

# AIR CONDITIONING SYSTEM

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**SPECIFICATION (R-134a)**


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Heater unit	
Type	Three-way-f low full-air-mix system
Heating capacity	3,800 Kcal/h
Heater control assembly	Rotary type (Vacuum Control System)
Air conditioning	
Cooling capacity	3,700 Kcal/h
Compressor	
Model	FX-15 (Swash plate type)
Refrigerant unit lubricant, cc (cu. in.)	PAG oil FD46XG or Equivalent 140~160 (8.5-9.7)
Bore x stroke	029.0 x 23.3 mm
Displacement	154 cc/rev
Dual pressure switch	
High pressure switch	OFF 32±2 <b>kg/cm<sup>2</sup></b> (3,138 kPa, 455 psi) ON 26±2 <b>kg/cm<sup>2</sup></b> (2,550 kPa, 370 psi)
Low pressure switch	OFF 2.0±0.2 <b>kg/cm<sup>2</sup></b> (200 kPa, 28 psi) ON 2.25±0.2 <b>kg/cm<sup>2</sup></b> (220 kPa, 32 psi)
Freezer prevention	Air temperature thermostat OFF : 0° (32°F) ON : 4°C (39°F)
Pressure relief valve	
Working pressure	35.0~42.2 kg/cm (498~600 psi)
Resealed pressure	28.1 kg/cm (400 psi)
Refrigerant and quantity	R-134a Approx. 650~700g

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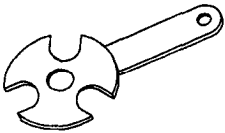
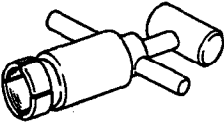

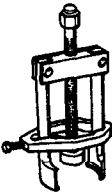
**SERVICE STANDARDS**


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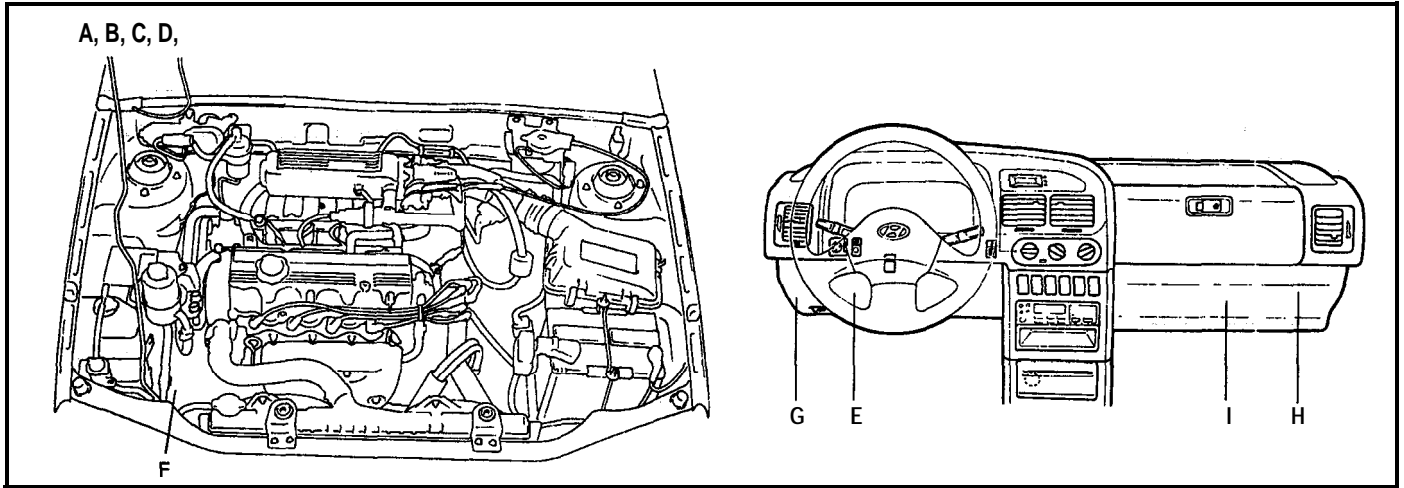
Amount of deflection of V belt	
New belt	5-5.5 mm (0.20-0.21 in.)
Used belt	6-7 mm (0.23-0.28 in.)
After driving	0.35-0.75 mm (0.014-0.030 in.)
Compressor clutch clearance	8 mm (0.31 in.)
TV belt size	
Type	4 PK
Length	910 mm (35.8 in.)

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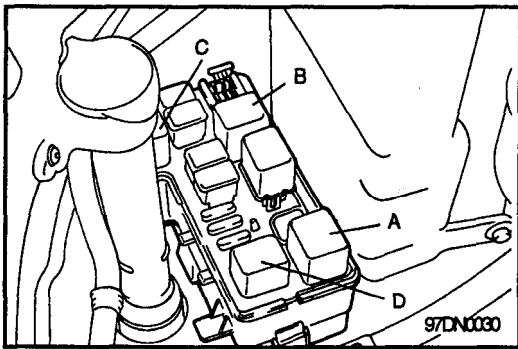
## SPECIAL TOOLS

Tool (Number and name)	Illustration	Use
09977-34000 Pressure plate bolt remover		Removal and installation of pressure plate
09977-33700 Shaft seal remover and installer		Removal and installation of the shaft seal.
09977-33800 Snap ring remover		Removal of snap ring.
09455-34000 Bearing and gear puller		Removal of field coil.

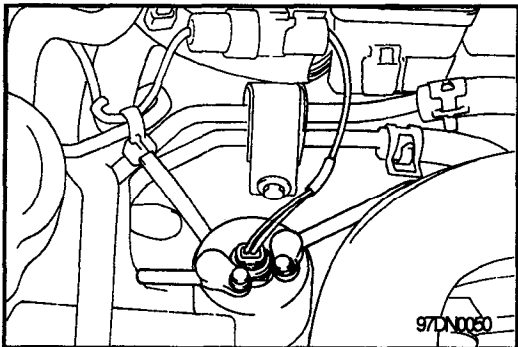
### LOCATION OF COMPONENTS



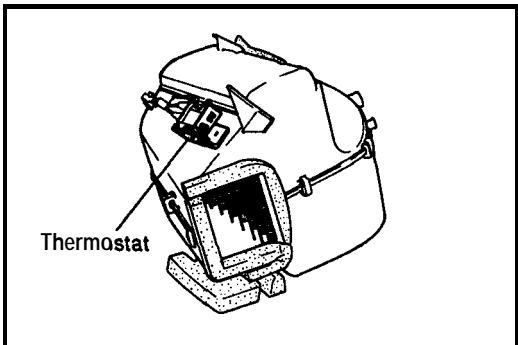
- A. A/C RELAY
- B. CONDENSOR FAN RELAY
- C. RADIATOR FAN RELAY (HI)
- D. RADIATOR FAN RELAY (LO)



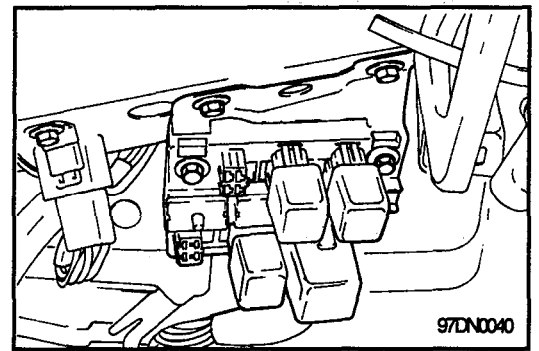
F. DUAL PRESSURE SWITCH



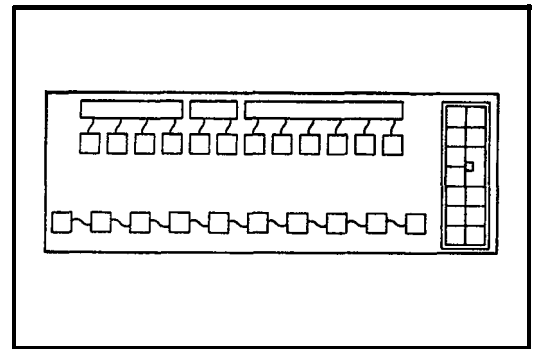
H. THERMOSTAT



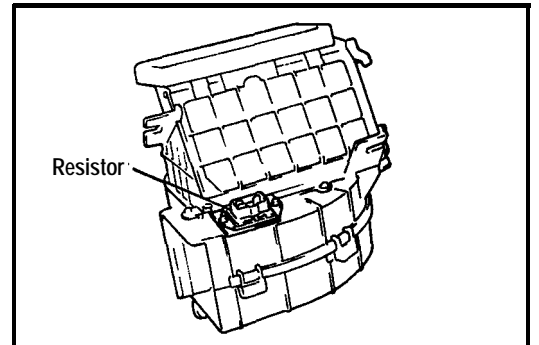
E. BLOWER RELAY



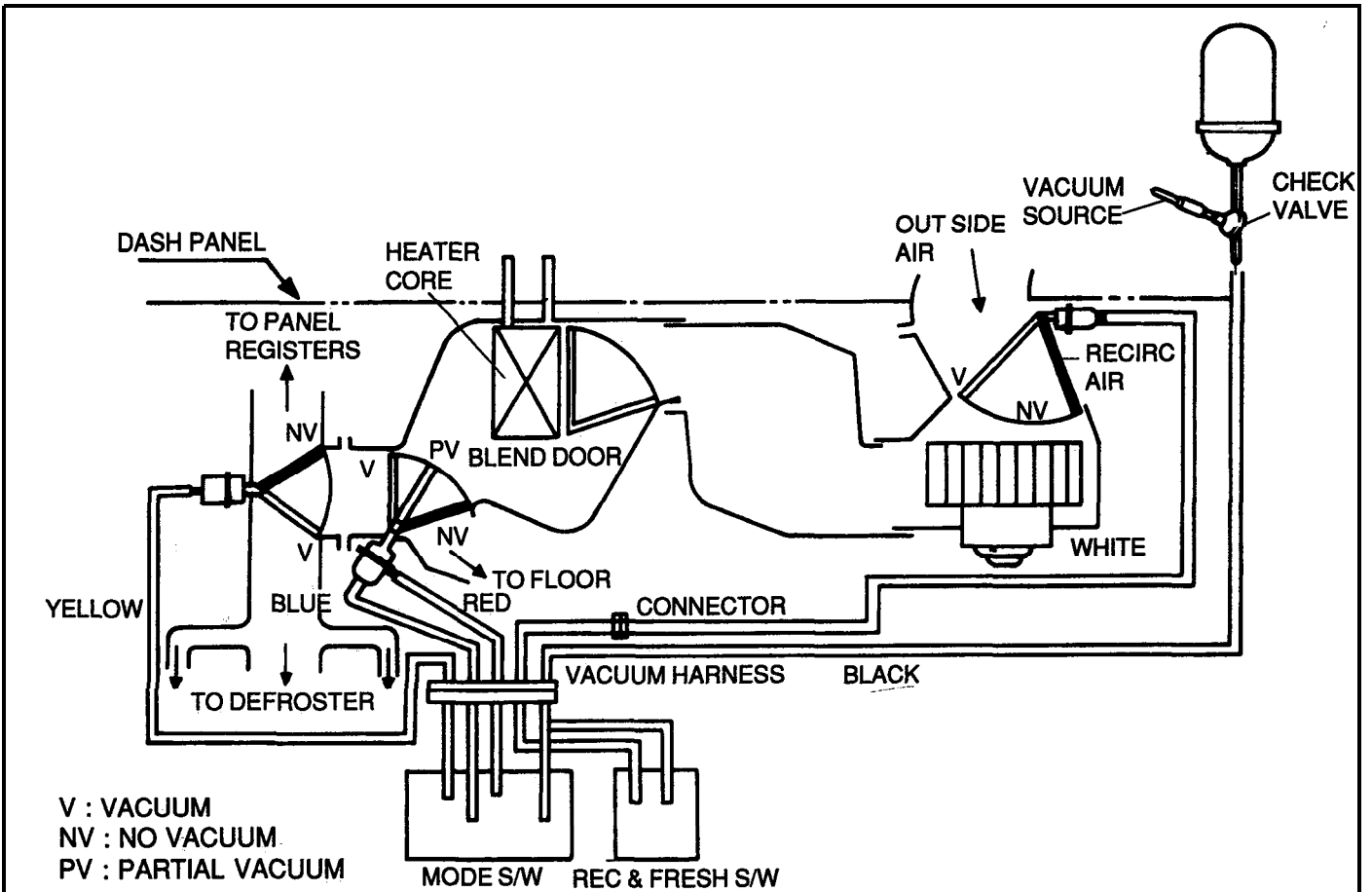
G. FUSE










I. BLOWER RESISTOR



VACUUM SYSTEM



MODE CONTROL SWITCHING

CONNECTION (Vacuum Hose Color)	FUNCTION	MODE SWITCH BUTTON					FRESH/ REC-BUTTON	
		 PANEL	 PANEL FLOOR	 FLOOR	 FLOOR DEF	 DEF	 RECIRC	 FRESH
BLACK	SOURCE	V	V	V	V	V	V	V
BLUE	FLOOR (PARTIAL)	A	V	V	V	A	-	-
RED	FLOOR (FULL)	A	A	V	A	A	-	-
YELLOW	PANEL	V	V	A	A	A	-	-
WHITE	RECIRC	*	*	*	*		V	A

V=Vacuum      A=Atmosphere  
 \*=Controlled by "RECIRC" or "FRESH" button.

**SYMPTOM AND PROBABLE CAUSE IN AIR FLOW MODE CONTROL SYSTEM**

Symptom	Probable cause
On "FLOOR" position. All air through defroster or DEF/FLOOR.	<ul style="list-style-type: none"> <li>o Blue and/or red vacuum hose pinched or disconnected at vacuum motor.</li> <li>o Black source hose pinched or disconnected at the connector.</li> <li>o Engine compartment vacuum source hose pinched or disconnected at the vacuum manifold.</li> <li>o Defective vacuum motor.</li> </ul>
On "DEF/FLOOR" position. All air through defroster.	<ul style="list-style-type: none"> <li>o Blue hose pinched or disconnected at vacuum motor.</li> <li>o Blue vacuum hoses installed improperly (reversed).</li> <li>o Black source hose pinched or disconnected at the connector.</li> <li>o Engine compartment vacuum source hose pinched or disconnected at the vacuum manifold.</li> <li>o Defective vacuum motor.</li> </ul>
On "PANEL VENTS" position. All air through defroster.	<ul style="list-style-type: none"> <li>o Yellow vacuum hose pinched or disconnected at vacuum motor.</li> <li>o Black source hose pinched or disconnected at the connector.</li> <li>o Engine compartment vacuum source hose pinched or disconnected at the vacuum manifold.</li> <li>o Defective vacuum motor.</li> </ul>
On "PANEL/FLOOR" position. All air through defroster or panel	<ul style="list-style-type: none"> <li>o Yellow vacuum hose pinched or disconnected at vacuum motor.</li> <li>o Blue hose pinched or disconnected at vacuum motor.</li> <li>o Black source hose pinched or disconnected at the connector.</li> <li>o Engine compartment vacuum source hose pinched or disconnected at the vacuum manifold.</li> <li>o Defective vacuum motor.</li> </ul>
On "DEF" position. (No vacuum) On "RECIRC" position, All air through fresh.	<ul style="list-style-type: none"> <li>o White vacuum hose disconnected at the connector or recirc duct vacuum motor.</li> <li>o Black source hose pinched or disconnected at the connector.</li> <li>o Engine compartment vacuum source hose pinched or disconnected at the vacuum manifold.</li> <li>o Defective vacuum motor.</li> </ul>
Engine poor idle	<ul style="list-style-type: none"> <li>o Engine compartment vacuum source hose disconnected.</li> </ul>

## SYMPTOM CHART

SYMPTOM		REMEDY
No hot air flow	Blower motor does not run at all	Perform the flow chart (page 97-8)
	Blower motor runs	Check following : <ul style="list-style-type: none"> <li>o Clogged heater duct</li> <li>o Clogged blower outlet</li> <li>o Clogged heater core or hose</li> <li>o Faulty air mix door</li> <li>o Air mix cable adjustment</li> </ul>
Hot air flow is low	Blower speed does not change	Perform flow chart (page 97-10)
	Blower runs properly	Check following: <ul style="list-style-type: none"> <li>o Clogged heater duct</li> <li>o Clogged blower outlet</li> <li>o Incorrect door position</li> </ul>
Compressor does not come on even though the condenser fan (or radiator-fan) run.		Perform the procedures in the flow chart. (page 97-11)
Compressor and condenser fan (or radiator fan) do not run.		Perform the procedures in the flow chart. (page 97-15)
Only condenser fan (or radiator fan) does not run.		Perform the procedures in the flow chart. (page 97-17)
Idle-up is not ok.		See the fuel and emissions section.

## QUICK TROUBLESHOOTING HINTS

1. Check fuse No. 1 and No. 11 for blower control system.
2. Check that blower relay is mounted in passenger compartment relay box.
3. Check fuse No. 5 and No. 14 for A/C control system.
4. Check that A/C relay is mounted in engine compartment relay box.
5. Check that A/C system is properly charged.  
(Refer to Air Conditioner service page 97-32)
6. Check fuse 30A (PINK) and 20A (BLUE) for condenser and radiator fan controls, mounted in engine compartment.

<b>SYMPTOM</b>	<b>BLOWER MOTOR DOES NOT RUN AT ALL</b>
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(Refer to circuit diagram page WS-138)

Inspect No.1 (30A) fuse and No 11 (20A) fuse in the dash fuse box.

O.K. N.G Replace fuse.

Disconnect the M51 connector from the blower motor.

o Ignition switch "ON", engine "OFF".  
o Blower switch is turned "ON".

o Measure voltage between the blower motor M51;2 terminal (+) and body ground (-).  
o Battery voltage should be read

O.K. N.G o Remove the blower relay from the passenger compartment relay box.

o Turn the ignition switch OFF.  
o Reconnect the M51 connector to the blower motor

o Measure voltage from the blower relay M32;4 and/or M32;1 terminal (+) to ground (-).  
o Battery voltage should be read.

o Connect a jumper wire between the M51;1 (BLU/BLK) terminal back side and body ground.  
Turn the ignition switch ON.  
o Blower motor should be run.

O.K. N.G

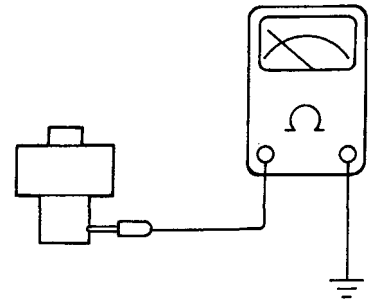
o Check blower relay operation (see page 97-65).  
o If relay is O.K repair open circuit between M39;2 and M32;3.

o Repair open circuit between  
o M32;4 and fuse No. 1.  
o M32;1 and fuse No. 11.

O.K. N.G Replace the blower motor.

o Turn the ignition switch OFF.  
o Remove the jumper wire.

(To Page 97-9)



(From page 97-8)

o Remove the heater control assembly (See page 97-21)  
o Disconnect the M39 (6P) connector from the blower switch.

o Connect the jumper wire between the M39;6 (BLU/BLK) terminal and body ground.

o Turn the ignition, blower switches ON.  
o Blower motor should be run.

O.K

N.G

Repair open in GRN wire between blower relay M32;3 terminal and blower switch M39;2 terminal.

o Turn ignition switch OFF.  
o Remove the jumper wire.

Inspect the blower speed control switch (see page 97-23)

O.K

N.G

Replace the blower switch assembly

Repair open BLK wire between the blower switch and body ground or poor ground (G02).

<b>SYMPTOM</b>	<b>BLOWER MOTOR RUNNING SPEED DOES NOT CHANGE.</b>
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(Refer to circuit diagram page WS-138)

1. Ignition switch OFF.
2. Remove the glove box cover.
3. Disconnect the M50 connector from the blower resistor.

- o Check for continuity between the 2 and 4 terminals of the blower resistor. (see page 97-34)
- o Should show continuity.

O.K

N.G

Replace the resistor.

- o Reconnect the M50 connector to the blower resistor.
- o Remove the heater control assembly. (See page 97-21)
- o Disconnect the M39 (6P) connector from the blower switch.

NOTE : May be blown out the thermal limiter or resistor coil.

Turn ignition switch ON.

- Measure voltage between :
- o M39;3 terminal and body ground.
  - o M39;4 terminal and body ground.
  - o M39;5 terminal and body ground.
  - o M39;6 terminal and body ground.
  - o Battery voltage should be read.

O.K

N.G

Repair open circuit between M39;3,4,5 terminal and M50;6,1,4 terminal.

- o Turn ignition switch OFF.
- o Check for continuity from M39;1 terminal to body ground.
- o Should show continuity.

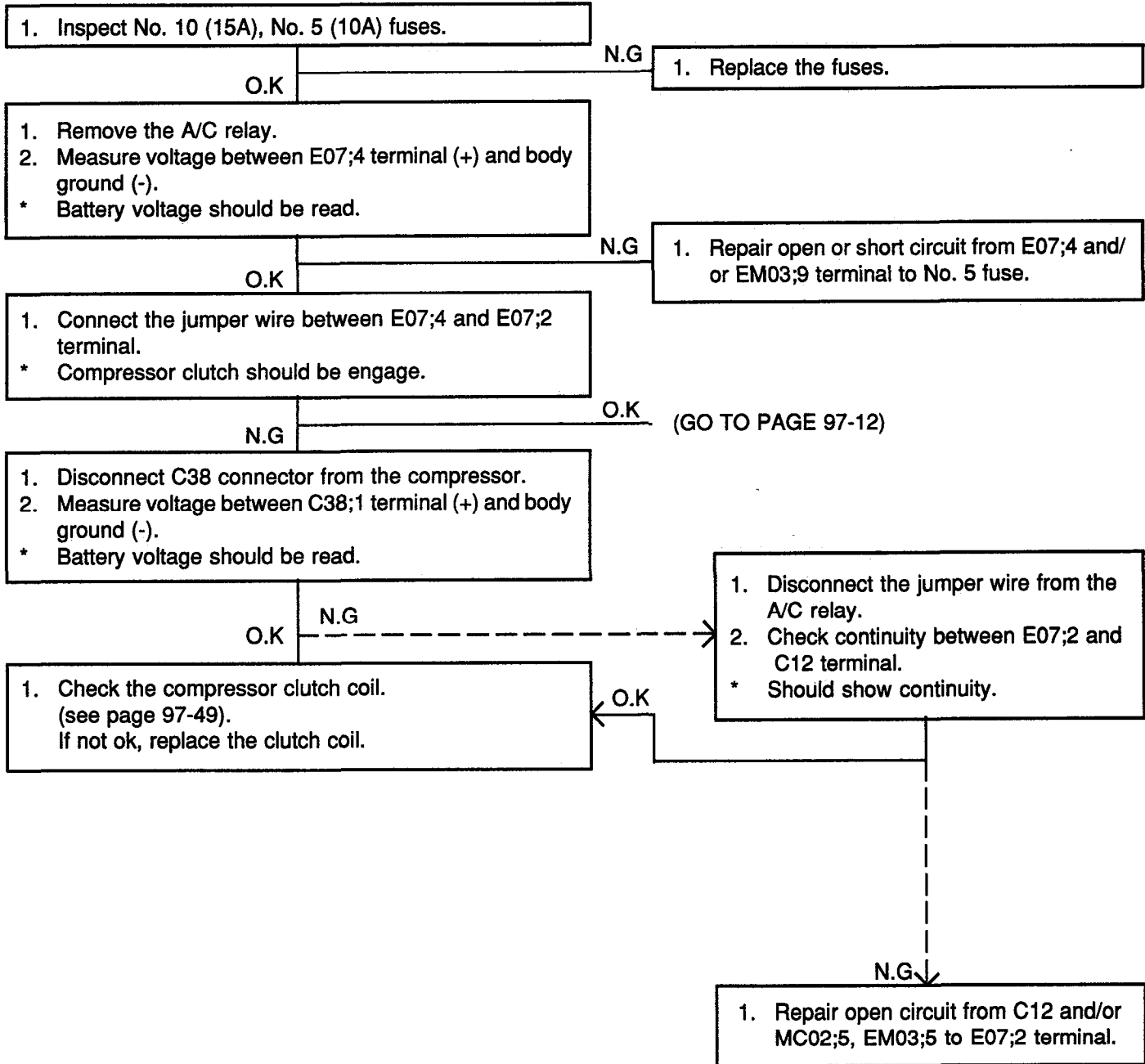
O.K

N.G

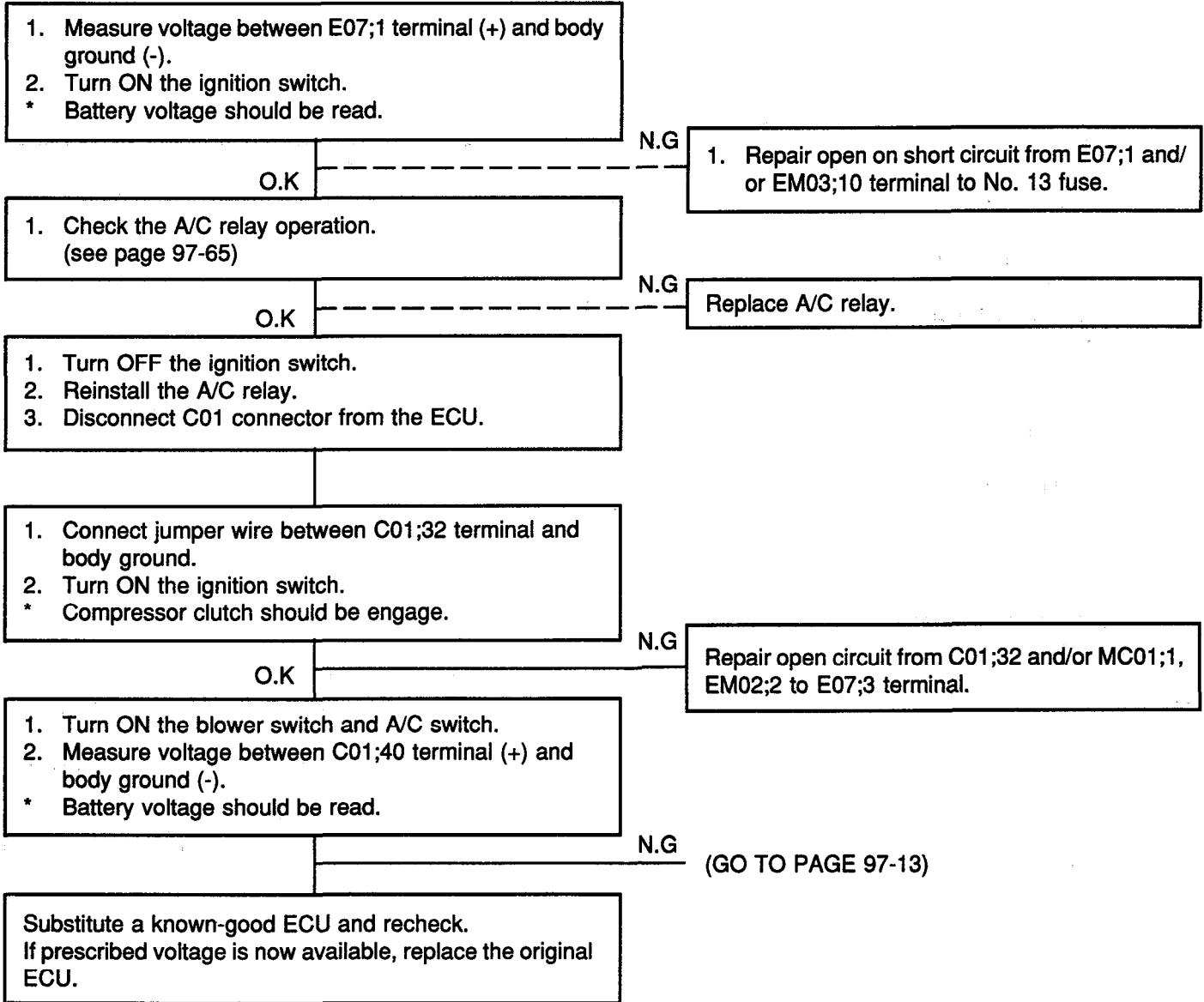
Repair open in BLK wire between M39;1 terminal and body ground (G02).

o Replace the blower switch assembly.

SYMPTOM	COMPRESSOR DOES NOT COME ON EVEN THOUGH THE CONDENSER FAN (or Radiator fan) RUN
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(FROM PAGE 97-11)



(FROM PAGE 97-12)

1. Turn OFF the ignition switch.
2. Reconnect the C01 connector to ECU.

1. Disconnect E20 connector from the dual pressure switch.
2. Measure voltage between E20;2 terminal (+) and body ground (-).
3. Turn the ignition, blower, A/C switches ON.
- \* Battery voltage should be read.

O.K

N.G

(GO TO PAGE 97-14)

1. Turn OFF the ignition switch.
2. Connect jumper wire between E20;1 and E20;2 terminal.

1. START the engine.
2. Turn the blower and A/C switches ON.
- \* Compressor should be run.

O.K

N.G

Repair open or short circuit from E20;1 to C01;40 terminal.

1. Remove the jumper wire.
2. Check A/C pressure by using manifold gage.

O.K

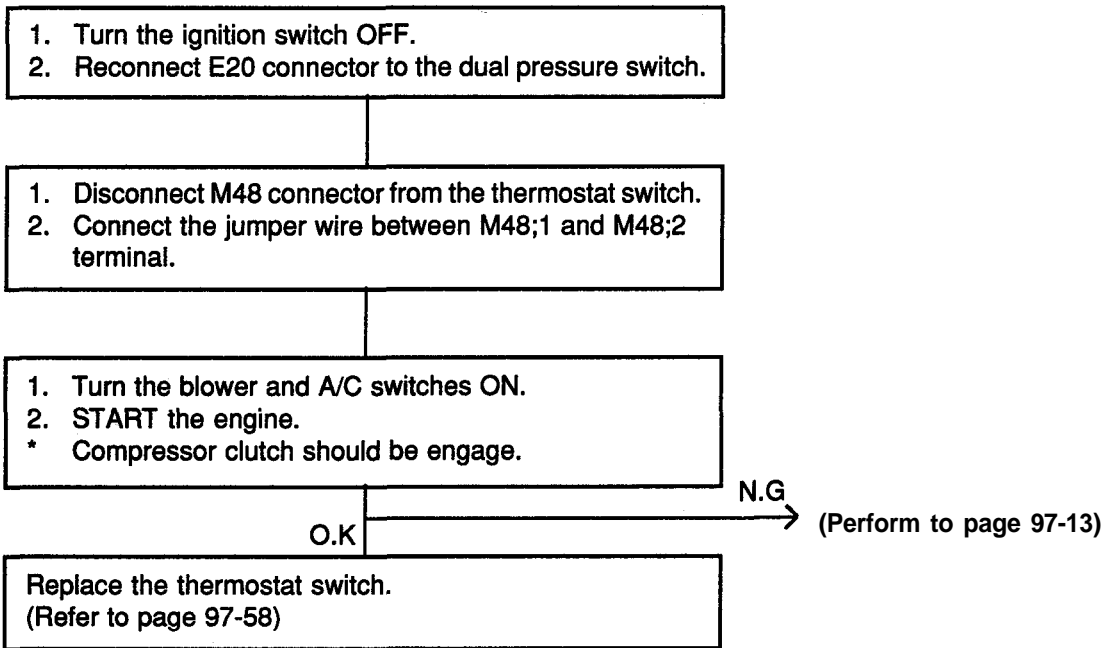
N.G

1. Recharge the refrigerant gas.
2. Check the gas leakage and repair the system.

Replace the dual pressure switch.

NOTE : May be low on refrigerant.

(FROM PAGE 97-13)



## SYMPTOM

COMPRESSOR AND CONDENSER FAN (or Radiator fan) DO NOT RUN.

(Refer to circuit diagram page WS-141)

1. Inspect blower motor proper operation.

O.K

N.G

Perform to page 97-10 blower motor control

2. Inspect No. 14 (10A) fuse in the dash fuse box and PINK (30A) fuse and BLUE (20A) fuse in the main fusible link box.

O.K

N.G

Replace the fuses.

1. Turn the ignition switch OFF.  
2. Pull out the heater control assembly.  
(Refer to page 97-21)  
3. Disconnect I15 connector from the A/C switch.

1. Turn the ignition and blower switches ON.  
2. Measure voltage between I15;4 terminal and body ground (-).  
\* Battery voltage should be read.

O.K

N.G

Repair open circuit from I15;4 and/or MI04;2 terminal to No. 14 fuse.

1. Turn the ignition switch OFF.  
2. Connect jumper wire between I15;4 and I15;5 terminal.

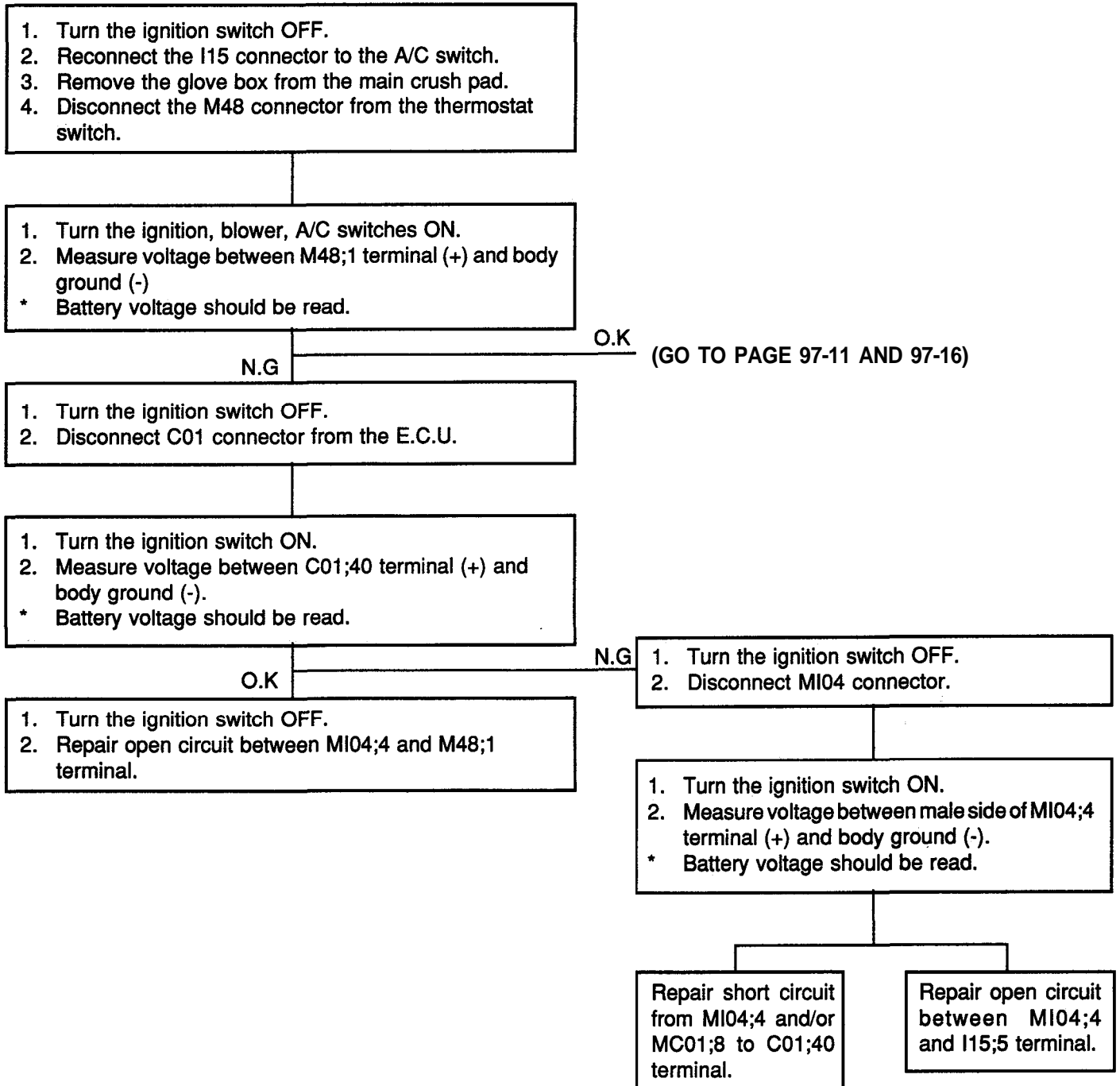
1. START the engine.  
2. Turn the blower switch ON.  
\* Compressor clutch and condenser fan (or Radiator fan) should be operate.

O.K

(GO TO PAGE 97-16)

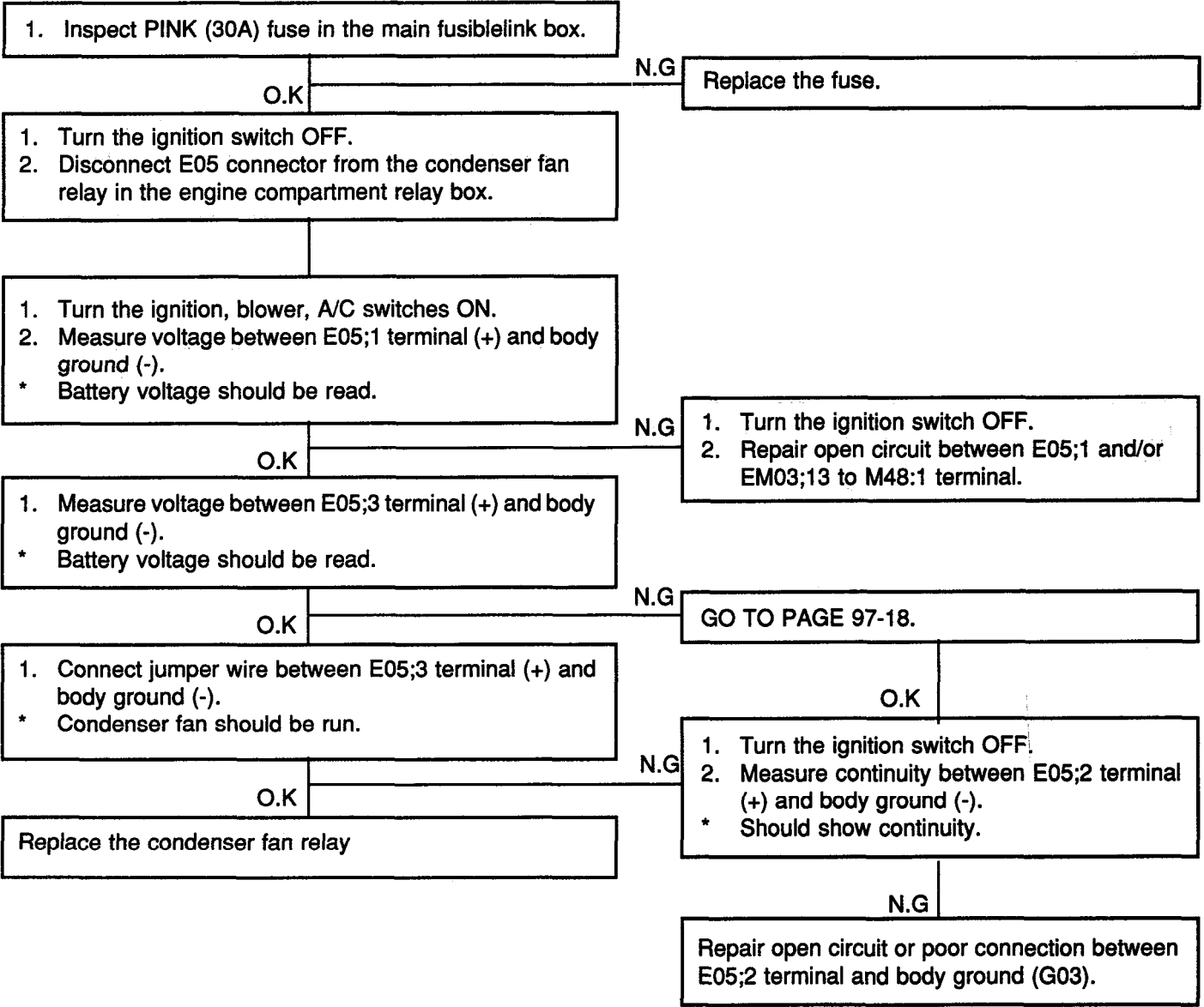
Replace the A/C switch.

(FROM PAGE 97-15)



<b>SYMPTOM</b>	<b>ONLY CONDENSER FAN (or radiator fan) DOES NOT RUN</b>
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(Refer to circuit diagram on page WS-58)



(FROM PAGE 97-17)

1. Disconnect E25 connector from the condenser fan motor.
  2. Measure voltage between E25 terminal (+) and body ground (-).
- \* Should show battery voltage.

O.K

N.G

Repair open circuit between E25;1 terminal and BLUE (20A) fuse for condenser fan in the main fusible link.

1. Reconnect E25 connect the to the condenser fan motor.
  2. Connect jumper wire between E25;2 terminal and body ground by using paper clip.
- \* Condenser fan should be run.

O.K

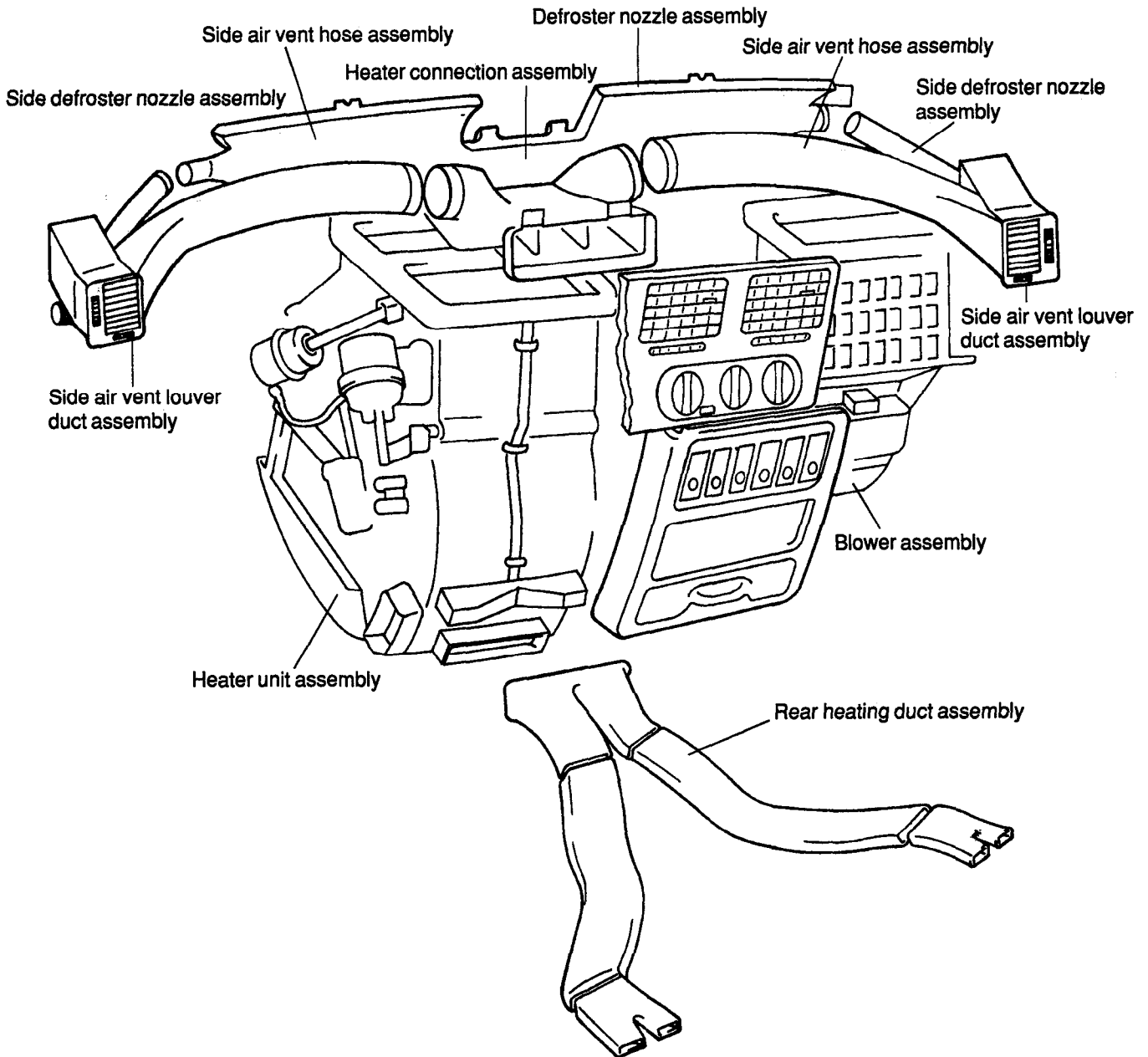
N.G

Replace the condenser fan motor assembly.

Repair poor connection or open circuit between E16;2 and E25;1 terminal.

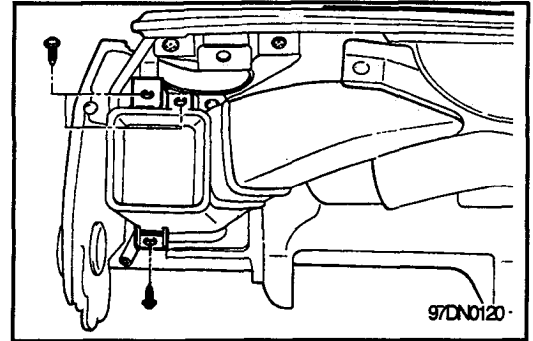
VENTILATORS

COMPONENTS

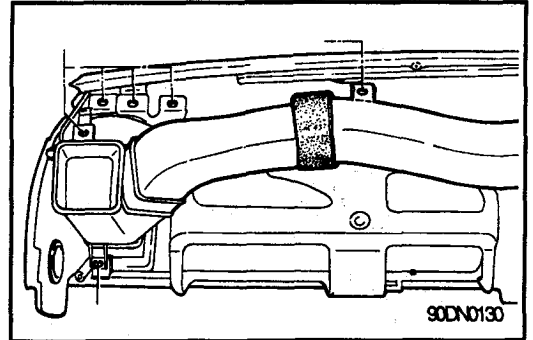


## REMOVAL AND INSTALLATION

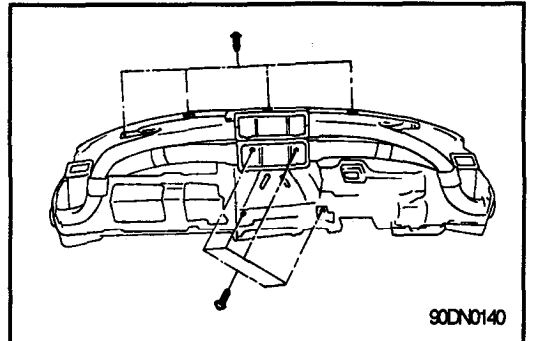
1. Remove the main crash pad assembly (Refer to BODY GROUP).
2. Remove the side air vent louver duct assembly (LH/RH) after removing the speaker.



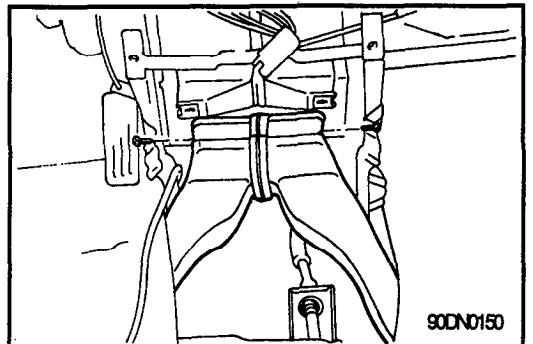
3. Remove the heater connection assembly.
4. Remove the defroster nozzle assembly.-
5. Remove the side defroster nozzle assembly (LH/RH).
6. Remove the crash pad upper cover assembly.



7. Remove the side air vent hose assembly (LH/RH).
8. Remove the side air vent louver assembly (LH/RH).

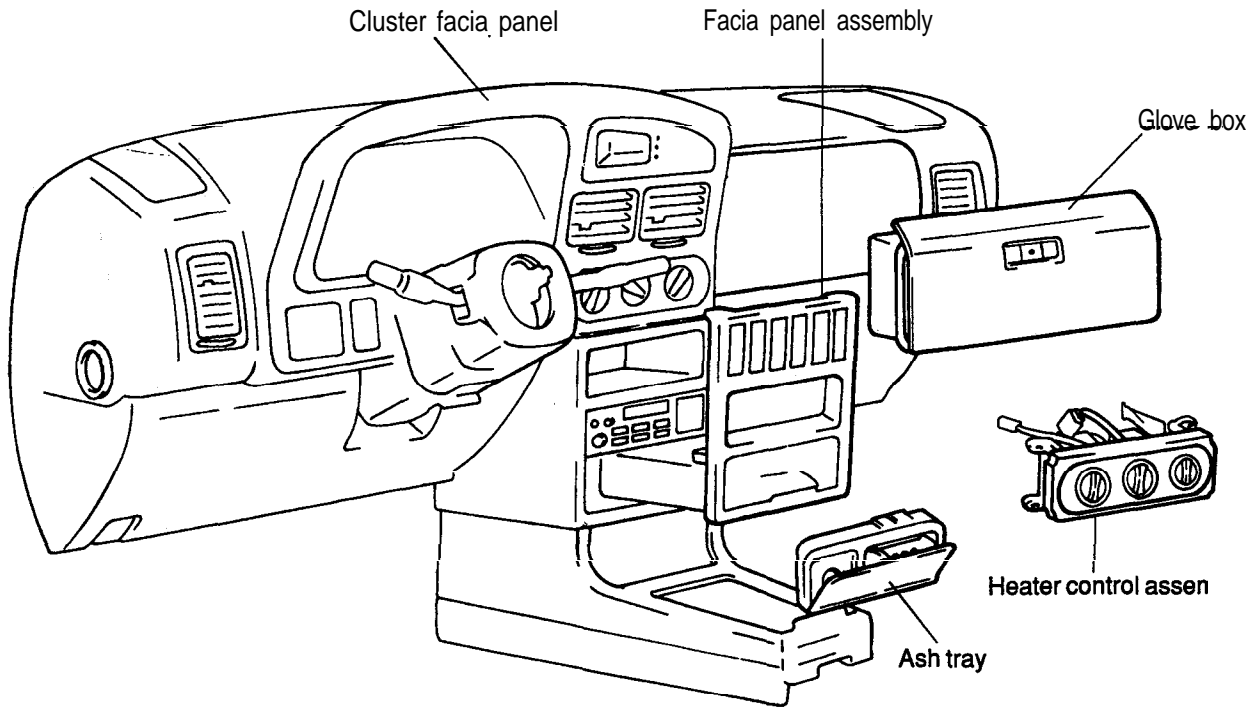


9. Remove the rear heating joint duct assembly and rear heating side duct assembly (LH/RH).
10. Installation is the reverse of removal procedures.



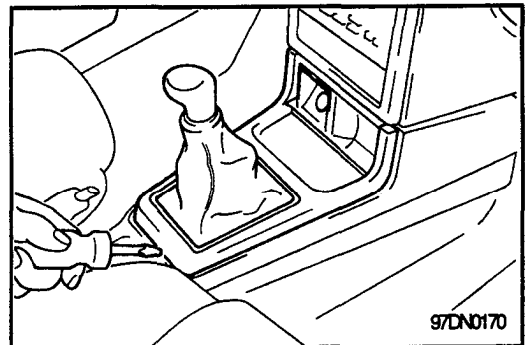
## HEATER CONTROL ASSEMBLY

## COMPONENTS



## REMOVAL AND INSTALLATION

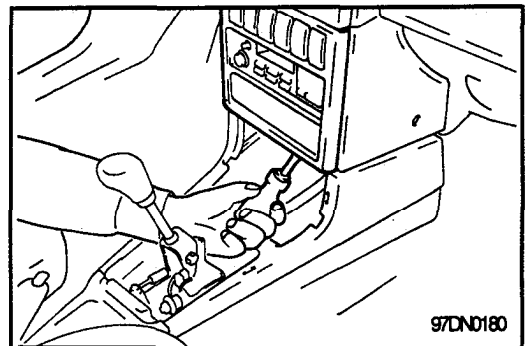
1. Disconnect the battery ground cable.
2. Remove the T.G.S (Transmission gear shift) knob.
3. Using a screwdriver, pry loose two clips and remove the front console cover after disconnect the connector for cigarette lighter.
4. Pull out the ash tray and remove two screws.



5. Using a screwdriver, pry loose 4 clips and disconnect the connectors.

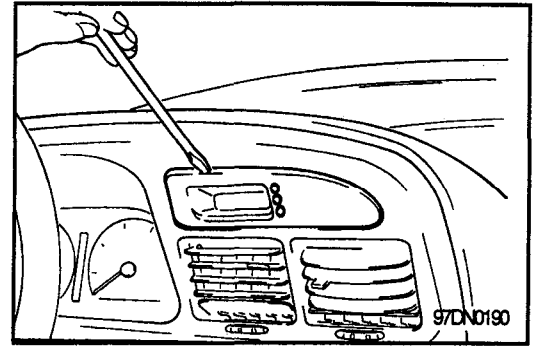
**NOTE : Tape the screwdriver tip before use.**

6. Remove the center facia panel.

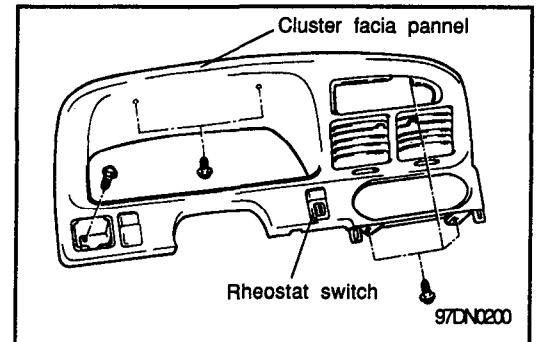


7. Remove the clock assembly, using a flat blade screwdriver.

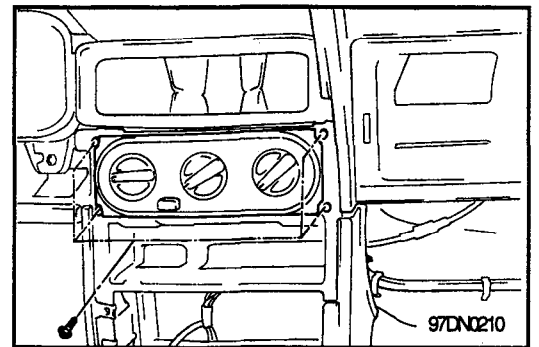
**NOTE : Tape the screwdriver tip before use.**



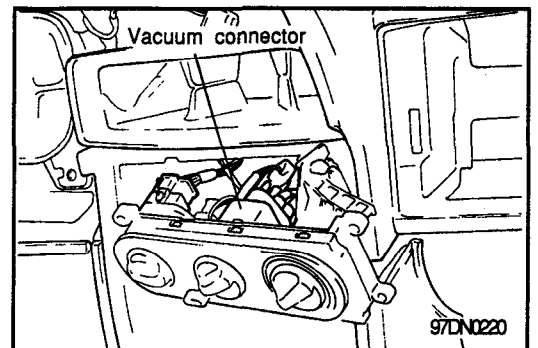
8. Disconnect connector from the rheostat switch.  
 9. Remove six screws from the cluster facia panel as shown right figure.  
 10. Remove the cluster facia panel.



11. Remove four mounting bolts of heater control assembly.  
 12. Pull out the heater control assembly and then disconnect connectors.



13. Disconnect the air mix control cable and vacuum connector.  
 14. Remove the heater control assembly.  
 15. Installation is the reverse of removal.



## AIR MIX CABLE ADJUSTMENT

After install the heater control assembly the adjust the air mix cable.

1. Slide the temperature control lever to HOT.
2. Turn the air mix door shaft arm to the left and connect the end of the cable to the arm.
3. Gently slide the cable outer housing back from the end enough to take up any slack in the cable, but not enough to make temperature control lever move, then snap the cable housing into the clamp.

**INSPECTION**

**BLOWER SWITCH**

1. Check for continuity between terminals as shown below.

Switch position	Terminal	1	2	3	4	5	6
OFF							
1		○	○	○	○		
2		○	○			○	
3		○	○	○			
4		○	○				○

If continuity is not as specified, replace the switch.

**AIR CONDITIONER SWITCH**

1. Check for continuity between terminals as shown below.

Switch position	Terminal	1	2	3	4	5	6
OFF		○	○	○			
ON		○	○	○	○	○	

If continuity is not as specified, replace the switch.

**MODE CONTROL SWITCH**

1. Connect the vacuum tester to black color hose of the vacuum connector.
2. Connect the vacuum hoses to mode control switch.
3. Clogged vacuum port for fresh/recirc control switch.
4. Check for vacuum hiss from the mode switch and vacuum hoses, and inspect for air flow between each hoses when the mode switch is at the each positions as shown below.

Hose color	Mode switch				
	Panel	Panel/ Floor	Floor	Floor/ Diffroster	Diffroster
Black	V	V	V	V	V
Blue	-	V	V	V	-
Red	-	-	V	-	-
Yellow	V	V	V	-	-
White	-	-	-	-	-

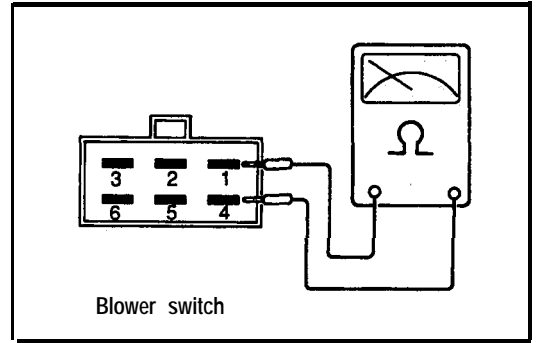
**NOTE :**  
'V' : make air flow with black hose.

If air flow is not as specified, replace the mode switch.

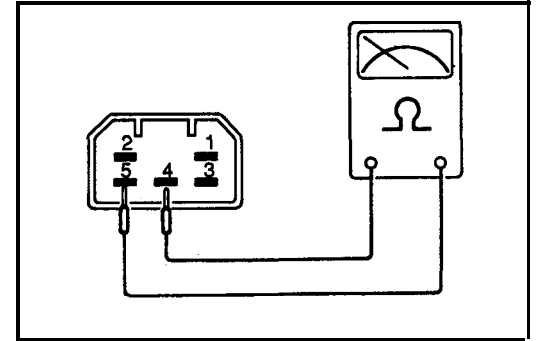
**FRESH/RECIRCE BUTTON**

1. Connect the vacuum tester to black color hose for the fresh/recirc control switch.
2. Check for vacuum hiss and air flow as shown right figure.

Hose color	Button switch position	
	Fresh	Recirc
Black	V	V
White	-	V

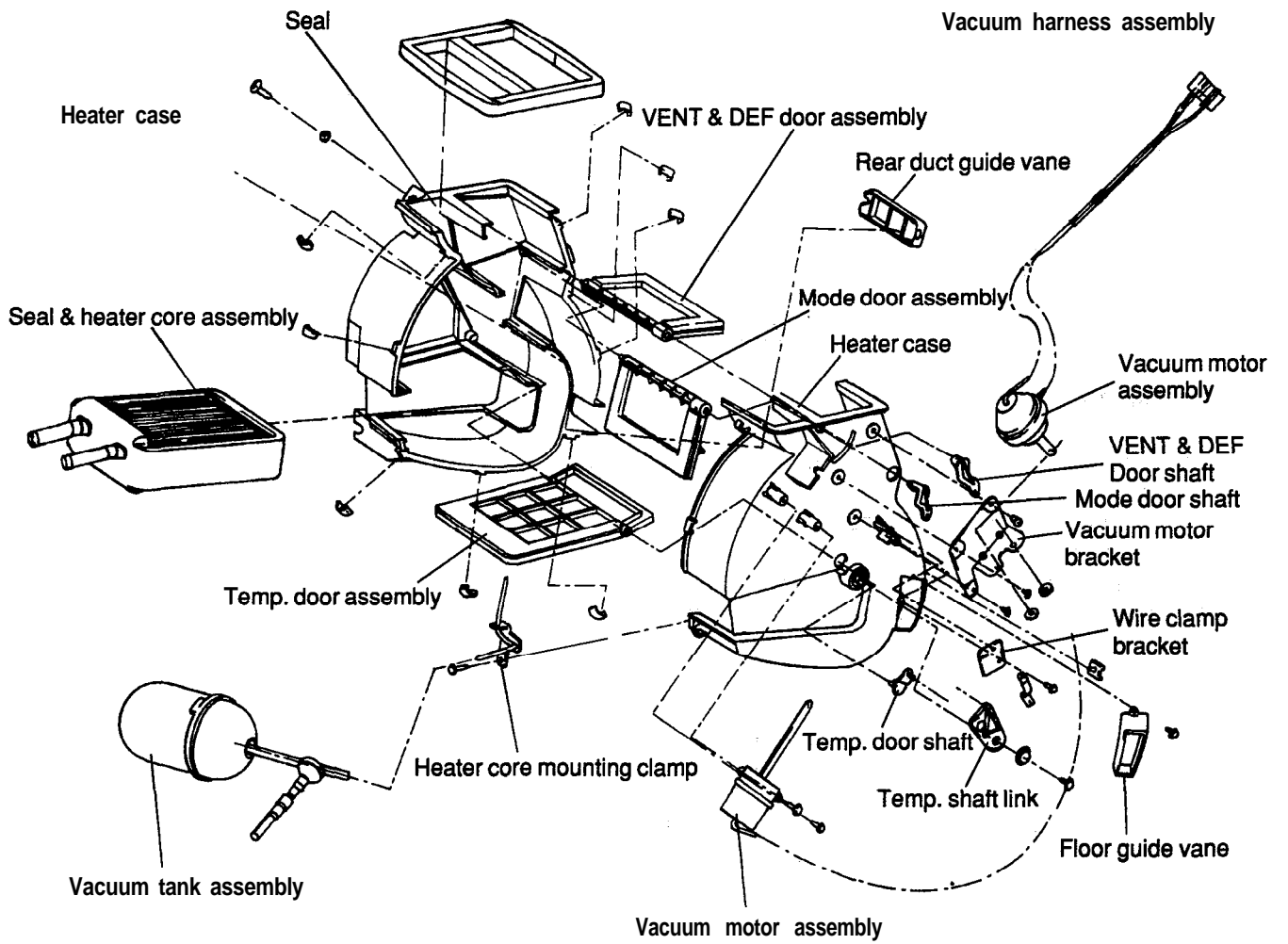


Blower switch



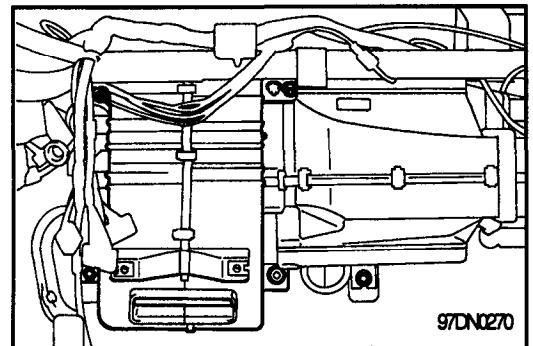
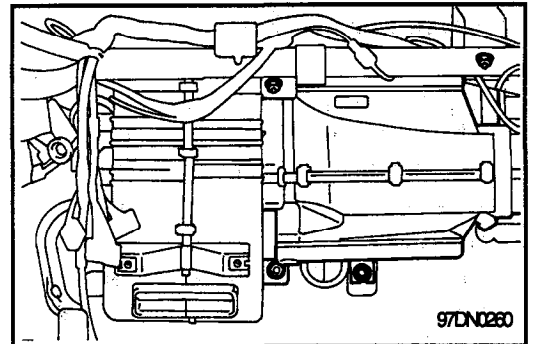
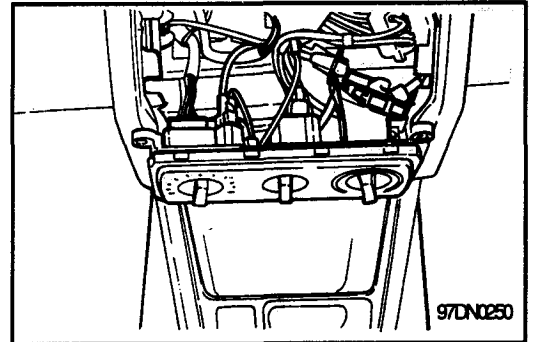
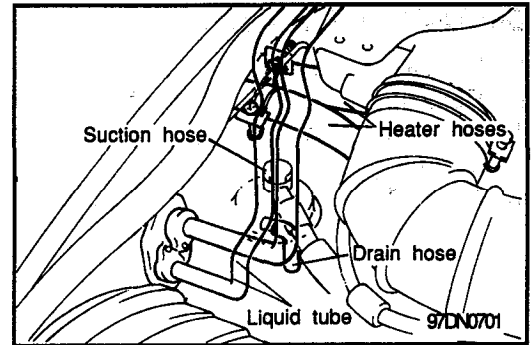
HEATER UNIT

COMPONENTS



**REMOVAL**

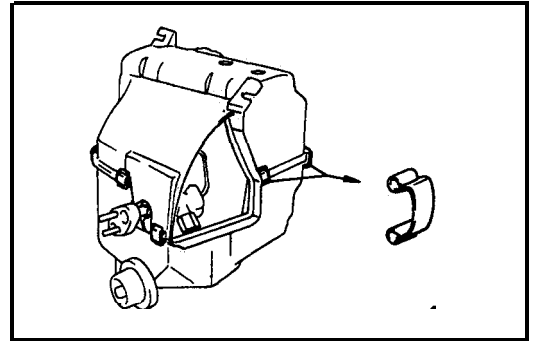
1. Disconnect the negative terminal from the battery.
  2. Discharge the refrigerant from the refrigeration system.  
(Refer to page 97-37).
  3. Drain the coolant from the radiator.
  4. Remove the heater hoses and the evaporator water drain hose.
  5. Remove the suction and the liquid lines from the evaporator.
  6. Disconnect the vacuum source hose from the pipe for mode control.
- 
7. Remove the front and rear console assembly, cluster facia panel and lower crash pad (LH).
  8. Remove the center facia panel (Refer to page 97-21).
- 
9. Remove the glove box assembly and lower crash pad.
  10. Remove the heater control assembly (Refer to page 97-21).
  11. Remove the center skin bracket.
- 
12. Remove the rear heating joint duct assembly.
  13. Remove the evaporator assembly.
  14. Remove the heater unit assembly.

**INSTALLATION**

1. Installation is the reverse of the removal procedures.
2. After installation of the heater unit check that the air mix lever slides smoothly, the full stroke right to left.  
If not ok, readjust the air mix cable (See page 97-22).

## DISASSEMBLY AND ASSEMBLY

1. Remove the seal from the cases.
2. Remove seven clips, holding the both cases.
3. Separate the cases then pull out the heater core from the heater cases.
4. Assembly is the reverse of disassembly procedures.



## INSPECTION

### HEATER CORE

1. Using a special tool, install to the heater core one side and the other side is clogged.
2. Place the heater core in water, then apply 200kpa (29psi) pressure.
3. Holding for two minutes, while checking for leakage from the heater core.  
If there is leakage, repair or replace the heater core.

### VACUUM MOTOR

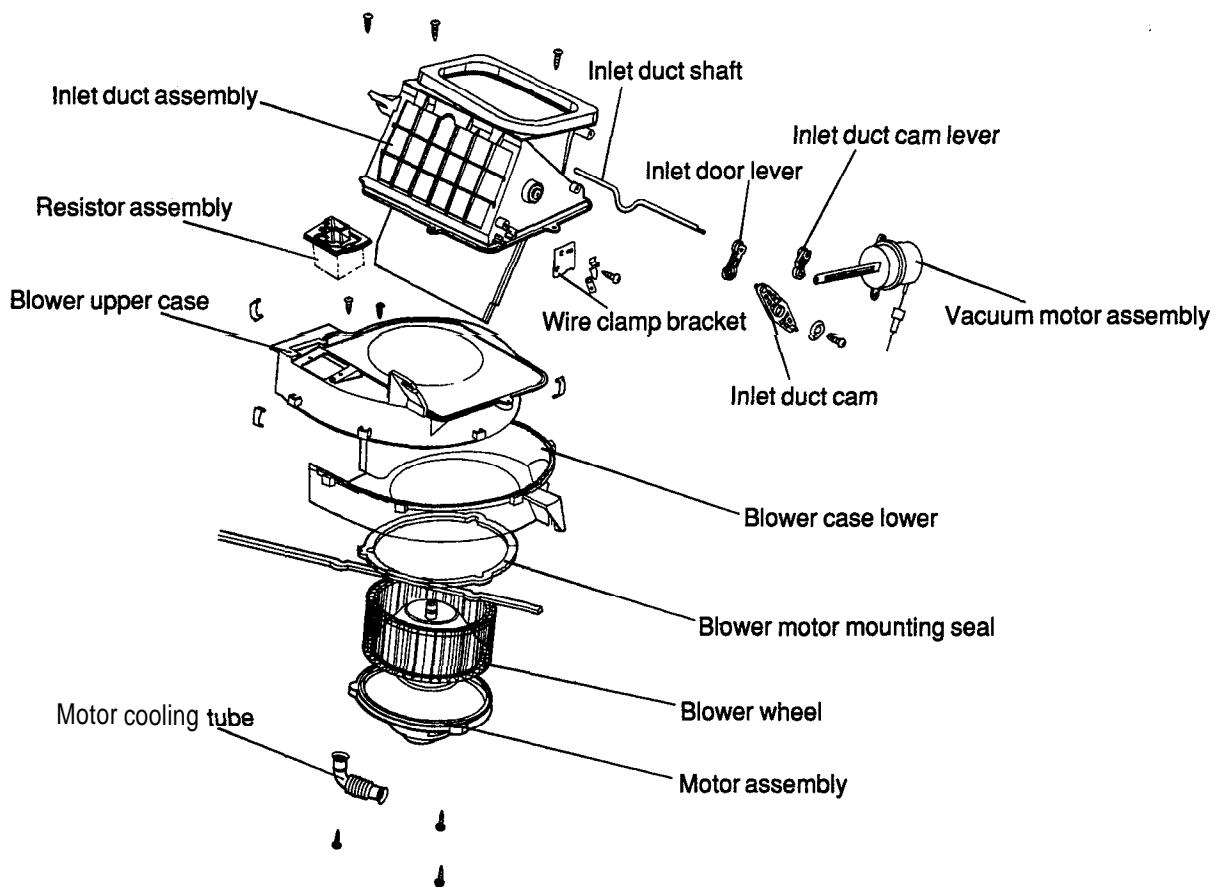
1. Connect vacuum tester to the each vacuum connectors and apply-650mmHg pressure.
2. Check vacuum hiss from the diaphragm of the vacuum motor and smoothly return the shaft to initial position.  
If not ok, replace the vacuum motor.

#### NOTE:

**Never manually operate any vacuum motor or vacuum motor controlled door this may cause internal damage to the motor diaphragm.**

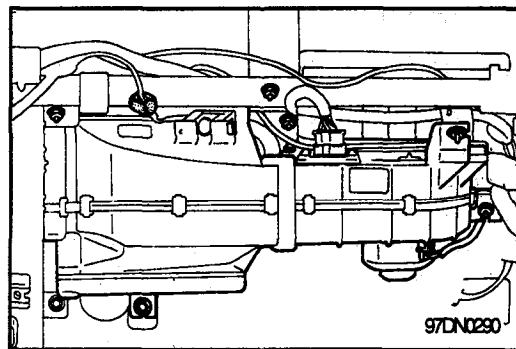
**BLOWER ASSEMBLY**

**COMPONENTS**



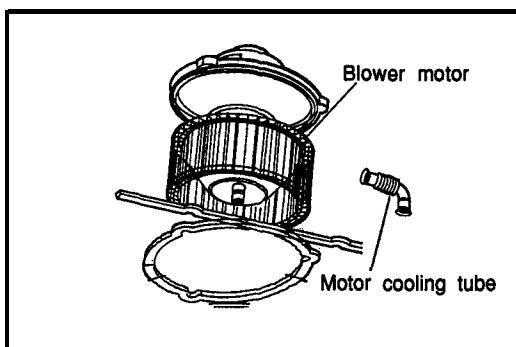
**REMOVAL AND INSTALLATION**

1. Remove the glove box housing cover assembly:
2. Remove the lower crash pad assembly.
3. Disconnect the resistor and blower motor connector.
4. Remove the three nuts from the blower unit mounting bracket.
5. Pull out the blower unit and then disconnect the fresh/recirc vacuum connector.
6. Installation is the reverse of removal.

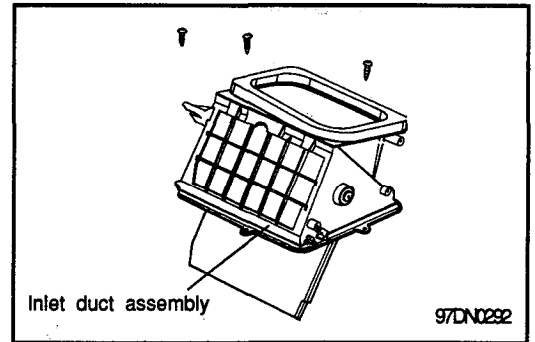


**DISASSEMBLY AND ASSEMBLY**

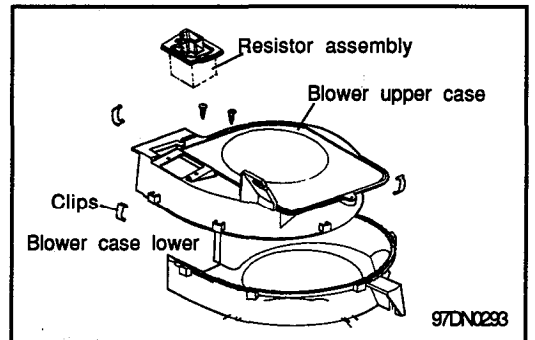
1. Disconnect the motor cooling tube.
2. Remove the three screws and the blower motor assembly.



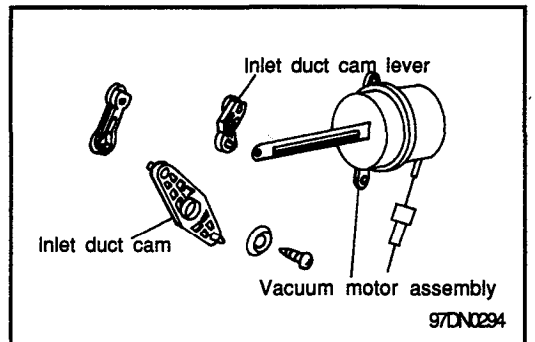
- Remove the three screws and the inlet duct assembly.



- Remove five clips, holding the upper case to the lower case.
- Remove two screws and the blower resistor.

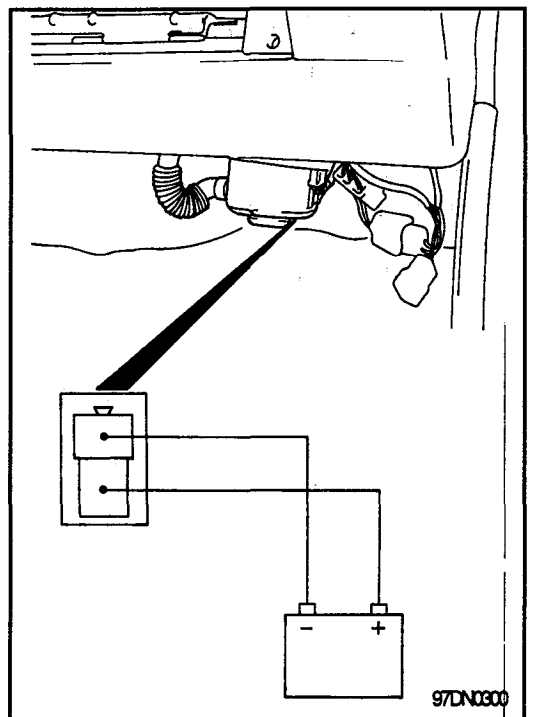


- Remove one screw from the cam lever of the vacuum motor.
- Remove two screws, holding the vacuum motor to the inlet duct.
- Remove the vacuum motor assembly.
- Assembly is the reverse of disassembly procedures.



## INSPECTION BLOWER MOTOR

- Check for bending or abnormal deflection of the rotating shaft of the blower motor assembly.
- Check for cracking or deterioration of the packing.
- Check for damage to the fan.
- Check for damage to the blower case.
- Check the operation of the inside/outside air selection damper, and for damage.
- Connect the blower motor terminals directly to the battery and check that the blower motor operates smoothly.
- Next, reverse the polarity and check that the blower motor operates smoothly in the reverse direction.



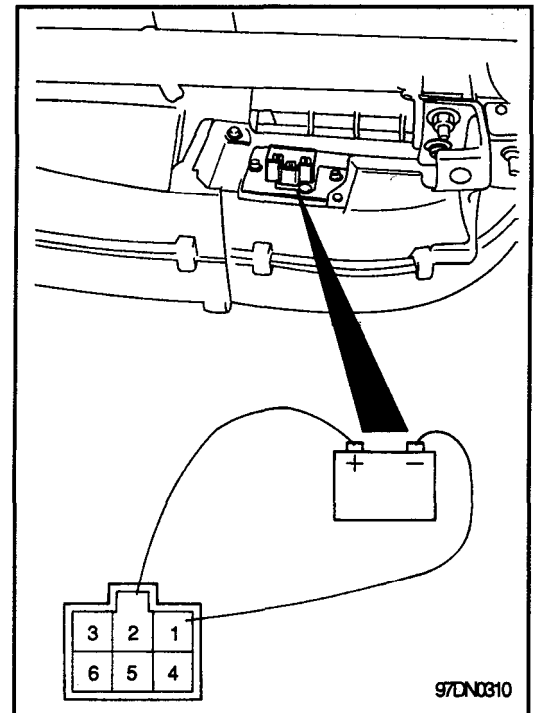
### BLOWER RESISTOR

1. Measure terminal-to-terminal resistance of the blower resistor. If measured resistance is not within specification, the blower resistor must be replaced.

Terminal Speed	1	2	3	4	5	6	Resistance (Ω)
	Ohmmeter indication	LO	HI		ML		
Continuity is indicated	○—○						2.4±0.24
		○—○	○				1.2±0.12
		○—○				○	0.4±0.04

**NOTE :**

O-O indicates that there is continuity between the points.

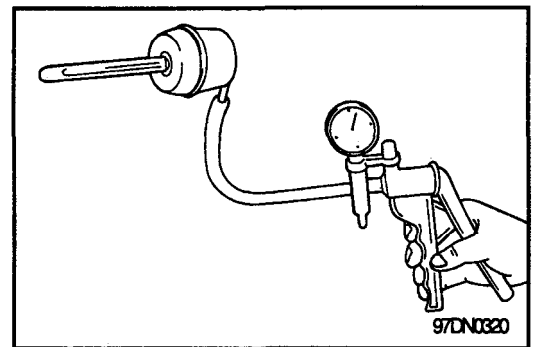


### VACUUM MOTOR

1. Connect vacuum tester to the vacuum motor and apply -650 mmHg pressure.
2. Check vacuum hiss from the vacuum motor and smoothly return the shaft to initial position. If not ok, replace the vacuum motor.

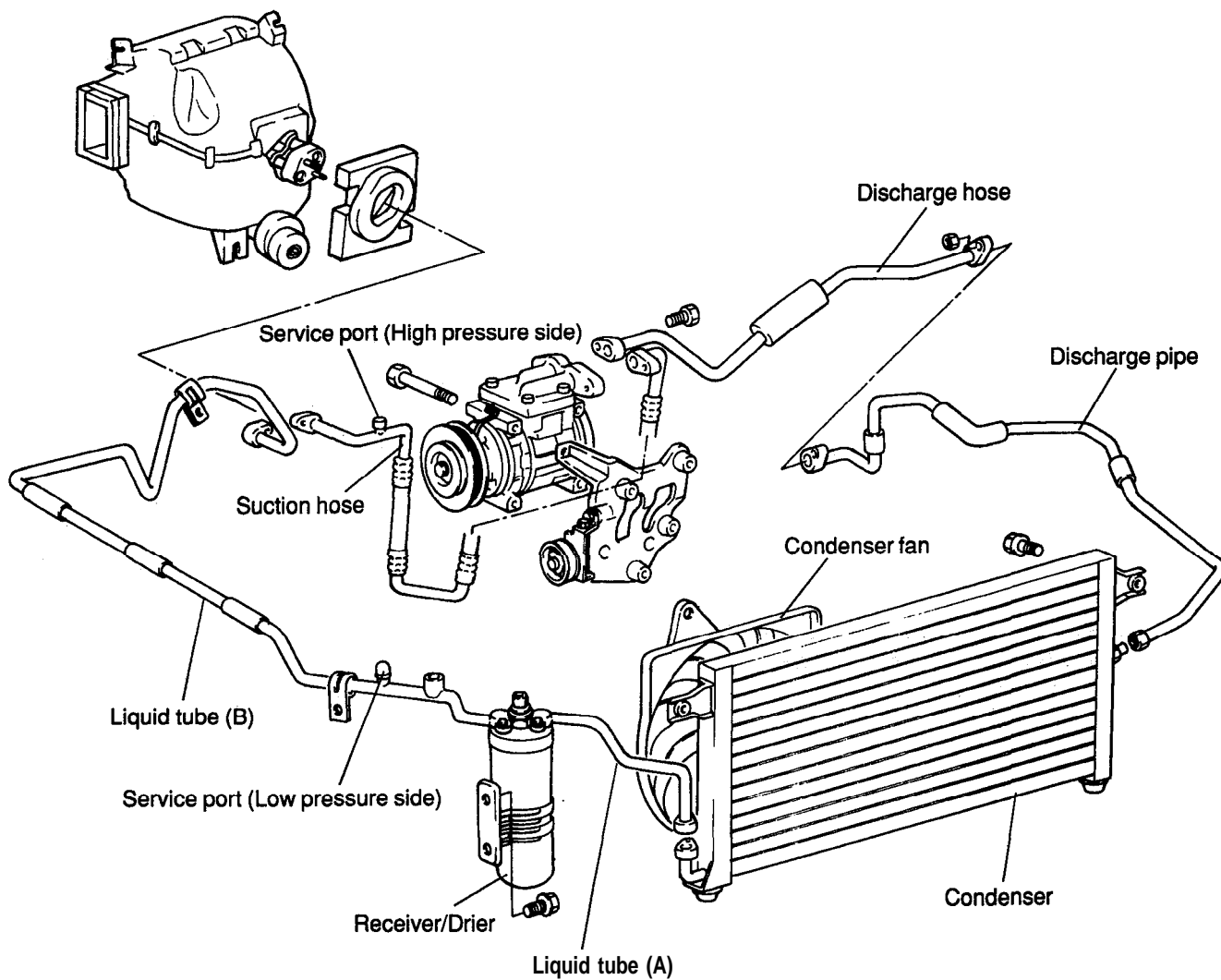
**NOTE :**

Never manually operate any vacuum motor or vacuum motor controlled door this may cause internal damage to the motor diaphragm.



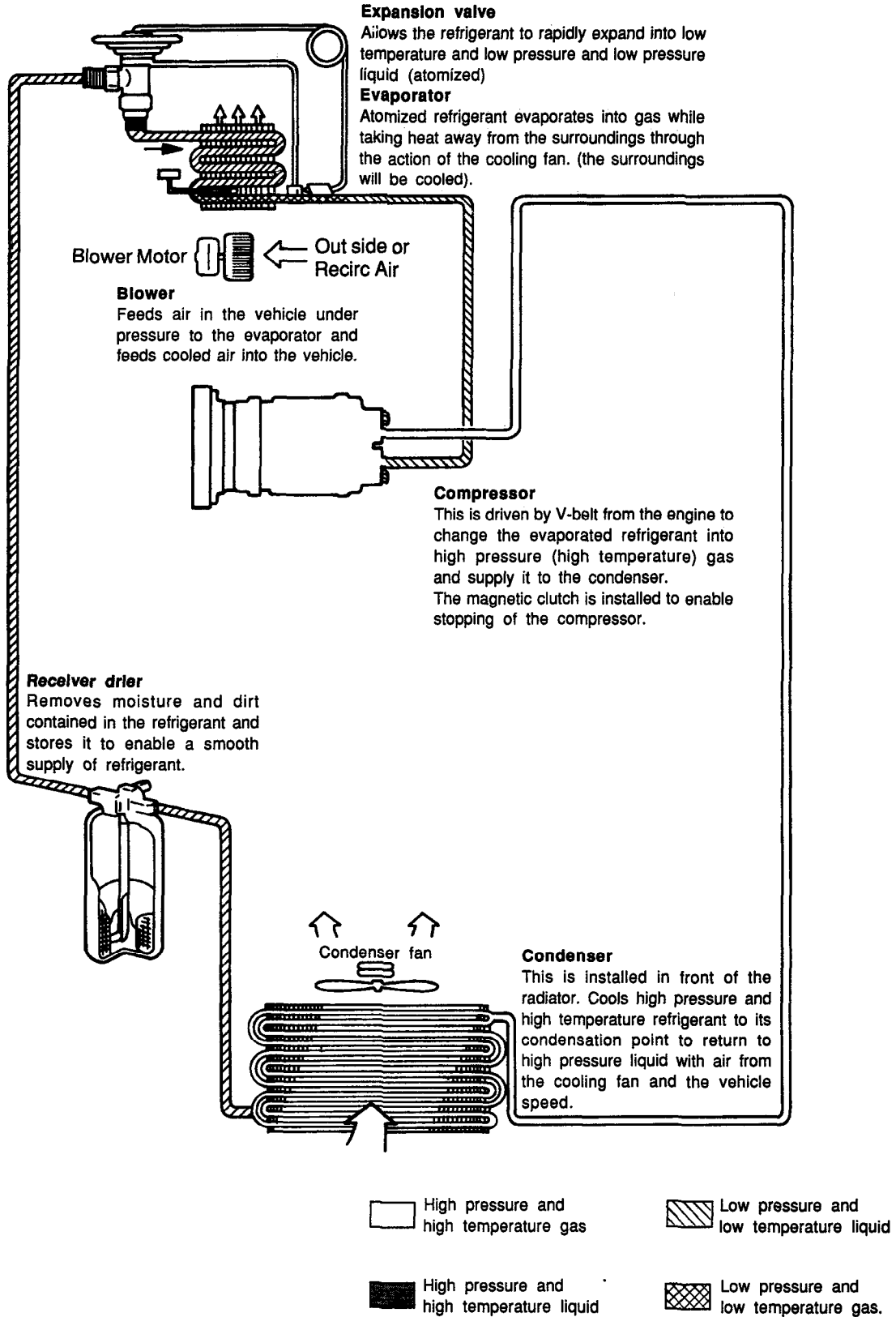
AIR CONDITIONING

COMPONENTS



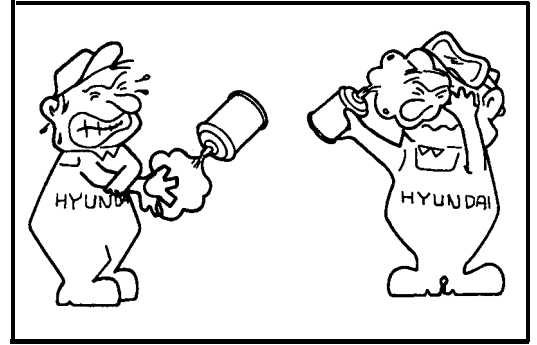
TORQUE : Nm (Kg-cm, lb.ft)

REFRIGERATION CYCLE



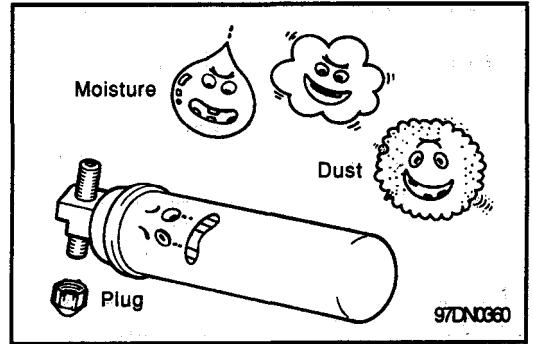
## GENERAL SERVICE INSTRUCTIONS WHEN HANDLING REFRIGERANT

1. R-134a liquid refrigerant is highly volatile. A drop on the skin of your hand could result in localized frostbite. When handling the refrigerant, be sure to wear gloves.
2. If the refrigerant splashes into your eyes, wash them with clean water immediately. It is standard practice to wear goggles or glasses to protect your eyes, and gloves to protect your hands.
3. The R-134a container is highly pressurized, never leave it in a hot place, and check that the storage temperature is below 52°C (126°F).
4. A halide leak detector is often used to check the system for refrigerant leakage. Bear in mind that R-134a, upon coming into contact with flame (this detector burns propane to produce a small flame), produces phosgene a toxic gas.
5. Use only recommended lubricant for R-134a A/C system and components. If lubricants other than recommended one used, system failure may occur.
6. The PAG lubricant absorbs moisture from the atmosphere at a rapid rate, therefore the following precautions must be observed.
  - When removing refrigerant components from a vehicle cap immediately the components to prevent A/C system from the entry of moisture.
  - When installing refrigerant components to a vehicle, do not remove the cap until just before connecting the components.
  - Complete the connection of all refrigerant tubes and hoses without delay to prevent the A/C system from entry of moisture.
  - Use the recommended lubricant from a sealed container only.
7. If accidental system discharge occurs, ventilate the work area before resuming service.



**WHEN REPLACING PARTS ON A/C SYSTEM**

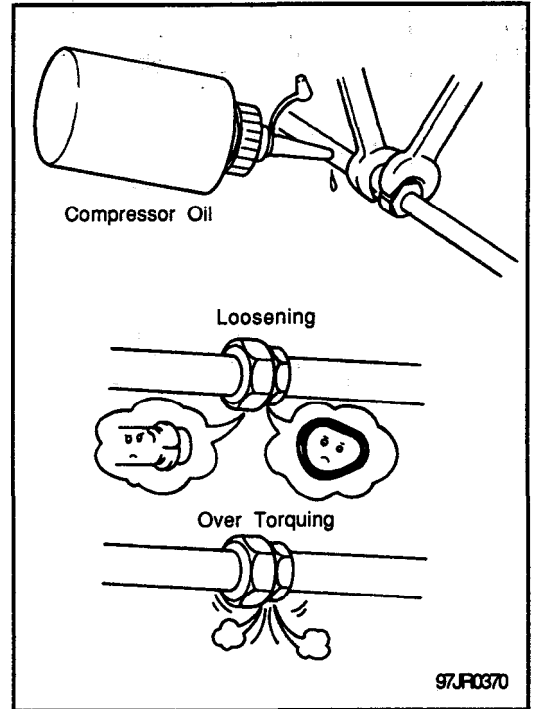
1. Never open or loosen a connection before discharging the system.
2. Seal the open fittings with a cap or plug immediately in disconnected parts to prevent intrusion of moisture and dust.
3. Do not remove the sealing caps from a replacement component until it is ready to be installed.
4. Before connecting an open fitting, always install a new sealing ring. Coat the fitting and seal with refrigerant oil before making the connection.



**WHEN INSTALL CONNECTING PARTS**

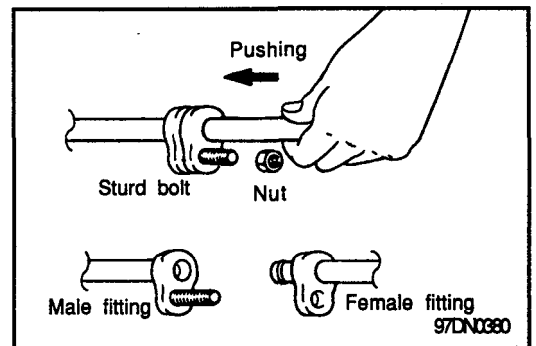
**Bolt/nut coupling type**

1. Lubricate O-ring fittings with compressor oil for easy tightening and to prevent leaking of refrigerant gas.
2. Tighten the nut using two wrenches to avoid twisting the tube.
3. Tighten the O-ring fittings to the specified torque.



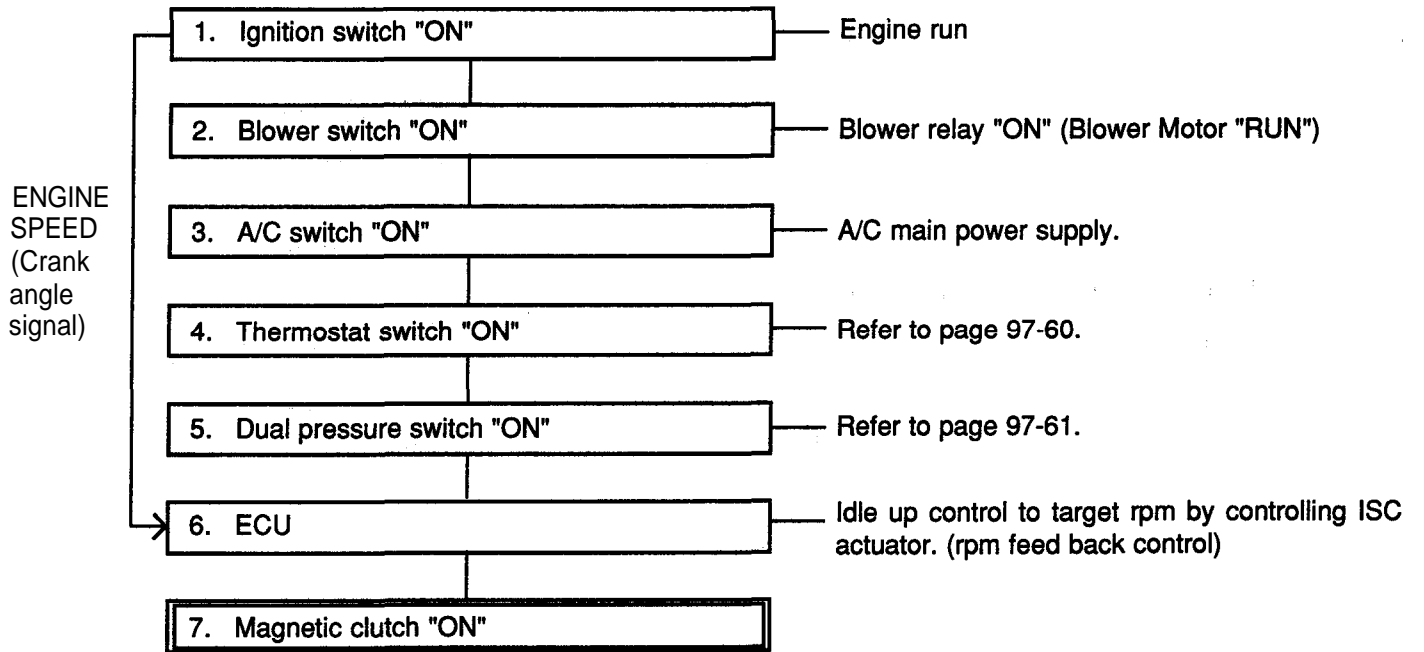
**FLANGE WITH GUIDE PIN TYPE**

1. Check for missing or damaged the new O-ring (use only specified one) and lubricate using compressor oil.
2. Hand tighten the nut by pushing the one side pipe.
3. Tighten the nut to the specified torque.



### HOW IS THE MAGNETIC CLUTCH ENERGIZED ?

The general process until the magnetic clutch is energized as shown below.



**ON-VEHICLE INSPECTION**

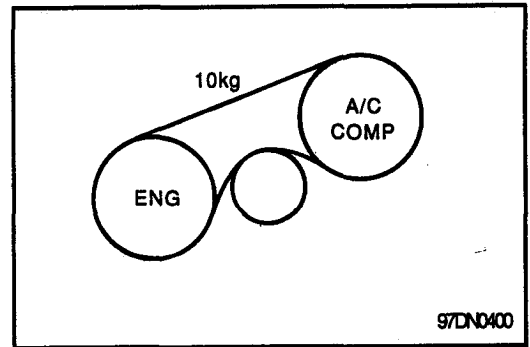
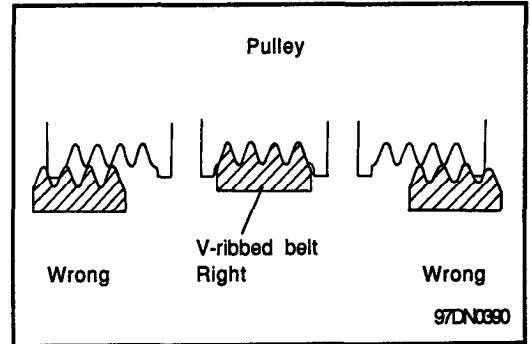
1. Check condenser fins for blockage or damage.  
If the fins are clogged, clean them with pressurized water.

**NOTE:**

**Be careful not to damage the fins.**

2. Make sure that drive belt is installed correctly.  
Check that the drive belt fits properly in the ribbed grooves.
3. Check drive belt tension.  
If the proper tensions are not maintained, belt slippage will greatly reduce air conditioning performance and drive belt life. To avoid such adverse effects, the following service procedure should be followed:
  - 1) Any belt that has operated for a minimum of one half-hour is considered to be a "used" belt. Adjust air conditioning drive belt at the time of new-car preparation.
  - 2) Check drive, belt tension at regular service intervals and adjust as needed.

	L(mm)
NEW BELT	55.5
USED BELT	6-7
AFTER DRIVING	a



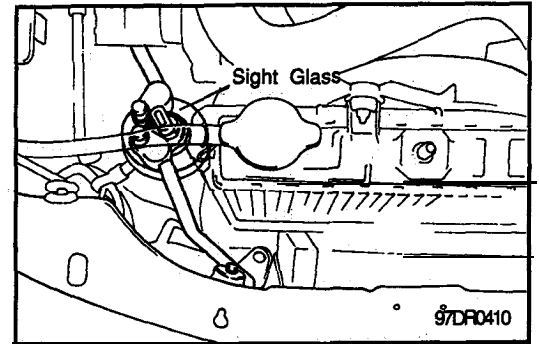
4. Start Engine.
5. Turn ON A/C Switch.  
Check that the A/C operates at each position of the blower switch.
6. Check magnetic clutch operation.
7. Check idle RPM increases.  
When the magnetic clutch engages, idle RPM should be increased (refer to engine section).

6. Check condenser and radiator fan motor rotates.

AIR-COND SWITCH	THERMO SWITCH (85°C)	RADIATOR FAN MOTOR	CONDENSER FAN MOTOR
ON	ON	HI	ON
	OFF	LO	ON
OFF	ON	HI	OFF
	OFF	OFF	OFF

9. Check amount of refrigerant

1. Bring the engine speed up to 1,500 rpm.
2. Operate air conditioner at maximum cooling for a few minutes.
3. Observe the sight glass on the receiver-drier and check the amount of refrigerant in the system.



ITEM	SYMPTOM	AMOUNT REFRIGERANT	REMEDY
1	Bubbles present in sight glass	Insufficient	Check for leak with gas leak detector
2	No bubbles present in sight glass	Empty, proper or too much	Refer to items 3 and 5
3	No temperature difference between compressor inlet and outlet	Empty or nearly empty	Evacuate and charge system. Then check for leak with gas leak detector
4	Temperature between compressor inlet and outlet is noticeably different	Proper or too much	Refer to items 5 and 6
5	Immediately after the air conditioner is turned off, refrigerant in sight glass stays clear	Too much	Discharge the excess refrigerant to specified amount
6	When the air conditioner is turned off, refrigerant foams and then stays clear	Proper	

10. If no cooling or it is insufficient, inspect for leakage.

Using a gas leak detector, inspect each component of the refrigeration system.

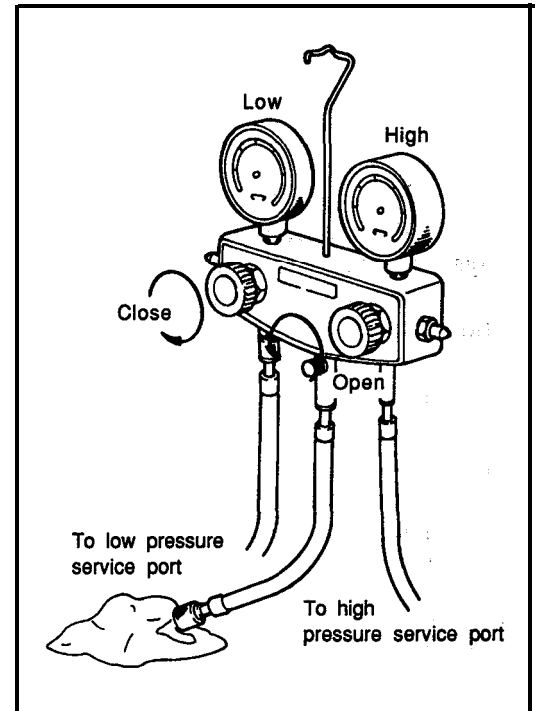
## DISCHARGING THE REFRIGERANT SYSTEM

1. Connect the manifold gauge set to the system.
2. Place the free end of the center hose on a shop towel.
3. Slowly open the high-pressure hand valve to adjust the refrigerant flow. Open the valve slightly.

### NOTE:

**If refrigerant is allowed to escape too fast, compressor oil will be drawn out of the system.**

4. Check the shop towel to make sure no oil is being discharged. If oil is present, partially close the hand valve.
5. After the manifold gauge reading drops below 434 kPa (3.5 kg/cm<sup>2</sup>, 50 psi), slowly open the low-pressure hand valve.
6. As the system pressure drops, gradually open both the high and the low-pressure hand valves until both gauges read 1 kPa (0 kg/cm<sup>2</sup>, 0 psi).



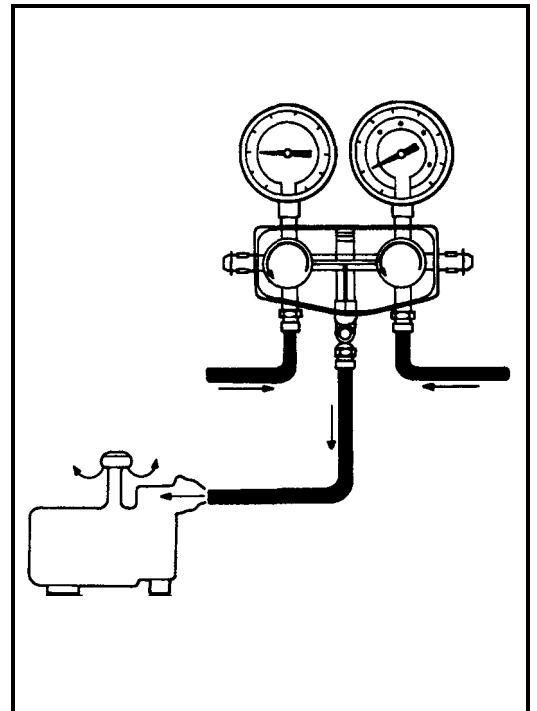
## EVACUATING REFRIGERANT SYSTEM

1. When an A/C System has been opened to the atmosphere, such as during installation or repair, it must be evacuated using a vacuum pump. (If the system has been open for several days, the receiver/dryer should be replaced).
2. Start the pump, then open both gauge valves. Turn the pump for about 15 minutes. Close the valves and stop the pump. The low gauge should indicate above 700 mm Hg (27 in-Hg) and remain steady with the valves closed.

### NOTE :

**If low pressure does not reach more than 700 mmHg (27 in-Hg) in 15 minutes, there is probably a leak in the system. Check for leaks, and repair (see Leak Test below).**

3. If there are no leaks open the valves and continue pumping for at least another 15 minutes, then close both valves and stop the pump.



## LEAK TEST

1. Attach an Air Conditioning Service Station .
2. Open high pressure valve to charge the system to about 100 kPa (14psi), then close the supply valve.
3. Check the system for leaks using a leak detector.
4. If you find leaks that require the system to be opened (to repair or replace hoses, fittings, etc.), release any charge in the system according to the Discharge Procedure on page 97-37.
5. After checking and repairing leaks, the system must be evacuated (see System Evacuation on page 97-37).

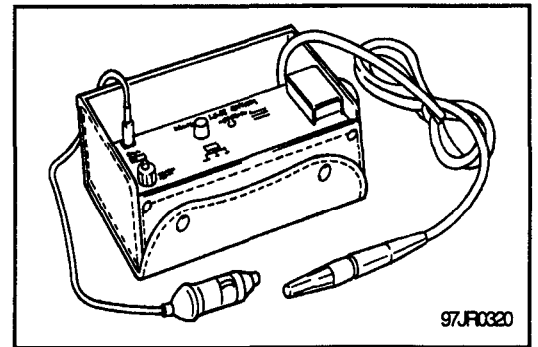
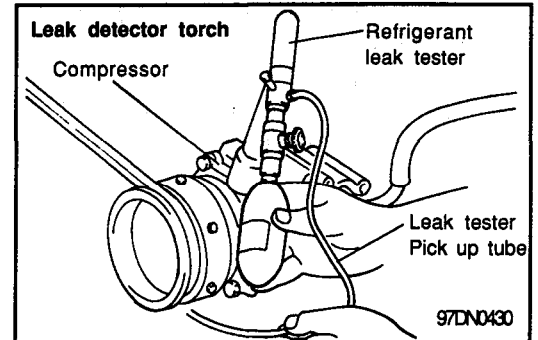
### Electronic Leak Detector

The leak detector is a delicate device that detects small amounts of halogen.

**In order to use the device properly, read the manuals supplied by the manufacturer to perform the specified maintenance and inspections.**

If a gas leak is detected, proceed as follows:

1. Check the torque on the connection fitting and, if necessary, tighten to the proper torque, check for leakage with the leak detector.
2. If leakage continues even after the fitting has been retightened, discharge the refrigerant from the system, disconnect the fitting, and check the seat for damage. Replace fitting, even if the damage is slight.
3. Check compressor oil and add oil if required.
4. Charge the system and recheck for leaks. If no leaks are found, evacuate and charge the system.



**CHARGING REFRIGERANT SYSTEM****NOTE**

This step is to charge the system through the low pressure side with refrigerant in a vapor state. When the refrigerant container is placed right side up, refrigerant will enter the system as a vapor.

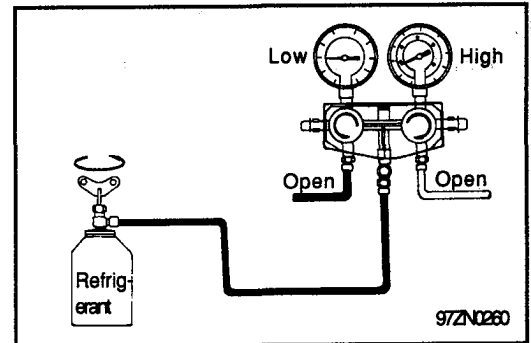
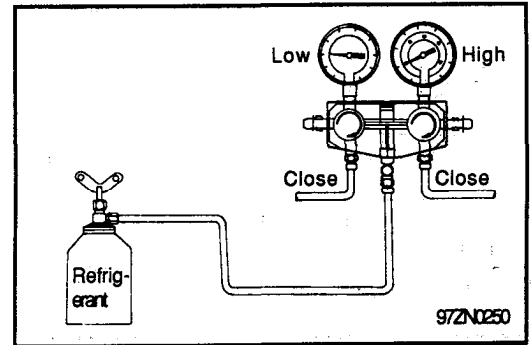
1. Attach an Air Conditioning Service Station as shown right figure.
2. Open the low pressure valve. Adjust the valve so that the low pressure gauge does not read over 412 kPa (4.2 kg/cm<sup>2</sup>, 60 psi)
3. Put the refrigerant in a pan of warm water on heat plate (maximum temperature 40°C (104°F)) to keep vapor pressure in the container slightly higher than vapor pressure in the system.
4. Run the engine at fast idle, and operate the air conditioner.

**NOTE :**

**Be sure to keep the container upright to prevent liquid refrigerant from being charged into the system through the suction side, resulting in possible damage to the compressor.**

5. Charge the system to the specified amount. Then, close the low pressure valve.

**Specified amount: 650-700 g (1.38-1.49 lbs)**

**PERFORMANCE TEST**

The performance test will help determine if the air conditioning system is operating within specifications.

1. Connect the hoses as shown above figure.
2. Insert a thermometer in the vent outlet. Determine the relative humidity and ambient air temperature by a portable weather station or calling the local weather station.
3. Test conditions:
  - o Avoid direct sunlight.
  - o Open engine hood.
  - o Open front doors.
  - o Set the temperature control dial to MAX COOL and slide the function control lever to PANEL position and recirculation control lever to RECIRC position.
  - o Turn the fan switch to HIGH.
  - o Run the engine at 1,500 RPM.
  - o No driver or passengers in vehicle.
4. After running the air conditioning for 20 minutes under the above test conditions, read the delivery temperature from the thermometer in the dash vent and the high and low system pressure from the A/C gauges.
5. Compare with performance test chart (Refer to page 97-41).

## PERFORMANCE TEMPERATURE CHART

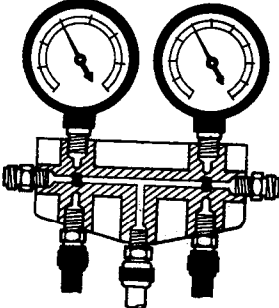
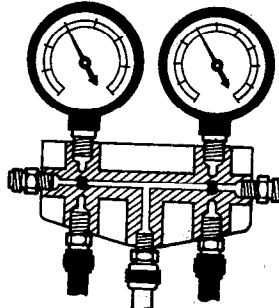
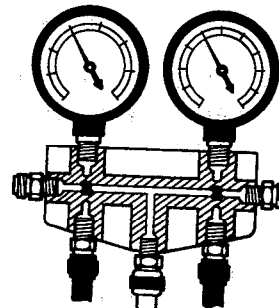
Garage ambient temperature °C(°F)	21 (70)	26.5(80)	32 (90)	37.5(100)	40.6(105)
Discharge all temperature °C(°F)	1.7-4.4 (35-40)	1.7-5.0 (35-41)	1.7-5.6 (35-42)	1.7-6.1 (35-43)	1.7-6.7 (35-44)
Compressor discharge pressure kPa (psi)	928-1.322 (132-186)	1.069-1.547 (152-220)	1.209-1.772 (172-252)	1.336-1.969 (190-280)	1.406-2.109 (200-300)
Evaporator suction pressure kPa(psi)	127-148 (18-21)	131-162 (18.6-23)	134-176 (19-25)	135-188 (19.2-26.8)	136-194 (19.4-27.6)

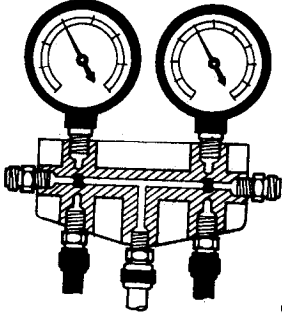
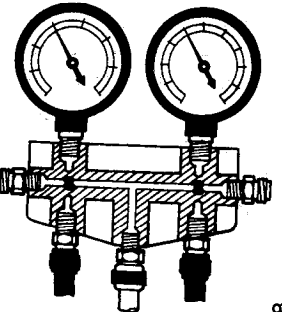
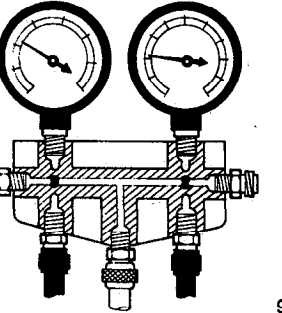
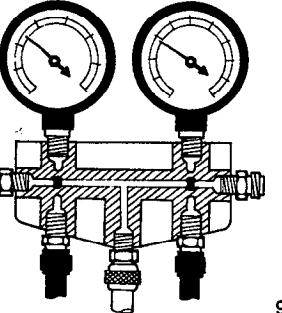
## NOTE :

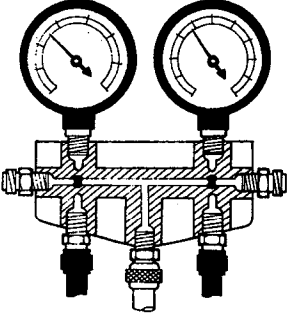
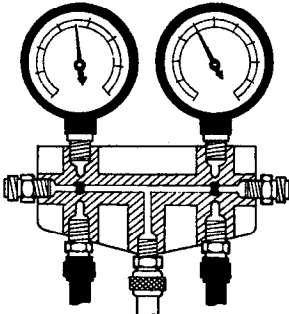
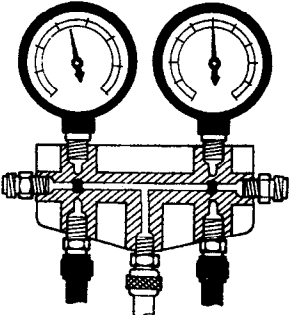
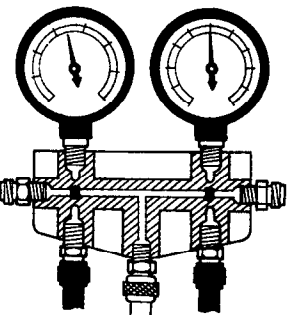
It should be noted that the gauge indications may vary slightly due to garage ambient temperature conditions.

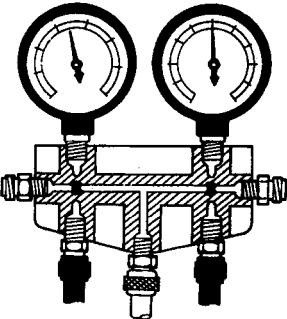
**PERFORMANCE TEST DIAGNOSIS**

The test gauge indicators shown on the following chapter are to be used as typical examples of common problems which you may need to diagnose.

GAUGE READINGS	OTHER SYMPTOMS	DIAGNOSIS	CORRECTION
<p>1</p> <p>Low side NORMAL</p> <p>High side NORMAL</p>  <p>97DN0440</p>	<ul style="list-style-type: none"> <li>o Sight glass: clear or few bubbles.</li> <li>o Discharge air: slightly cool.</li> <li>o Thermostatic switch: Low side gauge doesn't fluctuate with switch "ON" and "OFF" cycle.</li> </ul>	<p>Some air and moisture in system.</p>	<ol style="list-style-type: none"> <li>1. Leak test system.</li> <li>2. Discharge refrigerant from system.</li> <li>3. Repair leaks as located.</li> <li>4. Replace receiver-drier. The drier is probably saturated with moisture.</li> <li>5. Evacuated the system for at least 30 minutes.</li> <li>6. Charge system with refrigerant.</li> <li>7. Operate system and check performance.</li> </ol>
<p>2</p> <p>Low side NORMAL</p> <p>High side NORMAL</p>  <p>97DN0450</p>	<ul style="list-style-type: none"> <li>o Sight glass: Tiny bubbles.</li> <li>o Discharge air: Becomes warm as low side cycles into vacuum.</li> <li>o Discharge air: Becomes warm all the time during hot part of day.</li> </ul>	<p>Excessive moisture in system</p>	<ol style="list-style-type: none"> <li>1. Discharge refrigerant</li> <li>2. Replace receiver-drier</li> <li>3. Evacuate system with a vacuum pump.</li> <li>4. Recharge system to proper capacity.</li> <li>5. Operate system and check performance.</li> </ol>
<p>3</p> <p>Low side NORMAL</p> <p>High side NORMAL</p>  <p>97DN0460</p>	<ul style="list-style-type: none"> <li>o Compressor: Cycles on and off too fast.</li> <li>o Low side gauge: Not enough range shown on low side gauge.</li> </ul>	<p>Defective thermostatic switch</p>	<ol style="list-style-type: none"> <li>1. Stop engine and turn air conditioner "OFF"</li> <li>2. Replace thermostatic switch when installing new thermostic switch, make sure that capillary tube is installed in the same position and to the same depth in evaporator core as old switch tube.</li> <li>3. Operate system and check performance.</li> </ol>

	GAUGE READINGS	OTHER SYMPTOMS	DIAGNOSIS	function.
4	<p>Low side                      High side NORMAL to HIGH      NORMAL</p>  <p>97DN0470</p>	<ul style="list-style-type: none"> <li>o Compressor: low side pressure builds too high before compressor turns on (cycle "ON" point too high)</li> </ul>	<p>Faulty thermostatic switch</p>	<p><b>CORRECTION</b></p> <ol style="list-style-type: none"> <li>1. Stop engine and turn air conditioner "OFF"</li> <li>2. Repair or replace thermostatic switch (make sure that all wiring is positioned so that no short circuiting can occur).</li> <li>3. Operate system and check</li> </ol>
5	<p>Low side                      High side LOW                              LOW</p>  <p>97DN0480</p>	<ul style="list-style-type: none"> <li>o Discharge air: Slightly cool.</li> <li>o Sight glass: Some bubbles.</li> </ul>	<ul style="list-style-type: none"> <li>o System slightly low on refrigerant</li> </ul>	<p>performance.</p> <ol style="list-style-type: none"> <li>1. Check leaks.</li> <li>2. Discharge refrigerant.</li> <li>3. Repair leaks.</li> <li>4. Check compressor oil level.</li> <li>5. Evacuate system using a vacuum pump.</li> <li>6. Charge system with refrigerant</li> <li>7. Operate system and check</li> </ol>
6	<p>Low side                      High side LOW                              -LOW</p>  <p>97DN0490</p>	<ul style="list-style-type: none"> <li>o Discharge air: Warm</li> <li>o Sight glass: Clear</li> </ul>	<ul style="list-style-type: none"> <li>o System very low on refrigerant</li> <li>o Possible leak in</li> </ul>	<p>performance.</p> <ol style="list-style-type: none"> <li>1. Check leaks.</li> <li>2. Leak test compressor seal area very carefully.</li> <li>3. Discharge refrigerant.</li> <li>4. Check compressor oil level.</li> <li>5. Evacuate system using a vacuum pump.</li> <li>6. Charge system with refrigerant.</li> <li>7. Operate system and check performance.</li> </ol>
7	<p>Low side                      High side LOW                              LOW</p>  <p>97DN0500</p>	<ul style="list-style-type: none"> <li>o Discharge air: Slightly cool.</li> <li>o Expansion valve: Sweating or frost build up.</li> </ul>	<p>system.</p> <ul style="list-style-type: none"> <li>o Expansion valve stuck closed.</li> <li>o Screen plugged.</li> <li>o Sensing bulb mal-</li> </ul>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Disconnect inlet line at expansion valve and remove and inspect screen.</li> <li>3. Clean and replace screen and reconnect inlet line.</li> <li>4. Evacuate system using a vacuum pump.</li> <li>5. Charge system with refrigerant.</li> </ol>

	GAUGE READINGS	OTHER SYMPTOMS	DIAGNOSIS	CORRECTION
8	<p>Low side LOW      High side LOW</p>  <p>97DN0470</p>	<ul style="list-style-type: none"> <li>o Discharge air: slightly cool.</li> <li>o High side pipe: Cool and also shows sweating or frost.</li> </ul>	<ul style="list-style-type: none"> <li>o Restriction in high side of system</li> </ul>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Remove and replace receiver-drier, liquid pipes or other defective components.</li> <li>3. Evacuate system using a vacuum pump.</li> <li>4. Charge system with refrigerant.</li> <li>5. Operate system and check performance.</li> </ol>
9	<p>Low side HIGH      High side LOW</p>  <p>97DN0480</p>	<ul style="list-style-type: none"> <li>o Compressor: Noisy</li> </ul>	<ul style="list-style-type: none"> <li>o Compressor malfunction</li> </ul>	<ol style="list-style-type: none"> <li>1. Isolate compressor.</li> <li>2. Remove compressor cylinder head and inspect compressor.</li> <li>3. Check compressor oil level.</li> <li>4. Replace receiver-drier.</li> <li>5. Operate system and check performance.</li> </ol>
10	<p>Low side HIGH      High side HIGH</p>  <p>97DN0490</p>	<ul style="list-style-type: none"> <li>o Discharge air: Warm.</li> <li>o Sight glass: Bubbles.</li> <li>o High side pipe: Very hot</li> </ul>	<ul style="list-style-type: none"> <li>o Malfunctioning condenser Overcharge.</li> </ul>	<ol style="list-style-type: none"> <li>1. Check for loose or worn fan belt.</li> <li>2. Inspect condenser for clogged air passage.</li> <li>3. Inspect condenser mounting for proper radiator clearance.</li> <li>4. Check for refrigerant overcharge.</li> <li>5. Operate system and check performance.</li> </ol>
11	<p>Low side HIGH      High side HIGH</p>  <p>97DN0490</p>	<ul style="list-style-type: none"> <li>o Sight glass: Occasional bubbles</li> <li>o Discharge air: Slightly cool.</li> </ul>	<ul style="list-style-type: none"> <li>o Large amount of air and moisture</li> </ul>	<ol style="list-style-type: none"> <li>1. Discharge refrigerant from system.</li> <li>2. Replace receiver-drier which may be saturated with moisture.</li> <li>3. Evacuate system using vacuum pump.</li> <li>4. Charge system with refrigerant.</li> <li>5. Operate system and check performance.</li> </ol>

GAUGE READINGS		OTHER SYMPTOMS	DIAGNOSIS	CORRECTION
12	<p>Low side HIGH</p> <p>High side HIGH</p>  <p>97DN0490</p>	<ul style="list-style-type: none"> <li>o Discharge air: Warm.</li> <li>o Evaporator: Sweating or frost.</li> </ul>	<ul style="list-style-type: none"> <li>o Expansion valve stuck open</li> </ul>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace expansion valve, making sure all contacts are clean and secure.</li> <li>3. Evacuate system using vacuum pump, then recharge system with refrigerant.</li> <li>4. Operate system and check performance.</li> </ol>

**COMPRESSOR OIL LEVEL CHECK**

J97H-D1

The oil used to lubricate the compressor circulates in the system while the compressor is operating. Whenever replacing any component of the system or when a large amount of gas leakage occurs, add oil to maintain the original total amount of oil.

**Total amount of oil in the system : 140-160cc (8.5-9.7 us fl oz)**

**Adding Oil for Replacement Component Parts**

When replacing the system's component parts, be sure to add the following amount of oil to the parts being replaced.

Component parts to be replaced	Amount of oil cc (US fl oz)
Evaporator core	40 (1.28)
Condenser	25 (0.8)
Receiver-drier	40 (1.28)
Compressor	30 (0.96)
Tube, hose	15 (0.48)

## COMPRESSOR

### ON-VEHICLE INSPECTION

1. Install manifold gauge set.
2. Check compressor drive belt tension. (See page 97-35)
3. Run engine at approx. 1,500 rpm.
4. Check compressor for following :
  - a) Low pressure gauge reading is not lower and high pressure gauge reading is not higher than abnormal.
  - b) Metallic sound.
  - c) Leakage from shaft seal.If any of the above is not satisfactory, repair the compressor.

5. Check magnetic clutch.
  - a) Lift-up, the vehicle.
  - b) Inspect the pressure plate and the rotor for signs of oil.
  - c) Check the clutch bearings for noise and leaking grease.
  - d) Using an ohmmeter, measure the resistance of the stator coil between the clutch lead wire and ground.

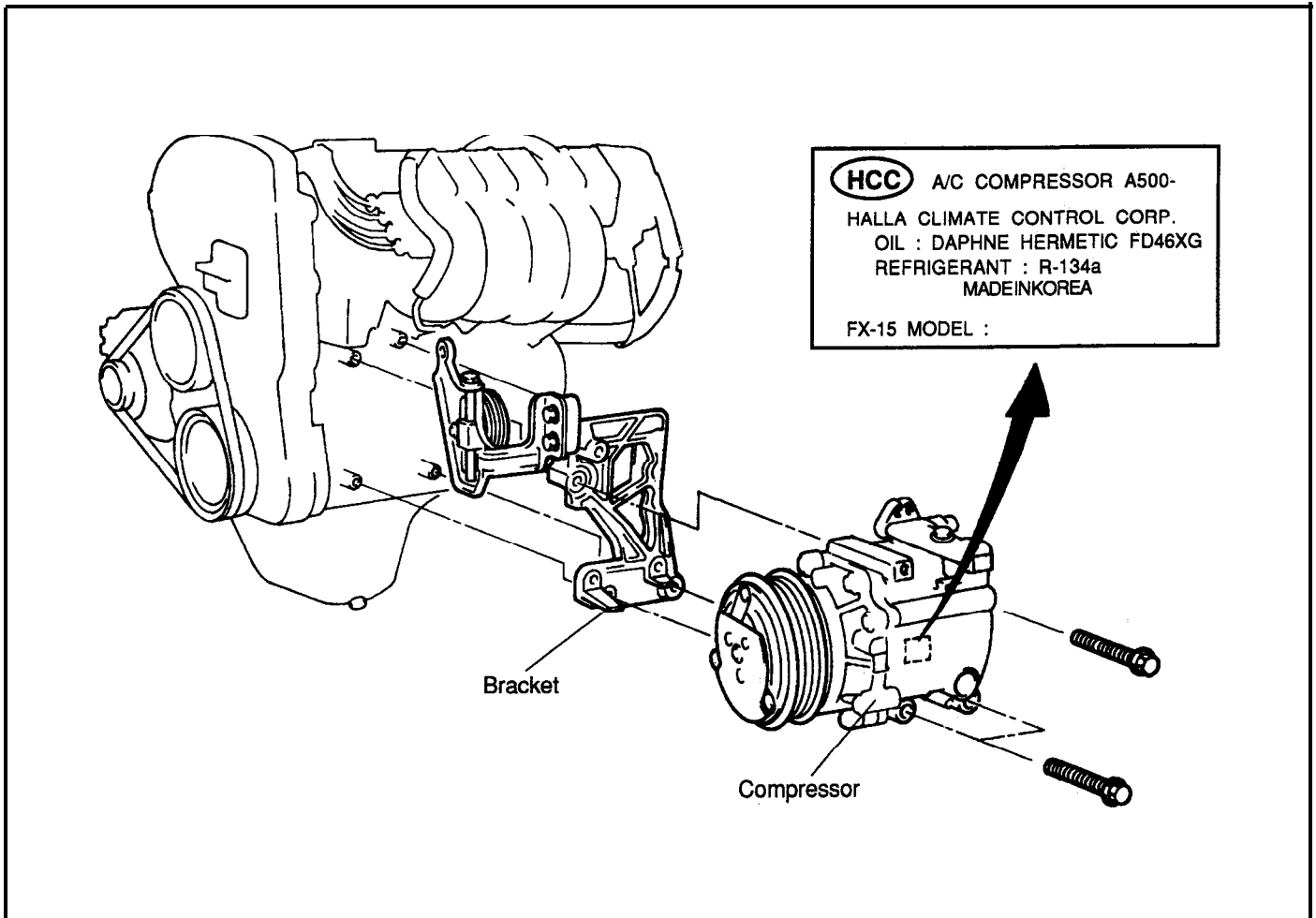
**Standard resistance : 3.4±0.2 at 20°C (68°F)**

If resistance value is not as specified, replace the coil.
  - e) Connect the positive (+) lead from the battery to terminal, check that the magnetic clutch is energized.If magnetic clutch is not energized, replace the coil.

**CAUTION:**

**Do not short the positive (+) lead wire on the vehicle by applying battery voltage.**

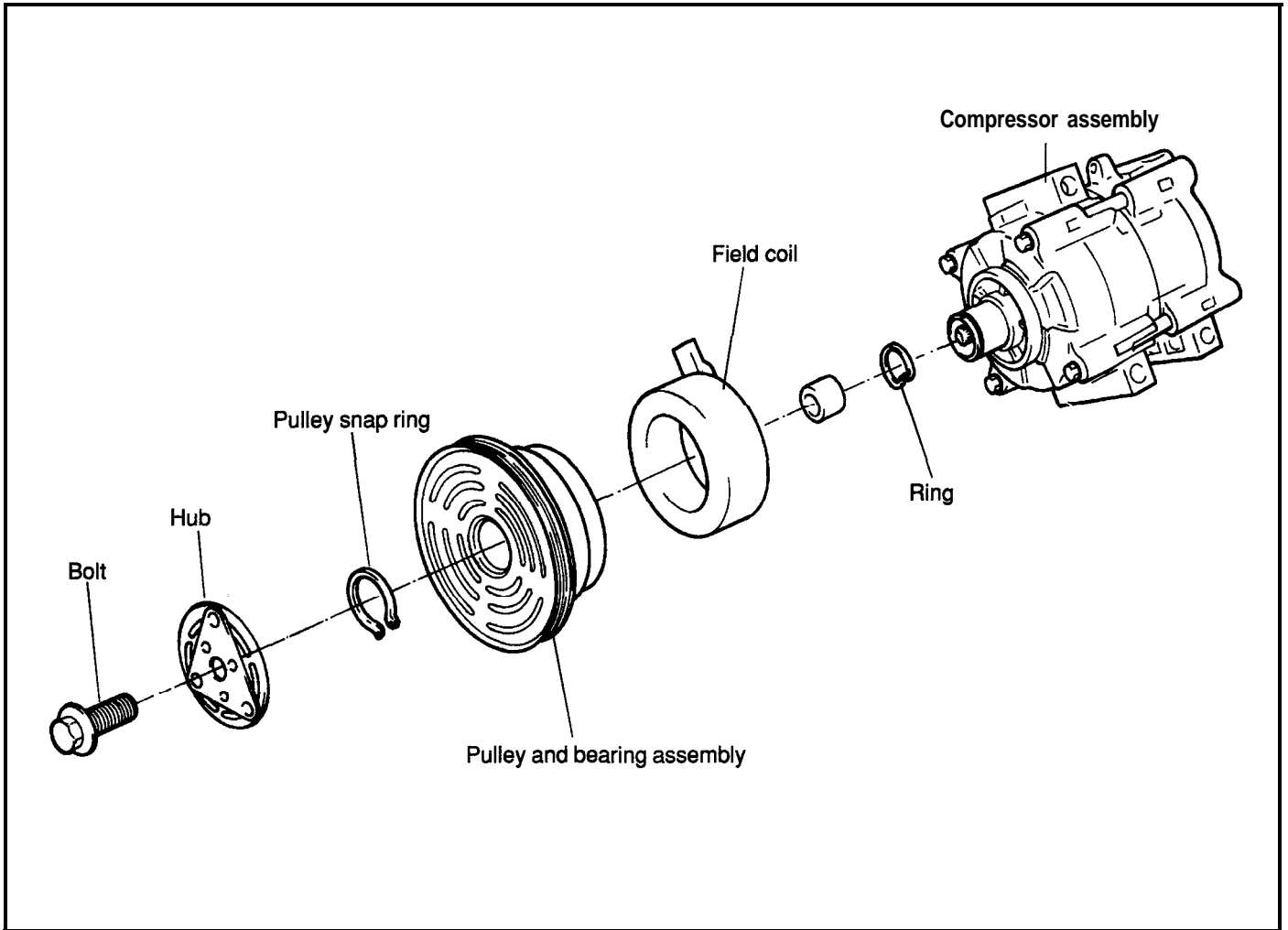
## REMOVAL AND INSTALLATION LOCATION



1. Loosen the tenston pulley and then remove the V belt.
2. Discharge the refrigerant. (Refer to page to 97-37)
3. Disconnect the magnetic clutch.

4. Remove the discharge hose and suction hose.
5. Remove the compressor.
6. Installation is the reverse of removal.

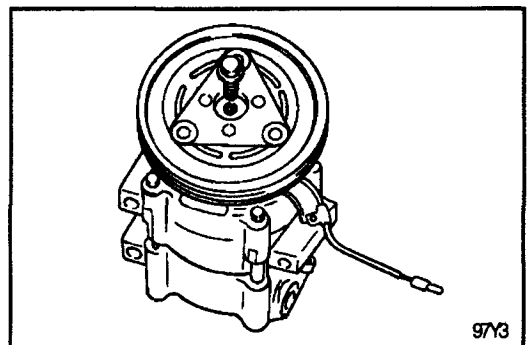
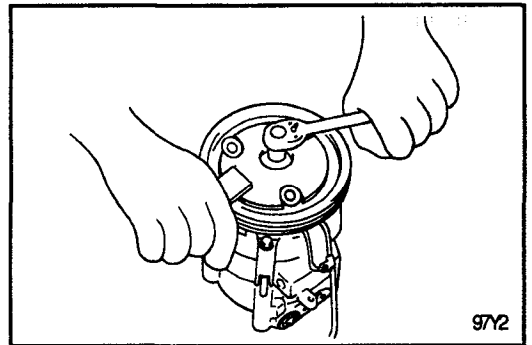
COMPONENTS



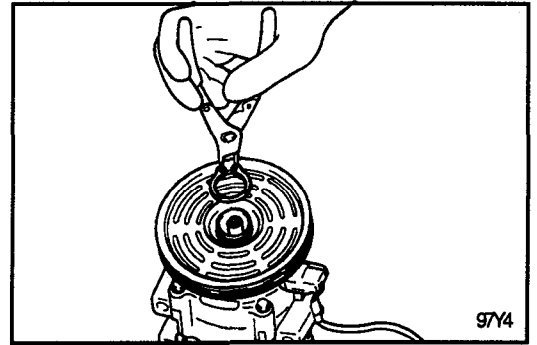
CLUTCH HUB AND PULLEY

Removal

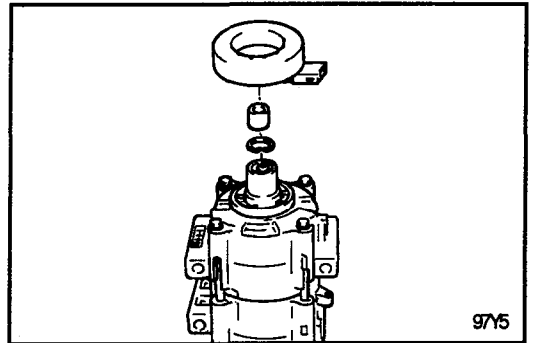
1. Remove the clutch hub retaining bolt with the aid of a spanner wrench.
2. Pull the clutch hub and shims from the compressor shaft. If the hub cannot be pulled from the compressor shaft, screw an 8-mm bolt into the shaft hole of the clutch hub to force the hub from the shaft.



- Remove the pulley retaining snap ring.

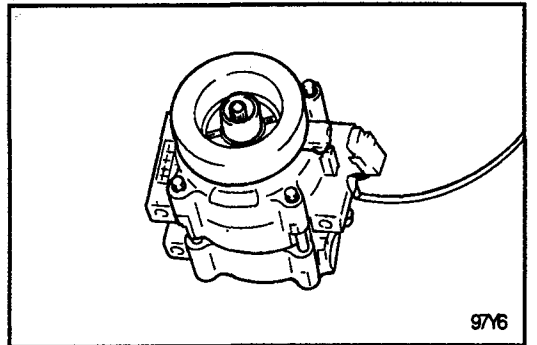


- Pull the pulley and bearing assembly from the compressor.

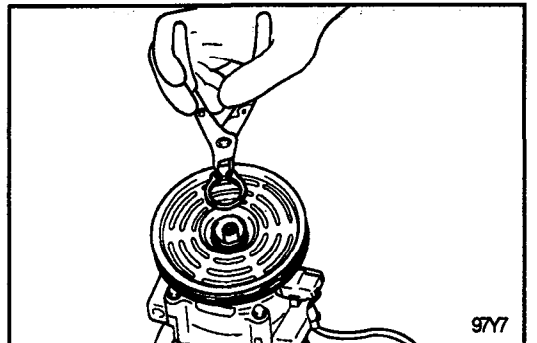


### Installation

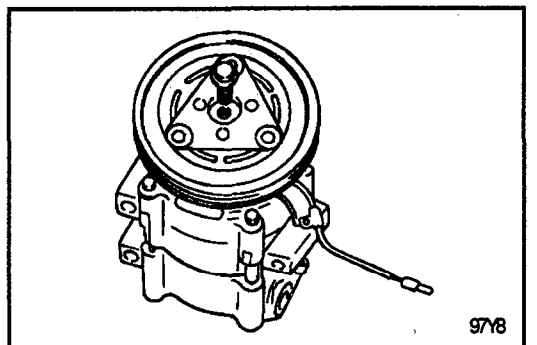
- Clean the pulley bearing surface of the compressor head to remove any dirt or corrosion.
- Install the pulley and bearing assembly on the compressor. The bearing is a slip fit on the compressor head and, if properly aligned, should slip on the compressor head.



- Install the pulley retaining snap ring with the bevel side of the snap ring out.



- Place one nominal thickness spacer shim inside the hub spline opening and slide the hub on the end of the compressor shaft.



- Thread a new hub retaining bolt into the end of the compressor shaft. Tighten the hub retaining bolt.

---

**Tightening torque : 10-15 Nm (100-150 kg.cm, 7-11 lb.ft)**

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**NOTE**

**Do not use air tools.**

- Check the clutch air gap between the clutch hub and the pulley mating surfaces with a feeler gauge. The air gap should be as follows:

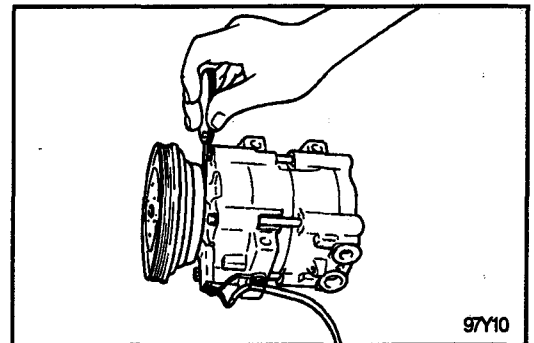
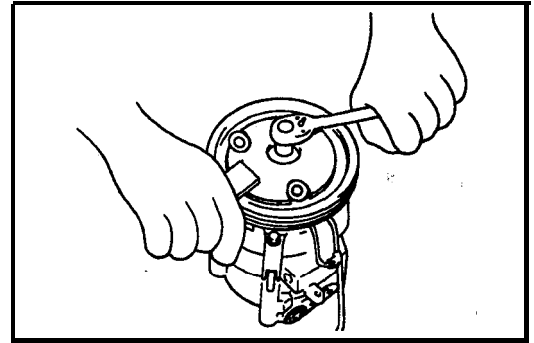
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**Between 0.014 and 0.030 inches.**

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Check at three locations equally spaced around the pulley.

- If the clutch air gap is not within the dimensions specified above, repeat steps 4 through 6 with the various thickness shims until the air gap is between the specified limits.



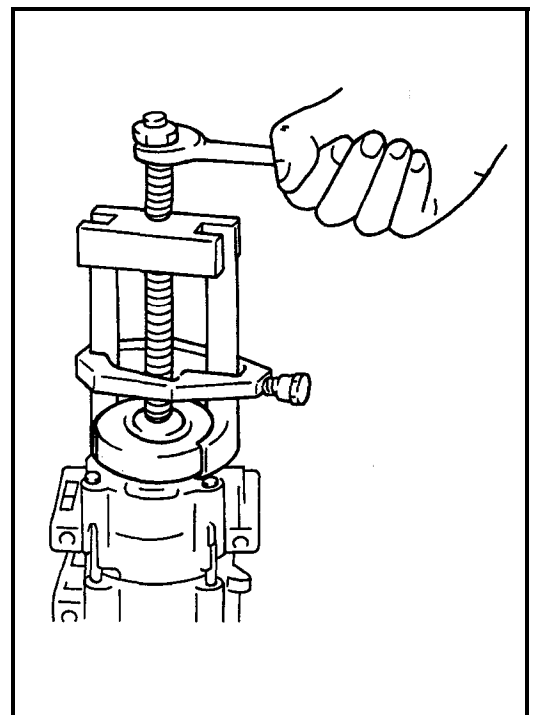
## CLUTCH FIELD COIL

### Removal

- Remove the clutch hub and pulley following the procedure given.
- Install shaft protector tool on the nose opening of the compressor.
- Install the puller on the compressor as shown in the illustration. Place the tip of the puller forcing screw on the center dimple of the shaft protector and the jaws of the puller around the back side of the field coil.
- Tighten the forcing screw with a wrench to pull the coil loose from the compressor front head.

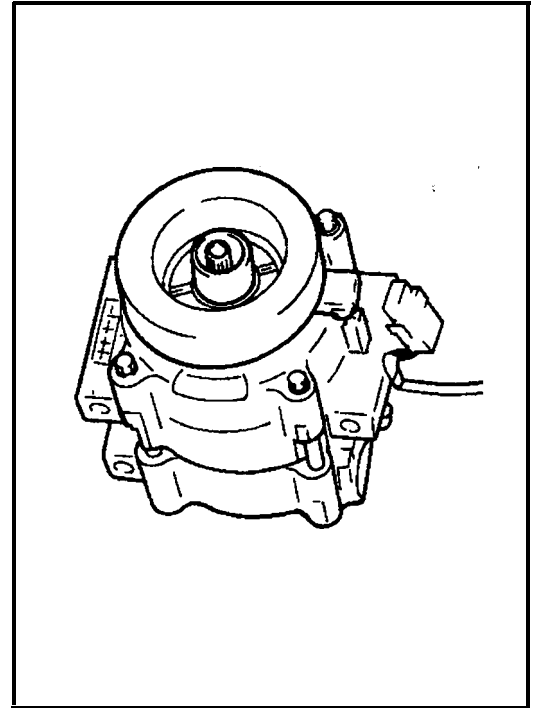
**NOTE**

**DO NOT USE AIR TOOLS.**



### Installation

1. Clean the coil press diameter of the front head to remove any dirt or corrosion.
2. With the compressor in a vertical position (nose up), place the coil in position on the front head of the compressor. Assure that the clutch coil electrical connector is positioned correctly.
3. Place the coil pressing tool in position over the compressor nose and the inner radius of the field coil.
4. Position an eight (8) inch, two jaw puller to the compressor and pressing tool as shown in the illustration. The jaws of the puller should be firmly engaged with the rear side of the compressor front mounts and the forcing screw should be piloted on the center of the pressing tool.
5. Tighten the forcing screw with a wrench by hand until the coil is pressed completely onto the compressor front head. Check to assure that the field coil bottoms against the front head at all points around the coil outer diameter.
6. Install the clutch pulley and hub on the compressor as outlined.

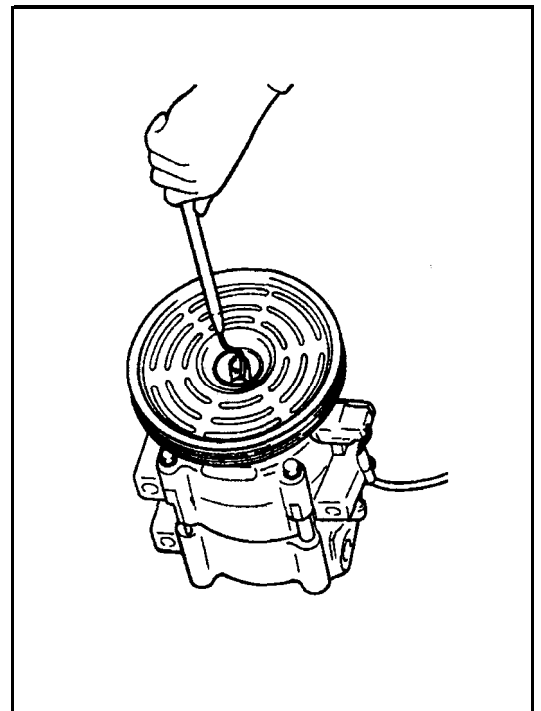


### Shaft Seal

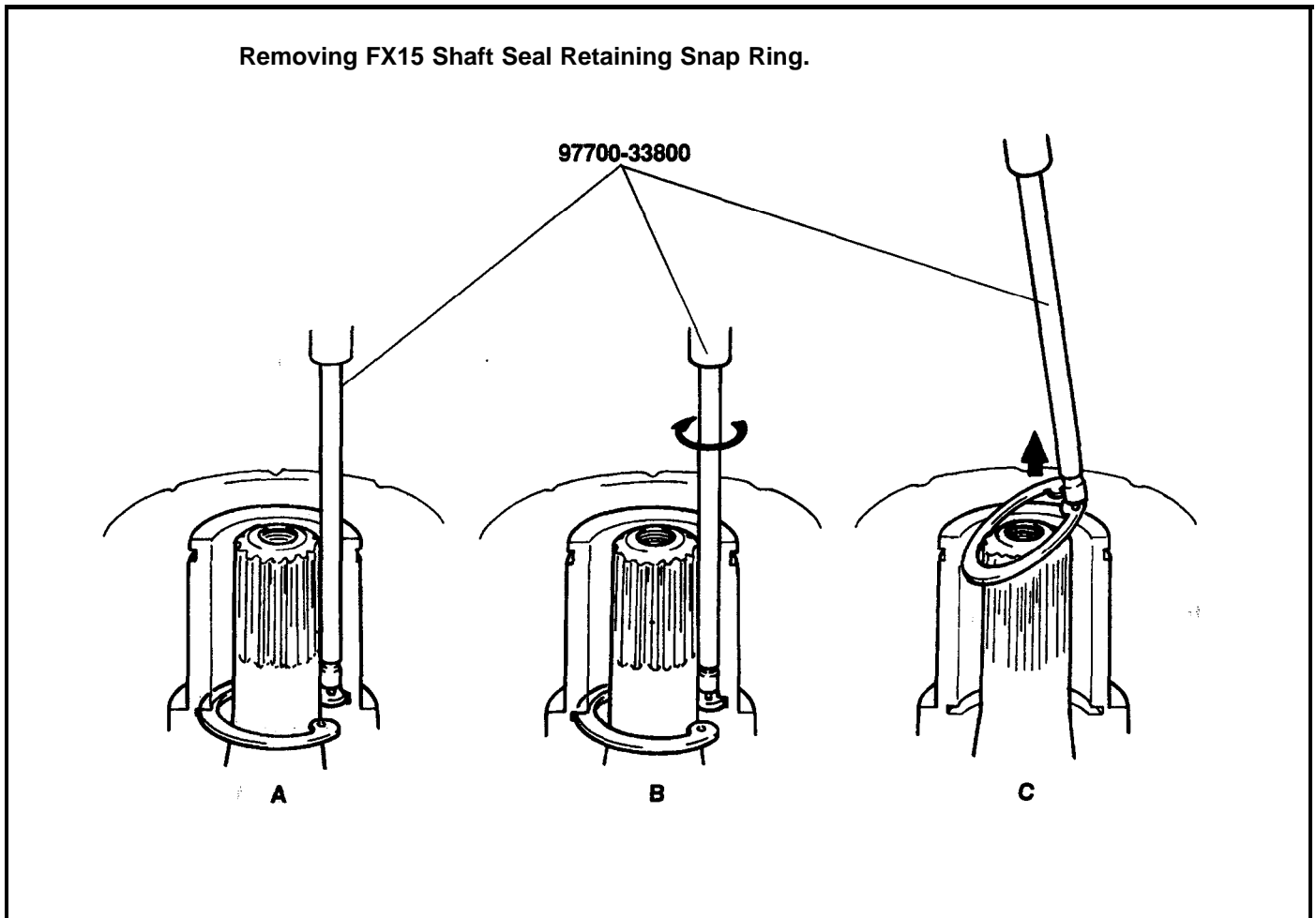
The refrigerant system must be discharged and the compressor must be removed from the vehicle prior to replacing the compressor shaft seal.

### REMOVAL

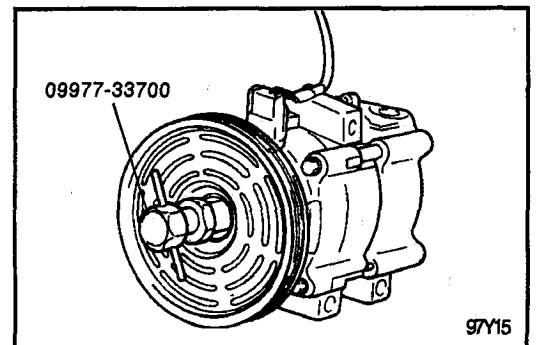
1. Remove the clutch hub from the compressor.
2. Remove the shaft seal felt from the nose of the compressor with a pick type tool.
3. Blow any debris from inside the compressor nose with low pressure compressed air. Then, clean the inside and outside nose area of the compressor with a lint-free cloth to remove any oil and dirt.



4. Remove the shaft seal retaining snap ring from inside the compressor nose with Snap Ring Remover as follows:

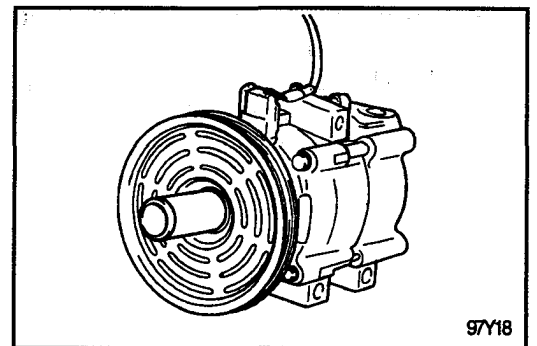
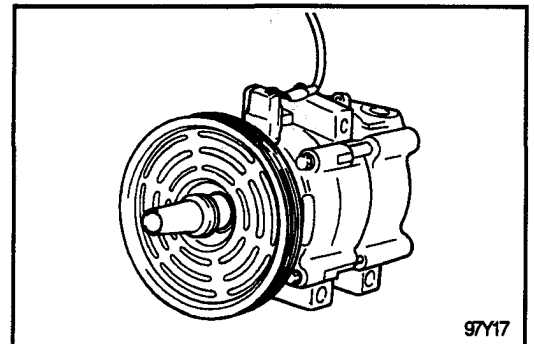
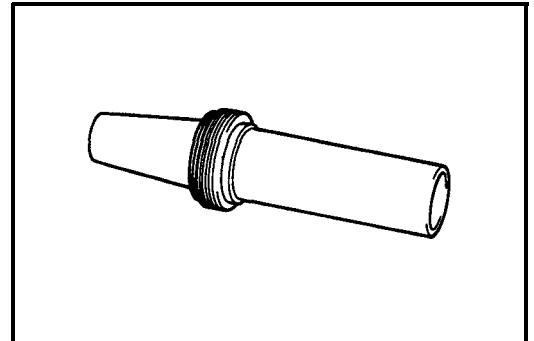


- o Insert tip of Snap Ring Remover into one of the snap ring eyes (View A).
  - o Rotate the Snap Ring Remover to position the tool tip and snap ring eye closest to the compressor shaft (View B).
  - o Pull the Snap Ring Remover tool up quickly while keeping the tool shaft against the side of the nose opening to remove the snap ring (View C).
5. Position the Shaft Seal Remove Tool (09977-33700) over the compressor shaft and push the tool into the nose of the compressor and down against the shaft seal. Engage the end of the tool with the internal diameter of the shaft seal. While holding the hex part of the tool, turn the tool handle clockwise to expand the tool tip inside the seal inner radius. Then, pull the shaft seal from the compressor with the tool.



### Installation

1. Obtain a new shaft seal kit. Carefully remove the contents from the package and locate the plastic shaft seal protector. Inspect the protector for any burrs or other damage. Do not use the protector if it is damaged. Obtain another shaft seal kit and use the protector from it.
2. Using a clean lint-free cloth, clean the shaft and the seal pocket inside the compressor nose.
3. Dip the shaft seal protector and seal in clean refrigerant oil and position the seal on the protector with the lip of the seal pointing toward the large end of the protector.
4. Place the seal protector with shaft seal over the end of the compressor shaft.
5. Place the shaft seal installer tool over the end of the shaft seal protector. Then, slowly push the shaft seal down the protector until it is seated in the compressor.
6. Remove the seal installer and seat protector from the compressor.
7. Place a new seal retaining snap ring into the compressor nose opening and seat the snap ring into the groove with the remover tool.
8. Leak test the shaft seal installation after rotating the shaft about 10 revolutions with the clutch hub.
9. Install a new felt into the compressor nose.
10. Install the clutch hub on the compressor as outlined in this section.



**HEAD GASKETS AND/OR O-RING SEALS**

This service procedure was not approved for the FX-15 Compressor at the time this section was approved for printing.

**HEAD REPLACEMENT**

Head replacement on the FX-15 compressor is not an authorized service procedure at the time this section was approved for publication.

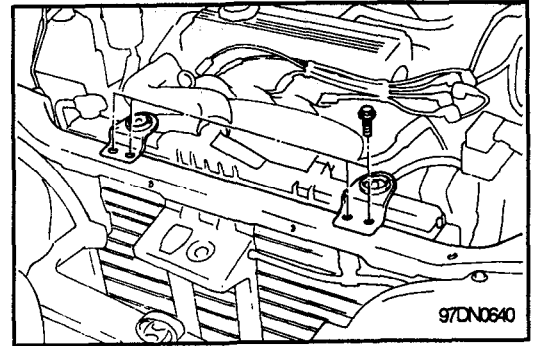
## CONDENSER ON-VEHICLE INSPECTION

1. Check the condenser fins for blockages or damage. The fins are clogged, clean them with compressed air. If the fins are bent, straighten them with a screwdriver or a pair of pliers.

### CAUTION

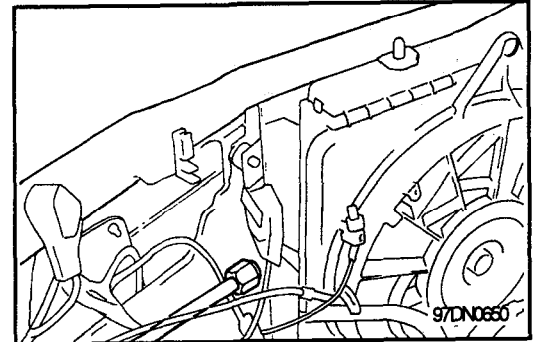
**Be careful not to damage the fins.**

2. Check the condenser fittings for leakage. Repair or replace if necessary.



## REMOVAL

1. Discharge the refrigerant from the system.
2. Disconnect the radiator upper hose as shown figure.
3. Remove the four upper radiator mounting bolts.
4. Lean the radiator back.



5. Disconnect the discharge tube using two wrenches to avoid twisting the tube.
6. Remove the liquid tube 'A'.

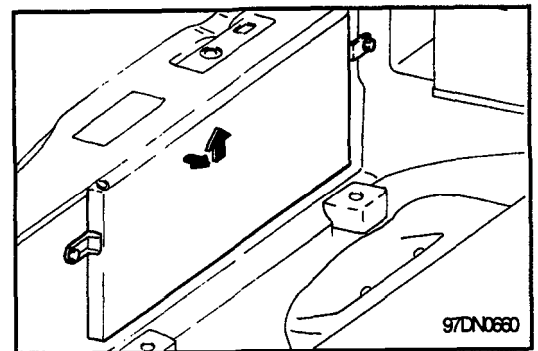
### NOTE:

**Cap the open fittings immediately to keep moisture out of the system.**

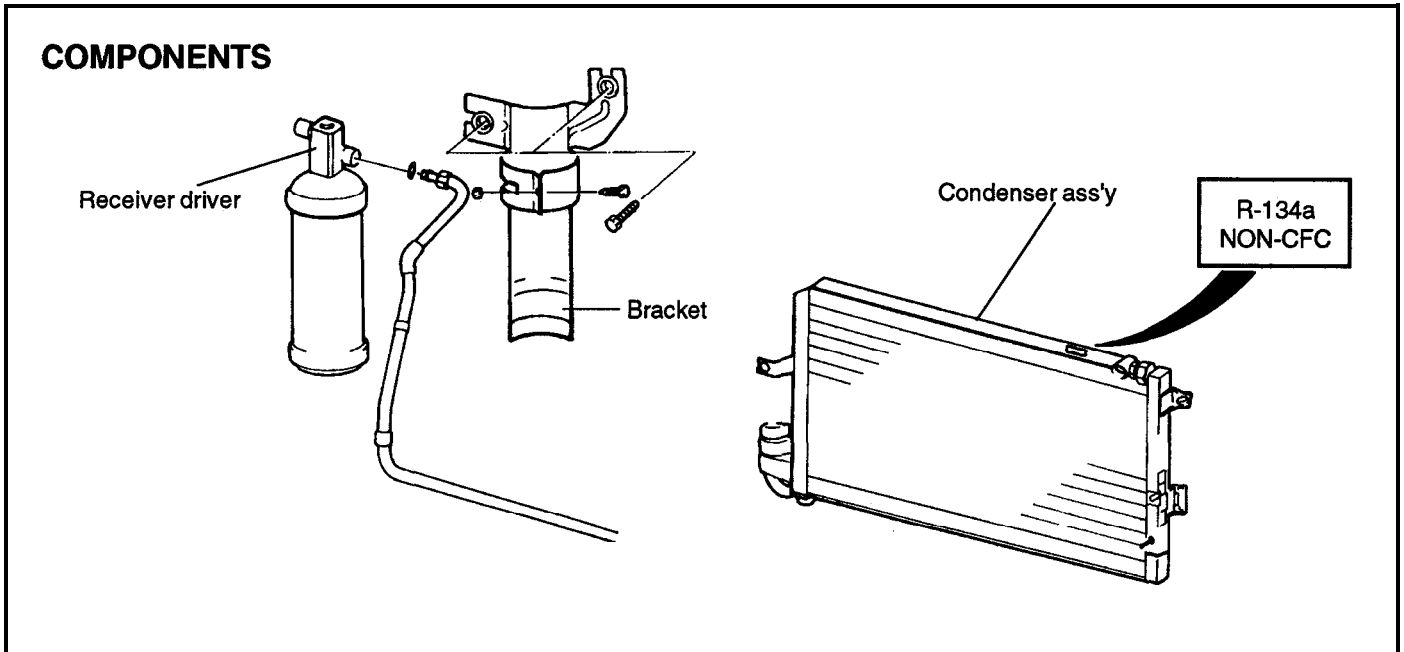
7. Remove the two condenser mounting bolts.
8. Remove the condenser.

## INSTALLATION

1. Installation is reverse of removal.
2. If the condenser is replaced with a new unit, add 25cc of compressor oil to the compressor.
3. Evacuate, charge and test refrigeration system.



## RECEIVER DRIER



## ON-VEHICLE INSPECTION

1. Check the sight glass, fusible plug and the fittings for leakage, using a leak detector.
2. Check the receiver-drier for clogging.
  - a) Run the engine at fast idle with the air conditioner ON.
  - b) Check both the inlet and outlet temperature. If difference in temperatures between the inlet and outlet is large, replace the receiver-drier.

## REMOVAL

1. Discharge the air conditioner system.
2. Disconnect the two liquid line pipes from the receiver-drier.
3. Remove the receiver-drier from the bracket.

**NOTE**

**Plug the all open fittings immediately to keep moisture out of the system.**

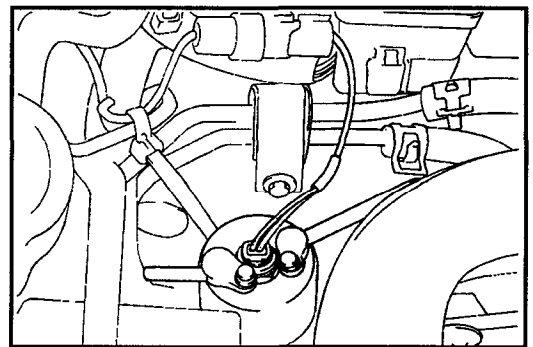
## INSTALLATION

1. Install the receiver-drier in the bracket.

**NOTE**

**Do not remove the blind plugs until ready for connection.**

2. Connect the two liquid line pipes to the receiver drier at specified torque.
3. If the receiver-drier is replaced with a new unit, add **40cc** of compressor oil to the compressor.
4. Evacuate, charge and test refrigeration system.



## EVAPORATOR ASSEMBLY ON-VEHICLE INSPECTION

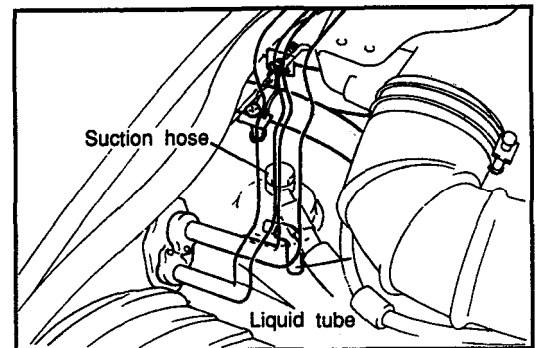
1. Check quantity of refrigerant gas during refrigeration cycle.
2. Install manifold gauge set.
3. Run the engine at 2,000 rpm at least 5 minutes.
4. Read the manifold gauge and check the gas leakage from the evaporator by using gas leak detector.
  - 1) If the expansion valve is clogged low pressure reading will drop to 0 kg/cm<sup>2</sup>, otherwise it is ok.
  - 2) If the expansion valve is clogged or gas leak from the evaporator, then repair or replace as necessary.

## REMOVE

1. Disconnect the battery negative terminal.
2. Discharge the refrigerant.
3. Disconnect the liquid tube 'B' and suction hose from the evaporator.

### NOTE:

**Cap the open fittings immediately to keep moisture and dirt out of the system.**



4. Remove the water drain hose from the evaporator.
5. Remove the grommet cover from the dash panel. (2 screws)

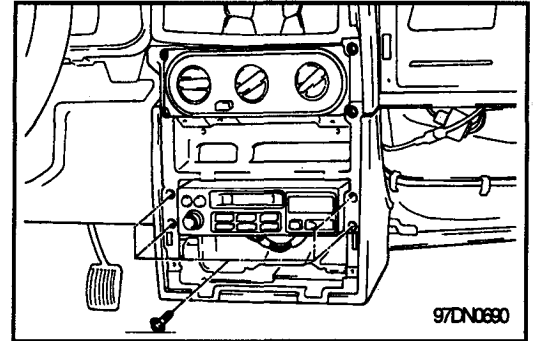
6. Remove the glove box assembly.

7. Remove the side lower crash pad. (6 screws)
6. Remove the front and rear console assembly.
9. Remove the cluster facia panel assembly.
  - (1) Remove the digital clock assembly.
  - (2) Remove the rheostat switch assembly.
10. Remove the lower crash pad center facia panel and disconnect the connectors.

NOTE : Using a screwdriver, pry loose one clip.

\* Tape the screwdriver tip before use.

11. Remove the radio and disconnect the connectors.



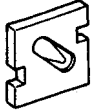
12. Remove 4 mounting bolts for heater control unit assembly.
13. Remove the main lower crash pad assembly.
14. Remove the brackets for center support lower crash pad and RH lower crash pad.
15. Disconnect the connectors for blower resistor (M63), blower motor (M61), thermostat (I12), and the vacuum hose from the recirce/fresh vacuum motor.
16. Remove the evaporator assembly. (2 bolts and 3 nuts)

## INSTALLATION

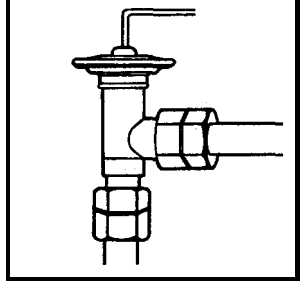
1. Installation is revers of removal.
2. If the evaporator unit is replaced with a new unit, add 50cc of compressor oil to the compressor.
3. Evacuate, charge and test refrigeration system.

## COMPONENTS

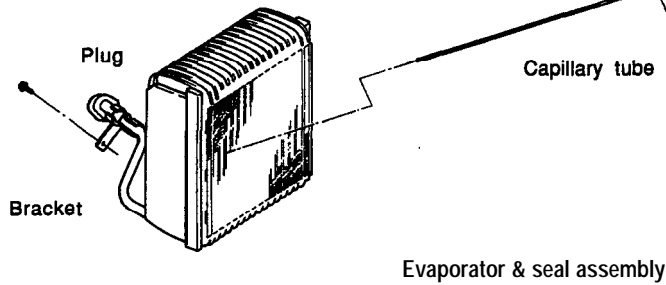
Evaporator pipe grommet



Upper case assembly



EXPANSION VALVE



Thermostat

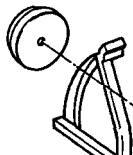
Capillary tube

Plug

Bracket

Evaporator &amp; seal assembly

Tube grommet



Seal



Seal

Lower case assembly

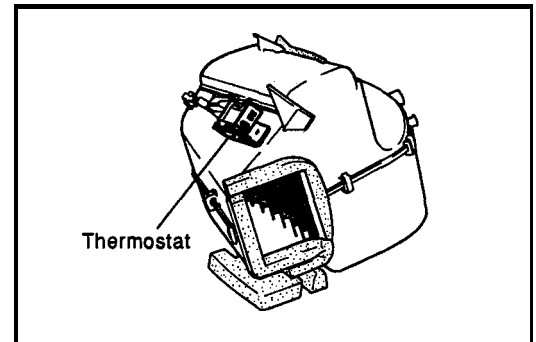
## DISASSEMBLY OF EVAPORATOR UNIT

1. Remove the seal from the cases.
2. Remove 7 clips, holding the upper case to the lower case.
3. Remove the pipe mounting screw.
4. Remove the upper unit case with the thermostat.

**NOTE :**

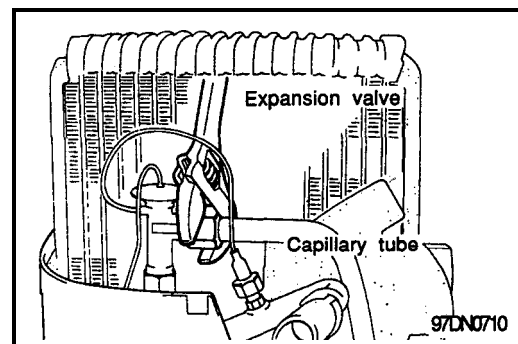
**Be careful not to broken the capillary tube of the thermostat.**

5. Disconnect the capillary tube from the outlet fitting of the evaporator.



Thermostat

5. Disconnect the liquid tube and suction tube from the inlet and outlet fittings of the expansion valve.
6. Remove the packing and heat sensing tube from suction tube of evaporator.
7. Remove the expansion valve.



## INSPECTION

1. Check the evaporator fins for blockage.  
If the fins are clogged, clean them with compressed air.

**NOTE :**

**Never use water to clean the evaporator.**

2. Check fittings for cracks or scratches.

## ASSEMBLY OF EVAPORATOR UNIT

1. Connect the expansion valve to the inlet fitting of the evaporator. Torque the nut.

**Torque : 235 kg-cm (17 ft-lb, 23 N.m)**

**NOTE :**

**Be sure that the O-ring are positioned on the tube fitting.**

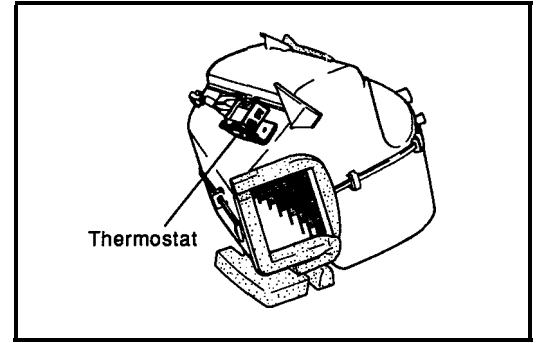
2. Install the holder to the suction tube with heat sensitizing tube.
3. Connect the liquid tube to the inlet fitting of the expansion valve. Torque the nut.

**Torque : 135 kg-cm (10 ft-lb, 13 N.m)**

4. Install lower unit case to the evaporator.
5. Install thermistor to the evaporator.
6. Install upper unit case.
7. Install one screw for the pipe clamp.
8. Install seven clips, holding the upper case to the lower case.

**THERMOSTAT  
ON-VEHICLE INSPECTION**

1. Disconnect the battery negative terminal.
2. Remove glove box.
3. Disconnect the M48 connector from the thermostat.
4. Measure the continuity between terminals of the M48 Connector.  
If no continuity between terminals, replace the thermostat.



**REMOVAL**

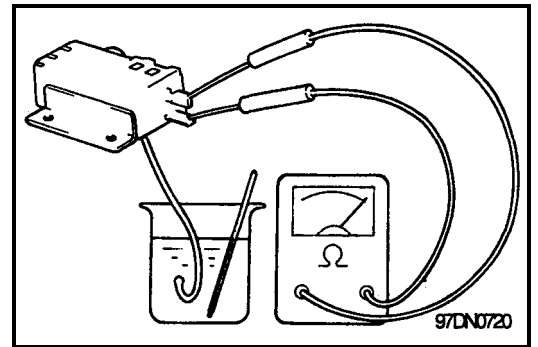
1. Remove the evaporator assembly (Refer to page 97-60).
2. Remove the thermostat from the evaporator upper cover.

**NOTE :**

**Be careful not to damage the evaporator core when remove the capillary tube with the thermostat.**

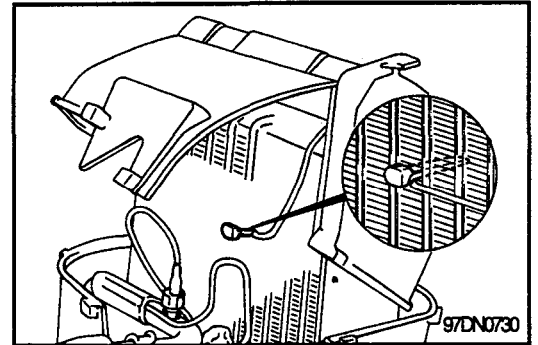
**INSPECTION**

1. Place the thermostat capillary tube in cold water and check for continuity.  
cut-off . . . . .  $0 \pm 1^\circ$   
Cut-in . . . . .  $4 \pm 1^\circ$
2. If cut-off or cut-in temperature is too low or too high, replace the thermostat.



**INSTALLATION**

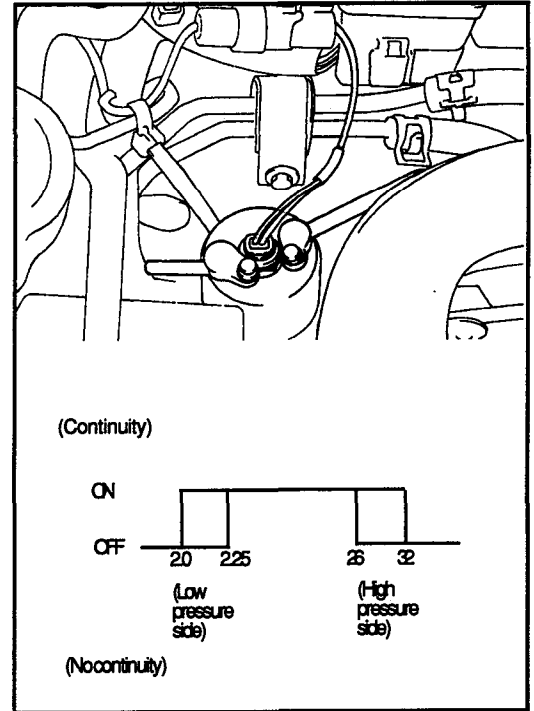
1. Insert the capillary tube end to a depth of 50 mm (2.0 in.) at a position 40 mm (1.6 in) from the top of the 3rd column from the left of the evaporator.
2. Install the thermostat.
3. Connect the M48 Connector to the thermostat.
4. Install the glove box.
5. Connect the battery negative terminal.
6. Test the refrigeration system.



## DUAL PRESSURE SWITCH

The dual pressure switch is a combination of the low pressure switch (for checking the quantity of refrigerant) and the high pressure switch (for prevention of overheating). It is installed in the receiver, and, when the pressure becomes approximately 200 KPa (28 psi) or lower, the compressor stops, thus preventing the compressor from being damaged by heat .

When the pressure reaches 3,138 KPa (455 psi) or higher, the compressor stops, thus preventing overheating. There is generally no necessity for inspection; if, however, an unusual condition, such as non-operation of the compressor is encountered, check by following the procedures below.



## ON-VEHICLE INSPECTION

1. Disconnect connector of the dual pressure switch.
2. Install the manifold gauge set.
3. Observe the gauge reading.
4. Check the continuity between the two terminals of the dual pressure switch shown in the figure.  
If defective, replace the dual pressure switch.

## REMOVAL

1. Discharge the air conditioner system.
2. Disconnect connector from the dual pressure switch.
3. Remove the dual pressure switch using two wrenches to avoid twisting the tube.

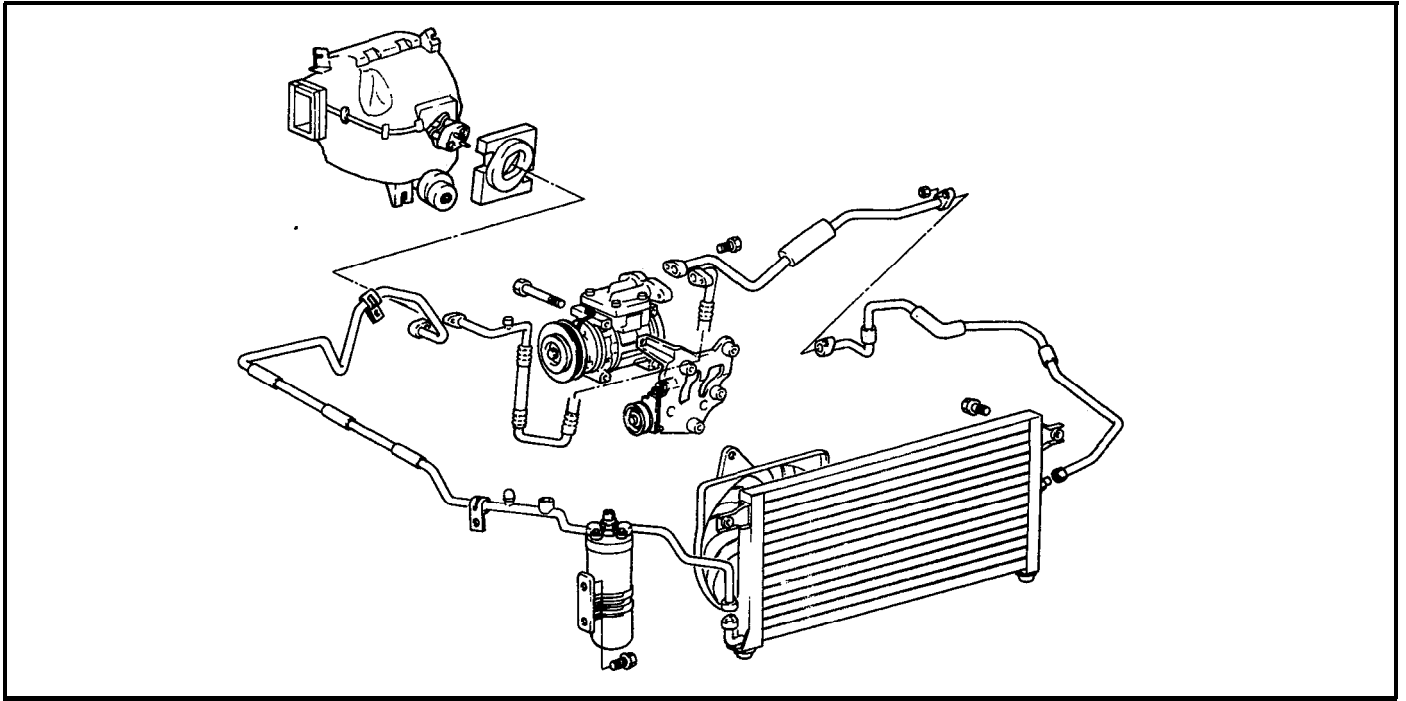
### NOTE :

**Cap the open fitting immediately to keep moisture out of the system.**

## INSTALLATION

1. installation is reverse of removal.
2. Evacuate, charge and test refrigeration system.

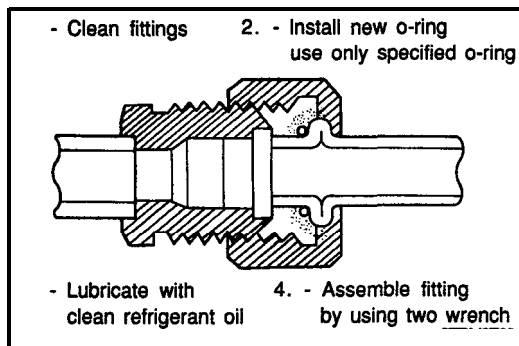
**HANDLING TUBING AND FITTINGS**



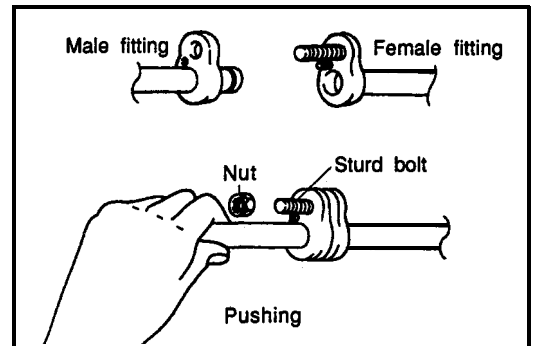
The internal parts of the refrigeration system will remain in a state of chemical stability as long as pure-moisture free refrigerant and refrigerant oil is used. Abnormal amounts of dirt, moisture or air can upset the chemical stability and cause troubles or even serious damage.

**The following precautions must be observed**

1. When it is necessary to open the refrigeration system, have everything you will need to service the system ready so the system will not be left open any longer than necessary.
2. Cap or plug all lines and fittings as soon as they are opened to prevent the entrance of dirt and moisture.
3. All lines and components in parts stock should be capped or sealed until they are ready to be used.
4. Never attempt to rebend formed lines to fit. Use the correct line for the installation you are servicing.
5. All tools, including the refrigerant dispensing manifold, the gage set manifold and test hoses should be kept clean and dry.



**BOLT-NUT TYPE COUPLING**



**FLANGE WITH GUIDE PIN TYPE**





**RELAYS**

**AIR CONDITIONER RELAY AND CONDENSER FAN RELAY**

1. Remove the battery ground cable.
2. Remove the cover of relay box located in engine compartment.
3. Remove the relays from relay box.
4. Check for continuity or voltage between the terminals.

**(AIR CONDITIONER RELAY-check for continuity)**

Terminal Condition	1	2	3	4
Constant				
Apply battery voltage to terminal 1 and 3				

If continuity is not as specified, replace the relay

**(CONDENSER FAN RELAY-check for voltage)**

Terminal Condition	1	2	3
Constant			
Apply battery voltage to terminal 1 and 2			

If continuity is not as specified, replace the relay.

**BLOWER FAN MOTOR RELAY**

1. Remove the battery ground cable.
2. Remove the cover of relay box located behind the crash pad.
3. Remove the relay and check for continuity between the terminals.

Terminal Condition	1	2	3	4
Constant				
Apply battery voltage to terminal 1 and 3				

If continuity is not as specified, replace the relay.

