hours, it must be driven slowly.

17. Reinstall all remaining removed parts.



Sunroof

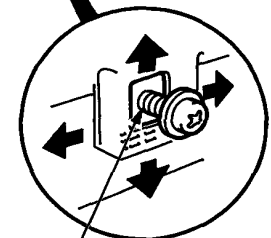
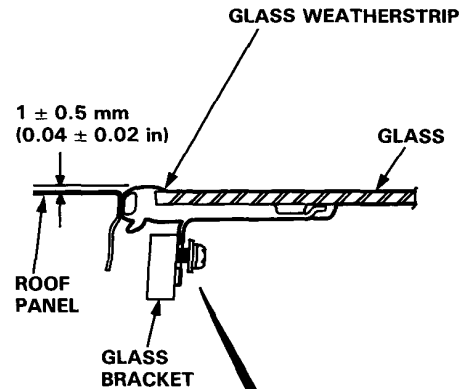
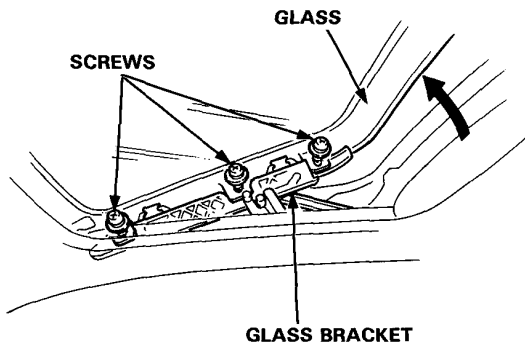
Troubleshooting

Symptom	Probable Cause
Water leak	<ol style="list-style-type: none"> 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	<ol style="list-style-type: none"> 1. Excessive clearance between glass weatherstrip and roof panel.
Motor noise	<ol style="list-style-type: none"> 1. Loose motor. 2. Worn gear or bearing. 3. Drive unit deformed.
Glass does not move, but motor turns	<ol style="list-style-type: none"> 1. Clutch out of adjustment. 2. Foreign matter stuck between guide rail and slider. 3. Inner cable loose. 4. Outer cable not attached properly.
Glass does not move and motor does not turn (glass can be moved with sunroof wrench)	<ol style="list-style-type: none"> 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 ± 0.5 mm (0.04 ± 0.02 in) all the way around. If not, slide the sunshade back, and:

1. Tilt-up the glass.
2. Loosen the screws and adjust the glass.
3. Repeat on opposite side if necessary.



NOTE: Apply liquid thread lock to the screw.

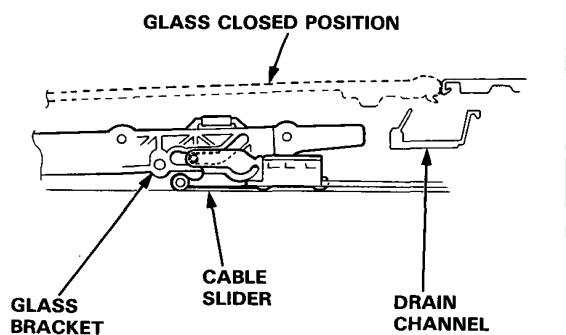
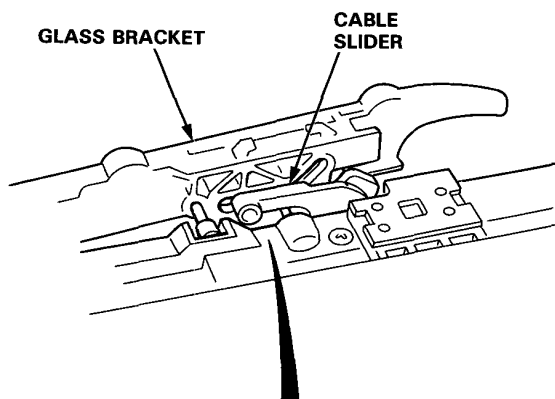
4. Side-to-side fit of glass weatherstrip can be adjusted by loosening the frame bolts and moving the frame right or left by hand (see page 20-48).



Glass Closing Adjustment

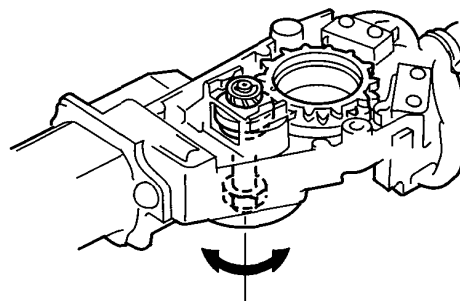
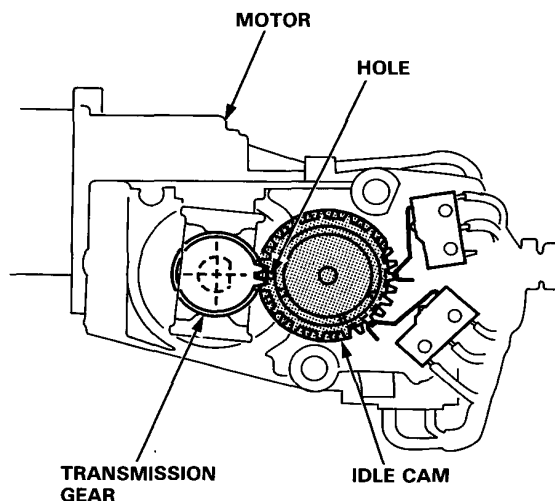
Open the glass about a foot, then close it to check where rear edge begins to rise. If it rises too soon and seats too tightly against the roof panel, or too late and does not seat tightly enough adjust it.

1. Remove the headliner (see page 20-53).
2. Remove the motor (see page 20-47).
3. Align the fully closed position of the glass bracket and cable slider on each side.



4. Check the fully closed position of the motor (idle cam) as shown.

NOTE: If necessary, adjust position of the idle cam by turning the motor (transmission gear) with the sunroof wrench.



5. Install the motor, check the operation of the glass (from tilt-up position to fully closed position, from fully open position to fully closed position) by operating the sunroof switch.

NOTE: Check the height of the glass (see page 20-44).

6. Close the glass fully, then check for water leaks.

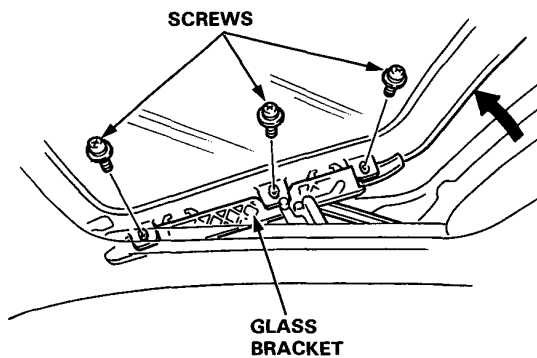
NOTE: Do not use high pressure water.

Sunroof

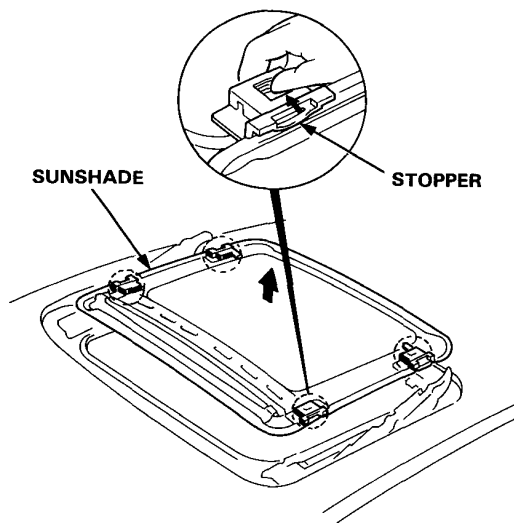
Glass and Sunshade Replacement

1. Open the sunshade.
2. Tilt-up the glass.
3. Remove the screws, then lift and remove the glass from the glass bracket.

NOTE: Apply liquid thread lock to the screws.



4. Slide the sunshade forward.
5. Detach the stoppers, then remove the sunshade from the guide rails.

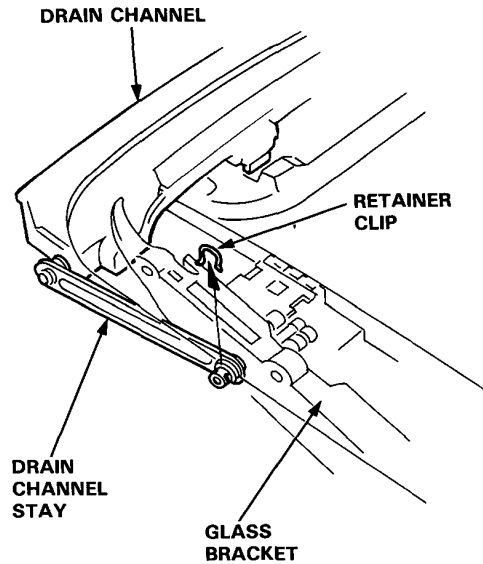


6. Installation is the reverse of the removal procedure.
7. Check for water leaks.

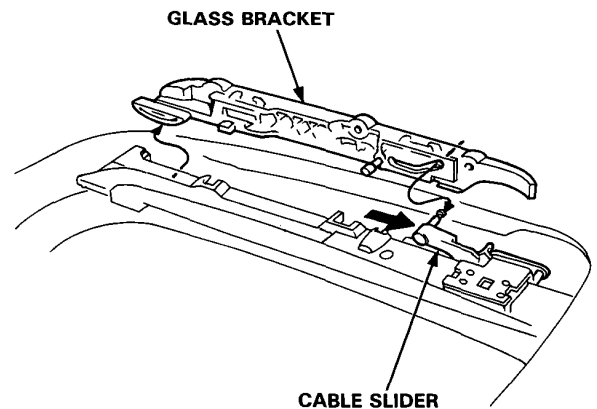
NOTE: Do not use high pressure water.

Glass Bracket Replacement

1. Remove the glass.
2. Pull out the retainer clip, then remove the drain channel stay from the glass bracket on each side.



3. Using the sunroof wrench, move the cable slider. Pull out the glass bracket from the cable slider, then remove the glass bracket.



4. Installation is the reverse of the removal procedure.

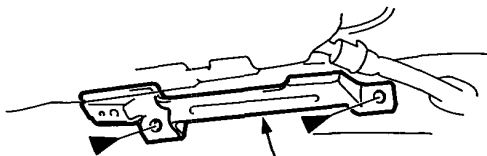
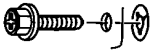


Motor, Drain Tube and Frame Replacement

CAUTION: Be careful not to damage the seats, dashboard and other interior trim.

1. Remove the glass and headliner (see page 20-53).
2. Remove the grab handle brackets.

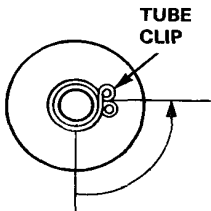
▶: Bolt locations ,2



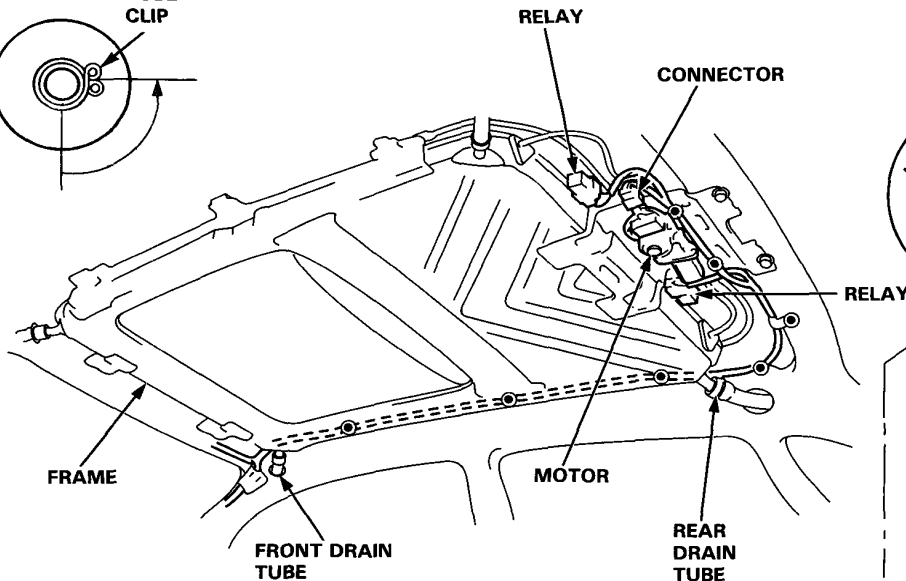
GRAB HANDLE BRACKET

3. Disconnect the motor connector, harness clips and remove the relays.
4. Disconnect the drain tubes.

NOTE: Install the tube clips with the ends facing the side to ease installation of the headliner.



TUBE CLIP



RELAY

CONNECTOR

RELAY

RELAY

FRAME

MOTOR

FRONT DRAIN TUBE

REAR DRAIN TUBE

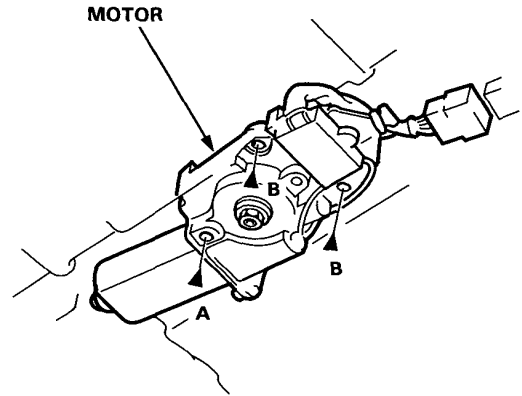
5. To remove the motor, remove the three screws.

NOTE: Make sure the cable sliders are parallel when installing the motor.

Use TORX® T20

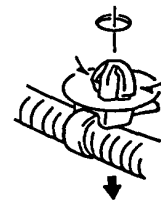
A ▲: Screw locations ,1

B ▲: Screw locations ,2



MOTOR

●: Clip locations ,7



(cont'd)

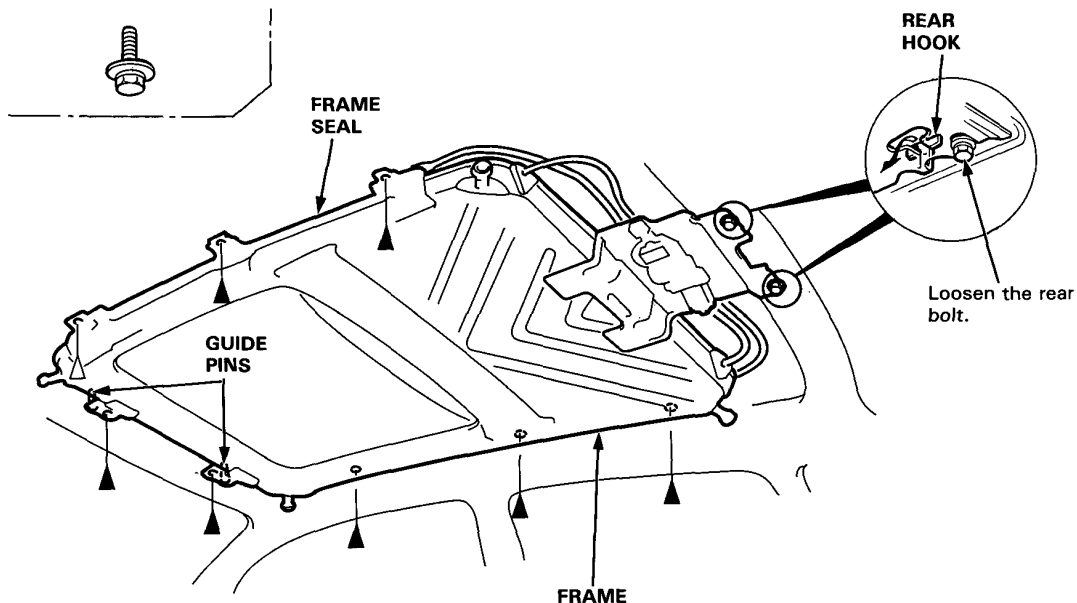
Sunroof

Motor, Drain Tube and Frame Replacement (cont'd)

- Loosen the rear bolts.
- Remove the eight bolts and detach the rear hooks, then remove the frame from the car.

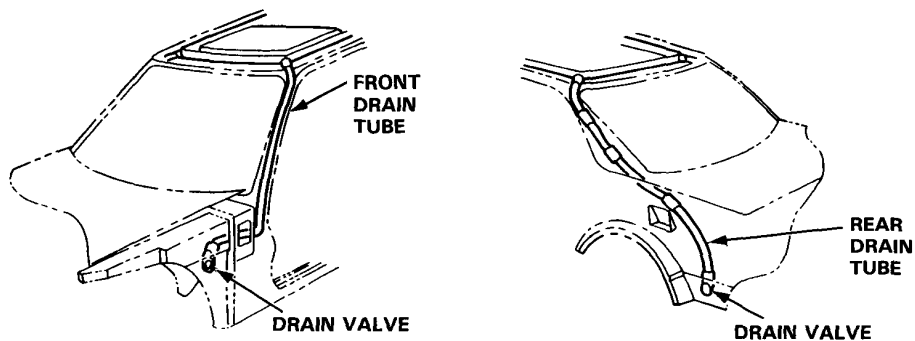
NOTE: You may require assistance when removing the frame.

►: Bolt locations ,8



- Pull the drain tubes out the front and rear pillars.

NOTE: Before pulling out the drain tube, tie a string to the end of it so it can be reinstalled.



- Installation is the reverse of the removal procedure.

NOTE:

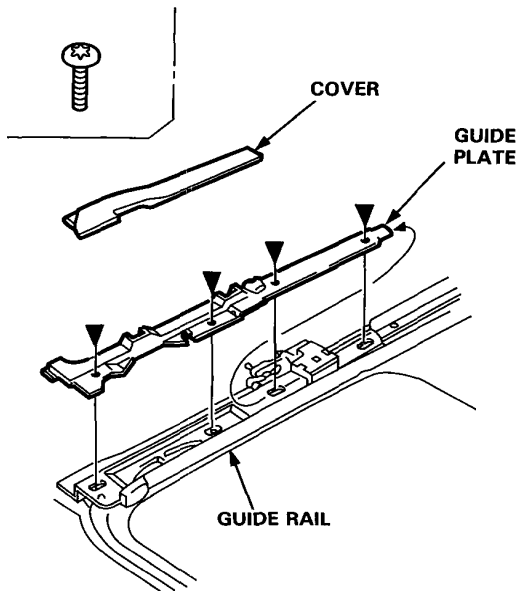
- Clean the surface of the frame.
- Check the frame seal.
- Check for water leaks.



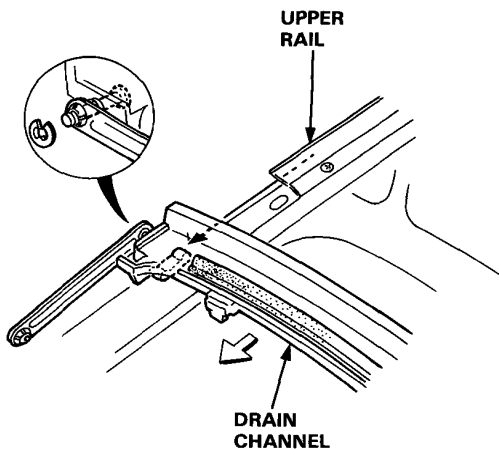
Guide Rails and Drive Unit Replacement

1. Remove the frame from the car (see page 20-47).
2. Remove the motor (see page 20-47).
3. Remove the glass brackets (see page 20-46).
4. Remove the covers and screws, then remove the guide plates.

►: Screw locations .4
Use TORX® T20



5. Slide the drain channel forward, then remove it.

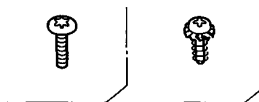


6. Remove the upper rails.
7. Remove the screws, then remove the drive unit with cable sliders attached.

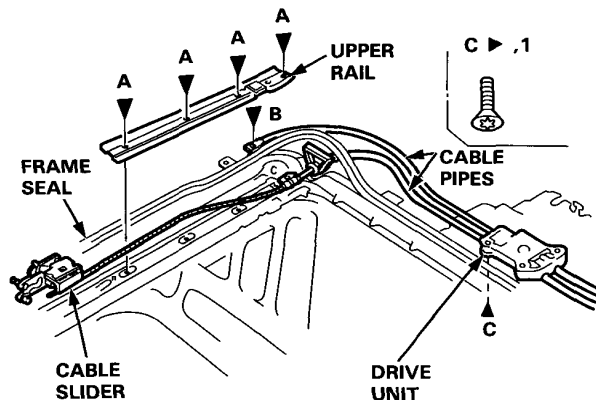
NOTE: Take care not to bend the cable pipes.

►: Screw locations

A ► .4 B ► .2

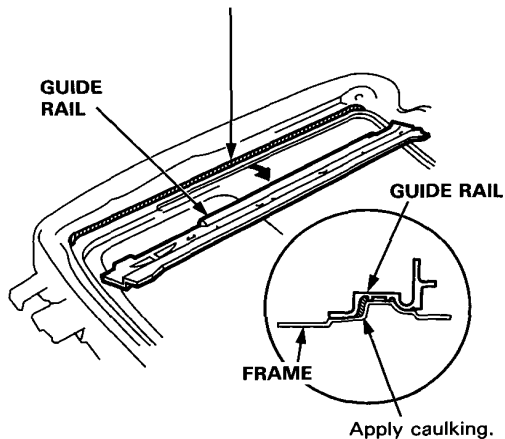


A ►, C ► Use TORX® T20



8. Remove the guide rails.

NOTE: To install, apply the caulking to guide rail mount faces of the frame.



9. Installation is the reverse of the removal procedure.

NOTE:

- Damaged parts should be replaced.
- Apply grease to the sliding portion.

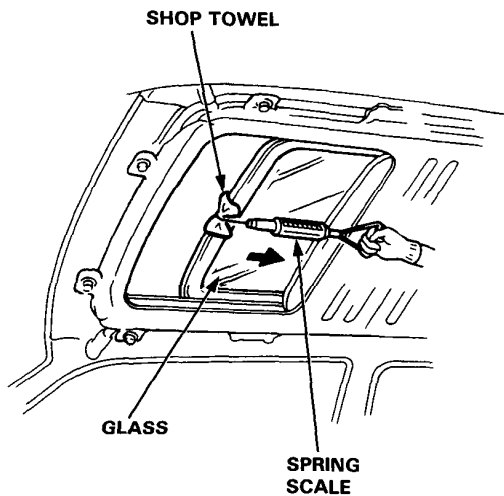
Sunroof

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 100 N (10 kg, 22 lbs), check side clearance and glass height adjustment (see page 20-44).

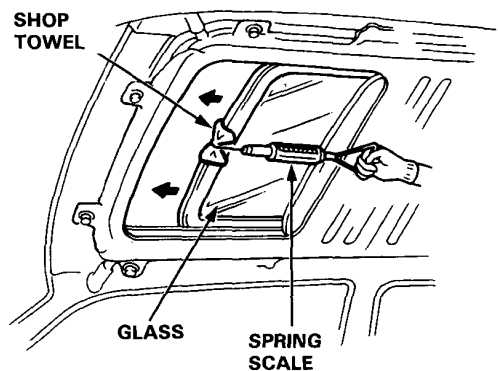


Closing Force Check (Motor Installed)

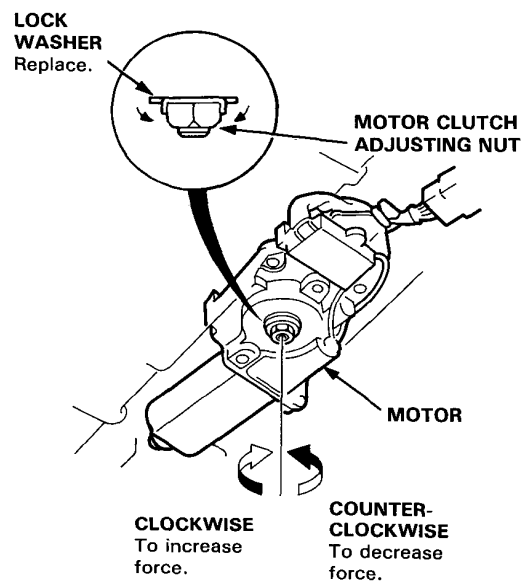
1. After installing all removed parts, have a helper hold the switch to close the glass while you measure force required to stop it. Attach a spring scale as shown. Read the force as soon as the glass stops moving, then immediately release the switch and spring scale.

CAUTION: When using a spring scale, protect the leading edge of the glass with a shop towel.

**Closing Force: 200–300 N
(20–30 kg, 44–55 lbs)**



2. If the force is 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.





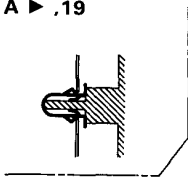
Interior Trim Replacement

Disassemble in the numbered sequence.

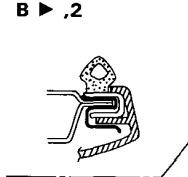
CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

NOTE: Take care not to bend or scratch the trim and panels.

►: Clip locations
A ► .19

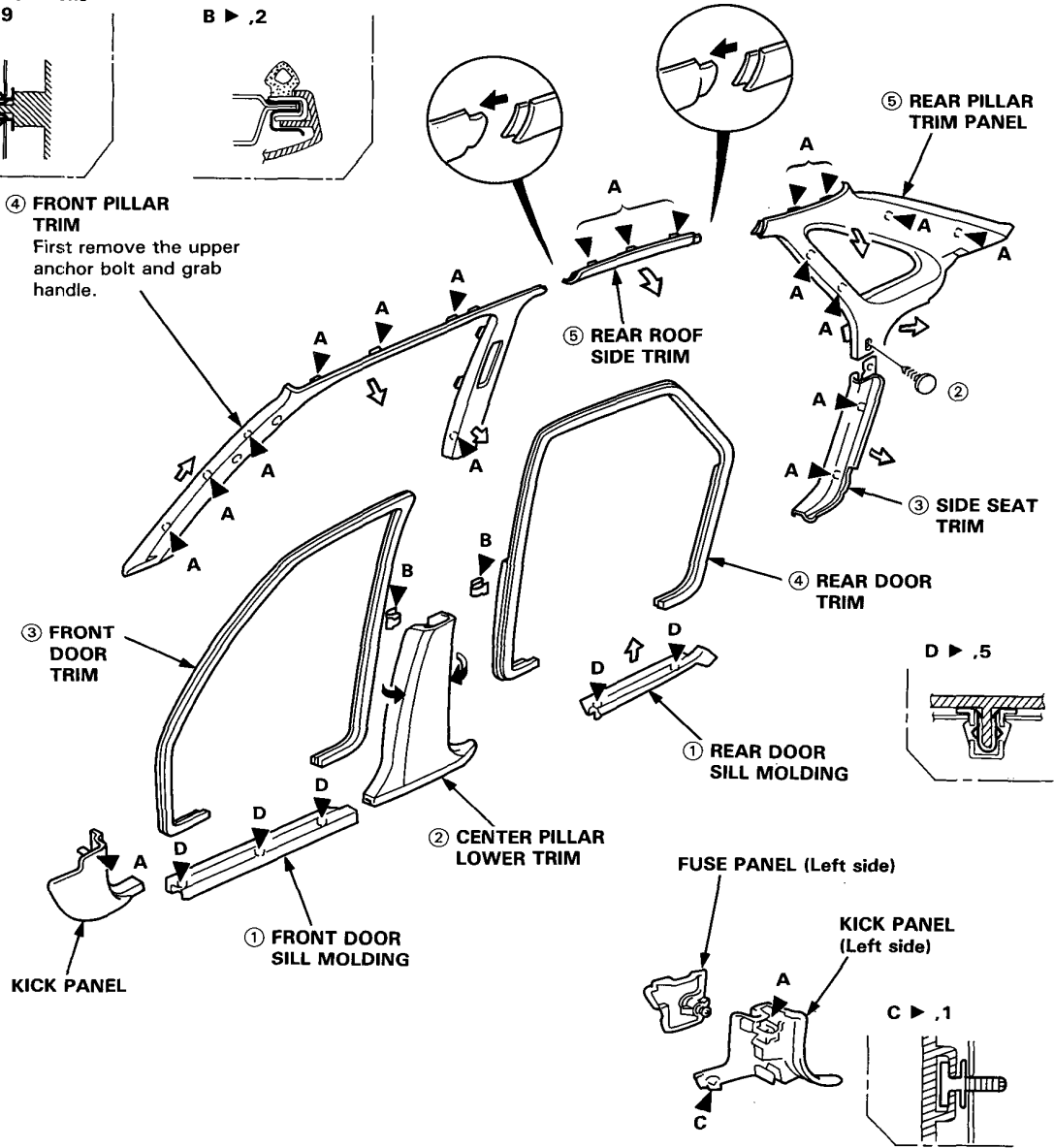


B ► .2



4 FRONT PILLAR TRIM

First remove the upper anchor bolt and grab handle.



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

Trunk Trim Replacement

Disassemble in the numbered sequence.

CAUTION: 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.

▼: Clip locations

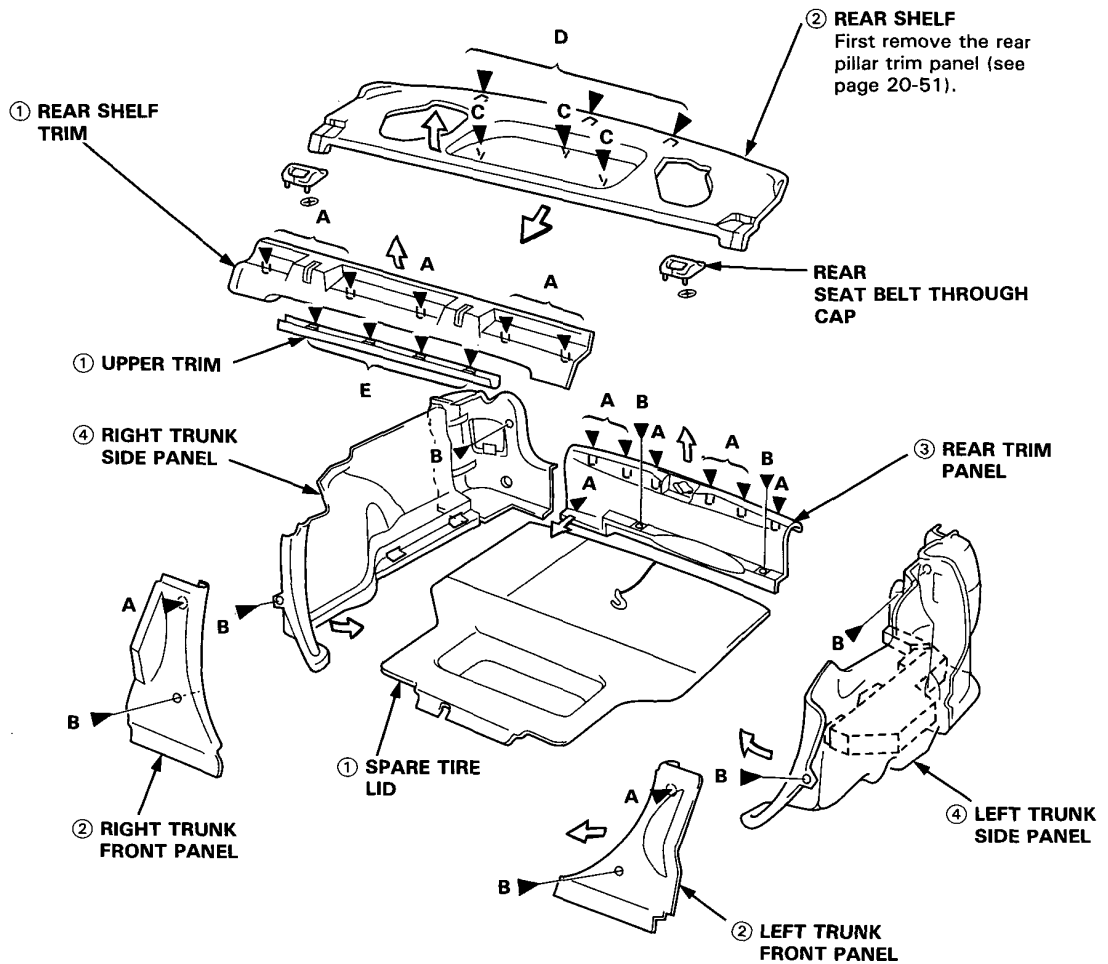
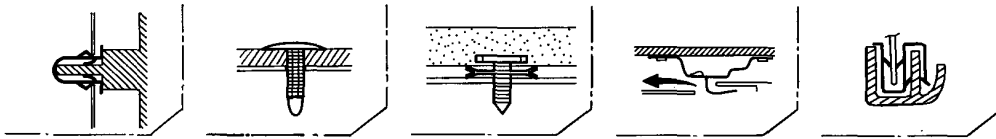
A ▶ ,14

B ▶ ,8

C ▶ ,3

D ▶ ,3

E ▶ ,4



Installation is the reverse of the removal procedure.

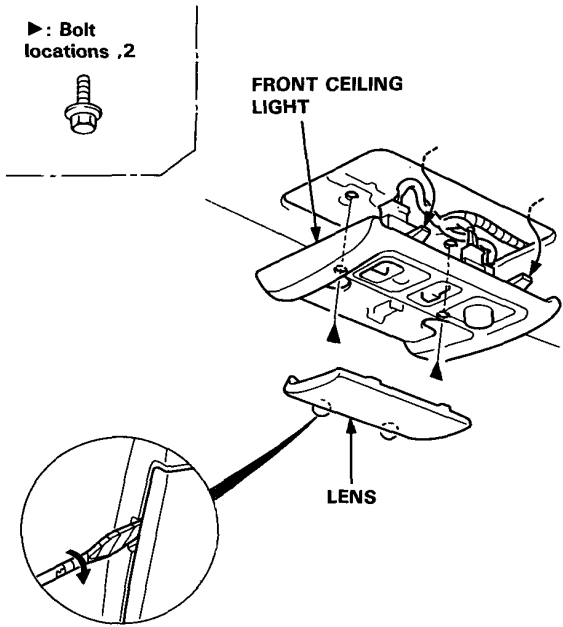
NOTE: If necessary, replace any damaged clips.



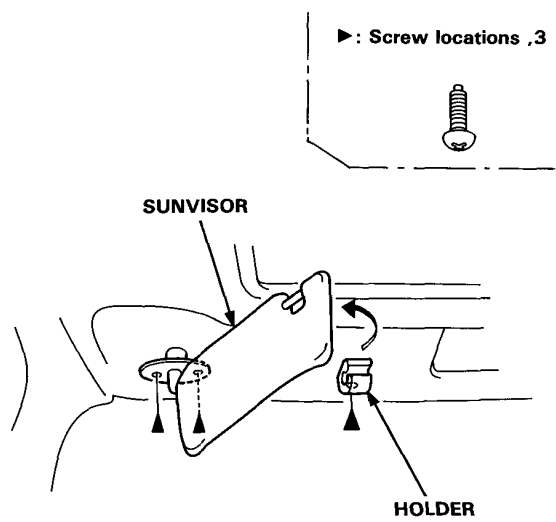
Headliner

Replacement

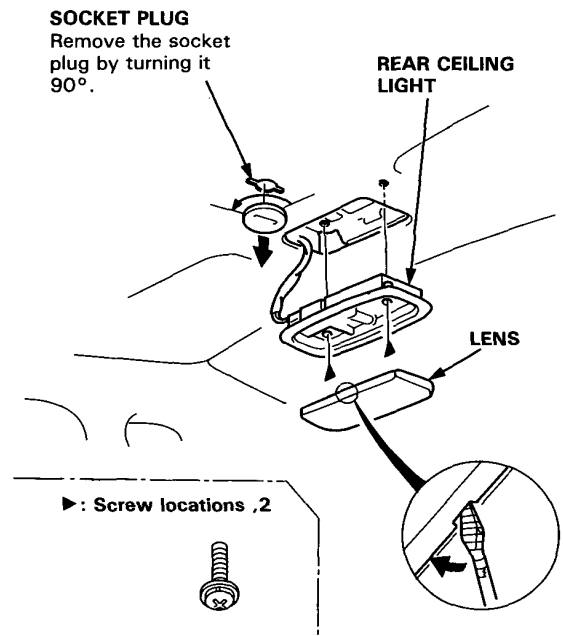
1. Remove the front ceiling light.



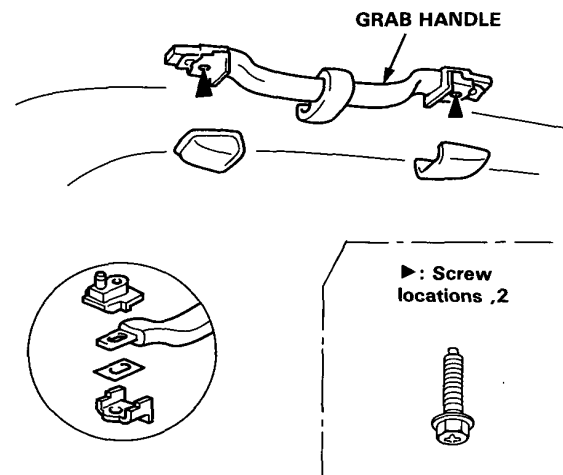
2. Remove the sunvisors and holders on each side.



3. Remove the rear ceiling light and sunroof socket plug (sunroof model).



4. Remove the grab handles on each side.



(cont'd)

Headliner

Replacement (cont'd)

5. Remove:

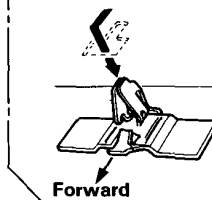
- Front seat (see page 20-55)
- Rear seat (see pages 20-61, 62)
- Front pillar trim, rear roof side trim and rear pillar trim panel (see page 20-51)

6. Remove the B clips and roof trim (sunroof model).

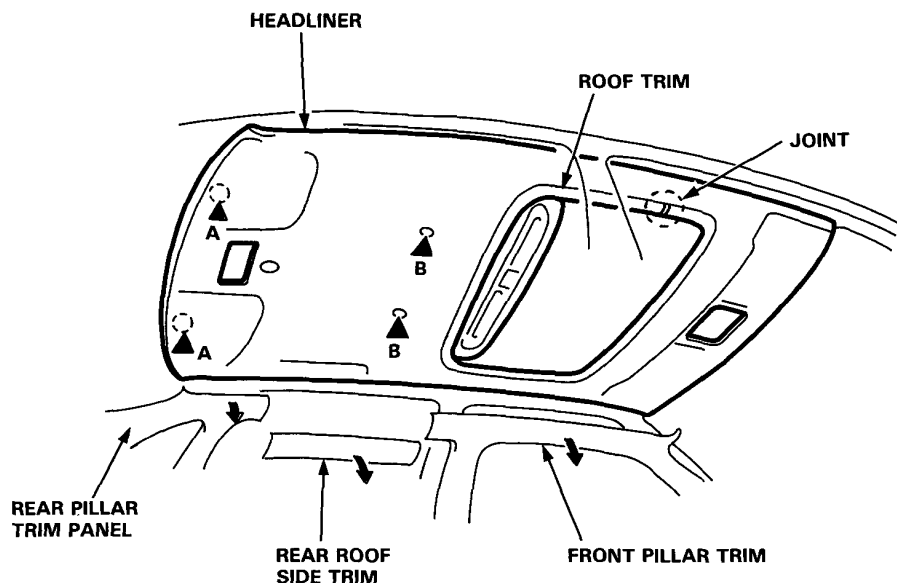
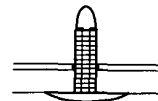
7. Detach the A clips by sliding the headliner forward.

▶: Clip locations

A ▶ Clip ,2



B ▶ Clip ,2



8. Remove the headliner from the passenger's door opening.

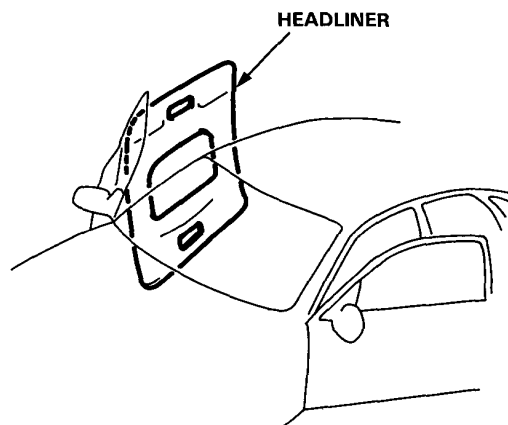
NOTE:

- Take care not to bend the headliner.
- Be careful not to damage the dashboard and other interior trim.

9. Installation is the reverse of the removal procedure.

NOTE:

- When installing the headliner through the door 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.





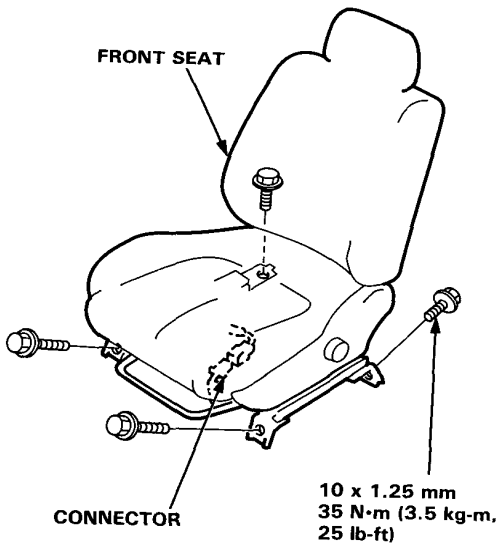
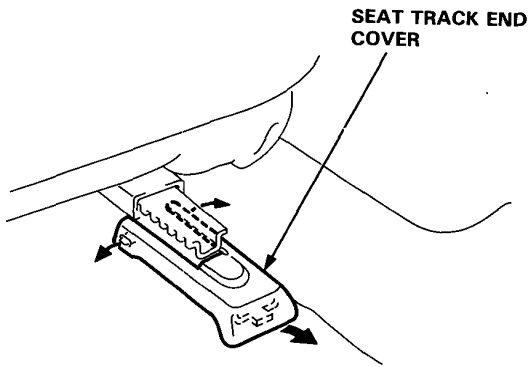
Seats

Front Seat Removal

NOTE: Take care not to scratch the seat covers and body.

1. Remove the seat track end cover.
2. Remove the bolts, then remove the front seat.

NOTE: Disconnect the connectors (power height seat and heated seat).

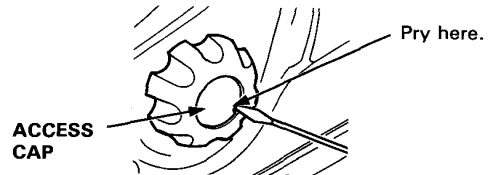


3. Installation is the reverse of the removal procedure.

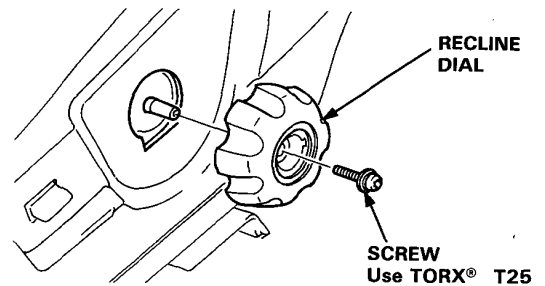
Front Seat Replacement

NOTE: Take care not to scratch the seat covers and body.

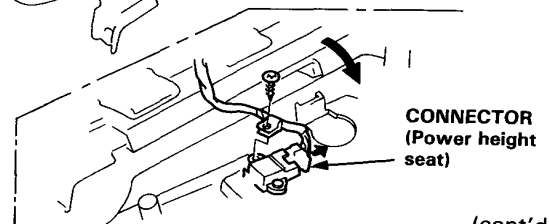
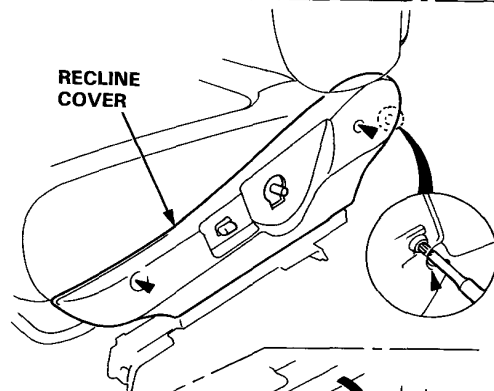
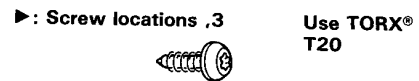
1. Remove the front seat, then take it out from the door opening.
2. Remove the access cap.



3. Remove the screw, then remove the recline dial.



4. Remove the screws and disconnect the connector (power height seat), then remove the recline cover.



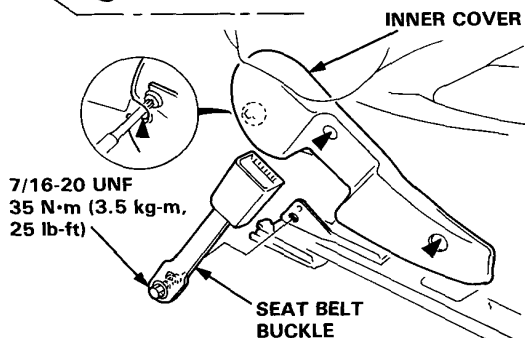
(cont'd)

Seats

Front Seat Replacement (cont'd)

5. Remove the seat belt buckle and screws, then remove the inner cover.

►: Screw locations ,3
Use TORX® T20



6. Remove the bolts on each side at the seat cushion.

►: Bolt locations Use TORX® T40

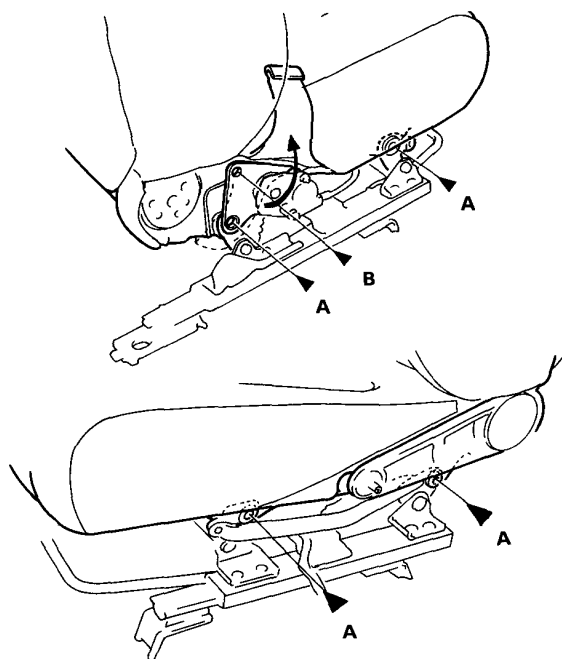
A ►: 8 x 1.25 mm 1.9 kg-m/14 lb-ft
<Power height seat>



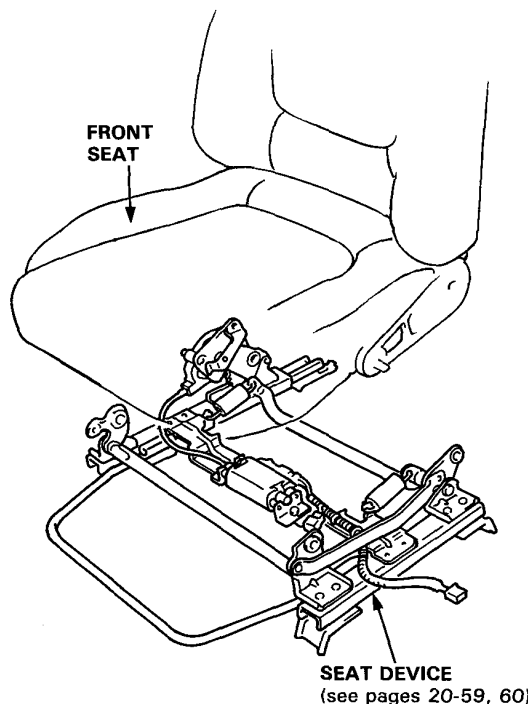
<Manual seat>



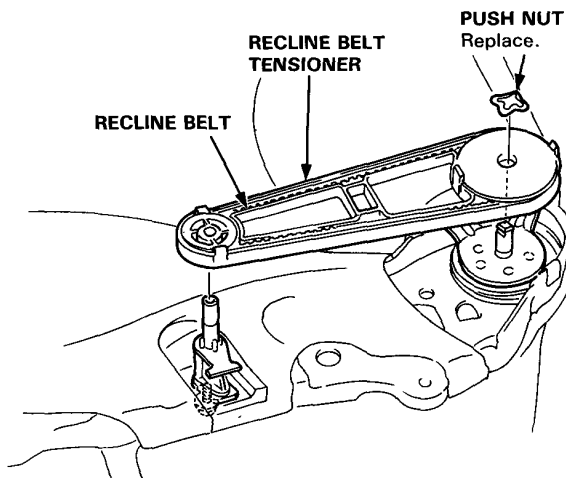
B ►:



7. Separate the front seat and seat device.



8. If necessary, remove the recline belt tensioner.



9. Installation is the reverse of the removal procedure.

NOTE:

- Apply grease to the moving surfaces.
- Do not apply grease to the recline belt.



Seats

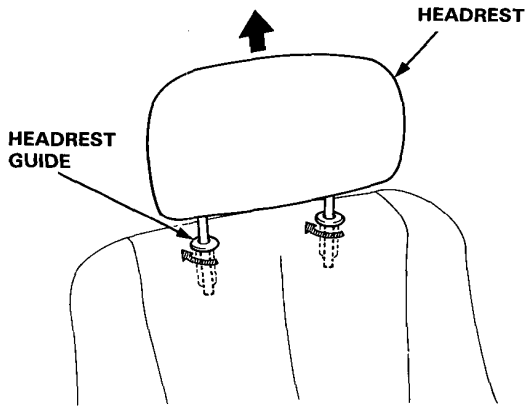
Front Seat Cover Replacement

CAUTION: Wear gloves to remove and install the seat cover.

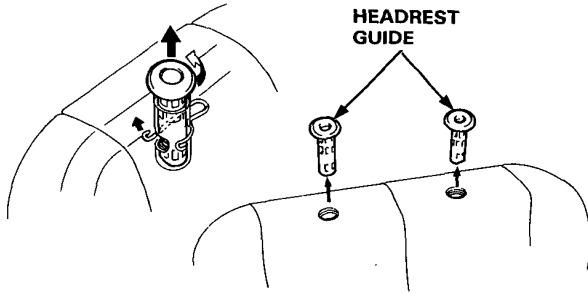
NOTE: Take care not to tear the seams or damage the cover.

Seat-back cover removal:

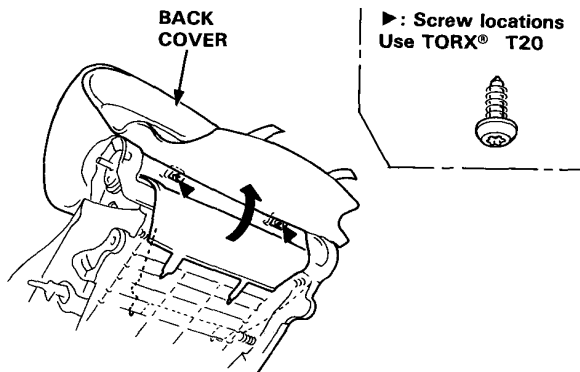
1. Separate the front seat and seat device.
(see page 20-55).
2. Remove the headrest by turning the headrest guides.



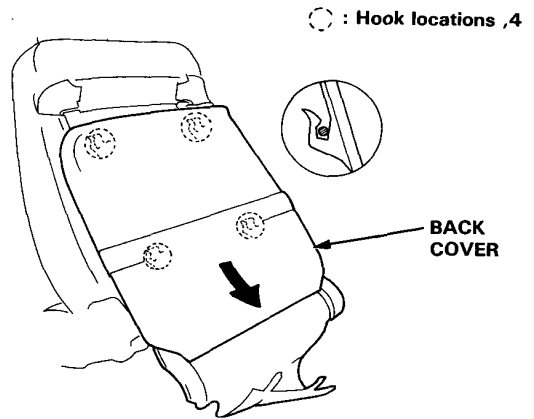
3. Remove the headrest guides by turning it.



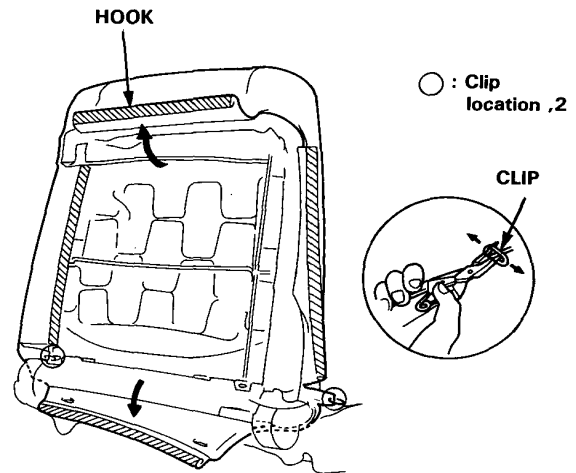
4. Remove the screws from under the seat-back.



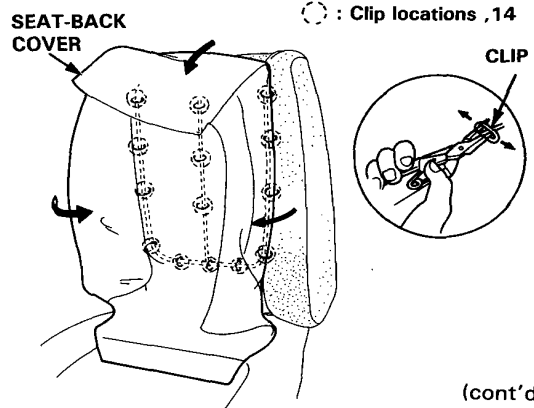
5. Slide the back cover, then remove it.



6. Remove the all hooks and clips of the seat-back cover.



7. Pull back the edge of the seat-back cover all the way around, then remove the clips.



(cont'd)

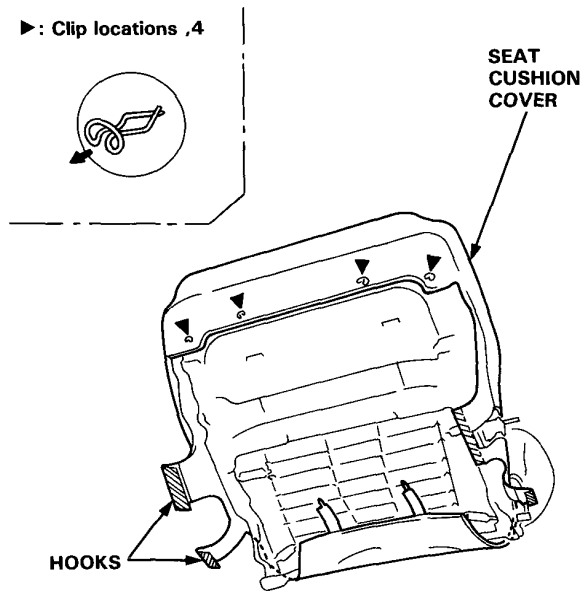
Seats

Front Seat Cover Replacement (cont'd)

Seat cushion cover removal:

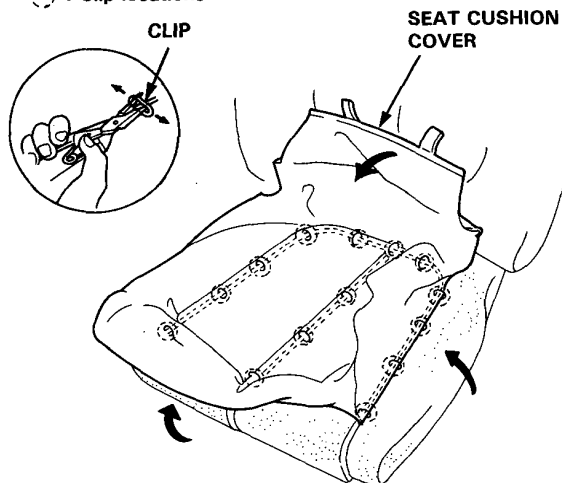
1. Separate the front seat and seat device.
(see page 20-55).
2. Remove the recline belt tensioner (see page 20-56).
3. Remove the all hooks and clips from under the seat cushion.

▶: Clip locations ,4



4. Pull back the edge of the seat cushion cover all the way around, then release the clips.

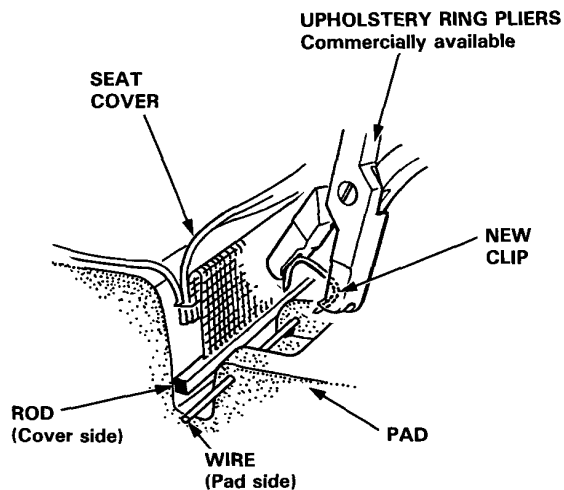
○: Clip locations



5. Installation is the reverse of the removal procedure.

NOTE:

- To prevent wrinkles when installing a seat covers, make sure the material is stretched evenly over the pad before securing all the clips.
- Replace the released clips with new ones.



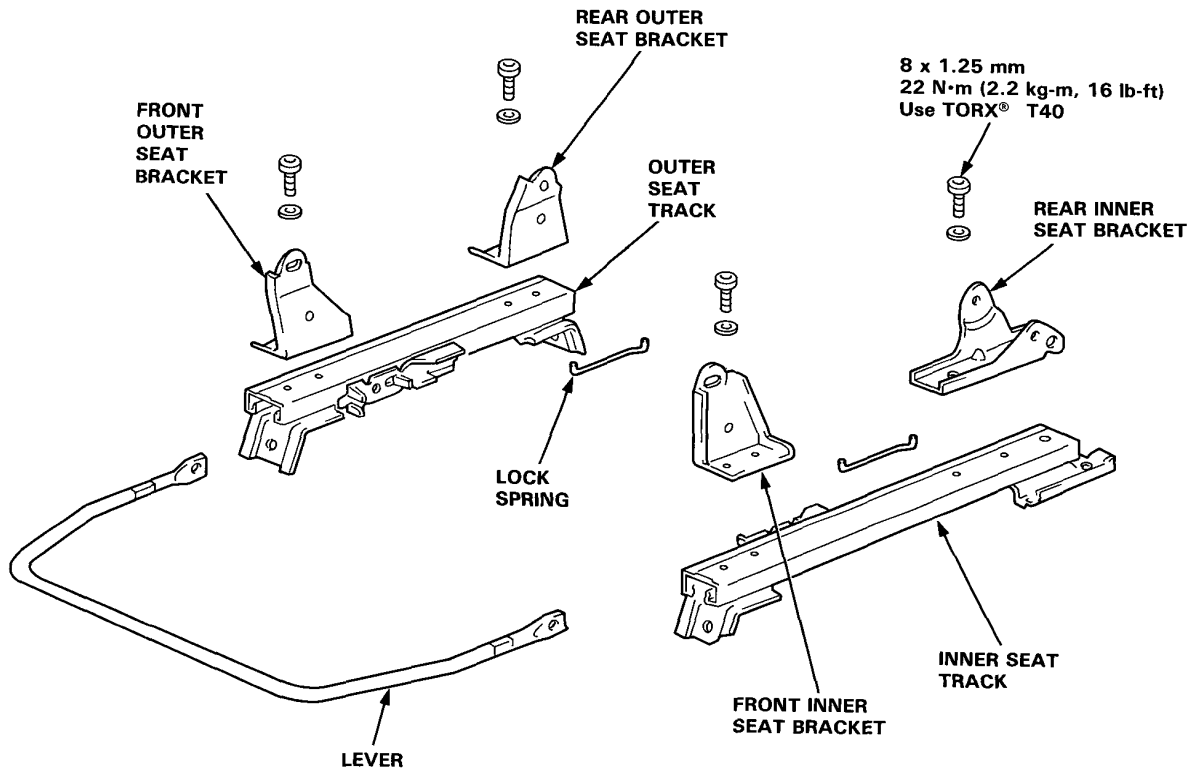


Front Seat Device Disassembly

CAUTION: Wear gloves to remove and install the seat track and elevation adjuster.

1. Remove the front seat device from the front seat (see page 20-55).
2. Disassemble the seat device as shown.

Manually adjustable:



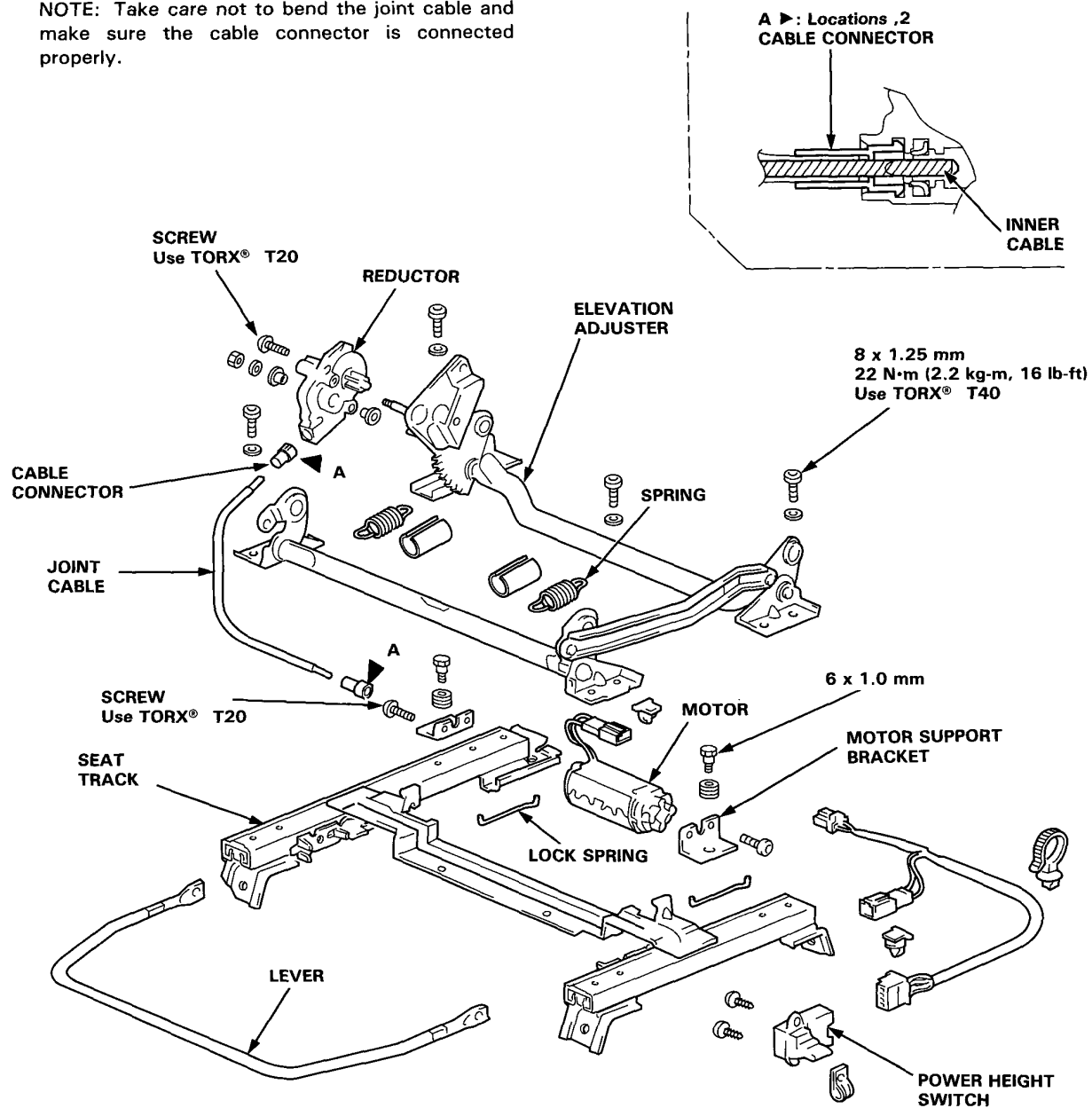
(cont'd)

Seats

Front Seat Device Disassembly (cont'd)

Power height adjustable:

NOTE: Take care not to bend the joint cable and make sure the cable connector is connected properly.



3. Installation is the reverse of the removal procedure.

NOTE:

- Apply grease (aeroshell grease 6) to the moving surface.
- Check the slide and height operations.



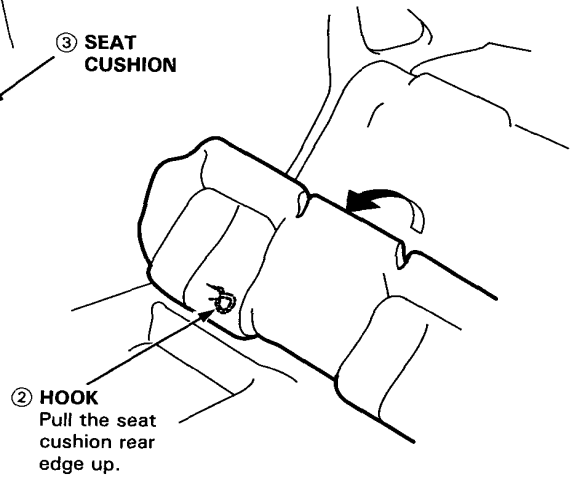
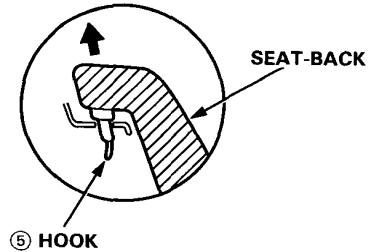
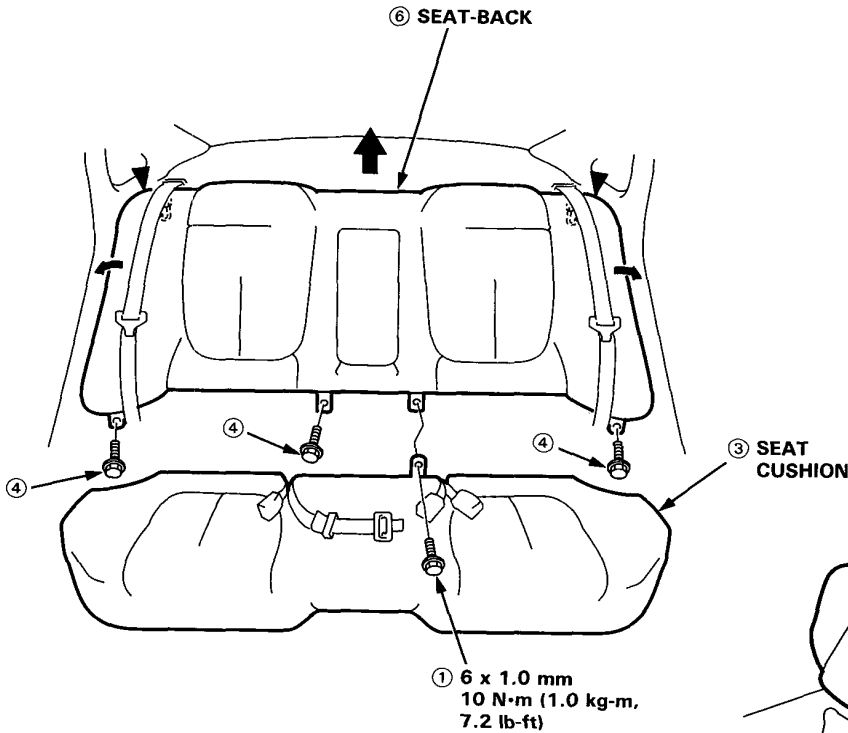
Rear seat Replacement

Fixed type:

Disassemble in the numbered sequence.

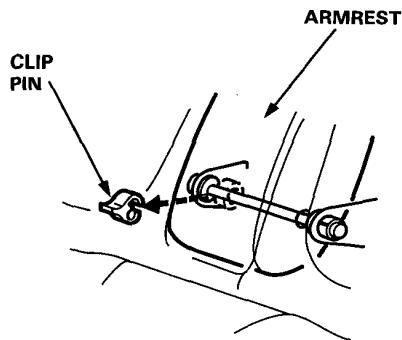
NOTE: Take care not to tear the seams or damage the cover.

▼: Hook locations ,2



Armrest removal:

Pull the clip pin out the armrest.



Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the seat-back and seat cushion, make sure there are no twists in the rear seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the rear seat belts.

(cont'd)

Seats

Rear Seat Replacement (cont'd)

Folded down type:

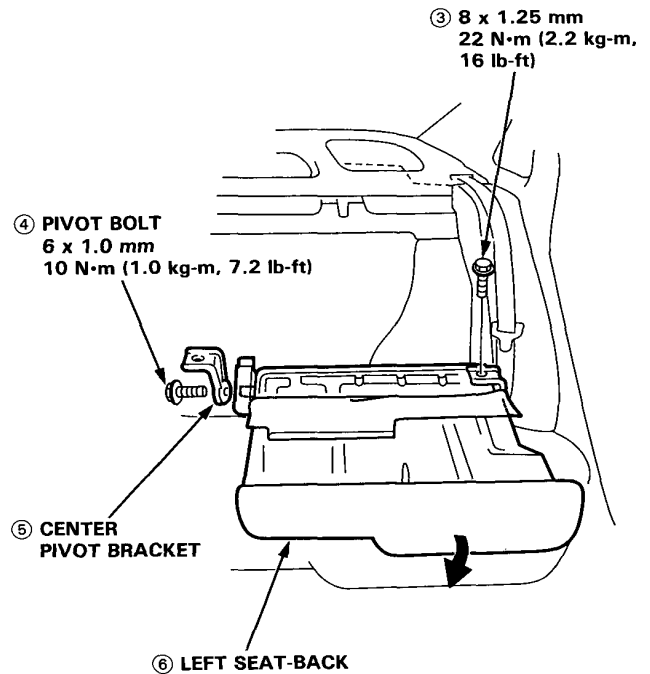
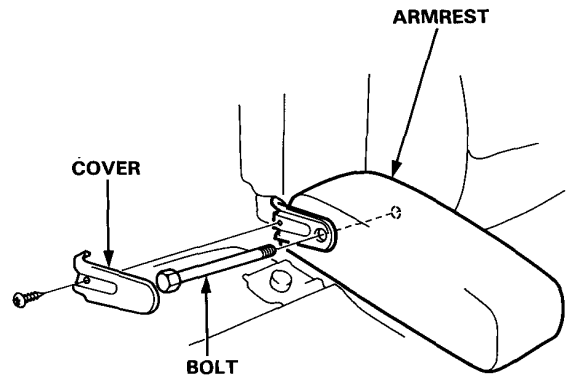
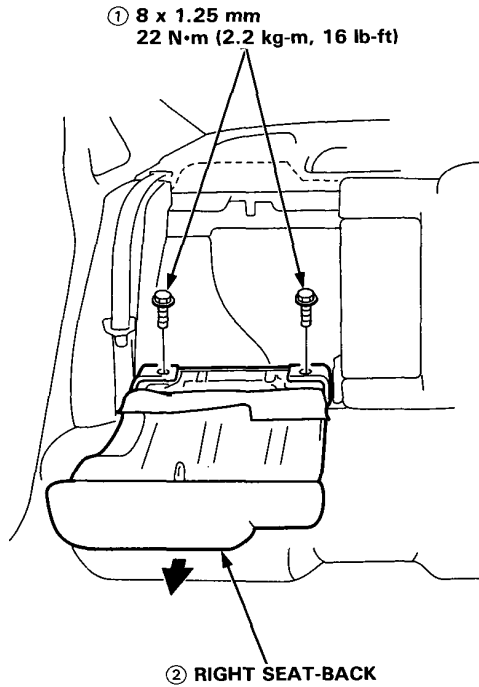
Disassemble in the numbered sequence.

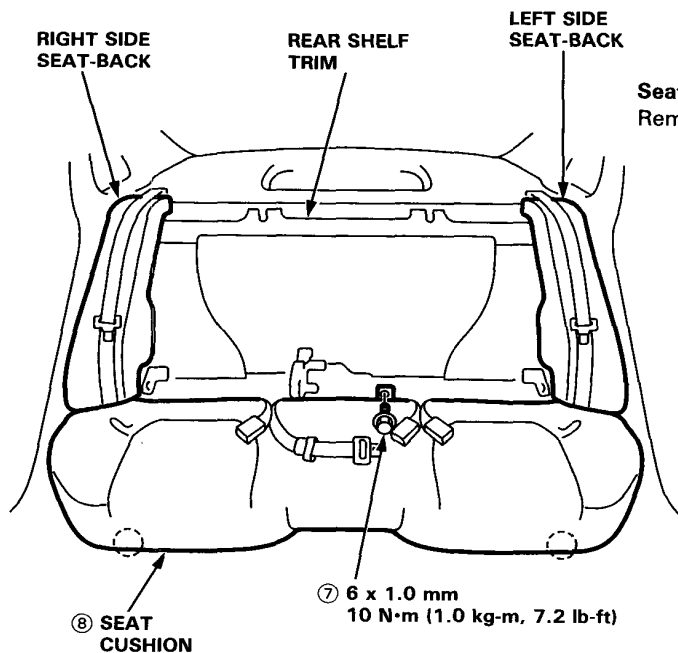
NOTE:

- Take care not to tear the seams or damage the seat cover.
- Remove the rear seat cushion in the same way as the fixed type (see page 20-61).

Armrest removal:

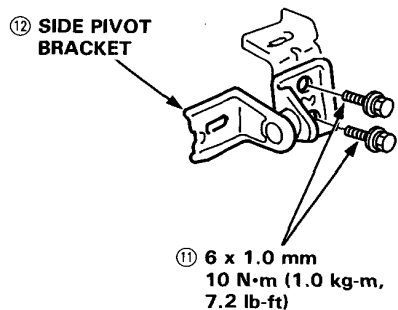
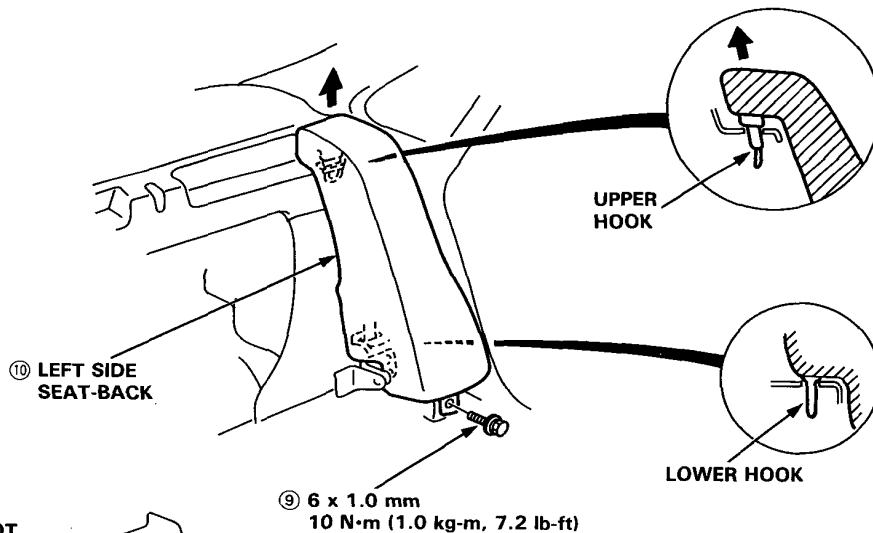
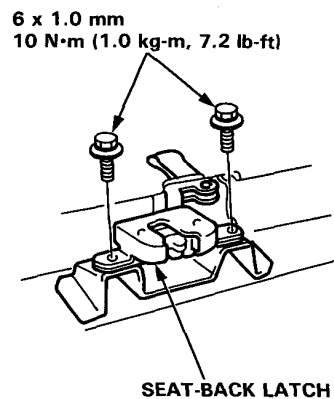
Remove the cover and bolt, then remove the armrest.





Seat-back latch removal:

Remove the rear shelf trim (see page 20-52) and bolts.



Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the seat-back and seat cushion, make sure there are no twists in the rear seat belt.
- When installing the seat cushion, slip the slits in the seat cushion over the rear seat belts.

Seats

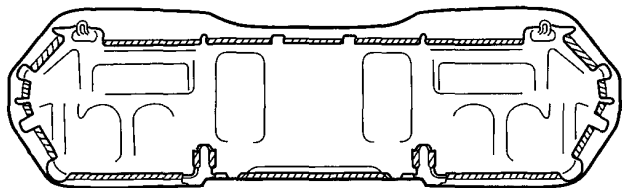
Rear Seat Cover Replacement

CAUTION: Wear gloves to remove and install the seat cover.

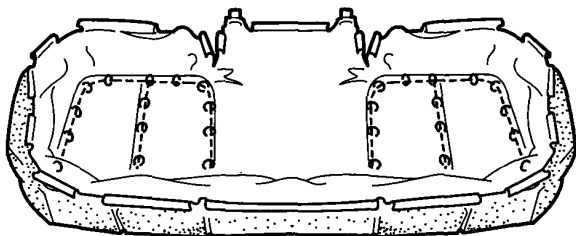
1. Remove the rear seat cushion and seat-back (see pages 20-61, 62).
2. Remove the all hooks of the seat cushion and seat-back covers.
3. Pull back the edge of the seat covers all the way around, then release the clips.

Seat cushion cover removal:

//// : Hook locations

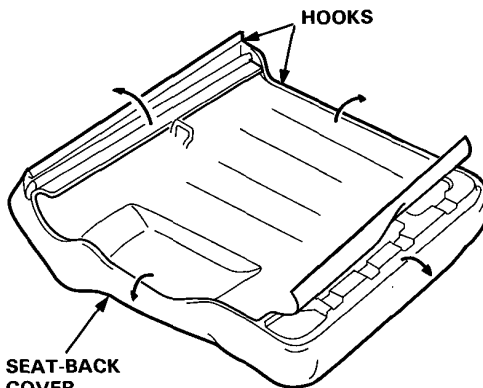


SEAT CUSHION COVER



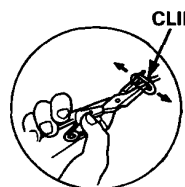
PAD

Seat-back cover removal:

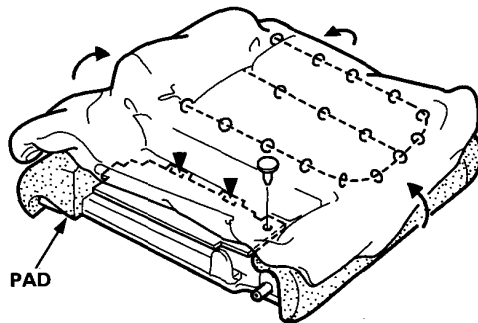
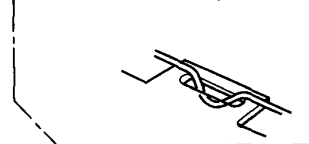


SEAT-BACK COVER

○ : Clip locations



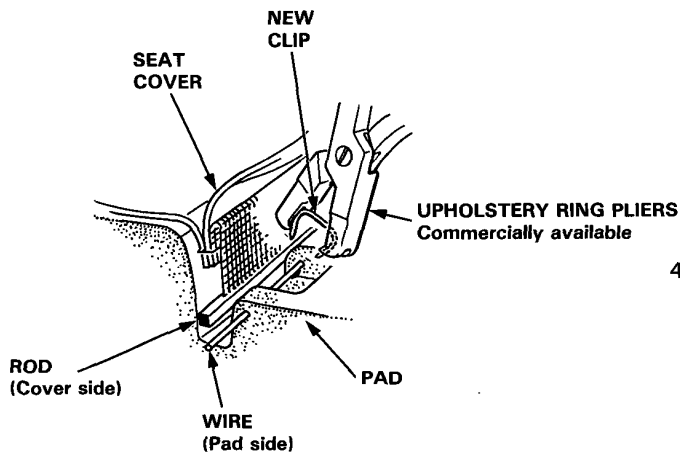
▼ : Hook locations ,2



4. Installation is the reverse of the removal procedure.

NOTE:

- To prevent wrinkles when installing a seat covers, make sure the material is stretched evenly over the pad before securing all the clips.
- Replace the released clips with new ones.





Seat Belts

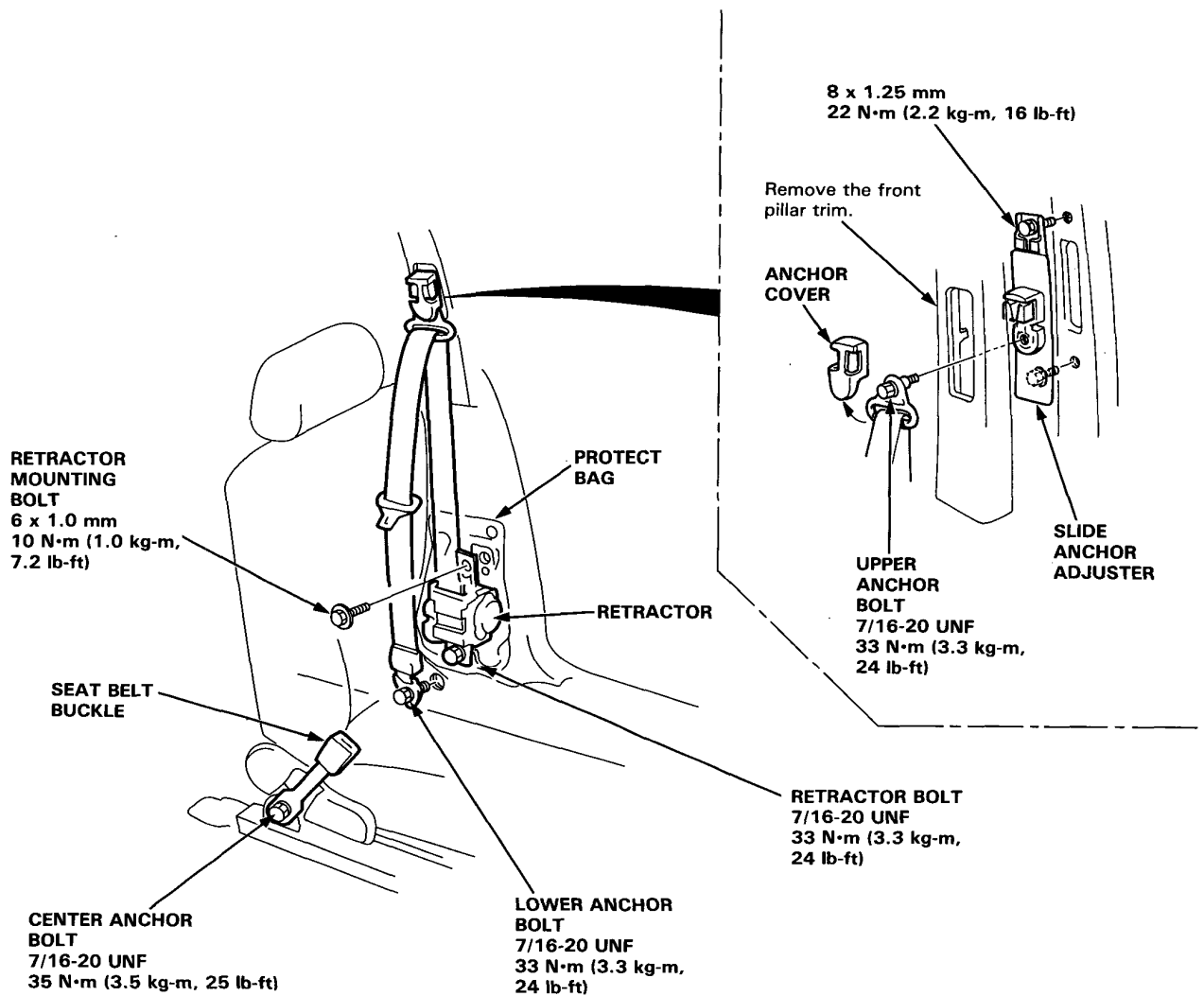
Front Seat Belt Replacement

CAUTION: Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove:
 - Center pillar lower trim (see page 20-51).
 - Front seat (see page 20-55).
2. Remove the all three anchor bolts, the retractor bolt and retractor mounting bolt, then remove the seat belt and seat belt buckle.

NOTE: When removing the anchor bolts and retractor bolt, use a 17 mm socket or box-end wrench.

3. Remove the front pillar trim (see page 20-51), then remove the shoulder anchor adjuster.

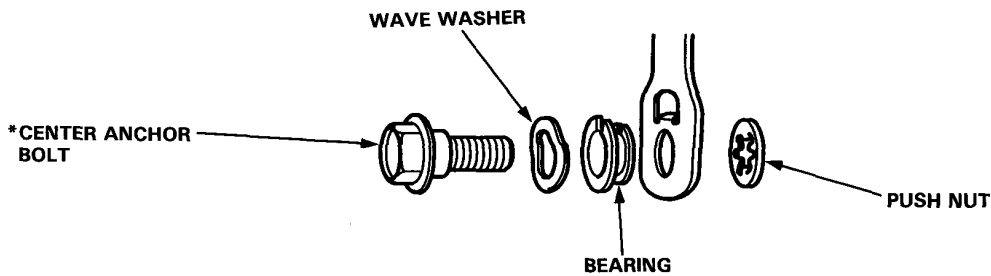
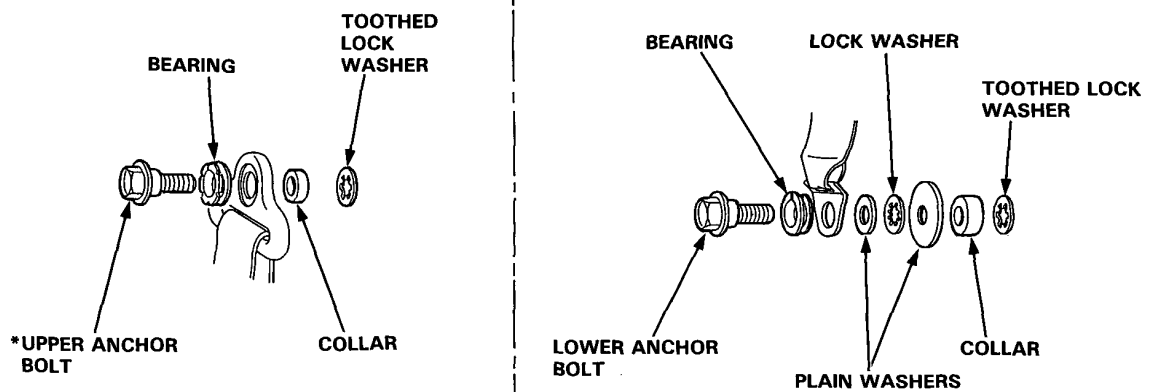


(cont'd)

Seat Belts

Front Seat Belt Replacement (cont'd)

Anchor bolt construction:



4. Check that the retractor locking mechanism functions as described on page 20-68.
5. Installation is the reverse of the removal procedure.

NOTE:

- Make sure you assemble the washers and collars on the upper and lower anchor bolts as shown.
- Before attaching the center pillar lower trim, make sure there are no twists or kinks in the seat belts.
- On reassembly, replace the upper anchor bolt and center anchor bolt (*) and use liquid thread lock.



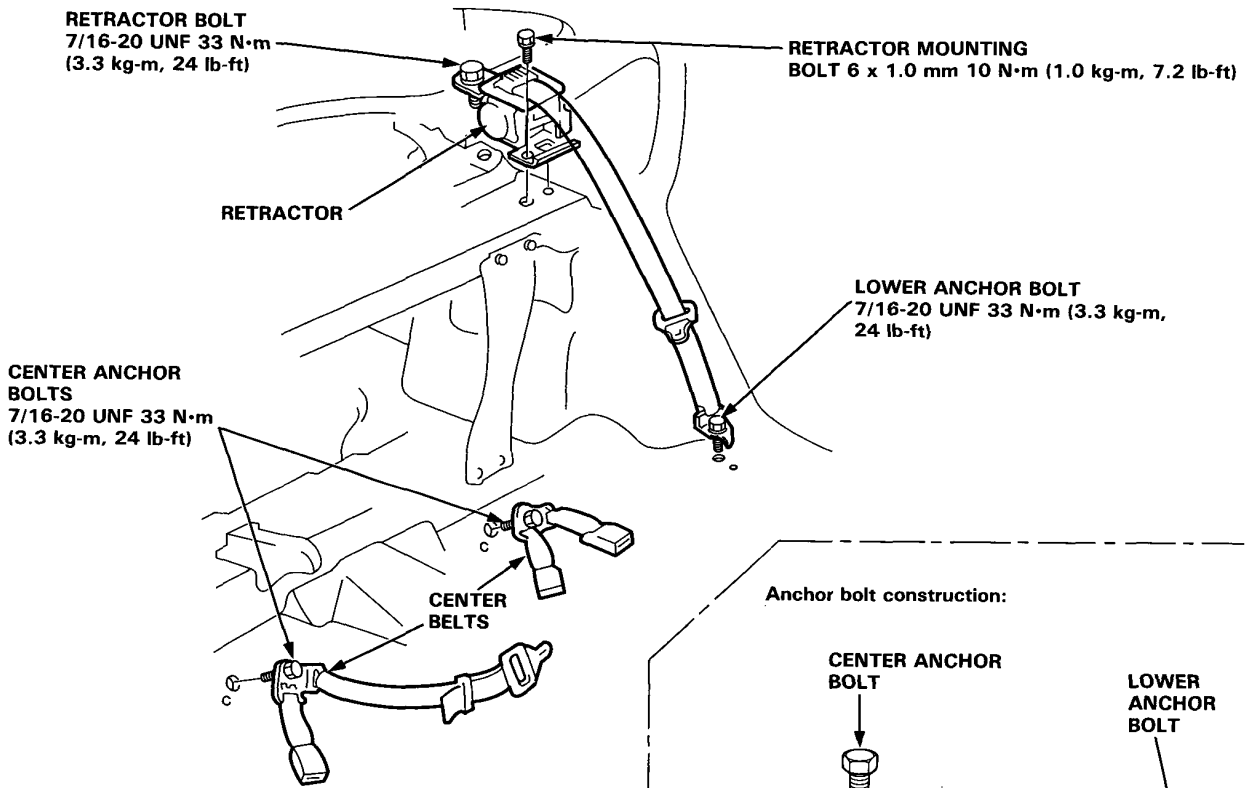
Seat Belts

Rear Seat Belt Replacement

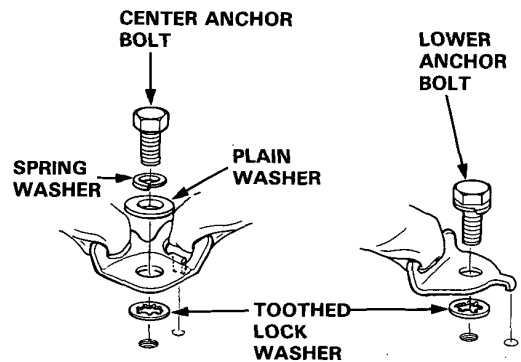
CAUTION: Check the rear seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove:
 - Rear seat-back (see pages 20-61, 62)
 - Rear shelf (see page 20-52)
2. Remove the all anchor bolts, the retractor bolt and retractor mounting bolt, then remove the rear seat belts and center belts.

NOTE: When removing the anchor bolts and retractor bolt, use a 17 mm socket or box-end wrench.



Anchor bolt construction:



3. Check that the retractor locking mechanism functions as described on page 20-68.
4. Installation is the reverse of the removal procedure.

NOTE:

- Before attaching the rear shelf and rear seat, make sure there are no twists or kinks in the seat belt.
- Pass the seat belts through the seat belt guides of the rear seat cushion.

Seat 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.

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.

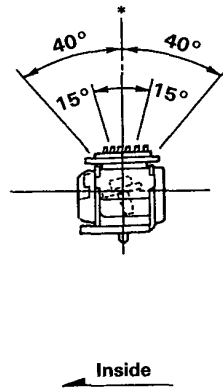
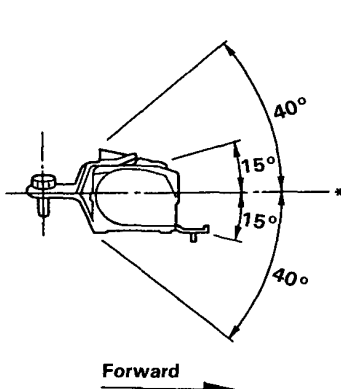
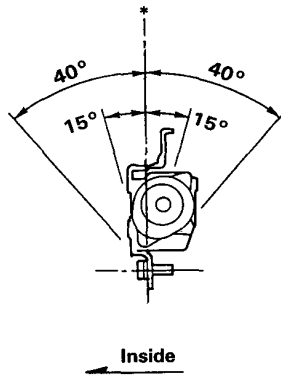
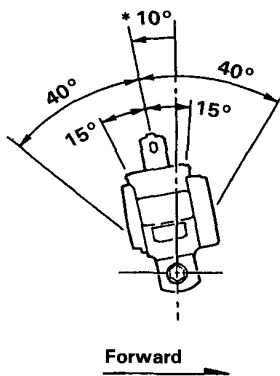
CAUTION: Use only soap and water to clean.

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. Replace the seat belt with a new one if there is any abnormality.

Front:

*: Mounted Position



3. Replace the seat belt with a new one if there is any abnormality.



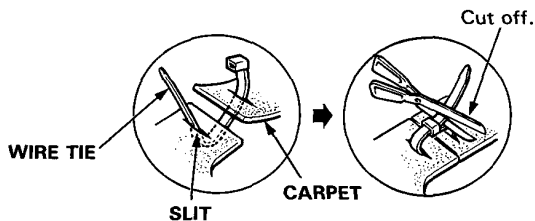
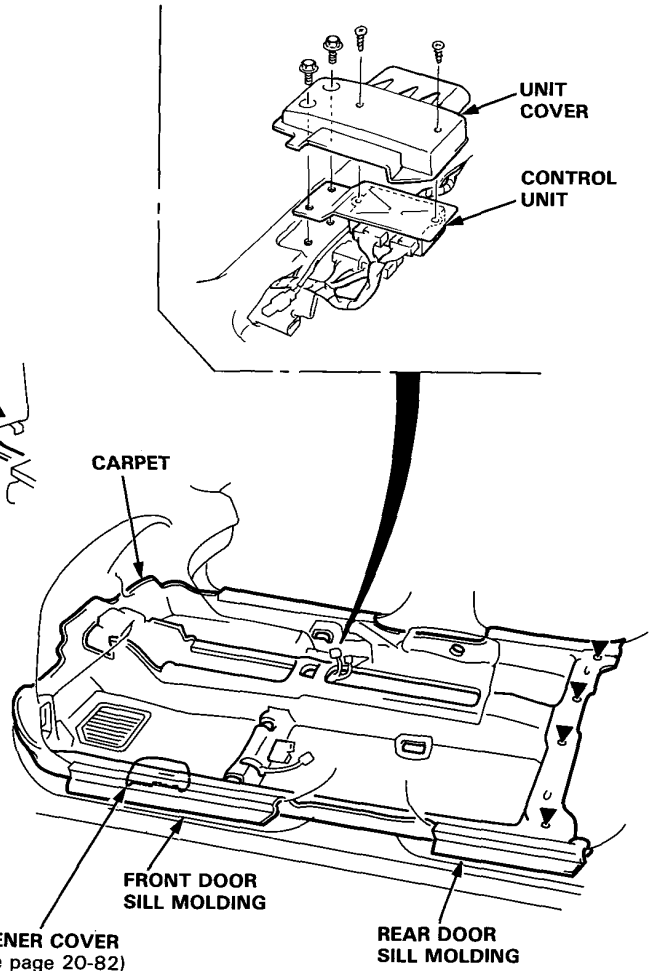
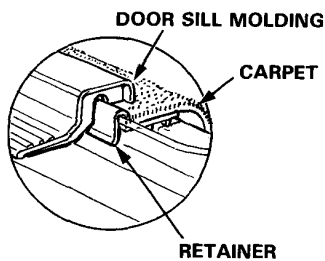
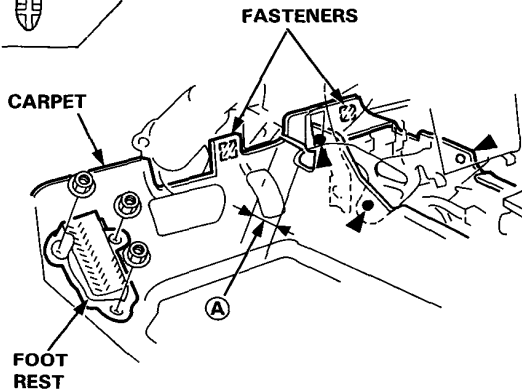
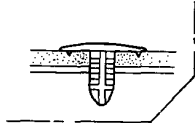
Carpet

Replacement

1. Remove:
 - Front seats (see page 20-55)
 - Rear seat cushion (see page 20-61)
 - Center consoles (see page 20-70)
 - Front seat belt lower anchor bolts (see page 20-65)
2. Pry out the clips and remove the door sill moldings.
3. Cut the (A) area first, then pull the carpet back as shown.
4. Remove the carpet by sliding it rearward.

- Center pillar lower trim (see page 20-51)
- Right and left kick panels (see page 20-51)
- Door sill moldings (see page 20-51)
- Foot rest and opener cover
- Control unit

►: Clip locations .7



5. Installation is the reverse of the removal procedure.

NOTE:

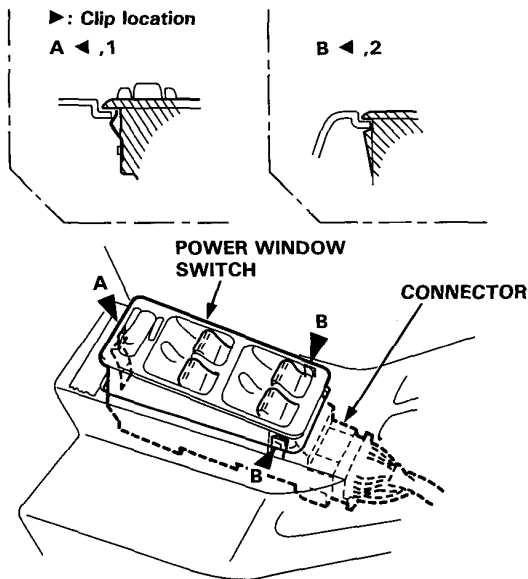
- Take care not to damage, wrinkle or twist the carpet.
- Make sure the seat harness is routed correctly.
- When installing, reattach the cut area with a wire tie as shown.

Center Consoles

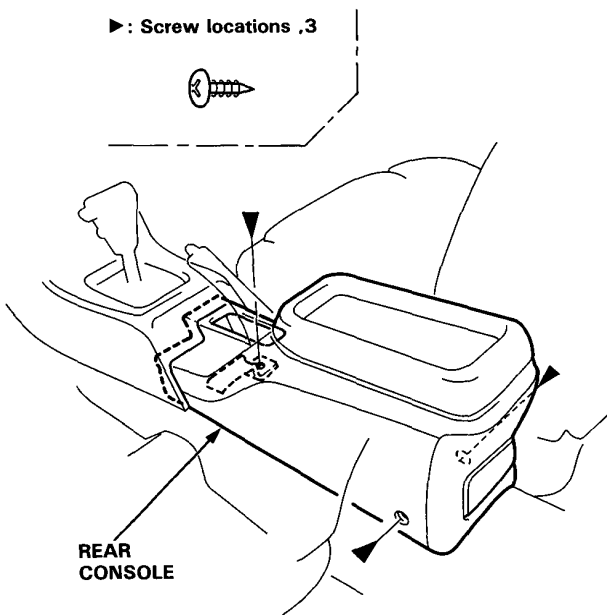
Replacement

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

1. Pry the clip out with a flat tip screwdriver, then remove the power window switch and disconnect the connector.



2. Remove the screws, then remove the rear console.

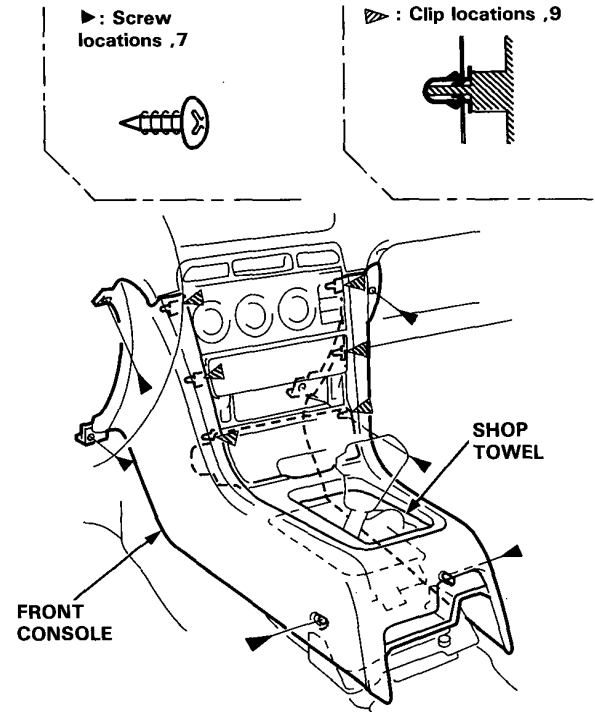


3. Remove the dashboard lower panel (see page 20-71) and glove box (see page 20-73).

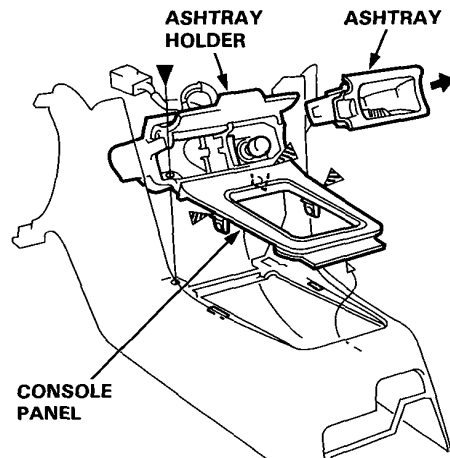
4. Remove the screws and clips, then remove the front console.

NOTE:

- Remove the shift lever knob (M/T).
- Lift up the parking lever.
- To prevent damage to selector lever and A/T indicator panel, wrap it with a shop towel (A/T).



5. Remove the ashtray.
6. Remove the screw and clips, then remove the ashtray holder and console panel as an assembly.



7. Installation is the reverse of the removal procedure.



Dashboard

Component Removal/Installation

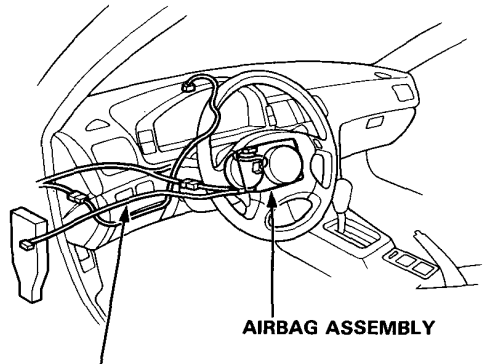
SRS wire harnesses are routed near the dashboard and steering column.

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE:

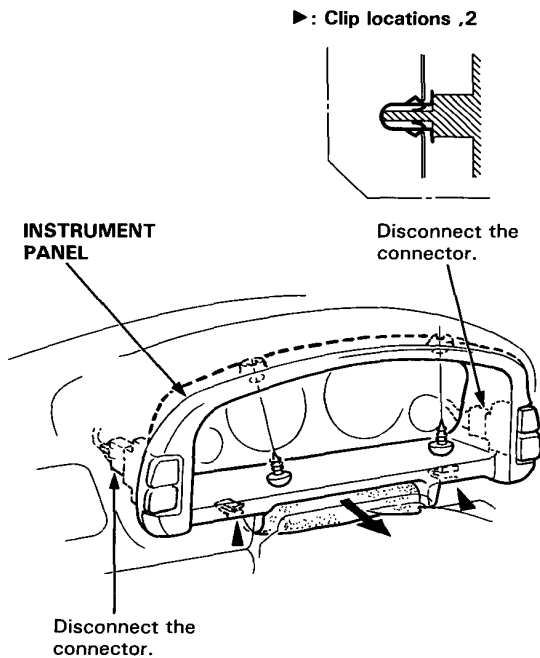
- Do not drop the screws inside the dashboard.
- When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

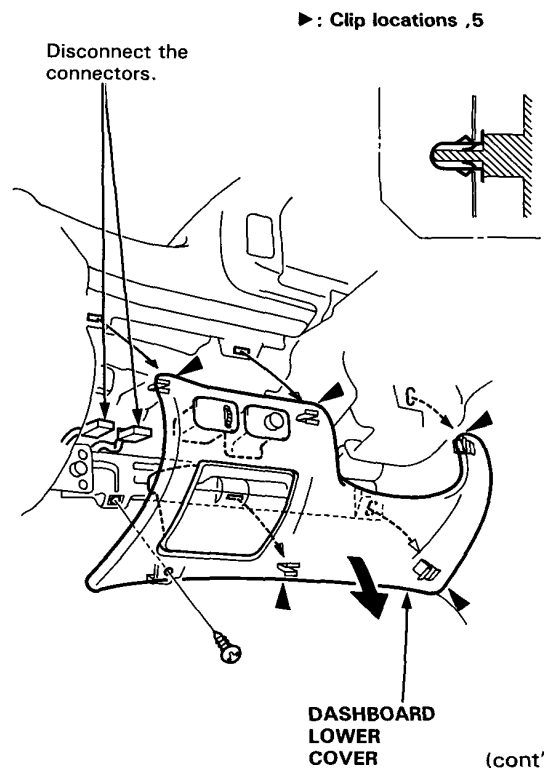
Instrument panel removal:

Lower the steering column.
Remove the screws and clips.



Dashboard lower cover removal:

Remove the screw and clips.



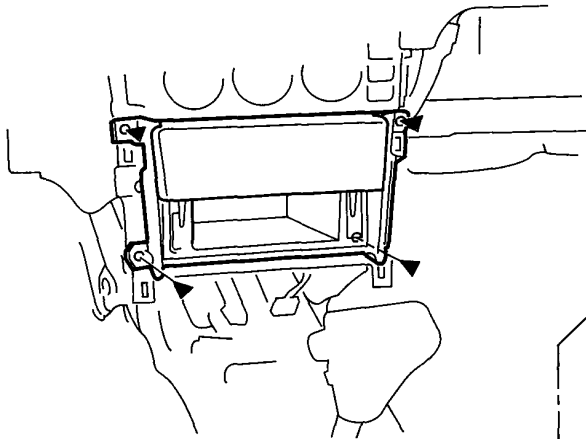
(cont'd)

Dashboard

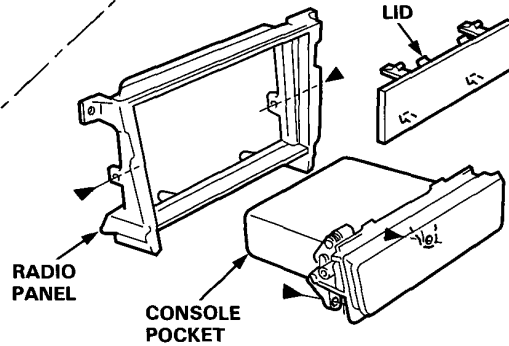
Component Removal/Installation (cont'd)

Radio panel and console pocket removal:

1. Remove the front console (see page 20-70).
2. Remove the screws.



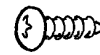
►: Screw locations .8



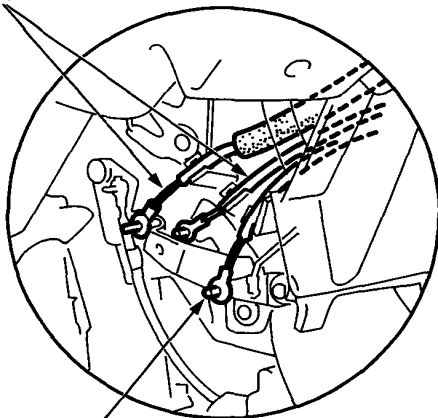
Heater control panel removal:

1. Remove the radio panel.
2. Remove the screws and disconnect the heater control cables and connectors.

►: Screw locations .4

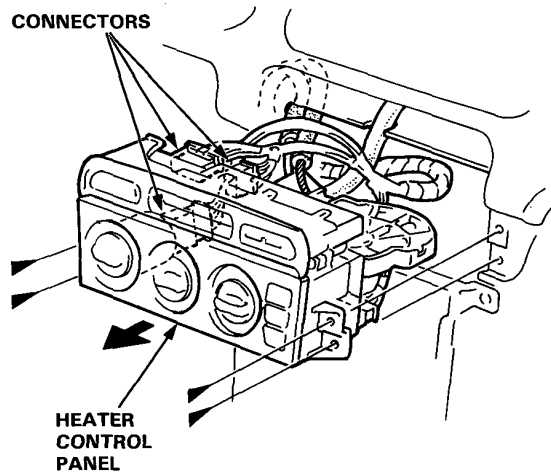


HEATER CONTROL
CABLES



COOL VENT CABLE

CONNECTORS

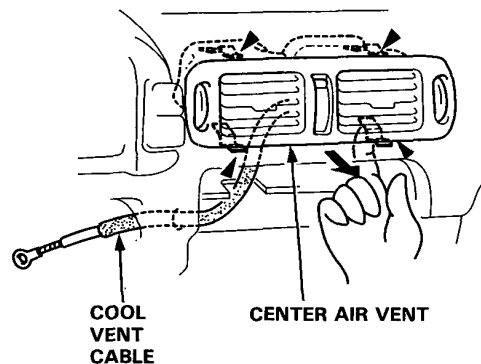


HEATER
CONTROL
PANEL

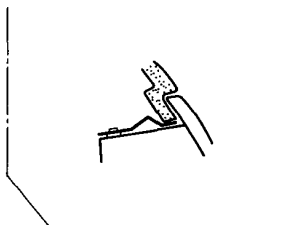


Center air vent removal:

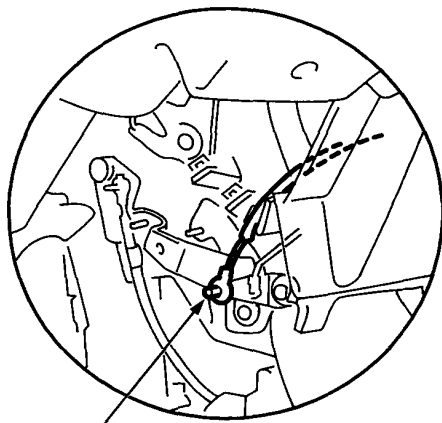
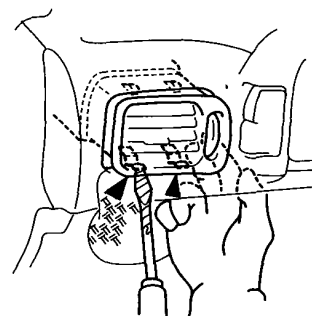
1. Remove the heater control panel.
2. Disconnect the cool vent cable.



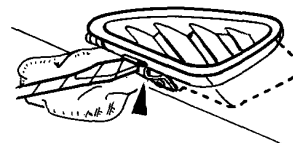
►: Clip locations , 7



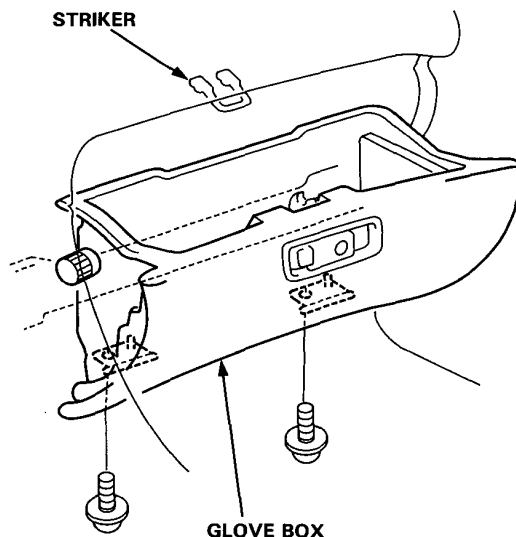
Side air vents removal:



COOL VENT CABLE



Glove box removal:
Remove the screws.



Installation is the reverse of the removal procedure.

NOTE: Adjust the heater control cables and cool vent cable (see section 21).

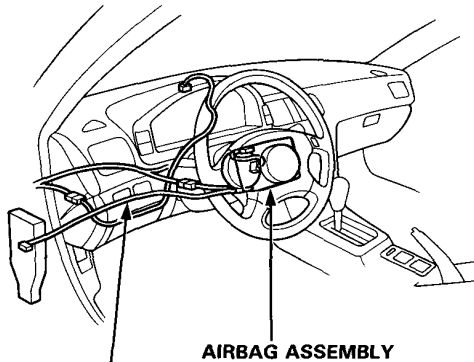
Dashboard

Replacement

SRS wire harnesses are routed near the dashboard and steering column.

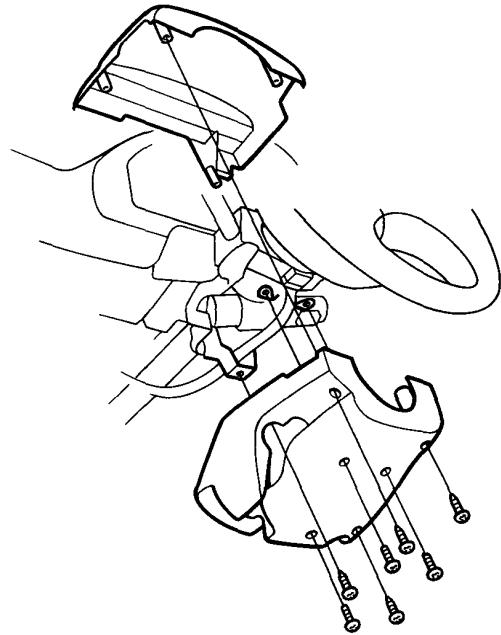
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harnesses, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

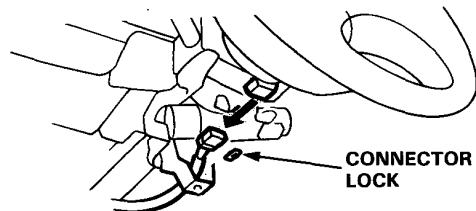


SRS MAIN HARNESS
(Covered with yellow outer insulation)

1. To remove the dashboard, first remove the:
 - Front seats (see page 20-55)
 - Front console (see page 20-70)
 - Dashboard lower cover (see page 20-71)
 - Glove box (see page 20-73)
2. Remove the steering column covers.



3. Pull out the connector lock, then disconnect the SRS main harness connector from the slip ring (see section 23).

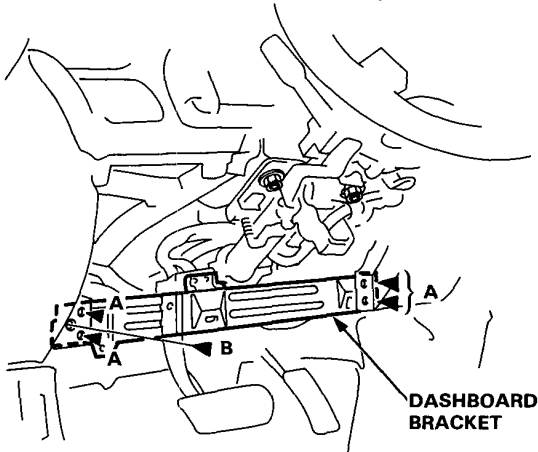
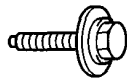




4. Remove the dashboard bracket.

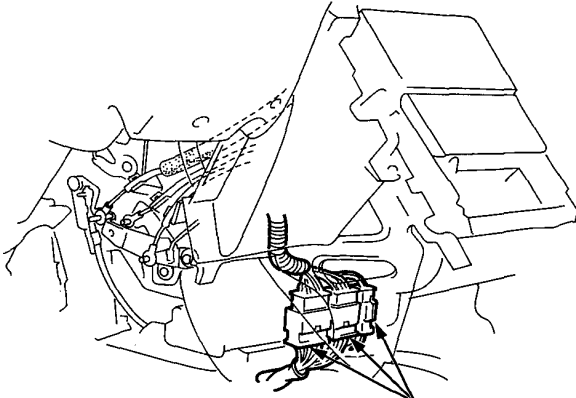
A ▶: Screw locations , 4

B ▶: Bolt location , 1

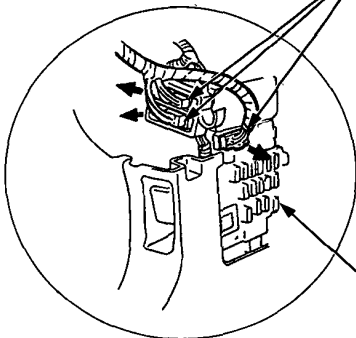


DASHBOARD BRACKET

5. Disconnect the dashboard wire harness connectors.

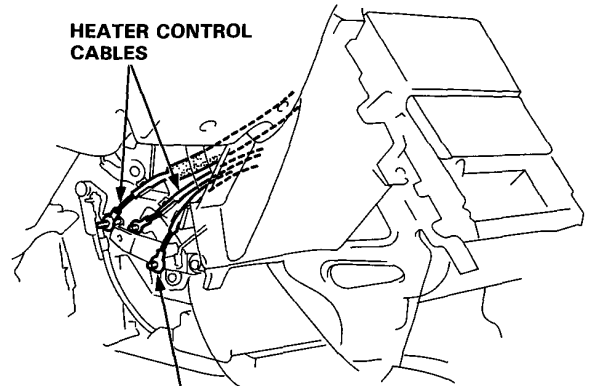


CONNECTORS



UNDER-DASH FUSE BOX

6. Disconnect the heater control cables and cool vent cable.



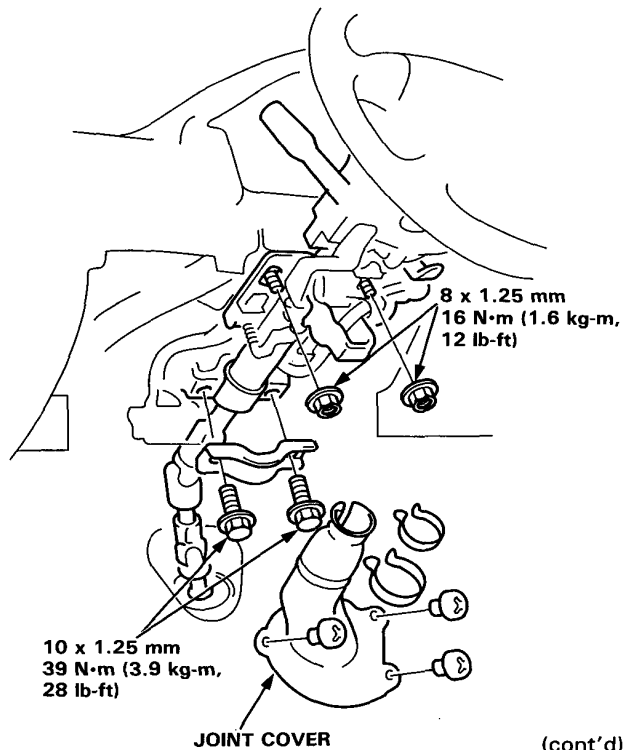
HEATER CONTROL CABLES

COOL VENT CABLE

7. Remove the steering joint cover.

8. Lower the steering column by removing the bolts and nuts.

NOTE: To prevent damage to the steering column, wrap it with a shop towel.



8 x 1.25 mm
16 N·m (1.6 kg-m,
12 lb-ft)

10 x 1.25 mm
39 N·m (3.9 kg-m,
28 lb-ft)

JOINT COVER

(cont'd)

Dashboard

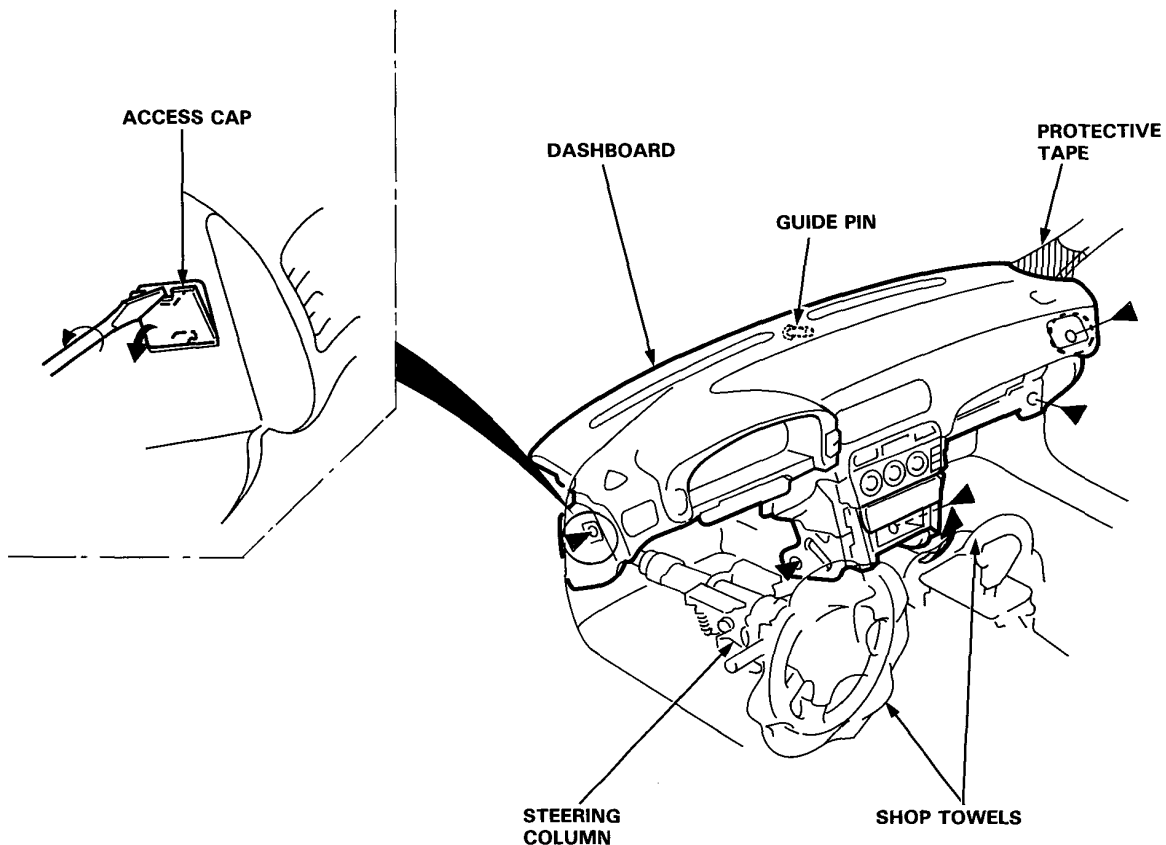
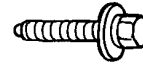
Replacement (cont'd)

9. Remove the bolts, then lift and remove the dashboard.

NOTE:

- Use protective tape on the bottom of the front pillar trim.
- Take care not to scratch the dashboard.
- To prevent damage to the selector lever and A/T gear position indicator panel, wrap it with a shop towel.

▶: Bolt locations, 5
6 x 1.0 mm
10 N·m (1.0 kg-m,
7.2 lb-ft)



10. Installation is the reverse of the removal procedure.

NOTE: Before tightening the bolts, make sure the dashboard wire harness are not pinched, and that the dashboard is not interfering with the heater control cables.

11. Adjust the heater control cables and cool vent cable (see section 21).



Bumpers

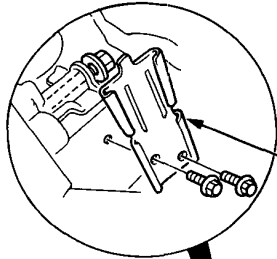
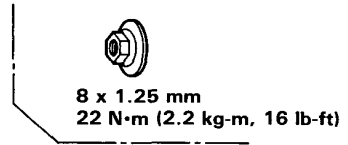
Front Bumper Replacement

Disassemble the front bumper as shown.

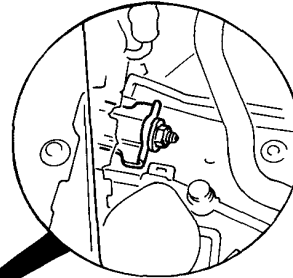
NOTE:

- An assistant is helpful when removing the front bumper.
- Take care not to scratch the front bumper.
- Open the hood.

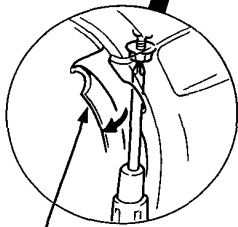
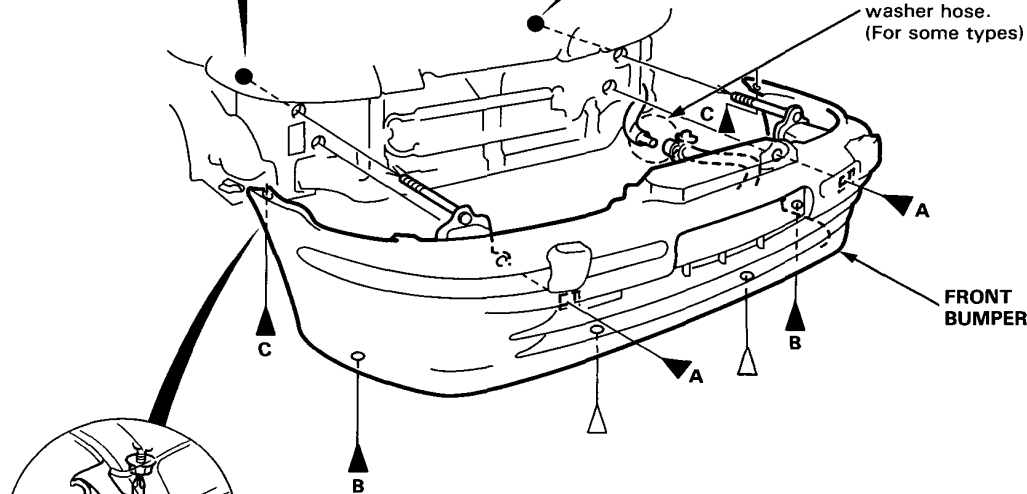
●: Nut locations ,2



Remove the coolant reservoir stay.



Disconnect the headlight washer hose.
(For some types)



INNER FENDER

▶: Bolt, screw locations

▷: Clip location ,2

A ▶ Bolt ,2



8 x 1.25 mm
22 N·m (2.2 kg-m,
16 lb-ft)

B ▶ Bolt ,2



6 x 1.0 mm
10 N·m (1.0 kg-m,
7.2 lb-ft)

C ▶ Screw ,2



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace the front bumper beams (see page 20-79).

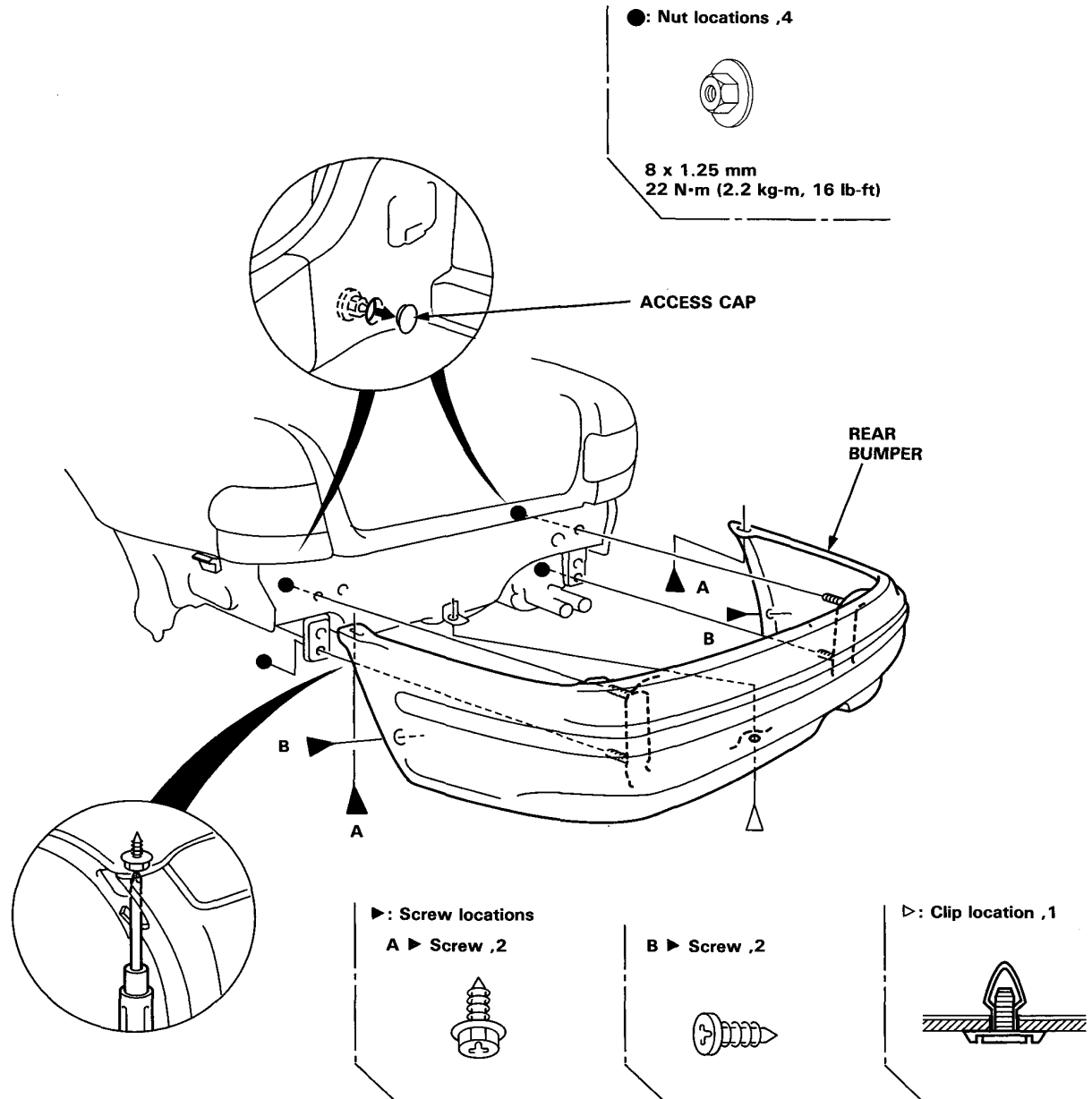
Bumpers

Rear Bumper Replacement

Disassemble the rear bumper as shown.

NOTE:

- An assistant is helpful when removing the rear bumper.
- Take care not to scratch the rear bumper.
- Open the trunk lid.



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace the rear bumper beams (see page 20-79).



Bumper Beams

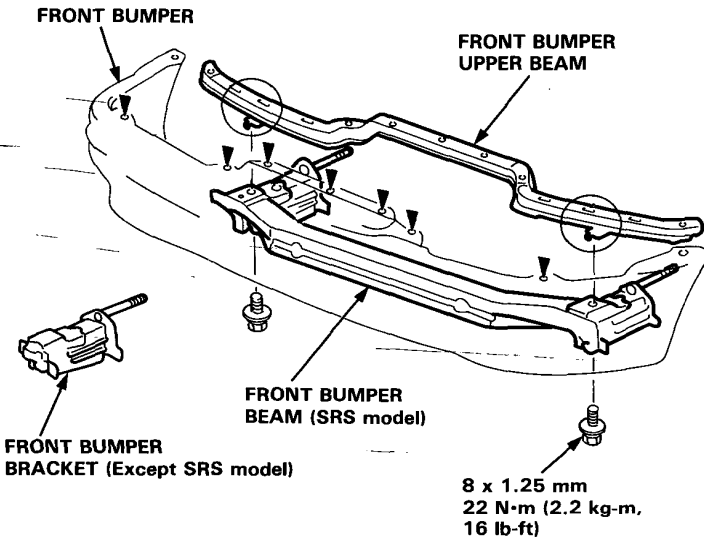
Replacement

Disassemble the bumper beams as shown.

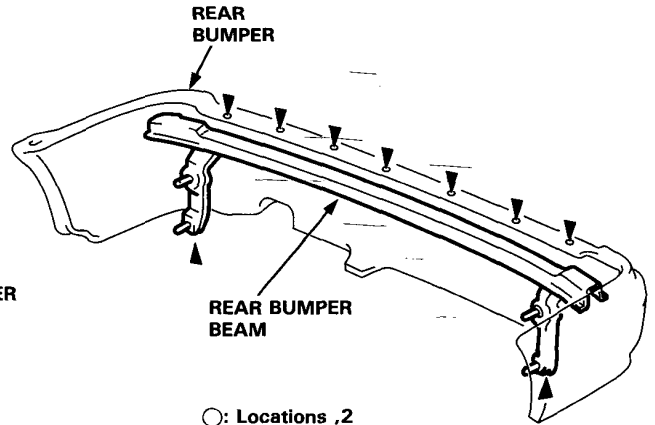
▼: Clip locations ,16



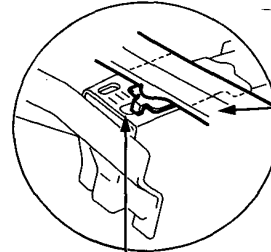
Front bumper beam:



Rear bumper beam:



○: Locations ,2

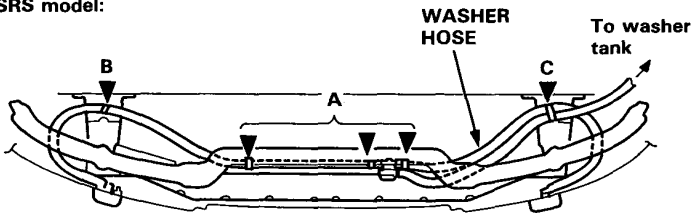


FRONT BUMPER UPPER BEAM

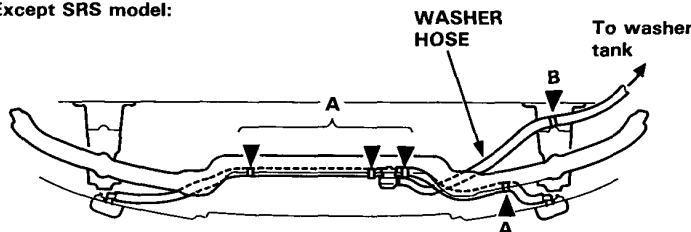
NOTE: Align the position of the front bumper upper beam on each side.

NOTE: Install the bumper beams, make sure the headlight washer hoses are fastened correctly on the bumper beams as shown.

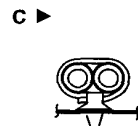
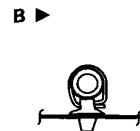
SRS model:



Except SRS model:



▶: Washer hose clip locations



Hood/Opener and Latch

Replacement/Adjustment

NOTE:

- An assistant is helpful when removing the hood.
- When removing the clips, use a clip remover.

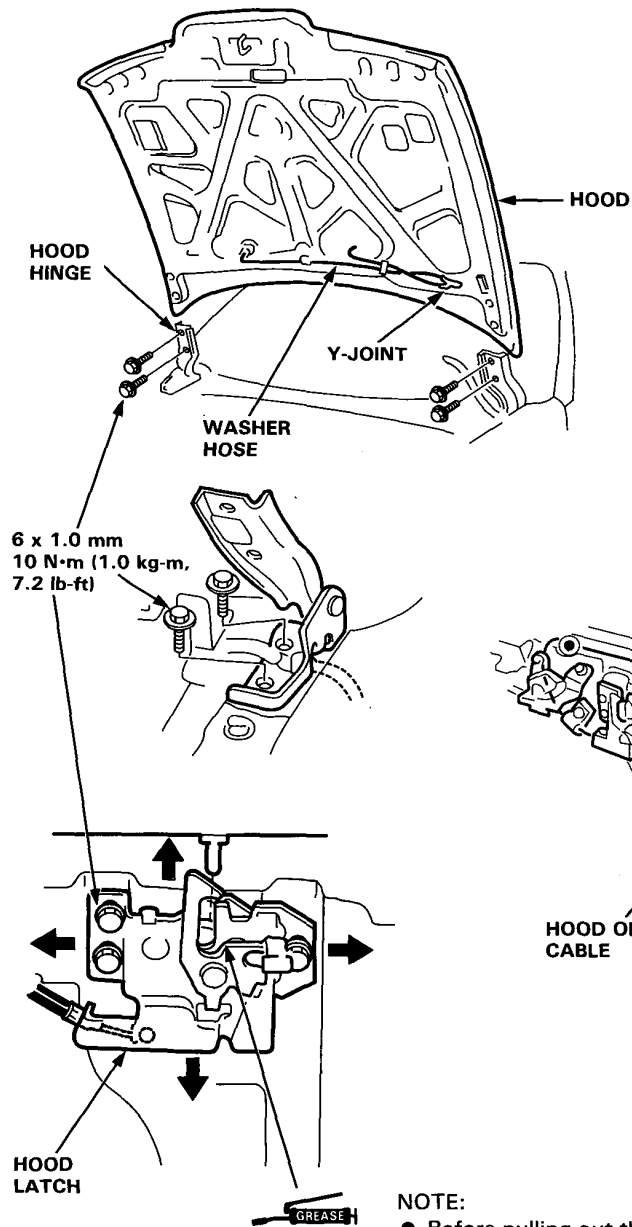
Installation is the reverse of the removal procedure.

NOTE:

- Make sure the hood opener cable is routed and connected properly.
- Make sure the hood locks securely.
- Make sure the hood opens properly.
- Adjust the hood alignment.

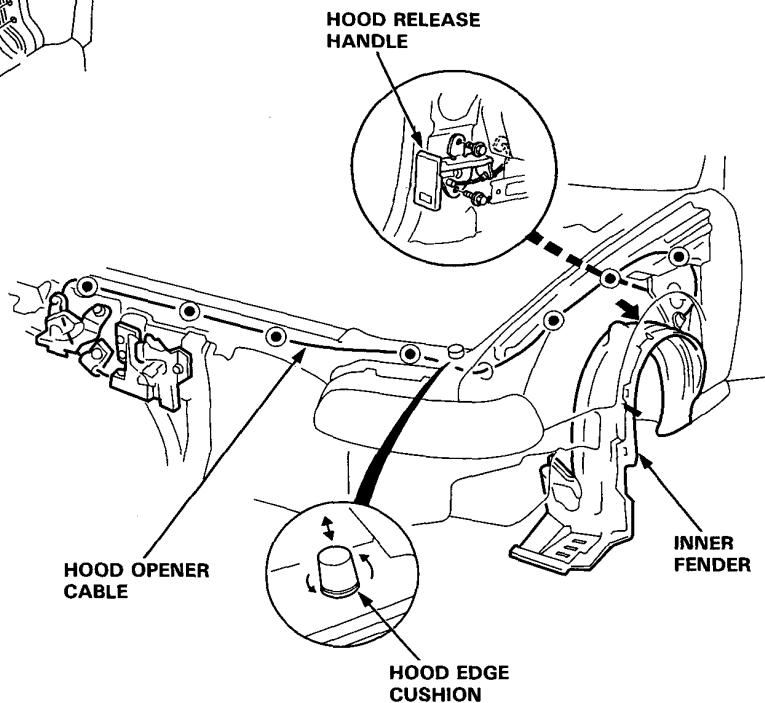
ALIGNMENT:

- The hood hinges can be adjusted right and left as well as fore and aft by using the elongated holes.
- Turn the hood edge cushions as necessary, to make the hood fit flush with the body at front and side edges.
- Adjust the hood latch to obtain the proper height at the forward edge.



NOTE:

- Before pulling out the hood opener cable, tie a string to the end of it so you can pull it back in later.
- Take care not to bend the hood opener cable.



●: Clip locations .7





Trunk Lid

Replacement/Adjustment

NOTE:

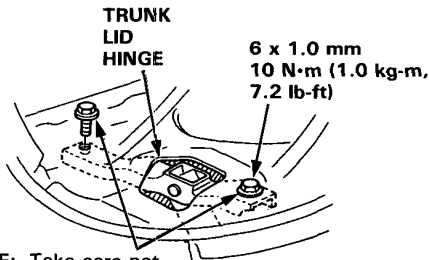
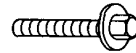
- An assistant is helpful when removing the trunk lid.
- Before pulling out the wire harness, tie a string to the end of it so you can pull it back in when the trunk lid is reinstalled.

Installation is the reverse of the removal procedure.

NOTE:

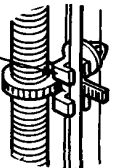
- Make sure the connectors are connected properly.
- Make sure the trunk lid locks securely.
- Make sure the trunk lid opens properly.
- Align the trunk lid alignment.

◀: Bolt locations ,4
 6 x 1.0 mm
 10 N·m (1.0 kg-m, 7.2 lb-ft)

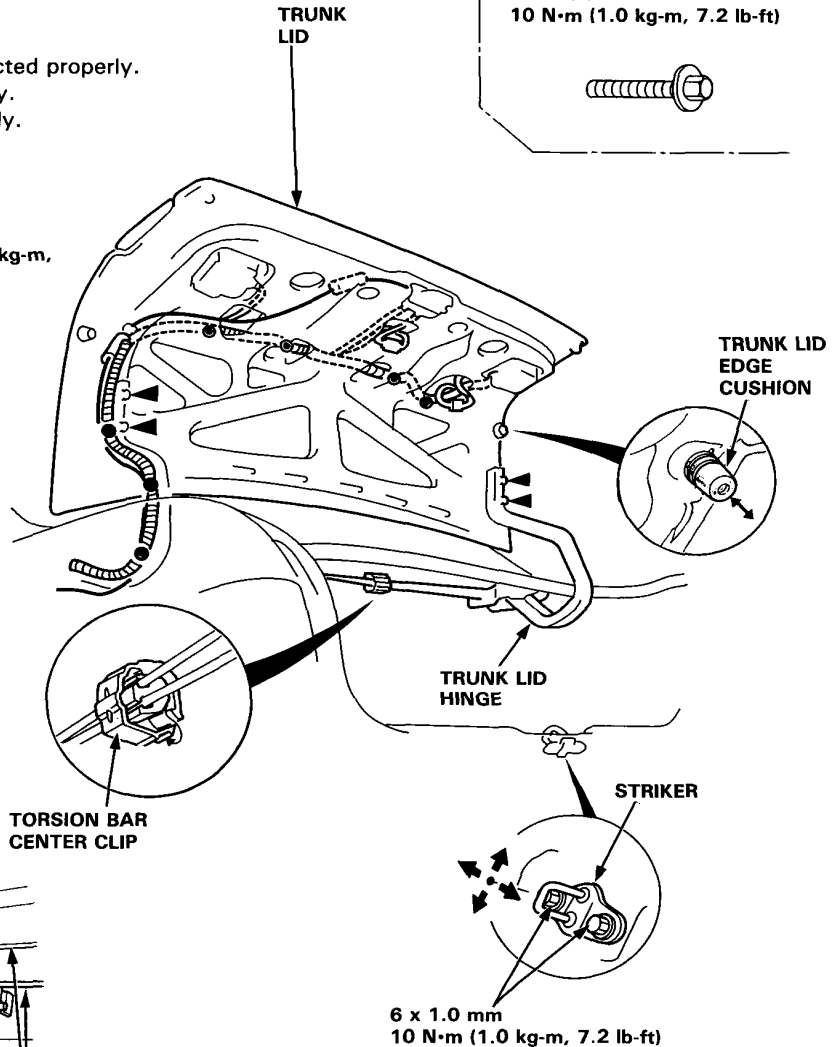


NOTE: Take care not to hit the rear window when removing the hinge bolts.

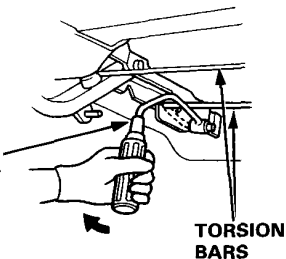
●: Clip locations ,3



●: Clip locations ,4



TORSION BAR ASSEMBLY TOOL



Adjust the torsion bars fore or aft with the torsion bar assembly tool as shown.



○ = Normal position
 ● = Higher tension

ALIGNMENT:

- Adjust the trunk lid fit to the trunk lid opening by moving the striker.
- Turn the trunk lid edge cushions as necessary, to make the trunk lid fit flush with the body at the rear and side edges.
- The trunk lid hinges can be adjusted fore and aft by using the elongated holes.

Opener and Opener Cables

Replacement

Installation is the reverse of the removal procedure.

NOTE:

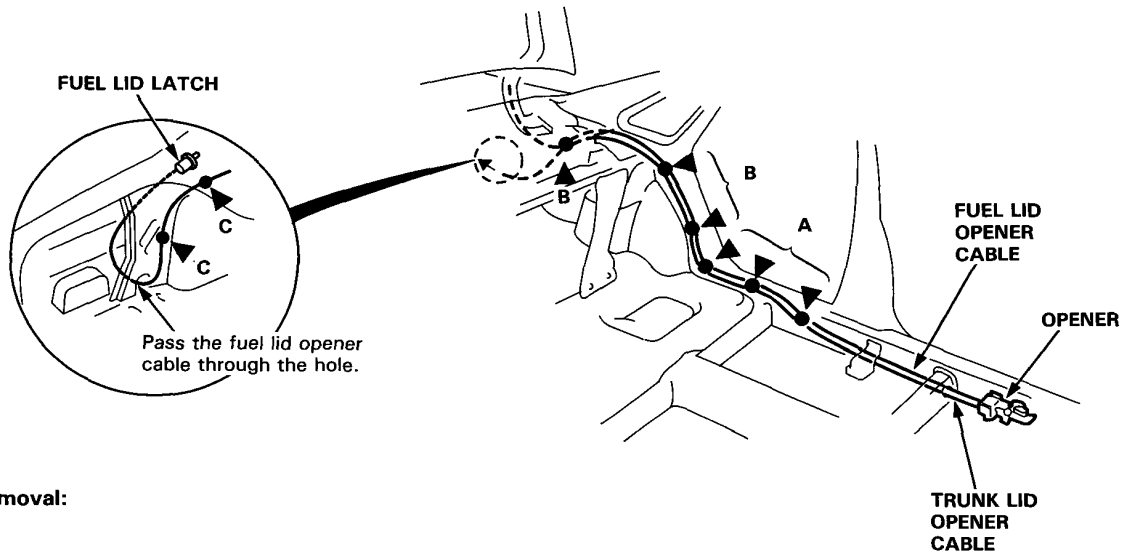
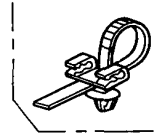
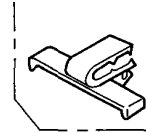
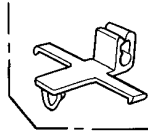
- Take care not to bend the fuel lid and trunk lid opener cables.
- Make sure the trunk lid and fuel lid opener cables are routed and connected properly.
- Check the fuel lid and trunk lid locks operation.

▶ : Cable clip locations

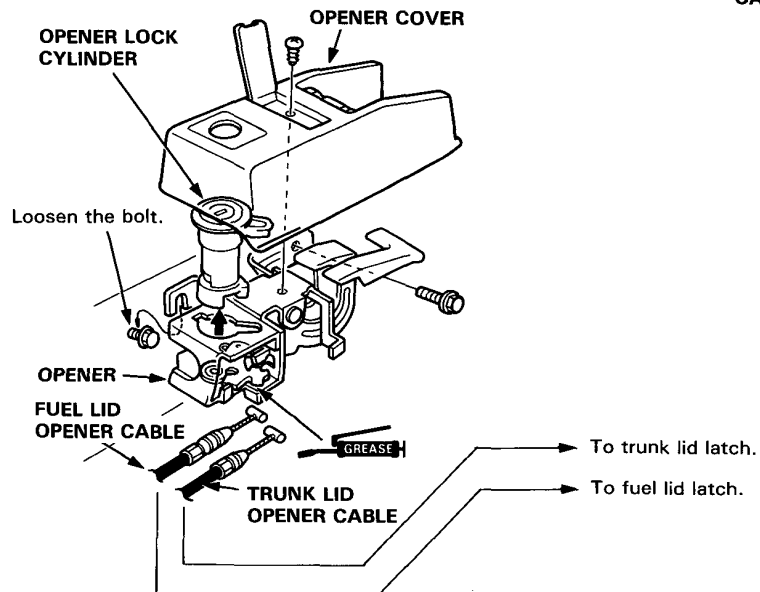
A ▶ ,3

B ▶ ,3

C ▶ ,2



Opener removal:



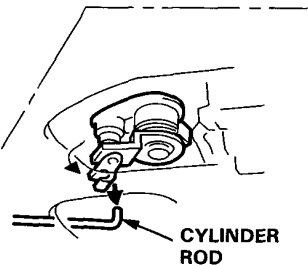
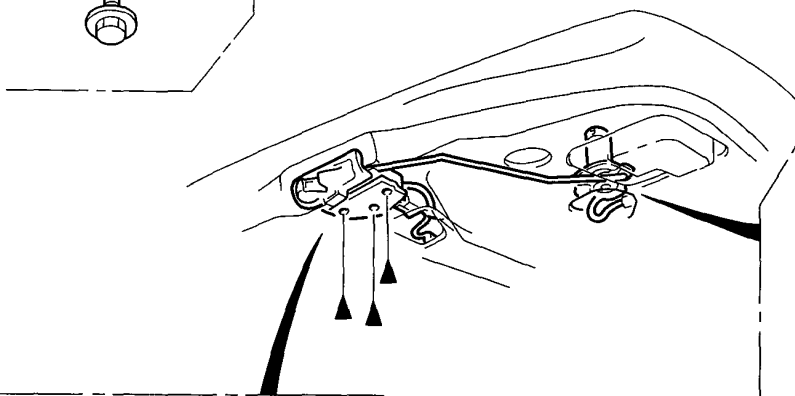


Trunk Lid Latch/Fuel Lid Latch

Replacement

Trunk lid latch removal:

▲: Bolt locations ,3



CYLINDER ROD

TRUNK LID OPENER CABLE

CYLINDER ROD

TRUNK LID LATCH

LATCH COVER

SECURITY LATCH SWITCH
Be careful not to damage.

GREASE

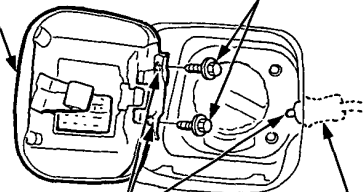
SECURITY CYLINDER SWITCH
Be careful not to damage.

LOCK CYLINDER

Fuel lid latch removal:

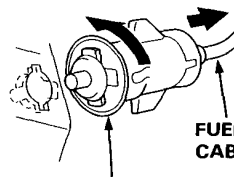
FUEL LID

6 x 1.0 mm 10 N·m (1.0 kg·m, 7.2 lb-ft)



FUEL LID LATCH

GREASE



FUEL LID OPENER CABLE

FUEL LID LATCH
Remove the fuel lid latch by turning it 90°

Installation is the reverse of the removal procedure.

NOTE:

- Take care not to bend the opener cables.
- Make sure the fuel lid fits flush with the body.
- Make sure the trunk lid and fuel lid locks securely.
- Make sure the fuel lid and trunk lid open properly.

Front Grille/License Plate Trim

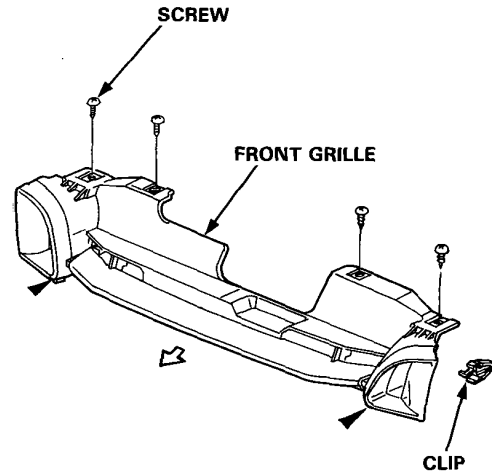
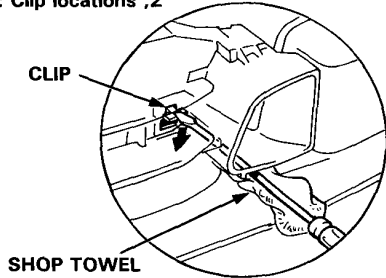
Front Grille Replacement

NOTE: Take care not to scratch the front grille.

1. Remove the front grille by removing the screws and pry the clips on each side with a flat tip screwdriver as shown.
2. Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

▶: Clip locations ,2



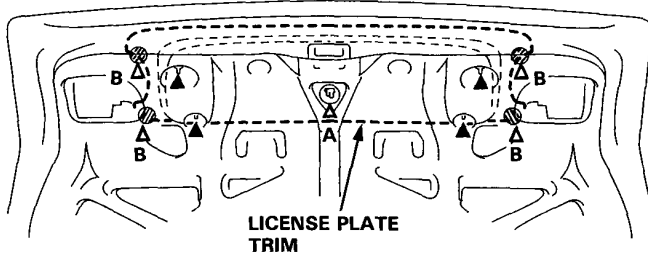
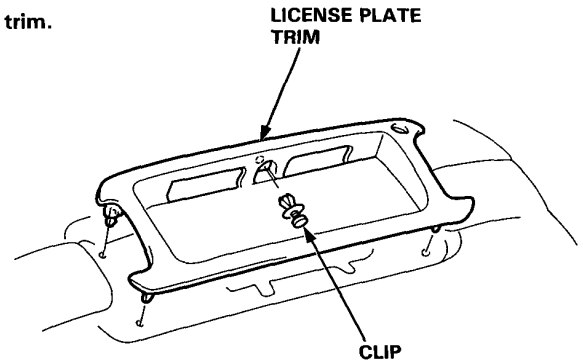
License Plate Trim Replacement

CAUTION: Wear gloves to remove and install the license plate trim.

NOTE: Take care not to scratch the body.

1. Remove the nut and clips.
NOTE: Take care not to drop the nut inside the trunk lid.
2. Lift and remove the license plate trim.
3. Installation is the reverse of the removal procedure.

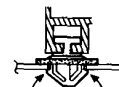
NOTE: If necessary, replace any damaged clips.



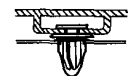
▲: Nut locations ,4



△: Clip locations
A △ Clip ,1



B △ Clip ,4



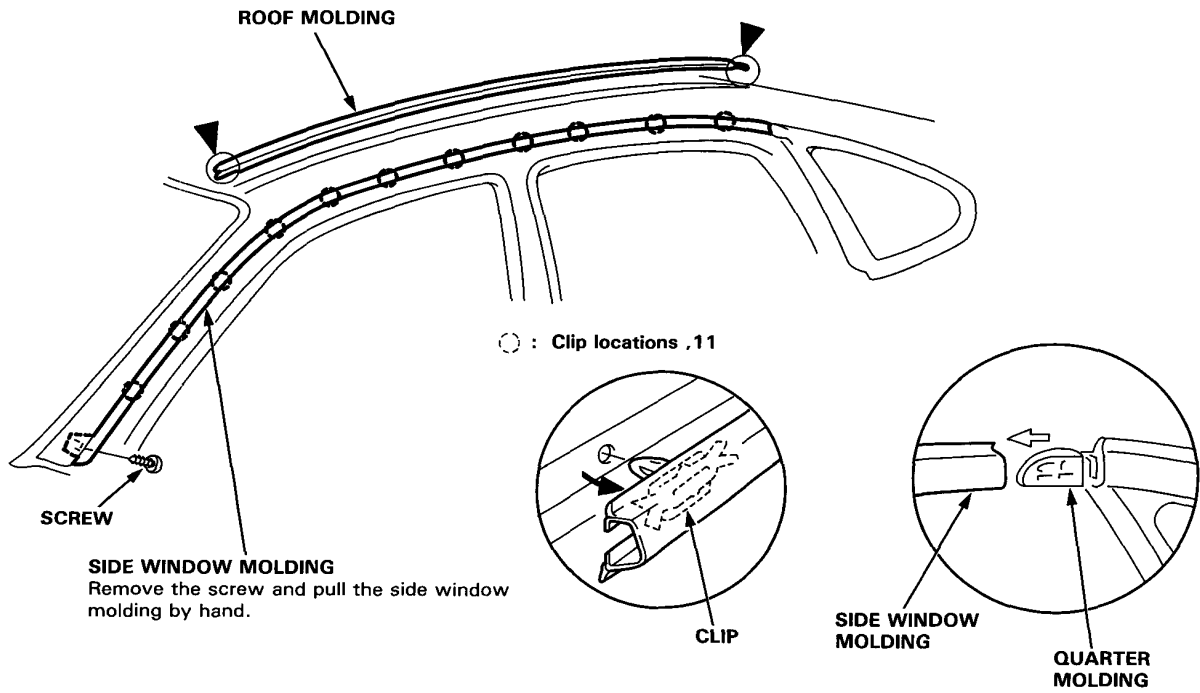
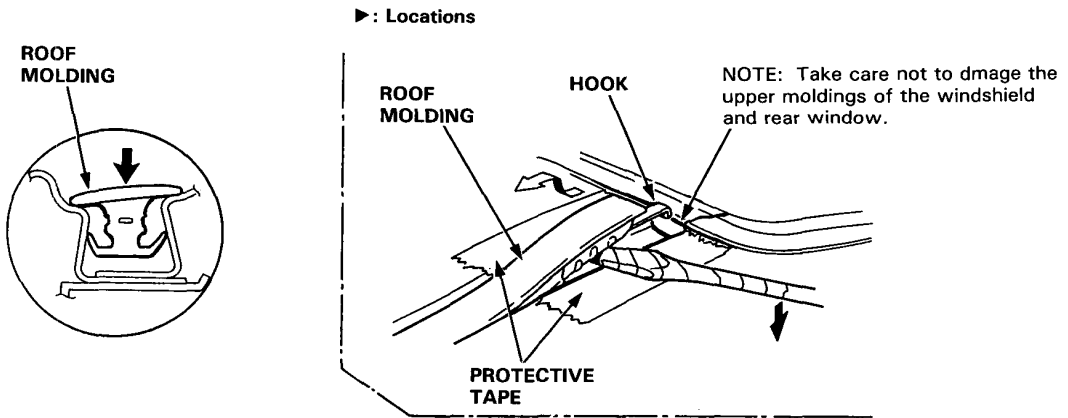


Roof Molding/Side Window Moldings

Replacement

CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

NOTE: Take care not to bend the roof molding, side molding and body.



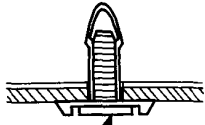
Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

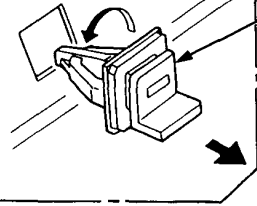
Side Sill Panel

Replacement

►: Clip locations ,9



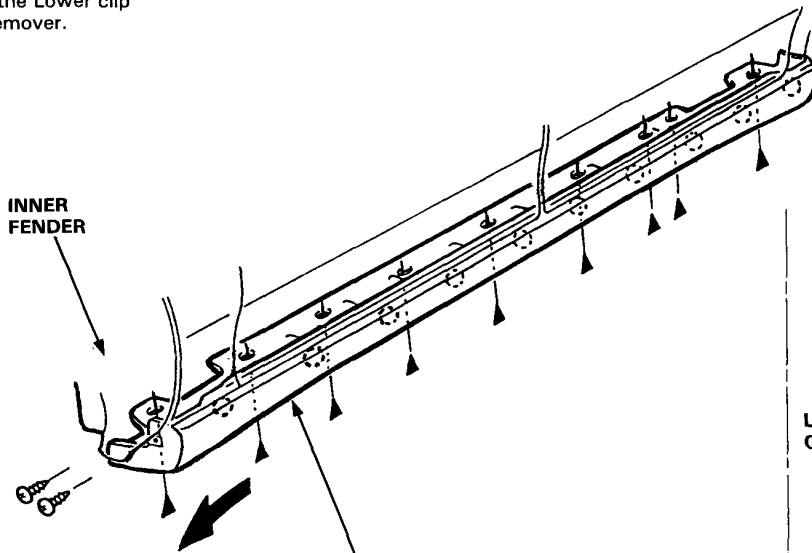
○: Clip locations ,10



SIDE CLIP

Remove the side clips from the body by turning them 45°

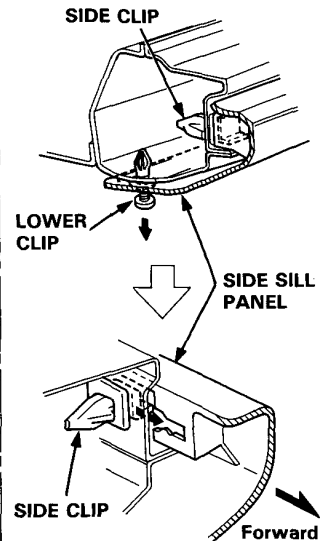
NOTE: Loosen the screw, then remove the Lower clip using a clip remover.



INNER FENDER

SIDE SILL PANEL

Remove the lower clips, then remove the side sill panel by sliding it forward.



NOTE: When removing the side sill panel, the side clips will stay in the body.

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 car.

NOTE:

- Take care not to twist the side sill panel.
- If necessary, replace any damaged side and lower clips.



Door Moldings

Replacement

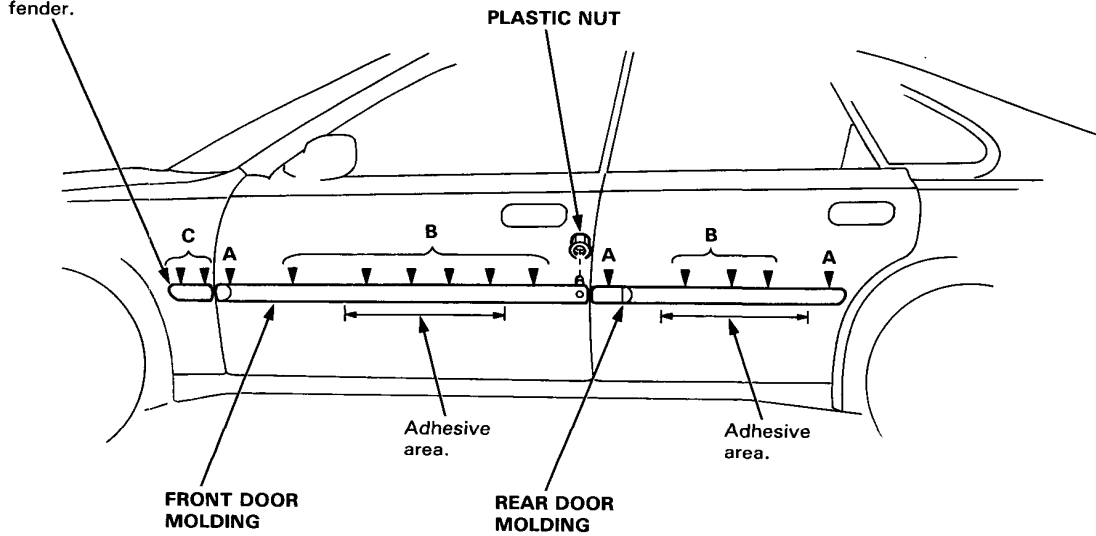
CAUTION: When prying with a flat tip screwdriver, wrap it with protective tape to prevent damage.

NOTE:

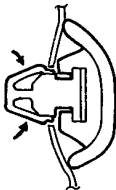
- To remove the door molding, remove the door panel and plastic cover.
- Take care not to bend the door moldings.
- Before reassembling, clean the door bonding surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- The steel core in the door molding cannot be restored to its original shape once it is bent. Replace door molding when the steel core is bent.

FRONT SIDE MOLDING

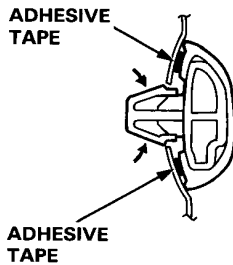
First remove the inner fender.



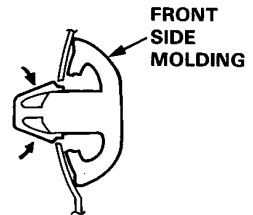
▼: Clip locations
A ▼ ,3



B ▼ ,9



C ▼ ,2



Installation is the reverse of the removal procedure.

NOTE: If necessary, replace any damaged clips.

(cont'd)

Door Moldings

Replacement (cont'd)

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

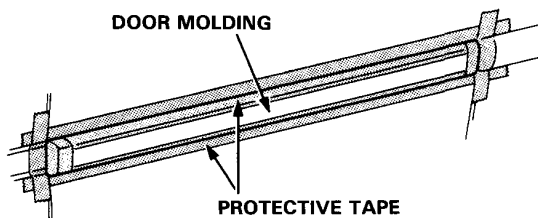
Tools:

- 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.

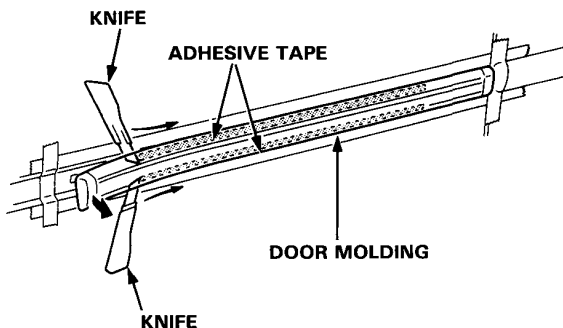
Door molding removal:

1. Remove the door panel and pull back the plastic cover (see pages 20-5, 6, 14, 15).
2. Apply protective tape on and around the molding.



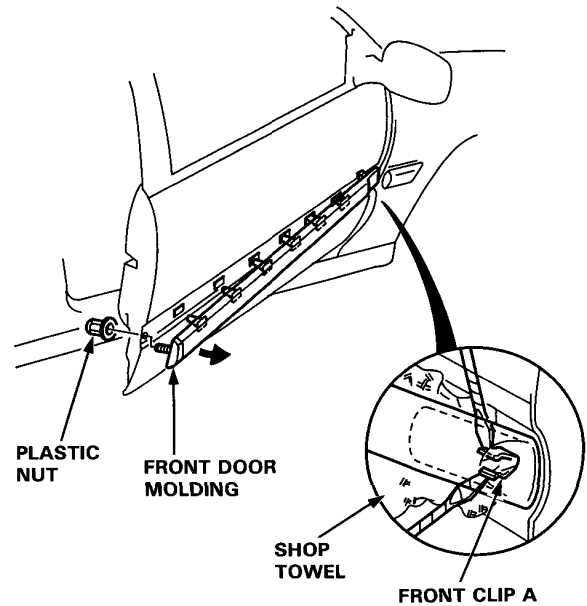
3. Release the clips from inside of the door. Carefully cut the adhesive tape with a knife or cutter while pulling the edge of the molding away from the door as shown.

NOTE: Take care not to scratch or bend the molding.



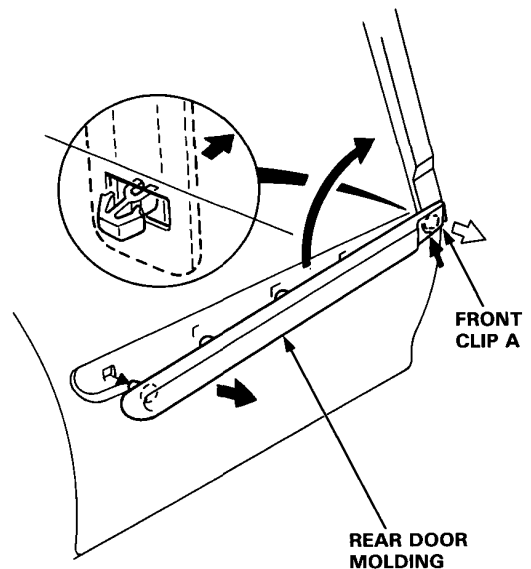
Front door molding:

Detach the front clip A from the outside.



Rear door molding:

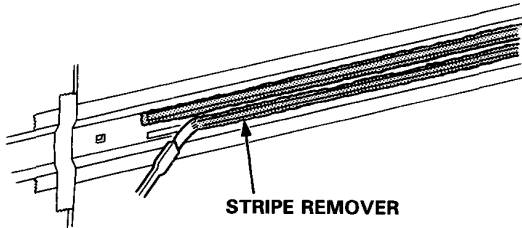
Remove the front clip A by turning it 90°.





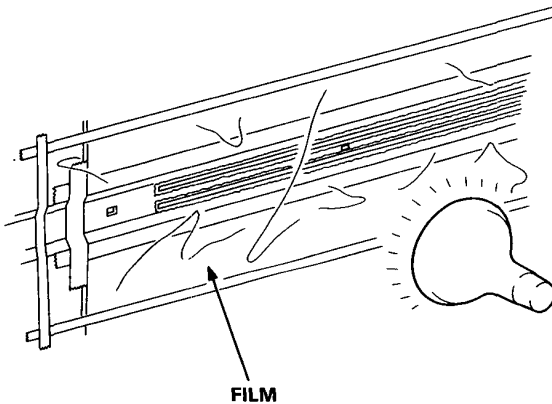
Adhesive tape residue removal:

4. Apply the stripe remover evenly to the bonding surface of the door.

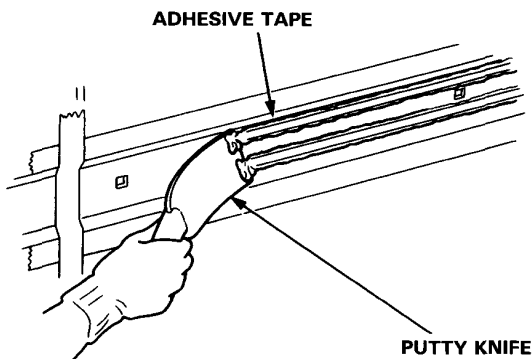


5. Cover the bonding surface of the door with a film, then heat to 40–50°C (104–122°F) for 5–10 minutes with an infrared dryer.

NOTE: Use care when heating to prevent deformation of the door.



6. Scrape the adhesive tape with a putty knife.



7. For removal of adhesive tape residue, follow-up with stripe adhesive remover, then scrape the adhesive tape with a putty knife.

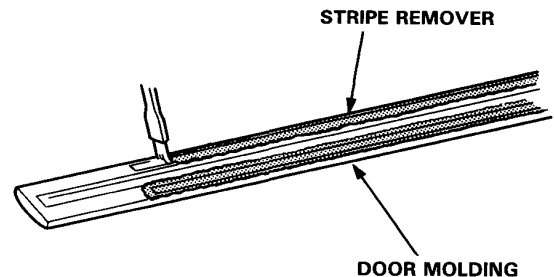
8. Peel off the protective tape, then clean the bonding surface with a sponge dampened in alcohol.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.

9. Remove the clips from the molding.

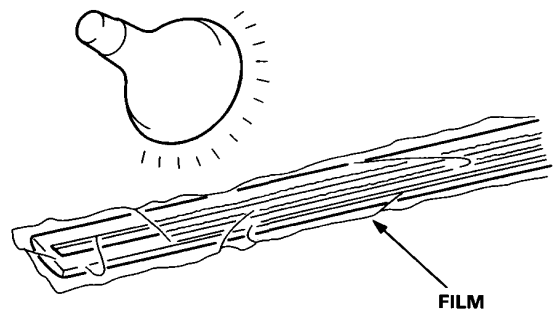
NOTE: If necessary, replace any damaged clips.

10. Apply the stripe remover evenly to the bonding surface of the molding.



11. Wrap the molding with film, then heat to 40–50°C (104–122°F) for 5–10 minutes with an infrared dryer.

NOTE: Use care when heating to prevent deformation of the molding.

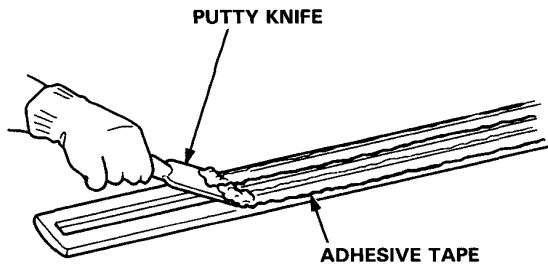


(cont'd)

Door Molding

Replacement (cont'd)

12. Scrape the adhesive tape with a putty knife.



13. For removal of adhesive tape residue, follow-up with stripe adhesive remover, then scrape the adhesive tape with a putty knife.

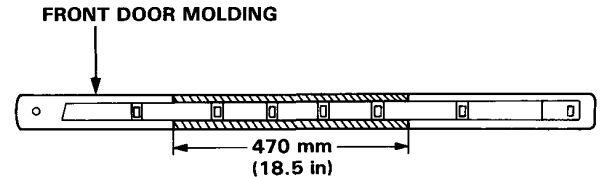
14. Peel off the protective tape, then clean the molding with a sponge dampened in alcohol.

NOTE: Make sure the bonding surface is kept free of water, oil and grease.

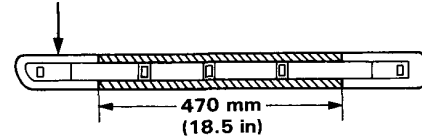
Door molding installation:

15. Glue the new adhesive tape to the moldings as shown.

 : Adhesive tape locations



REAR DOOR MOLDING



5 mm (0.2 in)

NEW ADHESIVE TAPE
Thickness: 1.2 mm (0.05 in)

16. Install the clips on the molding.
17. 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.

18. 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.

19. Reassemble all removed parts.



Rear Emblems

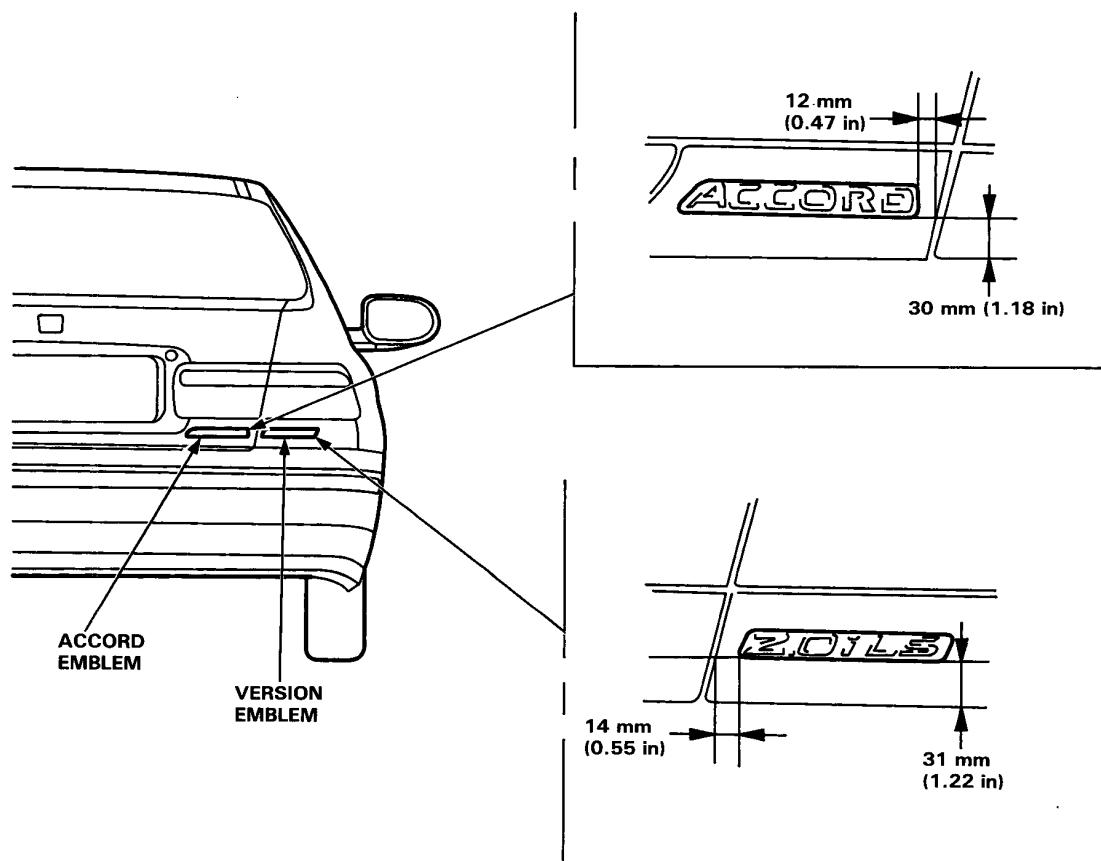
Installation

Apply the rear emblems where shown.

NOTE:

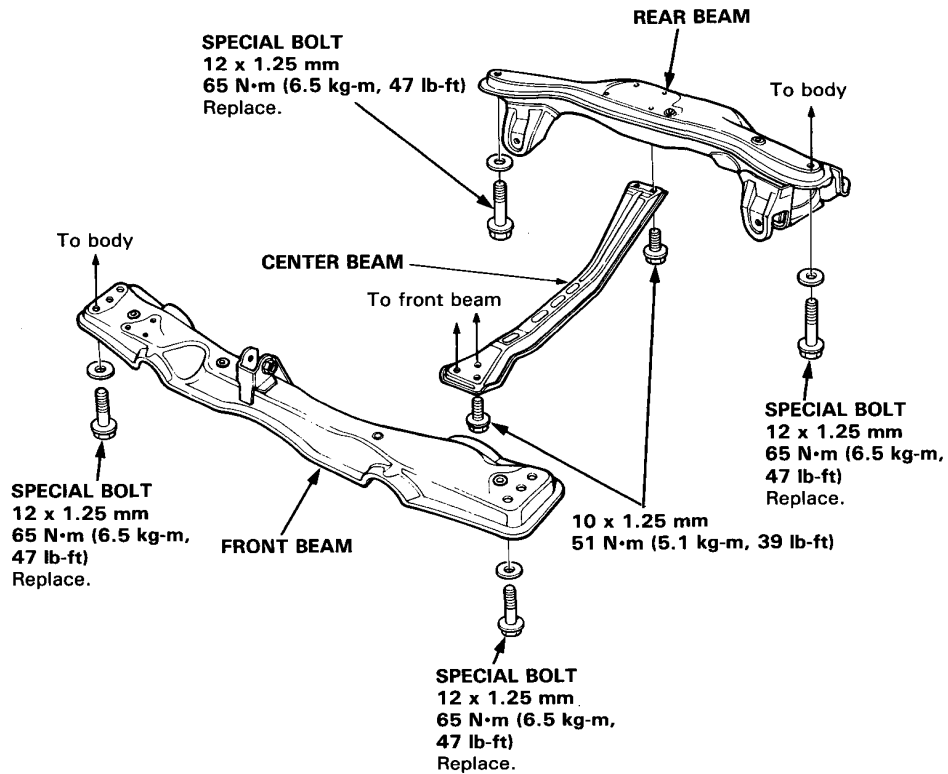
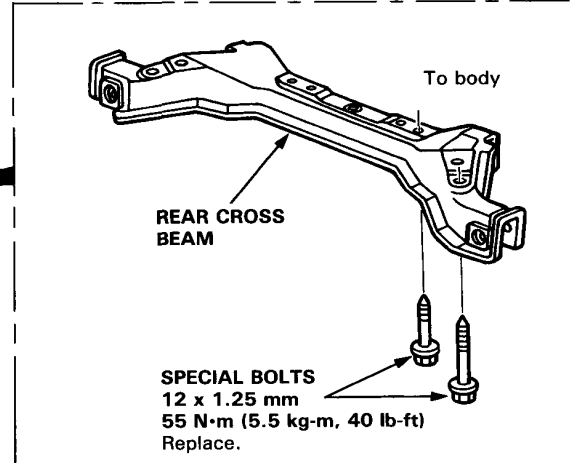
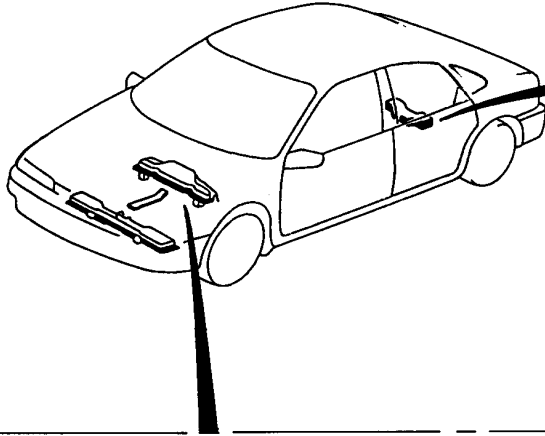
- Before applying, clean the body surface with a sponge dampened in alcohol.
- After cleaning, keep oil, grease and water from getting on the surface.
- When applying, make sure there are no wrinkles in the emblems.

Attachment Points (Reference):



Sub-frame

Sub-frame Torque Sequence:

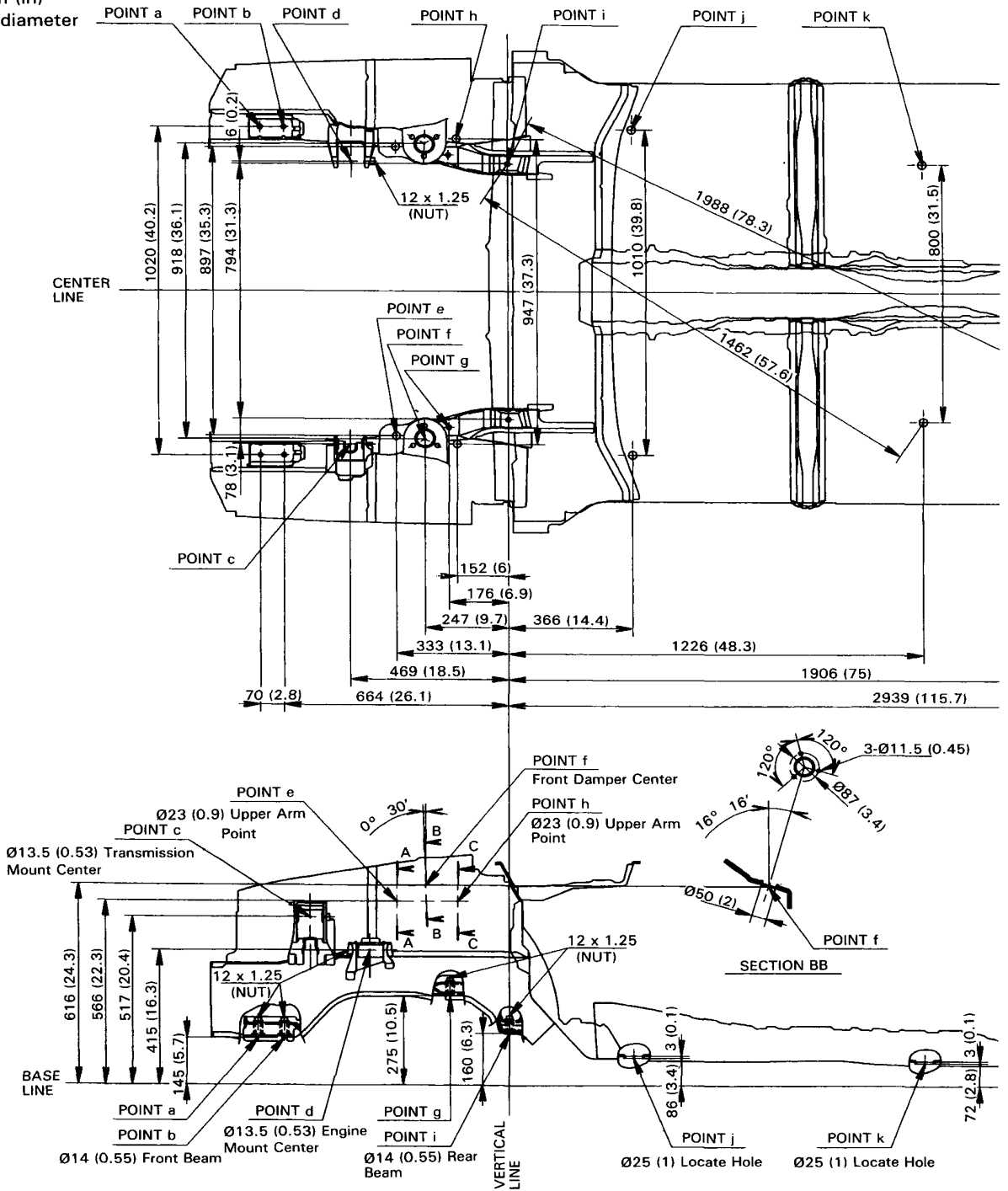


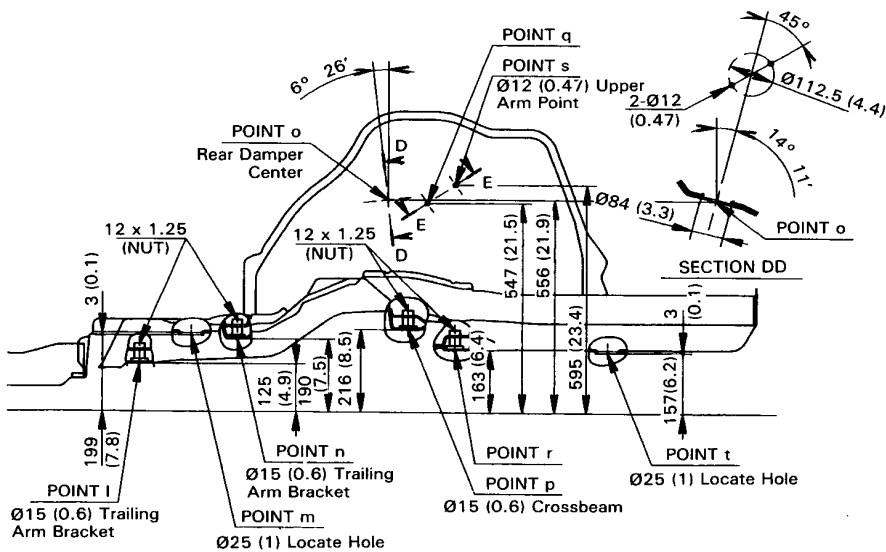
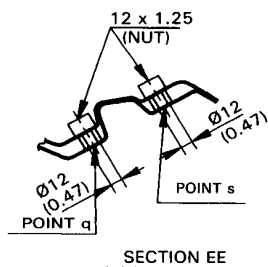
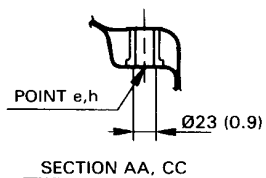
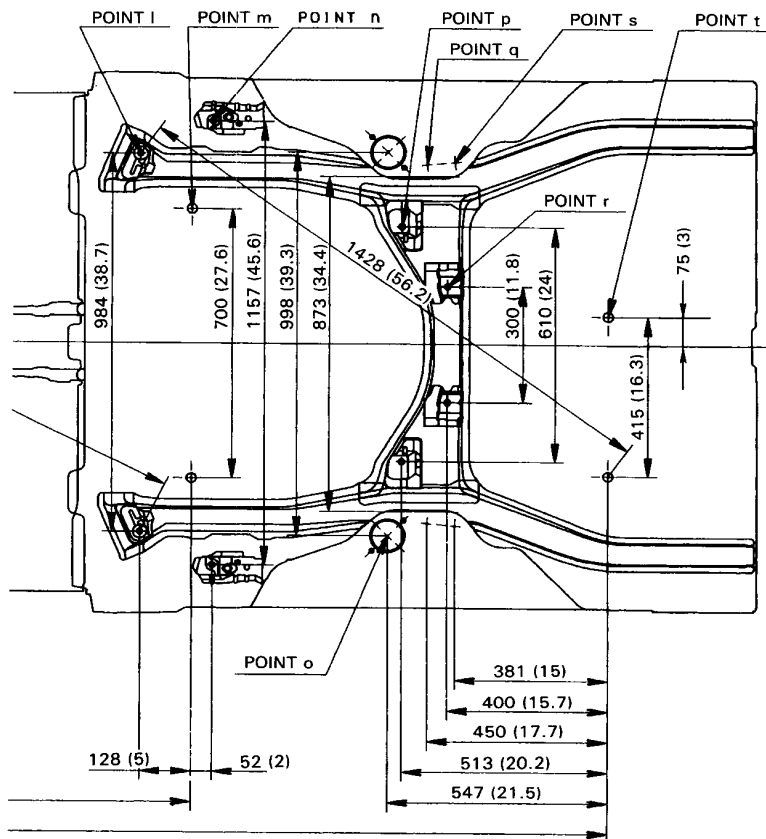
Frame Repair Chart

A/T Model

Unit: mm (in)

∅: Inner diameter

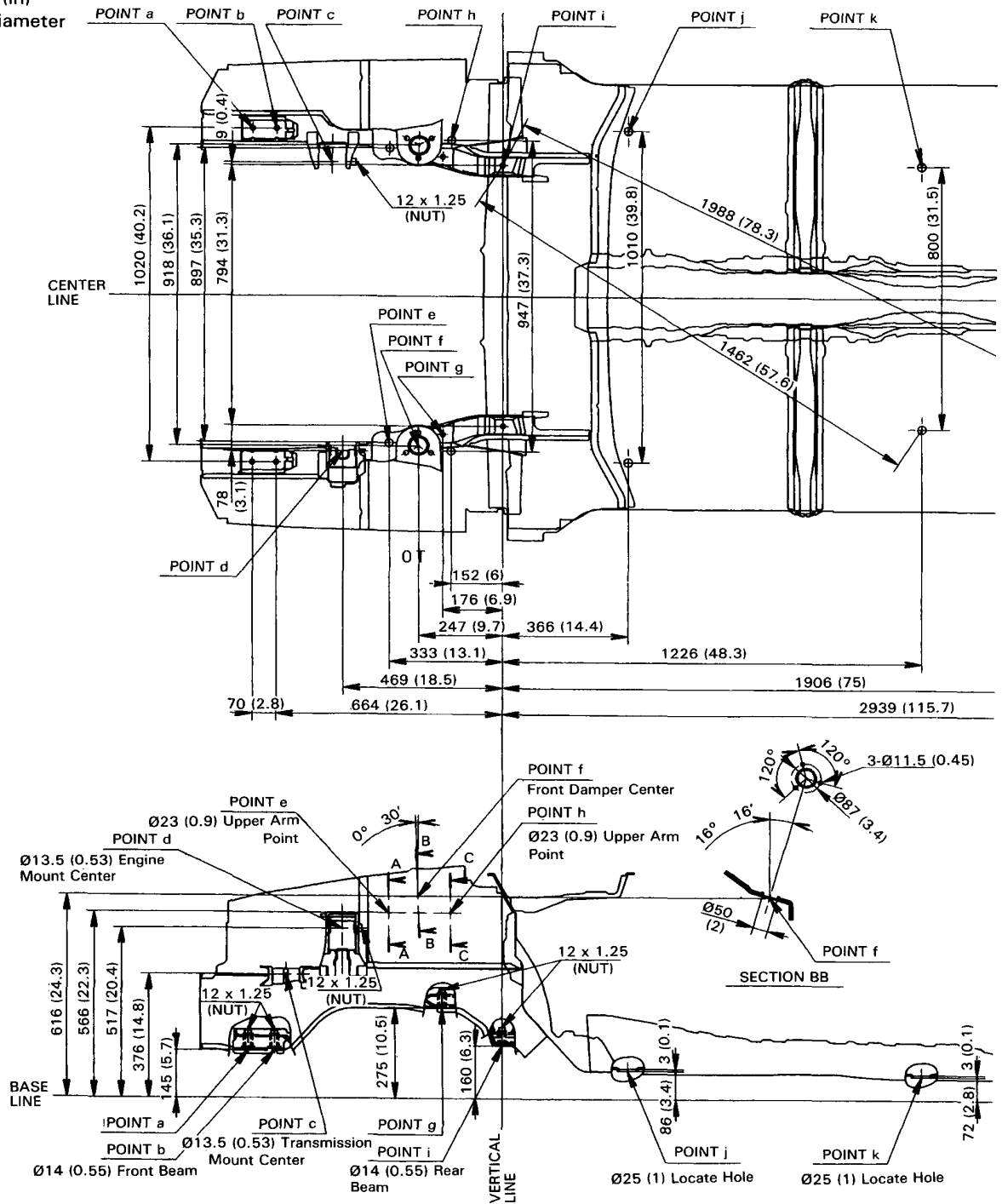


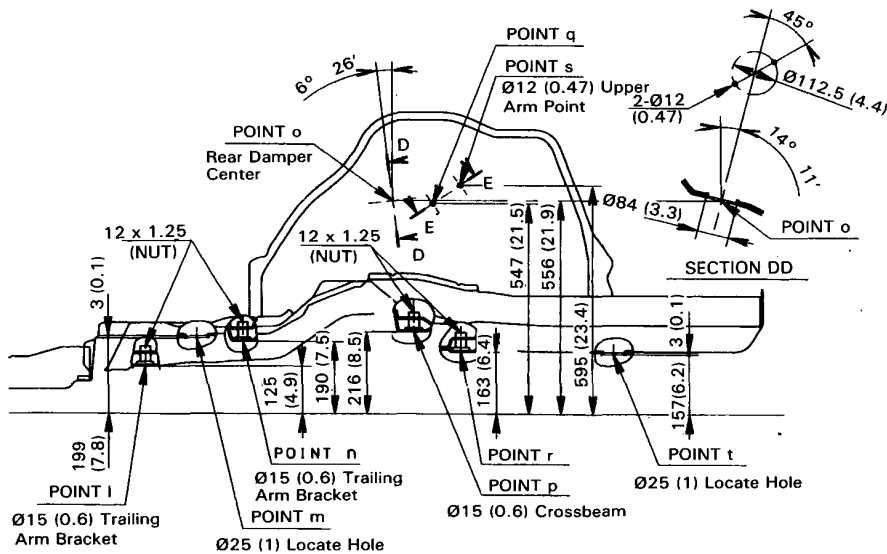
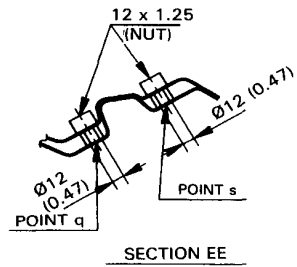
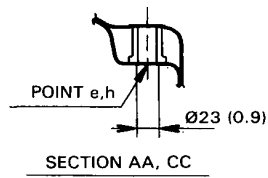
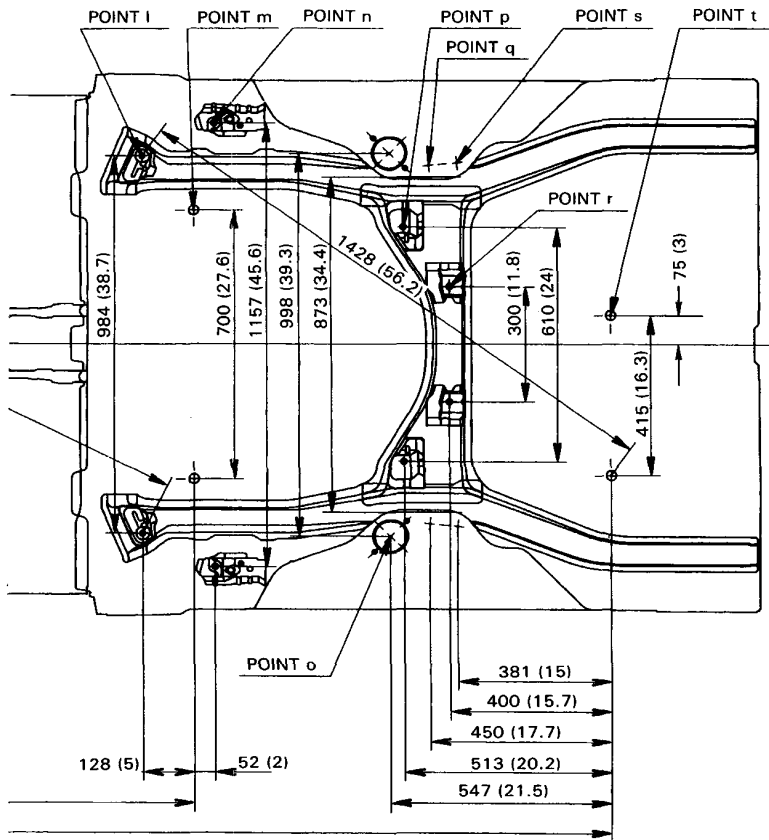


Frame Repair Chart

M/T Model

Unit: mm (in)
 ø: Inner diameter





Heater and Air Conditioning

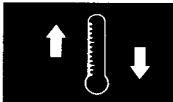
Heater	21-1
Air Conditioning	22-1

SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

Some models of the Accord include a driver's side airbag, located in the steering wheel hub, as part of a supplemental restraint system (SRS). Information necessary to safely service the SRS is included in this shop 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 only by an authorized HONDA dealer.

⚠ WARNING

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, could lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse/relay box may affect the SRS and must therefore be performed by an authorized HONDA dealer.

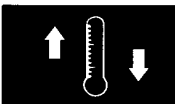




Heater

Illustrated Index	21-2	Cool Vent Cable	
Heater Door Positions	21-3	Replacement	21-23
Circuit Diagram	21-5	Heater Valve Cable	
*Troubleshooting		Adjustment	21-24
Symptom Chart	21-6	Air Mix Control Cable	
Heater Control Panel Input/ Output Signals	21-7	Adjustment	21-24
Flowchart		Mode Control Cable	
Blower Motor Speed	21-8	Adjustment	21-25
Blower Motor	21-10	Cool Vent Cable	
Recirculation Control Motor	21-13	Adjustment	21-25
Blower Unit		Recirculation Control Motor	
Replacement	21-15	Test	21-26
Overhaul	21-17	Relay	
*Heater Unit		Test	21-26
Replacement	21-18	Heater Fan Switch	
Overhaul	21-19	Test	21-27
Defroster Door Adjustment	21-20	Recirculation Control Switch	
Heater Control Panel		Test	21-27
Replacement	21-20		
Overhaul	21-21		
Air Mix Control Cable			
Replacement	21-22		
Mode Control Cable			
Replacement	21-23		

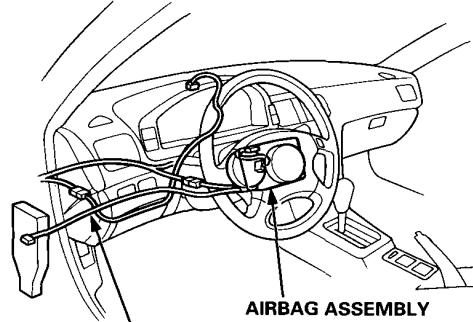
*: Read SRS precautions before working in these areas.



Illustrated Index

CAUTION:

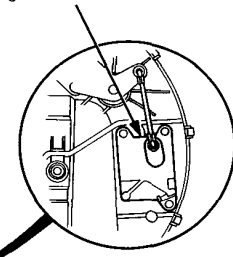
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



AIRBAG ASSEMBLY

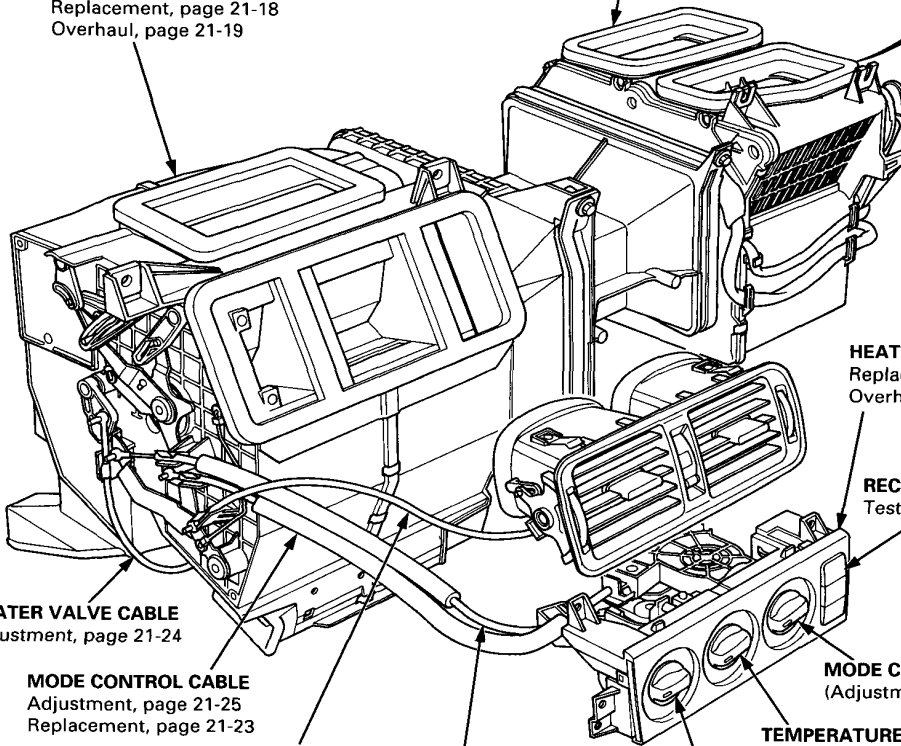
SRS MAIN HARNESS
(Covered with yellow outer insulation)

RECIRCULATION CONTROL MOTOR
Test, page 21-26



BLOWER UNIT
Replacement, page 21-15
Overhaul, page 21-17

HEATER UNIT
Replacement, page 21-18
Overhaul, page 21-19



HEATER CONTROL PANEL
Replacement, page 21-20
Overhaul, page 21-21

RECIRCULATION CONTROL SWITCH
Test, page 21-27

HEATER VALVE CABLE
Adjustment, page 21-24

MODE CONTROL CABLE
Adjustment, page 21-25
Replacement, page 21-23

COOL VENT CABLE
Adjustment, page 21-25
Replacement, page 21-23

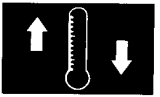
AIR MIX CONTROL CABLE
Adjustment, page 21-24
Replacement, page 21-22

HEATER FAN SWITCH
Test, page 21-27

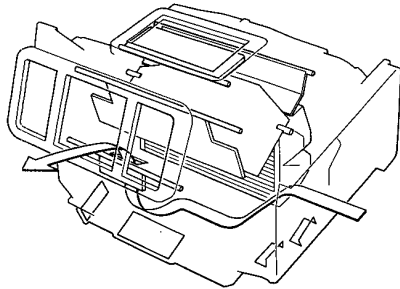
MODE CONTROL KNOB
(Adjustment: See MODE CONTROL CABLE)

TEMPERATURE CONTROL KNOB
(Adjustment: See AIR MIX CONTROL CABLE)

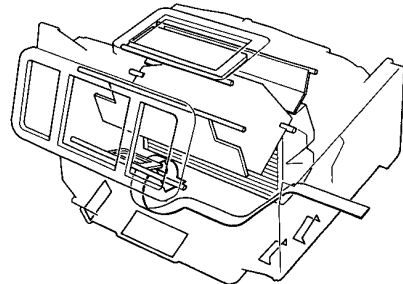
Heater Door Positions





(COOL VENT)

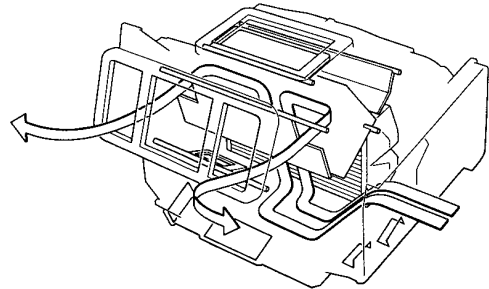
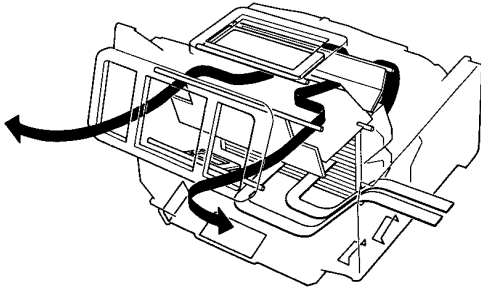


 HOT

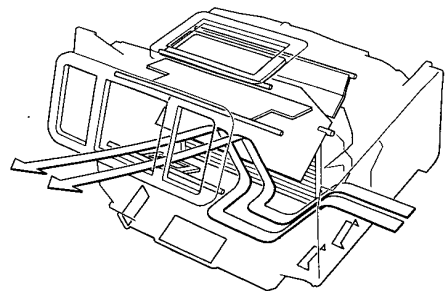
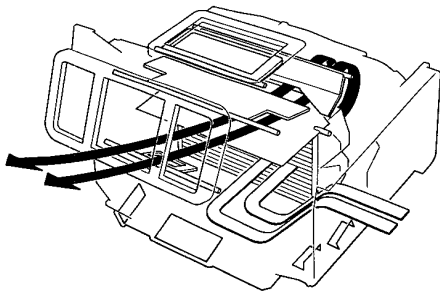


 COOL

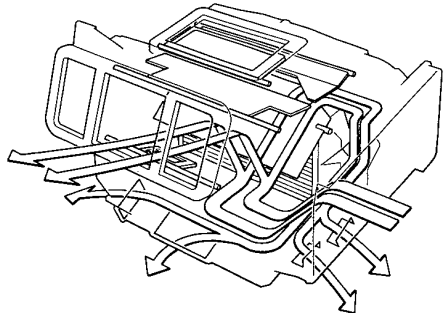
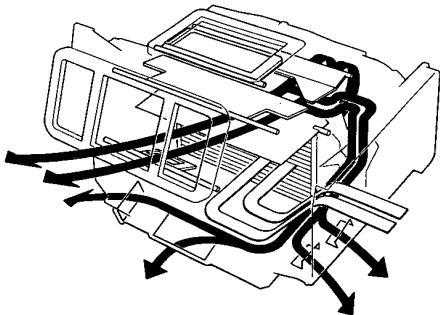
• Always blowing air each mode




(VENT)




(HEAT/VENT)

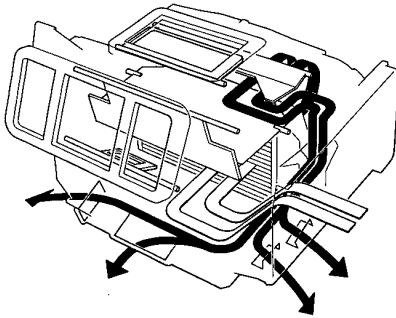


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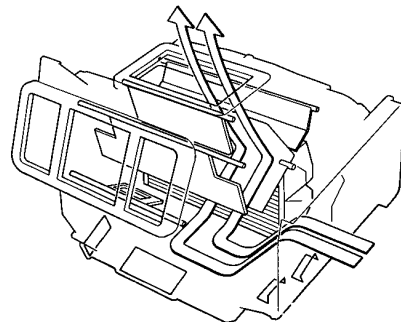
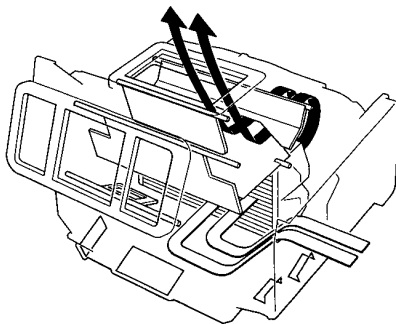
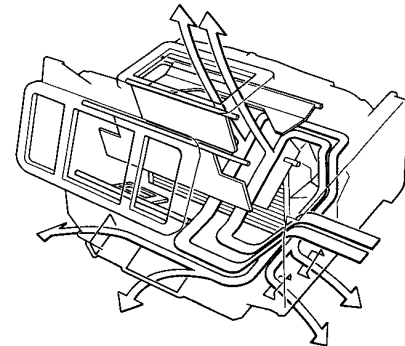
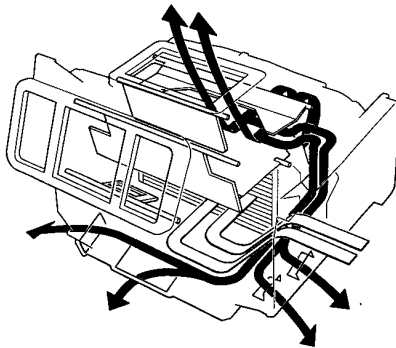
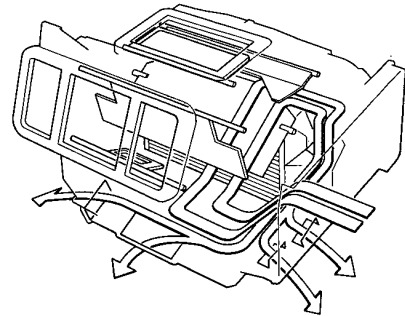
Heater Door Positions (cont'd)



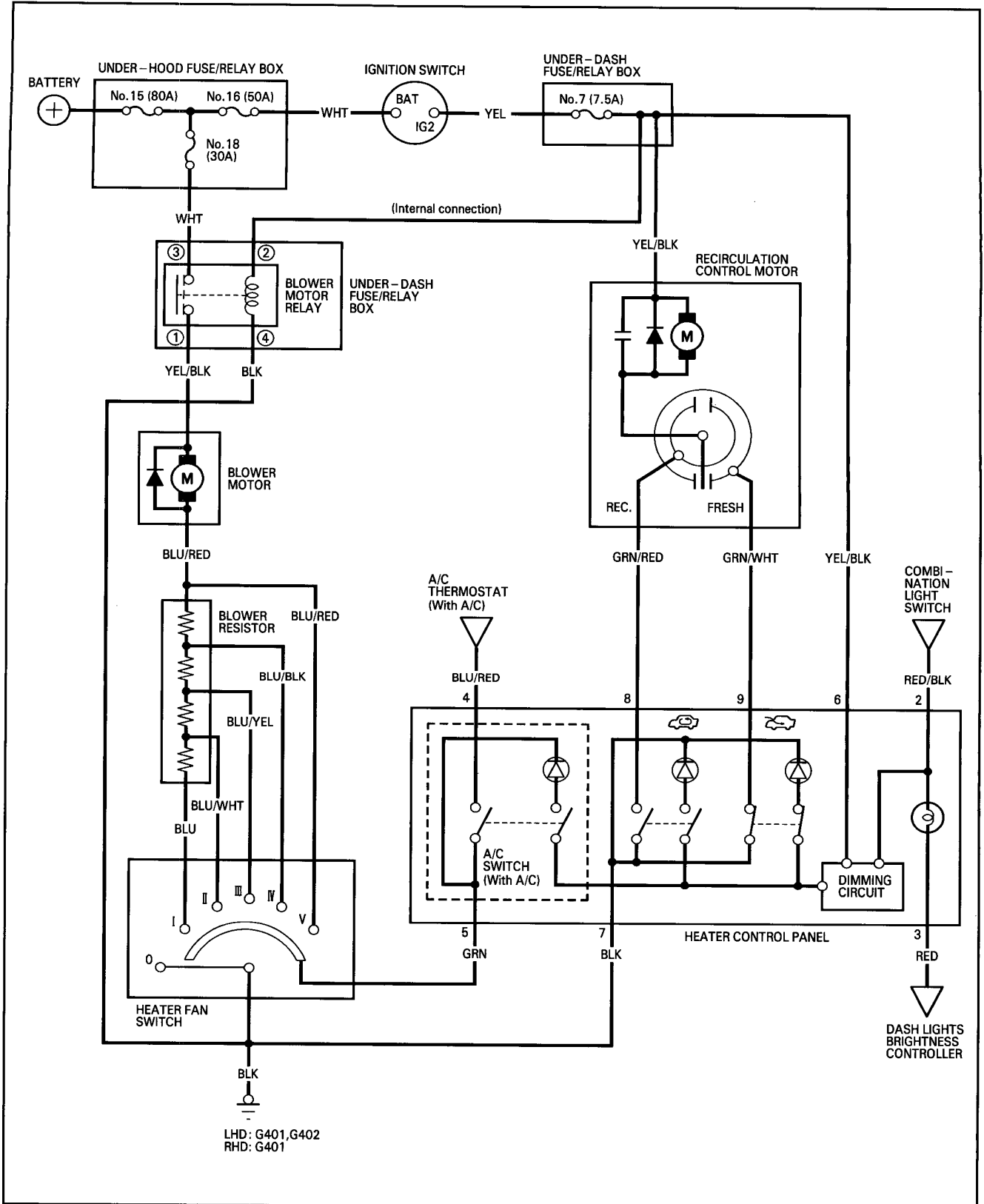
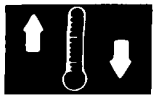
← HOT



← COOL



Circuit Diagram

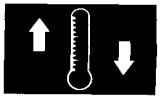


Troubleshooting

Symptom Chart

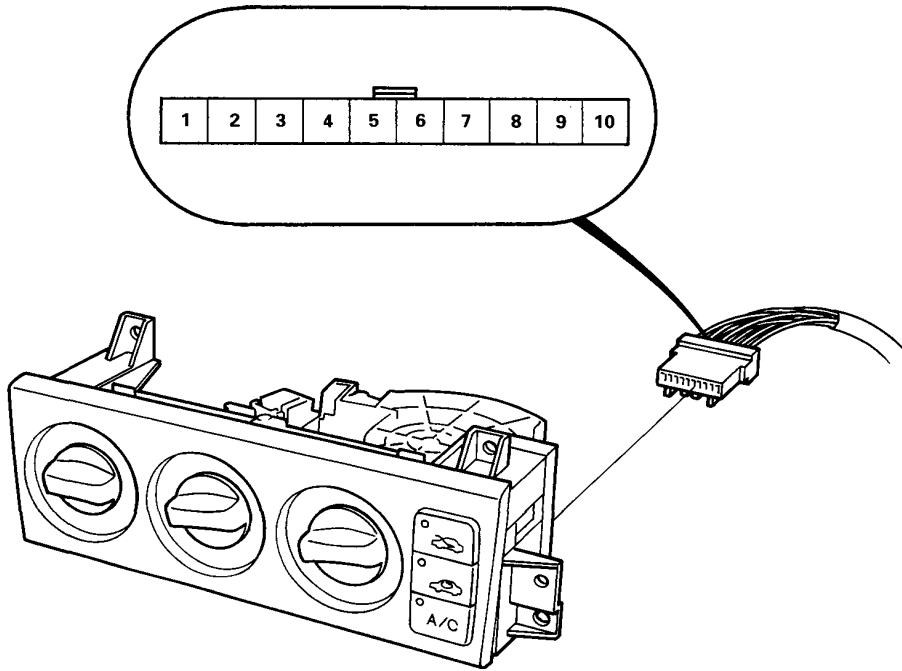
NOTE: Before troubleshooting, check the engine coolant level and allow the engine to warm up.

SYMPTOM		REMEDY
Hot air flow is low.	Blower motor runs, but one or more speeds are inoperative.	Follow the flowchart (see page 21-8).
	Blower runs properly.	Check for the following: <ul style="list-style-type: none"> • Clogged heater duct • Clogged blower outlet • Incorrect door position • Faulty temperature control
No hot air flow	Blower motor does not run at all.	Follow the flowchart (see page 21-10).
	Blower motor runs.	Check for the following: <ul style="list-style-type: none"> • Clogged heater duct • Clogged blower outlet • Clogged heater valve • Faulty air mix door • Heater valve cable adjustment (see page 21-24) • Air mix control cable adjustment (see page 21-24) • Faulty temperature control • Faulty thermostat (see section 10) • Clogged evaporator (with A/C) • Frozen evaporator (with A/C)
Mode control knob does not move.		<ul style="list-style-type: none"> • Check the heater door linkage and the heater unit. • Check the mode control cable adjustment (see page 21-25). • Faulty mode control
Recirculation control doors do not change between FRESH and REC.		Follow the flowchart (see page 21-13).



Heater Control Panel Input/Output Signals

View from wire side.



No.	Wire Color	Signal	No.	Wire Color	Signal
1			6	YEL/BLK	IG2 INPUT
2	RED/BLK	COMBINATION LIGHT SWITCH INPUT	7	BLK	GROUND OUTPUT
3	RED	BRIGHTNESS CONTROLLER OUTPUT	8	GRN/RED	RECIRCULATION INPUT
4	BLU/RED	A/C THERMOSTAT INPUT	9	GRN/WHT	FRESH INPUT
5	GRN	A/C SWITCH OUTPUT	10		

Troubleshooting

Flowchart — Blower Motor Speed

Blower motor runs, but one or more speeds are inoperative.

Turn the ignition switch ON, and the heater fan switch OFF.

Does the blower motor run?

YES **B** To page 21-9

NO
Turn the ignition switch OFF.

Disconnect the 5P connector from the blower resistor.

Measure the resistance between the No. ③ and No. ⑤ terminals of the blower resistor.

Is there approx. 2.31 Ω ?

NO **Replace the blower resistor.**

YES
Reconnect the 5P connector to the blower resistor.

Remove the heater control panel (see page 21-20).

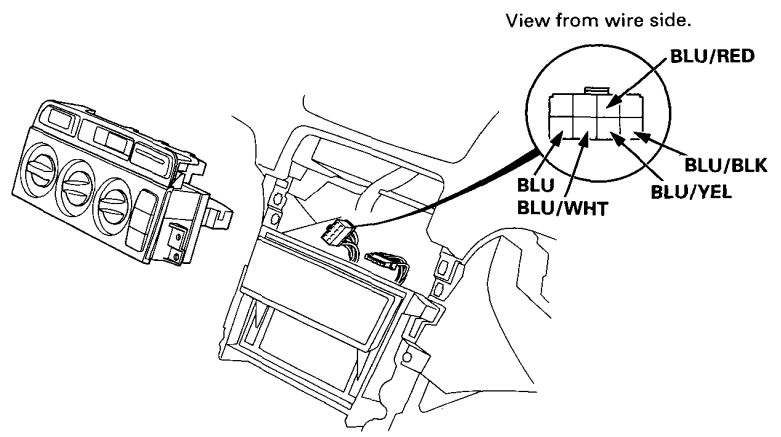
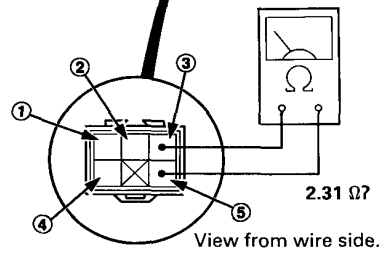
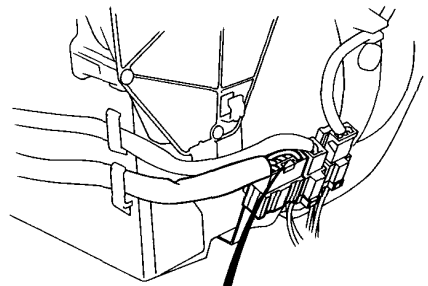
Disconnect the 8P connector from the heater fan switch.

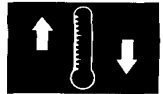
Turn the ignition switch ON.

At the 8P connector of the heater fan switch, ground each of these wires individually in the following order.

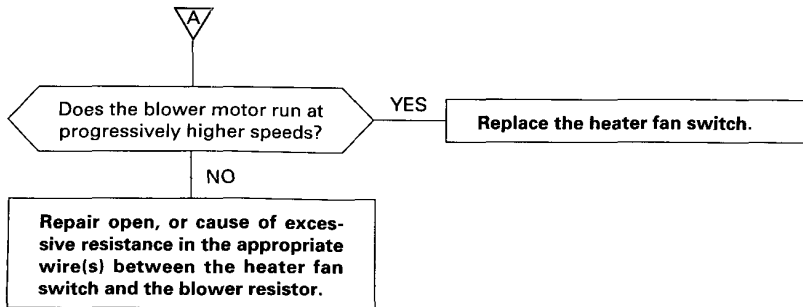
- BLU wire
- BLU/WHT wire
- BLU/YEL wire
- BLU/BLK wire
- BLU/RED wire

A
To page 21-9

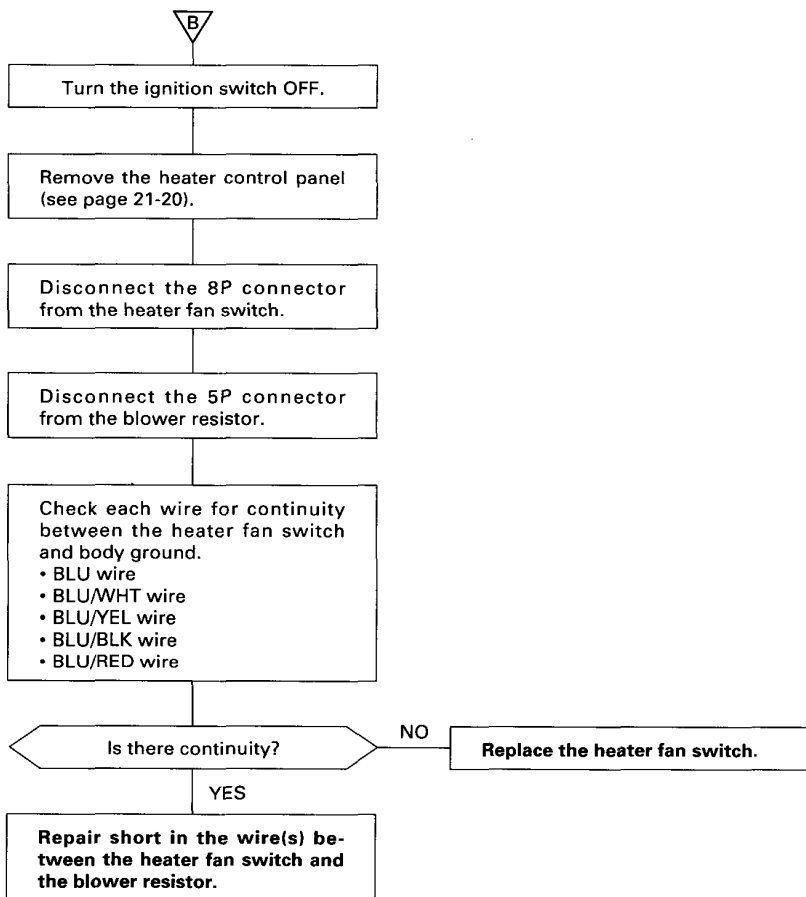




From page 21-8



From page 21-8



Troubleshooting

Flowchart — Blower Motor

Blower motor does not run at all.

Check the No. 7 (7.5 A) fuse in the under-dash fuse/relay box and the No. 18 (30 A) fuse in the under-hood fuse/relay box.

Are the fuses OK?

NO
Replace the fuse(s).

YES
Disconnect the 2P connector from the blower motor.

Turn the ignition switch ON.

Measure the voltage between the YEL/BLK wire terminal (+) and body ground (-).

Is there battery voltage?

NO
To page 21-12

YES
Turn the ignition switch OFF.

Connect battery power to the No. ① terminal and ground to the No. ② terminal.

Does the blower motor run?

NO
Replace the blower motor.

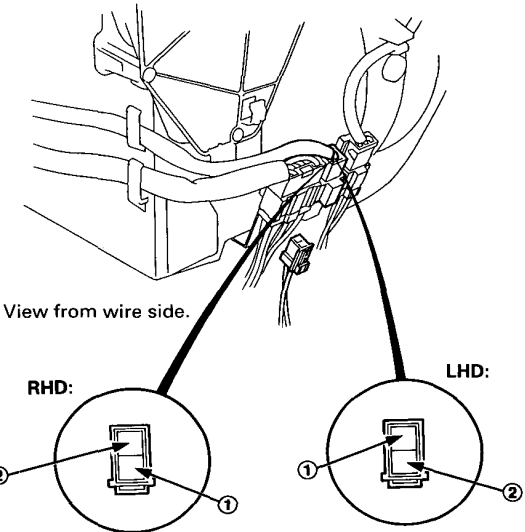
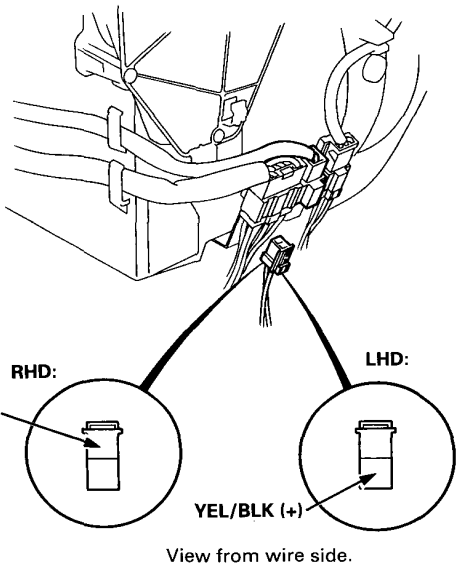
YES
Reconnect the 2P connector to the blower motor.

Remove the heater control panel (see page 21-20).

Disconnect the 8P connector from the heater fan switch.

Turn the ignition switch ON.

To page 21-11





From page 21-10

Measure the voltage between the BLU/RED wire terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLU/RED wire between the blower motor and the heater fan switch.

YES

Turn the ignition switch OFF.

Test the heater fan switch (see page 21-27).

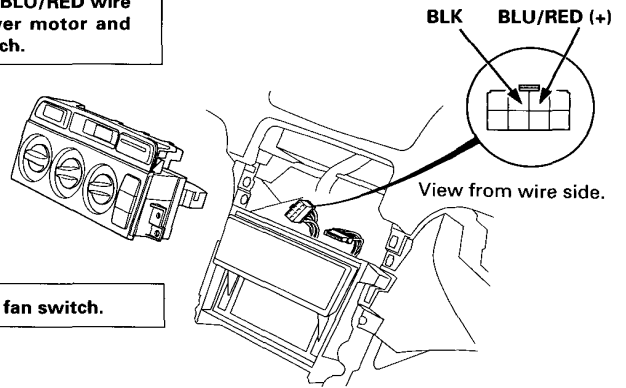
Is the heater fan switch OK?

NO

Replace the heater fan switch.

YES

Check for an open in the BLK wire between the heater fan switch and body ground. If the wire is OK, check for poor ground at G401 and G402 (LHD).



(cont'd)

Troubleshooting

Flowchart — Blower Motor (cont'd)

From page 21-10

Turn the ignition switch OFF.

Disconnect the blower motor relay from the under-dash fuse/relay box.

Test the blower motor relay (see page 21-26).

Is there relay OK?

NO

Replace the blower motor relay.

YES

Turn the ignition switch ON.

Measure the voltage between the No. ② terminal (+) and body ground (-).

Is there battery voltage?

NO

Replace the under-dash fuse/relay box.

YES

Turn the ignition switch OFF.

Measure the voltage between the No. ③ terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the WHT wire between the under-hood fuse/relay box and the under-dash fuse/relay box.

YES

Check for continuity in the BLK wire between the No. ④ terminal and body ground.

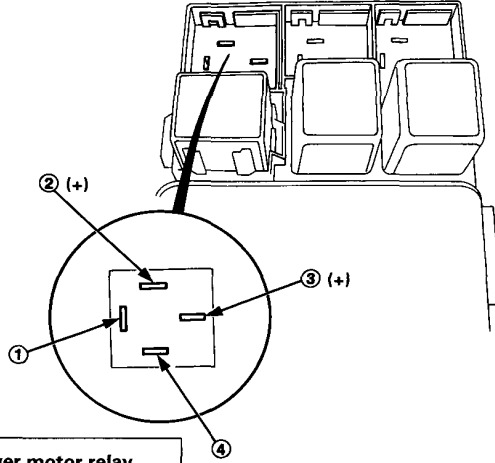
Is there continuity?

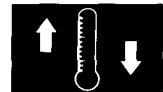
NO

Check for an open in the BLK wire between the under-dash fuse/relay box and body ground. If the wire is OK, check for poor ground at G401 and G402 (LHD).

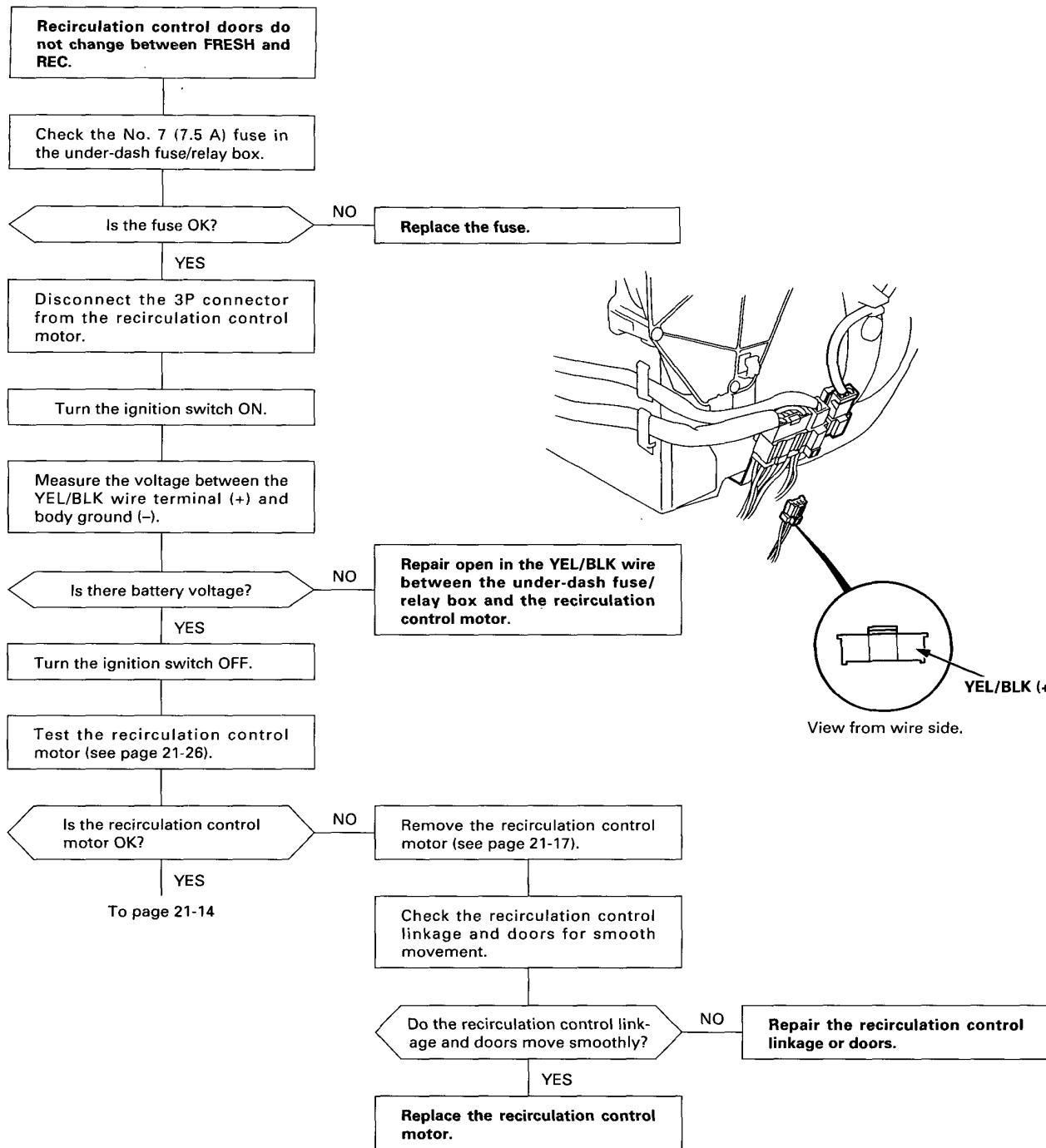
YES

Repair open in the YEL/BLK wire between the under-dash fuse/relay box and the blower motor.





Flowchart — Recirculation Control Motor



(cont'd)

Troubleshooting

Flowchart — Recirculation Control Motor (cont'd)

From page 21-13

Remove the heater control panel (see page 21-20).

Disconnect the 10P connector from the heater control panel.

Check for continuity in the GRN/WHT and GRN/RED wires between the heater control panel and the recirculation control motor.

Is there continuity?

NO

Repair open in the GRN/WHT and/or GRN/RED wire(s) between the heater control panel and the recirculation control motor.

YES

Check for continuity in the GRN/WHT and GRN/RED wires between the heater control panel and body ground.

Is there continuity?

YES

Repair short in the GRN/WHT and/or GRN/RED wire(s) between the heater control panel and the recirculation control motor.

NO

Check for continuity in the BLK wire between the heater control panel and body ground.

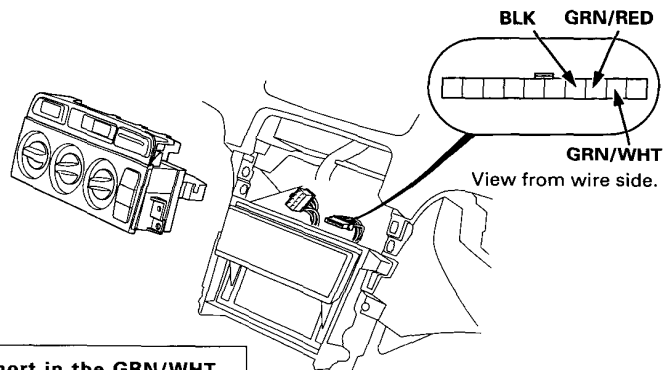
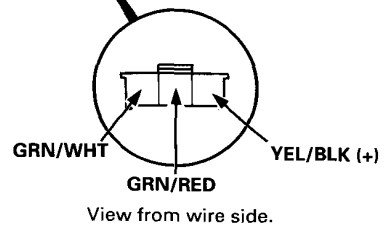
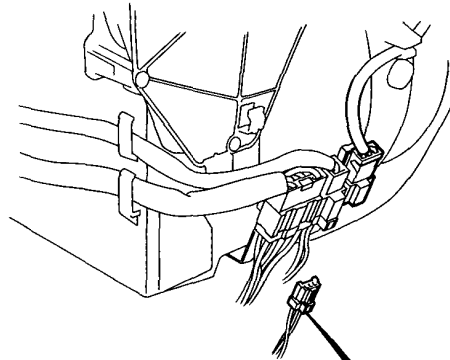
Is there continuity?

NO

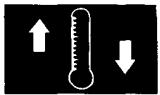
Repair open in the BLK wire between the heater control panel and body ground. If the wire is OK, check for poor ground at G401 and G402 (LHD).

YES

Replace the heater control panel.

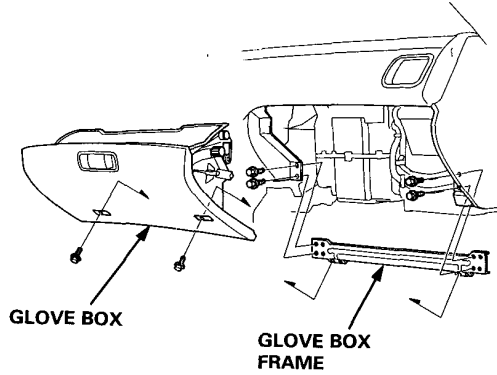


Blower Unit



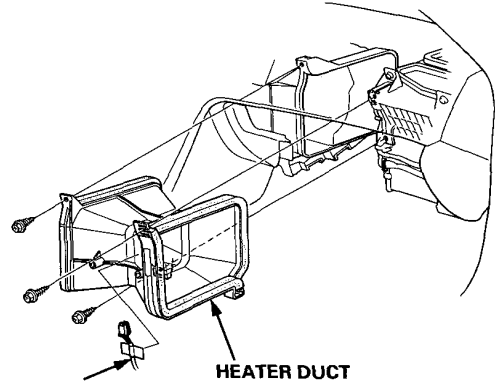
Replacement

1. Remove the two screws and the glove box.
2. Remove the four screws and the glove box frame.

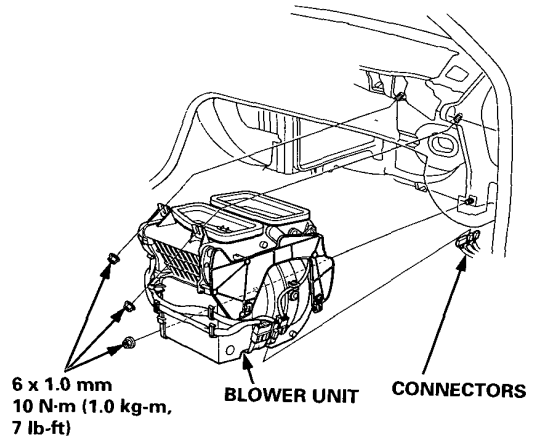


WITHOUT AIR CONDITIONING

- 3-a. Remove the A/C thermostat harness connector attached to the heater duct with tape. Then remove the three self-tapping screws and the heater duct.



- 3-b. Remove the three nuts, then disconnect the three remaining connectors and remove the blower unit.



(cont'd)

Blower Unit

Replacement (cont'd)

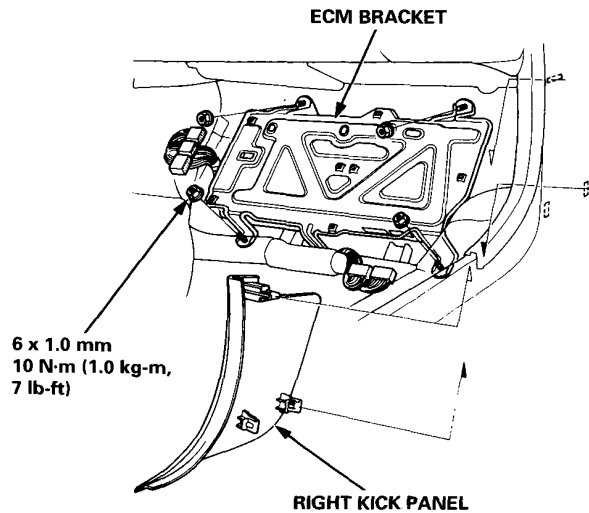
WITH AIR CONDITIONING

3-a. Remove the right kick panel and pull back the carpet.

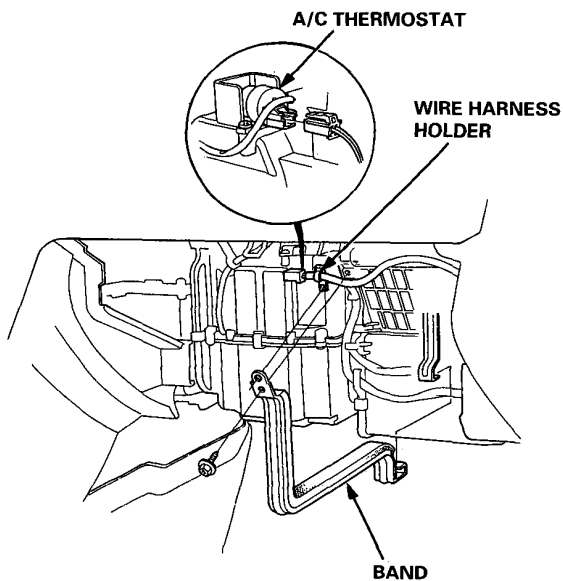
Remove the four nuts from the engine control module (ECM) bracket.

Disconnect the three connectors from the ECM and disconnect the two connectors from the transmission control module (TCM) (with A/T).

Remove the ECM and TCM (with A/T) together with the ECM bracket.

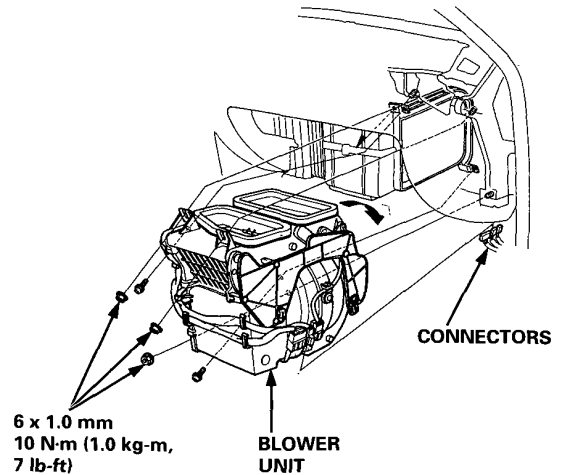


3-b. Disconnect the connector from the A/C thermostat and remove the wire harness holder from the band. Remove the self-tapping screw and the band.



3-c. Remove the two screws and the three nuts.

Disconnect the three remaining connectors, and pull the blower unit away from its mounts. "Roll" the front of it down as you remove it.



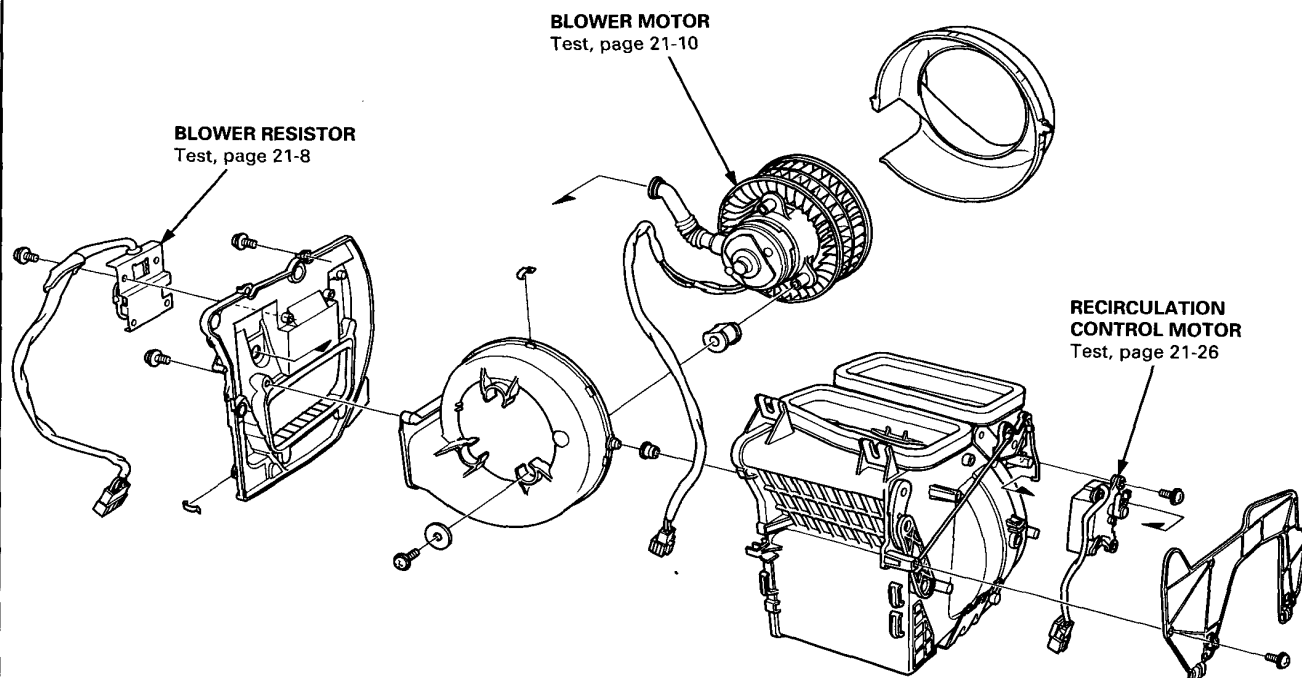
4. Install in the reverse order of removal, and make sure there are no air leaks.



Overhaul

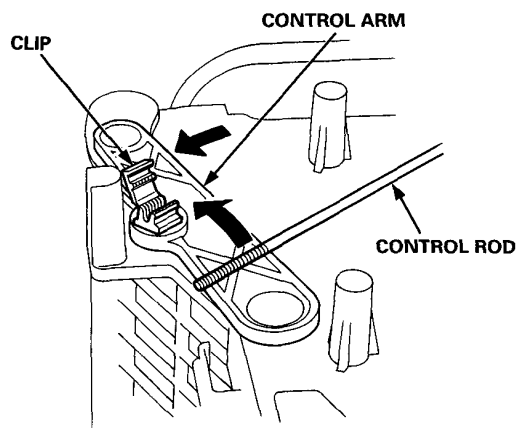
NOTE:

- Before reassembly, make sure that the recirculation control doors and linkage move smoothly without binding.
- When reattaching the recirculation control motor, make sure its positioning will not allow the recirculation control doors to be pulled too far. Attach the recirculation control motor and all linkage, then connect power and ground, and watch the movement of the recirculation control doors.



To adjust the control rod:

Connect the recirculation control motor connector to the main wire harness and turn the recirculation control switch to FRESH. Close the recirculation control door by turning the control arm as shown and holding it. Then connect the control rod to the clip.

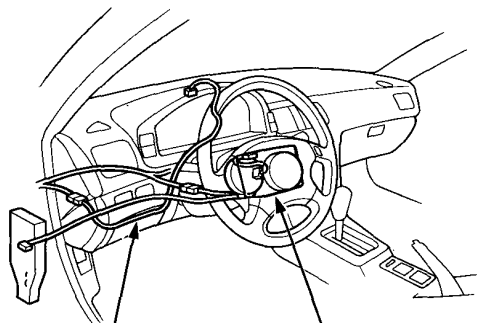


Heater Unit

Replacement

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS
(Covered with yellow outer insulation) AIRBAG ASSEMBLY

1. When the engine is cool, drain the engine coolant from the radiator (see section 10).

WARNING

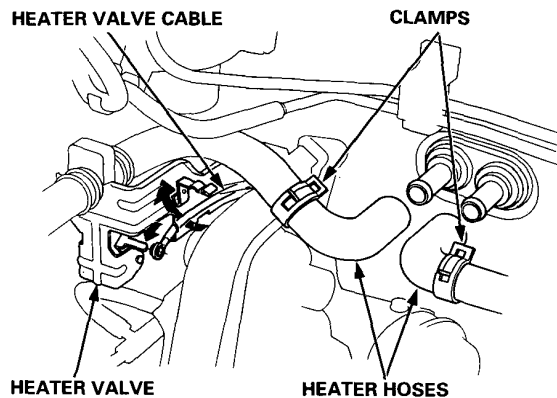
- Do not remove the radiator cap when the engine is hot; the engine coolant is under pressure and could severely scald you.
- Keep hands away from the radiator fan. The fan may start automatically without warning and run for up to 15 minutes, even after the engine is turned off.

2. Disconnect the heater hoses at the heater.

CAUTION: Engine coolant will damage paint. Quickly rinse any spilled engine coolant from painted surfaces.

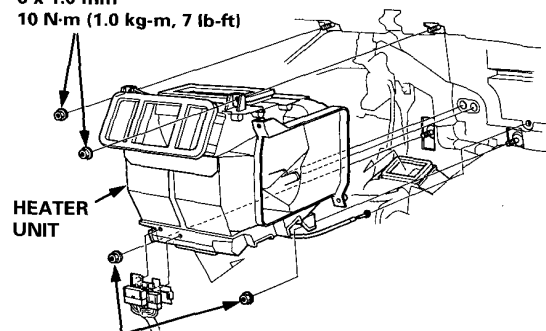
NOTE: Engine coolant will run out when the hoses are disconnected, drain it into a clean drip pan.

3. Disconnect the heater valve cable from the heater valve.



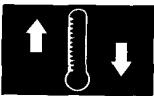
4. Remove the dashboard (see section 20).
5. Remove the heater duct (see page 21-15) or evaporator (see page 22-29).
6. Remove the connector holder from the heater unit.
7. Remove the four nuts, then remove the heater unit.

6 x 1.0 mm
10 N·m (1.0 kg·m, 7 lb·ft)



6 x 1.0 mm
10 N·m (1.0 kg·m, 7 lb·ft)

8. Install in the reverse order of removal, and:
 - apply sealant to the grommets.
 - do not interchange the inlet and outlet hoses. Make sure that the hose clamps are secure.
 - loosen the bleed bolt on the engine and refill the radiator and reservoir tank with the proper engine coolant mixture (see section 10). Tighten the bleed bolt when all the trapped air has escaped and engine coolant begins to flow from it.
 - connect all cables and make sure they are properly adjusted (see page 21-24, 25).



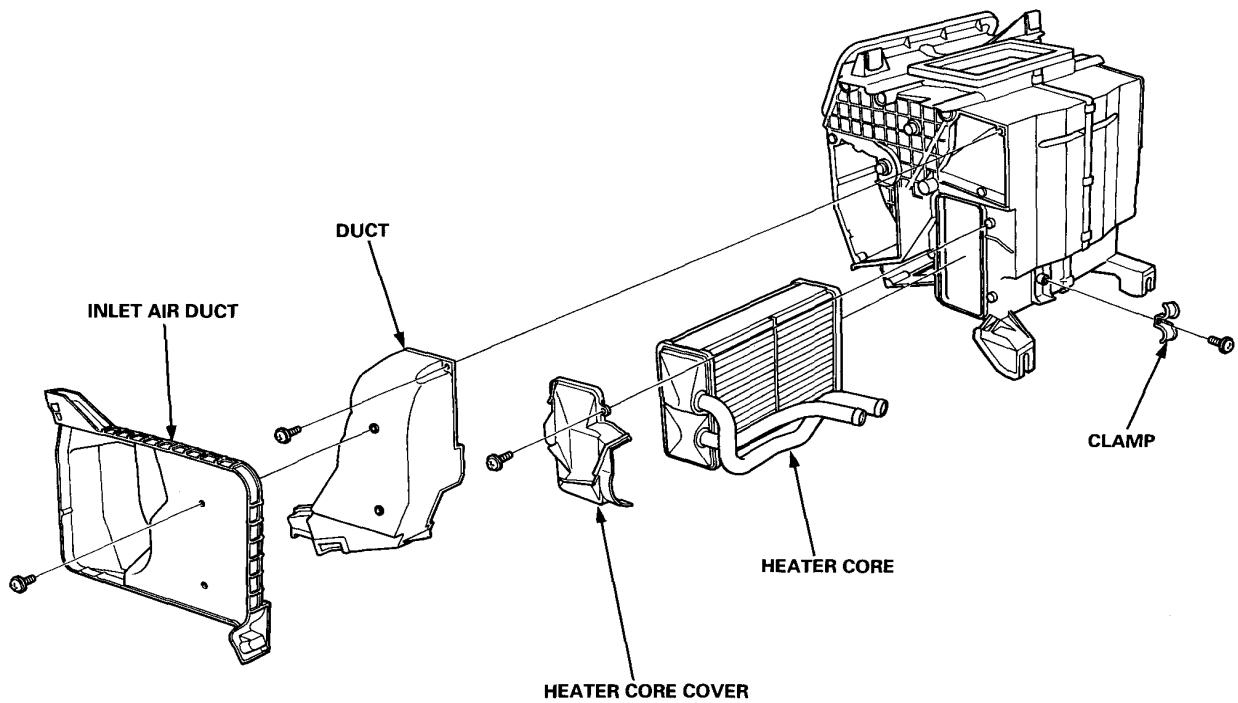
Overhaul

1. Remove the four screws and the inlet air duct.
2. Remove the four screws and the duct.
3. Remove the two screws and the heater core cover.
4. Remove the screw and clamp.

5. Pull out the heater core.

NOTE: Be careful not to bend the inlet and outlet pipes during heater core removal.

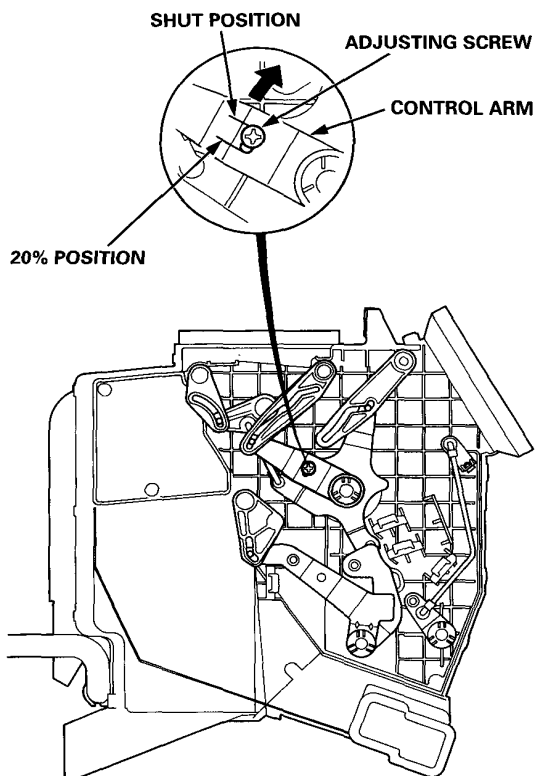
6. Assemble in the reverse order of disassembly.



Heater Unit

Defroster Door Adjustment

1. Set the mode control knob to VENT.
2. Loosen the adjusting screw.
3. Turn the control arm to right as shown, so that there will be a heat leakage of 20% from the defroster door.
4. Tighten the adjusting screw.

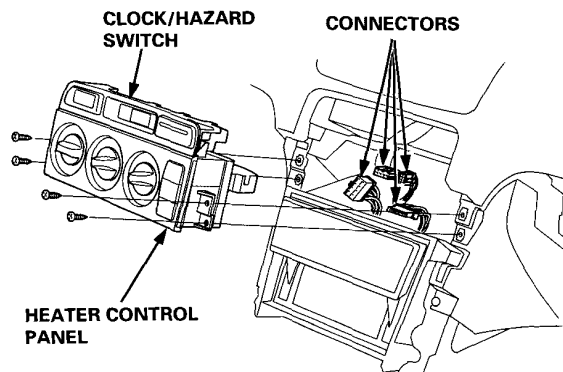


Heater Control Panel

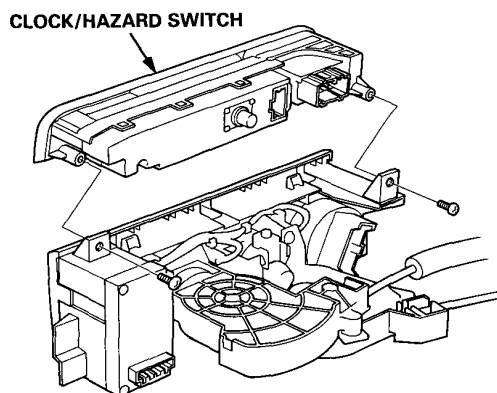
Replacement

1. Remove the front console (see section 20).
2. Disconnect the air mix control and mode control cables from the heater unit (see page 21-24, 25).
3. Remove the four self-tapping screws. Pull out the heater control panel and the clock/hazard switch assembly and disconnect the connectors, then remove the heater control panel and clock/hazard switch assembly.

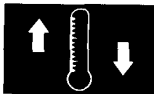
NOTE: The locking tab of the heater control panel 10P connector is on the bottom.



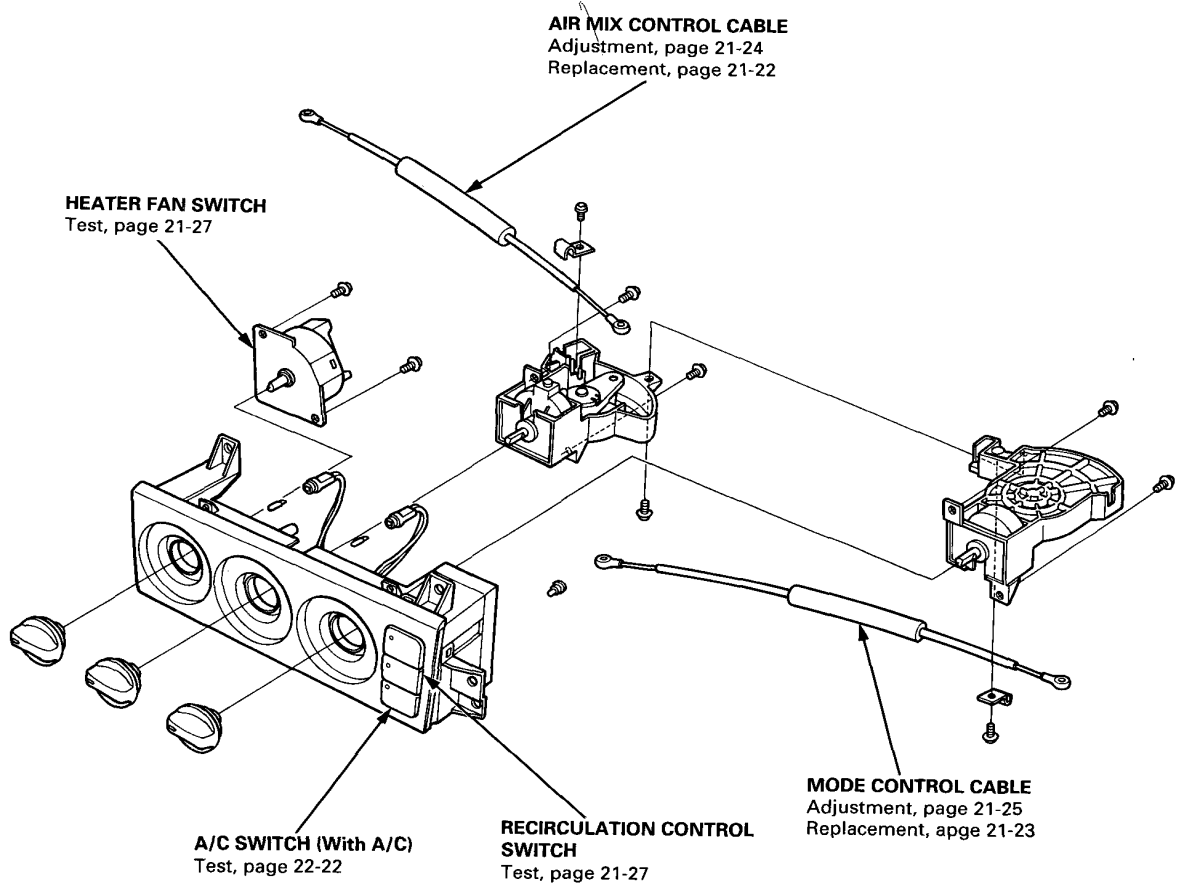
4. Remove the two self-tapping screws and clock/hazard switch assembly.



5. Install in the reverse order of removal, and adjust the air mix control and mode control cables at the heater unit (see page 21-24, 25).



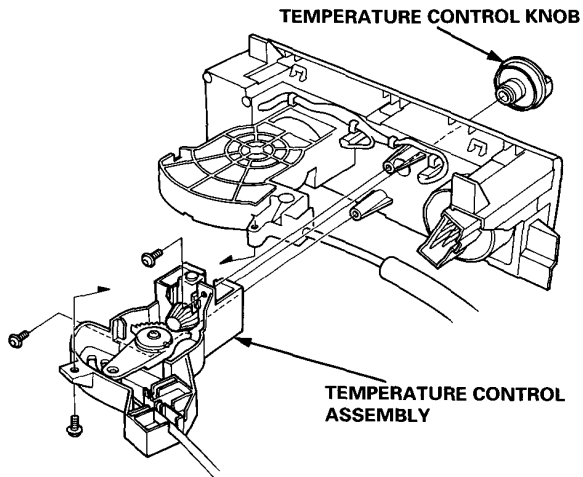
Overhaul



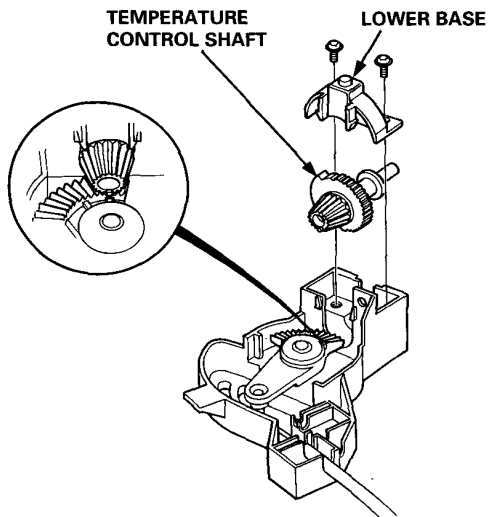
Heater Control Panel

Air Mix Control Cable Replacement

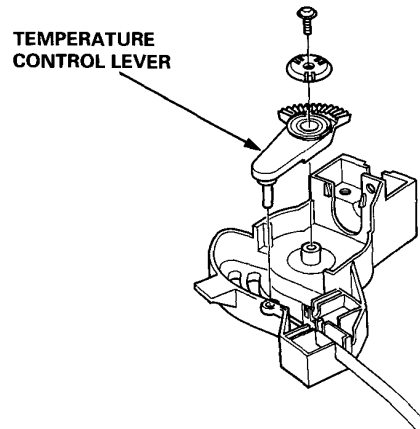
1. Pull out the temperature control knob.
2. Remove the three self-tapping (TORX) screws and remove the temperature control assembly.



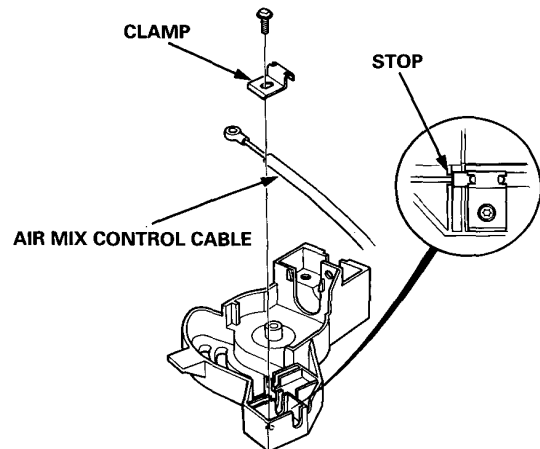
3. Remove the two self-tapping (TORX) screws and remove the lower base.
4. Remove the temperature control shaft.



5. Remove the self-tapping (TORX) screw and remove the temperature control lever.



6. Remove the self-tapping (TORX) screw and the clamp, and remove the air mix control cable.



7. Install in the reverse order of removal, and:

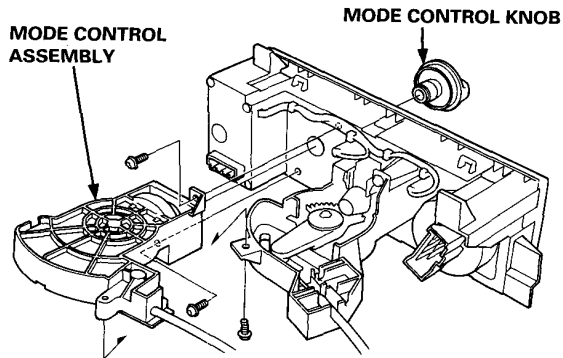
- hold the end of the cable against the stop.
- apply grease to the sliding surfaces.
- when installing the temperature control shaft, make sure that the marks on the temperature control shaft and temperature control lever are aligned.
- after installing, make sure that the temperature control knob moves smoothly without binding.



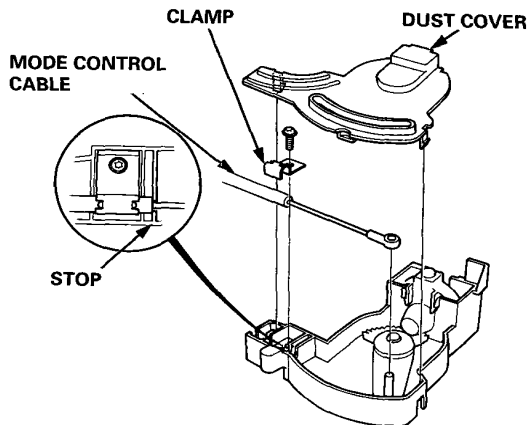
Cool Vent Cable

Mode Control Cable Replacement

1. Pull out the mode control knob.
2. Remove the three self-tapping (TORX) screws and remove the mode control assembly.



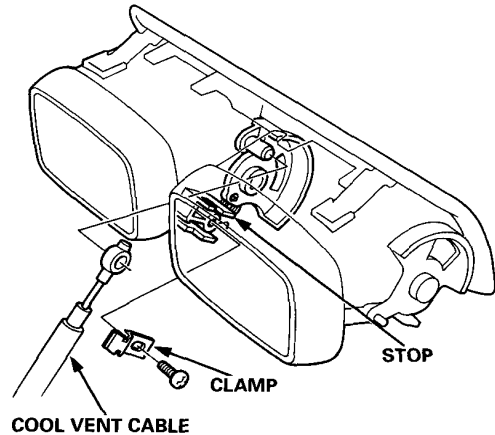
3. Remove the dust cover.
4. Remove the self-tapping (TORX) screw and the clamp, and remove the mode control cable.



5. Install in the reverse order of removal, and:
 - hold the end of the cable against the stop.
 - after installing, make sure that the temperature control knob moves smoothly without binding.

Replacement

1. Disconnect the cool vent cable from the heater unit (see page 21-25).
2. Remove the center air vent (see section 20).
3. Remove the self-tapping screw and the clamp, and remove the cool vent cable.

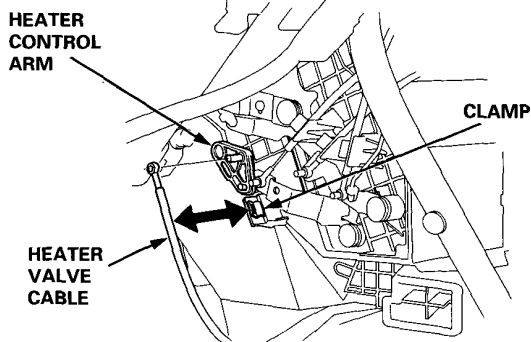


4. Install in the reverse order of removal, and:
 - hold the end of the cable against the stop.
 - after installing, make sure that the cool vent knob moves smoothly without binding.

Heater Valve Cable

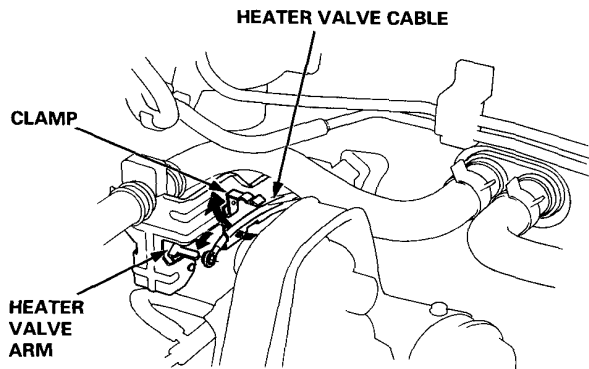
Adjustment

1. Disconnect the heater valve cable from the heater valve arm and the clamp, and from the heater control arm and the clamp.
2. Set the temperature control knob to MAX. COOL.
3. Turn the heater control arm as shown and connect the end of the heater valve cable to the heater control arm.
4. Gently slide the heater valve cable outer housing back from the end enough to take up any slack in the heater valve cable, but not enough to make the temperature control knob move, then snap the heater valve cable housing into the clamp.



5. Turn the heater valve arm to shut and connect the end of the heater valve cable to the heater valve arm.
6. Gently slide the heater valve cable outer housing back from the end enough to take up any slack in the heater valve cable, but not enough to make the temperature control knob move, then snap the heater valve cable housing into the clamp.

NOTE: The air mix control cable should always be adjusted whenever the heater valve cable has been disconnected.

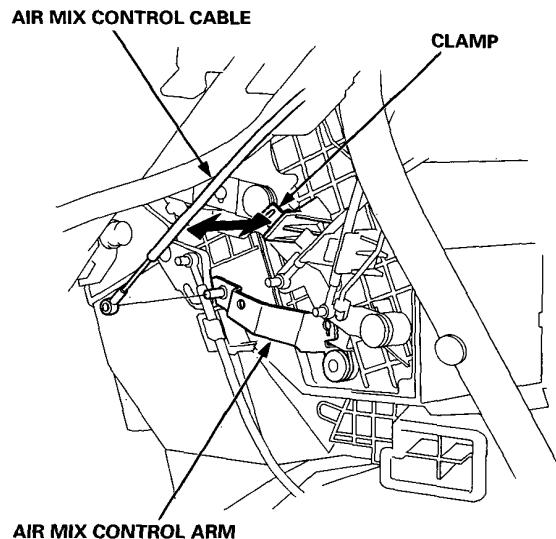


Air Mix Control Cable

Adjustment

1. Disconnect the air mix control cable from the air mix control arm and the clamp.
2. Set the temperature control knob to MAX. COOL.
3. Turn the air mix control arm as shown and connect the end of the air mix control cable to the air mix control arm.
4. Gently slide the air mix control cable outer housing back from the end enough to take up any slack in the air mix control cable, but not enough to make the temperature control knob move, then snap the air mix control cable housing into the clamp.

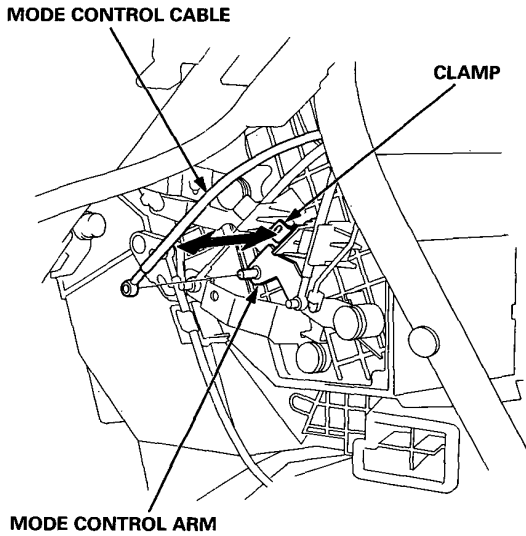
NOTE: The heater valve cable should always be adjusted whenever the air mix control cable has been disconnected.



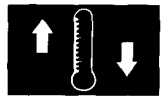
Mode Control Cable

Adjustment

1. Disconnect the mode control cable from the mode control arm and the clamp.
2. Set the mode control knob to VENT.
3. Turn the mode control arm as shown and connect the end of the mode control cable to the mode control arm.
4. Gently slide the mode control cable outer housing back from the end enough to take up any slack in the mode control cable, but not enough to make the mode control cable knob move, then snap the mode control cable housing into the clamp.

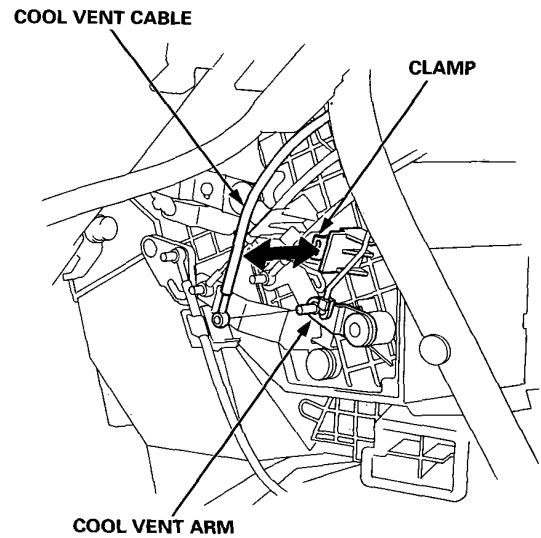


Cool Vent Cable



Adjustment

1. Disconnect the cool vent cable from the cool vent arm and the clamp.
2. Set the cool vent knob to SHUT (DOWN).
3. Turn the cool vent arm as shown and connect the end of the cool vent cable to the cool vent arm.
4. Gently slide the cool vent cable outer housing back from the end enough to take up any slack in the cool vent cable, but not enough to make the cool vent knob move, then snap the cool vent cable housing into the clamp.



Recirculation Control Motor

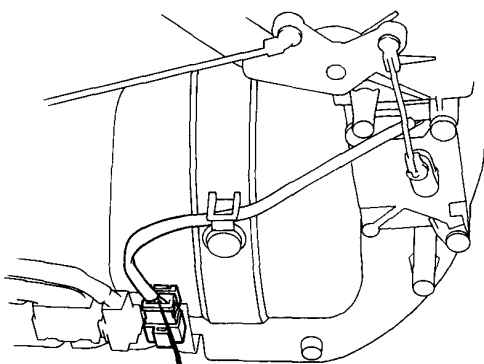
Test

1. Connect battery power to the No. ① terminal of the recirculation control motor connector and connect ground to the No. ② and No. ③ terminals; the recirculation control motor should run smoothly.
2. Disconnect the ground from the No. ② or the No. ③ terminal; the recirculation control motor should stop at FRESH or REC.

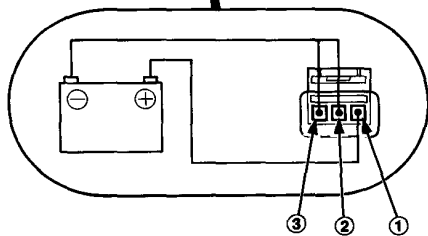
NOTE:

- Don't cycle the recirculation control motor for a long time.
- After adjusting the recirculation control rod, check the recirculation control motor on FRESH or REC. for two minutes to make sure it works properly.

CAUTION: Never connect power in the opposite direction.



View from wire side.



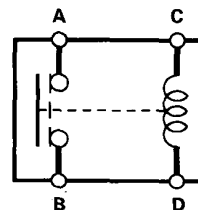
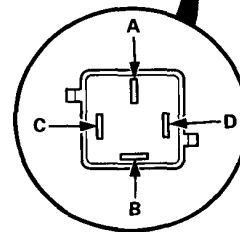
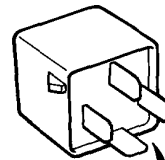
3. If the recirculation control motor does not run in step 1, remove it, and check the recirculation control linkage and doors for smooth movement. If the recirculation control linkage and doors move smoothly, replace the recirculation control motor.

Relay

Test

There should be continuity between the A and B terminals when power and ground are connected to the C and D terminals.

There should be no continuity when power is disconnected.



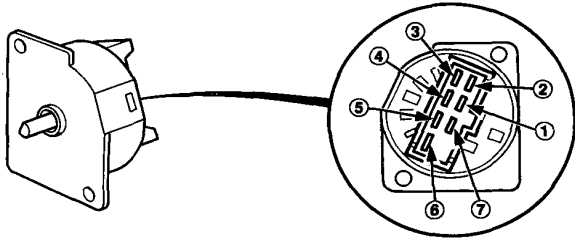
Heater Fan Switch

Test

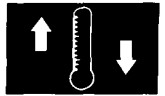
Check for continuity between the terminals according to the table below.

SWITCH CONNECTION

Terminal Position	①	②	③	④	⑤	⑥	⑦
0							
I	○	○	○				
II	○	○		○			
III	○	○			○		
IV	○	○				○	
V	○	○					○



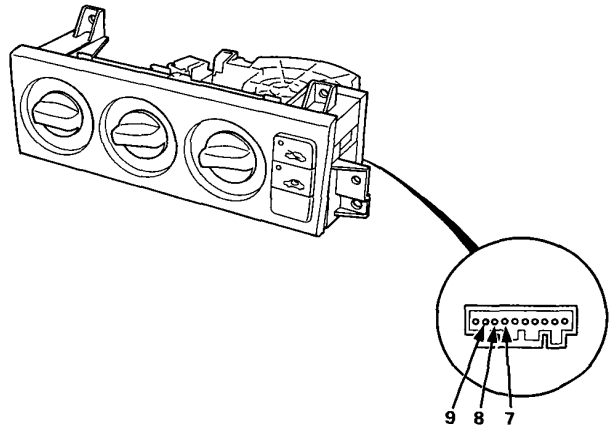
Recirculation Control Switch



Test

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

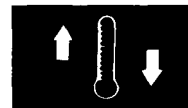
Terminal Position	7	8	9
	○	○	○
	○	○	



Air Conditioning

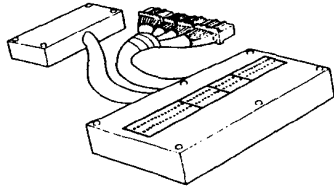
Special Tools	22-2	A/C Service Tips	22-23
Illustrated Index	22-3	A/C System Torque Specifications ..	22-24
Wiring/Connector Locations	22-4	A/C System Service	
Circuit Diagram	22-5	Discharge	22-25
Description		Performance Test	22-26
Outline	22-6	Pressure Test Chart	22-28
*Troubleshooting		Evaporator	
Reference Chart	22-7	Replacement	22-29
Flowchart		Overhaul	22-30
Radiator Fan	22-8	Compressor	
Condenser Fan	22-10	Description	22-31
Engine Coolant Temperature		Illustrated Index	22-32
(ECT) Switch A	22-12	Replacement	22-33
Both Fans	22-13	Clutch Inspection	22-35
Compressor	22-14	Clutch Overhaul	22-36
A/C System	22-17	Relief Valve Replacement	22-37
Radiator Fan Control Module Input		Belt Adjustment	22-38
Tests	22-20	Condenser	
A/C Thermostat		Replacement	22-39
Test	22-21	A/C System Service	
Relays		Evacuation	22-41
Test	22-21	Charging	22-42
Diodes		Leak Test	22-43
Test	22-22		
A/C Switch			
Test	22-22		

*: Read SRS precautions before working in this area.

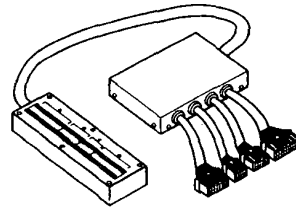


Special Tools

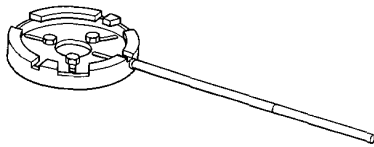
Ref. No.	Tool Number	Description	Qty.	Page Reference
①	07LAJ-PT30100 or 07LAJ-PT3010A	Test Harness	1	22-16
②	07NAB-HAC0100	A/C Clutch Holder	1	22-36
③	07JGG-0010100	Belt Tension Gauge	1	22-38



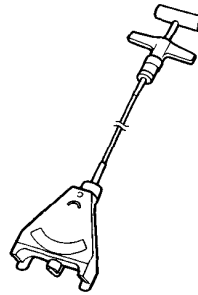
①



①

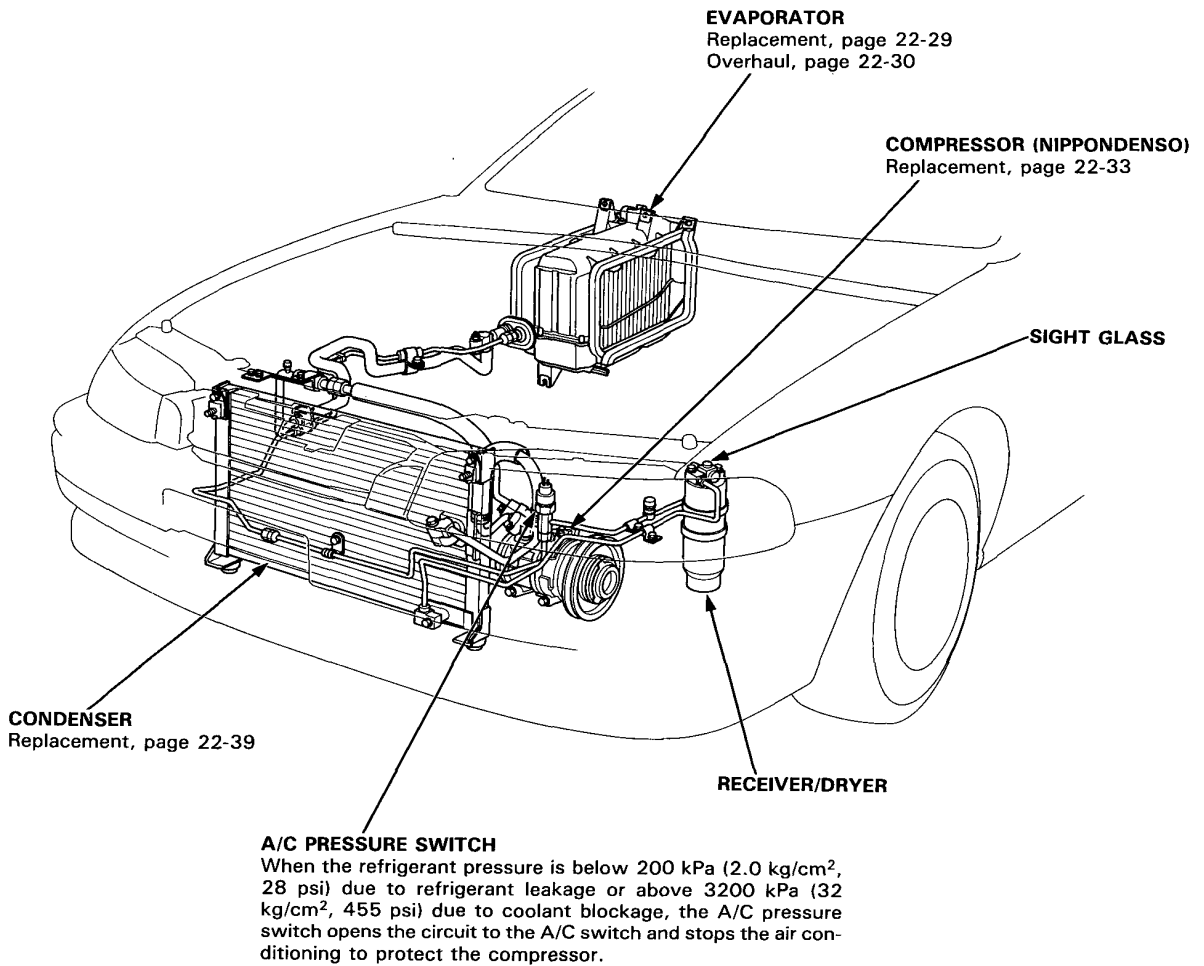


②



③

Illustrated Index

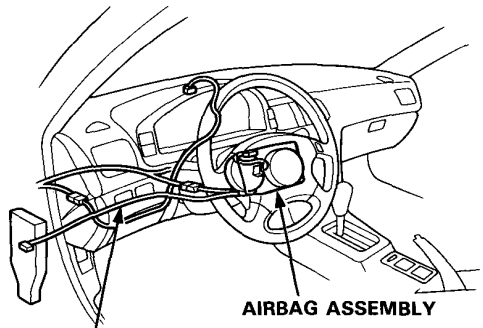


NOTE: After replacing parts, add refrigerant oil (see page 22-23).

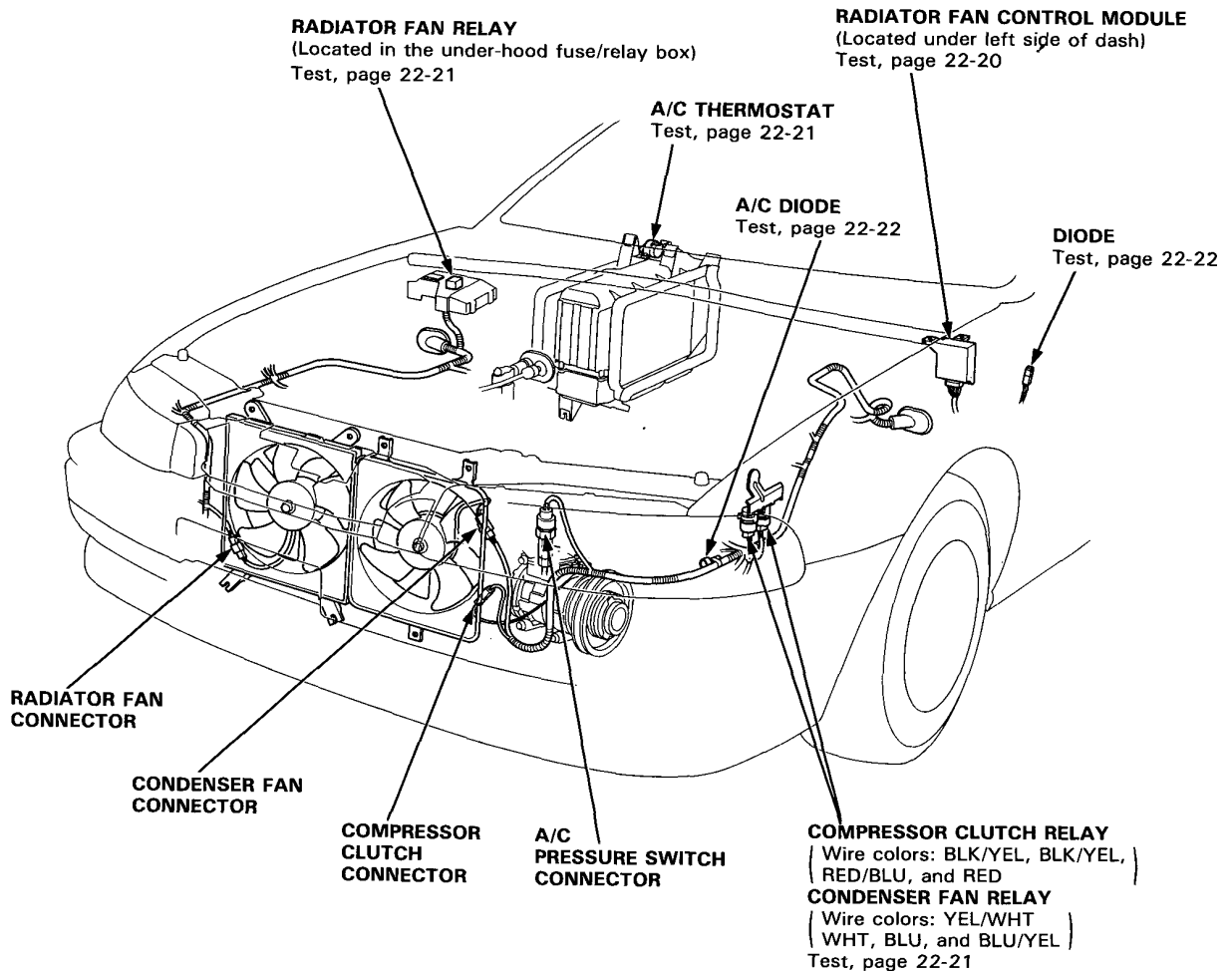
Wiring/Connector Locations

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

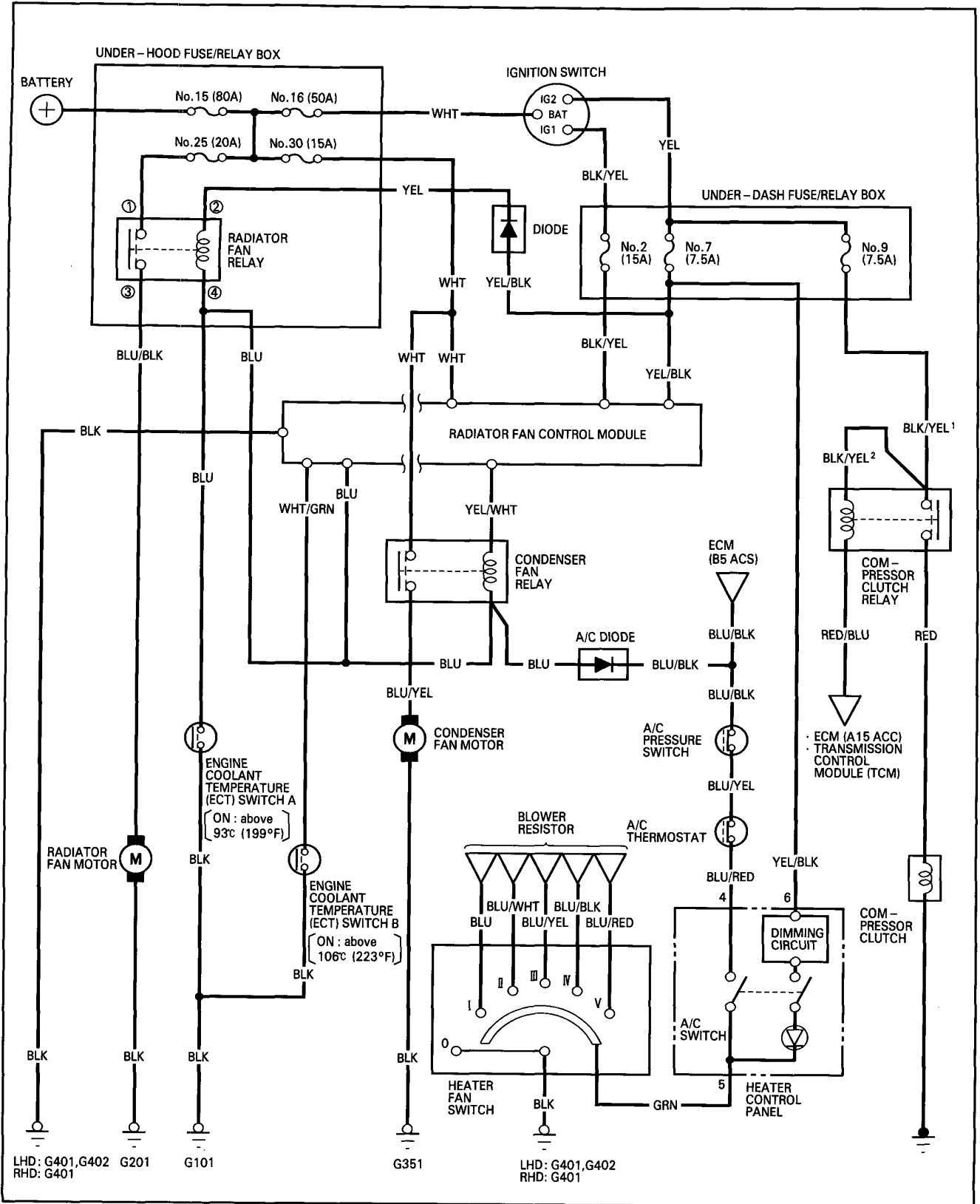


SRS MAIN HARNESS
(Covered with yellow outer insulation)





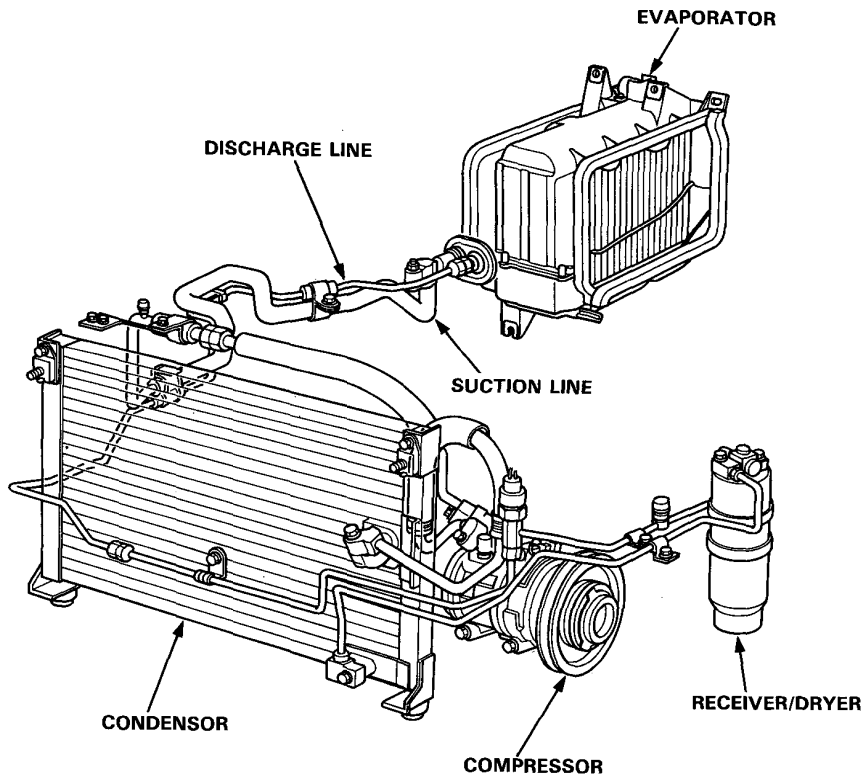
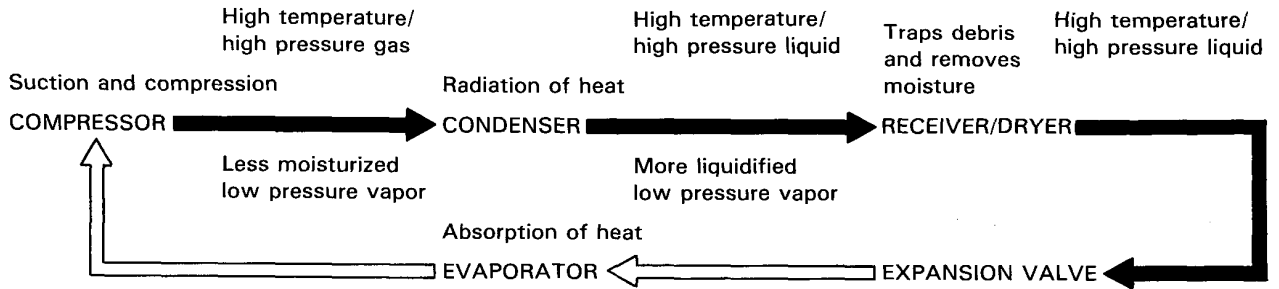
Circuit Diagram



Discription

Outline

The air conditioning system delivers cooled air into the passenger compartment by circulating refrigerant through the system as shown below.



This car uses R-134a refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants R-12 and R-134a. They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil "ND-OIL 8: P/N 38899-PR7-003" 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 to refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
- Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.



Troubleshooting

Reference Chart

- 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 *1 No. 30 (15 A), *1 No. 25 (20 A), *2 No. 9 (7.5 A), *2 No. 7 (7.5 A)
- Grounds No. G401, G402, G351, G201, G101

• All connectors are clean and tight.

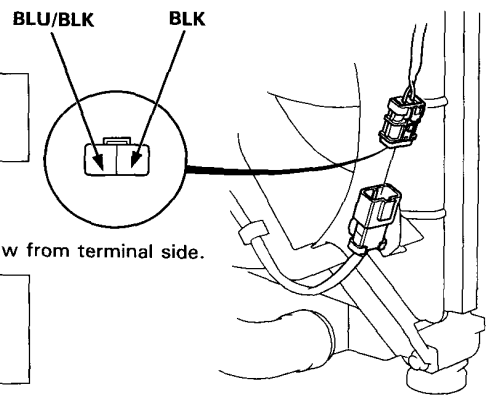
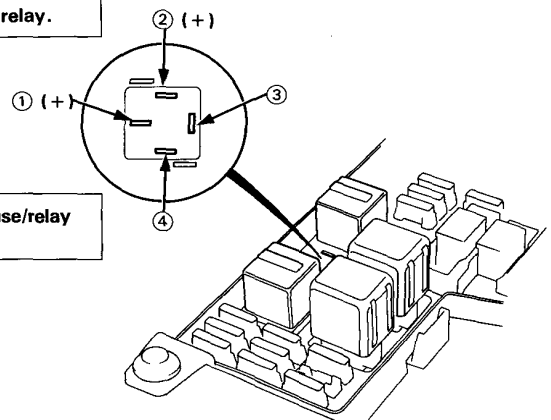
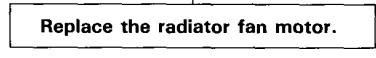
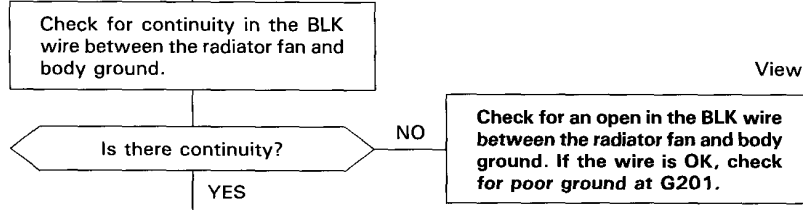
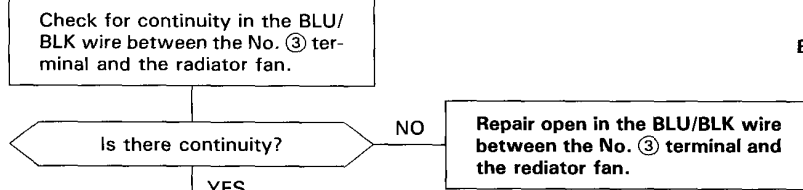
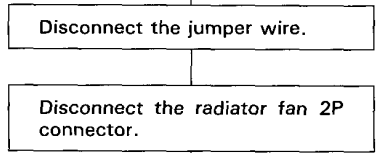
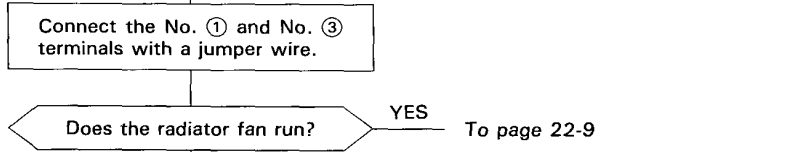
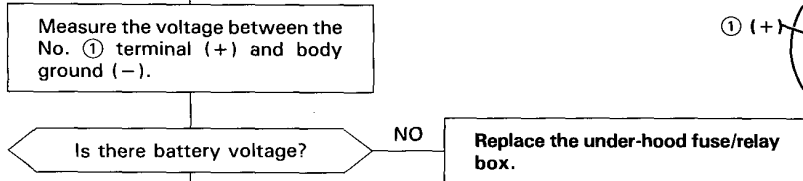
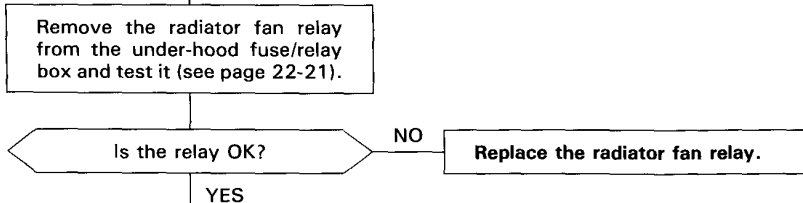
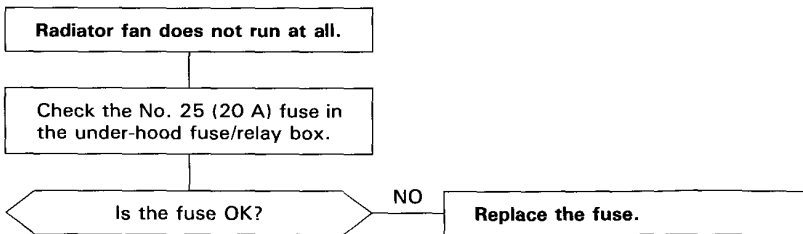
*1: In the under-hood fuse/relay box

*2: In the under-dash fuse/relay box

SYMPTOM	REMEDY
Radiator fan does not run at all.	Perform the procedures in the flowchart (see page 22-8).
Condenser fan does not run at all.	Perform the procedures in the flowchart (see page 22-10).
Both fans (radiator and condenser) do not run for engine cooling, but they both run with the A/C on.	Perform the procedures in the flowchart (see page 22-12).
Both fans do not run at all.	Perform the procedures in the flowchart (see page 22-13).
Compressor clutch does not engage.	Perform the procedures in the flowchart (see page 22-14).
A/C system does not come on (compressor and both fans).	Perform the procedures in the flowchart (see page 22-17).

Troubleshooting

Flowchart — Radiator Fan





From page 22-8

Disconnect the jumper wire and turn the ignition switch ON.

Measure the voltage between the No. ② terminal (+) and body ground (-).

Is there battery voltage?

YES

Repair open in the BLU wire between the No. ④ terminal and the condenser fan relay.

NO

Turn the ignition switch OFF.

Remove the diode from the diode 2P connector.

Turn the ignition switch ON.

Measure the voltage between the YEL/BLK wire terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the YEL/BLK wire between the under-dash fuse/relay box and the diode.

YES

Test the diode (see page 22-22).

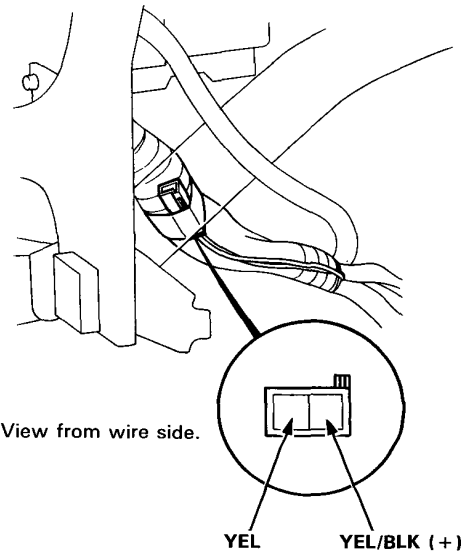
Is the diode OK?

NO

Replace the diode.

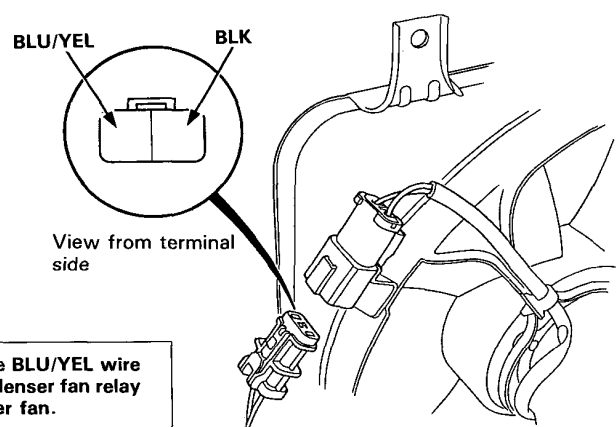
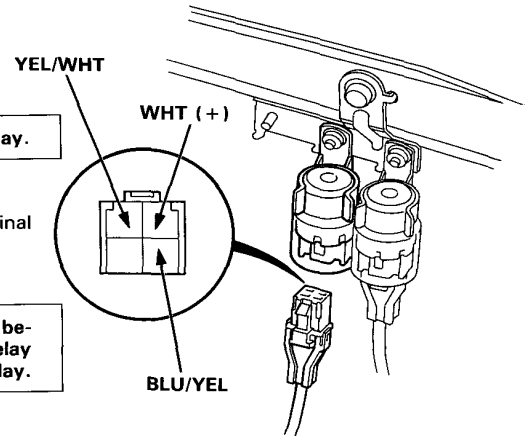
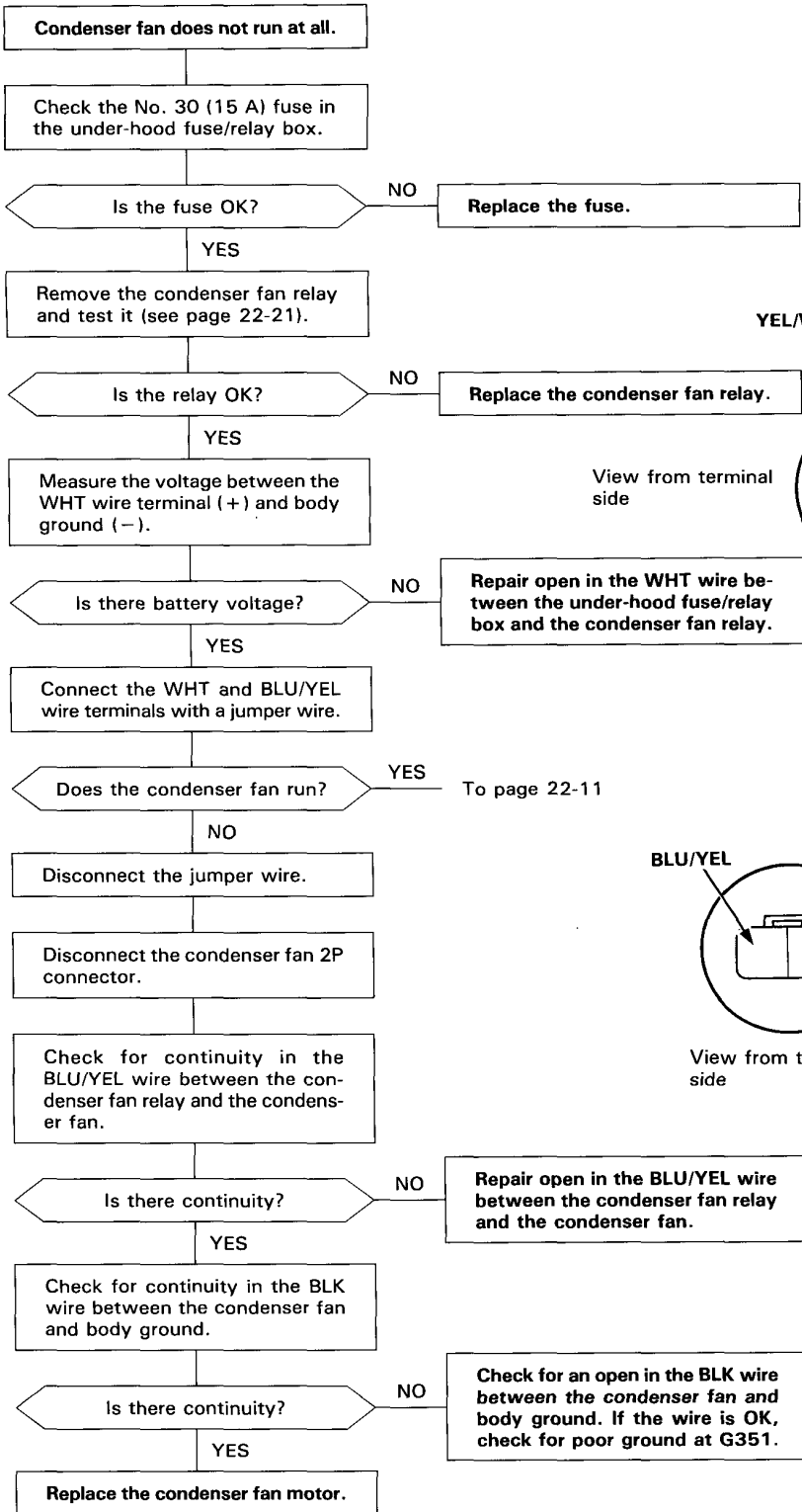
YES

Repair open in the YEL wire between the diode and the No. ② terminal.



Troubleshooting

Flowchart — Condenser Fan





From page 22-10

Disconnect the jumper wire.

Turn the ignition switch ON.

Measure the voltage between the YEL/BLK wire terminal (+) at the radiator fan control module and body ground (-).

Is there battery voltage?

NO

Repair open in the YEL/BLK wire between the under-dash fuse/relay box and the radiator fan control module.

YES

Measure the voltage between the YEL/WHT wire terminal (+) at the radiator fan control module and body ground (-).

Is there battery voltage?

NO

Repair open in the YEL/WHT wire between the radiator fan control module and the condenser fan relay.

YES

Disconnect the radiator fan control module 8P connector.

Check for continuity in the BLK wire between the radiator fan control module and body ground.

Is there continuity?

NO

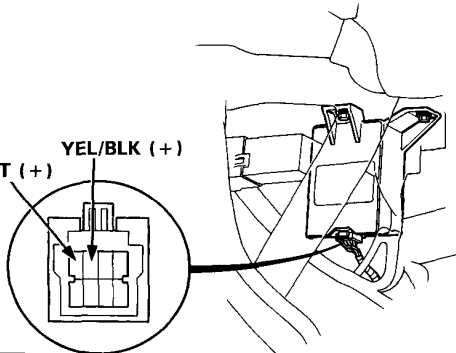
Check for an open in the BLK wire between the radiator fan control module and body ground. If the wire is OK, check for poor ground at G401 and G402 (LHD).

YES

Replace the radiator fan control module.

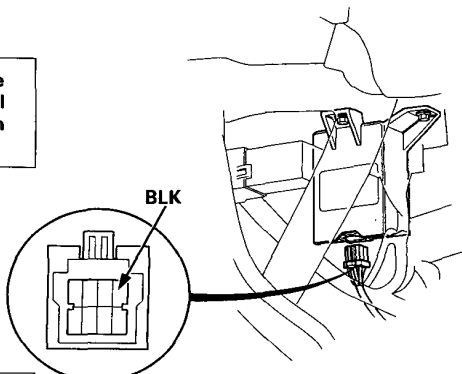
YEL/BLK (+)

YEL/WHT (+)



View from wire side.

BLK



View from wire side.

Troubleshooting

Flowchart — Engine Coolant Temperature (ECT) Switch A

Both fans (radiator and condenser) do not run for engine cooling, but they both run with the A/C on.

Disconnect the engine coolant temperature (ECT) switch A 2P connector.

Turn the ignition switch ON.

Measure the voltage between the BLU wire terminal (+) and body ground (-).

Is there battery voltage?

NO
Repair open in the BLU wire between the ECT switch A and the under-hood fuse/relay box.

YES

Turn the ignition switch OFF and check for continuity in the BLK wire between the ECT switch A and body ground.

Is there continuity?

NO
Check for an open in the BLK wire between the ECT switch A and body ground. If the wire is OK, check for poor ground at G101.

YES

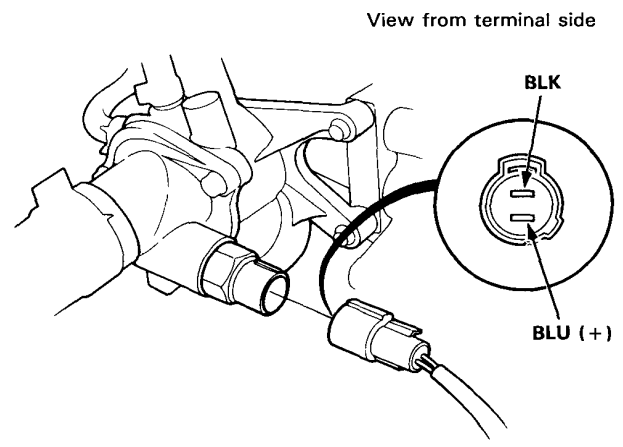
Check the temperature gauge.

Does it read above normal?

NO
Repair the cooling system.

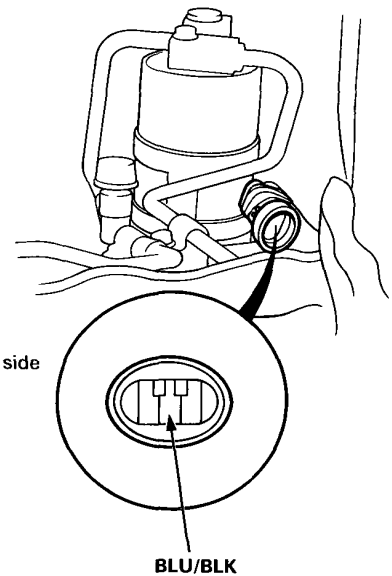
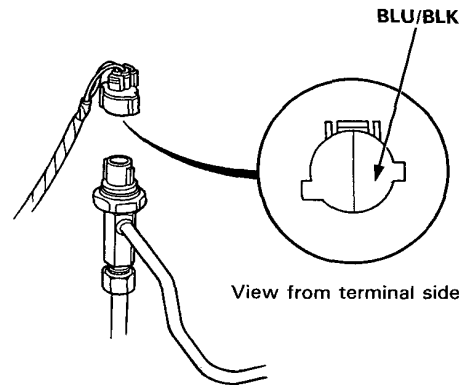
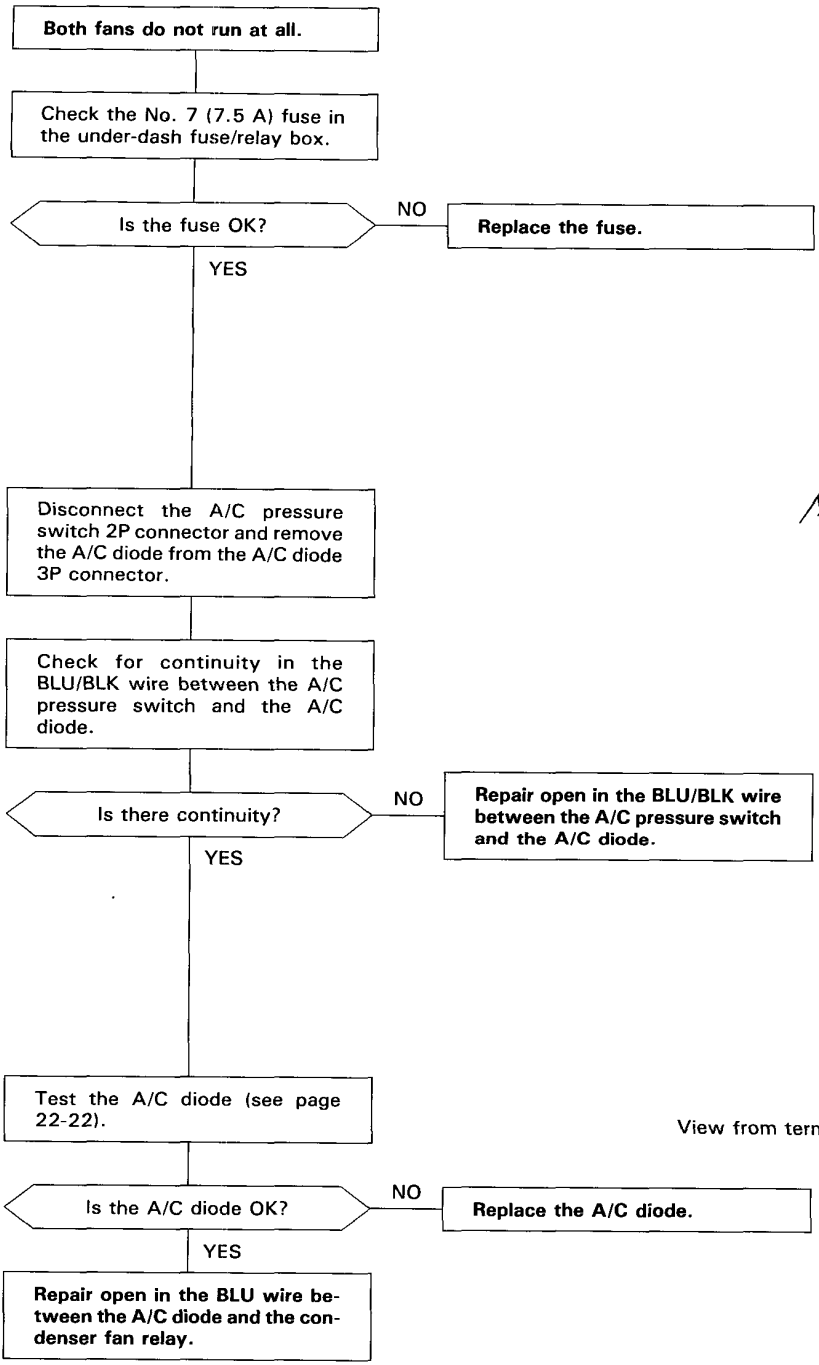
YES

Replace the ECT switch A.





Flowchart — Both Fans



Troubleshooting

Flowchart — Compressor

Compressor clutch does not engage.

Check the No. 9 (7.5 A) fuse in the under-dash fuse/relay box.

Is the fuse OK?

NO

Replace the fuse.

YES

Disconnect the A/C thermostat 2P connector and connect the BLU/YEL and BLU/RED wire terminals with a jumper wire.

Start the engine. Turn the A/C switch and the heater fan switch ON.

Does the compressor clutch engage?

YES

Replace the A/C thermostat.

NO

Turn the ignition switch, A/C switch and the heater fan switch OFF.

Remove the compressor clutch relay and test it (see page 22-21).

Is the relay OK?

NO

Replace the compressor clutch relay.

YES

Turn the ignition switch ON.

Measure the voltage between the BLK/YEL¹ wire terminal (+) and body ground (-).

Is there battery voltage?

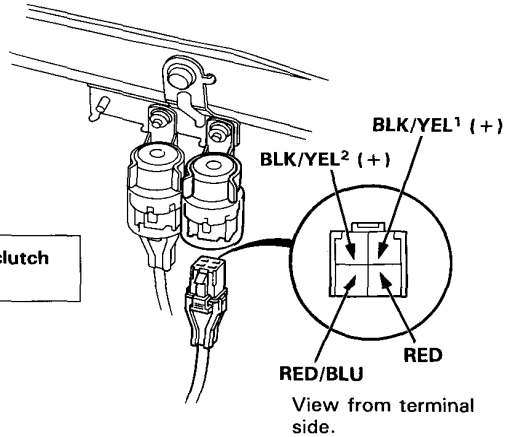
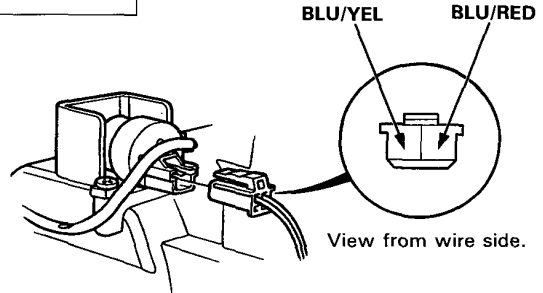
NO

Repair open in the BLK/YEL¹ wire between the under-dash fuse/relay box and the compressor clutch relay.

YES

Turn the ignition switch OFF.

To page 22-15

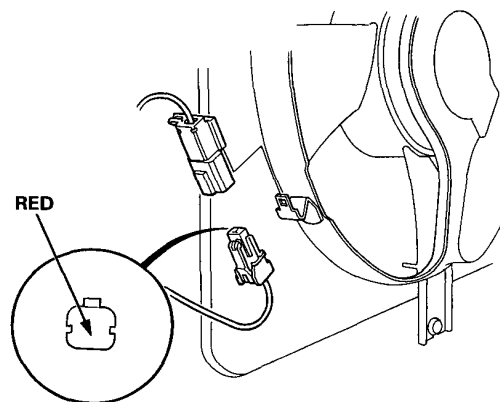




From page 22-14

Connect the BLK/YEL¹ and RED wire terminals with a jumper wire.

Start the engine.



View from terminal side.

Does the compressor clutch engage?

NO

Turn the ignition switch OFF and disconnect the jumper wire.

YES

Turn the ignition switch OFF and disconnect the jumper wire.

Disconnect the compressor clutch 1P connector.

Check for continuity in the RED wire between the compressor clutch relay and the compressor clutch.

Is there continuity?

NO

Repair open in the RED wire between the compressor clutch relay and the compressor clutch.

YES

Inspect the compressor clutch clearance and the compressor clutch field coil (see page 22-35).

Turn the ignition switch ON.

Measure the voltage between the BLK/YEL² wire terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the BLK/YEL² wire between the BLK/YEL¹ and BLK/YEL² wire terminals of the compressor clutch relay 4P connector.

YES

Turn the ignition switch OFF and install the compressor clutch relay.

To page 22-16

(cont'd)

Troubleshooting

Flowchart — Compressor (cont'd)

From page 22-15

Connect the test harness "A" and "B" connectors to the main wire harness only, not to the ECM (see section 11).

Turn the ignition switch ON.

Measure the voltage between the A15 terminal (+) and body ground (-).

Is there battery voltage?

NO

Repair open in the RED/BLU wire between the compressor clutch relay and the ECM.

YES

Make sure the A/C and heater fan switches are OFF.

Measure the voltage between the B5 terminal (+) and body ground (-).

Is there battery voltage?

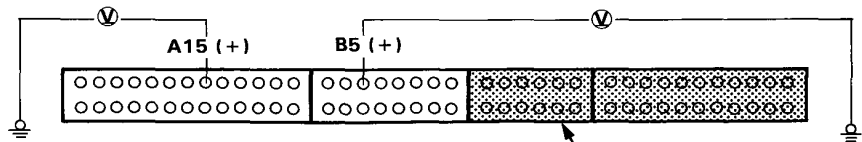
NO

Repair open in the BLU/BLK wire between the A/C diode and the ECM.

YES

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

Battery voltage?



Battery voltage?

TEST HARNESS
07LAJ-PT30100 or
07LAJ-PT3010A



Flowchart — A/C System

NOTE: First, check for refrigerant pressure.

A/C system does not come on (compressor and both fans).

Disconnect the A/C pressure switch 2P connector.

Turn the ignition switch ON.

Measure the voltage between the BLU/BLK wire terminal (+) and body ground (-).

Is there battery voltage?

NO Repair open in the BLU/BLK wire between the A/C pressure switch and the A/C diode or the ECM.

YES

Turn the ignition switch OFF.

Check for continuity between the No. ① and No. ② terminals of the A/C pressure switch.

Is there continuity?

NO Replace the A/C pressure switch.

YES

Reconnect the A/C pressure switch 2P connector.

Disconnect the A/C thermostat 2P connector.

Turn the ignition switch ON.

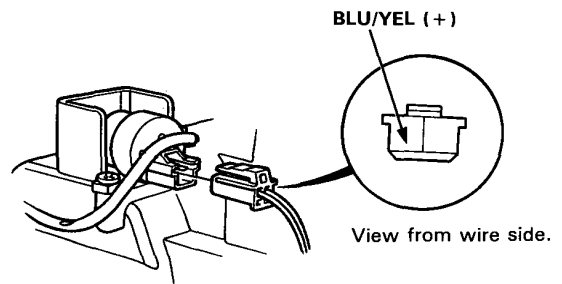
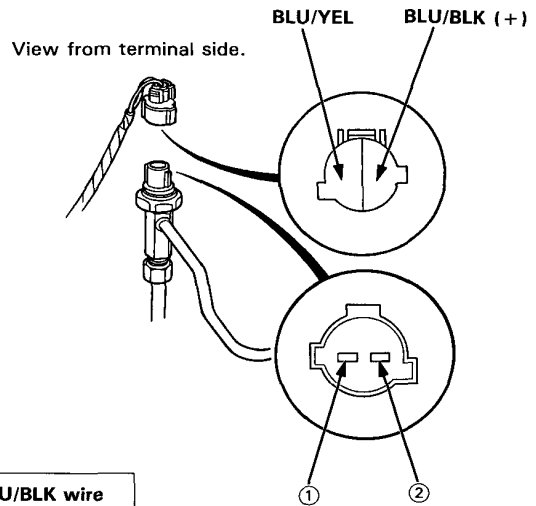
Measure the voltage between the BLU/YEL wire terminal (+) and body ground (-).

Is there battery voltage?

NO Repair open in the BLU/YEL wire between the A/C pressure switch and the A/C thermostat.

YES

To page 22-18



(cont'd)

Troubleshooting

Flowchart — A/C System (cont'd)

From page 22-17

Turn the ignition switch OFF.

Check for continuity between the No. ① and No. ② terminals of the A/C thermostat.

Is there continuity?

NO

Replace the A/C thermostat.

YES

Remove the heater control panel (see page 21-20).

Disconnect the heater control panel 10P connector.

Check for continuity in the BLU/RED wire between the A/C thermostat and the heater control panel.

Is there continuity?

NO

Repair open in the BLU/RED wire between the A/C thermostat and the heater control panel.

YES

Test the A/C switch (see page 22-22).

Is the A/C switch OK?

NO

Replace the heater control panel (A/C switch).

YES

Disconnect the heater fan switch 8P connector.

Check for continuity in the GRN wire between the heater control panel and the heater fan switch.

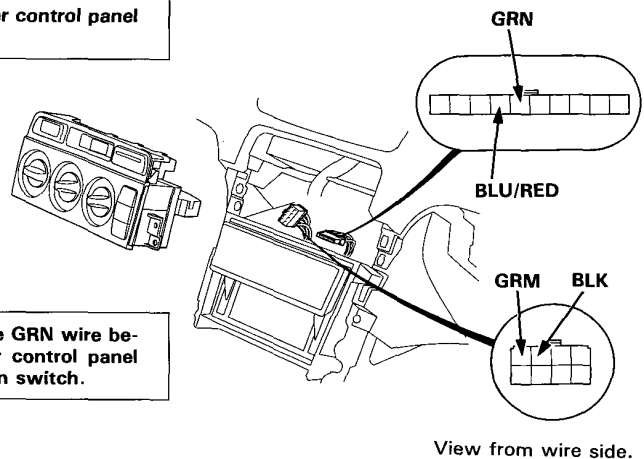
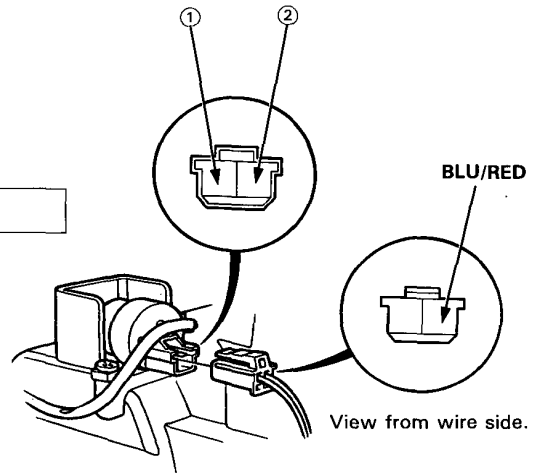
Is there continuity?

NO

Repair open in the GRN wire between the heater control panel and the heater fan switch.

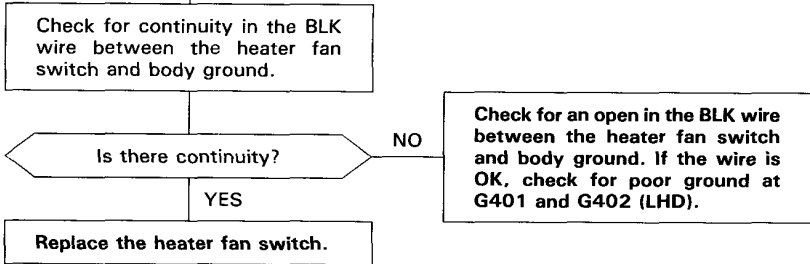
YES

To page 22-19





From page 22-18

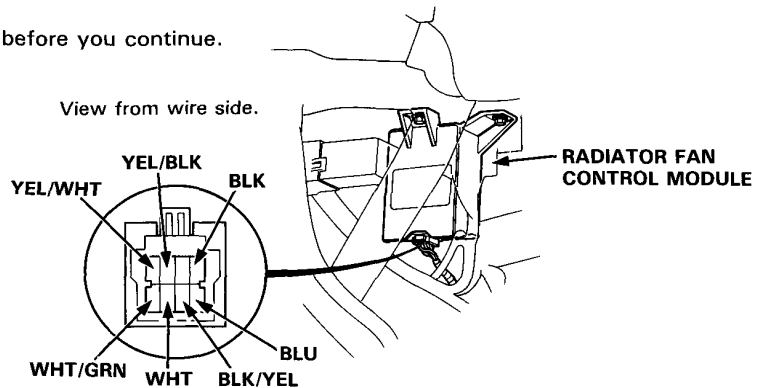


Troubleshooting

Radiator Fan Control Module Input Tests

NOTE: Perform the following tests with the radiator fan control module connected, the ignition switch ON and the A/C switch OFF.

If you find the cause of a problem, correct it before you continue.



WIRE COLOR	TEST CONDITION	DESIRED RESULTS	CORRECTIVE ACTION IF DESIRED RESULTS ARE NOT OBTAINED
BLK	Check for voltage to body ground.	There should be less than 1 volt.	Repair open to body ground.
WHT	Check for battery voltage.	There should be battery voltage.	Check No. 30 (15 A) fuse in the under-hood fuse/relay box; if OK, repair open in the WHT wire.
BLK/YEL	Check for battery voltage (Ignition switch—ON).		Check No. 2 (15 A) fuse in the under-dash fuse/relay box; if OK, repair open in the BLK/YEL wire.
YEL/BLK	Check for battery voltage (Ignition switch—ON).		Check No. 7 (7.5 A) fuse in the under-dash fuse/relay box; if OK, repair open in the YEL/BLK wire.
YEL/WHT	Check for battery voltage (Ignition switch—ON).		Replace radiator fan control module. Before you connect the new radiator fan control module, disconnect both fan relays. Check continuity between the YEL/WHT wire and ground, using the 20k scale on your ohmmeter. There should be no continuity. If there is continuity, the new radiator fan control module will be damaged when you connect it.
BLU	Connect to body ground (Ignition switch—ON).	Condenser fan and radiator fan should come on (engine coolant temperature below 93 °C [199°F]).	Check for an open in the BLU wire between the radiator fan control module and the condenser fan relay or the radiator fan relay. If OK, check for an open in the YEL/WHT wire between the radiator fan control module and the condenser fan relay or the YEL wire between the diode and the radiator fan relay or the YEL/BLK wire between the diode and the No. 7 (7.5 A) fuse in the under-dash fuse/relay box or the diode. If OK, test the condenser fan relay or the radiator fan relay.
WHT/GRN	Check for voltage.	Apprx. 11 V (engine coolant temperature below 106°C [223°F]).	Faulty engine coolant temperature (ECT) switch B, short to body ground or faulty radiator fan control module



A/C Thermostat

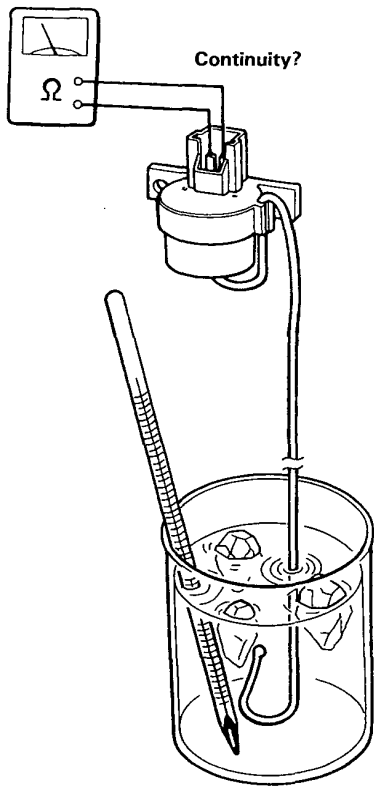
Test

Dip the A/C thermostat into a cup filled with ice water, and check for continuity between the terminals.

Cut off: 1.5 — -0.5°C (35 — 31°F)

Cut in: 2.5 — 5°C (36 — 41°F)

If cut-off or cut-in-temperature is too low or too high, replace the A/C thermostat.



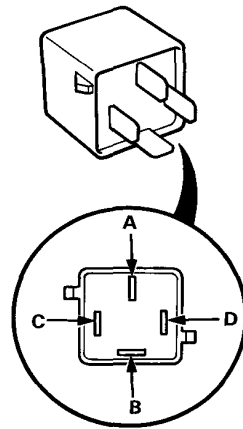
Relays

Test

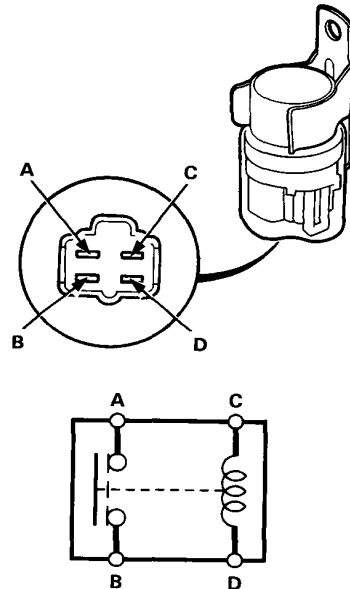
There should be continuity between the A and B terminals when power and ground are connected to the C and D terminals.

There should be no continuity when power is disconnected.

- **RADIATOR FAN RELAY**



- **CONDENSER FAN RELAY**
- **COMPRESSOR CLUTCH RELAY**



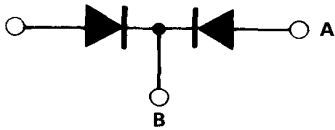
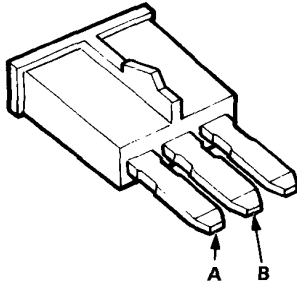
Diodes

Test

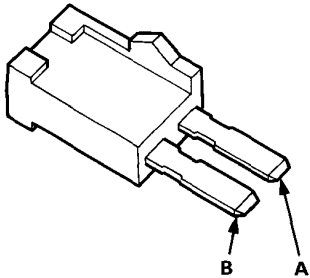
NOTE: The diodes are designed to pass current in one direction while blocking it in the opposite direction. Most ohmmeters, unless equipped with a diode tester, should not be used to test diodes.

Check for continuity in both directions between the A and B terminals. There should be continuity in only one direction.

A/C DIODE



DIODE

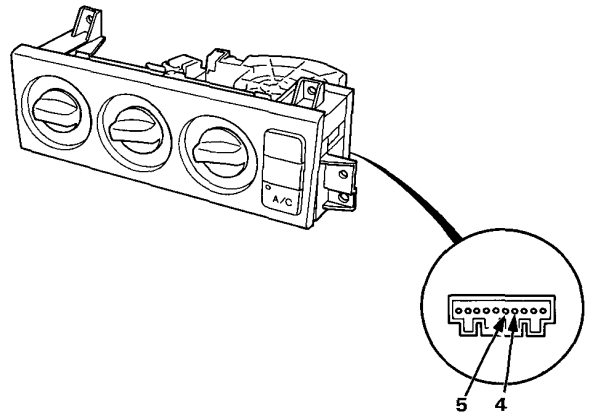


A/C Switch

Test

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

Terminal Position	4	5
OFF		
ON	○	○





A/C Service Tips

The air conditioning system uses R-134a refrigerant and polyalkyleneglycol (PAG) refrigerant oil "ND-OIL 8", which are not compatible with R-12 refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system and do not attempt to use R-12 servicing equipment; damage to the air conditioning system or your servicing equipment will result. Separate the manifold gauge sets (pressure gauges, hoses, joints) for refrigerants R-12 and R-134a. Do not confuse them.

⚠ WARNING When handling refrigerant (R-134a):

- always wear eye protection.
- do not let refrigerant get on your skin or in your eyes. If it does:
 - do not rub your eyes or skin.
 - splash large quantities of cool water in your eyes or on your skin.
 - rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- keep refrigerant containers (cans of R-134a) stored below 40°C (104°F).
- keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.
- work in well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small, enclosed area.

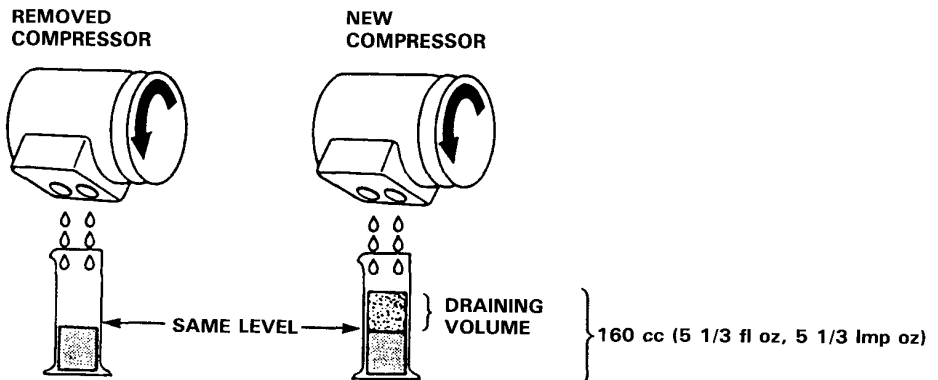
1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) 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, don't let refrigerant escape too fast; it will draw the compressor oil out of the system.
6. Add refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) after replacing the following parts:

NOTE:

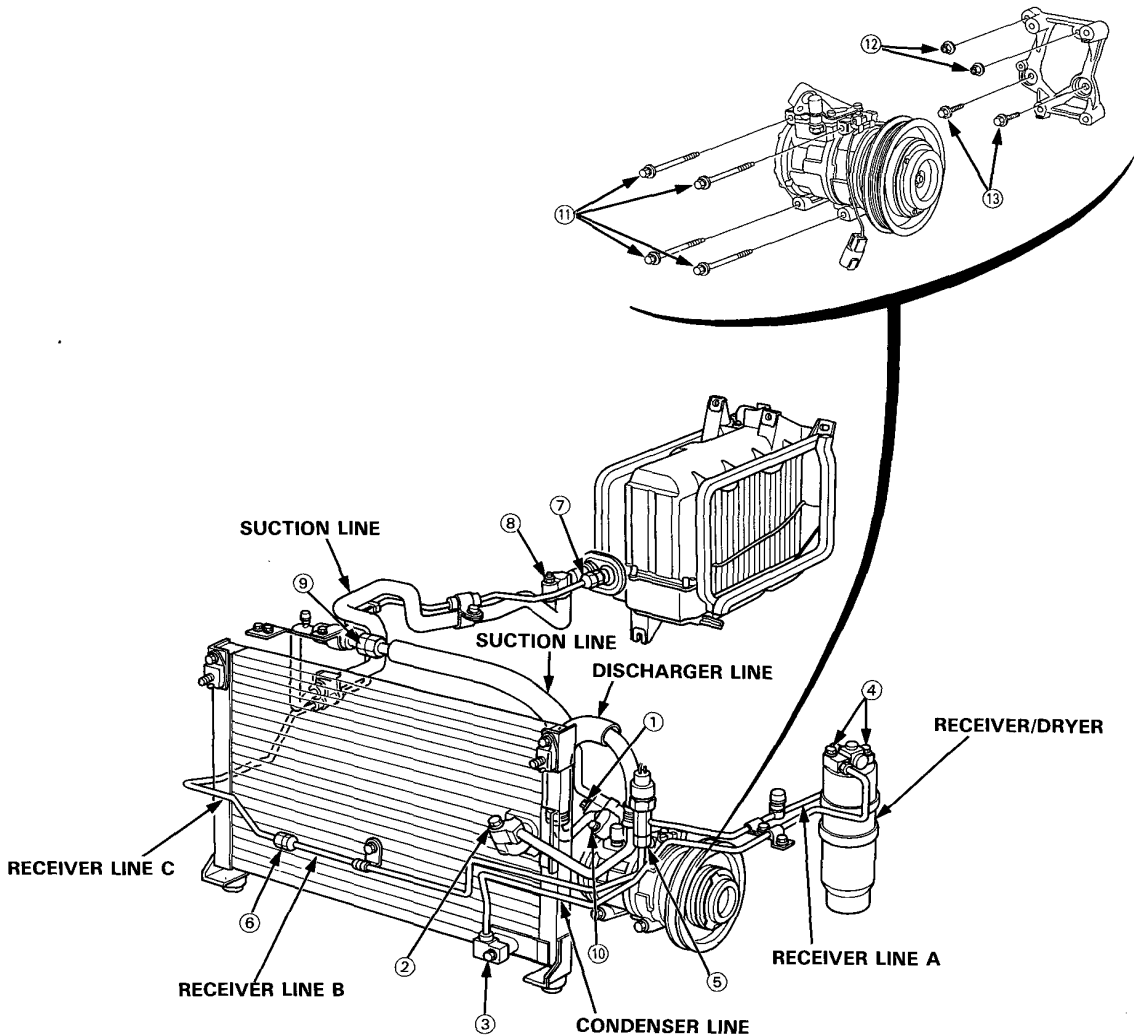
- Do not return the oil to the container once dispensed and never mix with other refrigerant oils to avoid contamination.
- Immediately after using the oil, replace the cap on the container and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the car; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

Condenser	15 cc (3/6 fl oz, 3/6 Imp oz)
Evaporator	25 cc (5/6 fl oz, 5/6 Imp oz)
Line or hose	10 cc (1/3 fl oz, 1/3 Imp oz)
Receiver/Dryer	10 cc (1/3 fl oz, 1/3 Imp oz)
Leakage repair	20 cc (2/3 fl oz, 2/3 Imp oz)
Compressor	On compressor replacement, subtract the volume of oil drained from the removed compressor from 160 cc (5 1/3 fl oz, 5 1/3 Imp oz), and drain the calculated volume of oil from the new compressor: 160 cc (5 1/3 fl oz, 5 1/3 Imp oz)-Volume of removed compressor = Draining volume.

NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 cc (1 2/3 fl oz, 1 2/3 Imp oz) from the new compressor.



A/C System Torque Specifications



① Discharge hose nut (6 x 1.0 mm)	10 N·m (1.0 kg-m, 7 lb-ft)
② Discharge hose bolt (6 x 1.0 mm)	10 N·m (1.0 kg-m, 7 lb-ft)
③ Condenser pipe nut (6 x 1.0 mm)	10 N·m (1.0 kg-m, 7 lb-ft)
④ Receiver/Dryer bolts (6 x 1.0 mm)	10 N·m (1.0 kg-m, 7 lb-ft)
⑤ Receiver pipe B joint nut (16 x 1.5 mm)	14 N·m (1.4 kg-m, 10 lb-ft)
⑥ Receiver pipe C joint nut (16 x 1.5 mm)	14 N·m (1.4 kg-m, 10 lb-ft)
⑦ Receiver pipe C joint nut; evaporator side (16 x 1.5 mm)	14 N·m (1.4 kg-m, 10 lb-ft)
⑧ Suction pipe nut (6 x 1.0 mm)	10 N·m (1.0 kg-m, 7 lb-ft)
⑨ Suction hose joint nut (24 x 1.5 mm)	33 N·m (3.3 kg-m, 24 lb-ft)
⑩ Suction hose nut (6 x 1.0 mm)	10 N·m (1.0 kg-m, 7 lb-ft)
⑪ Compressor mounting bolts (8 x 1.25 mm)	22 N·m (2.2 kg-m, 16 lb-ft)
⑫ Compressor bracket mounting nuts (10 x 1.25 mm)	50 N·m (5.0 kg-m, 36 lb-ft)
⑬ Compressor bracket mounting bolts (10 x 1.25 mm)	50 N·m (5.0 kg-m, 36 lb-ft)



A/C System Service

Discharge

⚠ WARNING

- Keep away from open flames. The refrigerant, although nonflammable, will produce a poisonous gas if burned.
- Work in a well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small enclosed area.

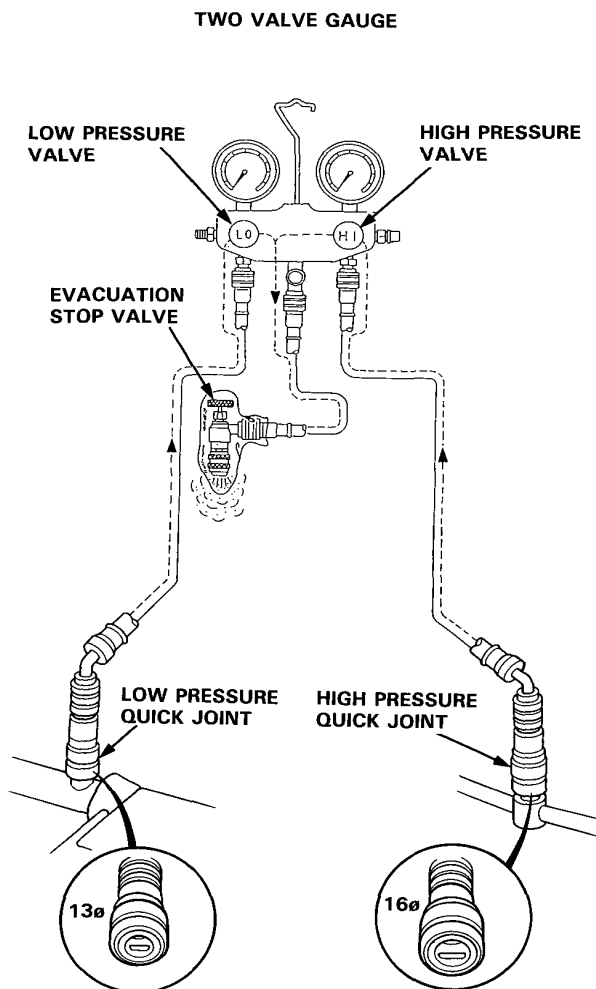
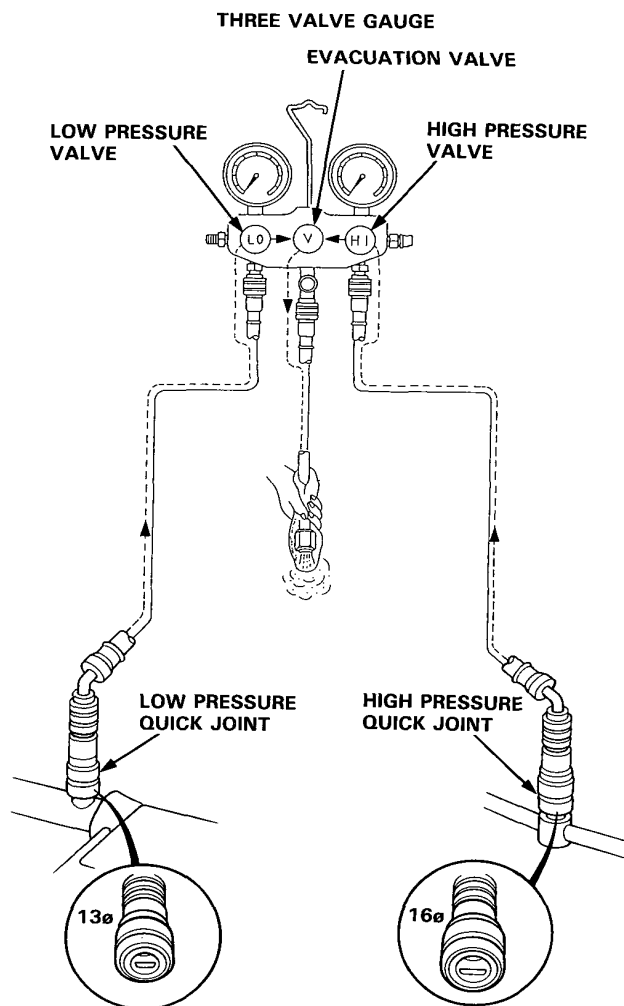
NOTE: Only use a gauge set for refrigerant R-134a.

1. Connect the R-134a gauges as shown.
2. Disconnect the center hose of the gauge set and place the free end in a shop towel.
3. Open the evacuation valve (two valve gauge: evacuate stop valve).

4. Slowly open the high pressure valve slightly to let refrigerant flow from the center hose only. Do not open the valve too wide. Check the shop towel to make sure no oil is being discharged with the refrigerant.

CAUTION: If refrigerant is allowed to escape too fast, compressor oil will be drawn out of the system.

5. After the high pressure gauge reading has dropped below 1000kPa (10 kg/cm², 142 psi), open the low side valve to discharge both high and low sides of the system.
6. Note the gauge reading and, as system pressure drops, gradually open both high and low side valves fully until both gauges indicate 0 kPa (0 kg/cm², 0 psi).



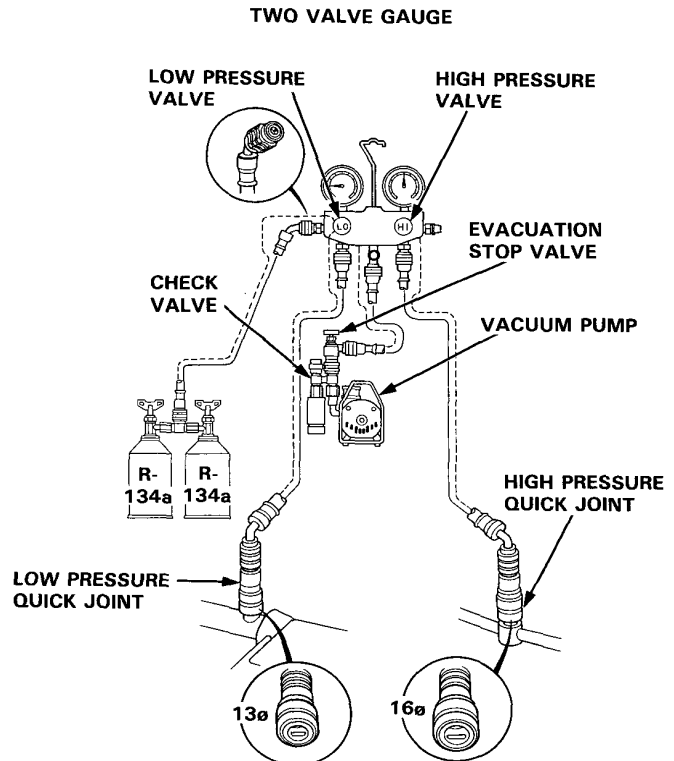
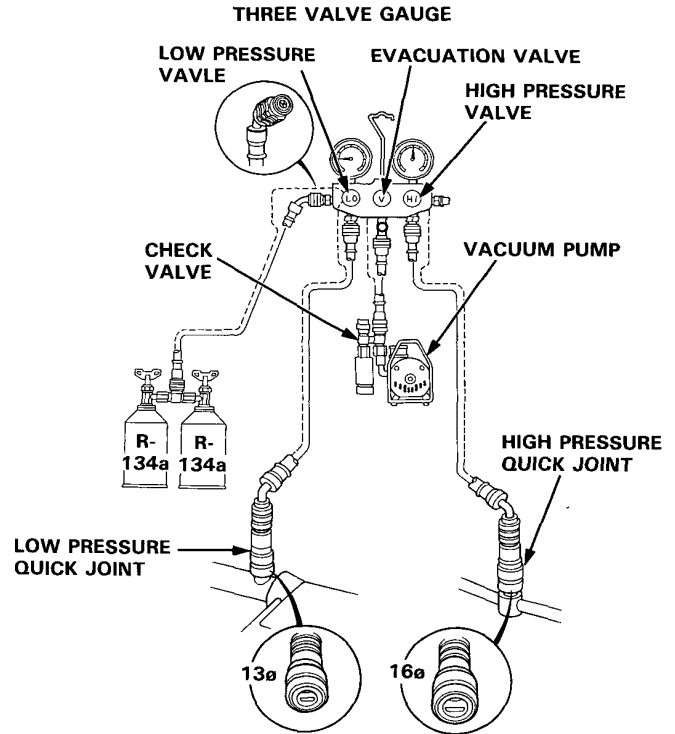
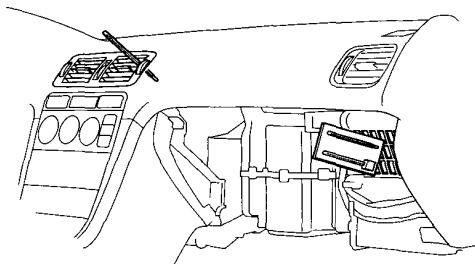
A/C System Service

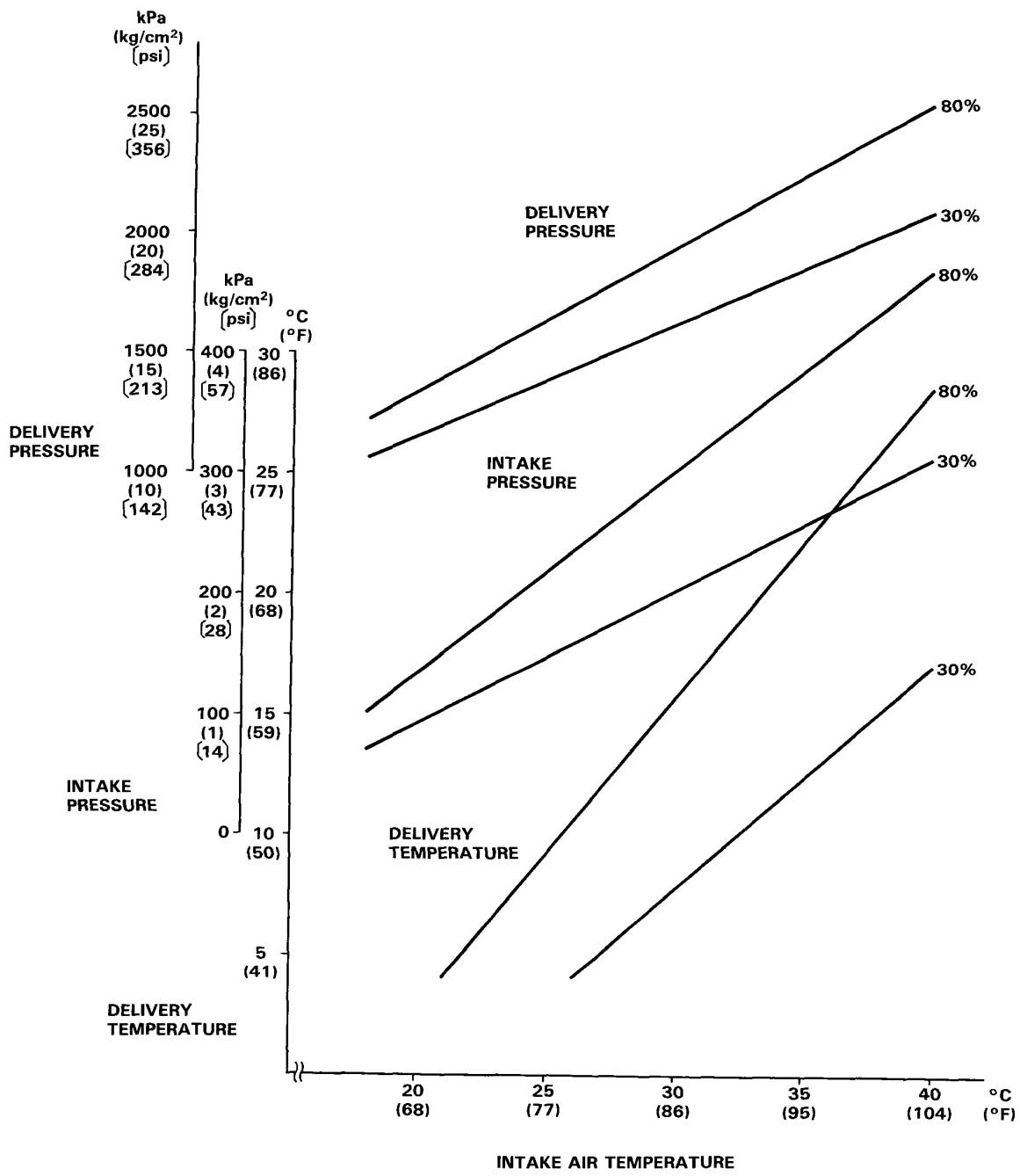
Performance Test

The performance test will help determine if the air conditioning system is operating within specifications.

NOTE:

- Only use a gauge set for refrigerant R-134a.
 - Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.
1. Connect the R-134a gauges as shown.
 2. Insert a thermometer in the center vent outlet. Determine the relative humidity and ambient air temperature by a portable weather station or calling the local weather station.
 3. Test conditions:
 - Avoid direct sunlight.
 - Open hood.
 - Open front doors.
 - Set the temperature control knob to MAX. COOL, set the mode control knob to VENT and push the recirculation control button to RECIRCU.
 - Turn the heater fan switch to MAX.
 - Run the engine at 1,500 min⁻¹(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.
 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 to 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

Pressure Test Chart

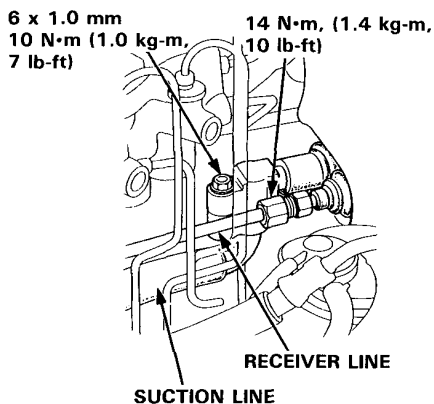
TEST RESULTS	RELATED SYMPTOMS	PROBABLE CAUSE	REMEDY
Discharge (high) pressure abnormally high	After stopping the compressor, pressure drops to about 200 kPa (2.0 kg/cm ² , 28 psi) quickly, and then falls gradually.	Air in system	Discharge, evacuate and recharge the system Evacuation: see page 22-41 Recharging: see page 22-42
	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Discharge, evacuate and recharge the system.
	Reduced or on air flow through condenser	<ul style="list-style-type: none"> Clogged condenser or radiator fins Condenser or radiator fan not working properly 	<ul style="list-style-type: none"> Clean Check voltage and fan speed Check fan direction
	Line to condenser is excessively hot.	Restricted flow of refrigerant in system	<ul style="list-style-type: none"> Expansion valve Restricted lines
Discharge pressure abnormally low	Excessive bubbles in sight glass; condenser is not hot.	Insufficient refrigerant in system	<ul style="list-style-type: none"> Check for leak Charge system
	High and low pressures are balanced soon after stopping the compressor. Low side is higher than normal.	<ul style="list-style-type: none"> Faulty compressor discharge or inlet valve Faulty compressor seal 	Replace compressor
	Outlet of expansion valve is not frosted, low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> Faulty expansion valve Moisture in system 	<ul style="list-style-type: none"> Replace Flush and discharge, evacuate and recharge the system
Suction (low) pressure abnormally low	Excessive bubbles in sight glass; condenser is not hot.	Insufficient refrigerant	<ul style="list-style-type: none"> Check for leaks. Discharge, evacuate and recharge the system Charge as required
	Expansion valve is not frosted and low pressure line is not cold. Low pressure gauge indicates vacuum.	<ul style="list-style-type: none"> Frozen expansion valve Faulty expansion valve 	Replace 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 is cool (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.	<ul style="list-style-type: none"> Expansion valve open too long Loose expansion valve 	Repair or replace
	Suction pressure is lowered when condenser is cooled by water.	Excessive refrigerant in system	Discharge, evacuate and recharge the system.
	High and low pressure are equalized as soon as the compressor is stopped and both gauges fluctuate while running.	<ul style="list-style-type: none"> Faulty gasket Faulty high pressure valve Foreign particle stuck in high pressure valve 	Replace compressor
Suction and discharge pressure abnormally high	Reduced air flow through condenser	<ul style="list-style-type: none"> Clogged condenser and/or radiator fins Condenser or radiator fan not working properly 	<ul style="list-style-type: none"> Clean condenser and/or radiator Check voltage and fan speed Check fan direction
	No bubbles in sight glass when condenser is cooled by water	Excessive refrigerant in system	Discharge, evacuate and recharge the system
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 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 compressor
Compressor heat damage	Black soot inside compressor and hoses	Restriction or leak in system.	Flush entire system, replace rubber lines or hoses.



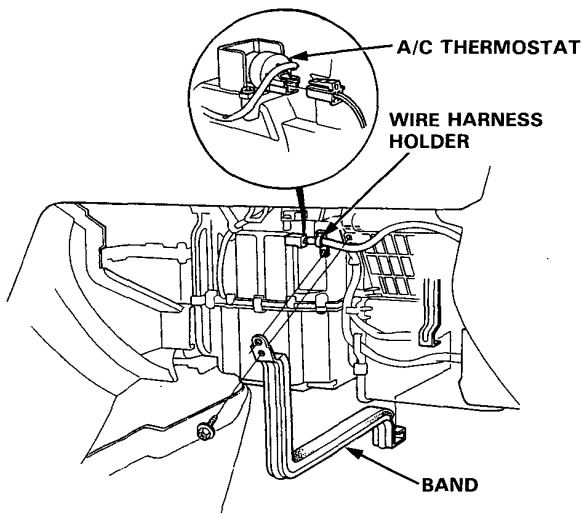
Evaporator Replacement

1. Disconnect the negative cable from the battery.
2. Discharge the refrigerant (see page 22-25).
3. Disconnect the receiver line from the evaporator.
4. Remove the bolt and disconnect the suction line from the evaporator.

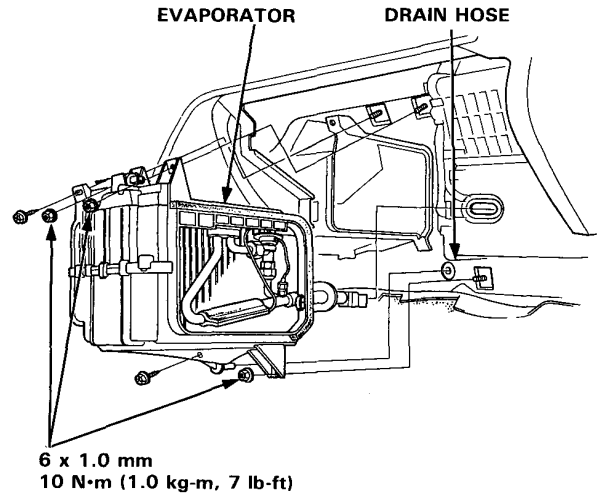
NOTE: Plug or cap the lines immediately after disconnecting, to avoid moisture and dust contamination into the system.



5. Remove the glove box and the glove box frame (see page 21-15).
6. Disconnect the connector from the A/C thermostat and remove the wire harness holder from the band.
7. Remove the self-tapping screw and the band.



8. Remove the drain hose.
9. Remove the three nuts and the two self-tapping screws, then remove the evaporator.



10. Install in the reverse order of removal, and:

- if you're installing a new evaporator, add refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) (see page 22-23).
- replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) before installing them.
NOTE: Be sure to use the right O-rings for R-134a to avoid leakage.
- apply sealant to the grommets.
- make sure that there is no air leakage.
- charge the system (see page 22-42) and test its performance (see page 22-26).

Evaporator

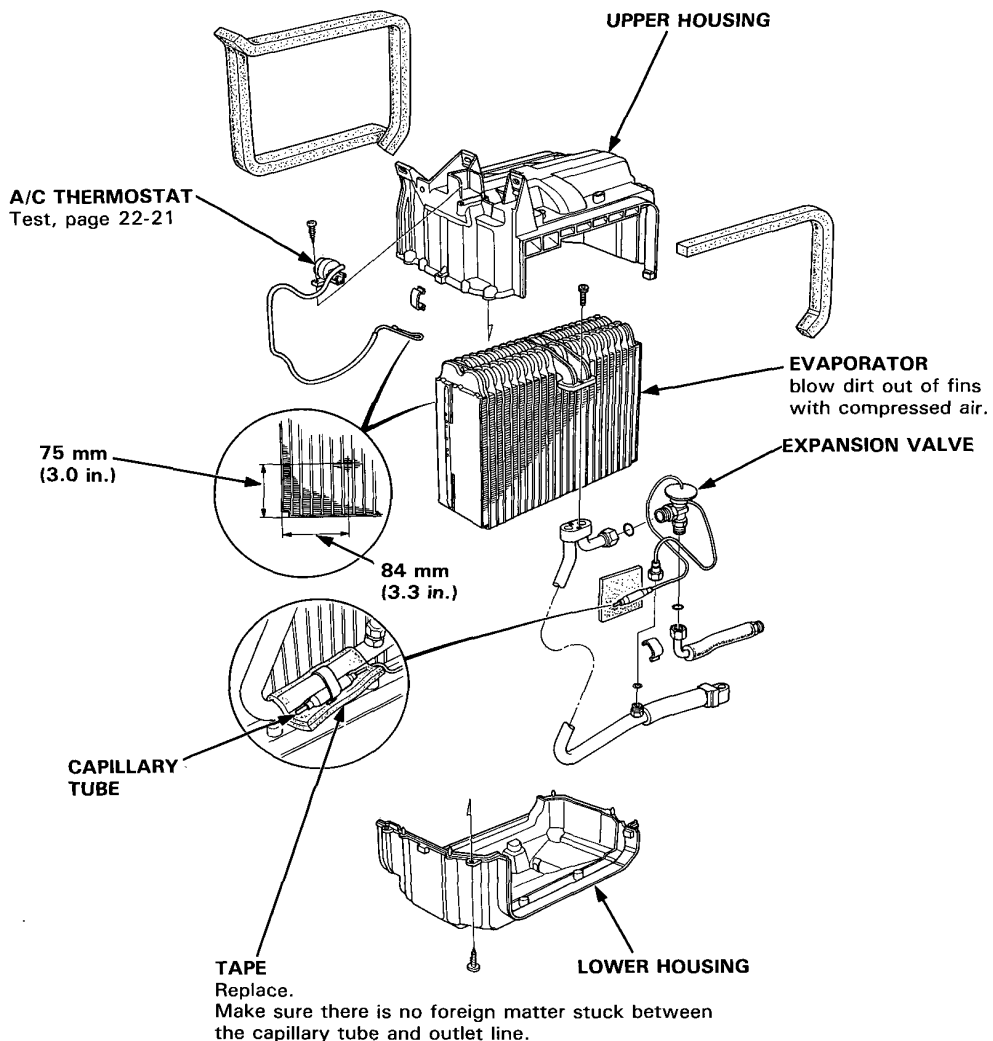
Overhaul

1. Pull out the A/C thermostat sensor from the evaporator fins.
2. Remove the self-tapping screws and clips from the housing.
3. Carefully separate the housings and remove the evaporator.
4. If necessary, remove the expansion valve.

NOTE: When loosening the expansion valve nuts, use a second wrench to hold the valve or evaporator pipe. Otherwise, they can be cracked.

5. Assemble in the reverse order of disassembly, and:

- replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) before installing them.
NOTE: Be sure to use the right O-rings for R-134a to avoid leakage.
- install the expansion valve capillary tube with the capillary tube in contact with the suction line directly, and wrap it with tape.
- reinstall the A/C thermostat sensor in its original location.

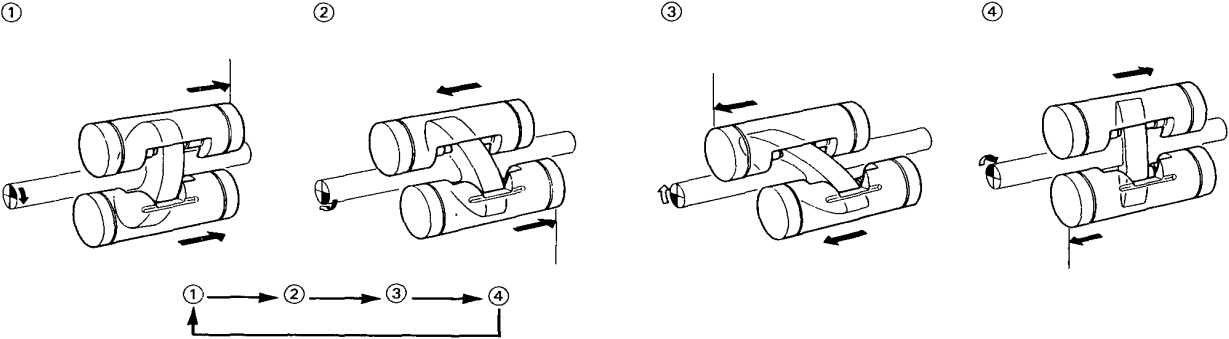
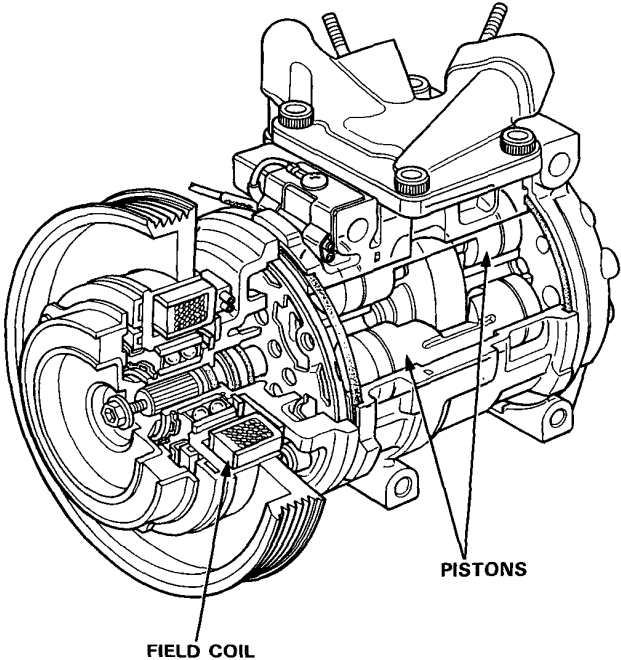




Compressor

Description

This compressor is a Nippondenso piston type for R-134a. A revolving inclined disc drives the surrounding 10 reciprocating pistons. As the inclined disc revolves, it pushes the pistons, protected by a ceramic shoe, thus compressing the refrigerant.



Compressor

Illustrated Index

Check the plated parts of the pressure plate for color changes, peeling or other damage. If there is damage, replace the clutch set.

Turn the pulley and check for excessive bearing play or drag. If there is excessive play or drag, replace the clutch set.

Check resistance by connecting an ohmmeter to the field coil wire and the compressor body. Field Coil Resistance: 3.6 ± 0.2 ohm at 20°C (68°F)
If resistance is not within specifications, replace the field coil.

COMPRESSOR COMPLETE
(Do not disassemble)

CENTER BOLT

PRESSURE PLATE

SHIM(S)

SNAP RING B

PULLEY

Inspection, page 22-35

SNAP RING A

FIELD COIL

Inspection, page 22-35

CLUTCH SET
Inspection,
page 22-35

RELIEF VALVE

Replacement, page 22-37

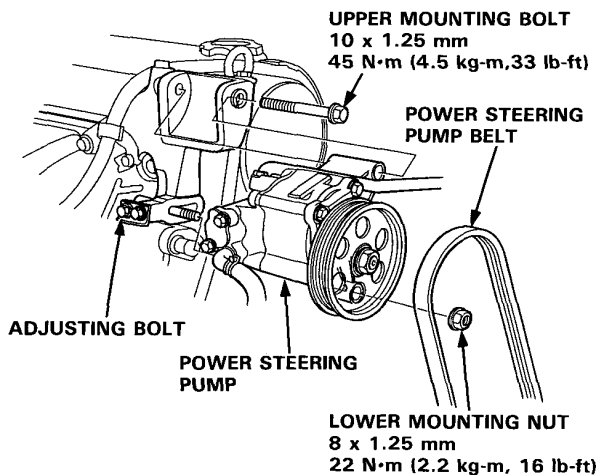
O-RING
Replace.



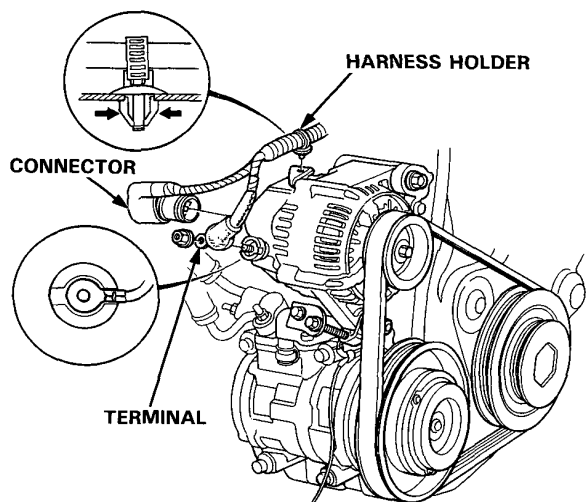
Replacement

1. If the compressor is marginally operable, run the engine at idle speed and let the air conditioning work a few minutes. Then shut the engine off and disconnect the battery negative terminal.
2. Discharge the refrigerant (see page 22-35).
3. Loosen the upper mounting bolt, lower mounting nut and the adjusting bolt, then remove the power steering pump belt. Remove the upper mounting bolt and the lower mounting nut, then remove the power steering pump.

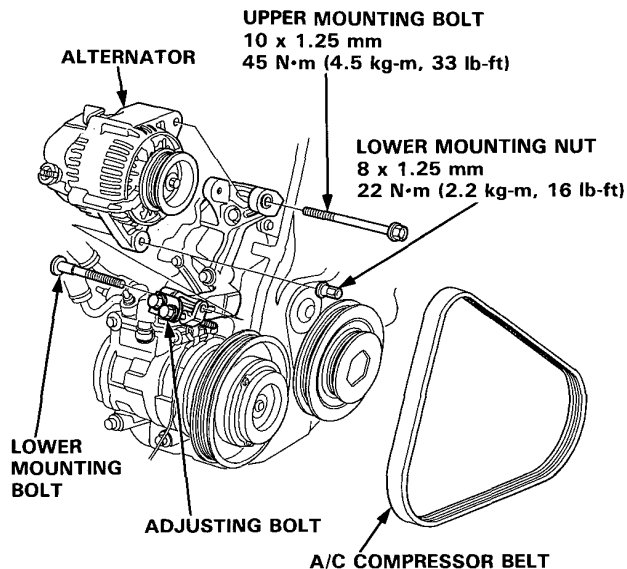
NOTE: Do not disconnect the inlet and outlet hoses from the power steering pump.



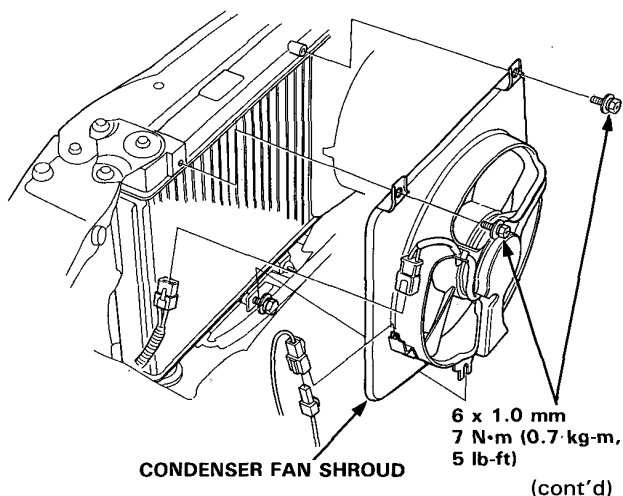
4. Remove the harness holder, connector and the terminal from the alternator.



5. Loosen the upper mounting bolt, lower mounting nut and the adjusting bolt, then remove the A/C compressor belt. Remove the upper mounting bolt, lower mounting nut and the lower mounting bolt, then remove the alternator.



6. Disconnect the condenser fan connector. Remove the compressor connector from the condenser fan shroud, then disconnect the compressor connector. Loosen the lower mounting bolt and remove the two upper mounting bolts, then remove the condenser fan shroud.

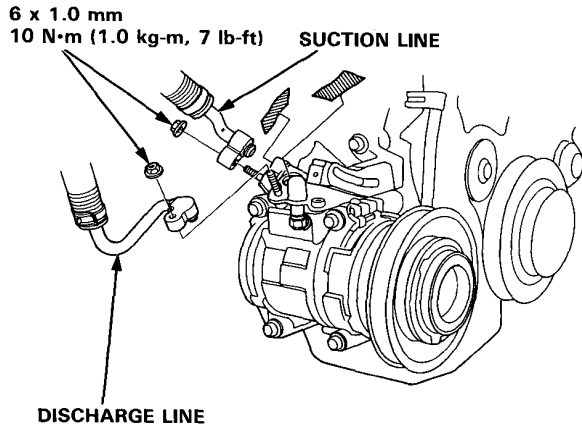


Compressor

Replacement (cont'd)

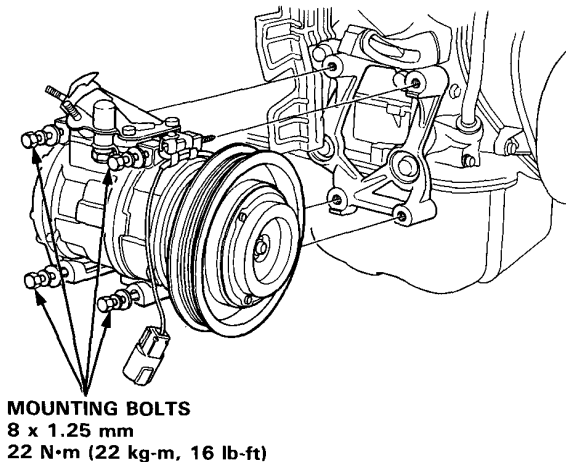
7. Remove the nut and disconnect the suction line from the compressor.
Remove the nut and disconnect the discharge line from the compressor.

NOTE: Plug or cap the lines immediately after disconnecting, to avoid moisture and dust contamination into the system.

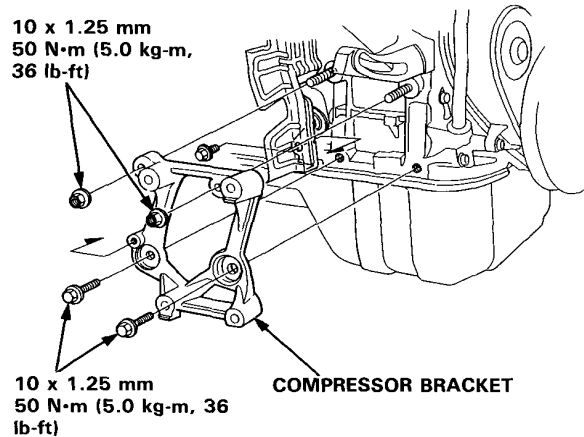


8. Remove the four mounting bolts and the compressor.

CAUTION: Do not damage the radiator fins when removing the compressor.



9. If necessary, remove the bolt from the heat insulator. Remove the two bolts and the two nuts, then remove the compressor bracket.



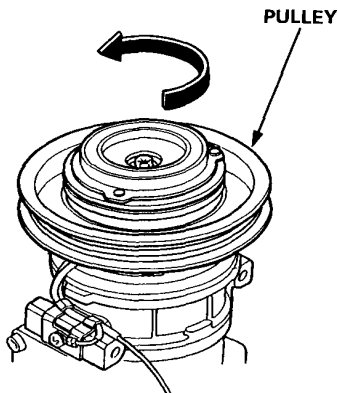
10. Install in the reverse order of removal, and:

- 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 160 cc (5 1/3 fl oz, 5 1/3 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 R-134a to avoid leakage.
- use (ND-OIL 8: P/N38899-PR7-003) oil for R-134a Nippondenso piston type compressors only.
- do not return the oil to the container once dispensed and never mix with other refrigerant oils to avoid contamination.
- 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 car; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- do not damage the radiator fins when installing the compressor.
- adjust A/C compressor belt tension (see page 22-38).
- adjust the power steering pump belt (see section 17).
- charge the system (see page 22-42) and test its performance (see page 22-26).



Clutch Inspection

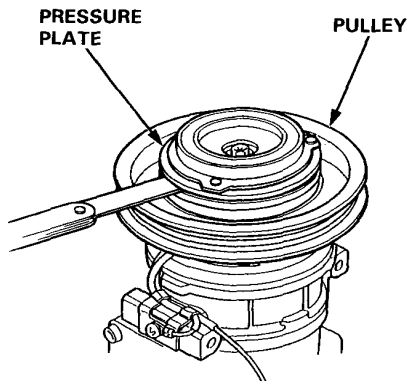
- Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



- Measure the clearance between the pulley and pressure plate all the way around. If the clearance is not within specified limits, the pressure plate must be removed and shims added or removed as required, following the procedure on page 22-36.

CLEARANCE; 0.5 ± 0.15 mm (0.020 ± 0.006 in)

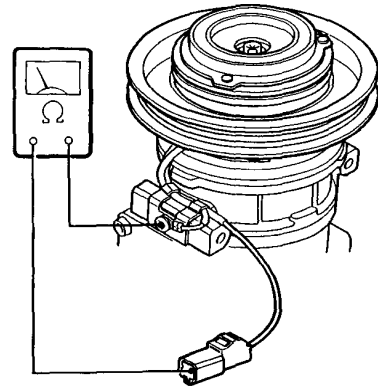
NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm and 0.5 mm.



- Check resistance of the field coil:

Field Coil Resistance: 3.6 ± 0.2 ohm at 20°C (68°F)

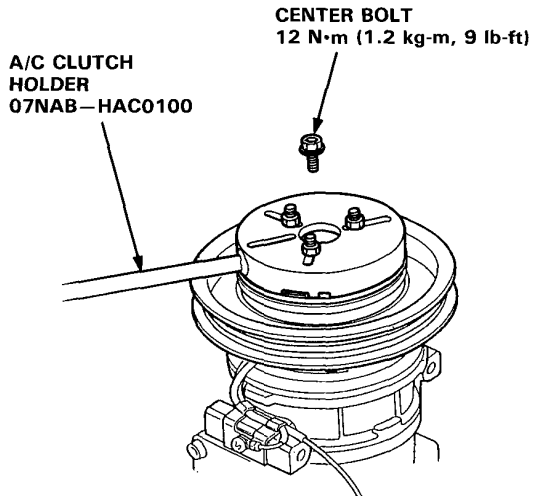
If resistance is not within specifications, replace the field coil.



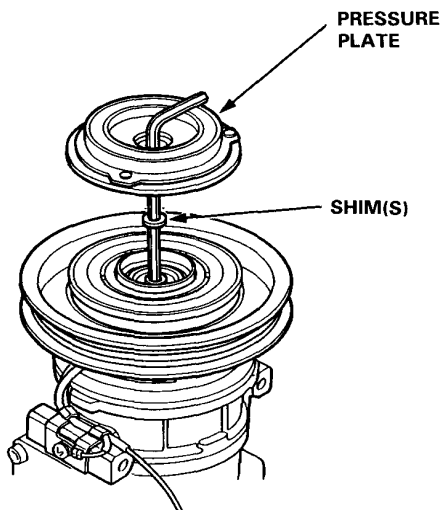
Compressor

Clutch Overhaul

1. Remove the center bolt while holding the pressure plate.



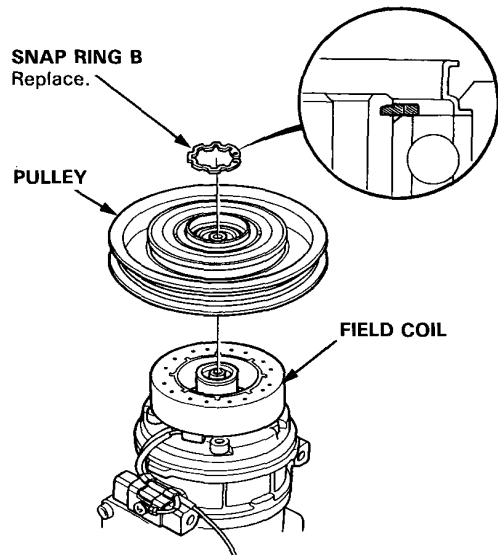
2. Remove the pressure plate and shim(s) taking care not to lose the shims.



3. Use snap ring pliers to remove the snap ring B, then remove the pulley.

NOTE:

- Be careful not to damage the pulley and compressor during removal/installation.
- Once the snap ring B is removed, replace it with a new one.

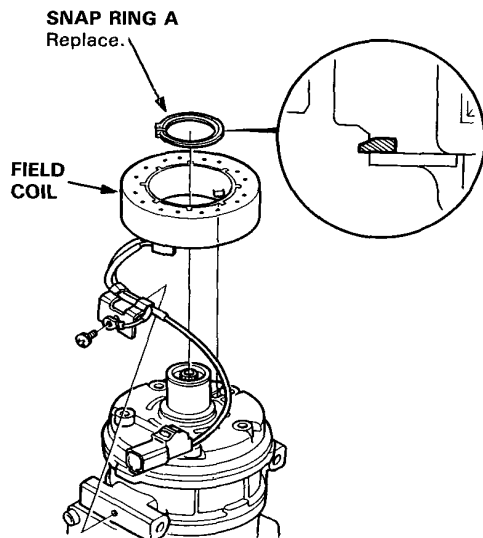




4. Remove the snap ring A and the field coil.

NOTE:

- Be careful not to damage the field coil and compressor during removal/installation.
- Once the snap ring A is removed, replace it with a new one.



5. Install in the reverse order of removal, and:

- install the field coil with the wire side facing down (see above).
- clean the pulley and compressor sliding surfaces with non-petroleum solvent.
- check the pulley bearings for excessive play.
- make sure the snap rings are in the groove properly.
- apply locking agent to the thread of the center bolt and tighten it securely.
- make sure that the pulley turns smoothly, after it's reassembled.

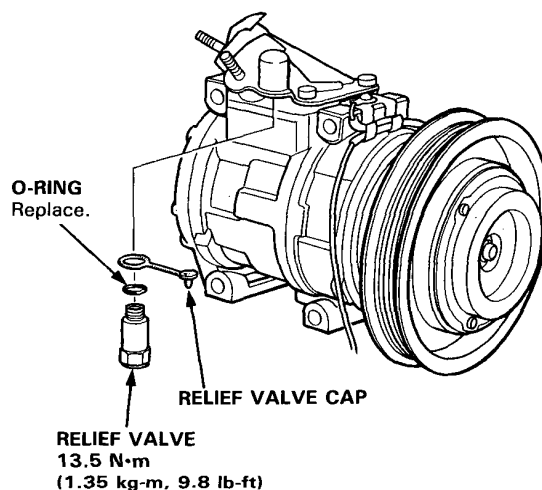
Relief Valve Replacement

NOTE: Make sure the suction and discharge ports are plugged with caps.

1. Remove the relief valve and the O-ring.

CAUTION:

- Do not let the compressor oil run out.
- Make sure there is no foreign matter in the system.



2. Install and tighten the relief valve.

- Clean the mating surfaces.
- Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) before installing it.

NOTE:

- Do not return the oil to the container once dispensed and never mix with other refrigerant oils to avoid contamination.
- 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 car; if may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Check for leaks, and insert the cap in the top of the valve.

Belt Adjustment

Deflection Method

1. Apply a force of 100 N (10 kg, 22 lbs) and measure the deflection between the alternator and crankshaft pulley.

A/C Compressor Belt

Used Belt: 10.0–12.0 mm (0.39–0.47 in)

New Belt: 4.5–7.0 mm (0.18–0.28 in)

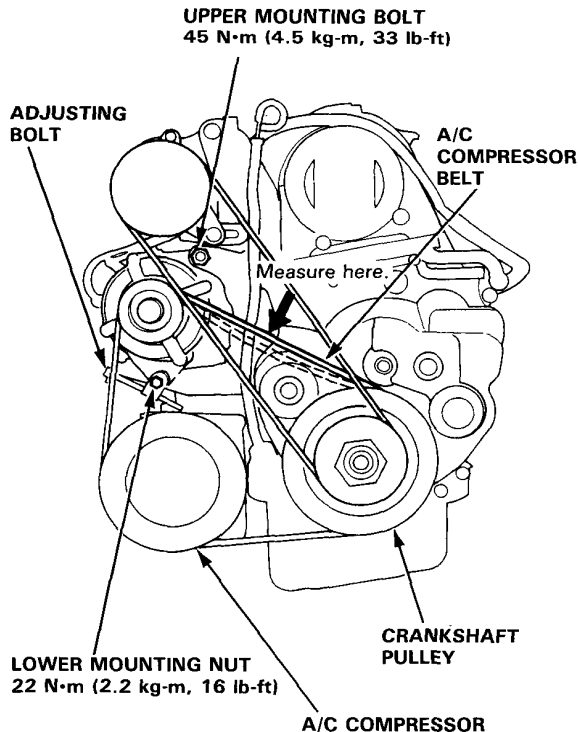
Power Steering Pump Belt

Used Belt: 13.5–16.0 mm (0.53–0.63 in)

New Belt: 9.5–11.5 mm (0.37–0.45 in)

NOTE: If there are cracks or any damage evident on the belt, replace it with a new one.

2. Loosen the upper mounting bolt and the lower mounting nut.
3. Turn the adjusting bolt to obtain the proper belt tension, then retighten the lower mounting nut and the upper mounting bolt.
4. Recheck the deflection of the belt.



Tension Gauge Method

1. Attach the belt tension gauge to the belt and measure the tension of the belt.

A/C Compressor Belt

Used Belt: 450–600 N (40–60 kg, 99–132 lbs)

New Belt: 950–1150 N (95–115 kg, 209–254 lbs)

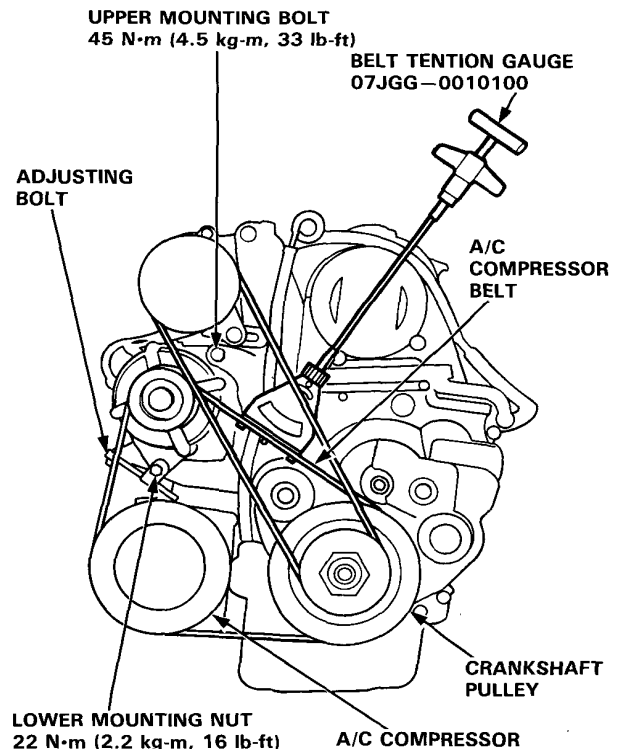
Power Steering Pump Belt

Used Belt: 350–500 N (35–50 kg, 77–110 lbs)

New Belt: 700–900 N (70–90 kg, 154–198 lbs)

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 belt tension gauge.
2. Loosen the upper mounting bolt and the lower mounting nut.
 3. Turn the adjusting bolt to obtain the proper belt tension, then retighten the lower mounting nut and the upper mounting bolt.
 4. Recheck the deflection of the belt.

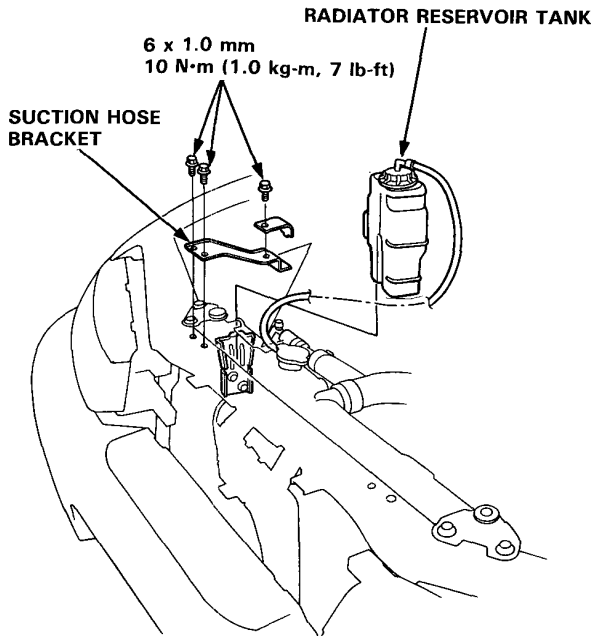




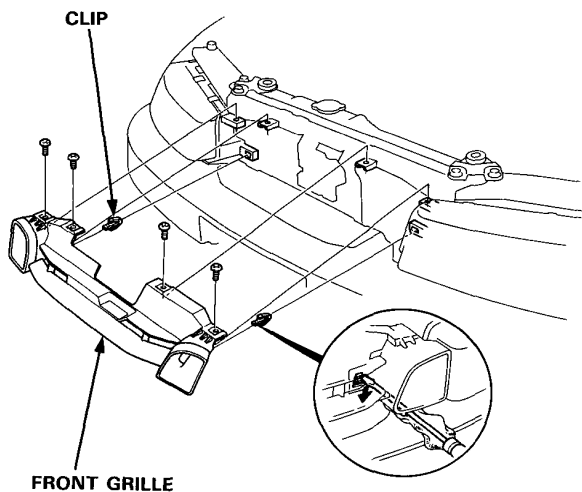
Condenser

Replacement

1. Discharge the refrigerant (see page 22-25).
2. Temporarily remove the radiator reservoir tank and the intake tube, then remove the three bolts and the suction hose brackets.

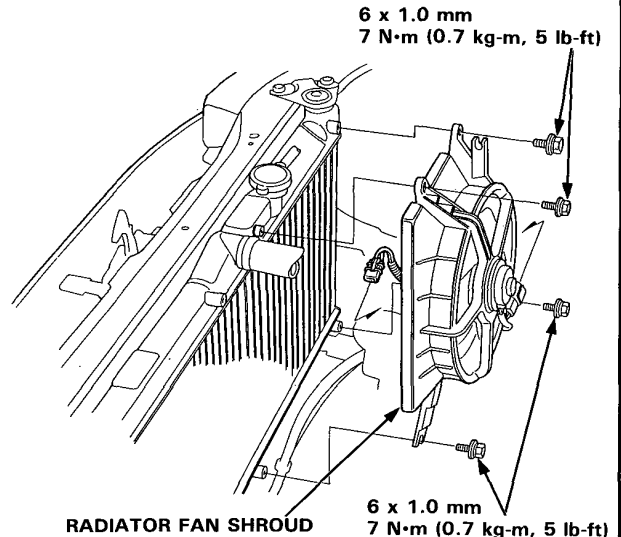


3. Remove the four screws and push the clips on each side with a flat tip screwdriver as shown, then remove the front grille.



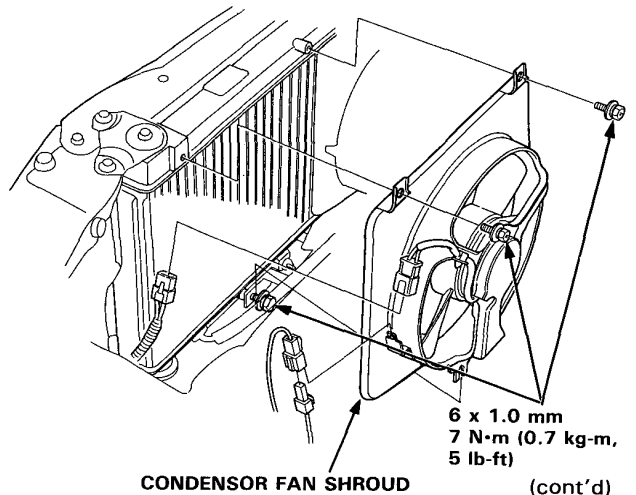
4. Disconnect the radiator fan connector. Remove the four mounting bolts and the radiator fan shroud.

CAUTION: Do not damage the radiator fins when removing the radiator fan shroud.



5. Disconnect the condenser fan connector. Remove the compressor connector from the condenser fan shroud, then disconnect the compressor connector. Loosen the lower mounting bolt and remove the two upper mounting bolts, then remove the condenser fan shroud.

CAUTION: Do not damage the radiator fins when removing the condensor fan shroud.

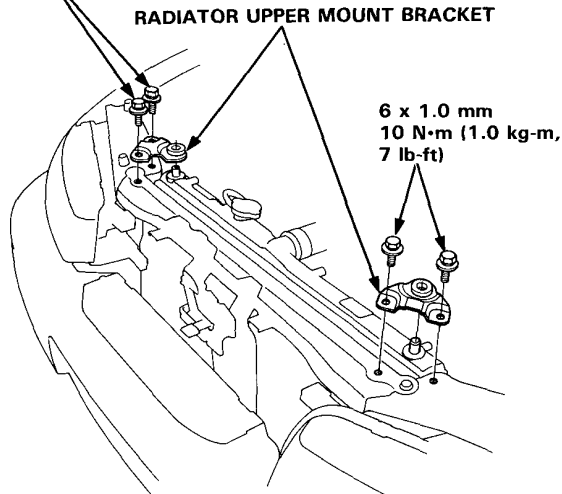


Condenser

Replacement (cont'd)

6. Remove the four bolts and the radiator upper mount brackets.

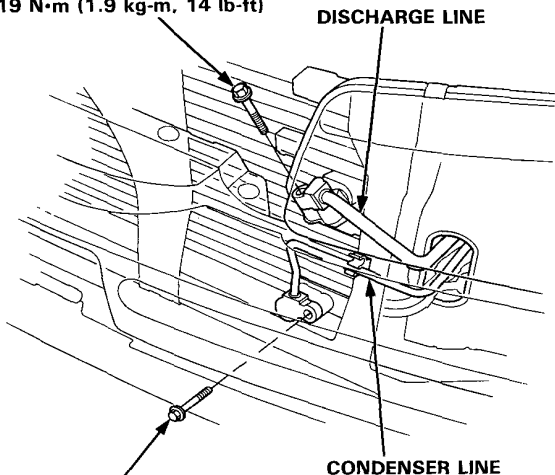
6 x 1.0 mm
10 N·m (1.0 kg-m, 7 lb-ft)



7. Remove the bolt and disconnect the condenser line from the condenser.
Remove the bolt and disconnect the discharge line from the condenser.

NOTE: Plug or cap the lines immediately after disconnecting, to avoid moisture and dust contamination into the system.

8 x 1.25 mm
19 N·m (1.9 kg-m, 14 lb-ft)

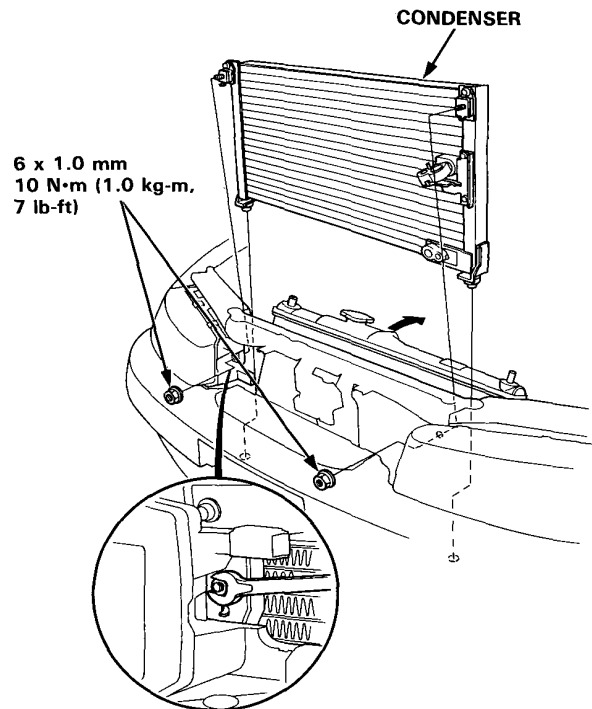


6 x 1.0 mm
10 N·m (1.0 kg-m, 7 lb-ft)

8. Remove the two mounting nuts and lift out the condenser as shown.

CAUTION:

- Do not damage the radiator and condenser fins when removing the condenser.
- Be careful not to drop the mounting nuts.



9. Install in the reverse order of removal, and:

- if you're installing a new condenser, add refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) (see page 22-23).
- replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil (ND-OIL 8: P/N 38899-PR7-003) before installing them.
NOTE: Be sure to use the right O-rings for R-134a to avoid leakage.
- do not damage the radiator and condenser fins when installing the condenser.
- be sure to install the condenser mount cushions securely into the holes.
- charge the system (see page 22-42) and test its performance (see page 22-26).

A/C System Service



Evacuation

NOTE:

- Only use a gauge set for refrigerant R-134a.
- Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

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 vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced.)
2. Connect a R-134a refrigerant gauge, pump and refrigerant containers (cans of R-134a) as shown.

NOTE: Do not open the cans.

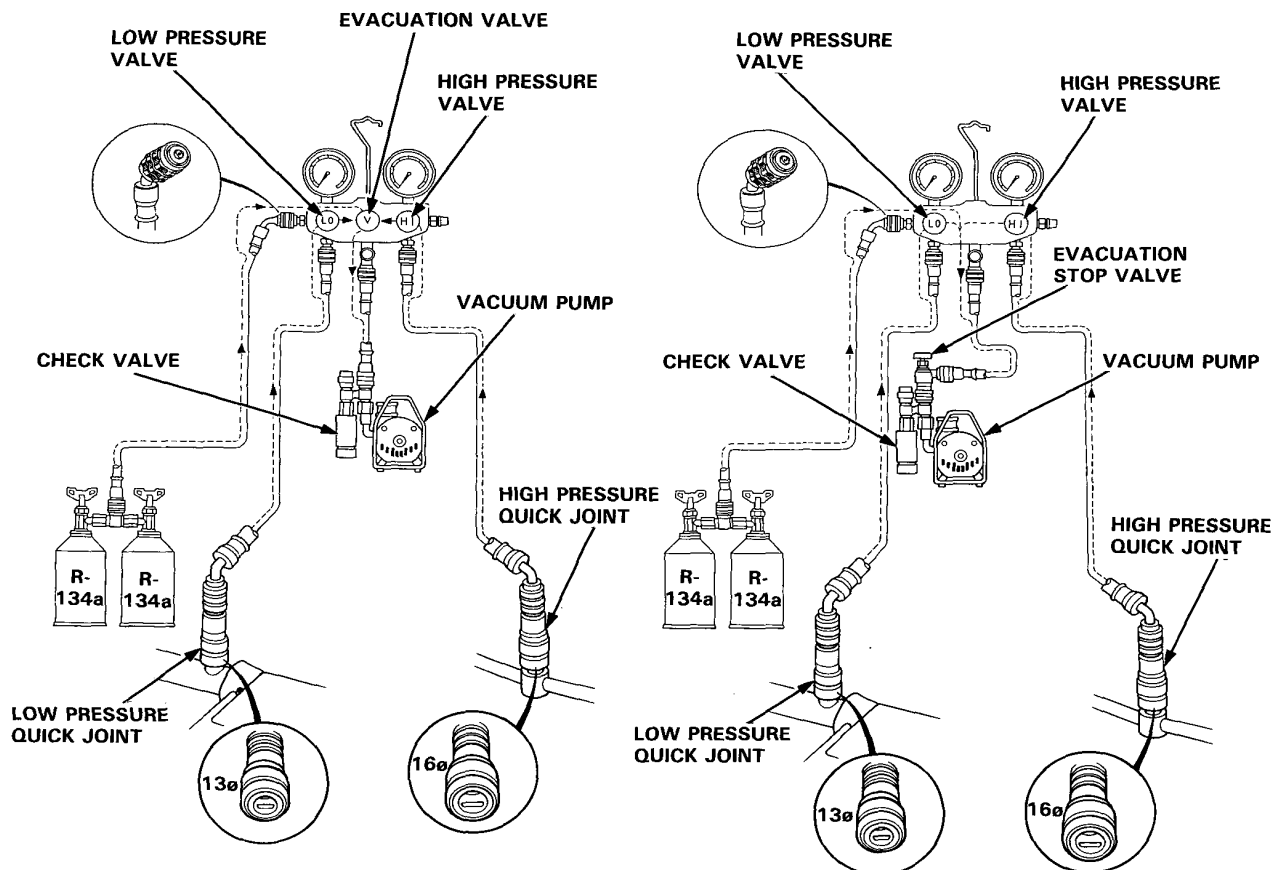
3. Start the pump, then open the both pressure valves, and evacuation valve (two valve gauge: evacuation stop valve). Run the pump for about 15 minutes. Close both pressure valves and the evacuation valve (two valve gauge: evacuation stop valve) and stop the pump. The low pressure gauge should indicate above 700 mmHg (27 in-Hg) and remain steady with the valves closed.

NOTE: If low pressure does not reach more than 700 mmHg (27 in-Hg) in 15 minutes, there is probably a leak in the system. Check for leaks, and repair (see Leak Test).

4. If there are no leaks, open the valves and continue pumping for at least another 15 minutes. Then close both valves and stop the pump.

THREE VALVE GAUGE

TWO VALVE GAUGE



A/C System Service

Charging

NOTE:

- Only use a gauge set for refrigerant R-134a.
- Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

⚠ WARNING When handling refrigerant (R-134a):

- always wear eye protection.
- do not let refrigerant get on your skin or in your eyes. If it does:
 - do not rub your eyes or skin.
 - splash large quantities of cool water in your eyes or on your skin.
 - rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- keep refrigerant containers (cans of R-134a) stored below 40°C (104°F).
- keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.
- work in well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small, enclosed area.

CAUTION: Do not overcharge the system; the compressor will be damaged.

1. After the leak test, check that the high pressure valve is closed and start the engine.

NOTE: Run the engine below 1500 min⁻¹ (rpm).

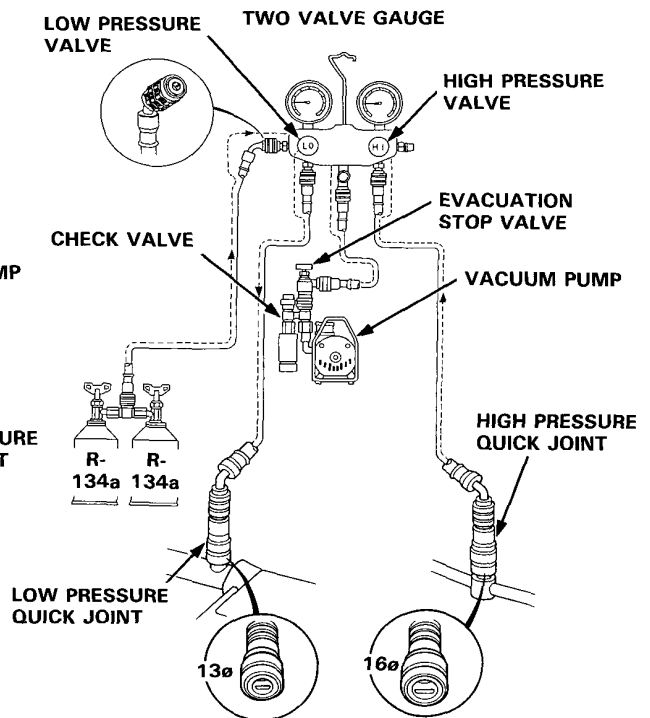
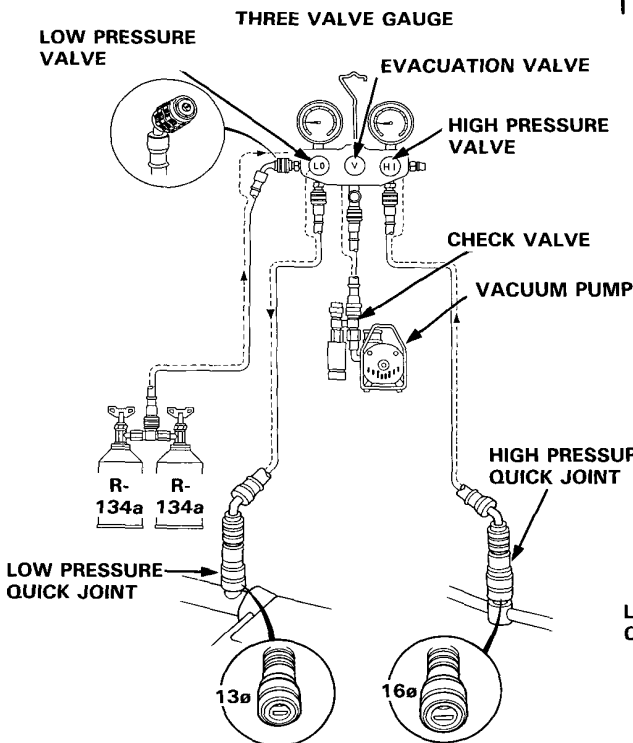
2. Open the front door. Turn the A/C switch ON. Set the temperature control knob to MAX. COOL. Set the mode control knob to VENT. Turn the heater fan switch to "V" (MAX).

3. Open the low pressure valve and charge with R-134a refrigerant.

⚠ WARNING

- Do not open the high pressure valve.
 - Do not turn the cans upside down.
4. Charge the system with refrigerant capacity. Refrigerant capacity: 750⁺⁰₋₅₀ g (26⁺⁰₋₂₀ oz)
 5. When fully charged, close the low pressure valve and the refrigerant cans. Check the system.
 6. Stop the engine and disconnect the charge hose quickly.
 7. Check the system for leaks using a leak detector proper to refrigerant R-134a.

NOTE: Particularly check for leaks around the compressor, condenser, and receiver/dryer.





Leak Test

NOTE:

- Only use a gauge set for refrigerant R-134a.
- Use a vacuum pump adapter which is equipped with a check valve to prevent the backflow of the vacuum pump oil.

⚠ WARNING When handling refrigerant (R-134a):

- always wear eye protection.
- do not let refrigerant get on your skin or in your eyes. If it does:
 - do not rub your eyes or skin.
 - splash large quantities of cool water in your eyes or on your skin.
 - rush to a physician or hospital for immediate treatment. Do not attempt to treat it yourself.
- keep refrigerant containers (cans of R-134a) stored below 40°C (104°F).
- keep away from open flame. Refrigerant, although non-flammable, will produce poisonous gas if burned.
- work in well-ventilated area. Refrigerant evaporates quickly, and can force all the air out of a small, enclosed area.

1. Close the evacuation valve (two valve gauge; evacuation stop valve).

2. Open the cans.

3. Open high pressure valve to charge the system to about 100 kPa (1.0 kg/cm², 14 psi), then close it.

NOTE: Close the low pressure valve.

4. Check the system for leaks using a leak detector proper to refrigerant R-134a.

NOTE: Particularly check for leaks around the compressor, condenser, and receiver/dryer.

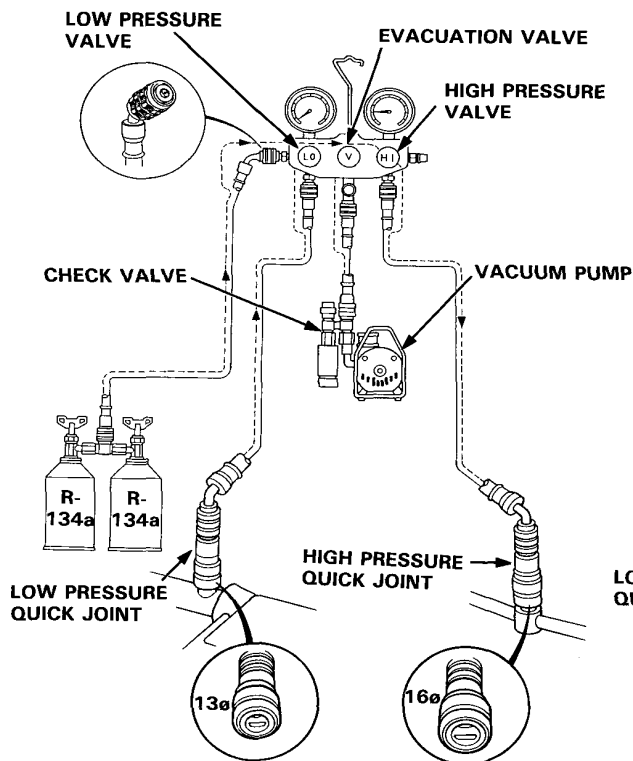
5. If you find any leaks, tighten the joint nuts and bolts to the specified torque.

6. Recheck the system for leaks using a leak detector.

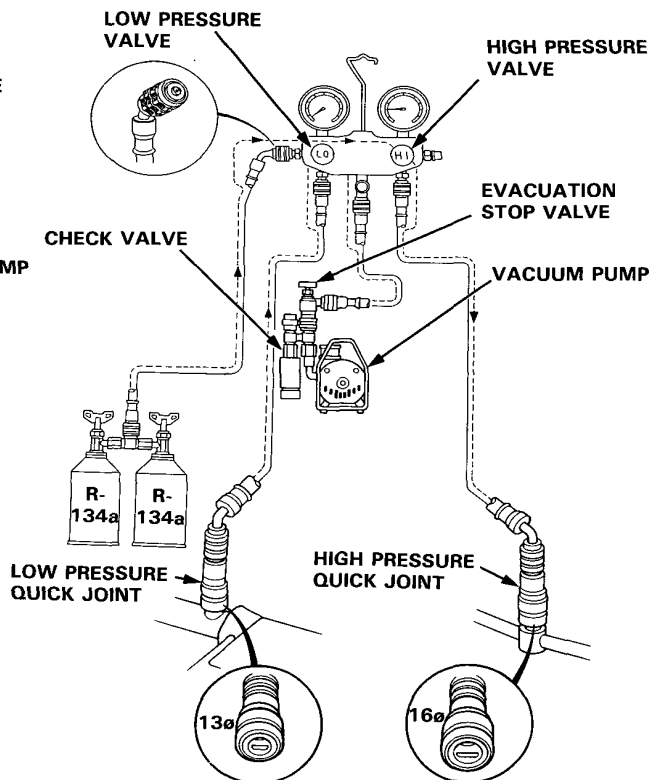
7. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), release any charge in the system.

8. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 22-14).

THREE VALVE GAUGE



TWO VALVE GAUGE



Read this before you do any electrical work on the car.

Some models of the Accord include a driver's side airbag, located in the steering wheel hub, as part of a supplemental restraint system (SRS). Information necessary to safely service the SRS is included in this shop 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 only by an authorized HONDA dealer.

▲ WARNING

- To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance on this system must be performed by an authorized HONDA dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, and replacing with wrong parts, could lead to personal injury caused by unintentional activation of the airbag.
- All SRS electrical wiring harnesses are covered with yellow outer insulation. Related components are located in the steering column, the dashboard, and behind the dashboard lower cover. Do not use electrical test equipment on these circuits.
- Servicing, disassembling or replacing nearby the steering wheel, under the dash, or related to the wire harnesses nearby the under-dash fuse/relay box may affect the SRS and must therefore be performed by an authorized HONDA dealer.

Electrical

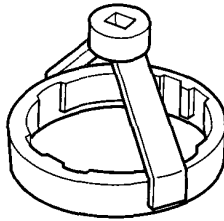
Special Tools	23-2	Indicator/Warning System	
Troubleshooting		*A/T Gear Position Indicator	23-138
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Five-step Troubleshooting	23-5	Engine Oil Pressure Warning System	13-127
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		Vehicle Speed Sensor (VSS)	23-127
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*Read SRS precautions on page 23-306 before working in these areas.

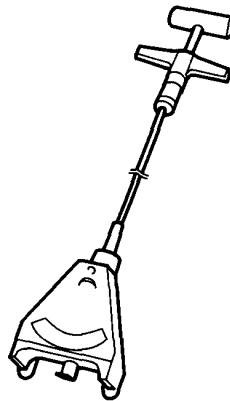


Special Tools

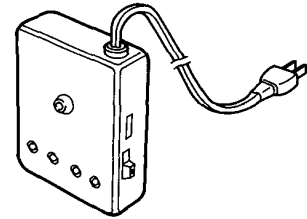
Ref. No.	Tool Number	Description	Qty.	Page Reference
①	07GAC—SE0020A	Fuel Sender Wrench	1	23-129
②	07JGG—0010100	Belt Tension Gauge	1	23-106, 107
③	07MAJ—SP00100	Keyless Entry Checker	1	23-292
④	07HAZ—SG00400	Deployment Tool	1	23-325
⑤	07MAZ—SS10100	SRS Disposal Bracket	1	23-324



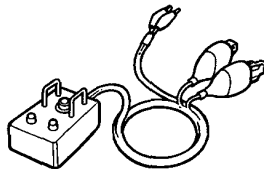
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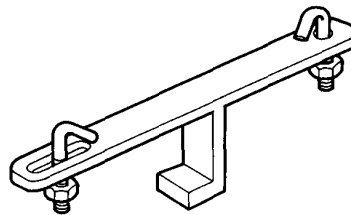
②



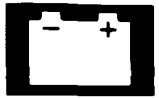
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④



⑤



Troubleshooting

Tips and Precautions

Before Troubleshooting

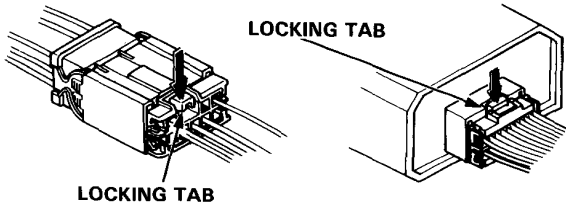
- Check applicable fuses in the appropriate fuse/relay box.
- Check the battery for damage, state of charge, and clean and tight connections.
- Check the alternator belt tension.

CAUTION:

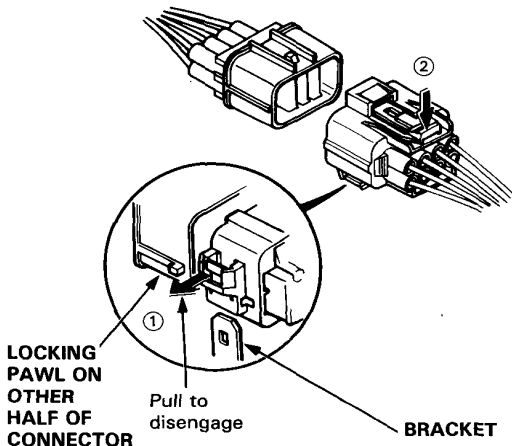
- Do not quick-charge a battery unless the battery ground cable has been disconnected. Otherwise, you will damage the alternator diodes.
- Do not attempt to crank the engine with the battery ground cable loosely connected or you will severely damage the wiring.

Handling Connectors

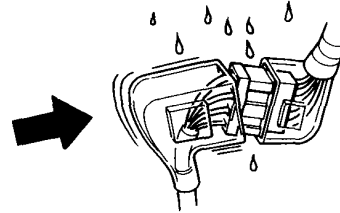
- Make sure the connectors are clean and have no loose wire terminals.
- Make sure multiple cavity connectors are packed with grease (except watertight connectors).
- All connectors have push-down release type locks.



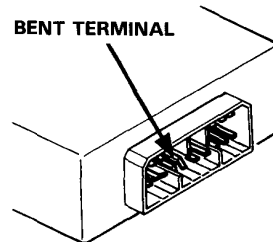
- Some connectors have a clip on their side used to attach them to a bracket on the body or on another component. This clip has a pull type lock.
- Some mounted connectors cannot be disconnected unless you first release the lock and remove the connector from its bracket.



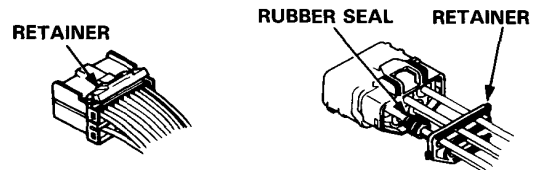
- Never try to disconnect connectors by pulling on their wires; pull on the connector halves instead.
- Always reinstall plastic covers.



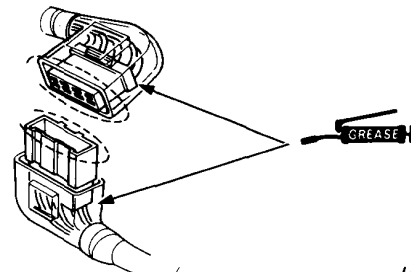
- Before connecting connectors, make sure the terminals are in place and not bent.



- 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.

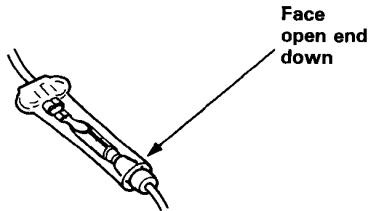


(cont'd)

Troubleshooting

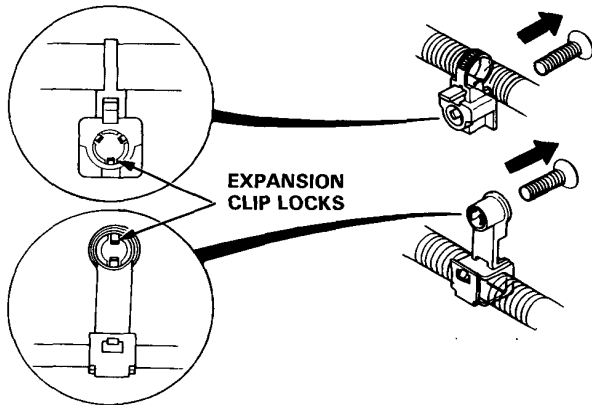
Tips and Precautions (cont'd)

- 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.

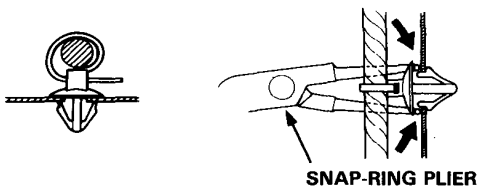


Handling Wires and Harnesses

- Secure wires and wire harnesses to the frame with their respective wire ties at the designated locations.
- Remove clips carefully; do not damage their locks.

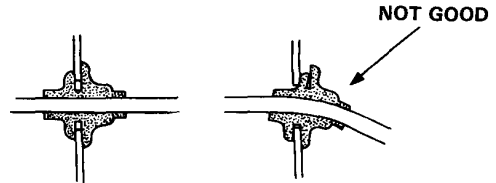


Slip pliers under the clip base and through the hole at an angle, then squeeze the expansion tabs to release the clip.



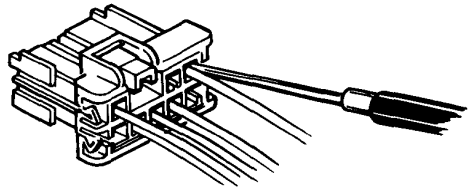
- After installing harness clips, make sure the harness does not interfere with any moving parts.
- Keep wire harnesses away from exhaust pipes and other hot parts, from sharp edges of brackets and holes, and from exposed screws and bolts.

- Seat grommets in their grooves properly.

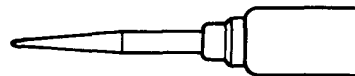


Testing and Repairs

- 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.





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

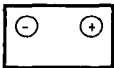




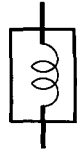


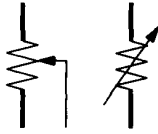

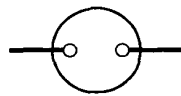







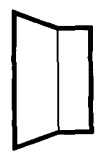

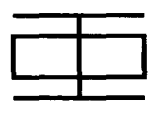
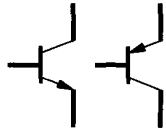
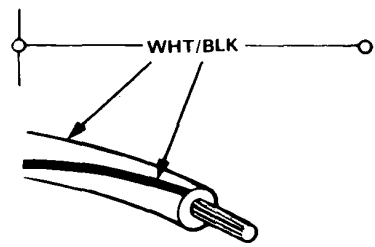
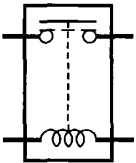
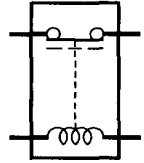



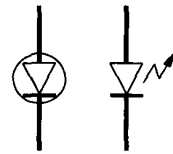


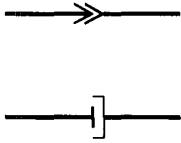

Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.

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.

How to Use This Section

Schematic Symbols

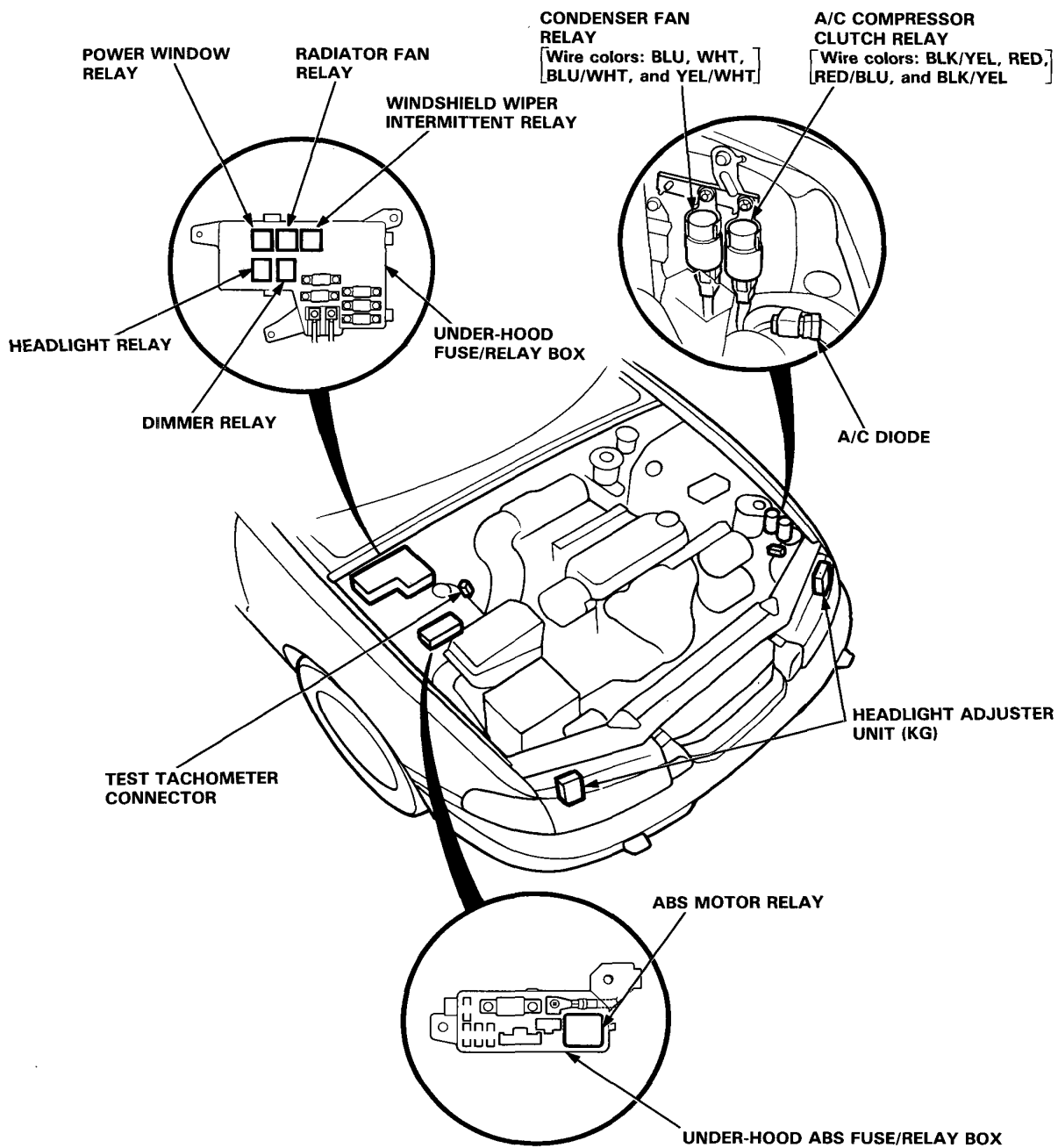
BATTERY  		GROUND Ground terminal  Component ground 		FUSE 	COIL, SOLENOID 	CIGARETTE LIGHTER 
RESISTOR 	VARIABLE RESISTOR 	THERMISTOR 	IGNITION SWITCH 	BULB 	HEATER 	
MOTOR 	PUMP 	CIRCUIT BREAKER 	HORN 	DIODE 	SPEAKER, BUZZER 	
ANTENNA Mast  Window 		TRANSISTOR (Tr) 		Wire Color Codes The following 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 (In normal position) Normally open relay Normally closed relay  		CONDENSER 				
SWITCH (In normal position) Normally open switch Normally closed switch  		LIGHT EMITTING DIODE (LED) 				
CONNECTION Input  Output 	CONNECTOR 	REED SWITCH 				



Relay and Control Unit Locations

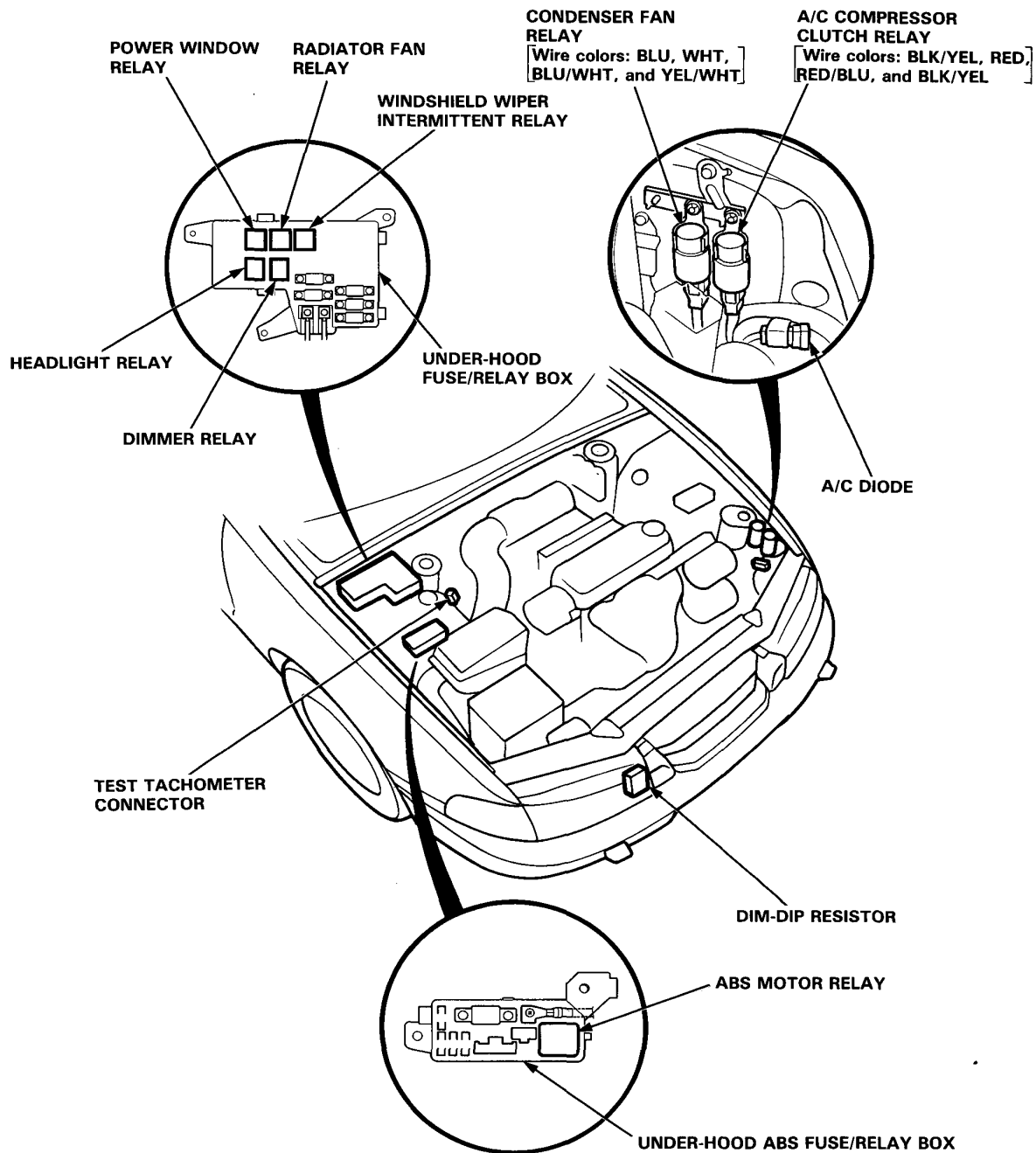
Engine Compartment

LHD:





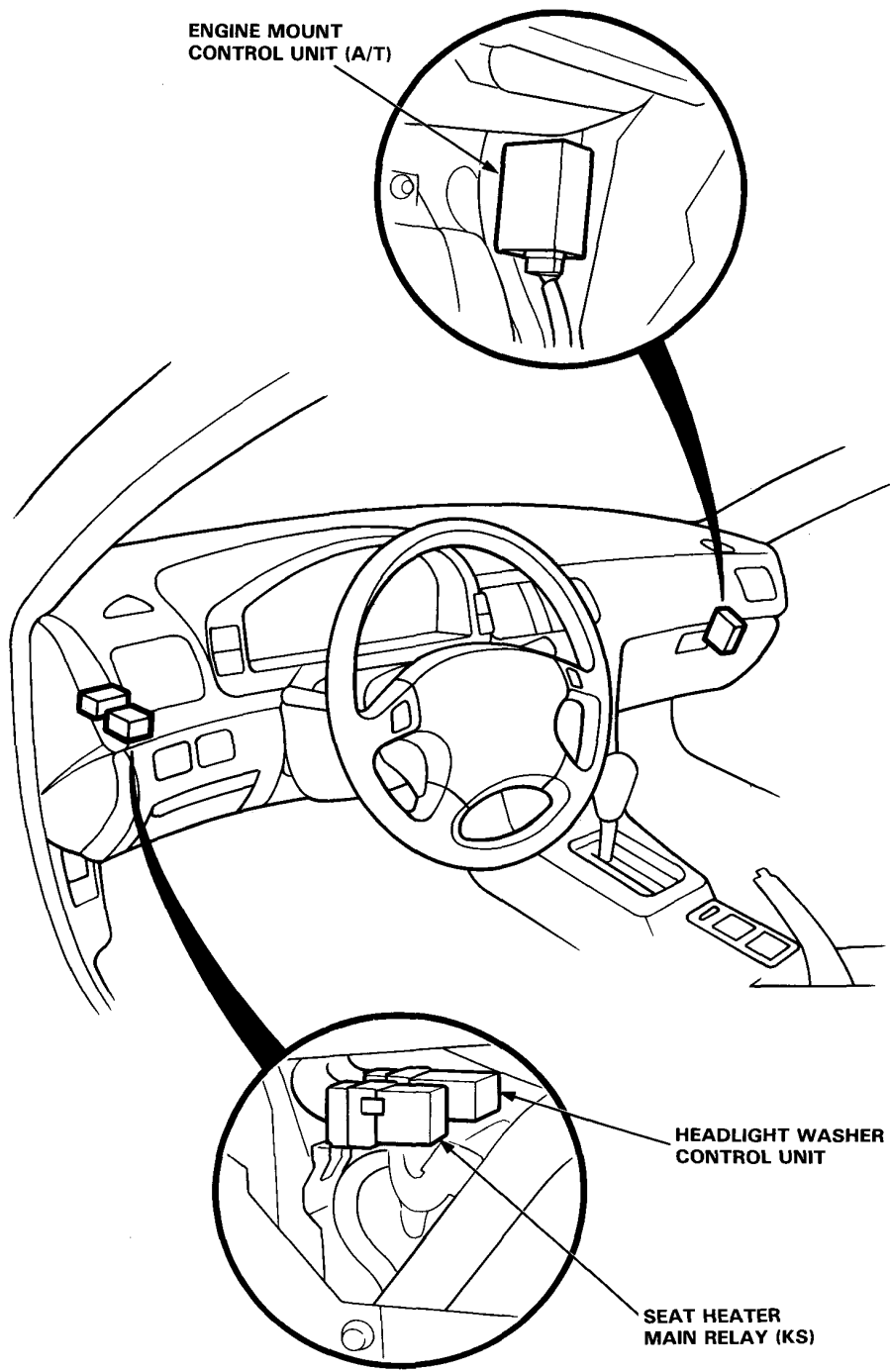
RHD:



Relay and Control Unit Locations

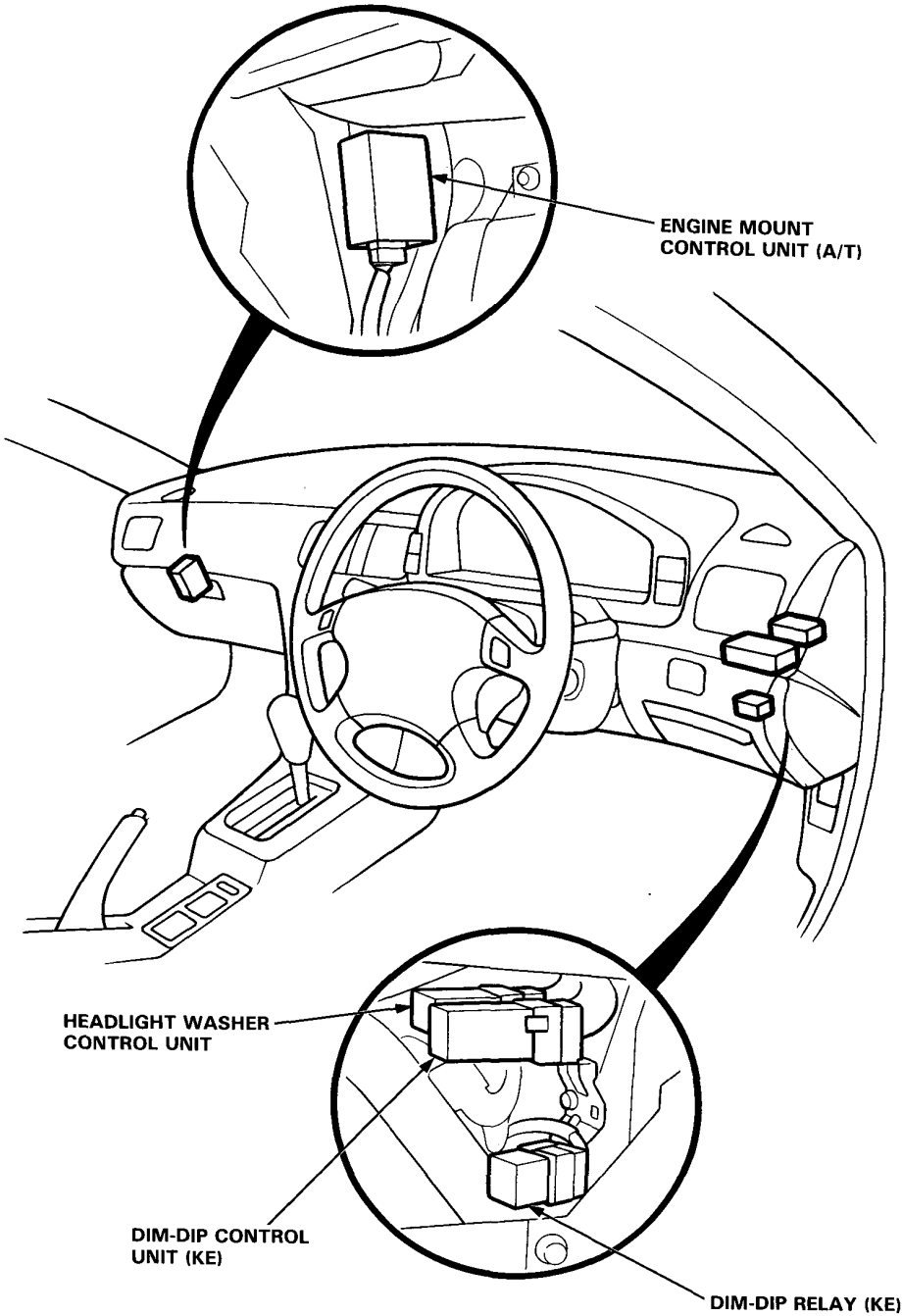
Dashboard

LHD:





RHD:

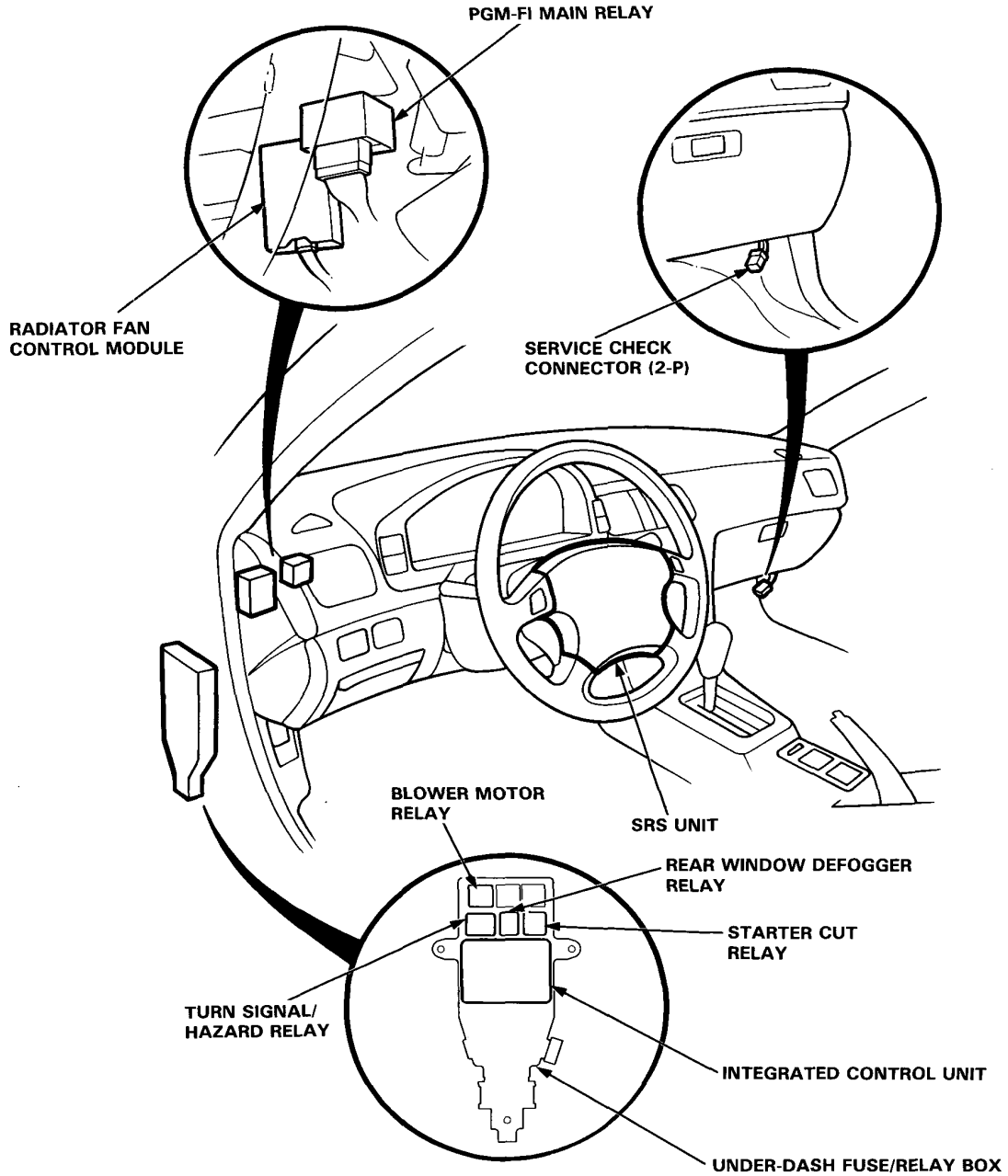


(cont'd)

Relay and Control Unit Locations

Dashboard (cont'd)

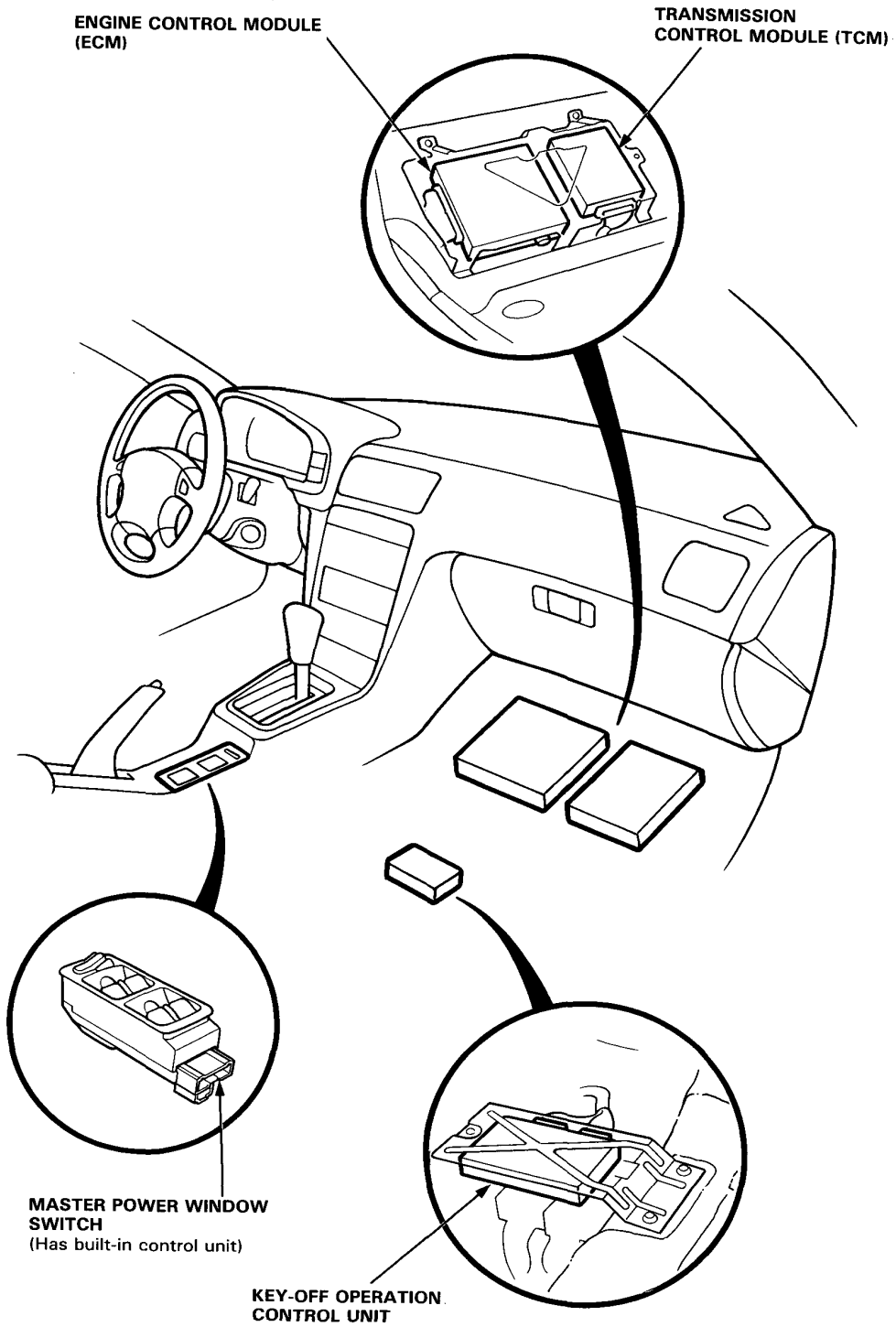
NOTE: LHD type is shown, RHD type is symmetrical.





Floor

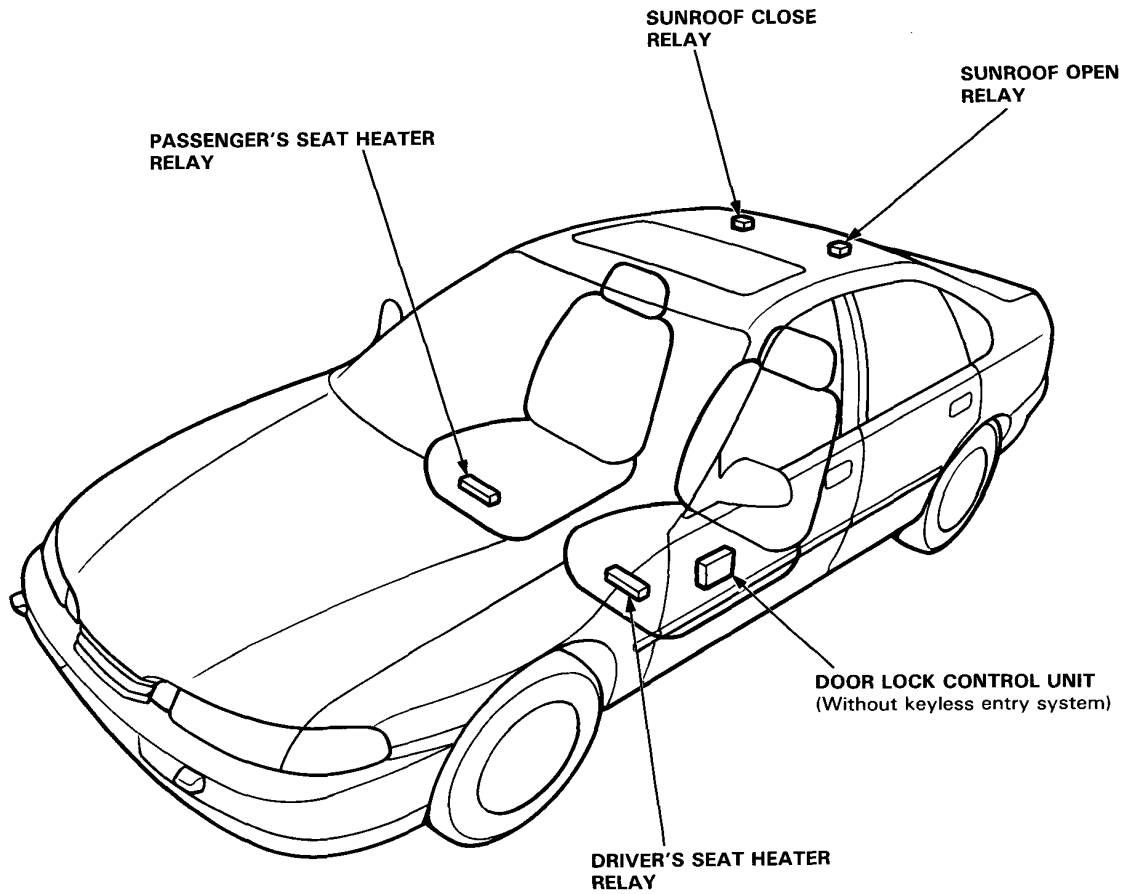
NOTE: LHD type is shown, RHD type is symmetrical.



Relay and Control Unit Locations

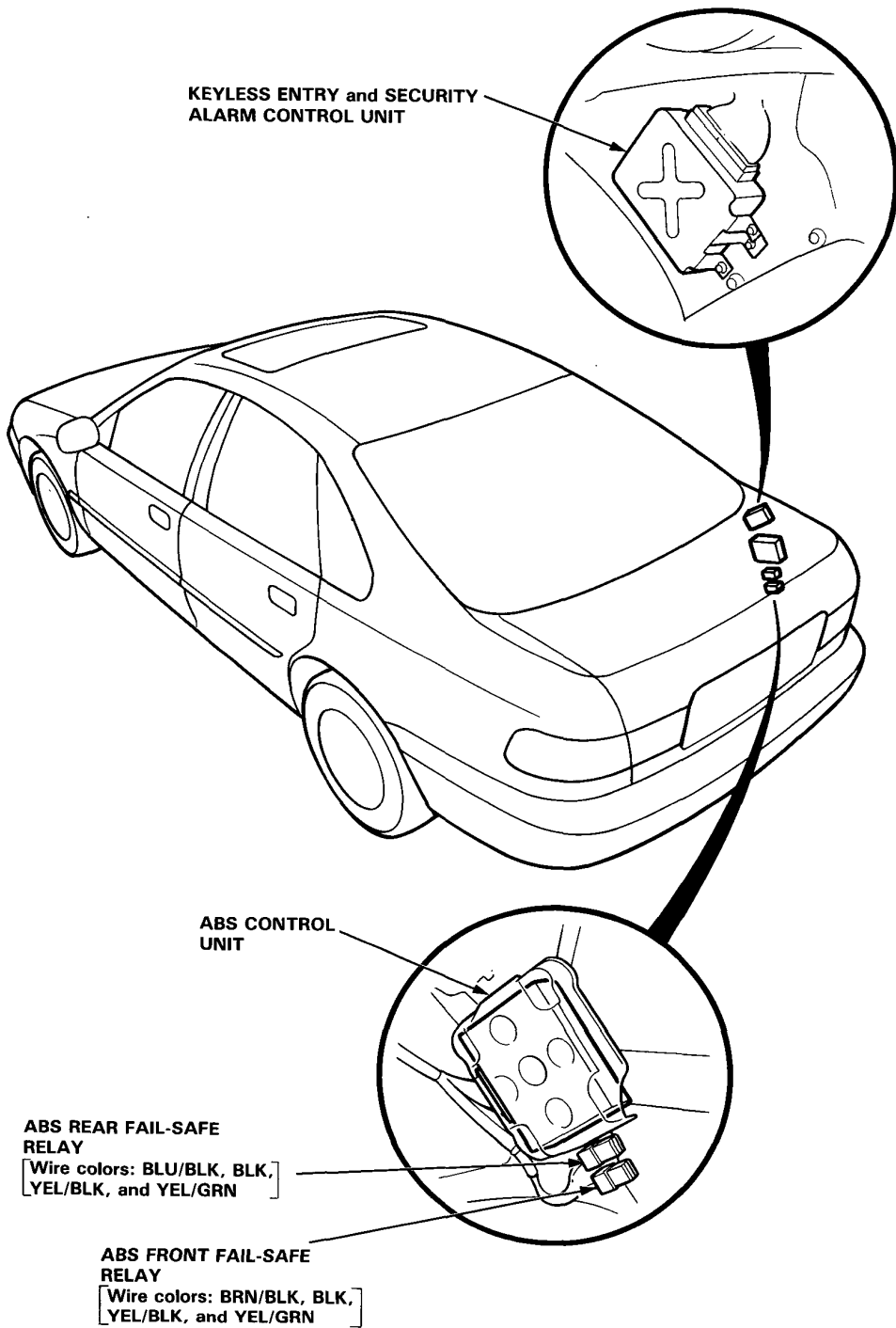
Door/Roof/Seat

NOTE: LHD type is shown, RHD type is similar.





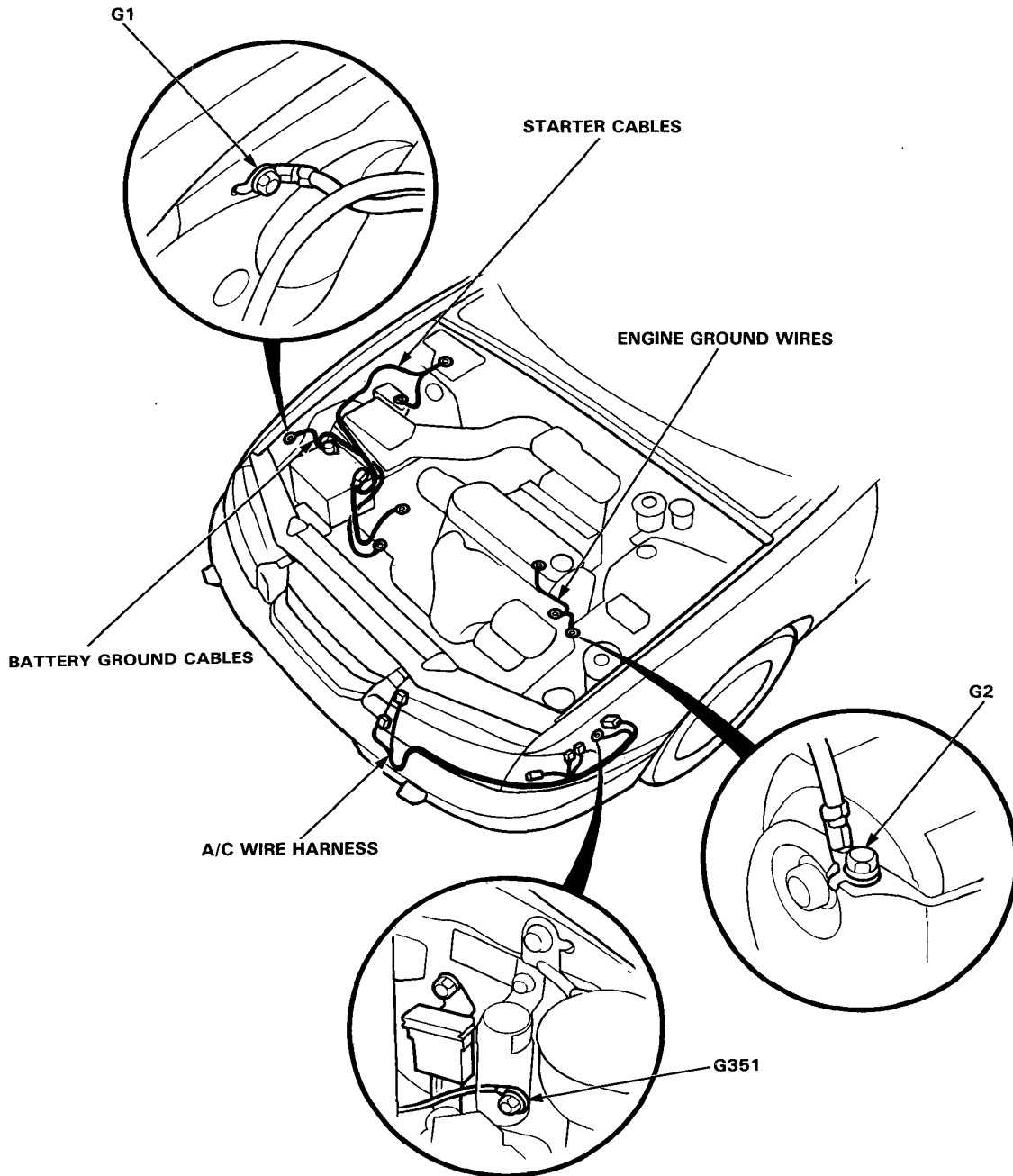
Trunk



Wire Harness and Ground Locations

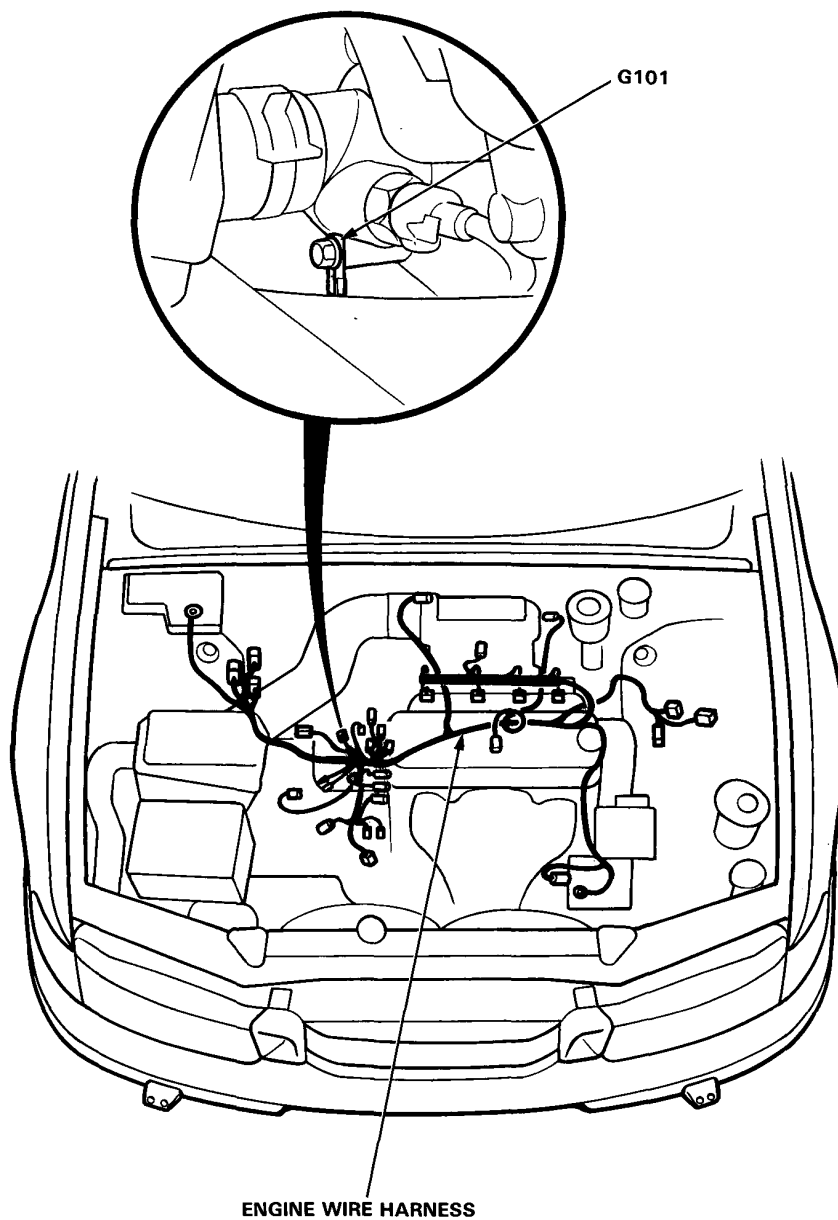
Engine Compartment

NOTE: LHD type is shown, RHD type is similar.





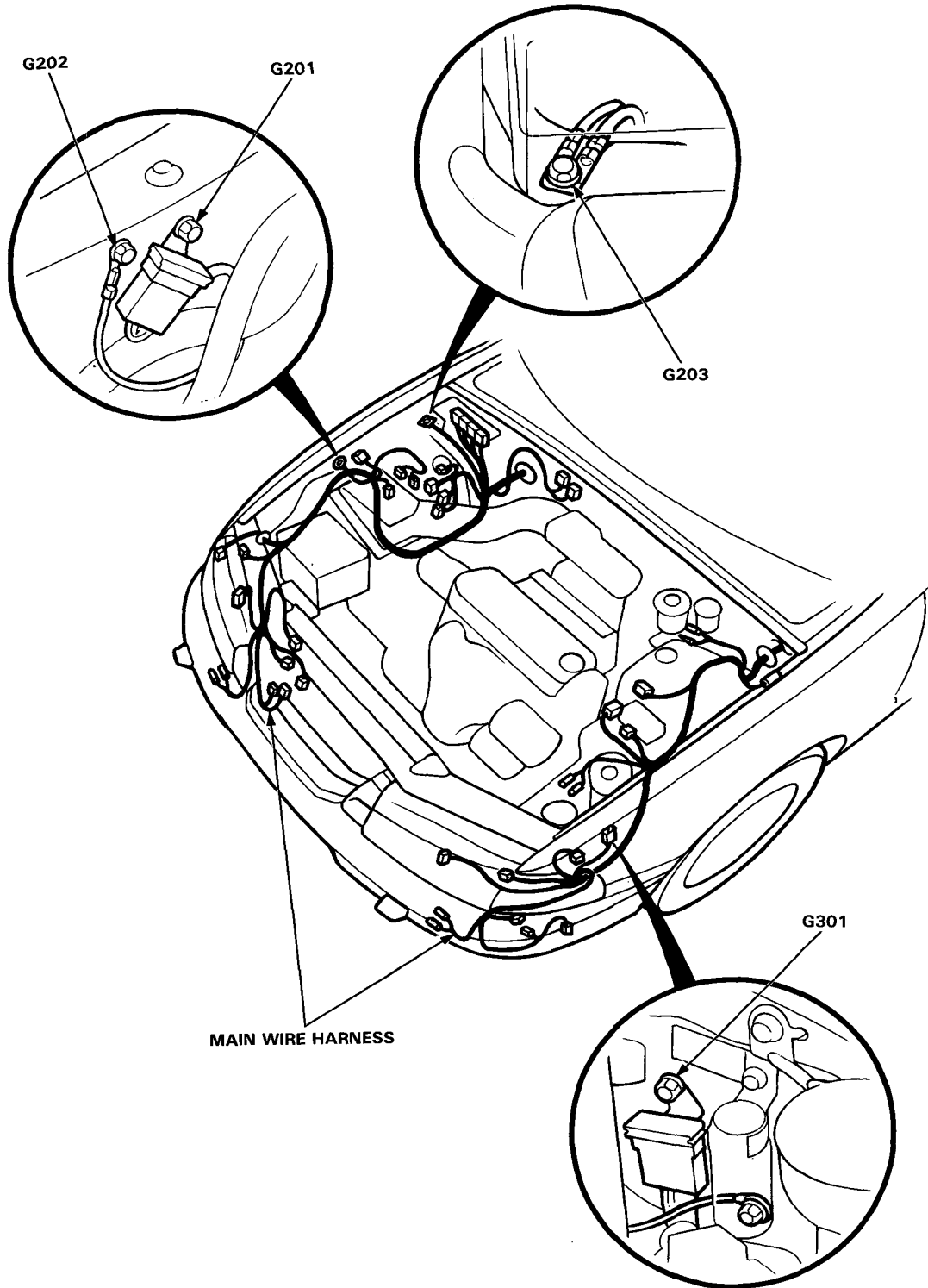
NOTE: LHD type is shown, RHD type is similar.



Wire Harness and Ground Locations

Engine Compartment

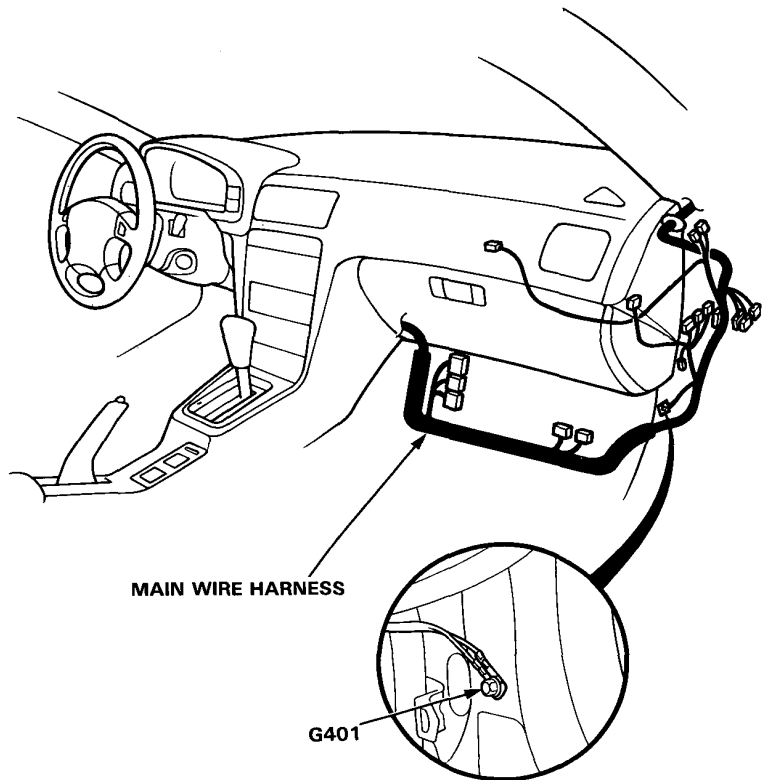
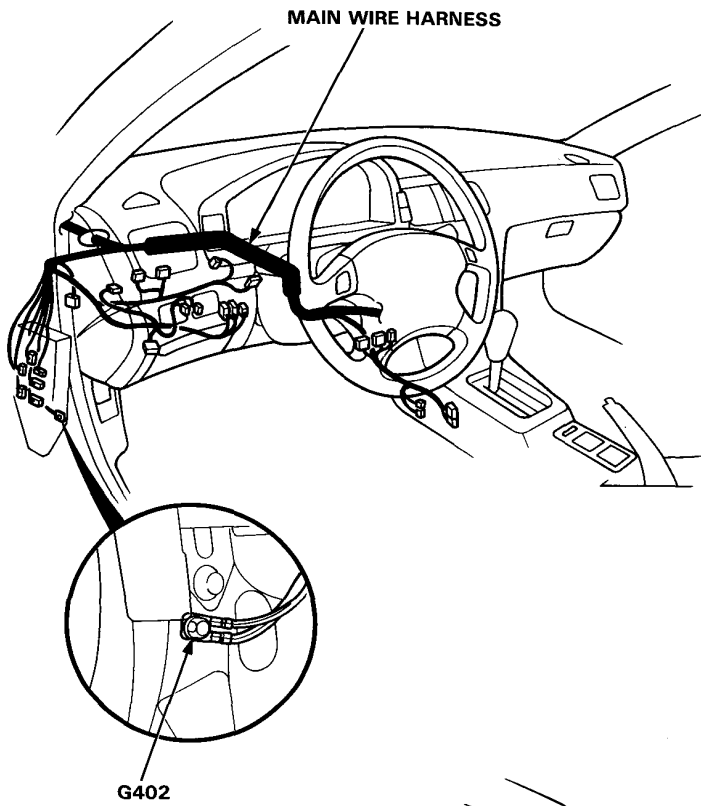
NOTE: LHD type is shown, RHD type is similar.





Dashboard

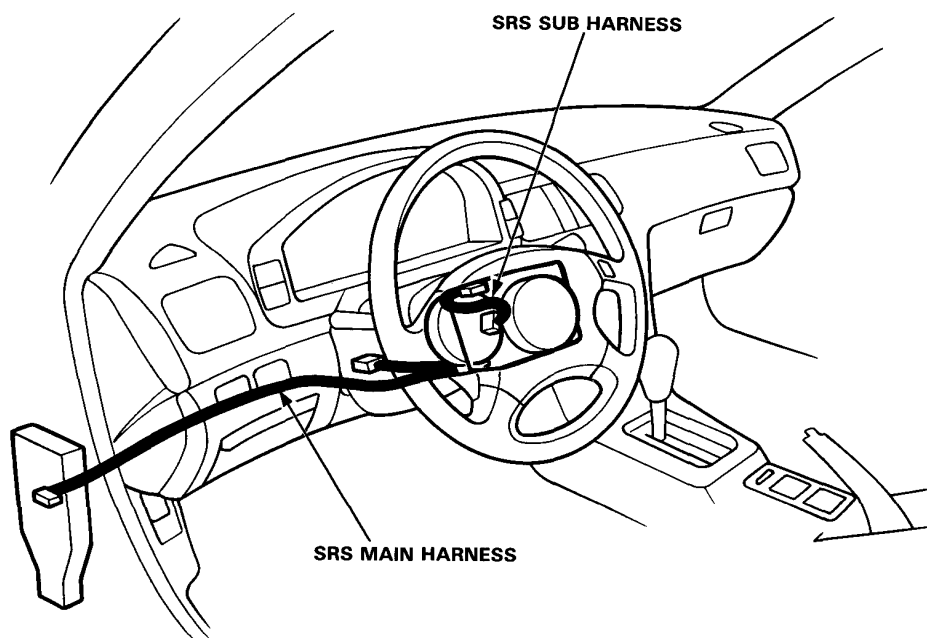
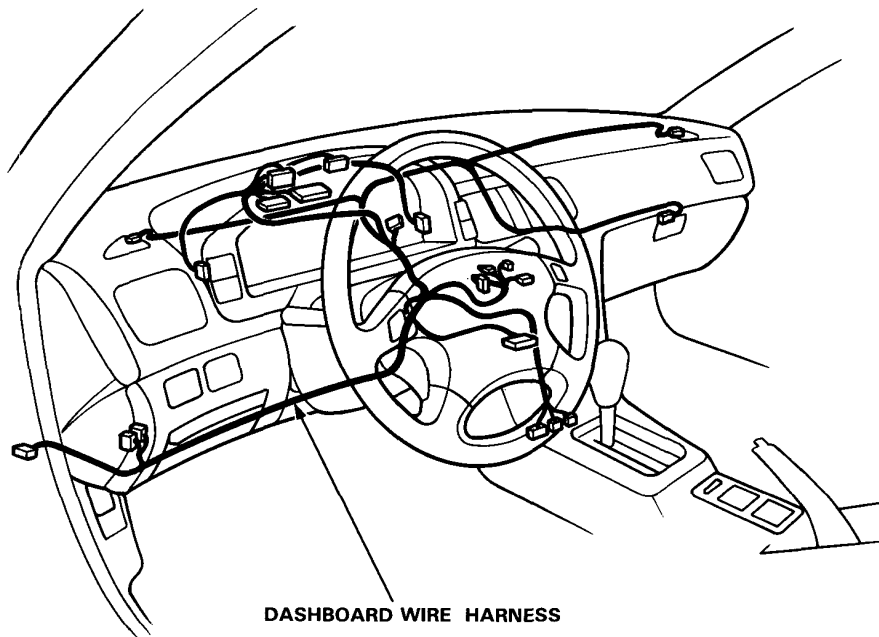
NOTE: LHD type is shown, RHD type is symmetrical.



Wire Harness and Ground Locations

Dashboard

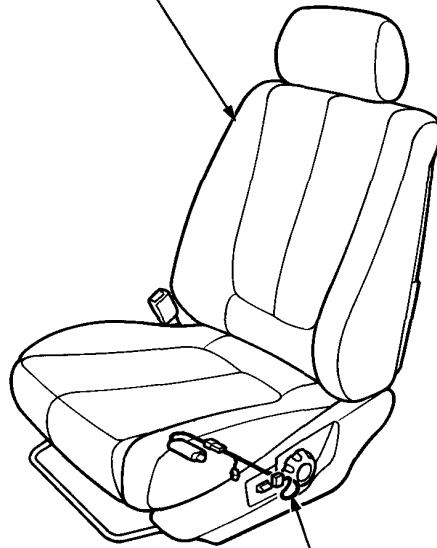
NOTE: LHD type is shown, RHD type is similar.





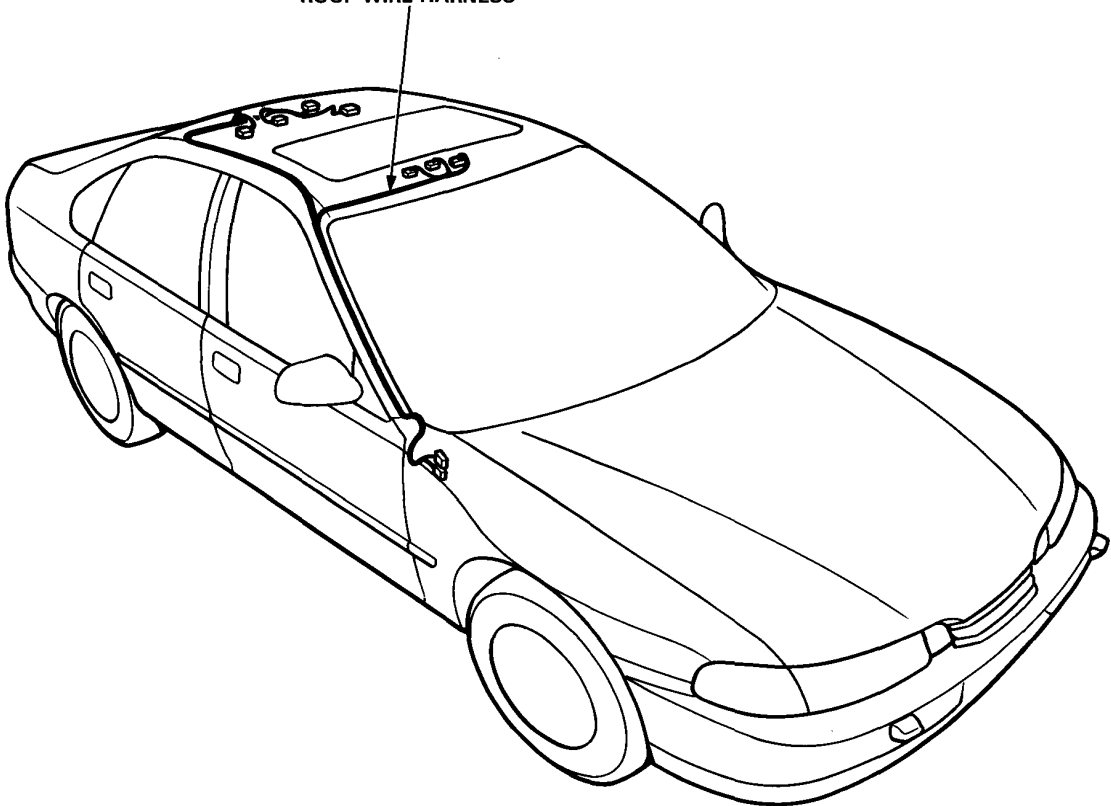
Roof/Seat

DRIVER'S SEAT
(LHD type is shown, RHD type is symmetrical.)



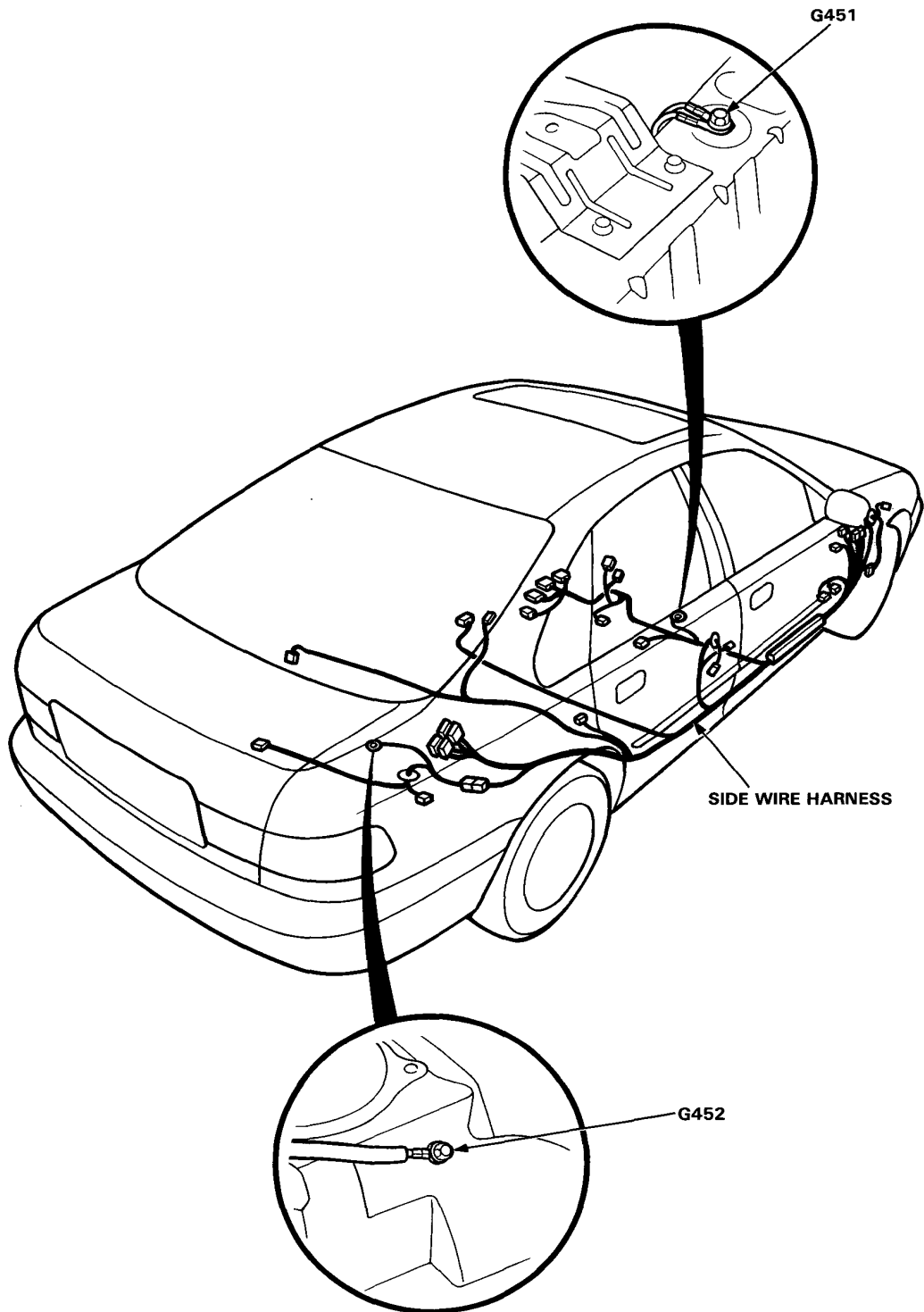
POWER SEAT WIRE HARNESS

ROOF WIRE HARNESS



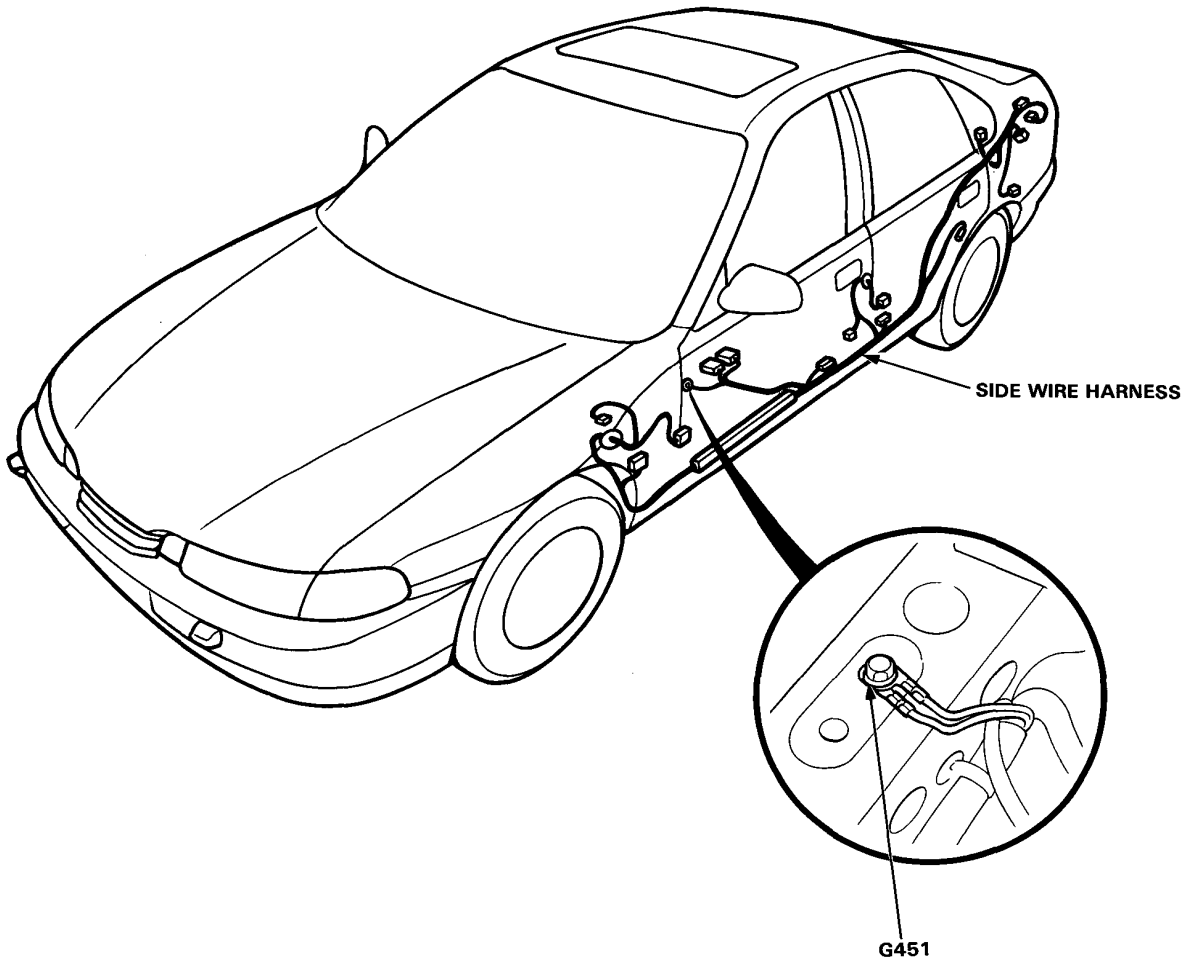
Wire Harness and Ground Locations

Floor (LHD)



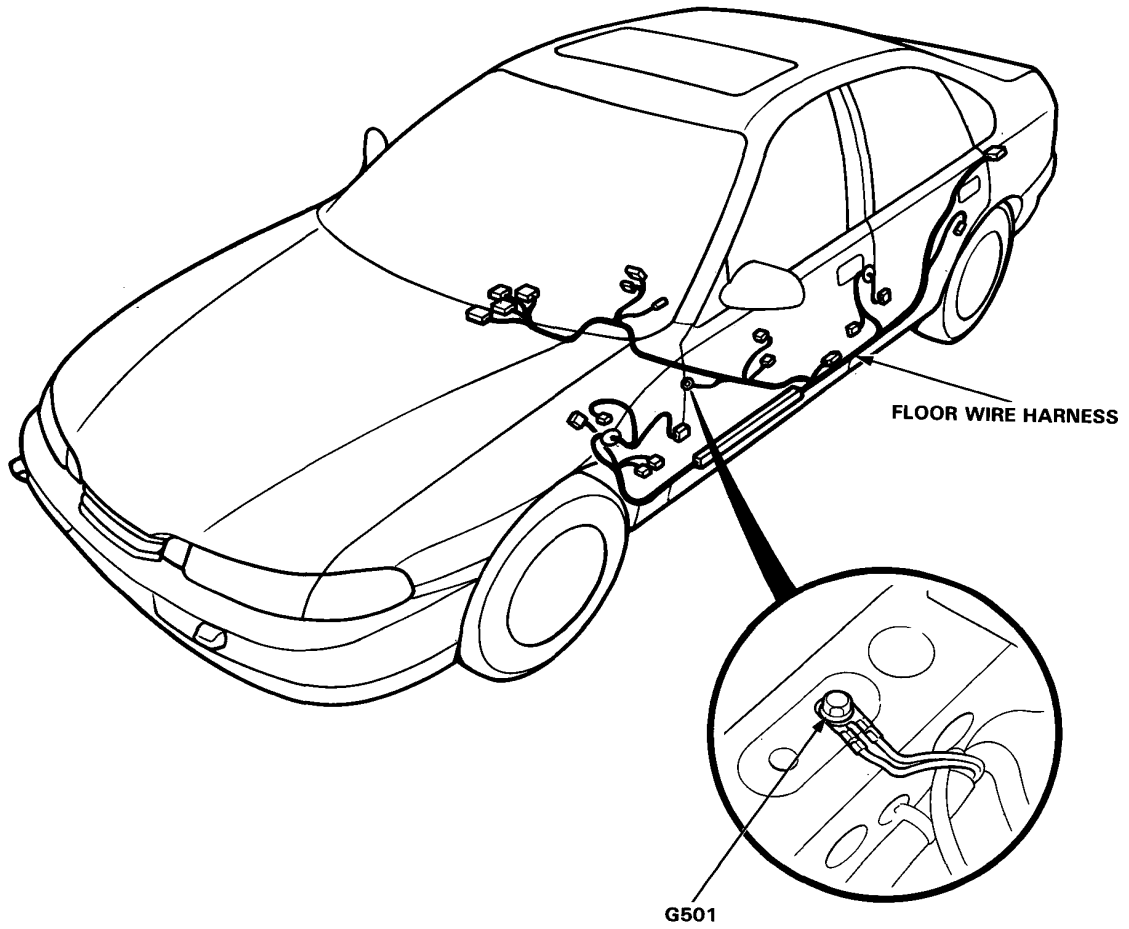


Floor (RHD)



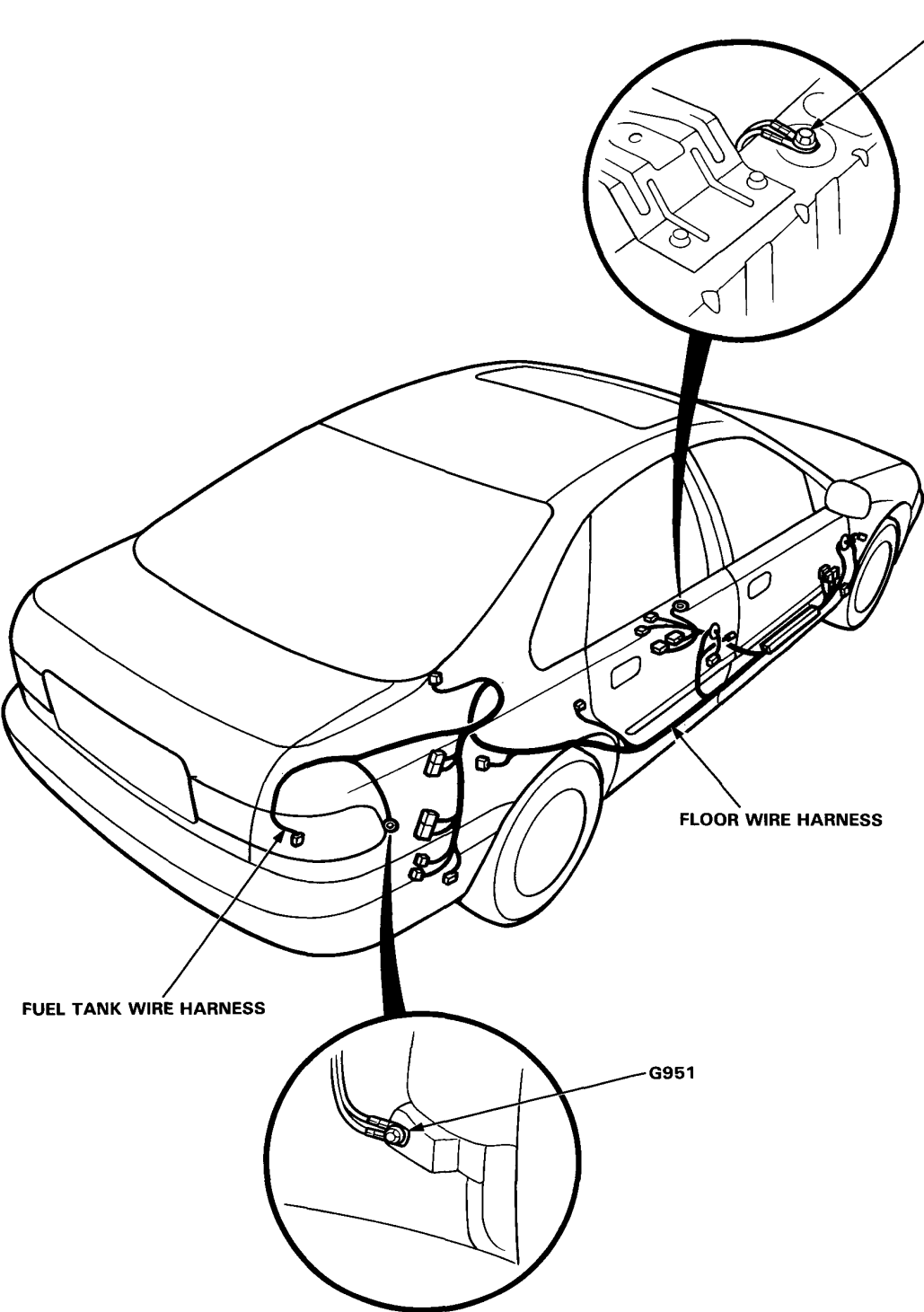
Wire Harness and Ground Locations

Floor (LHD)



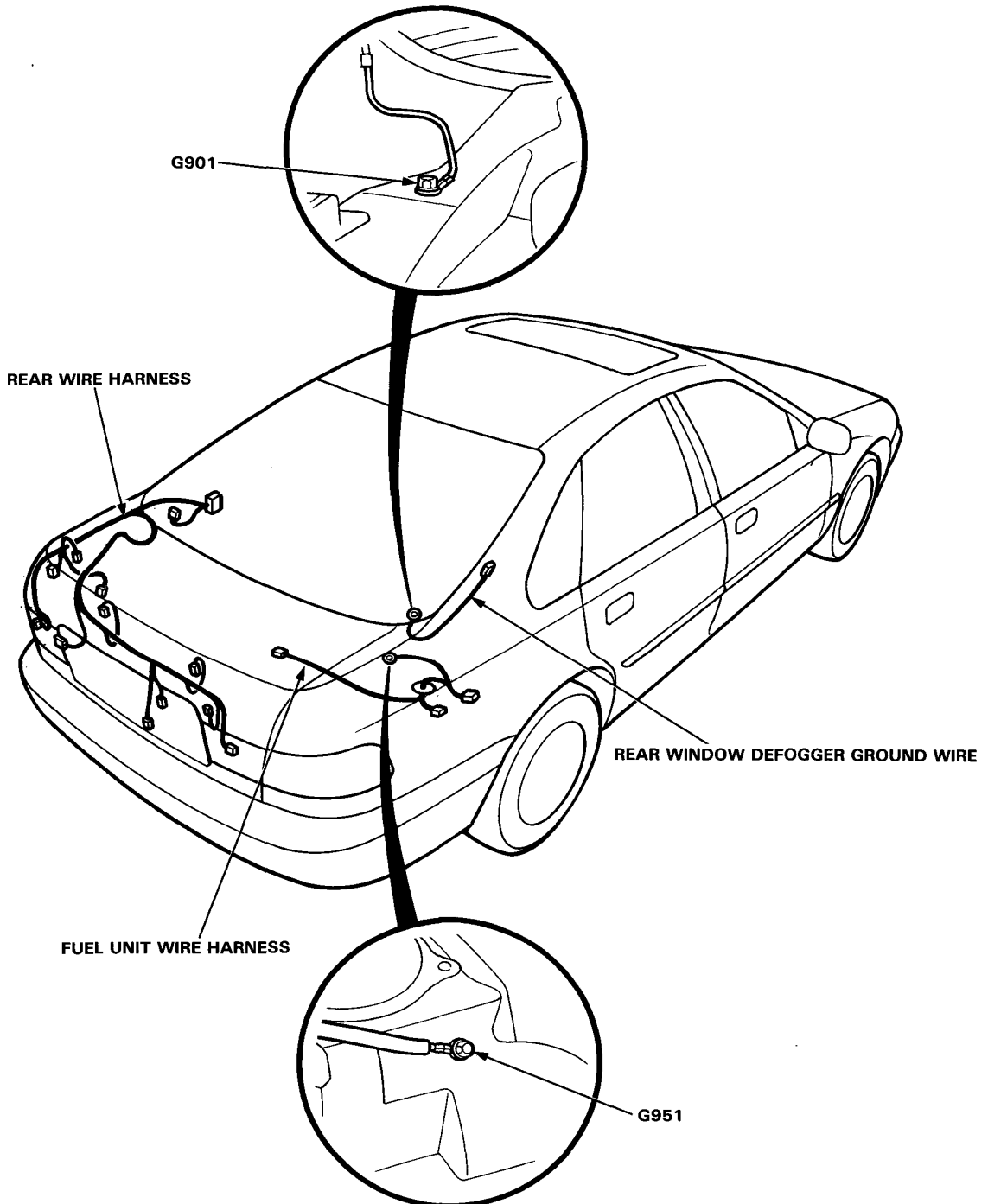


Floor (RHD)



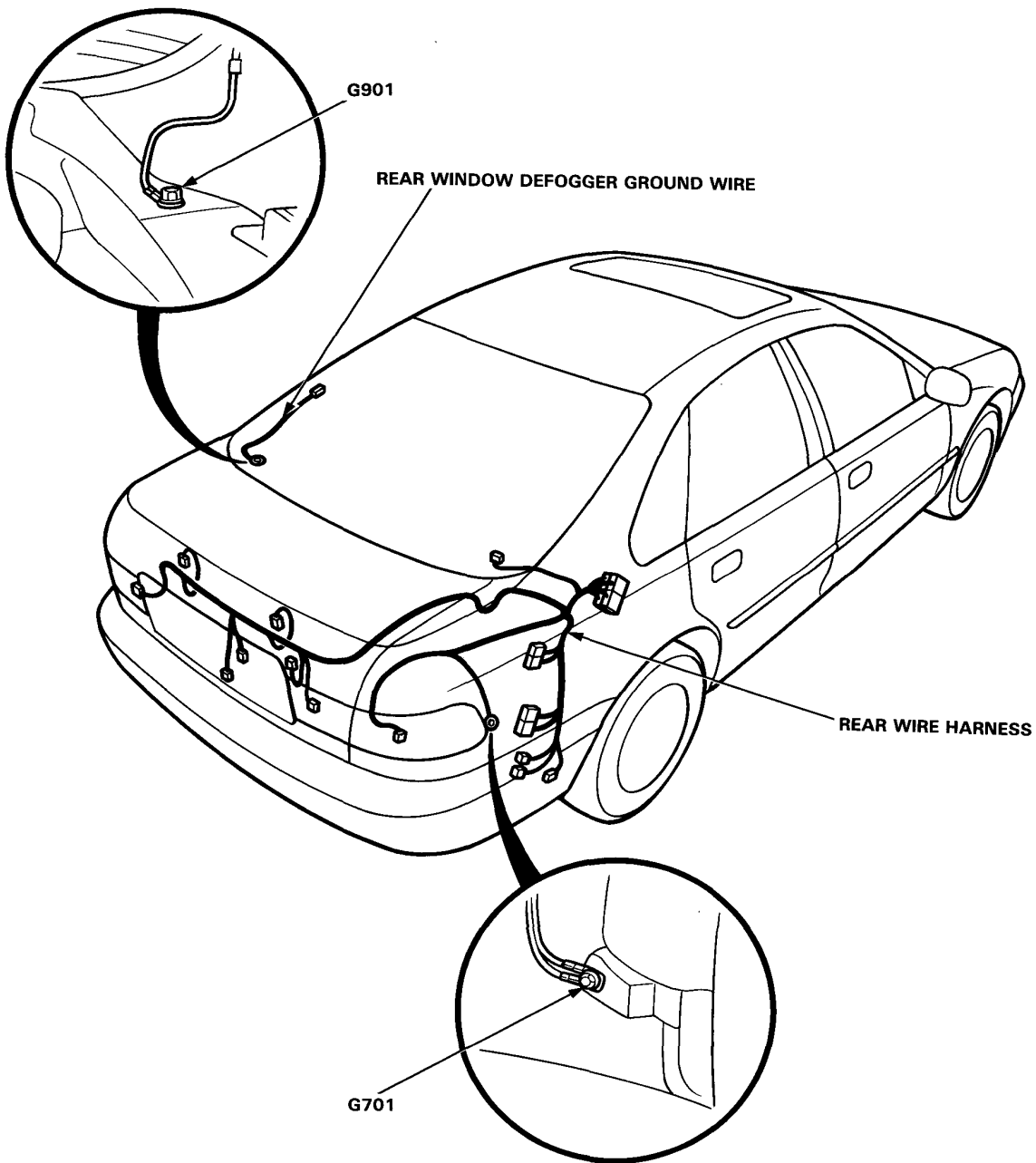
Wire Harness and Ground Locations

Floor and Rear (LHD)





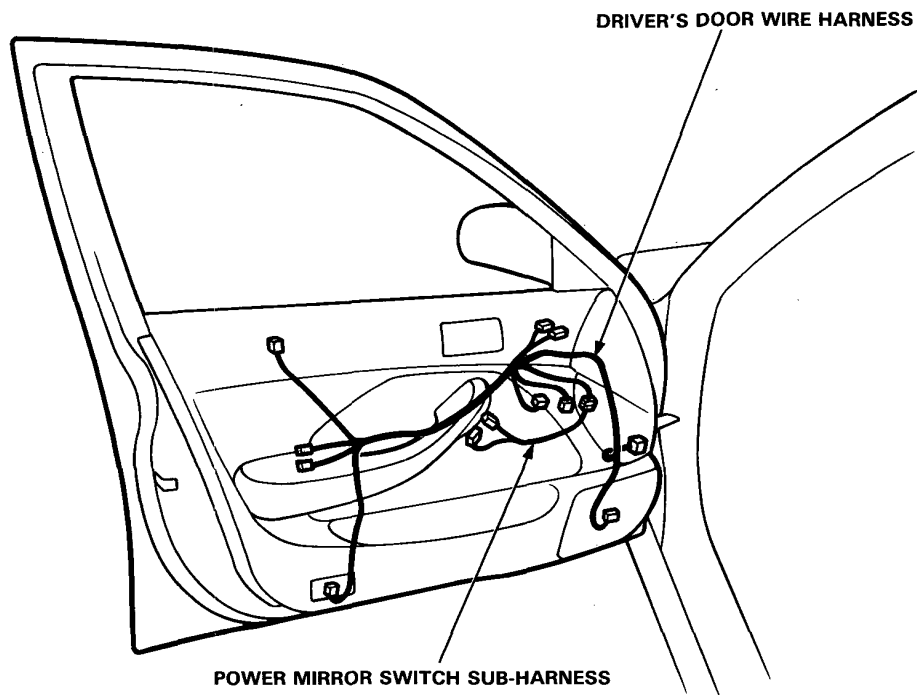
Rear (RHD)



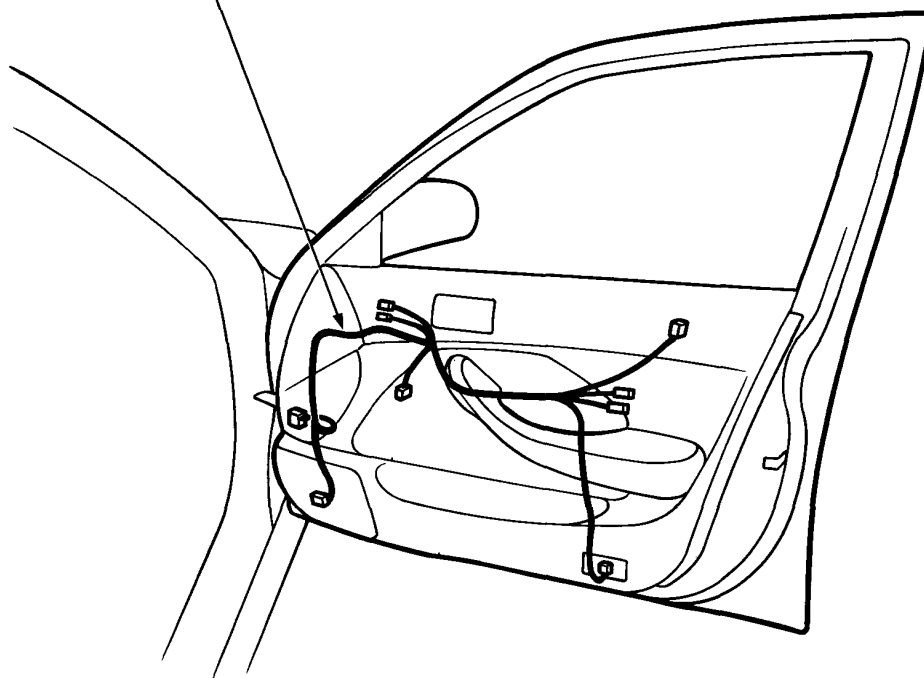
Wire Harness and Ground Location

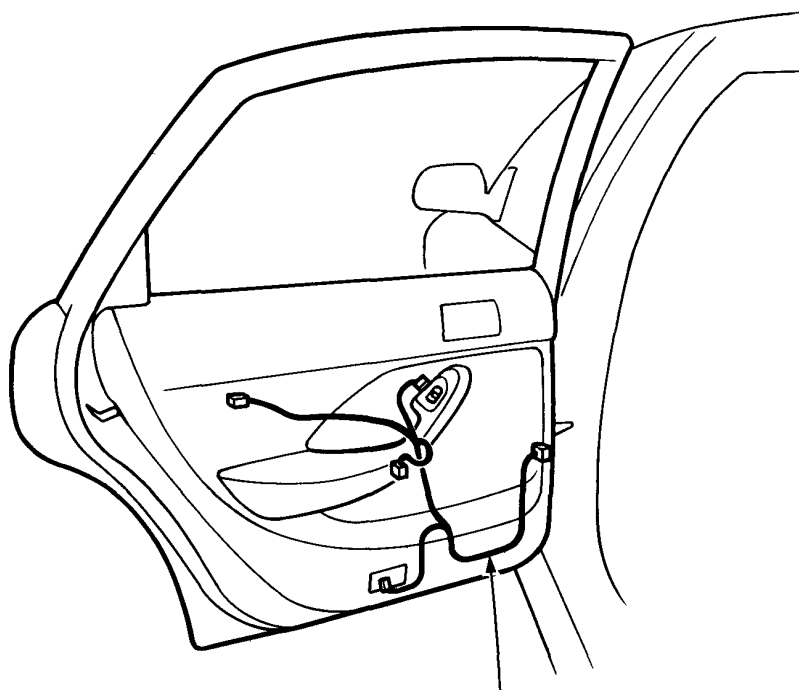
Door

NOTE: LHD type is shown, RHD type is symmetrical.

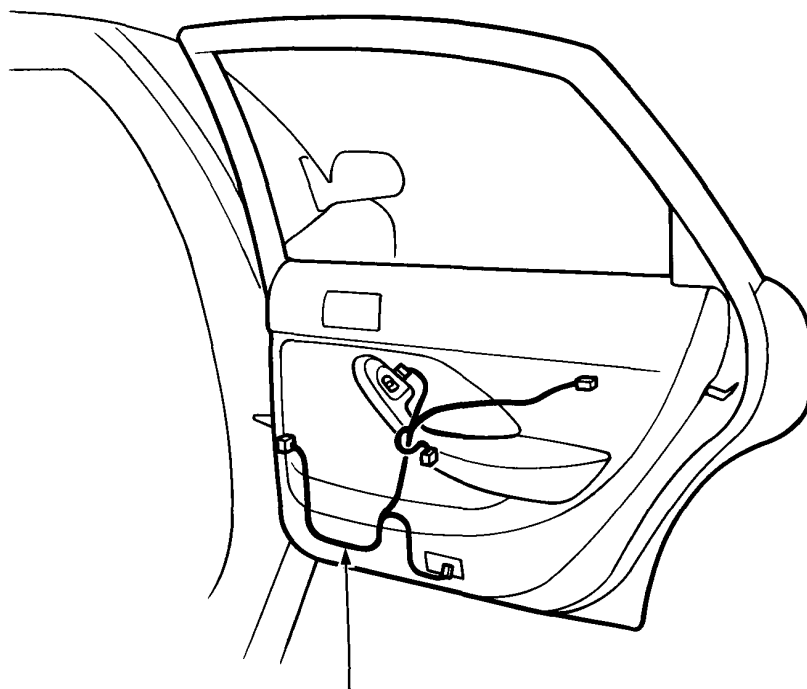


FRONT PASSENGER'S DOOR WIRE HARNESS





LEFT REAR DOOR WIRE HARNESS



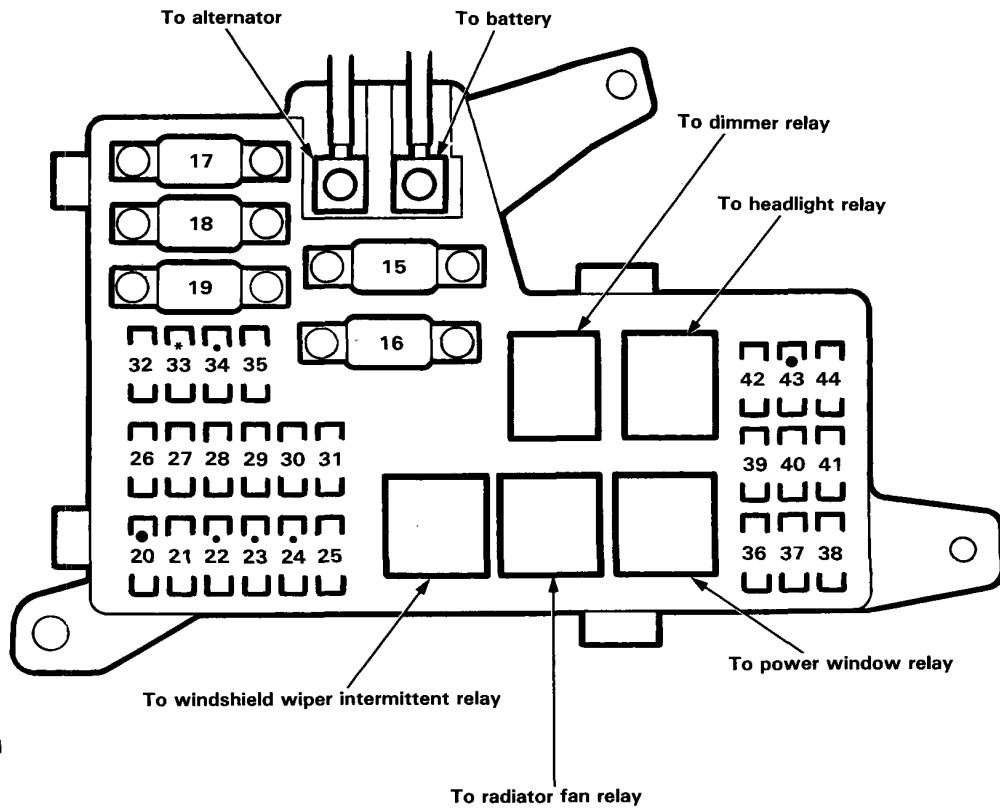
RIGHT REAR DOOR WIRE HARNESS

Fuses

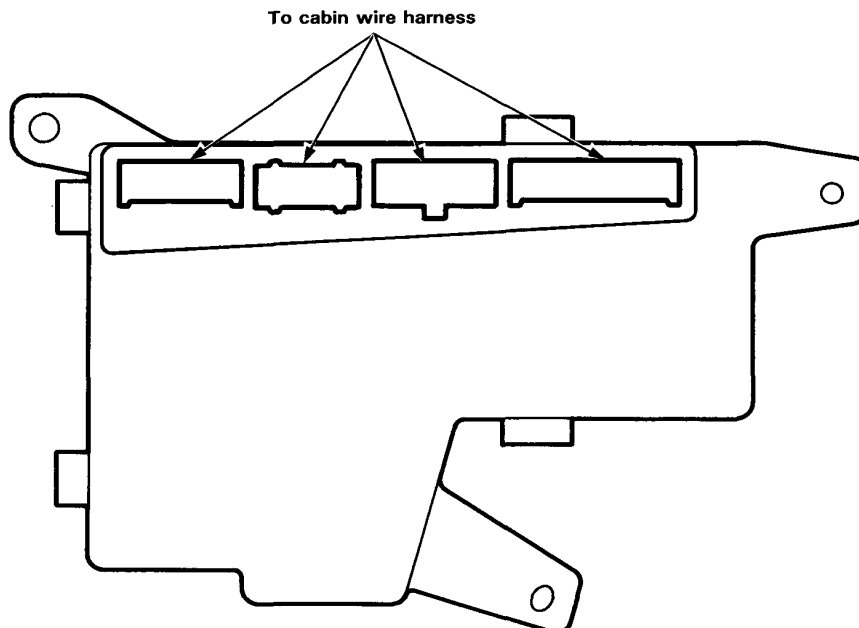
Under-hood Fuse/Relay Box

NOTE: The fuse/relay box is on the right side of the engine compartment.

Front View:



Back View:





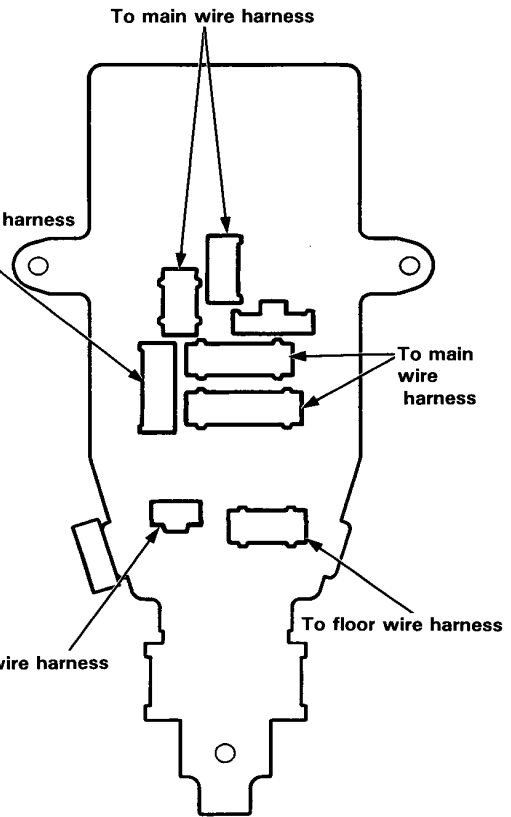
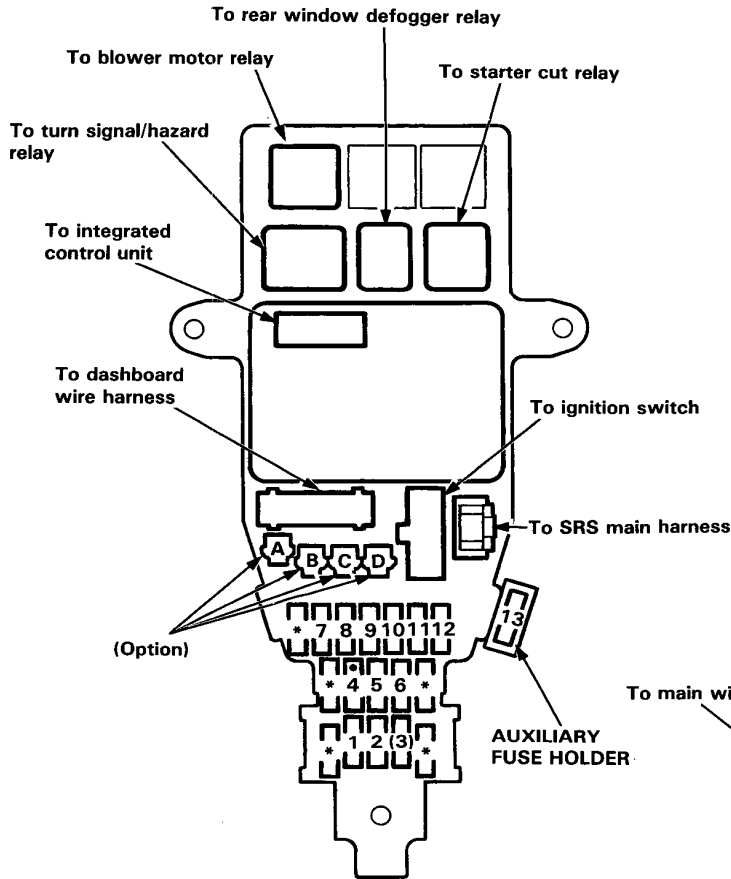
Fuse Number	Amps	Wire Color	Circuit(s) and Component(s) Protected
15	80 A	—	Main fuse (battery), power distribution
16	50 A	WHT	Main fuse (ignition switch)
17	40 A	BLK/GRN	Main fuse (rear window defogger relay)
18	30 A	WHT	Main fuse (blower motor [heater blower] relay)
19	30 A	RED/GRN	Main fuse (dash lights, parking lights [small lights]), via No. 13 (10 A) fuse in the auxiliary fuse holder (KE, KS)
20	10 A	[BLU/YEL]	Dim-dip relay (KE)
21	20 A	WHT/BLU	Power door lock control unit, keyless entry and security alarm system
22	—	—	Not used
23	—	—	Not used
24	—	—	Not used
25	20 A	—	Radiator fan relay
26	30 A	GRN	Sunroof
27	10 A	BLU/RED	Lighting system
28	30 A	WHT/BLK	Headlight washer control unit
29	15 A	WHT/BLU	Ceiling (interior) lights, cigarette lighter, trunk light
30	15 A	WHT	Condenser fan motor, radiator fan control module
31	10 A	YEL/BLU	PGM-FI main relay (+B)
32	20 A	WHT/RED	Power seat up-down motor (power seat height)
33	15 A	WHT/BLK	Seat heater (KS)
34	—	—	Not used
35	7.5 A	WHT/YEL	Clock (+B), engine control module (ECM), transmission control module (TCM), stereo sound system
36	20 A	GRN/BLK	Left rear power window, key-off operation system
37	20 A	YEL/BLK	Right rear power window, key-off operation system
38	20 A	WHT/YEL [BLU/BLK]	Left front power window, key-off operation system
39	20 A	BLU/BLK [WHT/YEL]	Right front power window, key-off operation system
40	20 A	RED/GRN	Right headlight, high beam indicator
41	20 A	WHT/YEL	Horns, brake lights, brake light signal, security horn
42	20 A	RED/YEL	Left headlight
43	10 A	[RED/GRN]	Dim-dip resistor (KE)
44	10 A	WHT/GRN	Hazard warning lights

[]: RHD

Under-dash Fuse/Relay Box

Front View:

Back View:



- : Not used
- * : Spare fuse
- () : With SRS



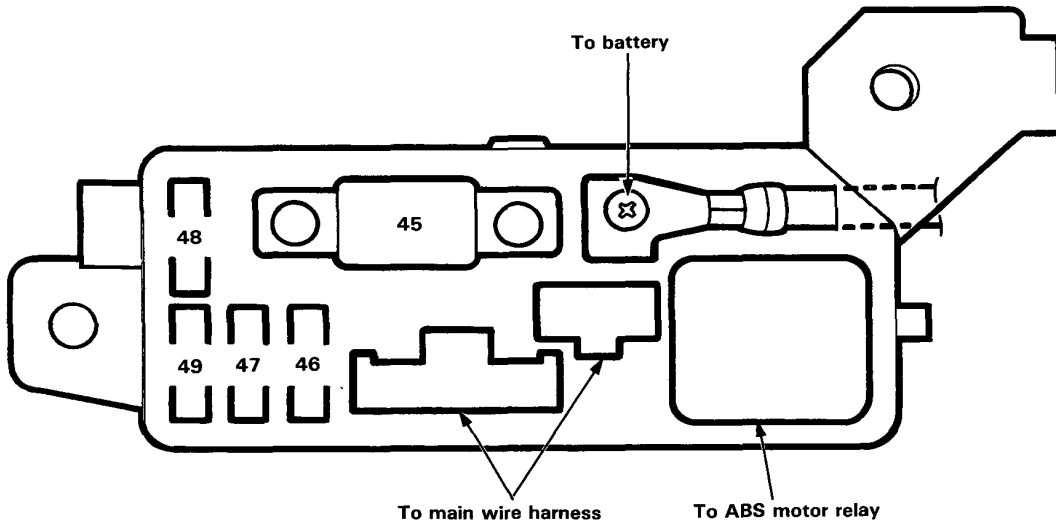
Fuse Number	Amps	Wire Color	Circuit(s) and Component(s) Protected
1	7.5 A	YEL/WHT	Keyless entry and security alarm system
2	15 A	BLK/YEL	Engine control module (ECM), transmission control module (TCM)
3	10 A	RED	SRS unit
4	—	—	Not used
5	7.5 A	YEL/GRN	Headlight adjuster (KG), power mirrors, key-off operation system, sunroof
6	30 A	GRN/BLK	Wiper/washer system
7	7.5 A	YEL/BLK	ABS control unit, heater control panel, radiator fan relay, radiator fan control module, rear window defogger relay
8	10 A	YEL	Back-up lights, clock, warning/indicator lights
9	7.5 A	BLK/YEL	A/C compressor clutch relay
10	7.5 A	YEL/RED (KE, KS)	Daytime running lights control unit (KS), dim-dip headlights (KE)
		RED/YEL (KF, KG)	Left taillight
11	10 A	YEL/RED	Stereo sound system (radio motor antenna)
12	7.5 A	BLU/RED	Engine control module (ECM), PGM-FI main relay
13	10 A	RED/BLK (KF, KG)	Dash lights, switch lights, parking lights, right taillight
	10 A	RED/GRN (KE, KS)	Combination light switch/lights, daytime running lights control unit (KS)

No. 13 FUSE: In the AUXILIARY FUSE HOLDER

Fuses

Under-hood ABS Fuse/Relay Box

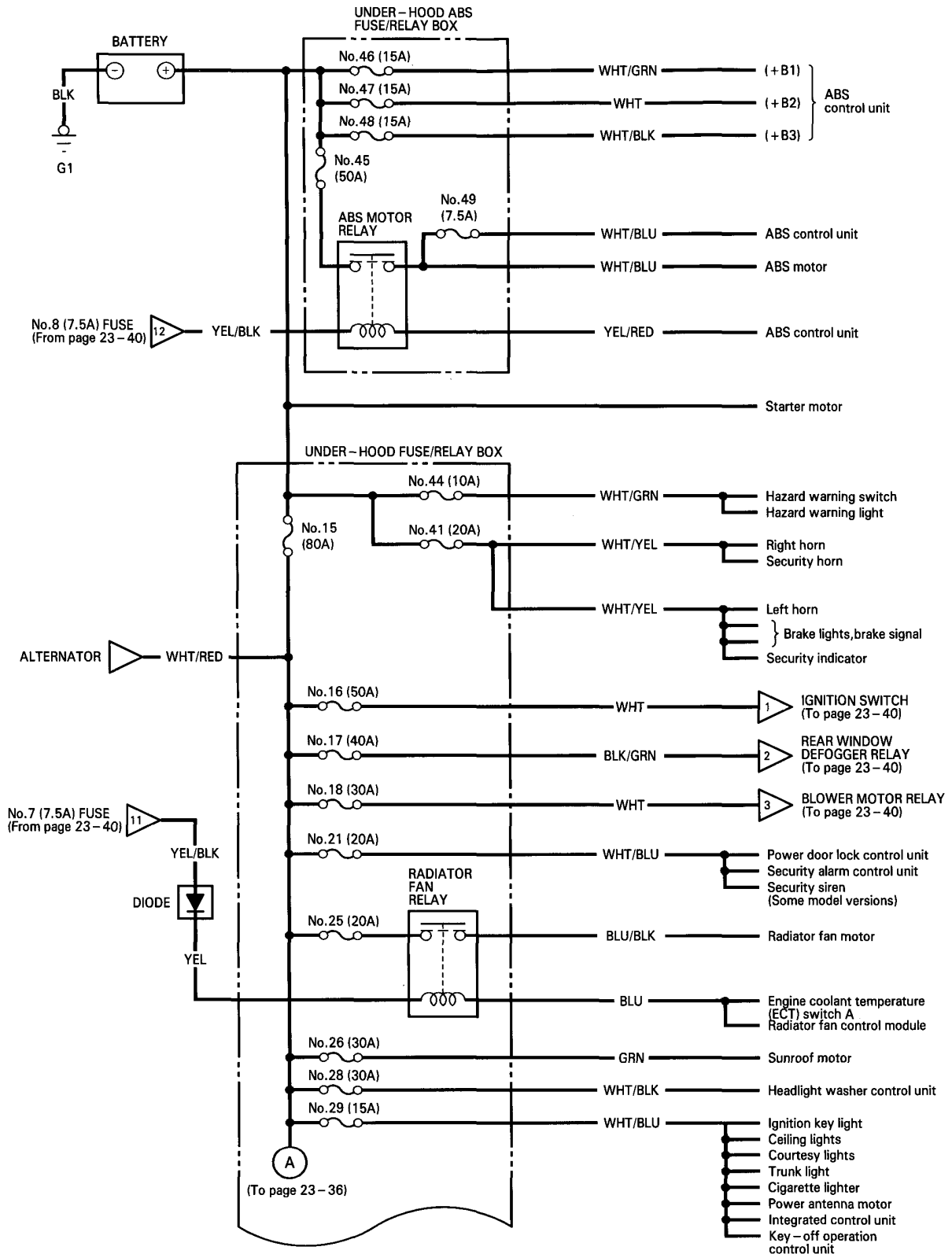
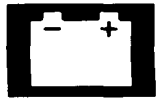
NOTE: The ABS fuse/relay box is on the right side of the engine compartment.



Fuse Number	Amps	Wire Color	Circuit(s) and Component(s) Protected
45	50 A	—	ABS motor relay
46	15 A	WHT/GRN	ABS control unit (+B1)
47	15 A	WHT	ABS control unit (+B2)
48	15 A	WHT/BLK	ABS control unit (+B3)
49	7.5 A	WHT/BLU	ABS control unit

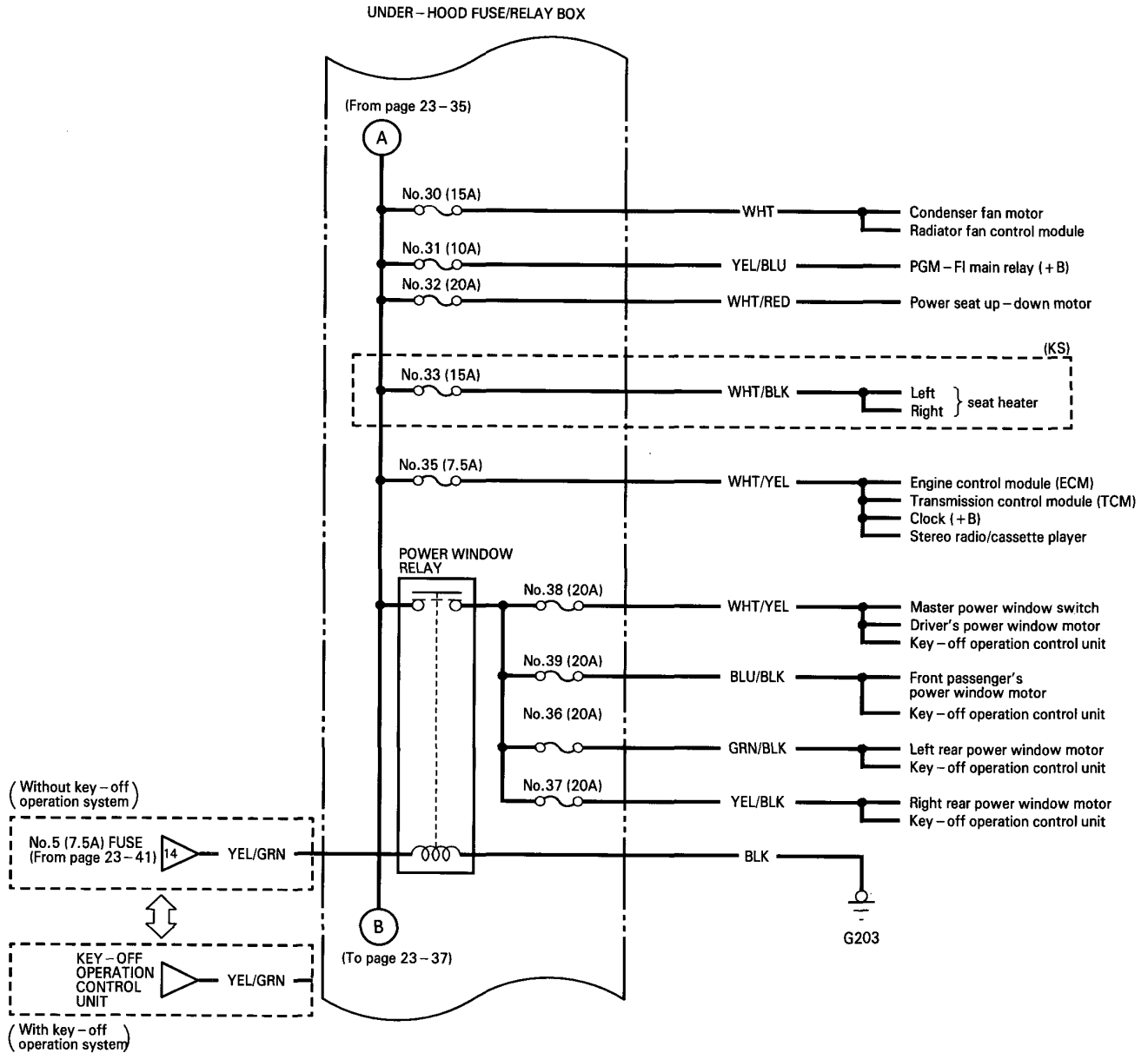
Power Distribution

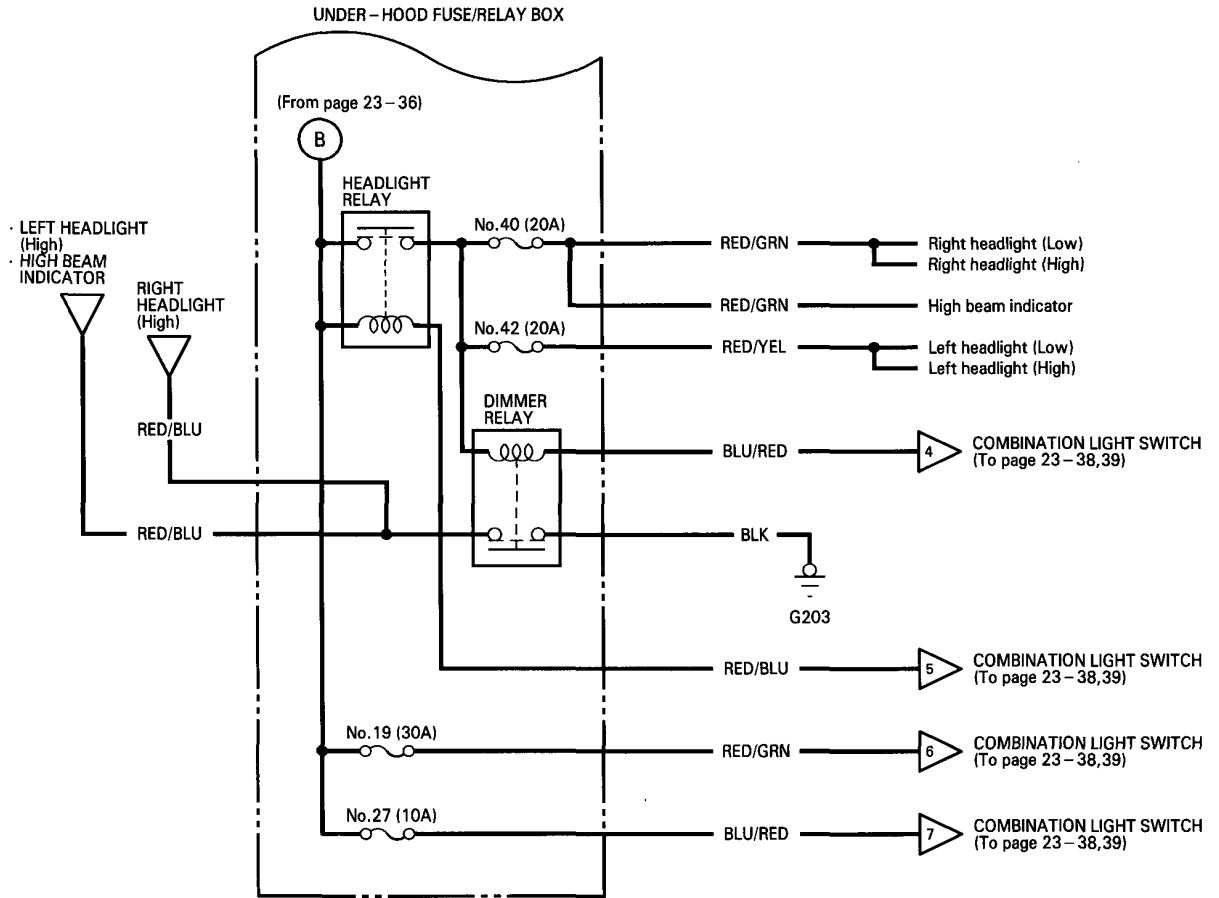
Circuit Identification (LHD)



Power Distribution

Circuit Identification (LHD cont'd)

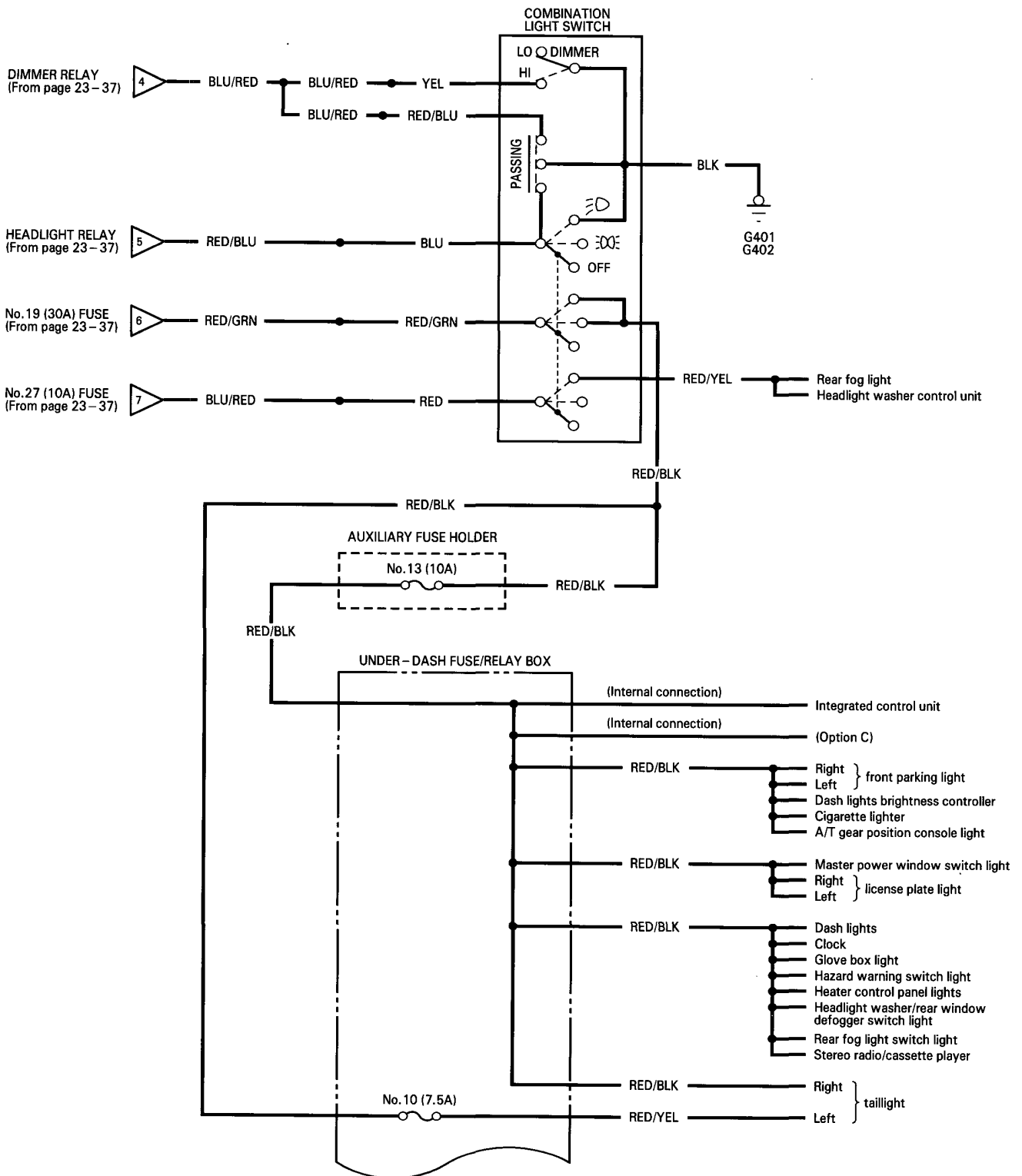




Power Distribution

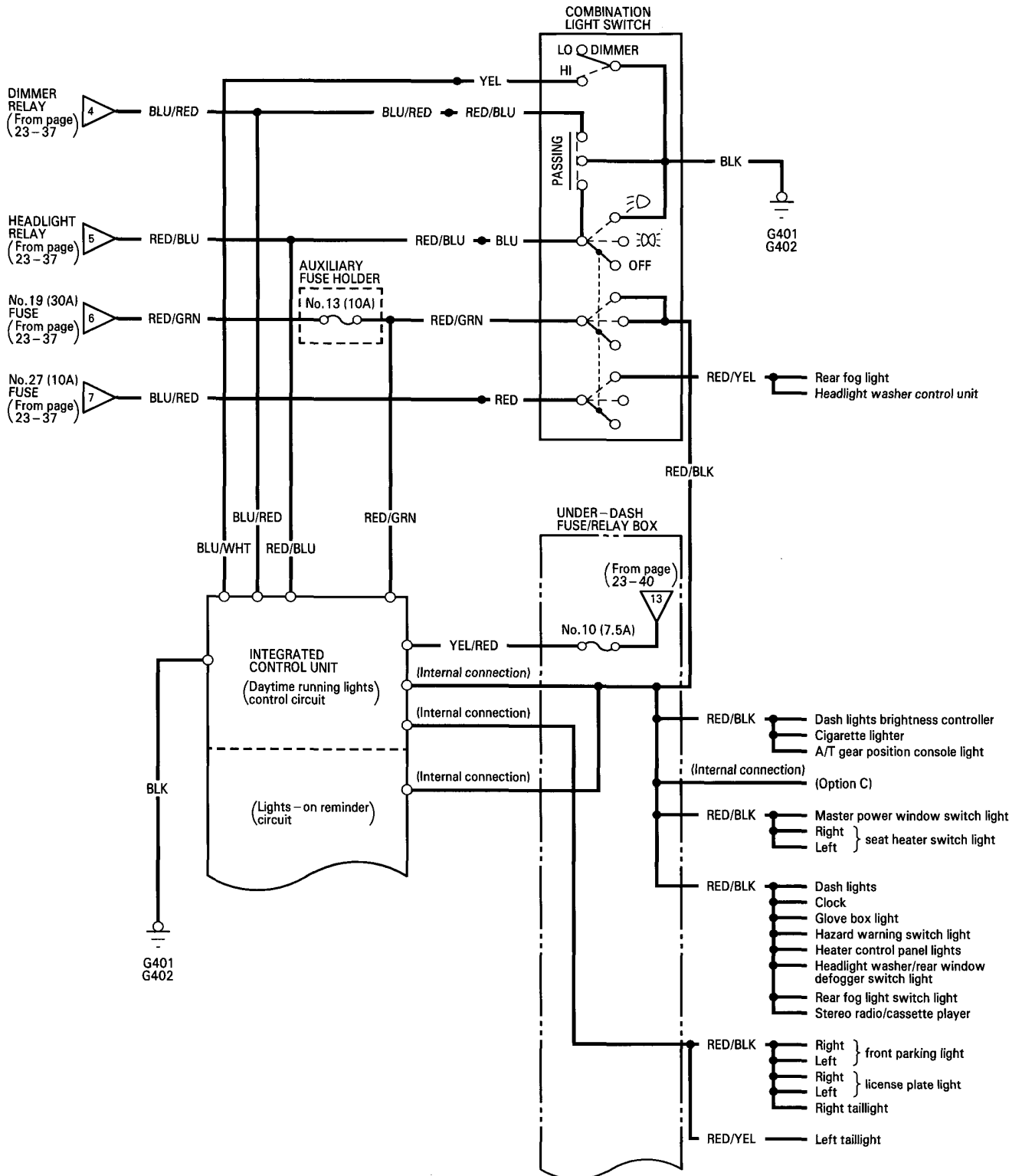
Identification (LHD cont'd)

KF,KG



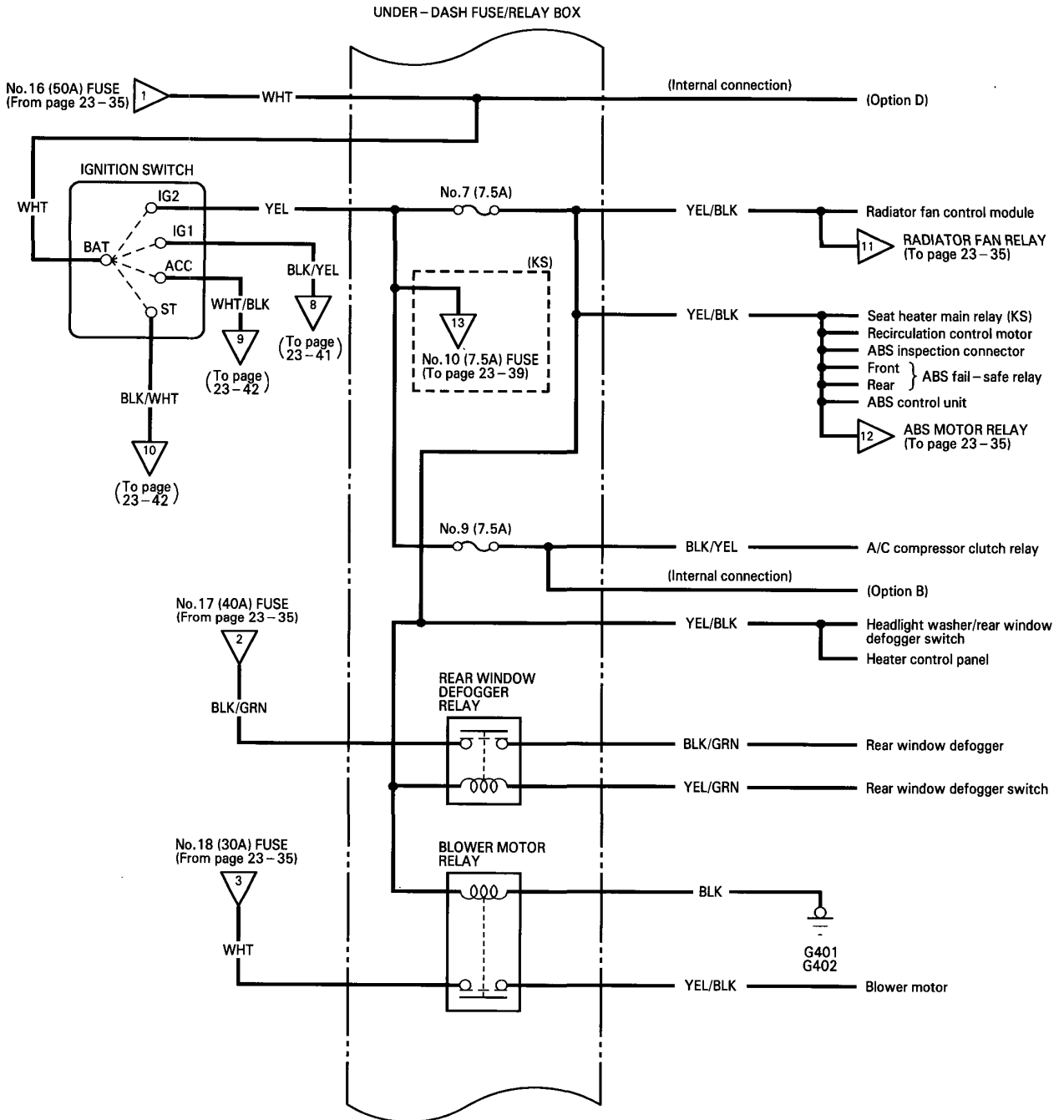


KS:



Power Distribution

Circuit Identification (LHD cont'd)



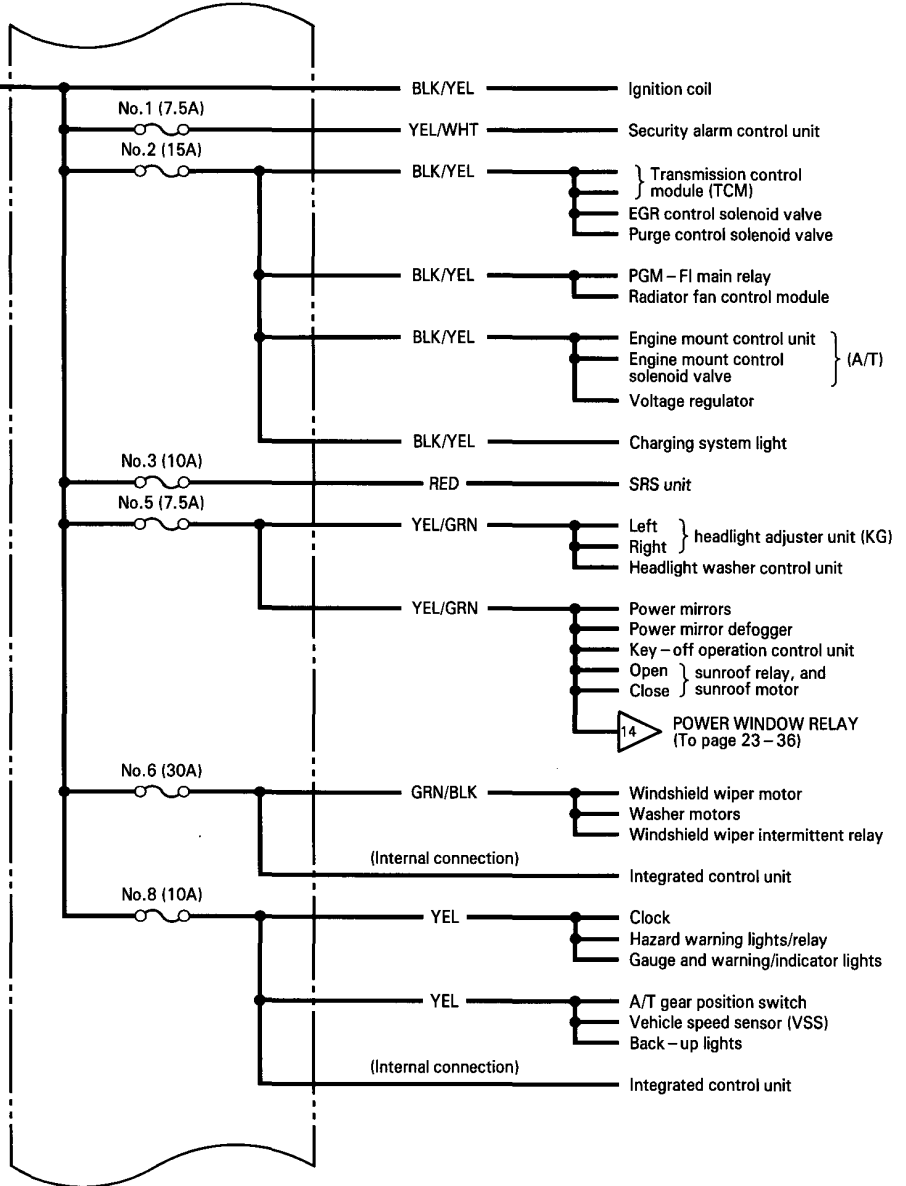


UNDER - DASH FUSE/RELAY BOX

IGNITION SWITCH (IG1)
(From page 23 - 40)

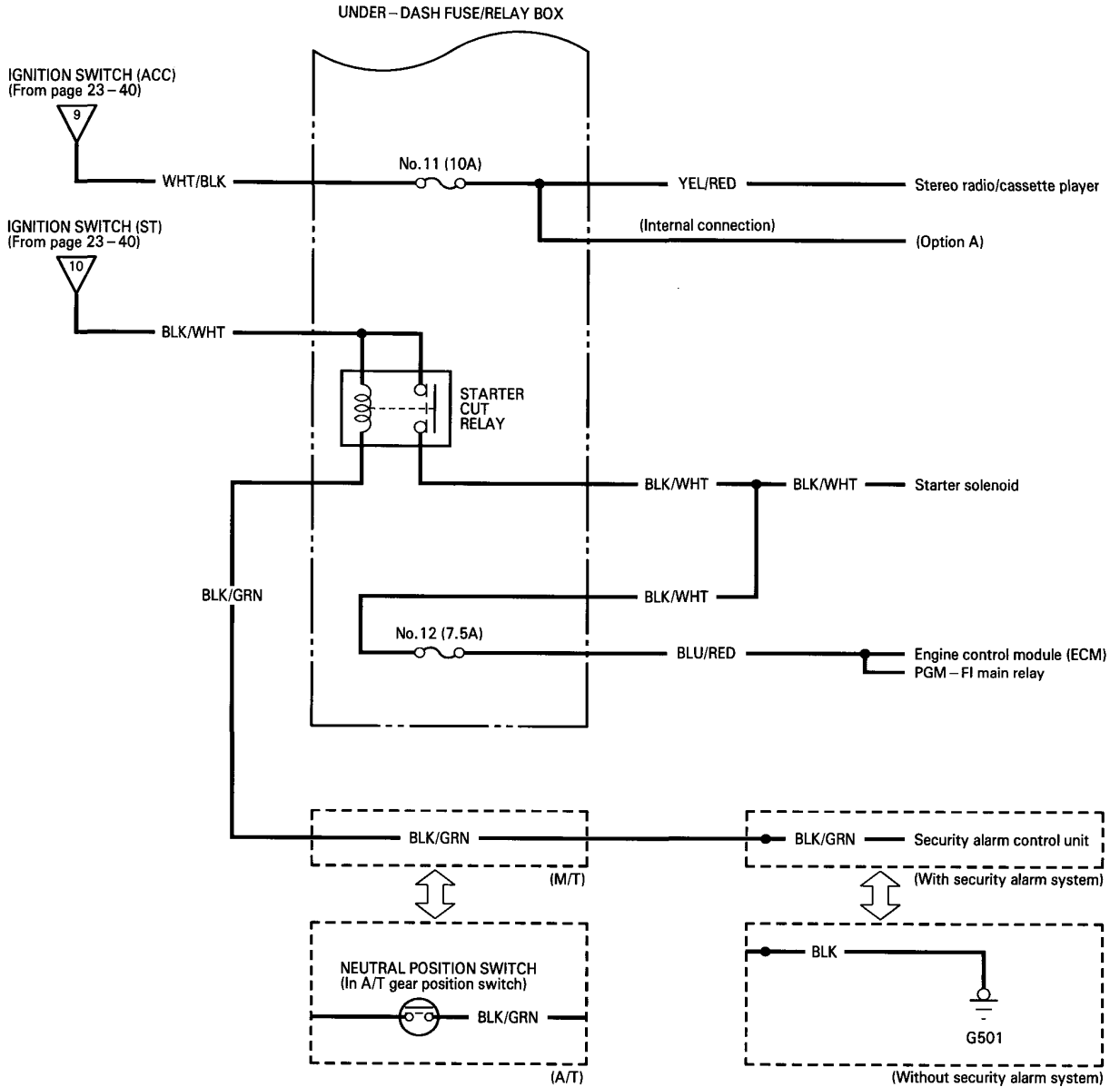


BLK/YEL



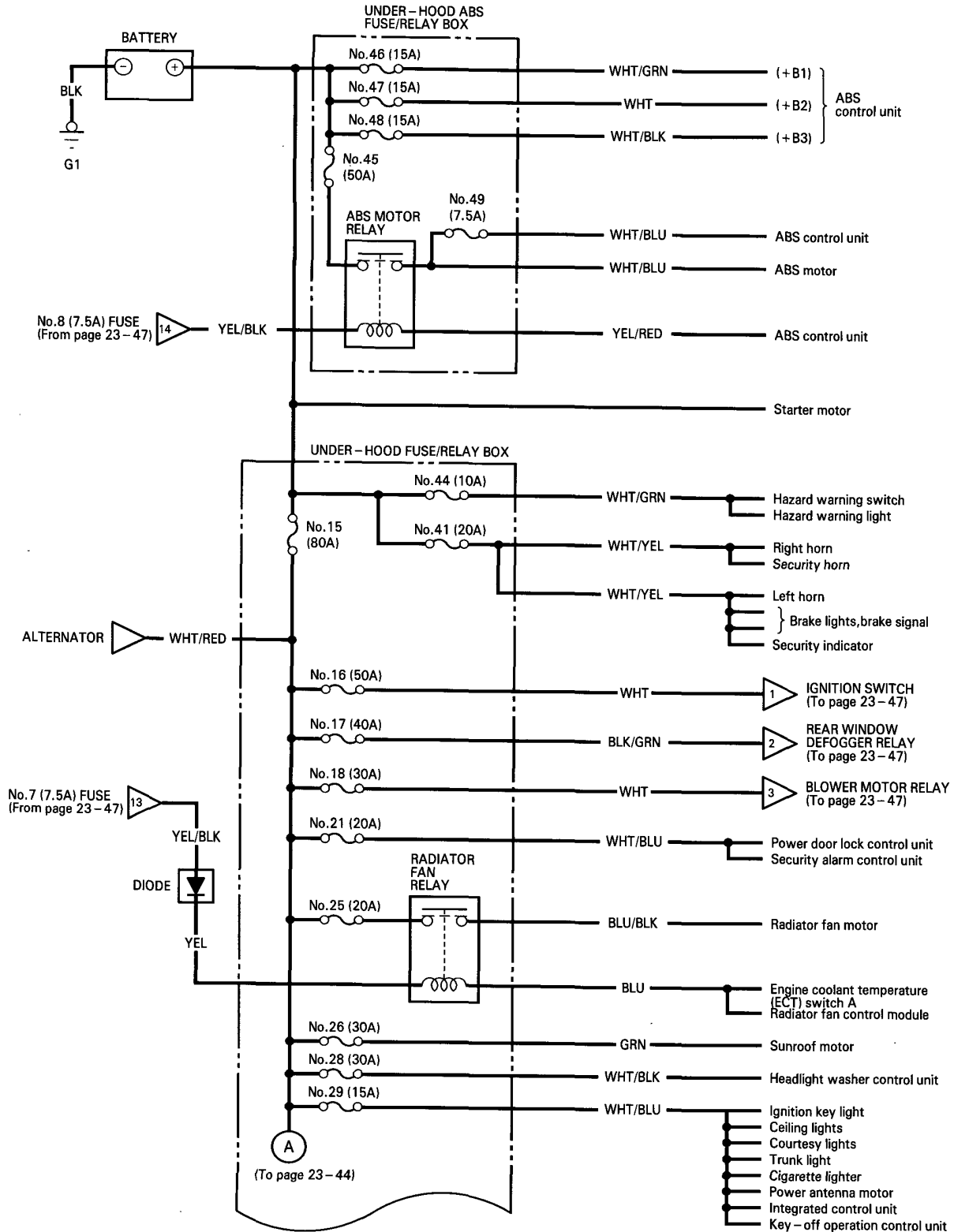
Power Distribution

Circuit Identification (LHD cont'd)



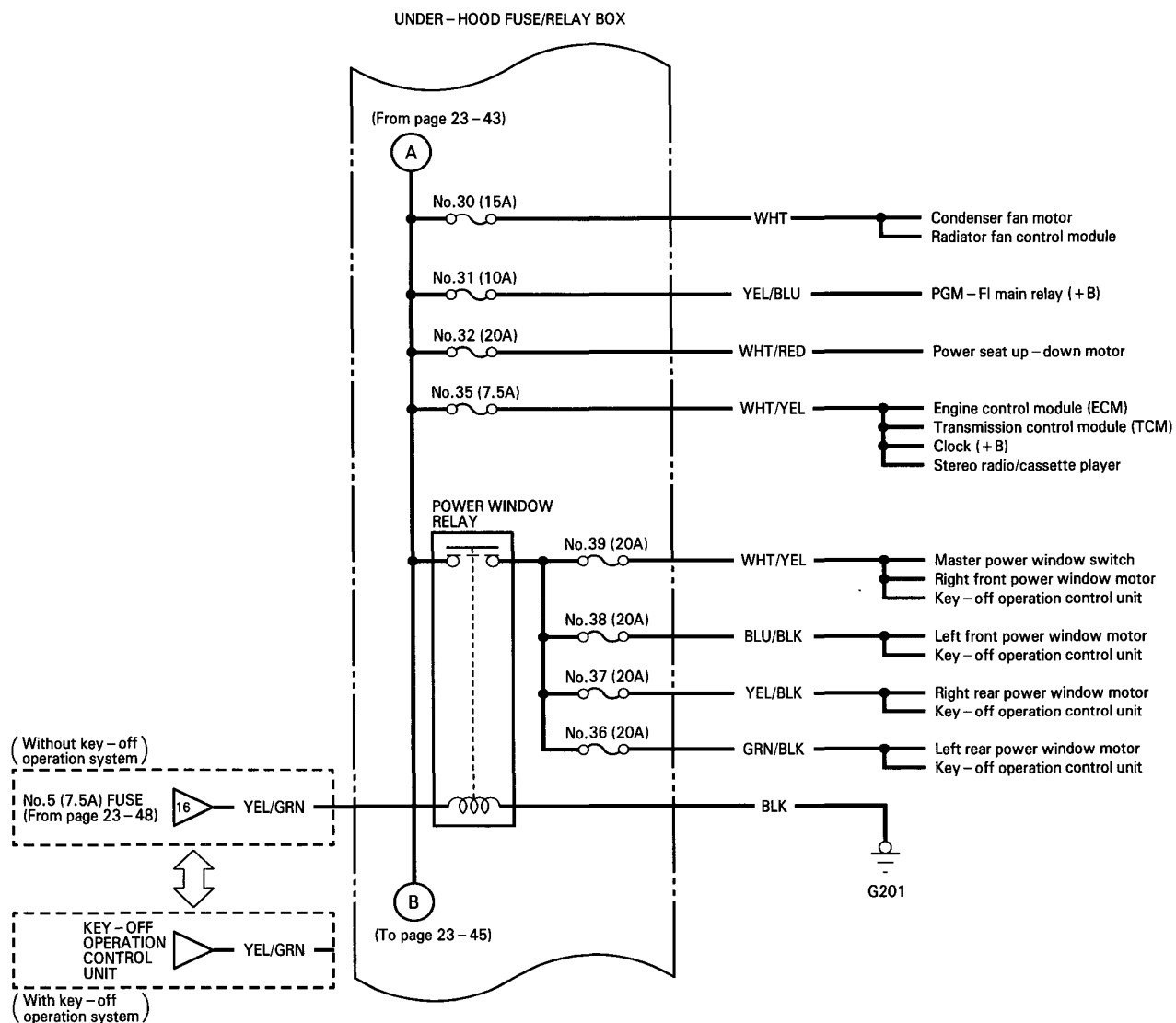


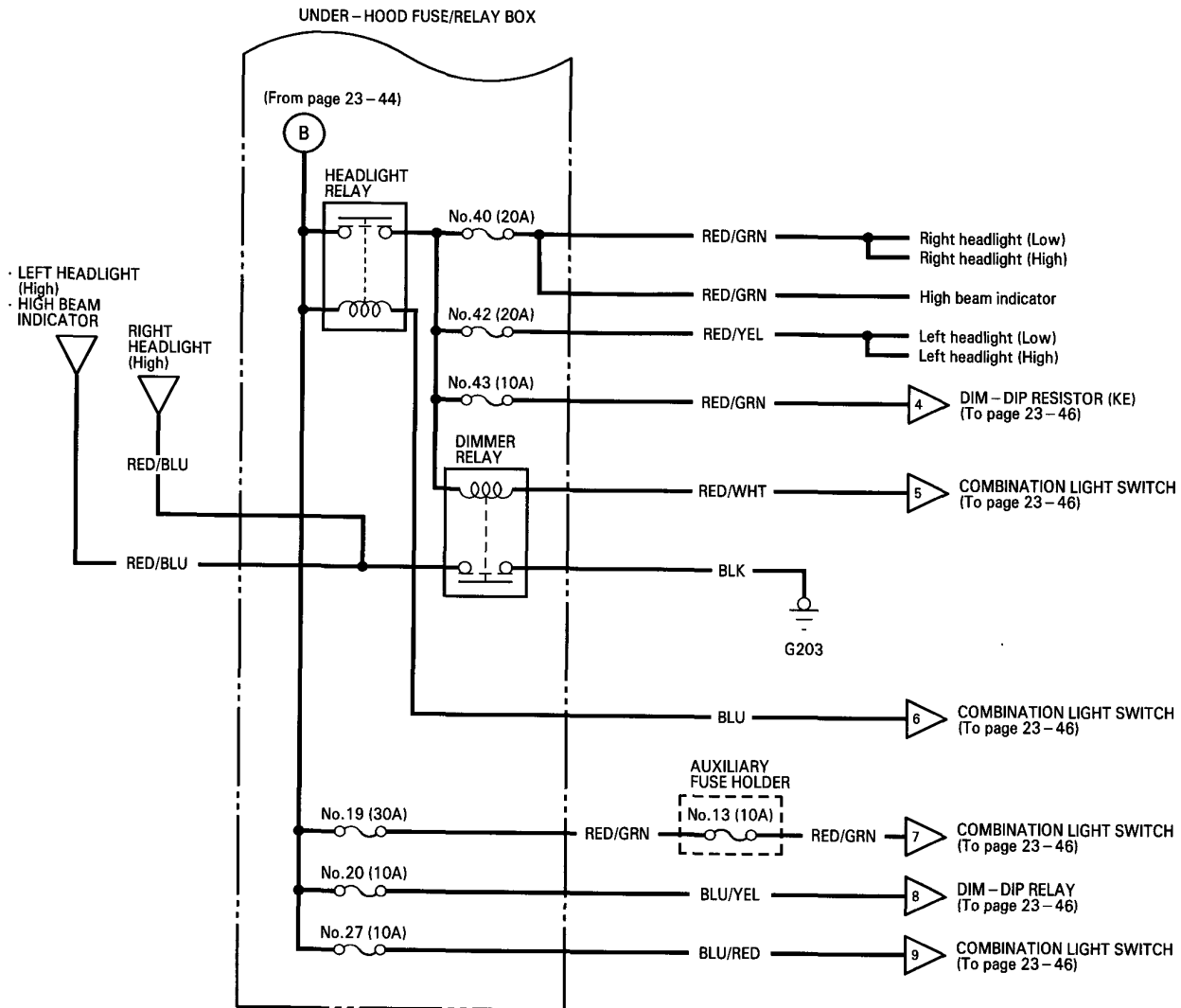
Circuit Identification (RHD)

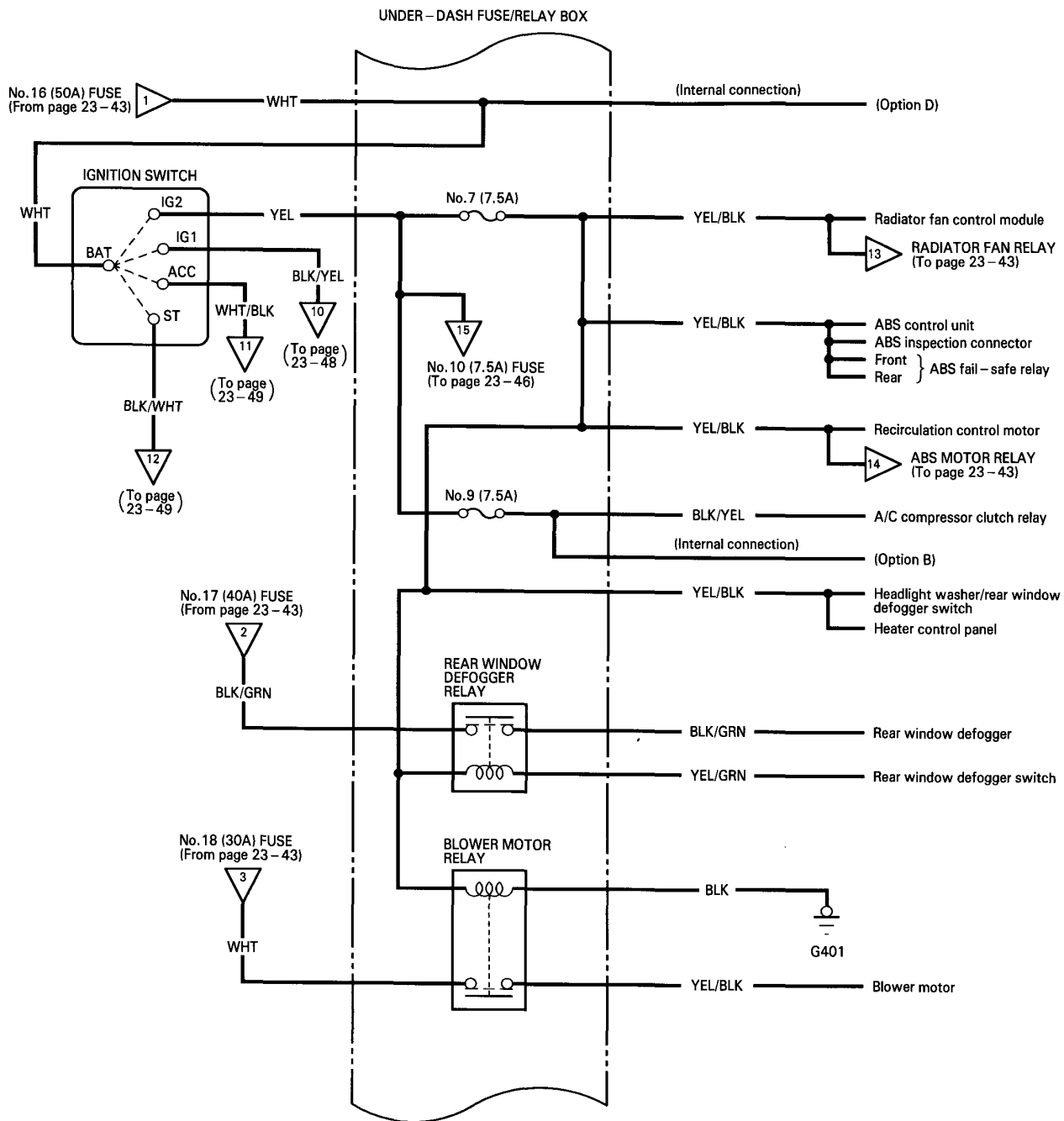


Power Distribution

Circuit Identification (RHD cont'd)

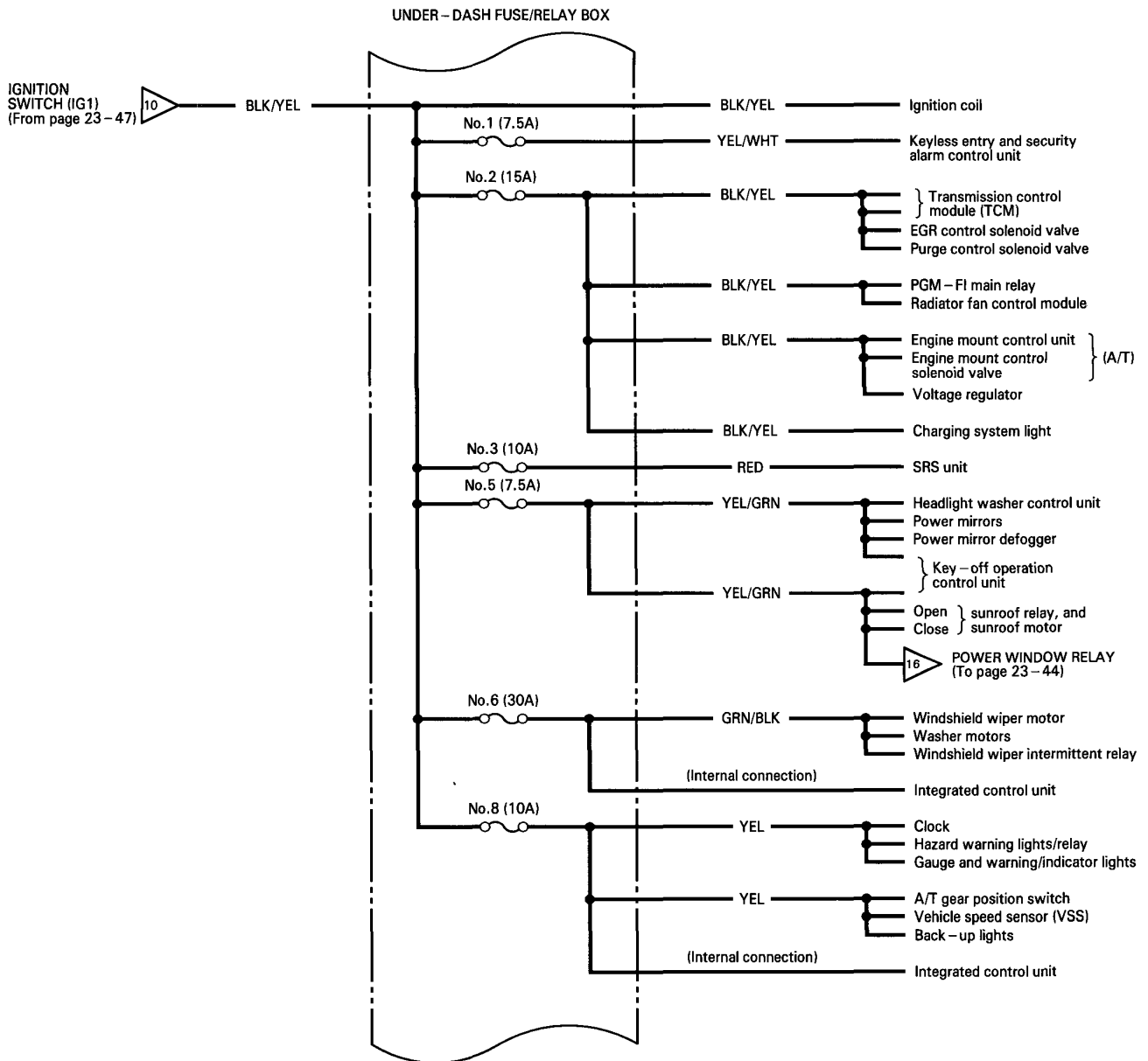


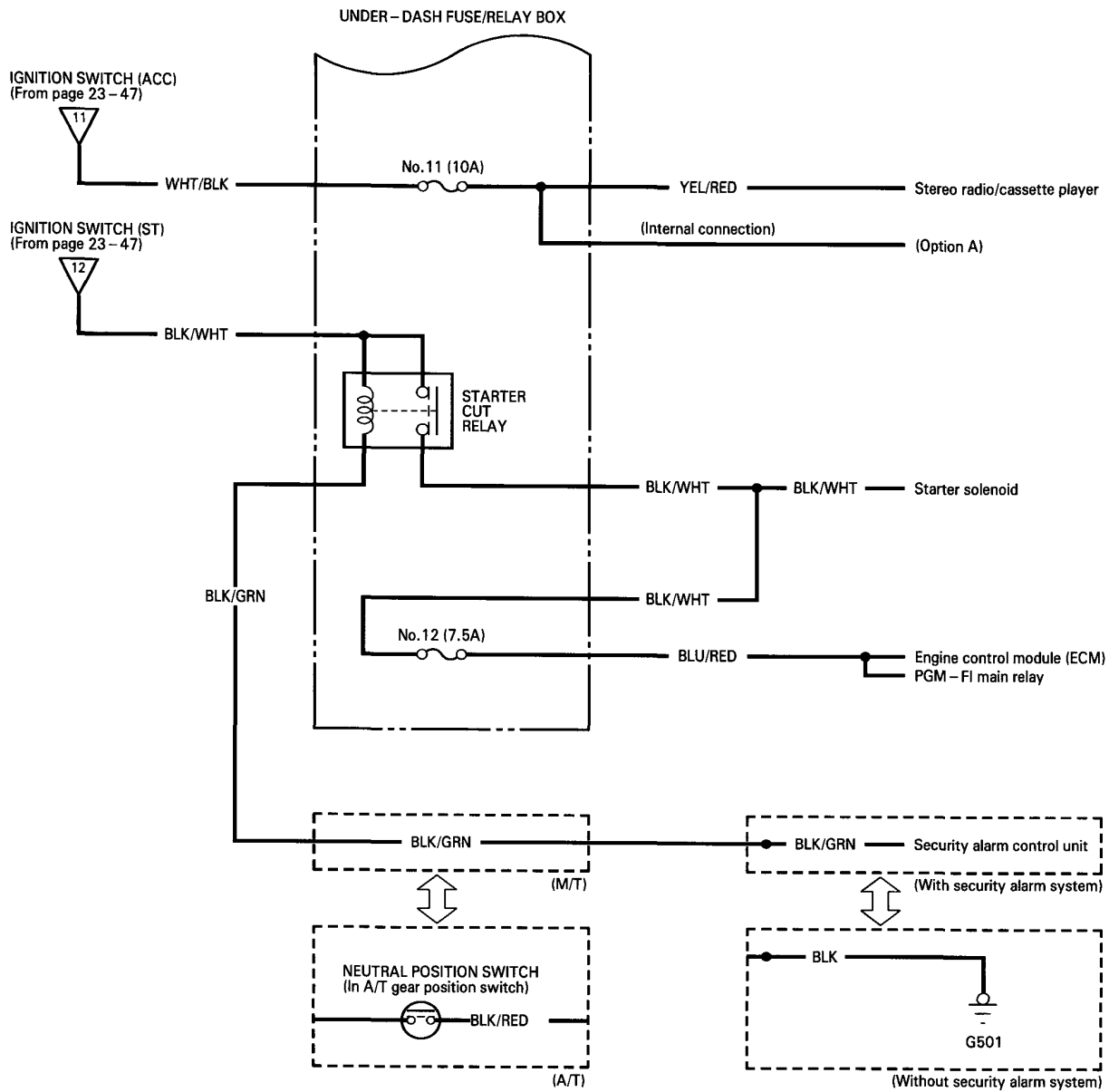




Power Distribution

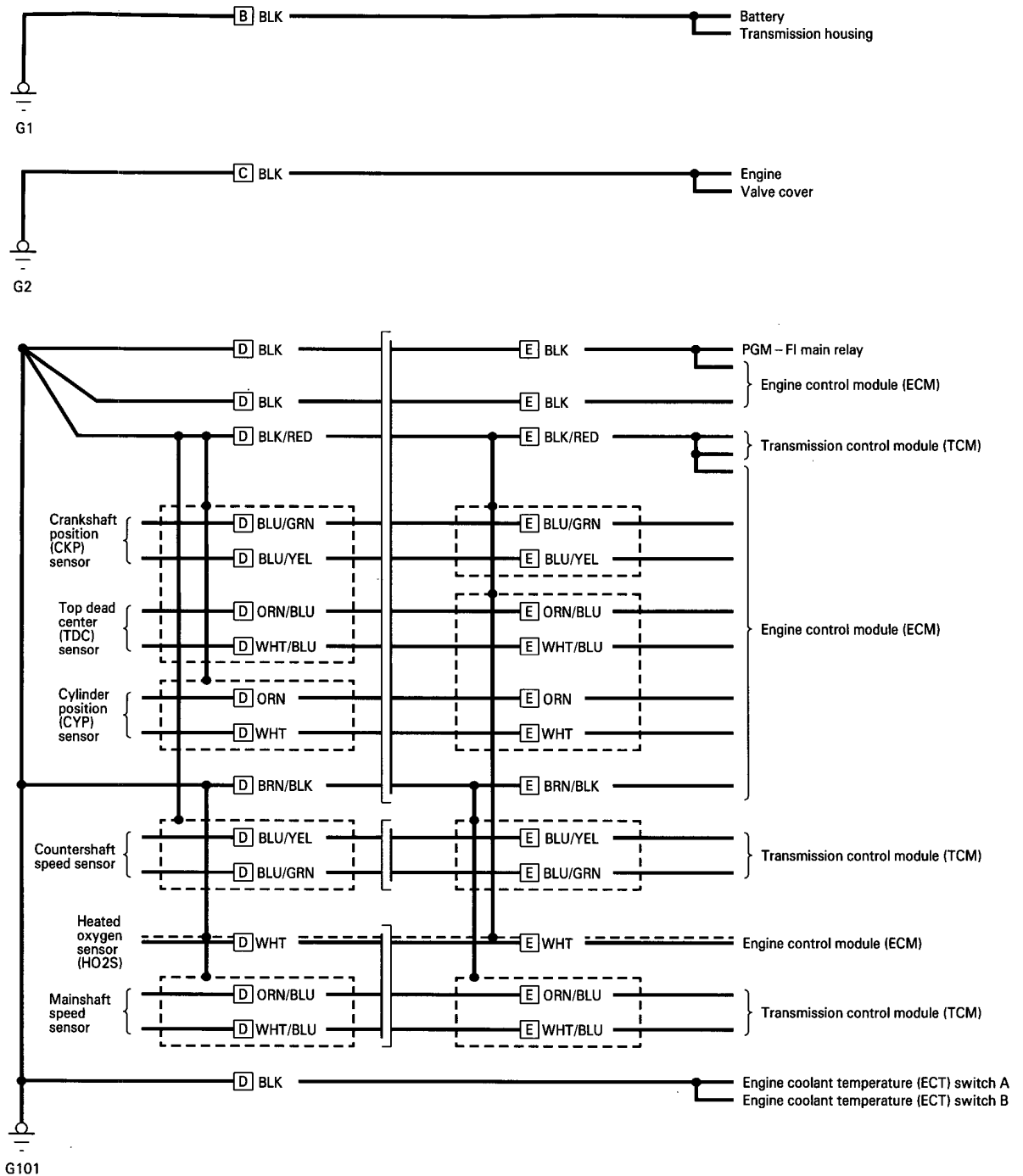
Circuit Identification (RHD cont'd)



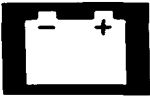


Ground Distribution

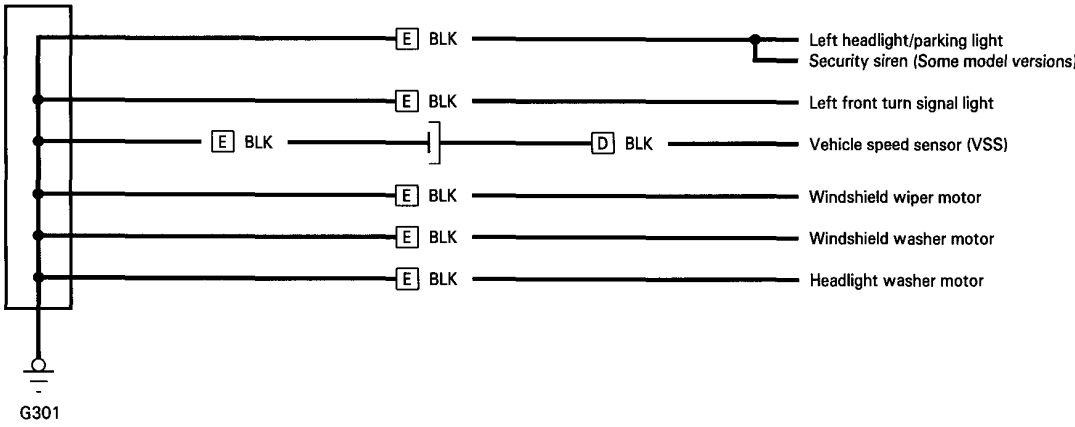
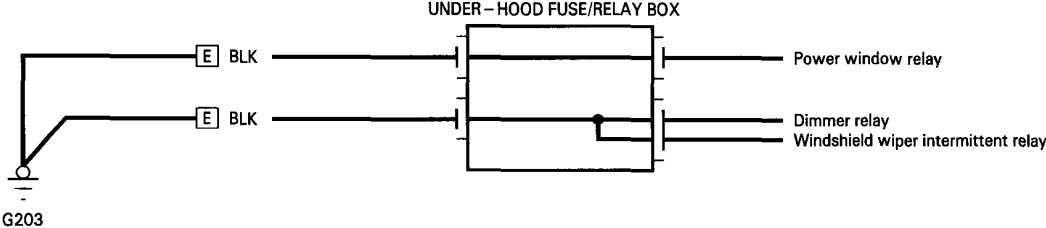
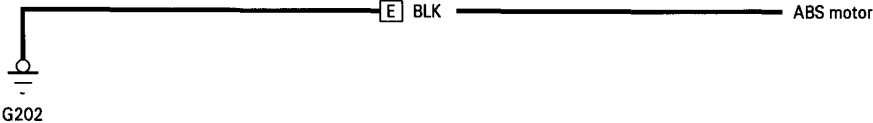
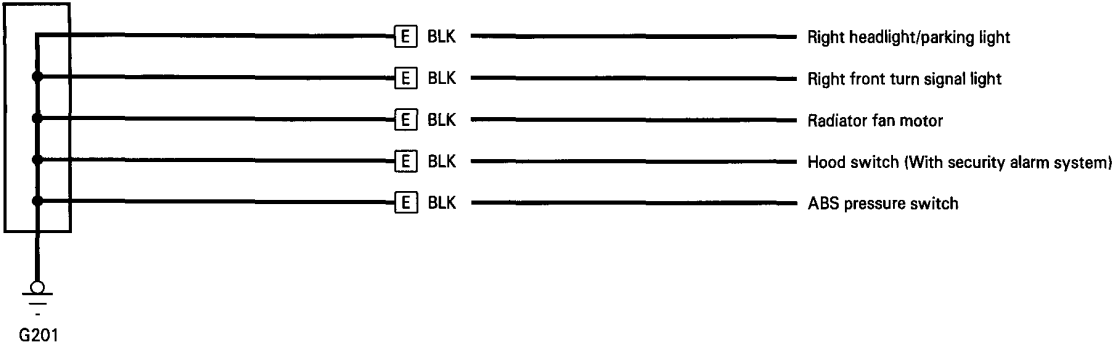
Circuit Identification



- B : Battery ground cables
- C : Engine ground cables
- D : Engine wire harness
- E : Main wire harness
- : Shielded wire



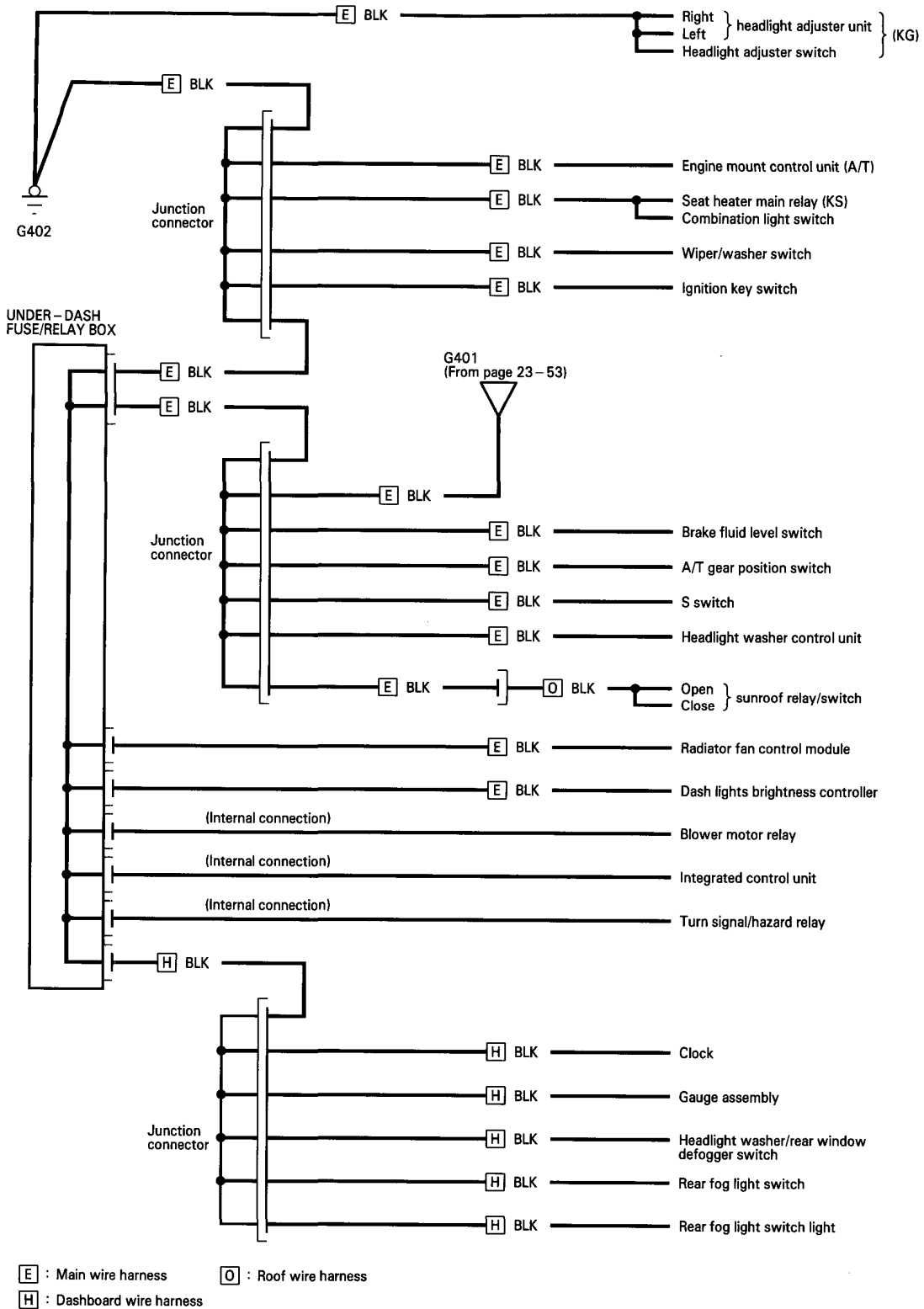
Circuit Identification (LHD)

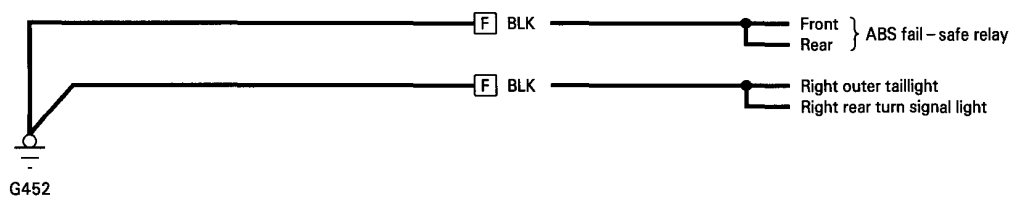
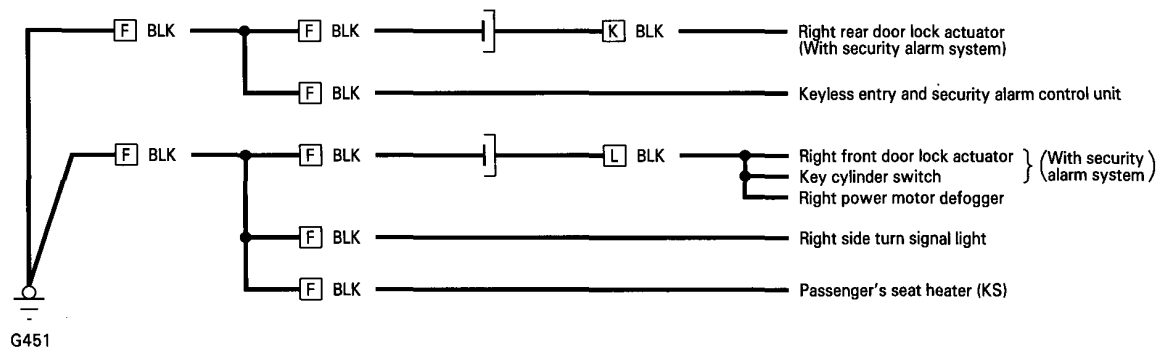
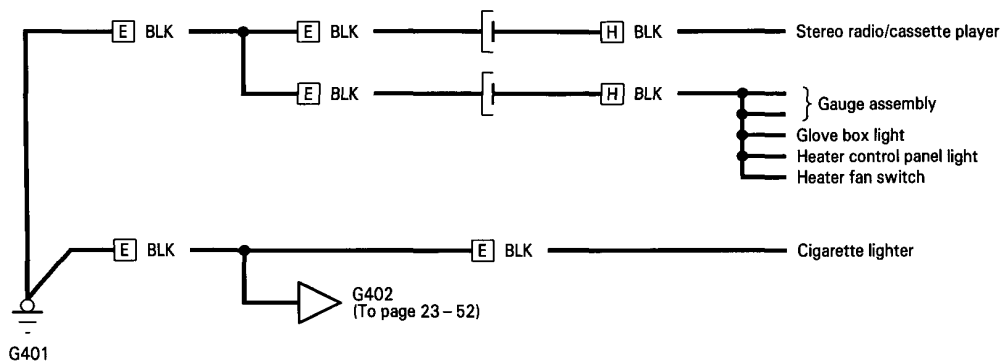


[D] : Engine wire harness
 [E] : Main wire harness

Ground Distribution

Circuit Identification (LHD cont'd)





[E] : Main wire harness

[F] : Side wire harness

[H] : Dashboard wire harness

[K] : Right rear door wire harness

[L] : Front passenger's door wire harness

Ground Distribution

Circuit Identification (LHD cont'd)

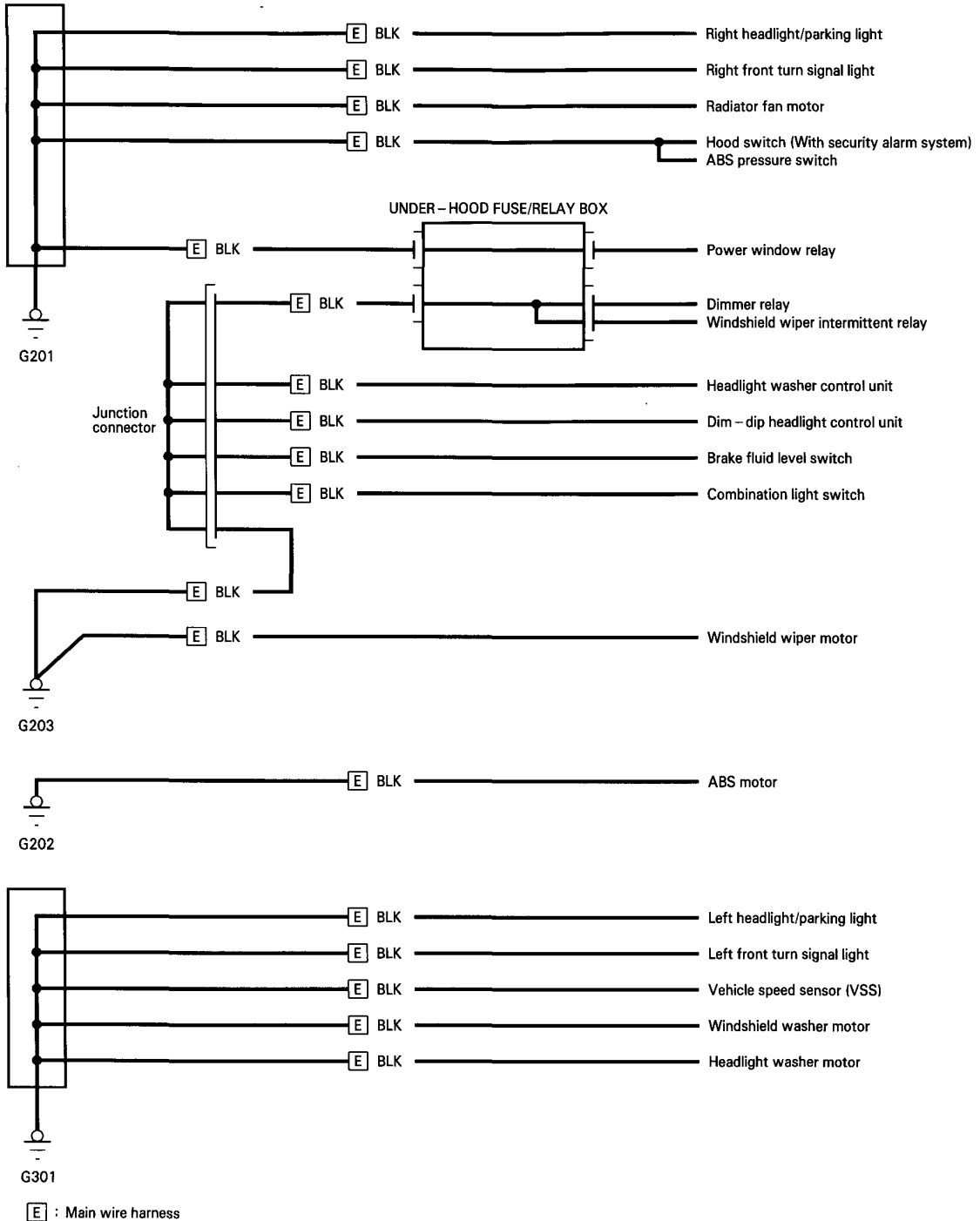


E : Main wire harness
G : Floor wire harness
I : Rear wire harness

J : Driver's door wire harness
M : Left rear door wire harness

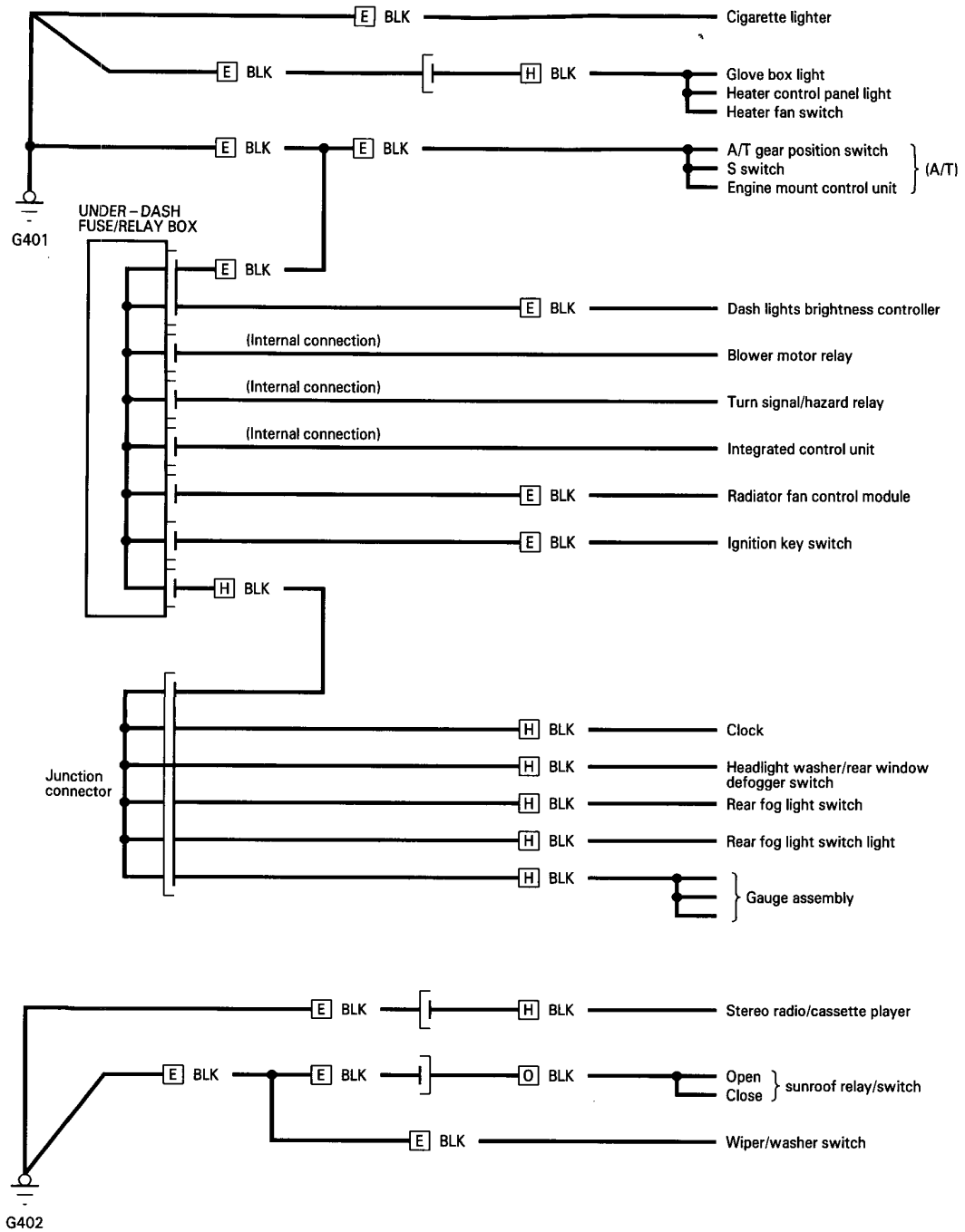


Circuit Identification (RHD)

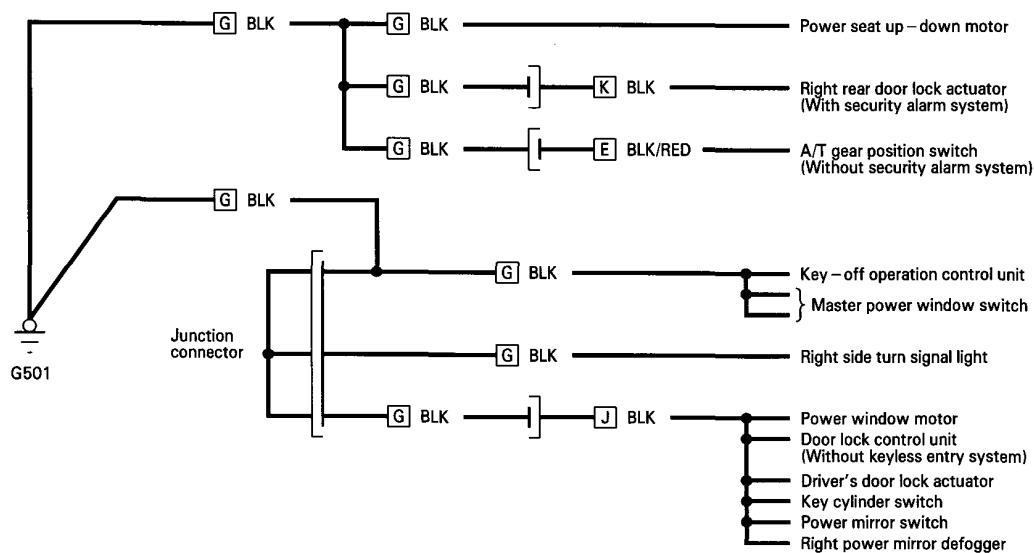
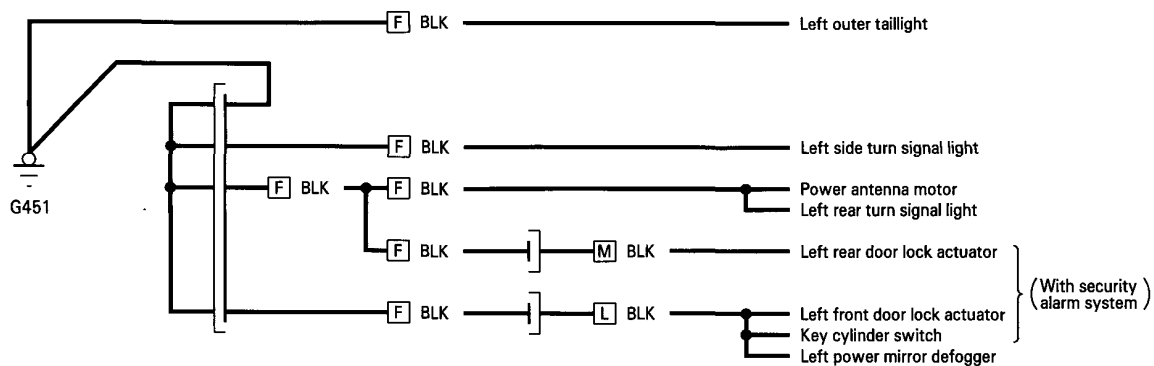


Ground Distribution

Circuit Identification (RHD cont'd)



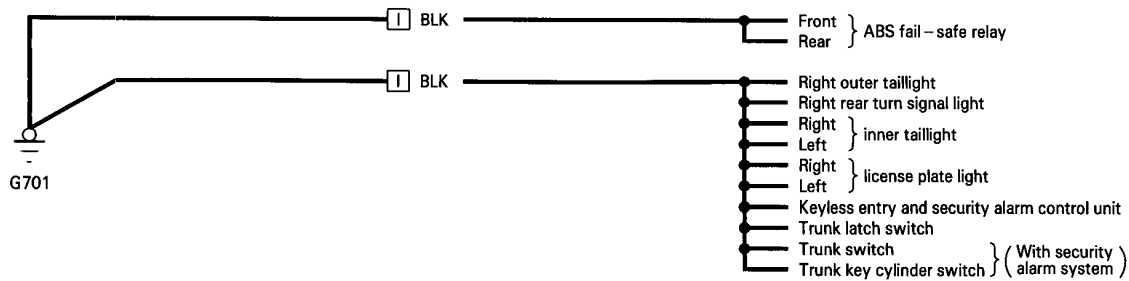
E : Main wire harness O : Roof wire harness
H : Dashboard wire harness



- | | |
|---------------------------------------|--|
| E : Main wire harness | K : Right rear door wire harness |
| F : Side wire harness | L : Front passenger's door wire harness |
| G : Floor wire harness | M : Left rear door wire harness |
| J : Driver's door wire harness | |

Ground Distribution

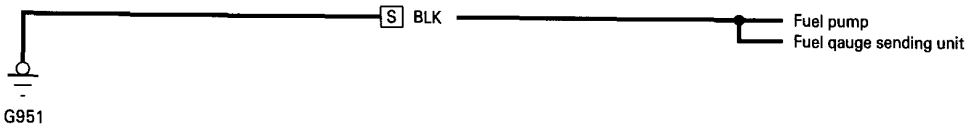
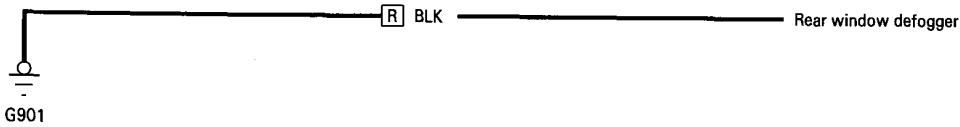
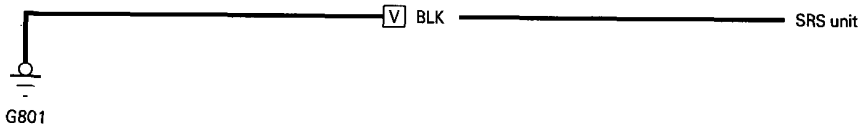
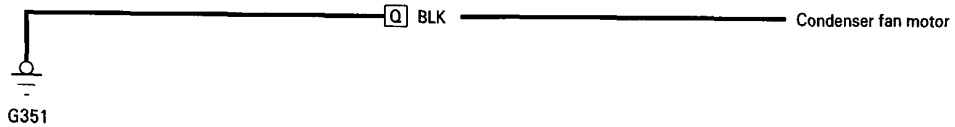
Circuit Identification (RHD cont'd)



I : Rear wire harness



Circuit Identification



Q : A/C wire harness

S : Fuel unit wire harness

R : Rear window defogger ground wire

V : SRS sub harness

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.

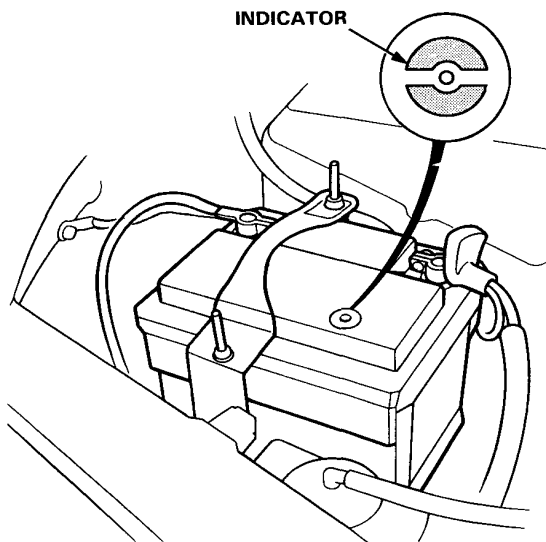
- If electrolyte gets on your skin or clothes, rinse it off with water immediately.
- If electrolyte gets in your eyes, flush it out by splashing water in your eyes for at least 15 minutes; call a physician immediately.

- 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.

NOTE: To get accurate results, the temperature of the electrolyte must be between 15 and 38°C (59 and 100°F) before testing.

Test Equipment Required:

- Battery Tester with:
Voltmeter with 0–18 V scale, ammeter with 0–100 A and 0–500 A scales, and a carbon pile with 0–300 W
- 12 V Battery Charger:
Fast charge capability of 50 A and slow charge capability of 5 A



Test Procedure:

1. Check for damage: If the case is cracked or the terminals are loose, replace the battery.
2. Check indicator (for basic charge condition): Blue or Green is OK. If the indicator is red, peel the tape off, remove the caps, and add distilled water; then reinstall the caps and tape. If the indicator is clear, go to step 3.
3. Test battery load capacity by connecting a battery tester, and applying a load of three times the battery ampere hour rating. When the load has been applied for exactly 15 seconds, the battery voltage reading should stay above 9.6 V.
 - If the reading stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the reading is between 6.5 and 9.6 V, connect a battery charger and charge the battery for three minutes at an initial rate of 40 amps.

CAUTION: Amperage will drop as voltage increases; do not increase the amperage to compensate or you may damage the battery.

- Watch the battery voltage during the entire three minutes; the highest reading should stay below 15.5 V.
 - If the reading stays below 15.5 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the reading exceeds 15.5 V any time during the three minutes of fast charge, the battery is not good; replace it.
- If the reading drops below 6.5 V, slow charge the battery by connecting a battery and charge at five amps for no more than 24 hours (or until the indicator shows full charge, or the specific gravity of the electrolyte is at least 1.250). Then test load capacity again.
 - If the voltage stays above 9.6 V, the battery is OK; clean its terminals and case, and reinstall it.
 - If the voltage still drops below 6.5 V, the battery is not good; replace it.



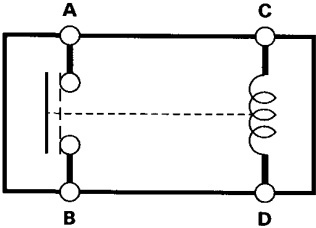
Power Relays

Relay Test (Normally-open Type)

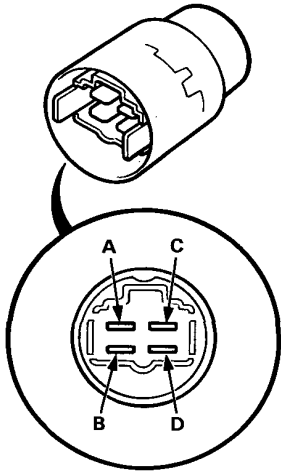
NOTE: See page 23-186 for the turn signal/hazard relay input test, and see page 23-235 for the seat heater relay test.

1. Remove the power relay from its socket.
2. Check for continuity between the relay terminals.

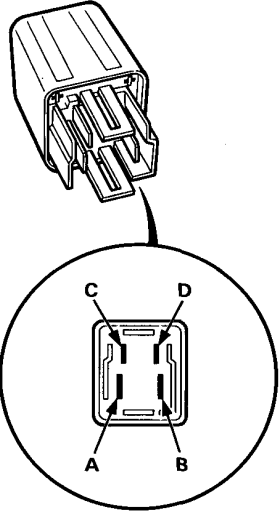
Terminal	A	B
Power (C-D)		
Connected		
Disconnected		



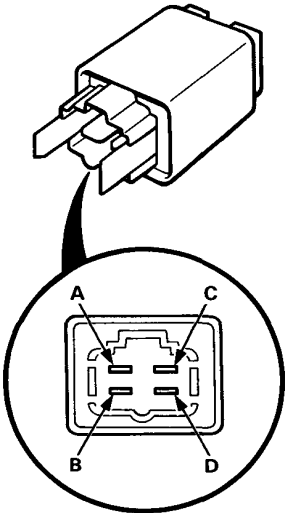
- A/C compressor clutch relay
- Condenser fan relay



- Dimmer relay
- Headlight relay
- Rear window defogger relay



- Starter cut relay

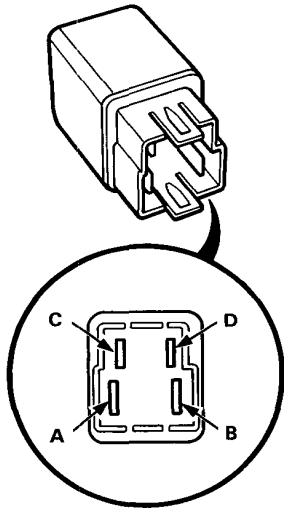


(cont'd)

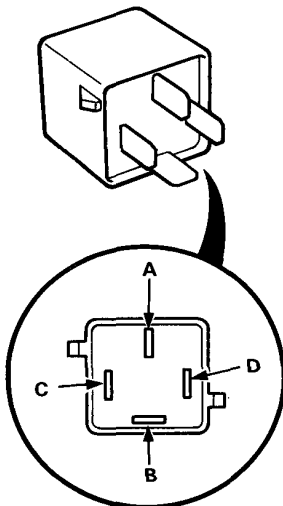
Power Relays

Relay Test (Normally-open Type) (cont'd)

- ABS motor relay



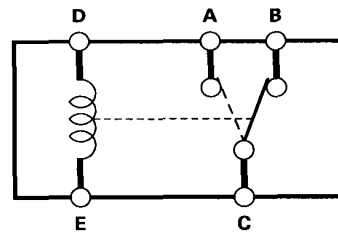
- ABS front fail-safe relay
- ABS rear fail-safe relay
- Blower motor relay
- Power window relay
- Radiator fan relay
- Seat heater main relay



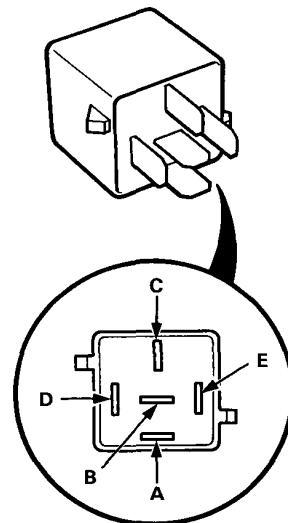
Relay Test (Five-terminal Type)

1. Remove the power relay from its socket.
2. Check for continuity between the relay terminals.

Terminal	A	B	C
Power (D-E)			
Connected	○	—	○
Disconnected		○	○



- Sunroof open relay
- Sunroof close relay
- Windshield wiper intermittent relay



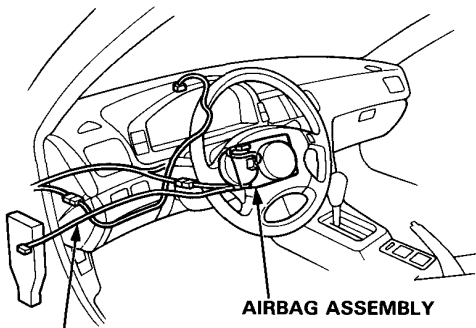


Ignition Switch

Test

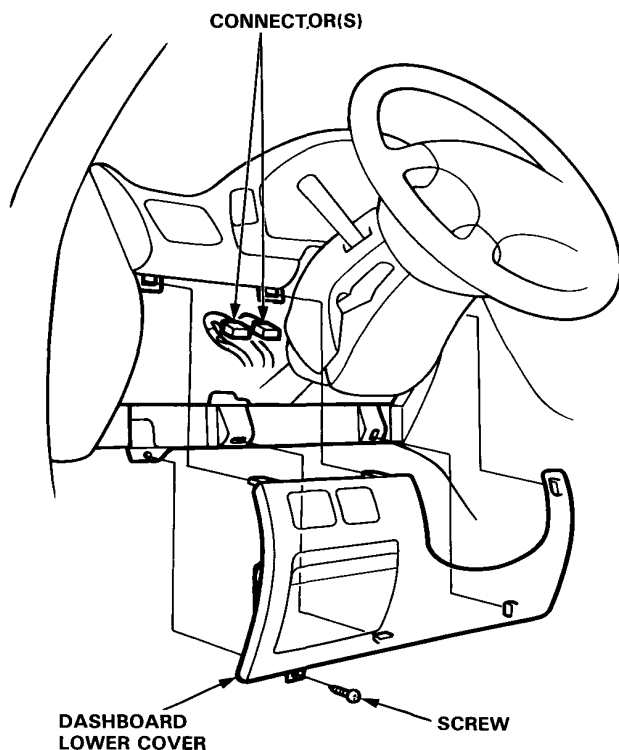
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



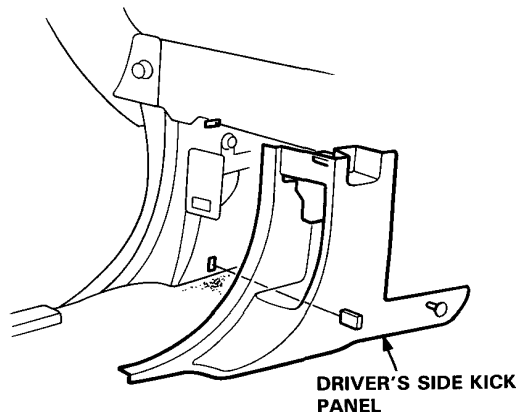
AIRBAG ASSEMBLY
SRS MAIN HARNESS
(Covered with yellow outer insulation)

1. Remove the screw and dashboard lower cover, then disconnect the connector(s) from the switch(es).



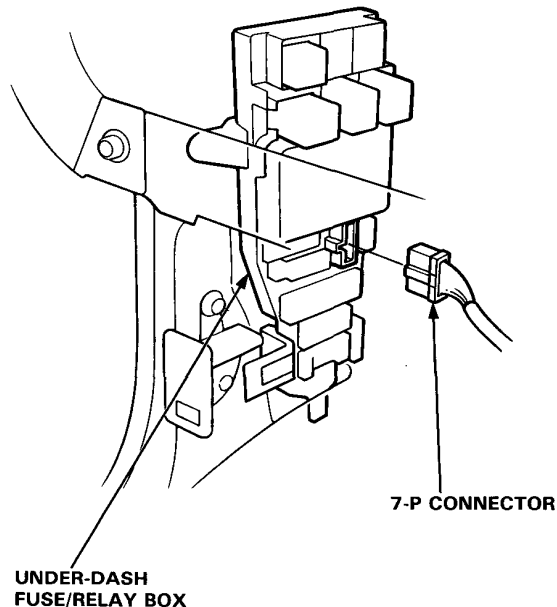
CONNECTOR(S)
DASHBOARD LOWER COVER
SCREW

2. Remove the driver's side kick panel.



DRIVER'S SIDE KICK PANEL

3. Disconnect the 7-P connector from the under-dash fuse/relay box.



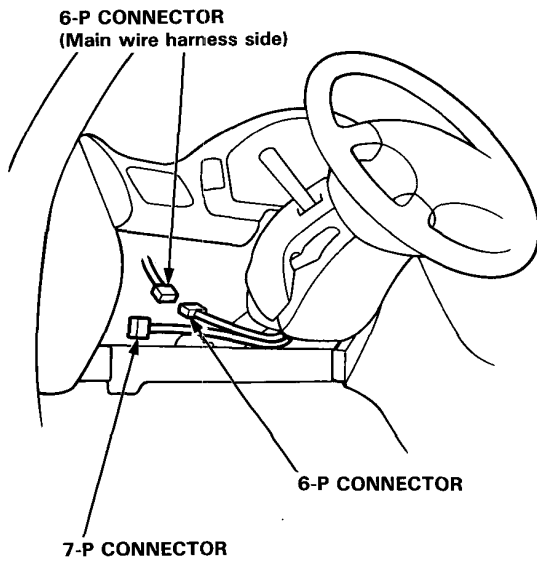
7-P CONNECTOR
UNDER-DASH FUSE/RELAY BOX

(cont'd)

Ignition Switch

Test (cont'd)

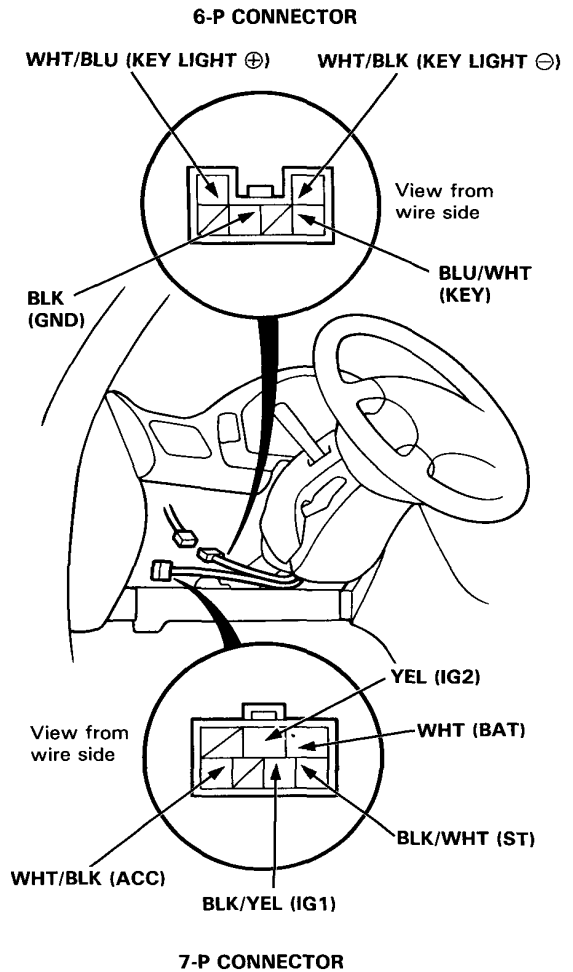
4. Disconnect the 6-P connector from the main wire harness.



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

Terminal Position	WHT/BLK (ACC)	WHT (BAT)	BLK/YEL (IG1)	YEL (IG2)	BLK/WHT (ST)	BLU/WHT (KEY)	BLK (GND)
0 (LOCK)							
I (ACC)	○—○						
II (ON)	○—○	○—○	○—○	○—○			
III (ST)		○—○	○—○	○—○	○—○		
Key-in						○—○	

NOTE: For ignition key light test and replacement refer to page 23-149.



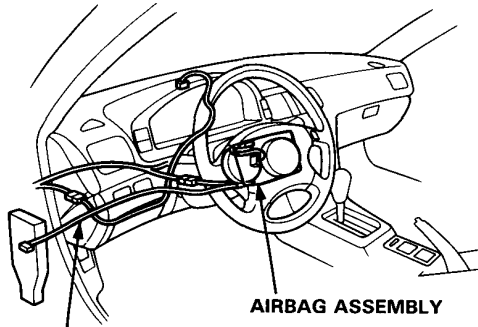
Ignition Switch



Replacement

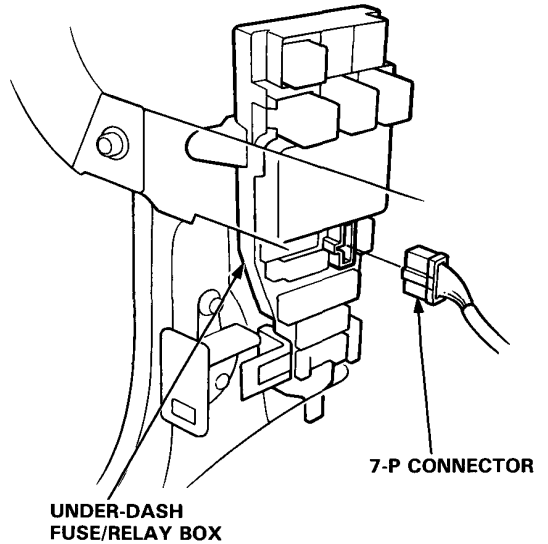
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

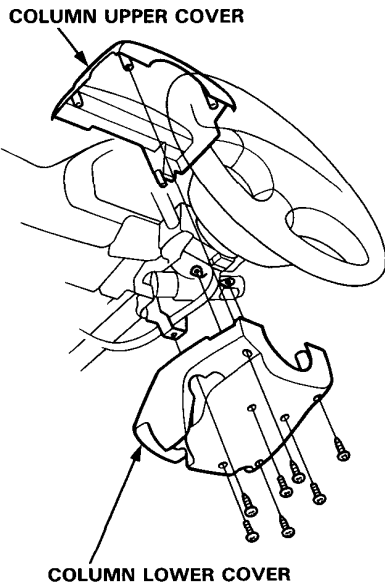


SRS MAIN HARNESS
(Covered with yellow outer insulation)

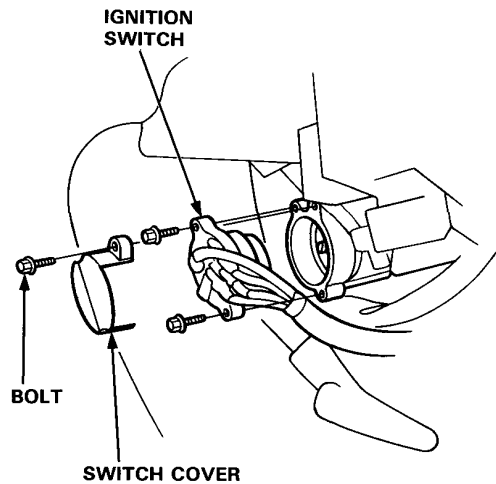
3. Disconnect the 7-P connector from the under-dash fuse/relay box.



1. Remove the screws and dashboard lower cover, then disconnect the connector(s) from the switch(es) (see page 23-63).
2. Remove the steering column covers.



4. Turn the ignition switch to "0".
5. Remove the switch cover and switch by removing the bolts.



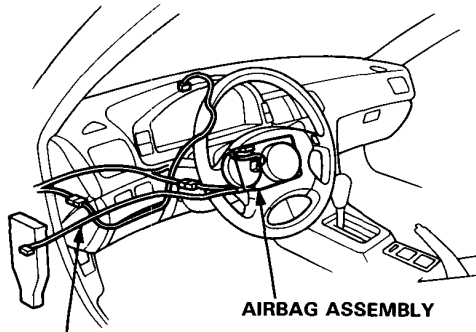
6. Install in the reverse order of removal.

Ignition Switch

Steering Lock Replacement

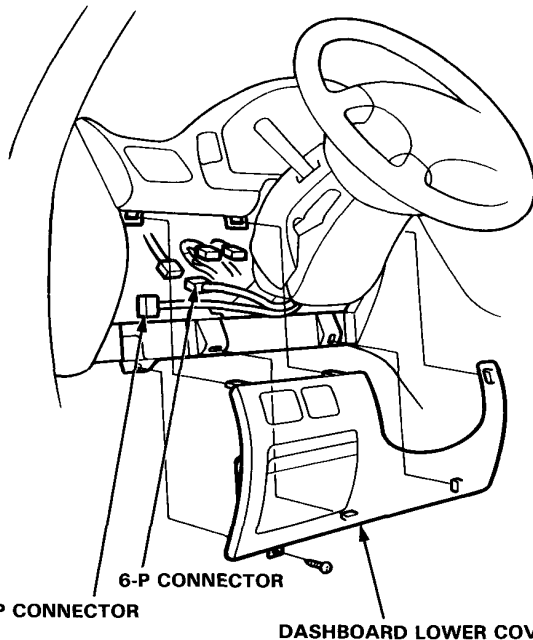
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

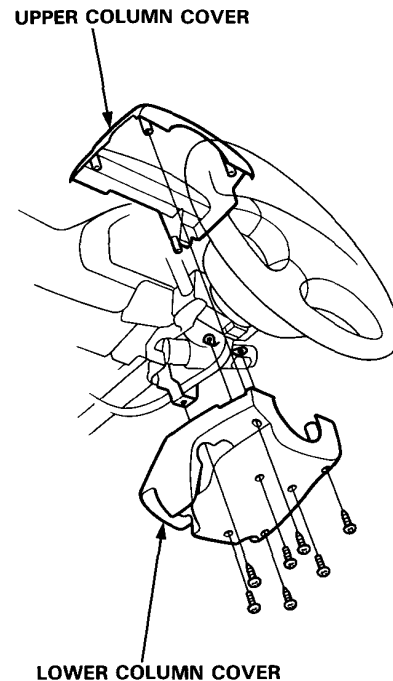


SRS MAIN HARNESS
(Covered with yellow outer insulation)

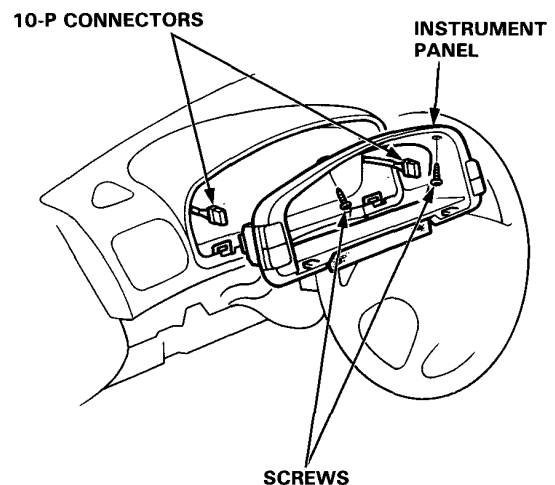
1. Remove the dashboard lower cover and driver's side kick panel (see page 23-63).
2. Disconnect the 7-P connector from the under-dash fuse/relay box and the 6-P connector from the main wire harness.



3. Remove the steering column covers.



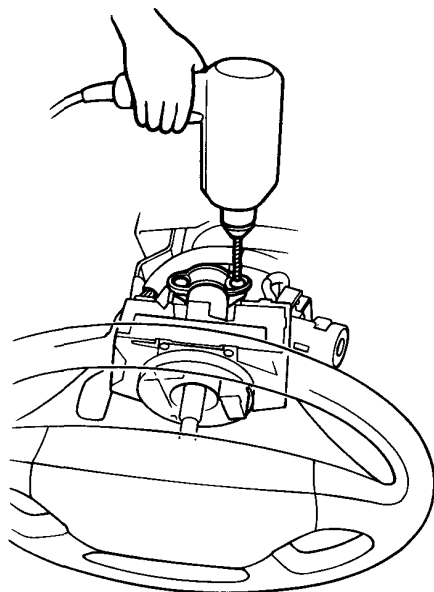
4. Remove the two screws from the instrument panel.
5. Remove the instrument panel and disconnect the 10-P connectors from the switches.





- Center-punch each of the two shear bolts and drill their heads off with a 5 mm (3/16 in) drill bit.

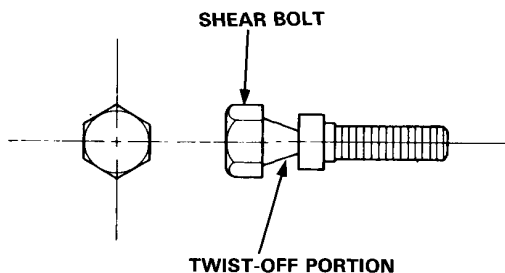
CAUTION: Do not damage the switch body when removing the shear bolts.



- Remove the shear bolts from the switch body.

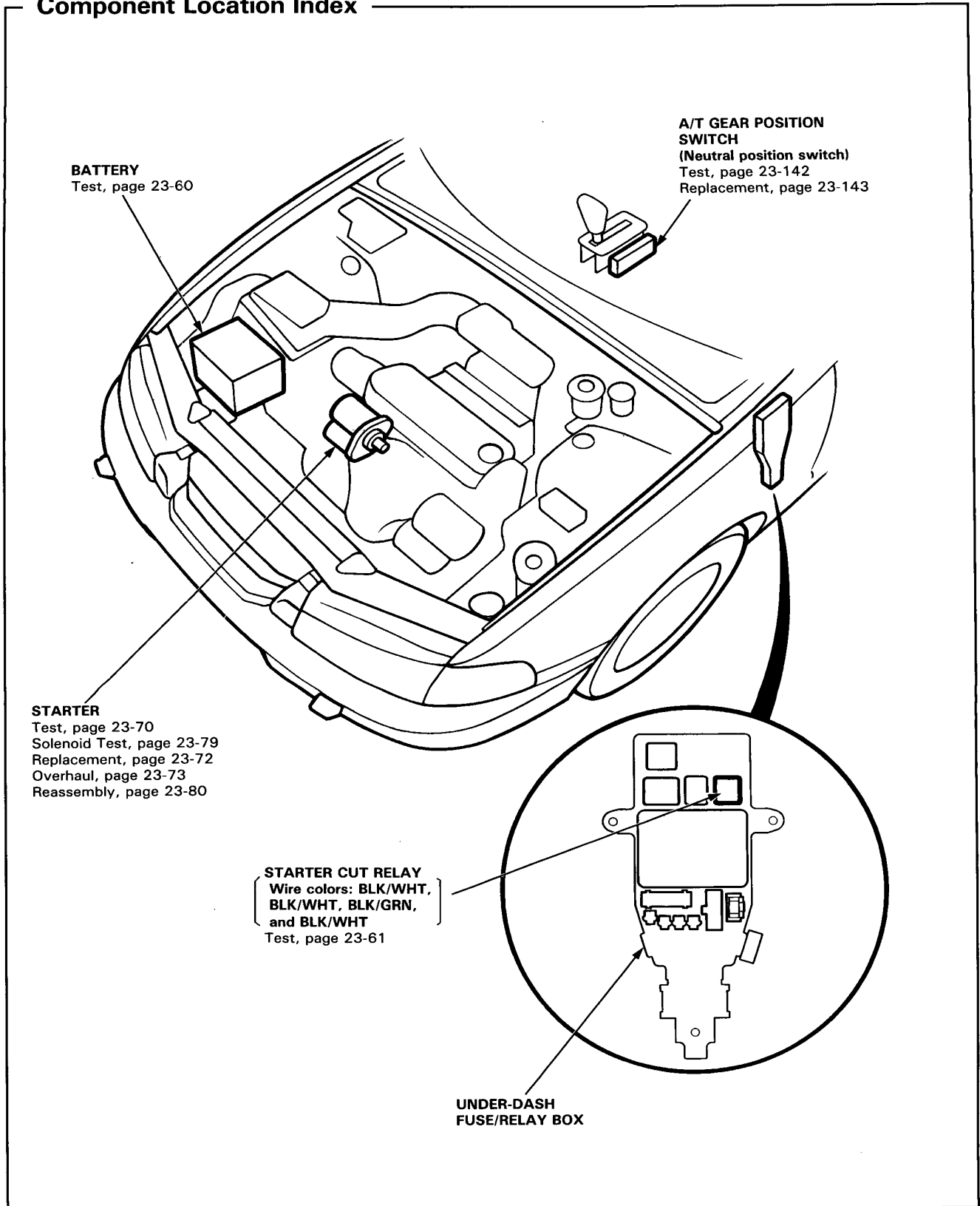
Installation:

- Install the new steering lock without the key inserted.
- Loosely tighten the new shear bolts.
- Insert the ignition key and check for proper operation of the steering wheel lock and that the ignition key turns freely.
- Tighten the shear bolts until the hex heads twist off.



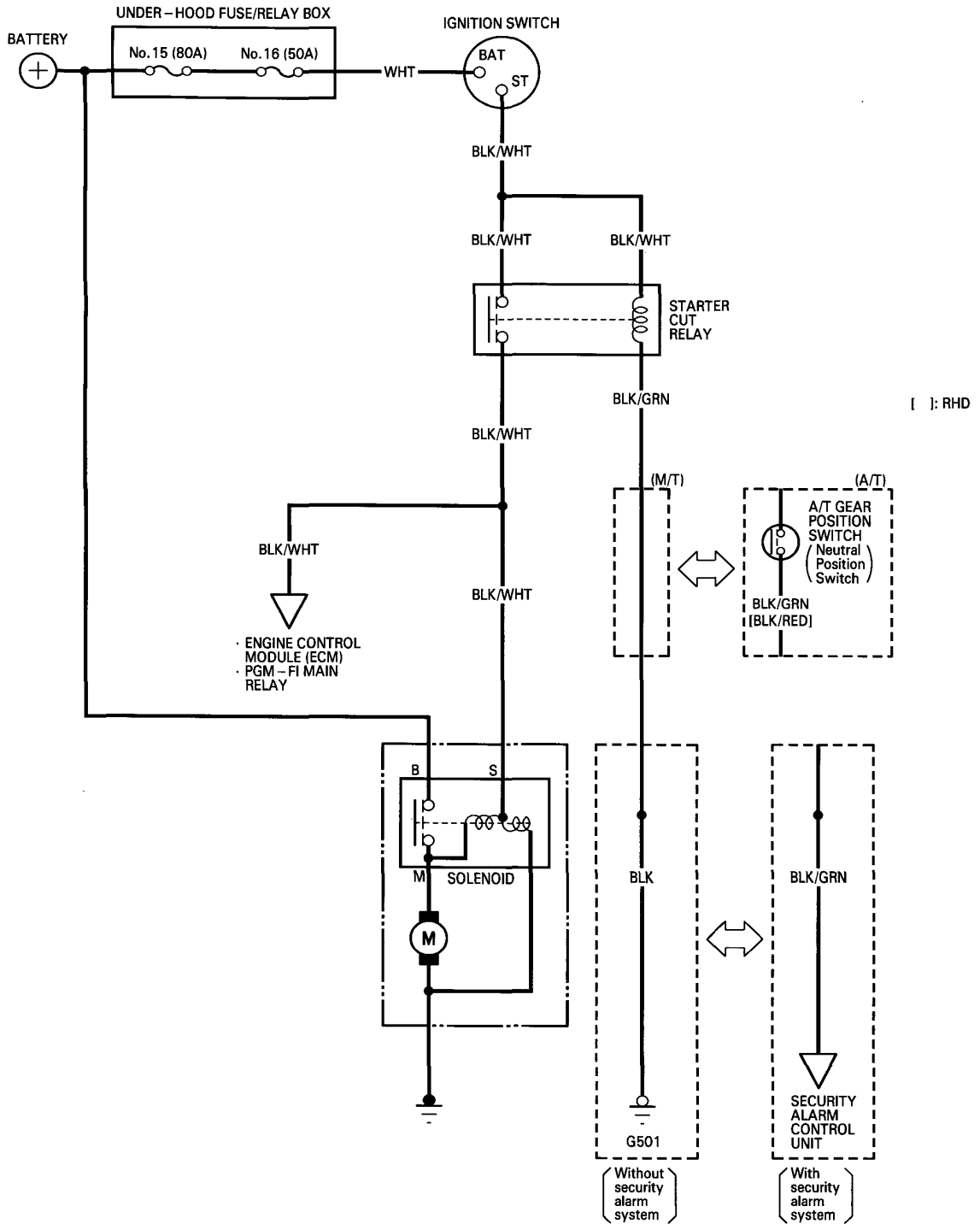
Starting System

Component Location Index





Circuit Diagram



Starting System

Starter Test

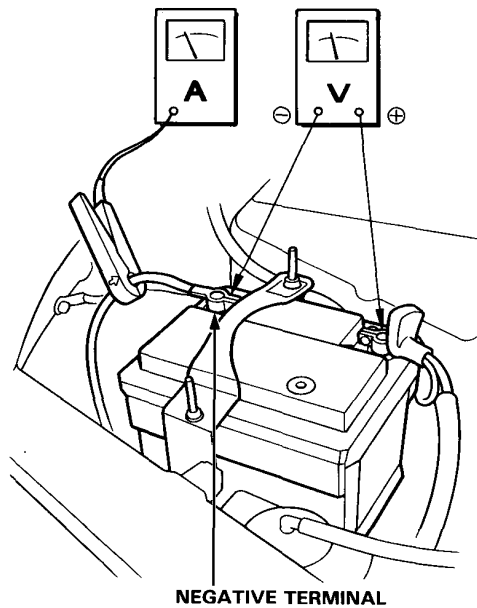
NOTE: The air temperature must be between 15°C and 38°C (59°F and 100°F) before testing.

Recommended Procedure:

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

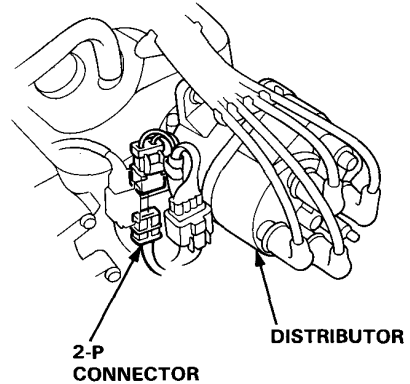
Alternate Procedure:

- Use the following equipment:
 - Ammeter, 0–400 A
 - Voltmeter, 0–20 V (accurate within 0.1 volt)
 - Tachometer, 0–1200 rpm
- Hook up voltmeter and ammeter as shown.



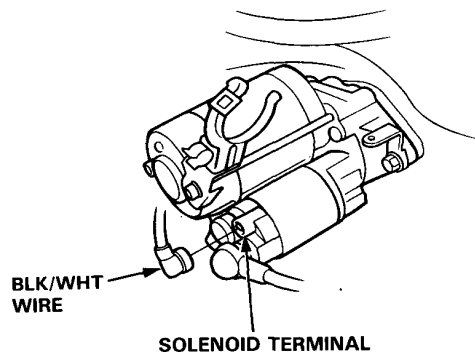
NOTE: After this test, or any subsequent repair, reset the engine control module (ECM) to clear any codes (see section 11).

1. Remove the 2-P connector from its bracket and disconnect it.



2. Check the starter engagement:
Turn the ignition switch to III (START). The starter should crank the engine.

- If the starter does not crank the engine, check the battery, battery positive cable, ground, and the wire connections for looseness and corrosion, and test again.
- If the starter still does not crank the engine, bypass the ignition switch circuit as follows:
Unplug the BLK/WHT wire from the solenoid terminal. 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 the starter and diagnose its internal problems.

- If the starter cranks the engine, check for:

- blown No. 16 (50 A) fuse in the under-hood fuse/relay box.
- an open in the BLK/WHT wire and the connectors.
- faulty starter cut relay.
- faulty ignition switch.
- faulty A/T gear position switch (neutral position switch).

3. Check for wear or damage:

The starter should crank the engine smoothly and steadily.

- If the starter engages, but cranks the engine erratically, check the starter, drive gear and flywheel ring gear for damage, and check the drive gear overrunning clutch for binding or slipping when the armature is rotated with the drive gear held.

If the gears are damaged, replace them.

4. Check cranking voltage and current draw:

- Voltage should be no less than 8.0 volts.
 - Current should be no more than 350 amperes.
- If voltage is too low, or current draw too high, check for:

- low battery.
- open circuit in starter armature commutator segments.
- starter armature dragging.
- shorted armature winding.
- excessive drag in engine.

5. 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.

6. Check the starter disengagement:

Turn the ignition switch to "III" and release to "II" position. The starter drive gear should disengage from the flywheel ring gear.

If the drive gear hangs up on the flywheel ring gear, check for:

- solenoid plunger and switch malfunction.
- dirty drive gear assembly or damaged overrunning clutch.

Starting System

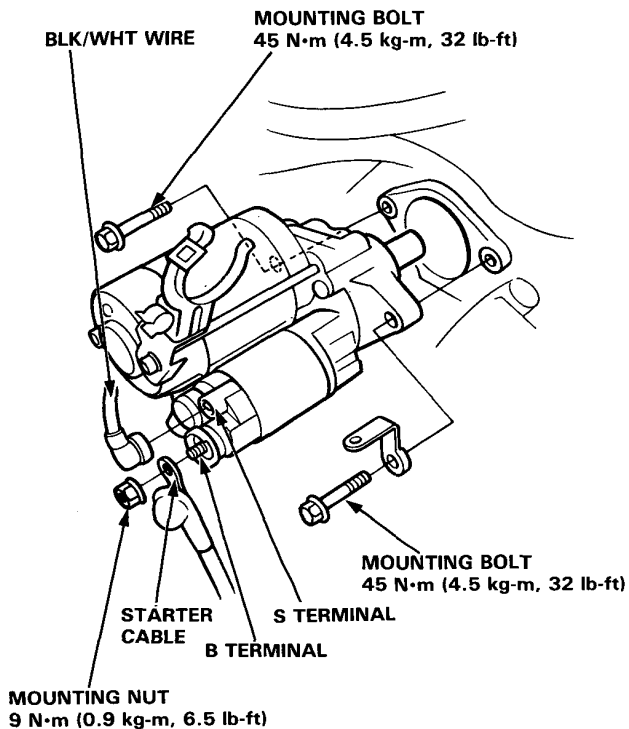
Starter Replacement

1. Disconnect the negative cable from the battery.
2. Remove the engine wire harness from the harness clip on the starter motor.
3. Disconnect the starter cable from the B terminal on the solenoid by removing the mounting nut, and disconnect the BLK/WHT wire from the S terminal.

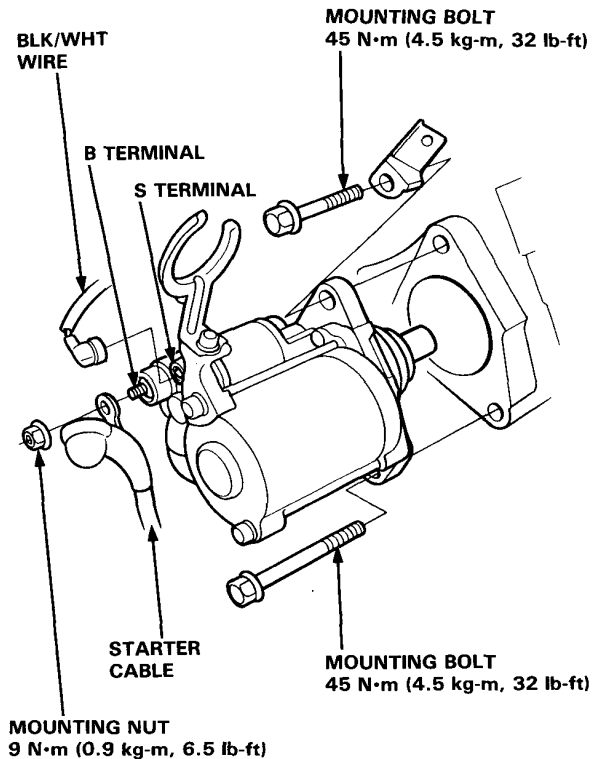
NOTE: In case of an A/T model, the starter cable also has to be removed from the bracket on the transmission housing.

4. Remove the two mounting bolts holding the starter, then remove the starter motor.

A/T:

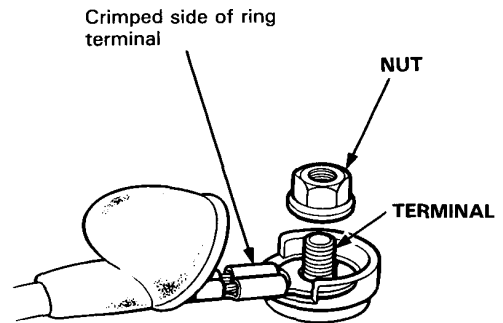


M/T:



5. Install in the reverse order of removal.

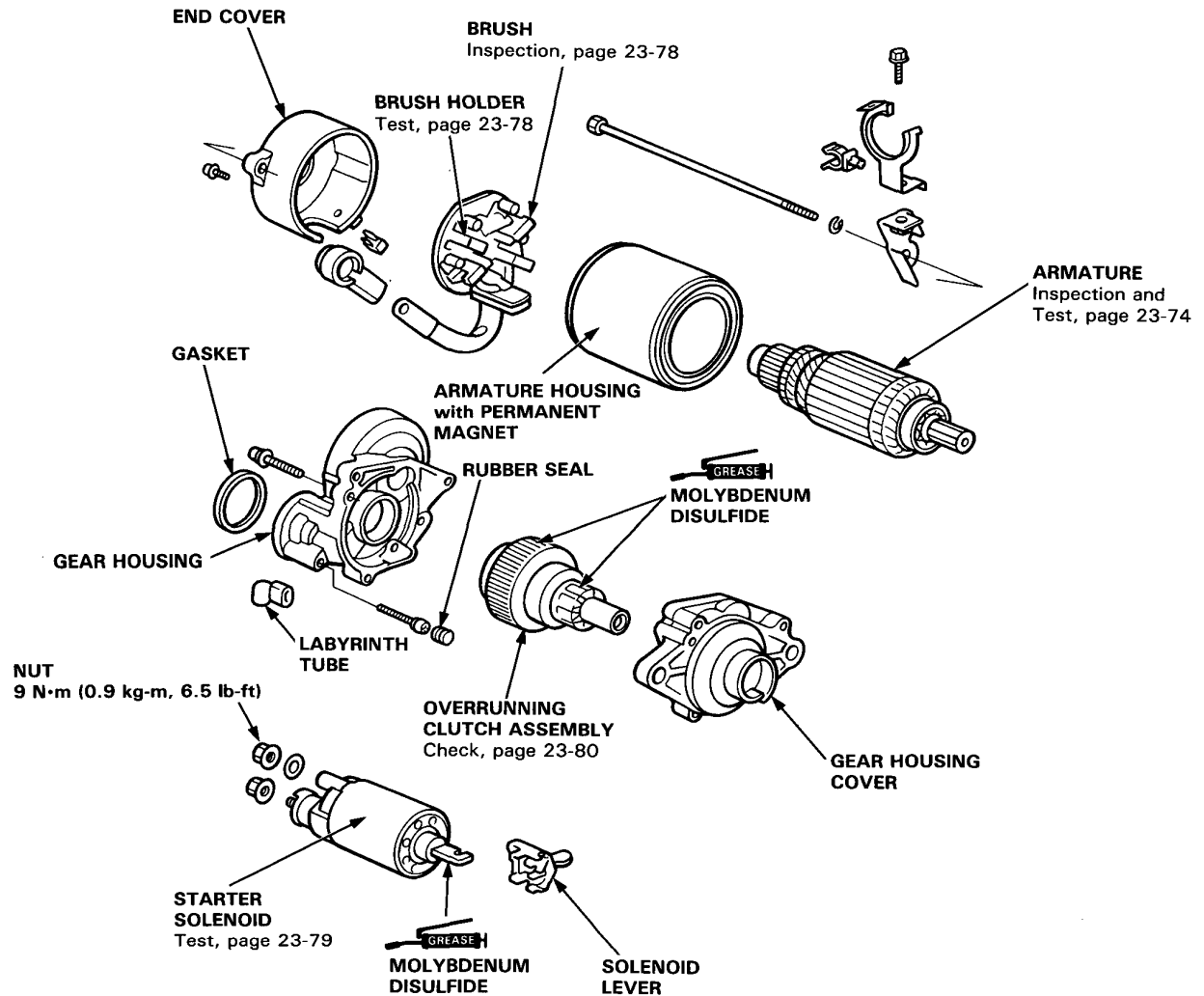
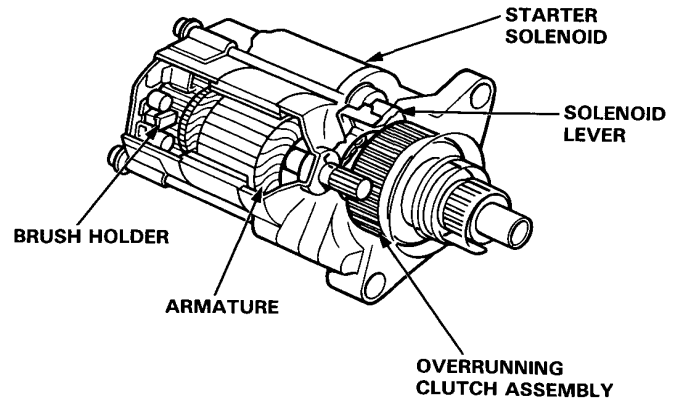
NOTE: When installing the starter cable, make sure that the crimped side of the ring terminal is facing out.





Starter Overhaul

CAUTION: Before removing the starter, disconnect the negative cable from the battery.

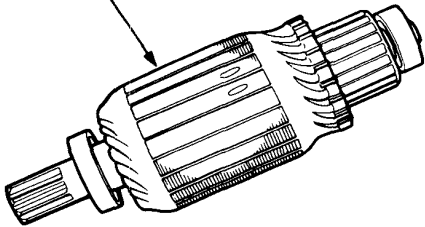


Starting System

Armature Inspection and Test

1. Inspect the armature surface for wear or damage.

Inspect for damage.

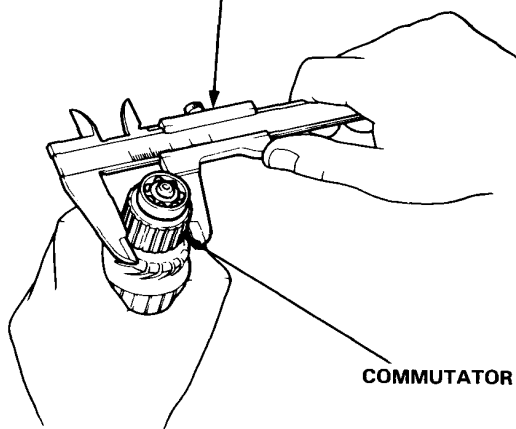


2. A dirty or burnt commutator surface may be resurfaced with emery cloth or a lathe within the following specifications.

Commutator Diameter

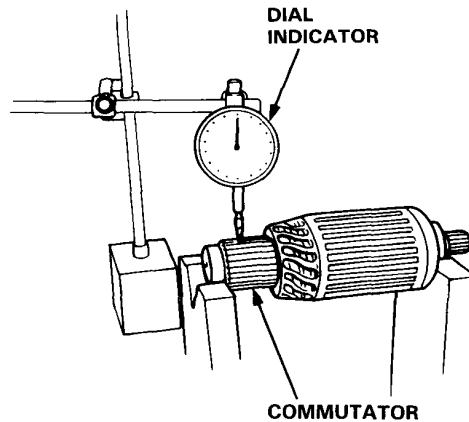
Standard (New): 28.0–28.1 mm
(1.102–1.106 in)
Service Limit: 27.5 mm (1.08 in)

VERNIER CALIPER

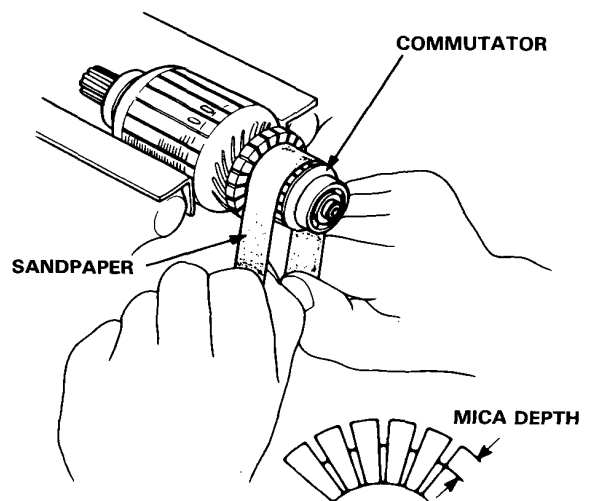


Commutator Runout

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



3. If the commutator runout and diameter are within limits, check the commutator for damage or for carbon dust or brass chips between the segments.
4. If the surface is dirty, recondition it with a #500 or #600 sandpaper. Then, check mica depth. If necessary, undercut the mica with a hacksaw blade to achieve proper depth.

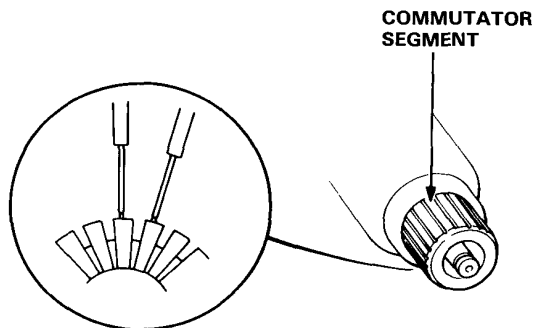


Commutator Mica Depth

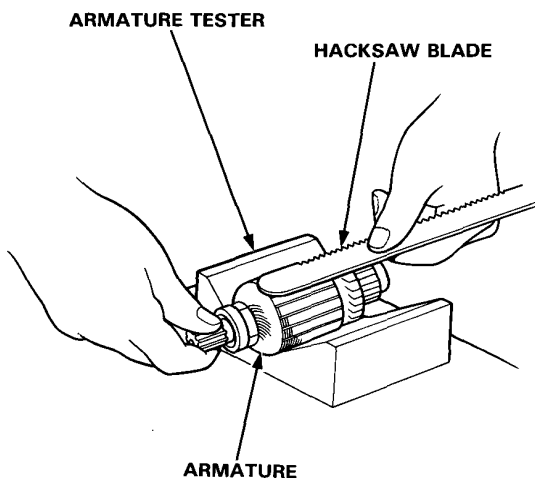
Standard (New): 0.4–0.5 mm (0.016–0.020 in)
Service Limit: 0.15 mm (0.006 in)



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

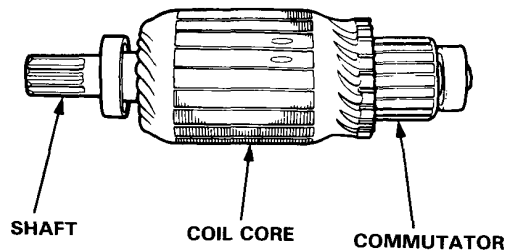


6. Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



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

7. With an ohmmeter, check that no continuity exists between the commutator and armature coil core, and between the commutator and armature shaft. If continuity exists, replace the armature.



Starting System

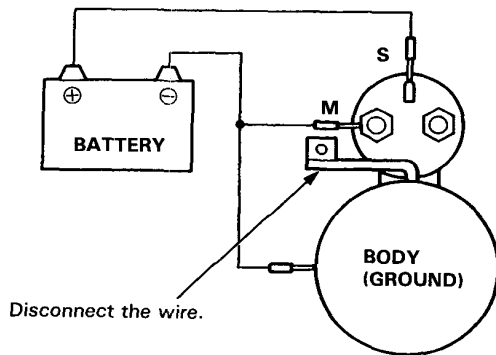
Performance Test

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 car).

Pull-in Coil Test:

Connect the battery as shown. If the pinion protrudes, it is working properly.

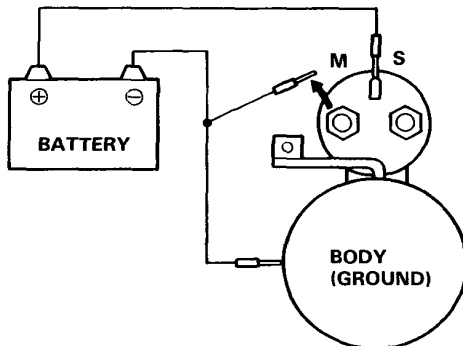
NOTE: Do not leave the battery connected for more than 10 seconds.



Hold-in Coil Test:

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

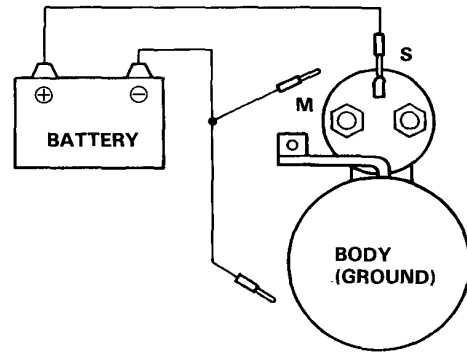
NOTE: Do not leave the battery connected for more than 10 seconds.



Retracting Test:

Also disconnect the battery from the body. If the pinion retracts immediately, it is working properly.

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





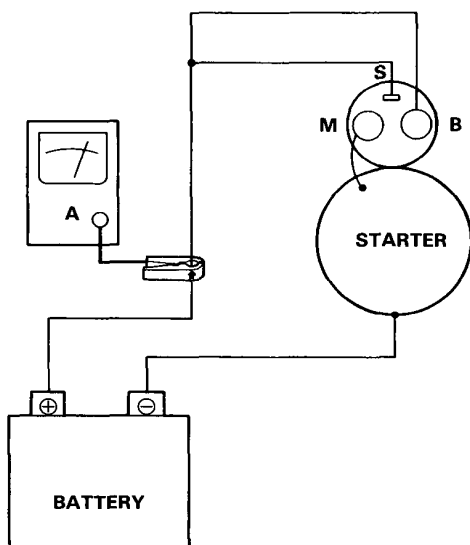
Starter No-load Test:

1. Clamp the starter firmly into 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 V, the starter is working properly.

Specifications:

**Mitsuba: 80 A or less (electric current),
(1.4 KW) 2600 min⁻¹ (rpm) or more (motor speed)**

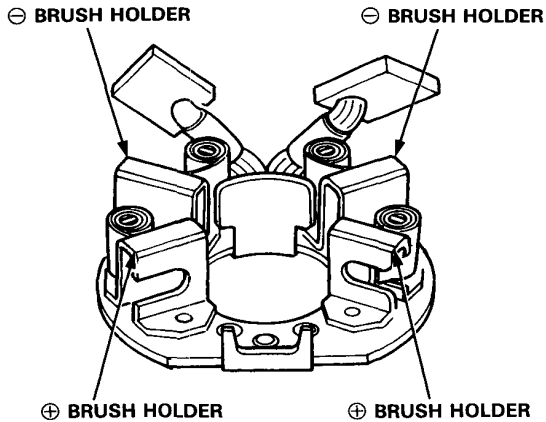
**Mitsuba: 80 A or less (electric current),
(1.6 KW) 2600 min⁻¹ (rpm) or more (motor speed)**



Starting System

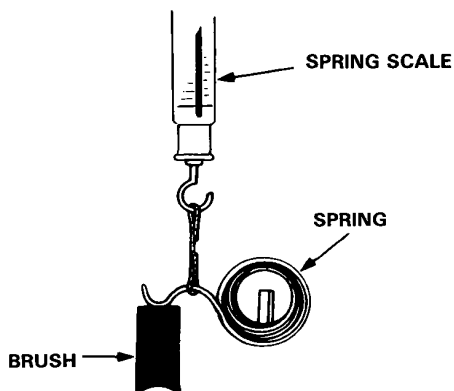
Starter Brush Holder Test

1. Check that there is no continuity between the ⊕ and ⊖ brush holders.
If continuity exists, 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
Mitsuba (1.4 KW)	16–18 N (1.6–1.8 kg, 3.5–4.0 lbs)
Mitsuba (1.6 KW)	16–18 N (1.6–1.8 kg, 3.5–4.0 lbs)



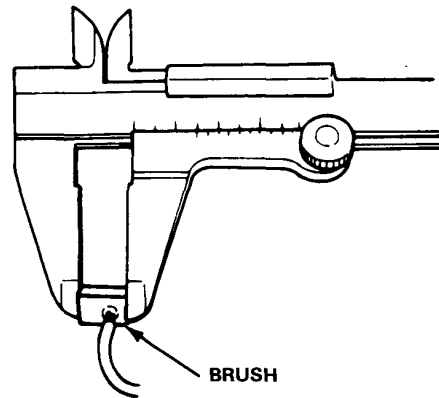
Starter Brush Inspection

Measure brush length. If it is less than the service limit, replace the armature housing and brush holder assembly.

Brush Length

Standard (New): 15.8–16.2 mm (0.62–0.64 in)

Service Limit: 10.0 mm (0.39 in)



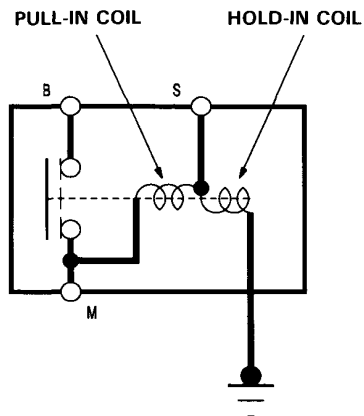
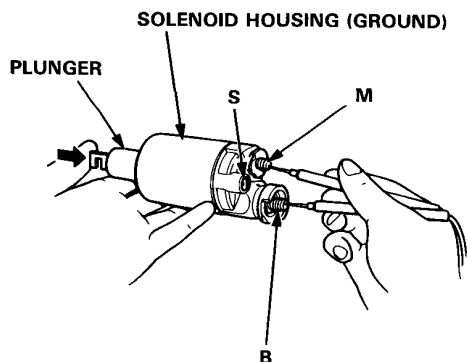
NOTE: To seat new brushes after installing them in their holders, slip a strip of #500 or #600 sandpaper, with the grit side up, over the commutator, and smoothly rotate the armature. The contact surface of the brushes will be sanded to the same contour as the commutator.



Starter Solenoid Test

1. Remove the starter solenoid (see page 23-73).
2. Check for continuity between the terminals in each solenoid plunger position according to the table.

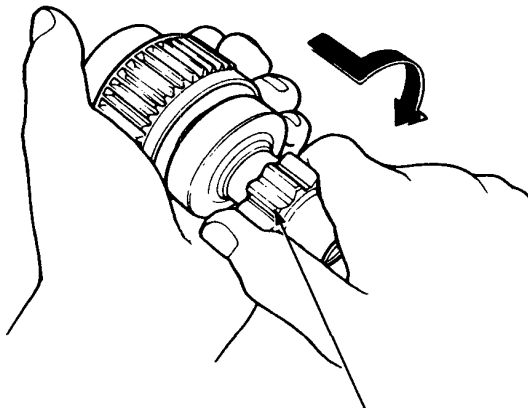
Terminal Position	B	M	S	GROUND
RELEASED		○	○	○
PUSHED	○	○	○	○



Starting System

Overrunning Clutch Check

1. Check that the overrunning clutch moves along the shaft freely. If it does not, replace it.
2. Check that the overrunning clutch locks in one direction and rotates smoothly in reverse. If it does not lock in either direction or it locks in both directions, replace it.



STARTER DRIVE GEAR

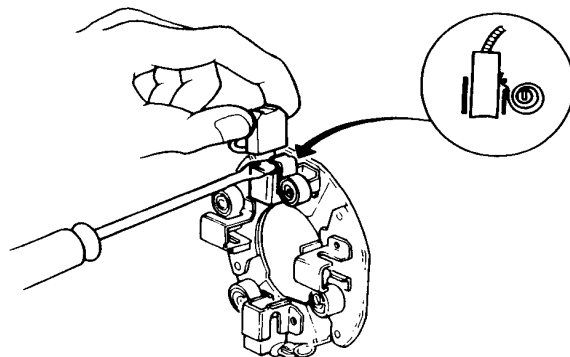
3. Check the starter drive gear for wear and damage. If it has any, replace the overrunning clutch assembly; the gear is not available separately.

NOTE: Check the condition of the flywheel or torque converter ring gear if the starter drive gear teeth are damaged.

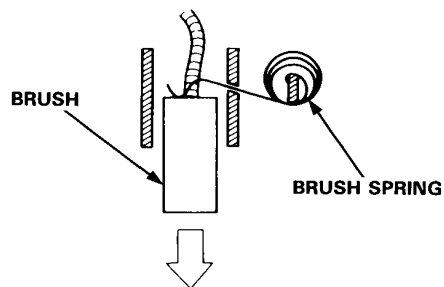
Starter Reassembly

Reassemble the starter in the reverse order of disassembly.

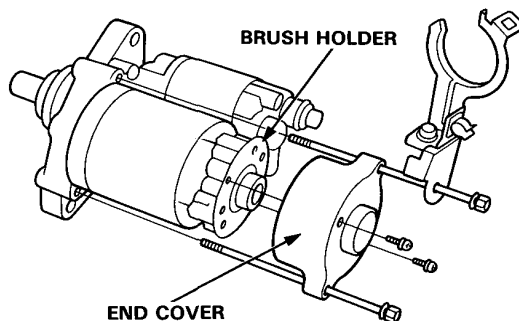
1. Pry back each brush spring with a screwdriver, then position the brush about halfway out of its holder, and release the spring to hold it there.



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.





Ignition System

Component Location Index

NOTE: LHD type is shown, RHD type is similar.

IGNITION TIMING

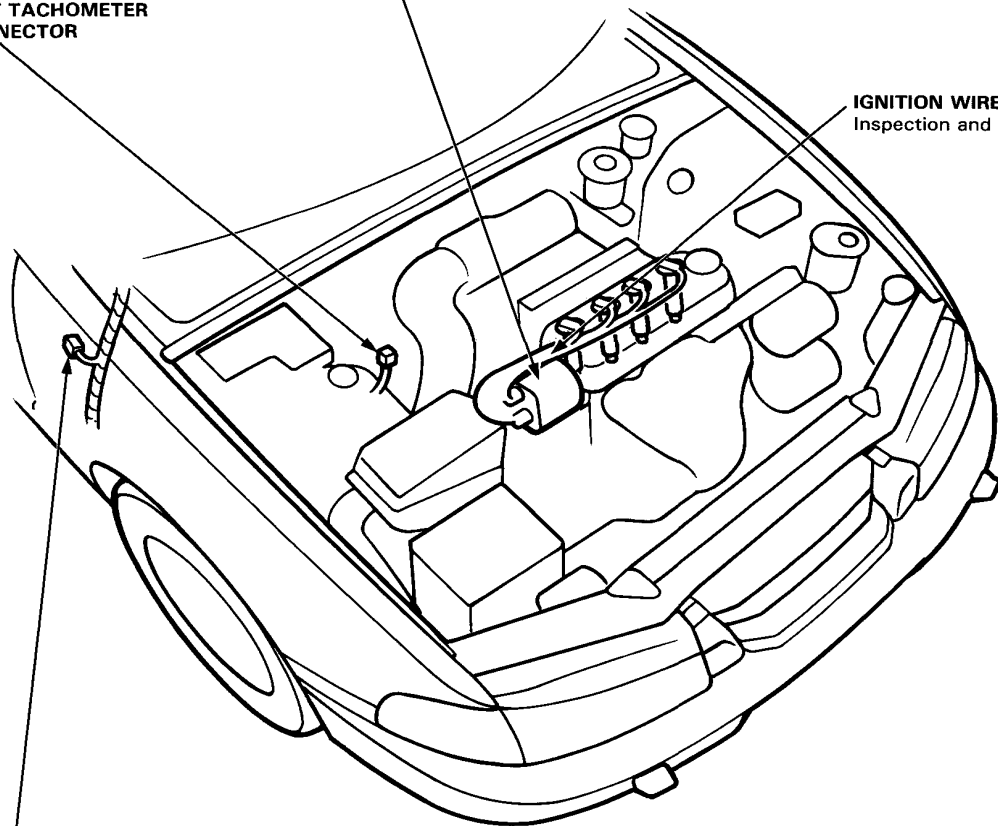
- Description, page 23-82
- Troubleshooting, section 11
- Inspection and setting, page 23-84

DISTRIBUTOR

- Top End Inspection, page 23-89
- Removal/Installation, page 23-89, 92
- Overhaul, page 23-90
- Reassembly, page 23-91
- Ignition Control Module (ICM)
Troubleshooting, section 11
- Ignition Control Module (ICM)
Input Test, page 23-86
- Ignition Coil Test, page 23-87

TEST TACHOMETER
CONNECTOR

IGNITION WIRES
Inspection and Test, page 23-91



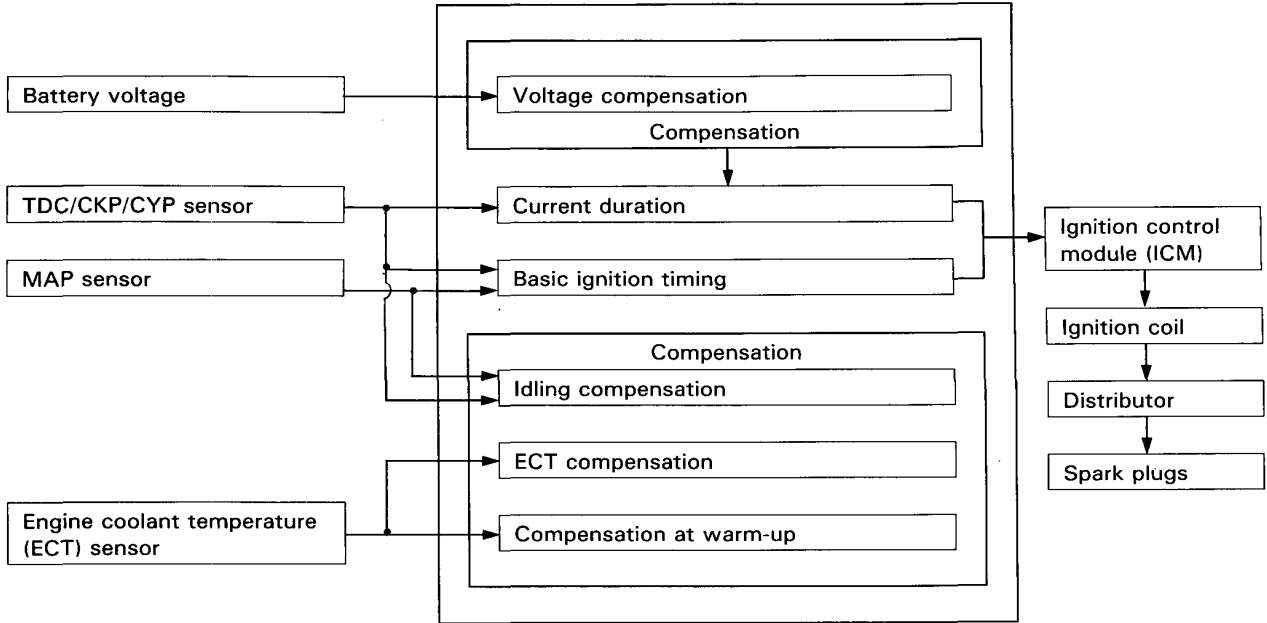
SERVICE CHECK CONNECTOR (2-P)
(Behind the passenger's side kick panel)

Ignition System

Description

Ignition Timing Control:

The programmed ignition (PGM-IG) used in this engine provides optimum control of ignition timing. A microcomputer determines the timing in response to engine speed and manifold vacuum. The input signals are transmitted by the TDC/crankshaft position (CKP)/cylinder position (CYP) sensor, throttle position (TP) sensor, engine coolant temperature (ECT) sensor, and MAP sensor. This system, which is not dependent on a governor or vacuum diaphragm, is capable of setting lead angles with complicated characteristics which cannot be provided by conventional governors or diaphragms.



Basic Control:

The engine control module (ECM) has stored within it the optimum basic ignition timing for operating conditions based upon engine speed and intake manifold vacuum. With compensating signals from sensors, the system determines optimum ignition timing and duration for ambient conditions and sends voltage pulses to the ICM.

Compensation of ignition timing:

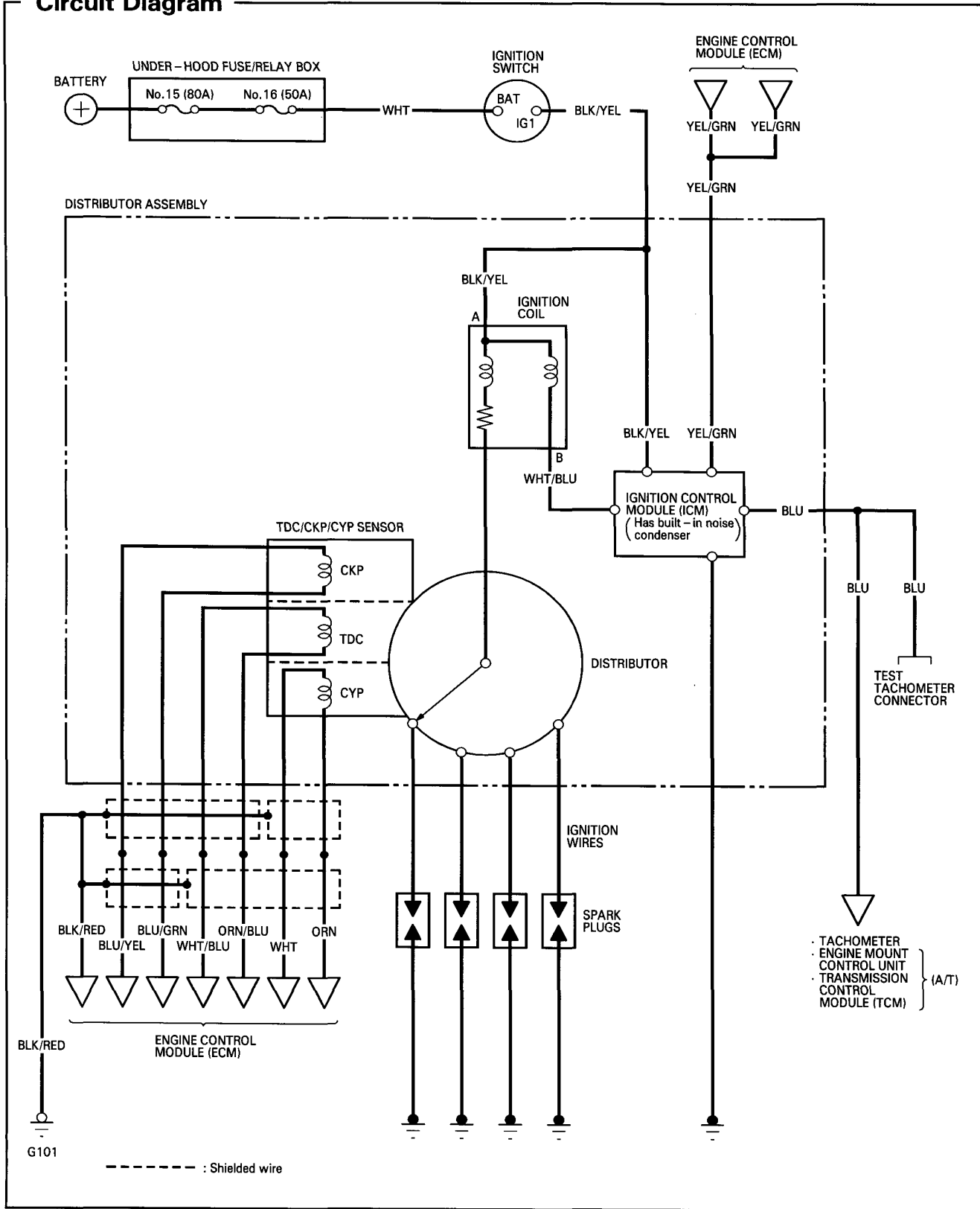
Compensation Item	Related Sensor and Information	Description
Idling	TDC/CKP/CYP sensor MAP sensor	Ignition timing is controlled to the target speed with compensation according to the idling speed.
Compensation at warm-up	ECT sensor	Lag angle is adjusted according to warm-up conditions to bring about a good balance between operating performance and exhaust gas level.
ECT compensation	ECT sensor	Compensation for lead angle at low engine coolant temperature and lag angle at high engine coolant temperature.

Control at Start:

Ignition timing is fixed at 7° BTDC for cranking. The cranking is detected by the TDC sensor (cranking rpm) and starter signal.



Circuit Diagram

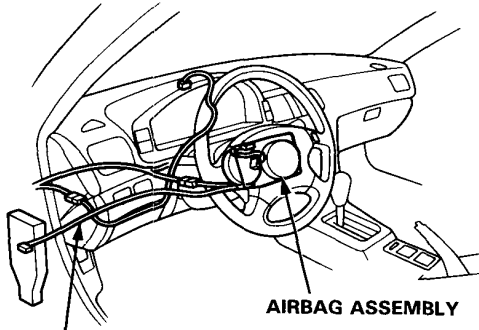


Ignition System

Ignition Timing Inspection and Setting

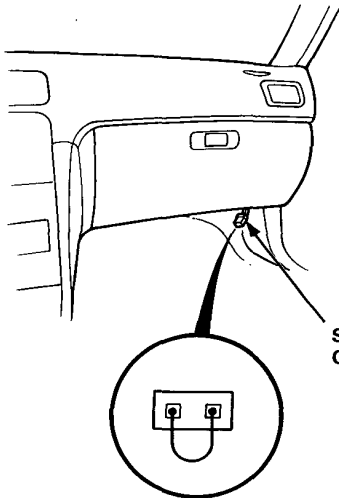
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

1. Start the engine and allow it to warm up (radiator fan comes on).
2. Pull out the service check connector located under the middle of the dash. Connect the GRN/WHT and ORN/RED terminals with a jumper wire.

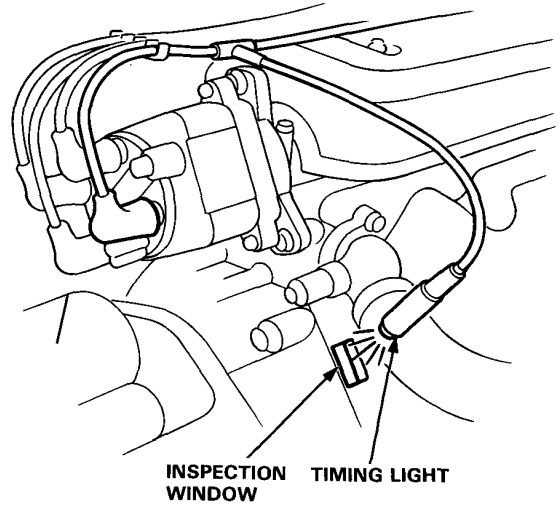


SERVICE CHECK CONNECTOR (2-P)

JUMPER WIRE

3. Check the idle speed (see page 23-85).

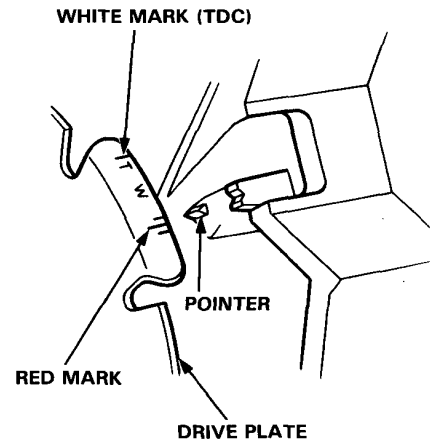
4. Connect a timing light to the No. 1 ignition wire and remove the rubber plug from the inspection window in the flywheel or drive plate housing.
5. While the engine idles, point the light toward the pointer on the flywheel (for M/T) or on the drive plate (A/T).



INSPECTION WINDOW
TIMING LIGHT

6. Check if the pointer and the red mark are aligned. If necessary, adjust ignition timing to the following specifications:

Ignition Timing: $15 \pm 2^\circ$ BTDC (RED)
at $770 \pm 50 \text{ min}^{-1}$ (rpm) with shift lever in neutral position and electrical systems turned off

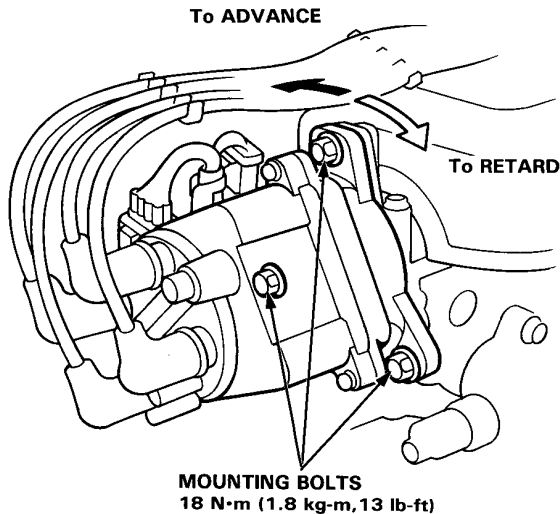


NOTE: The illustration shows A/T.



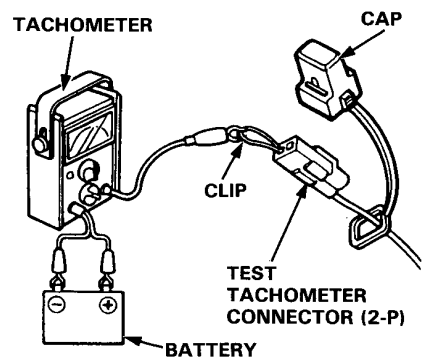
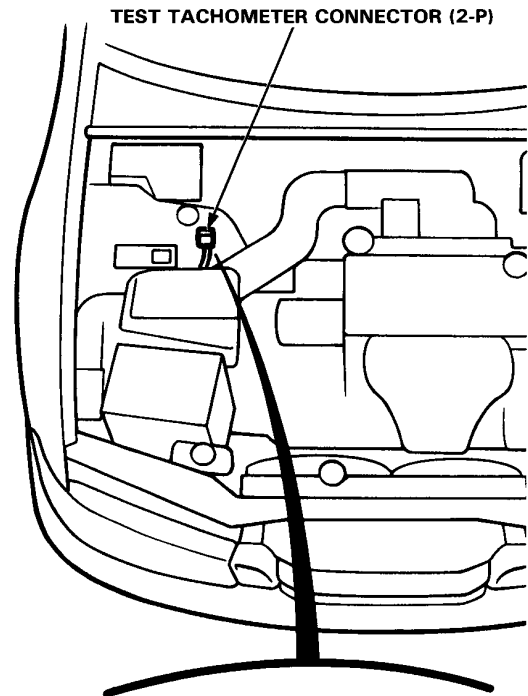
Idle Speed Inspection

7. To adjust the ignition timing, loosen the distributor mounting bolts, and turn the distributor housing counterclockwise to advance the timing, or clockwise to retard the timing.



8. Tighten the mounting bolts and recheck timing.
9. Remove the jumper wire from the service check connector (2-P) and reinstall the rubber plug into the inspection window.

1. Start the engine and allow it to warm up (radiator fan comes on).
2. Connect a tachometer to the test tachometer connector.



Idle speed: $770 \pm 50 \text{ min}^{-1}$ (rpm) with shift lever in neutral position and electrical systems turned off

3. Adjust the idle speed if necessary (see section 11).

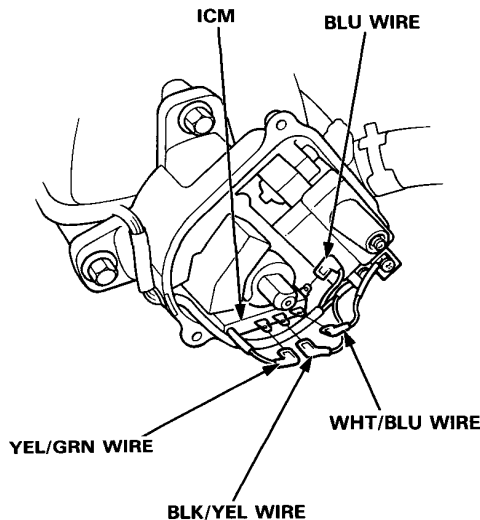
Ignition System

Ignition Control Module (ICM) Input Test

NOTE:

- See section 11 when the malfunction indicator lamp (MIL) blinks.
- Perform an input test for the ignition control module (ICM) after finishing the fundamental tests for the ignition system and the fuel and emissions system.
- The tachometer should operate normally.

1. Remove the distributor cap, the distributor rotor, and the inner cover.
2. Disconnect the BLK/YEL, WHT/BLU, YEL/GRN, and BLU wires from the ignition control module (ICM).



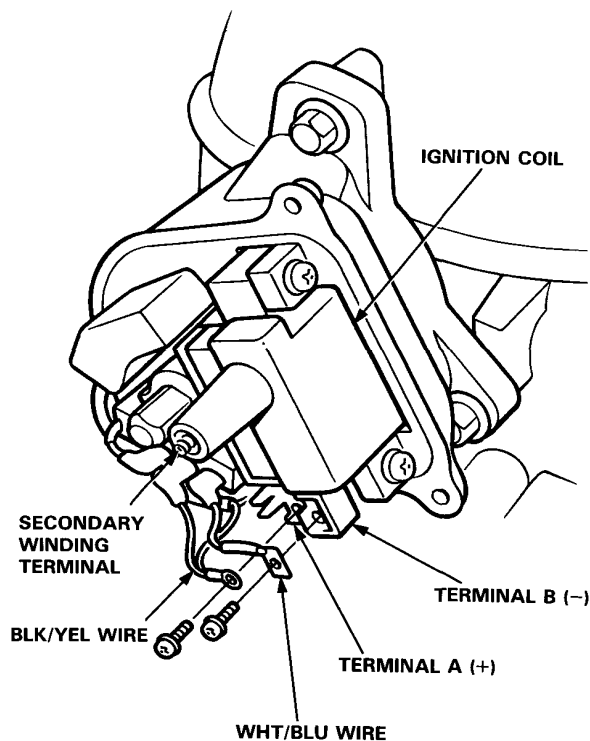
3. Turn the ignition switch ON. Check for voltage between the BLK/YEL wire and body ground. There should be battery voltage.
 - If there is no battery voltage, check for an open in the BLK/YEL wire between the ignition coil and the ICM.
 - If there is battery voltage, go to step 4.
4. Check for voltage between the WHT/BLU wire and body ground. There should be battery voltage.
 - If there is no battery voltage, check for:
 - faulty ignition coil.
 - an open in the WHT/BLU wire between the ignition coil and the ICM.
 - If there is battery voltage, go to step 5.

5. Check the YEL/GRN wire between the engine control module (ECM) and the ICM (see section 11).
6. Check the BLU wire between the tachometer and the ICM.
7. If all tests are normal, replace the ICM.



Ignition Coil Test

1. With the ignition switch OFF, remove the distributor cap.
2. Disconnect the BLK/YEL and WHT/BLU wires from the terminals by removing the two screws.



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

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

Primary Winding Resistance

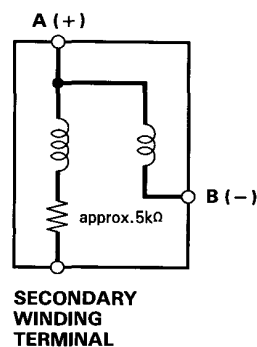
(between the A and B terminals):

0.6–0.8 Ω

Secondary Winding Resistance

(between the A and secondary winding terminals):

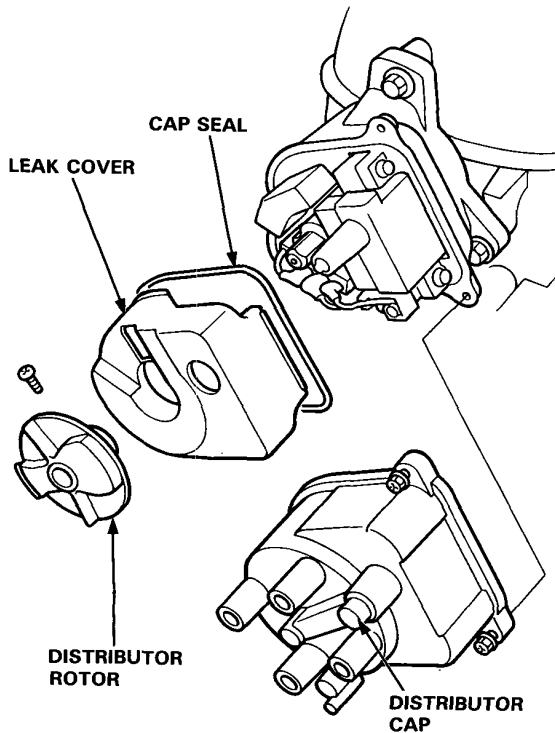
13–19 k Ω



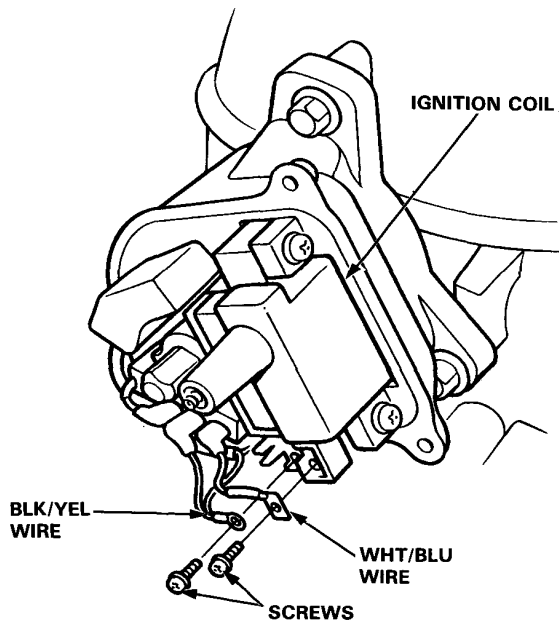
Ignition System

Ignition Coil Replacement

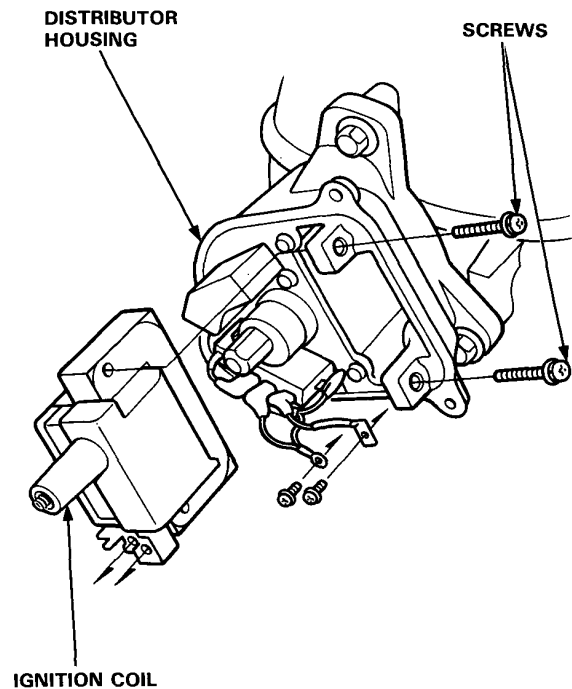
1. With the ignition switch OFF, remove the distributor cap, distributor rotor and cap seal, then remove the leak cover.



2. Disconnect the BLK/YEL and WHT/BLU wires from the terminals by removing the two screws.



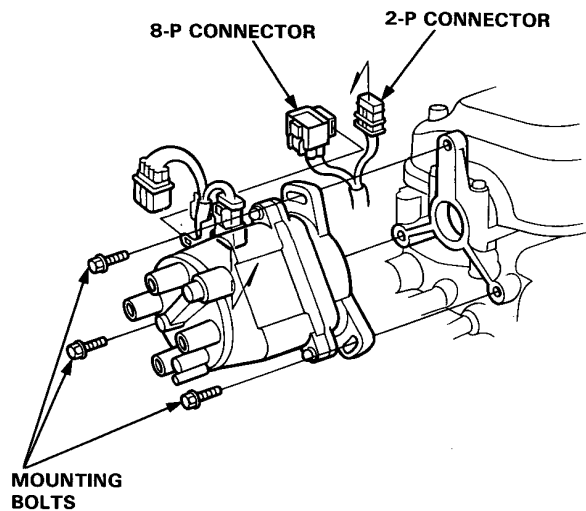
3. Remove the two screws and slide the ignition coil out of the distributor housing.





Distributor Removal

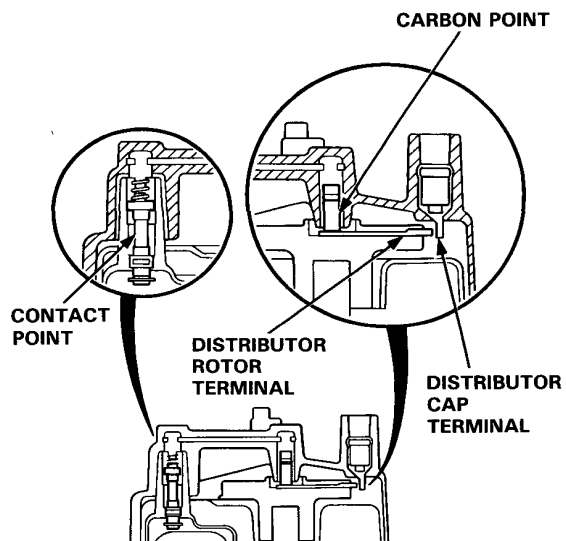
1. Remove the 2-P and 8-P connectors from their brackets, and disconnect them.
2. Disconnect the ignition wires from the distributor cap.



3. Remove the distributor mounting bolts, then remove the distributor from the cylinder head.

Distributor Top End Inspection

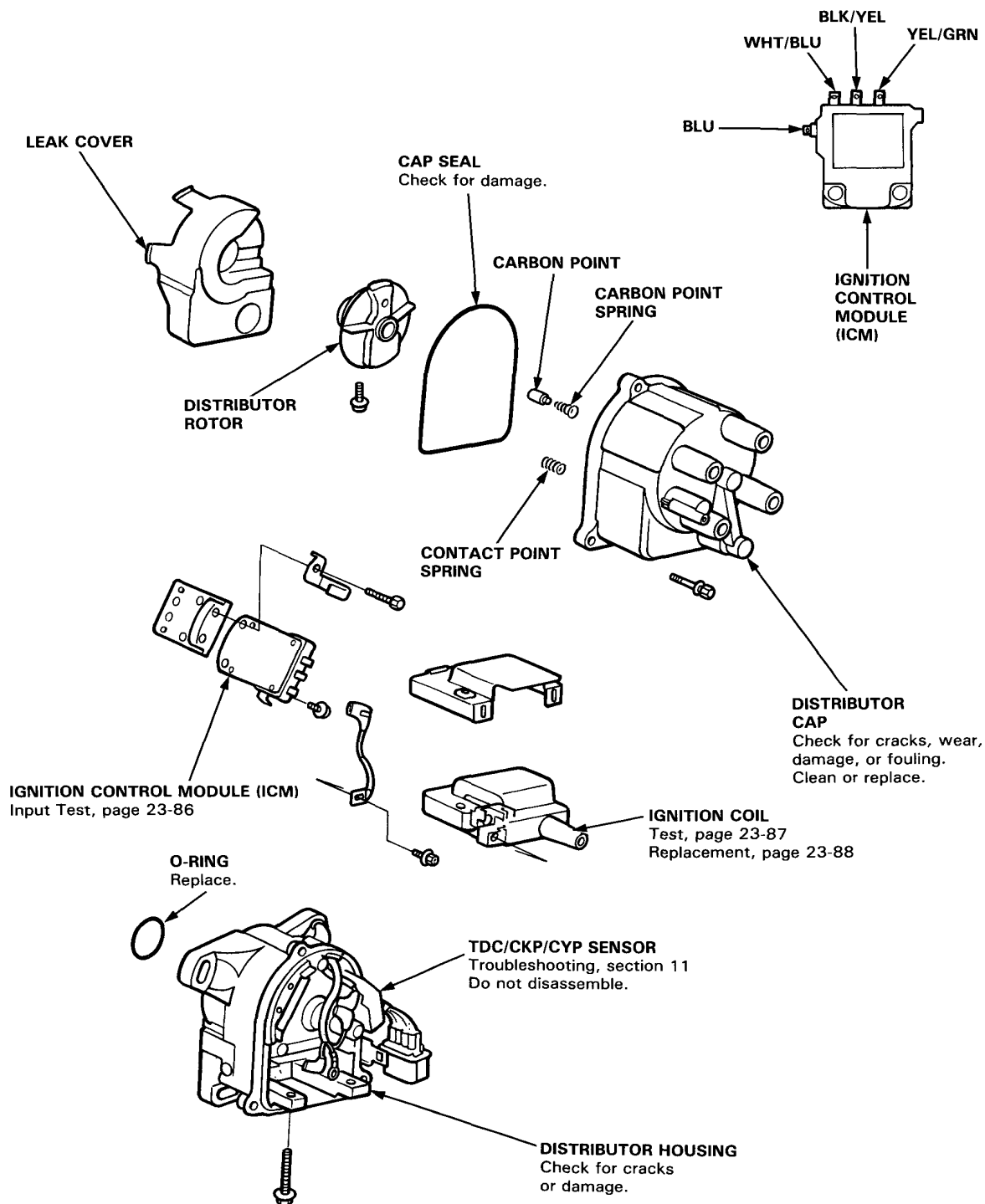
1. Check for rough or pitted rotor and cap terminals.
2. Scrape or file off the carbon deposits and smooth with an oil stone or #600 sandpaper.



3. Check the distributor cap for cracks, wear, and damage. If necessary, clean or replace it.

Ignition System

Distributor Overhaul

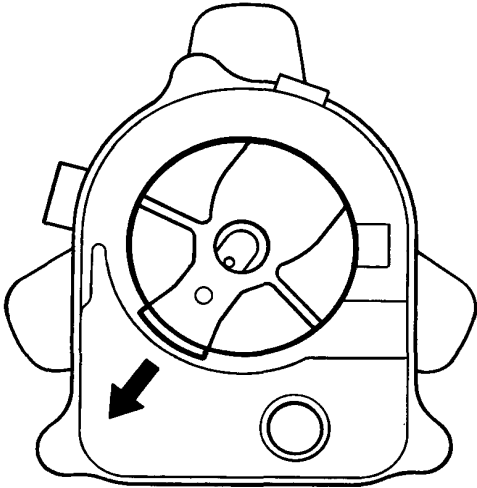




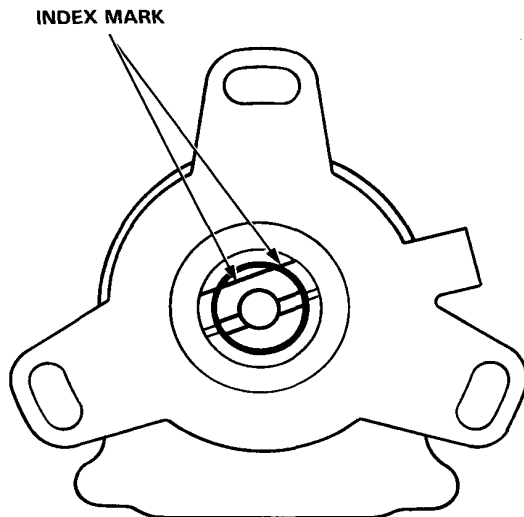
Distributor Reassembly

Reassemble the distributor in the reverse order of disassembly.

1. Install the distributor rotor, then turn it so that it faces in the direction shown (toward the No. 1 cylinder).



2. Set the thrust washer and coupling on the shaft.
3. Check that the distributor rotor is still pointing toward the No. 1 cylinder, then align the index mark on the distributor housing with the index mark on the coupling.

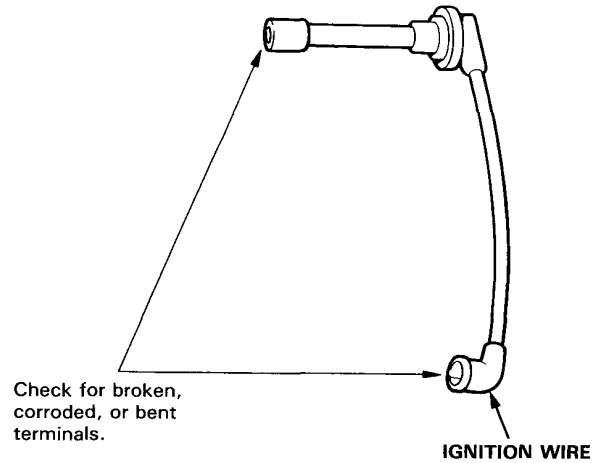


4. Drive in the pin and secure it with the pin retainer.

Ignition Wire Inspection and Test

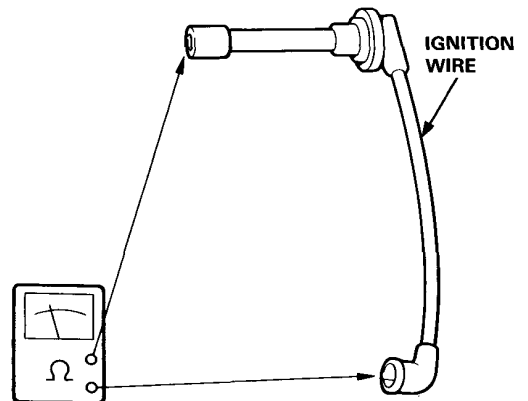
CAUTION: Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires; you might break them inside.

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



2. Connect ohmmeter probes and measure resistance.

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



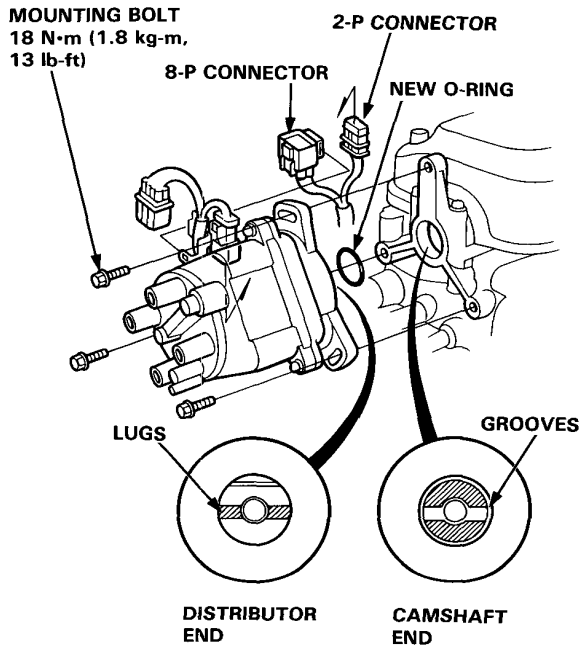
3. If resistance exceeds 25 k Ω , replace the ignition wire.

Ignition System

Distributor Installation

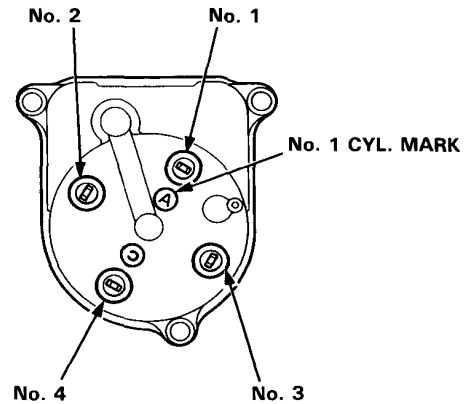
1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

NOTE: The lugs on the end of the distributor, and the 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 temporarily.
4. Connect the 2-P and 8-P connectors to the distributor.

5. Connect the ignition wires as shown.



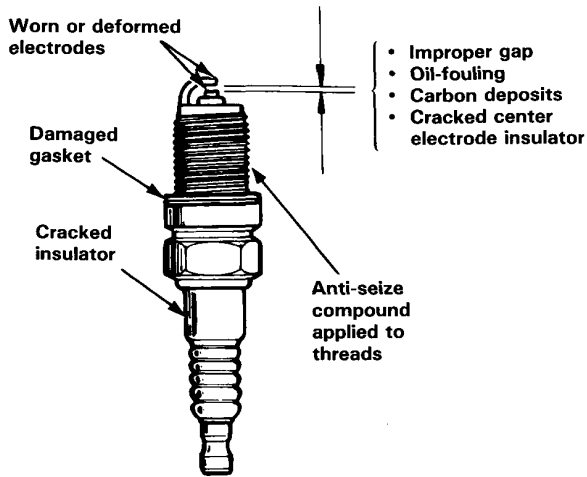
6. Set the timing with a timing light as shown on page 23-84.
7. After setting the timing, tighten the mounting bolts.

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



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.
- too low plug heat range.
- insufficient cooling.

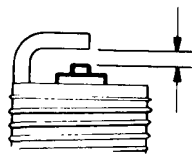
Fouled plug may be caused by:

- retarded ignition timing.
- oil in combustion chamber.
- too high plug heat range.
- excessive idling/low speed running.
- clogged air cleaner element.
- deteriorated ignition coil or ignition wires.
- incorrect spark plug gap.

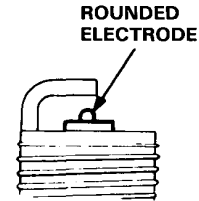
2. Adjust the gap with a suitable gapping tool.

Electrode Gap: 1.0–1.1 mm (0.039–0.043 in)

1.0–1.1 mm
(0.039–0.043 in)



3. Replace the plug if the center electrode is rounded as shown below.



4. Replace the plug if it is fouled or worn.

NOTE: Use only the spark plugs listed below.

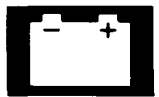
ZFR6F-11 (NGK) KJ20CR-L11 *(ND)	For all normal driving
ZFR7F-11 (NGK) KJ22CR-L11 *(ND)	For hot climates or continuous high speed driving
ZFR5F-11 (NGK) KJ16CR-L11 *(ND)	For cold climates

*(ND): NIPPONDENSO

5. Apply a small quantity of anti-seize compound to the plug threads.

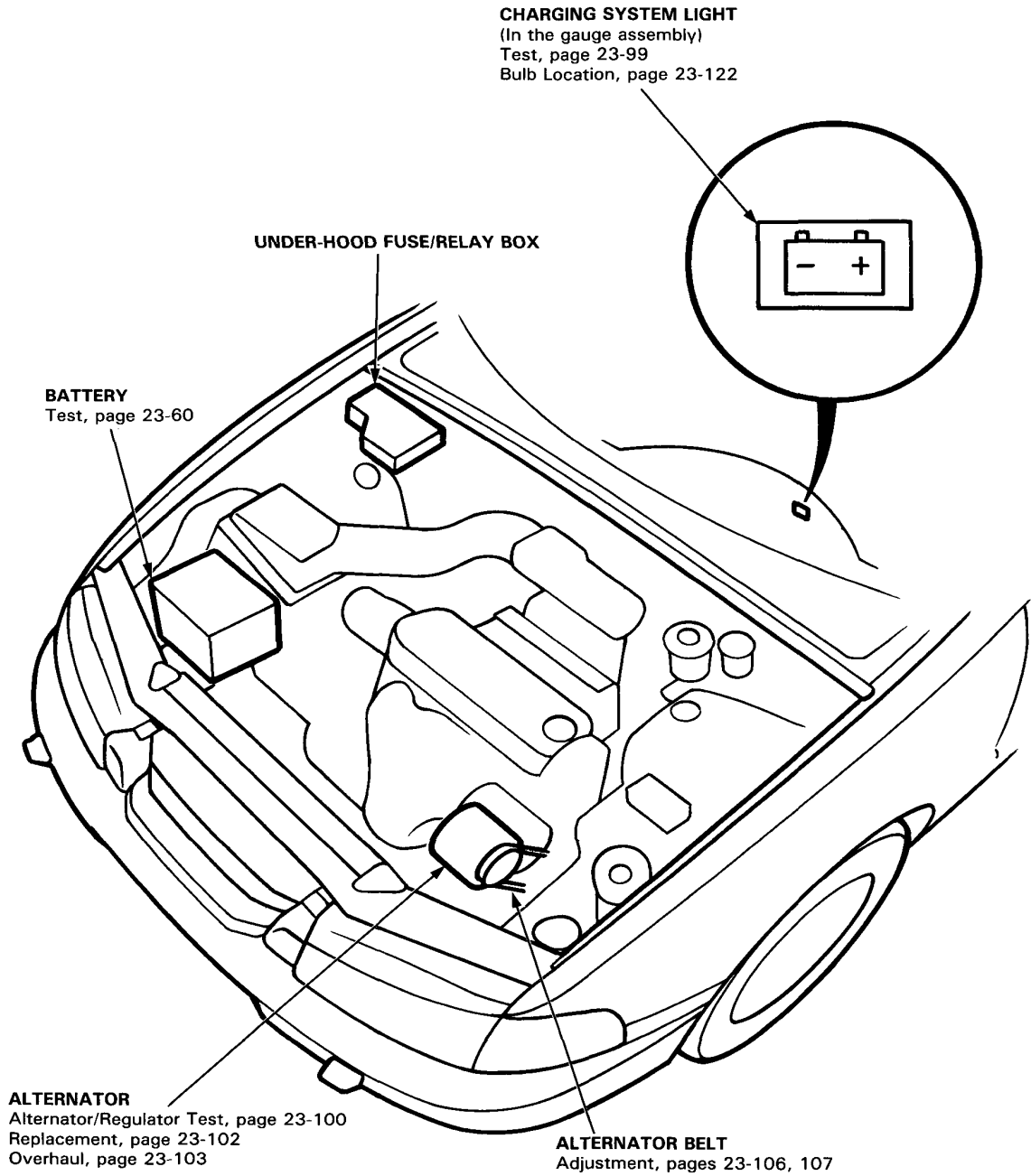
6. Screw the plugs into the cylinder head finger-tight, then torque them to 18 N·m (1.8 kg-m, 13 lb-ft).

Charging System



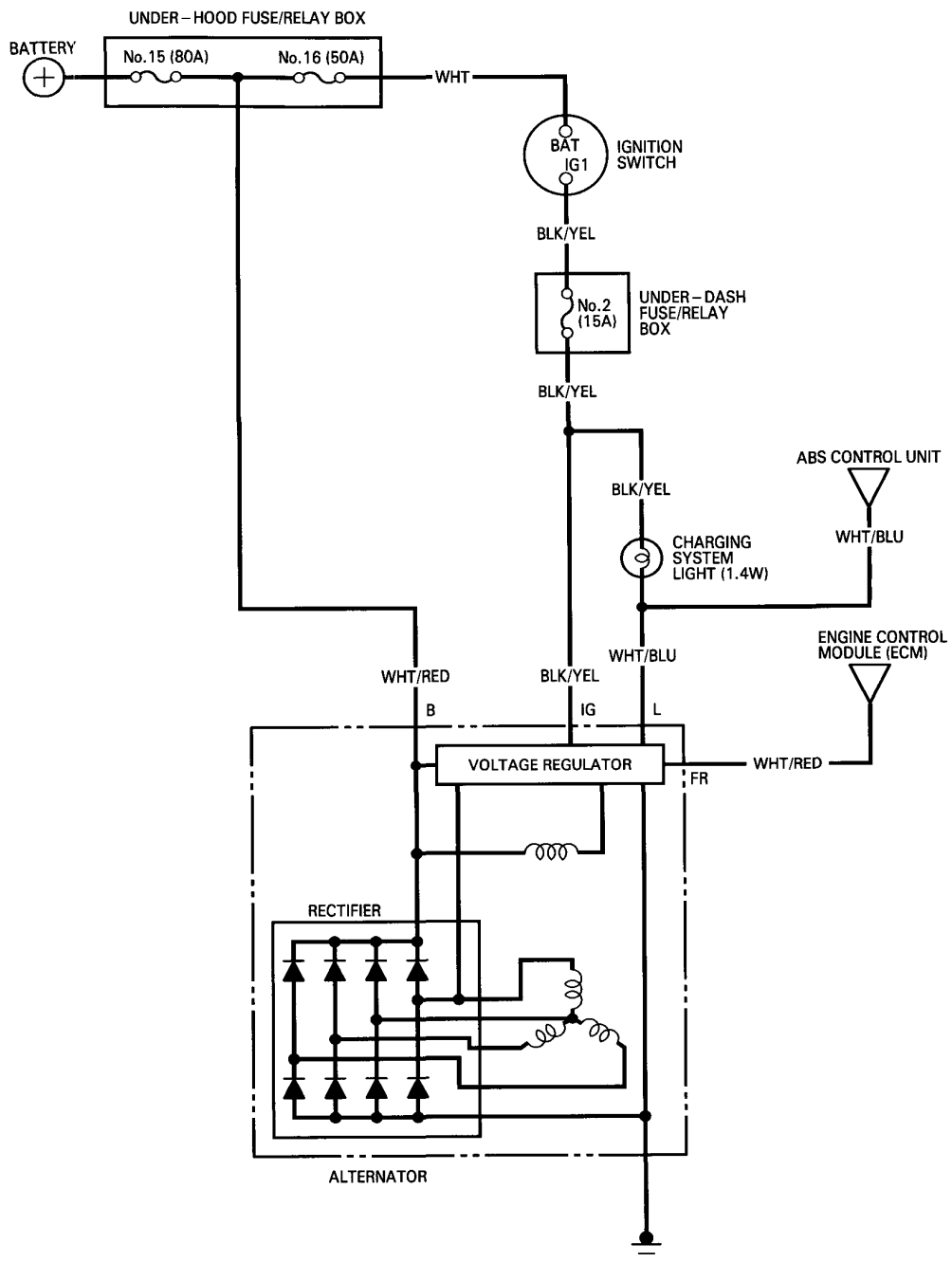
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



Charging System

Circuit Diagram

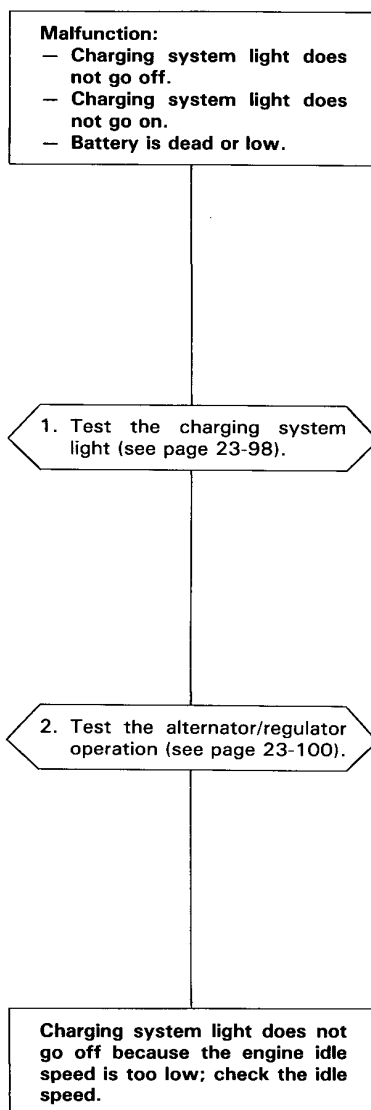




Troubleshooting

NOTE:

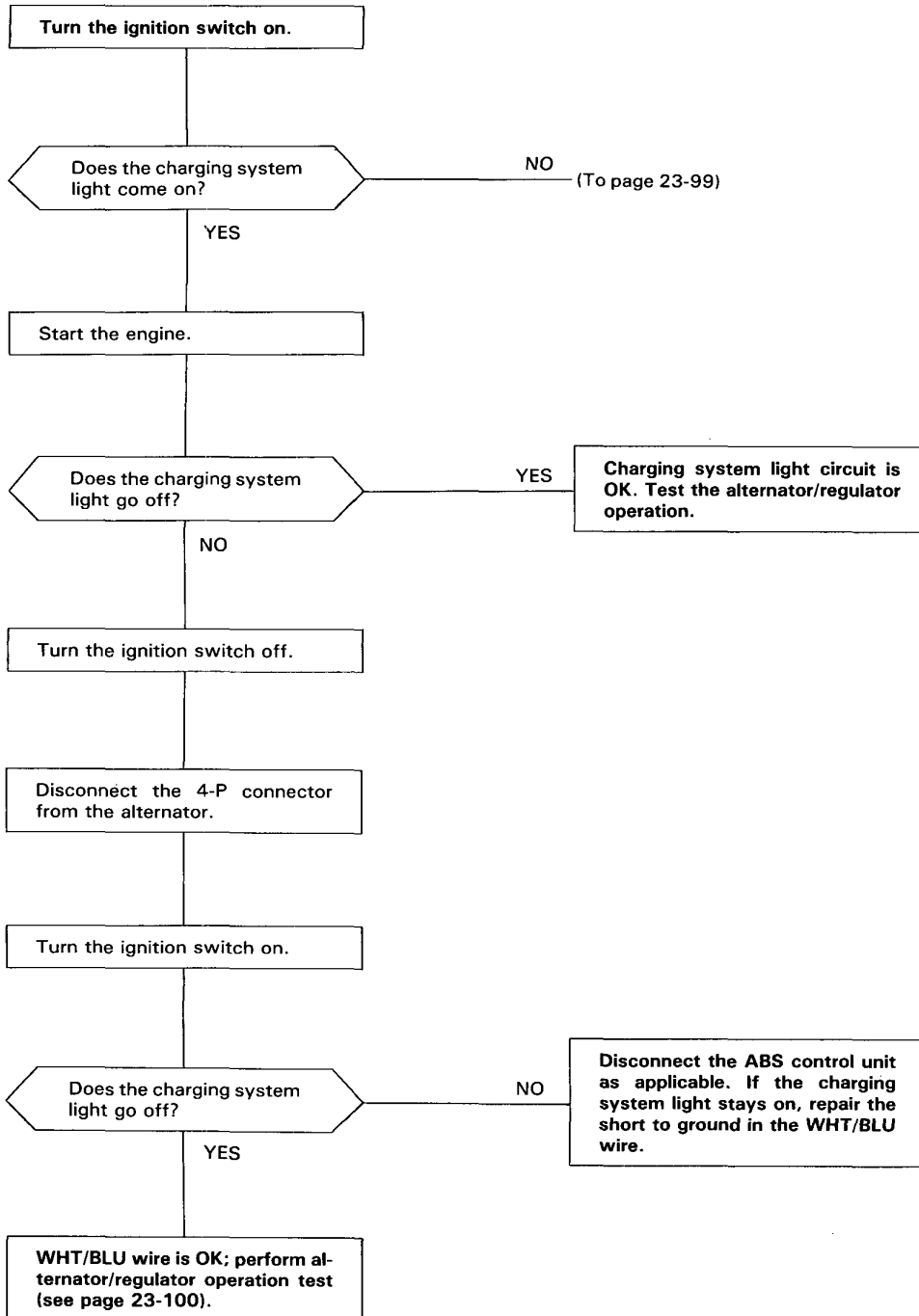
- Before troubleshooting, check:
 - the battery (see page 23-60).
 - the tension of the alternator belt (see page 23-106, 107).
 - that the self-diagnosis indicator light of the engine control module (ECM) does not blink. If it blinks (20 times), refer to section 11.
- Troubleshoot by performing following tests in the order listed below.



Charging System

Troubleshooting

Charging System Light Test





(From page 23-98)

Turn the ignition switch off.

Check fuse No. 2 (15 A) in the under-dash fuse/relay box.

Is the fuse OK?

NO

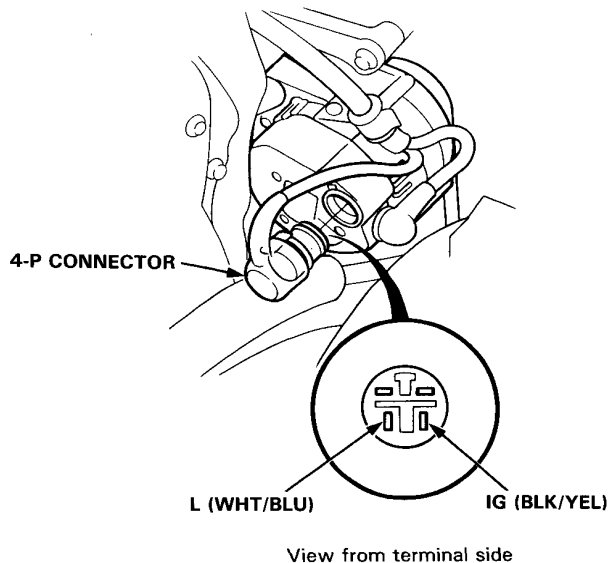
Replace the fuse.

YES

Disconnect the 4-P connector from the alternator.

Turn the ignition switch on.

Check for voltage at the IG (BLK/YEL wire) terminal of the 4-P connector.



Is there battery voltage?

NO

Repair open in the BLK/YEL wire.

YES

Ground the WHT/BLU wire at the L terminal of the 4-P connector.

Does the charging system light come on?

NO

Check for a blown charging system light bulb. If the bulb is OK, repair open in the WHT/BLU wire.

YES

Replace the voltage regulator.

Charging System

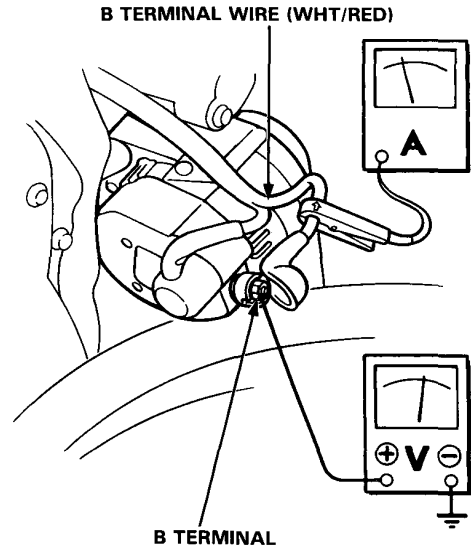
Troubleshooting

Alternator/Regulator Operation Test

CAUTION: Be careful during testing as the radiator and condenser fans come on suddenly while the engine is running.

Be sure to use a good battery. Connect an ammeter, and a voltmeter to the B terminal as shown.

NOTE: Be sure to use an ammeter capable of measuring amperages higher than 120 A.



Start the engine, and let it idle until it reaches normal operating temperature (radiator fan comes on two times).

Raise the engine speed to 2000 min^{-1} (rpm) and hold it there. Turn the headlights (HI) on and check the voltage at the battery terminals.

CAUTION: As the headlights warm up considerably, do not cover them.

Is there voltage between 13.9 and 15.1 V?

NO

Test the alternator components (see page 23-101).

YES

Turn the blower motor and the rear window defogger on, and check the battery voltage.

Is there battery voltage less than 13.5 V?

NO

Turn also the fog lights, brake lights, etc. on.

YES

Read the amperage.

Are there more than 50 A?

NO

Test the alternator components (see page 23-101).

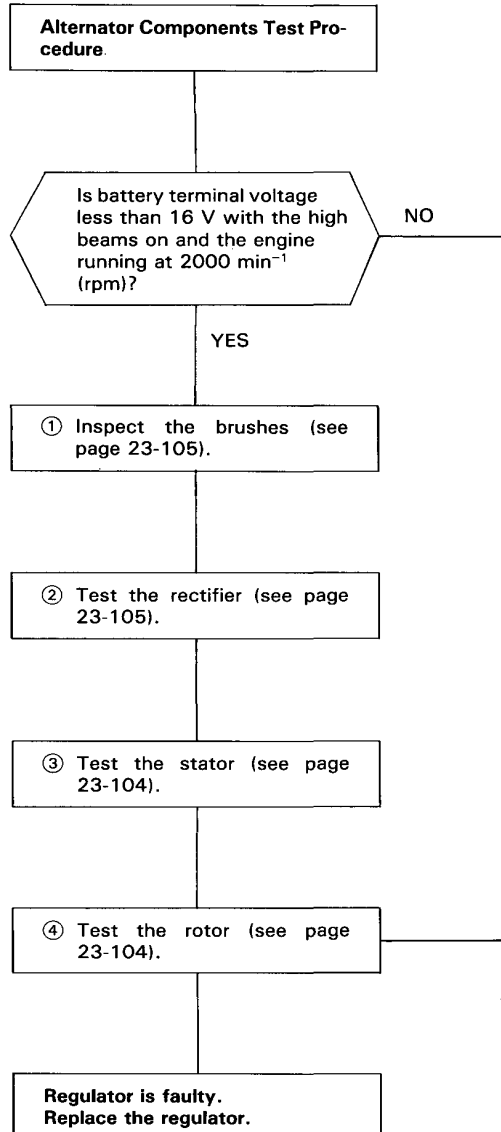
YES

Alternator/Regulator operation is OK. Test the alternator components (see page 23-101).



Alternator Components Test:

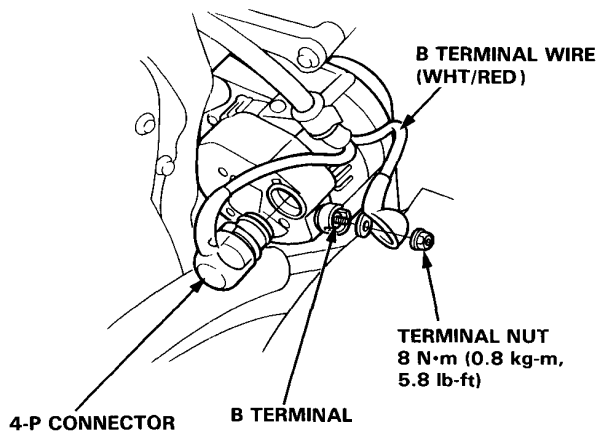
NOTE: Because an overall check is necessary to avoid misleading conclusions, test the alternator components in the order described below.



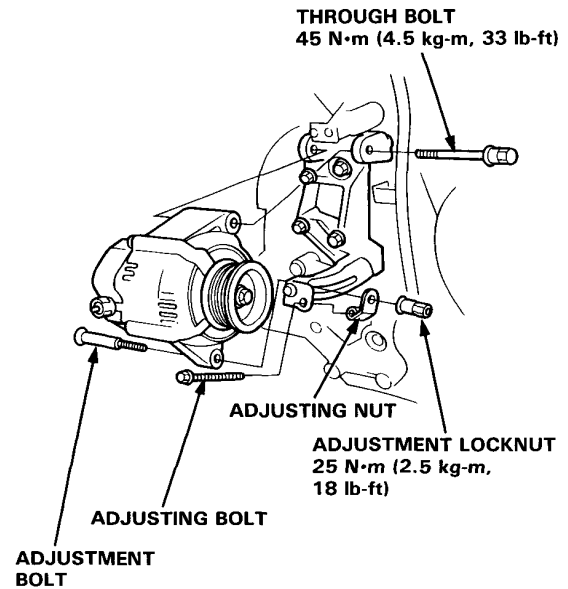
Charging System

Alternator Replacement

1. Remove the power steering pump (see section 17).
2. Disconnect the 4-P connector from the alternator.
3. Remove the terminal nut and the B terminal (WHT/RED) wire from the B terminal.



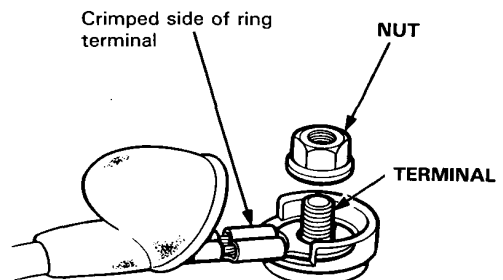
4. Loosen the through bolt, then loosen the adjustment locknut and the adjusting bolt.
5. Remove the belt from the alternator.
6. Remove the adjustment bolt and nut.
7. Remove the through bolt, then remove the alternator.



8. Install in the reverse order of removal.

NOTE:

- After installing the alternator, adjust the alternator belt tension (see page 23-106, 107) and power steering pump belt tension (see section 17).
- When installing the B terminal wire, make sure that the crimped side of the ring terminal is facing out.

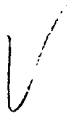
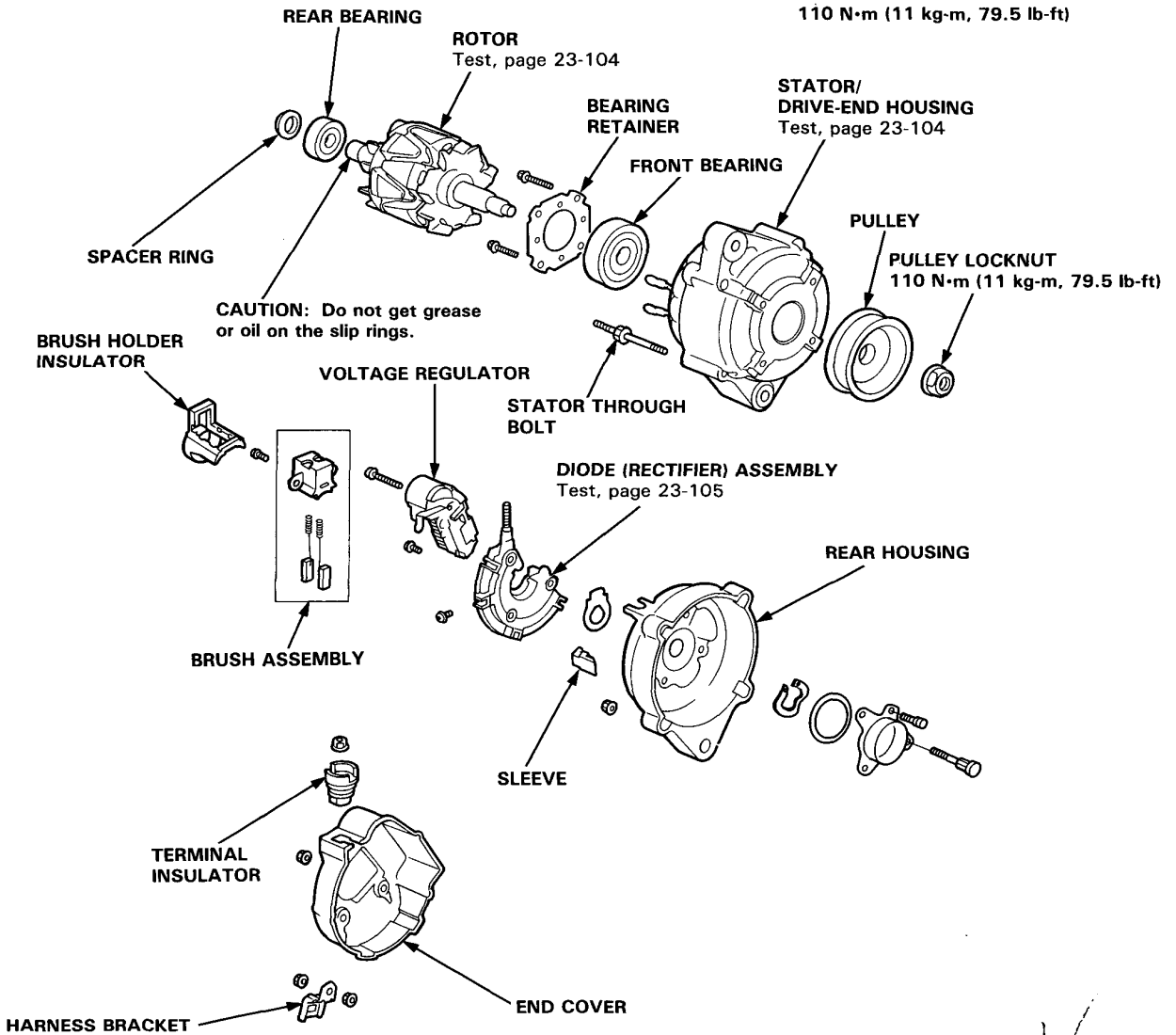
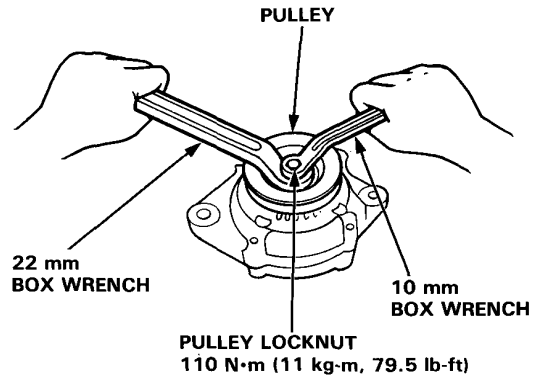




Alternator Overhaul

NOTE: It is only necessary to separate the pulley, drive-end housing, and rotor when the front bearing needs replacement.

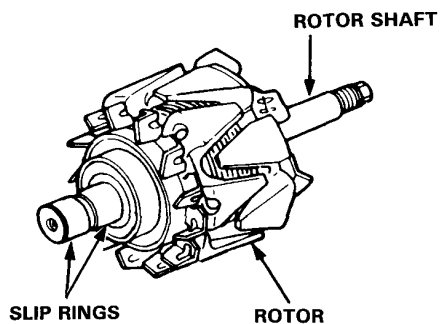
Loosen the pulley locknut with 10 mm and 22 mm box wrenches to remove the pulley from the rotor. If necessary, use an impact wrench.



Charging System

Rotor Slip Ring Test

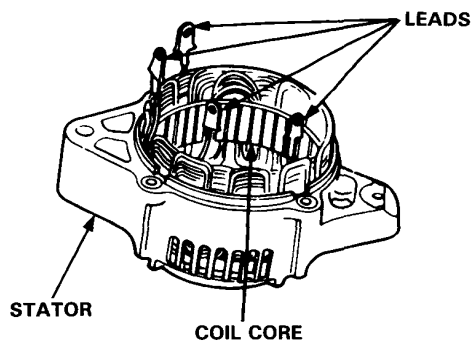
1. Check for continuity between the slip rings. There should be continuity.



2. Check for continuity between the slip rings and the rotor or rotor shaft. There should be no continuity.
3. If the rotor fails either continuity check, replace the rotor.

Stator Test

1. Check for continuity between each pair of leads. There should be continuity.



2. Check for continuity between each lead and the coil core. There should be no continuity.
3. If the coil fails either continuity check, replace the stator.

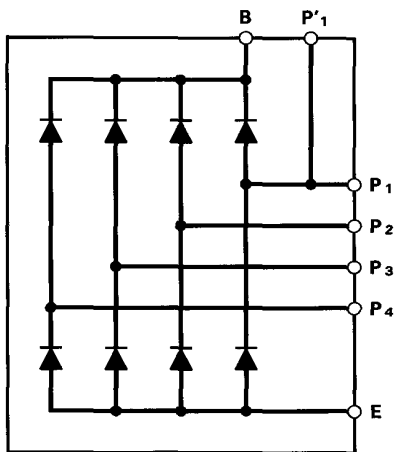
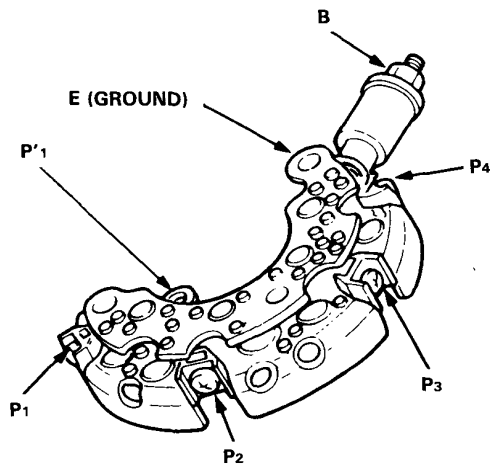




Rectifier Test

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 eight diodes (four pairs), each diode must be tested for continuity in both directions with an ohmmeter that has diode checking capability; a total of 16 checks.

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



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

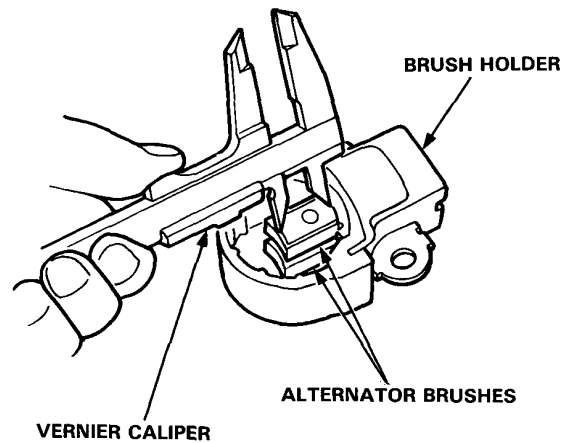
Alternator Brush Inspection

1. Remove the end cover, then take out the brush holder by removing its two screws.
2. Measure the length of the brushes with a vernier caliper as shown.

Alternator Brush Length

Standard: 10.5 mm (0.41 in)

Service Limit: 1.5 mm (0.06 in)



If the brushes are less than the service limit, replace the alternator brush assembly.



Charging System

Alternator Belt Adjustment (Without A/C)

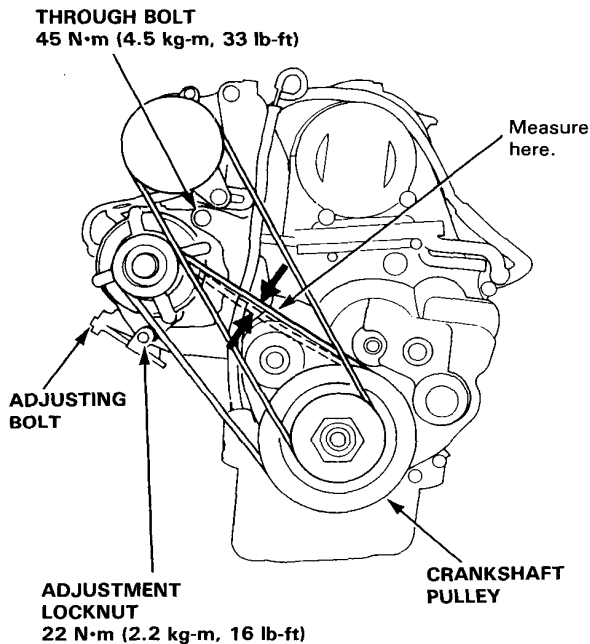
Deflection Method:

1. Apply a force of 100 N (10 kg, 22 lbs) and measure the deflection between the alternator and the crankshaft pulley.

Deflection: 10–12 mm (0.39–0.47 in)

NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the deflection should be 8.5–11 mm (0.33–0.43 in) when first measured.
- If there are cracks or any damage evident on the belt, replace it with a new one.



2. Loosen the through bolt and adjustment locknut.
3. Turn the adjusting bolt to obtain the proper belt tension, then retighten the nut and through bolt.
4. Recheck the belt deflection.

NOTE: For the power steering pump belt adjustment refer to section 17.

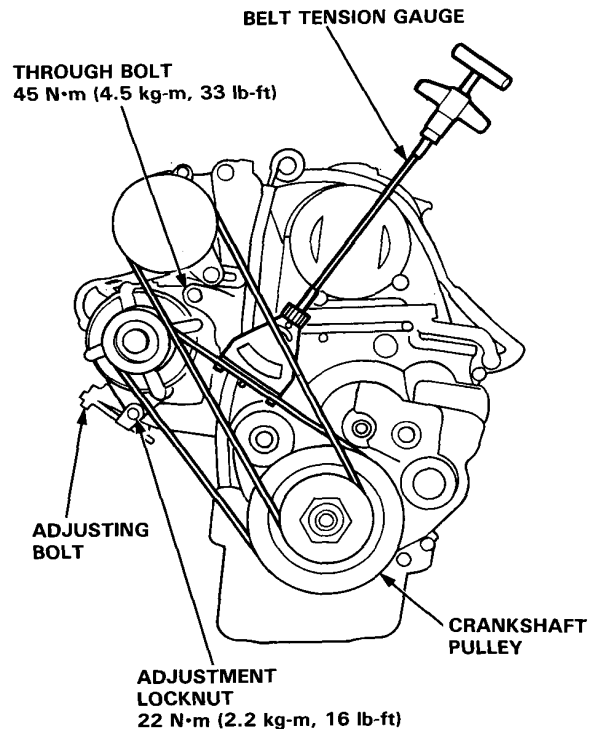
Belt Tension Gauge Method:

1. Attach the belt tension gauge to the belt and measure the tension of the belt.

Tension: 300–450 N (30–45 kg, 66–99 lbs)

NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the deflection should be 450–650 N (45–65 kg, 99–143 lbs) when first measured.
- 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.



2. Loosen the through bolt and adjustment locknut.
3. Turn the adjusting bolt to obtain the proper belt tension, then retighten the nut and through bolt.
4. Recheck the tension of the belt.

NOTE: For the power steering pump belt adjustment refer to section 17.



Alternator Belt Adjustment (With A/C)

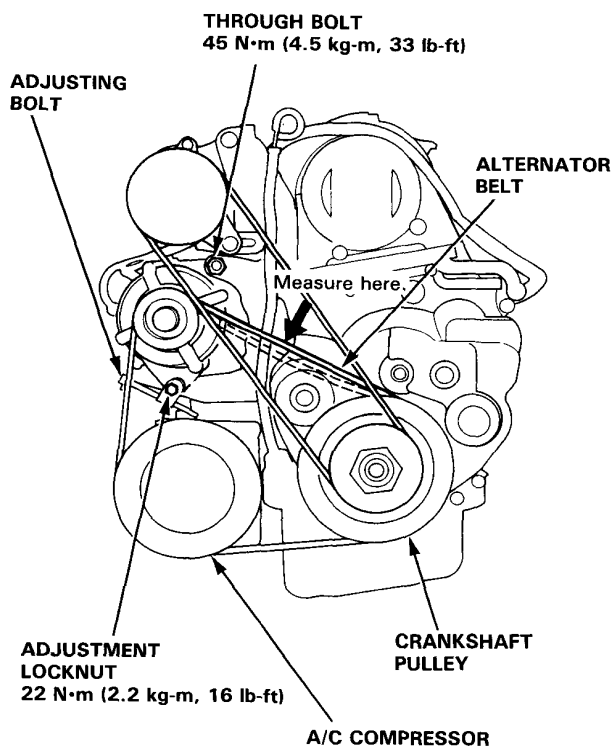
Deflection Method:

1. Apply a force of 100 N (10 kg, 22 lbs) and measure the deflection between the alternator and the crankshaft pulley.

Deflection: 10–12 mm (0.39–0.47 in)

NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the deflection should be 4.5–7 mm (0.18–0.28 in) when first measured.
- If there are cracks or any damage evident on the belt, replace it with a new one.



2. Loosen the through bolt and adjustment locknut.
3. Turn the adjusting bolt to obtain the proper belt tension, then retighten the nut and through bolt.
4. Recheck the belt deflection.

NOTE: For the power steering pump belt adjustment refer to section 17.

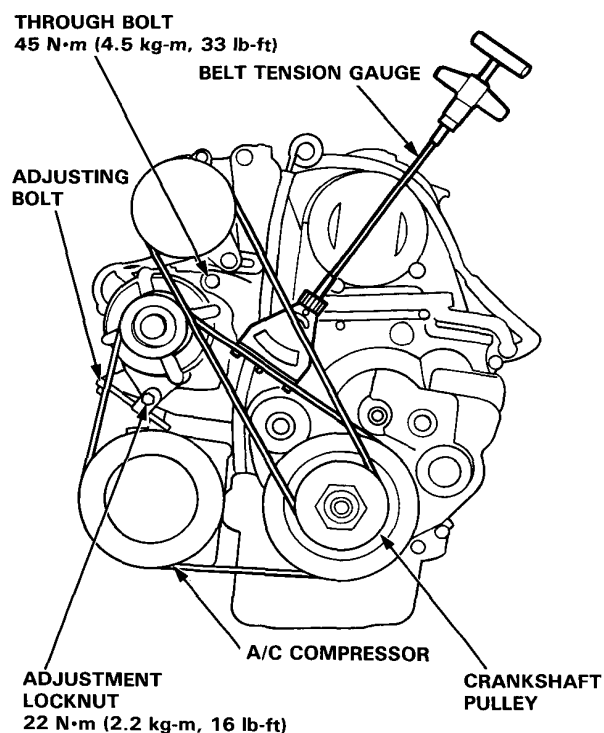
Belt Tension Gauge Method:

1. Attach the belt tension gauge to the belt and measure the tension of the belt.

Tension: 450–600 N (45–60 kg, 99–132 lbs)

NOTE:

- On a brand-new belt (one that has been run for less than five minutes), the tension should be 950–1150 N (95–115 kg, 209–254 lbs) when first measured.
- 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.



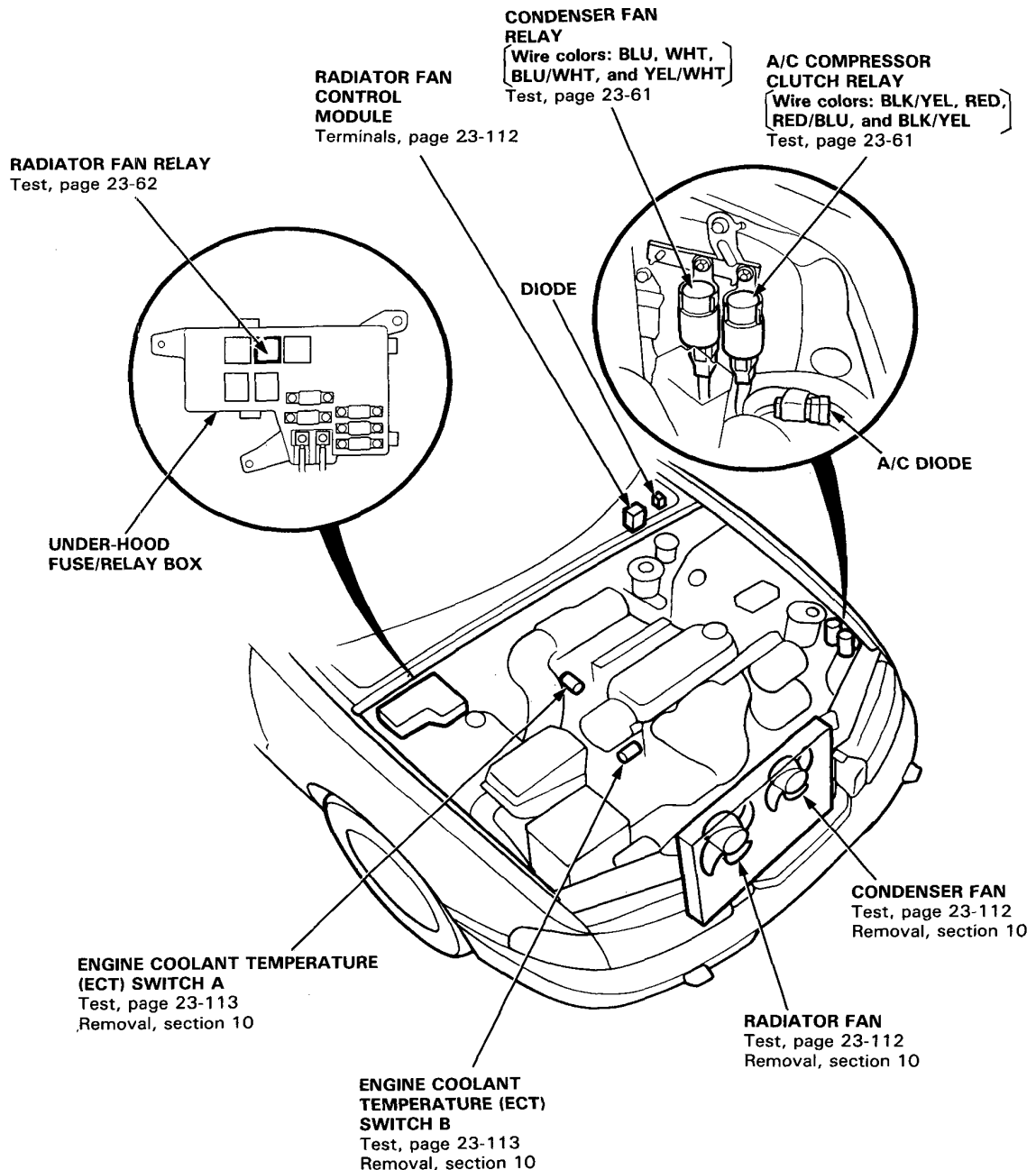
2. Loosen the through bolt and adjustment locknut.
3. Turn the adjusting bolt to obtain the proper belt tension, then retighten the nut and through bolt.
4. Recheck the tension of the belt.

NOTE: For the power steering pump belt adjustment refer to section 17.

Radiator and Condenser Fan Controls

Component Location Index

NOTE: LHD type is shown, RHD type is similar.

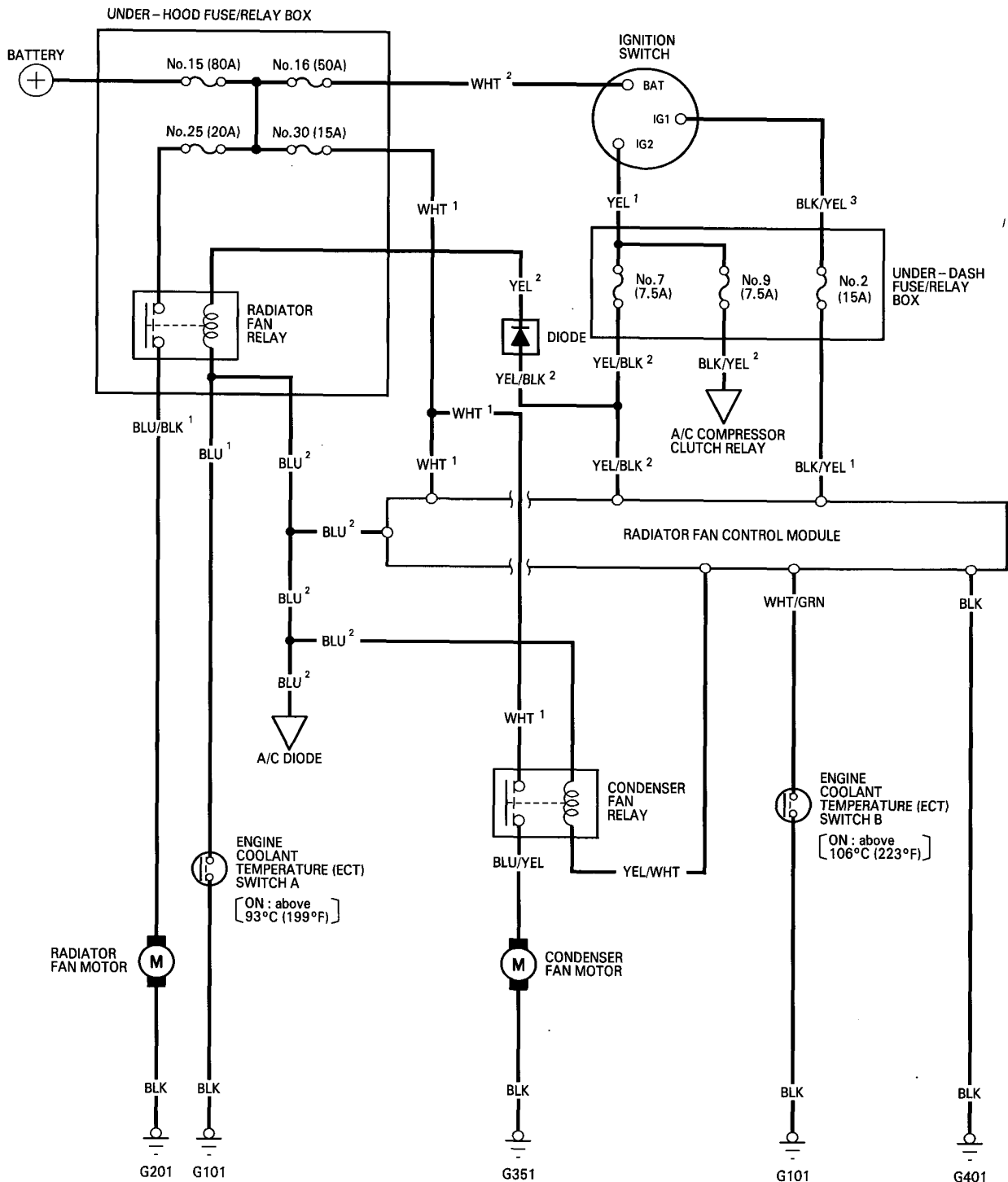


Radiator Fan Control:

When the coolant temperature is above approximately 106°C (223°F) after the engine has stopped, the radiator fan will run for about 15 minutes. Engine coolant temperature (ECT) switch A is in the thermostat housing, engine coolant temperature (ECT) switch B is located behind the water outlet housing. The radiator fan control module and the diode are located on the driver's side under the dash.

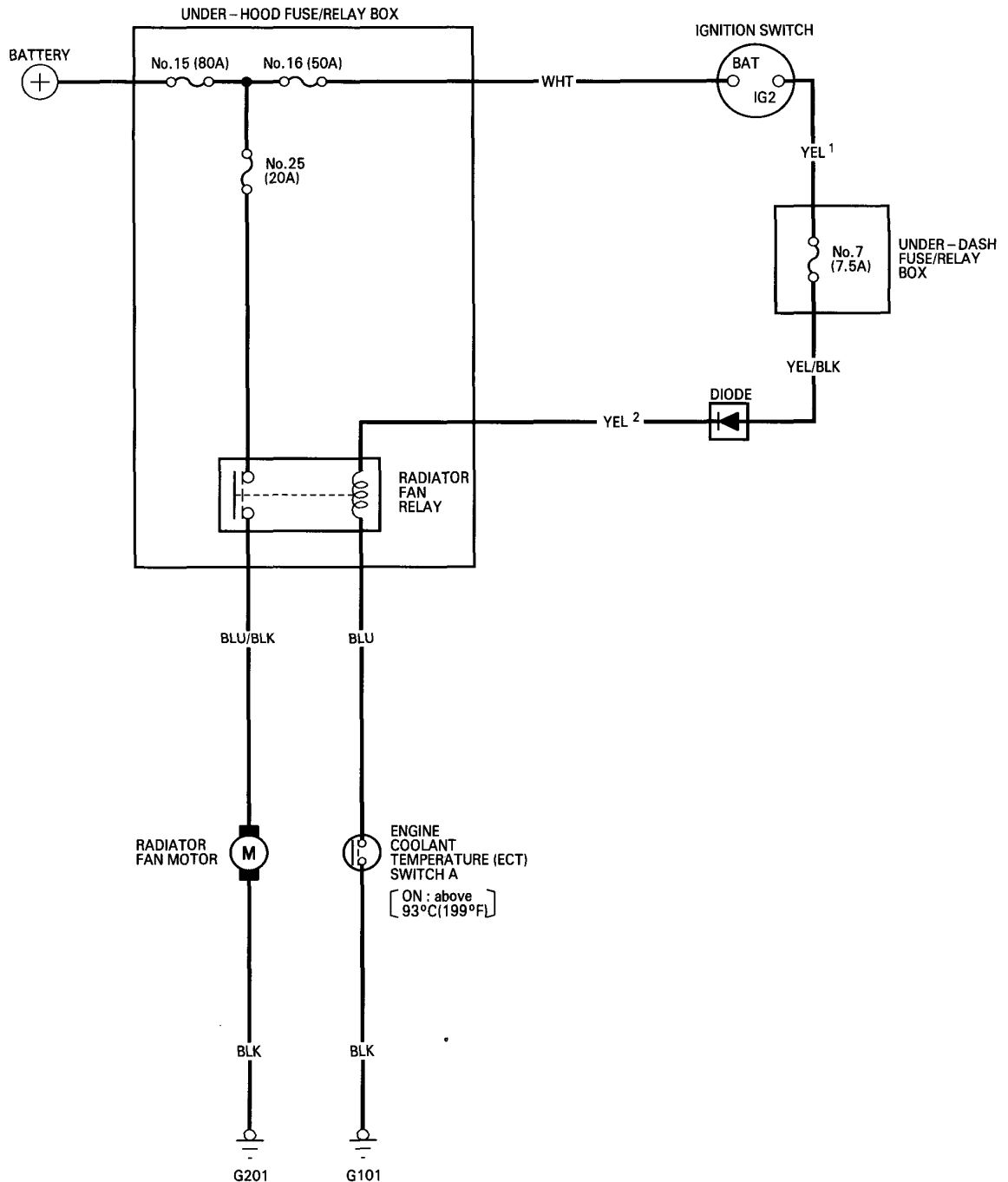


Circuit Diagram (With A/C)



Radiator and Condenser Fan Controls

Circuit Diagram (Without A/C)





Troubleshooting

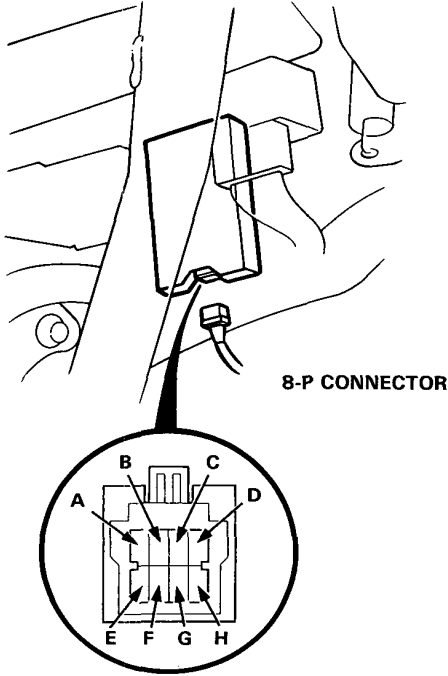
NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Item to be inspected											Open circuit, loose or disconnected terminals
		Blown No. 25 (15 A) fuse (In the under-hood fuse/relay box)	Blown No. 30 (15 A) fuse (In the under-hood fuse/relay box)	Blown No. 2 (15 A) fuse (In the under-dash fuse/relay box)	Blown No. 7 (15 A) fuse (In the under-dash fuse/relay box)	Radiator fan or condenser fan relay	Radiator fan or condenser fan motor	Engine coolant temperature (ECT) switch A	Engine coolant temperature (ECT) switch B	Faulty radiator fan control module	Faulty diode	Poor ground	
Only one fan runs with engine running and A/C ON.		1	2		3	4				5	G101 G201 G351	BLU/BLK ¹ , BLU ¹ , BLU ² YEL/WHT, BLU/YEL WHT ¹ , WHT/GRN	
Fans do not run.	Under all conditions			1			2	3	4		G101 G401 G402	BLK/YEL ¹ , YEL/BLK ² , WHT ¹	
Radiator fan control module fails to function properly (function time is too short or too long, etc).		1	2	3				4	5	6	G401 G402	WHT ¹ , YEL/BLK ² WHT/GRN, BLK/YEL ¹ YEL/WHT, BLU ²	

Radiator Fan Control Module

Terminals

RADIATOR FAN CONTROL MODULE



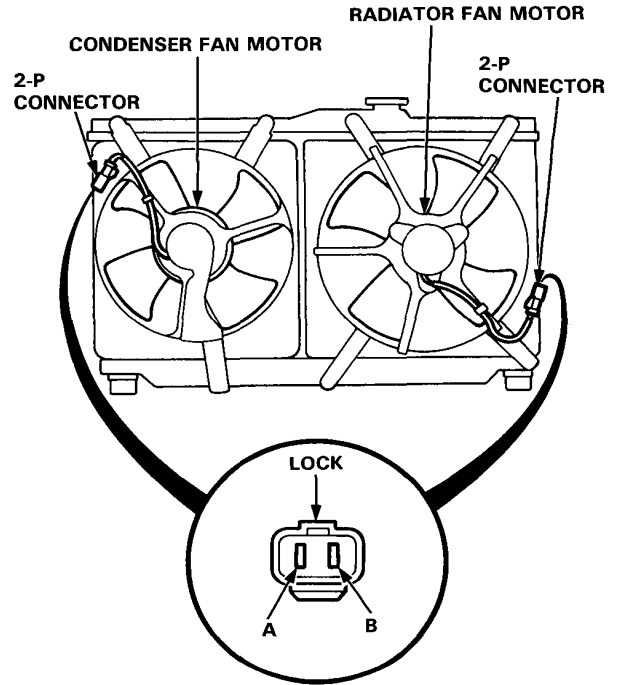
NOTE: See section 22 for the input test.

Terminal Wire Connects to

Terminal	Wire	Connects to
A	YEL/WHT	Condenser fan relay ⊖
B	YEL/BLK	Power supply and radiator fan relay ⊕ with ignition switch ON
C	—	Not used
D	BLK	Ground (G401)
E	WHT/GRN	Engine coolant temperature (ECT) switch B
F	WHT ¹	Constant power
G	BLK/YEL ¹	IG1 (Timer reset signal)
H	BLU	Condenser fan relay ⊕

Fan Motor Test

1. Disconnect the 2-P 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.

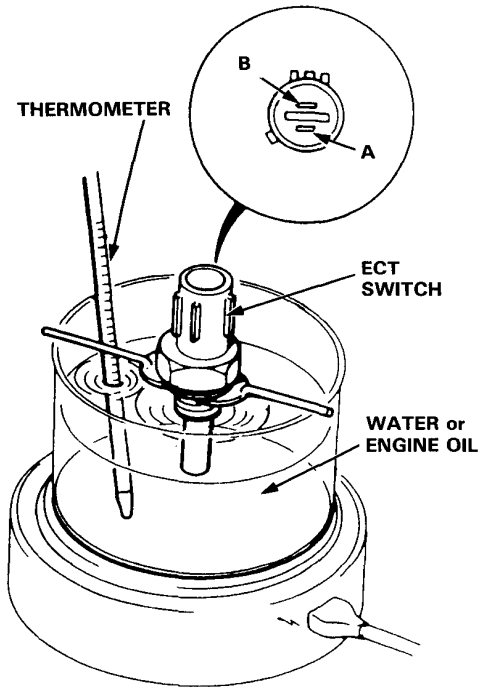


Engine Coolant Temperature (ECT) Switch Test

NOTE: Bleed air from the cooling system after installing the engine coolant temperature (ECT) switch (see section 10).

1. Remove the engine coolant temperature (ECT) switch A from the thermostat housing and the engine coolant temperature (ECT) switch B from the water outlet housing.
2. Suspend each ECT switch in a container of water or engine oil as shown.

NOTE: The illustration shows ECT switch A.



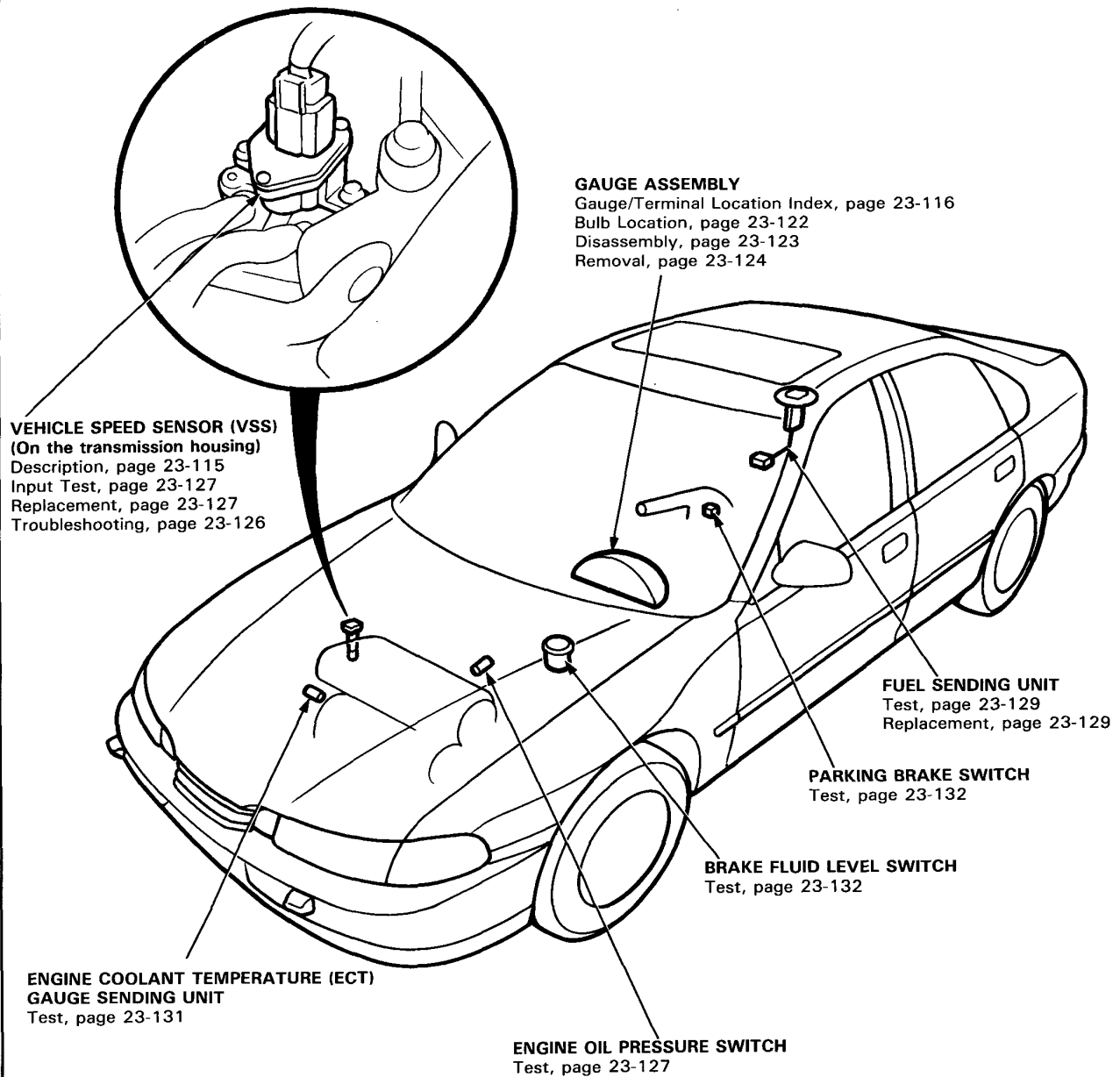
3. Heat the water or engine oil and check coolant temperature with a thermometer.
4. Check each ECT switch for continuity between the A and B terminals according to the table.

		Terminal	
Operation	Temperature	A	B
SWITCH A	ON	90–96°C (194°–199°F)	
	OFF	2–7°C (35–45°F) lower than the temperature when it goes on.	
SWITCH B	ON	103–109°C (217–228°F)	
	OFF	4–9°C (39–48°F) lower than the temperature when it goes on.	

Gauge Assembly

Component Location Index

NOTE: LHD type is shown, RHD type is similar.

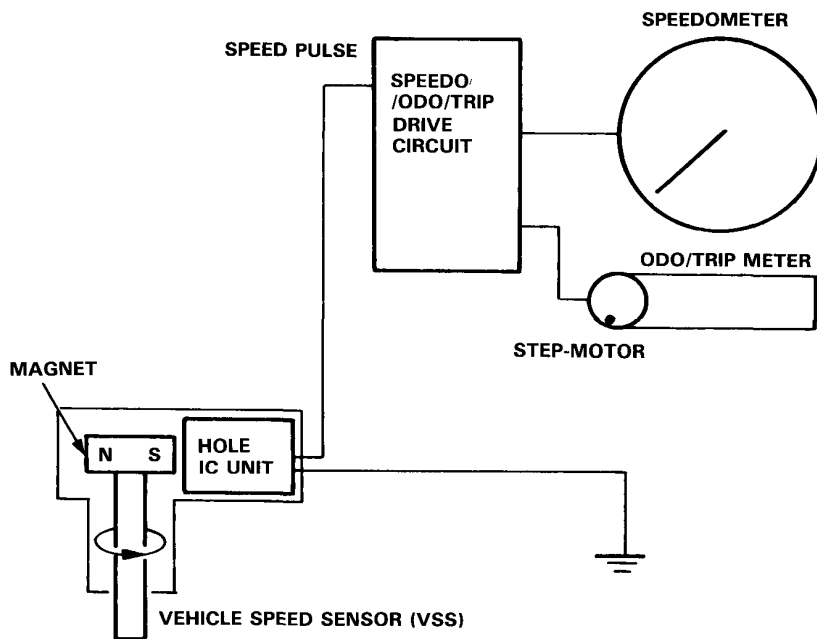




Description

Cableless Speedometer

This speedometer consists of a newly developed electrical vehicle speed sensor (VSS) and a speedo/odo/trip drive circuit. By means of bobbin type movements it eliminates engine noise-transmitted through the meter cable hole on the fire wall-and needle vibration caused by cable failure. Also, it made the ideal layout in the limited space available.

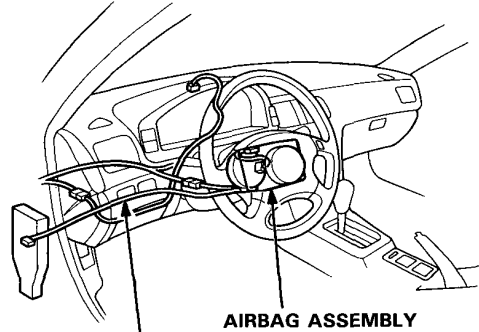


Gauge Assembly

Gauge/Terminal Location Index

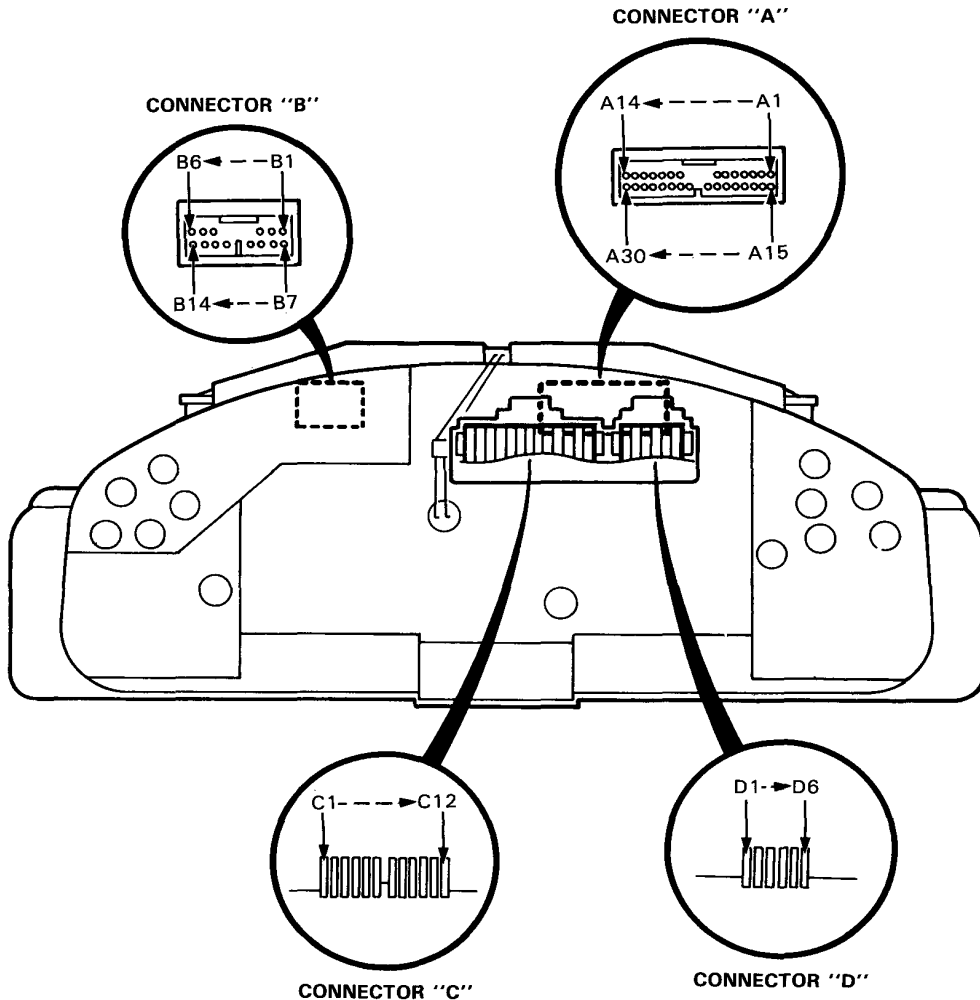
CAUTION:

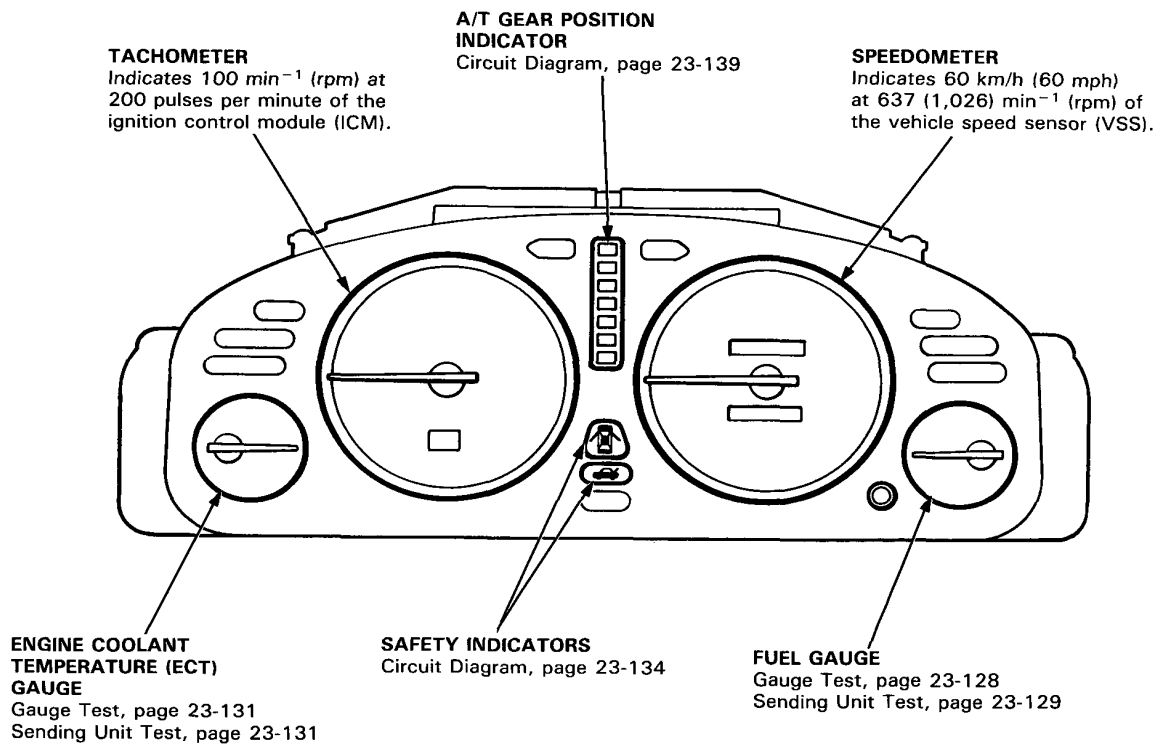
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



AIRBAG ASSEMBLY

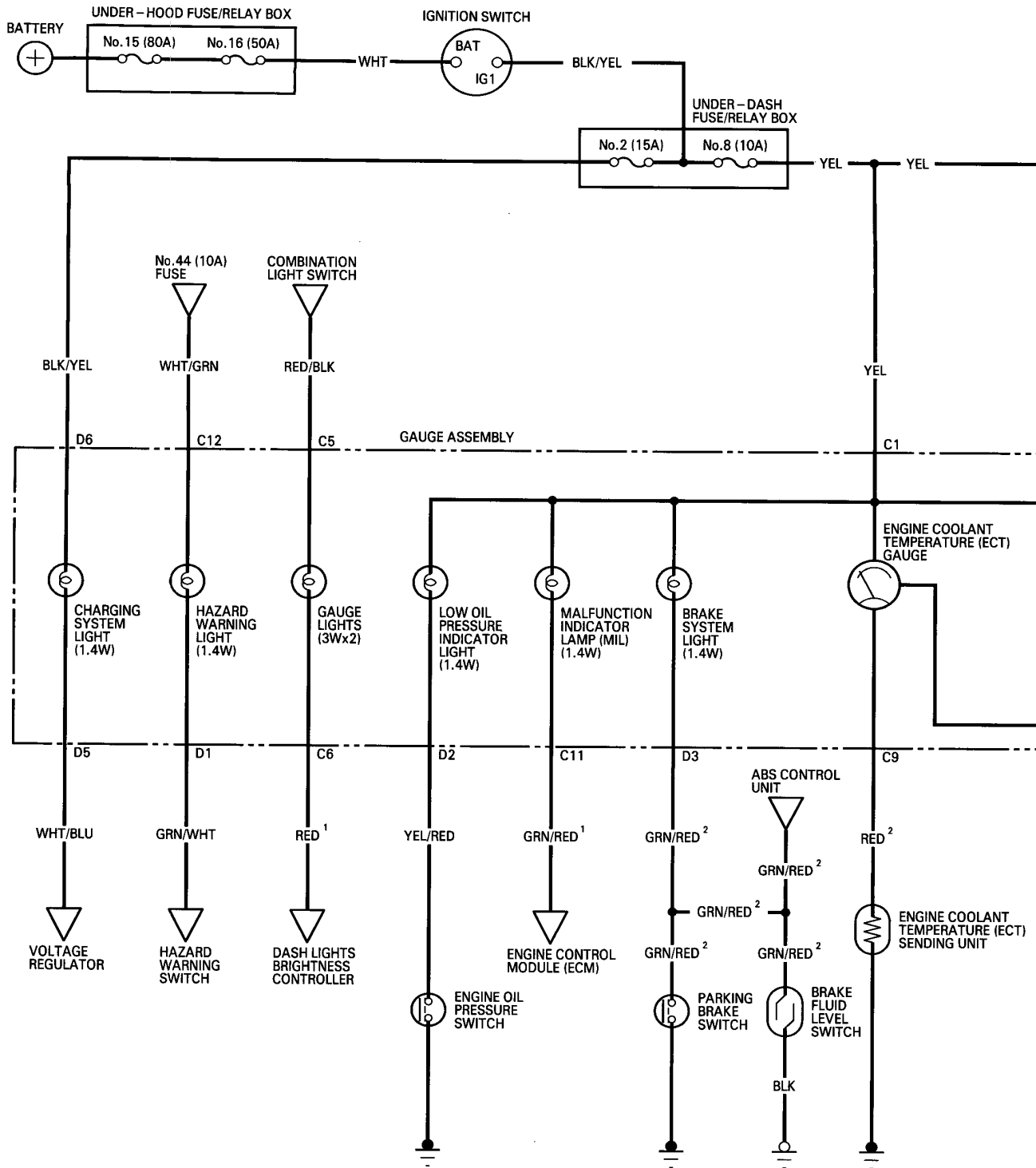
SRS MAIN HARNESS
(Covered with yellow outer insulation)



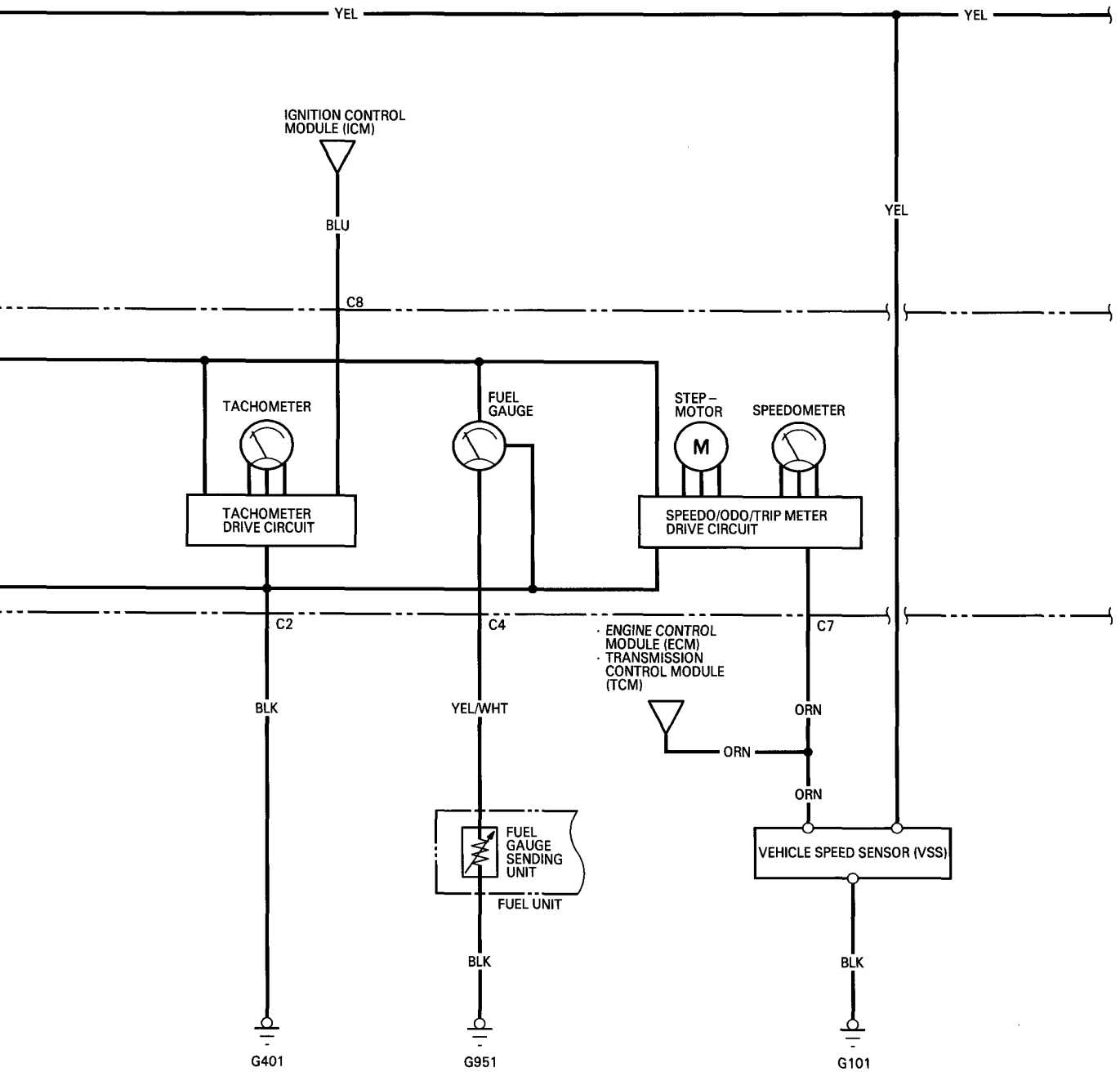
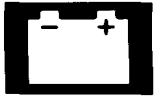


Gauge Assembly

Circuit Diagram

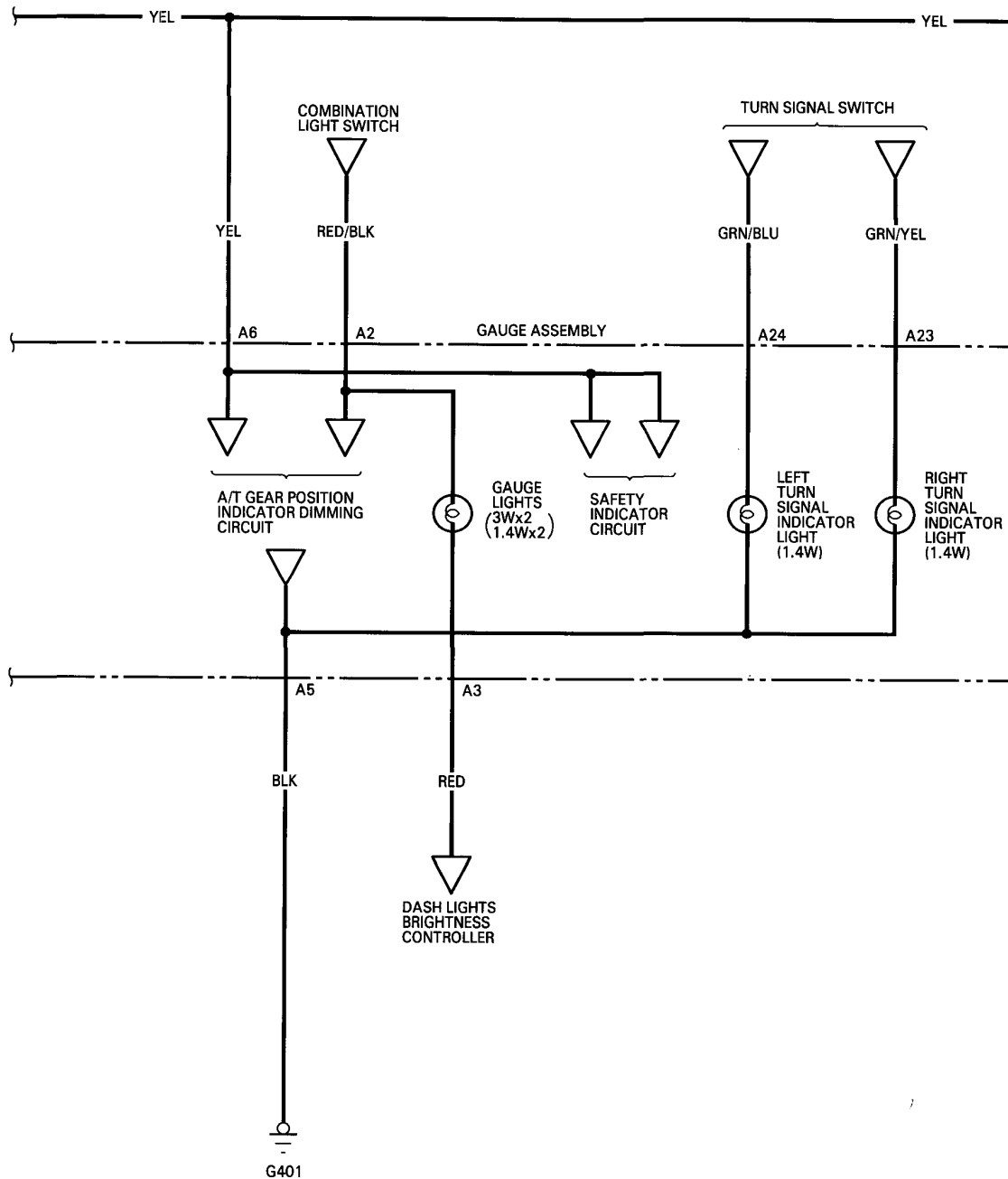


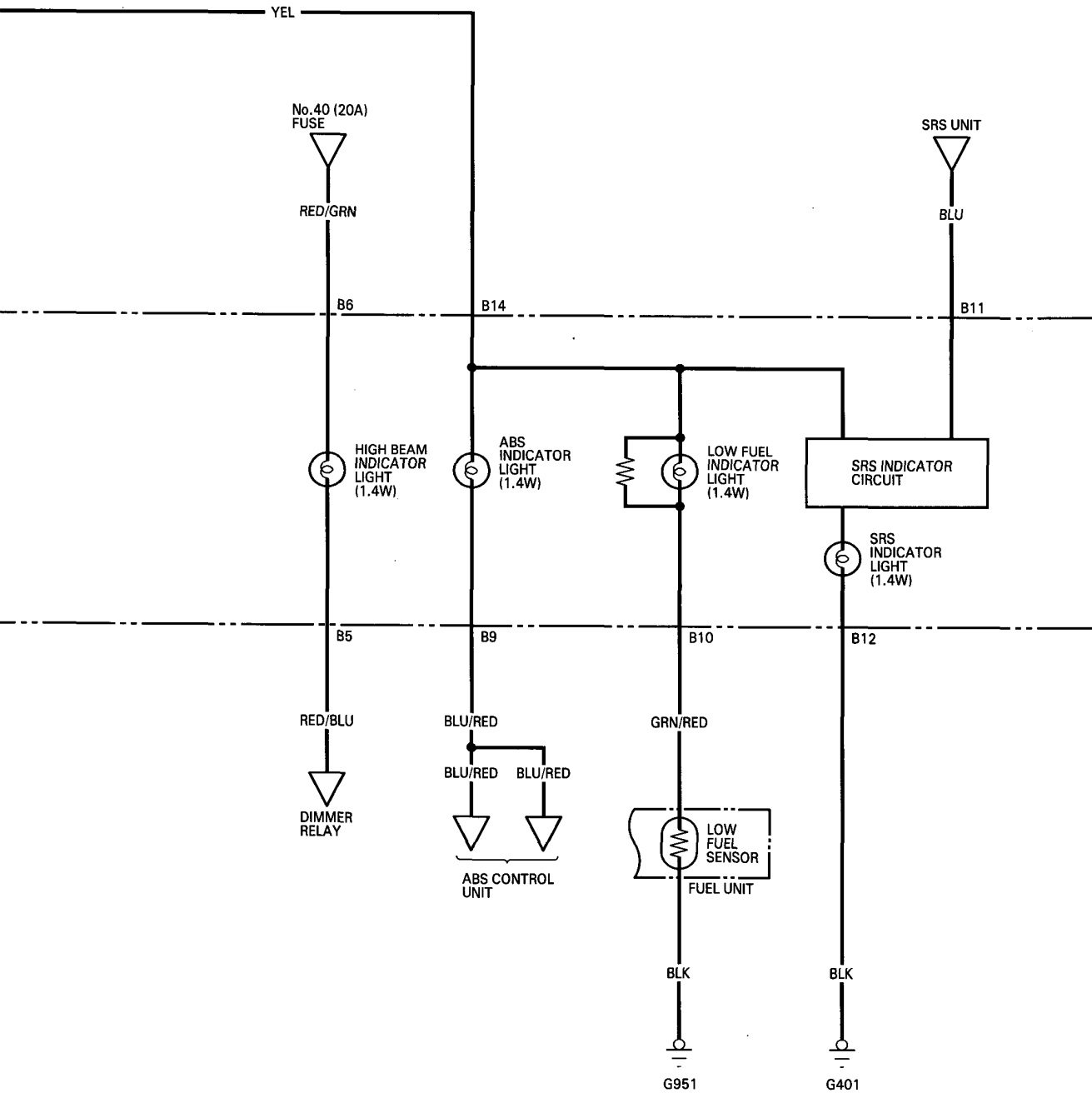
LHD: G401
G402
RHD: G203



Gauge Assembly

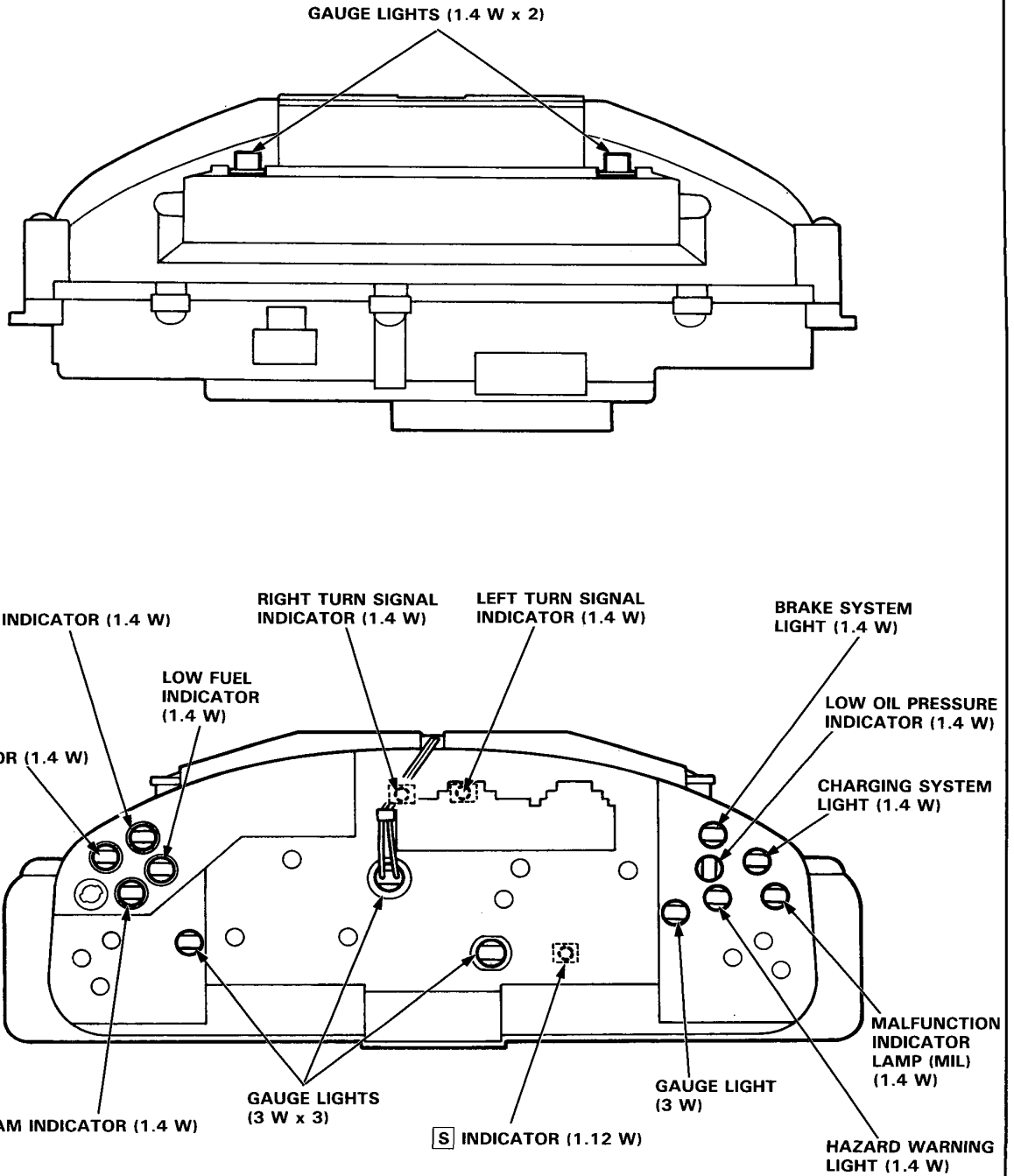
Circuit Diagram





Gauge Assembly

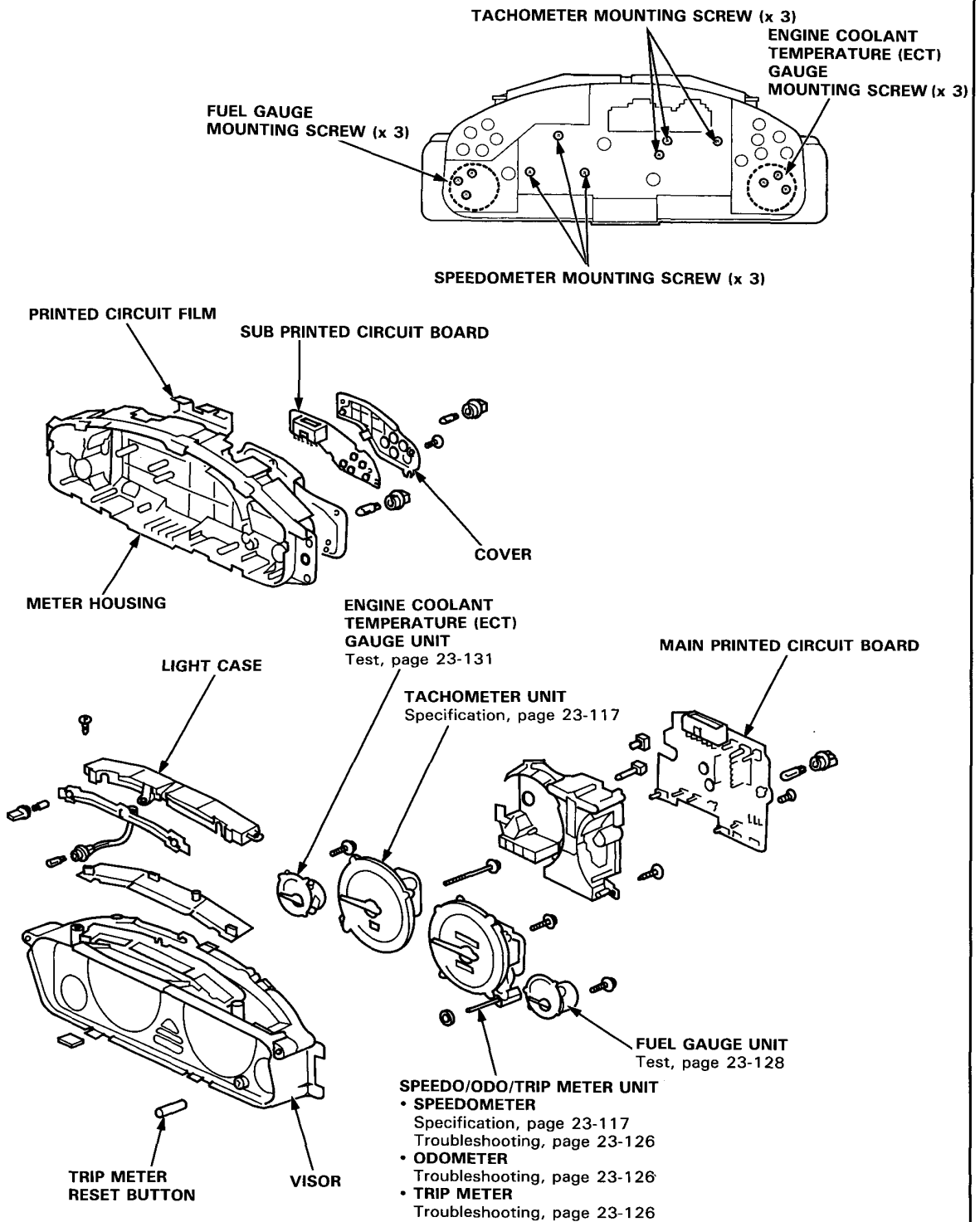
Bulb Locations





Disassembly

NOTE: Handle the terminals, printed circuit boards and printed circuit film carefully to avoid damaging them.

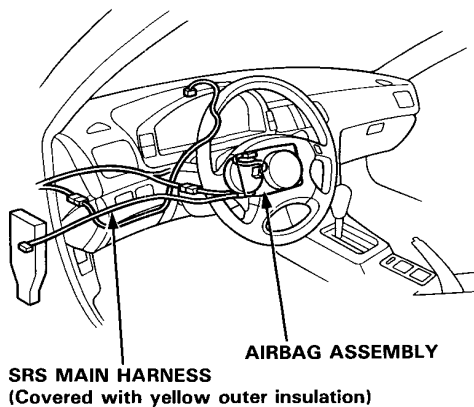


Gauge Assembly

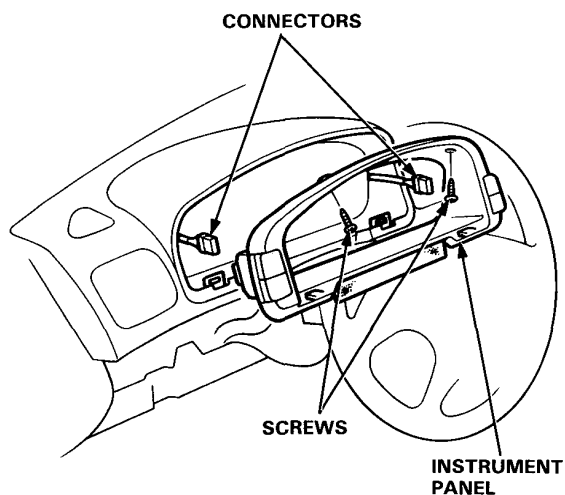
Removal

CAUTION:

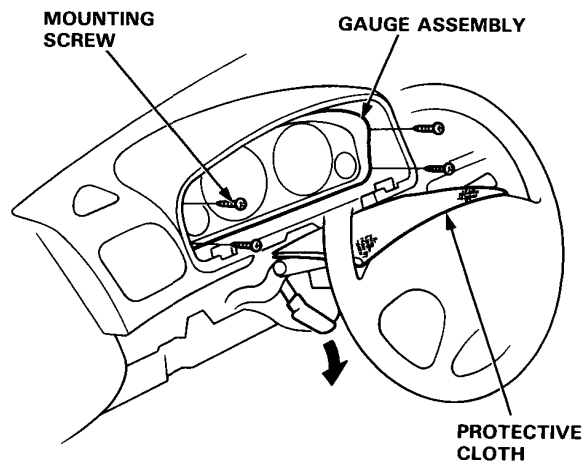
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



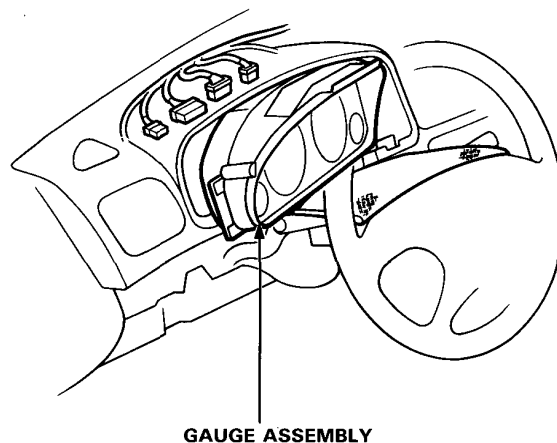
1. Remove the two screws from the instrument panel.
2. Remove the instrument panel and disconnect the connectors from the switches.



3. Remove the four mounting screws and spread a protective cloth on the steering column.
4. Tilt the steering wheel down with the tilt adjustment lever.

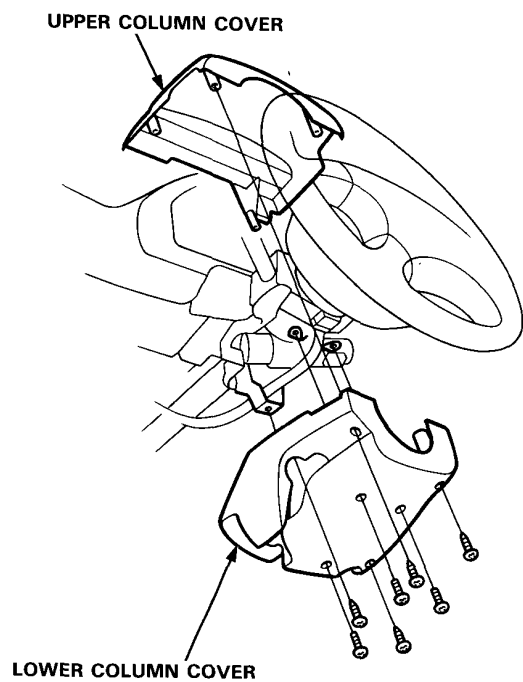


5. Pry the gauge assembly out and disconnect all connectors from it.



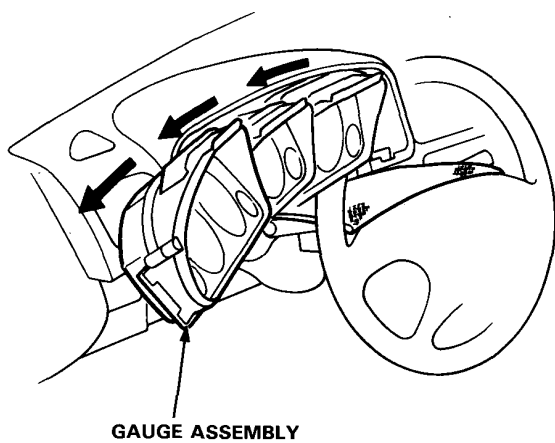


6. If necessary, remove the steering column covers.



8. Install in the reverse order of removal.

7. Carefully remove the gauge assembly.



Gauge Assembly

Speedo/Odo/Trip Meter Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

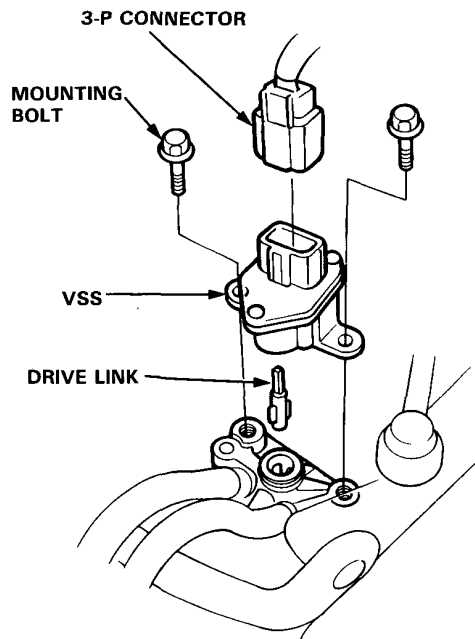
Symptom	Item to be inspected	Blown No. 8 (10 A) fuse in the under-dash fuse/relay box	Printed circuit boards and film	Speedometer	Odo/Trip meter	Vehicle speed sensor (VSS) input test	Vehicle speed sensor (VSS) is not installed correctly	Poor ground	Open circuit in the wires, loose or disconnected terminals
Odometer and trip meter work, but speedometer does not.				1					
Speedometer works, but odometer and trip meter do not.					1				
All meters do not work.	1	3	4		2		G401 G402	YEL, ORN	
Speedometer works incorrectly.			2			1			
Odometer or trip meter works incorrectly.			2	3		1			

NOTE: If any among the speedometer, odometer, trip meter, and speedo/odo/trip meter drive circuit is faulty, replace the speedo/odo/trip meter unit.

Vehicle Speed Sensor (VSS)

Input Test/Replacement

1. Disconnect the 3-P connector from the vehicle speed sensor (VSS).
2. Check for continuity between the BLK terminal and body ground.
 - If there is continuity, go to step 3.
 - If there is no continuity, check for:
 - poor ground (G301).
 - an open in the wire.
3. Check for voltage between the YEL terminal and body ground with the ignition switch ON.
 - If there is battery voltage, go to step 4.
 - If there is no voltage, check for:
 - blown No. 8 (10 A) fuse in the under-dash fuse/relay box.
 - an open in the wire.
4. Check for voltage between the ORN terminal and body ground with the ignition switch ON.
 - If there is 4–6 V, go to step 5.
 - If voltage is not 4–6 V, check for:
 - faulty speed/odo/trip meter drive circuit (C7 terminal of the gauge).
 - an open in the wire.
5. If all the input test prove OK, but the speed/odo/trip meter does not work, remove the two mounting bolts and replace the VSS.

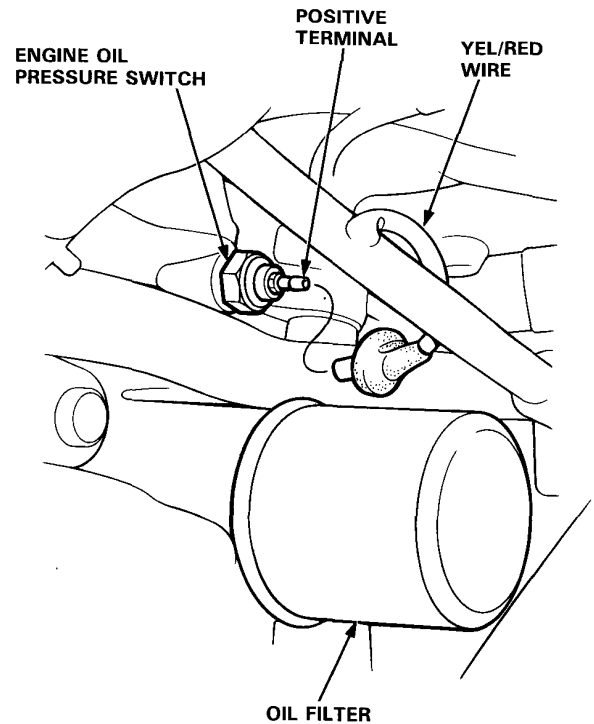


Engine Oil Pressure Warning System



Pressure Switch Test

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



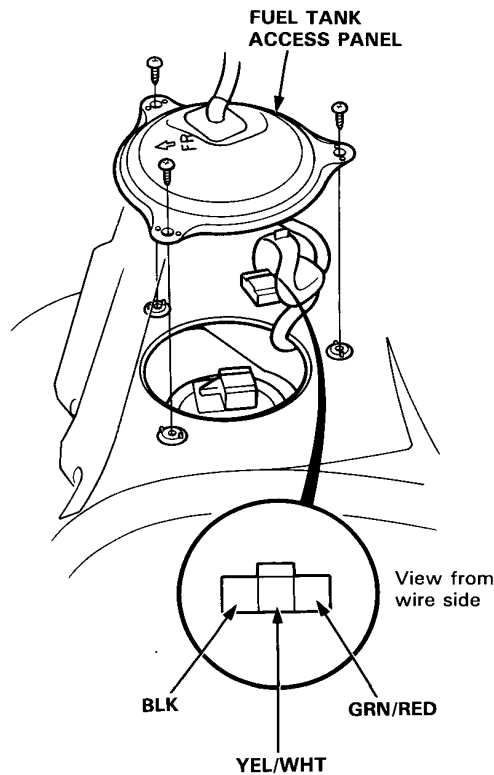
3. If the switch fails to work, check the engine oil level.
4. If the oil level is OK, check the engine oil pressure and, if necessary, inspect the oil pump (see section 8).

Fuel Gauge

Gauge Test

NOTE: Refer to page 23-119 for the circuit diagram of the fuel gauge.

1. Check the No. 8 (10 A) fuse in the under-dash fuse/relay box before testing.
2. Open the trunk and remove the floor trim panel, then turn the right rear seat forward.
3. Remove the screws and fuel tank access panel.
4. Disconnect the 3-P connector from the fuel gauge sending unit.



5. Connect the voltmeter positive probe to the YEL/WHT terminal and the negative probe to body ground, then turn the ignition switch ON (II). There should be between 5–8 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/WHT or BLK wire
 - poor ground (G951)
 - loose or disconnected terminals
 - faulty fuel gauge

6. Turn the ignition switch OFF (O), and connect a jumper wire between the YEL/WHT terminal and ground.

CAUTION: Do not connect power and ground to the terminals; it will damage the fuel gauge.

7. Turn the ignition switch ON (II), and check if the gauge indicates "1".

CAUTION: Disconnect the jumper wire as soon as the gauge reaches "1", or you will damage the gauge.

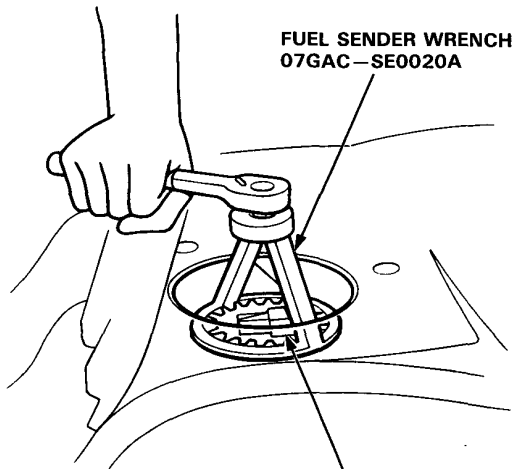
- If the fuel gauge does not work at all, replace it.
- If the fuel gauge is OK, inspect the sending unit.



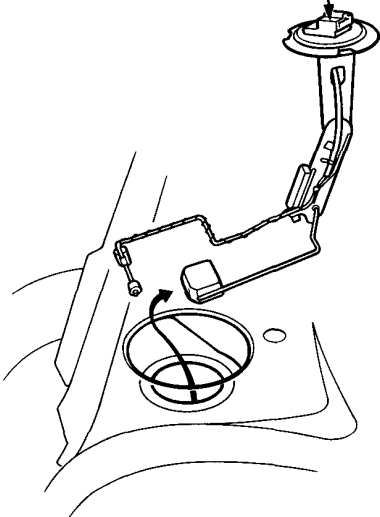
Sending Unit Test/Replacement

⚠ WARNING Do not smoke while working on the fuel system. Keep open flames away from the work area.

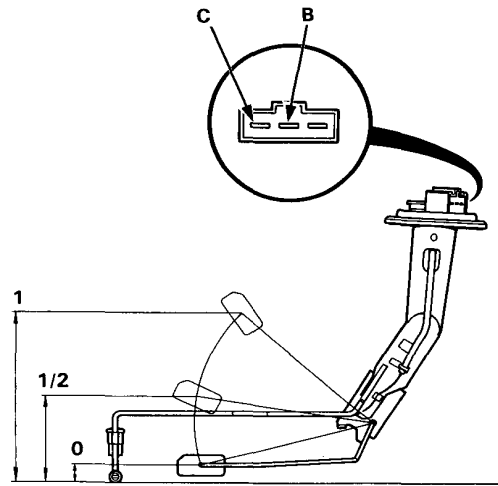
1. Open the trunk and remove the floor trim panel, then turn the right rear seat forward.
2. Remove the fuel tank access panel.
3. Disconnect the 3-P connector from the fuel gauge sending unit.
4. Remove the fuel gauge sending unit.



FUEL GAUGE SENDING UNIT



5. Check if the resistance between the B and C terminals changes evenly as the position of the float changes.
 - If it does not change evenly, replace the fuel sending unit.
 - If it changes evenly, go to step 7.
6. Support the sending unit on a workbench in the position shown.



Top of the workbench (Bottom of the fuel tank)

7. Measure the resistance between the B and C terminals by moving the float to the distances listed for 0 (EMPTY), 1/2 (HALF FULL), and 1 (FULL).

Float Position	0	1/2	1
Resistance (Ω)	105-110	25.5-39.5	2-5

0	1/2	1
17 mm (0.66 in)	80 mm (3.14 in)	145.5 mm (5.73 in)

8. If unable to obtain the above readings, replace the fuel gauge sending unit.

Low Fuel Indicator System

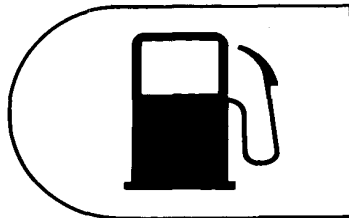
Indicator Light Test

NOTE: Refer to page 23-121 for the diagram of the low fuel indicator circuit.

1. Park the car on level ground.

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

2. Drain the fuel tank into an approved container. Then install the drain bolt with a new washer.
3. Add less than 8.6 l (1.9 Imp. Gal, 2.2 U.S. Gal) of fuel and turn the ignition switch ON. The low fuel indicator light should come on within four minutes.



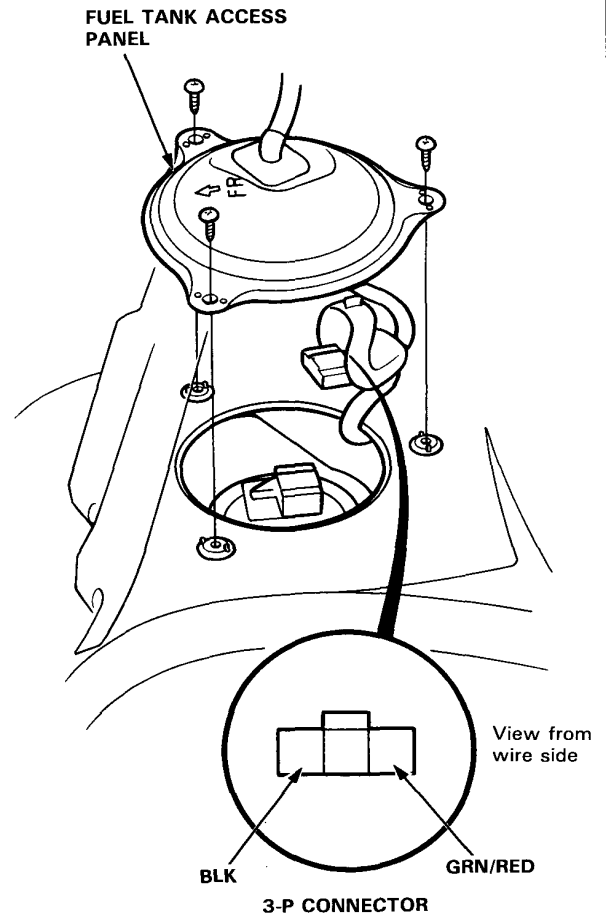
LOW FUEL INDICATOR LIGHT

4. Then add more than 4 l (0.9 Imp. Gal, 1.1 U.S. Gal). The light should go off within four minutes.

- If the indicator light did not come on in step 3, remove the fuel tank access panel and disconnect the 3-P connector from the fuel gauge sending unit. Connect the GRN/RED terminal to the BLK terminal with a jumper wire.

— If the light comes on, the problem is the sending unit.

— If the light does not come on, the problem is an open in the GRN/RED wire to the gauge assembly, no power to the gauge, a blown bulb, or poor ground.



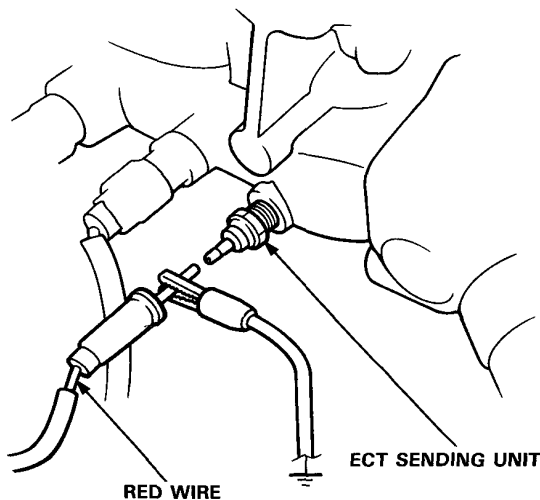
Engine Coolant Temperature (ECT) Gauge



Gauge Test

NOTE: Refer to page 23-118 for the circuit diagram of the engine coolant temperature (ECT) gauge.

1. Check the No. 8 (10 A) fuse in the under-dash fuse/relay box and YEL wire between the under-dash fuse/relay box and the gauge before testing.
2. Make sure the ignition switch is OFF, then disconnect the RED wire from the engine coolant temperature (ECT) sending unit and ground it with a jumper wire.



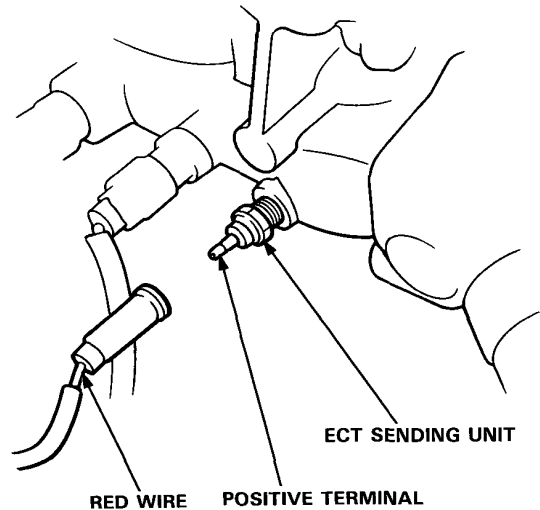
3. Turn the ignition switch ON. (II) Check that the pointer of the ECT gauge starts moving toward the red zone.

CAUTION: Turn the ignition switch OFF (0) before the pointer reaches the red zone on the gauge dial. Failure to do so may damage the gauge.

- If the pointer of the gauge does not swing at all, check for an open in the RED wire. If the wire is OK, check the ECT gauge.
- If the gauge is OK, check the ECT sending unit.

Sending Unit Test

1. Disconnect the RED wire from the engine coolant temperature (ECT) sending unit.
2. With the engine cold, use an ohmmeter to measure resistance between the positive terminal and the engine (ground).



3. Check the temperature of the coolant.
4. Run the engine and measure the change in resistance with the engine at operating temperature (radiator fan comes on).

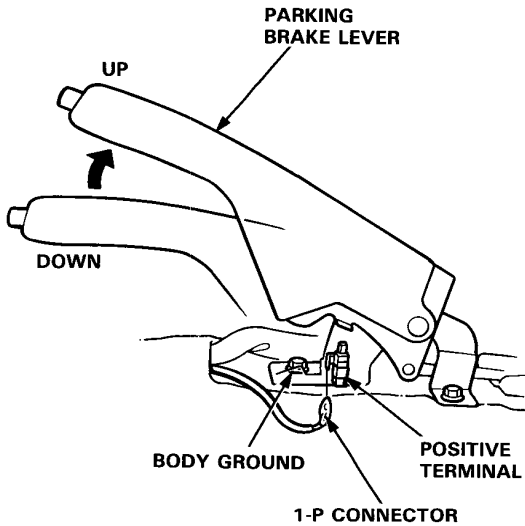
Temperature	56°C (133°F) (Engine cold)	85°C (185°F)– 100°C (212°F)
Resistance (Ω)	142	49–32

5. If the readings you get are substantially different from the specifications above, replace the ECT sending unit.

Brake Warning System

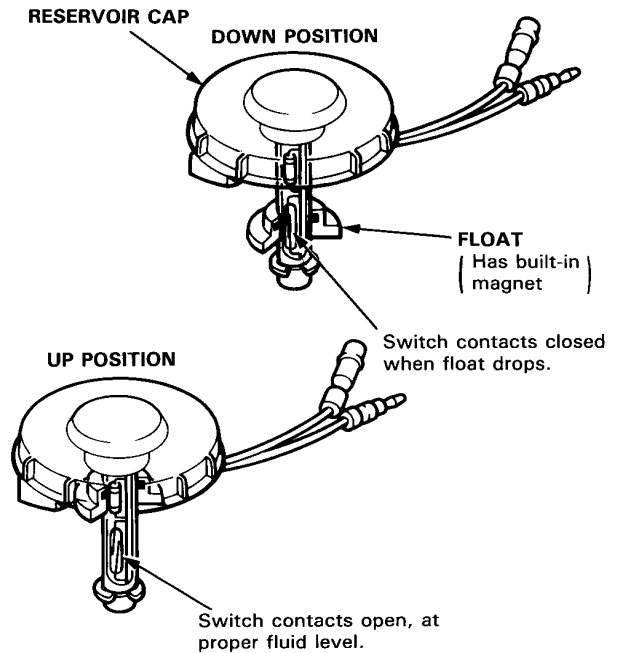
Parking Brake Switch Test

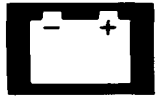
1. Remove the rear console (see section 20) and disconnect the 1-P connector from the parking brake switch.
2. There should be continuity between the positive terminal and body ground with the brake lever up. There should be no continuity with the brake lever down.



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 with the float up and down. There should be continuity with the float down and no continuity with the float up. Replace the reservoir cap assembly if necessary.





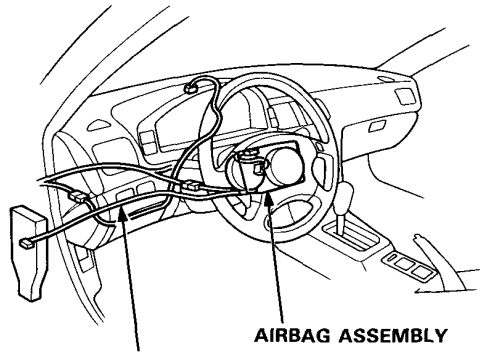
Safety Indicator

Component Location Index

CAUTION:

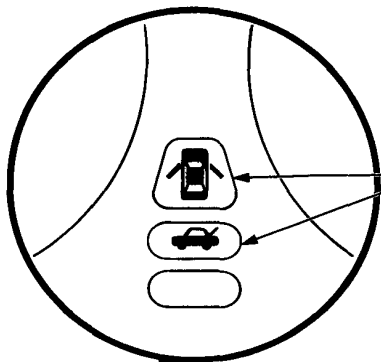
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown, RHD type is symmetrical.

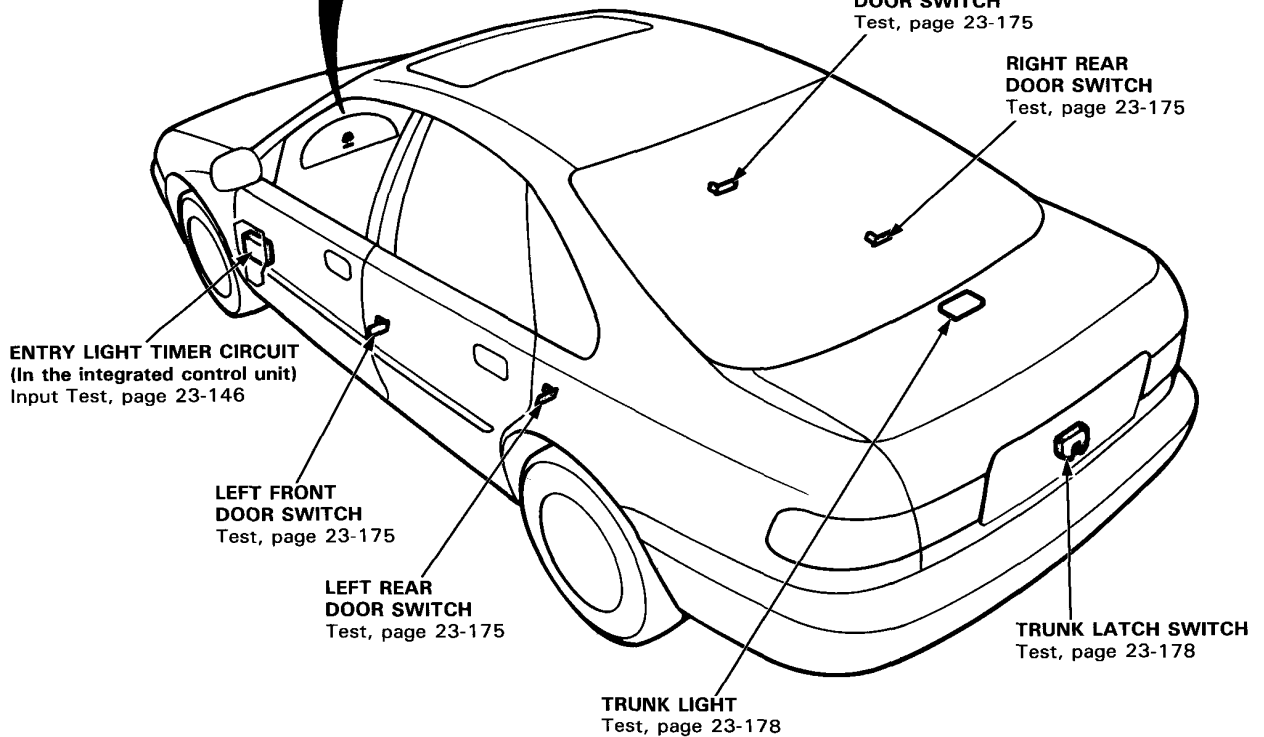


SRS MAIN HARNESS
(Covered with yellow outer insulation)

AIRBAG ASSEMBLY



SAFETY INDICATORS
(In the gauge assembly)
Troubleshooting, page 23-135
Input Test, page 23-136
Gauge Disassembly, page 23-123



RIGHT FRONT DOOR SWITCH
Test, page 23-175

RIGHT REAR DOOR SWITCH
Test, page 23-175

ENTRY LIGHT TIMER CIRCUIT
(In the integrated control unit)
Input Test, page 23-146

LEFT FRONT DOOR SWITCH
Test, page 23-175

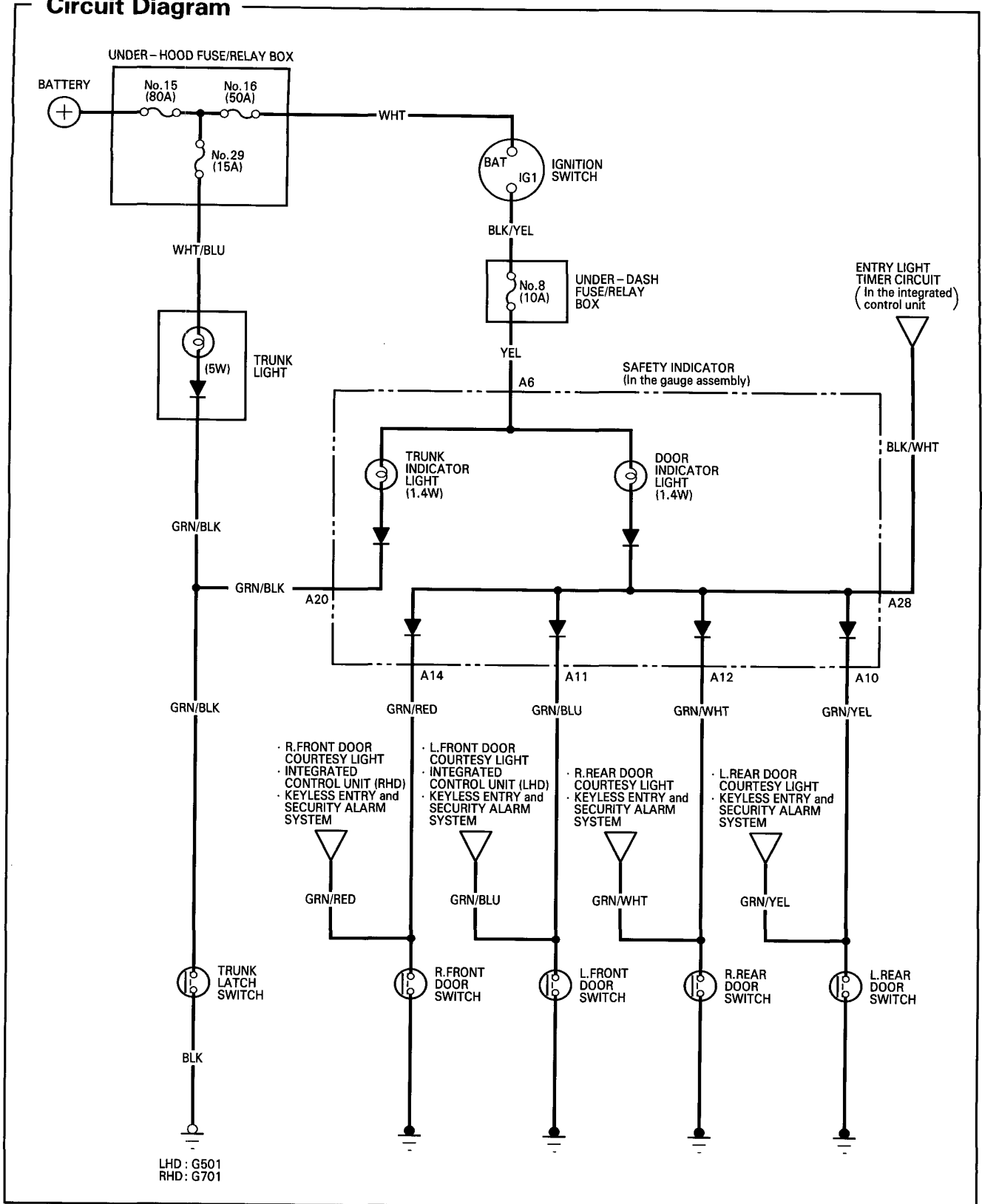
LEFT REAR DOOR SWITCH
Test, page 23-175

TRUNK LIGHT
Test, page 23-178

TRUNK LATCH SWITCH
Test, page 23-178

Safety Indicator

Circuit Diagram





Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected	Blown No. 8 (10 A) fuse in the under-dash fuse/relay box	Blown indicator light bulb	Safety indicator circuit (In the gauge assembly)	Door switch	Trunk latch switch	Poor Ground	Open circuit, loose or disconnected terminals
Symptom							
No indicators operate.	1		2				YEL
Door indicator light fails to come on with the door open.		1		2			YEL, GRN/BLU GRN/RED, GRN/WHT, GRN/YEL
Door indicator light does not go off with all doors closed.			2	1			YEL, GRN/BLU GRN/RED, GRN/WHT, GRN/YEL
Trunk indicator light fails to come on with trunk lid open.		1			2	LHD: G501 RHD: G701	YEL, GRN/BLK
Trunk indicator light does not go off with the trunk lid closed.			2		1		YEL, GRN/BLK

Safety Indicator

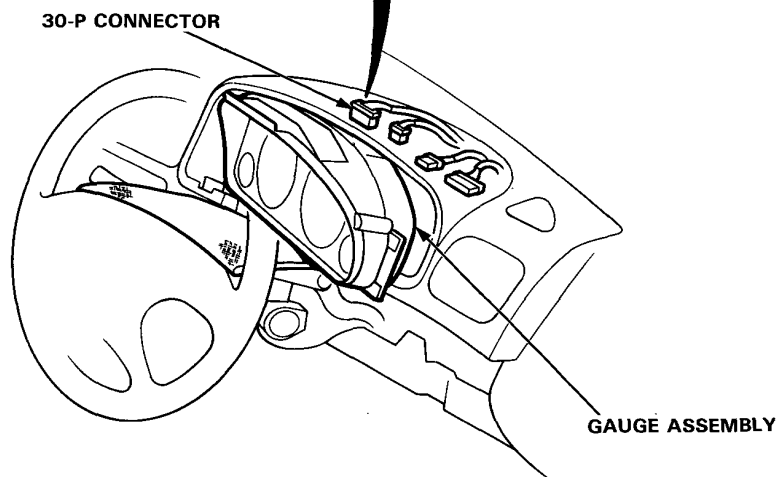
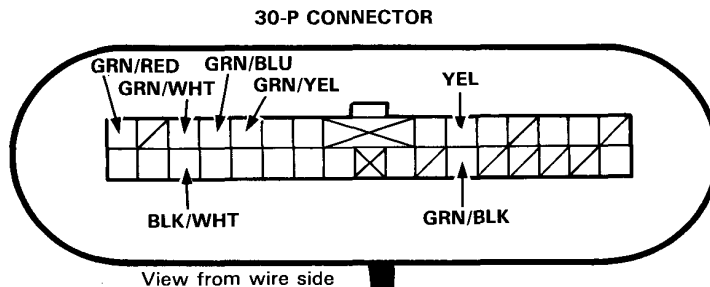
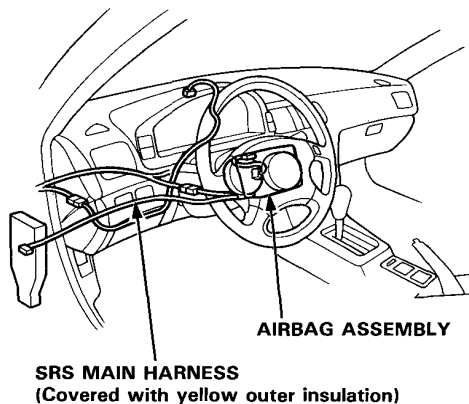
Indicator Input Test

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

1. Remove the gauge assembly (see page 23-124) and disconnect all connectors from it.
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 30-P 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 main printed circuit board.





No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained.
1	YEL	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 8 (10 A) fuse in the under-dash fuse/relay box• An open in the wire
2	GRN/BLK	Trunk lid open	Check for continuity to ground: There should be continuity. NOTE: Before testing, remove No. 29 (15 A) fuse in the under-hood fuse/relay box.	<ul style="list-style-type: none">• Faulty trunk latch switch• Poor ground (LHD: G501, RHD: G701)• An open in the wire
3	BLK/WHT	Front ceiling light switch in "MIDDLE" position	Connect to ground: Ceiling lights should come on.	<ul style="list-style-type: none">• Faulty entry light timer circuit• Blown No. 29 (15 A) fuse in the under-hood fuse/relay box• Faulty ceiling light• An open in the wire
4	GRN/BLU	Left front door open	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none">• Faulty door switch• An open in the wire
	GRN/RED	Right front door open		
	GRN/YEL	Left rear door open		
	GRN/WHT	Right rear door open		

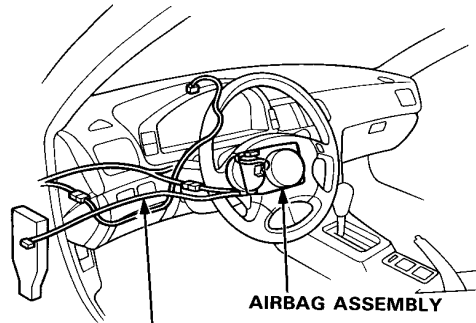
A/T Gear Position Indicator

Component Location Index

CAUTION:

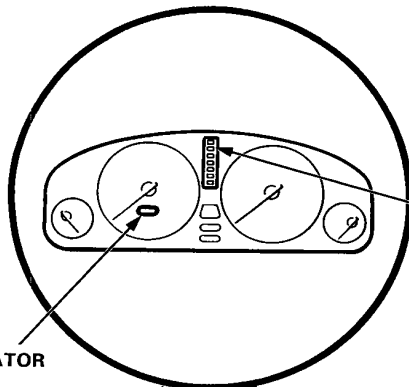
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown, RHD type is similar.



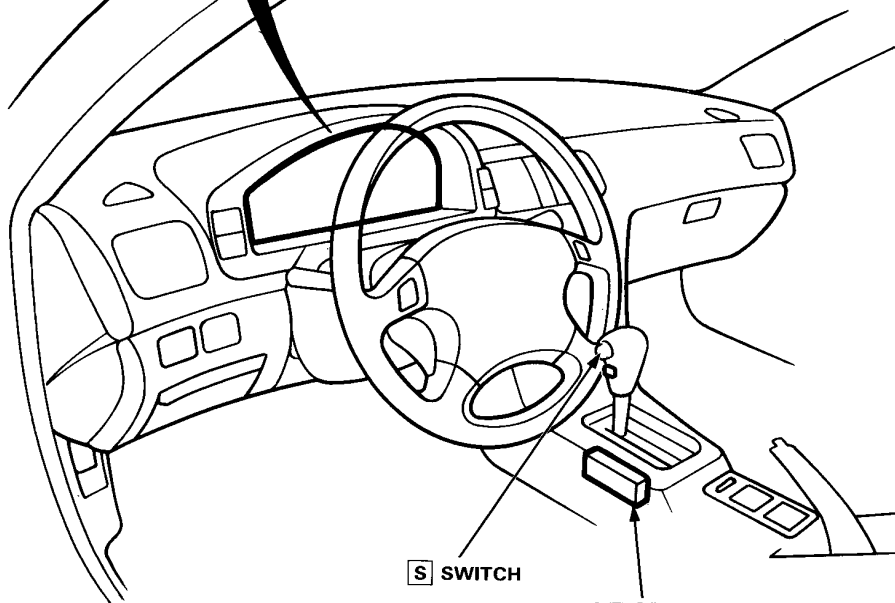
SRS MAIN HARNESS
(Covered with yellow outer insulation)

AIRBAG ASSEMBLY



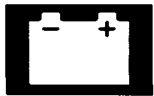
A/T GEAR POSITION INDICATOR
Input Test, page 23-140
Bulb Replacement, page 23-143

S INDICATOR

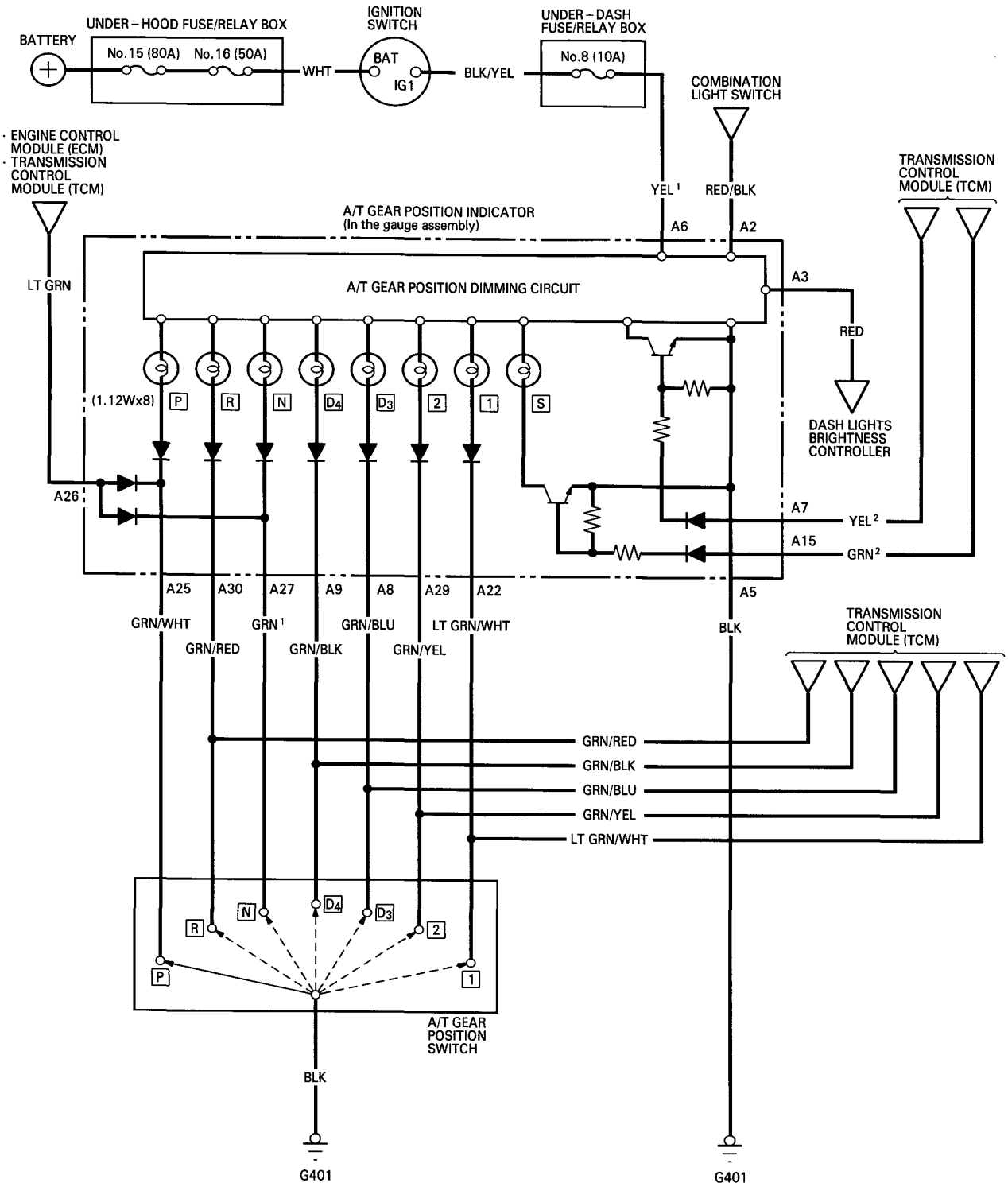


S SWITCH

A/T GEAR POSITION SWITCH
Test, page 23-142
Replacement, page 23-143



Circuit Diagram



A/T Gear Position Indicator

Indicator Input Test

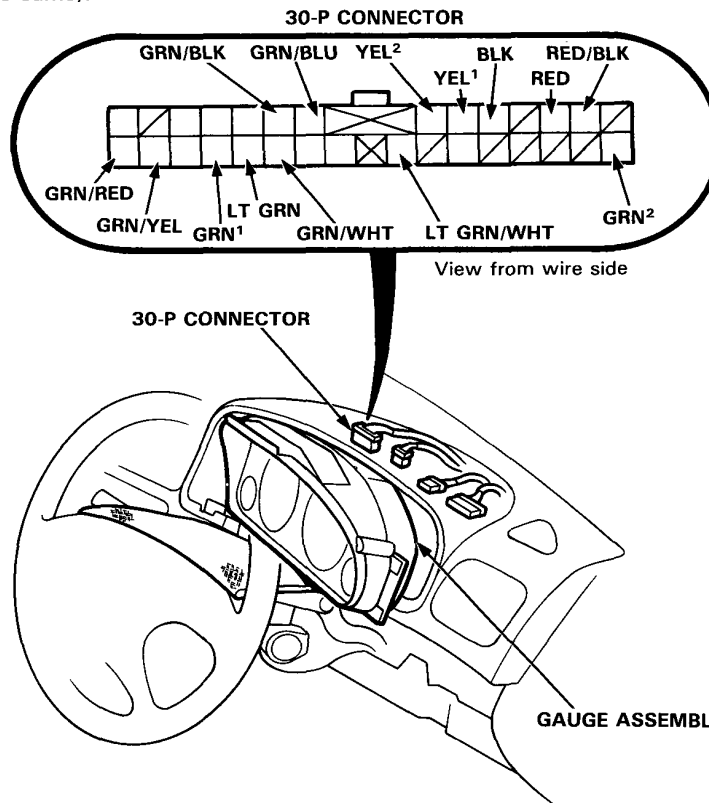
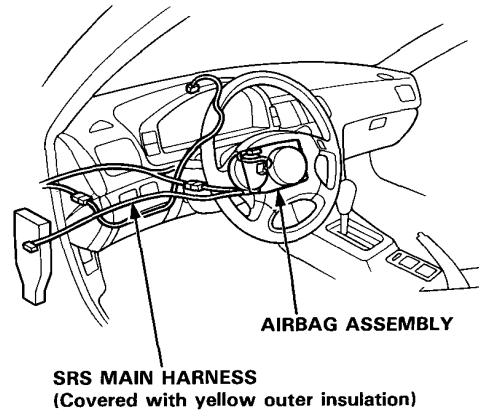
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

1. Remove the gauge assembly (see page 23-124) and disconnect all connectors from it.
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 30-P 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 main printed circuit board.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, YEL¹ and YEL² are not the same).





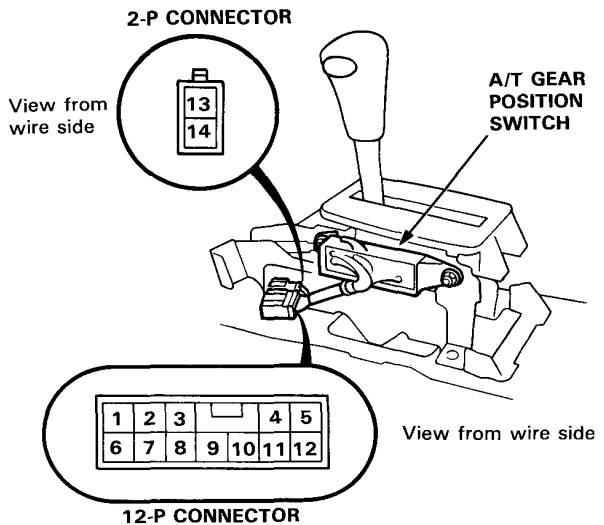
No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	YEL ¹	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 8 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
3	GRN/WHT	Ignition switch OFF, and shift lever in each position	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty A/T gear position switch • Poor ground (G401) • An open in the wire
	GRN/RED			
	GRN			
	GRN/BLK			
	GRN/BLU			
	GRN/YEL			
	LT GRN/WHT			
4	RED/BLK	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (30 A) fuse in the under-hood fuse/relay box • Blown No. 13 (10 A) fuse in the auxiliary fuse holder • Faulty combination light switch • An open in the wire
5	GRN ²	Ignition switch ON and shift lever in any position except D₃ and D₄	Check for voltage to ground: There should be battery voltage for about two seconds after ignition switch ON (bulb check function).	<ul style="list-style-type: none"> • Faulty transmission control module (TCM) • An open in the wire
		Ignition switch ON, shift lever in D₃ or D₄ , and S switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty S switch • Faulty A/T gear position switch • Faulty TCM • An open in the wire
6	YEL ²	Ignition switch ON, shift lever in D₃ or D₄ , and S switch ON	Check for voltage to ground: There should be about 5 V.	<ul style="list-style-type: none"> • Faulty S switch • Faulty A/T gear position switch • Faulty TCM • An open in the wire
7	LT GRN	Ignition switch ON	Check for voltage to ground: There should be about 5 V.	<ul style="list-style-type: none"> • Faulty engine control module (ECM) • Faulty TCM • An open in the wire

A/T Gear Position Indicator

A/T Gear Position Switch Test/Adjustment

Test:

1. Remove the console, then disconnect the 12-P and 2-P connectors from the switch.
2. Check for continuity between the terminals in each switch position according to the table.
 - Move the lever back and forth at each position without touching the push button, 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 below.



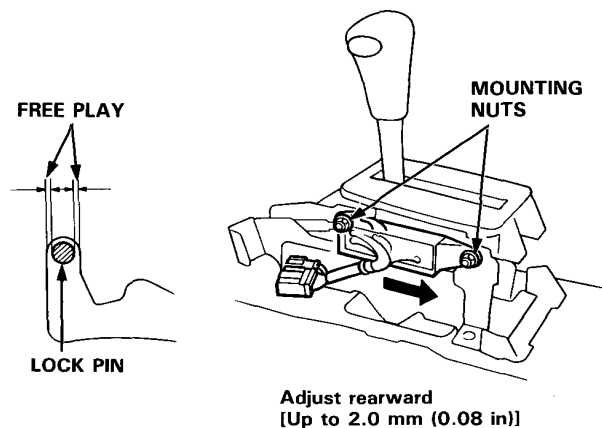
Terminal Position	A/T Gear Position Switch								Back – up Light Switch		Neutral Position Switch	
	8	1	2	3	4	6	7	11	9	10	13	14
1	○				○							
2	○			○								
D3	○		○									
D4	○	○										
N	○					○					○	○
R	○						○		○	○		
P	○							○			○	○

Adjustment:

1. Shift to **P** and loosen the mounting nuts.
2. Slide the switch rearward [up to 2.0 mm (0.08 in)] until there is continuity between No. 8 and No. 11 terminals within the range of free play of the shift lever.
3. Recheck for continuity between each of terminals.

NOTE:

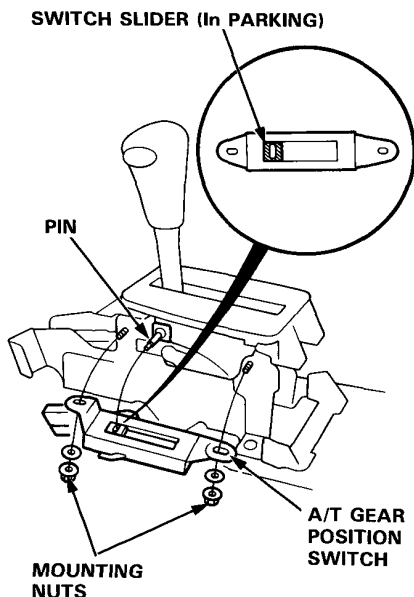
- If adjustment is not possible, check for damaged shift lever detent and/or bracket. If there is no damage, replace the A/T gear position switch.
- The engine should start when the shift lever is in **P** anywhere within the range of free play.





A/T Gear Position Switch Replacement

1. Remove the console, then disconnect the 12-P and 2-P connectors from the switch.
2. Remove the two mounting nuts and the switch.



3. Position the slider of the new switch to "Parking" as shown above.
4. Shift the lever to "Parking".
5. Attach the switch, and tighten the two mounting nuts.
6. Test the switch in the **P** and **N** positions.

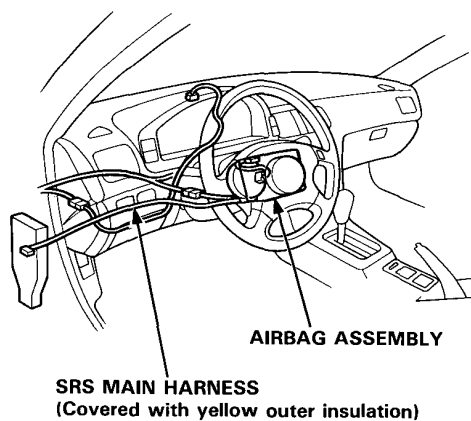
NOTE: The engine should start when the shift lever is in **P** anywhere within the range of free play.

7. Connect the 12-P and 2-P connectors, clamp the harness, and install the console.

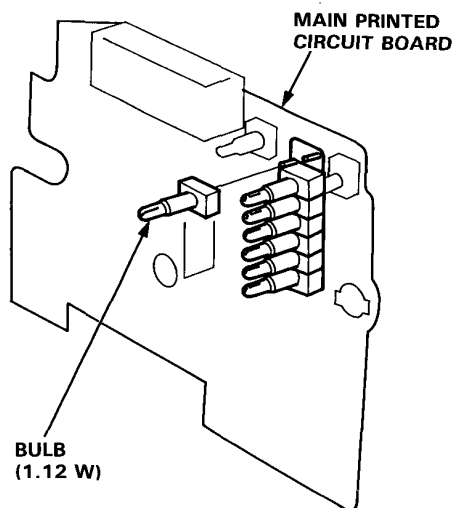
Bulb Replacement

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



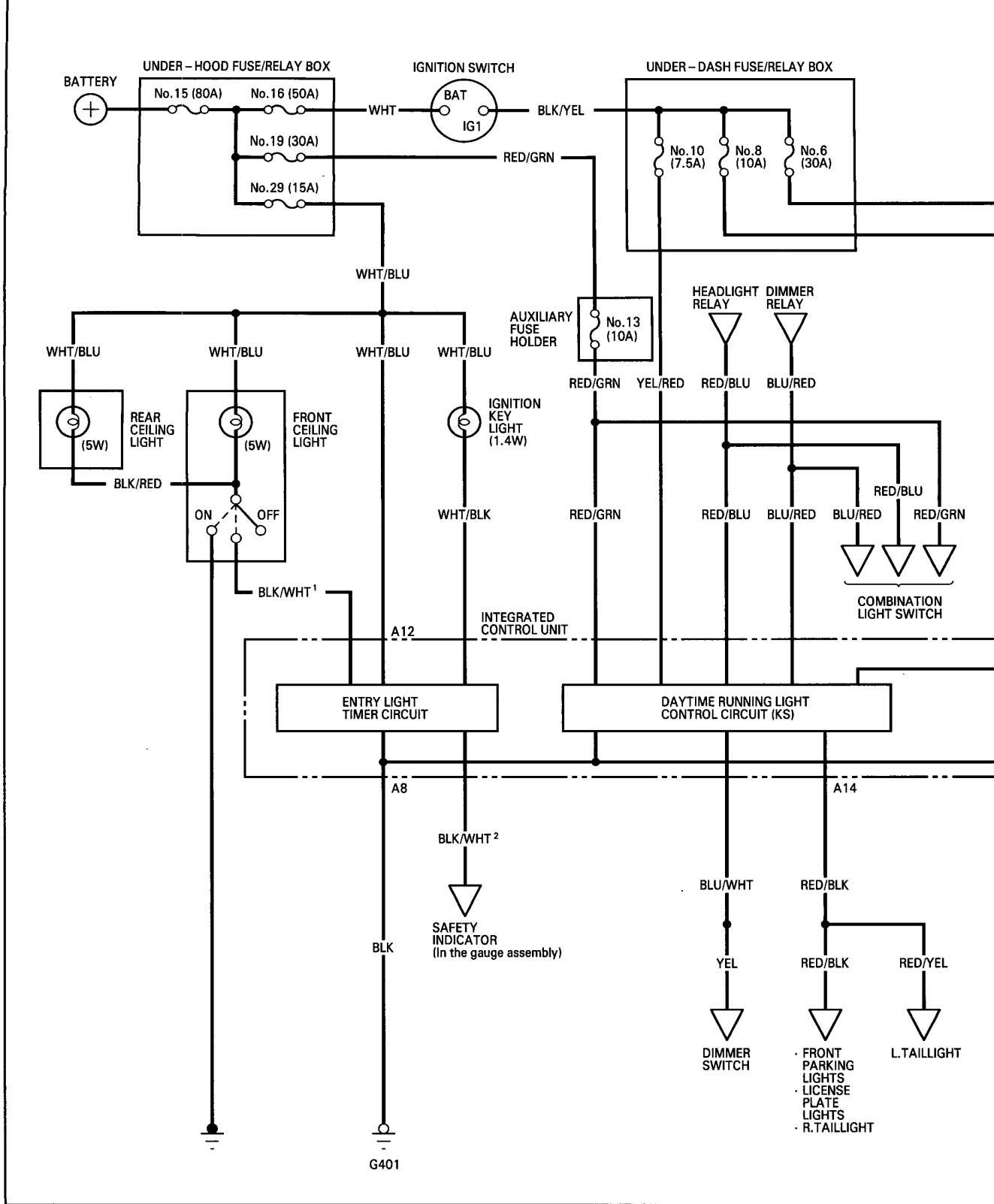
1. Remove the gauge assembly (see page 23-124).
2. Disassemble the gauge assembly (see page 23-123).
3. Replace the bulbs at the main printed circuit board.

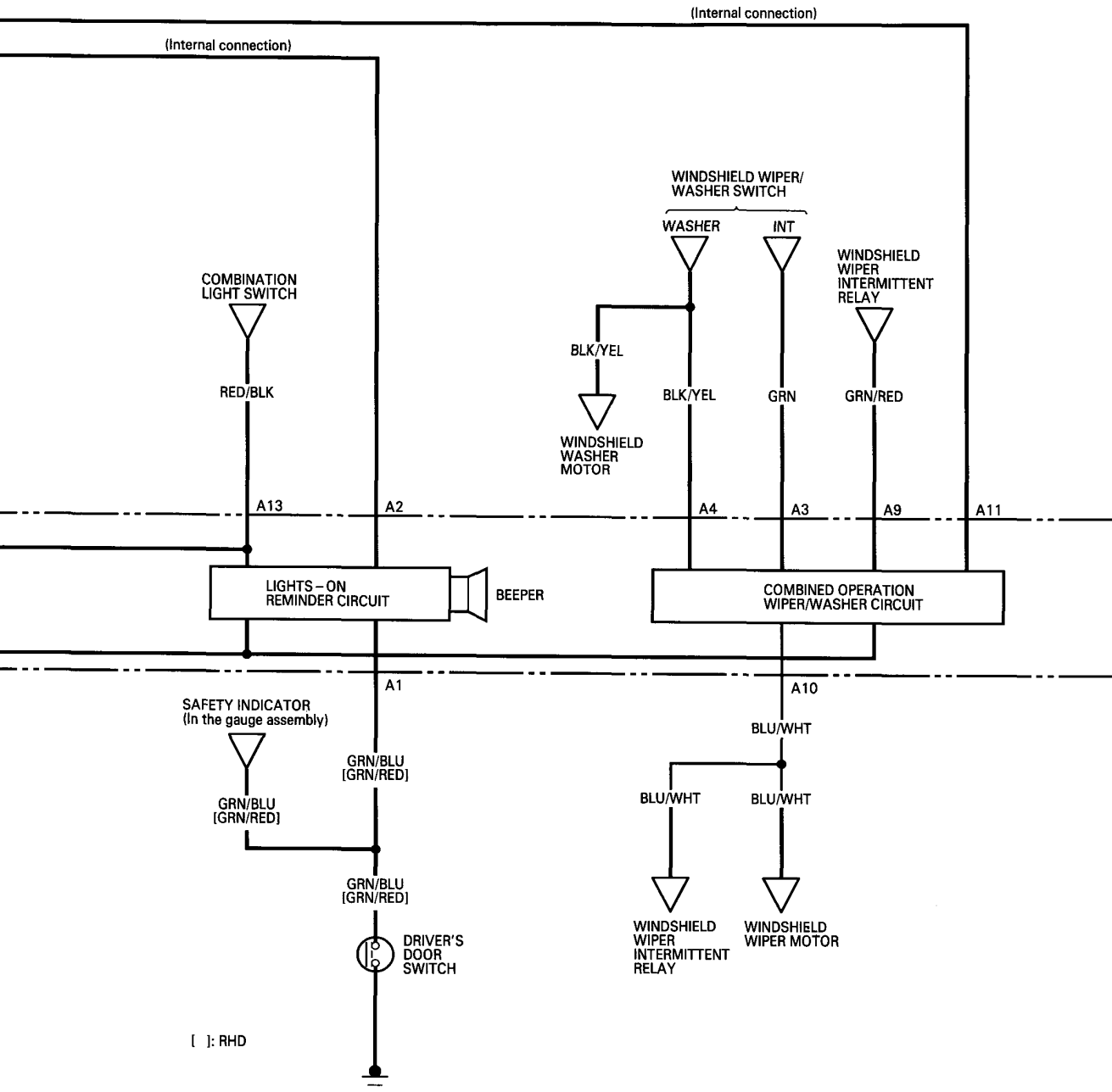


4. Install in the reverse order of removal.

Integrated Control Unit

Circuit Diagram





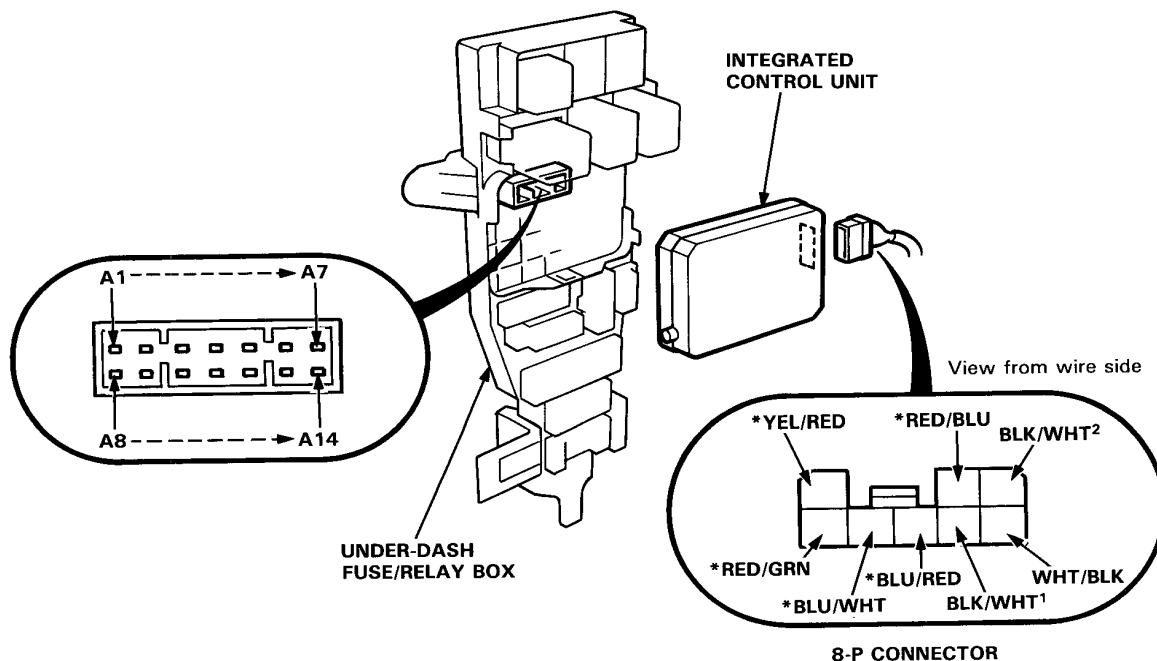
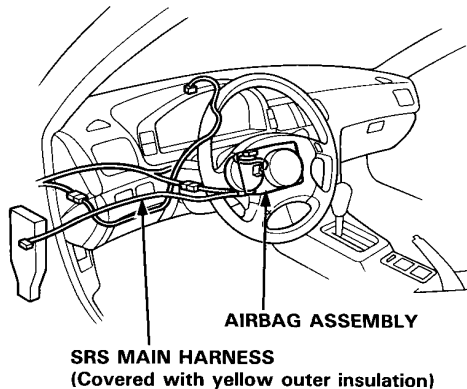
Integrated Control Unit

Input Test

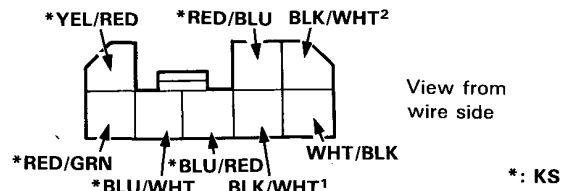
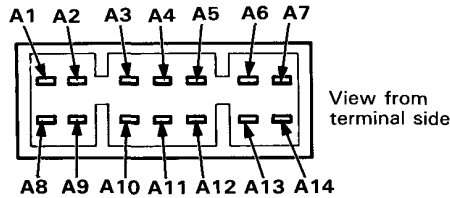
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

1. Remove the driver's side kick panel, then disconnect the 8-P connector from the integrated control unit.
2. Remove the integrated control unit from the under-dash fuse/relay box.
3. Inspect the connector and the 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 socket.
 - If a 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.



*: KS



Entry Light Timer System:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	A8	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	A12	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 29 (15 A) fuse in the under-hood fuse/relay box • An open in the wire
3	WHT/BLK	Under all conditions	Connect to ground: Ignition key light should come on.	<ul style="list-style-type: none"> • Blown bulb • An open in the wire
4	BLK/WHT ¹	Front ceiling light switch in "MIDDLE" position	Connect to ground: Ceiling lights should come on.	<ul style="list-style-type: none"> • Blown No. 29 (15 A) fuse in the under-hood fuse/relay box • Faulty front ceiling light switch • Blown bulb • An open in the wire
5	BLK/WHT ²	Driver's door open	Check for voltage to ground: There should be 1 V or less. NOTE: Use a digital multimeter.	<ul style="list-style-type: none"> • Faulty driver's door switch • An open in the wire

Daytime Running Lights System (KS):

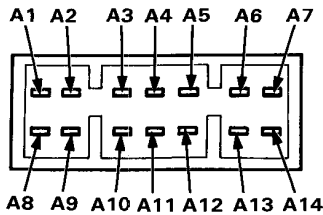
NOTE: Before performing the input test, check No. 13 (10 A) fuse in the auxiliary fuse holder.

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	A8	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	RED/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (30 A) fuse in the under-hood fuse/relay box • An open in the wire
3	A13	Headlight switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (30 A) fuse in the under-hood fuse/relay box • Faulty combination light switch • An open in the wire
4	RED/BLU	Combination light switch ON (second position "D")	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty combination light switch • Faulty headlight relay • An open in the wire
5	BLU/RED	Passing switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty combination light switch • Faulty headlight relay • Faulty dimmer relay • An open in the wire
6	YEL/RED	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 10 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
7	A14	Connect the RED/GRN terminal to the A14 terminal	Front position lights, taillights and license plate lights should come on.	<ul style="list-style-type: none"> • Blown bulbs • An open in the wire
8	BLU/WHT	Dimmer switch HI	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty combination light switch • Poor ground (G401) • An open in the wire

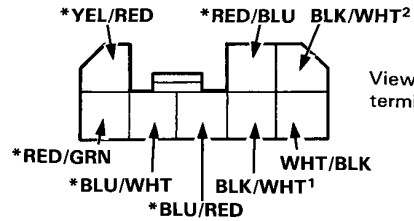
(cont'd)

Integrated Control Unit

Input Test (cont'd)



View from terminal side



View from terminal side

*: KS

Lights-on Reminder System:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	A8	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	A13	Headlight switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 19 (30 A) fuse in the under-hood fuse/relay box • Blown No. 13 (10 A) fuse in the auxiliary fuse holder • Faulty combination light switch • An open in the wire
3	A2	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 8 (10 A) fuse in the under-dash fuse/relay box • An open in the wire
4	A1	Driver's door open	Check for voltage to ground: There should be 1 V or less. NOTE: Use a digital multimeter.	<ul style="list-style-type: none"> • Faulty driver's door switch • An open in the wire

Wiper/Washer System:

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	A8	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	A11	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 6 (30 A) fuse in the under-dash fuse/relay box • Faulty wiper intermittent relay • An open in the wire
3	A3	Ignition switch ON and wiper switch in "INT" position	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 6 (30 A) fuse in the under-dash fuse/relay box • Faulty wiper switch • An open in the wire
4	A4	Ignition switch ON and washer switch ON	Check for voltage to ground: There should be battery voltage	<ul style="list-style-type: none"> • Blown No. 6 (30 A) fuse in the under-dash fuse/relay box • Faulty washer switch • An open in the wire
5	A9	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 6 (30 A) fuse in the under-dash fuse/relay box • Faulty wiper intermittent relay • Faulty windshield wiper motor • An open in the wire
6	A10	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 6 (30 A) fuse in the under-dash fuse/relay box • An open in the wire

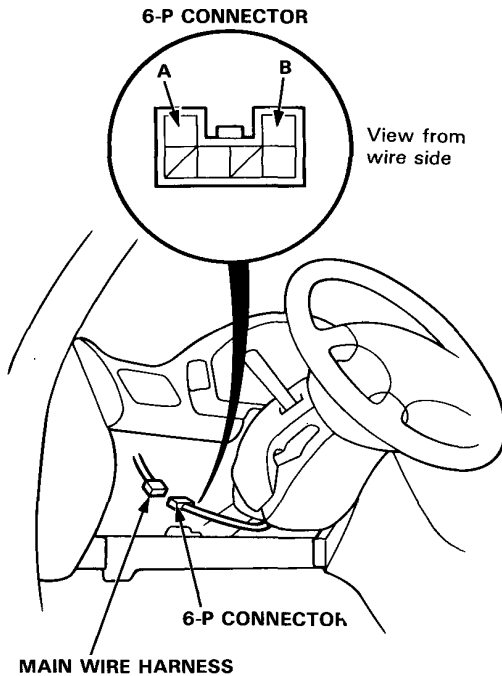


Entry Light Timer System

Ignition Key Light Test

NOTE: For the entry light timer circuit input test to page 23-147.

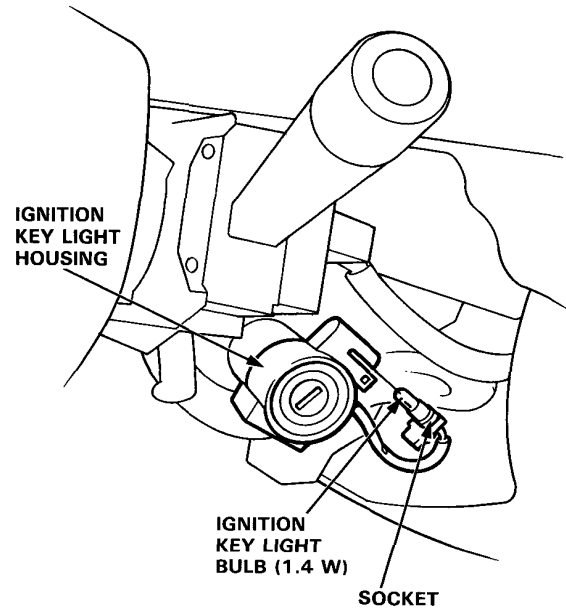
1. Remove the dashboard lower cover (see page 23-63).
2. Disconnect the 6-P connector from the main wire harness.



3. Check for continuity between the A and B terminals. If there is no continuity, check for:
 - a blown bulb of the ignition key light.
 - an open in the wire.

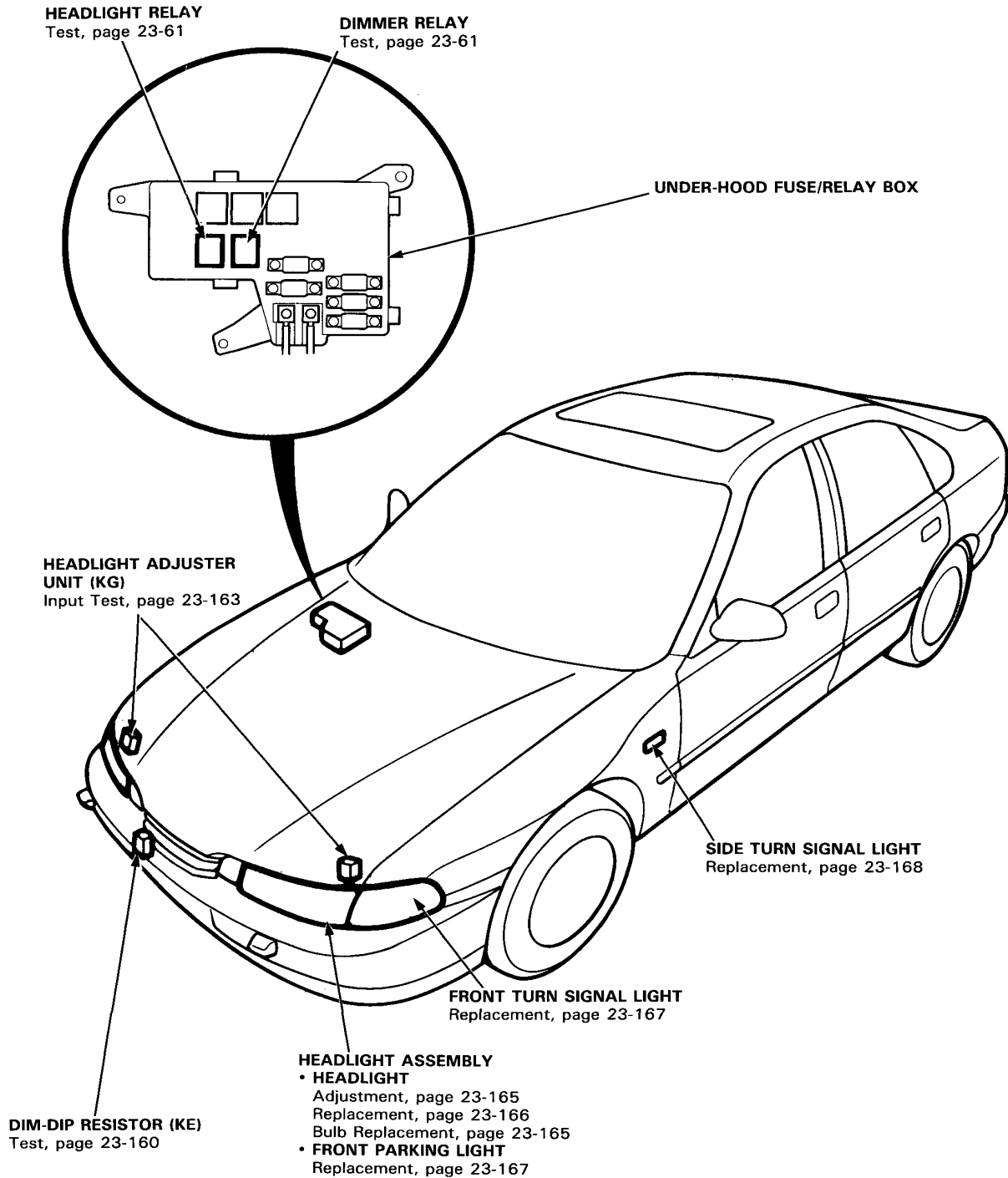
Ignition Key Light Replacement

1. Remove the steering column covers (see page 23-65).
2. Remove the bulb/socket from the key light housing by turning the socket 45° counterclockwise.



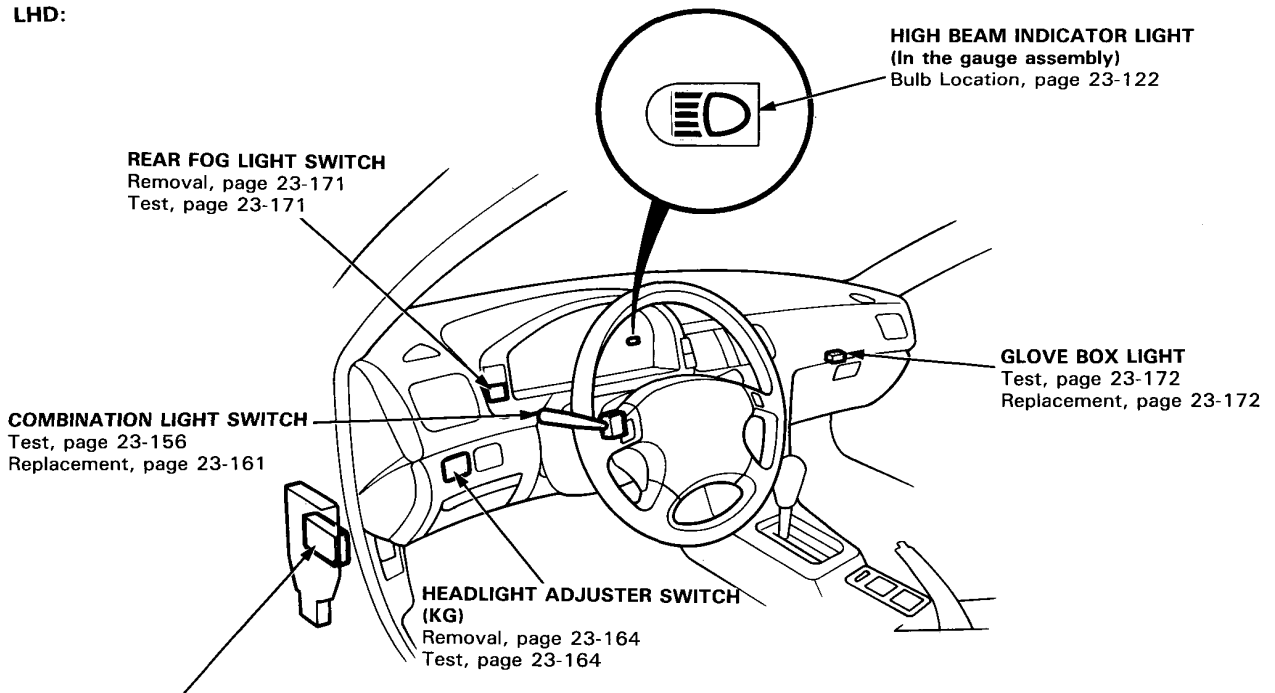
Lighting System

Component Location Index



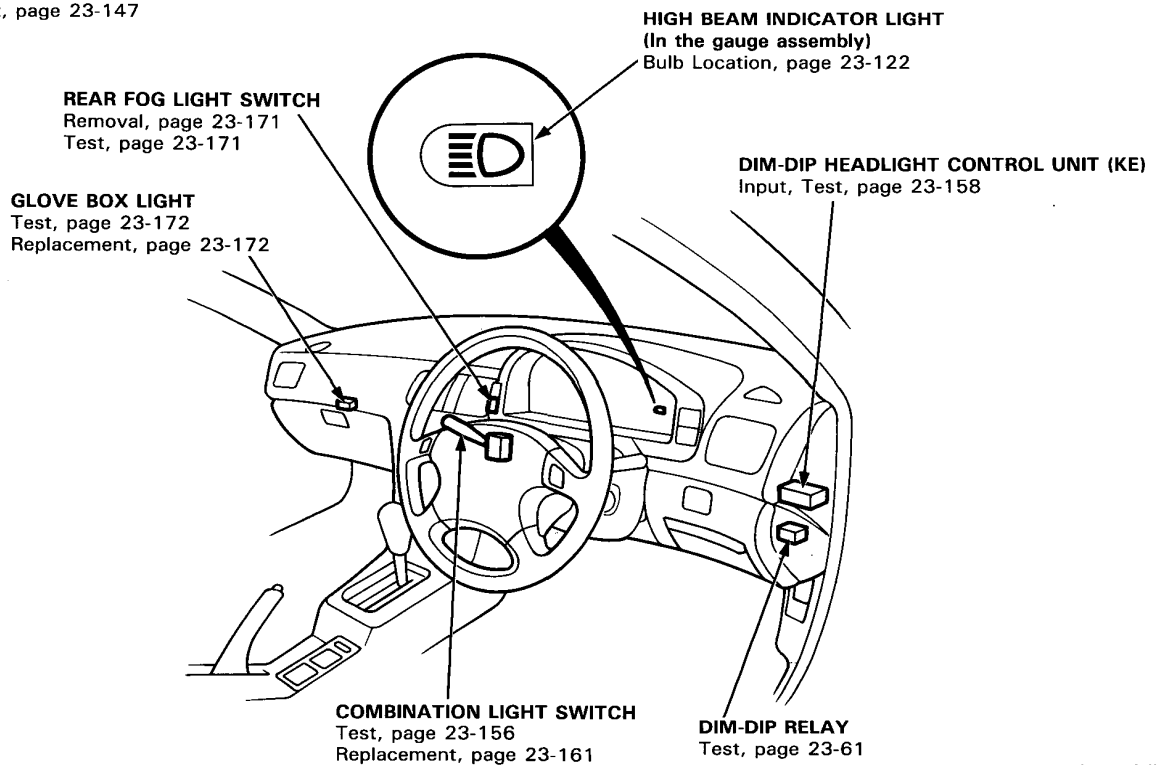


LHD:



DAYTIME RUNNING LIGHTS CONTROL CIRCUIT (KS)
(In the integrated control unit)
Input Test, page 23-147

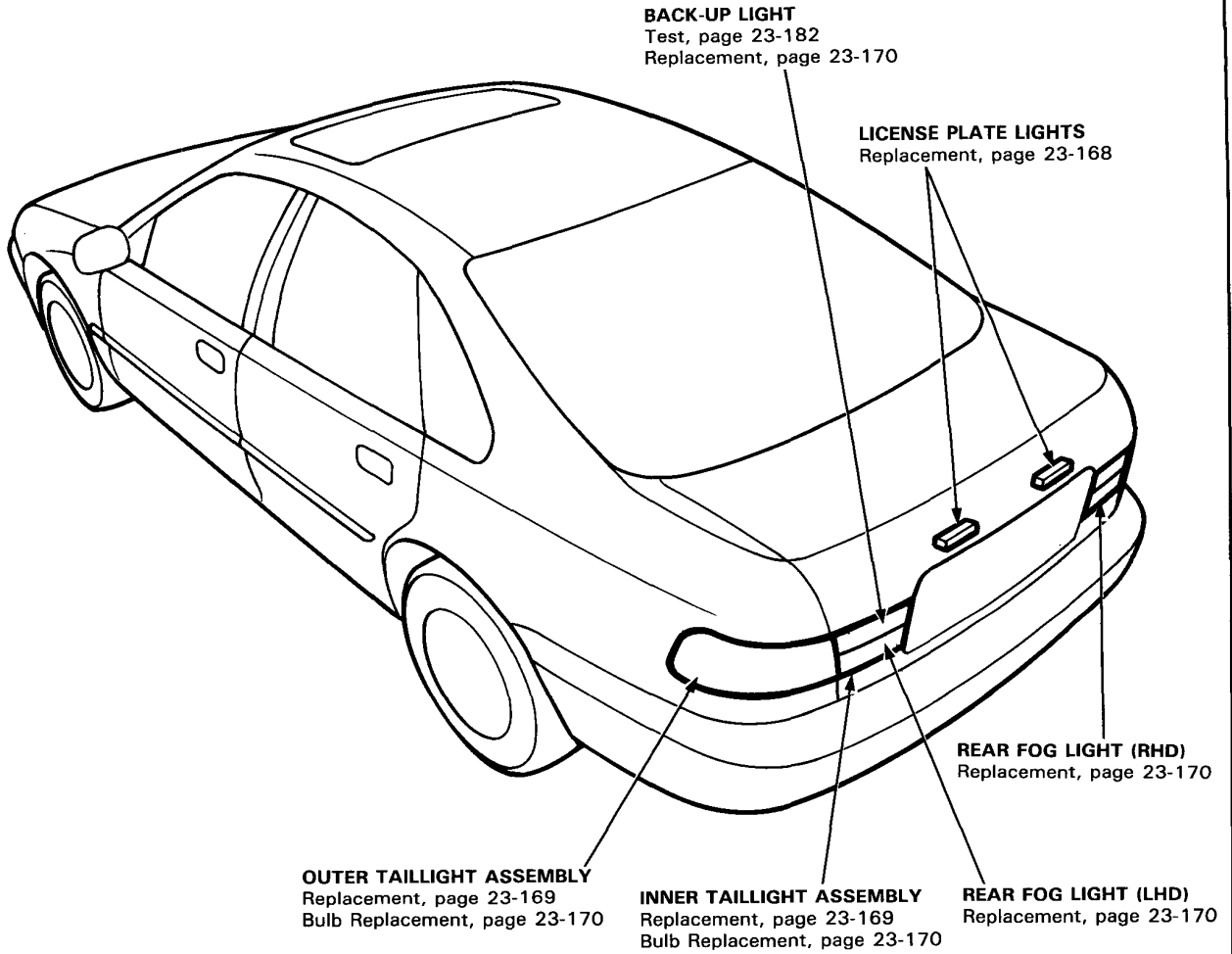
RHD:



(cont'd)

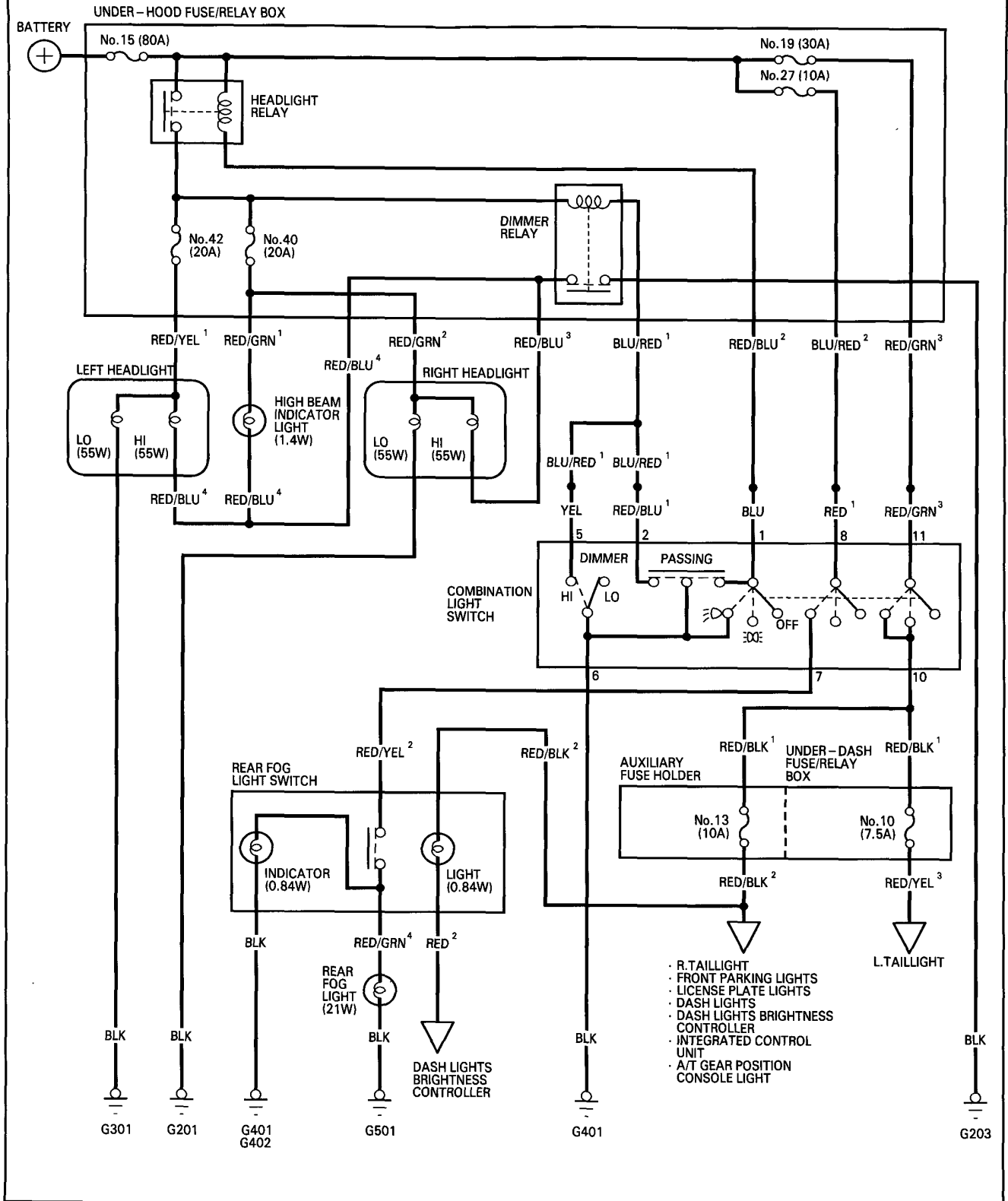
Lighting System

Component Location Index (cont'd)



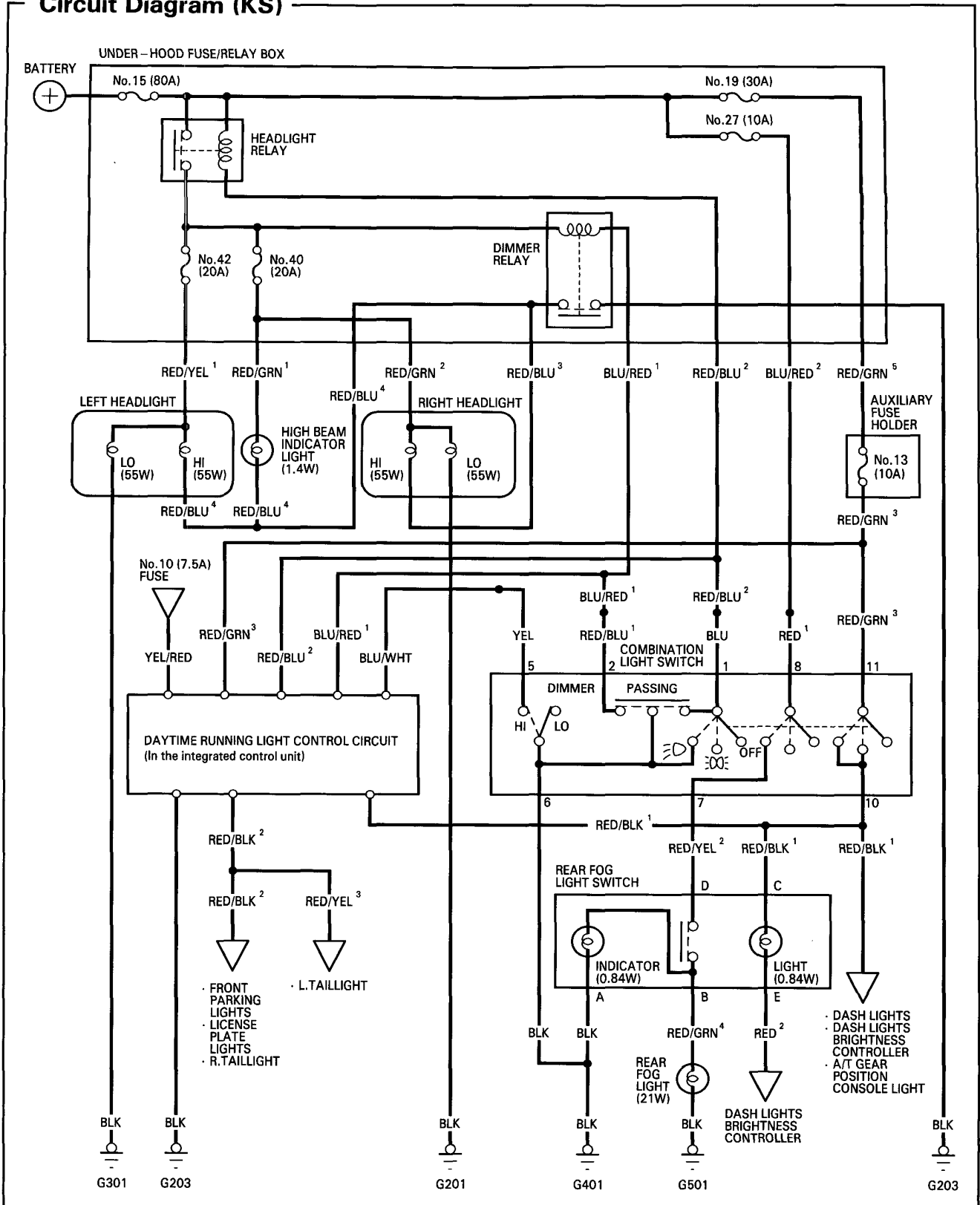


Circuit Diagram (KF and KG)



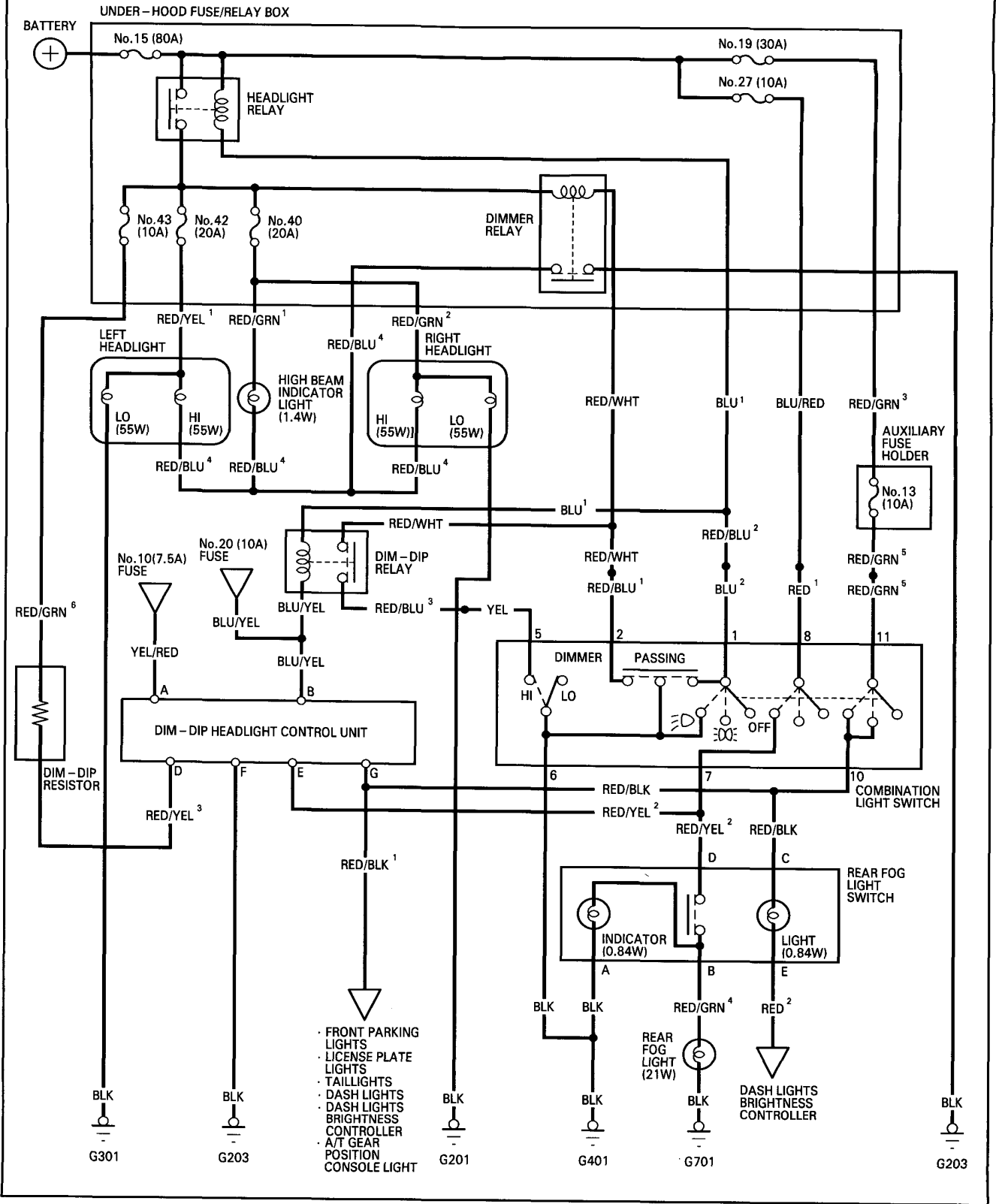
Lighting System

Circuit Diagram (KS)





Circuit Diagram (KE)



Lighting System

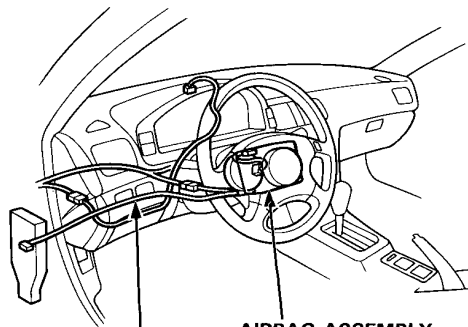
Combination Light Switch Test

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

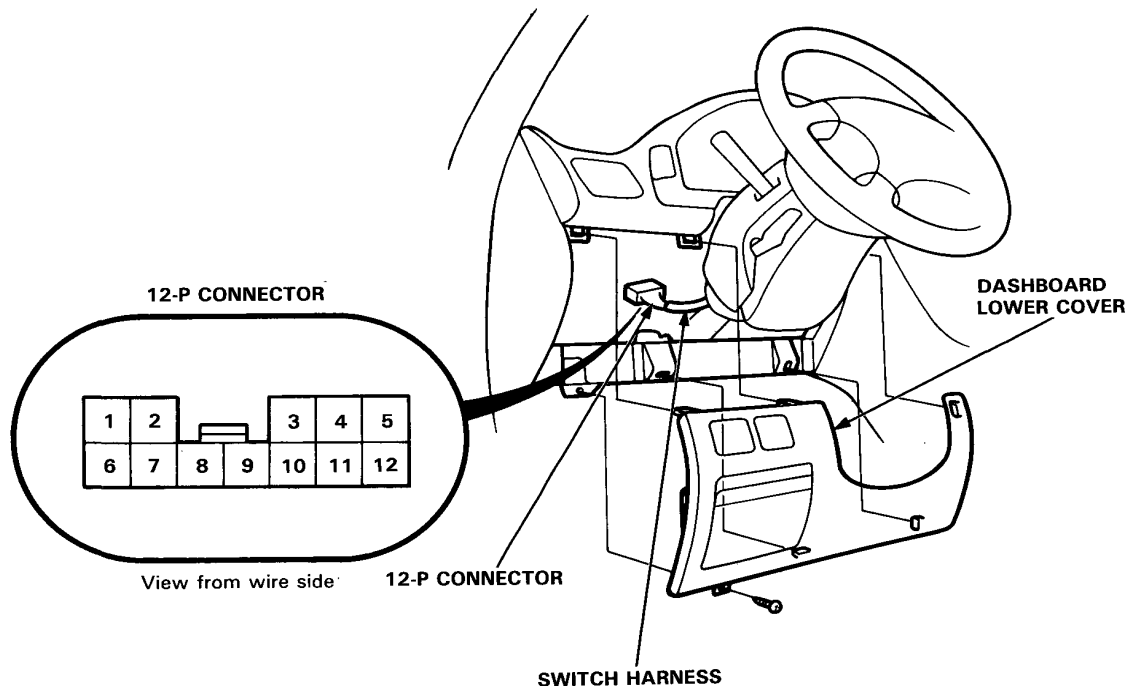
1. Remove the dashboard lower cover (see page 23-63).
2. Disconnect the 12-P connector from the main wire harness.
3. Inspect the connector terminals to be sure they are all making good contact.

- If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
- If the terminals look OK, check for continuity between them in each switch position according to the tables.
 - If there is no continuity between them, check for continuity in the switch harness.
 - If there is continuity in the harness, replace the combination light switch.



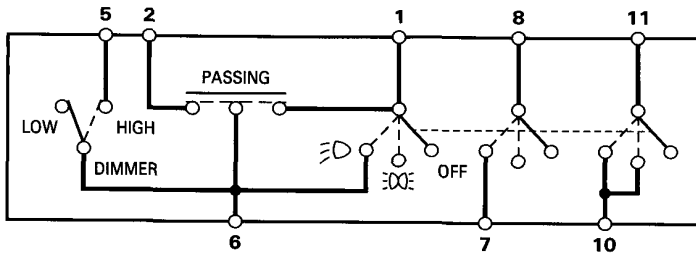
AIRBAG ASSEMBLY

SRS MAIN HARNESS
(Covered with yellow outer insulation)



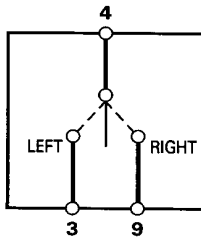


Headlight/Dimmer/Passing Switch:



Terminal		1	2	5	6	7	8	10	11
Headlight switch	OFF								
	☸							○—○	
	☸	○—○				○—○	○—○	○—○	
Passing switch (Headlight switch "OFF")	OFF								
	ON	○—○	○—○		○—○				
Passing switch (Headlight switch "☸")	OFF	○—○			○—○				
	ON	○—○	○—○		○—○				
Dimmer switch	LOW								
	HIGH			○—○	○—○				

Turn Signal Switch:



Terminal	3	4	9
RIGHT		○—○	
(Neutral)			
LEFT	○—○		

NOTE: For the turn signal circuit diagram refer to page 23 – 185.

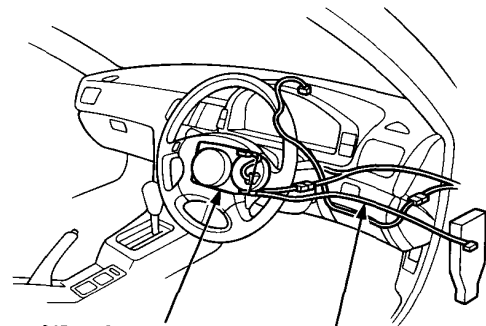
Lighting System

Dim-dip Headlight Control Unit Input Test (KE)

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

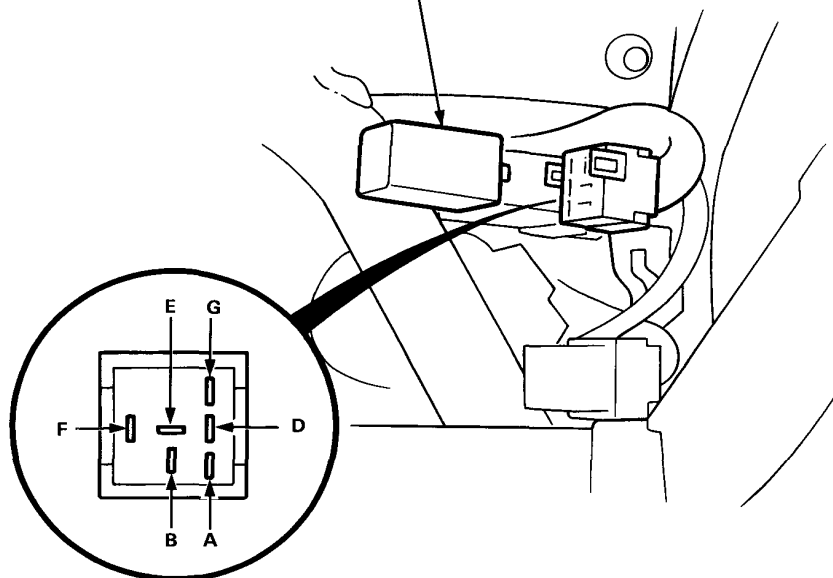
1. Remove the dashboard lower cover (see page 23-63).
2. Inspect the control unit and socket terminals to be sure they are all making good contact.
 - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - If the terminals look OK, make the following input tests at the socket.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the dim-dip headlight control unit must be faulty; replace it.



AIRBAG ASSEMBLY

SRS MAIN HARNESS
(Covered with yellow outer insulation)

DIM-DIP HEADLIGHT CONTROL UNIT



View from terminal side



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	F	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none">• Poor ground (G203)• An open in the wire
2	B	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 20 (10 A) fuse in the under-hood fuse/relay box• Faulty dim-dip relay• Faulty combination light switch• An open in the wire
3	A	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 10 (7.5 A) fuse in the under-dash fuse/relay box• An open in the wire
4	E	Headlight switch ON (second position "D")	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 27 (10 A) fuse in the under-hood fuse/relay box• Faulty combination light switch• An open in the wire
5	G	Headlight switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 19 (30 A) fuse in the under-hood fuse/relay box• Blown No. 13 (10 A) fuse in the auxiliary fuse holder• Faulty combination light switch• An open in the wire
6	D	Headlight switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 43 (10 A) fuse in the under-hood fuse/relay box• Faulty headlight relay• Faulty dim-dip resistor• Faulty combination light switch• Poor ground (G401)• An open in the wire

Lighting System

Dim-dip Resistor Test (KE)

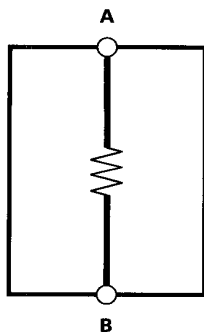
CAUTION: The dim-dip resistor becomes very hot when using the dim-dip headlights. Do not touch it or the attaching hardware immediately after they have been turned off.

1. Disconnect the 2-P connector from the resistor.
2. Using an ohmmeter, measure resistance between the A and B terminals. Replace the resistor if the resistance is not within specifications.

NOTE: Resistance will vary with the resistor temperature before and after use.

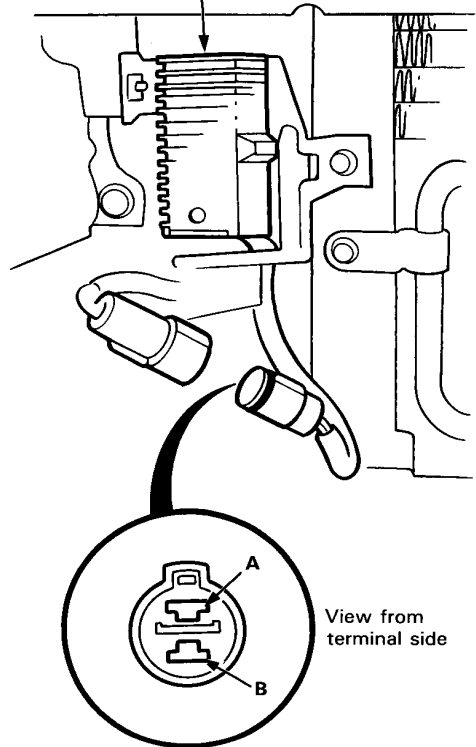
Resistance: 0.68–0.79 ohms

From No.43 (10A) FUSE



To DIM - DIP
HEADLIGHT
CONTROL UNIT

RESISTOR
(Located in the right front
of the engine compartment)



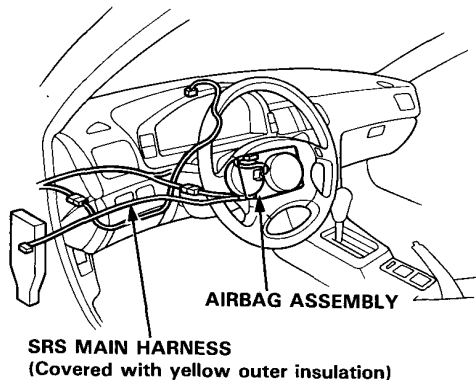
3. If it is not within specifications, replace the dim-dip resistor.



Combination Light Switch Replacement

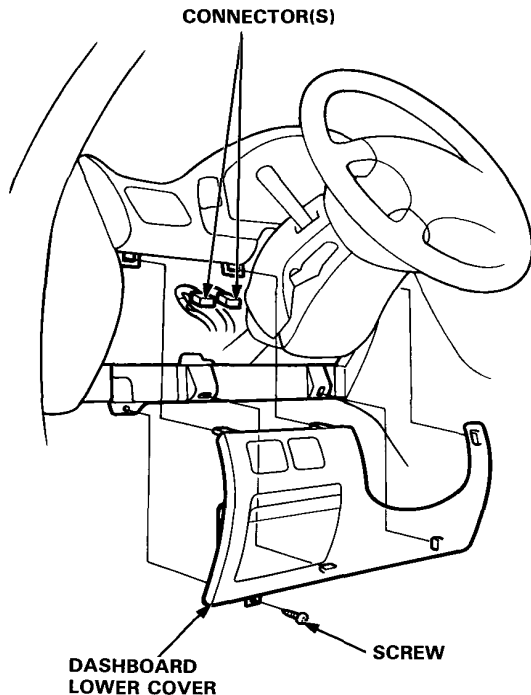
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

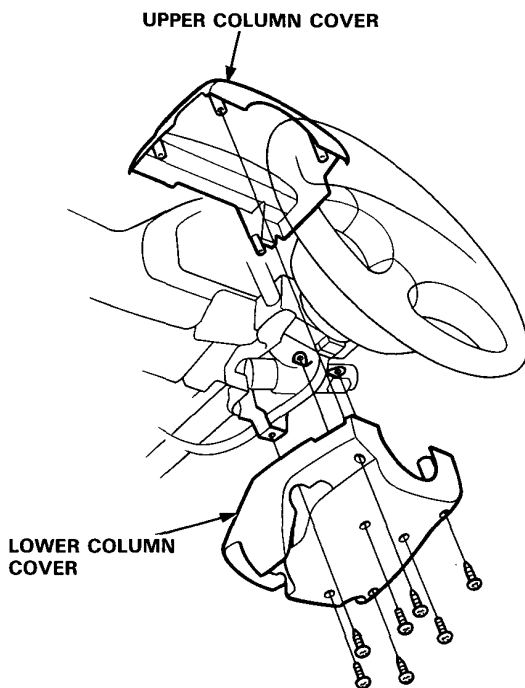


NOTE: LHD type is shown, RHD type is similar.

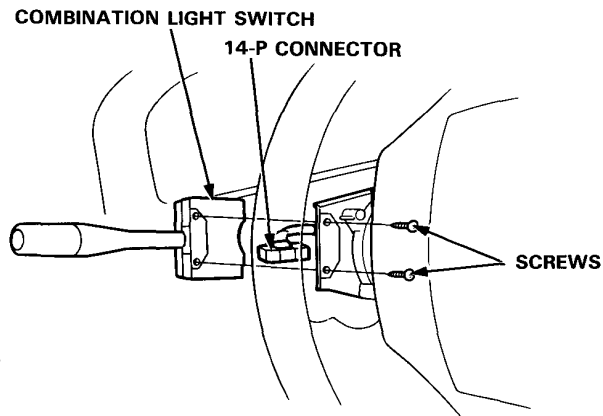
1. Remove the screw and dashboard lower cover, then disconnect the connector(s) from the switch(es).



2. Remove the steering column covers.

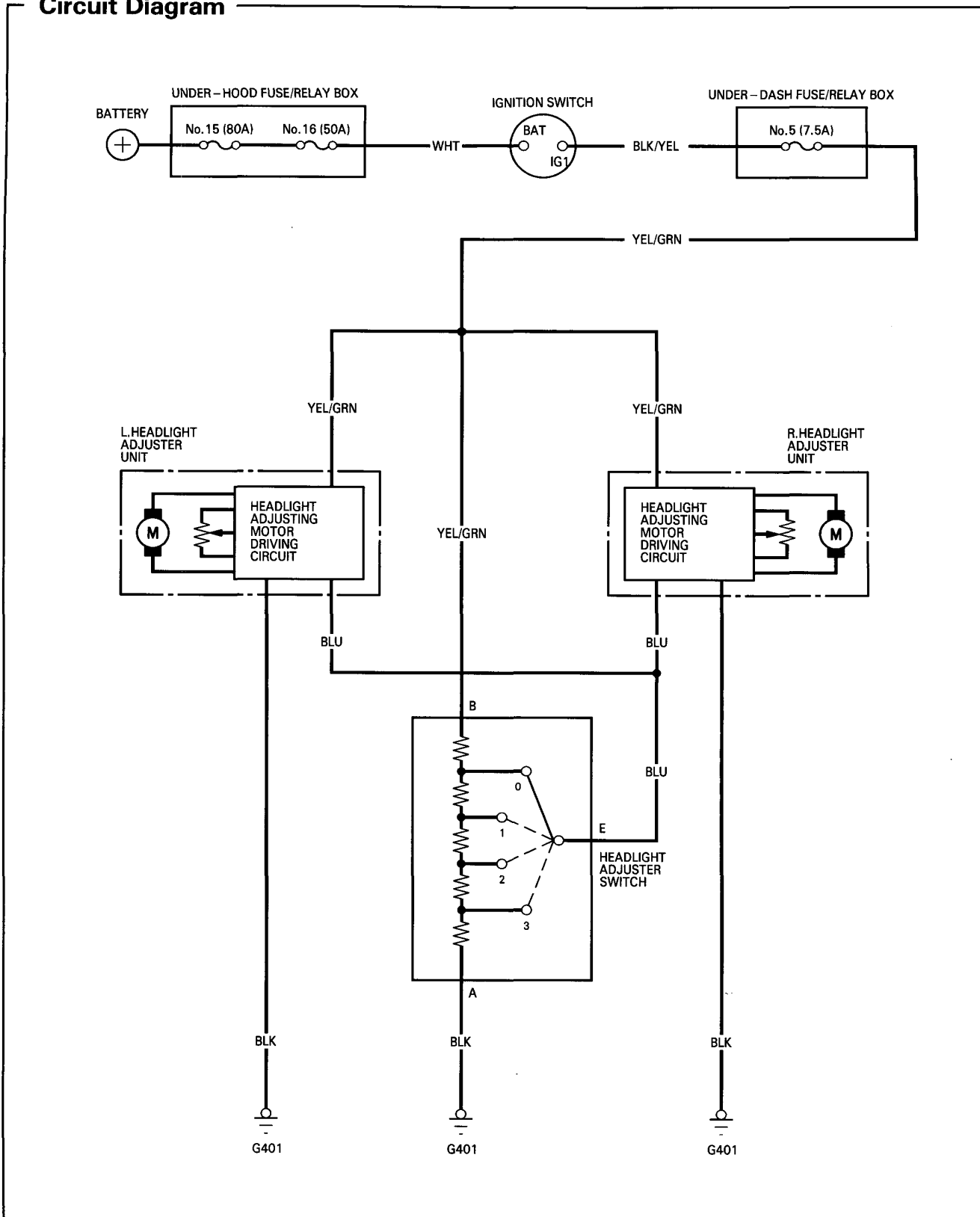


3. Disconnect the 14-P connector from the combination light switch, then remove the two screws and the switch.



Headlight Adjuster (KG)

Circuit Diagram



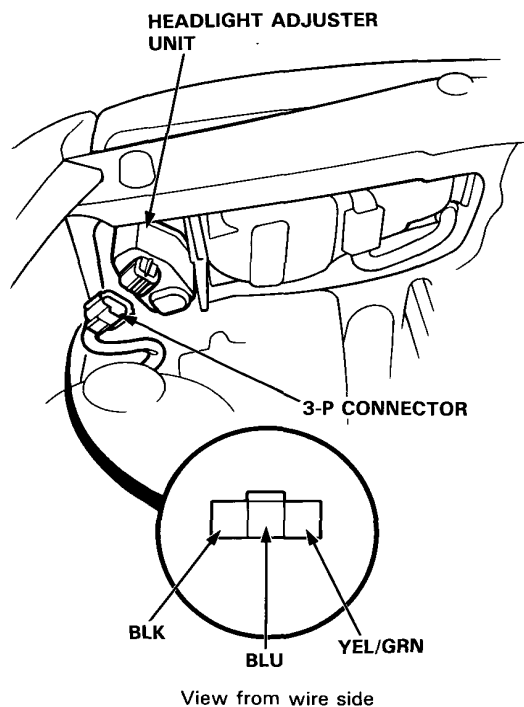


Headlight Adjuster Unit Input Test

NOTE: Before testing, check for:

- blown No. 5 (7.5 A) fuse in the under-dash fuse/relay box.
- bent, loose or corroded terminals.

1. Disconnect the 3-P connectors from each headlight adjuster unit.



2. Check for continuity between the 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 YEL/GRN terminal and body ground with the ignition switch ON (II). There should be battery voltage.

- If there is no voltage, check for an open in the YEL/GRN wire.
- If there is battery voltage, go to step 4.

4. Check for continuity between the BLU terminal and body ground in any switch position. There should be continuity.

- If there is no continuity, check for:
 - an open in the BLU wire.
 - faulty headlight adjuster switch.
- If there is continuity, go to step 5.

5. If all input tests prove OK, but the headlight adjuster does not work, check for frozen, stuck or improperly installed headlight adjuster unit. If mechanical check is OK, replace the headlight adjuster unit.

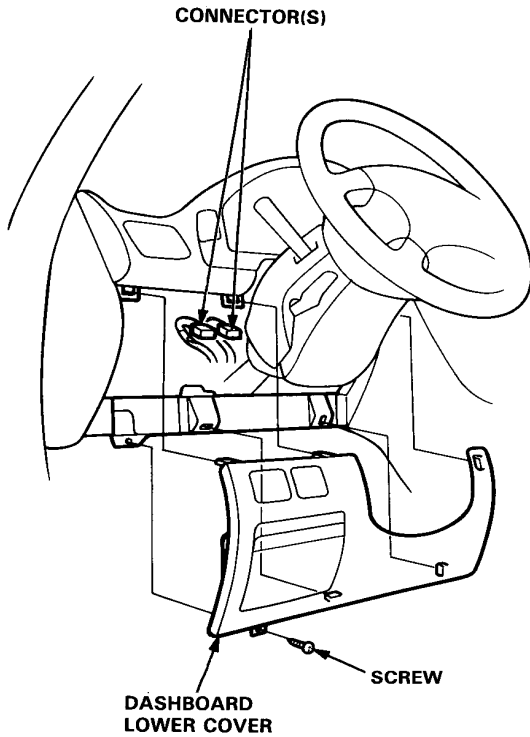
6. After installing, recheck the system.

Headlight Adjuster (KG)

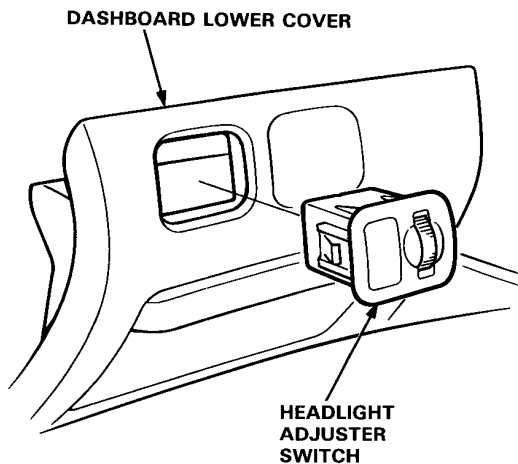
Switch Removal

CAUTION: Be careful not to damage the dashboard lower cover.

1. Remove the screw and dashboard lower cover, then disconnect the connector(s) from the switch(es).

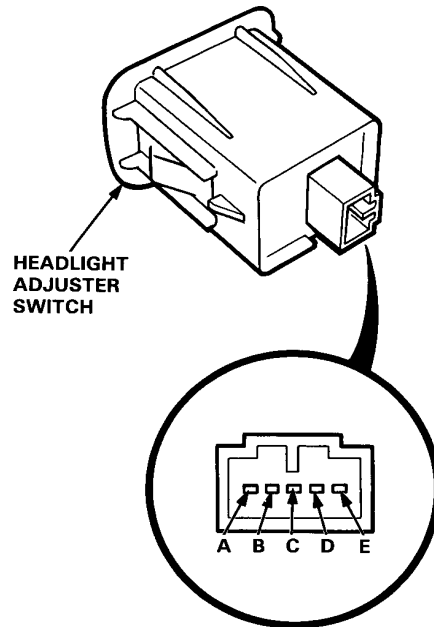


2. Push the switch out from behind the dashboard lower cover.



Switch Test

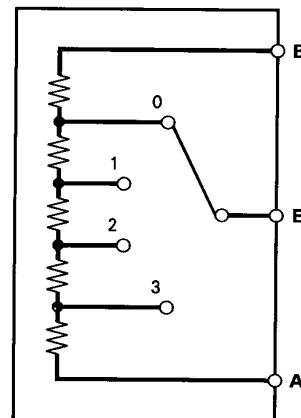
1. Remove the switch and disconnect the connector from it.
2. Measure the resistance between the A and B terminals, and then measure the resistance between the B and E terminals at positions 0, 1, 2, and 3 by rotating the dial.



Between A and B: Approx. 996 Ω

Between B and E:

Dial Position	0	1	2	3
Resistance [Approx. (Ω)]	562	731	815	910





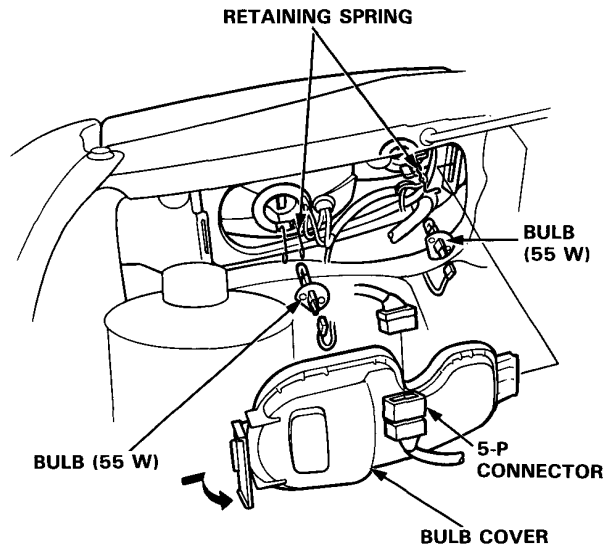
Headlights

Bulb Replacement

CAUTION:

- Halogen headlights can become very hot in use: do not touch them or the attaching hardware immediately after they have been turned off.
- Do not try to replace or clean the headlights with the lights on.
- Do not touch the glass of the halogen bulbs.

1. Disconnect the 5-P connector from the headlight.
2. Open the bulb cover.
3. Turn the retaining spring out and disconnect the connector from each bulb, then replace the bulb.



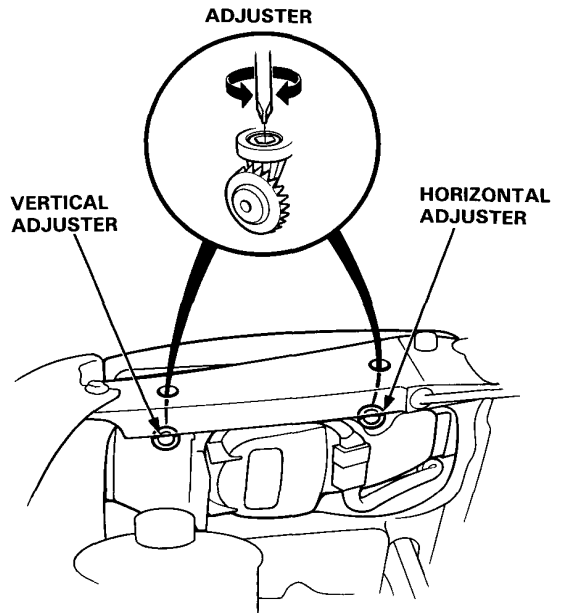
Adjustment

CAUTION:

- Halogen headlights can become very hot in use: do not touch them or the attaching hardware immediately after they have been turned off.
- Do not try to replace or clean the headlights with the lights on.

NOTE: Adjust the headlights to local requirements.

1. Adjust them by turning the adjusters with a hexagon wrench or a Phillips screwdriver.



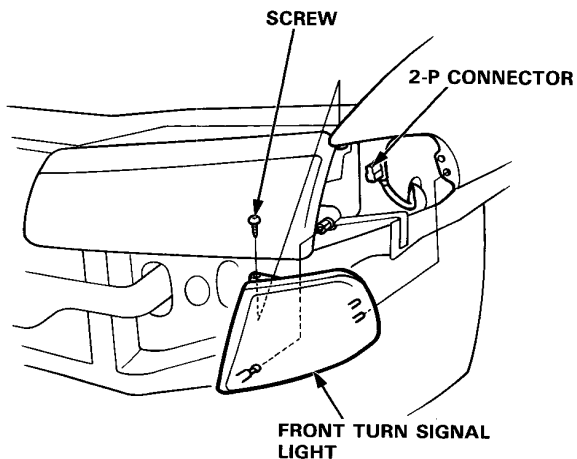
Headlights

Headlight Replacement

CAUTION:

- Halogen headlights can become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.
- Do not try to replace or clean the headlights with the lights on.
- Do not touch the glass of the halogen bulbs.

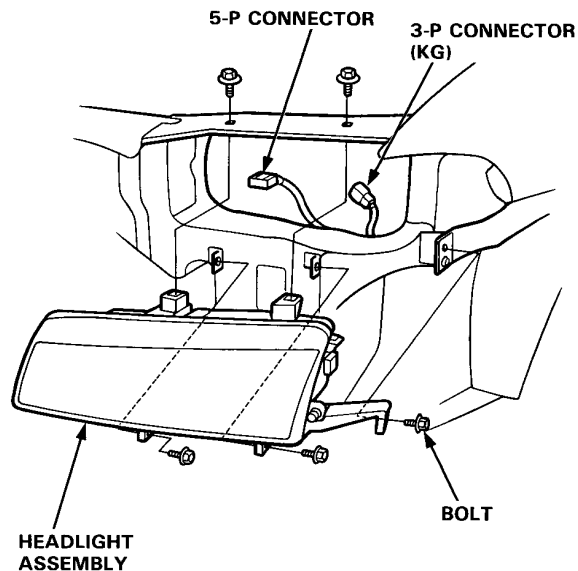
1. Remove the screw and pull out the front turn signal light.
2. Disconnect the 2-P connector from the front turn signal light and remove the light.
3. Remove the front grille and front bumper (see section 20).



4. Disconnect the 5-P connector from the headlight.

NOTE: Disconnect the 3-P connector from the headlight adjuster unit (KG).

5. Remove the five bolts and the headlight assembly.

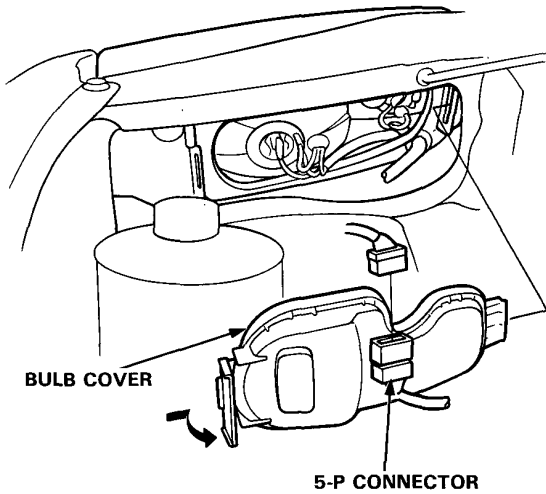


6. After installing the headlight, adjust it to local requirements.

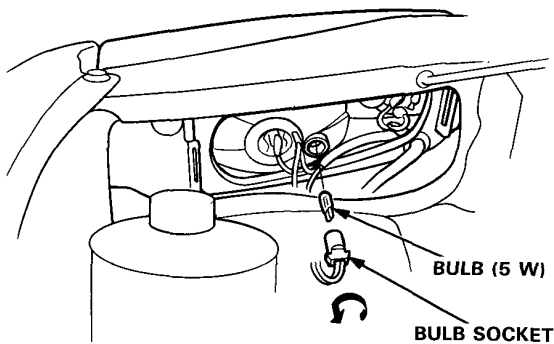
Front Parking Lights

Replacement

1. Disconnect the 5-P connector from the headlight.
2. Remove the bulb cover.



3. Turn the bulb socket 45° counterclockwise to remove it from the housing, then replace the bulb.



Front Turn Signal Lights

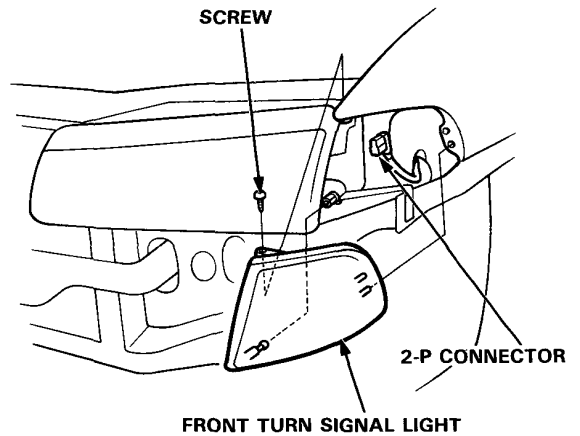


Replacement

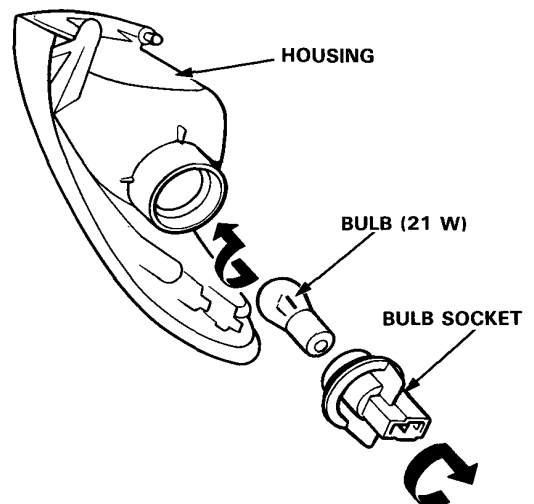
1. Remove the screw and separate the light from the headlight.

NOTE: Carefully remove the light without damaging the headlight and the front fender.

2. Disconnect the 2-P connector from the light.



3. Turn the bulb socket 45° counterclockwise to remove it from the housing, then replace the bulb.

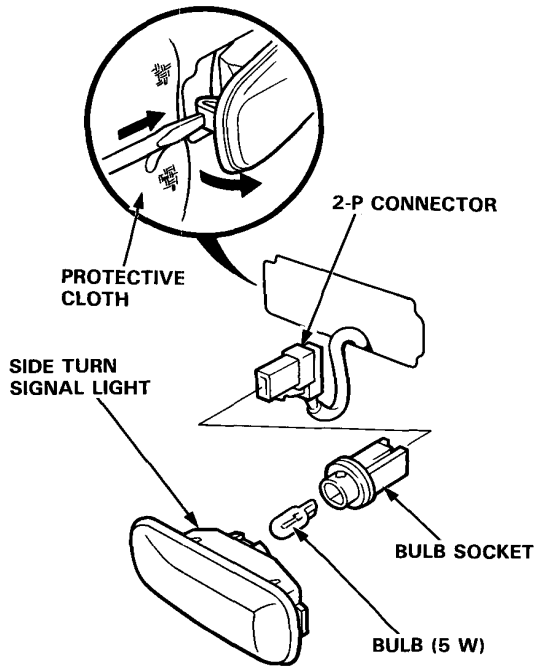


Side Turn Signal Lights

Replacement

CAUTION: Be careful not to damage the front fender.

1. Carefully remove the side turn signal light.

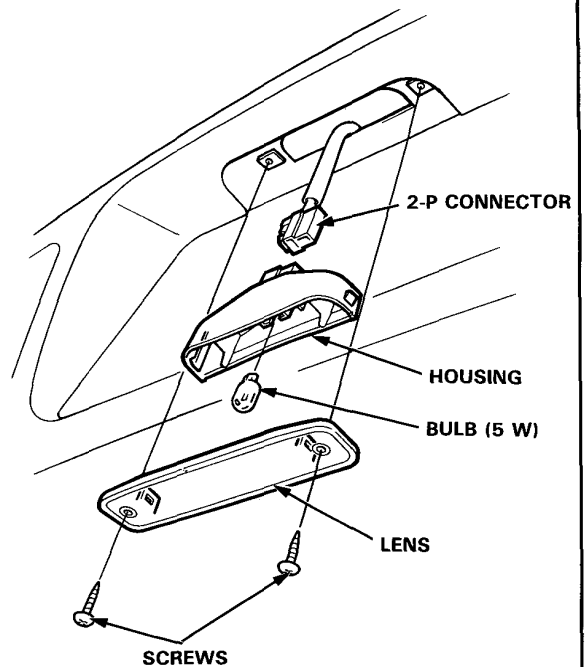


2. Disconnect the 2-P connector from the bulb socket.
3. Turn the bulb socket 45° counterclockwise to remove it from its housing.
4. Remove the bulb from the bulb socket.

License Plate Lights

Replacement

1. Remove the two screws from the license plate light and pull it out from the trunk lid.
2. Disconnect the 2-P connector from the license plate light and replace it.
3. In case of a bulb replacement, remove the lens and replace the bulb.



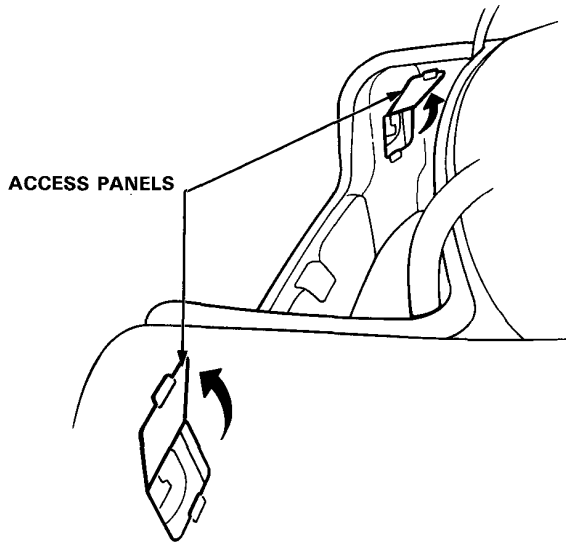


Taillights

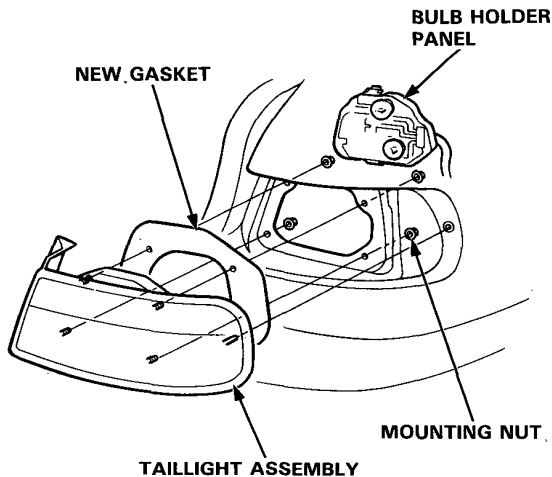
Replacement

Outer Taillight:

1. Open the trunk lid and access panels.

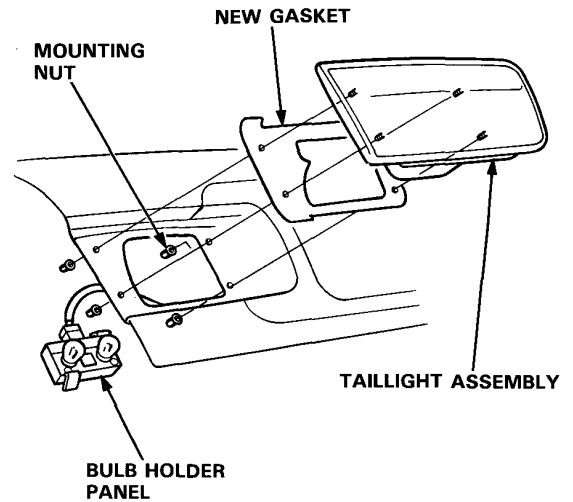


2. Disconnect the 12-P connector and remove the bulb holder panel.
3. Remove the four mounting nuts and replace the taillight assembly.



Inner Taillight:

1. Open the trunk lid.
2. Remove the bulb holder panel.
3. Remove the four mounting nuts from the backside of the trunk lid and replace the taillight assembly.

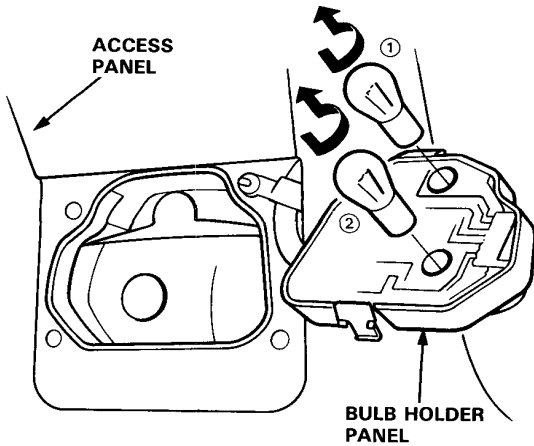


Taillights

Bulb Replacement

Outer Taillight:

1. Open the trunk lid and access panel.
2. Disconnect the 12-P connector and remove the bulb holder panel.



- ① TURN SIGNAL LIGHT BULB (21 W)
- ② BRAKE/TAILLIGHT BULB (21/5 W)

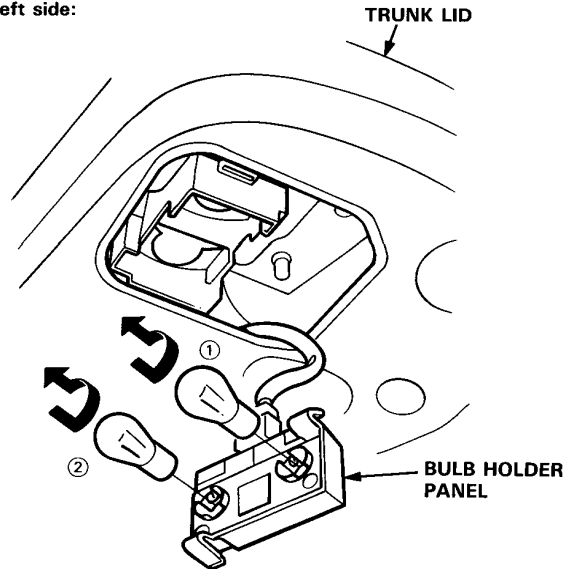
3. Turn the bulb 45° counterclockwise and replace it.

Inner Taillight:

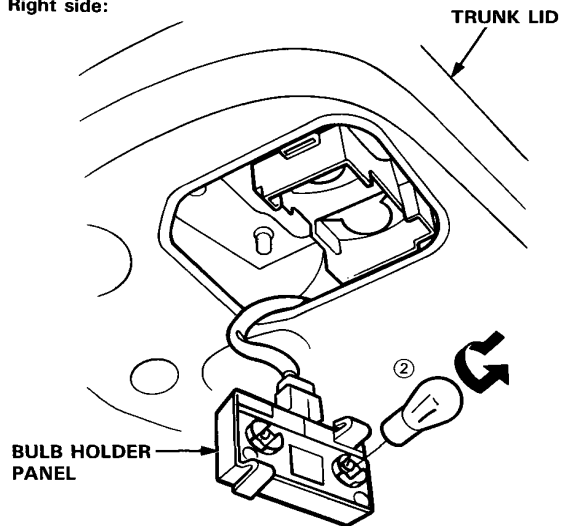
1. Open the trunk lid and access panel.
2. Remove the bulb holder panel.

NOTE: LHD type is shown, on RHD type, the rear fog light is located on the right side.

Left side:

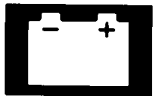


Right side:



- ① REAR FOG LIGHT BULB (21 W)
- ② BACK-UP LIGHT BULB (21 W)

3. Turn the bulb 45° counterclockwise and replace it.

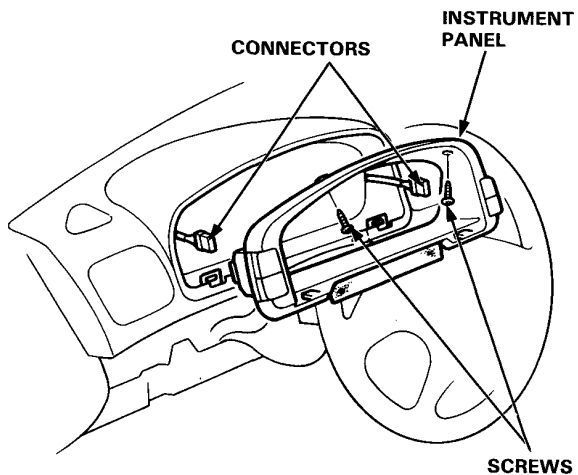


Rear Fog Light

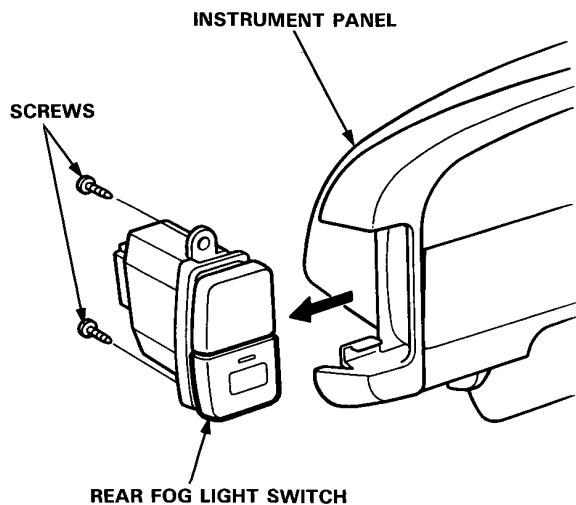
Switch Removal

NOTE: For the rear fog light bulb replacement refer to previous page.

1. Remove the two screws and instrument panel.
2. Disconnect each connector from the instrument panel.



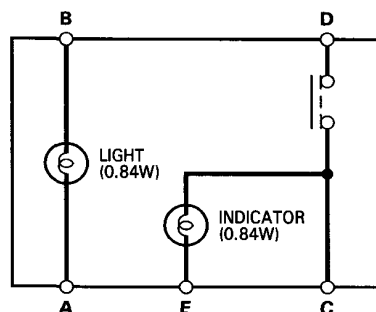
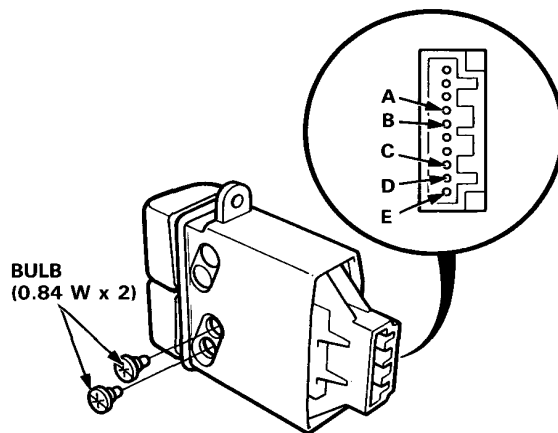
3. Remove the two screws and rear fog light switch.



Switch Test

1. Remove the rear fog light switch from the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A	B	C	D	E
OFF			○	○	○
ON	○	○	○	○	○

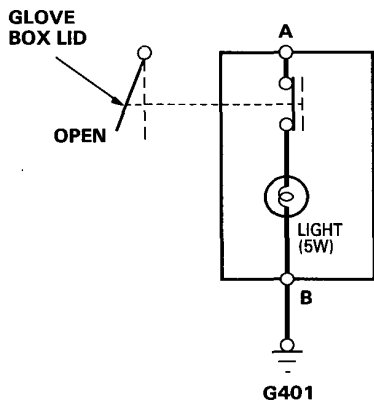
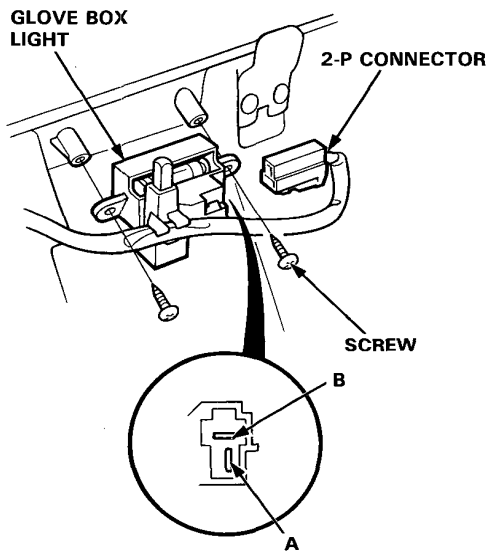


Glove Box Light

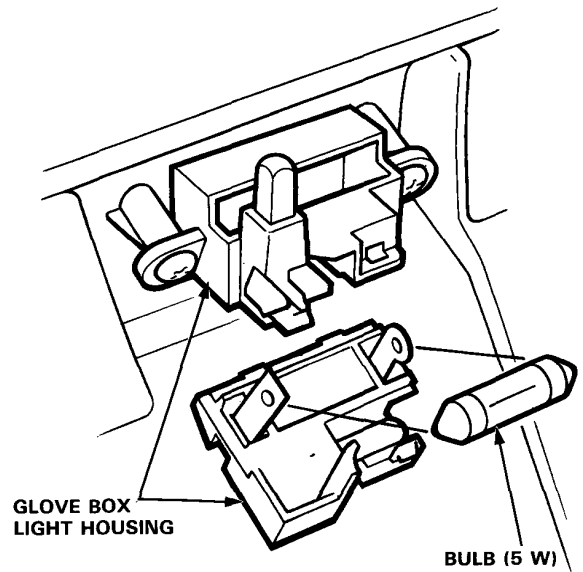
Test/Replacement

1. Open the glove box lid and remove the two screws from the glove box light.
2. Disconnect the 2-P connector from the light.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal	A		B
Position			
CLOSE (OFF)			
OPEN (ON)	○	○	○



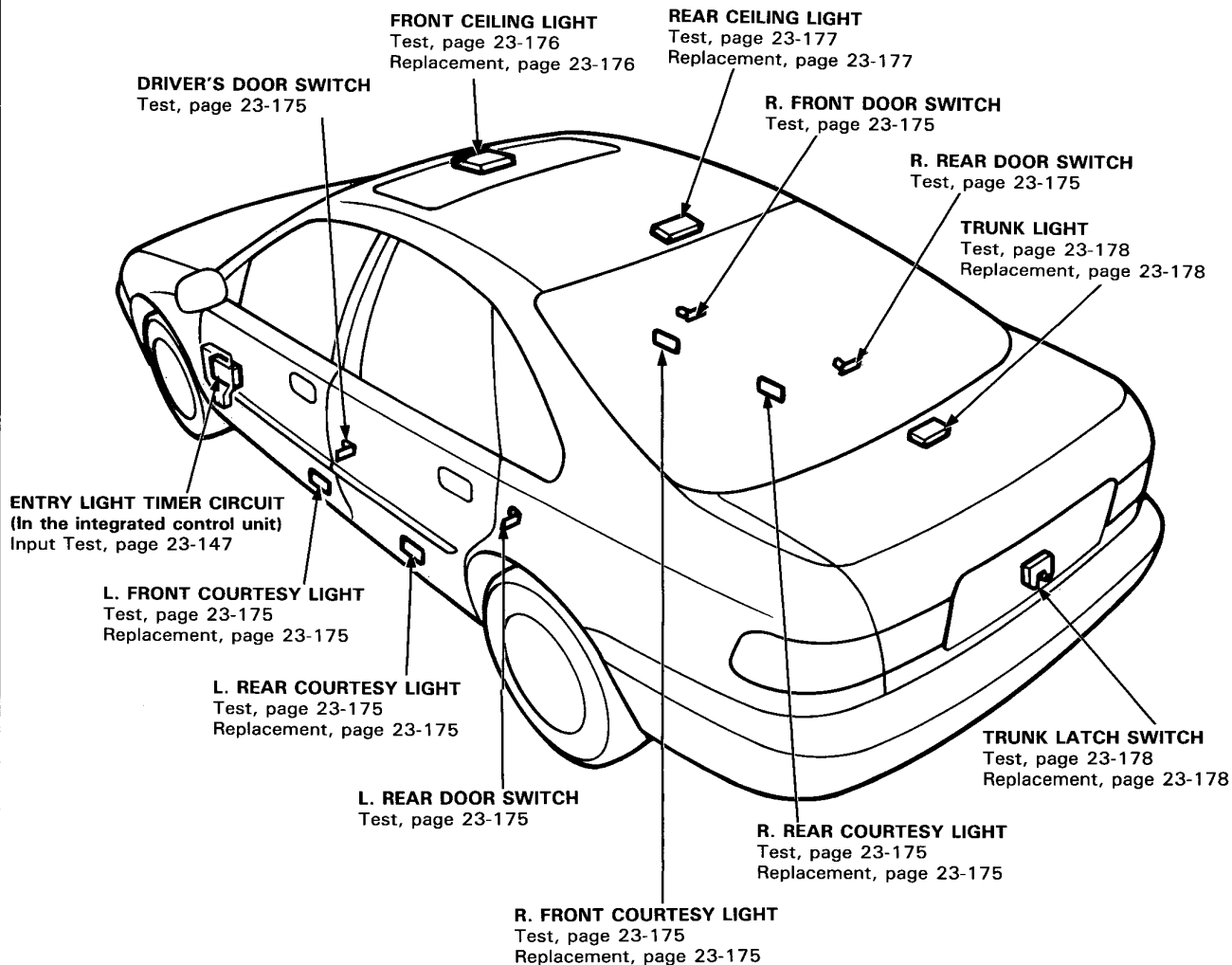
4. If there is no continuity, separate the glove box light housing and replace the bulb.





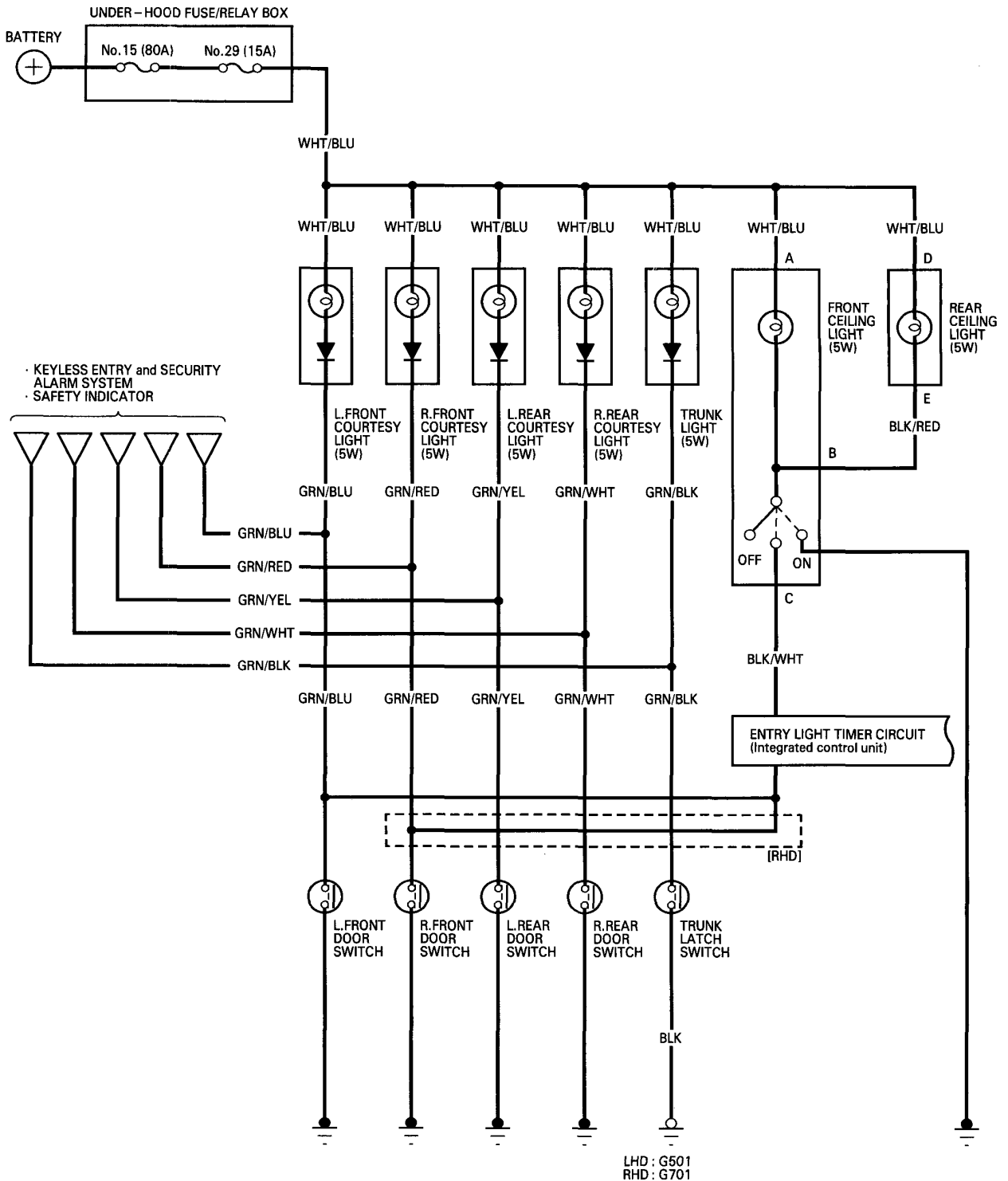
Ceiling/Courtesy/Trunk Lights

Component Location Index



Ceiling/Courtesy/Trunk Lights

Circuit Diagram

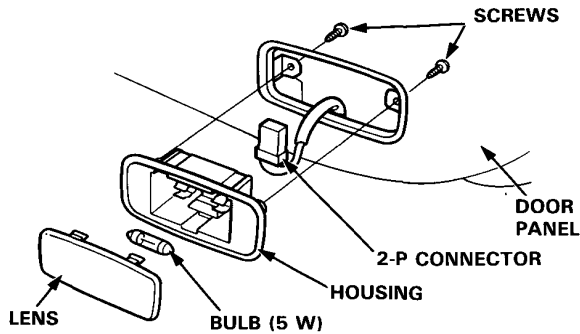




Courtesy Light Test/Replacement

NOTE: The bulb or lens alone can be replaced without removing the door panel.

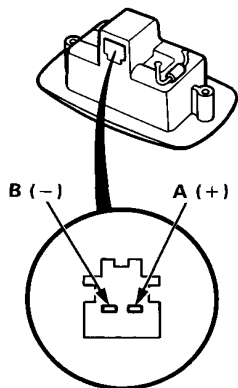
1. Remove the door panel (see section 20).
2. Remove the two mounting screws and the courtesy light, then disconnect the 2-P connector.



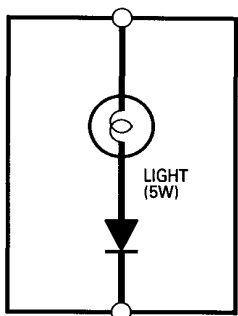
3. Make sure that bulb is OK, then check for continuity between A (+) and B (-) terminals.

NOTE: This light has a diode in it. To get an accurate reading, either test it with a volt ohmmeter that compensates for diode, or make sure you connect your test leads to match the polarity shown.

4. If there is no continuity, replace the courtesy light.



From No.29 (15A) FUSE

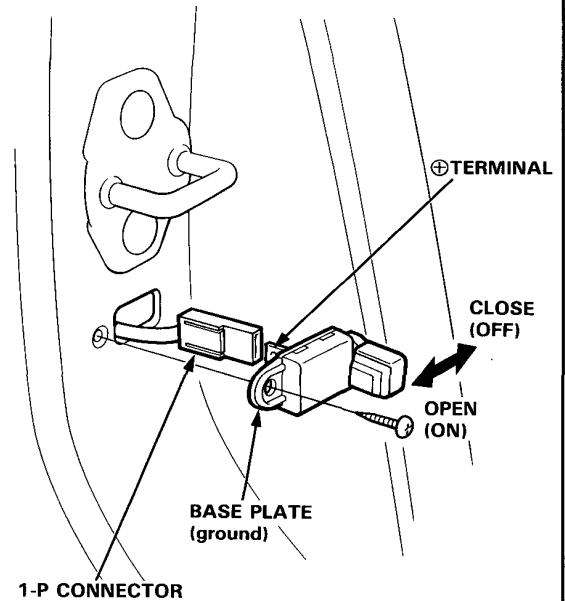


To DOOR SWITCH

Door Switch Test

1. Remove the screw and pull out the switch.
2. Disconnect the 1-P connector and remove the switch.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	⊕ TERMINAL	BASE PLATE
CLOSE (OFF)		
OPEN (ON)	○	○

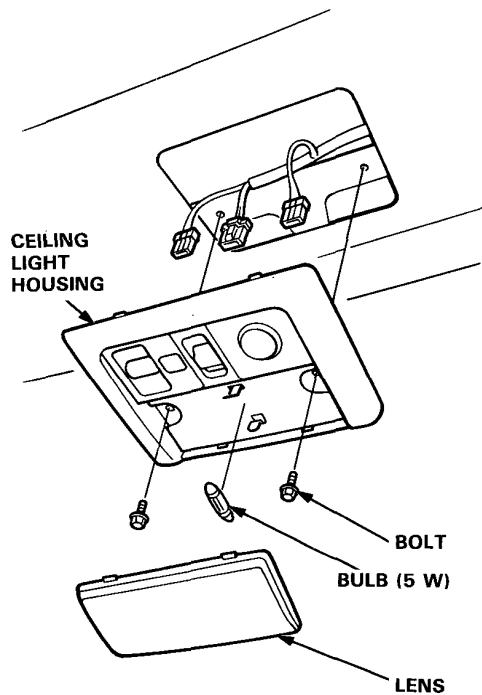


Ceiling/Courtesy/Trunk Lights

Ceiling Lights Test/Replacement

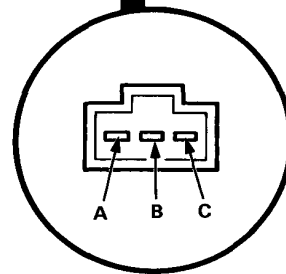
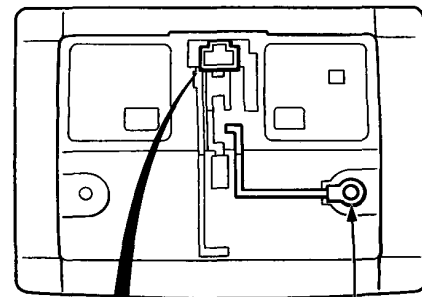
Front Ceiling Lights

1. Turn the ceiling light switch OFF.
2. Pry the lens off from the light housing.
3. Remove the two bolts and the light housing.
4. Disconnect the connectors from the light housing.

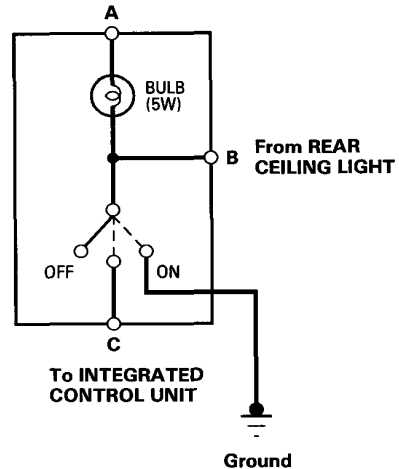


5. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	A		B	C	Ground
OFF	○	⊗	○		
(Middle)	○	⊗	○	○	
ON	○	⊗	○		○



From No.29 (15A) FUSE

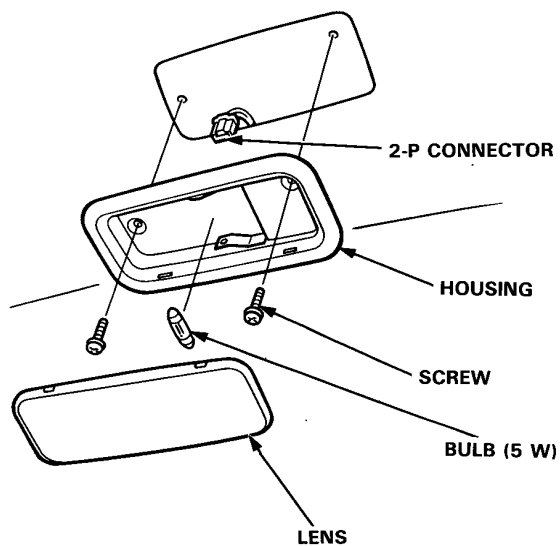


6. If there is no continuity in each switch position, replace the bulb.

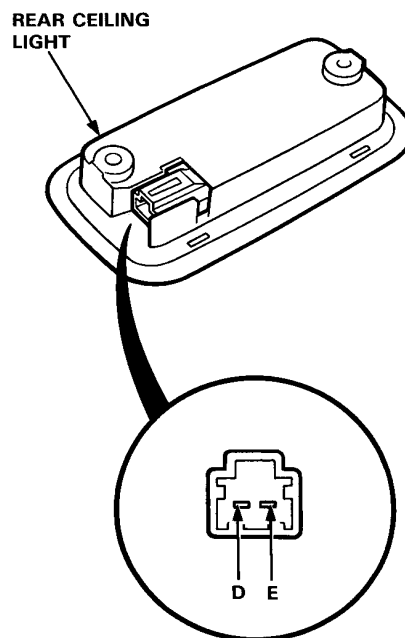


Rear Ceiling Light:

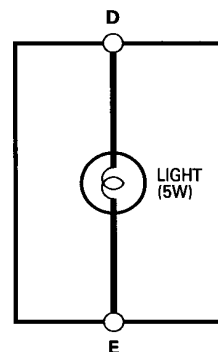
1. Turn the front ceiling light switch OFF and pry the rear ceiling light lens off.
2. Remove the two screws and housing.
3. Disconnect the 2-P connector from the housing.



4. Check for continuity between the D and E terminals with the bulb in the socket. There should be continuity.
5. If there is no continuity, replace the bulb.



From No.29 (15A) FUSE



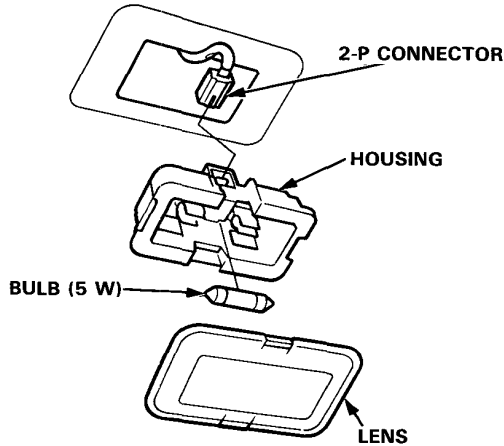
To FRONT
CEILING LIGHT

Ceiling/Courtesy/Trunk Lights

Trunk Light Test/Replacement

NOTE: The bulb or lens alone can be replaced without removing the trunk light housing.

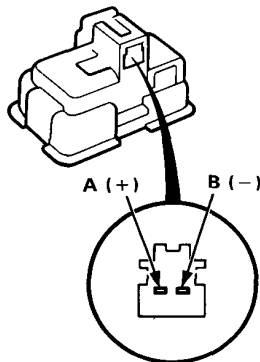
1. Pry out the trunk light.
2. Disconnect the 2-P connector from the light.



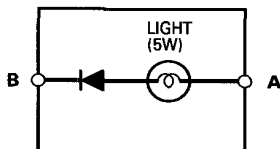
3. Make sure that bulb is OK, then check for continuity between A (+) and B (-) terminals.

NOTE: This light has a diode in it. To get an accurate reading, either test it with a volt ohmmeter that compensates for diode, or make sure you connect your test leads to match the polarity shown.

4. If there is no continuity, replace the trunk light.



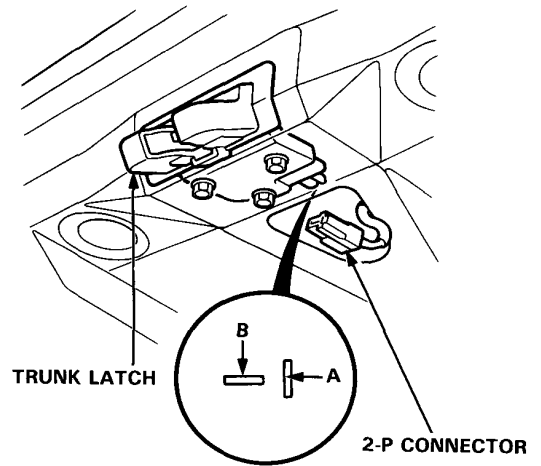
To TRUNK
LATCH
SWITCH



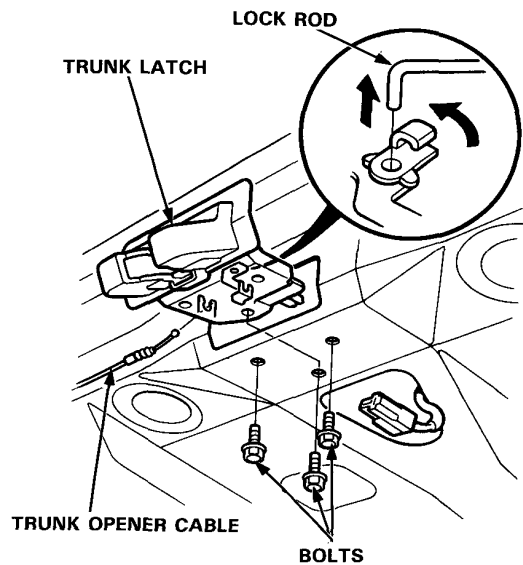
From
No.29 (15A)
FUSE

Latch Switch Test/Replacement

1. Open the trunk lid and disconnect the 2-P connector from the trunk latch.
2. Check for continuity between the A and B terminals with the trunk lid open.
3. If there is no continuity, go to step 4.



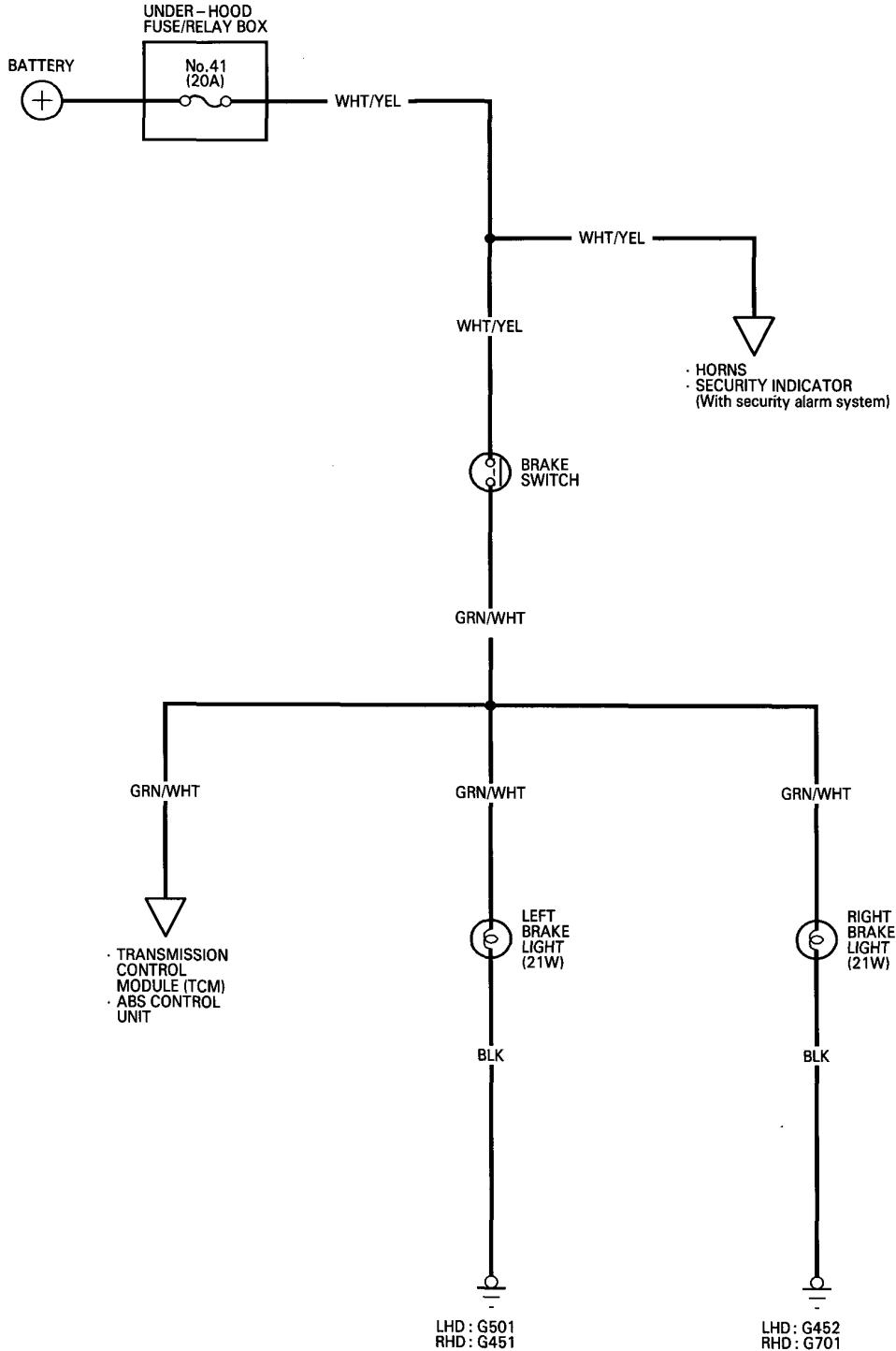
4. Remove the three mounting bolts and pull the latch out of the trunk lid.
5. Disconnect the 2-P connector from the trunk switch (with the security alarm system).
6. Disconnect the lock rod and opener cable, then replace the trunk latch.





Brake Lights

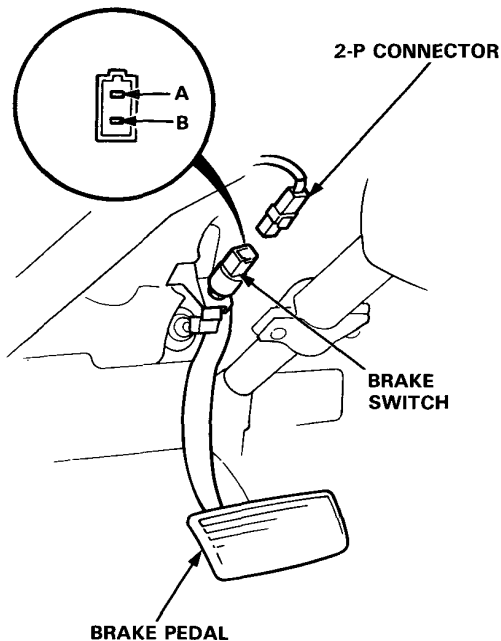
Circuit Diagram



Brake Lights

Brake Switch Test

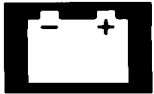
1. If the brake lights do not go on, check for:
 - blown No. 41 (20 A) fuse in the under-hood fuse/relay box.
 - blown brake light bulbs in the outer taillight assembly (see page 23-170).
2. If the fuse and bulbs are OK, disconnect the 2-P connector from the brake switch.



3. Check for continuity between the A and B terminals in each switch position according to the table.

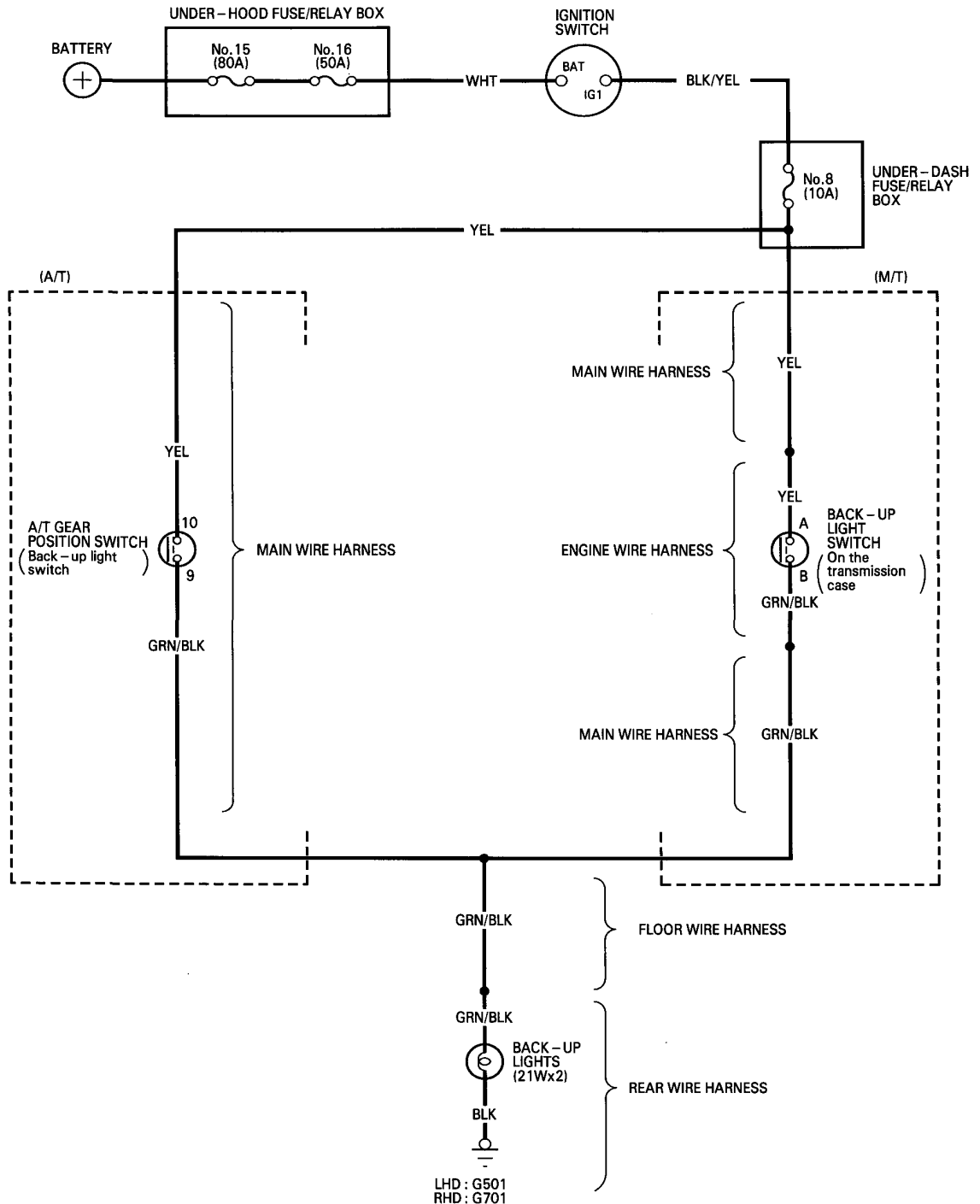
Terminal Position	A	B
Brake pedal (Release)		
Brake pedal (Push)	○—○	○—○

- If there is no continuity with the brake pedal pushed, replace the brake switch or adjust the brake pedal height (see section 19).
- If there is continuity, but the brake lights do not go on, check for:
 - faulty bulb holder panel.
 - poor ground (LHD: G452, G501
RHD: G451, G701).
 - an open in the WHT/YEL or GRN/WHT wire.



Back – up Lights

Circuit Diagram

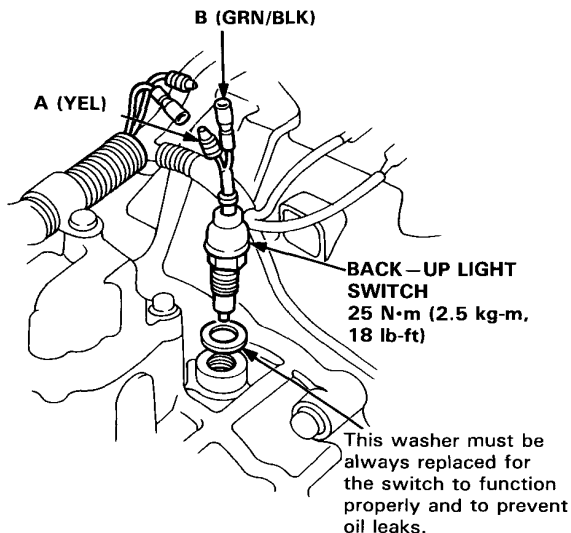


Back-up Lights

Switch Test

Manual transmission:

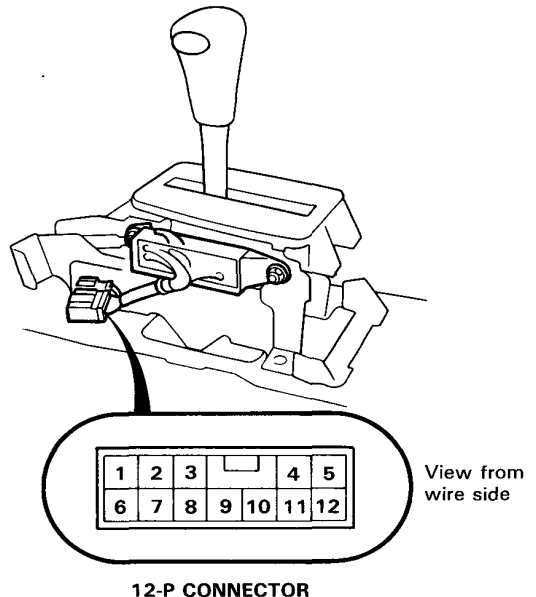
1. Turn the ignition switch ON and move the shift lever to **[R]**.
The back-up lights should come on.
 - If a back-up light does not go on, check for a blown bulb in the taillight assembly.
 - If both back-up lights do not go on, check for blown No. 8 (10 A) fuse in the under-dash fuse/relay box.
 - If the fuse and bulbs are OK, go to step 2.
2. Disconnect the connectors from the back-up light switch.



3. Check for continuity between the A and B terminals. Only with the shift lever in **[R]**, there should be continuity.
 - If there is no continuity, replace the switch (see section 13).
 - If there is continuity, but the back-up lights do not go on, check for:
 - an open in the YEL or GRN/BLK wire.
 - poor ground (LHD: G501, RHD: G701).

Automatic transmission:

1. Turn the ignition switch ON and move the shift lever to **[R]**.
The back-up lights should come on.
 - If a back-up light does not go on, check for a blown bulb in the taillight assembly.
 - If both back-up lights do not go on, check for blown No. 8 (10 A) fuse in the under-dash fuse/relay box.
 - If the fuse and bulbs are OK, go to step 2.
2. Disconnect the 12-P connector from the A/T gear position switch (back-up light switch).



3. Move the shift lever back and forth in **[R]** without touching the push button, and check for continuity between No. 9 and No. 10 terminals. There should be continuity within the range of free play of the shift lever.
 - If there is no continuity within the range of free play, adjust the position of the A/T gear position switch (see page 23-142).
 - If there is continuity, but the back-up lights do not go on, check for:
 - an open in the YEL or GRN/BLK wire.
 - poor ground (LHD: G501, RHD: G701).

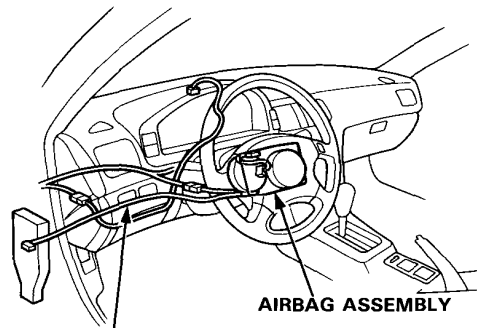


Turn Signal/Hazard Flasher System

Component Location Index

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

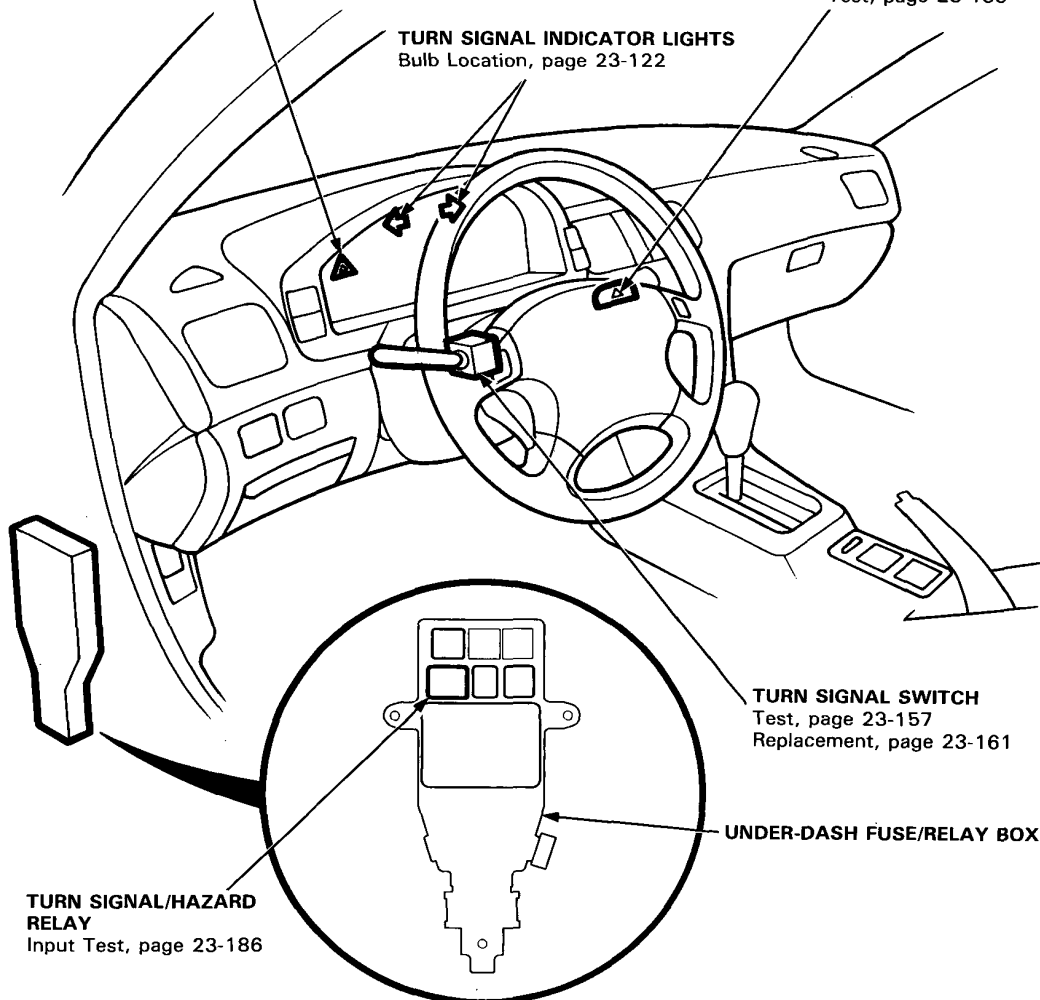


SRS MAIN HARNESS
(Covered with yellow outer insulation)

HAZARD WARNING LIGHT
Bulb Location, page 23-122

HAZARD WARNING SWITCH
Removal, page 23-188
Test, page 23-188

TURN SIGNAL INDICATOR LIGHTS
Bulb Location, page 23-122



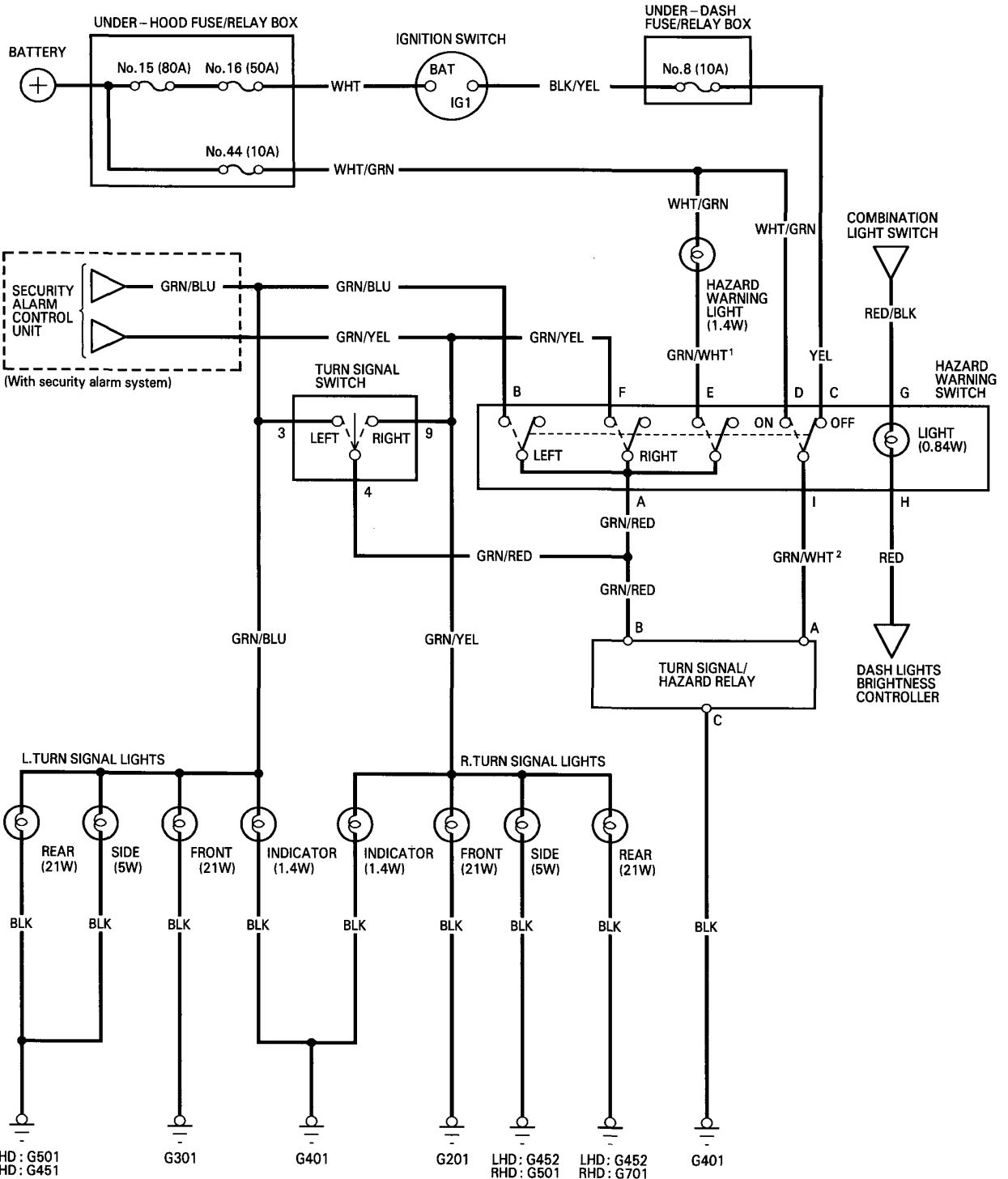
TURN SIGNAL SWITCH
Test, page 23-157
Replacement, page 23-161

UNDER-DASH FUSE/RELAY BOX

TURN SIGNAL/HAZARD RELAY
Input Test, page 23-186



Circuit Diagram



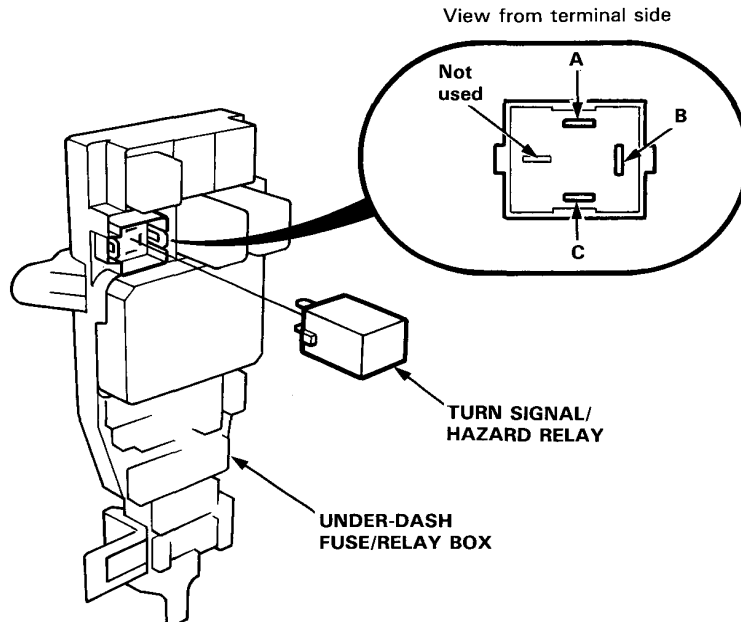
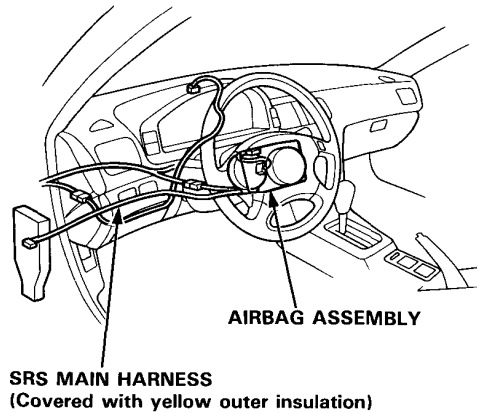
Turn Signal/Hazard Flasher System

Turn Signal/Hazard Relay Input Test

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

1. Remove the driver's side kick panel (see page 23-63).
2. Remove the turn signal/hazard relay from the under-dash fuse/relay box.
3. Inspect the relay 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 socket.
 - If a 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.





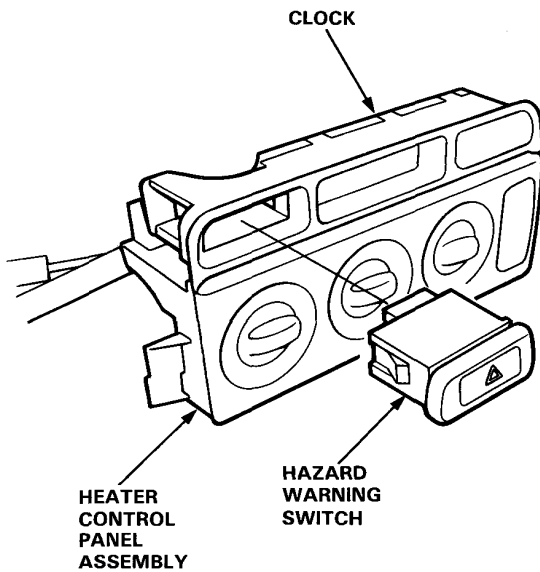
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	C	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none">• Poor ground (G401)• An open in the wire
2	A	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 8 (10 A) fuse in the under-dash fuse/relay box• Faulty hazard warning switch• An open in the wire
		Hazard warning switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 44 (10 A) fuse in the under-hood fuse/relay box• Faulty hazard warning switch• An open in the wire
3	A, B	Hazard warning switch ON, connect the A terminal to the B terminal.	Hazard warning light should come on.	<ul style="list-style-type: none">• Faulty hazard warning switch• Poor ground (G201, G301, G401, G402, G451, G452, G501, G701)• An open in the wire
		Ignition switch ON, connect the A terminal to the B terminal with the turn signal switch in position right or left.	Right or left turn signal light should come on.	<ul style="list-style-type: none">• Faulty turn signal switch• Poor ground (G201, G301, G401, G402, G451, G452, G501, G701)• An open in the wire

Turn Signal/Hazard Flasher System

Hazard Warning Switch Removal

CAUTION: Be careful not to damage the consoles.

1. Remove the rear console panel (see section 20).
2. Remove the front console panel (see section 20).
3. Remove the heater control panel assembly (see section 21).
4. Pry the hazard warning switch out from the clock.



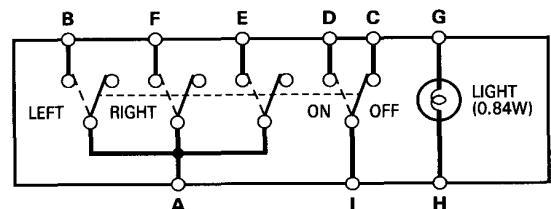
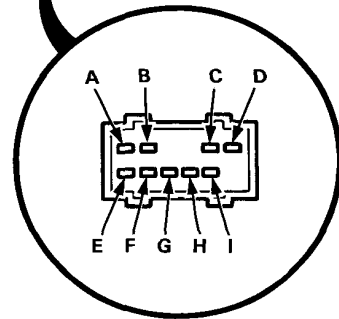
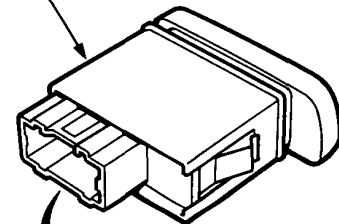
5. Install in the reverse order of removal.

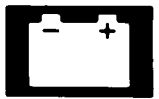
Hazard Warning Switch Test

1. Remove the hazard warning switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B	C	D	E	F	G	H	I
Position									
OFF			○	—			○	⊕	○
ON	○	○		○	—	○		○	○

HAZARD WARNING SWITCH





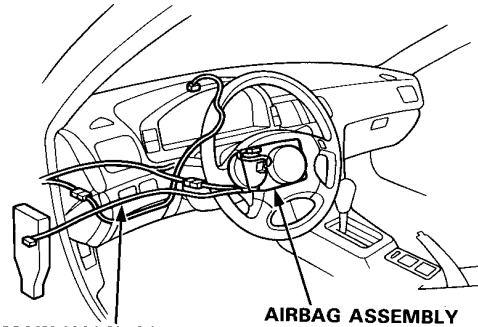
Dash Lights Brightness Controller

Component Location Index

CAUTION:

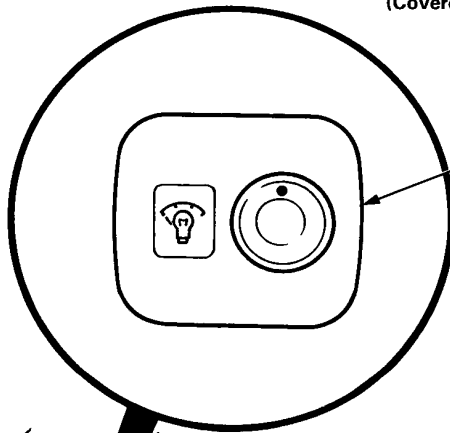
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown, RHD type is symmetrical.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

AIRBAG ASSEMBLY

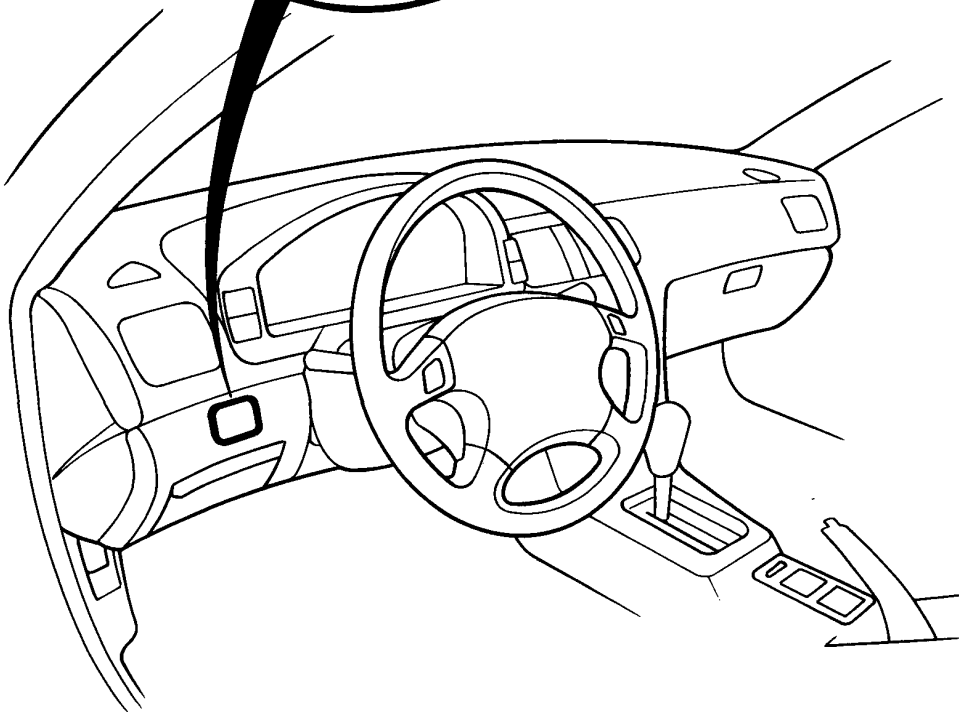


DASH LIGHTS BRIGHTNESS CONTROLLER

(The control unit is built into the controller)

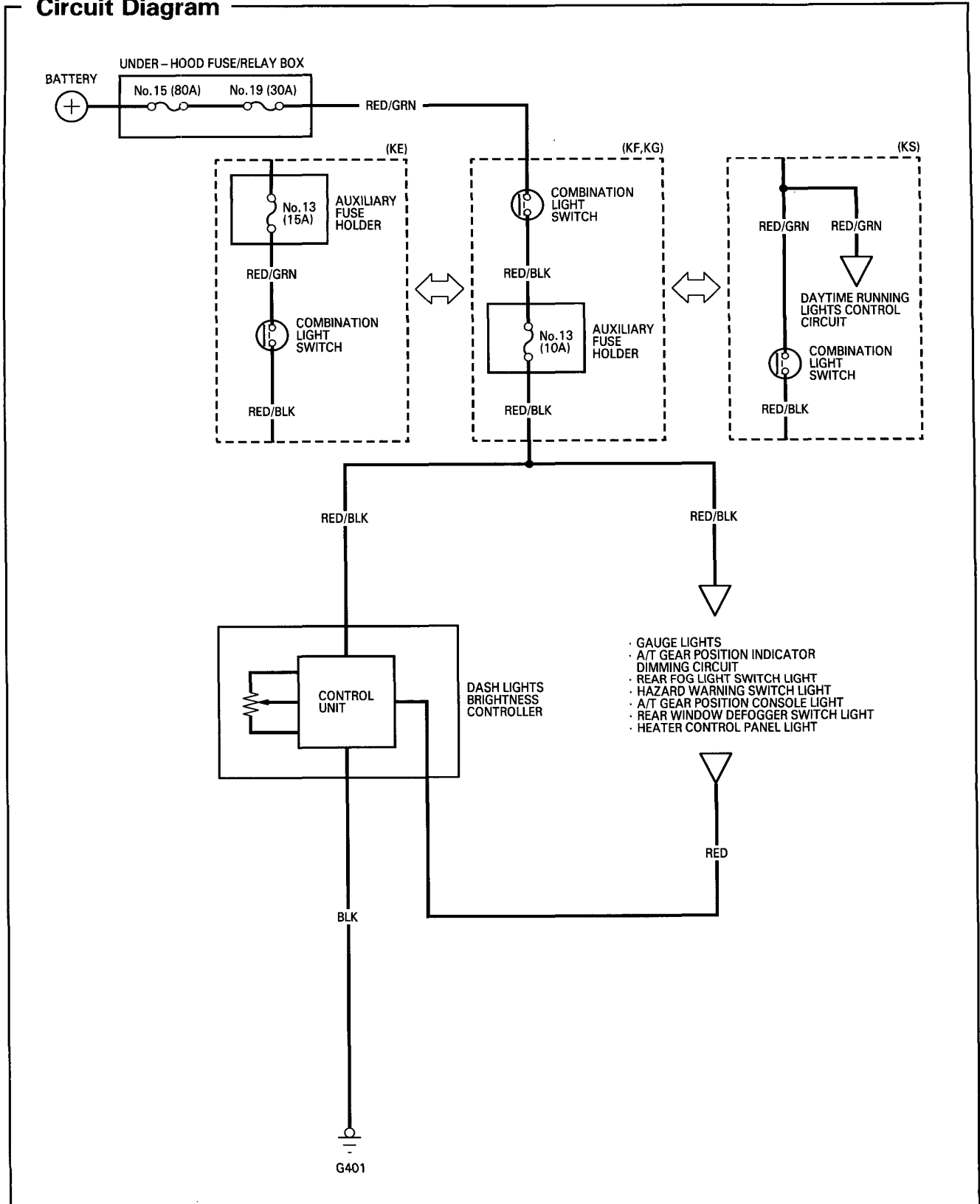
Input Test, page 23-191

Replacement, page 23-192



Dash Lights Brightness Controller

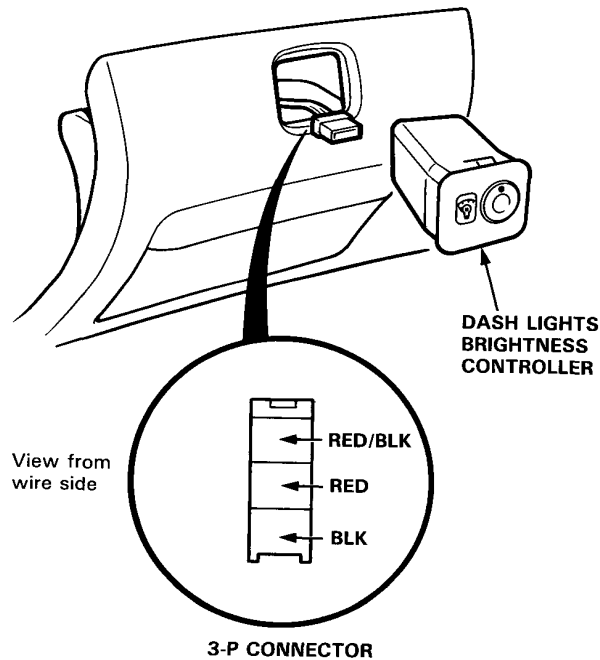
Circuit Diagram





Controller Input Test

1. Remove the dash lights brightness controller from the dashboard lower cover (see page 23-192).
2. Disconnect the 3-P 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 input tests prove OK, the dash lights brightness controller must be faulty; replace it.

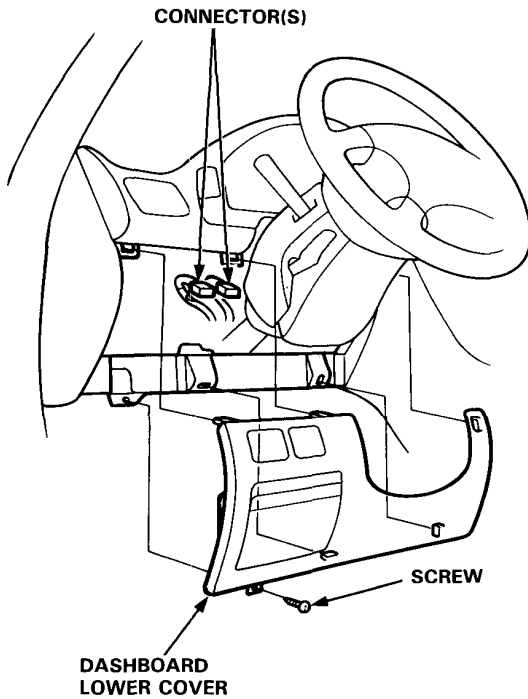


No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	RED/BLK	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 13 (10 A) fuse in the auxiliary fuse holder • Faulty combination light switch • An open in the wire
3	RED	Combination light switch ON	Connect to ground: Dash lights should come on full bright.	<ul style="list-style-type: none"> • An open in the wire

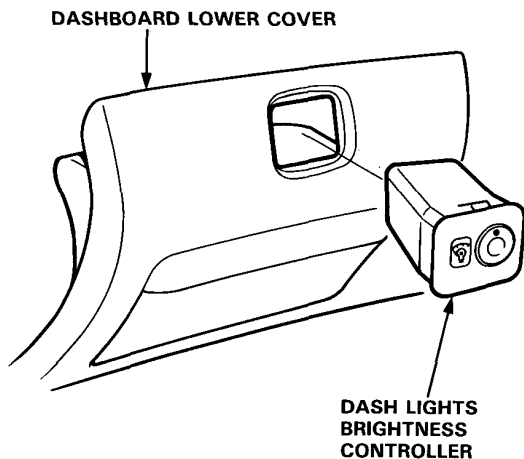
Dash Lights Brightness Controller

Controller Replacement

1. Remove the screw and dashboard lower cover, then disconnect the connector(s) from the switch(es).



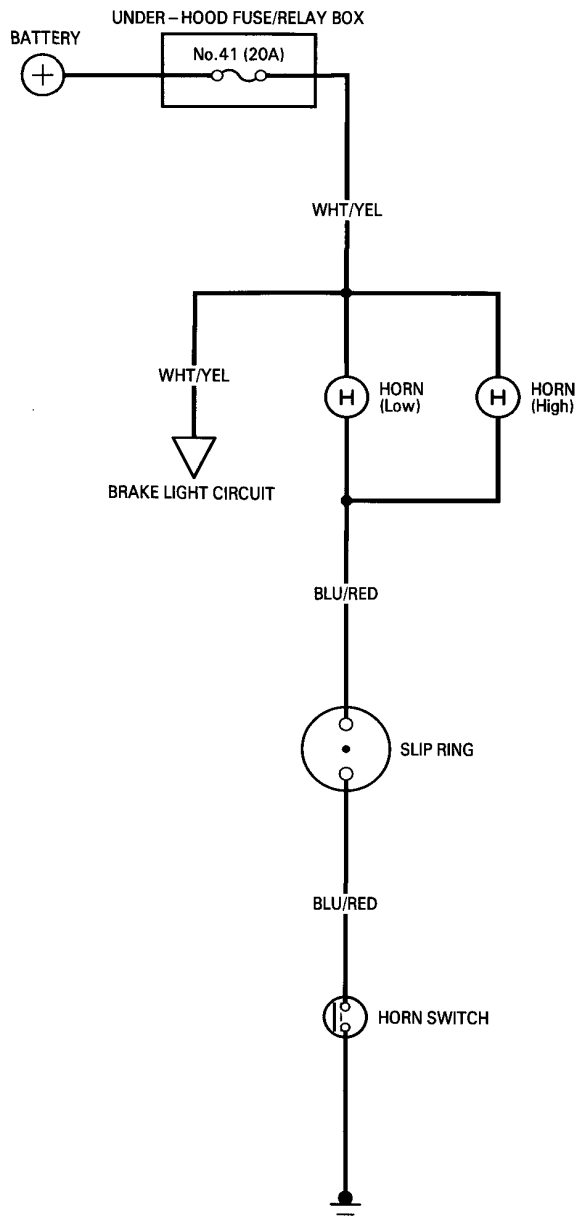
2. Push the controller out from behind the dashboard lower cover and replace it.





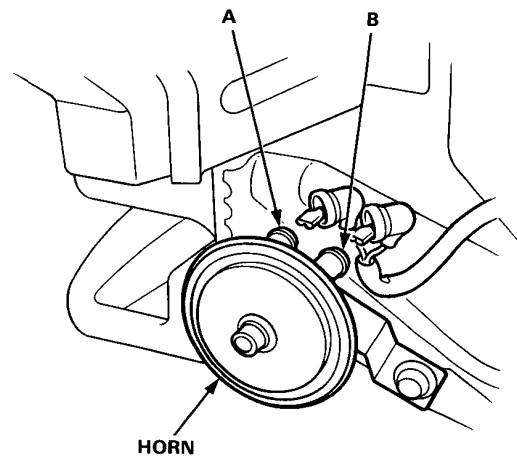
Horns

Circuit Diagram



Horn Test

1. Remove the front bumper (see section 20).
2. Disconnect the connectors from the horn.
3. Test the horn by connecting battery power to one terminal and grounding the other. The horn should sound.



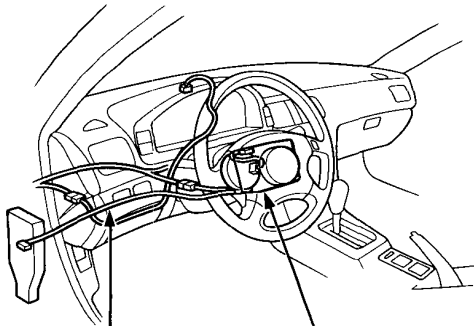
4. Replace the horn if it fails to sound.

Horns

Switch Test

CAUTION:

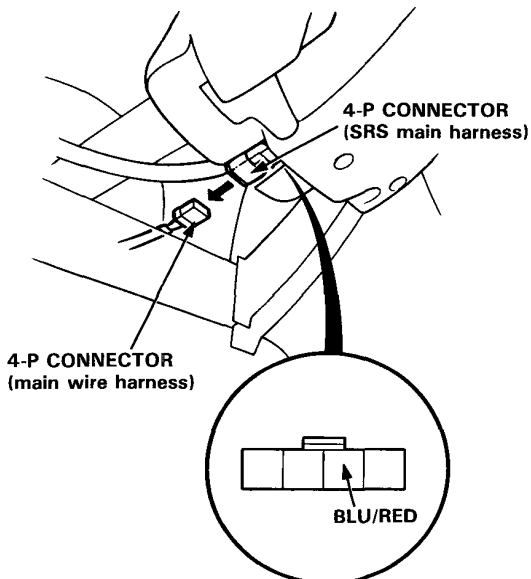
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

AIRBAG ASSEMBLY

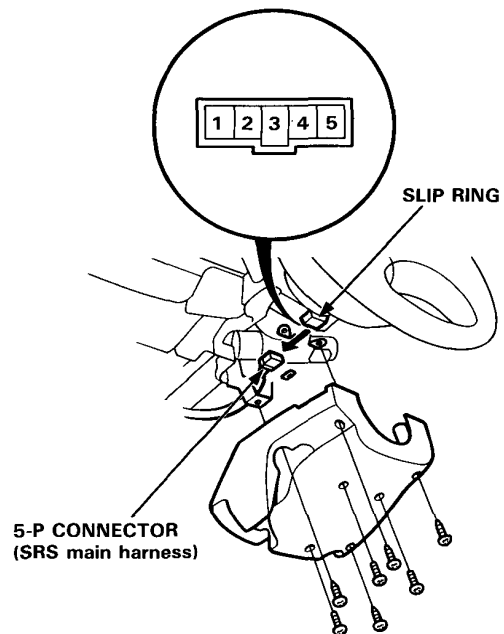
1. Remove the dashboard lower cover (see page 23-63).
2. Disconnect the SRS main harness 4-P connector from the main wire harness.



View from wire side

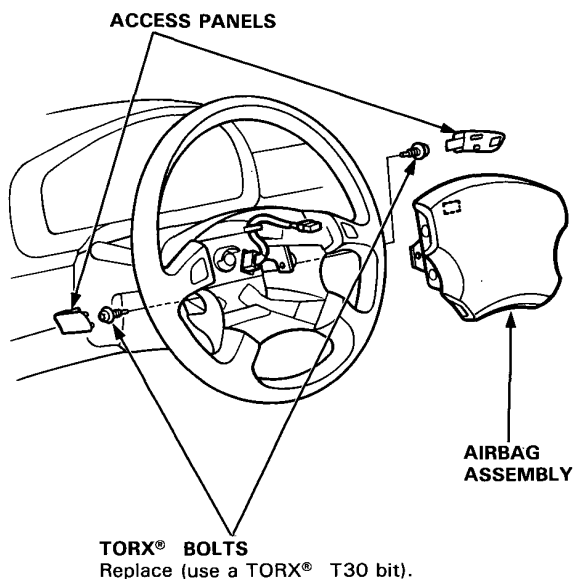
3. Check for continuity between the BLU/RED (SRS main harness side) terminal and body ground with the horn button pushed.
 - If there is continuity, the horn switch is OK.
 - If there is no continuity, go to step 4.
4. Remove the column lower cover, and then disconnect the 5-P connector from the slip ring.

NOTE: See page 23-308 before removing the connector locked with the connector lock pin.

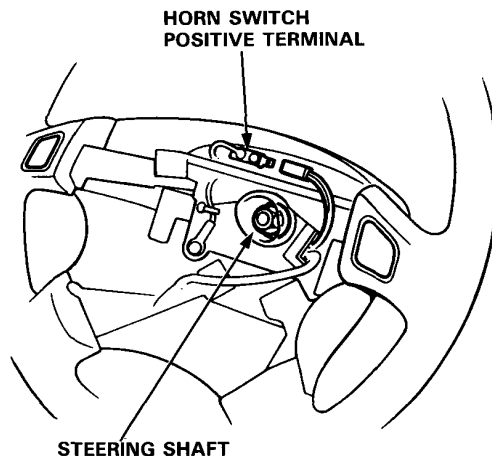




5. Check for continuity between No. 3 terminal and body ground with the horn button pushed.
 - If there is continuity, check for bent, loose or corroded terminal, or an open in the BLU/RED wire between the SRS main harness.
 - If there is no continuity, go to step 6.
6. Remove the access panels from the steering wheel.
7. Remove the two TORX® bolts using a TORX® T30 bit, then remove the airbag assembly.



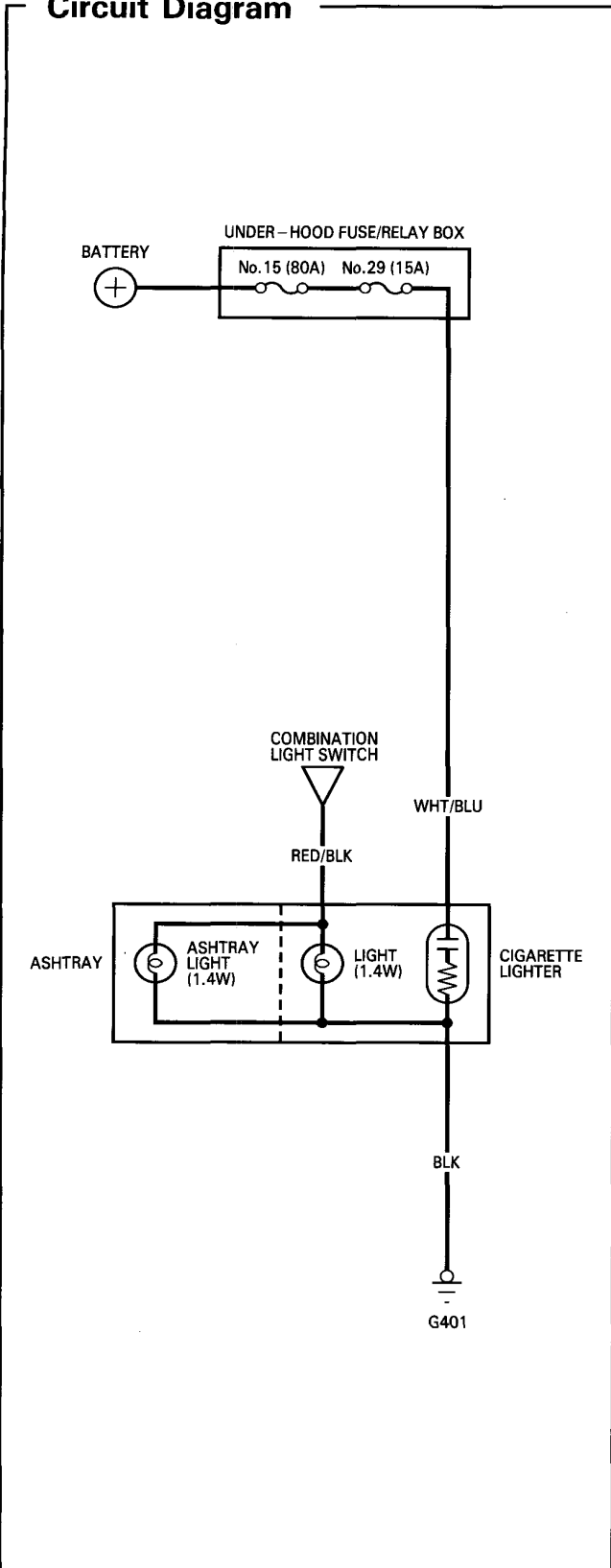
8. Check for continuity between the horn switch positive terminal and the steering shaft with the horn button pushed.



- If there is continuity, check for:
 - a faulty slip ring.
 - a bent, loose or corroded terminal, or an open in the BLU/RED wire between the SRS sub harness.
 - If there is no continuity, repair or replace the horn switch.
9. Install the steering wheel (see section 17).
 10. After installing, make sure that the horn switch and SRS system work correctly.

Cigarette Lighter

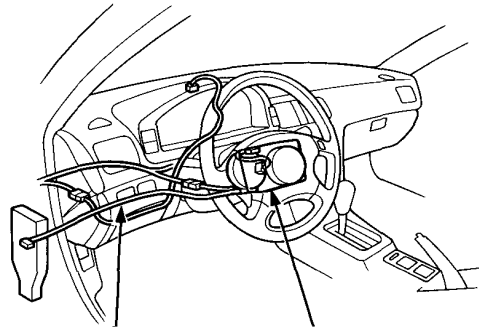
Circuit Diagram



Test/Replacement

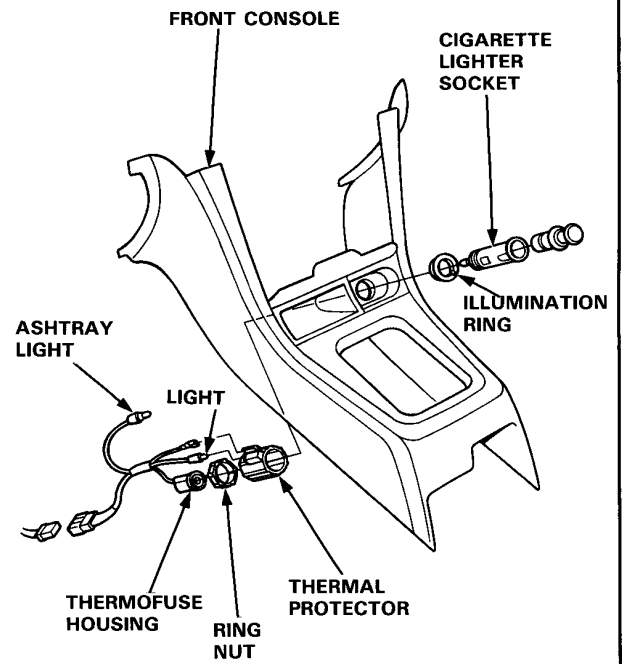
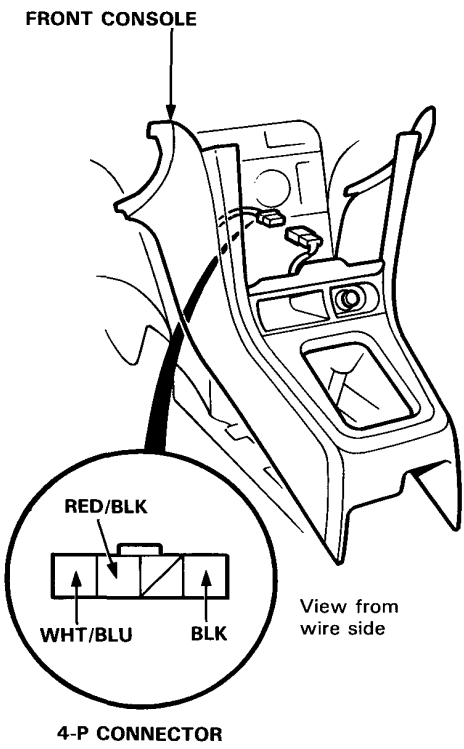
CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS
AIRBAG ASSEMBLY
(Covered with yellow outer insulation)

1. Remove the rear console (see section 20).
 2. Remove the front console (see section 20).
 3. Disconnect the 4-P connector from the cigarette lighter.
 4. 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 systems.
 - If the terminals look OK, go to step 5.



5. Check for voltage between the WHT/BLU and BLK terminals.
There should be battery voltage.
 - If there is no continuity, check for:
 - blown No. 29 (15 A) fuse in the under-hood fuse/relay box.
 - poor ground (G401).
 - an open in the wire.

6. Check for voltage between the RED/BLK and BLK terminals with the combination light switch ON.
There should be battery voltage.
 - If there is no voltage, check for:
 - blown No. 13 (10 A) fuse in the auxiliary fuse holder.
 - faulty combination light switch.
 - an open in the wire.

7. If all tests prove OK, replace the cigarette lighter.

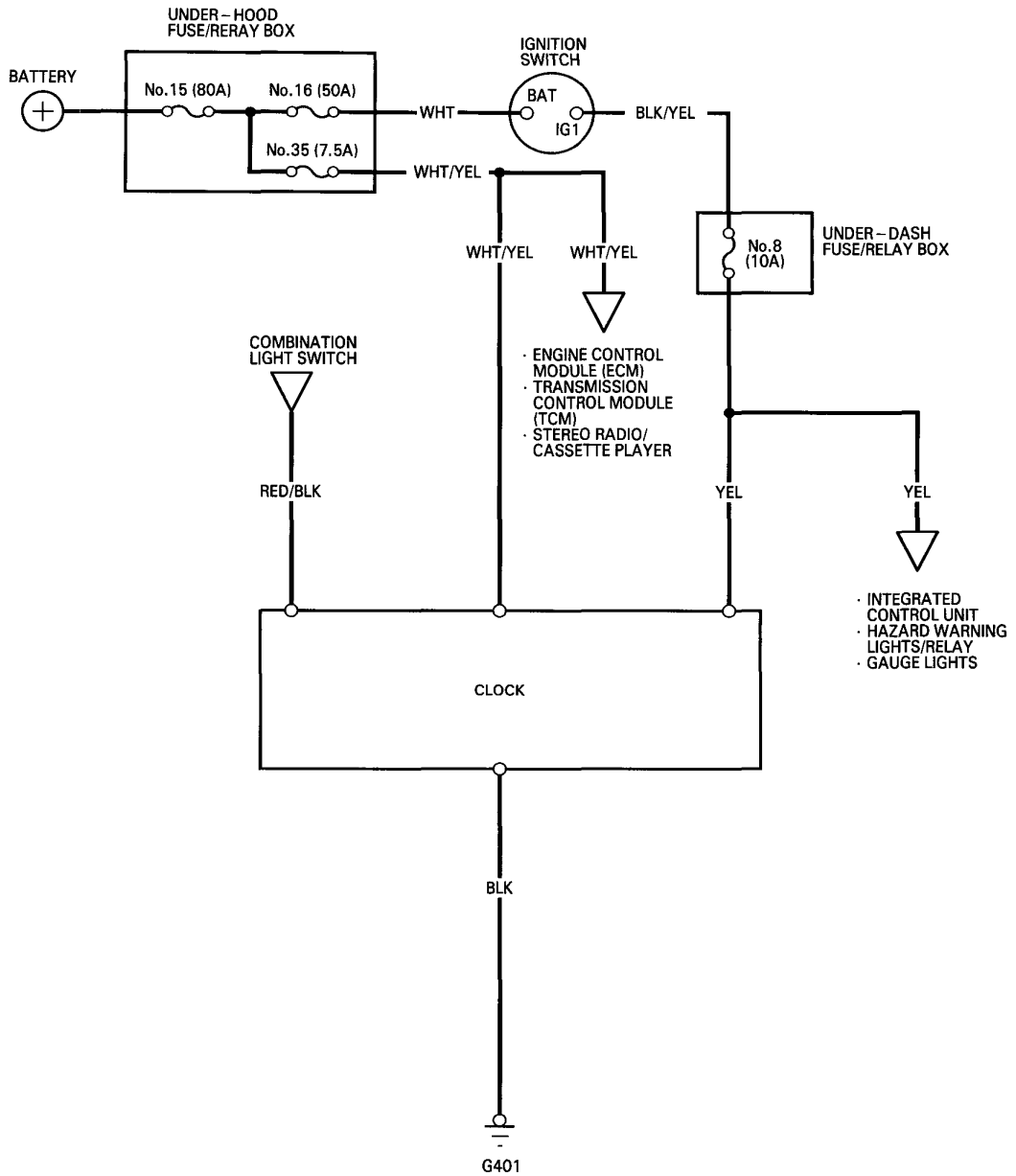
8. Disconnect the thermofuse housing from the socket.

9. Remove the ring nut and separate the cigarette lighter socket from the thermal protector.

10. When installing the cigarette lighter, align each lug on the face panel, illumination ring, and cigarette lighter socket with the groove in the hole, then position the bulb housing on the thermal protector between the stops in the console panel.

Clock

Circuit Diagram

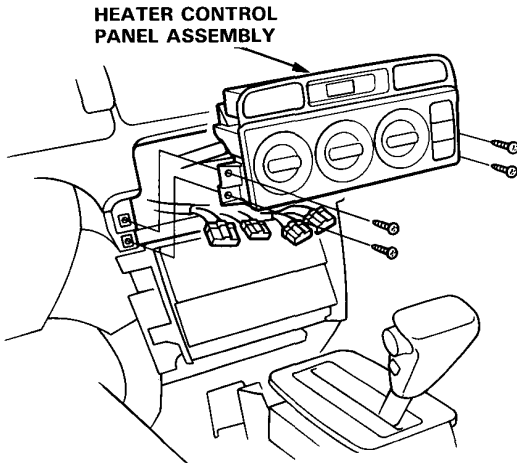




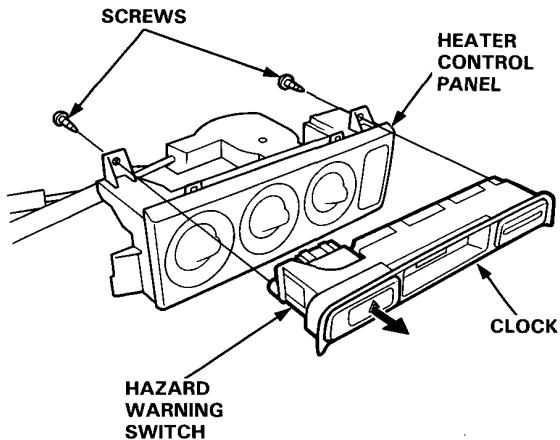
Removal

CAUTION: Be careful not to damage the consoles.

1. Remove the rear console (see section 20).
2. Remove the front console (see section 20).
3. Remove the heater control panel assembly (see section 21).

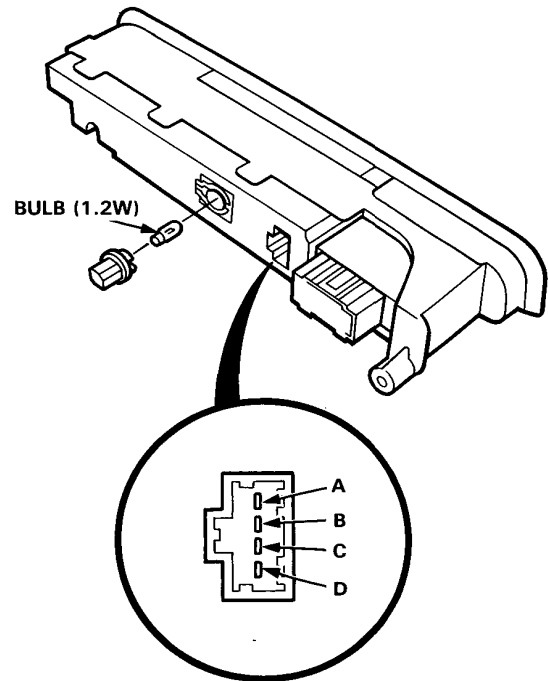


4. Separate the clock from the heater control panel by removing the two screws.
5. If necessary, pry the hazard warning switch out from the clock.



6. Install in the reverse order of removal.

Terminals



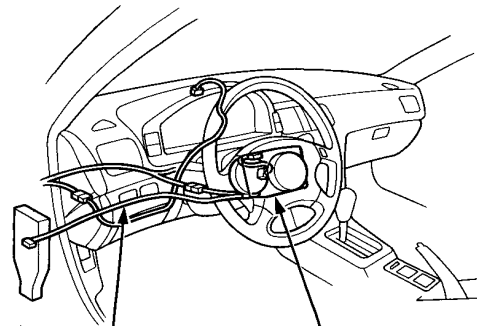
Terminal	Wire	Connects to
A	WHT/YEL	Constant power (time memory)
B	YEL	IG1 (main clock power supply)
C	RED/BLK	Lights-on signal
D	BLK	Ground

Stereo Sound System

Component Location Index

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS

AIRBAG ASSEMBLY

(Covered with yellow outer insulation)

TWEETERS
Replacement, page 23-208

RIGHT FRONT DOOR SPEAKER
Replacement, page 23-207

REAR SPEAKER
Replacement, page 23-208

LEFT FRONT DOOR SPEAKER
Replacement, page 23-207

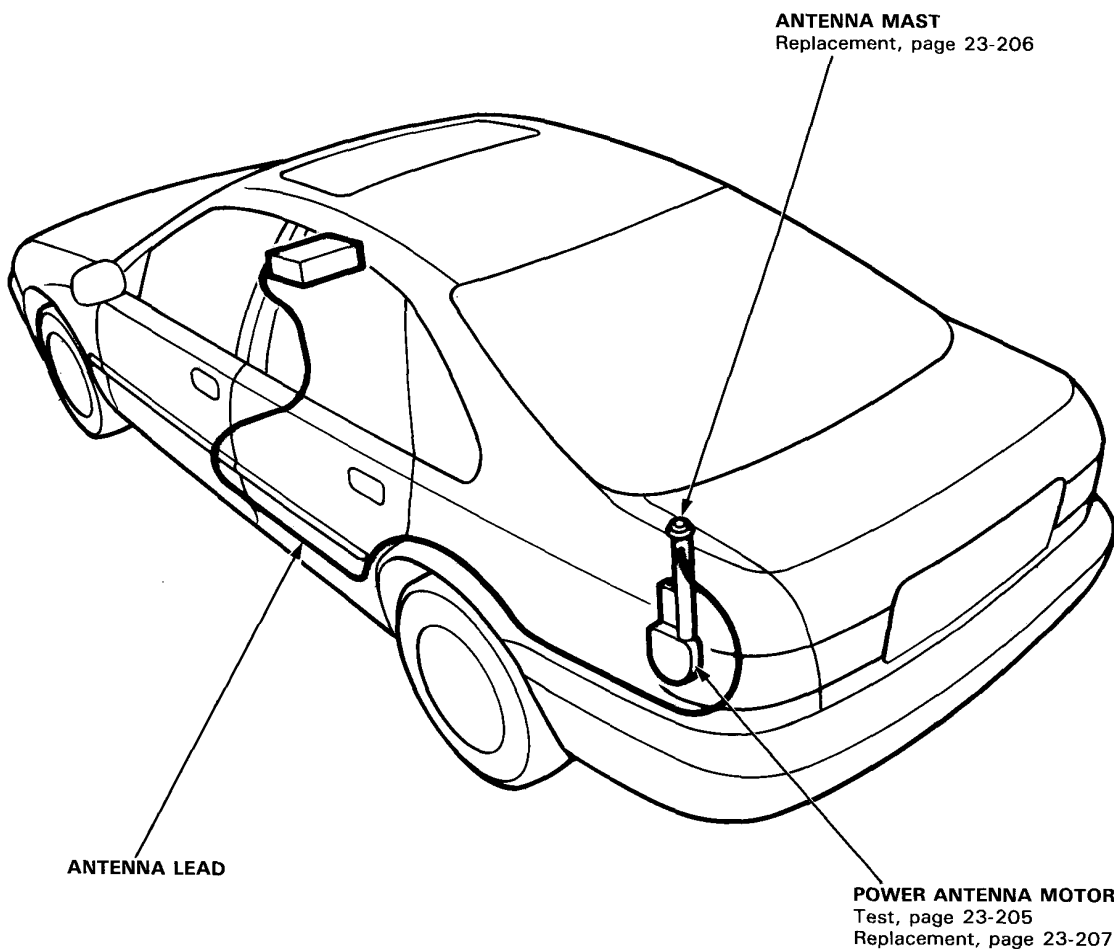
STEREO RADIO/CASSETTE PLAYER
Removal, page 23-204
Terminals, page 23-204



Description:

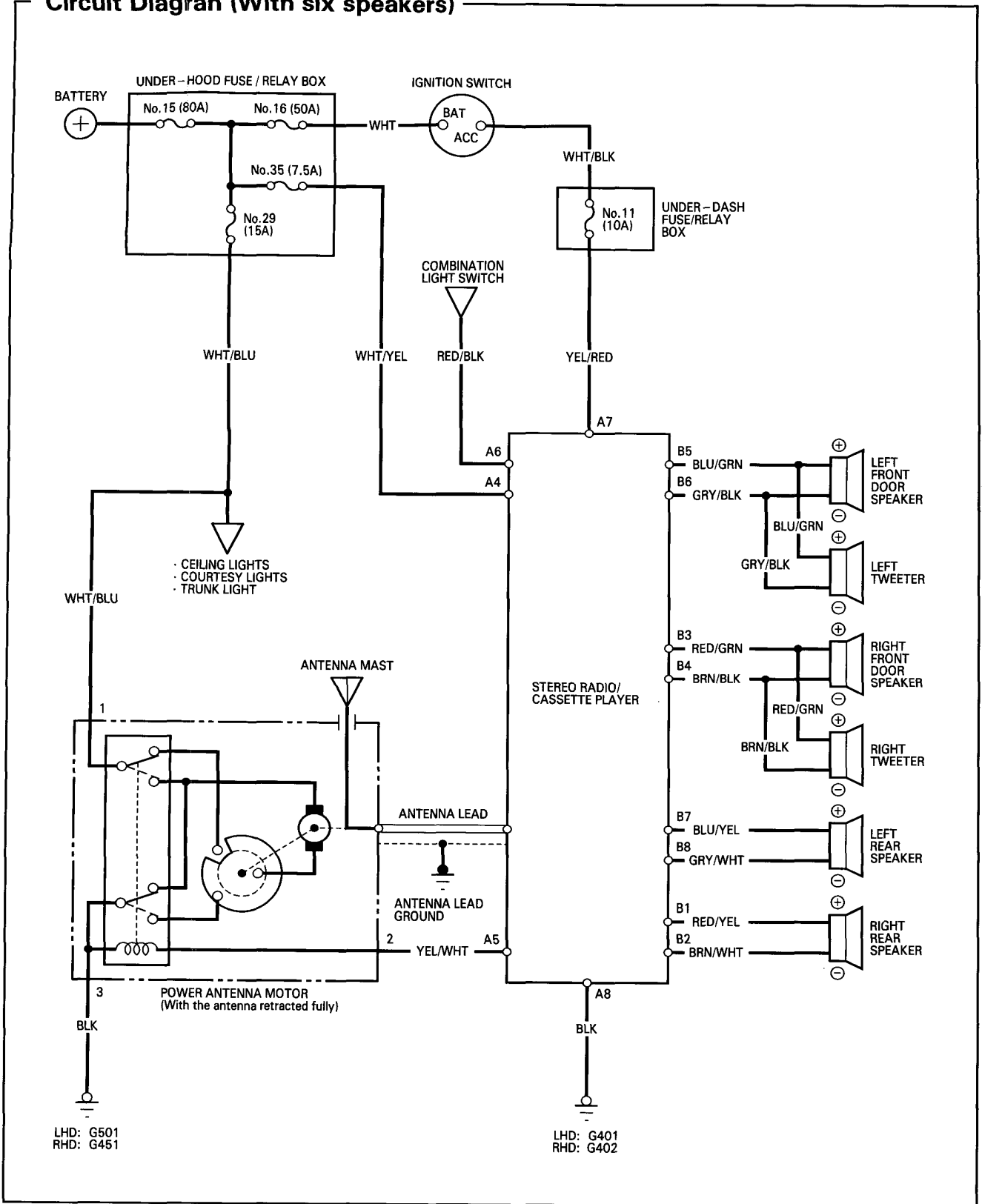
For the stereo radio/cassette player description, please see the owner's manual.

The power antenna mast is controlled by the radio ON/OFF switch. It will extend fully whenever the radio switch and the ignition switch are on at the same time. When the radio or the ignition is shut off, the antenna retracts fully. The antenna motor has a built-in relay together with a limit switch for this function.



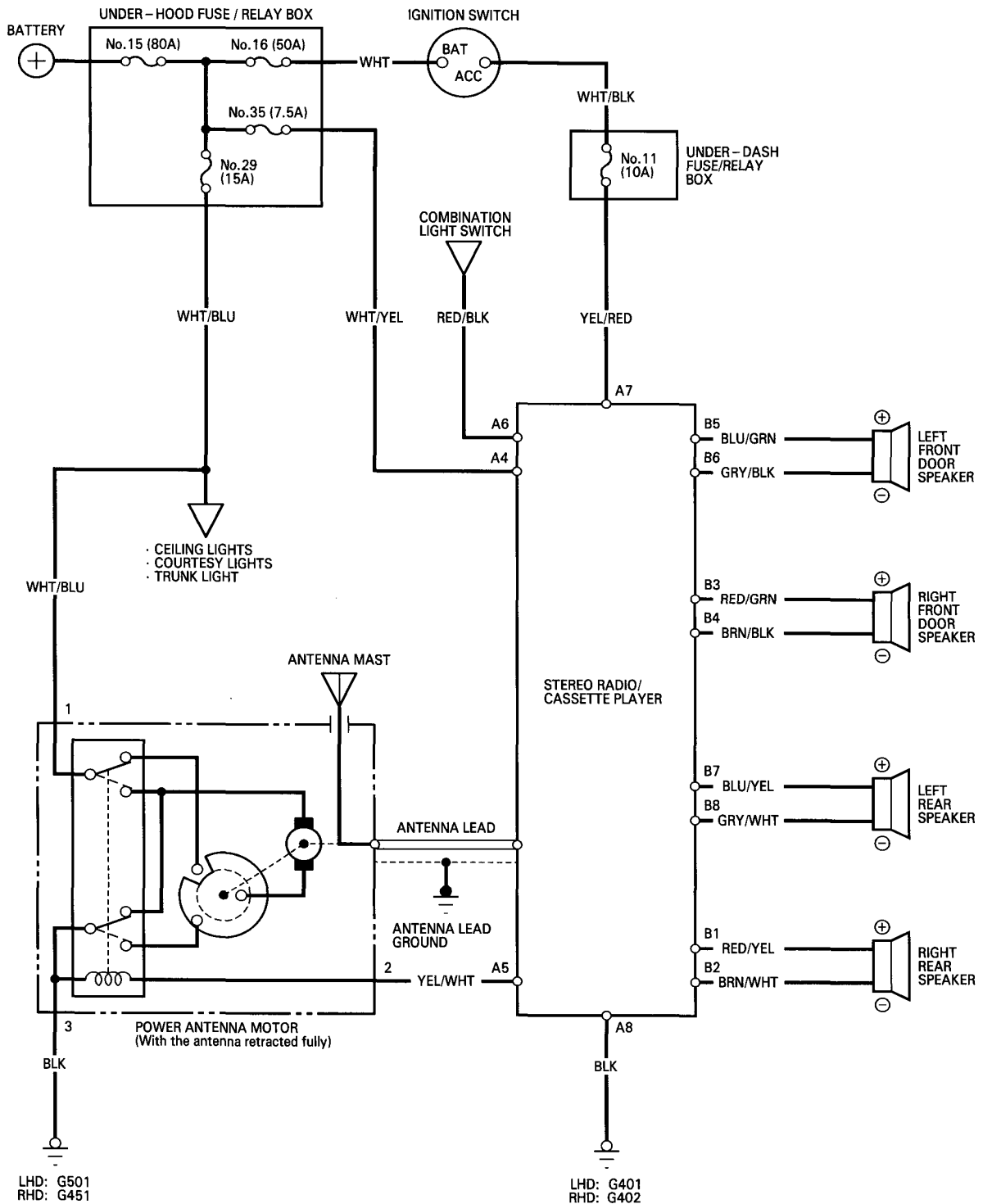
Stereo Sound System

Circuit Diagram (With six speakers)





Circuit Diagram (With four speakers)

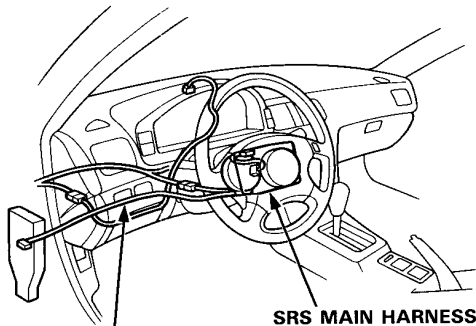


Stereo Sound System

Unit Removal

CAUTION:

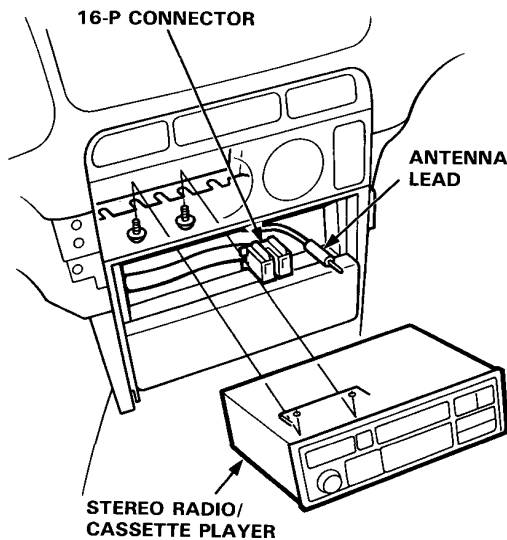
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



AIRBAG ASSEMBLY
(Covered with yellow outer insulation)

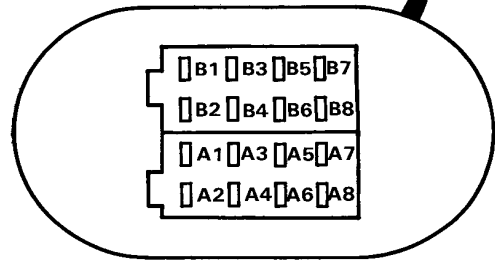
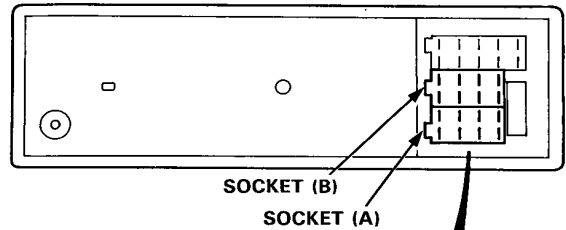
SRS MAIN HARNESS

1. Remove the front console panel (see section 20).
2. Remove the two mounting screws. Pull the stereo radio/cassette player out part of the way.



3. Disconnect the 16-P connector and antenna lead, then remove the stereo radio/cassette player.

Unit Terminals



Terminal	Wire	Connects to
A1	—	(Not used)
A2	—	(Not used)
A3	—	(Not used)
A4	WHT/YEL	Constant power (Tuning memory)
A5	YEL/WHT	Radio-switched power
A6	RED/BLK	Lights-on signal
A7	YEL/RED	ACC
A8	BLK	Ground
B1	RED/YEL	Right rear speaker ⊕
B2	BRN/WHT	Right rear speaker ⊖
B3	RED/GRN	Right front speaker ⊕
B4	BRN/BLK	Right front speaker ⊖
B5	BLU/GRN	Left front speaker ⊕
B6	GRY/BLK	Left front speaker ⊖
B7	BLU/YEL	Left rear speaker ⊕
B8	GRY/WHT	Left rear speaker ⊖

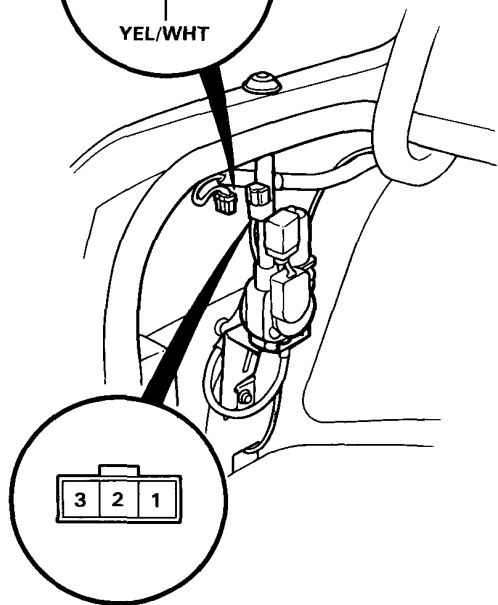
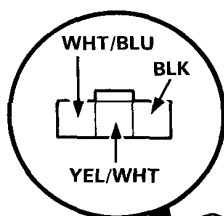
Terminal	Wire	Connects to
A1	—	(Not used)
A2	—	(Not used)
A3	—	(Not used)
A4	WHT/YEL	Constant power (Tuning memory)
A5	YEL/WHT	Radio-switched power
A6	RED/BLK	Lights-on signal
A7	YEL/RED	ACC
A8	BLK	Ground
B1	RED/YEL	Right rear speaker ⊕
B2	BRN/WHT	Right rear speaker ⊖
B3	RED/GRN	Right front speaker ⊕
B4	BRN/BLK	Right front speaker ⊖
B5	BLU/GRN	Left front speaker ⊕
B6	GRY/BLK	Left front speaker ⊖
B7	BLU/YEL	Left rear speaker ⊕
B8	GRY/WHT	Left rear speaker ⊖



Power Antenna Motor Test

1. Remove the left trunk side trim panel.
2. Disconnect the 3-P connector from the motor, and remove the connector from its clamp.
3. First, check power to the motor at the connector terminals:
There should be battery voltage between the WHT/BLU (+) and BLK (-) terminals all the time. There should be battery voltage between the YEL/WHT (+) and BLK (-) terminals only with the ignition and radio switched ON.

View from wire side

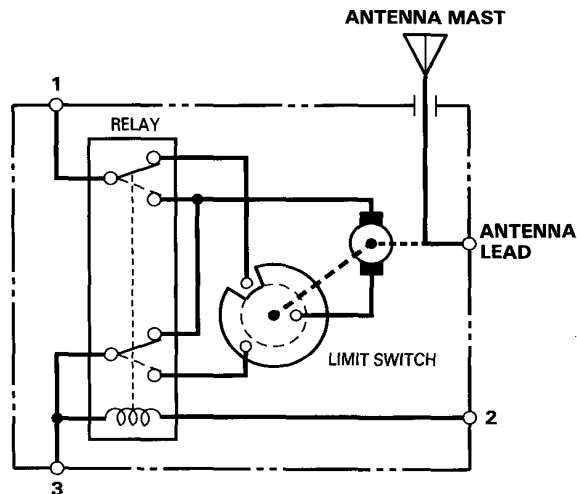


View from wire side

4. Test the motor:

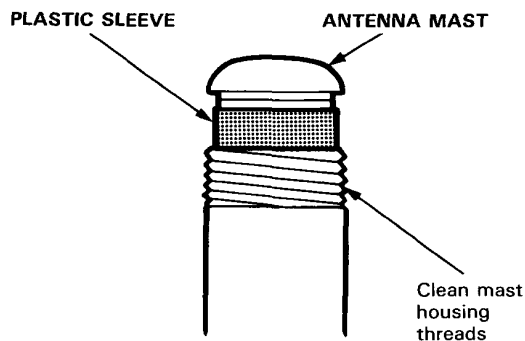
FULL EXTEND	Connect battery power to the No. 1 and No. 2 terminals and ground to the No. 3 terminal.
RETRACT	Then disconnect power from the No. 2 terminal.

5. If the motor does not run or fails to run smoothly, replace it.



Sticking Antenna:

6. If the antenna sticks in either the up or down position:
 - Remove the special nut, spacer, and bushing (see next page).
 - Clean the antenna mast housing threads and reinstall the spacer and bushing.
 - Torque the special nut to 2.3 N·m (0.23 kg·m, 1.7 lb-ft).



NOTE: If the special nut is over-torqued, the antenna may stick. If sticking occurs, back the nut off until the antenna moves freely.

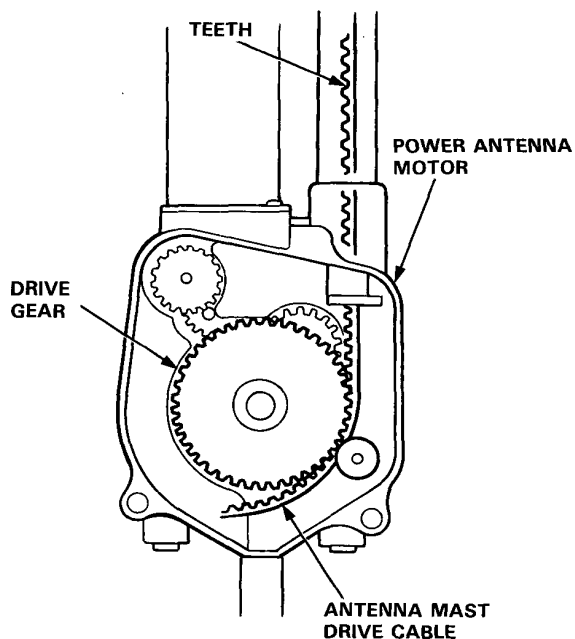
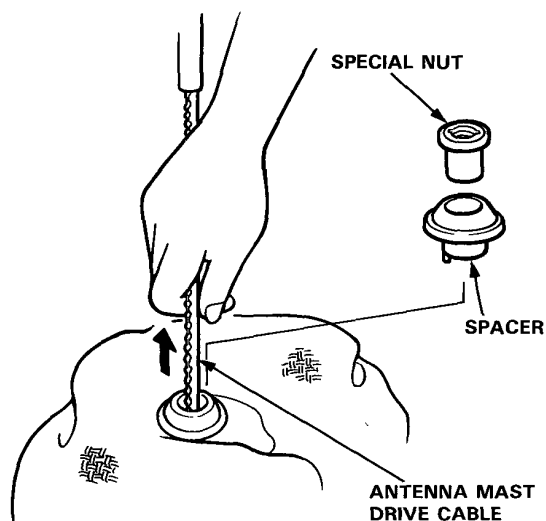
Stereo Sound System

Antenna Mast Replacement

Removal:

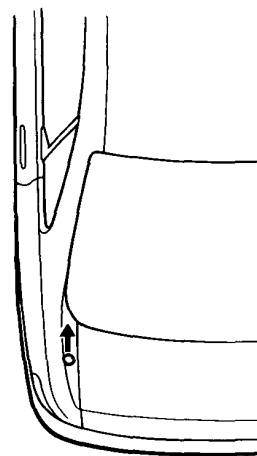
NOTE: The antenna mast alone can be replaced without removing the power antenna motor.

1. Remove the special nut, spacer, and bushing.
2. Carefully withdraw the antenna mast while extending it by turning the radio switch ON.



Installation:

1. Hold the antenna so the teeth on the drive cable face in the direction shown, and insert the drive cable into the antenna housing.



2. Check for engagement of the cable teeth to the drive gear by carefully moving the cable up and down.
3. Turn the radio switch "OFF", and let the motor pull the drive cable inside the antenna housing.
4. Clean the threads on the antenna mast housing. Insert the antenna mast into the antenna housing. Install the bushing and spacer, and tighten the special nut to 2.3 N·m (0.23 kg-m, 1.7 lb-ft).

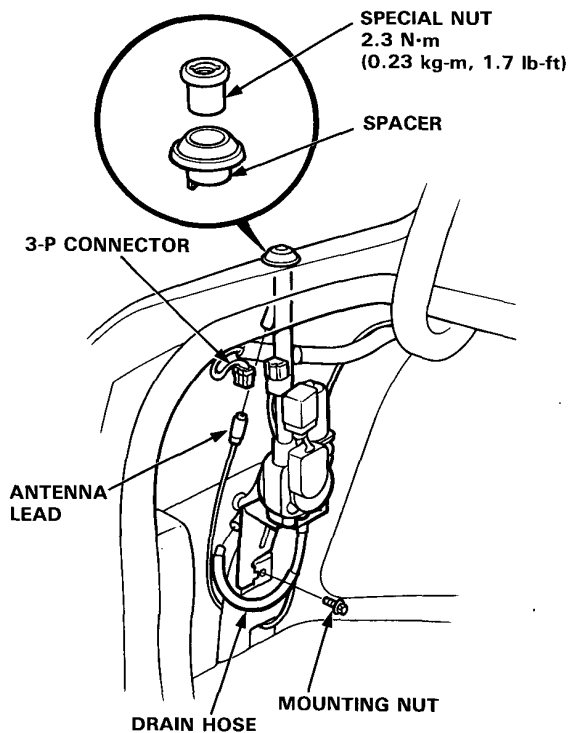
NOTE: If the special nut is overtorqued, the antenna may stick. If sticking occurs, back the nut off until the antenna moves freely.

5. Check that the antenna mast extends and retracts fully when the radio switch is turned ON and OFF repeatedly.



Power Antenna Motor Replacement

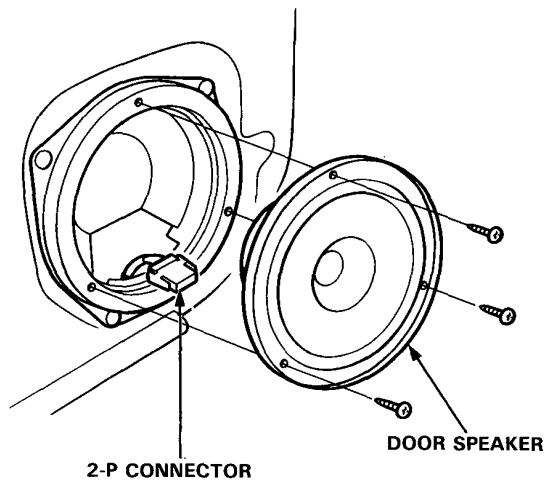
1. Remove the left trunk side trim panel.
2. Disconnect the 3-P connector and antenna lead from the motor, then remove the special nut and mounting nut to take out the motor with the antenna mast.



3. During installing, tighten the special nut, then tighten the mounting nut on the motor bracket.

Door Speaker Replacement

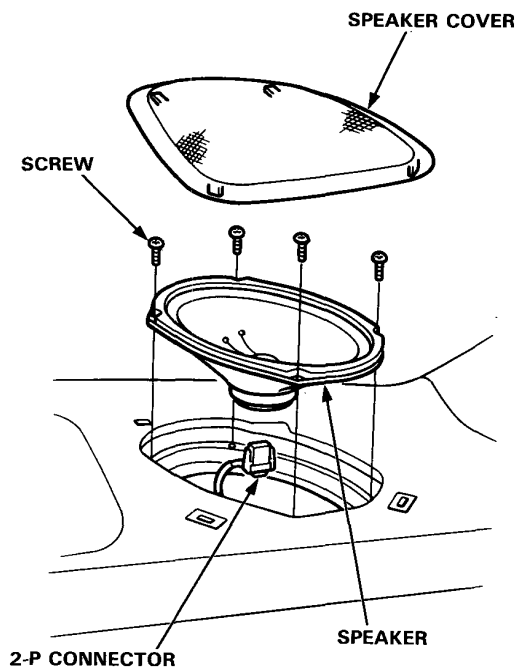
1. Remove the door panel.
2. Remove the three screws, then disconnect the 2-P connector from the speaker and remove the speaker.



Stereo Sound System

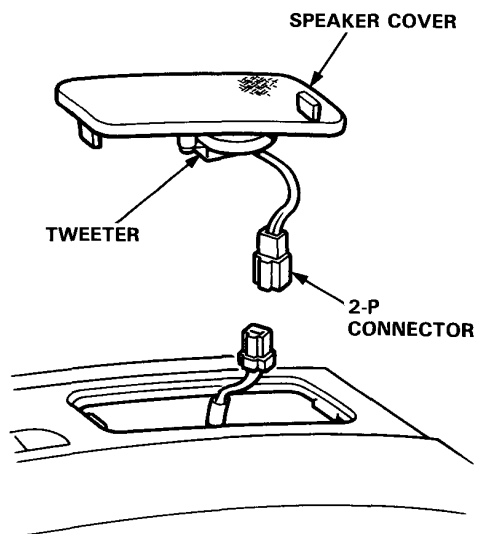
Rear Speaker Replacement

1. Remove the speaker cover.
2. Remove the four screws from the speaker, then disconnect the 2-P connector and remove the speaker.



Tweeter Replacement

1. Carefully pry the speaker cover with the tweeter out from the dashboard, then disconnect the 2-P connector from the tweeter.



2. If it is necessary, remove the two screws, then separate the tweeter from the speaker cover.



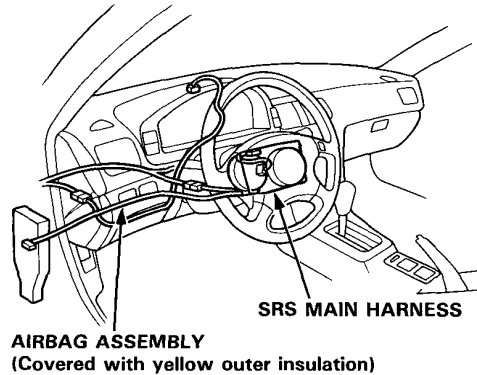
Rear Window Defogger

Component Location Index

CAUTION:

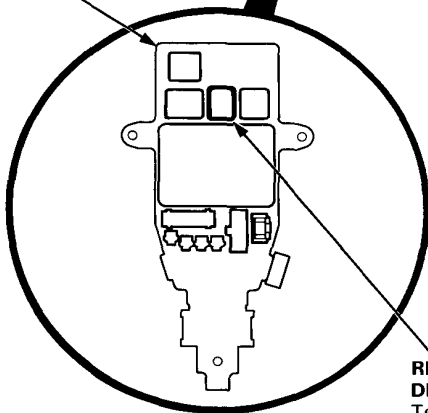
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown, RHD type is symmetrical.



**REAR WINDOW
DEFOGGER SWITCH**
Test, page 23-213
Replacement, page 23-213

**UNDER-DASH
FUSE/RELAY BOX**

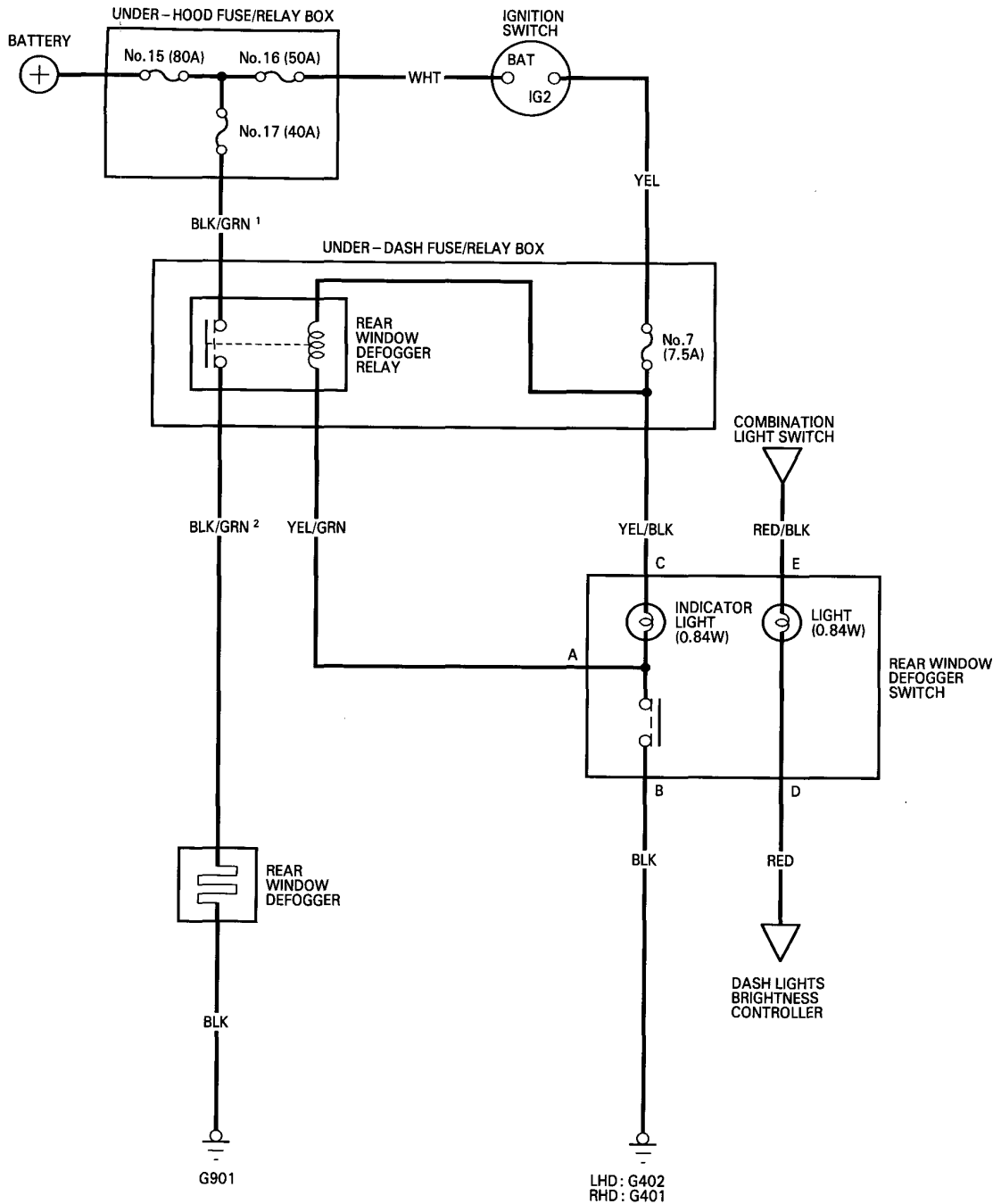


**REAR WINDOW
DEFOGGER RELAY**
Test, page 23-61

REAR WINDOW DEFOGGER
Function Test, page 23-212

Rear Window Defogger

Circuit Diagram





Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected	Blown indicator light bulb	Blown No. 7 (7.5 A) fuse (In the under-dash fuse/relay box)	Blown No. 17 (40 A) fuse (In the under-hood fuse/relay box)	Function test	Defogger relay	Defogger switch	Broken defogger wire	Poor ground	Open circuit, loose or disconnected terminals
Symptom									
Defogger works, but indicator light does not go on.	1								YEL/BLK
Defogger does not work and indicator light does not go on.		1				2		LHD: G402 RHD: G401	
Defogger does not work, but indicator light goes on.			1	4	2		3	G901	BLK/GRN ¹ , YEL/GRN BLK/GRN ²

Rear Window Defogger

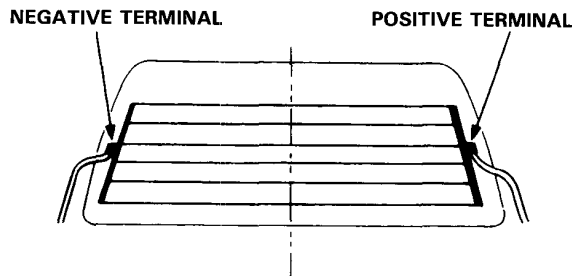
Function Test

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:
 - faulty defogger relay.
 - faulty defogger switch.
 - an open in the 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 defogger ground wire.

3. Touch the voltmeter positive probe to the halfway point of each defogger wire and the negative probe to the negative terminal.

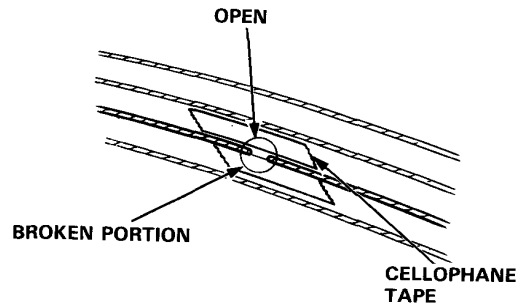
There should be approximately 6 V with the ignition switch and defogger switch ON.

- If the voltage is as specified, the defogger wire is OK.
- If the voltage is not as specified, repair the defogger.
 - If it is more than 6 V, repair the wire half on the negative side.
 - If it is less than 6 V, repair the wire half on the positive side.

Defogger Wires Repair

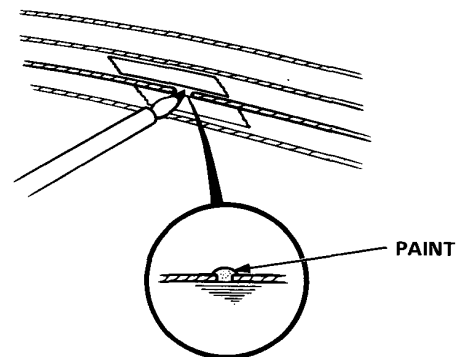
NOTE: To make an effective repair, the broken section must be no longer than one inch.

1. Lightly rub the area around the break with fine steel wool, then clean 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 broken. Allow 30 minutes to dry.

NOTE: Thoroughly mix the paint before use.

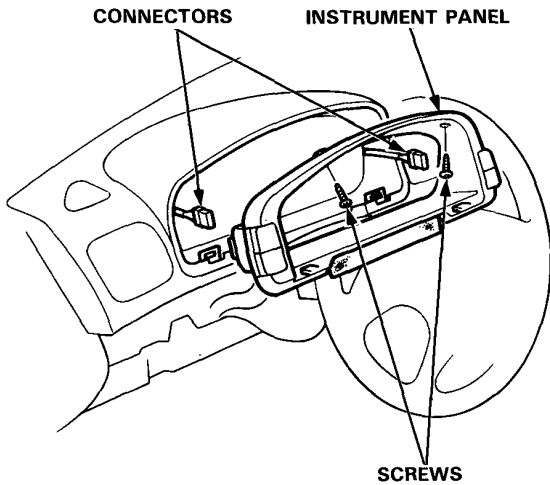


4. Check for continuity in the repaired wire.
5. Apply a second coat of paint in the same way. Let it dry three hours before removing the tape.

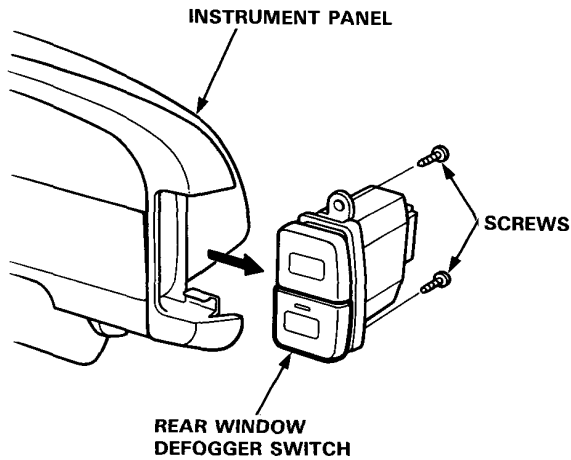


Switch Replacement

1. Remove the two screws and instrument panel.
2. Disconnect each connector from the instrument panel.



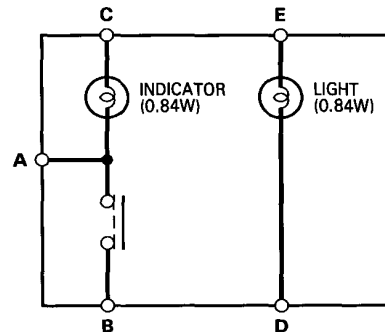
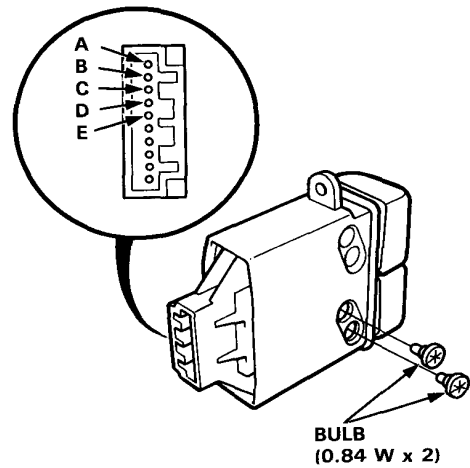
3. Remove the two screws and rear window defogger switch.



Switch Test

1. Remove the rear window defogger switch from the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

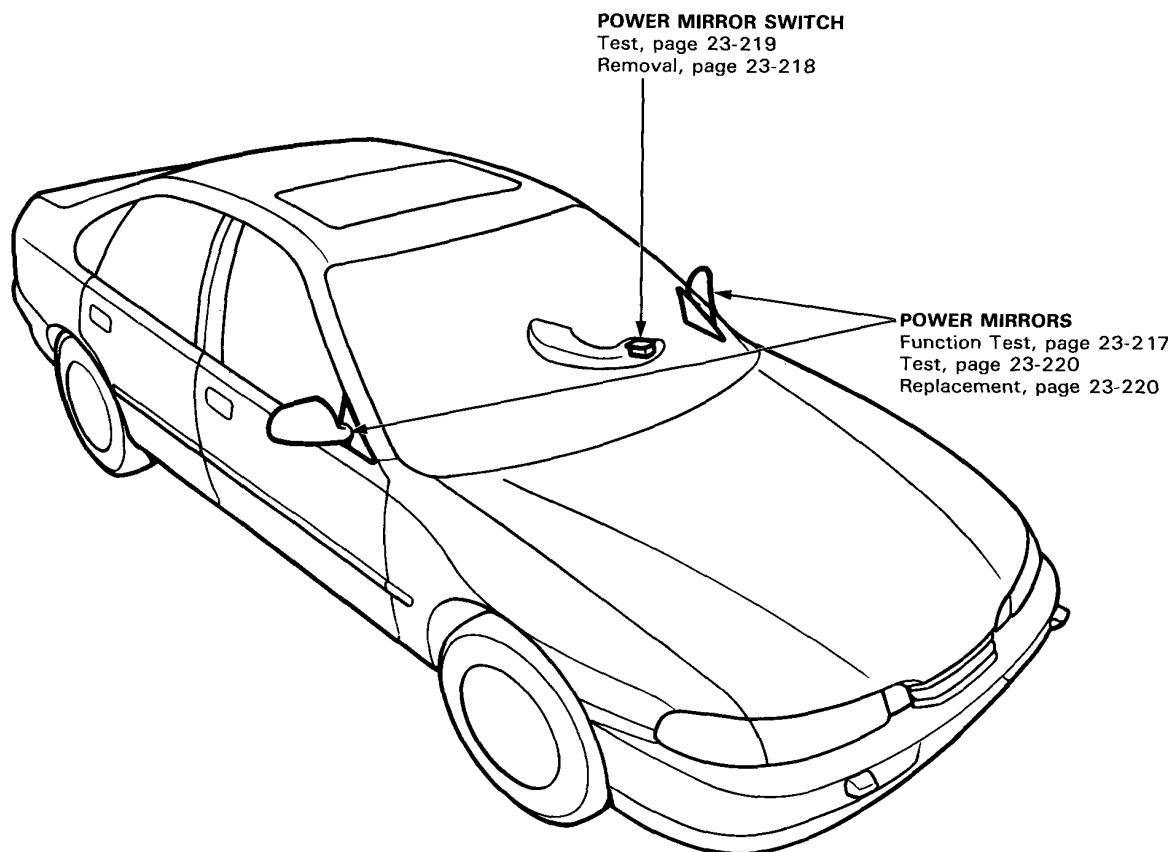
Terminal Position	A	B	C	D	E
OFF	○	○	○	○	○
ON	○	○	○	○	○



Power Mirrors

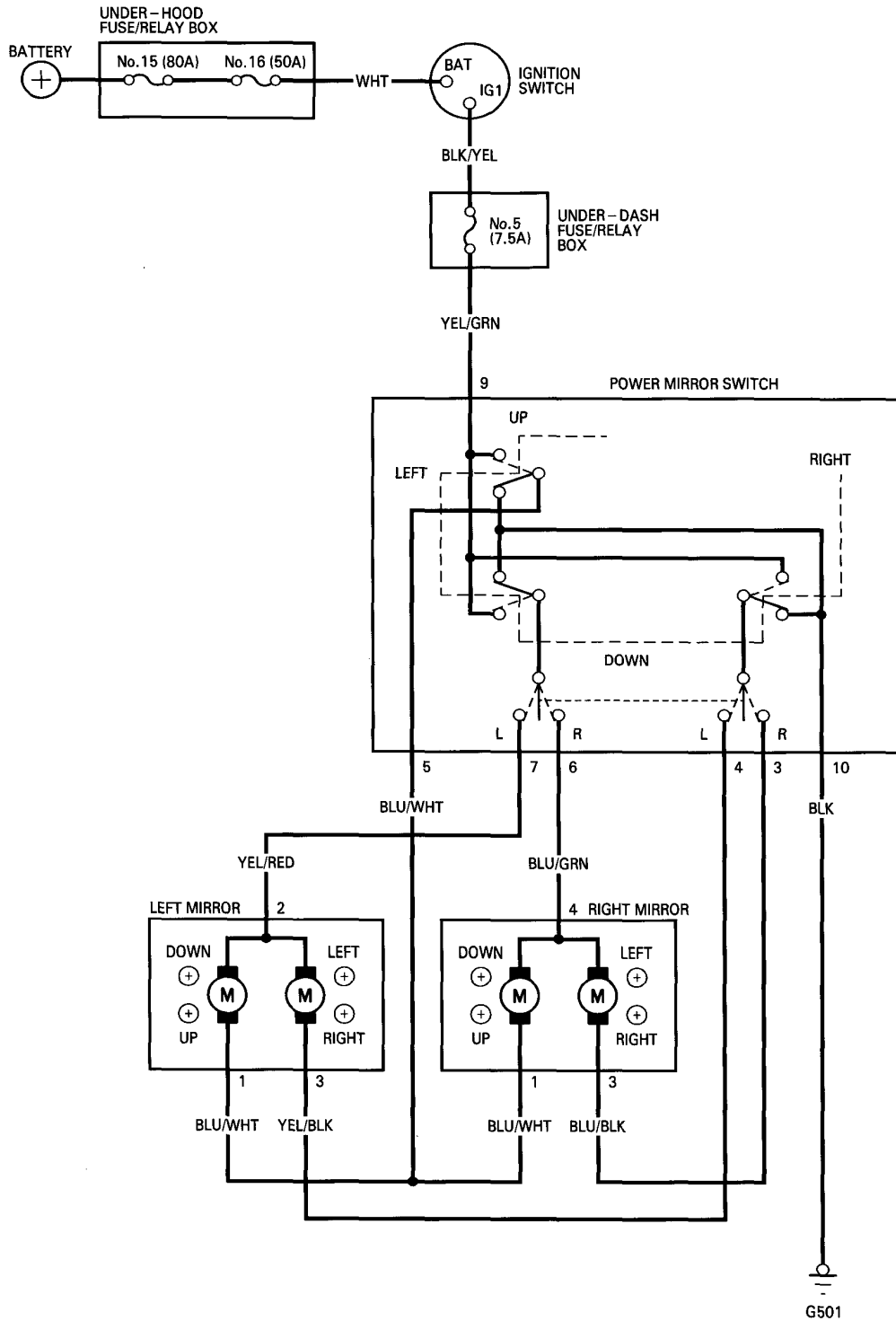
Component Location Index

NOTE: LHD type is shown, RHD type is symmetrical.



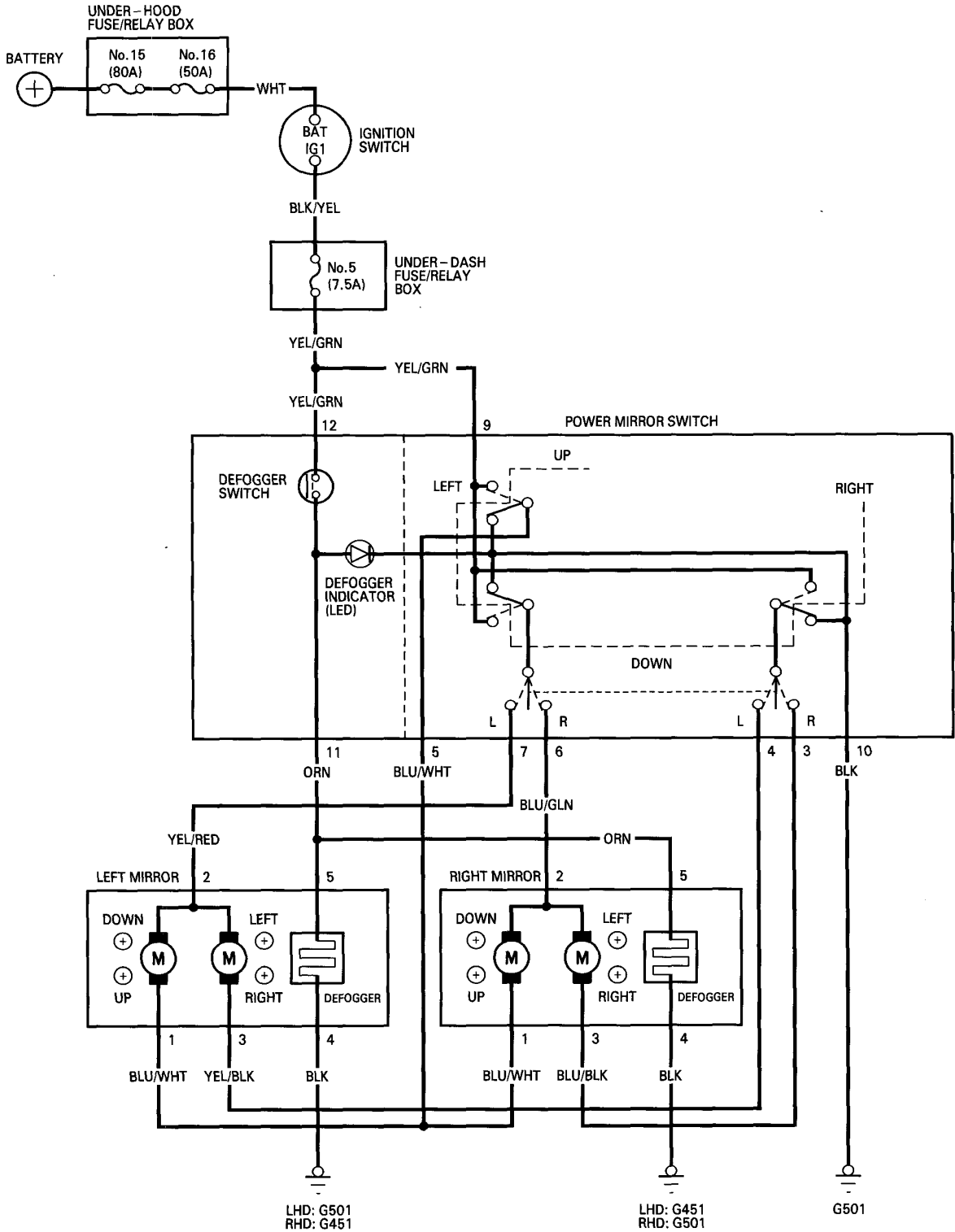


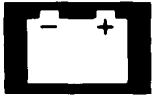
Circuit Diagram (Without defogger)



Power Mirrors

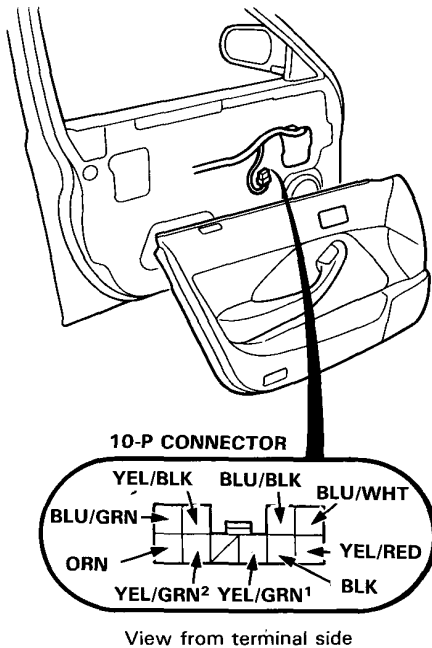
Circuit Diagram (With defogger)





Function Test

1. Remove the driver's door panel as described under "Switch Removal" on the next page.



Mirror Test

One or both inoperative:

1. Check for voltage between the YEL/GRN¹ terminal and body ground with the ignition switch ON. There should be battery voltage.
 - If there is no voltage, check for:
 - blown No. 5 (7.5 A) fuse in the under-dash fuse/relay box.
 - an open in the YEL/GRN¹ wire.
 - If there is battery voltage, go to step 2.
2. Check for continuity between the BLK terminal and body ground. There should be continuity.
 - If there is no continuity, check for:
 - an open in the BLK wire.
 - poor ground (G501).

Left mirror inoperative:

Connect the YEL/GRN¹ terminal of the 10-P connector to the YEL/RED terminal, and the BLU/WHT (or YEL/BLK) terminal to body ground with jumper wires. The left mirror should tilt down (or swing left) with the ignition switch ON (II).

- If the mirror does not tilt down (or does not swing left), check for an open in the BLU/WHT (or YEL/BLK) wire between the left mirror and the 10-P connector. If the wire is OK, check the left mirror motor.

- If the mirror neither tilts down nor swings left, repair the YEL/RED wire.
- If the mirror works properly, check the mirror switch.

Right mirror inoperative:

Connect the YEL/GRN¹ terminal of the 10-P connector to the BLU/GRN terminal, and the BLU/WHT (or BLU/BLK) terminal to body ground with jumper wires.

The right mirror should tilt down (or swing left) with the ignition switch ON.

- If the mirror does not tilt down (or does not swing left), check for an open in the BLU/WHT (or BLU/BLK) wire between the right mirror and the 10-P connector. If the wire is OK, check the right mirror motor.
- If the mirror neither tilts down nor swings left, repair the BLU/GRN wire.
- If the mirror works properly, check the mirror switch.

Defogger Test

NOTE: Check the No. 5 (7.5 A) fuse in the under-dash fuse/relay box before testing.

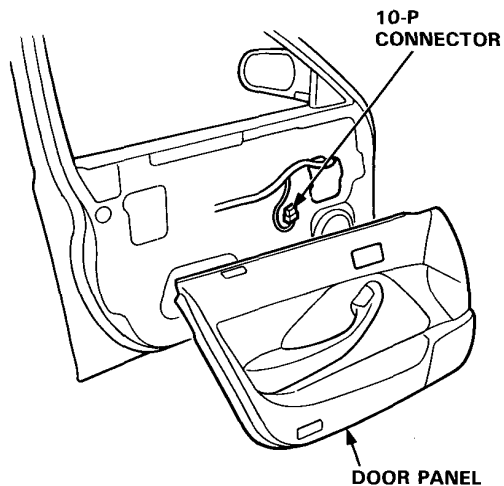
1. Check for voltage between the YEL/GRN² terminal of the 10-P connector and body ground with the ignition switch ON (II). There should be battery voltage.
 - If there is no voltage, check for an open in the YEL/GRN² wire between the under-dash fuse/relay box and the 10-P connector.
 - If there is battery voltage, go to step 2.
2. Connect the YEL/GRN² terminal of the 10-P connector to the ORN terminal with a jumper wire. Both the right and left mirrors should gradually warm up with the ignition switch ON (II).
 - If neither warms up, repair the ORN wire.
 - If only one fails to warm up, check its mirror defogger element.
 - If both warm up, check the switch.

Power Mirrors

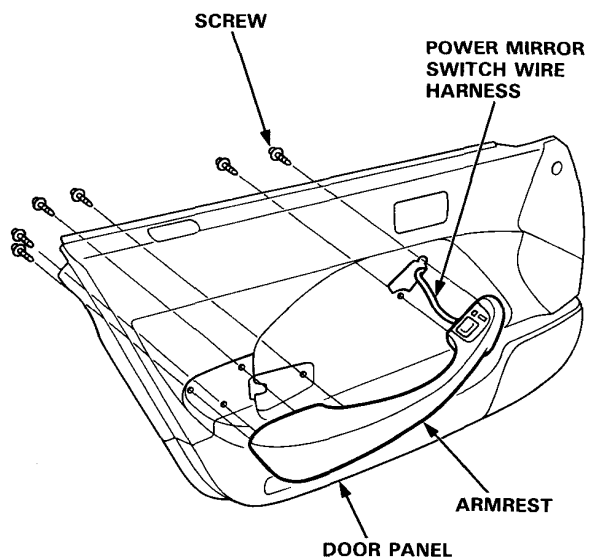
Switch Removal

NOTE: Be careful not to damage the door panel and armrest.

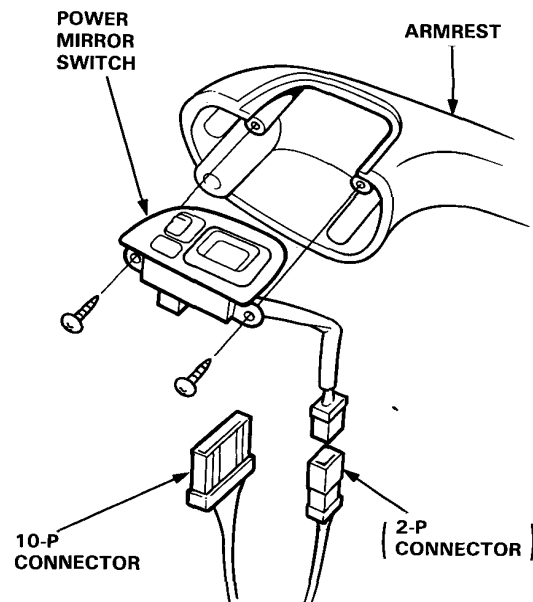
1. Remove the four screws and clips, then remove the door panel by pulling it upward and disconnect the 10-P connector.



2. Remove the armrest from the driver's door panel by removing the six screws.



3. Remove the two screws, then remove the power mirror switch from the armrest and disconnect the 10-P (and 2-P) connector(s).



(): With defogger



Switch Test

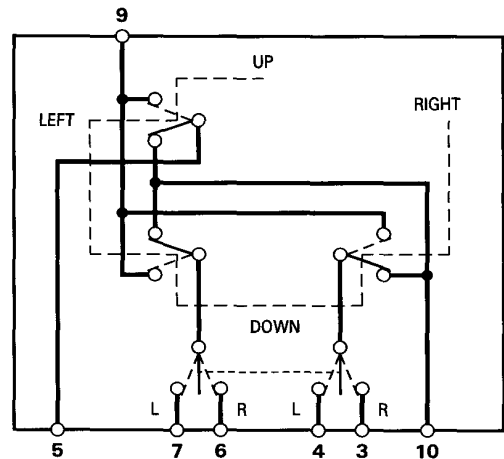
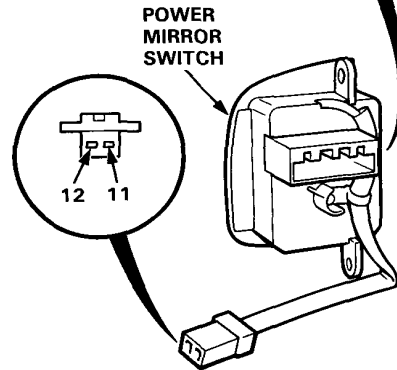
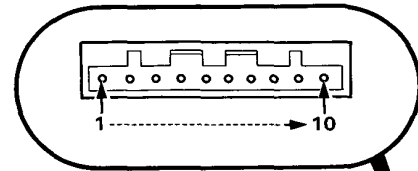
1. Remove the switch as described under "Switch Removal" on the left page.
2. Check for continuity between the terminals in each switch position according to the table.

Mirror Switch:

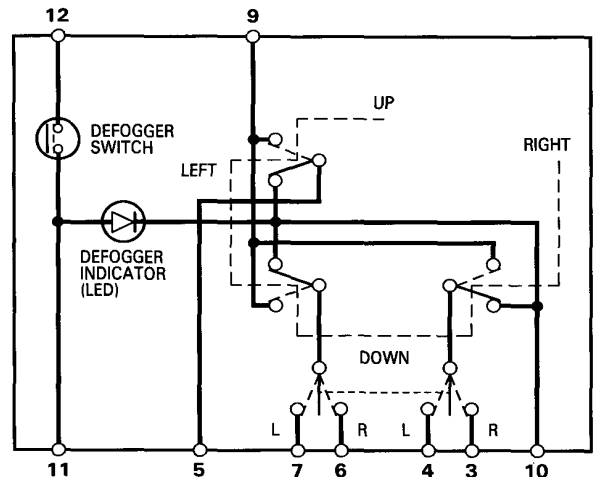
Terminal	9	10	5	4	7	3	6
Position							
R OFF		○—○				○—○	
R UP	○—○		○—○				○—○
R DOWN	○—○					○—○	○—○
R LEFT	○—○		○—○				○—○
R RIGHT	○—○					○—○	
L OFF		○—○	○—○	○—○	○—○		
L UP	○—○		○—○		○—○		
L DOWN	○—○		○—○	○—○	○—○		
L LEFT	○—○		○—○		○—○		○—○
L RIGHT	○—○			○—○			○—○

Defogger Switch:

Terminal	12	11	LED	10
Position				
ON	○—○	○—○	⊗	○—○
OFF		○—○	⊗	○—○



With defogger:

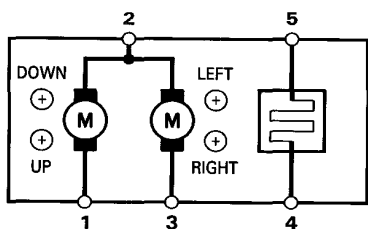
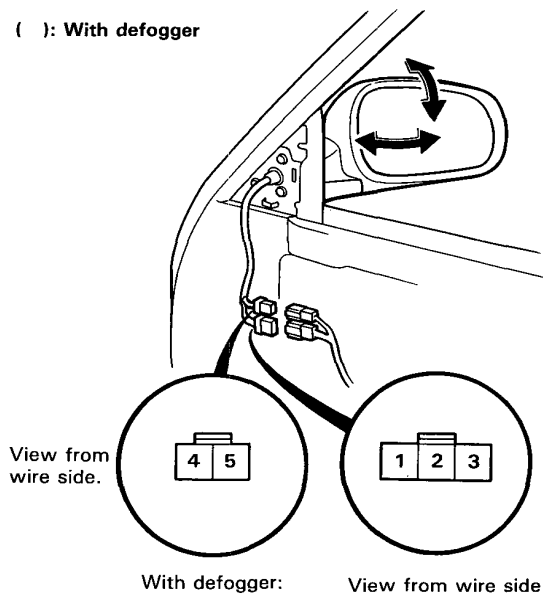


Power Mirrors

Power Mirror Motor Test

1. Carefully pry out the window corner panel with a flat tip screwdriver.
2. Remove the door panel (see section 20).
3. Disconnect the 3-P (and 2-P) connector(s) from the mirror.

(): With defogger



4. Test the motor:

Terminal	1	2	3
Position			
TILT UP	⊕	⊖	
TILT DOWN	⊖	⊕	
SWING LEFT		⊕	⊖
SWING RIGHT		⊖	⊕

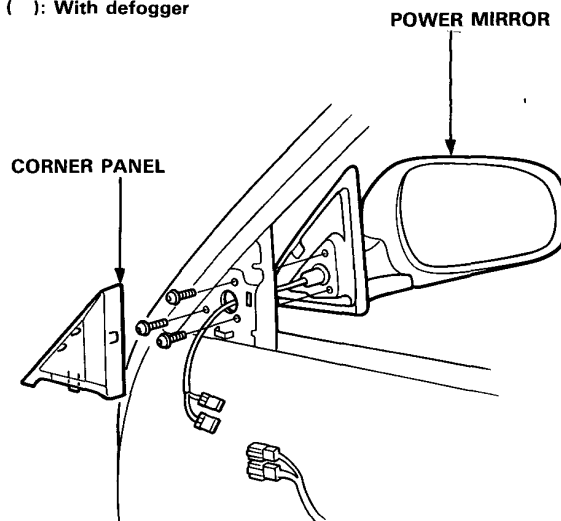
5. Check for continuity between the No. 5 and No. 4 terminals (RX 10³ scale). There should be continuity.

Power Mirror Replacement

NOTE: Before removing the mirror, lower the window fully.

1. Carefully pry out the window corner panel with a flat tip screwdriver.
2. Remove the door panel (see section 20).
3. Disconnect the 3-P (and 2-P) connector(s) from the mirror.
4. While holding the mirror with one hand, remove the three mounting screws with the other and replace the mirror.

(): With defogger



Sunroof



Component Location Index

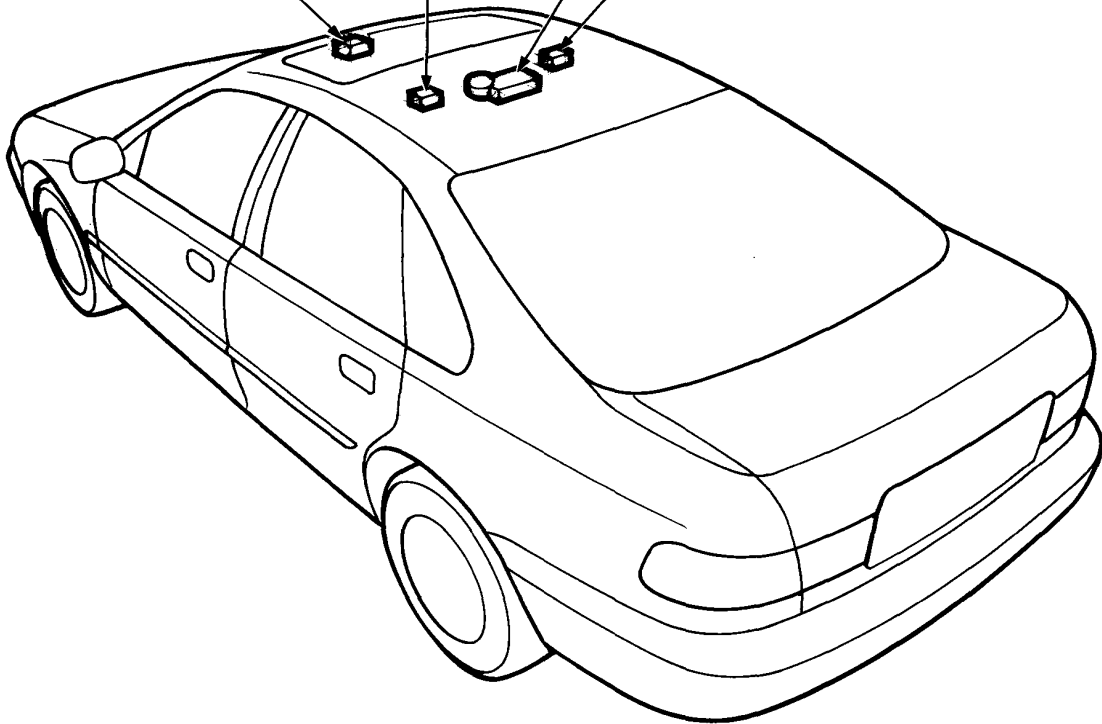
SUNROOF SWITCH
Removal, page 23-223
Test, page 23-223

SUNROOF CLOSE RELAY
Test, page 23-62
[Wire colors: GRN, GRN/RED, YEL/GRN, GRN/YEL, and BLK]

SUNROOF MOTOR ASSEMBLY

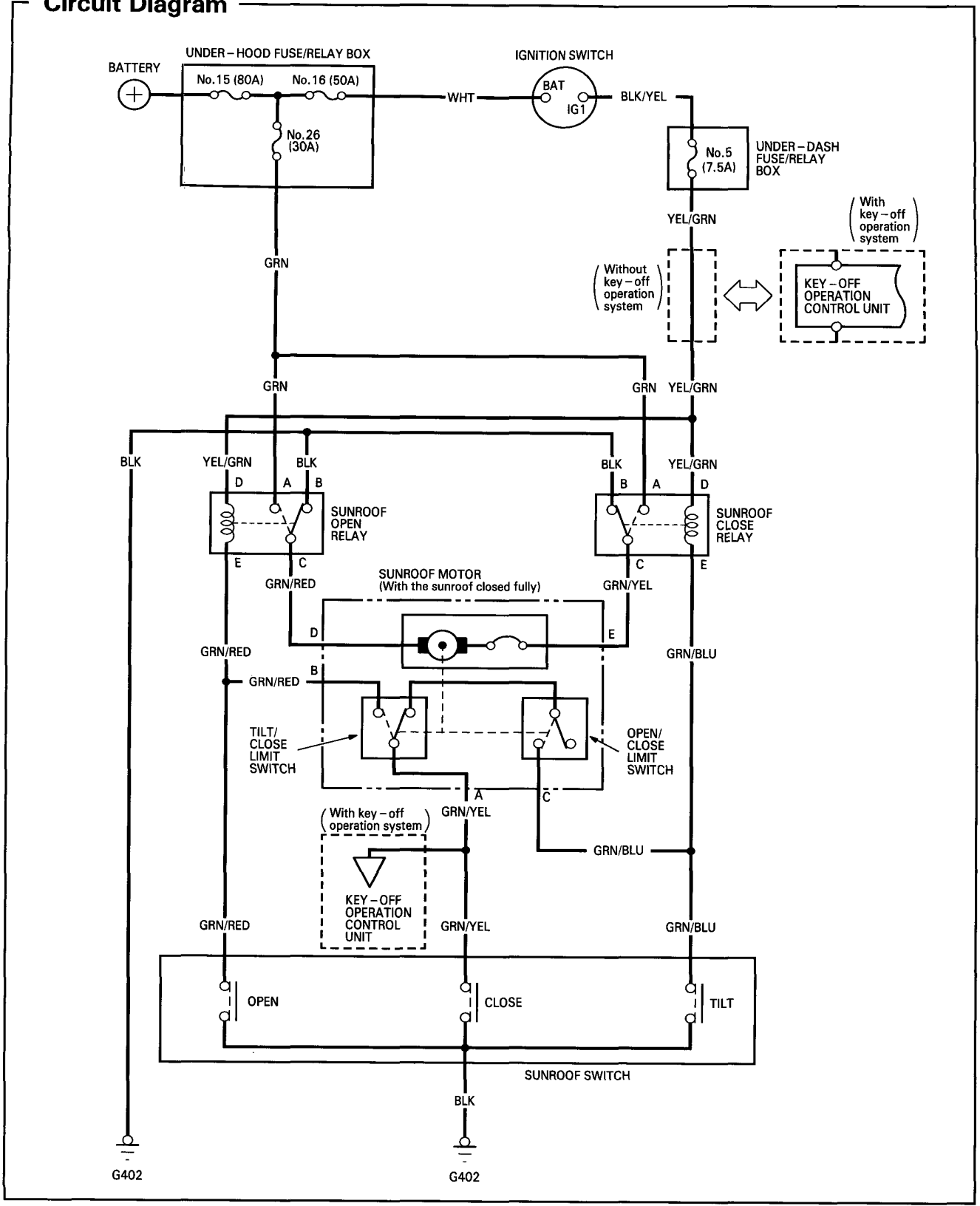
- **SUNROOF MOTOR**
Test, page 23-224
Replacement, section 20
- **OPEN/CLOSE, TILT/CLOSE SWITCH**
(Built into the motor assembly)
Test, page 23-224

SUNROOF OPEN RELAY
Test, page 23-62
[Wire colors: GRN, GRN/RED, YEL/GRN, GRN/RED, and BLK]



Sunroof

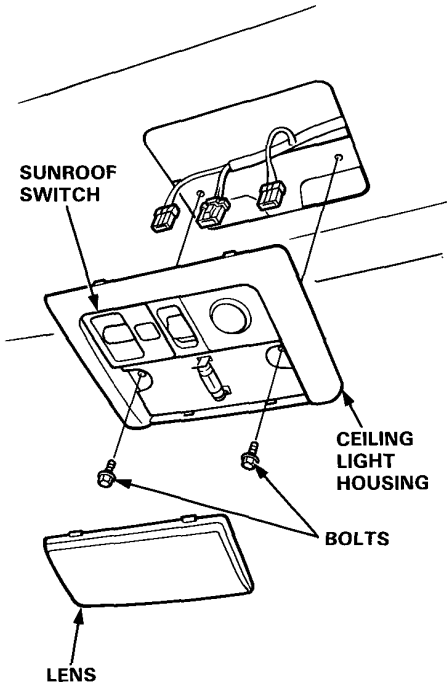
Circuit Diagram



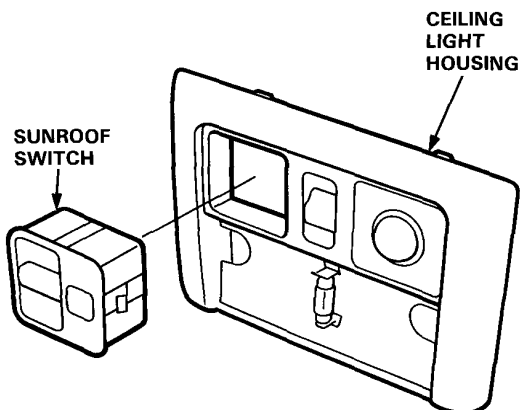


Switch Removal

1. Turn the front ceiling light switch OFF.
2. Pry the ceiling light lens off from the light housing.
3. Remove the two bolts and the light housing.
4. Disconnect the connectors from the light housing.

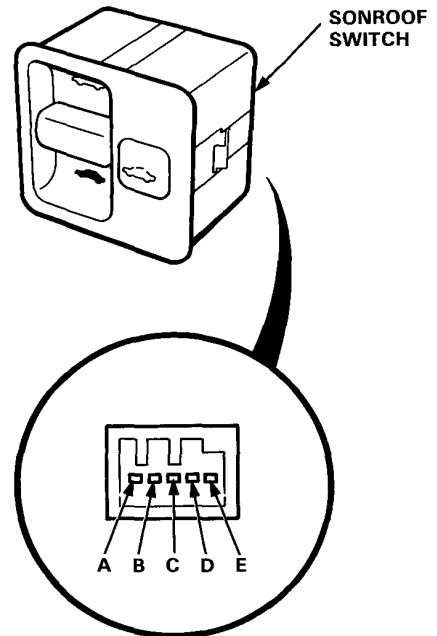


5. Separate the sunroof switch from the ceiling light housing.

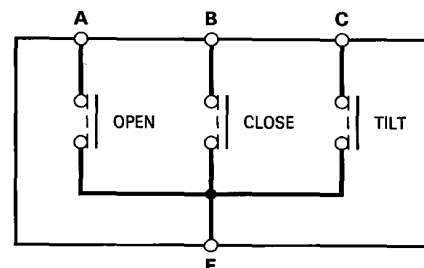


Switch Test

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



Terminal	A	B	C	E
Position				
TILT			○—○	
CLOSE		○—○		○
OPEN	○			○



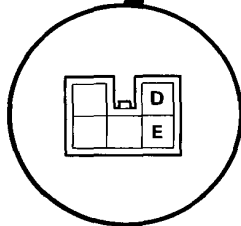
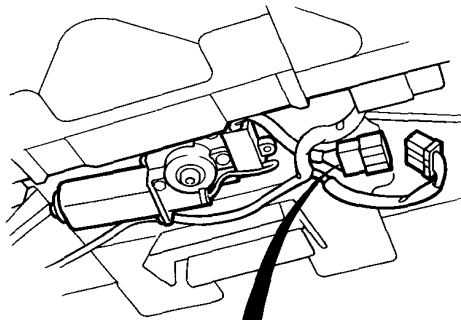
Sunroof

Motor Test

1. Remove the roof lining (see section 20).
2. Disconnect the 5-P connector from the sunroof motor.
3. Test the motor:

Terminal	D	E
Position		
OPEN	⊕	⊖
CLOSE	⊖	⊕

NOTE: The motor clutch test is in section 20.



View from wire side

5-P CONNECTOR

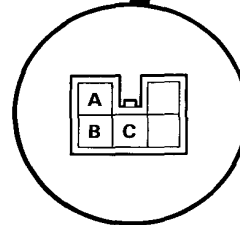
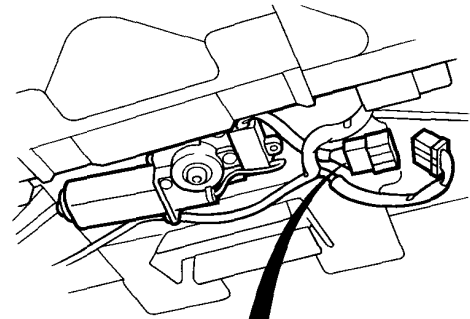
4. If the motor does not run or fails to run smoothly, replace it.

Open/Close, Tilt/Close Switch Test

1. Remove the roof lining (see section 20).
2. Disconnect the 5-P connector from the motor.
3. Check for continuity between the terminals in each switch position according to the table.

NOTE: Turn the motor by hand with the wrench.

Terminal	A	B	C
Sunroof position			
Tilted up	○	○	
Fully closed			
Fully open	○		○



View from wire side

5-P CONNECTOR

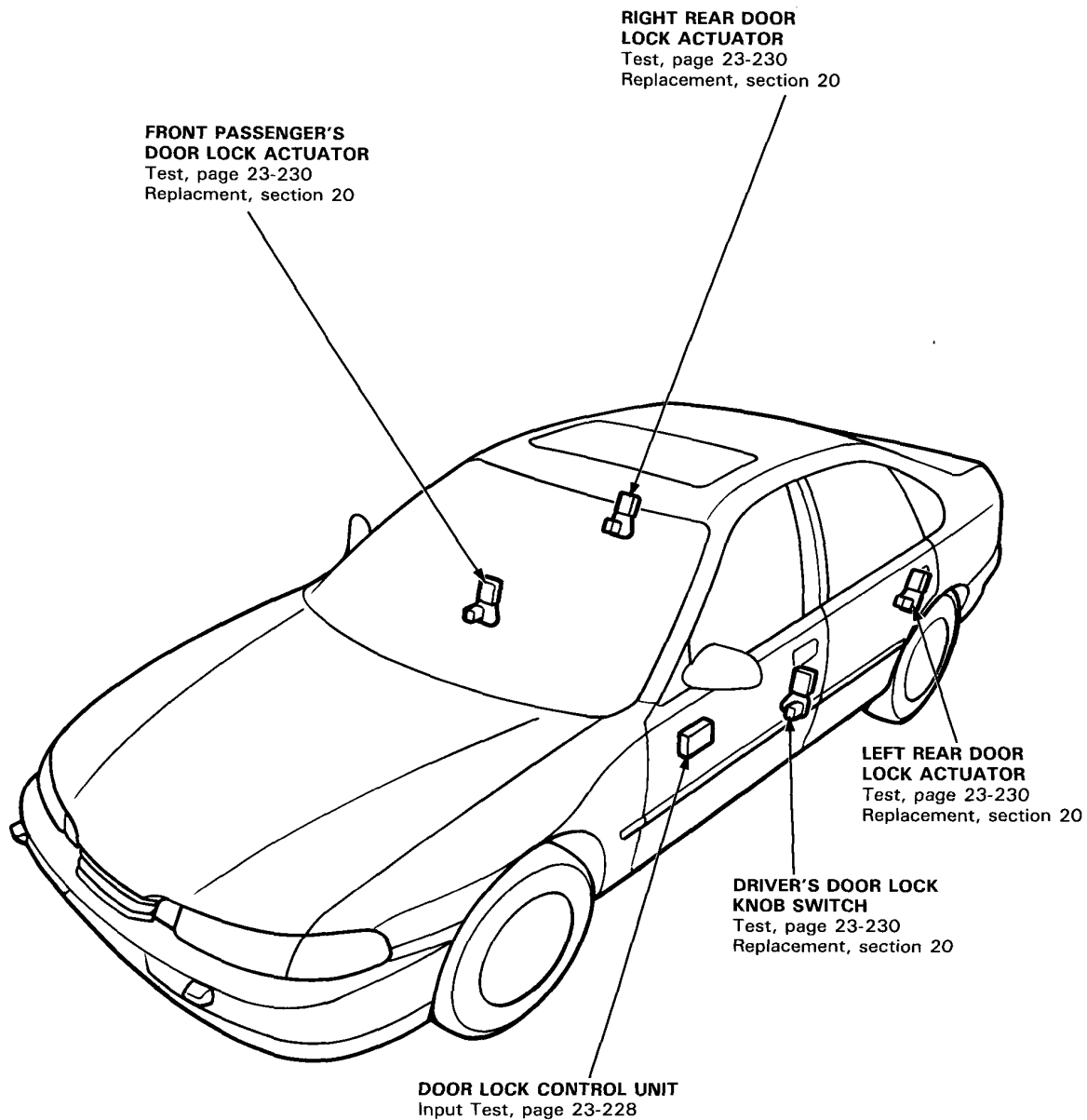
4. If there is no continuity, replace the sunroof motor assembly.

Power Door Locks (Without Keyless Entry System)



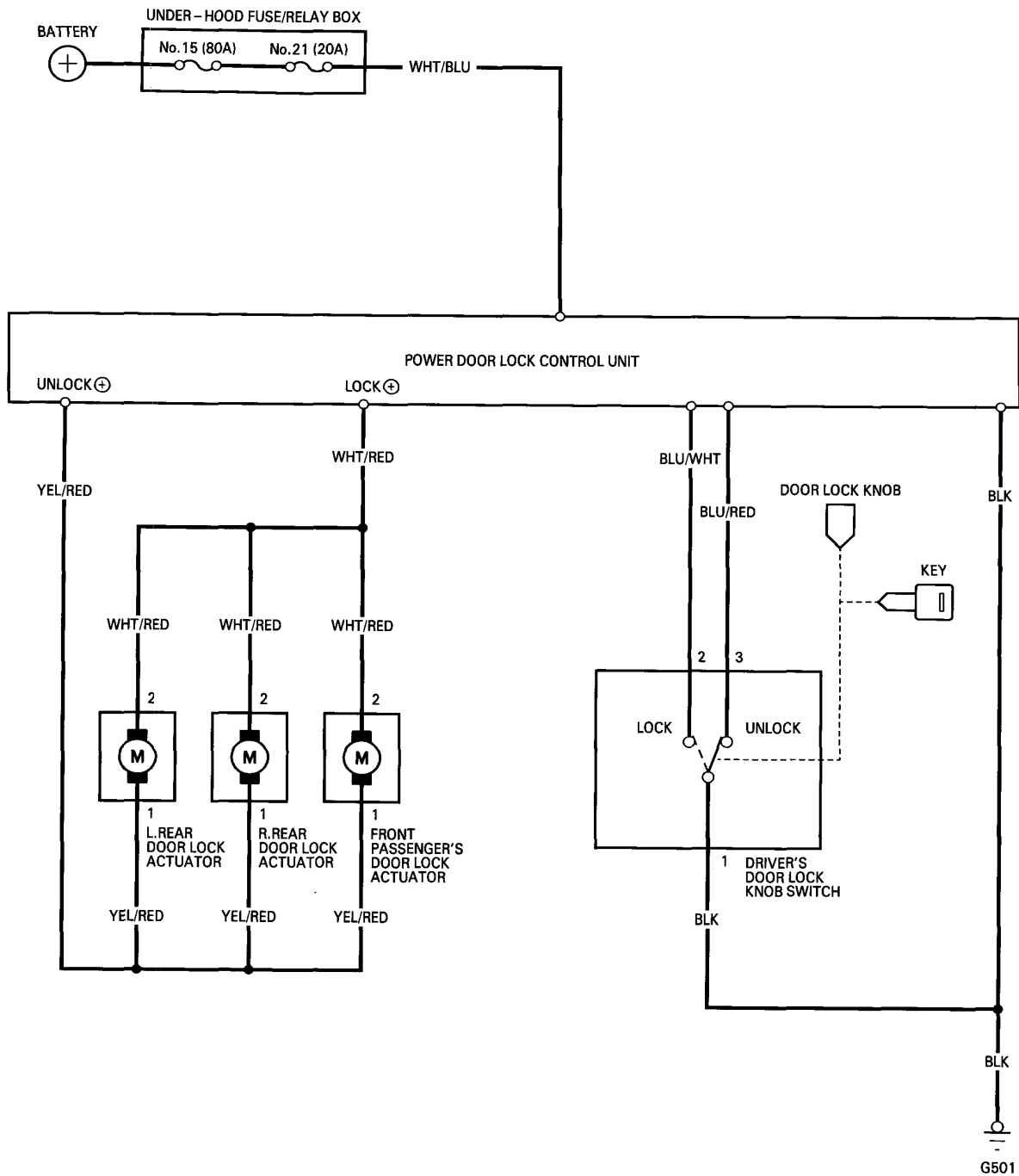
Component Location Index

NOTE: LHD type is shown, RHD type is symmetrical.



Power Door Locks (Without Keyless Entry System)

Circuit Diagram





Troubleshooting

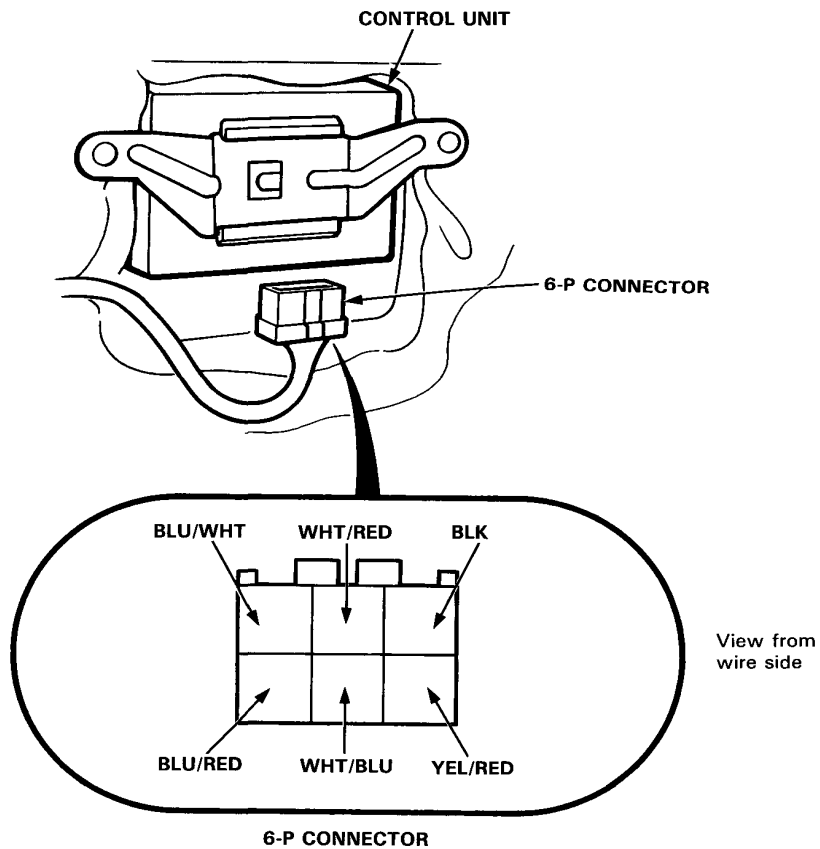
NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected		Blown No. 21 (20 A) fuse (In the under-hood fuse/relay box)	Door lock knob switch	Passenger's door lock actuator	Control unit input	Disconnected or obstructed door lock rod/linkage	Poor ground	Open circuit, loose or disconnected terminals
Symptom								
Doors do not lock with driver's door lock knob switch.	All doors	1	1		2		G501	WHT/BLU, YEL/RED WHT/RED
	One or more doors			1		2		YEL/RED, WHT/RED

Power Door Locks (Without Keyless Entry System)

Control Unit Input Test

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6-P connector from the door lock 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 a 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.





No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G501) • An open in the wire
2	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 21 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
3	BLU/RED	Driver's door lock knob switch in "UNLOCK"	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door lock knob switch • Poor ground (G501) • An open in the wire
4	BLU/WHT	Driver's door lock knob switch in "LOCK"	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Faulty driver's door lock knob switch • Poor ground (G501) • An open in the wire
5	WHT/RED and YEL/RED	Connect the WHT/BLU and WHT/RED terminals, and the YEL/RED and BLK terminals with jumper wires momentarily.	Check the door lock actuators: All doors should lock as the battery is connected momentarily.	<ul style="list-style-type: none"> • Faulty passenger's door lock actuator • An open in the wire
		Connect the WHT/BLU and YEL/RED terminals, and the WHT/RED and BLK terminals with jumper wires momentarily.	Check the door lock actuators: All doors should unlock as the battery is connected momentarily.	

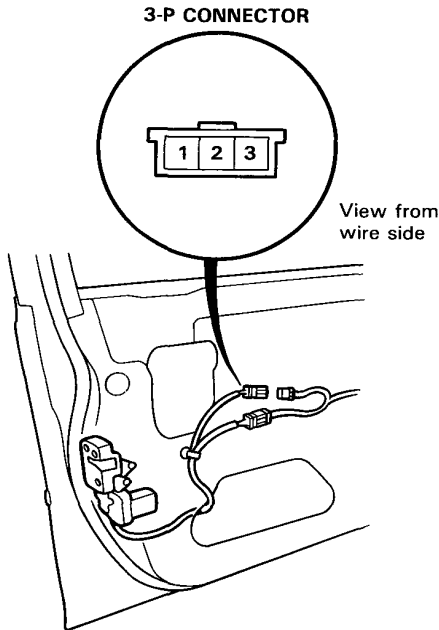
Power Door Locks (Without Keyless Entry System)

Door Lock Knob Switch Test

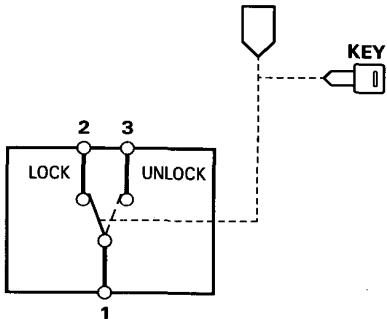
1. Remove the driver's door panel (see section 20).
2. Disconnect the 3-P connector from the door lock knob switch.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal	1	2	3
Position			
LOCK	○	○	
UNLOCK	○		○

NOTE: LHD type is shown, RHD type is symmetrical.



DRIVER'S DOOR LOCK KNOB SWITCH



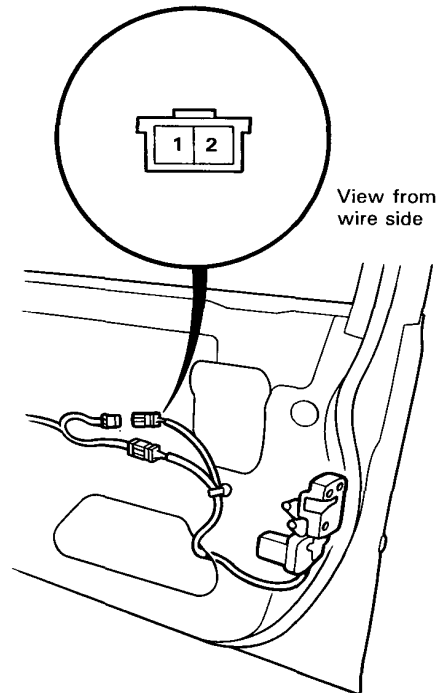
Passenger's Door Lock Actuator Test

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2-P connector from the door lock actuator.

NOTE:

- The illustration shows the front passenger's door of the LHD type, RHD type is symmetrical.
- The rear doors are similar.

2-P CONNECTOR



3. Test the actuator:

Terminal	1	2
Position		
LOCK	⊖	⊕
UNLOCK	⊕	⊖

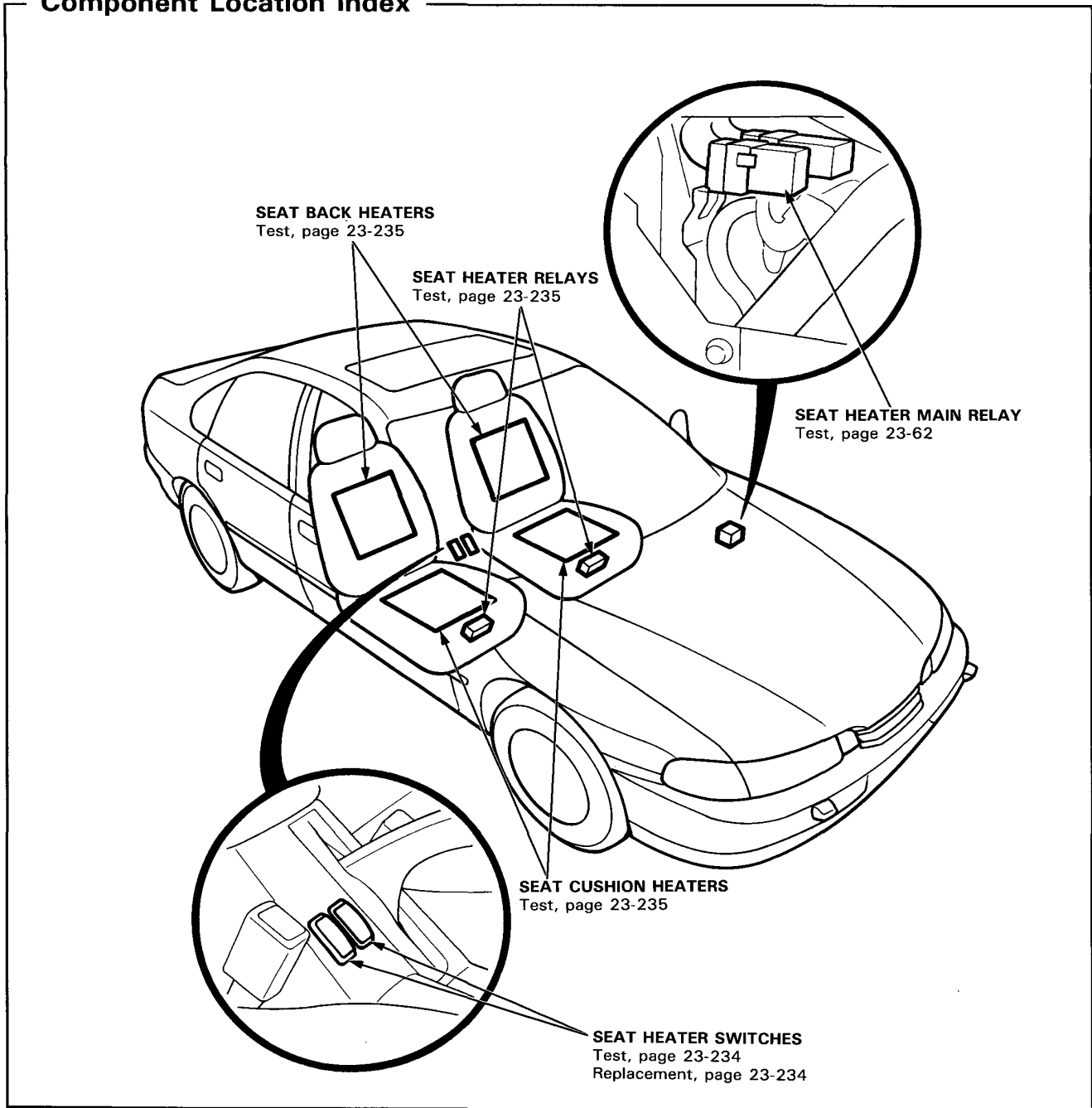
CAUTION: To prevent damage to the actuator, connect battery power only momentarily.

4. If the actuator does not work properly, replace it.



Seat Heaters (KS)

Component Location Index

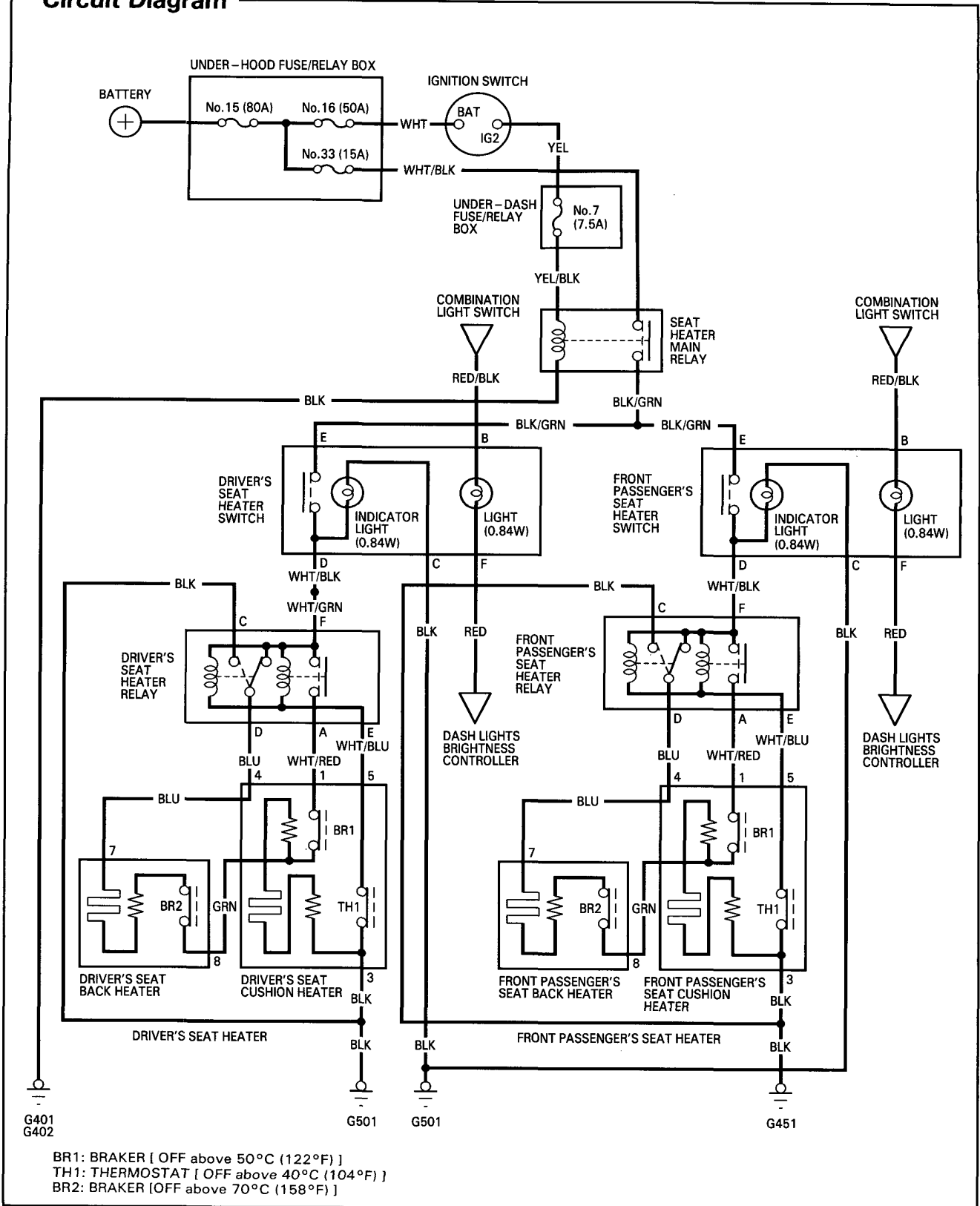


Description

Two heaters are provided in each front seat; one in the seat cushion and another in the seat back. In normal use, temperature is automatically controlled by the thermostat [OFF above 40°C (104°F)] built into each seat cushion heater. Breaker 1 [OFF above 50°C (122°F)] and breaker 2 [OFF above 70°C (158°F)] cut off the circuit to prevent abnormal temperature rise.

Seat Heaters (KS)

Circuit Diagram





Troubleshooting

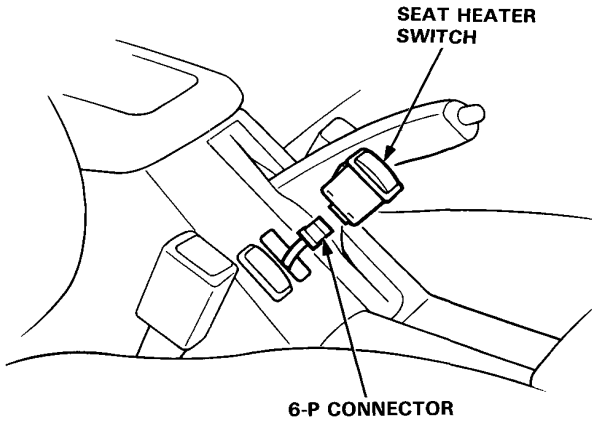
NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected		Blown No. 33 (15 A) fuse (In the under-hood fuse/relay box)	Blown No. 7 (7.5 A) fuse (In the under-dash fuse/relay box)	Blown indicator light bulb	Seat heater switch	Seat heater	Seat heater main relay input	Seat heater relay input	Poor ground	Open circuit, loose or disconnected terminals
Seat heaters work, but indicator light does not go on.				1						BLK
Seat heaters do not work and indicator light does not go on.		1			2		3	G401 G402		YEL/BLK, WHT/BLK BLK/GRN, BLK
Seat heaters do not work, but indicator light goes on.	Driver's or front passenger's seat					2		1		WHT/BLK, WHT/GRN, WHT/RED, WHT/BLU
Seat cushion heater or seat back heater does not work, but indicator light goes on.						1		2		BLU, GRN

Seat Heaters (KS)

Switch Replacement

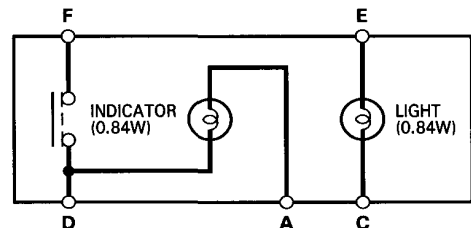
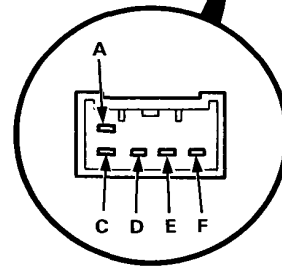
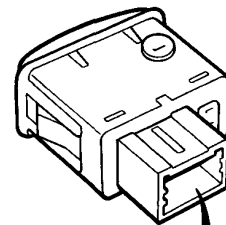
1. Pry the switch out of the center console.
2. Disconnect the 6-P connector from the switch.



Switch Test

1. Remove the seat heater switch from the center console.
2. Check for continuity between the terminals according to the table.

Terminal Position	A		D	F	E		C
ON	○	⊕	○	○		○	⊕
OFF	○	⊕	○			○	○

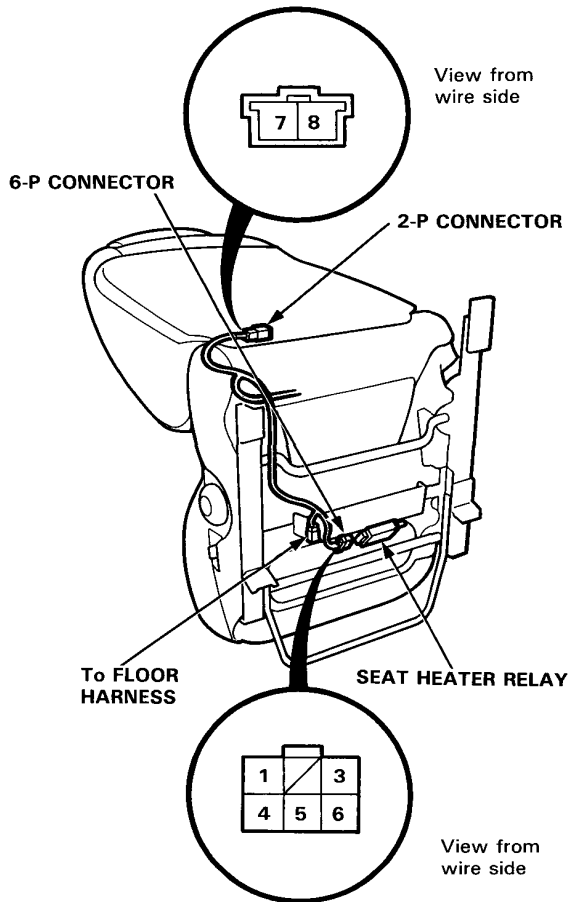




Heater Test

1. Disconnect the 6-P connector and 2-P connector as shown below.

NOTE: Driver's seat is shown, front passenger's seat is similar.

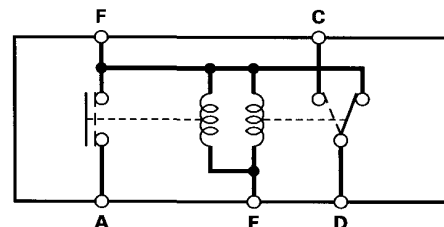
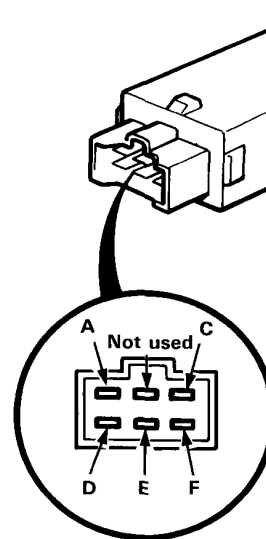


2. **Seat Cushion Heater:**
Check for continuity between the No. 1 and No. 5 terminals (Rx10³ scale). There should be continuity.
3. **Seat Back Heater:**
Check for continuity between the No. 7 and No. 8 terminals (Rx10³ scale). There should be continuity.

Relay Test

Seat Heater Relay:

1. Remove the seat, then remove the seat heater relay from the bottom of the seat.
2. Check for continuity between terminals F and A. There should be no continuity.
3. When power and ground are connected to terminals F and E, there should be continuity between terminals C and D, and should be battery voltage to the A terminal.
4. When power is disconnected, there should be continuity between terminals F and D.



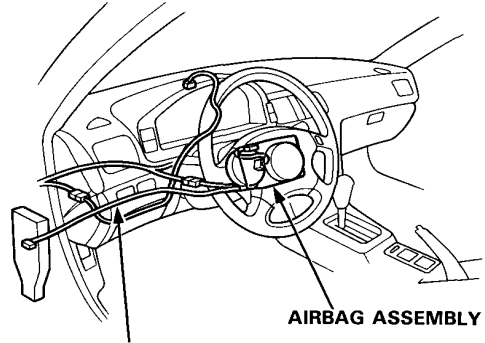
Key-off Operation System

Component Location Index

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown, RHD type is similar.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

POWER WINDOW
RELAY

Test, page 23-62

UNDER-HOOD
FUSE/RELAY BOX

FRONT PASSENGER'S
WINDOW MOTOR

Test, page 23-241
Replacement, section 20

MASTER POWER
WINDOW SWITCH

Input Test, page 23-242
Test, page 23-248
Removal, page 23-250

KEY-OFF OPERATION
CONTROL UNIT

Input Test, page 23-244

R. REAR WINDOW SWITCH

Test, page 23-251
Removal, page 23-250

DRIVER'S WINDOW
MOTOR

Test, page 23-241
Replacement, section 20

R. REAR WINDOW MOTOR

Test, page 23-241
Replacement, section 20

KEY CYLINDER
SWITCH

Test, page 23-299
Replacement, section 20

L. REAR WINDOW SWITCH

Test, page 23-251
Removal, page 23-250

L. REAR WINDOW MOTOR

Test, page 23-241
Replacement, section 20



Description

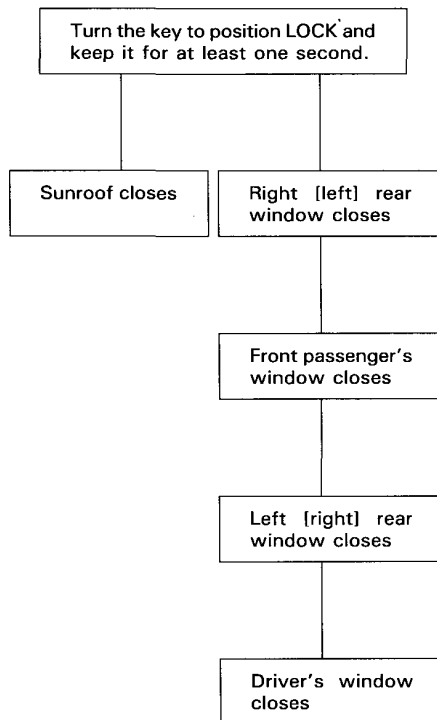
This system makes it possible to close the windows and the sunroof from outside the car. To activate the system:

- 1) Insert the key into the driver's door lock.
- 2) Turn the key to position LOCK.
- 3) Keep the key in this position for at least one second.

Operating Conditions:

- The system works only with the driver's door lock.
- You have to keep the key in LOCK for one second to start the first closing operation.
- The system works only as long as you keep the key in LOCK. When you release the key, the system will stop immediately. Turning the key back to LOCK will reactivate the system.
- The system works even when the main switch in the master power window switch is OFF.
- The system will stop immediately if the master power window switch or one of the rear window switches is pushed.

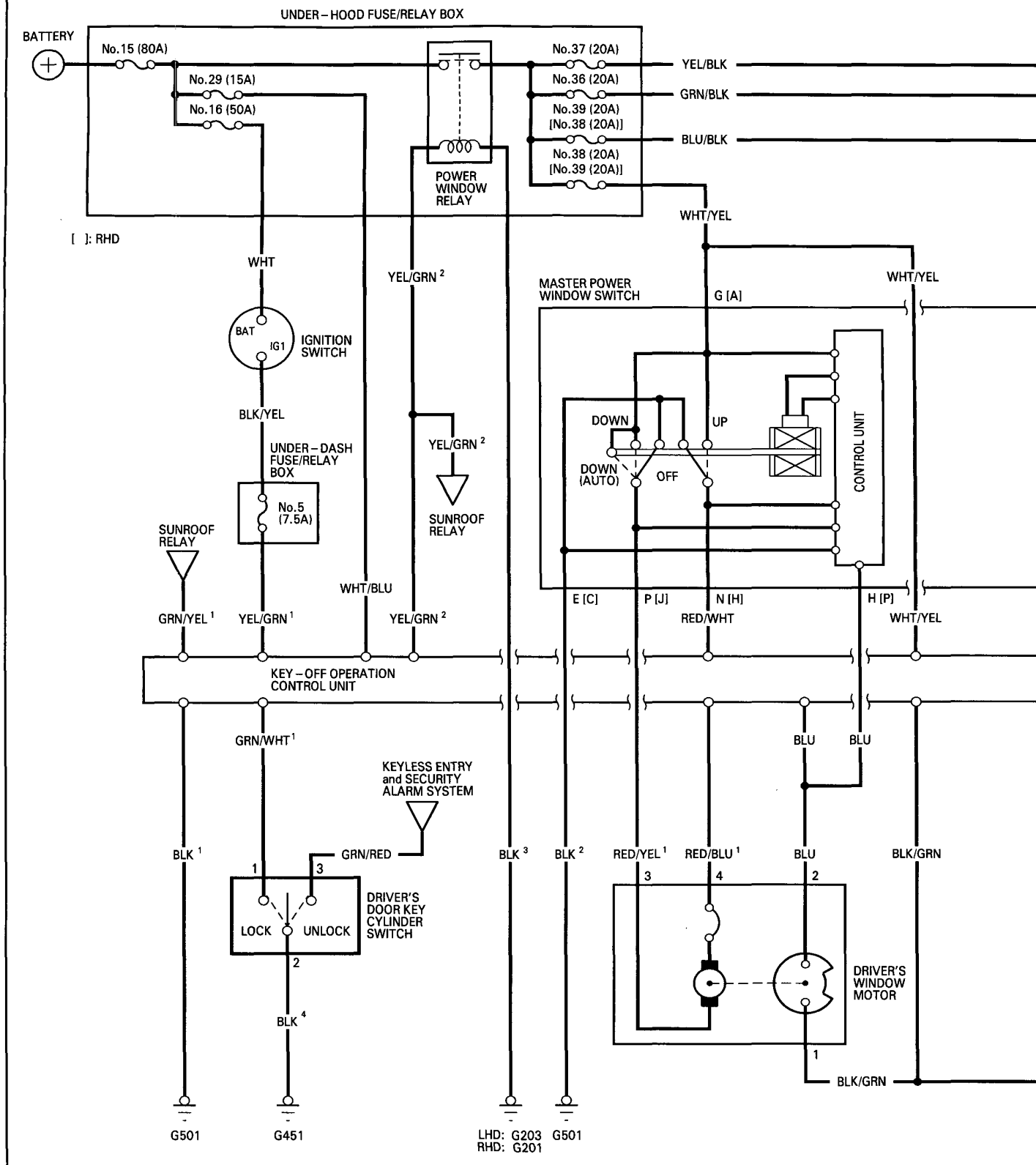
Closing Sequence:

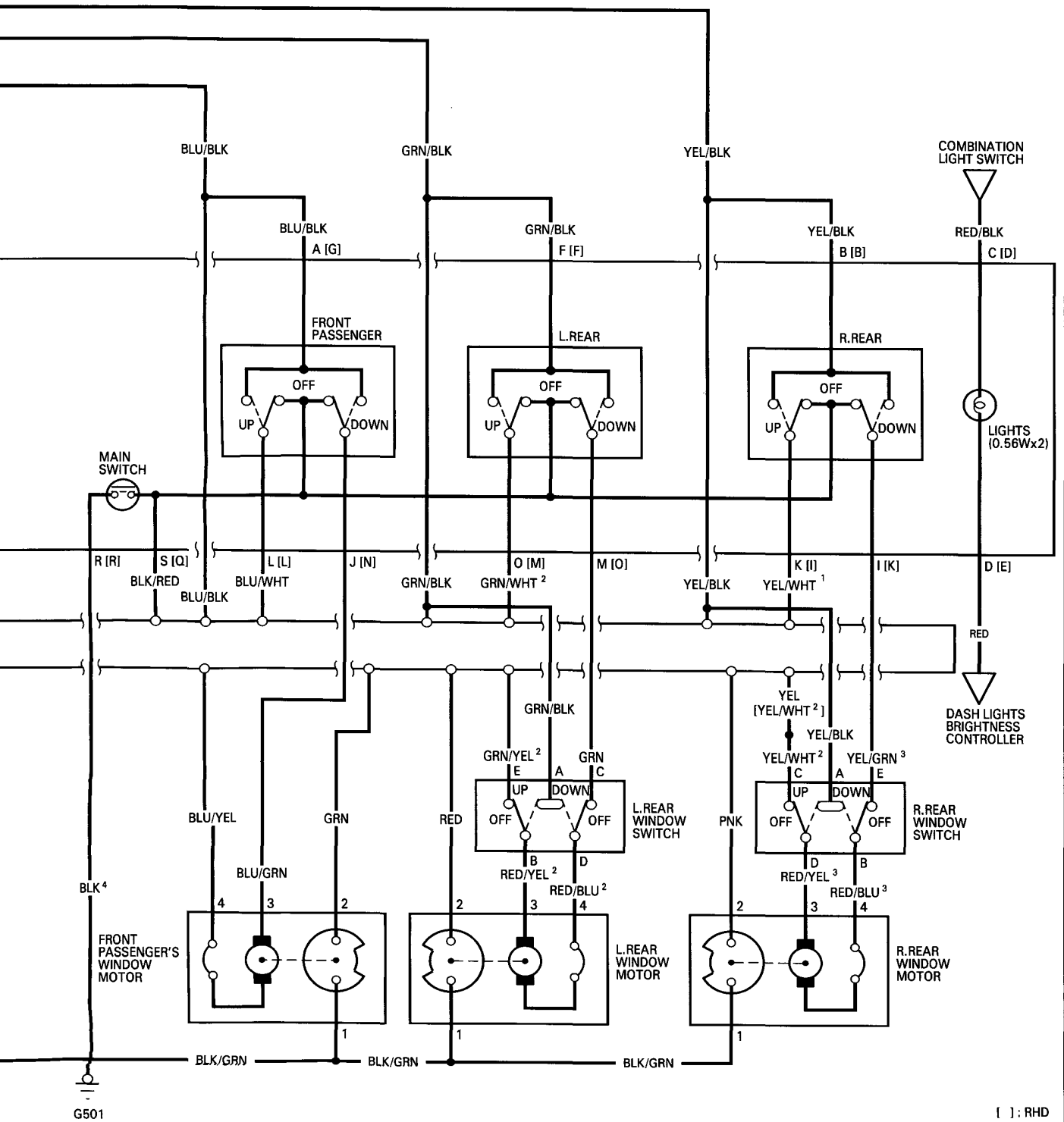


[]: RHD

Key – off Operation System

Circuit Diagram





[] : RHD

Key-off Operation System

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected	In the under-hood fuse/relay box					Blown No. 5 (7.5 A) fuse (In the under-dash fuse/relay box)	Power window relay	Key cylinder switch	Master power window switch	*Rear window switch	Power window motor	Sunroof relay	Sunroof motor	Key-off operation control unit	Poor ground	Open circuit, loose or disconnected terminals
	Blown No. 29 (15 A) fuse	*Blown No. 36 (20 A) fuse	*Blown No. 37 (20 A) fuse	Blown No. 38 (20 A) fuse	Blown No. 39 (20 A) fuse											
Symptom																
All windows and sunroof do not close.	1					2		3						G451 G501	WHT/BLU GRN/WHT ¹	
All windows do not close but sunroof closes.							1							[G201] G203	BLK/RED	
All windows close but sunroof does not close.											1	2			GRN/YEL YEL/GRN ²	
Driver's window does not close.				1	[1]			3		2			4	G501	WHT/YEL RED/YEL ¹ RED/BLU ¹	
Front passenger's window does not close.				[1]	1			3		2			4	G501	BLU/BLK BLU/YEL BLU/GRN	
Left rear passenger's window does not close.		1						3	4	2			5		GRN/BLK RED/YEL ² RED/BLU ² GRN/YEL GRN	
Right rear passenger's window does not close.			1					3	4	2			5		YEL/BLK YEL/WHT ² YEL/GRN ³ RED/YEL ³ RED/BLU ³ YEL	
The system does not stop with the key released.								1					2		GRN/WHT ¹	
The system does not stop with any of the power window switches pushed.									1	2			3		RED/WHT BLU/WHT GRN/WHT ² YEL/WHT ¹	

*: With rear power windows

[]: RHD

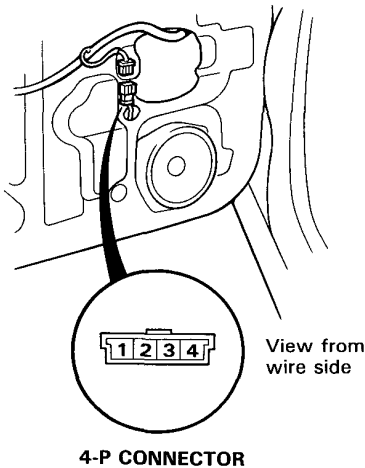


Driver's Window Motor Test

Motor Test:

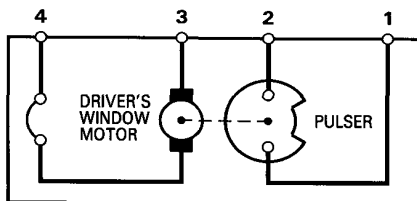
1. Remove the door panel (see section 20).
2. Disconnect the 4-P connector from the motor.
3. Test the motor by connecting battery power to the No. 3 terminal and grounding the No. 4 terminal. Test the motor in each direction by switching the leads.
4. If the motor does not run or fails to run smoothly, replace it.

NOTE: LHD type is shown, RHD type is symmetrical.



Pulser Test:

Connect the test leads of an analog ohmmeter to the No. 1 and No. 2 terminals. Run the motor by connecting power and ground to the No. 3 and No. 4 terminals. The ohmmeter needle should move back and forth alternately.

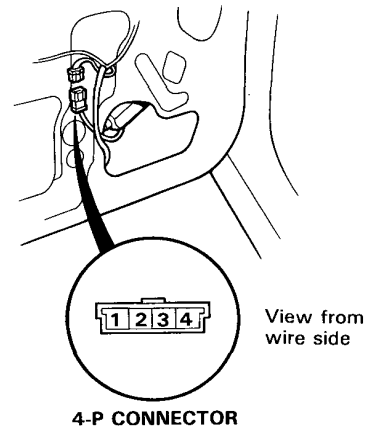


Passenger's Window Motor Test

Motor Test:

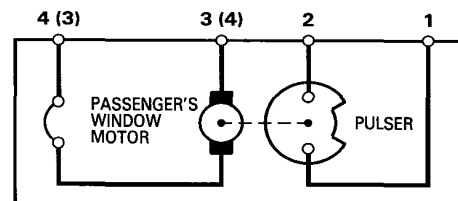
1. Remove the door panel (see section 20).
2. Disconnect the 4-P connector from the motor.
3. Test the motor by connecting battery power to the No. 3 terminal and grounding the No. 4 terminal. Test the motor in each direction by switching the leads.
4. If the motor does not run or fails to run smoothly, replace it.

NOTE: The illustration shows the left rear door.



Pulser Test:

Connect the test leads of an analog ohmmeter to the No. 3 and No. 4 terminals. 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.



(): REAR

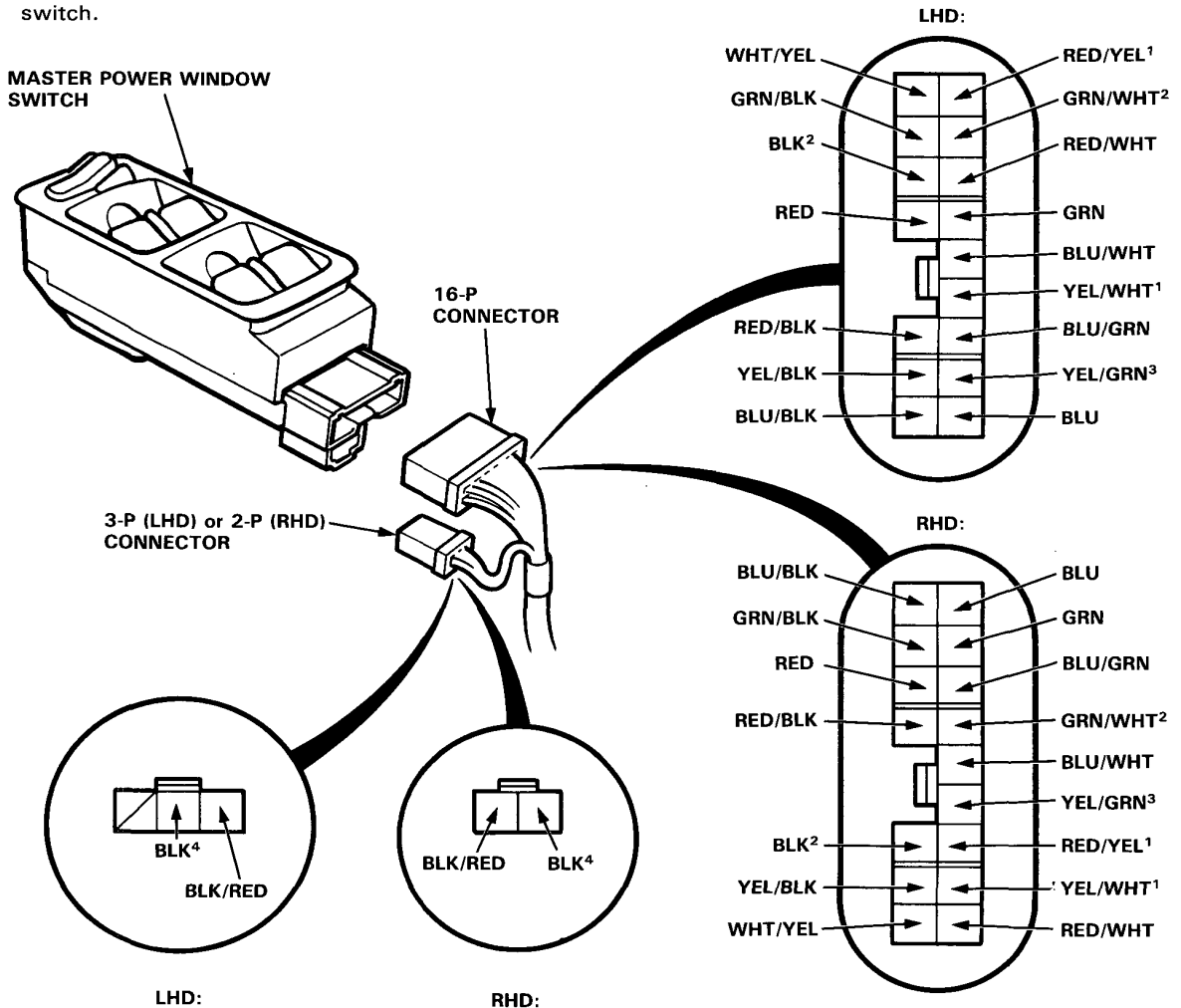
Key-off Operation System

Master Power Window Switch Input Test

NOTE: The control unit is built into the master power window switch.

1. Pry the switch out of the rear console and disconnect the connectors.
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, make the following input tests at the connectors.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all input tests prove OK, the control unit must be faulty; replace the master power window switch.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, BLK¹ and BLK² are not the same).





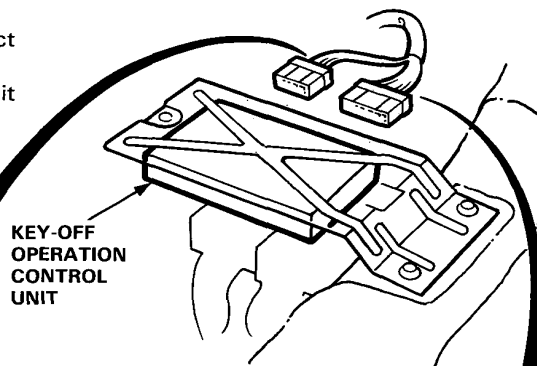
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK ⁴	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G501) • An open in the wire
2	WHT/YEL	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 29 (15 A) fuse in the under-hood fuse/relay box • Blown No. 36, 37, 38 or 39 (20 A) fuse in the under-hood fuse/relay box • Faulty key-off operation control unit • Faulty power window relay • An open in the wire
	BLU/BLK			
	GRN/BLK			
	YEL/BLK			
3	RED/WHT and RED/YEL ¹	Connect the WHT/YEL and RED/WHT terminals with a jumper wire, and the RED/YEL ¹ terminal to ground, then turn the ignition switch ON (II).	Check the driver's window motor: It should run.	<ul style="list-style-type: none"> • Faulty driver's window motor • An open in the wire
4	BLU/WHT and BLU/GRN	Connect the BLU/BLK and BLU/WHT terminals with a jumper wire, and the BLU/GRN terminal to ground, then turn the ignition switch ON (II).	Check the front passenger's window motor: It should run.	<ul style="list-style-type: none"> • Faulty front passenger's window motor • An open in the wire
5	GRN/WHT ² and GRN	Connect the GRN/BLK and GRN/WHT ² terminals with a jumper wire, and the GRN terminal to ground, then turn the ignition switch ON (II).	Check the left rear window motor: It should run.	<ul style="list-style-type: none"> • Faulty left rear window motor • Faulty left rear window switch • An open in the wire
6	YEL/WHT ¹ and YEL/GRN ³	Connect the YEL/BLK and YEL/WHT ¹ terminals with a jumper wire, and the YEL/GRN ³ terminal to ground, then turn the ignition switch ON (II).	Check the right rear window motor: It should run.	<ul style="list-style-type: none"> • Faulty right rear window motor • Faulty right rear window switch • An open in the wire
7	BLK/RED	Under all conditions	Check for continuity in the BLK/RED wire between the master power window switch and key-off operation control unit: There should be continuity.	<ul style="list-style-type: none"> • An open in the wire
8	BLU	Connect the WHT/YEL and RED/WHT terminals with a jumper wire, and the RED/YEL ¹ terminal to ground, then turn the ignition switch ON (II).	Connect an analog ohmmeter to the BLU terminal and body ground: The meter needle should move back and forth alternately as the driver's window motor runs.	<ul style="list-style-type: none"> • Faulty pulser • Faulty driver's window motor • An open in the wire
9	RED/BLK and RED	Combination light switch ON, and dash lights brightness controller on full bright	Check for voltage between the RED/BLK and RED terminals: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty combination light switch • Faulty dash lights brightness controller • An open in the wire

Key-off Operation System

Control Unit Input Test

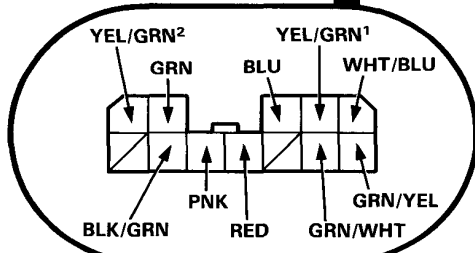
1. Remove the passenger's seat (see section 20).
2. Disconnect the 12-P and 14-P connectors from the key-off operation control unit.
3. Inspect the connector terminals to be sure they are all making good contact.
 - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
 - If the terminals look OK, make the following input tests at the connectors.
 - If a 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.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/GRN¹ and YEL/GRN² are not the same).



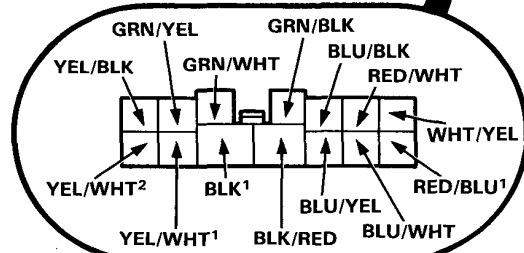
RHD:

12-P CONNECTOR



View from wire side

14-P CONNECTOR

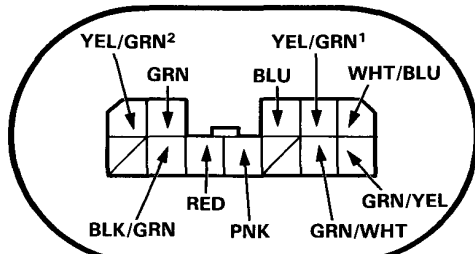


View from wire side



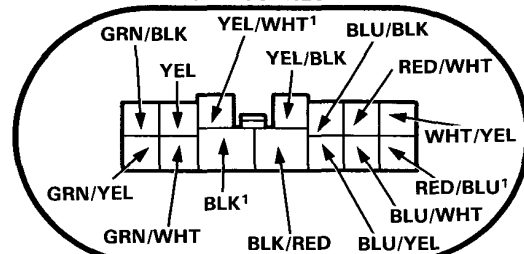
LHD:

12-P CONNECTOR



View from wire side

14-P CONNECTOR



View from wire side



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK ¹	under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none">• Poor ground (G501)• An open in the wire
2	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 29 (15 A) fuse in the under-hood fuse/relay box• An open in the wire
3	YEL/GRN ²	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none">• Faulty power window relay• Poor ground ([201], G203)• An open in the wire
4	YEL/GRN ¹	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 5 (7.5 A) fuse in the under-dash fuse/relay box• An open in the wire
5	GRN/WHT ¹	Turn the key cylinder switch to "LOCK"	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none">• Faulty key cylinder switch• Poor ground (G451)• An open in the wire
6	GRN/YEL ¹	Connect the GRN/YEL ¹ and BLK ¹ terminals with a jumper wire, then turn the ignition switch ON (II).	Check the sunroof operation: It should close.	<ul style="list-style-type: none">• Faulty sunroof motor• Faulty sunroof relay• Poor ground (G501)• An open in the wire
7	RED/WHT	Turn the ignition switch ON (II), then push up the driver's switch.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 38 [No. 39] (20 A) fuse in the under-hood fuse/relay box• Faulty master power window switch• An open in the wire
8	BLU/WHT	Turn the ignition switch ON (II), then push up the front passenger's switch.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 39 [No. 38] (20 A) fuse in the under-hood fuse/relay box• Faulty master power window switch• An open in the wire
9	GRN/WHT ²	Turn the ignition switch ON (II), then push up the left rear switch.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 36 (20 A) fuse in the under-hood fuse/relay box• Faulty master power window switch• An open in the wire
10	YEL/WHT ¹	Turn the ignition switch ON (II), then push up the right rear switch.	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none">• Blown No. 37 (20 A) fuse in the under-hood fuse/relay box• Faulty master power window switch• An open in the wire

[]: RHD

(cont'd)

Key-off Operation System

Control Unit Input Test (cont'd)

No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
11	WHT/YEL and RED/BLU ¹	Connect the WHT/YEL and RED/BLU ¹ terminals with a jumper wire, then turn the ignition switch ON (II).	Check the driver's window motor: It should run.	<ul style="list-style-type: none"> • Blown No. 38 [No. 39] (20 A) fuse in the under-hood fuse/relay box • Faulty power window relay • Faulty master power window switch • Faulty driver's window motor • Poor ground (G501) • An open in the wire
12	BLU/BLK and BLU/YEL	Connect the BLU/BLK and BLU/YEL terminals with a jumper wire, and the BLK/RED terminal to ground, then turn the ignition switch ON (II).	Check the front passenger's window motor: It should run.	<ul style="list-style-type: none"> • Blown No. 39 [No. 38] (20 A) fuse in the under-hood fuse/relay box • Faulty power window relay • Faulty master power window switch • Faulty front passenger's window motor • An open in the wire
13	GRN/BLK and GRN/YEL ²	Connect the GRN/BLK and GRN/YEL ² terminals with a jumper wire, and the BLK/RED terminal to ground, then turn the ignition switch ON (II).	Check the left rear window motor: It should run.	<ul style="list-style-type: none"> • Blown No. 36 (20 A) fuse in the under-hood fuse/relay box • Faulty power window relay • Faulty master power window switch • Faulty left rear window switch • Faulty left rear window motor • An open in the wire
14	YEL/BLK and YEL [YEL/WHT ²]	Connect the YEL/BLK and YEL [YEL/WHT ²] terminals with a jumper wire, and the BLK/RED terminal to ground, then turn the ignition switch ON (II).	Check the right rear window motor: It should run.	<ul style="list-style-type: none"> • Blown No. 37 (20 A) fuse in the under-hood fuse/relay box • Faulty power window relay • Faulty master power window switch • Faulty right rear window switch • Faulty right rear window motor • An open in the wire
15	BLK/RED	Under all conditions.	Check for continuity of the BLK/RED wire between the master power window switch and key-off operation control unit: There should be continuity.	<ul style="list-style-type: none"> • An open in the wire

[]: RHD



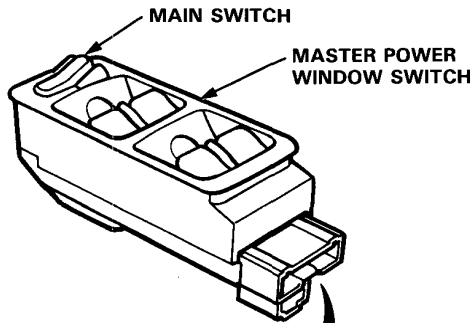
No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
16	BLU and BLK/GRN	Connect the WHT/YEL and RED/BLU ¹ terminals with a jumper wire, then turn the ignition switch ON (II).	Connect an analog ohmmeter to the BLU and BLK/GRN terminals: The meter needle should move back and forth alternately as the driver's window motor runs.	<ul style="list-style-type: none">• Faulty pulser• Faulty driver's window motor• An open in the wire
17	GRN and BLK/GRN	Connect the BLU/BLK and BLU/YEL terminals, and the BLK/RED and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Connect an analog ohmmeter to the GRN and BLK/GRN terminals: The meter needle should move back and forth alternately as the front passenger's window motor runs.	<ul style="list-style-type: none">• Faulty pulser• Faulty front passenger's window motor• An open in the wire
18	RED and BLK/GRN	Connect the GRN/BLK and GRN/YEL ² terminals, and the BLK/RED and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Connect an analog ohmmeter to the RED and BLK/GRN terminals: The meter needle should move back and forth alternately as the left rear window motor runs.	<ul style="list-style-type: none">• Faulty pulser• Faulty left rear window motor• An open in the wire
19	PNK and BLK/GRN	Connect the YEL/BLK and YEL [YEL/WHT ²] terminals and the BLK/RED and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Connect an analog ohmmeter to the PNK and BLK/GRN terminals: The meter needle should move back and forth alternately as the right rear window motor runs.	<ul style="list-style-type: none">• Faulty pulser• Faulty right rear window motor• An open in the wire

[]: RHD

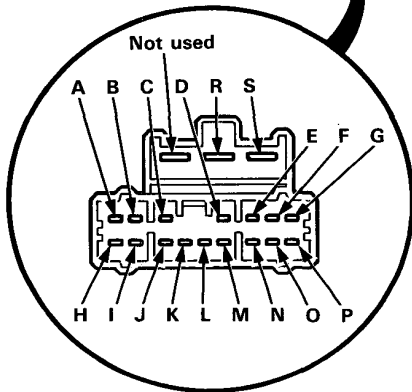
Key-off Operation System

Master Power Window Switch Test

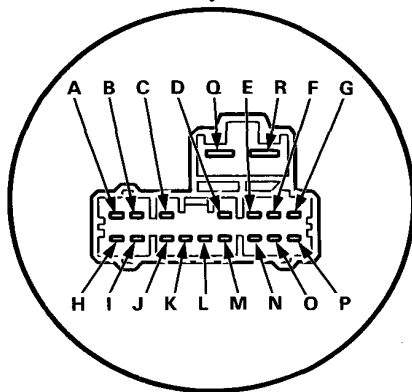
1. Pry the switch out of the floor console.
2. Check for continuity between the terminals in each switch position according to the table.



LHD:



RHD:



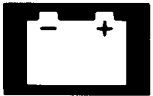
Driver's Switch

Position	Terminal			
	G [A]	P [J]	E [C]	N [H]
OFF		○	○	○
UP	○			○
DOWN	○	○		
DOWN (AUTO)	○	○		

Front Passenger's Switch

Position	Main Switch	Terminal				
		J [N]	L [L]	A [G]	R [R]	S [Q]
OFF	ON	○	○		○	○
	OFF	○	○			○
UP	ON	○		○		○
	OFF		○	○		○
DOWN	ON	○		○		○
	OFF	○		○		○

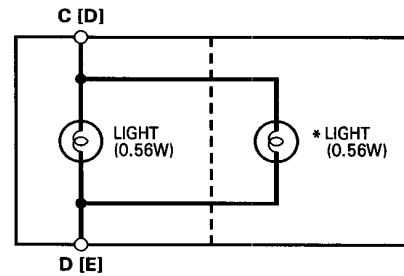
[]: RHD



*** L. Rear Switch**

Position	Terminal		M (O)	O (M)	F (F)	R (R)	S (Q)
		Main Switch					
OFF	ON		○	○	—	○	○
	OFF		○	○	—	○	○
UP	ON		○	○	○	○	○
	OFF		○	○	○	○	○
DOWN	ON		○	○	○	○	○
	OFF		○	○	○	○	○

3. Check for continuity between the C [D] and D [E] terminals. There should be continuity. If there is no continuity, check the bulb(s).



*** R. Rear Switch**

Position	Terminal		I (K)	K (I)	B (B)	R (R)	S (Q)
		Main Switch					
OFF	ON		○	○	—	○	○
	OFF		○	○	—	○	○
UP	ON		○	○	○	○	○
	OFF		○	○	○	○	○
DOWN	ON		○	○	○	○	○
	OFF		○	○	○	○	○

- *: With rear power windows
[]: RHD

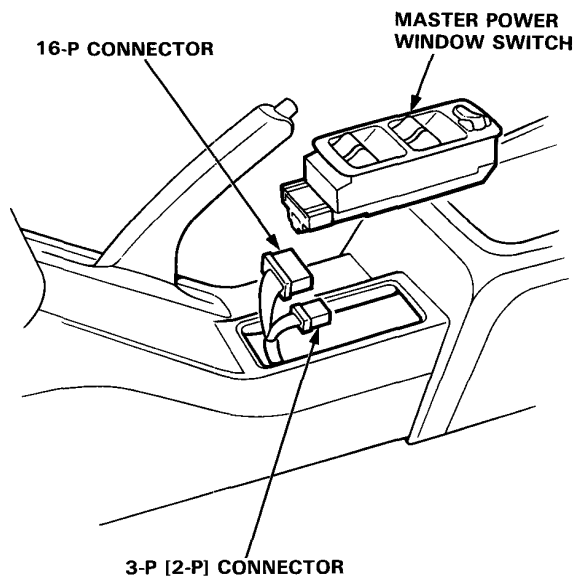
*: With rear power windows
[]: RHD

Key-off Operation System

Switch Removal

Master Power Window Switch:

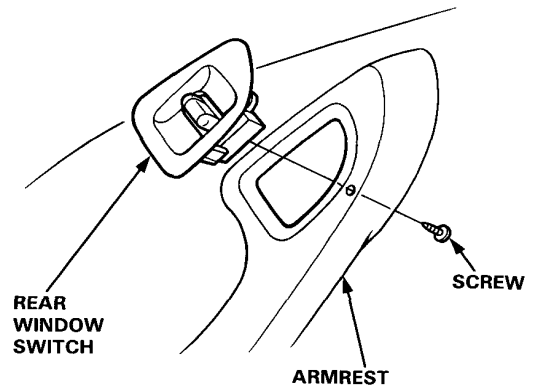
1. Carefully push the master power window switch out from behind the rear console.
2. Disconnect the 16-P and 3-P [2-P] connectors from the switch.

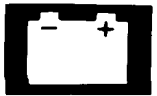


[]: RHD

Rear Window Switch:

1. Remove the rear door panel from the door and disconnect the connectors (see section 20).
2. Remove the screw and the switch from the armrest.

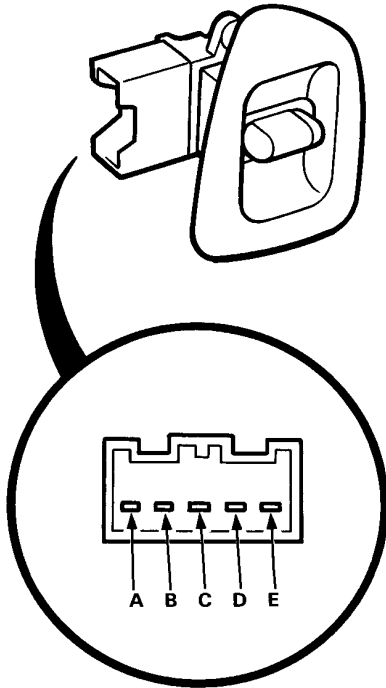




Rear Window Switch Test

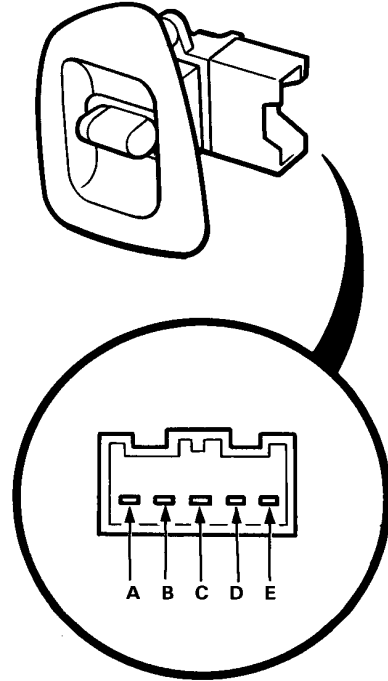
1. Remove the rear window switch from the armrest.
2. Check for continuity between the terminals in each switch position according to the table.

Left Rear Window Switch:



Terminal	A	B	C	D	E
Position					
UP	○—○		○—○		
OFF		○—○	○—○		○
DOWN	○—○			○—○	

Right Rear Window Switch:

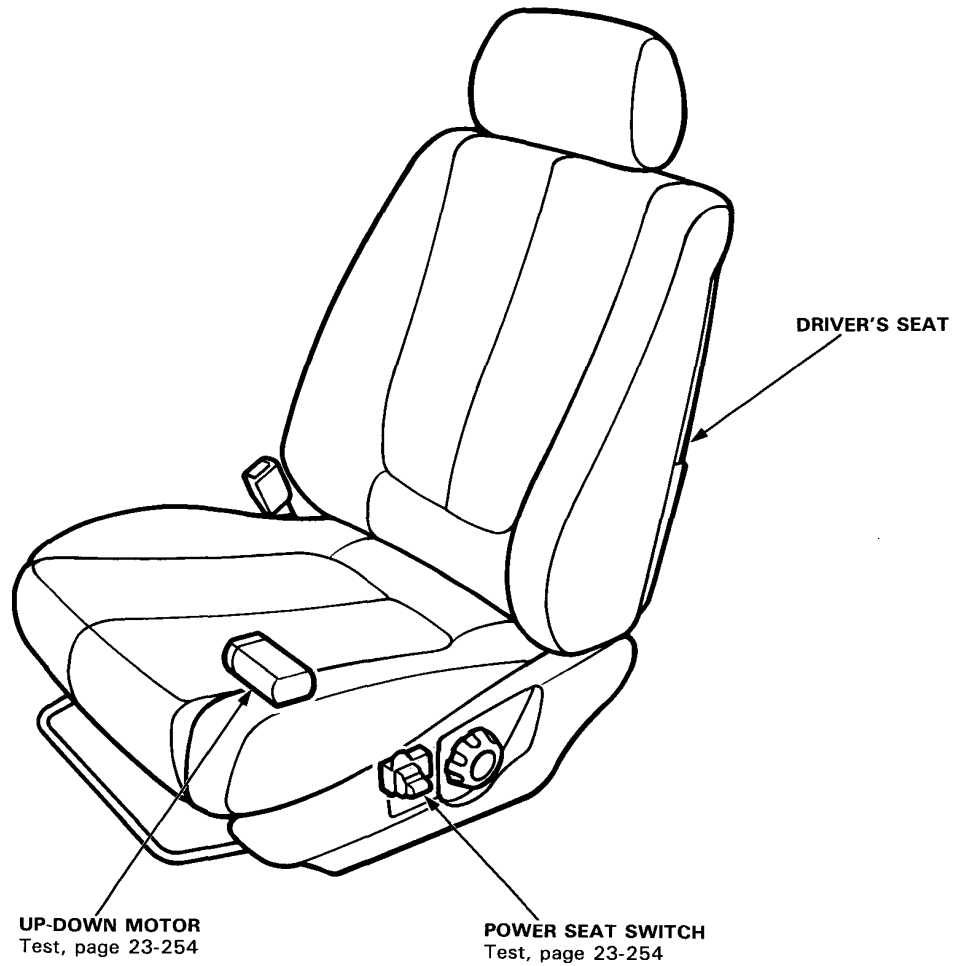


Terminal	A	B	C	D	E
Position					
UP	○—○	○—○		○—○	
OFF		○—○			○
DOWN	○—○		○—○	○—○	

Power Seat

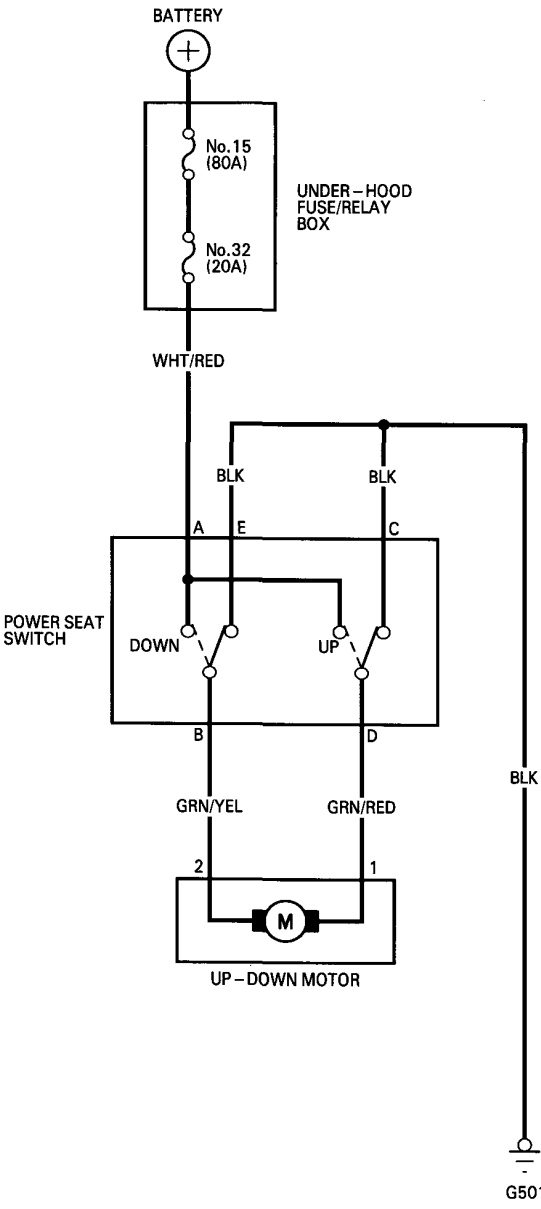
Component Location Index

NOTE: LHD type is shown, RHD type is symmetrical.





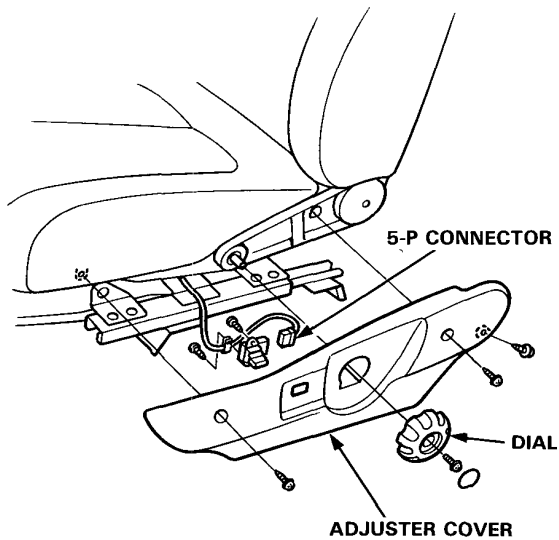
Circuit Diagram



Power Seat

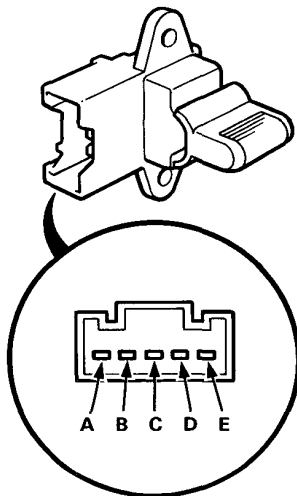
Switch Test

1. Remove the dial, and then remove the adjuster cover from the driver's seat by removing the three screws.



2. Disconnect the 5-P connector from the power seat switch, then remove the power seat switch from the adjuster cover by removing its two mounting screws.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B	C	D	E
Position					
UP	○			○	
DOWN	○	○			



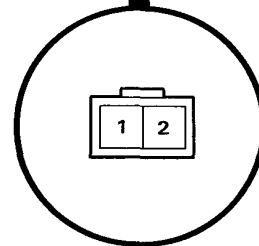
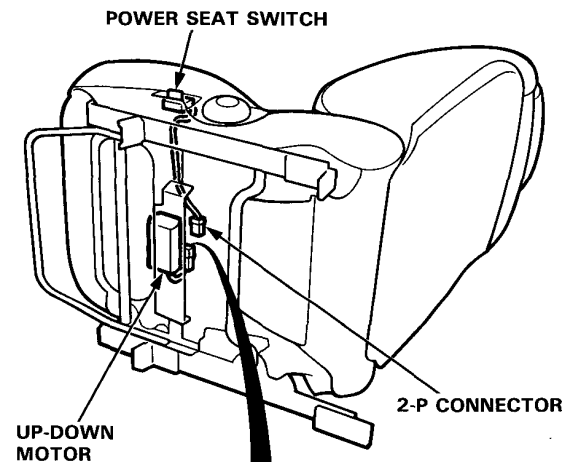
Motor Test

CAUTION: Be careful not to damage the seat, interior trim or body.

1. Remove the driver's seat (see section 20).
2. Disconnect the 2-P connector from the up-down motor.
3. Test the motor:

Terminal	1	2
Position		
UP	⊕	⊖
DOWN	⊖	⊕

CAUTION: When the motor stops running, disconnect battery power immediately.



View from terminal side

4. If the motor does not run or fails to run smoothly, replace it (see section 20).



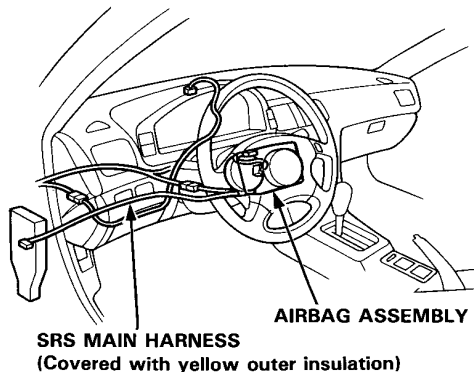
Power Windows (Without Key-off Operation)

Component Location Index

CAUTION:

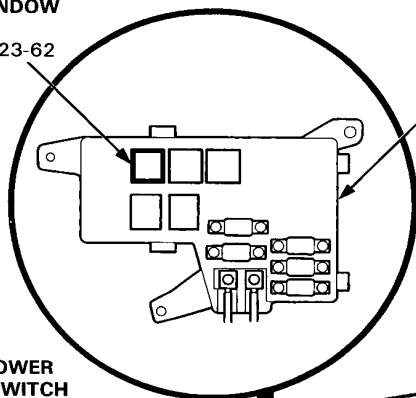
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

NOTE: LHD type is shown, RHD type is similar.



POWER WINDOW RELAY

Test, page 23-62



UNDER-HOOD FUSE/RELAY BOX

FRONT PASSENGER'S WINDOW MOTOR

Test, page 23-259
Replacement, section 20

MASTER POWER WINDOW SWITCH

Input Test, page 23-260
Test, page 23-248
Removal, page 23-250

*R. REAR WINDOW SWITCH

Test, page 23-251
Removal, page 23-250

*R. REAR WINDOW MOTOR

Test, page 23-259
Replacement, section 20

DRIVER'S WINDOW MOTOR

Test, page 23-259
Replacement, section 20

*L. REAR WINDOW MOTOR

Test, page 23-259
Replacement, section 20

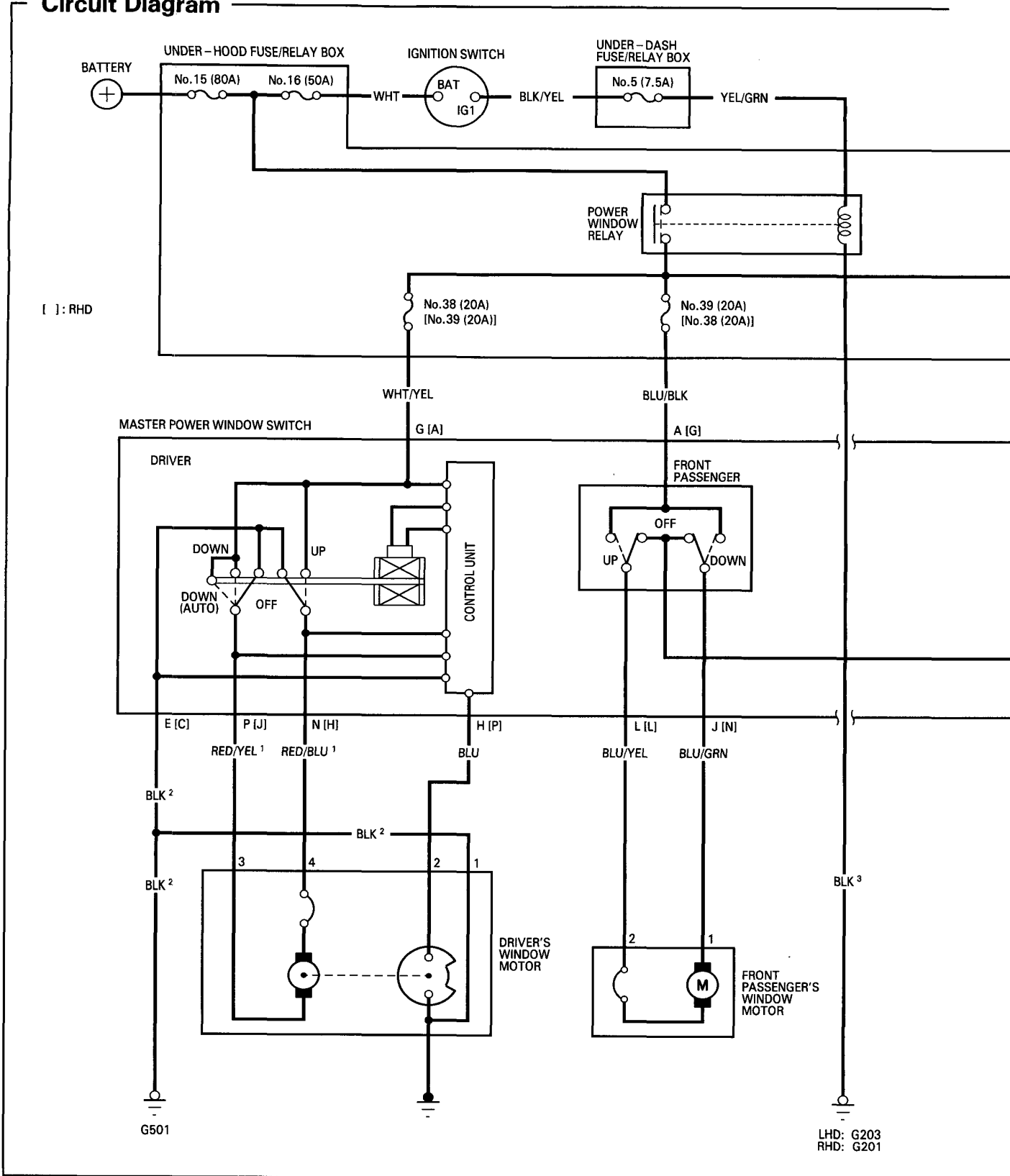
*L. REAR WINDOW SWITCH

Test, page 23-251
Removal, page 23-250

*: With rear power windows

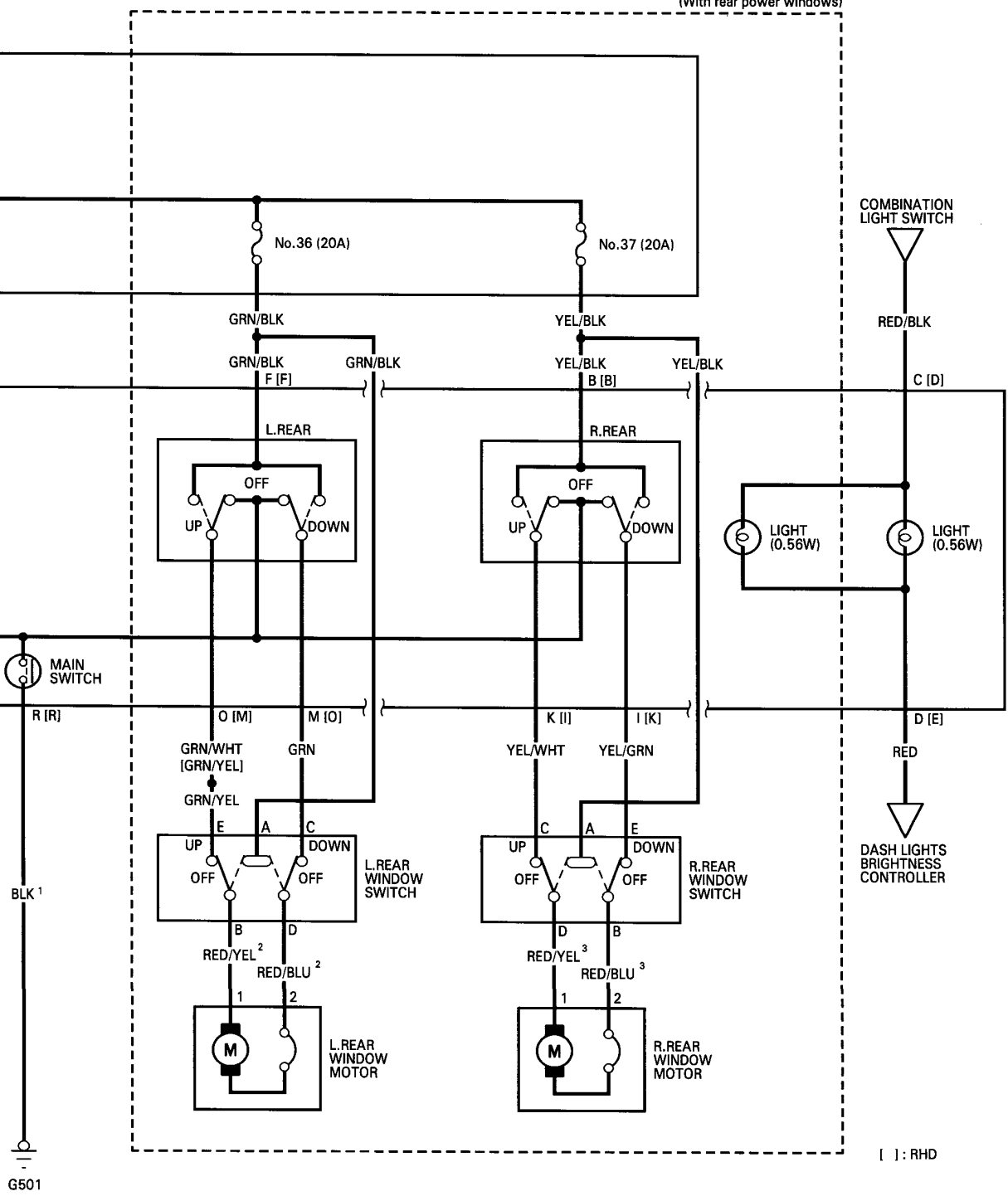
Power Windows (Without Key – off Operation)

Circuit Diagram





(With rear power windows)



Power Windows (Without Key-off Operation)

Troubleshooting

NOTE: The numbers in the table shown the troubleshooting sequence.

Symptom	Item to be inspected				Blown No. 5 (7.5 A) fuse (in the under-dash fuse/relay box)	Power window relay	Master power window switch	Passenger's window switch	Driver's window motor	Pulser (in the driver's window motor)	Passenger's window motor	Master power window switch input	Poor ground	Open circuit, loose or disconnected terminals
	Blown No. 36 (20 A) fuse	Blown No. 37 (20 A) fuse	Blown No. 38 (20 A) fuse	Blown No. 39 (20 A) fuse										
All windows do not work.					1	2	3						[G201] G203 G501	YEL/GRN
Driver's window does not work.			1	[1]					2			3	G501	WHT/YEL RED/YEL ¹ RED/BLU ¹
Driver's window does not work in DOWN AUTO.							1			2		3		BLU
Passenger's windows do not work.	Front passenger		[1]	1							2			BLU/YEL BLU/GRN
	Left rear	1						2			3			GRN/WHT [GRN/YEL] GRN GRN/BLK RED/YEL ² RED/BLU ²
	Right rear		1					2			3			YEL/WHT YEL/GRN YEL/BLK RED/YEL ³ RED/BLU ³

[]: RHD

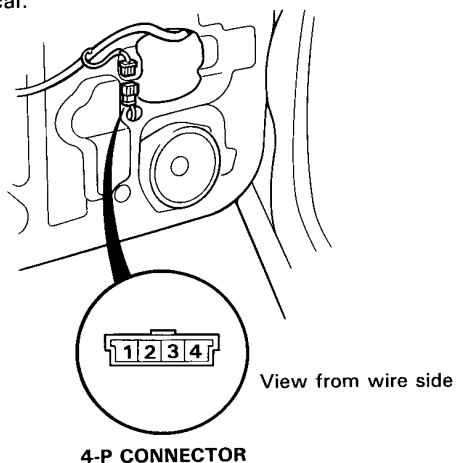


Driver's Window Motor Test

Motor Test:

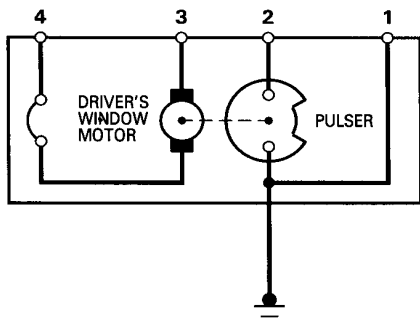
1. Remove the door panel (see section 20).
2. Disconnect the 4-P connector from the motor.
3. Test the motor by connecting battery power to the No. 3 terminal and grounding the No. 4 terminal. Test the motor in each direction by switching the leads.
4. If the motor does not run or fails to run smoothly, replace it.

NOTE: LHD type is shown, RHD type is symmetrical.



Pulser Test:

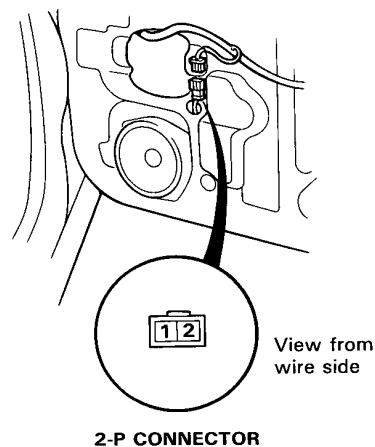
Connect the test leads of an analog ohmmeter to the No. 3 and No. 4 terminals. Run the motor by connecting power and ground to the No. 1 and No. 2 terminals. The ohmmeter needle should move back and forth alternately.



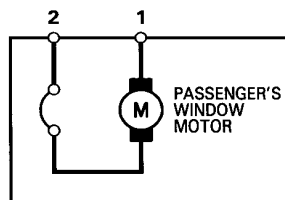
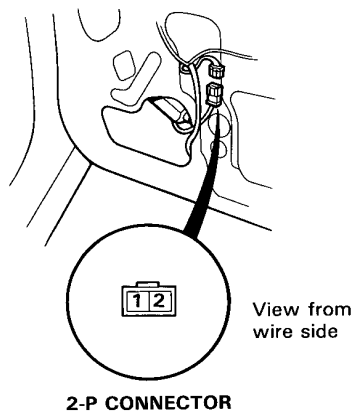
Passenger's Window Motor Test

1. Remove the door panel (see section 20).
2. Disconnect the 2-P connector from the motor.
3. Test the motor by connecting battery power to the No. 2 terminal and grounding the No. 1 terminal. Test the motor in each direction by switching the leads.
4. If the motor does not run or fails to run smoothly, replace it.

Front:



Rear:



() : REAR

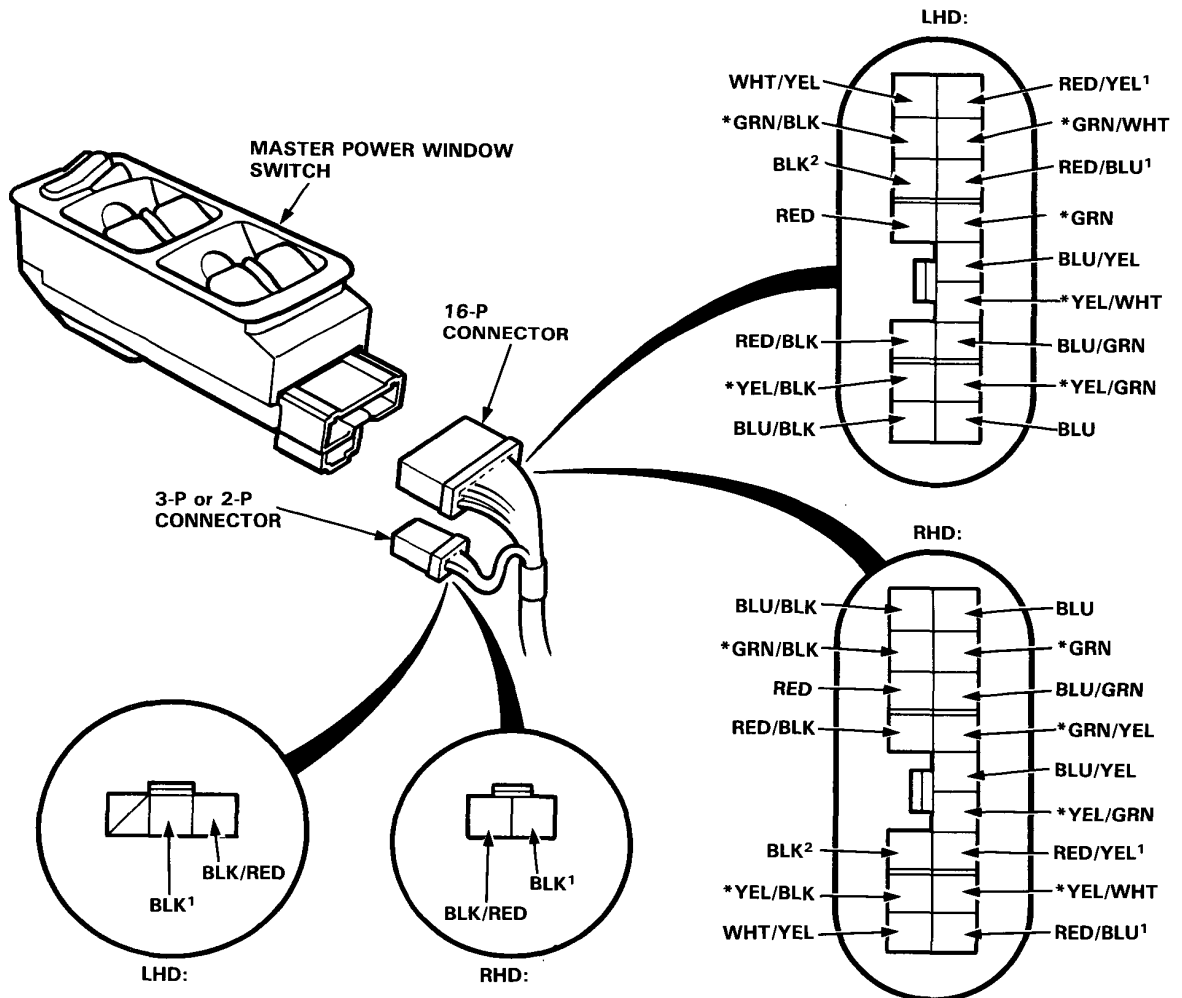
Power Windows (Without Key-off Operation)

Master Power Window Switch Input Test

NOTE: The control unit is built into the master power window switch.

1. Pry the switch out of the rear console and disconnect the connectors.
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, make the following input tests at the connectors.
 - If a test indicates a problem, find and correct the cause, then recheck the system.
 - If all input tests prove OK, the control unit must be faulty; replace the master power window switch.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, BLK¹ and BLK² are not the same).

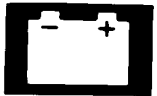


*: With rear power windows



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK ¹ and BLK ²	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G501) • An open in the wire
2	WHT/YEL	Ignition switch ON (II).	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 36, 37, 38, or 39 (20 A) fuse in the under-hood fuse/relay box • Faulty power window relay • An open in the wire
	BLU/BLK			
	GRN/BLK			
	YEL/BLK			
3	RED/YEL ¹ and RED/BLU ¹	Connect the WHT/YEL and RED/YEL ¹ terminals, and the RED/BLU ¹ and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Check the driver's window motor: It should run.	<ul style="list-style-type: none"> • Faulty driver's window motor • An open in the wire
4	BLU/YEL and BLU/GRN	Connect the BLU/BLK and BLU/YEL terminals, and the BLU/GRN and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Check the front passenger's window motor: It should run.	<ul style="list-style-type: none"> • Faulty front passenger's window motor • An open in the wire
5	GRN/WHT [GRN/YEL] and GRN	Connect the GRN/BLK and GRN terminals, and the GRN/WHT [GRN/YEL] and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Check the left rear window motor: It should run.	<ul style="list-style-type: none"> • Faulty left rear window motor • Faulty left rear window switch • An open in the wire
6	YEL/GRN and YEL/WHT	Connect the YEL/BLK and YEL/GRN terminals, and the YEL/WHT and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Check the right rear window motor: It should run.	<ul style="list-style-type: none"> • Faulty right rear window motor • Faulty right rear window switch • An open in the wire
7	BLU	Connect the WHT/YEL and RED/YEL ¹ terminals, and the RED/BLU ¹ and BLK ¹ terminals with jumper wires, then turn the ignition switch ON (II).	Connect an analog ohmmeter to terminals BLU and BLK ² : The meter needle should move back and forth alternately as the driver's window motor runs.	<ul style="list-style-type: none"> • Faulty pulser. • Faulty driver's window motor • An open in the wire
8	RED/BLK and RED	Combination light switch ON, and dash lights brightness controller on full bright	Check for voltage between the terminals RED/BLK and RED: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty combination light switch • Faulty dash lights brightness controller • An open in the wire

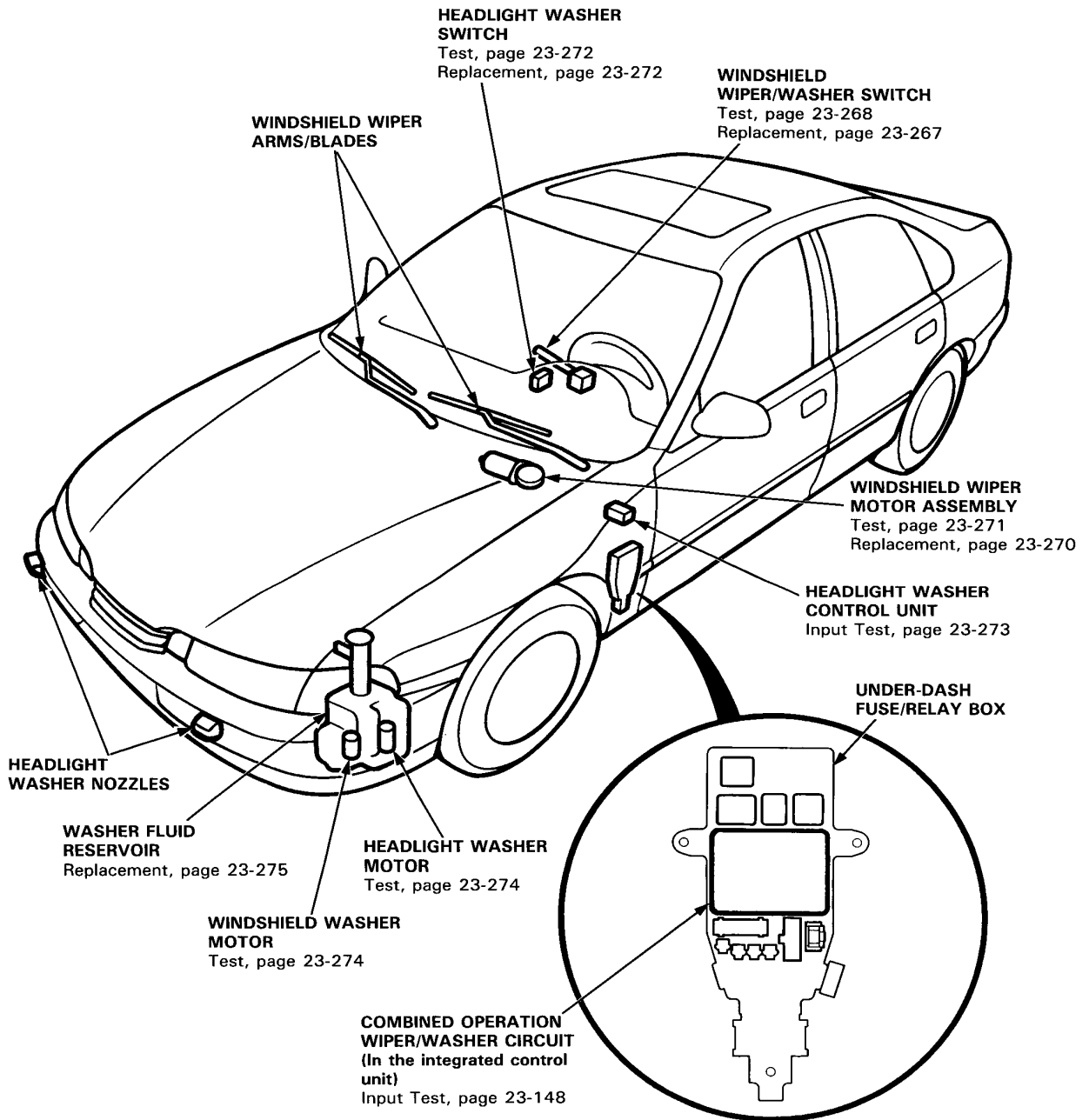
[]: RHD



Wiper/Washers

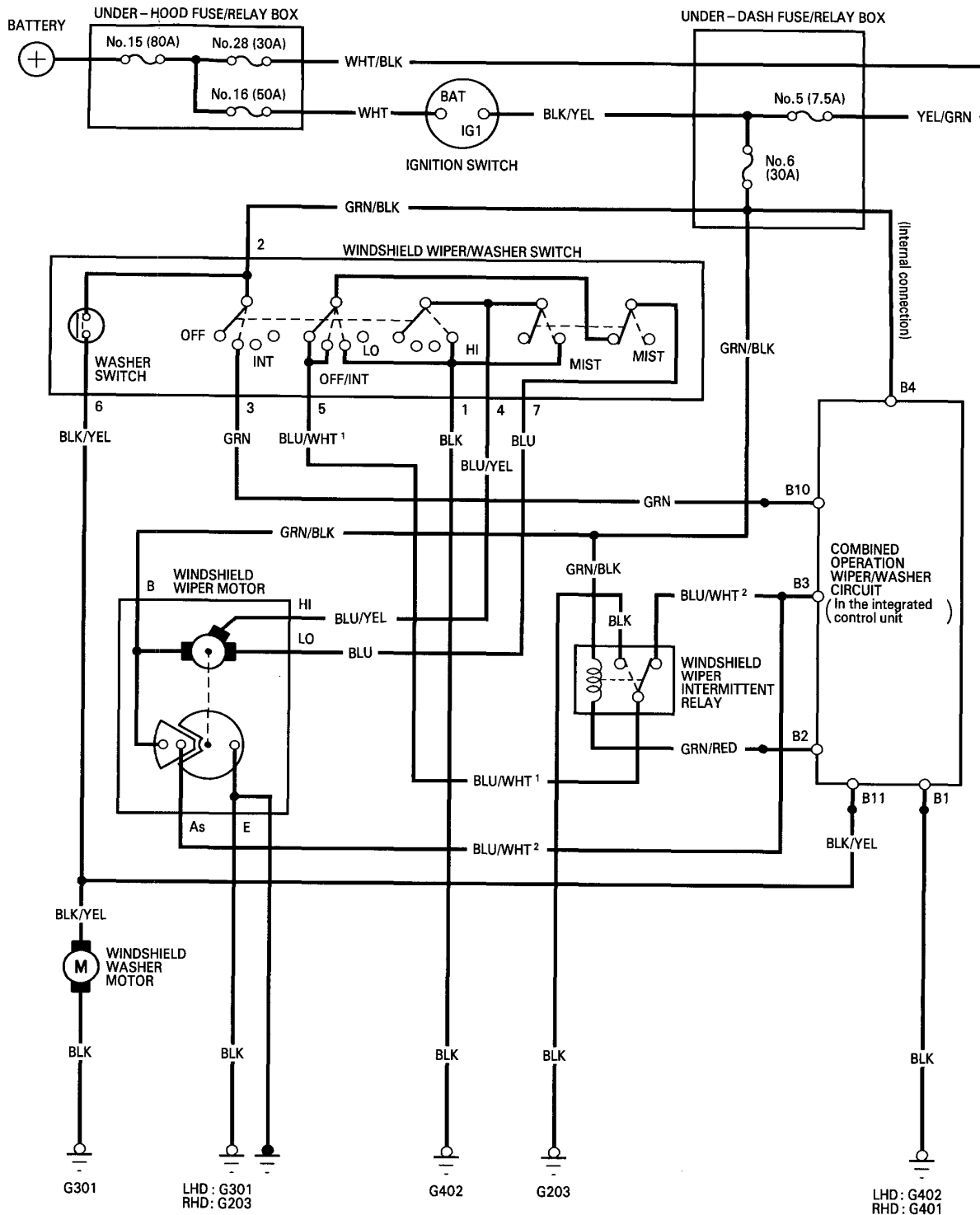
Component Location Index

NOTE: LHD type is shown, RHD type is similar.



Wiper/Washers

Circuit Diagram



Wiper/Washers

Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Windshield Wiper/Washer:

Item to be inspected		Blown No. 6 (30 A) fuse (In the under-dash fuse relay box)	Wiper switch	Mist switch	Wiper motor assembly	Washer switch	Washer motor	Wiper intermittent relay	Wiper intermittent circuit (In the integrated control unit)	Combined operation of wiper/washer (In the integrated control unit)	Not enough washer fluid in reservoir	Disconnected, blocked washer hose or clogged outlet	Disconnected wiper linkage	Poor ground	Open circuit, loose or disconnected terminals
Wipers do not work	In all positions	1	4		2								3	LHD: G301 RHD: G203	GRN/BLK
	In INT		1		3			2						G203	GRN or BLU/WHT ¹
	In LO or HI		1		2									G402 LHD: G301 RHD: G203	BLU/YEL or BLU
	In MIST			1											BLU/YEL
Blades do not return to park position when the switch turned OFF.			2		1									LHD: G301 RHD: G203	BLU/WHT ²
Intermittent cycle is erratic or wipers do not work intermittently.								2	1					G203 LHD: G402 RHD: G401	GRN/BLK, GRN, BLU/WHT ¹ GRN/RED
Little or no washer fluid is pumped.						4	3				1	2		G301	BLK/YEL
Wiper and washer do not work at the same time.									1						BLK/YEL

Headlight Washer:

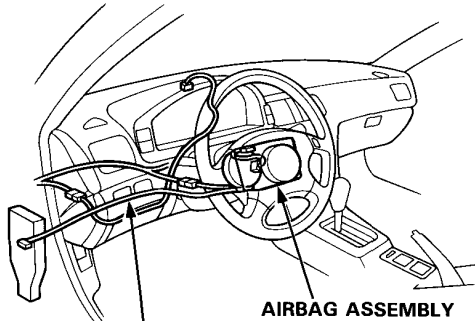
Item to be inspected		Blown No. 28 (30 A) fuse (In the under-hood fuse/relay box)	Headlight washer control unit	Washer switch	Washer motor	Combination light switch	Insufficient washer fluid in reservoir	Disconnected, blocked washer hose or clogged outlet	Poor ground	Open circuit, loose or disconnected terminals
Little or no washer fluid is pumped.		1	7	5	4	6	2	3	G301 LHD: G402 RHD: G203	WHT/BLK, RED/YEL GRN/WHT, WHT/RED



Windshield Wiper/Washer Switch Replacement

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

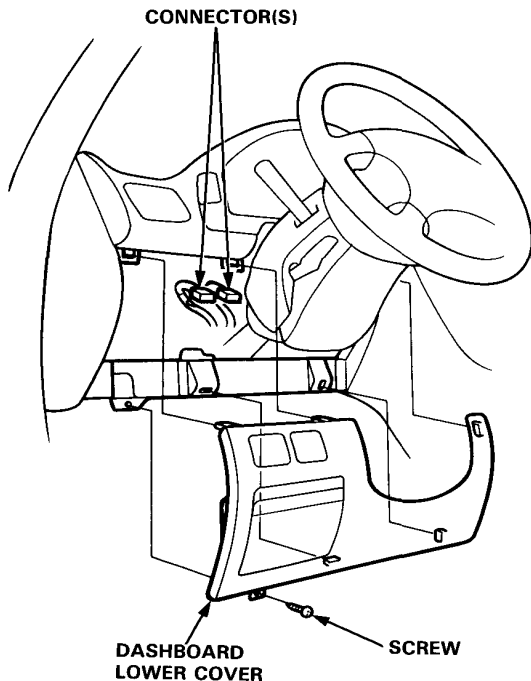


SRS MAIN HARNESS
(Covered with yellow outer insulation)

AIRBAG ASSEMBLY

NOTE: LHD type is shown, RHD type is similar.

1. Remove the screw and dashboard lower cover, then disconnect the connector(s) from the switch(es).

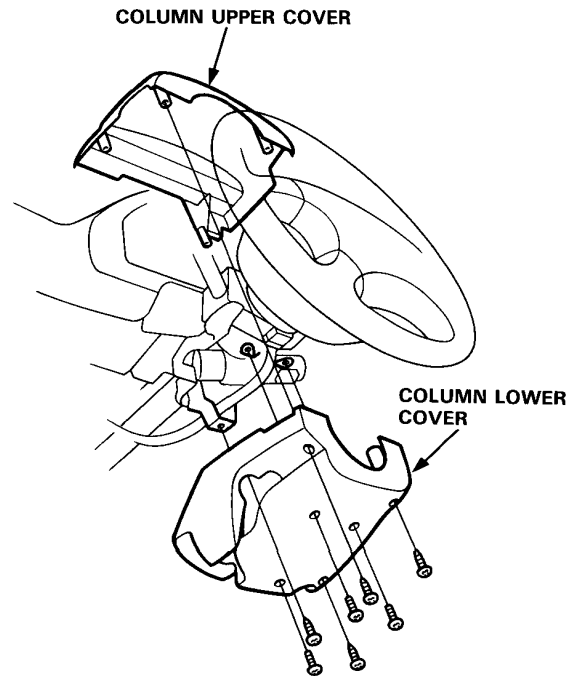


CONNECTOR(S)

DASHBOARD LOWER COVER

SCREW

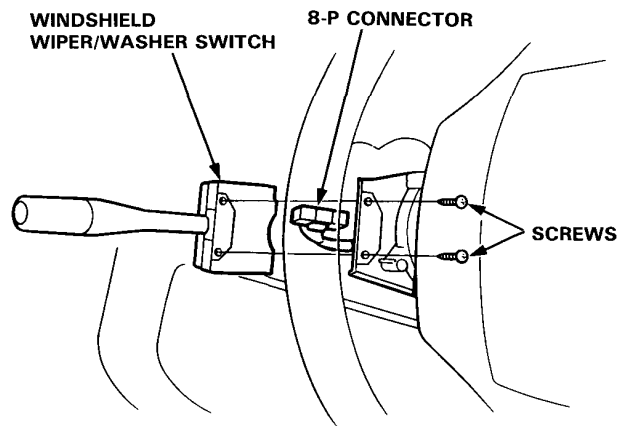
2. Remove the steering column covers.



COLUMN UPPER COVER

COLUMN LOWER COVER

3. Disconnect the 8-P connector from the windshield wiper/washer switch, then remove the two screws and the switch.



WINDSHIELD WIPER/WASHER SWITCH

8-P CONNECTOR

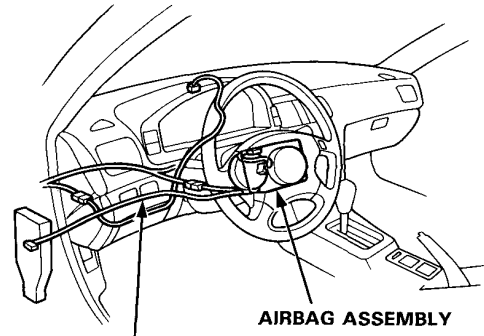
SCREWS

Wiper/Washers

Windshield Wiper/Washer Switch Test

CAUTION:

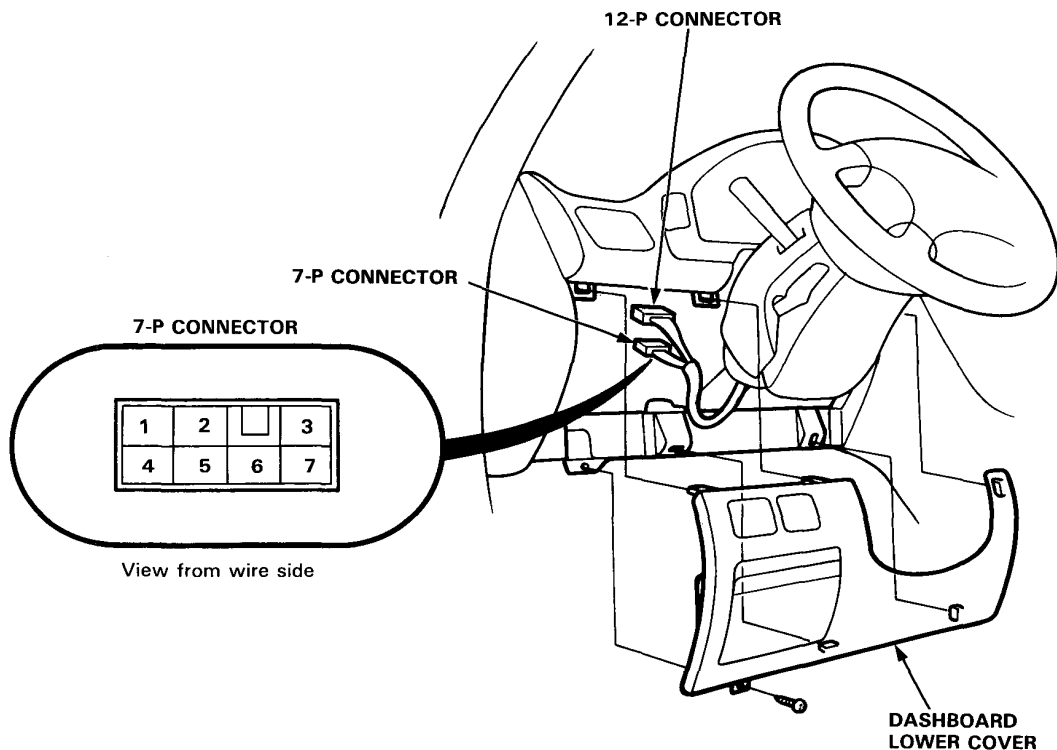
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

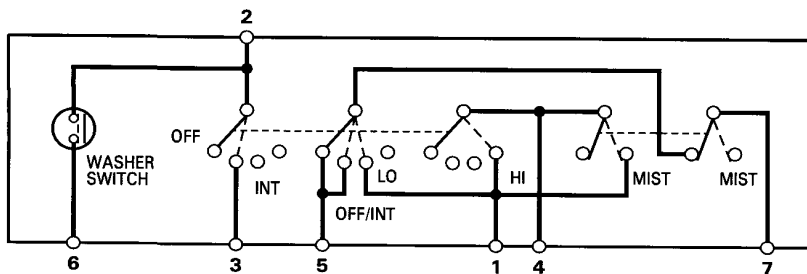


SRS MAIN HARNESS
(Covered with yellow outer insulation)

NOTE: LHD type is shown, RHD type is similar.

1. Remove the dashboard lower cover (see page 23-267).
2. Disconnect the connectors from the main wire harness.
3. Check for continuity between the terminals of the 7-P connector in each switch position according to the table.
4. If there is no continuity, check the harness between the main wire harness and the switch assembly.





Terminal	1	2	3	4	5	6	7
Position							
OFF					○	○	○
INT		○	○		○	○	○
LO	○						○
HI	○			○			
Mist switch "ON"	○			○			
Washer switch "ON"		○				○	

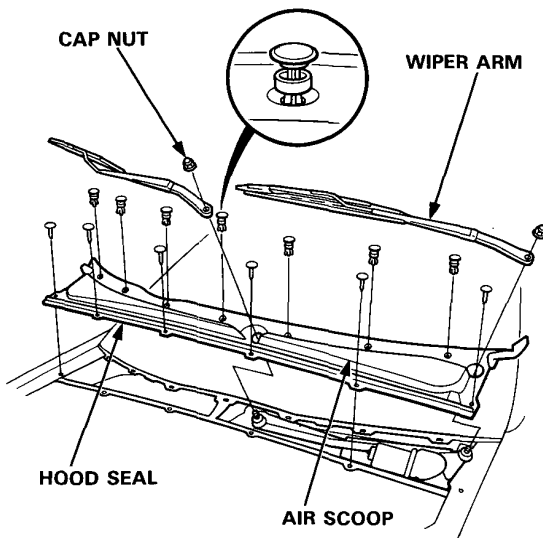
Wiper/Washers

Windshield Wiper Motor Replacement

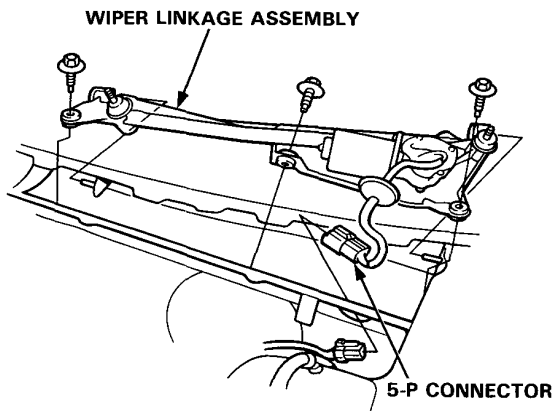
1. Open the hood and remove the cap nuts and the wiper arms.

NOTE: Remove the wiper arms carefully without damaging the hood.

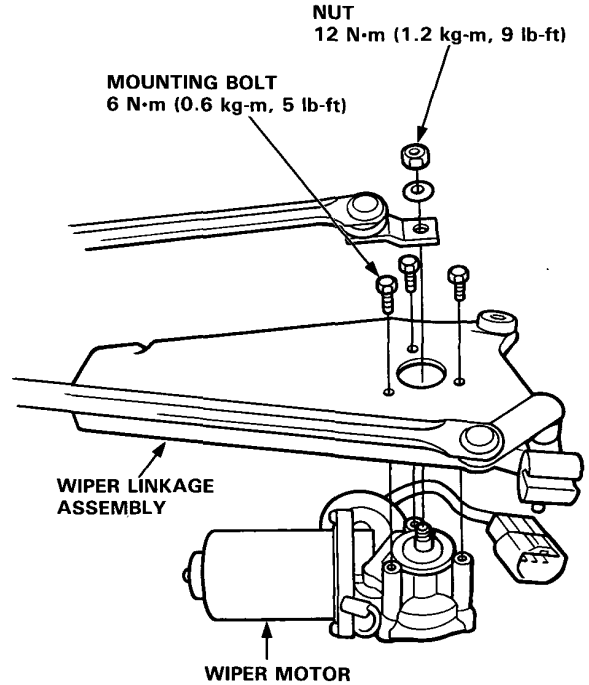
2. Remove the windshield lower molding, hood seal, and air scoop by prying the trim clips out and removing the screws.



3. Disconnect the 5-P connector from the wiper motor, then remove the wiper harness from the wiper linkage.
4. Remove the wiper linkage assembly by removing the three mounting bolts.



5. Remove the three mounting bolts and one nut from the wiper linkage to remove the wiper motor.



6. Install the wiper motor in the reverse order of removal.

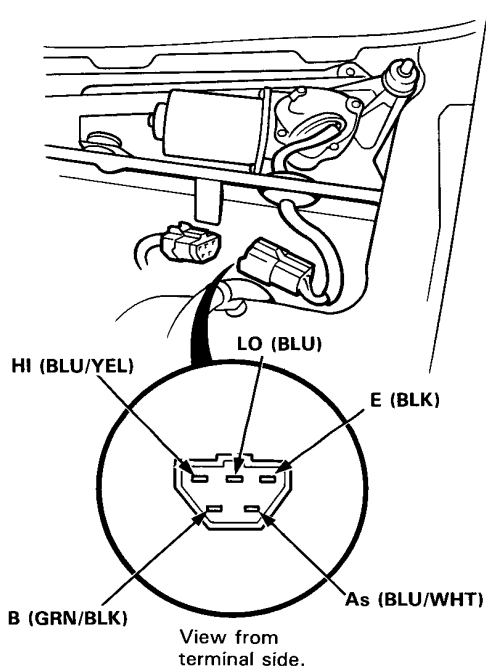


Windshield Wiper Motor Test

1. Open the hood and remove the cap nuts and the wiper arms.

NOTE: Remove the wiper arms carefully without damaging the hood.

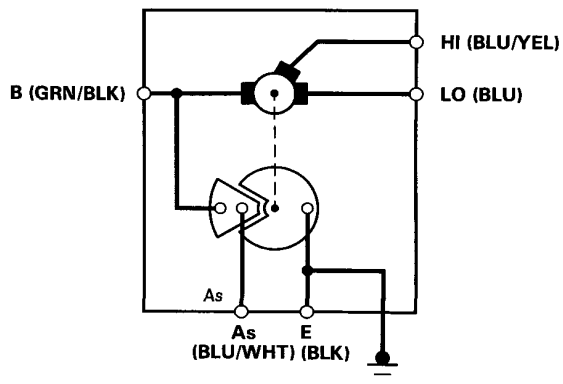
2. Disconnect the 5-P connector from the wiper motor assembly.



3. Test the motor:

Terminal Position	B (GRN/BLK)	LO (BLU)	HI (BLU/YEL)
LOW	⊕	⊖	
HIGH	⊕		⊖

4. If the motor does not run or fails to run smoothly, replace it.



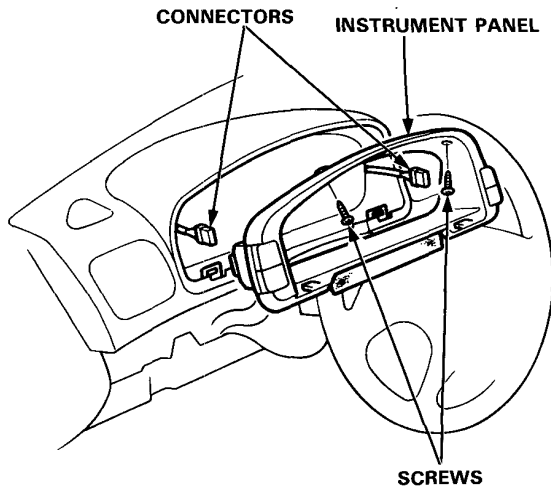
5. Reconnect the 5-P connector to the wiper motor assembly.
6. Connect an analog voltmeter between the As (BLU/WHT²) and the E (BLK) terminals. Run the motor by turning the wiper switch ON (LO or HI position). The voltmeter should alternately indicate 0 V and more than 4 V.

NOTE: Use an analog ohmmeter.

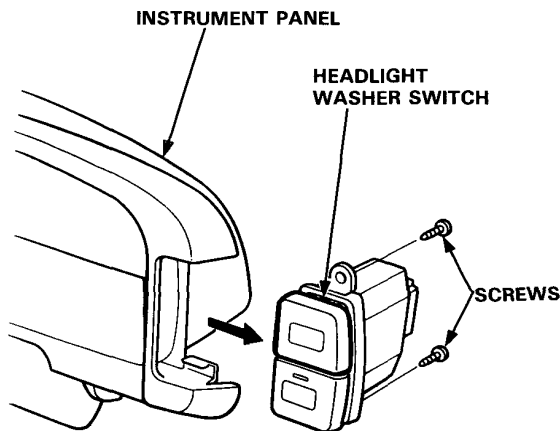
Wiper/Washers

Headlight Washer Switch Replacement

1. Remove the two screws and the instrument panel.
2. Disconnect each connector from the instrument panel.



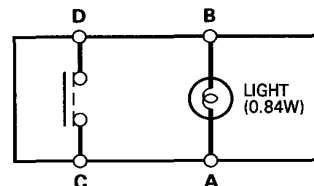
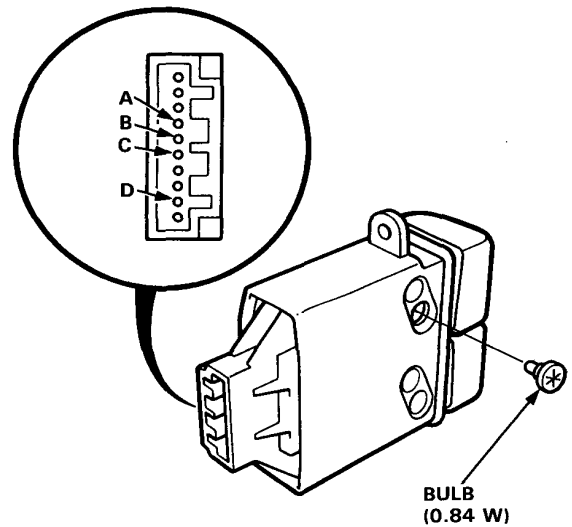
3. Remove the two screws and the headlight washer switch.



Headlight Washer Switch Test

1. Remove the headlight washer switch from the instrument panel.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	A		B	C	D
Position					
OFF	○	○	○		
ON				○	○

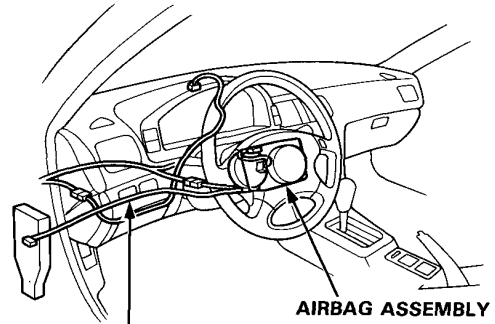




Headlight Washer Control Unit Input Test

CAUTION:

- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.

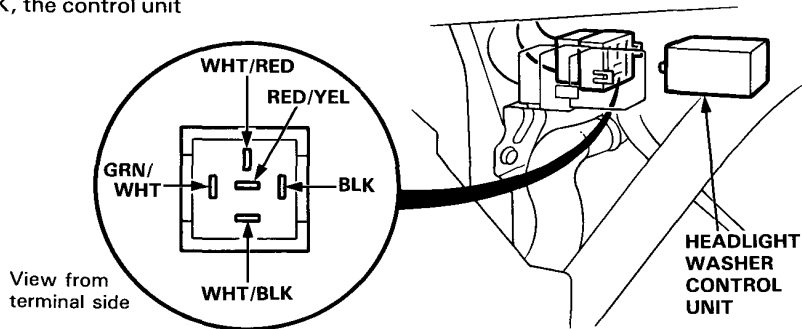


SRS MAIN HARNESS
(Covered with yellow outer insulation)

1. Remove the dashboard lower cover (see page 23-267).
2. Remove the headlight washer control unit from its socket.
3. Inspect the control unit 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 socket.
 - If a 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.

NOTE: LHD type is shown, RHD type is symmetrical.

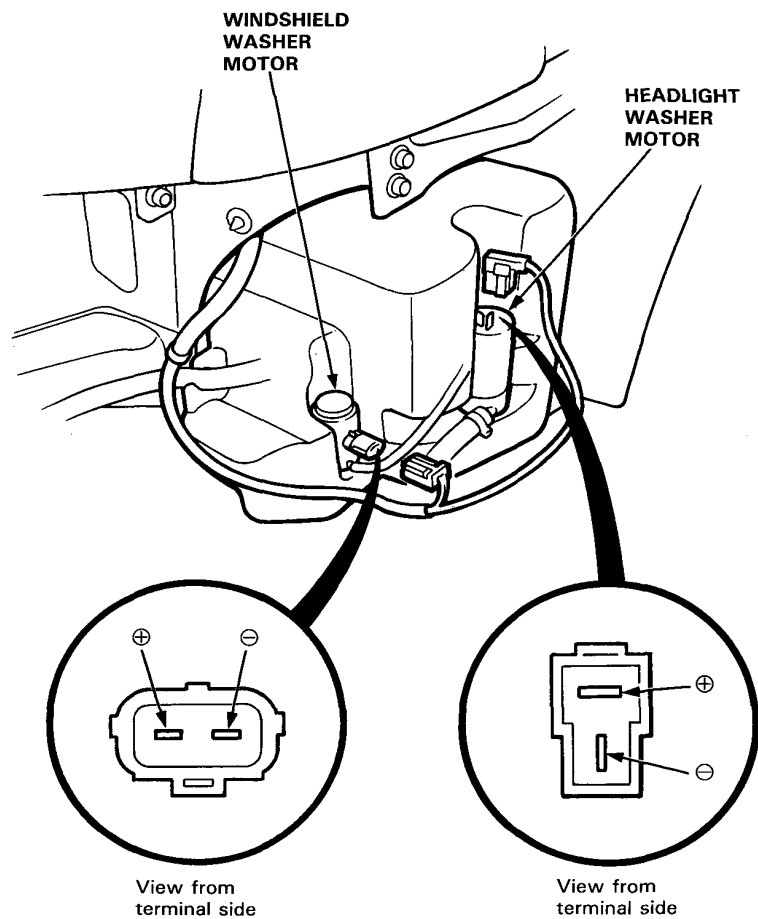


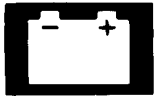
No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (LHD: G402, RHD: G203) • An open in the wire
2	WHT/BLK	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 28 (30 A) fuse in the under-hood fuse/relay box • An open in the wire
3	GRN/WHT	Ignition switch and headlight washer switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 5 (7.5 A) fuse in the under-dash fuse/relay box • Faulty headlight washer switch • An open in the wire
4	WHT/RED	Connect the WHT/BLK terminal to the WHT/RED terminal with a jumper wire.	Check the pump: It should run.	<ul style="list-style-type: none"> • Faulty headlight washer pump • Poor ground (G301) • An open in the wire
5	RED/YEL	Ignition switch and headlight switch ON (full or dim-dip)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 27 (10 A) fuse in the under-hood fuse/relay box • Faulty combination light switch • An open in the wire

Wiper/Washers

Washer Motor Test

1. Remove the left inner fender.
 2. Disconnect the 2-P connector from the washer motor.
 3. Test the washer motor by connecting battery power to the \oplus terminal and grounding the \ominus terminal.
- If the motor does not run, or fails to run smoothly, replace it.
 - If the motor runs smoothly but little or no washer fluid is pumped, check for a disconnected, blocked washer hose or a clogged pump outlet.





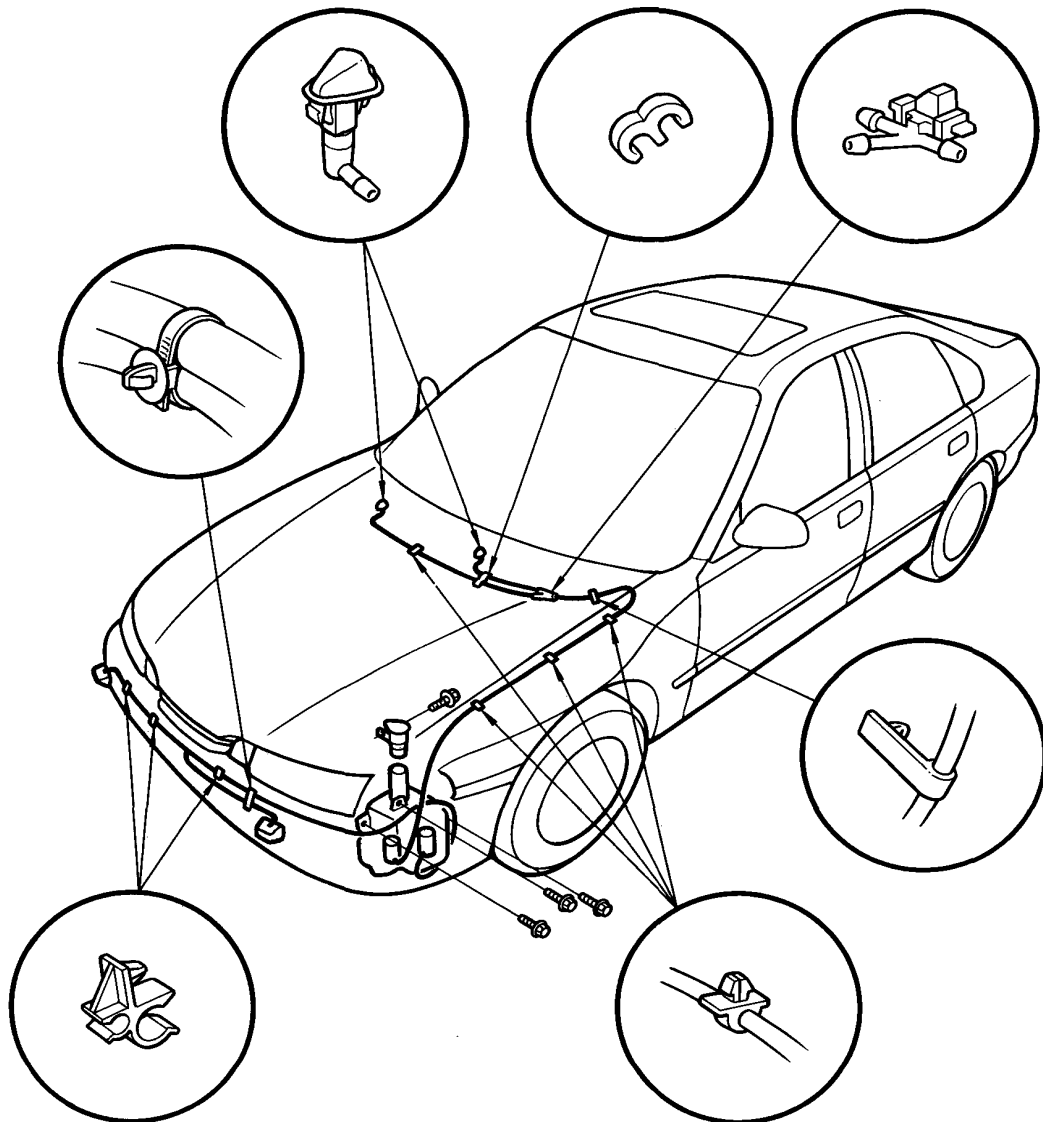
Washer Replacement

1. Remove the washer filler neck.
2. Remove the inner fender.
3. Disconnect the hose and the 2-P connectors from the washer motors.
4. Remove the three mounting bolts and pull out the washer reservoir.
5. Remove the washer motor from the washer reservoir.
6. Remove the washer nozzles and washer hose.

7. Install in the order of removal.

NOTE:

- While installing the washer system, take care not to pinch any hoses. Install the hose clips firmly.
- After installing, check/adjust the aim of the washer nozzles.

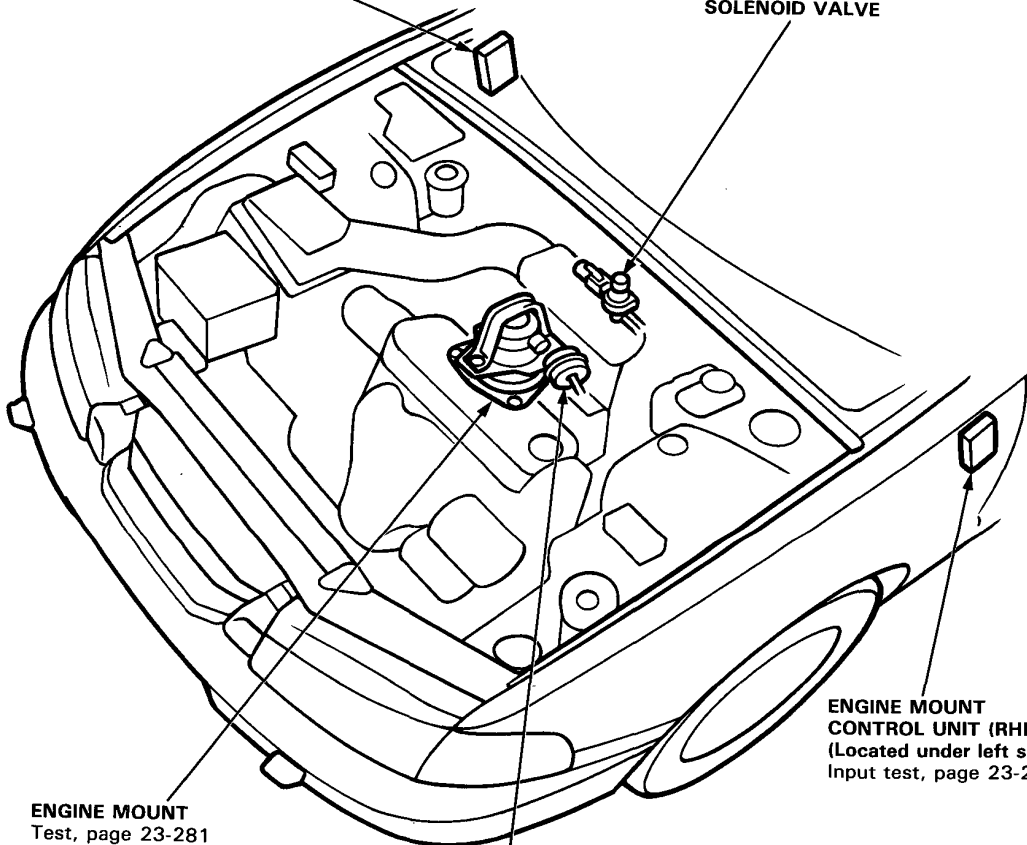


Engine Mount Control System (With A/T)

Component Location Index

**ENGINE MOUNT
CONTROL UNIT (LHD)**
(Located under right side of dash)
Input test, page 23-280

SOLENOID VALVE



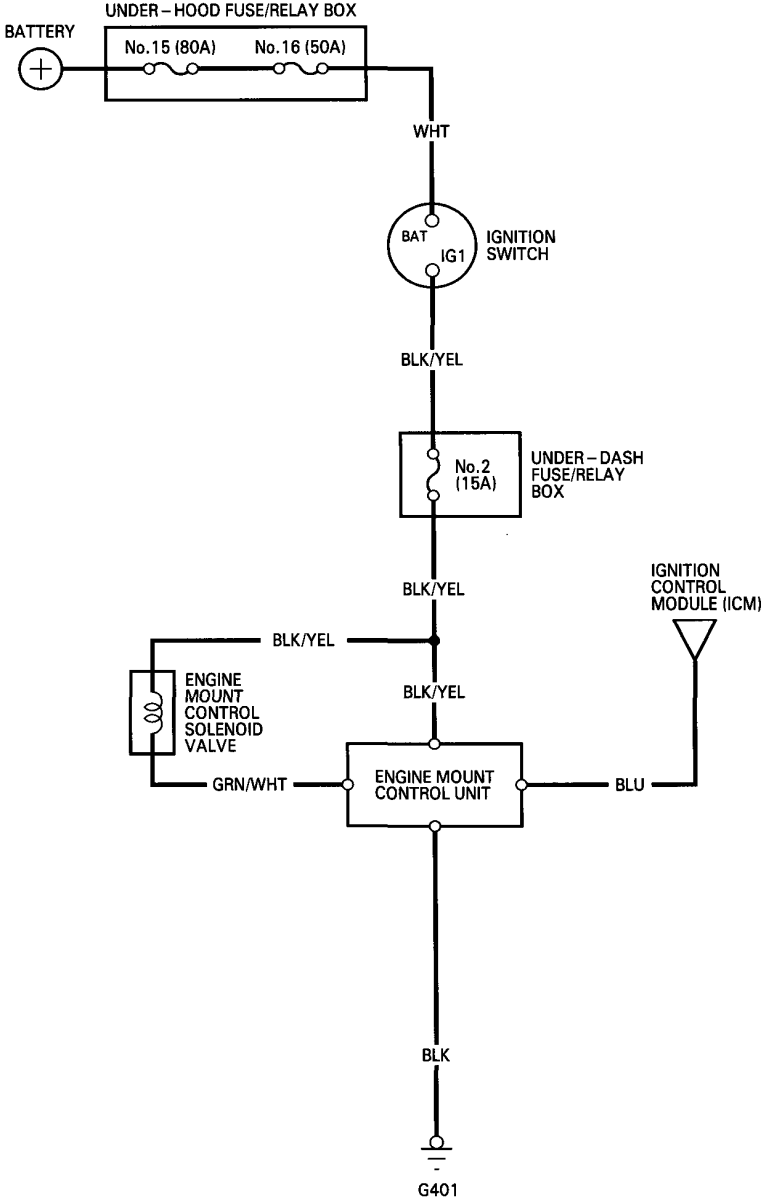
**ENGINE MOUNT
CONTROL UNIT (RHD)**
(Located under left side of dash)
Input test, page 23-280

ENGINE MOUNT
Test, page 23-281
Replacement, section 5

**VACUUM DIAPHRAGM
ACTUATOR**
Test, page 23-281



Circuit Diagram



Engine Mount Control System (With A/T)

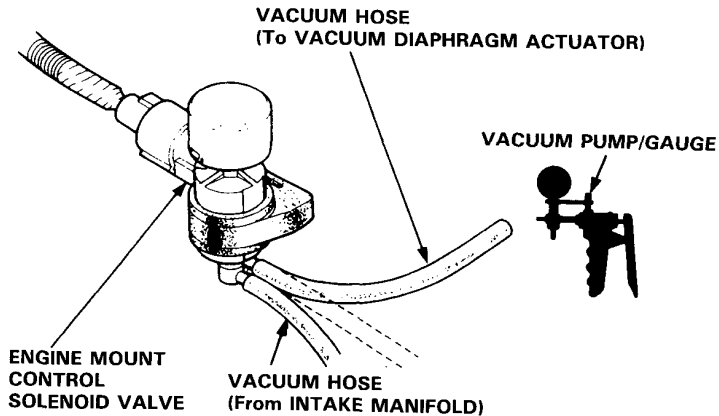
Troubleshooting

Check the vacuum hoses and vacuum pipes for bad connections, cracks, blockage or disconnected hoses.

Inspection of engine mount control solenoid valve.

Warm up engine to normal operating temperature (radiator fan comes on at least twice).

Disconnect the vacuum hose from the engine mount control solenoid valve, and connect a vacuum pump/gauge and hose to the engine mount control solenoid valve.



Is there intake manifold vacuum when the engine is below 800 min⁻¹ (rpm).

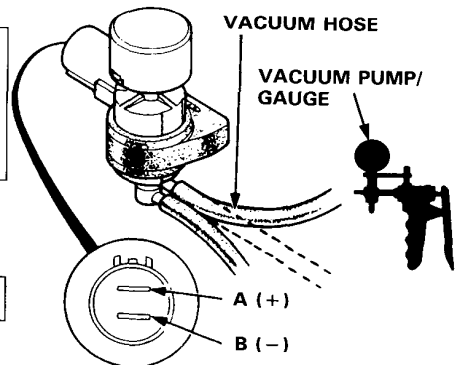
NO

Turn the ignition switch OFF (0).

YES

Disconnect the 2-P connector from the engine mount control solenoid valve, connect battery power to A terminal and ground to B terminal of the engine mount control solenoid valve.

Start the engine.



Is there intake manifold vacuum?

NO

YES

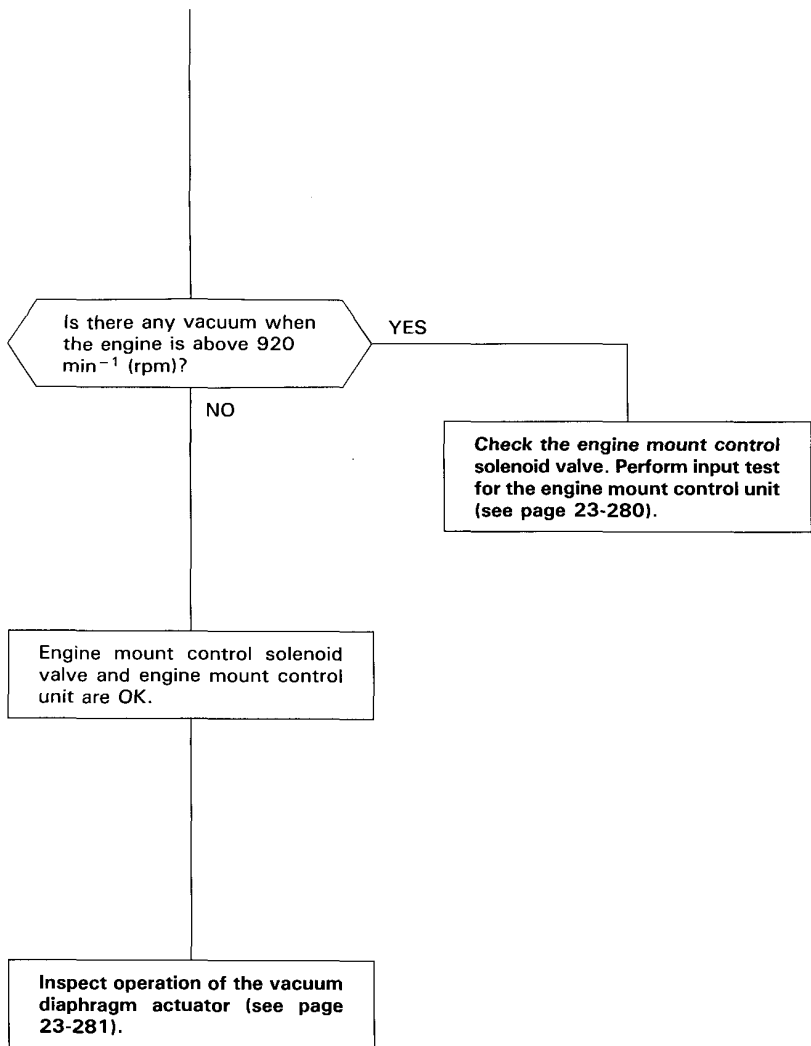
Engine mount control solenoid valve is OK.
Perform input test for the engine mount control unit (see page 23-280).

Replace the engine mount control solenoid valve.

(To page 23-279)



(From page 23-278)

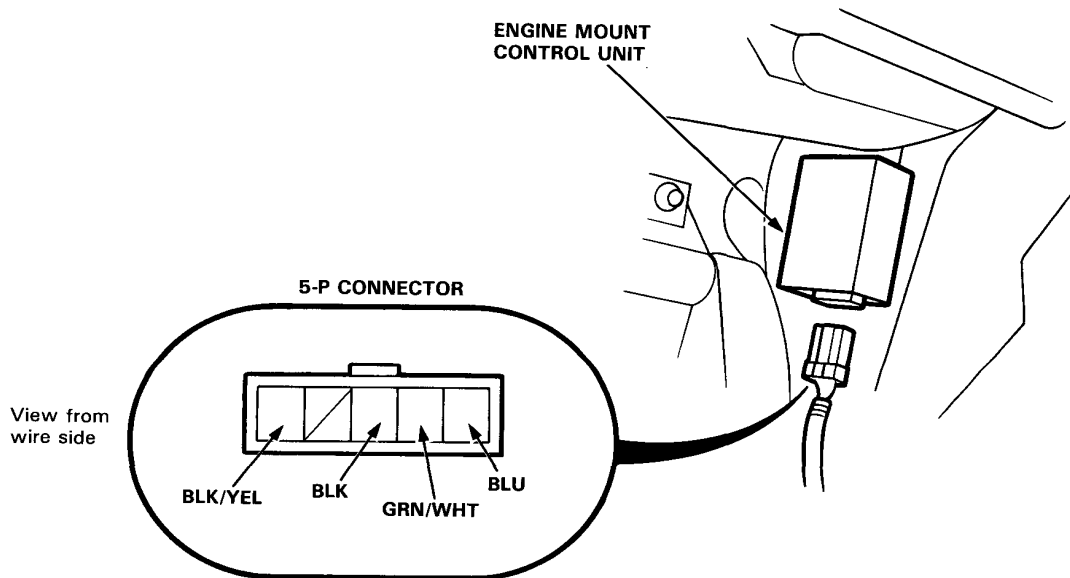


Engine Mount Control System (With A/T)

Control Unit Input Test

NOTE: Before testing, check the No. 2 (15 A) fuse in the under-dash fuse/relay box.

1. Disconnect the 5-P connector from the engine mount control unit.
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 any test indicates a problem, find and correct the cause, then recheck the system.
 - If all the input tests prove OK, the engine mount control unit must be faulty; replace it.



No.	Terminal	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G401) • An open in the wire
2	BLK/YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • An open in the wire
3	GRN/WHT	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty engine mount control solenoid valve • An open in the wire
4	BLU	Start the engine	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty ignition system • An open in the wire

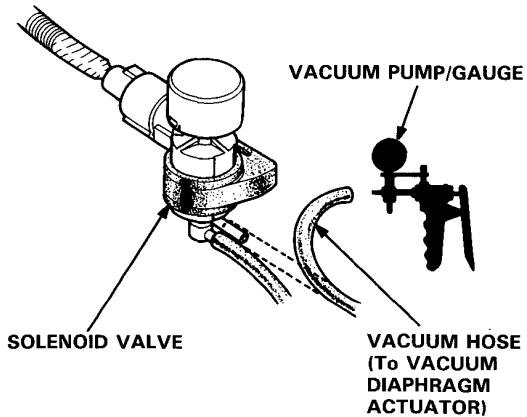
- Replace the engine mount control unit if the mount is not defective and no defects are found in the above input tests.



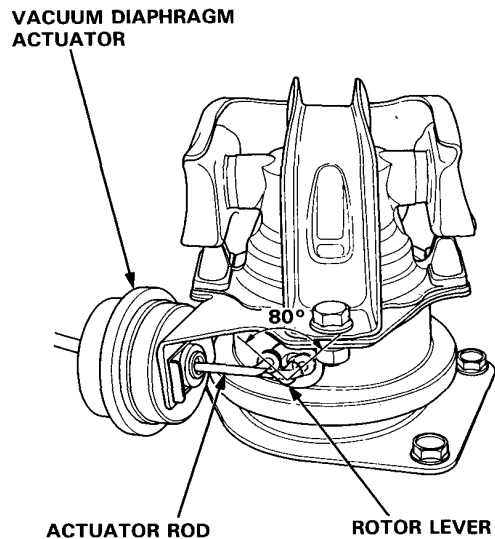
Vacuum Diaphragm Actuator and Mount Testing

1. Disconnect the vacuum hose from the engine mount control solenoid valve, then connect a vacuum pump/gauge.

NOTE: Clean and oil the vacuum diaphragm actuator rod, engine mount rotor, and lever linkage.



2. Apply vacuum of above 230 mmHg and check if the engine mount rotor operates to full stroke (rotor lever angle is 80 degrees).



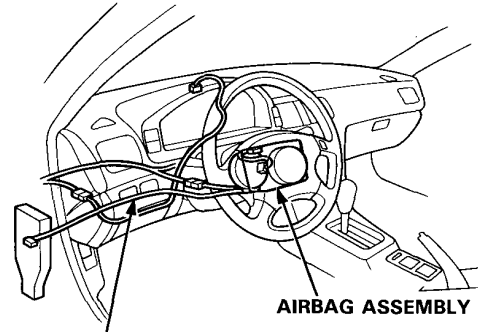
3. If the engine mount rotor does not operate properly replace the engine mount.

Keyless Entry and Security Alarm System

Component Location Index

CAUTION:

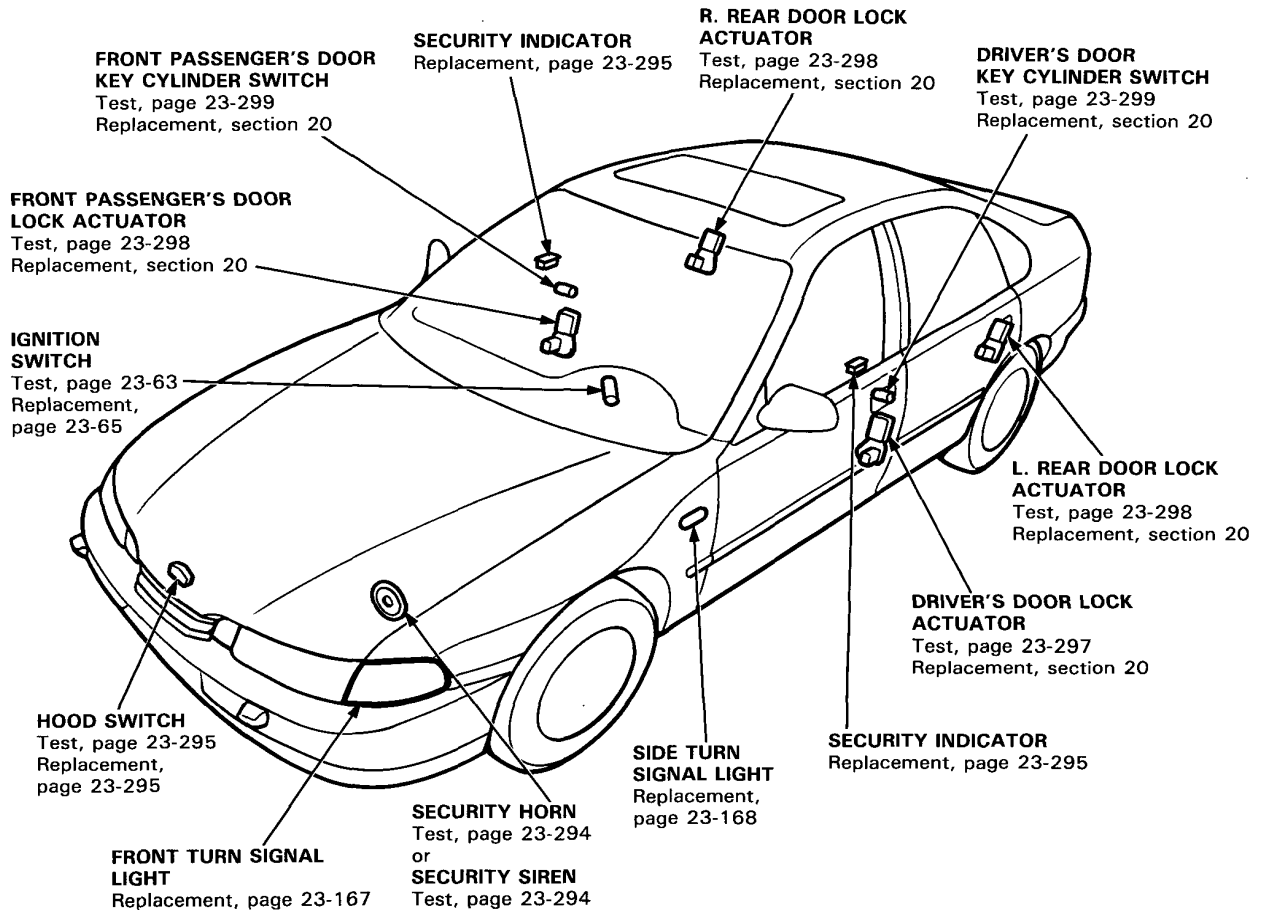
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- Before disconnecting the SRS wiring harness, turn the ignition switch off, disconnect the negative and positive battery cables, and wait at least three minutes.



SRS MAIN HARNESS
(Covered with yellow outer insulation)

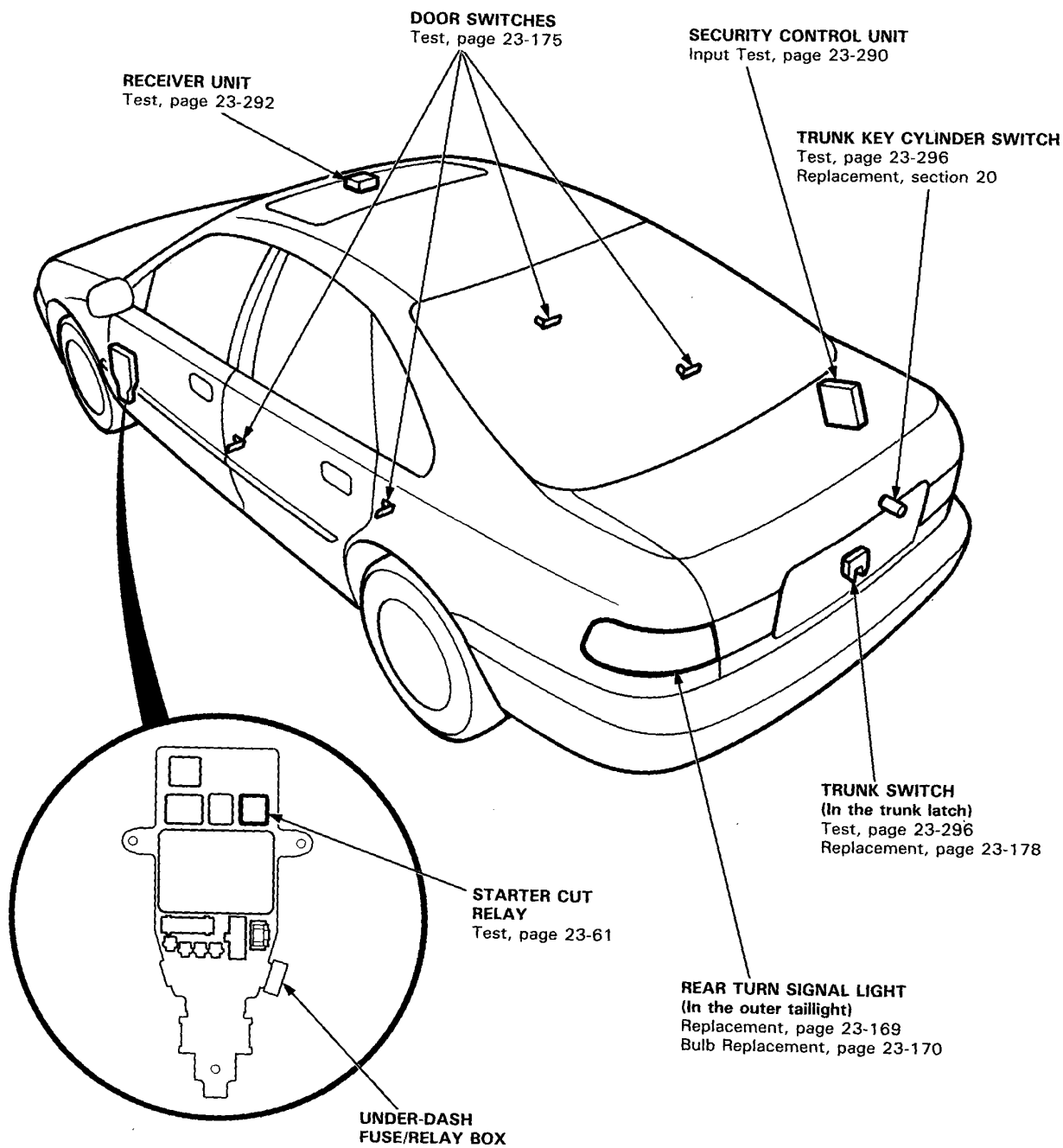
AIRBAG ASSEMBLY

NOTE: LHD type is shown, RHD type is similar.





NOTE: LHD type is shown, RHD type is similar.



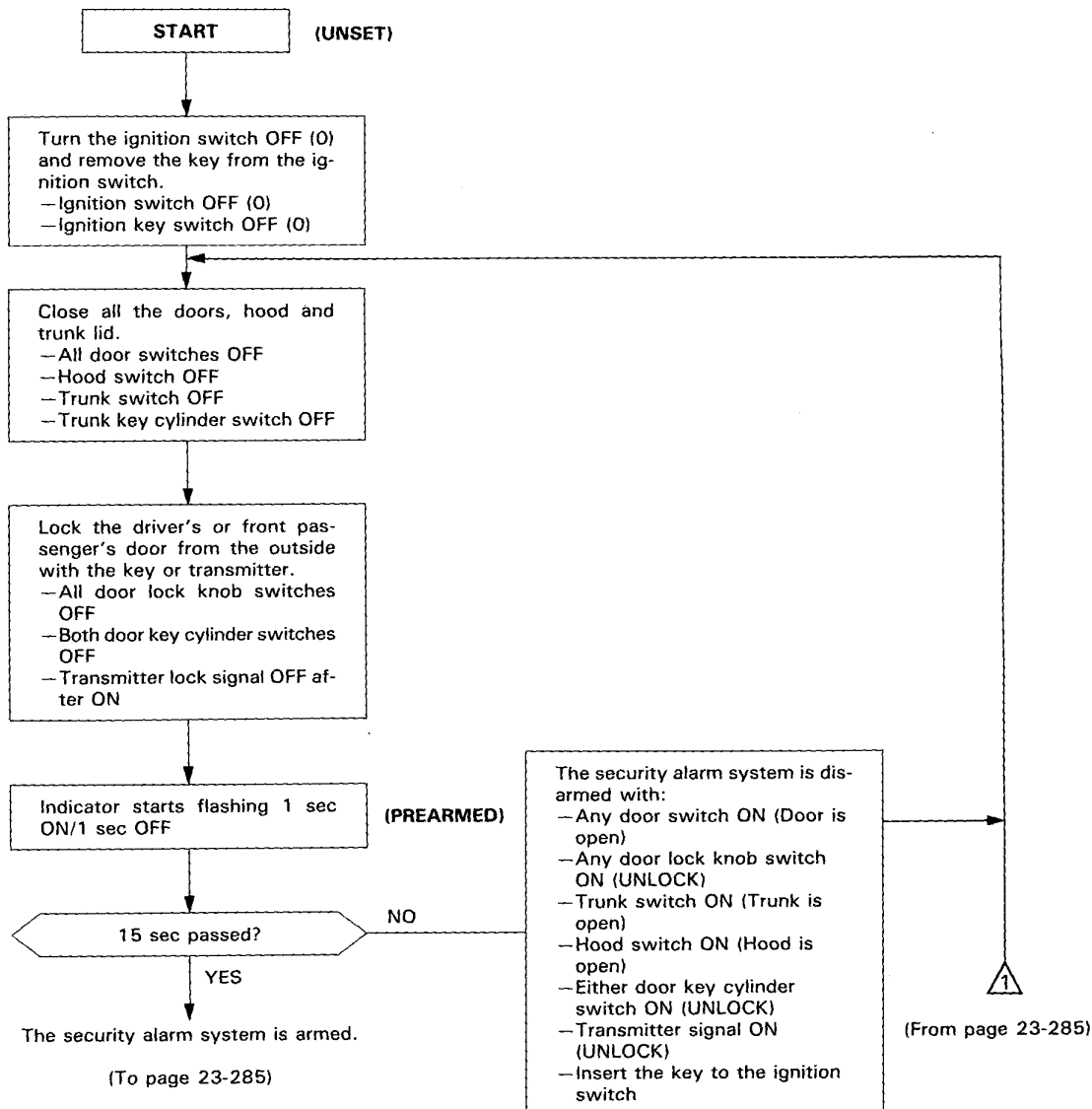
Keyless Entry and Security Alarm System

Description

This system is activated automatically 15 seconds after everything has been closed and locked. The security alarm system indicator light located on the front door panels will flash after the doors, hood and trunk are properly locked. If any of conditions 1) to 6) occurs, the horn or siren will sound and the turn signal lights will flash (except KX) for about 30 seconds or until the system is disarmed by unlocking the driver's door or front passenger's door from the outside with the key or transmitter.

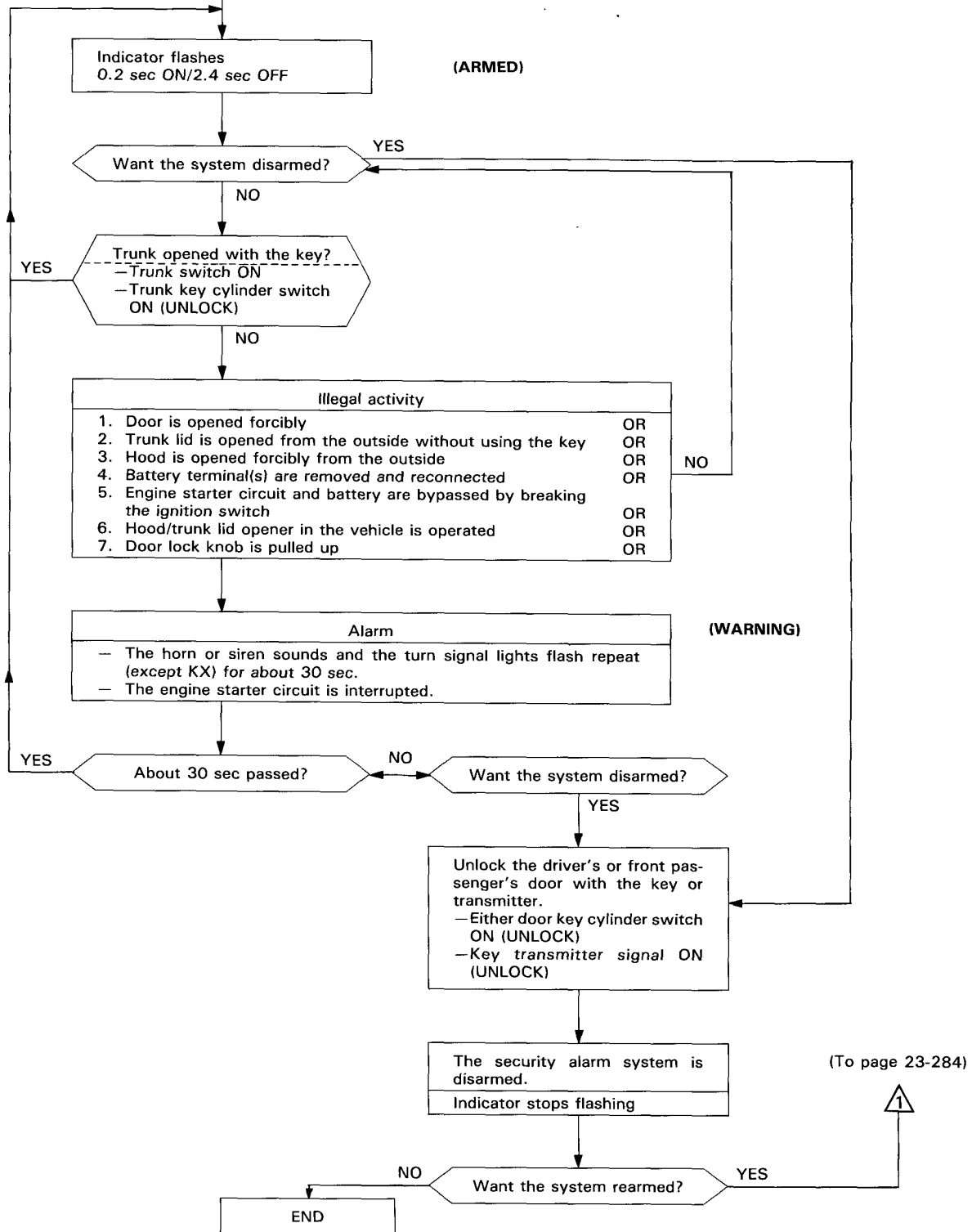
- Conditions:
- 1) A door is opened forcibly.
 - 2) The trunk lid is opened from the outside without using the key.
 - 3) The hood is opened forcibly from the outside.
 - 4) The battery terminal(s) are removed and reconnected.
 - 5) The engine starter circuit and battery circuit are bypassed by breaking the ignition switch.
 - 6) The hood/trunk lid opener in the vehicle is operated.
 - 7) A door lock knob is pulled up.

Flowchart of the security alarm system operation:



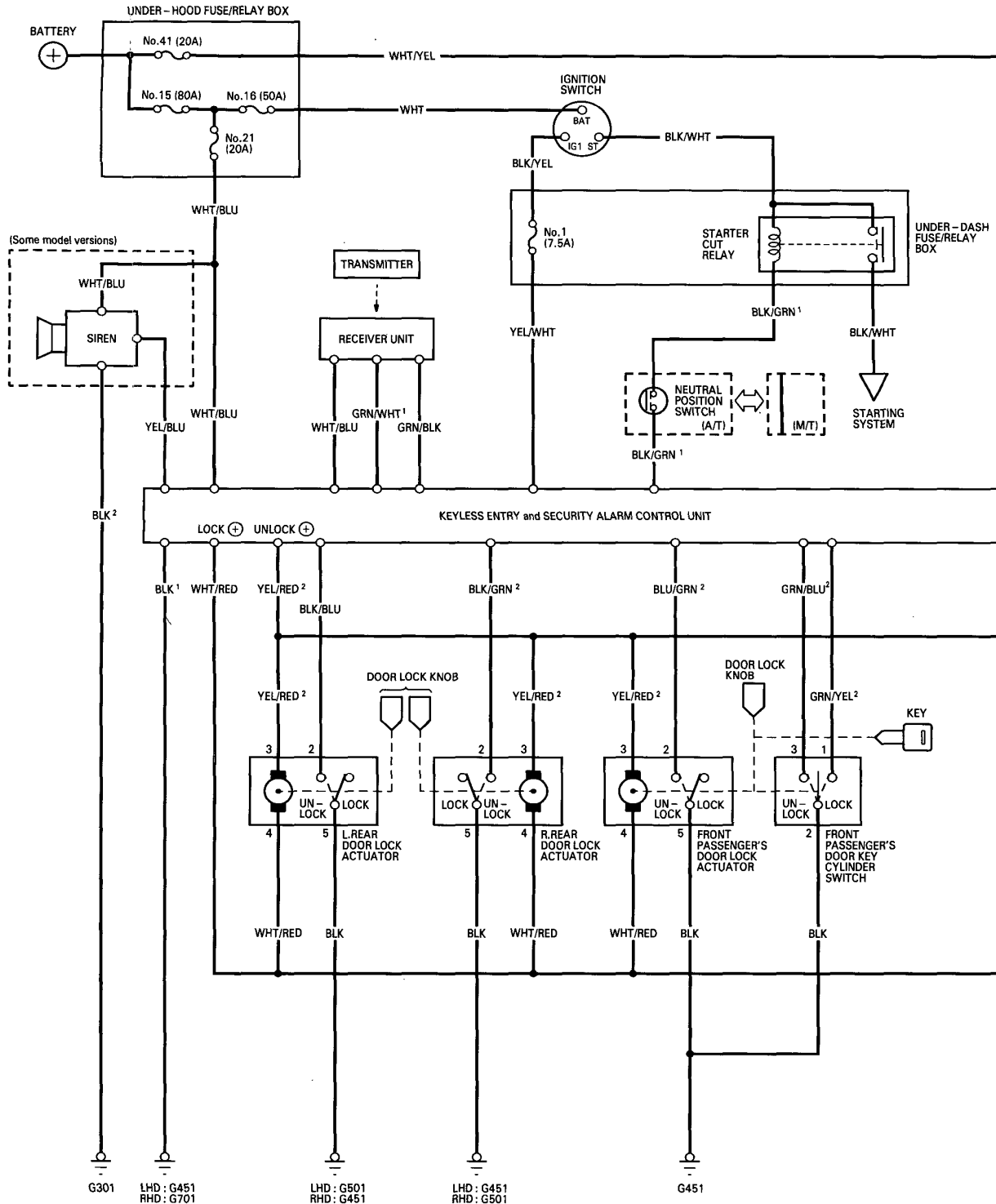


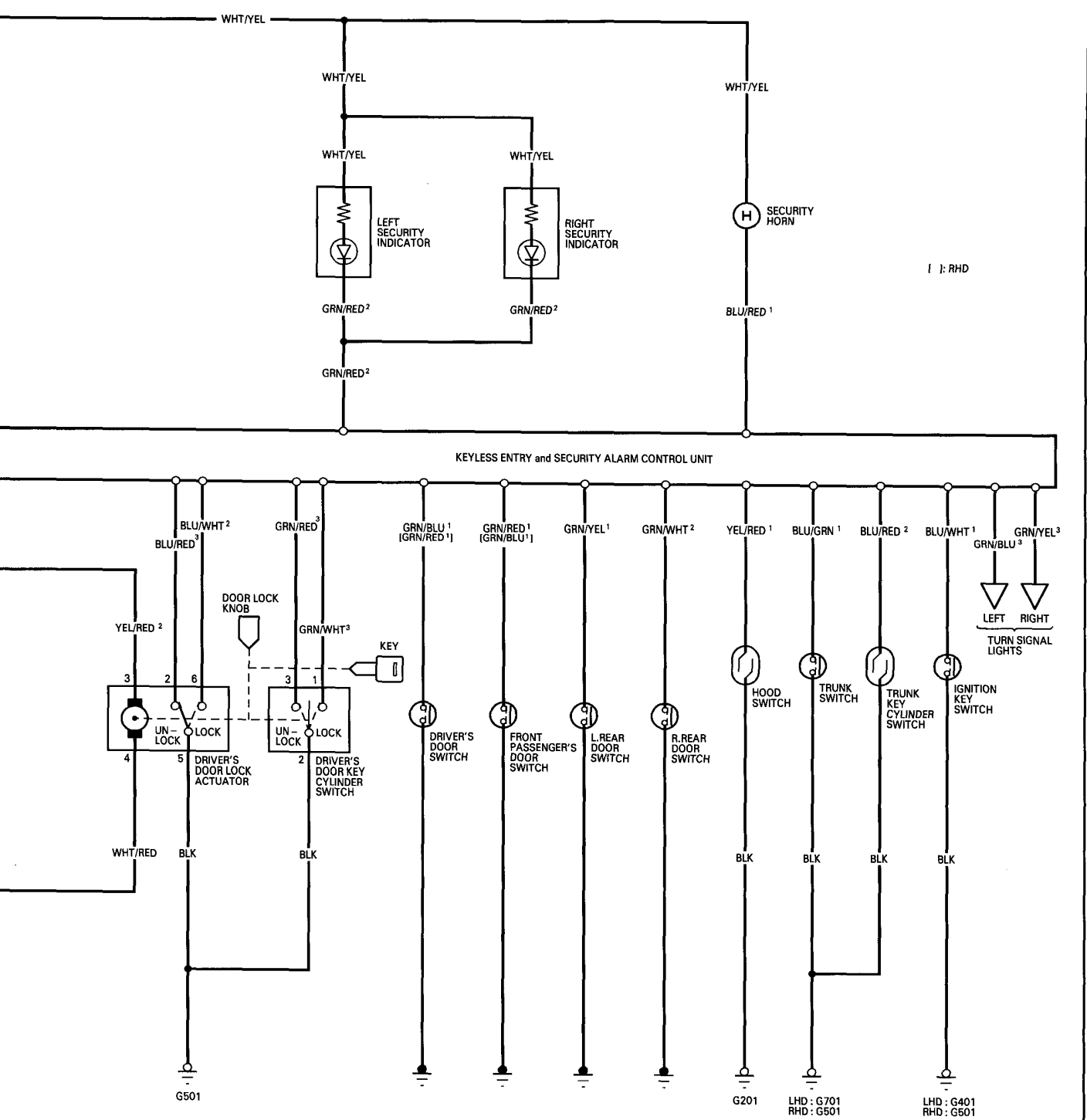
(From page 23-284)



Keyless Entry and Security Alarm System

Circuit Diagram





Keyless Entry and Security Alarm System

Troubleshooting

Security Alarm System:

NOTE: The numbers in the table show the troubleshooting sequence.

Item to be inspected	In the under-hood fuse/relay box		Blown No. 1 (7.5 A) fuse in the under-dash fuse/relay box	Faulty indicator light (LED)	Horn circuit/siren circuit	Starting system	Turn signal/hazard system	Starter cut relay	A/T gear position switch: (A/T)	Receiver unit/transmitter	Door key cylinder switch	Ignition key switch	Trunk key cylinder switch	Trunk switch	Hood switch	Door switch	Control unit input	Poor ground	Open circuit, loose or disconnected terminals
	Blown No. 21 (20 A) fuse	Blown No. 41 (20 A) fuse																	
Symptom																			
Security alarm cannot be set and indicator light does not flash.	1	2	3	4								5					6	G451 G501 G701	WHT/BLU,YEL/ WHT,WHT/YEL, GRN/RED ² BLU/WHT ¹
Starting system does not operate.						1		2	3								4		BLK/GRN ¹
Security alarm can be set, but alarm does not operate when the trunk, hood or a door is opened without the key.	Horn/siren alarm		1	2		3											4	G301	YEL/BLU,WHT/ YEL,BLU/RED ¹ , WHT/BLU
	Hazard warning lights alarm						1										2		GRN/BLU ³ , GRN/YEL ³
Alarm is not cancelled when the driver's or front passenger's door is opened with the key or transmitter.										2	1						3	G451 G501	BLU/WHT ² , GRN/BLU ² ,GRN/ WHT ¹ ,GRN/BLK WHT/BLU
Alarm does not operate when the hood is opened without the key.															1		2	G201	YEL/RED ¹
Alarm does not operate when the trunk lid is opened without the key.												2	1				3	G501 G701	BLU/GRN ¹ , BLU/RED ¹
Alarm does not operate when a door is opened without the key.															1	2			GRN/BLU ¹ , GRN/RED ¹ , GRN/YEL ¹ , GRN/WHT ²



Keyless Entry System:

NOTE: The numbers in the table show the troubleshooting sequence.

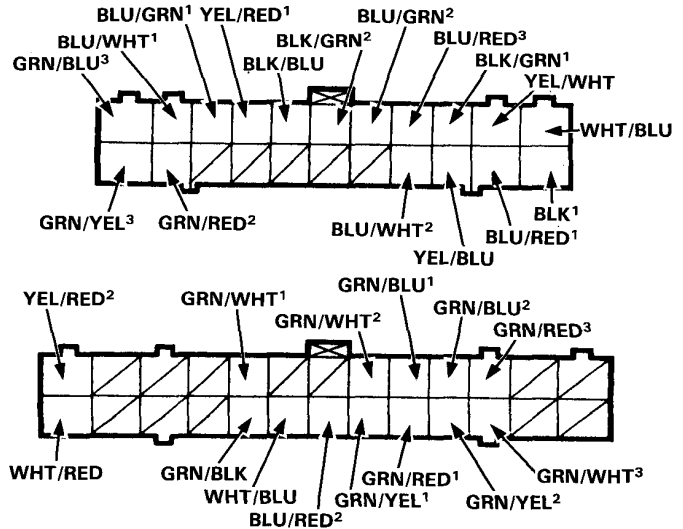
Item to be inspected		In the under-hood fuse/relay box		Blown No. 1 (7.5 A) in the under-dash fuse/relay box	Door lock knob switch	Driver's door lock key cylinder switch	Passenger's door lock key cylinder switch	Driver's door lock actuator	Passenger's door lock actuator	Receiver unit/transmitter	Control unit input	Disconnected or obstructed door lock rod/linkage	Poor ground	Open circuit, loose or disconnected terminals
		Blown No. 21 (20 A) fuse	Blown No. 41 (20 A) fuse											
Symptom														
Power door lock system does not work at all.		1	2	3							4		G451 G501	YEL/RED ² , WHT/RED, WHT/BLU, YEL/WHT
Doors do not lock or unlock with the driver's door key cylinder switch.	All doors				1						2		G501	GRN/RED ³ , GRN/WHT ³
	One or more doors							1			3	2		YEL/RED ² , WHT/RED
Doors do not lock or unlock with the passenger's door key cylinder switch.	All doors					1					2		G451	GRN/BLU ² , GRN/YEL ²
	One or more doors							1			3	2		YEL/RED ² , WHT/RED
Doors do not lock or unlock with the door lock knob.	All doors				1						2		G451 G501	YEL/RED ² , WHT/RED
	One or more doors							1	2		4	3		YEL/RED ² , WHT/RED
The power door lock system works properly but the keyless entry system does not work.										1	2			WHT/BLU, GRN/WHT ¹ GRN/BLK

Keyless Entry and Security Alarm System

Control Unit Input Test

1. Remove the right trunk side trim panel, then disconnect the 26-P and 22-P connectors from the security alarm control unit.
2. Inspect the connector and the 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 control unit must be faulty; replace it.

NOTE: Different wires with the same color have been given a number suffix to distinguish them (for example, GRN/BLU¹ and GRN/BLU² are not the same).



No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	BLK ¹	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> • Poor ground (G451 or G701) • An open in the wire
2	WHT/BLU	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 21 (20 A) fuse in the under-hood fuse/relay box • An open in the wire
3	GRN/RED ²	Under all conditions	Connect to ground: Security indicators should come on.	<ul style="list-style-type: none"> • Blown No. 41 (20 A) fuse in the under-hood fuse/relay box • Faulty security indicator • An open in the wire
4	YEL/WHT	Ignition switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Blown No. 1 (7.5 A) fuse in the under-dash fuse/relay box • An open in the wire
5	BLK/GRN ²	Ignition switch at START (M/T) Ignition switch at START and A/T gear position switch in position P	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> • Faulty starter cut relay • Faulty A/T gear position switch (A/T) • An open in the wire
6	BLU/RED ¹	Under all conditions	Connect to ground: Security horn should sound.	<ul style="list-style-type: none"> • Blown No. 41 (20 A) fuse in the under-hood fuse/relay box • Faulty security horn • An open in the wire
7	GRN/BLU ³	Connect battery power to the GRN/BLU ³ terminal.	Left turn signal light should come on as the battery is connected.	<ul style="list-style-type: none"> • Poor ground (G301, G401, G402, G451 or G501) • An open in the wire
8	GRN/YEL ³	Connect battery power to the GRN/YEL ³ terminal.	Right turn signal lights should come on as the battery is connected.	<ul style="list-style-type: none"> • Poor ground (G201, G401, G402, G452 or G501) • An open in the wire
9	YEL/BLU	Under all conditions	Connect to ground: Security siren should sound.	<ul style="list-style-type: none"> • Blown No. 21 (20 A) fuse in the under-hood fuse/relay box • Faulty security siren • Poor ground (G301) • An open in the wire



No.	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
10	YEL/RED ¹	Hood open	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty hood switch Poor ground (G201) An open in the wire
11	BLU/WHT ¹	Ignition key inserted into the ignition switch	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty ignition key switch Poor ground (G401 [G501]) An open in the wire
12	BLU/RED ²	Trunk key cylinder switch in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty trunk key cylinder switch Faulty trunk switch Poor ground (G701 [G501]) An open in the wire
13	BLU/GRN ¹	Trunk lid open	Check for continuity to ground: There should be continuity.	
14	GRN/BLU ¹ [GRN/RED ¹]	Driver's door open	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty driver's or front passenger's door switches Poor ground (G451, G501) An open in the wire
15	GRN/RED ¹ [GRN/BLU ¹]	Front passenger's door open		
16	GRN/YEL ¹	Left rear door open	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty left or right rear door switches Poor ground (G451, G501) An open in the wire
17	GRN/WHT ²	Right rear door open		
18	GRN/RED ³	Driver's door key cylinder switch in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty driver's door key cylinder switch Poor ground (G501) An open in the wire
19	GRN/WHT ³	Driver's door key cylinder switch in LOCK		
20	GRN/BLU ²	Front passenger's door key cylinder switch in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Faulty front passenger's door key cylinder switch Poor ground (G451) An open in the wire
21	GRN/YEL ²	Front passenger's door key cylinder switch in LOCK		
22	BLU/WHT ²	Driver's door lock knob in LOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Poor ground (G501) An open in the wire
23	BLU/RED ³	Driver's door lock knob in UNLOCK		
24	BLU/GRN ²	Front passenger's door lock knob in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Front passenger's door lock knob switch (built in the actuator) Poor ground (G451) An open in the wire
25	BLK/BLU	Left rear door lock knob in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Left rear door lock knob switch (built in the actuator) Poor ground (G501 [G451]) An open in the wire
26	BLK/GRN ²	Right rear door lock knob in UNLOCK	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> Right rear door lock knob switch (built in the actuator) Poor ground (G451 [G501]) An open in the wire
27	WHT/RED and YEL/RED ²	Connect the YEL/RED ² and WHT/BLU terminals and the WHT/RED and BLK ¹ terminals momentarily.	Check the door lock actuators: All doors should unlock as the battery is connected momentarily.	<ul style="list-style-type: none"> Faulty actuator An open in the wire
		Connect the WHT/RED and WHT/BLU terminals and the YEL/RED ² and BLK ¹ terminals momentarily.	Check the door lock actuators: All doors should lock as the battery is connected momentarily.	

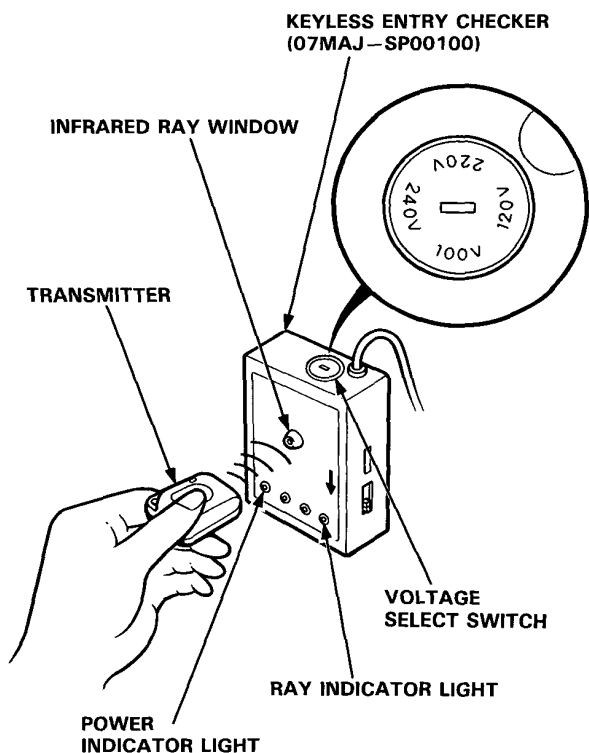
[]: RHD

Keyless Entry and Security Alarm System

Keyless Entry System Test

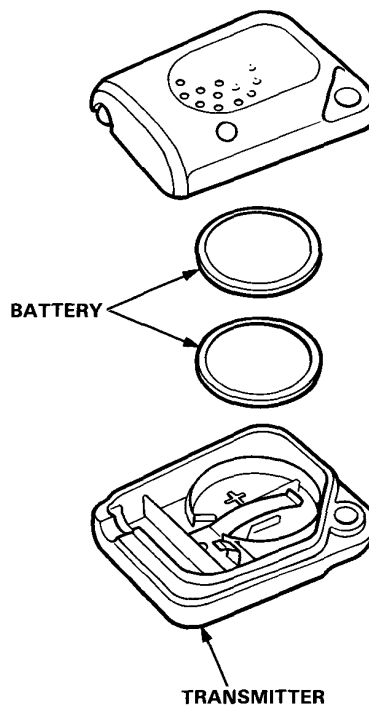
NOTE: Before testing, make sure that the power door lock system works properly.

1. Turn the voltage select switch and connect the Key-less Entry Checker to an AC power outlet. The power indicator light should go on.
2. Hold the transmitter within 500 mm (19.7 in) from the front of the infrared ray window, and press the button.
 - If the ray indicator light does not go on:
 - Dead or low battery
 - Faulty transmitter
 - If the ray indicator light goes on, go to step 3.



Battery Replacement:

Disassemble the transmitter and replace the battery.

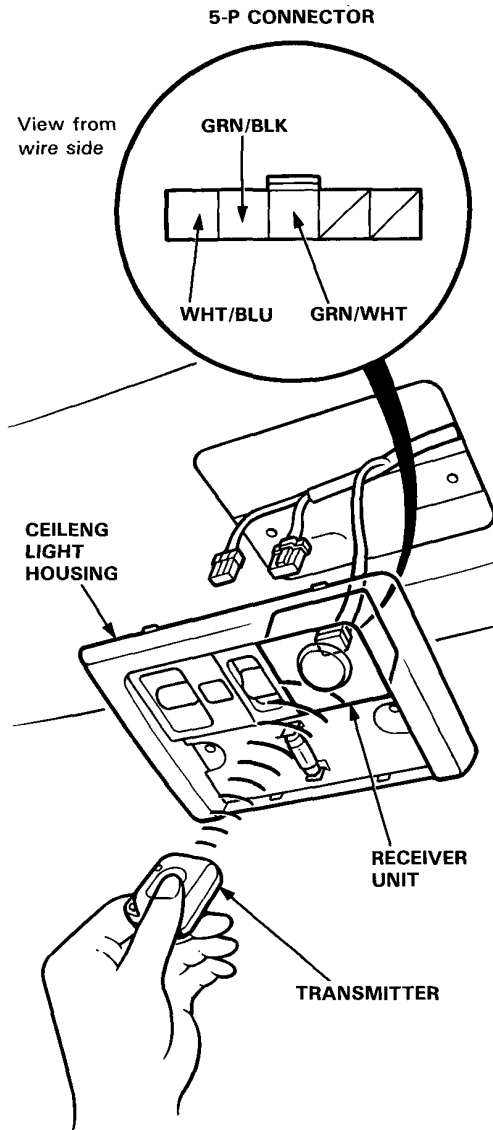




3. Pry the front ceiling light lens off and remove the two bolts from the front ceiling light housing.
4. Check if there is receiver output when the transmitter button is pressed.

Test method:

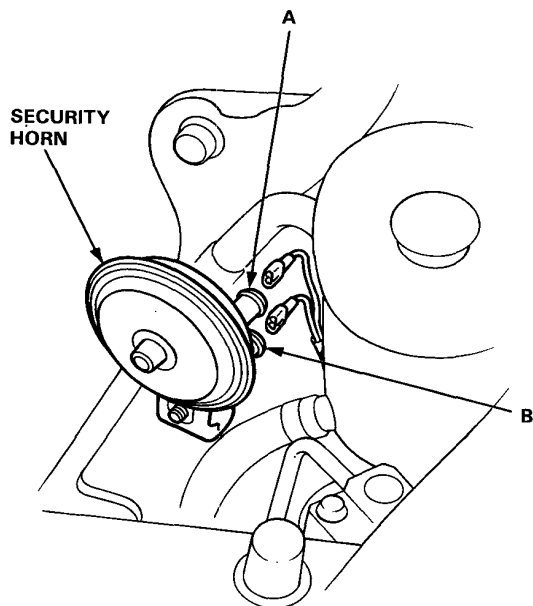
- Use a digital multimeter.
 - Do not disconnect the 5-P connector.
 - Connect the positive (+) probe to the GRN/WHT terminal and the negative (-) probe to the GRN/BLK terminal.
- If there is a momentary output voltage of about 3.5 mV – 1V, the receiver is OK.
 - If there is no voltage, check for an open in the GRN/WHT, WHT/BLU and GRN/BLK wires. If the wires are OK, replace the receiver.



Keyless Entry and Security Alarm System

Security Horn Test

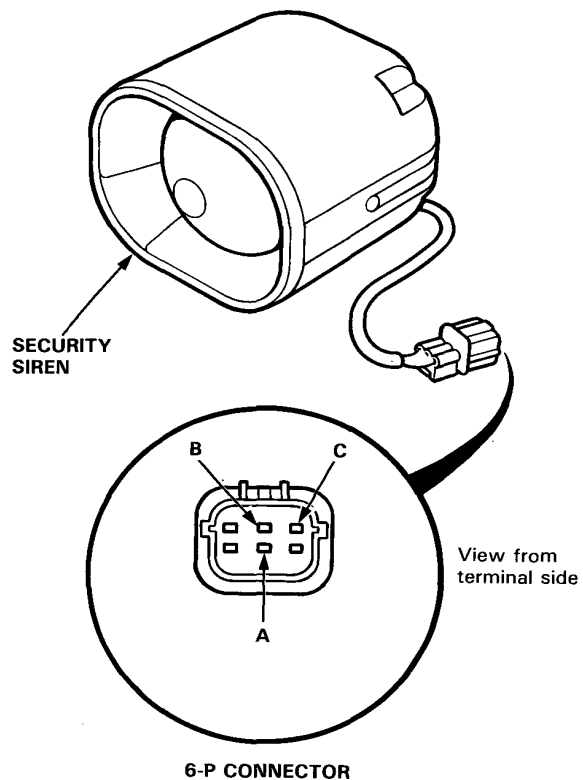
1. Open the hood and disconnect the terminals from the security horn.
2. Test the horn by connecting battery power to one terminal and grounding the other. The horn should sound.



3. Replace the horn if it fails to sound.

Security Siren Test

1. Open the hood and disconnect the 6-P connector from the security siren.
2. Connect terminal B to ground, then connect battery power to terminal C and ground terminal A. The siren should sound.

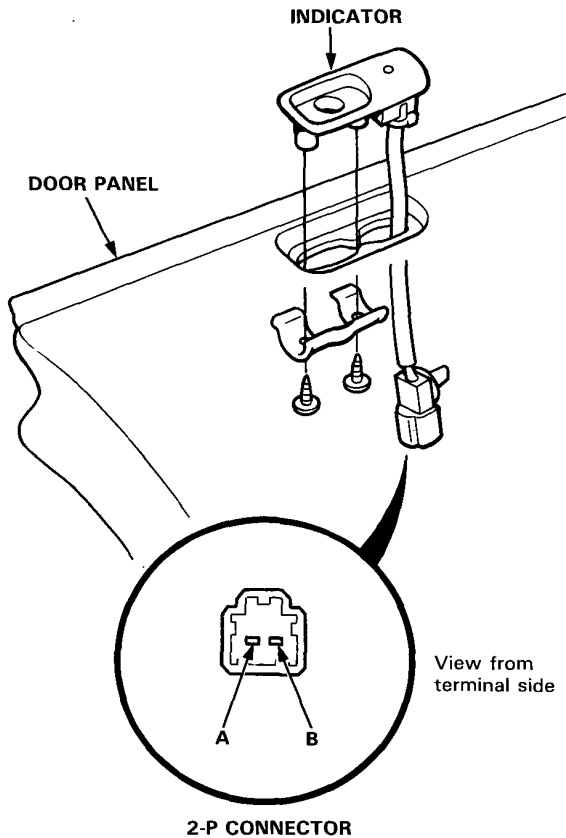


3. Replace the siren if it fails to sound.

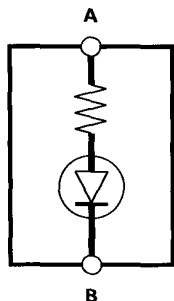


Indicator Replacement

1. Remove the front door panel (see section 20).
2. Remove the two screws and disconnect the 2-P connector from the indicator.
3. Remove the indicator from the door panel.



From No.41 (20A) FUSE



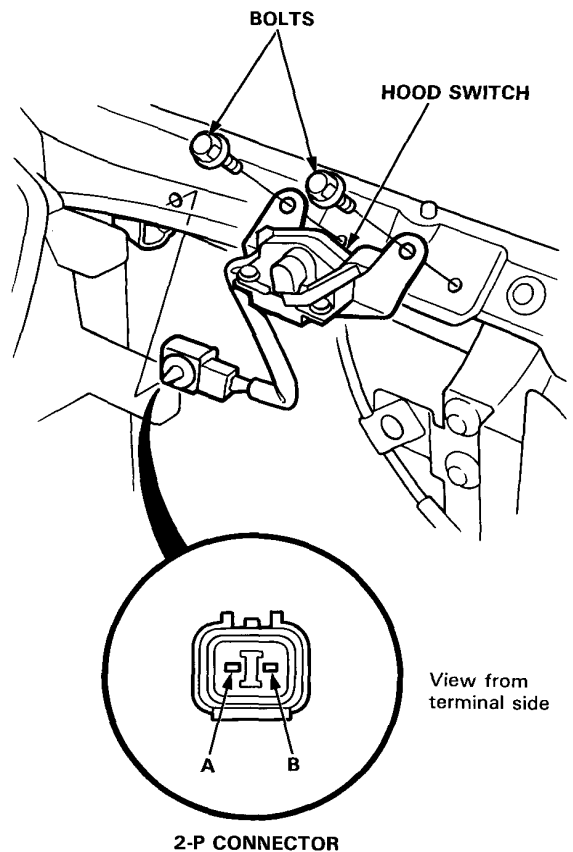
To SECURITY ALARM CONTROL UNIT

Hood Switch Test/Replacement

1. Open the hood.
2. Disconnect the 2-P connector from the hood switch.
3. Check for continuity between the terminals A and B in each switch position according to the table.

Terminal	A	B
Position		
Hood open (Lever release)	○	○
Hood close (Lever pushed)		

4. If the hood switch does not work properly, remove the two bolts and replace the switch.



Keyless Entry and Security Alarm System

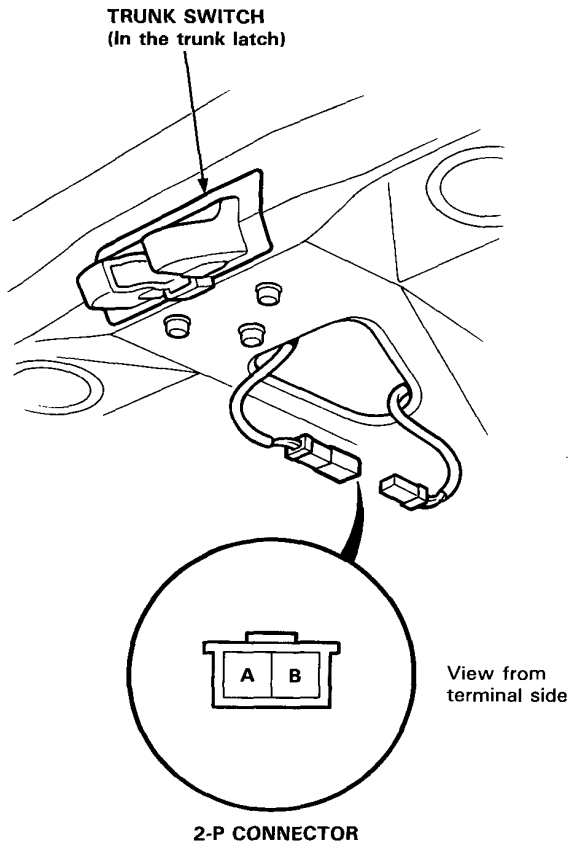
Trunk Switch Test

NOTE: The trunk switch is different from the trunk latch switch. For the trunk latch switch test refer to page 23-178.

1. Open the trunk lid and disconnect the 2-P connector from the trunk switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B
Position		
LOCK (Close)		
UNLOCK (Open)	○	○

3. If it fail to work, replace the trunk latch (see page 23-178).

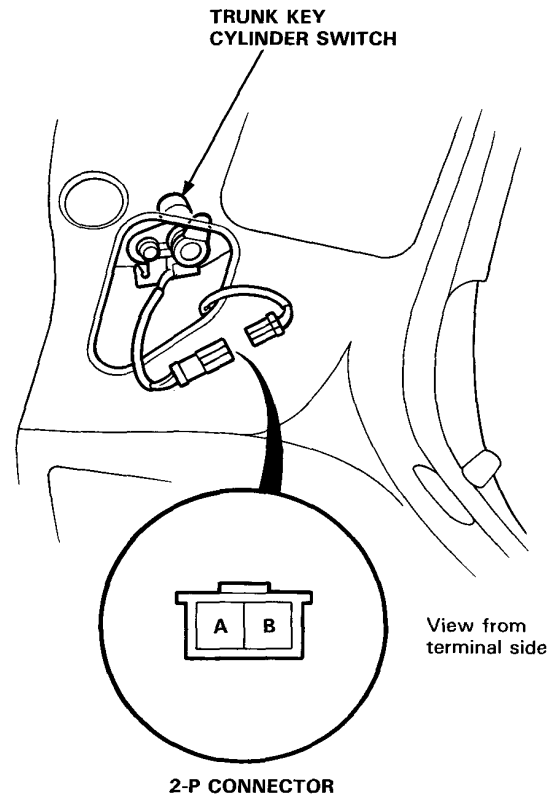


Trunk Key Cylinder Switch Test

1. Open the trunk lid and disconnect the 2-P connector from the trunk key cylinder switch.
2. Check for continuity between the terminals in each switch position according to the table.

Terminal	A	B
Position		
LOCK (Close)		
UNLOCK (Open)	○	○

3. If it fails to work, replace the trunk key cylinder switch (see section 20).

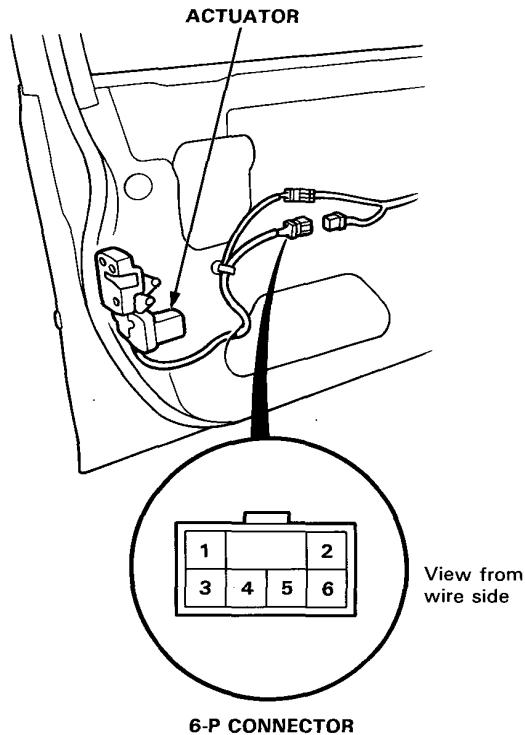




Driver's Door Lock Actuator Test

1. Remove the driver's door panel (see section 20).
2. Disconnect the 6-P connector from the door lock actuator.

NOTE: LHD type is shown, RHD type is symmetrical.



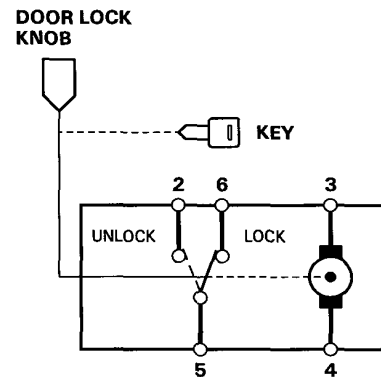
3. Test the actuator:

Terminal	3	4
Position		
LOCK	⊖	⊕
UNLOCK	⊕	⊖

CAUTION: To prevent damage to the actuator, connect battery power only momentarily.

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

Terminal	2	5	6
Position			
LOCK		○—○	○—○
UNLOCK	○—○	○—○	



5. If the actuator does not work properly, replace it.

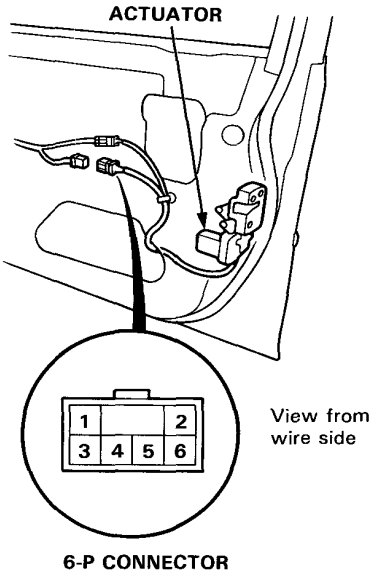
Keyless Entry and Security Alarm System

Passenger's Door Lock Actuator Test

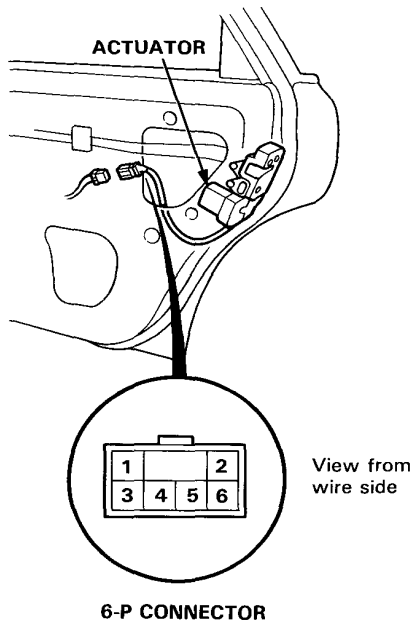
1. Remove the passenger's door panel (see section 20).
2. Disconnect the 6-P connector from the door lock actuator.

Front Passenger's Door:

NOTE: LHD type is shown, RHD type is symmetrical.



Rear Passenger's Door:



3. Test the actuator:

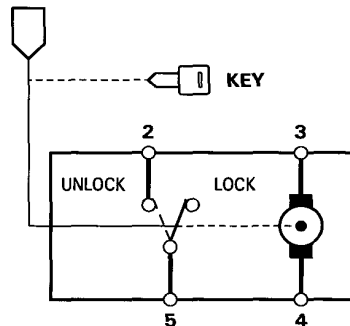
Terminal	3	4
Position		
LOCK	⊖	⊕
UNLOCK	⊕	⊖

CAUTION: To prevent damage to the actuator, connect battery power only momentarily.

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

Terminal	2	5
Position		
LOCK		
UNLOCK	○	○

DOOR LOCK KNOB



5. If the actuator does not work properly, replace it.



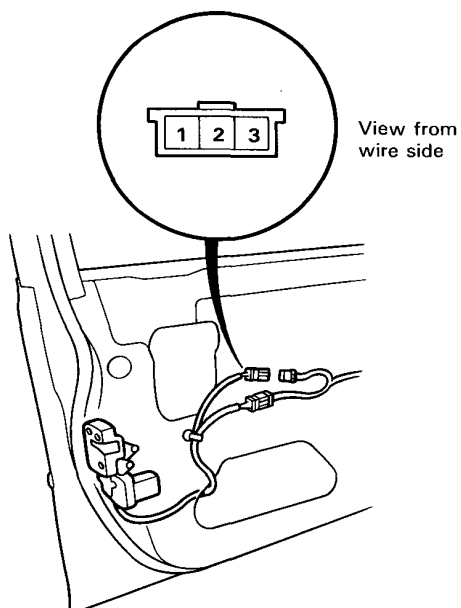
Key Cylinder Switch Test

1. Remove the front door panel (see section 20).
2. Disconnect the 3-P connector from the actuator.
3. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	1	2	3
LOCK	○	○	
UNLOCK		○	○

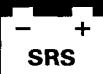
NOTE: LHD type is shown, RHD type is symmetrical.

3-P CONNECTOR



Supplemental Restraint System (SRS)-Type II

Component Location Index	23-302
Description	23-303
Circuit Diagram.....	23-304
Wiring Locations.....	23-305
Precautions/ Procedures.....	23-306
Troubleshooting	
Self-diagnosis system.....	23-310
Failure code table.....	23-311
Airbag Assembly	
Replacement.....	23-322
Disposal.....	23-324
Slip Ring	
Replacement.....	23-326

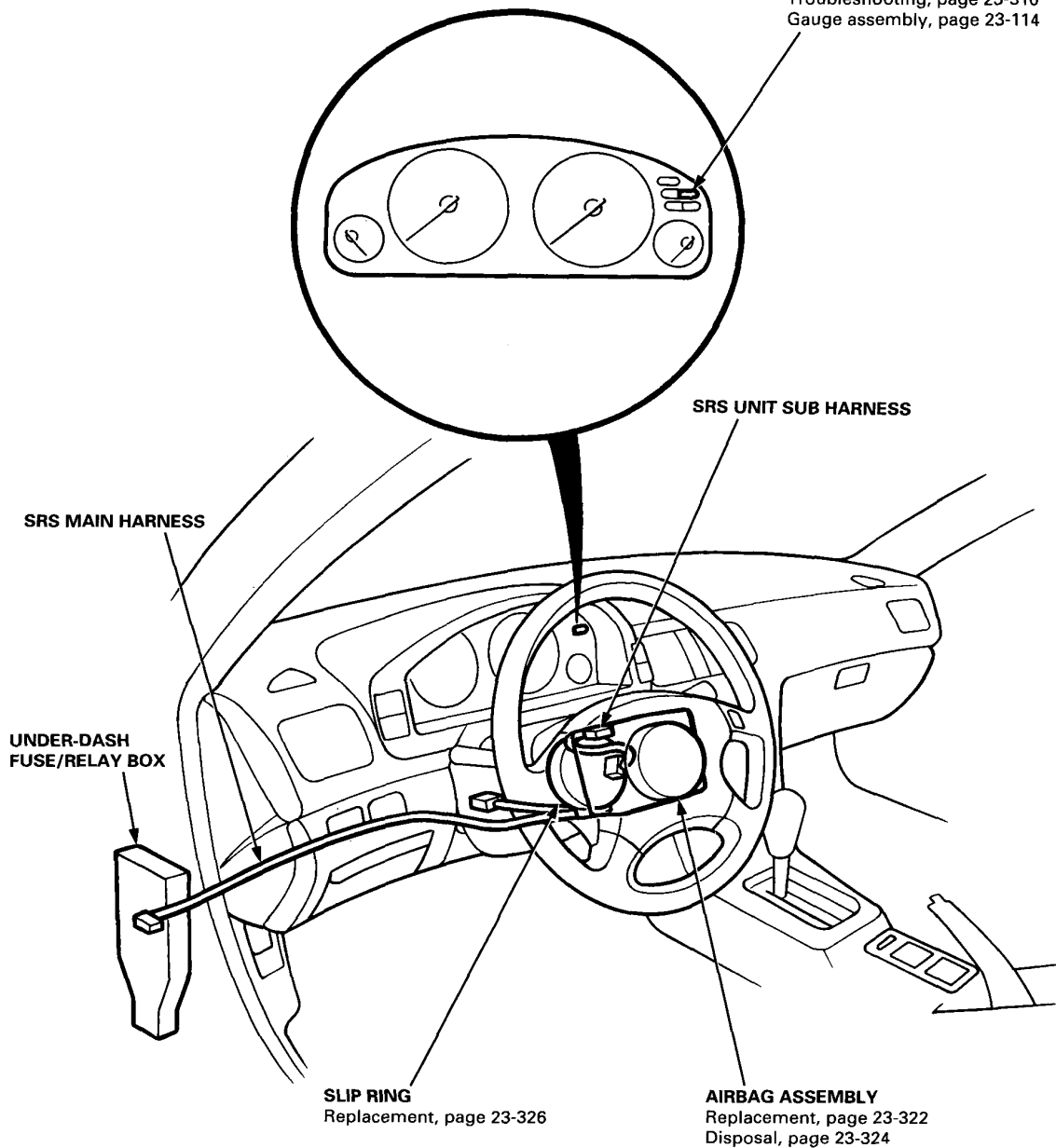


Supplemental Restraint System (SRS)-Type II

Component Location Index

NOTE: RHD type is symmetrical to LHD type.

SRS INDICATOR LIGHT
(In the gauge assembly)
Troubleshooting, page 23-310
Gauge assembly, page 23-114

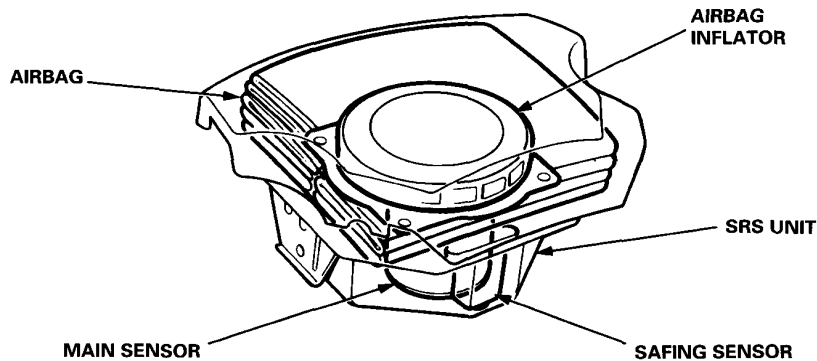




Description

The SRS is a safety device which, as a supplement to the seat belt, is designed to protect the driver by operating when the car receives a frontal impact exceeding a certain set limit.

The system is comprised of the airbag assembly (which in turn consists of the SRS unit, airbag inflator, and airbag) and the slip ring.



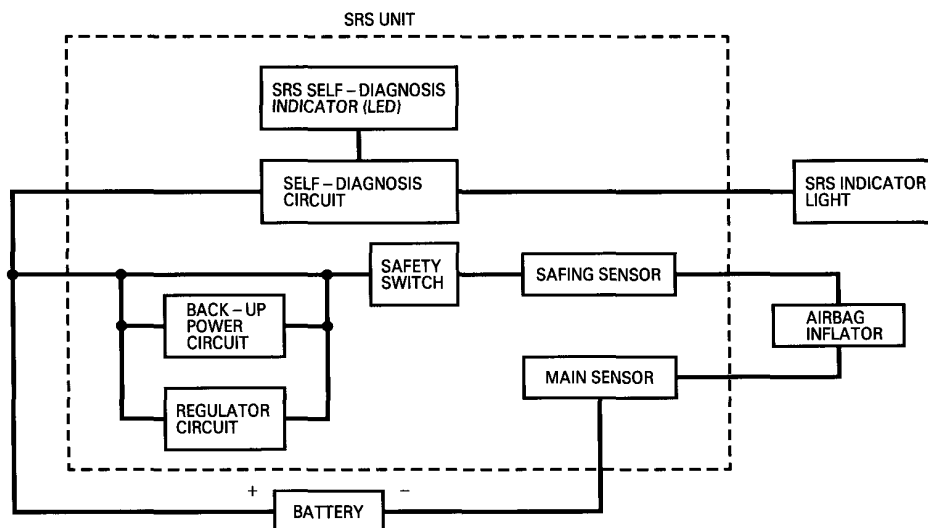
Operation

As shown in the diagram below, the main and safing sensors, and the safety switch are connected in series to the airbag inflator and the battery. A regulator circuit (increasing the reliability of the SRS system by raising the voltage when battery voltage drops) and a back-up power circuit are connected in parallel with the battery. The sensors, the safety switch, regulator and back-up circuits, and a self-diagnosis circuit (see description on next page) are all built into the SRS unit.

Sequence of operation:

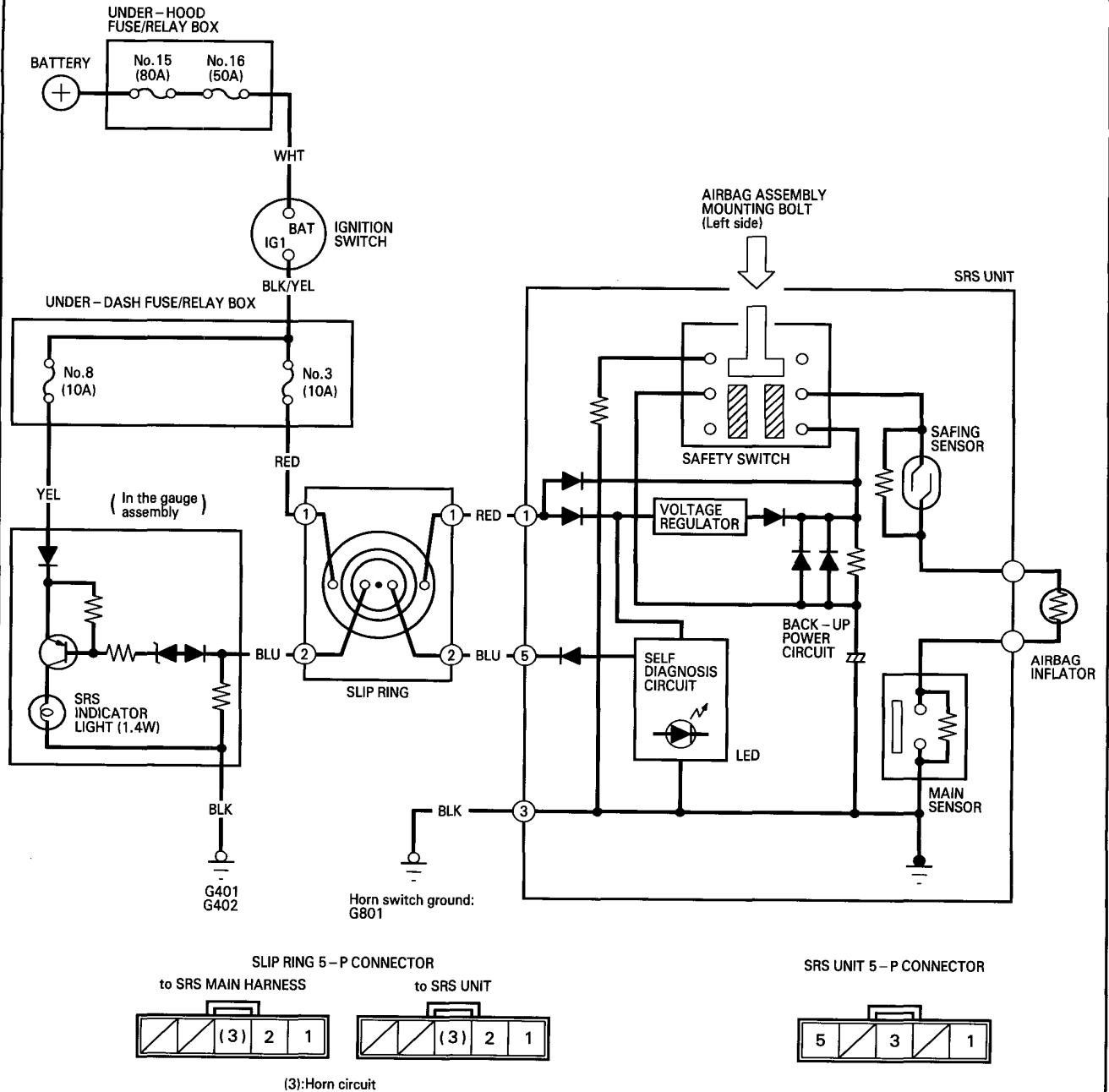
- (1) The main sensor and the safing-sensor activate.
- (2) Power is supplied to the airbag inflator by the battery or the back-up power circuit if the battery is disconnected due to the impact.
- (3) The airbag deploys.

It takes about 0.1 seconds from the beginning of the airbag deployment until it is completely deflated.



Supplemental Restraint System (SRS) – Type II

Circuit Diagram



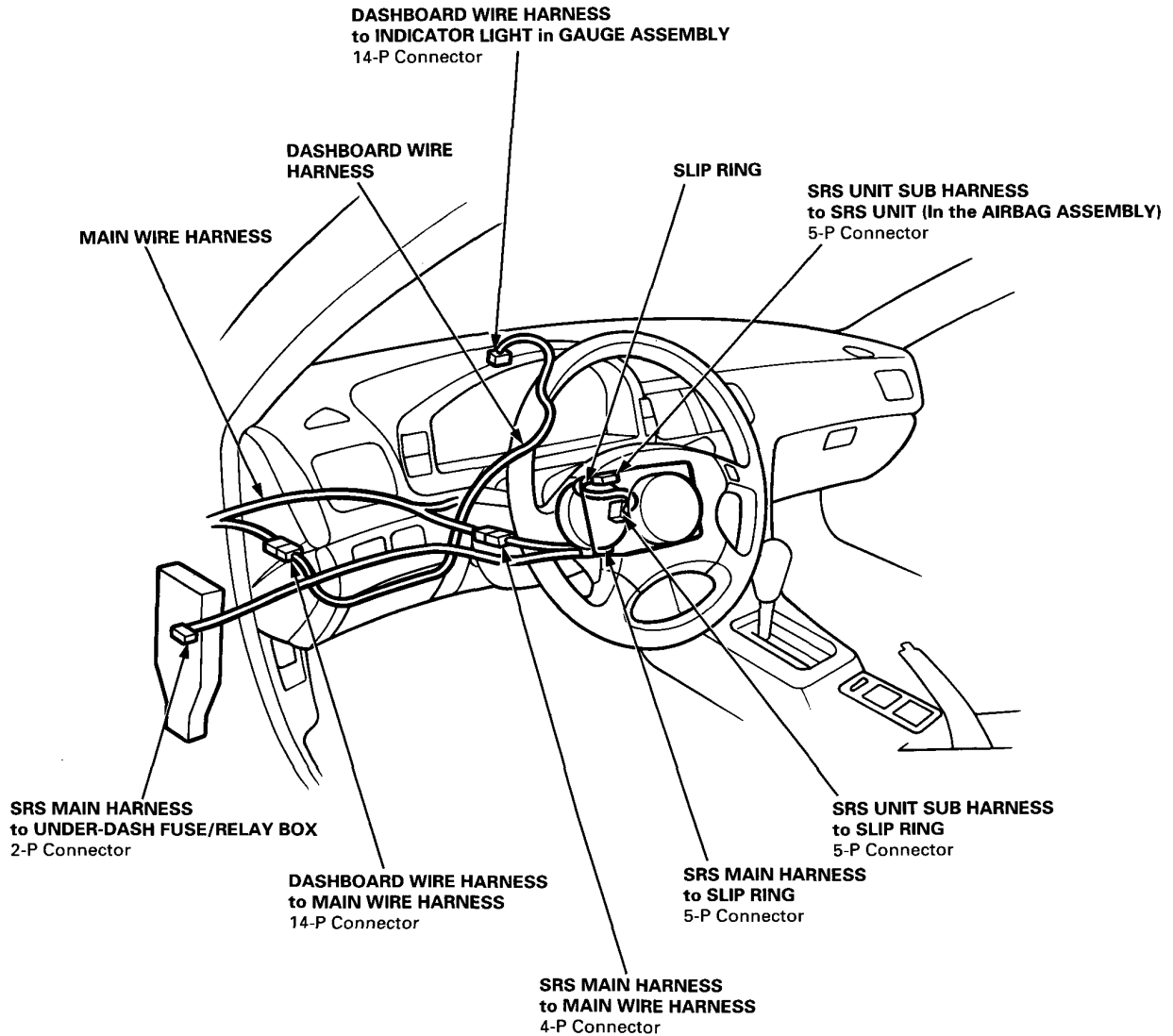


Wiring Locations

CAUTION: Make sure all SRS ground locations are clean and grounds are securely attached.

NOTE:

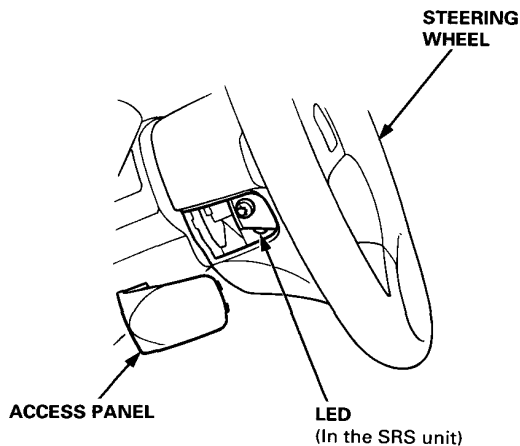
- All SRS electrical wiring harnesses are covered with yellow outer insulation.
- Replace the entire affected SRS harness assembly if it has an open circuit or damaged wiring.
- RHD type is symmetrical to LHD type.



Supplemental Restraint System (SRS)-Type II

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 assembly.
 - Slip ring.
 - Steering wheel.
- Use only a digital circuit tester to check the system. Using an analog circuit tester may cause an accidental deployment and possible injury.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Replacement of the combination light and wiper/washer switches can be done without removing the steering wheel:
 - Combination light and wiper/washer switch replacement (see page 23-114).
- After completed work, check that the connectors are installed tightly:
 - The SRS indicator light should go off 6 sec after the ignition switch has been turned on.
 - With the ignition switch turned on, the LED of the SRS unit should blink one time.

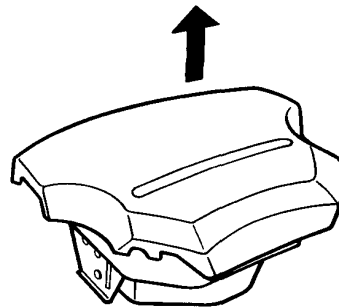


Airbag Handling and Storage

- Do not try to disassemble the airbag assembly. It has no serviceable parts. Once an airbag has been deployed, it cannot be repaired or reused.
- Be careful that the airbag assembly receives *no* strong shocks; it could deploy.
- Special bolts are necessary for installing the airbag assembly. Do not use other bolts.

For temporary storage of the airbag assembly during service, observe the following precautions:

- Store the removed airbag assembly with the pad surface up.



▲ WARNING If the airbag is improperly stored face down, accidental deployment could propel the unit with enough force to cause serious injury.

- Store the removed airbag assembly on a secure flat surface away from any high heat source (exceeding 85°C/185°F) and free of any oil, grease, detergent or water.

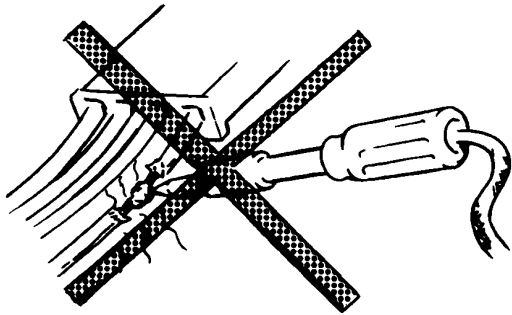
CAUTION: Improper handling or storage can internally damage the airbag assembly, making it inoperative. If you suspect the airbag assembly has been damaged, install a new unit and refer to the Deployment/Disposal Procedures for disposing of the damaged airbag.



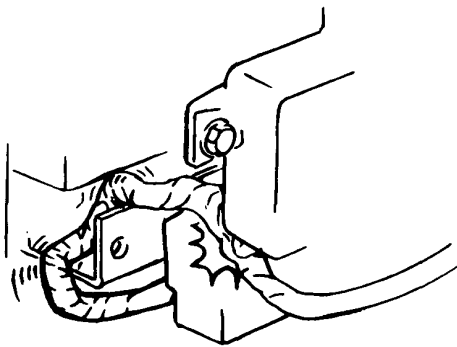
Wiring-related Precautions

- Never attempt to modify, splice or repair SRS wiring.

NOTE: SRS wiring can be identified by special yellow outer protective covering.



- Be sure to install the harness wires so that they are not pinched or interfering with other car parts.

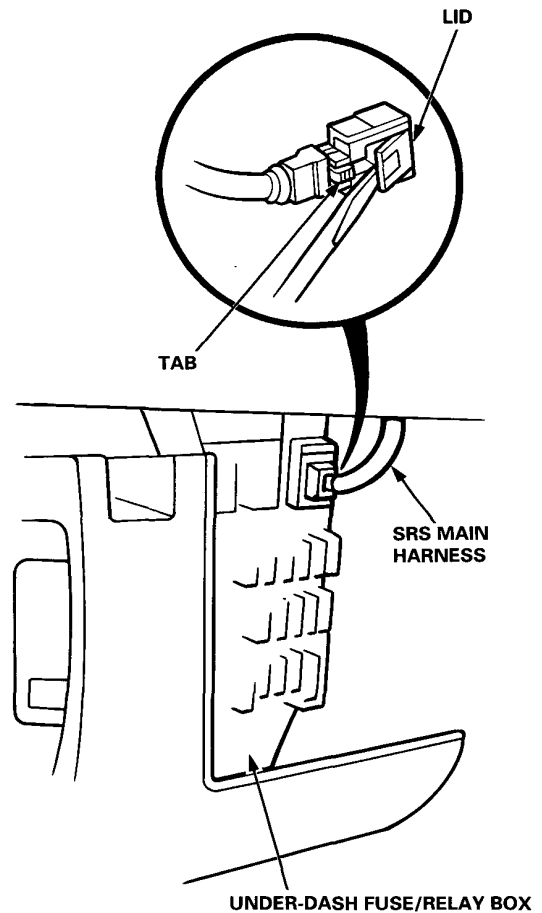


- Make sure all SRS ground locations are clean and grounds are securely fastened for optimum metal-to-metal contact. Poor grounding can cause intermittent problems that are difficult to diagnose.

Disconnecting the SRS Connector at the Under dash fuse/relay Box

CAUTION: Avoid breaking the connector; it's double-locked.

1. First lift the connector lid with a thin screwdriver, then press the connector tab down and pull the connector out.



2. To reinstall the connector, push it into position until it clicks, then close its lid.

(cont'd)

Supplemental Restraint System (SRS)-Type II

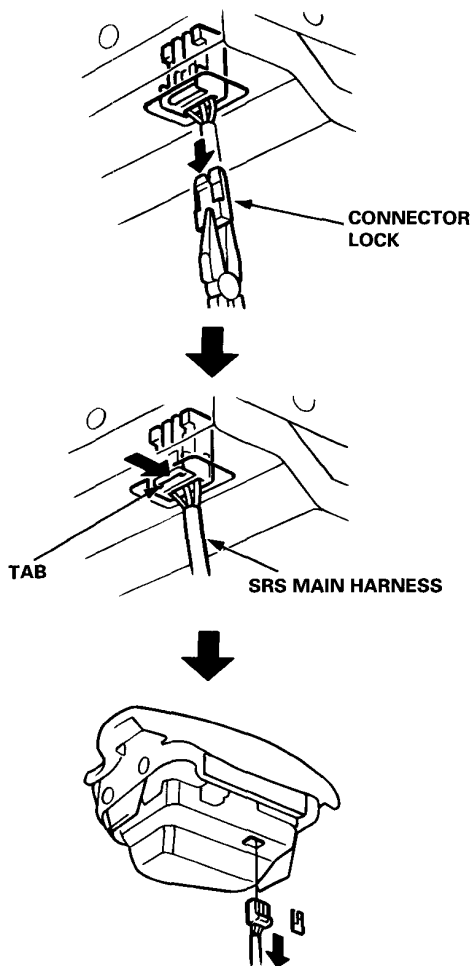
Wiring-related Precautions (cont'd)

Disconnecting the SRS Connector at the SRS Unit and Slip ring

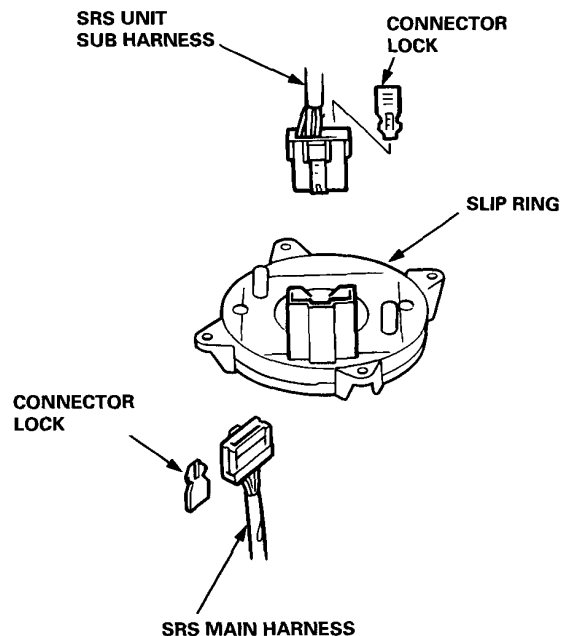
NOTE: Dispose of the connector lock; not reuse it.

1. Pull the connector lock out with pliers.
2. Depress the connector tab and pull the connector out.

SRS Unit:



Slip Ring:

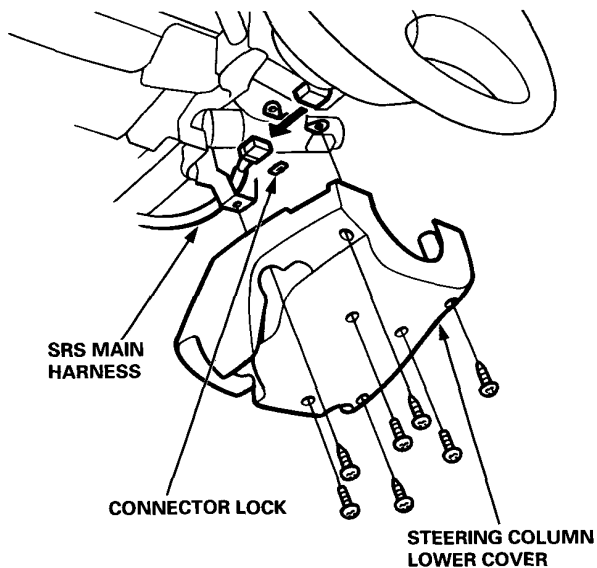


Steering-related Precautions

Steering Column Removal

CAUTION:

- Turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Be careful that the steering wheel receives no strong shocks.
- Before removing the steering column, first disconnect the connector between the slip ring and the SRS main harness.
- If the steering column is going to be removed without dismantling 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.

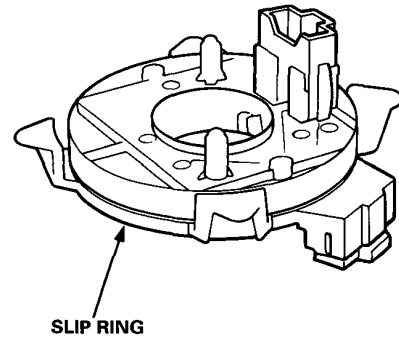


Do not replace the original steering wheel with any other design, since it will make it impossible to properly install the airbag (only use genuine Honda replacement parts).

Slip Ring

CAUTION:

- Do not grease the slip ring.
- Do not disassemble the slip ring. It has no serviceable parts and has to be replaced as a whole.
- Replace the slip ring every 10 years.
- The slip ring is a special part of models equipped with SRS. When replacing, be sure to use only a genuine Honda spare part.



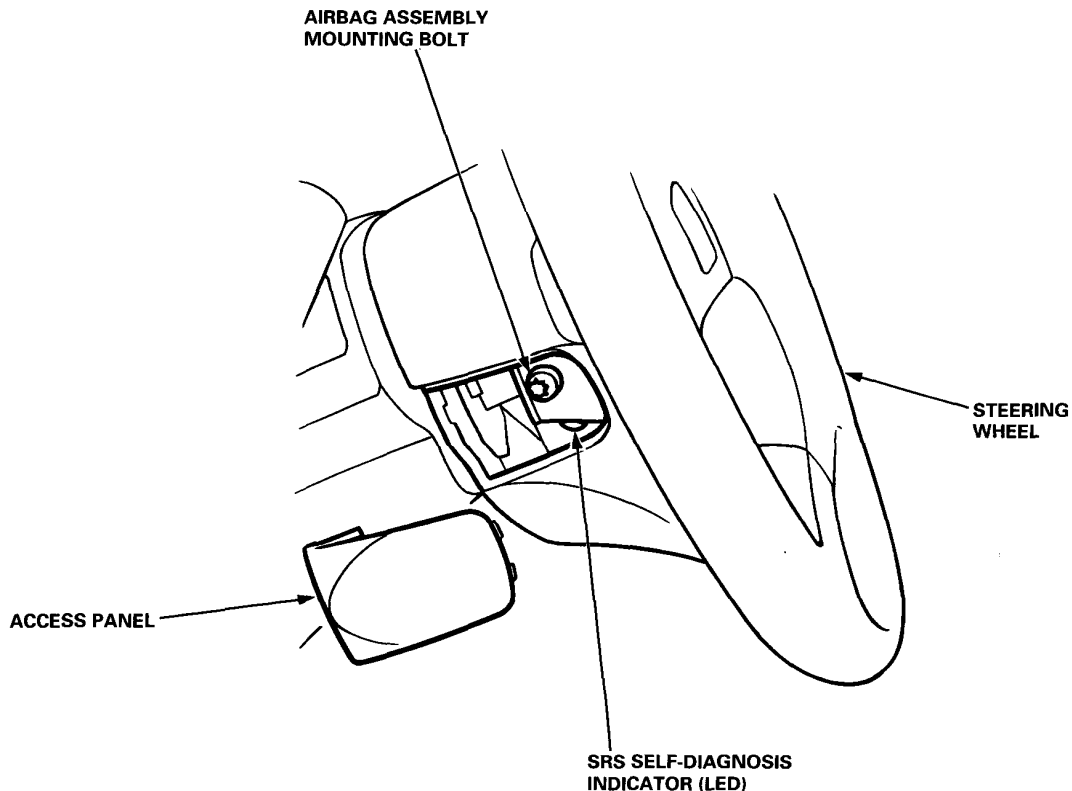
Supplemental Restraint System (SRS)-Type II

Troubleshooting

Self-diagnosis System

When the ignition switch is turned ON, the SRS indicator light comes on and goes off after about six seconds, and the self-diagnosis indicator (LED) blinks one time, if the system is operating normally. If there is an abnormality in the SRS, the SRS indicator light will stay on while the LED in the SRS unit will indicate the system problem by blinking a failure code (see the table on next page).

- If the SRS indicator light does not come on, or does not go off after 6 seconds, or if it comes on while driving, the system must be inspected and repaired as soon as possible.
- To see the indicated failure code, remove the access panel at the left side of the steering wheel.
- If there is a failure in the system, the LED will first blink one time (OK signal), then it will indicate the failure code.
- If simultaneous system problems occur, the LED will indicate only the problem with the higher priority. The problem with the highest priority is that on top of the failure code table, the problem with the lowest priority is that at the bottom of the table (see page 23-311).





Failure Code Table

Self-diagnosis indicator (LED) blinks	SRS indicator light	Cause
1	Doesn't come on (with the ignition switch turn ON)	<ul style="list-style-type: none">● Blown No.8 (10 A) fuse.● Blown SRS indicator light bulb.● Poor ground.
0	Doesn't go off	<ul style="list-style-type: none">● Blown No.3 (10 A) fuse.● Faulty SRS unit.● Poor ground.
1		<ul style="list-style-type: none">● Short (or open) in SRS indicator wire harness.
Stay on continuously		<ul style="list-style-type: none">● Faulty SRS self-diagnosis circuit.
2		<ul style="list-style-type: none">● Faulty safety switch.
3		<ul style="list-style-type: none">● Faulty back-up power circuit.
4		<ul style="list-style-type: none">● Faulty safety switch.
5		<ul style="list-style-type: none">● Open in airbag inflator.
6		<ul style="list-style-type: none">● Open in main sensor● Short in safing sensor.
7		<ul style="list-style-type: none">● Short in main sensor.● Open in safing sensor.

(cont'd)

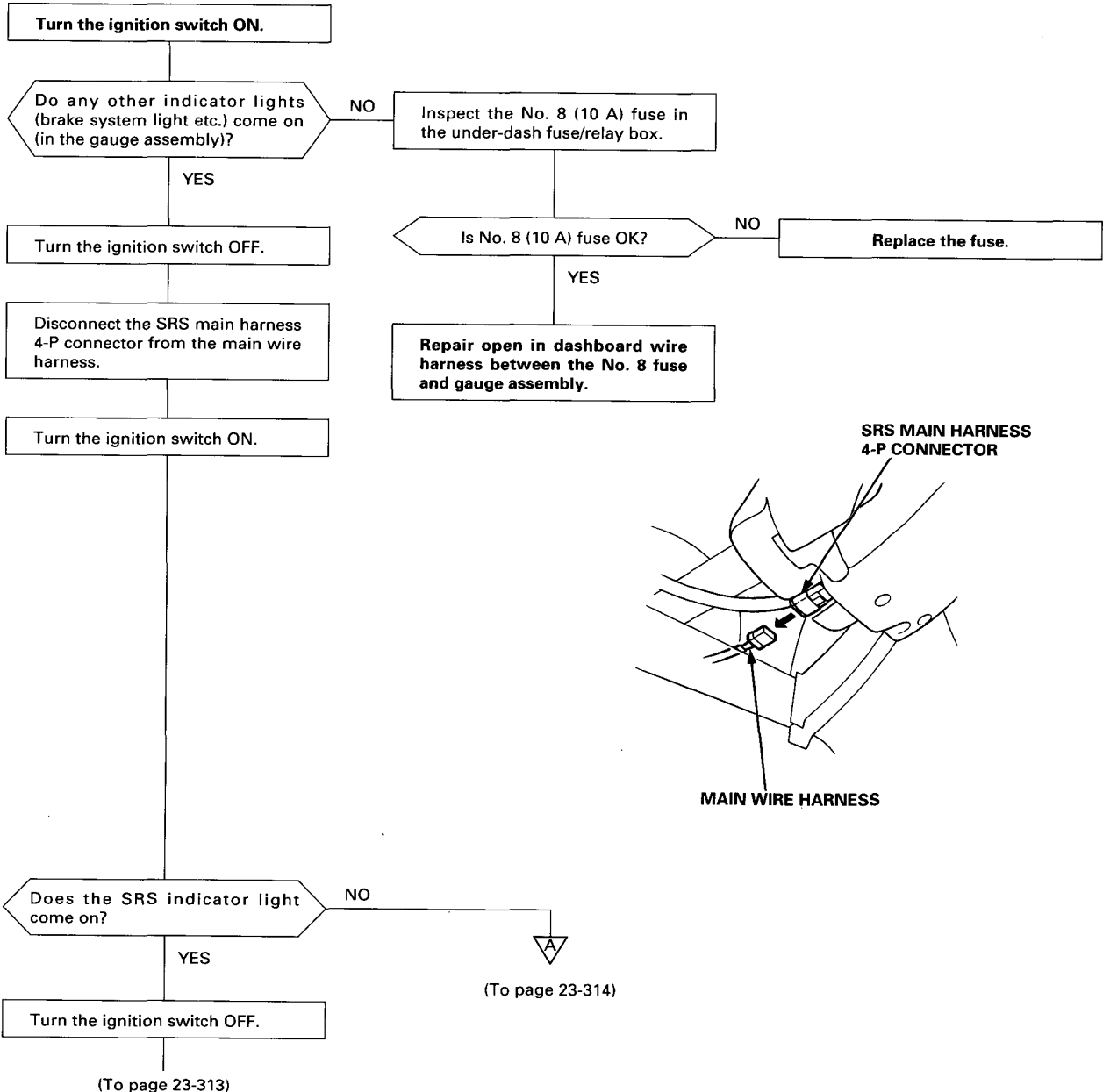
Supplemental Restraint System (SRS)-Type II

Troubleshooting (cont'd)

The SRS Indicator Does Not Light

- The SRS indicator light will not come on until six seconds after the ignition switch has been turned on.
- The LED of the SRS unit should blink one time.

CAUTION: Use only a digital circuit tester to check the system.



(From page 23-312)

Reconnect the SRS main harness 4-P connector to the main wire harness.

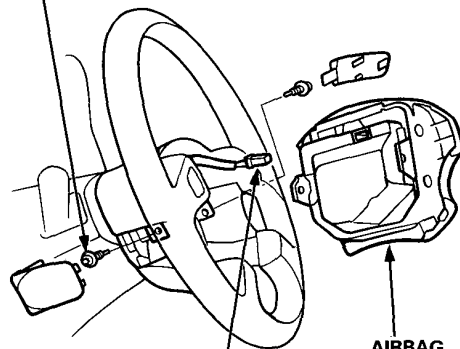
Disconnect the negative and positive battery cables, and wait three minutes.

Remove the airbag assembly from the steering wheel (see page 23-322).

CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting special bolt first (the safety switch will automatically turn off). Use a new special bolts for reinstalling the airbag.

Disconnect the SRS unit sub harness 5-P connector from the SRS unit (in the airbag assembly).

SPECIAL BOLT
(LEFT SIDE)



AIRBAG
ASSEMBLY

SRS UNIT SUB
HARNES
5-P CONNECTOR

Reconnect the positive and negative battery cables, then turn the ignition switch ON.

Does the SRS indicator light come on?

NO

Short in the BLU wire of the SRS unit sub harness, SRS main harness or the slip ring. Replace faulty component.

YES

SRS unit is faulty. Replace the airbag assembly.

(cont'd)

Supplemental Restraint System (SRS)-Type II

Troubleshooting (cont'd)

(From page 23-312)



Turn the ignition switch OFF.

Remove the gauge assembly, then inspect the SRS indicator light bulb.

Is the SRS indicator light bulb OK?

NO

Replace the indicator light bulb.

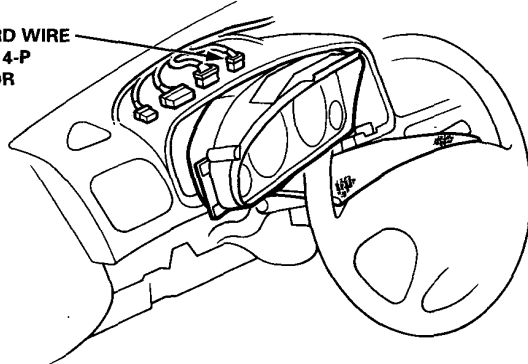
YES

Connect a voltmeter between the No. 11 terminal of the 14-P connector and body ground.

Turn the ignition switch ON.

Measure the voltage between the No. 11 terminal and body ground.

DASHBOARD WIRE HARNESS 14-P CONNECTOR



DASHBOARD WIRE HARNESS 14-P CONNECTOR



View from terminal side.

BLU



Less than 8.5V?



Is there less than 8.5 V with ignition switch ON?

NO

Short in BLU wire of the dashboard wire harness. Replace the dashboard wire harness.

YES

Turn the ignition switch OFF.

(To page 23-315)



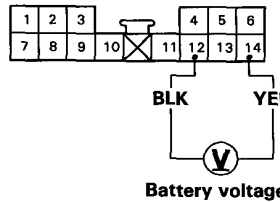
(From page 23-314)

Connect the voltmeter between the No. 14 terminal (+) and the No. 12 terminal (-) of the dashboard wire harness 14-P connector.

Turn the ignition switch ON.

Measure the voltage between the No. 14 terminal and the No. 12 terminal.

**DASHBOARD WIRE HARNESS
14-P CONNECTOR**



Is there battery voltage?

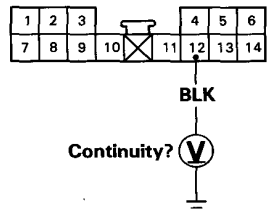
NO

Check for continuity between the No. 12 terminal and body ground.

YES

The SRS indicator circuit in the gauge assembly is faulty.

**DASHBOARD WIRE HARNESS
14-P CONNECTOR**



Does continuity exist?

NO

Repair open in the BLK wire (No. 12 terminal) between the gauge assembly and body ground or look for a poor ground (G401, G402).

YES

Repair open in the YEL wire (No. 14 terminal) of the dashboard wire harness between the gauge assembly and the No. 8 fuse.

(cont'd)

Supplemental Restraint System (SRS)-Type II

Troubleshooting (cont'd)

The SRS Indicator Light Stays on Continuously

- The LED of the SRS unit does not light.

Turn the ignition switch OFF, then inspect No. 3 (10 A) fuse in the under-dash fuse/relay box.

Is No. 3 (10 A) fuse OK?

NO

Replace the fuse.

YES

Disconnect the negative and positive battery cables, and wait three minutes.

Remove the airbag assembly from the steering wheel (see page 23-322).

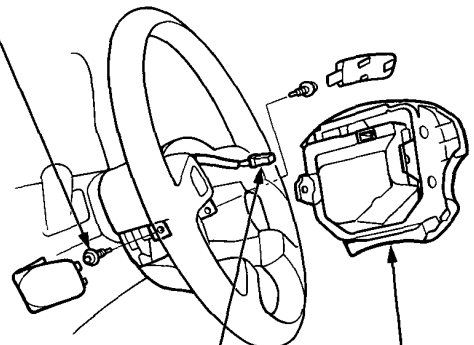
Disconnect the SRS unit sub harness 5-P connector from the SRS unit (In the airbag assembly).

Reconnect the positive and negative battery cables, then turn the ignition switch ON.

(To page 23-317)

CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting special bolt first (the safety switch will automatically turn off). Use a new special bolts for reinstalling the airbag.

SPECIAL BOLT
(LEFT SIDE)



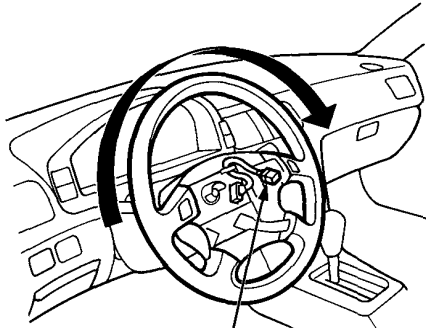
SRS UNIT SUB
HARNESS
5-P CONNECTOR

AIRBAG
ASSEMBLY

(From page 23-316)

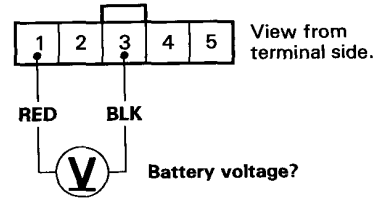
NOTE: Rotate the steering wheel slowly to check that there is good contact to the slip ring.

Measure the voltage between the No. 1 terminal and the No. 3 terminal of the SRS unit sub harness 5-P connector.



SRS UNIT SUB HARNESS 5-P CONNECTOR

SRS UNIT SUB HARNESS 5-P CONNECTOR

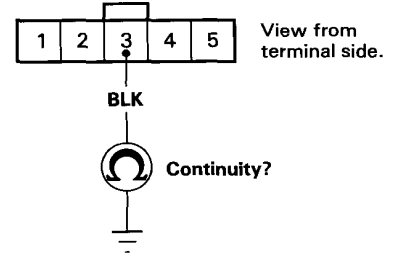


Is there battery voltage? YES **SRS unit is faulty. Replace the airbag assembly.**

NO

Check for continuity between the No. 3 terminal and body ground.

SRS UNIT SUB HARNESS 5-P CONNECTOR



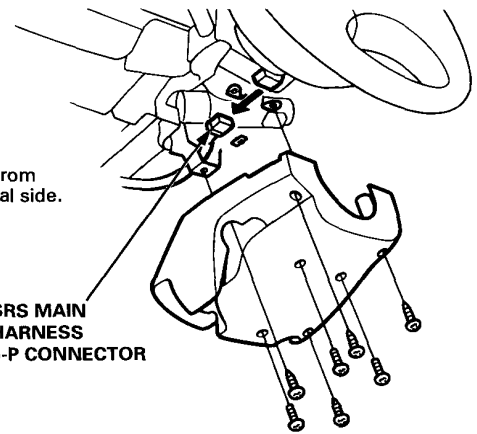
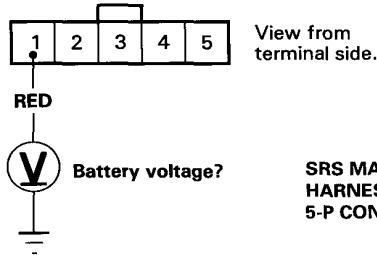
Is there continuity? NO **Open in the BLK wire (No. 3 terminal) of the SRS unit sub harness between the SRS unit and body ground or look for a poor ground (G801).**

YES

Disconnect the SRS main harness 5-P connector from the slip ring.

Measure the voltage between the No. 1 terminal of the SRS main harness 5-P connector and body ground.

SRS MAIN HARNESS 5-P CONNECTOR



Is there battery voltage? NO **Open in the RED wire of the SRS unit sub harness or the slipping. Replace the faulty component.**

YES

Open in the RED wire of the SRS main harness between the under-dash fuse/relay box and the slip ring. Replace the harness.

(cont'd)

Supplemental Restraint System (SRS)-Type II

Troubleshooting (cont'd)

The SRS Indicator Light Stays on Continuously.

- The LED of the SRS unit blinks one time.

Turn the ignition switch OFF, then disconnect the SRS main harness 4-P connector from the main wire harness.

Measure the voltage between the No.1 terminal of the SRS main harness 4-P connector and body ground.

Is there more than 8.5V until six seconds after the ignition switch has been turned on.

NO

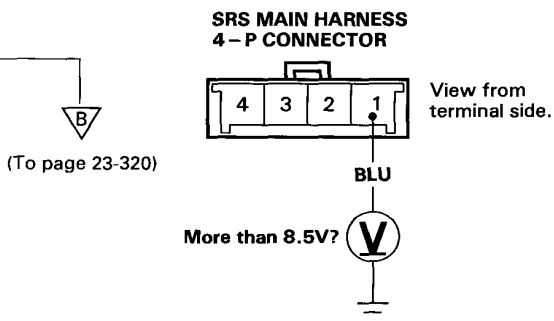
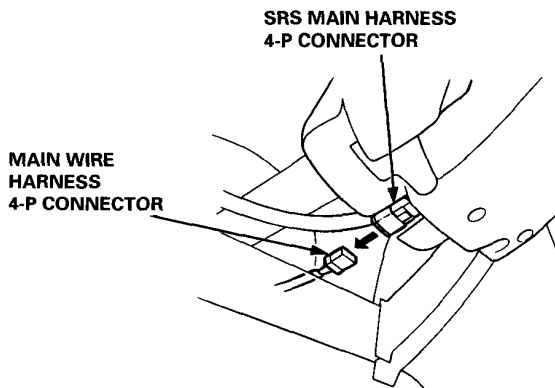
Turn the ignition switch OFF.

Disconnect the negative and positive battery cables, and wait three minutes.

Remove the airbag assembly from the steering wheel (see page 23-322).

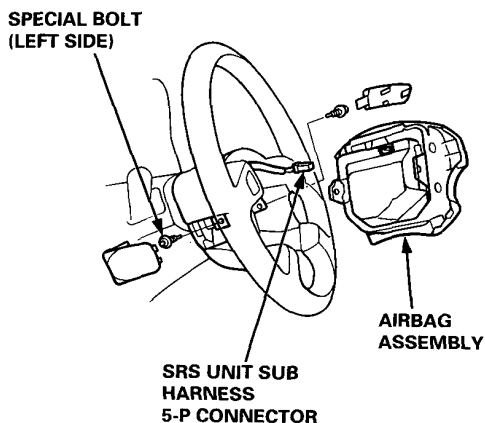
Disconnect the SRS unit sub harness 5-P connector from the SRS unit (In the airbag assembly).

(To page 23-319)



(To page 23-320)

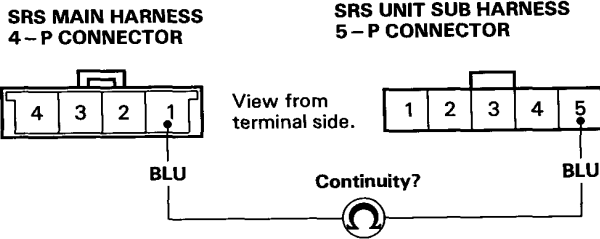
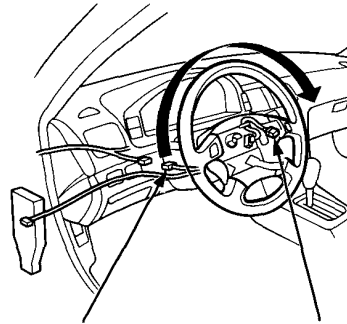
CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting special bolt first (the safety switch will automatically turn off). Use a new special bolts for reinstalling the airbag.



(From page 23-318)

NOTE: Rotate the steering wheel slowly to check that there is good contact to the slip ring.

Check for continuity between the No.1 terminal of the SRS main harness 4-P connector and No.5 terminal of the SRS unit sub harness 5-P connector.



Is there continuity?

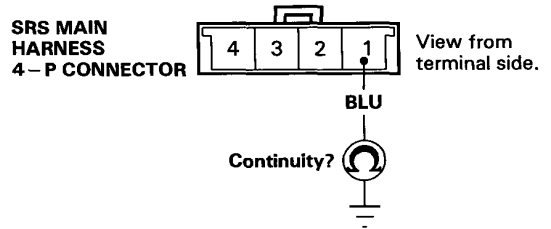
NO

Open in the BLU wire of the SRS main harness, SRS unit sub harness or the slip ring. Replace the faulty component.

YES

Check for continuity between the No.1 terminal of the SRS main harness 4-P connector and body ground.

NOTE: Rotate the steering wheel slowly to check that there is good contact to the slip ring.



Is there continuity?

YES

Short in the BLU wire of the SRS main harness, SRS unit sub harness or the slip ring. Replace the faulty component.

NO

SRS unit is faulty. Replace the airbag assembly.

(cont'd)

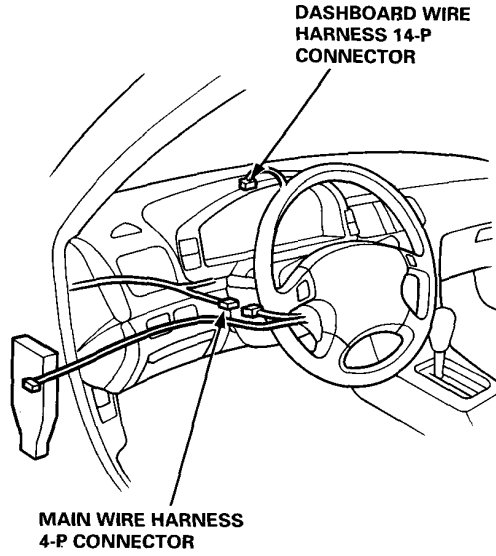
Supplemental Restraint System (SRS)-Type II

Troubleshooting (cont'd)

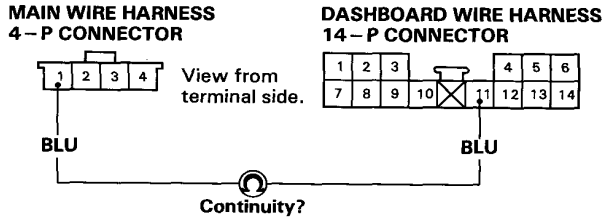
(From page 23-318)

B

Turn the ignition switch OFF, then remove the gauge assembly.



Check for continuity between the No.1 terminal of the main wire harness and the No.11 terminal of the dashboard wire harness.



Is there continuity?

NO

Open in the BLU wire of the dash-board wire harness or the main wire harness. Replace the faulty component.

YES

The SRS indicator circuit in the gauge assembly is faulty. Replace it.



The SRS Indicator Light Stays on Continuously.

- The LED of the SRS unit doesn't go off or blinks 2, 3, 4, 5, 6 or 7 times.

Replace the airbag assembly.

Supplemental Restraint System (SRS)-Type II

Airbag Assembly 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.

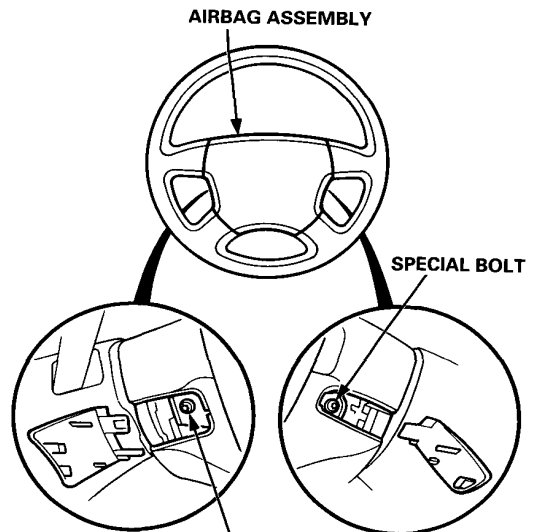
CAUTION:

- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- 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.
- Do not disassemble or tamper with the airbag assembly.
- Special bolts are necessary for installing the airbag assembly. Do not use other bolts.
- Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting special bolt first (the safety switch will automatically turn off).

1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.

2. Remove the airbag assembly.

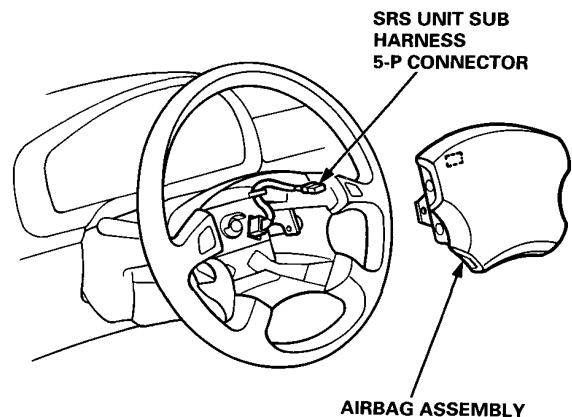
- Remove the special bolts using a TORX® T30 bit, then remove the airbag assembly.



(Remove the left side special bolt first.)

- Pull out the connector lock, then disconnect the SRS unit sub harness 5-P connector from the SRS unit, then remove the airbag assembly from the steering wheel.

NOTE: Dispose of the connector lock, it is not to be reused (see page 23-308).

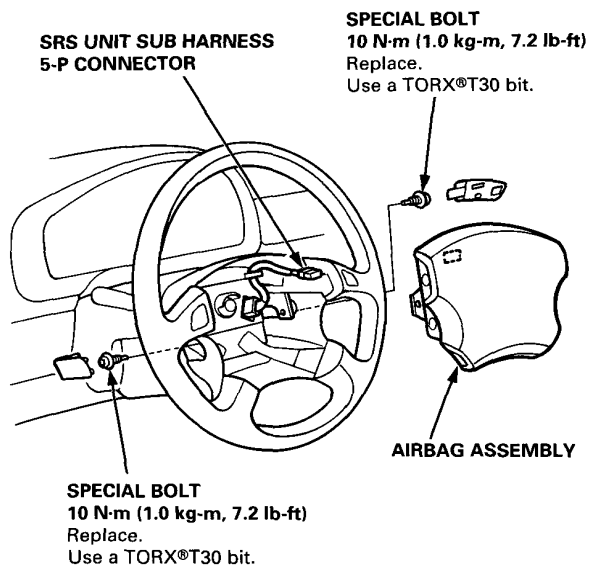




CAUTION: Be sure to install the SRS wiring so that it is not pinched or interfering with other car parts.

3. Install the new airbag assembly.
 - Reconnect the SRS unit sub harness 5-P connector to the SRS unit.
 - Place the airbag assembly in the steering wheel, and secure it with new special bolts.

NOTE: Be sure to torque the bolts as specified.



4. Reconnect the battery positive and negative cables.
5. After installing the airbag assembly, confirm proper system operation:
 - Turn the ignition ON (II): The instrument panel SRS indicator light should go on for about six seconds and then go off.
 - The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.

Supplemental Restraint System (SRS)-Type II

Airbag Assembly Disposal

Before scrapping any airbag (including one in a whole car to be scrapped) the airbag must be deployed. If the car is still within the warranty period, before deploying the airbag, the Honda District Service Manager must give approval and/or special instruction.

Only after an airbag is already deployed (as the result of vehicle collision, for example), can the normal scrapping procedure be done.

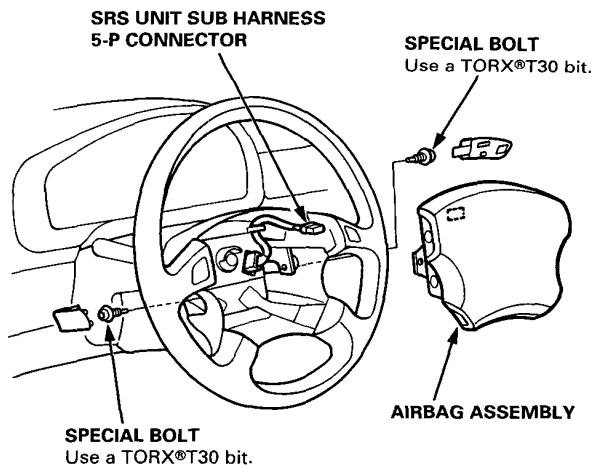
If the airbag appears, intact (not deployed), it should be treated with extreme caution.

Follow the procedure, described below.

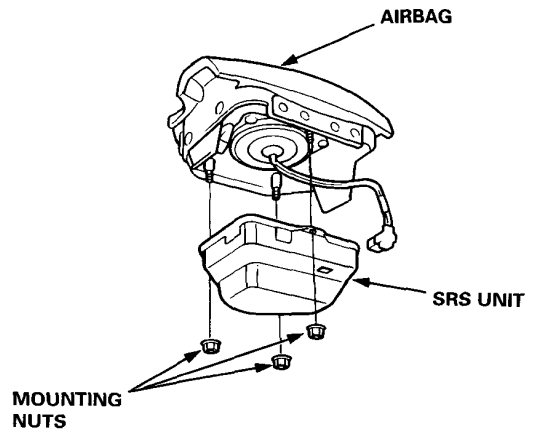
1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
2. Remove the special bolts using a TORX® T30 bit, then remove the airbag assembly (see page 23-322).

CAUTION: Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting special bolt fist (the safety switch will automatically turn off).

3. Disconnect the SRS unit sub harness 5-P connector from the SRS unit, then remove the airbag assembly from the steering wheel.



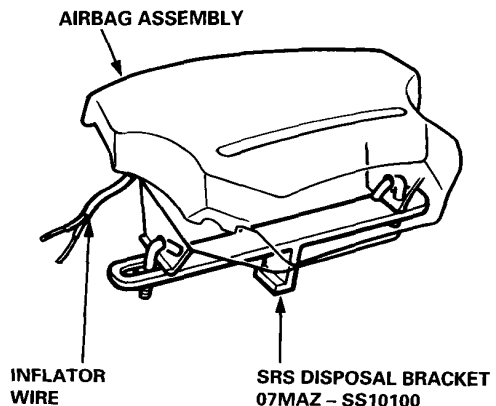
4. Remove the three SRS unit mounting nuts from the airbag assembly, then remove the SRS unit.



5. Install the SRS Disposal Bracket on the airbag assembly, and clamp it firmly into a vice.

WARNING Confirm that the airbag assembly is securely clamped or mounted; otherwise, severe personal injury could be caused by the deployment.

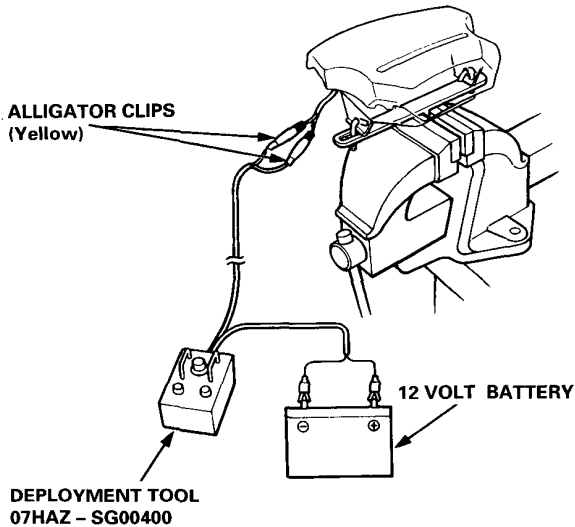
NOTE: Instead of using the SRS Disposal Bracket, the airbag assembly may be reinstalled to the steering wheel.



6. Cut off the airbag connector, then strip the wire ends.

7. Confirm that the Deployment Tool is functioning properly (see check procedure on this page).
8. Connect the alligator clips to the inflator wire ends.

▲ WARNING The distance between deployment tool and airbag assembly has to be at least 10 meters (30 ft).



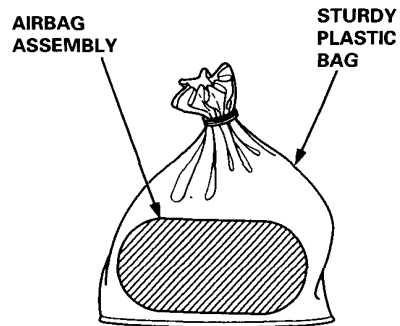
9. Connect a 12 volt battery to the tool:
 - If the green light on the tool goes on, the airbag igniter circuit is defective and cannot deploy the airbag. Go to Damaged Airbag Special Procedure.
 - If the red light on the tool goes on, the airbag is ready to be deployed.
10. Push the tool's deployment 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 audible / visible deployment happens and the green light on the tool goes on, continue with this procedure.
 - If the airbag doesn't deploy, yet the green light goes on, it's 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.

11. 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.



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 car, follow the removal procedure on page 23-322.
2. Package the airbag in exactly the same packaging that the new replacement part come in.
3. Make the outside of the box "DAMAGED AIRBAG NOT DEPLOYED" so it does not get confused with your parts stock.
4. Contact your Honda District 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 tool is OK; red means tool is faulty.
3. Disconnect the battery and the yellow clips.

Supplemental Restraint System (SRS)-Type II

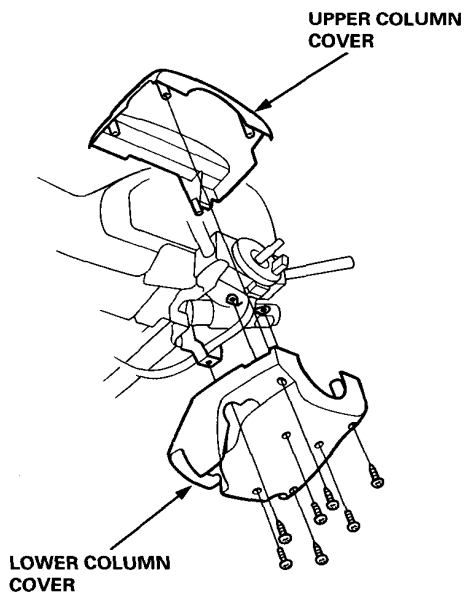
Slip Ring Removal

⚠ 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:

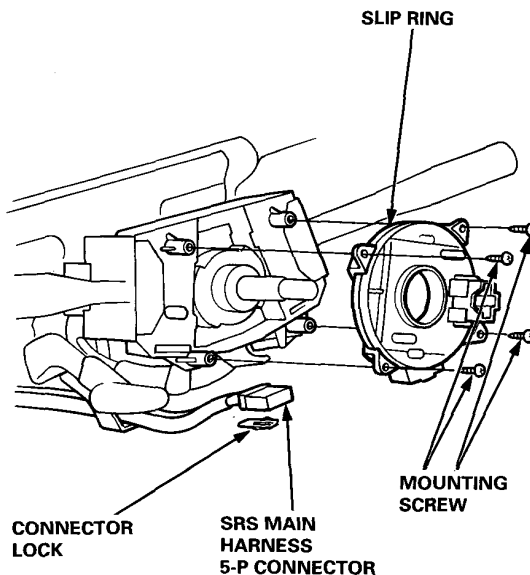
- Before beginning work related to the SRS system, turn the ignition switch off, disconnect the negative and positive battery cables, and wait three minutes.
- Do not install used SRS parts from another car. When repairing an SRS, use only new parts.
- Do not disassemble the slip ring. It has no serviceable parts and has to be replaced as a whole.
- Replace the slip ring every 10 years.
- The slip ring is a special part of models equipped with SRS. When replacing, be sure to use only a genuine Honda spare part.
- Make sure the wheels are aligned straight ahead. Remove the left airbag assembly mounting special bolt first (the safety switch will automatically turn off).

1. Turn the ignition switch off, then disconnect the negative and positive battery cables, and wait three minutes.
2. Remove the airbag assembly (see page 23-322).
3. Remove the steering wheel, then remove the upper and lower steering column covers.



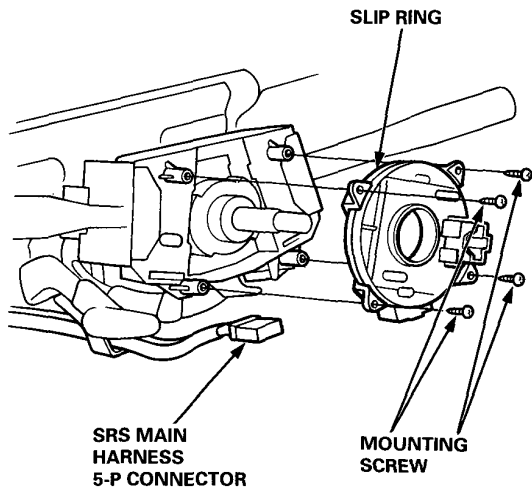
4. Pull out the connector lock, then disconnect the SRS main harness 5-P connector from the slip ring.

NOTE: Dispose of the connector lock, it is not to be reused.

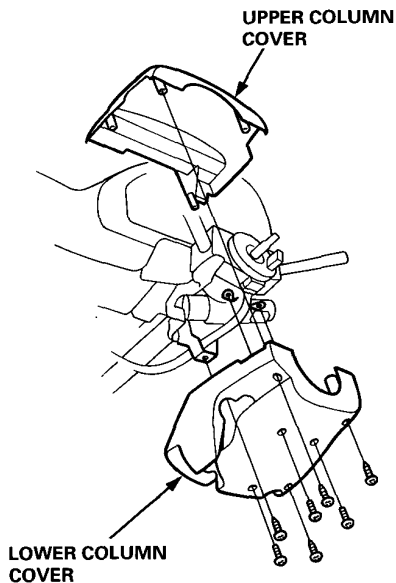


5. Remove the four mounting screws, then remove the slip ring.

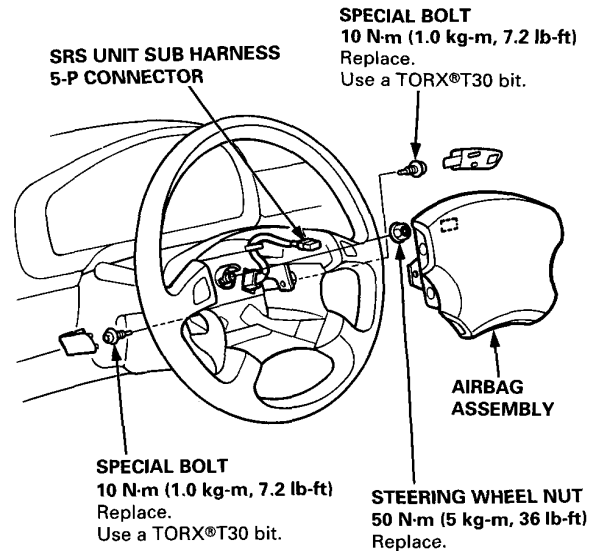
6. Install the slip ring on the steering column, then connect the SRS main harness 5-P connector to the slip ring.



7. Install the steering column upper and lower covers.



8. Install the steering wheel.



9. Connect the SRS unit sub harness 5-P connector to the SRS unit.

10. Place the airbag assembly into the steering wheel, and secure it with new special bolts.

NOTE: Be sure to torque the bolts as specified.

11. Reconnect the battery positive and negative cables.

12. After installing the slip ring, confirm proper system operation:

- Turn the ignition ON (II); the instrument panel SRS indicator light should go on for about six seconds and then go off.
- The SRS self diagnosis indicator (LED) should blink one time with the ignition switch ON.

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