

# Chassis and Engine Number

## Vehicle Identification Number

SAH HW H L L B A D 140001

**Manufacturer Code** \_\_\_\_\_  
Rover Group Ltd.

**Model Type** \_\_\_\_\_  
HW : Concerto

**Grade** \_\_\_\_\_  
H : GL, 1.5i  
W : 1.6i-16  
Y : 1.6i  
Z : 1.6i-16SE

**Body Type** \_\_\_\_\_  
L : 4-door Saloon  
W : 5-door Saloon

**Engine Type** \_\_\_\_\_  
L : 1400 SOHC Twin Carb.  
M : 1600 SOHC PGM-FI with Catalyst  
N : 1600 DOHC PGM-FI with Catalyst  
P : 1500 SOHC PGM-FI with Catalyst  
U : 1600 DOHC PGM-FI

**Transmission and Steering** \_\_\_\_\_  
B : RHD M/T 1500 SOHC  
C : RHD M/T 1600 SOHC  
D : RHD M/T 1600 DOHC  
J : RHD A/T 1500 SOHC  
J : RHD A/T 1600 SOHC  
N : LHD M/T 1400 SOHC  
P : LHD M/T 1600 SOHC  
R : LHD M/T 1600 DOHC  
T : LHD M/T 1500 SOHC  
V : LHD A/T 1500 SOHC  
X : LHD A/T 1600 SOHC  
Y : LHD A/T 1600 DOHC  
Z : LHD A/T 1400 SOHC

**Model Year** \_\_\_\_\_  
A : 1990, 1991

**Factory Code** \_\_\_\_\_  
D : Longbridge

**Serial Number** \_\_\_\_\_

## Engine Number

D14A1-E100001

**Engine Type** \_\_\_\_\_

D14A1: 1.4 ℓ SOHC Cabureted Engine without catalytic converter

D15B2: 1.5 ℓ SOHC PGM-FI Engine with catalytic converter

D16A8: 1.6 ℓ DOHC PGM-FI Engine with catalytic converter

D16A9: 1.6 ℓ DOHC PGM-FI Engine without catalytic converter for manual transmission

D16Z2: 1.6 ℓ SOHC PGM-FI Engine with catalytic converter

D16Z4: 1.6 ℓ DOHC PGM-FI Engine without catalytic converter for automatic transmission

**Serial Number** \_\_\_\_\_

## Transmission Number

P7-2000001

**Transmission Type** \_\_\_\_\_

P7 : Manual 5-speed  
MPPA : Automatic 4-speed

**Serial Number** \_\_\_\_\_

P7 : 2000001 ~  
MPPA : 2000001 ~

# Standards and Service Limits

## Automatic Transmission (cont'd)

Unit: mm (in)

Springs	MEASUREMENT	STANDARD (NEW)			
		Wire Diameter	O. D.	Free Length	No. of Coils
	Regulator valve spring A	1.58 x 2.00 (0.06 x 0.08)	14.7 (0.58)	86.5 (3.41)	20.9
	Regulator valve spring B	1.8 (0.07)	9.6 (0.38)	44 (1.73)	7.5
	Stator reaction spring	6 (0.24)	38.4 (1.51)	30.3 (1.20)	2
	Throttle modulator spring	1.2 (0.05)	9.4 (0.37)	{ 27.2 (1.07) 26.3 (1.04) }	8
	Carbureted				
	Fuel-Injected	1.2 (0.05)	9.4 (0.37)	{ 26.3 (1.04) 26.4 (1.04) }	8
	Torque converter check valve spring	1.1 (0.04)	8.4 (0.33)	36.4 (1.43)	12
	Cooler releaf valve spring	1.1 (0.04)	8.4 (0.33)	36.4 (1.43)	12
	Releaf valve spring	1.0 (0.04)	8.4 (0.33)	52 (2.05)	23
	Governor spring A	except 1.4 ℓ	18.8 (0.74)	38.1 (1.50)	4
	1.4 ℓ	1.0 (0.04)	18.8 (0.74)	20.4 (0.80)	4
	Governor spring B	except 1.4 ℓ	11.8 (0.46)	27.8 (1.09)	6
	1.4 ℓ	0.9 (0.04)	11.8 (0.46)	26.7 (1.05)	6
	2nd orifice control spring	0.8 (0.03)	6.6 (0.26)	43.8 (1.72)	27.6
	Servo orifice control spring	0.9 (0.04)	6.1 (0.24)	35.9 (1.41)	20
	Throttle spring A	1.0 (0.04)	8.5 (0.33)	{ 22.2 (0.87) 22.1 (0.87) }	{ 6 5.5 }
	Throttle adjust spring A (throttle B pressure)	0.8 (0.03)	6.2 (0.24)	30 (1.18)	8
	Throttle adjust spring A	0.8 (0.03)	6.2 (0.24)	27 (1.06)	8.5
	Throttle spring B	except 1.4 ℓ	8.5 (0.33)	41.3 (1.63)	13.9
	1.4 ℓ	1.4 (0.06)	8.5 (0.33)	41.4 (1.63)	8.4
	1-2 shift spring	DOHC	4.4 (0.17)	48.5 (1.91)	35.1
	1.5 ℓ, 1.6 ℓ (FI)	0.6 (0.02)	6.1 (0.24)	41.3 (1.63)	16.5
	Carbureted	0.5 (0.02)	4.5 (0.18)	46.8 (1.84)	35.1
	1-2 shift ball spring	1.4 ℓ, DOHC	4.5 (0.18)	12.7 (0.50)	11
	1.5 ℓ, 1.6 ℓ (FI)	0.4 (0.02)	4.5 (0.18)	14.4 (0.57)	8.2
	1.6 ℓ (Carb)	0.4 (0.02)	4.5 (0.18)	11.3 (0.44)	8
	2-3 shift spring	Fuel-Injected	7.6 (0.23)	46.5 (1.83)	20.7
	Carbureted	0.7 (0.03)	7.6 (0.23)	43 (1.69)	12.7
	2-3 shift ball spring	except DOHC	4.5 (0.18)	14.7 (0.58)	7.3
	DOHC	0.45 (0.02)	4.5 (0.18)	13.3 (0.52)	8
	3-4 shift spring	1.5 ℓ, 1.6 ℓ (FI)	9.6 (0.38)	38.1 (1.50)	10
	DOHC	0.9 (0.04)	9.6 (0.38)	33.9 (1.33)	11.3
	Carbureted	0.7 (0.03)	9.6 (0.38)	32.9 (1.30)	6.4
	3-4 shift ball spring	1.5 ℓ, 1.6 ℓ (FI)	4.5 (0.18)	11.2 (0.44)	7
	DOHC	0.5 (0.02)	4.5 (0.18)	10.8 (0.43)	7.4
	Carbureted	0.45 (0.02)	4.5 (0.18)	12.0 (0.47)	6.7
	Low accumulator spring A	2.34 x 2.9 (0.09 x 0.1)	21.5 (0.85)	66.7 (2.63)	10.2
	Low accumulator spring B	2.8 (0.11)	13.1 (0.52)	40 (1.57)	8.8
	Top accumulator spring	3.2 (0.13)	18.6 (0.73)	78.3 (3.08)	10
	2nd accumulator spring	3.5 (0.14)	20.2 (0.80)	76.7 (3.02)	9.6
	3rd accumulator spring	2.7 (0.10)	15.5 (0.61)	80.0 (3.15)	14.8
	L/C shift spring	Fuel-Injected	8.1 (0.32)	51.8 (2.04)	22.3
	1.4 ℓ	0.7 (0.03)	8.1 (0.32)	39.0 (1.54)	15.4
	1.6 ℓ (Carb.)	0.9 (0.04)	8.1 (0.32)	44.5 (1.75)	18.3
	L/C timing spring B	except 1.4 ℓ	6.6 (0.26)	55.6 (2.19)	30
	1.4 ℓ	1.0 (0.04)	6.6 (0.26)	52.3 (2.06)	30.1
	L/C control valve spring	DOHC	6.6 (0.26)	35.3 (1.39)	15.8
	Carbureted	0.7 (0.03)	6.6 (0.26)	32.5 (1.28)	14
	1.5 ℓ, 1.6 ℓ (FI)	0.7 (0.03)	6.6 (0.26)	33.8 (1.33)	15.8
	CPC valve spring	1.4 (0.06)	9.4 (0.37)	31.6 (1.24)	10.9

(FI): (Fuel-Injected)

# Engine - Overhaul

## IDENTIFICATION DATA

### Cylinder/piston matching

		Cylinder Ø a Tolerance + 0.018	Cylinder Ø a Tolerance + 0.018	Piston Ø b Tolerance ± 0.009	Piston Ø b Tolerance ± 0.009
Identificati- on (x)		XUD 7TE	XUD 9A	XUD 7TE	XUD 9A
<b>S</b>	None	80	83	79.93	82.93
<b>S</b>	A1	80.03	83.03	79.96	82.96
<b>SL - 1</b>	R1	80.20	83.20	80.13	83.13
<b>SL - 2</b>	R2	80.50	83.50	80.43	83.43
<b>SL - 3</b>	R3	80.80	83.80	80.73	83.73

**Note:** The piston Ø b must be measured at dimension c

	XUD 7TE	XUD 9A
c	22.50	25.00

The repair dimension identification (x) is stamped on the cylinder block and pistons.

### Gudgeon pin

	XUD 7TE	XUD 9A
Ø	28	25

### Piston ring gaps

	XUD 7TE	XUD 9A
First ring	0.20 to 0.40	0.20 to 0.40
Second ring	0.20 to 0.35	0.15 to 0.35
Oil control ring	0.10 to 0.35	0.10 to 0.30

# PGM-FI Control System

## Troubleshooting Flowchart — TDC/CRANK/CYL Sensor [1.6 l SOHC] —



Self-diagnosis LED indicates code 4: A problem in the CRANK circuit of the TDC/CRANK/CYL Sensor.



Self-diagnosis LED indicates code 8: A problem in the TDC circuit of the TDC/CRANK/CYL Sensor.



Self-diagnosis LED indicates code 9: A problem in the CYL circuit of the TDC/CRANK/CYL Sensor.



- Check Engine warning light has been reported on.  
- LED indicates CODE 4.

Turn the ignition switch OFF.

Remove HAZARD fuse in the main fuse box for 10 seconds to reset ECU.

Start engine.

Is Check Engine warning light and does LED indicate CODE 4?

NO

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

YES

Stop engine.

Disconnect the 8P connector from the TDC/CRANK/CYL sensor.

Measure resistance between C terminal and D terminal.

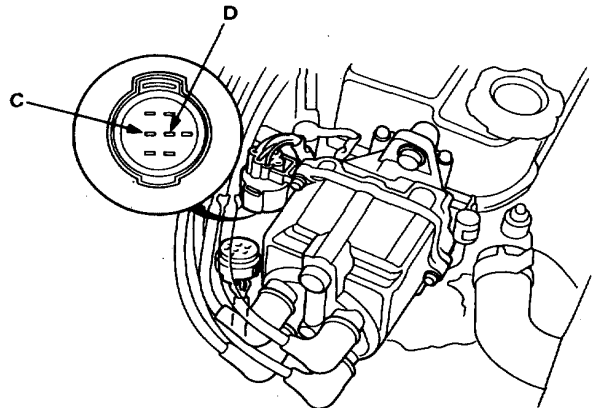
Is there 350-550  $\Omega$  ?

NO

Replace the distributor assembly (section 16).

YES

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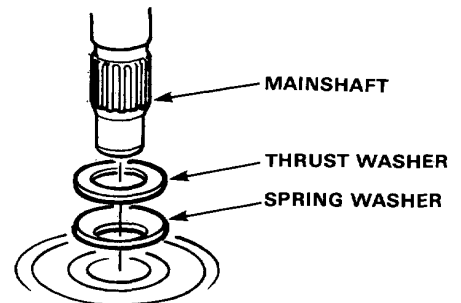
# Transmission Maintenance and Repair

## Mainshaft Thrust Shim Adjustment (cont'd)

### D16A: 70 mm Thrust Shim

	PART NUMBER	THICKNESS
A	23931-PL3-B00	0.60 mm (0.0236 in.)
B	23932-PL3-B00	0.63 mm (0.0284 in.)
C	23933-PL3-B00	0.66 mm (0.0260 in.)
D	23934-PL3-B00	0.69 mm (0.0272 in.)
E	23935-PL3-B00	0.72 mm (0.0283 in.)
F	23936-PL3-B00	0.75 mm (0.0295 in.)
G	23937-PL3-B00	0.78 mm (0.0307 in.)
H	23938-PL3-B00	0.81 mm (0.0319 in.)
I	23939-PL3-B00	0.84 mm (0.0331 in.)
J	23940-PL3-B00	0.87 mm (0.0343 in.)
K	23941-PL3-B00	0.90 mm (0.0354 in.)
L	23942-PL3-B00	0.93 mm (0.0366 in.)
M	23943-PL3-B00	0.96 mm (0.0378 in.)
N	23944-PL3-B00	0.99 mm (0.0390 in.)
O	23945-PL3-B00	1.02 mm (0.0402 in.)
P	23946-PL3-B00	1.05 mm (0.0413 in.)
Q	23947-PL3-B00	1.08 mm (0.0425 in.)
R	23948-PL3-B00	1.11 mm (0.0437 in.)
S	23949-PL3-B00	1.14 mm (0.0449 in.)
T	23950-PL3-B00	1.17 mm (0.0461 in.)
U	23951-PL3-B00	1.20 mm (0.0472 in.)
V	23952-PL3-B00	1.23 mm (0.0484 in.)
W	23953-PL3-B00	1.26 mm (0.0496 in.)
X	23954-PL3-B00	1.29 mm (0.0508 in.)
Y	23955-PL3-B00	1.32 mm (0.0520 in.)
Z	23956-PL3-B00	1.35 mm (0.0531 in.)
AA	23957-PL3-B00	1.38 mm (0.0543 in.)
AB	23958-PL3-B00	1.41 mm (0.0555 in.)
AC	23959-PL3-B00	1.44 mm (0.0567 in.)
AD	23960-PL3-B00	1.47 mm (0.0579 in.)
AE	23961-PL3-B00	1.50 mm (0.0591 in.)
AF	23962-PL3-B00	1.53 mm (0.0602 in.)
AG	23963-PL3-B00	1.56 mm (0.0614 in.)
AH	23964-PL3-B00	1.59 mm (0.0626 in.)
AI	23965-PL3-B00	1.62 mm (0.0638 in.)
AJ	23966-PL3-B00	1.65 mm (0.0650 in.)
AK	23967-PL3-B00	1.68 mm (0.0661 in.)
AL	23968-PL3-B00	1.71 mm (0.0673 in.)
AM	23969-PL3-B00	1.74 mm (0.0685 in.)
AN	23970-PL3-B00	1.77 mm (0.0697 in.)
AO	23971-PL3-B00	1.80 mm (0.0709 in.)

6. Check the thrust clearance in the manner described below.
  - a. Install the shims selected in the transmission housing.
  - b. Install the thrust washer and spring washer in the mainshaft.



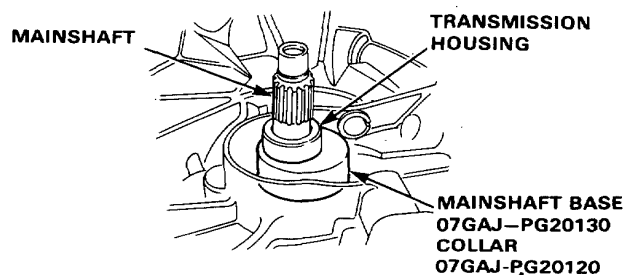
#### NOTE:

- Clean the thrust washer, spring washer and shim thoroughly before installation.
  - Install the thrust washer, spring washer and shim properly.
- c. Install the mainshaft in the clutch housing.
  - d. Place the transmission housing over the mainshaft and onto the clutch housing.
  - e. Tighten the clutch and transmission housings with several 10mm bolts.
  - f. Tap the mainshaft with a plastic hammer.

7. Check the thrust clearance in the manner described below.

**CAUTION: Measurement should be made at room temperature.**

- a. Slide the mainshaft base and the collar over the mainshaft.





# Troubleshooting

## Flowchart

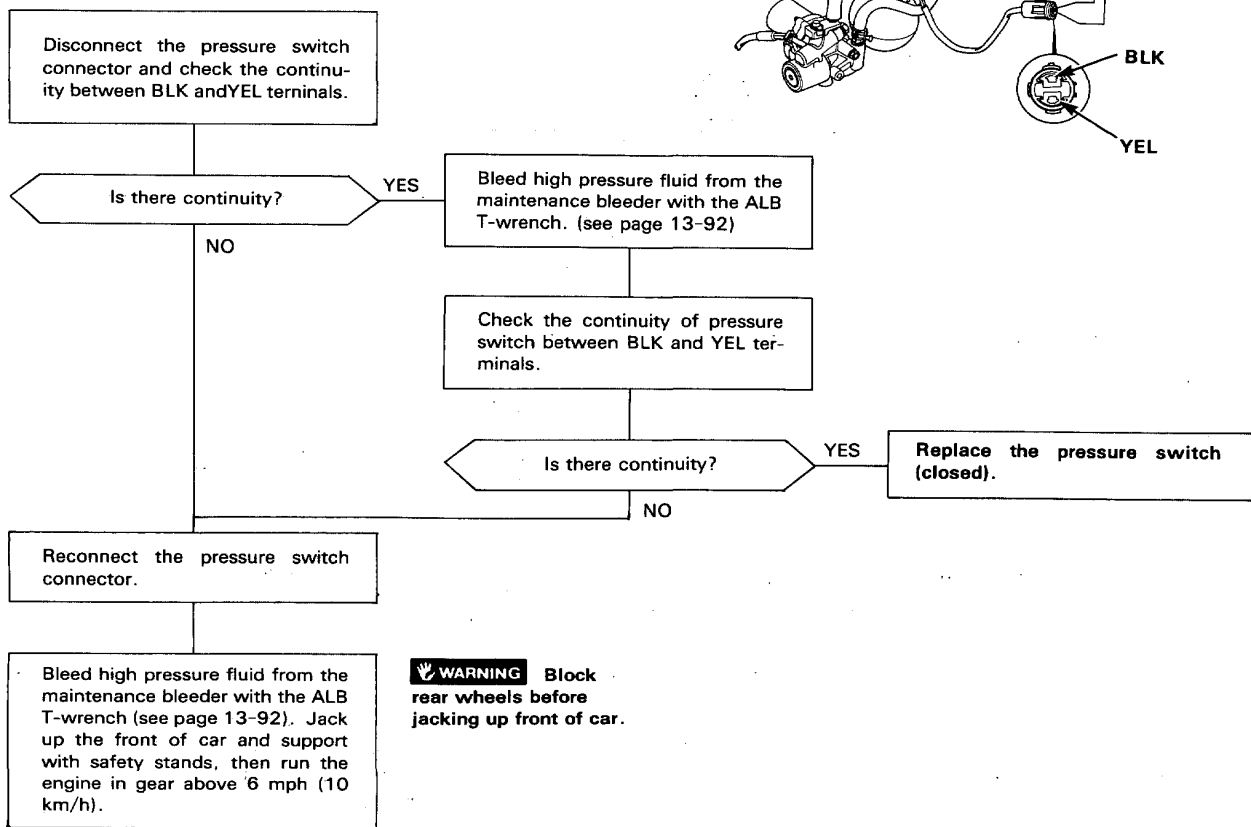
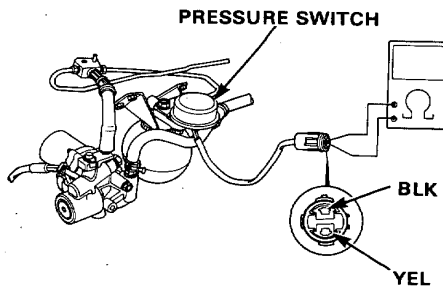
Problem Code 1: Hydraulic Controlled Components.

NOTE: The LED does not blink when the following failures occur.

- The contact points of the motor relay remain closed (the motor runs continuously even after the ignition key is removed).
- YEL/RED lead is shorted or the control unit is internally shorted (the motor stops when the ignition switch is turned lock).

### Pre-test steps:

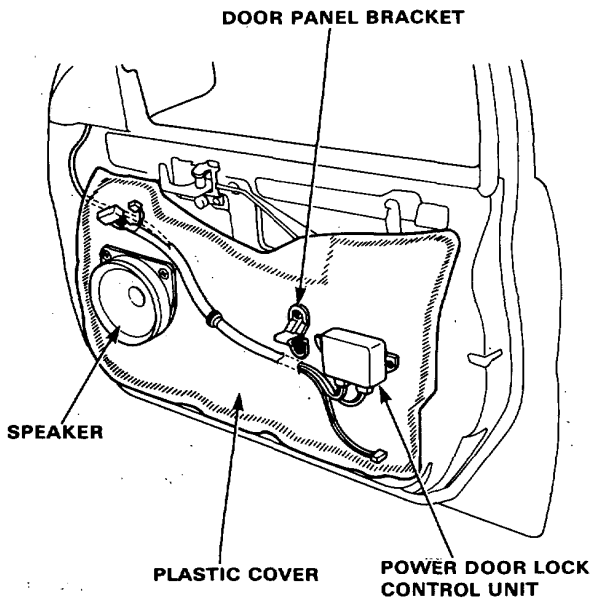
- Check No. 35 (40A) Fuse.
- Check all brake system hoses and pipes (low and high pressure) for signs of leaking bending or kinking.
- Check reservoir fluid level, and if necessary, fill to the MAX level.



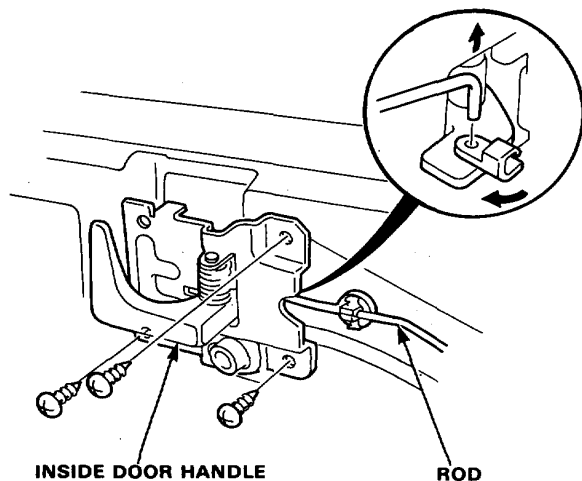
(To page 13-61)



7. Remove the screws, then remove the power door lock control unit, speaker and door panel bracket.
8. Carefully remove the plastic cover.



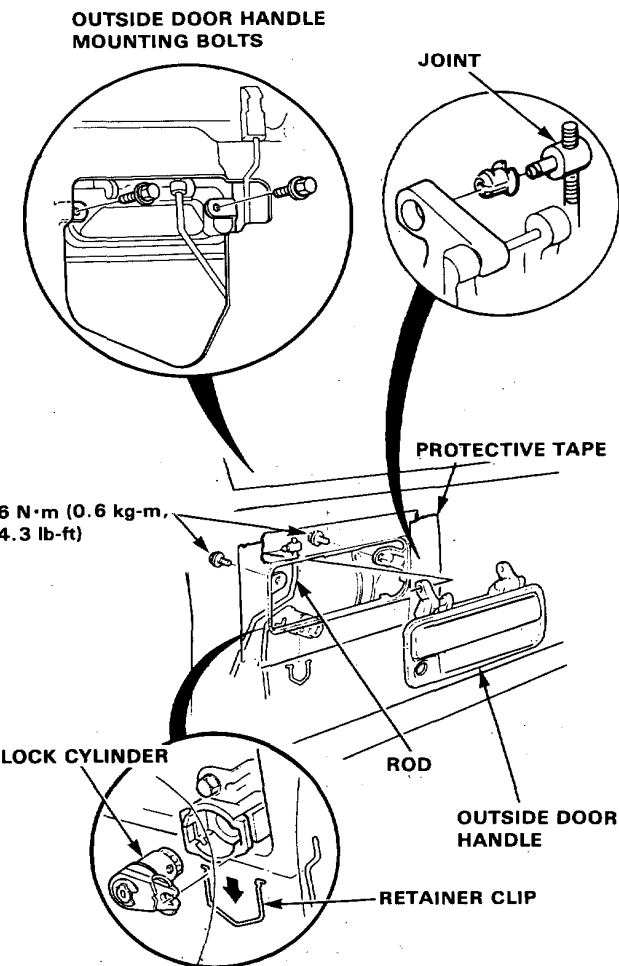
9. Remove the 3 screws, disconnect the latch rod, then remove the inside door handle.



10. Reconnect the window switch or use 12 V battery to operate the window regulator.

11. Raise the window fully.
12. Pull out the retainer clip, and take out the lock cylinder, then disconnect the lock rod.

NOTE: Use protective tape around the edge of the outside door handle to prevent scratching the paint.



13. Remove the mounting bolts for the outside door handle.
14. Pull the outside door handle out, and pry the joint off the handle with a flat tip screwdriver. Remove the handle from the rod.

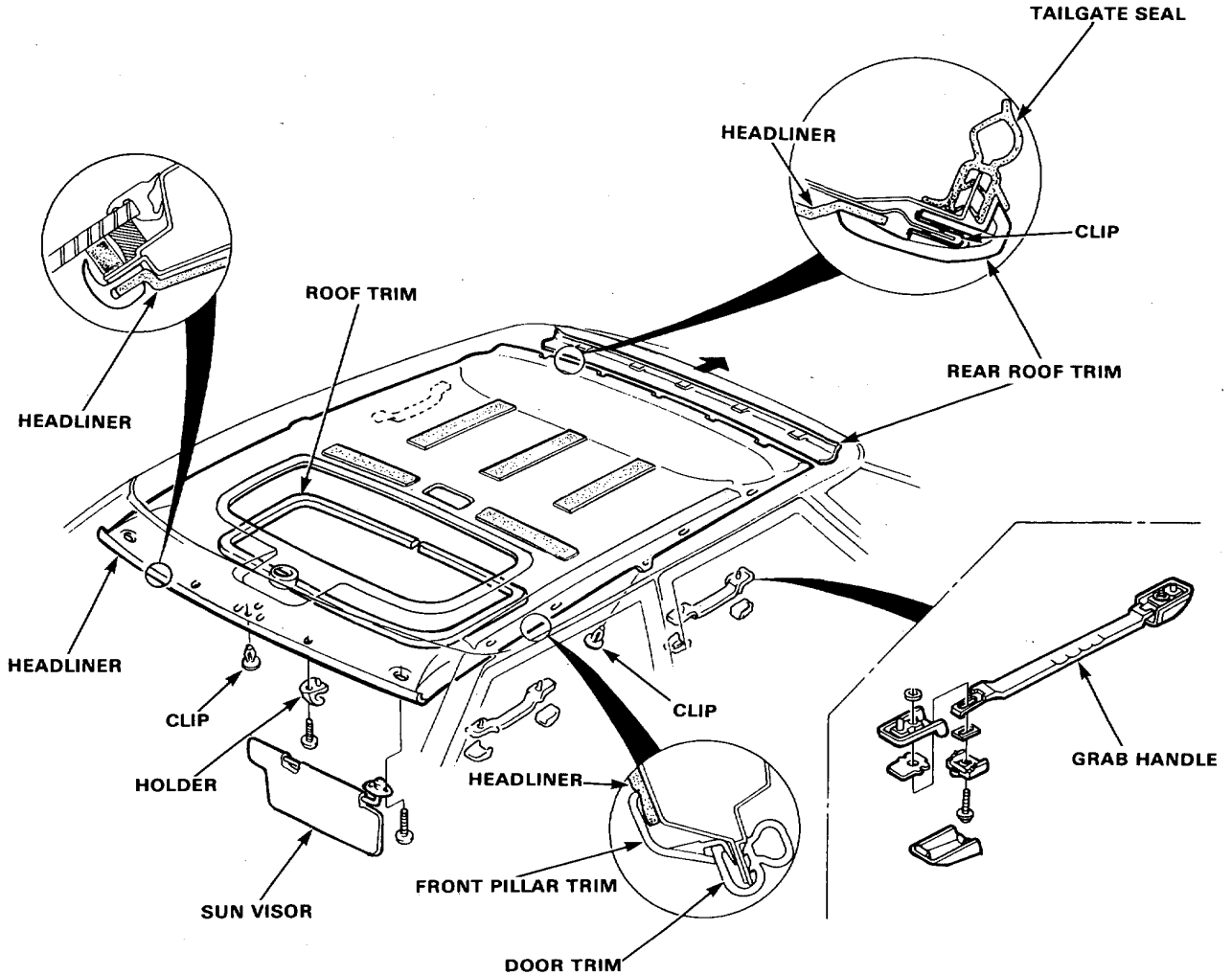
(cont'd)



# Headliner

## Replacement

1. Remove:
  - Sun visors and holders.
  - Front pillar trim (page 14-39).
  - Quarter window trim panel (page 14-39).
  - Dome light.
  - Grab handles.
2. Remove the clips and rear roof trim, then remove the headliner.



3. Assemble the headliner in the reverse order of disassembly.

### NOTE:

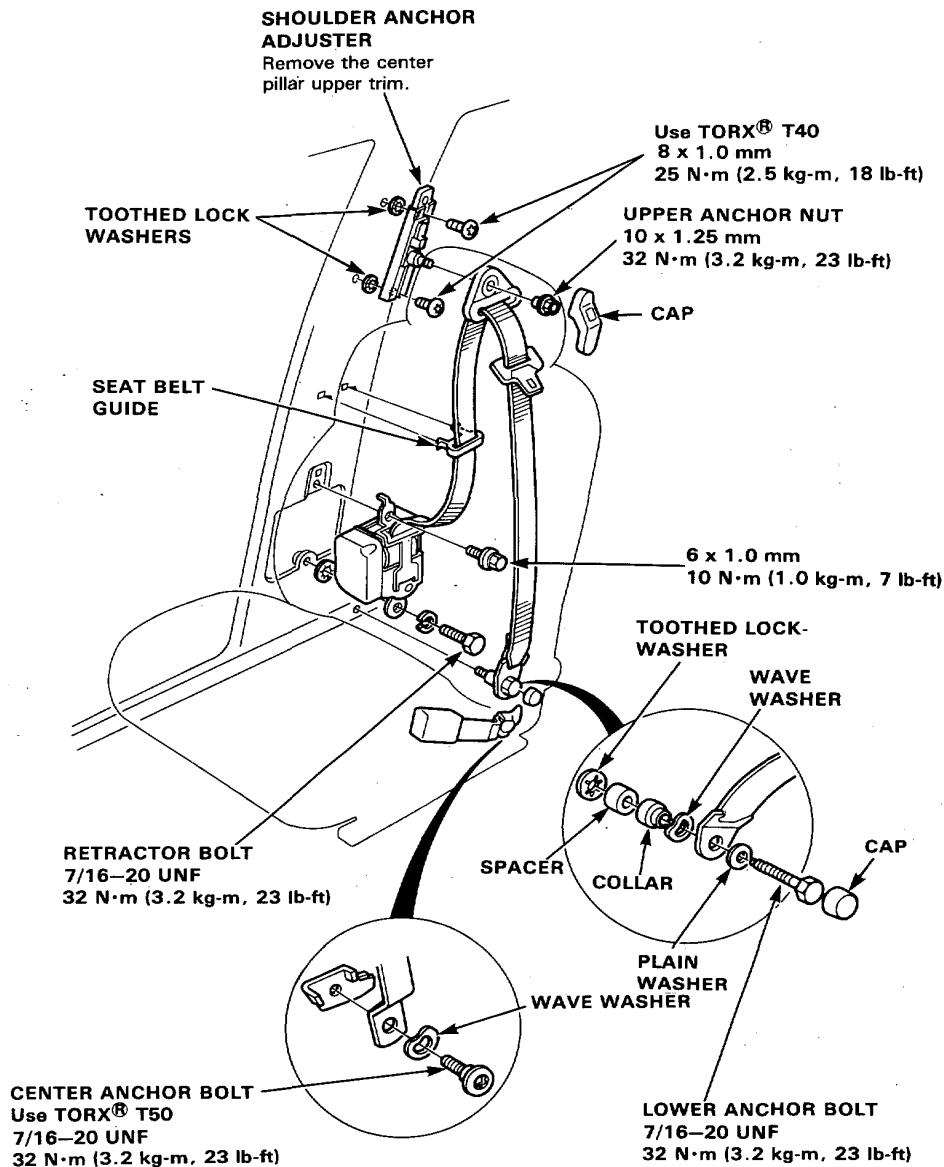
- When installing the headliner inside the passenger cabin, be careful not to fold or bend it. Also, be careful not to scratch the body.
- Check that the two sides of the headliner are securely attached to the trim.
- When installing the roof trim, install the joint towards the rear (Sunroof model).

# Front Seat Belts

## Replacement

**CAUTION:** Check the seat belts for damage and replace them if necessary. Be careful not to damage them during removal and installation.

1. Remove the center pillar lower trim.
2. Remove the upper anchor nut, lower anchor bolt and retractor bolt with a 17 mm socket or box-end wrench.
3. Remove the front seat, then remove the bolt and the center anchor.

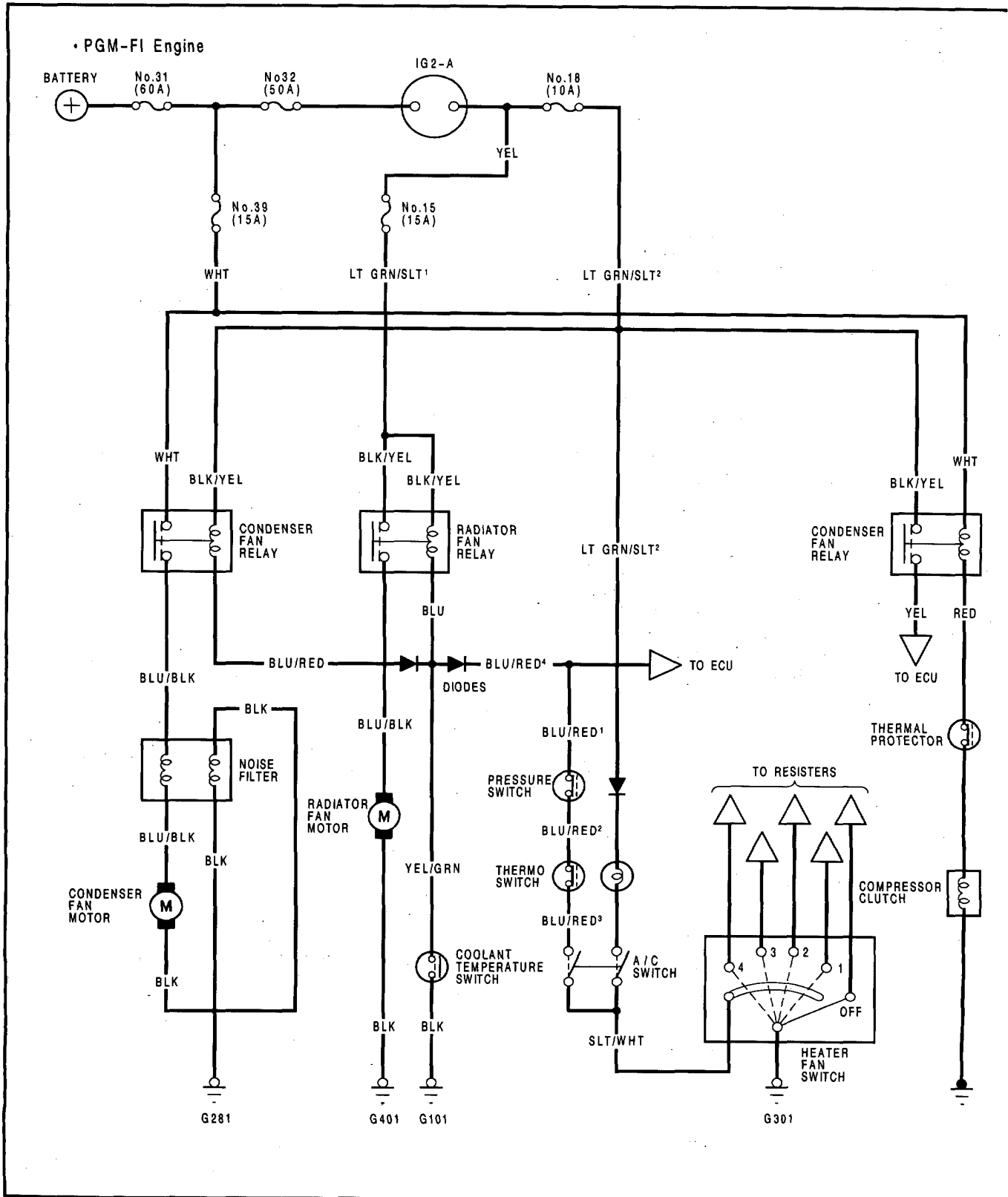


4. Check that the retractor locking mechanism functions as described on page 14-46.
5. Install the front seat belts in the reverse order of removal.

### NOTE:

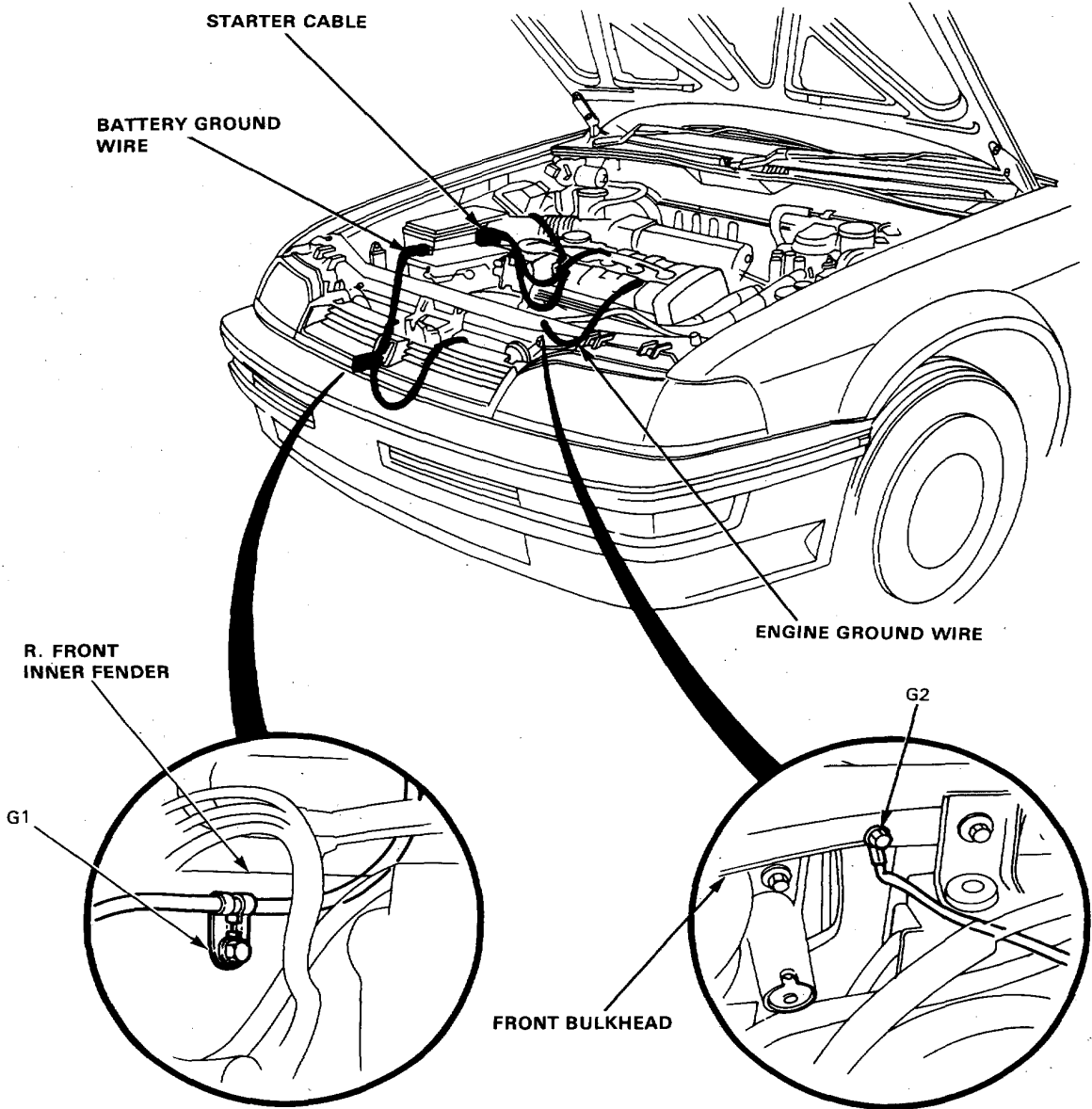
- Make sure you assemble the washers and collars on the upper and lower anchor bolts as shown.
- Before attaching the center pillar lower trim, make sure there are no twists or kinks in the belts.

# Circuit Diagram



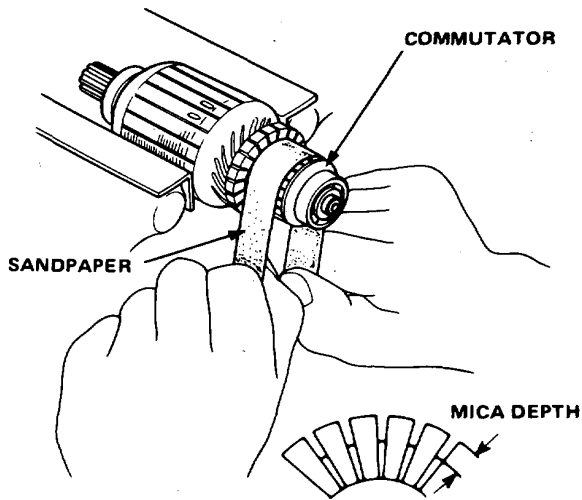
# Ground and Wire Harness Routing

NOTE: RH Drive type shown. LH Drive type is similar.





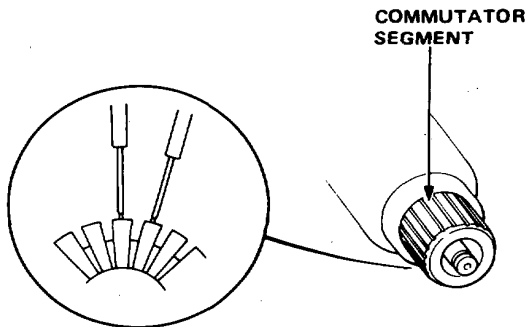
- If surface is dirty, recondition it with a #500 or #600 sandpaper. Then, check mica depth. If necessary, undercut mica with a hacksaw blade to achieve proper depth.



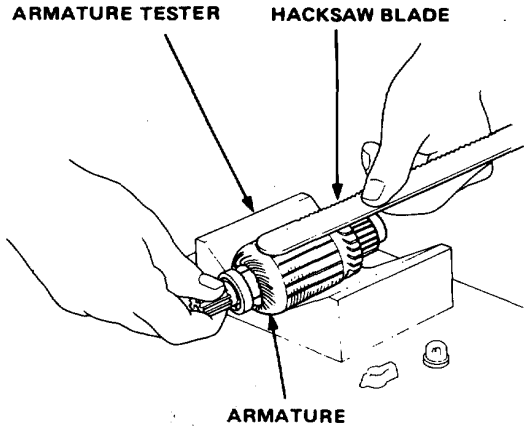
**Commutator Mica Depth**

	Standard (New)	Service Limit
ND (0.8 kw, 1.0 kw and 1.2 kw) and Hitachi (0.8 kw)	0.5—0.8 mm (0.020—0.031 in)	0.2mm (0.008 in)
Mitsuba (1.0 kw and 1.4 kw)	0.4—0.5mm (0.016—0.020 in)	0.15 mm (0.006 in)

- Check for continuity between each segment of the commutator. If an open circuit exists between any segment, replace the armature.

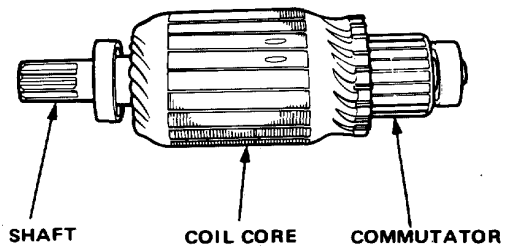


- Place the armature on an armature tester. Hold a hacksaw blade on the armature core.



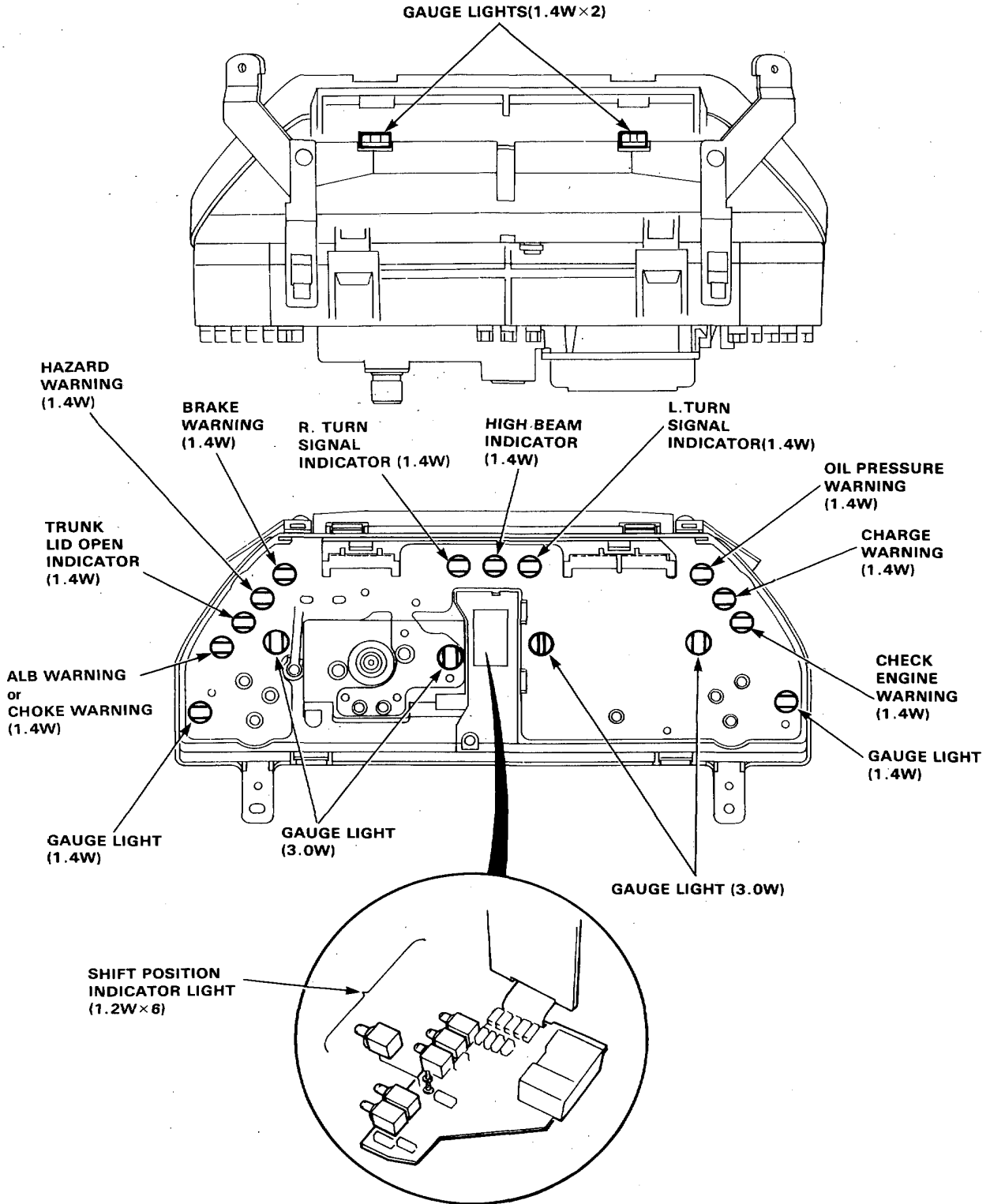
If the blade is attracted to the core or vibrates while core is turned, the armature is shorted. Replace the armature.

- With an ohmmeter, check that no continuity exists between the commutator and armature coil core, and between the commutator and armature shaft. If continuity exists, replace the armature.





# Bulb Locations

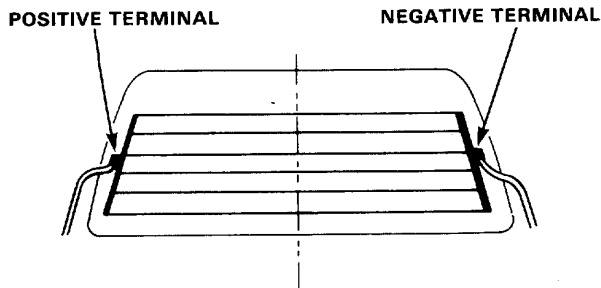




## Function Test

**CAUTION:** Be careful not to scratch or damage the defogger wires with the tester probe end.

1. Check for voltage between the positive terminal and body ground with the ignition switch and the defogger switch ON.  
There should be battery voltage.
  - If there is no voltage, check for :
    - Faulty defogger relay.
    - An open in the BLK, BLK/GRN<sup>2</sup> or YEL/GRN wire.
  - If there is battery voltage, go to step 2.

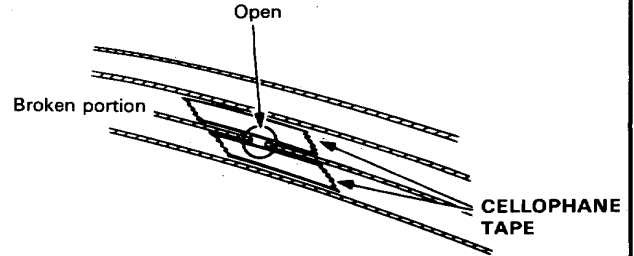


2. Check for continuity between the negative terminal and body ground.  
If no continuity check for open in the defogger ground wire.
3. Lightly touch the voltmeter positive probe to the center of each defogger wire, and the negative probe to the negative terminal.  
There should be approximately 6 V with the ignition switch and the defogger switch ON.
  - If the voltage is as specified, the defogger wire is OK.
  - If there is battery voltage, the defogger wire is broken in the negative side from the center.
  - If there is no voltage, the defogger wire is broken in positive side from the center.

## Defogger Wire Repair

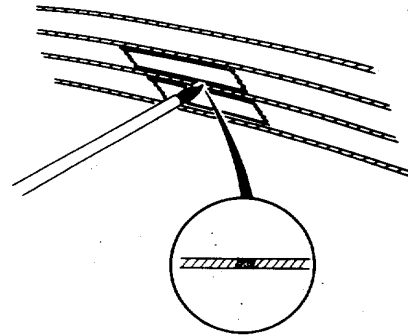
**NOTE:** Repair section must be no longer than one inch.

1. Lightly rub area around the break with the fine steel wool, then clean with alcohol.
2. Carefully mask above and below the broken portion defogger wire with cellophane tape.



3. Using a small brush, apply heavy coat of silver conductive paint extending about 1/8 in. on both sides of the break. Allow 30 minutes to dry.

**NOTE:** Thoroughly mix paint before use.



4. Check for proper operation with a voltmeter (approximately 6 V at the mid-point).
5. Apply a second coat of paint in the same manner. Dry 3 hours before removing tape.