

# HONDA CIVIC 1999 SERVICE MANUAL



**SEDAN 1999**  
**D16Y7**

# INTRODUCTION

## How to Use This Manual

This manual contains information for the 1996 – 2000 CIVIC. It is divided into 24 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 and the back cover. 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.

### NOTICE

The purpose of these messages is to help prevent damage to the vehicle, other property, or the environment.

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, might be done, or of the possible hazardous consequences of every conceivable way, nor could HONDA investigate all such ways. Anyone using service procedures or tools, whether or not recommended by HONDA, *must satisfy himself thoroughly* that neither personal safety nor vehicle safety will be jeopardized.

All information contained in this manual is based on the latest product information available at the time of printing. We reserve the right to make changes at any time without notice. No part of this publication may be reproduced, stored in retrieval system, or transmitted, in any form by any means, electronic, mechanical, photocopying, recording, or otherwise, without the prior written permission of the publisher. This includes text, figures and tables.

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Service Publication Office

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

General Info



Special Tools



Specifications

specs

Maintenance



Engine



Cooling



Fuel and Emissions



\*Transaxle



\*Steering



Suspension



\*Brakes  
(Including ABS)



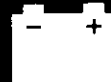
\*Body



\*Heater and  
Air Conditioning



\*Electrical



\*SRS



## General Information

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# U.S. 1999 Model (4-door Sedan)

**Vehicle Identification Number** JHM EJ6 5 2 \* X S 000001

**Manufacturer, Make and Type of Vehicle**

1HG: HONDA OF AMERICA MFG., INC.  
HONDA Passenger vehicle

2HG: HONDA OF CANADA MFG., INC.  
HONDA Passenger vehicle

JHM: HONDA MOTOR CO., LTD.  
HONDA Passenger vehicle

**Line, Body and Engine Type**

EJ6: CIVIC 4-door/D16Y7  
EJ8: CIVIC 4-door/D16Y8

**Body Type and Transmission Type**

5: Sedan/5-speed Manual  
6: Sedan/4-speed Automatic

**Vehicle Grade**

1: DX-V  
2: DX  
4: EX  
7: LX

**Check Digit**

**Model Year**

X: 1999

**Factory Code**

L: East Liberty, Ohio Plant, U.S.A.  
H: Alliston Plant, Ontario, Canada  
S: Suzuka Plant, Mie Prefecture, Japan

**Serial Number**

000001: JAPAN, U.S.A.  
500001: CANADA

**Engine Number** D16Y7 - 4500001

**Engine Type**

D16Y7: 1600 SOHC 16-valves Sequential Multiport Fuel-injected Engine  
D16Y8: 1600 SOHC VTEC 16-valves Sequential Multiport Fuel-injected Engine

**Serial Number**

U.S.A : D16Y7, D16Y8 - 4500001~

**Transmission Number** B4RA - 8000001

**Transmission Type**

B4RA : 4-speed Automatic Transmission  
S40 : 5-speed Manual Transmission

**Serial Number**

B4RA (U.S.A.) : 8000001~  
M4RA (JAPAN): 4000001~  
S40 (JAPAN) : 1000001~

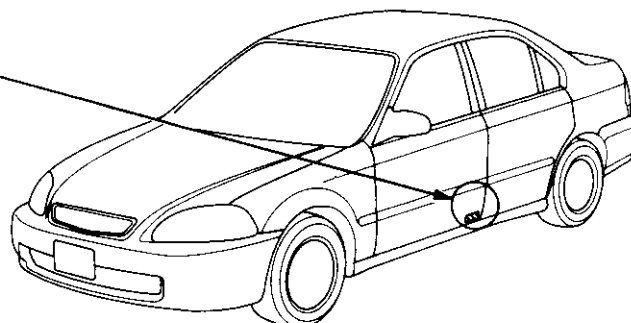
**Paint Code**

Paint Code	Color
BG-41P	Iced Teal Pearl
G-95P	Clover Green Pearl
NH-578	Taffeta White
NH-592P	Flamenco Black Pearl
NH-583M	New Vogue Silver Metallic
R-96P	Inza Red Pearl

**Paint Code**

**COLOR**  
**NH-578**

**Vehicle Identification Number and Federal Motor Vehicle Safety Standard Certification**





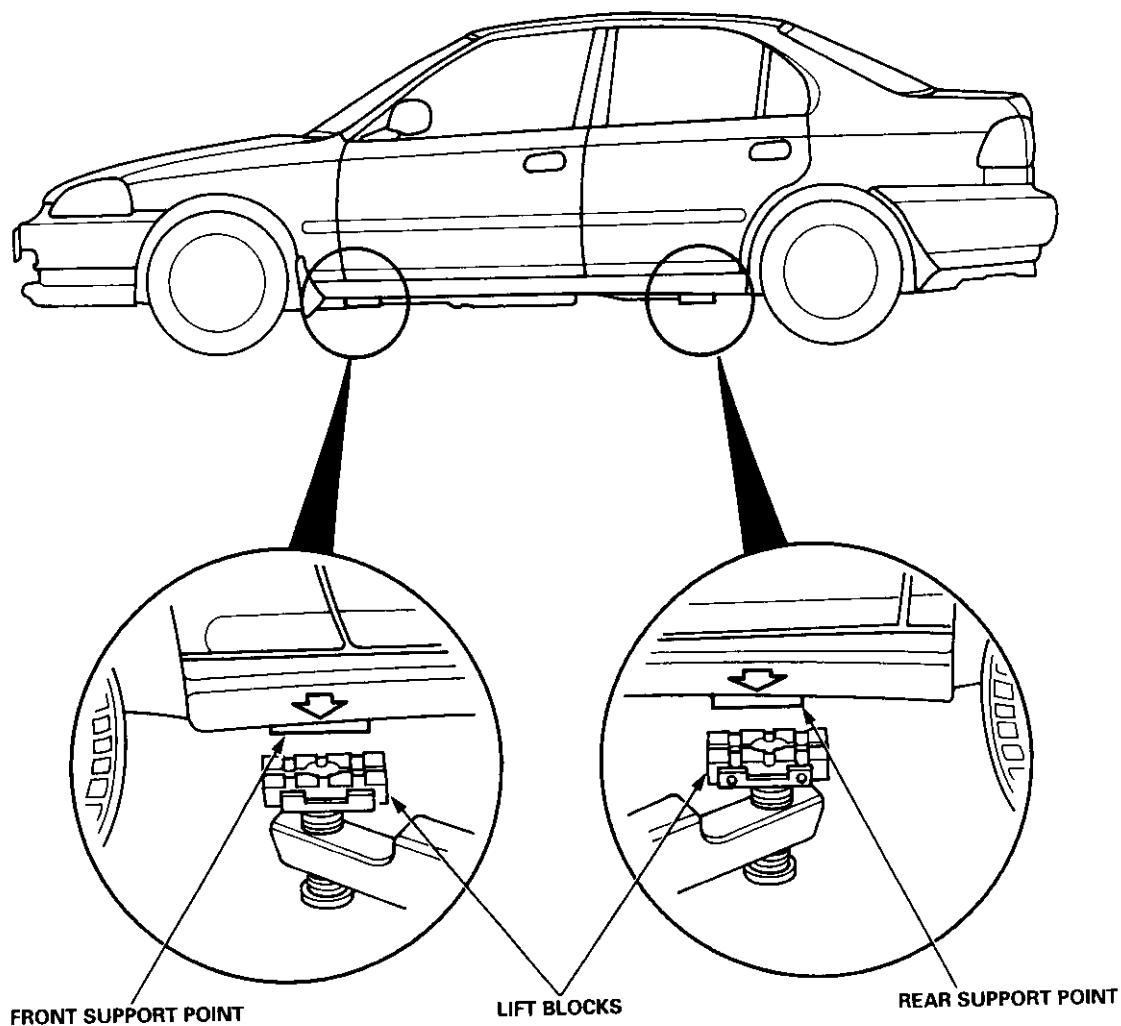
## Lift and Safety Stands

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

### NOTE:

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

1. Place the lift blocks as shown.
2. Raise the hoist a few inches (centimeters) and rock the vehicle to be sure it is firmly supported.
3. Raise the hoist to full height, and inspect lift points for solid support.



# Lift and Support Points

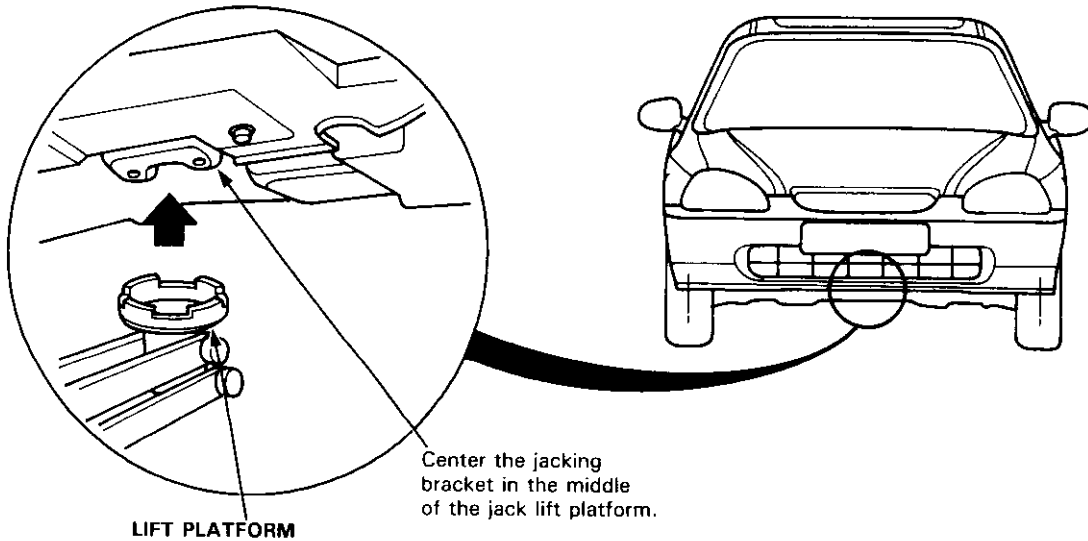
## Floor Jack

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

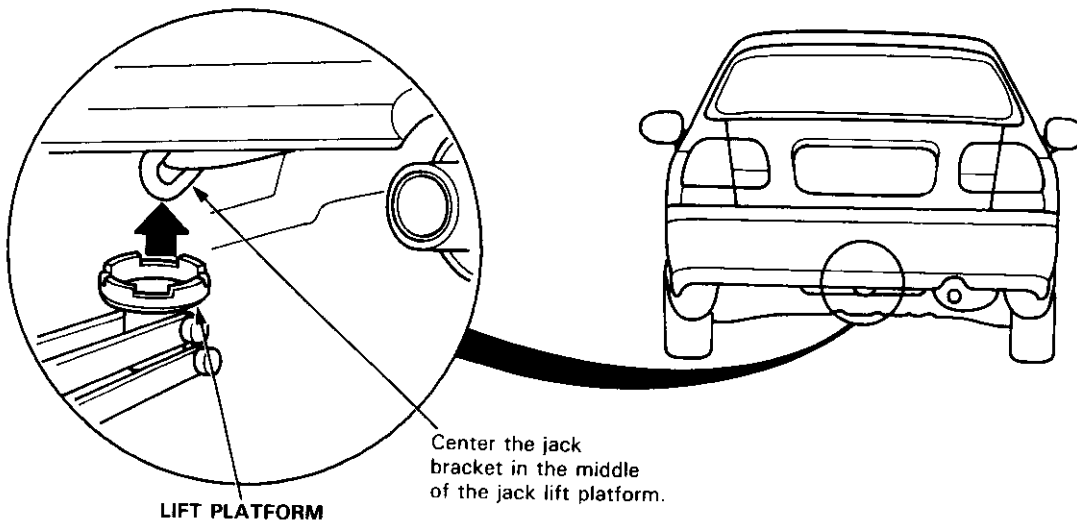
**▲ WARNING**

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

### FRONT:



### REAR:





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

## Emergency Towing

There are three popular methods of towing a vehicle:

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

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

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

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

### Manual Transmission and CVT

- Release the parking brake.
- Shift the transmission to neutral (CVT to **N** position).

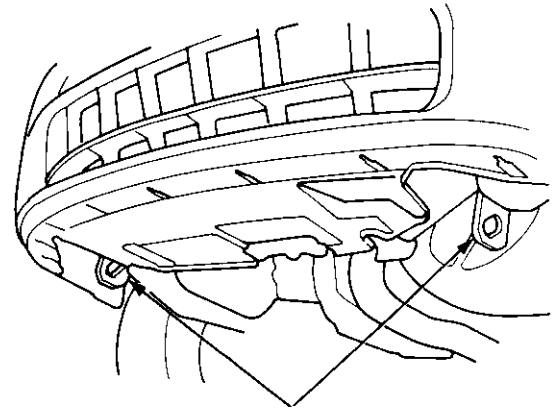
### Automatic Transmission

- Release the parking brake.
- Start the engine.
- Shift to **D<sub>2</sub>** position, then **N** position.
- Turn off the engine.

### CAUTION:

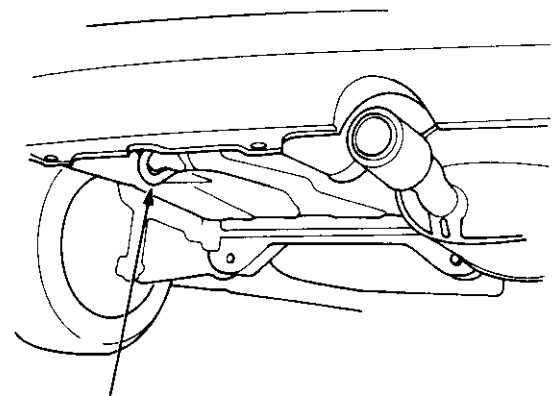
- Improper towing preparation will damage the transmission. Follow the above procedure exactly. If you cannot shift the transmission or start the engine (automatic transmission), your vehicle must be transported on a flat-bed.
- It is best to tow the vehicle no farther than 50 miles (80 km), and keep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

Front:



TIE DOWN HOOKS

Rear:



TOWING HOOK

## **Specifications**

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**Engine Block (B16A2 engine) — Section 7**

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Cylinder block	Warpage of deck surface	0.05 (0.002)	0.08 (0.03)	
	Bore diameter	81.00 – 81.02 (3.189 – 3.190)	81.07 (3.192)	
	Bore taper	—	0.05 (0.002)	
	Reboring limit	—	0.25 (0.01)	
Piston	Skirt O.D. At 15 mm (0.6 in) from bottom of skirt	80.980 – 80.990 (3.1882 – 3.1886)	80.970 (3.1878)	
	Clearance in cylinder	0.010 – 0.040 (0.0004 – 0.0016)	0.05 (0.002)	
	Groove width (for ring)	Top	1.030 – 1.040 (0.0406 – 0.0409)	1.060 (0.0417)
		Second	1.230 – 1.240 (0.0484 – 0.0488)	1.260 (0.0496)
Piston ring	Ring-to-groove clearance	Top	0.045 – 0.070 (0.0018 – 0.0028)	0.13 (0.005)
		Second	0.040 – 0.065 (0.0016 – 0.0026)*1	0.13 (0.005)
	Ring end gap	Top	0.045 – 0.070 (0.0018 – 0.0028)*2	0.13 (0.005)
			0.20 – 0.35 (0.008 – 0.014)*1	0.60 (0.024)
		Second	0.20 – 0.30 (0.008 – 0.012)*2	0.60 (0.024)
			0.40 – 0.55 (0.016 – 0.022)	0.70 (0.028)
	Oil	0.20 – 0.50 (0.008 – 0.020)*1	0.70 (0.028)	
		0.20 – 0.45 (0.008 – 0.018)*2	0.70 (0.028)	
Piston pin	O.D.	20.994 – 21.000 (0.8265 – 0.8268)	—	
	Pin-to-piston clearance	0.010 – 0.022 (0.0004 – 0.0009)	—	
Connecting rod	Nominal	Pin-to-rod interference	0.013 – 0.032 (0.0005 – 0.0013)	—
		Small end bore diameter	20.968 – 20.981 (0.8255 – 0.8260)	—
		Large end bore diameter	48.0 (1.89)	—
		End play installed on crankshaft	0.15 – 0.30 (0.006 – 0.012)	0.40 (0.016)
Crankshaft	Main journal diameter	No. 1, 2, 4 and 5 journals	54.976 – 55.000 (2.1644 – 2.1654)	—
		No. 3 journal	54.970 – 54.994 (2.1642 – 2.1651)	—
	Rod journal diameter	44.976 – 45.000 (1.7707 – 1.7717)	—	
	Taper	0.005 (0.0002) max.	0.010 (0.0004)	
	Out of round	0.004 (0.0002) max.	0.006 (0.0002)	
	End play	0.10 – 0.35 (0.004 – 0.014)	0.45 (0.018)	
	Total runout	0.020 (0.0008) max.	0.030 (0.0012)	
Bearing	Main bearing-to-journal oil clearance	No. 1, 2, 4 and 5 journals	0.024 – 0.042 (0.0009 – 0.0017)	0.06 (0.002)
		No. 3 journal	0.030 – 0.048 (0.0012 – 0.0019)	0.06 (0.002)
		Rod bearing-to-journal oil clearance	0.032 – 0.050 (0.0013 – 0.0020)	0.06 (0.002)

\*1: RIKEN manufactured piston ring.

\*2: TEIKOKU PISTON RING manufactured piston ring.

**Engine Lubrication (D16Y5, D16Y7, D16Y8 engines) — Section 8**

MEASUREMENT		STANDARD (NEW)	SERVICE LIMIT	
Engine oil	Capacity ℓ (US qt, Imp qt)	D16Y7	4.3 (4.5, 3.8) for engine overhaul 3.6 (3.8, 3.2) for oil change, including filter 3.3 (3.5, 2.9) for oil change, without filter	
		D16Y5, D16Y8	3.7 (3.9, 3.3) for engine overhaul 3.3 (3.5, 2.9) for oil change, including filter 3.0 (3.2, 2.6) for oil change, without filter	
Oil pump	Inner-to-outer rotor radial clearance	0.02 – 0.14 (0.001 – 0.006)	0.20 (0.008)	
	Pump housing-to-outer rotor radial clearance	0.10 – 0.18 (0.004 – 0.007)	0.20 (0.008)	
	Pump housing-to-rotor axial clearance	0.03 – 0.08 (0.001 – 0.003)	0.15 (0.006)	
Relief valve	Pressure setting with oil temperature 176°F (80°C) kPa (kgf/cm <sup>2</sup> , psi)	at idle	70 (0.7, 10) min.	
		at 3,000 rpm	340 (3.5, 50) min.	

(cont'd)

# Standards and Service Limits

## Cooling — Section 10

	MEASUREMENT	STANDARD (NEW)
Radiator	Coolant capacity ℓ (US qt, Imp qt) including engine, heater, cooling line and reservoir  Reservoir capacity: 0.4 ℓ (0.42 US qt, 0.35 Imp qt)	A/T: D16Y7 4.1 (4.3, 3.6) for overhaul 3.0 (3.2, 2.6) for coolant change
Radiator cap	Opening pressure kPa(kgf/cm <sup>2</sup> , psi)	93 – 123 (0.95 – 1.25, 14 – 18)
Thermostat	Start to open °F (°C) Fully open °F (°C) Valve lift at fully open	169 – 176 (76 – 80) 194 (90) 8.0 (0.31) min.
Cooling fan	Thermoswitch "ON" temperature °F (°C) Thermoswitch "OFF" temperature °F (°C)	196 – 203 (91 – 95) Subtract 5 – 15 (3 – 8) from actual "ON" temperature

Unit of length: mm (in)

**Fuel and Emission — Section 11**

MEASUREMENT		STANDARD (NEW)				
Fuel pressure regulator	Pressure with fuel pressure regulator vacuum hose disconnected kPa (kgf/cm <sup>2</sup> , psi)	D16Y5	260 – 310 (2.7 – 3.2, 38 – 46)			
		D16Y7	260 – 310 (2.7 – 3.2, 38 – 46)			
		D16Y8	260 – 310 (2.7 – 3.2, 38 – 46)			
		B16A2	270 – 320 (2.8 – 3.3, 40 – 47)			
Fuel tank	Capacity ℓ (US gal, Imp gal)	45 (11.9, 9.9)				
Engine	Idle speed rpm	M/T (neutral)		A/T or CVT ( <b>N</b> or <b>P</b> position)		
		U.S.A.	Canada	U.S.A.	Canada	
		D16Y5	670 ± 50	—	700 ± 50	—
		D16Y7	670 ± 50	750 ± 50	700 ± 50	750 ± 50
		D16Y8	670 ± 50	750 ± 50	700 ± 50	750 ± 50
		B16A2	700 ± 50	750 ± 50	—	—
	Idle CO %	0.1 max.				



**Steering — Section 17**

	MEASUREMENT	STANDARD (NEW)
Steering wheel	Play at steering wheel circumference Starting load at steering wheel circumference N (kgf, lbf) Manual steering Power steering	0 – 10 (0 – 0.4)  15 (1.5, 3.3) 29 (3.0, 6.6)
Gearbox	Angle of rack guide screw loosened M/S from locked position P/S Preload at pinion gear shaft N·m (kgf·cm, lbf·in) M/S P/S	20 ± 5° 20° Max 0.5 – 1.7 (5 – 17, 4.3 – 14.8) 0.6 – 1.2 (6 – 12, 5.20 – 10.42)
Pump	Pump pressure with valve closed (oil temp./speed: 40°C (105°F) min./idle. Do not run for more than 5 seconds). kPa (kgf/cm <sup>2</sup> , psi)	6,400 – 7,400 (65 – 75, 920 – 1,070)
Power steering fluid	Recommended power steering fluid Fluid capacity ℓ (US qt, Imp qt) Reservoir	HONDA Power Steering Fluid 0.85 (0.90, 0.75) at disassembly 0.4 (0.42, 0.35)
Power steering belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys '99 model: B16A2 Engine Type only '96 – '99 models: Other Engine Types  Tension measured with belt tension gauge N (kgf, lbf) '99 model: B16A2 Engine Type only '96 – '99 models: Other Engine Types '99 model: B16A2 Engine Type only '96 – '99 models: Other Engine Types	7.5 – 11.0 (0.30 – 0.43) with used belt 5.0 – 7.0 (0.20 – 0.28) with new belt 10.5 – 14.0 (0.41 – 0.55) with used belt 7.5 – 10.0 (0.30 – 0.39) with new belt  390 – 540 (40 – 55, 88 – 120) with used belt 340 – 490 (35 – 50, 77 – 110) with used belt 740 – 880 (75 – 90, 170 – 200) with new belt 640 – 780 (65 – 80, 143 – 176) with new belt

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

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



# Standards and Service Limits

## Suspension — Section 18

		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Wheel alignment	Camber	Front	0°00' ± 1°	_____	
		Rear	-1° ± 1°	_____	
	Caster	Front	1°40' ± 1°	_____	
		Total toe	Front Rear	In 1.0 ± 2.0 (1/16 ± 1/16) In 2.0 <sup>+2.0</sup> / <sub>-1.0</sub> (1/16 ± 1/16)	_____ _____
	Front wheel turning angle	Inward wheel	39°50'	_____	
Outward wheel		33°10' (Reference)	_____		
Wheel	Rim runout	Aluminum wheel	Axial Radial	0 - 0.7 (0 - 0.03) 0 - 0.7 (0 - 0.03)	2.0 (0.08) 1.5 (0.06)
		Steel wheel	Axial Radial	0 - 1.0 (0 - 0.04) 0 - 1.0 (0 - 0.04)	2.0 (0.08) 1.5 (0.06)
	Wheel bearing		End play	Front	0 - 0.05 (0 - 0.002)
		Rear		0 - 0.05 (0 - 0.002)	_____

## Brakes — Section 19

		MEASUREMENT	STANDARD (NEW)	SERVICE LIMIT	
Parking brake lever		Play in stroke at 196 N (20 kgf, 44 lbf) lever force	To be locked when pulled 6 - 9 notches	_____	
Foot brake pedal		Pedal height (with floor mat removed)	M/T A/T, CVT	156.5 (6.16) 161 (6 5/16)	_____ _____
		Free play		1 - 5 (1/16 - 3/16)	_____
Master cylinder		Piston-to-pushrod clearance	0 - 0.4 (0 - 0.02)	_____	
Disc brake	Disc thickness	Front	20.9 - 21.8 (0.82 - 0.86)	19.0 (0.75)	
		Rear	8.9 - 9.1 (0.350 - 0.358)	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	9.5 - 10.5*1 8.5 - 9.5*2	1.6 (0.06) 1.6 (0.06)		
	Rear	7.0 - 8.0 (0.28 - 0.31)	1.6 (0.06)		
Rear brake drum	I.D. Lining thickness		200 (7.87)	201 (7.91)	
			4.0 (0.16)	2.0 (0.08)	

\*1. 5410 Stamped on the caliper body.

\*2. 2056 Stamped on the caliper body.

## Air Conditioning — Section 22

		MEASUREMENT	STANDARD (NEW)
Air Conditioning system SANDEN	Lubricant type: SP-10 (P/N 38897 - P13 - A01AH or 38899 - P13 - A01) (For refrigerant: HFC-134a (R-134a))	Lubricant capacity	20 (2/3 0.7)
		mℓ (fl oz, lmp oz)	Evaporator 45 (1 2/3, 1.6)
			Line or hose 10 (1/3, 0.4)
			Receiver 10 (1/3, 0.4)
NIPPONDENSO	Lubricant type: ND-OIL8 (P/N 38899 - PR7 - 003) (For Refrigerant: HFC-134a (R-134a))	Lubricant capacity	25 (5/6 0.9)
		mℓ (fl oz, lmp oz)	Evaporator 60 (2, 2.1)
			Line or hose 10 (1/3, 0.4)
			Receiver 10 (1/3, 0.4)
Compressor SANDEN	Lubricant type: SP-10	Lubricant capacity	130 - 150 (4 1/3 - 4.6, 5.0 - 5.3)
		mℓ (fl oz, lmp oz)	Field coil resistance at 68°F (20°C) Ω 3.05 - 3.35
			Pulley-to-pressure plate clearance 0.5 ± 0.15 (0.020 ± 0.006)
NIPPONDENSO	Lubricant type: ND-OIL8 (P/N 38899 - PR7 - 003 or P/N 38899 - PR7 - A01) (For Refrigerant: HFC-134a (R-134a))	Lubricant capacity	140 (4.7, 4.9) - 155 (5.2, 5.4)
		mℓ (fl oz, lmp oz)	Stator coil resistance at 20°C (68°F) Ω 3.4 - 3.8
			Pulley-to-pressure plate clearance 0.5 ± 0.15 (0.02 ± 0.006)
Compressor belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys		7.5 - 9.5 (0.30 - 0.37) with used belt 5.0 - 6.5 (0.20 - 0.26) with new belt
		Belt tension	N (kgf, lbf) 340 - 490 (35 - 50, 77 - 110) with used belt 690 - 830 (70 - 85, 150 - 190) with new belt
	Measured with belt tension gauge		

\*: 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.

**Electrical — Section 23**

	MEASUREMENT	STANDARD (NEW)	
Ignition coil	Rated voltage V	12	
	Primary winding resistance at 68°F (20°C) Ω	HITACHI TEC	0.45 – 0.55 0.63 – 0.77
	Secondary winding resistance at 68°F (20°C) kΩ	HITACHI TEC	22.4 – 33.6 12.8 – 19.2
Ignition wire	Resistance at 68°F (20°C) kΩ	25 max.	
	Firing order	1 – 3 – 4 – 2	
Spark plug	Type	See section 23	
	Gap	1.1 $^{0}_{-0.1}$ (0.043 $^{0}_{-0.004}$ )	
Ignition timing	At idle ° BTDC (Red)	12 ± 2	
Alternator belt*	Deflection with 98 N (10 kgf, 22 lbf) between pulleys	8.0 – 10.5 (0.31 – 0.41) with used belt 6.0 – 8.5 (0.26 – 0.33) with new belt	
	Belt tension N (kgf, lbf) Measured with belt tension gauge	340 – 490 (35 – 50, 77 – 110) with used belt 540 – 740 (55 – 75, 121 – 165) with new belt	
Alternator (MITSUBISHI)	Output 13.5 V at hot A	75	
	Coil resistance (rotor) at 68°F (20°C) kΩ	3.4 – 3.8	
	Slip ring O.D.	22.7 (0.89)	
	Brush length	19.0 (0.75)	
	Brush spring tension g (oz)	340 – 420 (12.0 – 14.8)	
Alternator (DENSO)	Output 13.5 V at hot A	80	
	Coil resistance (rotor) at 68°F (20°C) kΩ	2.2 – 3.0	
	Slip ring O.D.	14.4 (0.57)	
	Brush length	10.5 (0.41)	
	Brush spring tension g (oz)	330 (11.6)	
Starter motor (MITSUBA 1.0 kW 1.2 kW)	Type	Gear reduction	
	Commutator mica depth	0.4 – 0.5 (0.016 – 0.020)	
	Commutator runout	0 – 0.02 (0 – 0.0008)	
	Commutator O.D.	28.0 – 28.1 (1.102 – 1.106)	
	Brush length	15.8 – 16.2 (0.62 – 0.64)	
	Brush spring tension (new) N (kgf, lbf)	15.7 – 17.7 (1.60 – 1.80, 3.5 – 4.0)	
		0.15 (0.006)	0.05 (0.002)
		27.5 (1.083)	11.0 (0.43)

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

# Design Specifications

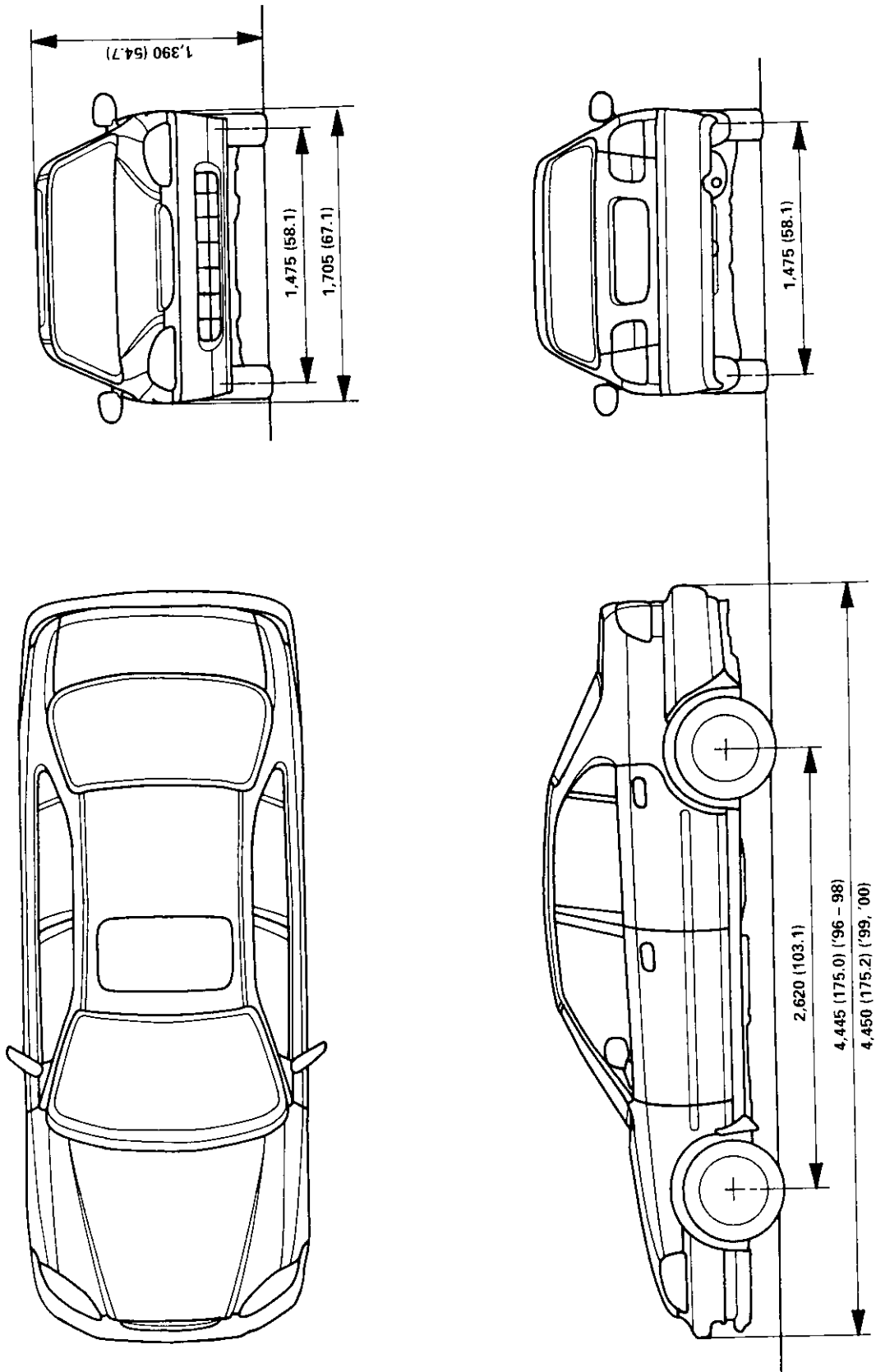
	ITEM	METRIC	ENGLISH	NOTE	
DIMENSIONS	Overall Length				
	2-door Coupe/4-door Sedan ('96 - '98)	4,445 mm	175.0 in		
		4,450 mm	175.2 in		
	2-door Hatchback ('96, '97)	4,170 mm	164.2 in		
		4,180 mm	164.6 in		
	Overall width	1,705 mm	67.1 in		
	Overall height	1,375 mm	54.1 in		
	2-door Coupe/2-door Hatchback	1,390 mm	54.7 in		
	4-door Sedan	2,620 mm	103.1 in		
	Wheelbase	1,475/1,475 mm	58.1/58.1 in		
Track					
Front/Rear					
Ground Clearance	150 mm	5.9 in			
Seating Capacity		Five			
WEIGHT (USA)	Gross Vehicle Weight Rating (GVWR)				
	2-door Coupe		3,290 lbs		
	HX M/T, DX M/T	—	3,320 lbs		
	HX CVT ('96)	—	3,330 lbs		
	HX CVT ('97, '98)	—	3,360 lbs		
	HX CVT ('99)	—	3,290 lbs		
	DX A/T ('96 - '98)	—	3,310 lbs		
	DX A/T ('99, '00)	—	3,440 lbs		
	EX	—	3,480 lbs		
	Si	—	3,285 lbs		
	2-door Hatchback		3,290 lbs		
	CX, DX ('96, '97)	—	3,290 lbs		
	CX, DX ('98)	—	3,290 lbs		
	CX ('99, '00)	—	3,290 lbs		
DX M/T ('99, '00)	—	3,330 lbs			
DX A/T ('99, '00)	—	3,330 lbs			
4-door Sedan		3,460 lbs			
DX, LX, DX-V	—				
EX	—				
WEIGHT (CANADA)	Gross Vehicle Weight Rating (GVWR)				
	2-door Coupe				
	DX ('96)	1,500 kg	—		
	DX ('97 - '00)	1,510 kg	—		
	DX-G	1,510 kg	—		
	Si ('96)	1,560 kg	—		
	Si ('97 - '00)	1,570 kg	—		
	SiR	1,590 kg	—		
	2-door Hatchback				
	CX, CX-G ('96)	1,495 kg	—		
	CX, CX-G ('97)	1,505 kg	—		
	CX-G ('98)	1,510 kg	—		
	CX ('98 - '00)	1,510 kg	—		
	DX M/T, SE M/T	1,510 kg	—		
DX A/T, SE A/T	1,530 kg	—			
4-door Sedan					
LX, LX-V	1,510 kg	—			
EX M/T	1,510 kg	—			
EX A/T	1,540 kg	—			
ENGINE	Type	Water-cooled, 4-stroke SOHC*1, SOHC VTEC*2, SOHC VTEC-E*3, DOHC VTEC*4 gasoline engine		*1: D16Y7 *2: D16Y8 *3: D16Y5 *4: B16A2	
	Cylinder Arrangement	Inline 4-cylinder, transverse			
	Bore and Stroke	D16Y5, D16Y7, D16Y8 B16A2	75.0 x 90.0 mm		2.95 x 3.54 in
	Displacement	D16Y5, D16Y7, D16Y8 B16A2	81.0 x 77.4 mm		3.19 x 3.05 in
	Compression Ratio	D16Y5, D16Y7	1,590 cm <sup>3</sup>		97.0 cu-in
		D16Y8	1,595 cm <sup>3</sup>		97.3 cu-in
		B16A2			
	Valve Train	Belt driven, 4 valve per cylinder			
	Lubrication System	Forced and wet sump, trochoid pump			
	Oil Pump Displacement at 6,800 engine rpm	D16Y5, D16Y7, D16Y8 B16A2	33.4 l (35.3 US qt, 29.4 Imp qt)/minute		
	Water Pump Displacement at 6,000 engine rpm	D16Y5, D16Y7, D16Y8 B16A2	43.8 l (46.3 US qt, 38.6 Imp qt)/minute		
	Fuel Required	D16Y5, D16Y7, D16Y8 B16A2	125 l (132 US qt, 110 Imp qt)/minute		
			140 l (148 US qt, 123 Imp qt)/minute		
		UNLEADED gasoline with 86 Pump Octane Number or higher			
		Premium UNLEADED gasoline 91 Pump Octane Number or higher			
STARTER	Type/Make	Gear reduction/MITSUBA			
	Normal Output	1.0 kW, 1.2 kW			
	Nominal Voltage	12 V			
	Hour Rating	30 seconds			
	Direction of Rotation	Clockwise as viewed from gear end			

	ITEM	METRIC	ENGLISH	NOTES			
STARTER (cont'd)	Weight MITSUBA 1.0, 1.2 kW	3.4 kg	7.5 lbf				
CLUTCH	Clutch Type	M/T A/T CVT	Single plate dry, diaphragm spring Torque converter				
	Clutch Facing Area	M/T	Multi plates wet snnp, hydraulic 160 cm <sup>2</sup>   25 sq-in				
TRANSMISSION	Transmission Type	M/T A/T CVT	Synchronized 5-speed forward, 1 reverse 4-speed automatic, 1 reverse Non-stage speed forward, 1 reverse Direct 1 : 1				
	Primary Reduction		Direct 1 : 1				
	Manual transmission		Engine type				
			D16Y5	D16Y7	D16Y8	B16A2	
	Gear Ratio	1st	3.250	3.250	3.250	3.230	*1: 2-door Hatch back *2: 2-door Coupe, and 4-door Sedan
		2nd	1.782	1.782	1.909	2.105	
		3rd	1.172	1.172	1.250	1.458	
		4th	0.909	0.909	0.909	1.107	
		5th	0.702	0.702	0.702	0.875	
		Reverse	3.153	3.153	3.153	3.000	
	Final Reduction	Gear ratio	3.722	3.722*/4.058*2	4.250	4.266	
		Gear type	Single helical gear				
	Automatic transmission		Engine type				
			D16Y7		D16Y8		
Gear Ratio	1st	2.600		2.722			
	2nd	1.468		1.516			
	3rd	0.926		0.975			
	4th	0.638		0.638			
	Reverse	1.954		1.954			
Final Reduction	Gear ratio	4.357		4.357			
	Gear type	Single helical gear					
CVT							
Gear Ratio	Low - O.D.	2.466 - 0.449					
	Reverse	2.466					
Secondary Reduction Gear Ratio		1.333					
Final Reduction Gear Ratio		4.357					
AIR CONDITIONING	Cooling Capacity	3,530 Kcal/h	14,000 BTU/h				
	Compressor	Type/Make No. of Cylinders Capacity Max. Speed Lubricant Capacity	Scroll/SANDEN			SP-10	
			85.7 ml/rev 10,000 rpm 130 ml	5.22 cu-in/rev 4 1/3 fl oz, 4.6 Imp oz			
	Compressor	Type/Manufacturer No. of Cylinder Capacity Max. Speed Lubricant Capacity	Swash-plate/DENSO				
			155.3 ml/rev 76,000 rpm 140 ml	10 9.4 cu-in/rev 4 2/3 fl oz, 4.9 Imp oz			
		Lubricant Type	ND-OIL8				
	Condenser	Type	Corrugated fin				
	Evaporator	Type	Corrugated fin				
	Blower	Type Motor Input Speed Control Max. Capacity	Sirocco fan 200 W/12 V 4-speed variable 460 m <sup>3</sup> /h   16,200 cu-ft/h				
	Temperature Control		Air-mix type				
Compressor Clutch	Type Power Consumption	Dry, single plate, poly-V-belt drive 40 W max./12 V at 68°F (20°C)					
Refrigerant	Type Quantity	HFC-134a (R-134a) 650 <sub>-50</sub> g   22.9 <sub>-1.8</sub> oz					

(cont'd)

4-door Sedan:

Unit: mm (in)





## **Maintenance**

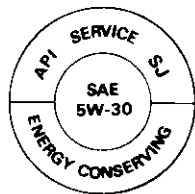
<b>Lubrication Points .....</b>	<b>4-2</b>
<b>Maintenance Schedule for 1996 Model</b>	
<b>Normal Conditions .....</b>	<b>4-4</b>
<b>Severe Conditions .....</b>	<b>4-6</b>
<b>Maintenance Schedule for 1997 Model</b>	
<b>Normal Conditions .....</b>	<b>4-8</b>
<b>Severe Conditions .....</b>	<b>4-10</b>
<b>Maintenance Schedule for 1998 Model</b>	
<b>Normal Conditions .....</b>	<b>4-12</b>
<b>Severe Conditions .....</b>	<b>4-14</b>
<b>Maintenance Schedule for 1999 Model</b>	
<b>Normal Conditions .....</b>	<b>4-16</b>
<b>Severe Conditions .....</b>	<b>4-18</b>
<b>Maintenance Schedule for 2000 Model</b>	
<b>Normal Conditions .....</b>	<b>4-20</b>
<b>Severe Conditions .....</b>	<b>4-22</b>

# Lubrication Points

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

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

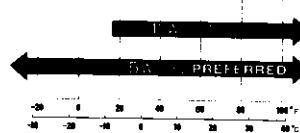
API SERVICE LABEL



API CERTIFICATION SEAL



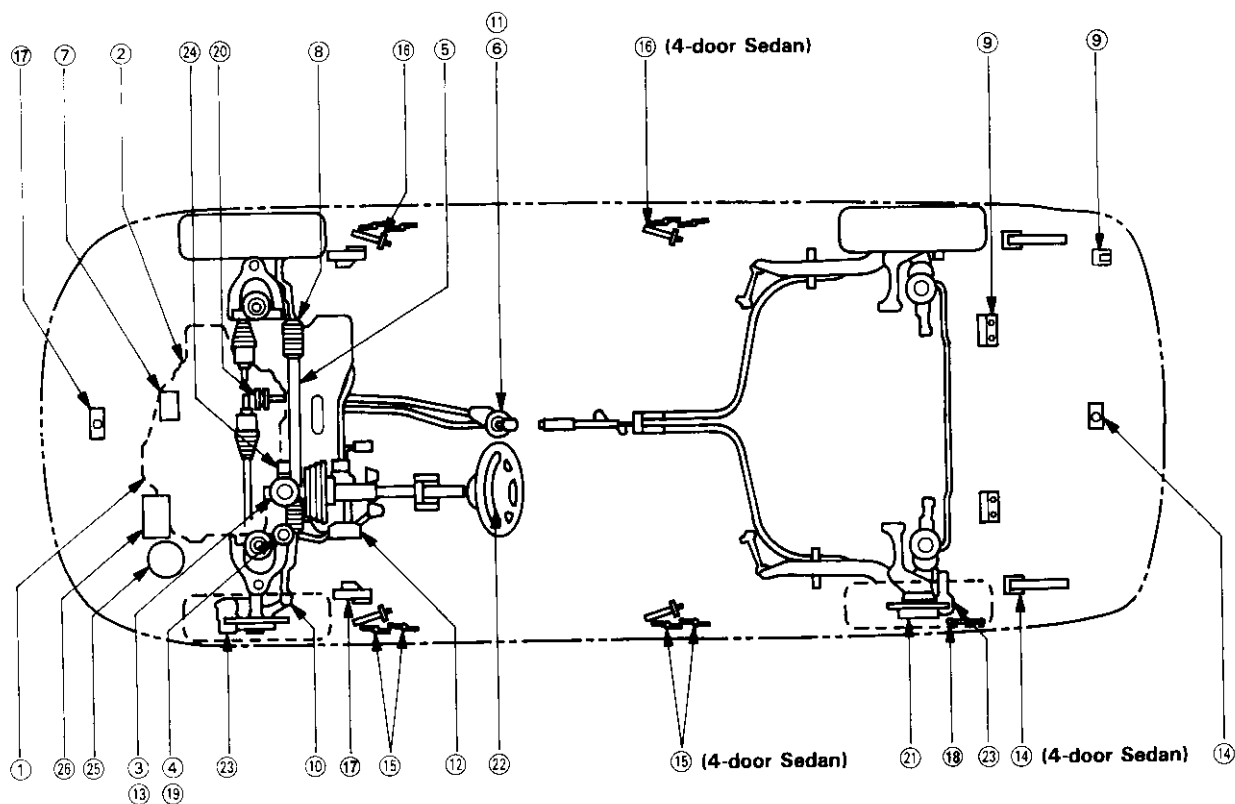
Recommended Engine Oil



Engine oil viscosity for ambient temperature ranges

NOTE: The items marked \*1, \*2, \*3, \*4 and \*5 on above chart are described as follows:

- \*1: Always use Genuine Honda Manual Transmission Fluid (MTF). Using motor oil can cause stiffer shifting because it does not contain the proper additives.
- \*2: Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.
- \*3: Use Genuine Honda CVT fluid only. Using other fluid can affect transmission operation and may reduce transmission life.
- \*4: Always use Genuine Honda DOT3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
- \*5: Always use Genuine Honda Power Steering Fluid. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.



NOTE: Lubricate all hinges, latches and locks once a year.  
 In corrosive areas, more frequent lubrication is necessary.  
 We recommend Honda White Lithium Grease.



# Maintenance Schedule for 1999 Model

## Normal Conditions

Follow the Normal Conditions Maintenance Schedule for 1999 Model if the severe driving conditions specified in the Severe Conditions Maintenance Schedule for 1999 Model on pages 4-18 and 4-19 do not apply.

Service at the indicated distance or time whichever comes first.	miles x 1,000		km x 1,000		months		15	30	45	60	75	90	105	120	SECTION and PAGE	
	12	24	36	48	60	72	84	96								
Replace engine oil	Every 7,500 miles (12,000 km) or 12 months															8-6
Replace engine oil filter	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Check engine oil and coolant	Check oil and coolant at each fuel stop															
Replace air cleaner element	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Inspect valve clearance	At 30,000 miles (48,000 km) only															6-12
Replace spark plugs	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Replace timing belt and inspect water pump	B16A2 engine															23-111
Inspect and adjust drive belts	•	•	•	•	•	•	•	•	•	•	•	•	•	•		
Inspect idle speed	U.S. Model: B16A2 engine 700 ± 50 rpm (M/T: neutral) Except B16A2 engine 670 ± 50 rpm (M/T: neutral) 700 ± 50 rpm (A/T or CVT: [N] or [P] position) Canada Model: 750 ± 50 rpm (M/T: neutral) 750 ± 50 rpm (A/T or CVT: [N] or [P] position)															11-220 to 11-223
Replace engine coolant	Capacity for change: M/T: Except B16A2 engine: 3.8 ℓ (4.0 US qt, 3.3 Imp qt) B16A2 engine: 4.5 ℓ (4.8 US qt, 4.0 Imp qt) A/T: D16Y7 engine: 3.7 ℓ (3.9 US qt, 3.3 Imp qt) D16Y8 engine: 3.9 ℓ (4.1 US qt, 3.4 Imp qt) CVT: 3.9 ℓ (4.1 US qt, 3.4 Imp qt) Check specific gravity for freezing point.															
Replace transmission fluid	Manual transmission: Genuine Honda MTF 1.8 ℓ (1.9 US qt, 1.6 Imp qt)*2 2.2 ℓ (2.3 US qt, 1.9 Imp qt)*3 for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 Imp qt) for change with Genuine Honda Premium Formula ATF CVT: 3.9 ℓ (4.1 US qt, 3.4 Imp qt) for change with Genuine Honda CVT Fluid															
Inspect front and rear brakes	• Check the brake pad and disc thickness and free movement. • Check the wheel cylinder for leaks. • Check the brake linings for cracking, glazing, wear, or contamination. • Check the calipers for leakage.															13-3 14-118 14-299
	*1: 2 door coupe *2: S40 Transmission *3: S4C Transmission															



Service at the indicated distance or time whichever comes first.	miles x 1,000		15	30	45	60	75	90	105	120	SECTION and PAGE	
	km x 1,000		24	48	72	96	120	144	168	192		
Replace brake fluid (Including ABS)			12	24	36	48	60	72	84	96	19-7	
Check parking brake adjustment			●	●	●	●	●	●	●	●	19-6	
Rotate tires (Check tire inflation and condition at least once per month)			Rotate tires every 7,500 miles (12,000 km)									
<b>Visually inspect the following items:</b>												
Tie-rod ends, steering gear box, and boots											Check steering linkage for looseness. Check condition of boots. Check for fluid leaks.	17-31
Suspension components											Check the bolts for tightness. Check the condition of ball joint boots.	18-8, 9, 21, 22
Driveshaft boots											Check condition of boots.	16-3
Brake hoses and lines (including ABS)											Check for damage or leakage.	19-39
All fluid levels and condition of fluids			●	●	●	●	●	●	●	●	Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.	10-6, 13-3, 14-117, 299 19-7
Cooling system hoses and connections											Check all hoses for damage, leaks, and deterioration. Check for proper fan operation.	10-2
Exhaust system*											Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness.	9-6 to 9-12
Fuel lines and connections*											Check for leaks. Retighten loose connections and replace any damaged parts.	11-224

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

**For 1999 Canada model:** Follow the Severe Conditions Maintenance Schedule for 1999 Model on page 4-18 and 4-19.

# Maintenance Schedule for 1999 Model

## Severe Conditions

Follow the Severe Conditions Maintenance Schedule for 1999 Model if the vehicle is driven MAINLY under one or more of the Severe Driving Conditions (page 4-19):

Service at the indicated distance or time whichever comes first.	miles x 1,000		30		45		60		75		90		105		120		SECTION and PAGE
	24	48	72	96	120	144	168	192	24	36	48	60	72	84	96		
Replace engine oil and oil filter	Every 3,750 miles (6,000 km) or 6 months																8-6, 8
Check engine oil and coolant	Check oil and coolant at each fuel stop																
Replace air cleaner element Use normal schedule except in dusty conditions	●																8-6, 10-6
Inspect valve clearance	At 30,000 miles (48,000 km) only																
Replace spark plugs	D16Y5, D16Y7, D16Y8 engines	●														23-111	
	B16A2 engine	●															
Replace timing belt** and inspect water pump	●																23-111
Inspect and adjust drive belts	●																
Inspect idle speed	●																17-32 22-43 23-125
	U.S. Model: B16A2 engine 700 ± 50 rpm (M/T: neutral) Except B16A2 engine 670 ± 50 rpm (M/T: neutral) 700 ± 50 rpm (A/T or CVT: [N] or [P] position) Canada Model: 750 ± 50 rpm (M/T: neutral) 750 ± 50 rpm (A/T or CVT: [N] or [P] position)																
Replace engine coolant	●																10-7
	Capacity for change: M/T: Except B16A2 engine: 3.8 ℓ (4.0 US qt, 3.3 imp qt) B16A2 engine: 4.5 ℓ (4.8 US qt, 4.0 imp qt) A/T: D16Y7 engine: 3.7 ℓ (3.9 US qt, 3.3 imp qt) D16Y8 engine: 3.9 ℓ (4.1 US qt, 3.4 imp qt) CVT: 3.9 ℓ (4.1 US qt, 3.4 imp qt) Check specific gravity for freezing point.																
Replace transmission fluid	MT	●														13-3 14-118 14-299	
	AT	●															
Inspect front and rear brakes	CVT**	●														19-4, 8, 10, 12, 16, 18, 24, 26, 31, 35, 36, 39	
	Manual transmission: Genuine Honda MTF 1.8 ℓ (1.9 US qt, 1.6 imp qt)** 2.2 ℓ (2.3 US qt, 1.9 imp qt)** for change Automatic transmission: 2.7 ℓ (2.9 US qt, 2.4 imp qt) for change with Genuine Honda Premium Formula ATF CVT: 3.9 ℓ (4.1 US qt, 3.4 imp qt) for change with Genuine Honda CVT Fluid																
<ul style="list-style-type: none"> <li>● Check the brake pad and disc thickness and free movement.</li> <li>● Check the wheel cylinder for leaks.</li> <li>● Check the brake linings for cracking, glazing, wear, or contamination.</li> <li>● Check the callipers for leak.</li> </ul>																	

\*1: Replace the timing belt at 60,000 miles (USA) 100,000 km (Canada) if the vehicle regularly is driven in one or more of these conditions:  
● In very high temperatures (over 110°F, 43°C).  
● In very low temperatures (under -20°F, -29°C).

\*2: If the customer drives at high speed in high temperatures [90°F (32°C) above], the transmission fluid should be changed every 15,000 miles (24,000 km).  
2 door coupe \*3: S40 Transmission \*4: S4C Transmission



Service at the indicated distance or time whichever comes first.	miles x 1,000		15		30		45		60		75		90		105		120		SECTION and PAGE
	km x 1,000	months	24	48	72	96	120	144	168	196	24	48	72	96	120	144	168	196	
Replace brake fluid																			19-7
Check parking brake adjustment			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	19-6
Lubricate all hinges, locks, and latches			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	4-2, 3
Clean antenna mast			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	23-193
Rotate tires (Check tire inflation and condition at least once per month)			Rotate tires every 7,500 miles (12,000 km)															—	
<b>Visually inspect the following items:</b>																			
Tie-rod ends, steering gear box, and boots			Every 7,500 miles (12,000 km) or 6 months															17-31	
Suspension components																		18-8, 9, 21, 22	
Driveshaft boots																		16-3	
Brake hoses and lines (including ABS)																		19-39	
All fluid levels and condition of fluids																		10-6, 13-3, 14-117, 299 19-7	
Cooling system hoses and connections			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	10-2
Exhaust system*			●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	9-6 to 9-12
Fuel lines and connections*																		11-224	
Lights and controls																		23-168	
Vehicle underbody																		—	

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

**Severe Driving Conditions:**

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

NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule for 1999 Model on pages 4-16 and 4-17.

# Maintenance Schedule for 1999 Model

## Severe Conditions

Follow the Severe Conditions Maintenance Schedule for 2000 Model if the vehicle is driven MAINLY under one or more of the Severe Driving Conditions (page 4-23):

Service at the indicated distance or time whichever comes first.	miles x 1,000		30		45		60		75		90		105		120		SECTION and PAGE
	15	24	12	24	36	48	60	72	84	96	108	120	132	144	156	168	
Replace engine oil and oil filter	Every 3,750 miles (6,000 km) or 6 months																8-6, 8
Check engine oil and coolant	Check oil and coolant at each fuel stop																8-6, 10-6
Replace air cleaner element Use normal schedule except in dusty conditions	●																11-244
Inspect valve clearance	At 30,000 miles (48,000 km) only																6-12
Replace spark plugs	D16Y5, D16Y7, D16Y8 engines	●															23-111
	B16A2 engine	●															23-111
Replace timing belt*1 and inspect water pump	●																6-19, 62, 10-14
Inspect and adjust drive belts	●																17-32 22-43 23-125
	Check for cracks and damage. Check deflection and tension at center of following belts pressing with 98 N (10 kgf, 22 lbf) tension: Alternator drive belt: 8.0 – 10.5 mm (0.31 – 0.41 in) P/S pump belt: B16A2 engine: 7.5 – 11.0 mm (0.30 – 0.43 in) Except B16A2 engine: 10.5 – 14.0 mm (0.41 – 0.55 in) A/C compressor belt: B16A2 engine: 6.0 – 9.5 mm (0.24 – 0.37 in) Except B16A2 engine: 7.5 – 9.5 mm (0.30 – 0.37 in)																
Inspect idle speed	●																11-220 to 11-223
	U.S. Model: B16A2 engine 700 ± 50 rpm (M/T: neutral) Except B16A2 engine 670 ± 50 rpm (M/T: neutral) 700 ± 50 rpm (A/T or CVT: [N] or [P] position) Canada Model: 750 ± 50 rpm (M/T: neutral) 750 ± 50 rpm (A/T: [N] or [P] position)																
Replace engine coolant	●																10-7
	Capacity for change: M/T: Except B16A2 engine: 3.8 ℓ (4.0 US qt, 3.3 imp qt) B16A2 engine: 4.5 ℓ (4.8 US qt, 4.0 imp qt) A/T: D16Y7 engine: 3.7 ℓ (3.9 US qt, 3.3 imp qt) D16Y8 engine: 3.9 ℓ (4.1 US qt, 3.4 imp qt) CVT: 3.9 ℓ (4.1 US qt, 3.4 imp qt) Check specific gravity for freezing point.																
Replace transmission fluid	MT	●															13-3 14-118 14-299
	AT	●															
	CVT**2	●															

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

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

\*2: If the customer drives at high speed in high temperatures [90°F (32°C) above], the transmission fluid should be changed every 15,000 miles (24,000 km).  
2 door coupe \*3: S4C Transmission \*4: S4C Transmission



Service at the indicated distance or time whichever comes first.	miles x 1,000		km x 1,000		months		15	30	45	60	75	90	105	120	NOTE	SECTION and PAGE
	15	30	45	60	75	90	105	120	144	168	196					
Inspect front and rear brakes	Every 7,500 miles (12,000 km) or 6 months														<ul style="list-style-type: none"> <li>• Check the brake pad and disc thickness and free movement.</li> <li>• Check the wheel cylinder for leaks.</li> <li>• Check the brake linings for cracking, glazing, wear, or contamination.</li> <li>• Check the callipers for leakage.</li> </ul>	19-4, 8, 10, 12, 16, 18, 24, 26, 31, 35, 36, 39
Replace brake fluid			●							●					Use Genuine Honda DOT3 brake fluid. Check that brake fluid level is between the upper and lower marks on the reservoir.	19-7
Check parking brake adjustment	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Fully engaged 6 to 9 clicks.	19-6
Lubricate all hinges, locks, and latches	●	●	●	●	●	●	●	●	●	●	●	●	●	●	Lubricate all hinges, latches and locks.	4-2, 3
Clean antenna mast	●	●	●	●	●	●	●	●	●	●	●	●	●	●		23-193
Rotate tires (Check tire inflation and condition at least once per month)	Rotate tires every 7,500 miles (12,000 km)														The suggested rotation method is shown in the diagram in the Owner's Manual.	—
<b>Visually inspect the following items:</b>																
Tie-rod ends, steering gear box, and boots	Every 7,500 miles (12,000 km) or 6 months														<ul style="list-style-type: none"> <li>• Check steering linkage for looseness.</li> <li>• Check condition of boots.</li> <li>• Check for fluid leaks.</li> </ul>	17-31
Suspension components															<ul style="list-style-type: none"> <li>• Check the bolts for tightness.</li> <li>• Check the condition of ball joint boots.</li> </ul>	18-8, 9, 21, 22
Driveshaft boots															• Check condition of boots.	16-3
Brake hoses and lines (including ABS)															• Check for damage or leakage.	19-39
All fluid levels and condition of fluids															<ul style="list-style-type: none"> <li>• Check levels, condition of fluids, and check for leaks. If brake fluid is low, check brake pad thickness.</li> </ul>	10-6, 13-3, 14-117, 299, 19-7
Cooling system hoses and connections															<ul style="list-style-type: none"> <li>• Check all hoses for damage, leaks, and deterioration.</li> <li>• Check for proper fan operation.</li> </ul>	10-2
Exhaust system*															• Check the catalytic converter heat shield, exhaust pipe, and muffler for damage, leaks, and tightness.	9-6 to 9-12
Fuel lines and connections*															• Check for leaks.	11-224
Lights and controls															• Check all lighting functions.	23-168
Vehicle underbody															• Check for damage and fluid leaks.	—

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

**Severe Driving Conditions:**

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

NOTE: If the car is driven OCCASIONALLY under a "severe" condition, you should follow the Normal Conditions Maintenance Schedule for 2000 Model on pages 4-20 and 4-21.

## **Engine**

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



## **Engine Removal/Installation**

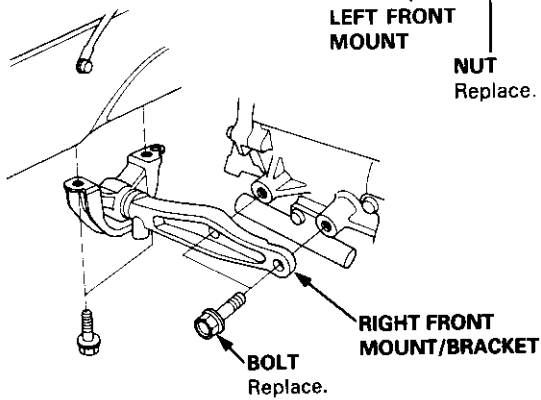
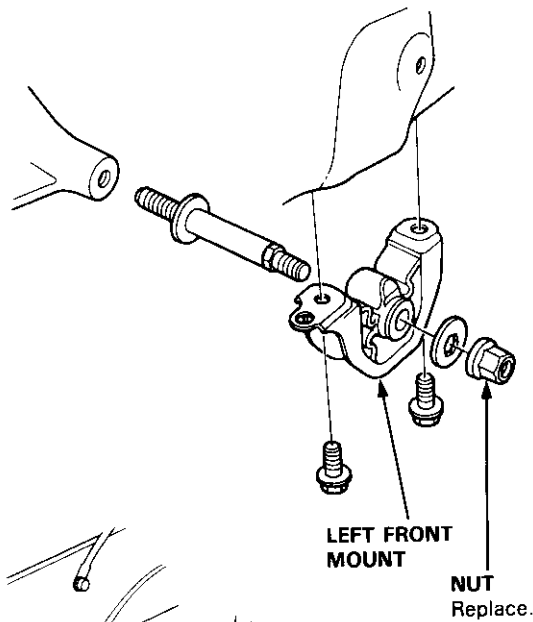
<b>Removal .....</b>	<b>5-2</b>
<b>Installation .....</b>	<b>5-12</b>



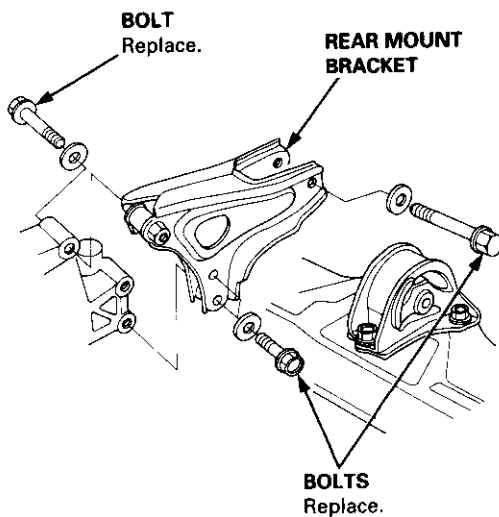




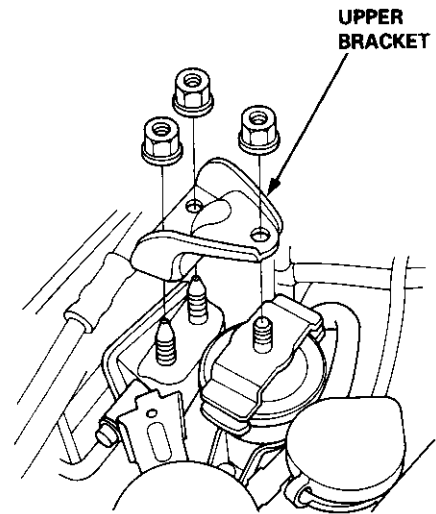
39. Remove the left and right front mount and bracket.



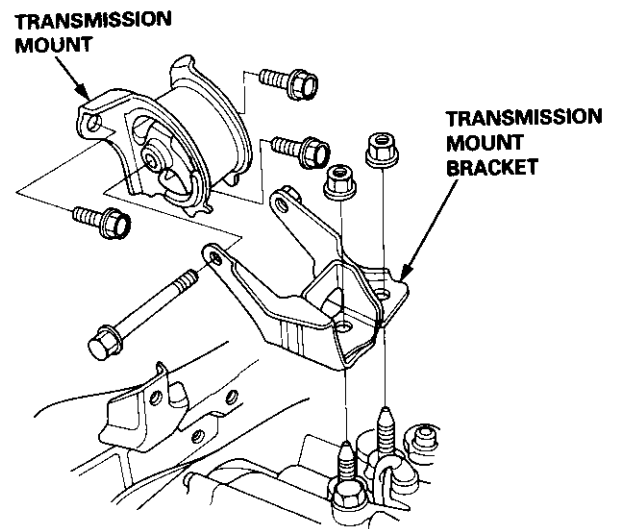
40. Remove the rear mount bracket.



41. Remove the upper bracket.



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



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

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

45. Raise the engine all the way, and remove it from the car.

# Engine Removal/Installation

## Installation

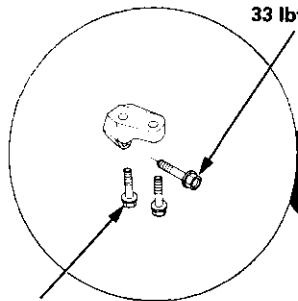
### Bracket Bolts Torque Specifications:

D16Y5, D16Y7, D16Y8 engines

D16Y5, D16Y8 engines (M/T):

REAR STIFFENER

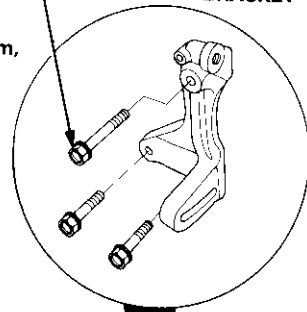
10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)



8 x 1.25 mm  
24 N·m (2.4 kgf·m, 17 lbf·ft)

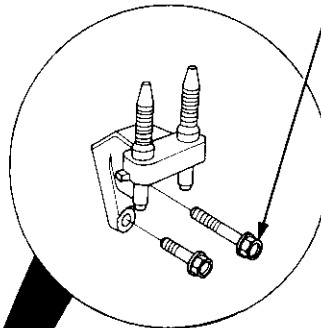
10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)

P/S PUMP  
BRACKET



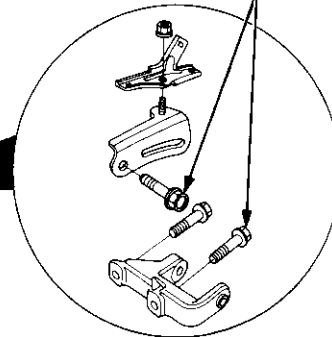
10 x 1.25 mm  
54 N·m (5.5 kgf·m,  
40 lbf·ft)

ENGINE SIDE  
MOUNT BRACKET



ALTERNATOR  
BRACKET

10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)

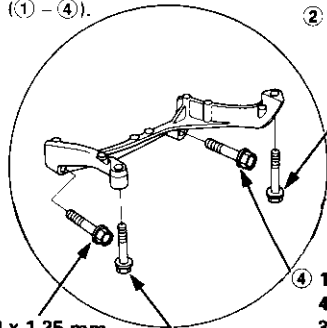


EXCEPT D16Y5, D16Y8 engines (M/T):

STIFFENER

Tighten the bolts on the stiffener  
in the numbered sequence as shown  
(① - ④).

② 8 x 1.25 mm  
24 N·m (2.4 kgf·m,  
17 lbf·ft)

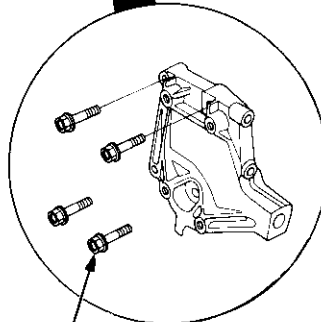


④ 10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)

③ 10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)

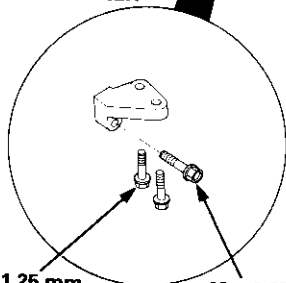
① 8 x 1.25 mm  
24 N·m (2.4 kgf·m,  
17 lbf·ft)

A/C COMPRESSOR  
BRACKET



10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)

D16Y5, D16Y8  
engines (M/T):  
FRONT  
STIFFENER



8 x 1.25 mm  
24 N·m (2.4 kgf·m,  
17 lbf·ft)

10 x 1.25 mm  
44 N·m (4.5 kgf·m,  
33 lbf·ft)

# Engine Removal/Installation

## Installation (cont'd)

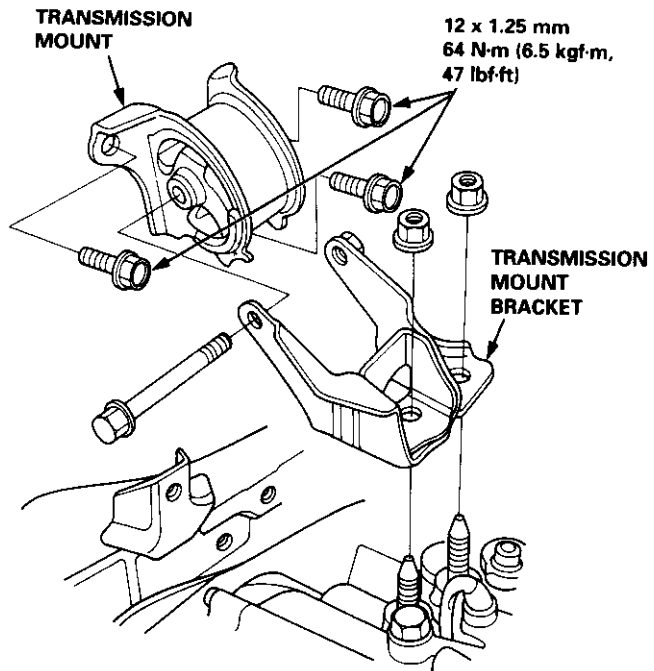
### Engine Installation:

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

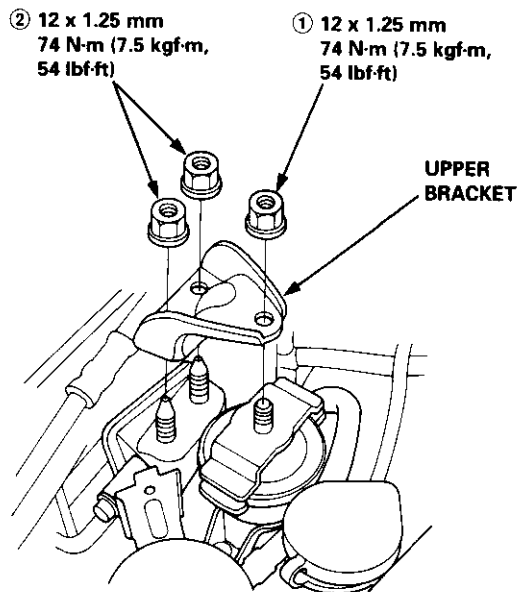
1. Install the transmission mount and bracket, then tighten the bolts on the frame side.

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

Except CVT:



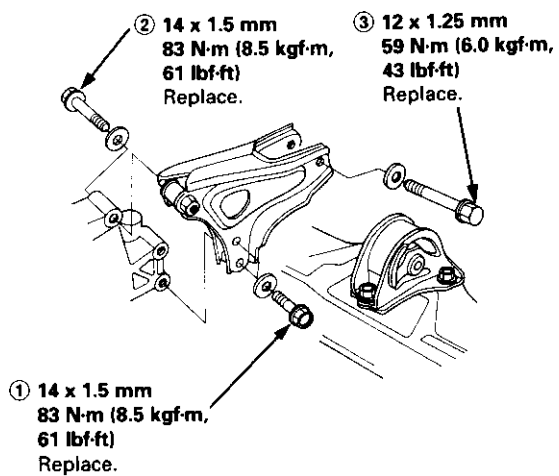
2. Install the upper bracket, then tighten the nuts in the numbered sequence shown (① - ②).



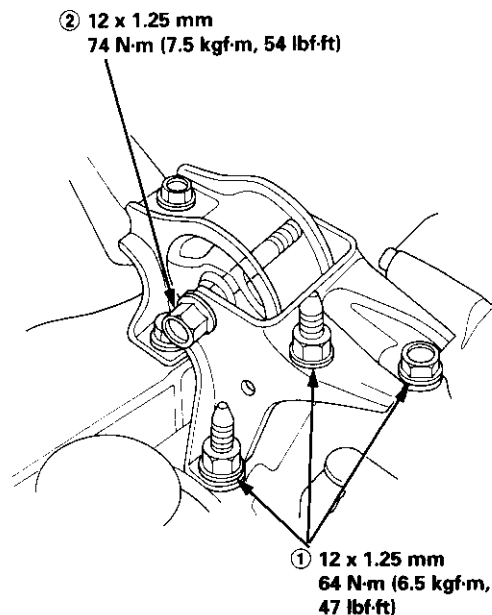


3. Install the rear mount bracket, then tighten the bolts in the numbered sequence shown (① - ③).

Except CVT:



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

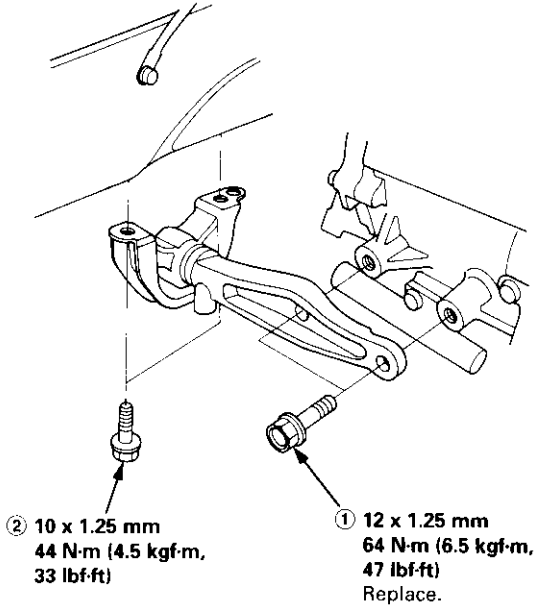


5. Tighten the bolts on the right front mount/bracket in the numbered sequence shown (① - ②).

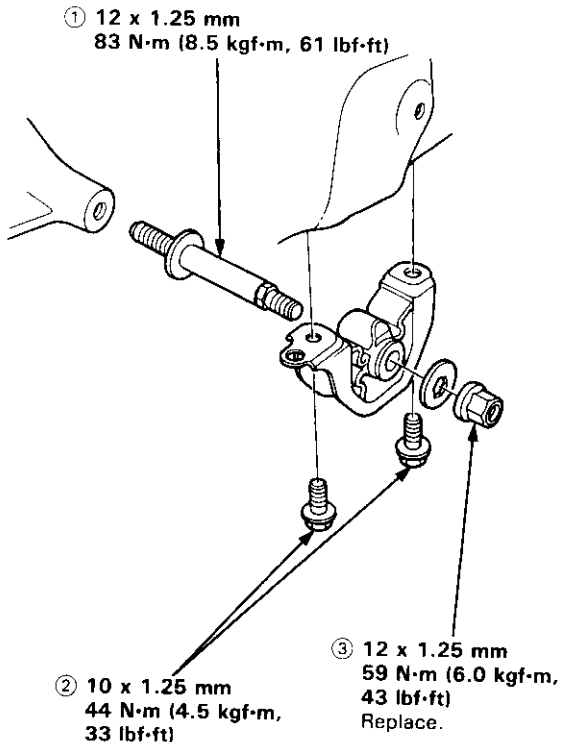
# Engine Removal/Installation

## Installation (cont'd)

Except CVT:



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



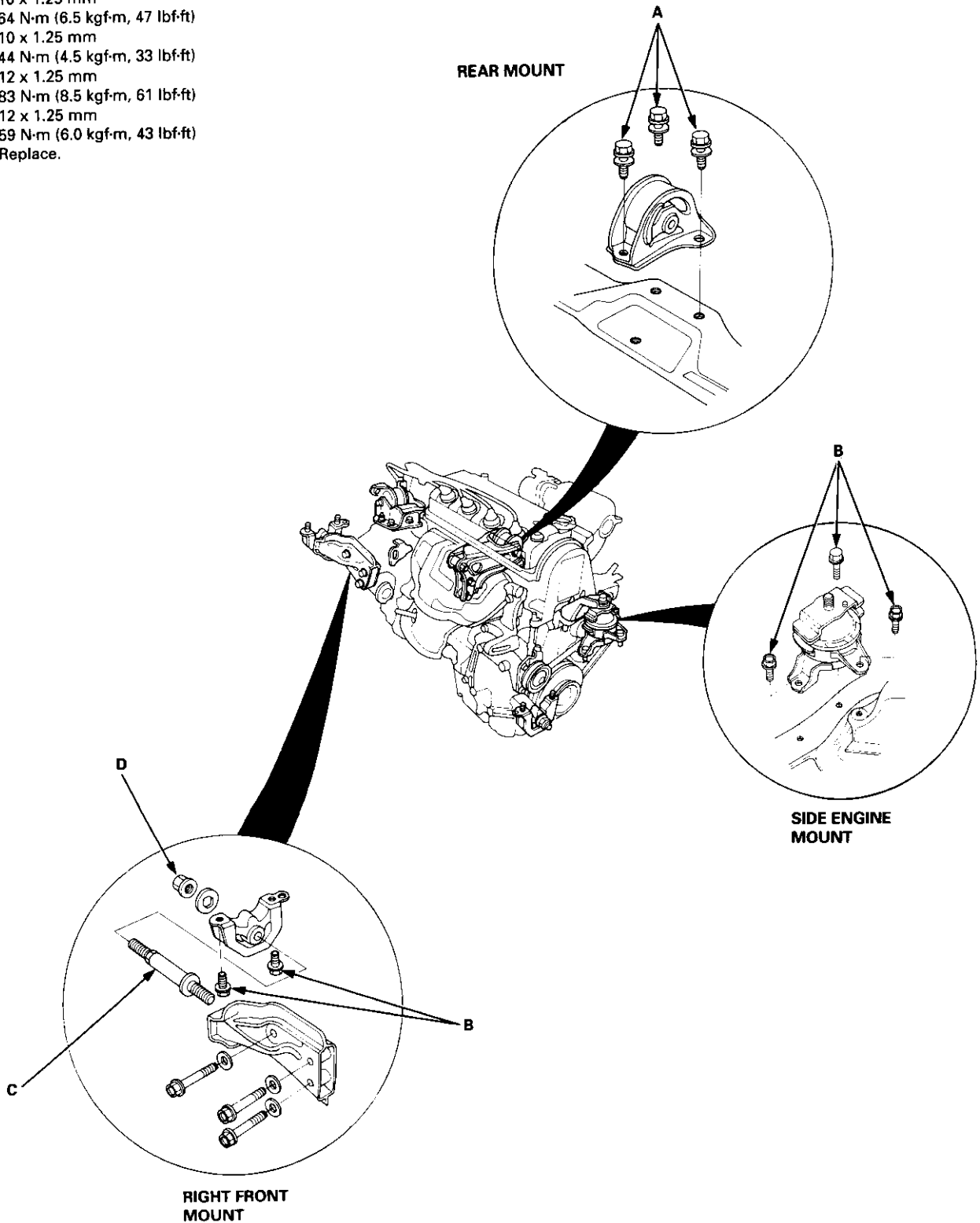
7. Perform the following:

- Clean the areas where the driveshaft(s) and the intermediate shaft contact the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air.
- Check that the set rings on the ends of the driveshaft and intermediate shaft click into place.  
**CAUTION: Use new set rings.**
- Adjust the shift cable (see section 14).
- Adjust the throttle cable (see section 11).
- Adjust the cruise control cable (see section 23).
- Refill the engine with engine oil (see page 8-6).
- Refill the transmission with fluid (see section 13, 14).
- Refill the radiator with engine coolant (see page 10-7).
- Bleed air from the cooling system with the heater valve open (see page 10-7).
- Clean the battery posts and cable terminals with sandpaper, assemble them, then apply grease to prevent corrosion.
- Inspect for fuel leakage (see section 11).  
After assembling the fuel line, turn on (II) the ignition switch (do not operate the starter) so that the fuel pump runs for approximately two seconds and the fuel line pressurizes. Repeat this operation two or three times, then check for fuel leakage at any point in the fuel line.



**Mount and Bracket Bolts/Nuts Torque Value Specifications:**

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



## Cylinder Head/Valve Train D16Y5, D16Y7, D16Y8 engines

Special Tools .....	6-2	Cylinder Head	
VTEC Control System		Illustrated Index .....	6-23
Troubleshooting Flowchart .....	6-3	Removal .....	6-27
VTEC Solenoid Valve		Warpage .....	6-40
Inspection .....	6-6	Installation .....	6-45
VTEC Rocker Arms		Rocker Arms	
Manual Inspection		Removal .....	6-30
(D16Y5 engine) .....	6-7	Disassembly/Reassembly .....	6-31
Manual Inspection		Rocker Arms and Lost Motion Assemblies	
(D16Y8 engine) .....	6-7	Inspection (D16Y5, D16Y8	
Inspection Using Special Tools		engines) .....	6-34
(D16Y5 engine) .....	6-8	Rocker Arms and Shafts	
Inspection Using Special Tools		Clearance Inspection .....	6-35
(D16Y8 engine) .....	6-10	Camshaft	
Valve Clearance		Inspection .....	6-36
Adjustment .....	6-12	Valves, Valve Springs and Valve Seals	
Valve Seals		Removal .....	6-38
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not required) .....	6-14	Valve Movement .....	6-39
Crankshaft Pulley and Pulley Bolt		Replacement .....	6-41
Replacement .....	6-16	Reaming .....	6-43
Timing Belt		Valve Seats	
Illustrated Index .....	6-17	Reconditioning .....	6-40
Inspection .....	6-18	Valves	
Tension Adjustment .....	6-18	Installation .....	6-43
Removal .....	6-19	Camshaft/Rocker Arms and	
Installation .....	6-20	Camshaft Seal/Pulley	
Crankshaft Speed Fluctuation (CKF) Sensor		Installation .....	6-44
Replacement .....	6-22		



# Valve Clearance

## Adjustment

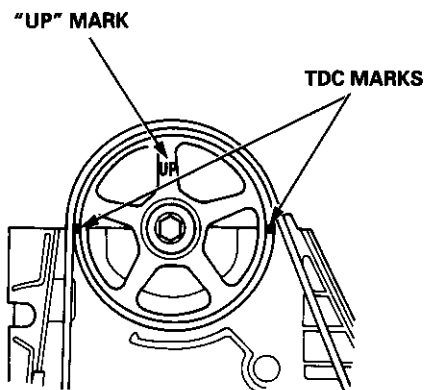
### NOTE:

- Valves should be adjusted only when the cylinder head temperature is less than 100°F (38°C).
- After adjusting, retorque the crankshaft pulley bolt (see page 6-16).

1. Remove the cylinder head cover.

NOTE: Refer to page 6-46 when installing the cylinder head cover.

2. Remove the upper cover (see page 6-19).
3. Set the No. 1 piston at TDC. The "UP" mark on the cam-shaft pulley should be at top, and the TDC marks should align with the cylinder head surface.



4. Adjust valves on No. 1 cylinder.

Intake: 0.18 – 0.22 mm (0.007 – 0.009 in)

Exhaust: 0.23 – 0.27 mm (0.009 – 0.011 in)

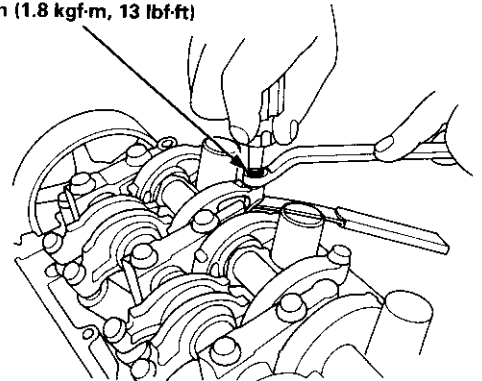
5. Loosen the locknut, and turn the adjustment screw until the feeler gauge slides back and forth with a slight amount of drag.

### D16Y7 engine:

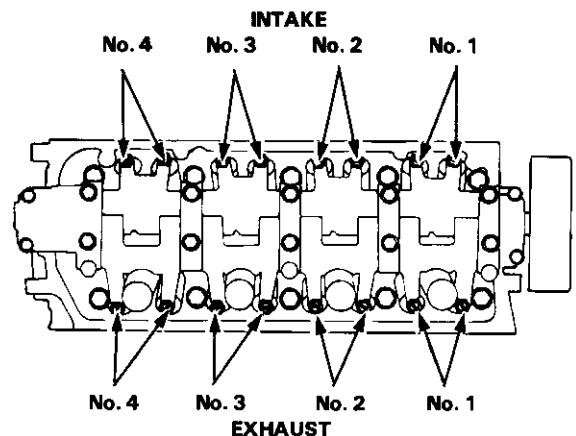
**CAUTION:** Do not overtighten the locknuts; the rocker arms are made of aluminum.

### INTAKE and EXHAUST VALVE LOCKNUTS

18 N·m (1.8 kgf·m, 13 lbf·ft)



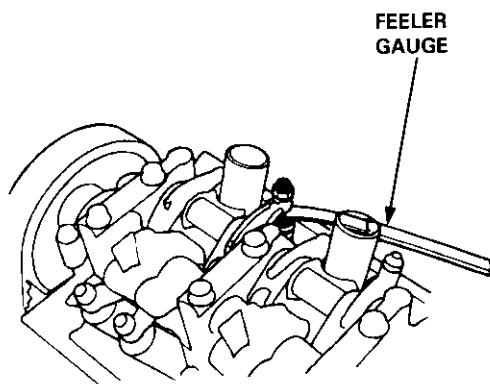
### Adjusting screw locations:



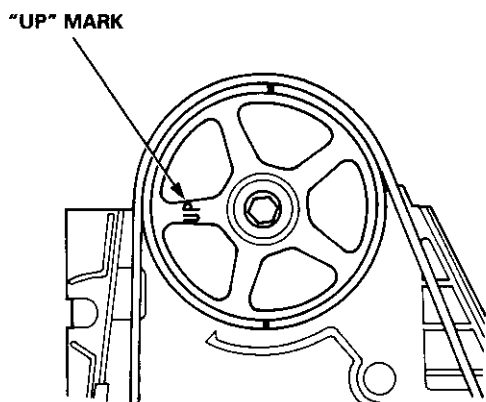




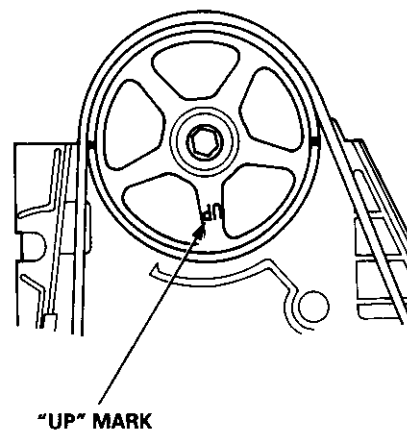
6. Tighten the locknut, and check the clearance again. Repeat the adjustment if necessary.



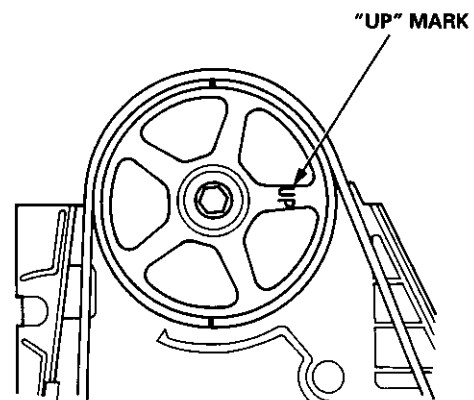
7. Rotate the crankshaft 180° counterclockwise (camshaft pulley turns 90°). The "UP" mark should be on the exhaust side. Adjust valves on No. 3 cylinder.



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



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



# Valve Seals

## Replacement (Cylinder head removal not required)

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

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

**▲ WARNING** Always wear approved eye protection when using the in-car valve spring compressor.

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

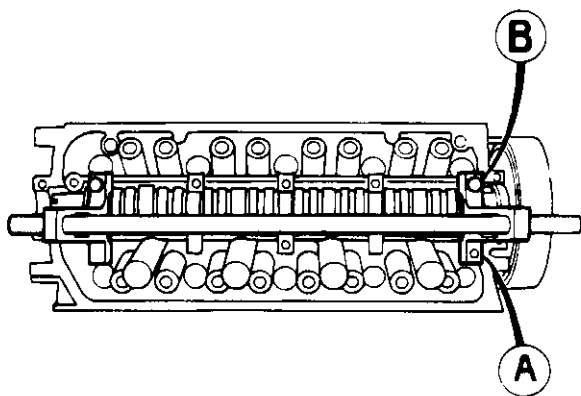
2. Remove the cylinder head cover and the rocker arm assembly.

NOTE:

- Refer to page 6-30 for rocker arm assembly removal.
- When removing or installing the rocker arm assembly, do not remove the camshaft holder bolts. The bolts will keep the holders, springs and rocker arms on the shaft.
- Refer to page 6-46 when installing the cylinder head cover.

3. Remove the fuel injectors and the wire harness.

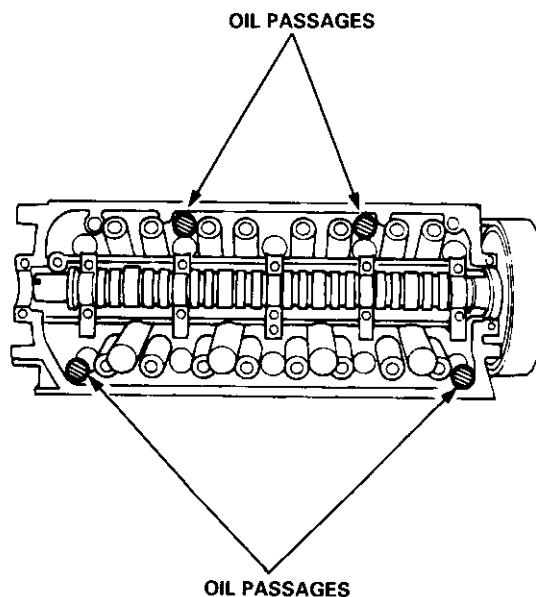
4. Using the 8 mm bolts supplied with the tool, mount the two uprights to the cylinder head at the end camshaft holders. The uprights fit over the camshaft as shown.



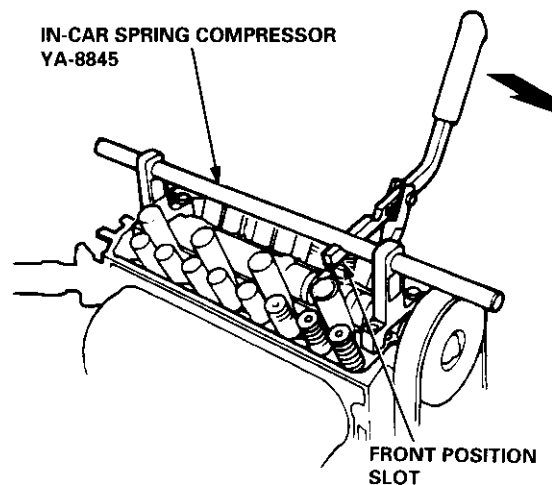
5. Insert the cross shaft through the top hole of the two uprights.

### Intake Valve Seals:

6. Select the 7/8 in diameter short compressor attachment, and fasten the attachment to the No. 4 hole of the lever arm with the speed pin supplied.
7. Insert an air adaptor into the spark plug hole. Pump air into the cylinder to keep the valve closed while compressing springs and removing the valve keepers.
8. Put shop towels over the oil passages to prevent the valve keepers from falling into the cylinder head.



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

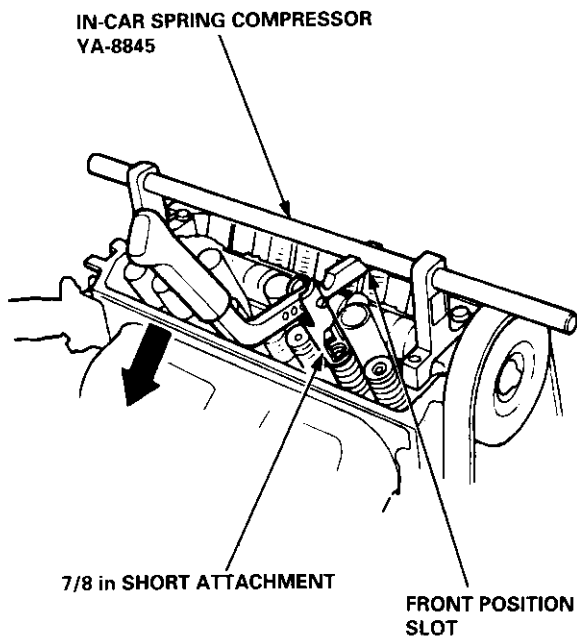




10. Using a downward motion on the lever arm, compress the valve spring and remove the keepers from the valve stem. Slowly release pressure on the spring.
11. Remove the valve seals (see page 6-38).
12. Install the valve seals (see page 6-43).
13. Install the springs, the retainers and the keepers in reverse order of removal.

**Exhaust Valve Seals:**

14. Select the 7/8 in. diameter short compressor attachment, and fasten the attachment to the No. 2 hole of the lever arm with the speed pin supplied.
15. Position the lever arm under the cross shaft so the lever is perpendicular to the shaft and the compressor attachment rests on top of the retainer for the spring being compressed. Use the front position slot on the lever as shown.



16. Using a downward motion on the lever arm, compress the valve spring and remove the keepers from the valve stem. Slowly release pressure on the spring.
17. Remove the valve seals (see page 6-38).
18. Install the valve seals (see page 6-43).
19. Install the springs, the retainers and the keepers in reverse order of removal.
20. Repeat steps 6 to 19 on the other cylinders.

# Crankshaft Pulley and Pulley Bolt

## Replacement

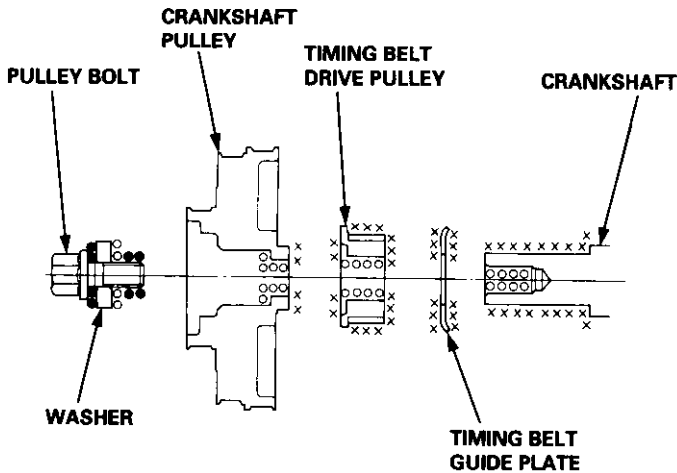
When installing and tightening the pulley, follow the procedure below.

Clean, remove any oil, and lubricate points shown below.

○: Clean

×: Remove any oil

●: Lubricate



**Crankshaft pulley bolt size and torque value:**

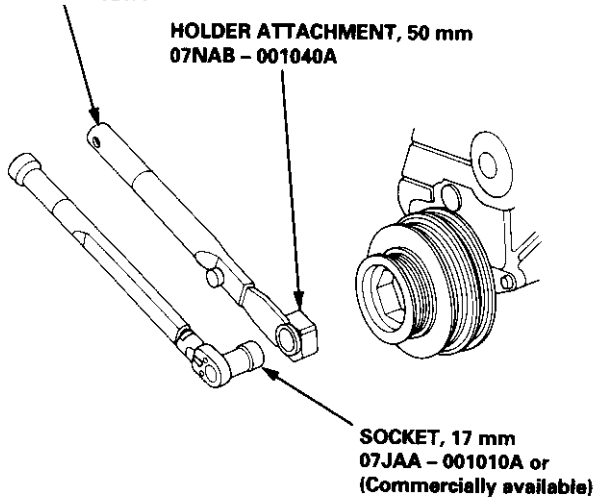
14 x 1.25 mm

20 N·m (2.0 kgf·m, 14 lbf·ft) + 90°

**NOTE:** Do not use an impact wrench when installing.

**HOLDER HANDLE**  
07JAB - 001020A

**HOLDER ATTACHMENT, 50 mm**  
07NAB - 001040A

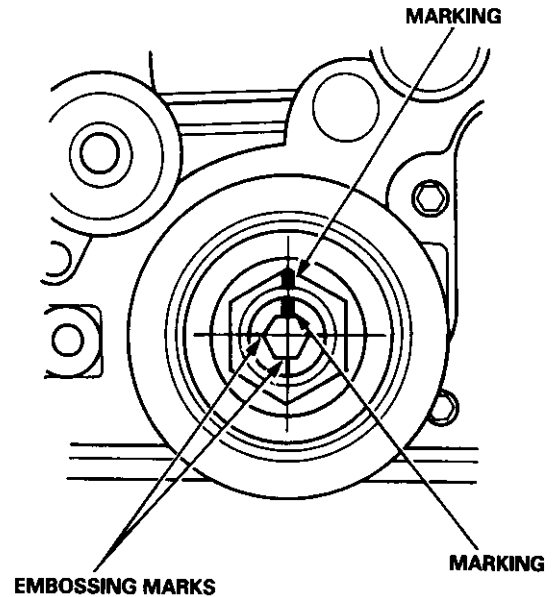


**SOCKET, 17 mm**  
07JAA - 001010A or  
(Commercially available)

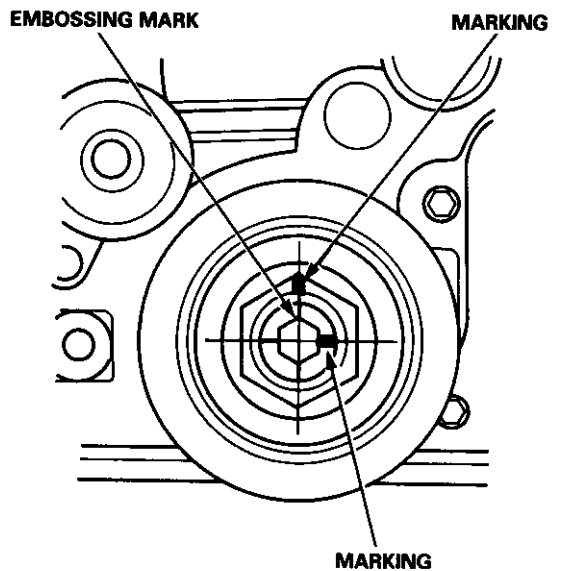
1. Tighten the pulley bolt to the specified torque.

**Torque: 20 N·m (2.0 kgf·m, 14 lbf·ft)**

2. Use a felt tip pen to mark the pulley bolt head and washer.



3. Tighten the pulley bolt an additional 90°.

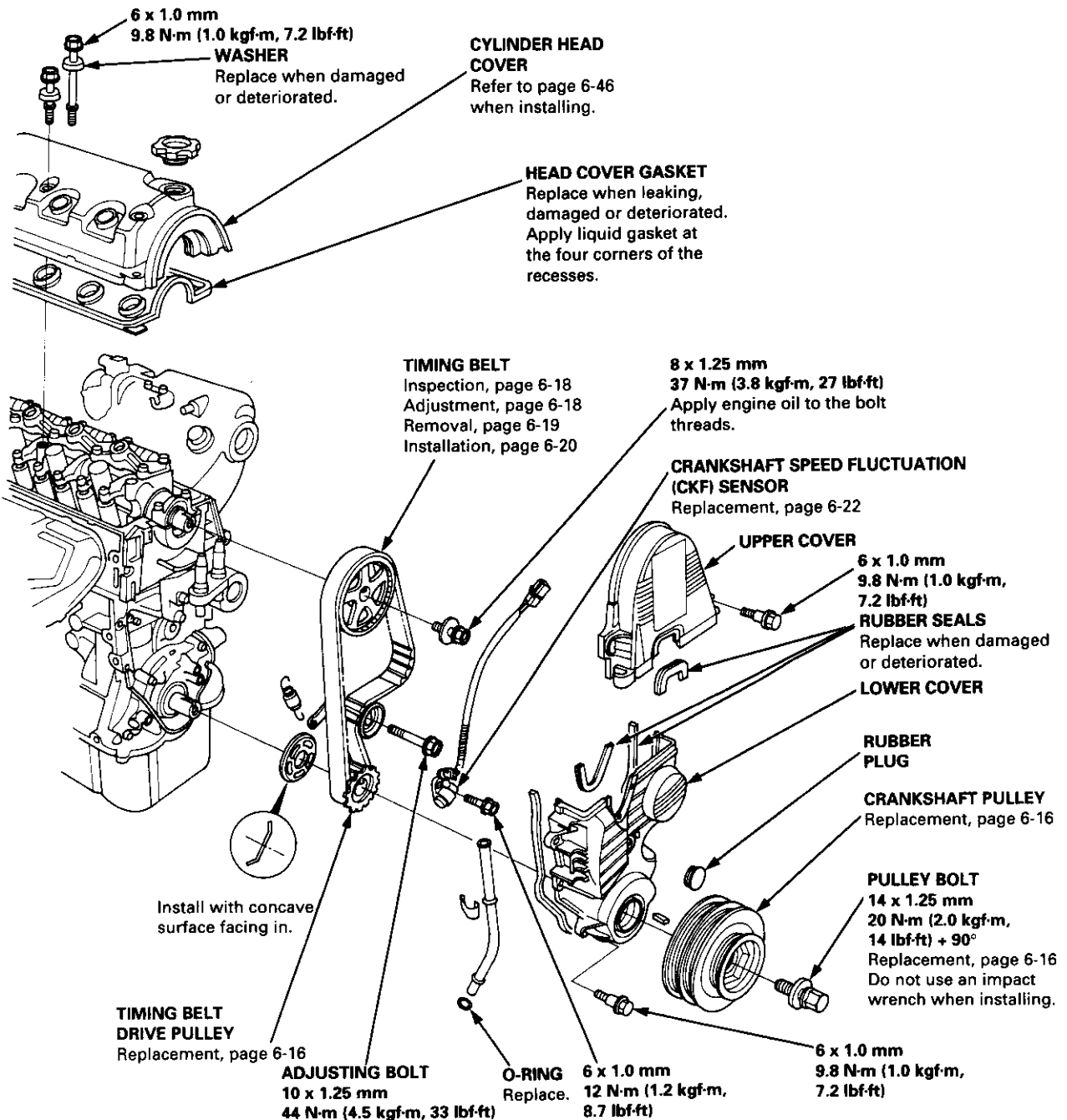




## Illustrated Index

### NOTE:

- Refer to page 6-20 for how to position the crankshaft and pulley before installing the belt.
- Mark the direction of rotation on the belt before removing.
- Do not use the upper cover and lower cover for storing removed items.
- Clean the upper cover and lower cover before installing.
- Replace the camshaft seals and crankshaft seals if there is oil leakage.
- Refer to page 6-16 before installing the timing belt.



# Timing Belt

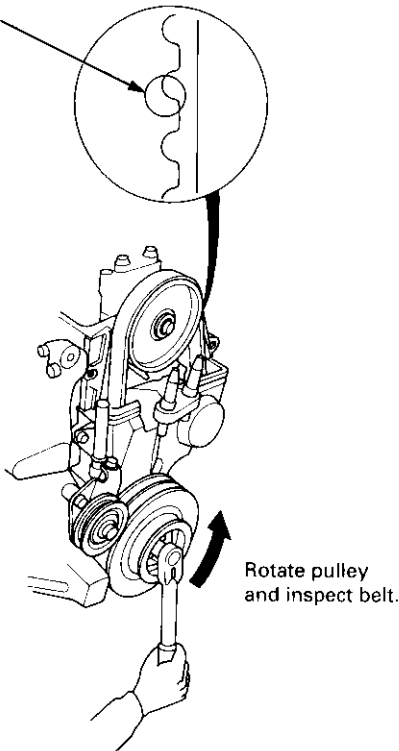
## Inspection

1. Remove the cylinder head cover.
  - Refer to page 6-46 when installing.
2. Remove the upper cover (see page 6-19).
3. 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.



4. After inspecting, retorque the crankshaft pulley bolt (see page 6-16).

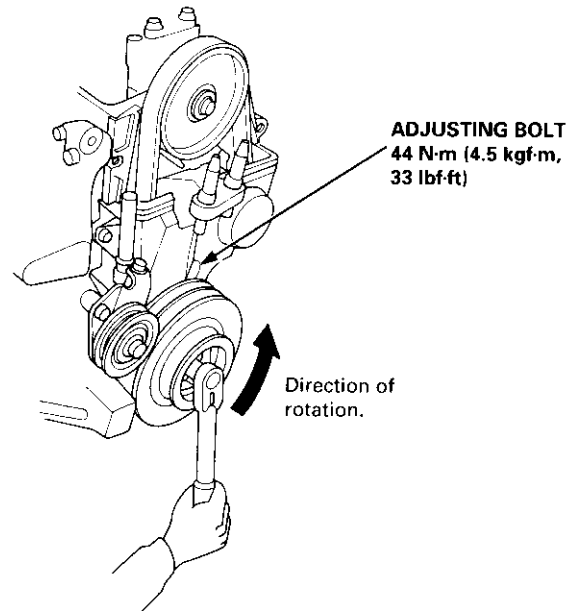
## Tension Adjustment

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

### NOTE:

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

1. Remove the cylinder head cover.
  - Refer to page 6-46 when installing.
2. Remove the upper cover (see page 6-19).
3. Rotate the crankshaft five or six revolutions to set the belt.
4. Set the No. 1 piston at TDC (see page 6-21).
5. Loosen the adjusting bolt 180°.



6. Rotate the crankshaft counterclockwise three teeth on the camshaft pulley.
7. Tighten the adjusting bolt.
8. After inspecting, retorque the crankshaft pulley bolt (see page 6-16).

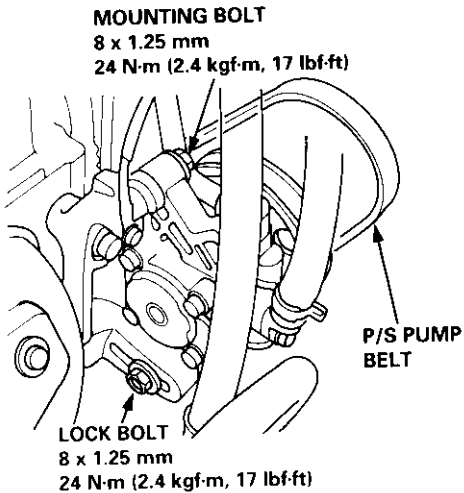


## Removal

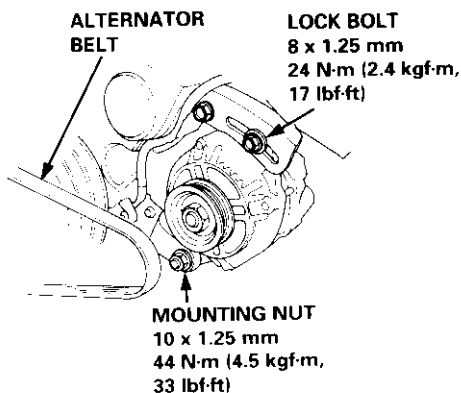
### NOTE:

- Replace the timing belt at 105,000 miles (168,000 km) according to the maintenance schedule (normal conditions/severe conditions).  
If the vehicle is regularly driven in one or more of the following conditions, replace the timing belt at 60,000 miles (U.S.A.) 100,000 km (Canada).
  - In very high temperatures (over 110°F, 43°C).
  - In very low temperatures (under -20°F, -29°C).
- Turn the crankshaft pulley so the No. 1 piston is at top dead center (TDC) before removing the belt (see page 6-21).
- Inspect the water pump before installing the timing belt (see page 10-14).

1. Remove the splash shield (see page 5-7).
2. Loosen the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump.

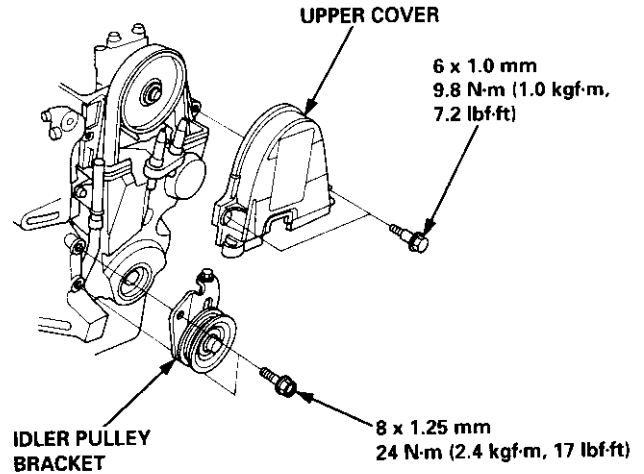


3. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt (see page 5-6).
4. Loosen the mounting nut and lock bolt, then remove the alternator belt.



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

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



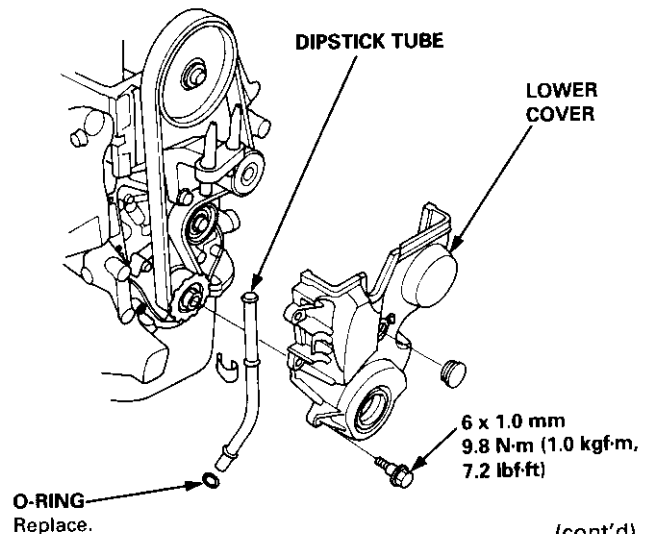
6. Remove the upper bracket (see page 6-29).

### NOTE:

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

7. Remove the crankshaft pulley (see page 6-16).
8. Remove the lower cover and dipstick tube.

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

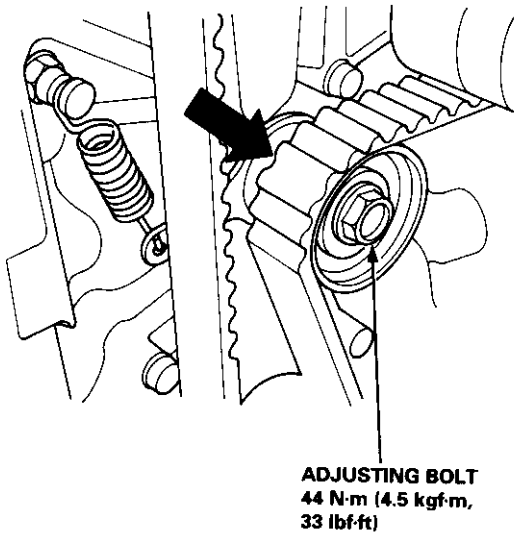


(cont'd)

# Timing Belt

## Removal (cont'd)

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

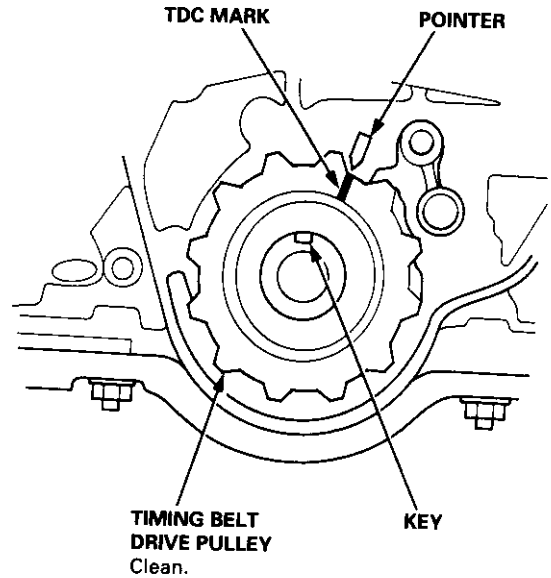


11. Remove the timing belt.

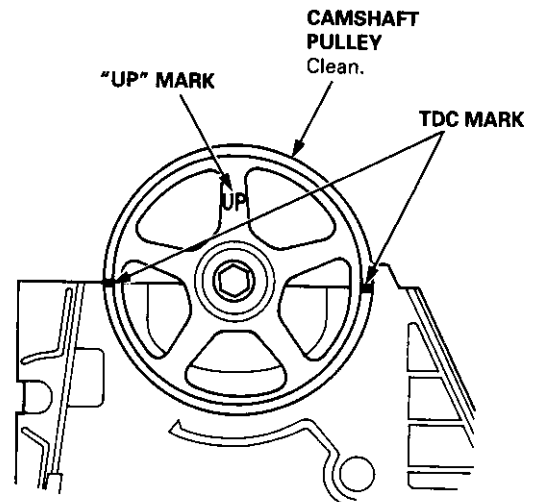
## Installation

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

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



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

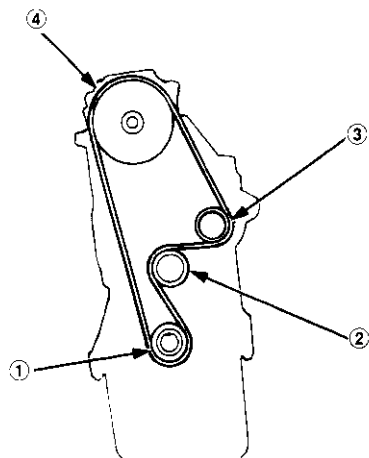






3. Install the timing belt tightly in the sequence shown.  
①Timing belt drive pulley (crankshaft) →②Adjusting pulley →③Water pump pulley →④Camshaft pulley.

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



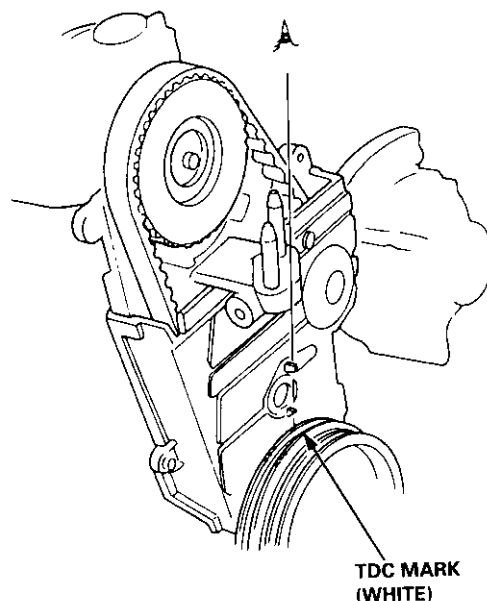
4. Loosen and retighten the adjusting bolt to tension the timing belt.  
5. Install the lower cover and upper cover.

NOTE: Clean the upper and lower covers before installation.

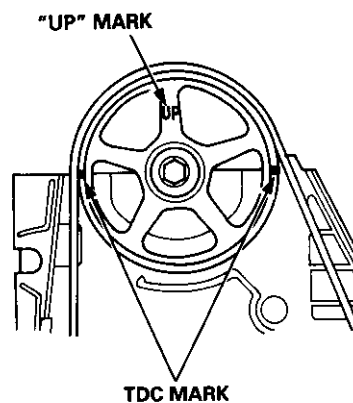
6. Install the crankshaft pulley, then tighten the pulley bolt (see page 6-16).  
7. Rotate the crankshaft pulley about five or six turns counterclockwise so that the timing belt positions on the pulleys.  
8. Adjust the timing belt tension (see page 6-18).

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

#### CRANKSHAFT PULLEY:



#### CAMSHAFT PULLEY:



10. If the camshaft and crankshaft pulleys are not positioned at TDC, remove the timing belt and adjust the position following the procedure on page 6-20. Then reinstall the timing belt.
11. After installation, adjust the tension of each belt.
- See section 23 for alternator belt tension adjustment.
  - See section 22 for A/C compressor belt tension adjustment.
  - See section 17 for P/S pump belt tension adjustment.

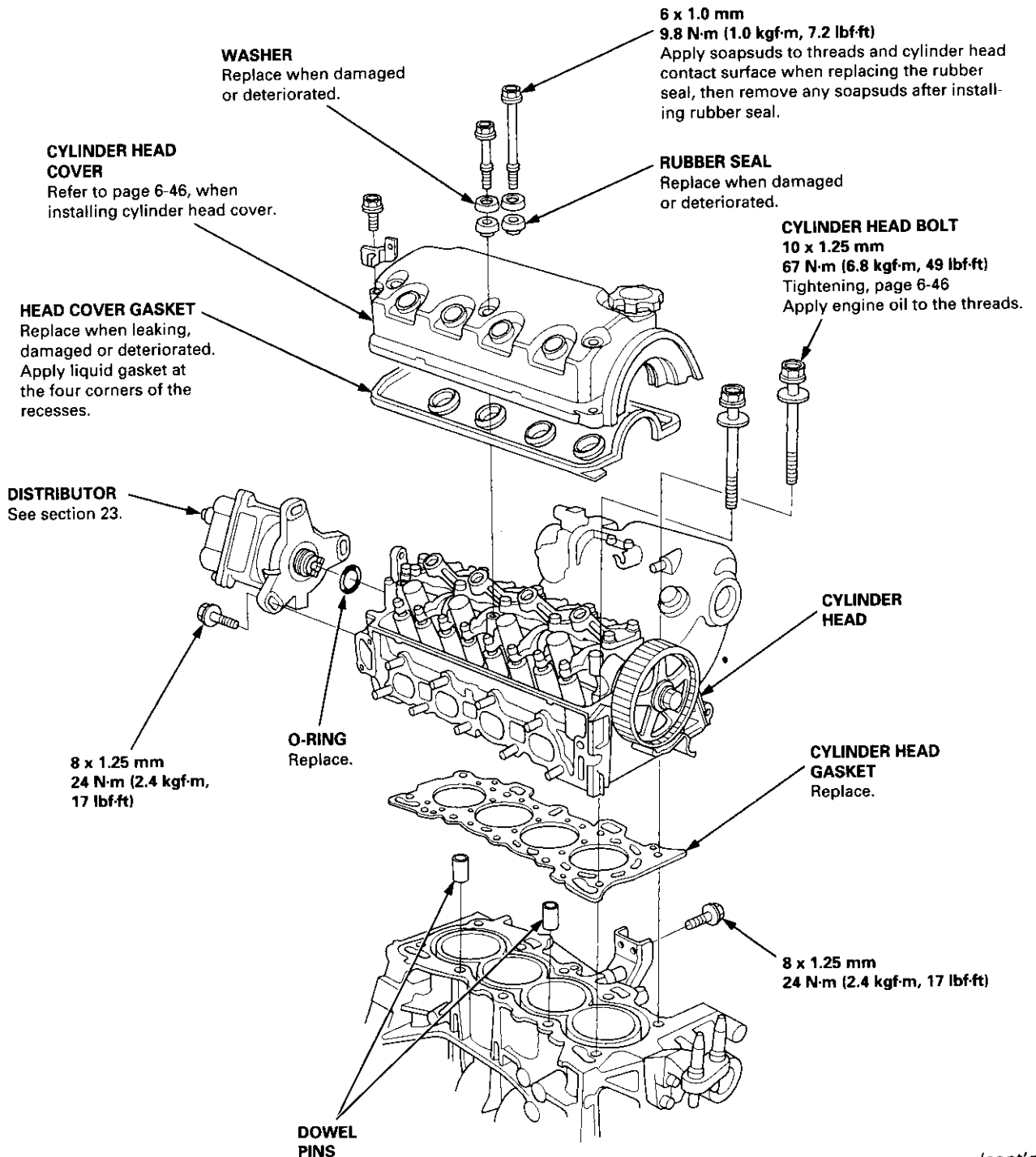


## Illustrated Index

### CAUTION:

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

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



(cont'd)

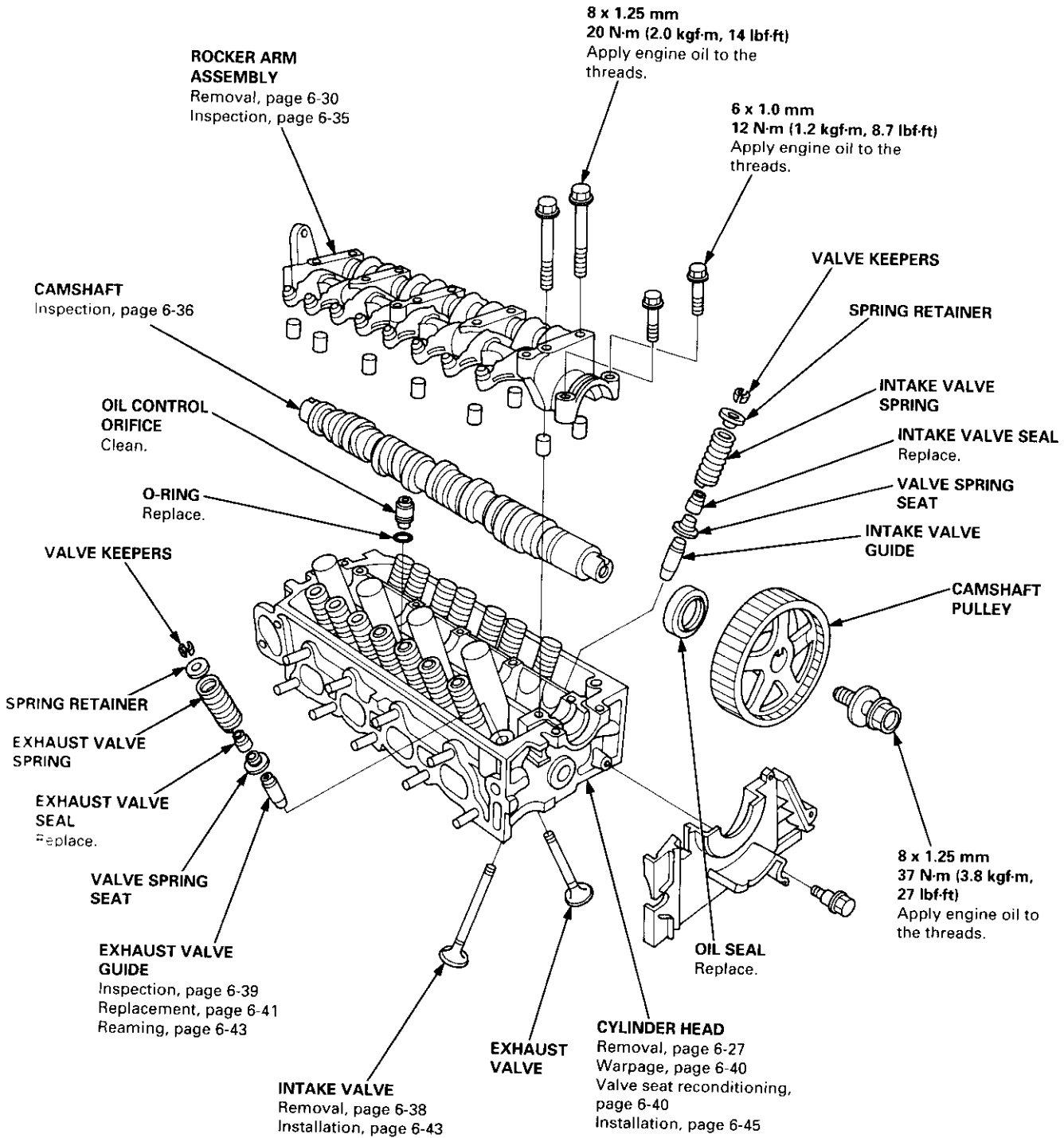
# Cylinder Head

## Illustrated Index (cont'd)



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

D16Y7 engine:





## Removal

Engine removal is not required for this procedure.

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

### CAUTION:

- Use fender covers to avoid damaging painted surfaces.
- To avoid damage, unplug the wiring connectors carefully while holding the connector portion to avoid damage.
- To avoid damaging the cylinder head, wait until the engine coolant temperature drops below 100°F (38°C) before loosening the retaining bolts.

### NOTE:

- Mark all wiring and hoses to avoid misconnection. Also, be sure that they do not contact other wiring or hoses, or interfere with other parts.
- Inspect the timing belt before removing the cylinder head.
- Turn the crankshaft pulley so that the No. 1 piston is at top dead center (see page 6-21).

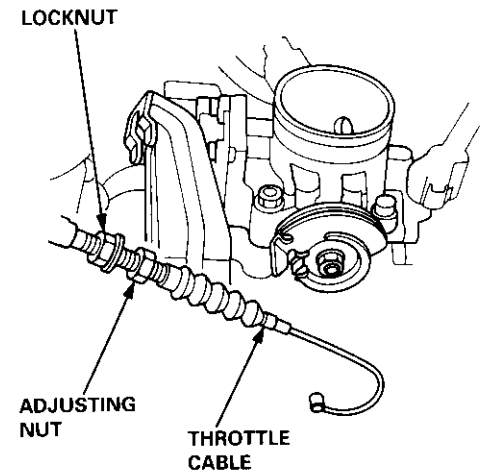
1. Disconnect the negative terminal from the battery.
2. Drain the engine coolant (see page 10-7).
  - Remove the radiator cap to speed draining.
3. Remove the intake air duct and air cleaner housing (see page 5-3).
4. Remove the mounting bolt and lock bolt, then remove the power steering (P/S) pump belt and pump (see page 5-5).
5. Loosen the idler pulley center nut and adjusting bolt, then remove the air conditioning (A/C) compressor belt (see page 5-6).
6. Loosen the mounting nut and lock bolt, then remove the alternator belt (see page 6-19).
7. Remove the P/S pump bracket (see page 5-12).

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

### NOTE:

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

### D16Y7 engine:



# Cylinder Head

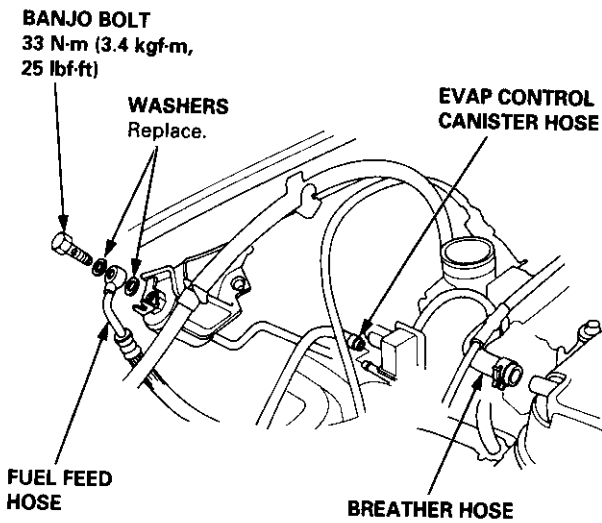
## Removal (cont'd)

9. Relieve fuel pressure (see section 11).

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

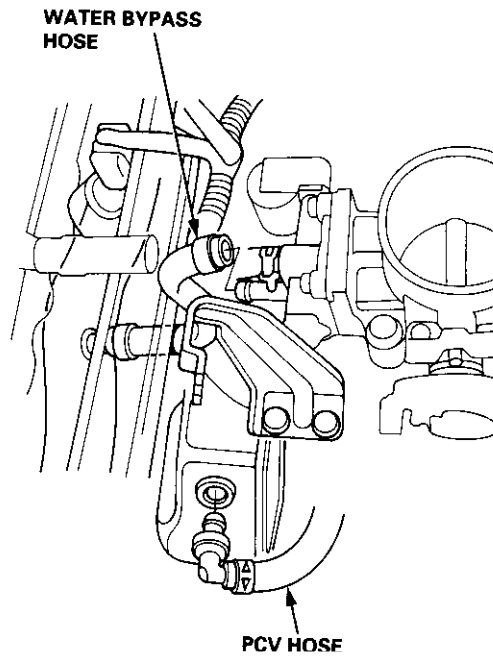
10. Remove the evaporative emission (EVAP) control canister hose, fuel feed hose and breather hose.

D16V7 engine:



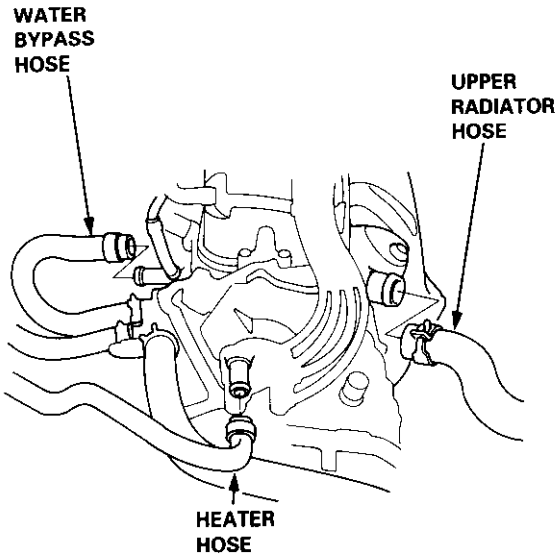
11. Remove the brake booster vacuum hose, fuel return hose and vacuum hose (see page 5-4).
12. Remove the water bypass hose and positive crankcase ventilation (PCV) hose.

D16V7 engine:





13. Remove the upper radiator hose, heater hose and water bypass hose.



14. Remove the engine wire harness connectors and wire harness clamps from the cylinder head and the intake manifold.

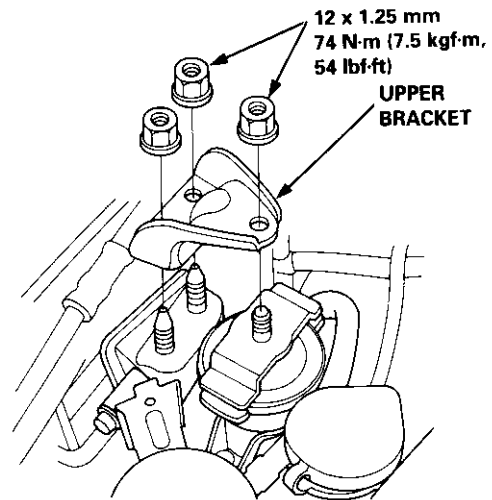
- Four fuel injector connectors
- Engine coolant temperature (ECT) sensor connector
- ECT switch connector
- ECT gauge sending unit connector
- Throttle position sensor connector
- Manifold absolute pressure (MAP) sensor connector
- Primary heated oxygen sensor (primary HO2S) connector
- Secondary heated oxygen sensor (secondary HO2S) connector (D16Y7 engine)
- Exhaust gas recirculation (EGR) valve lift sensor connector (D16Y5 engine)
- VTEC solenoid valve connector (D16Y5, D16Y8 engines)
- VTEC pressure switch connector (D16Y5, D16Y8 engines)
- Idle air control (IAC) valve connector

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

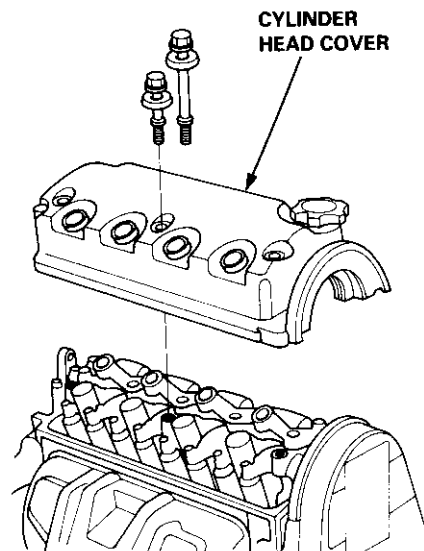
16. Remove the upper bracket.

NOTE:

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



17. Remove the cylinder head cover.



(cont'd)



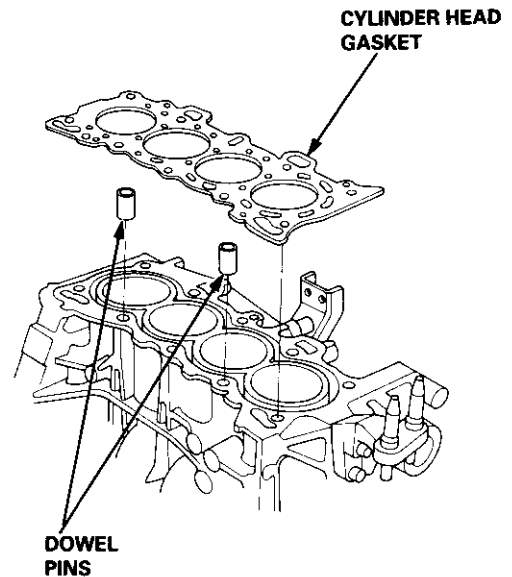
## Installation

Install the cylinder head in the reverse order of removal:

**NOTE:**

- Always use a new head gasket.
- Cylinder head and cylinder block surface must be clean.
- "UP" mark on the camshaft pulley should be at the top.
- Turn the crankshaft so the No. 1 piston is at TDC (see page 6-20).
- Clean the oil control orifice before installing.
- Do not use the upper cover and lower cover to store removed items.
- Clean the upper cover and lower cover before installation.

1. Cylinder head dowel pins must be aligned.



(cont'd)

# Cylinder Head

## Installation (cont'd)

2. Position the camshaft correctly (see page 6-20).
3. Tighten the cylinder head bolts sequentially in four steps.

**1st step:** ① - ⑩ 20 N·m (2.0 kgf·m, 14 lbf·ft)

**2nd step:** ① - ⑩ 49 N·m (5.0 kgf·m, 36 lbf·ft)

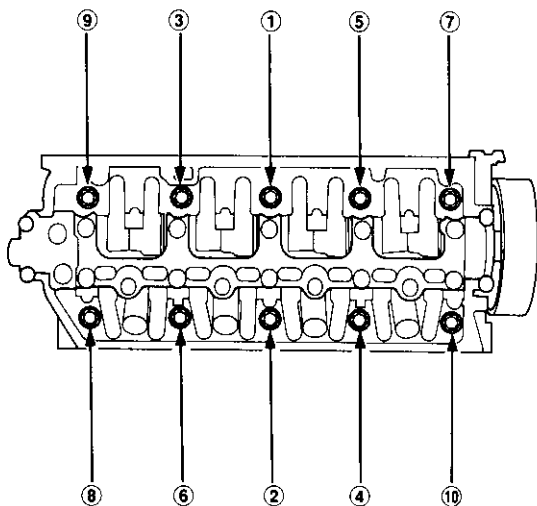
**3rd step:** ① - ⑩ 67 N·m (6.8 kgf·m, 49 lbf·ft)

**4th step:** ①, ② 67 N·m (6.8 kgf·m, 49 lbf·ft)

### NOTE:

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

### CYLINDER HEAD BOLTS TORQUE SEQUENCE:

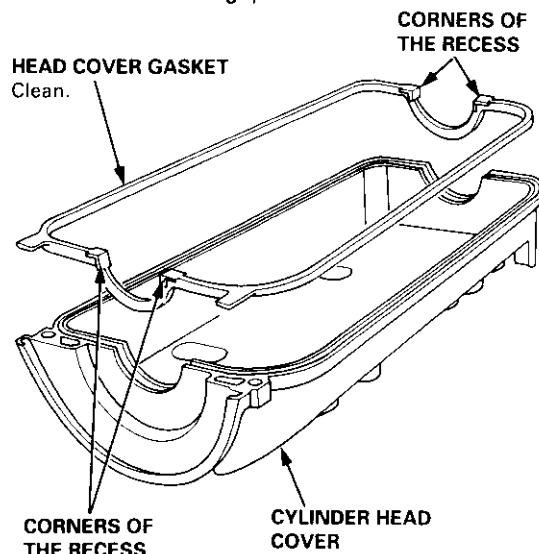


4. Install the intake manifold and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nuts (see pages 9-2 thru 9-4).
  - Always use a new intake manifold gasket.
5. Install the exhaust manifold and tighten the nuts in a crisscross pattern in two or three steps, beginning with the inner nut (see pages 9-6 and 9-7).
  - Always use a new exhaust manifold gasket.
6. Install the exhaust manifold bracket. Install the exhaust pipe A and the bracket, then install the cover.

7. Install the timing belt (see page 6-20).
8. Adjust the valve clearance (see page 6-12).
9. Install the head cover gasket in the groove of the cylinder head cover. Seat the recesses for the camshaft first, then work it into the groove around the outside edges.

### NOTE:

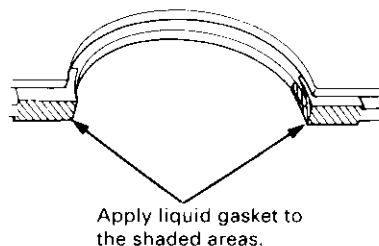
- Before installing the head cover gasket, thoroughly clean the seal and the groove.
- When installing, make sure the head cover gasket is seated securely in the corners of the recesses with no gap.



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

### NOTE:

- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Check that the mating surfaces are clean and dry before applying liquid gasket.
- Do not install the parts if five minutes or more have elapsed since applying liquid gasket. Instead, reapply liquid gasket after removing old residue.
- After assembly, wait at least 30 minutes before filling the engine with oil.







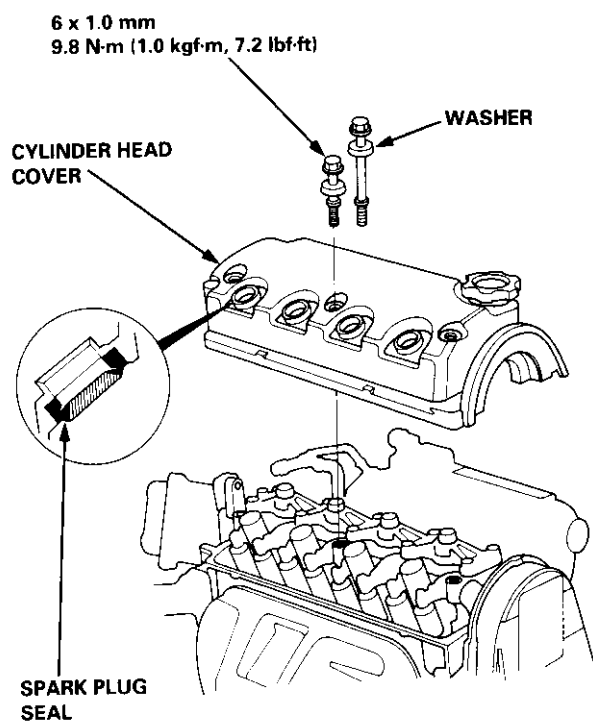
11. When installing the cylinder head cover, hold the head cover gasket in the groove by placing your fingers on the camshaft holder contacting surfaces (top of the semicircles).

Set the spark plug seal on the spark plug tube.

Once the cylinder head cover is on the cylinder head, slide the cover slightly back and forth to seat the head cover gasket.

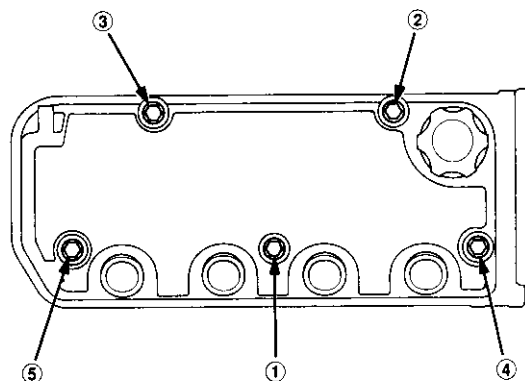
**NOTE:**

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



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

**NOTE:** After assembly, wait at least 30 minutes before filling the engine with oil.



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

## Engine Block


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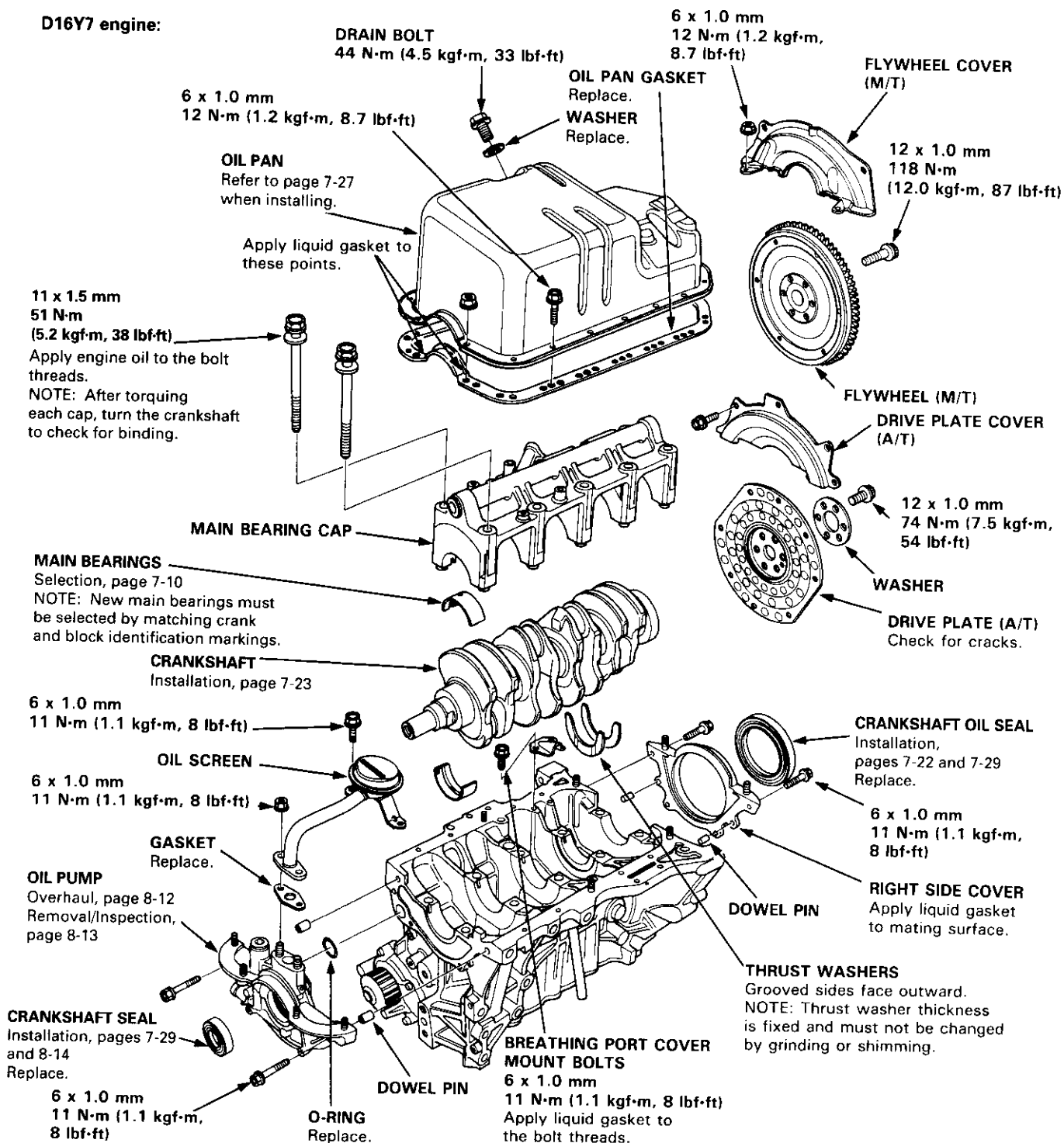
(cont'd)

 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 case before installing them.
- Use liquid gasket, part No. 08718 - 0001 or 08718 - 0003.
- Clean the oil pan gasket mating surfaces before installing it.

**D16Y7 engine:**



# Oil Pan

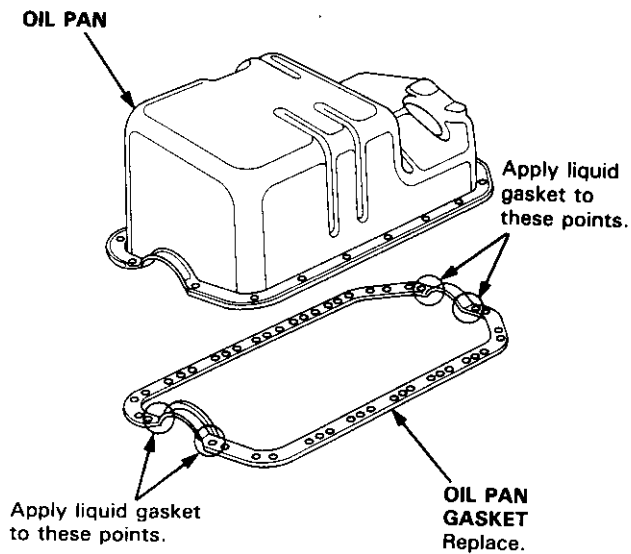
## Installation (cont'd)

2. Install the oil pan gasket and oil pan.

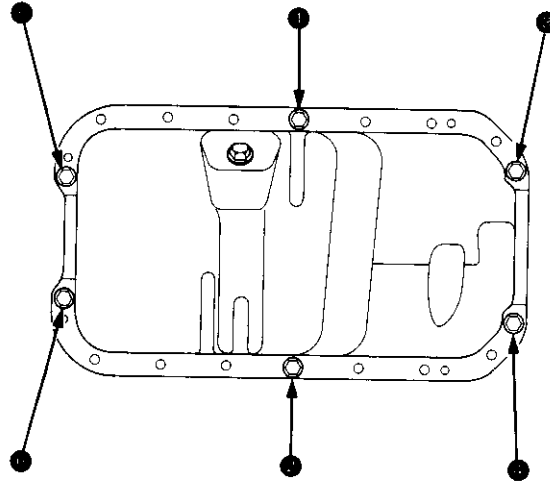
**NOTE:**

- Use a new oil pan gasket.
- Install the oil pan no more than five minutes after applying liquid gasket.

**D16Y7 engine:**



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



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

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

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

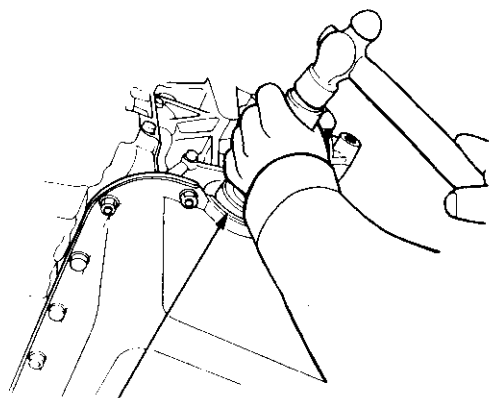


## Installation

### NOTE:

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

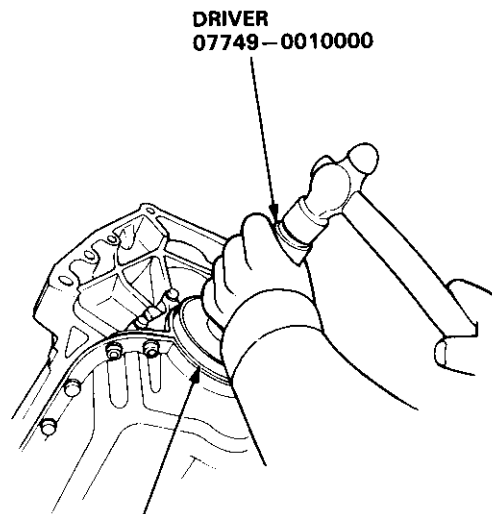
1. Using the special tool, drive in the timing pulley-end seal until the driver bottoms against the oil pump.  
When the seal is in place, clean any excess grease off the crankshaft and check that the oil seal lip is not distorted.



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

2. Measure the flywheel-end seal thickness and the oil seal housing depth. Using the special tool, drive the flywheel-end seal into the rear cover to the point where the clearance between the bottom of the oil seal and the right side cover is 0.5 – 0.8 mm (0.02 – 0.03 in) (see page 7-23).

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



**DRIVER**  
07749-0010000

**DRIVER ATTACHMENT**  
07948-SB00101  
Install seal with the  
part number side  
facing out.

## Engine Lubrication

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(cont'd)

**NOTE:**

- Use new O-rings when reassembling.
- Apply oil to O-rings before installation.
- Use liquid gasket, Part No. 08718 - 0001 or 08718 - 0003.
- Clean the oil pan gasket mating surfaces before installing.
- Apply liquid gasket to the recesses of the oil pan gasket (see page 7-27).

**CAUTION:** Do not overtighten the drain bolt.

**ENGINE OIL PRESSURE SWITCH**

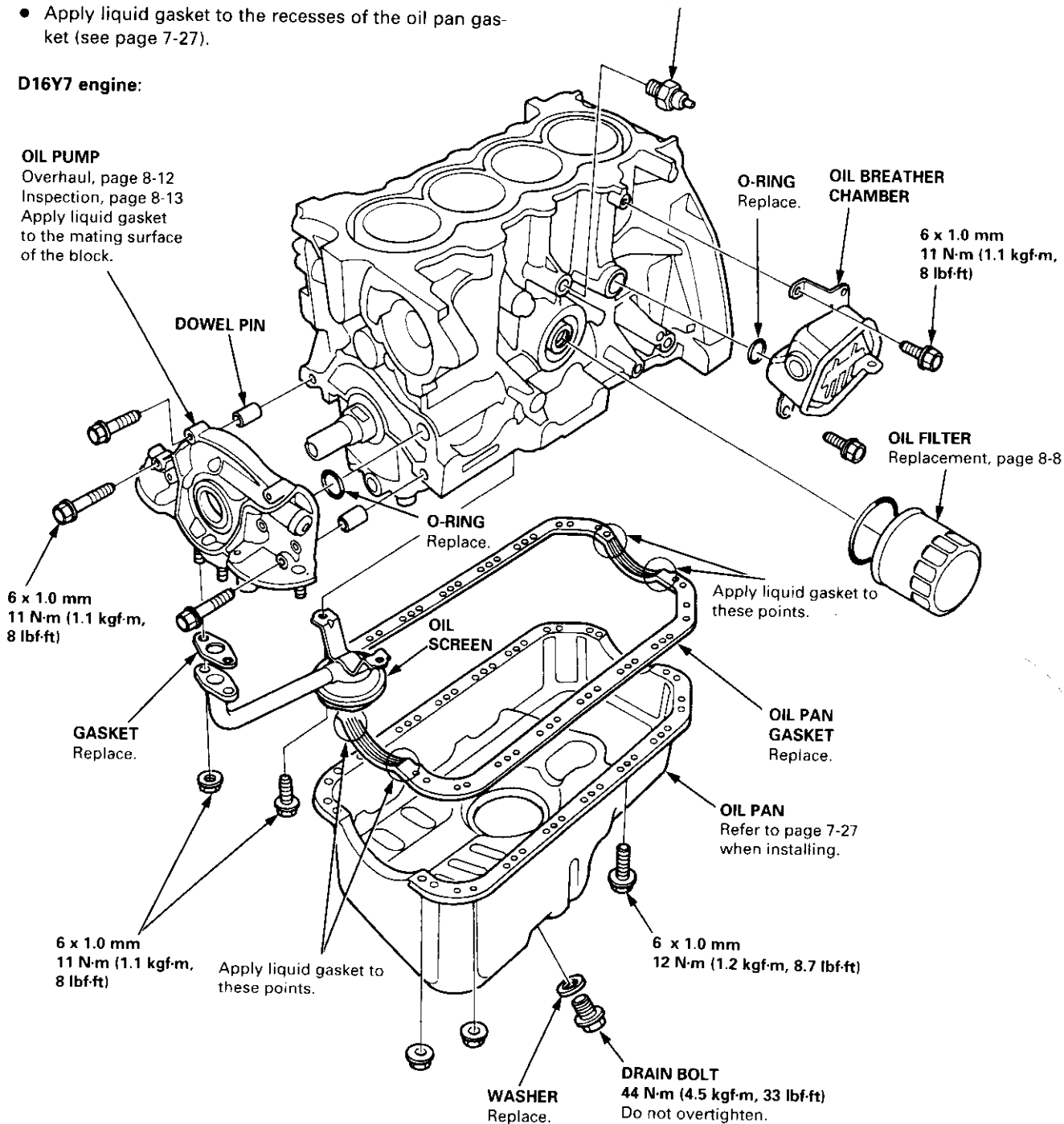
18 N·m (1.8 kgf·m, 13 lbf·ft)

1/8 in. BSPT (British Standard Pipe Taper)  
28 threads/inch. Use proper liquid sealant.

**D16Y7 engine:**

**OIL PUMP**

Overhaul, page 8-12  
Inspection, page 8-13  
Apply liquid gasket to the mating surface of the block.



# Engine Oil

## Inspection

1. Park the vehicle on level ground, and turn off the engine. Allow the oil a few minutes to drain back into the oil pan so the dipstick will show the actual level.
2. Make certain that the oil level indicated on the dipstick is between the upper and lower marks.
3. If the level has dropped close to the lower mark, add oil until it reaches the upper mark.

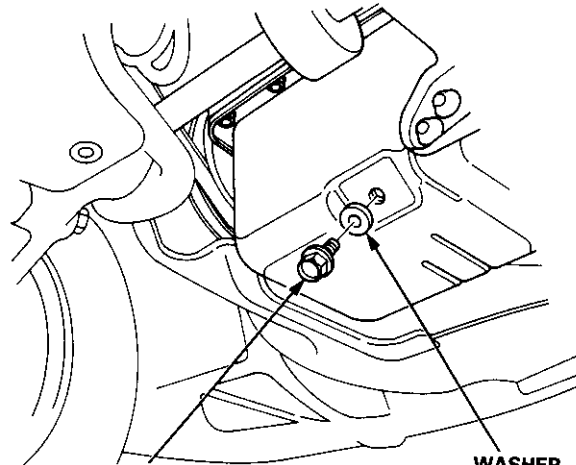
**CAUTION:** Insert the dipstick carefully to avoid bending it.

## Replacement

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

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

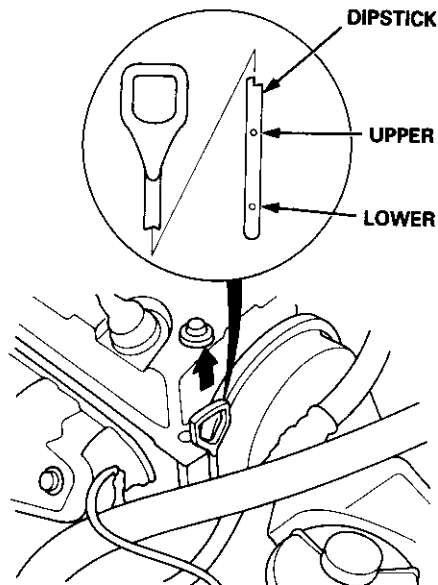
**B16A2, D16Y7 engines:**



**DRAIN BOLT**  
44 N·m (4.5 kgf·m, 33 lbf·ft)  
Do not overtighten.

**WASHER**  
Replace.

**D16Y5, D16Y7, D16Y8 engines:**



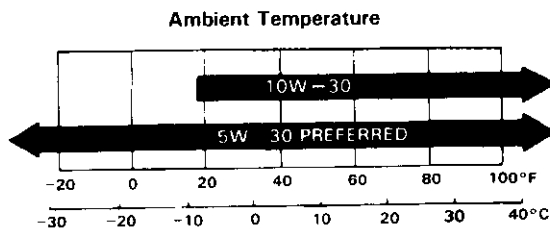




- Reinstall the drain bolt with a new washer, and refill the engine with the recommended oil.

Requirement	API Service Grade: Use an "Energy Conserving" SJ grade oil or an "Energy Conserving II" SH grade oil, SAE 5W - 30 preferred. You can also use an oil that bears the API CERTIFICATION mark.
Capacity	B16A2 engine: 3.7 l (3.9 US qt, 3.3 Imp qt) at oil change. 4.0 l (4.2 US qt, 3.5 Imp qt) at oil change, including filter. 4.8 l (5.1 US qt, 4.2 Imp qt) after engine overhaul. D16Y7 engine: 3.6 l (3.8 US qt, 3.2 Imp qt) at change, including filter. 3.3 l (3.5 US qt, 2.9 Imp qt) at change, without filter. 4.3 l (4.5 US qt, 3.8 Imp qt) after engine overhaul. D16Y5, D16Y8 engines: 3.3 l (3.5 US qt, 2.9 Imp qt) at change, including filter. 3.0 l (3.2 US qt, 2.6 Imp qt) at change, without filter. 3.7 l (3.9 US qt, 3.3 Imp qt) after engine overhaul.
Change	Every 7,500 miles (12,000 km) or 12 months (Normal Conditions). Every 3,750 miles (6,000 km) or 6 months (Severe Conditions).

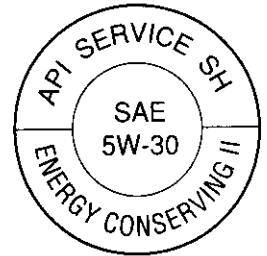
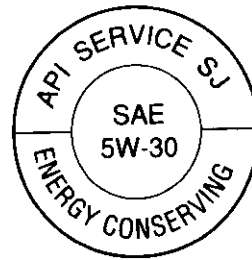
NOTE: Under normal conditions, the oil filter should be replaced at every other oil change. Under severe conditions, the oil filter should be replaced at each oil change. The numbers in the middle of the API Service label tell you the oil's SAE viscosity or weight. Select the oil for your car according to this chart:



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



API CERTIFICATION MARK



API SERVICE LABEL

- Run the engine for more than three minutes, then check for oil leakage.

# Oil Filter

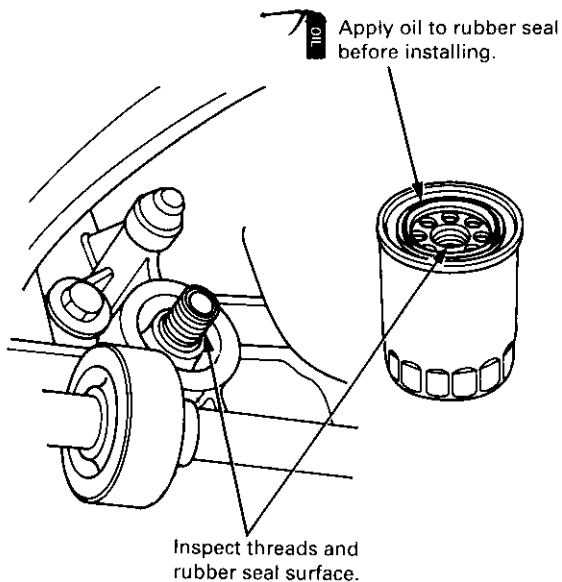
## Replacement

### ⚠ WARNING

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

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

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



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

**Tighten: 7/8 turn clockwise.**

**Tightening torque: 22 N·m (2.2 kgf·m, 16 lbf·ft)**

## **Intake Manifold/Exhaust System**

### **Intake Manifold**

**Replacement ..... 9-2**

### **Exhaust Manifold**

**Replacement ..... 9-6**

### **Exhaust Pipe and Muffler**

**Replacement ..... 9-9**

### **Three Way Catalytic Converter (TWC)**

**Inspection ..... 9-12**

### **Heated Oxygen Sensor (HO2S)**

**Replacement ..... 9-12**



# Intake Manifold

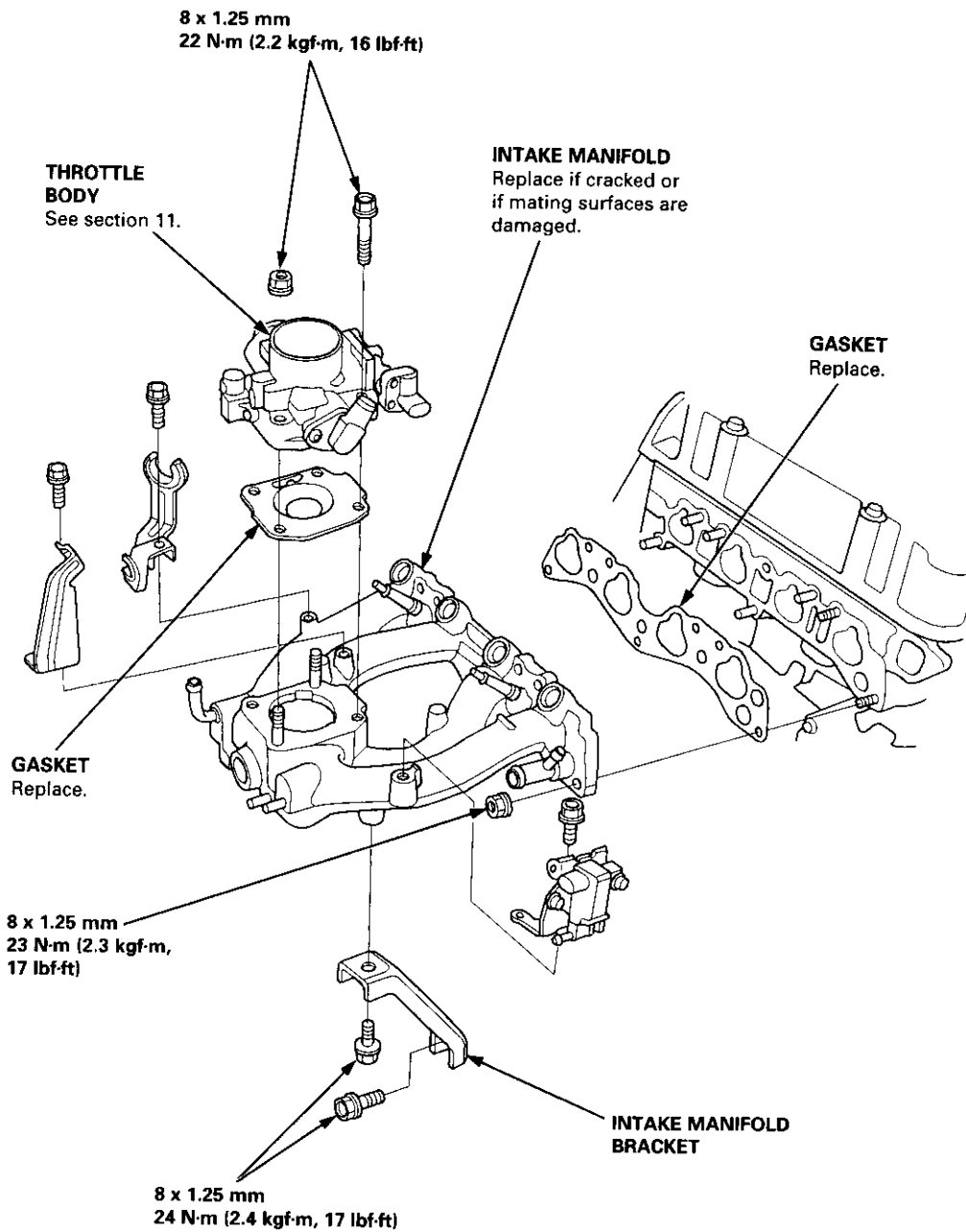
## Replacement

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.

D16Y7 engine:



# Exhaust Manifold

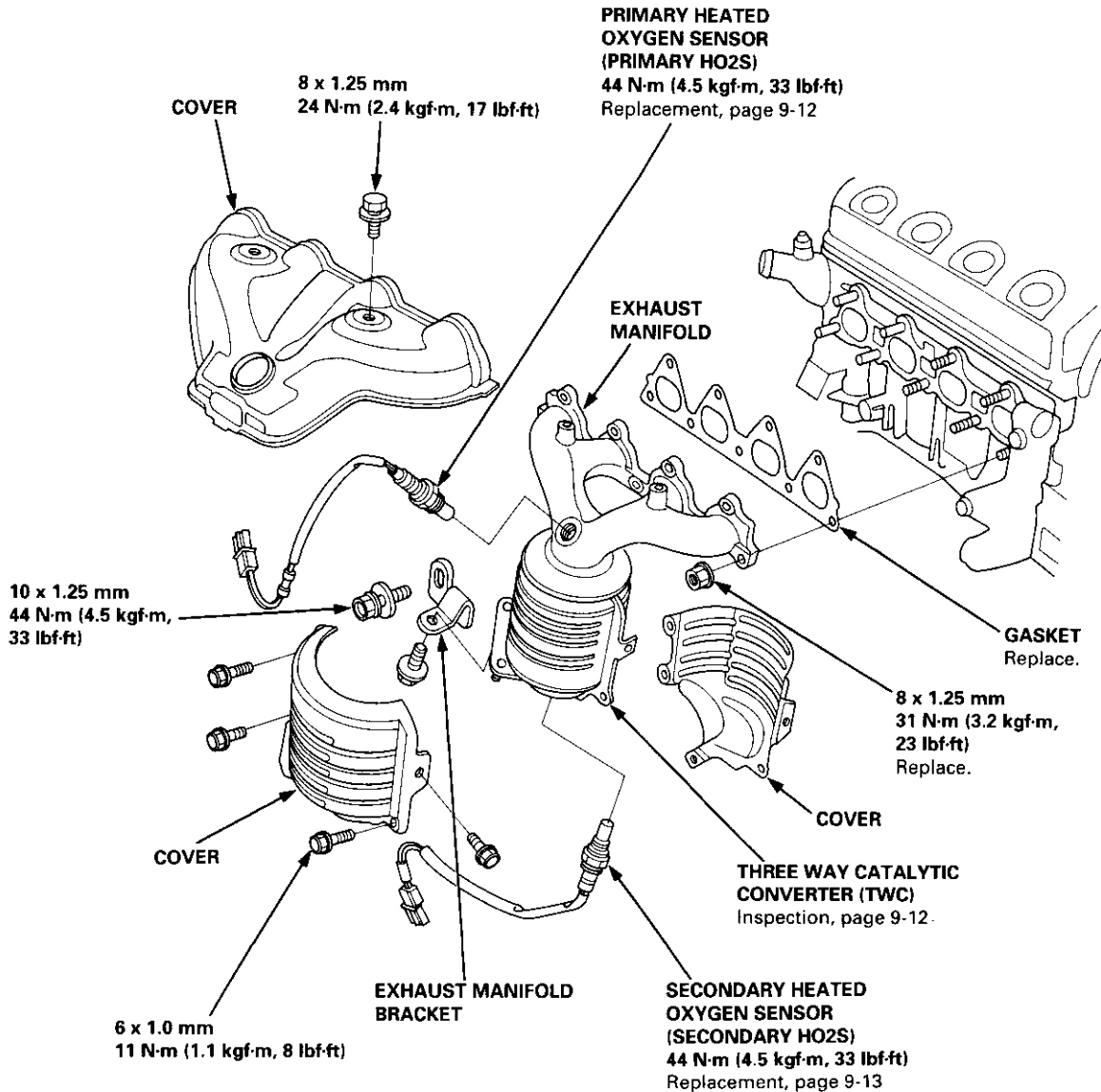
## Replacement

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

### CAUTION:

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

D16Y5, D16Y7 engines:



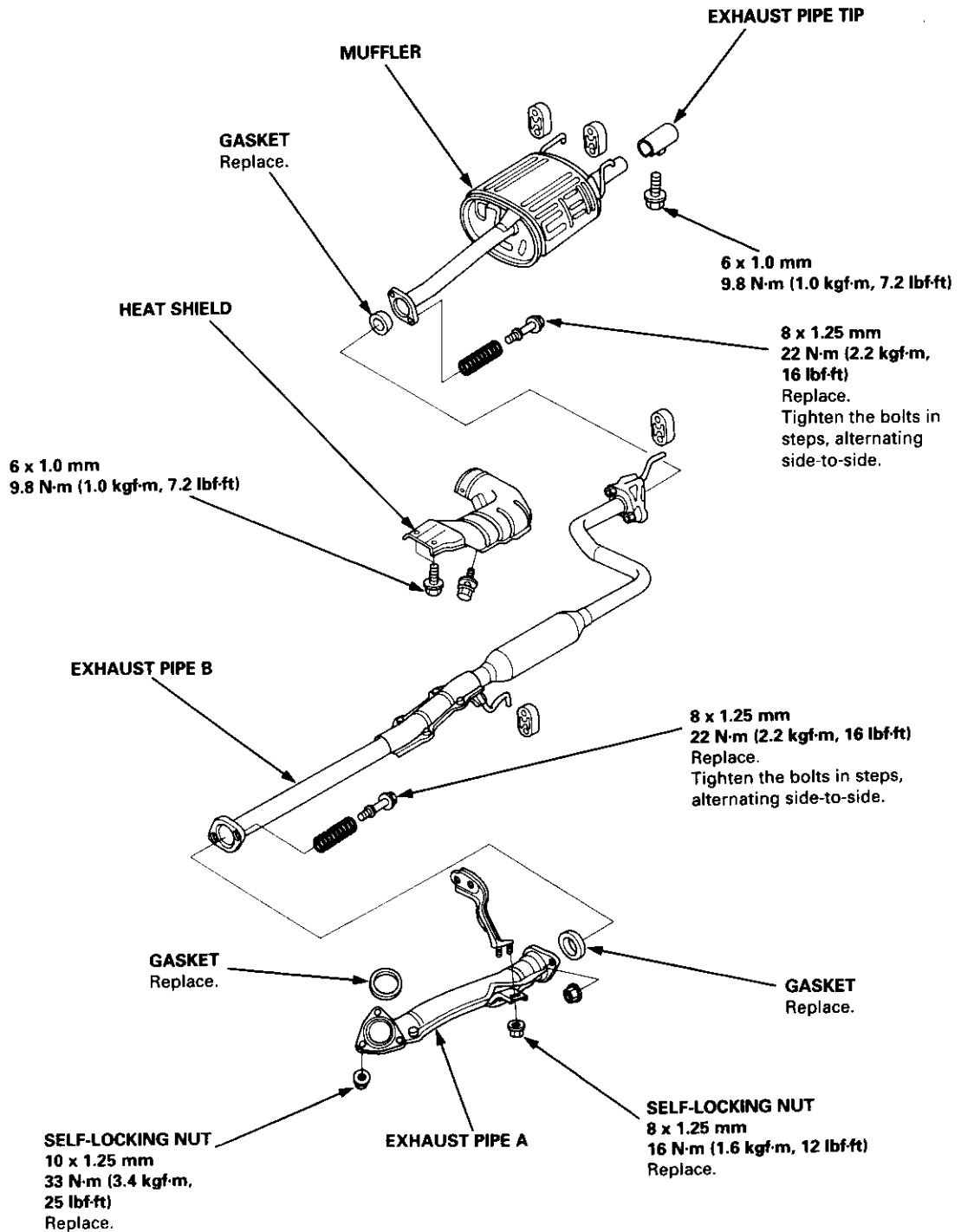
# Exhaust Pipe and Muffler



## Replacement

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

D16Y5, D16Y7 engines:



(cont'd)

## Cooling

<b>Illustrated Index .....</b>	<b>10-2</b>
<b>Radiator</b>	
<b>Replacement .....</b>	<b>10-6</b>
<b>Engine Coolant Refilling and     Bleeding .....</b>	<b>10-7</b>
<b>Cap Testing .....</b>	<b>10-9</b>
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<b>Thermostat</b>	
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<b>Engine Coolant Temperature (ECT) Switch</b>	
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<b>Inspection .....</b>	<b>10-14</b>
<b>Replacement .....</b>	<b>10-14</b>



# Illustrated Index

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

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

M/T	4.2 l (4.4 US qt, 3.7 Imp qt)* <sup>1</sup> 5.0 l (5.3 US qt, 4.4 Imp qt)* <sup>2</sup>
A/T	4.1 l (4.3 US qt, 3.6 Imp qt)* <sup>3</sup> 4.3 l (4.5 US qt, 3.8 Imp qt)* <sup>4</sup>
CVT	4.3 l (4.5 US qt, 3.8 Imp qt)

\*1: D16Y5, D16Y7, D16Y8 engines

\*2: B16A2 engine

\*3: D16Y7 engine

\*4: D16Y8 engine

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

**NOTE:**

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

## RADIATOR

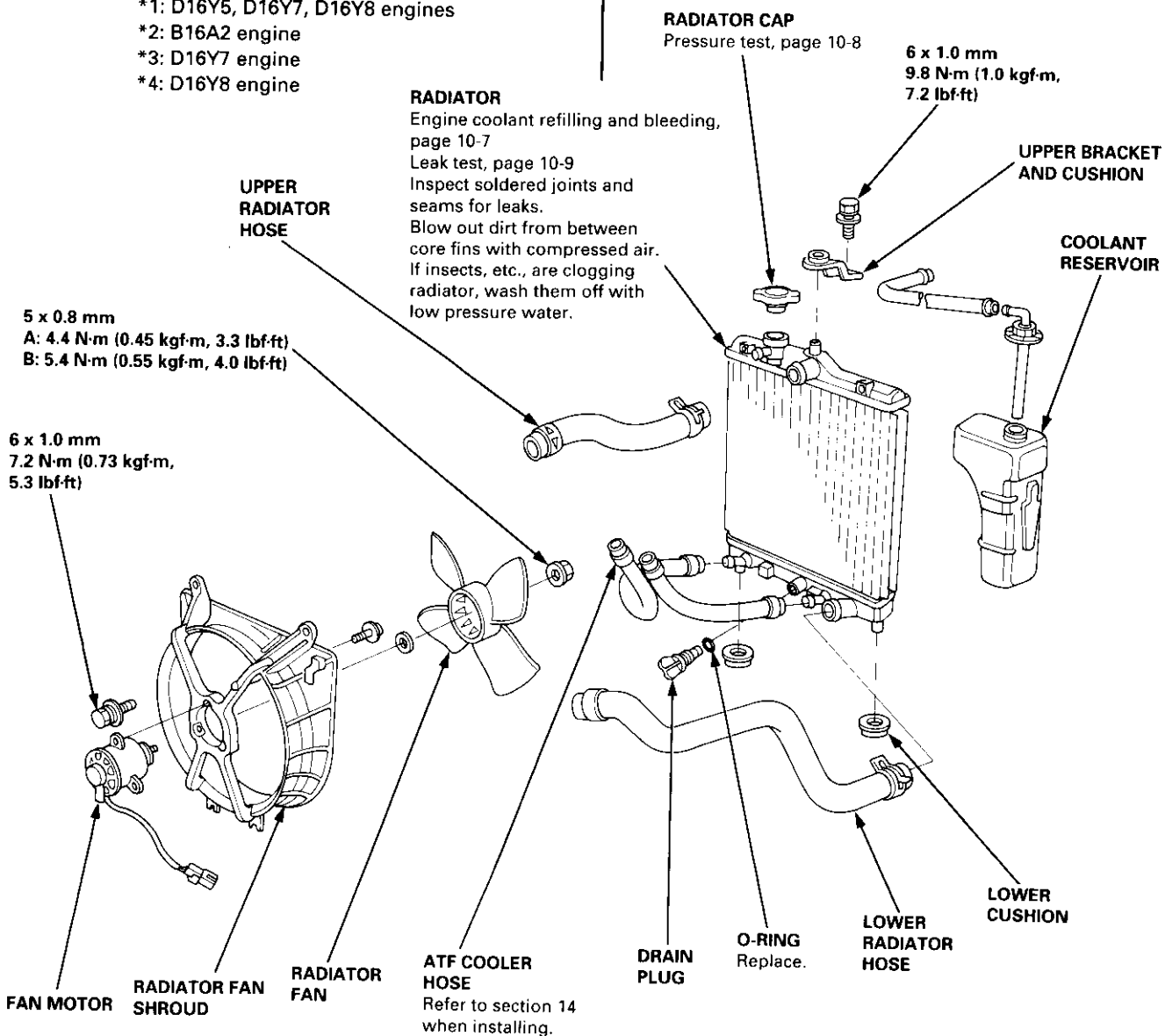
Engine coolant refilling and bleeding, page 10-7

Leak test, page 10-9

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.



A: TOYO RADIATOR manufactured radiator

B: NIPPONDENSO manufactured radiator



# Radiator

## Replacement

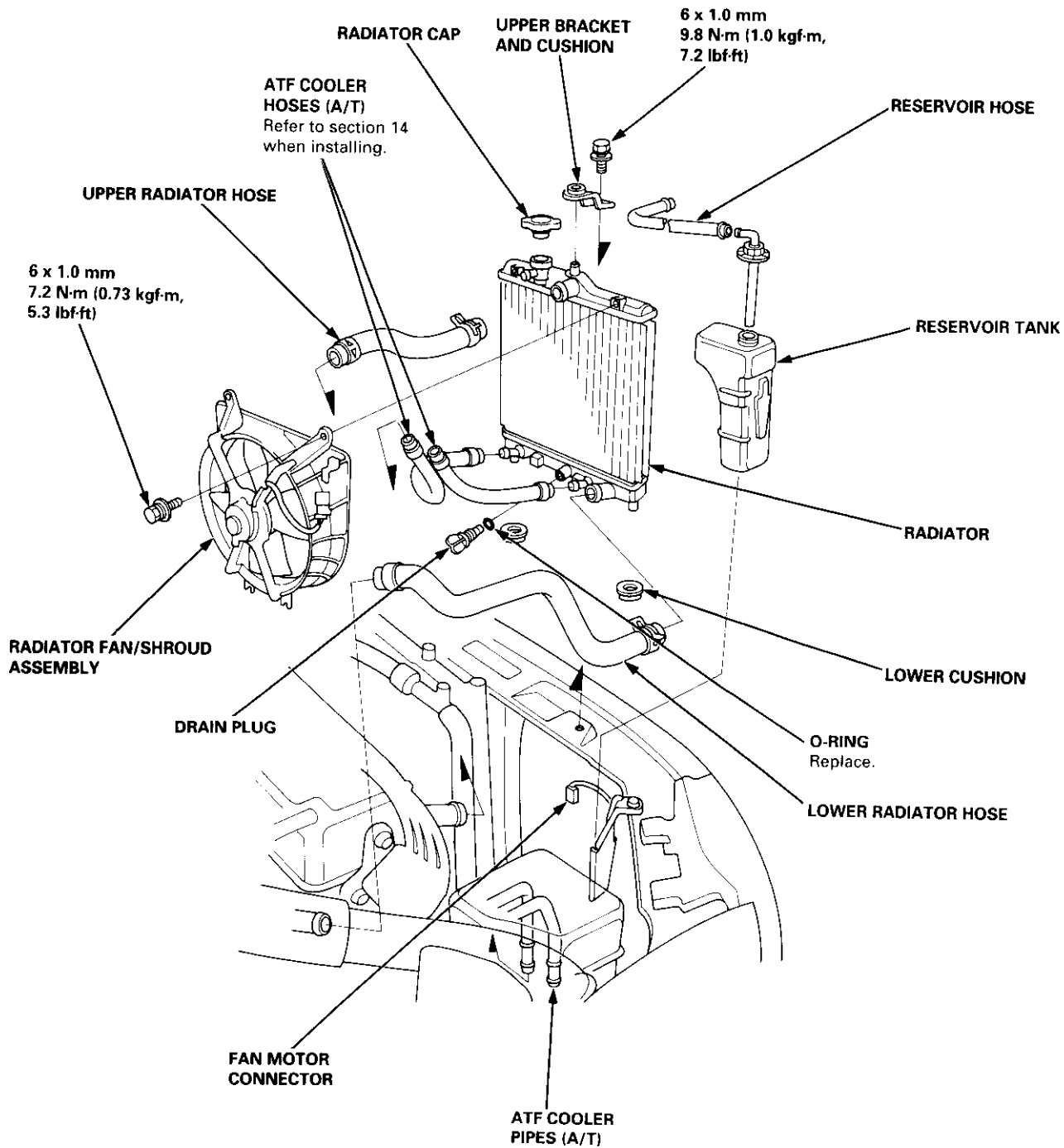
1. Drain the engine coolant.
2. Remove the upper and lower radiator hoses, and ATF cooler hoses.
3. Disconnect the fan motor connector.
4. Remove the radiator upper bracket, then pull up the radiator.

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

Install the radiator in the reverse order of removal:

**NOTE:**

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

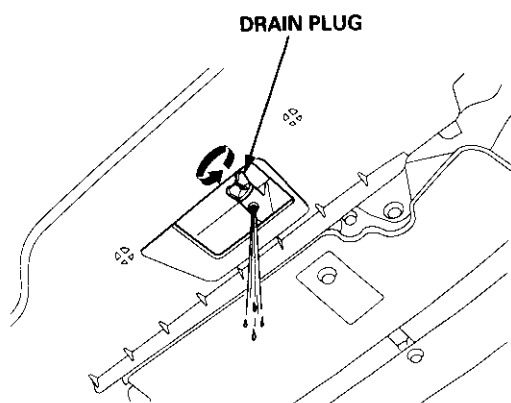




## Engine Coolant Refilling and Bleeding

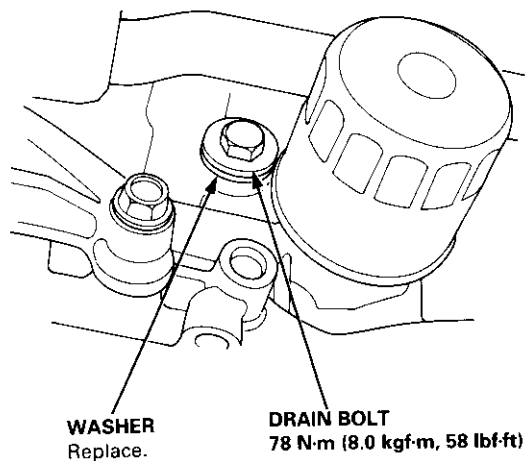
**CAUTION:** When pouring engine coolant, be sure to shut the relay box lid and not to let coolant spill on the electrical parts or the paint. If any coolant spills, rinse it off immediately.

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

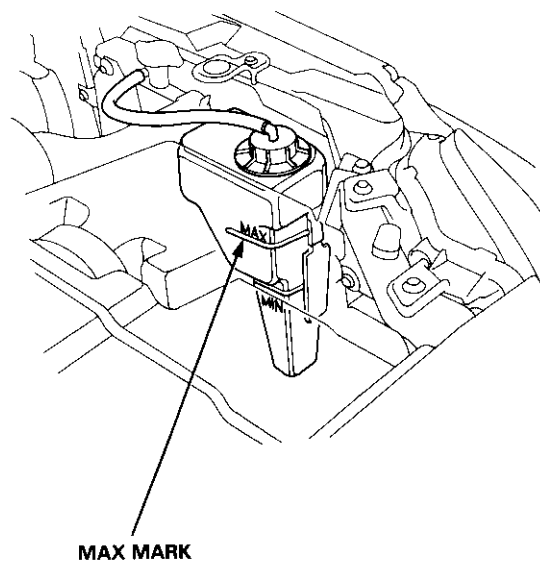


4. Remove the drain bolt from the cylinder block.

**D16Y5, D16Y7, D16Y8 engines:**



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



(cont'd)

# Radiator

## Engine Coolant Refilling and Bleeding (cont'd)

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

### NOTE:

- Use only genuine Honda antifreeze/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.

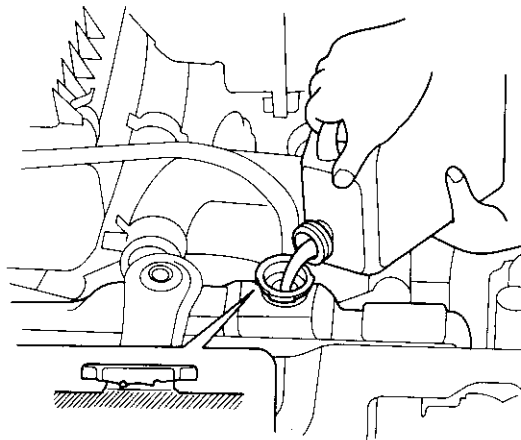
### CAUTION:

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

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

A/T | 3.7 ℓ (3.9 US qt, 3.3 Imp qt)\*3

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

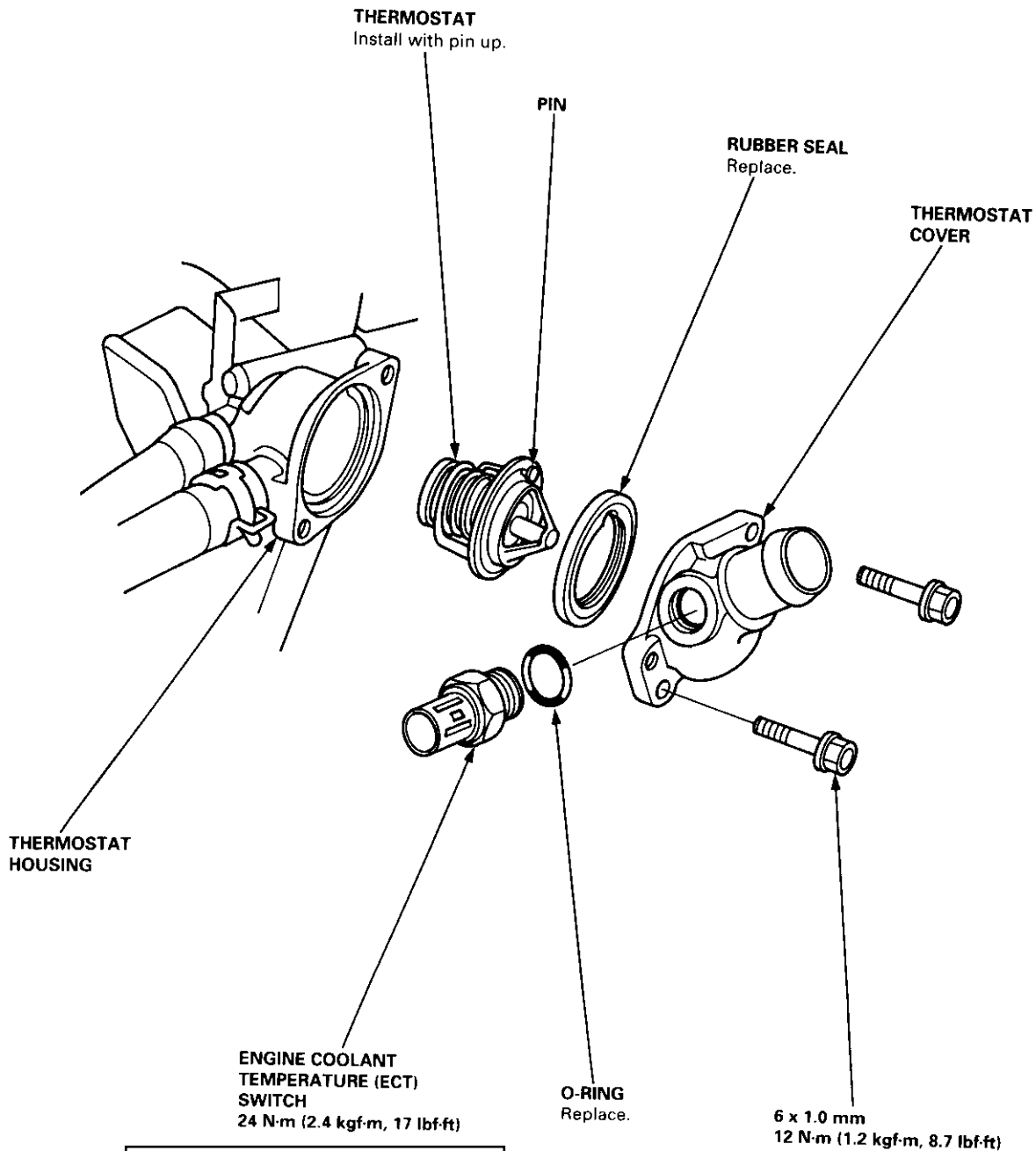


10. Start the engine and let it run until it warms up (the radiator fan comes on at least twice).
11. Turn off the engine. Check the level in the radiator, add coolant if needed.
12. Put the radiator cap on tightly, then run the engine again and check for leaks.

# Thermostat

## Replacement

NOTE: Use a new O-ring when reassembling.



Use same torque value for Engine Coolant Temperature Sensor in 11-5.

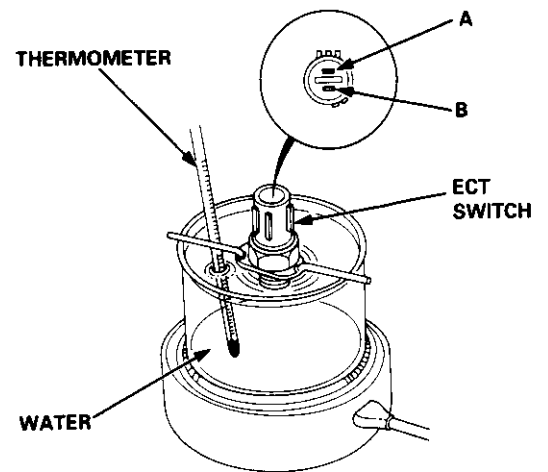


## Testing

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

**NOTE:** Bleed air from the cooling system after installing the ECT switch (see page 10-7).

1. Remove the ECT switch from the thermostat housing (see page 10-10).
2. Suspend the ECT switch in a container of water as shown.



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

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

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

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

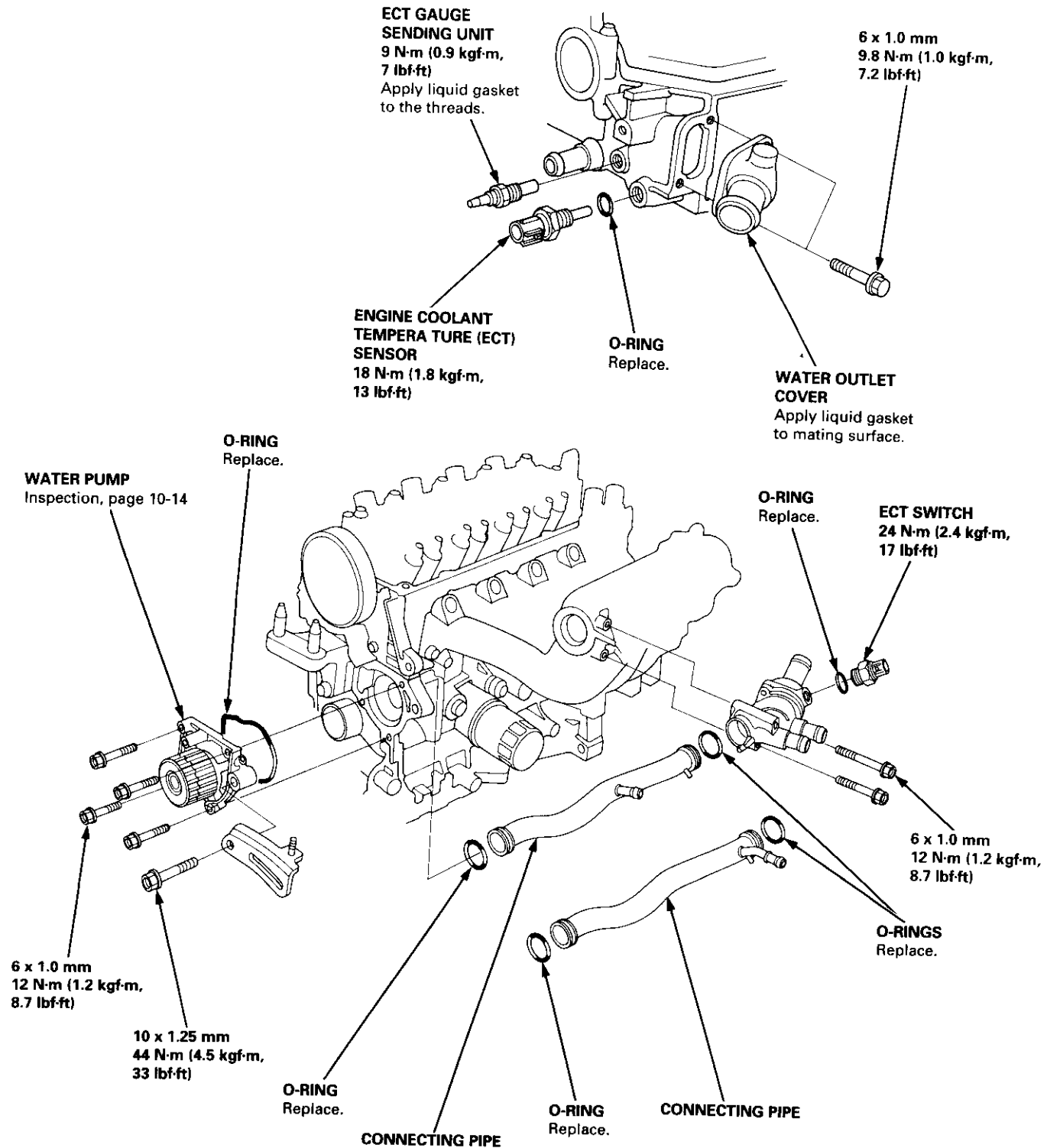
# Water Pump

## Illustrated Index

### NOTE:

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

D16Y5, D16Y7, D16Y8 engines:



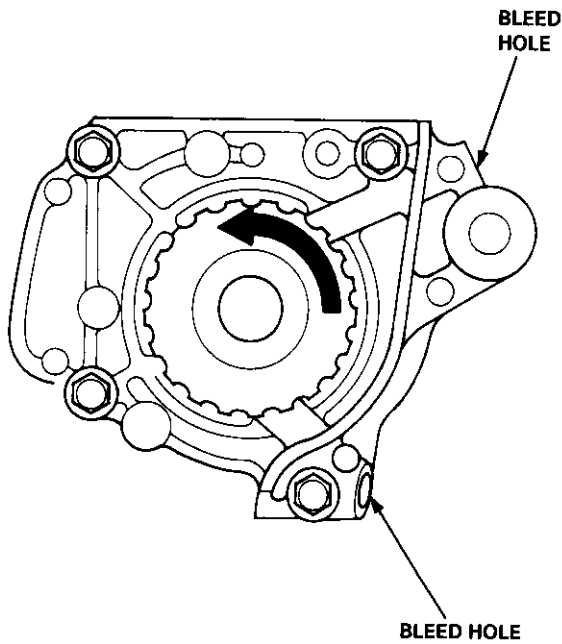
# Water Pump

## Inspection

1. Remove the timing belt (see section 6).
2. Turn the water pump pulley counterclockwise. Check that it turns freely.
3. Check for signs of seal leakage.

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

D16Y5, D16Y7, D16Y8 engines:

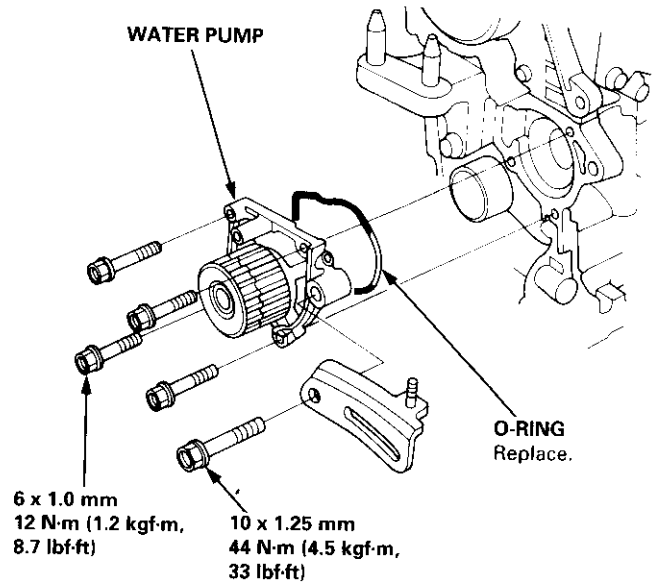


## Replacement

1. Remove the timing belt (see section 6).
2. Remove the water pump by removing five bolts.

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

D16Y5, D16Y7, D16Y8 engines:



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## Emission Control System

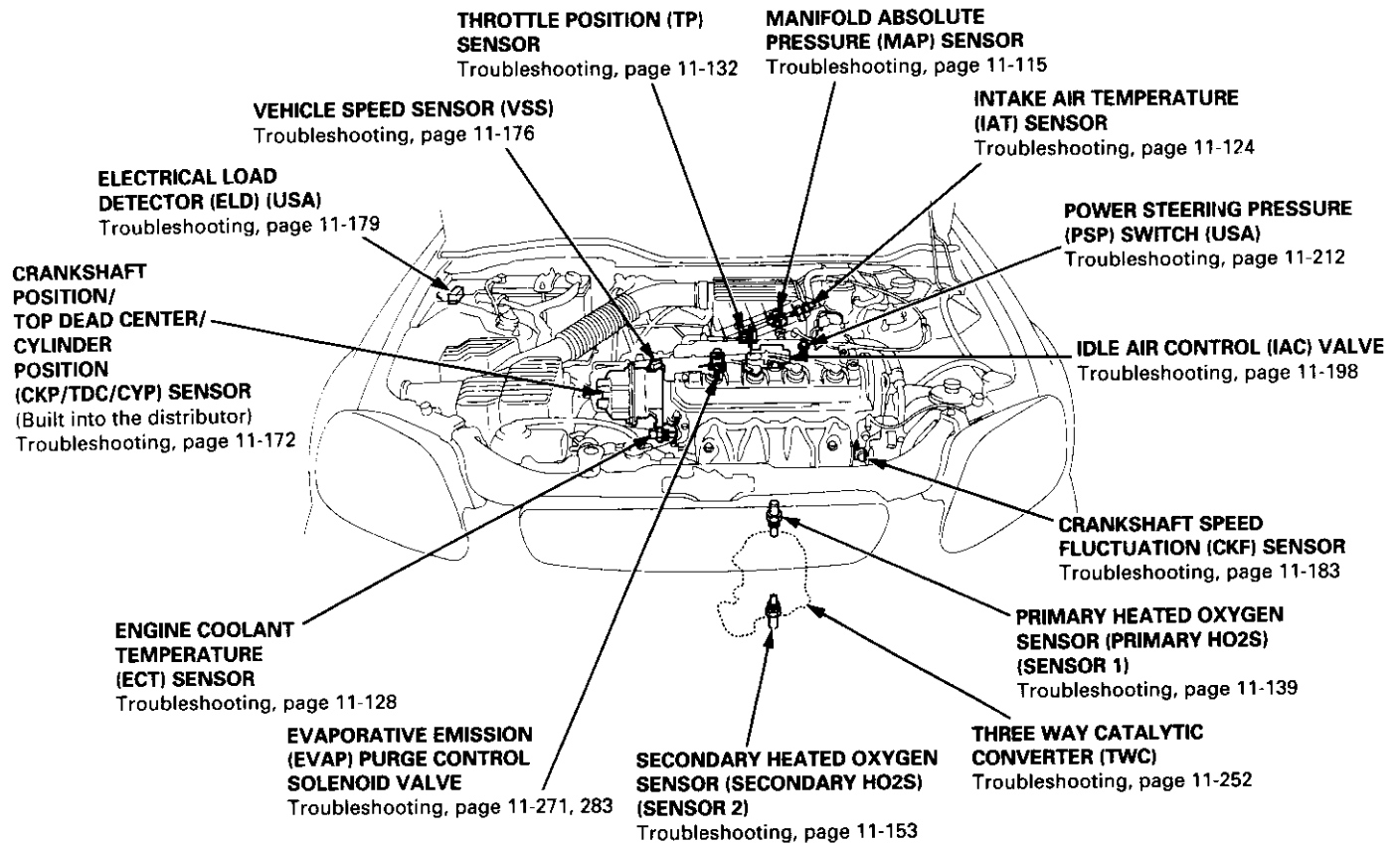
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**D16Y7 engine:**

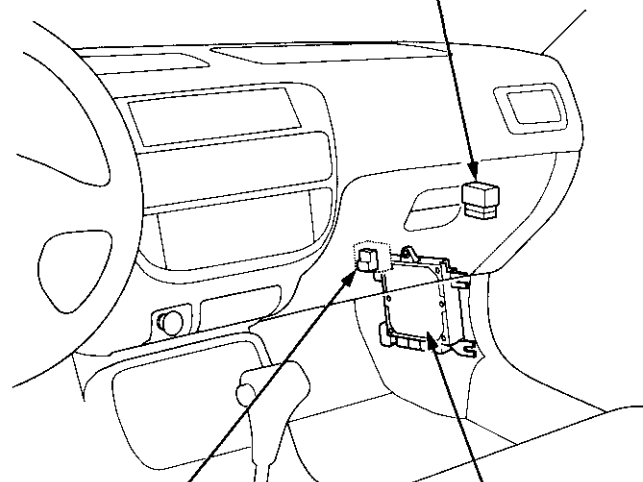


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'99 - 00 models:

**PGM-FI MAIN RELAY**  
Relay Testing, page 11-237  
Troubleshooting, page 11-238



**SERVICE CHECK CONNECTOR  
(2P)**  
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page 11-81

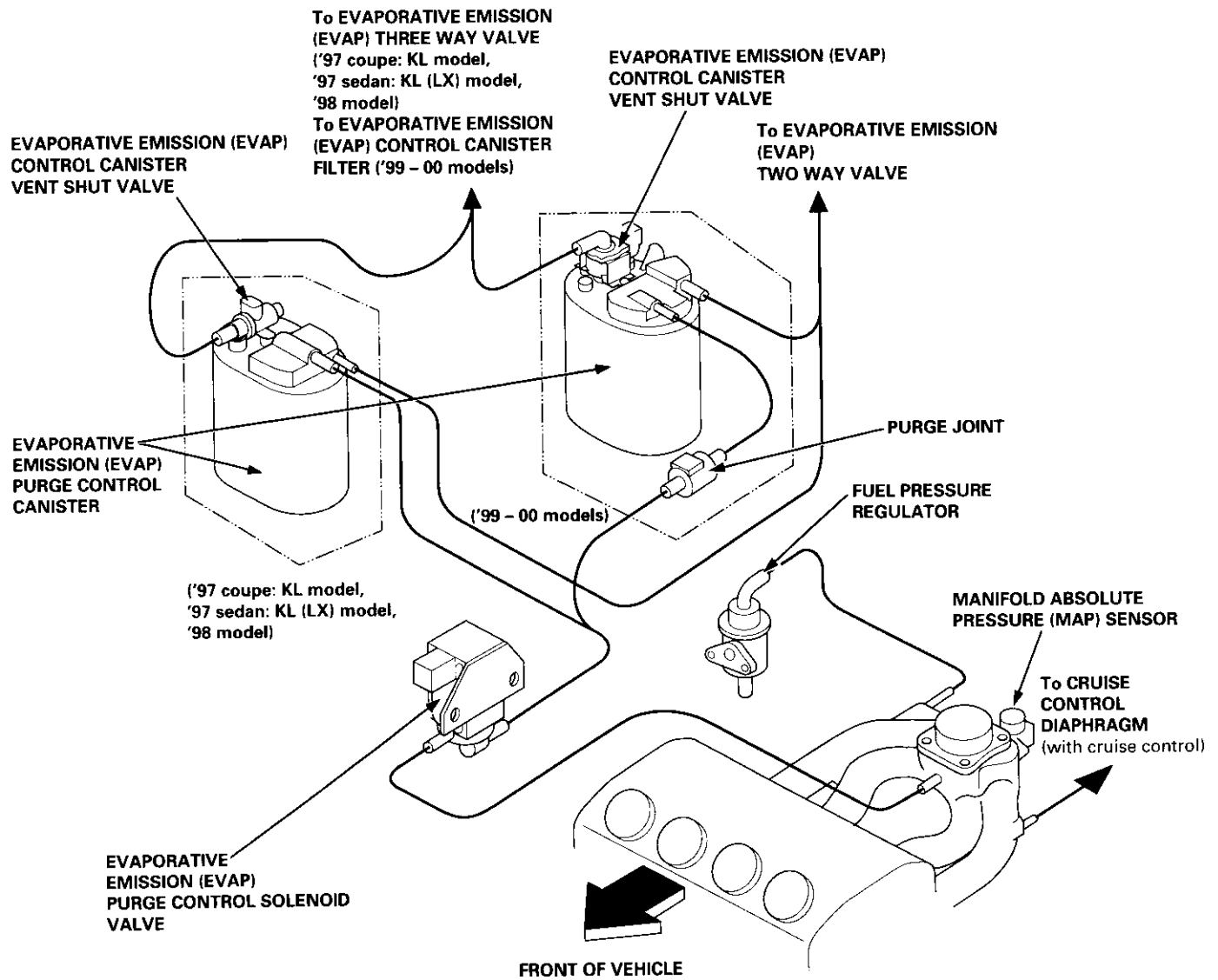
**ENGINE CONTROL MODULE  
(ECM)/POWERTRAIN  
CONTROL MODULE (PCM)**  
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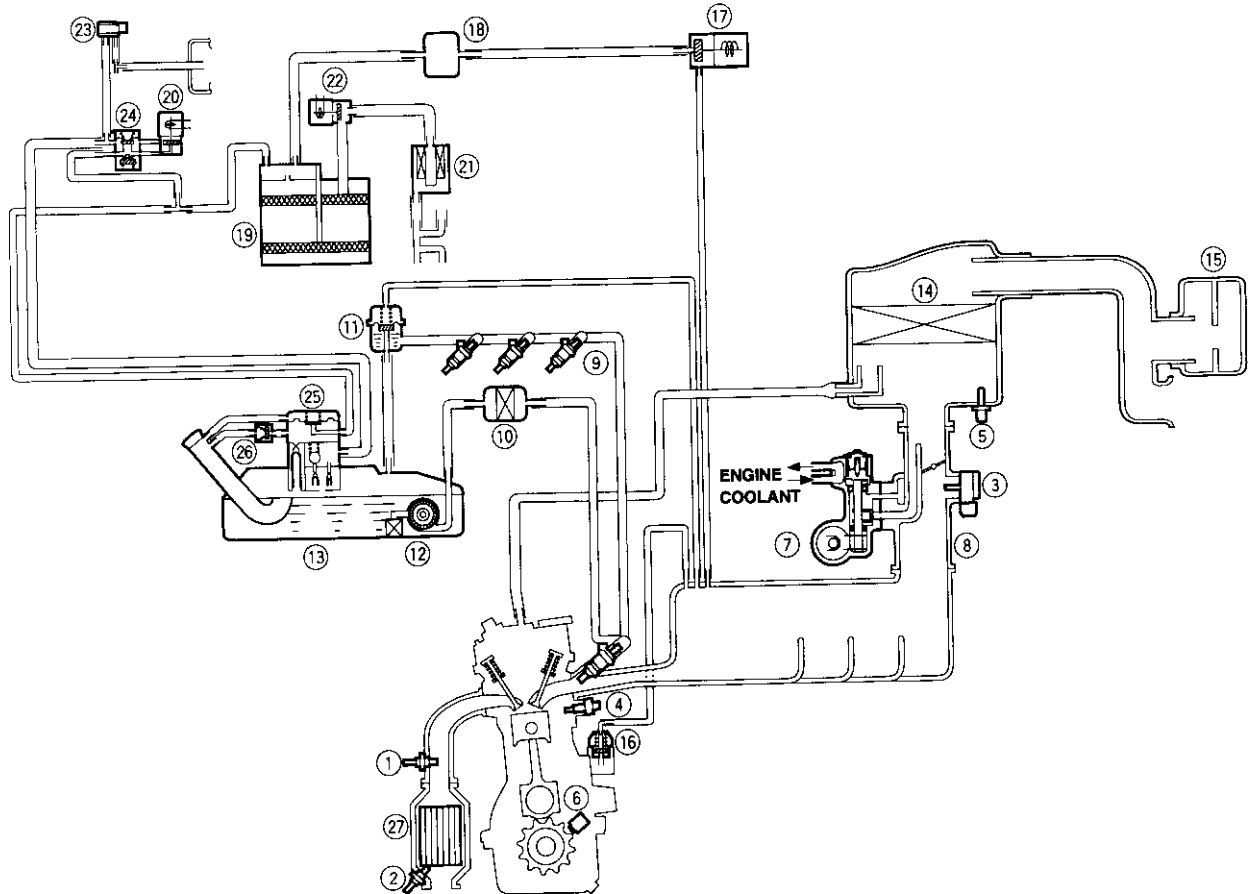
D16Y7 engine ('97 coupe: KL model, '97 sedan: KL (LX) model, '98 model, '99 model, '00 model):



(cont'd)



D16V7 engine ('99 - 00 models):



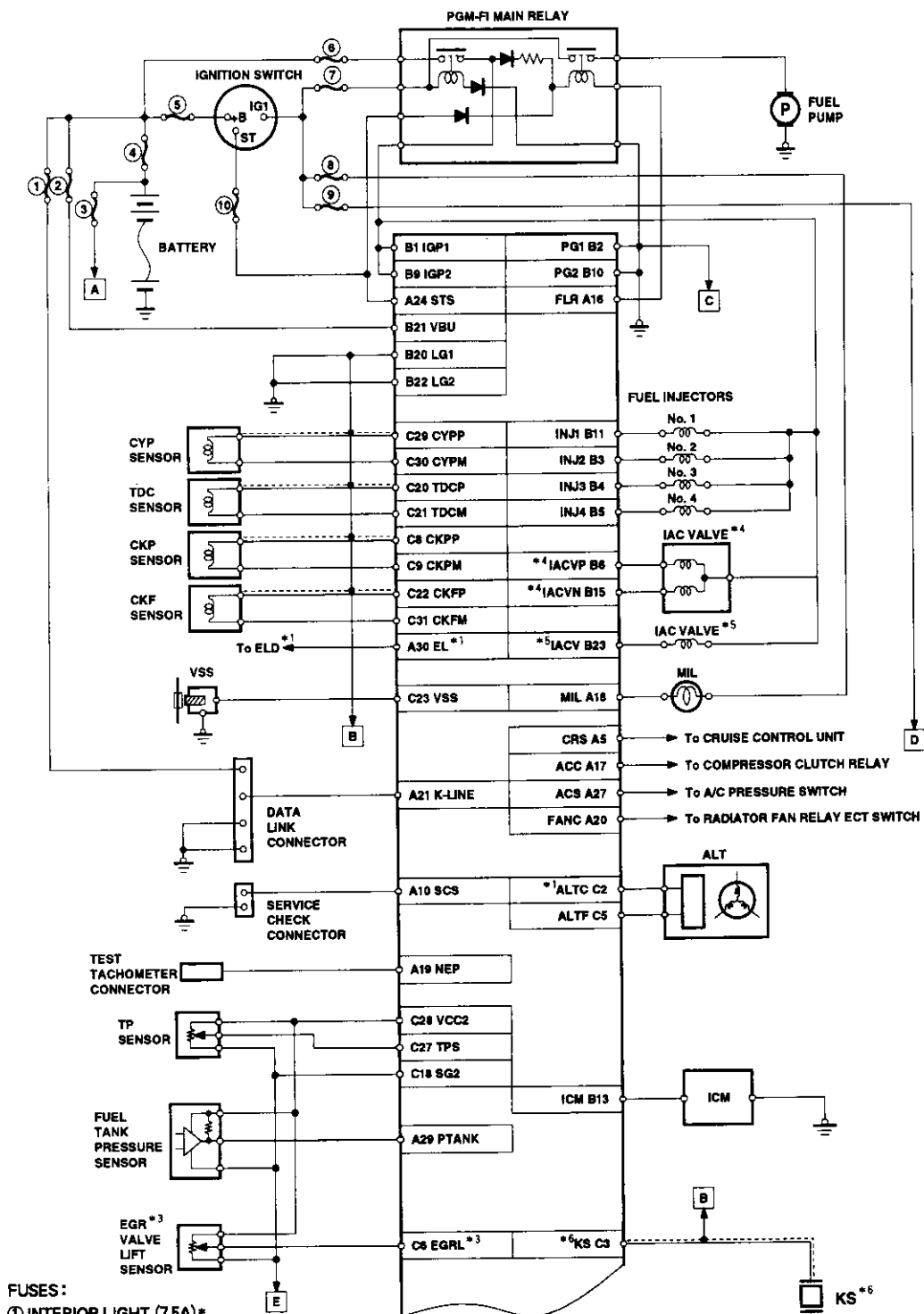
- ① PRIMARY HEATED OXYGEN SENSOR (PRIMARY HO<sub>2</sub>S, SENSOR 1)
- ② SECONDARY HEATED OXYGEN SENSOR (SECONDARY HO<sub>2</sub>S, SENSOR 2)
- ③ MANIFOLD ABSOLUTE PRESSURE (MAP) SENSOR
- ④ ENGINE COOLANT TEMPERATURE (ECT) SENSOR
- ⑤ INTAKE AIR TEMPERATURE (IAT) SENSOR
- ⑥ CRANKSHAFT SPEED FLUCTUATION (CKF) SENSOR
- ⑦ IDLE AIR CONTROL (IAC) VALVE
- ⑧ THROTTLE BODY (TB)
- ⑨ FUEL INJECTOR
- ⑩ FUEL FILTER
- ⑪ FUEL PRESSURE REGULATOR
- ⑫ FUEL PUMP (FP)
- ⑬ FUEL TANK
- ⑭ AIR CLEANER
- ⑮ RESONATOR

- ⑯ POSITIVE CRANKCASE VENTILATION (PCV) VALVE
- ⑰ EVAPORATIVE EMISSION (EVAP) PURGE CONTROL SOLENOID VALVE
- ⑱ PURGE JOINT
- ⑲ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER
- ⑳ EVAPORATIVE EMISSION (EVAP) BYPASS SOLENOID VALVE
- ㉑ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER FILTER
- ㉒ EVAPORATIVE EMISSION (EVAP) CONTROL CANISTER VENT SHUT VALVE
- ㉓ FUEL TANK PRESSURE SENSOR
- ㉔ EVAPORATIVE EMISSION (EVAP) TWO WAY VALVE
- ㉕ ONBOARD REFUELING VAPOR RECOVERY (ORVR) VENT SHUT VALVE
- ㉖ ONBOARD REFUELING VAPOR RECOVERY (ORVR) VAPOR RECIRCULATION VALVE
- ㉗ THREE WAY CATALYTIC CONVERTER (TWC)

(cont'd)



# Electrical Connections ('99 - 00 Models except D16Y5 engine with M/T)



**FUSES:**

- ① INTERIOR LIGHT (7.5A)\*
- ② BACK UP (7.5A)\*
- ③ HORN (15A)\*
- ④ BATTERY (80A)\*
- ⑤ IG1 (40A)\*
- ⑥ FI E/M (15A)\*
- ⑦ No. 13 FUEL PUMP (15A)

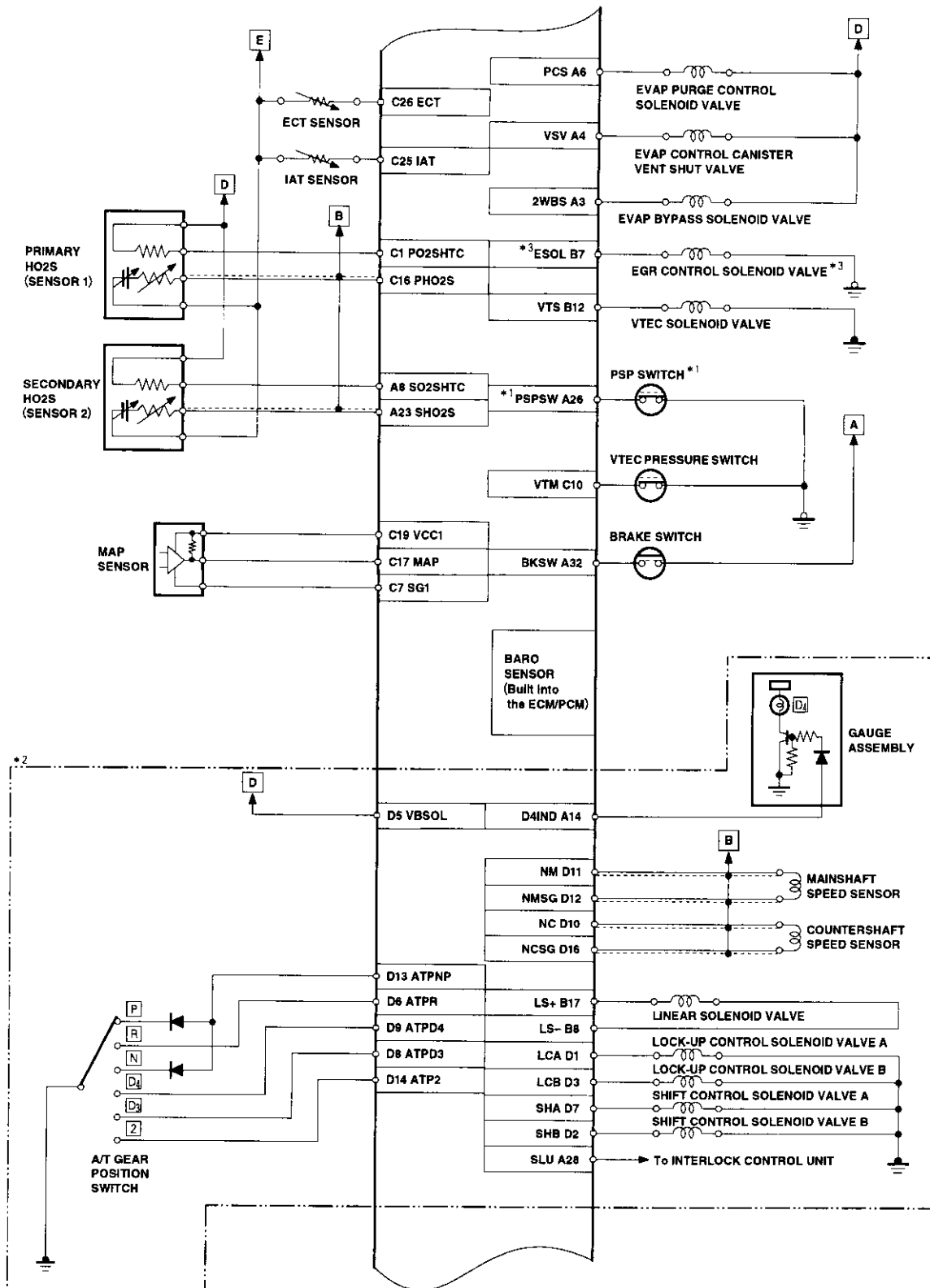
- ⑧ No. 25 METER (7.5A)
- ⑨ No. 15 ALTERNATOR SP SENSOR (7.5A)
- ⑩ No. 31 STARTER SIGNAL (7.5A)

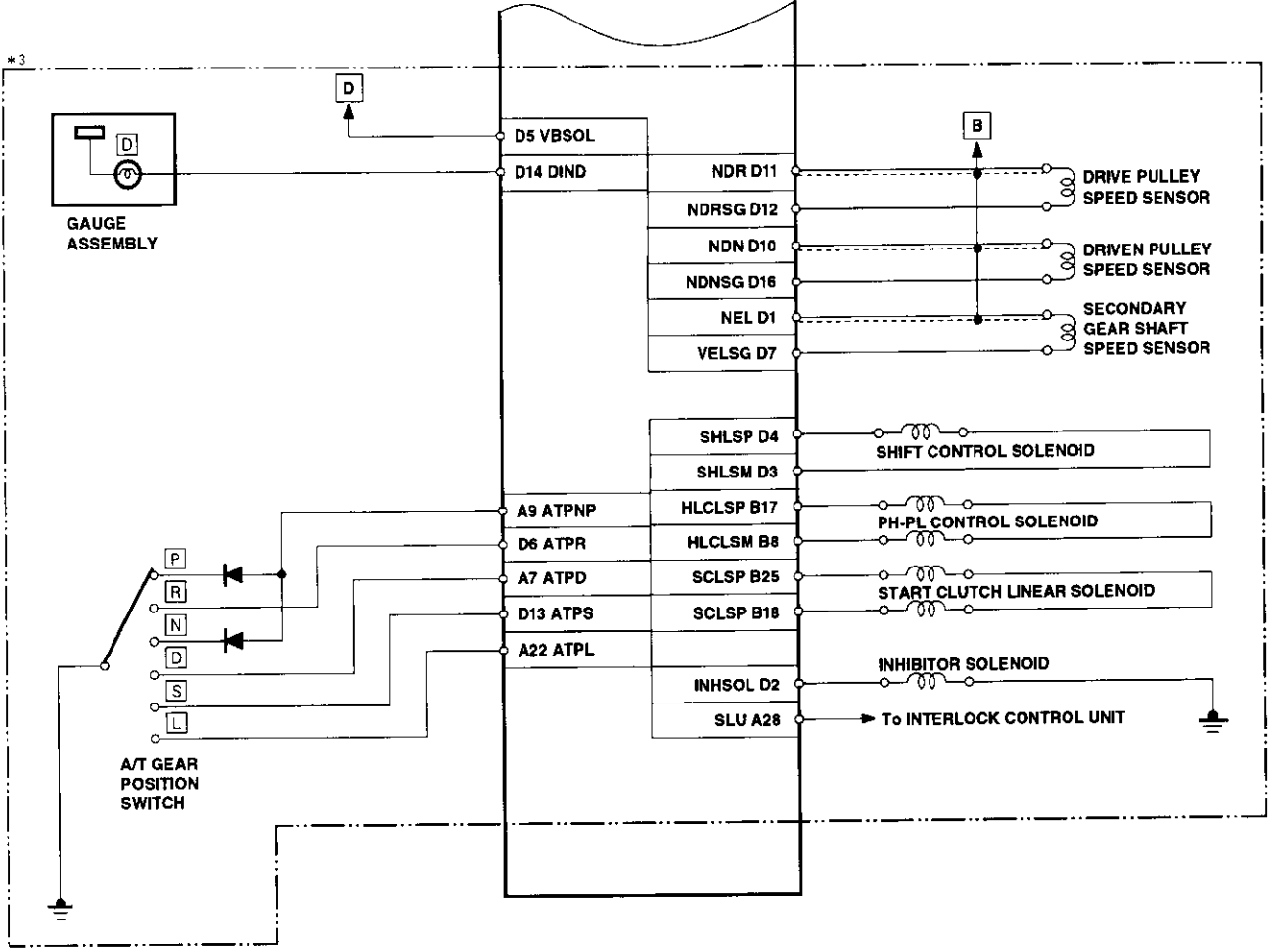
\*: in the under-hood fuse/relay box

(cont'd)

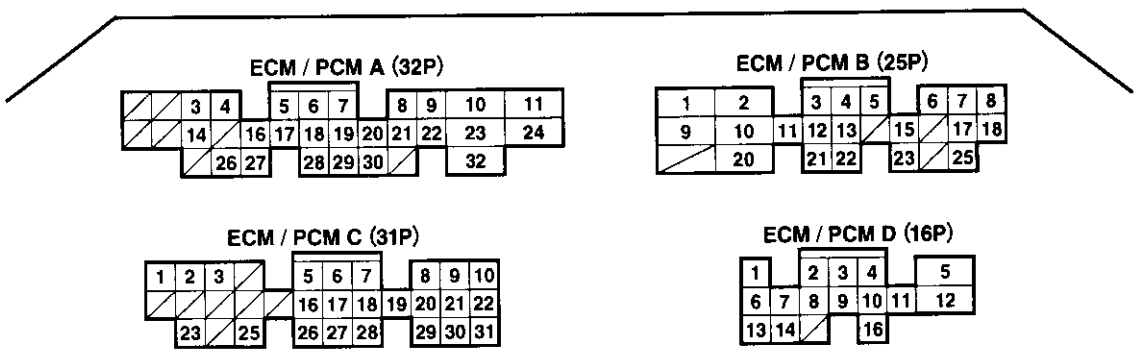
# System Description

## Electrical Connections ('99 – 00 Models except D16Y5 engine with M/T) (cont'd)





- \*1: USA model
- \*2: A/T(D16Y7, D16Y8 engine)
- \*3: CVT(D16Y5 engine)
- \*4: A/T and D16Y7 engine
- \*5: Except A/T and D16Y7 engine
- \*6: CVT(D16Y5 engine), D16Y8 engine and B16A2 engine



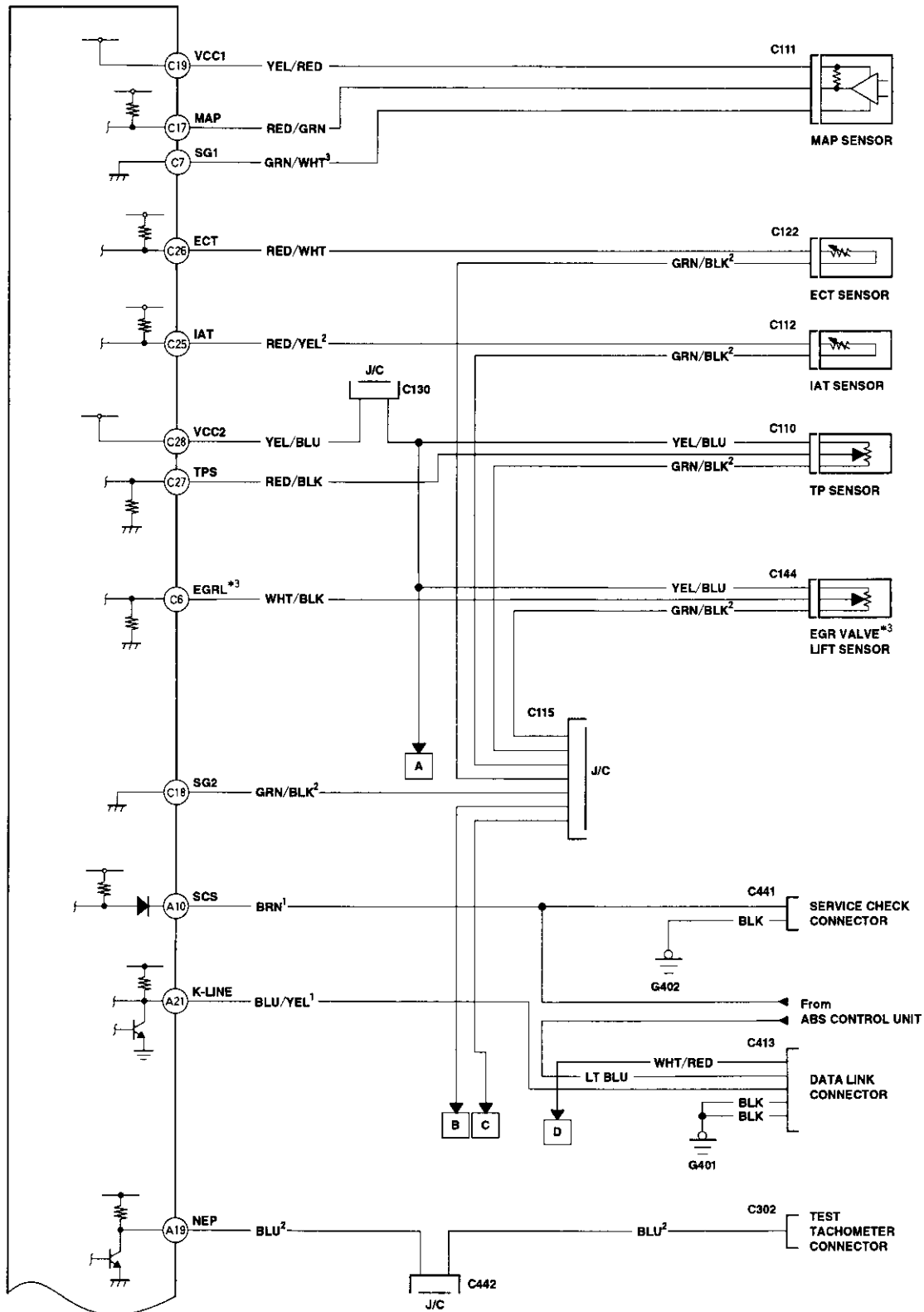
TERMINAL LOCATIONS

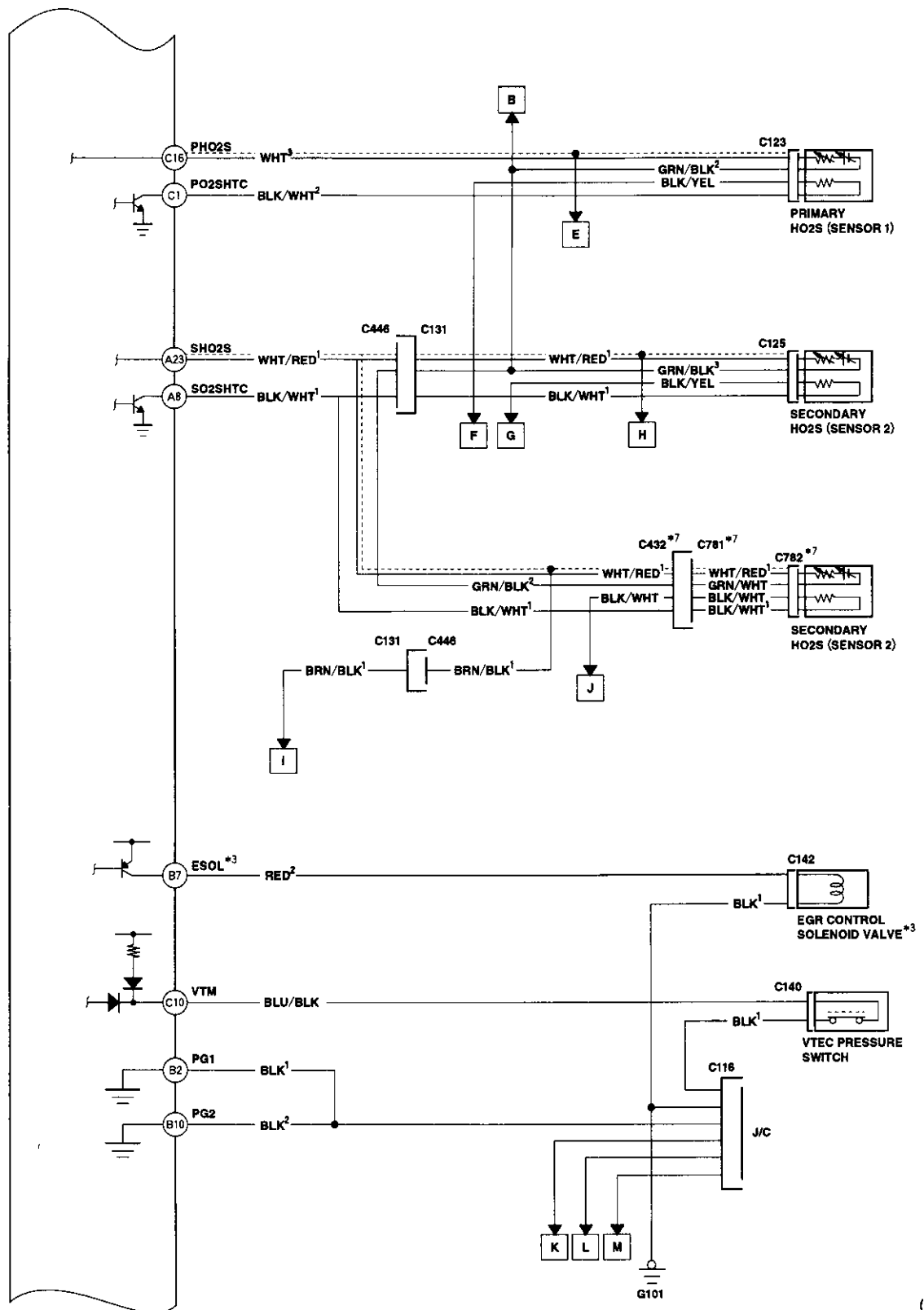
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# System Description

## Electrical Connections ('99 – 00 Models except D16Y5 engine with M/T) (cont'd)

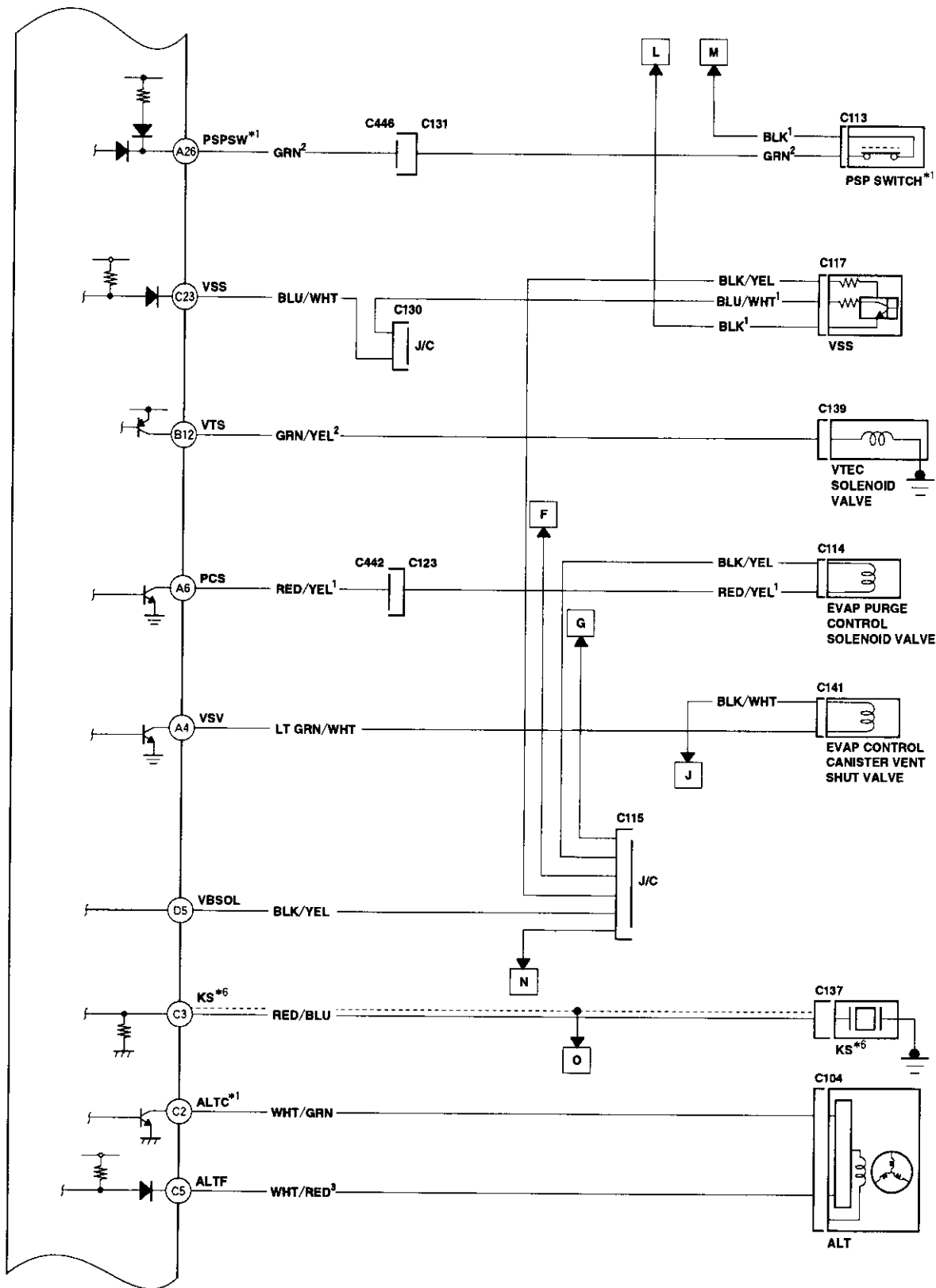


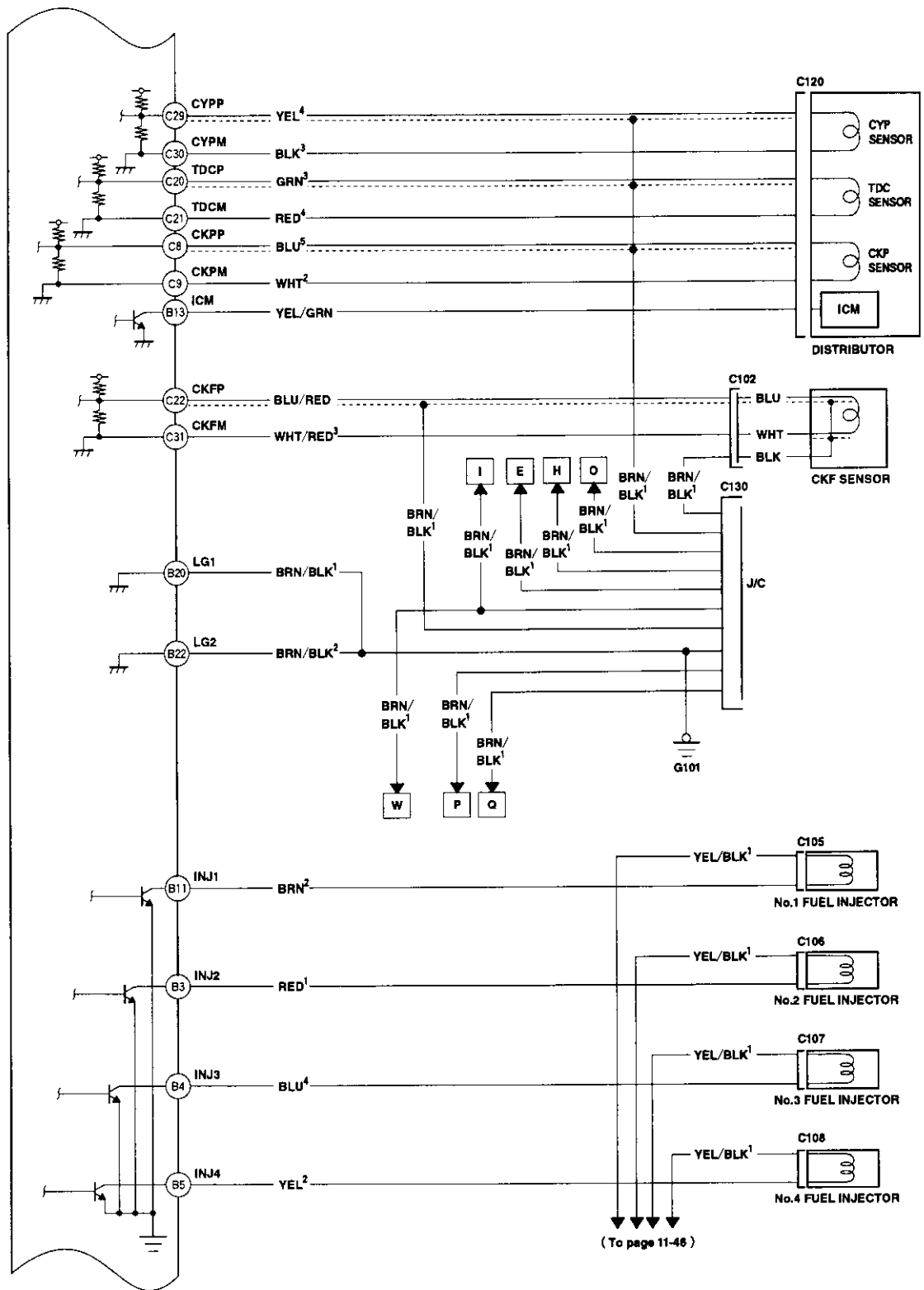


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# System Description

## Electrical Connections ('99 - 00 Models except D16Y5 engine with M/T) (cont'd)



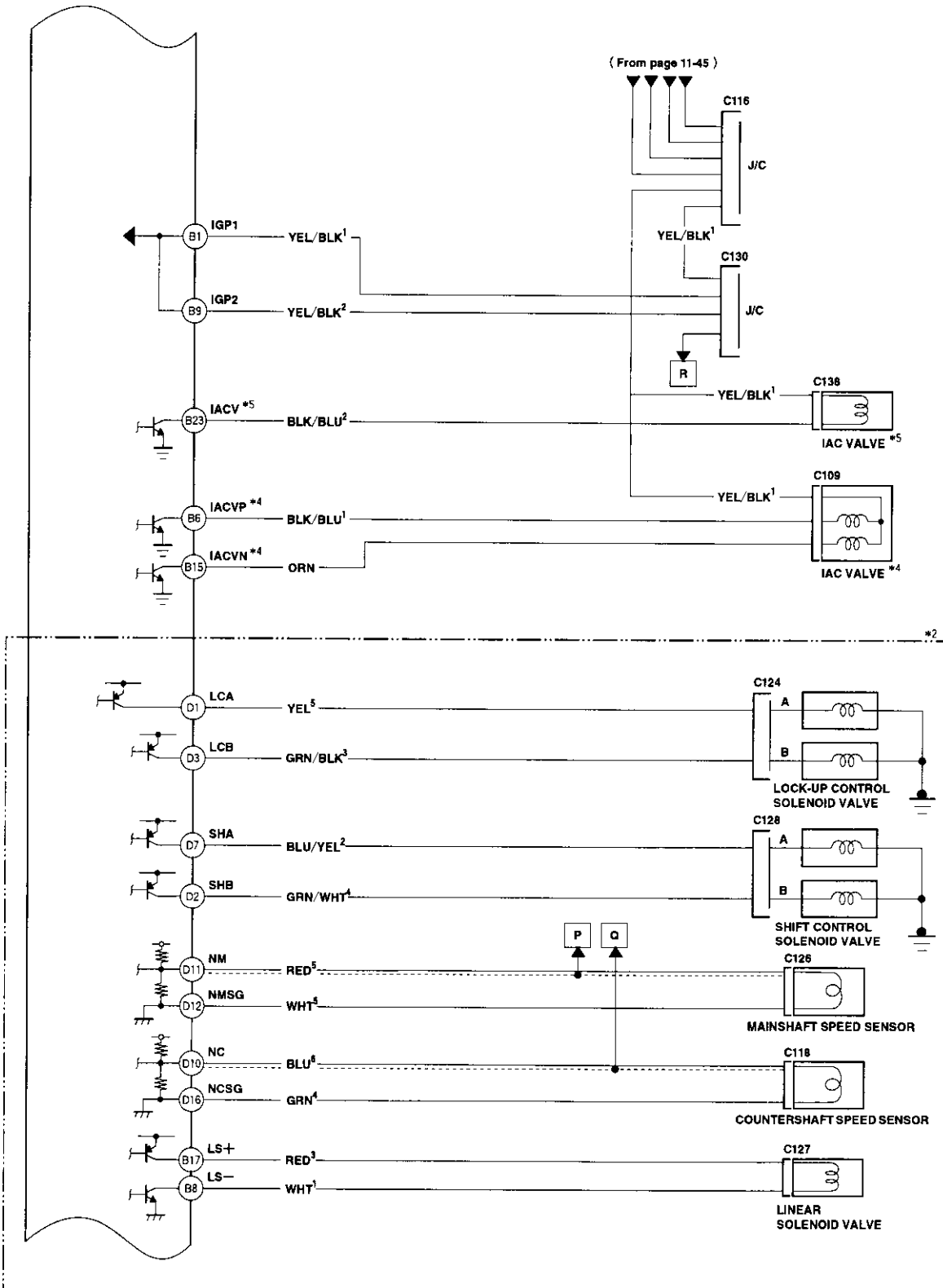


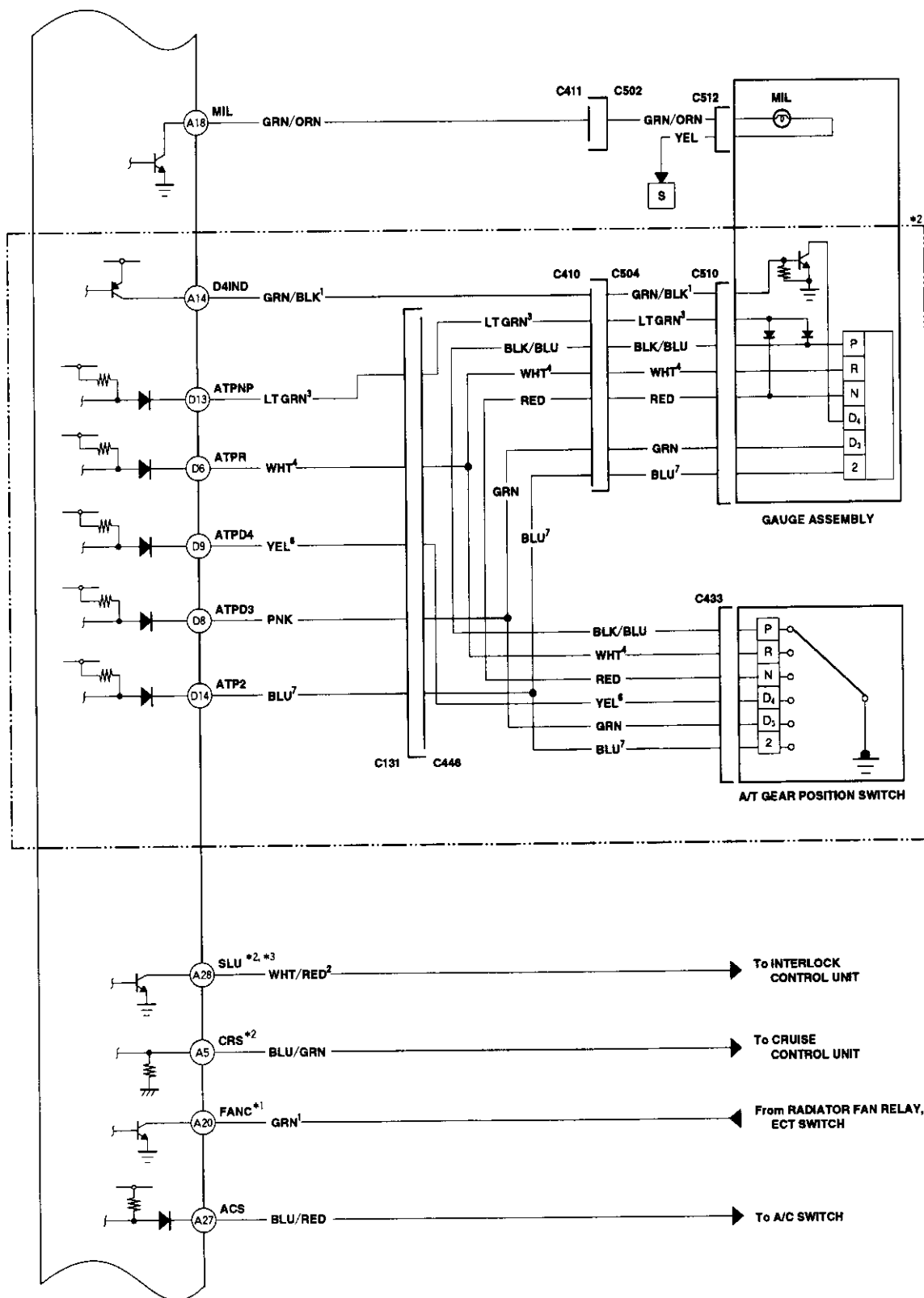
(To page 11-46)

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# System Description

## Electrical Connections ('99 - 00 Models except D16Y5 engine with M/T) (cont'd)

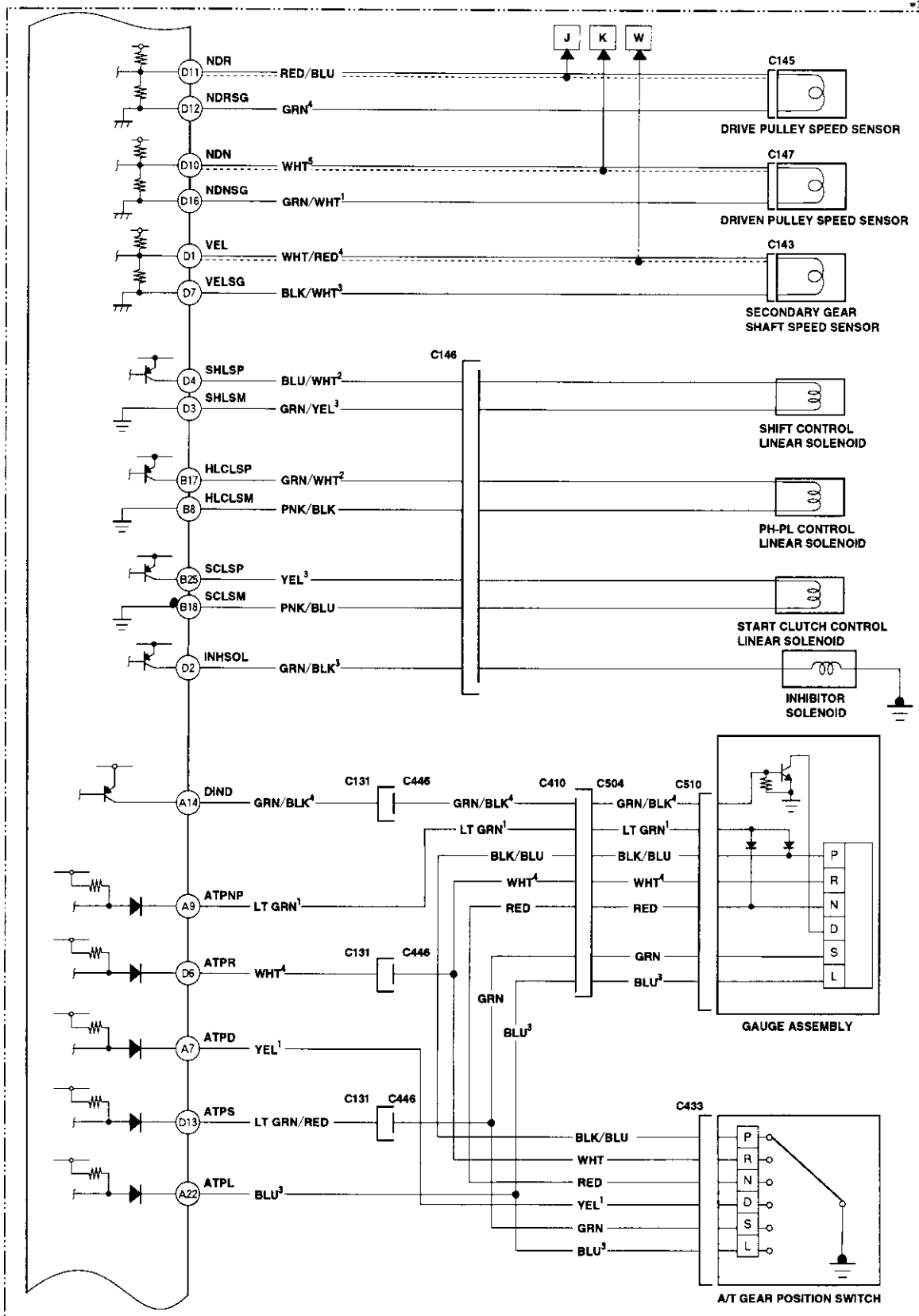


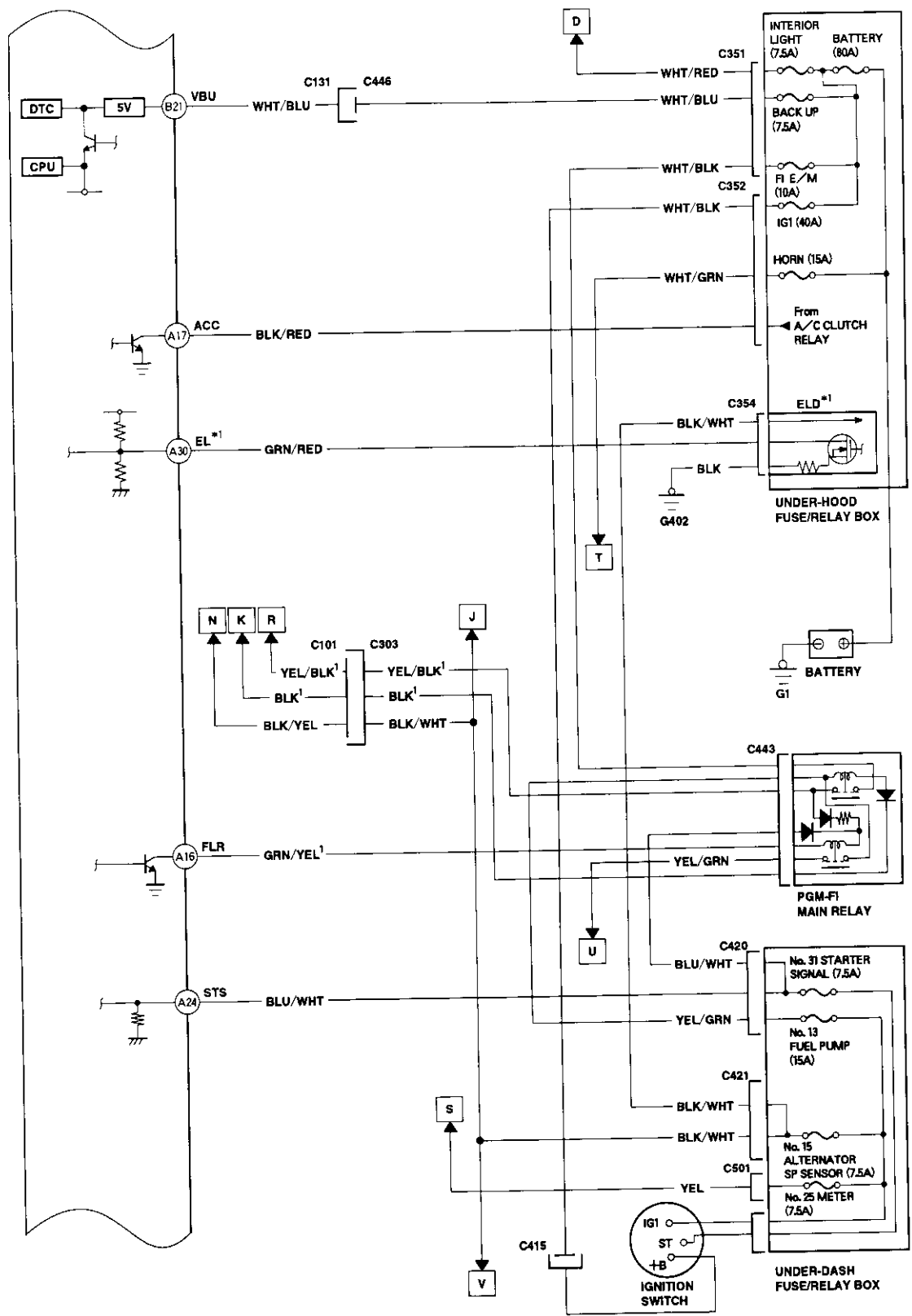


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# System Description

## Electrical Connections ('99 - 00 Models except D16Y5 engine with M/T) (cont'd)



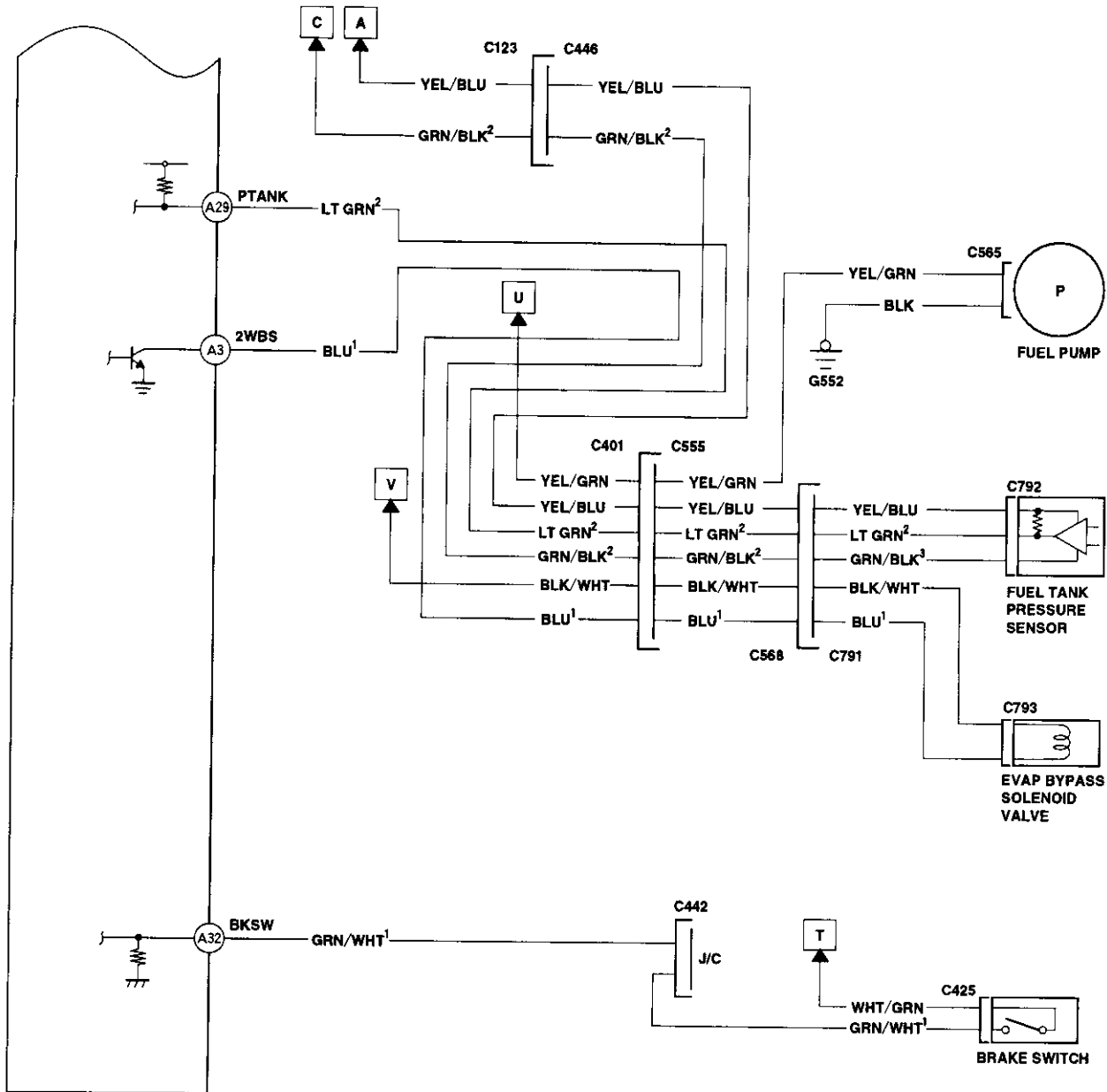


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# System Description

## Electrical Connections ('99 – 00 Models except D16Y5 engine with M/T) (cont'd)

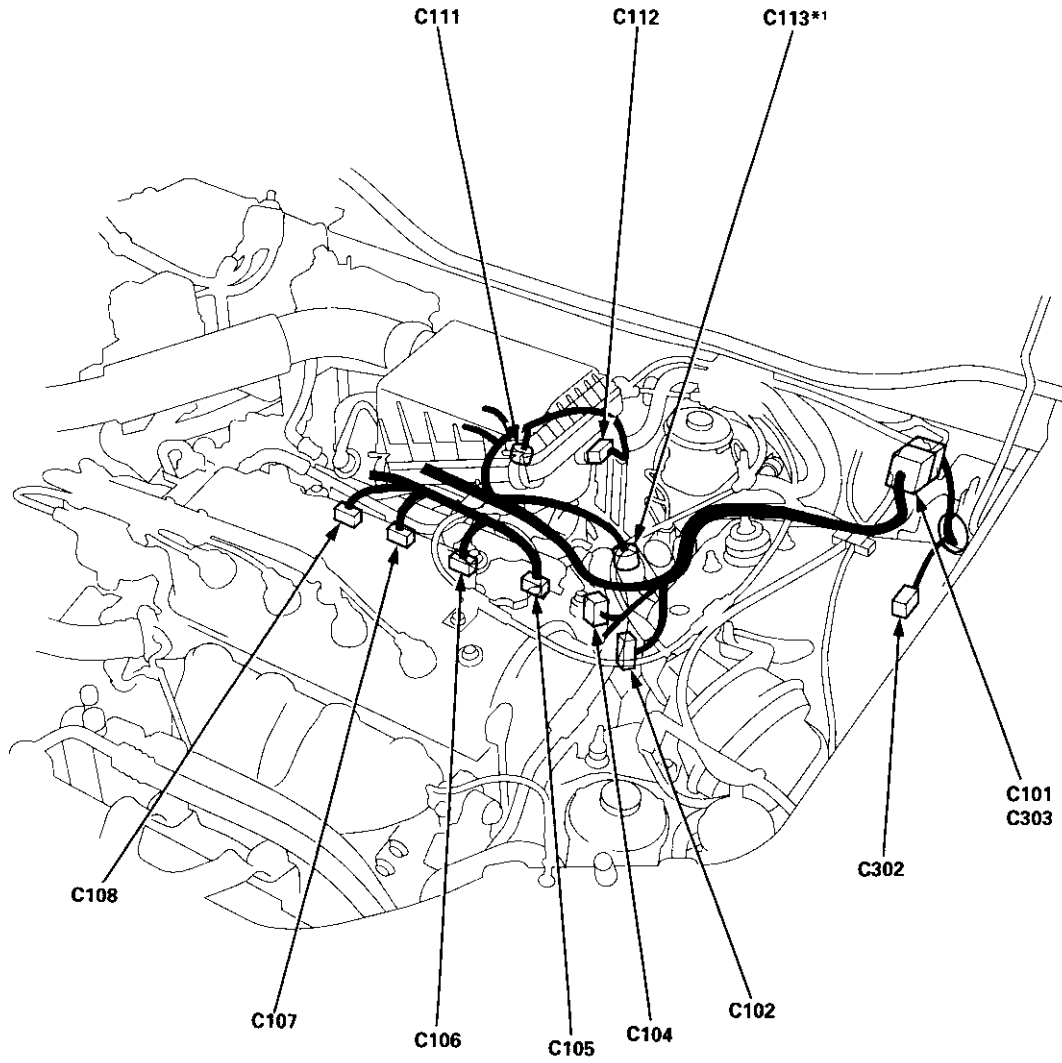


- \*1: USA model
- \*2: A/T (D16Y7, D16Y8 engine)
- \*3: CVT (D16Y5 engine)
- \*4: A/T and D16Y7 engine
- \*5: Except A/T and D16Y7 engine
- \*6: CVT (D16Y5 engine), D16Y8 engine and B16A2 engine
- \*7: D16Y8, B16A2 engine

# System Description

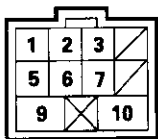
## System Connectors [Engine Compartment] (cont'd)

'99 - 00 D16Y7 engine:



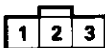


C101



① BLK/YEL	6 WHT/BLU
② BLK <sup>1</sup>	7 YEL/GRN
3 YEL/RED	8 —
4 —	9 BLK/WHT
⑤ YEL/BLK <sup>1</sup>	10 BLK/YEL

C102



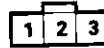
① WHT/RED <sup>3</sup>
② BRN/BLK <sup>1</sup>
③ BLU/RED

C104\*1



1 BLK/YEL
② WHT/GRN
3 WHT/BLU
④ WHT/RED <sup>3</sup>

C104  
(Canada)



① WHT/RED <sup>3</sup>
2 BLK/YEL
3 WHT/BLU

C105



① YEL/BLK <sup>1</sup>
② BRN <sup>2</sup>

C106



① YEL/BLK <sup>1</sup>
② RED <sup>1</sup>

C107



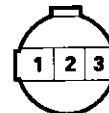
① YEL/BLK <sup>1</sup>
② BLU <sup>4</sup>

C108



① YEL/BLK <sup>1</sup>
② YEL <sup>2</sup>

C111



① YEL/RED
② GRN/WHT <sup>3</sup>
③ RED/GRN

C112



① GRN/BLK <sup>2</sup>
② RED/YEL <sup>2</sup>

C113\*1



① GRN <sup>2</sup>
② BLK <sup>2</sup>

C302



② BLU <sup>2</sup>
--------------------

NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK<sup>1</sup> and YEL/BLK<sup>2</sup> are not the same).

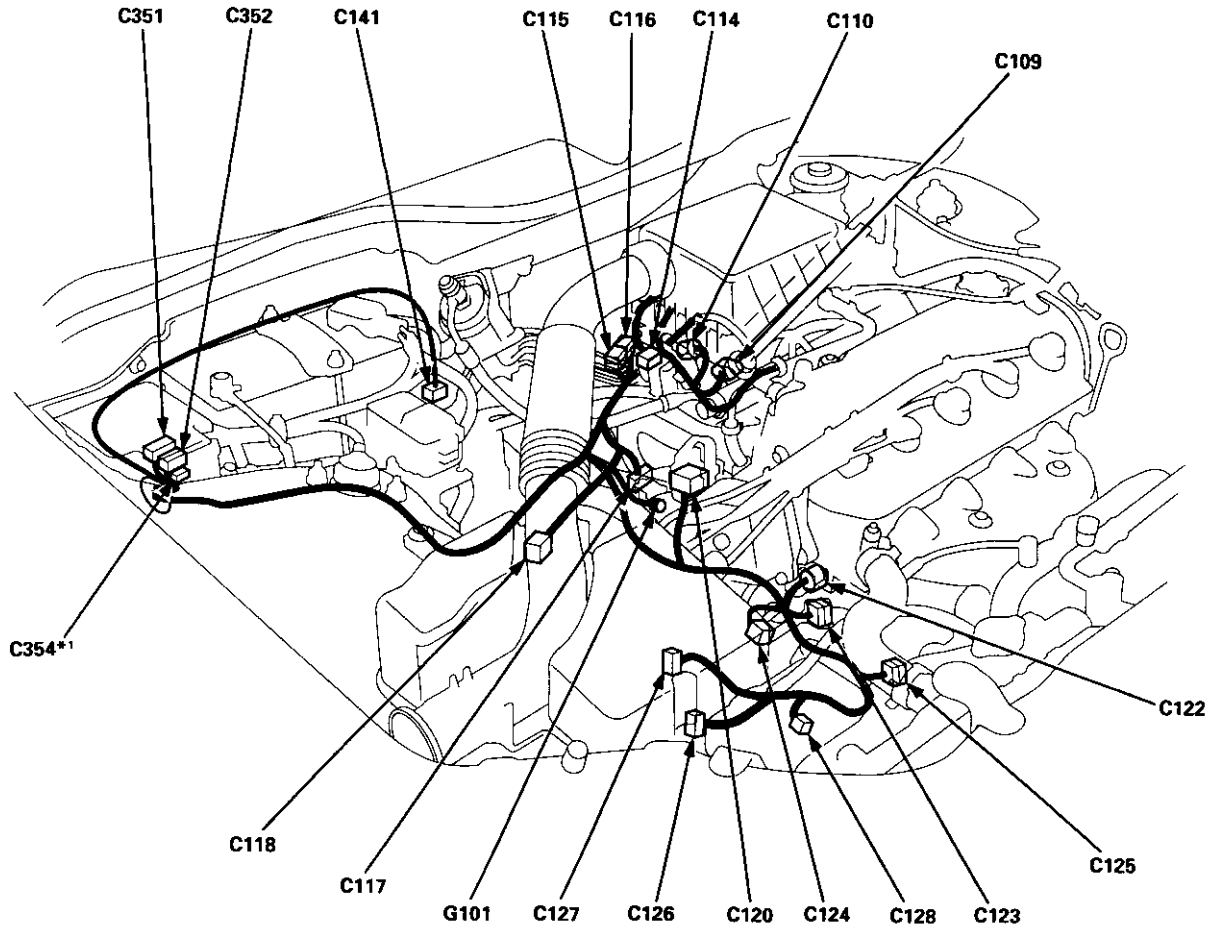
- : Related to Fuel and Emissions System.
- Connector with male terminals (double outline): View from terminal side
- Connector with female terminals (single outline): View from wire side

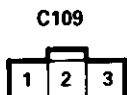
(cont'd)

# System Description

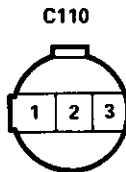
## System Connectors [Engine Compartment] (cont'd)

'99 - 00 D16Y7 engine:





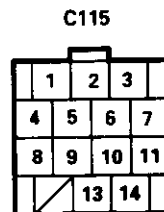
① ORN
② YEL/BLK <sup>1</sup>
③ BLK/BLU <sup>1</sup>



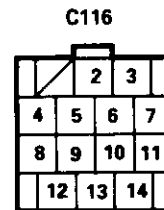
① GRN/BLK <sup>2</sup>
② RED/BLK
③ YEL/BLU



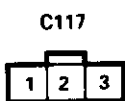
① BLK/YEL
② RED/YEL <sup>1</sup>



① BLK/YEL	⑧ GRN/BLK <sup>2</sup>
2 BLK/YEL	⑨ GRN/BLK <sup>2</sup>
③ BLK/YEL	⑩ GRN/BLK <sup>2</sup>
④ BLK/YEL	⑪ GRN/BLK
⑤ BLK/YEL	12 —
⑥ BLK/YEL	⑬ GRN/BLK <sup>2</sup>
⑦ BLK/YEL	⑭ GRN/BLK <sup>2</sup>



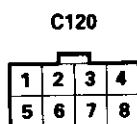
1 —	8 BLK
② YEL/BLK <sup>1</sup>	⑨ BLK <sup>1</sup>
③ YEL/BLK <sup>1</sup>	⑩ BLK <sup>1</sup>
④ YEL/BLK <sup>1</sup>	⑪ BLK <sup>1</sup>
⑤ YEL/BLK <sup>1</sup>	⑫ BLK <sup>1</sup>
⑥ YEL/BLK <sup>1</sup>	⑬ BLK <sup>1</sup>
⑦ YEL/BLK <sup>1</sup>	⑭ BLK <sup>1</sup>



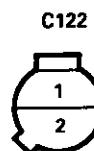
① BLK <sup>1</sup>
② BLK/YEL
③ BLU/WHT <sup>1</sup>



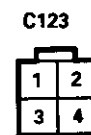
① GRN <sup>4</sup>
② BLU <sup>6</sup>



① YEL/GRN	5 BLK/YEL
② BLU <sup>5</sup>	⑥ WHT <sup>2</sup>
③ GRN <sup>3</sup>	⑦ RED <sup>4</sup>
④ YEL <sup>4</sup>	⑧ BLK <sup>3</sup>



① RED/WHT
② GRN/BLK <sup>2</sup>



① WHT <sup>3</sup>
② GRN/BLK <sup>2</sup>
③ BLK/YEL
④ BLK/WHT <sup>2</sup>



① GRN/BLK <sup>3</sup>
② YEL <sup>5</sup>



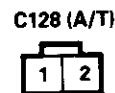
① WHT/RED <sup>1</sup>
② RED/YEL <sup>2</sup>
③ BLK/YEL
④ BLK/WHT <sup>1</sup>



① WHT <sup>5</sup>
② RED <sup>6</sup>



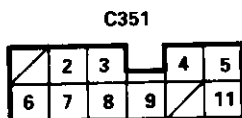
① WHT <sup>3</sup>
② RED <sup>1</sup>



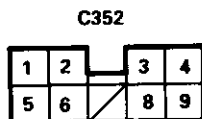
① BLU/YEL <sup>2</sup>
② GRN/WHT <sup>4</sup>



① LT GRN/WHT
② BLK/YEL



1 —	⑦ WHT/BLK
2 WHT/BLU	⑧ WHT/BLU
3 WHT/GRN	9 WHT/GRN
4 BLK	10 —
5 WHT/RED	11 BLU/WHT
⑥ WHT/RED	



1 GRN	6 BLK/YEL
2 BLU/WHT	7 —
3 WHT/BLK	⑧ WHT/GRN
④ WHT/BLK	9 WHT
⑤ BLK/RED	



① BLK/WHT
② BLK
③ GRN/RED

NOTE: • Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK<sup>1</sup> and YEL/BLK<sup>2</sup> are not the same).

• ○: Related to Fuel and Emissions System.

• — Connector with male terminals (double outline): View from terminal side

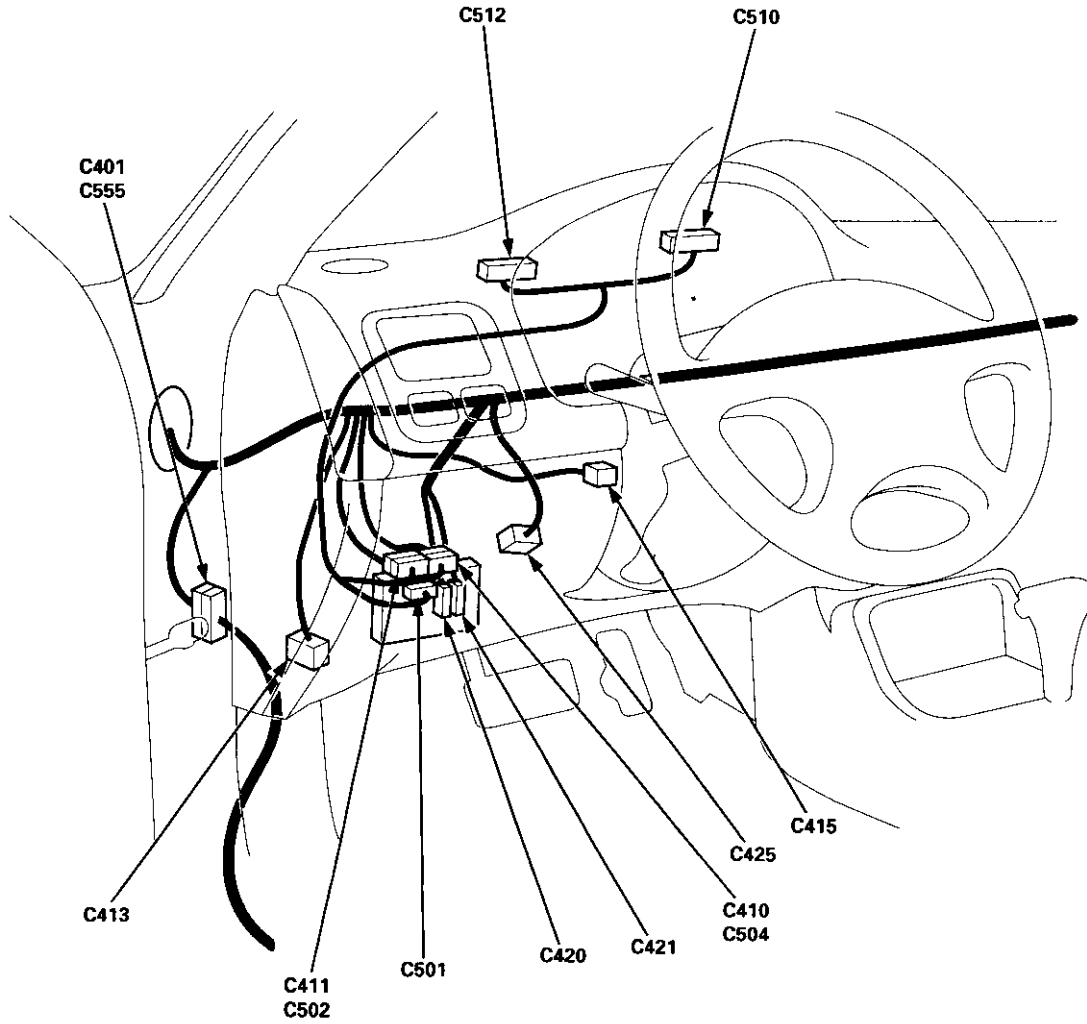
• — Connector with female terminals (single outline): View from wire side

(cont'd)

# System Description

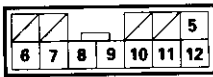
## System Connectors [Dash and Floor]

(\*99 - 00 models except D16Y5 engine with M/T)



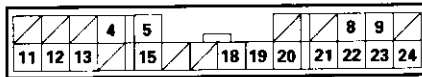


C410 (A/T)



1	_____	⑦	BLK/BLU
2	_____	8	_____
3	_____	⑨	BLU <sup>1</sup> *
4	_____	⑩	GRN
⑤	WHT*	⑪	GRN/BLK <sup>1</sup> *
⑥	RED	⑫	LT GRN <sup>1,2</sup>

C411



1	_____	13	LT GRN/RED
2	_____	14	_____
3	_____	15	WHT/BLK
4	BLU/YEL	16	_____
5	BLU (SRS)	17	_____
6	_____	18	WHT/BLU
7	_____	19	BLU
8	RED/BLU*	20	RED/BLU
9	LT GRN*	⑳	GRN/ORN
10	_____	22	BLU/WHT
11	YEL/GRN	23	YEL/RED
12	RED	24	BLU/RED (ABS)

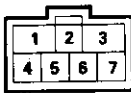
\*: Cruise Control

C413



1	_____	9	_____
2	_____	10	_____
3	_____	11	_____
4	_____	⑫	BLK
5	_____	⑬	BLK
⑥	LT BLU	14	_____
7	_____	⑮	BLU/YEL <sup>1</sup>
8	WHT/RED	16	_____

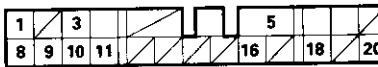
C415



1	BLK/YEL*
1	BLK/WHT
2	BLU/RED
③	WHT/BLK
4	BLK
5	WHT
6	WHT/BLU
7	WHT/GRN

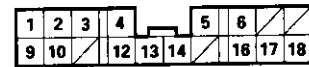
\*: Security Alarm System

C420



1	RED/BLU (Canada)	⑪	BLK/WHT
2	_____	12	_____
3	BLK	13	_____
4	_____	14	_____
5	WHT/GRN	15	_____
6	WHT/BLU	16	BLK/WHT (Canada)
7	_____	17	_____
⑧	YEL/GRN	18	WHT/GRN
9	BLK/YEL	19	_____
⑩	BLK/WHT	20	WHT/RED

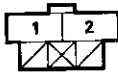
C421



1	RED/YEL	10	GRN/YEL
2	BLK/BLU (ABS)	11	_____
3	RED/GRN	⑫	BLK/WHT
4	GRN/BLK	⑬	BLK/WHT
5	RED/BLU	14	GRN/RED
6	WHT/BLU	15	_____
7	_____	16	GRN/RED
8	_____	17	RED/BLK
9	RED/WHT	18	RED/BLK

C425

(without cruise control)



①	GRN/WHT*
②	WHT/GRN
3	_____
4	_____

C425

(with cruise control)



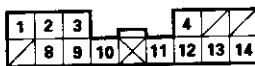
1	LT GRN
2	GRY
③	GRN/WHT*
④	WHT/GRN

C501



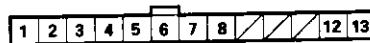
1	RED/GRN	11	YEL/BLK
2	BLK/BLU	12	BLK/YEL
3	WHT/BLU	13	YEL/GRN
4	BLK	14	_____
5	GRN/WHT	15	RED/BLK
6	GRN/RED	16	_____
7	GRN/ORN	17	_____
8	BLU/YEL	18	BLK/WHT
9	GRN/YEL	19	YEL/RED
⑩	YEL	20	_____

C510 (A/T)



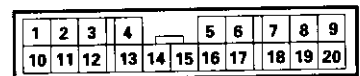
1	YEL	8	BLK
2	RED/BLK	⑨	GRN/BLK <sup>1</sup>
3	RED	⑩	GRN
④	BLU <sup>1</sup>	⑪	RED
5	_____	⑫	WHT*
6	BRN	⑬	BLK/BLU
7	_____	⑭	LT GRN <sup>2</sup>

C512



1	WHT/BLK	8	BLU
2	GRN/BLK	9	_____
3	YEL/RED	10	_____
④	YEL	11	_____
⑤	GRN/ORN	12	RED
6	RED/GRN	13	RED/BLK
7	GRN/RED	_____	_____

C555



1	GRN/ORN	11	WHT/GRN
②	BLK/WHT	⑫	LT GRN <sup>2</sup>
3	GRN/WHT	⑬	BLU <sup>1</sup>
4	BLU/BLK	14	GRN
⑤	YEL/BLU	15	LT GRN/RED
⑥	GRN/BLK <sup>2</sup>	16	GRN/BLK
7	RED/BLU	17	GRN/WHT
8	WHT/RED	⑮	YEL/GRN
9	BLU/RED	19	YEL/RED
10	BLU/WHT	20	BLU/YEL

NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK<sup>1</sup> and YEL/BLK<sup>2</sup> are not the same).

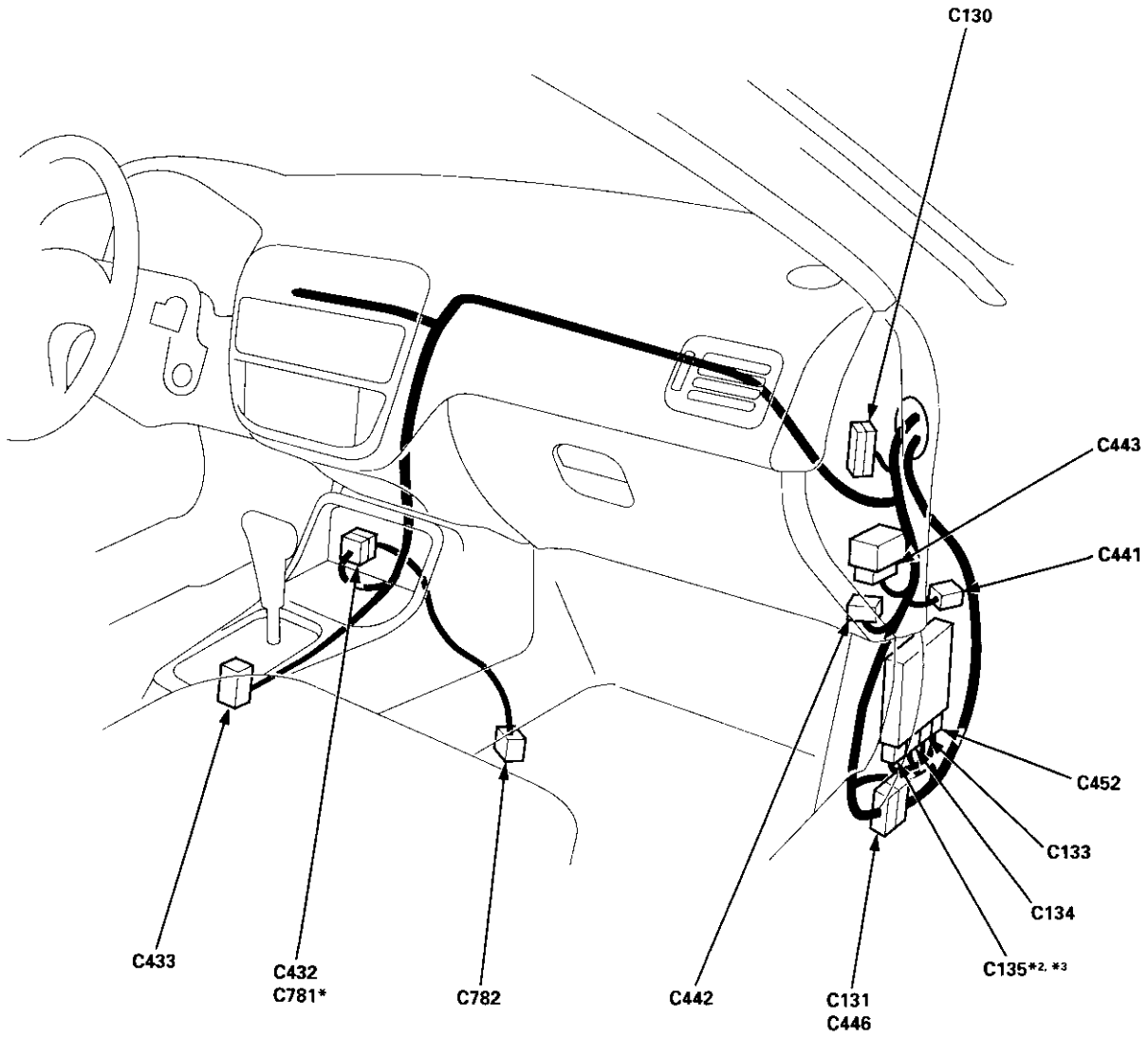
- ○: Related to Fuel and Emissions System.
- — Connector with male terminals (double outline): View from terminal side
- — Connector with female terminals (single outline): View from wire side

(cont'd)

# System Description

## System Connectors [Dash and Floor] (cont'd)

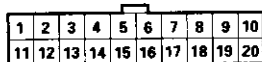
('99 - 00 models except D16Y5 engine with M/T)







C130



1	YEL/BLU	11	BRN/BLK
2	YEL/BLU	12	BRN/BLK
3	YEL/BLU	13	BRN/BLK
4	YEL/BLK	14	BRN/BLK
5	YEL/BLK	15	BRN/BLK
6	YEL/BLK	16	BRN/BLK
7	YEL/BLK	17	BRN/BLK
8	BLU/WHT	18	BRN/BLK
9	BLU/WHT	19	BRN/BLK
10	BLU/WHT	20	BRN/BLK

C131



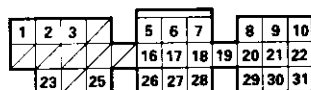
1	BLK/WHT	13	BLU
2	WHT/RED	14	YEL**
3	WHT	15	GRN/BLK**
4	LT GRN	16	PNK**
5	---	17	LT GRN/RED**
6	YEL	18	---
7	GRN	19	---
8	GRN/BLK	20	GRN/BLK
9	GRN	21	BLU/WHT
10	WHT/BLU	22	YEL/BLU
11	---	23	RED/YEL
12	---	24	BRN/BLK

C133 (ECM/PCM-B)



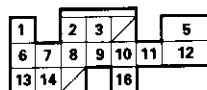
1	YEL/BLK	16	BLK	19	---
2	BLK	17	BRN	20	BRN/BLK
3	RED	18	GRN/YEL	21	WHT/BLU
4	BLU	19	YEL/GRN	22	BRN/BLK
5	YEL	20	---	23	BLK/BLU
6	BLK/BLU	21	ORN	24	---
7	RED**	22	---	25	YEL**
8	WHT	23	RED	---	---
9	PNK/BLK**	24	GRN/WHT**	---	---
10	YEL/BLK	25	PNK/BLU**	---	---

C134 (ECM/PCM-C)



1	BLK/WHT	13	---	25	RED/YEL
2	WHT/GRN	14	---	26	RED/WHT
3	RED/BLU	15	---	27	RED/BLK
4	---	16	WHT	28	YEL/BLU
5	WHT/RED	17	RED/GRN	29	YEL
6	WHT/BLK**	18	GRN/BLK	30	BLK
7	GRN/WHT	19	YEL/RED	31	WHT/RED
8	BLU	20	GRN	---	---
9	WHT	21	RED	---	---
10	BLU/BLK	22	BLU/RED	---	---
11	---	23	BLU/WHT	---	---
12	---	24	---	---	---

C135 (PCM-D)\*\*



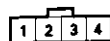
1	YEL	10	YEL
2	GRN/WHT	11	BLU
3	GRN/BLK	12	RED
4	---	13	WHT
5	BLK/YEL	14	LT GRN
6	WHT	15	BLU
7	BLU/YEL	16	---
8	PNK	17	GRN

C135 (PCM-D)\*\*



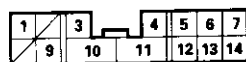
1	WHT/RED	9	---
2	GRN/BLK	10	WHT
3	GRN/YEL	11	RED/BLU
4	BLU/WHT	12	GRN
5	BLK/YEL	13	LT GRN/RED
6	WHT	14	GRN/BLK
7	BLK/WHT	15	---
8	---	16	RED/WHT

C432



1	BLK/WHT
2	GRN/BLK
3	WHT/RED
4	BLK/WHT

C433\*\* \*



1	BLK	8	---
2	---	9	PNK*
3	YEL/RED	10	BLK/WHT
4	GRN/BLK	11	BLK/RED
5	BLU	12	BLK/BLU
6	GRN	13	WHT
7	YEL	14	RED

\* Cruise control

C441



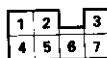
1	BRN
2	BLK

C442



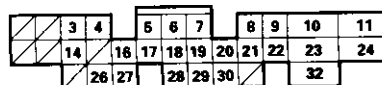
1	BRN/BLK	11	GRN/RED
2	BRN/BLK	12	GRN/RED
3	BRN/BLK	13	GRN/RED
4	BLU/WHT	14	---
5	BLU/WHT	15	---
6	BLU/WHT	16	---
7	GRN/WHT	17	BLU
8	GRN/WHT	18	BLU
9	GRN/WHT	19	BLU
10	GRN/WHT	20	BLU

C443



1	GRN/YEL	5	YEL/GRN
2	BLU/WHT	6	YEL/BLK
3	BLK	7	WHT/BLK
4	YEL/GRN	---	---

C452 (ECM/PCM-A)



1	---	13	---	25	---
2	---	14	GRN/BLK	26	GRN
3	BLU	15	---	27	BLU/RED
4	LT GRN/WHT	16	GRN/YEL	28	WHT/RED
5	BLU/GRN	17	BLK/RED	29	LT GRN
6	RED/YEL	18	GRN/ORN	30	GRN/RED
7	YEL**	19	BLU	31	---
8	BLK/WHT	20	GRN	32	GRN/WHT
9	LT GRN**	21	BLU/YEL	---	---
10	BRN	22	BLU**	---	---
11	---	23	WHT/RED	---	---
12	---	24	BLU/WHT	---	---

C782



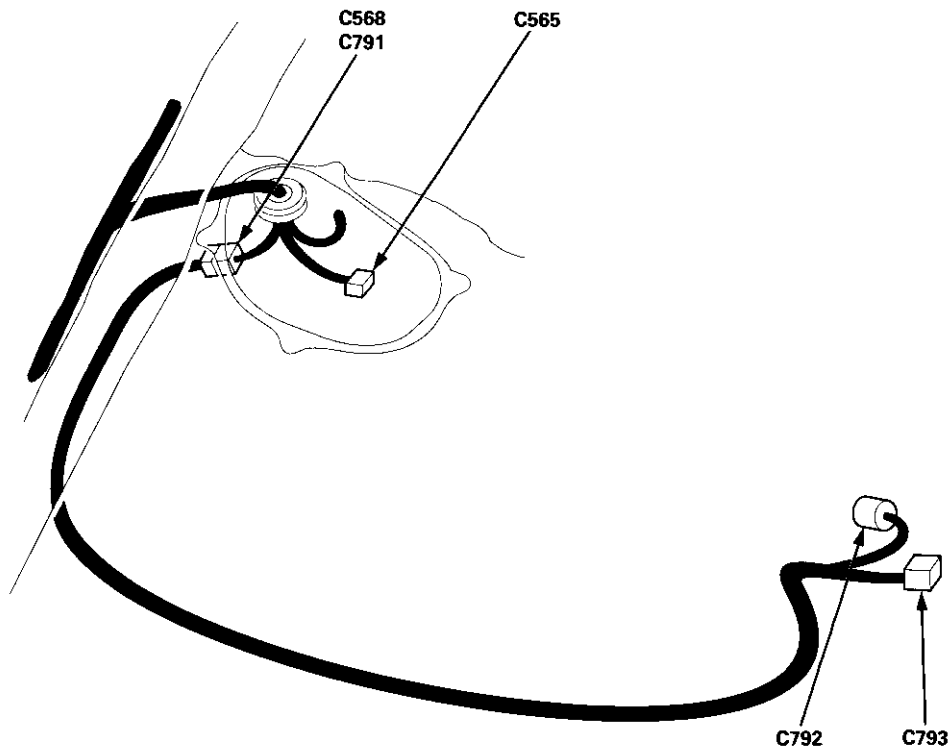
1	WHT/RED
2	GRN/WHT
3	BLK/WHT
4	BLK/WHT

NOTE: ● Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK<sup>1</sup> and YEL/BLK<sup>2</sup> are not the same).  
 ○ Related to Fuel and Emissions System.  
 — Connector with male terminals (double outline): View from terminal side  
 — Connector with female terminals (single outline): View from wire side

# System Descriptions

## System Connectors [Fuel Pump]

('99 - 00 models except D16Y5 engine with M/T)

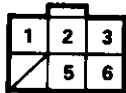


C565



①	BLK
②	YEL/GRN

C568



①	BLU <sup>1</sup>
②	LT GRN <sup>2</sup>
③	BLK/WHT
4	—
⑤	YEL/BLU
⑥	GRN/BLK <sup>2</sup>

C792



①	YEL/BLU
②	GRN/BLK <sup>2</sup>
③	LT GRN <sup>2</sup>

C793



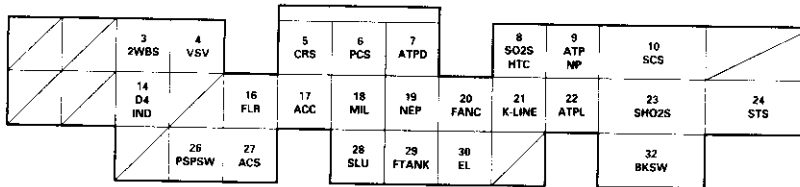
①	BLK/WHT
②	BLU <sup>1</sup>

- NOTE:
- Different wires with the same color have been given a number suffix to distinguish them (for example, YEL/BLK<sup>1</sup> and YEL/BLK<sup>2</sup> are not the same).
  - ○: Related to Fuel and Emissions System.
  - — Connector with male terminals (double outline): View from terminal side
  - — Connector with female terminals (single outline): View from wire side

# Troubleshooting

## Engine/Powertrain Control Module Terminal Arrangement ('99 – 00 Models except D16Y5 engine with M/T)

ECM/PCM CONNECTOR A (32P)



ECM/PCM CONNECTOR A (32P)

Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
3	BLU	2WBS (EVAP BYPASS SOLENOID VALVE)	Drives EVAP bypass solenoid valve.	With ignition switch ON (II): battery voltage
4	LT GRN/WHT	VSV (EVAP CONTROL CANISTER VENT SHUT VALVE)	Drives EVAP control canister vent shut valve.	With ignition switch ON (II): battery voltage
5*1	BLU/GRN	CRS (CRUISE CONTROL SIGNAL)	Down shift signal input from cruise control unit.	When cruise control is used: pulses
6	RED/YEL	PCS (EVAP PURGE CONTROL SOLENOID VALVE)	Drives EVAP purge control solenoid valve.	With engine running, engine coolant, below 154°F (68°C): battery voltage With engine running, engine coolant, above 154°F (68°C): duty controlled
7*3	YEL	ATPD (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In <input type="checkbox"/> position: 0 V In other than <input type="checkbox"/> position: Approx. 5 V
8	BLK/WHT	SO2SHTC (SECONDARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives secondary heated oxygen sensor heater.	With ignition switch ON (III): battery voltage With fully warmed up engine running: duty controlled
9*3	LT GRN	ATPNP (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In park or neutral: 0 V In any other position: Approx. 5 V
10	BRN	SCS (SERVICE CHECK SIGNAL)	Detects service check connector signal (the signal causing a DTC indication)	With the terminal connected: 0 V With the terminal disconnected: about 5 V or battery voltage
14*1	GRN/BLK	D4IND (D4 INDICATOR)	Drives D4 indicator light.	With D4 indicator light turned ON: 0 V With D4 indicator light turned OFF: battery voltage
16	GRN/YEL	FLR (FUEL PUMP RELAY)	Drives fuel pump relay.	0 V for two seconds after turning ignition switch ON (II), then battery voltage
17	BLK/RED	ACC (A/C CLUTCH RELAY)	Drives A/C clutch relay.	With compressor ON: 0 V With compressor OFF: battery voltage
18	GRN/ORN	MIL (MALFUNCTION INDICATOR LIGHT)	Drives MIL.	With MIL turned ON: 0 V With MIL turned OFF: battery voltage
19	BLU	NEP (ENGINE SPEED PULSE)	Outputs engine speed pulse.	With engine running: pulses
20	GRN	FANC (RADIATOR FAN CONTROL)	Drives radiator fan relay.	With radiator fan running: 0 V With radiator fan stopped: battery voltage
21	BLU/YEL	K-LINE	Sends and receives scan tool signal.	With ignition switch ON (III): pulses
22*3	BLU	ATP L (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In <input type="checkbox"/> position: 0 V In other than <input type="checkbox"/> position: Approx. 5 V
23	WHT/RED	SHO2S (SECONDARY HEATED OXYGEN SENSOR, SENSOR 2)	Detects secondary heated oxygen sensor (sensor 2) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
24	BLU/WHT	STS (STARTER SWITCH SIGNAL)	Detects starter switch signal.	With starter switch ON (III): battery voltage With starter switch OFF: 0 V
26	GRN	PSPSW (P/S PRESSURE SWITCH SIGNAL)	Detects PSP switch signal.	At idle with steering wheel in straight ahead position: 0 V At idle with steering wheel at full lock: battery voltage
27	BLU/RED	ACS (A/C SWITCH SIGNAL)	Detects A/C switch signal.	With A/C switch ON: 0 V With A/C switch OFF: about 5 V
28*1,*3	WHT/RED	SLU (INTERLOCK CONTROL UNIT)	Drives interlock control unit.	With ignition switch ON (III) and brake pedal depressed: battery voltage
29	LT GRN	PTANK (FUEL TANK PRESSURE SENSOR)	Detects fuel tank pressure sensor signal.	With ignition switch ON (II) and fuel fill cap opened: about 2.5 V
30	GRN/RED	EL (ELD)	Detects ELD signal.	With parking lights turned on at idle: about 2.5 – 3.5 V With low beam headlights turned on at idle: about 1.5 – 2.5 V
32	GRN/WHT	BKSX (BRAKE SWITCH)	Detects brake switch signal.	With brake pedal released: 0 V With brake pedal depressed: battery voltage

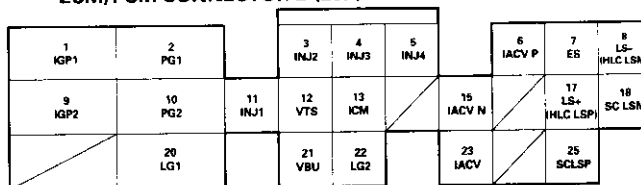
\*1: A/T (D16Y7, D16Y8 engine)

\*2: M/T

\*3: CVT (D16Y5 engine)



### ECM/PCM CONNECTOR B (25P)



Wire side of female terminals

### PCM CONNECTOR B (25P)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	YEL/BLK	IGP1 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
2	BLK	PG1 (POWER GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
3	RED	INJ2 (No. 2 FUEL INJECTOR)	Drives No. 2 fuel injector.	With engine running: duty controlled
4	BLU	INJ3 (No. 3 FUEL INJECTOR)	Drives No. 3 fuel injector.	
5	YEL	INJ4 (No. 4 FUEL INJECTOR)	Drives No. 4 fuel injector.	
6	BLK/BLU	IACV P (IDLE AIR CONTROL VALVE POSITIVE SIDE)	Drives IAC valve (positive side).	With engine running: duty controlled
7*3	RED	ESOL (EGR CONTROL SOLENOID VALVE)	Drives EGR control solenoid valve.	With EGR operating during driving with fully warmed up engine: duty controlled With EGR not operating: 0 V
8*3	PNK/BLK	HLC LSM (PH-PL CONTROL LINEAR SOLENOID NEGATIVE SIDE)	Ground for PH-PL control linear solenoid	
8*1	WHT	LS - (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE - SIDE)	A/T clutch pressure control solenoid valve power supply negative electrode.	With ignition switch ON (II): duty controlled
9	YEL/BLK	IGP2 (POWER SOURCE)	Power source for the ECM/PCM control circuit.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
10	BLK	PG2 (POWER GROUND)	Ground for the ECM/PCM control circuit.	Less than at all times
11	BRN	INJ1 (No. 1 FUEL INJECTOR)	Drives No. 1 fuel injector.	With engine running: duty controlled
12*4	GRN/YEL	VTS (VTEC SOLENOID VALVE)	Drives VTEC solenoid valve.	With engine at low rpm: 0 V With engine at high rpm: battery voltage
13	YEL/GRN	ICM (IGNITION CONTROL MODULE)	Sends ignition pulse.	With ignition switch ON (II): battery voltage With engine running: pulses
15	ORN	IACV N (IDLE AIR CONTROL VALVE NEGATIVE SIDE)	Drives the IAC valve (negative side).	With engine running: duty controlled
17*1	RED	LS + (A/T CLUTCH PRESSURE CONTROL SOLENOID VALVE + SIDE)	A/T clutch pressure control solenoid valve power supply positive electrode	With ignition switch ON (II): duty controlled
17*3	GRN/WHT	HLC LSP (PH-PL CONTROL LINEAR SOLENOID POSITIVE SIDE)	Drives PH-PL control linear solenoid	With ignition switch ON (II): Pulsing signal
18*3	PNK/BLU	SC LSM (START CLUTCH LINEAR SOLENOID NEGATIVE SIDE)	Ground for start clutch control linear solenoid	
20	BRN/BLK	LG1 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
21	WHT/BLU	VBU (VOLTAGE BACK UP)	Power source for the ECM/PCM control circuit. Power source for the DTC memory.	Battery voltage at this times
22	BRN/BLK	LG2 (LOGIC GROUND)	Ground for the ECM/PCM control circuit.	Less than 1.0 V at all times
23	BLK/BLU	IACV (IDLE AIR CONTROL VALVE)	Drives IAC valve.	With engine running: duty controlled
25*3	YEL	SC LSP (START CLUTCH LINEAR SOLENOID POSITIVE SIDE)	Drives start clutch control linear solenoid.	With ignition switch ON (II): Pulsing signal

\*1: A/T (D16Y7, D16Y8 engine)

\*4: D16Y5, D16Y8, B16A2 engine

\*2: M/T

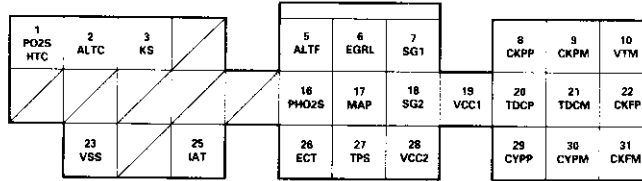
\*3: CVT (D16Y5 engine)

(cont'd)

# Troubleshooting

## Engine/Powertrain Control Module Terminal Arrangement ('99 - 00 Models except D16Y5 engine with M/T) (cont'd)

ECM/PCM CONNECTOR C (31P)



ECM/PCM CONNECTOR C (31P)

Wire side of female terminals

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1	BLK/WHT	PO2SHTC (PRIMARY HEATED OXYGEN SENSOR HEATER CONTROL)	Drives primary heated oxygen sensor heater.	With ignition switch ON (II): battery voltage With fully warmed up engine running: duty controlled
2	WHT/GRN	ALTC (ALTERNATOR CONTROL)	Sends alternator control signal.	With fully warmed - up engine running: battery voltage During driving with small electrical load: 0 V
3	RED/BLU	KS (KNOCK SENSOR)	Detects KS signal.	With engine knocking: pulses
5	WHT/RED	ALTF (ALTERNATOR FR SIGNAL)	Detects alternator FR signal.	With fully warmed up engine running: 0 V - battery voltage (depending on electrical load)
6*3	WHT/BLK	EGR L (EGR VALVE LIFT SENSOR)	Detects EGR valve lift sensor signal.	At idle: about 1.2 V
7	GRN/WHT	SG1 (SENSOR GROUND)	Ground for MAP sensor.	Less than 1.0 V at all times
8	BLU	CKPP (CKP SENSOR P SIDE)	Detects CKP sensor.	With engine running: pulses
9	WHT	CKPM (CKP SENSOR M SIDE)	Ground for CKP sensor.	
10**	BLU/BLK	VTM (VTEC PRESSURE SWITCH SIGNAL)	Detects VTEC pressure switch signal.	With engine at low engine speed: 0 V With engine at high engine speed: battery voltage
16	WHT	PHO2S (PRIMARY HEATED OXYGEN SENSOR, SENSOR 1)	Detects primary heated oxygen sensor (sensor 1) signal.	With throttle fully opened from idle with fully warmed up engine: above 0.6 V With throttle quickly closed: below 0.4 V
17	RED/GRN	MAP (MANIFOLD ABSOLUTE PRESSURE SENSOR)	Detects MAP sensor signal.	With ignition switch ON (II): about 3 V At idle: about 1.0 V (depending on engine speed)
18	GRN/BLK	SG2 (SENSOR GROUND)	Sensor ground.	Less than 1.0 V at all times
19	YEL/RED	VCC1 (SENSOR VOLTAGE)	Power source to MAP sensor.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
20	GRN	TDCP (TDC SENSOR P SIDE)	Detects TDC sensor.	With engine running: pulses
21	RED	TDCM (TDC SENSOR M SIDE)	Ground for TDC sensor.	
22	BLU/RED	CKFP (CKF SENSOR P SIDE)	Detects CKF sensor.	With engine running: pulses
23	BLU/WHT	VSS (VEHICLE SPEED SENSOR)	Detects VSS signal.	With ignition switch ON (II) and front wheel rotating: cycles 0 V - about 5 V or battery voltage
25	RED/YEL	IAT (INTAKE AIR TEMPERATURE SENSOR)	Detects IAT sensor signal.	With ignition switch ON (II): about 0.1 - 4.8 V (depending on intake air temperature)
26	RED/WHT	ECT (ENGINE COOLANT TEMPERATURE SENSOR)	Detects ECT sensor signal.	With ignition switch ON (II): about 0.1 - 4.8 V (depending on engine coolant temperature)
27	RED/BLK	TPS (THROTTLE POSITION SENSOR)	Detects TP sensor signal.	With throttle fully open: about 4.8 V With throttle fully closed: about 0.5 V
28	YEL/BLU	VCC2 (SENSOR VOLTAGE)	Provides sensor voltage.	With ignition switch ON (II): about 5 V With ignition switch OFF: 0 V
29	YEL	CYPP (CYP SENSOR P SIDE)	Detects CYP sensor.	With engine running: pulses
30	BLK	CYPM (CYP SENSOR M SIDE)	Ground for CYP sensor.	
31	WHT/RED	CKFM (CKF SENSOR M SIDE)	Ground for CKF sensor signal.	

\*1: A/T (D16Y7, D16Y8 engine)

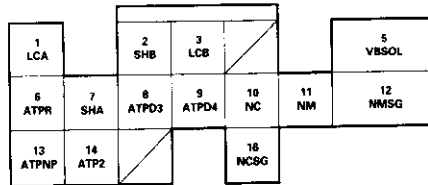
\*2: M/T

\*3: CVT (D16Y5 engine)

\*4: D16Y5, D16Y8, B16A2 engine



**ECM/PCM CONNECTOR D (16P)**



Wire side of female terminals

**ECM/PCM CONNECTOR D (16P)**  
(D16Y7, D16Y8 engine)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1*	YEL	LCA (LOCK-UP CONTROL SOLENOID VALVE A)	Drives lock-up control solenoid valve A.	With lock-up ON: battery voltage With lock-up OFF: 0 V
2*	GRN/WHT	SHB (SHIFT CONTROL SOLENOID VALVE B)	Drives shift control solenoid valve B.	In [2] position, in 1st and 2nd gear in [D <sub>4</sub> ], [D <sub>3</sub> ] position: Battery voltage In [1] position, in 3rd gear in [D <sub>4</sub> ], [D <sub>3</sub> ] in 4th gear in [D <sub>4</sub> ] position: 0 V
3*	GRN/BLK	LCB (LOCK UP CONTROL SOLENOID VALVE B)	Drives lock-up control solenoid valve B.	When full lock-up: Battery voltage With half lock-up: Pulsing signal
5*	BLK/YEL	VBSOL (BATTERY VOLTAGE FOR SOLENOID VALVE)	Power source of solenoid valve.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
6*	WHT	ATPR (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In R position: 0 V In any other position: Approx. 10 V
7*	BLU/YEL	SHA (SHIFT CONTROL SOLENOID VALVE A)	Drives shift control solenoid valve A.	In [1], [2] position, in 2nd and 3rd gear in [D <sub>4</sub> ], [D <sub>3</sub> ] position: Battery voltage In 1st gear in [D <sub>4</sub> ], [D <sub>3</sub> ] position, in 4th gear in [D <sub>4</sub> ] position: 0 V
8*	PNK	ATPD3 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D3 position: 0 V In any other position: Approx. 10 V
9*	YEL	ATPD4 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In D4 position: 0 V In any other position: Approx. 5 V
10*	BLU	NC (COUNTERSHAFT SPEED SENSOR)	Detects countershaft speed sensor signals.	Depending on vehicle speed: Pulsing signal When vehicle is stopped: 0 V
11*	RED	NM (MAINSHAFT SPEED SENSOR)	Detects mainshaft speed sensor signals.	With engine running: pulses
12*	WHT	NMSG (MAINSHAFT SPEED SENSOR GROUND)	Ground for mainshaft speed sensor.	
13*	LT GRN	ATPNP (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In park or neutral: 0 V In any other position: Approx. 10 V
14*	BLU	ATP2 (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In 2nd position: 0 V In any other position: Approx. 10 V
16*	GRN	NCSG (COUNTERSHAFT SPEED SENSOR GROUND)	Ground for countershaft speed sensor.	

\*1: A/T (D16Y7, D16Y8 engine)

\*2: M/T

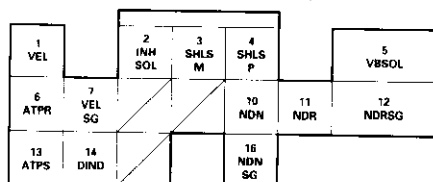
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# Troubleshooting

## Engine/Powertrain Control Module Terminal Arrangement ('99 – 00 Models except D16Y5 engine with M/T) (cont'd)

ECM/PCM Connector D (16P)

ECM/PCM CONNECTOR D (16P)



Wire side of female terminals

ECM/PCM CONNECTOR D (16P) (D16Y5 engine: CVT)

NOTE: Standard battery voltage is 12 V.

Terminal number	Wire color	Terminal name	Description	Signal
1*3	WHT/RED	VEL (SECONDARY GEAR SHAFT SPEED SENSOR)	Secondary gear shaft speed sensor.	Depending on vehicle speed: pulses When vehicle is stopped: 0 V
2*3	GRN/BLK	INHSOL (INHIBITOR SOLENOID CONTROL)	Inhibitor solenoid control.	With inhibitor solenoid ON: battery voltage With inhibitor solenoid OFF: 0 V
3*3	GRN/YEL	SHLSM (SHIFT CONTROL LINEAR SOLENOID NEGATIVE SIDE)	Ground for shift control linear solenoid.	
4*3	BLU/WHT	SHLSP (SHIFT CONTROL LINEAR SOLENOID POSITIVE SIDE)	Drives shift control linear solenoid power.	With ignition switch ON (II): pulses
5*3	BLK/YEL	VBSOL (BATTERY VOLTAGE FOR SOLENOID VALVE)	Power source of solenoid valve.	With ignition switch ON (II): battery voltage With ignition switch OFF: 0 V
6*3	WHT	ATPR (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In R position: 0 V In any other position: Approx. 10 V
7*3	BLK/WHT	VELSG (SECONDARY GEAR SHAFT SPEED SENSOR GROUND)	Ground for secondary gear shaft speed sensor.	
10*3	WHT	NDN (DRIVEN PULLEY SPEED SENSOR)	Detects driven pulley speed sensor signal.	In other than Park or neutral: pulses
11*3	RED/BLU	NDR (DRIVE PULLEY SPEED SENSOR)	Detects drive pulley speed sensor signal.	In other than Park or neutral: pulses
12*3	GRN	NDRSG (DRIVE PULLEY SPEED SENSOR GROUND)	Ground for drive pulley speed sensor.	
13*3	LT GRN/RED	ATPS (AT GEAR POSITION SWITCH)	Detects A/T gear position switch signal.	In S position: 0 V In any other position: Approx. 10 V
14*3	GRN/BLK	DIND (D INDICATOR LIGHT)	Drives D indicator.	With D indicator turned ON: 5 V With D indicator turned OFF: 0 V
16*3	RED/WHT	NDNSG (DRIVEN PULLEY SPEED SENSOR GROUND)	Ground for driven pulley speed sensor.	

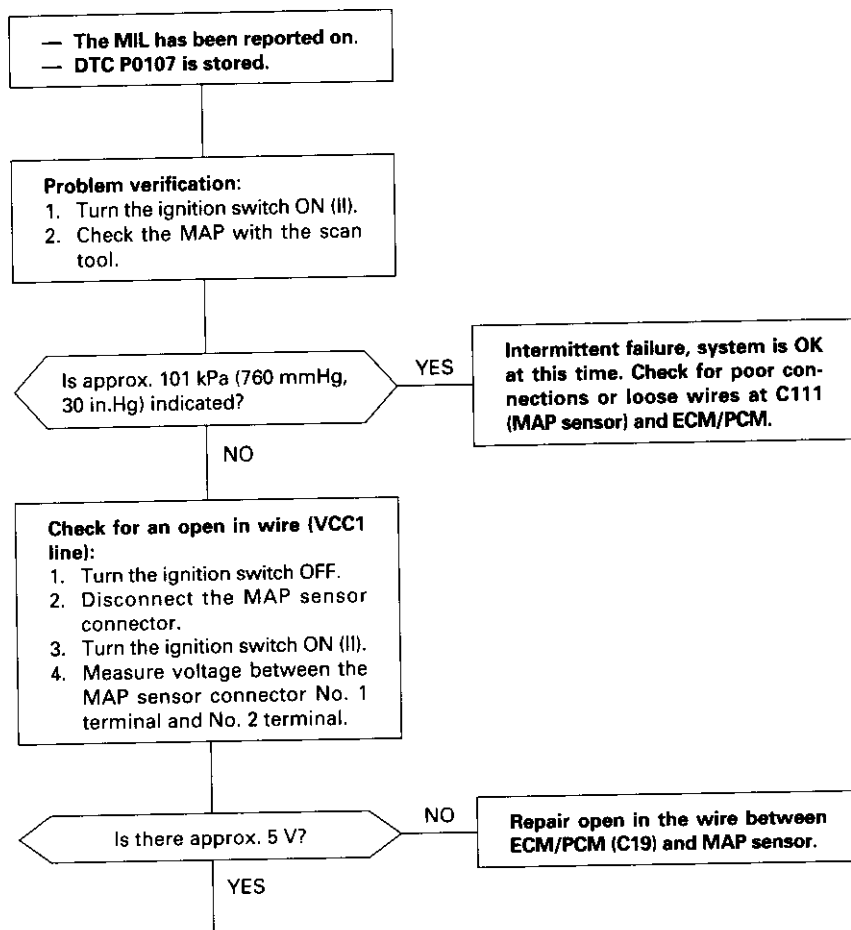
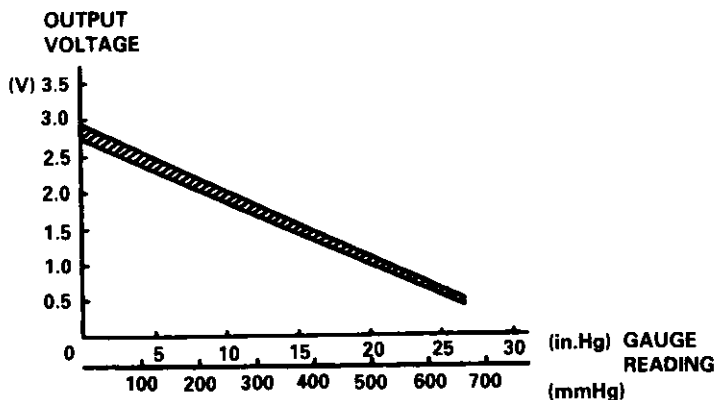
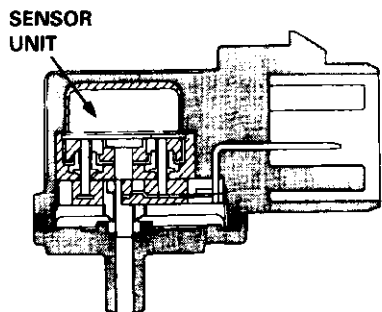
\*3: CVT (D16Y5 engine)



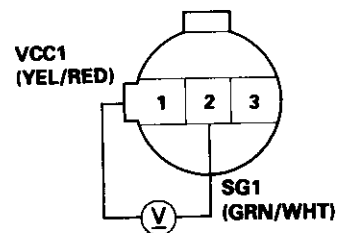
## Manifold Absolute Pressure (MAP) Sensor (’99 – 00 Models except D16Y5 engine with M/T)

**P0107** The scan tool indicates Diagnostic Trouble Code (DTC) P0107: A low input (high vacuum) problem in the Manifold Absolute Pressure (MAP) sensor.

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



MAP SENSOR 3P CONNECTOR (C114)



Wire side of female terminals

(To page 11-120)

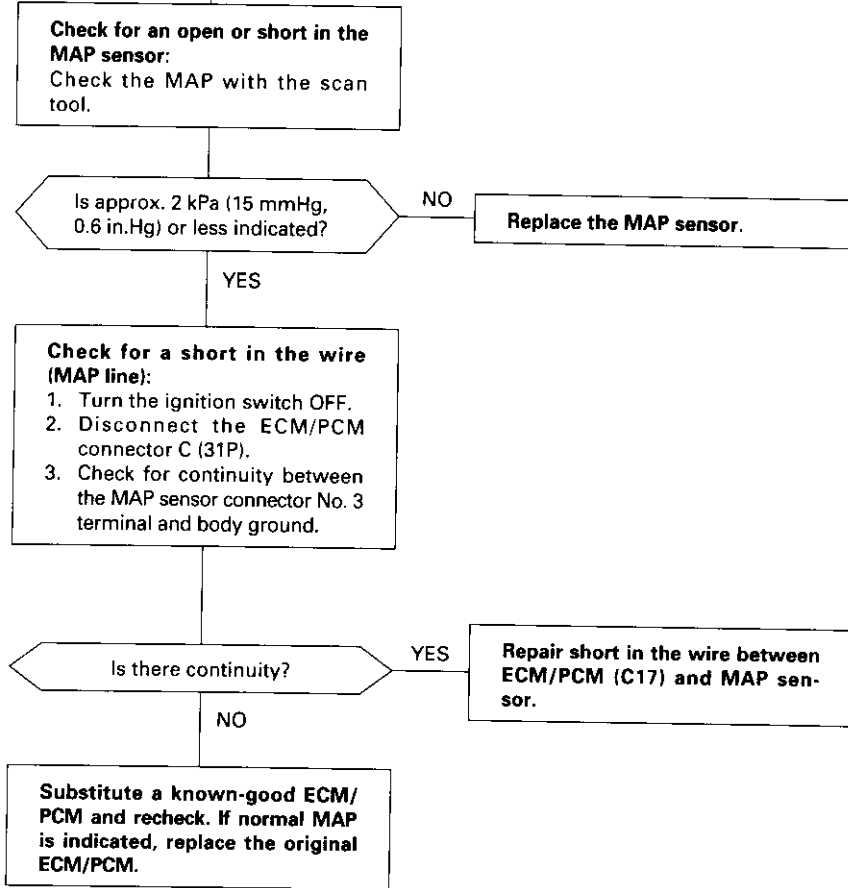
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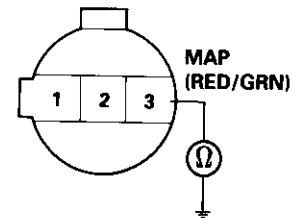
# PGM-FI System

## Manifold Absolute Pressure (MAP) Sensor ( '99 - 00 Models except D16Y5 engine with M/T) (cont'd)

(From page 11-119)



MAP SENSOR 3P CONNECTOR (C114)

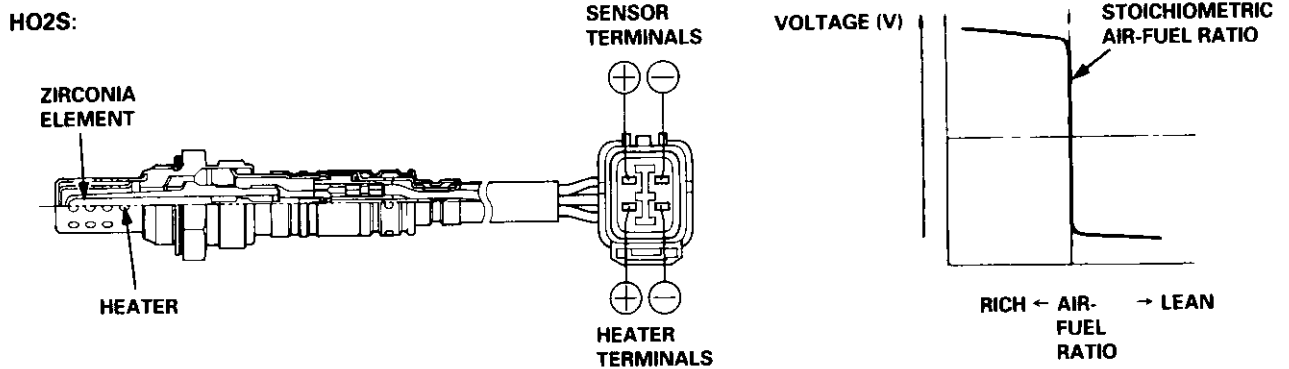


Wire side of female terminals

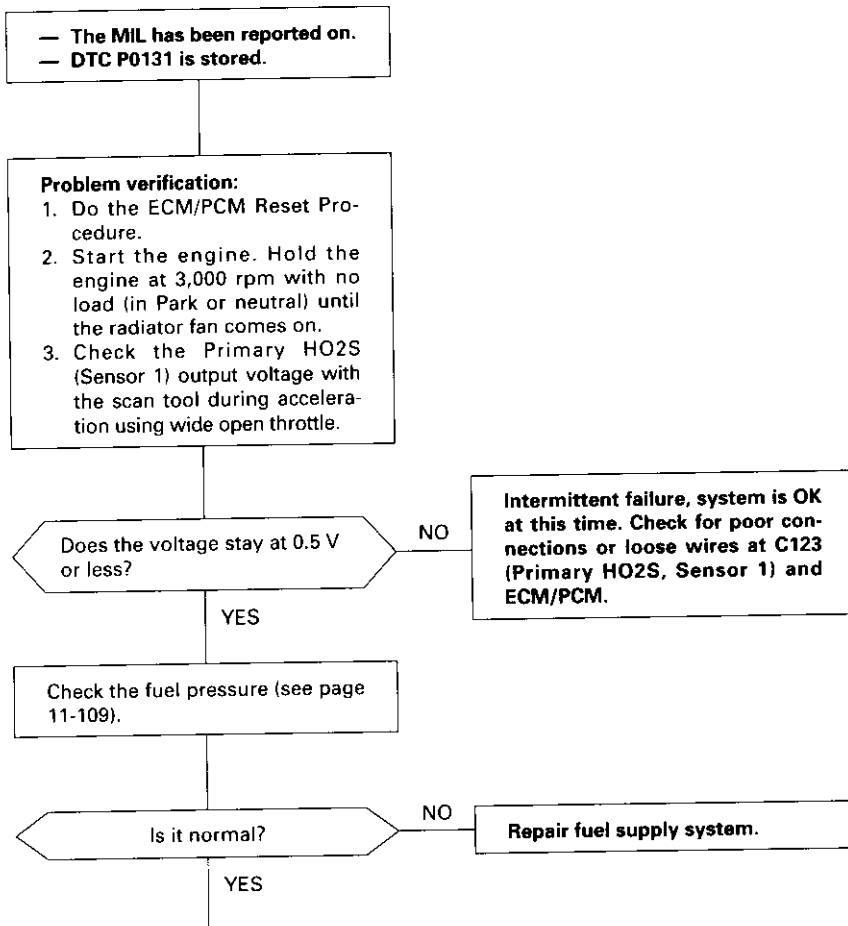


## Primary Heated Oxygen Sensor (Primary HO2S) (Sensor 1) (’99 – 00 Models except D16Y5 engine with M/T)

The Heated Oxygen Sensors (HO2S) detect the oxygen content in the exhaust gas and signals the ECM/PCM. In operation, the ECM/PCM receives the signals from the sensor and varies the duration during which fuel is injected. To stabilize the sensor’s output, the sensor has an internal heater. The Primary HO2S (Sensor 1) is installed in exhaust manifold (D16Y8, B16A2 engine: exhaust pipe A).



**P0131** The scan tool indicates Diagnostic Trouble Code (DTC) P0131: A low voltage problem in the Primary Heated Oxygen Sensor (HO2S) (Sensor 1) circuit.



(To page 11-142)

(cont'd)

# Idle Control System

## Air Conditioning Signal ('99 – 00 Models except D16Y5 engine with M/T)

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

**Inspection of Air Conditioning Signal.**

**Check for a short in the wire (ACS line):**

1. Turn the ignition switch OFF.
2. Disconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Measure voltage between ECM/PCM connector terminals A27 and B20.

Is there battery voltage?

YES

NO

**Check for a short in the wire (ACS line):**

1. Turn the ignition switch OFF.
2. Disconnect the ECM/PCM connector A (32P).
3. Check for continuity between body ground and ECM/PCM connector terminal A27.

Is there continuity?

NO

YES

**Repair short in the wire between the ECM/PCM (A27) and the A/C pressure switch.**

**Check for an open in the wire (ACC line):**

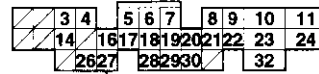
1. Turn the ignition switch OFF.
2. Reconnect the A/C pressure switch 2P connector.
3. Turn the ignition switch ON (II).
4. Momentarily connect ECM/PCM connector terminals A17 and B20 with a jumper wire several times.

(To page 11-207)

- Substitute a known-good ECM/PCM and recheck. If prescribed voltage is now available, replace the original ECM/PCM.
- See the air conditioner inspection (see section 22).

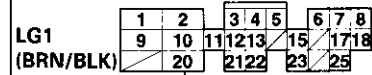
### ECM/PCM CONNECTORS

#### A (32P)



#### ACS (BLU/RED)

#### B (25P)

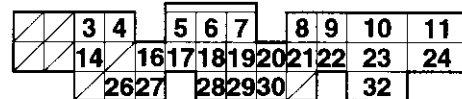


#### LG1 (BRN/BLK)



Near 0V

### ECM/PCM CONNECTOR A (32P)



#### ACS (BLU/RED)

Wire side of female terminals

### ECM/PCM CONNECTORS

#### A (32P)



#### ACC (BLK/RED)

#### B (25P)

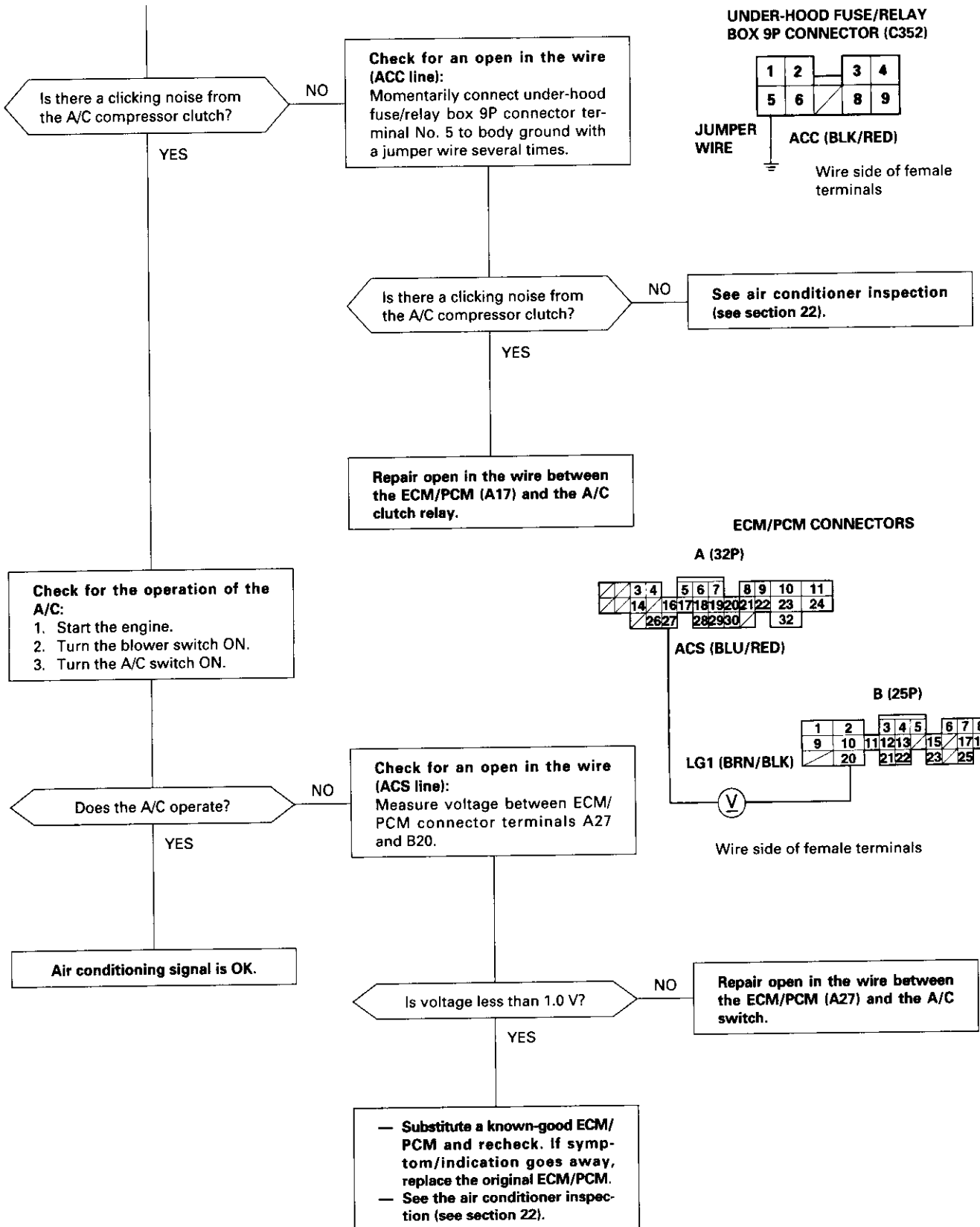


#### JUMPER WIRE

#### LG1 (BRN/BLK)



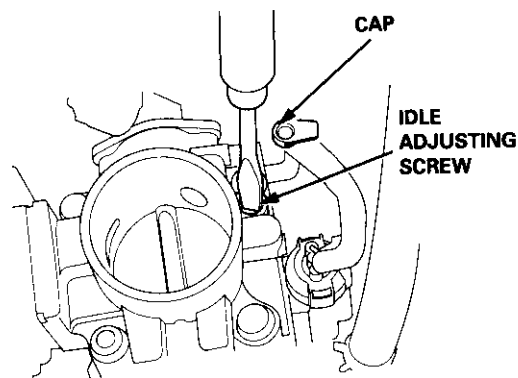
(From page 11-206)





**D16Y7 engine:**

**NOTE:** When you remove the ACL housing, do not disconnect the IAT sensor connector.



5. After turning the idle adjusting screw 1/2-turn, check the idle speed again. If it is out of spec, turn the idle adjusting screw 1/2-turn again.  
**NOTE:** Do not turn the idle adjusting screw more than 1/2-turn without checking the idle speed.
6. Idle the engine for one minute with heater fan switch at HI and air conditioner on, then check the idle speed.

**Idle speed should be:**

<b>M/T</b>	810 ± 50 rpm
<b>A/T, CVT</b>	810 ± 50 rpm (in <b>N</b> or <b>P</b> position)

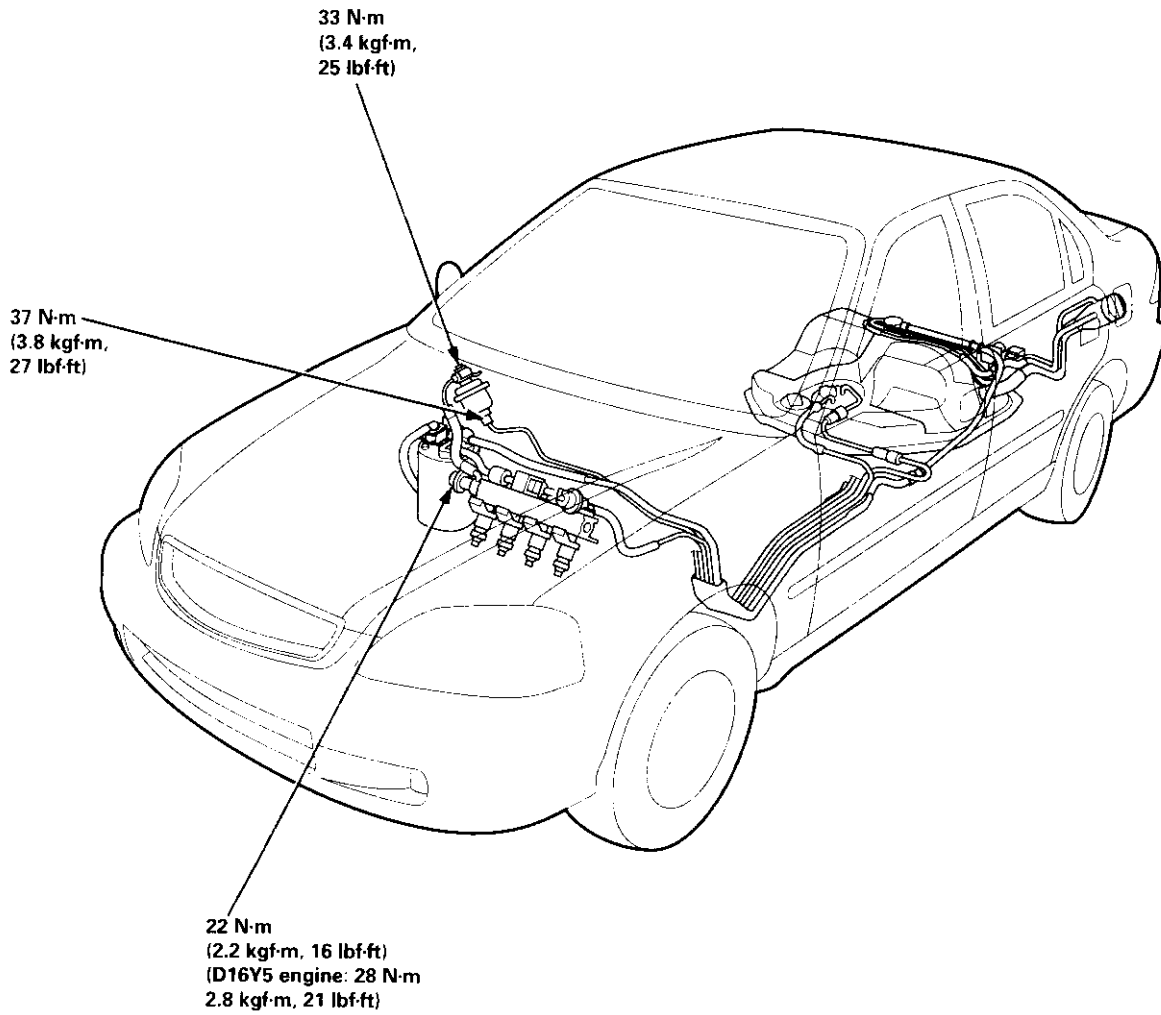
**NOTE:**

- Do not turn the idle adjusting screw when the air conditioner is on.
- If the idle speed is not within specification, see Symptom Chart on page 11-84. (cont'd)

# Fuel Supply System

## Fuel Lines

NOTE: Check fuel system lines, hoses, fuel filter, and other components for damage, leaks and deterioration, and replace if necessary.



The illustration shows '99 - 00 models.

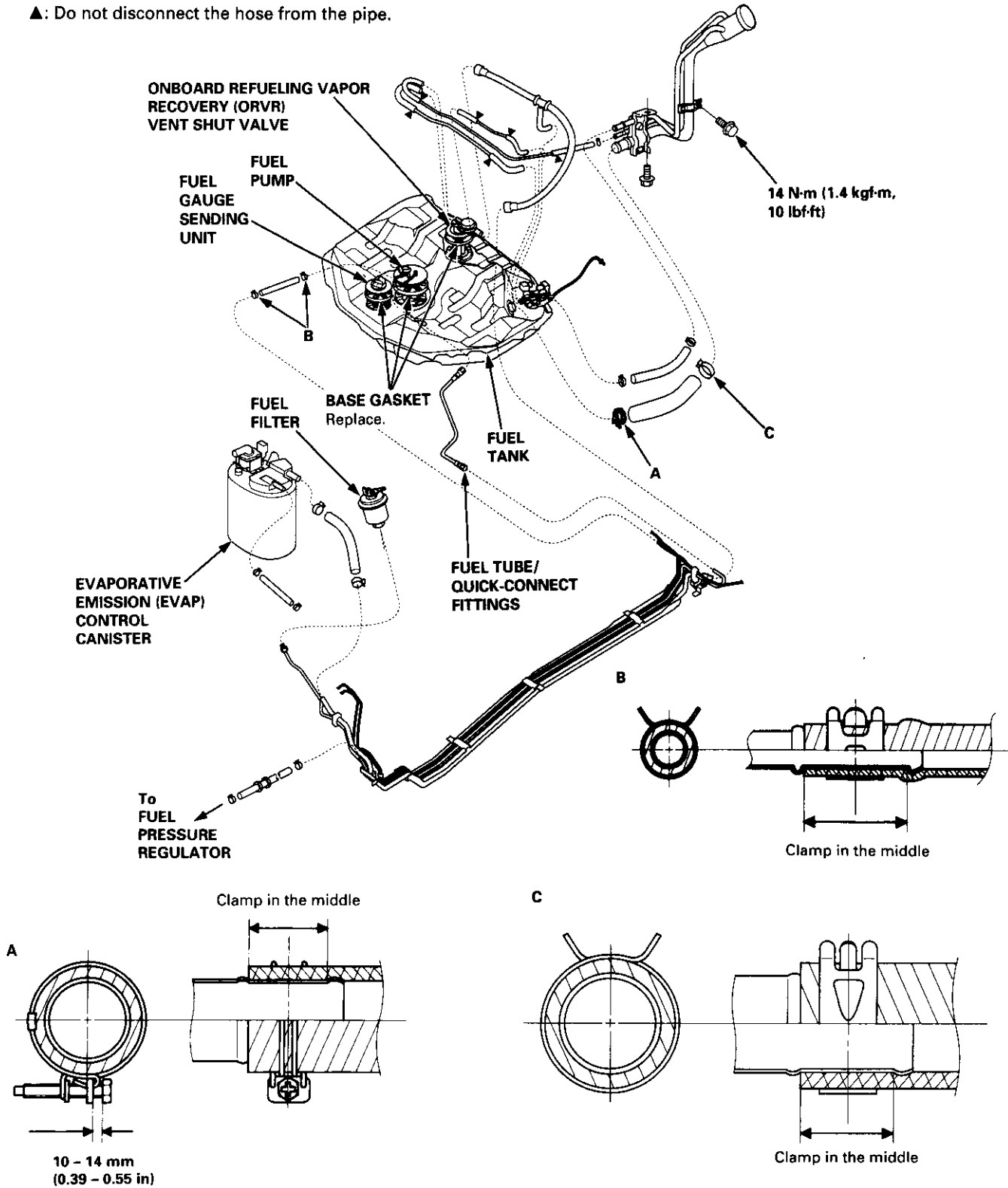
# Fuel Supply System

## Fuel Lines (cont'd)

'99 - 00 models:

NOTE: Check all hose clamps and retighten if necessary.

▲: Do not disconnect the hose from the pipe.





## Fuel Tube/Quick-Connect Fittings

### Precautions

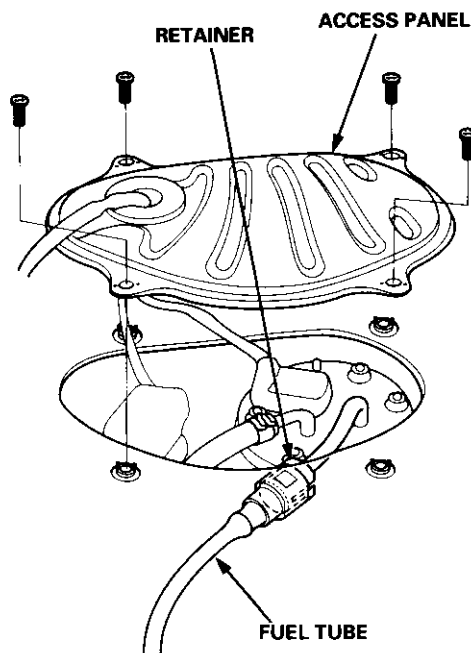
**⚠ WARNING** Do not smoke while working on the fuel system. Keep open flames away from your work area.

The fuel tube/quick-connect fittings assembly connects the in-tank fuel pump with the fuel feed pipe. For removing or installing the fuel pump and fuel tank, it is necessary to disconnect or connect the quick-connect fittings. Pay attention to following:

- The fuel tube/quick-connect fittings assembly is not heat-resistant; be careful not to damage it during welding or other heat-generating procedures.
- The fuel tube/quick-connect fittings assembly is not acid-proof; do not touch it with a shop towel which was used for wiping battery electrolyte. Replace the fuel tube/quick-connect fittings assembly if it came into contact with electrolyte or something similar.
- When connecting or disconnecting the fuel tube/quick-connect fittings assembly, be careful not to bend or twist it excessively. Replace it if damaged.

A disconnected quick-connect fitting can be reconnected, but the retainer on the mating pipe cannot be reused once it has been removed from the pipe. Replace the retainer when

- Replacing the fuel pump.
- Replacing the fuel feed pipe.
- It has been removed from the pipe.
- It is damaged.



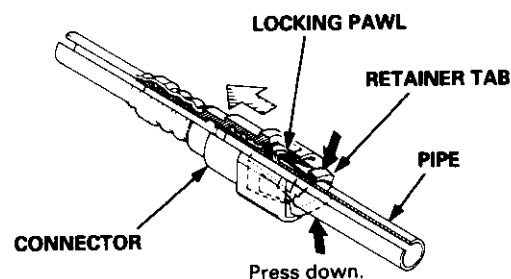
### Disconnection

**⚠ WARNING** Do not smoke while working on the fuel system. Keep open flames away from your work area.

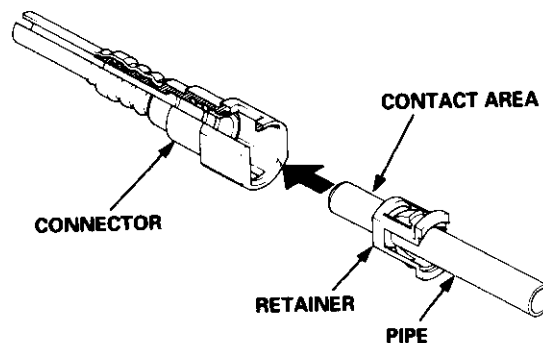
1. Relieve fuel pressure (see pages 11-230, 231).
2. Check the fuel quick-connect fittings for dirt, and clean if necessary.
3. Hold the connector with one hand and press down the retainer tabs with the other hand, then pull the connector off.

#### NOTE:

- Be careful not to damage the pipe or other parts. Do not use tools.
- If the connector does not move, keep the retainer tabs pressed down, and alternately pull and push the connector until it comes off easily.
- Do not remove the retainer from the pipe; once removed, the retainer must be replaced with a new one.



4. Check the contact area of the pipe for dirt and damage.
  - If the surface is dirty, clean it.
  - If the surface is rusty or damaged, replace the fuel pump or fuel feed pipe.



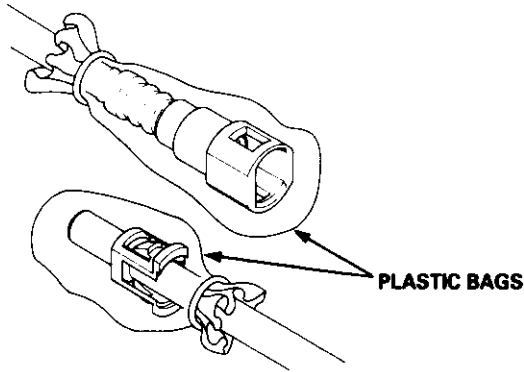
(cont'd)



# Fuel Supply System

## Fuel Tube/Quick-Connect Fittings (cont'd)

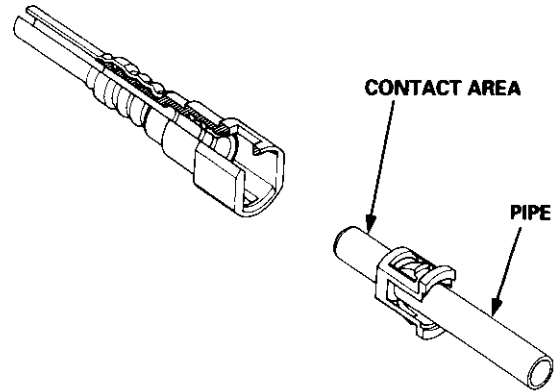
5. To prevent damage and keep out foreign matter, cover the disconnected connector and pipe end with plastic bags.



### Connection

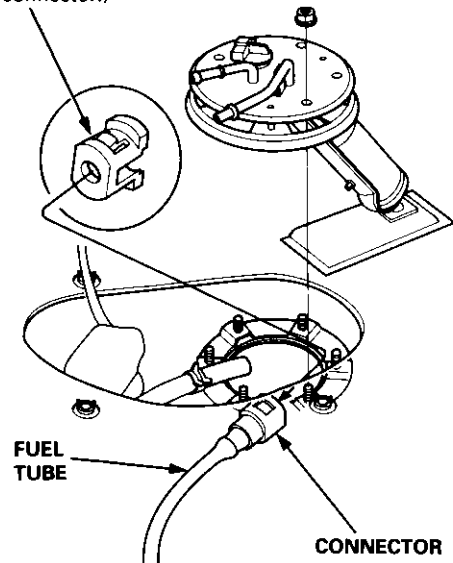
**⚠ WARNING** Do not smoke while working on the fuel system. Keep open flames away from your work area.

1. Check the pipe contact area for dirt and damage, and clean if necessary.



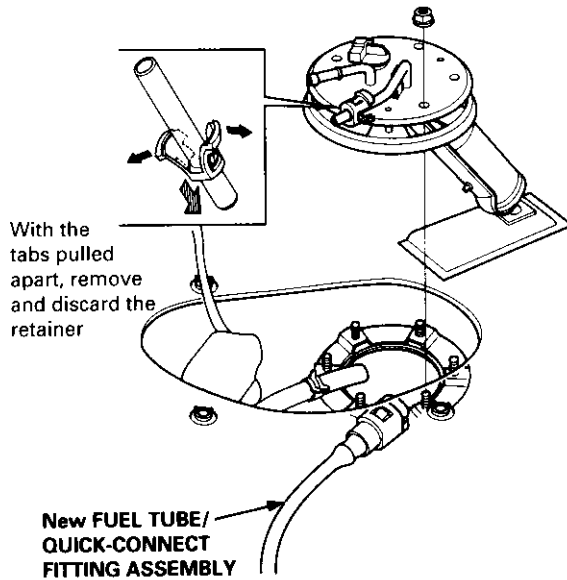
2. Insert a new retainer into the connector if the retainer is damaged, or after
  - replacing the fuel pump.
  - replacing the fuel feed pipe.
  - removing the retainer from the pipe.

**New RETAINER**  
(Insert into the connector.)





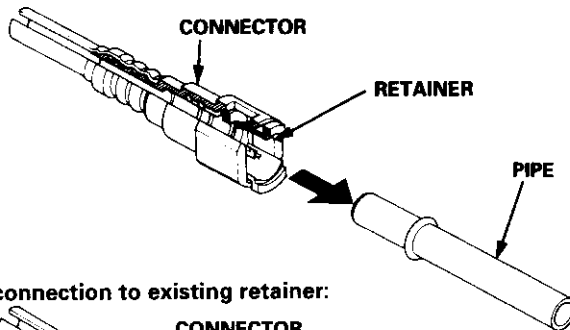
Before connecting a new fuel tube/quick-connect fitting assembly, remove the old retainer from the mating pipe.



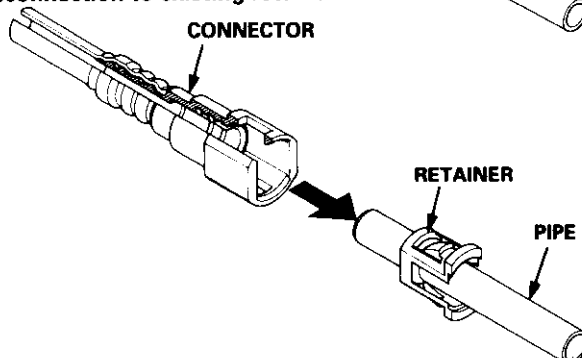
3. Align the quick-connect fittings with the pipe, and align the retainer locking pawls with the connector grooves. Then press the quick-connect fittings onto the pipe until both retainer pawls lock with a clicking sound.

**NOTE:** If it is hard to connect, put a small amount of new engine oil on the pipe end.

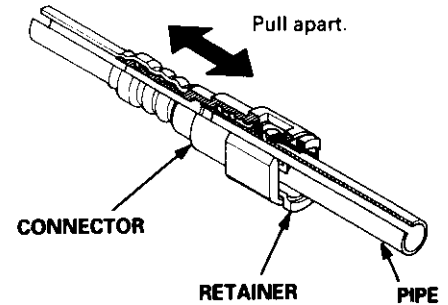
**Connection with new retainer:**



**Reconnection to existing retainer:**



4. Make sure the connection is secure and the pawls are firmly locked into place; check visually and by pulling the connector.



5. Reconnect the battery negative cable, and turn the ignition switch ON (II). The fuel pump will run for about two seconds, and fuel pressure will rise. Repeat two or three times, and check that there is no leakage in the fuel supply system.

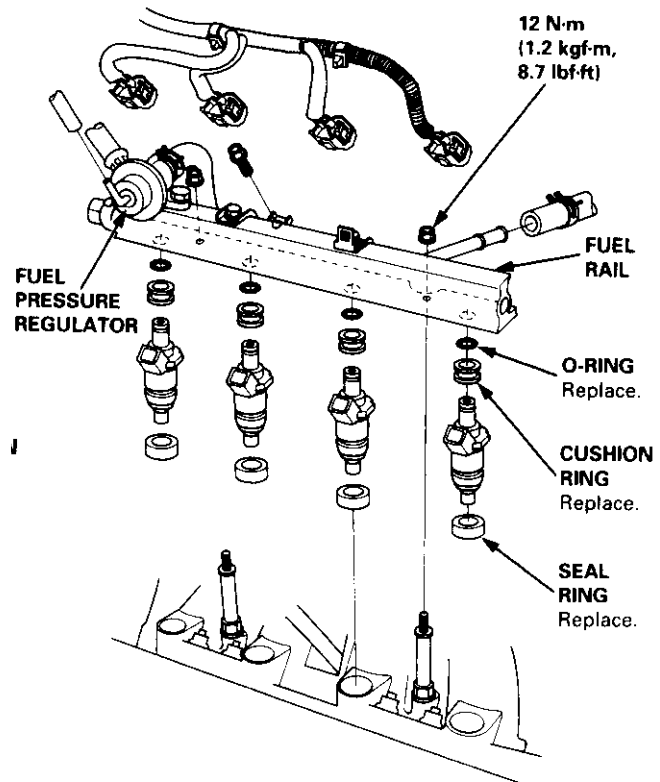
# Fuel Supply System

## Fuel Injectors

### Replacement

**⚠ WARNING** Do not smoke when working on the fuel system. Keep open flames away from your work area.

1. Relieve the fuel pressure (see pages 11-230, 231).
2. Disconnect the connectors from the fuel injectors (D16Y7 engine: Remove the air cleaner).
3. Disconnect the vacuum hoses from the fuel pressure regulator. Place a shop towel over the fuel return hose, then disconnect it from the fuel pressure regulator. Disconnect the vacuum hoses and 2P connector from the EVAP purge control solenoid valve.
4. Remove the retainer nuts on the fuel rail.
5. Disconnect the fuel rail.
6. Remove the fuel injectors from the intake manifold.



# Fuel Supply System

## Fuel Pressure Regulator

### Testing

**⚠ WARNING** Do not smoke during the test. Keep open flames away from your work area.

1. Attach the special tool(s) to the service port on the fuel filter (see pages 11-230, 231).

#### Pressure should be:

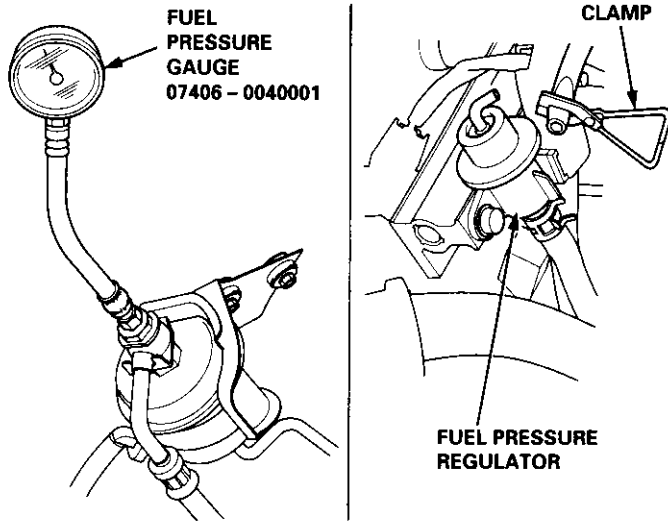
except B16A2 engine

260 – 310 kPa (2.7 – 3.2 kgf/cm<sup>2</sup>, 38 – 46 psi)

B16A2 engine:

270 – 320 kPa (2.8 – 3.3 kgf/cm<sup>2</sup>, 40 – 47 psi)

(with the fuel pressure regulator vacuum hose disconnected and pinched)



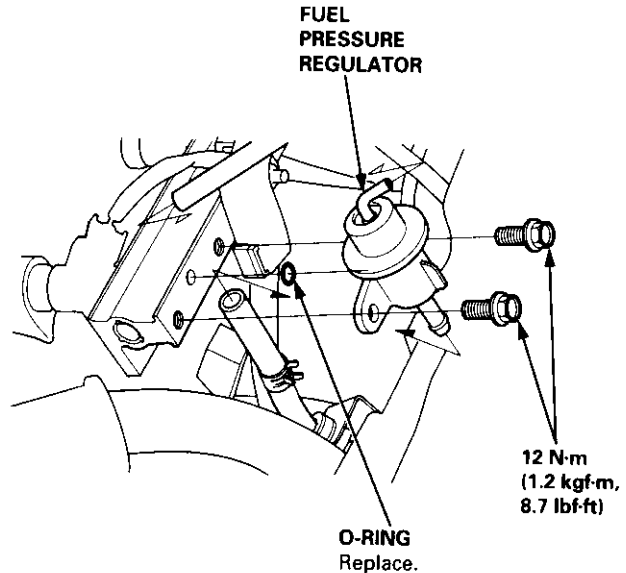
2. Reconnect the vacuum hose to the fuel pressure regulator.
3. Check that the fuel pressure rises when the vacuum hose from the fuel pressure regulator is disconnected again.

If the fuel pressure did not rise, replace the fuel pressure regulator.

### Replacement

**⚠ WARNING** Do not smoke while working on fuel system. Keep open flame away from your work area.

1. Place a shop towel under the fuel pressure regulator, then relieve fuel pressure (see pages 11-230, 231).
2. Disconnect the vacuum hose and fuel return hose.
3. Remove the two 6 mm retainer bolts and the fuel pressure regulator.



4. Apply clean engine oil to a new O-ring, and carefully install it into its proper position.
5. Install the fuel pressure regulator in the reverse order of removal.



## Fuel Filter

### Replacement

#### ⚠ WARNING

- Do not smoke while working on fuel system. Keep open flame away from your work area.
- While replacing the fuel filter, be careful to keep a safe distance between battery terminals and any tools.

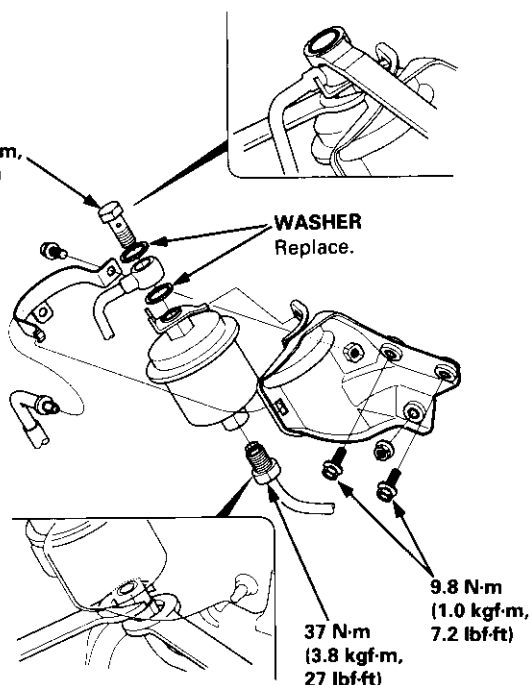
The fuel filter should be replaced whenever the fuel pressure drops below the specified value [260 – 310 kPa (2.7 – 3.2 kgf/cm<sup>2</sup>, 38 – 46 psi), (270 – 320 kPa (2.8 – 3.3 kgf/cm<sup>2</sup>, 40 – 47 psi))\* with the fuel pressure regulator vacuum hose disconnected and pinched] after making sure that the fuel pump and the fuel pressure regulator are OK. \*: B16A2 engine

1. Place a shop towel under and around the fuel filter.
2. Relieve fuel pressure (see pages 11-230, 231).
3. Remove the 12 mm banjo bolt and the fuel feed pipe from the fuel filter, while supporting it with the another wrench, as shown.
4. Remove the fuel filter clamp and fuel filter.
5. Install the new fuel filter in the reverse order removal, and note these items:
  - When assembling, use new washers as shown.
  - Clean the flared joint of high pressure hoses thoroughly before reconnecting them.

### '97 AND LATER MODELS:

12 mm  
BANJO  
BOLT  
33 N-m  
(3.4 kgf-m,  
25 lbf-ft)

WASHER  
Replace.



# Fuel Supply System

## Fuel Pump

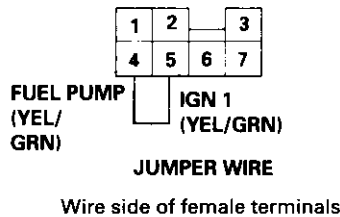
### Testing

**▲ WARNING** Do not smoke during the test. Keep open flame away from your work area.

If you suspect a problem with the fuel pump, check that the fuel pump actually runs; when it is ON (II), you will hear some noise if you hold your ear to the fuel fill port with the fuel fill cap removed. The fuel pump should run for two seconds when ignition switch is first turned ON (II). If the fuel pump does not make noise, check it as follows:

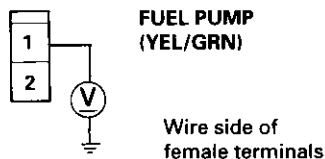
1. Remove the seat cushion (see section 20).
2. Remove the access panel from the floor.
3. Make sure the ignition switch is OFF, then disconnect the fuel tank 2P connector.
4. Connect the PGM-FI main relay 7P connector terminal No. 4 and No. 5 with a jumper wire.

#### PGM-FI MAIN RELAY 7P CONNECTOR (C443)



5. Check that battery voltage is available between the fuel pump connector terminal No. 1 and body ground when the ignition switch is turned ON (II).

#### 2P CONNECTOR (C565)

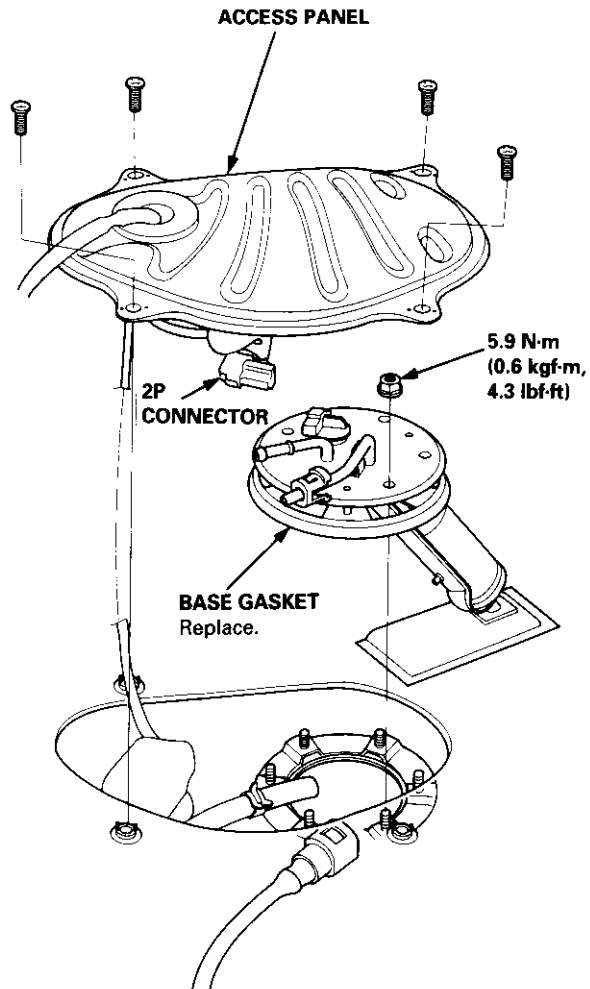


- If battery voltage is available, check the fuel pump ground. If the ground is OK, replace the fuel pump.
- If there is no voltage, check the wire harness (see page 11-238).

### Replacement

**▲ WARNING** Do not smoke while working on fuel system. Keep open flames away from your work area.

1. Remove the seat cushion (see section 20).
2. Remove the access panel from the floor.



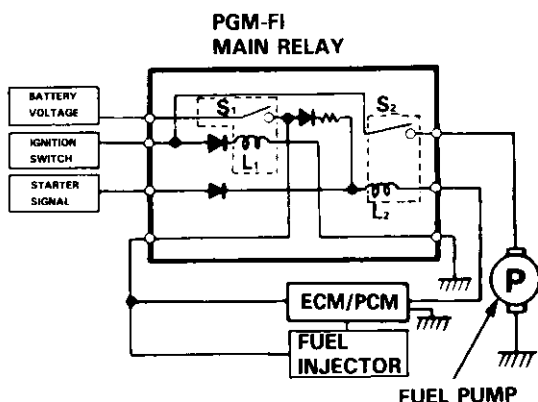
3. Disconnect the 2P connector from the fuel pump.
4. Remove the fuel pump mounting nuts.
5. Remove the fuel pump from the fuel tank.
6. Install parts in the reverse order of removal.



## PGM-FI Main Relay

### Description

The PGM-FI main relay actually contains two individual relays. This relay is located at the right side of the cowl. One relay is energized whenever the ignition is on which supplies the battery voltage to the ECM/PCM, power to the fuel injectors, and power for the second relay. The second relay is energized for two seconds when the ignition is switched ON (II), and when the engine is running, to supply power to the fuel pump.



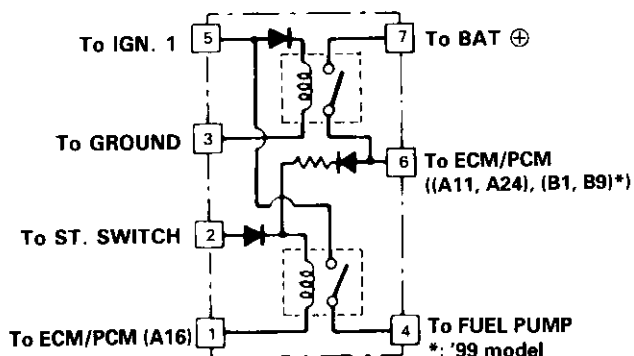
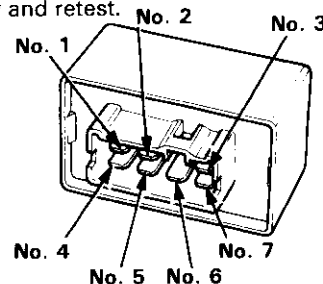
### Relay Testing

#### NOTE:

- If the engine starts and continues to run, the PGM-FI main relay is OK.
- Use the terminal numbers below; ignore the terminal numbers molded into the relay.

1. Remove the PGM-FI main relay.
2. Attach the battery positive terminal to the No. 2 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check for continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.

- If there is continuity, go on to step 3.
- If there is no continuity, replace the PGM-FI main relay and retest.



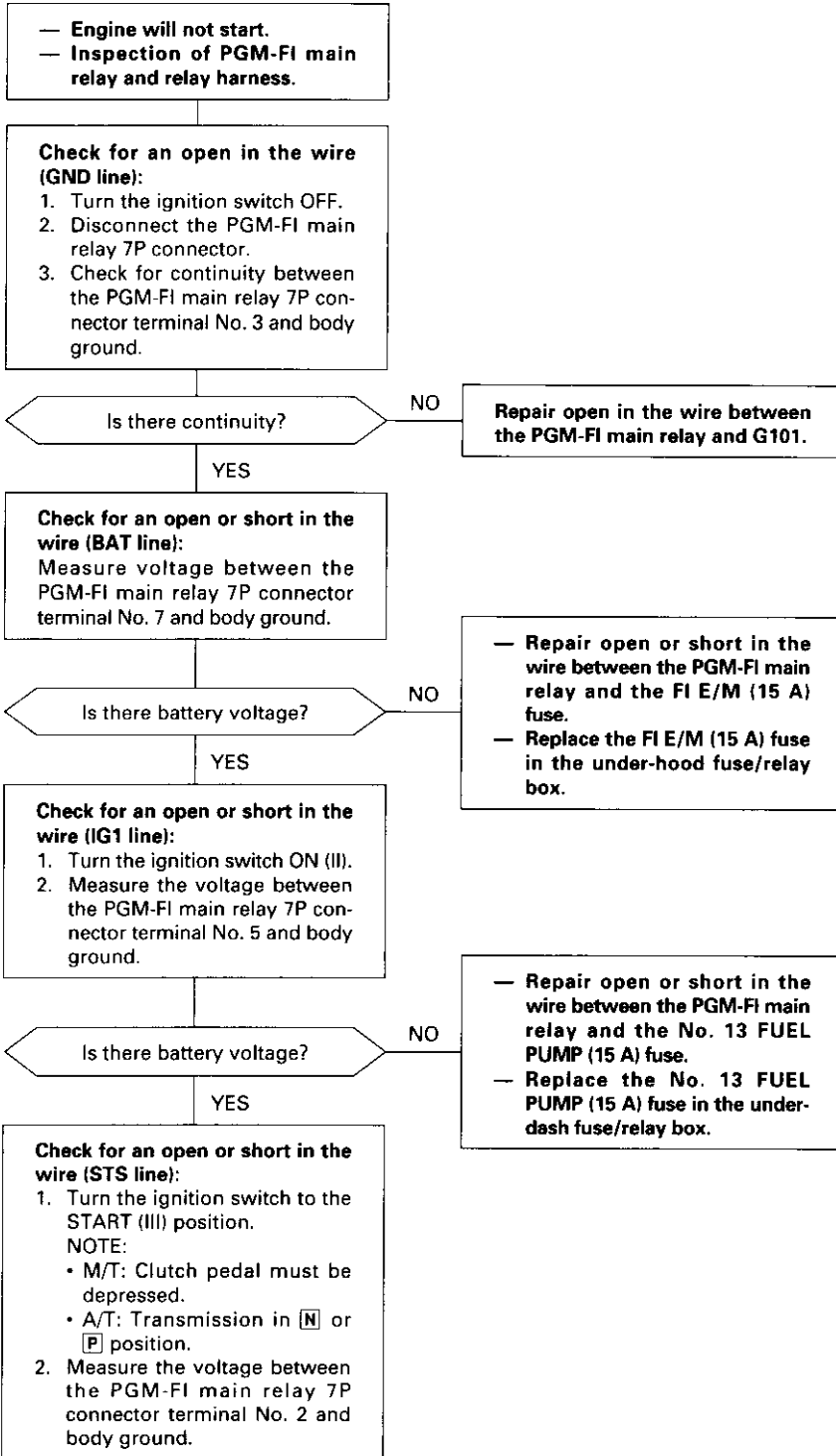
3. Attach the battery positive terminal to the No. 5 terminal and the battery negative terminal to the No. 3 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 7 terminal and No. 6 terminal of the PGM-FI main relay.
  - If there is continuity, go on to step 4.
  - If there is no continuity, replace the PGM-FI main relay and retest.
4. Attach the battery positive terminal to the No. 6 terminal and the battery negative terminal to the No. 1 terminal of the PGM-FI main relay. Then check that there is continuity between the No. 5 terminal and No. 4 terminal of the PGM-FI main relay.
  - If there is continuity, the PGM-FI main relay is OK. If the fuel pump still does not work, go to Harness Testing on the next page.
  - If there is no continuity, replace the PGM-FI main relay and retest.

(cont'd)

# Fuel Supply System

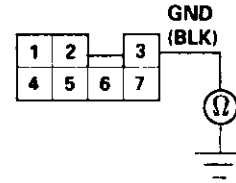
## PGM-FI Main Relay (cont'd)

### Circuit Troubleshooting

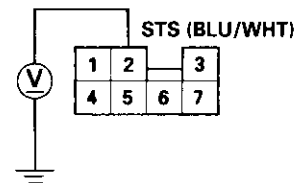
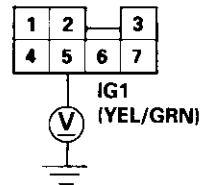
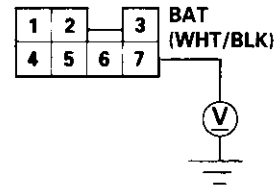


'96 - 98 models: (To page 11-239)  
'99 - 00 models: (To page 11-240)

PGM-FI MAIN RELAY 7P CONNECTOR (C443)



Wire side of female terminals



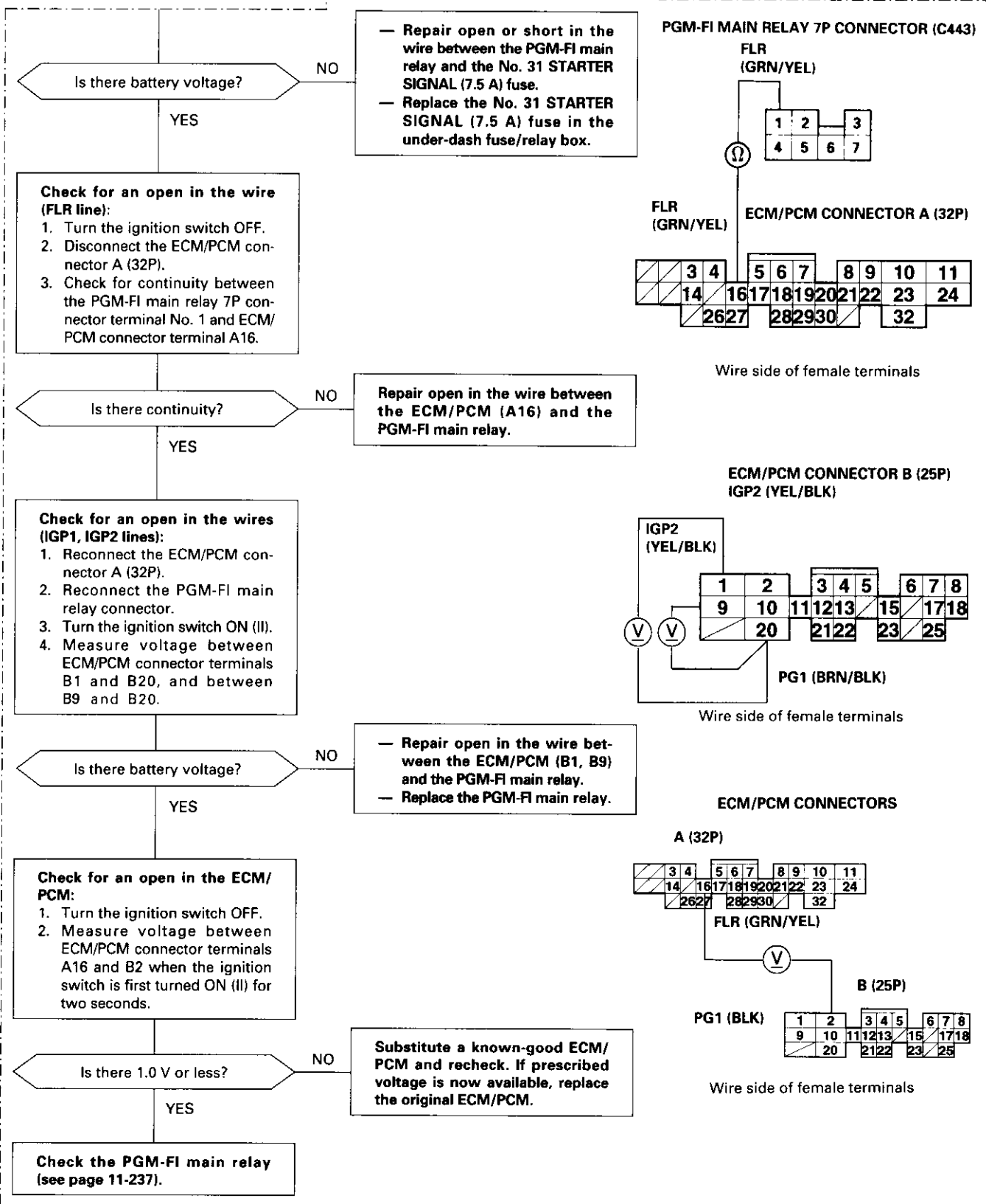


# Fuel Supply System

## PGM-FI Main Relay (cont'd)

(From page 11-238)

('99 - 00 models)



# Fuel Supply System

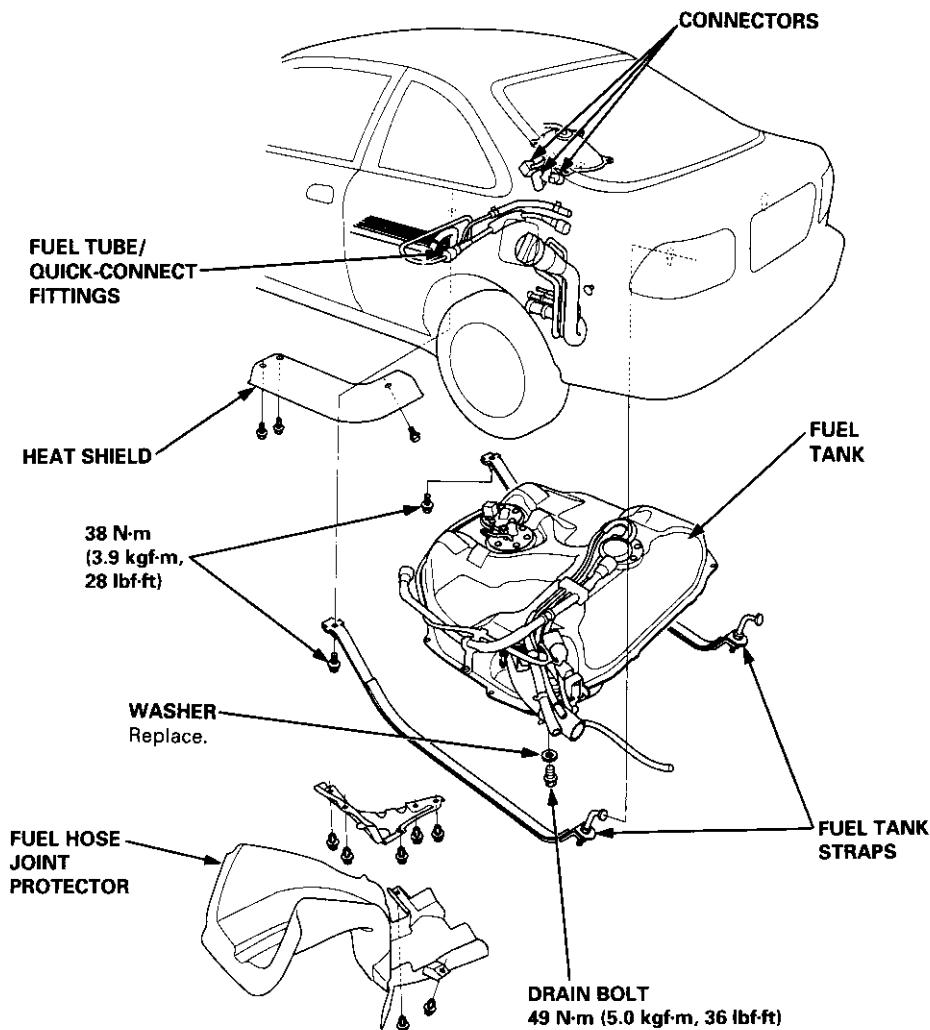
## Fuel Tank (cont'd)

'99 - 00 models:

### Replacement

**⚠ WARNING** Do not smoke while working on fuel system. Keep open flame away from your work area.

1. Relieve the fuel pressure (see pages 11-230, 231).
2. Remove the seat cushion (see section 20).
3. Remove the access panel from the floor.
4. Disconnect the 2P (C565) and 3P (C564) connectors and 6P (C568) connector.
5. Disconnect the hose and quick-connect fittings (see pages 11-226, 227).
6. Jack up the vehicle, and support it with jackstands.
7. Remove the fuel hose joint protector and heat shield.
8. Remove the drain bolt, and drain the fuel into an approved container.
9. Disconnect the hoses (see page 11-226). Slide back the clamps, then twist hoses as you pull, to avoid damaging them.
10. Place a jack, or other support, under the tank.
11. Remove the strap nuts, and let the straps fall free.
12. Remove the fuel tank. If it sticks on the undercoat applied to its mount, carefully pry it off the mount.
13. Install the drain bolt with a new washer, then coat the drain bolt with Noxrust 124B, Allow the Noxrust dry for 20 minutes.
14. Install the remaining parts in the reverse order of removal.

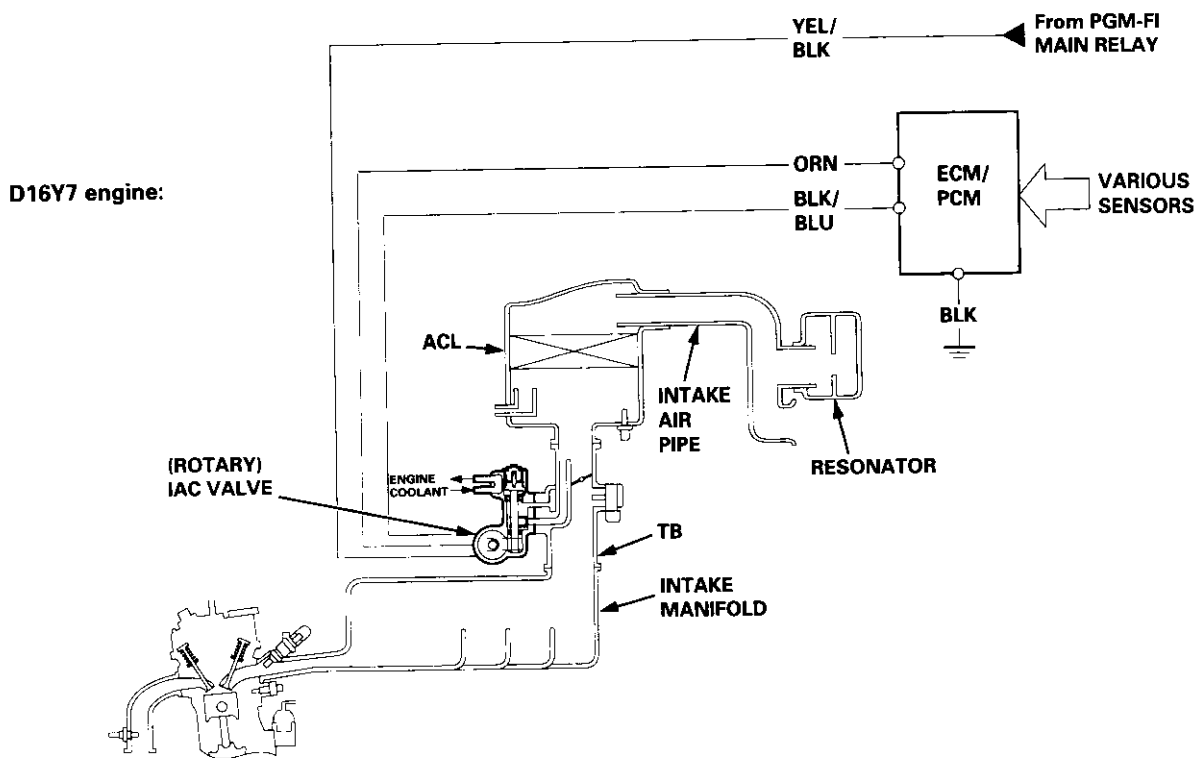




# Intake Air System

## System Description

The system supplies air for all engine needs. It consists of the intake air pipe, Air Cleaner (ACL), intake air duct, Throttle Body (TB), Idle Air Control (IAC) Valve and intake manifold. A resonator in the intake air pipe provides additional silencing as air is drawn into the system.

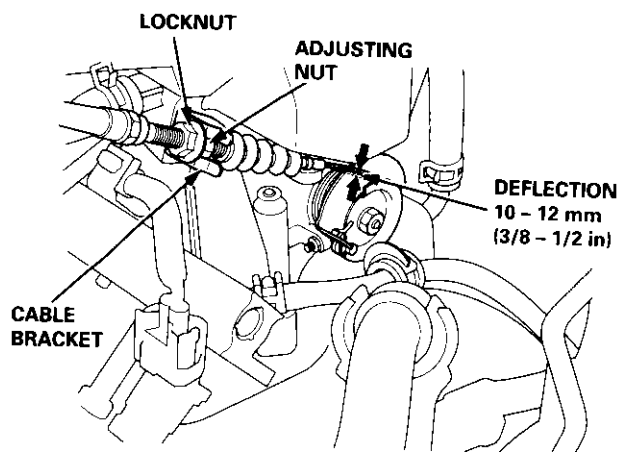


## Throttle Cable

### Inspection/Adjustment

1. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
2. Check that the throttle cable operates smoothly with no binding or sticking. Repair as necessary.
3. Check cable free play at the throttle linkage. Cable deflection should be 10 – 12 mm (3/8 – 1/2 in.).

D16Y7 engine:



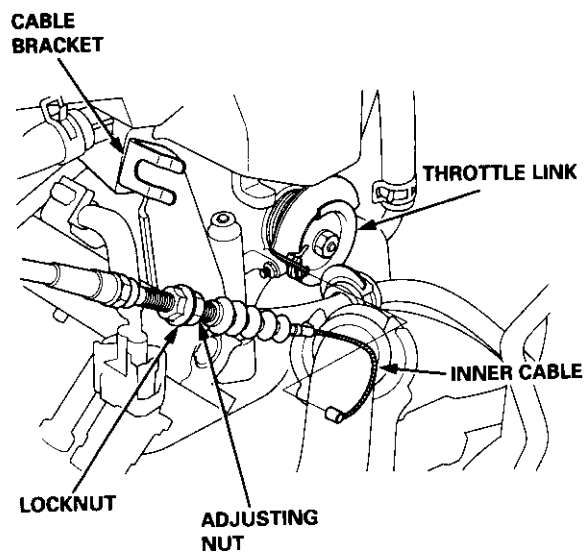


## Installation

### D16Y5, D16Y8, D16Y7 engine:

1. Open the throttle valve fully, then install the throttle cable in the throttle linkage, and install the cable housing in the cable bracket.

### D16Y7 engine:



2. Start the engine. Hold the engine at 3,000 rpm with no load (in Park or neutral) until the radiator fan comes on, then let it idle.
3. Hold the cable sheath, removing all slack from the cable.

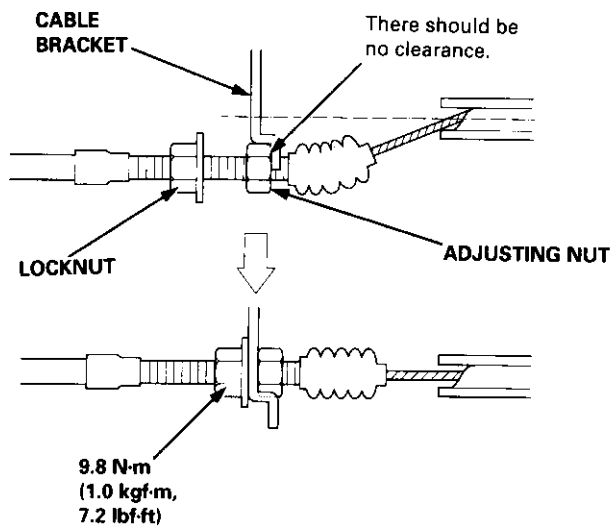
(cont'd)

# Intake Air System

## Throttle Cable (cont'd)

4. Set the locknut on the cable bracket. Adjust the adjusting nut so that its free play is 0 mm.
5. Remove the cable sheath from the throttle bracket, reset the adjusting nut and tighten the locknut.

D16Y7 engine:





## Throttle Body

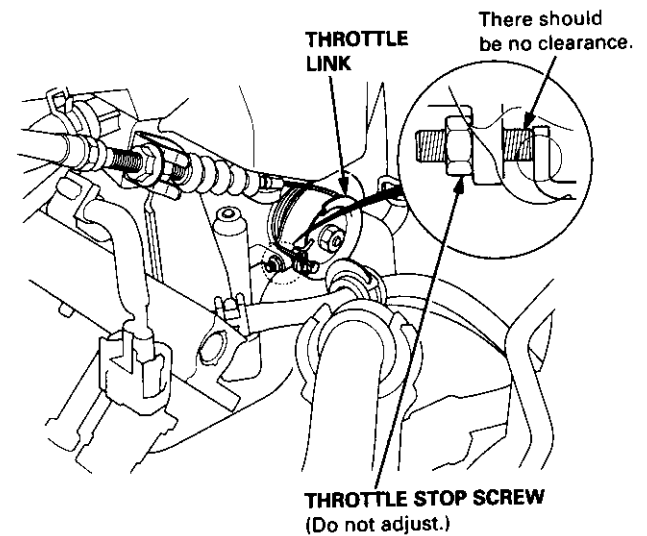
### Description

The throttle body is either a single-barrel side-draft type (D16Y5, D16Y8, B16A2 engine) or a down-draft type (D16Y7 engine). The lower portion of the throttle valve is heated by engine coolant from the cylinder head. The idle adjusting screw which regulates the bypass air is located on the top of the throttle body.

### Inspection

1. Check that the throttle cable operates smoothly without binding or sticking.  
If there are any abnormalities, check for:
  - Excessive wear or play in the throttle valve shaft.
  - Sticky or binding throttle lever at the fully closed position.
  - Clearance between throttle stop screw and throttle lever at the fully closed position.

### D16Y7 engine:



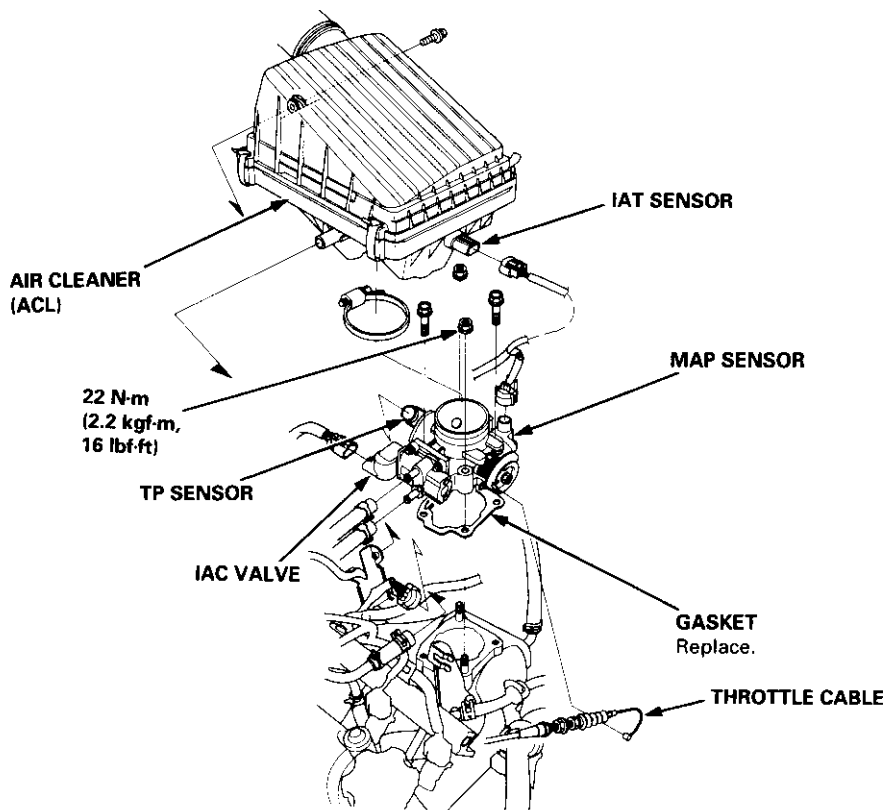
(cont'd)

# Intake Air System

## Throttle Body (cont'd)

### Removal

D16Y7 engine:



#### NOTE:

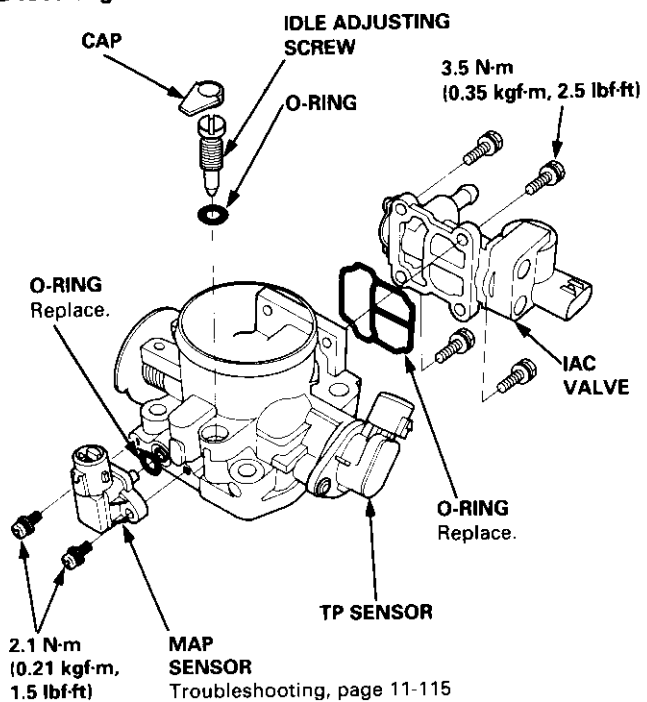
- Do not adjust the throttle stop screw.
- After reassembly, adjust the throttle cable (see page 11-244).
- The TP sensor is not removable.





## Disassembly

D16Y7 engine:



# Emission Control System

## Positive Crankcase Ventilation (PCV) System

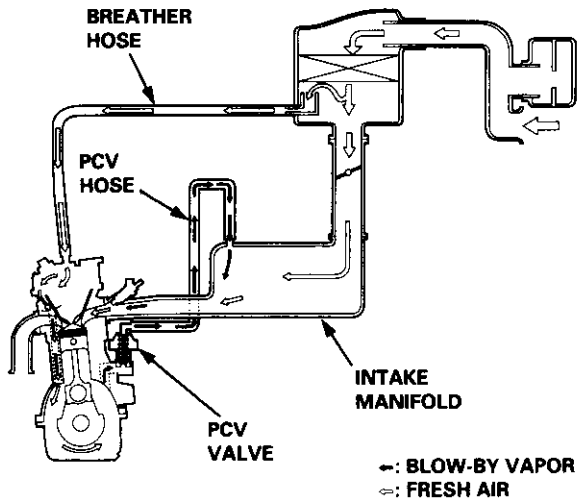
### Description

The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.

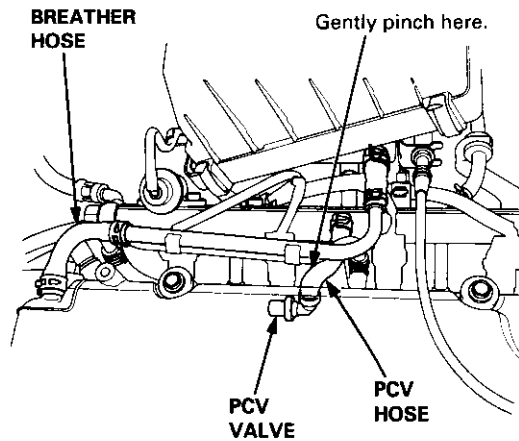
### Inspection

1. Check the PCV hoses and connections for leaks and clogging.
2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and the intake manifold is lightly pinched with your fingers or pliers.

D16Y7 engine:



D16Y7 engine:



If there is no clicking sound, check the PCV valve grommet for cracks and damage. If the grommet is OK, replace the PCV valve and recheck.

# Emission Control System

## Positive Crankcase Ventilation (PCV) System

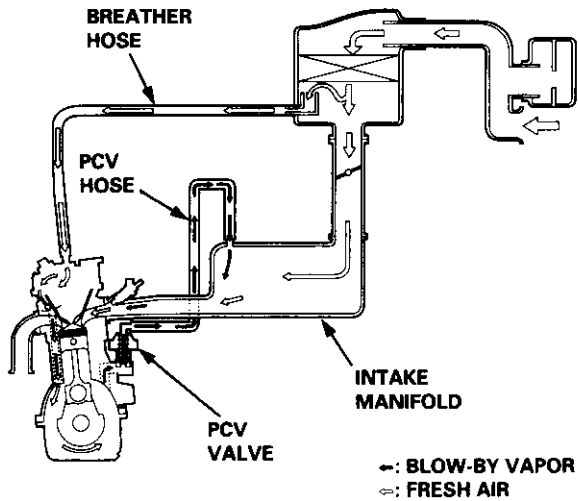
### Description

The Positive Crankcase Ventilation (PCV) system is designed to prevent blow-by gas from escaping to the atmosphere. The PCV valve contains a spring-loaded plunger. When the engine starts, the plunger in the PCV valve is lifted in proportion to intake manifold vacuum and the blow-by gas is drawn directly into the intake manifold.

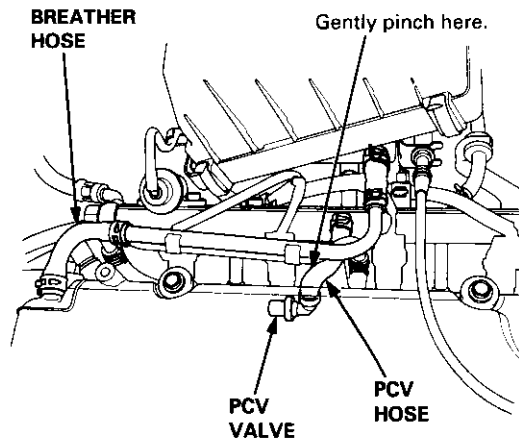
### Inspection

1. Check the PCV hoses and connections for leaks and clogging.
2. At idle, make sure there is a clicking sound from the PCV valve when the hose between the PCV valve and the intake manifold is lightly pinched with your fingers or pliers.

D16Y7 engine:



D16Y7 engine:



## **Transaxle**

<b>Clutch .....</b>	<b>12-1</b>
<b>Manual Transmission .....</b>	<b>13-1</b>
<b>Automatic Transmission .....</b>	<b>14-1</b>
<b>Differential .....</b>	<b>15-1</b>
<b>Driveshafts .....</b>	<b>16-1</b>



## **Automatic Transmission**

<b>Automatic Transmission .....</b>	<b>14-1</b>
<b>Continuously Variable Transmission (CVT) .....</b>	<b>14-193</b>



# Automatic Transmission

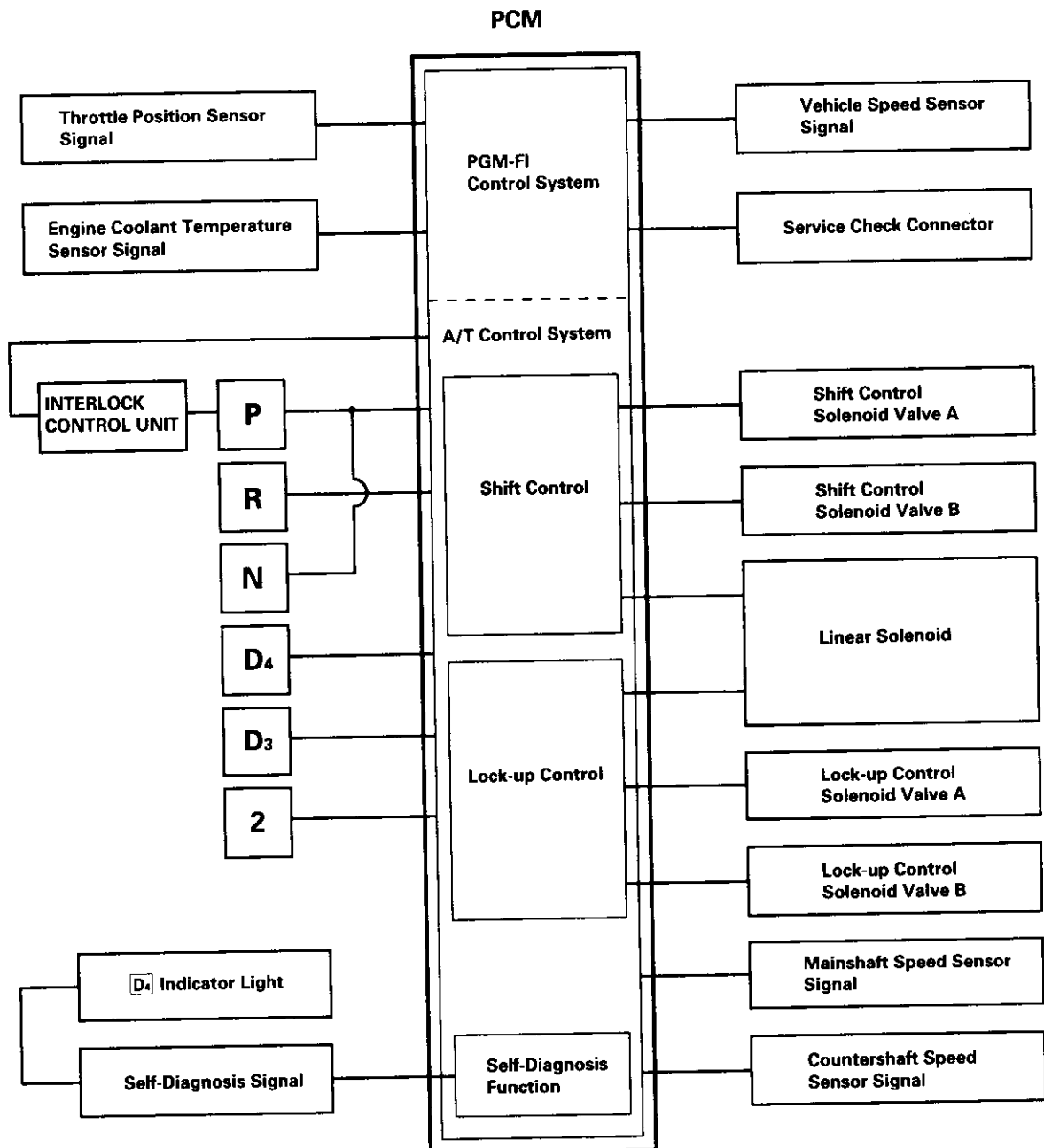
Special Tools .....	14-2	Valve Body	
Description .....	14-3	Repair .....	14-139
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## Electronic Control System

The electronic control system consists of a Powertrain Control Module (PCM), sensors, a linear solenoid and four solenoid valves. Shifting and lock-up are electronically controlled for comfortable driving under all conditions. The PCM is located below the dashboard, under the front lower panel on the passenger's side.



(cont'd)

# Description

## Electronic Control System (cont'd)

### Shift Control

The PCM instantaneously determines which gear should be selected by various signals sent from sensors, and actuates the shift control solenoid valves A and B to control shifting. Also, a Grade Logic Control System has been adopted to control shifting in **D<sub>4</sub>** position while the vehicle is ascending or descending a slope, or reducing speed.

Position	Gear	Shift Control Solenoid Valve A	Shift Control Solenoid Valve B
<b>D<sub>4</sub></b> , <b>D<sub>3</sub></b>	1st	OFF	ON
	2nd	ON	ON
	3rd	ON	OFF
<b>D<sub>4</sub></b>	4th	OFF	OFF
<b>2</b>	2nd	ON	ON
<b>R</b> *	Reverse	ON	OFF

\*See page 14-31 for reverse inhibitor control description.

### Lock-up Control

From sensor input signals, the PCM determines whether to turn the lock-up ON or OFF, and activates lock-up control solenoid valve A and/or B accordingly. The combination of driving signals to lock-up control solenoid valves A and B and the linear solenoid pressure is shown in the table below.

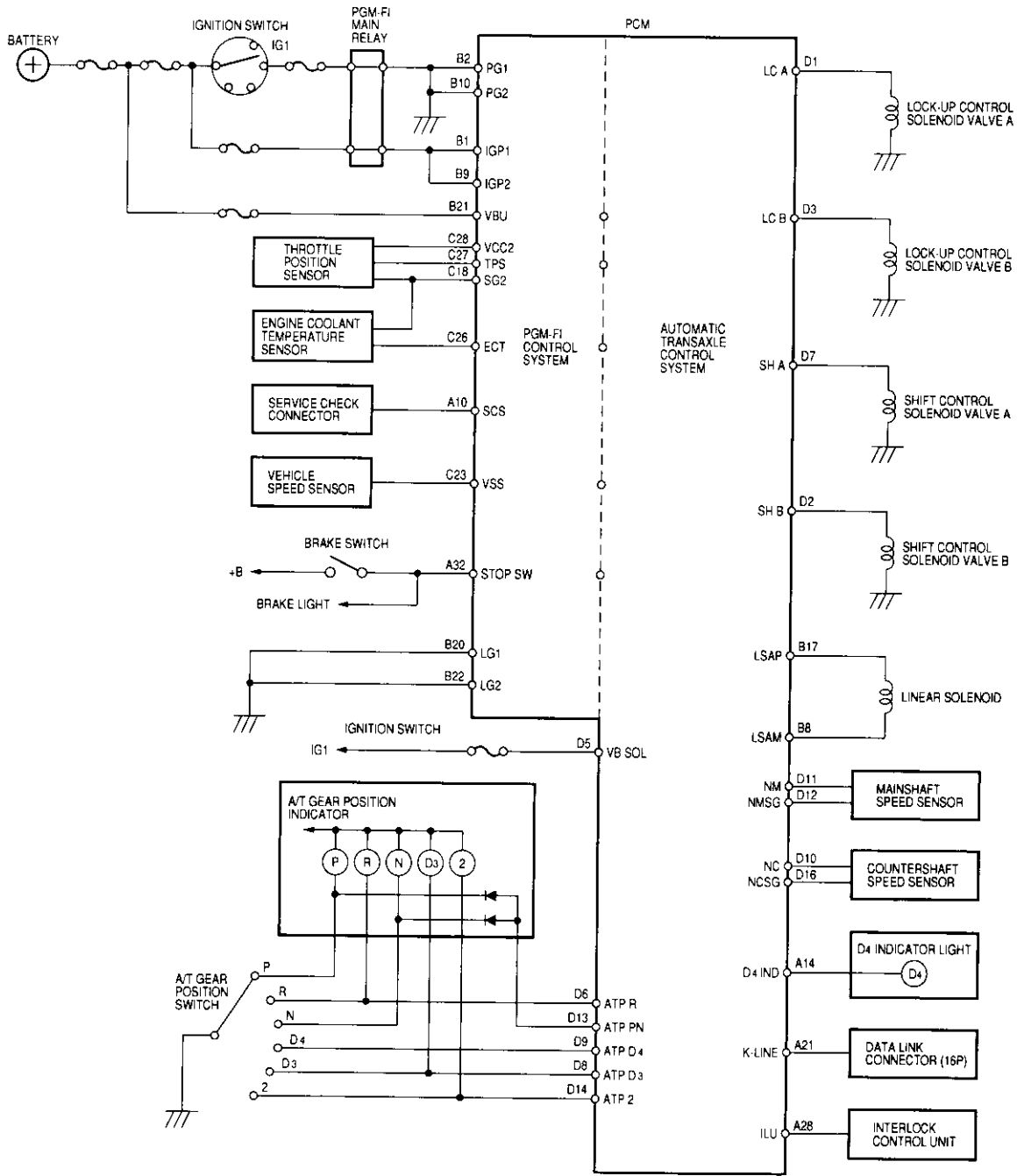
Lock-up Conditions	Lock-up Control Solenoid Valve A	Lock-up Control Solenoid Valve B	Linear Solenoid Pressure
Lock-up OFF	OFF	OFF	High
Lock-up, Half	ON	Duty operation OFF ↔ ON	Low
Lock-up, Full	ON	ON	High
Lock-up during deceleration	ON	Duty operation OFF ↔ ON	Low



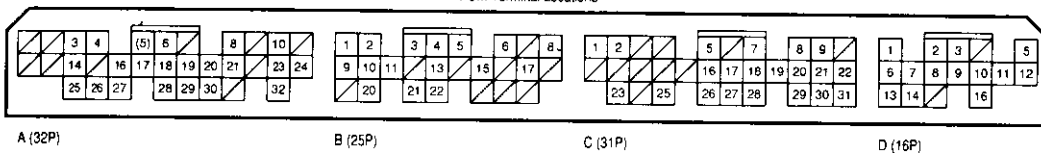
# Description

## Electronic Control System (cont'd)

### Circuit Diagram and Terminal Locations — '99 - 00 Models



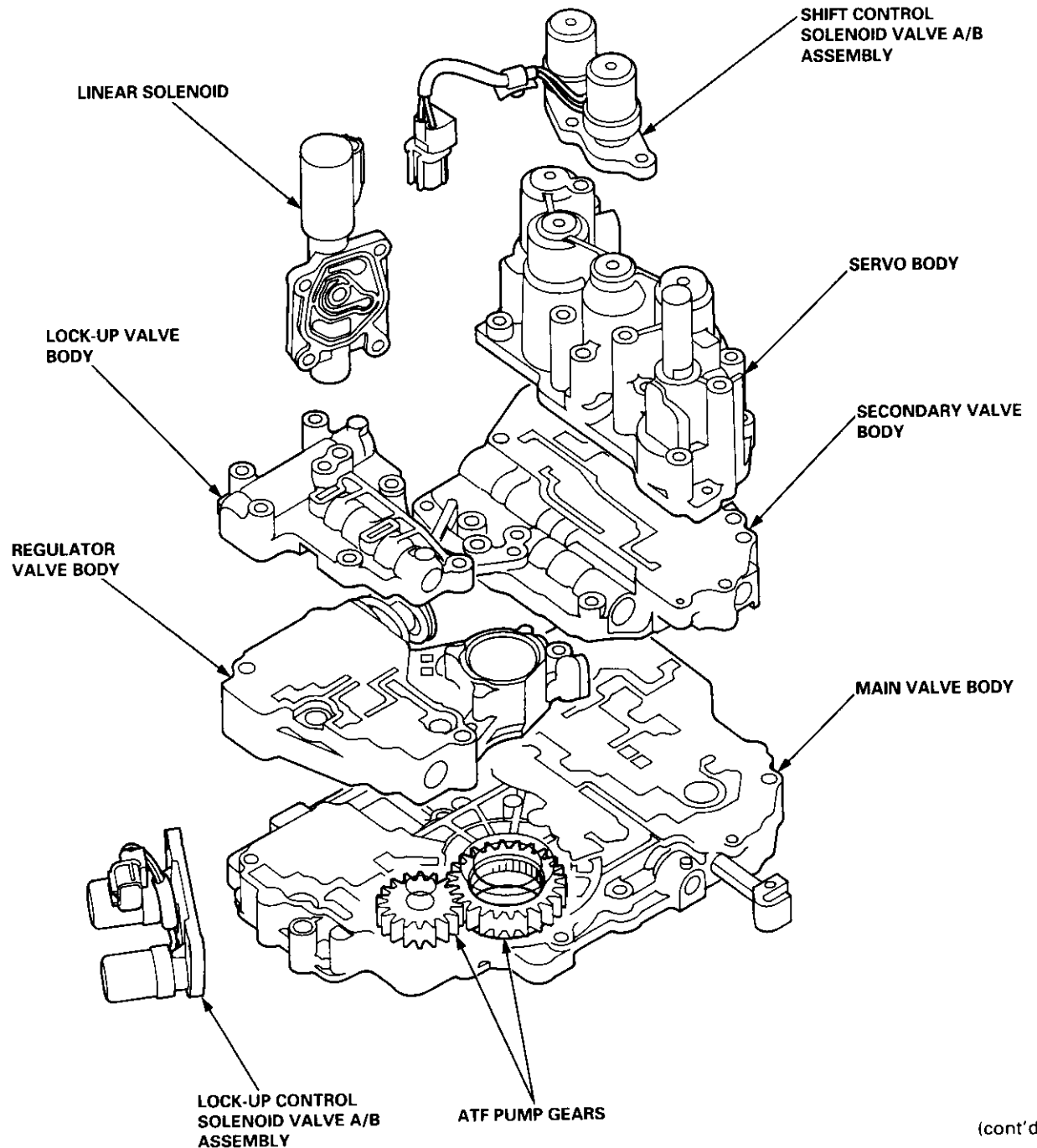
PCM Terminal Locations





## Hydraulic Control

The hydraulic control system is controlled by the ATF pump, valves, accumulators, and electronically controlled solenoids. The ATF pump is driven by splines on the end of the torque converter which is attached to the engine. Fluid from the ATF pump flows through the regulator valve to maintain specified pressure through the main valve body to the manual valve, directing pressure to each of the clutches. The valve body includes the main valve body, the regulator valve body, the lock-up valve body, the secondary valve body, the servo body, the linear solenoid, the shift control solenoid valve A/B assembly, and the lock-up control solenoid valve A/B assembly. The shift control solenoid valve A/B assembly and the linear solenoid are bolted on the outside of the transmission housing. The lock-up control solenoid valve A/B assembly is bolted on the outside of the torque converter housing.



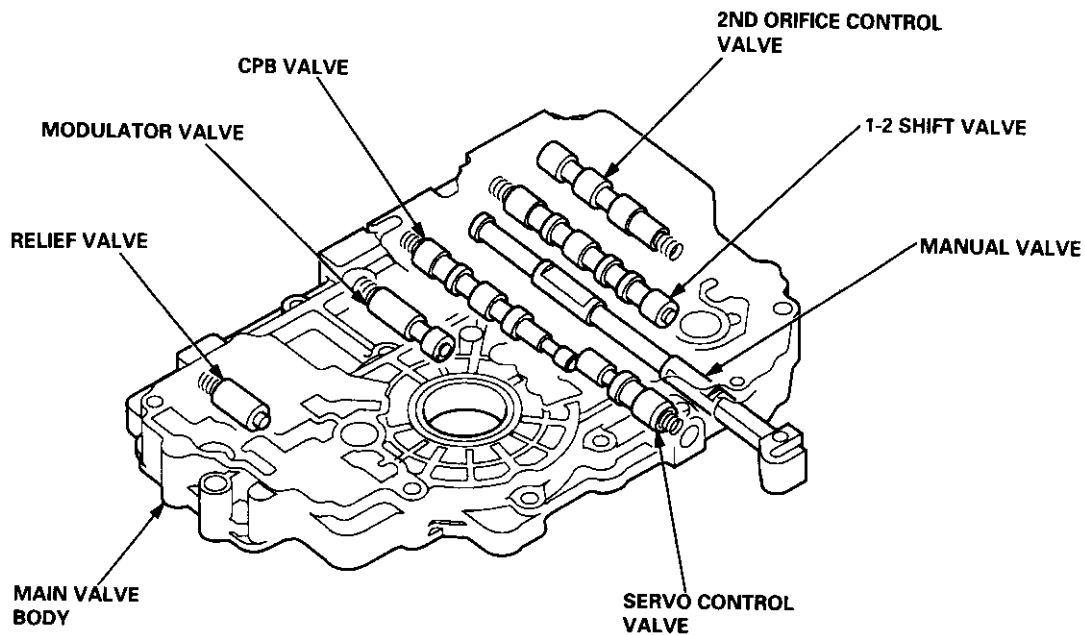
(cont'd)

# Description

## Hydraulic Control (cont'd)

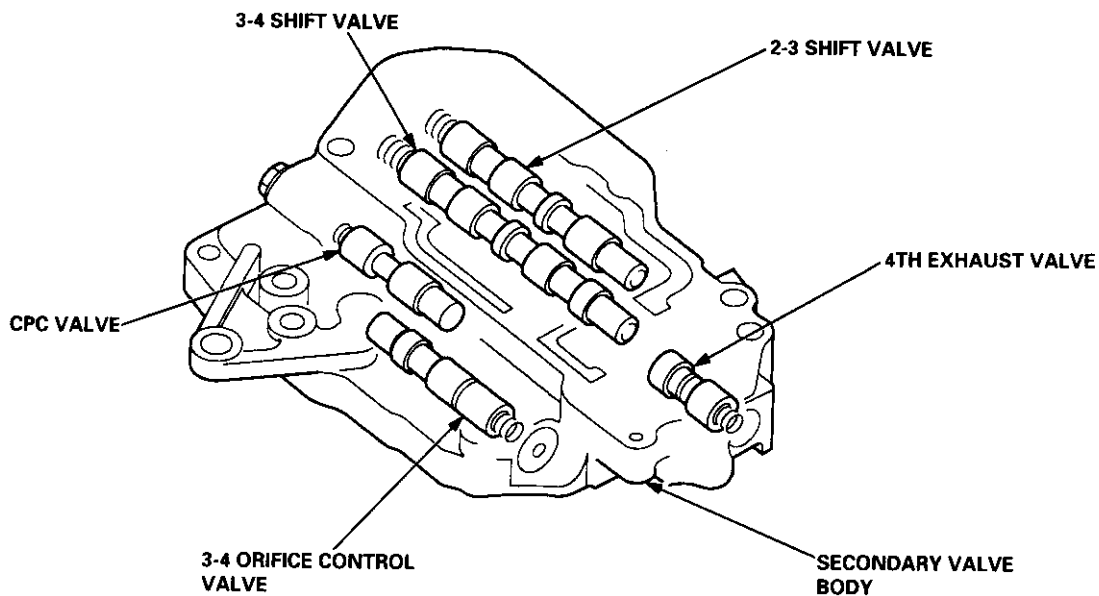
### Main Valve Body

The main valve body houses the manual valve, the 1-2 shift valve, the 2nd orifice control valve, the CPB valve, the modulator valve, the servo control valve, and the relief valve. The primary functions of the main valve body are to switch fluid pressure on and off and to control the hydraulic pressure going to the hydraulic control system.



### Secondary Valve Body

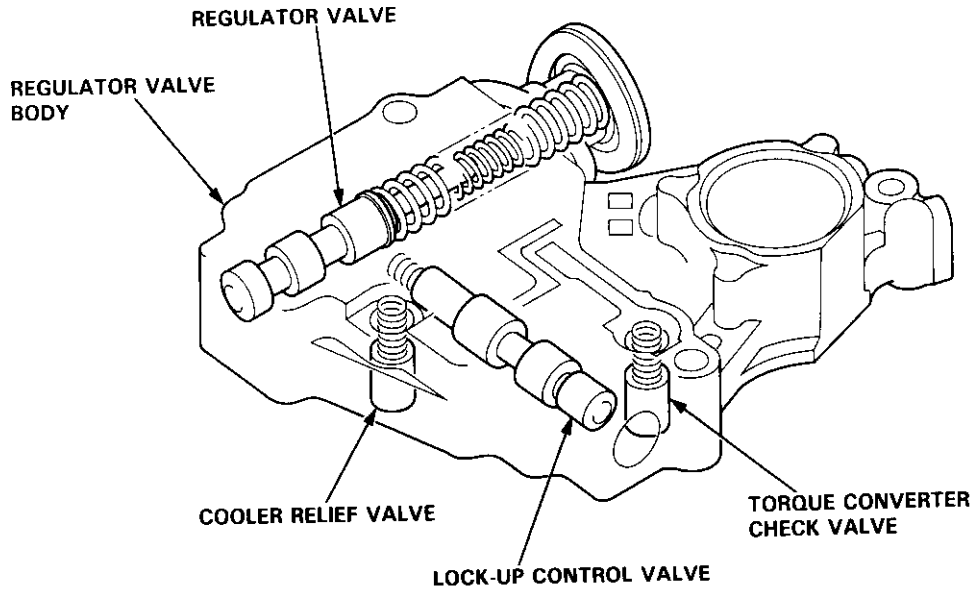
The secondary valve body is located on the main valve body. The secondary valve body houses the 2-3 shift valve, the 3-4 shift valve, the 3-4 orifice control valve, the 4th exhaust valve, and the CPC valve.





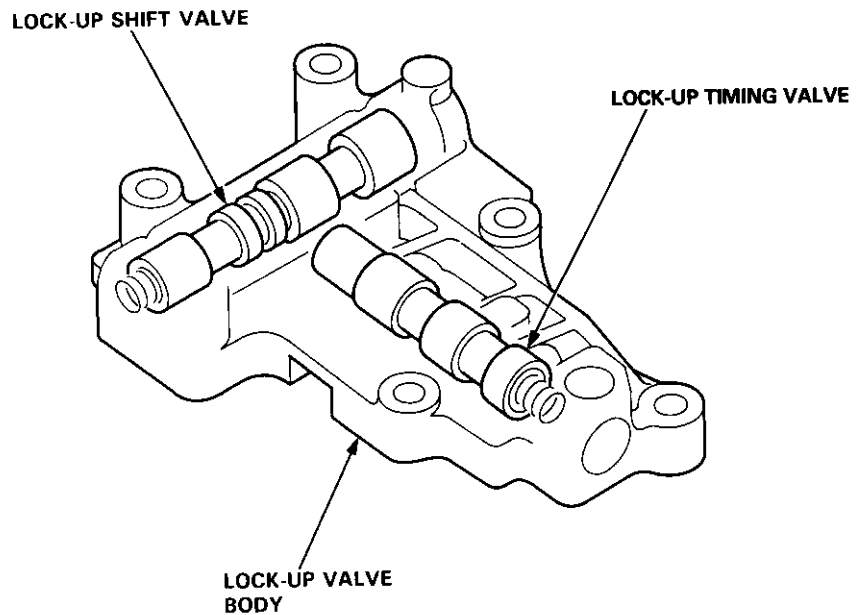
### Regulator Valve Body

The regulator valve body is located on the main valve body. The regulator valve body consists of the regulator valve, the torque converter check valve, the cooler relief valve, and the lock-up control valve.



### Lock-up Valve Body

The lock-up valve body with the lock-up shift valve and the lock-up timing valve is located on the regulator valve body.



icont'd

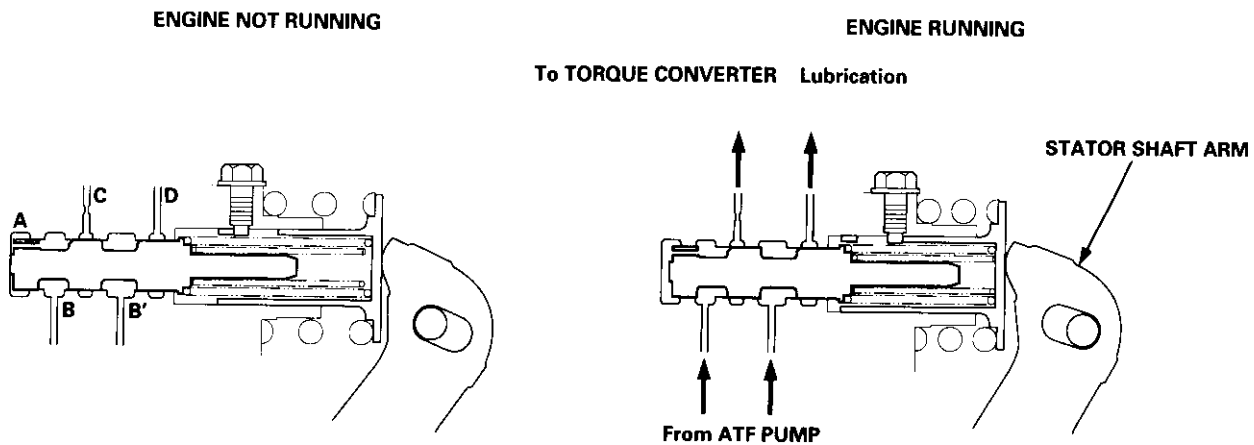
# Description

## Hydraulic Control (cont'd)

### Regulator Valve

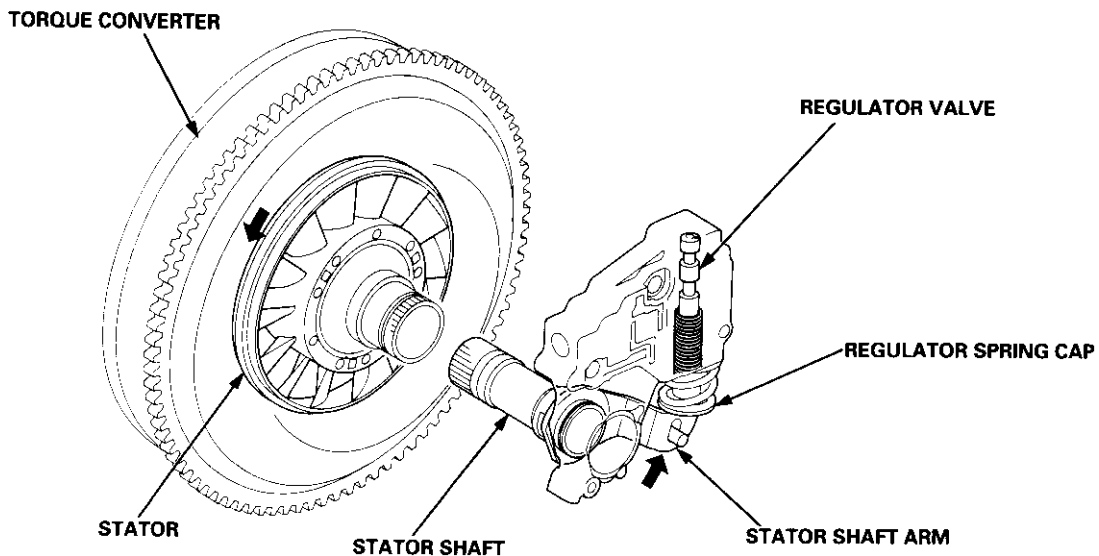
The regulator valve maintains a constant hydraulic pressure from the ATF pump to the hydraulic control system, while also furnishing fluid to the lubricating system and torque converter. The fluid from the ATF pump flows through B and B'. The regulator valve has a valve orifice. The fluid entering from B flows through the orifice to the A cavity. This pressure of the A cavity pushes the regulator valve to the right side, and this movement of the regulator valve uncovers the fluid port to the torque converter and the relief valve. The fluid flows out to the torque converter, and the relief valve and regulator valve moves to the left side. According to the level of the hydraulic pressure through B, the position of the regulator valve changes and the amount of the fluid from B' through D and C also changes. This operation is continued, maintaining the line pressure.

NOTE: When used, "left" or "right" indicates direction on the illustration below.



### Stator Reaction Hydraulic Pressure Control

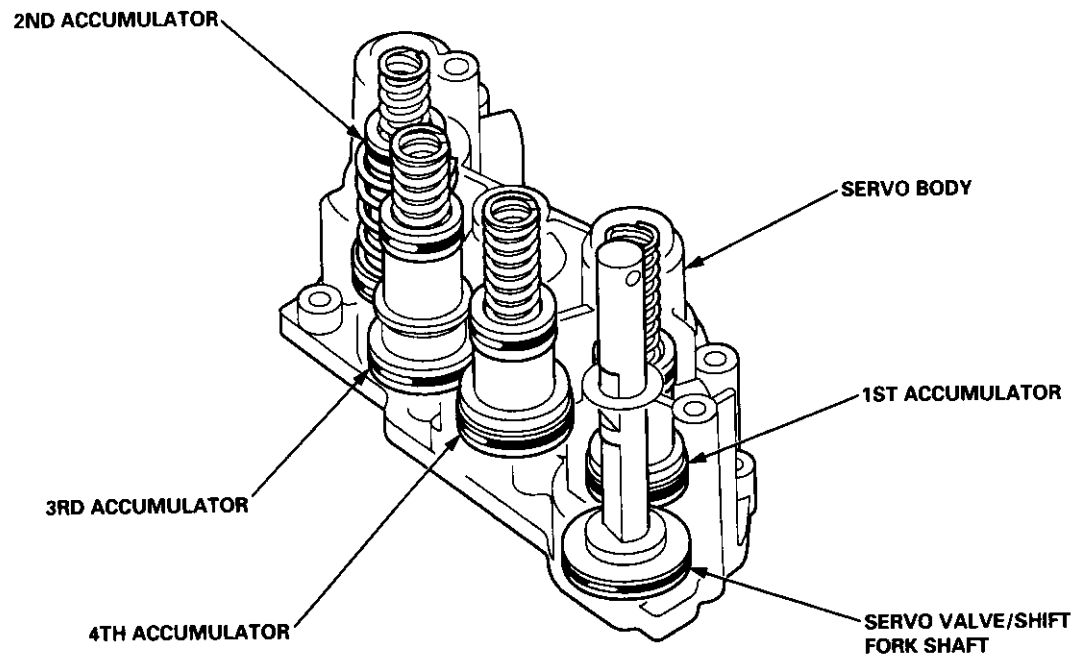
Hydraulic pressure increases according to torque, are performed by the regulator valve using the stator torque reaction. The stator shaft is splined with the stator in the torque converter, and its arm end contacts the regulator spring cap. When the vehicle is accelerating or climbing (Torque Converter Range), the stator torque reaction acts on the stator shaft, and the stator arm pushes the regulator spring cap in the direction of the arrow in proportion to the reaction. The stator reaction spring compresses, and the regulator valve moves to increase the line pressure which is regulated by the regulator valve. The line pressure reaches its maximum when the stator torque reaction reaches its maximum.





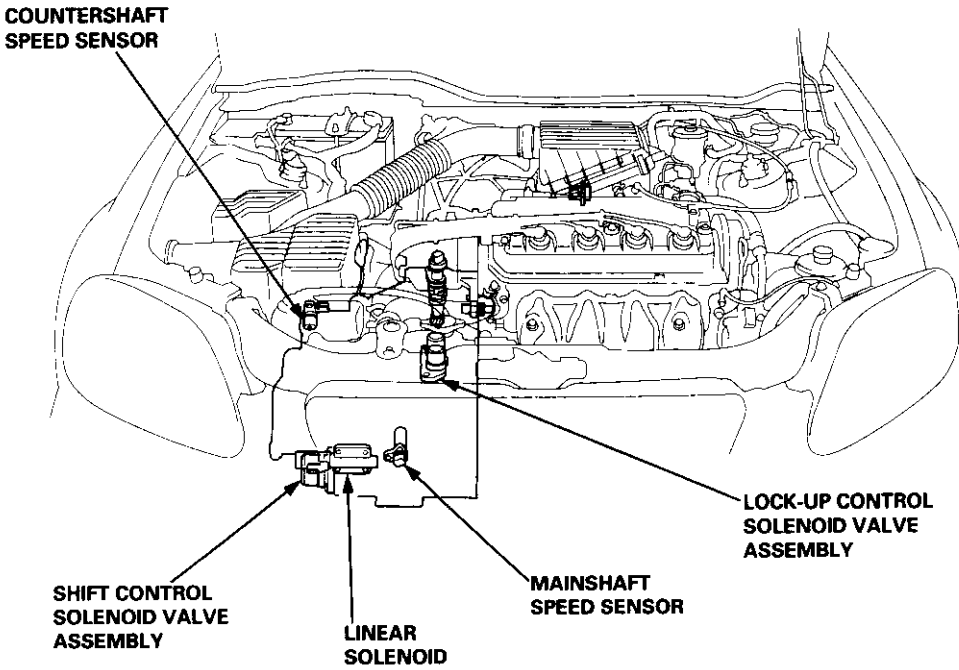
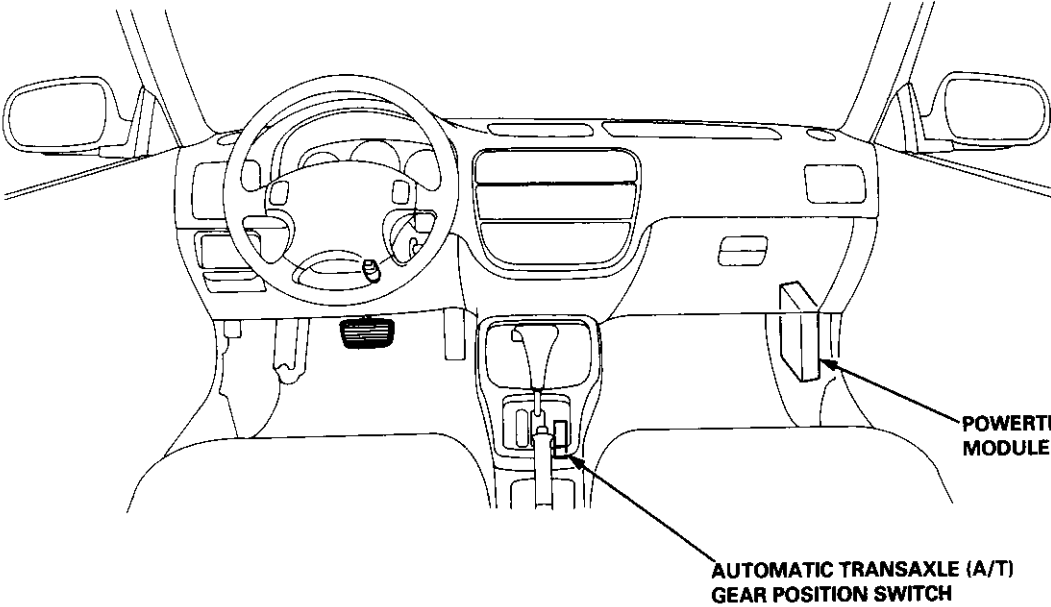
### Servo Body

The servo body is located on the secondary valve body. The servo body contains the servo valve which is integrated with the reverse shift fork, and the accumulators.

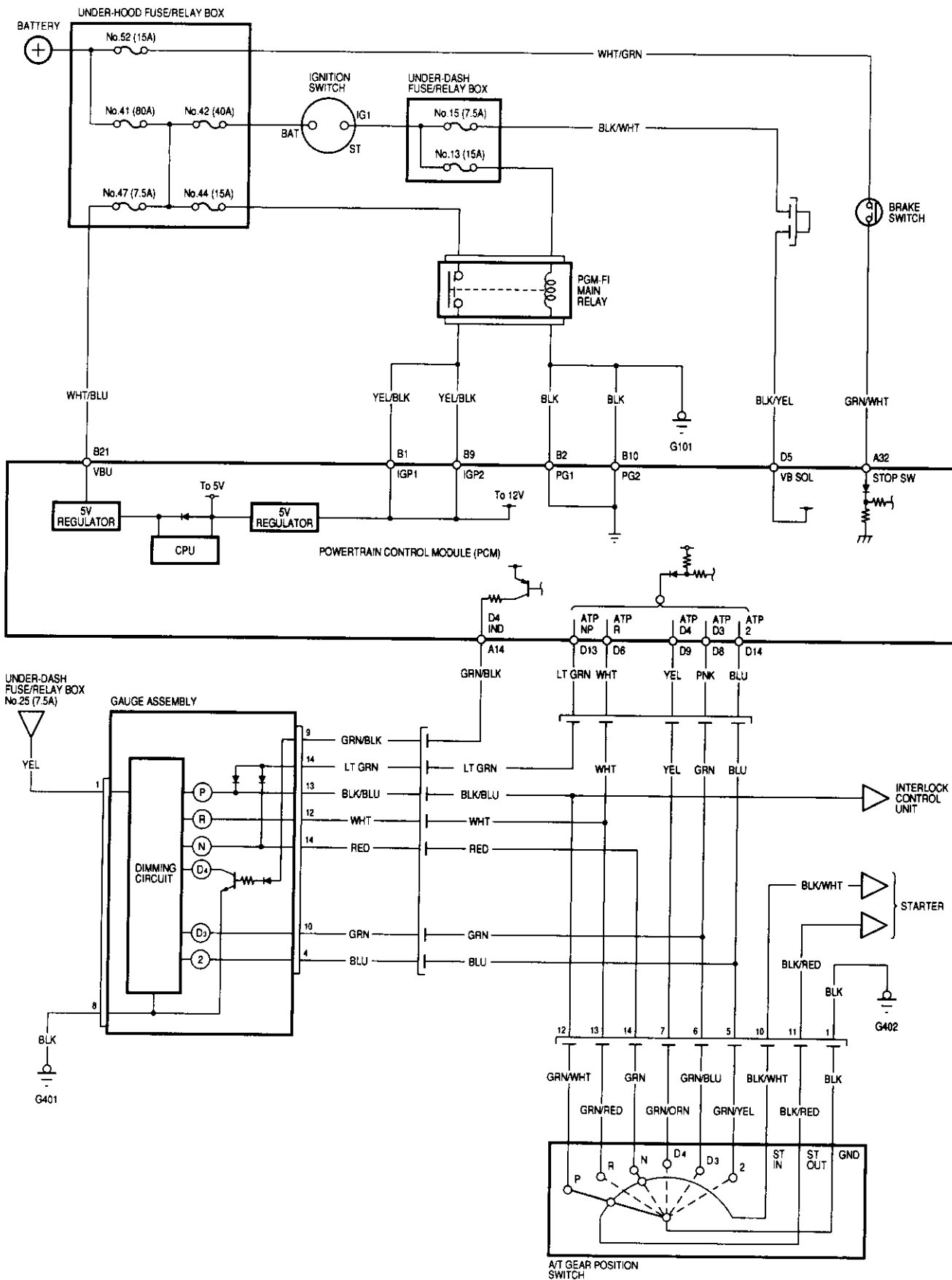


NOTE: The illustration shows the '96 - '98 models; the '99 - 00 models are similar.

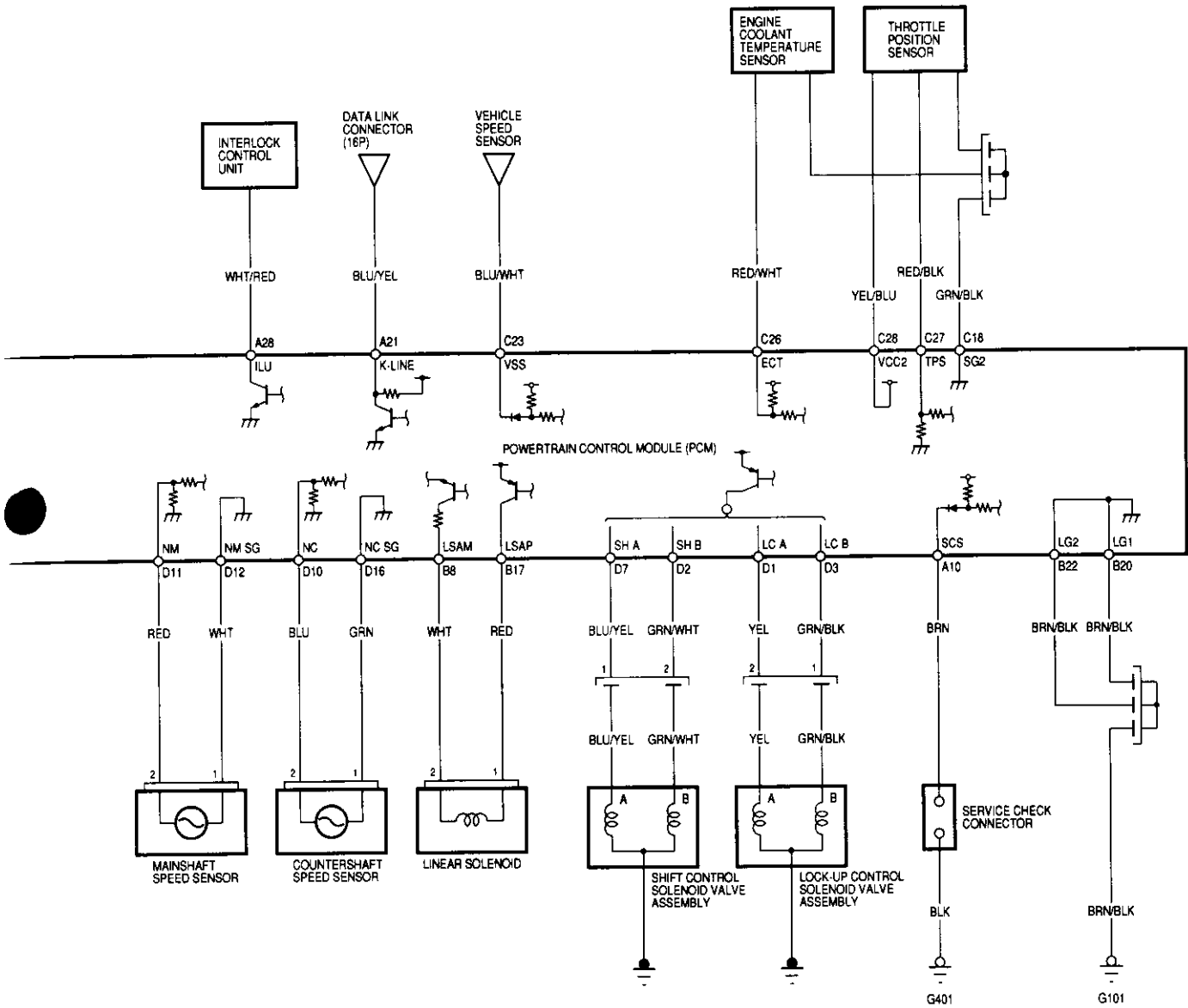
# Component Locations



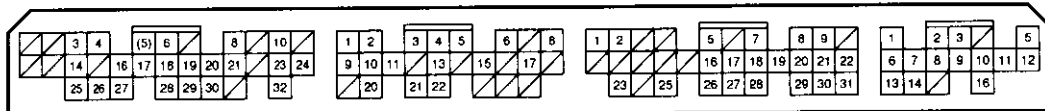
# PCM Circuit Diagram (A/T Control System: '99 - 00 Models)







PCM Terminal Locations



A (32P)

B (25P)

C (31P)

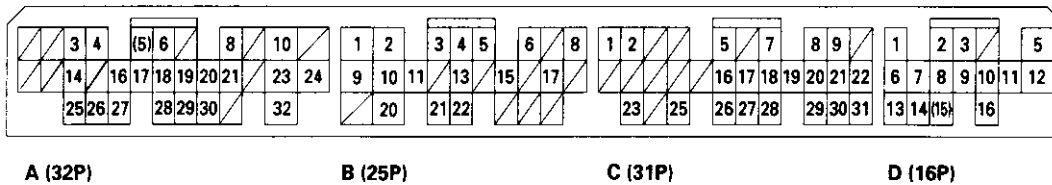
D (16P)

# PCM Terminal Voltage/Measuring Conditions ('99 – 00 Models)



## A/T Control System

The PCM terminal voltage and measuring conditions are shown for the connector terminals that are related to the A/T control system. The other PCM terminal voltage and measuring conditions are described in section 11.

PCM Connector Terminal Locations



### PCM CONNECTOR A (32P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
A10	SCS	Service check signal	With ignition switch ON (II) and service check connector open: Approx. 5 V With ignition switch ON (II) and service check connector connected with special tool: 0 V
A14	D4 IND	 indicator light control	When ignition switch is first turned ON (II): Approx. 10 V for two seconds In  position: Approx. 10 V
A28	ILU	Interlock Control	When ignition switch ON (II), brake pedal depressed, and accelerator pedal released: Battery voltage
A32	STOP SW	Brake switch signal input	Brake pedal depressed: battery voltage Brake pedal released: 0 V

### PCM CONNECTOR B (25P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
B1	IGP1	Power supply system	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B2	PG1	Ground	
B8	LS AM	Linear solenoid power supply negative electrode	With ignition switch ON (II): Pulsing signal
B9	IGP2	Power supply system	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B10	PG2	Ground	
B17	LS AP	Linear solenoid power supply positive electrode	With ignition switch ON (II): Pulsing signal
B20	LG1	Ground	
B21	VBU	Back-up power supply	Always battery voltage
B22	LG2	Ground	



PCM CONNECTOR D (16P)

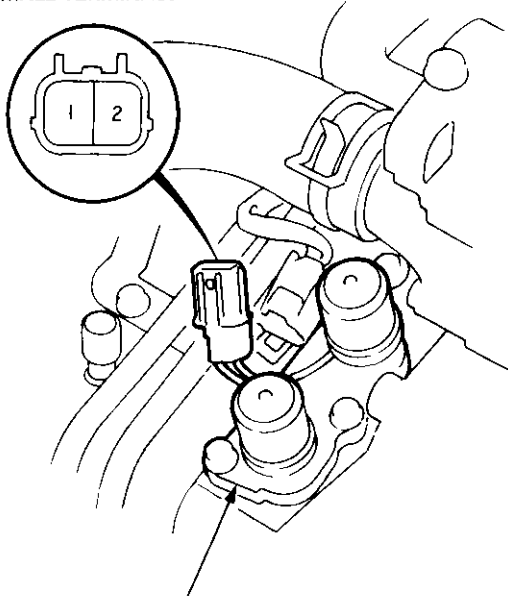
Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
D1	LCA	Lock-up control solenoid valve A control	When lock-up is ON: Battery voltage With no lock-up: 0 V
D2	SHB	Shift control solenoid valve B control	In [2] position, in 1st and 2nd gear in [D <sub>1</sub> ], [D <sub>2</sub> ] position: Battery voltage In 3rd gear in [D <sub>4</sub> ], [D <sub>3</sub> ], in 4th gear in [D <sub>4</sub> ] position: 0 V
D3	LCB	Lock-up control solenoid valve B control	When full lock-up: Battery voltage With half lock-up: Pulsing signal
D4	—	Not used	
D5	VB SOL	Lock-up control solenoids, shift control solenoids and linear solenoid power supply electrode	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
D6	ATP R	A/T gear position switch [R] position input	In [R] position: 0 V In other than [R] position: Approx. 10 V
D7	SHA	Shift control solenoid valve A control	In [2] position, in 2nd and 3rd gear in [D <sub>4</sub> ], [D <sub>3</sub> ] position: Battery voltage In 1st gear in [D <sub>4</sub> ], [D <sub>3</sub> ] position, in 4th gear in [D <sub>4</sub> ] position: 0 V
D8	ATP D3	A/T gear position switch [D <sub>3</sub> ] position input	In [D <sub>3</sub> ] position: 0 V In other than [D <sub>3</sub> ] position: Approx. 10 V
D9	ATP D4	A/T gear position switch [D <sub>4</sub> ] position switch	In [D <sub>4</sub> ] position: 0 V In other than [D <sub>4</sub> ] position: Approx. 5 V
D10	NC	Countershaft speed sensor signal input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: 0 V
D11	NM	Mainshaft speed sensor signal input	Depending on engine speed: Pulsing signal When engine is stopped: 0 V
D12	NMSG	Mainshaft speed sensor ground	
D13	ATP NP	A/T gear position switch [P] and [N] position input	In [P] and [N] positions: 0 V In other than [P] and [N] positions: Approx. 10 V
D14	ATP 2	A/T gear position switch [2] position input	In [2] position: 0 V In other than [2] position: Approx. 10 V
D16	NCSG	Countershaft speed sensor ground	



## Test

1. Disconnect the 2P connector from the lock-up control solenoid valve A/B assembly.

TERMINAL SIDE OF  
MALE TERMINALS



LOCK-UP CONTROL  
SOLENOID VALVE A/B  
ASSEMBLY

2. Measure the resistance between the No. 2 terminal (solenoid valve A) of the lock-up control solenoid valve connector and body ground, and between the No. 1 terminal (solenoid valve B) and body ground.

**STANDARD: 12 – 25  $\Omega$**

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.

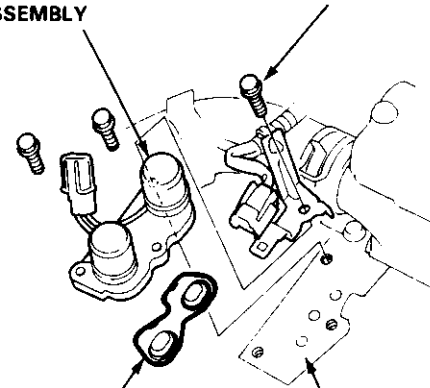
## Replacement

**NOTE:** Lock-up control solenoid valves A and B must be removed/replaced as an assembly.

1. Remove the mounting bolts and lock-up control solenoid valve A/B assembly.

LOCK-UP CONTROL  
SOLENOID VALVE  
ASSEMBLY

6 x 1.0 mm  
12 N·m (1.2 kgf·m, 8.7 lbf·ft)



FILTER/GASKET  
Replace.

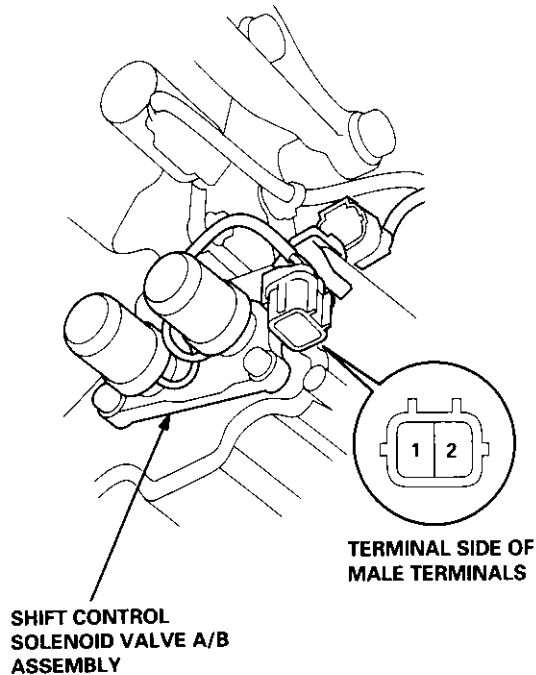
Clean the mounting surface  
and fluid passages.

2. Clean the mounting surface and fluid passages of the lock-up control solenoid valve assembly, and install a new lock-up control solenoid valve A/B with a new filter/gasket.
3. Check the connector for rust, dirt or oil, and reconnect it securely.

# Shift Control Solenoid Valve A/B Assembly

## Test

1. Disconnect the 2P connector from the shift control solenoid valve A/B assembly.



2. Measure the resistance between the No. 1 terminal (solenoid valve A) of the shift control solenoid valve connector and body ground, and between the No. 2 terminal (solenoid valve B) and body ground.

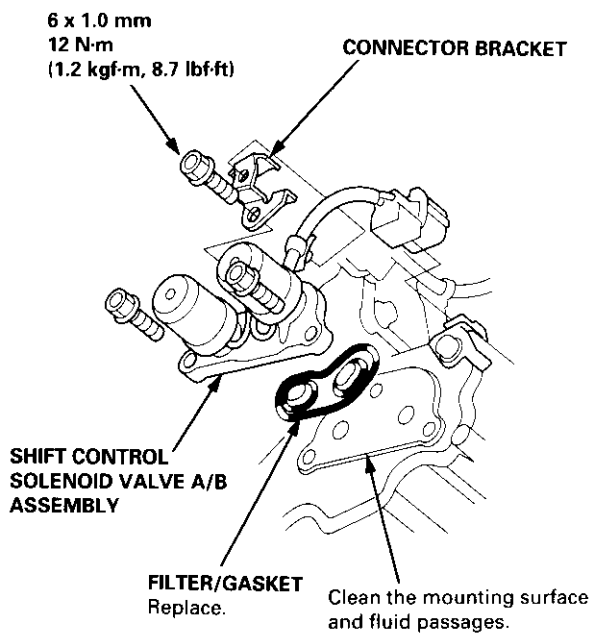
**STANDARD: 12 – 25  $\Omega$**

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

NOTE: Shift control solenoid valves A and B must be removed/replaced as an assembly.

1. Remove the mounting bolts and shift control solenoid valve A/B assembly.

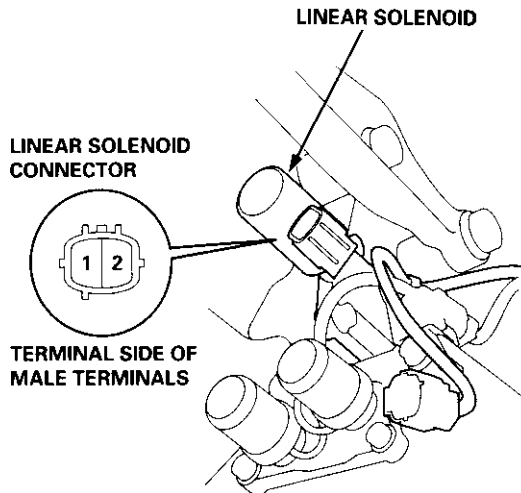


2. Clean the mounting surface and fluid passages of the shift control solenoid valve assembly, and install a new shift control solenoid valve A/B with a new filter/gasket and the clamp bracket.
3. Check the connector for rust, dirt or oil, and reconnect it securely.



## Test

1. Disconnect the linear solenoid connector.



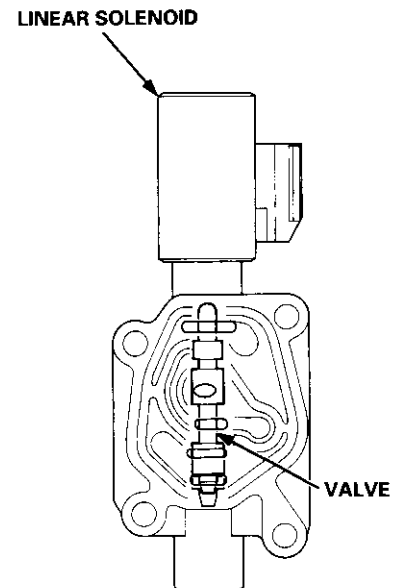
2. Measure the resistance between the No. 1 and the No. 2 terminals of the linear solenoid connector.

**STANDARD:** approx. 5  $\Omega$

3. If the resistance is out of specification, replace the linear solenoid assembly.
4. Connect the No. 2 terminal of the linear solenoid connector to the battery positive terminal and connect the No. 1 terminal to the battery negative terminal. A clicking sound should be heard.

5. If not, remove the linear solenoid assembly.
6. Check that the linear solenoid fluid passage for dust or dirt.
7. Connect the No. 2 terminal of the linear solenoid connector to the battery positive terminal and connect the No. 1 terminal to the battery negative terminal. Check that the valve moves.
8. Disconnect one of the battery terminals and check that the valve releases.

**NOTE:** You can see the valve movement through the fluid passage in the mounting surface of the linear solenoid assembly.



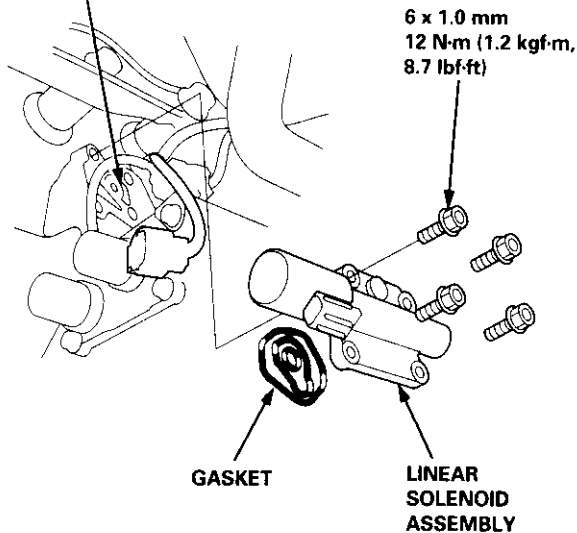
9. If the valve binds, or moves sluggishly, or the linear solenoid does not operate, replace the linear solenoid assembly.

## Linear Solenoid Assembly

### Replacement

1. Remove the mounting bolts and the linear solenoid assembly.

Clean the mounting surface and fluid passages.



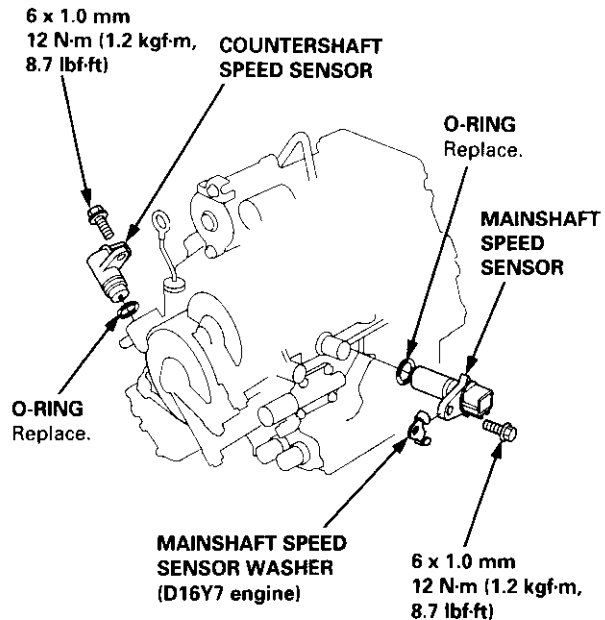
2. Clean the mounting surface and fluid passage of the linear solenoid assembly and transmission housing.
3. Install a new linear solenoid assembly with a new gasket.

**NOTE:** Do not pinch the gasket when installing the linear solenoid; make sure that the gasket is installed properly in the mounting groove of the linear solenoid.

4. Check the linear solenoid connector for rust, dirt or oil, and connect it securely.

### Replacement

1. Remove the 6 mm bolt and the countershaft speed sensor from the right side cover.



2. Remove the 6 mm bolt and the mainshaft speed sensor from the transmission housing.
3. Replace the O-ring with a new one before installing the countershaft speed sensor or the mainshaft speed sensor.

**NOTE:** Install the mainshaft speed sensor washer on the mainshaft speed sensor. The mainshaft speed sensor washer is used on models with the D16Y7 engine.

# Symptom-to-Component Chart



## Hydraulic System

SYMPTOM	Check these items on the PROBABLE CAUSE List	Check these items on the NOTES List
Engine runs, but vehicle does not move in any gear.	1, 2, 3, 5, 6, 7, 36, 38	K, L, R, S
Vehicle moves in [2], [R], but not in [D <sub>3</sub> ], [D <sub>4</sub> ], position.	6, 8, 9, 10, 30, 54	C, M, O
Vehicle moves in [D <sub>3</sub> ], [D <sub>4</sub> ], [R], but not in [2] position.	6, 11, 12, 24	C, L
Vehicle moves in [D <sub>3</sub> ], [D <sub>4</sub> ], [2], but not in [R] position.	4, 6, 14, 15	C, L, Q
Vehicle moves in [N] position.	10, 12, 13, 14, 16, 29, 33, 34, 35	C, D
Excessive idle vibration.	1, 2, 19, 32, 36, 45, 47, 48	B, K, L
Poor acceleration; flares on starting off in [D <sub>4</sub> ], [D <sub>3</sub> ] position		
Stall rpm high in [D <sub>4</sub> ], [D <sub>3</sub> ], [2] position.	1, 2, 3, 6, 38, 41	K, L, R
Stall rpm high in [D <sub>4</sub> ], [D <sub>3</sub> ] position.	6, 8, 10	C, D
Stall rpm high in [2] position.	6, 12	C, D
Stall rpm is in specification.	14	N
Stall rpm low.	17, 32, 45, 47, 48	R
No shift	19, 20, 40, 48, 49	G, L
Fails to shift in [D <sub>3</sub> ], [D <sub>4</sub> ] position; from 1st to 3rd gear	22, 49	
Fails to shift in [D <sub>3</sub> ], [D <sub>4</sub> ] position; from 1st to 4th gear	22, 23, 48	
Erratic upshifting.		
1-2 upshift, 2-3 upshift, 3-4 upshift	58	
1-2 upshift	21, 48	
2-3 upshift	22, 49	
3-4 upshift	23, 48	
Harsh upshift (1-2).	12, 19, 20, 29, 50, 51, 57, 58	C, D, E
Harsh upshift (2-3).	13, 19, 20, 24, 27, 29, 50, 51, 57, 58	C, D, E, H, L
Harsh upshift (3-4).	14, 19, 20, 25, 28, 29, 50, 51, 57, 58	C, D, E, I, L
Harsh downshift (2-1).	19, 20, 24, 43, 54, 57, 58	O
Harsh downshift (3-2).	12, 19, 20, 25, 43, 55, 57, 58	C, D, E, H
Harsh downshift (4-3).	13, 19, 20, 26, 43, 56, 57, 58	C, D, E, I
Flares on 2-3 upshift.	13, 19, 20, 24, 27, 51	E, L
Flares on 3-4 upshift.	14, 19, 20, 25, 28, 51	E, L, N
Excessive shock on 2-3 upshift.	13, 19, 20, 24, 27, 43, 50, 51, 58	E, L, N
Excessive shock on 3-4 upshift.	14, 19, 20, 25, 28, 43, 50, 51, 58	E, L, N
Late shift from [N] position to [D <sub>4</sub> ] or [D <sub>3</sub> ] position.	10, 30	M
Late shift from [N] position to [R] position.	4, 14, 21, 53	Q
Noise from transmission in all shift lever positions.	2, 37	K, L, Q
Vehicle does not accelerate more than 31 mph (50 km/h).	17	
Shift lever does not operate smoothly.	6, 39	P
Fails to shift; stuck in 4th gear.	19, 48, 49	
Transmission will not shift into park in [P] position.	6, 18, 39	P
Stall rpm high; all clutch pressures are in specification.	41	D, K, O
Lock-up clutch does not disengage.	19, 44, 45, 46, 47, 50, 51, 58	E, L
Lock-up clutch does not operate smoothly.	19, 41, 44, 45, 46, 47, 50, 51, 58	L
Lock-up clutch does not engage.	19, 41, 44, 45, 46, 47, 50, 51, 57, 58	E, L
Vibration in all positions	36	

(cont'd)



# Symptom-to-Component Chart

## Hydraulic System (cont'd)

PROBABLE CAUSE			
1	Low ATF.	41	Torque converter check valve stuck.
2	ATF pump worn or binding.	42	Foreign material in separator plate.
3	Regulator valve stuck.	43	CPB valve stuck.
4	Servo valve stuck.	44	Lock-up timing valve stuck.
5	Mainshaft worn/damaged.	45	Lock-up shift valve stuck.
6	Shift cable broken/out of adjustment.	46	Lock-up control valve stuck.
7	Final gears worn/damaged.	47	Lock-up piston defective.
8	One-way (sprag) clutch worn/damaged.	48	Shift control solenoid valve A defective.
9	1st gears worn/damaged (2 gears).	49	Shift control solenoid valve B defective.
10	1st clutch defective.	50	Lock-up control solenoid valve A defective.
11	2nd gears worn/damaged (2 gears).	51	Lock-up control solenoid valve B defective.
12	2nd clutch defective.	52	Servo control valve stuck.
13	3rd clutch defective.	53	1st accumulator defective.
14	4th clutch defective.	54	Foreign material in 2nd exhaust orifice.
15	Reverse gears worn/damaged (3 gears).	55	Foreign material in 3rd exhaust orifice.
16	Excessive ATF.	56	Foreign material in 4th exhaust orifice.
17	Torque converter one-way clutch defective.	57	Mainshaft speed sensor defective.
18	Park mechanism defective.	58	Countershaft speed sensor defective.
19	Linear solenoid assembly defective.		
20	CPC valve stuck.		
21	1-2 shift valve stuck.		
22	2-3 shift valve stuck.		
23	3-4 shift valve stuck.		
24	2nd accumulator defective.		
25	3rd accumulator defective.		
26	4th accumulator defective.		
27	2nd orifice control valve stuck.		
28	3-4 orifice control valve stuck.		
29	Foreign material in main orifice.		
30	Foreign material in 1st orifice.		
31	Foreign material in reverse orifice.		
32	Engine output low.		
33	Needle bearing worn/damaged.		
34	Thrust washer worn/damaged.		
35	Clutch clearance incorrect.		
36	Drive plate defective or transmission misassembly.		
37	Torque converter housing or transmission housing bearing worn/damaged.		
38	ATF strainer clogged.		
39	Joint in shift cable and transmission or body worn.		
40	Modulator valve stuck.		



The following symptoms can be caused by improper repair or assembly	Check these items on the PROBABLE CAUSE DUE TO IMPROPER REPAIR List	Items on the NOTES List
Vehicle creeps in <b>[N]</b> position.	R1, R2	
Vehicle does not move in <b>[D<sub>3</sub>]</b> or <b>[D<sub>4</sub>]</b> position.	R4	
Transmission locks up in <b>[R]</b> position.	R3, R11	
Excessive drag in transmission.	R6	K, R
Excessive vibration, rpm related.	R7	
Noise with wheels moving only.	R5	
Main seal pops out.	R8	S
Various shifting problems.	R9, R10	

PROBABLE CAUSE DUE TO IMPROPER REPAIR	
R1.	Improper clutch clearance.
R2.	Improper gear clearance.
R3.	Park lever installed upside down.
R4.	One-way (sprag) clutch installed upside down.
R5.	Reverse selector hub installed upside down.
R6.	ATF pump binding.
R7.	Torque converter not fully seated in ATF pump.
R8.	Main seal improperly installed.
R9.	Springs improperly installed.
R10.	Valves improperly installed.
R11.	Shift fork bolt not installed.

(cont'd)

# Symptom-to-Component Chart

## Hydraulic System (cont'd)

NOTES	
A.	See flushing procedure, page 14-187 and 188.
B.	Set idle rpm in gear to specified idle speed. If still no good, adjust motor mounts as outlined in engine section of this manual.
C.	If the large clutch piston O-ring is broken, inspect the piston groove for rough machining.
D.	If the clutch pack is seized or is excessively worn, inspect the other clutches for wear, and check the orifice control valves, CPC valve and linear solenoid for free movement.
E.	If the linear solenoid is stuck, inspect the clutches for wear.
G.	If the 1-2 shift valve is stuck closed, the transmission will not upshift. If stuck open, the transmission has no 1st gear.
H.	If the 2nd orifice control valve is stuck, inspect the 2nd and 3rd clutch packs for wear.
I.	If the 3-4 orifice control valve is stuck, inspect the 3rd and 4th clutch packs for wear.
J.	If the clutch pressure control valve is stuck closed, the transmission will not shift out of 1st gear.
K.	Improper alignment or main valve body and torque converter housing may cause ATF pump seizure. The symptoms are mostly an rpm-related ticking noise or a high-pitched squeak.
L.	If the ATF strainer is clogged with particles of steel or aluminum, inspect the ATF pump and differential pinion shaft. If both are OK and no cause for the contamination is found, replace the torque converter.
M.	If the 1st clutch feed pipe guide in the end cover is scored by the mainshaft, inspect the ball bearing for excessive movement in the transmission housing. If OK, replace the end cover as it is dented. The O-ring under the guide is probably worn.
N.	<ul style="list-style-type: none"> <li>• Replace the mainshaft if the bushing for the 4th feed pipe is loose or damaged. If the 4th feed pipe is damaged or out of round, replace the right side cover.</li> <li>• Replace the mainshaft if the bushing for the 1st feed pipe is loose or damaged. If the 1st feed pipe is damaged or out of round, replace it.</li> </ul>
O.	A worn or damaged sprag clutch is mostly a result of shifting the transmission in <b>D<sub>3</sub></b> or <b>D<sub>4</sub></b> position while the wheels rotate in reverse, such as rocking the vehicle in snow.
P.	Inspect the frame for collision damage.
Q.	<p>Inspect for damage and wear:</p> <ol style="list-style-type: none"> <li>1. Reverse selector gear teeth chamfers.</li> <li>2. Engagement teeth chamfers of countershaft 4th and reverse gear.</li> <li>3. Shift fork for scuff marks in center.</li> <li>4. Differential pinion shaft for wear under pinion gears.</li> <li>5. Bottom of 3rd clutch for swirl marks.</li> </ol> <p>Replace items 1, 2, 3 and 4 if worn or damaged. If transmission makes a clicking, grinding or whirring noise, also replace mainshaft 4th gear, 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.</p> <p>If bottom of 3rd clutch is swirled and transmission makes gear noise, replace the countershaft and final driven gear.</p>
R.	Be very careful not to damage the torque converter housing when replacing the main ball bearing. You may also damage the ATF pump when you torque down the main valve body. This will result in ATF pump seizure if not detected. Use the proper tools.
S.	Install the main seal flush with the torque converter housing. If you push it into the torque converter housing until it bottoms out, it will block the fluid return passage and result in damage.

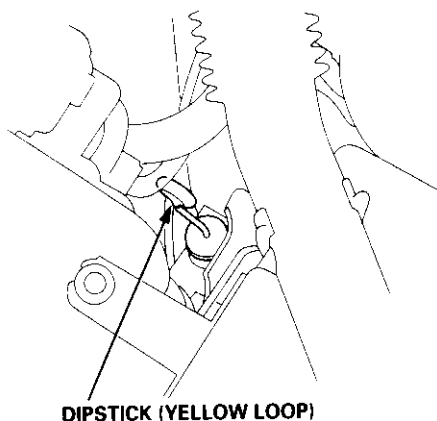


# Fluid Level

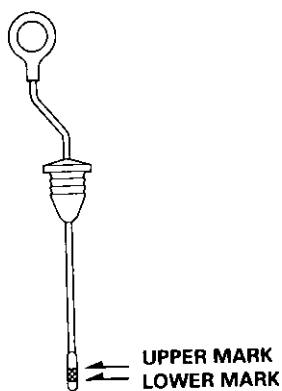
## Checking

NOTE: Keep all foreign particles out of the transmission.

1. Warm up the engine to normal operating temperature (the radiator fan comes on).
2. Park the vehicle on the level ground, then turn off the engine.
3. Remove the dipstick (yellow loop) from the transmission, and wipe it with a clean cloth.
4. Insert the dipstick into the transmission.

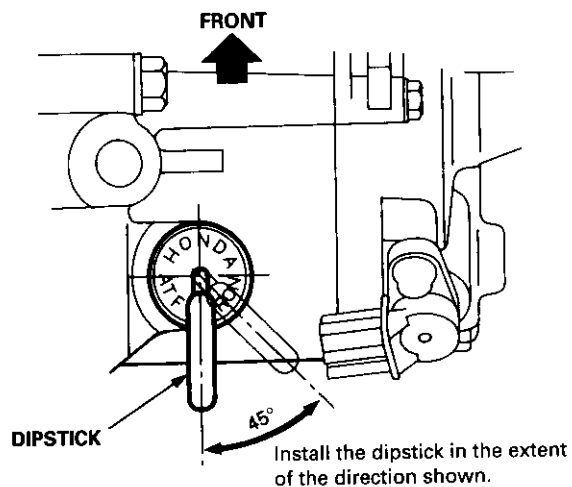


5. Remove the dipstick and check the fluid level. It should be between the upper mark and lower marks.



6. If the level is below the lower mark, pour the recommended fluid into the filler hole to bring it to the upper mark. Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

7. Insert the dipstick back into the transmission in the direction shown.



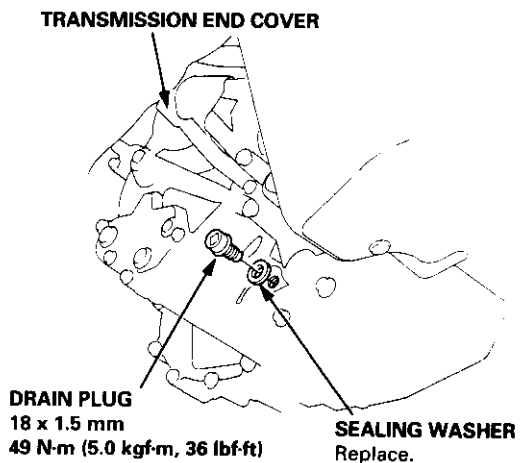
# Fluid Level

## Changing

NOTE: Keep all foreign particles out of the transmission.

1. Bring the transmission up to operating temperature (the radiator fan comes on) by driving the vehicle.
2. Park the vehicle on the level ground, and turn the engine off.
3. Remove the drain plug, and drain the automatic transmission fluid (ATF).

NOTE: If a cooler flusher is to be used, see page 14-187 and 14-188.



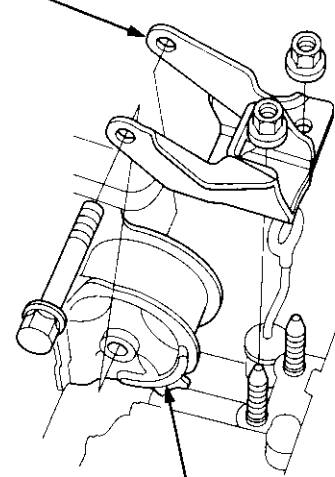
4. Reinstall the drain plug with a new sealing washer, then refill the transmission with the recommended fluid into the filler hole to the upper mark on the dipstick. Always use Genuine Honda Premium Formula Automatic Transmission Fluid (ATF). Using a non-Honda ATF can affect shift quality.

**Automatic Transmission Fluid Capacity:**  
2.7 ℓ (2.9 US qt, 2.4 Imp qt) at changing  
5.9 ℓ (6.2 US qt, 5.2 Imp qt) at overhaul



23. Place a jack under the transmission, and raise the transmission just enough to take weight off of the mounts, then remove the transmission mount.

TRANSMISSION  
MOUNT BRACKET

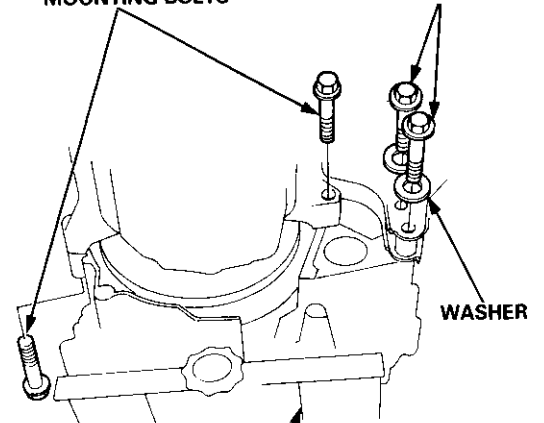


TRANSMISSION MOUNT

24. Remove the transmission housing mounting bolts and the rear engine mounting bolts.
25. Pull the transmission away from the engine until it clears the 14 mm dowel pins, then lower it on the transmission jack.

TRANSMISSION HOUSING  
MOUNTING BOLTS

REAR ENGINE  
MOUNTING BOLTS  
Replace.



TRANSMISSION  
JACK

26. If necessary, remove the torque converter and starter motor.

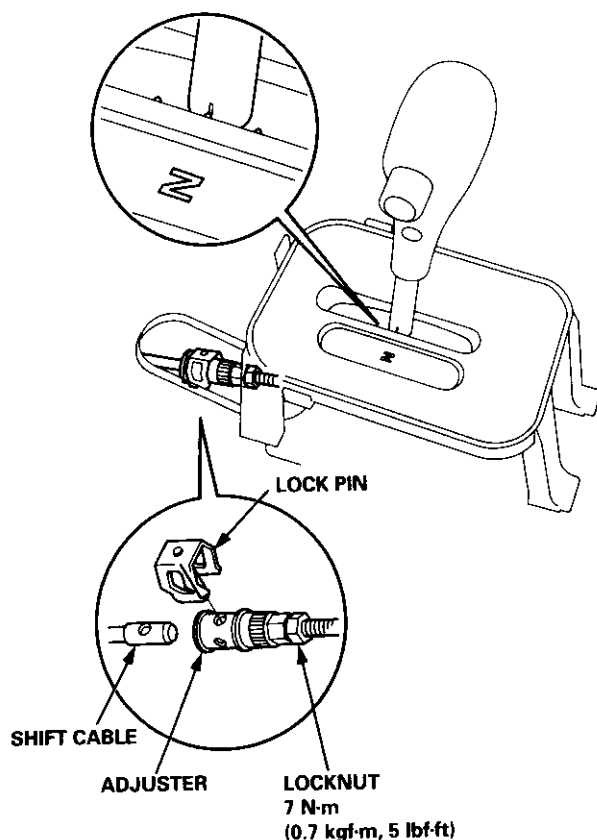


# Shift Cable

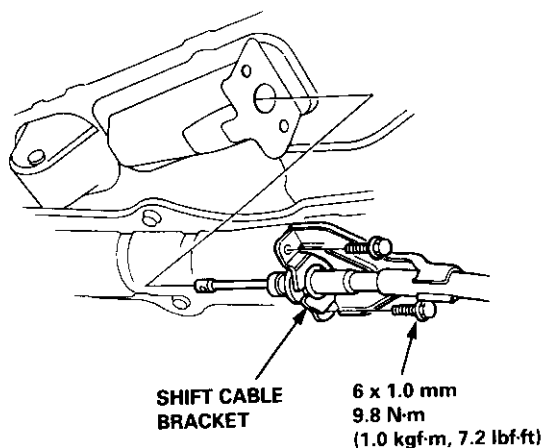
## Removal/Installation

**▲ WARNING** Make sure lifts are placed properly (see section 1).

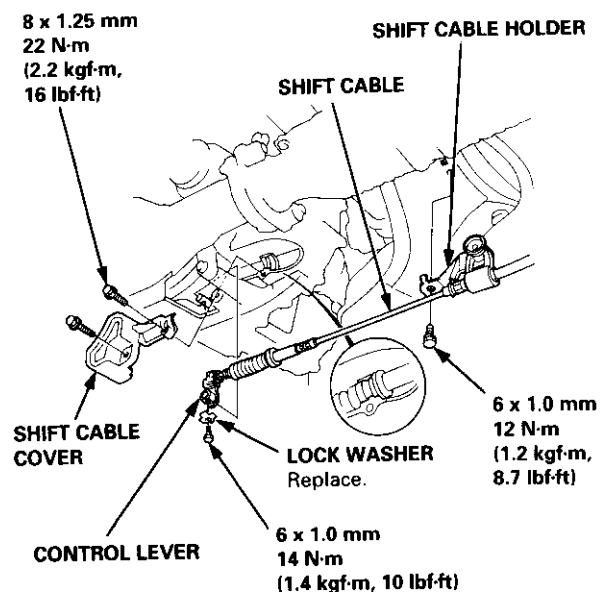
1. Remove the front console (see section 20).
2. Shift to **N** position, then remove the lock pin from the adjuster.



3. Remove the shift cable bracket.



4. Remove the shift cable holder.
5. Remove the shift cable cover.
6. Remove the control lever from the control shaft, then remove the shift cable. Take care not to bend the cable when removing/installing it.



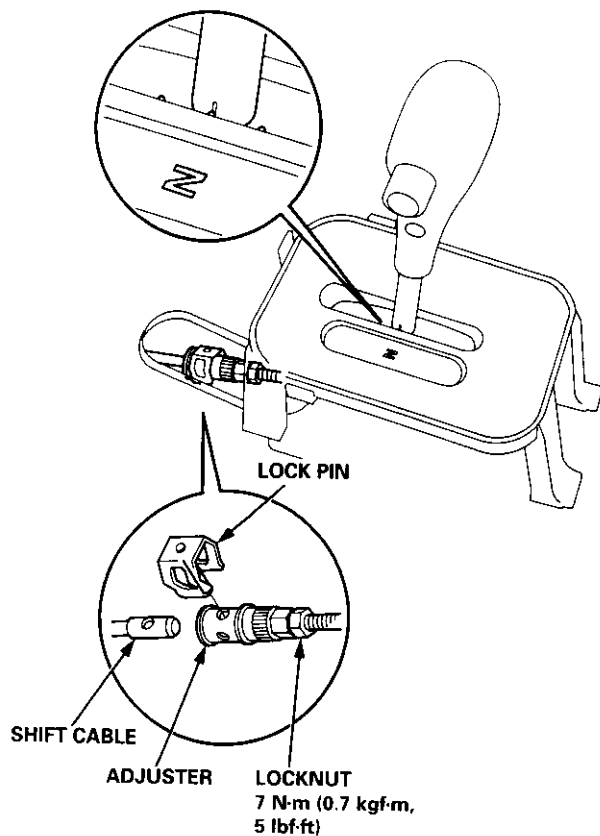
7. Install the shift cable in the reverse order of removal.
8. Check the cable adjustment on reassembly (see page 14-190).

# Shift Cable

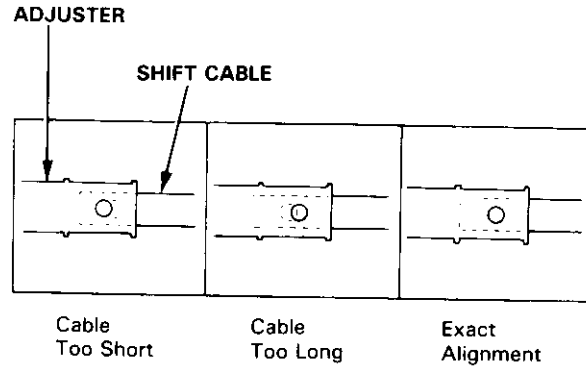
## Adjustment

**▲ WARNING** Make sure lifts are placed properly (see section 1).

1. Remove the front console (see section 20).
2. Shift to **N** position, then remove the lock pin from the adjuster.



3. Check that the hole in the adjuster is perfectly aligned with the hole in the shift cable. There are two holes in the adjuster. They are positioned 90° apart to allow cable adjustment in 1/4 turn increments.

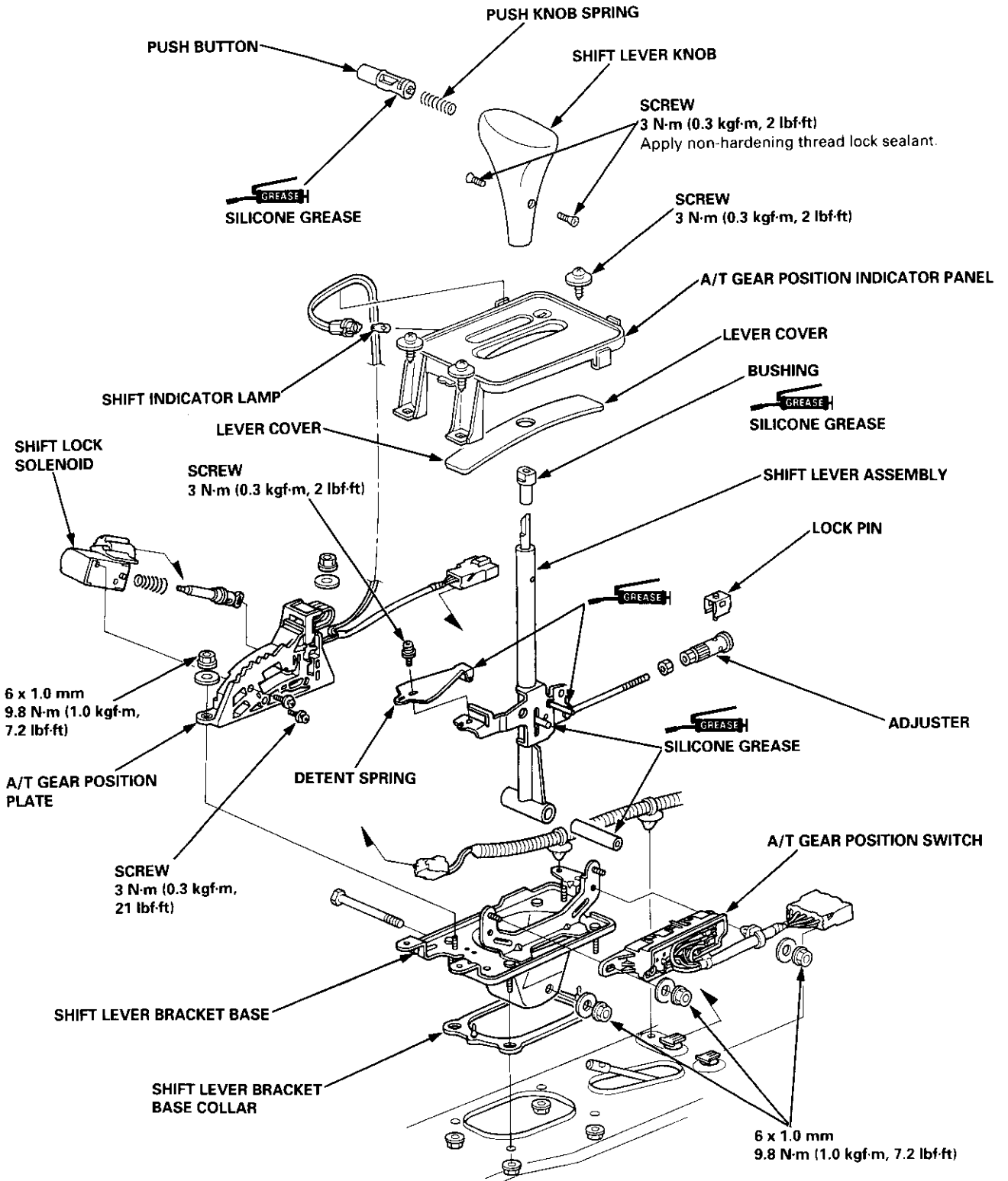


4. If the hole is not perfectly aligned, loosen the locknut on the adjuster and adjust as required.
5. Tighten the locknut to 7 N·m (0.7 kgf·m, 5 lbf·ft).
6. Install the lock pin on the adjuster. If you feel the lock pin binding as you reinstall it, the cable is still out of adjustment and must be readjusted.
7. Make sure the lock pin is seated in the adjuster securely.
8. Move the shift lever to each gear, and verify that the shift position indicator follows the automatic trans-axle gear position switch.
9. Start the engine, and check the shift lever in all gears. If any gear does not work properly, refer to troubleshooting (see page 14-109 thru 14-112).
10. Insert the ignition key into the key cylinder on the A/T gear position indicator panel, and verify that the shift lock lever is released.





# Shift Lever

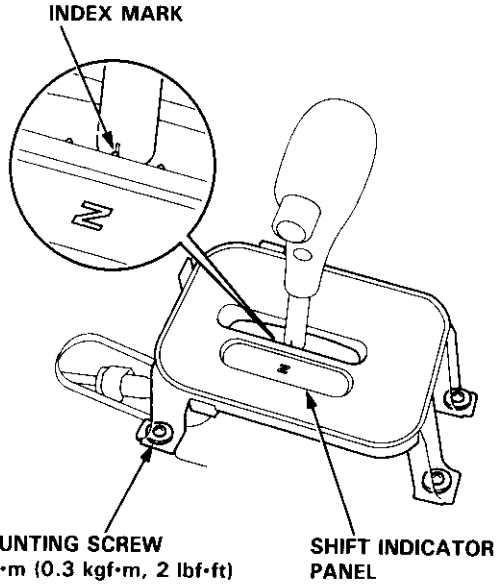


# Shift Indicator Panel

# ATF Cooler Hoses

## Adjustment

1. Check that the index mark on the indicator aligns with the **N** mark on the shift indicator panel when the transmission is in NEUTRAL.

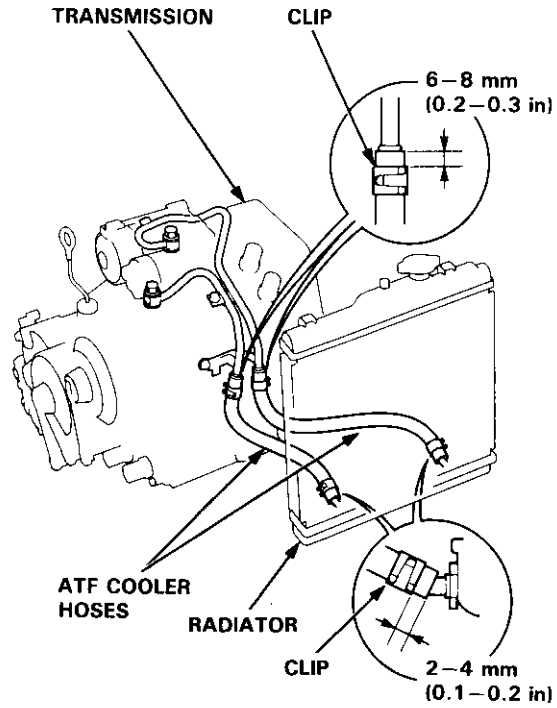


2. If not aligned, remove the front console (see section 20).
3. Remove the shift indicator panel mounting screws and adjust by moving the panel.

**NOTE:** Whenever the shift indicator panel is removed, reinstall the panel as described above.

## Connection

1. Connect the ATF cooler hoses to the ATF cooler lines and ATF cooler, and secure them with the clips as shown.

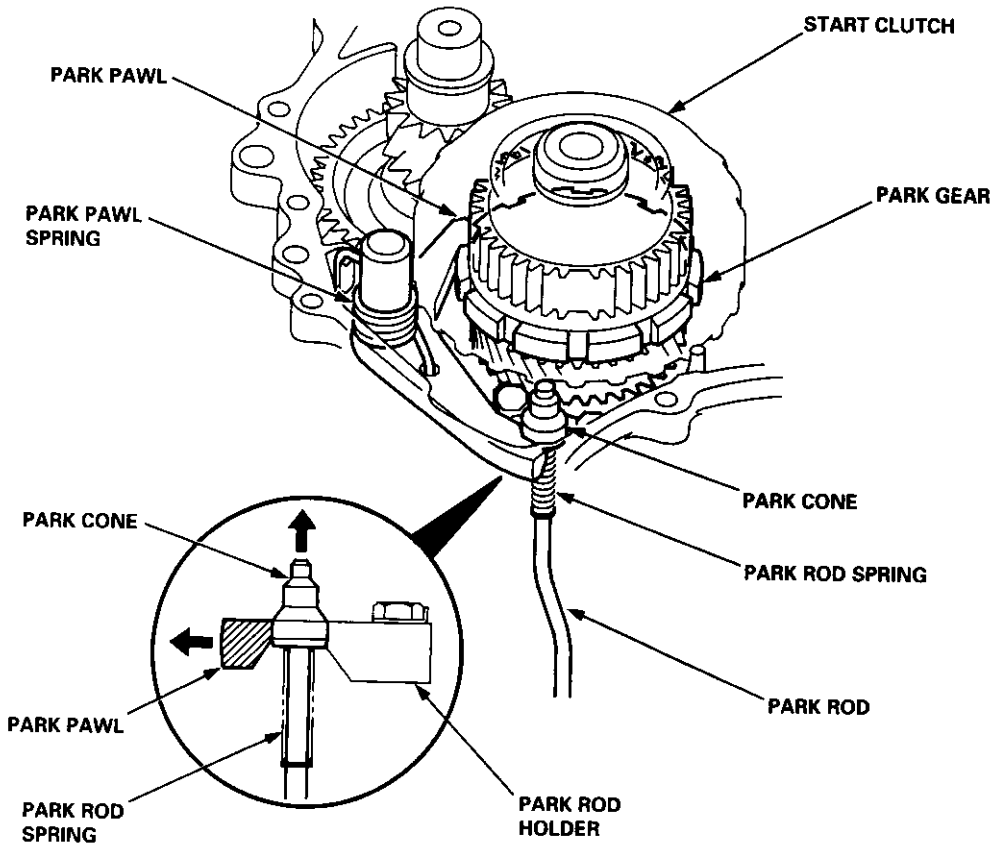


# Description

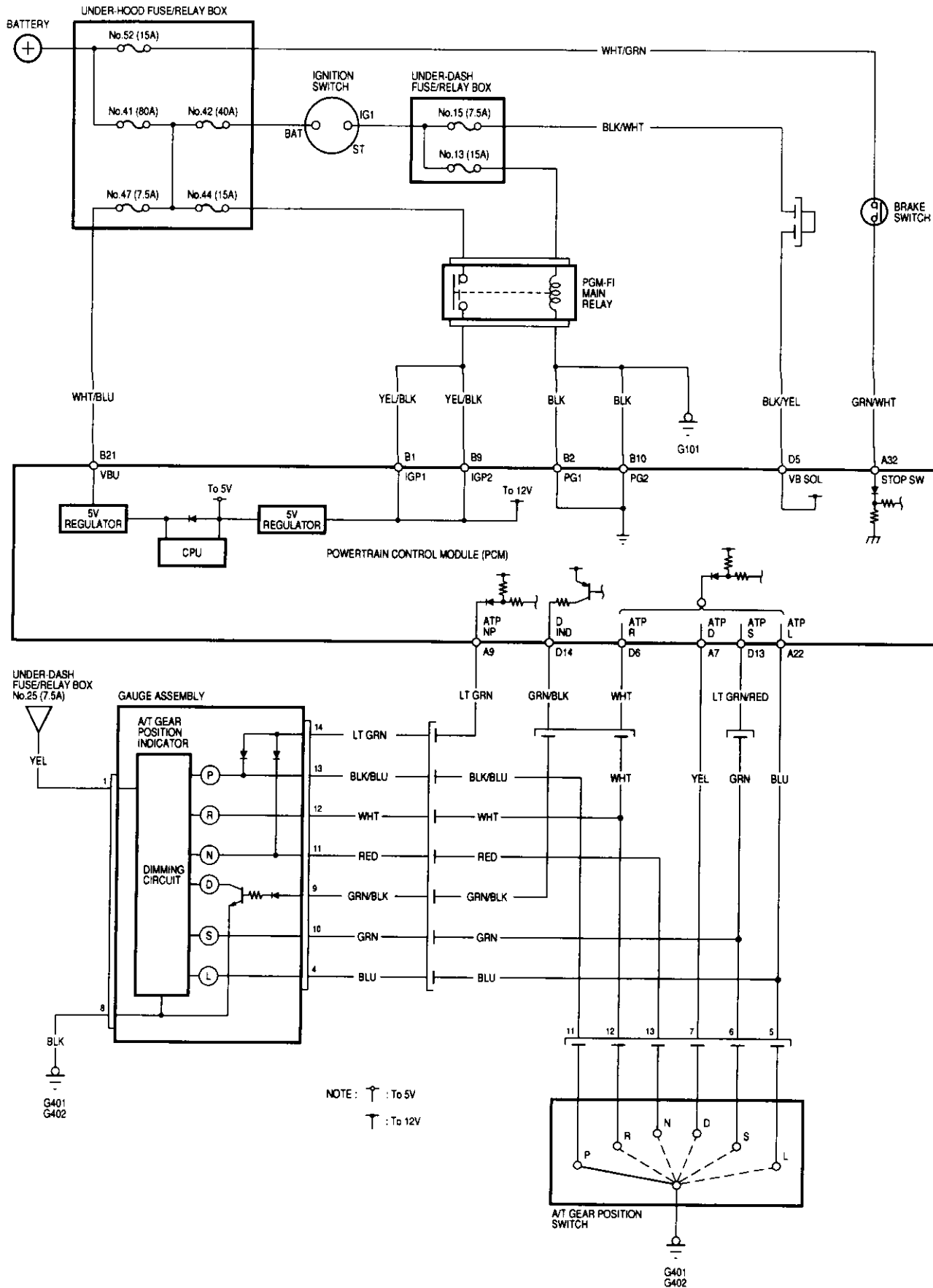
## Park Mechanism

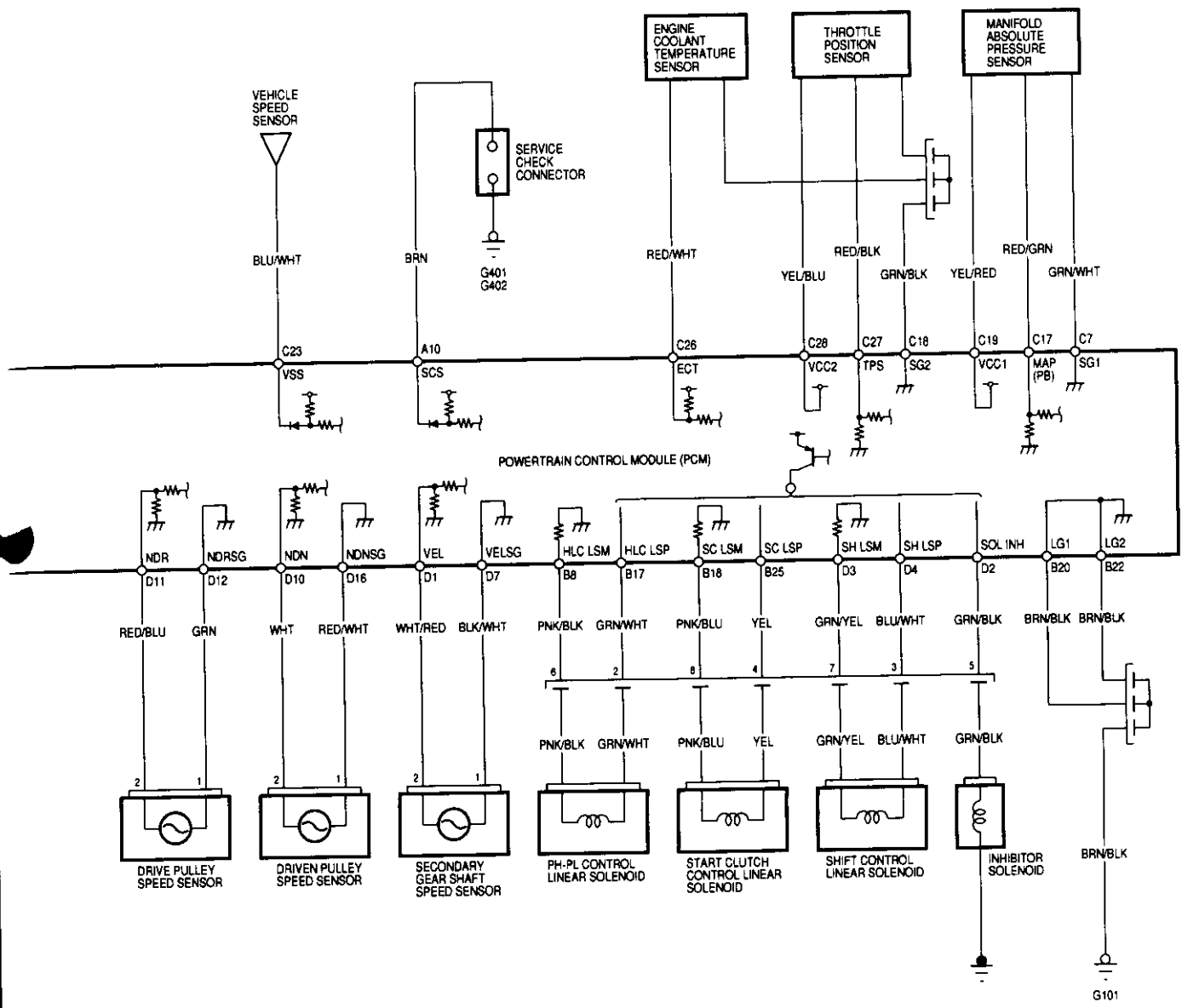
The park mechanism locks the transmission by engaging the park pawl with the park gear which is integral with the secondary drive gear. The secondary drive gear engages with the secondary driven gear which engages with the final driven gear.

Shifting to **P** position causes the park cone (installed at the end of the park rod) to press the park pawl onto the park gear. Even if the end of the park pawl rides on the top of the park gear teeth, slight movement of the vehicle will cause the park pawl and the park gear to mesh with each other completely because the park cone receives the tension from the park rod spring. The park pawl receives the tension (which acts to separate the park pawl from the park gear) from the park pawl spring.

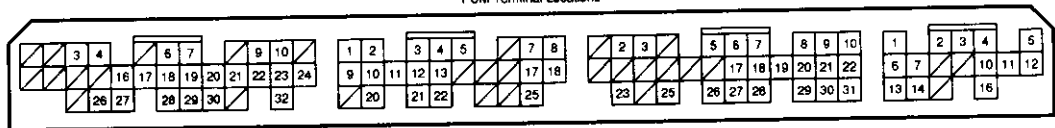


# PCM Circuit Diagram (A/T Control System: '99 - 00 Models)





PCM Terminal Locations



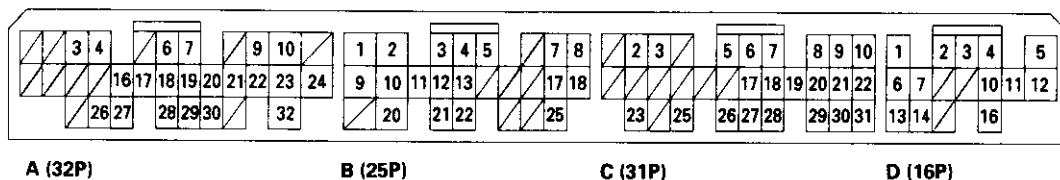
A (32P)                      B (25P)                      C (31P)                      D (16P)

# PCM Terminal Voltage/Measuring Conditions ('99 – 00 Models)

## A/T Control System

The PCM terminal voltage and measuring conditions are shown for the connector terminals that are related to the A/T control system. The other PCM terminal voltage and measuring conditions are described in section 11.

### PCM Connector Terminal Locations



### PCM CONNECTOR A (32P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
A7	ATP D	A/T gear position switch D position input	In <b>D</b> position: 0 V In other than <b>D</b> position: Approx. 10 V
A9	ATP NP	A/T gear position switch P and N positions input	In <b>P</b> and <b>N</b> positions: 0 V In other than <b>P</b> and <b>N</b> position: Approx. 10 V
A10	SCS	Timing and adjustment service check signal	With ignition switch ON (II) and service check connector open: 5 V With ignition switch ON (II) and service check connector connected with special tool: 0 V
A22	ATP L	A/T gear position switch L position input	In <b>L</b> position: 0 V In other than <b>L</b> position: Approx. 10 V
A32	STOP SW	Brake switch signal output	Brake pedal depressed: Battery voltage Brake pedal released: 0 V

### PCM CONNECTOR B (25P)

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
B1	IGP1	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B2	PG1	Ground	
B8	HLC LSM	PH-PL control linear solenoid power supply negative electrode	
B9	IGP2	Power supply circuit from main relay	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
B10	PG2	Ground	
B17	HLC LSP	PH-PL control linear solenoid power supply positive electrode	With ignition switch ON (II): Pulsing signal
B18	SC LSM	Start clutch control linear solenoid power supply negative electrode	
B20	LG1	Ground	
B21	VBU	Back-up power supply	Always battery voltage
B22	LG2	Ground	
B25	SC LSP	Start clutch control linear solenoid power supply positive electrode	With ignition switch ON (II): Pulsing signal

**PCM CONNECTOR D (16P)**

Terminal Number	Signal	Description	Measuring Conditions/Terminal Voltage
D1	VEL	Secondary gear shaft speed sensor signal input	Depending on vehicle speed: Pulsing signal When vehicle is stopped: Approx. 0 V
D2	SOL INH	Inhibitor solenoid control	With inhibitor solenoid ON: Battery voltage With inhibitor solenoid OFF: 0 V
D3	SH LSM	Shift control linear solenoid power supply negative electrode	
D4	SH LSP	Shift control linear solenoid power supply positive electrode	With ignition switch ON (II): Pulsing signal
D5	VB SOL	Power supply for solenoid valves	With ignition switch ON (II): Battery voltage With ignition switch OFF: 0 V
D6	ATP R	A/T gear position switch <b>[R]</b> position input	In <b>[R]</b> position: 0 V In other than <b>[R]</b> position: Approx. 10 V
D7	VEL SG	Secondary gear shaft speed sensor ground	
D8	—	Not used	
D9	—	Not used	
D10	NDN	Driven pulley speed sensor signal input	In other than <b>[P]</b> and <b>[N]</b> position: Pulsing signal
D11	NDR	Driven pulley speed sensor signal input	In other than <b>[P]</b> and <b>[N]</b> position: Pulsing signal
D12	NDR SG	Drive pulley speed sensor ground	
D13	ATP S	A/T gear position switch <b>[S]</b> position input	In <b>[S]</b> position: 0 V In other than <b>[S]</b> position: Battery voltage
D14	D IND	D indicator light control	When ignition switch is first turned ON (II): Battery voltage for two seconds In <b>[D]</b> position: Battery voltage
D15	—	Not used	
D16	NDN SG	Driven pulley speed sensor ground	

## **Driveshafts**

**Special Tools ..... 16-2**

### **Driveshafts**

**Inspection ..... 16-3**

**Removal ..... 16-3**

**Disassembly ..... 16-5**

**Reassembly ..... 16-8**

**Installation ..... 16-18**

### **Intermediate Shaft**

**Removal ..... 16-20**

**Disassembly ..... 16-20**

**Reassembly ..... 16-21**

**Installation ..... 16-23**







## Inspection

### Driveshaft Boot

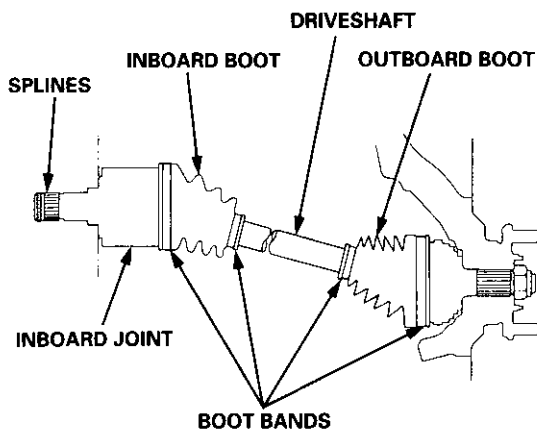
Check the boots on the driveshaft for cracks, damage, leaking grease and loose boot bands. If any damage is found, replace the boot and boot bands.

### Loose Splines

Turn the driveshaft by hand and make sure the splines and joint are not excessively loose. If any damage is found, replace the inboard joint.

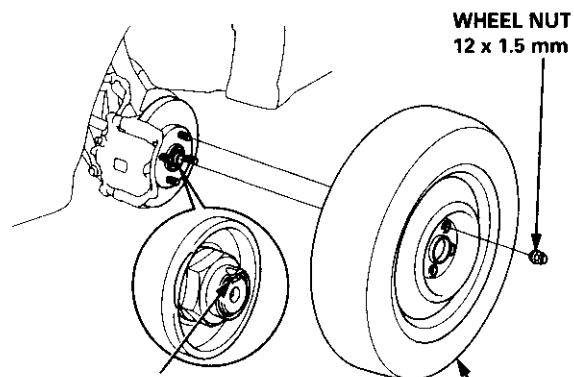
### Twisted or Cracked

Make sure the driveshaft is not twisted or cracked. Replace it if necessary.

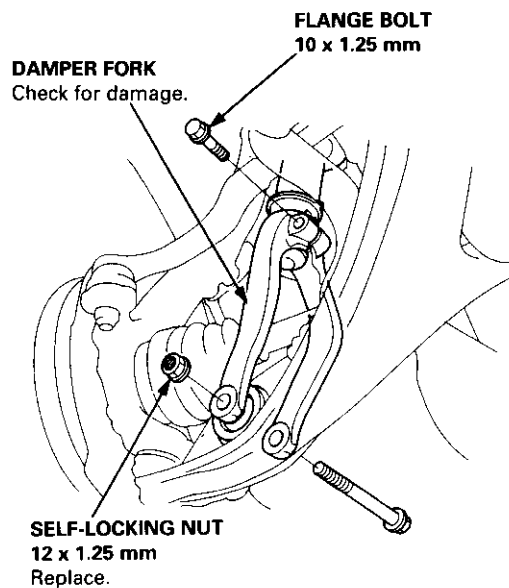


## Removal

1. Loosen the wheel nuts slightly.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and front wheels.



4. Drain the transmission fluid (see section 13 or 14).
5. Raise the locking tab on the spindle nut, then remove the nut.
6. Remove the self-locking nut and flange bolts.



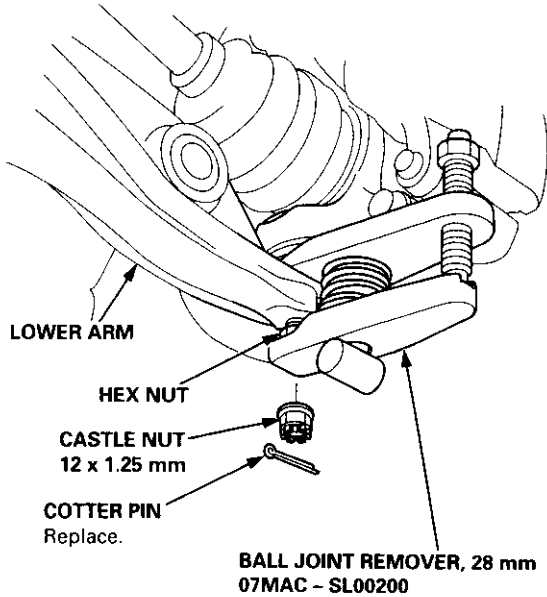
7. Remove the damper fork.

(cont'd)

# Driveshafts

## Removal (cont'd)

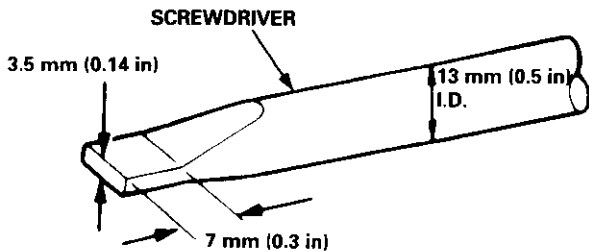
- Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.



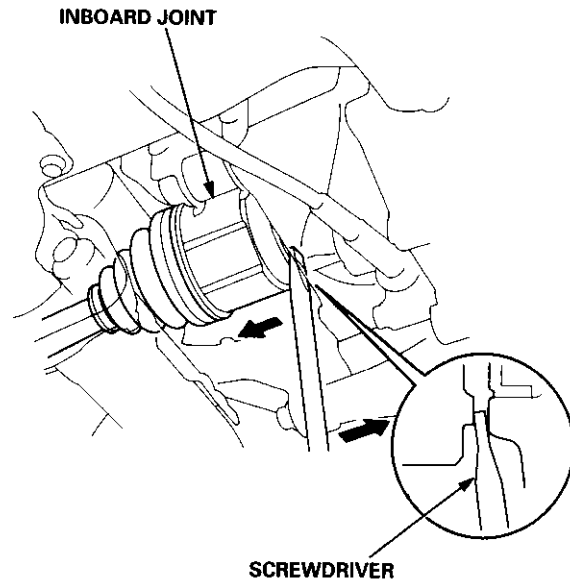
- Install a 12 mm hex nut on the ball joint. Be sure that the hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.
- Use the special tool as shown in section 18, to separate the ball joint and lower arm. Be careful not to damage the ball joint boot.

NOTE: If necessary, apply penetrating type lubricant to loosen the ball joint.

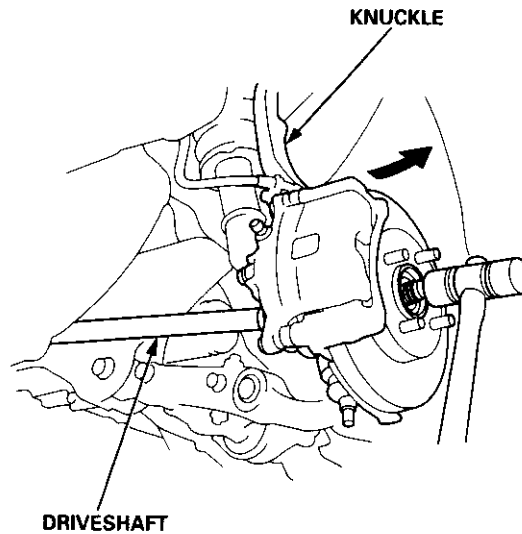
- Pry the driveshaft assembly with a screwdriver, as shown, to force the set ring at the driveshaft end past the groove.



- Pull the inboard joint, and remove the driveshaft from the differential case as an assembly. Do not pull on the driveshaft; the inboard joint may come apart. Use care when prying out the assembly, and pull it straight to avoid damaging the differential oil seal.



- Pull the knuckle outward, and remove the driveshaft outboard joint from the front wheel hub using a plastic hammer.



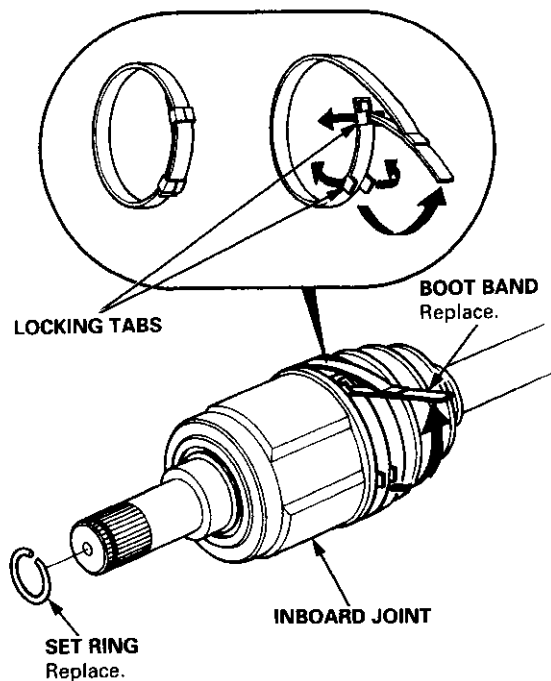


## Disassembly

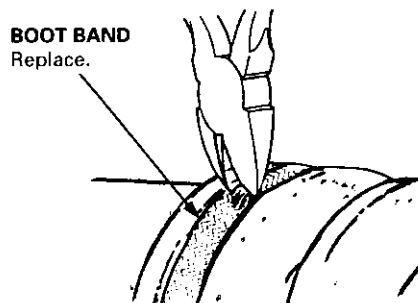
### Inboard Joint Side:

1. Carefully clamp the driveshaft in a vise with soft jaws, then remove the set ring from the inboard joint.
2. Remove the boot bands. Take care not to damage the boot.
  - If the boot band is a locking tab type, pry up the locking tabs with a screwdriver, and raise the end of the band.
  - If the boot band is a welded type, cut the boot band.
  - If the boot band is a crimping type, pry up the end of the band with a screwdriver.
  - If the boot band is a double loop type, lift up the band bend.

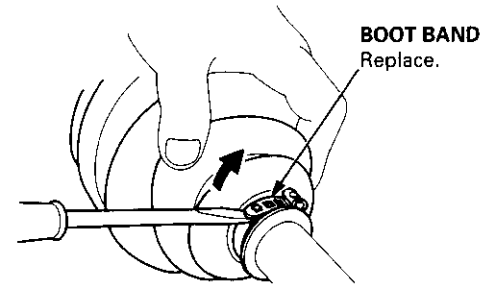
### Locking Tab Type



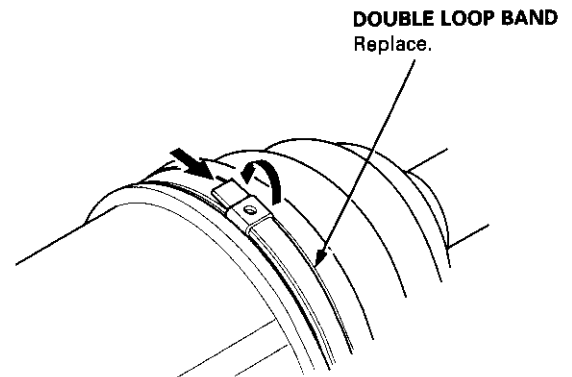
### Welded Type



### Crimping Type



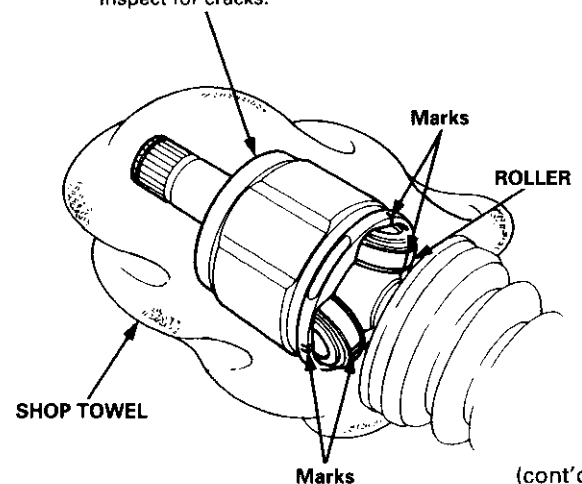
### Double Loop Type



3. Mark each roller and inboard joint to identify the locations of rollers and grooves in the inboard joint. Then remove the inboard joint on the shop towel. Be careful not to drop the rollers when separating them from the inboard joint.

### INBOARD JOINT

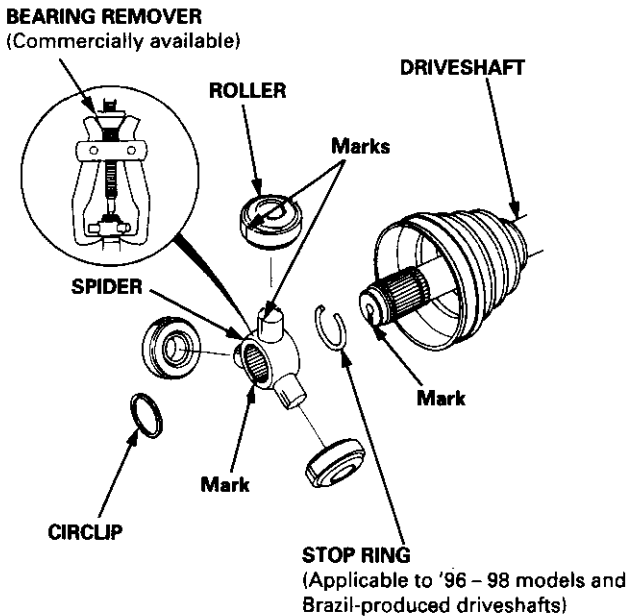
Check splines for wear or damage.  
Check inside bore for wear.  
Inspect for cracks.



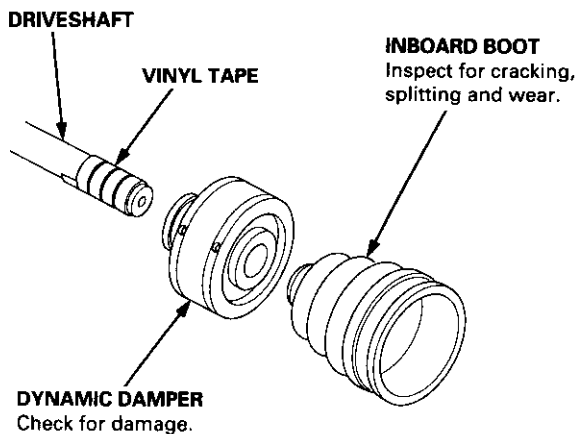
# Driveshafts

## Disassembly (cont'd)

4. Mark the rollers and spider to identify the locations of the rollers on the spider, then remove the rollers.



5. Remove the circlip.
6. Mark the spider and driveshaft to identify the position of the spider on the shaft.
7. Remove the spider using a bearing remover.
8. Remove the stop ring (Applicable to '96 - 98 models and Brazil-produced driveshafts).
9. Wrap the splines on the driveshaft with vinyl tape to prevent damage to the boot and dynamic damper.



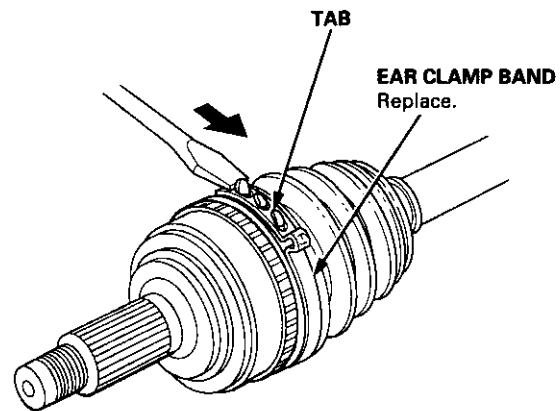
10. Remove the inboard boot, and if necessary, the dynamic damper.

### Outboard Joint Side:

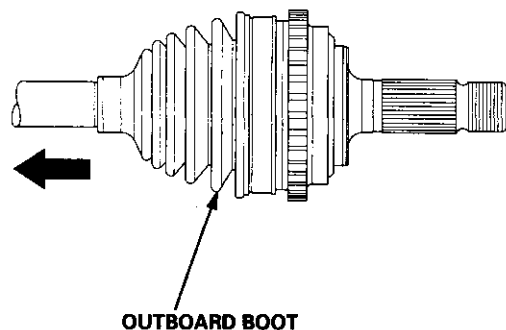
1. Lift up the three tabs with a screwdriver, then remove the boot bands. Take care not to damage the boot.

#### NOTE:

- If the boot band is a double loop type, lift up the band bend.
- If the boot band is a welded type, cut the boot band.
- If the boot band is a locking tabs type, pry up the tabs with a screwdriver and lift up the end of the band.

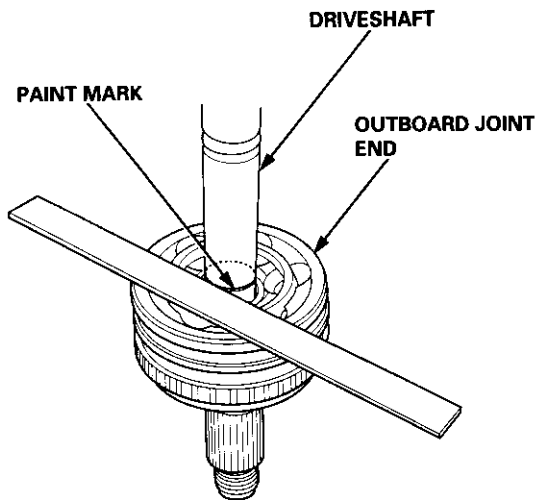


2. Slide the outboard boot to the inboard joint side.

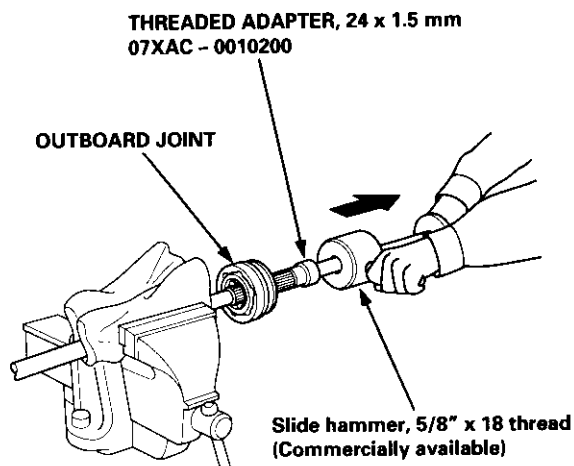




3. Wipe off the grease to expose the driveshaft and the outboard joint inner race.
4. Mark the driveshaft at the same position of the outboard joint end with paint.

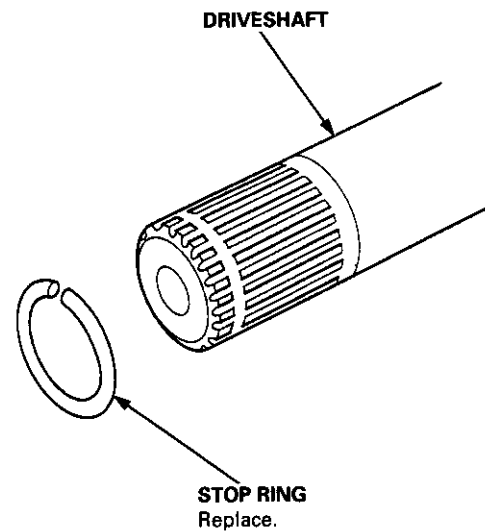


5. Carefully clamp the driveshaft in a vise.



6. Remove the outboard joint using a special tool as shown.

7. Remove the driveshaft from the vise.
8. Remove the stop ring from the driveshaft.




# Driveshafts

## Reassembly

### U.S. and Canada-Produced Driveshafts

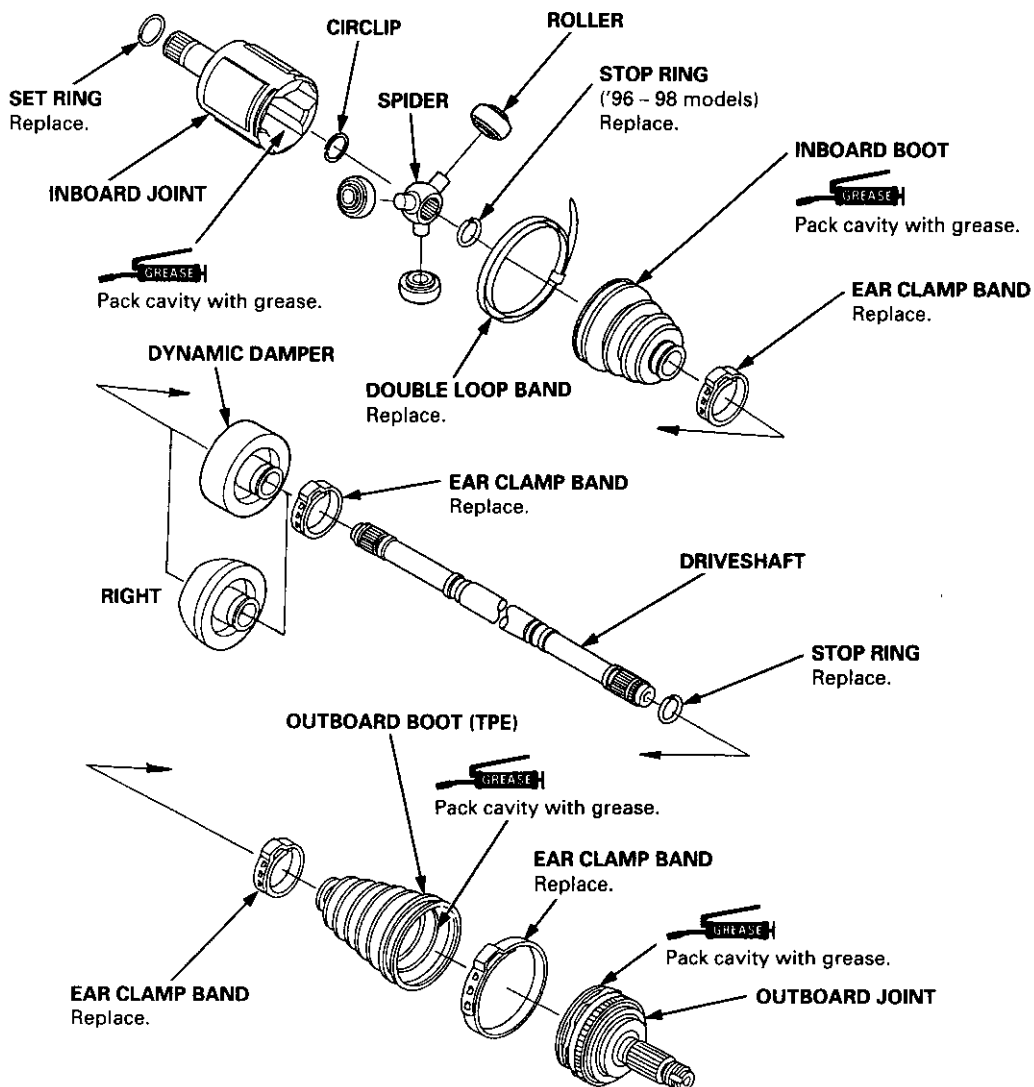
Note these items during reassembly:

- 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 and both joint boots with the joint grease included in the new driveshaft set.

### Grease quantity:

Inboard Joint	115 – 135 g (4.0 – 4.8 oz)
Outboard Joint	115 – 135 g (4.0 – 4.8 oz)


- The '98 Canada model and all '99 – 00 models uses a TPE (Thermoplastic Polyester Elastomer) outboard joint boot. Use the ear clamp type boot band in the outboard joint boot set.





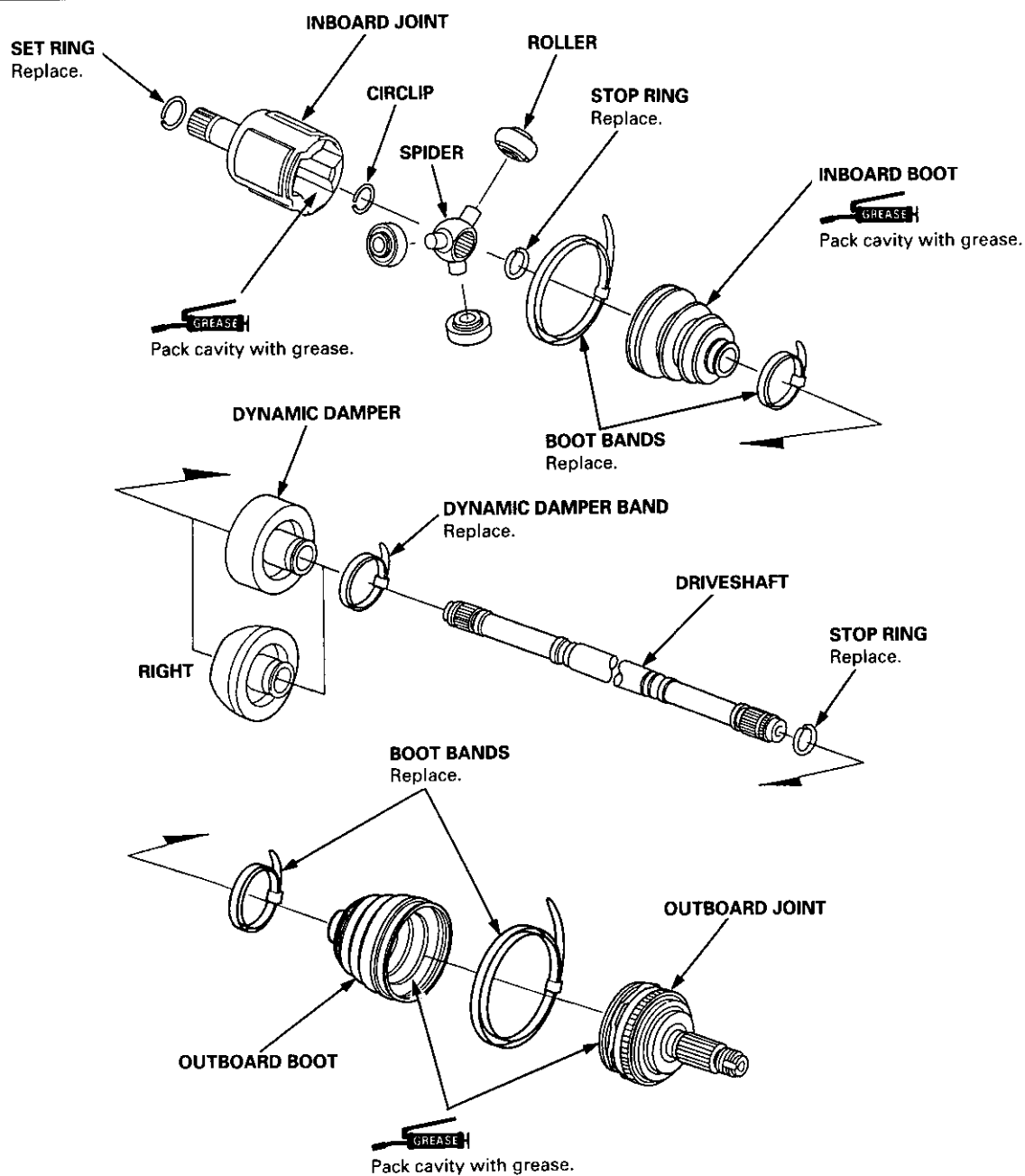
### Brazil-Produced Driveshafts

Note these items during reassembly:

- 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 and both joint boots with the joint grease included in the new driveshaft set.

### Grease quantity:

Inboard Joint	115 – 135 g (4.0 – 4.8 oz)
Outboard Joint	115 – 135 g (4.0 – 4.8 oz)




(cont'd)

# Driveshafts

## Reassembly (cont'd)

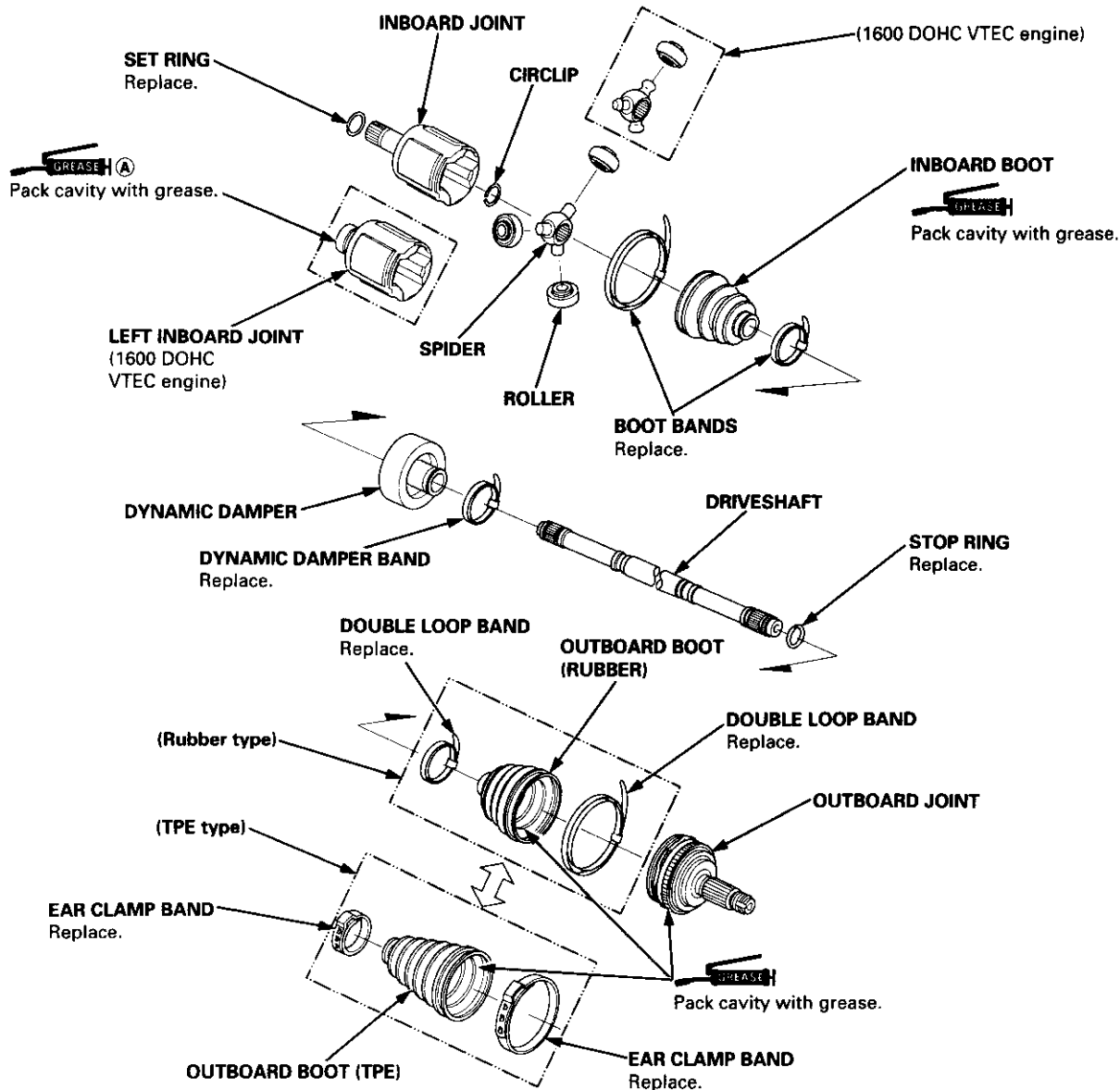
### Japan-Produced Driveshafts

Note these items during reassembly:

- 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 and both joint boots with the joint grease included in the new driveshaft set.

### Grease quantity:

Inboard Joint	1600 DOHC VTEC engine	130 – 140 g (4.6 – 4.9 oz)	
	Except 1600 DOHC VTEC engine	110 – 120 g (3.9 – 4.2 oz)	
	Splines (A)	0.5 – 1.0 g (0.018 – 0.035 oz)	
Outboard Joint	1600 DOHC VTEC engine	Rubber boot: 90 – 100 g (3.2 – 3.5 oz)	TPE boot: 105 – 115 g (3.7 – 4.1 oz)
	Except 1600 DOHC VTEC engine	Rubber boot: 70 – 80 g (2.5 – 2.8 oz)	TPE boot: 95 – 105 g (3.4 – 3.7 oz)

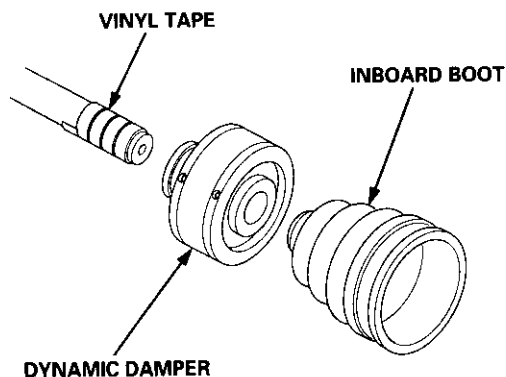




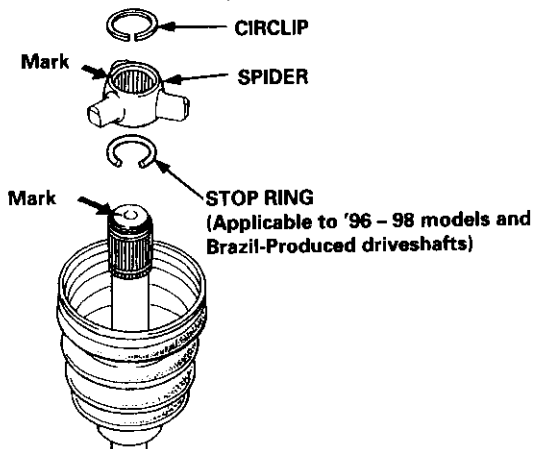


**Inboard Joint Side:**

1. Wrap the splines with vinyl tape to prevent damage to the boots and dynamic damper.

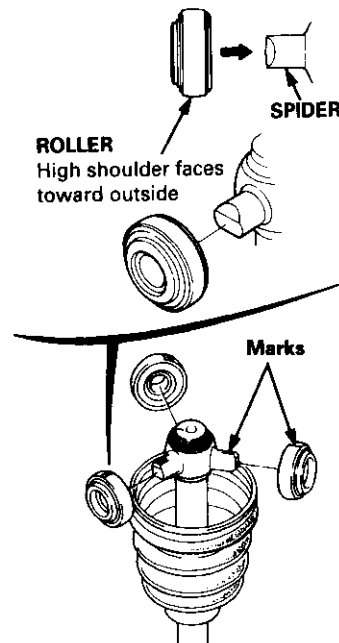


2. Install the dynamic damper and inboard boot to the driveshaft, then remove the vinyl tape. Take care not to damage the boots.
3. Install the stop ring into the driveshaft groove (Applicable to '96 - 98 models and Brazil - Produced driveshafts). Always rotate the stop ring in its groove to be sure it is fully seated.



4. Install the spider on the driveshaft by aligning the marks on the spider and the end of the driveshaft.
5. Fit the circlip into the driveshaft groove. Always rotate the circlip in its groove to be sure it is fully seated.

6. Fit the rollers onto the spider with their high shoulders facing outward, and note these items:
  - Reinstall the rollers in their original positions on the spider by aligning the marks.
  - Hold the driveshaft pointed up to prevent the rollers from falling off.



7. Pack the inboard joint with the joint grease included in the new driveshaft set.

**Grease quantity:**

**Japan-Produced:**

**1600 DOHC VTEC engine:**

130 - 140 g (4.6 - 4.9 oz)

**Except 1600 DOHC VTEC engine:**

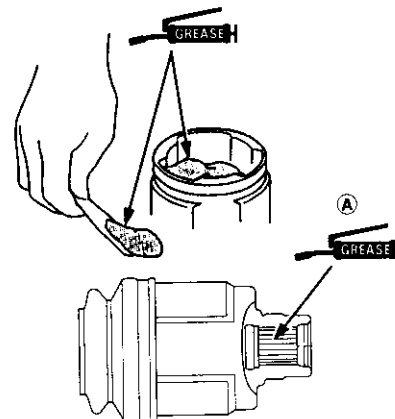
110 - 120 g (3.9 - 4.2 oz)

**Left inboard joint splines (A):**

0.5 - 1.0 g (0.018 - 0.035 oz)

**U.S., Canada, and Brazil-Produced:**

115 - 135 g (4.0 - 4.8 oz)

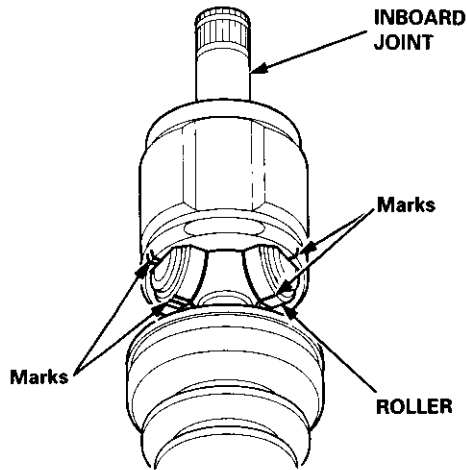


(cont'd)

# Driveshafts

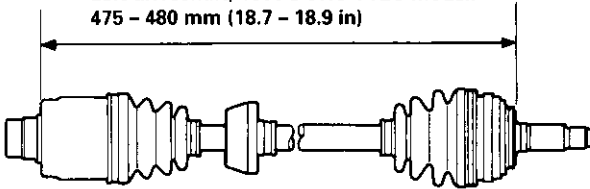
## Reassembly (cont'd)

8. Fit the inboard joint onto the driveshaft, and note these items:
  - Reinstall the inboard joint onto the driveshaft by aligning the marks on the inboard joint with the marks on the rollers.
  - Hold the driveshaft so that the inboard joint points up to prevent it from falling off.

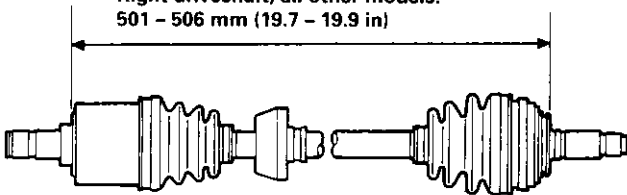


9. Adjust the length of the driveshafts to the figure below, then adjust the boots to halfway between full compression and full extension. The ends of the boots seat in the groove of the driveshaft and joint.

Left driveshaft, 1600 DOHC VTEC model:  
475 - 480 mm (18.7 - 18.9 in)



Right driveshaft, 1600 DOHC VTEC model:  
475 - 480 mm (18.7 - 18.9 in)  
Left driveshaft, all other models:  
774 - 779 mm (30.5 - 30.7 in)  
Right driveshaft, all other models:  
501 - 506 mm (19.7 - 19.9 in)



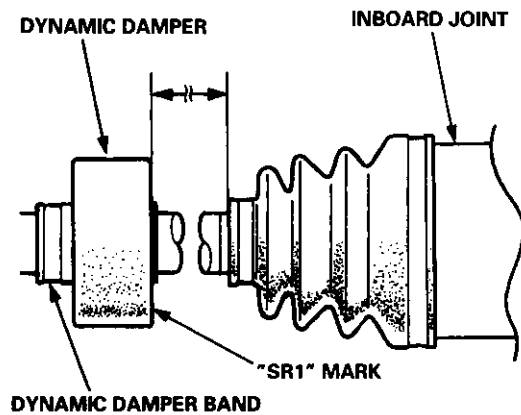
10. If necessary position the dynamic damper as shown below.
  - Install a new dynamic damper band, and bend down both sets of locking tabs.
  - Lightly tap on the doubled-over portion of the band to reduce its height.

Left:

1600 DOHC VTEC model:  $26 \pm 2$  mm ( $1.0 \pm 0.1$  in)  
All other models:  $94 \pm 2$  mm ( $3.7 \pm 0.1$  in)  
With "SR1" mark:  $75 \pm 2$  mm ( $2.9 \pm 0.1$  in)

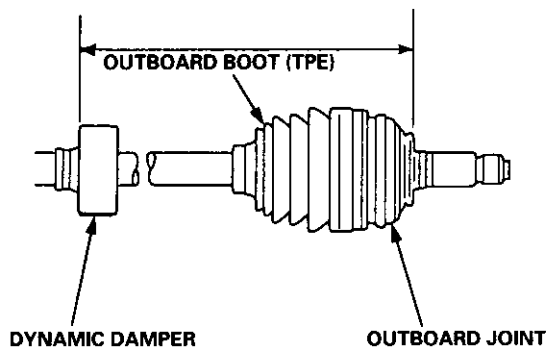
Right:

1600 DOHC VTEC models:  $26 \pm 2$  mm ( $1.0 \pm 0.1$  in)  
All other models:  $55 \pm 2$  mm ( $2.2 \pm 0.1$  in)



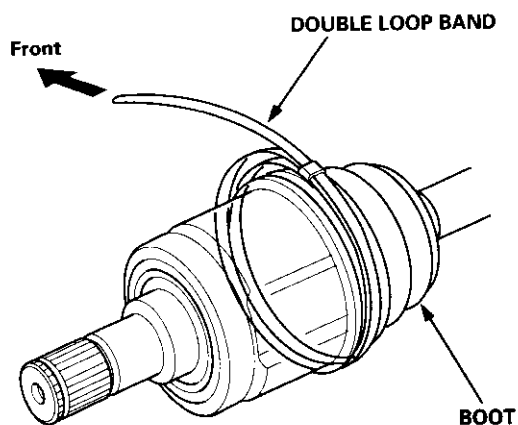
U.S. and Canada-Produced (TPE BOOT)

Left:  $536 \pm 2$  mm ( $21.1 \pm 0.1$  in)  
Right:  $283 \pm 2$  mm ( $10.4 \pm 0.1$  in)

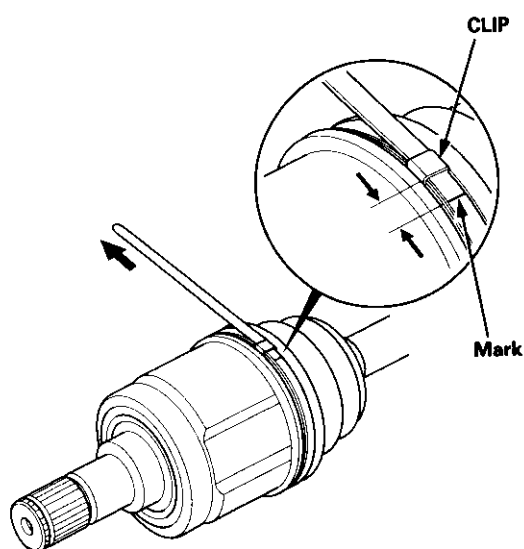




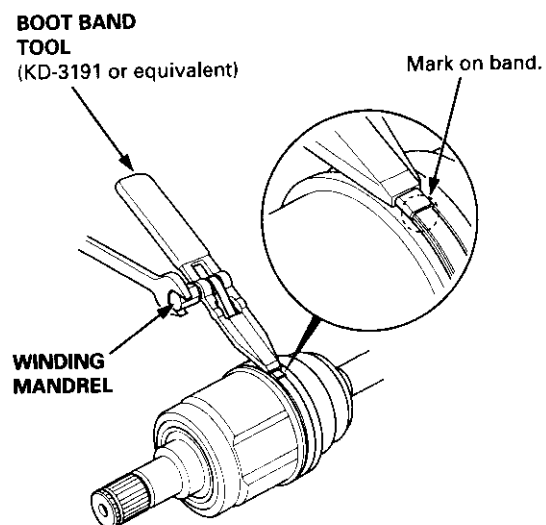
11. Set the double loop band onto the boot and dynamic damper with the band end toward the front of the vehicle.



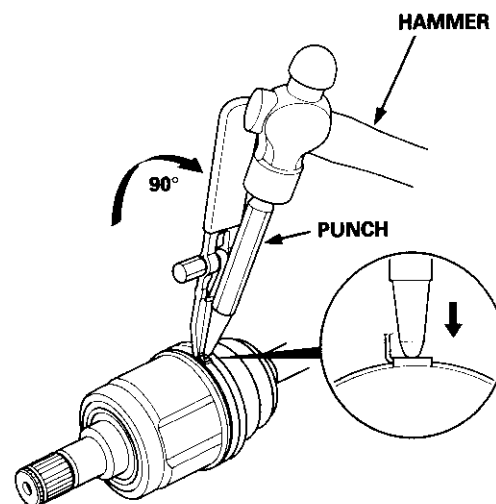
12. Pull up the slack in the band by hand.
13. Mark a position on the band 10 – 14 mm (0.4 – 0.6 in) from the clip.



14. Thread the free end of the band through the nose section of the boot band tool and into the slot on the winding mandrel.
15. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the mark you made on the band meets the edge of the clip.



16. Lift up the boot band tool to bend the free end of the band 90 degrees, then center-punch the clip.

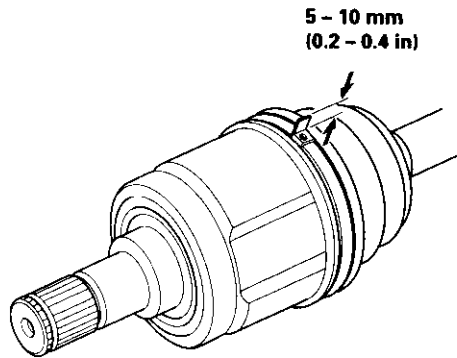


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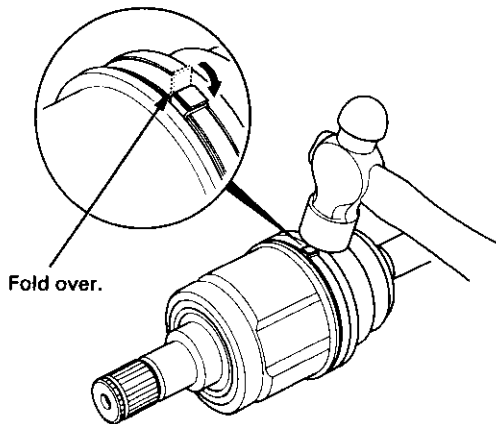
# Driveshafts

## Reassembly (cont'd)

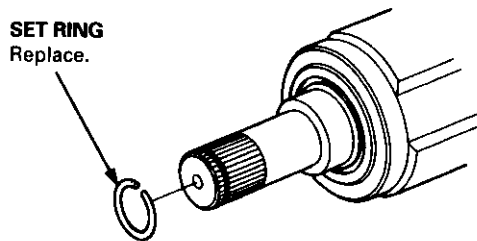
17. Unwind the boot band tool, and cut off the excess 5 - 10 mm (0.2 - 0.4 in) from the clip.



18. Secure the end of the boot band by tapping it down with a hammer.



19. Install the new set ring.



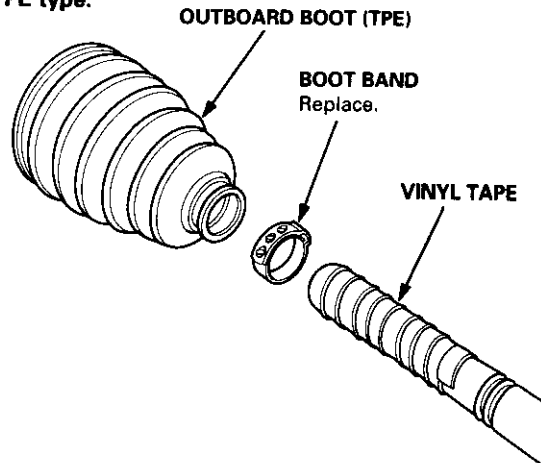
Note these items after reassembly:

- Make sure the band and clip does not interfere with anything and the band does not move.
- Remove any grease remaining on the surrounding surfaces.

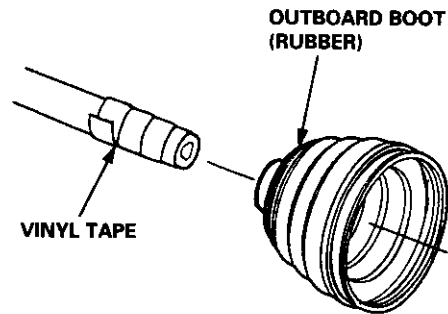
### Outboard Joint Side:

1. Wrap the splines with vinyl tape to prevent damage to the boot.

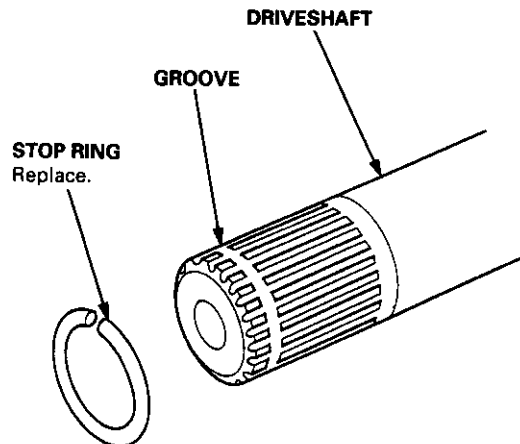
#### TPE type:



#### Rubber type:

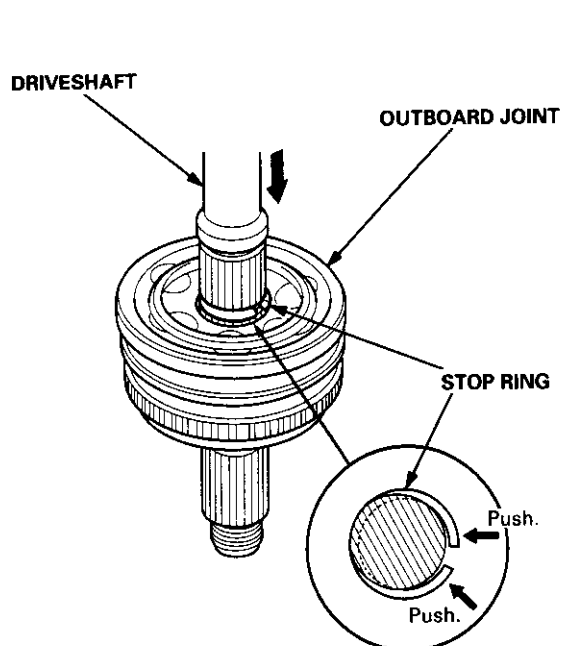


2. Install the boot band and outboard boot, then remove the vinyl tape. Take care not to damage the boot.
3. Install the stop ring into the driveshaft groove.

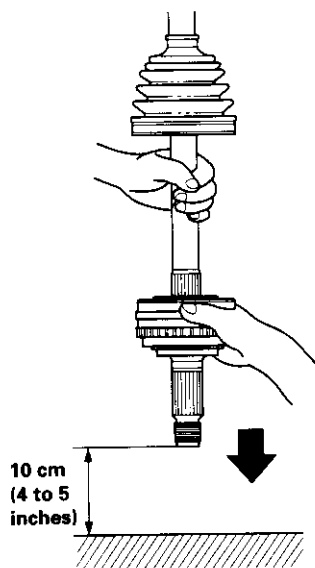




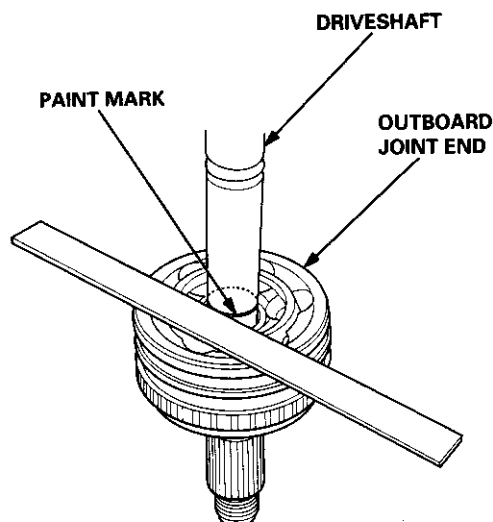
4. Insert the driveshaft into the outboard joint until the stop ring is close on the joint.



5. To completely seat the outboard joint, pick up the driveshaft and joint, and drop them from about 10 cm (4 to 5 inches) onto a hard surface. Do not use a hammer as excessive force may damage the driveshaft.



6. Check the alignment of the paint mark with the outboard joint end.



7. Pack the outboard joint with the joint grease included in the new joint boot set.

**Grease quantity**

**U.S., Canada, and Brazil-Produced:**

115 - 135 g (4.0 - 4.8 oz)

**Japan-Produced:**

**1600 DOHC VTEC engine:**

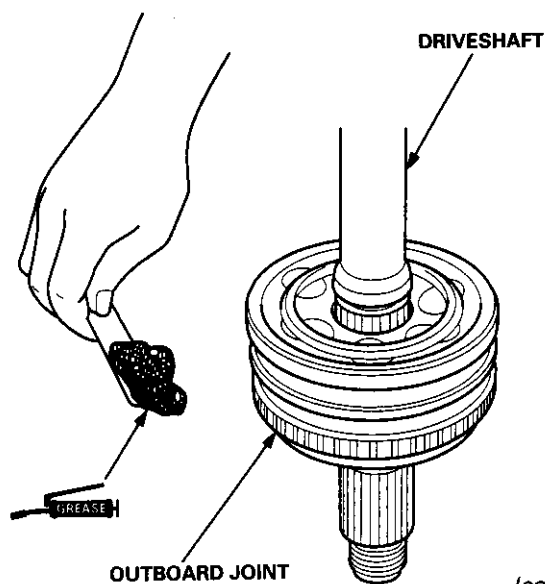
Rubber boot: 90 - 100 g (3.2 - 3.5 oz)

TPE boot: 105 - 115 g (3.7 - 4.1 oz)

**Except 1600 DOHC VTEC engine:**

Rubber boot: 70 - 80 g (2.5 - 2.8 oz)

TPE boot: 95 - 105 g (3.4 - 3.7 oz)

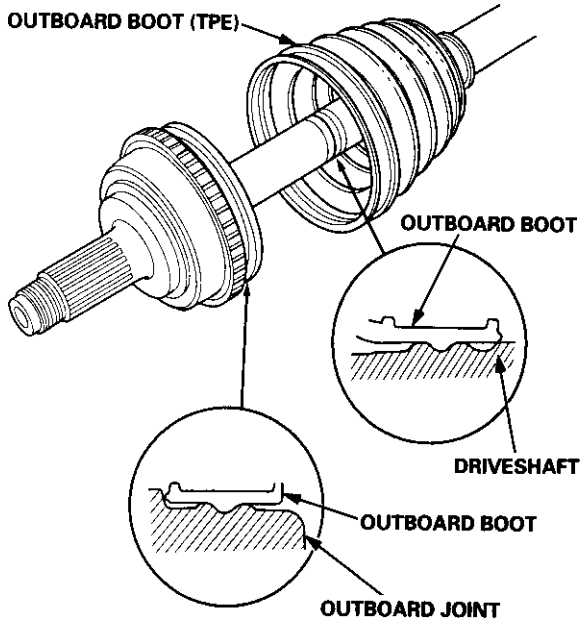


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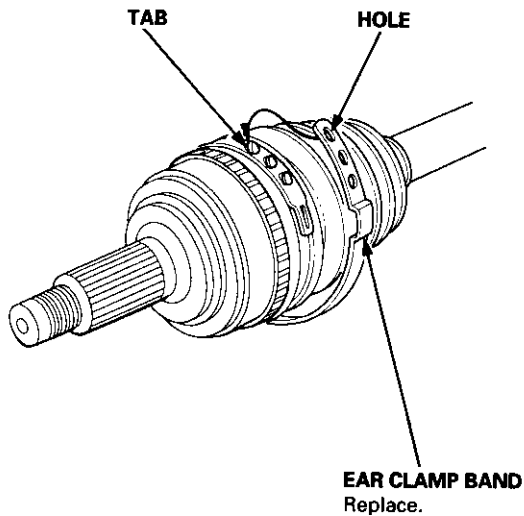
# Driveshafts

## Reassembly (cont'd)

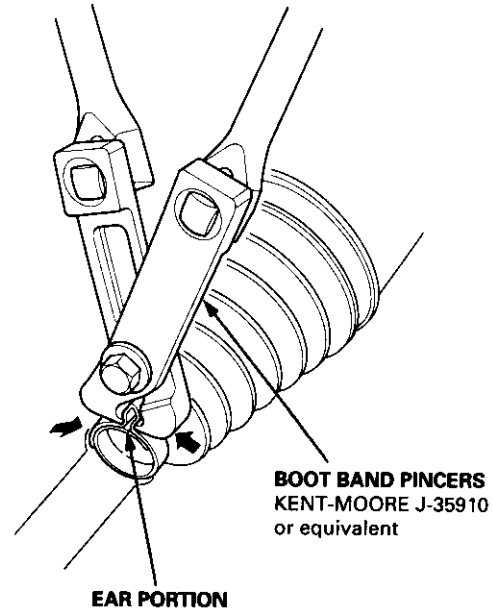
8. Install the outboard boot and the boot bands.
  - If the boot is the rubber type, go to step 13.
  - If the boot is the TPE type, go to step 9.
9. Fit the boot ends onto the driveshaft and outboard joint.



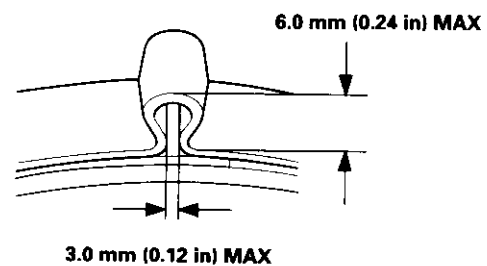
10. Set the ear clamp band by threading the tab into the holes of the band.



11. Close the ear portion of the band with a commercially available boot band pincers.

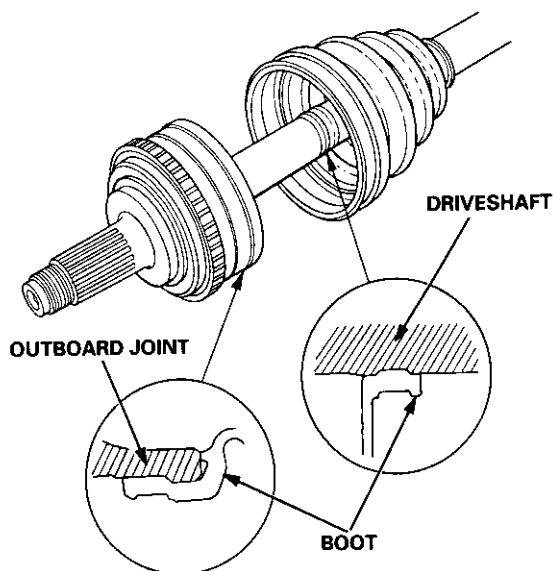


12. Check the clearance between the closed ear portion of the band. If the clearance is not within the standard, close the ear portion of the band further.

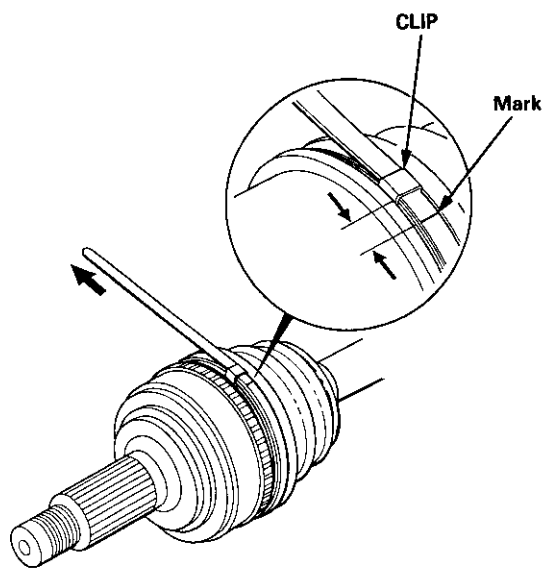




13. Fit the boot ends onto the driveshaft and the outboard joint

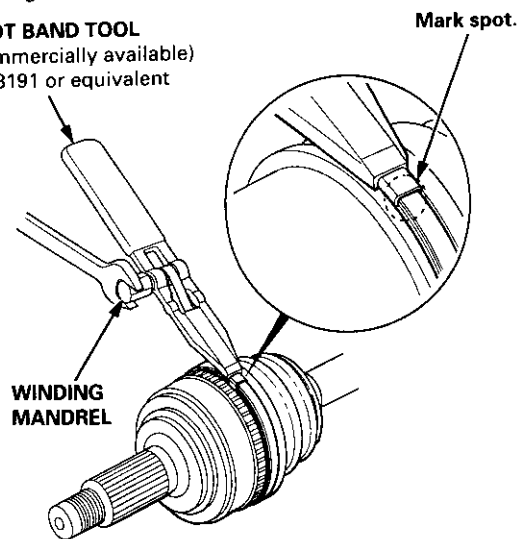


14. Fit the double loop boot bands onto the boot ends.
15. Pull up the slack in the band by hand.
16. Mark a position on the band 10 - 14 mm (0.4 - 0.6 in.) from the clip.

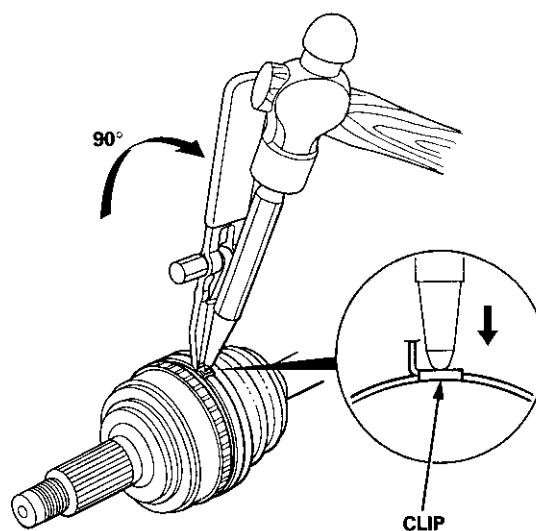


17. Thread the free end of the band through the nose section of a commercially available boot band tool KD-3191 or equivalent and into the slot on the winding mandrel.

**BOOT BAND TOOL**  
(Commercially available)  
KD-3191 or equivalent



18. Place a wrench on the winding mandrel of the boot band tool, and tighten the band until the marked spot on the band meets the edge of the clip.
19. Lift up the boot band tool to bend the free end of the band 90° to the clip. Center punch the clip, then fold over the remaining tail onto the clip.

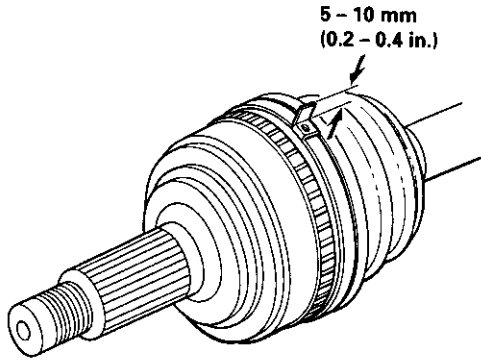


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# Driveshafts

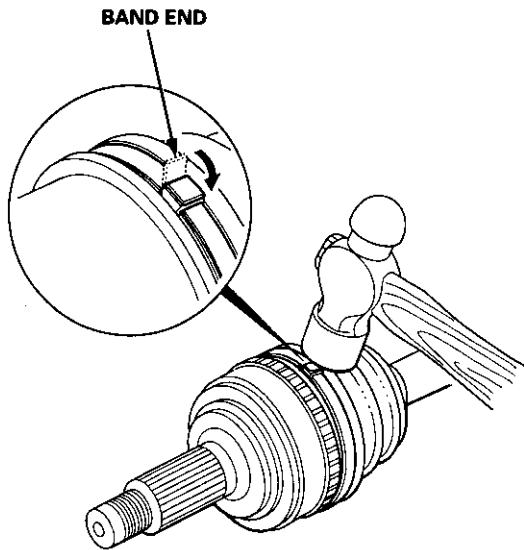
## Reassembly (cont'd)

20. Unwind the boot band tool, and cut off the excess free end of the band to leave a 5 – 10 mm (0.2 – 0.4 in.) tail protruding from the clip.



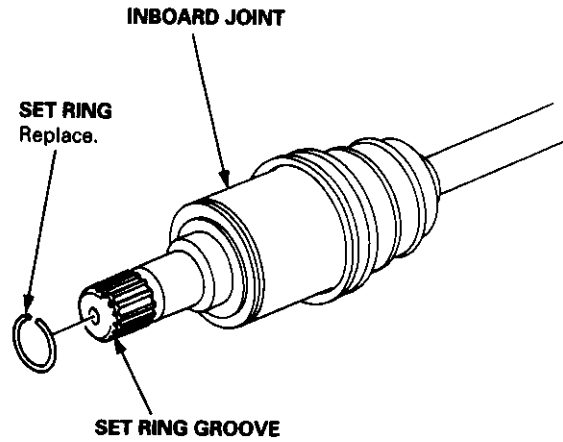
21. Bend the band by tapping it down with a hammer.

NOTE: Make sure the band and the clip does not interfere with anything, and the band does not move. Remove any grease remaining in the surrounding surfaces.

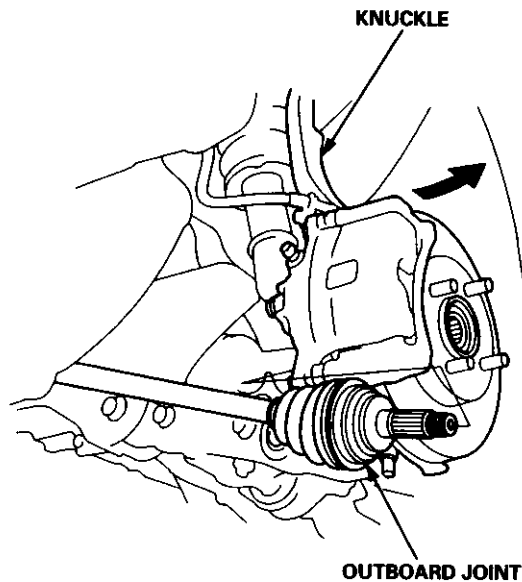


## Installation

1. Install the new set ring onto the driveshaft groove. Always use a new set ring whenever the driveshaft is being installed.



2. Install the outboard joint into the knuckle.

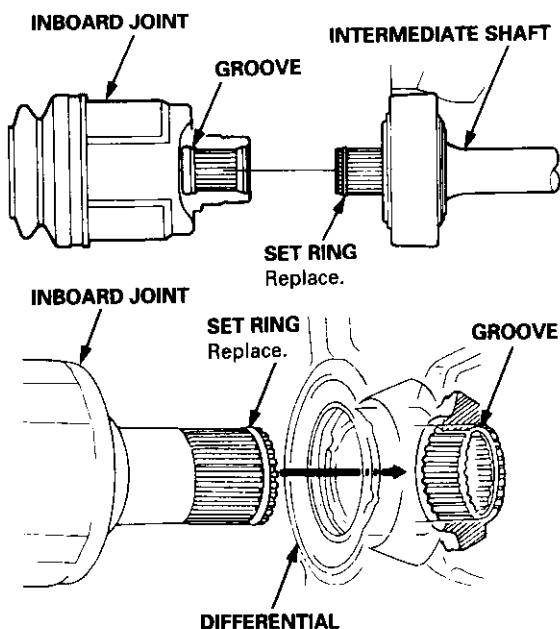






3. Insert the inboard end of the driveshaft into the differential or intermediate shaft until the set ring locks in the groove.

NOTE: Clean the areas where the driveshaft contact the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air.

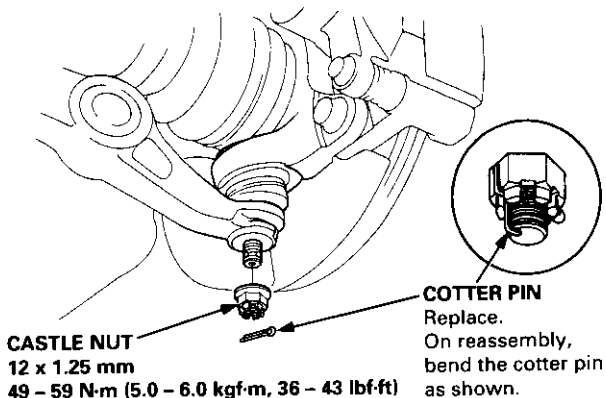


4. Install the knuckle on the lower arm, then tighten the castle nut and install a new cotter pin.

NOTE: Wipe off the grease before tightening the nut at the ball joint.

**CAUTION:**

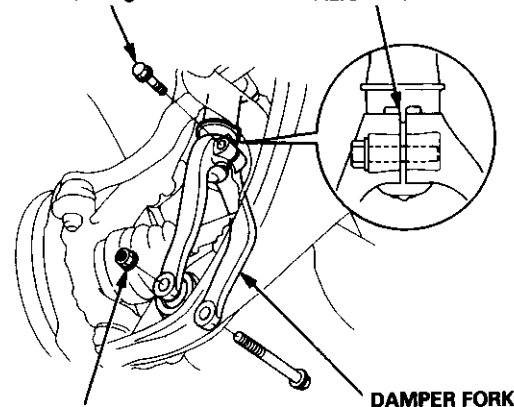
- Be careful not to damage the ball joint boot.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.



5. Install the damper fork over the driveshaft and onto the lower arm. Install the damper in the damper fork so the aligning tab is aligned with the slot in the damper fork.

**FLANGE BOLT**  
10 x 1.25 mm  
43 N-m (4.4 kgf-m, 32 lbf-ft)

**ALIGNING TAB**

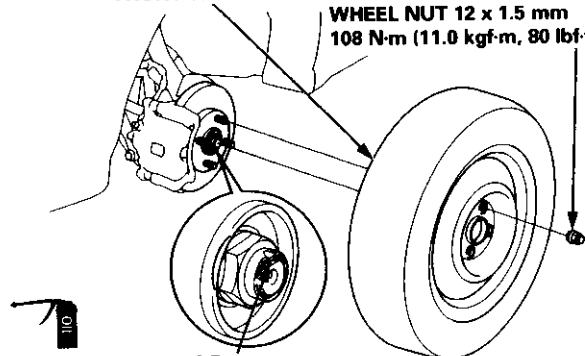


**SELF-LOCKING NUT**  
12 x 1.25 mm  
64 N-m (6.5 kgf-m, 47 lbf-ft)  
Replace.

6. Loosely install the flange bolts and the new self-locking nut.
7. Apply oil to the seating surface of the new spindle nut.

**FRONT WHEEL**

**WHEEL NUT 12 x 1.5 mm**  
108 N-m (11.0 kgf-m, 80 lbf-ft)



**SPINDLE NUT 22 x 1.5 mm**  
181 N-m (18.5 kgf-m, 134 lbf-ft)

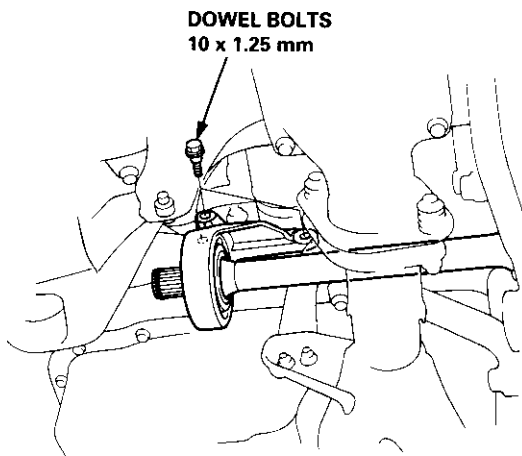
NOTE: After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.

8. Install a new spindle nut, then tighten the nut.
9. Clean the mating surfaces of the brake disc and the wheel, then install the front wheel with the wheel nuts.
10. Tighten the flange bolts and the new self-locking nut with the vehicle's weight on the damper.
11. Refill the transmission with recommended fluid (see section 13 or 14).
12. Check the front wheel alignment and adjust if necessary (see section 18).

# Intermediate Shaft

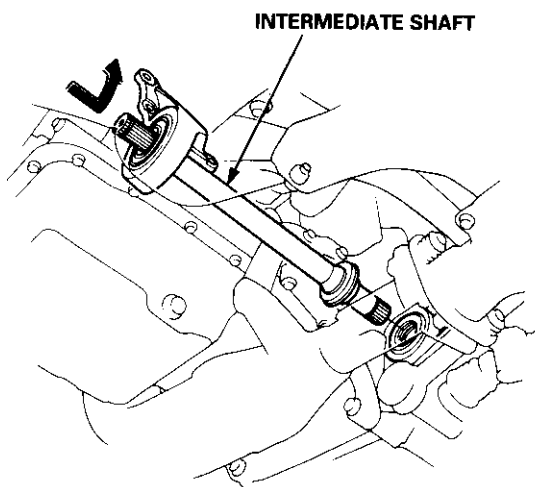
## Removal

1. Drain the transmission oil or fluid (see section 13 or 14).
2. Remove the left driveshaft (see page 16-3).
3. Remove the three dowel bolts.



4. Remove the intermediate shaft from the differential.

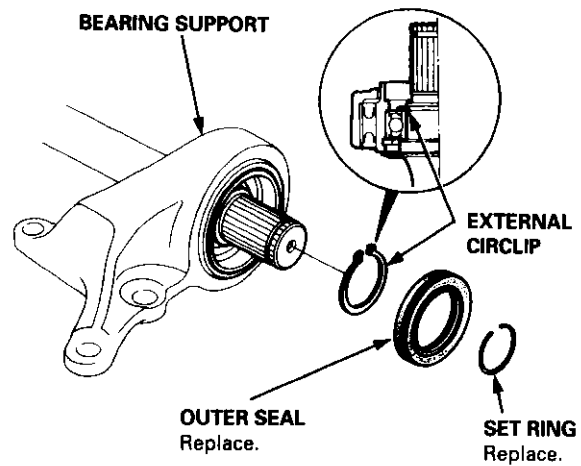
**CAUTION:** Hold the intermediate shaft horizontal until it is clear of the differential to prevent damage to the differential oil seal.



## Disassembly

**NOTE:** Be careful not to damage the metal rings on the intermediate shaft during disassembly.

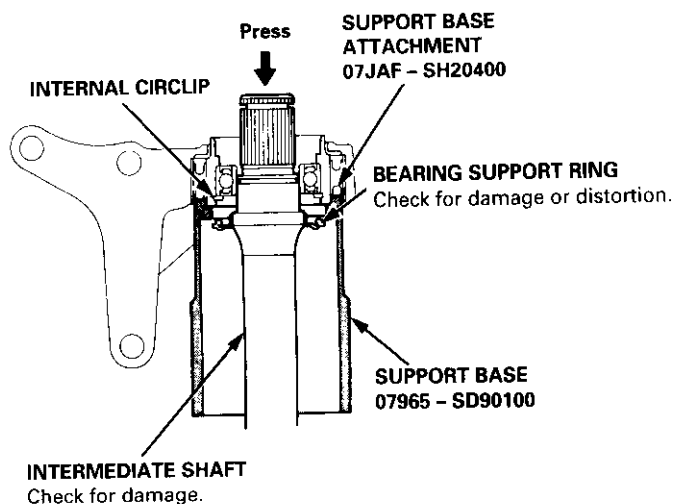
1. Remove the set ring.
2. Remove the intermediate shaft outer seal from the bearing support.
3. Remove the external circlip.



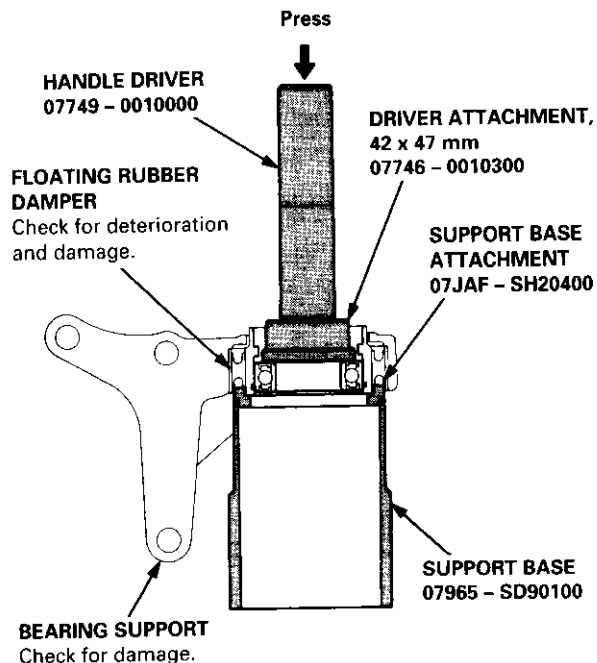


## Disassembly

4. Press the intermediate shaft out of the shaft bearing using the special tools and a press as shown.
5. Remove the internal circlip.



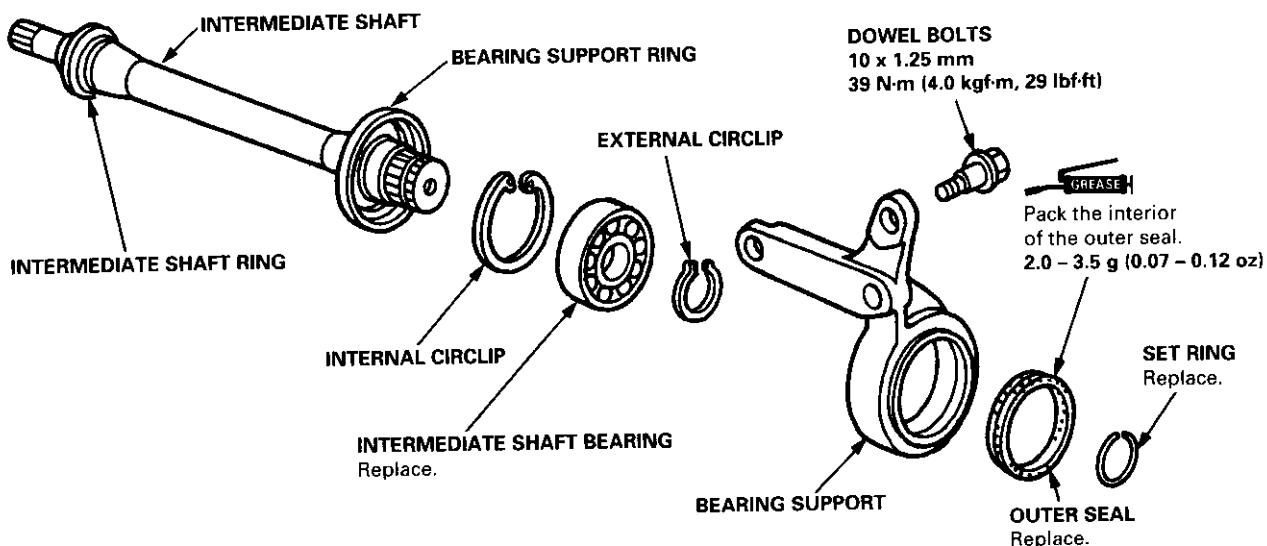
6. Press the intermediate shaft bearing out of the bearing support using the special tools and a press as shown.



## Reassembly

### NOTE:

- Clean the disassembled parts with solvent, and dry them thoroughly with compressed air. Do not wash the rubber parts with solvent.
- Be careful not to damage the metal rings on the intermediate shaft during reassembly.

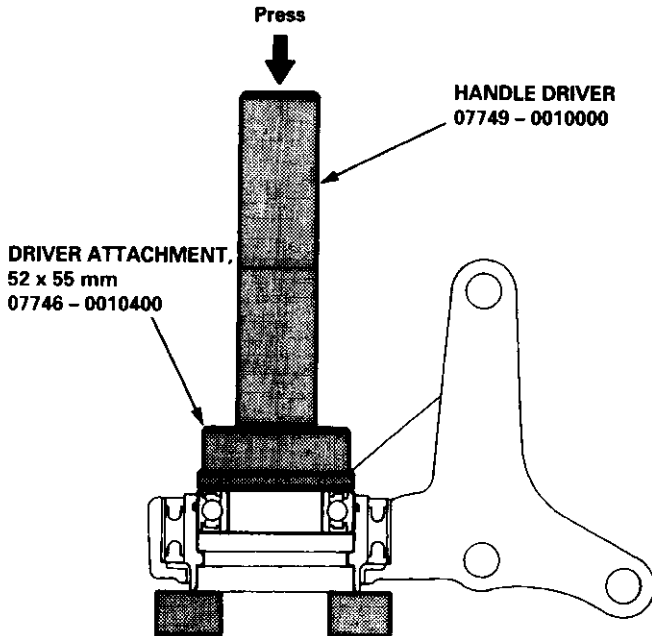


(cont'd)

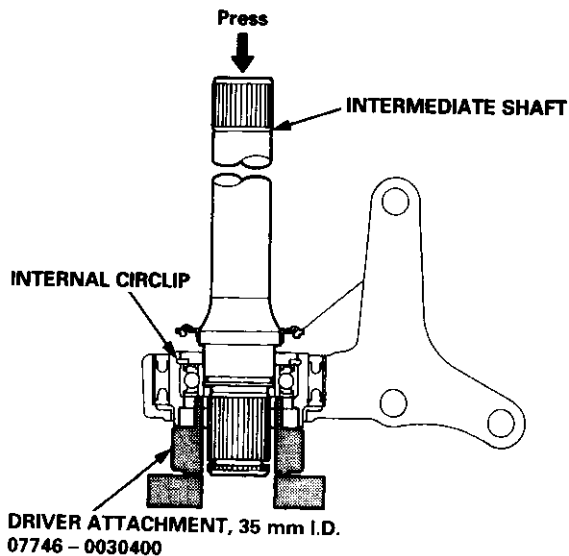
# Intermediate Shaft

## Reassembly (cont'd)

1. Press the intermediate shaft bearing into the bearing support using the special tools and a press as shown.

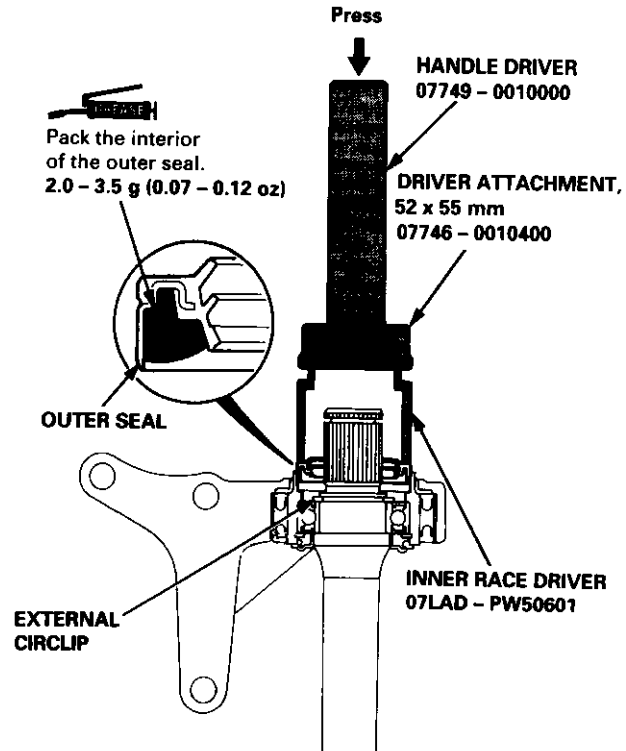


2. Seat the internal circlip in the groove of the bearing support.
3. Press the intermediate shaft into the shaft bearing using the special tools and a press.



4. Seat the external circlip in the groove of the intermediate shaft.
5. Install the outer seal into the bearing support using the special tools as shown.

NOTE: Install the seal flush with the bearing support.



6. Install the new set ring in the intermediate shaft groove.

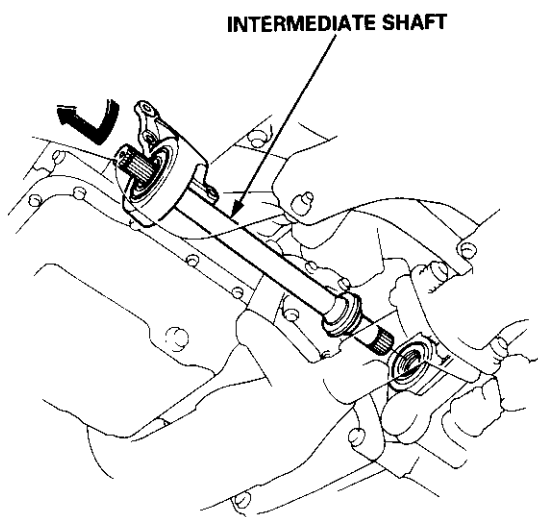


## Installation

1. Insert the intermediate shaft assembly into the differential.

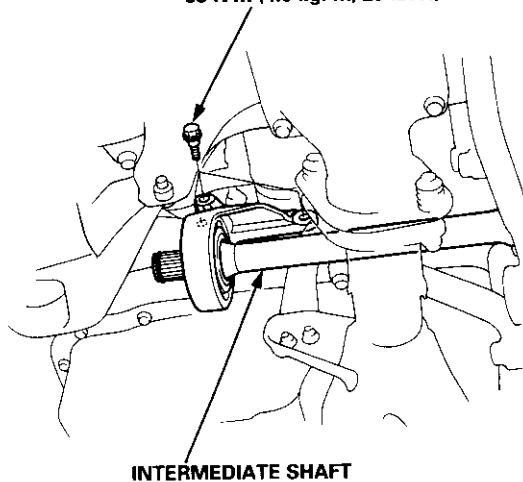
**CAUTION:** Hold the intermediate shaft horizontal to prevent damage to the differential oil seal.

**NOTE:** Clean the areas where the intermediate shaft contacts the transmission (differential) thoroughly with solvent or carburetor cleaner, and dry with compressed air.



2. Install the three dowel bolts, then tighten them.

**DOWEL BOLTS**  
10 x 1.25 mm  
39 N·m (4.0 kgf·m, 29 lbf·ft)



# Steering

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# Component Locations

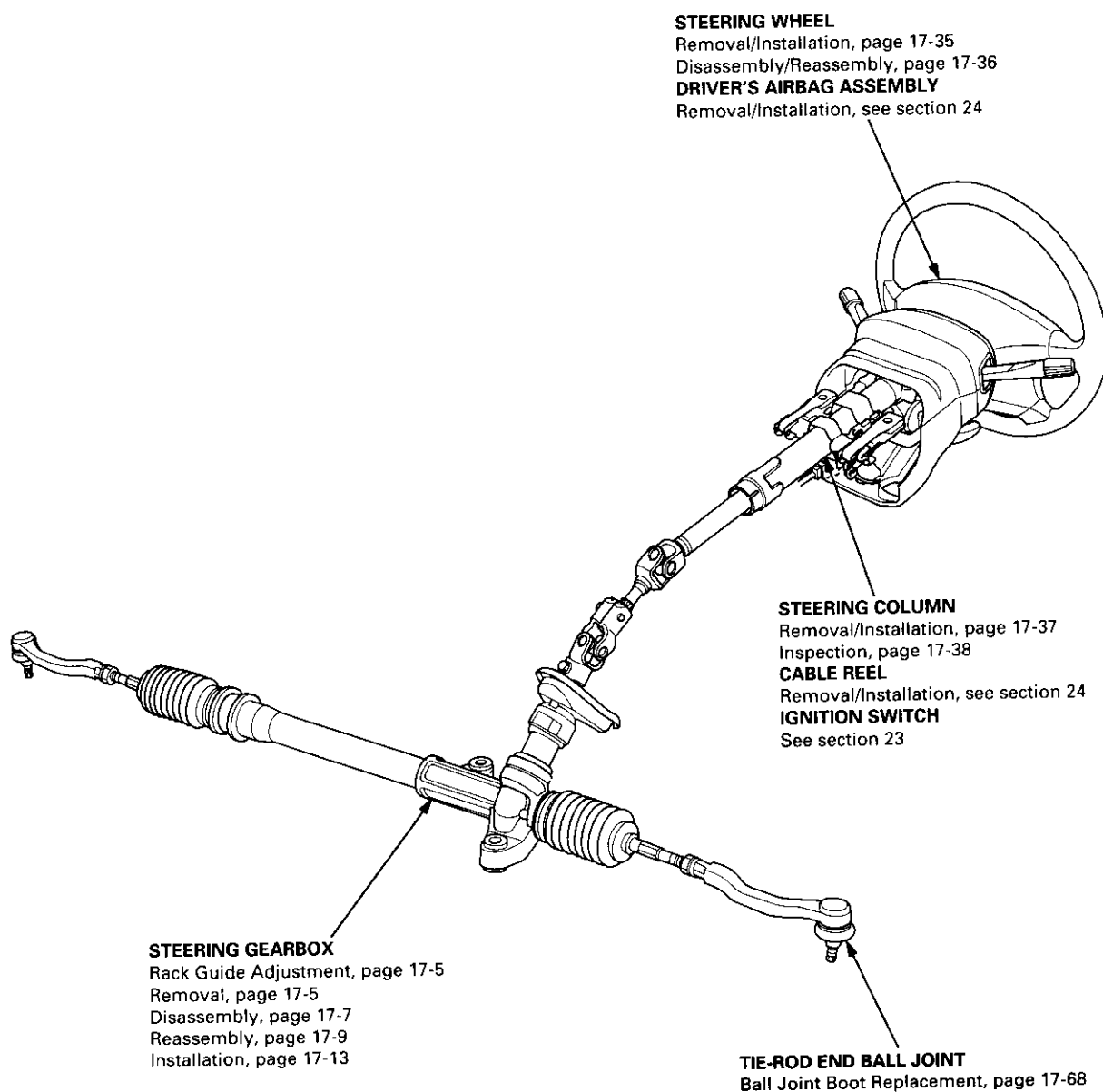
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### Manual Steering

#### NOTE:

- If an intact airbag assembly has been removed from a scrapped vehicle or has been found defective or damaged during transit, storage or service, it should be deployed (see section 24).
- Before removing the gearbox, remove the driver's airbag assembly and steering wheel.
- After installing the gearbox, check the wheel alignment and adjust if necessary.

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



# Inspection and Adjustment

## Steering Operation

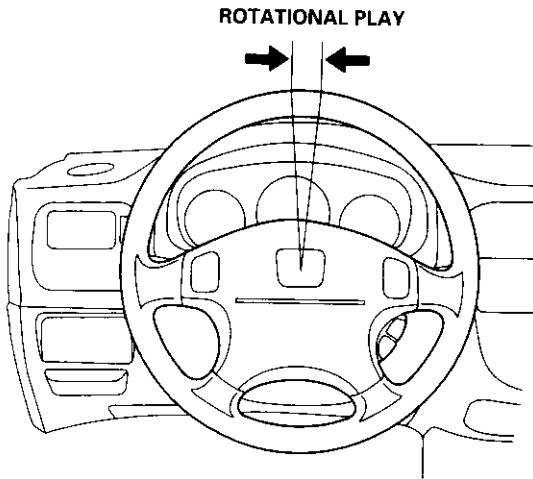
### Steering Wheel Rotational Play

Place the front wheels in a 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 service limit, perform rack guide adjustment (see page 17-5).

If the play is still excessive after rack guide adjustment, inspect the steering linkage and gearbox as described below.



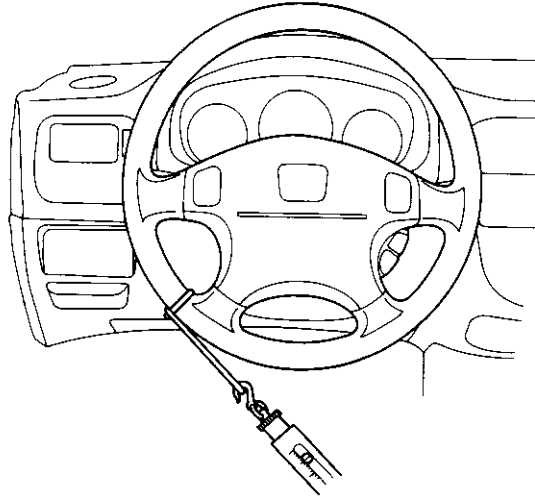
### Steering Effort Check

Raise the front wheels off the ground.

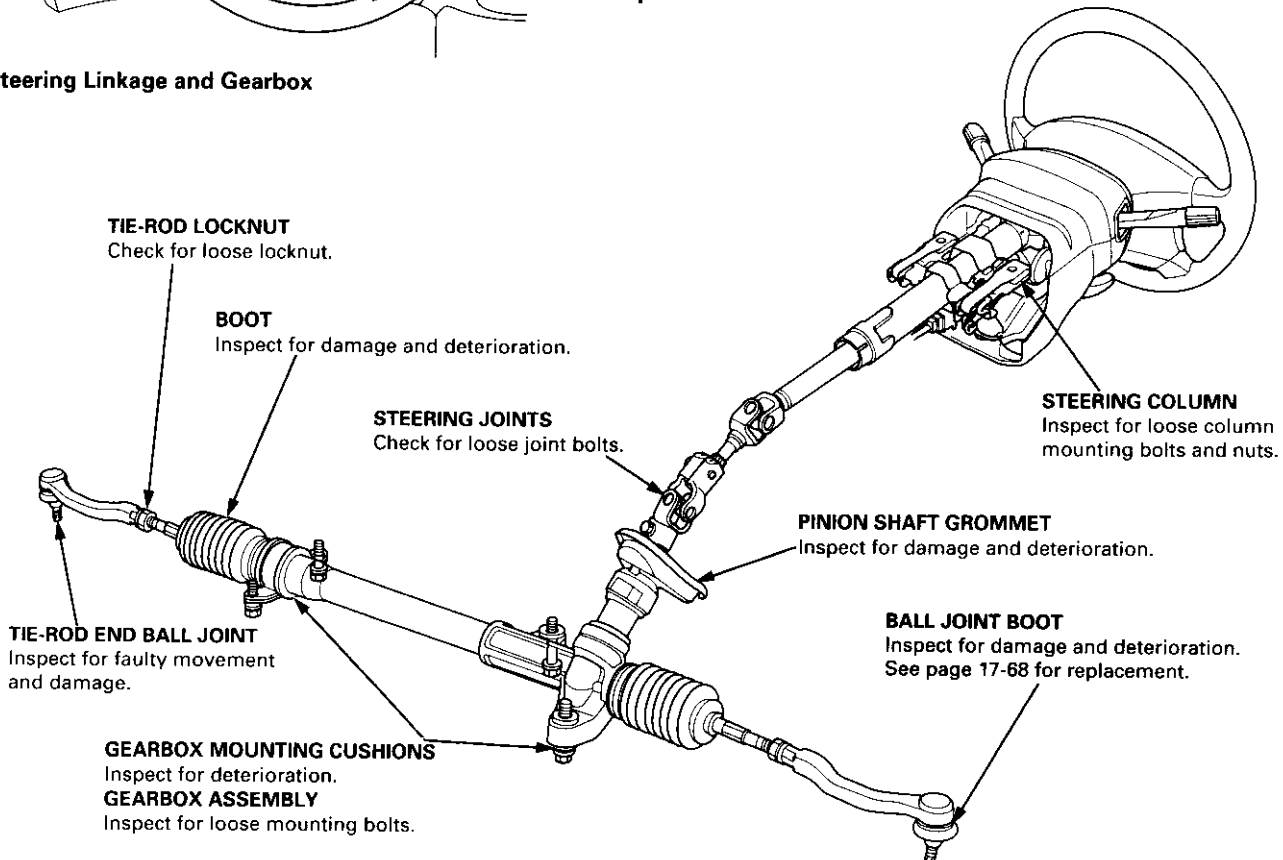
Turn the steering wheel with a spring scale and check its reading.

**Standard: 15 N (1.5 kgf, 3.3 lbf) maximum**

If it reads more, perform rack guide adjustment (see page 17-5).



## Steering Linkage and Gearbox



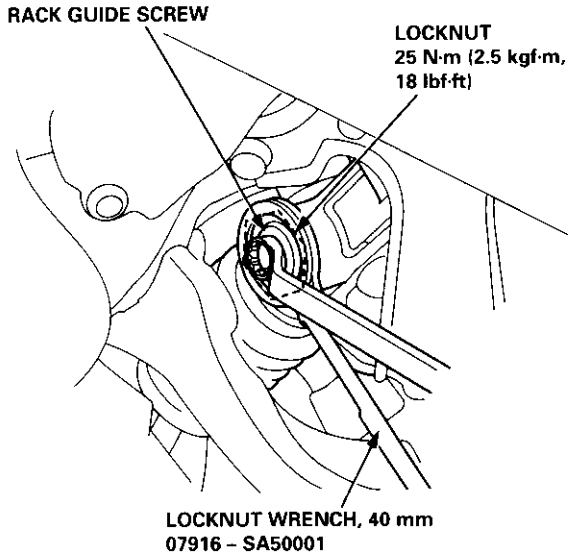




## Rack Guide Adjustment

NOTE: Perform the rack guide adjustment with the wheels in the straight ahead position.

1. Loosen the rack guide screw locknut with the special tool, then loosen the rack guide screw.



2. Tighten the rack guide screw until it compresses the spring and seats against the rack guide, then loosen it.
3. Retighten the rack guide screw to 4 N-m (0.4 kgf-m, 2.9 lbf-ft), then back it off to specified angle.

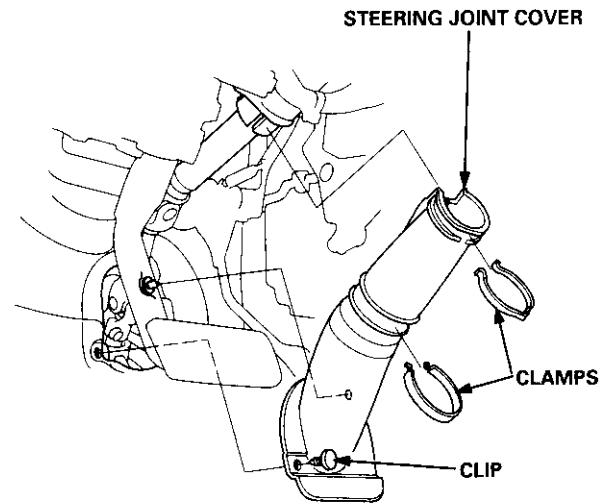
**Specified Return Angle: 30° max.**

4. Tighten the locknut while holding the rack guide screw.
5. Check for tight or loose steering through the complete turning travel.
6. Recheck steering effort (see page 17-4).

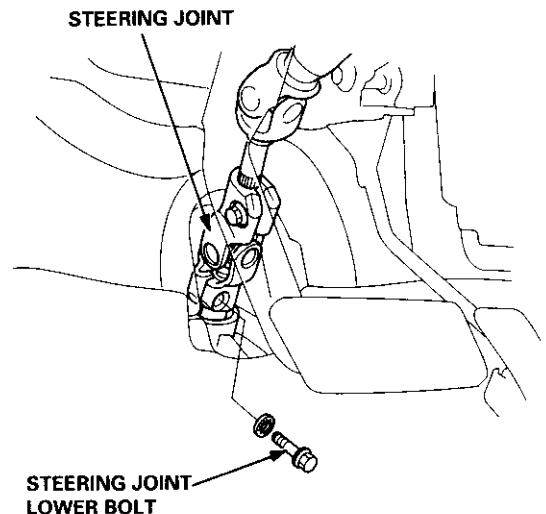
## Removal

NOTE: Using solvent and a brush, to wash any oil and dirt off the gearbox. Blow dry with compressed air.

1. Raise the front of vehicle, and support it on safety stands in the proper locations (see section 1).
2. Remove the front wheels.
3. Remove the steering wheel (see page 17-35).
4. Remove the steering joint cover.



5. Remove the steering joint lower bolt, and disconnect the steering joint by moving the joint toward the column.

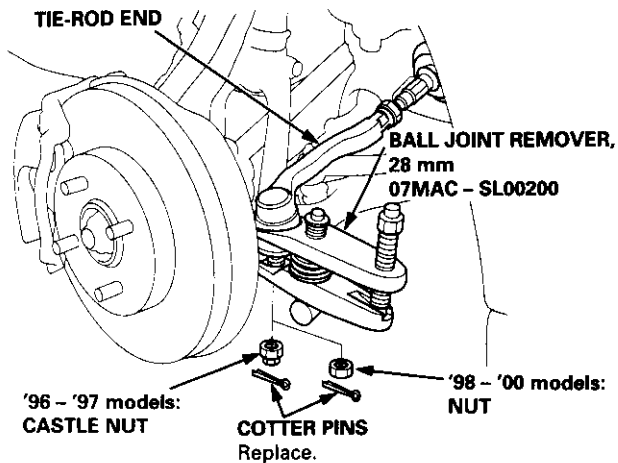


(cont'd)

# Steering Gearbox

## Removal (cont'd)

6. Remove the cotter pin from the castle nut ('96 - '97 models) or nut ('98 - '00 models) and remove the nut.



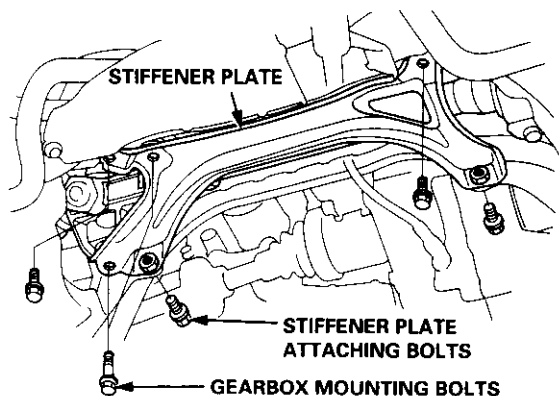
7. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the ball joint remover.

NOTE: Remove the ball joint using the special tool. Refer to section 18 for how to use the ball joint remover.

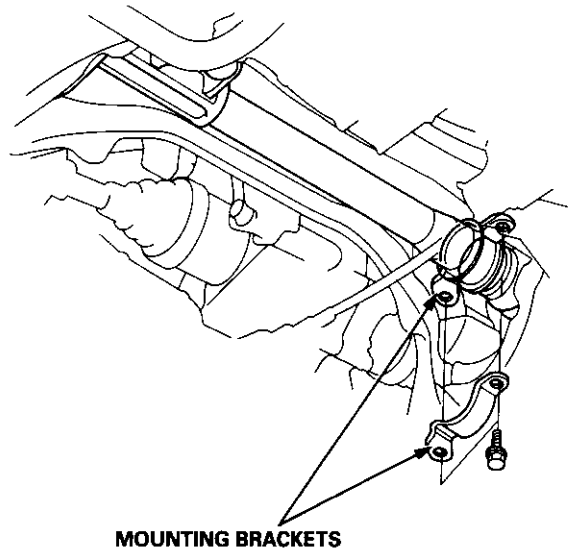
8. Separate the tie-rod ball joint and knuckle using the special tool.

**CAUTION: Avoid damaging the ball joint boot.**

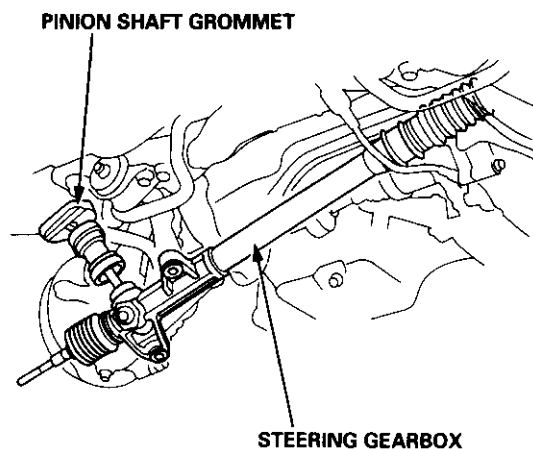
9. Remove the left tie-rod end, then slide the rack all the way to the right.
10. Separate the exhaust pipe A or TWC (see section 9).
11. Disconnect the shift linkage (see section 13 or section 14).
12. Remove the stiffener plate.



13. Remove the mounting bracket.



14. Pull the steering gearbox all the way down to clear the pinion shaft from the bulkhead, then remove the pinion shaft grommet.
15. Move the steering gearbox to right so the left rack end clears the rear beam, then tilt the left side down to remove it from the car.



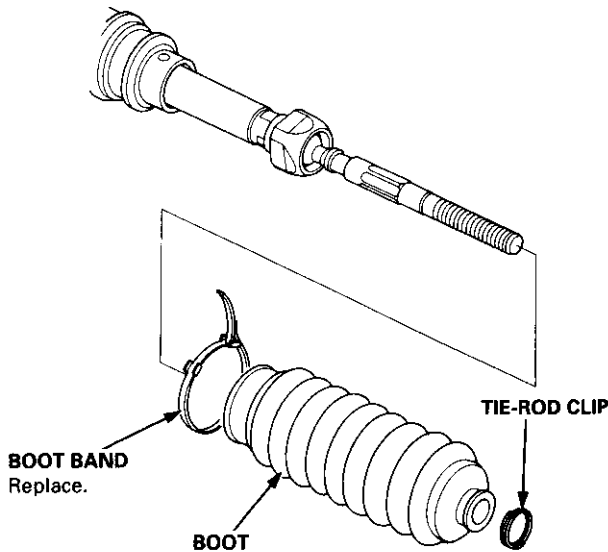


## Disassembly

1. Place the gearbox in a vise with a soft jaws, then clamp the gearbox at the mount bracket or gear housing.

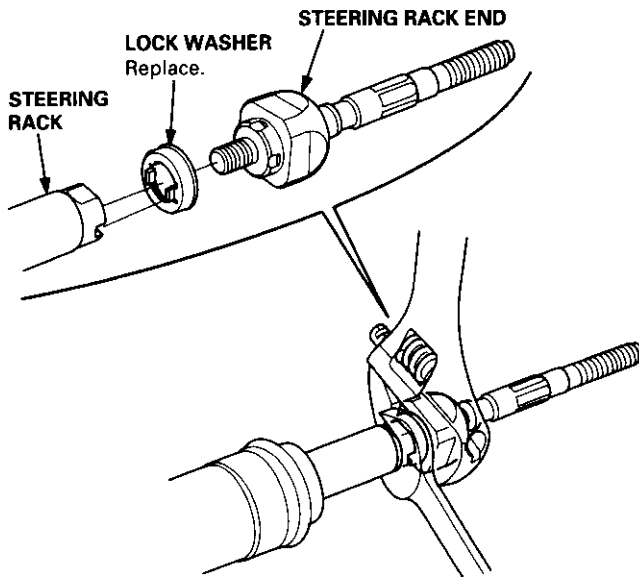
**CAUTION:** Be careful not to distort the gear housing by clamping it too tight in the vise incorrectly.

2. Remove the tie-rod end and locknut.
3. Remove the boot bands and tie-rod clips. Pull the boots away from the ends of the gearbox.

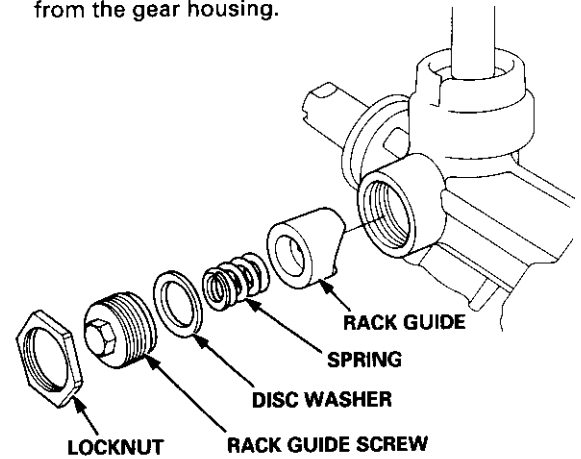


4. Hold the steering rack with one wrench, and unscrew the rack end with another wrench.

**CAUTION:** Be careful not to damage the rack surface with the wrench.



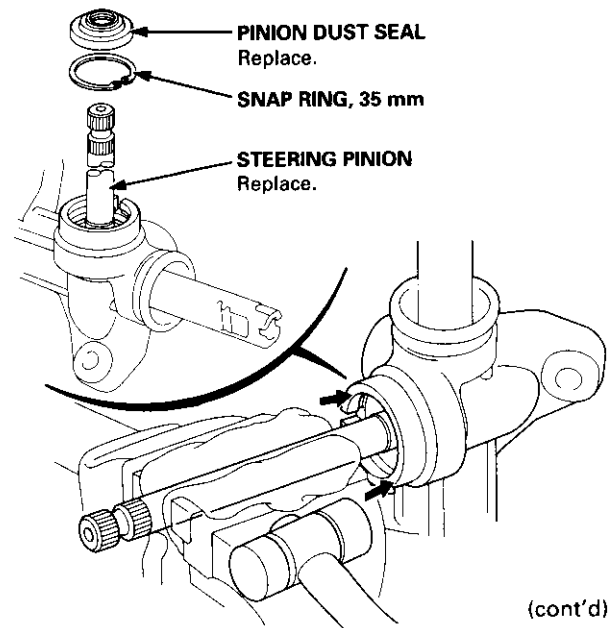
5. Push the right end of the rack back into the cylinder housing so the smooth surface that rides against the seal won't be damaged.
6. Loosen the locknut, and remove the rack guide screw.
7. Remove the disc washer, spring and rack guide from the gear housing.



8. Remove the pinion dust seal and the 35 mm snap ring.
9. Hold the pinion shaft with a vise securely. Remove the pinion by tapping evenly around the flanged section of the gearbox with a plastic hammer.

**CAUTION:** Do not tap on the steering rack.

**NOTE:** Do not reuse the removed pinion.



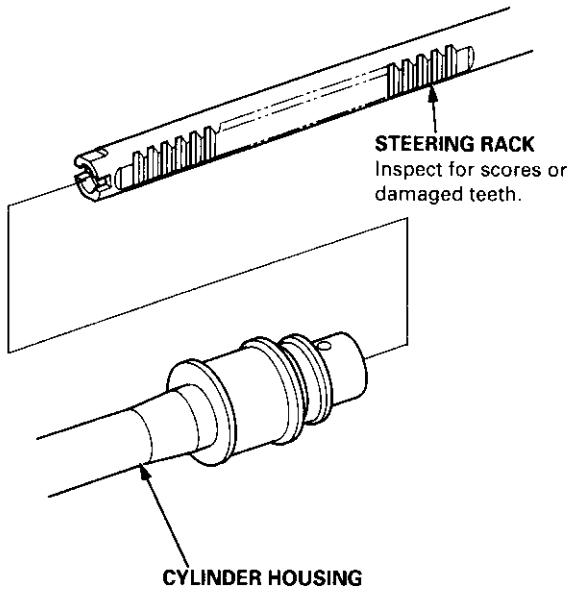
(cont'd)

# Steering Gearbox

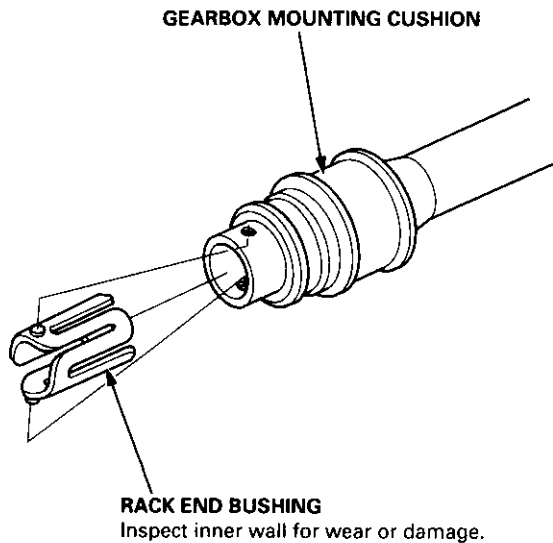
## Disassembly (cont'd)

10. Slide the steering rack out of the cylinder housing.

**CAUTION:** Be careful not to damage the bushing in the cylinder housing.



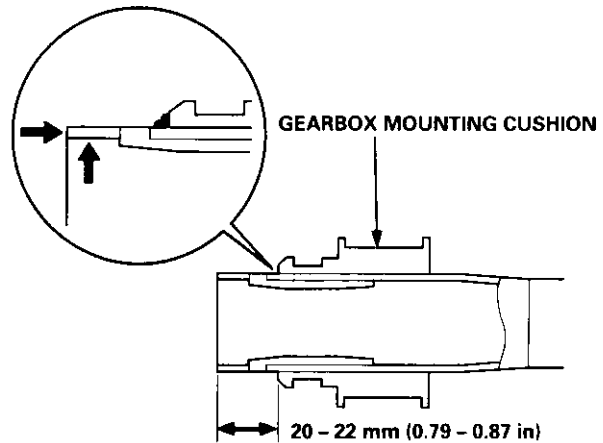
11. Remove the rack end bushing.



12. Replace the gearbox mounting cushion if necessary:

- To remove the cushion, use a sharp knife and make a cut down the length of the cushion. Be careful not to damage the paint on the outside of the cylinder housing. Remove the old cushion.
- Apply weatherstrip adhesive to the inside of the new cushion. Install the cushion onto the cylinder housing and position it 20 – 22 mm (0.79 – 0.87 in) from the end of the cylinder housing as shown.

**NOTE:** After installing the cushion, wipe off any excess adhesive that may have dripped into the inside of the cylinder housing.

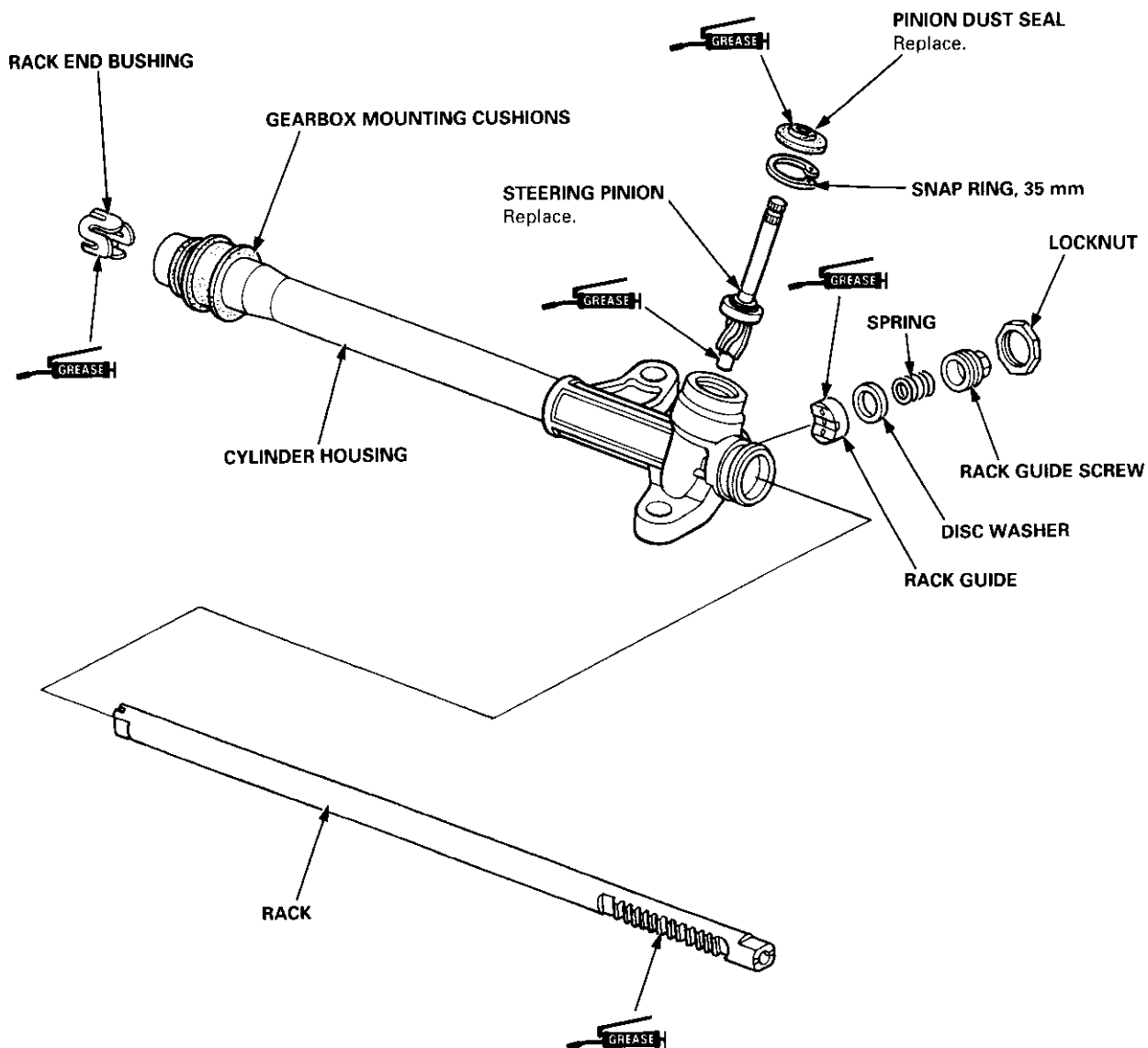




## Reassembly

NOTE:

- Clean the disassembled parts with solvent, and dry them with compressed air. Do not dip the rubber parts in solvent.
- Always replace the non-reuseable parts with new ones before assembly.
- Do not allow dust, dirt, or other foreign materials to enter the steering gearbox.



(cont'd)

# Steering Gearbox

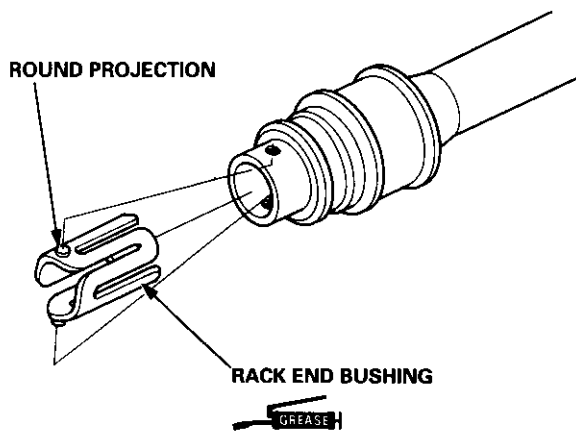
## Reassembly (cont'd)

1. Apply a thin coat of grease to the inside surface of the rack end bushing.

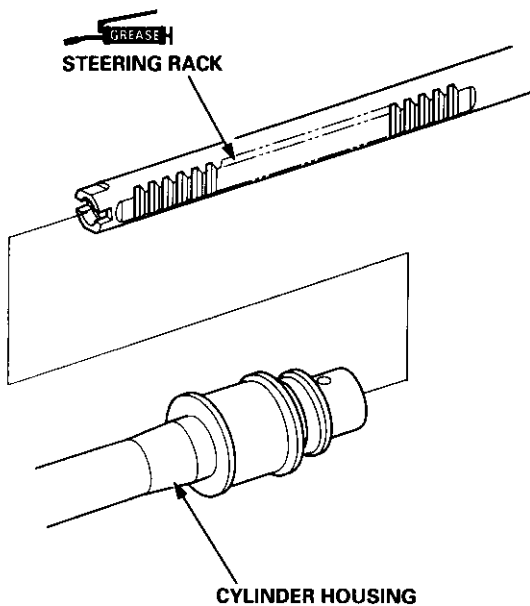
Grease quantity: 1 – 3 g (0.04 – 0.1 oz)

**CAUTION:** Do not fill the slots with grease; they must remain open to serve as air passages.

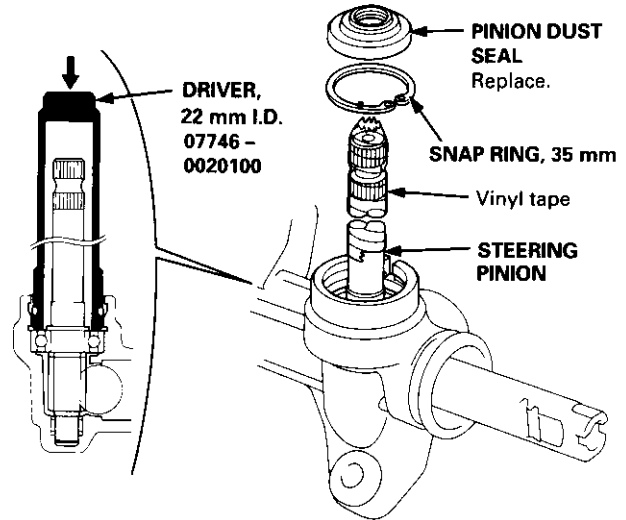
2. Install the rack end bushing by aligning the round projection on the bushing with the hole in the cylinder housing



3. Grease the steering rack teeth.
4. Install the steering rack into the cylinder housing carefully to avoid damaging the rack end bushing.

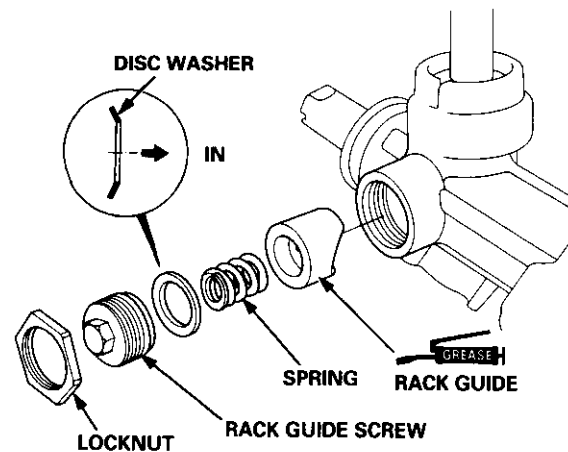


5. Drive in the steering pinion in the gear housing with the special tools.



6. Install the 35 mm snap ring securely in the gear housing groove.
7. Apply vinyl tape to the pinion shaft, then coat the vinyl tape with grease.
8. Install the pinion dust seal on the gear housing until it seats properly, then remove the tape.
9. Grease the sliding surface of the rack guide, and install it on to the gear housing.
10. Install the spring, disc washer and rack guide screw on the gear housing.

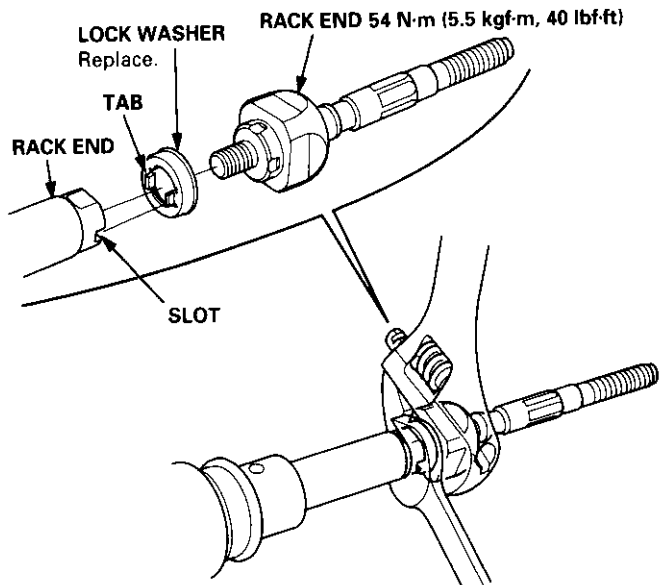
**NOTE:** Install the disc washer with its convex side facing in.



11. Adjust the rack guide screw (see page 17-5).

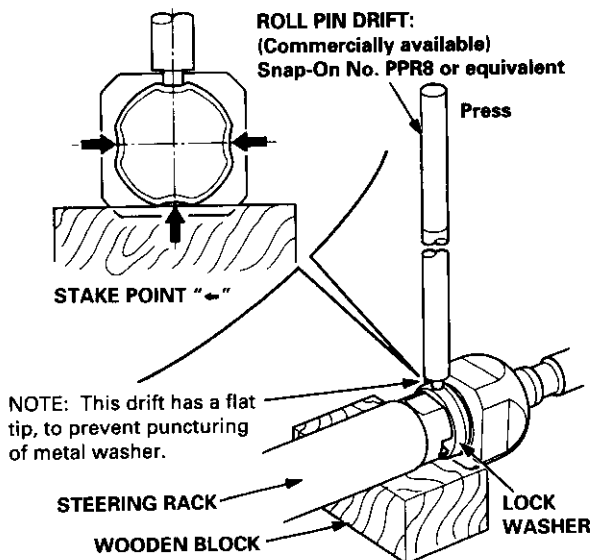


12. Install the new lock washer in the groove in the steering rack.
13. Install the steering rack end into the rack.

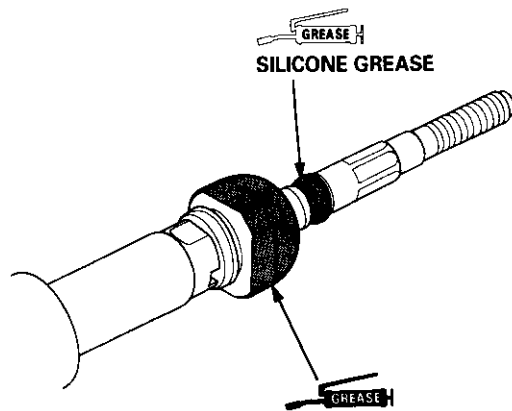


14. Hold the steering rack with a wrench and tighten the rack end with another.
15. After tightening the rack ends, stake the four sections of the lock washer with a roll pin drift and a mallet.

- Place the wood block on the press table, then set the lock washer section of the rack end on the wood block securely.
- Be sure the tool is aligned with the flat sections of the steering rack end before pressing.
- Stake the lock washer in the center of the flat section of the steering rack end.

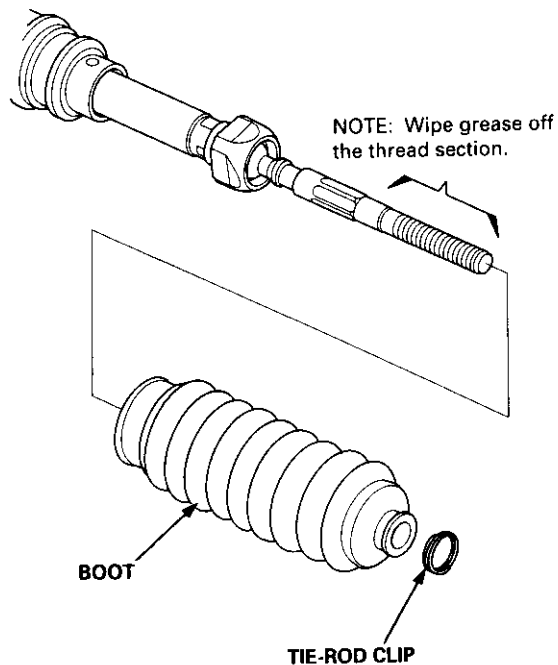


16. Apply grease around the outside of the rack end housing.



17. Apply a light coat of silicone grease to the boot grooves on the rack ends.
18. Install the boots in the rack end with the tie-rod clips.

**NOTE:** Install the boot band with the rack in the straight ahead position (right and left tie-rods are equal in length).



(cont'd)

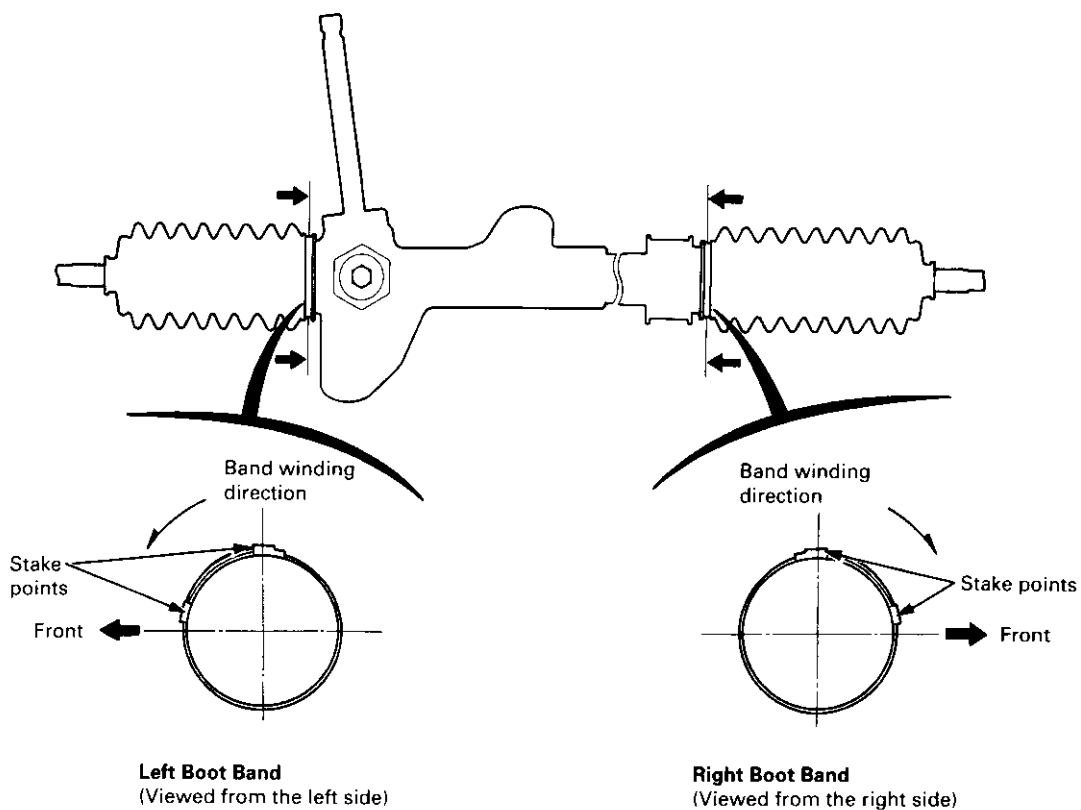
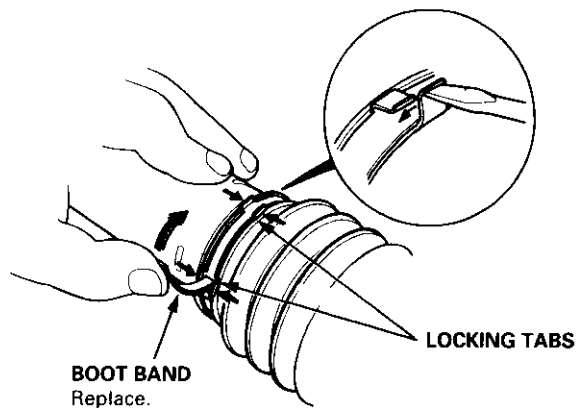
# Steering Gearbox

## Reassembly (cont'd)

19. Install the boot band so that the locking tabs of the band (stake points) are in the range shown below. (Tabs should face up and slightly forward.)
20. Bend both sets of locking tabs.
21. Lightly tap on the doubled-over portions to reduce their height.

**CAUTION: Stake the band locking tabs firmly.**

22. Slide the rack right and left to be certain that the boots are not deformed or twisted.



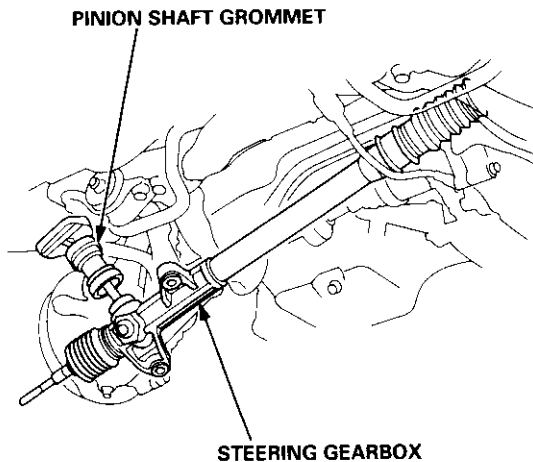




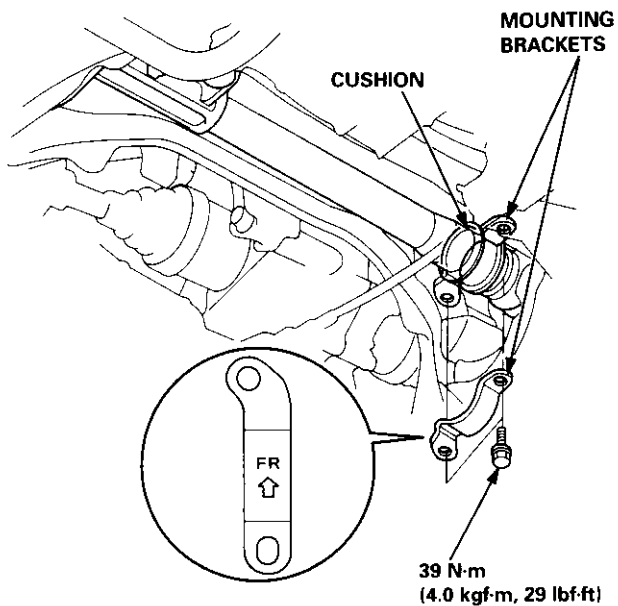
## Installation

1. Slide the rack all the way to the right.
2. Install the pinion shaft grommet, and insert the pinion shaft up through the bulkhead.

NOTE: Align the notch in the pinion shaft grommet with the tab on the gear housing.

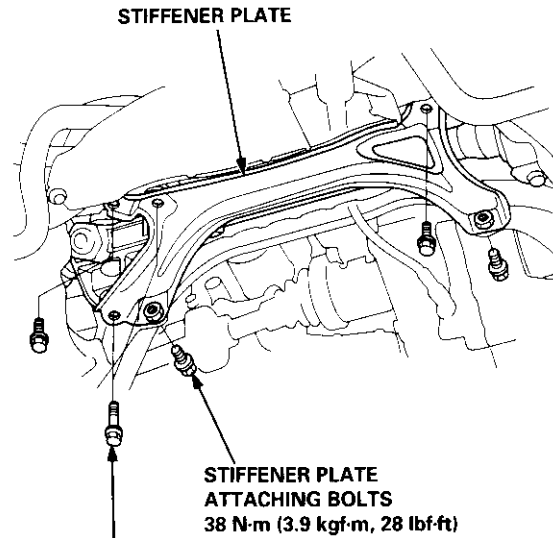


3. Install the mounting brackets with the two gearbox mounting bolts on the cushion.



NOTE: The arrow on the bracket point toward the front.

4. Install the stiffener plate with the two gearbox mounting bolts and stiffener plate attaching bolts. NOTE: Install the bolts loosely first, then tighten them securely.

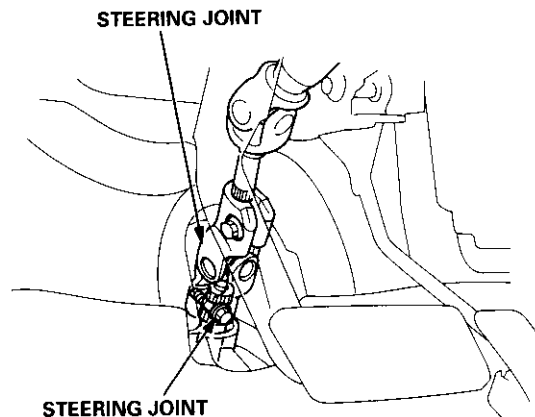


GEARBOX MOUNTING BOLTS  
43 N-m (4.4 kgf-m, 32 lbf-ft)

5. Center the steering rack within its stroke.
6. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft), and tighten the lower bolt.

NOTE:

- Connect the steering shaft and pinion with the steering wheel and steering rack centered.
- Be sure that the lower steering joint bolt is securely in the groove in the steering gearbox pinion.
- If the steering wheel and rack are not centered, reposition the serrations at lower end of the steering joint.



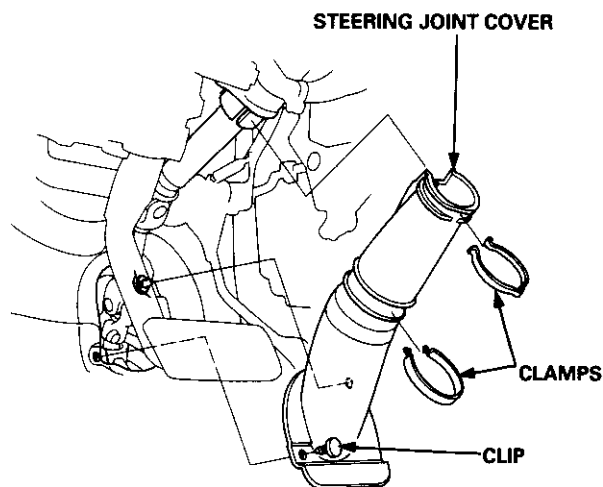
STEERING JOINT  
LOWER BOLT  
22 N-m  
(2.2 kgf-m, 16 lbf-ft)

(cont'd)

# Steering Gearbox

## Installation (cont'd)

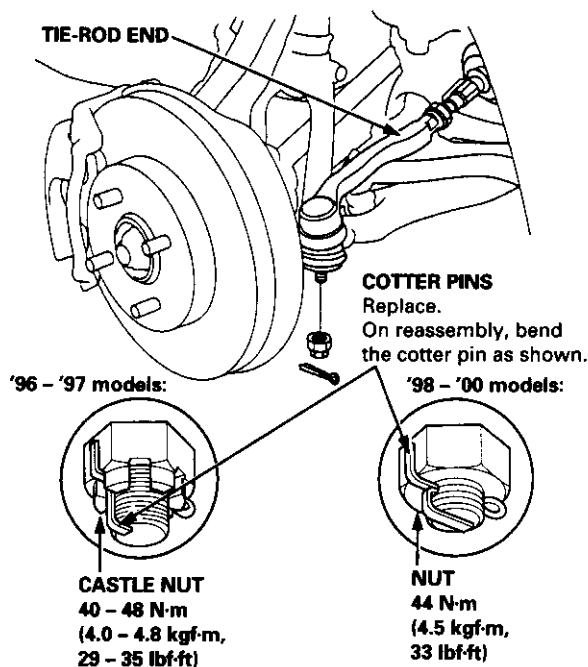
- Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (approximately two turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see page 17-35).
- Install the steering joint cover with the clamps and clips.



- Reconnect the tie-rod ends to the steering knuckles, then tighten the castle nut ('96 - '97 models) or nut ('98 - '00 models) to the specified torque, and install new cotter pins.

**NOTE:** Before connecting the tie-rod ends, wipe off any grease contamination from the ball joint tapered section and threads.

**CAUTION:** Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening ('96 - '97 models only).



- Install the exhaust pipe A or TWC (see section 9).
- Connect the shift linkage (see section 13 or section 14).
- Install the front wheels.
- After installation, perform the following checks.
  - Adjust the front toe (see section 18).
  - Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods, if necessary.

**NOTE:** Turn the right and left tie-rods equally.



# Component Locations

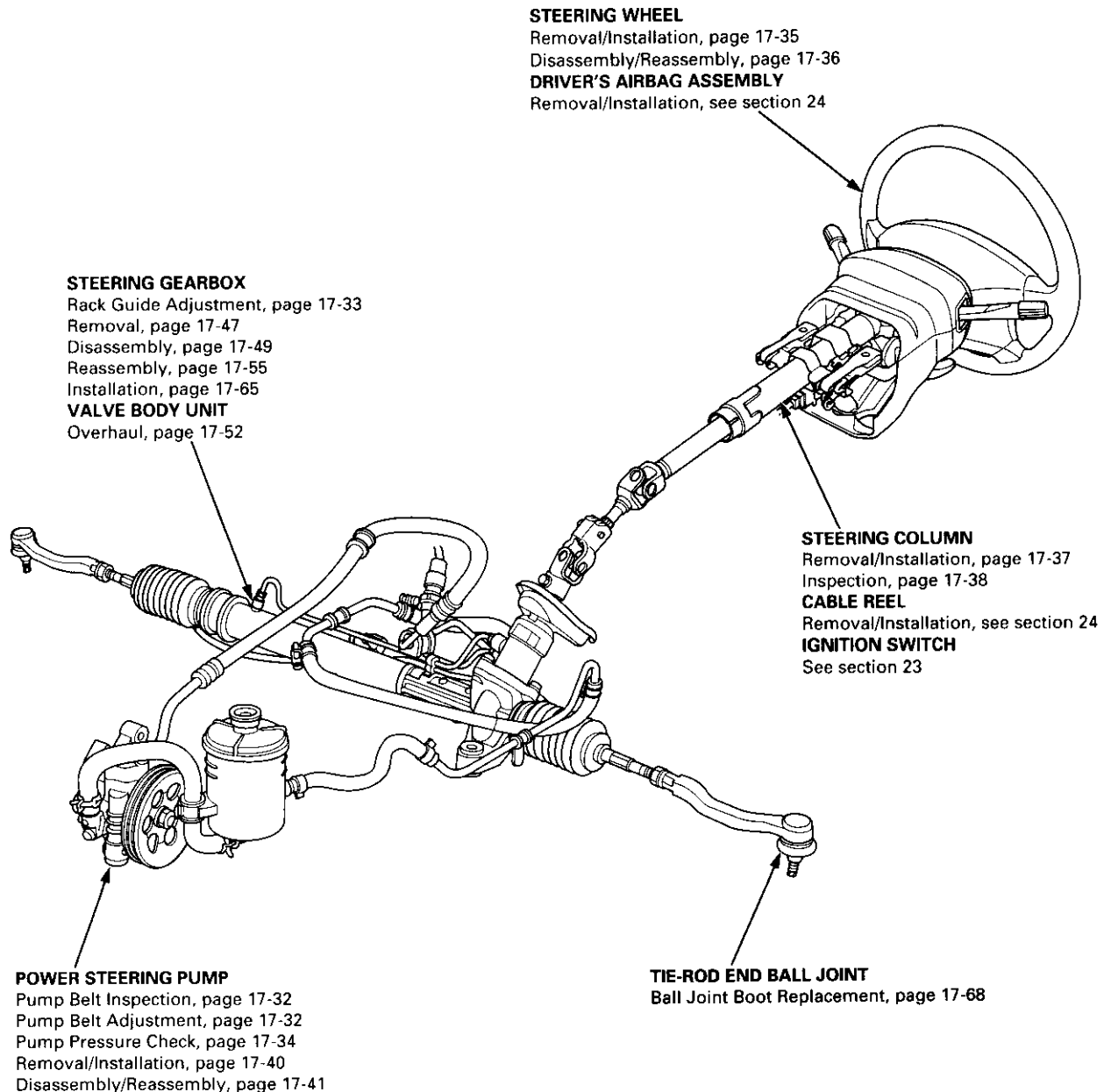
## Index

### Power Steering:

#### NOTE:

- If an intact airbag assembly has been removed from a scrapped vehicle or has been found defective or damaged during transit, storage or service, it should be deployed (see section 24).
- Before removing the gearbox, remove the driver's airbag assembly and steering wheel.
- After installing the gearbox, check the wheel alignment and adjust if necessary.

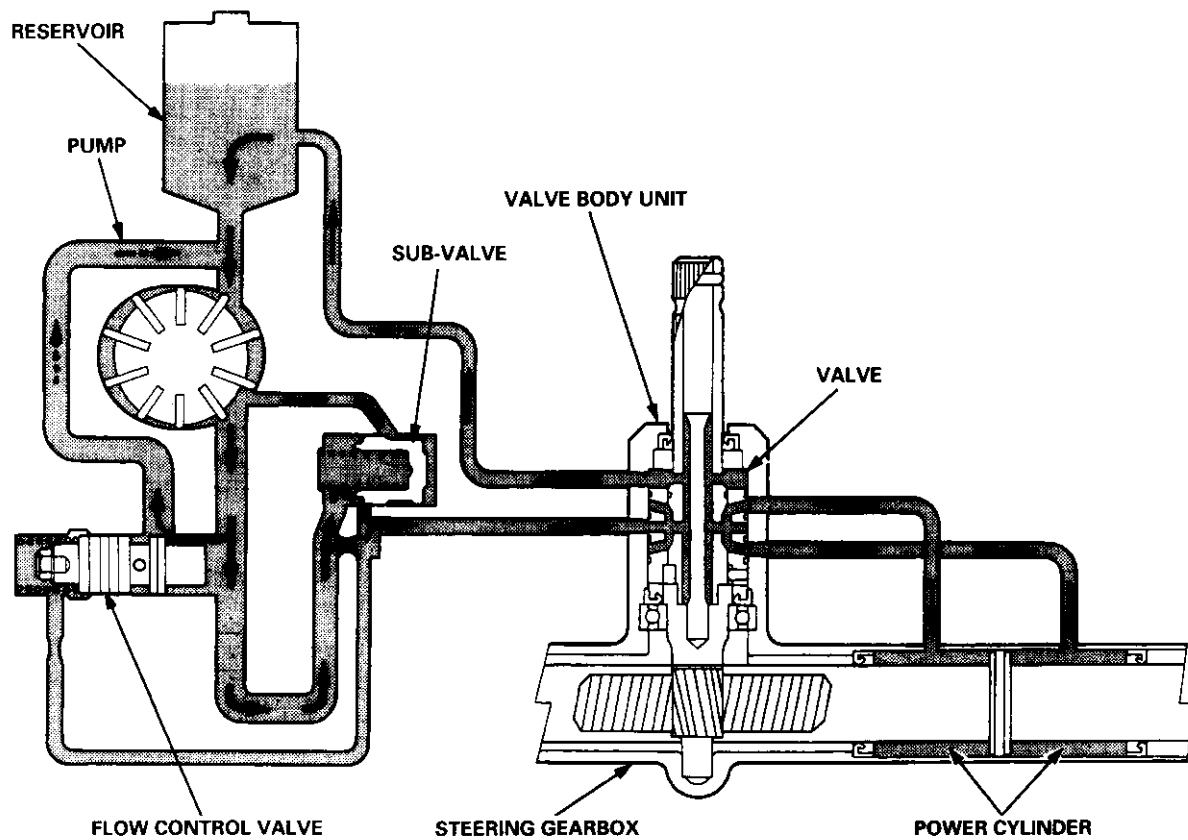
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.



# System Description

## Fluid Flow Diagram

The system is a compact rotary-valve-type power steering, connected to the steering gearbox. The fluid pressure is provided by a vane-type pump which is driven by the engine crank pulley. The amount of fluid and pressure is regulated by the flow control valve built into the pump. The fluid pressure from the pump is delivered to the valve body unit around the pinion of the steering gearbox. The valve inside the valve body unit controls the hydraulic pressure and changes the direction of the flow. The fluid then flows to the power cylinder, where rack thrust is generated. Fluid returning from the power cylinder flows back to the reservoir, where the fluid is "filtered" and supplied to the pump again.

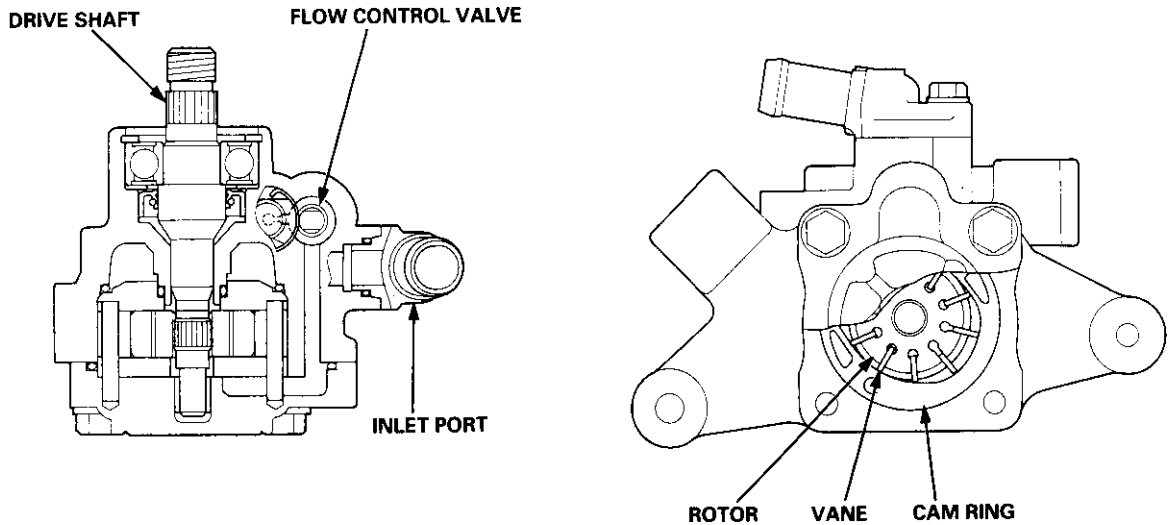




# Steering Pump

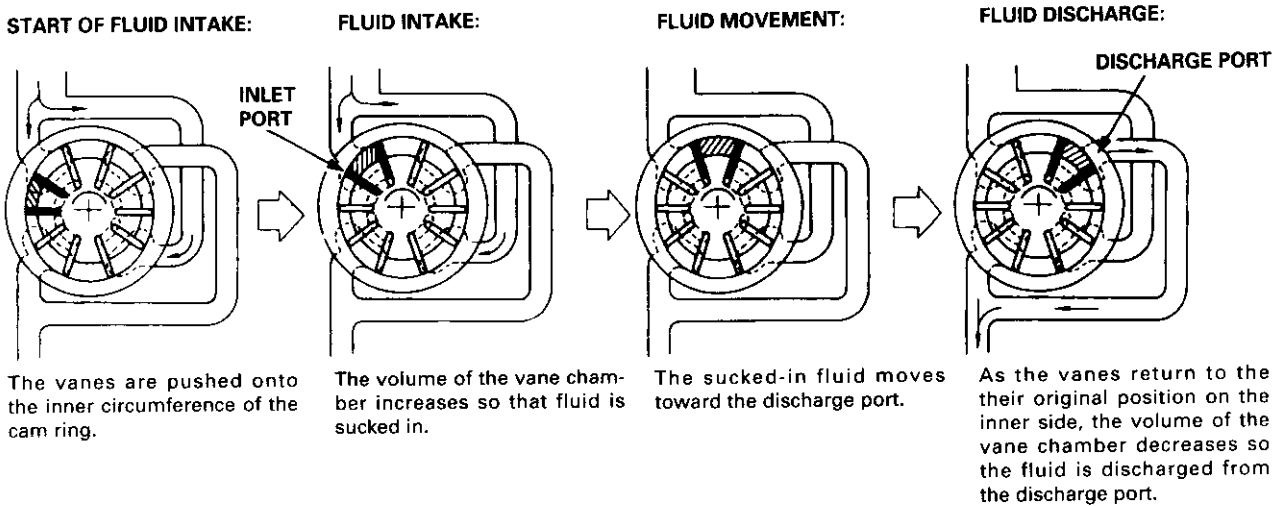
## Construction

The pump is a vane-type incorporating a flow control valve (with an integrated relief valve) and is driven by a POLY-V-belt from the crank pulley. The pump features 10 vanes. Each vane performs two intake/discharge operations for every rotation of the rotor. This means that the hydraulic fluid pressure pulse becomes extremely small during discharge.



## Operation

The belt-driven pulley rotates the rotor through the drive shaft. As the rotor rotates, the hydraulic pressure is applied to the vane chamber of the rotor and the vanes will rotate while being pushed onto the inner circumference of the cam ring. The inner circumference of the cam ring has an extended portion with respect to the center of the shaft, so the vanes move downward in the axial direction as the rotor rotates. As a result of this roller movement, the internal volume of the vane chamber will change, resulting in fluid intake and discharge.

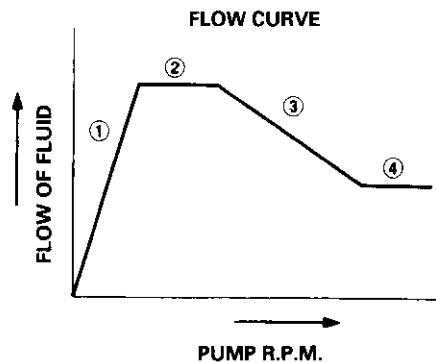


(cont'd)

# System Description

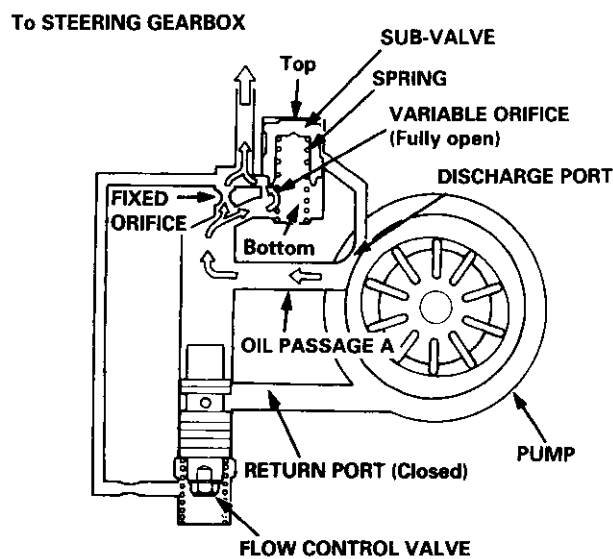
## Steering Pump (cont'd)

The flow control valve and sub-valve in the pump performs the following steps ① through ④ to control the flow of fluid, that is to increase the discharge volume when engine speed is low, and to decrease it when the engine speed increases. The assistance thrust of the steering gearbox changes in compliance with the change in the discharge volume.



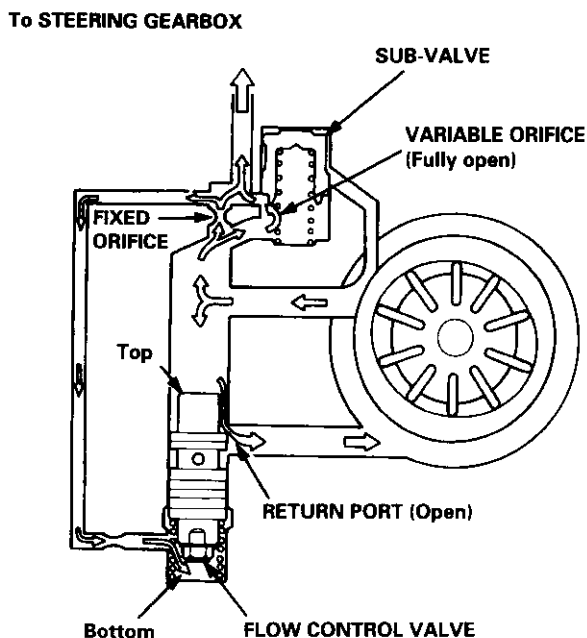
- ① When the engine starts, fluid discharged from the discharge port starts to flow through oil passage A, the fixed orifice and the variable orifice to the steering gearbox. When the engine speed is extremely low, the return port is closed by the flow control valve.

Fluid pressure discharged from the discharge port is applied to the top of the sub-valve, and the fluid pressure that passed through oil passage A is applied to the bottom of the sub-valve. When this happens, the pressure difference between the ends of oil passage A, which is caused by the resistance oil passage A when the fluid flows through the passage, is applied to the sub-valve. However, the pressure difference applied to the sub-valve, that is the force that pushes the sub-valve down, is too small to overcome the spring force, and the variable orifice is fully open when the engine speed is extremely low.



- ② Because the fluid volume flowing through the fixed orifice and variable orifice increases, a pressure difference is created between the ends of these orifices, and it increases in proportion to the engine speed. As the fluid pressure that passed the fixed orifice and variable orifice is directed to the bottom of the flow control valve, a pressure difference is created between the top and bottom of the valve, which pushes down the flow control valve and opens the return port. As a result, part of the fluid discharged from the discharge port returns to the pump suction port, keeping the discharge volume constant.

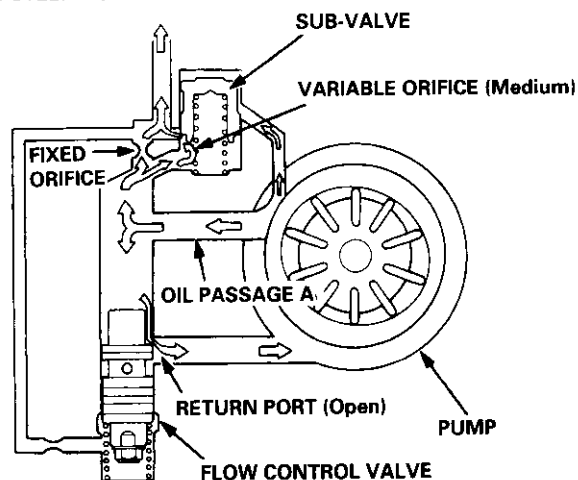
In this condition, the sub-valve does not move, and the variable orifice stays fully open.





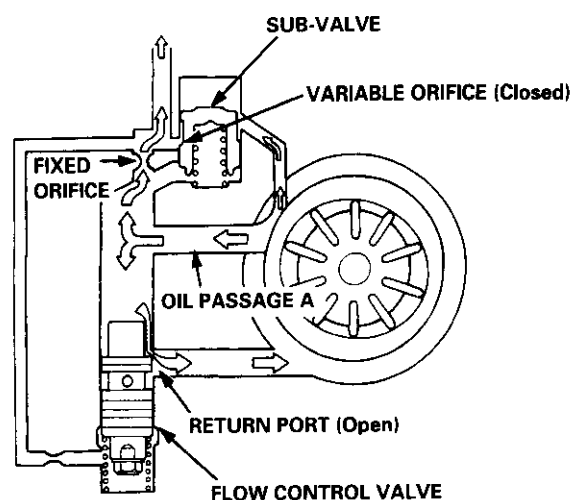
- ③ The fluid volume that flows through oil passage A and the pressure difference applied to the sub-valve increase in proportion to the engine speed. The sub-valve lowers overcoming the spring force, and it starts to close the variable orifice to regulate the discharge volume. When this happens, the fluid volume flowing to the steering gearbox decreases as the engine speed increases. At the same time, the flow control valve continues to control the fluid volume to the return port.

To STEERING GEARBOX



- ④ As the engine speed increases further, the pressure difference at the sub-valve increases further as well. The sub-valve then closes the variable orifice completely, regulating the discharge volume further. When this happens, the fluid volume discharged from the pump to the steering gearbox is regulated and maintained at a given level until the engine speed reaches the high speed range. The flow control valve functions continues to control the fluid volume to the return port.

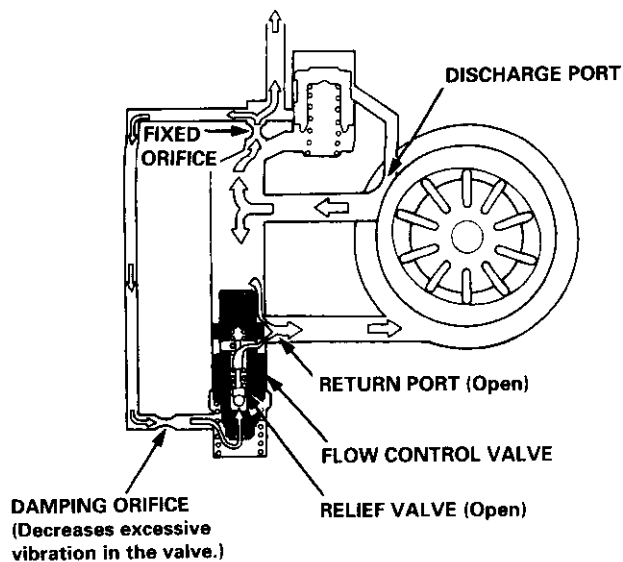
To STEERING GEARBOX



### Pressure Relief

Pressure at the discharge side of the fixed orifice is directed to the bottom of the flow control valve. When the pressure builds up, the relief valve in the flow control valve opens to release the pressure at the bottom of the valve. This allows the flow control valve to be pushed back by the pressure difference, and the fluid volume to the pump return port increases.

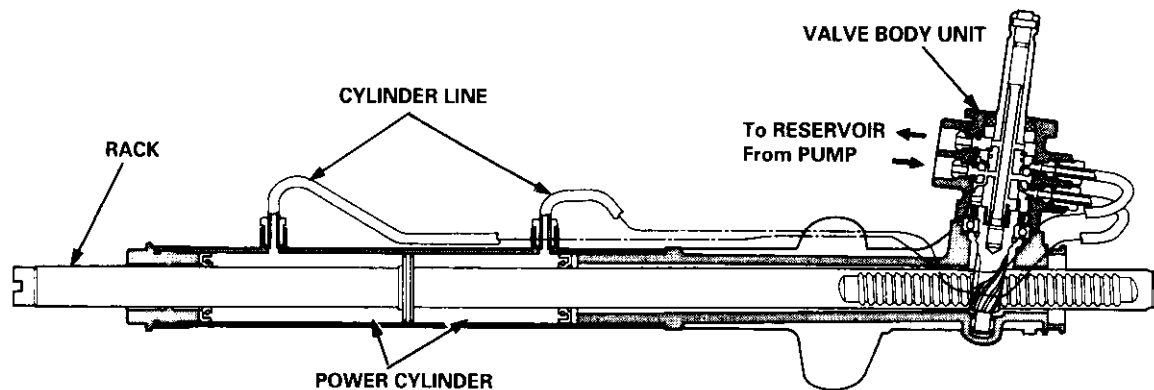
As explained above, the system keeps the pump discharge pressure (relief pressure) from exceeding the given level by controlling the volume of the fluid to the pump return port.



# System Description

## Steering Gearbox

The rack-and-pinion type steering gearbox has a valve body unit incorporated with the pinion to control the steering fluid pressure. Steering fluid from the pump is regulated by a rotary valve in the valve body unit and is sent through the cylinder line to the power cylinder, where hydraulic pressure is applied. The steering fluid in the other side of the power cylinder returns through the cylinder line and valve body unit to the reservoir.

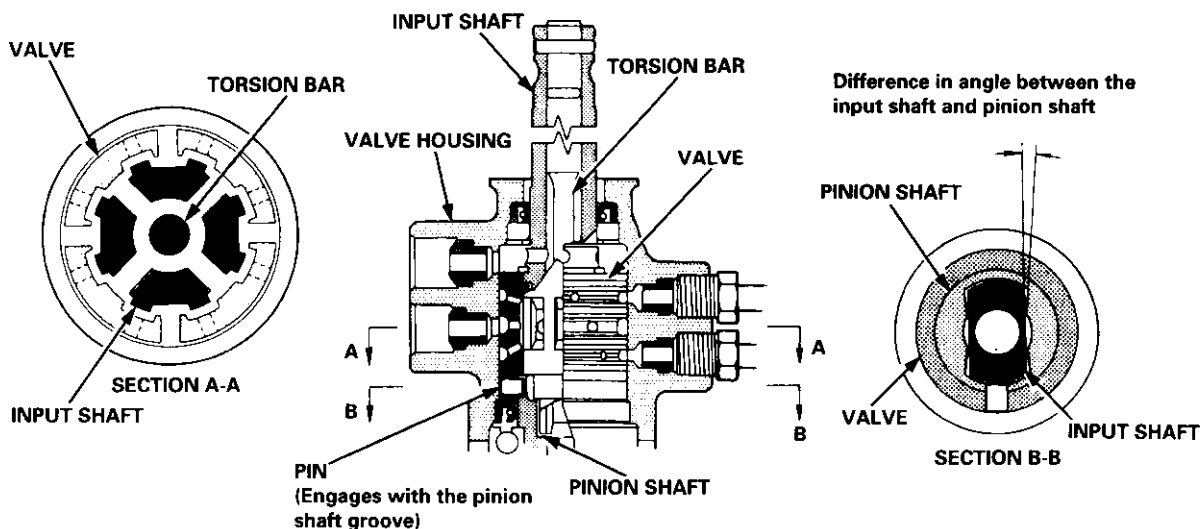


## Valve Body Unit

Inside the valve body unit is the valve, which is coaxial with the pinion shaft, and controls the steering fluid pressure. The valve housing is connected with the fluid line from the pump, the return line to the reservoir, and the two cylinder lines from the respective power cylinder. The pinion shaft is double-structured with the input shaft connected to the pinion gear, both of which are interconnected with the torsion bar.

The pin inserted in the valve and the pinion shaft groove engage; this allows the pinion shaft to rotate together with the valve. Because of this construction, the difference in angle in the circumferential direction between the input shaft and the valve becomes larger according to the torsional strength of the pinion or steering resistance. However, maximum torsion between the shafts is regulated by the engaged splines of the shafts at the pin engagement section to hold the torsion bar within the set value.

This allows the steering system to function as an ordinary rack-and-pinion type steering if the steering fluid is not pressurized because of a faulty pump.



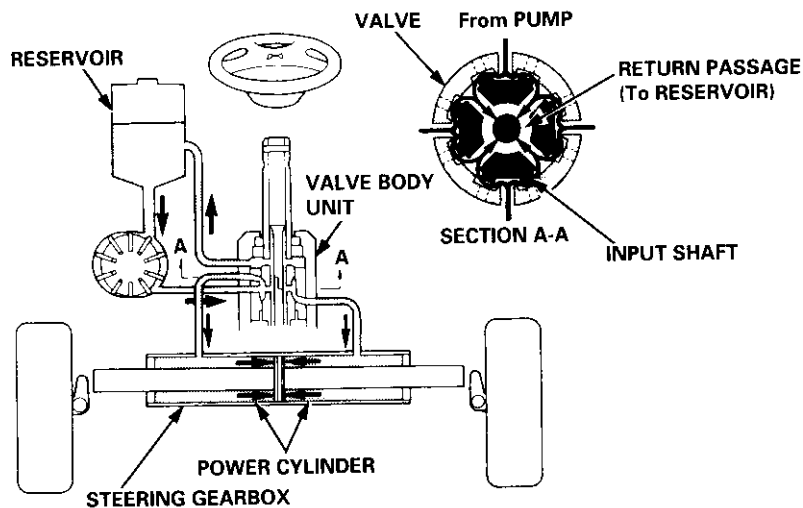




## Pressure Control

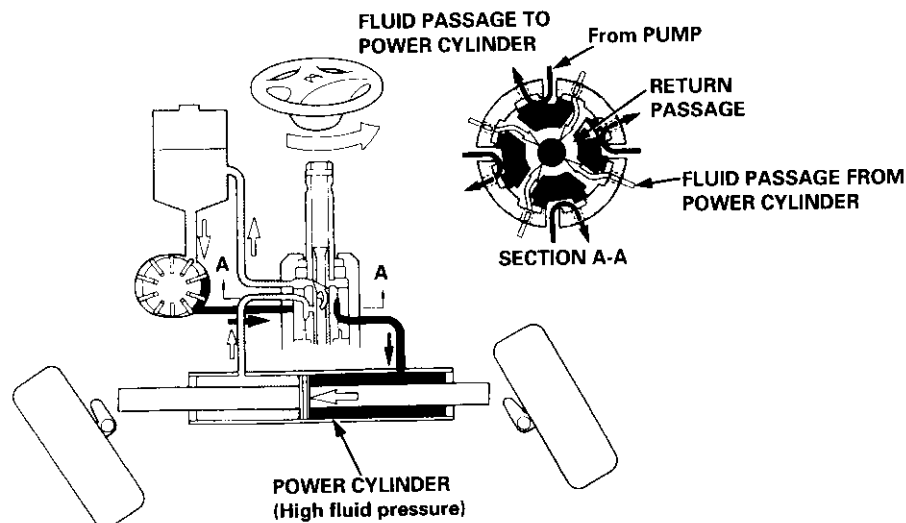
### Low assist at higher speeds:

When steering resistance is low, such as when driving at high speeds, or when driving straight ahead, the input shaft is near or in the neutral position, so there is little or no flow to any of the power cylinder orifices. Most of the feed pressure from the pump is bypassed to the reservoir. Because of this, the pressure stays the same in both sides of the power cylinder, resulting in low or no assist.



### High assist at lower speeds:

When steering resistance is high, such as when driving at low speeds, or when turning the wheel with the vehicle stopped, the difference in angle created between the input shaft and the valve opens the fluid passage on one side, and closes the fluid passage on the other side, at each pair of orifices. The fluid pressure increases in the side of the power cylinder fed by the larger fluid passage. This increased pressure pushes on the rack piston, allowing the steering wheel to be turned with light effort. On the other side of the power cylinder, the return passage opens allowing the steering fluid to return through the input shaft to the reservoir. The fluid passages to the power cylinder automatically change in size, increasing as the steering resistance increases. In other words, the passages become larger and power assist increases when the steering effort would normally be high, (for example, when parking or making low speed turns), and the passages become smaller and power assist decreases when the steering effort would normally be low, (for example, when driving at high speeds or straight ahead).



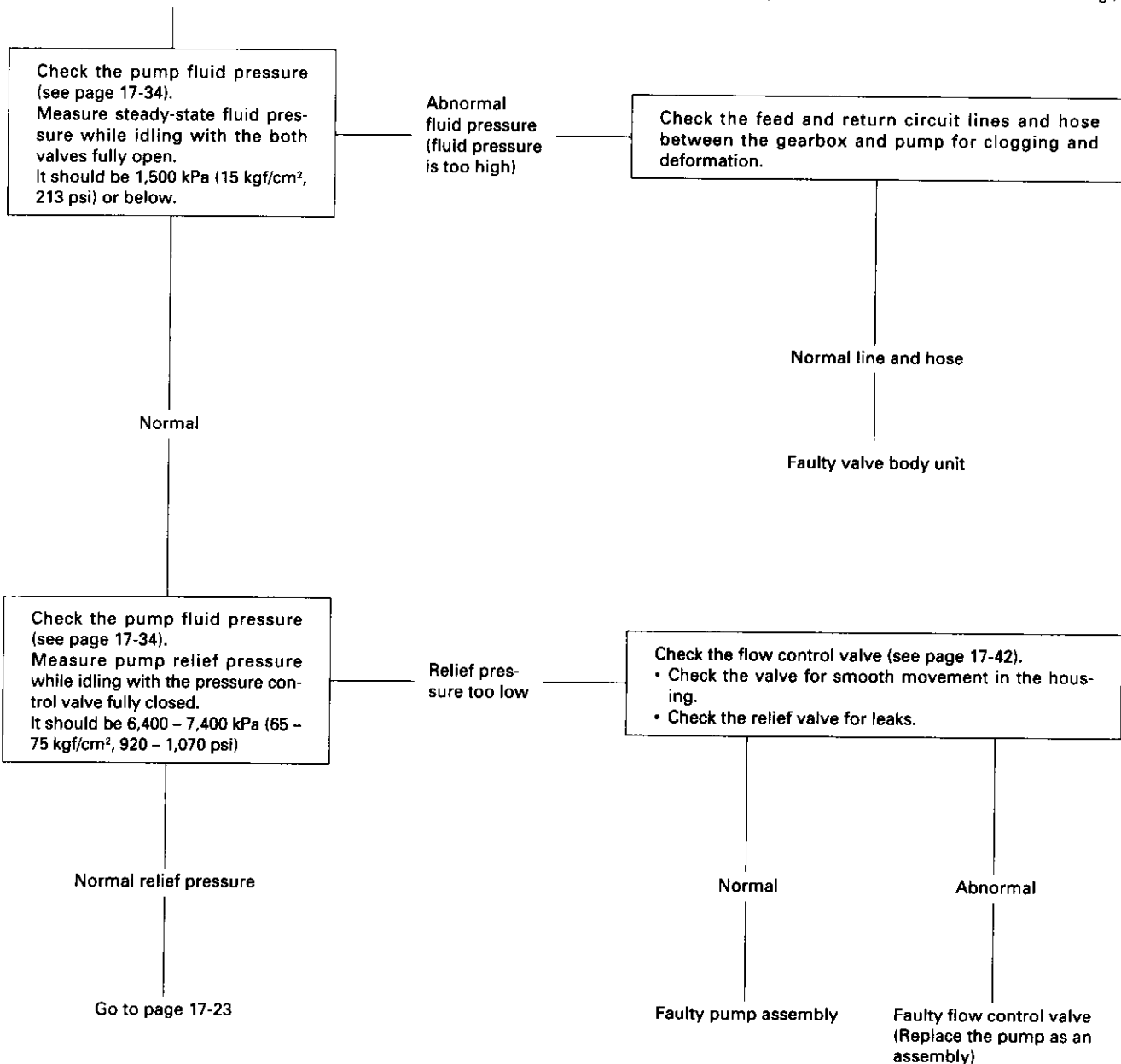
# Troubleshooting

## General Troubleshooting

Check the following before you begin:

- Has the suspension been modified in a way that would affect steering?
- Are tire sizes, tire variety and air pressure correct?
- Is the steering wheel original equipment or equivalent?
- Is the power steering pump belt properly adjusted?
- Is steering fluid reservoir filled to proper level?
- Is the engine idle speed correct and steady?

Hard Steering (Check the power assist, see page 17-30. If the force is over 29 N (3.0 kgf, 6.6 lbf), Proceed with this troubleshooting.)





Check the force required to turn the wheel (see page 17-30). Start the engine and measure the force required to turn the wheel to the right and left. Difference of the force required to turn the wheel to the right and to the left should be 2.9 N (0.3 kgf, 0.7 lbf) or below.

Normal  
Compare the steering to another alike vehicle.

Abnormal

Check cylinder lines A and B for deformation.

Deformed

Faulty cylinder lines

Not deformed

Check for bent rack shaft.

Not bent

Check rack guide adjustment (see page 17-33).

Adjustment OK

Faulty valve body unit

(cont'd)

# Troubleshooting

## General Troubleshooting (cont'd)

Assist (excessively light steering) at high speed.

Check the rack guide for proper adjustment (see page 17-33).

If the problem is not corrected by adjusting the rack guide, adjust the front wheel alignment (see section 18).

Shock or vibration when wheel is turned to full lock.

Check the rack guide for proper adjustment (see page 17-33).

Rack guide was backed off excessively.

Adjust the rack guide.

Rack guide is adjusted properly.

If the problem is not corrected by adjusting the rack guide, replace the gearbox.

Check the belt for slippage and adjust as necessary (see page 17-32).

Steering wheel will not return smoothly.

Check cylinder lines A and B for deformation.

A or B cylinder line is deformed; replace it.

A and B cylinder lines are normal, check wheel alignment (see section 18).

Wheel alignment is abnormal, adjust as needed.

Wheel alignment is normal. Check the steering wheel operation and power assist check (see page 17-30).

If the measurements are out of specifications, adjust the rack guide.

If the problem is not corrected by adjusting the rack guide, replace the gearbox.



Uneven or rough steering.

Improperly adjusted rack guide.

Adjust the rack guide (see page 17-33).

If the problem is not corrected by adjusting the rack guide, replace the gearbox.

Belt slipping on pulley.

Adjust the belt tension. Replace the belt, if necessary (see page 17-32).

Idle speed low or erratic.

If the engine stalls when the wheel is turned while car is stopped or moving at low speed, adjust the idle speed (see section 11).

Air in reservoir, or check power steering fluid level.

Check power steering fluid level. If the level is excessively low, check for leaks in the system. Add fluid to the specified level.

If fluid level is OK, check O-rings and seals on both ends of the pump inlet hose, and the P/S pump housing mating surfaces and the pump shaft oil seal for suction leaks. Replace parts as necessary.

Steering wheel kicks back during wide turns.

Pump belt slipping on pulley (pump stops momentarily).

Adjust the belt tension (see page 17-32) or replace belt.

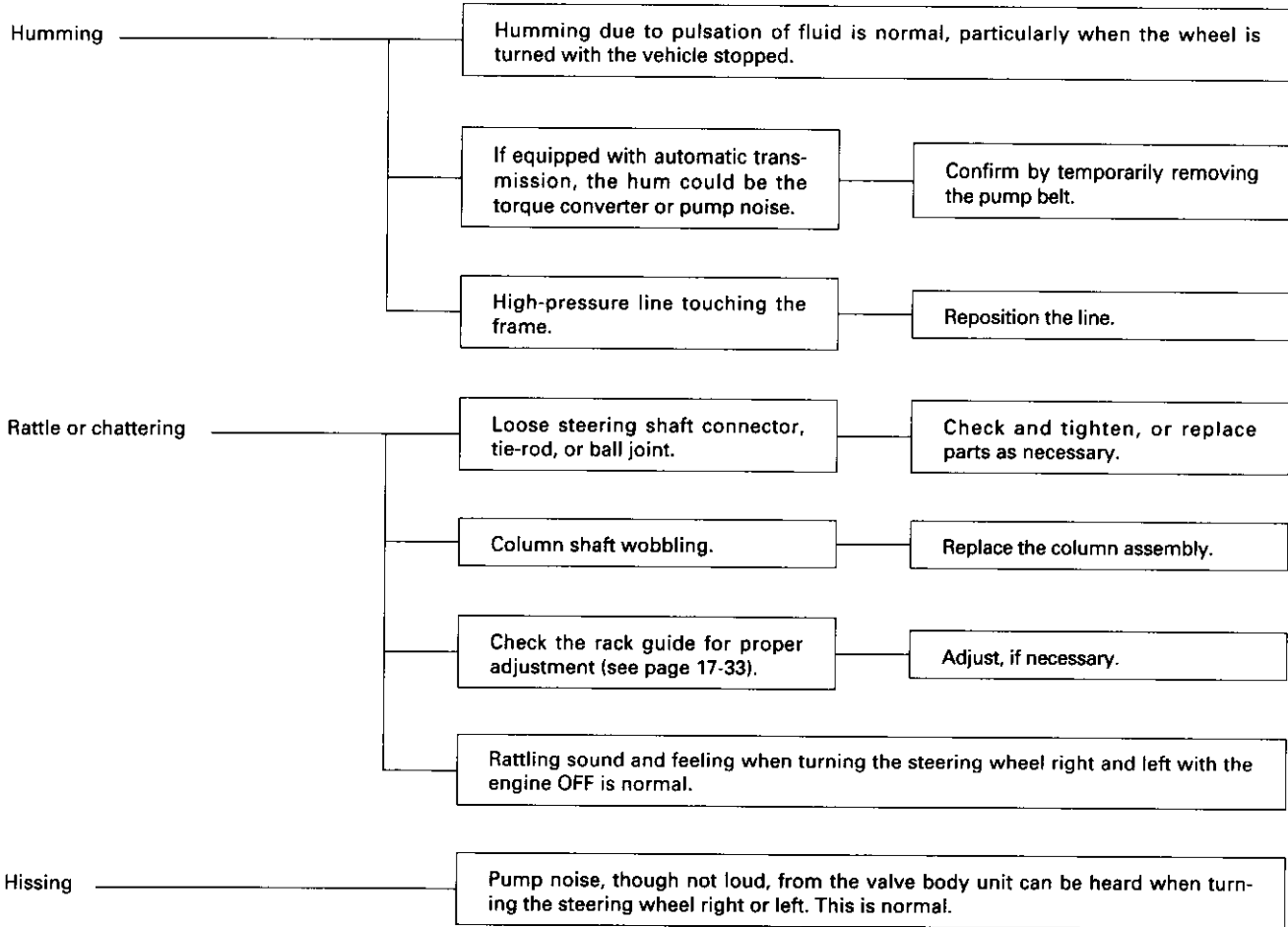
Install the power steering pressure gauge. Close the pressure control valve fully and measure the pump pressure (see page 17-34).

Check if pump pressure is normal and the gauge needle travel is 500 kPa (5 kgf/cm<sup>2</sup>, 71 psi) or less. Check the flow control valve if the needle travel exceeds 500 kPa (5 kgf/cm<sup>2</sup>, 71 psi). If the flow control valve is normal, replace the pump as an assembly.

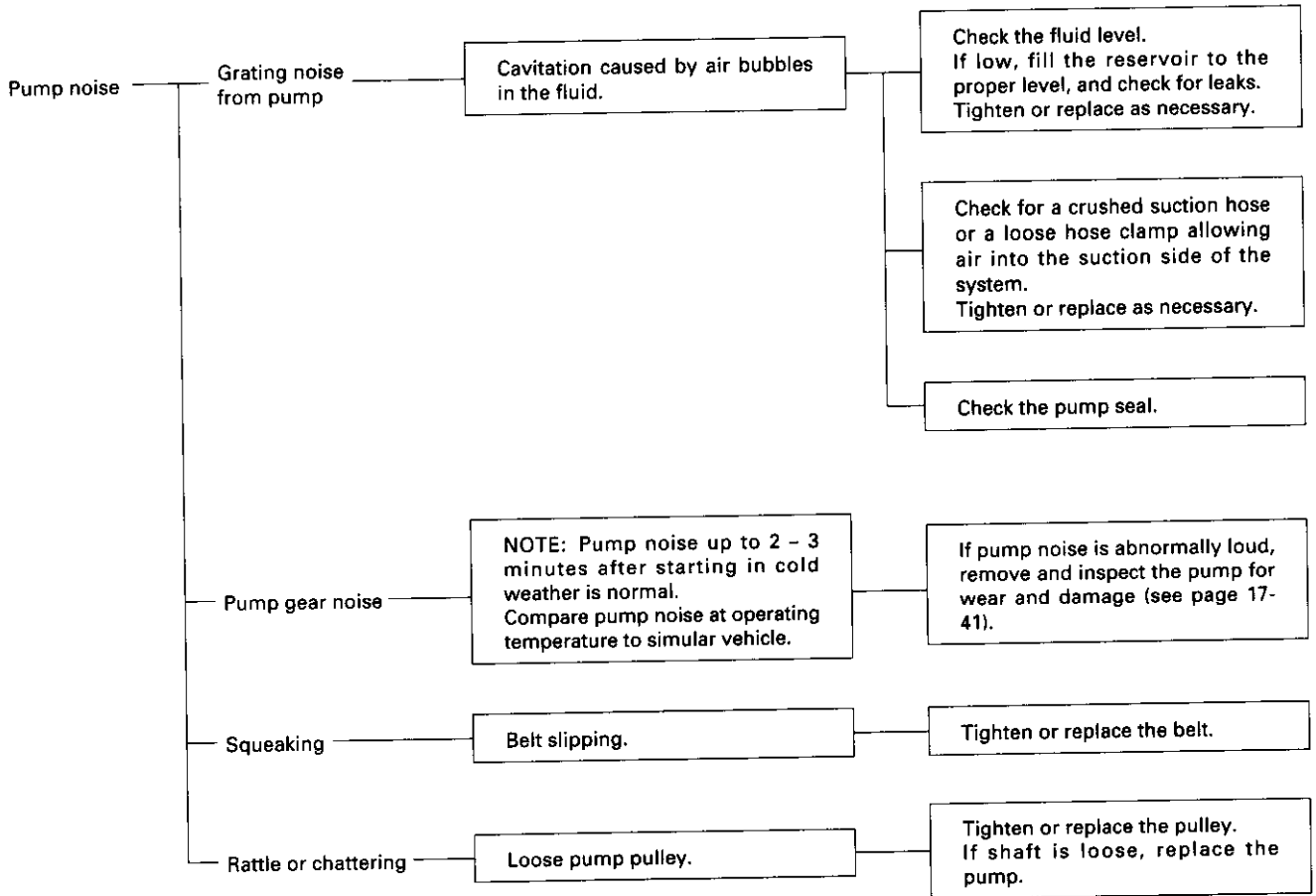
# Troubleshooting

## Noise and Vibration

NOTE: Pump noise in first 2 – 3 minutes after starting in cold weather is normal.



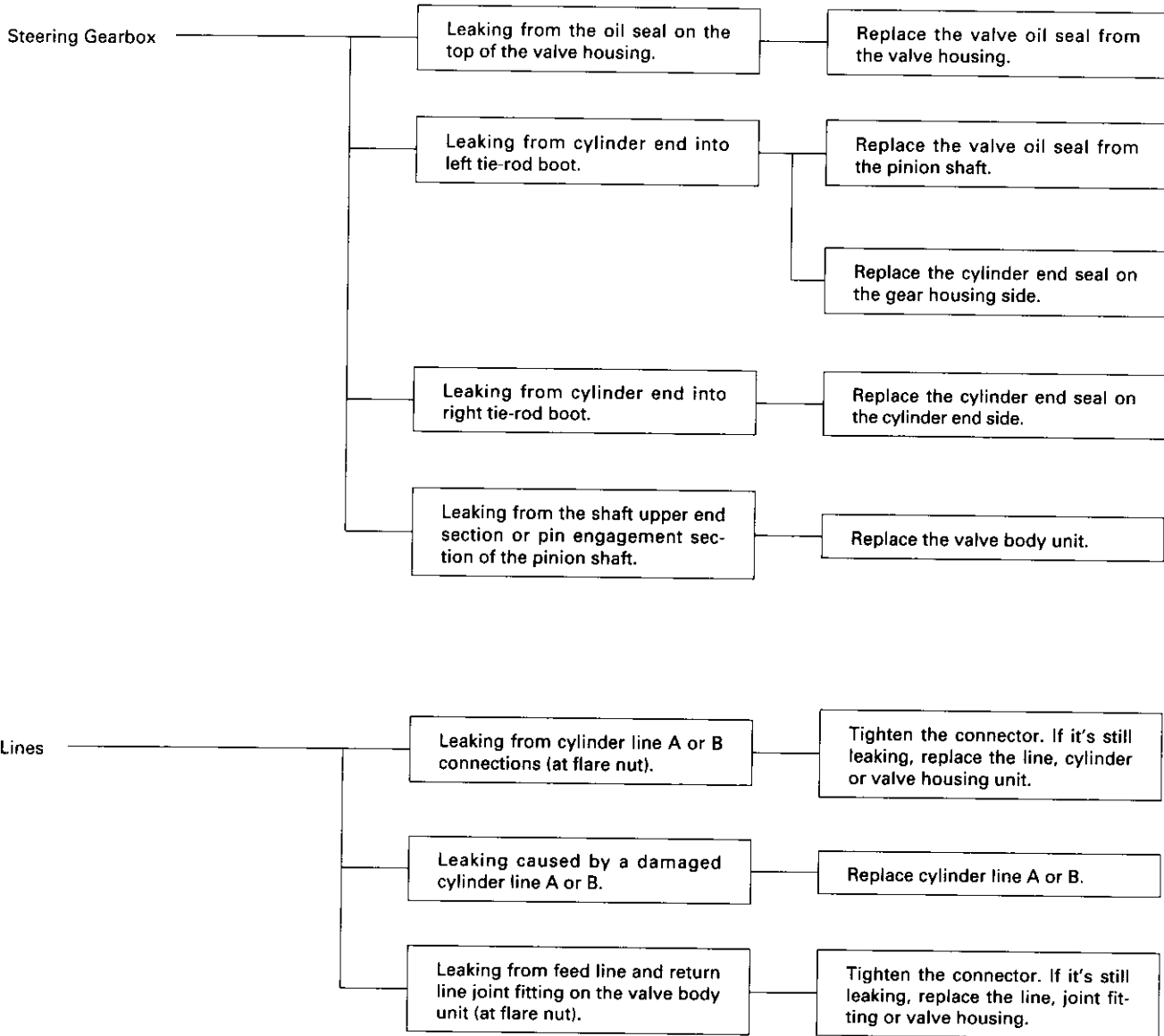
**CAUTION:** When inspecting, do not hold the steering wheel all the way to the right or the left.



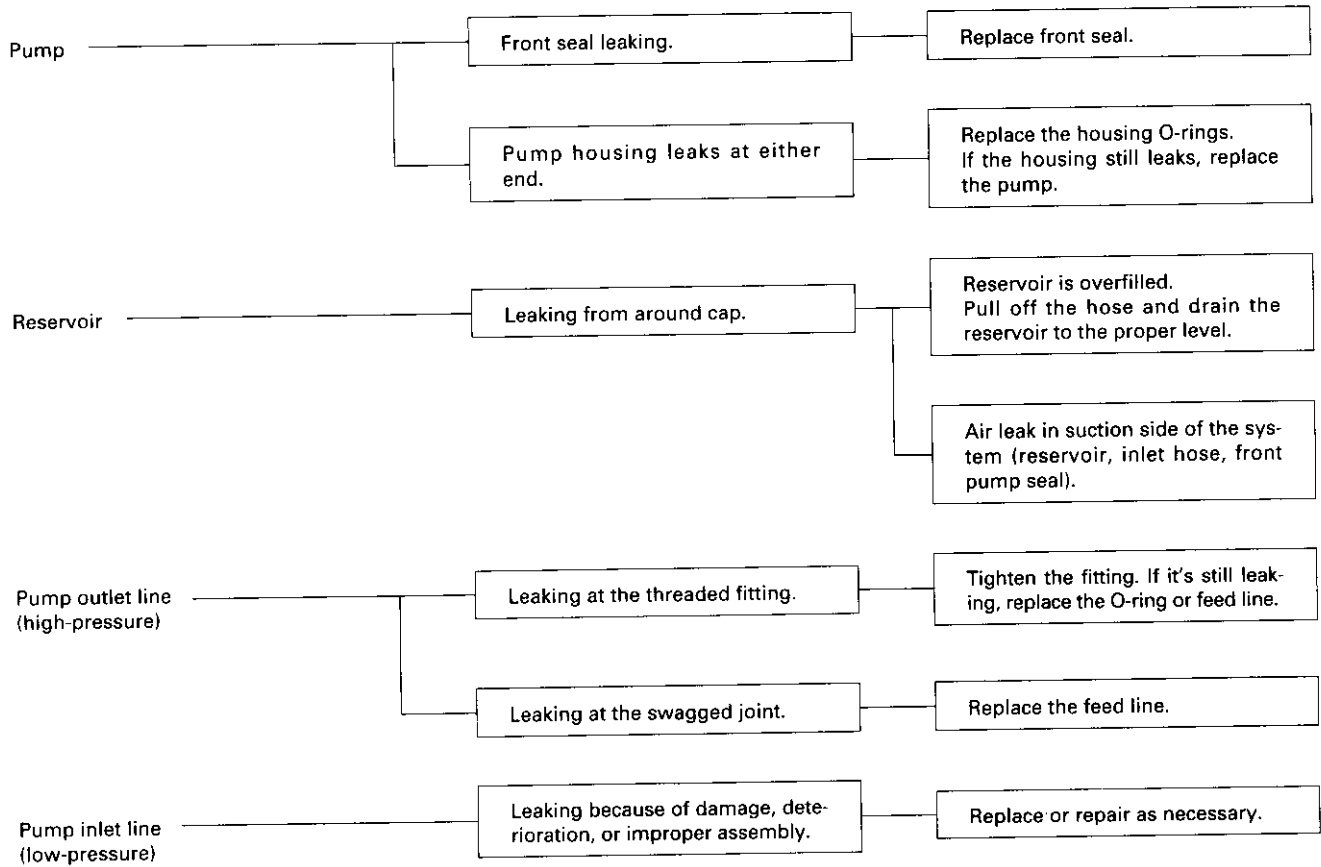
# Troubleshooting

## Fluid Leaks

- Check the gearbox assembly for oil leaks carefully. Oil can leak out of various points, depending on location of the faulty oil seals/seal rings. Check the following before removing the gearbox from the frame.

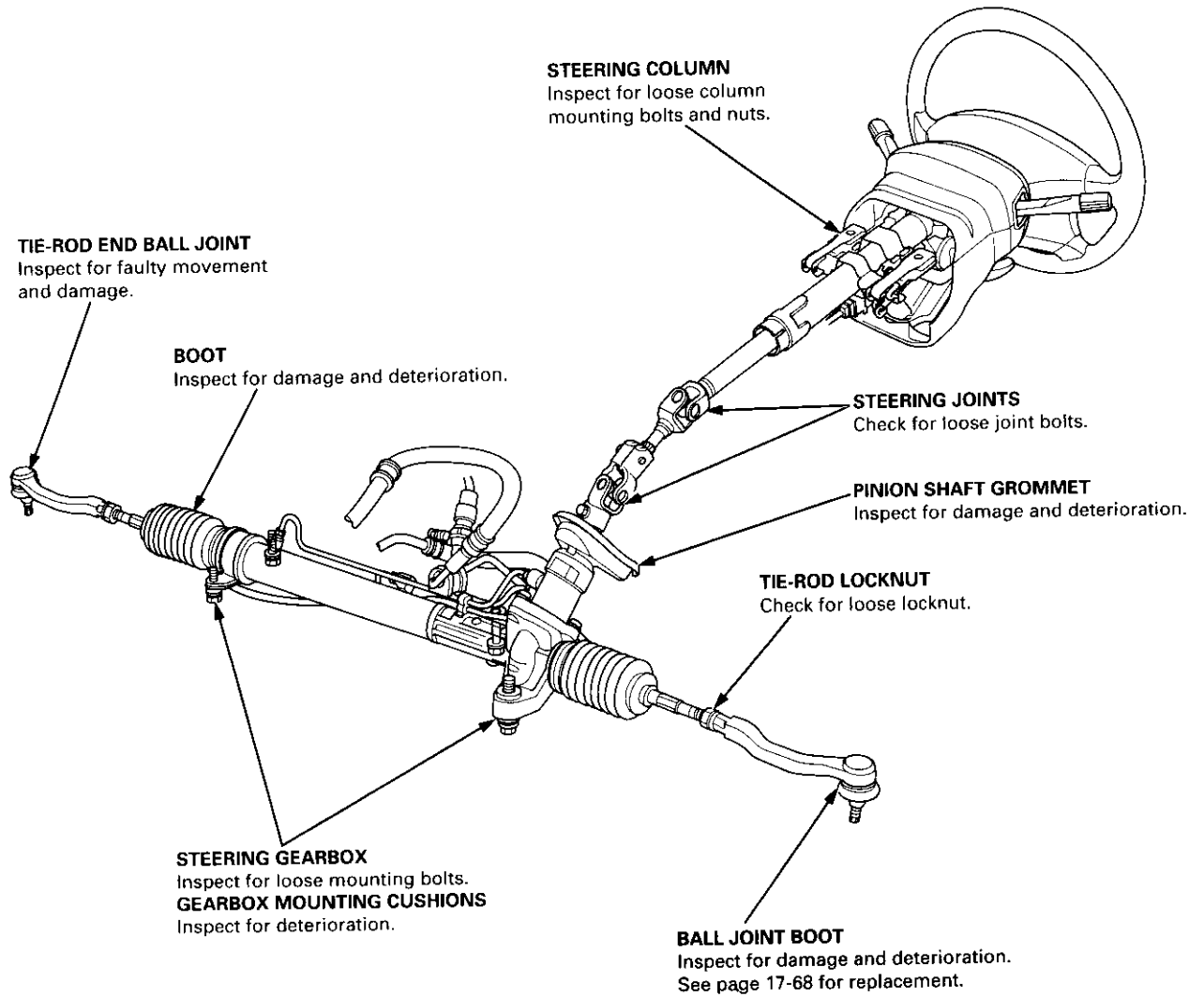








## Steering Linkage and Gearbox



# Inspection and Adjustment

## Pump Belt

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

### Inspection

Attach the special tool to the belt and measure the tension of the belt.

**Tension:**

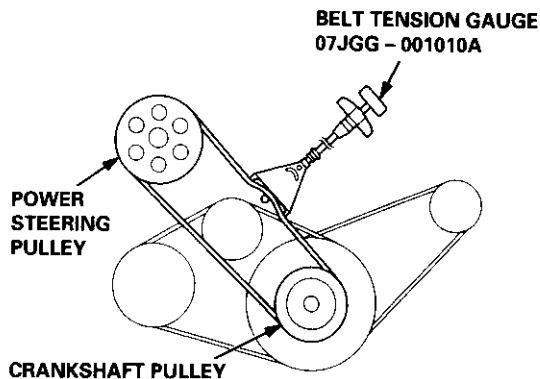
#### '96 - '00 models: Other Engine Types

**Used Belt:** 340 - 490 N (35 - 50 kgf, 77 - 110 lbf)

**New Belt:** 640 - 780 N (65 - 80 kgf, 143 - 176 lbf)

**NOTE:**

- If there are cracks or any damage evident on the belt, replace it with a new one.
- Follow the manufacturer's instructions for the tension gauge.



Inspect the pump belt for cracks or any damage. Replace the belt with a new one if necessary.

#### Measurement without Belt Tension Gauge:

Apply a force of 98 N (10 kgf, 22 lbf) and measure the deflection between the power steering pump and the crankshaft pulleys.

**Deflection:**

#### '99 - '00 models: B16A2 Engine Type only

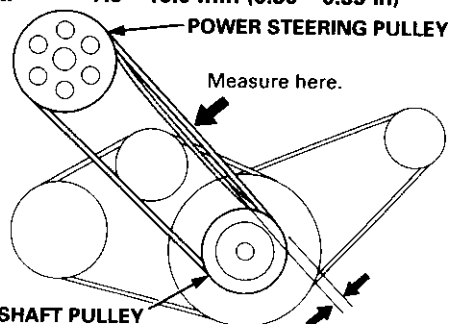
**Used Belt:** 7.5 - 11.0 mm (0.30 - 0.43 in)

**New Belt:** 5.0 - 7.0 mm (0.20 - 0.28 in)

#### '96 - '00 models: Other Engine Types

**Used Belt:** 10.5 - 14.0 mm (0.41 - 0.55 in)

**New Belt:** 7.5 - 10.0 mm (0.30 - 0.39 in)

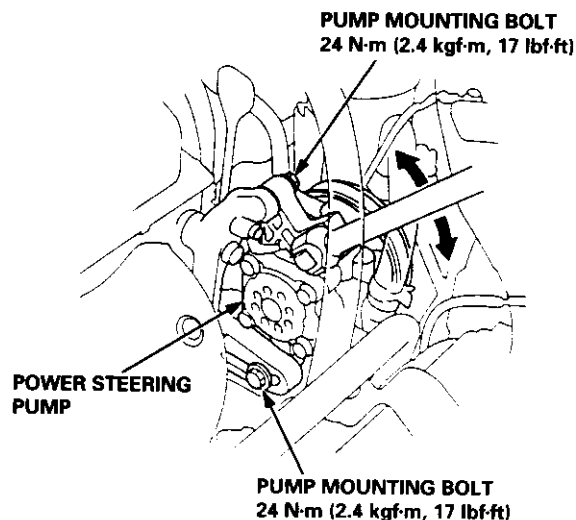


### Adjustment

1. Loosen the power steering pump mounting bolts.
2. Adjust the belt tension.

#### '96 - '00 models: Other Engine Types

- Pry power steering pump away from the engine with a wrench to get the proper belt tension, then retighten the mounting bolts.



3. Start the engine and turn the steering wheel from lock-to-lock several times, then stop the engine and recheck the deflection of the belt.



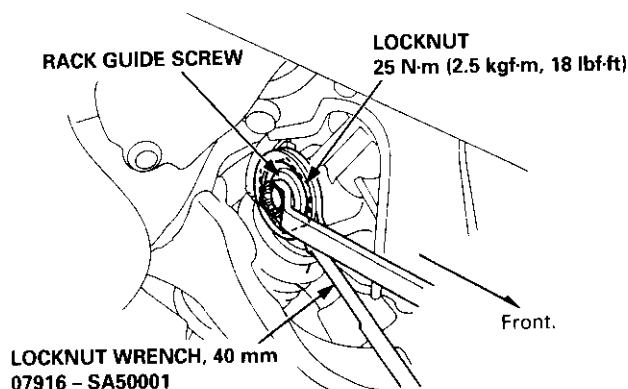
## Rack Guide Adjustment

NOTE: Perform rack guide adjustment with the wheels in the straight ahead position.

1. Loosen the rack guide screw locknut with the special tool.

'96 - '97 models:

Loosen the rack guide screw.



'98 - '00 models:

Remove the rack guide screw and remove the old sealant off of the threaded section.

Apply new sealant all around the threads. Loosely install the rack guide screw.

2. Tighten the rack guide screw to 25 N-m (2.5 kgf-m, 18 lbf-ft), then loosen it.
3. Retighten the rack guide screw to 3.9 N-m (0.4 kgf-m, 2.9 lbf-ft), then back it off to specified angle.

**Specified Return Angle: 20° max.**

4. Tighten the locknut while holding the rack guide screw.
5. Check for tight or loose steering through the complete turning travel.
6. Perform following inspections:
  - Steering operation (see page 17-30).
  - Power assist with vehicle parked.

## Fluid Replacement

Check the reservoir at regular intervals, and add fluid as necessary.

**CAUTION:** Always use Genuine Honda Power Steering Fluid-V or S. Using any other type of power steering fluid or automatic transmission fluid can cause increased wear and poor steering in cold weather.

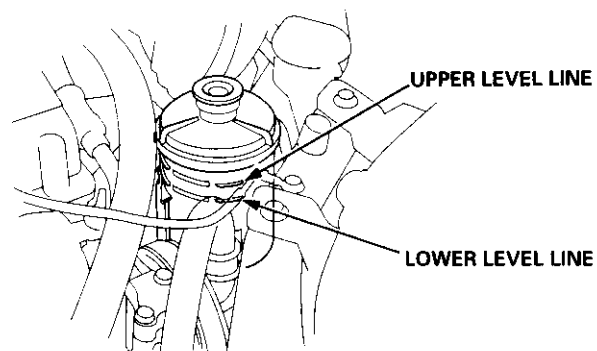
**SYSTEM CAPACITY:**

0.85 liter (0.90 US. qt, 0.75 Imp.qt)

at disassembly

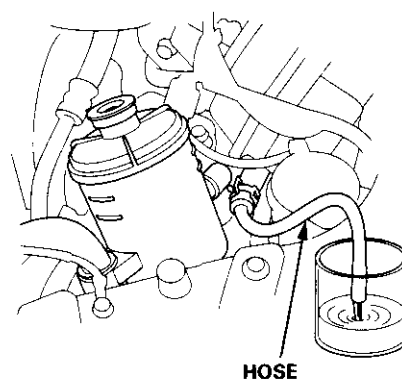
**RESERVOIR CAPACITY:**

0.4 liter (0.42 US. qt, 0.35 Imp.qt)



1. Raise the reservoir, then disconnect the return hose.
2. Connect a hose of suitable diameter to the disconnected return hose, and put the hose end in a suitable container.

**CAUTION:** Take care not to spill the fluid on the body and parts. Wipe off any spilled fluid at once.



3. Start the engine, let it run at idle, and turn the steering wheel from lock-to-lock several times. When fluid stops running out of the hose, shut off the engine. Discard the fluid.
4. Reinstall the return hose on the reservoir.
5. Fill the reservoir to the upper level line.
6. Start the engine and run it at fast idle, then turn the steering from lock-to-lock several times to bleed air from the system.
7. Recheck the fluid level and add some if necessary.
 

**CAUTION:** Do not fill the reservoir beyond the upper level line.

# Inspection and Adjustment

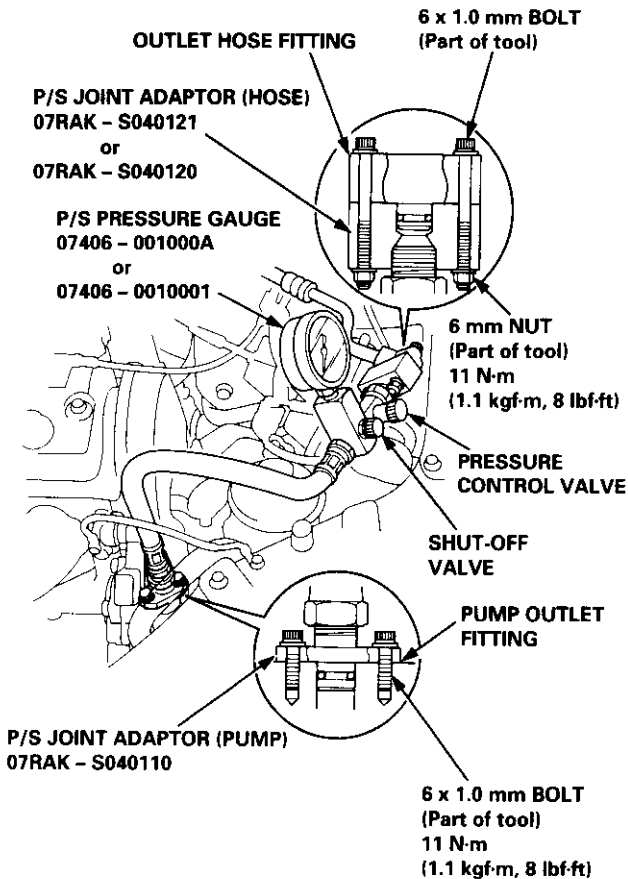
## Pump Pressure Check

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 high pressure hose with care so as not to spill the power steering fluid on the frame and other parts.

1. Disconnect the outlet line from the pump outlet fitting, then install the P/S joint adaptor (pump) on the pump outlet.
2. Connect the P/S joint adaptor (hose) to the power steering pressure gauge, then connect the outlet hose to the adaptor.
3. Install the power steering pressure gauge to the P/S joint adaptor (pump) as shown.

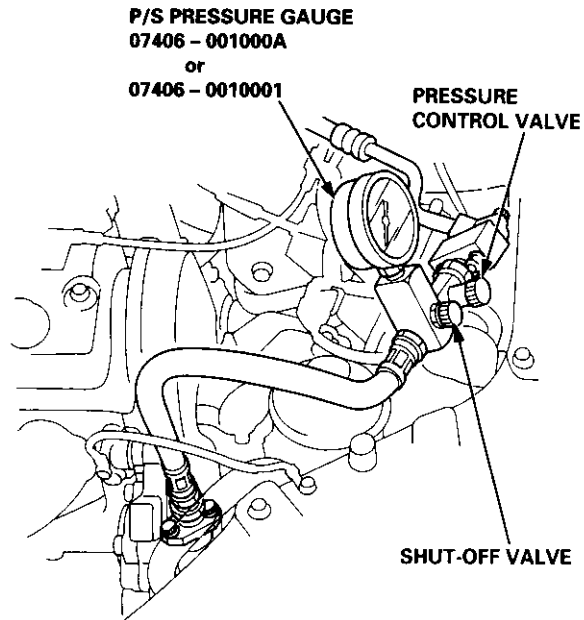


4. Open the shut-off valve fully.
5. Open the pressure control valve fully.

6. Start the engine and let it idle.
7. Turn the steering wheel from lock-to-lock several times to warm the fluid to operating temperature.
8. Measure steady-state fluid pressure while idling. If the pump is in good condition, the gauge should read less than 1500 kPa (15 kgf/cm<sup>2</sup>, 213 psi). If it reads high, check the outlet line or valve body unit (see General Troubleshooting 17-22).
9. Close the pressure control valve, then close the shut-off valve gradually until the pressure gauge needle is stable. Read the pressure.
10. Immediately open the pressure control valve fully.

**CAUTION:** Do not keep the pressure control valve closed more 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 6,400 - 7,400 kPa (65 - 75 kgf/cm<sup>2</sup>, 920 - 1,070 psi). A low reading means pump output is too low for full assist. Repair or replace the pump.



# Steering Wheel

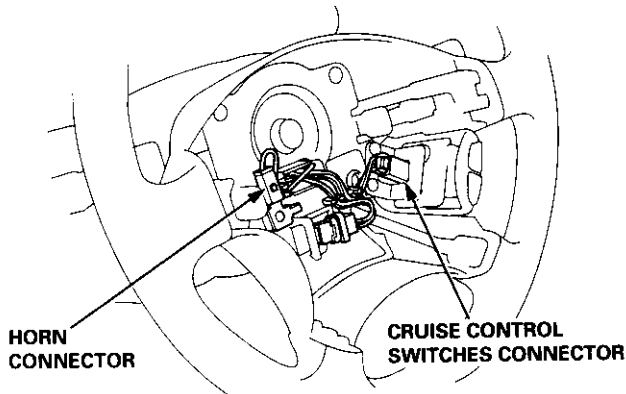


## Removal

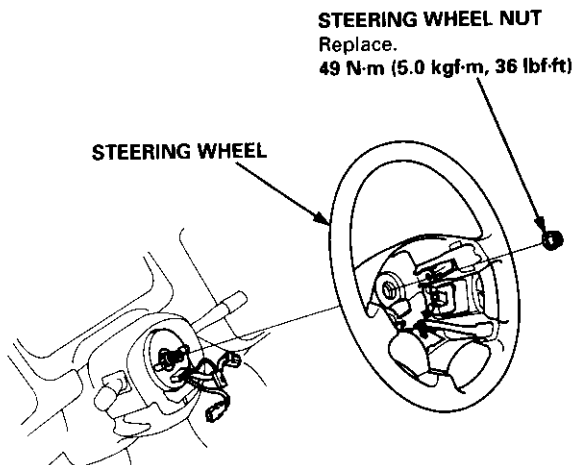
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

NOTE: Before removing the steering wheel, align the front wheels straight ahead.

1. Remove the driver's airbag assembly from the steering wheel (see section 24).
2. Disconnect the horn connector and cruise control switches connector.



3. Remove the steering wheel nut.



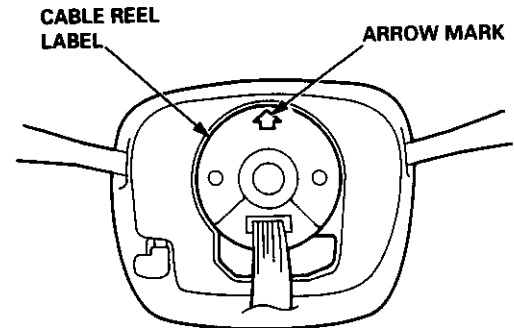
4. Remove the steering wheel by rocking it slightly from side-to-side as you pull steadily with both hands.

## Installation

**CAUTION:** Do not tap on the steering wheel or steering column shaft when installing the steering wheel.

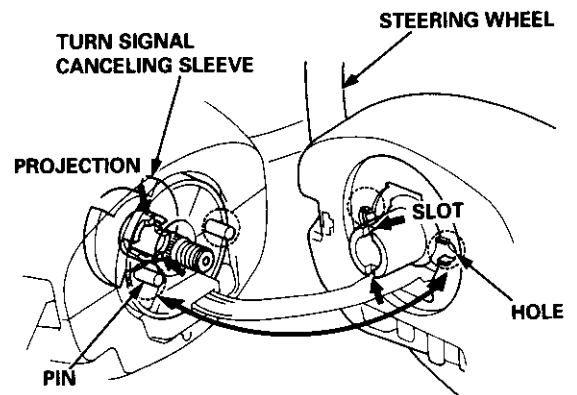
NOTE: Before installing the steering wheel, align the front wheels straight ahead.

1. Before installing the steering wheel, center the cable reel. Do this by first rotating the cable reel clockwise until it stops. Then rotate it counterclockwise approximately two turns. The arrow mark on the cable reel label should point straight up.



2. Install the steering wheel with the steering wheel nut.

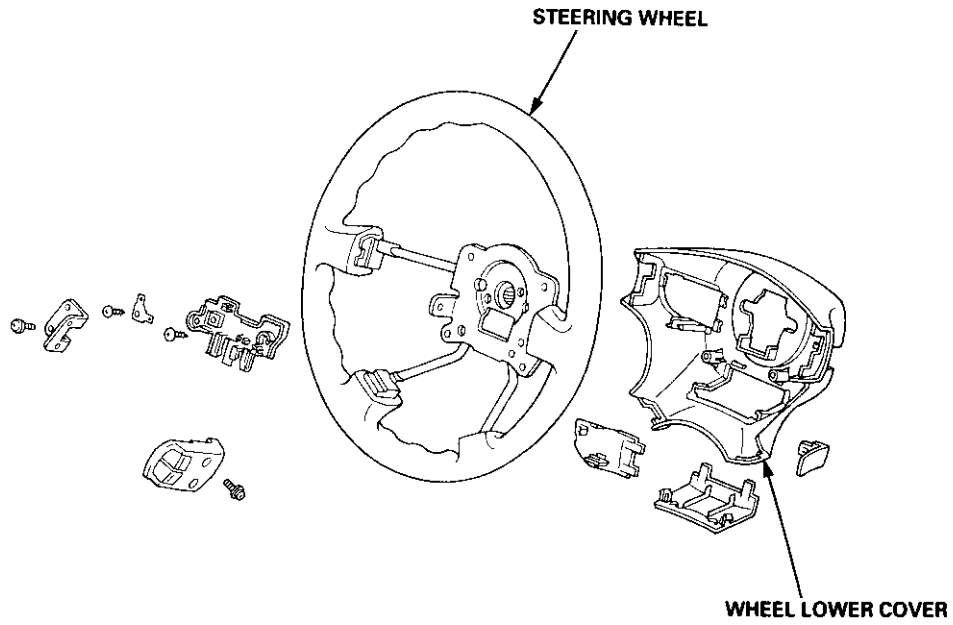
NOTE: Be sure the steering wheel shaft engages the cable reel and canceling sleeve.



3. Attach the cruise control switches connector to the steering wheel clip.
4. Connect the horn connector.
5. Install the driver's airbag assembly, and confirm proper system operation (see section 24).
6. Check the horn and cruise control switches for proper operations.

# Steering Wheel

## Disassembly/Reassembly





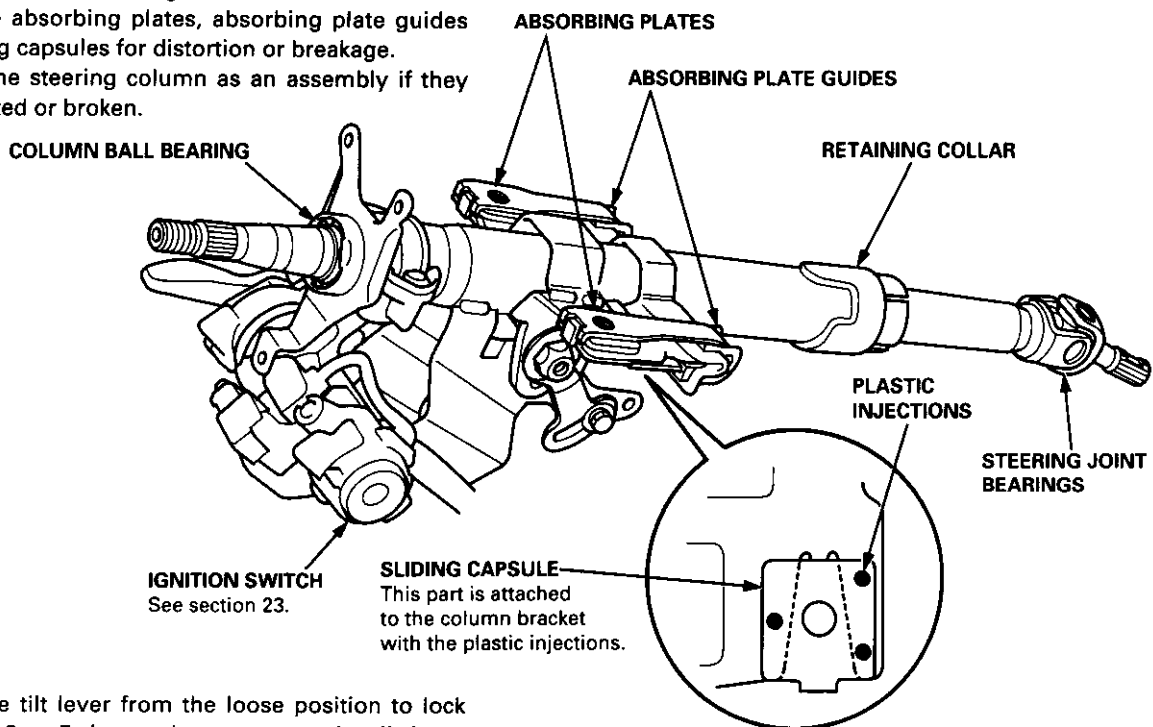


# Steering Column

## Inspection

NOTE: The tilt steering column type is shown; the conventional steering column is similar except for the tilt mechanism.

- Check the steering column ball bearing and the steering joint bearings for play and proper movement. If there is noise or if there is excessive play, replace the steering column as an assembly.
- Check the retaining collar for damage. If it is damaged, replace the retaining collar.
- Check the absorbing plates, absorbing plate guides and sliding capsules for distortion or breakage. Replace the steering column as an assembly if they are distorted or broken.

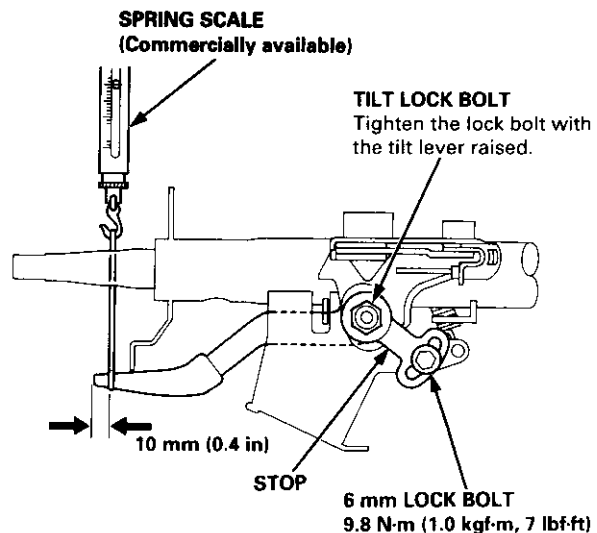


1. Move the tilt lever from the loose position to lock position 3 to 5 times; then measure the tilt lever preload 10 mm (0.4 in) from the end of the tilt lever.

**Preload: 70 – 90 N (7 – 9 kgf, 15 – 20 lbf)**

2. If the measurement is out of the specification, adjust the preload using the following procedures.
  - a. Loosen the tilt lever, and set the steering column in the neutral position.
  - b. Remove the 6 mm lock bolt and remove the stop.
  - c. Adjust the preload by turning the tilt lock bolt left or right.
  - d. Pull up the tilt lever to the uppermost position and install the stop. Check the preload again. If the measurement is still out of specification, repeat the above procedures "a" through "c" to adjust.

**CAUTION:** Be careful not to loosen the tilt lever when installing the stop or tightening the 6 mm lock bolt.



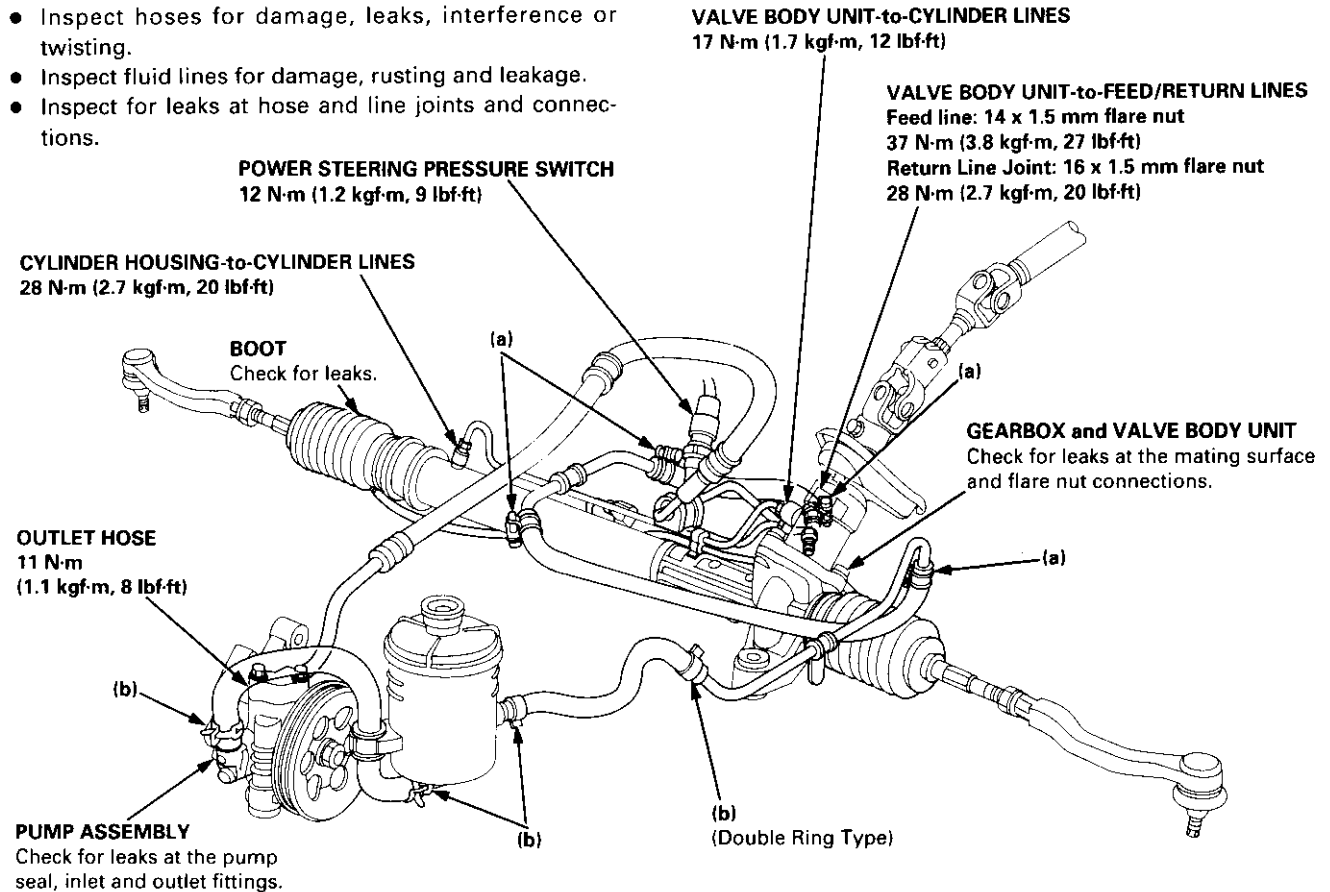


# Power Steering Hoses, Lines

## Fluid Leakage Inspection

### HOSES and LINES

- Inspect hoses for damage, leaks, interference or twisting.
- Inspect fluid lines for damage, rusting and leakage.
- Inspect for leaks at hose and line joints and connections.



## Replacement

### NOTE:

- Connect each hose to the corresponding pipe securely until it contacts the stop on the line. Install the clamp or adjustable clamp at the specified distance from the hose end as shown.
- Add the power steering fluid to the specified level on the reservoir and check for leaks.

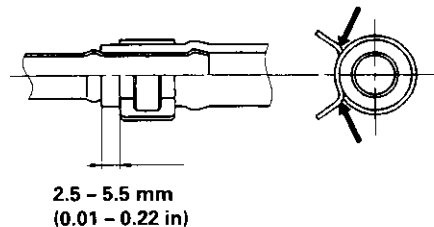
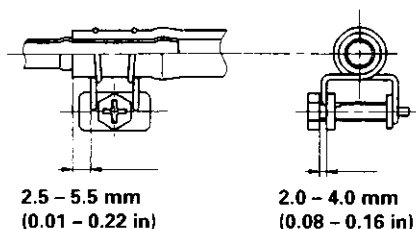
### ADJUSTABLE HOSE CLAMP:

- Position the adjustable hose clamps at the points indicated (a) in the drawing above.
- Slide the hose over the line until it contacts the stop.

**CAUTION:** Check all clamps for deterioration or deformation; replace with the clamps new ones if necessary.

### HOSE CLAMP:

- Position the hose clamps at the points indicated (b) in the drawing above.
- Slide the hose over the line until it contacts the stop.

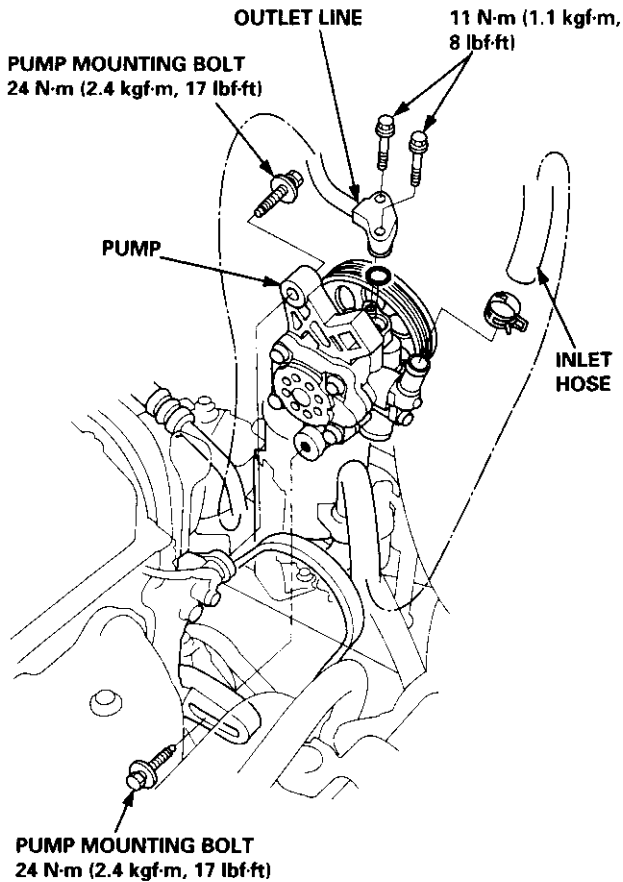


# Power Steering Pump

## Removal/Installation

**NOTE:** Before disconnecting the hoses from the pump, place a suitable container under the vehicle.

1. Remove the belt by loosening the pump mounting bolts and adjusting bolt ('99 – '00 models: B16A2 Engine Type only).



2. Cover the A/C compressor with several shop towels to protect it from spilled power steering fluid.
3. Disconnect the inlet hose and the outlet line from the pump, and plug them.

**NOTE:** Take care not to spill the fluid on the body or parts. Wipe off any spilled fluid at once.

4. Remove the pump mounting bolts and adjusting bolt ('99 – '00 models: B16A2 Engine Type only), then remove the pump.

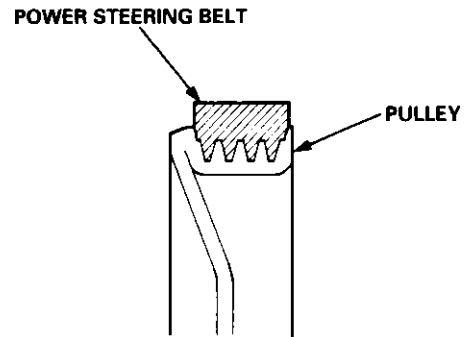
**NOTE:**

- Do not turn the steering wheel with the pump removed.
- Wrap the opening of the pump with a piece of tape to prevent foreign material from entering the pump.

5. Connect the inlet hose and the outlet line. Tighten the pump fittings securely.
6. Loosely install the pump in the pump bracket with mounting bolts and adjusting bolt ('99 – '00 models: B16A2 Engine Type only).
7. Install the pump belt.

**CAUTION:**

- Make sure that the power steering belt is properly positioned on the pulleys.
- Do not get power steering fluid or grease in the power steering belt or pulley faces. Clean off any fluid or grease before installation.



8. Adjust the pump belt (see page 17-32).
9. Fill the reservoir to the upper level line (see page 17-33).

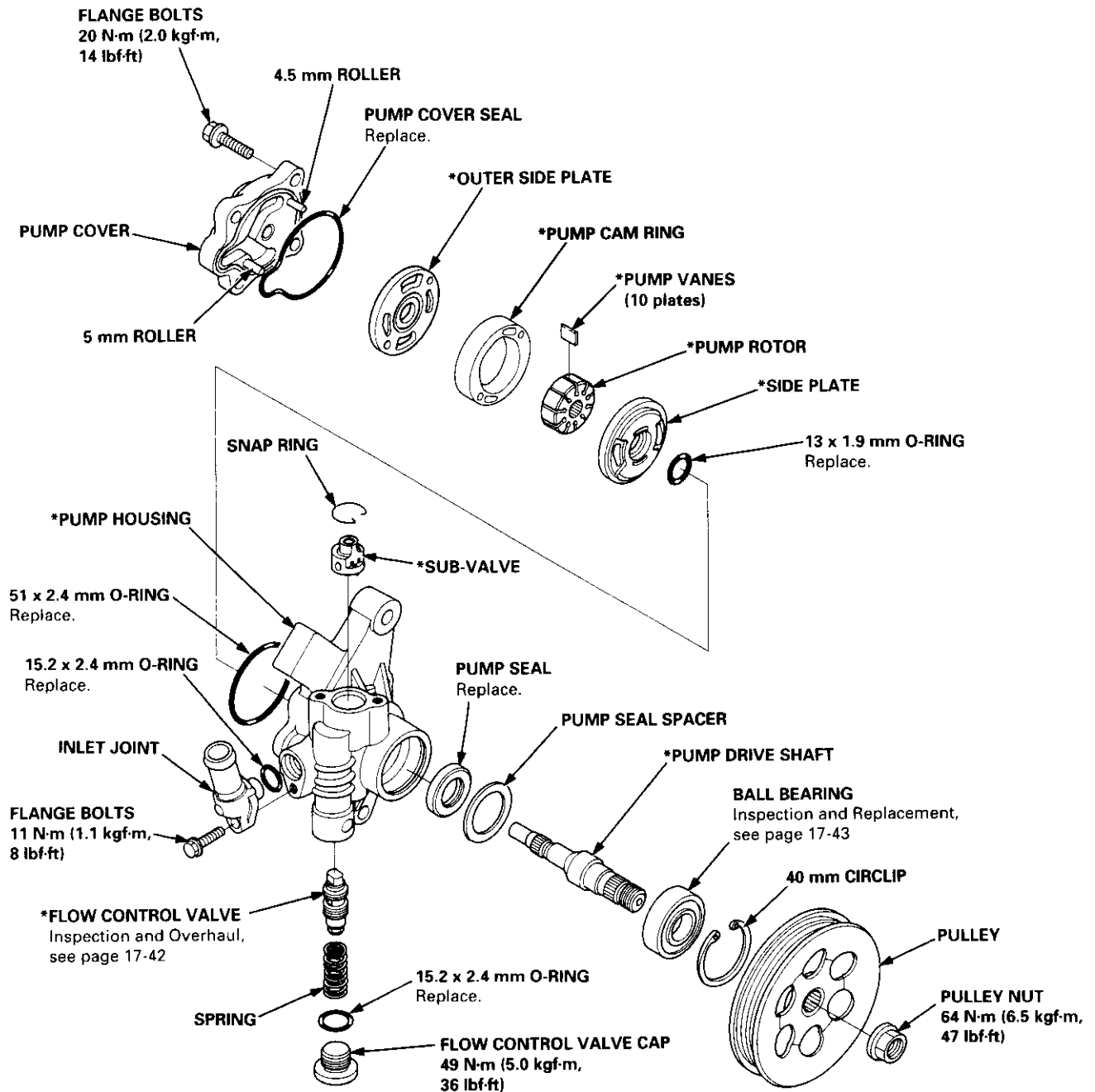


## Disassembly

**CAUTION:** The power steering components are made of aluminum. Avoid damaging the components during assembly.

### NOTE:

- Clean the disassembled parts with a solvent, and dry them with compressed air. Do not dip the rubber parts in a solvent.
- Always replace the O-rings and rubber seals with new ones before assembly.
- Apply recommended power steering fluid to the parts indicated in the assembly procedures.
- Do not allow dust, dirt, or other foreign materials to enter the power steering system.
- Replace the pump as an assembly if the parts indicated with asterisk (\*) are worn or damaged.



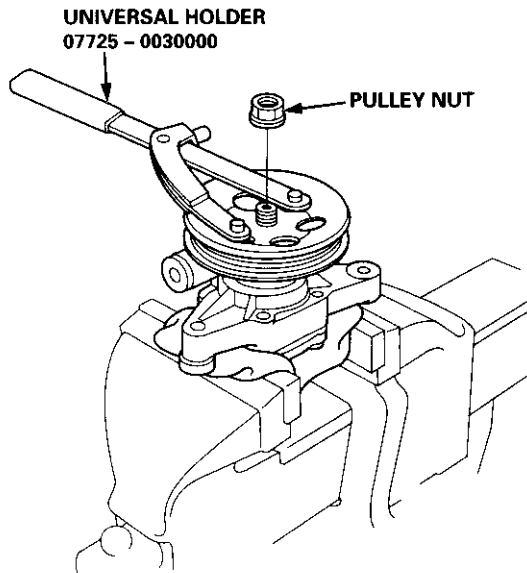
(cont'd)

# Power Steering Pump

## Disassembly (cont'd)

1. Drain the fluid from the pump.
2. Hold the steering pump in a vise with soft jaws, hold the pulley with the special tool, and remove the pulley nut and pulley.

**CAUTION:** Be careful not to damage the pump housing with the jaws of the vise and extension bar.

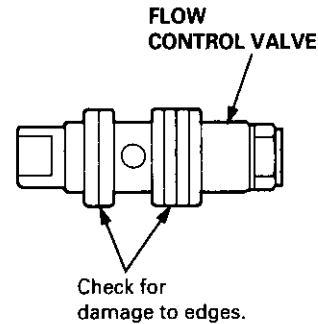


3. Loosen the flow control valve cap with a hex wrench and remove it.
4. Remove the O-ring, flow control valve and spring.
5. Remove the inlet joint and O-ring.
6. Remove the pump cover and pump cover seal.
7. Remove the outer side plate, pump cam ring, pump rotor, pump vanes, side plate and O-rings.
8. Remove the snap ring, then remove the sub-valve from the pump housing.
9. Remove the circlip, then remove the pump drive shaft by tapping the shaft end with the plastic hammer.
10. Remove the pump seal spacer and pump seal.

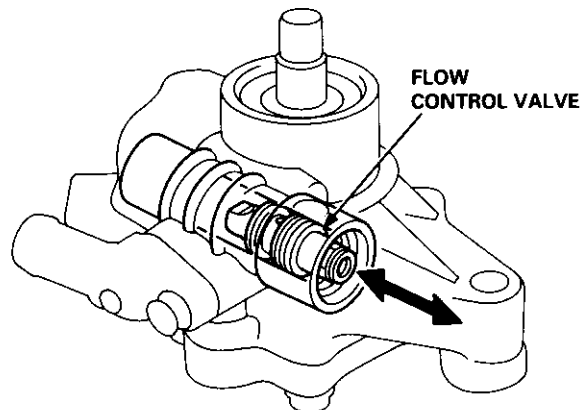
## Inspection

### Flow Control Valve:

1. Check the flow control valve for wear, burrs, and other damage to the edges of the grooves in the valve.

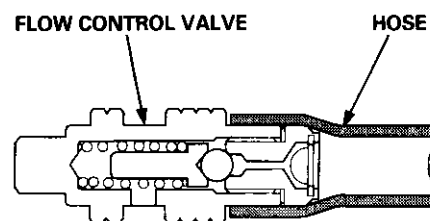


2. Inspect the bore the flow control valve for scratches or wear.
3. Slip the valve back in the pump, and check that it moves in and out smoothly.



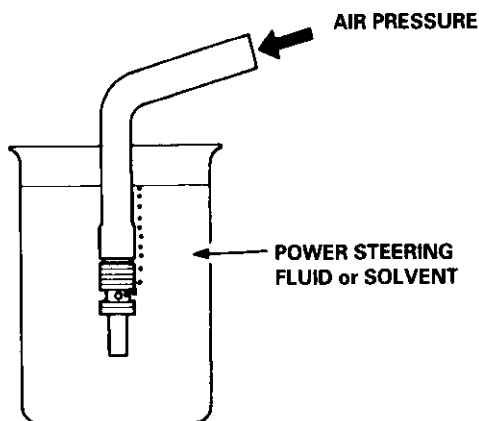
If OK, go on step 4; if not, replace the pump as an assembly. The flow control valve is not available separately.

4. Attach a hose to the end of the valve as shown.

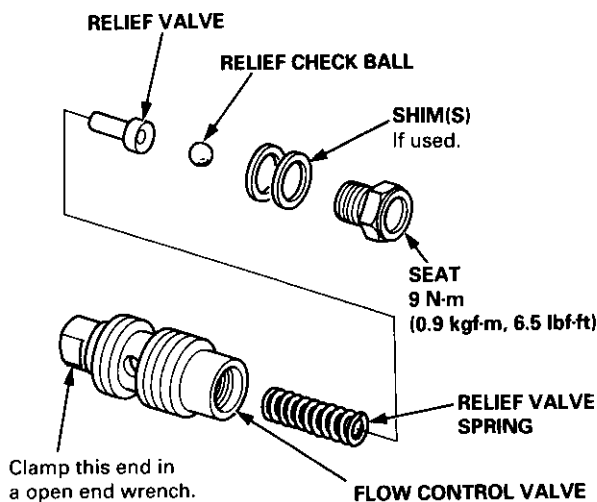




- Submerge the valve in a container of power steering fluid or solvent, and blow in the hose. If air bubbles leak through the valve at less than 98 kPa (1.0 kgf/cm<sup>2</sup>, 14.2 psi), repair it as follows.



- Hold the bottom end of the valve with an open end wrench.
- Unscrew the seat in the top end of the valve, and remove any shims, the relief check ball, relief valve and relief valve spring.

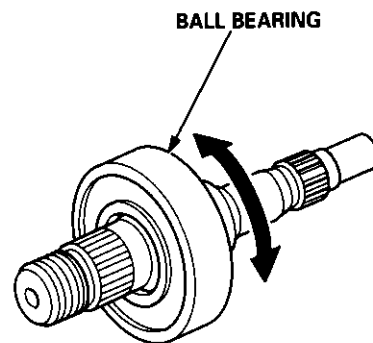


- Clean all the parts in solvent, dry them off, then reassemble and retest the valve. If the flow control valve tests OK, reinstall it in the pump. If the flow control valve still leaks air, replace the pump as an assembly. The flow control valve is not available separately.

**NOTE:** If necessary, relief pressure is adjusted at the factory by adding shims under the check ball seat. If you found shims in your valve, be sure you reinstall as many as you took out.

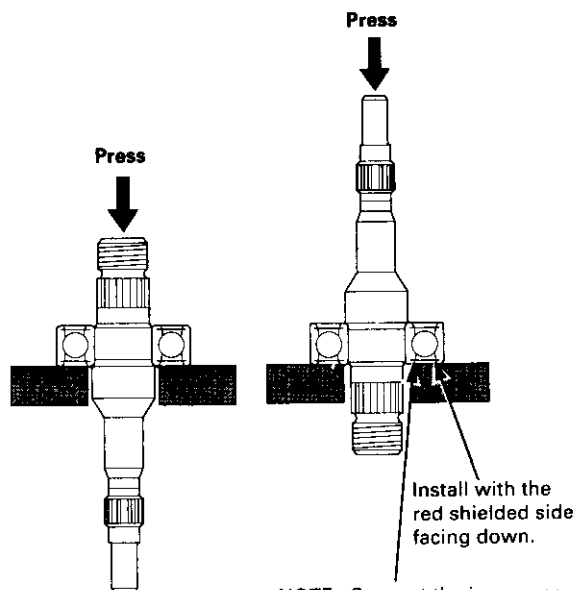
### Ball Bearing:

- Inspect the ball bearing by rotating the outer race slowly. If any play or roughness is felt, replace the ball bearing.



- Remove and discard the ball bearing using a press as shown.
- Install the new ball bearing using a press as shown.

### Ball Bearing Replacement:

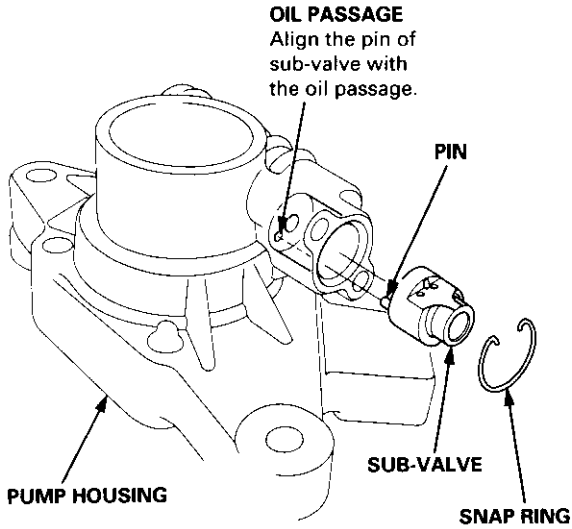


**NOTE:** Support the inner race with the tool securely.

# Power Steering Pump

## Reassembly

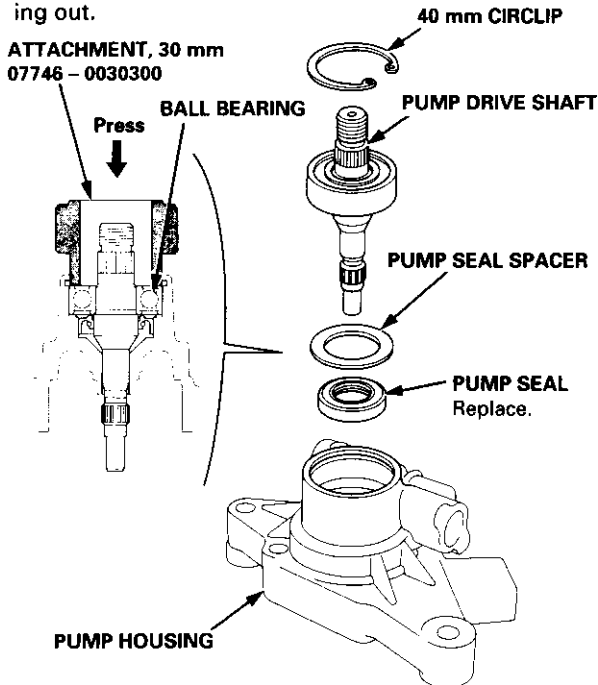
1. Align the pin of the sub-valve with the oil passage in pump housing, and push down the sub-valve. Install the snap ring properly.



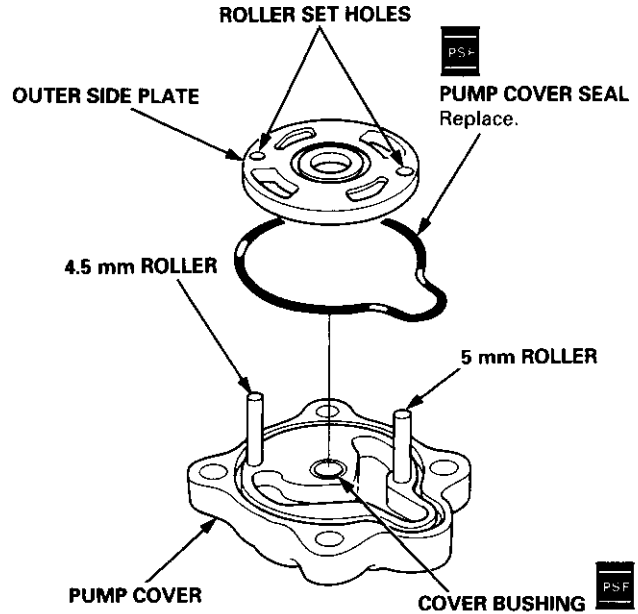
2. Install the new pump seal in the pump housing by hand, then install the pump seal spacer.

**NOTE:** Insert the pump seal with its grooved side facing in.

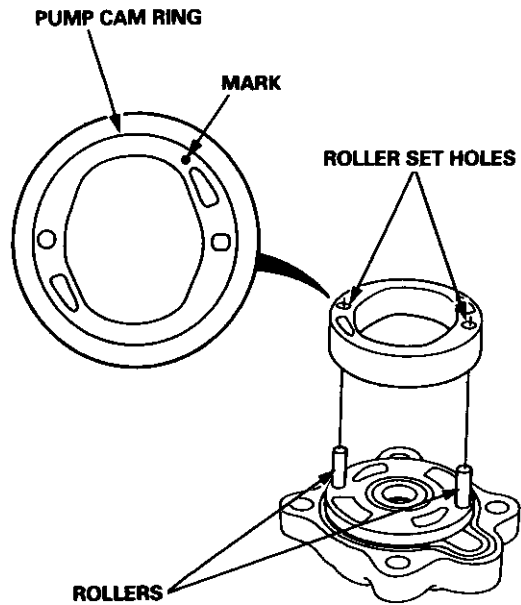
3. Position the pump drive shaft in the pump housing, then drive it in using a special tool as shown.
4. Install the 40 mm circlip with its radiused side facing out.



5. Coat the pump cover seal and the cover bushing with the power steering fluid, then install the pump cover seal into the groove in the pump cover.
6. Install the outer side plate over the two rollers.



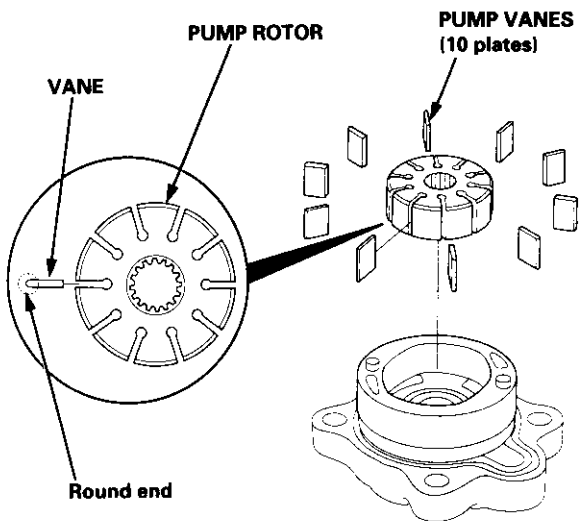
7. Set the pump cam ring over the two rollers with the "°" mark on the cam ring upward.



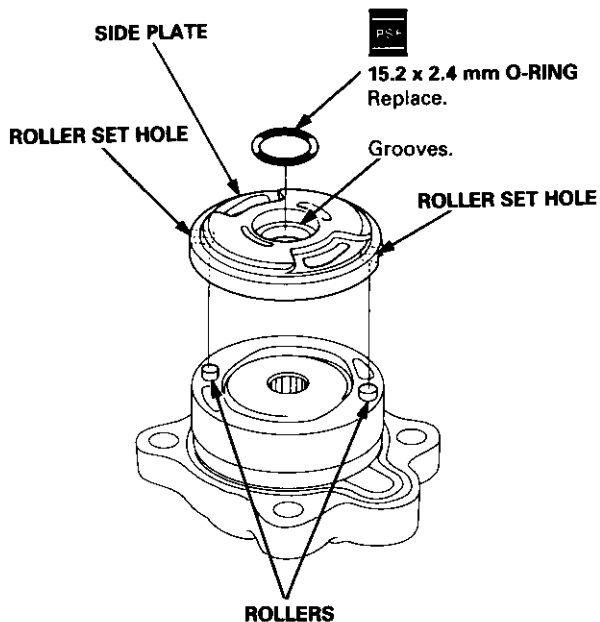


8. Assemble pump rotor to the pump cover with the "O" marks on the rotor facing down.
9. Set the 10 vanes in the grooves in the rotor.

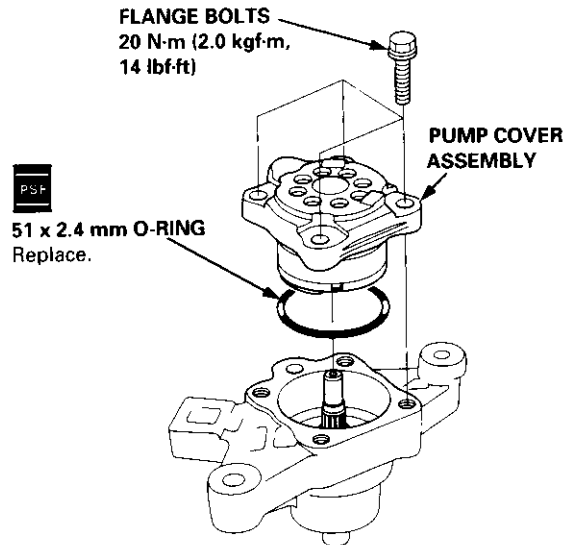
NOTE: Be sure that the round ends of the vanes are in contact with the sliding surface of the cam ring.



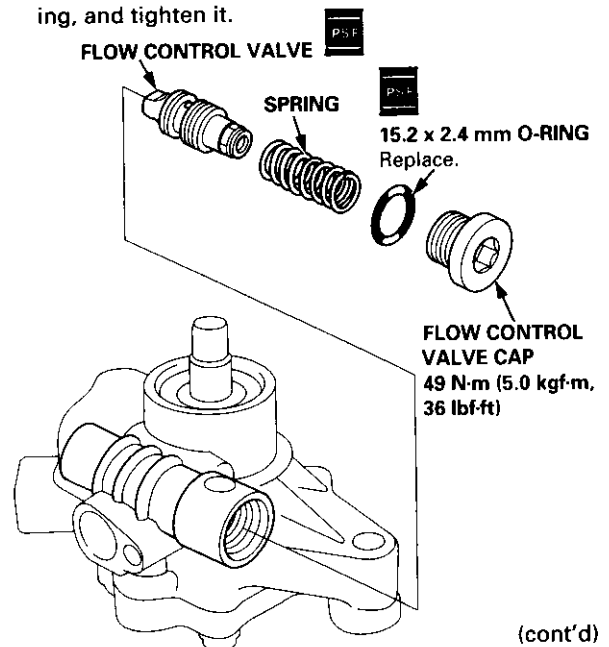
10. Coat the O-ring with power steering fluid, and install it into the grooves in the side plate.
11. Install the side plate on the cam ring by aligning the roller set holes in the side plate with the rollers.



12. Coat the O-ring with power steering fluid, and position it into the pump housing.
13. Install the pump cover assembly in the pump housing.



14. Coat the flow control valve with power steering fluid.
15. Install the flow control valve and spring on the pump housing.
16. Coat the O-ring with power steering fluid, and install it on the flow control valve cap.
17. Install the flow control valve cap on the pump housing, and tighten it.



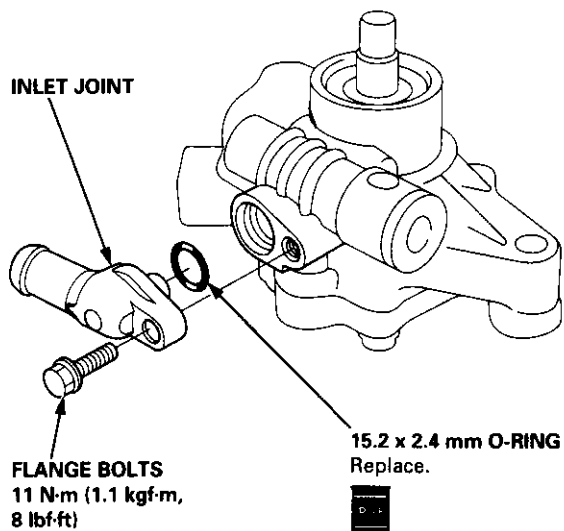
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# Power Steering Pump

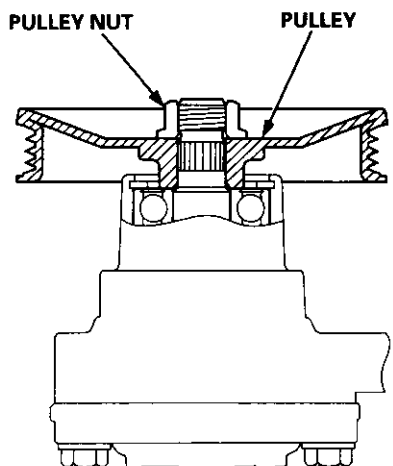
## Reassembly (cont'd)

18. Coat the O-ring with power steering fluid, and install it into the grooves in the inlet joint.
19. Install the inlet joint on the pump housing.

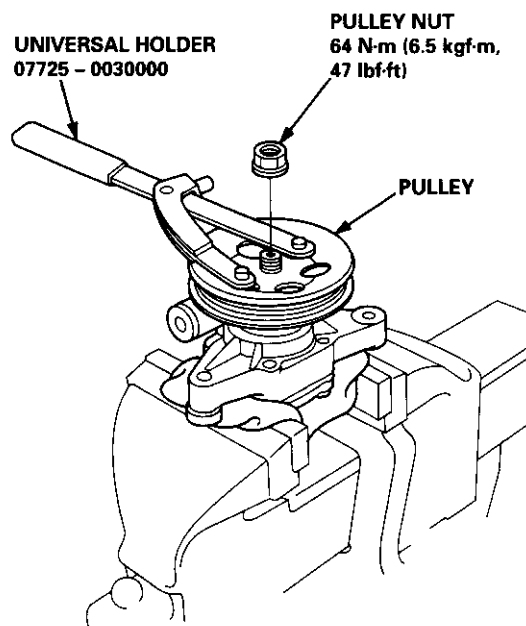


20. Install the pulley as shown below, then loosely install the pulley nut. Hold the steering pump in a vise with soft jaws.

**CAUTION:** Be careful not to damage the pump housing with the jaws of the vise.



21. Hold the pulley with the special tool, and tighten the pulley nut.



22. Check that the pump turns smoothly by turning the pulley by hand.

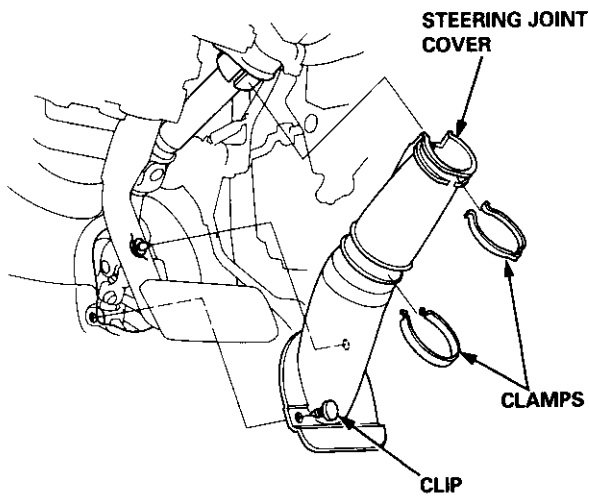
# Steering Gearbox



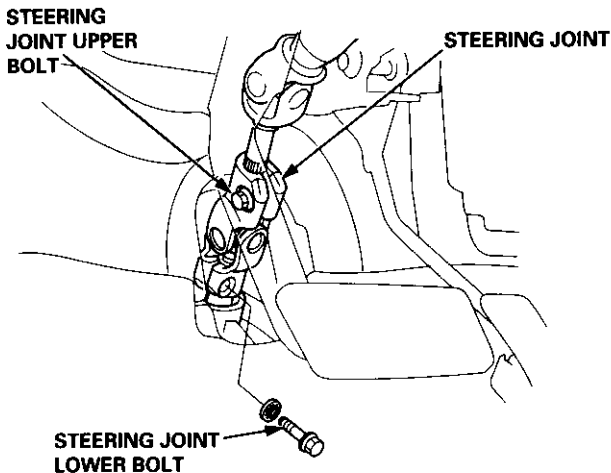
## Removal

NOTE: Using solvent and a brush, wash any oil and dirt off the valve body unit its lines, and the end if the gear-box. Blow dry with compressed air.

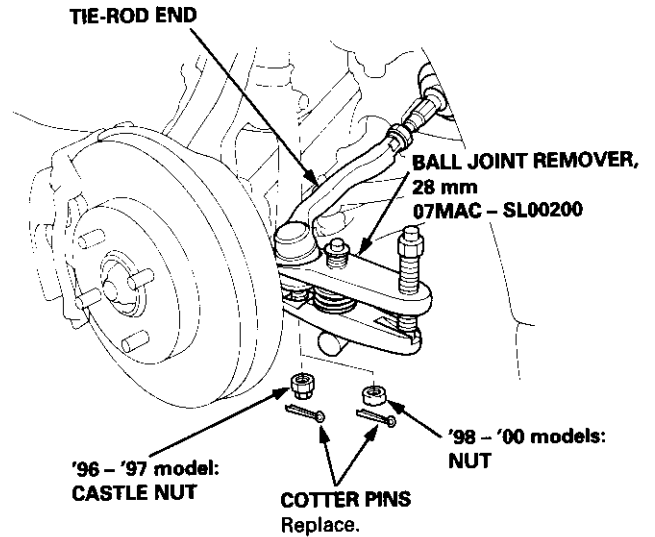
1. Drain the power steering fluid as described on page 17-33.
2. Raise the front of vehicle, and support it on safety stands in the proper locations (see section 1).
3. Remove the front wheels.
4. Remove the driver's airbag assembly, and steering wheel (see page 17-35).
5. Remove the steering joint cover.



6. Remove the steering joint lower bolt, and loosen the steering joint upper bolt. Disconnect the steering joint by moving the joint toward the column.



7. Remove the cotter pin from the castle nut ('96 - '97 models) or nut ('98 - '00 models) and remove the nut.



8. Install the 10 mm hex nut on the ball joint. Be sure that the 10 mm hex nut is flush with the ball joint pin end, or the threaded section of the ball joint pin might be damaged by the special tool.

NOTE: Remove the ball joint using the special tool. Refer to section 18 for how to use the ball joint remover.

9. Separate the tie-rod ball joint and knuckle using the special tool.

**CAUTION: Avoid damaging the ball joint boot.**

10. Remove the left tie-rod end, then slide the rack all the way to the right.
11. Separate the exhaust pipe A or TWC (see section 9).
12. Disconnect the shift linkage (see section 13 or section 14).

(cont'd)

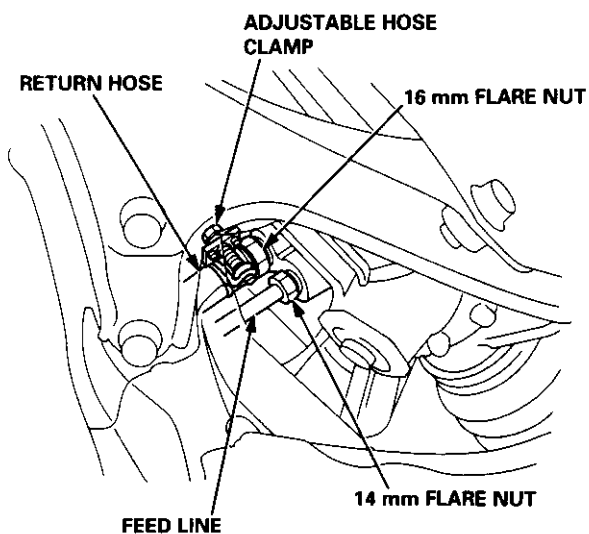
# Steering Gearbox

## Removal (cont'd)

- Loosen the 14 mm flare nut and disconnect the feed line.
- Loosen the adjustable hose clamp and disconnect the return hose.
- Loosen the 16 mm flare nut and remove the return hose joint from the valve body unit.

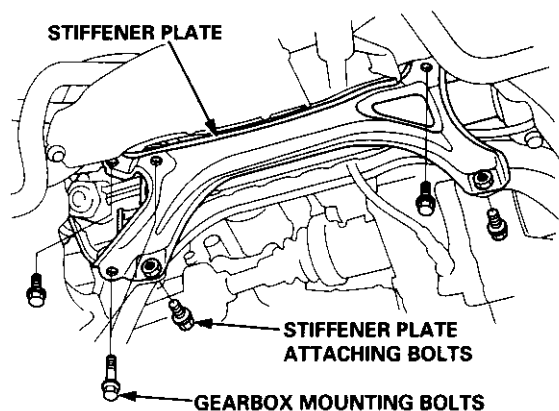
**CAUTION:** After disconnecting the hose and line, plug or seal the hose and line with a piece of tape or equivalent to prevent foreign materials from entering the valve body unit.

**NOTE:** Do not loosen the cylinder line A and B between the valve body unit and cylinder.

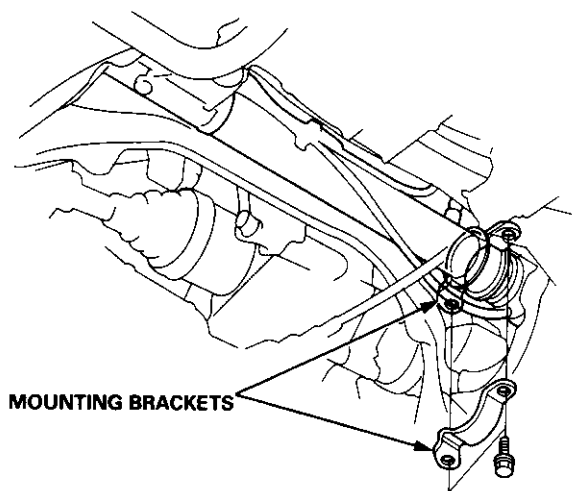


- Remove the stiffener plate.

**NOTE:** Some stiffener plate attaching bolts are also used as gearbox mounting bolts. The gearbox will tilt to side when these bolts are removed.

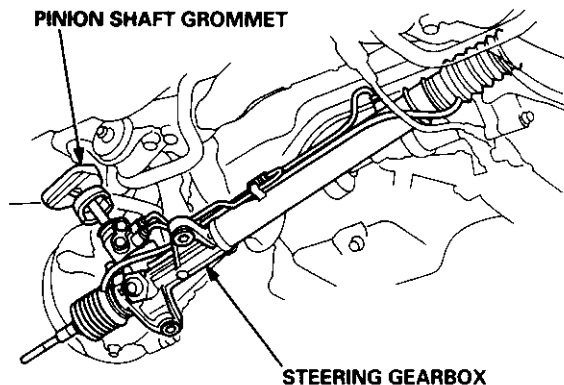


- Remove the mounting brackets.



- Pull the steering gearbox all the way down to clear the pinion shaft from the bulkhead, then remove the pinion shaft grommet.
- Move the steering gearbox to right so the left rack end clears the rear beam, then tilt the left side down to remove it from the vehicle.

**CAUTION:** Be careful not to bend or damage the feed line and cylinder lines when removing the gearbox.





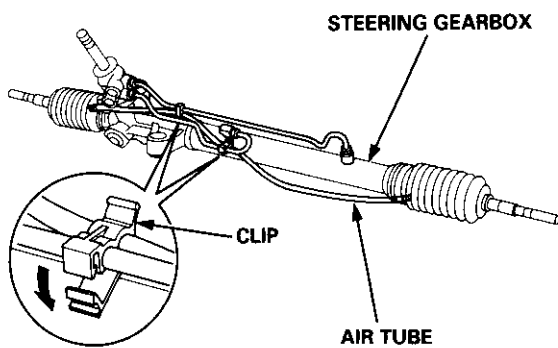
## Disassembly

### Steering Rack Disassembly

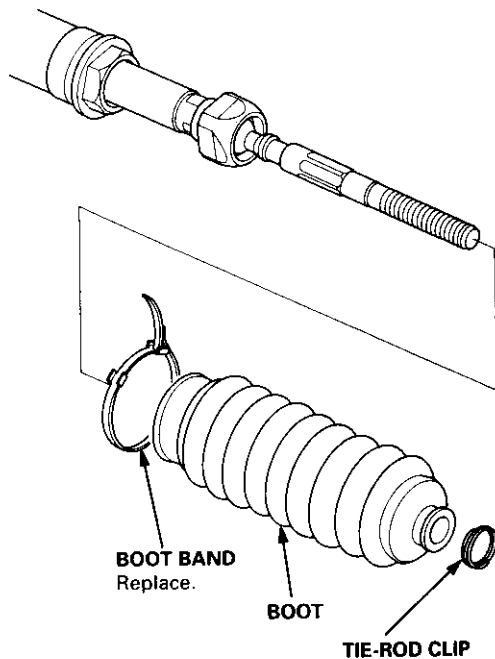
**NOTE:**

- Before disassemble the gearbox, wash it off with solvent and a brush.
- Do not dip seals and O-rings in solvent.

1. Remove the steering gearbox (see page 17-47).
2. Remove the tie-rod end and locknut.
3. Remove air tube and clips.



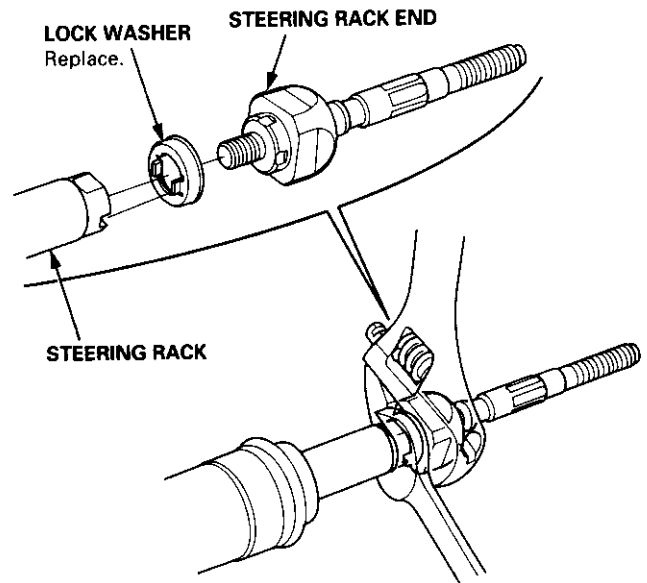
4. Remove the boot bands and tie-rod clips. Pull the boots away from the ends of the gearbox.



5. Hold the steering rack with a wrench ('98 - '00 models: left end only), and unscrew the rack end with another wrench.

**CAUTION:** Be careful not to damage the rack surface with the wrench.

**NOTE:** '96 - '97 models is shown.

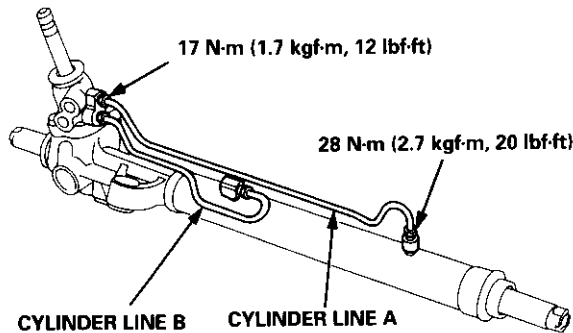




55. Install the cylinder lines A and B.

NOTE:

- Clean the joints of the cylinder lines A and B thoroughly. The joints must be free of foreign material.
- Install the cylinder lines A and B by tightening the flare nuts by hand first, then tighten the flare nuts to the specified torque.



56. Grease the sliding surface of the rack guide, and install it onto the gear housing.

57. '96 - '97 models:

Apply a thin coat of grease to the new O-ring, and install it on the rack guide screw.

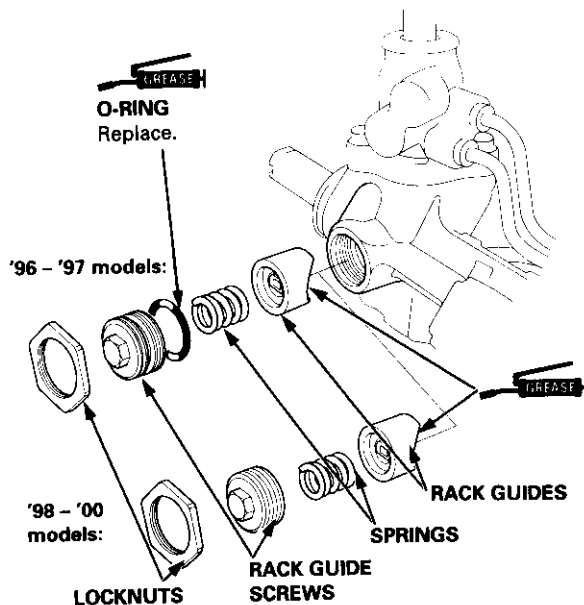
'98 - '00 models:

Remove the old sealant off of the threaded section, then apply new sealant all around the threads.

58. Install the spring, rack guide screw and locknut on the gear housing.

59. Adjust the rack guide screw (see page 17-33).

NOTE: After adjusting, check that the rack moves smoothly by sliding the rack right and left.



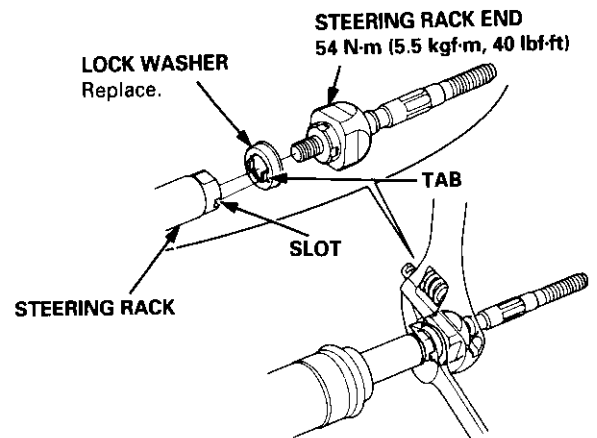
60. Install the new lockwasher in the groove in the steering rack.

61. Screw each rack ends into the rack.

62. Hold the steering rack with a wrench ('98 - '00 models: left end only), and tighten the rack ends.

CAUTION: Be careful not to damage the rack surface with the wrench.

NOTE: '96 - '97 model is shown.

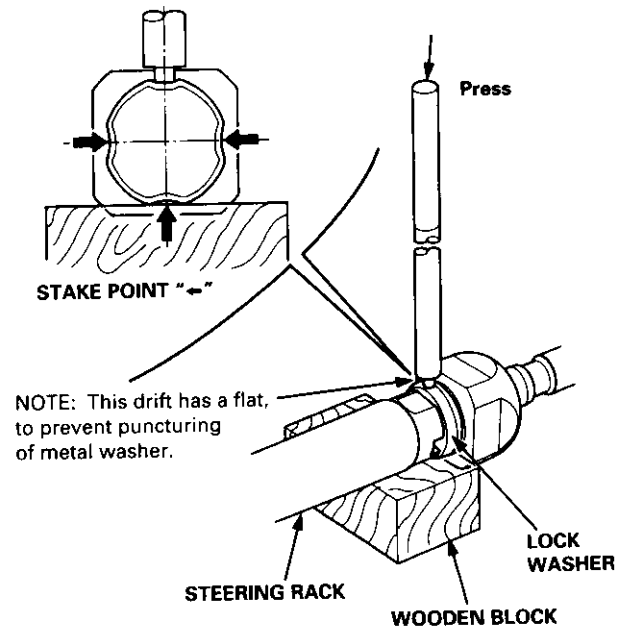


63. After tightening the rack ends, stake the four sections of lock washer with a drift and a mallet.

● Place the wood block on the press table, then set the lock washer section of the rack end on the wood block securely.

● Be sure the tool is aligned with the flat sections of the steering rack end before pressing.

● Stake the lock washer in the center of the flat section of the steering rack end.

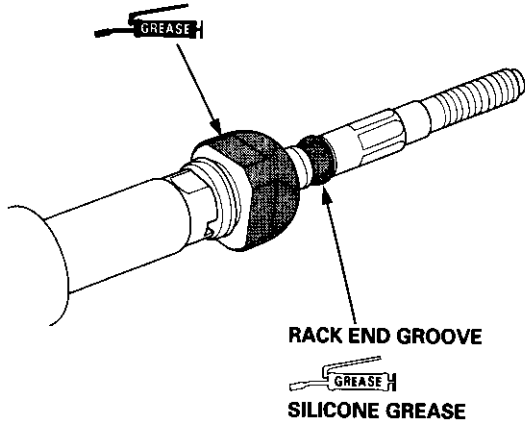


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# Steering Gearbox

## Reassembly (cont'd)

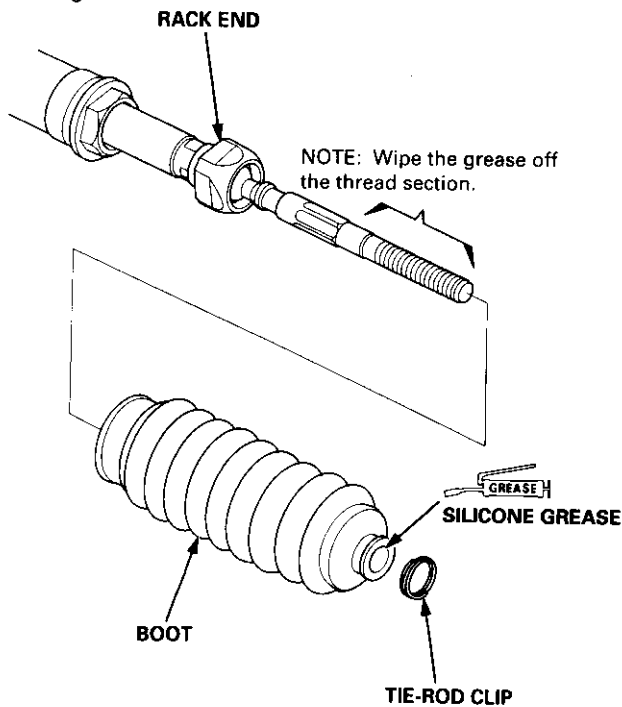
64. Apply grease to the circumference of the rack end housing.



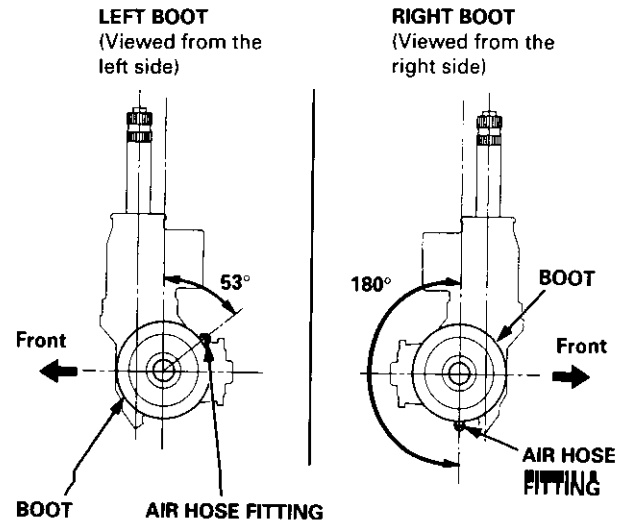
65. Apply a light coat of silicone grease to the boot grooves on the rack ends.

66. Install the boots in the rack end with the tie-rod clips.

NOTE: Install the boots with the rack in the straight ahead position (right and left tie-rods are equal in length).

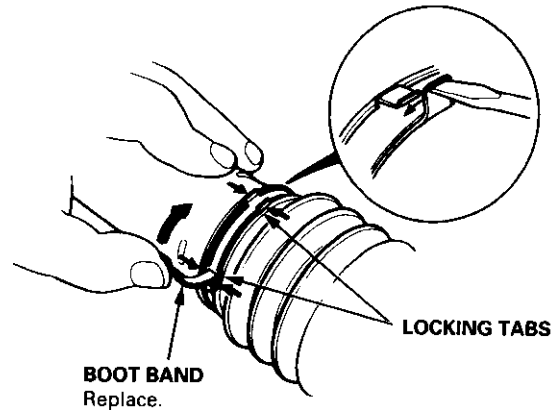


67. Adjust the air hose fitting position of the boots by turning it as shown below.



68. Install new boot bands on the boot, and bend both sets of locking tabs.

**CAUTION: Stake the band locking tabs firmly.**

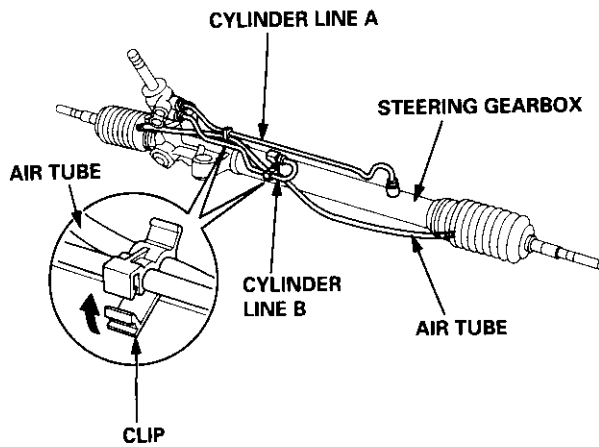


69. Lightly tap on the doubled-over portions to reduce their height.

70. Slide the rack right and left to be certain that the boots are not deformed or twisted.



71. Connect the air tube between the right and left boot.
72. Install the clips on the cylinder lines, then clamp the air tube with the clips.

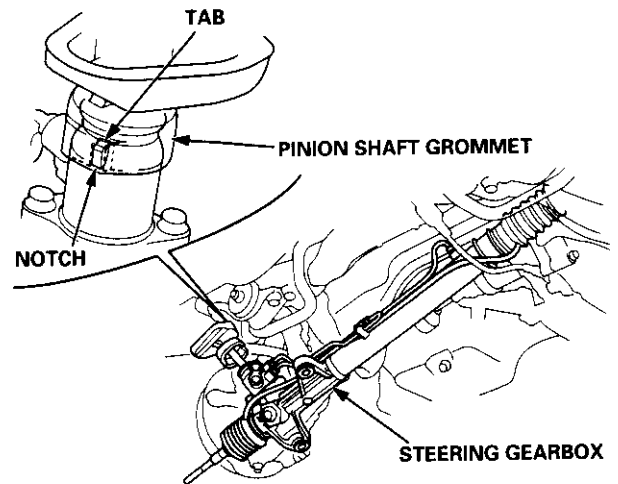


## Installation

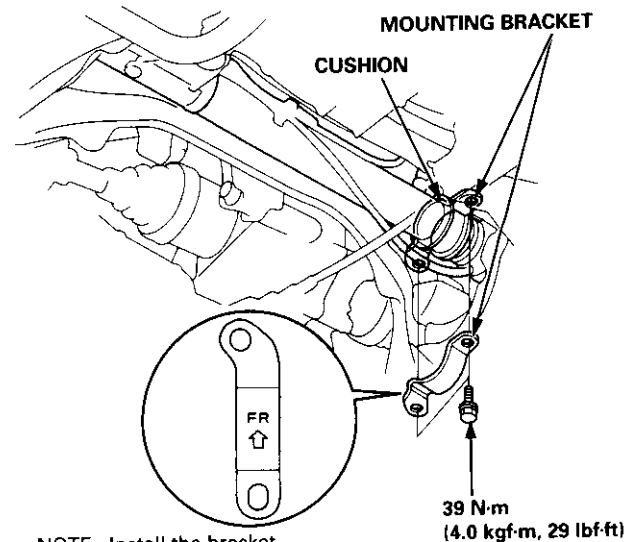
**CAUTION:** Be careful not to bend or damage the feed line and cylinder lines when installing the gearbox.

1. Before installing the gearbox, slide the rack all the way to right.
2. Install the mounting cushion on the steering gearbox.
3. Install the pinion shaft grommet, then insert the pinion shaft through the bulkhead.

**NOTE:** Align the notch in the pinion shaft grommet with the tab on the valve housing.



4. Install the mounting bracket over the mounting cushion, then install two gearbox mounting bolts.



**NOTE:** Install the bracket with the arrow pointing toward the front.

39 N·m  
(4.0 kgf·m, 29 lbf·ft)

(cont'd)

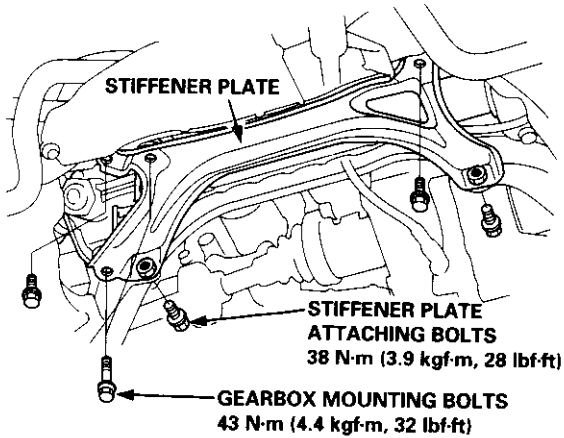
# Steering Gearbox

## Installation (cont'd)

5. Install the stiffener plate with the two gearbox mounting bolts and stiffener plate attaching bolts.

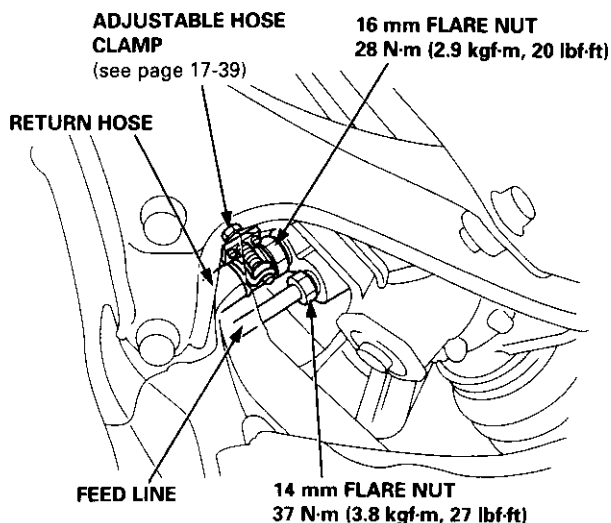
**CAUTION:** Be sure the air tube is not caught or pinched by stiffener plate.

**NOTE:** Install the bolts loosely first, then tighten them securely.



6. Install the return hose joint by tightening the 16 mm flare nut.
7. Connect the return hose securely, and tighten the adjustable hose clamp from the engine compartment.
8. Connect the feed line and tighten the 14 mm flare nut.

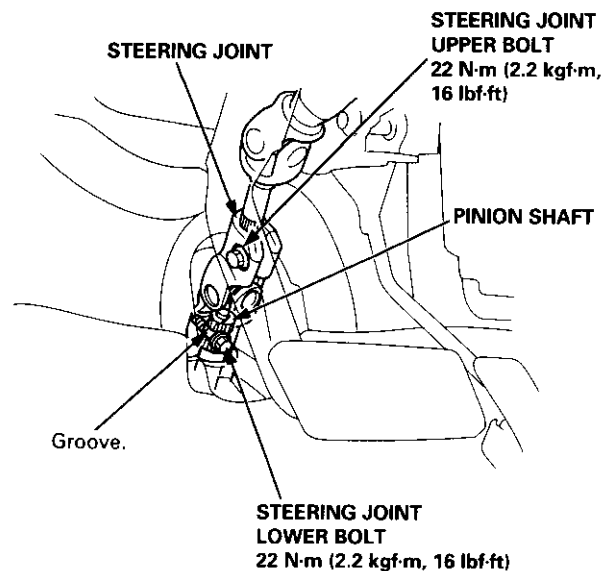
**NOTE:** Make sure that there is no interference between the fluid lines, the rear beam or any other parts.



9. Center the steering rack within its stroke.
10. Slip the lower end of the steering joint onto the pinion shaft (line up the bolt hole with the groove around the shaft), and tighten the upper and lower steering joint bolt.

**NOTE:**

- Connect the steering shaft and pinion with the cable reel and steering rack centered.
- Be sure that the lower steering joint bolt is securely in the groove in the steering gearbox pinion.
- If the steering wheel and rack are not centered, reposition the serrations at lower end of the steering joint.

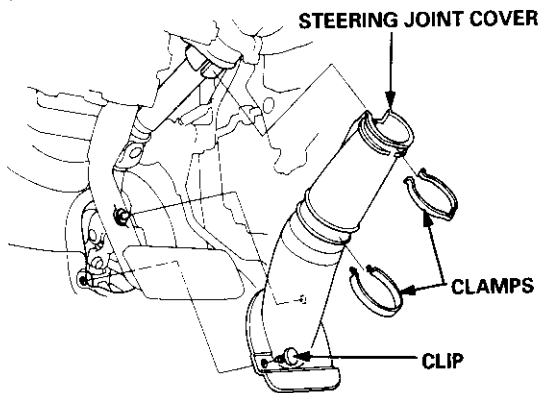


11. Center the cable reel by first rotating it clockwise until it stops. Then rotate it counterclockwise (approximately two turns) until the arrow mark on the label points straight up. Reinstall the steering wheel (see page 17-35).





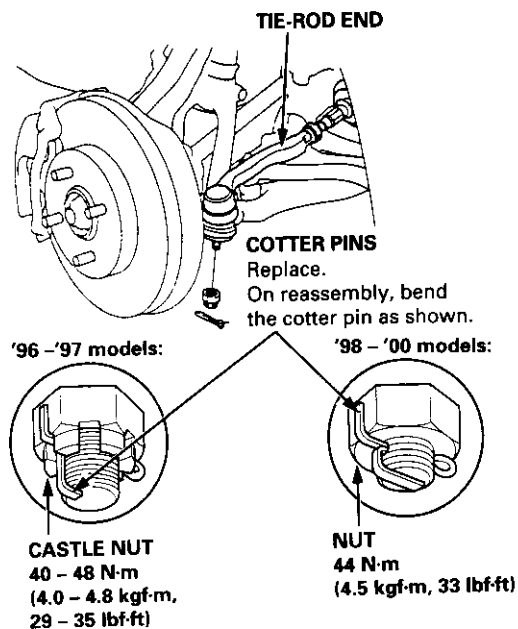
12. Install the steering joint cover with the clamps and a clip.



13. Reconnect the tie-rod ends to the steering knuckles, tighten the castle nut ('96 - '97 models) or nut ('98 - '00 models) to the specified torque, and install new cotter pins.

NOTE: Before connecting the tie-rod ends, wipe off any grease contamination from the ball joint tapered section and threads.

**CAUTION:** Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening ('96 - '97 models only).



14. Install the exhaust pipe A or TWC (see section 9).
15. Connect the shift linkage (see section 13 or section 14).
16. Install the front wheels.
17. Fill the system with power steering fluid, and bleed air from the system (see page 17-33).
18. After installation, perform the following checks.
  - Start the engine, allow it to idle, and turn the steering wheel from lock-to-lock several times to warm up the fluid. Check the gearbox for leaks (see page 17-39).
  - Adjust the front toe (see section 18).
  - Check the steering wheel spoke angle. Adjust by turning the right and left tie-rods, if necessary.

NOTE: Turn the right and left tie-rods equally.

## Ball joint Boot Replacement

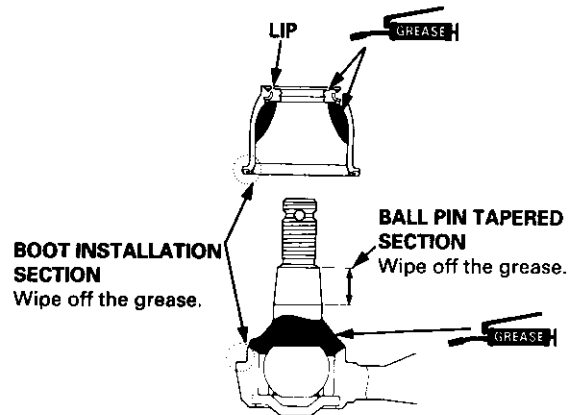
'98 - '00 models:

**CAUTION:** Do not contaminate the boot installation section with grease.

1. Remove the boot from the tie-rod end, and wipe the old grease off the ball pin.
2. Pack the lower area of the ball pin with fresh grease.
3. Pack the interior of the new boot and lip with fresh grease.

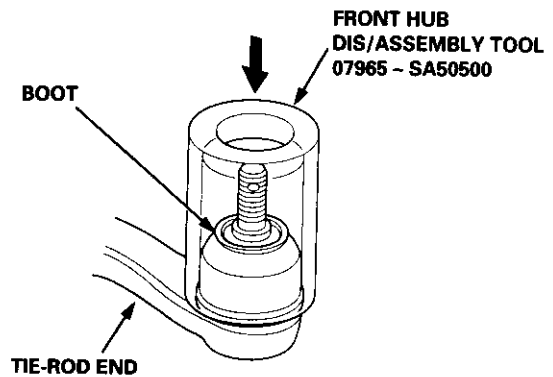
**CAUTION:**

- 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 new boot using the special tool as shown below.

**NOTE:** The boot must not be a gap at the boot installation sections.



**CAUTION:** After installing the boot, check the ball pin tapered section for grease contamination, and wipe it if necessary.

# Suspension

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# Component Locations



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#### KNUCKLE/HUB

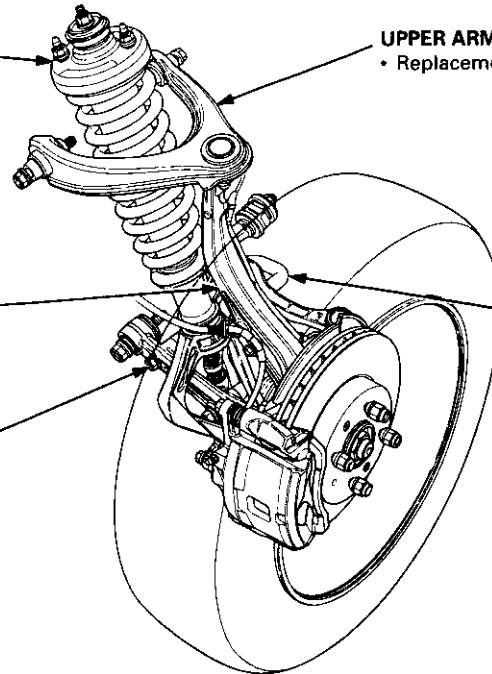
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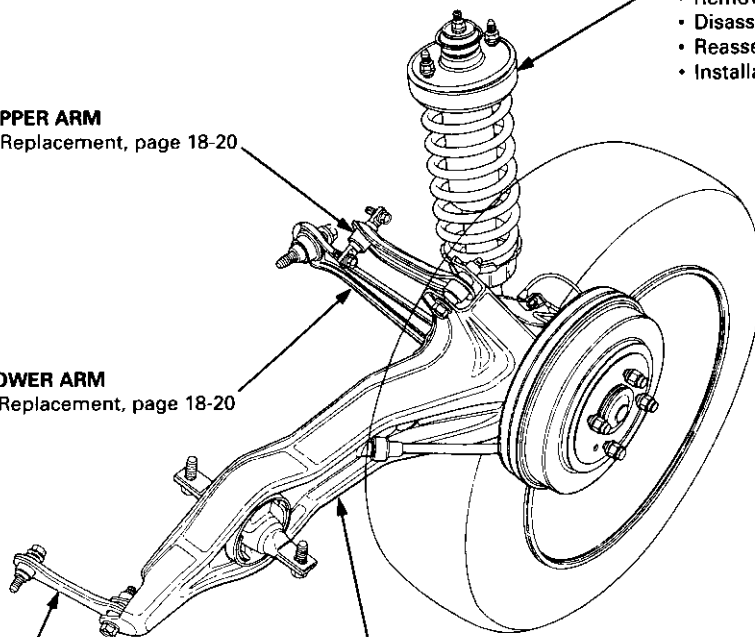
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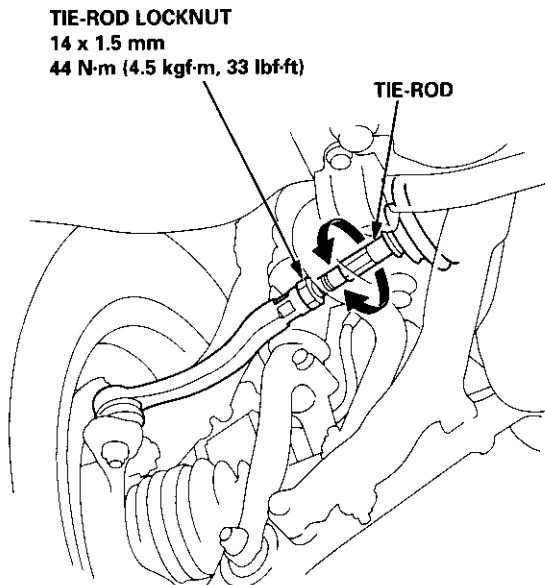
## Front Toe Inspection/Adjustment

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

1. Check the tire pressure.
2. Center steering wheel spokes.
3. Check the toe with the wheels pointed straight ahead.

**Front toe: IN  $1 \pm 2$  mm (IN  $1/16 \pm 1/16$  in)**

- If adjustment is required, go on to step 4.
  - If no adjustment is required, remove alignment equipment.
4. Loosen the tie-rod locknuts, and turn both tie-rods in the same direction until the front wheels are in straight ahead position.



5. Turn both tie-rods equally until the toe reading on the turning radius gauge is correct.
6. After adjusting, tighten the tie-rod locknuts.

NOTE: Reposition the tie-rod boot if it is twisted or displaced.

## Rear Toe Inspection/Adjustment

NOTE: Use commercially-available computerized four wheel alignment equipment to measure wheel alignment (caster, camber, toe, and turning angle). Follow the equipment manufacturer's instructions.

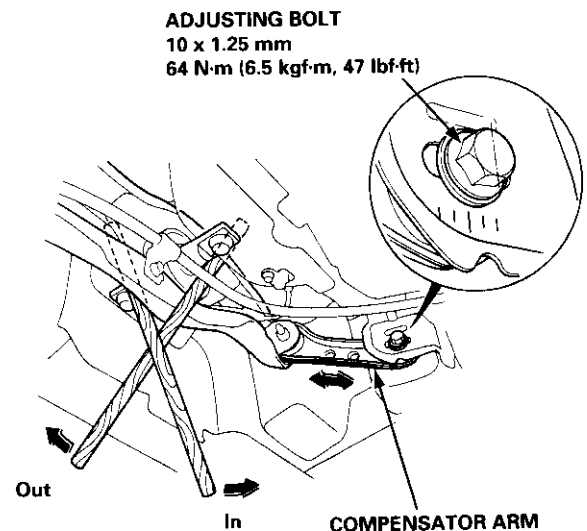
1. Release parking brake.

NOTE:

- Measure difference in toe measurements with the wheels pointed straight ahead.
- If the parking brake is engaged, you may get an incorrect reading.

**Rear toe-in:  $2 \pm 2$  mm ( $1/16 \pm 1/16$  in)**

- If adjustment is required, go to step 2.
  - If no adjustment is required, remove alignment equipment.
2. Before adjustment, note the locations of adjusting bolts on the right and left compensator arms.
  3. Loosen the adjusting bolts, and slide the compensator arm in or out, as shown, to adjust the toe.



4. Tighten the adjusting bolts.
- Example:  
After the rear toe inspection, the wheel is 2 mm (0.08 in) out of the specification.  
— Move the arm so the adjusting bolt moves 2 mm (0.08 in) inward from the position recorded before the adjustment.  
— The distance the adjusting bolt is moved should be equal to the amount out-of-specification.

# Front Suspension

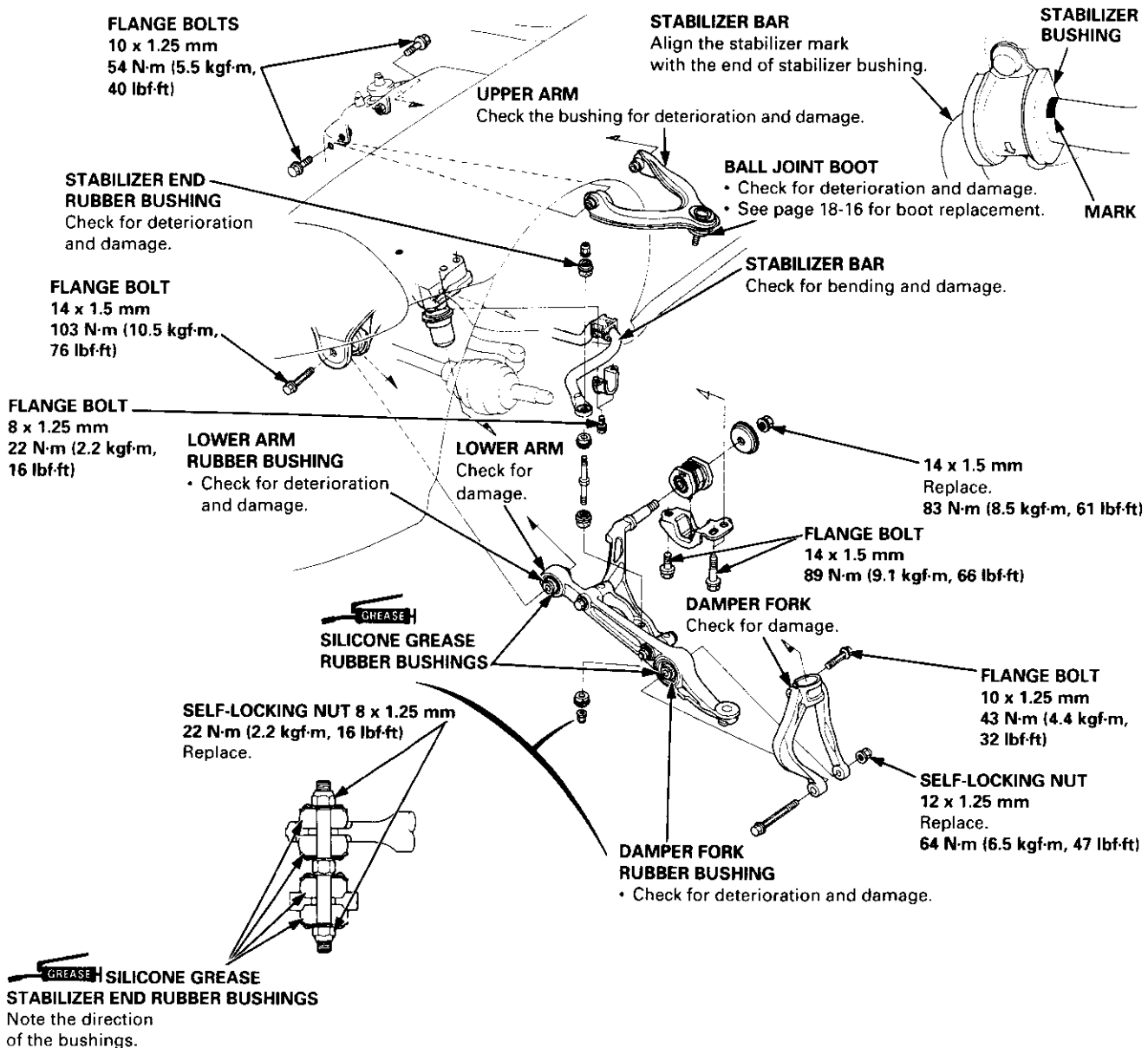
## Suspension Arms Replacement ('96 – 99 models)

### CAUTION:

- Replace the self-locking nuts after removal.
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.

### NOTE:

- Wipe off any dirt, oil or grease on the threads before tightening the fasteners.
- The right and left damper forks are not interchangeable. The left damper fork is marked with "AL" while the right damper fork is marked with "AR".
- The right and left upper arms are not interchangeable. The left upper arm is marked with "SO1-L" while the right upper arm is marked with "SO1-R".
- Before tightening the upper and lower mounting nuts on the stabilizer link, adjust the location of the link with the suspension under vehicle load.
- When installing the radius arm washers, the "FR" mark faces the front of the vehicle.
- After installing the suspension arm, check the front wheel alignment, and adjust if necessary (see page 18-4).



# Front Suspension

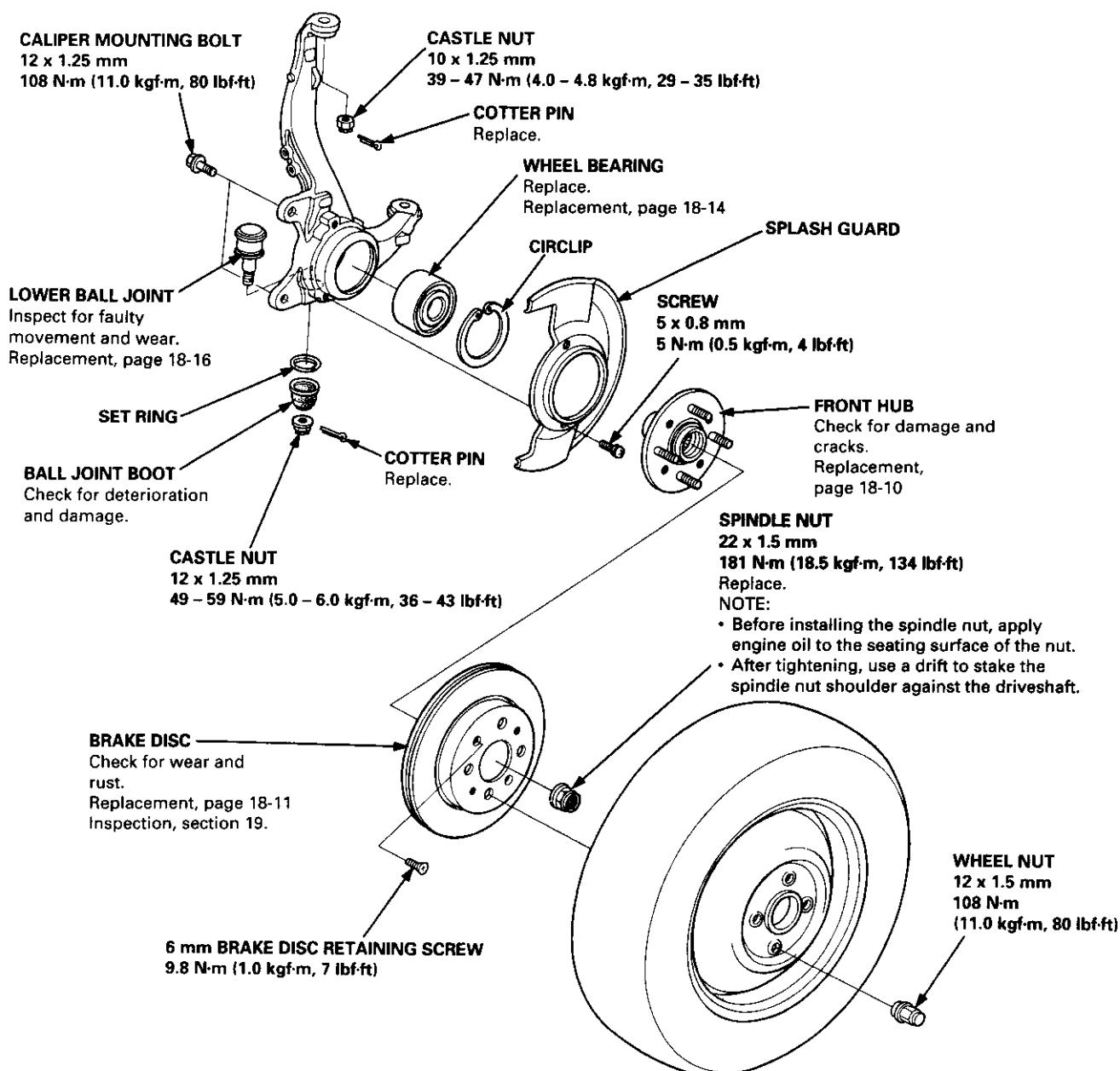
## Knuckle/Hub Replacement

### CAUTION:

- Replace the self-locking nuts after removal.
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.
- Torque the castle nut to the lower torque specification, then tighten it only far enough to align the slot with the pin hole. Do not align the nut by loosening.

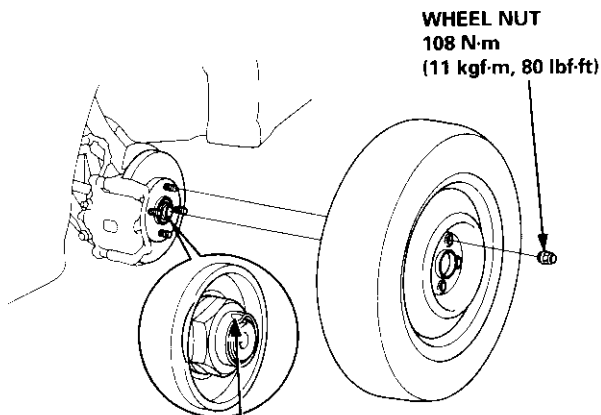
### NOTE:

- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- On the aluminum wheels, remove the center cap from the inside of the wheel after removing the wheel.
- Before installing the brake disc, clean the mating surfaces of the front hub and brake disc.
- Before installing the wheel, clean the mating surfaces of the brake disc and wheel.
- Wipe off the grease before tightening the nut at the ball joint.





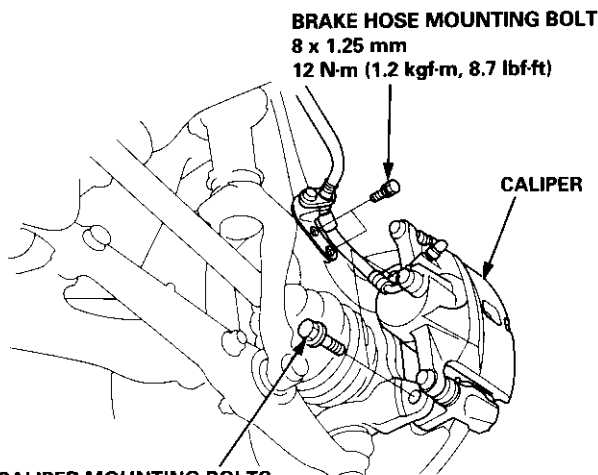
1. Loosen the wheel nuts slightly.
2. Raise the front of the vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and wheel.



**WHEEL NUT**  
108 N-m  
(11 kgf-m, 80 lbf-ft)

**SPINDLE NUT**  
181 N-m (18.5 kgf-m, 134 lbf-ft)  
Replace.  
NOTE: Before installing the spindle nut, apply engine oil to the seating surface of the nut. After tightening, use a drift to stake the spindle nut shoulder against the driveshaft.

4. Raise the locking tab on the spindle nut, then remove the nut.
5. Remove the brake hose mounting bolts.



**BRAKE HOSE MOUNTING BOLT**  
8 x 1.25 mm  
12 N-m (1.2 kgf-m, 8.7 lbf-ft)

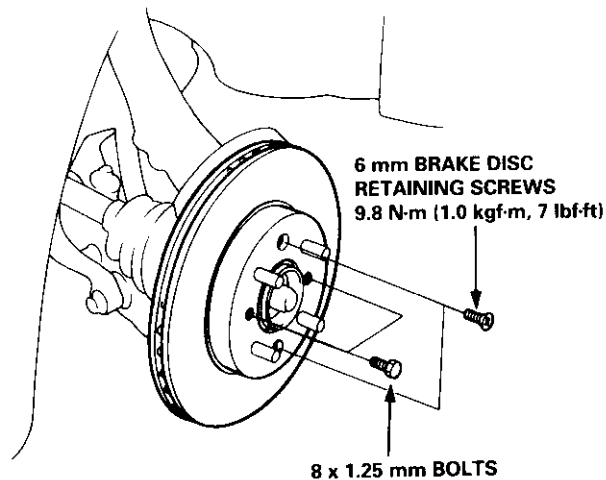
**CALIPER**

**CALIPER MOUNTING BOLTS**  
12 x 1.25 mm  
108 N-m (11.0 kgf-m, 80 lbf-ft)

6. Remove the caliper mounting bolts and hang the caliper assembly to one side.

**CAUTION:** To prevent accidental damage to the caliper assembly or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

7. Remove the 6 mm brake disc retaining screws.



**6 mm BRAKE DISC RETAINING SCREWS**  
9.8 N-m (1.0 kgf-m, 7 lbf-ft)

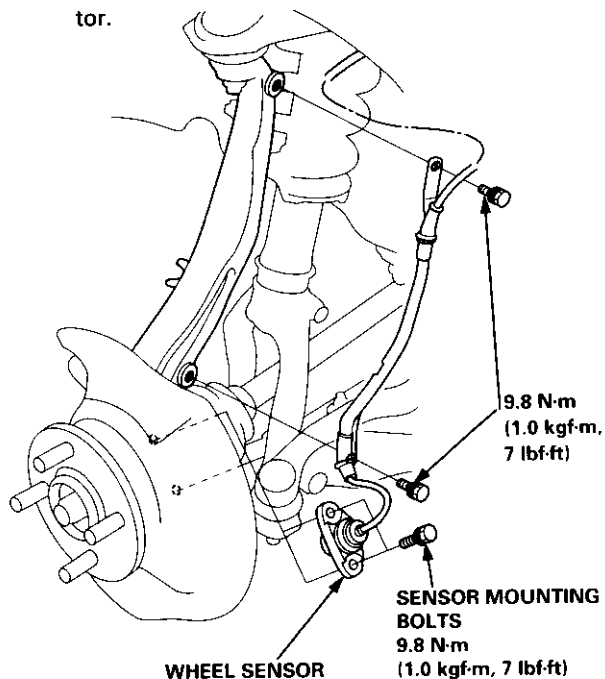
**8 x 1.25 mm BOLTS**

8. Screw two 8 x 1.25 mm bolts into the disc to push it away from the hub.

**NOTE:** Turn each bolt two turns at a time to prevent cocking the disc excessively.

9. Remove the brake disc from the knuckle.
10. Check the front hub for damage and cracks.
11. Remove the wheel sensor from the knuckle (for vehicles with ABS).

**NOTE:** Do not disconnect the wheel sensor connector.



**9.8 N-m**  
(1.0 kgf-m,  
7 lbf-ft)

**SENSOR MOUNTING BOLTS**  
9.8 N-m  
(1.0 kgf-m, 7 lbf-ft)

**WHEEL SENSOR**

(cont'd)



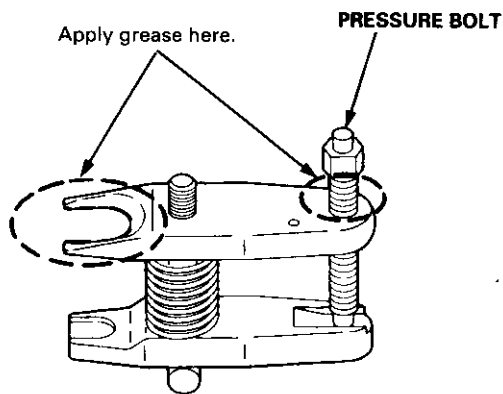
# Front Suspension

## Knuckle/Hub Replacement (cont'd)

**NOTE:** Use the special tool to separate the ball joints from the suspension or steering arm.

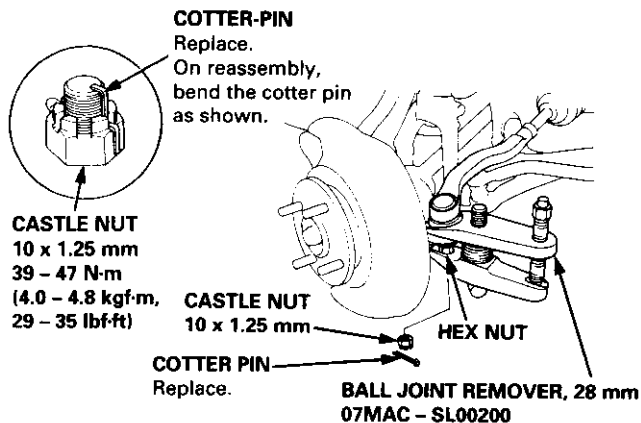
**CAUTION:** Be careful not to damage the ball joint boot.

12. Clean any dirt or grease off the ball joint.
13. Remove the cotter pin from the steering arm, and remove the nut.
14. Apply grease to the special tool on the areas shown. This will ease installation of the tool and prevent damage to the pressure bolt threads.

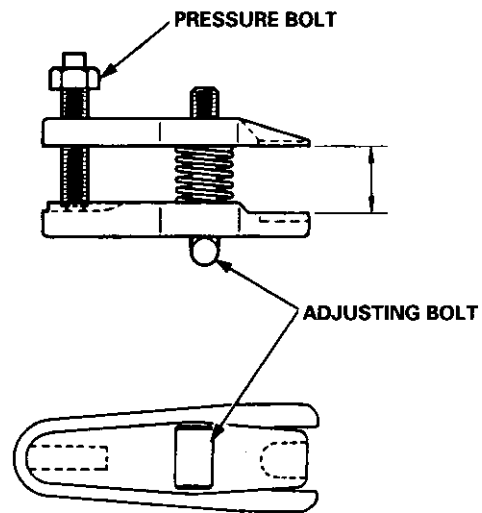


15. Install a 10 mm hex nut onto the ball joint. Be sure that the hex nut is flush with the ball joint pin end to prevent damage to the threaded end of the ball joint.
16. Install the special tool as shown. Insert the jaws carefully, making sure you do not damage the ball joint boot. Adjust the jaw spacing by turning the pressure bolt.

**NOTE:** If necessary, apply penetrating type lubricant to loosen the ball joint.



17. Once the special tool is in place, turn the adjusting bolt as necessary to make the jaws parallel. Then hand-tighten the pressure bolt, and recheck the jaws to make sure they are still parallel.



**NOTE:** After making the adjustment to the adjusting bolt, be sure the head of the adjusting bolt is in this position to allow the jaw to pivot.

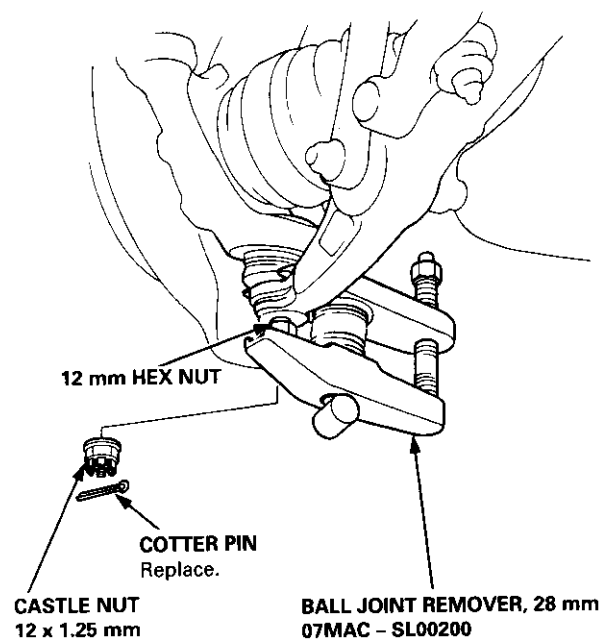
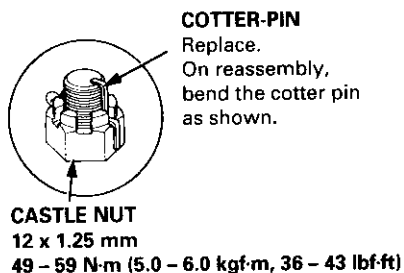
18. With a wrench, tighten the pressure bolt until the ball joint shaft pops loose from the steering arm.

**▲ WARNING** Wear eye protection. The ball joint can break loose suddenly and scatter dirt or other debris into your eyes.

19. Remove the tool, then remove the nut from the end of the ball joint and pull the ball joint out of the steering/suspension arm. Inspect the ball joint boot and replace it if damaged.



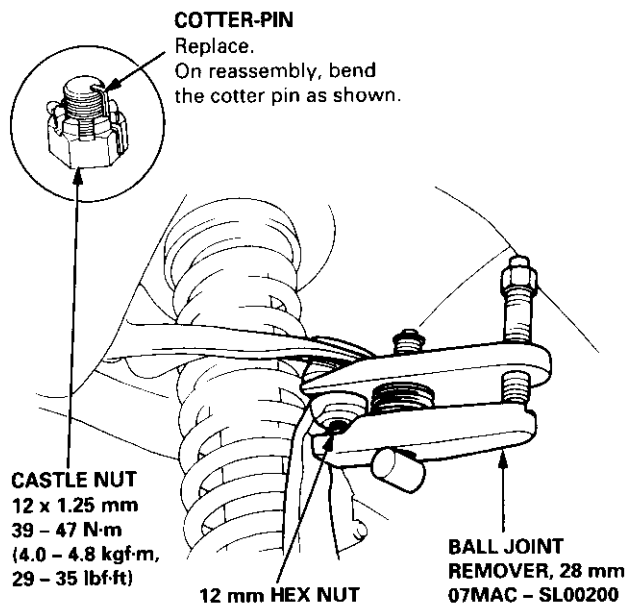
- Remove the cotter pin from the lower arm ball joint castle nut, and remove the nut.



- Install a 12 mm hex nut onto 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.
- Use the special tool as shown on page 18-12 to separate the ball joint and lower arm.

**NOTE:** If necessary, apply penetrating type lubricant to loosen the ball joint.

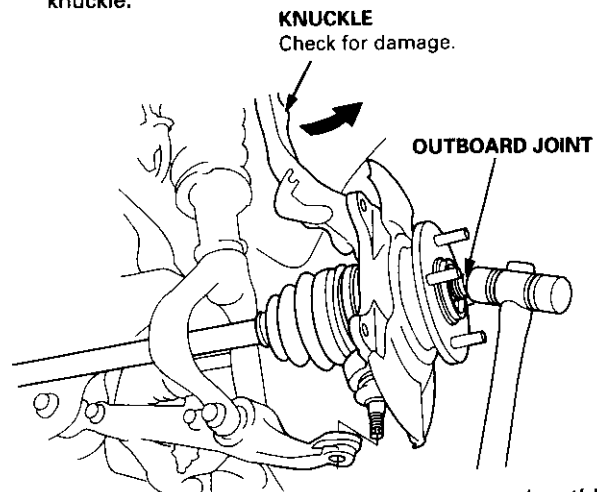
- Remove the cotter pin from the upper ball joint castle nut, and remove the nut.



- Install the 12 mm hex nut onto 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.
- Use the special tool as shown on page 18-12 to separate the ball joint and knuckle.

**NOTE:** If necessary, apply penetrating type lubricant to loosen the ball joint.

- Pull the knuckle outward and remove the driveshaft outboard joint from the knuckle by tapping the drive shaft end with a plastic hammer, then remove the knuckle.



(cont'd)

# Front Suspension

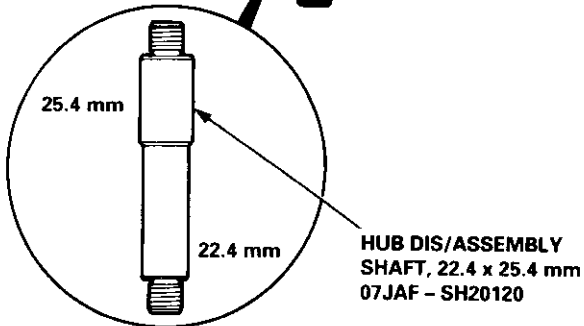
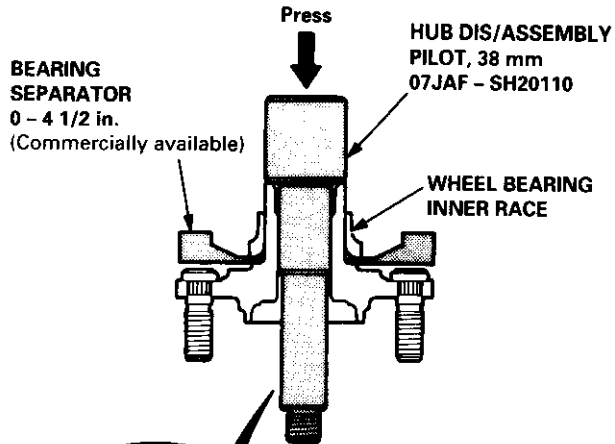
## Knuckle/Hub Replacement (cont'd)

NOTE: Replace the bearing with a new one after removal.

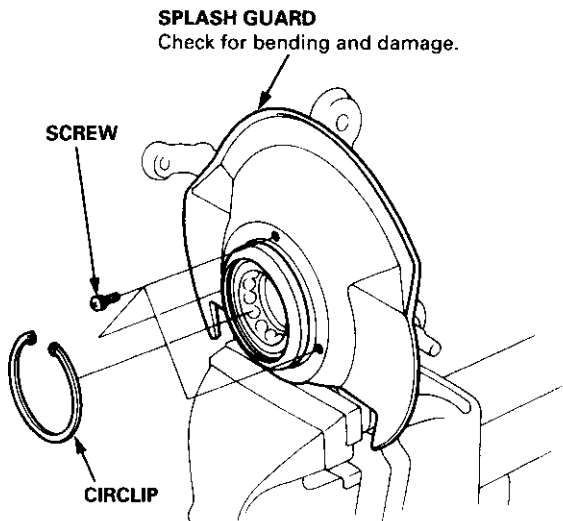
27. Separate the hub from the knuckle using the special tools and a hydraulic press.

### CAUTION:

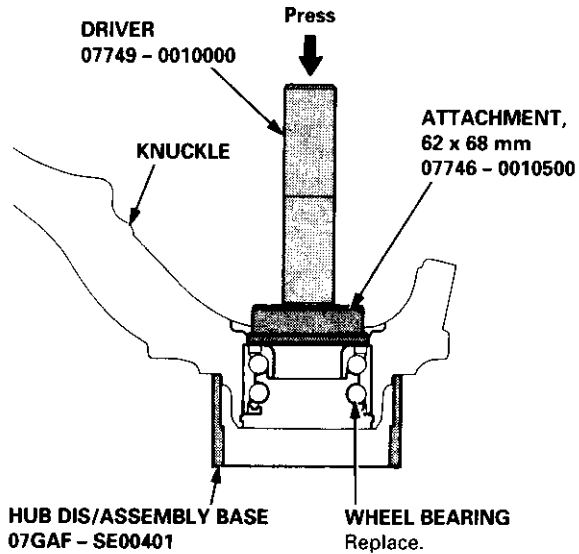
- Take care not to distort the splash guard.
- Hold onto the hub to keep it from falling when pressed clear.
- To prevent damage to the tool, make sure the threads are fully engaged before pressing.



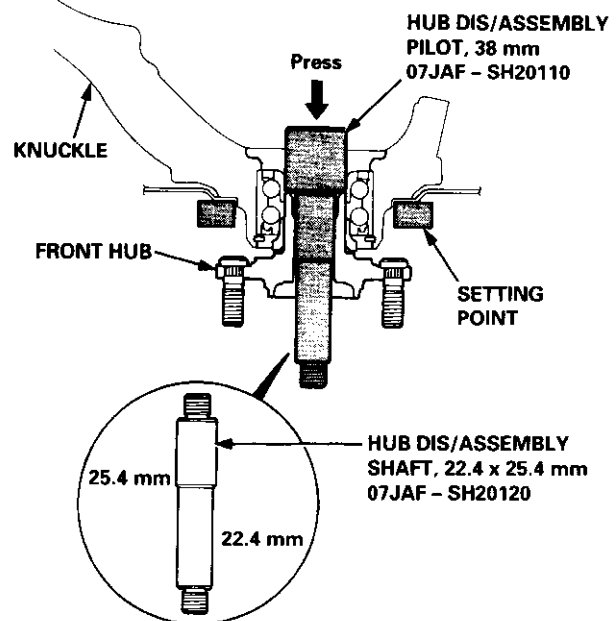
28. Remove the circlip and the splash guard from the knuckle.



29. Press the wheel bearing out of the knuckle using the special tools and a press as shown.



30. Press the wheel bearing inner race from the hub using the special tools, a bearing separator, and a press as shown.

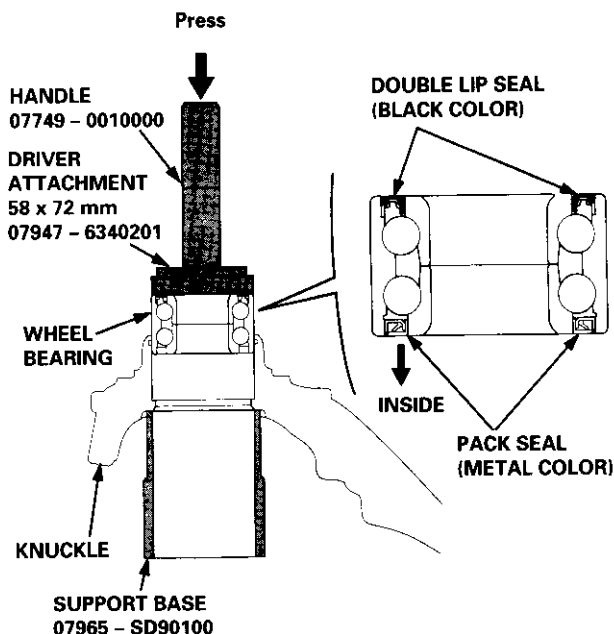




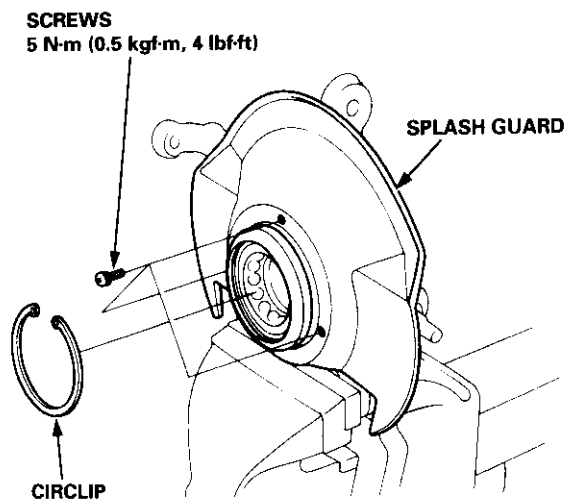
NOTE: Wash the knuckle and hub thoroughly in high flash point solvent before reassembly.

31. Press a new wheel bearing into the knuckle using the special tools and a press as shown.

NOTE: Place the wheel bearing onto the knuckle with the pack seal (metal color) toward the inside. Be careful not to damage the sleeve of the pack seal.

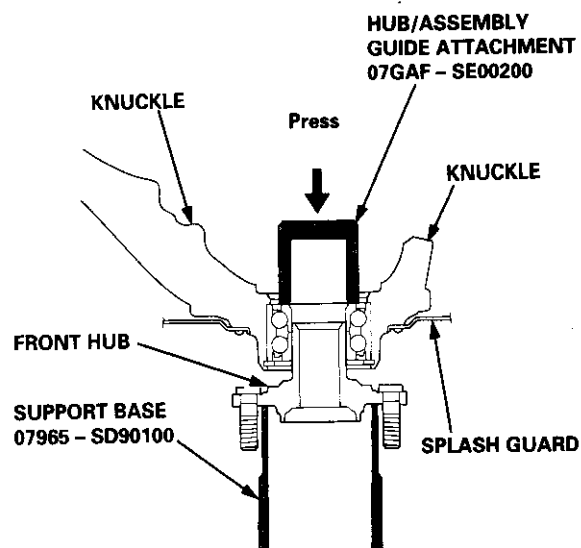


32. Install the circlip securely in the knuckle groove.
33. Install the splash guard, and tighten the screws.



34. Install the hub on the knuckle using the special tools shown and a hydraulic press as shown.

**CAUTION: Take care not to distort the splash guard.**



35. Install the knuckle in the reverse order of removal, and pay particular attention to the following items:

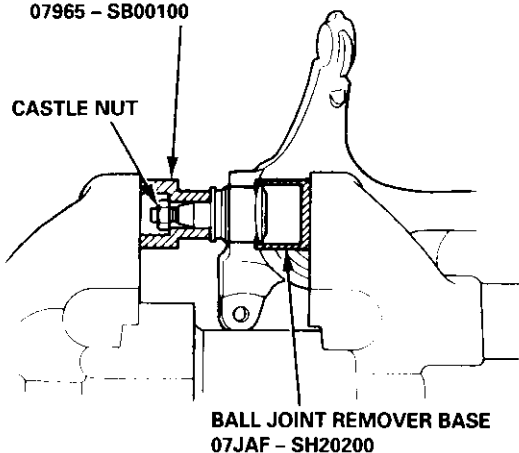
- Be careful not to damage the ball joint boots when installing the knuckle.
- Torque all mounting hardware to the specified torque values.
- Torque the castle nuts to the lower torque specifications, then tighten them only far enough to align the slot with the pin hole. Do not align the castle nut by loosening.
- Install new cotter pins into the castle nuts after torquing.
- Avoid twisting the sensor wires when installing the wheel sensor.
- Before installing the brake disc, clean the mating surfaces of the front hub and the inside of the brake disc.
- Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
- Check the front wheel alignment, and adjust it if necessary (see page 18-4).

# Front Suspension

## Lower Ball Joint Replacement

1. Remove the knuckle (see page 18-11).
2. Remove the boot by prying the set ring off.
3. Check the boot for deterioration and damage, replace if necessary.
4. Install the special tools onto the ball joint and tighten the castle nut.
5. Position the special tools over the ball joint as shown, then set the assembly in a vise. Press the ball joint out of the knuckle.

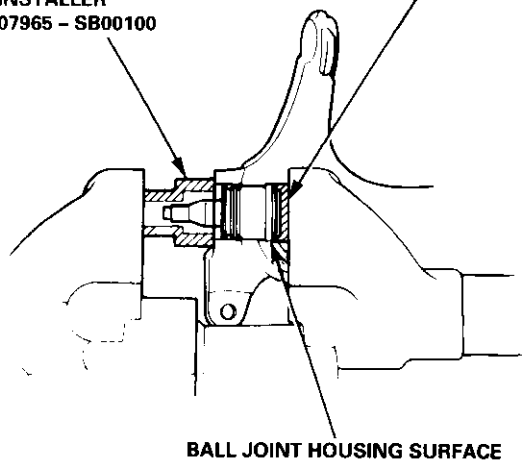
**BALL JOINT REMOVER/INSTALLER**  
07965 - SB00100



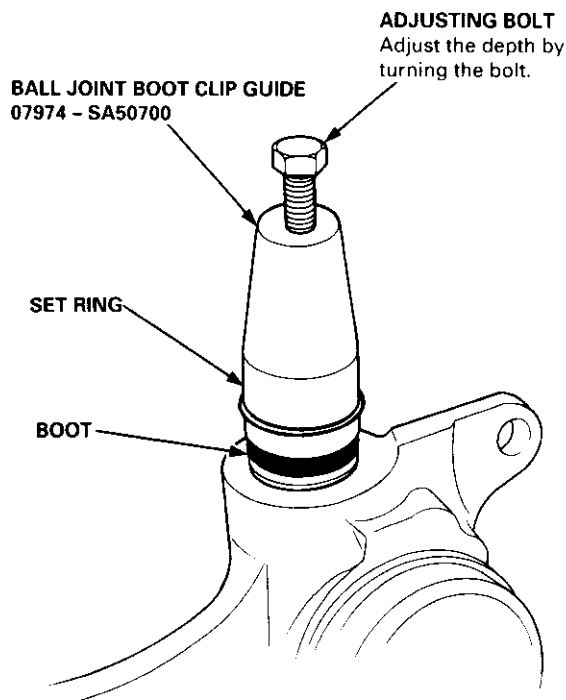
6. Place the ball joint in position by hand.
7. Install the special tools over the ball joint as shown, then press the ball joint in.

**BALL JOINT REMOVER/INSTALLER**  
07965 - SB00100

**BALL JOINT INSTALLER BASE**  
07965 - SB00200



8. Install the ball joint boot and set ring using the special tool (see page 18-16).



9. Install the knuckle in the reverse order of removal, and pay particular attention to the following items:

- Be careful not to damage the ball joint boots when installing the knuckle.
- Torque all mounting hardware to the specified torque values.
- Torque the castle nuts to the lower torque specifications, then tighten them only far enough to align the slot with the pin hole. Do not align the castle nut by loosening.
- Install new cotter pins into the castle nuts after torquing.
- Avoid twisting the sensor wires when installing the wheel sensor.
- Before installing the brake disc, clean the mating surfaces of the front hub and the inside of the brake disc.
- Before installing the wheel, clean the mating surface of the brake disc and the inside of the wheel.
- Check the front wheel alignment, and adjust it if necessary (see page 18-4).

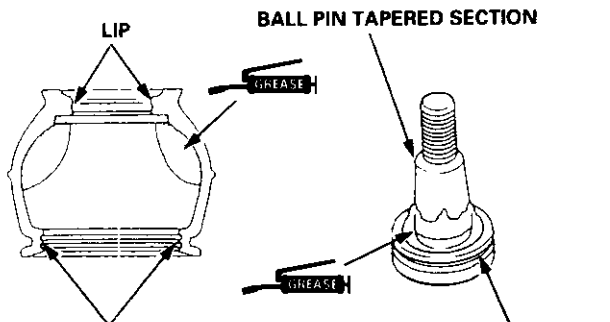


## Ball Joint Boot Replacement

1. Remove the set ring and the boot.

**CAUTION:** Do not contaminate the boot installation section with grease.

2. Pack the interior of the boot and lip with grease.



**BOOT INSTALLATION SECTION** Wipe off the grease.  
**BOOT INSTALLATION SECTION** Wipe off the grease.

3. Wipe the grease off the sliding surface of the ball pin and pack with fresh grease.

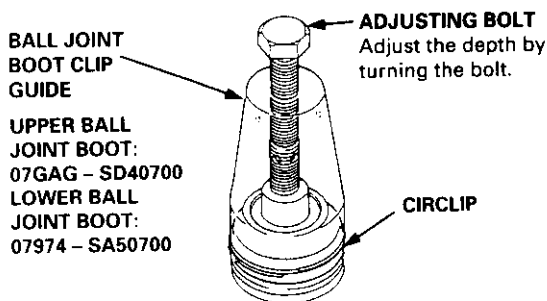
**CAUTION:**

- 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 into the groove of the boot installation section securely, then bleed the air.

5. Install the upper and lower ball joint boot set rings using the special tools as follows:

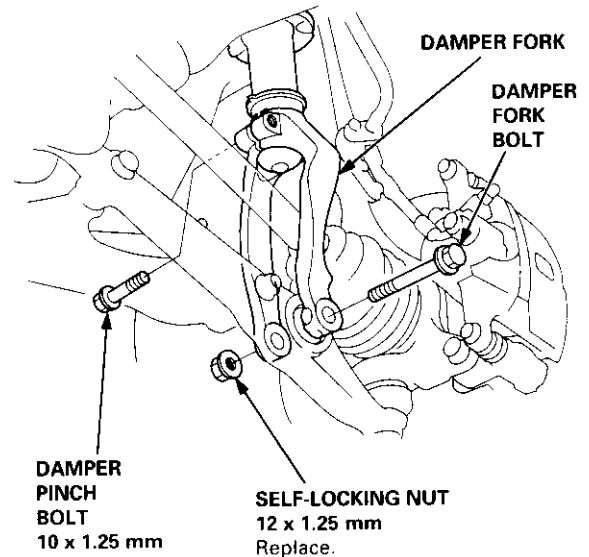
Lower ball joint: Adjust the special tool with the adjusting bolt until the end of the tool aligns with the groove on the boot. Slide the set ring over the tool and into position.



**CAUTION:** After installing the boot, check the ball pin tapered section for grease contamination and wipe it if necessary.

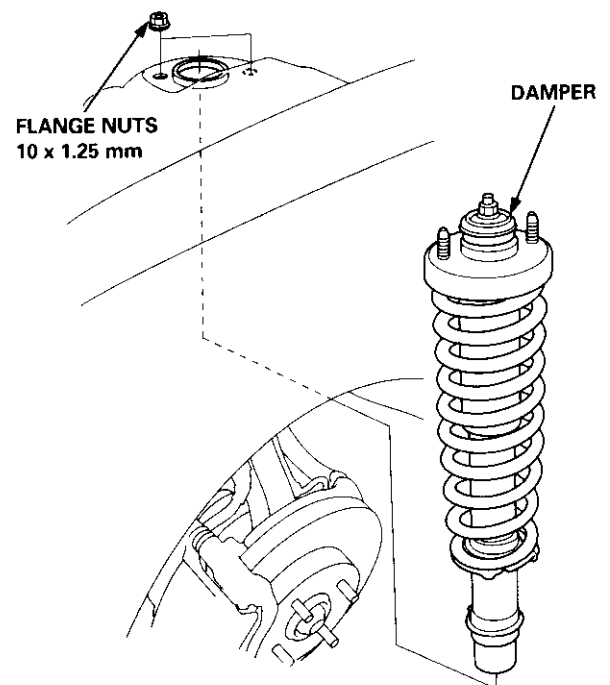
## Removal

1. Remove the front wheels (see page 18-11).
2. Remove the damper pinch bolt from the top of damper fork.



3. Remove the damper fork bolt and self-locking nut from the bottom of the damper fork, then remove damper fork.

4. Remove the damper by removing the two nuts.



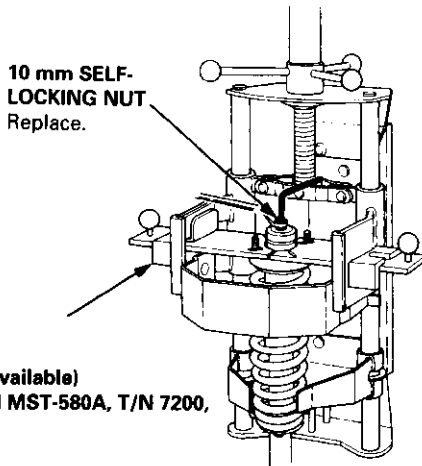
# Front Damper

## Disassembly/Inspection

### Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions, then remove the self-locking nut.

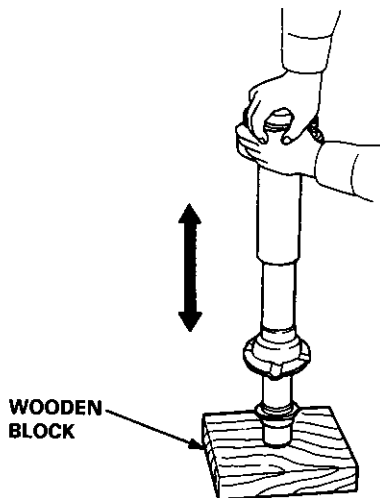
**CAUTION:** Do not compress the spring more than necessary to remove the nut.



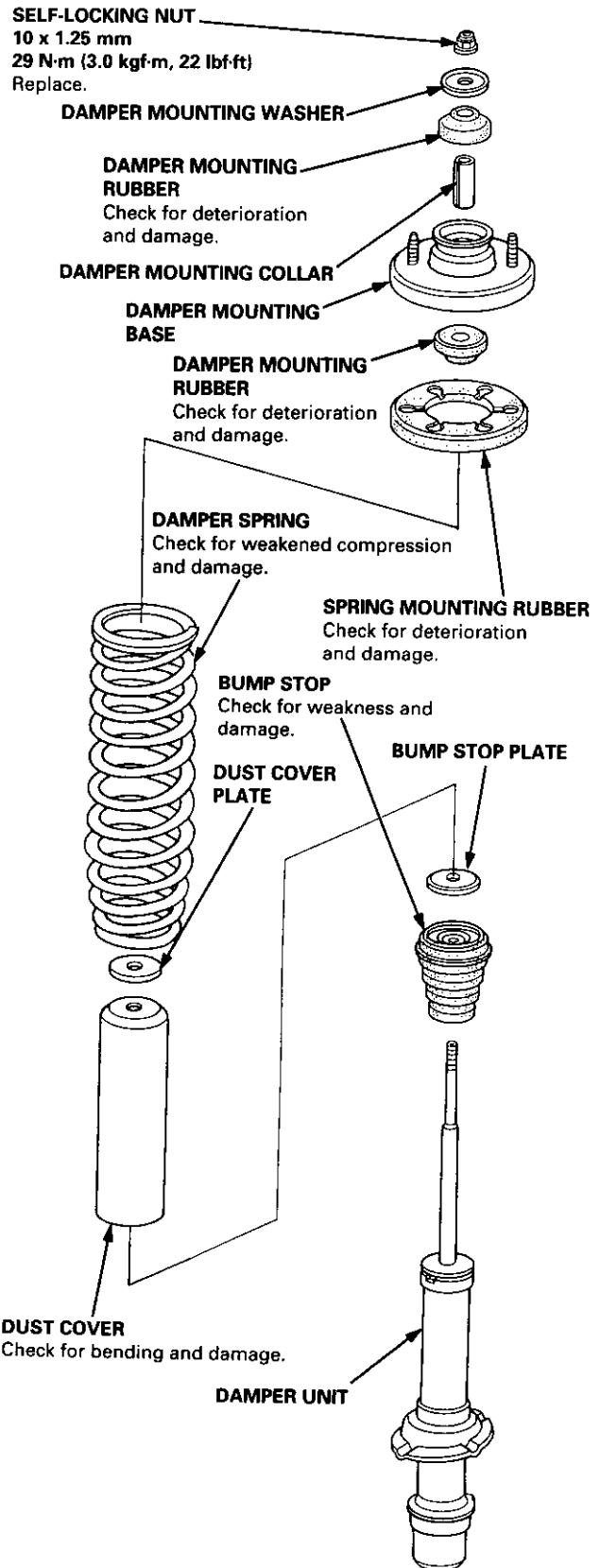
2. Release the pressure from the spring compressor, then disassemble the damper as shown in the next column.

### Inspection

1. Reassemble all parts, except the spring.
2. Push on the damper assembly as shown.



3. Check for smooth operation through a full stroke, both compression and extension.  
NOTE: The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.
4. Check for oil leaks, abnormal noises, or binding during these tests.

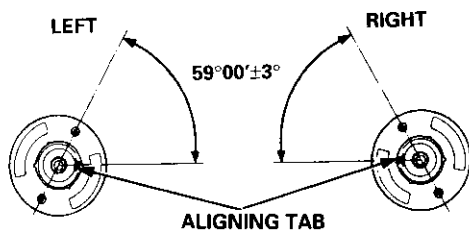




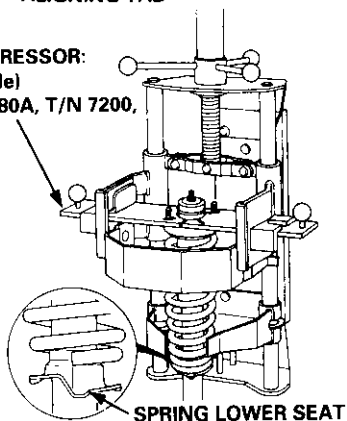
## Reassembly

1. Install the damper unit on a spring compressor.
2. Assemble the damper in reverse order of removal except the damper mounting washer and self locking nut.

NOTE: Align the bottom of the damper spring and spring lower seat as shown.

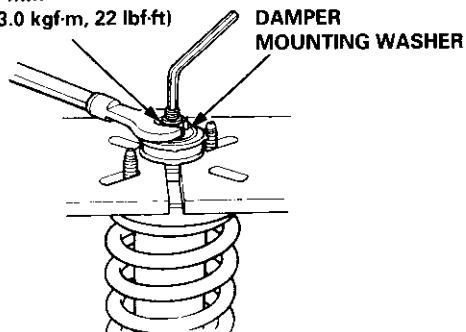


**STRUT SPRING COMPRESSOR:**  
(Commercially available)  
BRANICK® T/N MST-580A, T/N 7200,  
or equivalent



3. Position the damper mounting base onto the damper unit as shown.
4. Compress the damper spring.
5. Install the damper mounting rubber, damper mounting washer, and a new 10 mm self-locking nut.
6. Hold the damper shaft, and tighten the 10 mm self-locking nut.

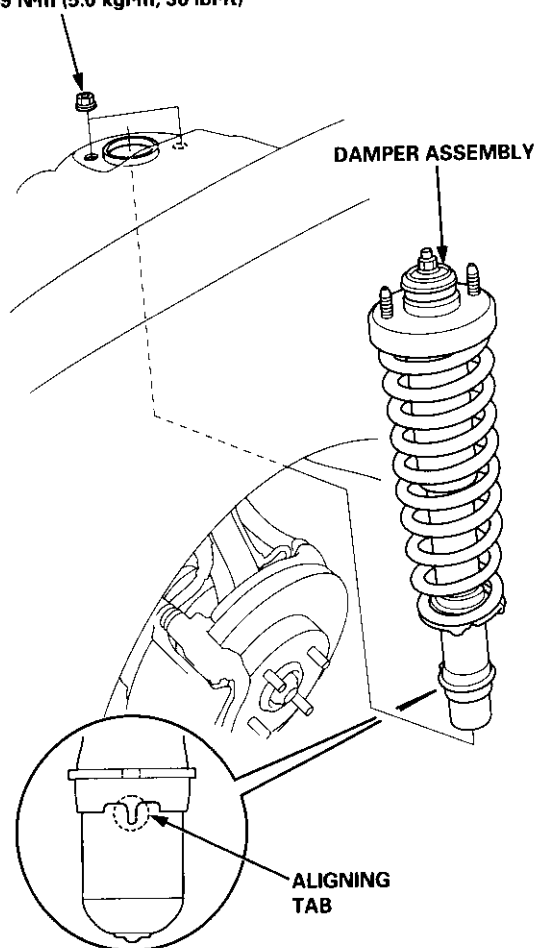
**SELF-LOCKING NUT**  
10 x 1.25 mm  
29 N-m (3.0 kgf-m, 22 lbf-ft)  
Replace.



## Installation

1. Loosely install the damper onto the frame with the aligning tab facing inside, then loosely install the two flange nuts.

**FLANGE NUTS**  
10 x 1.25 mm  
49 N-m (5.0 kgf-m, 36 lbf-ft)



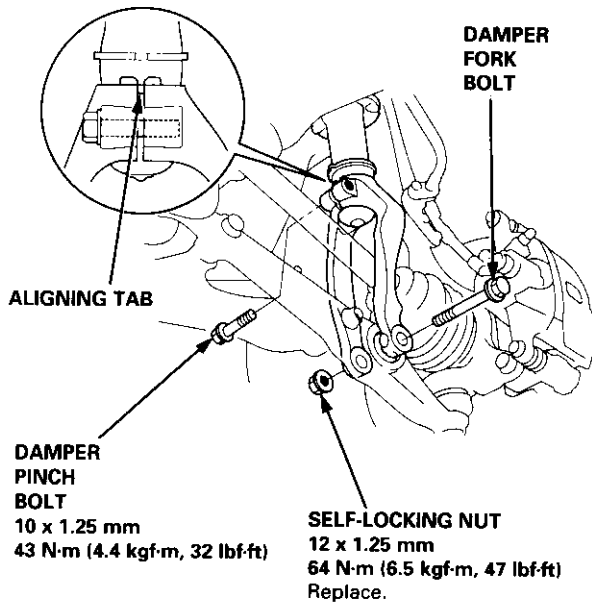
(cont'd)



# Front Damper

## Installation (cont'd)

2. Install the damper fork over the driveshaft and onto the lower arm. Install the front damper into the damper fork so the aligning tab is aligned with the slot in the damper fork.



3. Loosely install the damper pinch bolt into the top of the damper fork.
4. Loosely install the damper fork bolt and a new self-locking nut into the bottom of the damper fork.
5. Raise the knuckle with a floor jack until the vehicle just lifts off the safety stand.

**▲ WARNING** The floor jack must be securely positioned or personal injury may result.

6. Tighten the damper pinch bolt.
7. Tighten the damper fork bolt and self-locking nut.
8. Tighten the flange nuts on top of the damper.
9. Install the brake hose mounts with the brake hose mounting bolts.
10. Install the front wheel.

# Rear Suspension



## Suspension Arms Replacement ('96 - 99 models)

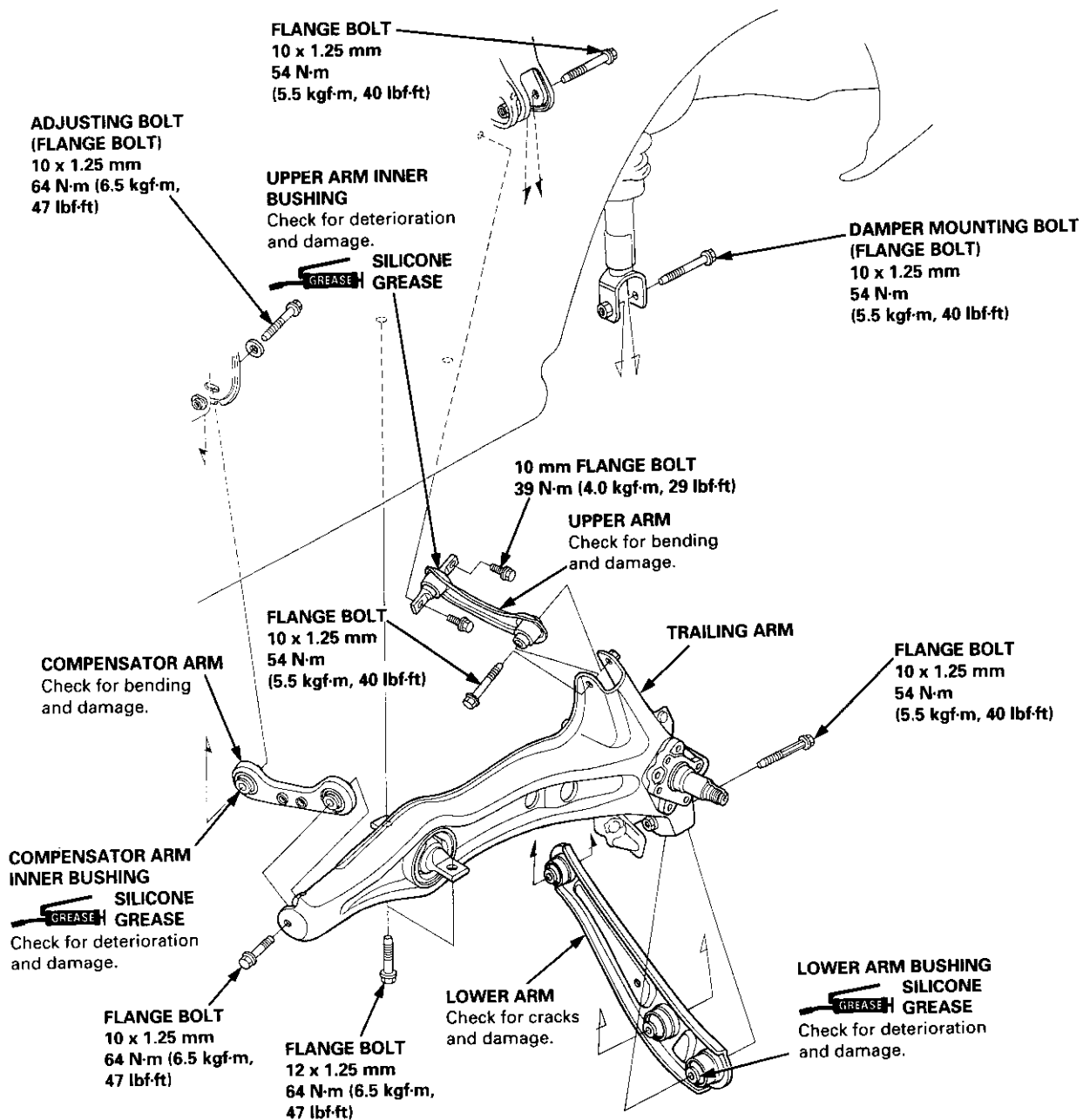
**WARNING** When the suspension arms are to be removed, place additional weight in the trunk before hoisting. When substantial weight is removed from the rear of the vehicle, the center of gravity may change causing the car to tip forward.

### CAUTION:

- Replace the self-locking nuts after removal.
- The vehicle should be on the ground before any bolts or nuts connected to rubber mounts or bushings are tightened.

### NOTE:

- Make sure the toe adjusting bolts on the compensator arm are installed in the same direction.
- "↑ UP L" or "↑ UP LH G" or "↑ UP LK" or "↑ UP LS" is stamped on the left upper arm and "↑ UP R" or "↑ UP RH G" or "↑ UP RK" or "↑ UP RS" on the right upper arm.
- The right and left compensator arm are symmetrical. Install so the "↑ UP" stamped side faces forward.
- After installing the suspension arm, check the rear wheel alignment, and adjust if necessary (see page 18-4).





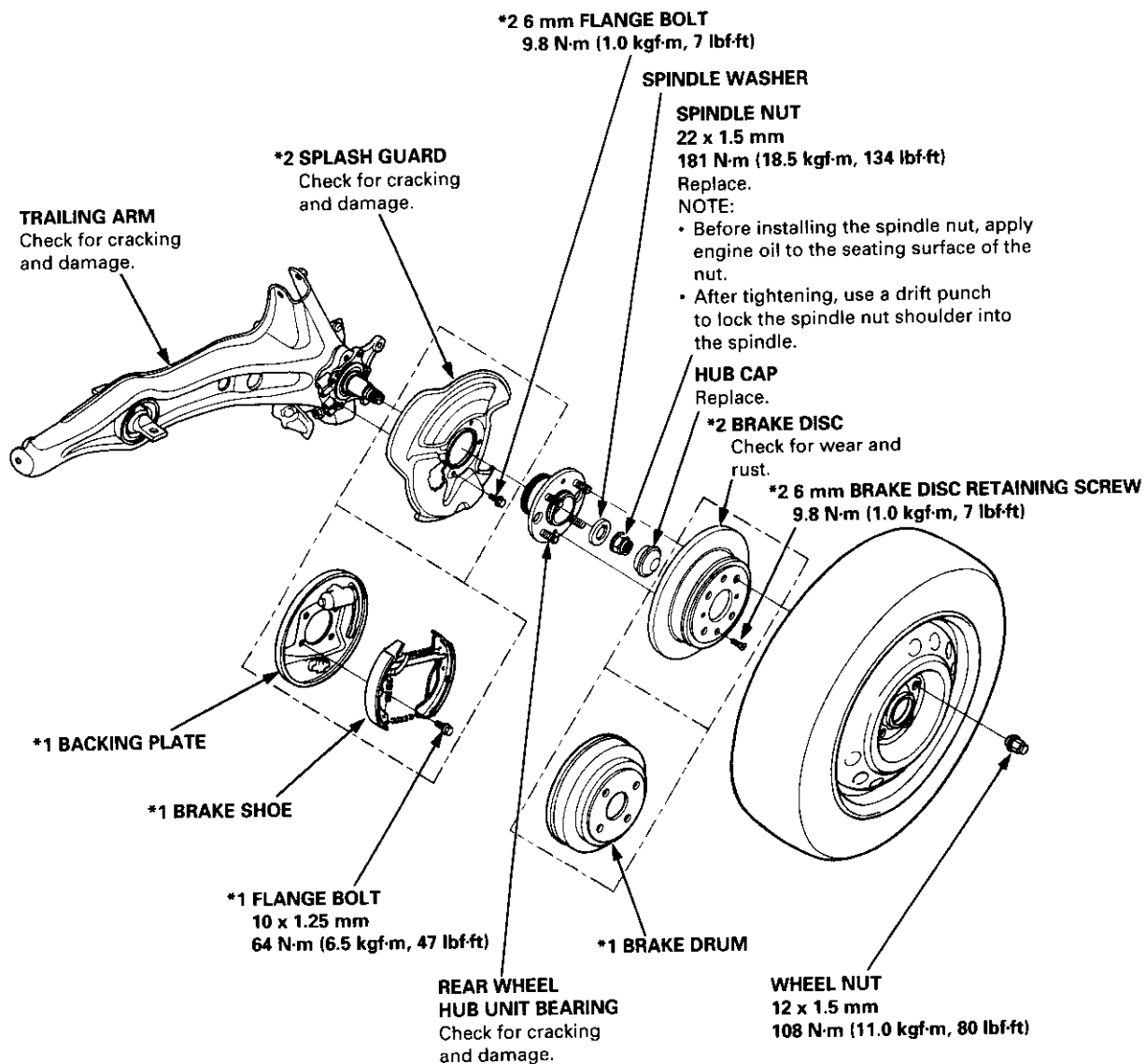
## Hub Bearing Unit Replacement

### NOTE:

- Use only genuine Honda wheel weights for aluminum wheels. Non-genuine wheel weights may corrode and damage the aluminum wheels.
- On the aluminum wheels, remove the center cap from the inside of the wheel after removing the wheel.
- Before installing the brake disc (or brake drum), clean the mating surfaces of the rear hub and the brake disc (or brake drum).
- Before installing the wheel, clean the mating surfaces of the brake disc (or brake drum) and wheel.

\*1: For vehicles with drum brakes.

\*2: '99 2D Si and Si-R models



(cont'd)

# Rear Suspension

## Hub Bearing Unit Replacement (cont'd)

NOTE: Disc type ('99 2D Si and Si-R models)

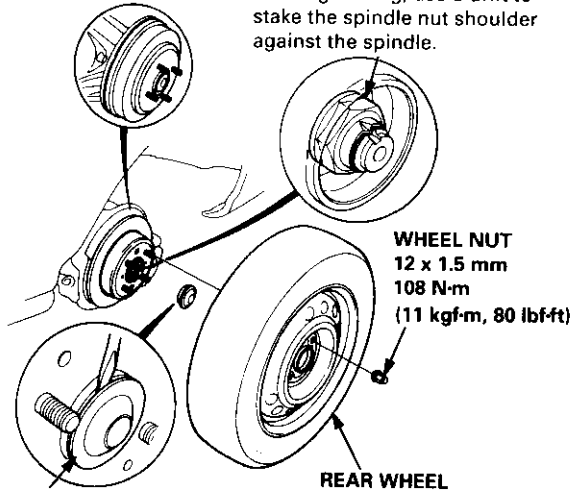
1. Loosen the wheel nuts slightly.
2. Raise the rear of vehicle, and support it with safety stands in the proper locations (see section 1).
3. Remove the wheel nuts and rear wheel.
4. Pull the parking brake lever up.
5. Remove the hub cap.
6. Raise the locking tab on the spindle nut, then remove the nut.

**SPINDLE NUT**  
22 x 1.5 mm  
181 N·m (18.5 kgf·m, 134 lbf·ft)  
Replace.

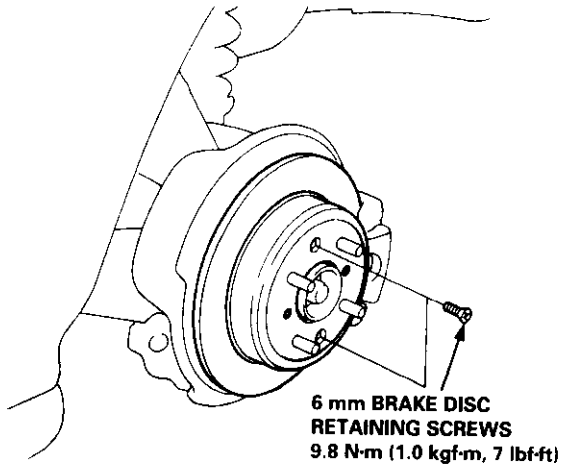
NOTE:

- Before installing the spindle nut, apply engine oil to the seating surface of the nut.
- After tightening, use a drift to stake the spindle nut shoulder against the spindle.

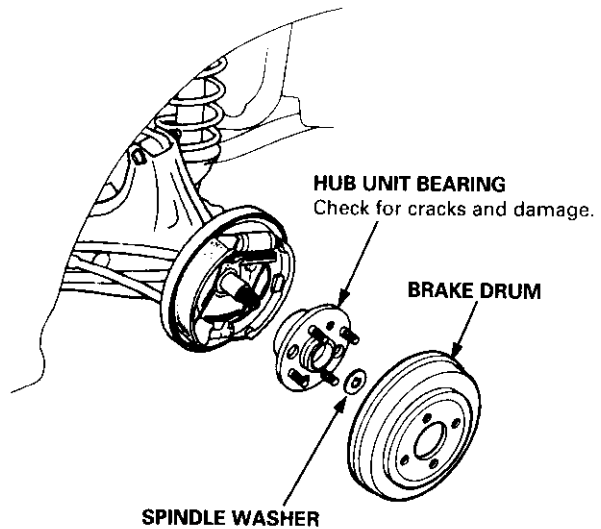
(For vehicles with drum brakes:)



7. Remove the 6 mm brake disc retaining screws.

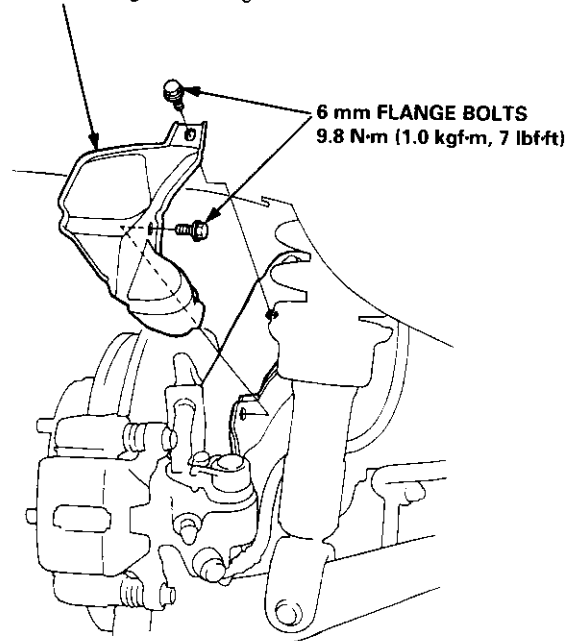


8. Release the parking brake lever.
9. Remove the brake drum, hub unit bearing, and spindle washer (for vehicles with drum brakes).



10. Remove the 6 mm flange bolts and caliper shield.

**CALIPER SHIELD**  
Check for bending and damage.

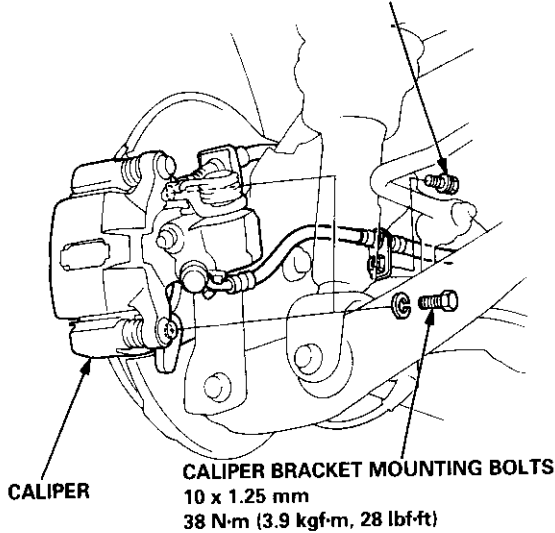




- Remove the two brake hose mounting bolts.
- Remove the caliper bracket mounting bolts, and hang the caliper to one side.

**CAUTION:** To prevent accidental damage to the caliper or brake hose, use a short piece of wire to hang the caliper from the undercarriage.

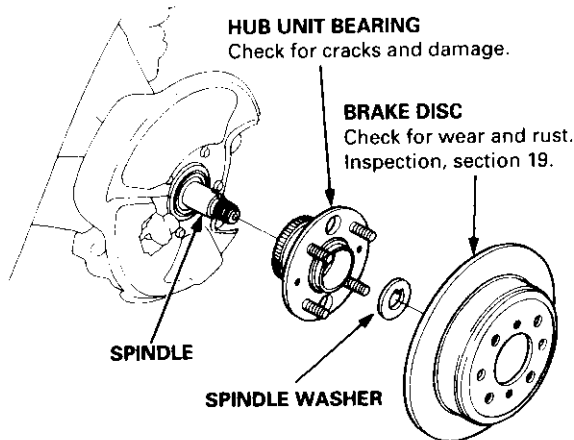
**BRAKE HOSE MOUNTING BOLTS**  
22 N·m (2.2 kgf·m, 16 lbf·ft)



- 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.

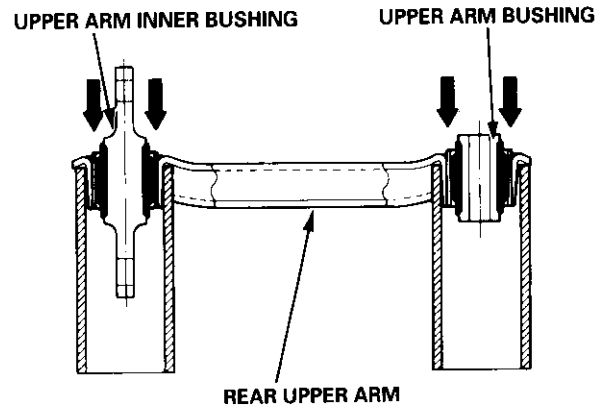
- Remove the brake disc.
- Remove the hub unit bearing from the spindle.



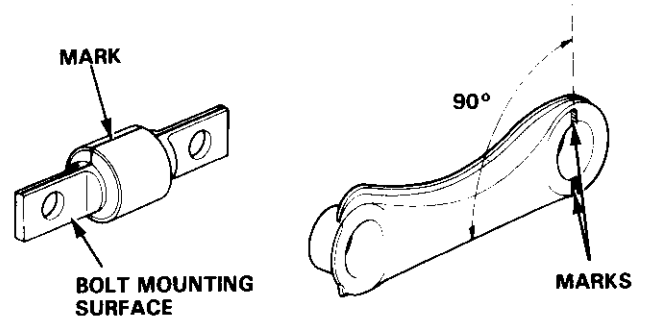
- Install in the reverse order of removal.

## Upper Arm Bushing Replacement

- Remove the upper arm bushing and upper arm inner bushing as shown.

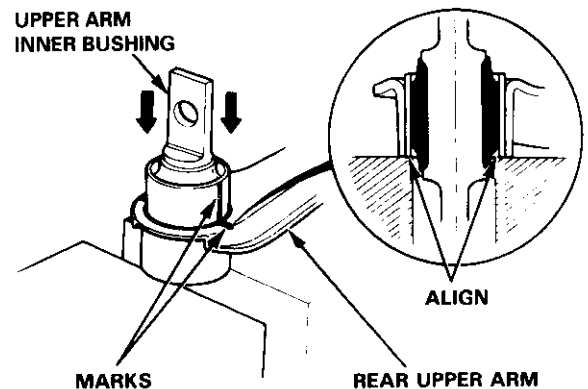


- Scribe a line on the upper arm inner bushing so that it is in line with the bolt mounting surface.
- Mark to points on the upper arm so that they are in line and make a right angle with the arm as shown in the drawing.



- Drive in the upper arm inner bushing with the marks aligned.
- Drive the upper arm bushing into the upper arm.

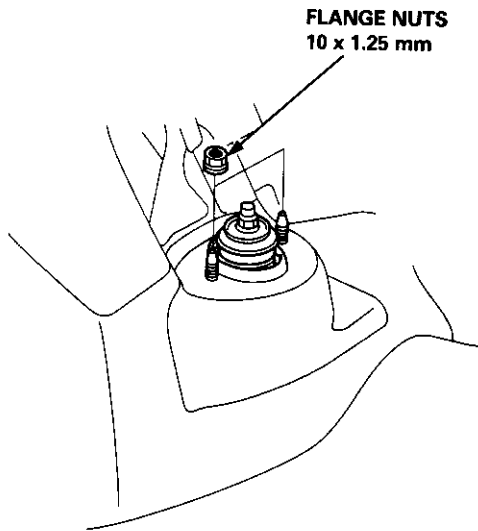
**NOTE:** Drive in the upper arm bushing and upper arm inner bushing until their leading edges are flush with the upper arm.



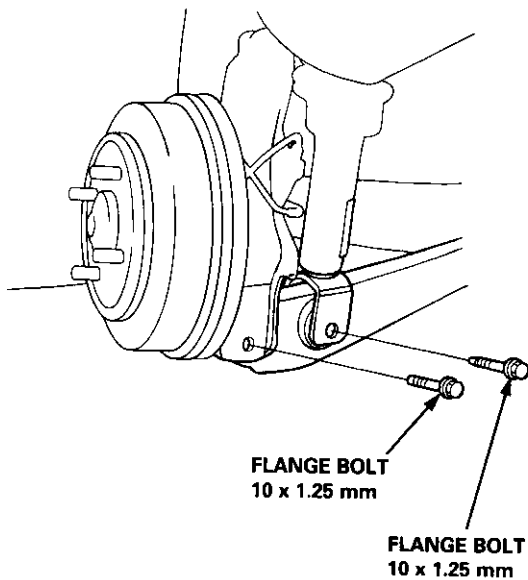
# Rear Damper

## Removal

1. Remove the rear wheels (see page 18-22).
2. Remove the speaker cover and speaker (Hatchback).  
Sedan and Coupe: Remove the trunk side panel (see section 20).
3. Remove the two flange nuts.

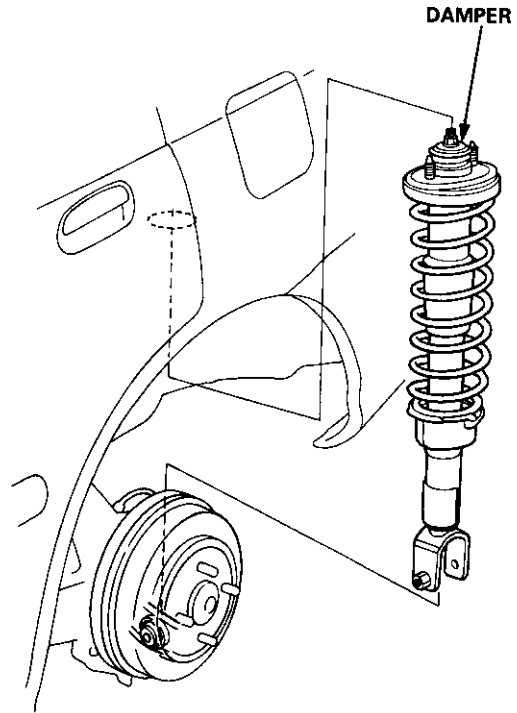


4. Remove the flange bolt from the damper.



5. Remove the flange bolt that connects the lower arm to the trailing arm.

6. Lower the rear suspension, and remove the damper.



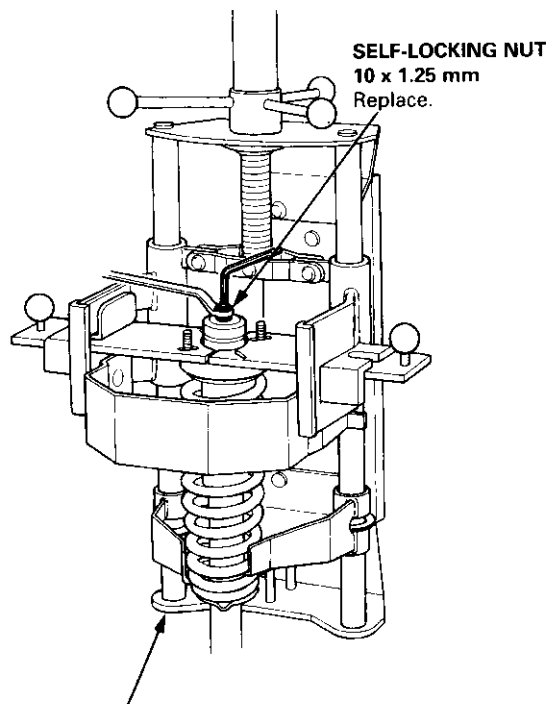


## Disassembly/Inspection

### Disassembly

1. Compress the damper spring with the spring compressor according to the manufacturer's instructions, then remove the self-locking nut.

**CAUTION:** Do not compress the spring more than necessary to remove the self-locking nut.

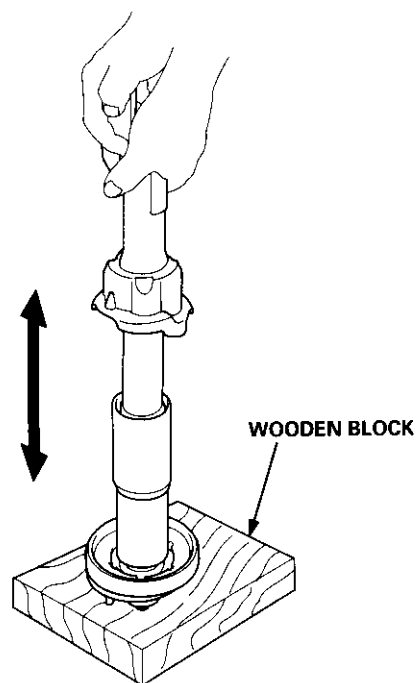


**STRUT SPRING COMPRESSOR:**  
(Commercially available)  
BRANICK® T/N MST-580A, T/N 7200, or equivalent

2. Release the pressure from the spring compressor, then disassemble the damper as shown on page 18-25.

### Inspection

1. Reassemble all parts, except the spring.
2. Push on the damper as shown.



3. Check for smooth operation through a full stroke, both compression and extension.

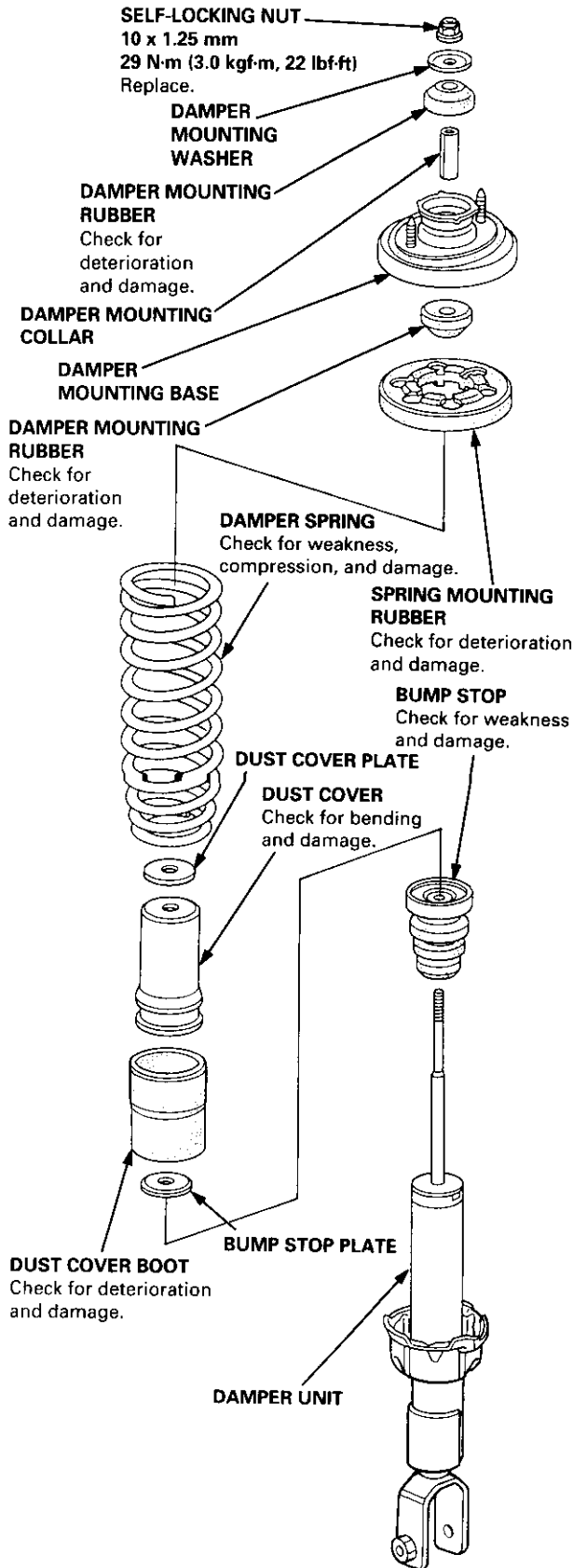
**NOTE:** The damper should move smoothly. If it does not (no compression or no extension), the gas is leaking, and the damper should be replaced.

4. Check for oil leaks, abnormal noises, and binding during these tests.

(cont'd)

# Rear Damper

## Disassembly/Inspection (cont'd)

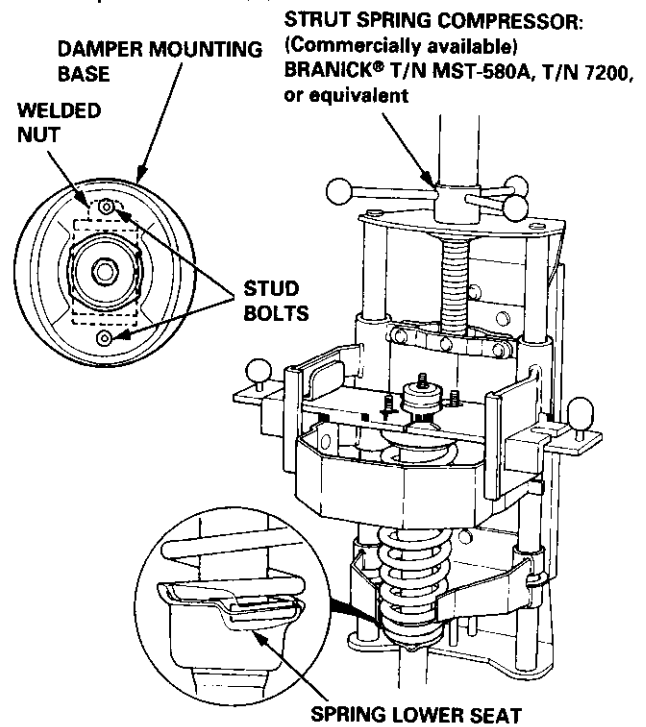


## Reassembly

1. Install the damper unit onto a spring compressor.
- NOTE:** Follow the manufacturer's instructions.
2. Assemble the rear damper in the reverse order of disassembly except the damper mounting washer and self-locking nut.

**NOTE:** Align the bottom of the damper spring and spring lower seat as shown.

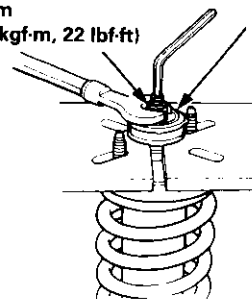
3. Position the damper mounting base onto the damper unit as shown.



4. Compress the damper spring with the spring compressor.
5. Install the damper mounting washer, and loosely install a new self-locking nut.
6. Hold the damper shaft with a hex wrench, and tighten the self-locking nut.

**SELF-LOCKING NUT**  
10 x 1.25 mm  
29 N·m (3.0 kgf·m, 22 lbf·ft)  
Replace.

**DAMPER MOUNTING WASHER**



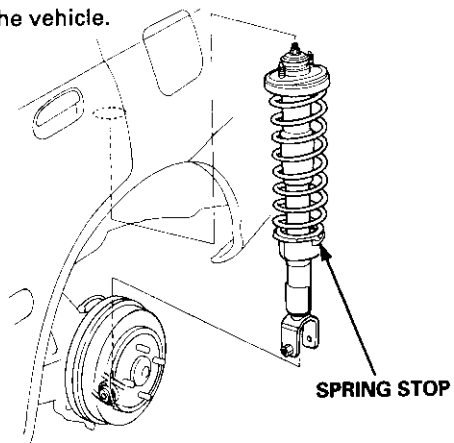


# Rear Damper

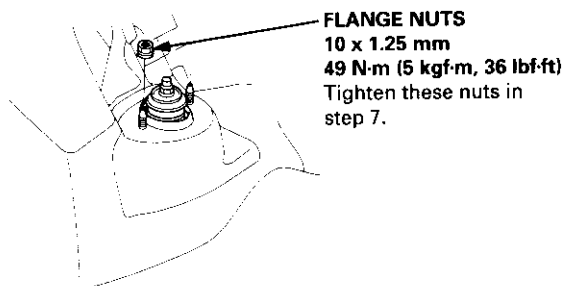


## Installation

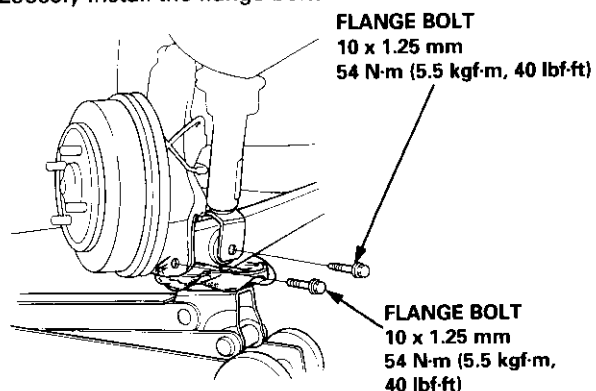
1. Lower the rear suspension, and position the damper with the spring stop pointed toward the left side of the vehicle.



2. Loosely install the two flange nuts.



3. Loosely install the flange bolts.



4. Raise the rear suspension with a floor jack until the vehicle just lifts off the safety stand.

**▲ WARNING** The floor jack must be securely positioned or personal injury may result.

5. Tighten the flange bolts.
6. Tighten the two flange nuts on top of the damper to the specified torque.
7. Check the rear wheel alignment and adjust if necessary (see page 18-4).

## **Brakes**

<b>Conventional Brakes .....</b>	<b>19-1</b>
<b>Anti-lock Brake System (ABS) .....</b>	<b>19-43</b>



## Conventional Brake

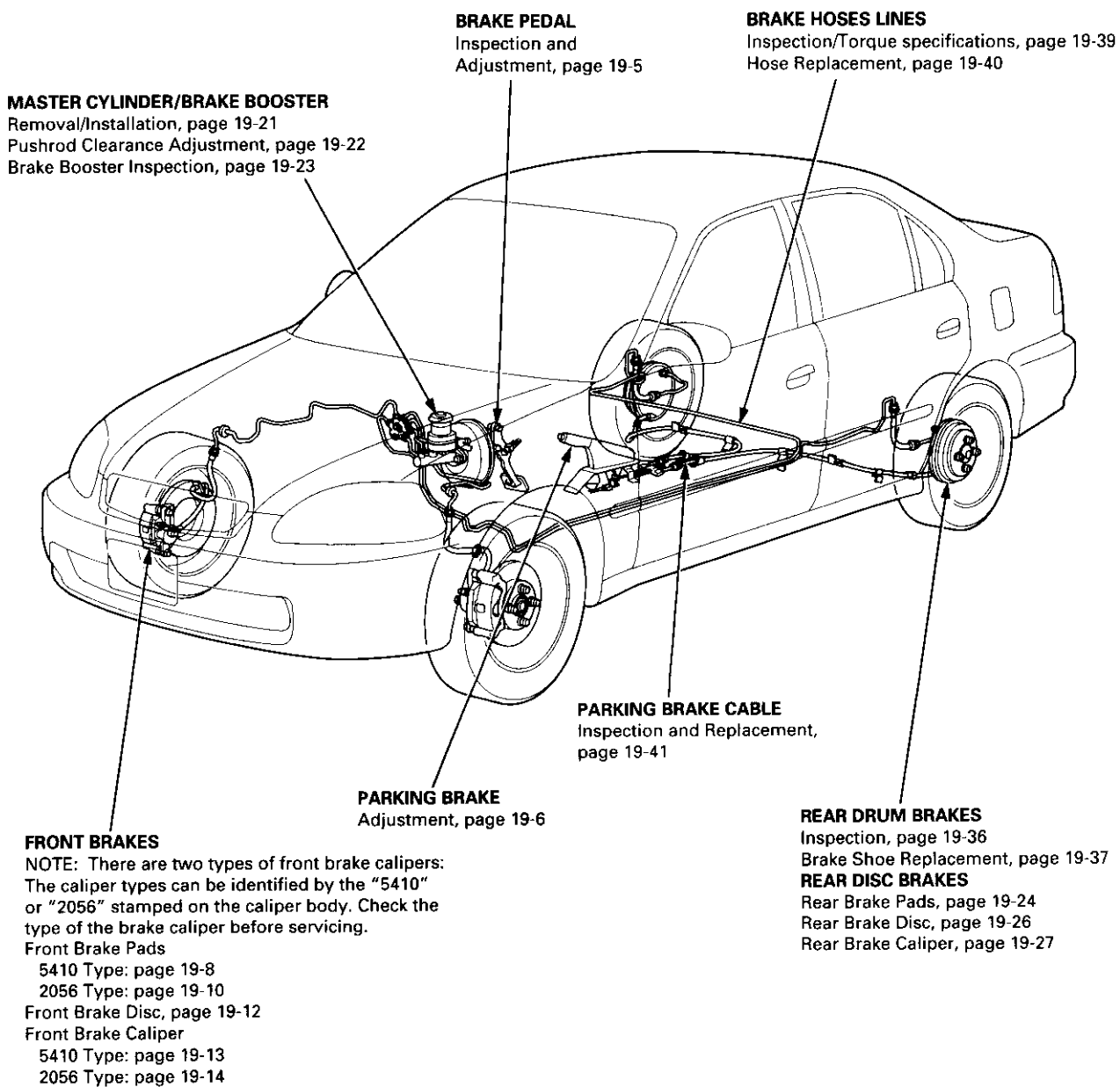
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Parking Brake .....	19-6	Disassembly .....	19-27
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Brake Booster Inspection .....	19-23		



# Component Locations



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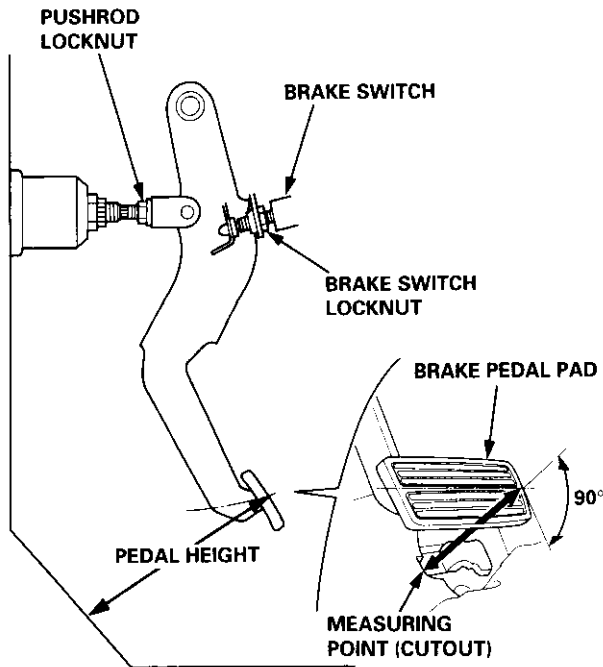




## Brake Pedal

### 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. At the carpet cutout, measure the pedal height from the right side center of the pedal pad.



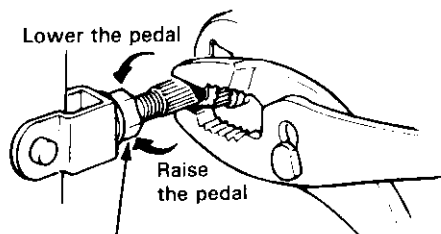
### Standard Pedal Height (with carpet removed):

M/T: 156.5 mm (6.16 in)

A/T, CVT: 161 mm (6 5/16 in)

3. Loosen the pushrod locknut, and screw the pushrod in or out with pliers until the standard pedal height from the floor is reached. After adjustment, tighten the locknut firmly.

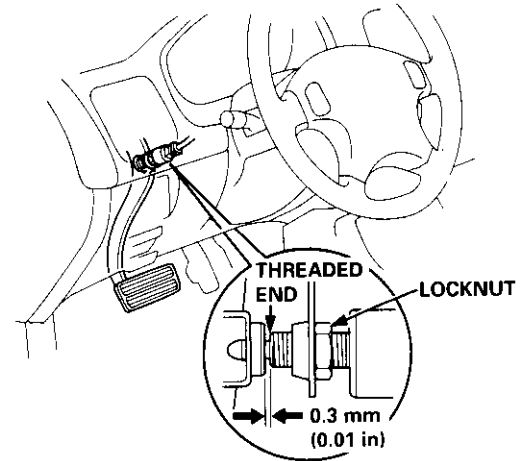
**NOTE:** Do not adjust the pedal height with the pushrod depressed.



**PUSHROD LOCKNUT**  
15 N·m  
(1.5 kgf·m, 11 lbf·ft)

4. Screw in the brake switch until its plunger is fully depressed (threaded end touching the pad on the pedal arm). Then back off the switch 1/4 turn to make 0.3 mm (0.01 in) of clearance between the threaded end and pad. Tighten the locknut firmly. Connect the brake switch connector.

**CAUTION:** Make sure that the brake lights go off when the pedal is released.



5. Check the brake pedal free play as described below.

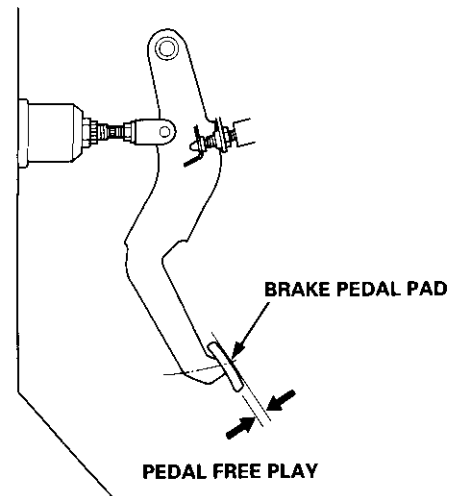
### Pedal Free Play

1. With the engine off, inspect the play on the pedal pad by pushing the pedal by hand.

**Free Play:** 1 – 5 mm (1/16 – 3/16 in)

2. If the pedal free play is out of specification, adjust the brake switch.

**CAUTION:** If the pedal free play is insufficient, it may result in brake drag.



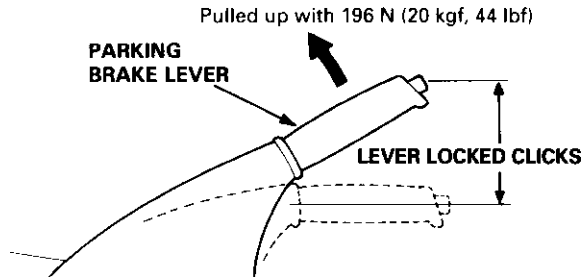
# Inspection and Adjustment

## Parking Brake

### Inspection

1. Pull the parking brake lever with 196 N (20 kgf, 44 lbf) force to fully apply the parking brake. The parking brake lever should be locked within the specified number of clicks.

**Lever Locked clicks: 6 – 9**



2. Adjust the parking brake if the lever clicks are out of specification.

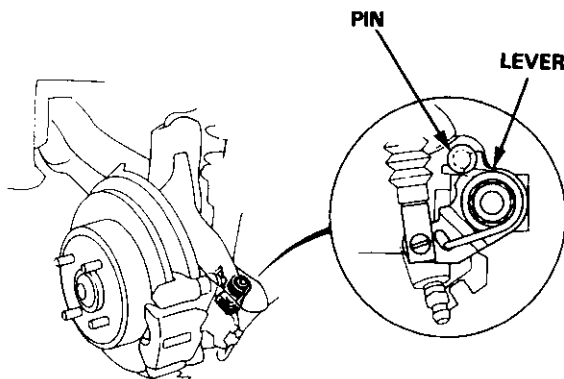
### Adjustment

**NOTE:** After servicing the rear brake pads or calipers, or the rear brake shoe, loosen the parking brake adjusting nut, start the engine, and depress the brake pedal several times to set the self-adjusting brake before adjusting the parking brake.

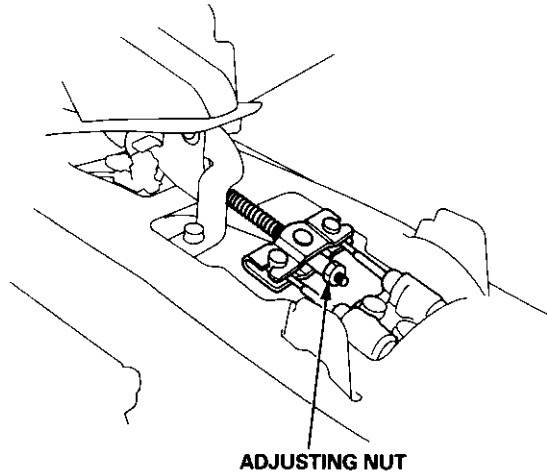
1. Raise the rear wheels off the ground, and support the vehicle on safety stands.

**⚠ WARNING** Block the front wheels before jacking up the rear of the vehicle.

2. On vehicles with rear disc brakes, make sure the parking brake arm on the rear brake caliper contacts the brake caliper pin.



3. Remove the rear console (see section 20).
4. Pull the parking brake lever up one click.
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 when the parking brake lever is pulled up fully.
8. Reinstall the rear console.



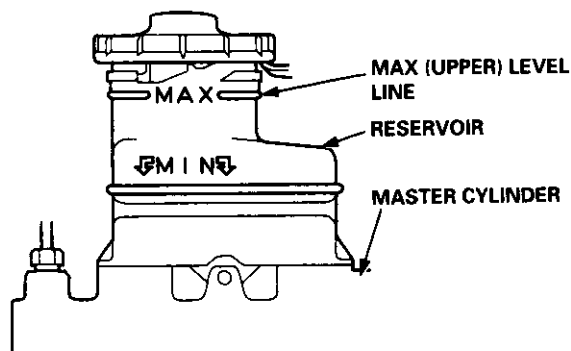
# Bleeding

### CAUTION:

- Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Do not spill brake fluid on the vehicle, it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

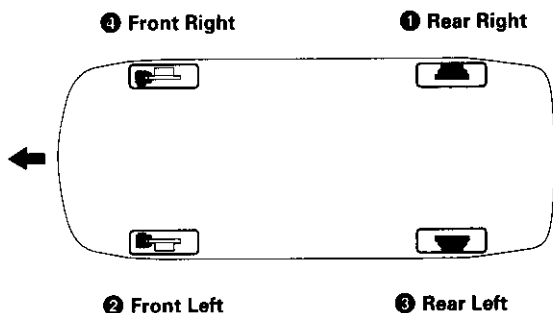
NOTE: The reservoir on the master cylinder must be at the MAX (upper) level mark at the start of the bleeding procedure and checked after bleeding each brake caliper. Add fluid as required.

1. Make sure the brake fluid level in the reservoir is at the MAX (upper) level line.

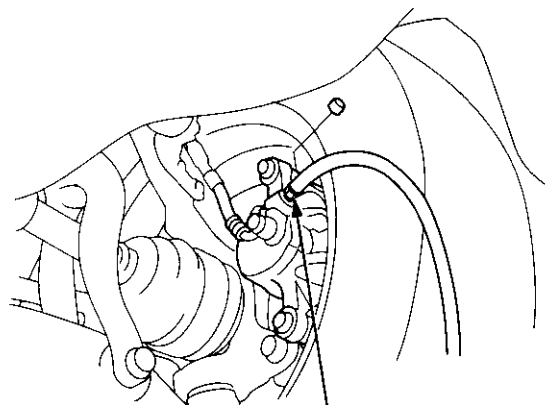


2. Have someone slowly pump the brake pedal several times, then apply steady pressure.
3. Loosen the brake bleed screw to allow air to escape from the system. Then tighten the bleed screw securely.
4. Repeat the procedure for each wheel in the sequence shown below until air bubbles no longer appear in the fluid.
5. Refill the master cylinder reservoir to the MAX (upper) level line.

### BLEEDING SEQUENCE:

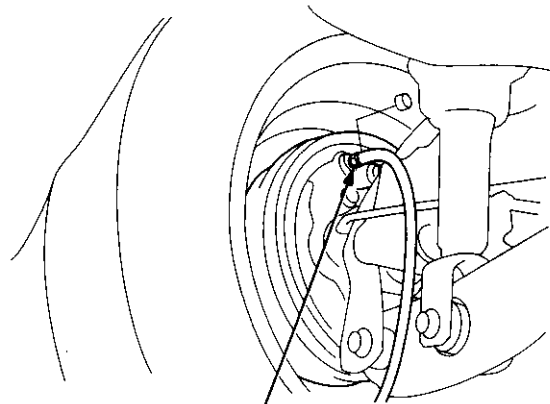


### FRONT:



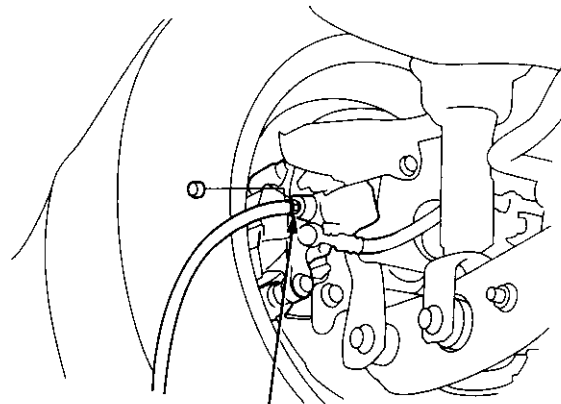
**BLEED SCREW**  
9 N·m (0.9 kgf·m, 6.5 lbf·ft)

### REAR (Drum Brake):



**BLEED SCREW**  
7 N·m (0.7 kgf·m, 5 lbf·ft)

### REAR (Disc Brake):

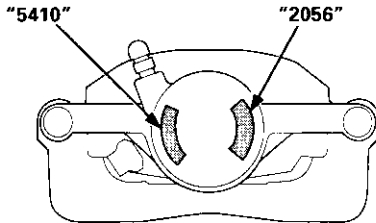


**BLEED SCREW**  
9 N·m (0.9 kgf·m, 6.5 lbf·ft)

# Front Brake Pads

## Inspection and Replacement

NOTE: There are two types of front brake calipers: The caliper types can be identified by the "5410" or "2056" stamped on the caliper body as shown below. Check the type of the brake caliper before servicing.



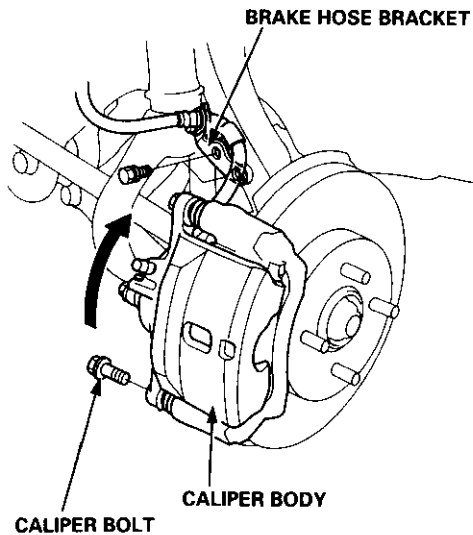
### 5410 Type:

NOTE: For 2056 type disassembly procedures, see page 19-10.

#### ⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA approved vacuum cleaner to avoid breathing brake dust.

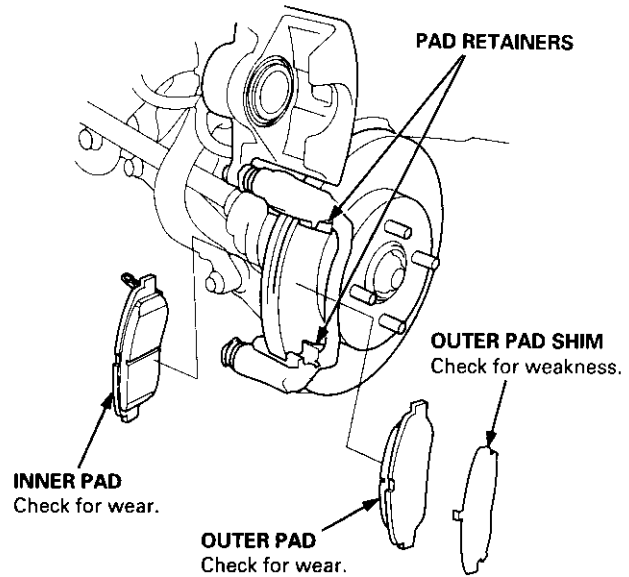
1. Loosen the front wheel nuts slightly, then raise the vehicle, and support it on safety stands. Remove the front wheels.
2. Remove the brake hose bracket from the knuckle.
3. Remove the caliper bolt, and pivot the caliper up out of the way.



NOTE: Check the hoses and pin boots for damage and deterioration.

4. Remove the pad shim, pad retainers, and pads.

NOTE: When the caliper is equipped with an outer pad shim, replace the shim together with the pads as a set.

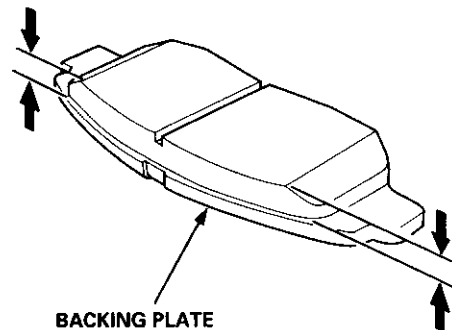


5. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include the pad backing plate thickness.

#### Brake Pad Thickness:

Standard: 9.5 – 10.5 mm (0.37 – 0.41 in)

Service Limit: 1.6 mm (0.06 in)

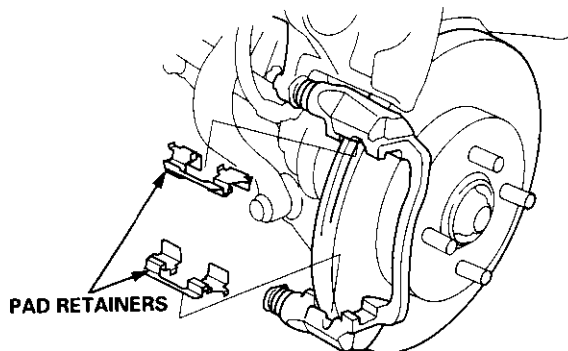


6. If the brake pad thickness is less than the service limit, replace the front pads as a set.





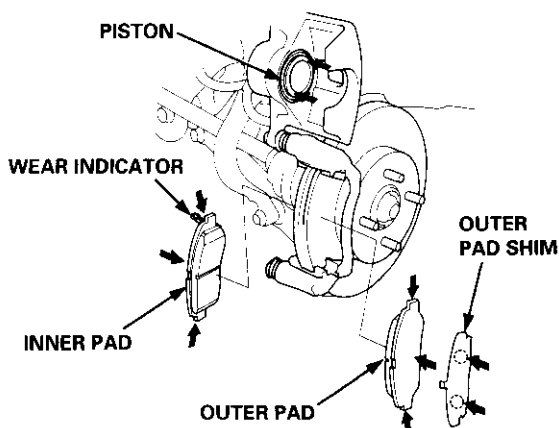
7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.



10. Apply grease to the points indicated by the arrows in the following illustration:

NOTE: Use the pad grease included in the pad set or Molykote M77 grease, and apply a thin coat of grease evenly to the designated points.

- Piston end and inner pad contact surface
- Pad and caliper bracket contact surface
- Outer pad and caliper body contact surface
- Outer pad shim and outer pad contact surface
- Outer pad shim and caliper body contact surface



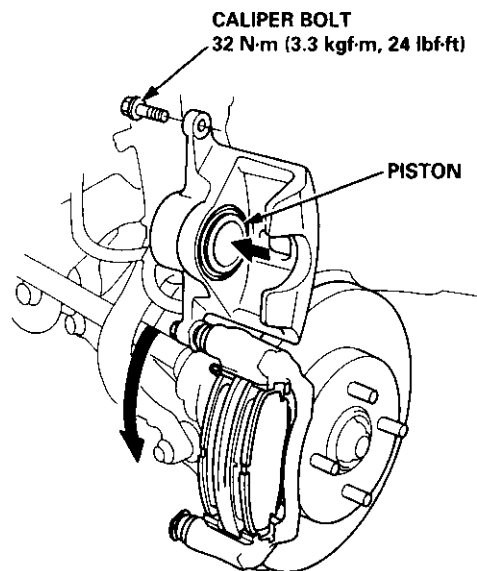
11. Install the brake pads and pad shim correctly.

**⚠ WARNING**

- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

NOTE: Install the pad with the wear indicator on the inside.

12. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.



13. Pivot the caliper down into position, then install the caliper bolt and tighten it.

**CAUTION: Be careful not damage the pin boot when pivoting the caliper down.**

14. Install the brake hose bracket on the knuckle.

NOTE: Inspect the brake hose for interference or twisting.

15. Depress the brake pedal several times to make sure the brakes work, then test-drive.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

16. After installation, check for leaks at hose and line joints or connections, and retighten if necessary.

(cont'd)

# Front Brake Pads

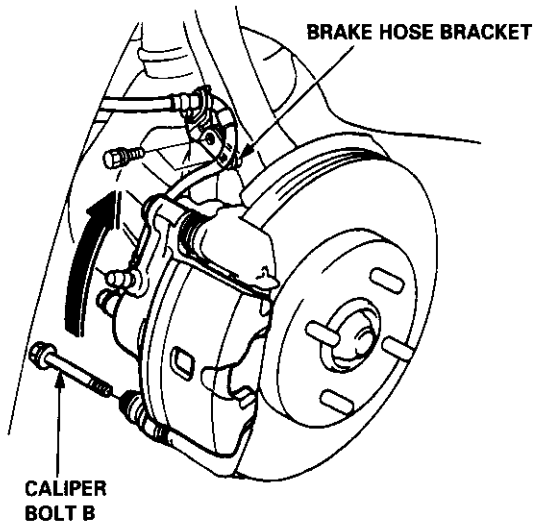
## Inspection and Replacement (cont'd)

2056 Type:

**WARNING**

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA-approved vacuum cleaner to avoid breathing brake dust.

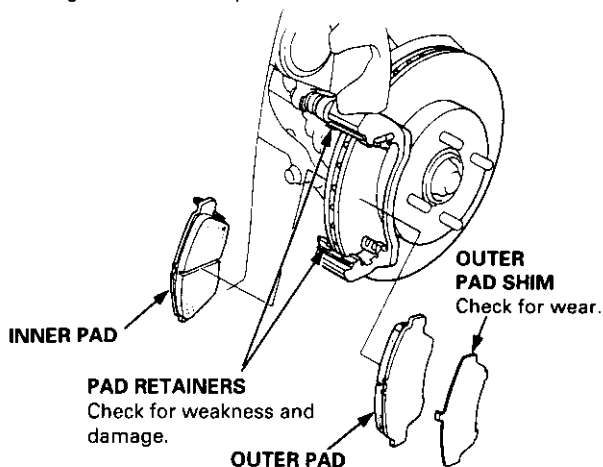
1. Loosen the front wheel nuts slightly, then raise the vehicle, and support it on safety stands. Remove the front wheels.
2. Remove the brake hose bracket from the knuckle.
3. Remove the caliper bolt B, and pivot the caliper out of the way.



NOTE: Check the hoses and pin boots for damage and deterioration.

4. Remove the pad shim, pad retainers, and pads.

NOTE: When replacing the pads, replace the shim together with the pads as a set.

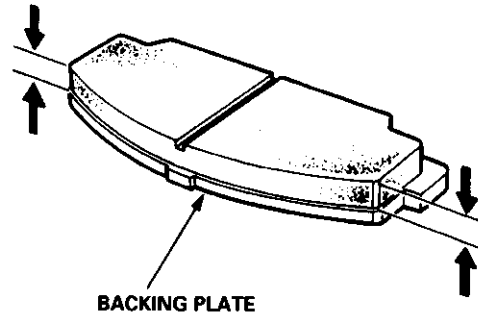


5. Using vernier calipers, measure the thickness of each brake pad lining. The measurement does not include the pad backing plate thickness.

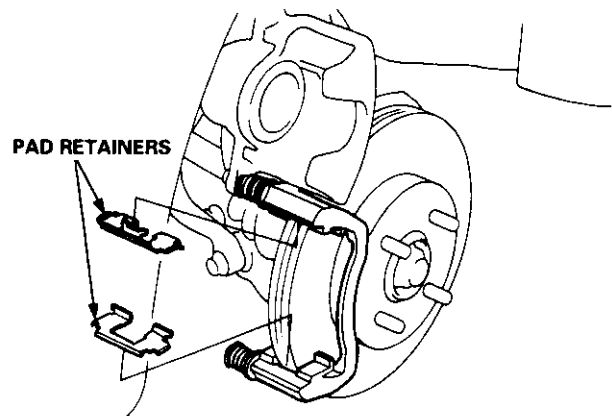
**Brake Pad Thickness:**

**Standard:** 8.5 – 9.5 mm (0.33 – 0.37 in)

**Service Limit:** 1.6 mm (0.06 in)



6. If the brake pad thickness is less than the service limit, replace the front pads as a set.
7. Clean the caliper thoroughly; remove any rust, and check for grooves and cracks.
8. Check the brake disc for damage and cracks.
9. Install the pad retainers.

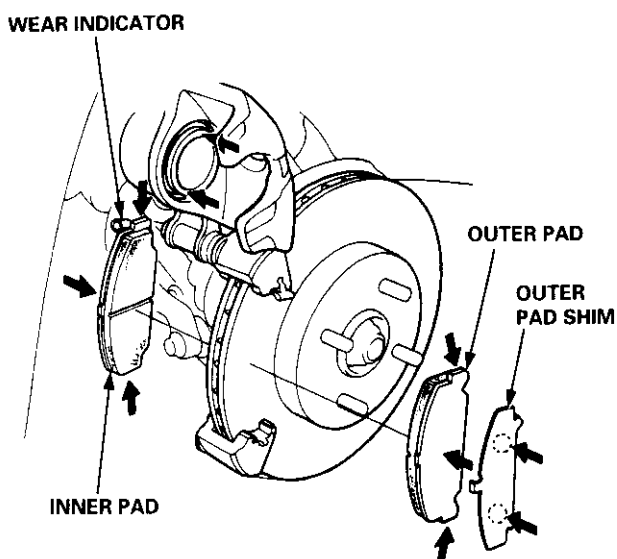




10. Apply grease to the points indicated by the arrows in the following illustration:

NOTE: Use the pad grease included in the pad set or Molykote M77 grease, and apply a thin coat of grease evenly to the designated points.

- Piston end and inner pad contact surface
- Pad and caliper bracket contact surface
- Outer pad and caliper body contact surface
- Outer pad shim and outer pad contact surface
- Outer pad shim and caliper body contact surface



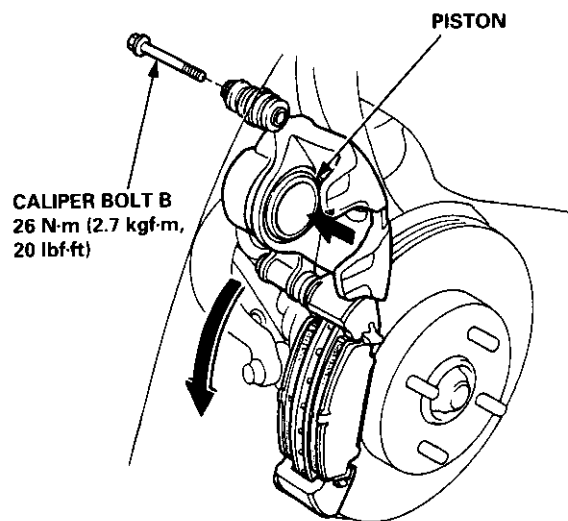
11. Install the brake pads and pad shim correctly.

**▲ WARNING**

- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.
- Contaminated brake discs or pads reduce stopping ability. Keep grease off the discs and pads.

NOTE: Install the pad with the wear indicator on the inside.

12. Push in the piston so that the caliper will fit over the pads. Make sure that the piston boot is in position to prevent damaging it when pivoting the caliper down.



13. Pivot the caliper down into position, then install caliper bolt B and tighten it.

14. Install the brake hose bracket on the knuckle.

NOTE: Inspect the brake hose for interference and twisting.

15. Depress the brake pedal several times to make sure the brakes work, then test-drive.

NOTE: Engagement of the brake may require a greater pedal stroke immediately after the brake pads have been replaced as a set. Several applications of the brake pedal will restore the normal pedal stroke.

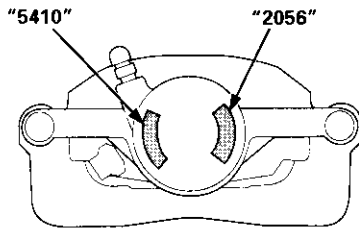
16. After installation, check for leaks at hose and line joints and connections, and retighten if necessary.

# Front Brake Caliper



## Disassembly

NOTE: There are two types of front brake calipers: The caliper types can be identified by the "5410" or "2056" stamped on the caliper body as shown below. Check the type of the brake caliper before servicing.



### 5410 Type:

NOTE: For 2056 type disassembly procedures, see page 19-14.

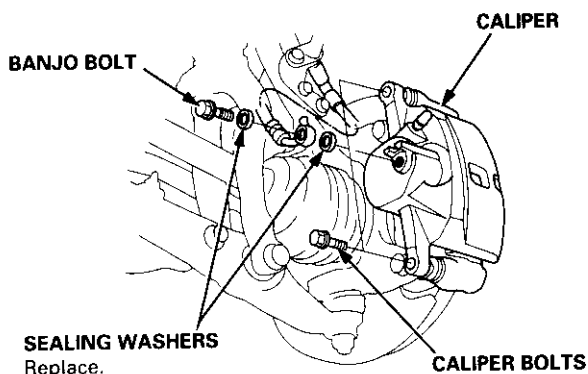
#### ⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA approved vacuum cleaner to avoid breathing brake dust.

#### CAUTION:

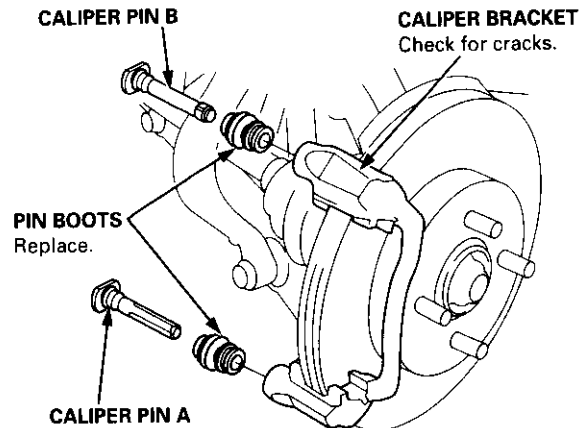
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.

1. Remove the banjo bolt, and disconnect the brake hose from the caliper.



2. Remove the caliper bolts, then remove the caliper from the bracket.

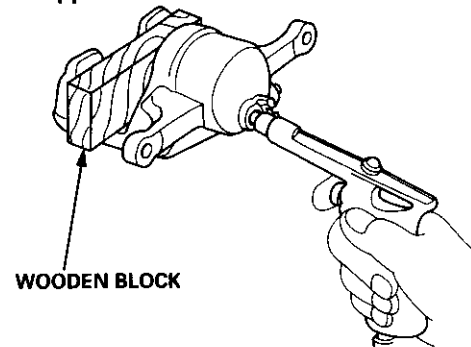
3. Remove the caliper pins and pin boots from the caliper bracket.



4. If necessary, apply compressed air to the caliper fluid inlet to get the piston out. Place a shop rag or wooden block as shown to cushion the piston when it is expelled. Use low pressure air in short spurts.

#### ⚠ WARNING

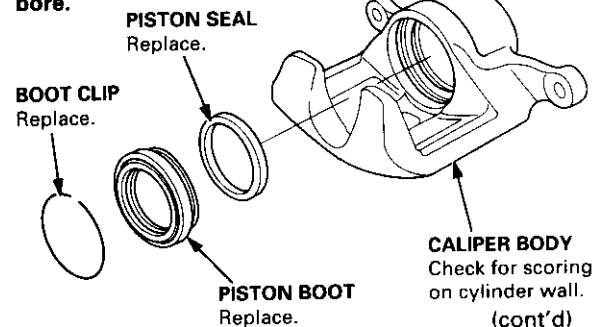
- Do not place your fingers in front of the piston.
- Do not use high air pressure; use an OSHA approved 30 PSI nozzle.



5. Remove the piston from the caliper, and check the piston for scoring.

6. Remove the boot clip, piston boot and piston seal.

CAUTION: Take care not to damage the cylinder bore.



# Front Brake Caliper

## Disassembly (cont'd)

2056 Type:

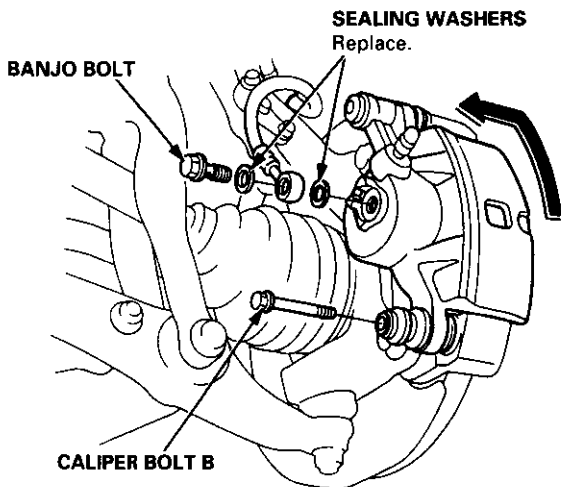
**⚠ WARNING**

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA approved vacuum cleaner to avoid breathing brake dust.

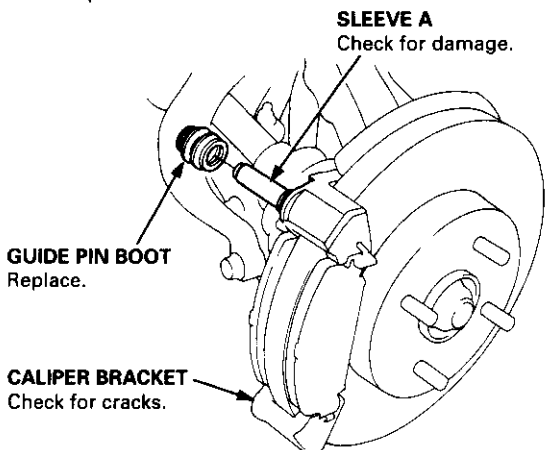
**CAUTION:**

- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.

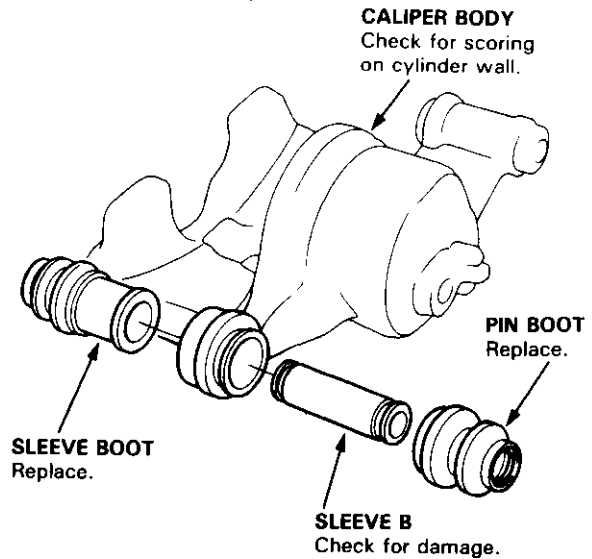
1. Remove the banjo bolt, and disconnect the brake hose from the caliper.



2. Remove caliper bolt B, pivot the caliper up out of the way, then remove the caliper from the bracket.
3. Remove the guide pin boot from sleeve A on the caliper bracket.



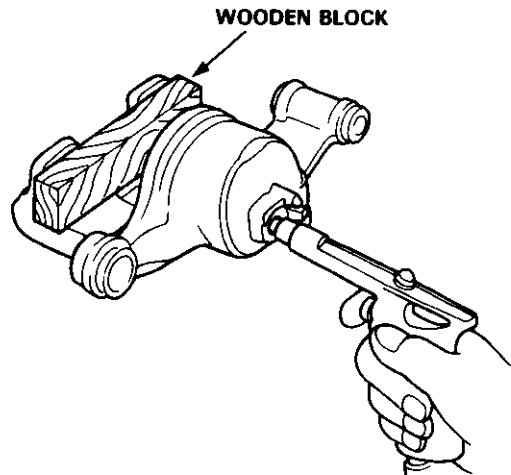
4. Remove the pin boot, sleeve B and sleeve boot from the caliper body.



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; use an OSHA approved 30 PSI nozzle.

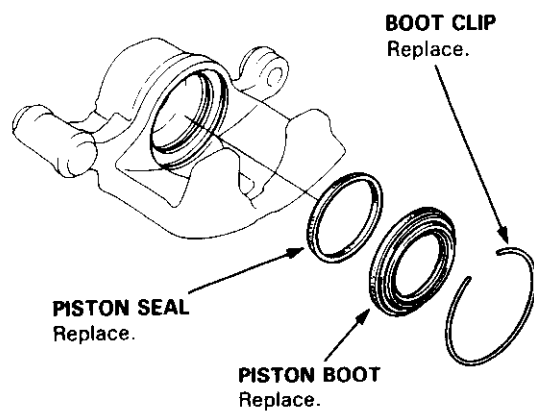


6. Remove the piston from the caliper, and check the piston for scoring.



7. Remove the boot clip, piston boot and piston seal.

**CAUTION:** Take care not to damage the cylinder bore.



# Front Brake Caliper

## Reassembly

5410 Type:

NOTE: For 2056 type reassembly procedures, see page 19-18.

### ⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA approved vacuum cleaner to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.
- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.


### CAUTION:

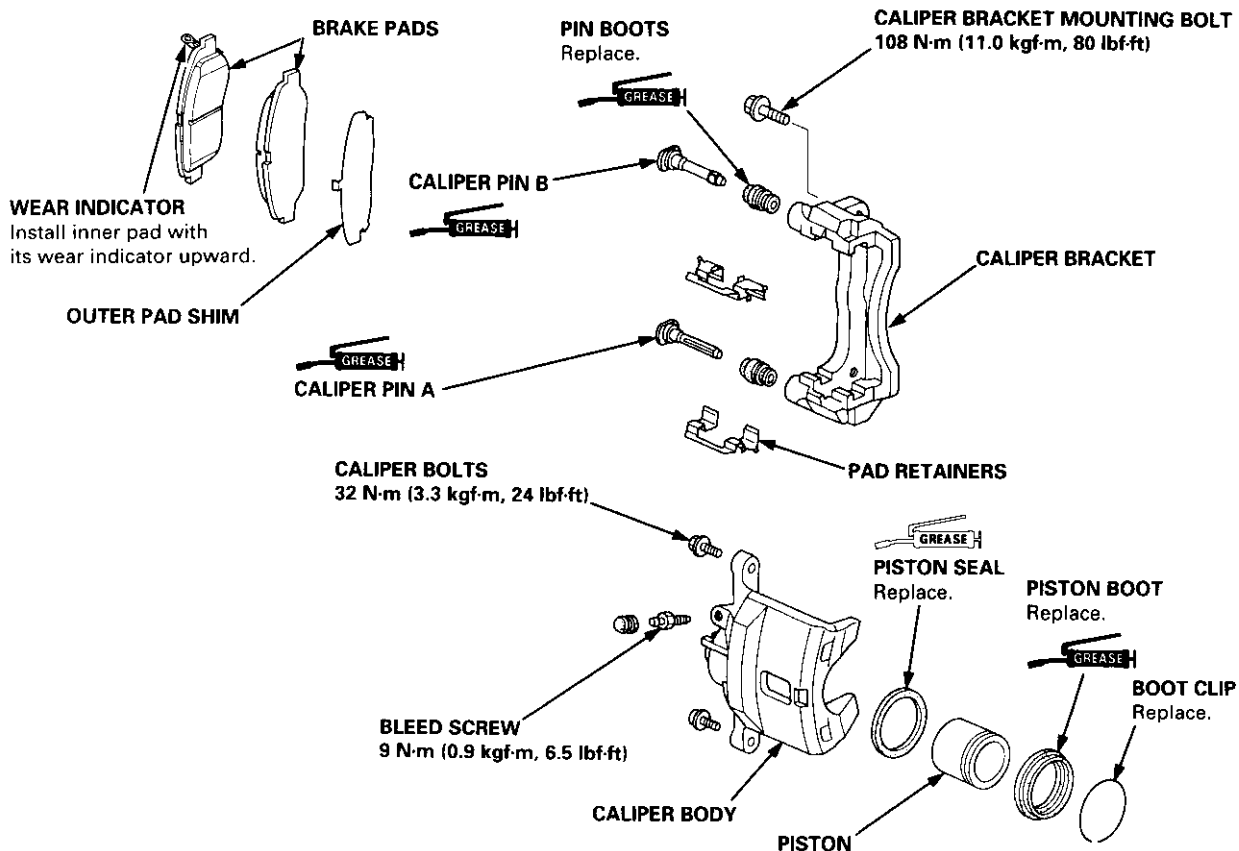
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.

### NOTE:

- Coat the piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

 GREASE: Use recommended rubber grease in the caliper seal set.

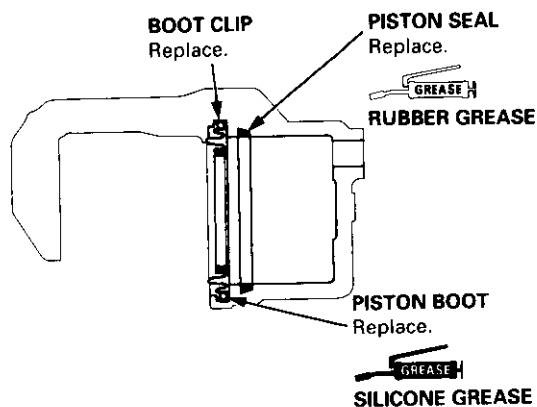
 GREASE: Use recommended seal grease in the caliper seal set.



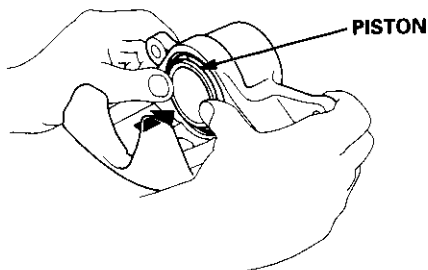


1. Clean the piston and caliper bore with brake fluid, and inspect for wear and damage.
2. Coat the new piston seal with the recommended rubber grease in the caliper seal set, and install the seal in the cylinder groove.
3. Apply the recommended seal grease in the caliper seal set to the sealing lips and inside of a new piston boot, and securely install it in the caliper with the new boot clip.

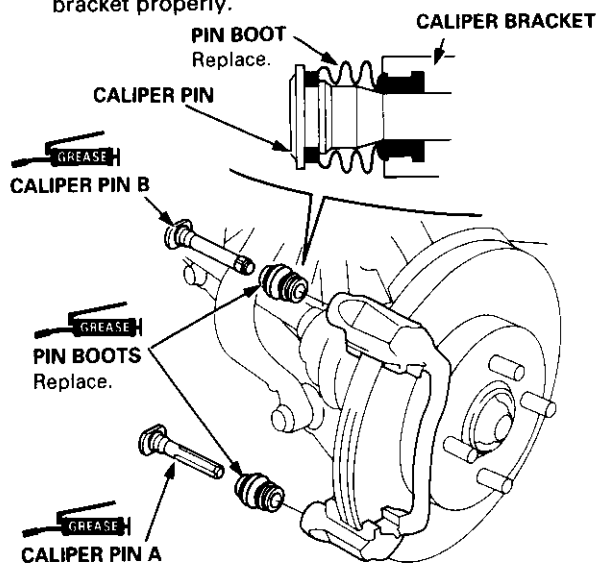
**CAUTION:** Be careful not to damage the caliper cylinder wall.



4. Lubricate the caliper and piston with brake fluid, then install the piston in the cylinder with the dished end facing in.



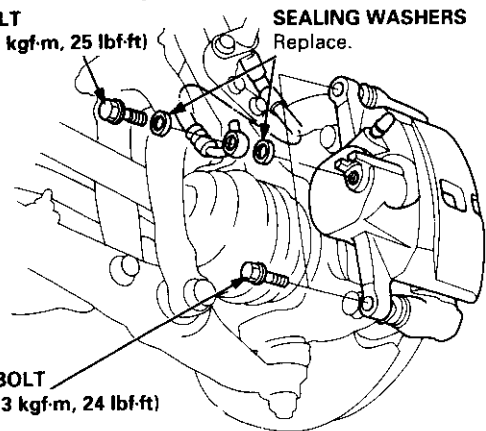
5. Apply the recommended seal grease in the caliper seal set to the sliding surface of the pins and the inside of the new pin boots.
6. Install the pin boots into the grooves in the caliper bracket properly.



7. Insert pin A and pin B into the caliper bracket.
8. Install the pin boots into the grooves in the pins properly.
9. Install the brake pads in their original positions (see page 19-9).
10. Push in the piston so that the caliper will fit over the pads, and install the caliper.
11. Tighten the caliper bolts.
12. Connect the brake hose to the caliper with new sealing washers, and tighten the banjo bolt.

**BANJO BOLT**  
34 N-m (3.5 kgf-m, 25 lbf-ft)

**SEALING WASHERS**  
Replace.



13. Fill the brake reservoir, and bleed the brake system (see page 19-7).
14. Perform the following checks:
  - Check for leaks at hose and line joints and connections, and retighten if necessary.
  - Check for brake hoses for interference and twisting.

(cont'd)



# Front Brake Caliper

## Reassembly (cont'd)

2056 Type:

### ⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA approved vacuum cleaner to avoid breathing brake dust.
- Contaminated brake discs or pads reduce stopping ability.
- When reusing the pads, always reinstall the brake pads in their original positions to prevent loss of braking efficiency.

### CAUTION:

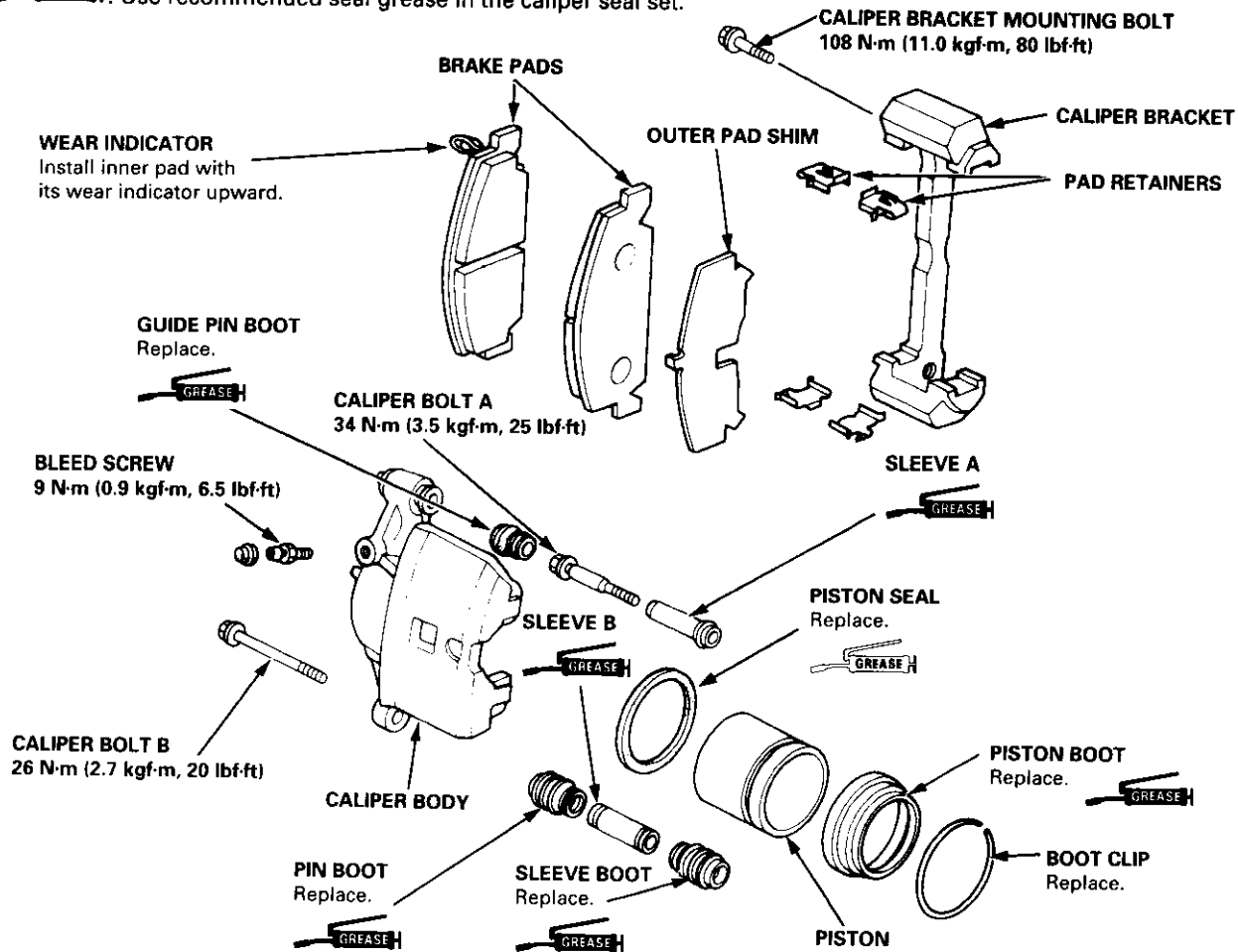
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- Clean all parts in brake fluid and air dry; blow out all passages with compressed air.
- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Make sure no dirt or other foreign matter is allowed to contaminate the brake fluid.
- Always use Genuine Honda DOT 3 Brake Fluid. Using a non-Honda brake fluid can cause corrosion and decrease the life of the system.

### NOTE:

- Coat the piston, piston seal, and caliper bore with clean brake fluid.
- Replace all rubber parts with new ones whenever disassembled.

 GREASE: Use recommended rubber grease in the caliper seal set.

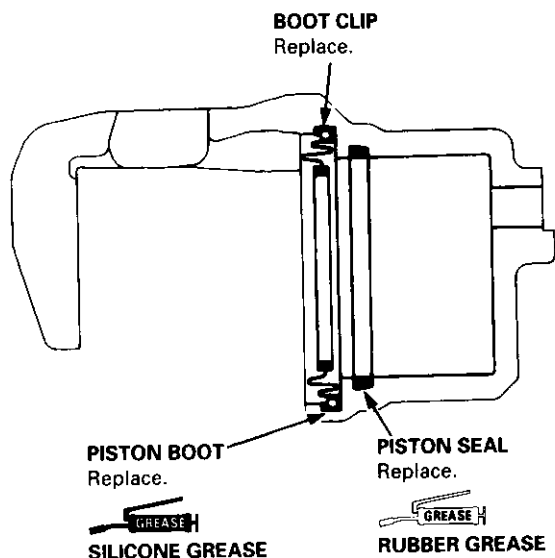
 GREASE: Use recommended seal grease in the caliper seal set.



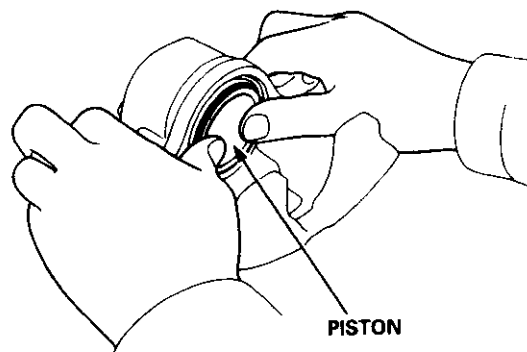


1. Clean the piston and caliper bore with brake fluid, and inspect for wear and damage.
2. Coat a new piston seal with the recommended rubber grease in the caliper seal set, and install the seal in the cylinder groove.
3. Apply the recommended seal grease in the caliper seal set to the sealing lips and inside of a new piston boot, and securely install it in the caliper with a new boot clip.

**CAUTION:** Be careful not to damage the caliper cylinder wall.

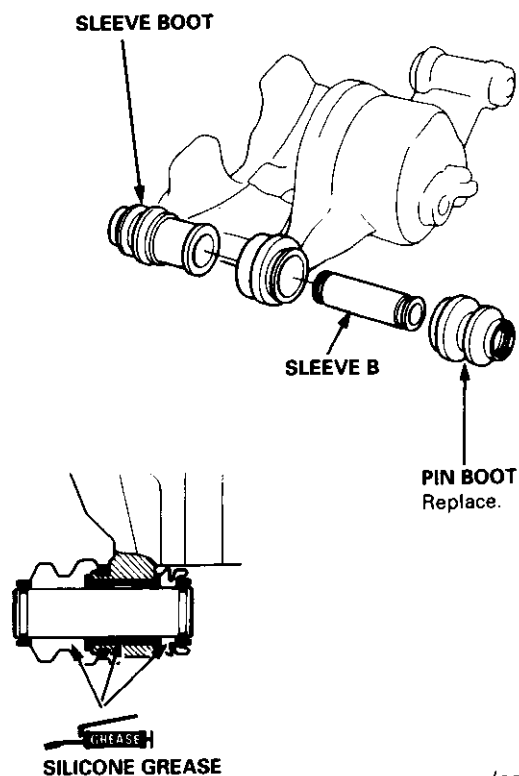


4. Lubricate the caliper and piston with brake fluid, then install the piston in the cylinder with the dished end facing in.



5. Apply the recommended seal grease in the caliper seal set to the sliding surface of sleeve B and the inside of the new pin and sleeve boots.
6. Install the new sleeve and pin boots and sleeve B on the caliper.

**NOTE:** Make sure to install the boots into the grooves in the caliper and sleeve B properly.

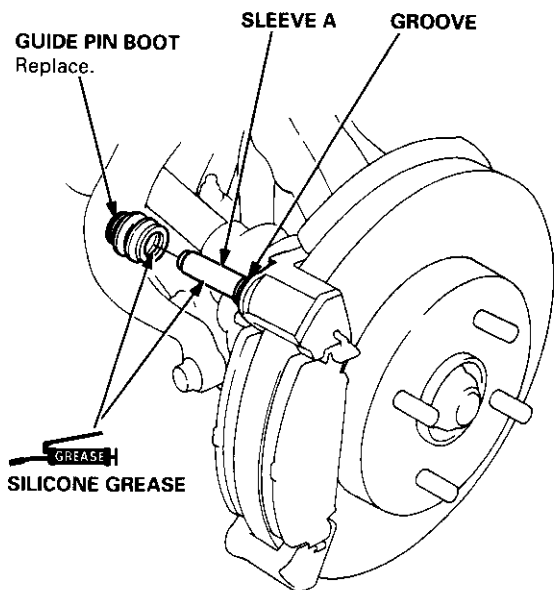


(cont'd)

# Front Brake Caliper

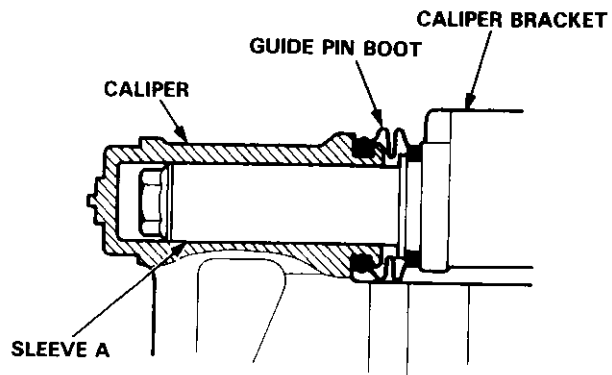
## Reassembly (cont'd)

7. Apply the recommended seal grease in the caliper seal set to the sliding surface of sleeve A and the inside of a new guide pin boot.
8. Install the guide pin boot into the groove in the sleeve A.
9. Make sure that the brake pad retainers and brake pads are in their original positions (see page 19-10).

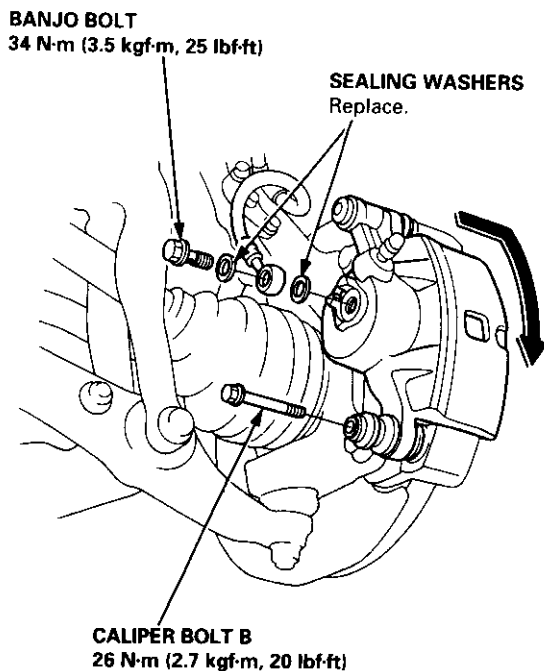


10. Install the caliper onto sleeve A, and pivot it down into position.

NOTE: Install the guide pin boot into the groove in the caliper properly.



11. Connect the brake hose to the caliper with new sealing washers, and tighten the banjo bolt.
12. Tighten the caliper bolt B.



13. Fill the brake reservoir and bleed the brake system (see page 19-7).
14. Perform the following checks.
  - Check for leaks at hose and line joints and connections, and retighten if necessary.
  - Check for brake hoses for interference and twisting.

# Master Cylinder/Brake Booster



## Removal/Installation

### CAUTION:

- Be careful not to bend or damage the brake lines when removing the master cylinder.
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.
- To prevent spills, cover the hose joints with rags or shop towels.

1. Disconnect the brake fluid level switch connectors.
2. Remove the reservoir cap from the master cylinder.
3. The brake fluid may be sucked out through the top of the master cylinder reservoir with a syringe.
4. Disconnect the brake lines from the master cylinder.
5. Remove the master cylinder mounting nuts and washers.
6. Remove the master cylinder from the brake booster.
7. Disconnect the vacuum hose from the brake booster.
8. Remove the cotter pin and clevis pin from the clevis.

**CAUTION:** Do not disconnect the clevis by removing it from the operating rod of the brake booster. If the clevis is loosened, adjust the pushrod length before installing the brake booster (see page 19-22).

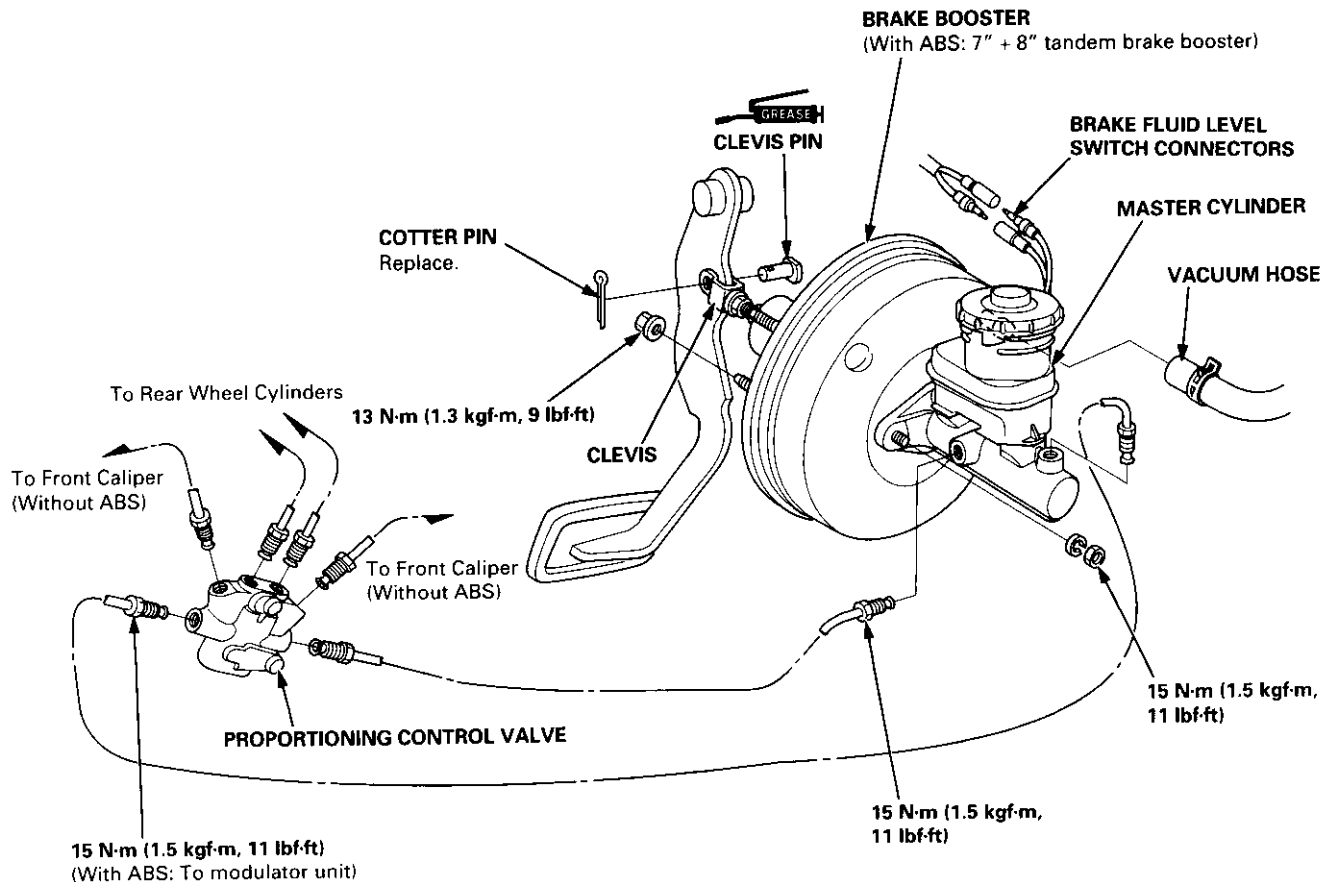
9. Remove the four booster mounting nuts.
10. Pull the brake booster forward until the clevis is clear of the bulkhead.
11. Remove the brake booster from the engine compartment.
12. Install the brake booster and master cylinder in the reverse order of removal.

### CAUTION:

- When connecting the brake lines, make sure that there is no interference between the brake lines and other parts.
- Be careful not to bend or damage the brake lines when installing the master cylinder.

**NOTE:** If replacing the master cylinder or brake booster, check and adjust the pushrod clearance before installing the master cylinder (see page 19-22).

13. Fill the master cylinder reservoir, and bleed the brake system (see page 19-7).
14. After installation, check the brake pedal height and brake pedal free play (see page 19-5) and adjust if necessary.



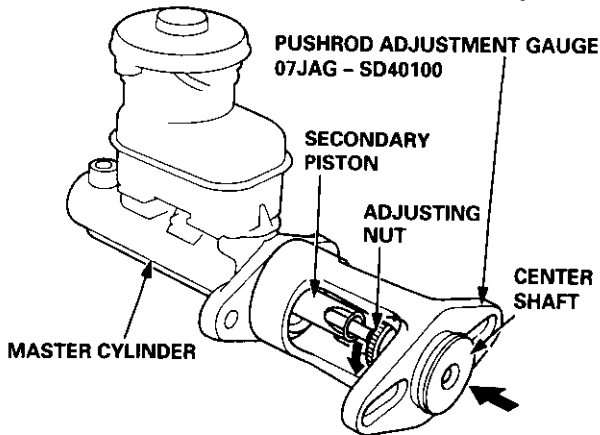
# Master Cylinder/Brake Booster

## Pushrod Clearance Adjustment

### NOTE:

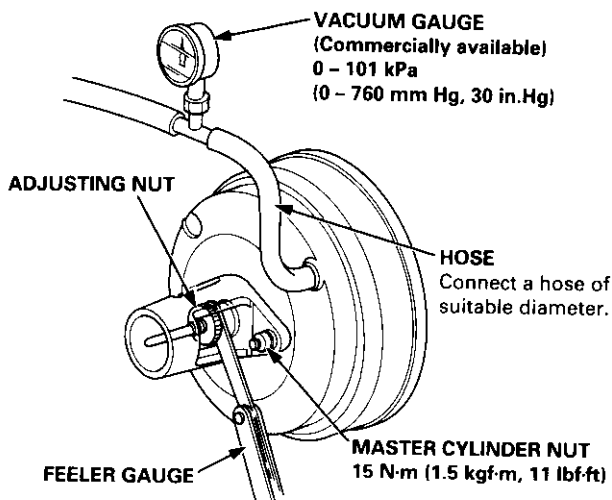
- The master cylinder pushrod-to-piston clearance must be checked and adjustments made, if necessary, before installing the master cylinder.
- ABS type is shown, conventional brake type is similar.

1. Set the special tool on the master cylinder body; push in the center shaft until the top of it contacts the end of the secondary piston by turning the adjusting nut.



2. Without disturbing the center shaft's position, install the special tool upside down on the booster.
3. Install the master cylinder nuts, and tighten to the specified torque.
4. Connect the booster in-line with a vacuum gauge 0 - 101 kPa (0 - 760 mmHg, 30 in.Hg) to the booster's engine vacuum supply, and maintain an engine speed that will deliver 66 kPa (500 mmHg, 20 in.Hg) vacuum.
5. With a feeler gauge, measure the clearance between the gauge body and the adjusting nut as shown.

Clearance: 0 - 0.4 mm (0 - 0.02 in)



NOTE: If the clearance between the gauge body and adjusting nut is 0.4 mm (0.02 in), the pushrod-to-piston clearance is 0 mm. However, if the clearance between the gauge body and adjusting nut is 0 mm, the pushrod-to-piston clearance is 0.4 mm (0.02 in) or more. Therefore, it must be adjusted and rechecked.

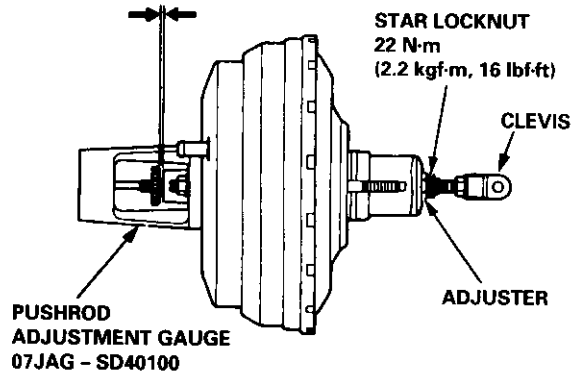
6. If clearance is incorrect, loosen the star locknut, and turn the adjuster in or out to adjust.

### NOTE:

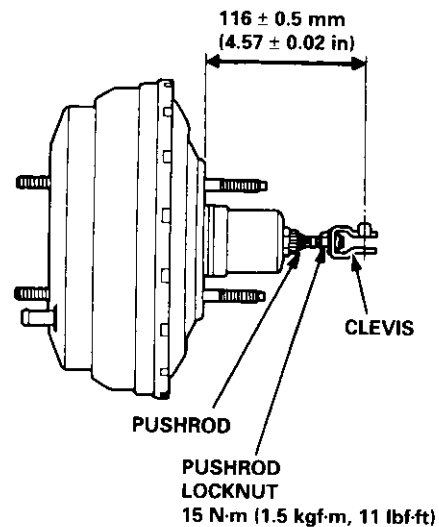
- Adjust the clearance while the specified vacuum is applied to the booster.
- Hold the clevis while adjusting.

7. Tighten the star locknut securely.

8. Remove the special tool.  
0 - 0.4 mm (0 - 0.02 in)



9. Adjust the pushrod length as shown if the booster is removed.



10. Install the master cylinder (see page 19-21).



## Brake Booster Inspection

### Functional Test

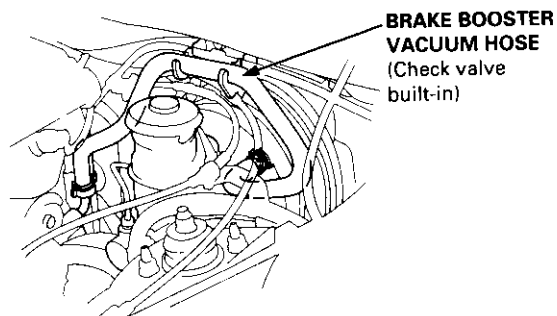
1. With the engine stopped, depress the brake pedal several times to deplete the vacuum reservoir, then depress the pedal hard and hold it for 15 seconds. If the pedal sinks, either the master cylinder is bypassing internally, or the brake system (master cylinder, lines, modulator, proportioning control valve, or caliper) is leaking.
2. Start the engine with the pedal depressed. If the pedal sinks slightly, the vacuum booster is operating normally. If the pedal height does not vary, the booster or check valve is faulty.
3. With the engine running, depress the brake pedal lightly. Apply just enough pressure to hold back automatic transmission creep. If the brake pedal sinks more than 25 mm (1.0 in.) in three minutes, the master cylinder is faulty. A slight change in pedal height when the A/C compressor cycles on and off is normal. (The A/C compressor load changes the vacuum available to the booster.)

### Leak Test

1. Depress the brake pedal with the engine running, then stop the engine. If the pedal height does not vary while depressed for 30 seconds, the vacuum booster is OK. If the pedal rises, the booster is faulty.
2. With the engine stopped, depress the brake pedal several times using normal pressure. When the pedal is first depressed, it should be low. On consecutive applications, the pedal height should gradually rise. If the pedal position does not vary, check the booster check valve.

### Booster Check Valve Test

1. Disconnect the brake booster vacuum hose at the booster.
2. Start the engine and let it idle. There should be vacuum. If no vacuum is available, the check valve is not working properly. Replace the brake booster vacuum hose and check valve, and retest.



# Rear Drum Brake

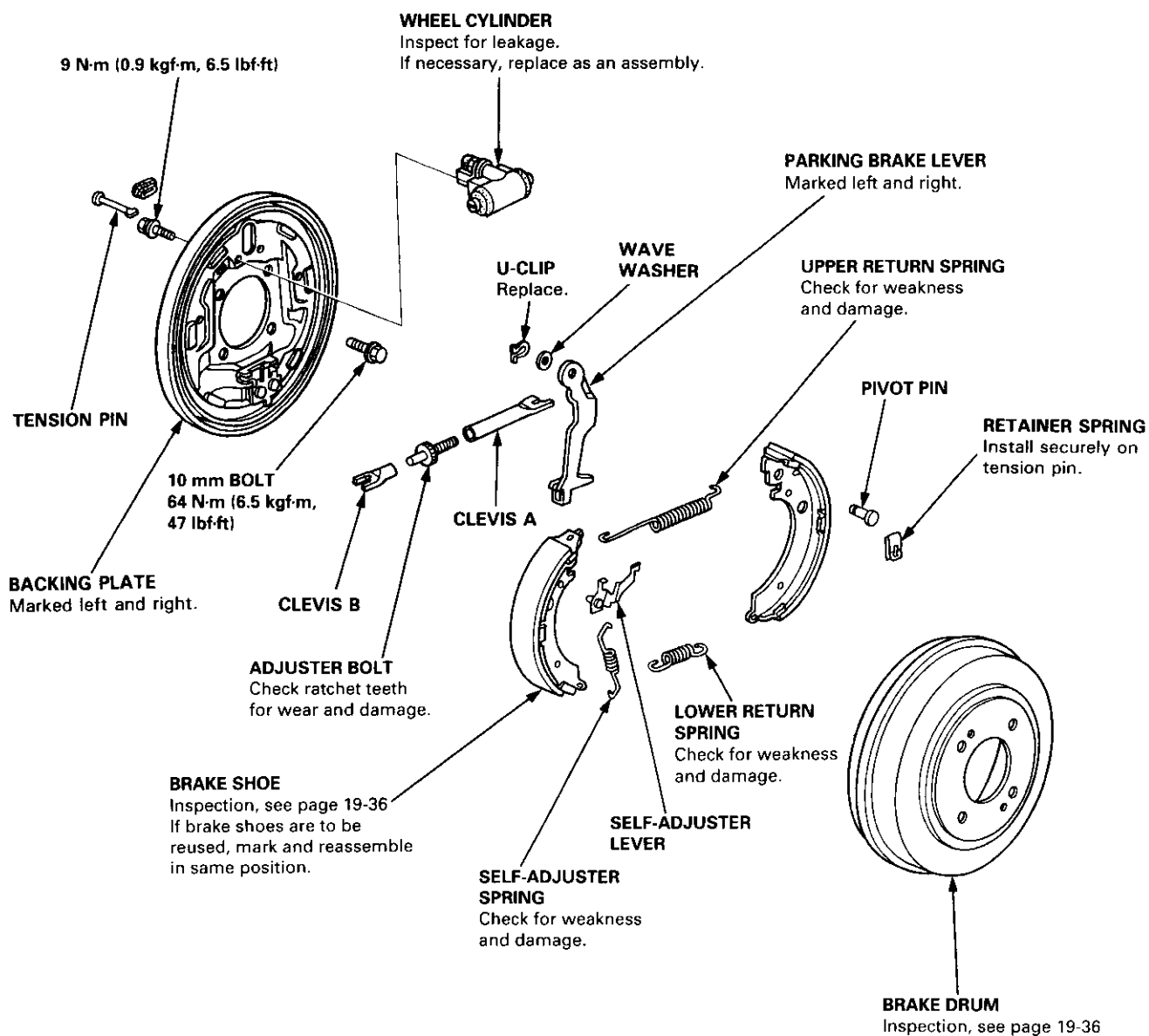


## Index/Inspection

### ⚠ WARNING

- Never use an air hose or dry brush to clean brake assemblies.
- Use an OSHA approved vacuum cleaner to avoid breathing brake dust.
- Contaminated brake linings or drums reduce stopping ability.
- Block the front wheels before jacking up the rear of the vehicle.

1. Block the front wheels, loosen the rear wheel nuts slightly, support the rear of the vehicle on safety stands, then remove the rear wheels.
2. Release the parking brake, and remove the rear brake drum.



# Rear Drum Brake

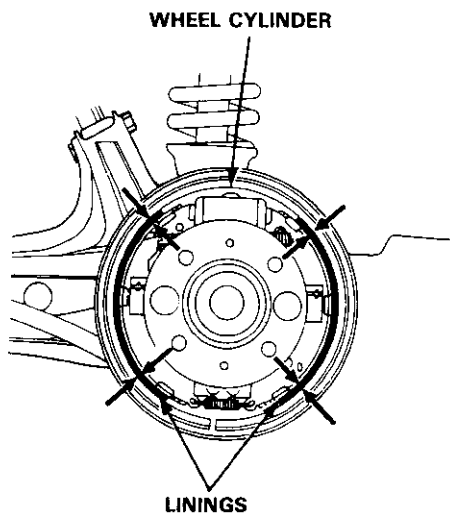
## Inspection

1. Check the wheel cylinder for leakage.
2. Check the brake linings for cracking, glazing, wear, and contamination.
3. Measure the brake lining thickness.

### Brake Lining Thickness:

**Standard:** 4.0 mm (0.157 in)

**Service Limit:** 2.0 mm (0.08 in)



**NOTE:** Measurement does not include brake shoe thickness.

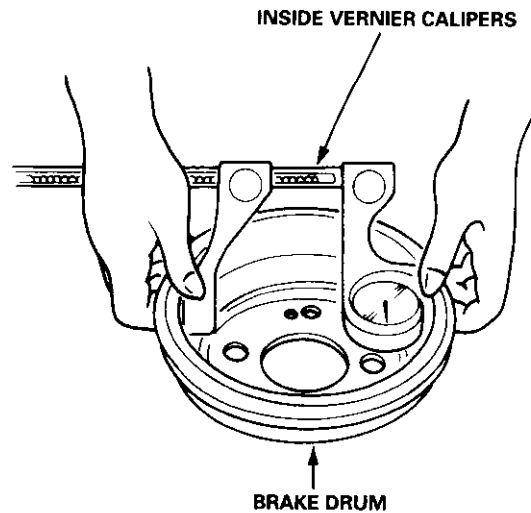
4. If the brake lining thickness is less than the service limit, replace the brake shoes as a set.
5. Check the bearings in the hub unit for smooth operation. If defective, refer to section 18.

6. Measure the inside diameter of the brake drum using the inside vernier calipers.

### Drum Inside Diameter:

**Standard:** 199.9 – 200.0 mm (7.870 – 7.874 in)

**Service Limit:** 201.0 mm (7.913 in)



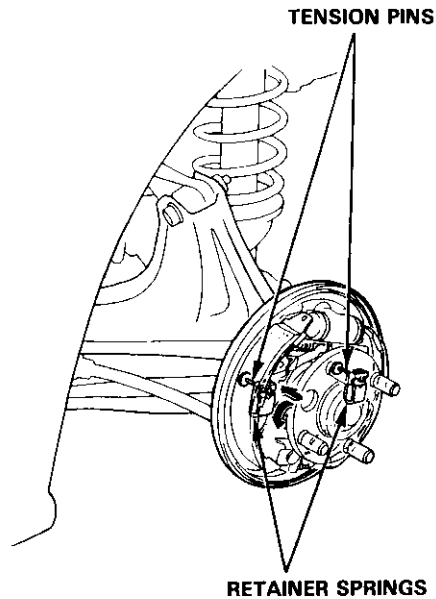
7. If the inside diameter of the brake drum is more than the service limit, replace the brake drum.
8. Check the brake drum for scoring, grooves, and cracks.





## Brake Shoe Disassembly

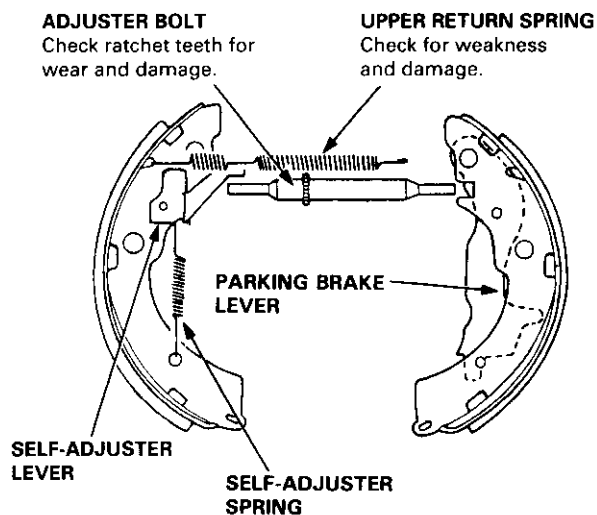
1. Remove the tension pins by pushing the retainer springs and turning them.



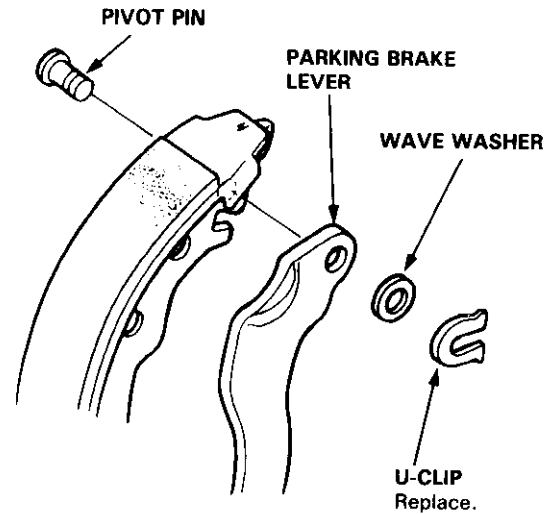
2. Lower the brake shoe assembly, and remove the lower return spring.

**NOTE:** Be careful not to damage the dust cover on the wheel cylinder.

3. Remove the brake shoe assembly.
4. Disconnect the parking brake cable from the parking brake lever.
5. Remove the upper return spring, self-adjuster lever, and self-adjuster spring, and separate the brake shoes.



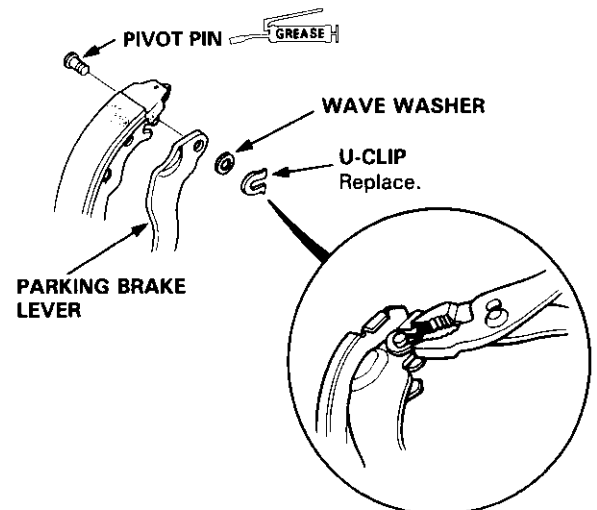
6. Remove the wave washer, parking brake lever, and pivot pin from the brake shoe by removing the U-clip.



## Brake Shoe Reassembly

1. Apply brake cylinder grease (P/N: 08733 - B020E) or equivalent rubber grease to the sliding surface of the pivot pin, and insert the pin into the brake shoe.
2. Install the parking brake lever and wave washer on the pivot pin and secure them with the U-clip.

**NOTE:** Pinch the U-clip securely to prevent the pivot pin from coming out of the brake shoe.



(cont'd)

# Rear Drum Brake

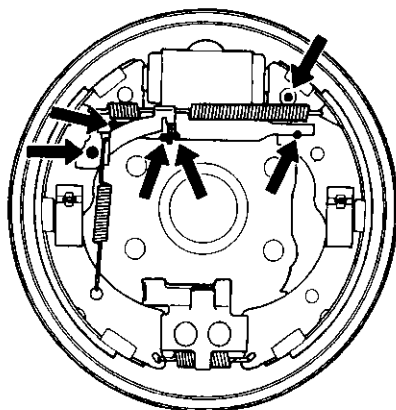
## Brake Shoe Reassembly (cont'd)

3. Connect the parking brake cable to the parking brake lever.
4. Apply grease on each sliding surface.

**▲ WARNING** Contaminated brake linings reduce stopping ability. Keep grease or oil off the brake linings. Wipe any excess grease off the parts.

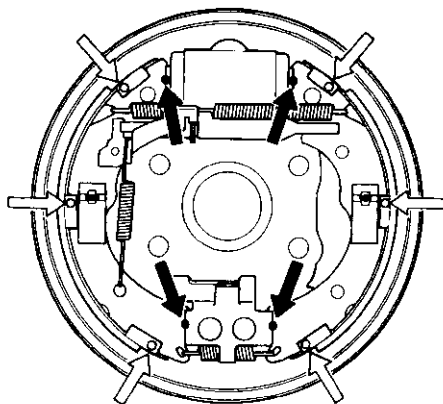
- Apply brake cylinder grease (P/N: 08733 - B020E) or equivalent rubber grease to the sliding surfaces as shown.

→● Sliding surface



- Apply Molykote 44MA to the brake shoe ends and opposite edges of the shoes as shown.

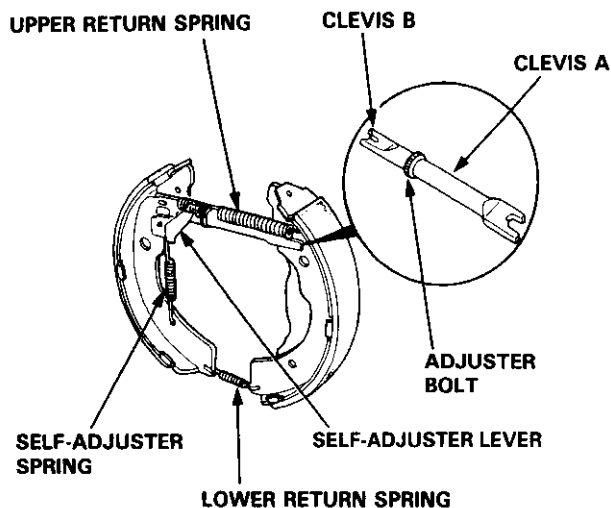
→● Opposite edge of the shoe  
⇒○ Brake shoe ends



5. Clean the threaded portions of clevises A and B. Coat the threads of the clevises with grease. To shorten the clevises, turn the adjuster bolt.
6. Hook the self-adjuster spring to the self-adjuster lever first, then to the brake shoe.
7. Install the clevises and upper return spring, noting the installation direction.

NOTE: Be careful not to damage the wheel cylinder dust covers.

8. Install the lower return spring.
9. Install the tension pins and retaining springs.



10. Install the brake drum.
11. If the wheel cylinder has been removed, bleed the brake system (see page 19-7), and check for leaks at brake line connections, and retighten if necessary.
12. Depress the brake pedal several times to set the self-adjusting brake.
13. Adjust the parking brake (see page 19-6).

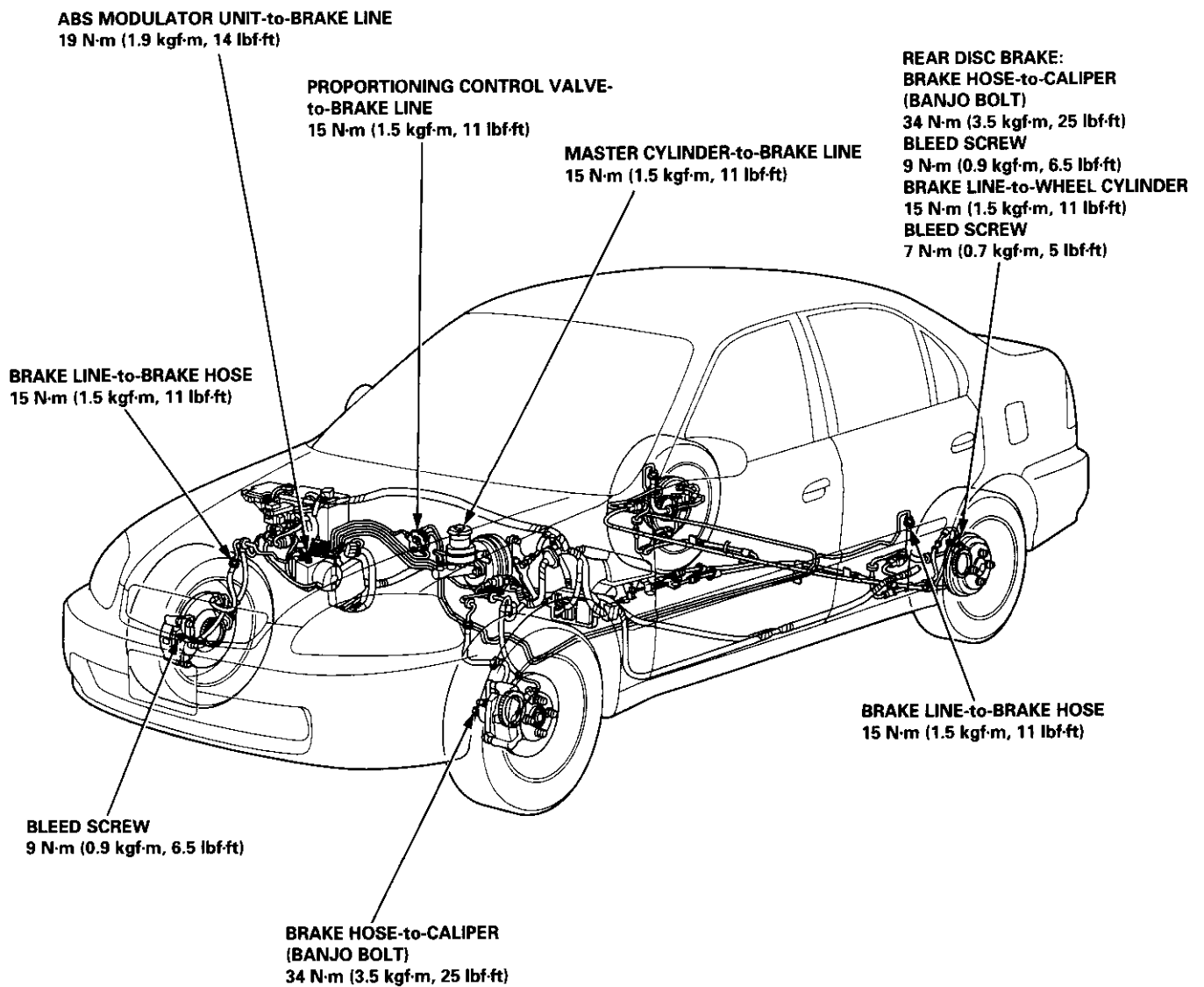
# Brake Hoses/Lines



## Inspection/Torque Specifications

1. Inspect the brake hoses for damage, deterioration, leaks, interference, and twisting.
2. Check the brake lines for damage, rusting, and leakage. Also check for bent brake lines.
3. Check for leaks at hose and line joints and connections, and retighten if necessary.
4. Check the master cylinder and ABS modulator unit for damage and leakage.

**CAUTION:** Replace the brake hose clip whenever the brake hose is serviced.



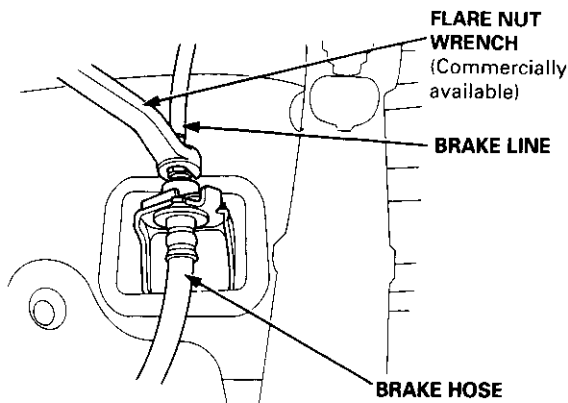
# Brake Hoses/Lines

## Hose Replacement

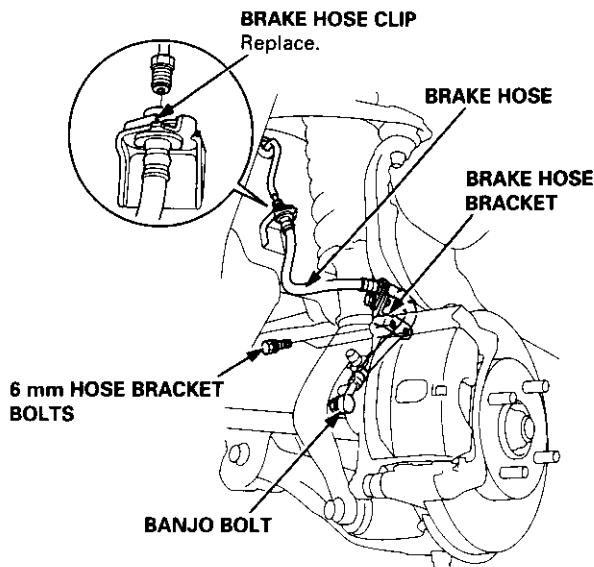
### CAUTION:

- Before reassembling, check that all parts are free of dust and other foreign particles.
- Replace parts with new ones whenever specified to do so.
- Do not spill brake fluid on the vehicle; it may damage the paint; if brake fluid does contact the paint, wash it off immediately with water.

1. Replace the brake hose if the hose is twisted, cracked, or if it leaks.
2. Disconnect the brake hose from the brake line using a 10 mm flare nut wrench.

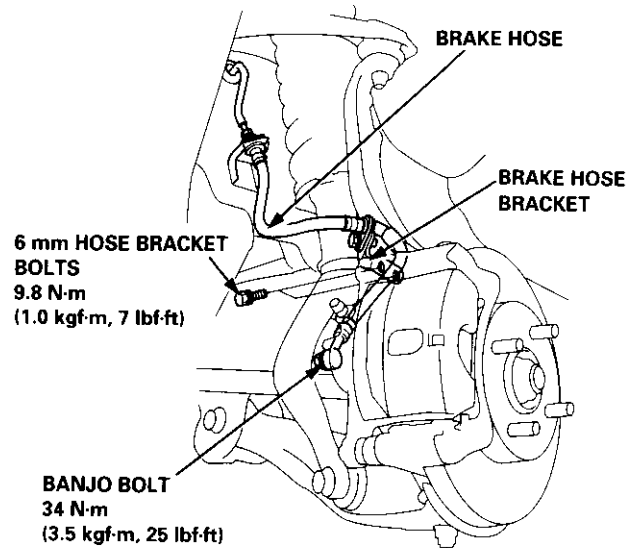


3. Remove and discard the brake hose clip from the brake hose.

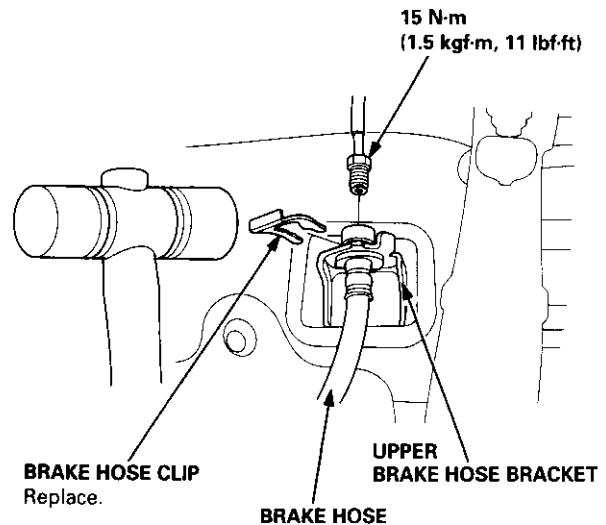


4. Remove the banjo bolt, and disconnect the brake hose from the caliper.
5. Remove the brake hose bracket from the knuckle.

6. Install the brake hose bracket and brake hose onto the knuckle first, then connect the brake hose to the caliper with the banjo bolt and new sealing washers.



7. Install the brake hose onto the upper brake hose bracket with a new brake hose clip.



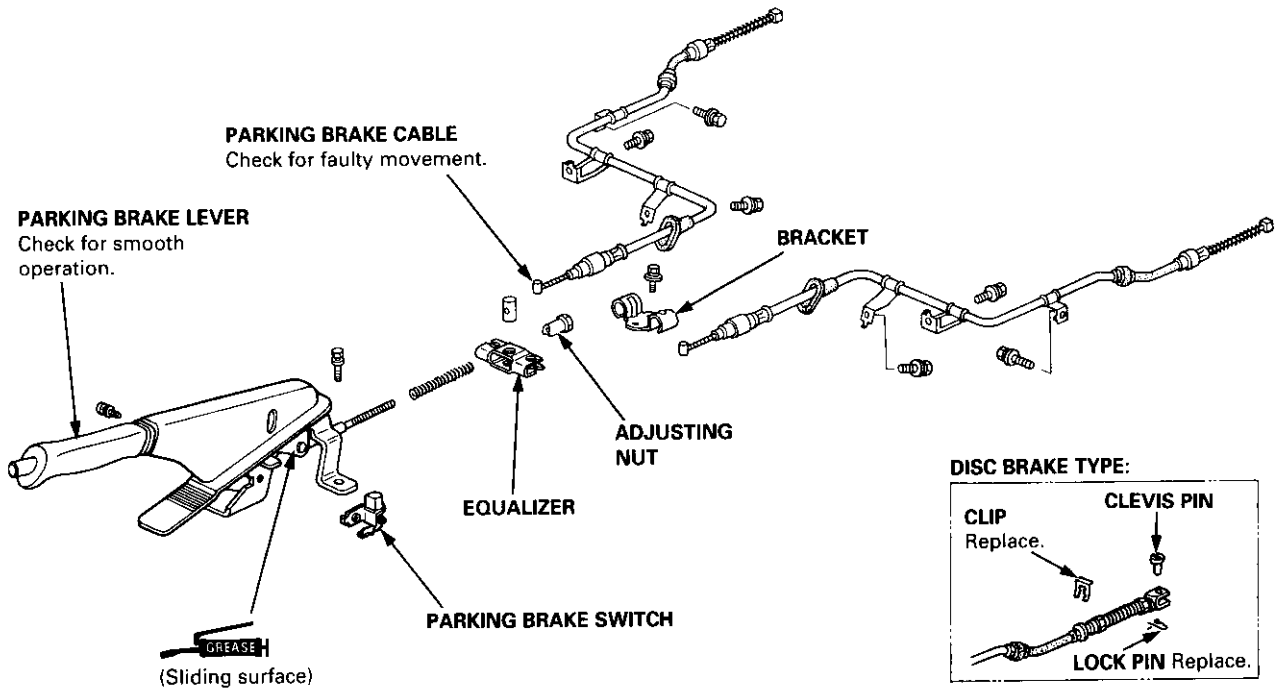
8. Connect the brake line to the brake hose.
9. After installing the brake hose, bleed the brake system (see page 19-7).
10. Perform the following checks:
  - Check the brake hose and line joint for leaks, and tighten if necessary.
  - Check the brake hoses for interference and twisting.



# Parking Brake Cable

## Inspection and Replacement

**CAUTION:** The parking brake cables must not be bent or distorted. This will lead to stiff operation and premature cable failure.

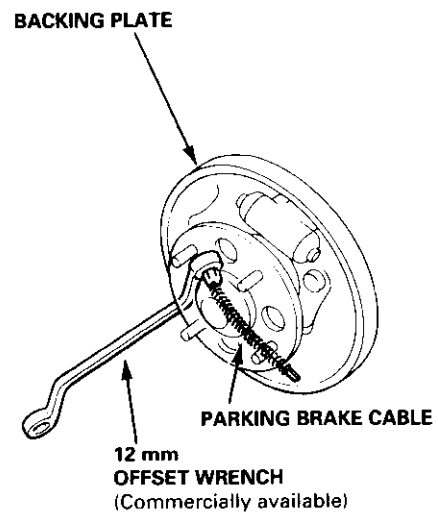
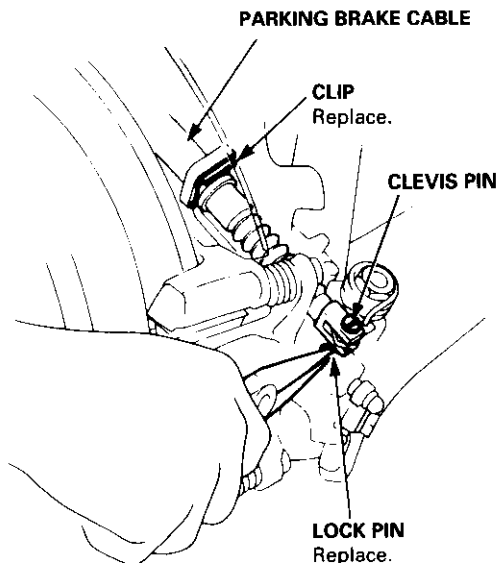


### Disc Brake Type:

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.

### Drum Brake Type:

Remove the parking brake cable from the backing plate using a 12 mm offset wrench as shown.

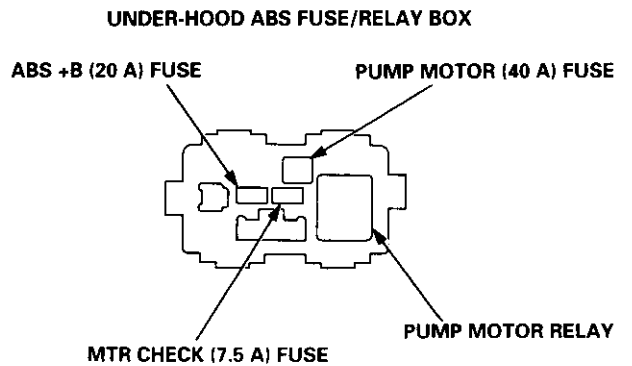
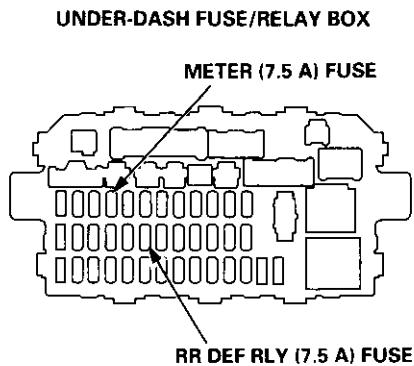
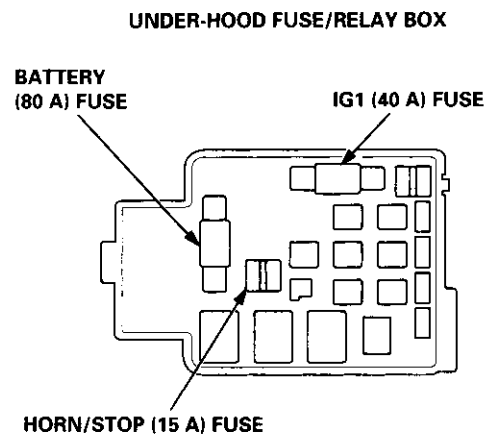
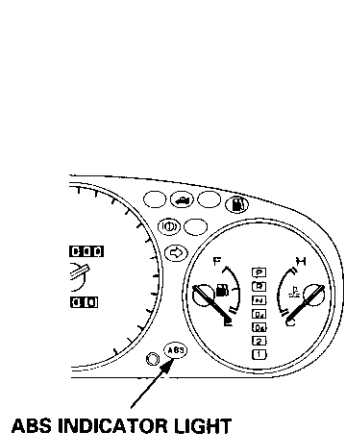
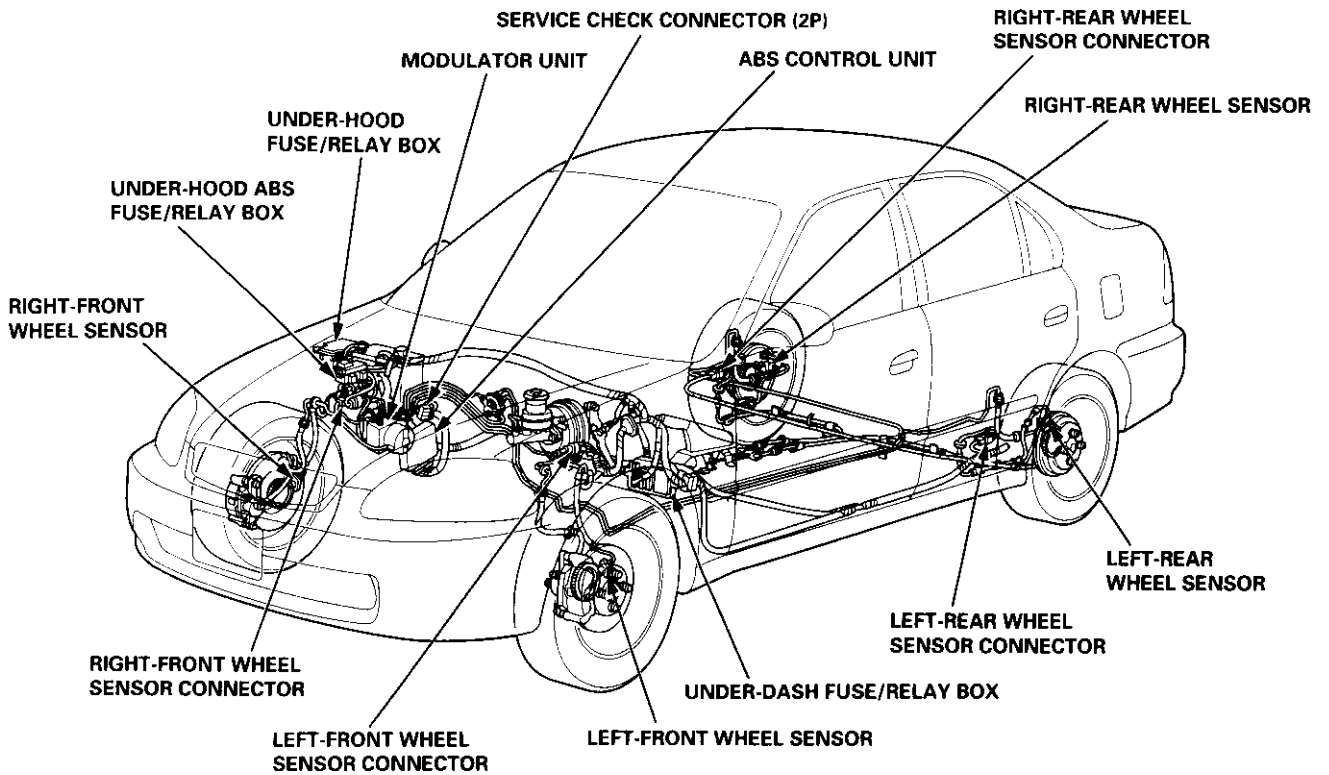


## Anti-lock Brake System (ABS)

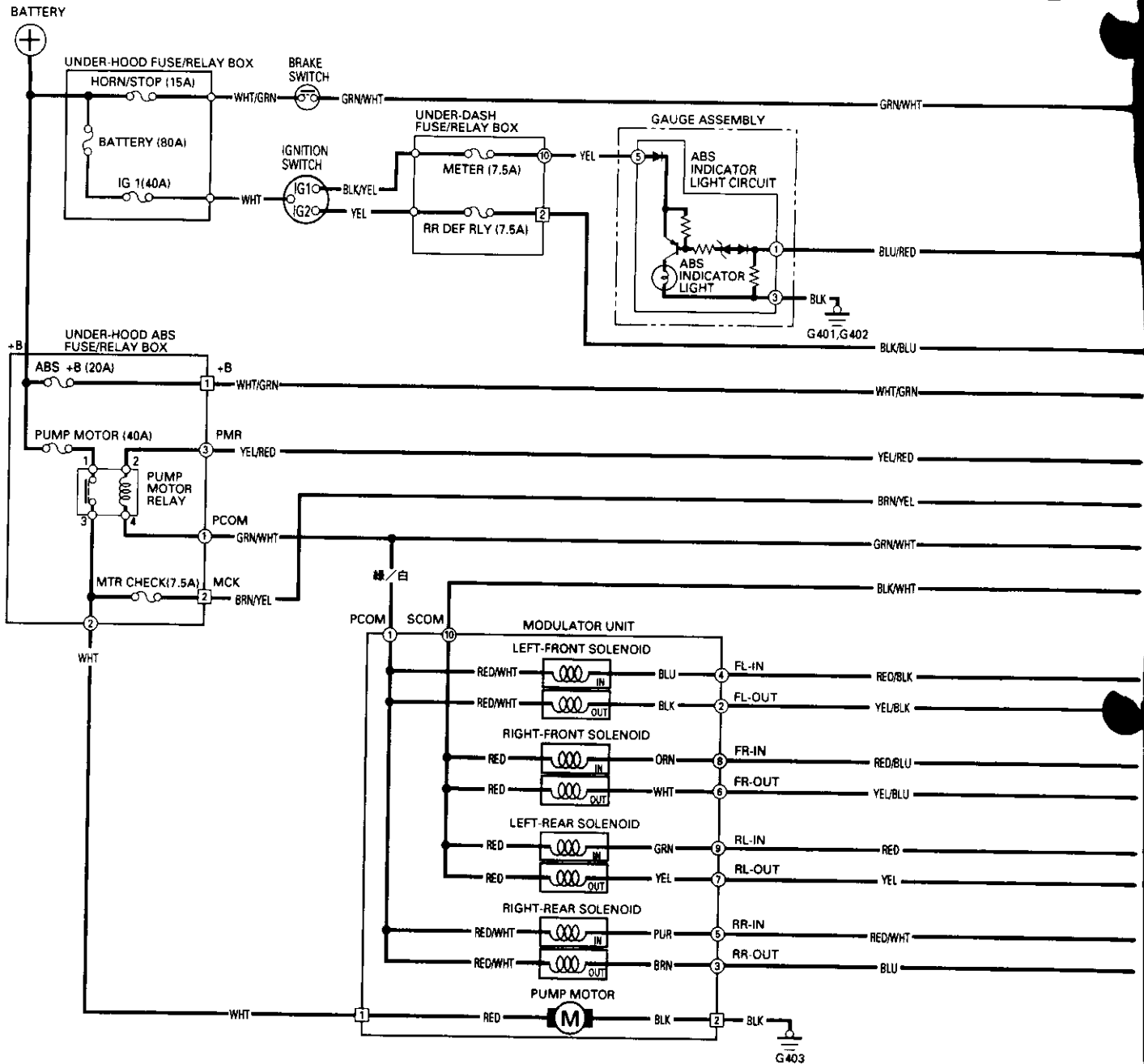
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# Component Locations



# Circuit Diagram



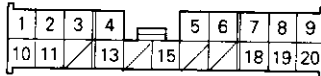
UNDER-HOOD ABS FUSE/RELAY BOX  
3P CONNECTOR (○ number)



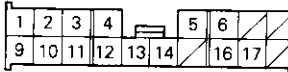
UNDER-HOOD ABS FUSE/RELAY BOX  
2P CONNECTOR (□ number)



UNDER-DASH FUSE/RELAY BOX  
20P CONNECTOR (○ number)



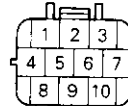
UNDER-DASH FUSE/RELAY BOX  
18P CONNECTOR (□ number)



GAUGE ASSEMBLY 5P CONNECTOR  
(○ number)



MODULATOR UNIT 10P CONNECTOR  
(○ number)

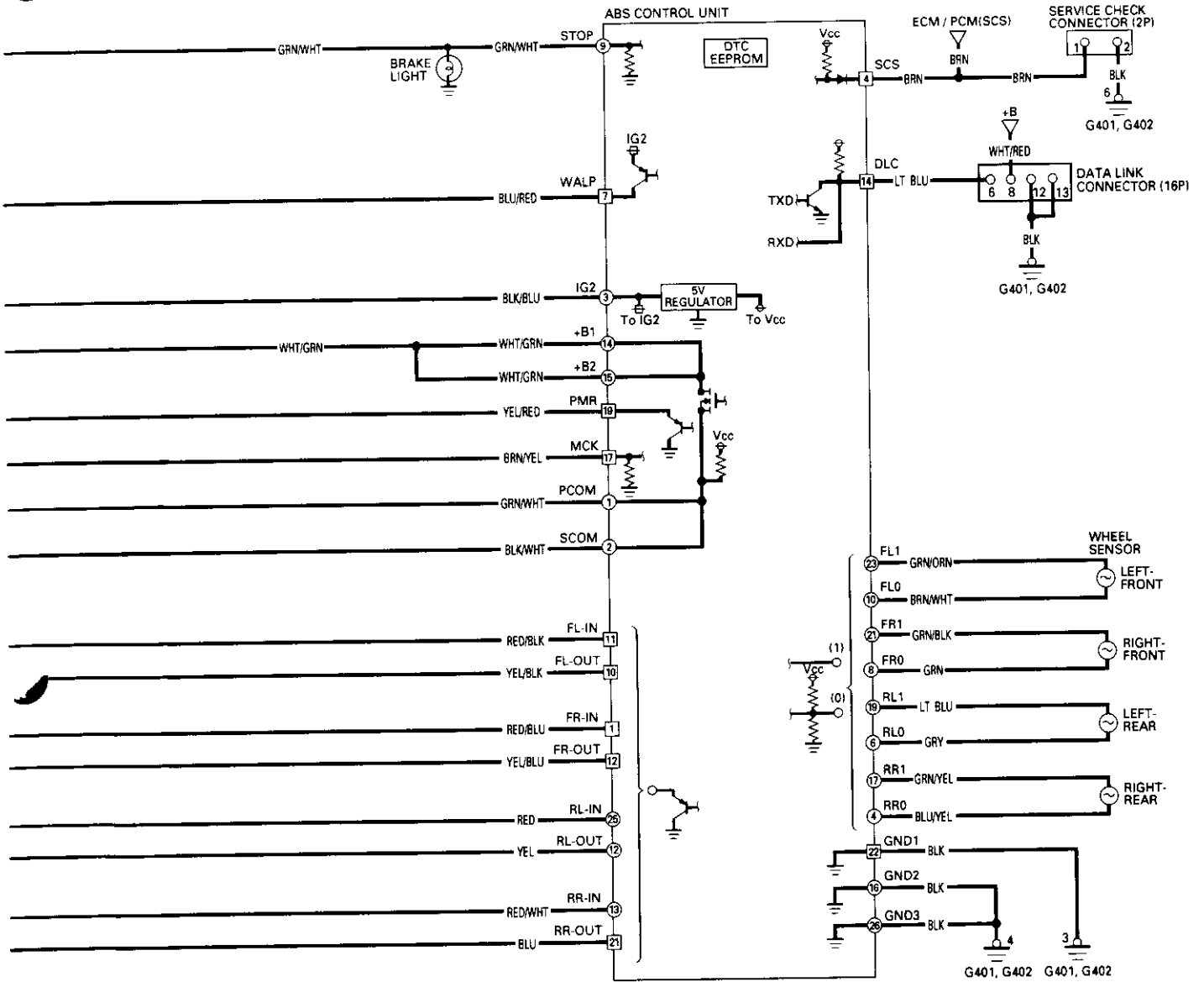


PUMP MOTOR 2P CONNECTOR  
(□ number)

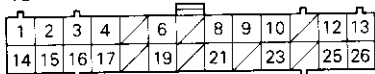


Wire side of female terminals

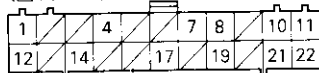




ABS CONTROL UNIT 26P CONNECTOR  
(○ number)



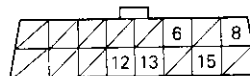
ABS CONTROL UNIT 22P CONNECTOR  
(□ number)



SERVICE CHECK CONNECTOR (2P)



DATA LINK CONNECTOR (16P)



WHEEL SENSOR 2P CONNECTOR

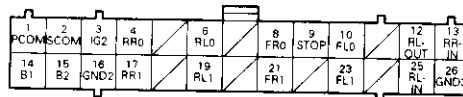


Wire side of female terminals

Terminal side of male terminals

# ABS Control Unit Terminal Arrangement

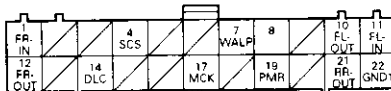
ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement terminals	Voltage			
					Conditions (Ignition Switch ON (II))		Output voltage	
1	GRN/WHT	PCOM (Primary common)	Power source for the solenoid valve and pump motor.	1-GND	Engine	ON	Solenoid ON	0 V
								Solenoid OFF
2	BLK/WHT	SCOM (Secondary common)	Power source for the solenoid valve.	2-GND	Engine	OFF (Connect the SCS service connector)		Approx. 3 V
3	BLK/BLU	IG2 (Ignition 2)	Detects ignition switch 2 signal. (System activate signal)	3-GND				
4	BLU/YEL	RR0 (Rear-right 0)	Detects right-rear wheel sensor signal.	4-17	When the wheel is turned at 1 turn/second.			53 mV or above on digital tester (AC range) (Reference) 150 mVp-p or above on oscilloscope
6	GRY	RLO (Rear-left 0)	Detects left-rear wheel sensor signal.	6-19				
8	GRN	FRO (Front-right 0)	Detects right-front wheel sensor signal.	8-21				
9	GRN/WHT	STOP (Stop)	Detects brake switch signal. (Prevents unnecessary ABS operation)	9-GND	Brake pedal depressed.			Battery voltage
					Brake pedal released.			0 V
10	BRN/WHT	FLO (Front-left 0)	Detects left-front wheel sensor signal.	10-23	When the wheel is turned at 1 turn/second.			53 mV or above on digital tester (AC range) (Reference) 150 mVp-p or above on oscilloscope
12	YEL	RL-OUT (Rear-left outlet)	Drives left-rear outlet solenoid valve.	12-GND	Engine	ON	Solenoid ON	0 V
								Solenoid OFF
13	RED/WHT	RR-IN (Rear-right inlet)	Drives right-rear inlet solenoid valve.	13-GND	Engine	OFF (Connect the SCS service connector)		Approx. 3 V
14	WHT/GRN	B1 (Battery 1)	Power source for the solenoid valve and pump motor.	14-GND		Battery voltage		
15	WHT/GRN	B2 (Battery 2)	Power source for the solenoid valve and pump motor.	15-GND				
16	BLK	GND2 (Ground 2)	Ground for the ABS control unit.	16-GND				Below 0.3 V
17	GRN/YEL	RR1 (Rear-right 1)	Detects right-rear wheel sensor signal.	17-4	When the wheel is turned at 1 turn/second.			53 mV or above on digital tester (AC range) (Reference) 150 mVp-p or above on oscilloscope
19	LT BLU	RL1 (Rear-left 1)	Detects left-rear wheel sensor signal.	19-6				
21	GRN/BLK	FR1 (Front-right 1)	Detects right-front wheel sensor signal.	21-8				
23	GRN/ORN	FL1 (Front-left 1)	Detects left-front wheel sensor signal.	23-10	Stops			Approx. 2.5 V
25	RED	RL-IN (Rear-left inlet)	Drives left-rear inlet solenoid valve.	25-GND	Engine	ON	Solenoid ON	0 V
								Solenoid OFF
					Engine	OFF (Connect the SCS service connector)		Approx. 3 V
26	BLK	GND3 (Ground 3)	Ground for the ABS control unit.	26-GND				

### ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

Terminal number	Wire color	Terminal sign (Terminal name)	Description	Measurement terminals	Voltage			
					Conditions (Ignition Switch ON (III))		Output voltage	
1	RED/BLU	FR-IN (Front-right inlet)	Drives right-front inlet solenoid valve.	1-GND	Engine	ON	Solenoid ON	0 V
							Solenoid OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)		Approx. 3 V
4	BRN	SCS (Service check signal)	Detects service check signal (Diagnostic trouble code indication)	4-GND	SCS service connector connected.		0 V	
					SCS service connector disconnected.		Approx. 5 V	
7	BLU/RED	WALP (Warning lamp)	Drives ABS indicator light (The indicator light goes off when ABS control unit outputs battery voltage).	7-GND	Indicator light ON		Approx. 2 V	
					Indicator light OFF		Battery voltage	
8	BLU/YEL		Not used.					
10	YEL/BLK	FL-OUT (Front-left outlet)	Drives left-front outlet solenoid valve.	10-GND	Engine	ON	Solenoid ON	0 V
							Solenoid OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)		Approx. 3 V
11	RED/BLK	FL-IN (Front-left inlet)	Drives left-front inlet solenoid valve.	11-GND				
12	YEL/BLU	FR-OUT (Front-right outlet)	Drives right-front outlet solenoid valve.	12-GND				
14	LT BLU	DLC (Data link connector)	Communicates with Honda PGM Tester.	14-GND		---	Approx. 5 V	
17	BRN/YEL	MCK (Motor check)	Detects pump motor drive signal.	17-GND	Pump motor relay	ON	Battery voltage	
						OFF	0 V	
19	YEL/RED	PMR (Pump motor relay)	Drives pump motor relay.	19-GND	Engine	ON	Solenoid ON	0 V
							Solenoid OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)		Approx. 3 V
21	BLU	RR-OUT (Rear-right outlet)	Drives right-rear outlet solenoid valve.	21-GND	Engine	ON	Pump motor relay ON	0 V
							Pump motor relay OFF	AC: 3~6 V
						OFF (Connect the SCS service connector)		Approx. 3 V
22	BLK	GND2 (Ground 2)	Ground for the ABS control unit.	22-GND			Below 0.3 V	

# Troubleshooting Precautions

## ABS Indicator Light

- The ABS indicator light comes on when the ABS control unit detects a problem in the system. However, even though the system is normal, the ABS indicator light can come on, too, under the following conditions. To determine the actual cause of the problem, question the customer about the problem, taking the following conditions into consideration.
  - Signal disturbance
  - Wheel spin
  - Only drive wheels rotate
  - Battery voltage fluctuates
- When a problem is detected and the ABS indicator light comes on, the indicator light can stay on until the ignition switch is turned off, or it can automatically go off, depending on the mode.
  - Light stays on until the ignition switch is turned off: When the system is in the system down mode.
  - Light automatically goes off: When the system is in the control inhibition mode.  
(refer to symptom-to-system chart)
- The ABS indicator light stays on when the system is reactivated without erasing the DTC, but it goes off after starting the car.  
When the wheel sensor system is faulty and the ABS indicator light comes on, the algorithm of the system automatically turns off the ABS indicator light after the wheel speed signal returns to the normal speed. While, when the DTC is erased, the CPU is reset and the ABS indicator light goes off when the system checked out normal by the initial diagnosis. Therefore, test-drive the car after servicing the wheel sensor system, and be sure that the ABS indicator light does not come on.
- When the ABS control unit outputs battery voltage to the gauge assembly, the ABS indicator light goes off.

## Diagnostic Trouble Code (DTC)

- The diagnostic trouble code (DTC) is memorized when a problem is detected and the ABS indicator light does not go off, or when the ABS indicator light comes on.  
The DTC is not memorized when the ABS indicator light comes on unless the CPU is activated.
- The memory can hold any number of DTCs. However, when the same DTC is detected twice or more, the later one is written over the old one.  
Therefore, when the same problem is detected repeatedly, it is recorded as one DTC.
- The DTCs are indicated in the order of ascending number, not in the order they occur.
- The DTCs are memorized in the EEPROM (non-volatile memory).  
Therefore, the memorized DTCs cannot be canceled by disconnecting the battery. Perform the specified procedures to erase.

## Self-diagnosis

- The self-diagnosis can be classified into these four categories:
  - Initial diagnosis: Performed right after the engine starts and until the ABS indicator light goes off.
  - Except ABS control: Performed when the ABS is not functioning.
  - During ABS control: Performed when the ABS is functioning.
  - During warning: Performed when the ABS indicator light is ON.
- The system performs the following controls when a problem is detected by the self-diagnosis:
  - ABS indicator light ON
  - Memory of DTC
  - Mode change to the "system down mode" or the "control inhibition mode".

MODE	ABS INDICATOR LIGHT	MAIN RELAY	SOLENOID VALVE	CPU	Restart condition		DTC
SYSTEM DOWN	ON	No operation	Drive inhibition	Operation*1	Ignition switch	OFF → ON	Memory
CONTROL INHIBITION	ON	No operation	Drive inhibition	Operation	Automatic		Memory

\*1: Except CPU failure



#### **Kickback**

1. The motor operates when the ABS is functioning, and the fluid in the reservoir is forced out to the master cylinder causing kickback at the brake pedal.
2. The ABS control unit operates the solenoid valve when the brake pedal is released after the initial diagnosis. You may hear the faint solenoid valve operation sound at this time, but it is normal.

#### **Pump Motor**

1. The pump motor operates when the ABS is functioning.
2. The ABS control unit checks the pump motor operation during acceleration. You may hear the faint operation sound at this time, but it is normal.

#### **Brake Fluid Replacement/Air Bleeding**

1. Brake fluid replacement and air bleeding procedures are the same as for conventional brakes.

#### **Troubleshooting**

1. The troubleshooting flowcharts explain the procedures on the assumption that the cause of the problem is still present and the ABS indicator light is still on.  
Note that troubleshooting following the flowchart when the ABS indicator light does not come on can result in incorrect judgment.
2. Question the customer about the conditions when the problem occurred, and try to reproduce the same conditions for troubleshooting.  
Self-diagnosis is made at various times such as the initial diagnosis, except ABS control, during ABS control, during acceleration, during the specified vehicle speed, etc. Therefore, the symptom cannot be checked unless the check conditions match with the problem conditions.
3. When the ABS indicator light does not come on during the test drive, but the troubleshooting is performed based on the DTC, check for the loose connectors, poor contact of the terminals, etc, before troubleshooting.
4. After troubleshooting, erase the DTC and test-drive the car. Be sure that the ABS indicator light does not come on.
5. The connector illustrations show the female connectors with a single outline and the male connectors with a double outline.
6. The connector terminal cavities containing female terminals are always numbered by looking at the connector from the wire side, and the cavities containing male terminals are always numbered by looking at the connector from the terminal side.

# Diagnostic Trouble Code (DTC)

## Diagnostic Trouble Code (DTC) Indication

NOTE: This operation can also be carried out with the Honda PGM Tester.

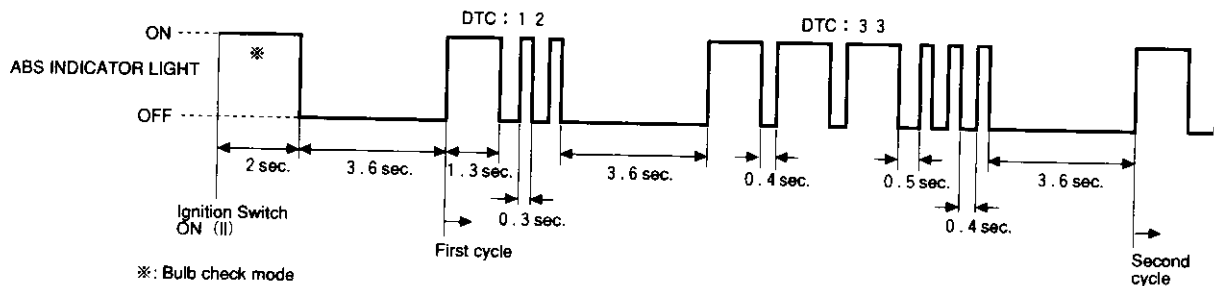
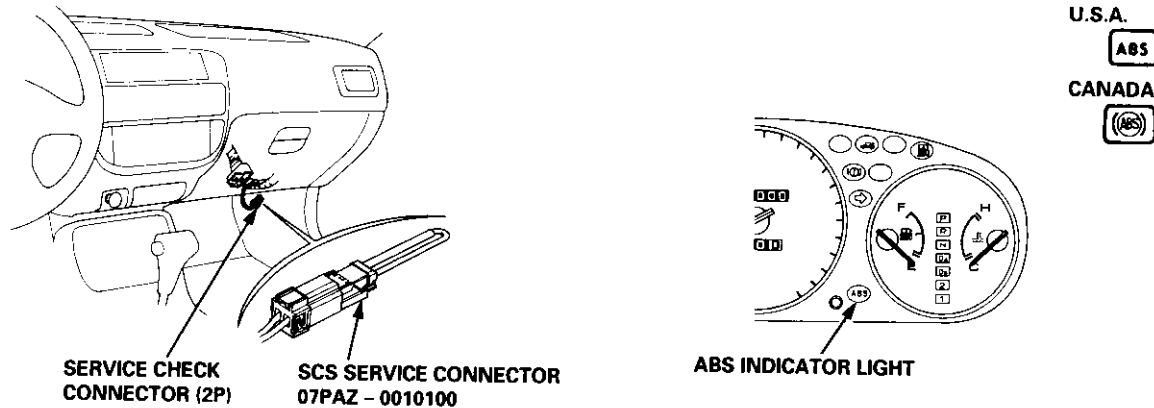
1. Connect the SCS service connector to the service check connector inside the passenger's side kick panel.
2. Turn the ignition switch ON (II), but do not start the engine.  
NOTE: Do not depress the brake pedal when turning the ignition switch.
3. Record the blinking frequency of the ABS indicator light. The blinking frequency indicates the DTC.
4. Turn the ignition switch OFF, and remove the SCS service connector.  
NOTE: The Malfunction Indicator Lamp (MIL) will stay on after the engine is started if the SCS service connector is connected.
5. Erase the DTC.

### Conditions for DTC indication

- The vehicle is stopped.
- The SCS service connector is connected before the ignition switch is turned ON (II).
- The brake pedal is released.
- The SCS service connector remains connected during this procedure.

The DTC indication stops and the ABS control unit executes the software function if at least one of the following conditions is satisfied:

- The vehicle is not stopped.
- The ABS control unit receives the normal signal (which is for the ABS control unit) from a Honda PGM Tester.
- The SCS service connector is disconnected during this procedure.



- When the ignition switch is turned ON (II), the ABS indicator light comes on to check the bulb. Do not count it as a DTC.
- The ABS control unit can memorize any number of DTCs.
- The new DTC is not memorized when the ABS control unit has already memorized the same DTC.
- If the DTC is not memorized, the ABS indicator light stays ON after it goes off for 3.6 seconds.



# Diagnostic Trouble Code (DTC)

## Symptom-to-System Chart

DTC	ABS INDICATOR LIGHT	DIAGNOSIS/SYMPTOM	DETECTION TIMING				PROBLEM LOCATION	PROBABLE CAUSE
			INITIAL DIAGNOSIS	EXCEPT ABS CONTROL	DURING ABS CONTROL	DURING WARNING		
NO DTC	OFF	ABS indicator light does not come on when ignition switch is turned on (II)						<ul style="list-style-type: none"> <li>Open in the power source circuit for the ABS indicator light</li> <li>Blown ABS indicator light bulb</li> <li>Open in the ABS indicator light drive circuit.</li> <li>Short to power in the WALP circuit</li> <li>Faulty ABS control unit</li> </ul>
	ON	ABS indicator light does not go off after engine is started						<ul style="list-style-type: none"> <li>Open in the IG2 circuit</li> <li>Open in the +B circuit</li> <li>Open and/or short to body ground in the WALP circuit</li> <li>Faulty ABS control unit</li> </ul>
11	ON*	Wheel sensor (open/short to body ground/short to power)	○	○	○	○	FR	<ul style="list-style-type: none"> <li>Open, short to body ground and/or short to power in the wheel sensor circuit</li> <li>Faulty wheel sensor</li> <li>Faulty ABS control unit</li> </ul>
13							FL	
15							RR	
17							RL	
12	ON*	Wheel sensor/Pulsar (chipped pulser gear/noise)		○	○	○	FR	<ul style="list-style-type: none"> <li>Short to wheel sensor (0) circuit in the wheel sensor (1) circuit</li> <li>Faulty wheel sensor installation</li> <li>Chipped pulser gear</li> <li>Faulty ABS control unit</li> </ul>
14							FL	
16							RR	
18							RL	
31	ON	Solenoid (open/short to body ground/short to power/stuck)	○	○	○		FR-IN	<ul style="list-style-type: none"> <li>Open, short to body ground and/or short to power in the solenoid drive circuit</li> <li>Open in the COM circuit</li> <li>Open solenoid</li> <li>Faulty ABS control unit</li> </ul>
32							FR-OUT	
33							FL-IN	
34							FL-OUT	
35							RR-IN	
36							RR-OUT	
37							RL-IN	
38	RL-OUT							
51	ON	Motor lock		○	○			<ul style="list-style-type: none"> <li>Open in the motor power source circuit</li> <li>Open in the motor GND circuit</li> <li>Faulty pump motor</li> <li>Faulty ABS control unit</li> </ul>
52	ON	Motor stuck OFF		○	○			<ul style="list-style-type: none"> <li>Open in the COM, PMR and/or MCK circuit</li> <li>Open and/or blown fuse in the under-hood ABS fuse/relay box power source circuit</li> <li>Faulty pump motor relay</li> <li>Faulty ABS control unit</li> </ul>
53	ON	Motor stuck ON		○				<ul style="list-style-type: none"> <li>Short to body ground in the PMR circuit</li> <li>Short to power in the pump motor power source circuit</li> <li>Faulty pump motor relay</li> <li>Faulty ABS control unit</li> </ul>
54	ON	Main relay stuck OFF	○	○	○			<ul style="list-style-type: none"> <li>Open, short to body ground and/or blown fuse in the B1 or B2 circuit</li> <li>Short to body ground and/or short to power in the COM circuit</li> <li>Faulty modulator unit</li> <li>Faulty ABS control unit</li> </ul>
61	ON	Ignition voltage (low voltage/high voltage)	○	○	○	○		<ul style="list-style-type: none"> <li>Connection of the 24 V battery for engine start</li> <li>Faulty charging system</li> <li>Open in the IG2 circuit</li> <li>Faulty ABS control unit</li> </ul>
81	ON	CPU	○	○	○	○		<ul style="list-style-type: none"> <li>External factor(s) can be the cause(s) of the problem</li> <li>Faulty ABS control unit</li> </ul>

\*: If DTCs 11-18 (wheel sensor codes) were detected the last time the vehicle was driven, the ABS indicator light will stay on until the ignition switch is turned ON (II), and the control unit confirms that the wheel sensors are OK.

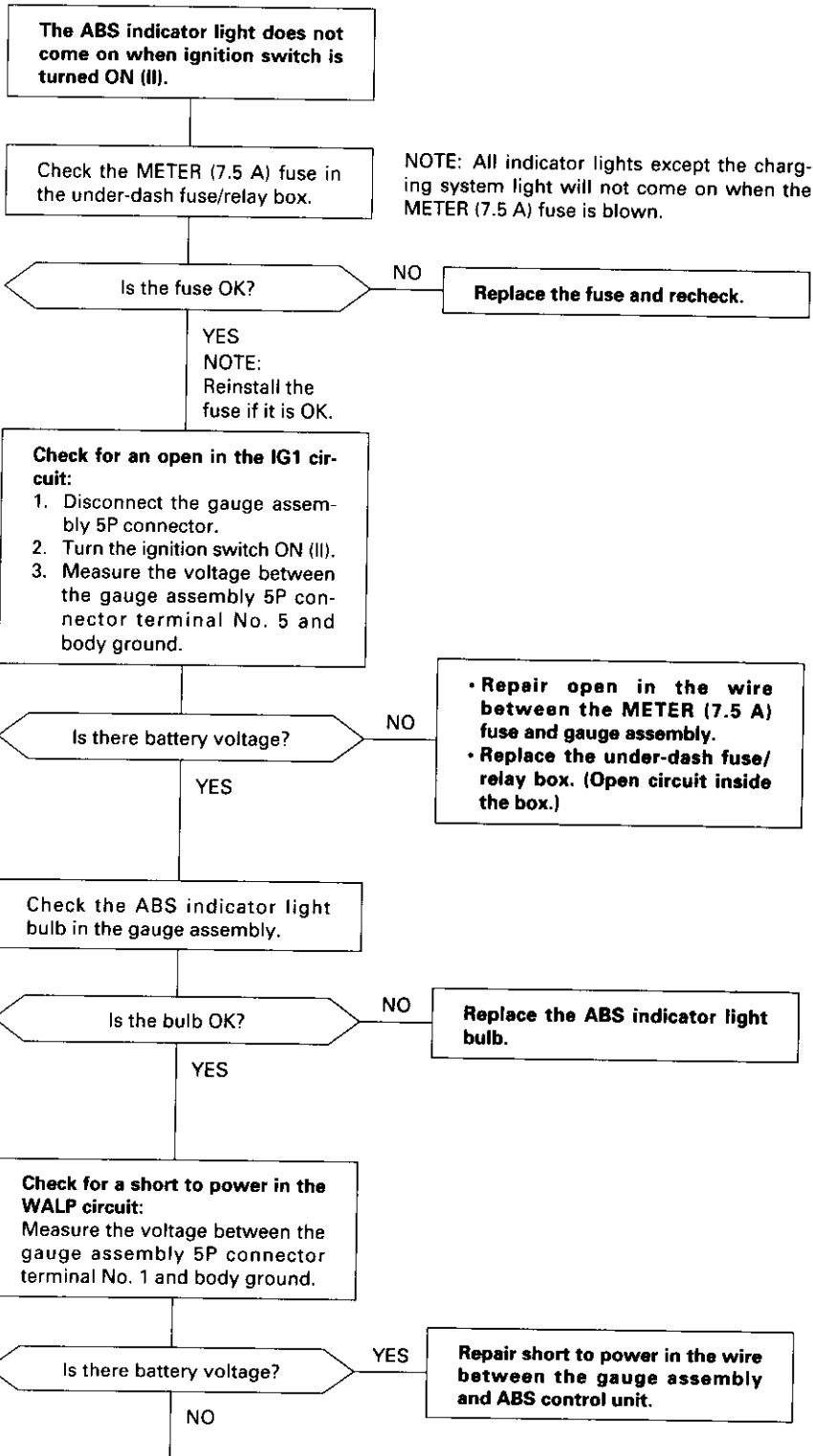


CONDITION FOR DETECTION	MANAGEMENT		REFER TO PAGE
	DURING ABS CONTROL	EXCEPT ABS CONTROL	
			19-60
			19-62
The ABS indicator light comes on when vehicle is stopped and wheel sensor a given voltage does not input.	System down	System down	19-64
The ABS indicator comes on under the following conditions. <ul style="list-style-type: none"> <li>• When more than one of wheels are at a standstill and the velocity of the fastest wheel reaches a given speed.</li> <li>• When the velocity of the fastest wheel reaches or exceeds a given speed, and if there are some wheels whose velocity is slower than a certain percentage of the fastest wheel speed for a given period.</li> <li>• When there are temporary open or short circuits of the wheel sensor, chipped pulser gear, or signal disturbance.</li> </ul>	System down	System down	19-64
The main relay repeats ON/OFF switching at all times. <ul style="list-style-type: none"> <li>• When the main relay is ON, a short test pulse is sent to each valve. If there is some discrepancy, the ABS indicator light comes on.</li> <li>• When the main relay is OFF, a short test pulse is sent to each valve. If the solenoid drive voltage is out of a given range, the ABS indicator light comes on.</li> </ul>	System down	System down	19-66
<ul style="list-style-type: none"> <li>• The pump motor is activated once or twice after every ignition switch ON (II) operation while the vehicle accelerates, then the motor drive voltage is checked. When the voltage is abnormal, the ABS indicator light comes on.</li> <li>• After ABS control completion, the motor is switched off and the main CPU checks the motor drive voltage. When the voltage is abnormal, the ABS indicator light comes on.</li> </ul>	—	System down	19-68
During an active motor test or ABS control, the main CPU checks the supply voltage to the motor. When the voltage is abnormal, the ABS indicator light comes on.	System down	System down	19-68
If the motor drive voltage indicates motor operation when the main CPU does not switch the motor ON, the ABS indicator comes on.	—	System down	19-68
<ul style="list-style-type: none"> <li>• When a solenoid valve failure is detected, the CPU checks the voltage of the main relay output. If the voltage is lower than a given voltage, the ABS indicator light comes on.</li> <li>• The main relay repeats ON/OFF switching at all times. When the main relay is off, a short test pulse is sent to each valve. The CPU monitors the reference voltage. If the voltage is out of a given range, the ABS indicator light comes on.</li> </ul>	System down	System down	19-71
When the ignition voltage is lower or higher than a given voltage, the CPU inhibits ABS control and switches off the main relay, and the ABS indicator light comes on. When the ignition voltage recovers to normal range, ABS inhibition is canceled.	Inhibit all wheels	Inhibit all wheels	19-73
The main CPU and sub CPU check each other under certain conditions. When the CPUs detect the following discrepancies, the ABS indicator light comes on. <ul style="list-style-type: none"> <li>• When there is discrepancy in the calculated wheel speed velocity that continues for more than a given period.</li> <li>• When there is discrepancy in the phase information that continues for more than a given period.</li> <li>• When there is discrepancy in the calculated control parameter.</li> <li>• When the watch dog control pulse fails for a given period.</li> <li>• When the check of the ROM fails.</li> <li>• When there is discrepancy in the data reading and writing procedure of RAM.</li> </ul>	System down	System down	19-74

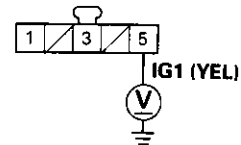
# Troubleshooting

## ABS Indicator Light Does Not Come On

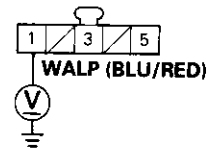
The ABS indicator light does not come on when ignition switch is turned ON (II).



GAUGE ASSEMBLY 5P CONNECTOR



Wire side of female terminals



(From page 19-60)

**Check the gauge assembly:**

1. Turn the ignition switch OFF.
2. Connect the gauge assembly 5P connector.
3. Connect the terminal No. 3 to body ground with a jumper wire.
4. Turn the ignition switch ON (II).

Does the ABS indicator light come on?

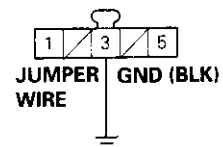
NO

**Replace the ABS indicator light drive circuit in the gauge assembly.**

YES

- Repair open in the wire between the gauge assembly and body ground.
- Repair poor ground (G401, G402).

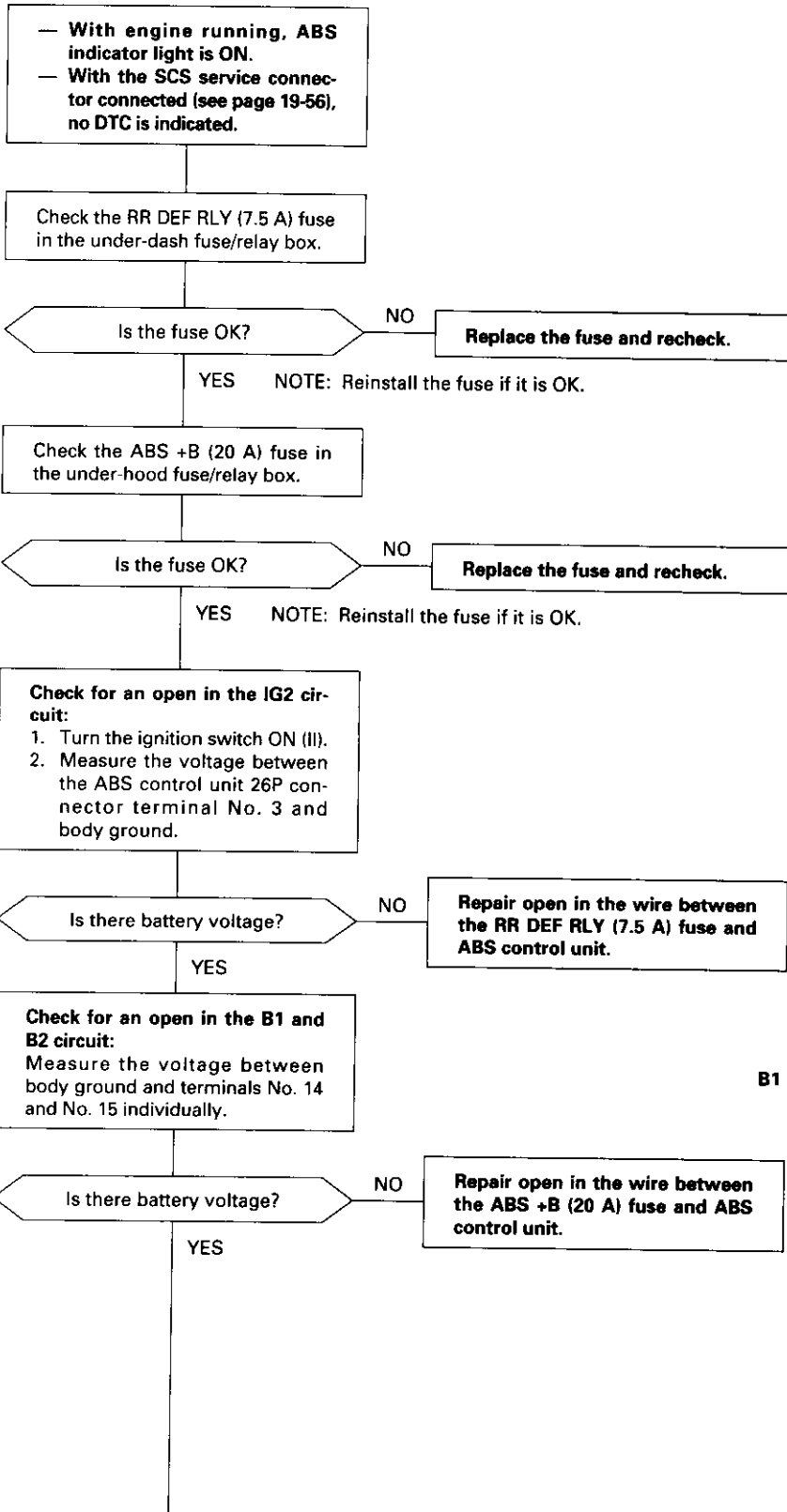
**GAUGE ASSEMBLY 5P CONNECTOR**



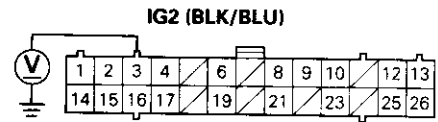
# Troubleshooting

## ABS Indicator Light Does Not Go Off

The ABS indicator light does not go off after the engine is started.

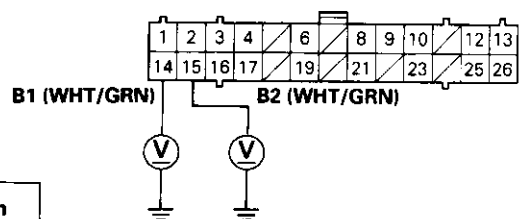


ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

ABS CONTROL UNIT 26P CONNECTOR



Wire side of female terminals

(To page 19-63)

(From page 19-62)

**Check for a short to body ground in the WALP circuit:**

1. Turn the ignition switch OFF.
2. Disconnect the ABS control unit 22P and gauge assembly 5P connectors.
3. Check for continuity between the ABS control unit 22P connector terminal No. 7 and body ground.

Is there continuity?

**YES**  
**Repair short to body ground in the wire between the ABS control unit and gauge assembly.**

NO

**Check the ABS control unit:**

1. Connect the ABS control unit 22P connector.
2. Turn the ignition switch ON (II).
3. Measure the voltage between the ABS control unit 22P connector terminal No. 7 and body ground.

Is there battery voltage?

**NO**

**Check for an open in the GND2 circuit:**

1. Connect the ABS control unit 26P connector terminal No. 16 to body ground with a jumper wire.
2. Measure the voltage between the ABS control unit 22P connector terminal No. 7 and body ground.

YES

Is there battery voltage?

**YES**

- Repair open in the wire between the ABS control unit and body ground.
- Repair poor ground (G401, G402).

NO

**Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**

**Check for an open in the WALP circuit:**  
 Measure the voltage between the gauge assembly 5P connector terminal No. 1 and body ground.

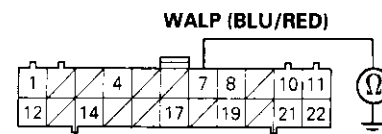
Is there battery voltage?

**NO**  
**Repair open in the wire between the ABS control unit and gauge assembly.**

YES

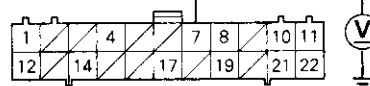
**Replace the ABS indicator light drive circuit in the gauge assembly.**

**ABS CONTROL UNIT 22P CONNECTOR**



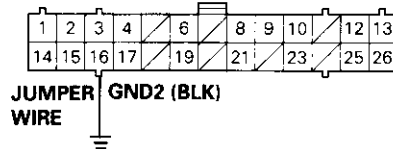
Wire side of female terminals

**ABS CONTROL UNIT 22P CONNECTOR**



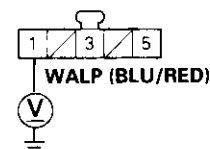
Wire side of female terminals

**ABS CONTROL UNIT 26P CONNECTOR**



Wire side of female terminals

**GAUGE ASSEMBLY 5P CONNECTOR**



Wire side of female terminals

# Troubleshooting

## Wheel Sensor

### Diagnostic Trouble Code (DTC) 11-18: Wheel Sensor Diagnosis

NOTE: The ABS indicator light comes on when only the drive wheels are turning, signal disturbance is detected, etc. Therefore, test-drive the car at a speed of 12 mph (20 km/h) or more after turning the ignition switch from OFF to ON (II), and if the ABS indicator light does not come on, the system is OK.

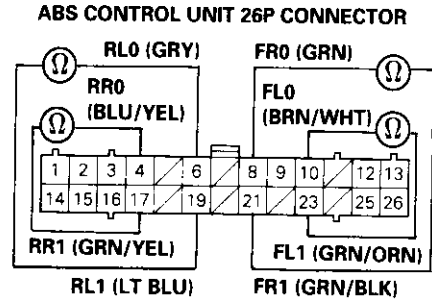
- With the ignition switch ON (II), ABS indicator light does not go off.
- After driving, ABS indicator light comes on.
- With the SCS service connector connected (see page 19-56), DTCs 11-18 are indicated.

**Check the wheel sensor circuit:**

1. Disconnect the ABS control unit 26P connector.
2. Measure the resistance between the appropriate wheel sensor (0) and (1) circuit terminals\*.

\*

DTC	Appropriate Terminal	
	(0) SIDE	(1) SIDE
11, 12 (Right-front)	No. 8: FR0	No. 21: FR1
13, 14 (Left-front)	No. 10: FL0	No. 23: FL1
15, 16 (Right-rear)	No. 4: RR0	No. 17: RR1
17, 18 (Left-rear)	No. 6: RL0	No. 19: RL1



Is the resistance OK?  
(Front: 750 - 1050 Ω/20°C, 68°F)  
(Rear: 850 - 1150 Ω/20°C, 68°F)

NO

- Repair open in the (0) or (1) circuit wire, or short to the (0) circuit wire in the (1) circuit wire between the ABS control unit and appropriate wheel sensor.
- Replace the appropriate wheel sensor.

YES

**Check for a short to body ground in the wheel sensor circuit:**  
Check for continuity between the ABS control unit 26P connector appropriate wheel sensor (0) circuit terminal\* and body ground.

Is there continuity?

YES

- Repair short to body ground in the (0) or (1) circuit wire between the ABS control unit and appropriate wheel sensor.
- Replace the appropriate wheel sensor.

NO

**Check for a short to power in the wheel sensor circuit:**

1. Reconnect the ABS control unit 26P connector.
2. Start the engine.
3. Measure the voltage between the ABS control unit 26P connector appropriate wheel sensor (0) circuit terminal and body ground.

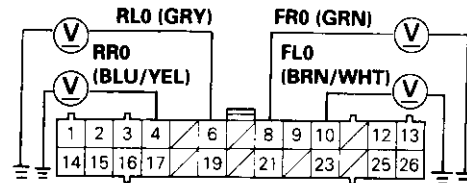
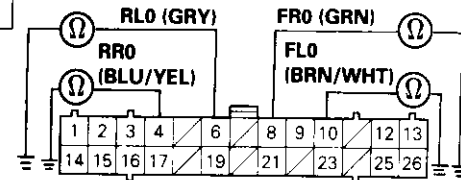
Is there 4 V or more?

YES

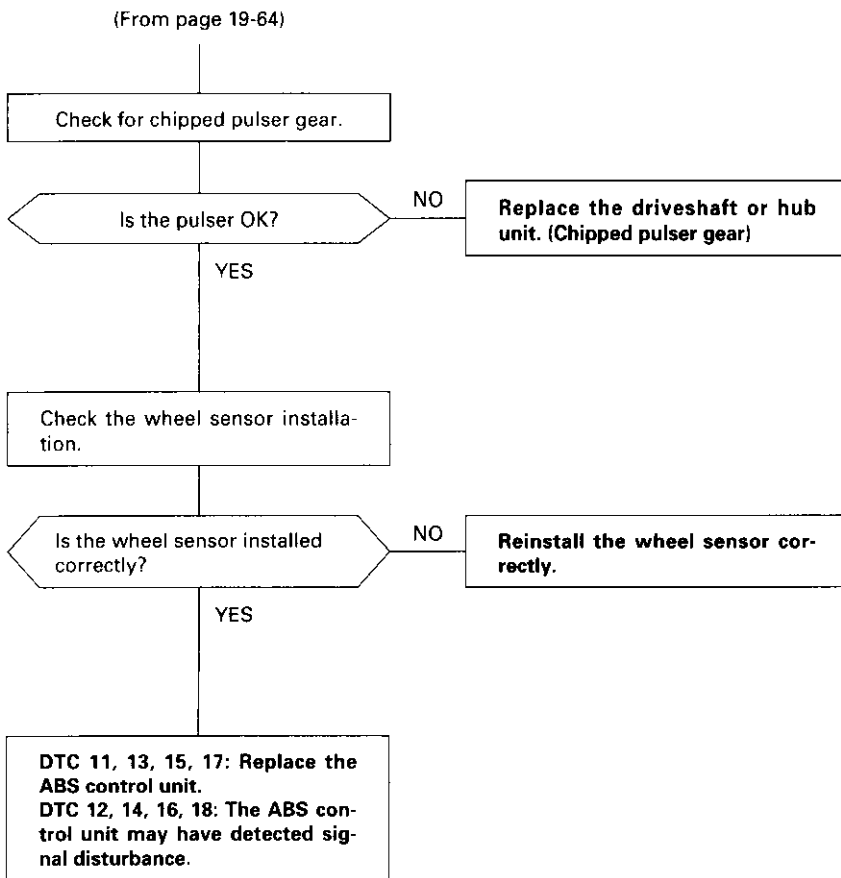
- Repair short to power in the (0) or (1) circuit wire between the ABS control unit and appropriate wheel sensor.

NO

- NOTE:
- Normal voltage: Approx. 2 V
  - 0 V: Replace the ABS control unit.
  - 4 V or more indicates a short to power.



(To page 19-65)



# Troubleshooting

## Solenoid

### Diagnostic Trouble Code (DTC) 31-38: Solenoid Diagnosis

- With the ignition switch ON (II), ABS indicator light does not go off, or ABS indicator light comes on while ABS is functioning.
- With the SCS service connector connected (see page 19-56), DTCs 31-38 are indicated.

#### Check for a short to power in the solenoid circuit:

1. Disconnect the ABS control unit 22P and 26P connectors.
2. Start the engine.
3. Measure the voltage between the ABS control unit connector appropriate solenoid circuit terminal\* and body ground.

Is there battery voltage?

YES

Repair short to power in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.

NO

#### Check for a short to body ground in the solenoid circuit:

Check for continuity between the appropriate solenoid circuit terminal\* and body ground.

Is there continuity?

YES

- Repair short to body ground in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.
- Replace the modulator unit.

NO

#### Check the ABS control unit:

1. Turn the ignition switch OFF.
2. Connect the ABS control unit 22P and 26P connectors.
3. Connect the SCS service connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the ABS control unit 26P connector appropriate COM circuit terminal\*\* and body ground.

Is there approx. 3 V?

NO

Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.

YES

(To page 19-67)

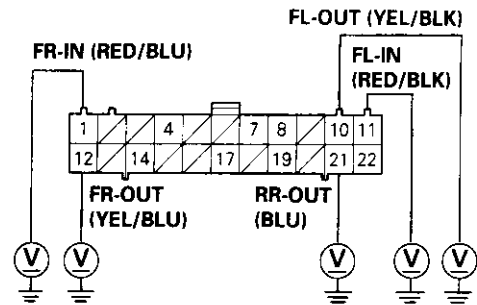
\*

DTC	Appropriate Connector	Appropriate Terminal
31: FR-IN	22P	No. 1
32: FR-OUT	22P	No. 12
33: FL-IN	22P	No. 11
34: FL-OUT	22P	No. 10
35: RR-IN	26P	No. 13
36: RR-OUT	22P	No. 21
37: RL-IN	26P	No. 25
38: RL-OUT	26P	No. 12

\*\*

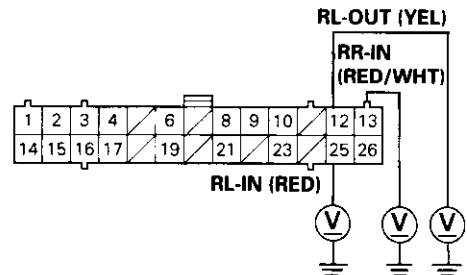
DTC	Appropriate Terminal
31: FR-IN	No. 2: SCOM
32: FR-OUT	No. 2: SCOM
33: FL-IN	No. 1: PCOM
34: FL-OUT	No. 1: PCOM
35: RR-IN	No. 1: PCOM
36: RR-OUT	No. 1: PCOM
37: RL-IN	No. 2: SCOM
38: RL-OUT	No. 2: SCOM

ABS CONTROL UNIT 22P CONNECTOR

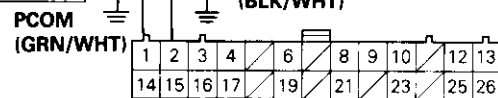
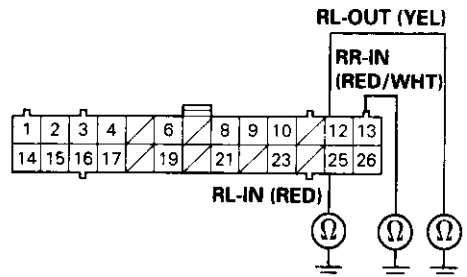
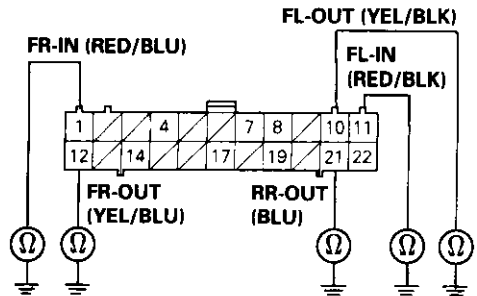


Wire side of female terminals

ABS CONTROL UNIT 26P CONNECTOR

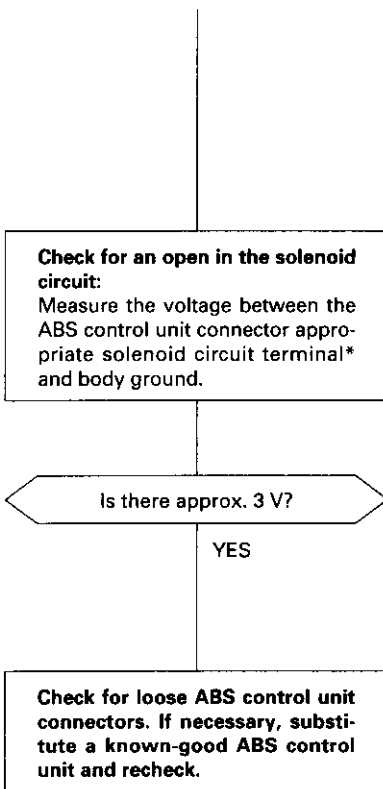


Wire side of female terminals





(From page 19-66)

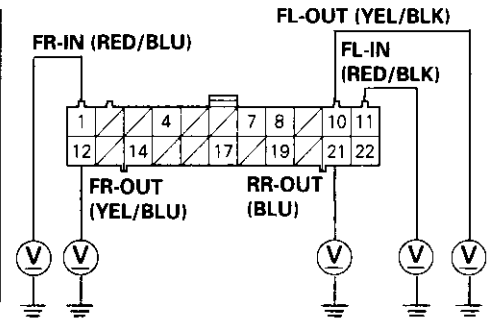


\*

DTC	Appropriate Connector	Appropriate Terminal
31: FR-IN	22P	No. 1
32: FR-OUT	22P	No. 12
33: FL-IN	22P	No. 11
34: FL-OUT	22P	No. 10
35: RR-IN	26P	No. 13
36: RR-OUT	22P	No. 21
37: RL-IN	26P	No. 25
38: RL-OUT	26P	No. 12

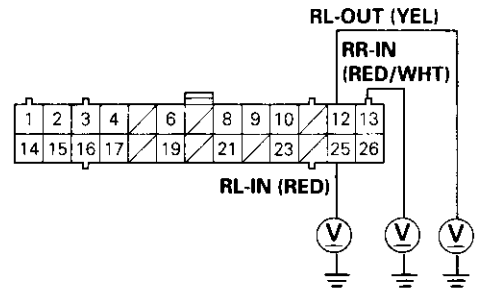
- Repair open in the appropriate COM circuit wire between the ABS control unit and modulator unit.
- Repair open in the appropriate solenoid circuit wire between the ABS control unit and modulator unit.
- Replace the modulator unit.

**ABS CONTROL UNIT 22P CONNECTOR**



Wire side of female terminals

**ABS CONTROL UNIT 26P CONNECTOR**



Wire side of female terminals

# Troubleshooting

## ABS Pump Motor

### Diagnostic Trouble Code (DTC) 51~53: ABS Pump Motor Diagnosis

— With the ignition switch ON (II), ABS indicator light does not go off.  
 — With the SCS service connector connected (see page 19-56), DTCs 51~53 are indicated.

Check the MTR CHECK (7.5 A) fuse.

Is the fuse OK?

NO **Replace the fuse and recheck.**

YES  
 NOTE: Reinstall the fuse if it is OK.

NOTE: Short the PMR terminal to body ground for a moment, and recheck the fuse. If the fuse is blown, check for a short to body ground in the MCK circuit.

Check the PUMP MOTOR (40 A) fuse.

Is the fuse OK?

NO **Replace the fuse and recheck.**

YES  
 NOTE: Reinstall the fuse if it is OK.

NOTE: Short the PMR terminal to body ground for a moment, and recheck the fuse. If the fuse is blown, check for a short to body ground in the wire between the under-hood ABS fuse/relay box and pump motor.

Check the pump motor relay (see section 23).

Is the relay OK?

NO **Replace the pump motor relay.**

YES

**Check the pump motor power source circuit:**  
 Turn the ignition switch ON (II).

Does the pump motor operate?

YES **Check for a short to power in the pump motor power source circuit:**  
 Remove the pump motor relay.

NO

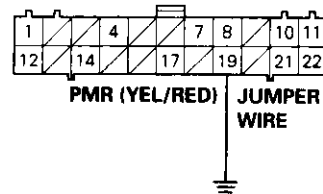
Does the pump motor operate?

YES **Repair short to power in the wire between the under-hood ABS fuse/relay box and ABS pump motor.**

NO

**Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals

(To page 19-69)

(From page 19-68)

**Check the pump motor circuit:**  
 1. Remove the pump motor relay.  
 2. Turn the ignition switch ON (II).  
 3. Connect the pump motor relay connector +B and MOTOR terminals with a jumper wire for a moment.

Does the pump motor operate?

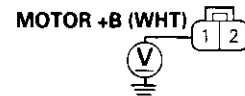
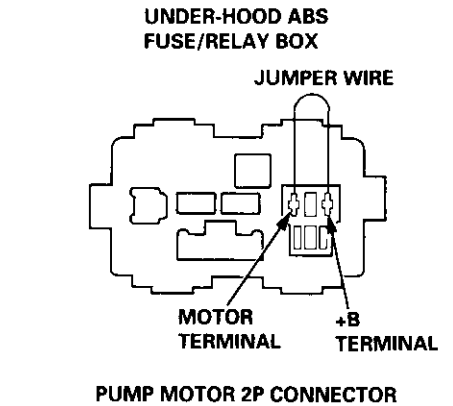
YES

NO

**Check for an open in the pump motor +B circuit:**  
 1. Turn the ignition switch OFF.  
 2. Disconnect the pump motor 2P connector.  
 3. Turn the ignition switch ON (II).  
 4. Connect the pump motor relay connector +B and MOTOR terminals with a jumper wire.  
 5. Measure the voltage between the pump motor 2P connector terminal No. 1 and body ground.

Is there battery voltage?

YES



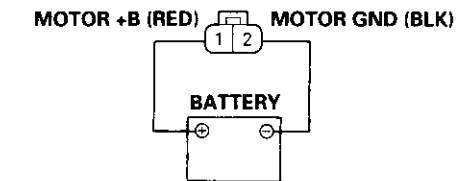
Wire side of female terminals

**Repair open in the wire between the under-hood ABS fuse/relay box and pump motor.**

**Check the pump motor operation:**  
 Connect the battery (+) terminal to the pump motor 2P connector terminal No. 1, and the (-) terminal to the terminal No. 2 for a moment.

Does the pump motor operate?

YES



**Replace the modulator unit. (Faulty pump motor)**

**Check for a short to body ground in the PMR circuit:**  
 1. Turn the ignition switch OFF.  
 2. Disconnect the ABS control unit 22P connector.  
 3. Check for continuity between terminal No. 19 and body ground.

Is there continuity?

NO

YES

**Repair open in the wire between the pump motor and body ground, or poor ground (G403).**

**Repair short to body ground in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

**ABS CONTROL UNIT 22P CONNECTOR**



Wire side of female terminals

(To page 19-70)

(cont'd)

# Troubleshooting

## ABS Pump Motor (cont'd)

(From page 19-69)

**Check for an open in the PCOM circuit:**

1. Turn the ignition switch OFF.
2. Reconnect the ABS control unit 22P connector.
3. Connect the SCS service connector.
4. Turn the ignition switch ON (II).
5. Measure the voltage between the pump motor relay connector PCOM terminal and body ground.

Is there approx. 3 V?

NO  
**Repair open in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

YES

**Check for an open in the PMR circuit:**  
Measure the voltage between the ABS control unit 22P connector terminal No. 19 and body ground.

Is there approx. 3 V?

NO  
**Repair open in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

YES

**Check for an open in the MCK circuit:**

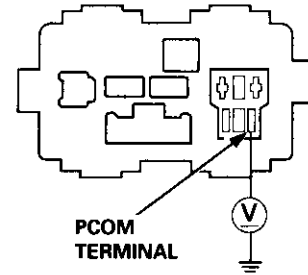
1. Turn the ignition switch OFF.
2. Disconnect the SCS service connector.
3. Turn the ignition switch ON (III).
4. Measure the voltage between the ABS control unit 22P connector terminal No. 17 and body ground while connecting the pump motor relay connector +B and MOTOR terminal with a jumper wire for moment.

Is there battery voltage?

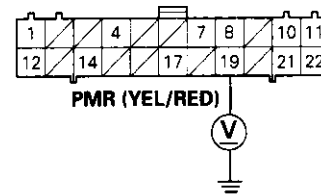
NO  
**Repair open in the wire between the under-hood ABS fuse/relay box and ABS control unit.**

YES

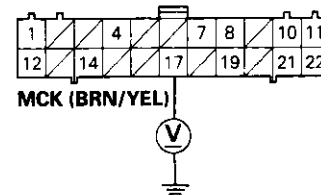
**Check for loose ABS control unit connectors. If necessary, substitute a known-good ABS control unit and recheck.**



ABS CONTROL UNIT 22P CONNECTOR

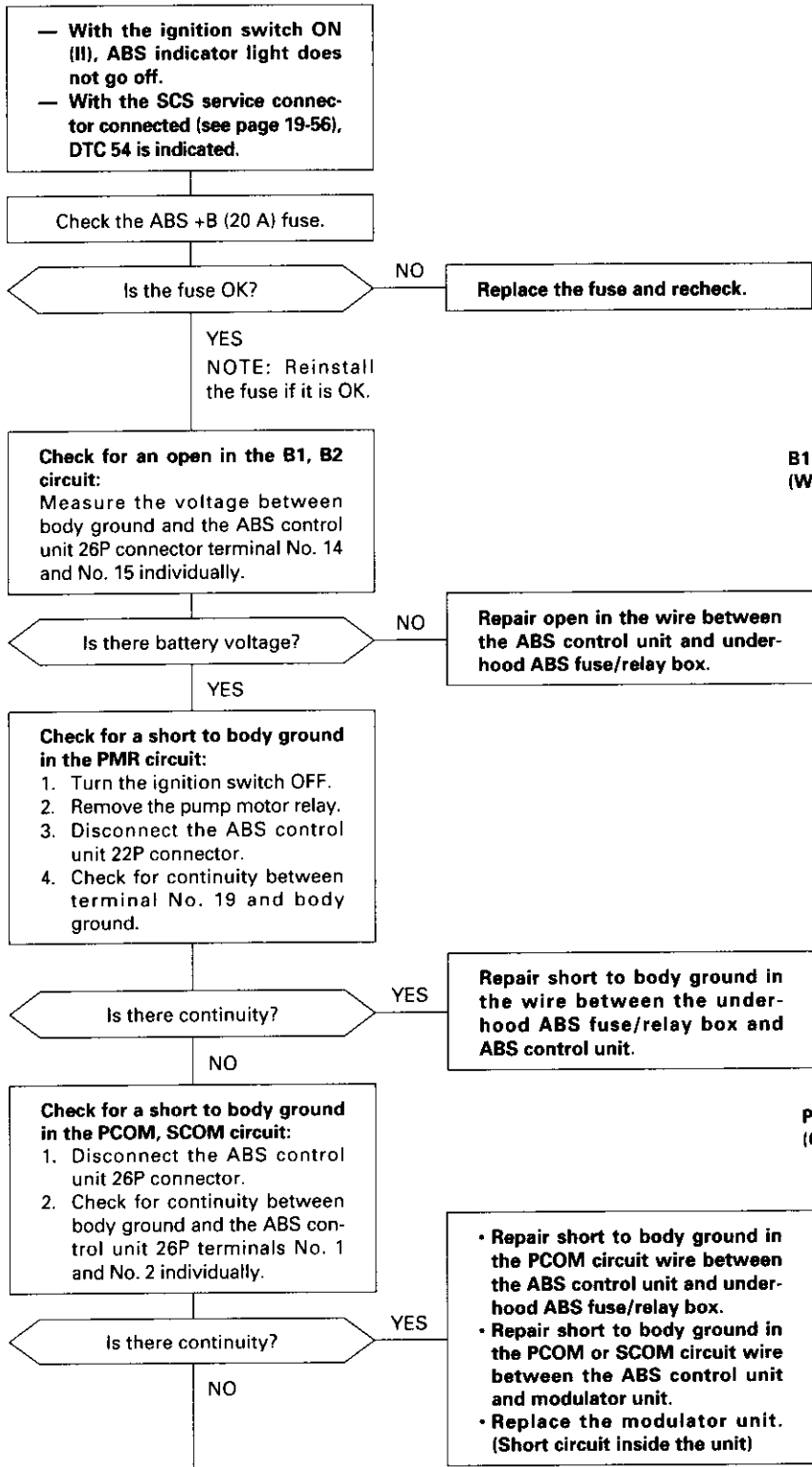


Wire side of female terminals



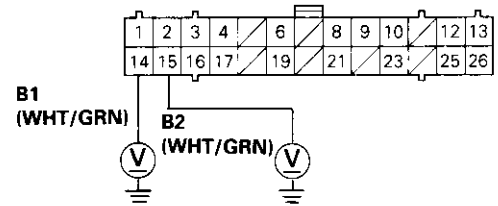
# Main Relay

## Diagnostic Trouble Code (DTC) 54: Main Relay Diagnosis



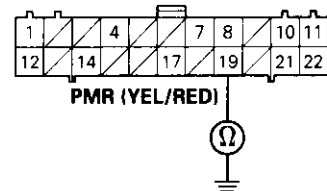
(To page 19-72)

ABS CONTROL UNIT 26P CONNECTOR

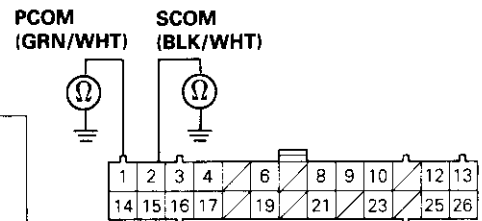


Wire side of female terminals

ABS CONTROL UNIT 22P CONNECTOR



Wire side of female terminals



(cont'd)

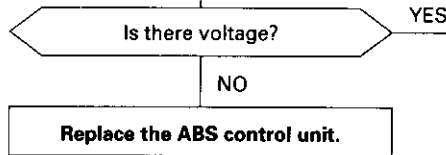
# Troubleshooting

## Main Relay (cont'd)

(From page 19-71)

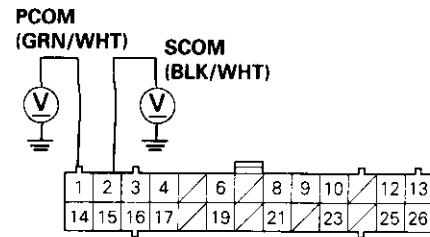
**Check for a short to power in the PCOM, SCOM circuit:**

1. Turn the ignition switch ON (I).
2. Measure the voltage between body ground and ABS control unit 26P connector terminals No. 1 and No. 2 individually.



- Repair short to power in the PCOM circuit wire between the ABS control unit and under-hood ABS fuse/relay box.
- Repair short to power in the PCOM or SCOM circuit wire between the ABS control unit and modulator unit.
- Replace the modulator unit. (Short to power inside the unit)

NOTE: Voltage indicates a short to power.



# Ignition Voltage

## Diagnostic Trouble Code (DTC) 61: Ignition Voltage Diagnosis

- With the engine running, ABS indicator light is ON.
- With the SCS service connector connected (see page 19-56), DTC 61 is indicated.

**Problem verification:**

1. Erase the DTC.
2. Start the engine.
3. Make sure that the ABS indicator light comes on and DTC 61 is indicated.

Is DTC 61 indicated? NO **The system is OK at this time.**

YES

**Check the IG2 circuit:**

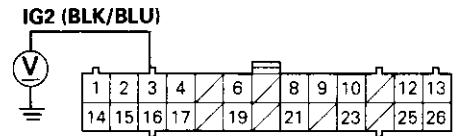
Measure the voltage between the ABS control unit 26P connector terminal No. 3 and body ground.

Is there 18 V or above? YES **Check the charging system.**

NO

**If the voltage is 0 V, check for an open in the IG2 circuit.  
If there is 12 – 17 V, substitute a known-good ABS control unit and recheck.**

**ABS CONTROL UNIT 26P CONNECTOR**

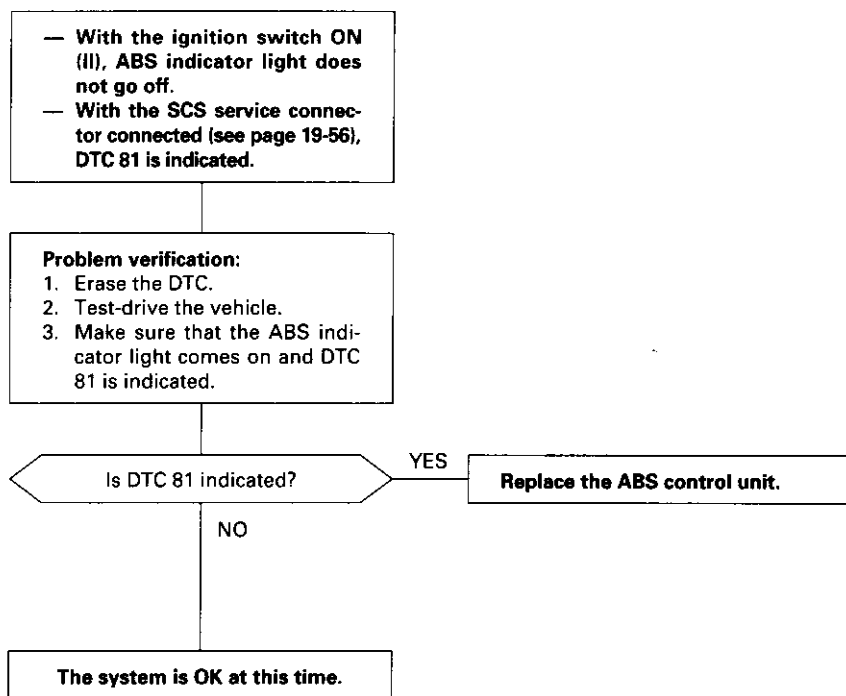


Wire side of female terminals

# Troubleshooting

## Central Processing Unit (CPU)

### Diagnostic Trouble Code (DTC) 81: CPU Diagnosis





## 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.
- Take care not to damage or deform the brake lines during removal and installation.
- To prevent the brake fluid from flowing, plug and cover the hose ends and joints with a shop towel or equivalent material.

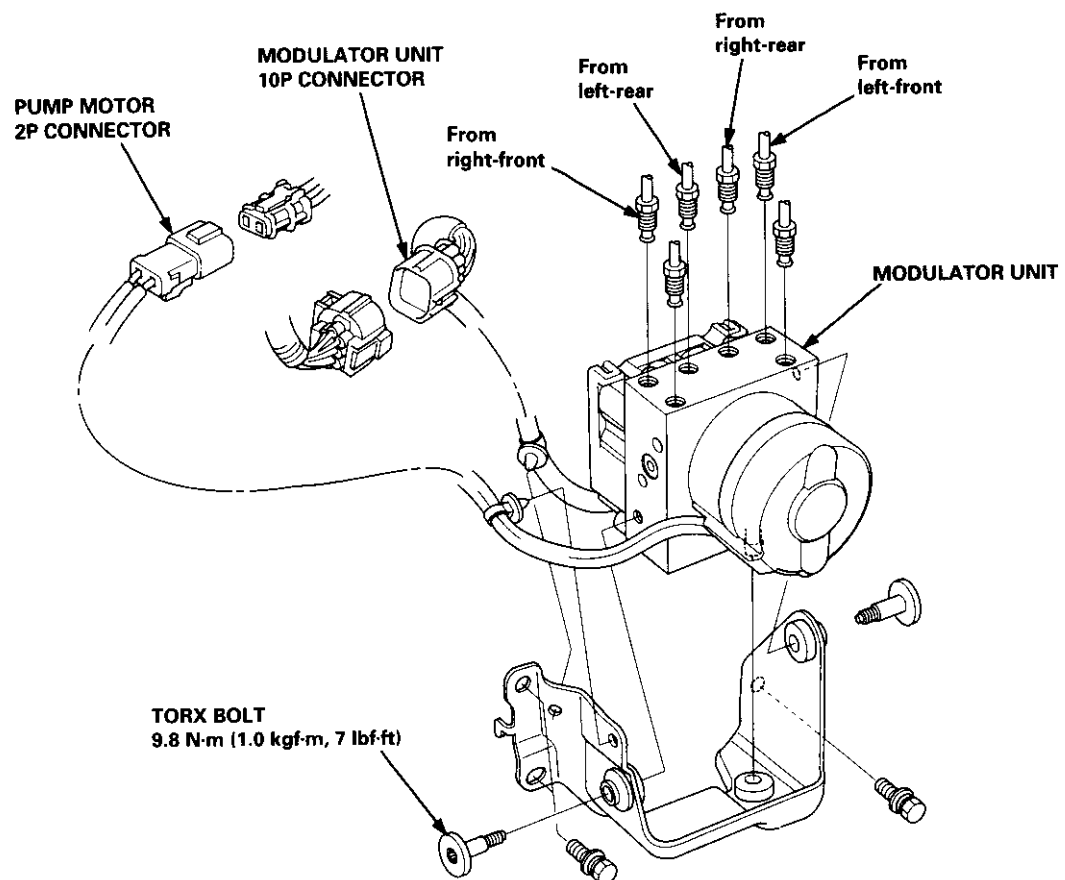
NOTE: Tighten the flare nuts to 15 N·m (1.5 kgf·m, 11 lbf·ft).

### Removal

1. Disconnect the modulator unit 10P and pump motor 2P connectors.
2. Disconnect the brake lines, then remove the modulator unit.

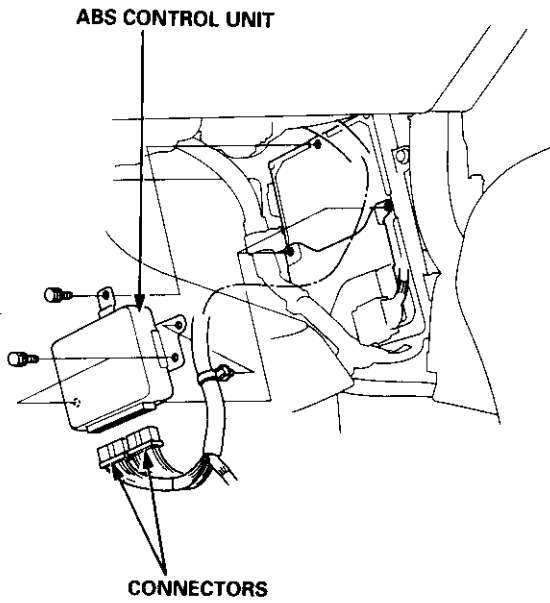
### Installation

1. Install the modulator unit, then connect the brake lines.
2. Connect the modulator unit 10P and pump motor 2P connectors.
3. Bleed the brake system.
4. Start the engine, and check that the ABS indicator light goes off.



## Replacement

1. Remove the right side kick panel.
2. Disconnect the ABS control unit connectors.
3. Remove the ABS control unit.
4. Install the ABS control unit in the reverse order of removal.

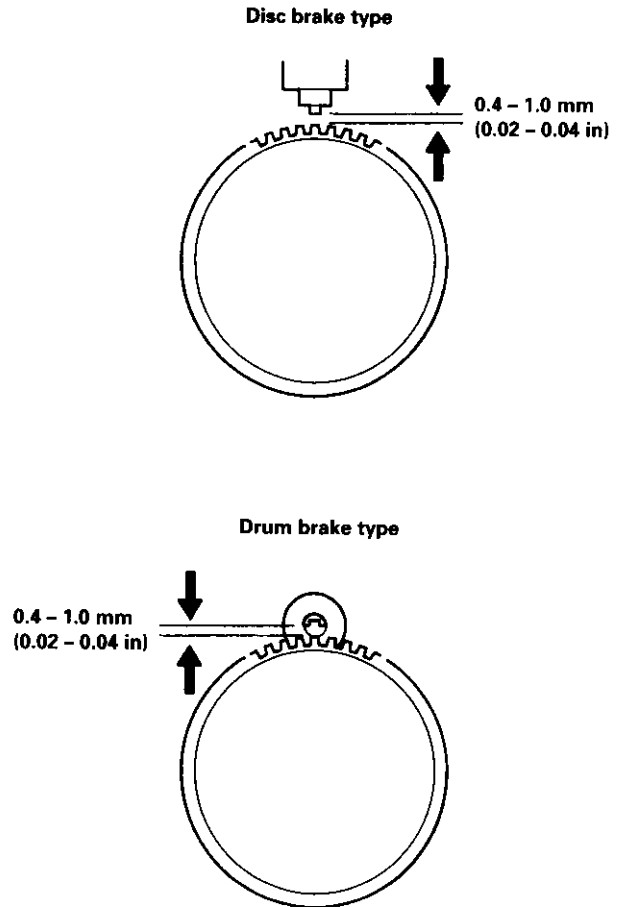


## Inspection

1. Check the front and rear pulser for chipped or damaged teeth.
2. Measure the air gap between the wheel sensor and pulser all the way around while rotating the pulser.

**Standard: 0.4 – 1.0 mm (0.02 – 0.04 in)**

**NOTE:** If the gap exceeds 1.0 mm (0.04 in), the probability is a distorted suspension arm which should be replaced.

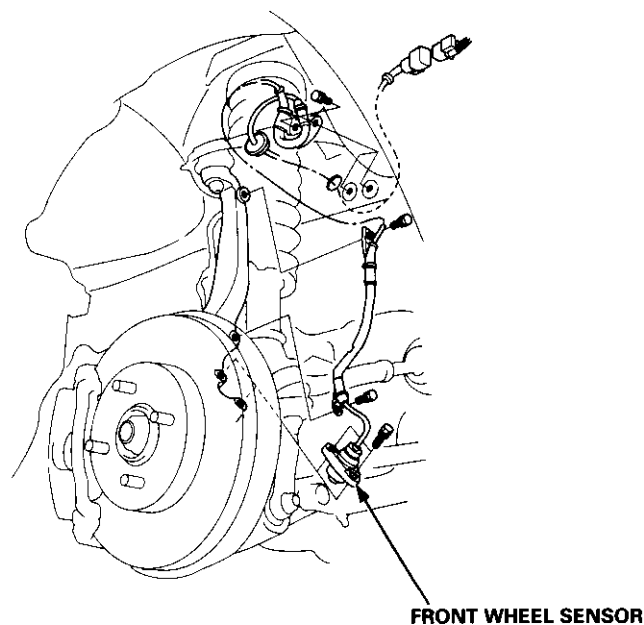


## Wheel Sensor Replacement

### NOTE:

- Be careful when installing the sensors to avoid twisting the wires.
- The torque value of the bolts is 9.8 N·m (1.0 kgf·m, 7 lbf·ft).

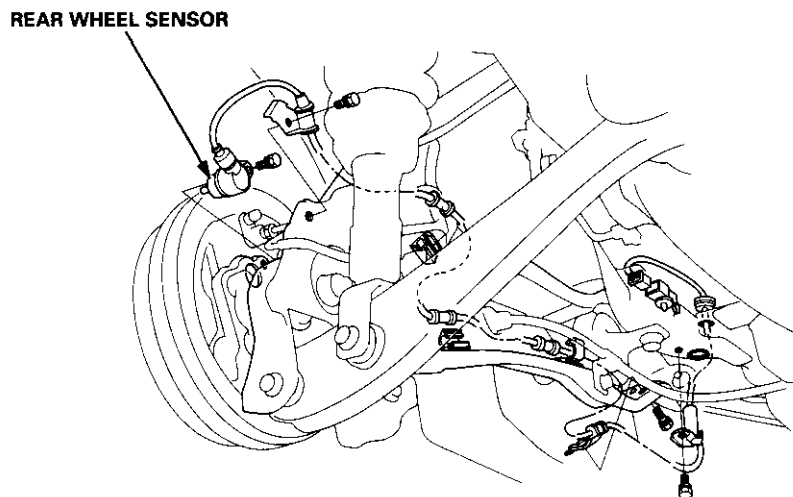
### Front



### Rear

1. Remove the hub bearing unit (see section 18).
2. Remove the four backing plate bolts.
3. Pull the backing plate away from the trailing arm, then remove the wheel sensor. It is not necessary to disconnect the brake line.

NOTE: This illustration is drum brake type. The torque value of the disk type is same as drum type.



## **Body ('99 model)**

### **Dashboard**

**Center Panel Removal and  
Installation ..... 20-136**

### **Bumpers**

**Front Grille Removal and  
Installation ..... 20-136**

**Front Air Spoiler Replacement ..... 20-137**

### **Seats**

**Front Seat Disassembly and  
Reassembly ..... 20-138**

**Front Seat Torsion Bar  
Replacement ..... 20-139**

### **Emblems**

**Installation ..... 20-140**



# Dashboard

## Center Panel Removal and Installation

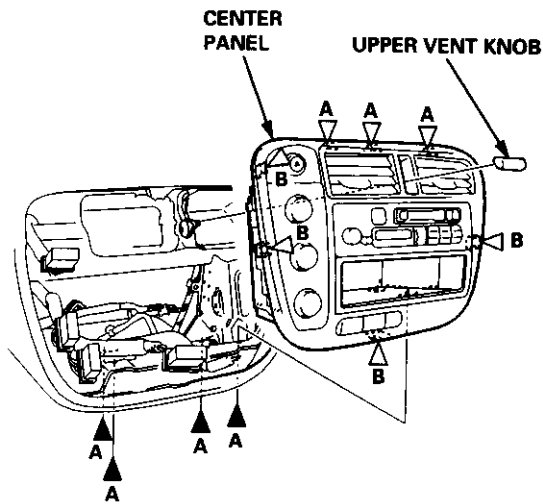
1. Remove the dashboard center lower cover.
2. Remove the screws, then pull out the center panel.

►: Screw locations, 4

▷: Clip locations

A ▷, 3

B ▷, 4



3. Disconnect the connectors from the heater control unit and hazard warning switch.
4. Installation is the reverse of the removal procedure.

NOTE: Make sure the connectors are connected properly.

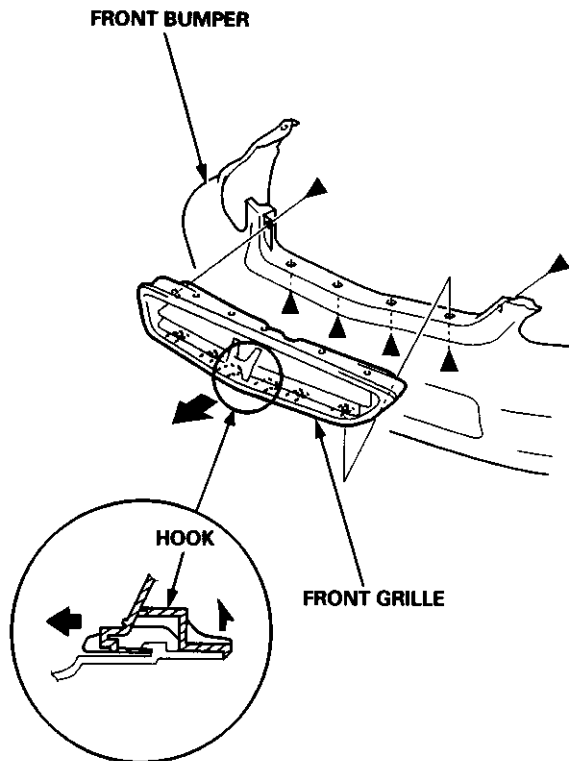
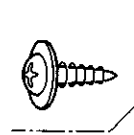
# Bumpers

## Front Grille Removal and Installation

NOTE: Take care not to scratch the front bumper.

Remove the front bumper. Remove the screws, then slide the front grille forward by detaching the hooks.

►: Screw locations, 6



Installation is the reverse of the removal procedure.



## Front Air Spoiler Replacement

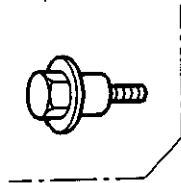
**CAUTION:** Put on gloves to protect your hands.

**NOTE:**

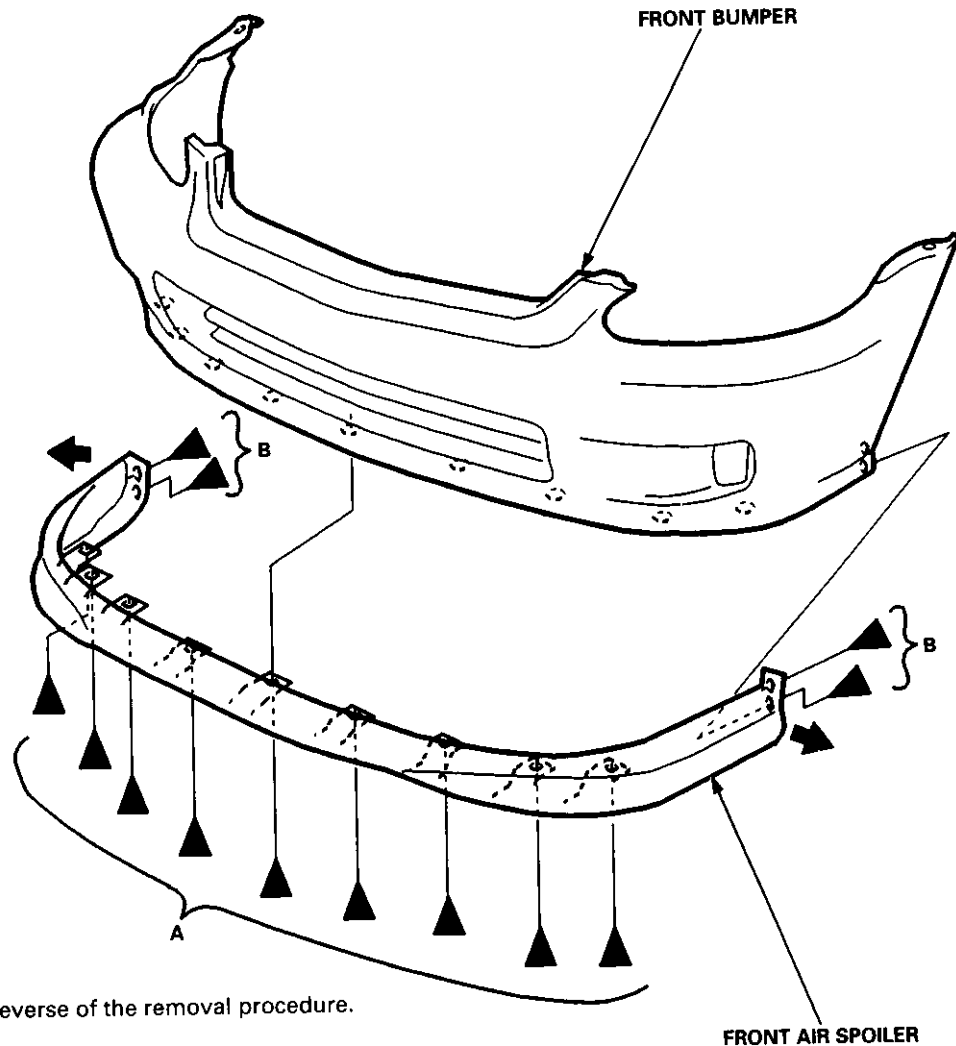
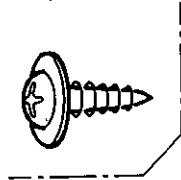
- An assistant is helpful when removing the front bumper.
- Take care not to scratch the front bumper and body.

► Bolt, screw locations

A ►, 9



B ►, 4



Installation is the reverse of the removal procedure.

**NOTE:**

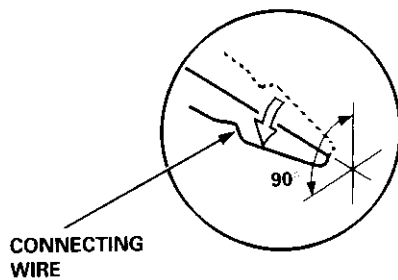
- Make sure the front bumper engages the front bumper side stiffener on each side securely.
- If necessary, adjust the front bumper side stiffener to obtain the proper gap.



## Front Seat Torsion Bar Replacement

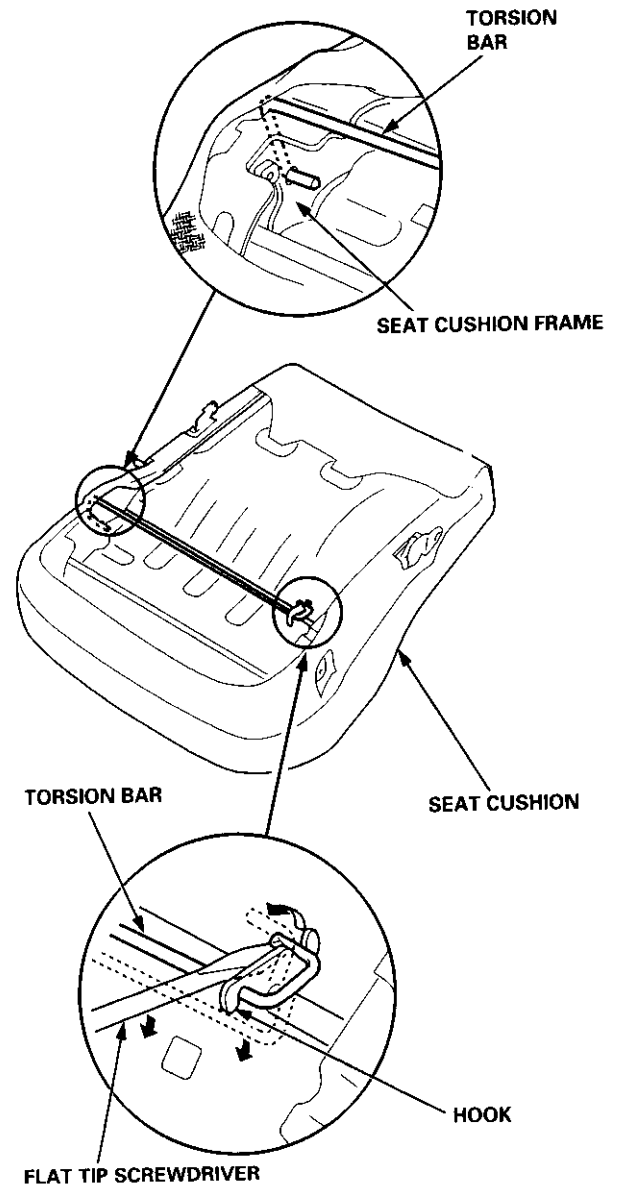
Reassemble in the reverse order of disassembly, and note these items:

- Make sure the bushing and pivot washer are installed properly.
- To connect the connecting wire, twist it 90°.
- Replace the back cover clips with new ones.
- To prevent wrinkles when installing the seat-back cover, make sure the material is stretched evenly over the pad.
- Apply multipurpose grease to the moving portion of the seat track.



NOTE: Take care not to tear the seams or damage the seat covers.

1. Remove the seat cushion.
2. Remove the torsion bar from the hook with a flat tip screwdriver, then pull out the torsion bar from the seat cushion frame. Put on gloves to protect your hands.

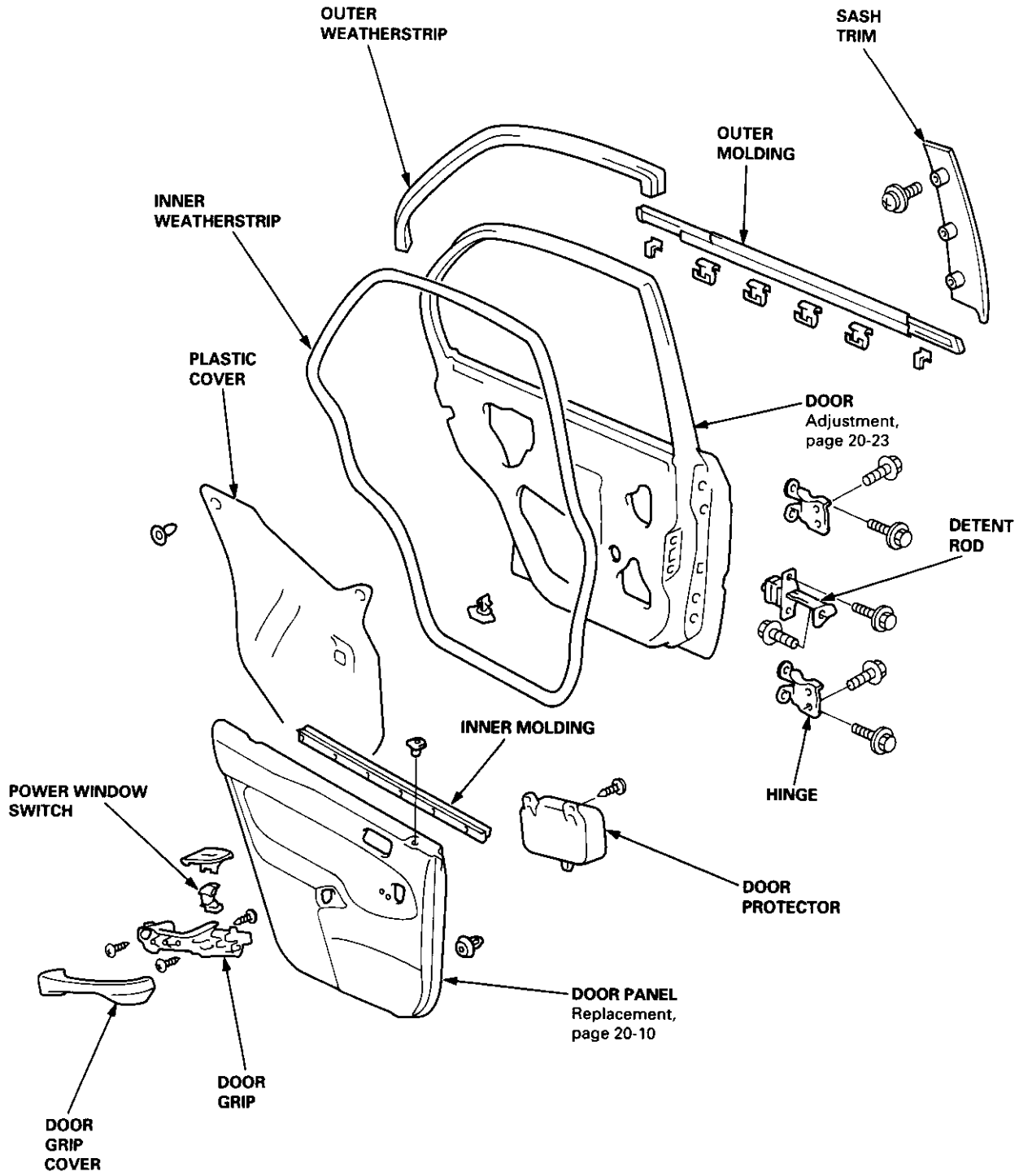


3. Install in the reverse order of removal.

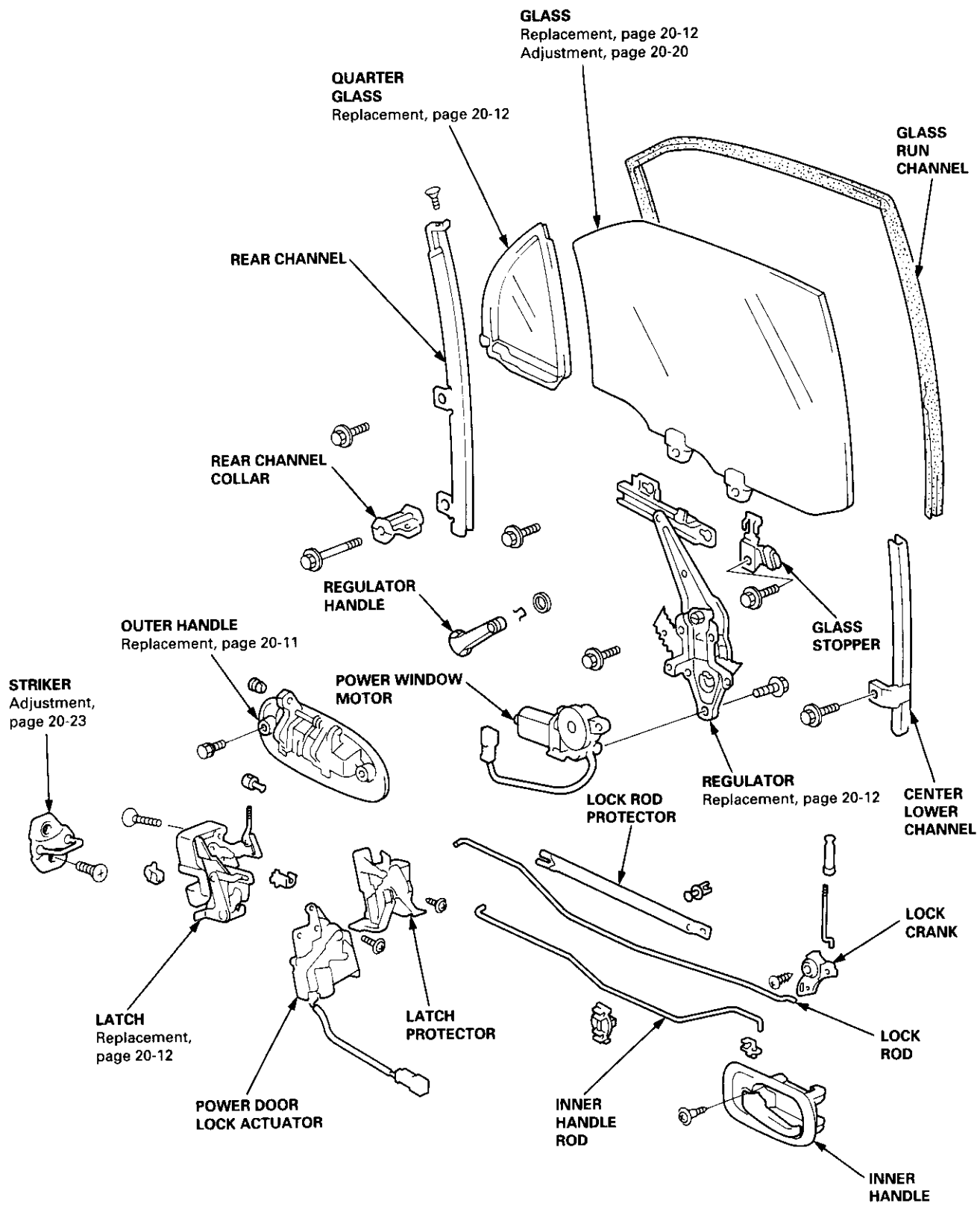
# Doors

## Rear Door Index

4D:





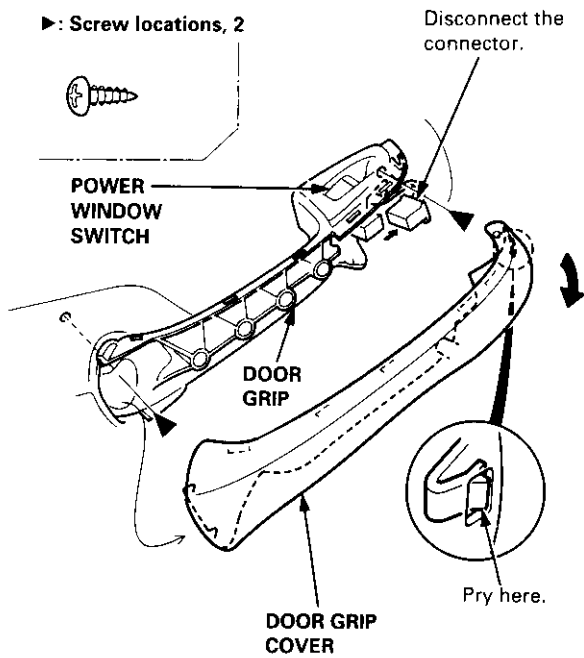


# Doors

## Door Panel Replacement

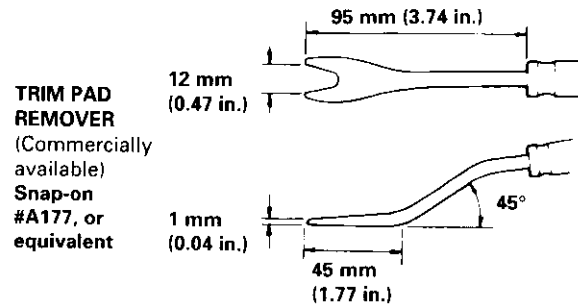
NOTE: Take care not to scratch the door panel and other parts.

1. Remove:
  - Inner handle (see page 20-9)
  - Regulator handle (see page 20-4)
2. Remove the door grip cover, then remove the screws.

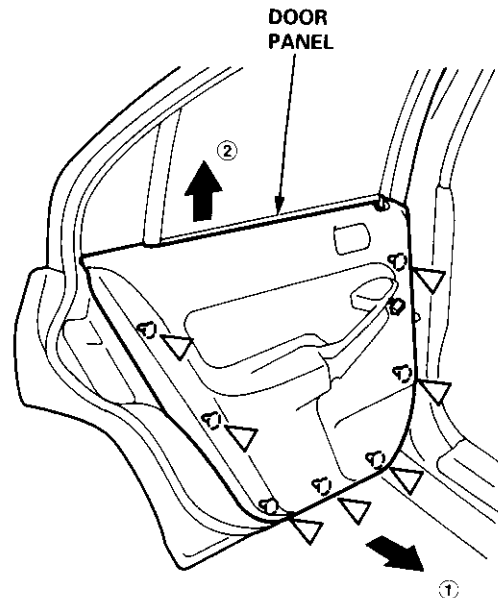
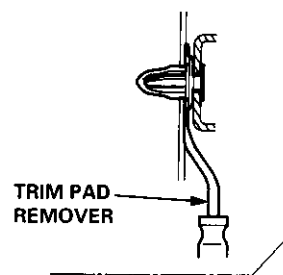


3. Release the clips that hold the door panel. Remove the door panel by pulling it upward.

NOTE: Remove the door panel with as little bending as possible to avoid creasing or breaking it.



►: Clip locations, 7



4. Installation is the reverse of the removal procedure.



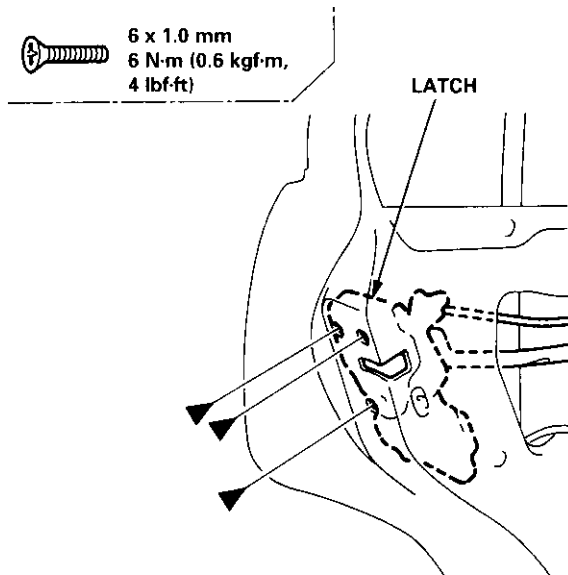
## Outer Handle Replacement

NOTE: Raise the glass fully.

1. Remove:
  - Door panel
  - Plastic cover (see page 20-8)

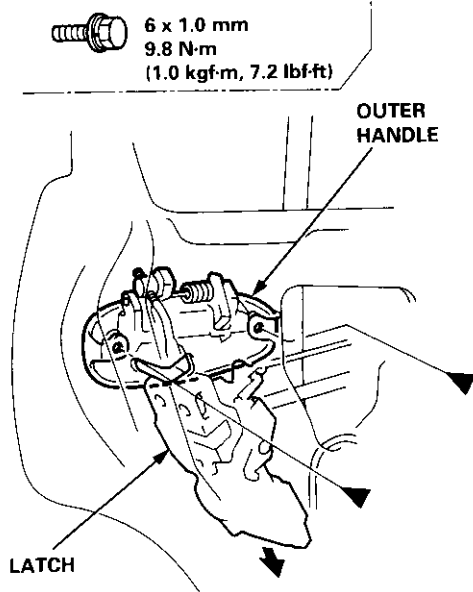
2. Remove the screws.

►: Screw locations, 3



3. Move the latch down, and remove the bolts.

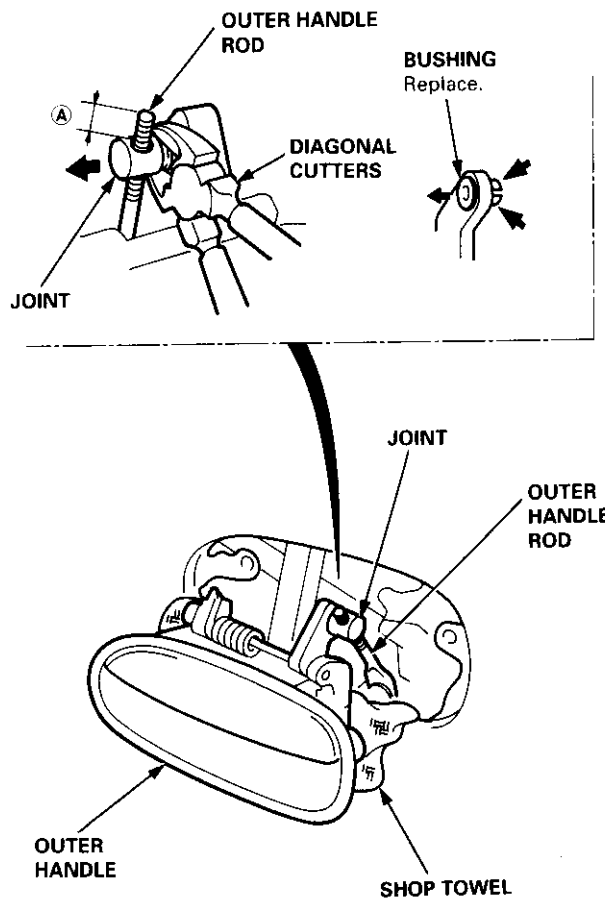
►: Bolt locations, 2



4. Pull out the outer handle. Pry the outer handle rod out of its joint using diagonal cutters.

NOTE:

- To ease reassembly, note location **A** of the outer handle rod on the joint before disconnecting it.
- Take care not to bend the outer handle rod.
- Use a shop towel to protect the opening in the door.



5. Installation is the reverse of the removal procedure.

NOTE: Make sure the door locks and opens properly.

# Doors

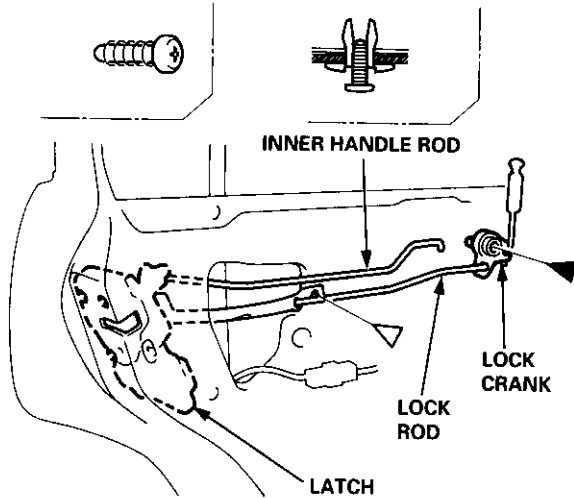
## Latch Replacement

NOTE: Raise the glass fully.

1. Remove:
  - Door panel (see page 20-10)
  - Plastic cover (see page 20-8)
  - Outer handle (see page 20-11)
2. Remove the lock crank and clip.

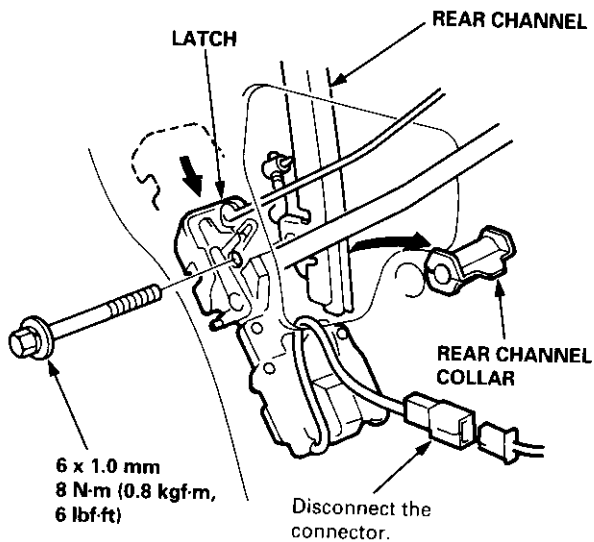
►: Screw location, 1

▷: Clip location, 1



3. Remove the rear channel collar.

NOTE: Take care not to bend the lock rod and inner handle rod.



4. Remove the latch through the hole in the door.
5. Installation is the reverse of the removal procedure.

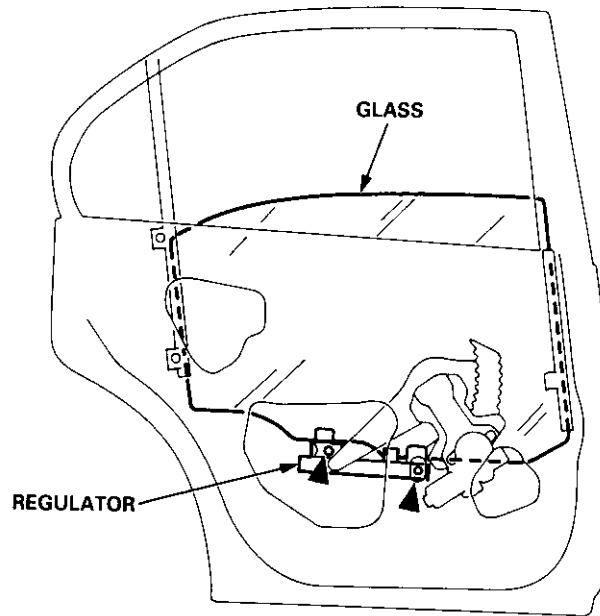
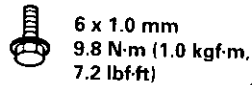
NOTE: Make sure the door locks and opens properly.

## Glass/Regulator Replacement

1. Remove:
  - Door panel (see page 20-10)
  - Plastic cover (see page 20-8)
2. Carefully move the glass until you can see the bolts, then remove them.

NOTE: Take care not to drop the glass inside the door.

►: Bolt locations, 2

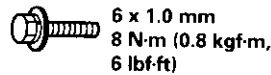


3. Carefully lower the glass. Remove the bolts and screw from the rear channel, then remove the glass from the rear channel.

NOTE: Take care not to drop the glass inside the door.

►: Bolt, screw locations

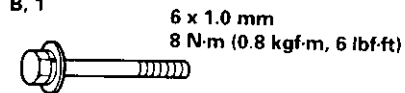
A, 1



C, 1

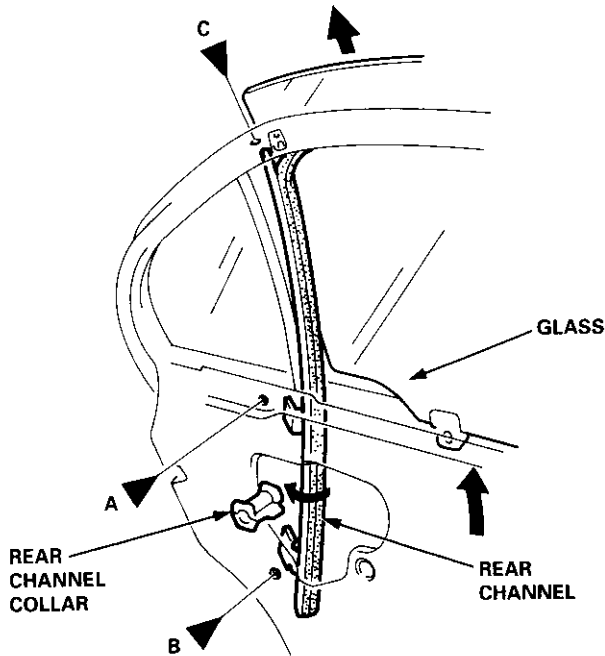


B, 1

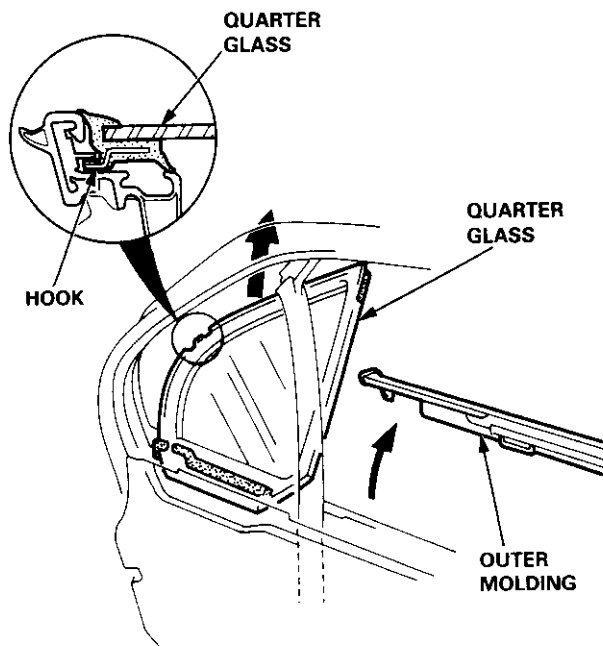




4. Carefully remove the glass from the window slot.



5. Remove the outer molding, then remove the quarter glass.



6. Disconnect the connector, and detach the harness clip, then remove the regulator through the hole in the door.

► Bolt locations

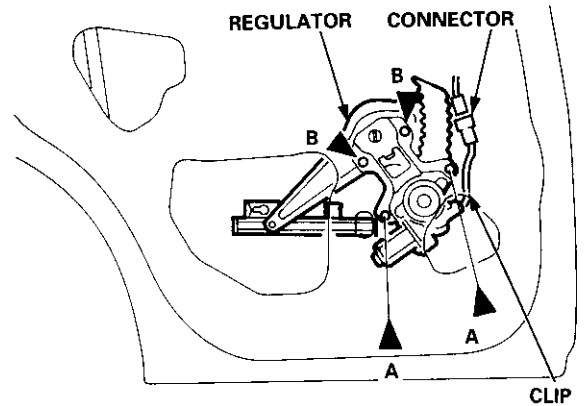
A ►, 2

6 x 1.0 mm  
8 N·m (0.8 kgf·m,  
6 lbf·ft)



B ►, 2

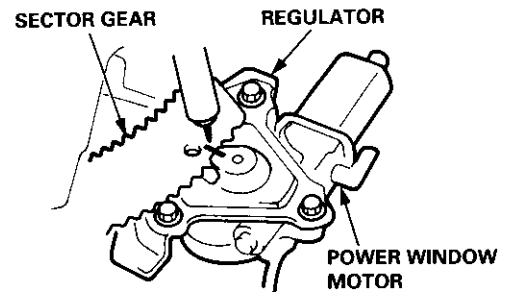
6 x 1.0 mm  
8 N·m (0.8 kgf·m,  
6 lbf·ft)  
Loosen.



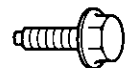
7. Grease all the sliding surfaces of the regulator where shown.

NOTE:

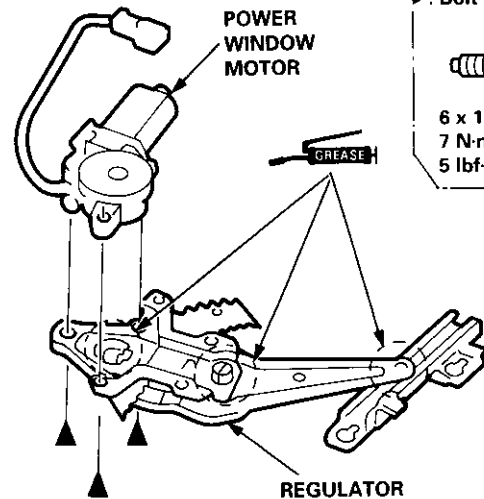
- If necessary, remove the power window motor from the regulator.
- Before removing the power window motor, scribe a line across the sector gear and regulator.



► Bolt locations, 3



6 x 1.0 mm  
7 N·m (0.7 kgf·m,  
5 lbf·ft)



8. Installation is the reverse of the removal procedure.

NOTE: Roll the glass up and down to see if it moves freely without binding. Also make sure that there is no clearance between the glass and glass run channel when the glass is closed. Adjust the position of the glass as necessary (see page 20-20).

# Seats

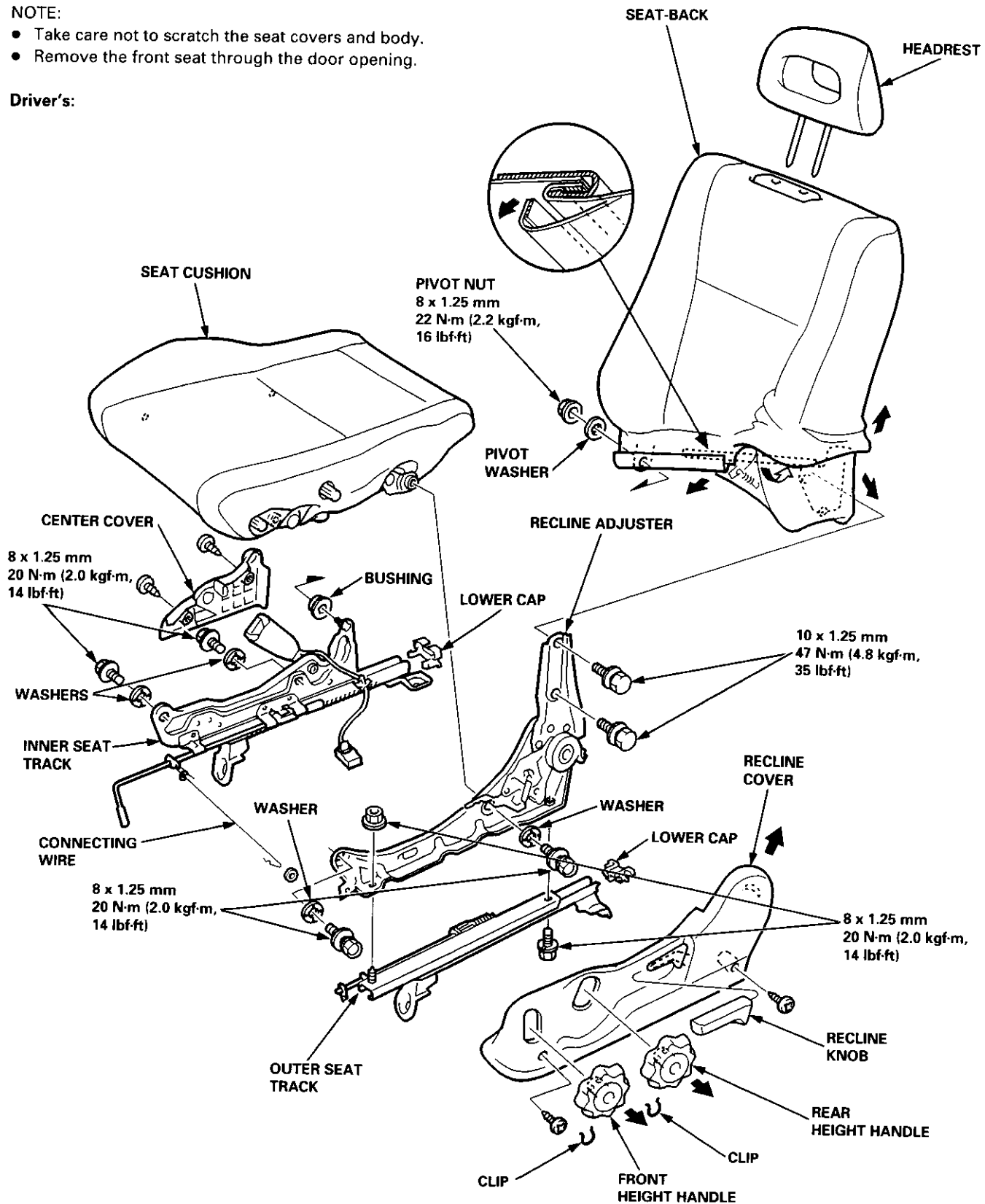
## Front Seat Disassembly and Reassembly

**CAUTION:** When prying with a flat-tip screwdriver, wrap it with protective tape to prevent damage.

**NOTE:**

- Take care not to scratch the seat covers and body.
- Remove the front seat through the door opening.

**Driver's:**



## Heater and Air Conditioning

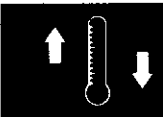
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### SUPPLEMENTAL RESTRAINT SYSTEM (SRS)

The Civic SRS includes a driver's airbag located in the steering wheel hub. In addition, all models (except some models for Canada) have a passenger's airbag located in the dashboard above the glove box. Information necessary to safely service the SRS is included in this Service Manual. Items marked with an asterisk (\*) on the contents page include, or are located near, SRS components. Servicing, disassembling or replacing these items will require special precautions and tools, and should therefore be done by an authorized 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 SRS service work must be performed by an authorized Honda dealer.
- Improper service procedures, including incorrect removal and installation of the SRS, could lead to personal injury caused by unintentional deployment of the airbags.
- Do not bump the SRS unit. Otherwise, the system may fail in case of a collision, or the airbags may deploy when the ignition switch is ON (II).
- SRS electrical wiring harnesses are identified by yellow color coding. Related components are located in the steering column, front console, dashboard, dashboard lower panel, and in the dashboard above the glove box. Do not use electrical test equipment on these circuits.



# Heater

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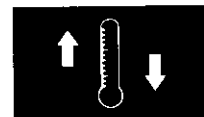
## Mode Control Switch

Test — '96 - 98 Models ..... 21-50

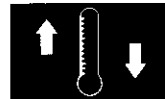
## Power Transistor

Test — '99 - 00 Models ..... 21-50

\*: Read SRS precautions before working in this area.

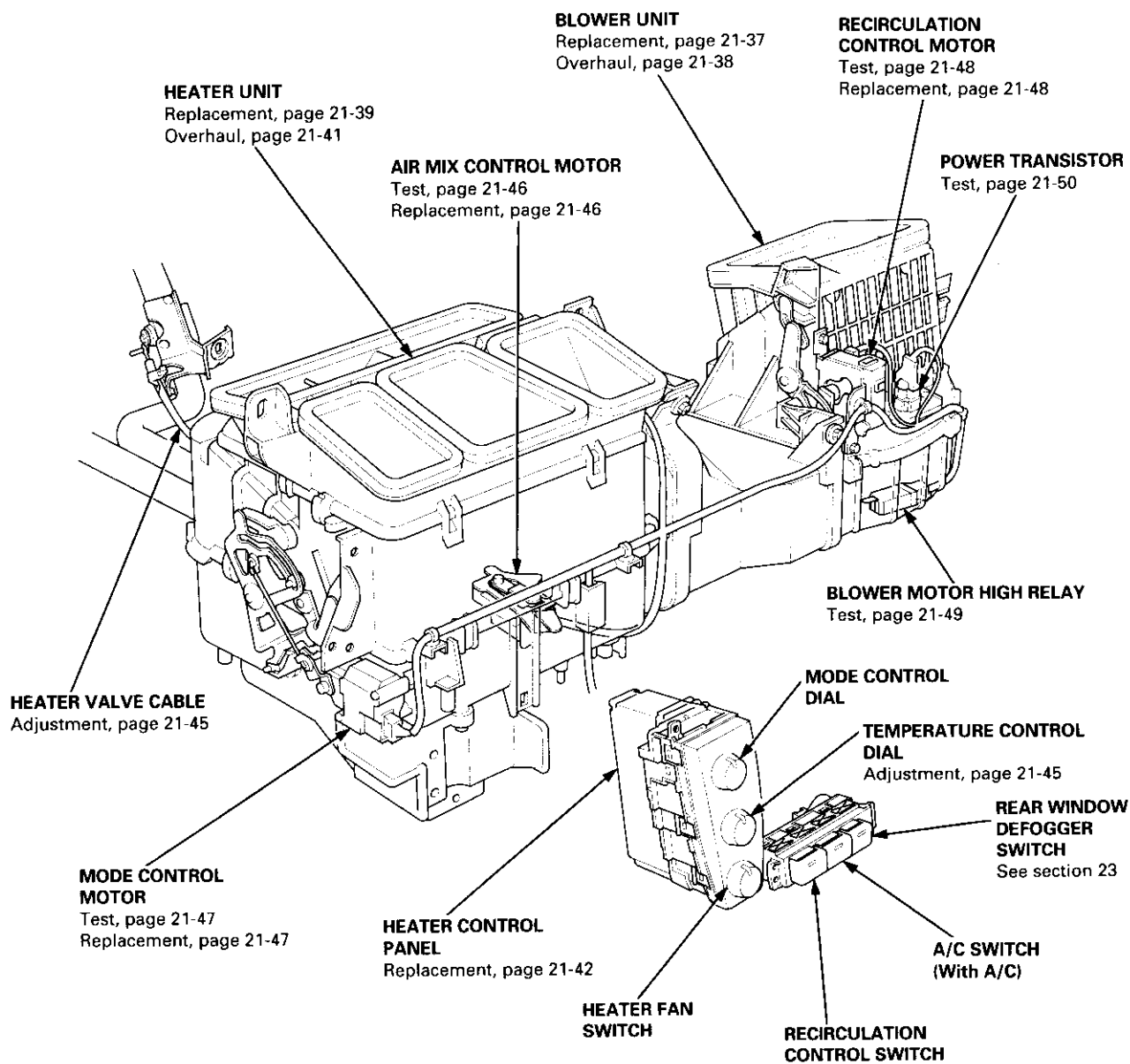






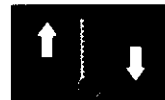
## '99 – 00 Models

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





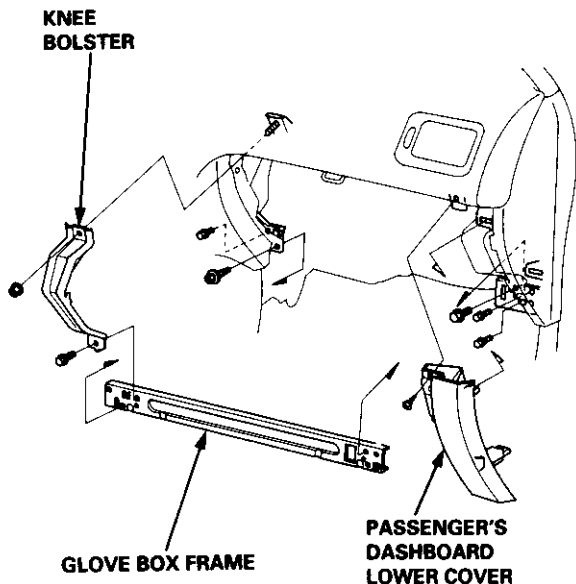
# Blower Unit



## Replacement

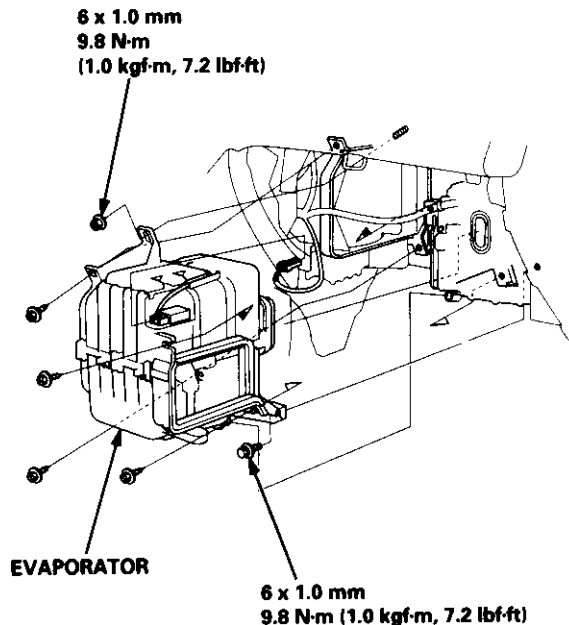
**NOTE:** The blower motor, recirculation control motor and blower resistor can be replaced without removing the blower unit (see next page).

1. Move the temperature control to "HOT."  
'96-98: Slide the temperature control lever.  
'99-00: Turn the ignition switch ON (II), then turn the temperature control knob. Turn the ignition switch off.
2. Remove the glove box (see section 20).
3. Remove the self-tapping screw and the passenger's dashboard lower cover. Remove the bolt, the nut and the knee bolster, then remove the five bolts and the glove box frame.

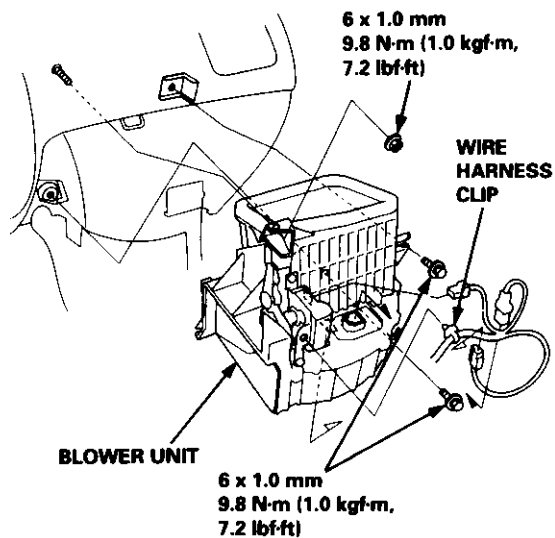


### With Air Conditioning

4-b. Remove the evaporator (see page 22-28).



5. Disconnect the connectors from the blower motor, blower resistor ('96 - 98 models), power transistor ('99 - 00 models), blower motor high relay ('99 - 00 models) and recirculation control motor. Remove the wire harness clip from the recirculation control motor, and release the wire harness from the clamp on the blower unit. Remove the two mounting bolts, the mounting nut and the blower unit.



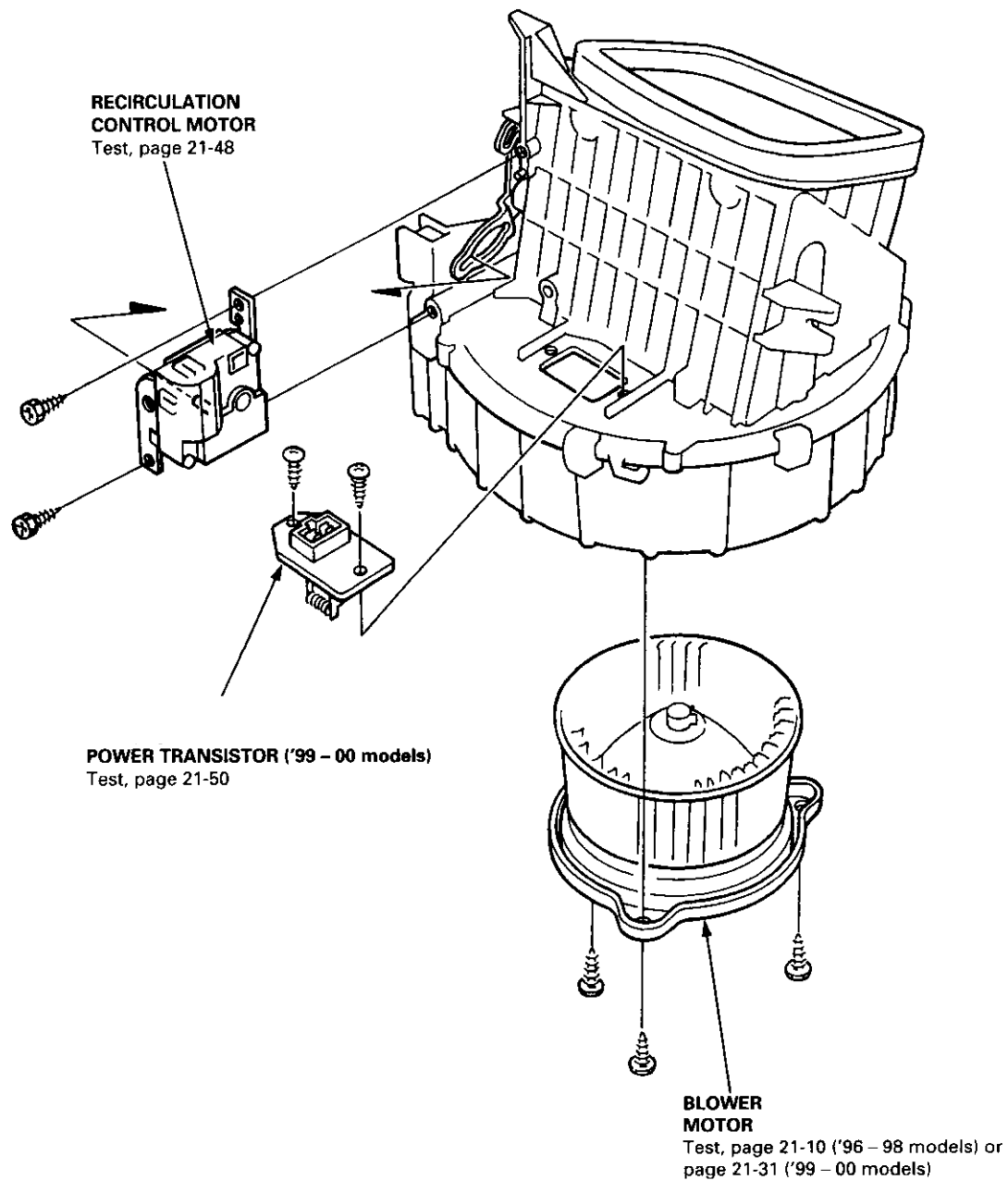
6. Install in the reverse order of removal. Make sure that there is no air leakage.

# Blower Unit

## Overhaul

### NOTE:

- Before reassembly, make sure that the recirculation control door and linkage move smoothly without binding.
- When attaching the recirculation control motor, make sure its positioning will not allow the recirculation control door to be pulled too far.
- After attaching the recirculation control motor, connect power and ground, and watch the movement of the recirculation control door.

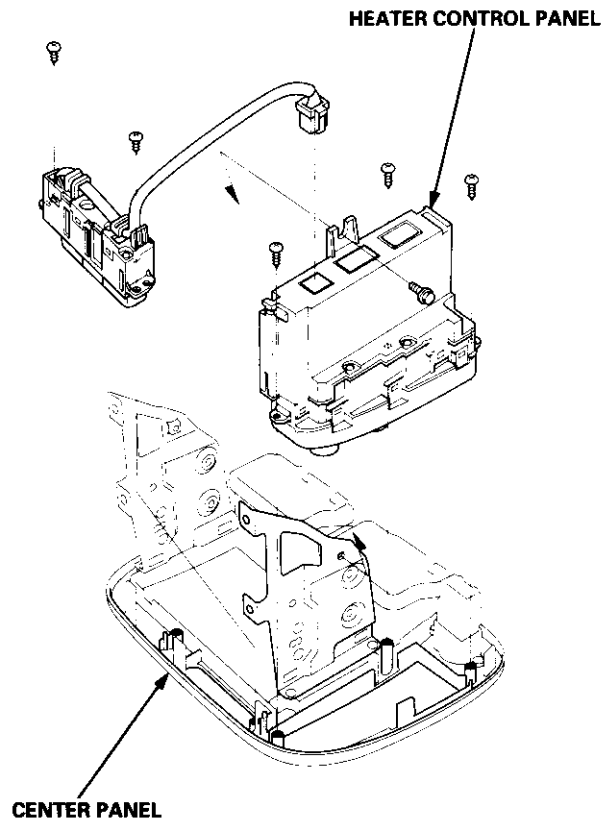


# Heater Control Panel

## Replacement

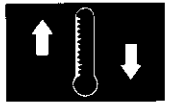
'99 – 00 models:

1. Remove the center panel together with the heater control panel (see section 20).
2. Remove the self-tapping screws and the heater control panel from the center panel.



3. Install in the reverse order of removal. After installation, operate the heater control panel to see whether it works properly.

# Mode Control Motor



## Test

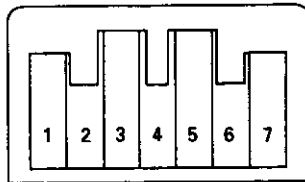
1. Disconnect the 7P connector from the mode control motor.
2. Connect battery power to the No. 1 terminal, and ground the No. 7 terminal.

**CAUTION:** Never connect the battery in the opposite direction.

3. Using a jumper wire, connect the No. 7 terminal individually to the No. 2, 3, 4, 5 and 6 terminals in that order. Each time the connection is made, the mode control motor should run smoothly and stop.

**NOTE:** If the mode control motor does not run when jumping the first terminal, jump that terminal again after jumping the other terminals. The mode control motor is OK if it runs when jumping the first terminal again.

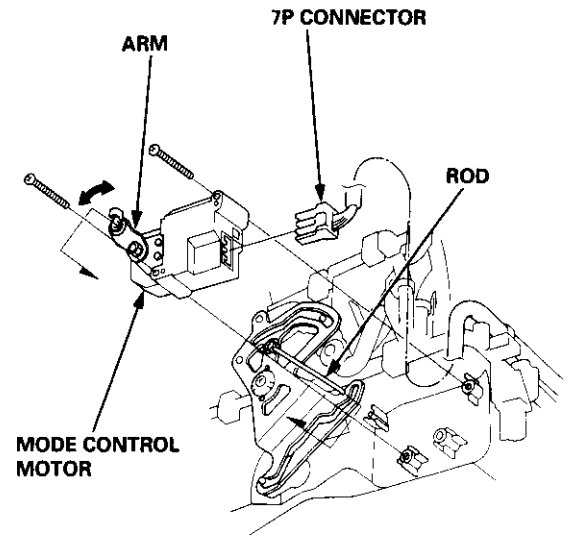
MODE CONTROL MOTOR



4. If the mode control motor does not run in step 3, remove it, then check the mode control linkage and doors for smooth movement. If they move smoothly, replace the mode control motor.

## Replacement

1. Disconnect the 7P connector from the mode control motor.



2. Remove the rod from the arm of the mode control motor.
3. Remove the two self-tapping screws and the mode control motor.
4. Install in the reverse order of removal. After installation, make sure the mode control motor runs smoothly.

# Recirculation Control Motor

## Test

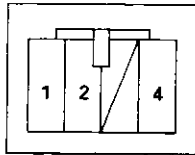
1. Disconnect the 4P connector from the recirculation control motor.
2. Connect battery power to the No. 1 terminal, and ground the No. 2 and No. 4 terminals; the recirculation control motor should run smoothly.

**CAUTION:** Never connect the battery in the opposite direction.

3. Disconnect the No. 2 or No. 4 terminals from ground; the recirculation control motor should stop at FRESH or RECIRCULATE.

**NOTE:** Don't cycle the recirculation control motor for a long time.

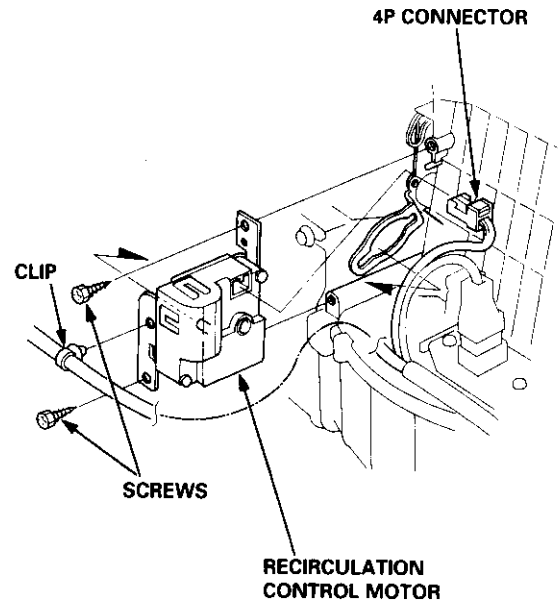
RECIRCULATION CONTROL MOTOR



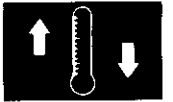
4. If the recirculation control motor does not run in step 2, remove it, then check the recirculation control linkage and door for smooth movement. If they move smoothly, replace the recirculation control motor.

## Replacement

1. Disconnect the 4P connector from the recirculation control motor, and remove the wire harness clip from it.

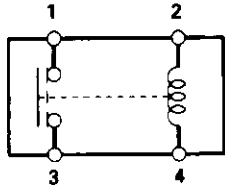


2. Remove the two self-tapping screws and the recirculation control motor.
3. Install in the reverse order of removal. After installation, make sure the recirculation control motor runs smoothly.

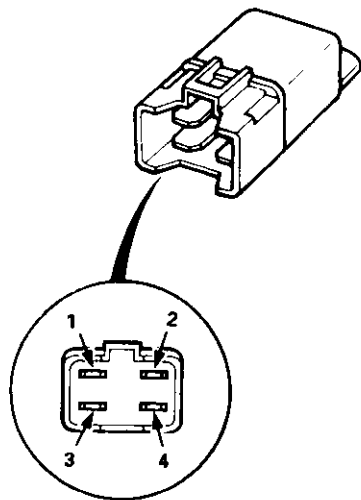


## Test

There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals, and there should be no continuity when power is disconnected.



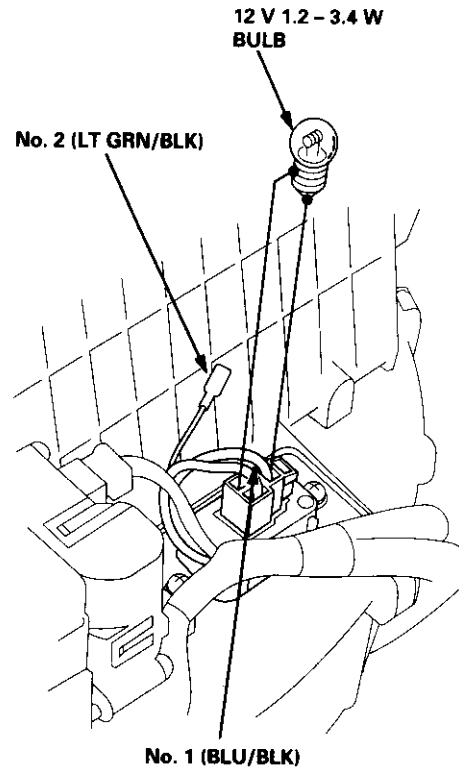
- Blower motor high relay ('99 - 00 models)





### Test — '99 - 00 Models

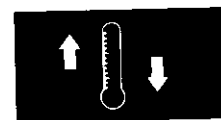
1. Disconnect the 3P connector from the power transistor.
2. Carefully release the lock tab on the No. 2 terminal in the 3P connector, then remove the terminal and insulate it from body ground.

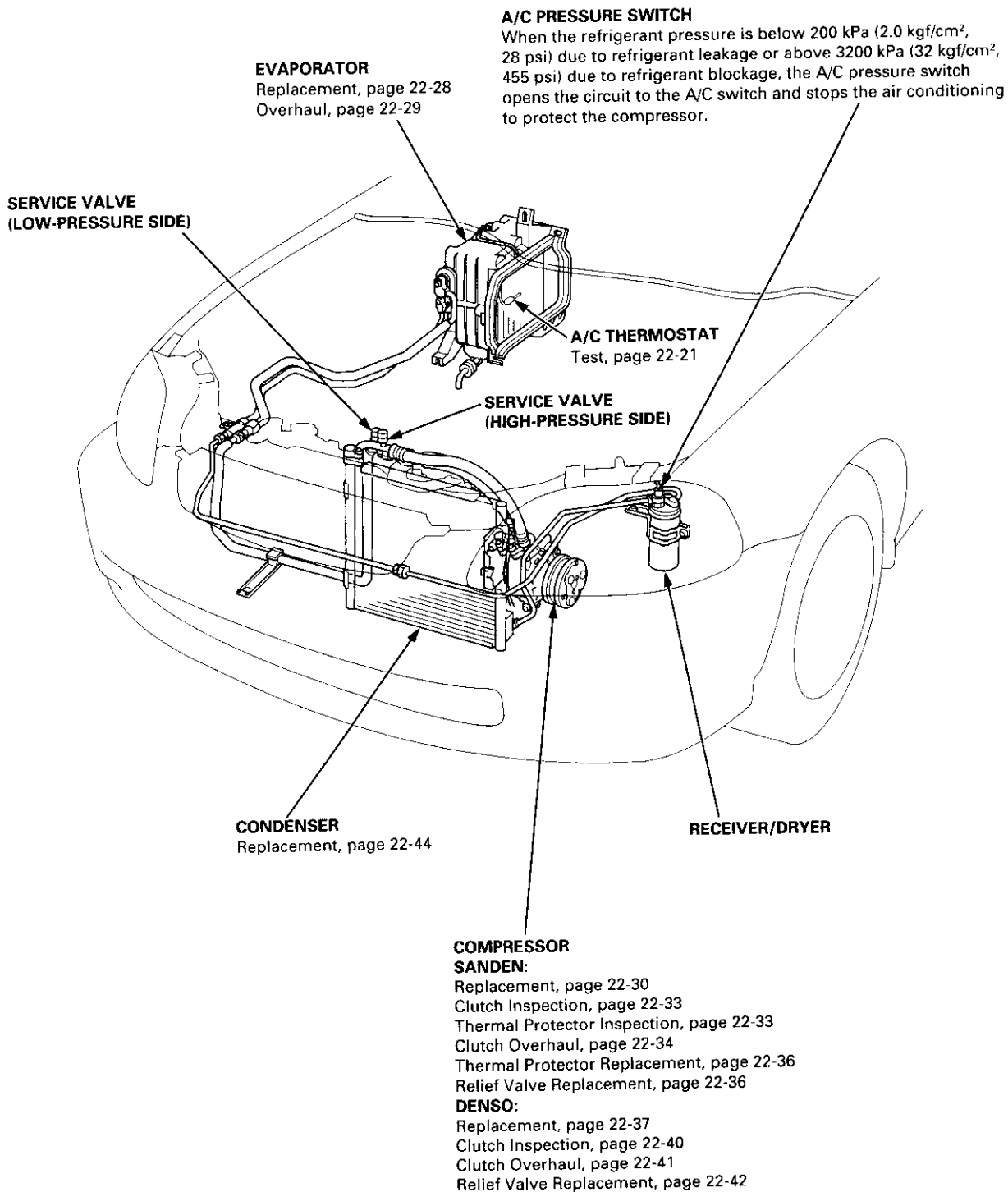
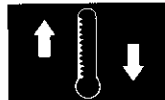


3. Connect a 1.2 - 3.4 W bulb between the No. 1 and the No. 2 cavity on the 3P connector.
4. Reconnect the 3P connector to the power transistor.
5. Turn the ignition switch ON (II), and check that the blower motor runs.

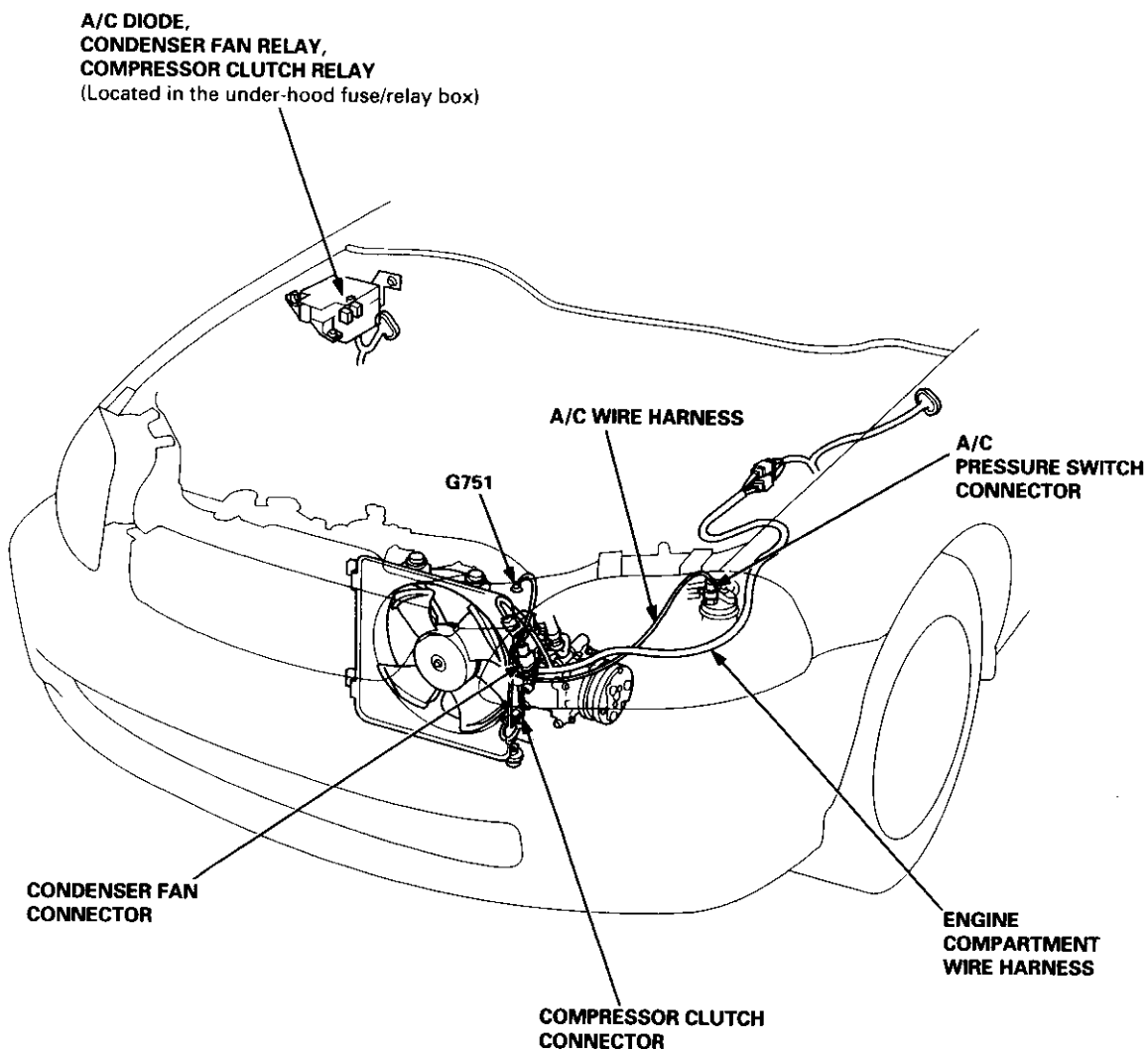
## Air Conditioning

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# Wiring/Connector Locations

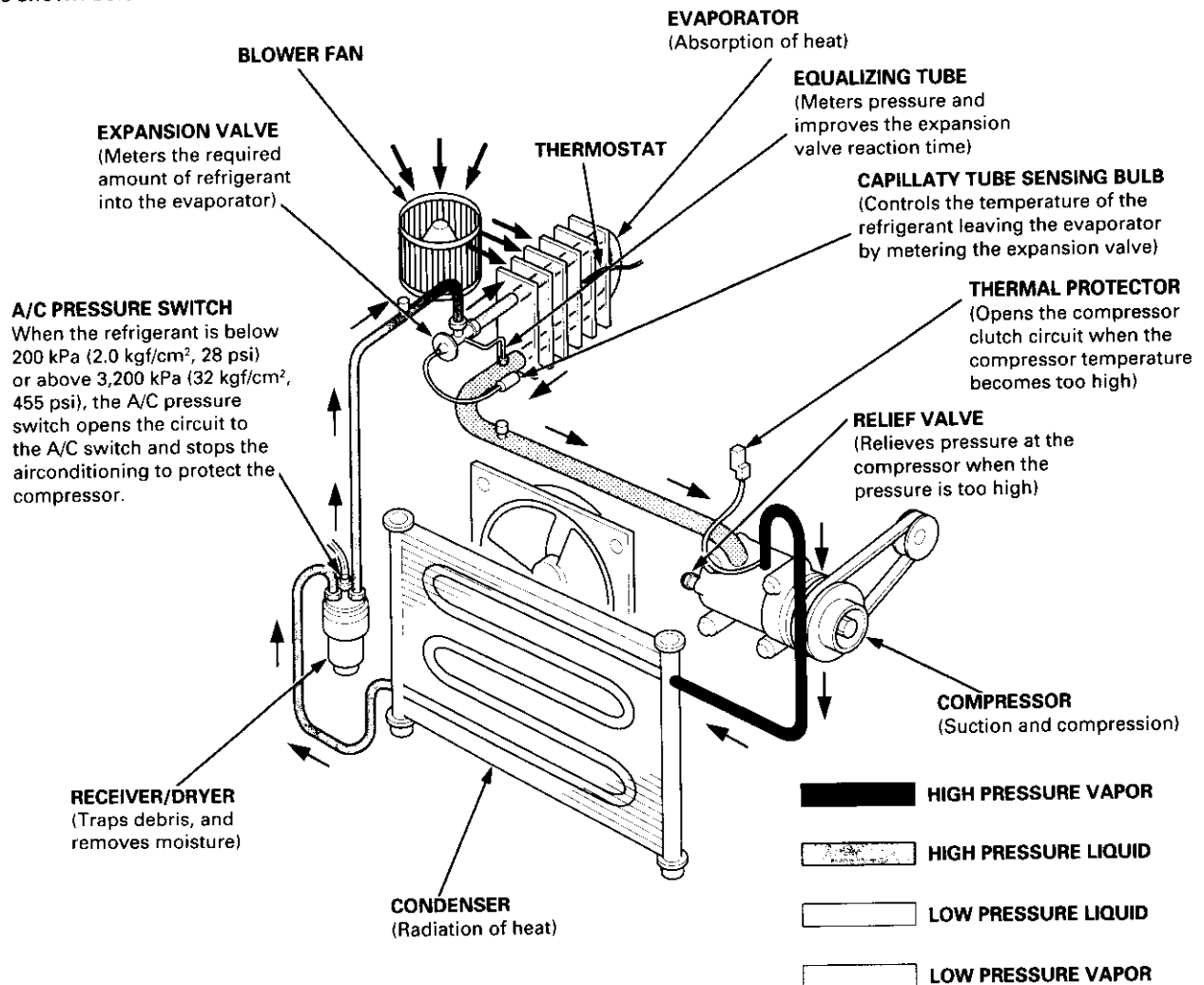


# Description



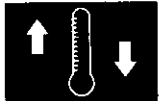
## Outline

The air conditioner system removes heat from the passenger compartment by circulating refrigerant through the system as shown below.

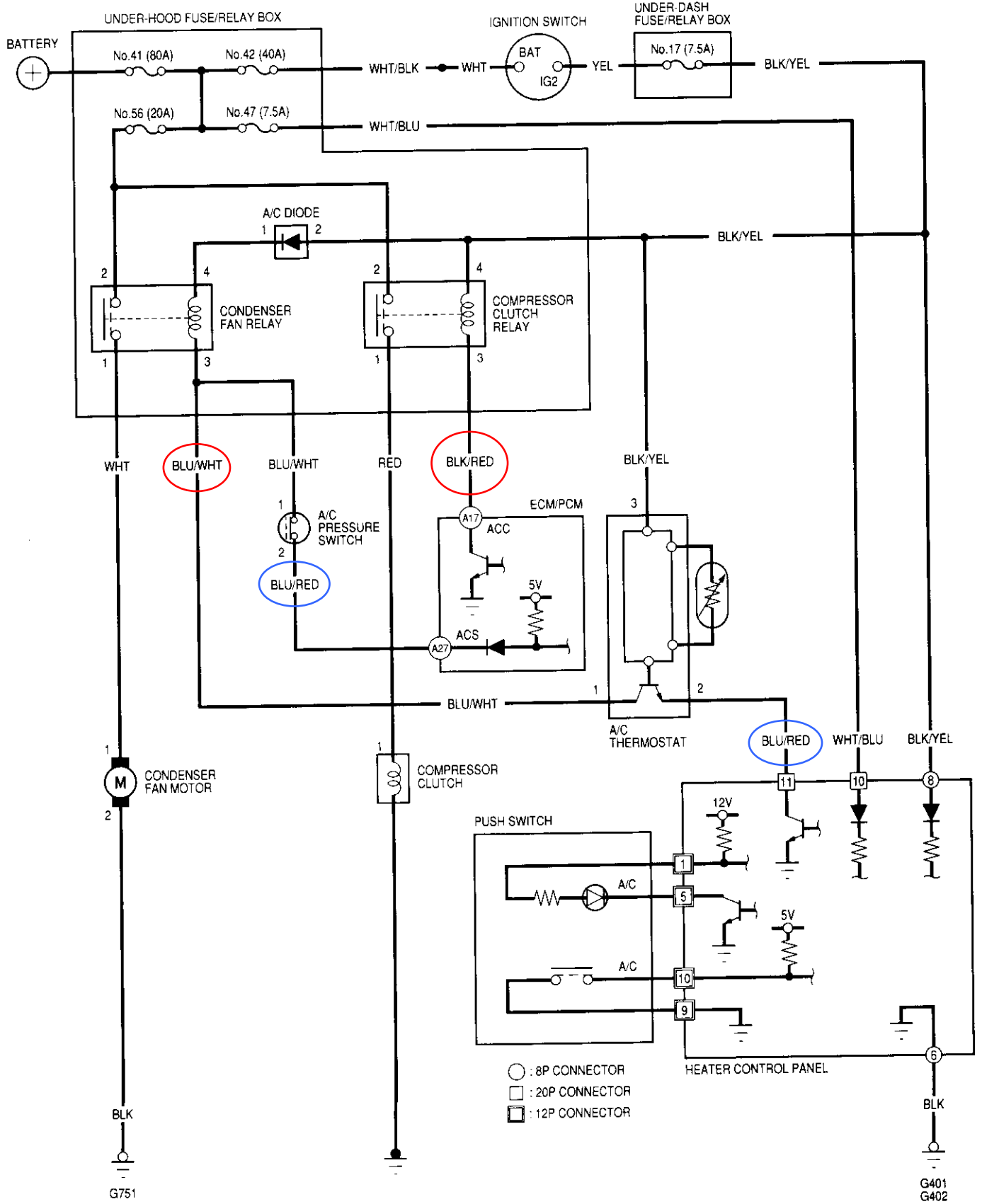


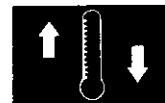
This car uses HFC-134a (R-134a) refrigerant which does not contain chlorofluorocarbons. Pay attention to the following service items:

- Do not mix refrigerants CFC-12 (R-12) and HFC-134a (R-134a). They are not compatible.
- Use only the recommended polyalkyleneglycol (PAG) refrigerant oil designed for the R-134a compressor (SANDEN: SP-10; DENSO: ND-OIL8). Intermixing the recommended (PAG) refrigerant oil with any other refrigerant oil will result in compressor failure.
- All A/C system parts (compressor, discharge line, suction line, evaporator, condenser, receiver/dryer, expansion valve, O-rings for joints) have to be proper for refrigerant R-134a. Do not confuse with R-12 parts.
- Use a halogen gas leak detector designed for refrigerant R-134a.
- R-12 and R-134a refrigerant servicing equipment are not interchangeable. Use only a recovery/recycling/charging station that is U.L.-listed and is certified to meet the requirements of SAE J2210 to service R-134a air conditioning systems.
- Always recover the refrigerant R-134a with an approved recovery/recycling/charging station before disconnecting any A/C fitting.



# '99 - 00 Models





## Test

1. Remove the A/C thermostat (see page 22-29).
2. Connect battery power to the No. 3 terminal, ground the No. 2 terminal, and connect a test light between the No. 1 and No. 3 terminals.

NOTE: Use a 12 V, 3 W – 18 W test light.

3. Dip the A/C thermostat into a cup filled with ice water, and check the test light.

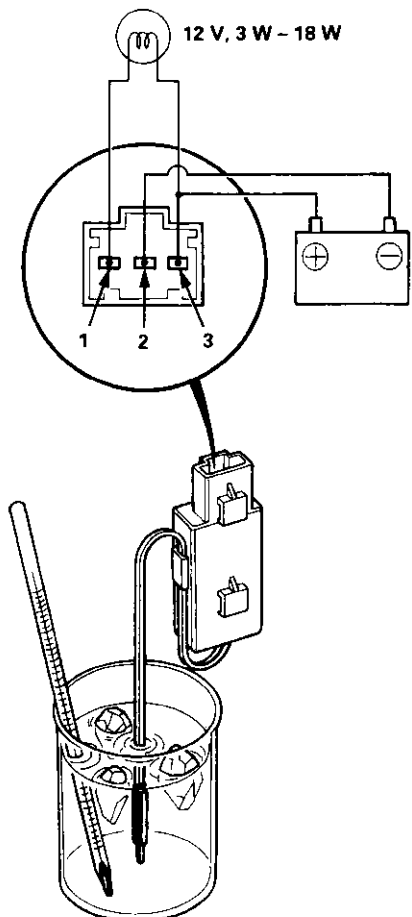
### Serpentine-type evaporator

The light should go off at 36 – 39°F (2 – 4°C) or less, and should come on at 39 – 41°F (4 – 5°C) or more.

### Laminate-type evaporator

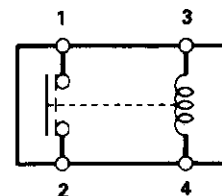
The light should go off at 39 – 43°F (4 – 6°C) or less, and should come on at 43 – 45°F (6 – 7°C) or more.

If the light doesn't come on and go off as specified, replace the A/C thermostat.

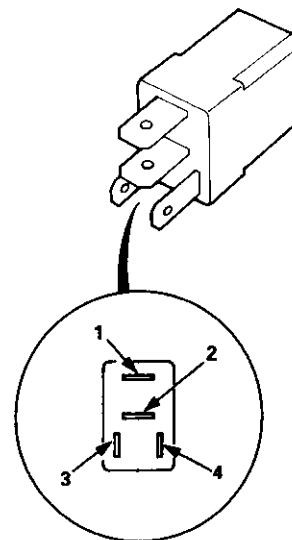


## Test

There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals, and there should be no continuity when power is disconnected.



- Condenser fan relay
- Compressor clutch relay



# A/C Service Tips and Precautions

The air conditioner system uses HFC-134a (R-134a) refrigerant and polyalkyleneglycol (PAG) refrigerant oil\*, which are not compatible with CFC-12 (R-12) refrigerant and mineral oil. Do not use R-12 refrigerant or mineral oil in this system, and do not attempt to use R-12 servicing equipment; damage to the air conditioner system or your servicing equipment will result.

\*Sanden SP-10:

- P/N 38897 – P13 – A01AH: 120 ml (4 fl-oz, 4.2 Imp-oz)
- P/N 38899 – P13 – A01: 40 ml (1 1/3 fl-oz, 1.4 Imp-oz)

\*DENSO ND-OIL 8:

- P/N 38897 – PR7 – A01AH: 120 ml (4 fl-oz)
- P/N 38899 – PR7 – A01: 40 ml (1 1/3 fl-oz)

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove R-134a from the air conditioner system.

**CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.**

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

**WARNING** Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Always disconnect the negative cable from the battery whenever replacing air conditioning parts.
2. Keep moisture and dust out of the system. When disconnecting any lines, plug or cap the fittings immediately; don't remove the caps or plugs until just before you reconnect each line.
3. Before connecting any hose or line, apply a few drops of refrigerant oil to the O-ring.
4. When tightening or loosening a fitting, use a second wrench to support the matching fitting.
5. When discharging the system, use a R-134a refrigerant recovery/recycling/charging station; don't release refrigerant into the atmosphere.
6. Add refrigerant oil after replacing the following parts:

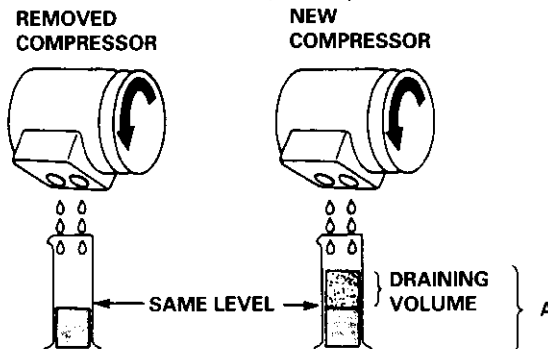
NOTE:

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

Condenser .....	20 ml (2/3 fl-oz, 0.7 Imp-oz)
Evaporator .....	45 ml (1 2/3 fl-oz, 1.6 Imp-oz)
Line or hose .....	10 ml (1/3 fl-oz, 0.4 Imp-oz)
Receiver/Dryer .....	10 ml (1/3 fl-oz, 0.4 Imp-oz)
Leakage repair .....	25 ml (5/6 fl-oz, 0.9 Imp-oz)
Compressor .....	For compressor replacement, subtract the volume of oil drained from the removed compressor from A, and drain the calculated volume of oil from the new compressor: $A - \text{Volume of removed compressor} = \text{Volume to drain from new compressor}$ .

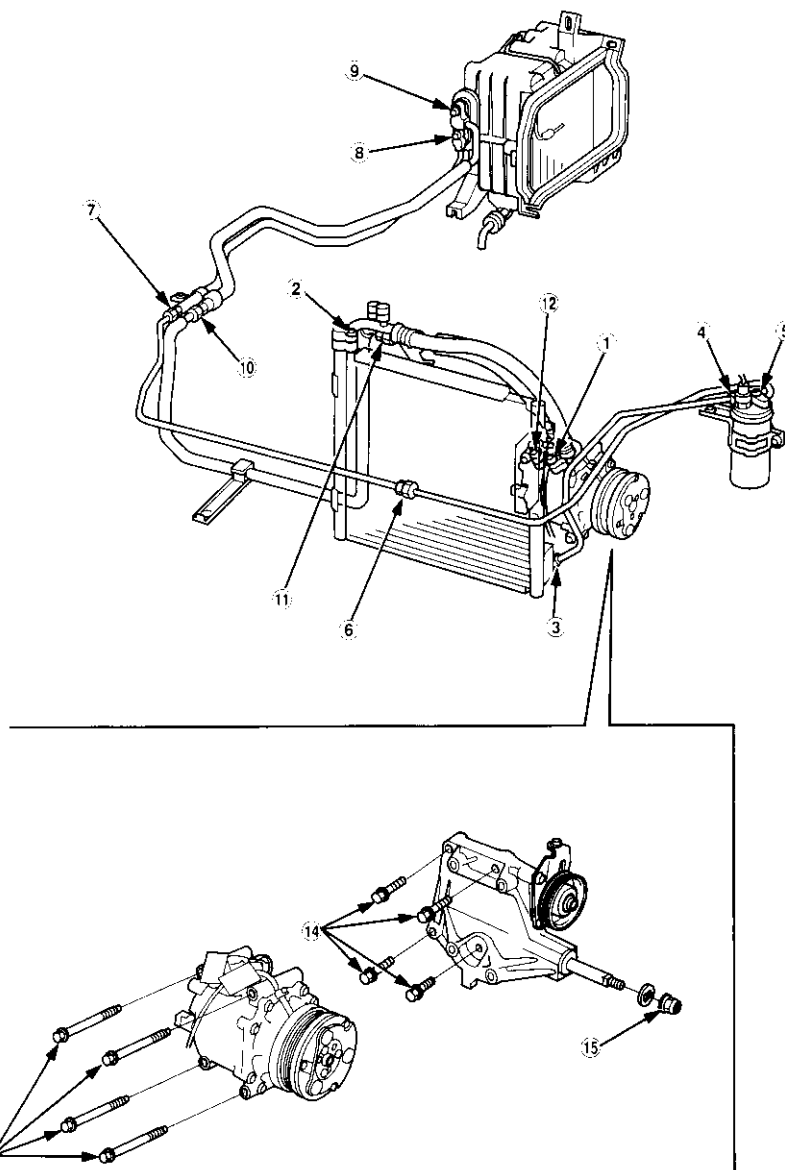
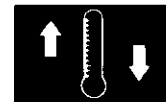
A: SANDEN 130 ml (4 1/3 fl-oz, 4.6 Imp-oz); DENSO 140 ml (4 2/3 fl-oz, 4.9 Imp-oz),

NOTE: Even if no oil is drained from the removed compressor, don't drain more than 50 ml (1 2/3 fl-oz, 1.8 Imp-oz) from the new compressor.





# A/C System Torque Specifications



① Discharge hose to the compressor (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
② Discharge hose to the condenser (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
③ Condenser pipe to the condenser (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
④ Condenser pipe to the receiver/dryer (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑤ Receiver pipe A to the receiver/dryer (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑥ Receiver pipe B to the receiver pipe A .....	13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑦ Receiver pipe C to the receiver pipe B .....	13 N·m (1.3 kgf·m, 9.4 lbf·ft)
⑧ Receiver pipe C to the evaporator (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑨ Suction pipe B to the evaporator (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑩ Suction pipe A to the suction pipe B .....	31 N·m (3.2 kgf·m, 23 lbf·ft)
⑪ Suction hose to the suction pipe A .....	31 N·m (3.2 kgf·m, 23 lbf·ft)
⑫ Suction hose to the compressor (6 x 1.0 mm) .....	9.8 N·m (1.0 kgf·m, 7.2 lbf·ft)
⑬ Compressor to the compressor bracket (8 x 1.25 mm) .....	24 N·m (2.4 kgf·m, 17 lbf·ft)
⑭ Compressor bracket to the cylinder block (10 x 1.25 mm) .....	44 N·m (4.5 kgf·m, 33 lbf·ft)
⑮ Compressor bracket to the left front engine mount (12 x 1.25 mm) .....	59 N·m (6.0 kgf·m, 43 lbf·ft)

# A/C System Service

## Performance Test

The performance test will help determine if the air conditioner system is operating within specifications.

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

**CAUTION: Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.**

If accidental system discharge occurs, ventilate work area before resuming service.

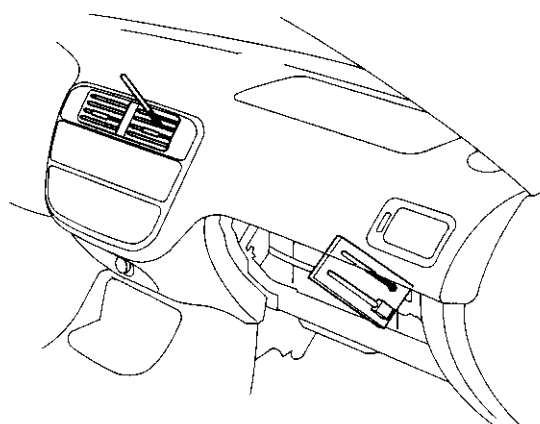
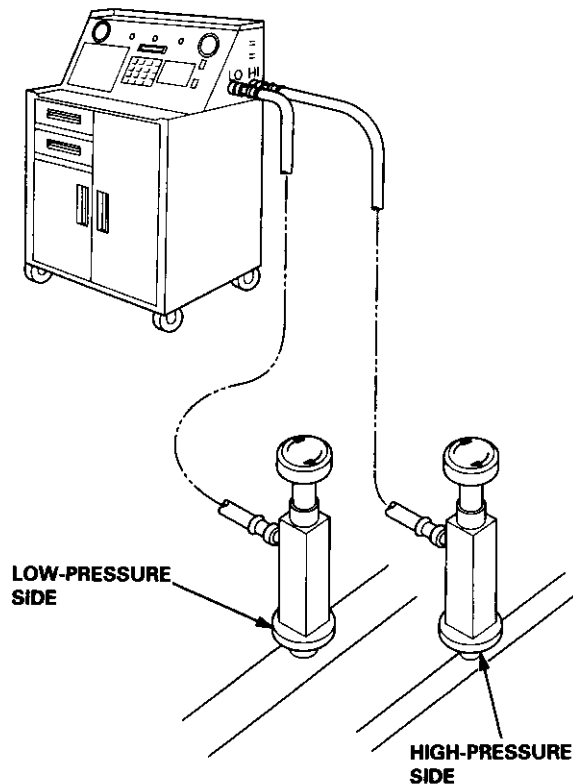
R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

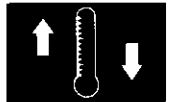
**▲ WARNING** Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recover/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.
2. Insert a thermometer in the center vent outlet. Determine the relative humidity and air temperature.
3. Test conditions:
  - Avoid direct sunlight.
  - Open hood.
  - Open front doors.
  - Set the temperature control lever or dial to MAX. COOL, the mode control switch or dial on VENT and the recirculation control switch on RECIRCULATE.
  - Turn the A/C switch on, and the heater fan switch on MAX.
  - Run the engine at 1,500 rpm.
  - No driver or passengers in vehicle
4. After running the air conditioning for 10 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent and the high and low system pressure from the A/C gauges.

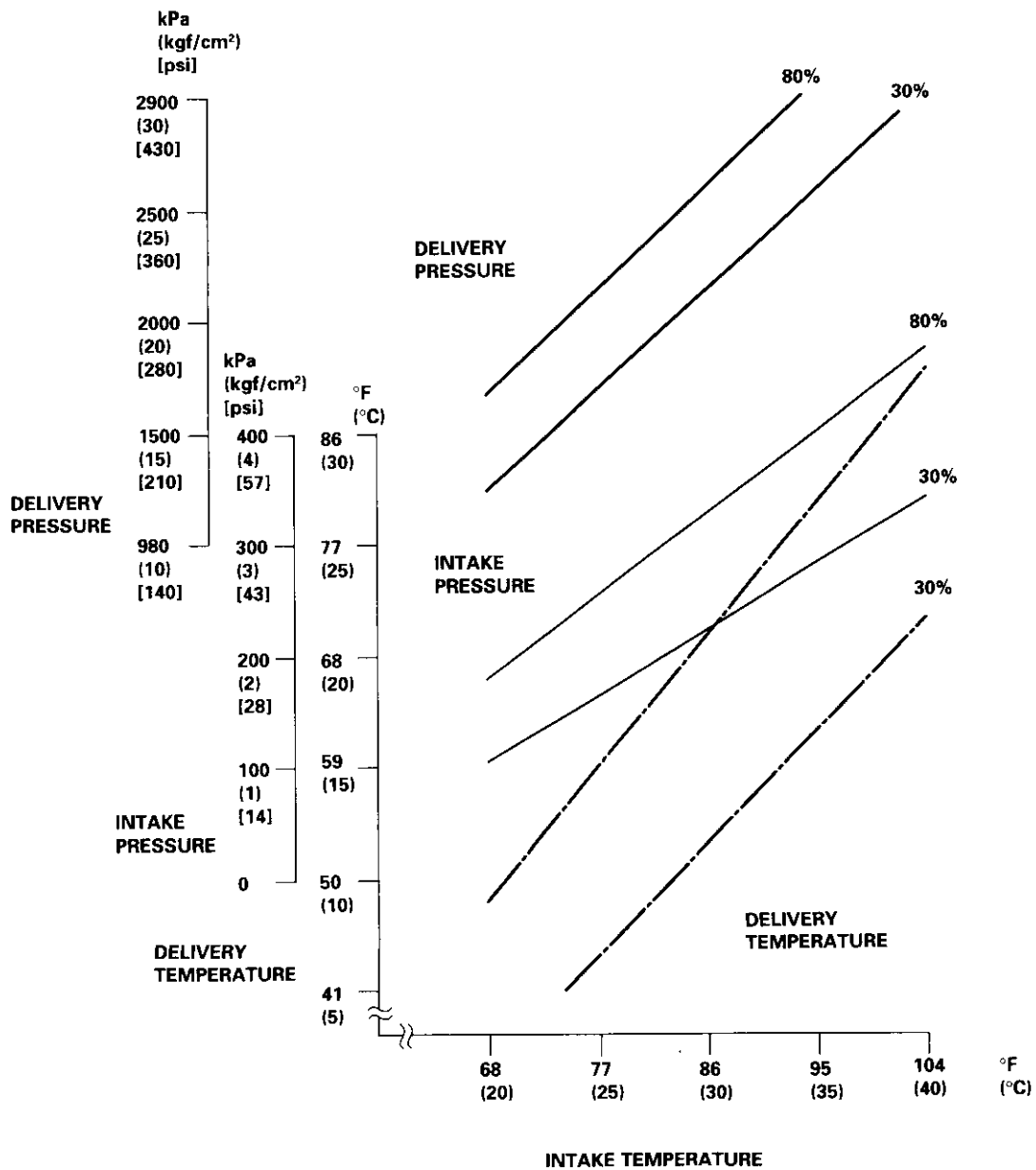
### Recovery/Recycling/Charging Station

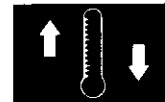




5. To complete the charts:

- 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 10% above and 10% below the humidity level.
- From each point, draw a horizontal line across the delivery temperature.
- The delivery temperature should fall between the two lines.
- Complete the low side pressure test and high side pressure test in the same way.
- Any measurements outside the line may indicate the need for further inspection.





## Recovery

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

**CAUTION:** Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

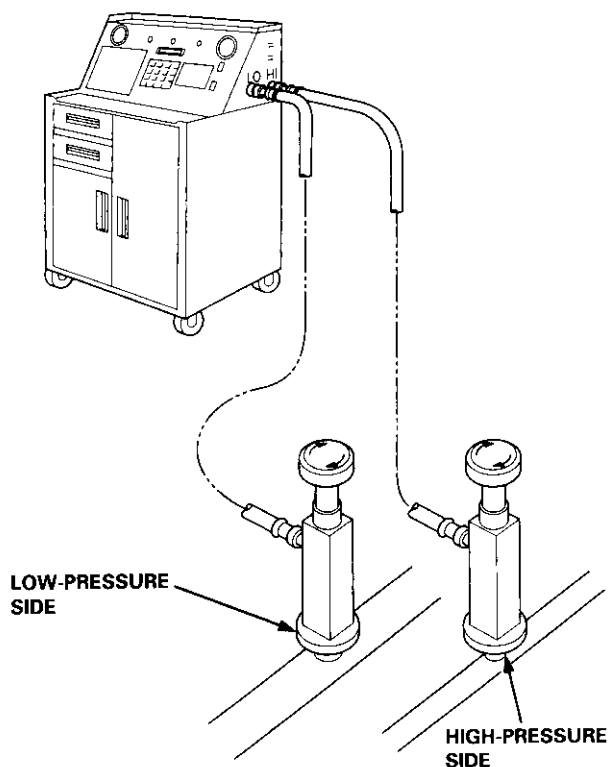
**▲ WARNING** Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.
2. Measure the amount of refrigerant oil removed from the A/C system after the recovery process is completed.

**NOTE:** Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

### Recovery/Recycling/Charging Station

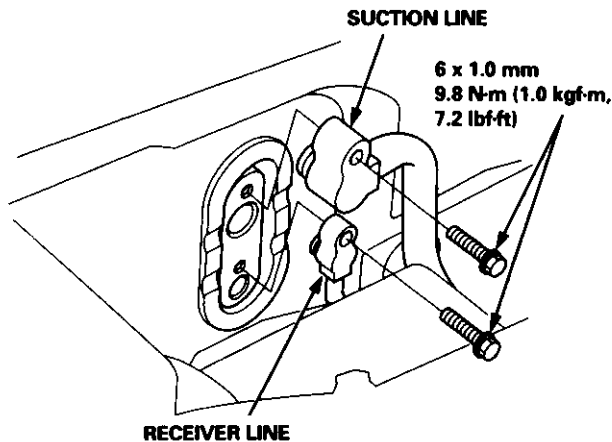


# Evaporator

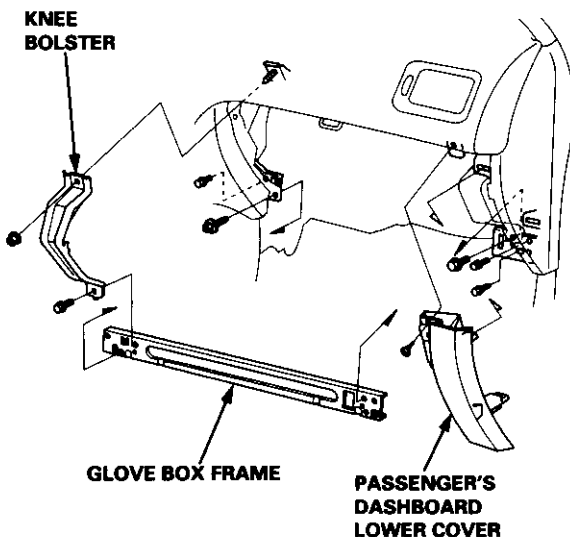
## Replacement

1. Move the temperature control to "HOT."  
'96-98: Slide the temperature control lever.  
'99-00: Turn the ignition switch ON (II), then turn the temperature control knob. Turn the ignition switch off.
2. Remove the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
4. Remove the bolts, then disconnect the suction and receiver lines from the evaporator.

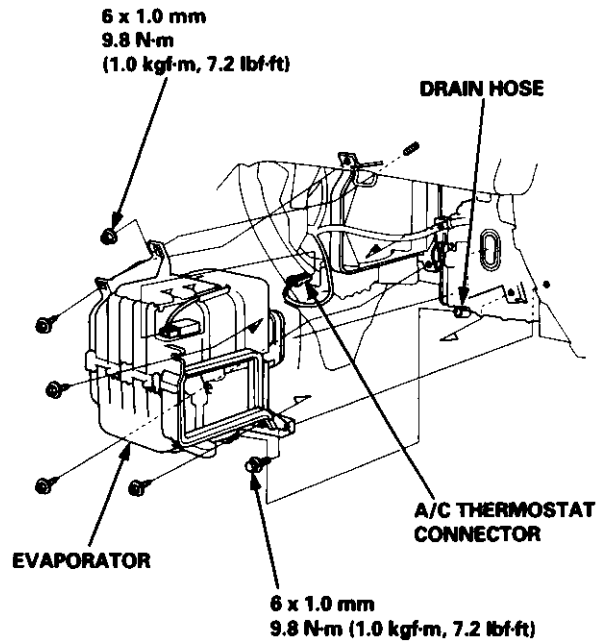
NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



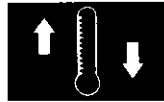
5. Remove the glove box (see section 20).
6. Remove the self-tapping screw and the passenger's dashboard lower cover. Remove the bolt, the nut and the knee bolster, then remove the five bolts and the glove box frame.



7. Disconnect the connector from the A/C thermostat, and remove the wire harness from the evaporator. Remove the four self-tapping screws, the mounting bolt and the mounting nut. Disconnect the drain hose, then remove the evaporator.



8. Install in the reverse order of removal. Make note of the following items.
  - If you're installing a new evaporator, add refrigerant oil (SANDEN, SP-10 or DENSO, ND-OIL 8) (see page 22-22).
  - Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.  
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
  - Apply sealant to the grommets.
  - Make sure that there is no air leakage.
  - Charge the system (see page 22-46), and test its performance (see page 22-24).



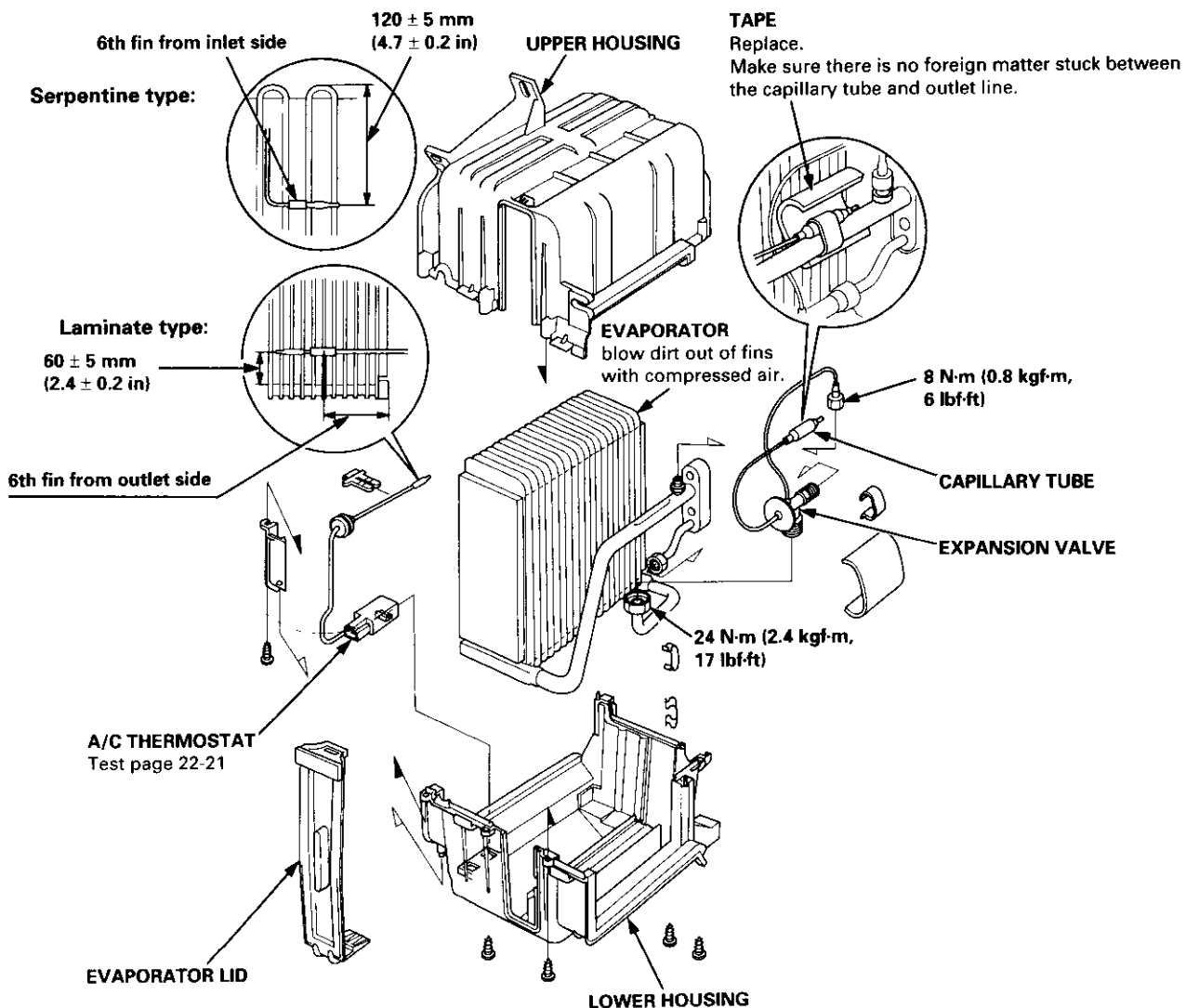
# Overhaul

1. Pull out the A/C thermostat sensor from the evaporator fins.
2. Remove the self-tapping screws and clamps from the housings.
3. Carefully separate the housings, then remove the evaporator.
4. If necessary, remove the expansion valve.

NOTE: When loosening the expansion valve nuts, use a second wrench to hold the expansion valve or the evaporator pipe. Otherwise, they can be damaged.

5. Assemble in the reverse order of disassembly. Make note of following items.

- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.  
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Install the expansion valve capillary tube so that it is in direct contact with the suction line. Then wrap with tape.
- Reinstall the A/C thermostat sensor to its original location.

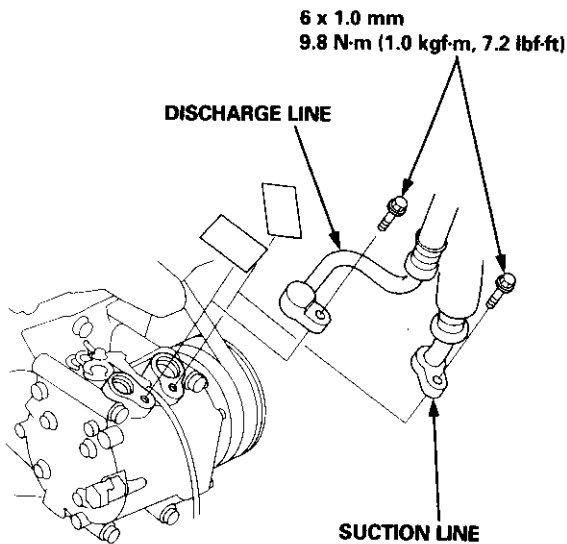


# Compressor (SANDEN)

## Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioner work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
4. Remove the bolts, then disconnect the suction and discharge lines from the compressor.

NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

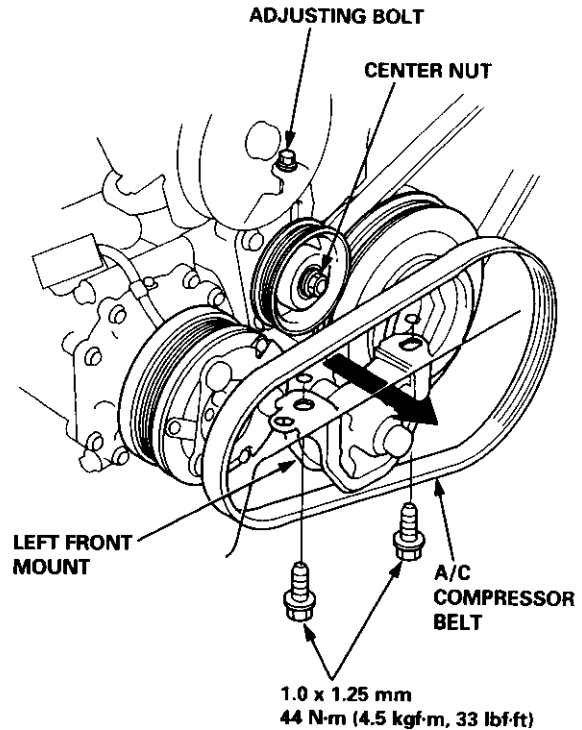


5. Remove the condenser (see page 22-44).

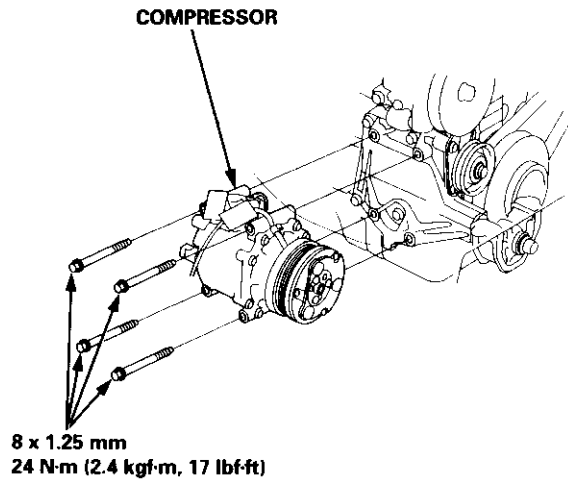
NOTE: Do not disconnect the discharge hose from the condenser.

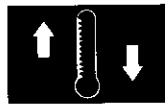
6. Remove the power steering pump belt (see section 17).

7. Loosen the center nut of the idler pulley and the adjusting bolt, then remove the A/C compressor belt from the pulleys. Remove the two mounting bolts from the left front mount, then remove the A/C compressor belt by passing it through the gap between the body and the left front mount.



8. Remove the four mounting bolts and the compressor.



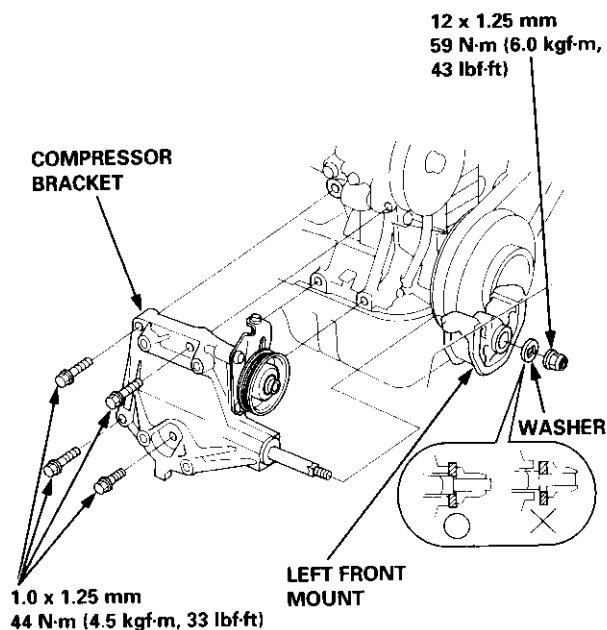


9. If necessary, remove the compressor bracket as follows.

- Remove the nut and the washer.

NOTE: When tightening the nut of the left front mount, make sure the washer is set properly on the left front engine mount as shown.

- Remove the four mounting bolts and the compressor bracket.



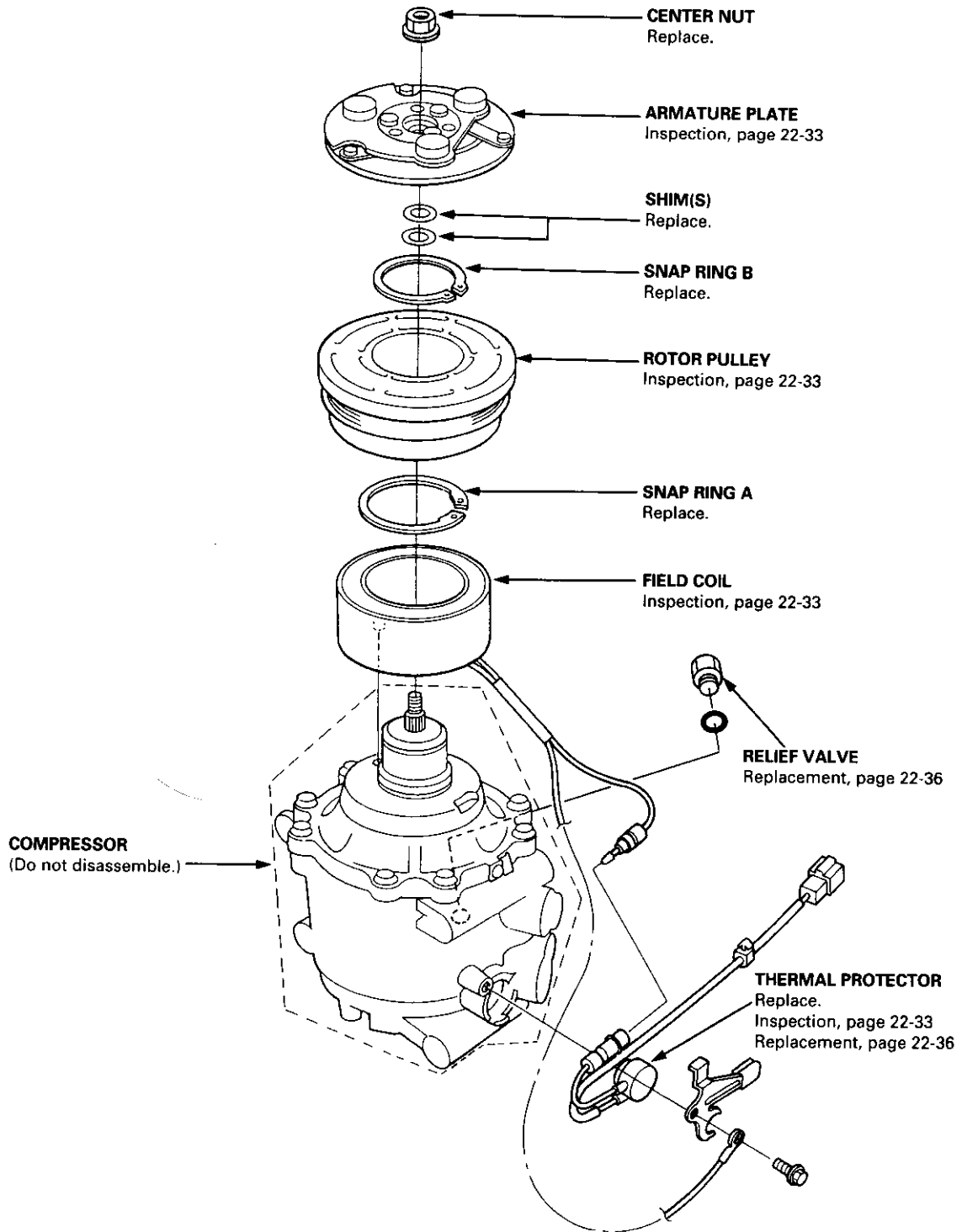
10. Install in the reverse order of removal. Make note of the following items.

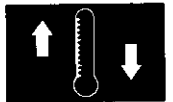
- If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 130m<sup>l</sup> (4 1/3 fl-oz, 4.6 Imp-oz); the result is the amount of oil you should drain from the new compressor (through the suction fitting).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.  
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (SP-10) for R-134a Sanden and Hadsys spiral type compressors only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Adjust the A/C compressor belt (see page 22-43) and the power steering pump belt (see section 17).
- Charge the system (see page 22-46), and test its performance (see page 22-24).



# Compressor (SANDEN)

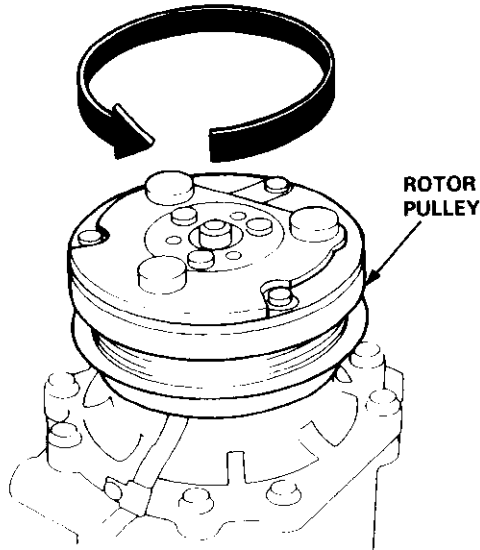
## Illustrated Index





## Clutch Inspection

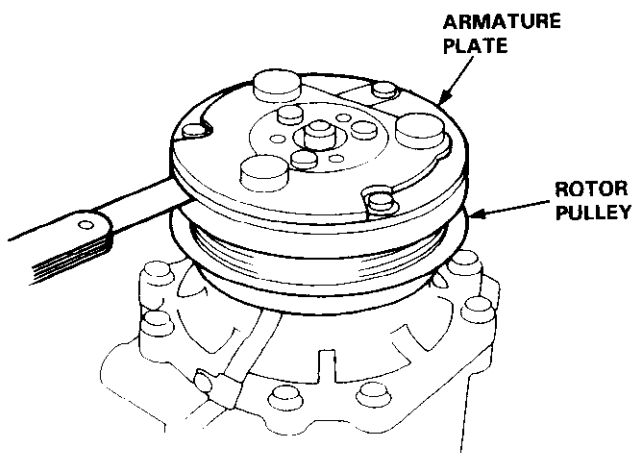
- Check the plated parts of the armature plate for color changes, peeling or other damage. If there is damage, replace the clutch set.
- Check the rotor pulley bearing play and drag by rotating the rotor pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



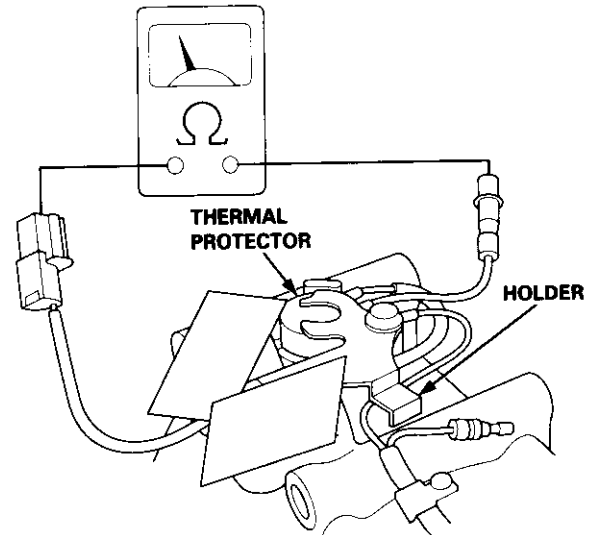
- Measure the clearance between the rotor pulley and the armature plate all the way around. If the clearance is not within specified limits, the armature plate must be removed and shims added or removed as required, following the procedure on page 22-34.

**Clearance:  $0.5 \pm 0.15$  mm ( $0.020 \pm 0.006$  in)**

**NOTE:** The shims are available in four thicknesses: 0.1 mm, 0.2 mm, 0.4 mm and 0.5 mm



- Release the field coil connector from the holder, then disconnect it. Check the thermal protector for continuity. If there is no continuity, replace the thermal protector.

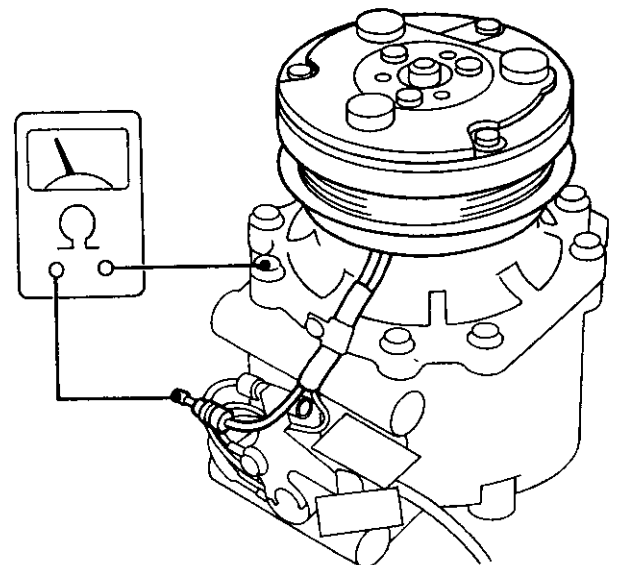


**NOTE:** The thermal protector will have no continuity above 251.6 to 262.4°F (122 to 128°C). When the temperature drops below 240.8 to 219.8°F (116 to 104°C), the thermal protector will have continuity.

- Check resistance of the field coil.

**Field Coil Resistance: 3.05 to 3.35  $\Omega$  at 68°F (20°C)**

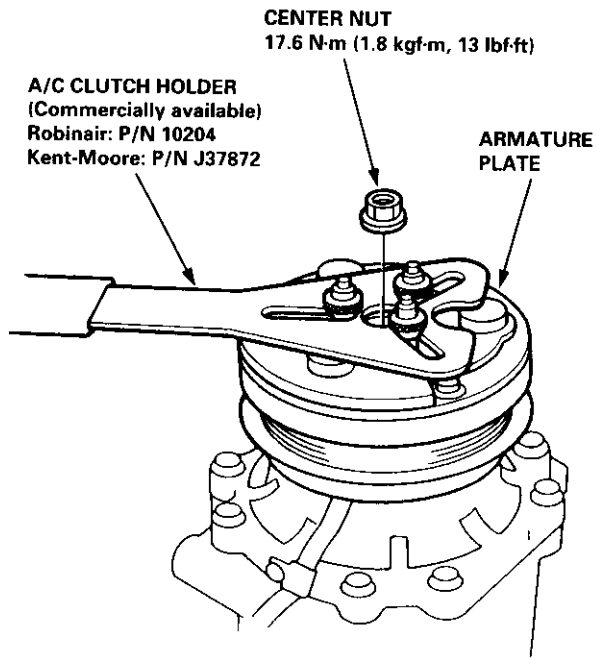
If resistance is not within specifications, replace the field coil.



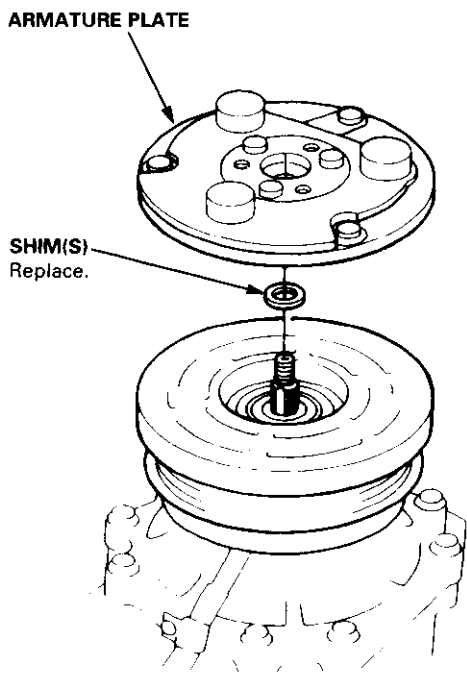
# Compressor (SANDEN)

## Clutch Overhaul

1. Remove the center nut while holding the armature plate with the tool.



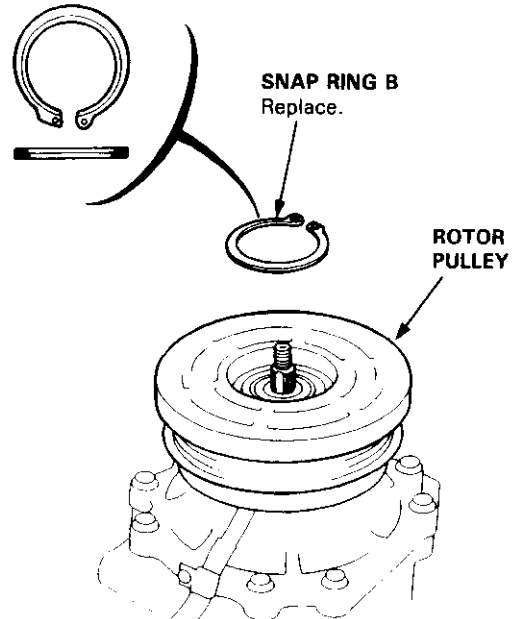
2. Remove the armature plate by pulling it up by hand.



3. Remove snap ring B with snap ring pliers.

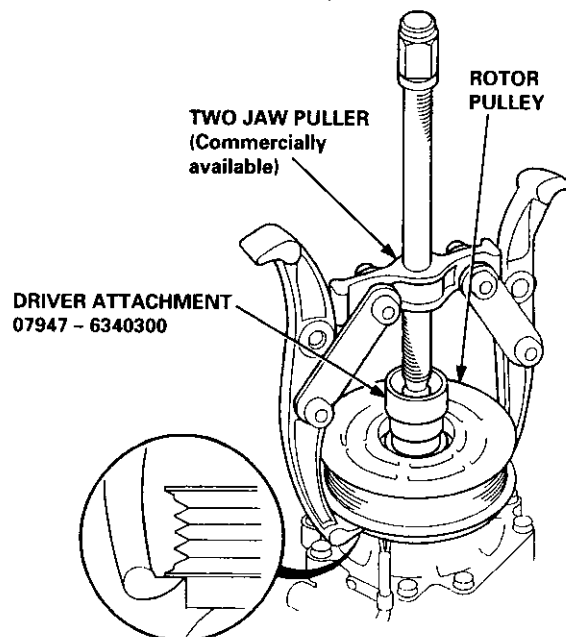
### NOTE:

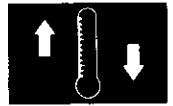
- Be careful not to damage the rotor pulley and compressor during removal/installation.
- Once snap ring B is removed, replace it with a new one.



4. Remove the rotor pulley from the shaft with a puller and the special tool.

NOTE: Place the claws of the puller on the back of the rotor pulley, not on the belt area; otherwise the rotor pulley can be damaged.

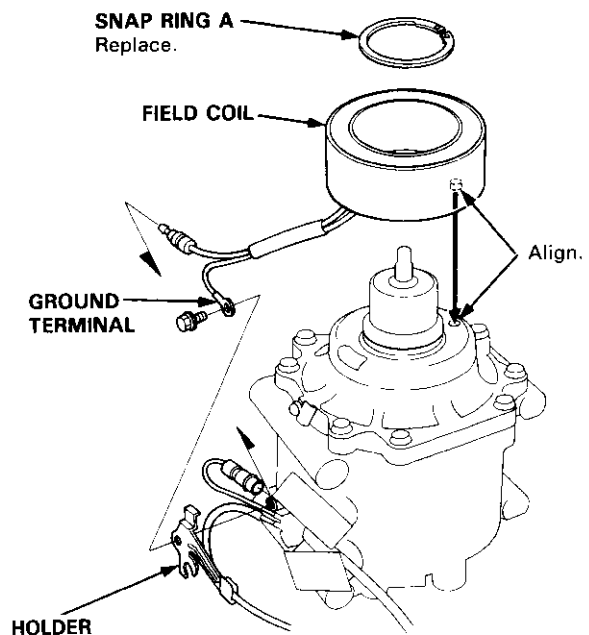




5. Remove the screw from the field coil ground terminal, then disconnect the field coil connector. Remove snap ring A with snap ring pliers, then remove the field coil.

NOTE:

- Be careful not to damage the field coil and compressor during remove/installation.
- Once snap ring A is removed, replace it with a new one.
- When installing the field coil, align the boss on the field coil with the hole in the compressor.

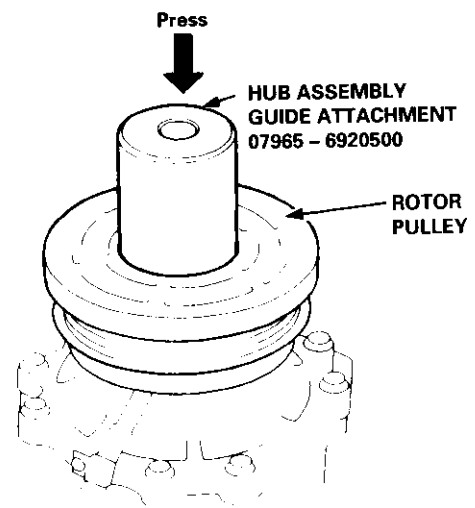


7. Assemble in the reverse order of disassembly. Make note of the following items.

- Install the field coil with the wire side facing down.
- Clean the rotor pulley and compressor sliding surfaces with non-petroleum solvent.
- Make sure the snap rings are fully seated in the groove.
- Make sure that the rotor pulley turns smoothly after it's reassembled.
- Route and clamp the wires properly or they can be damaged by the rotor pulley.

6. Position the rotor pulley squarely over the field coil. Press the rotor pulley onto the compressor boss with the special tool. If the rotor pulley does not press on straight, remove it, and check the rotor pulley and compressor boss for burrs or damage.

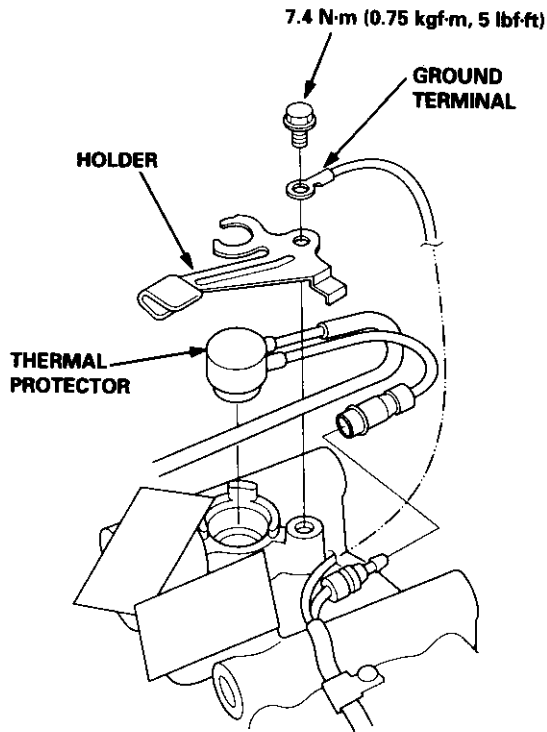
**CAUTION: Maximum press load: 39,200 kPa (400 kgf/cm<sup>2</sup>, 5,690 psi)**



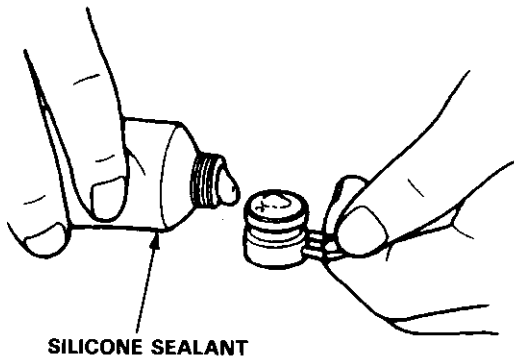
# Compressor (SANDEN)

## Thermal Protector Replacement

1. Remove the bolt, the ground terminal and the holder. Disconnect the field coil connector, then remove the thermal protector.



2. Replace the thermal protector with a new one, and apply silicone sealant to the top of the thermal protector.



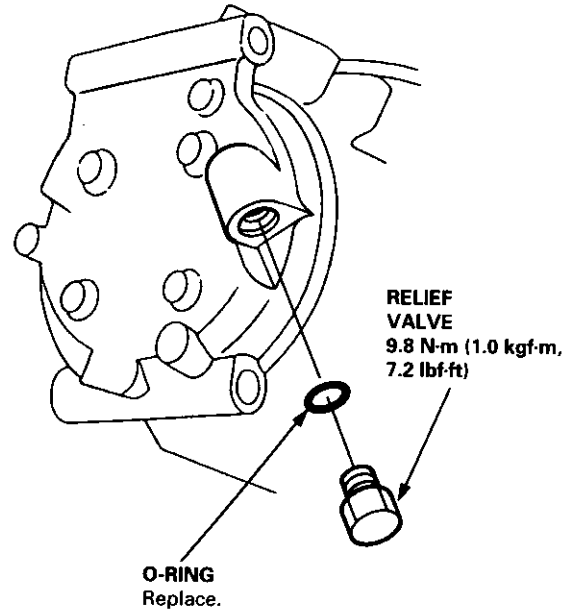
3. Install in the reverse order of removal.

## Relief Valve Replacement

1. Remove the relief valve and the O-ring.

### NOTE:

- Do not let the compressor oil run out.
- Make sure that no foreign matter enters the system.



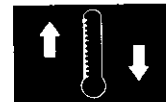
2. Clean the mating surfaces.
3. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.

### NOTE:

- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.

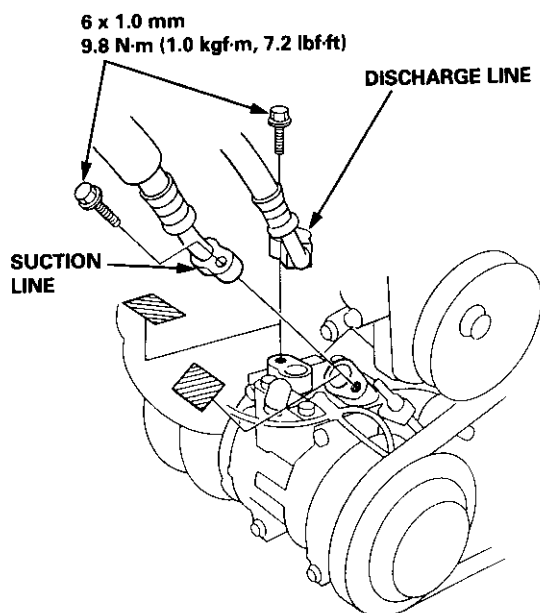
4. Install and tighten the relief valve.
5. Charge the system (see page 22-46), and test its performance (see page 22-24).

# Compressor (DENSO)



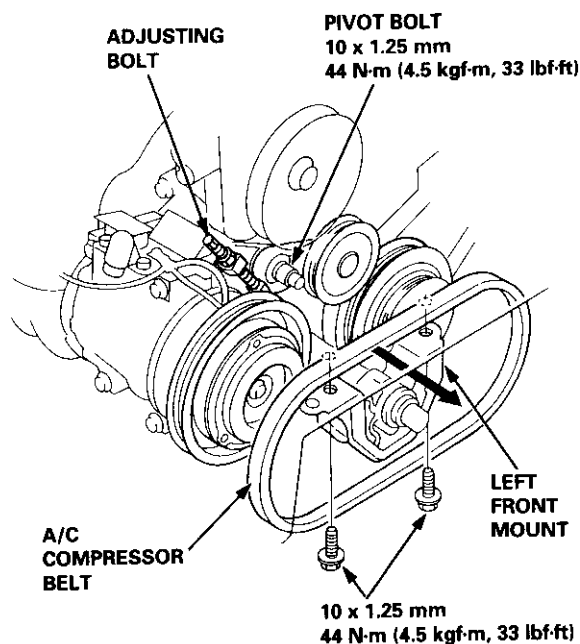
## Replacement

1. If the compressor is marginally operable, run the engine at idle speed, and let the air conditioning work for a few minutes, then shut the engine off.
2. Disconnect the negative cable from the battery.
3. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
4. Remove the each bolt, then disconnect the suction and discharge lines from the compressor. Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.

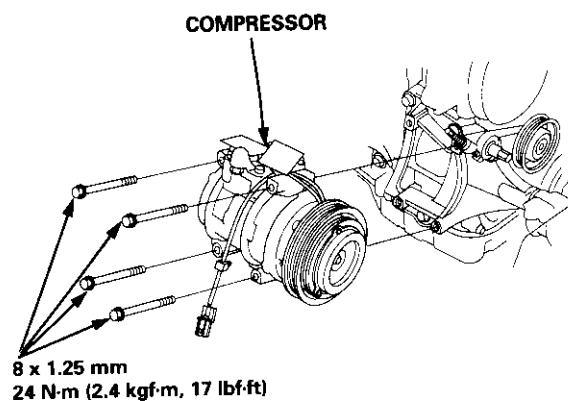


5. Remove the condenser, but do not disconnect the discharge hose from the condenser (see page 22-44).
6. Remove the power steering pump belt (see section 17).

7. Loosen the pivot bolt of the idler pulley bracket and the adjusting bolt, then remove the A/C compressor belt from the pulleys. If necessary, remove the mounting bolts from the left front mount, then remove the A/C compressor belt through the gap between the body and the left front mount.



8. Disconnect the compressor clutch connector, then remove the mounting bolts and the compressor.

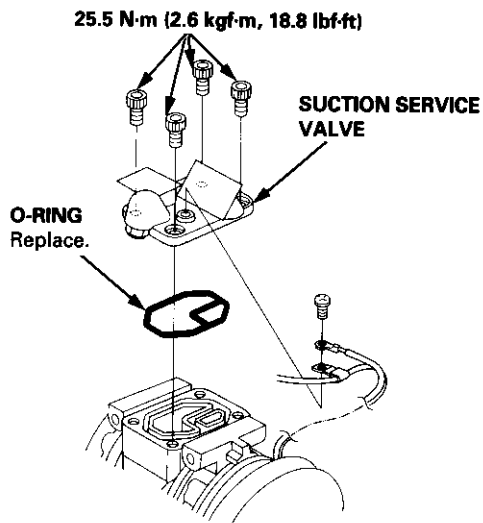


(cont'd)

# Compressor (DENSO)

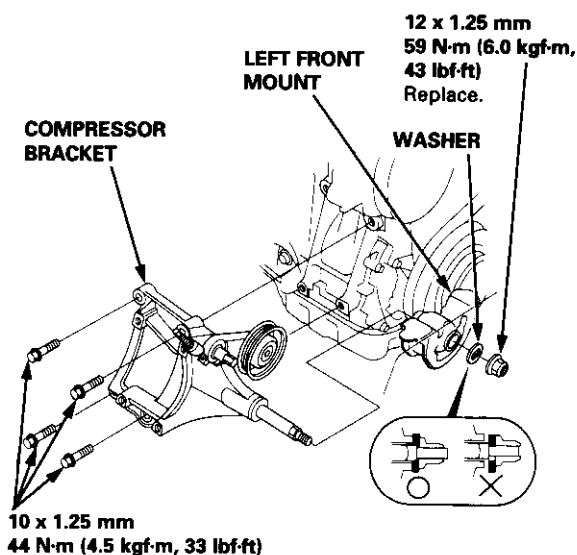
## Replacement (cont'd)

9. Remove the bolts, the suction service valve and the O-ring from the compressor.



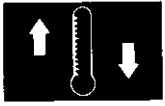
10. If necessary, remove the compressor bracket as follows.

- Remove the nut and the washer from the left front mount. When tightening the nut to the left front mount, make sure the washer is set properly on the left front mount as shown.
- Remove the mounting bolts and the compressor bracket.

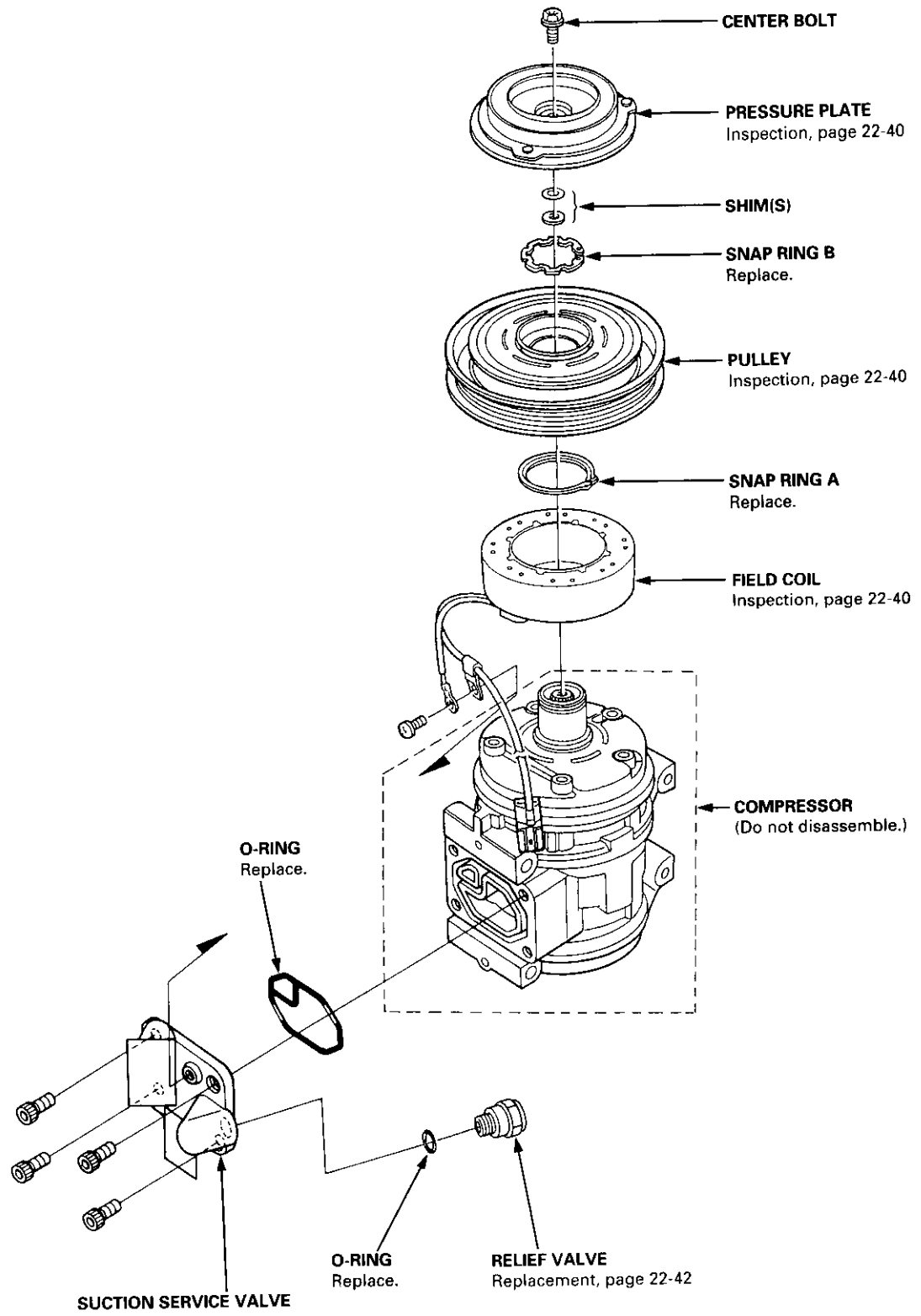


11. Install in the reverse order of removal, and note these items:

- If you're installing a new compressor, drain all the refrigerant oil from the removed compressor, and measure its volume. Subtract the volume of drained oil from 140 ml (4 2/3 fl-oz, 4.9 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. Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Use refrigerant oil (DENSO, ND-OIL8) for HFC-134a DENSO piston type compressors only.
- To avoid contamination, do not return the oil to the container once dispensed, and never mix it with other refrigerant oils.
- Immediately after using the oil, replace the cap on the container, and seal it to avoid moisture absorption.
- Do not spill the refrigerant oil on the vehicle; it may damage the paint; if the refrigerant oil contacts the paint, wash it off immediately.
- Adjust the A/C compressor belt (see page 22-43) and the power steering pump belt (see section 17).
- Charge the system (see page 22-46), and test its performance (see page 22-24).



# Illustrated Index

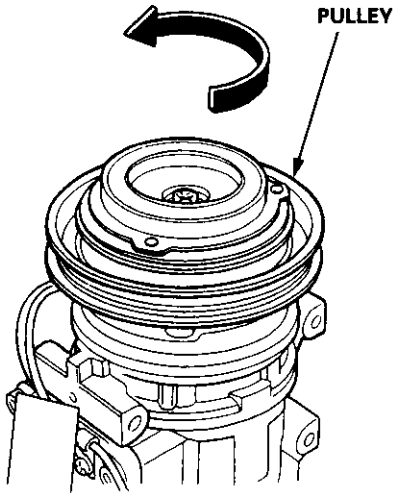




# Compressor (DENSO)

## Clutch Inspection

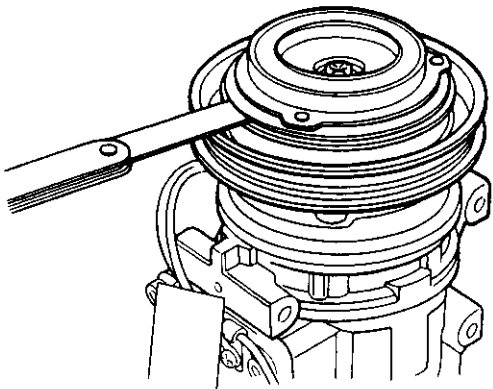
- Check the plated parts of the pressure plate for color changes, peeling or other damage. If there is damage, replace the clutch set.
- Check the pulley bearing play and drag by rotating the pulley by hand. Replace the clutch set with a new one if it is noisy or has excessive play/drag.



- Measure the clearance between the pulley and the pressure plate all the way around. If the clearance is not within specified limits, the pressure plate must be removed and shim(s) added or removed as required, following the procedure on page 22-41.

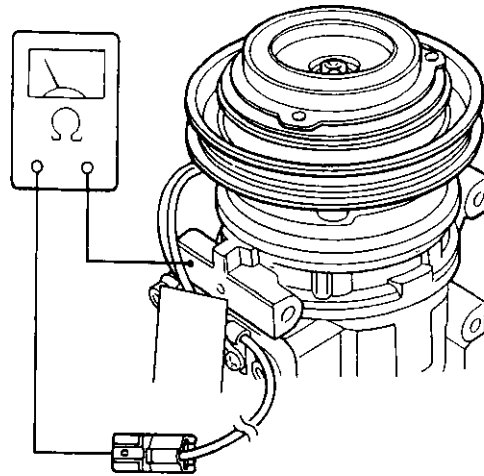
**Clearance:  $0.5 \pm 0.15$  mm ( $0.020 \pm 0.006$  in)**

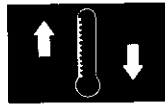
NOTE: The shims are available in three thicknesses: 0.1 mm, 0.3 mm and 0.5 mm.



- Check resistance of the field coil. If resistance is not within specifications, replace the field coil.

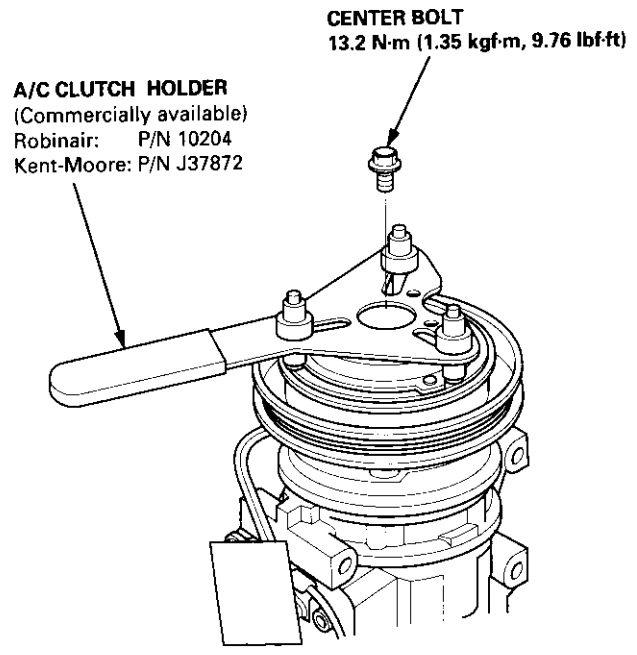
**Field Coil Resistance: 3.4 to 3.8  $\Omega$  at 20°C (68°F)**



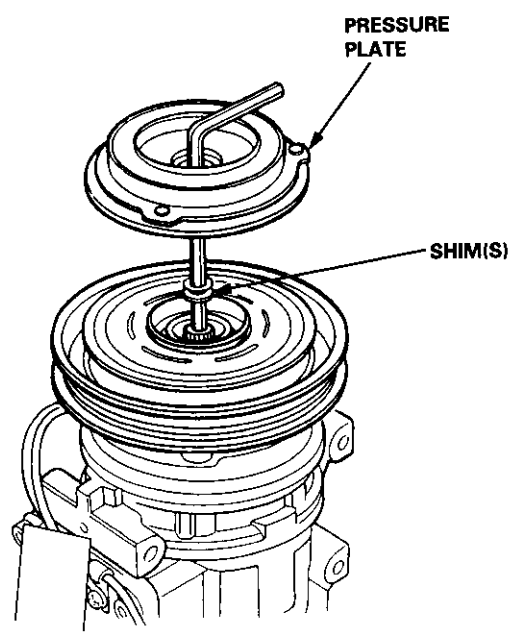


## Clutch Overhaul

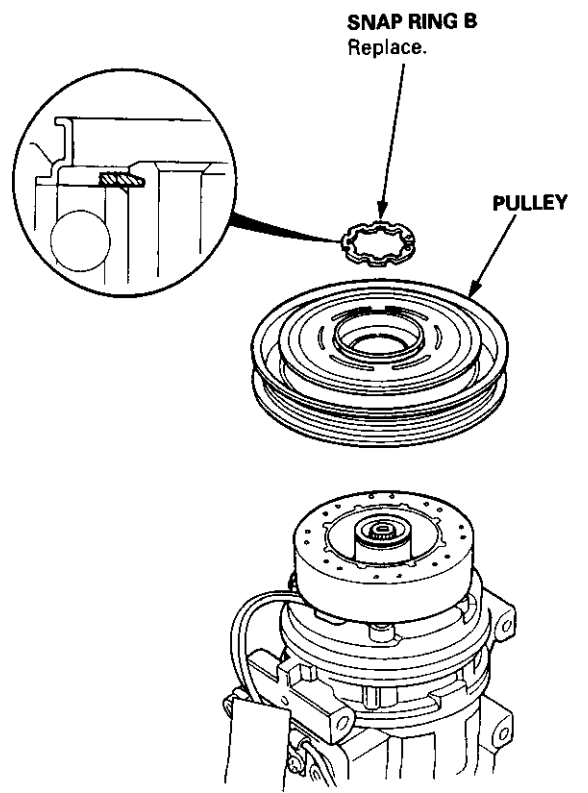
1. Remove the center bolt while holding the pressure plate with the special tool.



2. Remove the pressure plate and shim(s), taking care not to lose the shim(s).



3. Remove the snap ring B with snap ring pliers, then remove the pulley. Be careful not to damage the pulley and compressor.

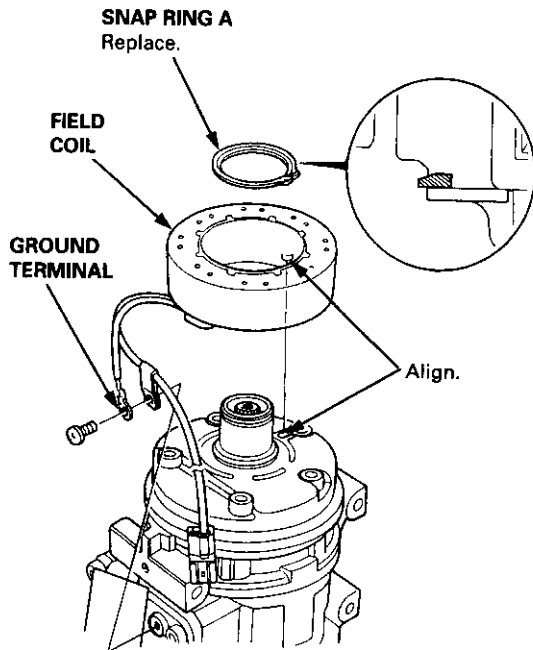


(cont'd)

# Compressor (DENSO)

## Clutch Overhaul (cont'd)

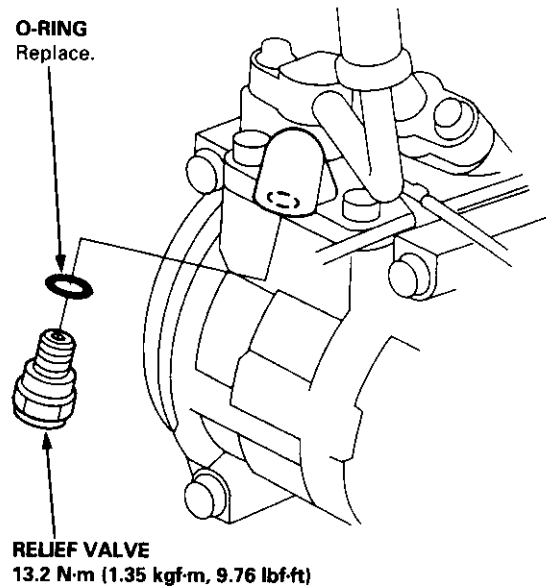
4. Remove the screw from the field coil ground terminal. Remove the snap ring A with snap ring pliers, then remove the field coil. Be careful not to damage the field coil and compressor.



5. Reassemble the compressor clutch in the reverse order of disassembly, and note these items:
  - Install the field coil with the wire side facing down.
  - Clean the pulley and compressor sliding surfaces with non-petroleum solvent.
  - Install new snap rings, and make sure they are fully seated in the groove.
  - Make sure that the pulley turns smoothly after it's reassembled.
  - Route and clamp the wires properly or they can be damaged by pulley.

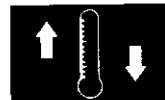
## Relief Valve Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
2. Remove the relief valve and the O-ring. Plug the opening to keep foreign matter from entering the system and the compressor oil from running out.



3. Clean the mating surfaces.
4. Replace the O-ring with a new one at the relief valve, and apply a thin coat of refrigerant oil before installing it.
5. Remove the plug, and install and tighten the relief valve.
6. Charge the system (see page 22-46), and test its performance (see page 22-24).

# A/C Compressor Belt



## Adjustment

### Tension Gauge Method

1. Attach the special tool to the A/C compressor belt as shown below, and measure the tension of the belt.

#### A/C Compressor Belt

##### Used Belt:

Except B16A2 engine

340 – 490 N (35 – 50 kgf, 77 – 110 lbf)

##### New Belt:

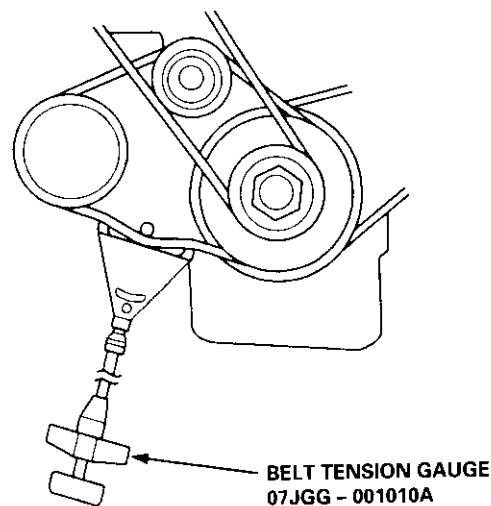
Except B16A2 engine

690 – 830 N (70 – 85 kgf, 150 – 190 lbf)

Note these items when adjusting belt tension:

- Follow the manufacturer's instructions for the belt tension gauge.
- If there are cracks or any damage evident on the belt, replace it with a new one.
- "Used belt" means a belt which has been used for five minutes or more.
- "New belt" means a belt which has been used for less than five minutes.

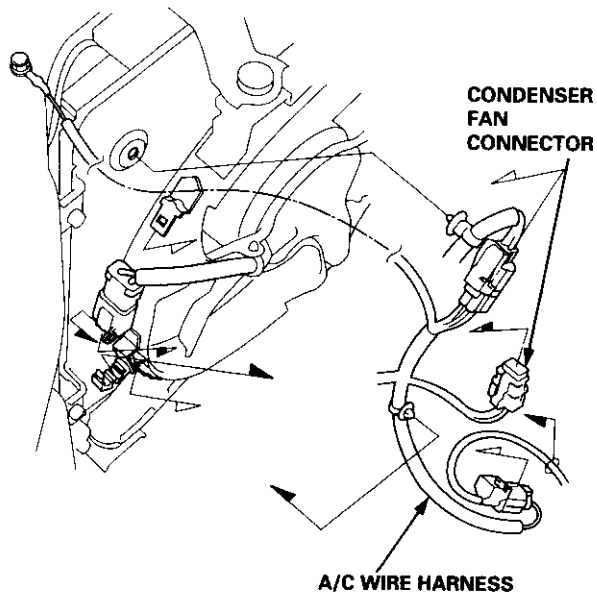
2. Loosen the center nut of the idler pulley (SANDEN), or the pivot bolt of the idler pulley bracket and the lock nut of the adjusting bolt (DENSO).
3. Turn the adjusting bolt to get proper belt tension.
4. Retighten the center nut of the idler pulley (SANDEN), or the pivot bolt of the idler pulley bracket and the lock nut of the adjusting bolt (DENSO).
5. Recheck the tension of the A/C compressor belt.



# Condenser

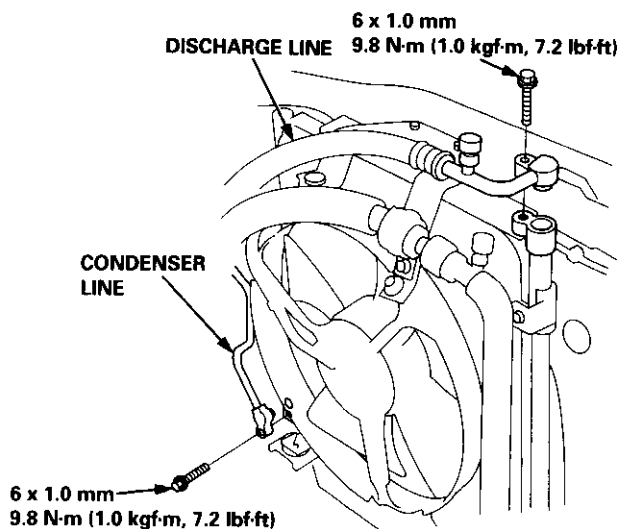
## Replacement

1. Recover the refrigerant with a recovery/recycling/charging station (see page 22-27).
2. Disconnect the condenser fan connector from the A/C wire harness, then remove the A/C wire harness from the condenser fan shroud.



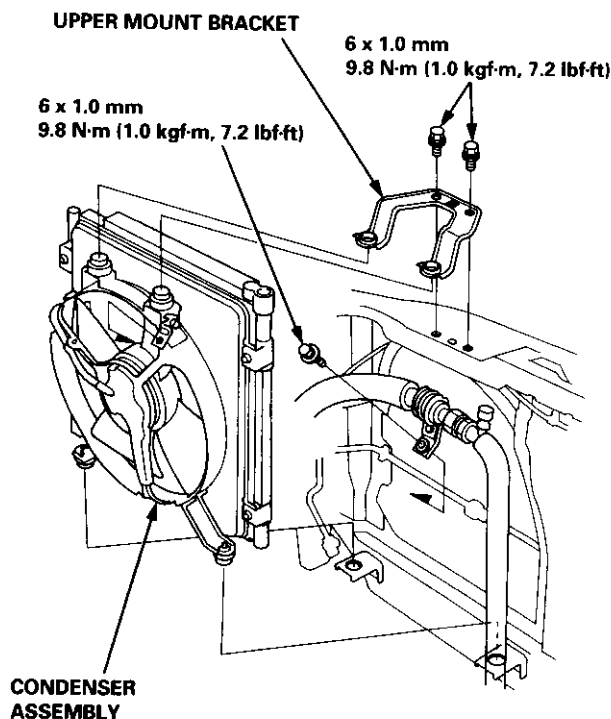
3. Remove the bolts, then disconnect the discharge and condenser lines from the condenser.

NOTE: Plug or cap the lines immediately after disconnecting them to avoid moisture and dust contamination.



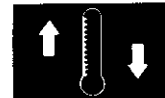
4. Remove the bolt from the suction hose bracket, and remove the two bolts and the upper mount bracket. Remove the condenser assembly by lifting it up.

NOTE: Be careful not to damage the condenser fins when removing the condenser assembly.



5. Install in the reverse order of removal. Make note of the following items.

- If you're installing a new condenser, add refrigerant oil (SANDEN, SP-10 or DENSO, ND-OIL 8) (see page 22-22).
- Replace the O-rings with new ones at each fitting, and apply a thin coat of refrigerant oil before installing them.  
NOTE: Be sure to use the right O-rings for HFC-134a (R-134a) to avoid leakage.
- Be careful not to damage the condenser fins when installing the condenser assembly.
- Charge the system (see page 22-46), and test its performance (see page 22-24).



## Evacuation

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

**CAUTION:** Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

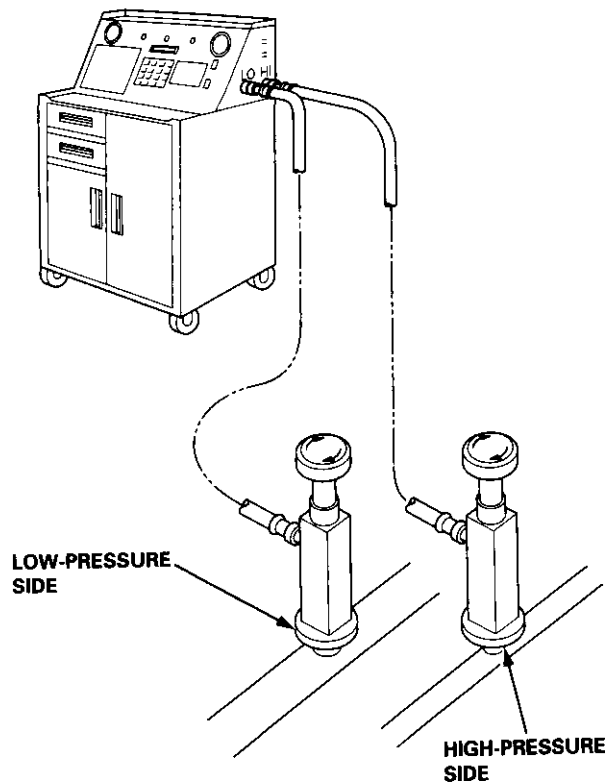
**▲ WARNING** Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a R-134a refrigerant recovery/recycling/charging station. (If the system has been open for several days, the receiver/dryer should be replaced, and the system should be evacuated for several hours.)
2. Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.

**NOTE:** If low pressure does not reach more than 93.3 kPa (700 mmHg, 27.6 in.Hg) in 15 minutes, there is probably a leak in the system. Partially charge the system, and check for leaks (see Leak Test).

## Recovery/Recycling/Charging Station



# A/C System Service

## Charging

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

**CAUTION:** Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

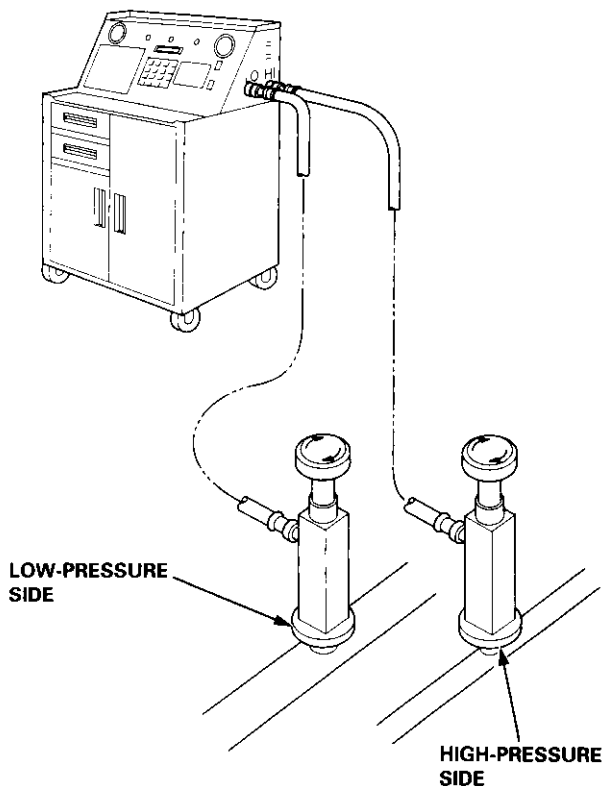
If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

**Refrigerant capacity: 600 – 650 g (21.1 – 22.9 oz)**

**CAUTION:** Do not overcharge the system; the compressor will be damaged.

Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown, following the equipment manufacturer's instructions.

### Recovery/Recycling/Charging Station



## Leak Test

Use only service equipment that is U.L.-listed and is certified to meet the requirements of SAE J2210 to remove HFC-134a (R-134a) from the air conditioner system.

**CAUTION:** Exposure to air conditioner refrigerant and lubricant vapor or mist can irritate eyes, nose and throat. Avoid breathing the air conditioner refrigerant and lubricant vapor or mist.

If accidental system discharge occurs, ventilate work area before resuming service.

R-134a service equipment or vehicle air conditioner systems should not be pressure tested or leak tested with compressed air.

**⚠ WARNING** Some mixtures of air and R-134a have been shown to be combustible at elevated pressures and can result in fire or explosion causing injury or property damage. Never use compressed air to pressure test R-134a service equipment or vehicle air conditioner systems.

Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

1. Connect a R-134a refrigerant recovery/recycling/charging station to the vehicle, as shown in the previous column, following the equipment manufacturer's instructions.

**NOTE:** Be sure to install the same amount of new refrigerant oil back into the A/C system before charging.

2. Open the high-pressure valve to charge the system to the specified capacity, then close the supply valve, and remove the charging system couplers.

**Refrigerant capacity: 600 – 650 g (21.1 – 22.9 oz)**

3. Check the system for leaks using a R-134a refrigerant leak detector with an accuracy of 14 g (0.5 oz) per year or better.
4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), recover the system according to the Recovery Procedure on page 22-27.
5. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 22-45).

# Electrical

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NOTE: Unless otherwise specified, references to automatic transmission (A/T) in this section include the CVT.







## Five-step Troubleshooting

- 1. Verify The Complaint**  
Turn on all the components in the problem circuit to verify the customer complaint. Note the symptoms. Do not begin disassembly or testing until you have narrowed down the problem area.
- 2. Analyze The Schematic**  
Look up the schematic for the problem circuit. Determine how the circuit is supposed to work by tracing the current paths from the power feed through the circuit components to ground. If several circuits fail at the same time, the fuse or ground is a likely cause.

Based on the symptoms and your understanding of the circuit operation, identify one or more possible causes of the problem.

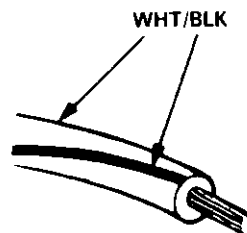
- 3. Isolate The Problem By Testing The Circuit**  
Make circuit tests to check the diagnosis you made in step 2. Keep in mind that a logical, simple procedure is the key to efficient troubleshooting. Test for the most likely cause of failure first. Try to make tests at points that are easily accessible.
- 4. Fix The Problem**  
Once the specific problem is identified, make the repair. Be sure to use proper tools and safe procedures.
- 5. Make Sure The Circuit Works**  
Turn on all components in the repaired circuit in all modes to make sure you've fixed the entire problem. If the problem was a blown fuse, be sure to test all of the circuits on the fuse. Make sure no new problems turn up and the original problem does not recur.

## Wire Color Codes

The following abbreviations are used to identify wire colors in the circuit schematics:









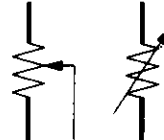

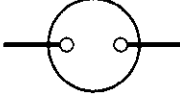










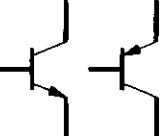




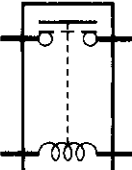
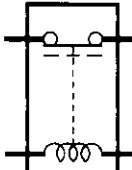



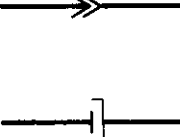

WHT	.....	White
YEL	.....	Yellow
BLK	.....	Black
BLU	.....	Blue
GRN	.....	Green
RED	.....	Red
ORN	.....	Orange
PNK	.....	Pink
BRN	.....	Brown
GRY	.....	Gray
PUR	.....	Purple
LT BLU	.....	Light Blue
LT GRN	.....	Light Green

The wire insulation has one color or one color with another color stripe. The second color is the stripe.

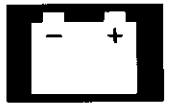


# Troubleshooting

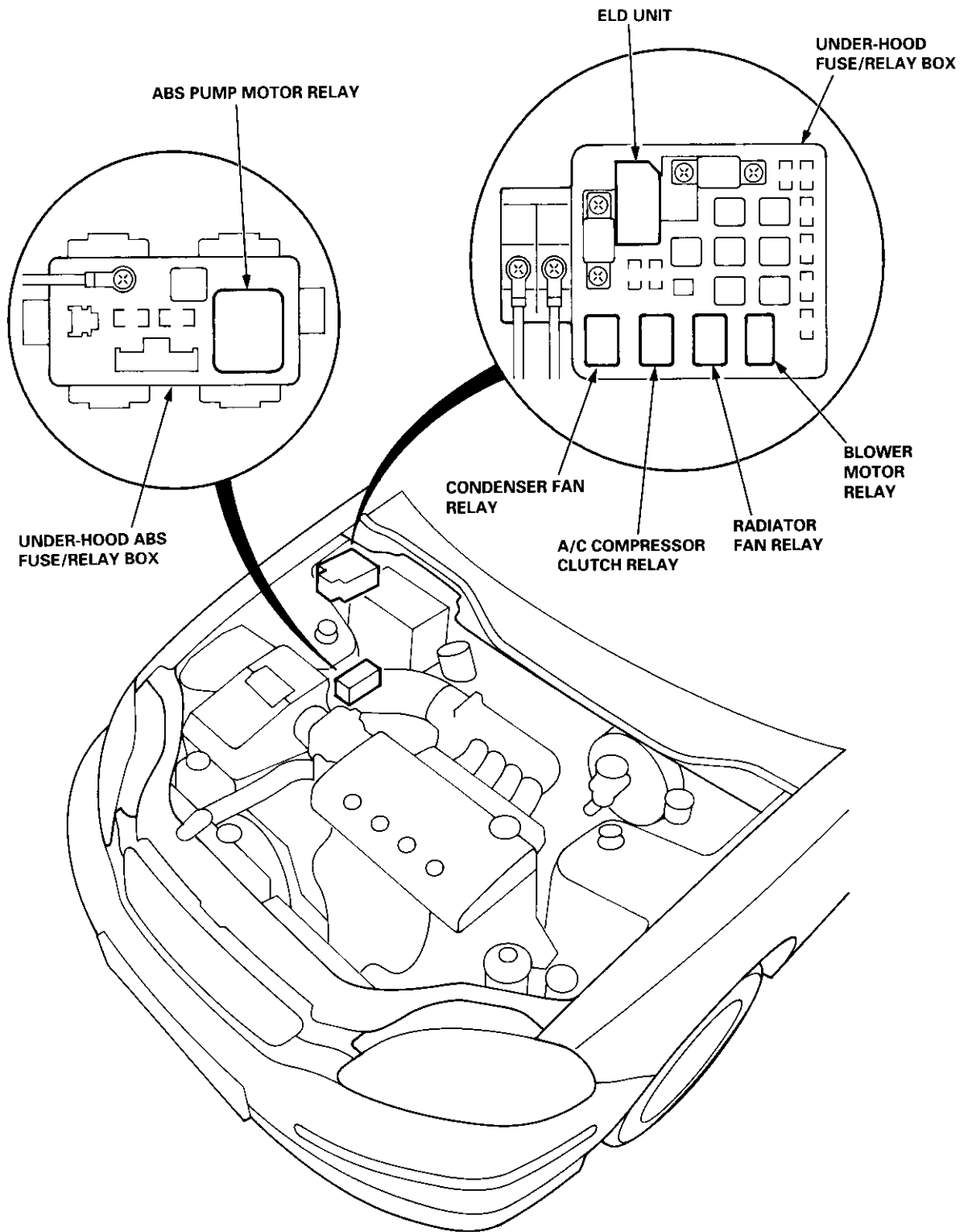
## Schematic Symbols

<b>BATTERY</b>  	<b>GROUND</b> Ground terminal   Component ground  		<b>FUSE</b> 	<b>COIL, SOLENOID</b> 	<b>CIGARETTE LIGHTER</b> 	
<b>RESISTOR</b> 	<b>VARIABLE RESISTOR</b> 	<b>THERMISTOR</b> 	<b>IGNITION SWITCH</b> 	<b>BULB</b> 	<b>HEATER</b> 	
<b>MOTOR</b> 	<b>PUMP</b> 	<b>CIRCUIT BREAKER</b> 	<b>HORN</b> 	<b>DIODE</b> 	<b>SPEAKER, BUZZER</b> 	
<b>ANTENNA</b> Mast   Window  		<b>TRANSISTOR (Tr)</b> 	<b>SWITCH (In normal position)</b> Normally open switch   Normally closed switch  		<b>LIGHT EMITTING DIODE (LED)</b>  	
<b>RELAY (In normal position)</b> Normally open relay   Normally closed relay  		<b>CONDENSER</b> 	<b>CONNECTION</b> Input   Output  		<b>CONNECTOR</b> 	<b>REED SWITCH</b> 

# Relay and Control Unit Locations

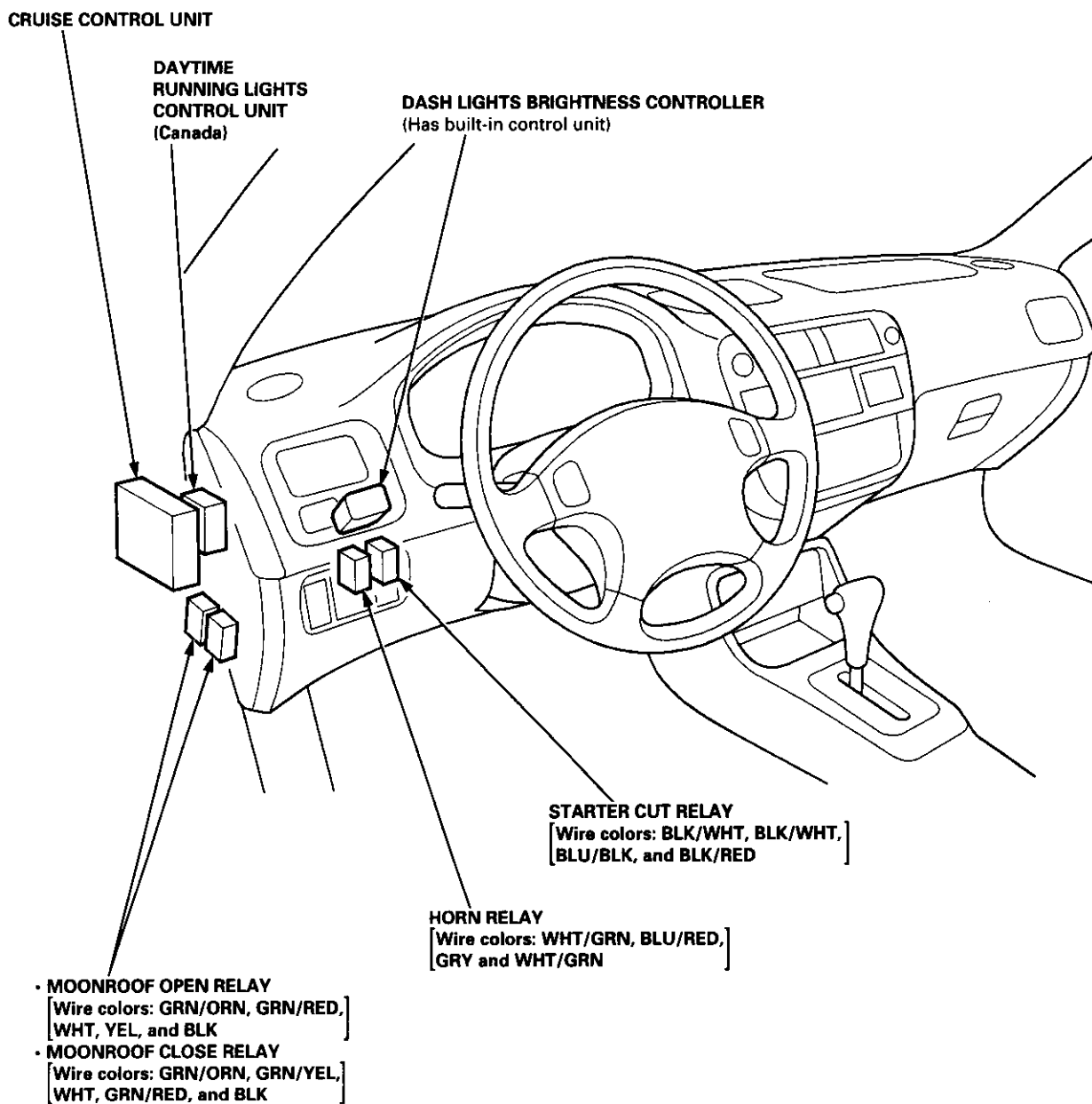


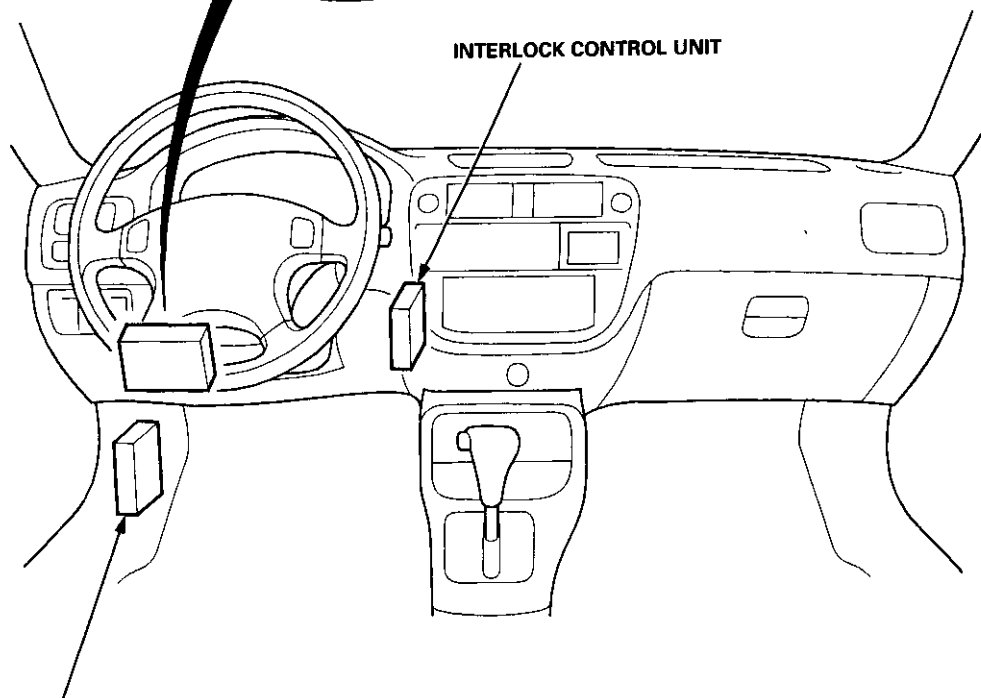
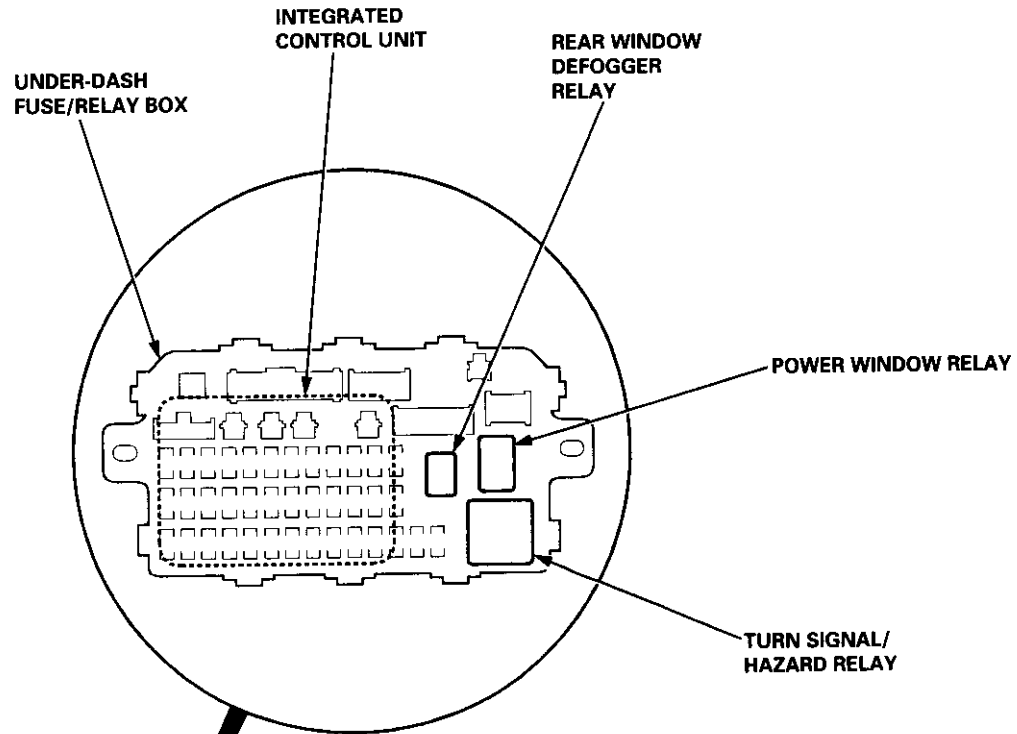
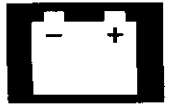
## Engine Compartment



# Relay and Control Unit Locations

Dashboard: '98 – 00 models

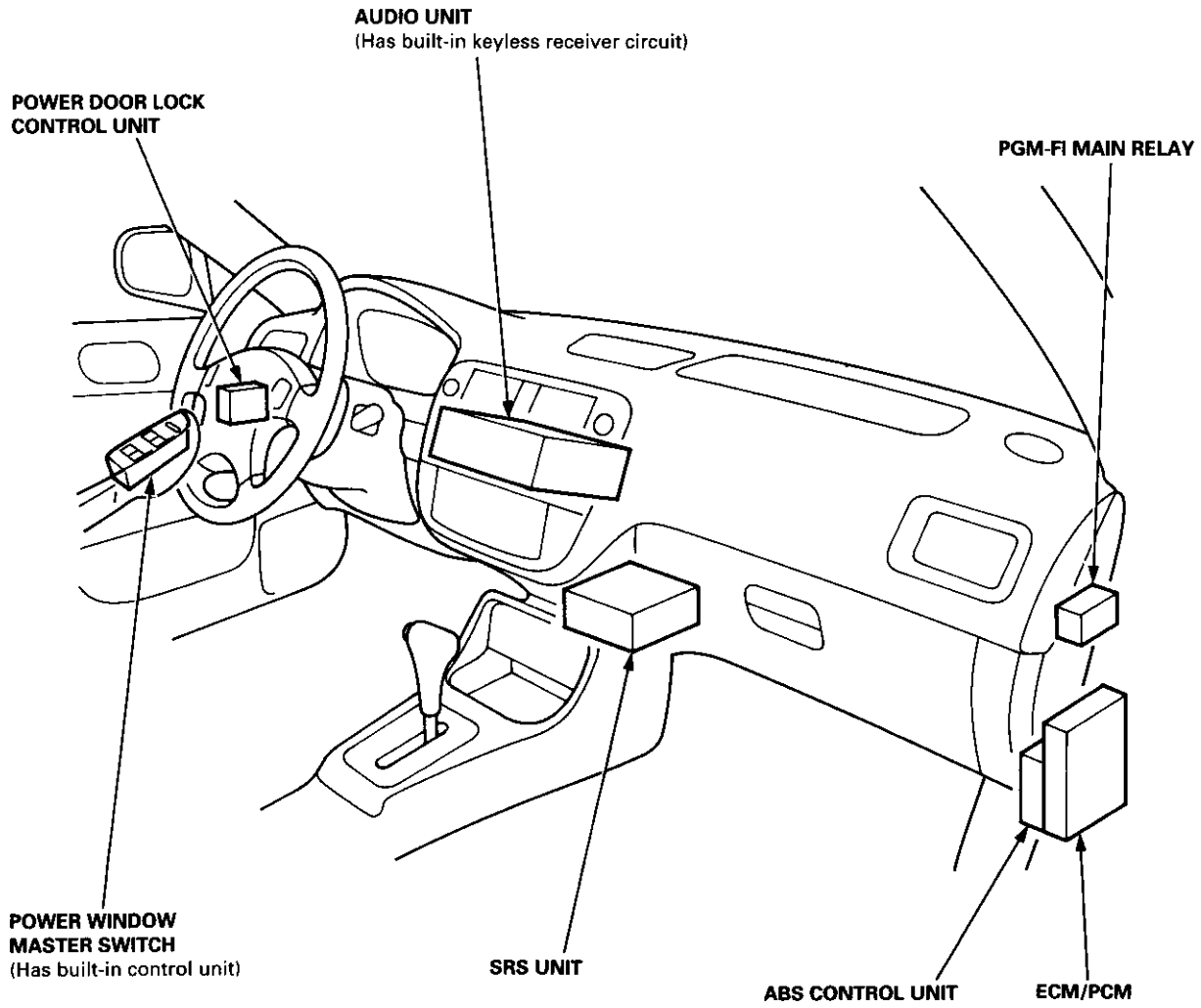




- TCM (CVT): Coupe
- KEYLESS DOOR LOCK CONTROL UNIT: '99 model (USA)

# Relay and Control Unit Locations

## Dashboard/Door



# Connector Identification and Wire Harness Routing



## How to Identify Connectors:

Identification numbers have been assigned to all connectors. The number is preceded by the letter "C" for connectors, "G" for ground terminals or "T" for non-ground terminals.

Harness	Location	Engine Compartment	Dashboard	Others (Floor, Door, Trunk/Hatch, and Roof)
Starter cables		T1, T2 and ⊕		
Battery ground cable		G1 and ⊖		
Engine ground cable A		T3 G2		
Engine ground cable B		T4 G3		
Under-hood ABS fuse/relay box wire harness (With ABS)		T5 and ⊕		
Engine wire harness		C101 thru C147 T101 and T102 G101		
Engine compartment wire harness		C201 thru C215 G201 and G202		
Main wire harness		C301 thru C310 C351 thru C361	C401 thru C452 G401 and G402	
Dashboard wire harness			C501 thru C520 G501	
Floor wire harness			C551 thru C573 G551 and G552	
Rear wire harness				C601 thru C621 G601 and G602
Driver's door wire harness				C631 thru C640
Passenger's door wire harness				C651 thru C657
Left rear door wire harness (Sedan)				C661 thru C664
Right rear door wire harness (Sedan)				C671 thru C674
Roof wire harness (Without moonroof)				C701 thru C719
Moonroof wire harness (With moonroof)				C711 thru C719
Heater sub-harness A			C721 thru C729	
Heater sub-harness B			C741 thru C744	
A/C wire harness		C751 thru C754 G751		
Hatch wire harness (Hatchback)				C761 thru C768 G761
Rear window defogger ground wire				C771 G771
Secondary heated oxygen sensor sub-harness				C781 and C782
Fuel tank pressure sensor sub-harness				C791 thru C793
SRS main harness				C801 thru C807 G801
Rear window defogger wire				C831 thru C833

# Connector Identification and Wire Harness Routing

## Starter Cables

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T1		Right side of engine compartment	Under-hood fuse/relay box	
T2		Right side of engine compartment	Starter motor	
⊕		Battery	Battery positive terminal	

## Battery Ground Cable

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
G1		Right front shock tower	Body ground, via battery ground cable	
⊖		Battery	Battery negative terminal	

## Engine Ground Cable A

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T3		Left side of engine	Power steering pump bracket	
G2		Left side of engine compartment	Body ground, via engine ground cable A	

## Engine Ground Cable B

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T4		Right side of engine compartment	Transmission	
G3		Right side of front frame	Body ground, via engine ground cable B	

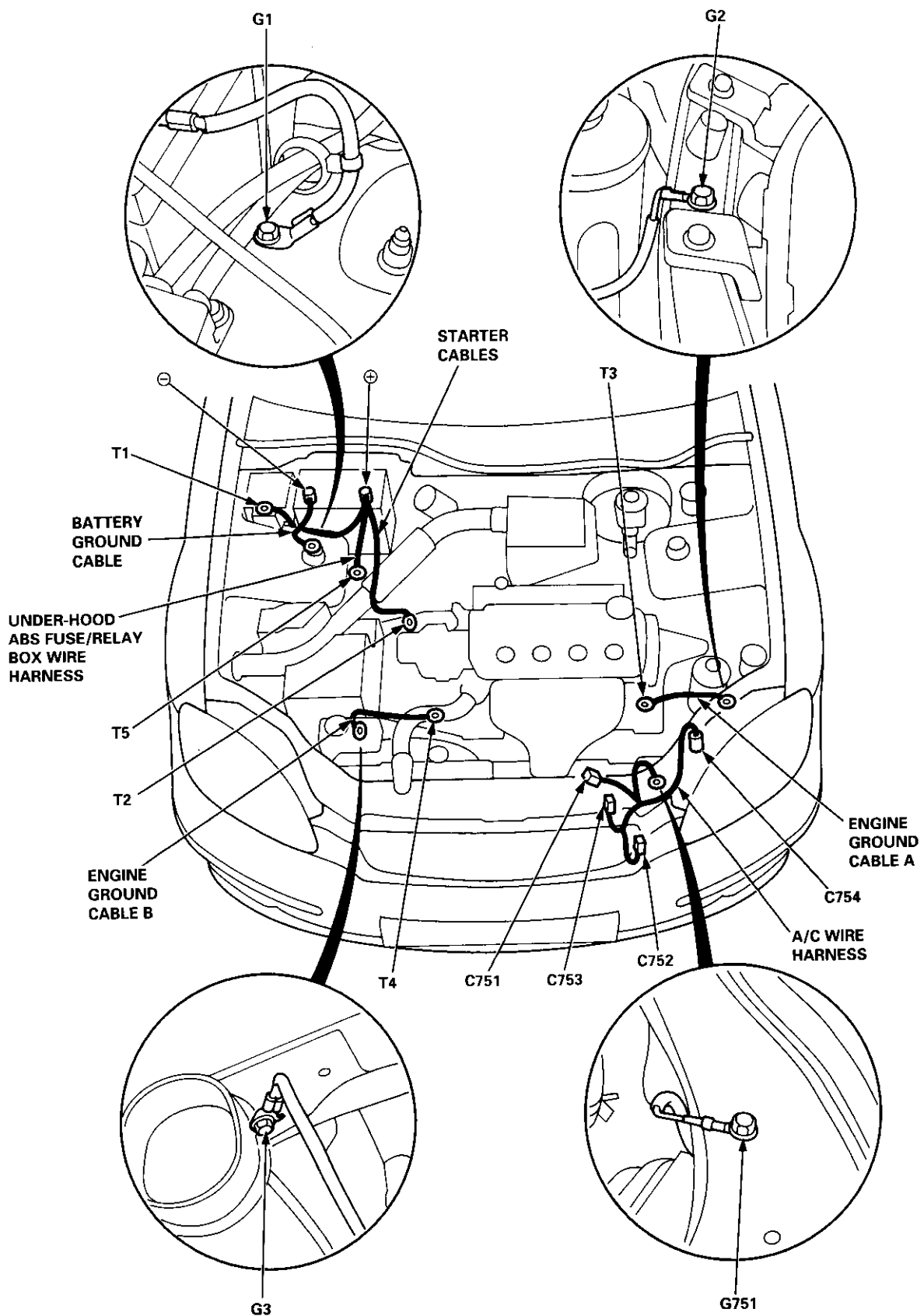
## Under-hood ABS Fuse/Relay Box Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
T5		Right side of engine compartment	Under-hood fuse/relay box	
⊕		Battery	Battery positive terminal	

## A/C Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C751	4	Right side of engine compartment	Engine compartment wire harness (C209)	
C752	1	Right side of engine compartment	Compressor clutch	
C753	2	Right side of engine compartment	Condenser fan motor	
C754	2	Right side of engine compartment	A/C pressure switch	
G751		Left side of engine compartment	Body ground, via A/C wire harness	





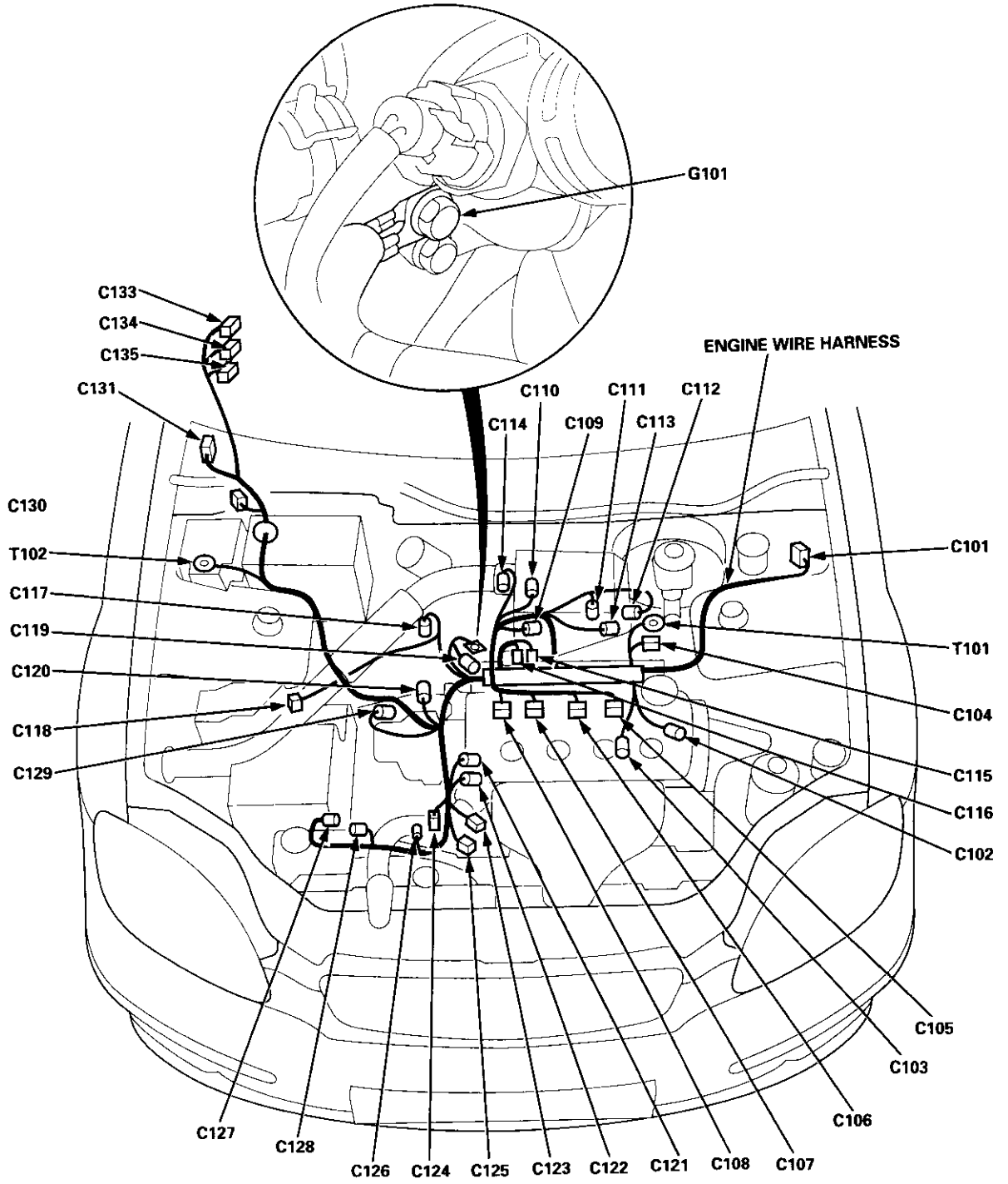
# Connector Identification and Wire Harness Routing

## Engine Wire Harness (D16Y7 engine): '99 - 00 models

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C101	10	Left side of engine compartment	Main wire harness (C303)	
C102	3	Middle of engine	Crankshaft speed fluctuation (CKF) sensor	
C103	1	Middle of engine	Engine oil pressure switch	
C104	4	Left side of engine compartment	Alternator	USA
C104	3	Left side of engine compartment	Alternator	Canada
C105	2	Middle of engine	No. 1 fuel injector	
C106	2	Middle of engine	No. 2 fuel injector	
C107	2	Middle of engine	No. 3 fuel injector	
C108	2	Middle of engine	No. 4 fuel injector	
C109	3	Middle of engine	IAC valve	
C110	3	Middle of engine	Throttle position (TP) sensor	
C111	3	Middle of engine	Manifold absolute pressure (MAP) sensor	
C112	2	Middle of engine	Intake air temperature (IAT) sensor	
C113	2	Middle of engine	Power steering pressure (PSP) switch	USA
C114	2	Middle of engine	EVAP purge control solenoid valve	
C115	14	Middle of engine	Junction connector	
C116	14	Middle of engine	Junction connector	
C117	3	Middle of engine	Vehicle speed sensor (VSS)	
C118	2	Right side of engine compartment	Countershaft speed sensor	A/T
C119	2	Middle of engine	Engine coolant temperature (ECT) switch A	
C120	8	Middle of engine	Distributor	
C121	1	Middle of engine	Engine coolant temperature (ECT) sending unit	
C122	2	Middle of engine	Engine coolant temperature (ECT) sensor	
C123	4	Middle of engine	Primary HO2S (sensor 1)	
C124	2	Middle of engine	Back-up light switch	M/T
C124	2	Middle of engine	Lock-up control solenoid valve	A/T
C125	4	Middle of engine	Secondary HO2S (sensor 2)	
C126	2	Middle of engine	Mainshaft speed sensor	A/T
C127	2	Middle of engine	Linear solenoid valve	A/T
C128	2	Middle of engine	Shift control solenoid valve	A/T
C129	1	Right side of engine compartment	Starter solenoid	
C130	20	Behind right kick panel	Junction Connector	
C131	22	Under right side of dash	Main wire harness (C446)	
C133	25	Behind right kick panel	ECM/PCM	
C134	31	Behind right kick panel	ECM/PCM	
C135	16	Behind right kick panel	PCM	A/T
T101		Left side of engine compartment	Alternator	
T102		Right side of engine compartment	Under-hood fuse/relay box	
G101		Middle of engine	Engine ground, via engine wire harness	



'99 - 00 models:



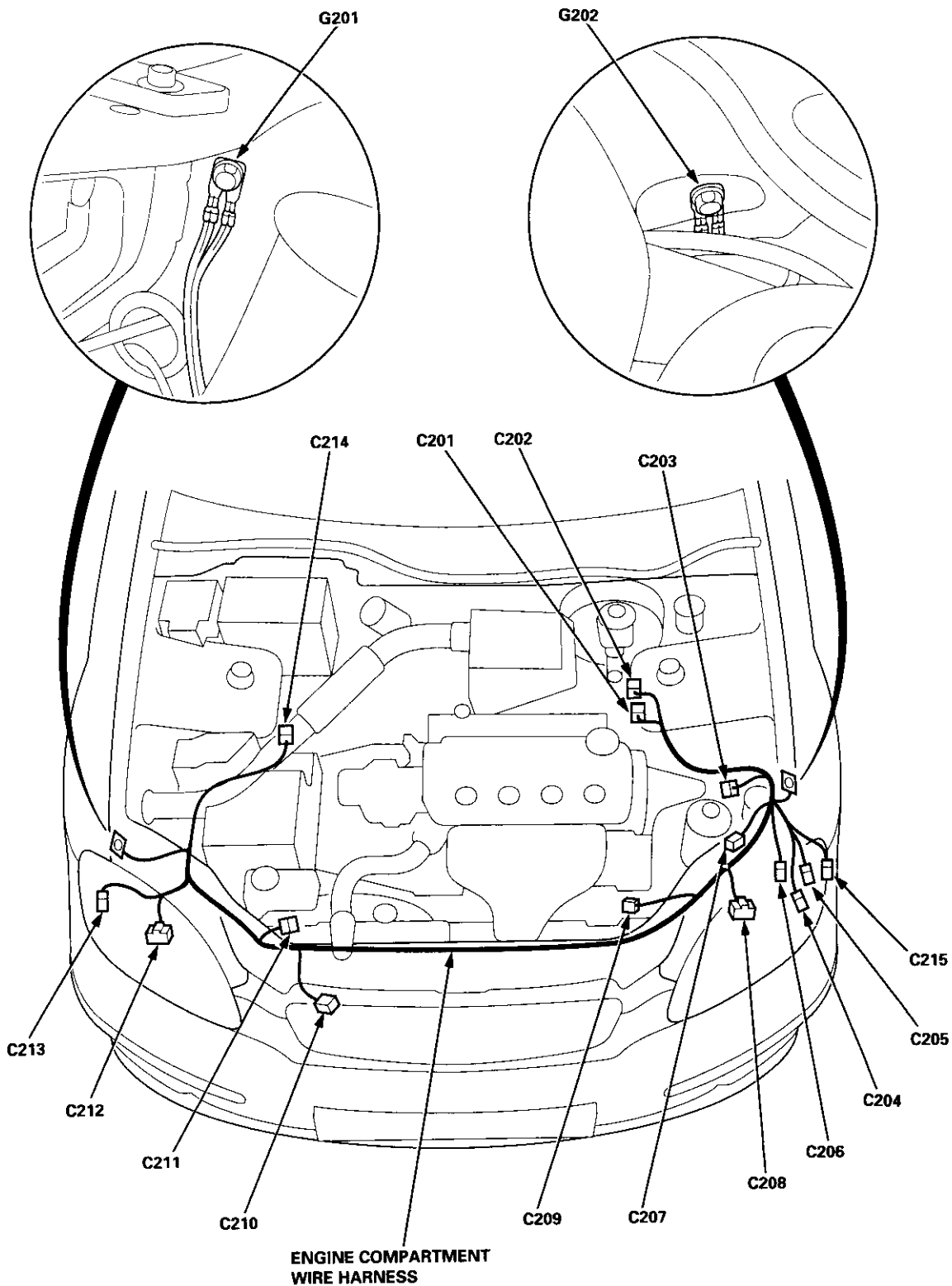
# Connector Identification and Wire Harness Routing

## Engine Compartment Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C201	10	Left side of engine compartment	Main wire harness (C308)	
C202	6	Left side of engine compartment	Main wire harness (C309)	*1
C202	2	Left side of engine compartment	Main wire harness (C309)	*2
C203	4	Left side of engine compartment	Cruise actuator	*1
C204	2	Behind front bumper	Windshield washer motor	
C205	2	Behind front bumper	Rear window washer motor	
C206	3	Left side of engine compartment	Left front turn signal/parking light	
C207	1	Behind front bumper	Front fog light	Optional
C208	3	Left side of engine compartment	Left headlight	
C209	4	Left side of engine compartment	A/C wire harness (C751)	
C210	2	Behind front bumper	Horn	'96 - 97 models
C210	1	Behind front bumper	Horn	'98 - 99 models
C211	2	Right side of engine compartment	Radiator fan motor	
C212	3	Right side of engine compartment	Right headlight	
C213	3	Right side of engine compartment	Right front turn signal/parking light	
C214	8	Right side of engine compartment	Main wire harness (C355)	
C215	2	Behind front bumper	Washer level switch	Canada '99 model
G201		Right side of engine compartment	Body ground, via engine compartment wire harness	
G202		Left side of engine compartment	Body ground, via engine compartment wire harness	

\*1: With cruise control

\*2: Without cruise control



# Connector Identification and Wire Harness Routing

## Main Wire Harness (Left side of engine compartment branch)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C301	5	Left side of engine compartment	Windshield wiper motor	
C302	2	Left side of engine compartment	Test tachometer connector	
C303	10	Left side of engine compartment	Engine wire harness (C101)	
C304	3	Left side of engine compartment	Daytime running lights resistor	Canada
C305	14	Left side of engine compartment	Engine wire harness (C136)	*1
C305	8	Left side of engine compartment	Engine wire harness (C136)	*2 } *5
C306	1	Left side of engine compartment	Brake fluid level switch (+)	
C307	1	Left side of engine compartment	Brake fluid level switch (-)	
C308	10	Left side of engine compartment	Engine compartment wire harness (C201)	
C309	6	Left side of engine compartment	Engine compartment wire harness (C202)	*3
C309	2	Left side of engine compartment	Engine compartment wire harness (C202)	*4
C310	2	Left side of engine compartment	Left front ABS wheel sensor	ABS

\*1: D16Y5 engine

\*5: '96 - 98 models

\*2: D16Y8 engine

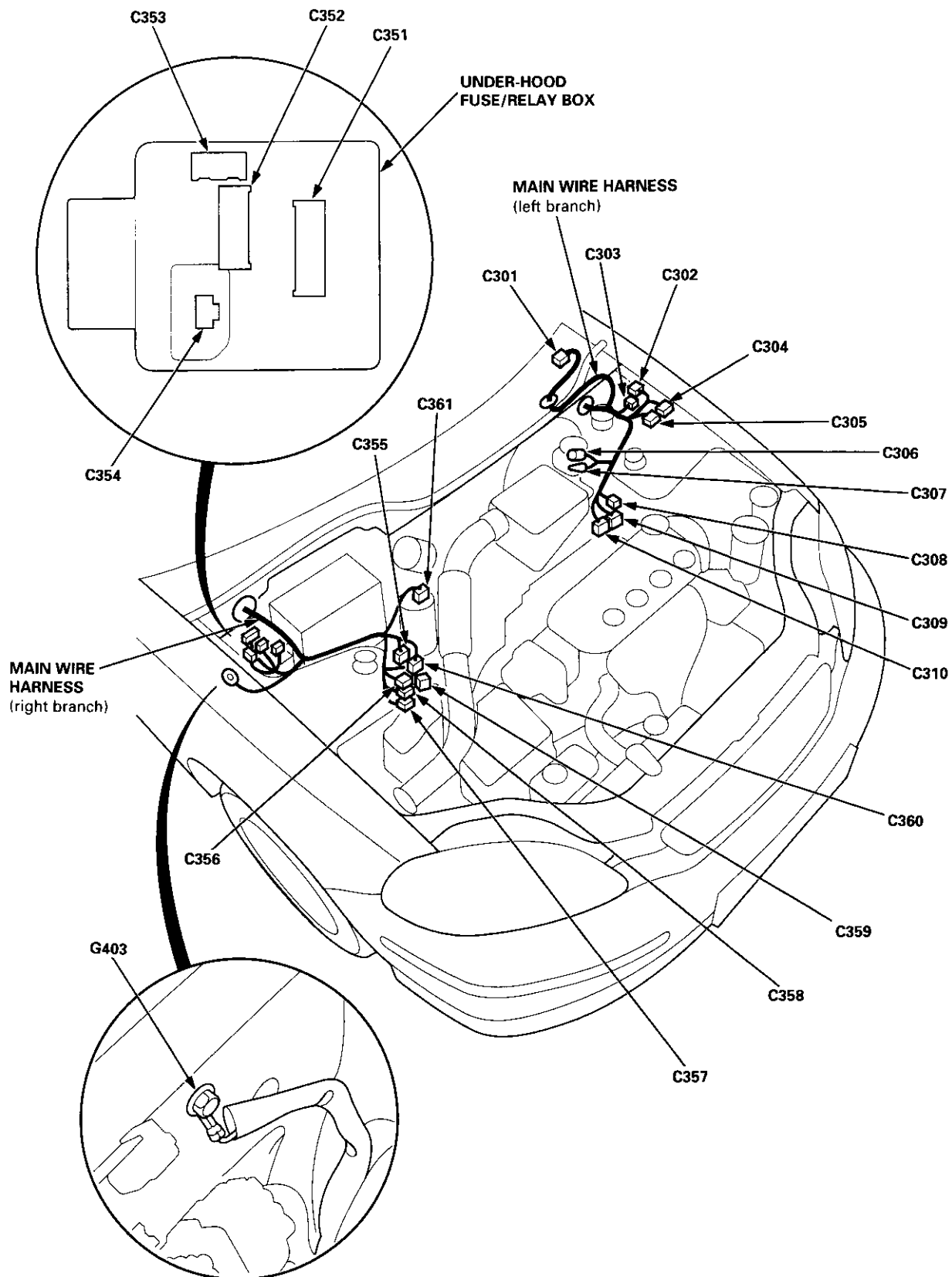
\*3: With cruise control

\*4: Without cruise control

## Main Wire Harness (Right side of engine compartment branch)

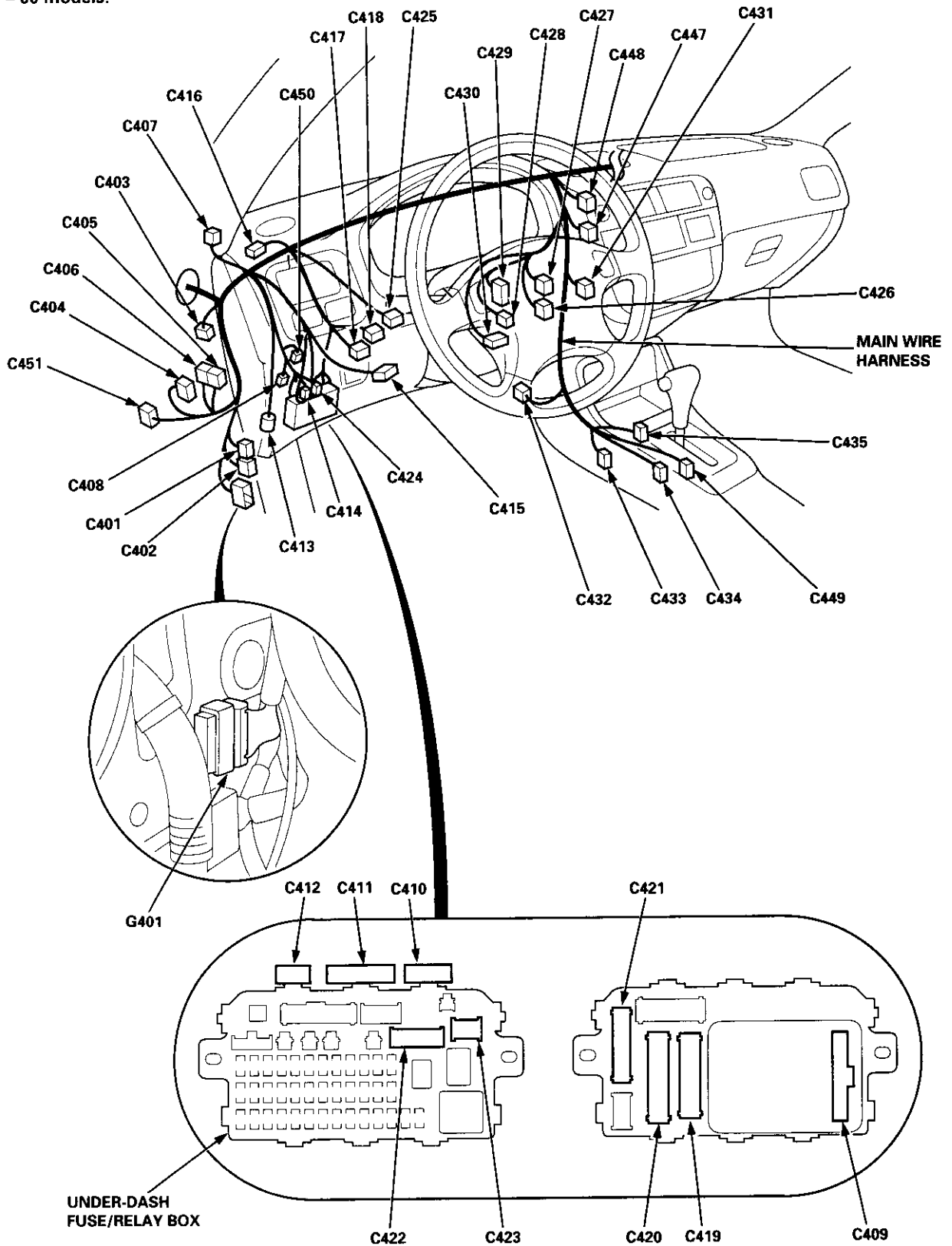
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C351	11	Right side of engine compartment	Under-hood fuse/relay box (C908)	
C352	9	Right side of engine compartment	Under-hood fuse/relay box (C906)	
C353	5	Right side of engine compartment	Under-hood fuse/relay box (C905)	
C354	3	Right side of engine compartment	Under-hood fuse/relay box (C907)	USA
C355	8	Right side of engine compartment	Engine compartment wire harness (C214)	
C356	3	Right side of engine compartment	Under-hood ABS fuse/relay box (C927)	ABS
C357	2	Right side of engine compartment	Under-hood ABS fuse/relay box (C926)	ABS
C358	2	Right side of engine compartment	Right front ABS wheel sensor	ABS
C359	10	Right side of engine compartment	ABS solenoid	ABS
C360	2	Right side of engine compartment	ABS pump motor	ABS
C361	2	Right side of engine compartment	EVAP control canister vent shut valve	*1
G403		Right side of engine compartment	Body ground, via main wire harness	

\*1: '99 - 00 models





'99 - 00 models:



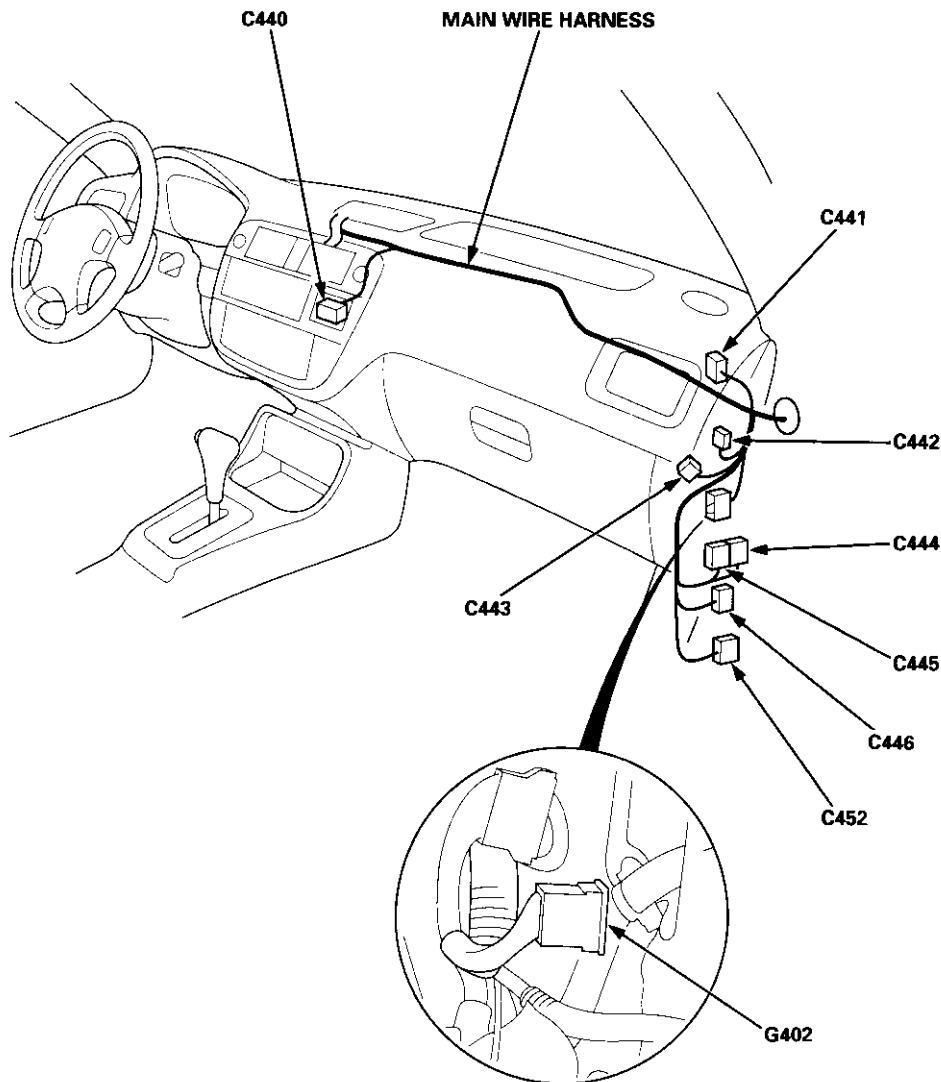


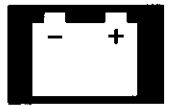
# Connector Identification and Wire Harness Routing

## Main Wire Harness (Right side of dash branch)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C440	16	Under middle of dash	Heater sub-harness A (C721)	
C441	2	Under right side of dash	Service check connector	
C442	20	Under right side of dash	Junction connector	
C443	7	Under right side of dash	PGM-FI main relay	
C444	22	Behind right side of kick panel	ABS control unit	
C445	26	Behind right side of kick panel	ABS control unit	
C446	22	Under right side of dash	Engine wire harness (C131)	
C452	32	Under right side of dash	ECM/PCM	*1
G402		Right kick panel	Body ground, via main wire harness	

\*1: '99 - 00 models



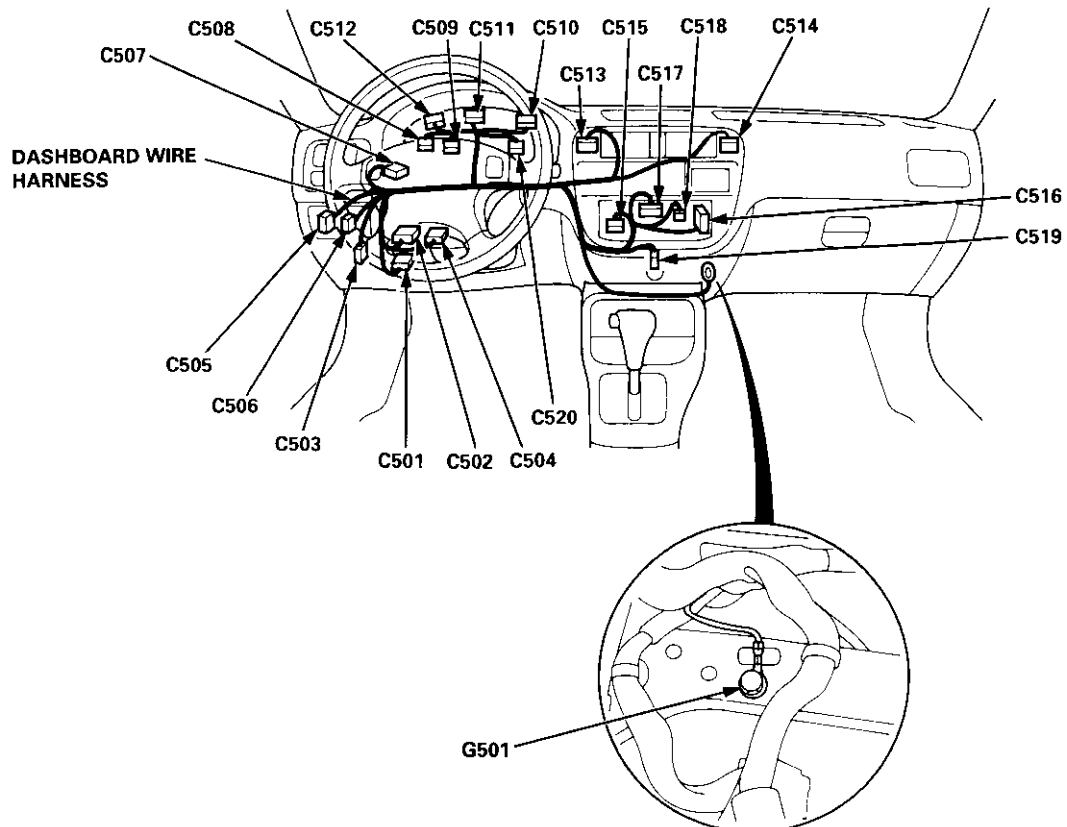


### Dashboard Wire Harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C501	20	Behind dashboard lower panel	Under-dash fuse/relay box (C912)	
C502	24	Above under-dash fuse/relay box	Main wire harness (C411)	
C503	16	Above under-dash fuse/relay box	Floor wire harness (C553)	
C504	12	Above under-dash fuse/relay box	Main wire harness (C410)	A/T
C505	5	Left side of steering wheel	Cruise main switch	
C506	3	Left side of steering wheel	Dash lights brightness controller	
C507	20	Below gauges	Junction connector	
C508	5	Behind gauges	Gauge assembly	SRS
C509	5	Behind gauges	Gauge assembly	*1
C510	14	Behind gauges	Gauge assembly	A/T
C511	16	Behind gauges	Gauge assembly	
C512	13	Behind gauges	Gauge assembly	
C513	10	Right side of gauges	Hazard warning switch	
C514	5	Right side of gauges	Rear window defogger switch	*2
C515	16	Behind middle of dash	Audio unit (Keyless receiver circuit)	*2
C515	20	Behind middle of dash	Audio unit	*3
C516	22	Behind middle of dash	Security control unit	Optional*2
C517	16	Behind middle of dash	Audio unit	*2
C518	5	Behind middle of dash	Security system	Optional*2
C519	2	Behind middle of dash	Accessory power outlet	
C520	5	Behind gauges	Gauge assembly	ABS
G501		Under middle of dash	Body ground, via dashboard wire harness	

\*1: With shift-up indicator or cruise control system ('96 - 97 models)  
With cruise control system ('98 model)

\*2: '96 - 98 models  
\*3: '99 - 00 models



# Connector Identification and Wire Harness Routing

## Floor Wire Harness (Coupe/Hatchback)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C551	16	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C923)	
C552	8	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C921)	
C553	16	Above under-dash fuse/relay box	Dashboard wire harness (C503)	
C554	4	Under left side of dash	Main wire harness (C402)	ABS
C555	14	Above under-dash fuse/relay box	Main wire harness (C401)	*4
C555	20	Above under-dash fuse/relay box	Main wire harness (C401)	*5
C556	25	Driver's door	Driver's door wire harness (C631)	*1
C556	2	Driver's door	Driver's door wire harness (C631)	*2
C557	25	Passenger's door	Passenger's door wire harness (C651)	*1
C557	2	Passenger's door	Passenger's door wire harness (C651)	*2
C558	1	Middle of floor	Parking brake switch	
C559	2	Left side of floor	Driver's seat belt switch	
C560	1	Left B-pillar	Driver's door switch	
C561	2	Inside of left rear wheel	Left rear ABS wheel sensor	ABS
C562	14	Left C-pillar	Rear wire harness (C601)	*4
C562	20	Left C-pillar	Rear wire harness (C601)	*5
C563	2	Left C-pillar	Rear wire harness (C602)	*4
C564	3	Fuel tank	Fuel gauge sending unit	
C565	2	Fuel tank	Fuel pump	
C566	2	Inside of right rear wheel	Right rear ABS wheel sensor	ABS
C567	1	Right B-pillar	Passenger's door switch	
C568	6	Fuel tank	Fuel tank pressure sensor sub-harness (C791)	*3
C569	10	Left side of dash	Power mirror switch	
G551		Left kick panel	Body ground, via floor wire harness	
G552		Left side of floor	Body ground, via floor wire harness	

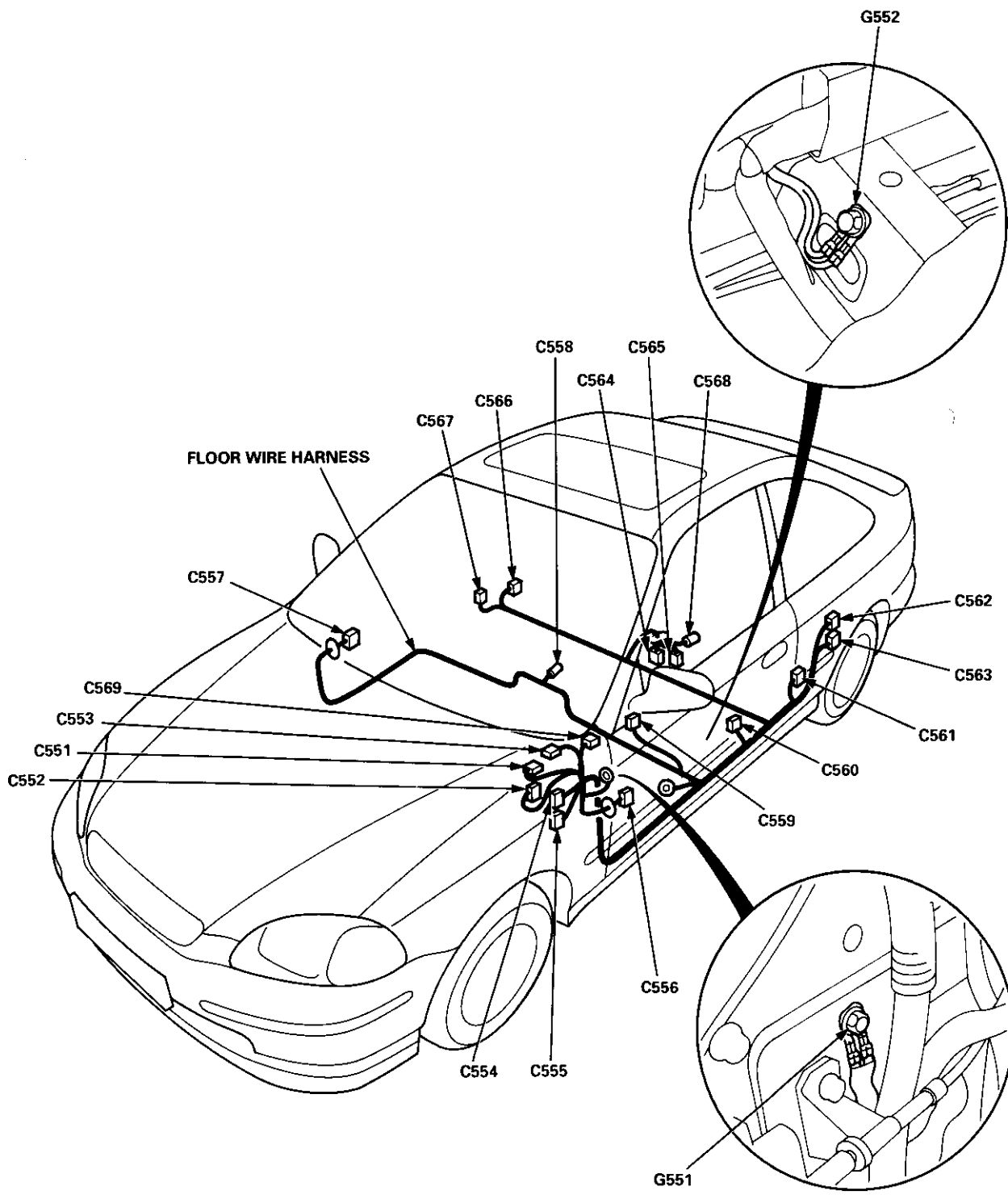
\*1: With power windows

\*4: '96 - 98 models

\*2: Without power windows

\*5: '99 - 00 models

\*3: D16Y8 engine (Coupe)



# Connector Identification and Wire Harness Routing

## Floor Wire Harness (Sedan): '97 – 00 models

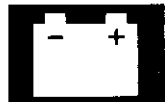
Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C551	16	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C923)	
C552	8	Behind under-dash fuse/relay box	Under-dash fuse/relay box (C921)	
C553	16	Above under-dash fuse/relay box	Dashboard wire harness (C503)	
C554	4	Under left side of dash	Main wire harness (C402)	ABS
C555	14	Above under-dash fuse/relay box	Main wire harness (C401)	*3
C555	20	Above under-dash fuse/relay box	Main wire harness (C401)	*4
C556	25	Driver's door	Driver's door wire harness (C631)	*1
C556	2	Driver's door	Driver's door wire harness (C631)	*2
C557	25	Passenger's door	Front passenger's door wire harness (C651)	*1
C557	2	Passenger's door	Front passenger's door wire harness (C651)	*2
C558	1	Middle of floor	Parking brake switch	
C559	2	Left side of floor	Driver's seat belt switch	
C560	1	Right B-pillar	Front passenger's door switch	
C561	2	Inside of left rear wheel	Left rear ABS wheel sensor	ABS
C562	16	Left C-pillar	Rear wire harness (C601)	*3
C562	20	Left C-pillar	Rear wire harness (C601)	*4
C563	2	Left C-pillar	Rear wire harness (C602)	*3
C564	3	Fuel tank	Fuel gauge sending unit	
C565	2	Fuel tank	Fuel pump (FP)	
C566	2	Inside of right rear wheel	Right rear ABS wheel sensor	ABS
C567	1	Left B-pillar	Driver's door switch	
C568	6	Fuel tank	Fuel tank pressure sensor sub-harness (C791)	
C569	10	Left side of steering wheel	Power mirror switch	
C570	6	Right B-pillar	Right rear door wire harness (C671)	
C571	6	Left B-pillar	Left rear door wire harness (C661)	
C572	1	Left quarter panel	Left rear door switch	
C573	1	Right quarter panel	Right rear door switch	
G551		Left kick panel	Body ground, via floor wire harness	
G552		Left side of floor	Body ground, via floor wire harness	

\*1: With power windows

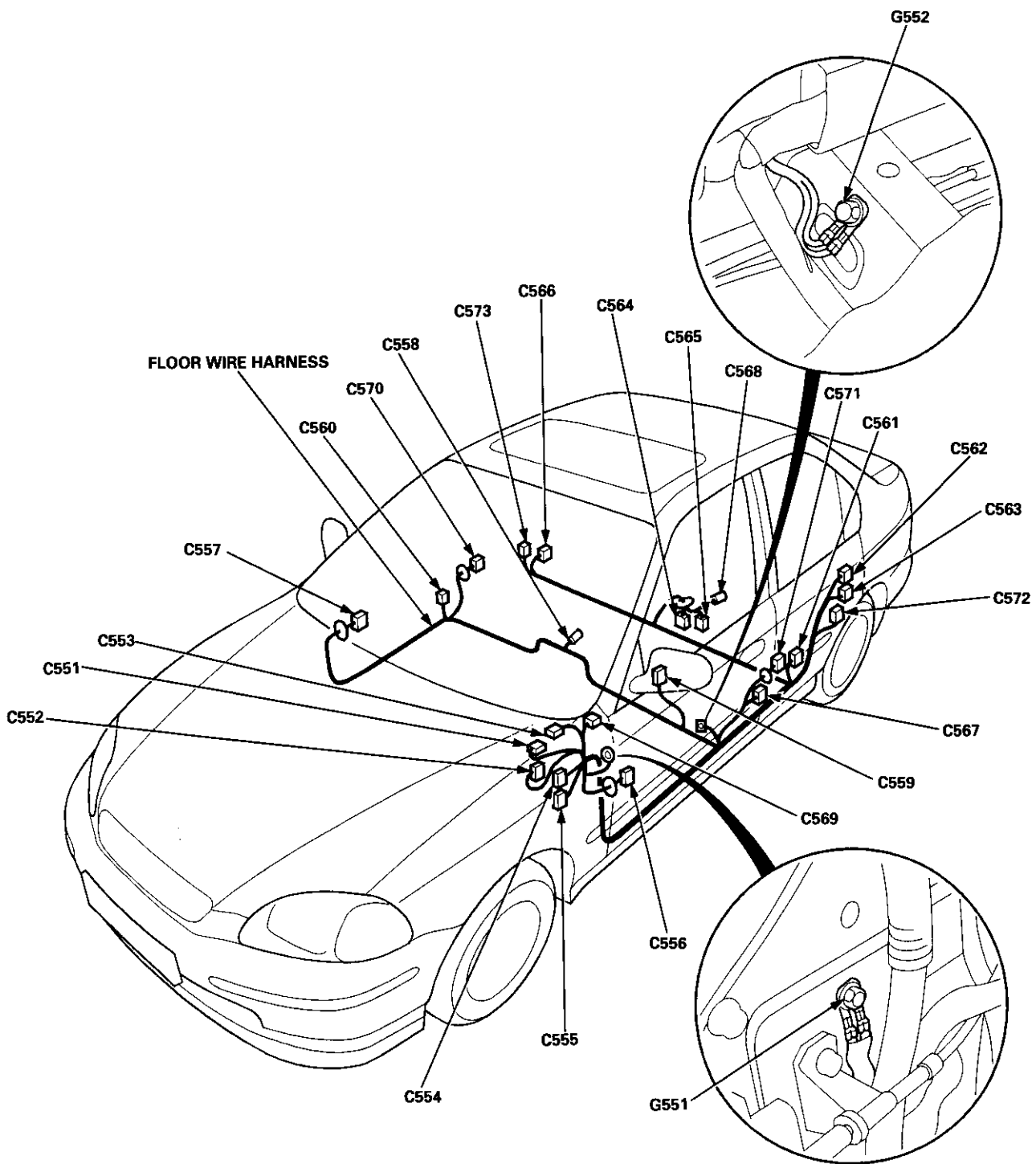
\*3: '97 – '98 models

\*2: Without power windows

\*4: '99 – 00 models



'97 - 00 models:

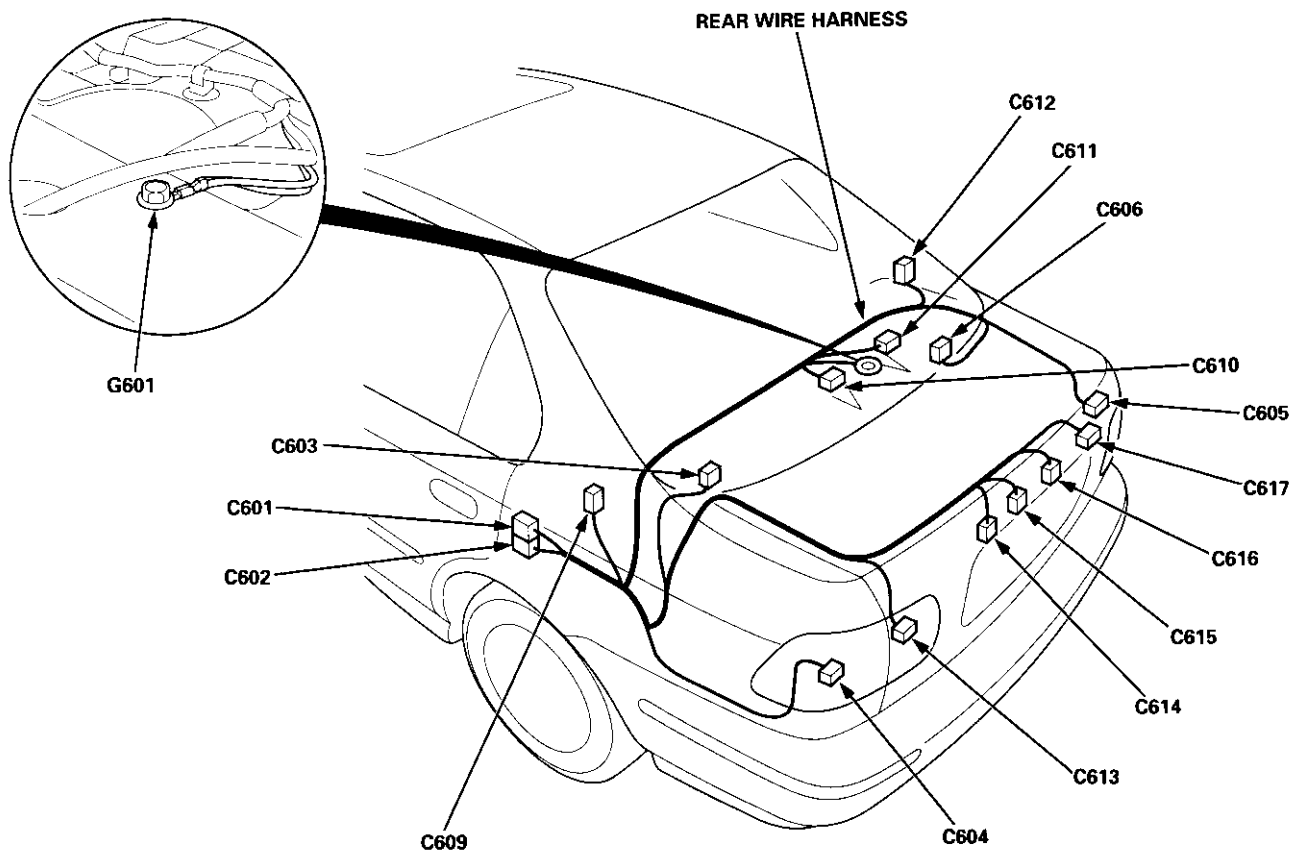




Rear Wire Harness (Coupe: '96 - 99 models/Sedan: '96 - 98 models)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C601	16	Left quarter panel	Floor wire harness (C562)	*
C601	20	Left quarter panel	Floor wire harness (C562)	
C602	2	Left quarter panel	Floor wire harness (C563)	
C603	2	Left quarter panel	Left rear speaker	
C604	4	Left side of trunk	Left outer taillight	
C605	4	Right side of trunk	Right outer taillight	
C606	2	Right quarter panel	Right rear speaker	
C609	1	Left side of rear window	Rear window defogger (+)	
C610	2	Middle of rear shelf	High mount brake light	
C611	2	Middle of rear shelf	Trunk light	
C612	1	Right side of rear window	Rear window defogger (-)	
C613	4	Left side of trunk	Left inner taillight	
C614	2	Middle of trunk	Left license plate light	
C615	2	Middle of trunk	Trunk latch switch	
C616	2	Middle of trunk	Right license plate light	
C617	4	Right side of trunk	Right inner taillight	
G601		Middle of trunk	Body ground, via rear wire harness	

\*: Coupe: '99 - 00 models



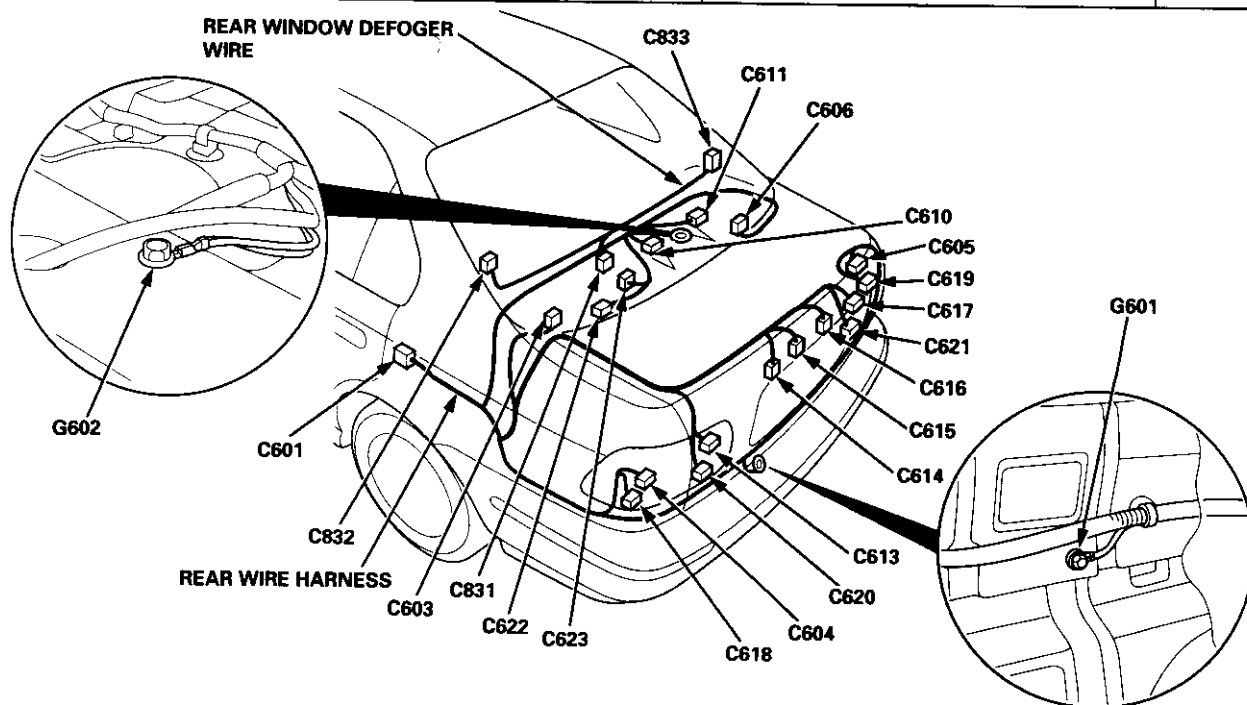
# Connector Identification and Wire Harness Routing

## Rear Wire Harness (Sedan): '99 - 00 models

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C601	20	Left quarter panel	Floor wire harness (C562)	
C603	2	Left quarter panel	Left rear speaker	
C604	4	Left side of trunk	Left outer taillight	
C605	4	Right side of trunk	Right outer taillight	
C606	2	Right quarter panel	Right rear speaker	
C610	2	Middle of rear shelf	High mount brake light	
C611	2	Middle of rear shelf	Trunk light	
C613	3	Left side of trunk	Left inner taillight	
C614	2	Middle of trunk	Left license plate light	
C615	2	Middle of trunk	Trunk latch switch	
C616	2	Middle of trunk	Right license plate light	
C617	3	Right side of trunk	Right inner taillight	
C618	2	Left side of trunk	Left outer taillight	
C619	2	Right side of trunk	Right outer taillight	
C620	2	Left side of trunk	Left inner taillight	
C621	2	Right side of trunk	Right inner taillight	
C622	1	Middle of rear shelf	Window antenna coil	
C623	2	Middle of rear shelf	Window antenna coil	
G601		Middle of trunk	Body ground, via rear wire harness	
G602		Middle of rear shelf	Body ground, via rear wire harness	

## Rear Window Defogger Wire

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C831	2	Middle of rear shelf	Window antenna coil	
C832	1	Left side of rear window	Rear window defogger ⊕	
C833	1	Right side of rear window	Rear window defogger ⊖	





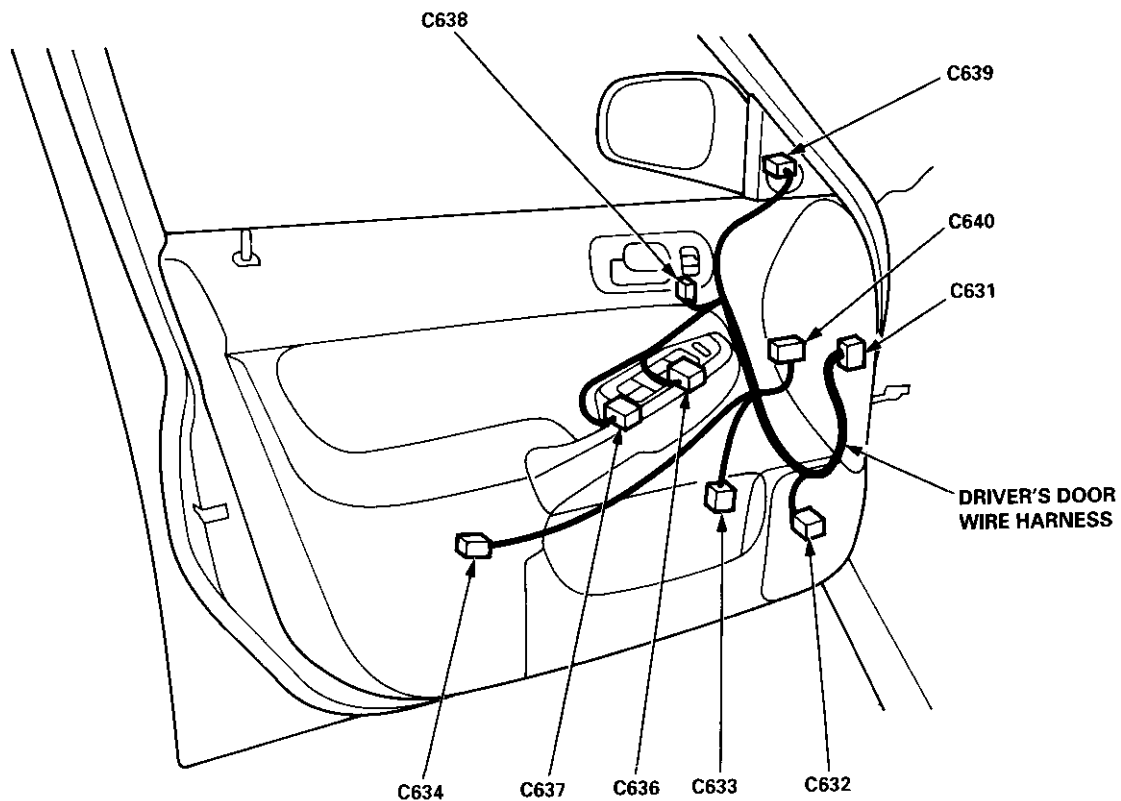


### Driver's Door Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C631	25	Driver's door	Floor wire harness (C556)	*1
C631	2	Driver's door	Floor wire harness (C556)	*2
C632	2	Driver's door	Left front door speaker	
C633	4	Driver's door	Driver's power window motor	*1
C634	4	Driver's door	Driver's door lock actuator	*1
C636	16	Driver's door	Power window master switch	*1
C637	1	Driver's door	Power window master switch	*1
C638	3	Driver's door	Driver's door lock switch	*1
C639	8	Inside of left power mirror	Left power mirror	*1
C640	12	Driver's door	Power door lock control unit	*1

\*1: With power windows

\*2: Without power windows



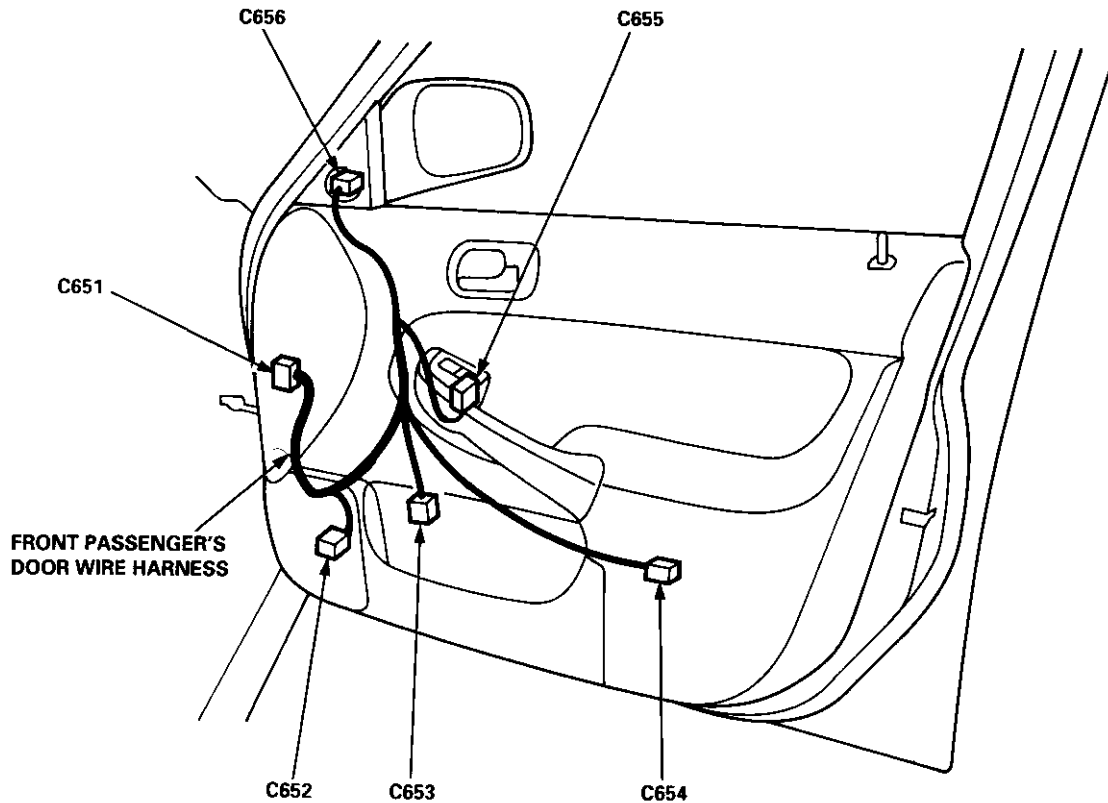
# Connector Identification and Wire Harness Routing

## Front Passenger's Door Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C651	25	Passenger's door	Floor wire harness (C557)	*1
C651	2	Passenger's door	Floor wire harness (C557)	*2
C652	2	Passenger's door	Right front door speaker	
C653	2	Passenger's door	Front passenger's power window motor	*1
C654	2	Passenger's door	Front passenger's door lock actuator	*1
C655	5	Passenger's door	Front passenger's power window switch	*1
C656	8	Inside of right power mirror	Right power mirror	*1

\*1: With power windows

\*2: Without power windows





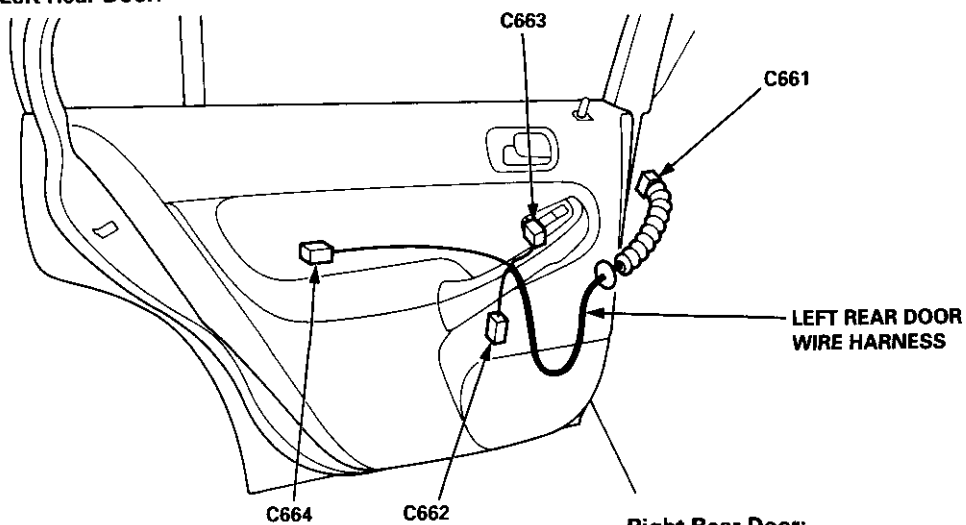
### Left Rear Door Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C661	6	Left B-pillar	Floor wire harness (C571)	
C662	2	Left rear door	Left rear power window motor	
C663	5	Left rear door	Left rear power window switch	
C664	2	Left rear door	Left rear door lock actuator	

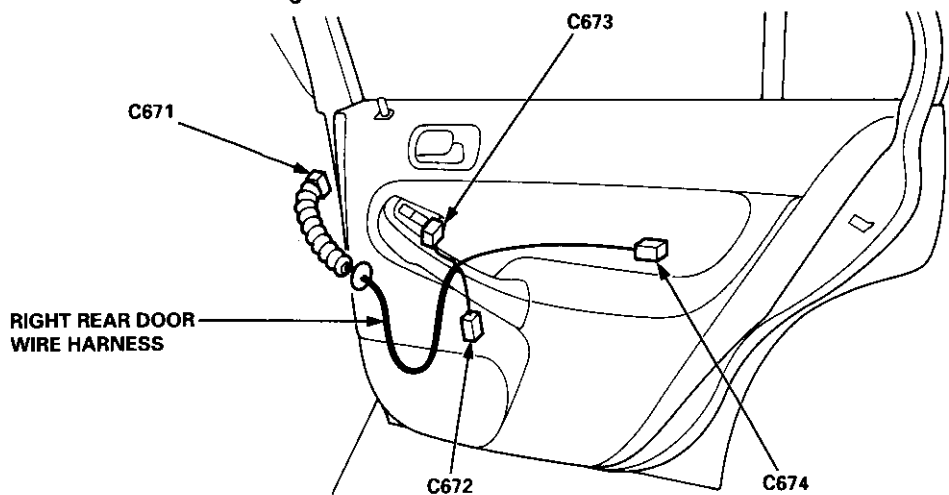
### Right Rear Door Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C671	6	Right B-pillar	Floor wire harness (C570)	
C672	2	Right rear door	Right rear power window motor	
C673	5	Right rear door	Right rear power window switch	
C674	2	Right rear door	Right rear door lock actuator	

#### Left Rear Door:



#### Right Rear Door:



# Connector Identification and Wire Harness Routing

## Roof Wire Harness (Coupe/Hatchback)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C701	2	Under left side of dash	Main wire harness (C407)	*1
C701	6	Under left side of dash	Main wire harness (C407)	*2
C702	2	Middle of roof	Ceiling light	
C719	1	Front of roof	Spotlight	*2

\*1: '96 - 98 models

\*2: '99 - 00 models

## Roof Wire Harness (Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C701	2	Under left side of dash	Main wire harness (C407)	*1
C701	6	Under left side of dash	Main wire harness (C407)	*2
C702	1	Middle of roof	Ceiling light (Power)	
C703	1	Middle of roof	Ceiling light (Ground)	
C719	1	Front of roof	Spotlight	*2

\*1: '96 - 98 models

\*2: '99 - 00 models

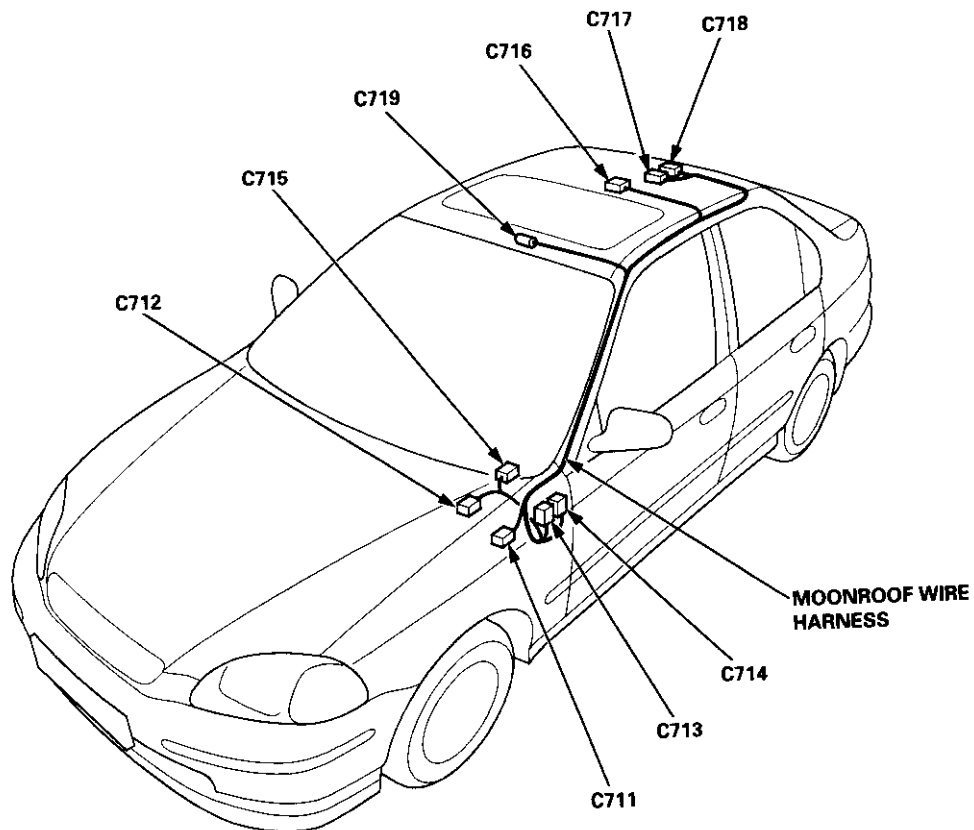
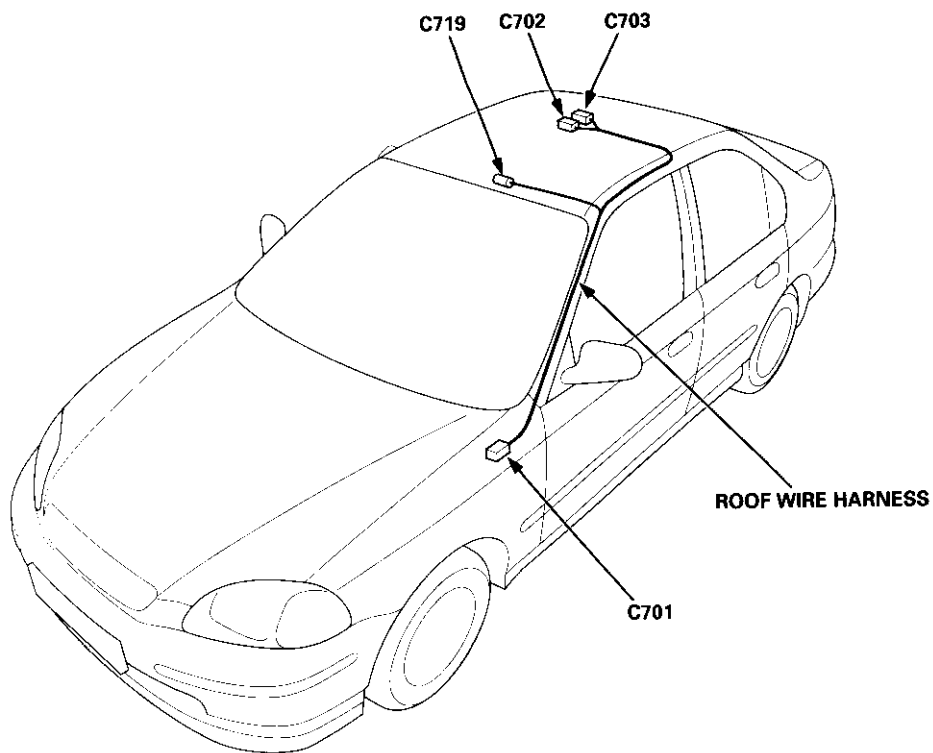
## Moonroof Wire Harness (Coupe/Sedan)

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C711	2	Under left side of dash	Main wire harness (C407)	*1, *2
C711	6	Under left side of dash	Main wire harness (C407)	*3
C712	3	Behind dashboard lower panel	Under-dash fuse/relay box (C910)	Optional
C713	6	Left side of dashboard bracket	Moonroof open relay	*1, *2
C713	5	Left side of dashboard bracket	Moonroof open relay	*3
C714	6	Left side of dashboard bracket	Moonroof close relay	*1, *2
C714	5	Left side of dashboard bracket	Moonroof close relay	*3
C715	4	Left side of steering wheel	Moonroof switch	
C716	3	Middle of roof	Ceiling light	
C717	2	Rear of roof	Moonroof motor	
C718	4	Rear of roof	Moonroof motor (Tilt switch)	
C719	1	Front of roof	Spotlight	*2, *3

\*1: '96 - 97 models

\*2: '98 model

\*3: '99 - 00 models



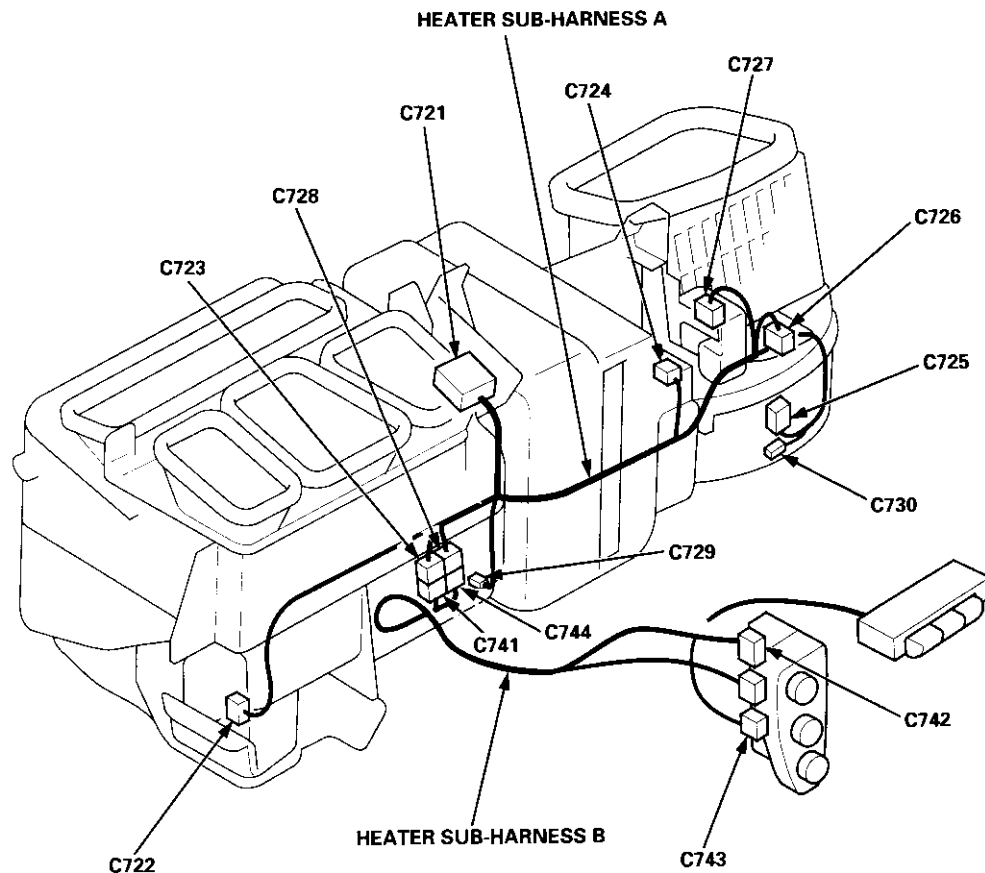


**Heater Sub-harness A: '99 - 00 models**

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C721	16	Under left side of dash	Main wire harness (C440)	
C722	7	Behind glove box	Mode control motor	
C723	24	Behind glove box	Heater sub-harness B (C741)	
C724	3	Behind glove box	A/C thermostat	
C725	2	Behind glove box	Blower motor	
C726	3	Behind glove box	Power transistor	
C727	4	Behind glove box	Recirculation control motor	
C728	1	Behind glove box	Heater sub-harness B (C744)	
C729	5	Behind glove box	Air mix control motor	
C730	4	Behind glove box	Blower motor high relay	

**Heater Sub-harness B: '99 - 00 models**

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C741	20	Behind glove box	Heater sub-harness A (C723)	
C742	8	Behind middle of dash	Heater control panel	
C743	20	Behind middle of dash	Heater control panel	
C744	1	Behind glove box	Heater sub-harness A (C728)	



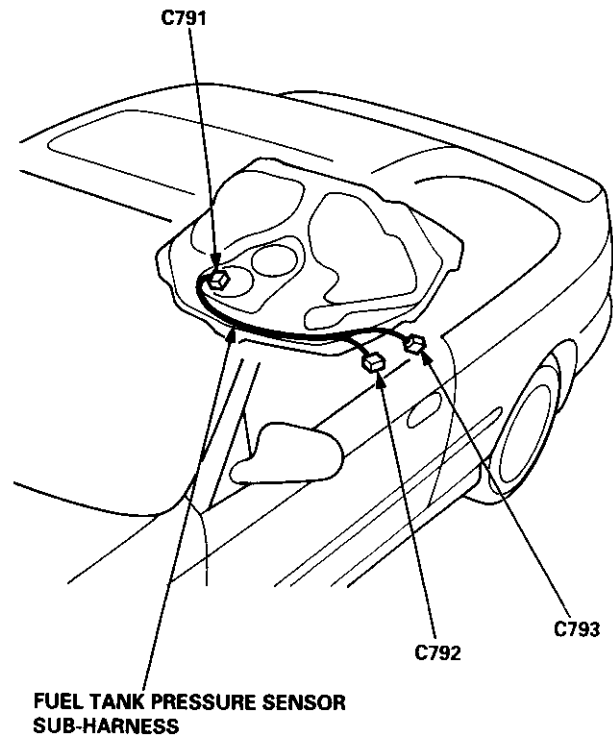
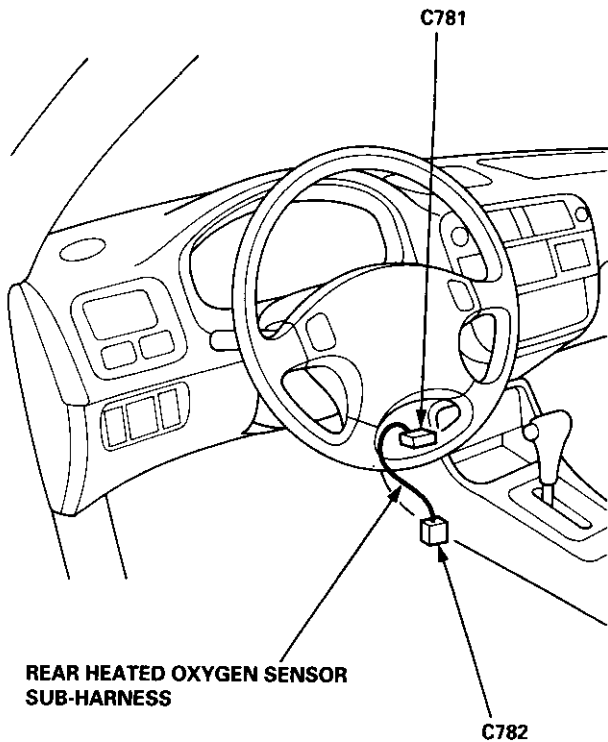
# Connector Identification and Wire Harness Routing

## Rear Heated Oxygen Sensor Sub-harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C781	4	Under middle of dash	Main wire harness (C432)	
C782	4	Under middle of dash	Secondary heated oxygen sensor (Secondary HO2S)	

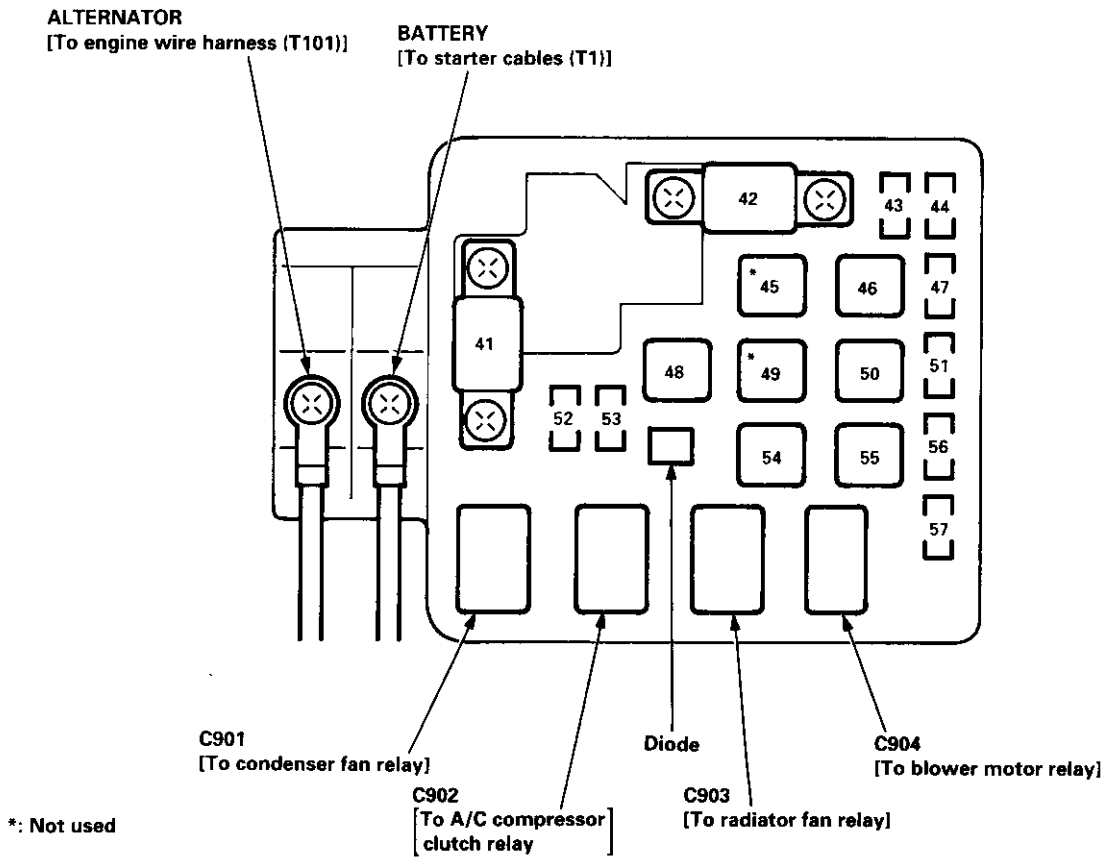
## Fuel Tank Pressure Sensor Sub-harness

Connector or Terminal	Number of Cavities	Location	Connects to	Notes
C791	6	Middle of floor	Floor wire harness (C568: Coupe/Hatchback, C574: Sedan)	
C792	3	Left side of fuel tank	Fuel tank pressure sensor	
C793	2	Left side of fuel tank	EVAP two way valve	

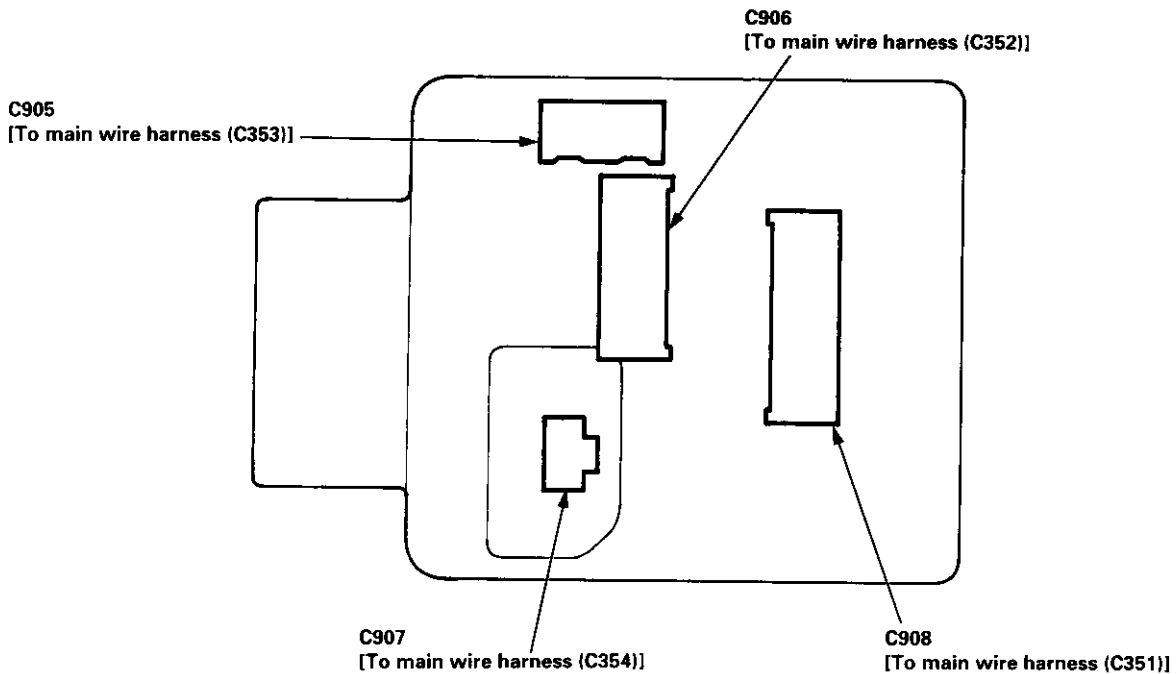


# Fuses

## Under-hood Fuse/Relay Box



NOTE: View from the backside of the under-hood fuse/relay box.



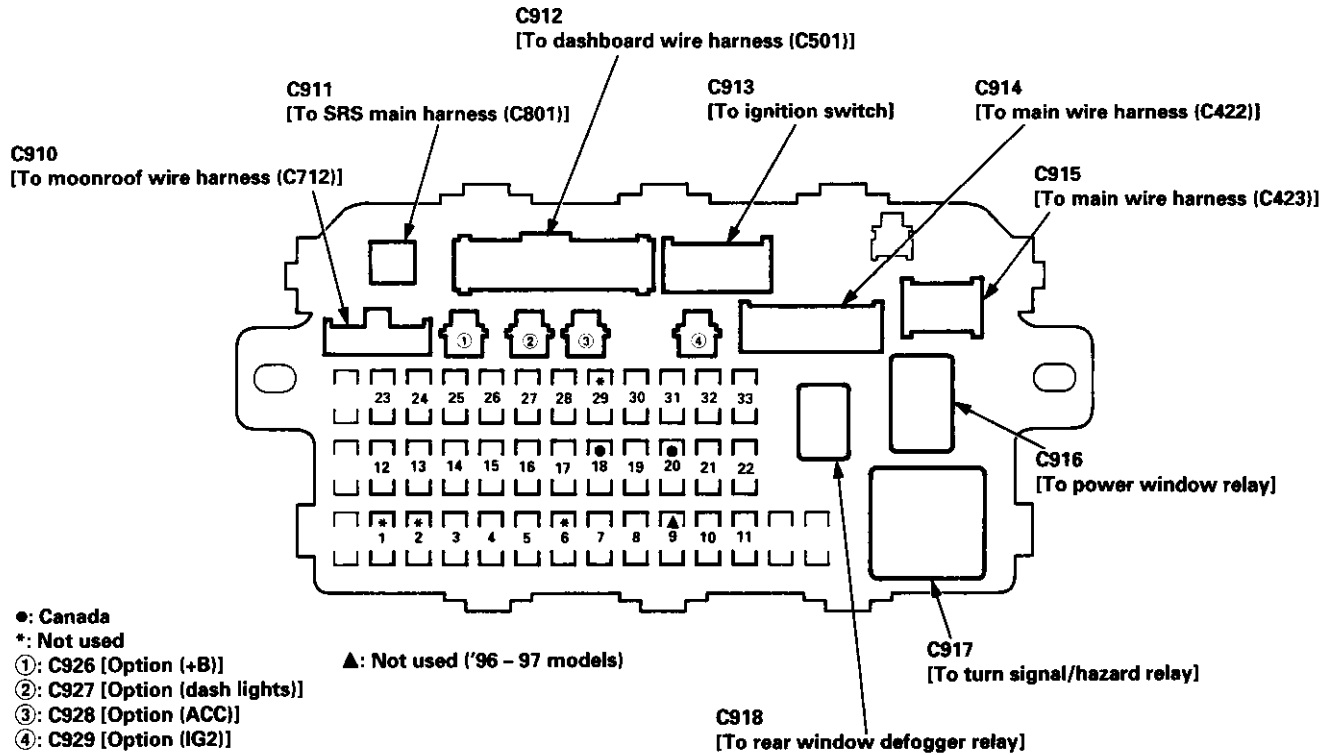




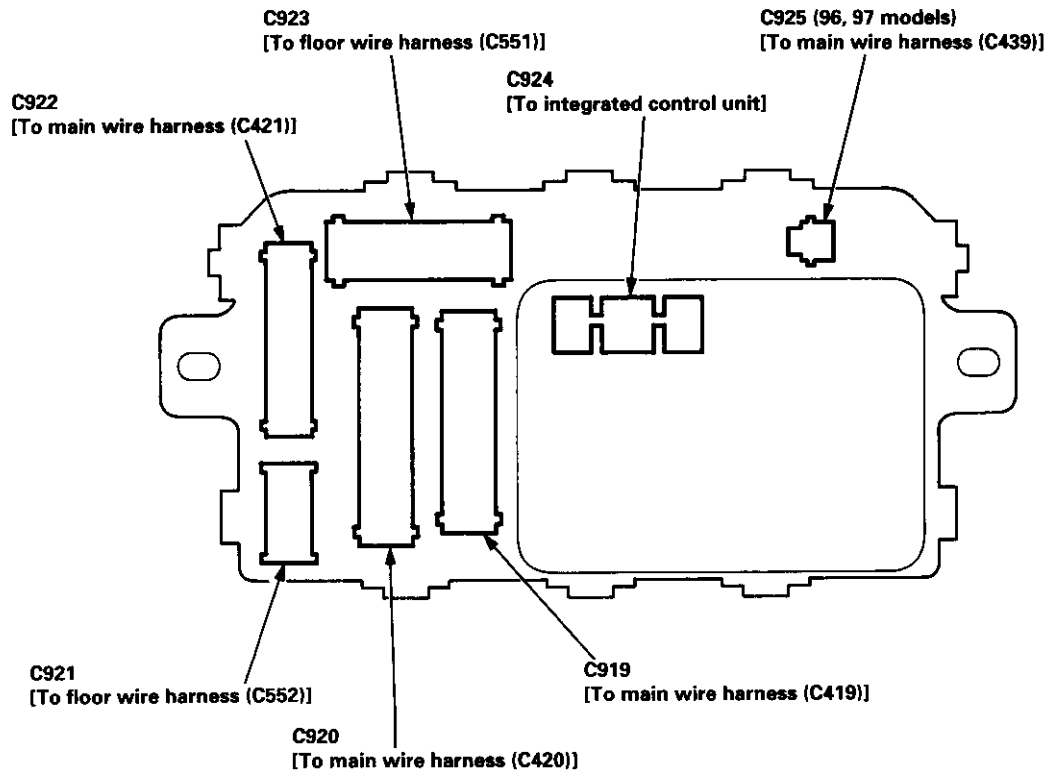
Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
41	80 A	—	Power distribution
42	40 A	WHT/BLK	To ignition switch (BAT)
43	7.5 A	WHT/RED	Ceiling light, data link connector, trunk light
44	15 A	WHT/BLK	PGM-FI main relay
45	—	—	Not used
46	40 A	WHT/BLU	Power window motors (via power window relay)
47	7.5 A	WHT/BLU	Audio unit, clock, TCM (CVT), ECM/PCM (VBU)
48	30 A	WHT	No. 33 (7.5 A) fuse, To combination light switch (headlight)
49	—	—	Not used
50	30 A	WHT/GRN	Rear window defogger (via rear window defogger relay)
51	20 A	WHT/GRN	Power door lock control unit, moonroof motor
52	15 A	WHT/GRN	Horn system, brake lights, brake signal
53	10 A	WHT/BLK	Hazard warning light, turn signal/hazard relay
54	40 A	WHT/RED	Option (+B)
55	40 A	BLU/WHT	Blower motor (via blower motor relay)
56	20 A	WHT	Condenser fan motor (via condenser fan relay)
		RED	A/C compressor clutch (via A/C compressor clutch relay)
57	20 A	BLK/RED	Radiator fan motor (via radiator fan relay)

# Fuses

## Under-dash Fuse/Relay Box



NOTE: View from the backside of the under-dash fuse/relay box.





Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
1	—	—	Not used
2	—	—	Not used
3	10 A	GRN	Rear window wiper motor, rear window washer motor
4	10 A	RED/BLU	Right headlight (high beam)
5	10 A	RED/GRN	Left headlight (high beam), high beam indicator light
6	—	—	Not used
7	20 A	RED/WHT	Left rear power window motor
8	20 A	YEL/BLK	Right rear power window motor
9	—	—	Not used ('96 – 97 models)
	15 A	RED	Distributor (ignition control module) ('98 – 99 models)
10	20 A	GRN/BLK	Front passenger's power window motor
11	20 A	BLU/BLK	Driver's power window motor
12	7.5 A	YEL/BLK	Turn signal/hazard relay (via turn signal/hazard switch)
13	15 A	YEL/GRN	PGM-FI main relay
		GRY or BLK/YEL	SRS unit (VA)
14	7.5 A	BLK/YEL	Cruise control system, audio unit*1, keyless door lock control unit*3
15	7.5 A	BLK/WHT	Alternator, VSS, ELD unit (USA), EVAP purge vent shut valve, oxygen sensors, TCM (CVT)*1
16	7.5 A	BLK/BLU	ABS pump motor, rear window defogger, power mirror*3, mirror defogger*3
17	7.5 A	BLK/YEL	A/C system, power mirror*1, option (IG2)
18	7.5 A	YEL/BLK	Daytime running lights relay (Canada)
19	7.5 A	YEL/RED	Back-up lights
20	10 A	BLK/WHT	Daytime running lights control unit (Canada)
21	10 A	RED/WHT	Right headlight (low beam)
22	10 A	RED/YEL	Left headlight (low beam)
23	10 A	GRY or PNK	SRS unit (VB)
24	7.5 A	GRN/ORN	Moonroof relays
25	7.5 A	YEL	Gauge and indicator lights, interlock control unit
26	20 A	GRN/BLK	Windshield wiper motor, windshield washer motor, integrated control unit (Canada)
27	15 A	YEL/GRN	Accessory socket (ACC)
28	10 A/15A <sup>2</sup>	YEL/RED	Audio unit, option (ACC)
29	—	—	Not used
30	7.5 A	RED/BLK	Dash lights, option (dash lights)
31	7.5 A	BLU/WHT	ECM/PCM, PGM-FI main relay, integrated control unit
32	7.5 A	RED/BLK	Front parking lights, taillights, license plate lights
33	7.5 A	WHT/GRN	Interlock control unit, key interlock solenoid

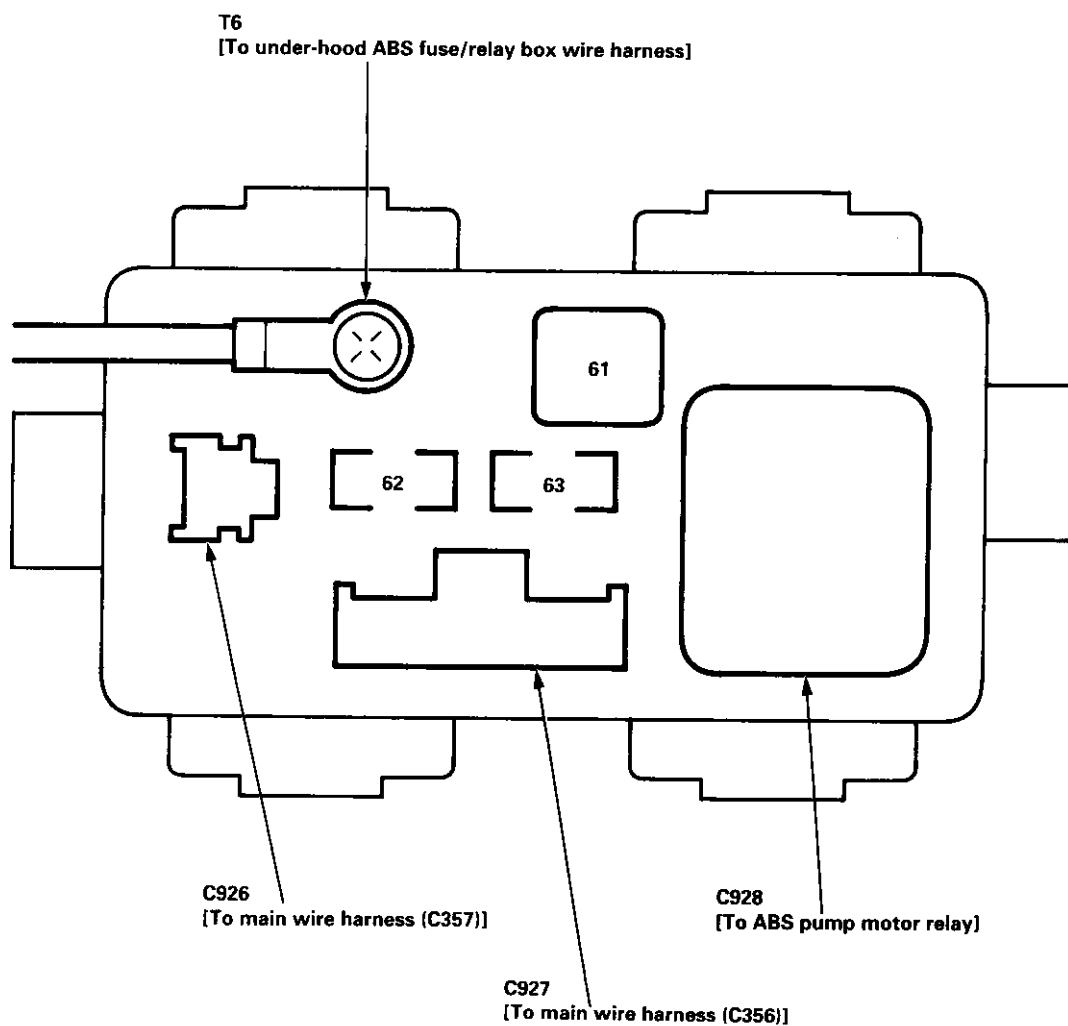
\*1: '96 – 98 models

\*2: '98 model

\*3: '99 – 00 models

# Fuses

## Under-hood ABS Fuse/Relay Box

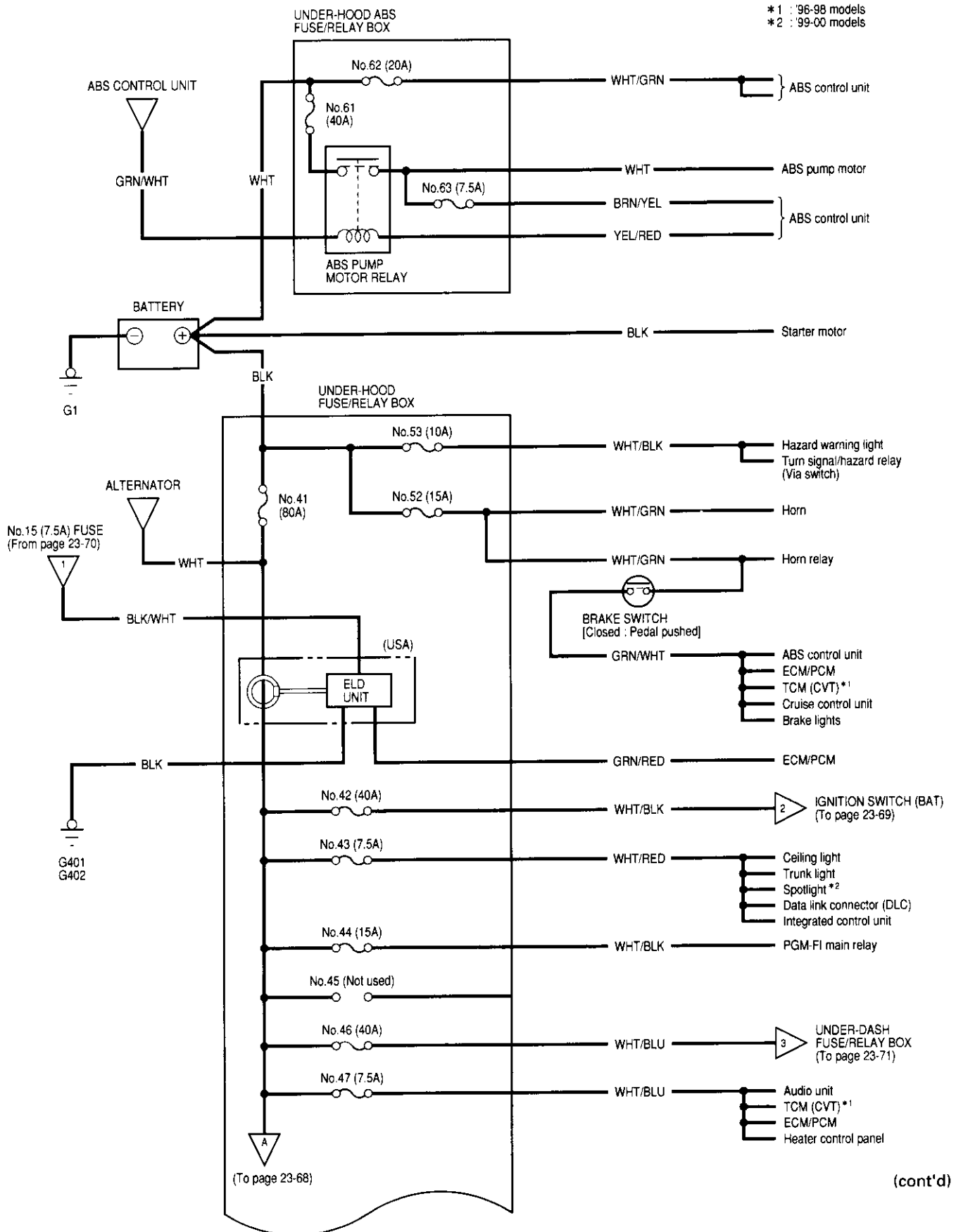


Fuse Number	Amps	Wire Color	Component(s) or Circuit(s) Protected
61	40 A	WHT	ABS pump motor (via ABS pump motor relay)
63	7.5 A	BRN/YEL	ABS control unit (motor check)
62	20 A	WHT/GRN	ABS control unit (+B1)

# Power Distribution



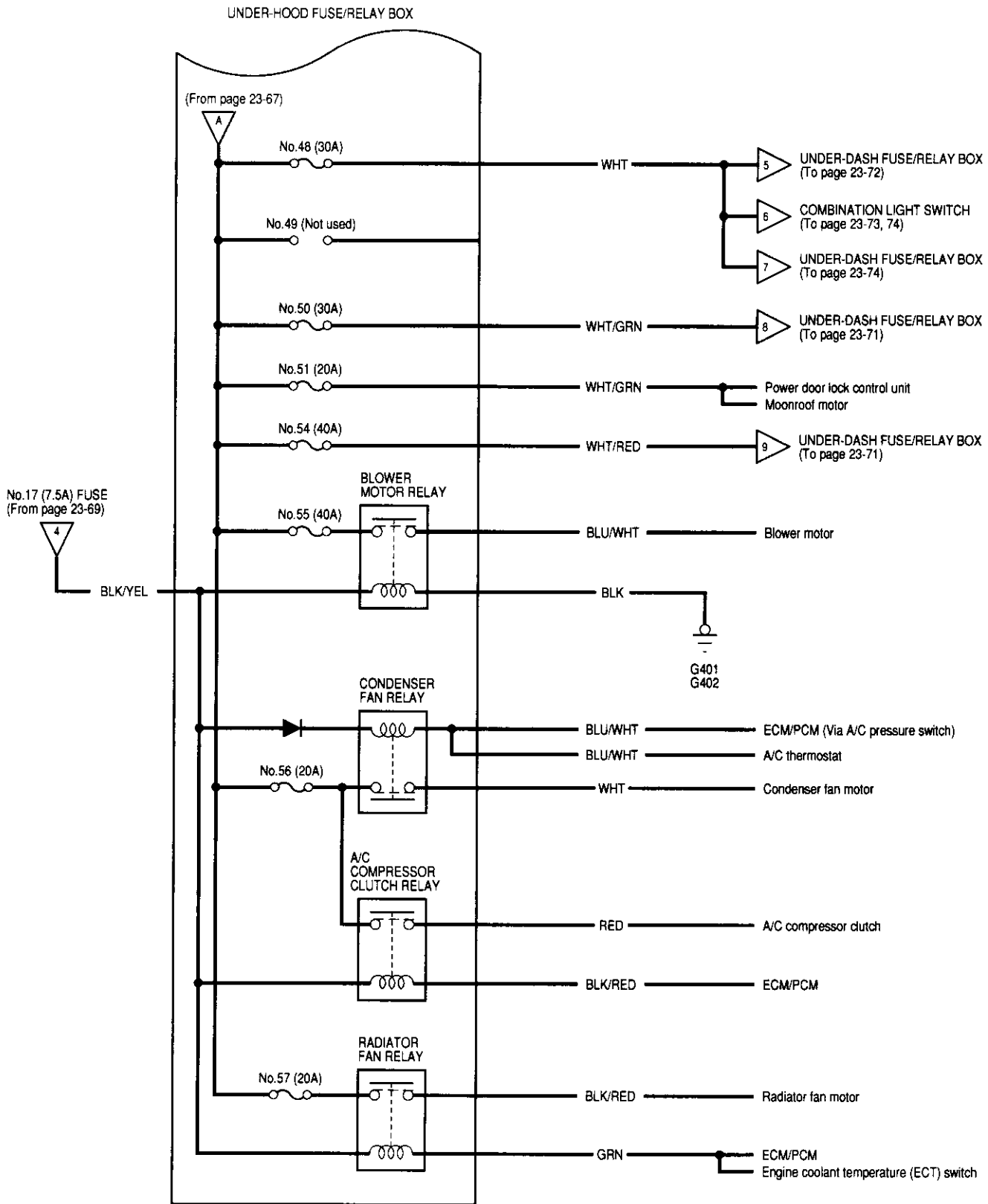
## Circuit Identification



(cont'd)

# Power Distribution

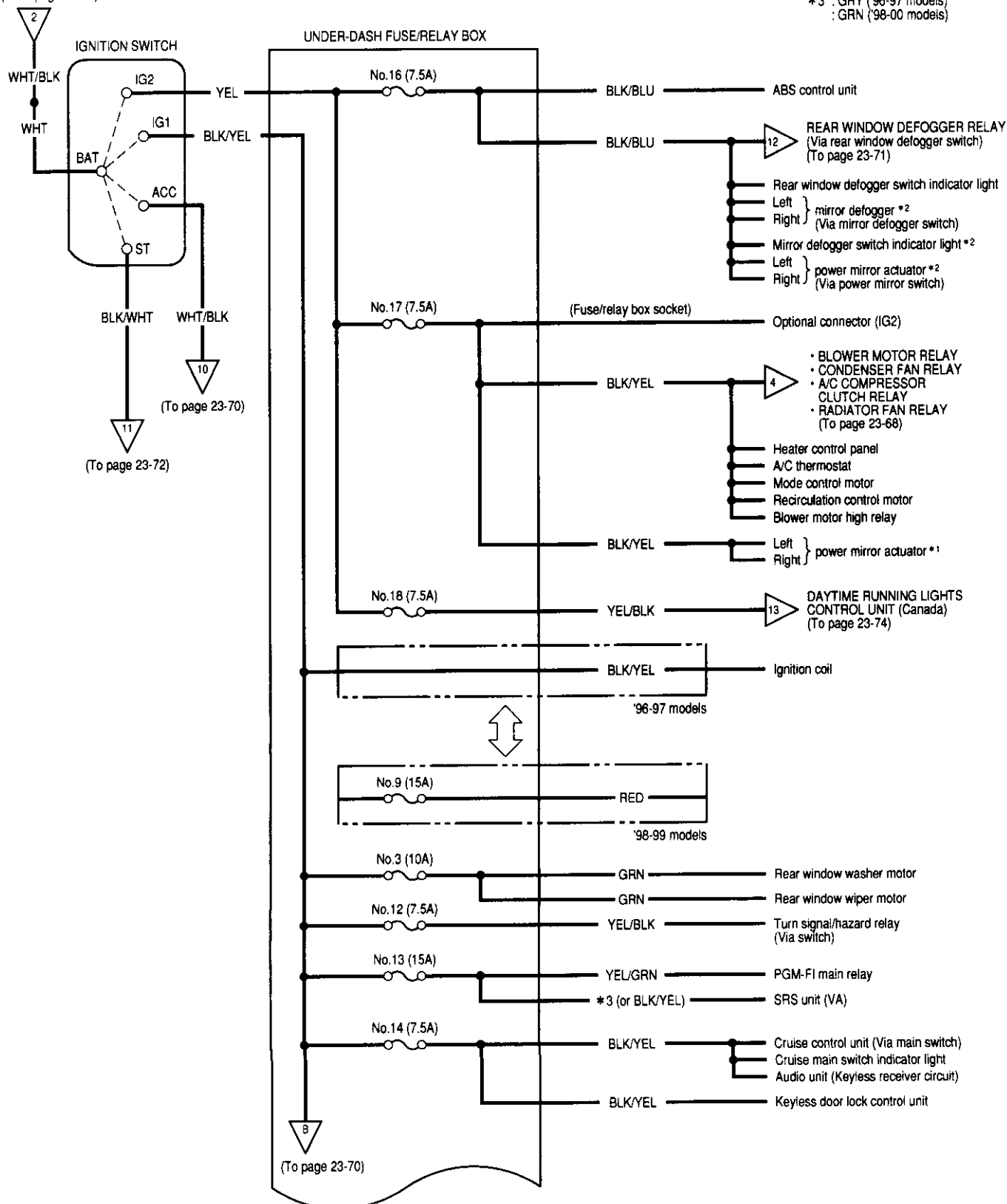
## Circuit Identification (cont'd)





No. 42 (40A) FUSE  
(From page 23-67)

\*1 : '96-98 models  
\*2 : '99 model  
\*3 : GRY ('96-97 models)  
: GRN ('98-00 models)



(cont'd)

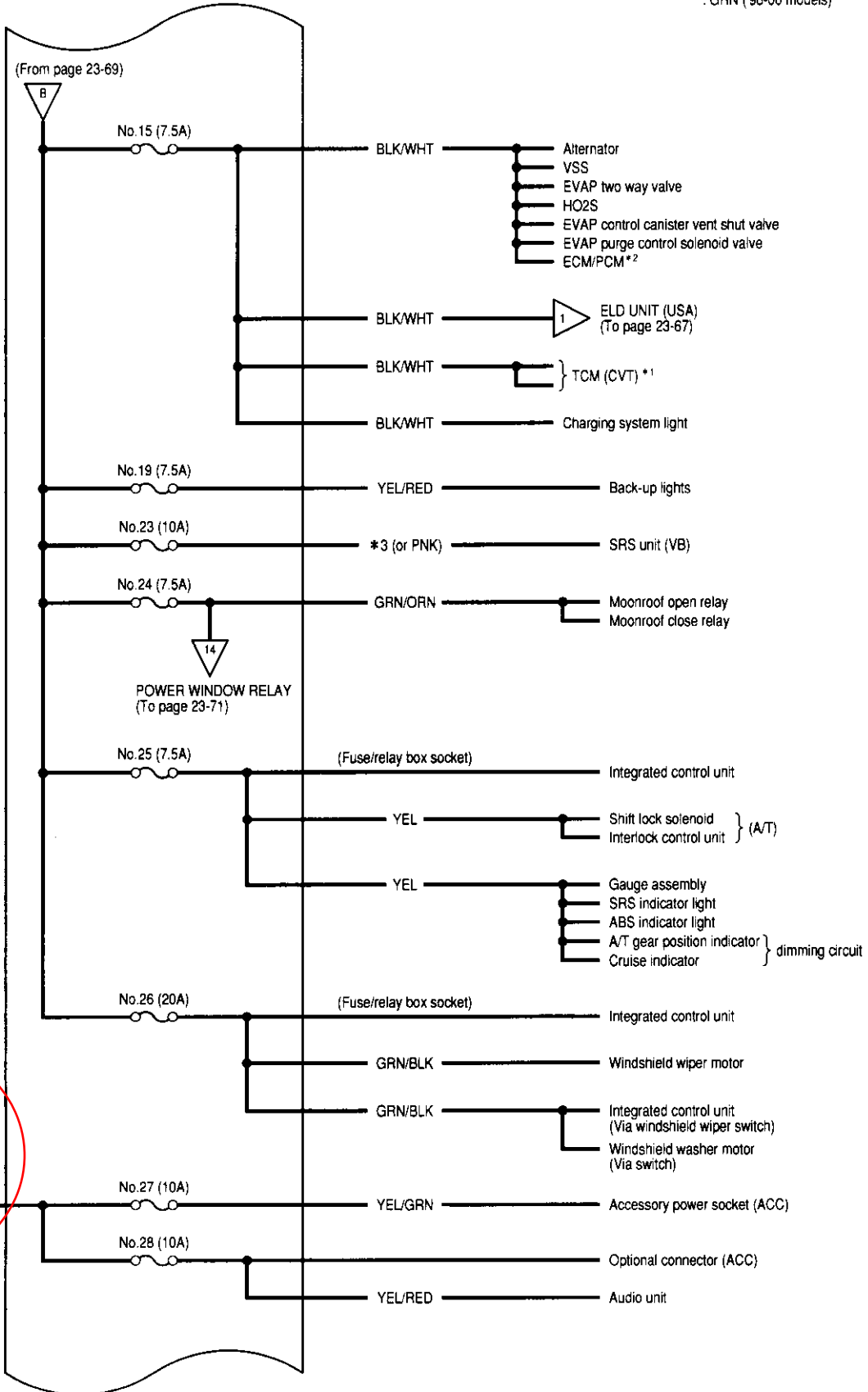
# Power Distribution

## Circuit Identification (cont'd)

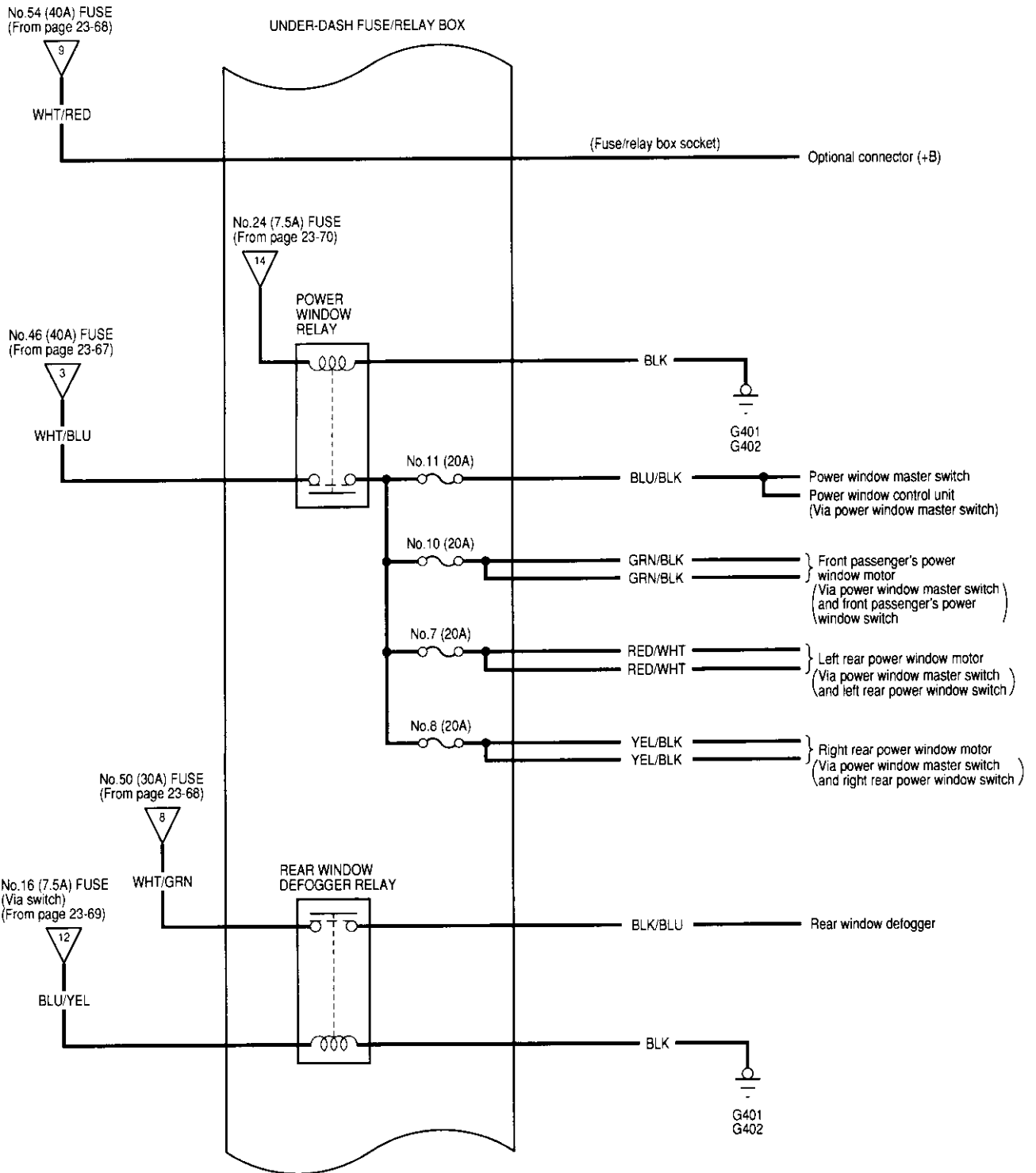
- \* 1 : '96-98 models
- \* 2 : '99 model
- \* 3 : GRY ('96-97 models)
- : GRN ('98-00 models)

UNDER-DASH FUSE/RELAY BOX

(From page 23-69)

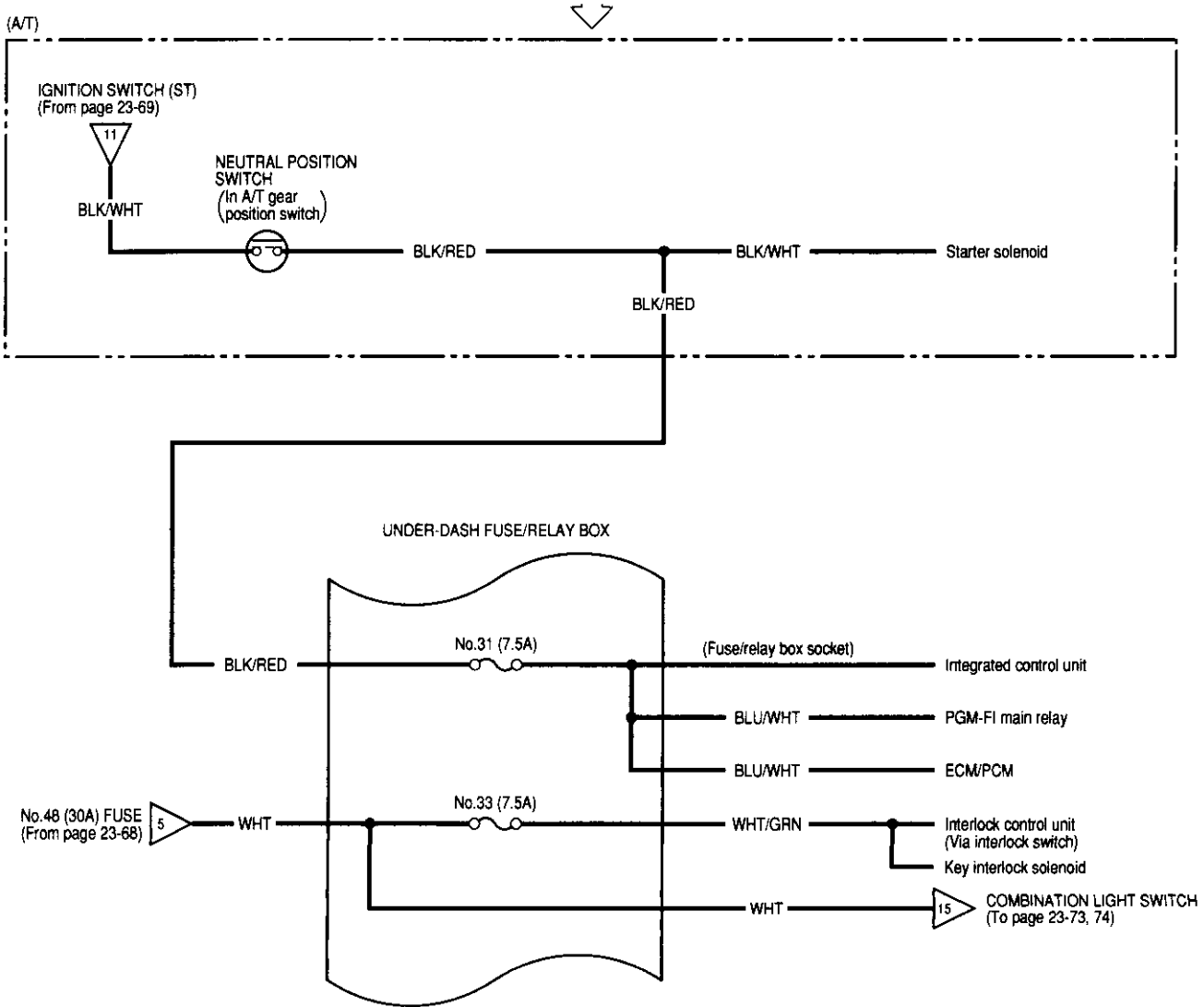






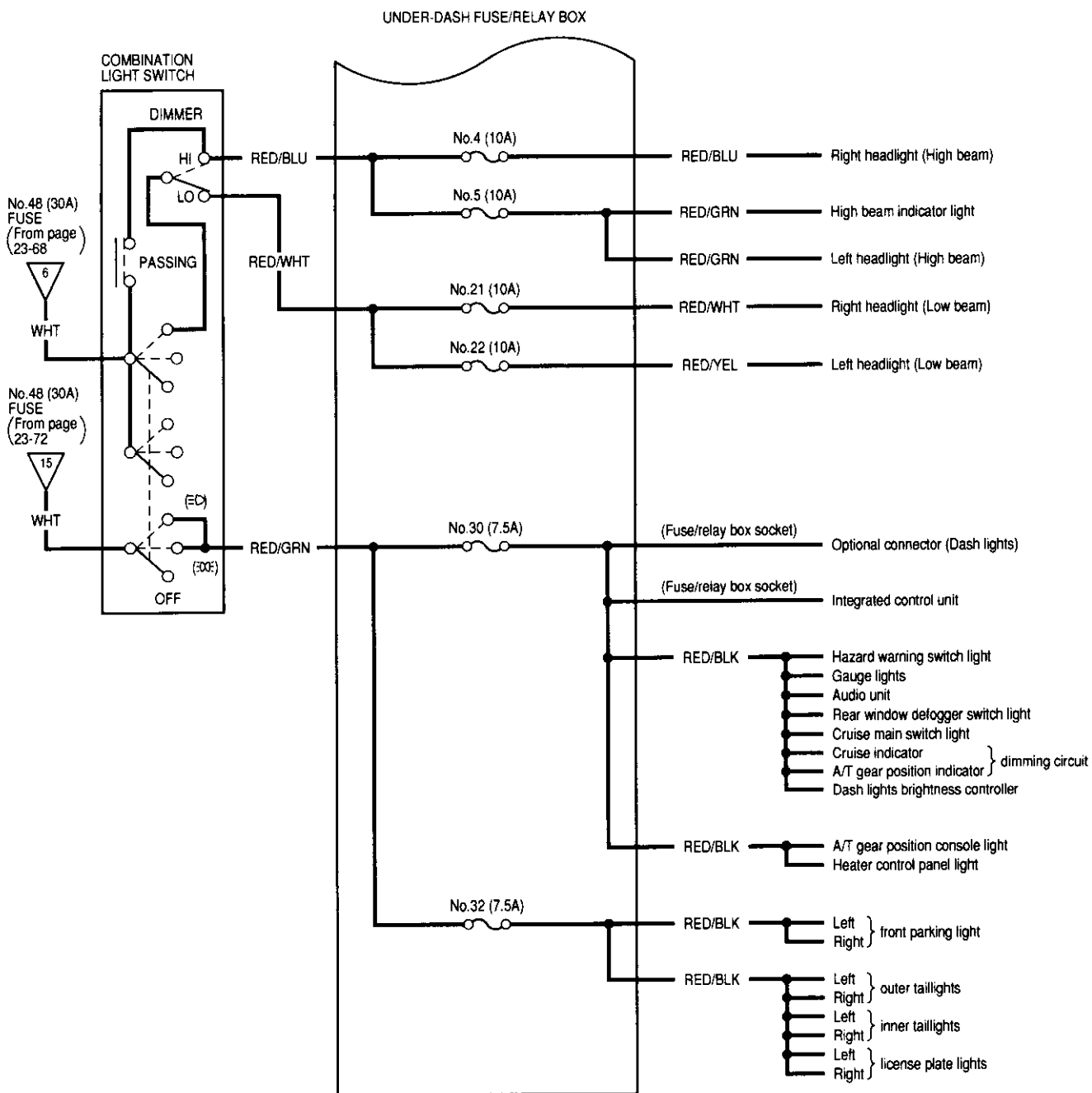
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# Power Distribution





USA:

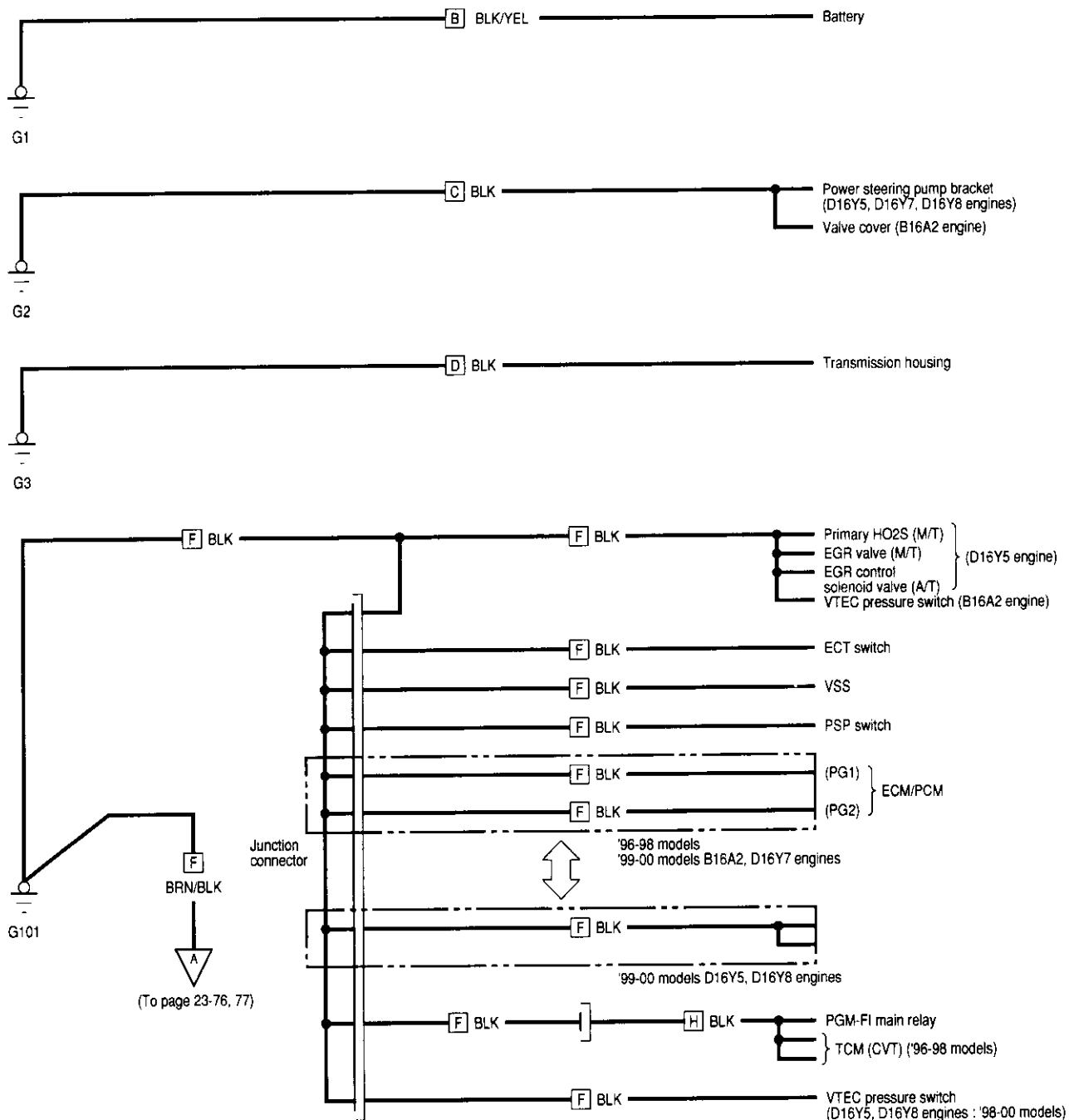


(cont'd)



# Ground Distribution

## Circuit Identification



[B] : Battery ground cable  
 [C] : Engine ground cable A

[D] : Engine ground cable B  
 [F] : Engine wire harness

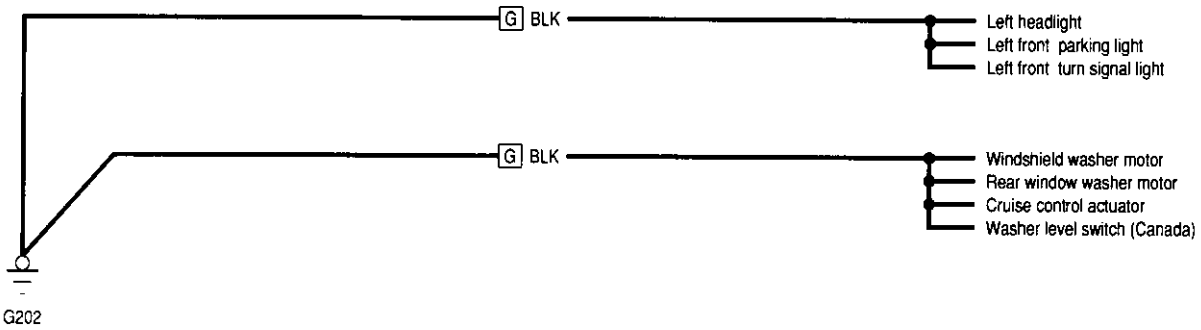
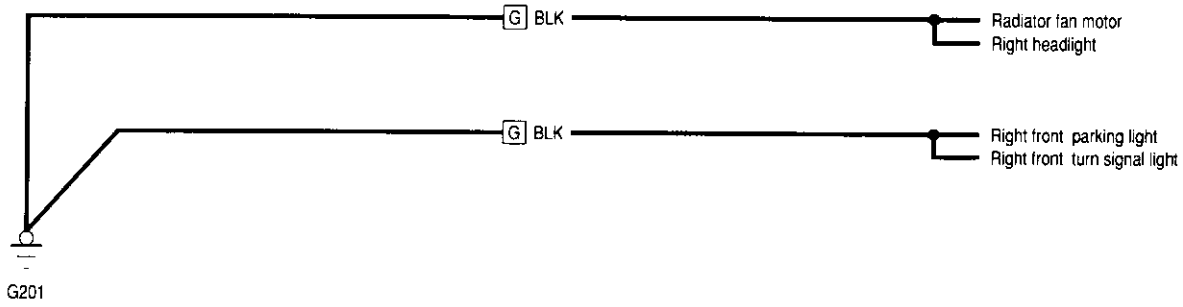
[H] : Main wire harness

(cont'd)



# Ground Distribution

## Circuit Identification (cont'd)

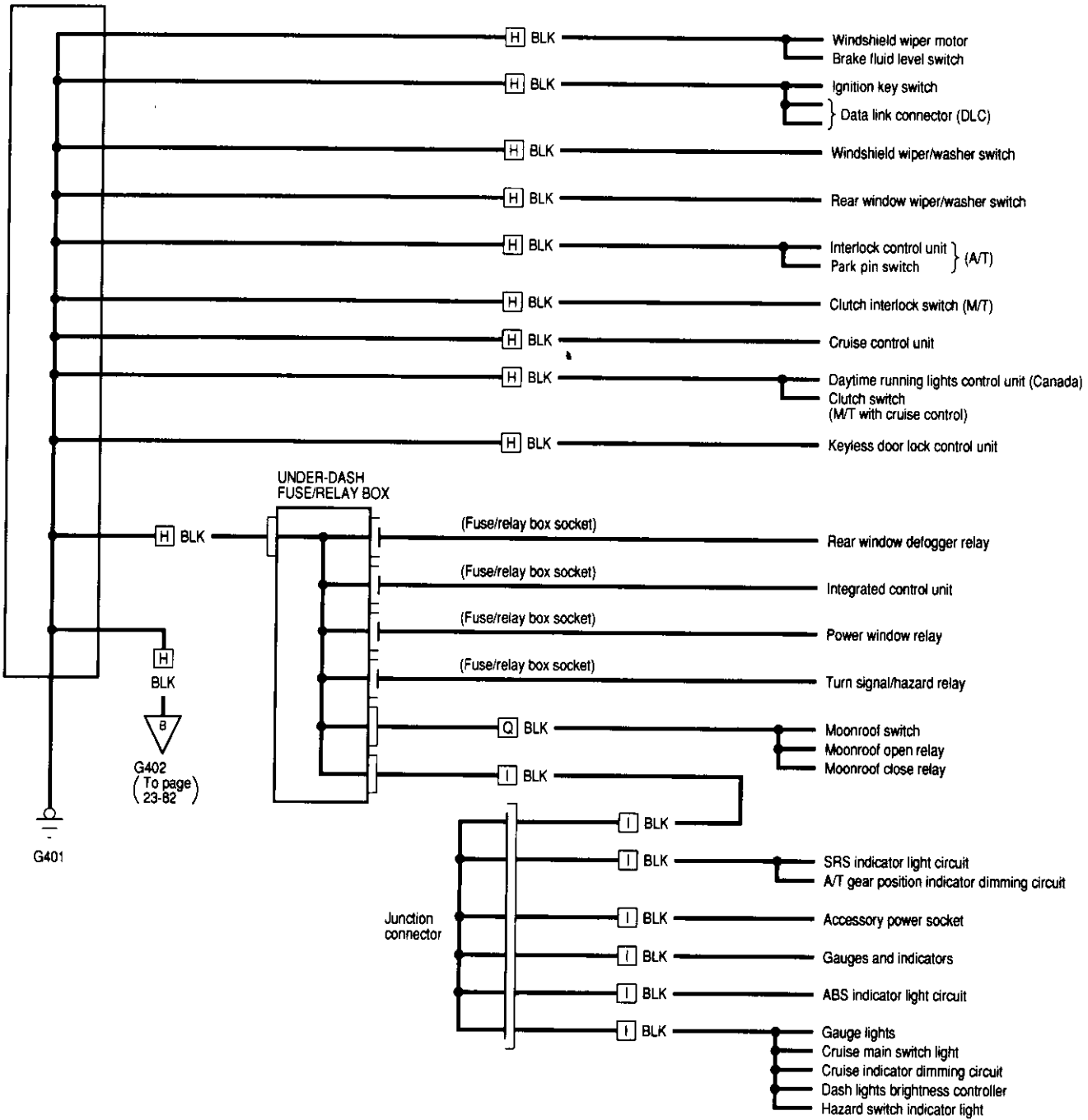


 : Engine compartment wire harness

# Ground Distribution

## Circuit Identification (cont`d)

'99-00 models:



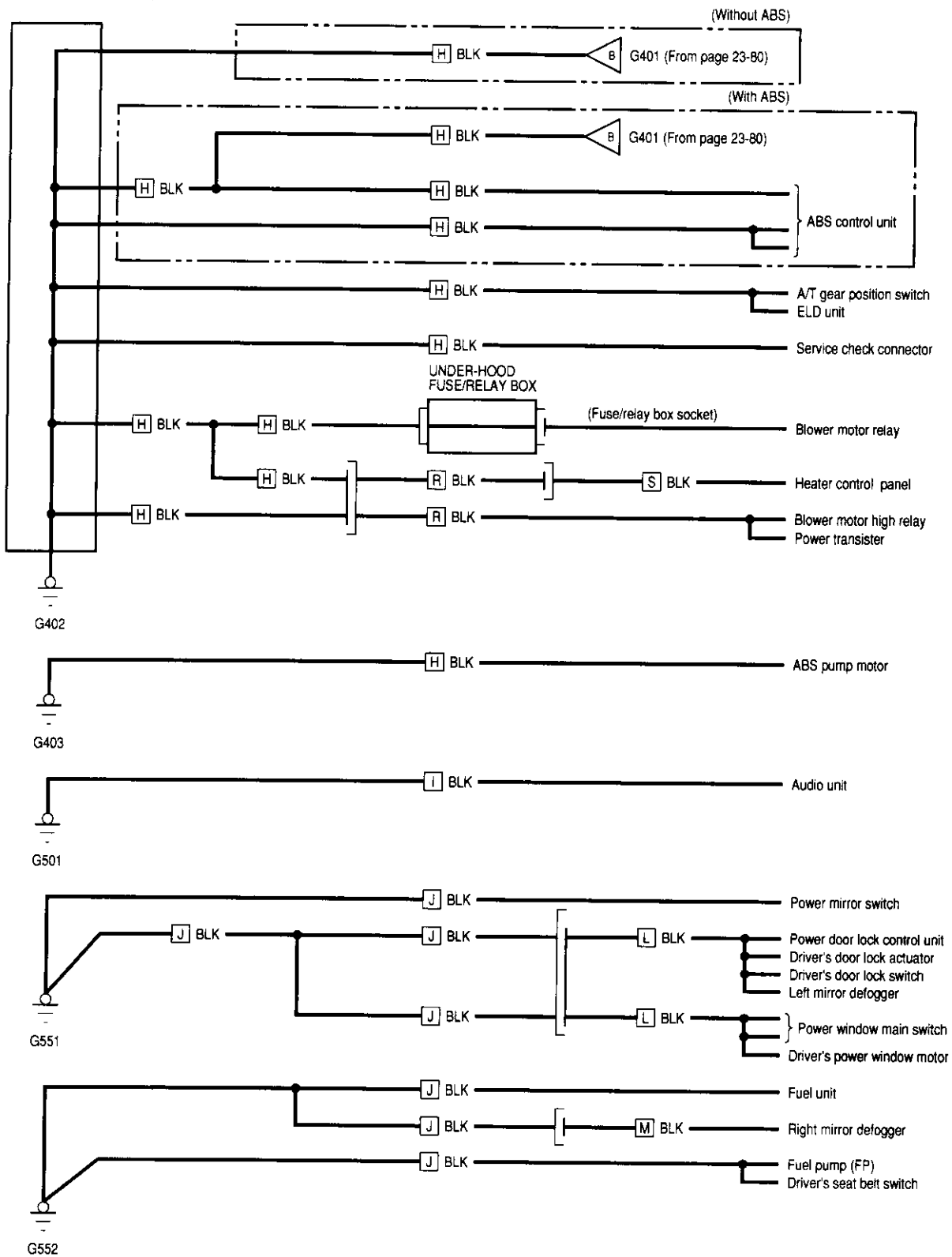
G : Engine compartment wire harness  
 H : Main wire harness

I : Dashboard wire harness  
 Q : Moonroof wire harness

# Ground Distribution

## Circuit Identification (cont'd)

'99-00 models:



[H] : Main wire harness

[J] : Floor wire harness

[R] : Heater sub-harness A

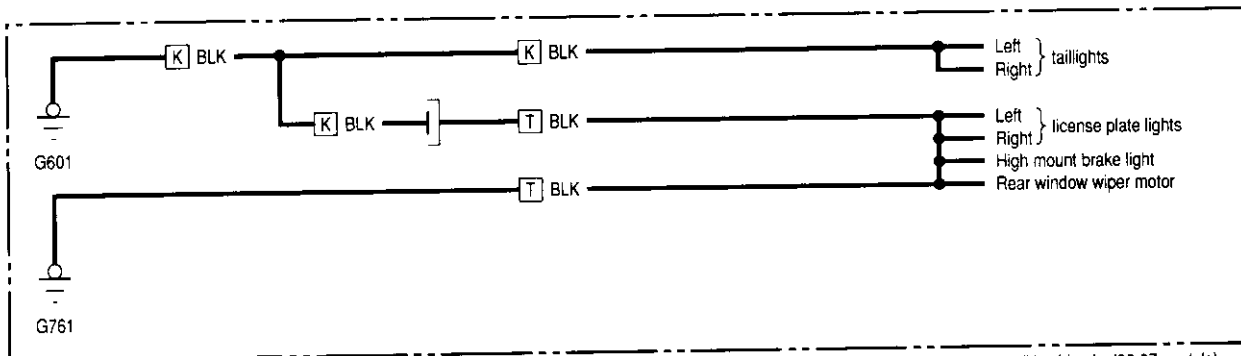
[M] : Passenger's door wire harness

[I] : Dashboard wire harness

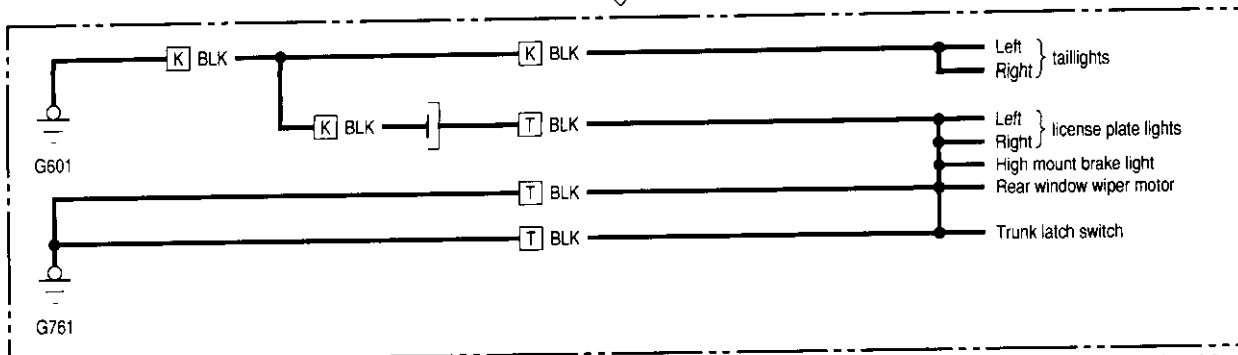
[L] : Driver's door wire harness

[S] : Heater sub-harness B

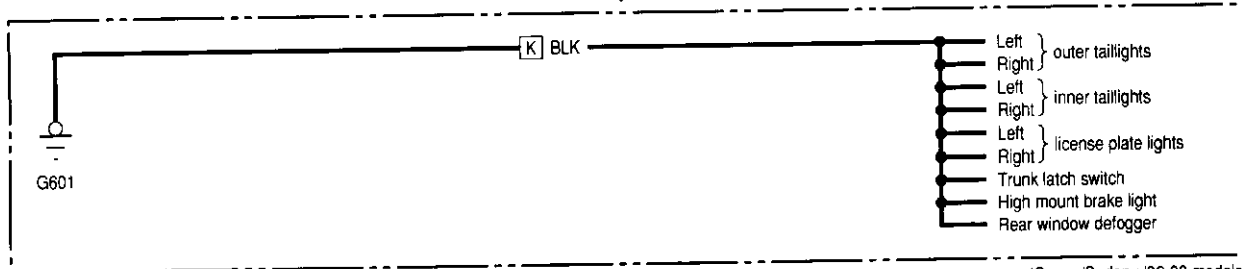




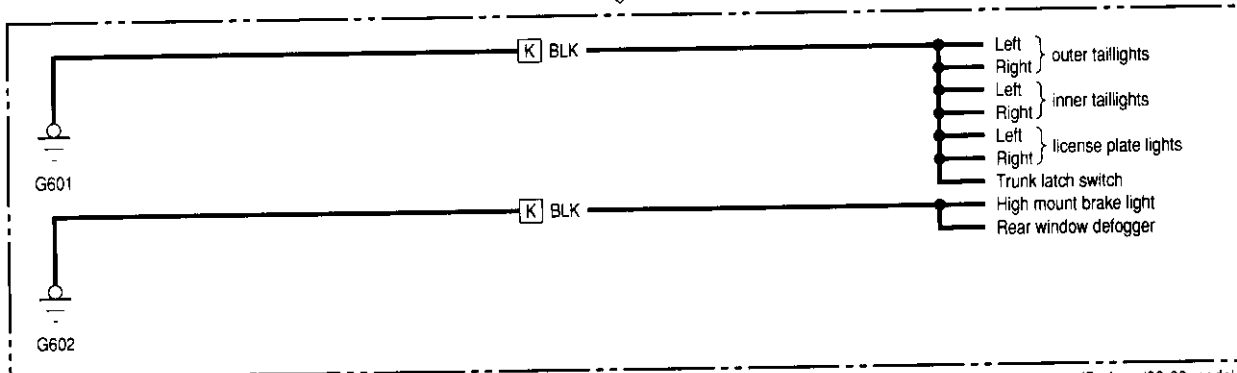
(Hatchback : '96-97 models)



(Hatchback : '98 model)



(Coupe/Sedan : '96-98 models)



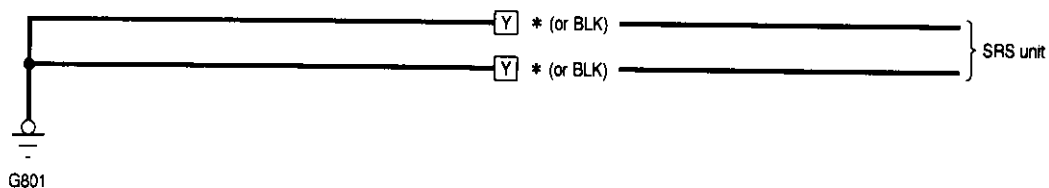
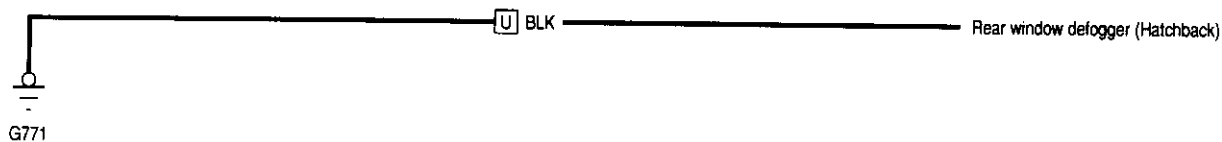
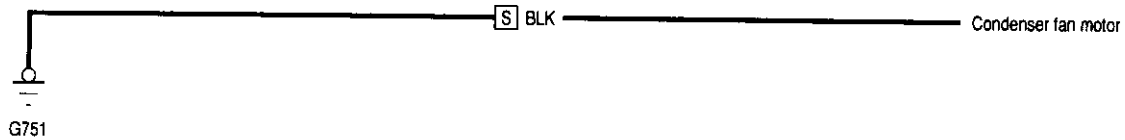
(Sedan : '99-00 models)

**K** : Rear wire harness  
**T** : Hatch wire harness

(cont'd)

# Ground Distribution

## Circuit Identification (cont`d)



**S** : A/C wire harness

**U** : Rear window defogger ground wire

**Y** : SRS main harness

\* GRY : '96-97 models

GRN : '98-00 models

# Under-dash Fuse/Relay Box

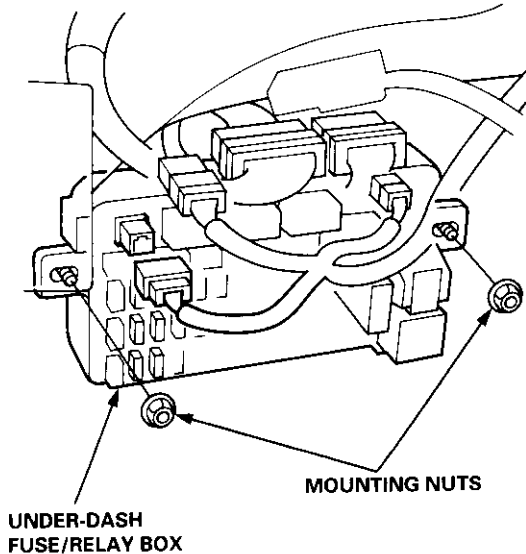


## Removal/Installation

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

### Removal:

1. Make sure you have the anti-theft code for the radio then write down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Disconnect the airbag connectors (see section 24).
4. Remove the driver's dashboard lower cover and knee bolster (see section 20).
5. Remove the two mounting nuts, and pull the under-dash fuse/relay box out from under the dash.



6. Disconnect the connectors from the under-dash fuse/relay box, and take out the under-dash fuse/relay box (see section 24).

### Installation:

1. Connect the connectors to the under-dash fuse/relay box, then install the under-dash fuse/relay box in the reverse order of removal (see section 24).
2. Install the driver's dashboard lower cover (see section 20).
3. Connect the airbag connectors (see section 24).
4. Connect the battery positive cable, then connect the negative cable.
5. Enter the anti-theft code for the radio, then enter the customer's radio station presets ('99 - 00 models).
6. Confirm that all systems work properly.

# Power Relays

## Relay Test

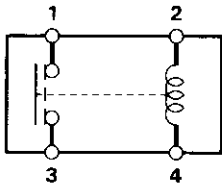
### Turn Signal/Hazard Relay:

See page 23-172

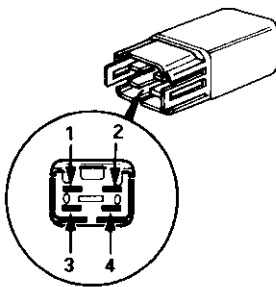
### Normally-open type:

1. Check for continuity between the terminals.
  - There should be continuity between the No. 1 and No. 3 terminals when power and ground are connected to the No. 2 and No. 4 terminals.
  - There should be no continuity between the No. 1 and No. 3 terminals when power is disconnected.

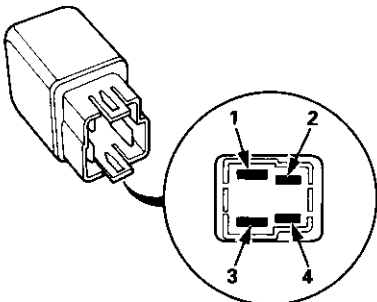
Terminal	1	3
Power (No. 2 - No. 4)		
Disconnected		
Connected		



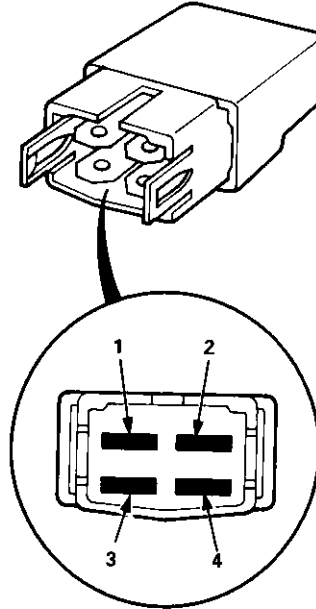
- Blower motor relay



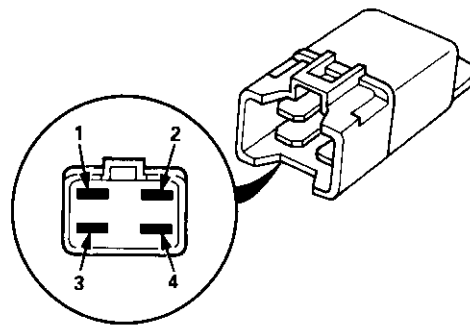
- ABS pump motor relay



- Rear window defogger relay



- Starter cut relay: '96 - 97 models
- Horn relay: '96 - 97 models
- Blower motor high relay: '99 - 00 models

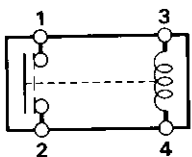




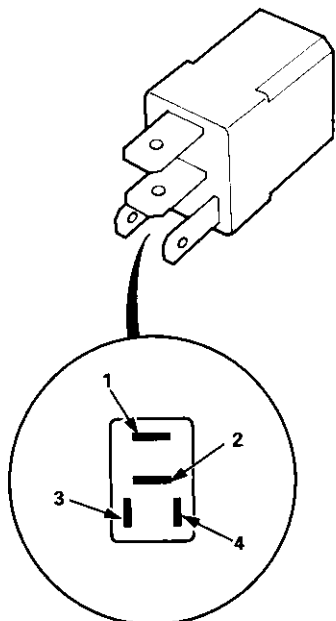
**Normally-open type:**

1. Check for continuity between the terminals.
  - There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 4 terminals.
  - There should be no continuity between the No. 1 and No. 2 terminals when power is disconnected.

Terminal	1	2
Power (No.3 - No.4)		
Disconnected		
Connected		



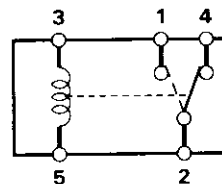
- Power window relay
- Radiator fan relay
- Condenser fan relay
- A/C compressor clutch relay
- Starter cut relay: '98 - 00 models
- Horn relay: '98 - 00 models



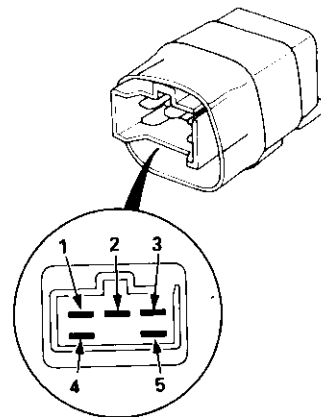
**Five-terminal type:**

1. Check for continuity between the terminals.
  - There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 3 and No. 5 terminals.
  - There should be continuity between the No. 2 and No. 4 terminals when power is disconnected.

Terminal	1	2	4
Power (No. 3 - No. 5)			
Disconnected			
Connected			



- Moonroof open relay: '96 - 97 models
- Moonroof close relay: '96 - 97 models



(cont'd)

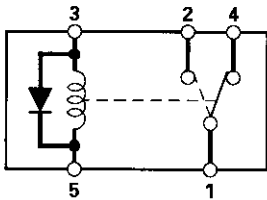
# Power Relays

## Relay Test (cont'd)

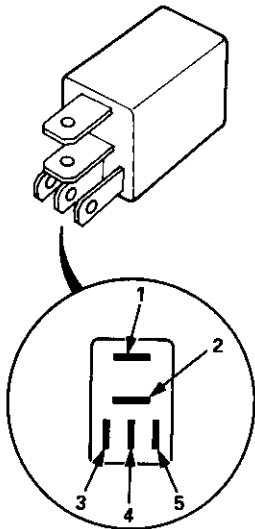
### Five-terminal type:

1. Check for continuity between the terminals.
  - There should be continuity between the No. 1 and No. 2 terminals when power and ground are connected to the No. 5 and No. 3 terminals.
  - There should be continuity between the No. 1 and No. 4 terminals when power is disconnected.

Terminal	1	2	4
Power (No. 5 - No. 3)			
Disconnected	○	○	○
Connected	○	○	



- Moonroof open relay: '98 - 00 models
- Moonroof close relay: '98 - 00 models



# Ignition Switch



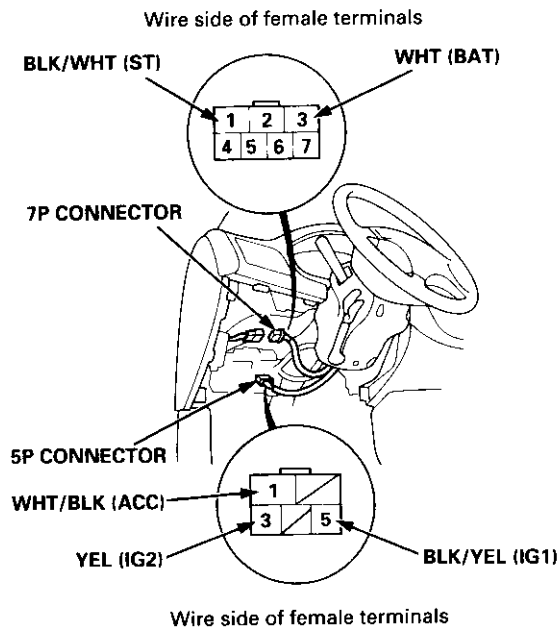
## Test

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

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Disconnect the battery negative cable.
3. Remove the driver's dashboard lower cover and knee bolster (see section 20).
4. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness.
5. Check for continuity between the terminals in each switch position according to the table.

Terminal Position	1 (ACC)	(3) (BAT)	5 (IG1)	3 (IG2)	(1) (ST)
O (LOCK)					
I (ACC)	○	○			
II (ON)	○	○	○	○	
III (START)		○	○		○

[ ]: 7P connector



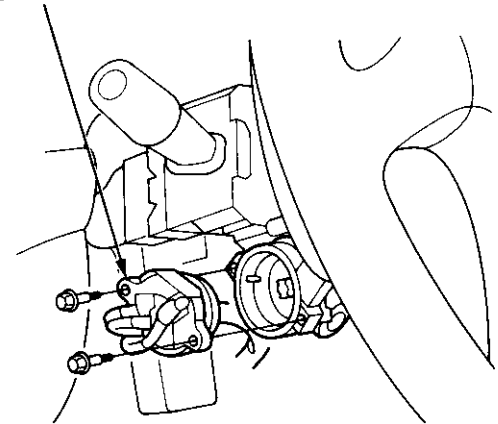
6. If the continuity checks do not agree with the table, replace the electrical switch.

## Electrical Switch Replacement

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

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Disconnect the battery negative cable.
3. Remove the driver's dashboard lower cover (see section 20).
4. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness (see left column).
5. Remove the steering column covers (see section 17).
6. Insert the ignition key, and turn it to "0 (LOCK)".
7. Remove the two screws and the electrical switch from the steering lock.

ELECTRICAL SWITCH



8. Install in the reverse order of removal.

# Ignition Switch

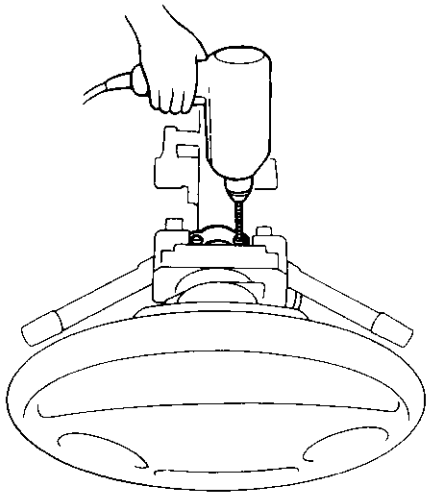
## Steering Lock Replacement

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

### Remove:

1. Make sure you have the anti-theft code for the radio, then wire down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Disconnect the battery negative cable.
3. Remove the driver's dashboard lower cover and knee bolster (see section 20).
4. Disconnect the 5P connector from the under-dash fuse/relay box and the 7P connector from the main wire harness (see previous page).
5. Remove the steering column covers, then remove the mounting bolts and nuts from the steering column (see section 17).
6. Lower the steering column assembly.
7. Center-punch each of the two shear bolts, then drill their heads off with a 5 mm (3/16 in) drill bit.

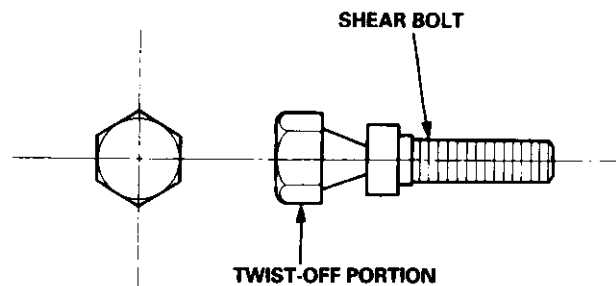
**CAUTION:** Do not damage the steering lock body.



8. Remove the shear bolts and the steering lock assembly.

### Installation:

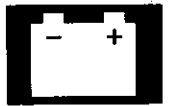
1. Install the new steering lock assembly without the key inserted.
2. Loosely tighten the new shear bolts.
3. Insert the ignition key, and check for proper operation of the steering wheel lock and that the ignition key turns freely.
4. Tighten the shear bolts until the hex heads twist off.



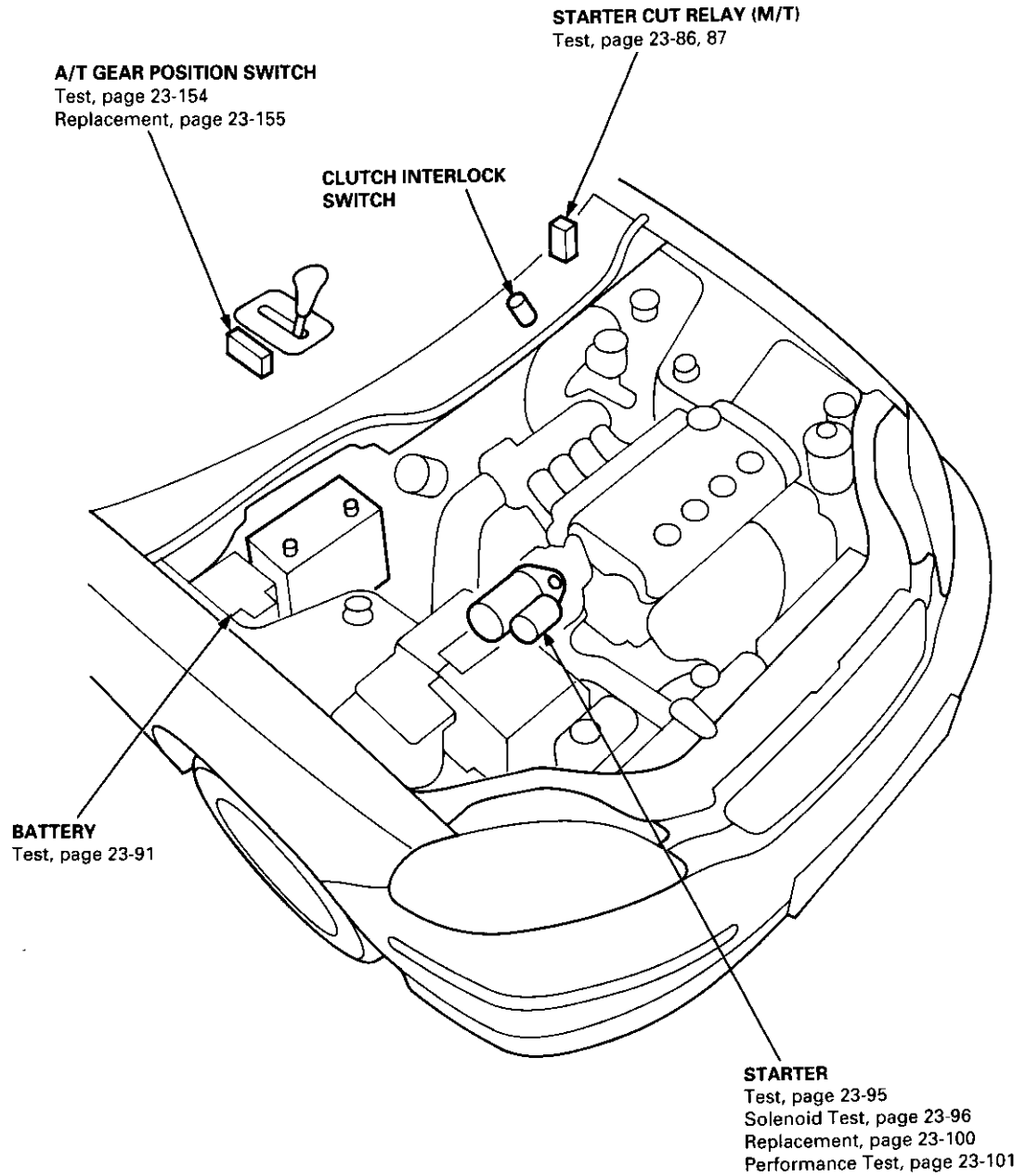
5. Install in the reverse order of removal.
6. Enter the anti-theft code for the radio, then enter the customer's radio station presets.



# Starting System

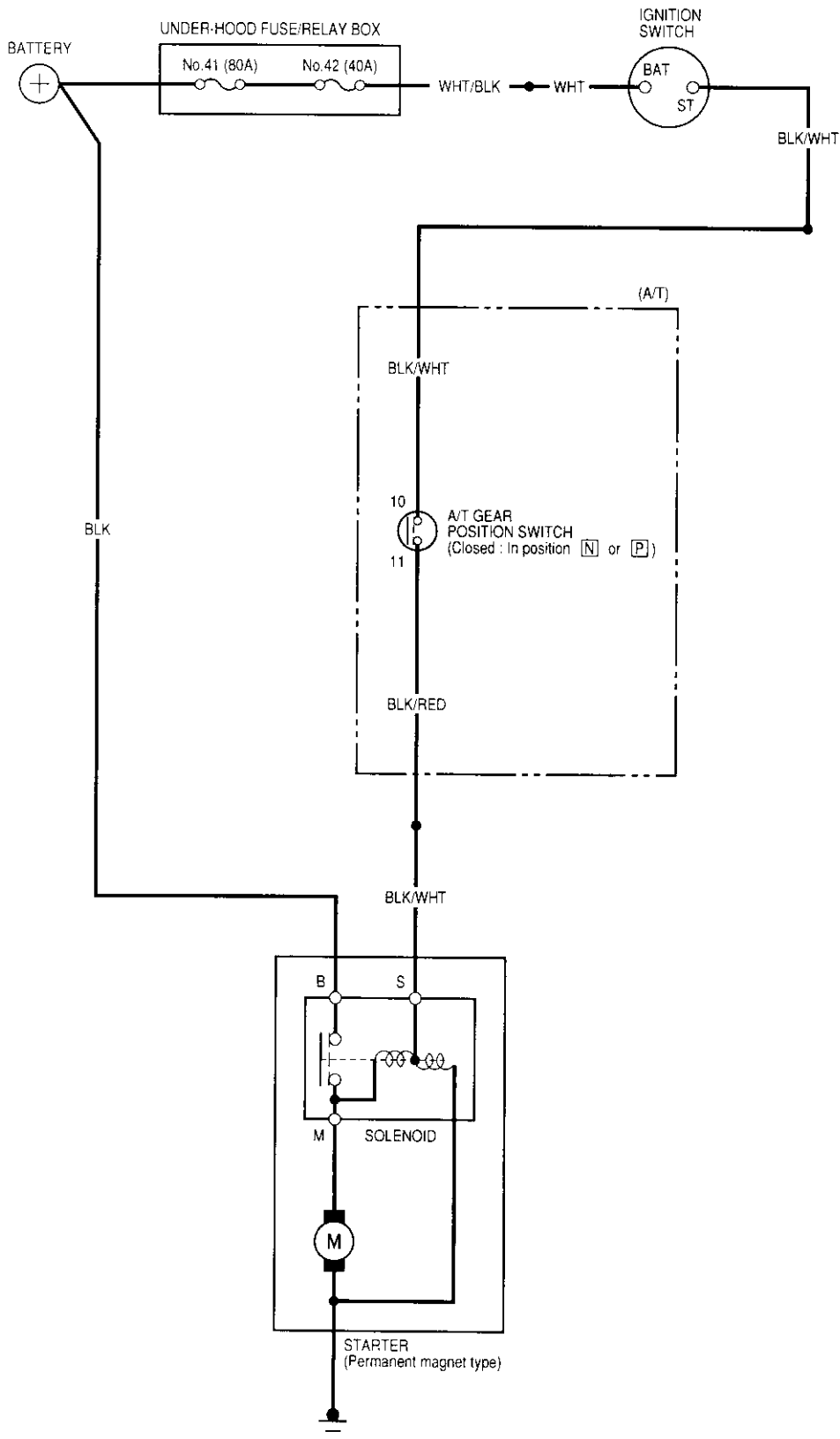


## Component Location Index



# Starting System

## Component Location Index





## Starter Test

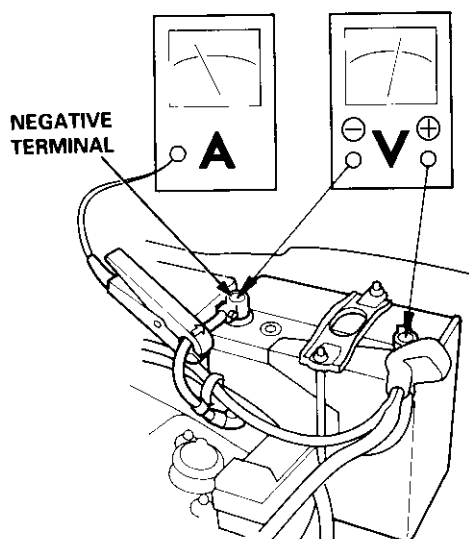
**NOTE:** The air temperature must be between 59 and 100°F (15 and 38°C) before testing.

### Recommended Procedure:

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

### Alternate Procedure:

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

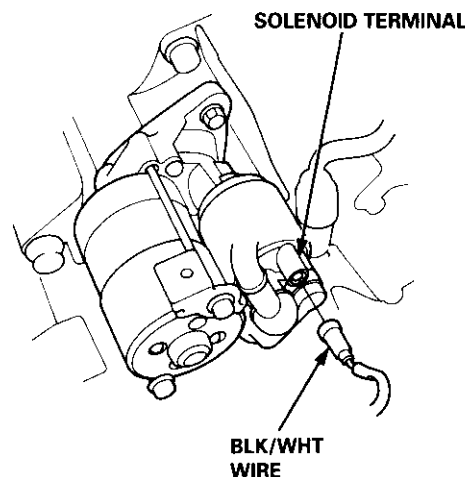


**NOTE:** After this test, or any subsequent repair, reset the ECM/PCM to clear any codes (see section 11).

### Check the Starter Engagement:

1. Remove the No. 44 (15 A) fuse from the under-hood fuse/relay box.
2. Turn the ignition switch to START (III) with the shift lever in **N** or **P** position (A/T) or with the clutch pedal depressed (M/T). The starter should crank the engine.
  - If the starter does not crank the engine, go to step 3.
  - If it cranks the engine erratically or too slowly, go to "Check for Wear and Damage" on the next page.

3. Check the battery, battery positive cable, ground, starter cut relay, and the wire connections for looseness and corrosion. Test again. If the starter still does not crank the engine, go to step 4.
4. Unplug the connector (BLK/WHT wire and solenoid terminal) from the starter.
5. Connect a jumper wire from the battery positive (+) terminal to the solenoid terminal. The starter should crank the engine.



- If the starter still does not crank the engine, remove it, and diagnose its internal problem.
  - If the starter cranks the engine, go to step 6.
6. Check the ignition switch (see page 23-89).
  7. Check the starter cut relay and clutch interlock switch (see page 23-86, 87).
  8. Check the A/T gear position switch (see page 23-154).
  9. Check for an open in the wire between the ignition switch and starter.

(cont'd)

# Starting System

## Starter Test (cont'd)

### Check for Wear and Damage

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

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

### Check Cranking Voltage and Current Draw

Cranking voltage should be no less than 8.5 volts. Current draw should be no more than 350 amperes.

If cranking voltage is too low, or current draw too high, check for:

- dead or low battery.
- open circuit in starter armature commutator segments.
- starter armature dragging.
- shorted armature winding.
- excessive drag in engine.

### Check Cranking rpm

Engine speed during cranking should be above 100 rpm. If speed is too low, check for:

- loose battery or starter terminals.
- excessively worn starter brushes.
- open circuit in commutator segments.
- dirty or damaged helical spline or drive gear.
- defective drive gear overrunning clutch.

### Check Starter Disengagement

With the shift lever in **N** or **P** position (A/T) or with the clutch pedal depressed (M/T), turn the ignition switch to START (III), and release to ON (II).

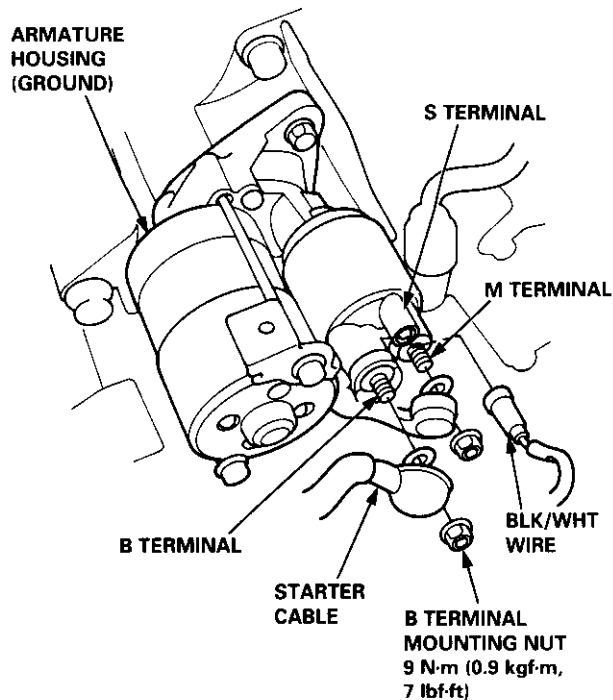
The starter drive gear should disengage from the torque converter or flywheel ring gear when you release the key.

If the drive gear hangs up on the torque converter or flywheel ring gear, check for:

- solenoid plunger and switch malfunction.
- dirty drive gear assembly or damaged overrunning clutch.

## Starter Solenoid Test

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

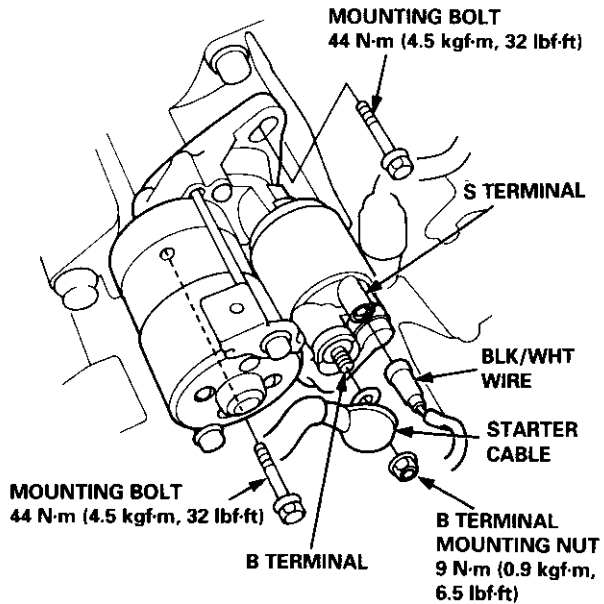


2. Check the pull-in coil for continuity between the S and M terminals. The coil is OK if there is continuity.

# Starting System

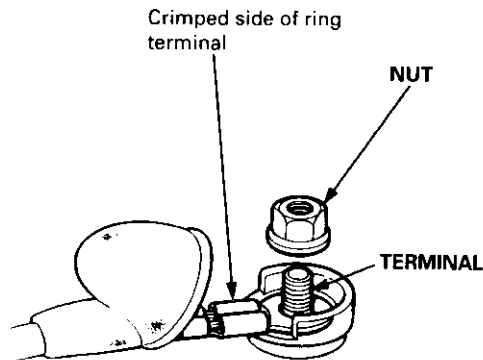
## Starter Replacement

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Disconnect the battery negative cable.
3. Disconnect the starter cable from the B terminal on the solenoid, then disconnect the BLK/WHT wire from the S terminal.



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



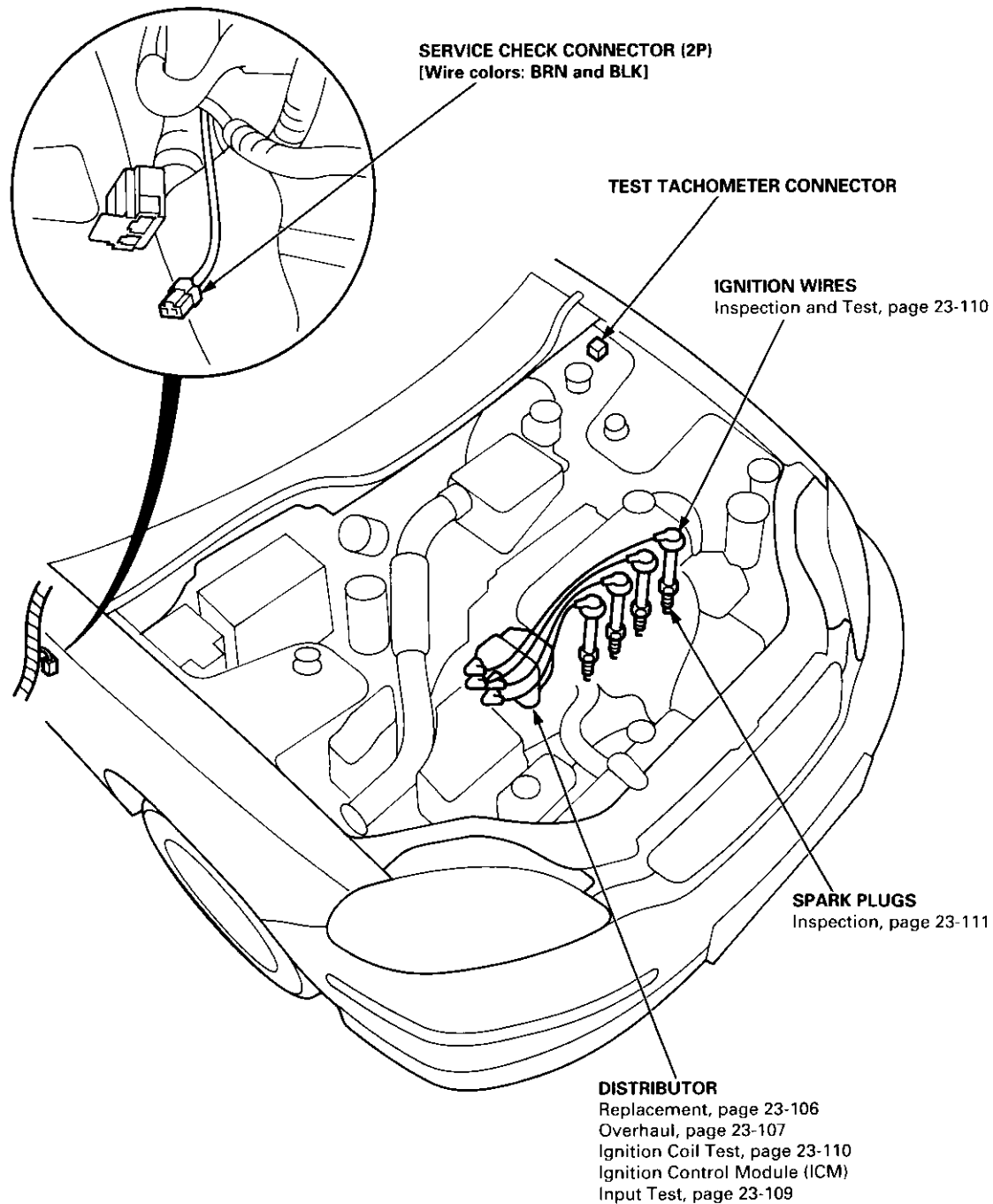
6. Connect the battery positive cable and negative cable to the battery.
7. Enter the anti-theft code for the radio, then enter the customer's radio station presets ('99 - 00 models).

# Ignition System

## Component Location Index

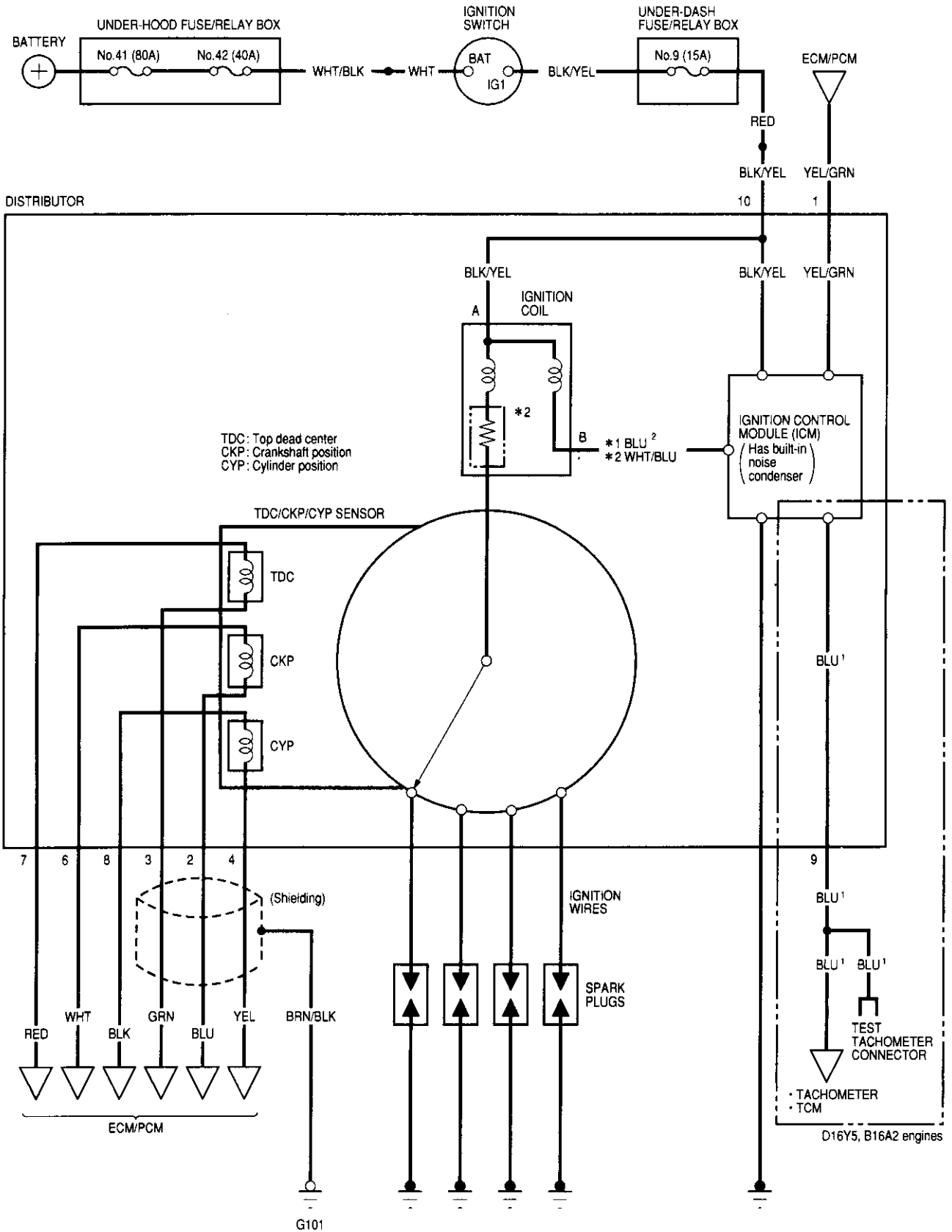
### IGNITION TIMING CONTROL SYSTEM

- Troubleshooting, section 11
- Idle speed Inspection/Adjustment, section 11
- Inspection and Setting, page 23-105



# Ignition System

## Circuit Diagram : '98-00 models



\*1 : HITACHI  
 \*2 : TEC



## Ignition Timing Inspection and Setting

1. Check the idle speed, and adjust it if necessary (see section 11).
2. Pull out the service check connector 2P (BRN and BLK wires) from the connector holder located under the dash on the front passenger side, then connect the SCS service connector (T/N 07PAZ - 0010100) to it.
3. Start the engine. Hold the engine at 3,000 rpm with no load (A/T in **N** or **P**, M/T in neutral) until the radiator fan comes on, then let it idle.
4. Connect the timing light to the No. 1 ignition wire, then point the light toward the pointer on the timing belt cover.
5. Check the ignition timing in no load conditions: headlights, blower fan, rear window defogger, and air conditioner are not operating.

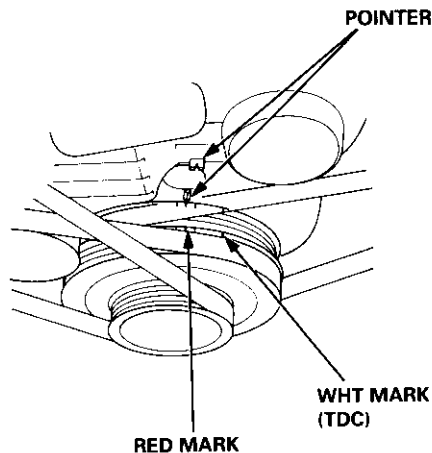
### Ignition Timing:

#### D16Y5, D16Y7, D16Y8 engines

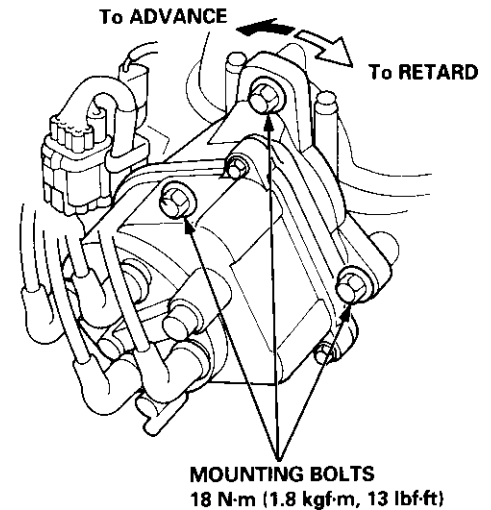
M/T	$12^{\circ} \pm 2^{\circ}$ BTDC (RED) during idling in neutral
A/T	$12^{\circ} \pm 2^{\circ}$ BTDC (RED) during idling in <b>N</b> or <b>P</b>

#### B16A2 engine

M/T	$16^{\circ} \pm 2^{\circ}$ BTDC (RED) during idling in neutral
-----	--



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



7. Tighten the distributor mounting bolts, and recheck the ignition timing.
8. Disconnect the SCS service connector from the service check connector.

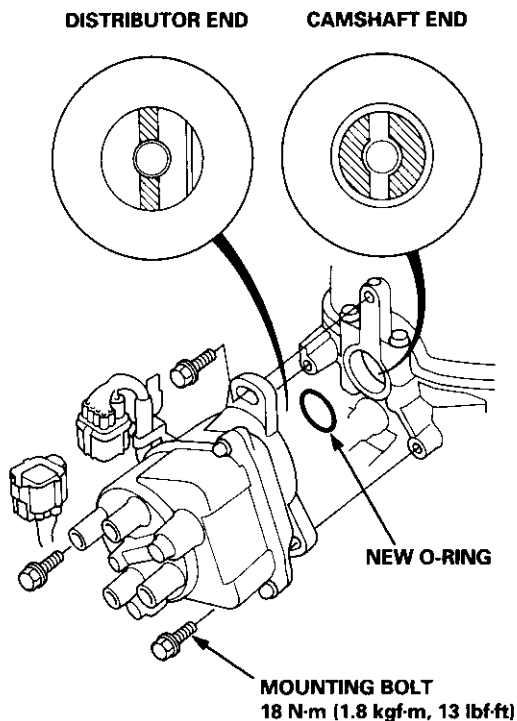


# Ignition System

## Distributor Replacement

### Removal:

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



### Installation:

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

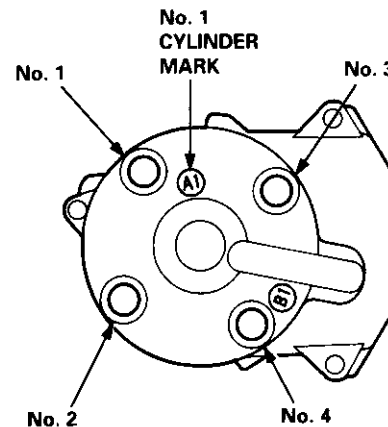
1. Coat a new O-ring with engine oil, then install it.
2. Slip the distributor into position.

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

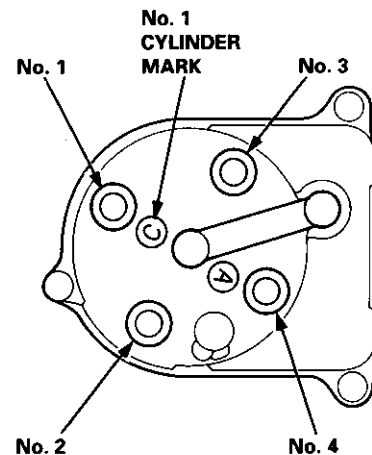
3. Install the mounting bolts, and tighten them lightly.

4. Connect the ignition wires to the distributor ignition (DI) cap as shown.

### HITACHI:



### TEC:

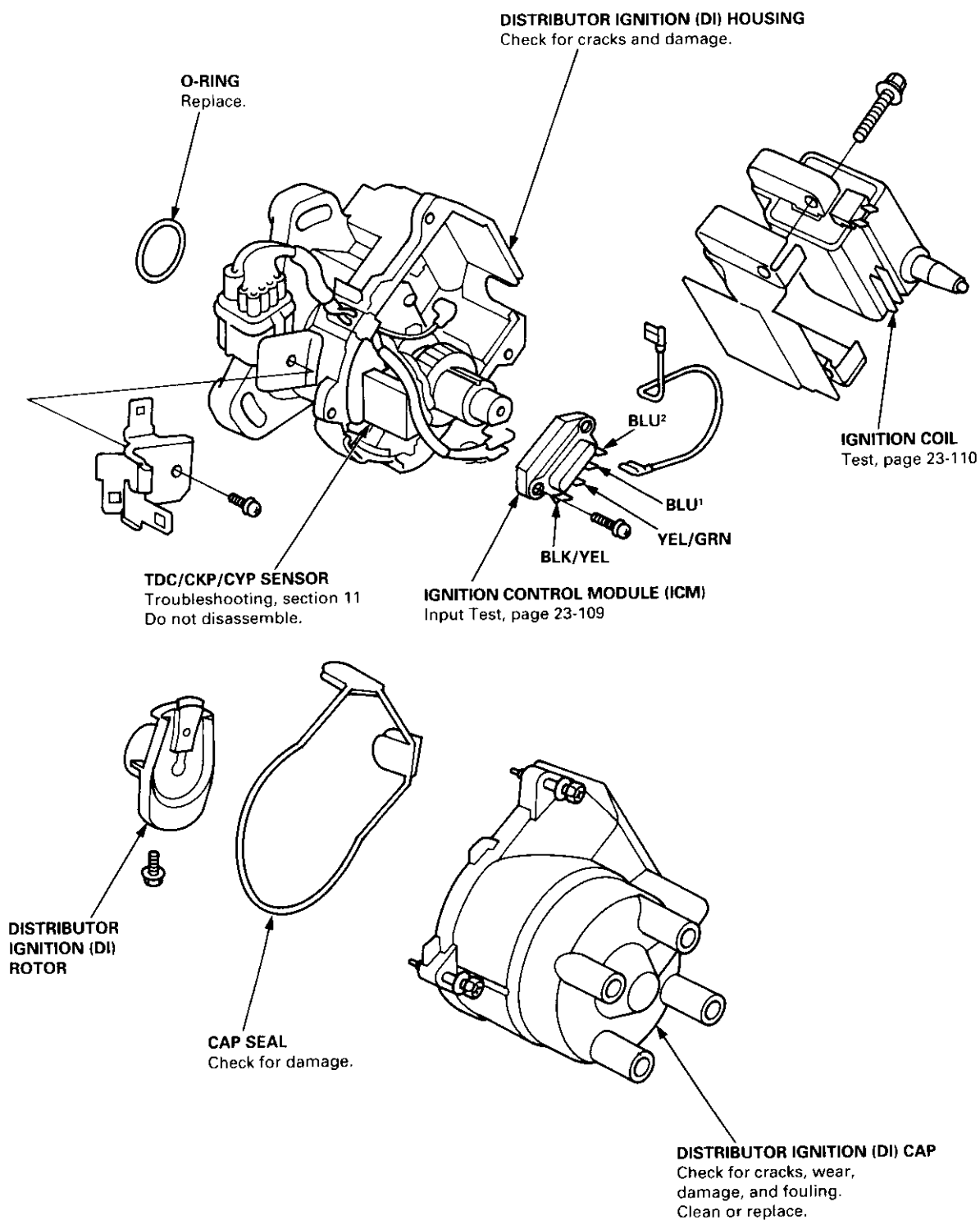


5. Connect the connector to the distributor.
6. Set the ignition timing (see previous page).
7. After setting the ignition timing, tighten the mounting bolts.



## Distributor Overhaul

HITACHI:

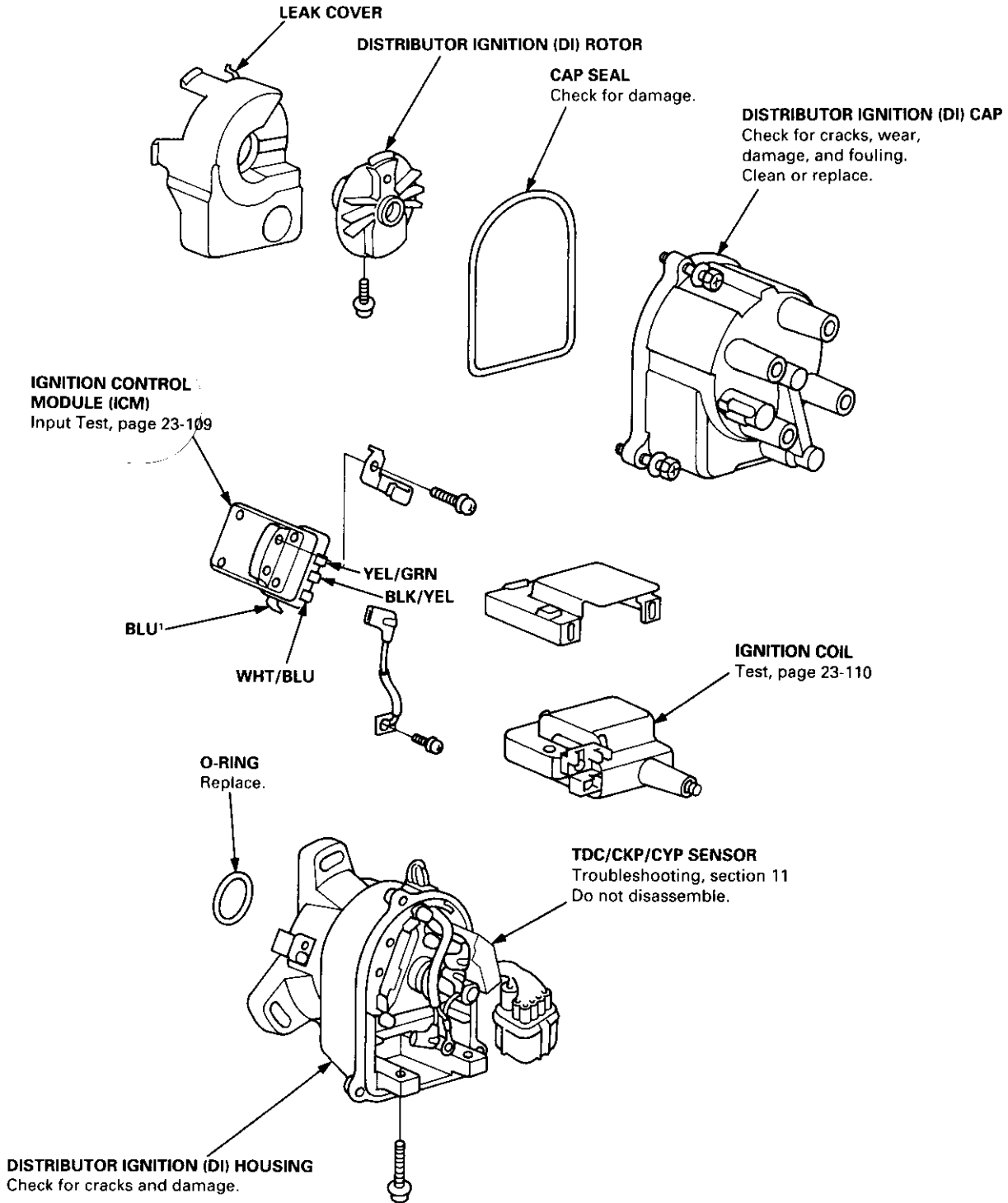


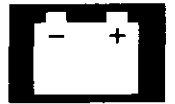
(cont'd)

# Ignition System

## Distributor Overhaul (cont'd)

TEC:





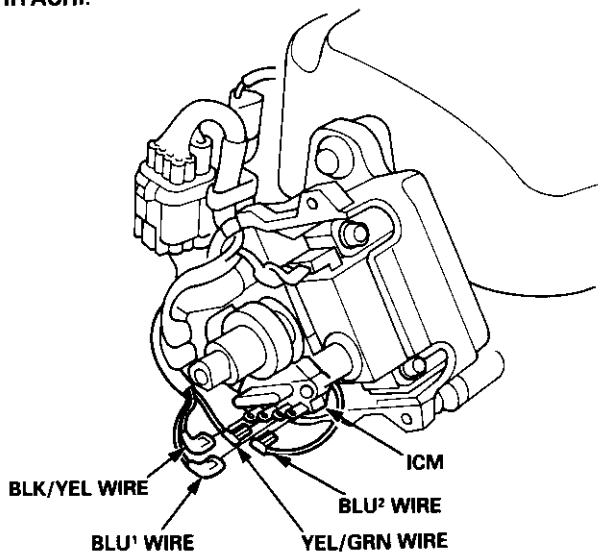
## Ignition Control Module (ICM) Input Test

### NOTE:

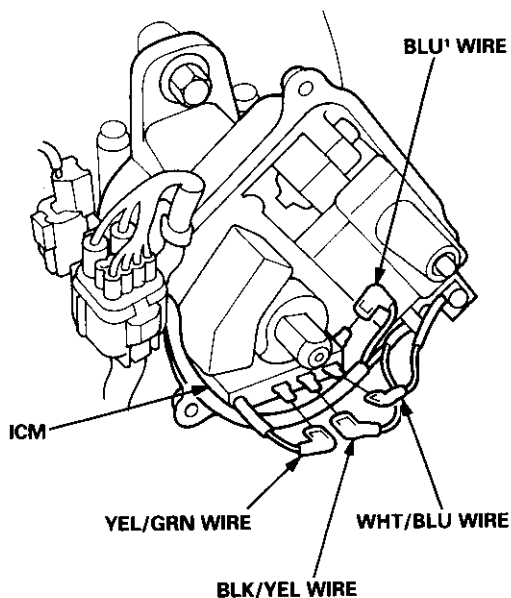
- See section 11 when the malfunction indicator lamp (MIL) turned on.
- Perform an input test for the ignition control module (ICM) after finishing the fundamental tests for the ignition system and the fuel and emissions systems.

1. Remove the distributor ignition (DI) cap, the distributor ignition (DI) rotor and the leak cover (TEC).
2. Disconnect the wires from the ICM.

### HITACHI:



### TEC:



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

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

4. Turn the ignition switch ON (II). Check for voltage between the wire\*1 and body ground. There should be battery voltage.

- If there is no battery voltage, check:
  - the ignition coil.
  - the wire\*1 between the ignition coil and the ICM.
- If there is battery voltage, go to step 5.

\*1: BLU<sup>2</sup> wire (HITACHI)  
WHT/BLU wire (TEC)

5. Disconnect the ECM/PCM connector A (32P). Check for continuity on the YEL/GRN wire between the ECM/PCM and the ICM. There should be continuity.
6. Check for continuity on the YEL/GRN wire to body ground. There should be no continuity.
7. Check for continuity on the BLU<sup>1</sup> wire between the test tachometer connector and the ICM. There should be continuity.
8. Check for continuity on the BLU<sup>1</sup> wire to body ground. There should be no continuity.
9. If all the tests are normal, replace the ICM.

# Ignition System

## Ignition Coil Test

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

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

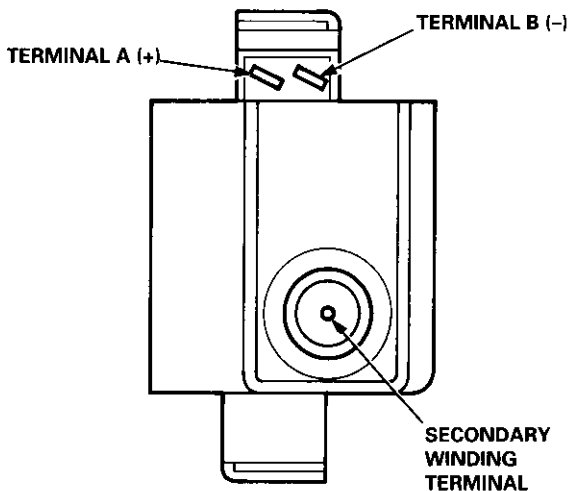
### HITACHI:

**Primary Winding Resistance**  
(Between the A and B terminals):

0.45 – 0.55  $\Omega$

**Secondary Winding Resistance**  
(Between the A and secondary winding terminals):

22.4 – 33.6 k $\Omega$



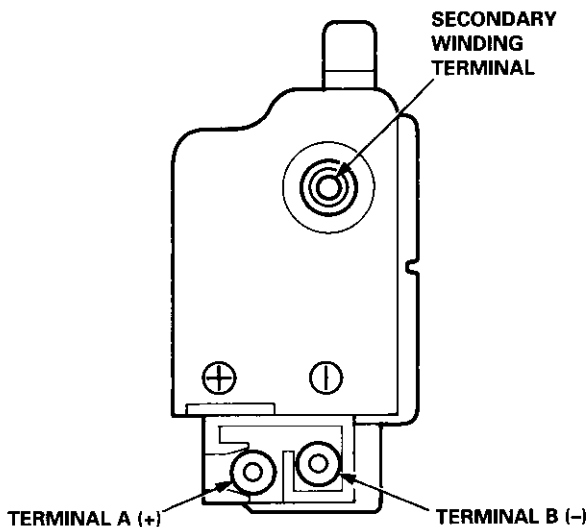
### TEC:

**Primary Winding Resistance**  
(Between the A and B terminals):

0.63 – 0.77  $\Omega$

**Secondary Winding Resistance**  
(Between the A and secondary winding terminals):

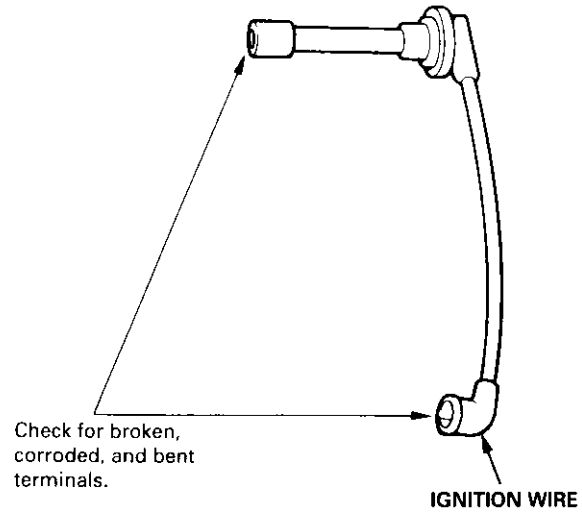
12.8 – 19.2 k $\Omega$



## Ignition Wire Inspection and Test

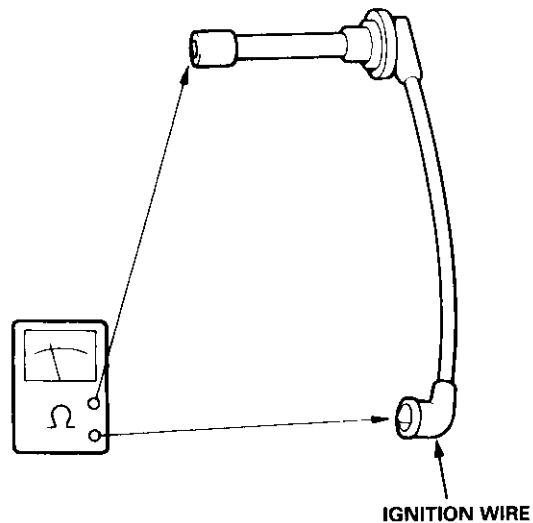
**CAUTION:** Carefully remove the ignition wires by pulling on the rubber boots. Do not bend the wires; you might break them inside.

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



2. Connect ohmmeter probes and measure resistance.

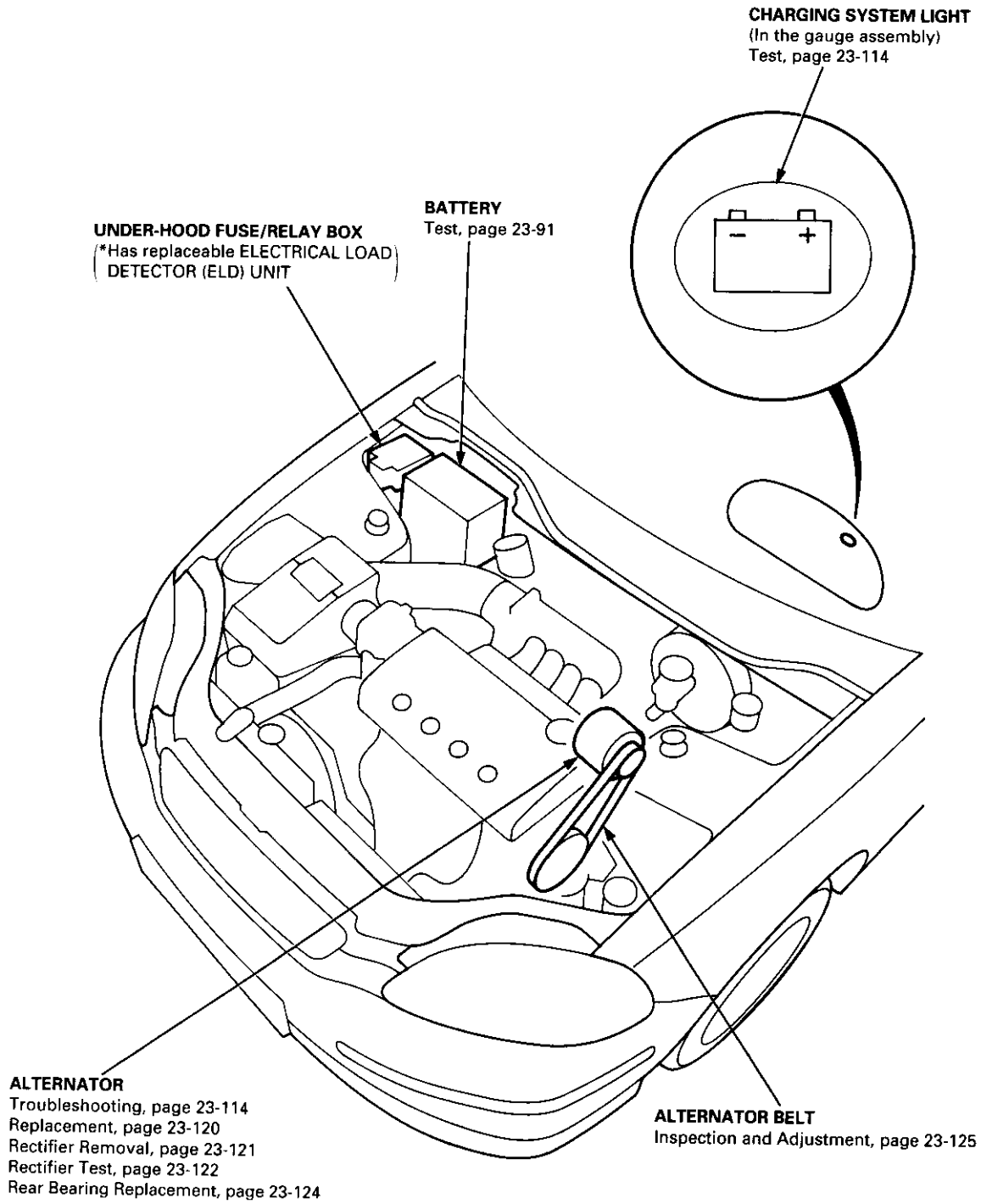
**Ignition Wire Resistance:**  
25 k $\Omega$  max. at 68°F (20°C)



3. If resistance exceeds 25 k $\Omega$ , replace the ignition wire.

# Charging System

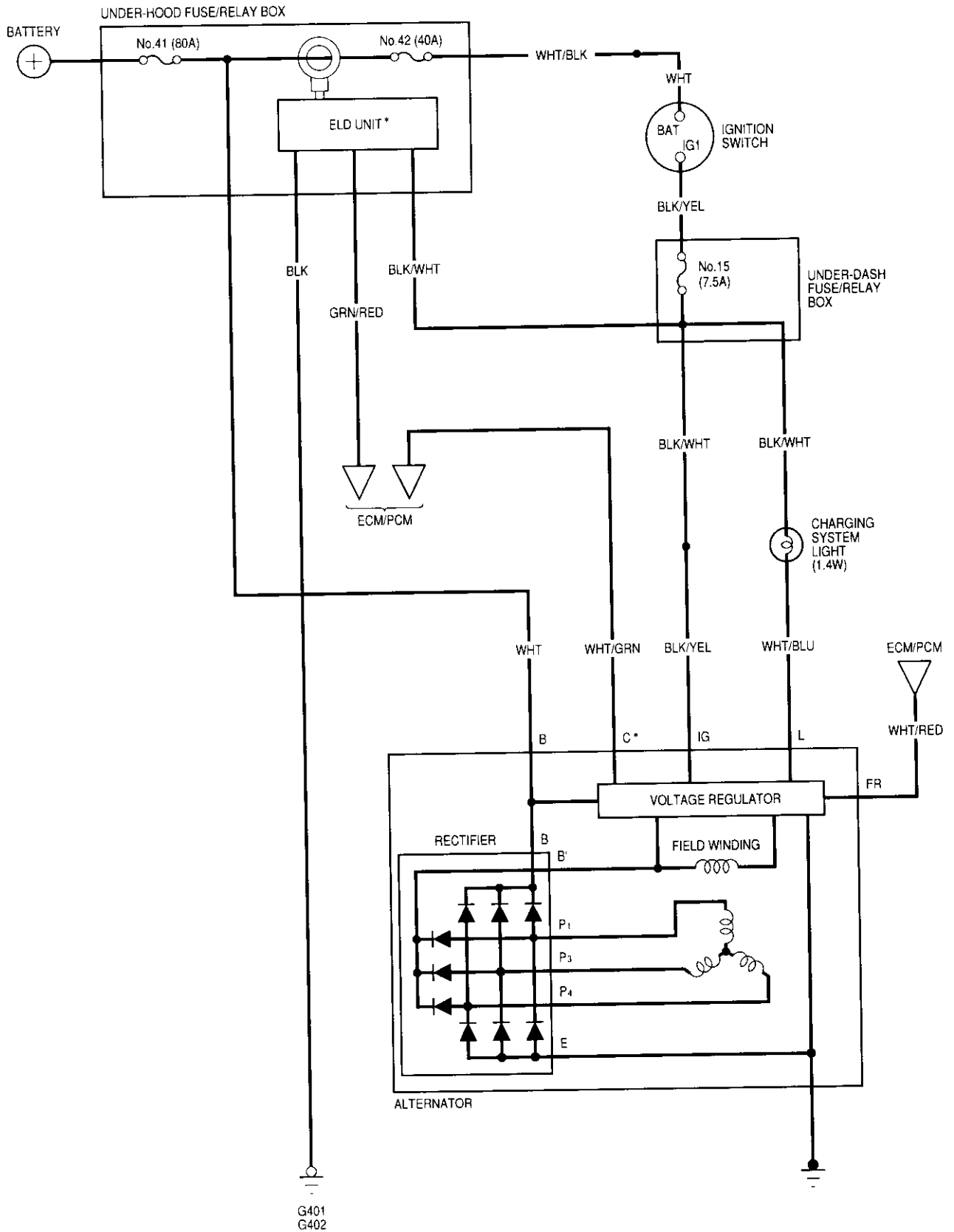
## Component Location Index



\*ELD unit: USA



# Circuit Diagram



\* : USA

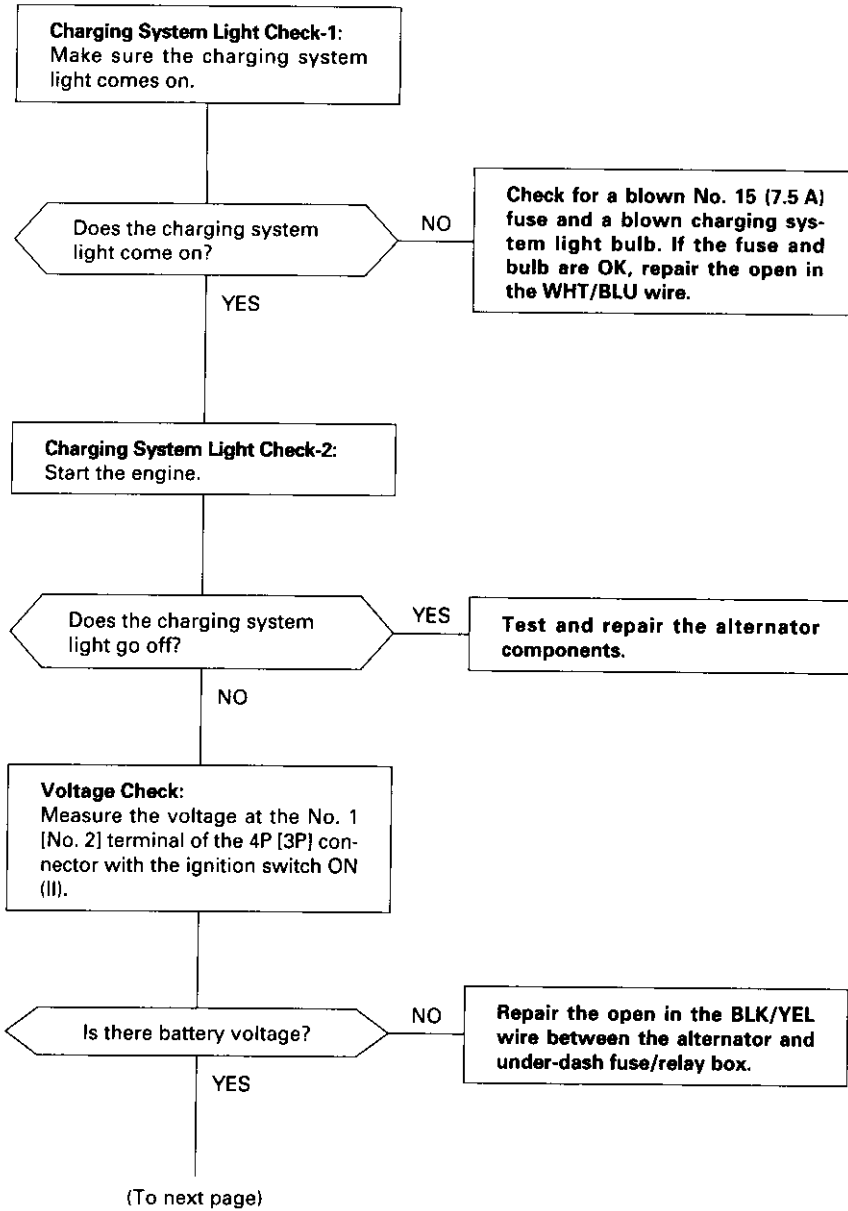
# Charging System

## Troubleshooting

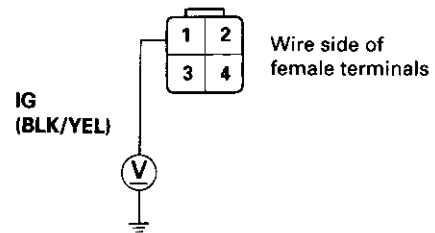
If the charging system light does not come on or does not go off, or the battery is dead or low, test the following items in the order listed below:

1. Battery (see page 23-91)
2. Charging system light
3. Voltage
4. Alternator control system (USA)
5. Alternator/regulator

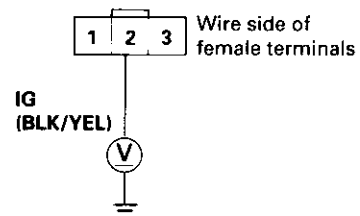
### Charging System Light Test



**ALTERNATOR 4P CONNECTOR (USA)**



**ALTERNATOR 3P CONNECTOR (Canada)**



[ ] : Canada





(From previous page)

**Check for an open in the L circuit-1:**

1. Turn the ignition switch OFF.
2. Disconnect the 4P [3P] connector from the alternator.
3. Ground the No. 3 terminal of the 4P [3P] connector.
4. Turn the ignition switch ON (II).

Does the charging system light come on? **NO** Turn the ignition switch OFF, and repair the open in the WHT/BLU wire.

YES

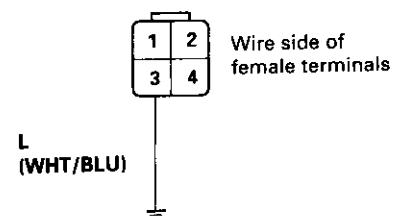
**Check for an open in the L circuit-2:**  
Disconnect the No. 3 terminal of the 4P [3P] connector from the ground.

Does the charging system light go off? **YES** Test and repair the alternator components.

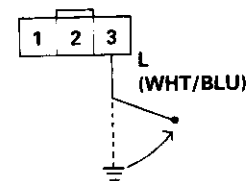
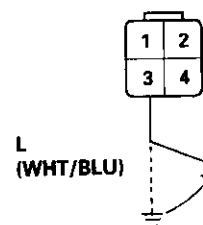
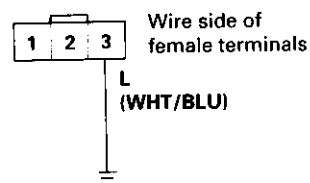
NO

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

### ALTERNATOR 4P CONNECTOR (USA)



### ALTERNATOR 3P CONNECTOR (Canada)



# Charging System

## Troubleshooting (cont'd)

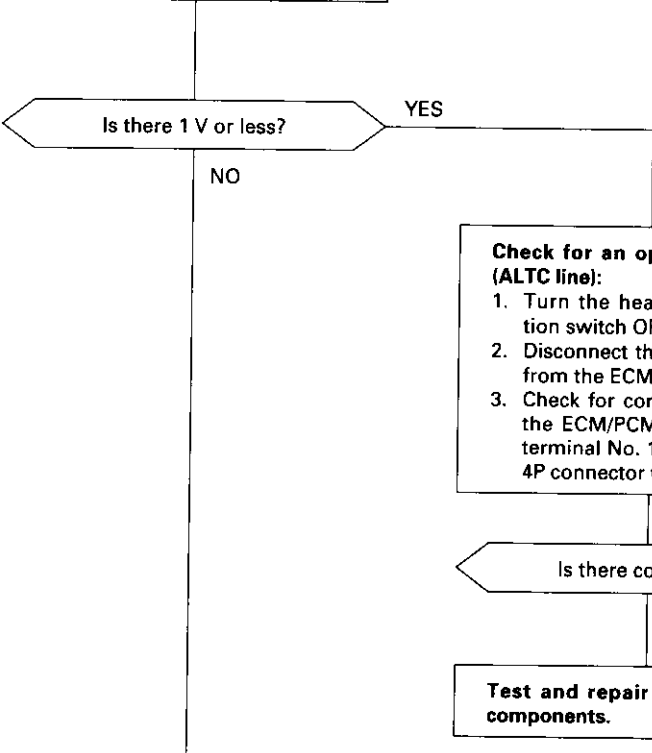
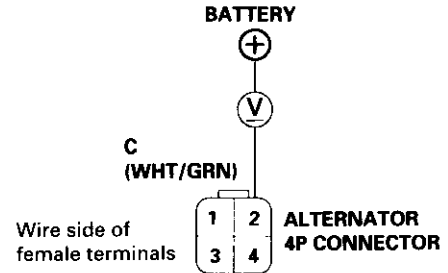
### Alternator Control System Test (USA): '96 - 98 models, '99 - 00 D16Y5 (M/T) engine

NOTE: Before testing, check proper operation of the ELD by confirming with the MIL (see section 11).

**Check for a short in the circuit (ALTC line):**

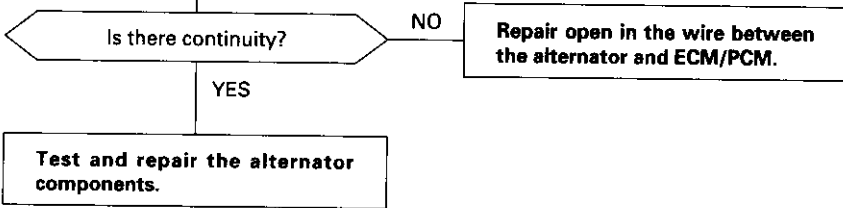
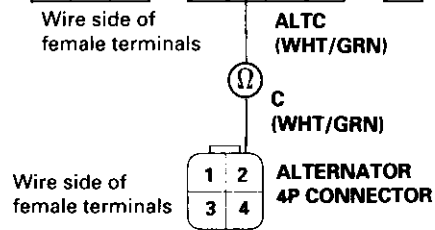
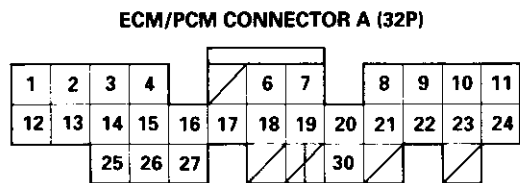
1. Reconnect the 4P connector to the alternator.
2. Start the engine, and turn the headlights (high beam) ON.
3. Measure voltage between the 4P connector terminal No. 2 and the positive terminal of the battery.

**CAUTION:** Be sure to use a voltmeter with its plus terminal connected to battery plus and its minus terminal to the 4P connector terminal No. 2.



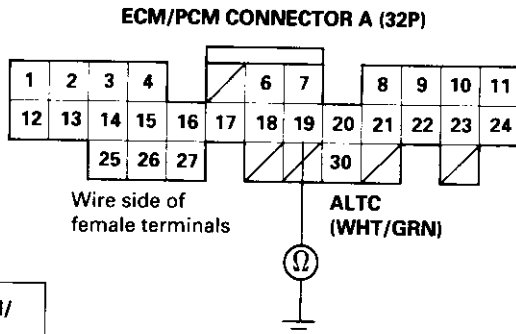
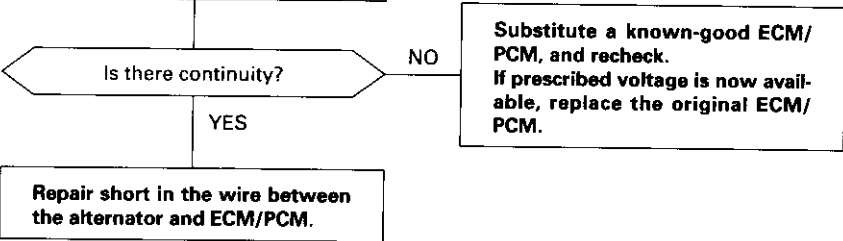
**Check for an open in the wire (ALTC line):**

1. Turn the headlight and ignition switch OFF.
2. Disconnect the 32P connector from the ECM/PCM.
3. Check for continuity between the ECM/PCM 32P connector terminal No. 19 and alternator 4P connector terminal No. 2.



**Check for short in the wire (ALTC line):**

1. Turn the headlight and ignition switch OFF.
2. Disconnect the 32P connector from the ECM/PCM.
3. Check for continuity between the ECM/PCM 32P connector terminal No. 19 and body ground.





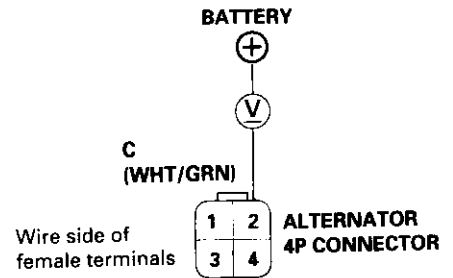
### Alternator Control System Test (USA): '99 - 00 models, except D16Y5 (M/T) engine

NOTE: Before testing, check proper operation of the ELD by confirming with the MIL (see section 11).

**Check for a short in the circuit (ALTC line):**

1. Reconnect the 4P connector to the alternator.
2. Start the engine, and turn the headlights (high beam) ON.
3. Measure voltage between the 4P connector terminal No. 2 and the positive terminal of the battery.

**CAUTION: Be sure to use a voltmeter with its plus terminal connected to battery plus and its minus terminal to the 4P connector terminal No. 2.**



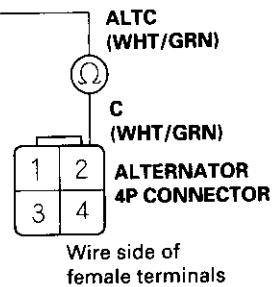
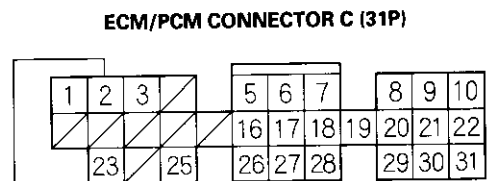
Is there 1 V or less?

YES

NO

**Check for an open in the wire (ALTC line):**

1. Turn the headlight and ignition switch OFF.
2. Disconnect the 31P connector from the ECM/PCM.
3. Check for continuity between the ECM/PCM 31P connector terminal No. 2 and alternator 4P connector terminal No. 2.



Is there continuity?

NO

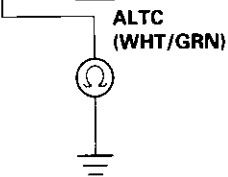
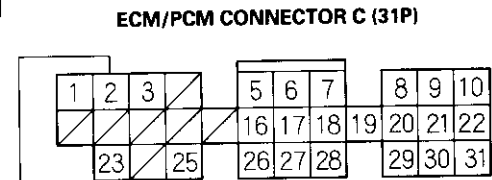
YES

**Repair open in the wire between the alternator and ECM/PCM.**

**Test and repair the alternator components.**

**Check for short in the wire (ALTC line):**

1. Turn the headlight and ignition switch OFF.
2. Disconnect the 31P connector from the ECM/PCM.
3. Check for continuity between the ECM/PCM 31P connector terminal No. 2 and body ground.



Is there continuity?

NO

YES

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

**Repair short in the wire between the alternator and ECM/PCM.**

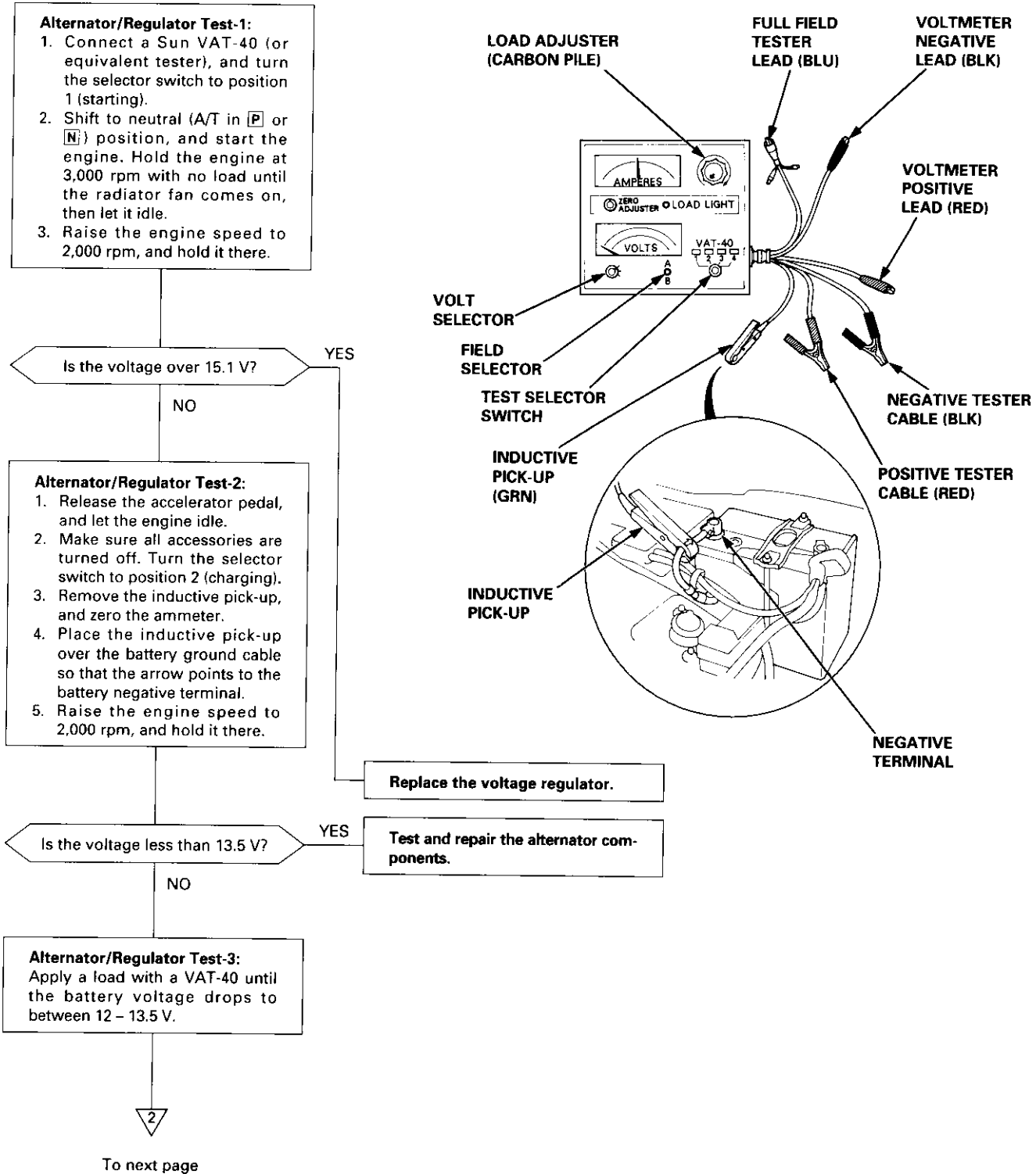
(cont'd)

# Charging System

## Troubleshooting (cont'd)

### Alternator/Regulator Test

NOTE: Make sure the battery is sufficiently charged (see page 23-91).





From previous page

2

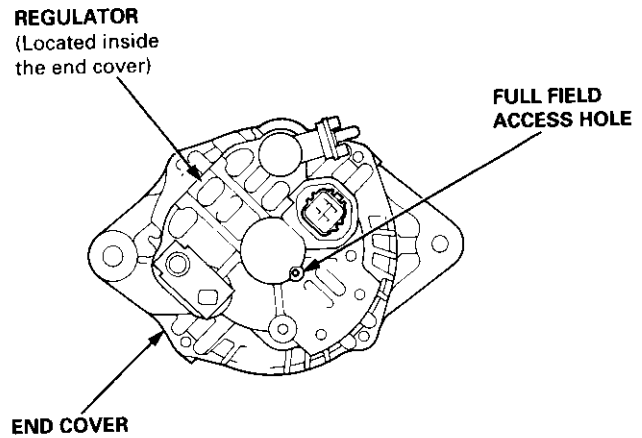
Is the amperage 50 A or more? YES **The charging system is OK.**

NO

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

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

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



Is the alternator output 50 A or more? NO **Test and repair the alternator components.**

YES

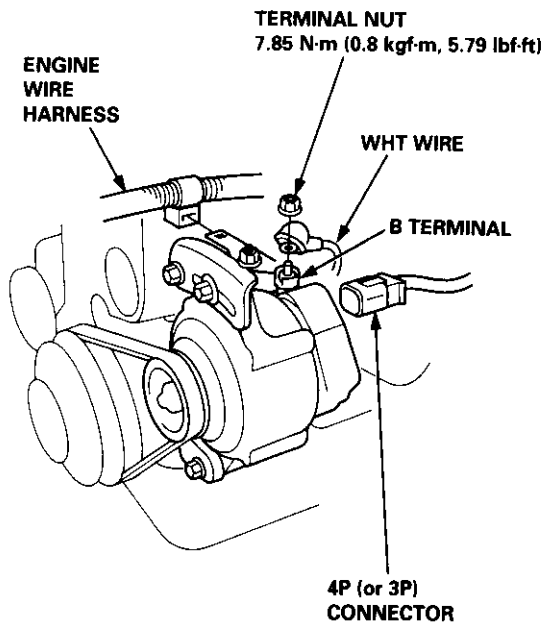
**Replace the voltage regulator.**

# Charging System

## Alternator Replacement

NOTE: Remove the alternator from below the vehicle.

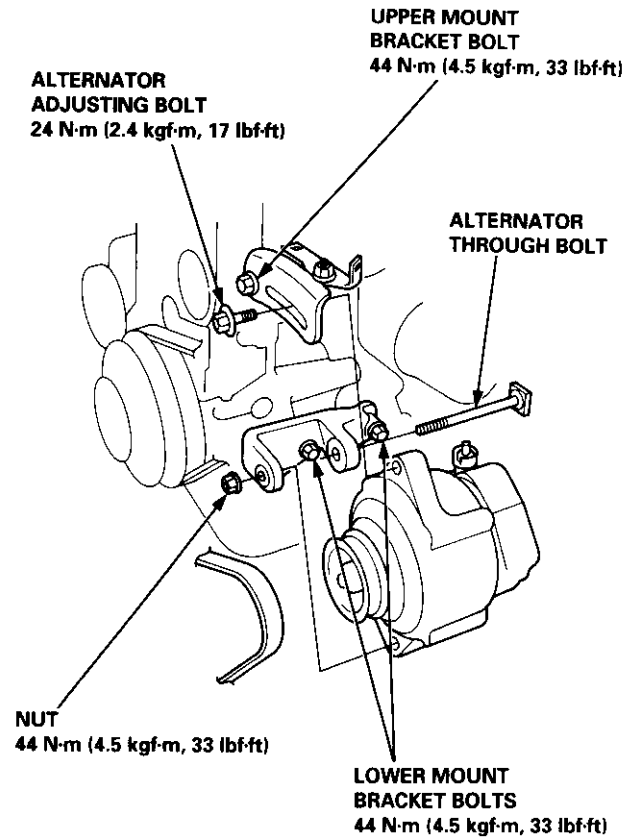
1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Remove the battery negative cable, then disconnect the positive cable.
3. Disconnect the 4P (or 3P) connector from the alternator.



( ): Canada

4. Remove the terminal nut and the WHT wire from the B terminal.

5. Remove the adjusting bolt and through bolt nut, then remove the alternator belt from the pulley.



6. Pull out the alternator through bolt, then remove the alternator.
7. If necessary, remove the mount bracket bolts, and the upper and lower mount brackets.
8. Adjust the alternator belt tension after installation (see page 23-125).
9. Enter the anti-theft code for the radio, then enter the customer's radio station presets ('99 - 00 models).



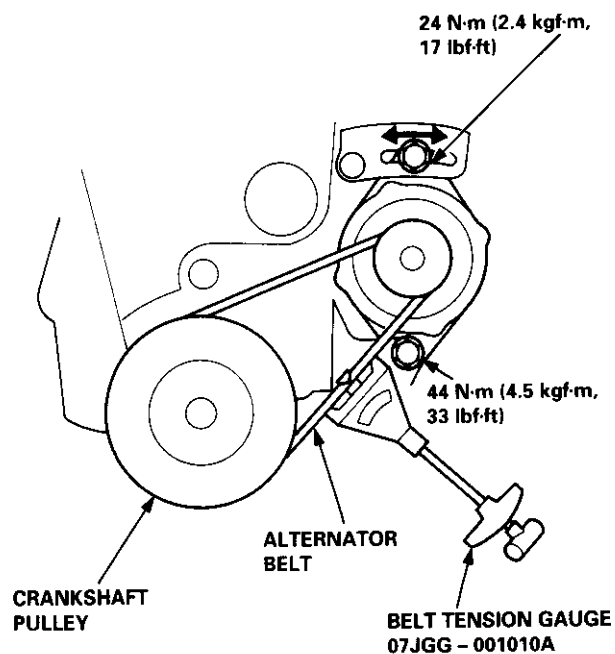
## Alternator Belt Inspection and Adjustment

### Belt Tension Gauge Method:

Following the gauge manufacturer's instructions, attach the special tool to the belt, and measure the tension.

Tension	340 – 490 N (35 – 50 kgf, 77 – 110 lbf)
---------	---

NOTE: On a brand-new belt (one that has been run for less than five minutes), the tension should be 540 – 740 N (55 – 75 kgf, 121 – 165 lbf) when first measured. If the belt is worn or damaged, replace it.

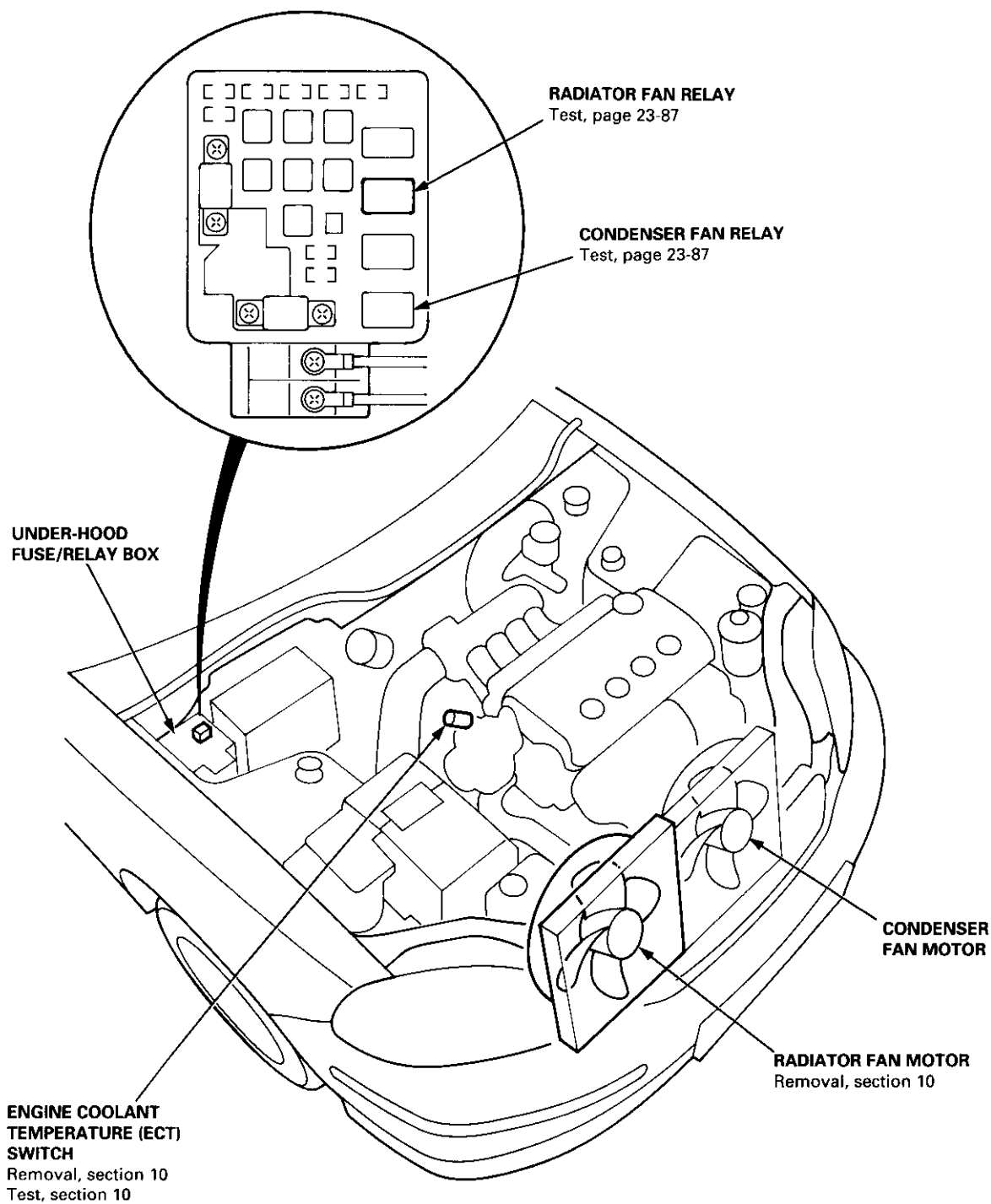


### If adjustment is necessary:

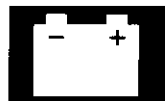
1. Loosen the lower mounting nut and the upper mounting bolt.
2. Move the alternator to obtain the proper belt tension, then retighten the upper mounting bolt and the lower mounting nut to the specified torques.
3. Recheck the tension of the belt.

# Fan Controls

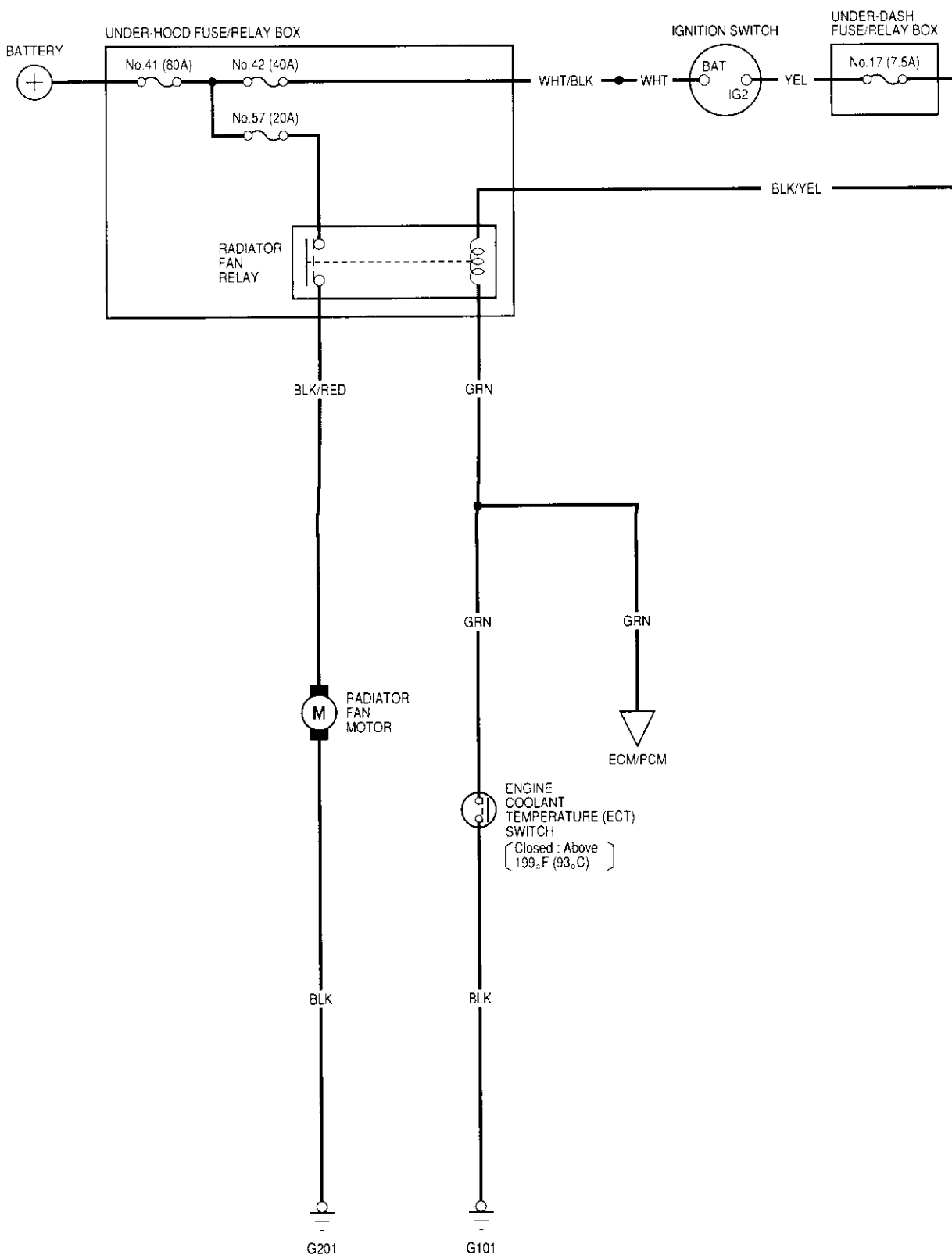
## Component Location Index







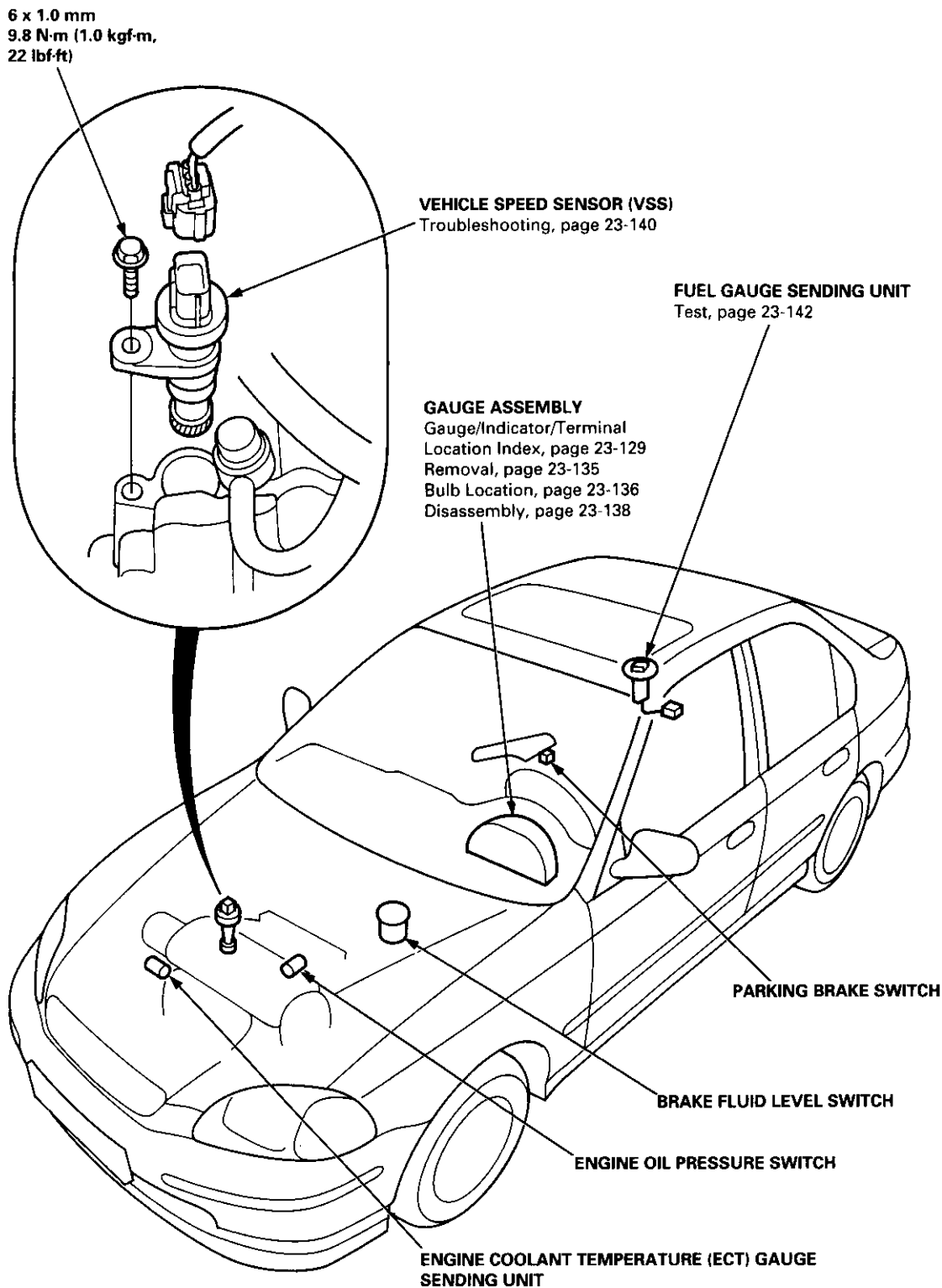
# Circuit Diagram



# Gauge Assembly

## Component Location Index

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

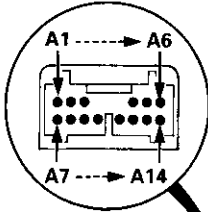


# Gauge Assembly

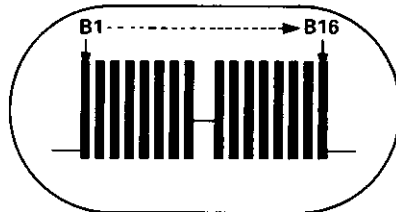
## Gauge/Indicator/Terminal Location Index (cont'd)

Without tachometer:

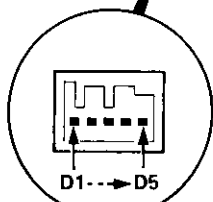
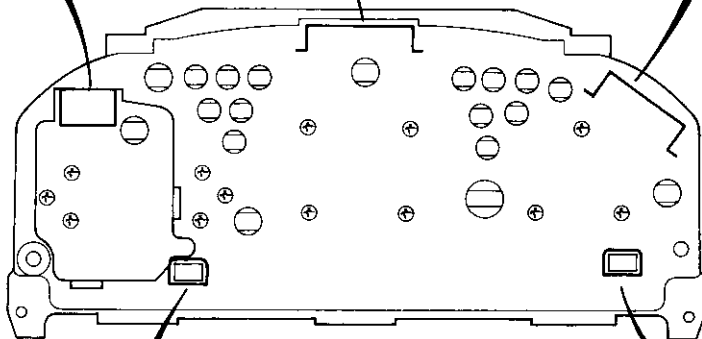
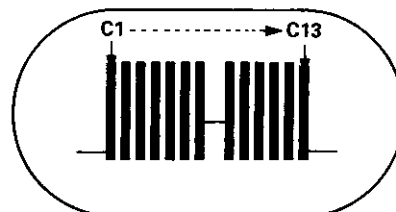
**CONNECTOR "A"**  
(A/T GEAR POSITION INDICATOR)



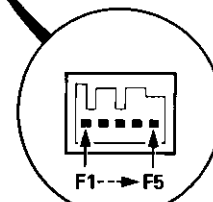
**CONNECTOR "B"**  
(GAUGE and INDICATOR)



**CONNECTOR "C"**  
(GAUGE and INDICATOR)

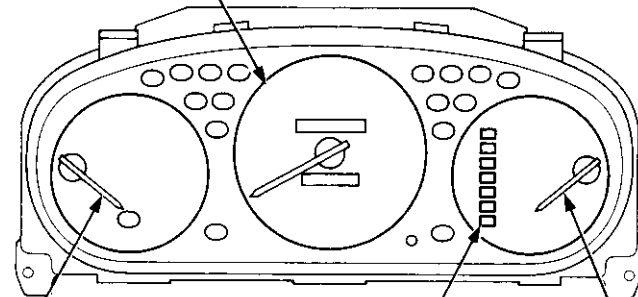


**CONNECTOR "D"**  
(ABS INDICATOR)



**CONNECTOR "F"**  
(SRS INDICATOR)

**SPEEDOMETER:**  
Indicates 60 km/h at 637 rpm or  
60 mph at 1,025 rpm of the  
vehicle speed sensor (VSS).



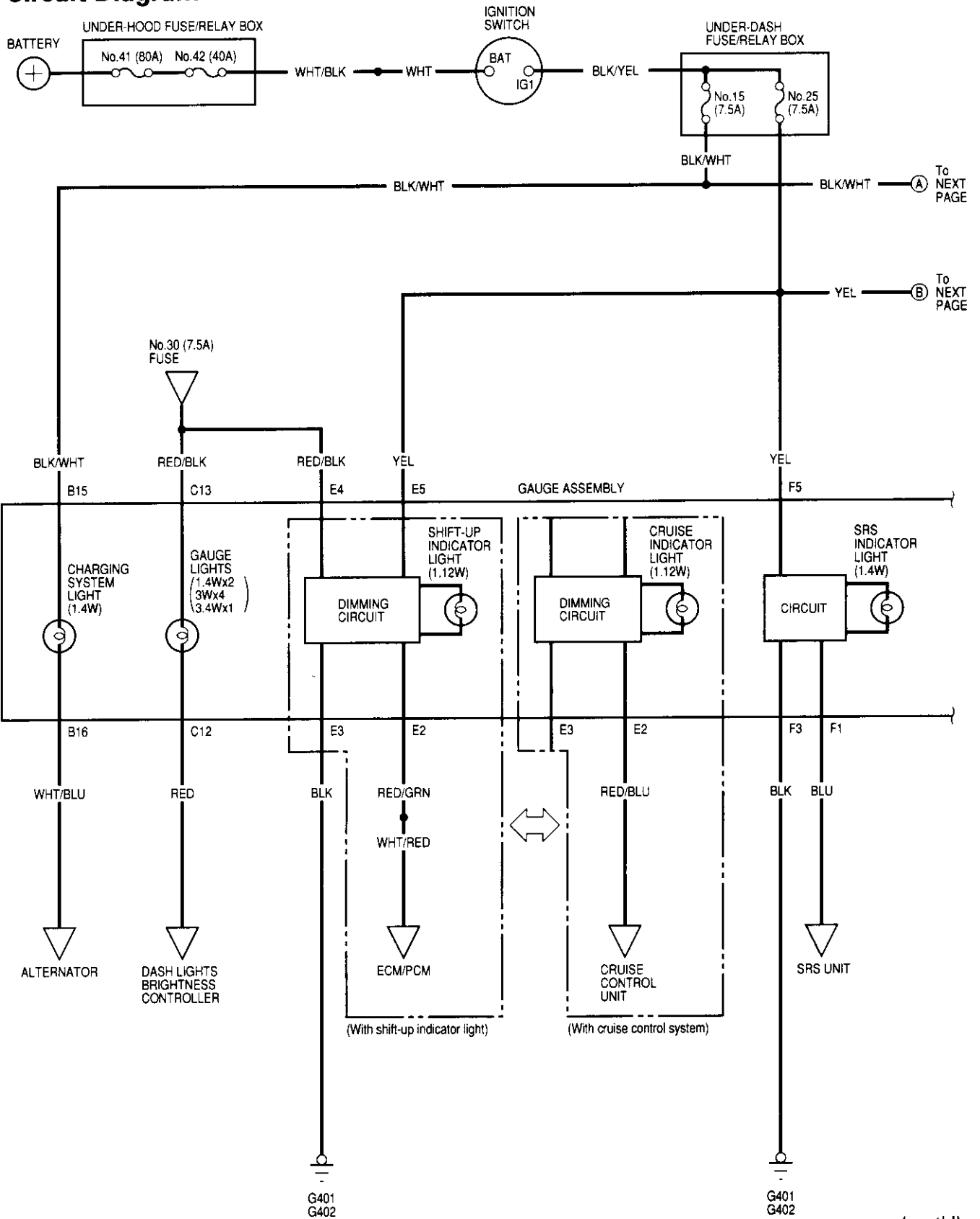
**ENGINE COOLANT TEMPERATURE (ECT) GAUGE**

**A/T GEAR POSITION INDICATOR**  
See page 23-149

**FUEL GAUGE**  
Gauge/Sending Unit Test, page 23-142



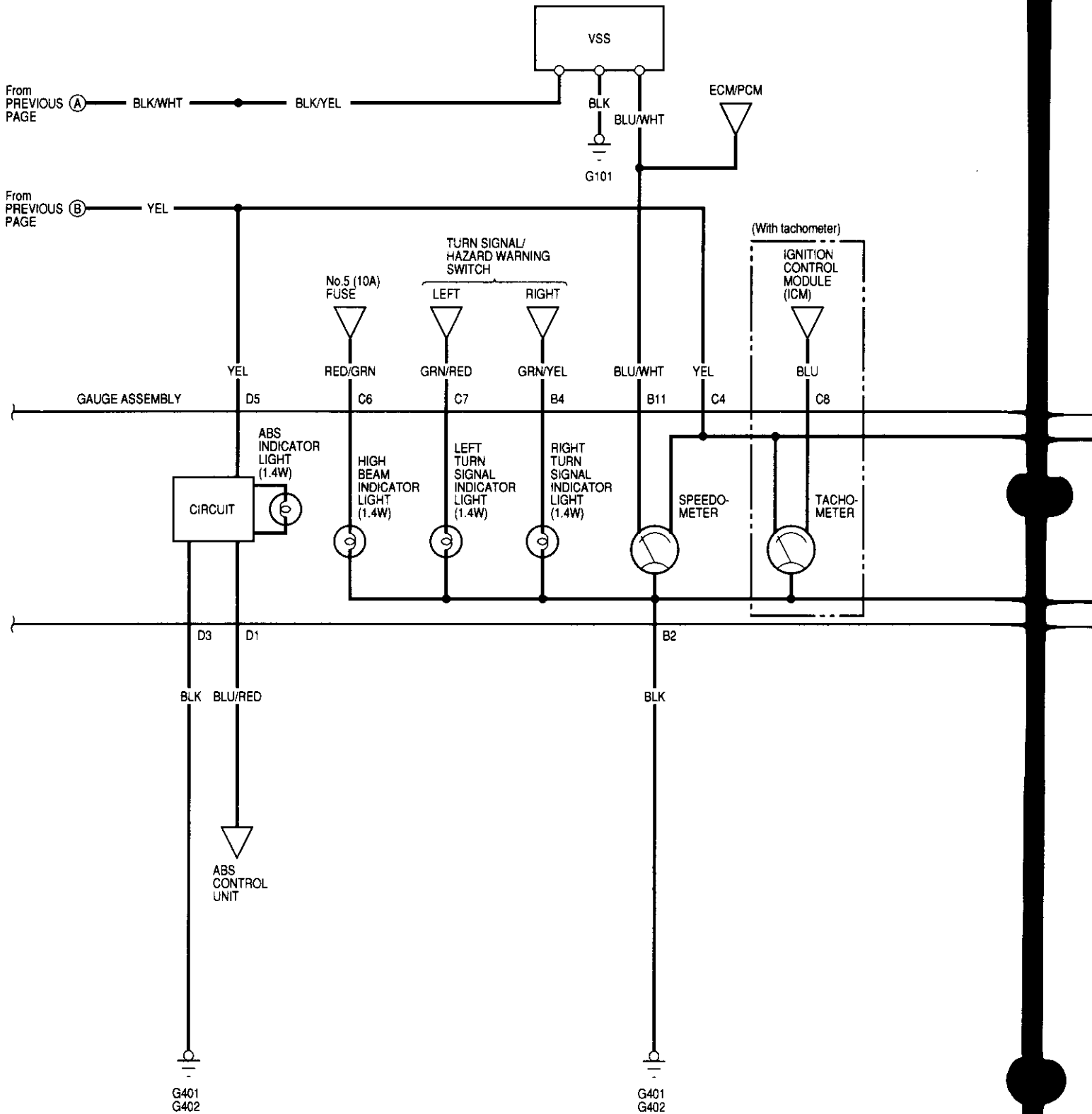
# Circuit Diagram



(cont'd)

# Gauge Assembly

## Circuit Diagram (cont'd)





GAUGE ASSEMBLY

To  
NEXT  
PAGE

ENGINE  
COOLANT  
TEMPERATURE  
(ECT)  
GAUGE



B12  
YEL/GRN



ENGINE  
COOLANT  
TEMPERATURE  
(ECT)  
SENDING UNIT

FUEL  
GAUGE



B10  
YEL/BLK



FUEL  
GAUGE  
SENDING  
UNIT

BLK

G552

LOW FUEL  
INDICATOR  
LIGHT  
(3W)



B8  
GRN/YEL



LOW  
FUEL  
SENSOR

FUEL UNIT

BRAKE  
SYSTEM  
LIGHT  
(1.4W)



B5  
GRN/RED

GRN/RED



TCM

RED/GRN



PARKING  
BRAKE  
SWITCH  
(Closed : Lever up  
Open : Lever down)

GRN/RED



BRAKE  
FLUID  
LEVEL  
SWITCH  
(Closed : Float down  
Open : Float up)

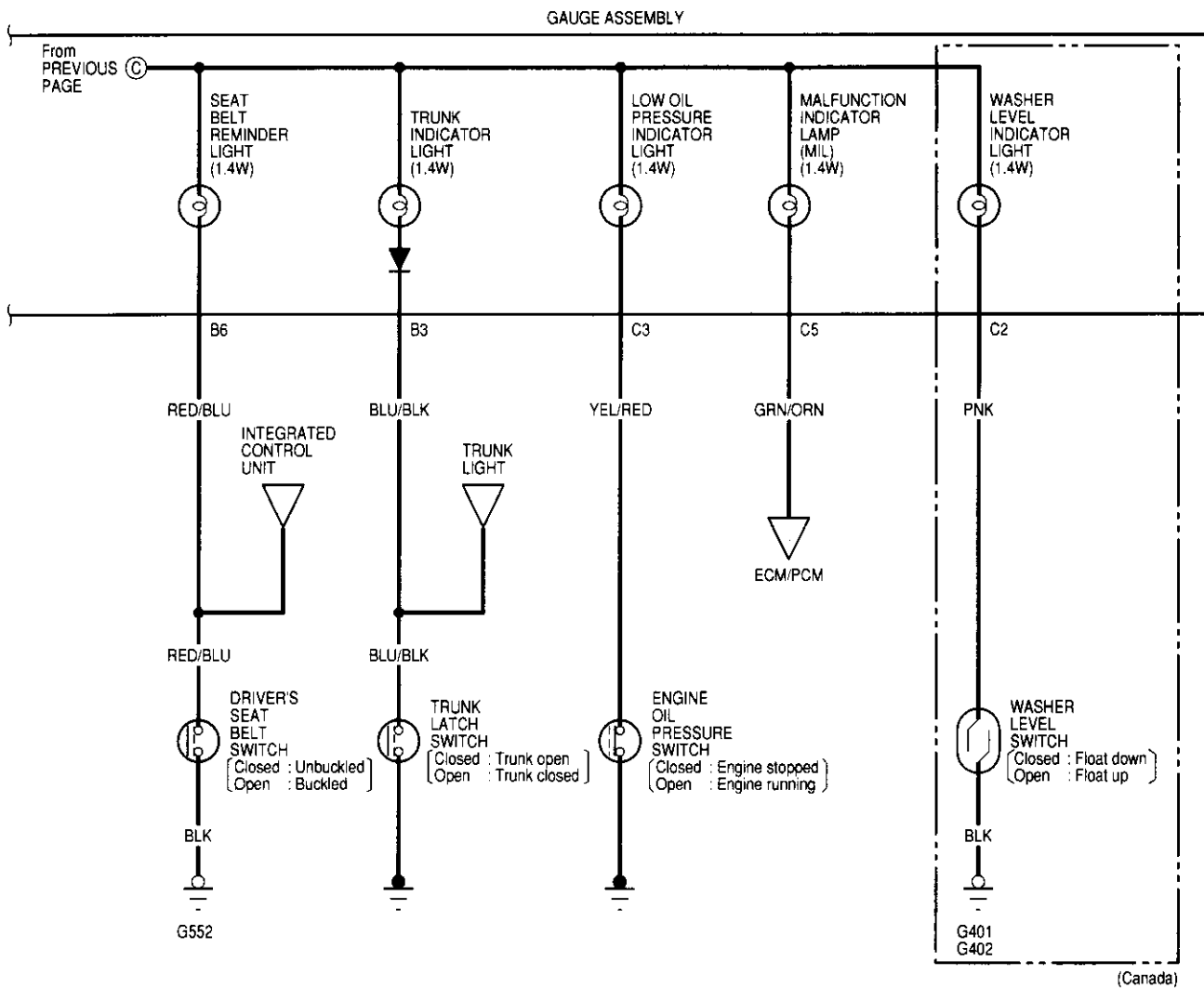
BLK

G401  
G402

(cont'd)

# Gauge Assembly

## Circuit Diagram (cont'd)



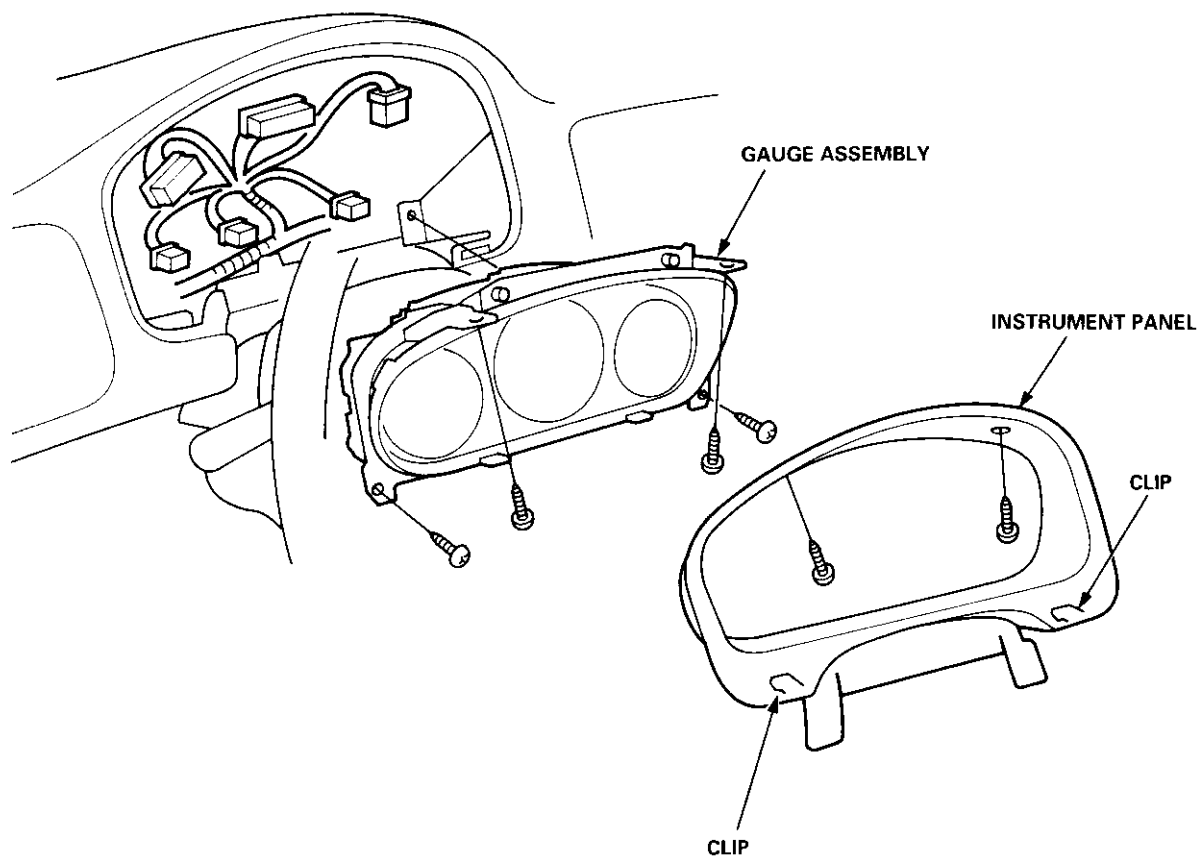


## Removal

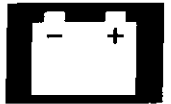
1. Remove the two screws from the instrument panel.
2. Remove the instrument panel.

**CAUTION:** Carefully remove the instrument panel without damaging the clips.

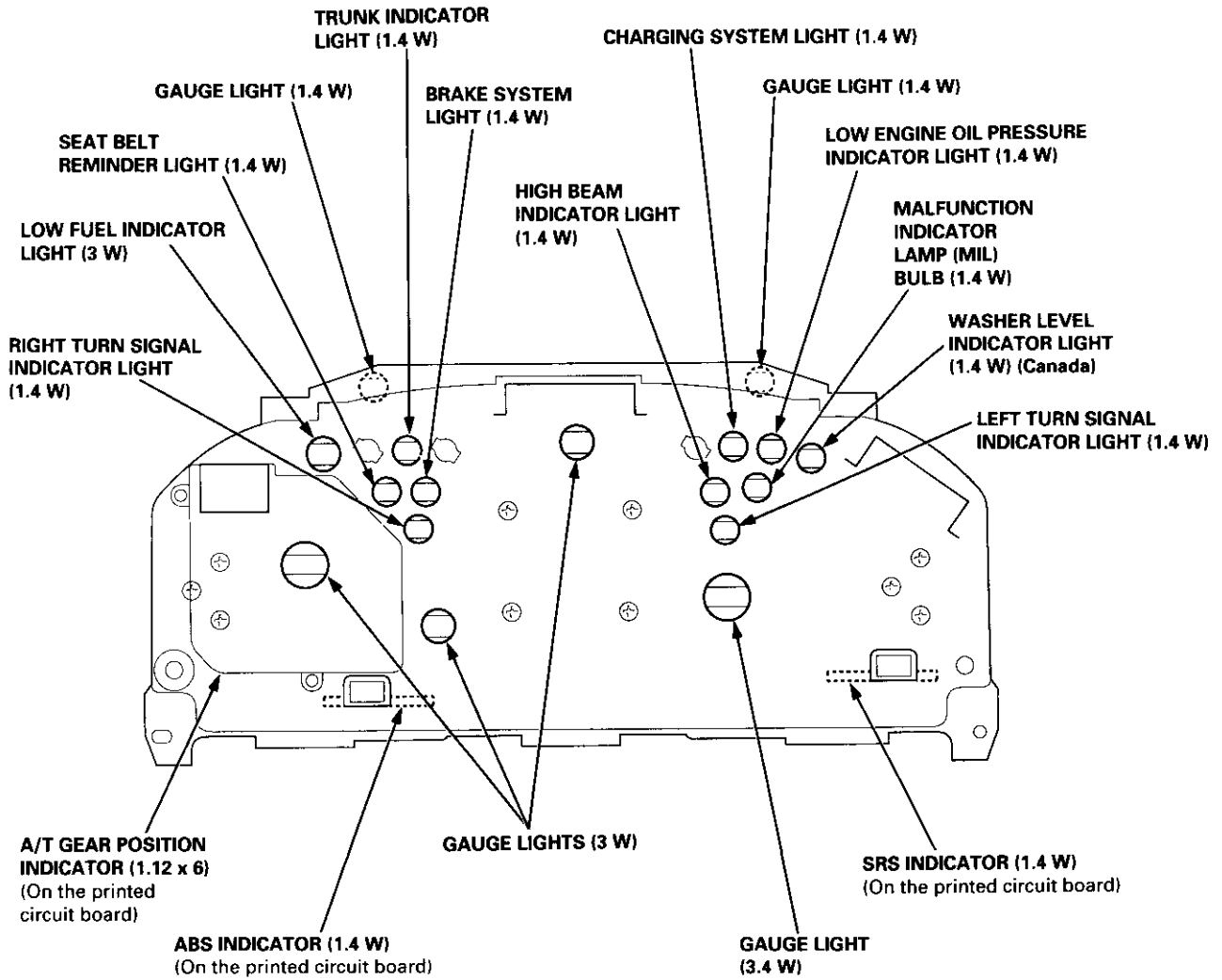
3. Tilt the steering wheel down with the tilt adjustment lever.
4. Spread a protective cloth over the steering column.
5. Remove the four mounting screws from the gauge assembly.
6. Pry the gauge assembly out, and disconnect all connectors from it.
7. Take out the gauge assembly.







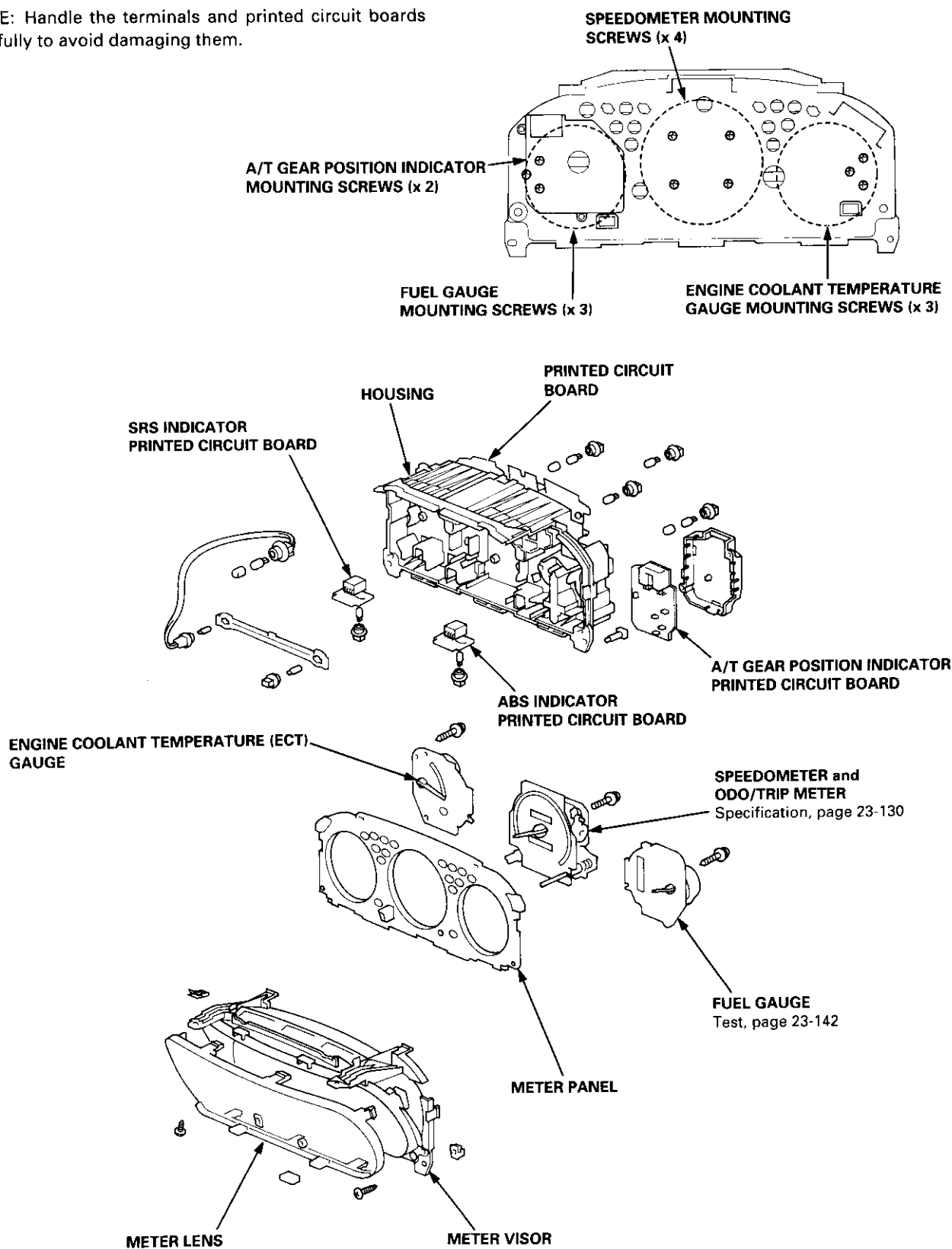
## Bulb Locations (Without Tachometer)





## Disassembly (Without Tachometer)

NOTE: Handle the terminals and printed circuit boards carefully to avoid damaging them.



# Vehicle Speed Sensor (VSS)

## Troubleshooting

Before testing, inspect the No. 15 (7.5 A) fuse in the under-dash fuse/relay box.

### Test the BLK wire:

1. Disconnect the 3P connector from the vehicle speed sensor (VSS).
2. Connect the test harness (07LAJ - PT30200) only to the engine wire harness.
3. Connect the RED test harness clip to the positive probe of a ohmmeter.
4. Check for continuity between the RED test harness clip and body ground.

TEST HARNESS  
07LAJ - PT3020A

RED TEST HARNESS  
CLIP

PROTECTIVE  
TAPE

VSS

Is there continuity?

NO

Repair open in the BLK wire  
between the VSS and G101.

YES

### Test the BLK/YEL wire:

1. Connect the WHT test harness clip to the positive probe of a voltmeter, and connect the RED test harness clip to the negative probe.
2. Turn the ignition switch ON (II).

GRN TEST HARNESS  
CLIP

TEST HARNESS  
07LAJ - PT3020A

RED TEST HARNESS  
CLIP

PROTECTIVE  
TAPE

VSS

Is there battery voltage?

NO

Repair open in the BLK/YEL wire  
between the VSS and the under-  
dash fuse/relay box.

YES

A

(To next page)

WHT TEST HARNESS CLIP



(From previous page)

**Test the BLU/WHT wire:**  
 Connect the GRN test harness clip to the positive probe of a voltmeter, and connect the RED test harness clip to the negative probe.

Is there about 5 V or more ?

NO  
 Repair open in the BLU/WHT wire between the VSS and ECM/PCM, TCM (CVT), and cruise control unit.

YES

**Test the VSS:**  
 1. Turn the ignition switch OFF.  
 2. Connect the other test harness connector to the VSS.  
 3. Raise the front of the vehicle, and support it with safety stands.  
 4. Put the vehicle in neutral with the ignition switch ON (II).  
 5. Slowly rotate one wheel with the other wheel blocked.

Does voltage pulse from 0 to approx. 5 V or more ?

NO  
 Replace the VSS.

YES

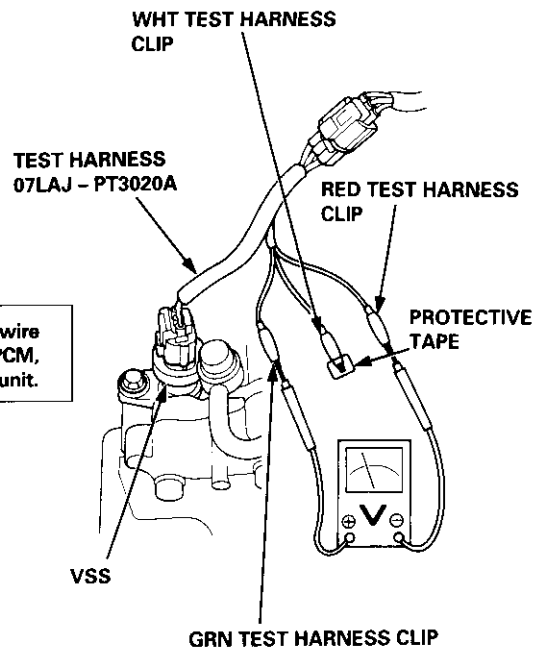
**Speedometer Test:**  
 1. Disconnect the 16P connector "B" from the gauge assembly.  
 2. Touch a probe to the BLU/WHT wire, and connect it to body ground through a voltmeter.  
 3. Slowly rotate one wheel with the other wheel blocked.

Does the meter indicate pulsing voltage?

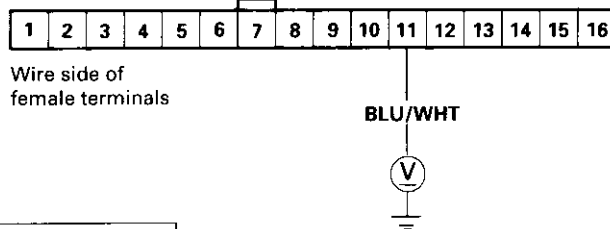
NO  
 Repair open in the BLU/WHT wire between the VSS and the speedometer.

YES

Replace the speedometer.



GAUGE ASSEMBLY 16P CONNECTOR "B"



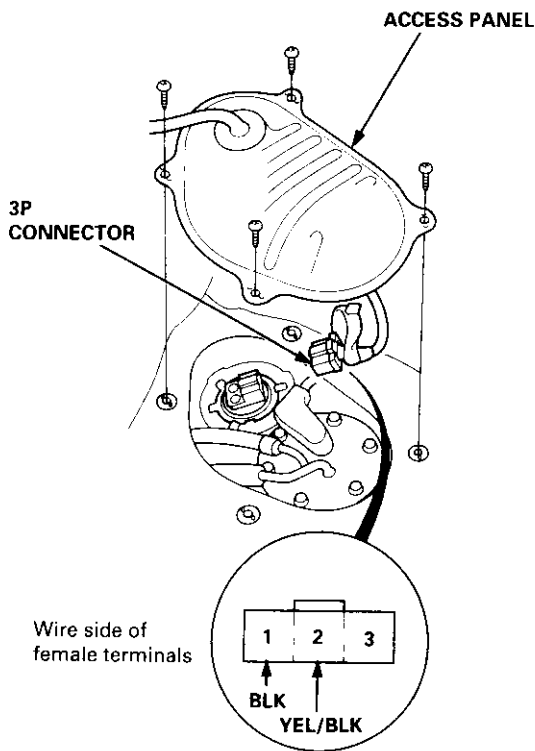
# Fuel Gauge

## Gauge/Sending Unit Test

**▲ WARNING** Do not smoke while working on the fuel system. Keep open flame away from your work area.

NOTE: Refer to page 23-133 for the fuel gauge system circuit.

1. Check the No. 25 (7.5 A) fuse in the under-dash fuse/relay box before testing.
2. Remove the access panel from the floor.



3. Disconnect the 3P connector from the fuel gauge sending unit.
4. Connect the voltmeter positive probe to the No. 2 terminal and the negative probe to the No. 1 terminal, then turn the ignition switch ON (II). There should be between 5 and 8 V.
  - If the voltage is as specified, go to step 5.
  - If the voltage is not as specified, check for:
    - an open in the YEL/BLK or BLK wire.
    - poor ground (G552).
5. Turn the ignition switch OFF.
6. Attach a jumper wire between the No. 1 and No. 2 terminals, then turn the ignition switch ON (II).

7. Check that the pointer of the fuel gauge starts moving toward the "F" mark.

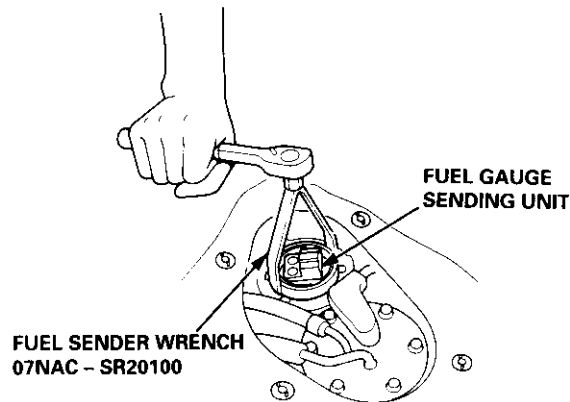
**CAUTION:** Turn the ignition switch OFF before the pointer reaches "F" on the gauge dial. Failure to do so may damage the fuel gauge.

NOTE: The fuel gauge is a bobbin (cross-coil) type, hence the fuel level is continuously indicated even when the ignition switch is OFF, and the pointer moves more slowly than that of a bimetal type.

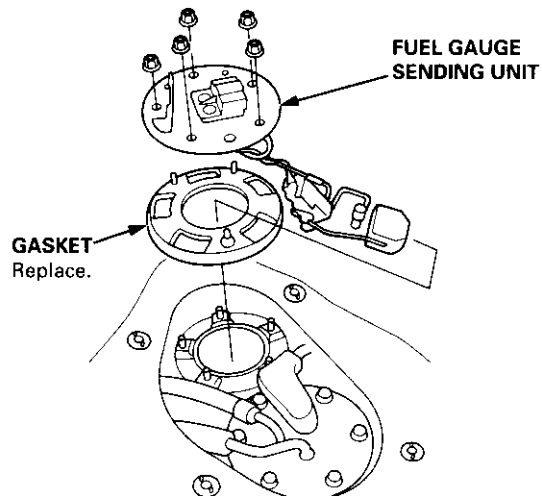
- If the pointer of the fuel gauge does not move at all, replace the gauge.
- If the gauge is OK, inspect the fuel gauge sending unit.

8. Remove the fuel gauge sending unit as shown.

Japan-produced



USA, Canada-produced





## Low Fuel Indicator Light Test

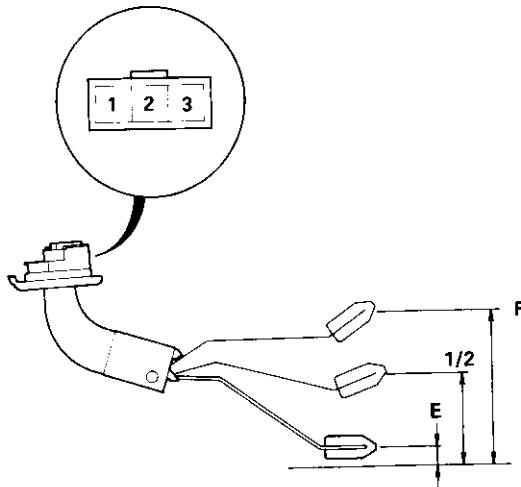
9. Measure the resistance between the No. 1 and No. 2 terminals at E (EMPTY), 1/2 (HALF FULL) and F (FULL) by moving the float.

USA, Canada-produced (Ceramic board type):

Float Position	E	1/2	F
Resistance ( $\Omega$ )	105 - 108	29.5 - 35.5	3.5 - 5

Japan-Produced (Wire-wound type):

Float Position	E	1/2	F
Resistance ( $\Omega$ )	105 - 110	25.5 - 39.5	2 - 5

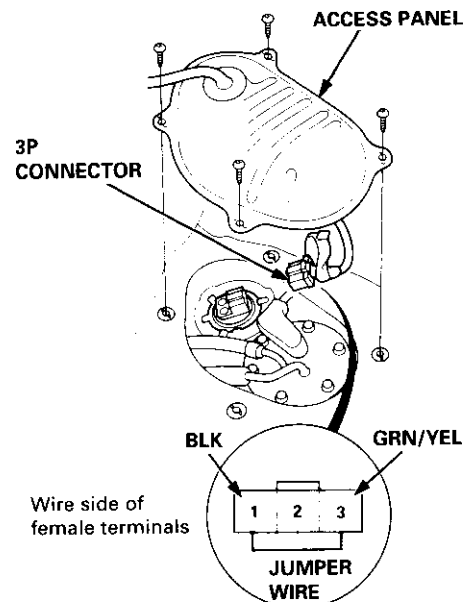


Top of the workbench (Bottom of the fuel tank)

If the resistance readings are beyond the range, replace the fuel gauge sending unit.

NOTE: For the low fuel indicator circuit diagram, refer to the gauge assembly circuit diagram (see page 23-231).

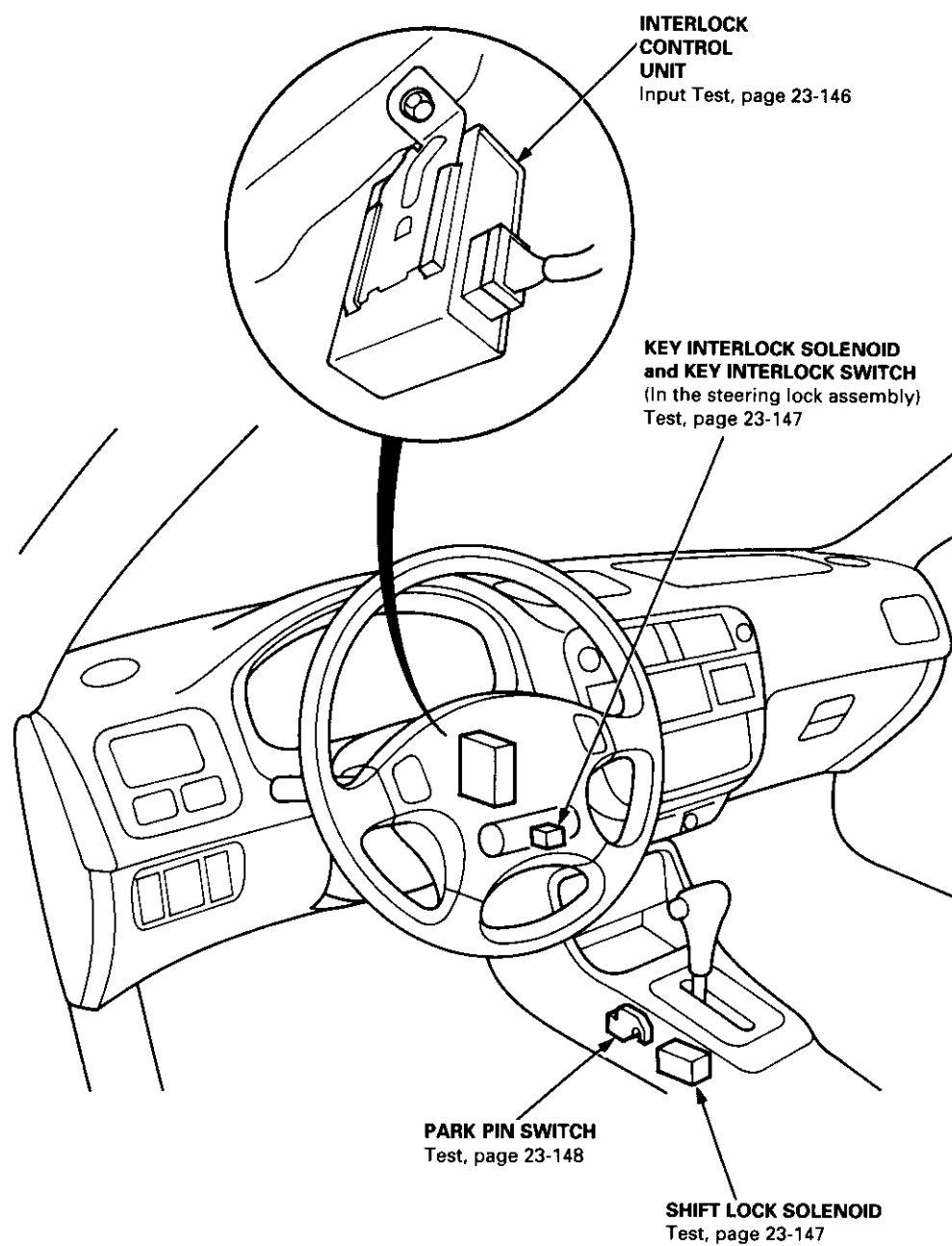
1. Check the No. 25 (7.5 A) fuse in the driver's under-dash fuse/relay box before testing.
2. Park the vehicle on level ground.
3. Drain the fuel into an approved container. Reinstall the fuel tank drain bolt with a new washer.
4. Add less than 4L (1.1 U.S. Gal, 0.9 Imp. Gal) of fuel, and turn the ignition switch ON (II). The low fuel indicator light should come on within four minutes.
  - If the light comes on within four minutes, go to step 8.
  - If the light does not come on within four minutes, go to step 5.
5. Remove the access panel from the floor.
6. Turn the ignition switch OFF, then disconnect the fuel tank sending unit 3P connector.
7. Connect the fuel tank sending unit 3P terminals No. 1 and No. 3 with a jumper wire.
  - If the light comes on, replace the fuel gauge sending unit (see page 23-142).
  - If the light does not come on, check for:
    - An open in the GRN/YEL wire between the fuel gauge sending unit and the fuel gauge.
    - A blown bulb.
    - A poor ground (G552)

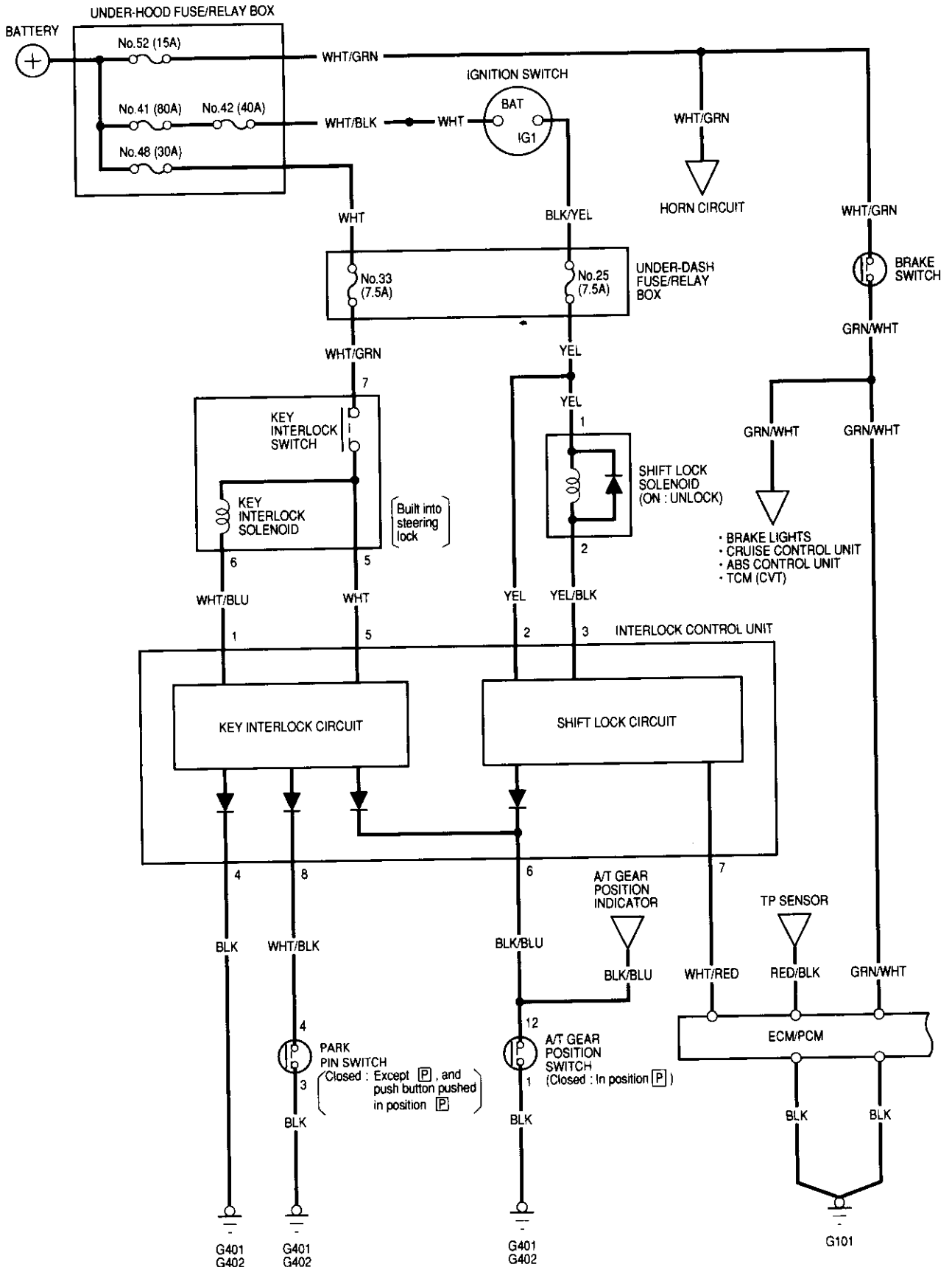


8. Add 4L (1.1 U.S. Gal, 0.9 Imp. Gal) of fuel. The light should go off within four minutes.

# Interlock System

## Component Location Index





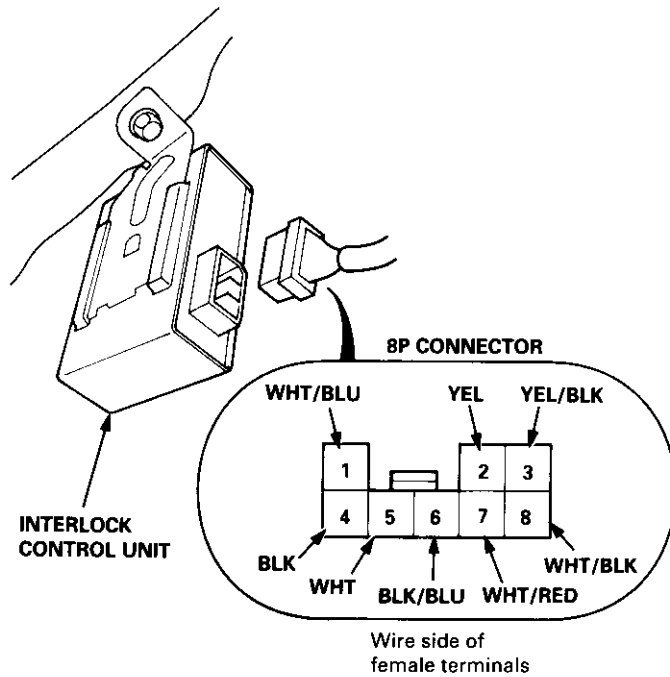


# Interlock System

## Control Unit Input Test

1. Disconnect the 8P connector from the interlock 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 a test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, substitute a known-good control unit, and recheck the system. If the check is OK, the control unit must be faulty; replace it.

**NOTE:** If the shift lock solenoid clicks when the ignition switch is turned ON (II) and you step on the brake pedal (with the shift lever in **P**), the shift lock system is electronically normal; if the shift lever cannot be shifted from **P**, test the A/T gear position switch, park pin switch, and see section 14.



### Key Interlock System:

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained	
1	WHT/BLU	Ignition switch turned to ACC (I) and key pushed in	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 48 (30 A) fuse in the underhood fuse/relay box</li> <li>• Blown No. 33 (7.5 A) fuse in the underdash fuse/relay box</li> <li>• Faulty steering lock assembly (key interlock solenoid)</li> <li>• An open in the wire</li> </ul>	
5	WHT				
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.		<ul style="list-style-type: none"> <li>• Poor ground (G401, G402)</li> <li>• An open in the wire</li> </ul>
6	BLK/BLU	Shift lever in <b>P</b>	Check for continuity to ground: There should be continuity.		<ul style="list-style-type: none"> <li>• Poor ground (G401, G402)</li> <li>• Faulty A/T gear position switch</li> <li>• An open in the wire</li> </ul>

Reconnect the 8P connector to the interlock control unit.

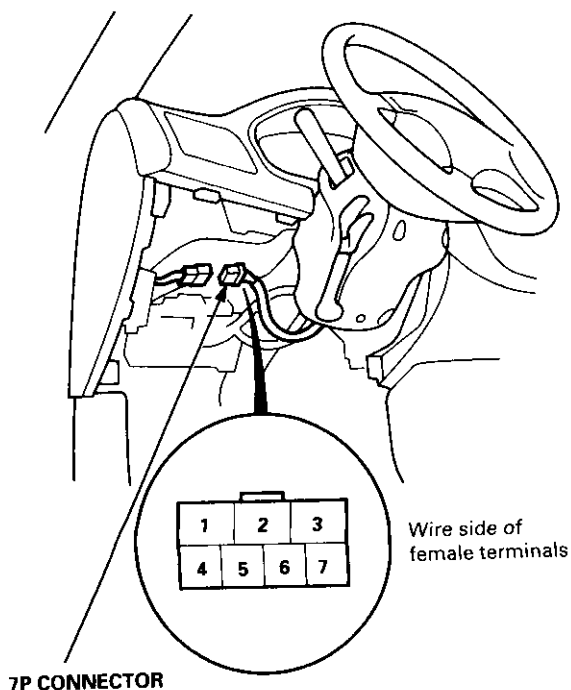
### Shift Lock System:

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
2	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 25 (7.5 A) fuse in the underdash fuse/relay box</li> <li>• An open in the wire</li> </ul>
3	YEL/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 25 (7.5 A) fuse in the underdash fuse/relay box</li> <li>• Faulty shift lock solenoid</li> <li>• An open in the wire</li> </ul>
6	BLK/BLU	Shift lever in <b>P</b>	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Poor ground (G401, G402)</li> <li>• Faulty A/T gear position switch</li> <li>• An open in the wire</li> </ul>
7	WHT/RED	Ignition switch ON (II) Brake pedal depressed	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Blown No. 52 (15 A) fuse in the underhood fuse/relay box</li> <li>• Faulty PCM</li> <li>• Faulty brake switch (see section 11)</li> <li>• Faulty throttle position (TP) sensor (see section 11)</li> <li>• An open in the wire</li> </ul>
		Ignition switch ON (III) Brake pedal and accelerator depressed at the same time	Check for voltage to ground: There should be battery voltage.	



## Key Interlock Solenoid Test

1. Remove the driver's dashboard lower cover and knee bolster (see section 20).
2. Disconnect the 7P connector from the main wire harness.



3. Check for continuity between the terminals in each key position according to the table.

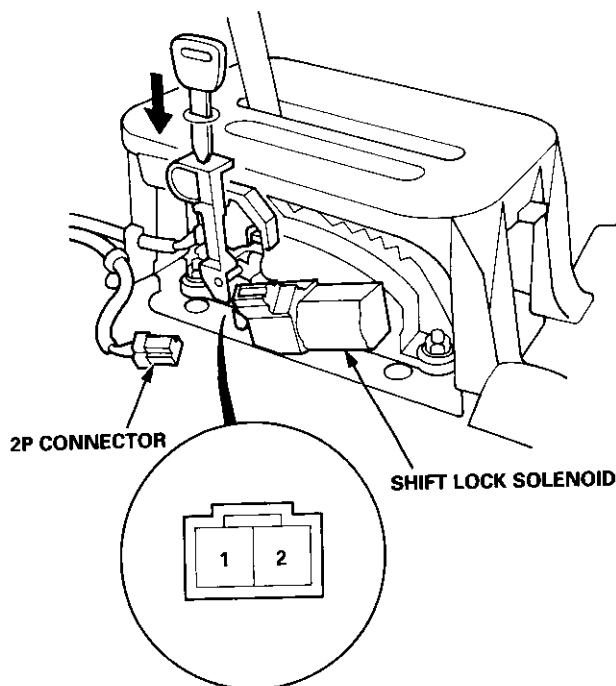
		Terminal		
Position		5	6	7
Ignition switch ACC (I)	Key pushed in	○—○—○		
	Key released	○—○		

4. Check that the key cannot be removed with power and ground connected to the No. 7 and No. 6 terminals.
  - If the key cannot be removed, the key interlock solenoid is OK.
  - If the key can be removed, replace the steering lock assembly (the interlock solenoid is not available separately).

## Shift Lock Solenoid Test

1. Remove the front console (see section 20).
2. Disconnect the shift lock solenoid 2P connector.
3. Connect battery power to the No. 1 terminal and ground to the No. 2 terminal of the solenoid momentarily.

NOTE: Do not connect power to the No. 2 (-) terminal (reverse polarity) or you will damage the diode inside the solenoid.

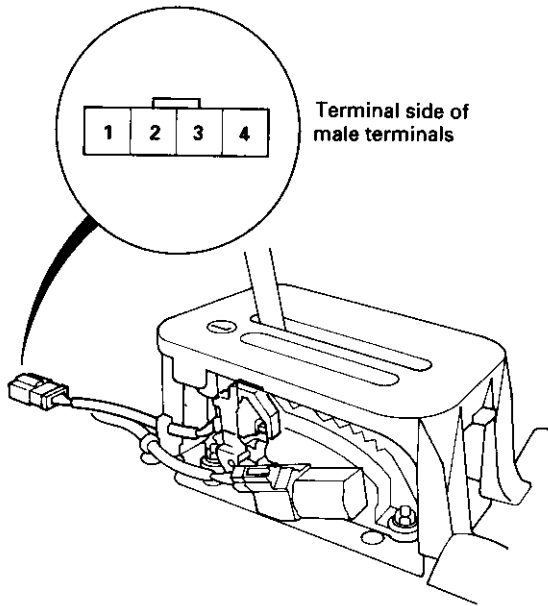


4. Check that the shift lock releases when the release lever is pushed, and check that it locks when the release lever is released.
5. If the solenoid does not work, replace the solenoid.

# Interlock System

## Park Pin Switch Test

1. Remove the front console (see section 20).
2. Disconnect the 4P connector from the park pin switch.
3. Check for continuity between the No. 3 and No. 4 terminals with:
  - the shift lever any position other than **P**, or
  - the push button pushed in **P**.There should be continuity.
4. Check for continuity between the No. 3 and No. 4 terminals with the shift lever in **P** and the push button released. There should be no continuity. If necessary, replace the park pin switch.



NOTE: Park pin switch 4P connector No. 1 and No. 2 terminals are for A/T gear position console light, refer to the circuit diagram on page 23-150.

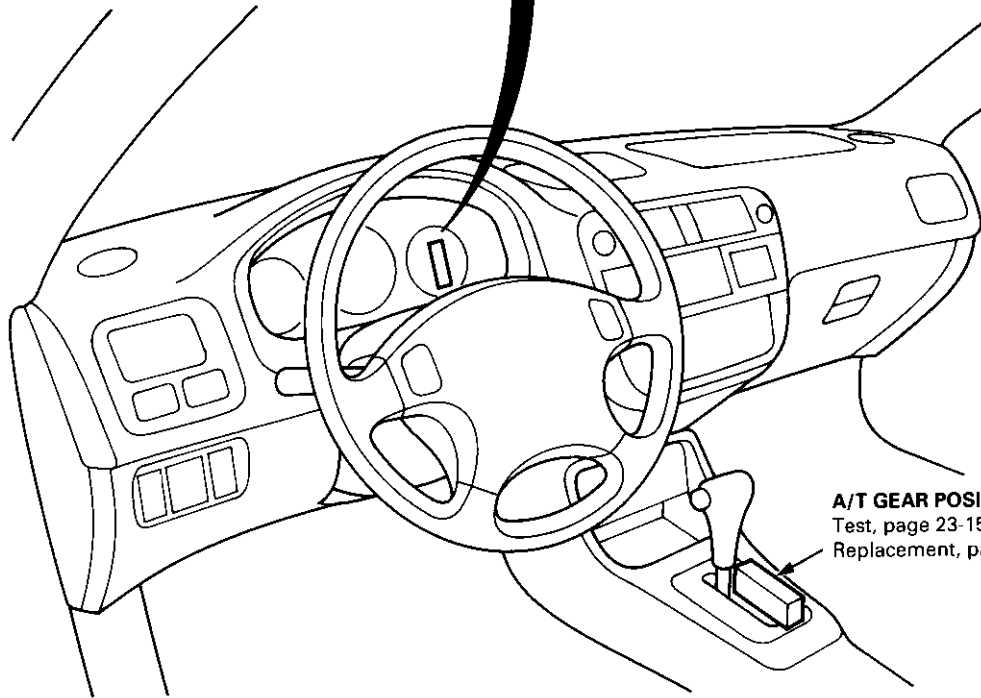
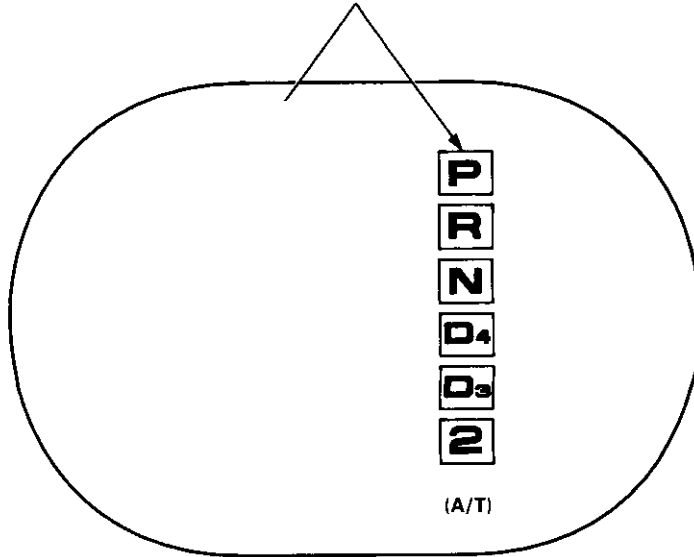


# A/T Gear Position Indicator

## Component Location Index

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

**A/T GEAR POSITION INDICATOR**  
Input Test, page 23-152

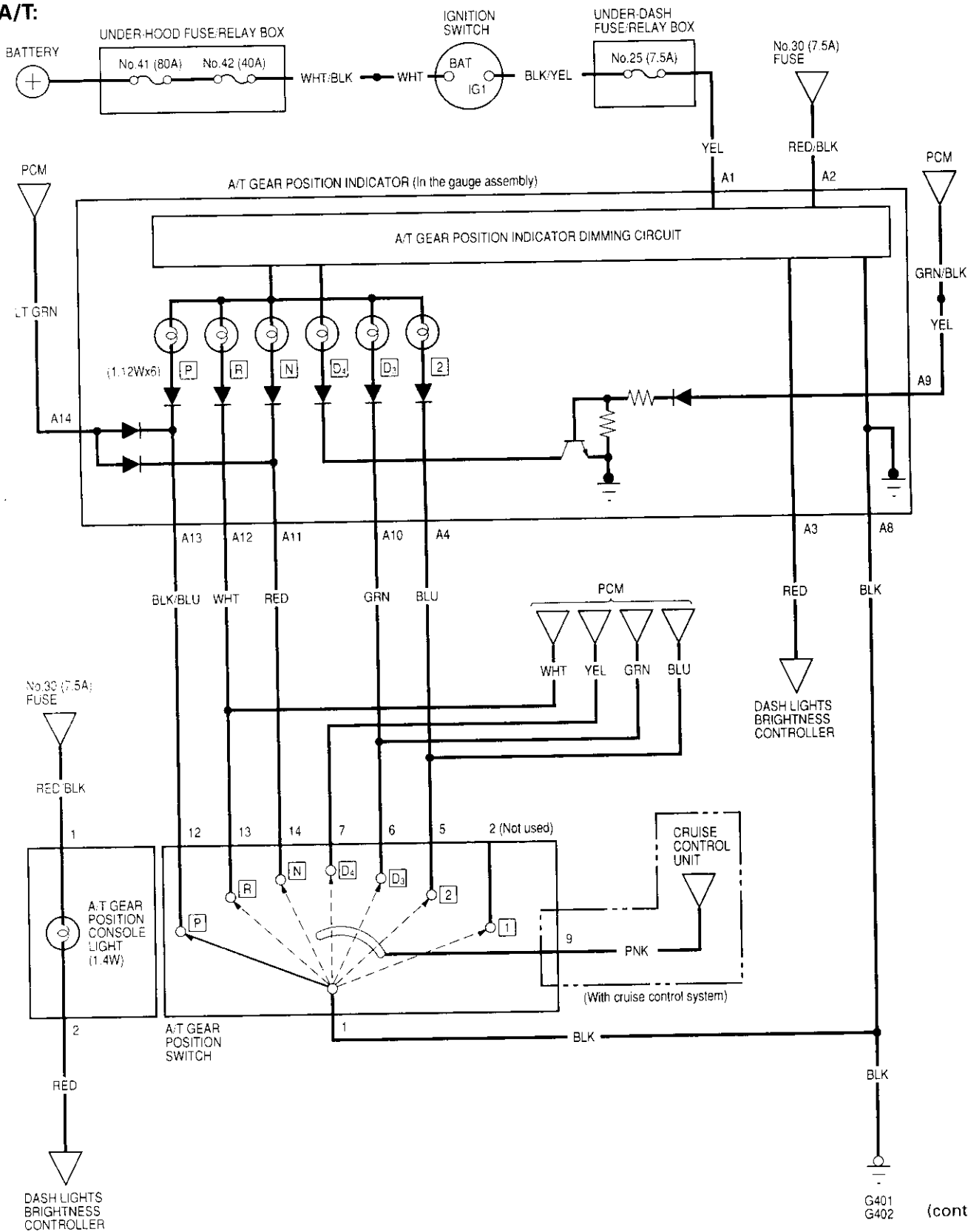


**A/T GEAR POSITION SWITCH**  
Test, page 23-154  
Replacement, page 23-155



# Circuit Diagram

A/T:

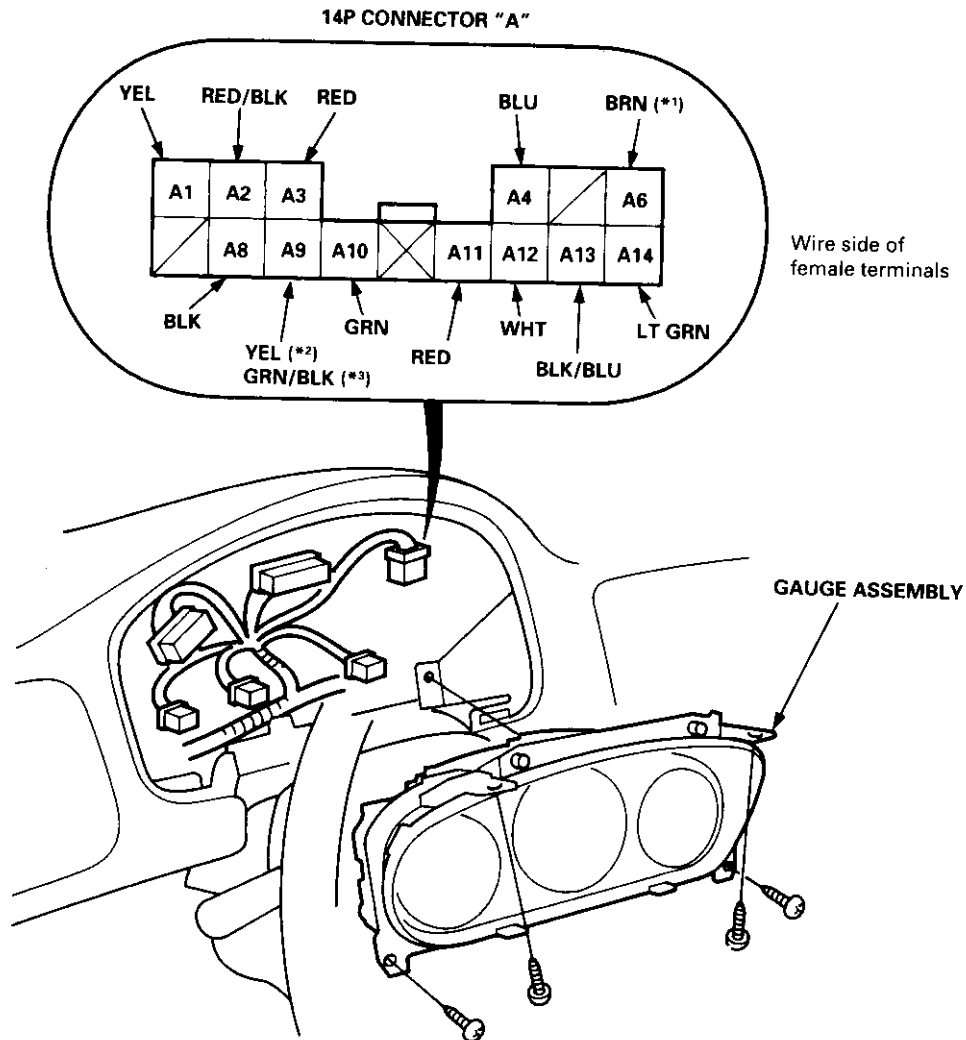


G401 G402 (cont'd)

# A/T Gear Position Indicator

## Indicator Input Test

1. Remove the gauge assembly from the dashboard (see page 23-135), and disconnect the 14P connector from the gauge assembly.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the 14P connector.
    - If a test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, but the indicator is faulty, replace the printed circuit board.



\*1: Not used  
\*2: A/T  
\*3: CVT



Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A1	YEL	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box</li> <li>• An open in the wire</li> </ul>
A2	RED/BLK	Combination light switch ON and dash lights brightness control dial on full bright	Check for voltage between RED/BLK and RED terminals: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 30 (7.5 A) fuse in the under-dash fuse/relay box</li> <li>• Faulty combination light switch</li> <li>• Faulty dash lights brightness controller</li> <li>• An open in the wire</li> </ul>
A3	RED			
A4	BLU	Shift lever in <b>2</b> or <b>L</b>	Check for continuity to ground: There should be continuity. NOTE: There should be no continuity in any other position.	<ul style="list-style-type: none"> <li>• Faulty A/T gear position switch</li> <li>• An open in the wire</li> </ul>
A10	GRN	Shift lever in <b>D<sub>s</sub></b> or <b>S</b>		
A11	RED	Shift lever in <b>N</b>		
A12	WHT	Shift lever in <b>R</b>		
A13	BLK/BLU	Shift lever in <b>P</b> NOTE: Don't depress the brake pedal.		
A9	YEL* <sup>1</sup>	Ignition switch ON (II) and shift lever in any position except <b>D<sub>s</sub></b>	Check for voltage to ground: There should be battery voltage for two seconds after the ignition switch is turned ON (II), and then less than 1 V.	<ul style="list-style-type: none"> <li>• Faulty TCM*<sup>2</sup>, PCM*<sup>3</sup></li> <li>• Faulty PCM*<sup>1</sup></li> <li>• An open in the wire</li> </ul>
	GRN/BLK* <sup>2</sup>	Ignition switch ON (II) and shift lever in any position except <b>D</b>		
A8	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G401, G402)</li> <li>• An open in the wire</li> </ul>
A14	LT GRN	Ignition switch ON (II)	Check for voltage to ground: <ul style="list-style-type: none"> <li>• There should be battery voltage*<sup>2</sup></li> <li>• There should be about 5 V*<sup>1</sup></li> </ul>	<ul style="list-style-type: none"> <li>• Faulty TCM*<sup>2</sup>, ECM/PCM*<sup>3</sup></li> <li>• Faulty PCM*<sup>1</sup></li> <li>• An open in the wire</li> </ul>

\*1: A/T

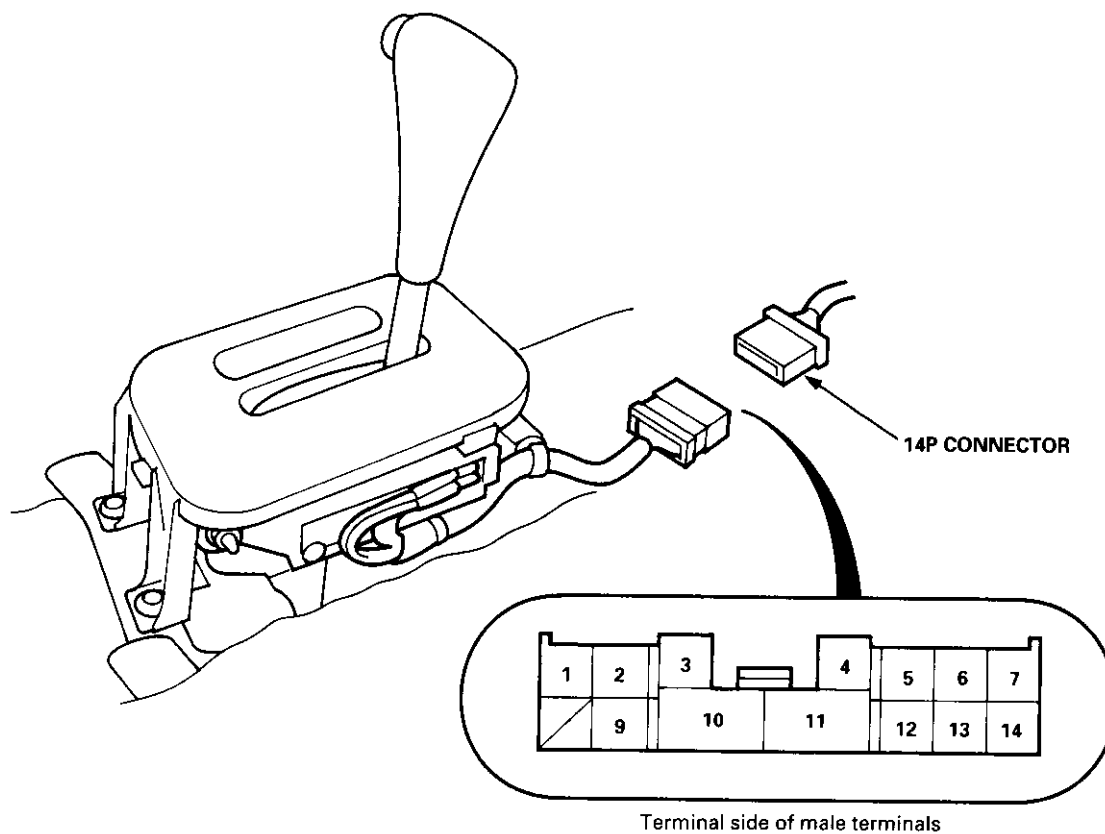
\*2: CVT ('96 - 98 models)

\*3: CVT ('99 - 00 models)

# A/T Gear Position Indicator

## A/T Gear Position Switch Test

1. Remove the front console (see section 20).
2. Disconnect the 14P connector from the A/T gear position switch.
3. Check for continuity between the terminals in each switch position according to the table.
  - Move the shift lever back and forth without pushing the shift lever at each switch position, and check for 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 switch as described on the next page.



**A/T Gear Position Switch**

Terminal Position	1	2	5	6	7	*1 9	12	13	14	Back - up Light Switch 3	4	Neutral Position Switch 10	11
(Not used)	○	○											
<b>2</b> L	○		○			○							
<b>D<sub>3</sub></b> S	○			○		○							
<b>D<sub>4</sub></b> D	○				○	○							
<b>N</b> N	○								○			○	○
<b>R</b> R	○									○	○		
<b>P</b> P	○						○					○	○

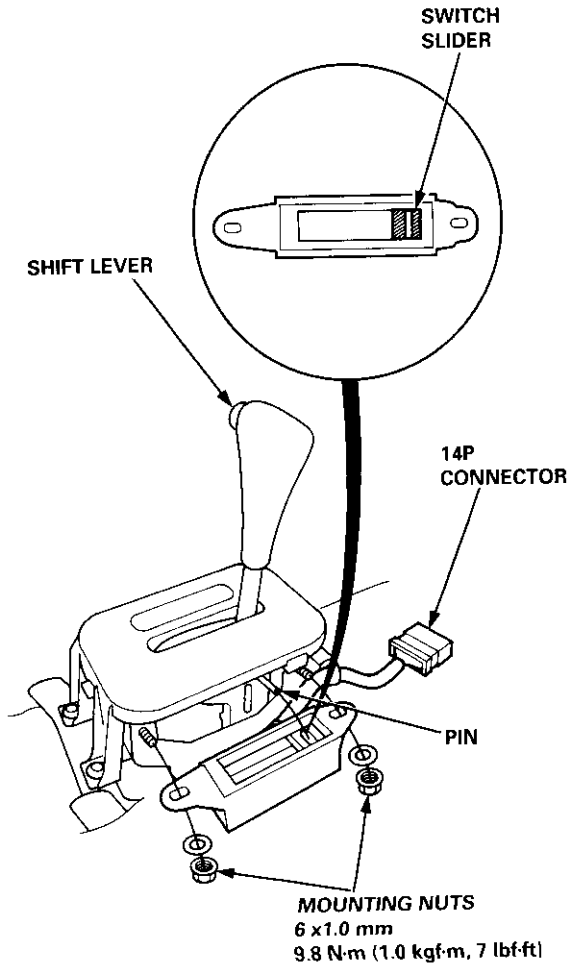
\* 1 : With cruise control system





## A/T Gear Position Switch Replacement

1. Remove the front console, then disconnect the 14P connector from the A/T gear position switch.
2. Remove the two mounting nuts.



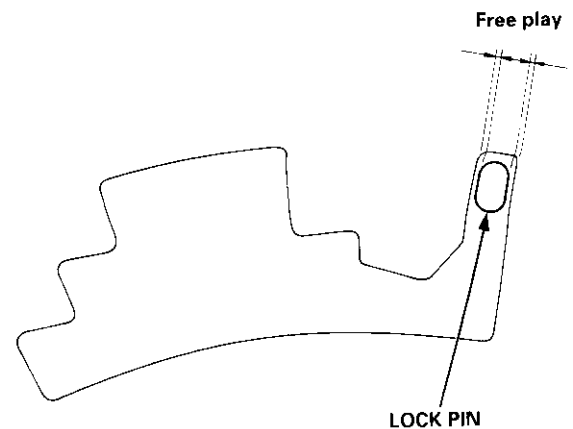
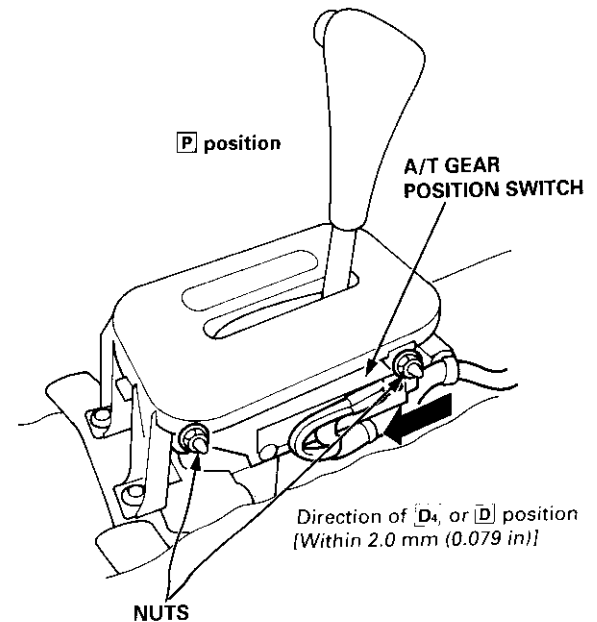
3. Position the switch slider to "Neutral" as shown above.
4. Move the shift lever to "Neutral", then slip the switch into position.
5. Attach the switch with the two mounting nuts.
6. Test the switch in the **P** and **N** position of the shift lever. The engine should start when the shift lever is in position **P** anywhere in the range of free play.
7. Connect the 14P connector, clamp the harness, and install the front console.

## A/T Gear Position Switch Adjustment

1. Shift to the **P** position, and loosen the nuts.
2. Slide the switch in the direction of **D<sub>2</sub>** or **D** position [within 2.0 mm (0.079 in.)] so that there is continuity between the No. 1 and No. 7 terminals in the range of free play of the shift lever.
3. Recheck for continuity between each of the terminals.

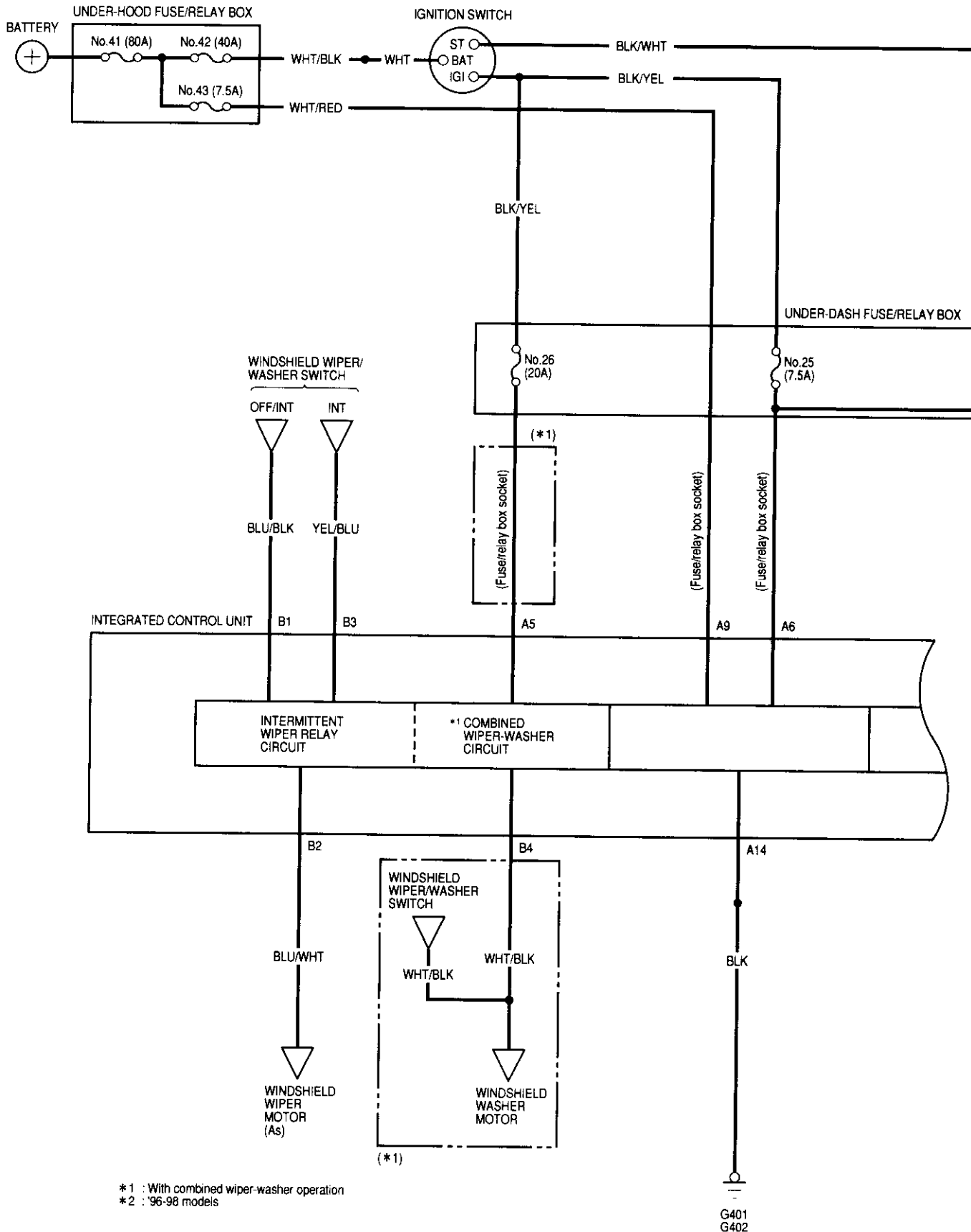
### NOTE:

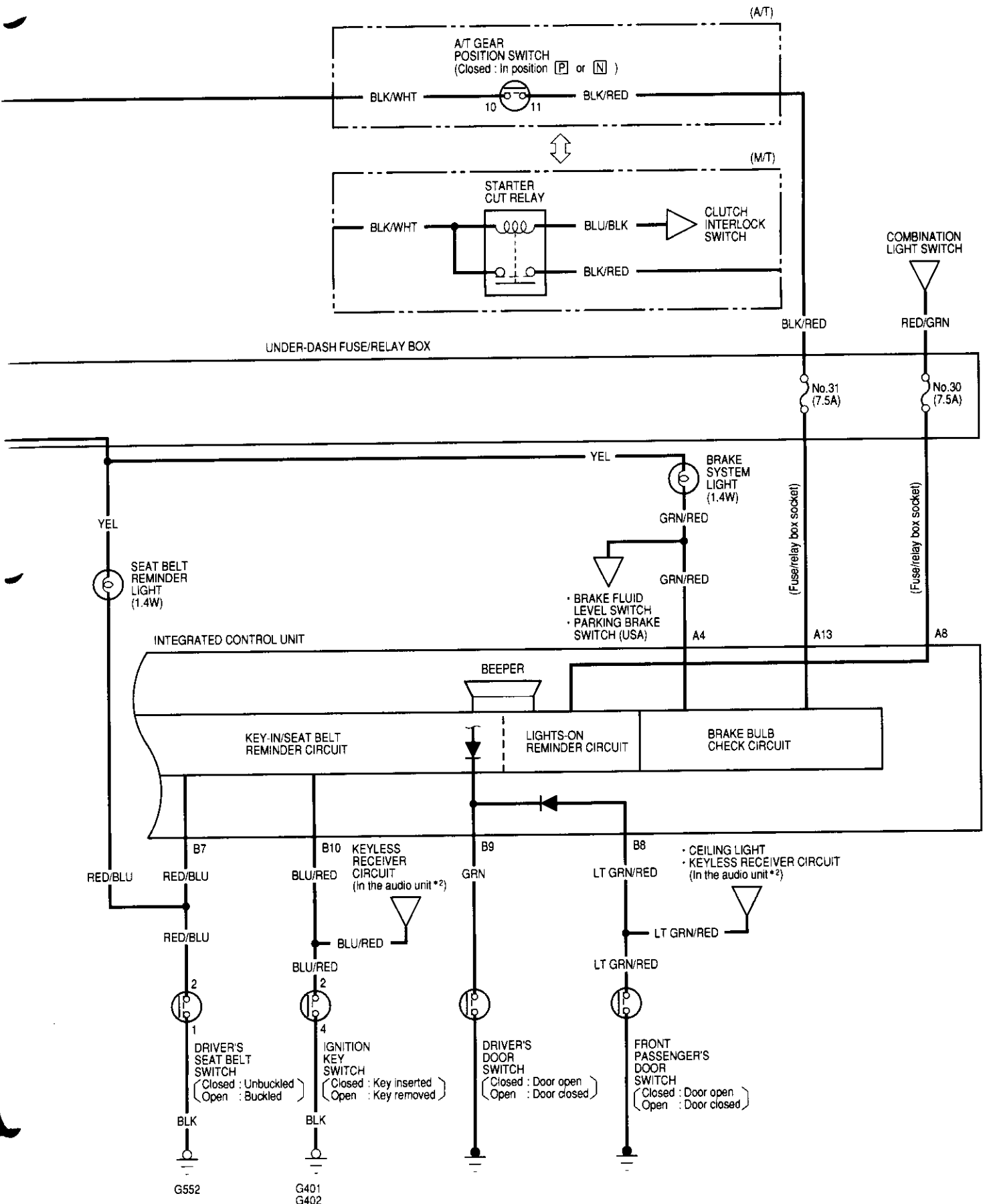
- If adjustment is not possible, check for damage to the shift lever detent and/or the bracket. If there is no damage, replace the console switch.
- The engine should start when the shift lever is in position **N** in the range of free play.



# Integrated Control Unit

## Circuit Diagram



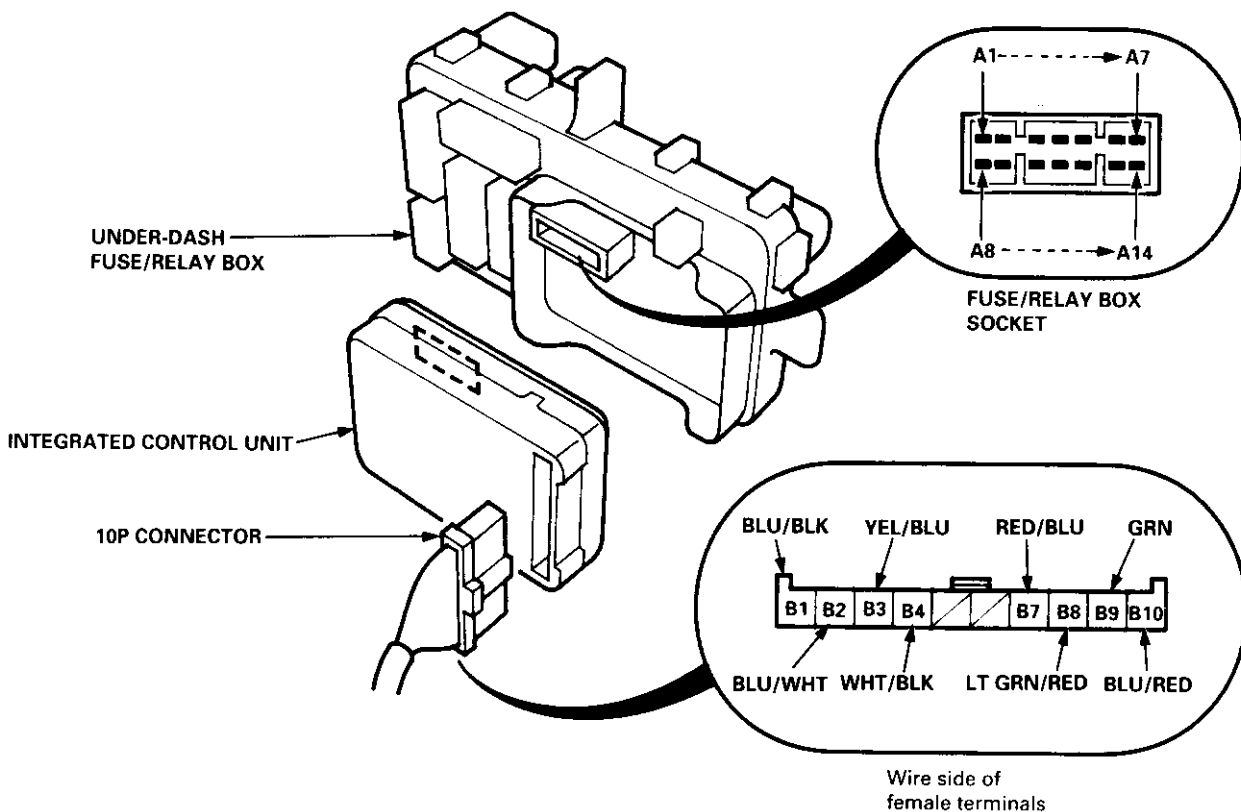


# Integrated Control Unit

## Input Test

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

1. Remove the driver's dashboard lower cover and knee bolster (see section 20).
2. Disconnect the 10P connector from the integrated control unit.
3. Remove the integrated control unit from the under-dash fuse/relay box.
4. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connector and the fuse/relay box socket.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, the control unit must be faulty; replace it.





**All Systems:**

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A14	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"><li>• Poor ground (G401, G402)</li><li>• An open in the wire</li></ul>
A9	_____	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"><li>• Blown No. 43 (7.5 A) fuse in the under-hood fuse/relay box</li><li>• An open in the wire</li></ul>
A6	_____	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"><li>• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box</li><li>• An open in the wire</li></ul>

**Intermittent Wiper System:**

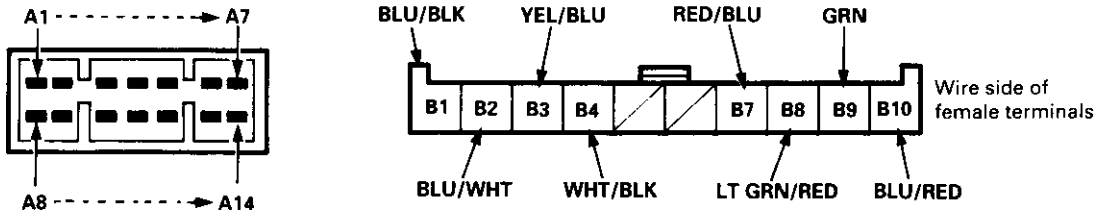
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B1 • B2	BLU/BLK and BLU/WHT	Ignition switch ON (II), and windshield wiper switch at OFF or INT	Check for continuity between the BLU/BLK and BLU/WHT terminals: There should be continuity.	<ul style="list-style-type: none"><li>• Blown No. 26 (20 A) fuse in the under-dash fuse/relay box</li><li>• Faulty windshield wiper switch</li><li>• Faulty windshield wiper motor</li><li>• An open in the wire</li></ul>
B3	YEL/BLU	Ignition switch ON (II), and windshield wiper switch at INT	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"><li>• Blown No. 26 (20 A) fuse in the under-dash fuse/relay box</li><li>• Faulty windshield wiper switch</li><li>• An open in the wire</li></ul>
*A5	_____	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"><li>• Blown No. 26 (20 A) fuse in the under-dash fuse/relay box</li><li>• An open in the wire</li></ul>
*B4	WHT/BLK	Ignition switch ON (II), and windshield washer switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"><li>• Faulty windshield washer switch</li><li>• An open in the wire</li></ul>

\*: With combined wiper-washer operation

(cont'd)

# Integrated Control Unit

## Input Test (cont'd)



### Key-in/Seat Belt Reminder, Lights-on Reminder System:

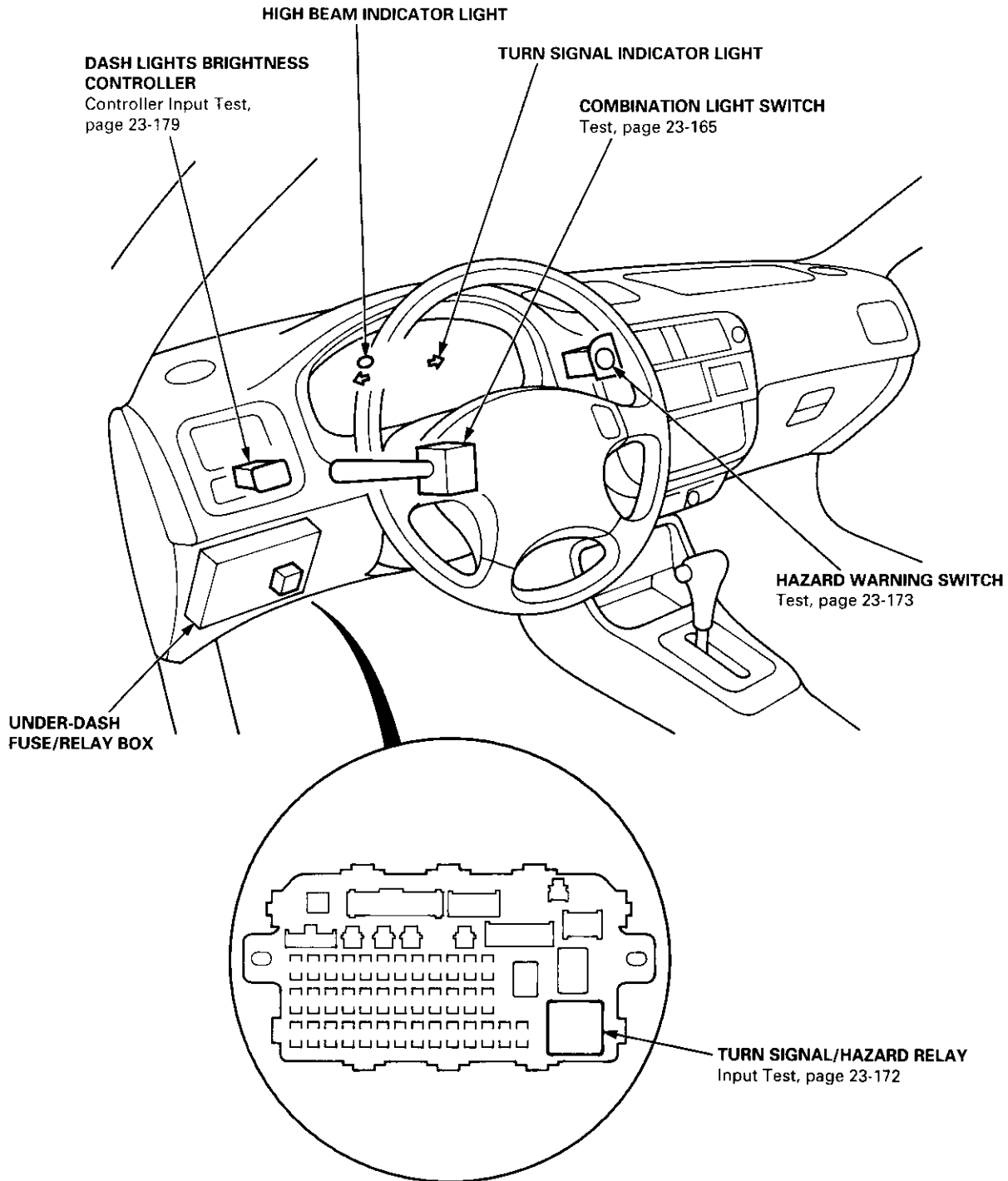
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A8	—	Combination light switch ON	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 30 (7.5 A) fuse in the under-dash fuse/relay box</li> <li>• Faulty combination light switch</li> <li>• An open in the wire</li> </ul>
B7	RED/BLU	Ignition switch ON (II), and driver's seat belt switch unbuckled	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Poor ground (G552)</li> <li>• Faulty seat belt switch</li> <li>• An open in the wire</li> </ul>
B9	GRN	Driver's door open	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Faulty driver's door switch</li> <li>• An open in the wire</li> </ul>
B10	BLU/RED	Ignition key inserted into the ignition key switch	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Poor ground (G401, G402)</li> <li>• Faulty ignition key switch</li> <li>• An open in the wire</li> </ul>

### Bulb Check System (Brake System Light):

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
A4	GRN/RED	Ignition switch ON (II), brake fluid reservoir full, and parking brake lever down	Connect to ground: Brake system light should come on.	<ul style="list-style-type: none"> <li>• Blown No. 25 (7.5 A) fuse in the under-dash fuse/relay box</li> <li>• Blown brake system light bulb</li> <li>• An open in the wire</li> </ul>
A13	BLU/WHT	Ignition switch at START (III)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 31 (7.5 A) fuse in the under-dash fuse/relay box</li> <li>• Faulty starter cut relay</li> <li>• An open in the wire</li> </ul>

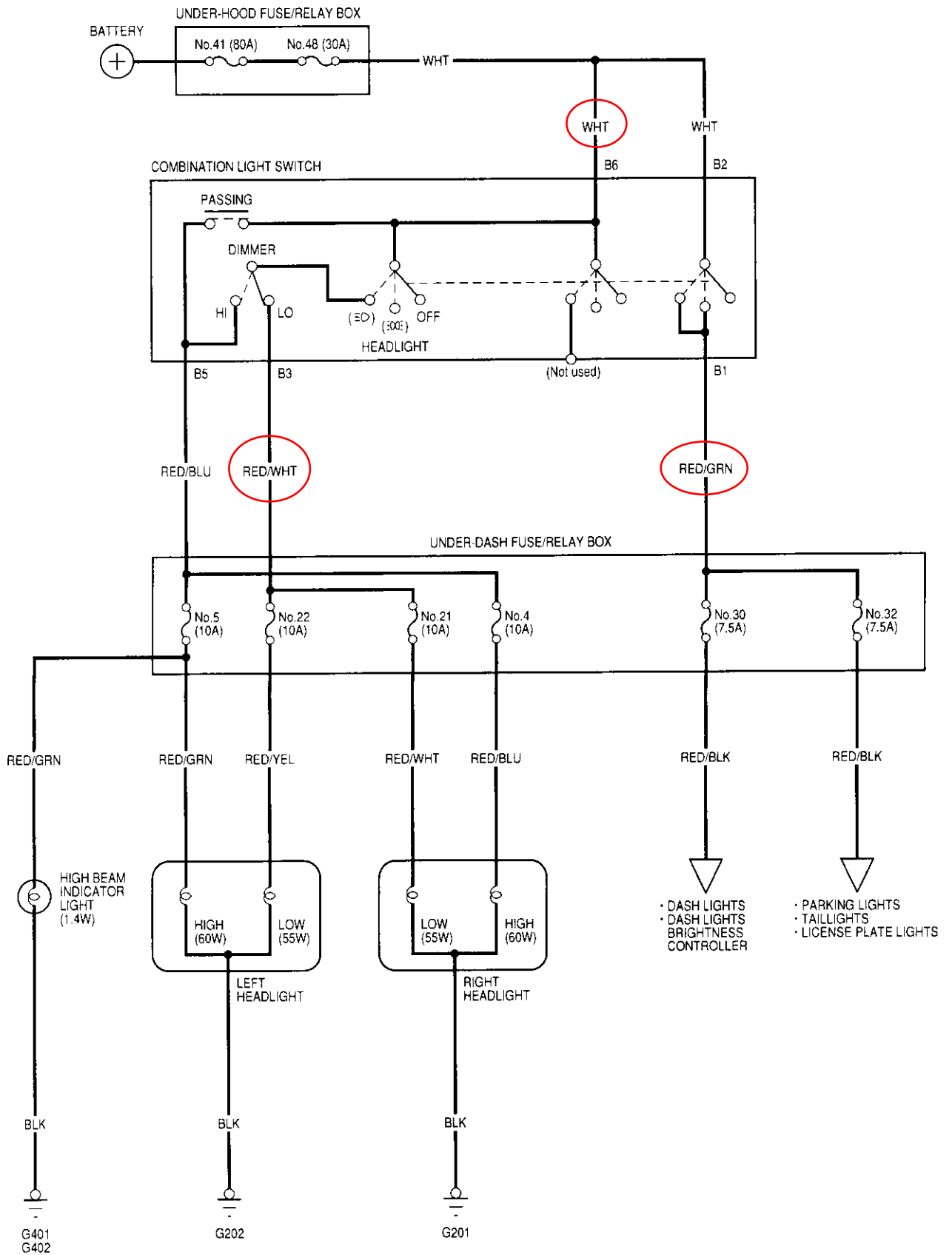
# Lighting System

## Component Location Index (cont'd)





# Circuit Diagram (USA)

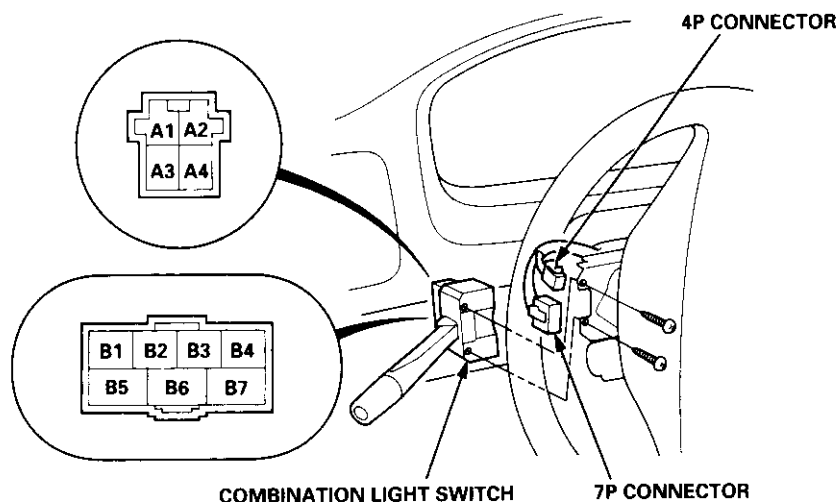






## Combination Light Switch Test

1. Remove the driver's dashboard lower cover and steering column covers (see section 20).
2. Disconnect the 4P and 7P connectors from the switch.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose, or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, check for continuity between them in each switch position according to the tables. If there is no continuity between any of them, check for continuity in the switch harness.
    - If there is continuity in the switch harness, replace the combination light switch.
    - If there is no continuity in the switch harness, replace it.



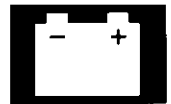
### Headlight/Dimmer/Passing Switch :

		Terminal	B1	B2	B3	* B4	B5	B6
Headlight switch	OFF							
	☺		○—○					
	☺	LOW	○—○		○—○	○—○	○—○	○—○
		HIGH	○—○			○—○	○—○	○—○
Passing switch	OFF							
	ON						○—○	

\* : Canada

### Turn Signal Switch :

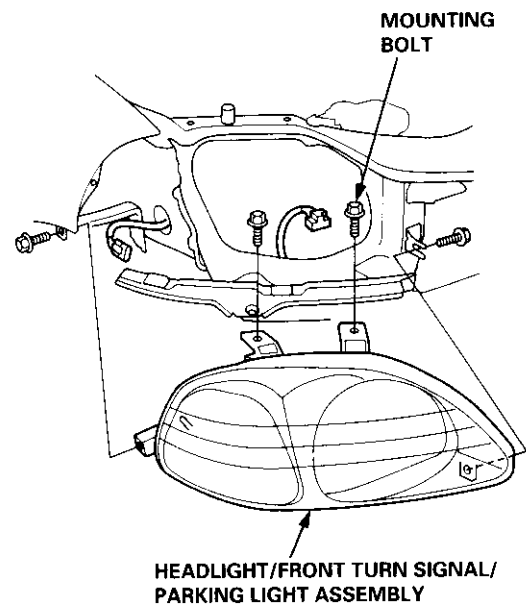
	Terminal	A1	A2	A4
RIGHT		○—○		○—○
NEUTRAL				
LEFT		○—○		



## Replacement

**CAUTION:** Halogen headlights become very hot in use; do not touch them or the attaching hardware immediately after they have been turned off.

1. Remove the front bumper (see section 20).
2. Remove the mounting bolts.
3. Disconnect each connector, then remove the headlight/front turn signal/parking light assembly.



**HEADLIGHT: 60/55 W**  
**FRONT TURN SIGNAL/PARKING LIGHT: 21/5 W**

# Headlights

## Adjustment

### ⚠ CAUTION

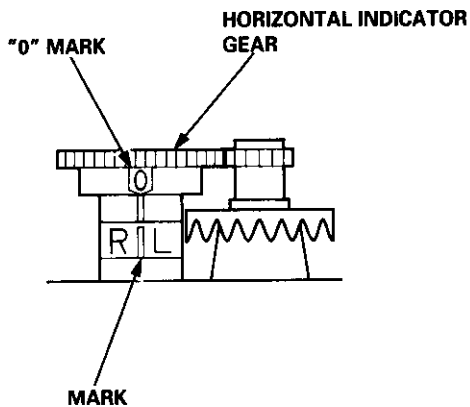
Headlight become very hot in use; do not touch them or any attaching hardware immediately after they have been turned off.

#### Before adjusting the headlights:

- Park the vehicle on level surface.
- Make sure the tire pressures are correct.
- The driver or someone who weighs the same should sit in the driver's seat.

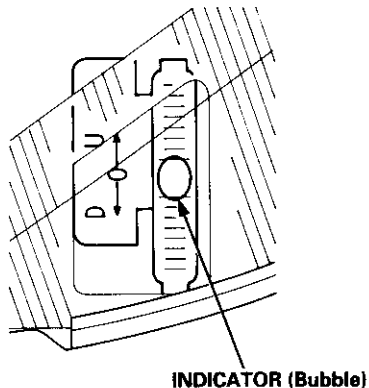
#### '96 - 98 models

1. Open the hood.
2. Check the horizontal adjustment indicator. The "0" mark on the horizontal indicator gear should be aligned with the mark on the horizontal indicator.



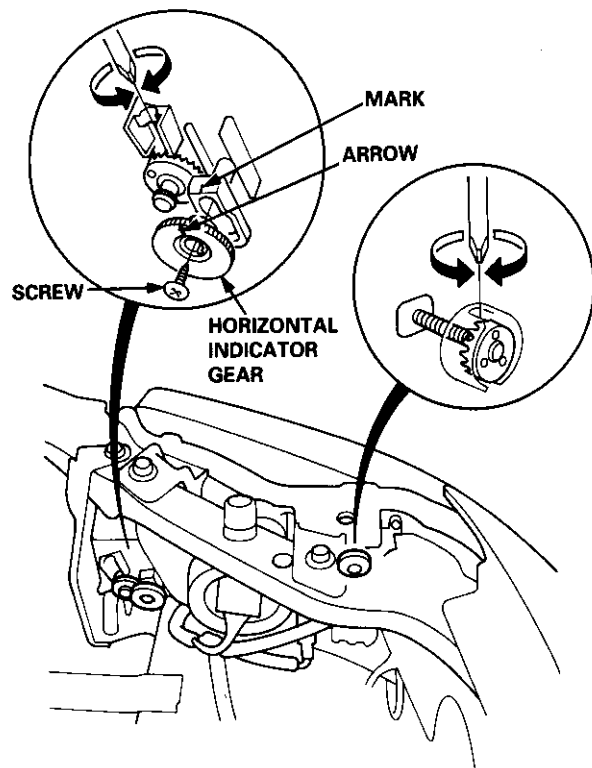
3. Check the vertical adjustment indicator. The bubble should be centered underneath the longest scribe mark on the gauge.

#### VERTICAL INDICATOR:



4. If either indicator is not aligned with its "0" mark as described left column, an adjustment can be made by using a Phillips screwdriver.
5. Adjust the headlights to local requirements by turning the adjusters.
6. After headlight replacement, it may be necessary to readjust the horizontal indicator gear.
  - First install the headlight, and adjust its horizontal and vertical aimings according to local requirements.
  - Then check that the arrow on the horizontal indicator gear is aligned with the mark on the horizontal indicator.
    - If they are not aligned, remove the screw, adjust the indicator gear, and retighten the screw.

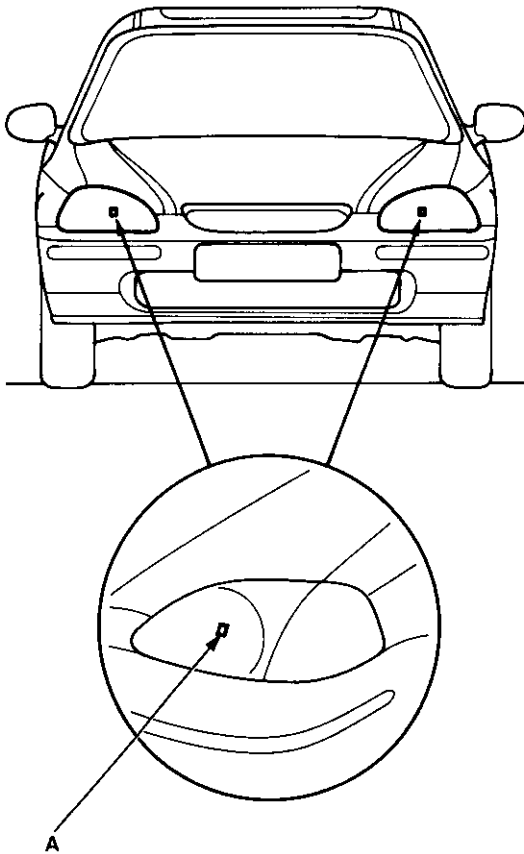
NOTE: As the outer lenses are made of an acrylic-coated, polycarbonated material, do not cover the headlights when they are turned on.



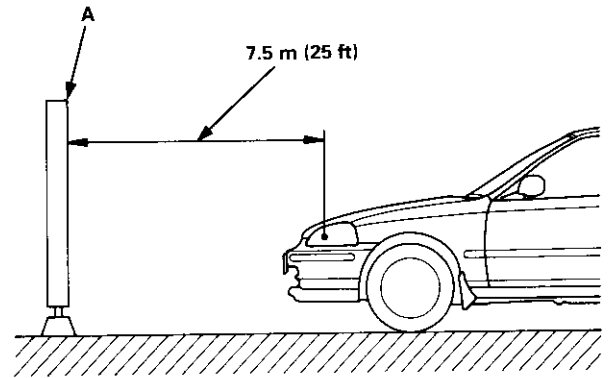


'99 - 00 models

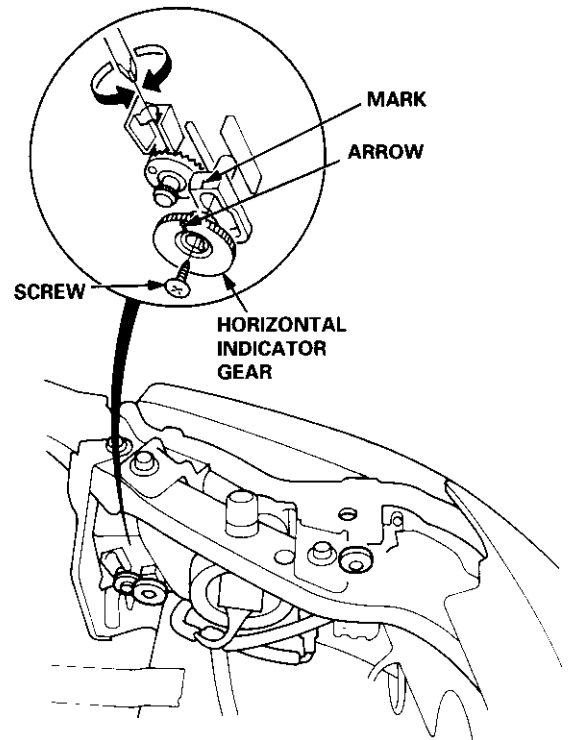
1. Clean the outer lens so that you can see the center of the headlights (A).



2. Park the vehicle in front of a wall or a screen (A).



3. Open the hood.
4. Turn the horizontal adjuster so that the arrow on the horizontal indicator gear (A) is pointing up.



(cont'd)

# Headlights

## Adjustment (cont'd)

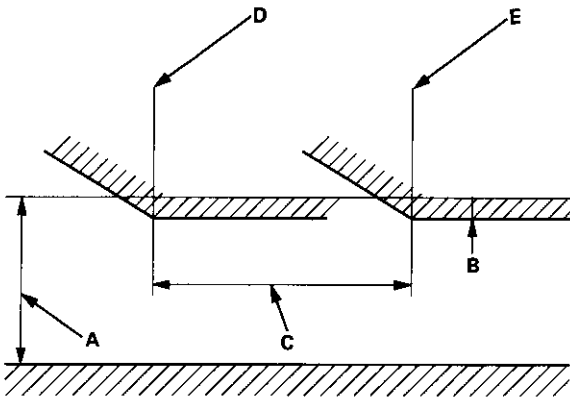
5. Turn the low beams on.
6. Determine if the headlights are aimed properly.

### Vertical adjustment:

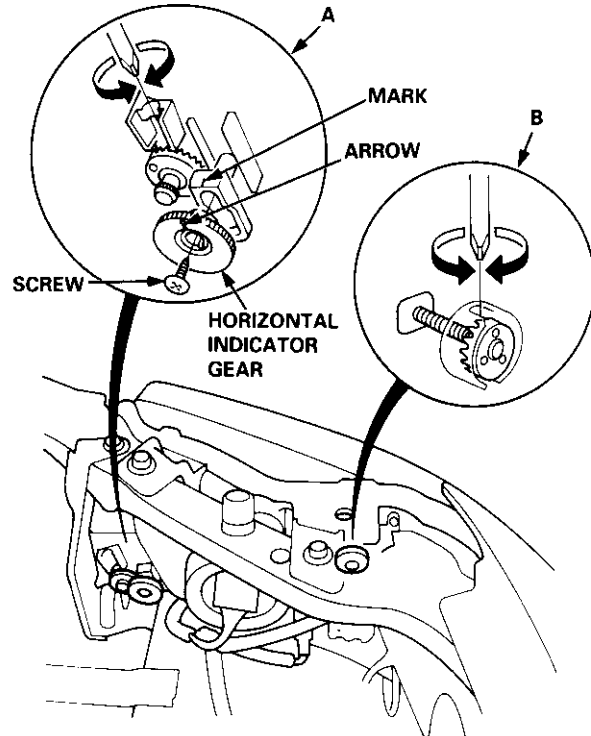
Measure the height of the headlights (A). The lights should reflect 52 mm (2.1 in.) below (B) headlight height.

### Horizontal adjustment:

The width of the refracting points (C) should be the same as the width of the headlight central points (D, E).



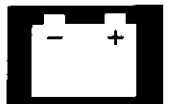
7. If necessary, adjust the headlights to local requirements by turning the horizontal adjuster (A) and the vertical adjuster (B).



8. After headlight replacement, it may be necessary to readjust the horizontal indicator gear.
  - First install the headlight, and adjust its horizontal and vertical aimings according to local requirements.
  - Then check that the arrow on the horizontal indicator gear is aligned with the mark on the horizontal indicator.
    - If they are not aligned, remove the screw, adjust the indicator gear, and retighten the screw.

**NOTE:** As the outer lenses are made of an acrylic-coated, polycarbonated material, do not cover the headlights when they are turned on.

# Taillights



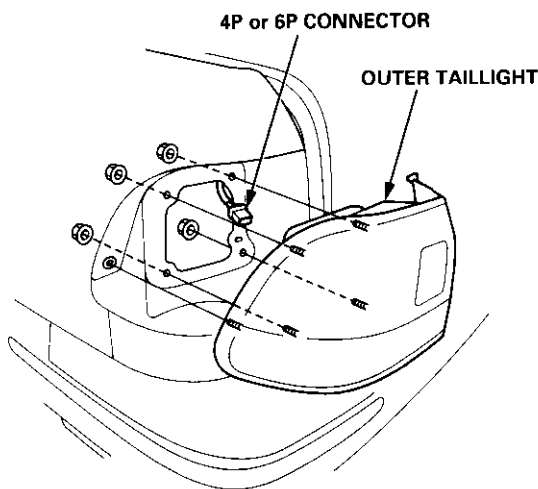
## Replacement (Except '99 – 00 Sedan)

### NOTE:

- Inspect the gasket; replace it if it is distorted or stays compressed.
- After installing the taillights, run water over them to make sure they do not leak.

### Outer Taillights ('96 – 00 models, except '99 – 00 Sedan):

1. Open the trunk lid/hatch.
2. Disconnect the 4P or 6P connector from the outer taillight.
3. Remove the four mounting nuts, then pull out the outer taillight.



### Hatchback:

BRAKE/TAILLIGHT: 21/5 W  
TURN SIGNAL LIGHT: 21 W  
BACK-UP LIGHT: 21 W

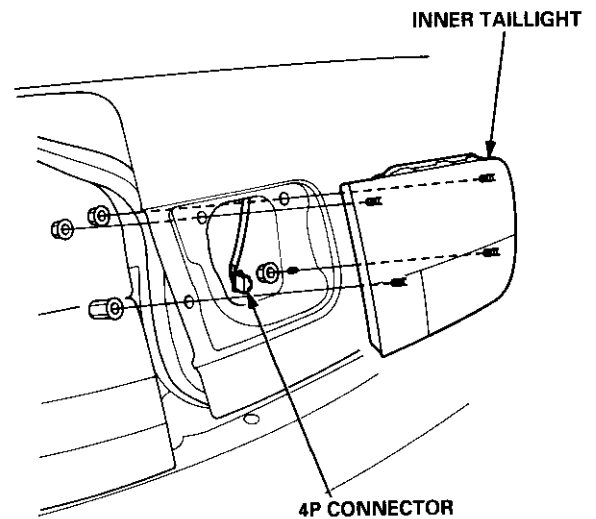
### Coupe/Sedan:

BRAKE/TAILLIGHT: 21/5 W  
TURN SIGNAL LIGHT: 21 W

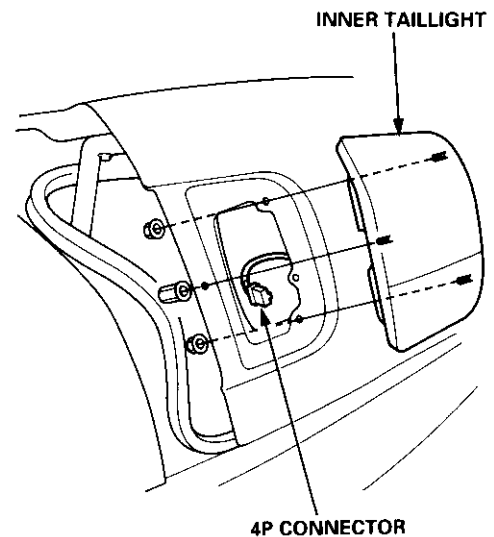
### Inner Taillights (Coupe '96 – 00 models/Sedan '96 – 98 models):

1. Open the trunk lid, then remove the access panel.
2. Disconnect the 4P connector from the inner taillight.
3. Remove the four [three] mounting nuts, then pull out the inner taillight.  
[ ]: Sedan

### Coupe:



### Sedan:



BRAKE/TAILLIGHT: 21/5 W  
BACK-UP LIGHT: 21 W

# Taillights

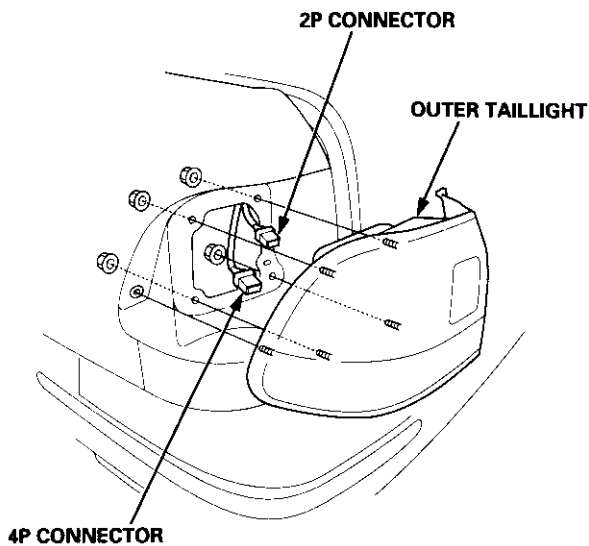
## Replacement ('99 – 00 Sedan)

### NOTE:

- Inspect the gasket; replace it if it is distorted or stays compressed.
- After installing the taillights, run water over them to make sure they do not leak.

### Outer Taillights:

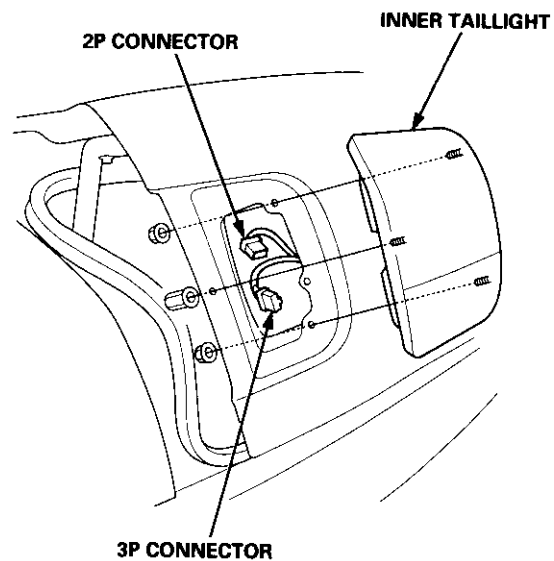
1. Open the trunk lid/hatch.
2. Disconnect the 4P and 2P connector from the outer taillight.
3. Remove the four mounting nuts, then pull out the outer taillight.



**BRAKE/TAILLIGHT: 21/5 W**  
**TURN SIGNAL LIGHT: 21 W**

### Inner Taillights:

1. Open the trunk lid, then remove the access panel.
2. Disconnect the 3P and 2P connector from the inner taillight.
3. Remove the three mounting nuts, then pull out the inner taillight.  
[ ]: Sedan



**BRAKE/TAILLIGHT: 21/5 W**  
**BACK-UP LIGHT: 21 W**



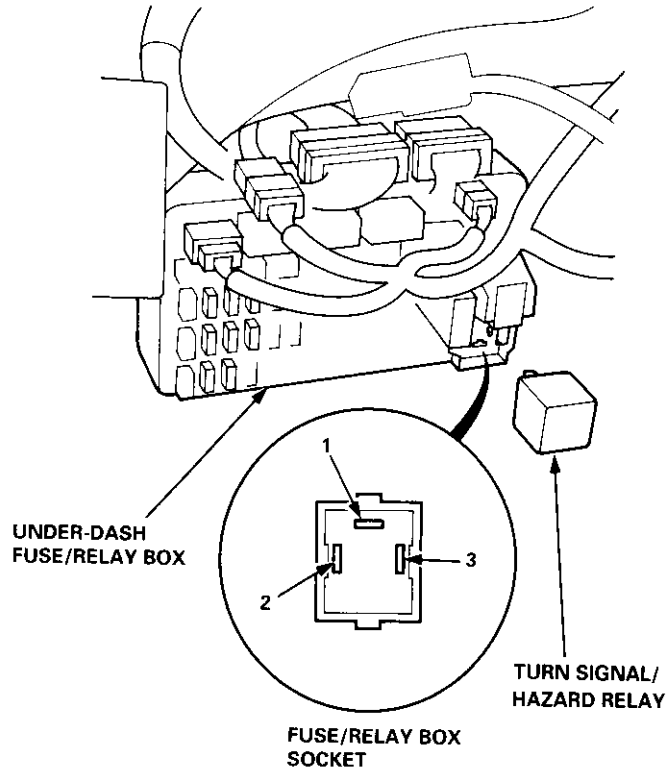


# Turn Signal/Hazard Flasher System

## Turn Signal/Hazard Relay Input Test

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

1. Remove the turn signal/hazard relay from the under-dash fuse/relay box.
2. Inspect the relay and fuse/relay box socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the fuse/relay box socket.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, the turn signal/hazard relay must be faulty; replace it.



Cavity	Test condition	Test: Desired results	Possible cause if result is not obtained
1	Hazard warning switch ON; connect the No. 1 terminal to the No. 3 terminal.	Hazard lights should come on.	<ul style="list-style-type: none"> <li>• Poor ground (G201, G202, G401, G402, G551, G552, G601, G761)</li> <li>• Faulty hazard warning switch</li> <li>• An open in the wire</li> </ul>
	Ignition switch ON (II) and turn signal switch in right or left; connect the No. 1 terminal to the No. 3 terminal.	Right or left turn signal lights should come on.	<ul style="list-style-type: none"> <li>• Faulty turn signal switch</li> </ul>
2	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G401, G402)</li> <li>• An open in the wire</li> </ul>
3	Ignition switch ON (II)	Connect for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 12 (7.5 A) fuse in the under-dash fuse/relay box</li> <li>• Faulty hazard warning switch</li> <li>• An open in the wire</li> </ul>
	Hazard warning switch ON	Connect for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 53 (10 A) fuse in the under-hood fuse/relay box</li> <li>• Faulty hazard warning switch</li> <li>• An open in the wire</li> </ul>

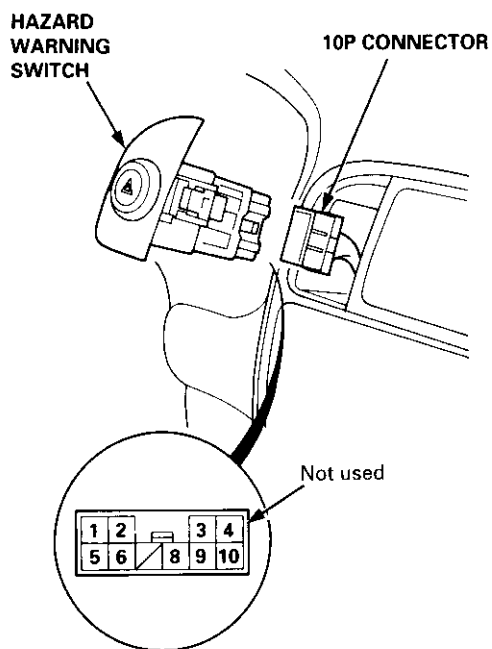


## Hazard Warning Switch Test

**CAUTION:** Be careful not to damage the hazard warning switch or the center outlet panel when prying the switch out.

'96 - 98 models:

1. Pry the hazard warning switch out of the center outlet panel.
2. Disconnect the 10P connector from the hazard warning switch.
3. Check for continuity between the terminals in each switch position according to the table.

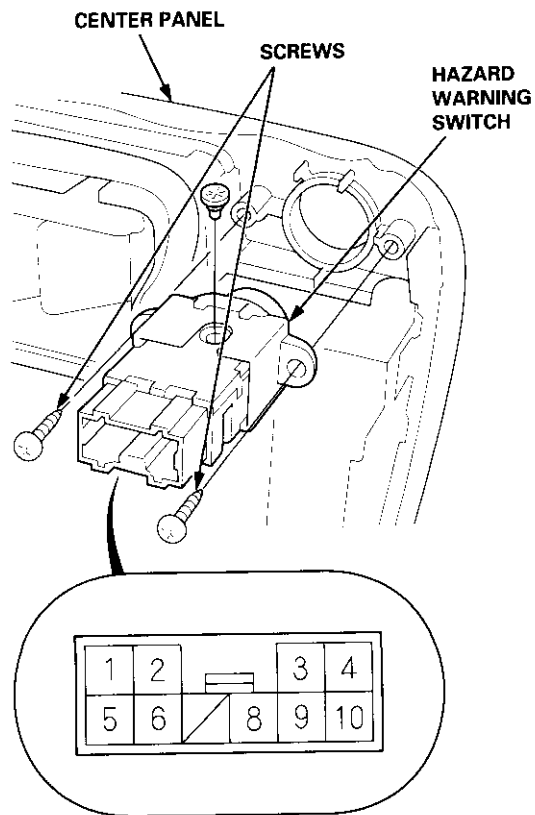


Terminal Position	1	2	3	4	5	6	8	9	10
OFF					○		○	○	○
ON	○	○	○	○		○	○	○	○

Terminal No. 4 is not used.

'99 - 00 models:

1. Remove the center panel (see section 20).
2. Remove the two screws, then remove the switch from the center panel.



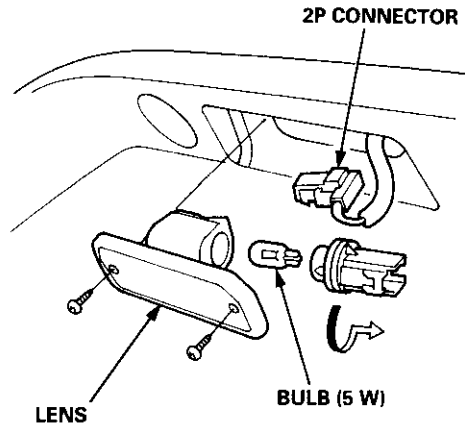
3. Check for continuity between the terminals in each switch position according to the table.

# License Plate Lights

## Replacement

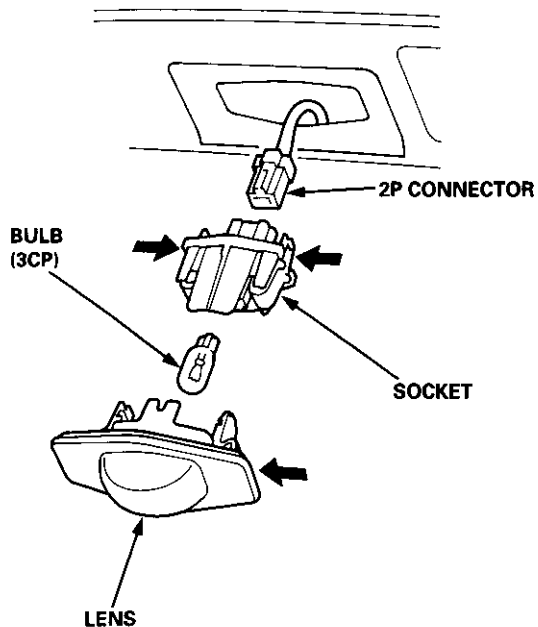
### '96 - 98 Sedan/Coupe:

1. Remove the two screws from the license plate light, and pull the light out part of the way.
2. Disconnect the 2P connector from the light.
3. Take the lens off, then replace the bulb.



### Hatchback/'99 - 00 Sedan:

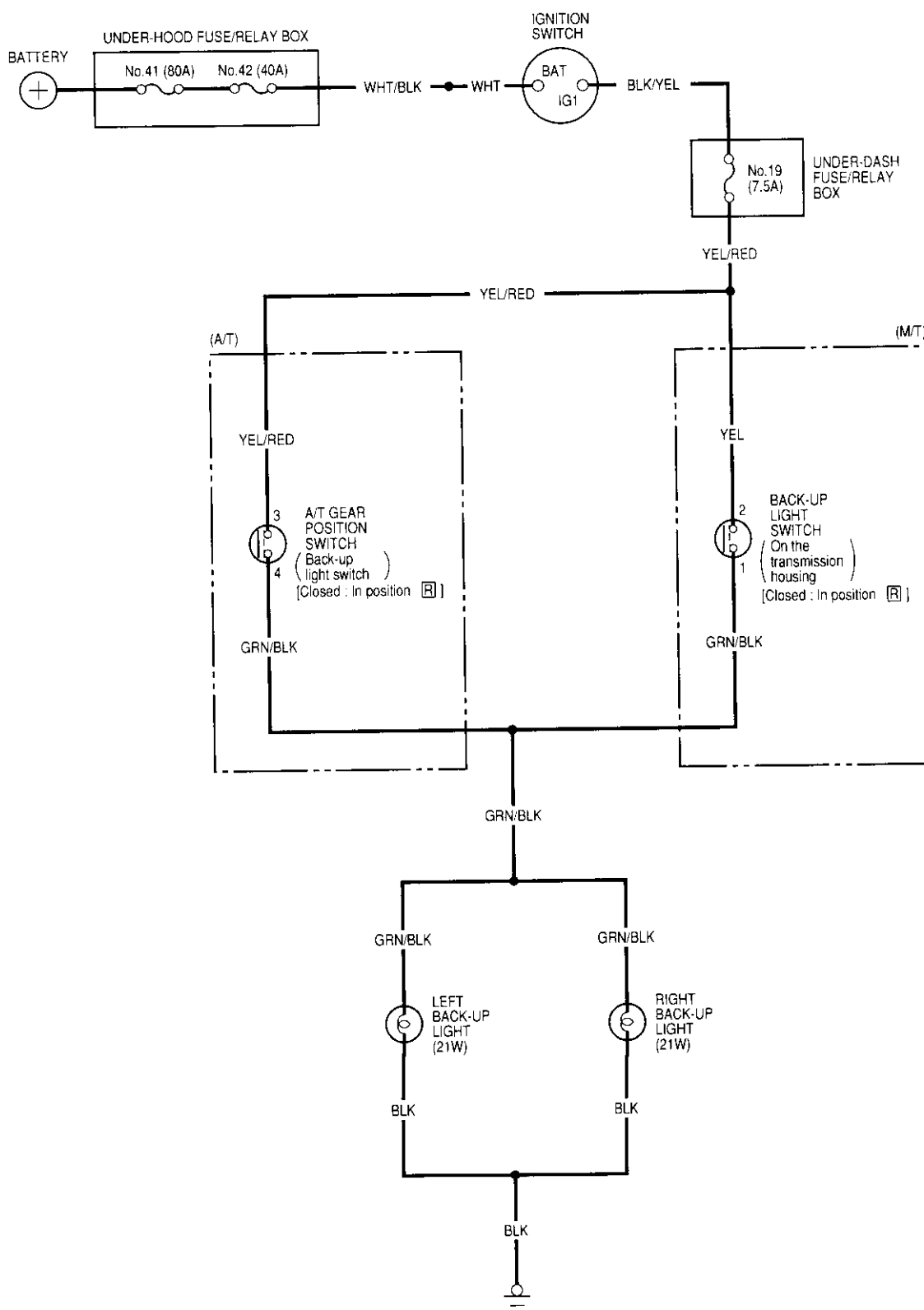
1. Carefully pry the licence plate light out of the license plate trim.
2. Disconnect the 2P connector from the light.





# Back-up Lights

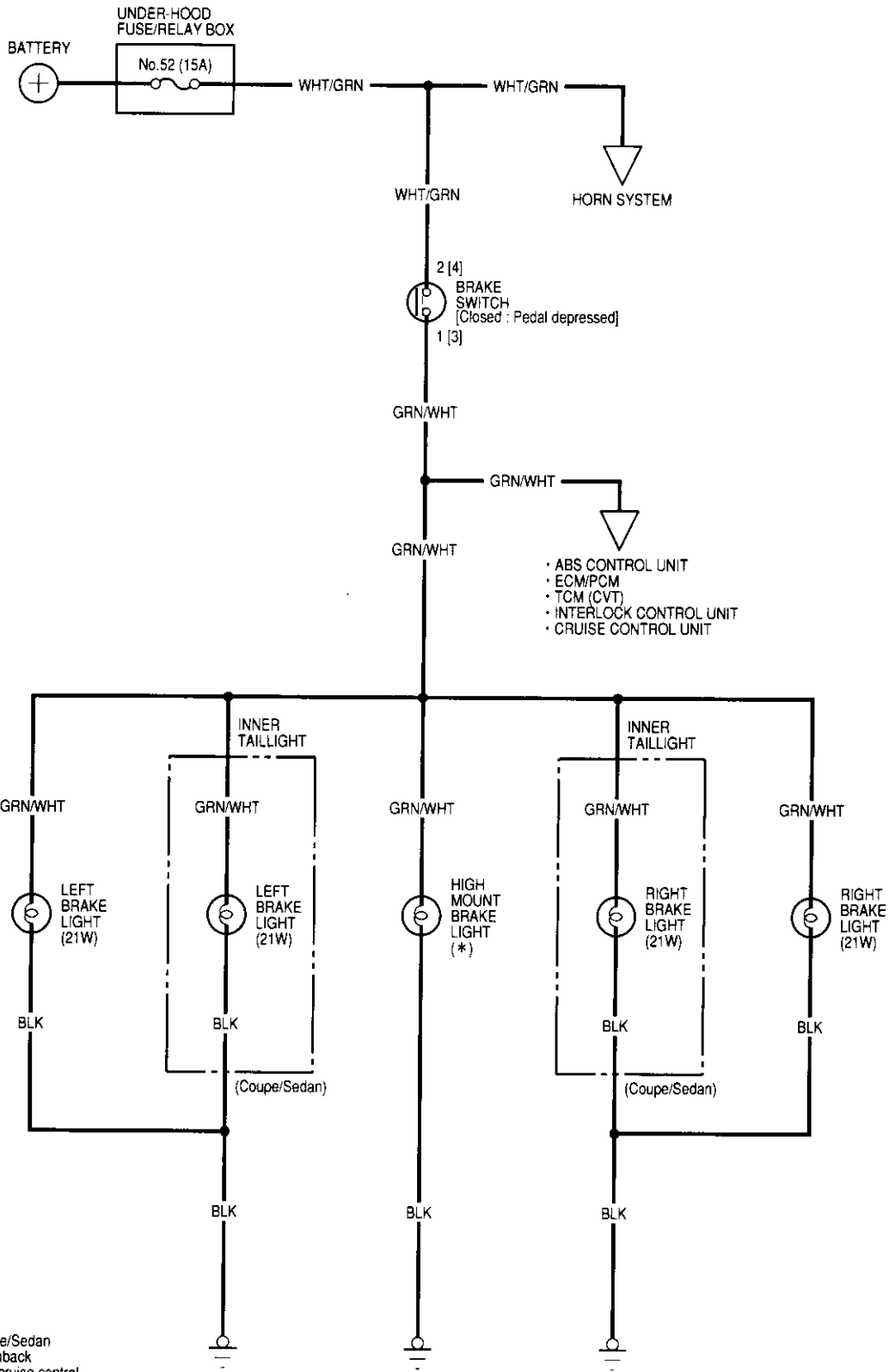
## Circuit Diagram



G601, G761 : Hatchback  
G601 : Coupe/Sedan

# Brake Lights

## Circuit Diagram



\* 21W : Coupe/Sedan  
 18W : Hatchback  
 { } : With cruise control

G601 : Hatchback/Coupe/Sedan

G761 : Hatchback  
 G601 : Coupe/Sedan  
 G602 : Sedan '99 model

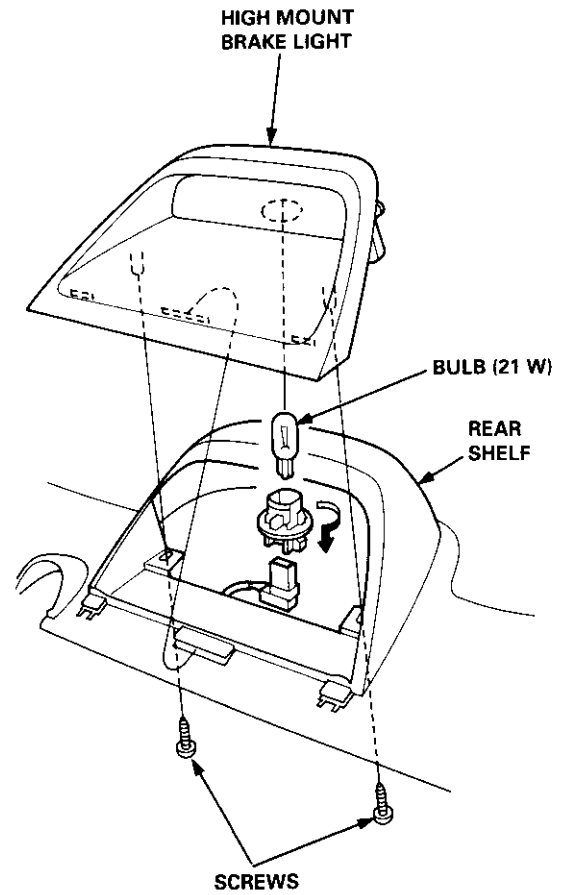
G601 : Hatchback/Coupe/Sedan



## High Mount Brake Light Replacement

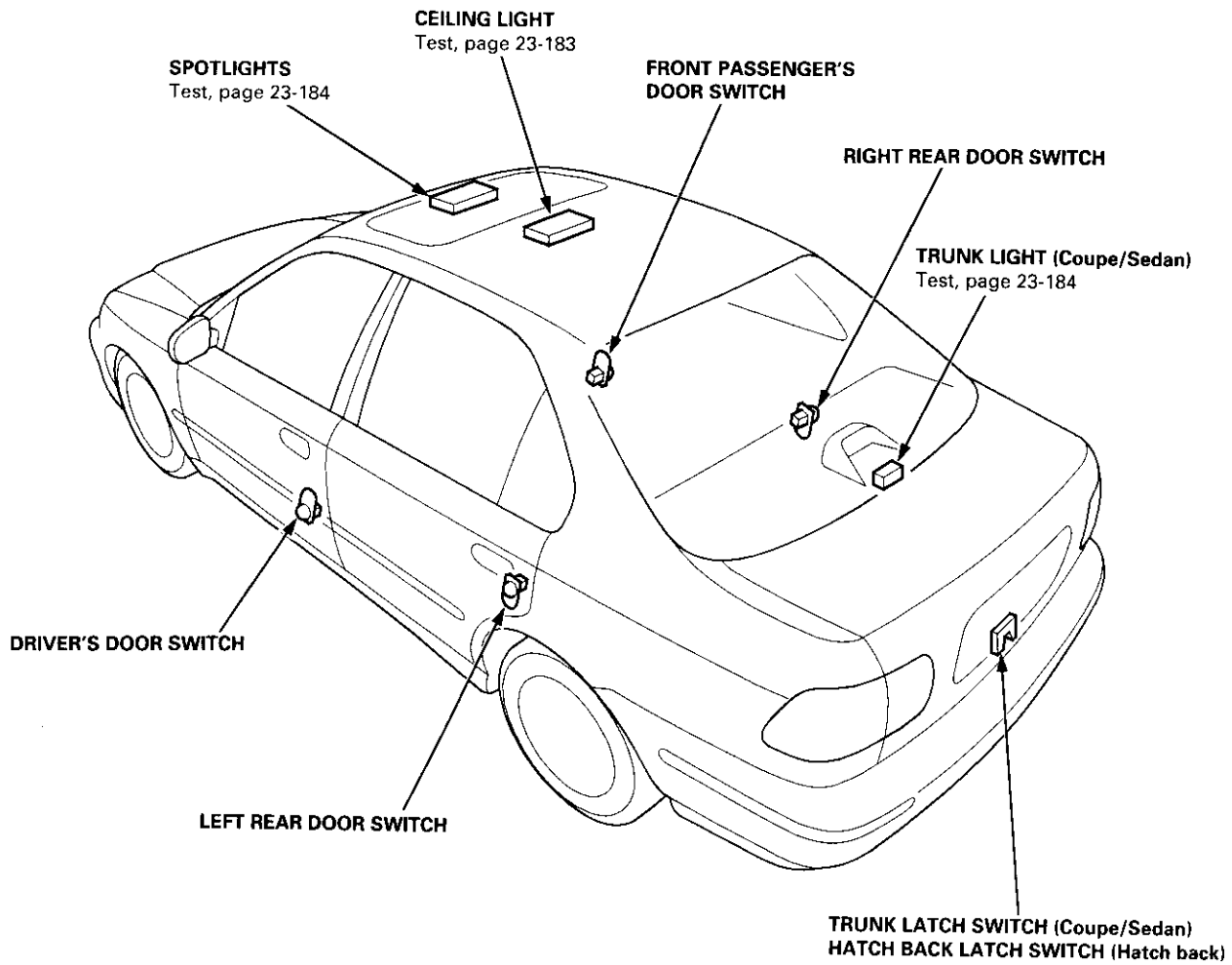
### Coupe/Sedan:

1. Remove the rear shelf (see section 20).
2. Remove the two screws, then remove the high mount brake light from the rear shelf.



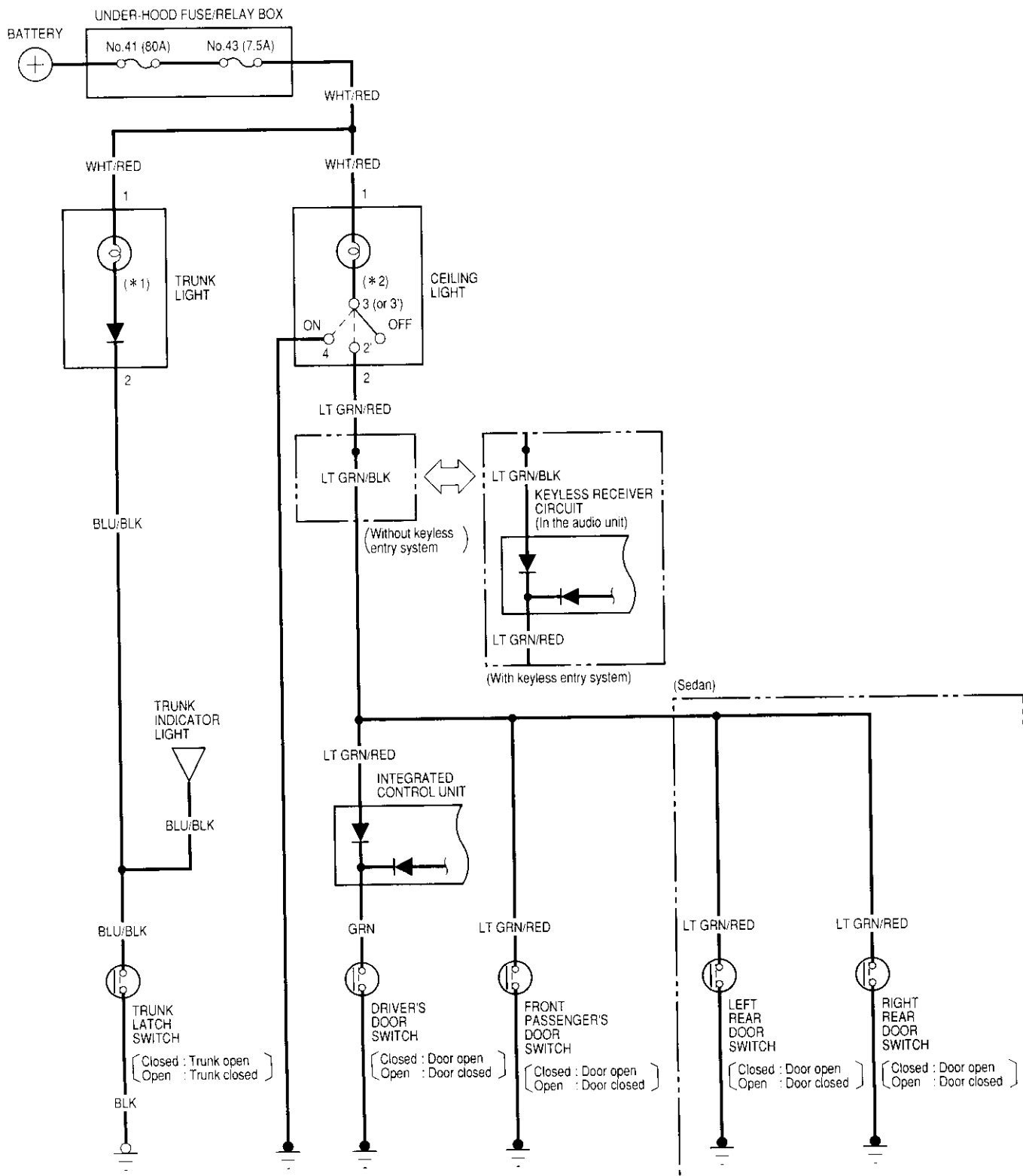
# Interior Lights

## Component Location Index





# Circuit Diagram (Without Spotlights)



G601, G761 : Hatchback  
 G601 : Coupe/Sedan

- \* 1 3.4W : USA, Canada-produced  
 5W : Japan-produced
- \* 2 8W : With moonroof  
 5W : Without moonroof



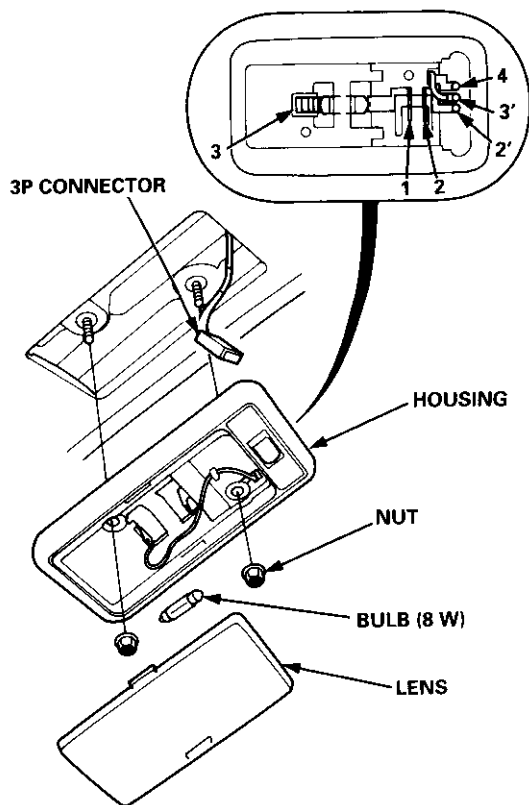


## Ceiling Light Test

1. Turn the light switch OFF.
2. Pry off the lens.
3. Remove the two mounting nuts (or a bolt) from the housing, then remove the housing.
4. Disconnect the connector(s) from the housing.
5. Check for continuity between the terminals in each switch position according to the table.

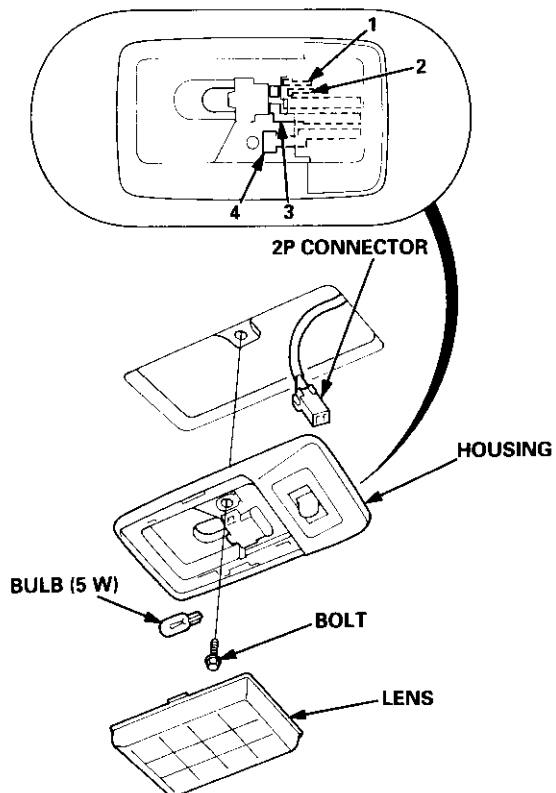
Terminal Position	1		2 or 2'	3 or 3'	4
OFF	○	⊗	—	○	
MIDDLE	○	⊗	○	○	
ON	○	⊗	—	○	○

With moonroof:

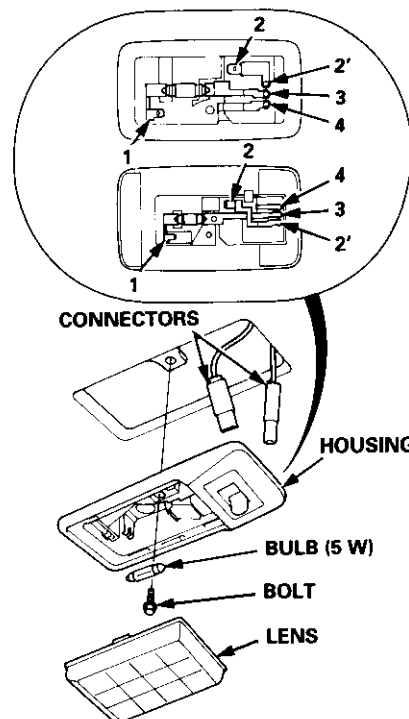


Without moonroof:

Coupe/Hatchback:



Sedan:

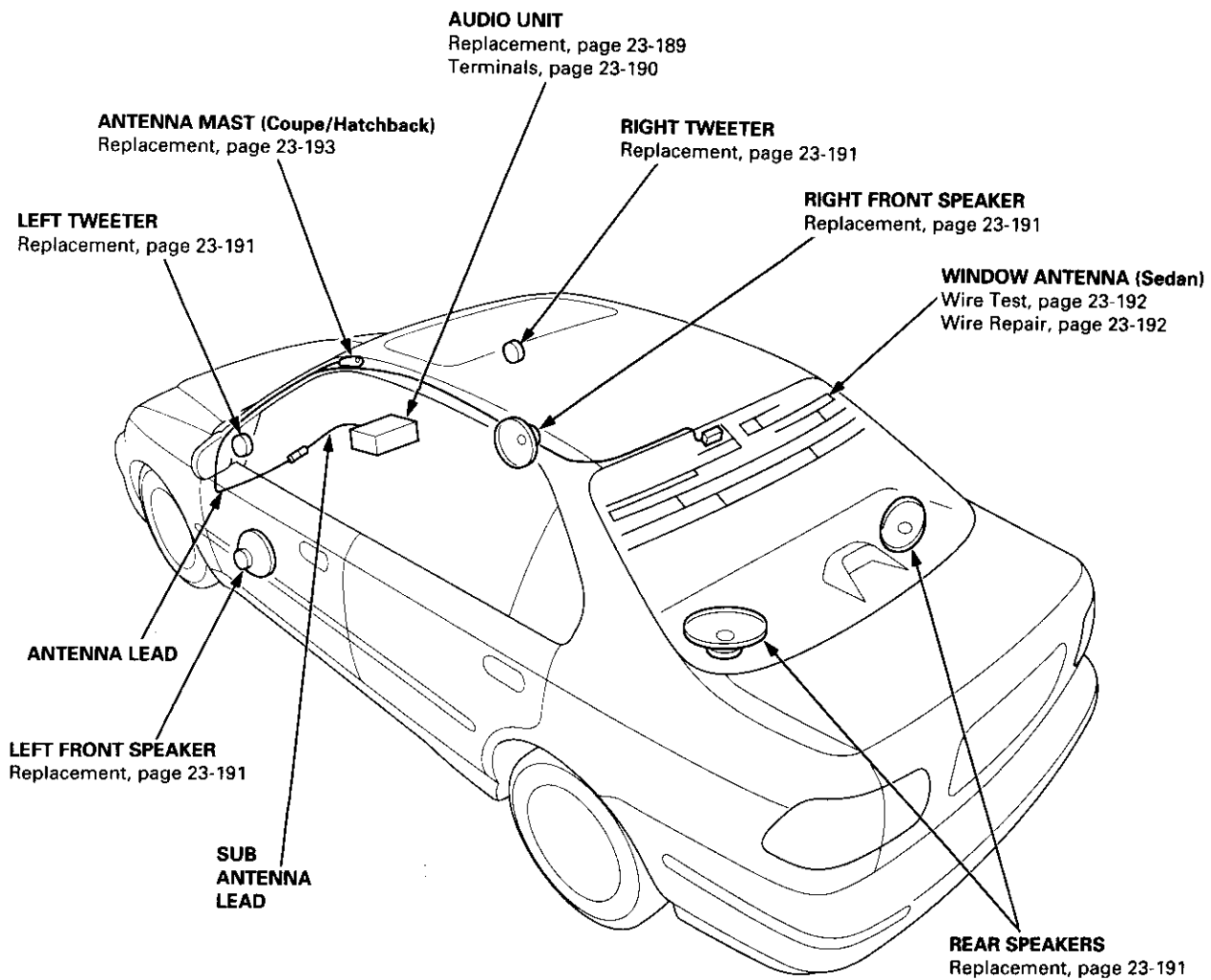


# Stereo Sound System

## Component Location Index (cont'd)

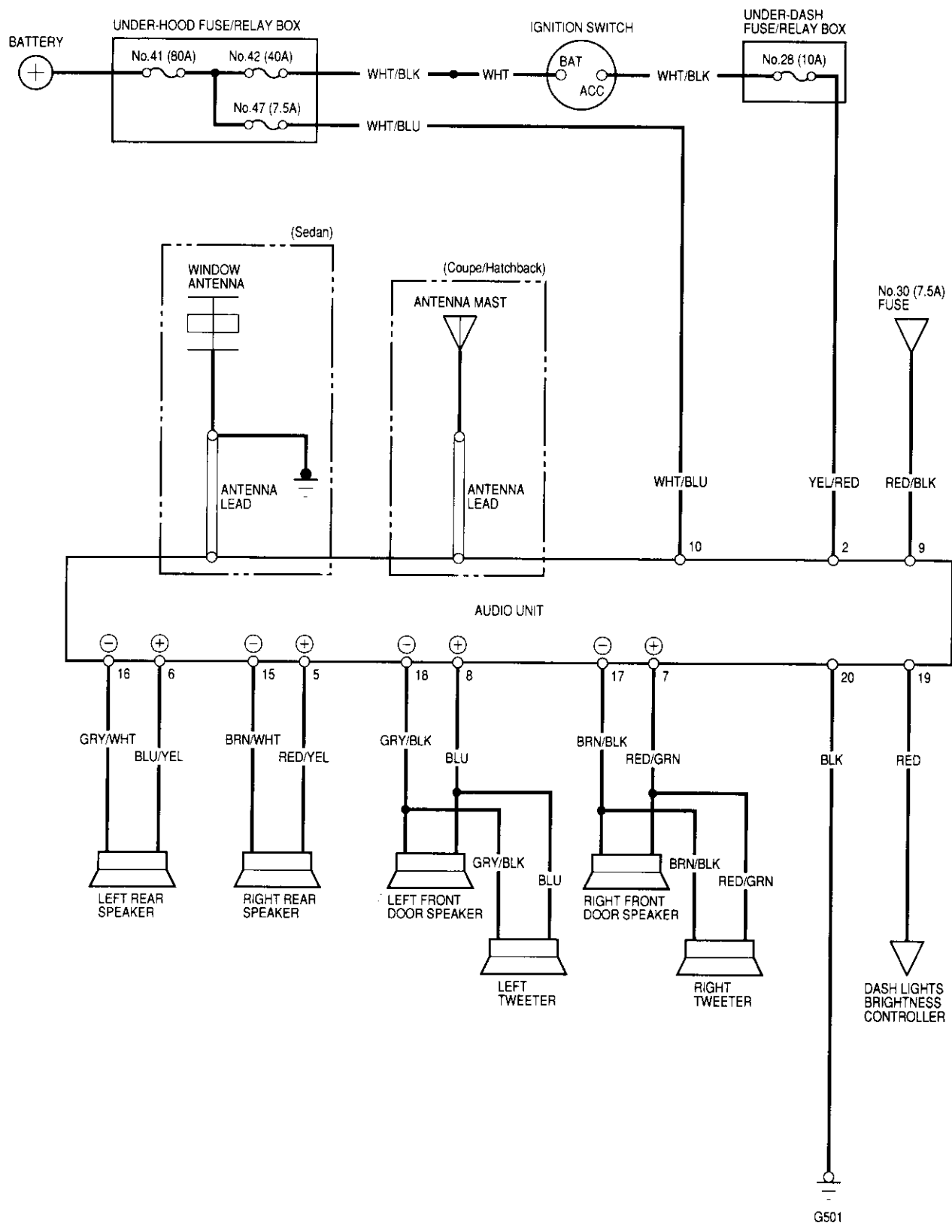
SRS components are located in this area. Review the SRS component locations, precautions, and procedures in the SRS section (24) before performing repairs or service.

'99 - 00 models



# Stereo Sound System

## Circuit Diagram ('99 - 00 models)

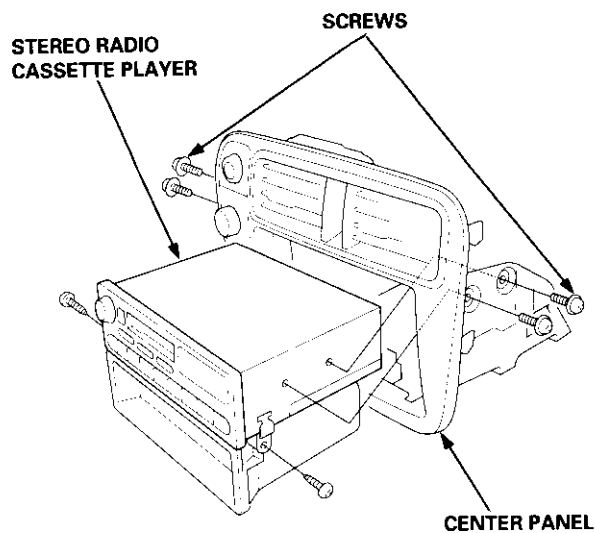




## Removal

### Stereo Radio/Cassette Player ('99 - 00 models):

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons.
2. Remove the center panel (see section 20).
3. Remove the four mounting screws, and disconnect the 20P connector and antenna lead, then remove the stereo radio/cassette player.

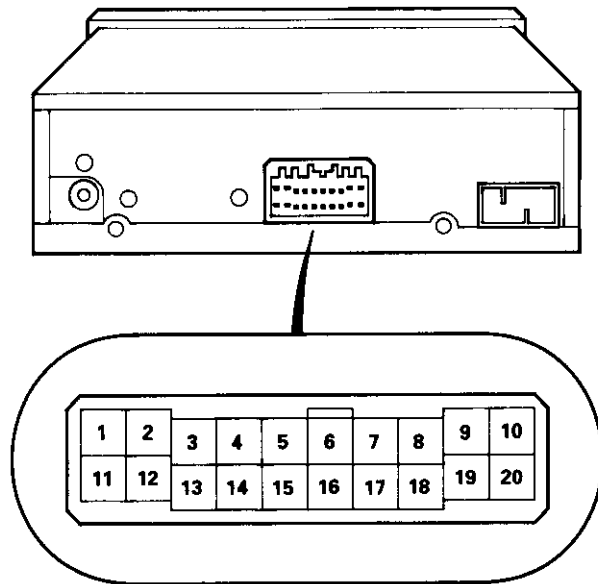


4. Enter the anti-theft code for the radio, then enter the customer's radio station presets.

# Stereo Sound System

## Stereo Radio Tuner Terminals

'99 - 00 models:



Cavity	Wire	Connects to
2	YEL/RED	ACC (main stereo power supply)
5	RED/YEL	Right rear speaker ⊕
6	BLU/YEL	Left rear speaker ⊕
7	RED/GRN	Right front door speaker ⊕, right tweeter ⊕
8	BLU	Left front door speaker ⊕, left tweeter ⊕
9	RED/BLK	Lights-on signal
10	WHT/BLU	Constant power (tuning memory)
15	BRN/WHT	Right rear speaker ⊖
16	GRY/WHT	Left rear speaker ⊖
17	BRN/BLK	Right front door speaker ⊖, right tweeter ⊖
18	GRY/BLK	Left front door speaker ⊖, left tweeter ⊖
19	RED	Dash lights brightness controller
20	BLK	Ground (G501)

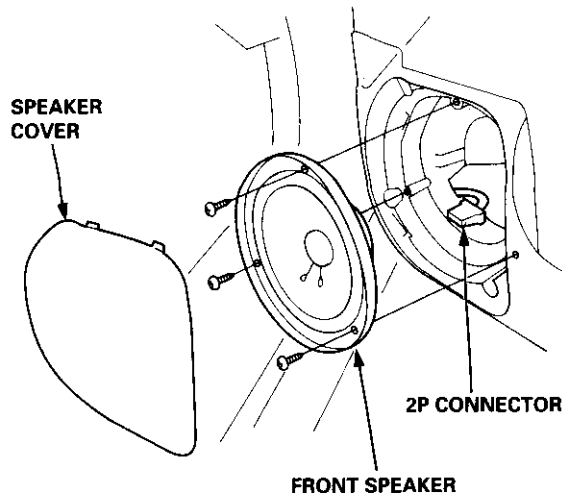
Terminals No. 1, 3, 4, 11, 12, 13, and 14: Not used



## Speaker Replacement

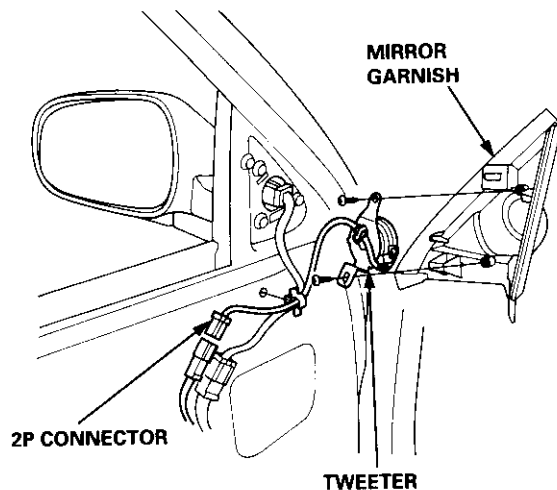
### Front speaker:

1. Remove the speaker cover.
2. Remove the three screws from the speaker.
3. Disconnect the 2P connector, and remove the door speaker.



### Tweeter:

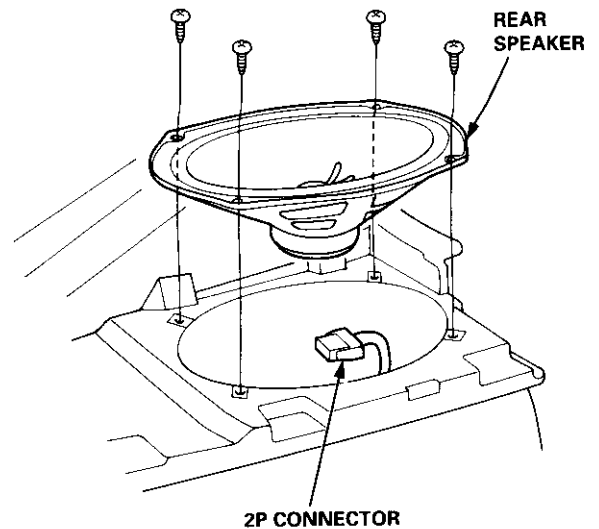
1. Remove the door panel (see section 20).
2. Disconnect the 2P connector from the tweeter.
3. Remove the mirror garnish.
4. Remove the two screws, then remove the tweeter.



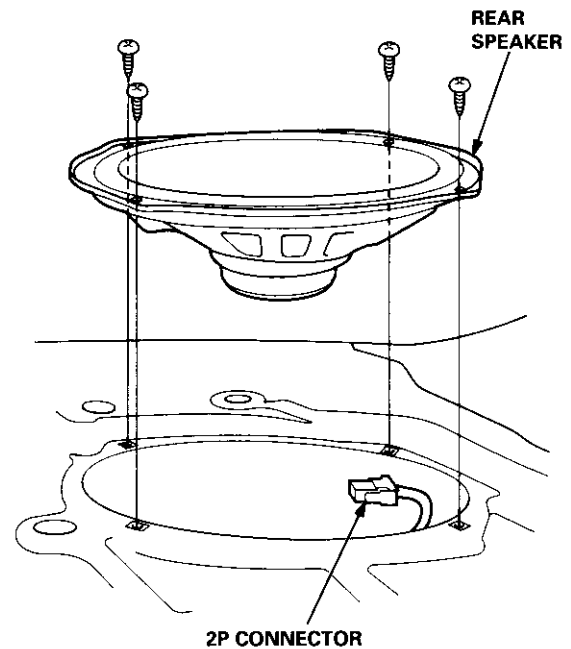
### Rear speaker:

1. Remove the rear side shelf or rear shelf (see section 20).
2. Disconnect the 2P connector from the speaker.
3. Remove the four screws, then remove the speaker.

### Hatchback:



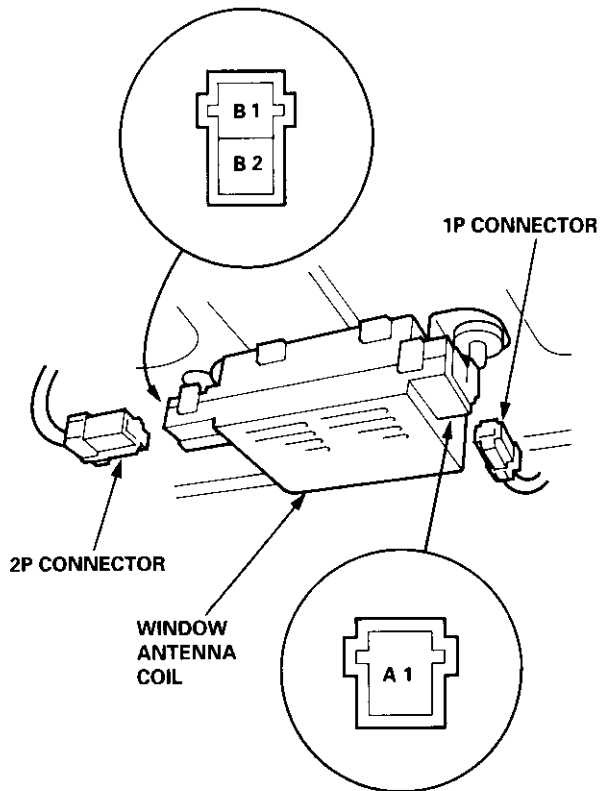
### Coupe/Sedan:





## Window Antenna Coil Test

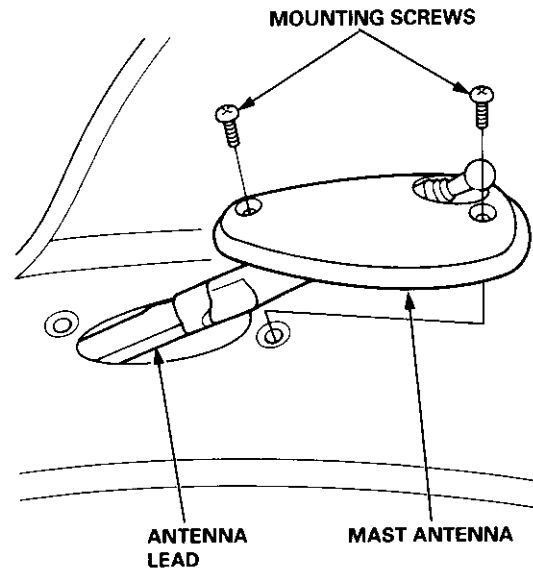
1. Remove the rear shelf (see section 20).
2. Disconnect the 2P and 1P connectors from the window antenna coil.



3. Check for continuity between terminal A1 and body ground and between terminals A1 and B1. If there is no continuity at either check, replace the window antenna coil.

## Mast Antenna Replacement

1. Disconnect the connector between the antenna lead and sub antenna lead.
2. Remove the two mounting screws, then remove the mast antenna.



# Horn

## Component Location Index

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

**HORN ASSEMBLY**  
Test, page 23-195

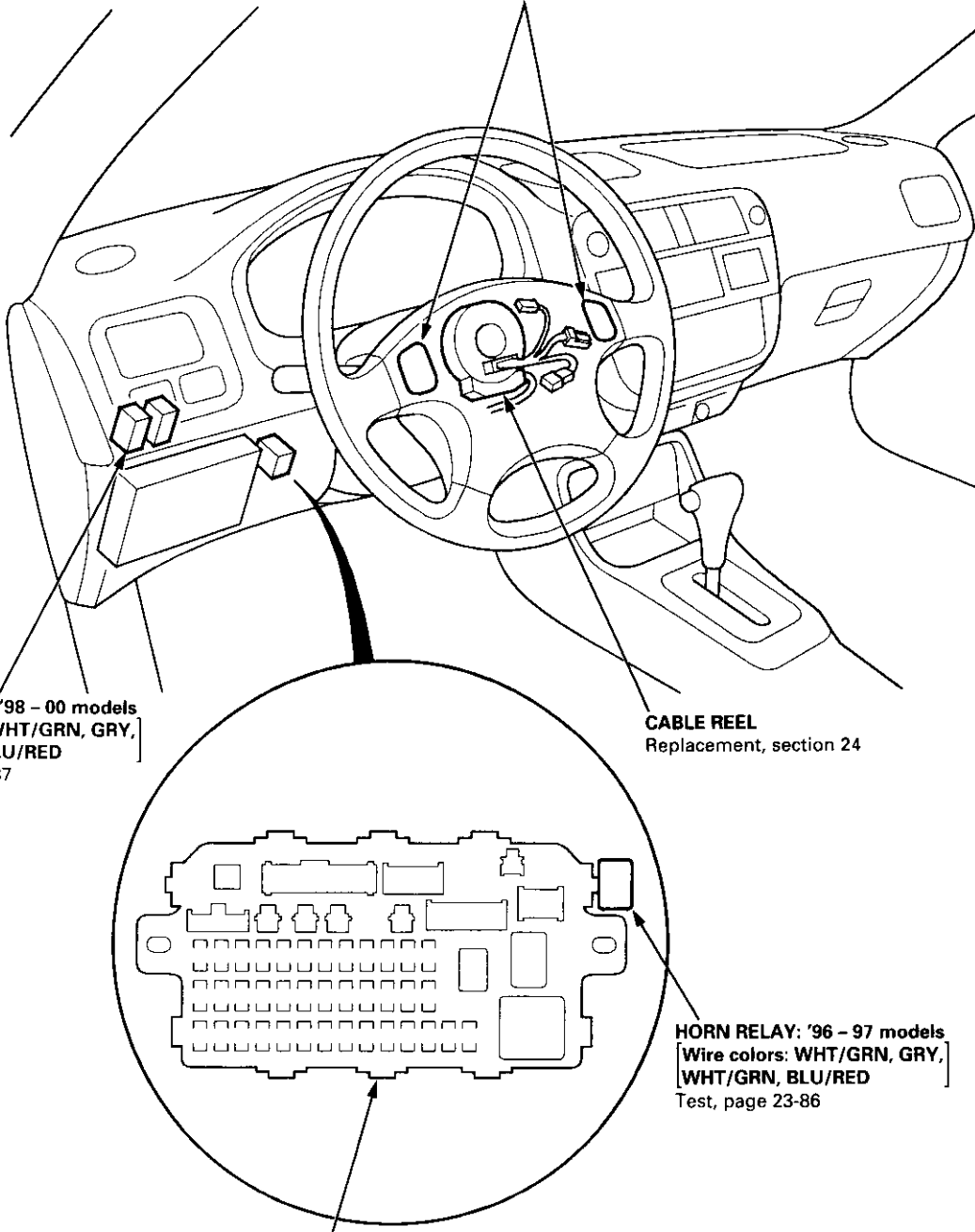
**HORN SWITCHES**  
Test, page 23-196

**HORN RELAY: '98 - 00 models**  
[Wire colors: WHT/GRN, GRY,  
WHT/GRN, BLU/RED]  
Test, page 23-87

**CABLE REEL**  
Replacement, section 24

**HORN RELAY: '96 - 97 models**  
[Wire colors: WHT/GRN, GRY,  
WHT/GRN, BLU/RED]  
Test, page 23-86

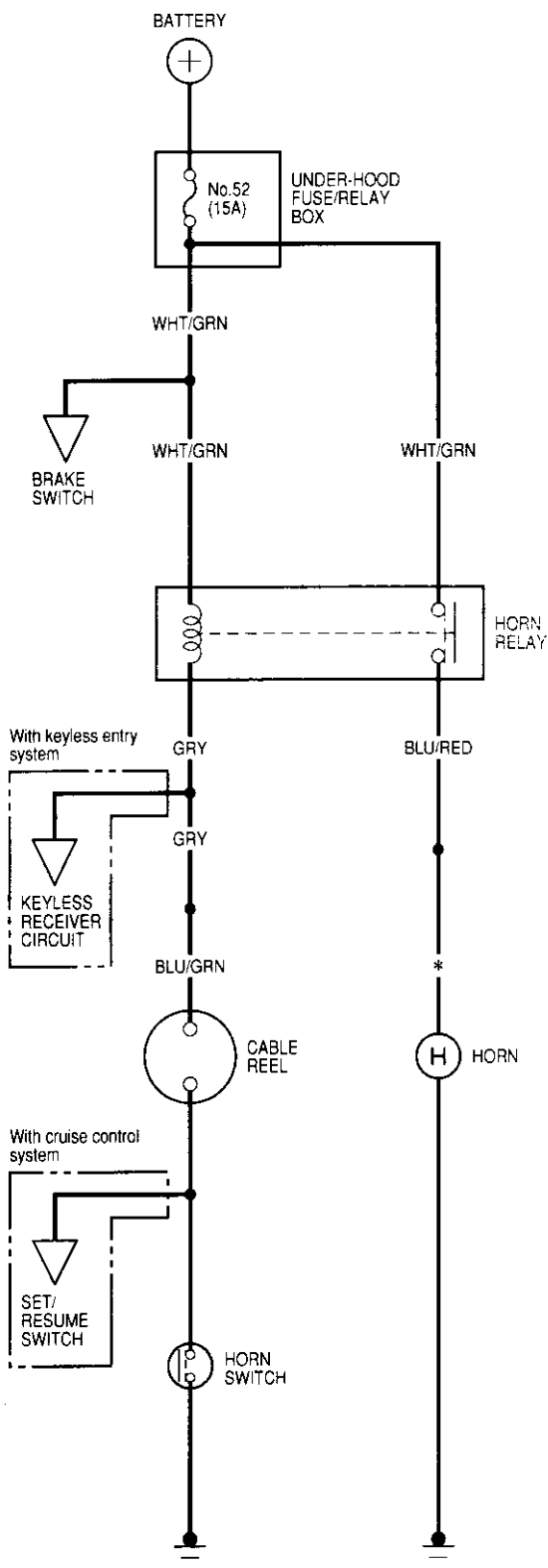
**UNDER-DASH FUSE/RELAY BOX**





# Horn

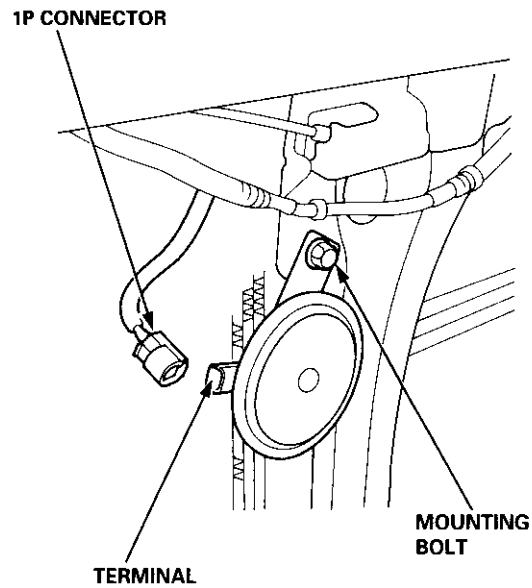
## Circuit Diagram: '98 – 00 models



\* '98 model: WHT/GRN  
'99 – 00 models: BLU/RED

## Horn Test: '98 – 00 models

1. Remove the front bumper (see section 20).
2. Disconnect the 1P connector from the horn.

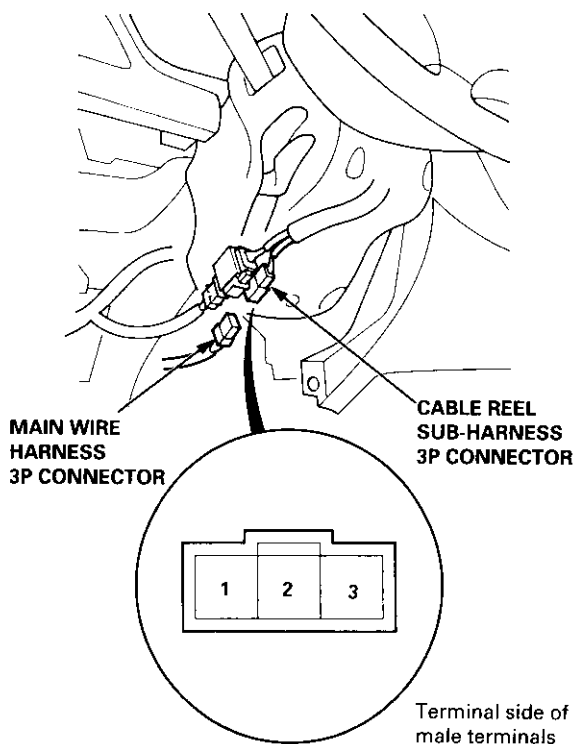


3. Test the horn by connecting battery power to the terminal and grounding the mounting bolt. If the horn fails to sound, replace it.

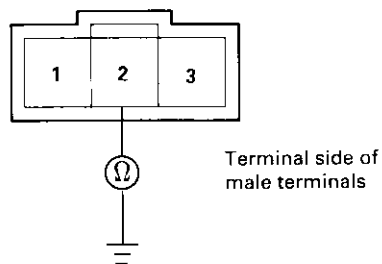


## Switch Test

1. Make sure you have the anti-theft code for the radio, then write down the frequencies for the radio's preset buttons ('99 - 00 models).
2. Disconnect the battery negative cable, then disconnect the positive cable, and wait at least three minutes.
3. Disconnect the driver's airbag connector (see section 24).
4. Remove the driver's dashboard lower cover (see section 20).
5. Disconnect the cable reel sub-harness 3P connector from the main wire harness.

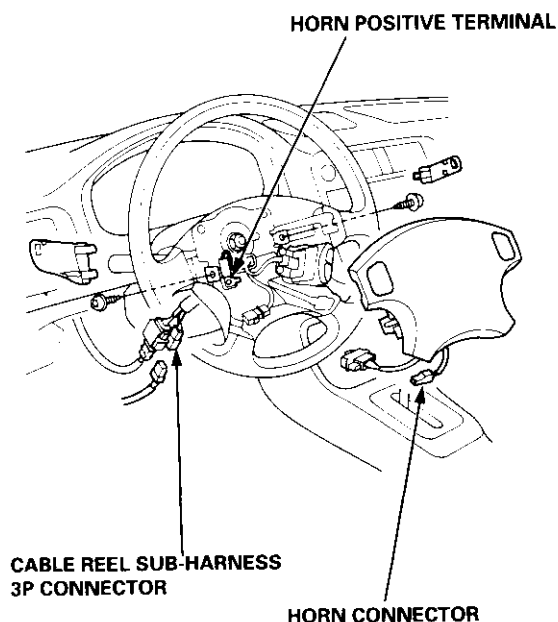


6. Check for continuity between the No. 2 terminal of the cable reel sub-harness and body ground with the horn switch pressed.



- If there is continuity, the horn switch is OK.
- If there is no continuity, go to step 6.

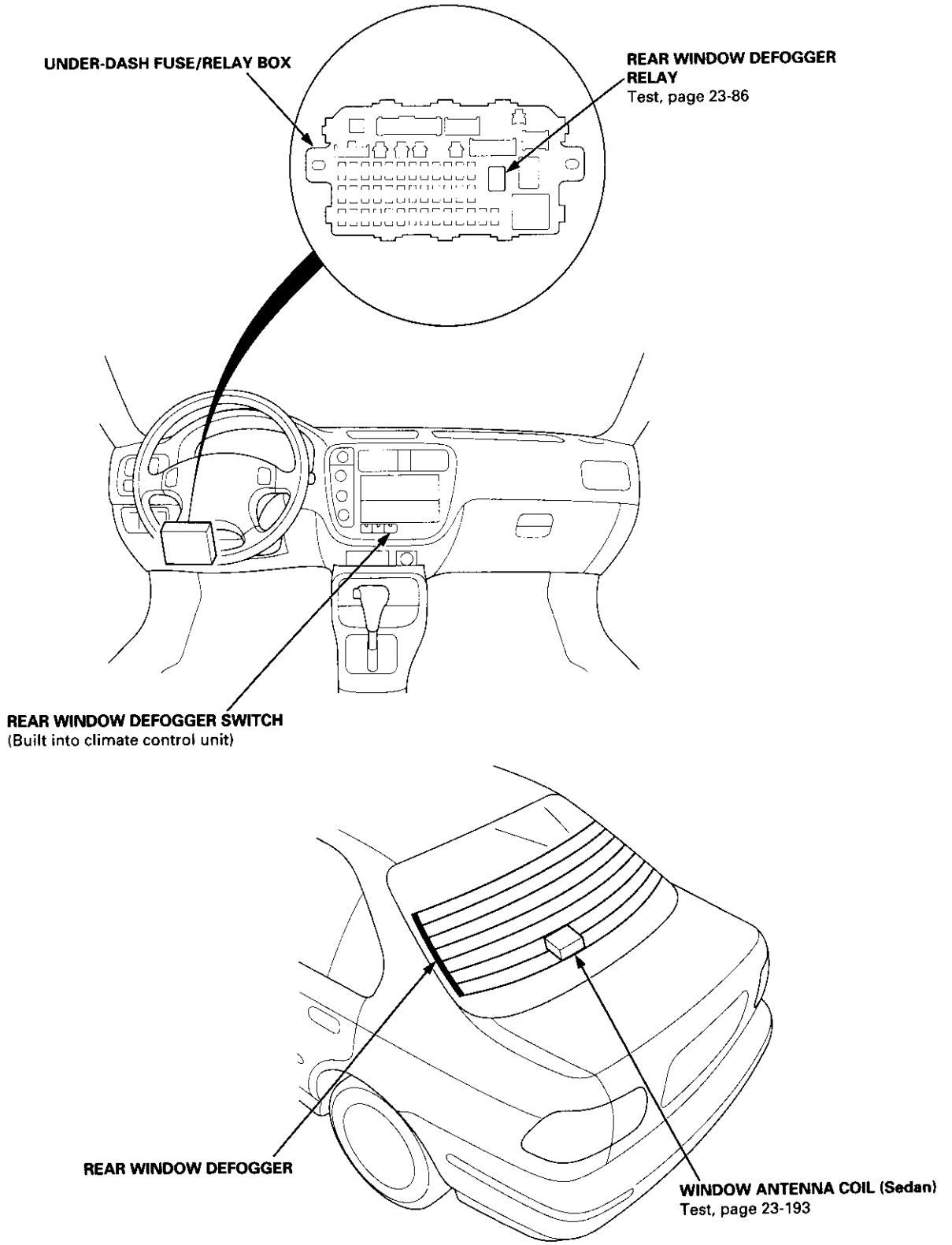
7. Remove the driver's airbag assembly (see section 24), then disconnect the horn connector from the steering wheel.
8. Check for continuity between the No. 2 terminal of the cable reel sub-harness 3P connector and horn positive terminal.



- If there is no continuity, replace the cable reel (see section 24).
  - If there is continuity, repair or replace the horn switch.
9. If all tests prove OK, reinstall the driver's airbag assembly (see section 24), and reconnect the cable reel sub-harness connector.
  10. Reconnect the driver's airbag connector, and reinstall the access panel on the steering wheel.
  11. Reconnect the battery positive cable, then the negative terminal.
  12. After installing the airbag assembly, confirm proper system operation:
    - Turn the ignition switch ON (II); the SRS indicator light should come on for about six seconds and then go off.
    - Make sure both horn buttons work.
  13. Enter the anti-theft code for the radio, then enter the customer's radio station presets ('99 - 00 models).

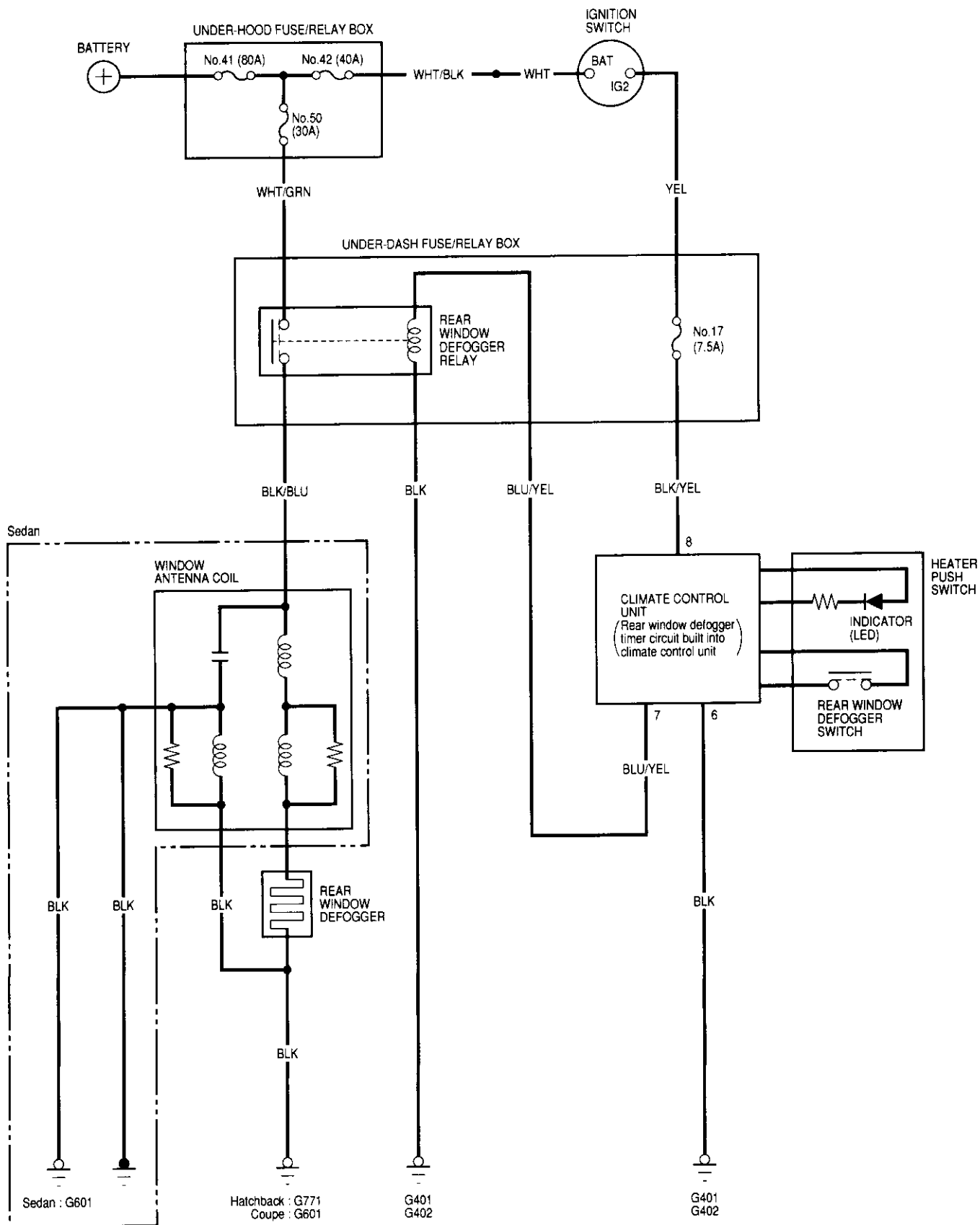


'99 - 00 models:





# '99 - 00 models



# Power Mirrors

---

## Component Location Index

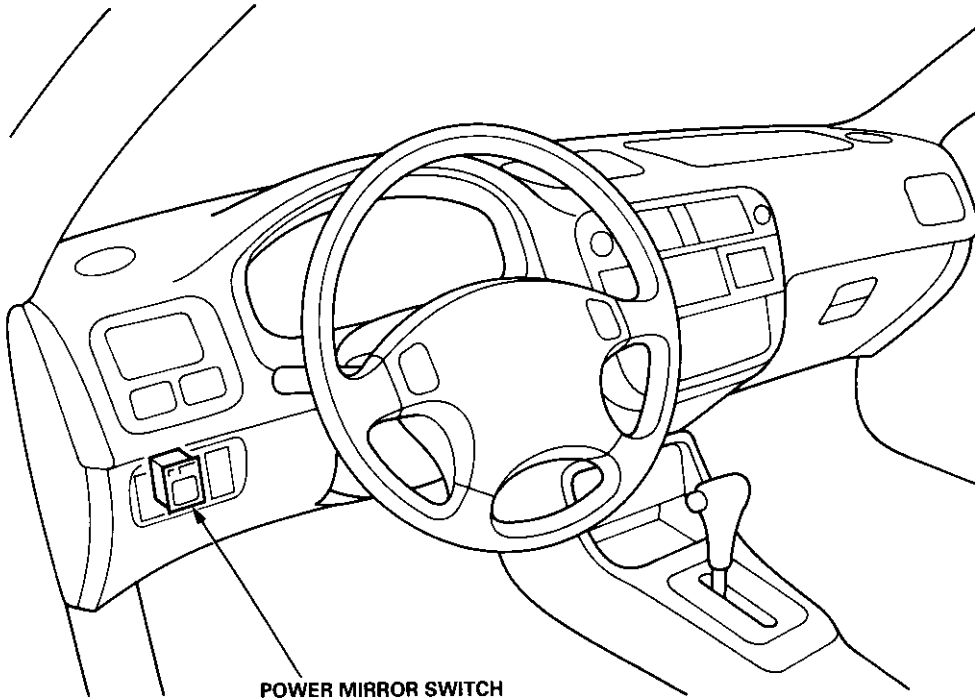
### Power Mirror

Function Test, page 23-207

Power Mirror Test, page 23-210

Replacement, section 20

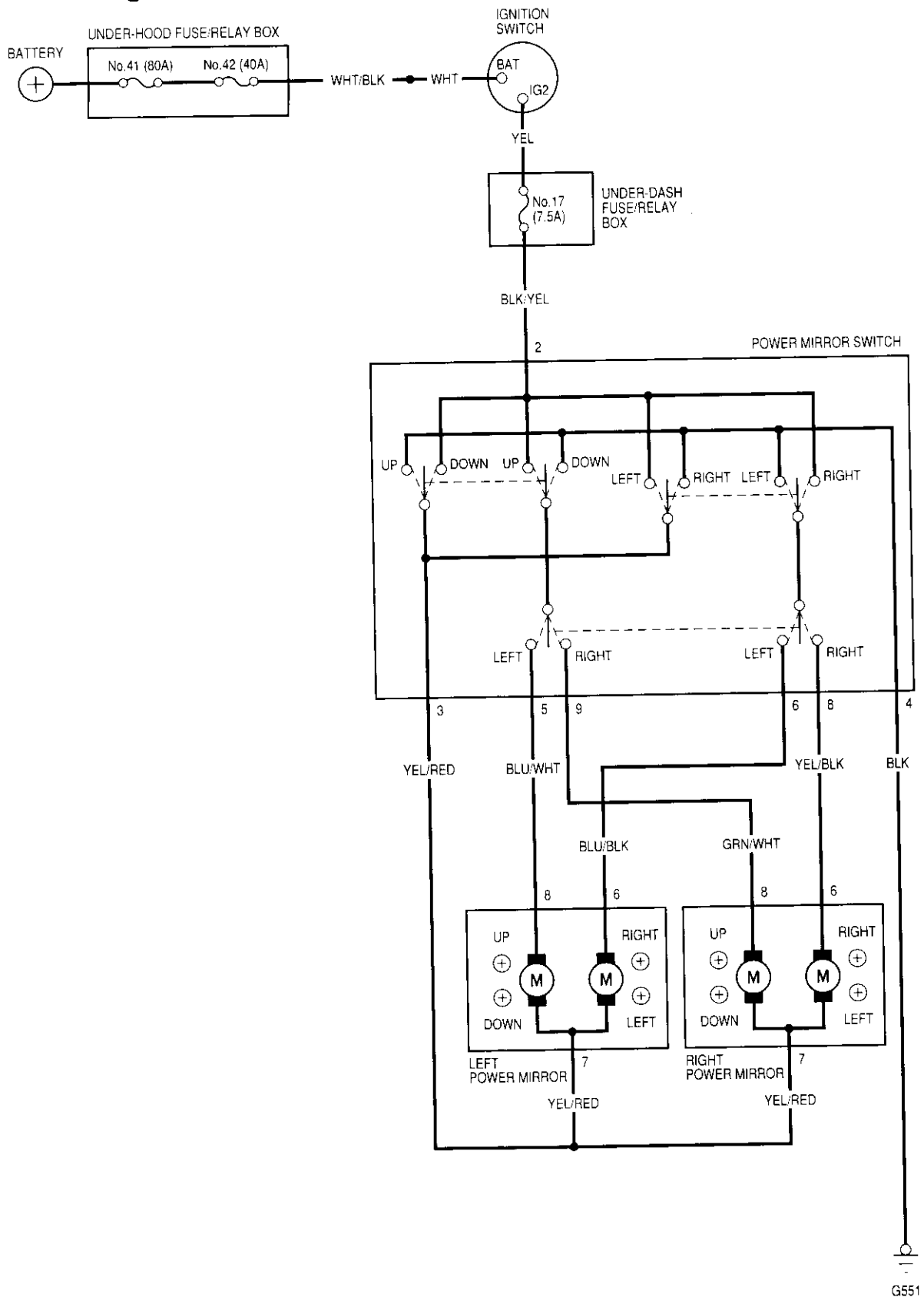
Actuator Replacement, page 23-210



**POWER MIRROR SWITCH**  
Test, page 23-209



# Circuit Diagram (Without Defogger)



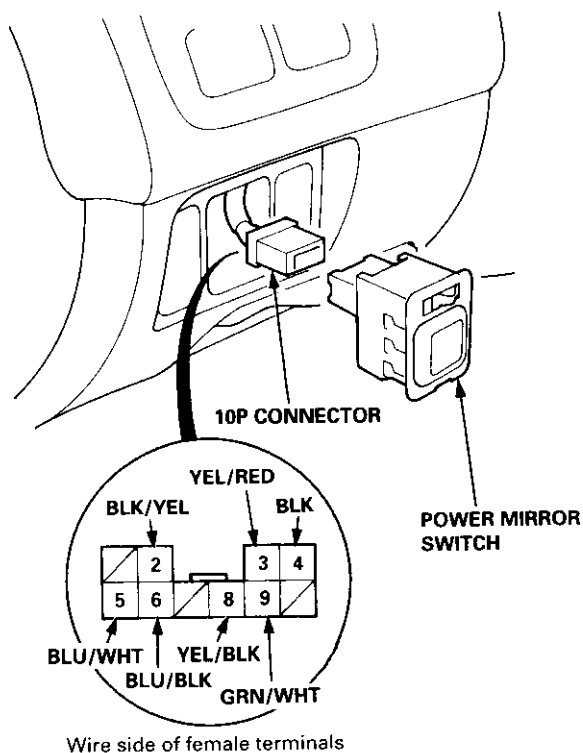


## Function Test

**CAUTION:** Be careful not to damage the mirror switch or the dashboard driver's lower cover when prying the switch out.

### Without defogger:

1. Pry the switch out of the driver's dashboard lower cover.
2. Disconnect the 10P connector from the switch.



## Mirror Test

### Both inoperative:

1. Check for voltage between the No. 2 (BLK/YEL) terminal and body ground with the ignition switch ON (II).  
There should be battery voltage.
  - If there is no voltage, check for:
    - blown No. 17 (7.5 A) fuse in the under-dash fuse/relay box.
    - an open in the BLK/YEL wire.
  - If there is battery voltage, go to step 2.
2. Check for continuity between the No. 4 (BLK) terminal and body ground.  
There should be continuity.
  - If there is no continuity, check for:
    - an open in the BLK wire.
    - poor ground (G551).

### Left mirror inoperative:

Connect the No. 2 (BLK/YEL) terminal of the 10P connector to the No. 3 (YEL/RED) terminal and the No. 5 (or No. 6) terminal to body ground with jumper wires. The left mirror should tilt down (or swing left) when the ignition switch is turned ON (II).

- If the mirror does not tilt down (or does not swing left), remove the left door panel, and check for an open in the BLU/WHT (or BLU/BLK) wire between the left power mirror and the switch.
  - If the wire is OK, check the left power mirror actuator.
- If the mirror neither tilts down nor swings left, repair the YEL/RED wire.
- If the mirror operates properly, check the mirror switch.

### Right mirror inoperative:

Connect the No. 2 (BLK/YEL) terminal of the 10P connector to the No. 3 (YEL/RED) terminal and the No. 9 (or No. 8) terminal to body ground with jumper wires. The right mirror should tilt down (or swing left) when the ignition switch is turned ON (II).

- If the mirror does not tilt down (or does not swing left), remove the right door panel, and check for an open in the GRN/WHT (or YEL/BLK) wire between the right power mirror and the switch.
  - If the wire is OK, check the right power mirror actuator.
- If the mirror neither tilts down nor swings left, repair the YEL/RED wire.
- If the mirror operates properly, check the mirror switch.

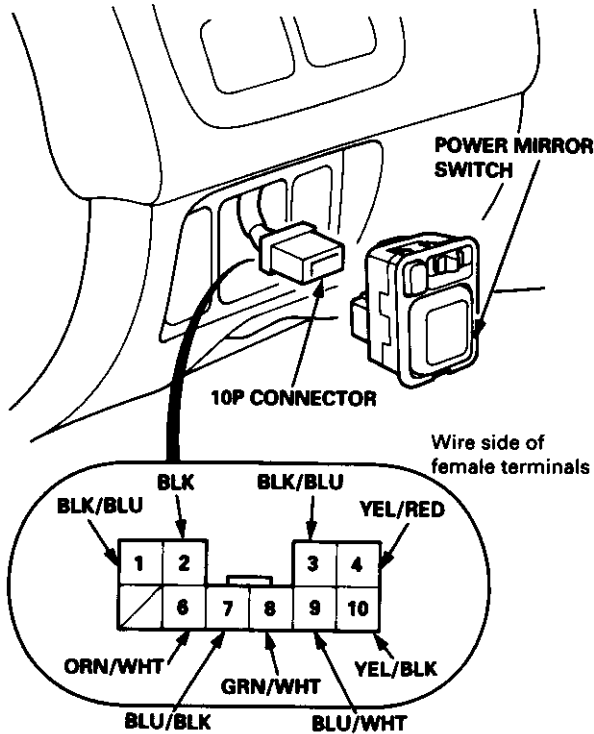
(cont'd)

# Power Mirrors

## Function Test (cont'd)

### With defogger:

1. Pry the switch out of the driver's dashboard lower cover.



2. Disconnect the 10P connector from the power mirror switch.

### Mirror Test

#### Both inoperative:

1. Check for voltage between the No. 1 terminal and body ground with the ignition switch ON (II). There should be battery voltage.
  - If there is no battery voltage, check for:
    - blown No. 16 (7.5 A) fuse in the under-dash fuse/relay box.
    - an open in the BLK/BLU wire.
  - If there is battery voltage, go to step 2.
2. Check for continuity between the No. 2 terminal and body ground. There should be continuity.
  - If there is no continuity, check for:
    - an open in the BLK wire.
    - poor ground (G551).
  - If there is continuity, check both mirrors individually as described in the next column.

#### Left mirror inoperative:

Connect the No. 1 terminal to the No. 7 terminal, and the No. 4 (or No. 9) 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 YEL/RED (or BLU/WHT) wire between the left mirror and the 10P connector. If the wire is OK, check the left mirror actuator.
- If the mirror neither tilts down nor swings left, repair the BLU/BLK wire.
- If the mirror works properly, check the mirror switch.

#### Right mirror inoperative:

Connect the No. 1 terminal to the No. 8 terminal, and the No. 4 (or No. 10) terminal to body ground with jumper wires. The right 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 YEL/RED (or YEL/BLK) wire between the right mirror and the 10P connector. If the wire is OK, check the right mirror actuator.
- If the mirror neither tilts down nor swings left, repair the GRN/WHT wire.
- If the mirror works properly, check the mirror switch.

#### Defogger inoperative:

1. Check for voltage between the No. 3 terminal and body ground with the ignition switch ON (II). There should be battery voltage.
  - If there is no battery voltage, check for:
    - blown No. 16 (7.5 A) fuse in the under-dash fuse/relay box.
    - An open in the BLK/BLU wire.
  - If there is battery voltage, go to step 2.
2. Connect the No. 3 terminal to the No. 6 terminal with a jumper wire. Both mirrors should gradually warm up when the ignition switch ON (II).
  - If neither mirror warms up, check for an open in the ORN/WHT wire.
  - If only one fails to warm up, check its mirror defogger element.
  - If both mirrors warm up, check the switch.





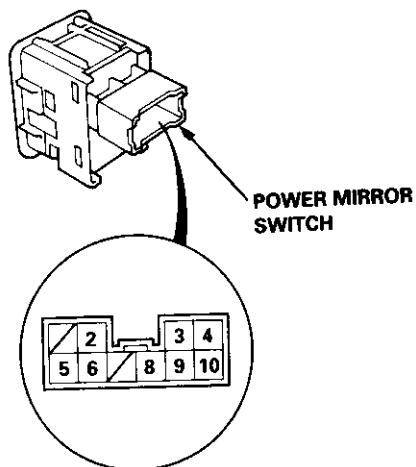
## Switch Test

### Without defogger:

1. Remove the switch as described in Function Test (see page 23-207).
2. Check for continuity between the terminals in each switch position according to the table.

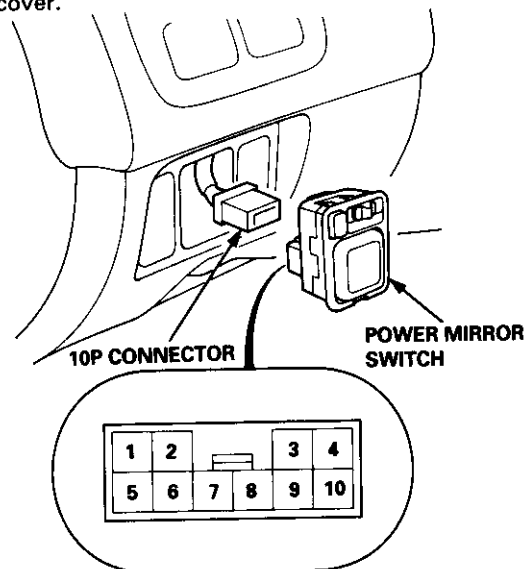
### Mirror Switch:

Terminal	2	3	4	5	6	8	9
Position							
L	UP	○	○	○	○		
	DOWN	○	○	○	○		
	LEFT	○	○	○	○	○	
	RIGHT	○	○	○	○	○	
R	UP	○	○	○			○
	DOWN	○	○	○			○
	LEFT	○	○	○		○	
	RIGHT	○	○	○		○	



### With defogger:

1. Pry the switch out of the dashboard driver's lower cover.



2. Disconnect the 10P connector from the switch.
3. Check for continuity between the terminals in each switch position according to the table.

### Mirror Switch:

Terminal	1	2	4	7	8	9	10
Position							
L	UP	○	○	○			
	DOWN	○	○	○			
	LEFT	○	○	○	○		
	RIGHT	○	○	○	○	○	
R	UP	○	○	○	○		
	DOWN	○	○	○	○		
	LEFT	○	○	○	○	○	
	RIGHT	○	○	○	○	○	○

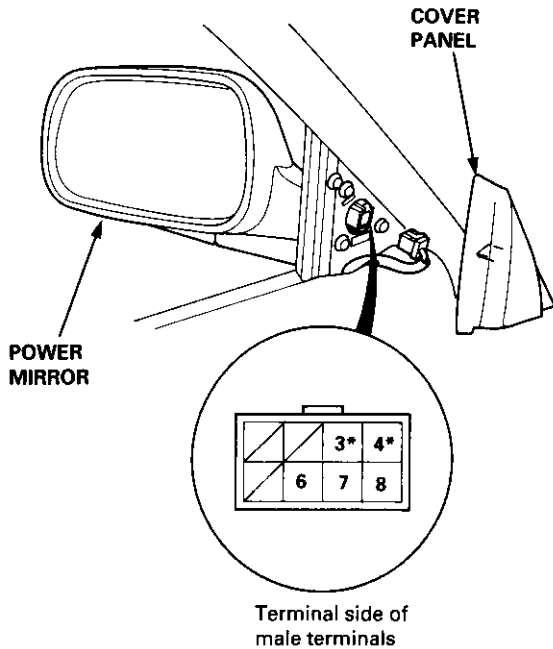
### Defogger Switch:

Terminal	2		3	6
Position				
ON	○	⊗	←	○
OFF	○	⊗	←	○

# Power Mirrors

## Power Mirror Test

1. Pry out the cover panel (see section 20).



Terminal side of male terminals

\*: Canada '99 - 00 models

2. Disconnect the 8P connector from the power mirror.
3. Check actuator operation by connecting power and ground according to the tables.

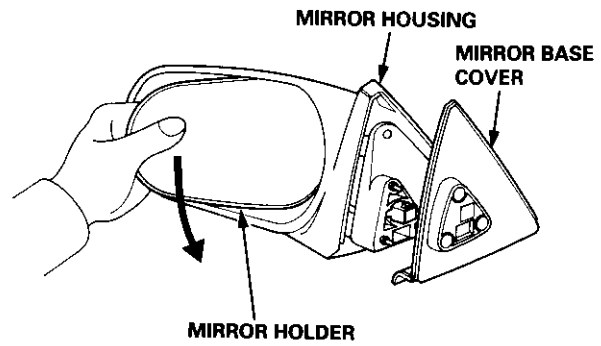
Terminal	6	7	8
Position			
TILT UP		⊖	⊕
TILT DOWN		⊕	⊖
SWING LEFT	⊖	⊕	
SWING RIGHT	⊕	⊖	

### Defogger Test:

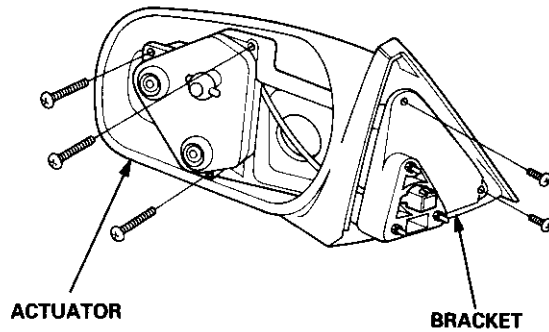
4. Check for continuity between the No. 3 and No. 4 terminals of the 8P connector. There should be continuity.

## Mirror Actuator Replacement (Donnelly Type)

1. Remove the power mirror from the door (see section 20), and disconnect the 8P connector.
2. Remove the mirror base cover from the mirror housing.



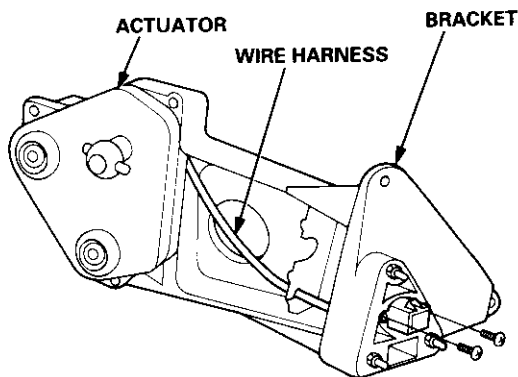
3. Remove the mirror holder from the mirror housing. Gently pull it out by hand.
4. Remove the three screws from the actuator and the two screws from the bracket at the base of the assembly.



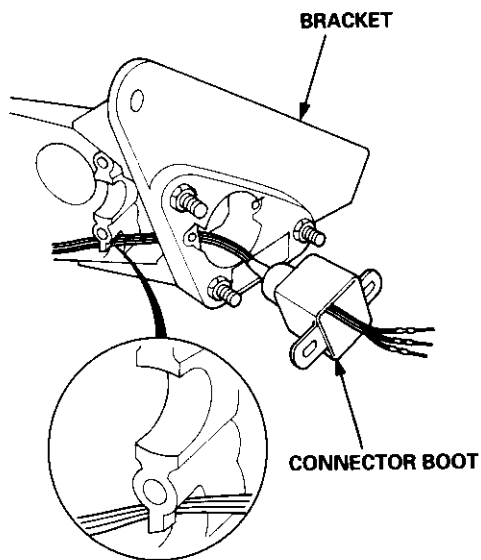
5. Remove the bracket from the housing.



6. Remove the two screws, cut the wire harness, and remove the actuator.

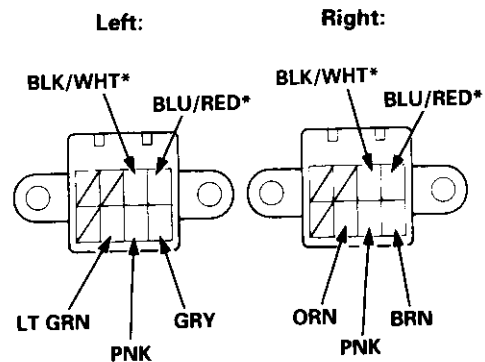


7. Record the terminal locations and wire colors.
8. Route the wire harness of the new actuator through the hole in the bracket. Be sure to pass the wire under the bracket clip.



9. Pass the connector boot over the wire harness.

10. Insert the terminals into the connector in the original arrangement (recorded in step 7), as shown below.



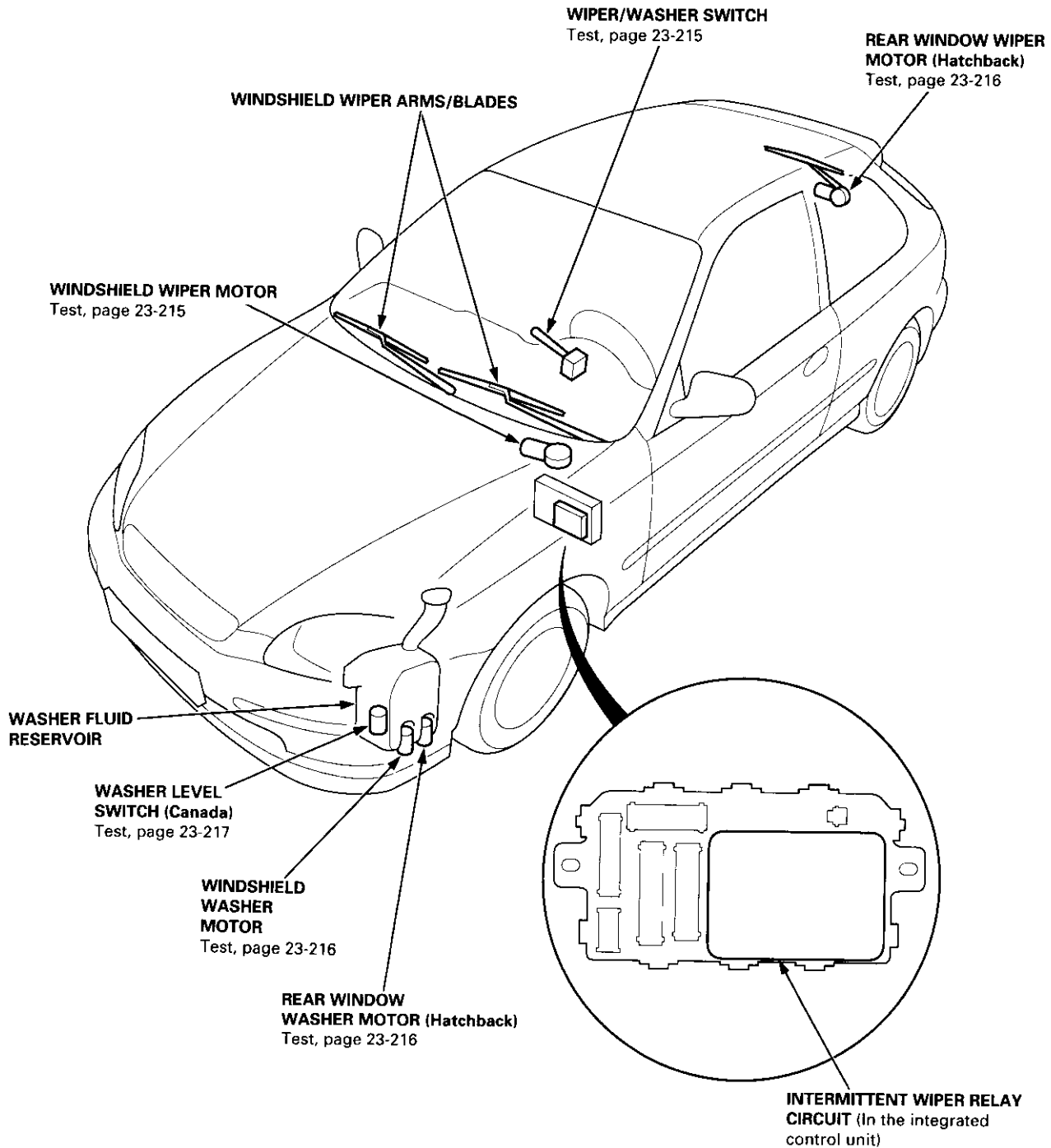
\*: Canada '99 - 00 models

11. Apply tape to seal the intersection of the connector boot and the wire harness.
12. Reassemble in the reverse order of disassembly. Be careful not to break the mirror when reinstalling it to the actuator.
13. Reinstall the mirror assembly to the door.
14. Operate the power mirror to check that the actuator works smoothly.

# Wipers/Washers

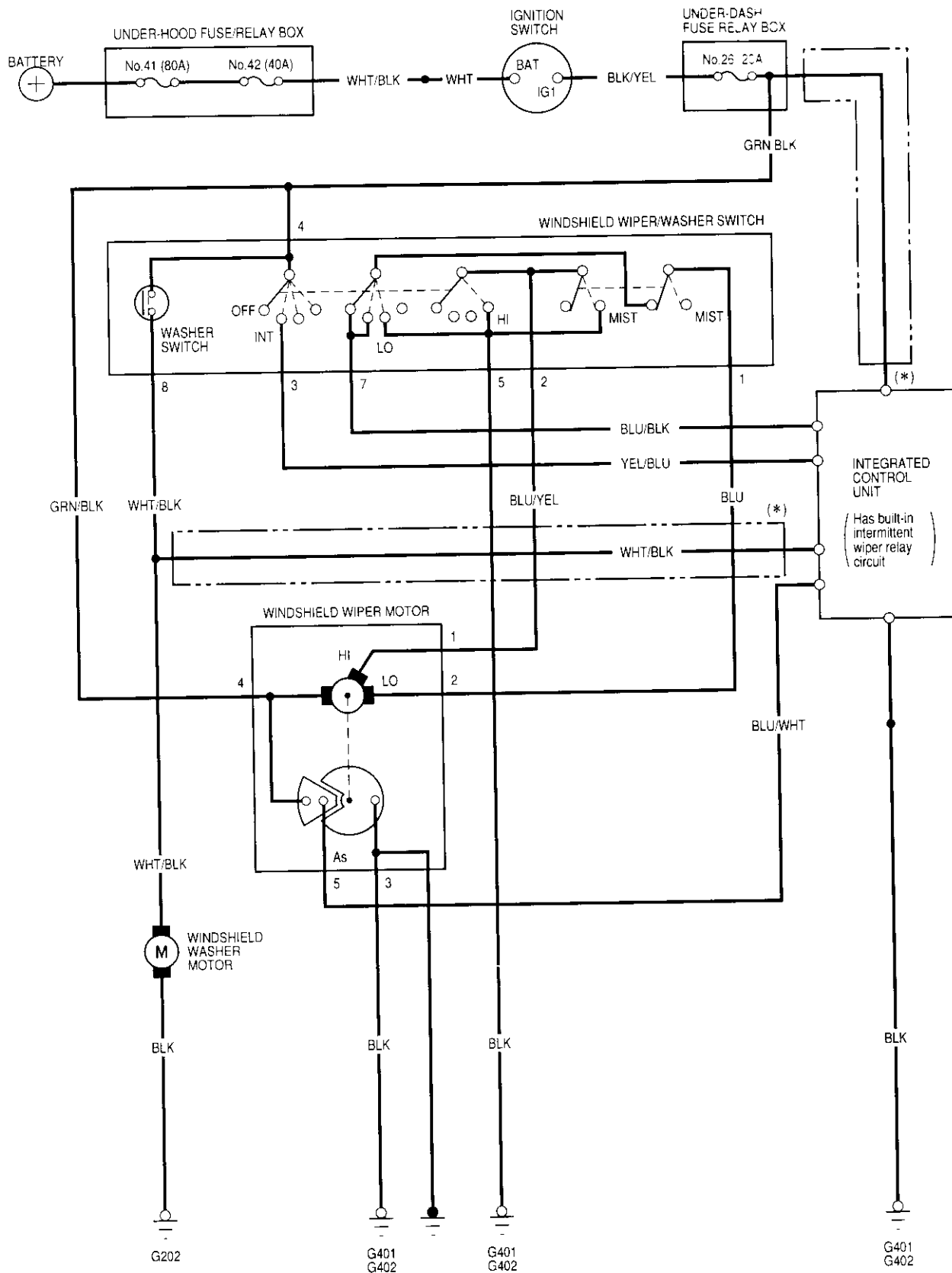
## Component Location Index

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





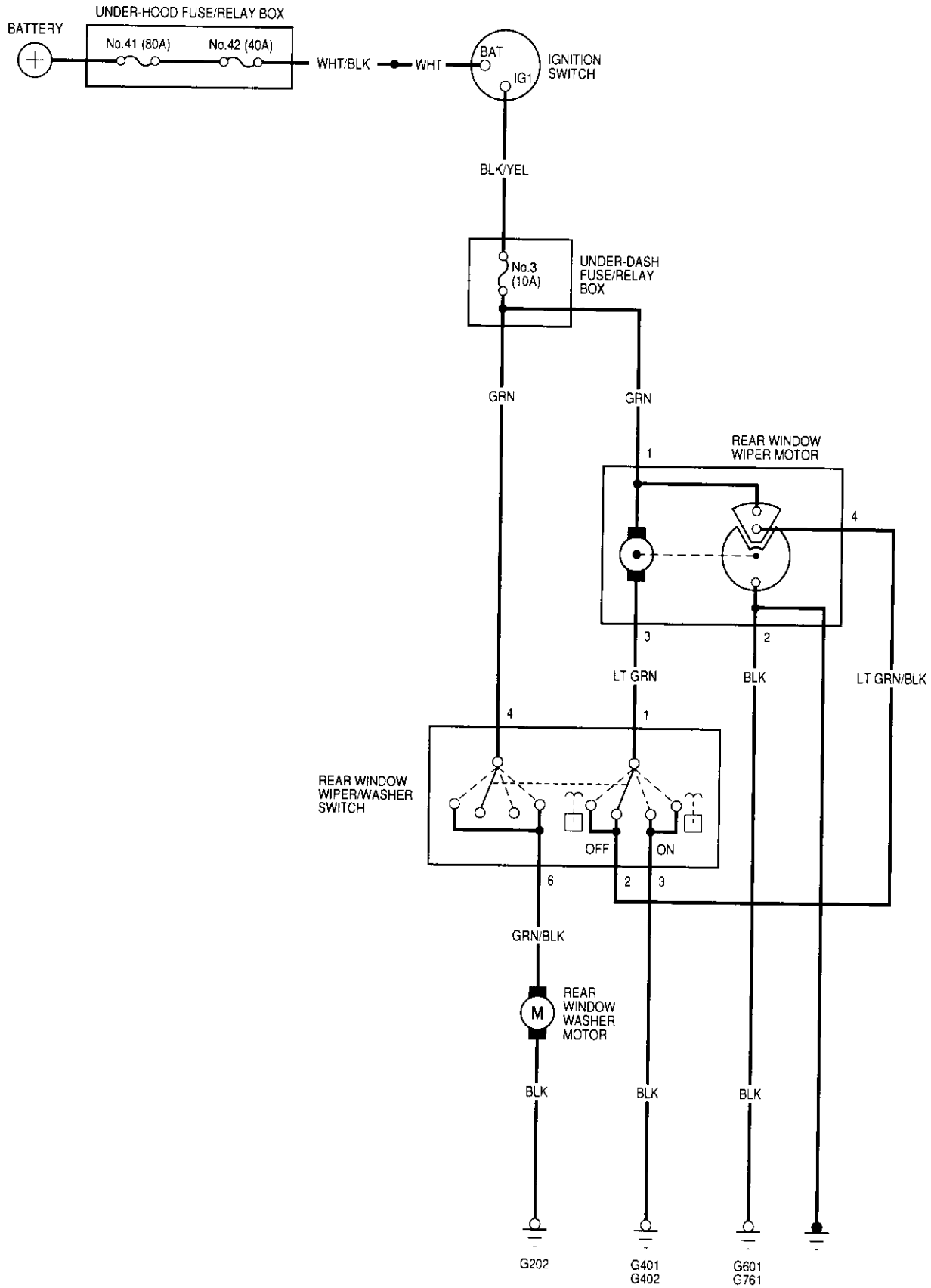
# Circuit Diagram (Windshield)



\* : With COMBINED OPERATION WIPER/WASHER

# Wipers/Washers

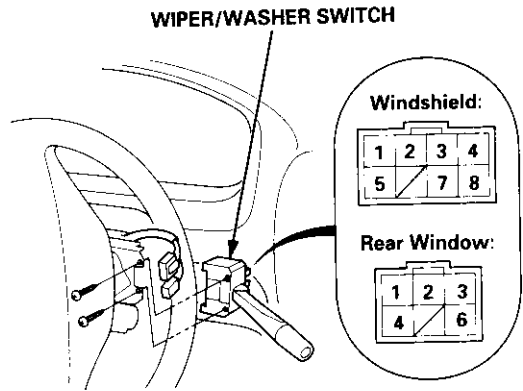
## Circuit Diagram (Rear Window)





## Wiper/Washer Switch Test

1. Remove the driver's dashboard lower cover (see section 20).
2. Remove the steering column covers.
3. Disconnect the 8P and 6P connectors from the switch, remove the two screws, and pull out the switch.



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

**Windshield Wiper/Washer Switch:**

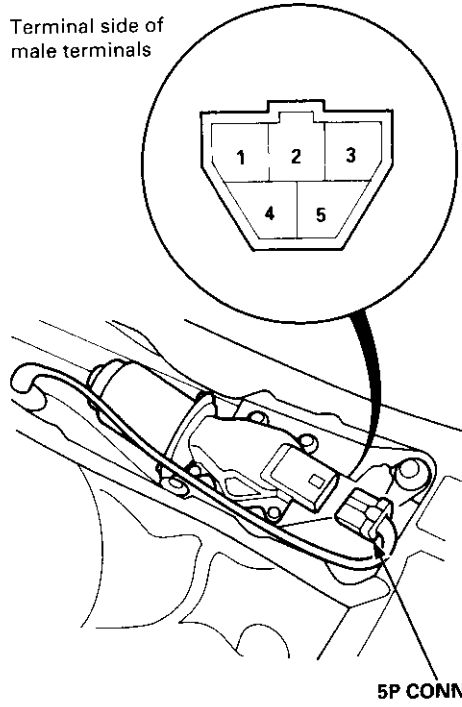
Terminal	1	2	3	4	5	7	8
Position							
OFF	○					○	
INT	○					○	
LO	○					○	
HI		○	○	○		○	
Mist switch "ON"		○	○	○		○	
Washer switch "ON"				○			○

**Rear Window Wiper/Washer Switch:**

Terminal	1	2	3	4	6
Position					
Washer switch "ON" (Wiper switch "OFF")	○	○		○	○
OFF	○	○			
ON	○		○		
Washer switch "ON" (Wiper switch "ON")	○		○	○	○

## Windshield Wiper Motor Test

1. Open the hood, and remove the cap nuts. Carefully remove the wiper arms so that they do not touch the hood.
2. Remove the cowl cover by prying out the trim clips (see section 20).
3. Disconnect the 5P connector from the windshield wiper motor.



4. Test the motor by connecting battery power and ground according to the table.

Terminal	1	2	4
Position			
LOW SPEED		⊖	⊕
HIGH SPEED	⊖		⊕

If the motor does not run or fails to run smoothly, replace it.

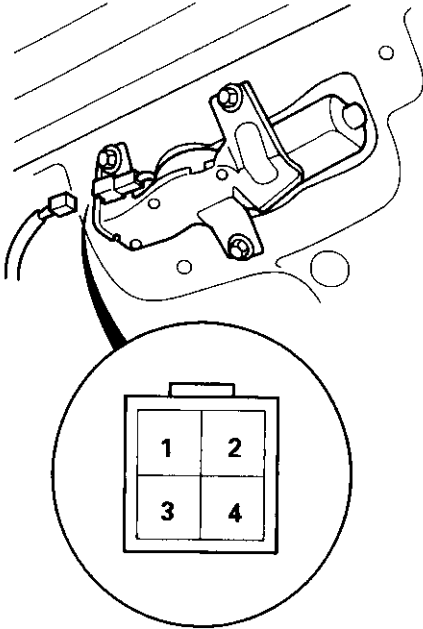
5. Connect an analog voltmeter between the No. 5 (+) and No. 3 (-) terminals, and run the motor at low or high speed.

The voltmeter should indicate 0 V and 4 V or less alternately.

# Wipers/Washers

## Rear Wiper Motor Test (Hatchback)

1. Remove the hatch lower trim panel (see section 20).
2. Disconnect the 4P connector from the wiper motor assembly.



3. Test the motor by connecting battery power to the No. 1 terminal and ground to the No. 3 terminal.

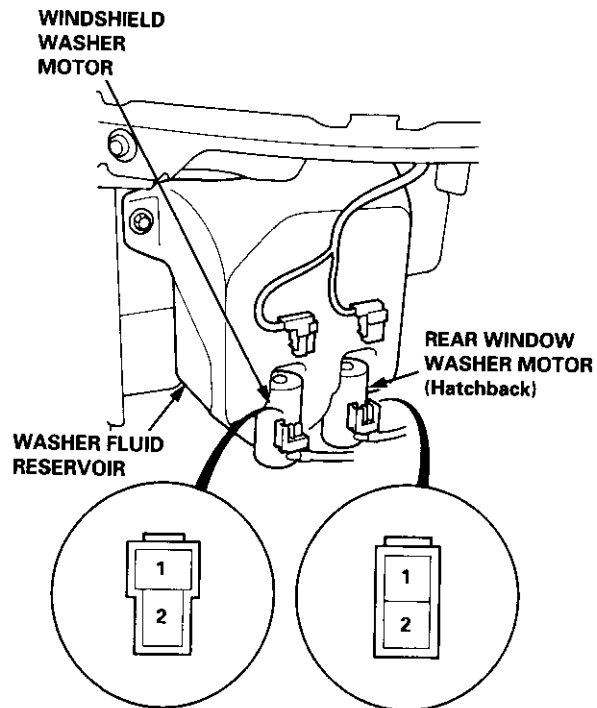
If the motor does not run or fails to run smoothly, replace it.

4. Reconnect the 4P connector to the wiper motor.
5. Connect an analog voltmeter between the No. 4 (+) and No. 2 (-) terminals.
6. Run the motor by turning the wiper switch ON.

The voltmeter should indicate 0 V and 4 V or less alternately.

## Washer Motor Test

1. Remove the front bumper (see section 20).
2. Disconnect the 2P connectors from the washer.



3. Test the washer motor by connecting battery power and ground according to the table.

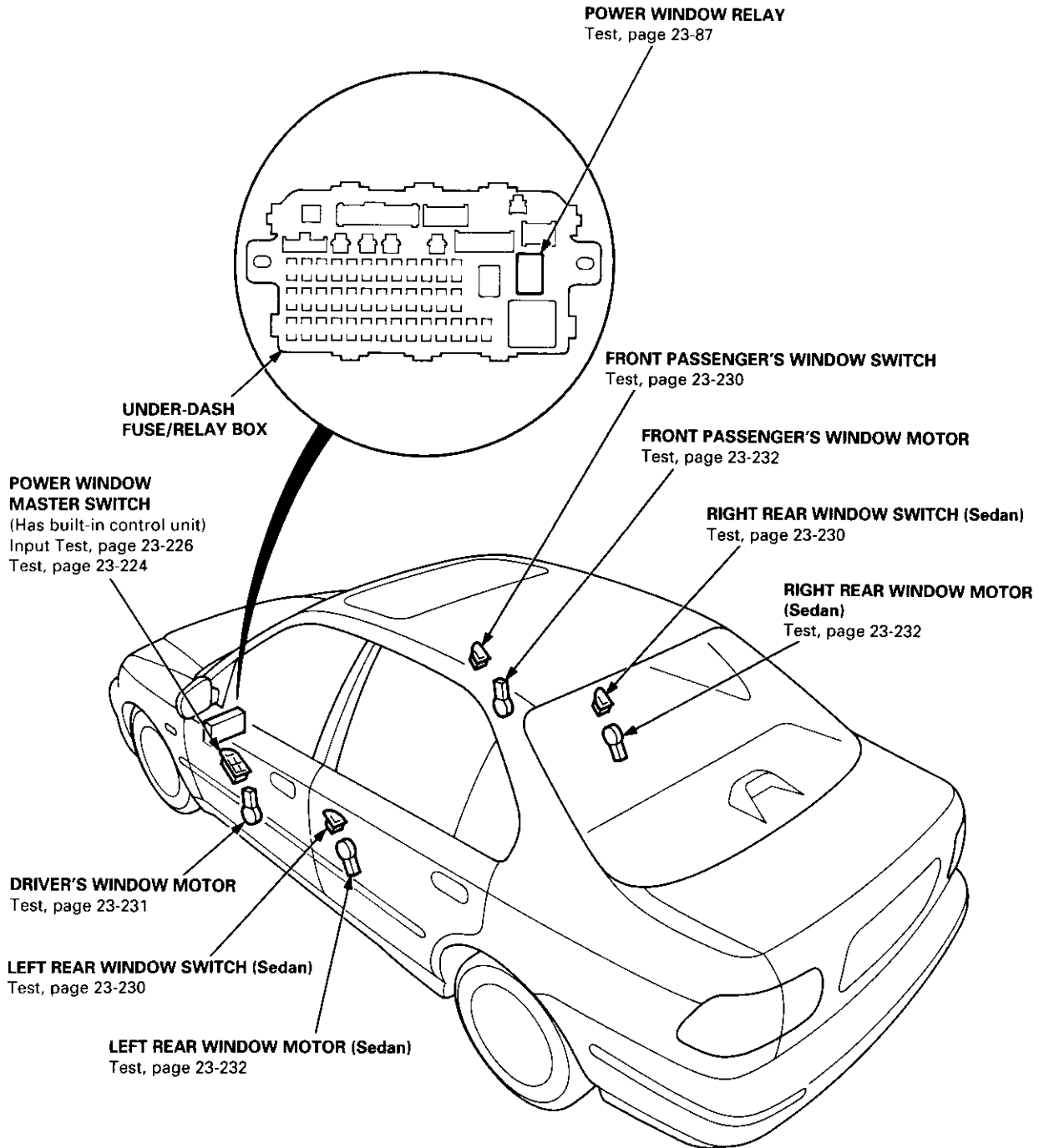
Terminal	1	2
Battery		
Disconnected		
Connected	⊕	⊖

- If the motor fails to run smoothly, replace it.
- If the motor runs smoothly, but little or no washer fluid is pumped, check for a disconnected or blocked washer hose, or a clogged pump outlet in the motor.



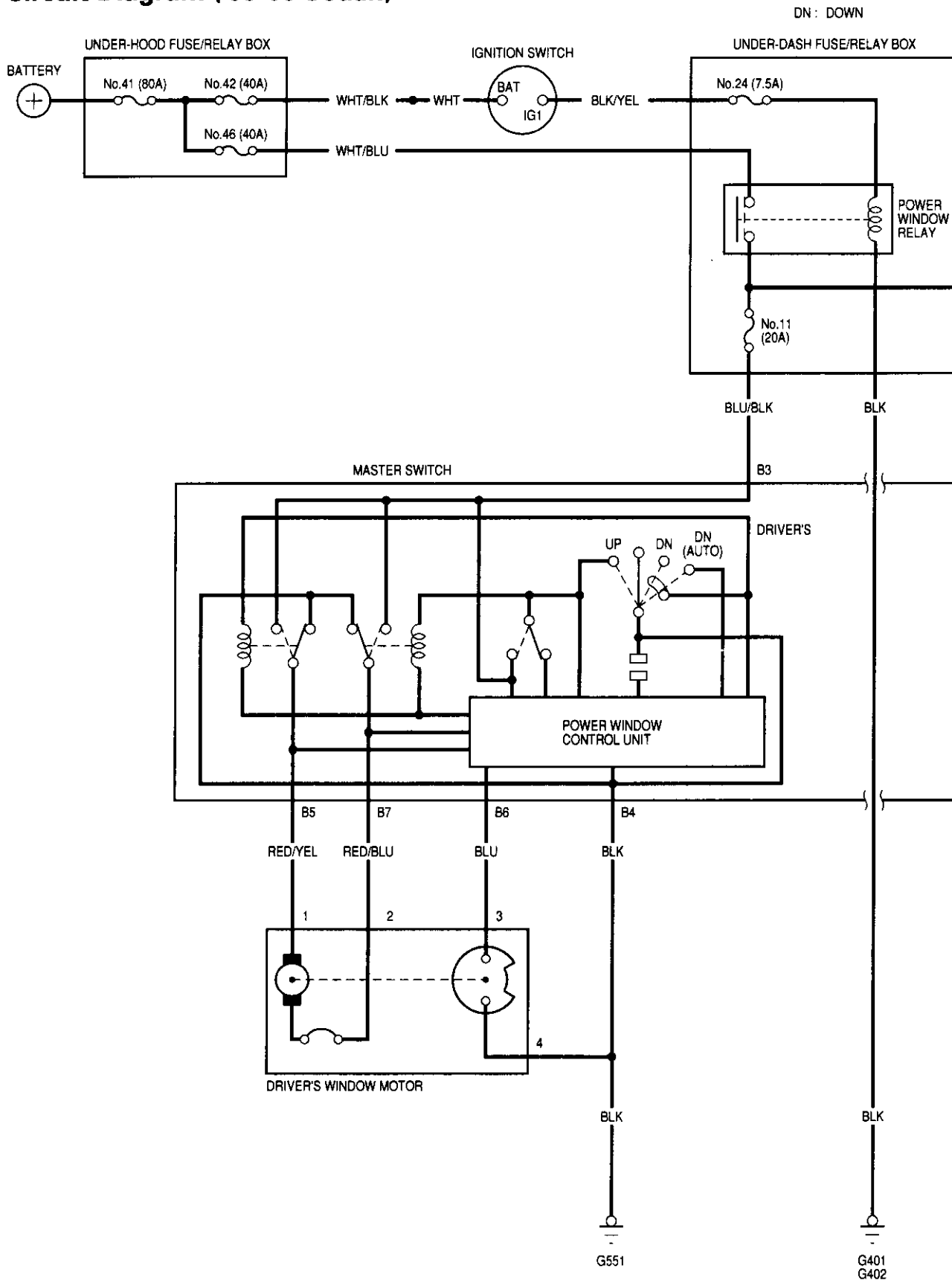
# Power Windows

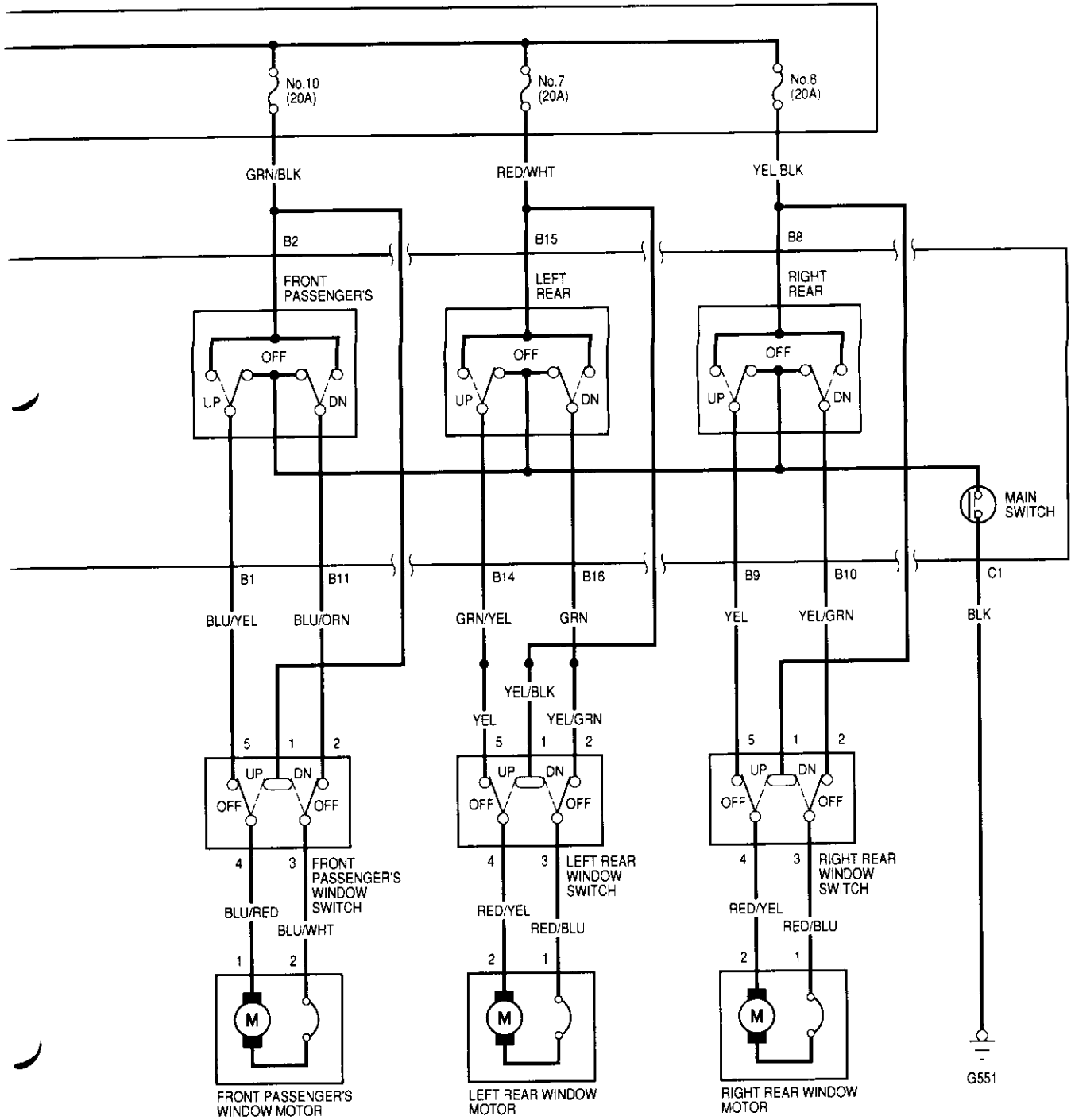
## Component Location Index



# Power Windows

## Circuit Diagram ('99-00 Sedan)

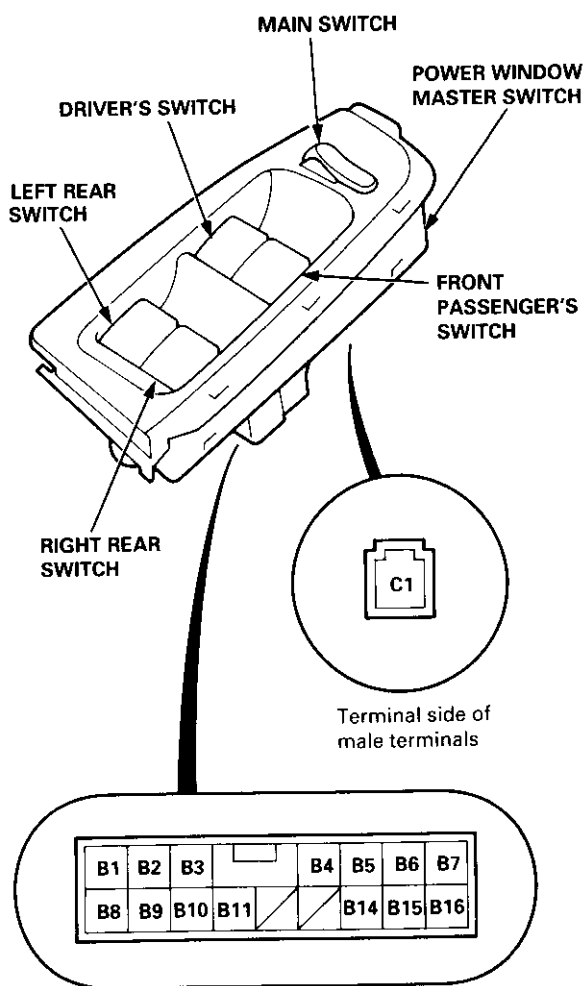






## Master Switch Test (Sedan)

1. Remove the armrest from the driver's door panel (see page 23-228).
2. Disconnect the 16P and 1P connectors from the master switch.



3. Check for continuity between the terminals in each switch position according to the tables.

### Driver's Switch:

The driver's switch is combined with the control unit so you cannot isolate the switch to test it. Instead, run the master switch input test procedures at terminals B3, B4, B5, B6 and B7 on page 23-228. If the tests are normal, the driver's switch must be faulty.

### Front Passenger's Switch:

Position	Terminal				
	Main Switch	B1	B2	B11	C1
OFF	ON	○	○	○	○
	OFF	○	○	○	○
UP	ON	○	○	○	○
	OFF	○	○	○	○
DOWN	ON	○	○	○	○
	OFF	○	○	○	○

### Left Rear Switch:

Position	Terminal				
	Main Switch	B14	B15	B16	C1
OFF	ON	○	○	○	○
	OFF	○	○	○	○
UP	ON	○	○	○	○
	OFF	○	○	○	○
DOWN	ON	○	○	○	○
	OFF	○	○	○	○

### Right Rear Switch:

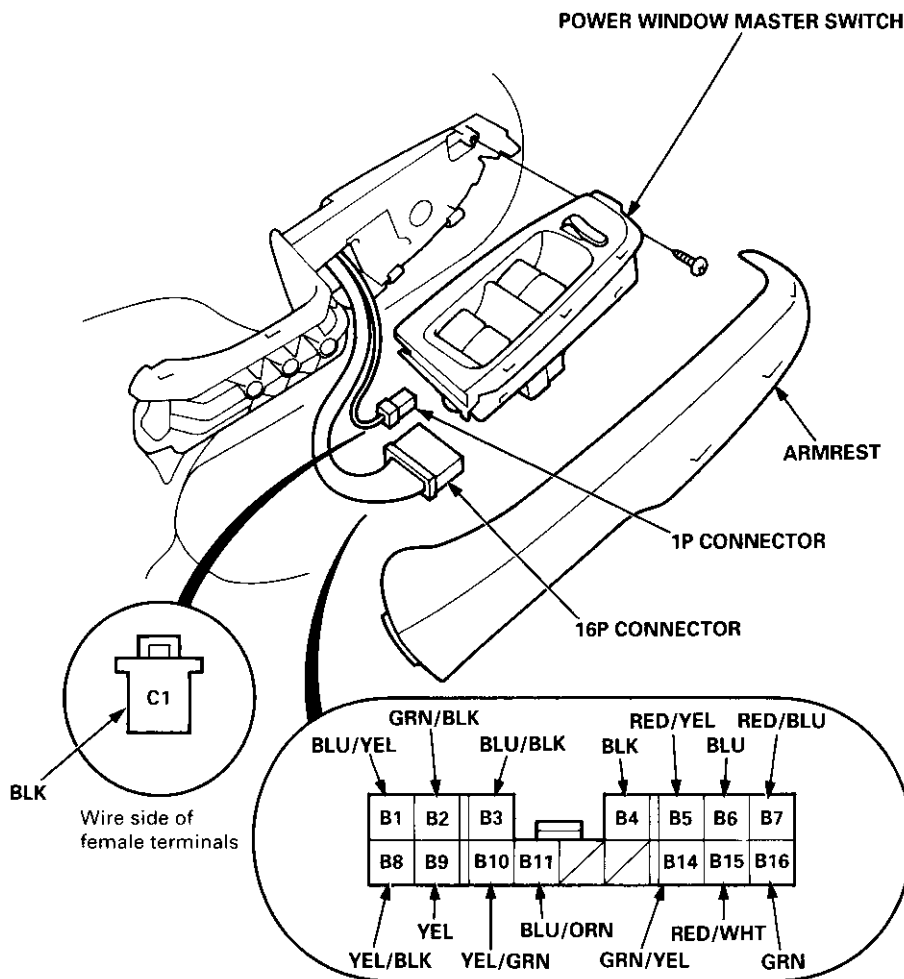
Position	Terminal				
	Main Switch	B8	B9	B10	C1
OFF	ON	○	○	○	○
	OFF	○	○	○	○
UP	ON	○	○	○	○
	OFF	○	○	○	○
DOWN	ON	○	○	○	○
	OFF	○	○	○	○

# Power Windows

## Master Switch Input Test (Sedan)

NOTE: The control unit is built into the power window master switch, and only controls driver's door window operations.

1. Remove the driver's armrest, and disconnect the 16P and 1P connectors from the master switch.
2. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connector.
    - If a test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, the power window maser switch must be faulty; replace it.





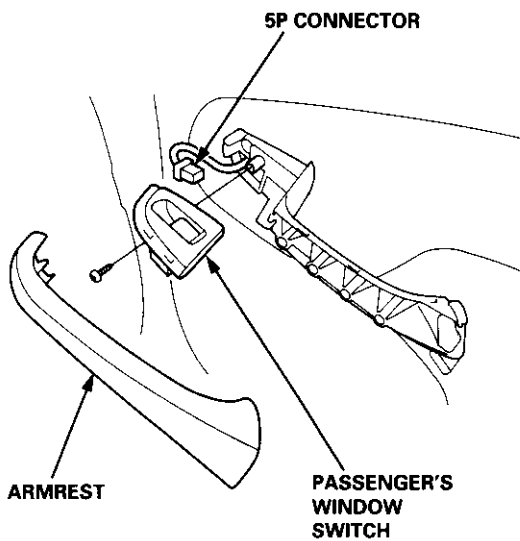
Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
B4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground G55*</li> <li>• An open in the wire</li> </ul>
C1				
B3	BLU/BLK	Ignition switch ON (II)	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 7, 8, 10 or 11 20 A fuse in the under-dash fuse area, box</li> <li>• Faulty power window area,</li> <li>• An open in the wire</li> </ul>
B2	GRN/BLK			
B8	YEL/BLK			
B15	RED/WHT			
B7	RED/BLU	Connect the BLU/BLK terminal to the RED/YEL terminal, and the RED/BLU terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the driver's window motor: It should run (the window moves down).	<ul style="list-style-type: none"> <li>• Faulty driver's window motor</li> <li>• An open in the wire</li> </ul>
B5	RED/YEL			
B1	BLU/YEL	Connect the GRN/BLK terminal to the BLU/YEL terminal, and the BLU/ORN terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the front passenger's window motor: It should run (the window moves down).	<ul style="list-style-type: none"> <li>• Faulty front passenger's window motor</li> <li>• Faulty front passenger's window switch</li> <li>• An open in the wire</li> </ul>
B11	BLU/ORN			
B9	YEL	Connect the YEL/BLK terminal to the YEL terminal, and the YEL/GRN terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the right rear motor: It should run (the window moves down).	<ul style="list-style-type: none"> <li>• Faulty right rear window motor</li> <li>• Faulty right window switch</li> <li>• An open in the wire</li> </ul>
B10	YEL/GRN			
B14	GRN/YEL	Connect the RED/WHT terminal to the GRN/YEL terminal, and the GRN terminal to the BLK terminal, then turn the ignition switch ON (II).	Check the left rear motor: It should run (the window moves down).	<ul style="list-style-type: none"> <li>• Faulty left rear window motor</li> <li>• Faulty left rear window switch</li> <li>• An open in the wire</li> </ul>
B16	GRN			
B6	BLU	Connect the BLU/BLK terminal to the RED/YEL terminal, and the BLK terminal to the RED/BLU terminal, then turn the ignition switch ON (II).	Check for voltage between the BLU and BLK terminals: Approx. 6 V should be indicated as the driver's window motor runs.	<ul style="list-style-type: none"> <li>• Faulty pulser</li> <li>• Faulty driver's window motor</li> <li>• An open in the wire</li> </ul>
B4	BLK			

# Power Windows

## Passenger's Window Switch Test

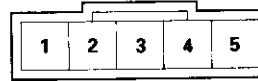
### Sedan:

1. Remove the armrest (see section 20).



2. Disconnect the 5P connector, then remove the mounting screw from the passenger's switch.

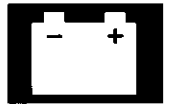
### Switch side of 5P terminal:



Terminal side of male terminals

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

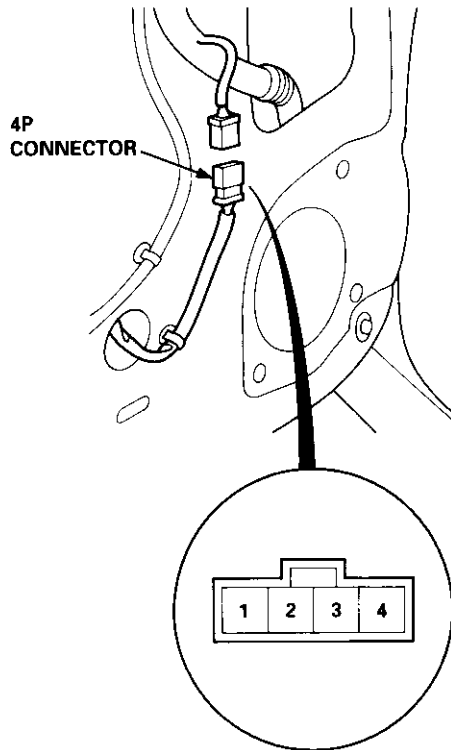
Terminal	1	2	3	4	5
Position					
UP	○	○—○		○	
OFF		○—○			
DOWN	○		○	○—○	



## Driver's Window Motor Test

### Motor Test:

1. Remove the driver's door panel (see section 20).



Terminal side of male terminals

2. Disconnect the 4P connector from the motor.
3. Test the motor in each direction by connecting battery power and ground according to the table.

Terminal	1	2
Direction		
UP	⊖	⊕
DOWN	⊕	⊖

**CAUTION:** When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

### Pulser Test:

5. Connect the test leads of an analog ohmmeter to the No. 3 and No. 4 terminals.
6. Run the motor by connecting power and ground to the No. 1 and No. 2 terminals. The ohmmeter needle should move back and forth alternately.

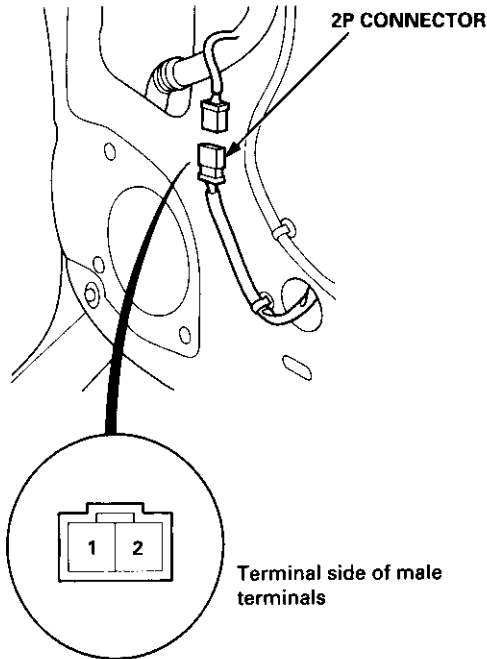


# Power Windows

## Passenger's Window Motor Test

### Front:

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P connector from the window motor.



3. Check window motor operation by connecting power and ground according to the table.

Terminal	1	2
Direction		
UP	⊕	⊖
DOWN	⊖	⊕

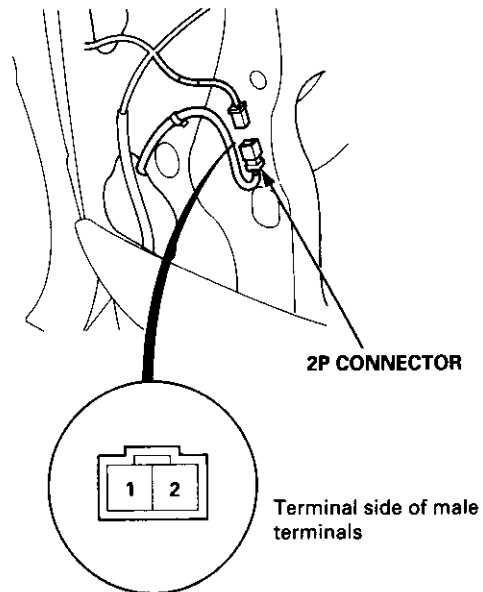
**CAUTION:** When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

### Rear:

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P connector from the window motor.

**NOTE:** The illustration shows the right rear window motor; the left rear window motor is symmetrical.



3. Check window motor operation by connecting power and ground according to the table.

Terminal	1	2
Direction		
UP	⊖	⊕
DOWN	⊕	⊖

**CAUTION:** When the motor stops running, disconnect one lead immediately.

4. If the motor does not run or fails to run smoothly, replace it.

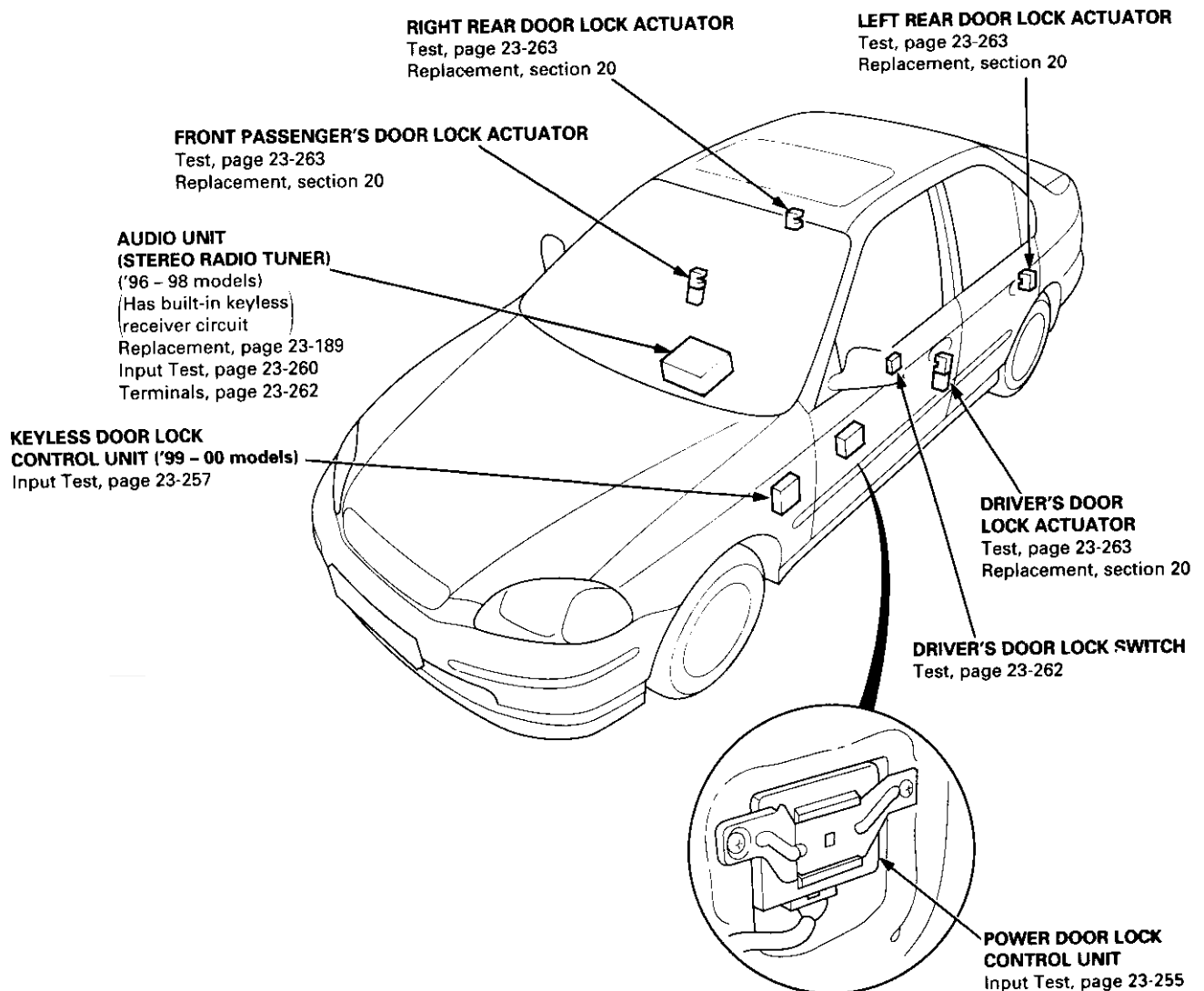
# Power Door Locks



## Component Location Index

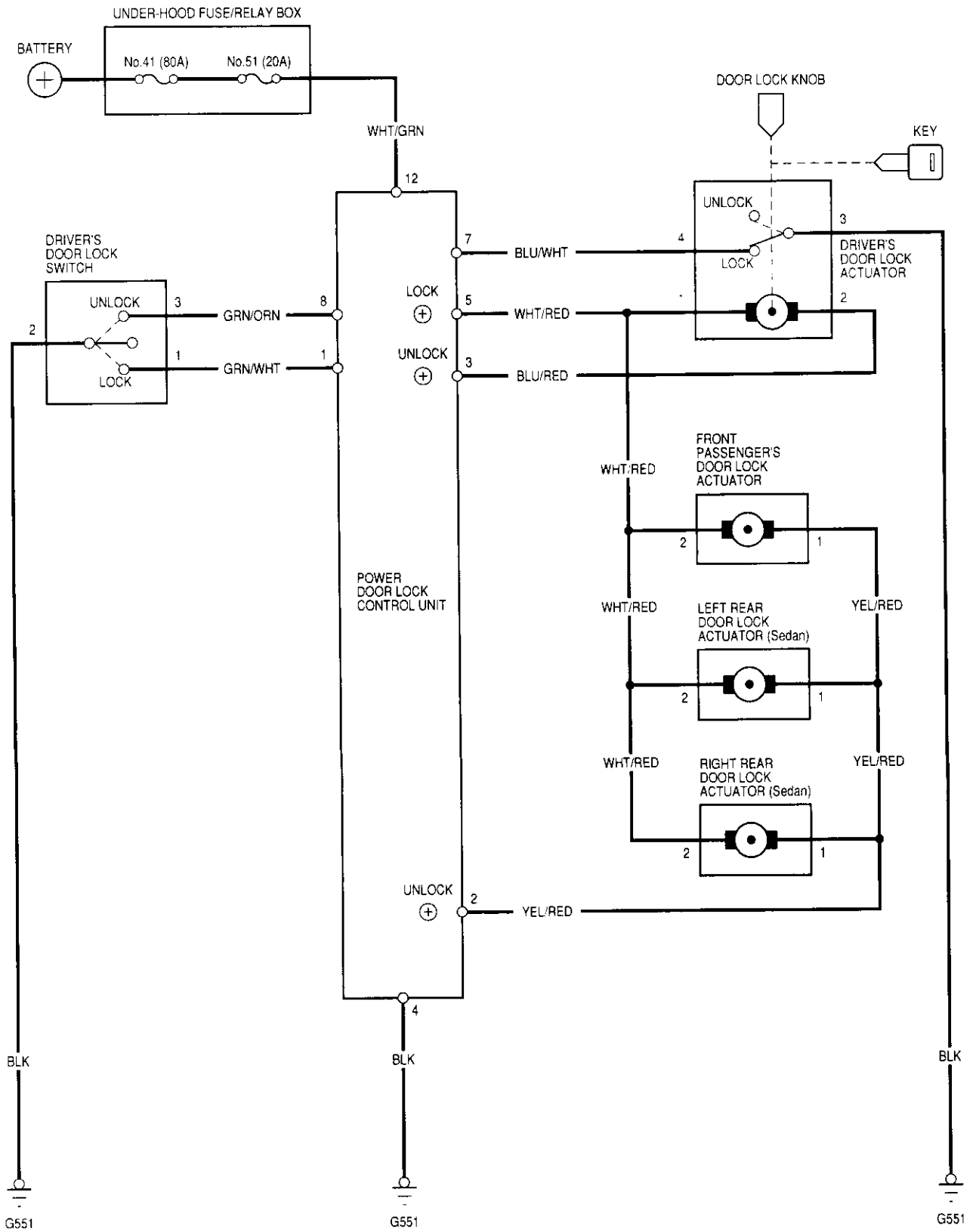
NOTE (With keyless entry system):

- If the doors unlock or lock with the transmitter, but the LED on the transmitter does not come on, the LED is faulty; replace the transmitter.
- When you unlock the doors with the transmitter, the ceiling light (middle position) comes on for 30 seconds. (However, if the audio unit is not installed, the light does not come on.)
- If any door is open, you cannot lock or unlock the doors with the transmitter.
- The horn sounds only the first time you press a transmitter button. (Pressing repeatedly does not activate the horn again.)
- If you unlocked the doors with the transmitter, but do not open any of the doors within 30 seconds, the doors relock automatically.
- The doors do not lock or unlock with the transmitter if the ignition key is inserted in the ignition switch.
- If you press the PANIC button for more than two seconds, the horn sounds for about 30 seconds, and the transmitter LED comes on. (The panic mode will not be activated if the ignition key is in the ignition switch.) The panic mode is cancelled by pressing any of the transmitter buttons.
- After replacing the transmitter battery, press the lock and unlock buttons five or six times to activate the transmitter.





# Circuit Diagram (Without Keyless Entry System)



# Power Door Locks

## Troubleshooting

NOTE: The numbers in the table show the troubleshooting sequence.

Symptom		Item to be inspected									
		Blown No. 51 (20 A) fuse (In the under-hood fuse/relay box)	Driver's door lock knob switch (In the driver's door lock actuator)	Control unit input	Passenger's door actuator	Disconnected or obstructed door lock rod/linkage	Driver's door lock switch	Transmitter inspection	Audio unit input (Has built-in keyless receiver circuit)	Poor ground	Open circuit, loose or disconnected terminals
Power door lock system does not work at all.		1		2					G551	WHT/GRN	
Doors don't lock with driver's door lock knob switch.	All doors	1	2	3						BLU/WHT	
	One or more doors				1	2				YEL/RED or WHT/RED	
Doors don't lock or unlock with driver's door lock switch.	All doors	1		3			2			GRN/WHT, GRN/ORN, YEL/RED or WHT/RED	
	One or more doors				1	2				YEL/RED or WHT/RED	
* The power door lock system works properly but the keyless entry system doesn't.							1	2	G401 G402	GRN/WHT or GRN/ORN	

\*: With keyless entry system

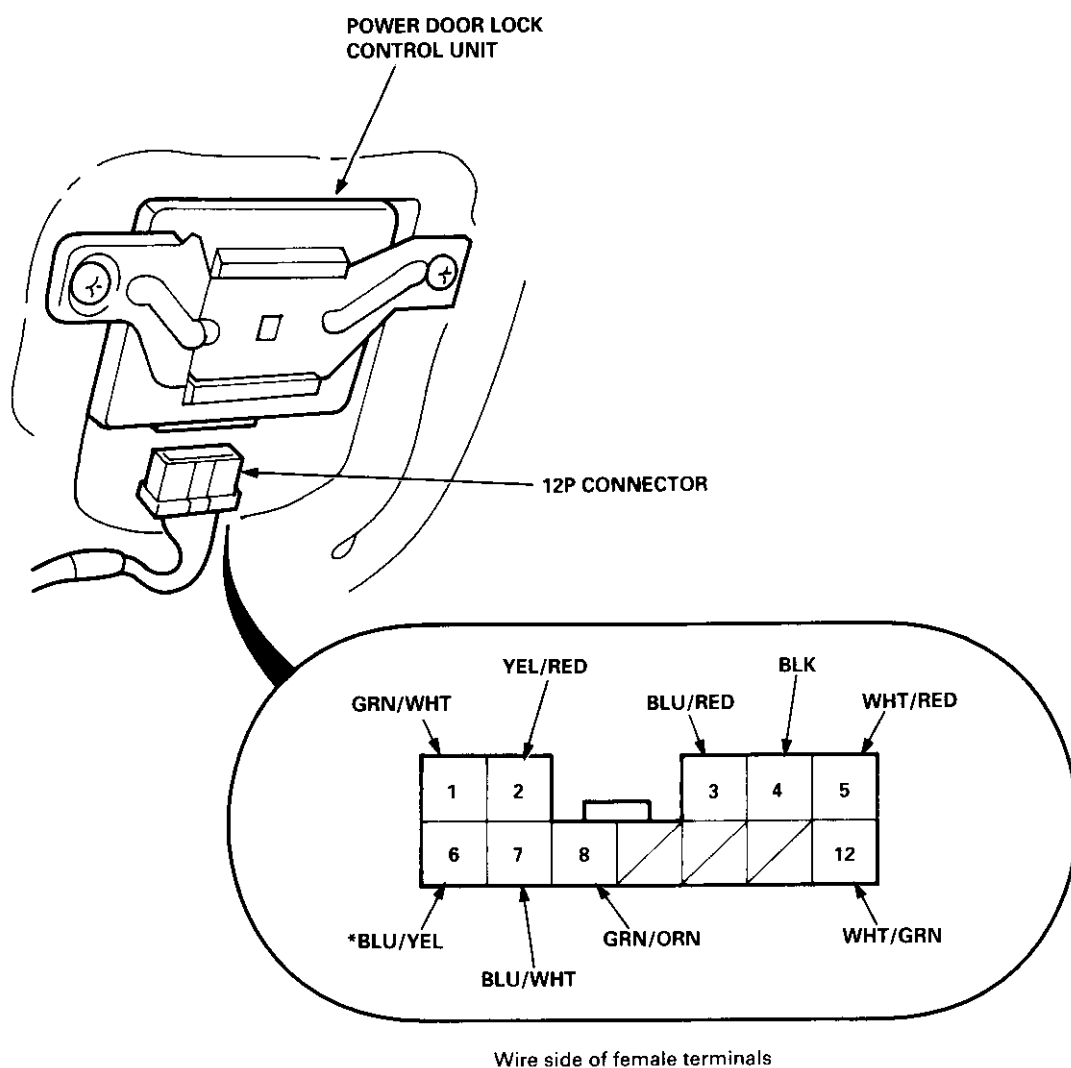
### NOTE:

- When the remote transmitter button is pressed the first time, only the driver's door will unlock. When the button is pressed the second time, all the doors will unlock.
- The doors will relock automatically after 30 seconds if a door is not opened, or the key is out of the ignition switch.
- The keyless entry system will not lock or unlock the doors when the key is in the ignition switch.



## Control Unit Input Test ('96 – '98 models and '99 – '00 models without Keyless Entry System)

1. Remove the driver's door panel (see section 20).
2. Disconnect the 12P connector from the control unit.
3. Inspect the connector and socket terminals to be sure they are all making good contact.
  - If the terminals are bent, loose or corroded, repair them as necessary, and recheck the system.
  - If the terminals look OK, make the following input tests at the connector.
    - If any test indicates a problem, find and correct the cause, then recheck the system.
    - If all the input tests prove OK, the control unit must be faulty; replace it.



\*: With keyless entry system

(cont'd)

# Power Door Locks

## Control Unit Input Test ('96 – 98 models and '99 – 00 models without Keyless Entry System) (cont'd)

Disconnect the 12P connector from the power door lock control unit.

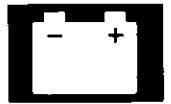
**CAUTION:** To prevent damage to the actuator, apply battery voltage only momentarily.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
4	BLK	Under all conditions	Check for continuity to ground: There should be continuity.	<ul style="list-style-type: none"> <li>• Poor ground (G551)</li> <li>• An open in the wire</li> </ul>
12	WHT/GRN	Under all conditions	Check for voltage to ground: There should be battery voltage.	<ul style="list-style-type: none"> <li>• Blown No. 51 (20 A) fuse in the under-hood fuse/relay box</li> <li>• An open in the wire</li> </ul>
2	YEL/RED	Connect the YEL/RED terminal to the WHT/GRN terminal, and the WHT/RED terminal to the BLK terminal momentarily.	Check door lock operation: All passenger's doors should unlock.	<ul style="list-style-type: none"> <li>• Blown No. 51 (20 A) fuse in the under-hood fuse/relay box</li> <li>• Faulty actuator</li> <li>• An open in the wire</li> </ul>
3	BLU/RED	Connect the BLU/RED terminal to the WHT/GRN terminal, and the WHT/RED terminal to the BLK terminal momentarily.	Check door lock operation: Driver's door should unlock.	
5	WHT/RED	Connect the WHT/RED terminal to the WHT/GRN terminal, and the YEL/RED terminal to the BLK terminal momentarily.	Check door lock operation: All passenger doors should lock.	
*6	BLU/YEL	Under all conditions.	Check for continuity between the power door lock control unit 12P connector No. 6 terminal and audio unit 16P connector No. 3 terminal: There should be continuity.	An open in the wire

\*: With keyless entry system

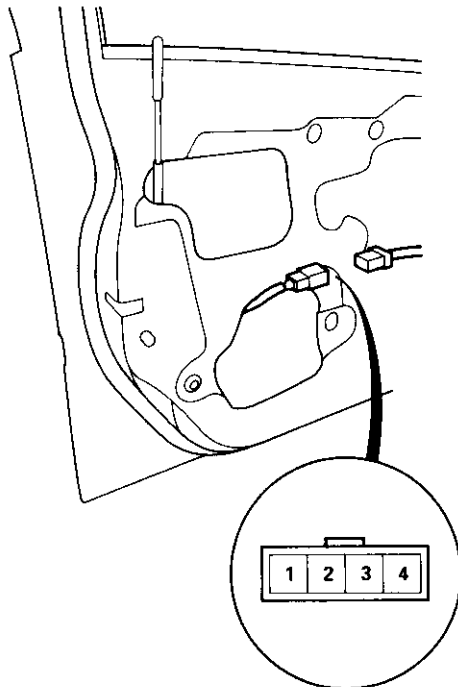
Reconnect the 12P connector to the power door lock control unit.

Cavity	Wire	Test condition	Test: Desired result	Possible cause if result is not obtained
1	GRN/WHT	Driver's door lock switch in LOCK	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Faulty driver's door lock switch</li> <li>• Poor ground (G551)</li> <li>• An open in the wire</li> </ul>
8	GRN/ORN	Driver's door lock switch in UNLOCK		
7	BLU/WHT	Driver's door lock knob in LOCK	Check for voltage to ground: There should be 1 V or less.	<ul style="list-style-type: none"> <li>• Faulty driver's door lock actuator</li> <li>• Poor ground (G551)</li> <li>• An open in the wire</li> </ul>



## Driver's Door Lock Actuator Test

1. Remove the driver's door panel (see section 20).
2. Disconnect the 4P connector from the actuator.



Terminal side of male terminals

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

Terminal Position	3	4
LOCK	○	○
UNLOCK		

4. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

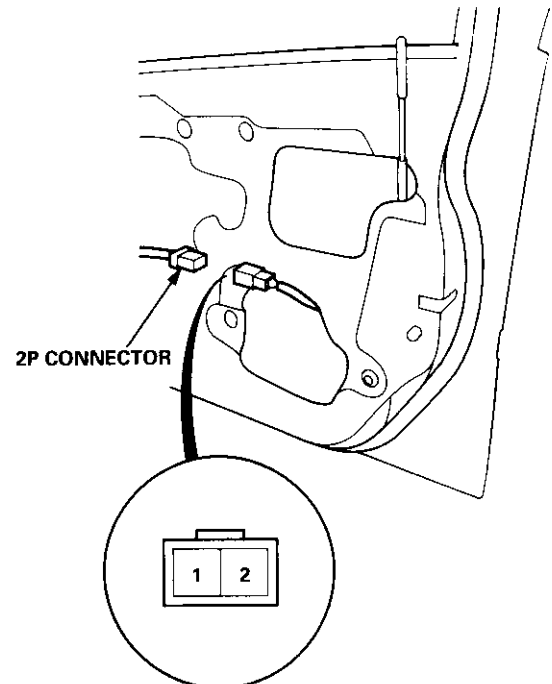
Terminal Position	1	2
LOCK	⊕	⊖
UNLOCK	⊖	⊕

5. If the actuator fails to work properly, replace it.

## Passenger's Door Lock Actuator Test

1. Remove the passenger's door panel (see section 20).
2. Disconnect the 2P connector from the actuator.

NOTE: The front passenger's door lock actuator is shown; the left rear and right rear door lock actuators are similar.



Terminal side of male terminals

3. Check actuator operation by connecting power and ground according to the table. To prevent damage to the actuator, apply battery voltage only momentarily.

Terminal Position	1	2
LOCK	⊖	⊕
UNLOCK	⊕	⊖

4. If the actuator fails to work properly, replace it.