

# HEATER & AIR CONDITIONER

## CONTENTS

### HEATER

<b>DESCRIPTION</b> .....	HA- 2
AIR FLOW .....	HA- 2
<b>SERVICE PROCEDURES</b> .....	HA- 4
HEATER COMPONENTS .....	HA- 4
HEATER/AIR CONDITIONER CONTROL ASSEMBLY .....	HA- 5
HEATER/BLOWER UNIT .....	HA- 6
RESISTOR .....	HA- 7
HEATER RELAY .....	HA- 7
<b>ELECTRICAL CIRCUIT</b> .....	HA- 8
SCHEMATIC .....	HA- 8
<b>TROUBLE DIAGNOSES AND CORRECTIONS</b> .....	HA- 9

### AIR CONDITIONER

<b>DESCRIPTION</b> .....	HA-10
REFRIGERATION SYSTEM .....	HA-10
AIR FLOW .....	HA-11
<b>GENERAL SERVICE</b> .....	HA-13
PRECAUTIONS .....	HA-13
INSTALLING MANIFOLD GAUGE .....	HA-13
HANDLING REFRIGERANT SERVICE CAN TAP .....	HA-14
DISCHARGING REFRIGERANT .....	HA-14
EVACUATING AND CHARGING REFRIGERANT SYSTEM .....	HA-14
COMPRESSOR OIL LEVEL CHECK .....	HA-16
<b>PERFORMANCE TEST</b> .....	HA-18
PERFORMANCE CHART .....	HA-18
PERFORMANCE TEST DIAGNOSES .....	HA-20
<b>SERVICE PROCEDURES</b> .....	HA-24
PRECAUTIONS FOR REMOVAL AND INSTALLATION .....	HA-24
AIR CONDITIONER COMPONENTS .....	HA-24
REFRIGERANT LINES .....	HA-25
COMPRESSOR IDLER PULLEY .....	HA-26
FAST IDLE CONTROL DEVICE (F.I.C.D.) .....	HA-26
COMPRESSOR .....	HA-26

CONDENSER .....	HA-26
RECEIVER DRIER (Liquid tank) .....	HA-27
AIR CONDITIONER CONTROL .....	HA-27
COOLING UNIT .....	HA-27
EXPANSION VALVE .....	HA-28
THERMOSTAT .....	HA-28
COMPRESSOR RELAY .....	HA-28
ACCESSORY RELAY .....	HA-28
BLOWER UNIT .....	HA-28
<b>COMPRESSOR (Disassembly and assembly)</b> .....	HA-29
PRECAUTIONS .....	HA-30
COMPRESSOR CLUTCH .....	HA-30
SHAFT SEAL .....	HA-31
SIDE COVER .....	HA-33
REAR END COVER AND REAR CYLINDER HEAD .....	HA-33
REPLACEMENT OF CYLINDER .....	HA-34
<b>ELECTRICAL CIRCUIT</b> .....	HA-37
SCHEMATIC .....	HA-37
<b>TROUBLE DIAGNOSES AND CORRECTIONS</b> .....	HA-39
AIR CONDITIONER DIAGNOSES .....	HA-39
BLOWER MOTOR DIAGNOSES .....	HA-41
COMPRESSOR CLUTCH DIAGNOSES .....	HA-42
COMPRESSOR DIAGNOSES .....	HA-44
FAST IDLE CONTROL DEVICE (F.I.C.D.) DIAGNOSES .....	HA-45
<b>SERVICE DATA AND SPECIFICATIONS</b> .....	HA-46
GENERAL SPECIFICATIONS .....	HA-46
INSPECTION AND ADJUSTMENT .....	HA-46
TIGHTENING TORQUE .....	HA-46
<b>SPECIAL SERVICE TOOLS</b> .....	HA-47

Refer to Section MA (Heater and Air Conditioner) for:

- CHECKING REFRIGERANT LEVEL
- CHECKING REFRIGERANT LEAKS

Refer to Section MA (Basic Mechanical System) for:

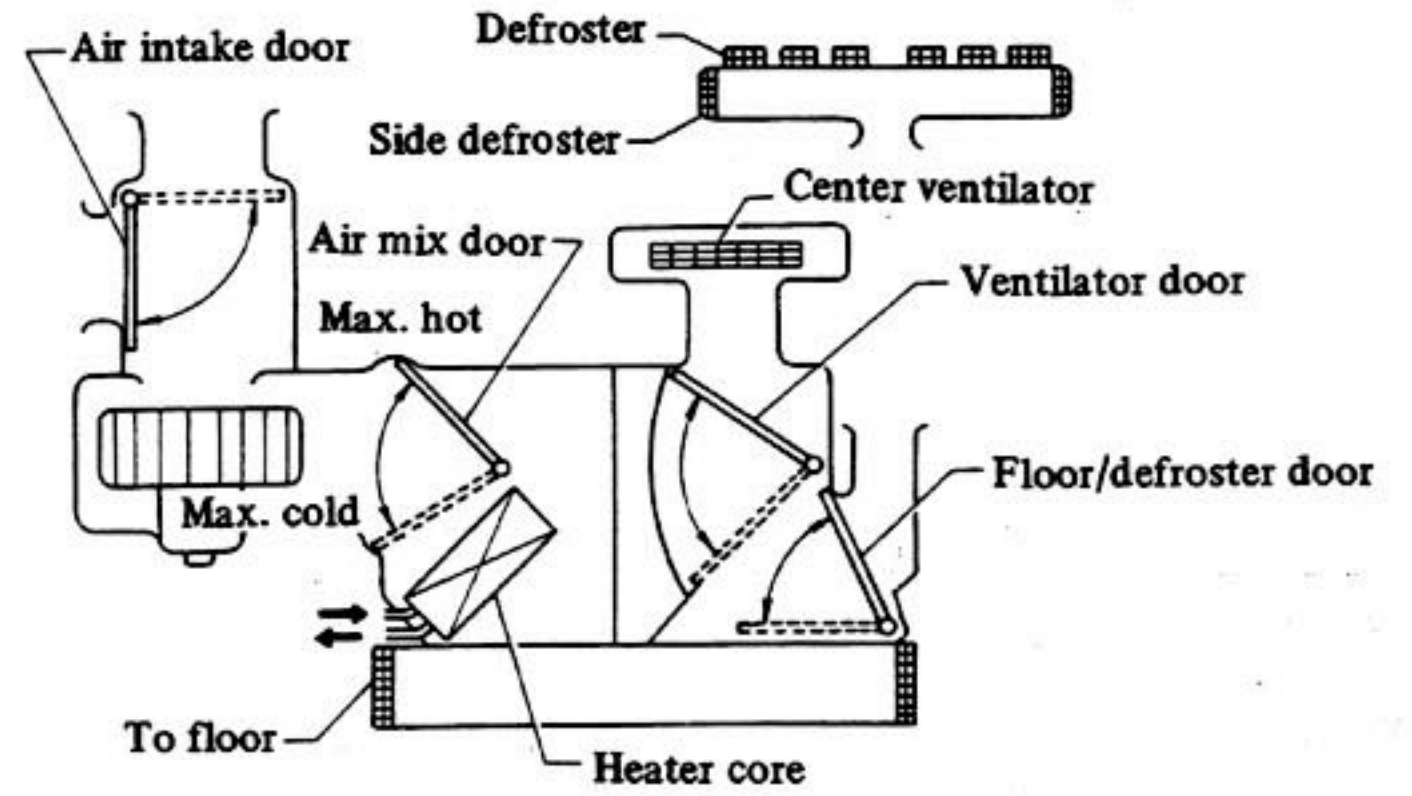
- CHECKING AND ADJUSTING DRIVE BELTS

# DESCRIPTION

## AIR FLOW

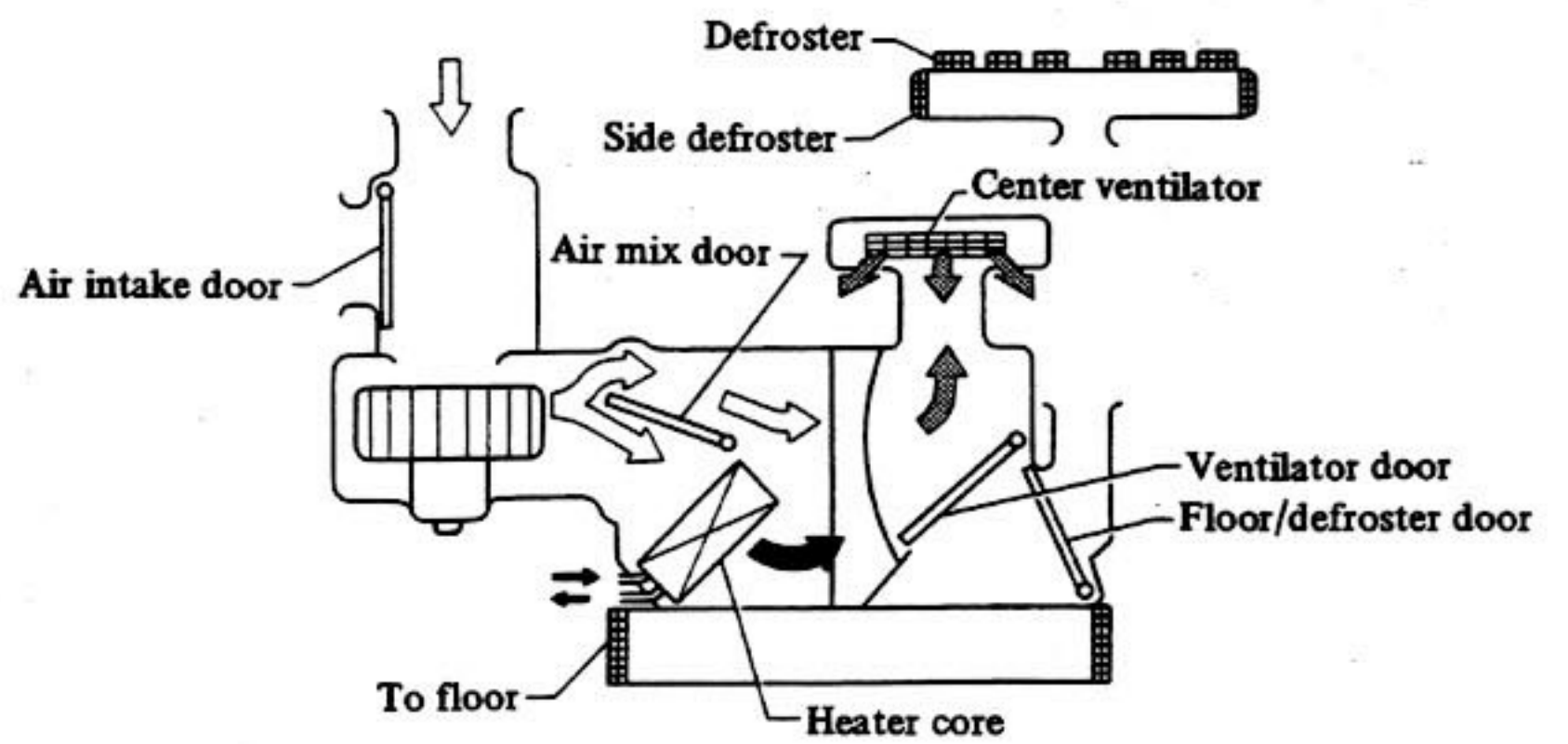
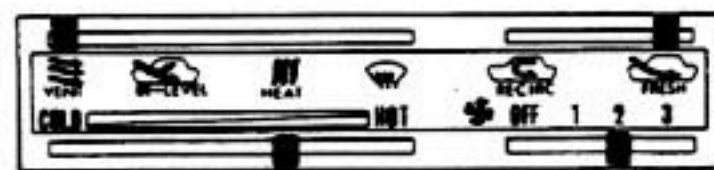
### MODEL 160 SERIES

#### OFF



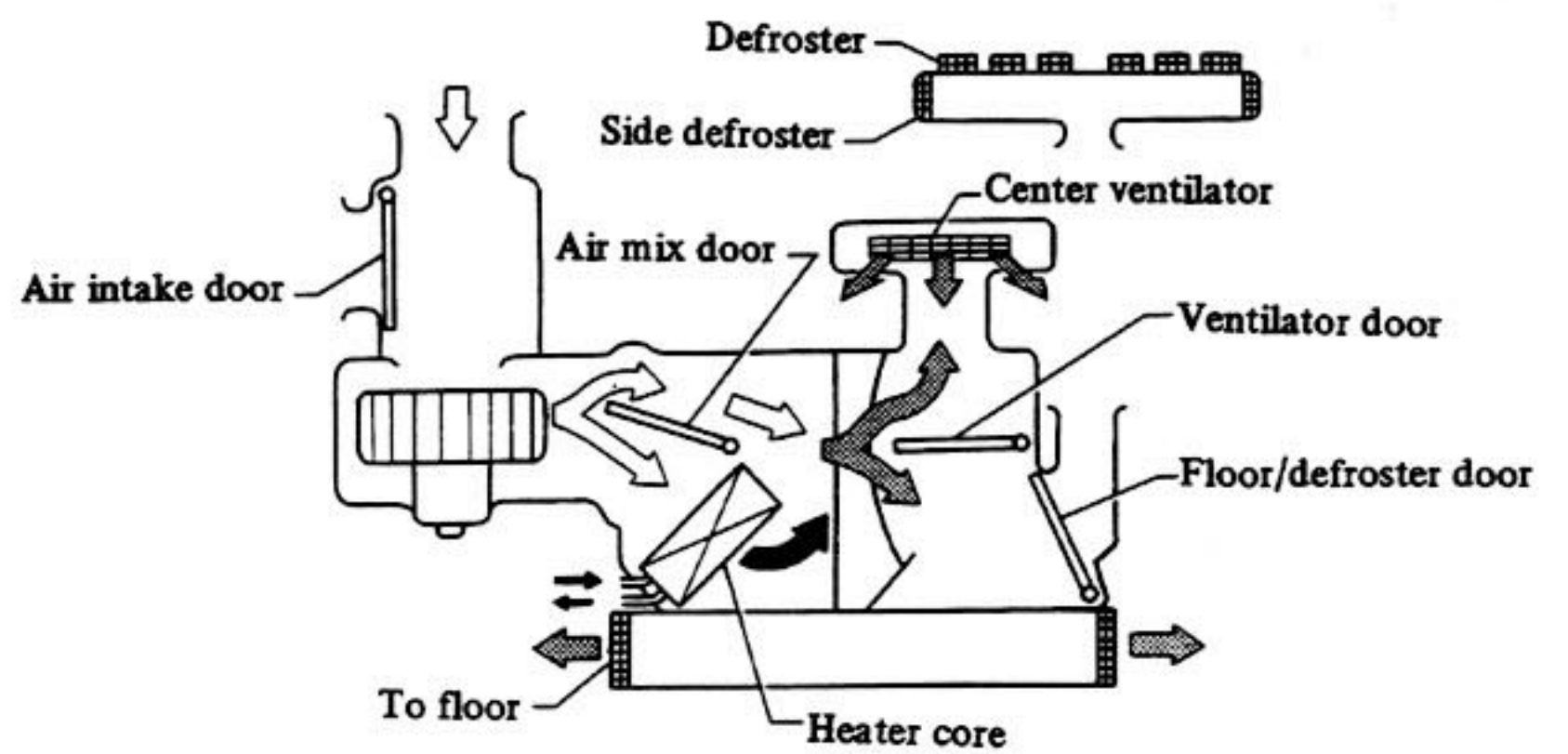
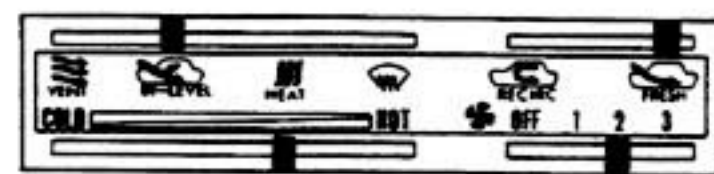
SHA606

#### VENT position



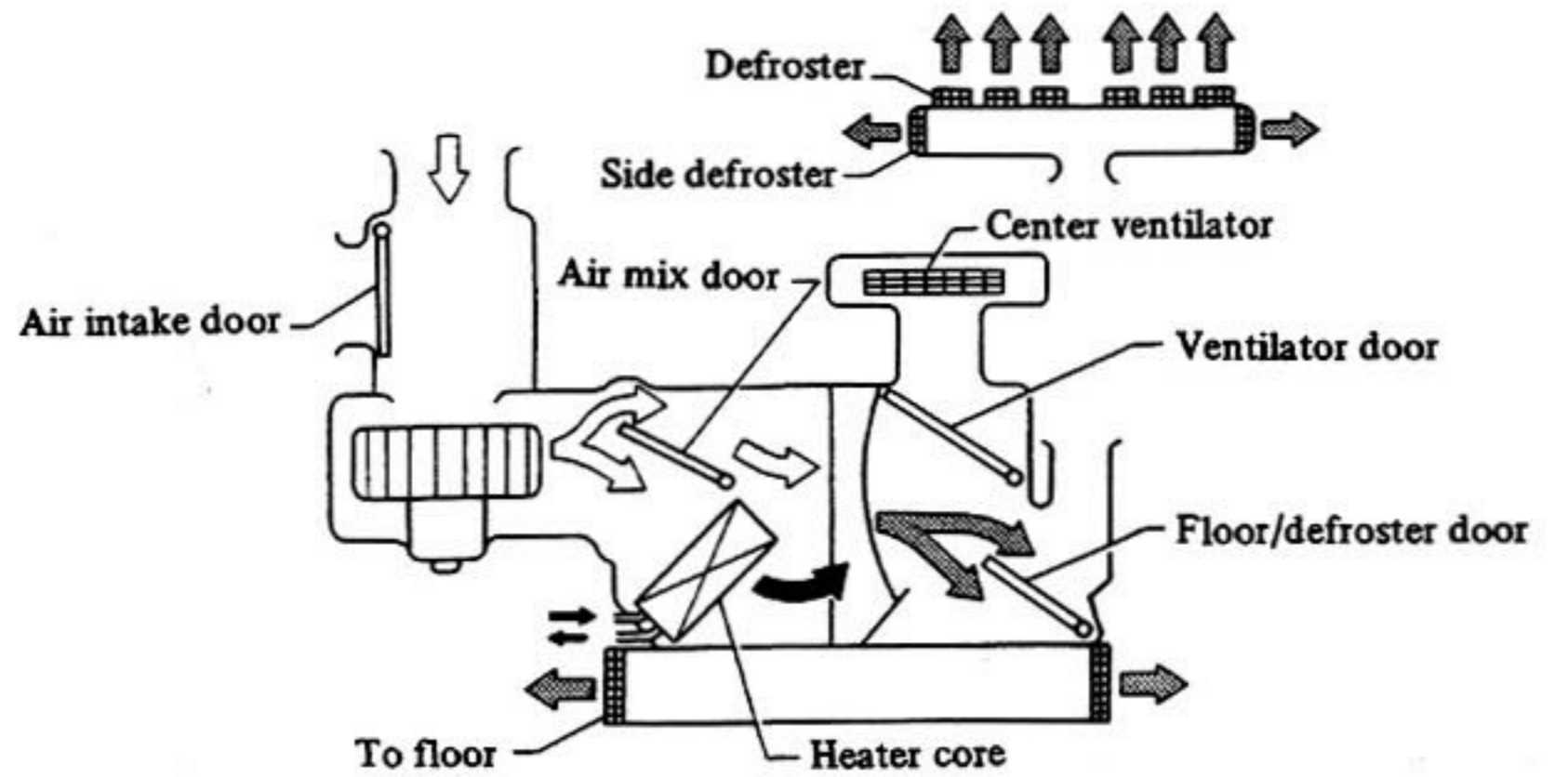
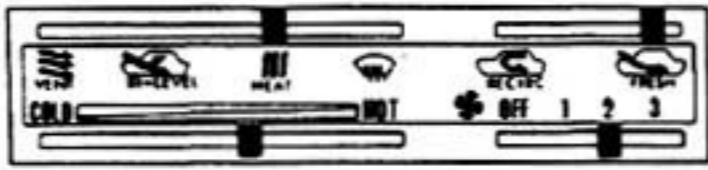
SHA609

#### B/L (BI-LEVEL) position



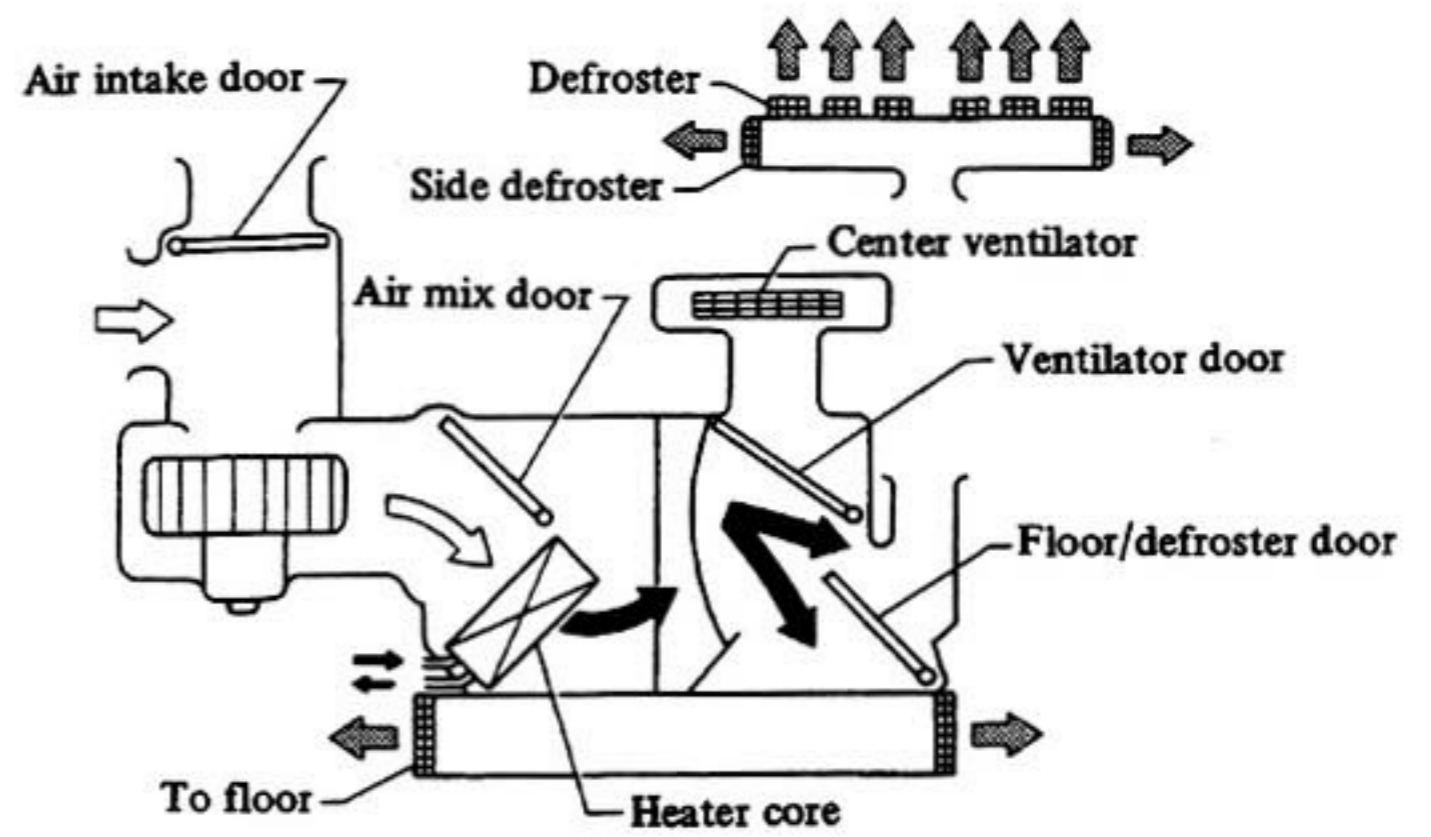
SHA610

**HEAT position**



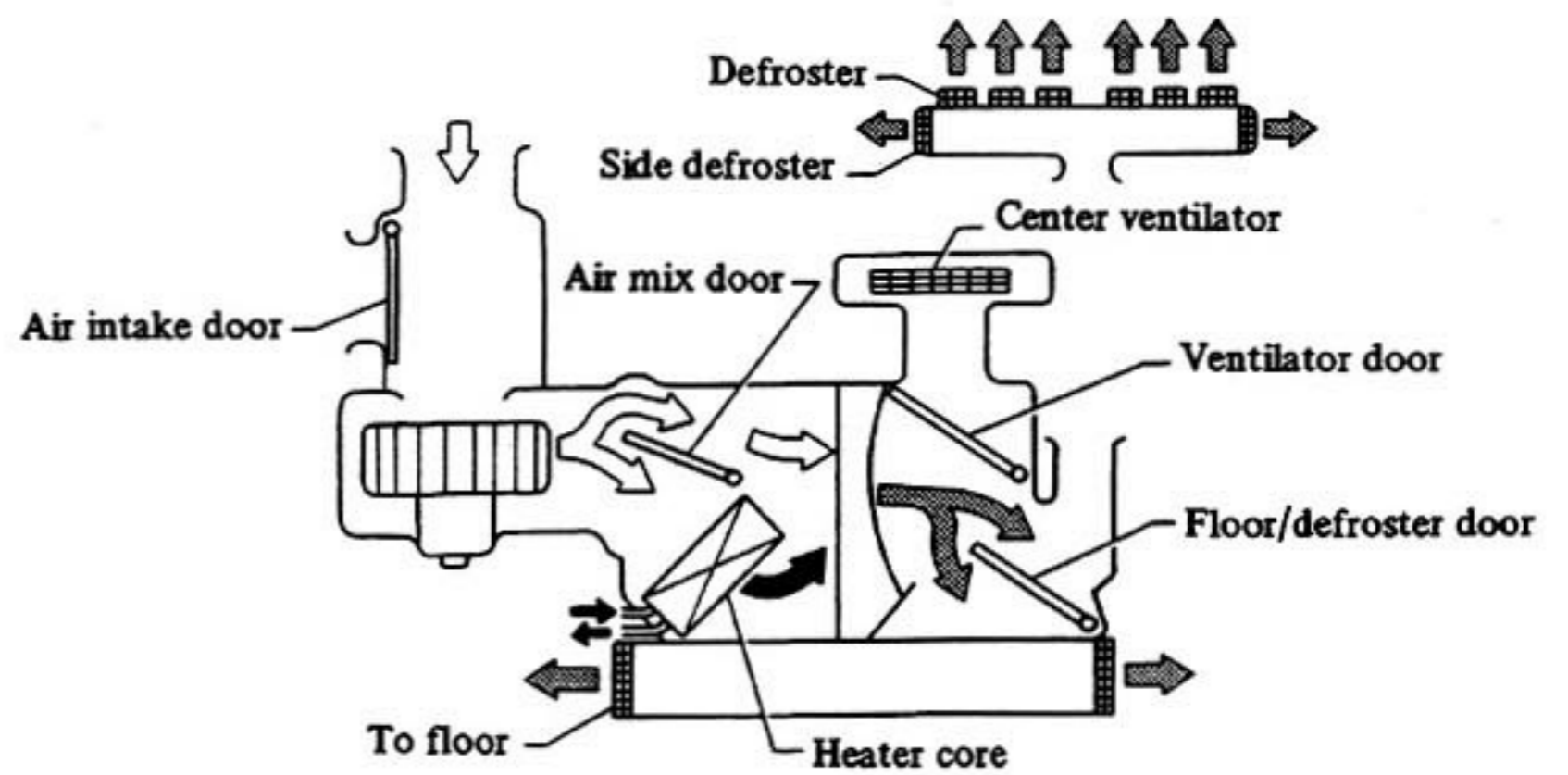
SHA608

**HEAT (Fast heating) position**



SHA607

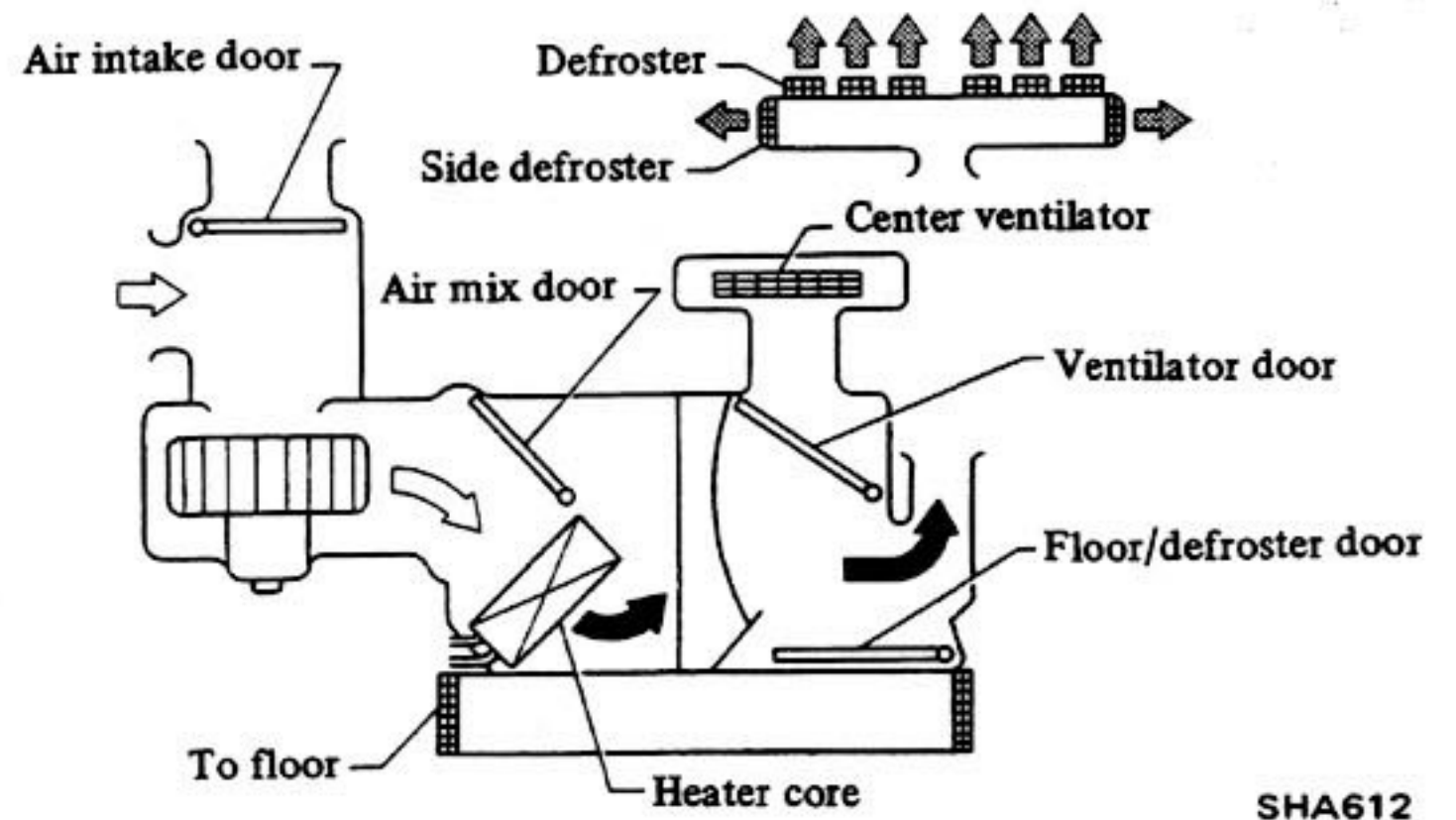
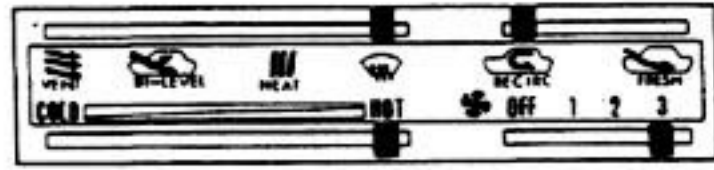
**position**



SHA611

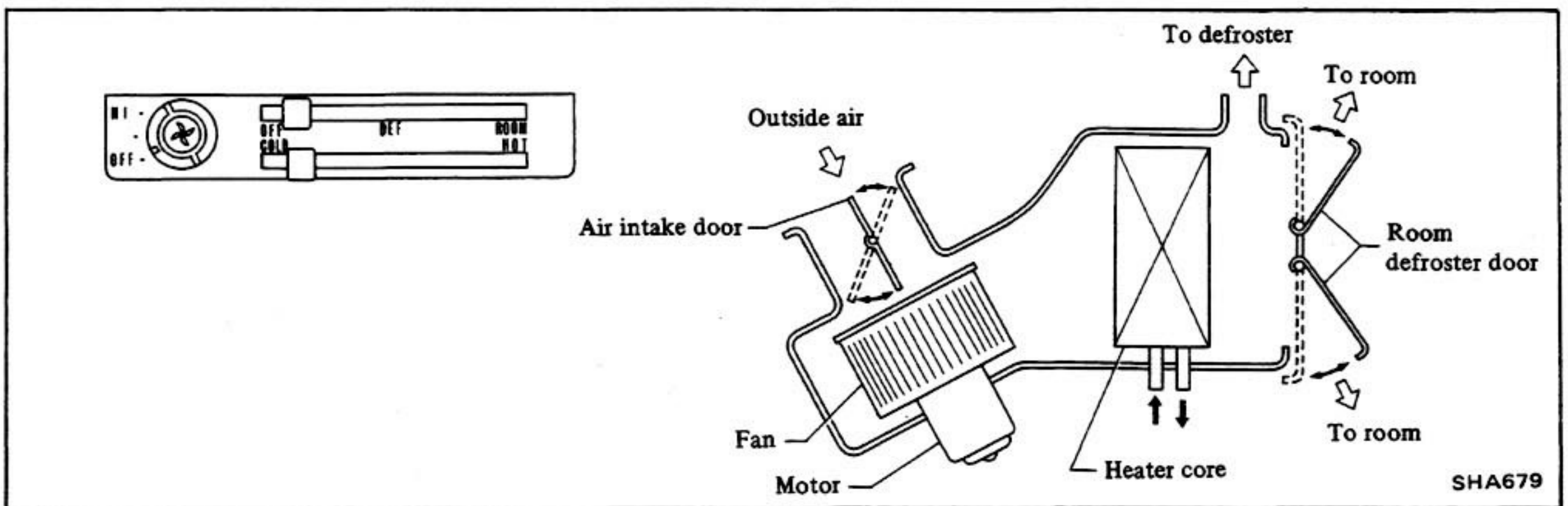
Service Procedures – HEATER

 position (Fast defrosting)



SHA612

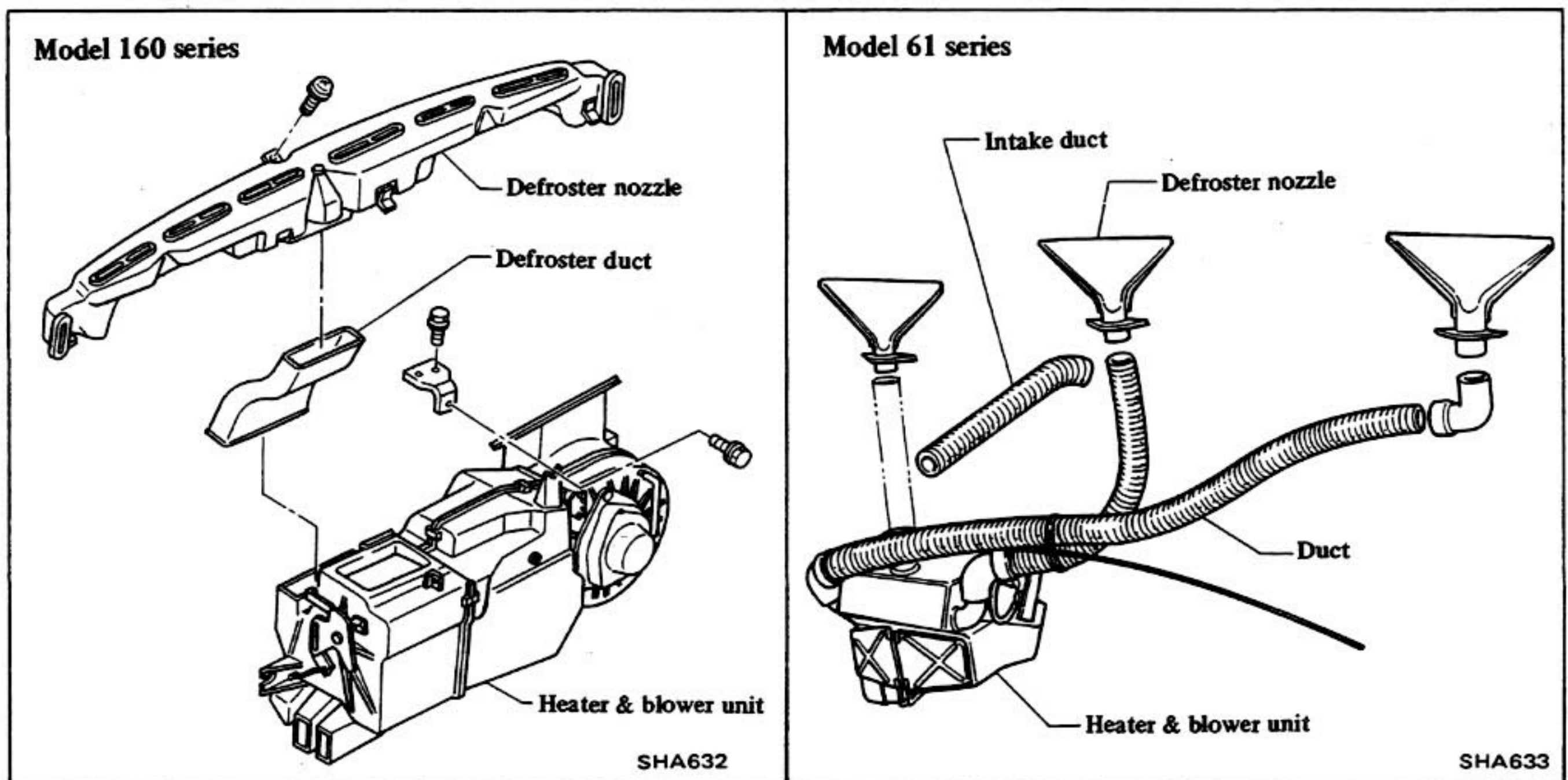
**MODEL 61 SERIES**



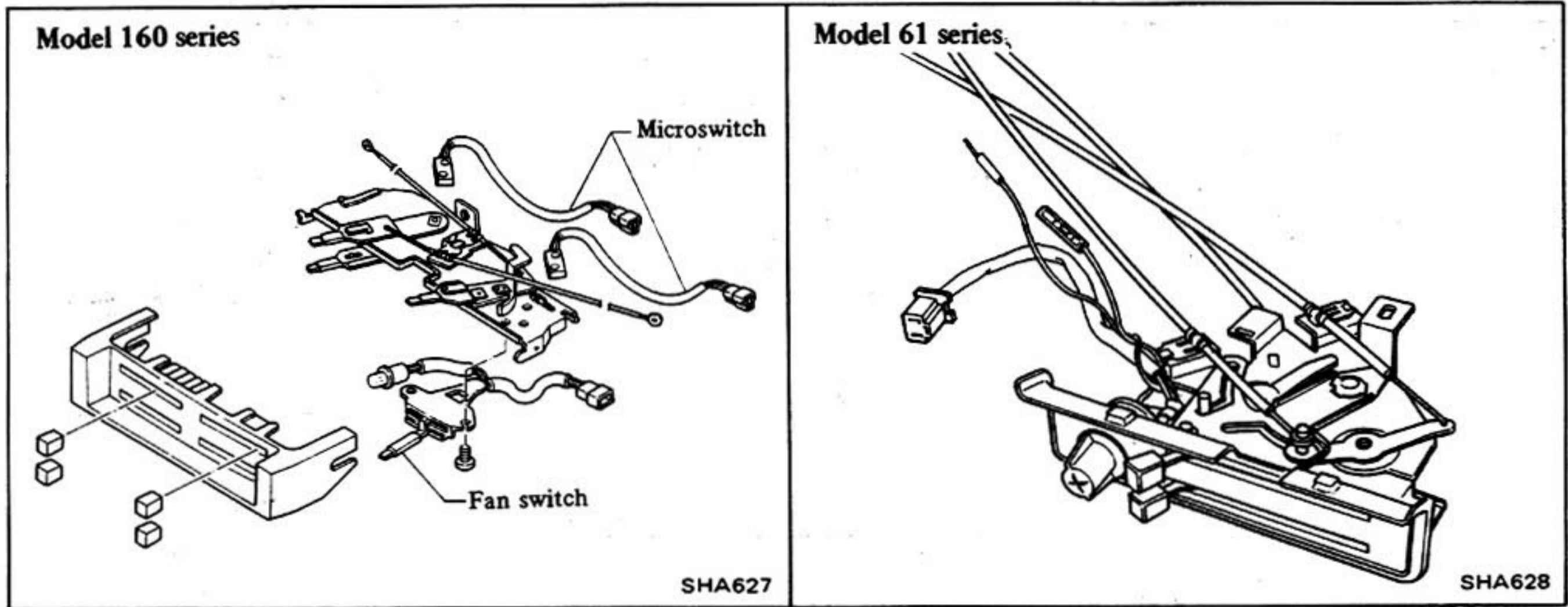
SHA679

**SERVICE PROCEDURES**

**HEATER COMPONENTS**



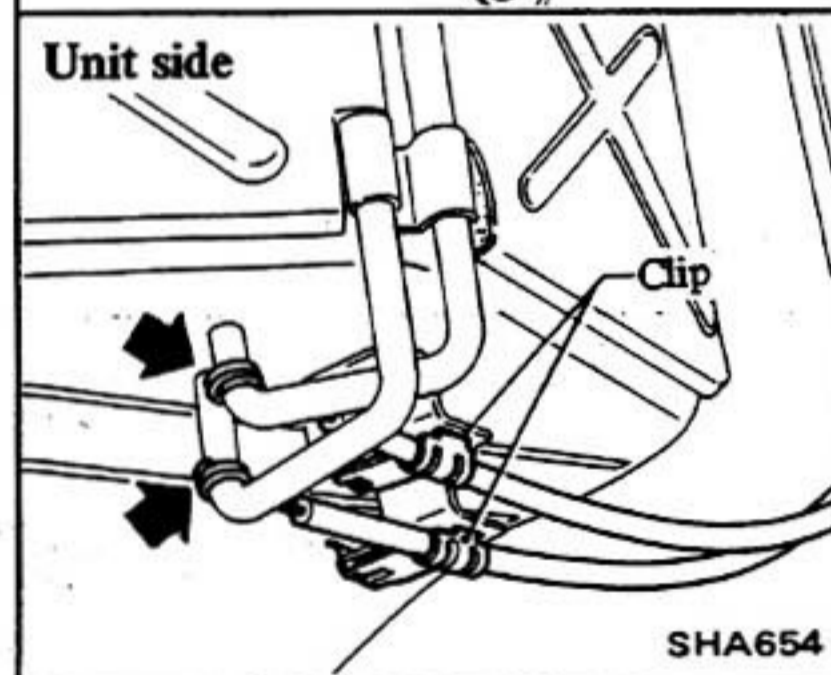
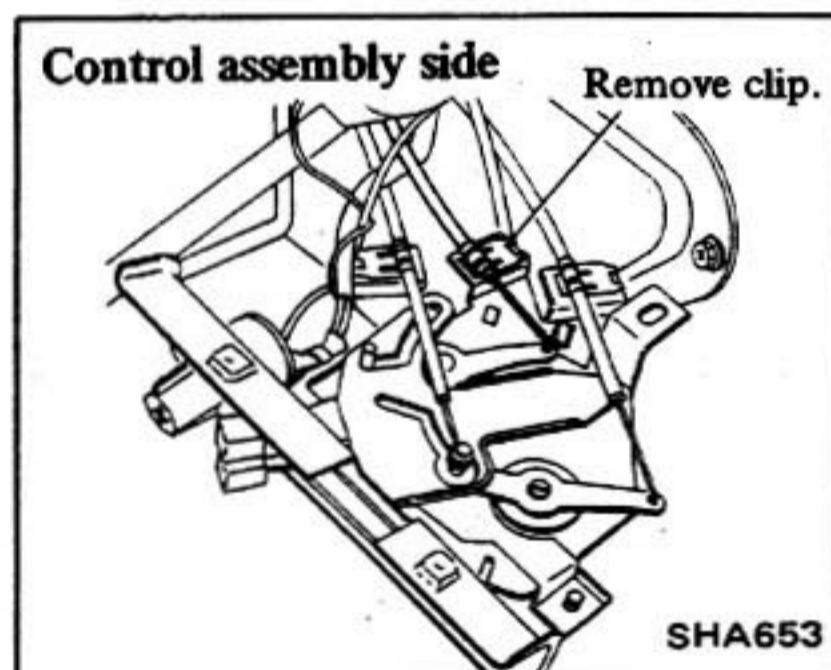
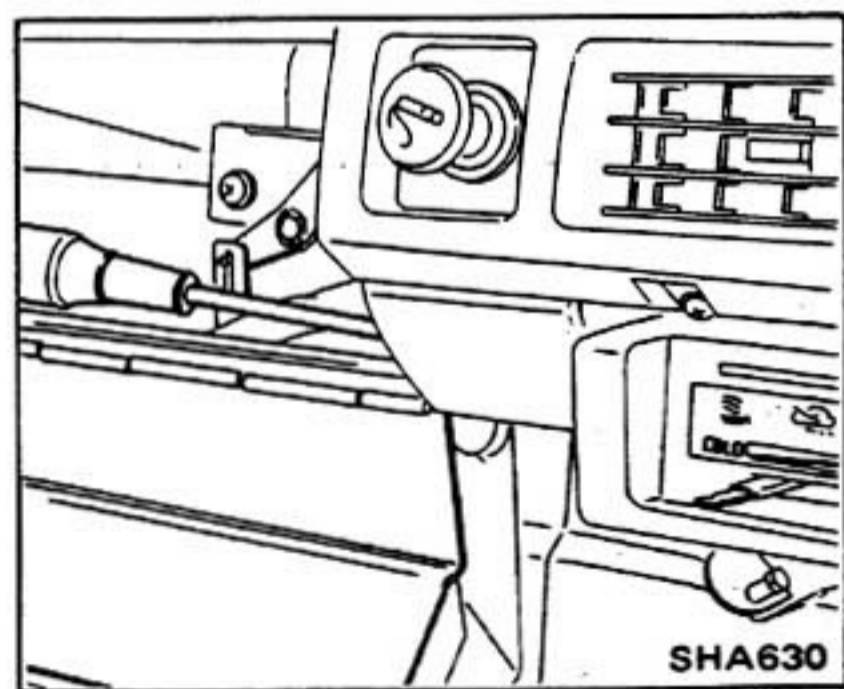
# HEATER/AIR CONDITIONER CONTROL ASSEMBLY



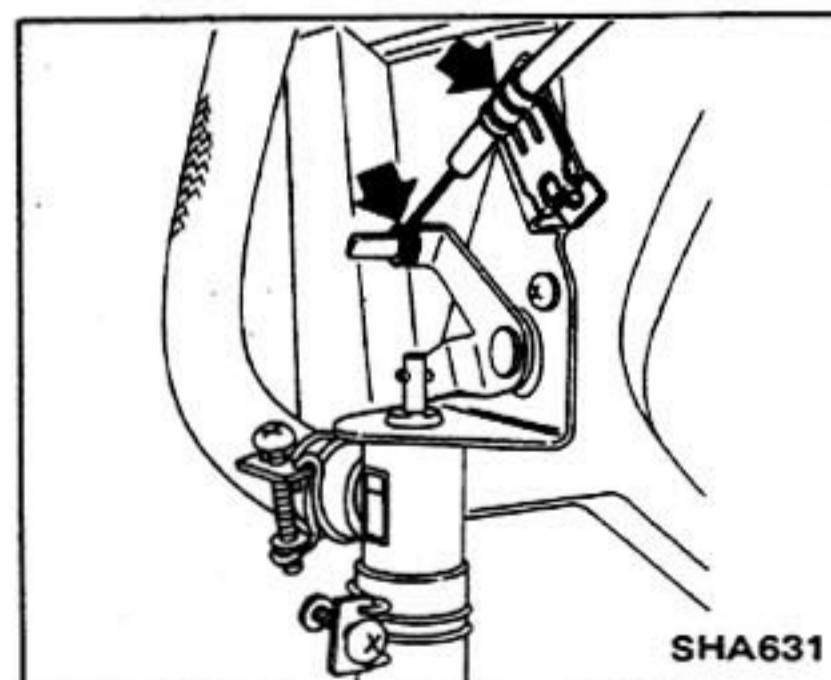
## REMOVAL AND INSTALLATION

### Model 160 series

1. Disconnect battery ground cable.
2. Remove glove box.
3. Remove ash tray.
4. Remove control cable retaining clips.
5. Remove control knob.
6. Remove screw and then remove control assembly.



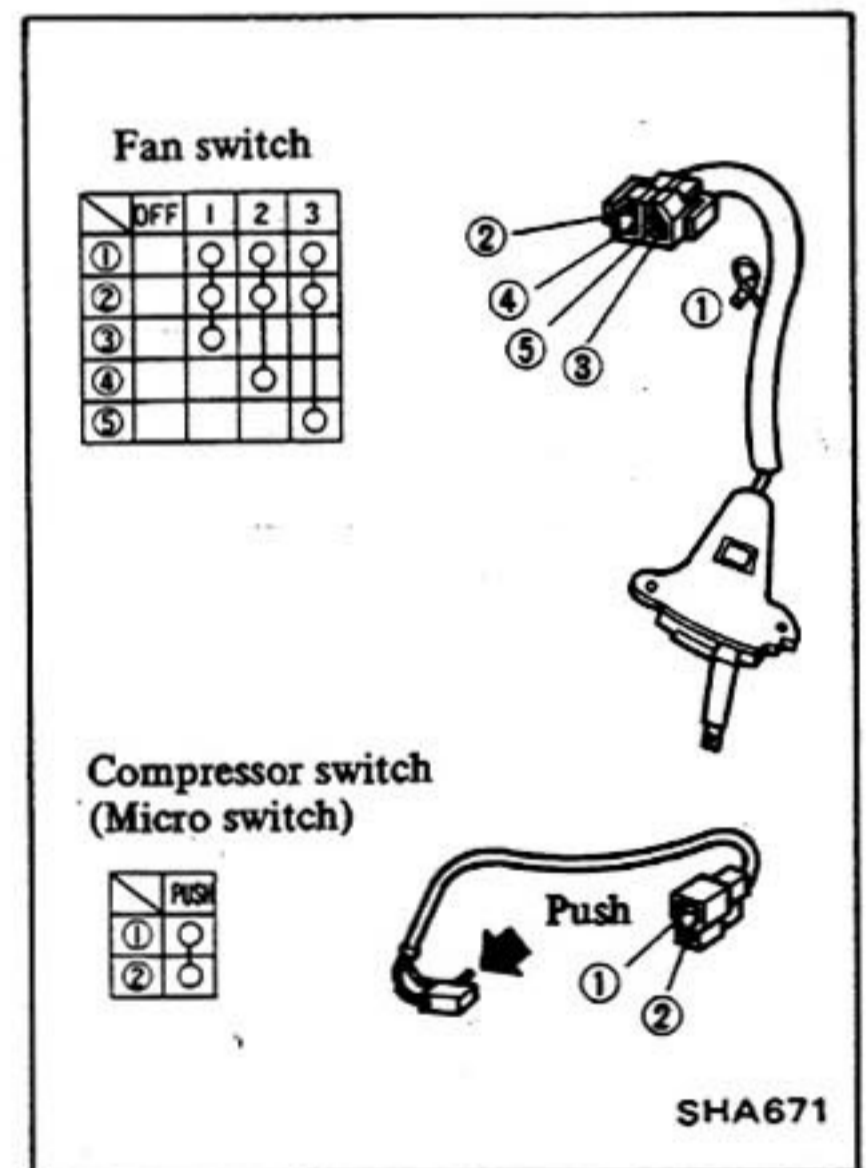
3. Disconnect water control cable.



4. Remove control assembly.

## INSPECTION

Test continuity through switch with a test lamp or ohmmeter.



### Model 61 series

1. Disconnect battery ground cable.
2. Disconnect "DEF" "ROOM" control cable.

## ADJUSTING HEATER CONTROL CABLE

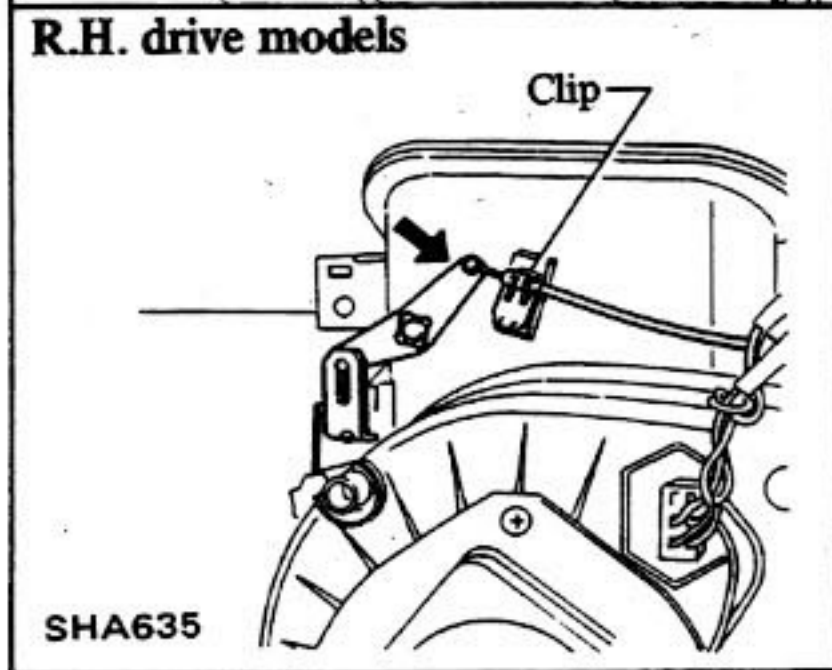
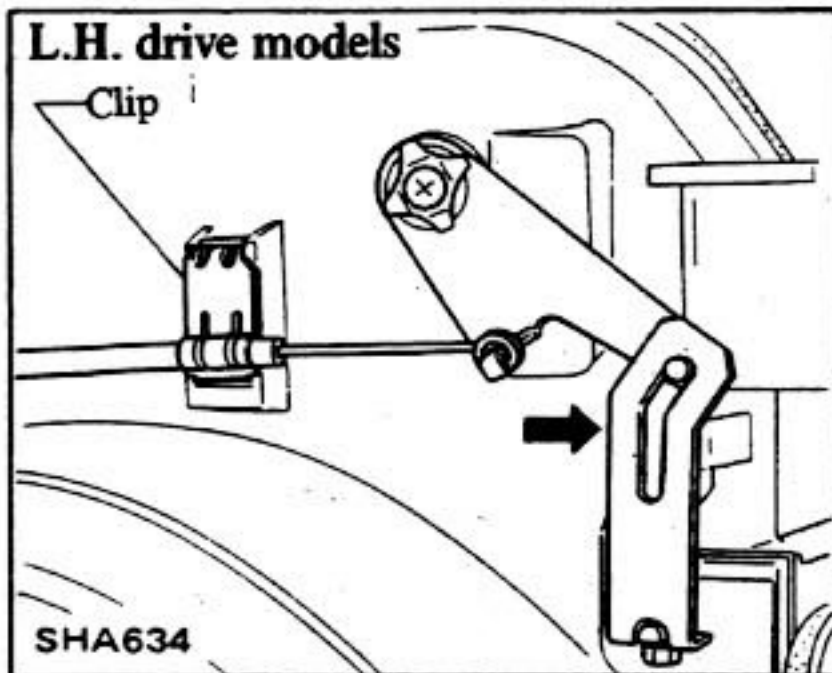
### Model 160 series

Air intake door control cable


1. Move control lever to "RECIRC".

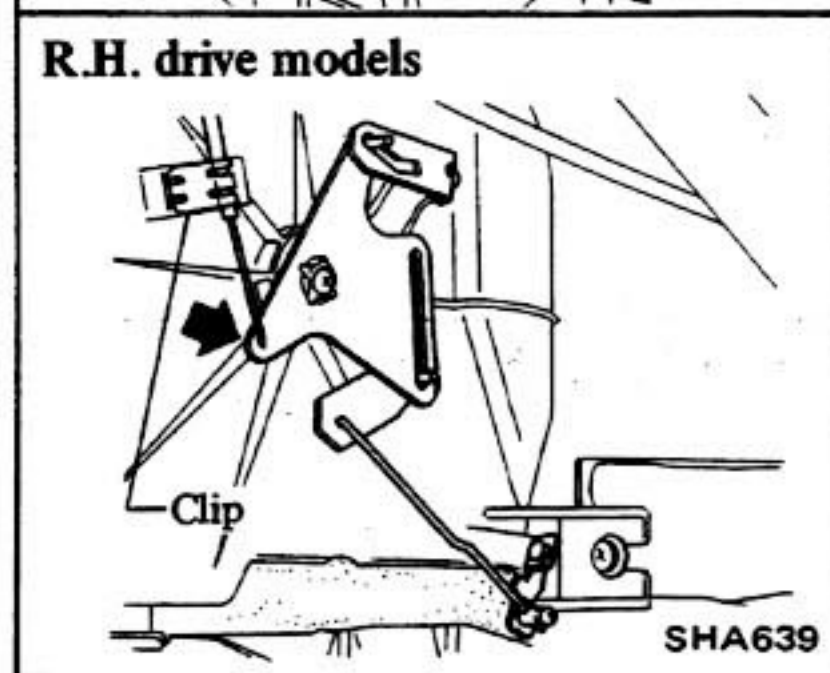
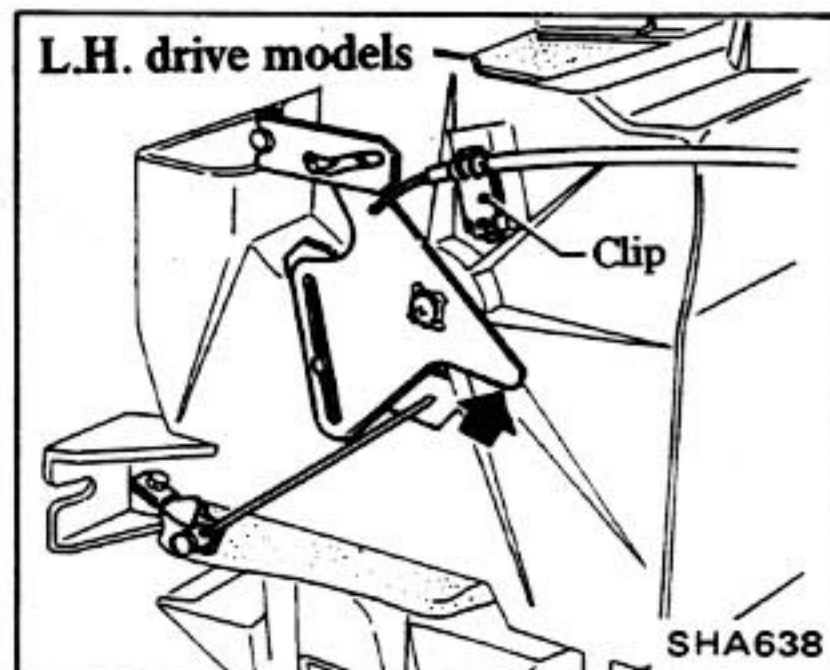
**Service Procedures – HEATER**

2. With lever pushed in direction of arrow, fasten control cable with clip.

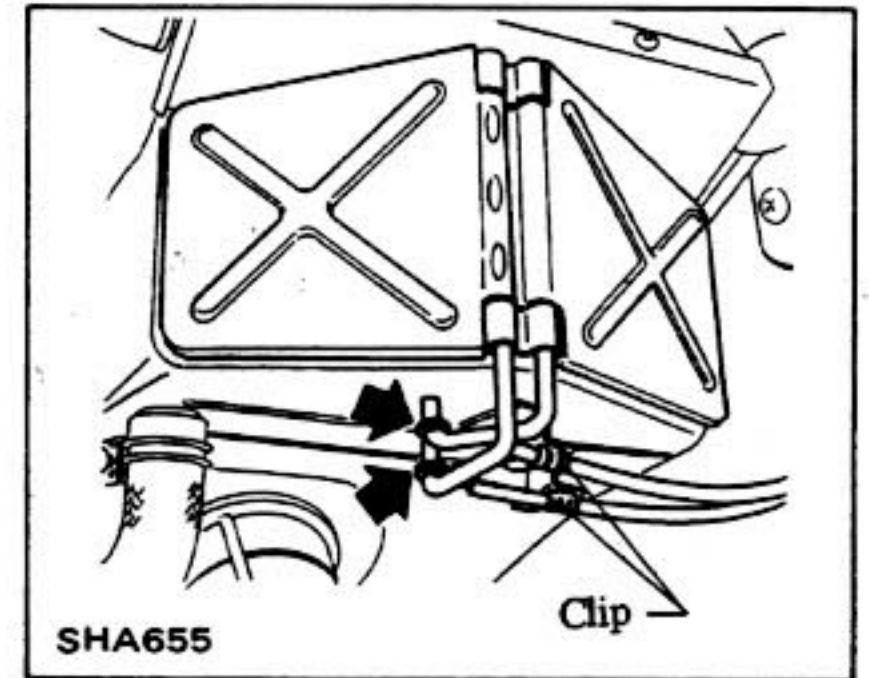


**Floor door/ventilator door control cable**

1. Move control lever to .
2. With lever pushed in direction of arrow, fasten control lever with clip.

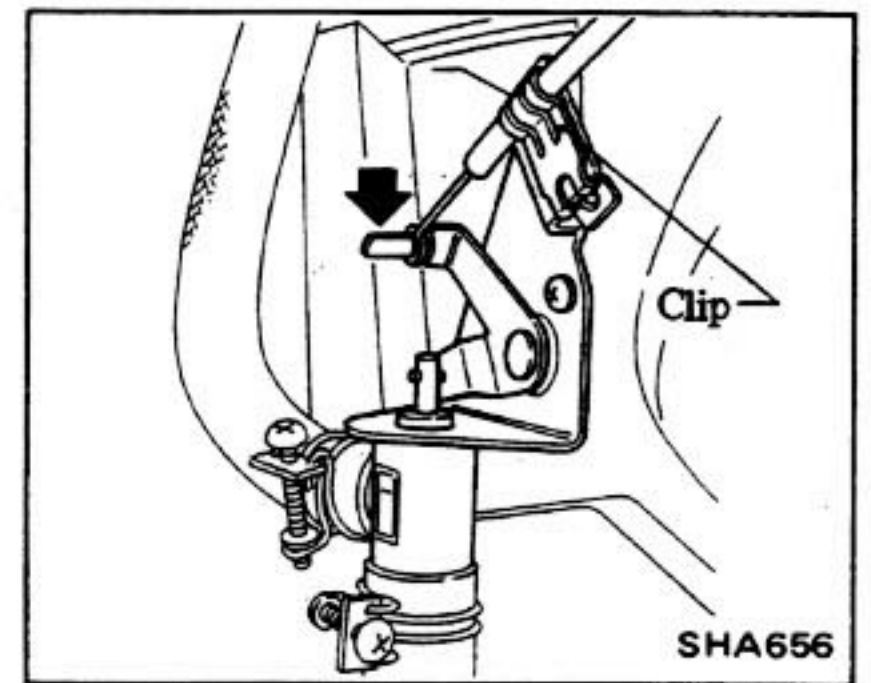


2. With heater door closed, connect cable and fasten it with clips.



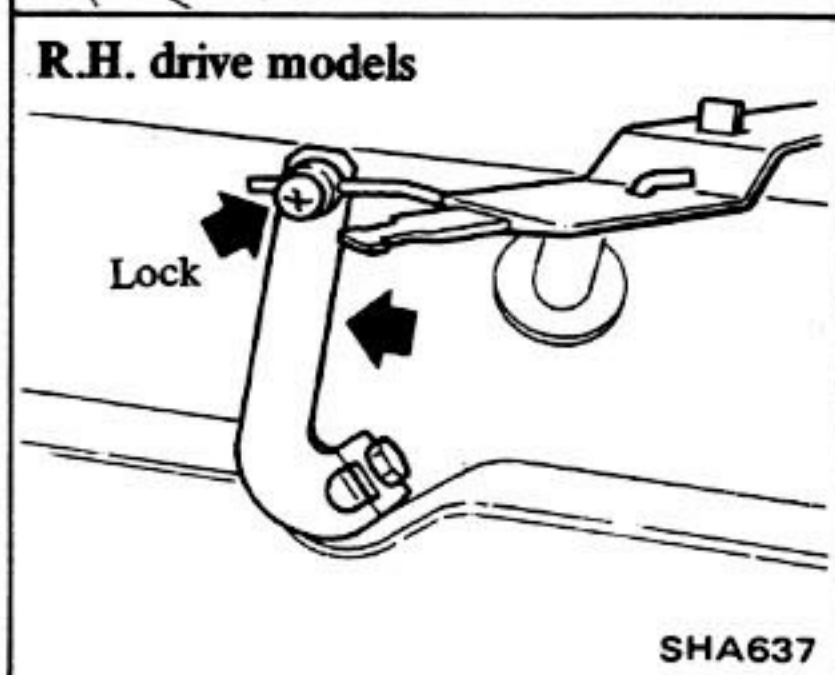
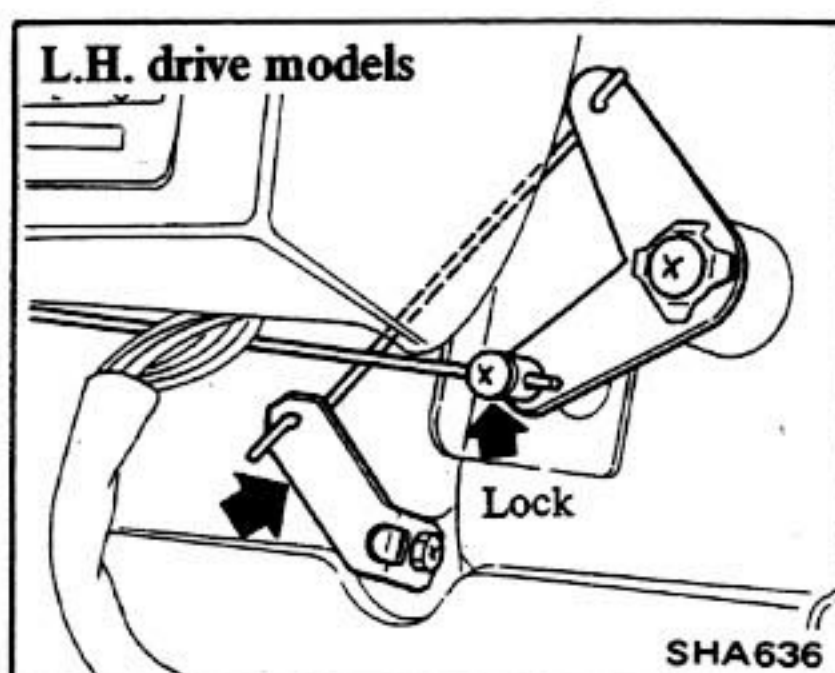
**Water cock control cable**

1. Move control lever to "COLD".
2. With water cock set at position shown by arrow, connect cable and fasten it with clips.



**Air mix door/water cock control cable**

1. Move control lever to "COLD".
2. With link pushed in direction of arrow, lock control cable with screw.

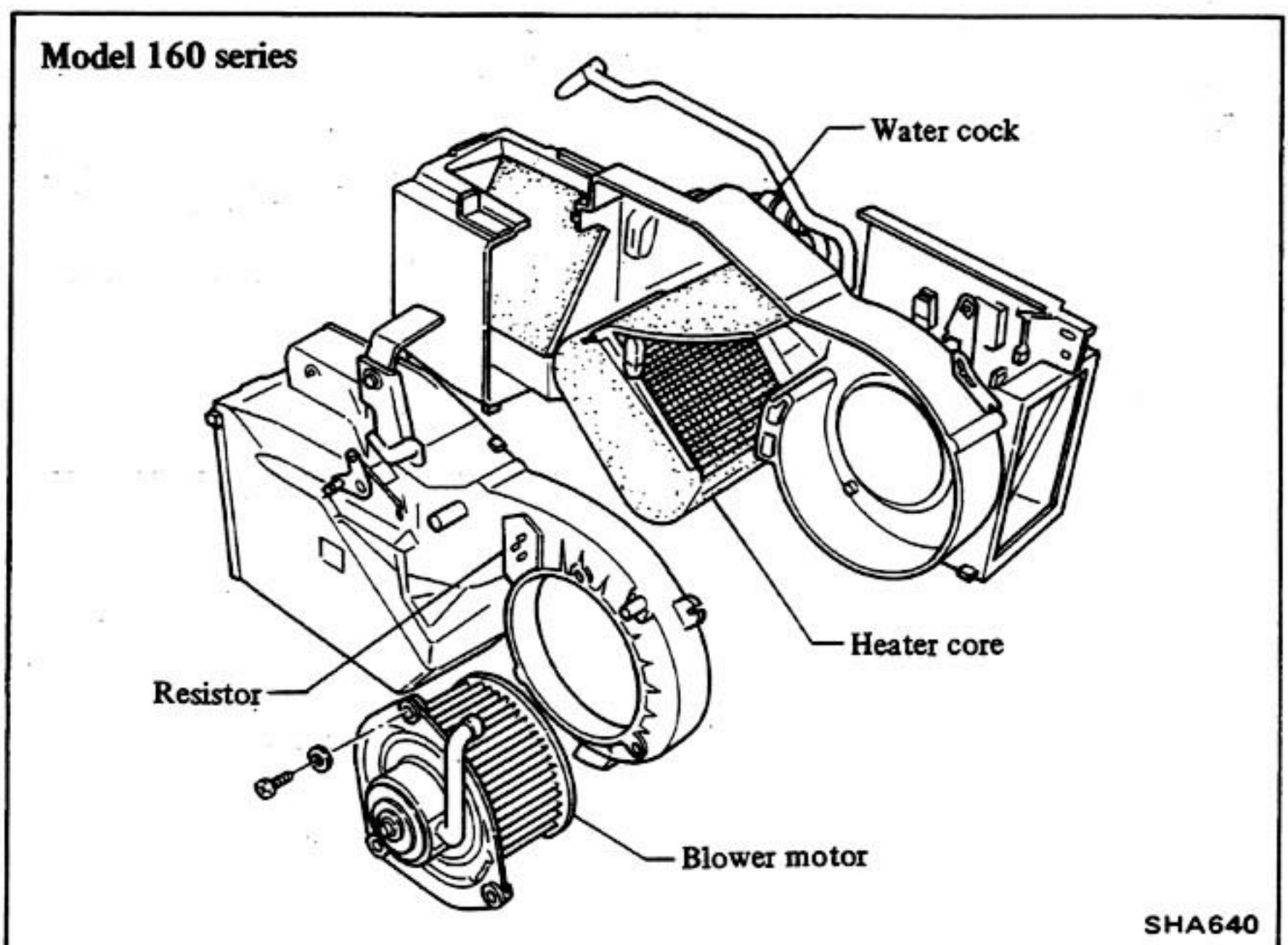


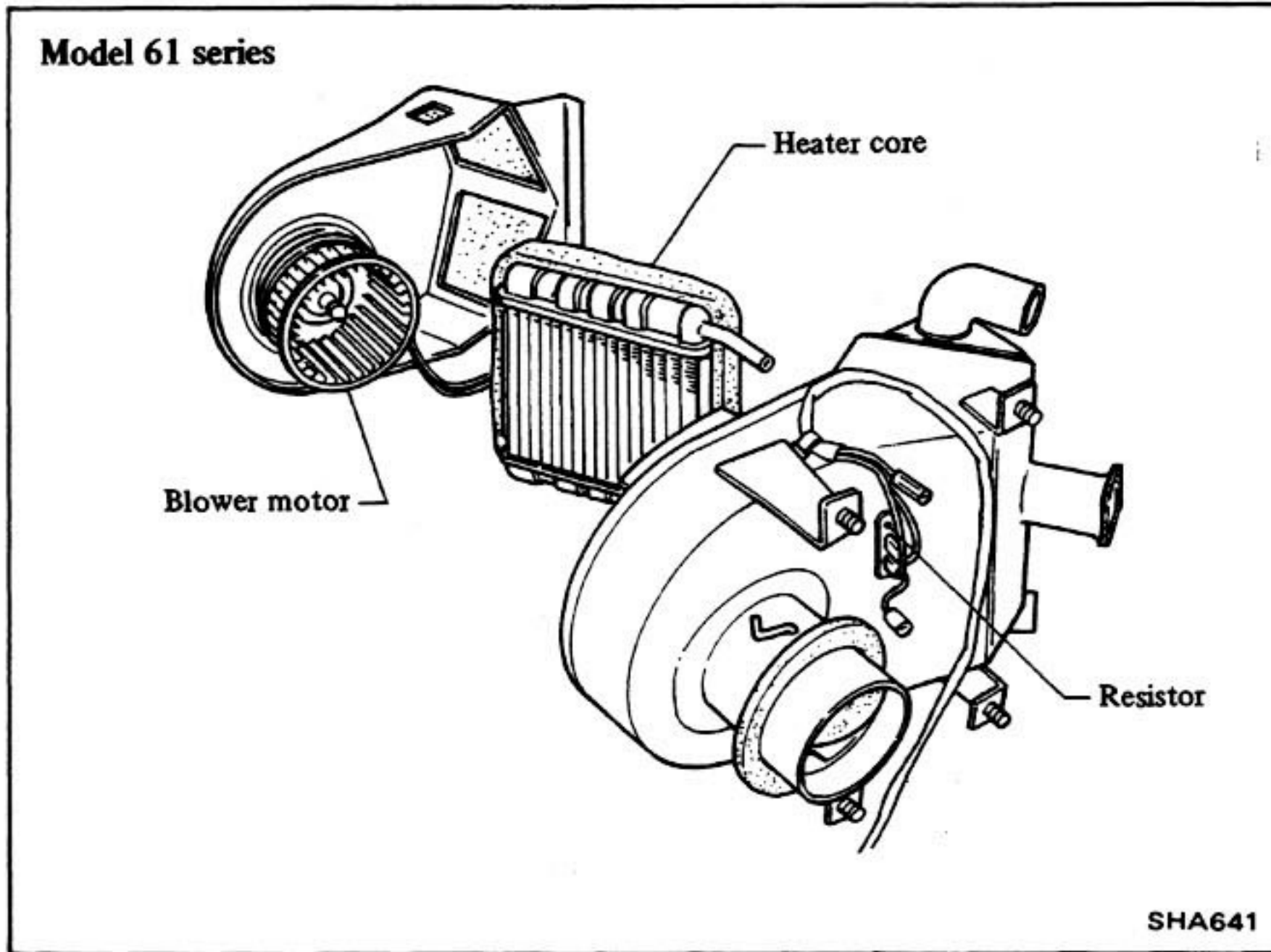
**Model 61 series**

**Room/defroster control cable**

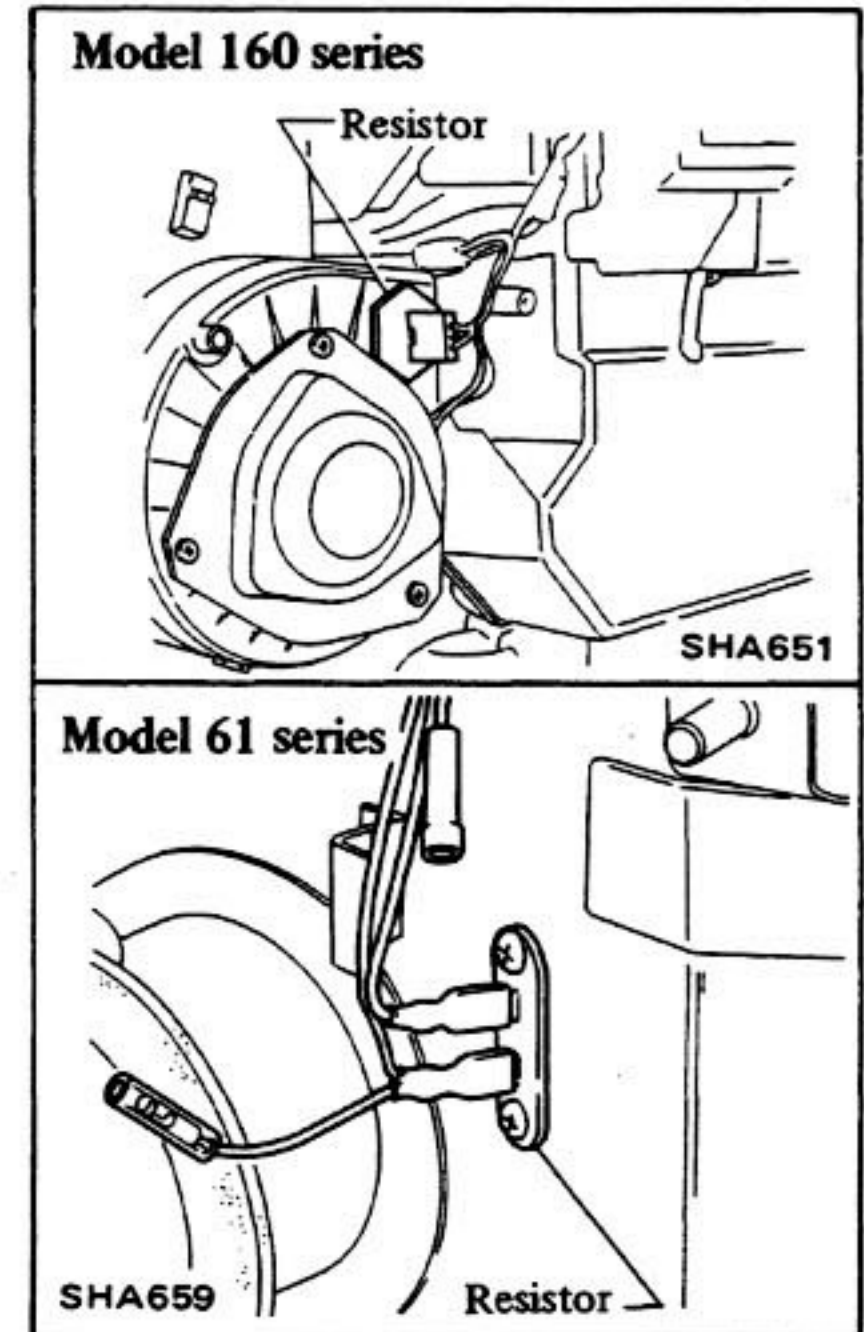
1. Move control lever to "OFF".

**HEATER/BLOWER UNIT**





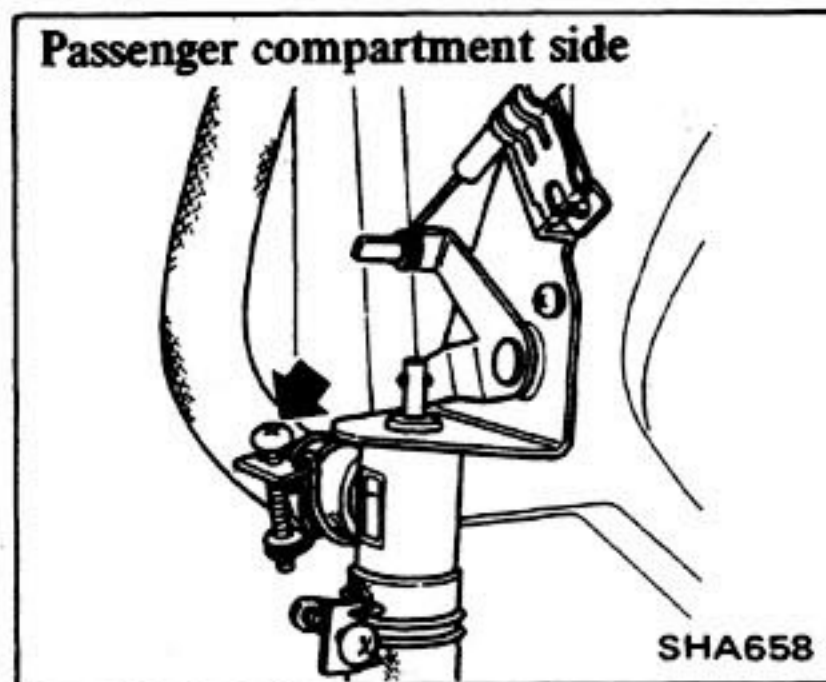
## RESISTOR



## REMOVAL AND INSTALLATION

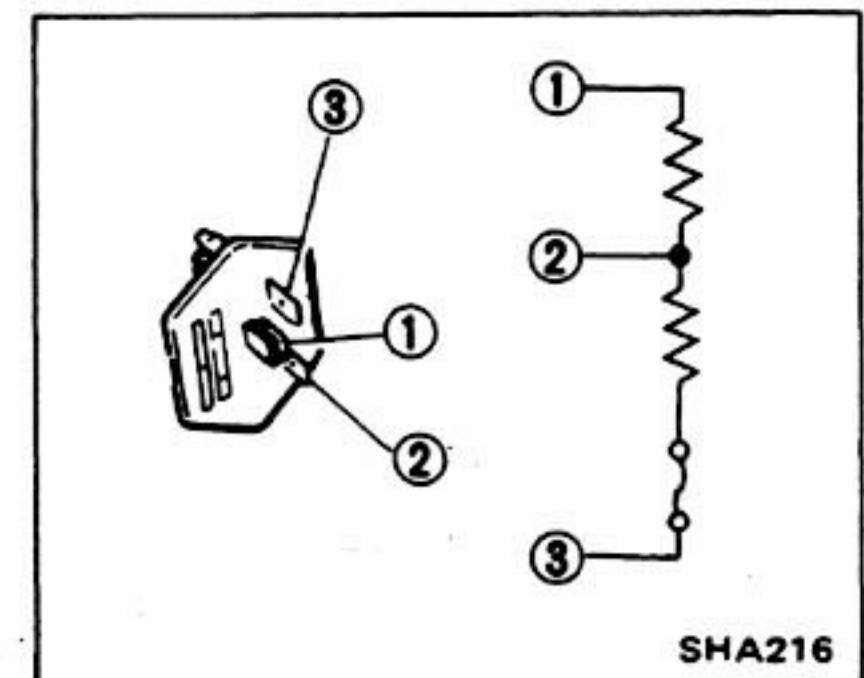
### Model 160 series

1. Disconnect battery ground cable.
2. Drain coolant.
3. Remove instrument upper finisher.
  - Remove assistant strap.
  - Remove radio, if so equipped.
  - Remove meter cover and then remove meter assembly.
4. Remove glove box.
5. Disconnect heater hose.
6. Remove heater control unit.
7. Remove heater/blower unit assembly.



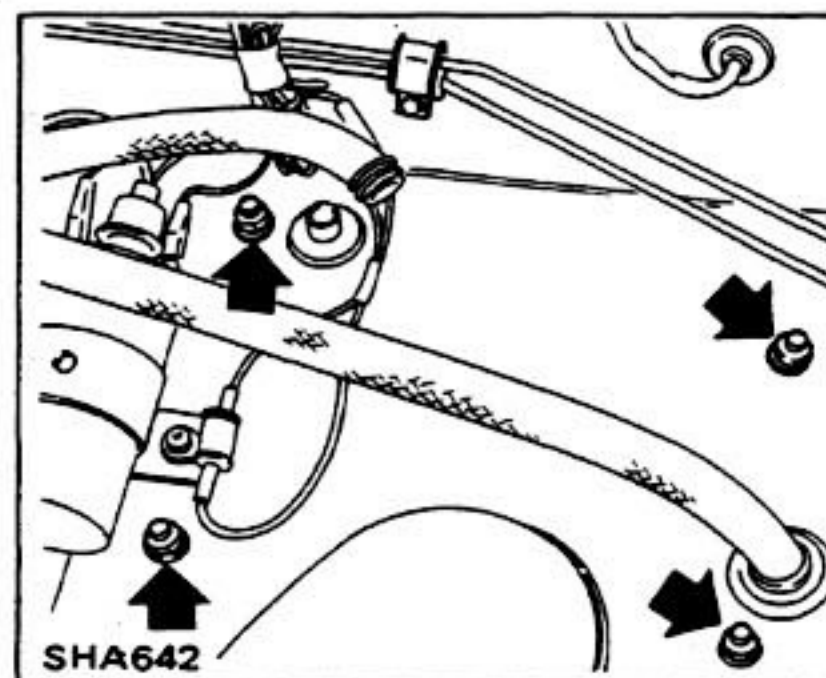
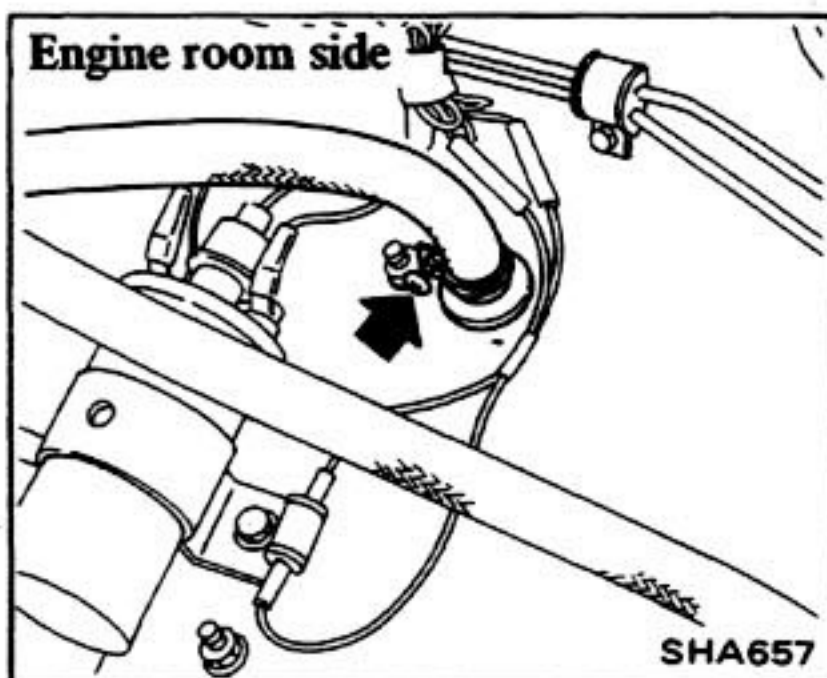
## INSPECTION

Test continuity through resistor with a test lamp or ohmmeter.

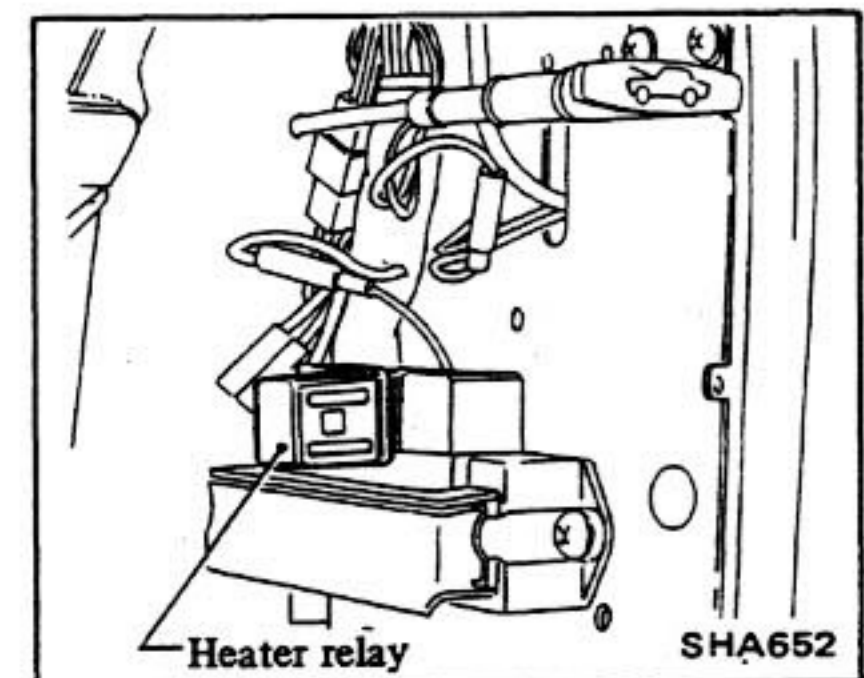


### Model 61 series

1. Disconnect battery ground cable.
2. Drain coolant.
3. Disconnect heater hose.
4. Remove control cable.
5. Remove duct.
6. Remove bolt and then remove heater/blower unit assembly.

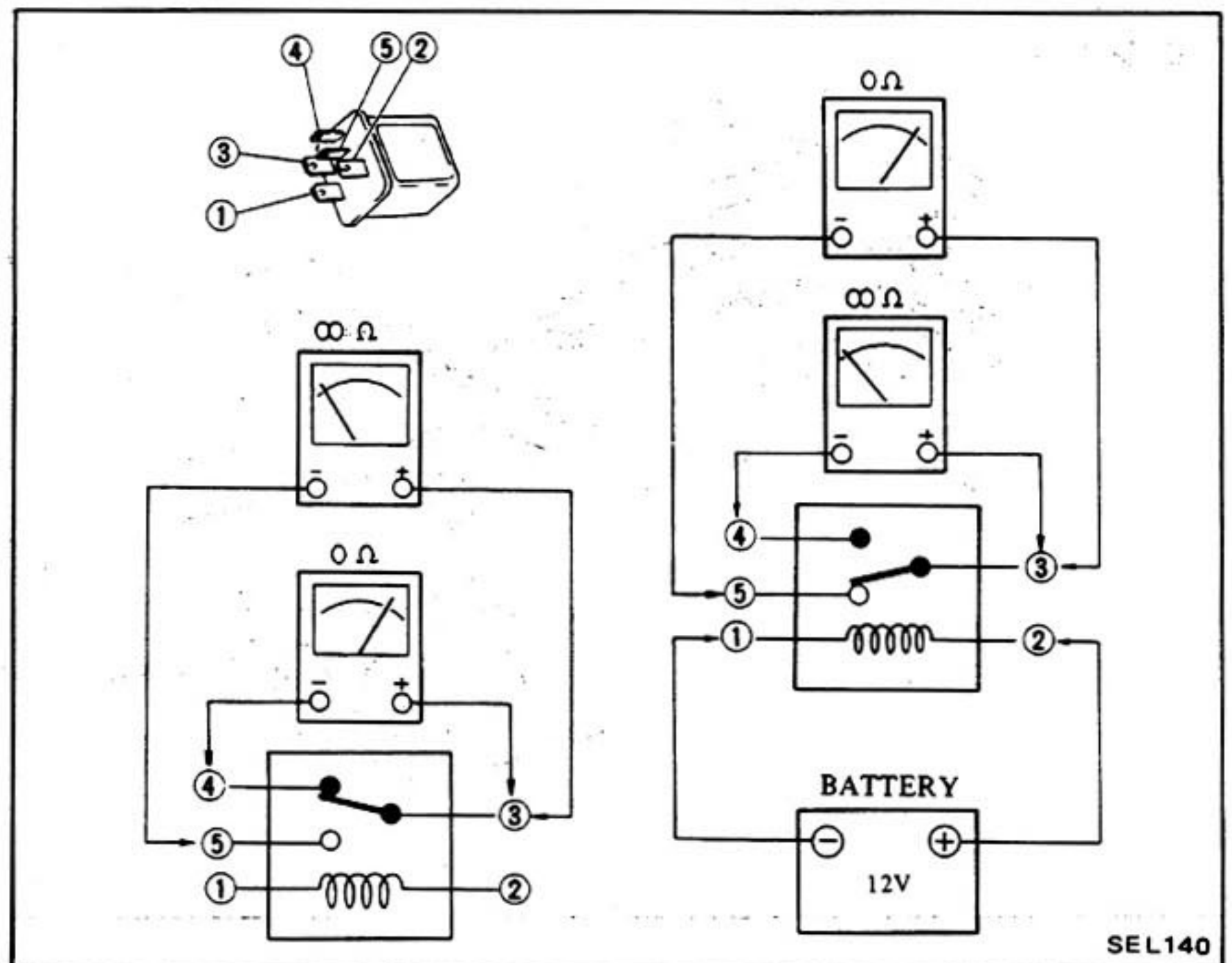


## HEATER RELAY



**INSPECTION**

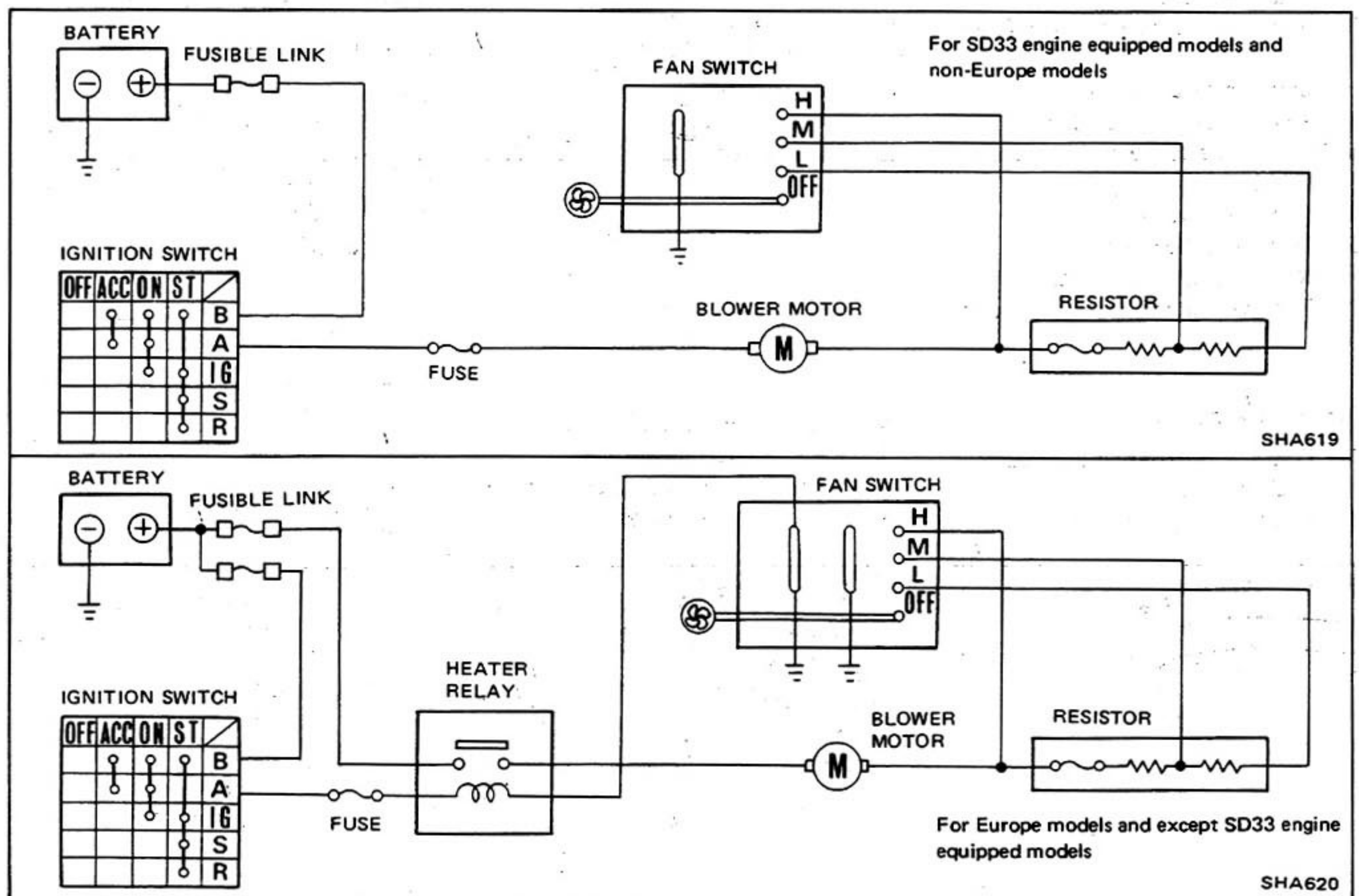
Test continuity through relay with an ohmmeter.



SEL140

**ELECTRICAL CIRCUIT**

**SCHEMATIC**



SHA619

For Europe models and except SD33 engine equipped models

SHA620



**TROUBLE DIAGNOSES AND CORRECTIONS**

Condition	Probable cause	Corrective action
Insufficient heating performance. No heated air discharged.	Cooling water temperature too low. Heater core plugged. Insufficient cooling water level. Malfunctioning air mix door. Malfunctioning water cock.	Check thermostat. Replace as necessary. Clean. Refill. Adjust control cable. Check water cock. Replace as necessary. Adjust control cable.
Insufficient air flow to floor.	Blower motor speed too low.  Malfunctioning floor door.	Check motor terminal voltage. Repair poor connection and discontinuity. Replace motor if necessary. Adjust control cable.
Insufficient defrosting performance. Cold air discharged.	Refer to "No heated air discharged".	
Insufficient air flow to defroster.	Malfunctioning floor door. Defroster nozzle plugged. Leak at defroster duct-to-nozzle connection.	Adjust control cable. Clean. Correct.
Heated air discharged in VENT and COLD position	Malfunctioning water cock.  Malfunctioning air mix door.	Check water cock. Replace as necessary. Adjust control cable. Adjust control cable.
Blower motor does not operate.	Faulty fan switch. Faulty resistor. Faulty blower motor. Faulty heater relay (For 180 wattage). Burned fuse. Loose connector.	Replace. Replace. Replace. Replace. Replace. Connect securely.
Control lever drags.	Inner wire rubbing against outer case end. Control cable bent excessively. Malfunctioning doors, door levers, etc.	Adjust control cable. Correct. Check and correct.
Recirculating air is not taken in with air intake lever in RECIRC.	Air intake door does not operate properly.	Adjust control cable.
Noise from blower motor.	Loose bolt in blower motor.	Check and tighten loose bolts.

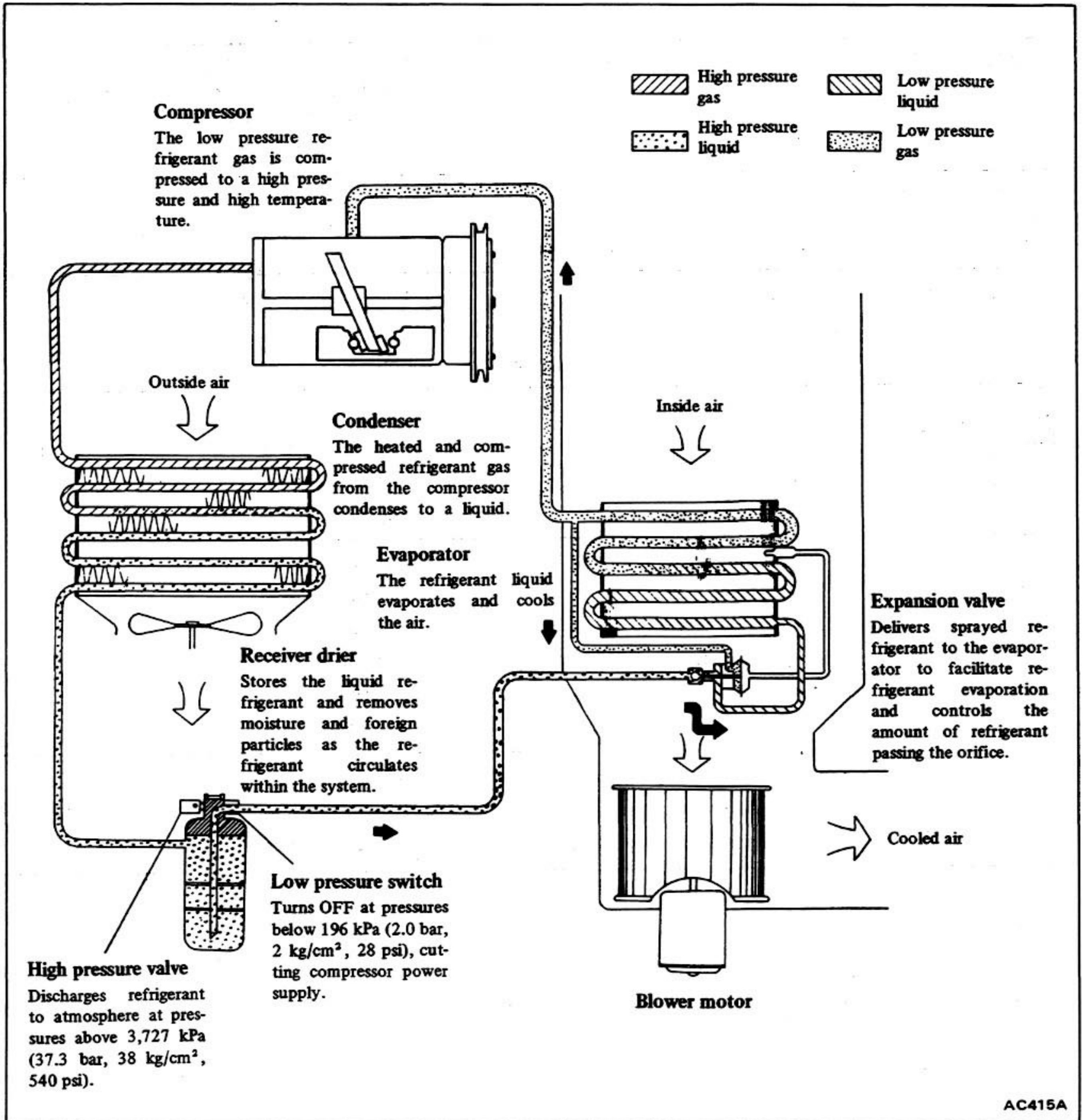
## DESCRIPTION

### REFRIGERATION SYSTEM

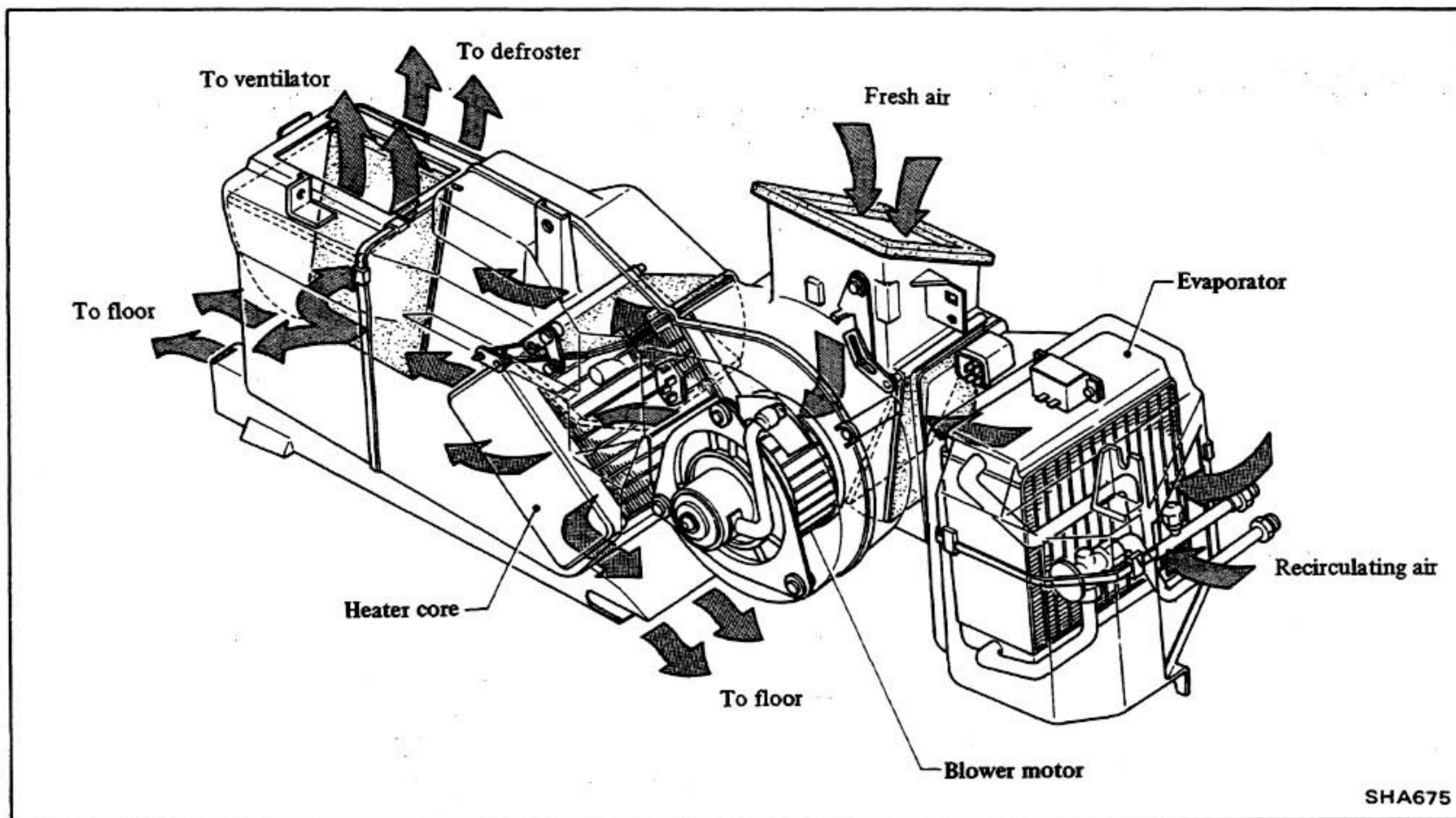
If you were to paint your finger with alcohol, your finger would feel cold. This is because the liquid alcohol takes heat away from your finger while it evaporates. If a quickly evaporating liquid such as alcohol is placed

in a container inside a box, the temperature inside the box will drop. This is because the alcohol is evaporated absorbing the heat from the air inside the box. If the gaseous alcohol is collected and cooled with cold water, it will be changed back into a liquid by absorption of its heat by the cold water.

The cooler operates on this principle. The liquid used is the refrigerant R-12. The heat inside the passenger compartment is absorbed by changing the refrigerant from a liquid to a gas and then dissipated to the outside by changing the refrigerant from a gas back to a liquid.

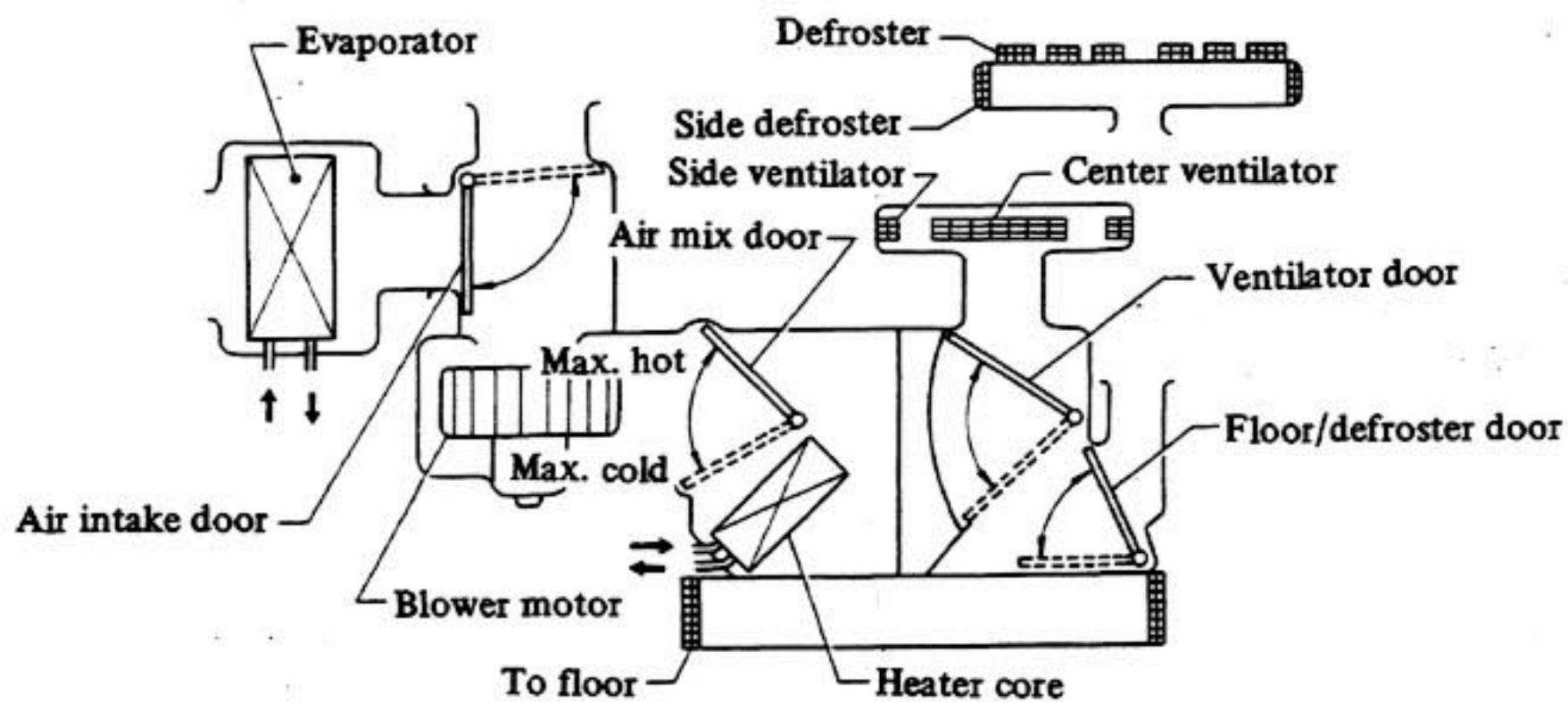
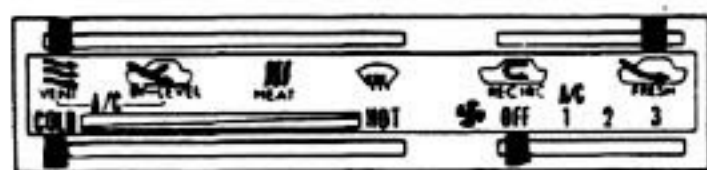


**AIR FLOW**



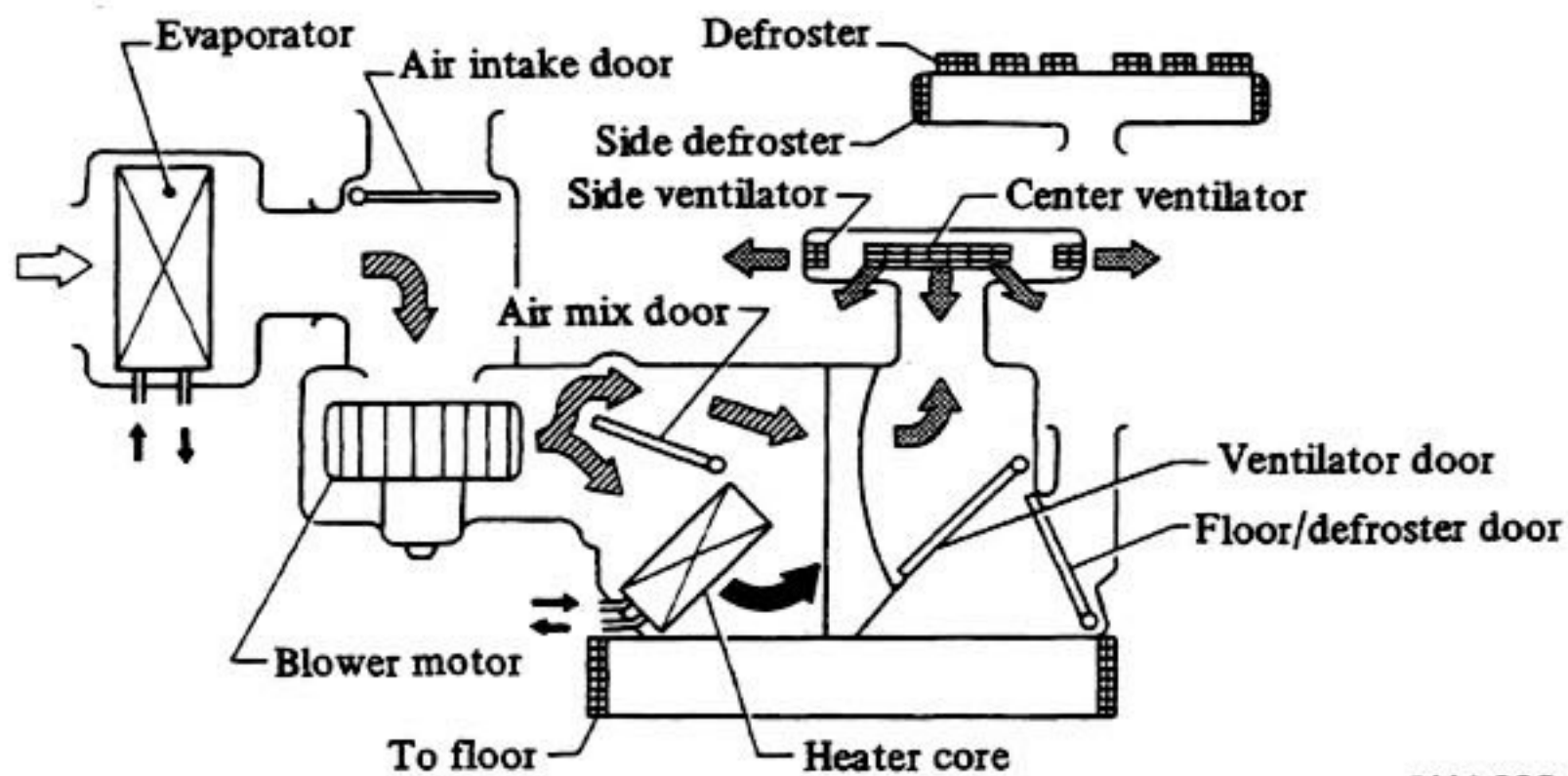
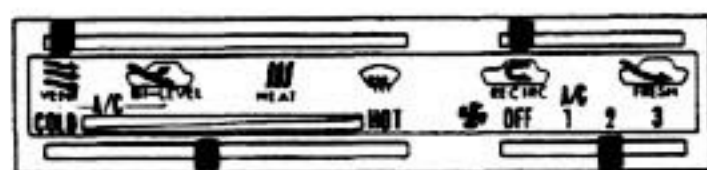
SHA675

**OFF**



SHA601

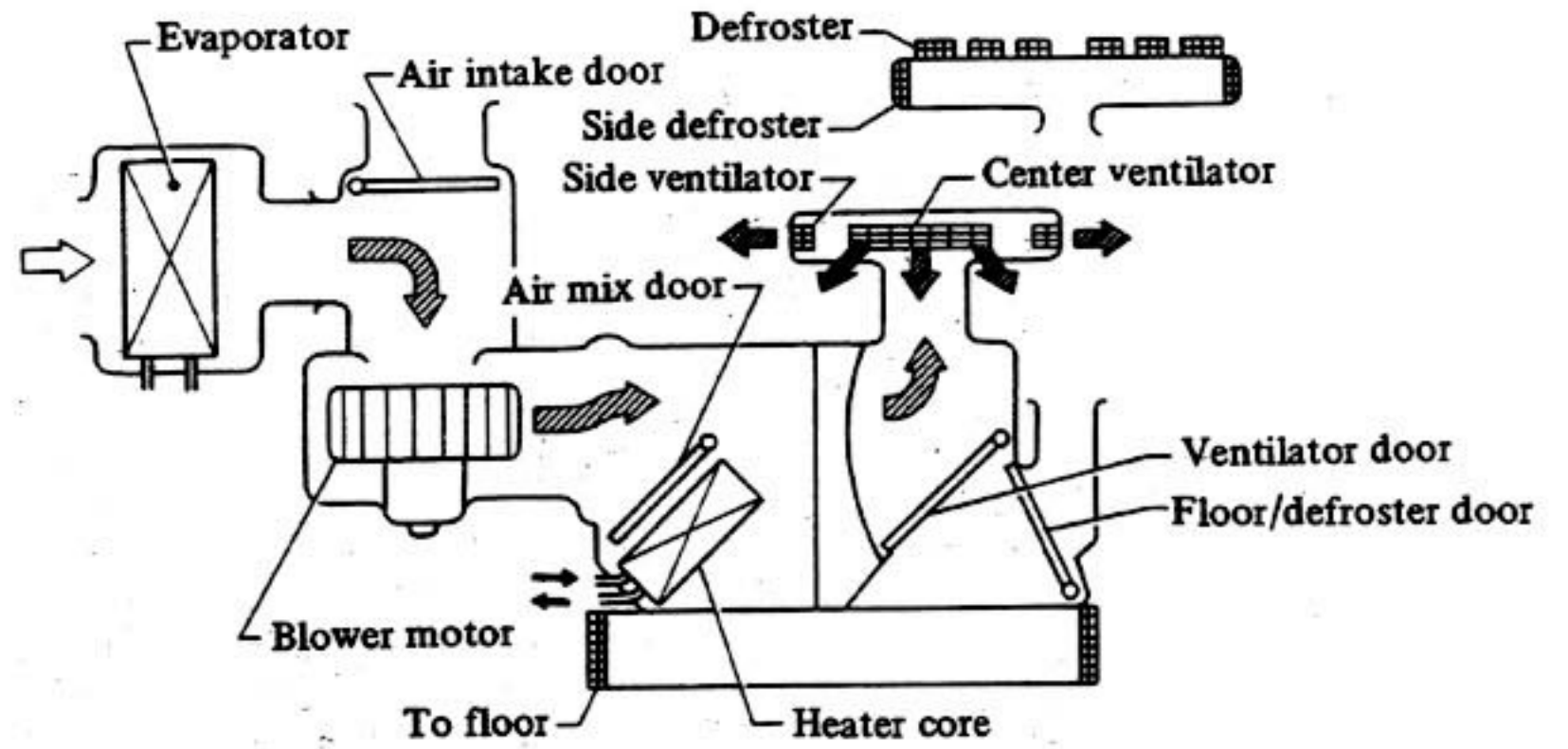
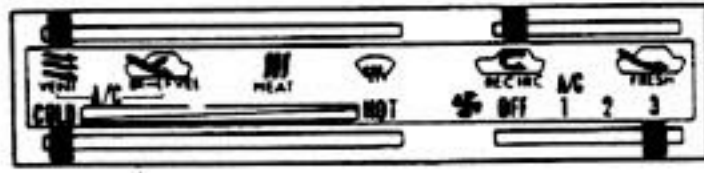
**VENT-A/C-position**



SHA602

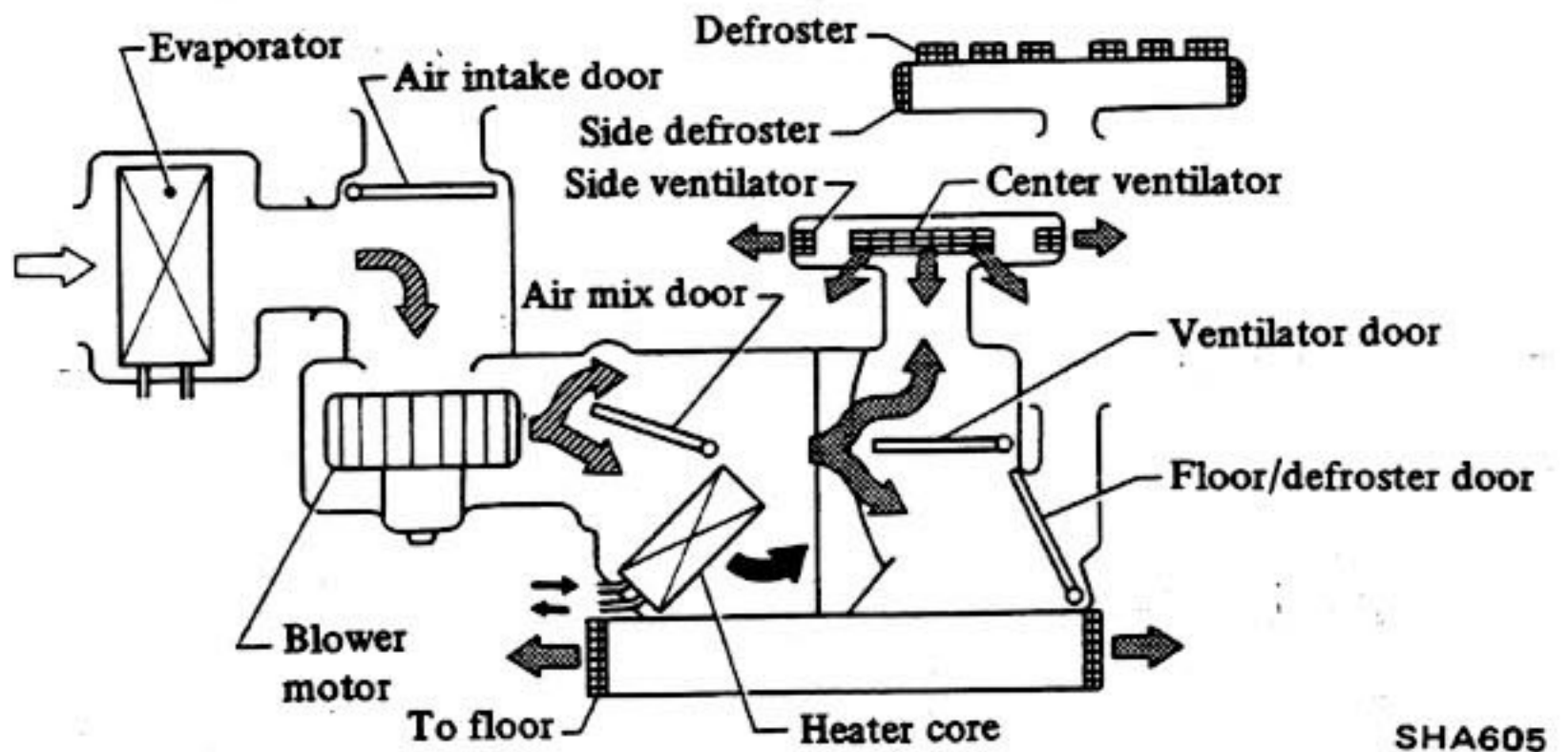
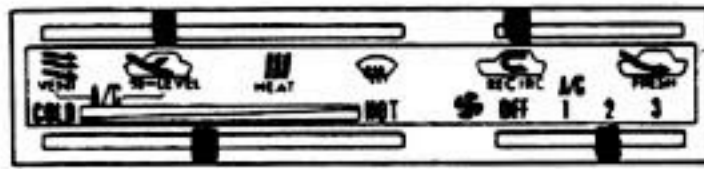
Description – AIR CONDITIONER

**VENT-A/C-position  
(Max. cooling)**



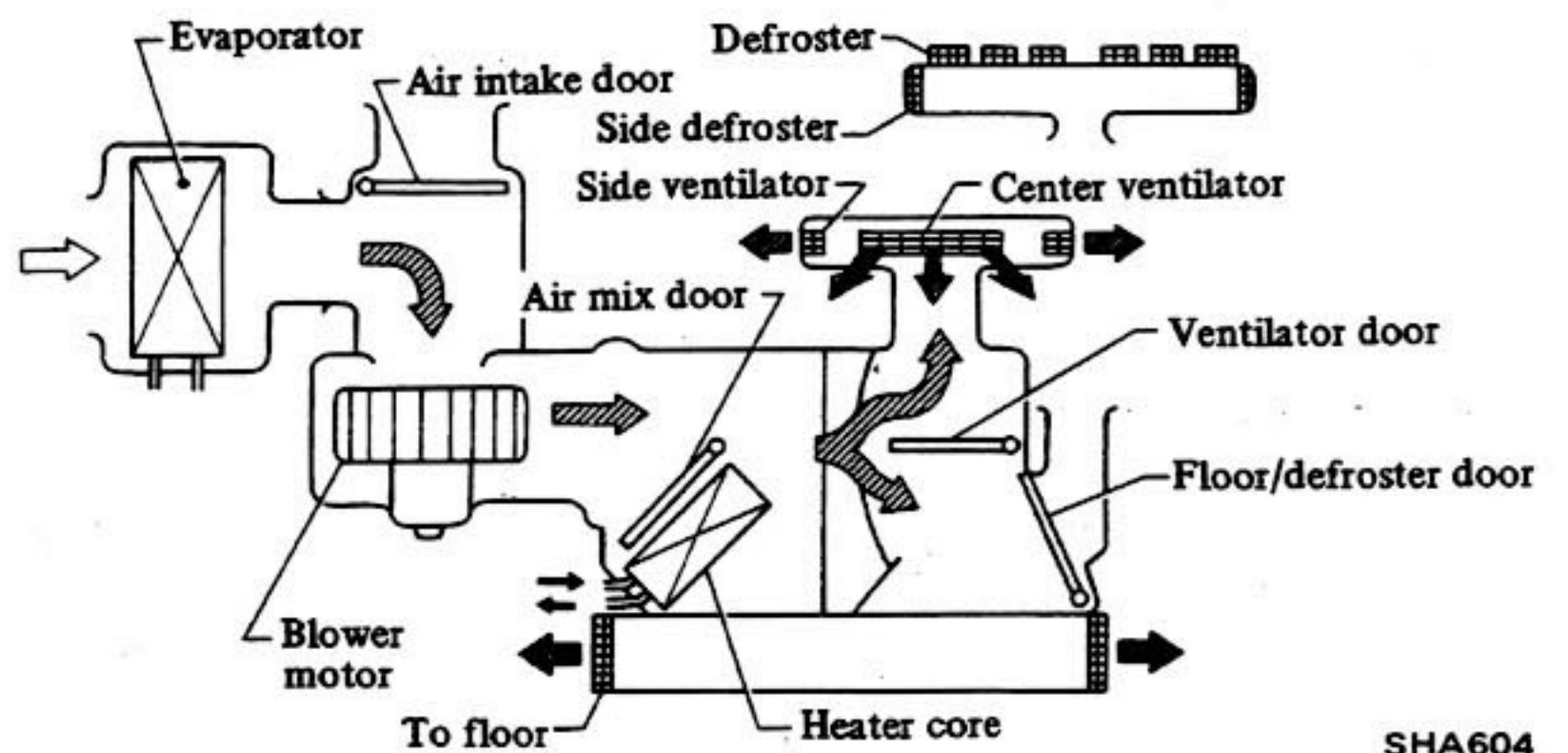
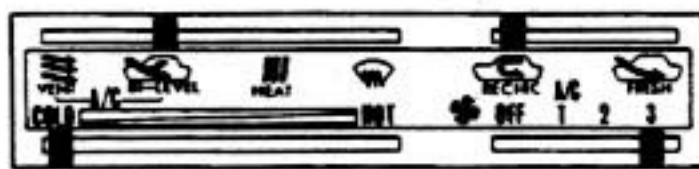
SHA603

**BI-LEVEL-A/C-position**



SHA605

**BI-LEVEL-A/C-position  
(Max. cooling)**



SHA604

**HEAT, HEAT (Fast heating),  
☀️ and ☀️ (Fast defrosting) position**

Refer to Description in Heater.

## GENERAL SERVICE

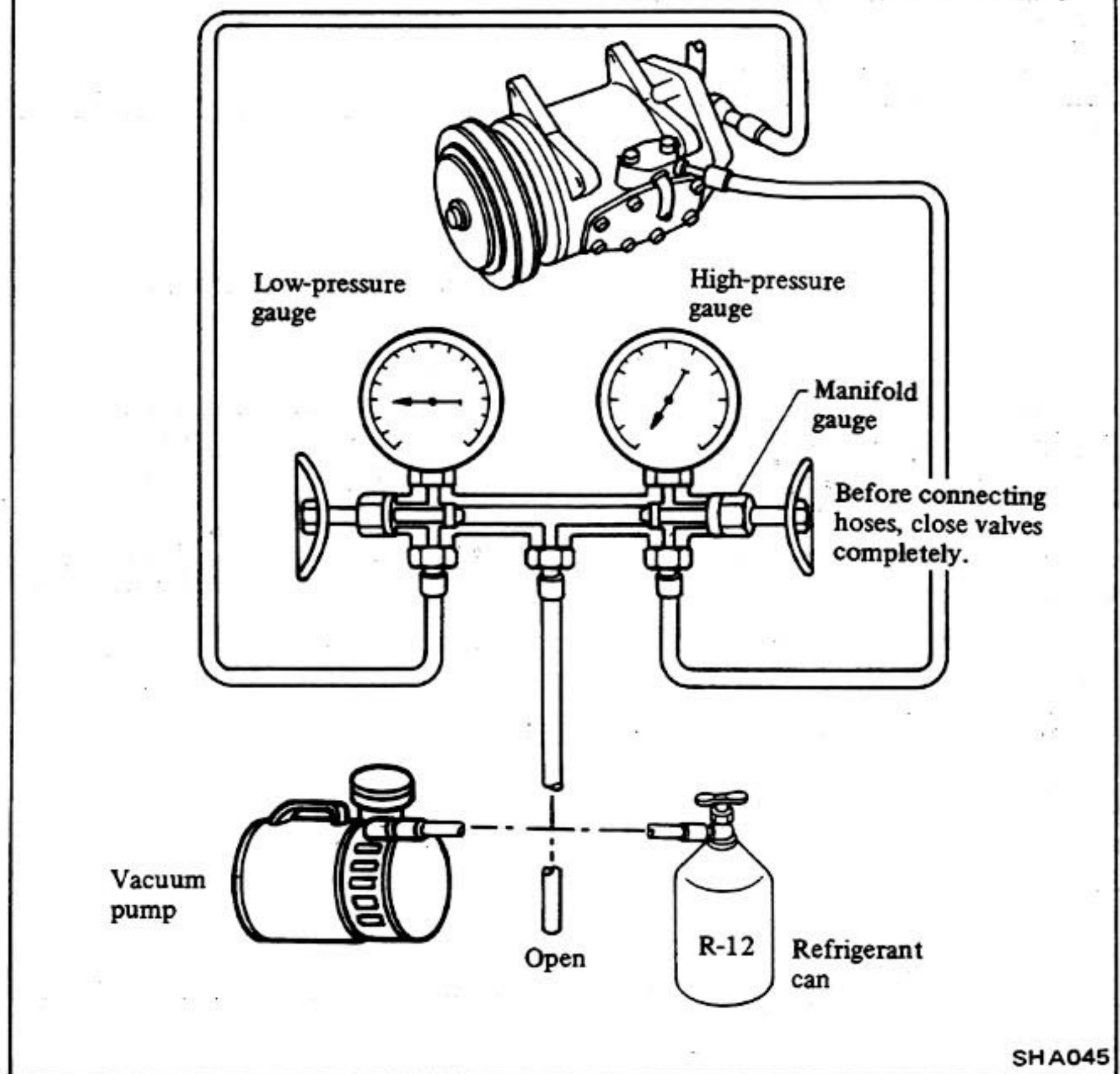
### PRECAUTIONS

#### WARNING:

1. Since direct contact of the liquid refrigerant with your skin will cause frostbite, always be careful when handling the refrigerant. Always wear goggles to protect your eyes when working around the system.
2. The refrigerant service container has a safe strength. However, if handled incorrectly, it will explode. Therefore, always follow the instructions on the label. In particular, never store it in a hot location [above 52°C (126°F)] or drop it from a high height.
3. The refrigerant gas is odorless and colorless and breathing may become difficult due to the lack of oxygen. Since the refrigerant gas is heavier than air and will lay close to the floor, be especially careful when handling it in small, confined spaces.
4. The refrigerant itself is nonflammable. However, a toxic gas (phosgene gas) is produced when it contacts fire and special care is therefore required when checking for leaks in the system with a halide torch.
5. Do not steam clean on the system, especially condenser, since excessively high pressure will build up in the system, resulting in explosion of the system.

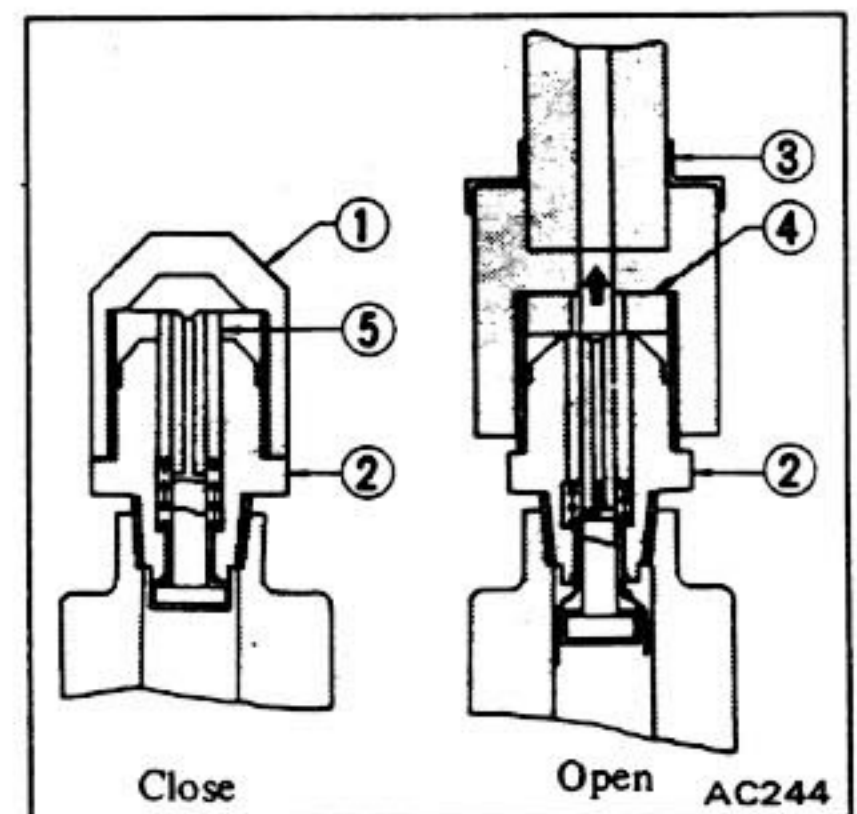
### INSTALLING MANIFOLD GAUGE

Hoses for the low pressure valve (suction valve) and high pressure valve (discharge valve) should be connected securely to "high" and "low", respectively, on the manifold. Refer to identification marks (suction side; "S" discharge side "D") on compressor.



#### Connection to service valve

1. Fully close both valves of manifold gauge. Connect high- and low-pressure charging hoses to manifold gauge.
2. Remove caps from service valves. Connect high- and low-pressure charging hoses to service valves in system.

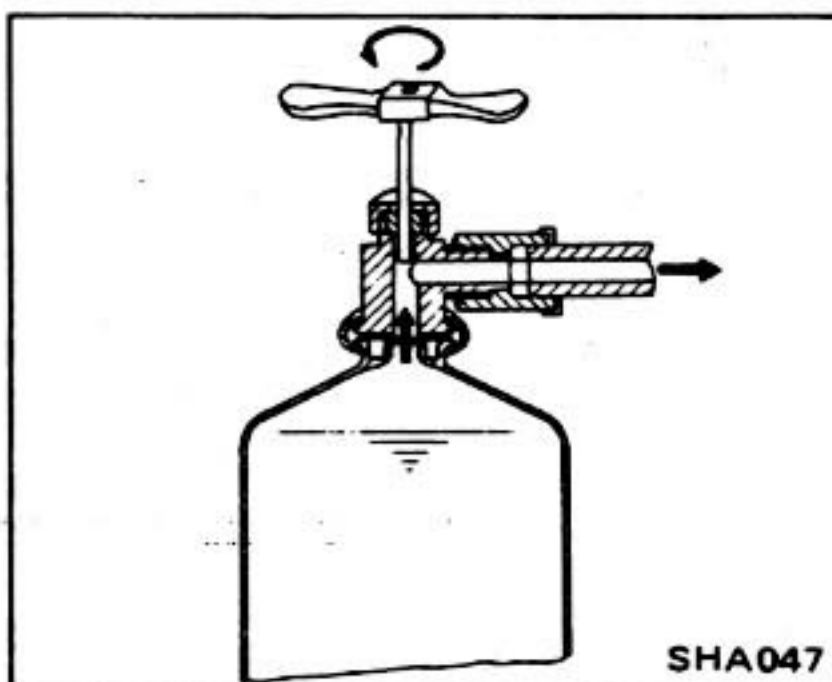


- 1 Cap
- 2 Service valve
- 3 Charging hose
- 4 Packing
- 5 Check valve

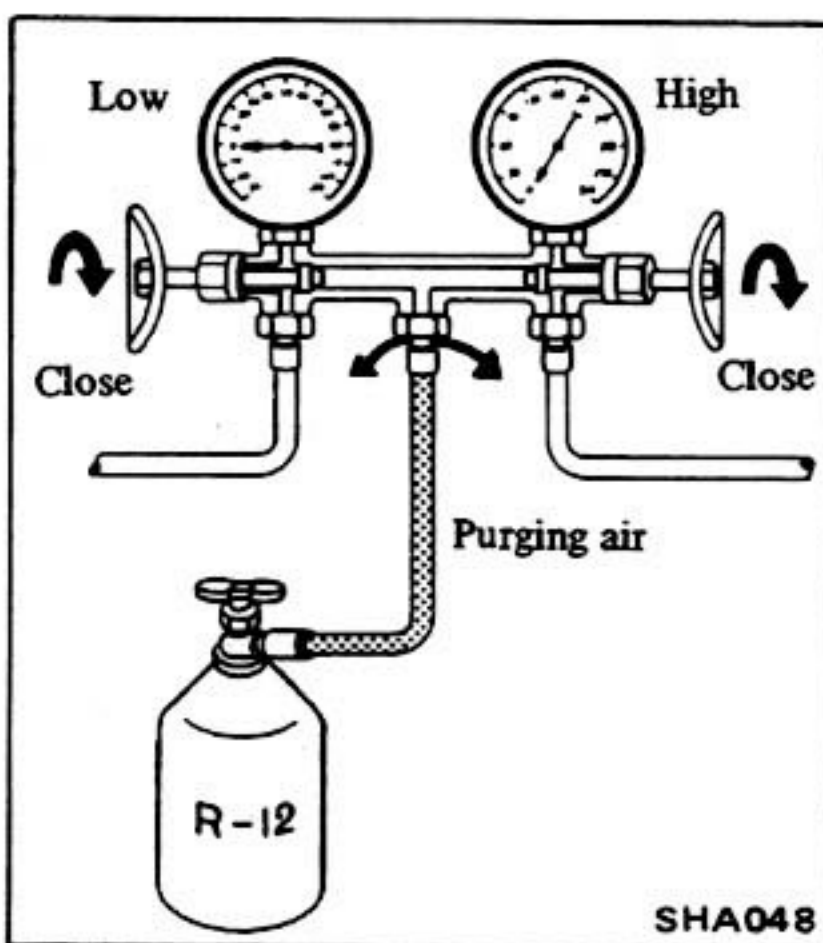
**Disconnection from service valve**

1. Fully close both valves of manifold gauge.
2. Quickly disconnect two charging hoses from service valves and install caps on service valves.

**CAUTION:**  
Do not over-tighten valve cap.



6. Purge air from charging hose by loosening charging hose nut at manifold gauge.

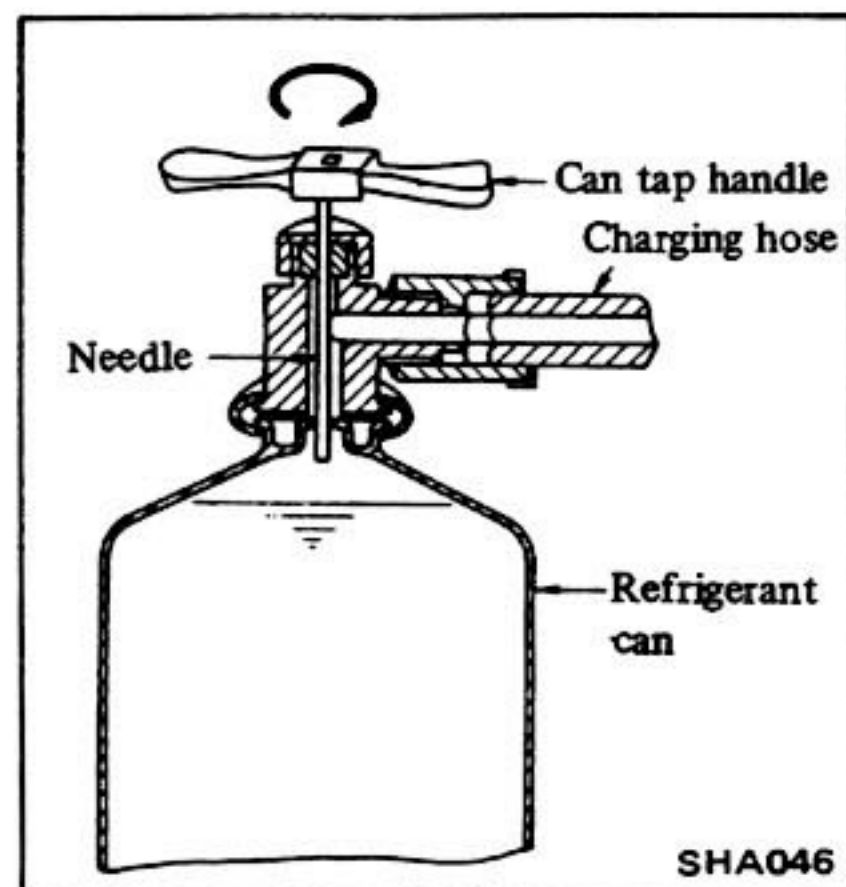


**HANDLING REFRIGERANT SERVICE CAN TAP**

The following procedures apply to conventional can taps.

For the correct usage, refer to the manufacturer's instructions.

1. Connect charging hose between manifold gauge and can tap.
2. Fully turn in (close) valve stem of manifold gauge.
3. Attach can tap to refrigerant can by turning can tap handle fully counterclockwise.
4. Make a hole in refrigerant can by turning can tap handle clockwise.



5. Turn the handle fully counterclockwise to raise the needle. Refrigerant gas will flow up to the manifold gauge.

**DISCHARGING REFRIGERANT**

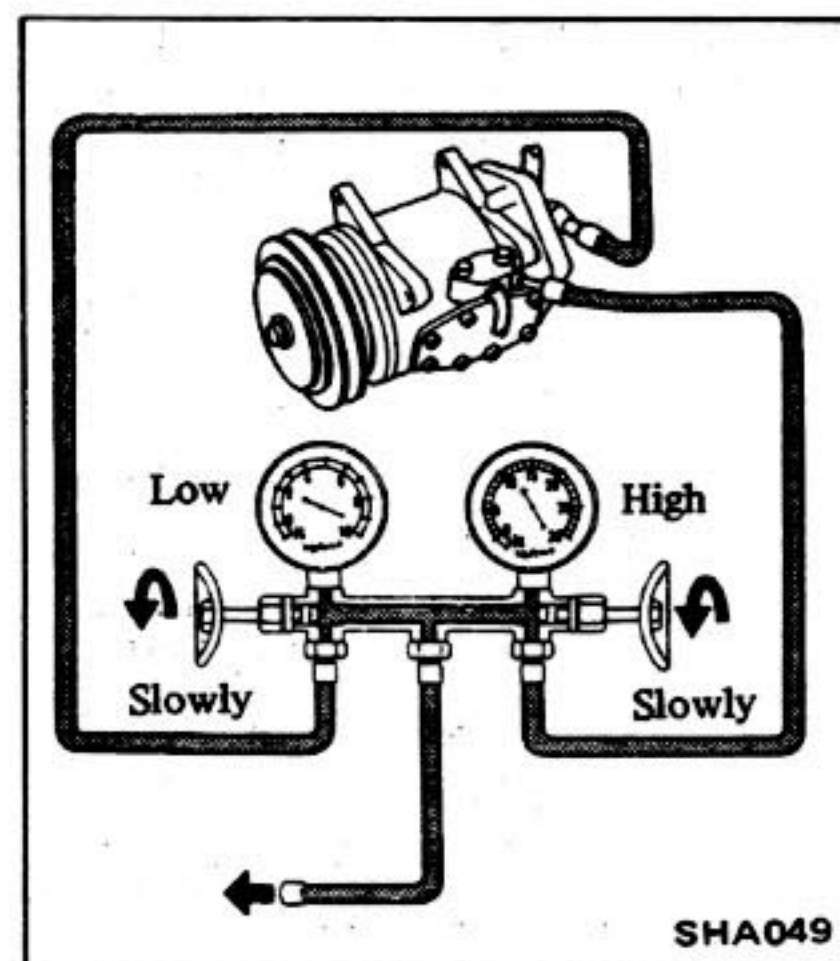
The pressurized refrigerant gas inside the system must be discharged at a pressure approaching atmospheric pressure prior to evacuating refrigerant inside the system.

1. Close high- and low-pressure valves of manifold gauge fully.
2. Connect two charging hoses of manifold gauge to their respective service valves.

**WARNING:**  
Securely connect high pressure (discharge) service valve to that of manifold gauge with a hose; also connect low pressure (suction) service valve to that of manifold gauge.

3. Open both manifold gauge valves slightly and slowly to discharge refrigerant from system.

Do not allow refrigerant to rush out. Otherwise, compressor oil will be discharged along with refrigerant.



**EVACUATING AND CHARGING REFRIGERANT SYSTEM**

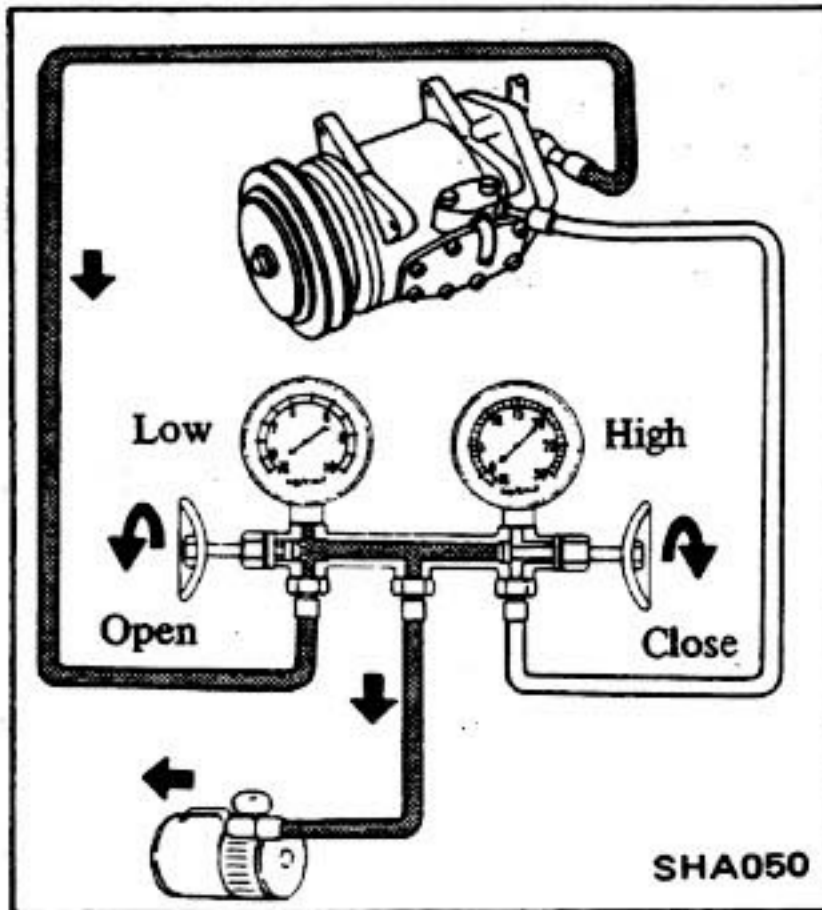
**EVACUATING REFRIGERANT SYSTEM**

1. Install manifold gauge on system and discharge refrigerant from system until pressure reaches atmospheric pressure.

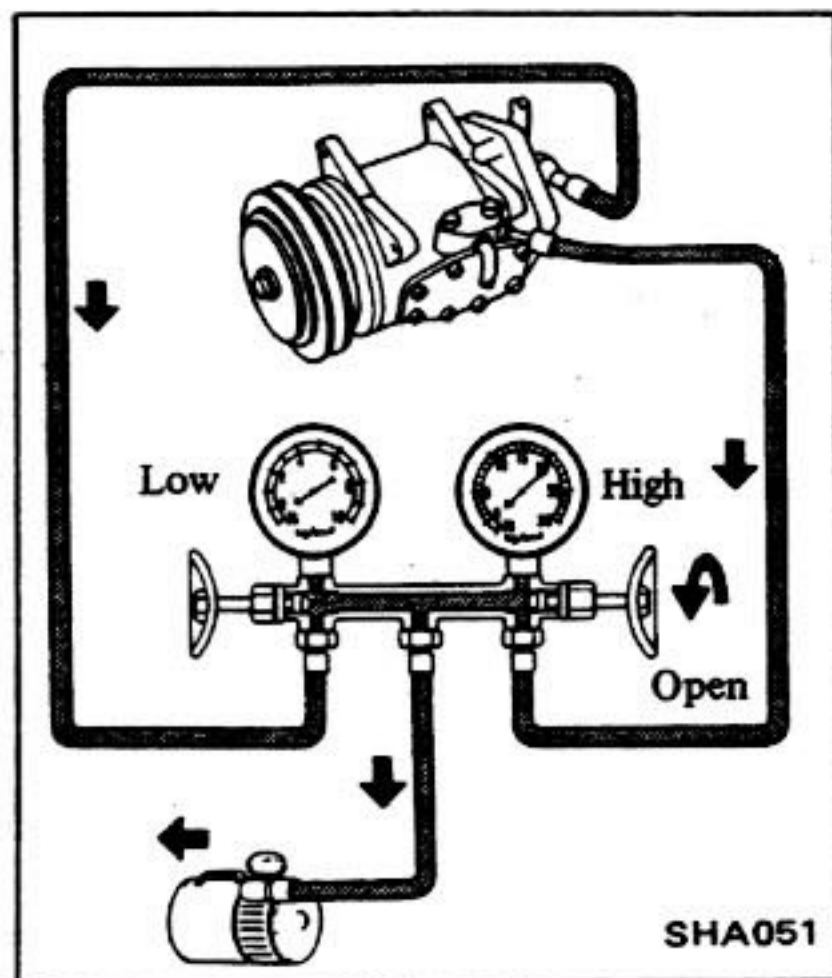
**WARNING:**  
Securely connect high pressure (discharge) service valve to that of manifold gauge with a hose; also connect low pressure (suction) service valve to that of manifold gauge.

2. Connect center charging hose to vacuum pump.
3. Close both valves of manifold gauge fully. Then start vacuum pump.

4. Open low-pressure valve and suck old refrigerant from system.



5. When low-pressure gauge reading has reached to approximately 66.7 kPa (667 mbar, 500 mmHg, 19.69 inHg), slowly open high-pressure valve.



6. When pressure inside system has dropped to 94.6 kPa (946 mbar, 710 mmHg, 27.95 inHg), fully close both valves of manifold gauge and stop vacuum pump. Let it stand for 5 to 10 minutes in this state and confirm that the reading does not rise.

a. The low-pressure gauge reads lower by 3.3 kPa (33 mbar, 25 mmHg, 0.98 inHg) per 300 m (1,000 ft) elevation. Perform evacuation according to the following table.

Elevation m (ft)	Vacuum of system* kPa (mbar, mmHg, inHg)
0 (0)	94.6 (946, 710, 27.95)
300 (1,000)	91.3 (913, 685, 26.97)
600 (2,000)	88.0 (880, 660, 25.98)
900 (3,000)	84.6 (846, 635, 25.00)

\*: Values show reading of the low-pressure gauge.

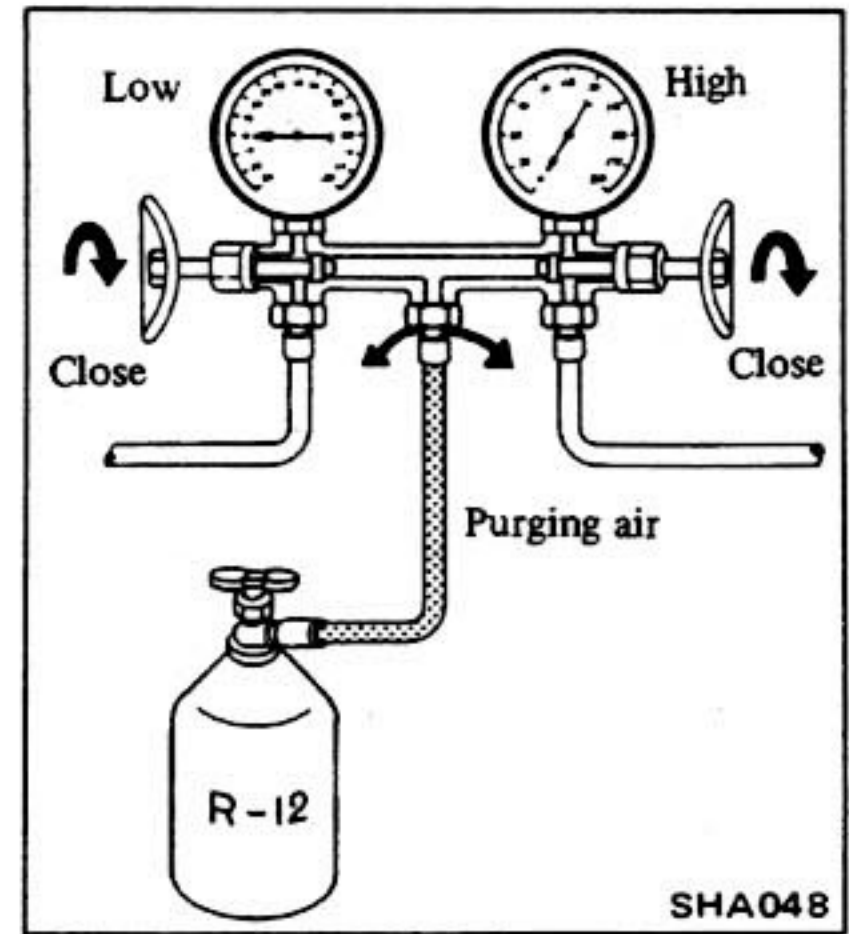
b. The rate of ascension of the low-pressure gauge should be less than 3.3 kPa (33 mbar, 25 mmHg, 0.98 inHg) in five minutes.

If the pressure rises or the specified negative pressure can not be obtained, there is a leak in the system. In this case, repair the leak described in the following.

- (1) Charge system with a can of refrigerant [about 0.4 kg (0.9 lb)]. Refer to Charging Refrigerant.
- (2) Check for refrigerant leakage with a leak detector. Repair any leakages found. Refer to Checking for Leaks (MA section).
- (3) Discharge refrigerant again, and then evacuate system.

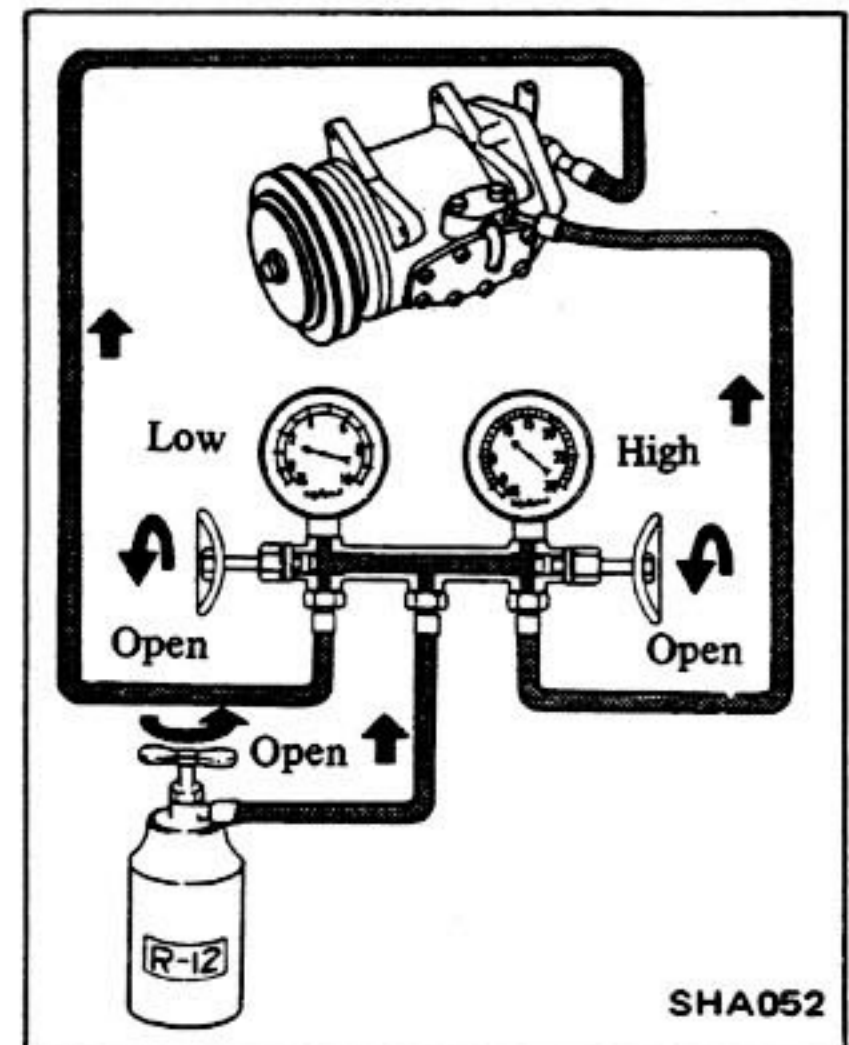
### CHARGING REFRIGERANT SYSTEM

1. Evacuate refrigerant system.
2. Close manifold gauge valves securely and disconnect charging hose from vacuum pump.
3.
  - (1) Connect center charging hose to refrigerant can through can tap.
  - (2) Break seal of refrigerant can and purge air from center charging hose.

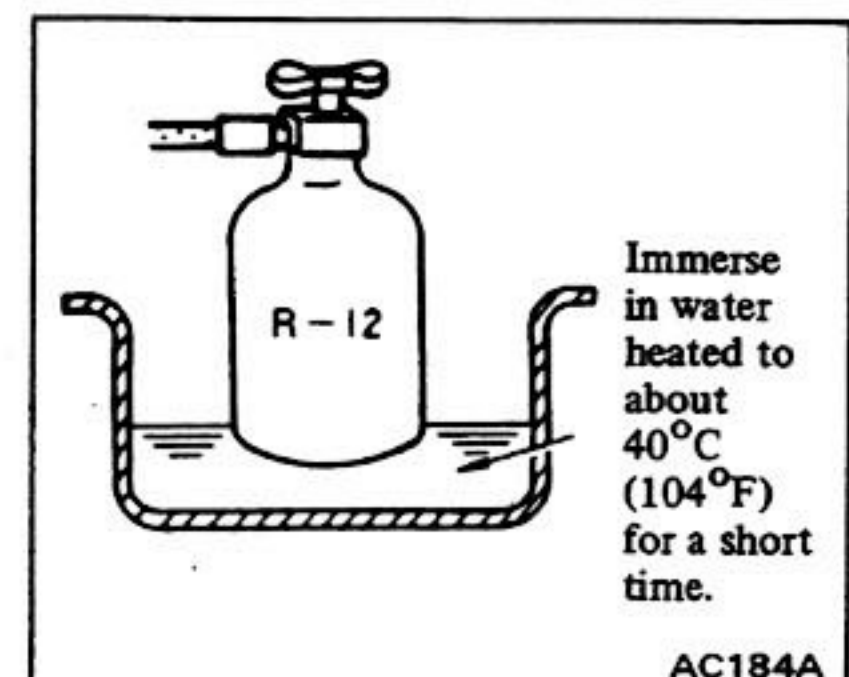


4. Charge refrigerant into system.  
a. In case of charging refrigerant gas.

Open high- and low-pressure valves of manifold gauge and charge refrigerant into system.



When refrigerant charging speed is slow, immerse refrigerant can in water, heated to a temperature of about 40°C (104°F) for a short time.



AC184A

**WARNING:**

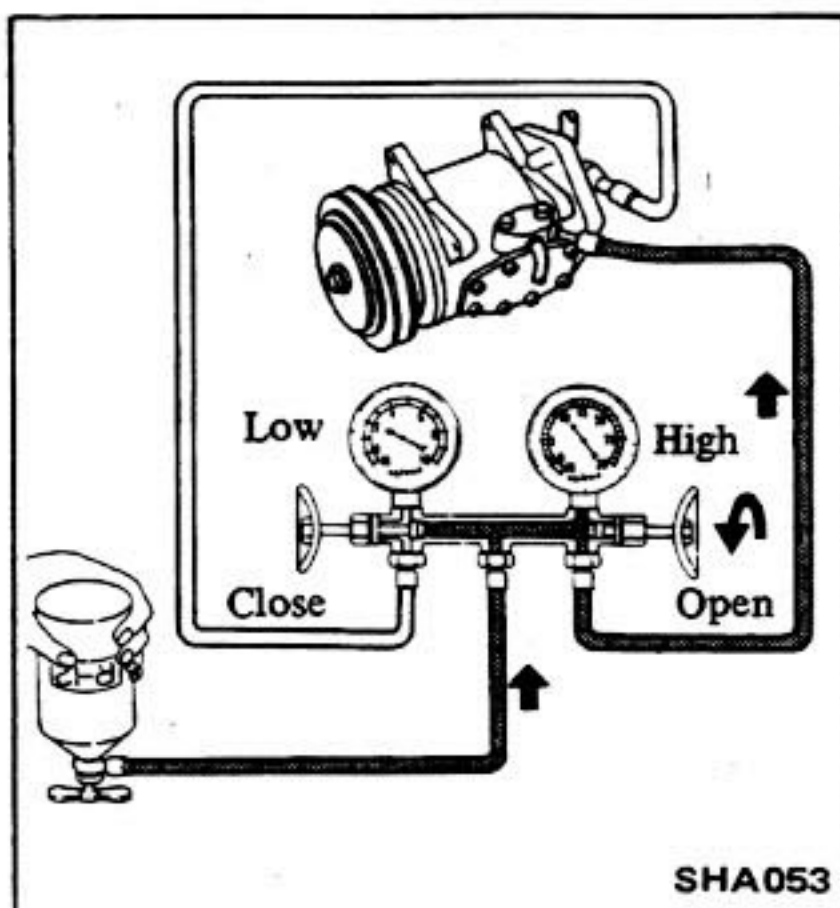
- a. Under any circumstances the refrigerant can must not be warmed in water heated to a temperature of over 52°C (126°F).
- b. A blow torch or stove must never be used to warm up the can.

b. In case of charging liquefied refrigerant.

Open high pressure valve of manifold gauge and charge liquefied refrigerant into system with can upside down.

**CAUTION:**

When charging liquefied refrigerant into the system with the can turned upside down to reduce charging time, charge it only through high pressure (discharge) service valve. After completion of charging, the compressor should always be turned several times manually.



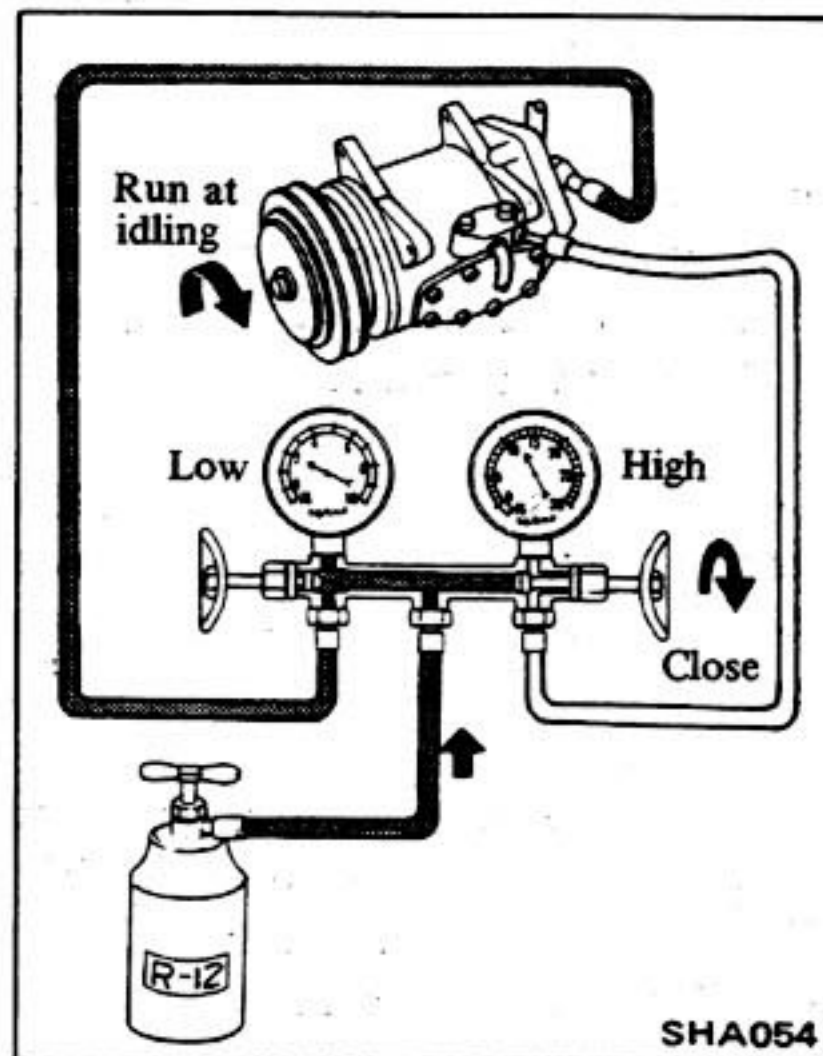
5. When refrigerant charging speed slows down, charge it while running the compressor for ease of charging. After having taken the steps up to 4 above, proceed with charging in the following order.

- (1) Shut off high pressure valve of manifold gauge.
- (2) Run the engine at idling speeds below 1,500 rpm.
- (3) Set mode dial, temperature dial and fan lever at maximum cool and speed respectively.

(4) Charge refrigerant while controlling low-pressure gauge reading at 275 kPa (2.75 bar, 2.8 kg/cm<sup>2</sup>, 40 psi) or less by turning in or out low-pressure valve of manifold gauge.

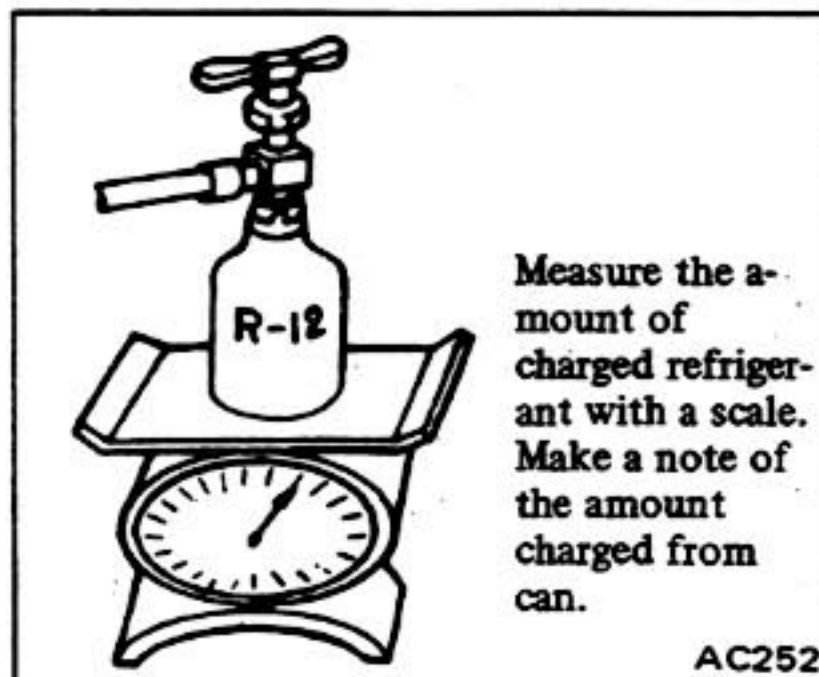
**WARNING:**

Never charge refrigerant through high pressure side (discharge side) of system since this will force refrigerant back into refrigerant can and can may explode.



6. When refrigerant can is empty, fully close both valves of manifold gauge and replace refrigerant can with a new one. Before charging refrigerant from new can, purge air from inside charging hose.

7. Charge the specified amount of refrigerant into system by weighing charged refrigerant with scale.



**Refrigerant capacity:**  
1.0 - 1.2 kg  
(2.2 - 2.6 lb)

The state of the bubbles in sight glass should only be used for checking whether the amount of charged refrigerant is small or not. Refer to Refrigerant Level Check (MA section). The amount of charged refrigerant can be correctly judged by means of discharge pressure.

8. Close manifold gauge valves. Then detach charging hoses from service valves of system. Be sure to install valve cap on service valve.

9. Confirm that there are no leaks in system by checking with a leak detector.

Refer to Checking for Leaks (MA section).

Conducting a performance test prior to removing manifold gauge is a good service operation. Refer to Performance Test.

## COMPRESSOR OIL LEVEL CHECK

The oil used to lubricate compressor circulates into system from the oil sump while compressor is operating. Therefore, to correctly measure compressor oil, the amount of oil flowing in the system must be considered. If a considerable amount of leakage of refrigerant gas occurs, the leakage of compressor oil is also considered.

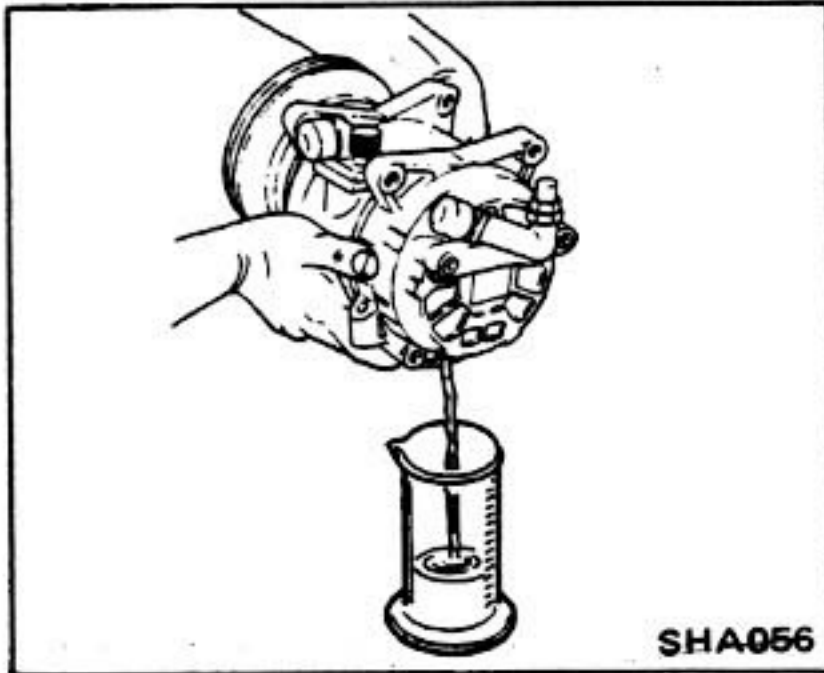
When checking the level of compressor oil or when replacing any component part of the system, use the following service procedure. This helps to return oil to compressor.

Dual air conditioner compressor oil should be contained in compressor and receiver drier. It is advisable to use receiver drier [filled with 70 ml (2.5 Imp fl oz) compressor oil] designed for use with dual air conditioner.

1. Operate compressor at engine idling speed (1,000 rpm or below), with controls set for maximum cooling and high blower speed, for 20 to 30 minutes in order to return compressor oil to compressor.



2. Stop the engine and discharge refrigerant of system and then remove compressor from the vehicle.
3. Remove compressor drain plug. Drain compressor oil from compressor oil sump and measure the amount.



If the amount is less than specification, refrigerant may have leaked. Conduct leak tests on connections of each system, and if necessary repair or replace faulty parts.

**Residual oil:**  
**270 mL**  
**(9.5 Imp fl oz)**

4. Check the purity of the oil. If the oil contains chips or other foreign material, clean oil sump with new oil.
5. Discard the used oil and fill with the same amount of new oil. Add oil if found less than above amount.

If compressor is inoperative due to faulty compressor or heavy loss of refrigerant, remove compressor and

repair as necessary. Then pour oil up to correct level and install on engine. After above steps have been completed, recheck oil level; drain oil to correct level if level is excessive.

## PERFORMANCE TEST

### PERFORMANCE CHART

#### TEST CONDITION

Test vehicle location : Indoor or in the shade	Temperature lever : Max. cold
Door windows : Open	Fan switch : 3rd
Hood : Open	Engine speed : 1,500 r.p.m.
Air lever : A/C	

#### TEST READING

**Compressor type : SWP123**

Inside air (Recirculating air) at cooling unit inlet		Discharged air temperature at center outlet °C (°F)	Relative humidity %	Ambient air temperature °C (°F)	Pressure high (Discharge side) kPa (bar, kg/cm <sup>2</sup> , psi)	Pressure low (Suction side) kPa (bar, kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)					
50	25 (77)	7.5 (46)	50	25 (77)	981 (9.81, 10.0, 142)	122.6 (1.226, 1.25, 17.8)
	30 (86)	12.4 (54)		30 (86)	1,177 (11.77, 12.0, 171)	150.0 (1.500, 1.53, 21.8)
	35 (95)	17.2 (63)		35 (95)	1,383 (13.83, 14.1, 201)	191.2 (1.912, 1.95, 27.7)
	40 (104)	22.0 (72)		40 (104)	1,579 (15.79, 16.1, 229)	225.6 (2.256, 2.30, 32.7)
60	25 (77)	9.1 (48)	70	25 (77)	1,089 (10.89, 11.1, 158)	148.1 (1.481, 1.51, 21.5)
	30 (86)	14.3 (58)		30 (86)	1,324 (13.24, 13.5, 192)	191.2 (1.912, 1.95, 27.7)
	35 (95)	19.3 (67)		35 (95)	1,559 (15.59, 15.9, 226)	235.4 (2.354, 2.40, 34.1)
	40 (104)	24.2 (76)		40 (104)	1,775 (17.75, 18.1, 257)	274.6 (2.746, 2.80, 39.8)
70	25 (77)	11.0 (52)				
	30 (86)	16.5 (62)				
	35 (95)	22.0 (72)				
	40 (104)	27.2 (81)				

**AIR CONDITIONER – Performance Test**

**Compressor type : SWP167**

Inside air (Recirculating air) at cooling unit inlet		Discharged air temperature at center outlet °C (°F)	Relative humidity %	Ambient air temperature °C (°F)	Pressure high (Discharge side) kPa (bar, kg/cm <sup>2</sup> , psi)	Pressure low (Suction side) kPa (bar, kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)					
50	25 (77)	4.1 (39)	50	25 (77)	1,128 (11.28, 11.5, 164)	98.1 (0.981, 1.00, 14.2)
	30 (86)	9.0 (48)		30 (86)	1,393 (13.93, 14.2, 202)	137.3 (1.373, 1.40, 19.9)
	35 (95)	13.9 (57)		35 (95)	1,638 (16.38, 16.7, 237)	176.5 (1.765, 1.80, 25.6)
	40 (104)	18.5 (65)		40 (104)	1,912 (19.12, 19.5, 277)	220.7 (2.207, 2.25, 32.0)
60	25 (77)	6.0 (43)	70	25 (77)	1,275 (12.75, 13.0, 185)	122.6 (1.226, 1.25, 17.8)
	30 (86)	11.0 (52)		30 (86)	1,569 (15.69, 16.0, 228)	171.6 (1.716, 1.75, 24.9)
	35 (95)	16.3 (61)		35 (95)	1,863 (18.63, 19.0, 270)	220.7 (2.207, 2.25, 32.0)
	40 (104)	21.3 (70)		40 (104)	2,177 (21.77, 22.2, 316)	269.7 (2.697, 2.75, 39.1)
70	25 (77)	7.8 (46)				
	30 (86)	13.3 (56)				
	35 (95)	18.9 (66)				
	40 (104)	24.2 (76)				

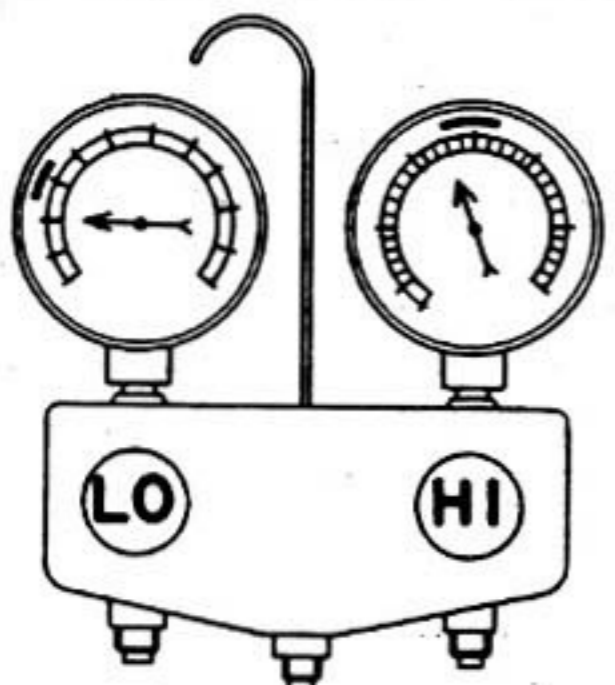
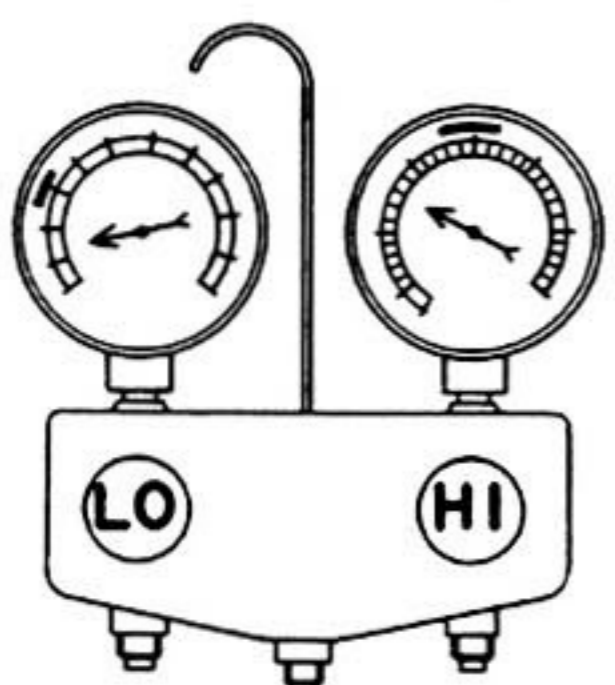
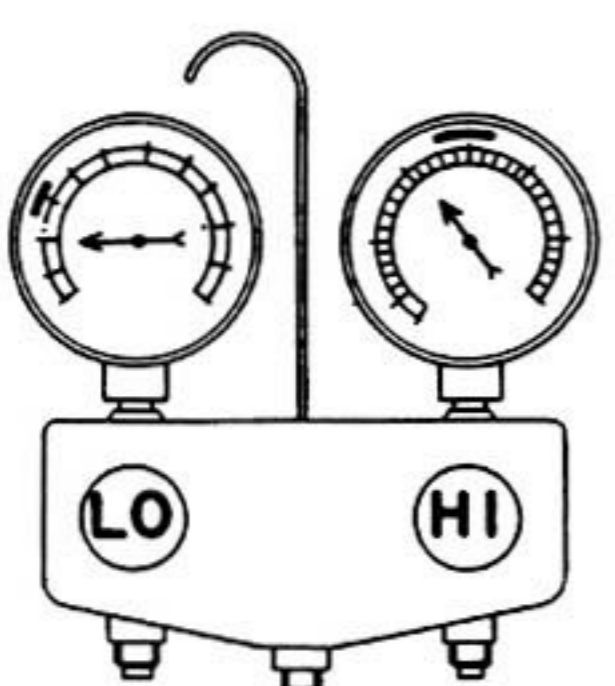
## PERFORMANCE TEST DIAGNOSES

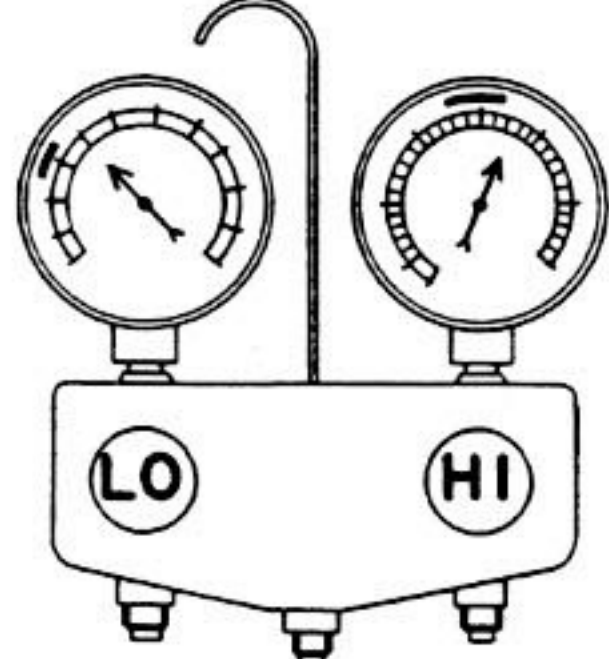
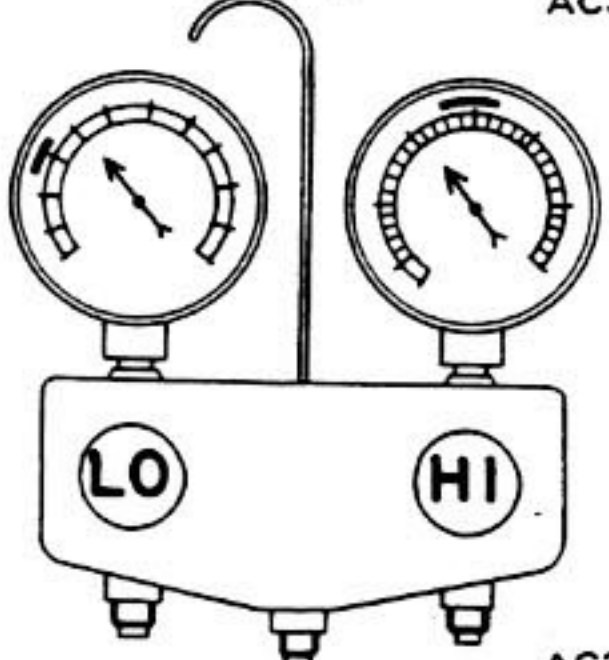
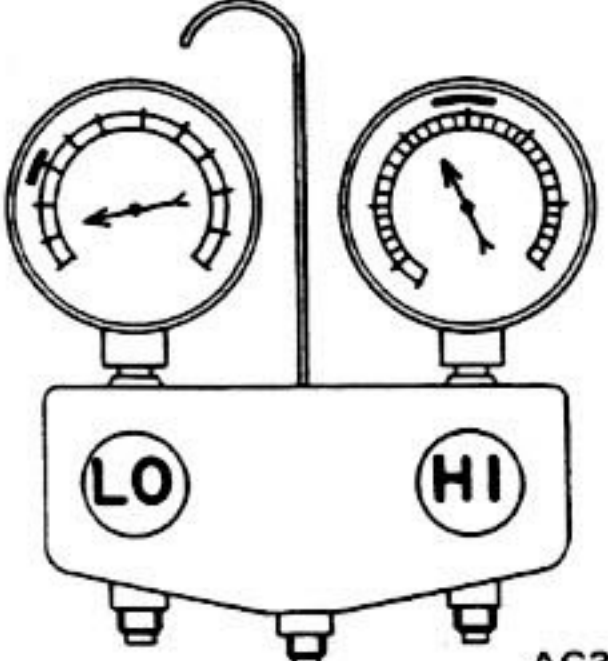
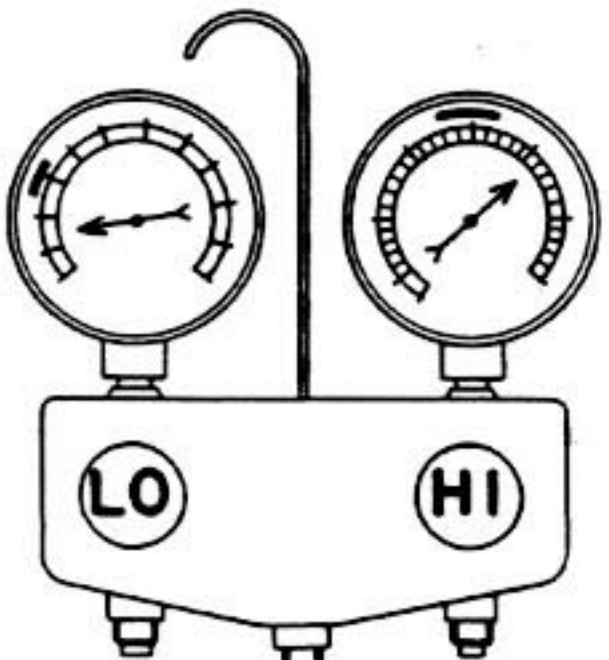
Characteristics revealed on the manifold gauge reading for the air conditioning system are shown in the following.

As to the method of a performance test, refer to the item of "Performance Test".

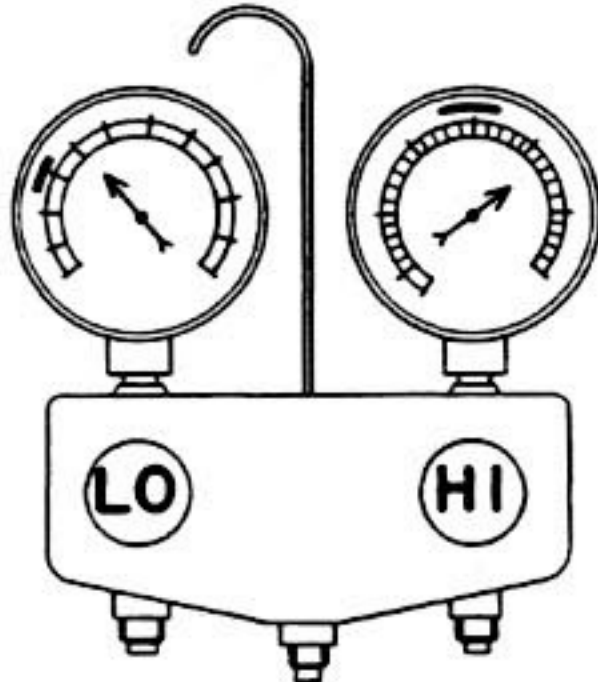
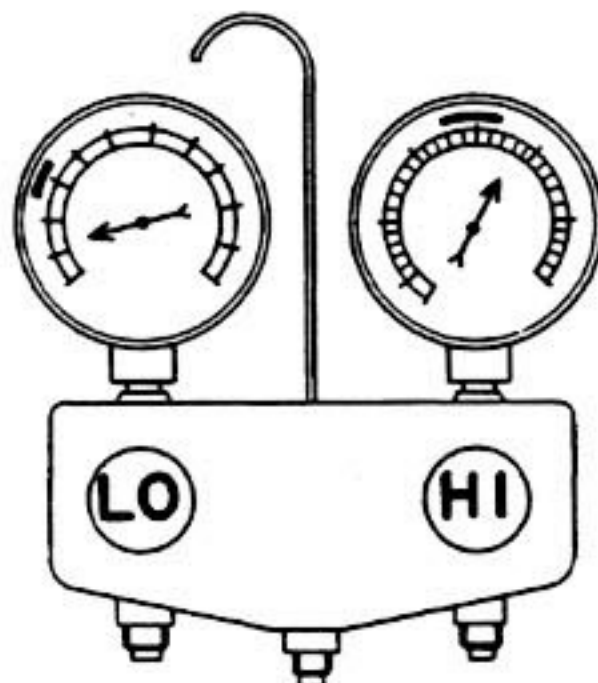
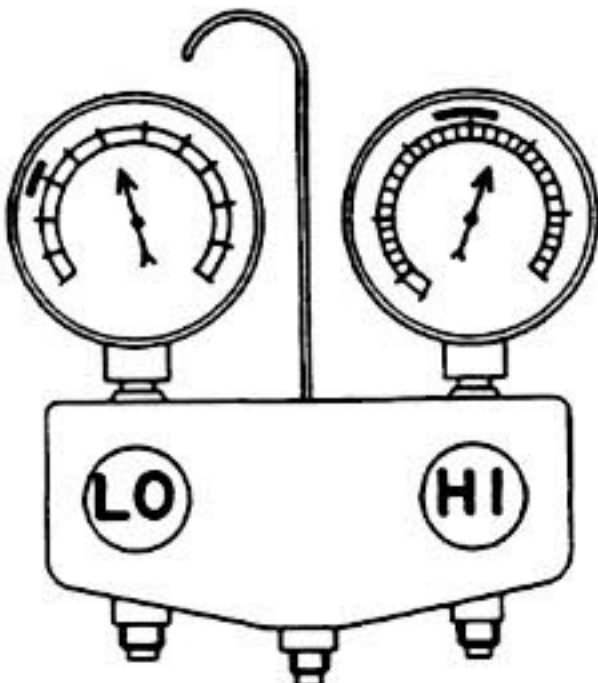
indicates a range based on the assumption that the air conditioning system is in good order. This range is described in PERFORMANCE CHART.

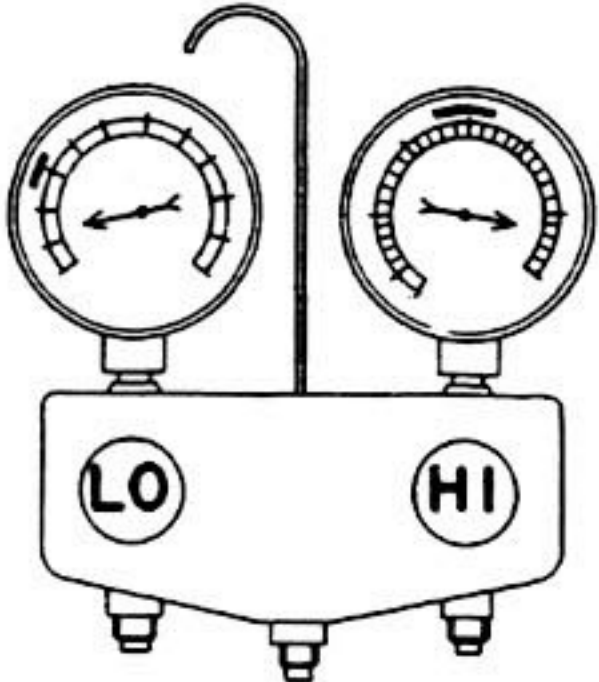
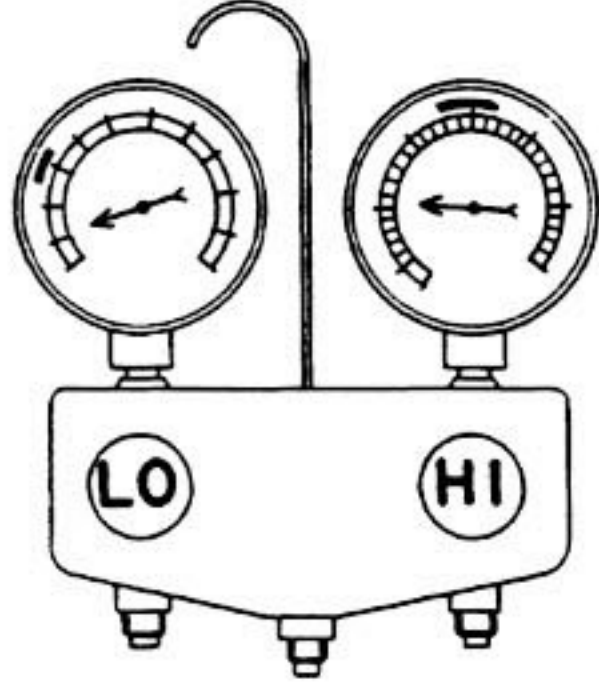
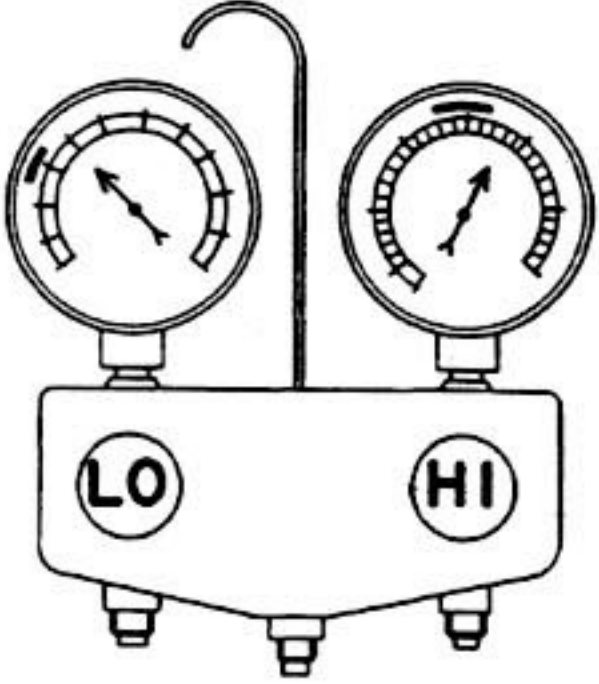
In the following table, the portion smeared with ink on each gauge scale

Condition	Probable cause	Corrective action
<p style="text-align: center;"><b>INSUFFICIENT REFRIGERANT CHARGE</b></p>  <p style="text-align: center;">AC352A</p> <p>Insufficient cooling. Bubbles appear in sight glass.</p>	<p>Refrigerant is small, or leaking a little.</p>	<ol style="list-style-type: none"> <li>1. Leak test.</li> <li>2. Repair leak.</li> <li>3. Charge system.</li> </ol> <p style="text-align: center;">Evacuate, as necessary, and recharge system.</p>
<p style="text-align: center;"><b>ALMOST NO REFRIGERANT</b></p>  <p style="text-align: center;">AC353A</p> <p>No cooling action. In sight glass appear a lot of bubbles or something like mist.</p>	<p>Serious refrigerant leak.</p>	<p><b>Stop compressor immediately.</b></p> <ol style="list-style-type: none"> <li>1. Leak test.</li> <li>2. Discharge system.</li> <li>3. Repair leak(s).</li> <li>4. Replace receiver drier if necessary.</li> <li>5. Check oil level.</li> <li>6. Evacuate and recharge system.</li> </ol>
<p style="text-align: center;"><b>FAULTY EXPANSION VALVE</b></p>  <p style="text-align: center;">AC354A</p> <p>Slight cooling. Sweating or frosted expansion valve inlet.</p>	<p>Expansion valve restricts refrigerant flow.</p> <ul style="list-style-type: none"> <li>• Expansion valve is clogged.</li> <li>• Expansion valve is inoperative.</li> </ul> <p>Valve stuck closed. Thermal bulb has lost charge.</p>	<p>If valve inlet reveals sweat or frost:</p> <ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Remove valve and clean it. Replace it if necessary.</li> <li>3. Evacuate system.</li> <li>4. Charge system.</li> </ol> <p>If valve does not operate:</p> <ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace valve.</li> <li>3. Evacuate and charge system.</li> </ol>

Condition	Probable cause	Corrective action
 <p>AC355A</p>  <p>AC356A</p>	<p>Insufficient cooling. Sweated suction line.</p> <p>No cooling. Sweating or frosted suction line.</p>	<p>Expansion valve allows too much refrigerant through evaporator.</p> <p>Faulty expansion valve.</p> <p>Check valve for operation. If suction side does not show a pressure decrease, replace valve.</p> <ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace valve.</li> <li>3. Evacuate and replace system.</li> </ol>
<p><b>FAULTY SUCTION THROTTLE VALVE</b></p>  <p>AC357A</p>	<p>Insufficient cooling. Frosted evaporator.</p>	<p>Suction throttle valve is inoperative.</p> <ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace valve.</li> <li>3. Evacuate and charge system.</li> </ol>
 <p>AC358A</p>	<p>Insufficient cooling.</p>	<p>Suction throttle valve restricts refrigerant flow.</p> <ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace valve.</li> <li>3. Evacuate and charge system.</li> </ol>

Performance Test – AIR CONDITIONER

Condition	Probable cause	Corrective action
<p><b>AIR IN SYSTEM</b></p>  <p>AC359A</p> <p>Insufficient cooling. Sight glass shows occasional bubbles.</p>	<p>Air mixed with refrigerant in system.</p>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace receiver drier.</li> <li>3. Evacuate and charge system.</li> </ol>
<p><b>MOISTURE IN SYSTEM</b></p>  <p>AC360A</p> <p>After operation for a while, pressure on suction side may show vacuum pressure reading. During this condition, discharge air will be warm. As a warning of this, reading shows 39 kPa (0.39 bar, 0.4 kg/cm<sup>2</sup>, 6 psi) vibration.</p>	<p>Drier is saturated with moisture. Moisture has frozen at expansion valve. Refrigerant flow is restricted.</p>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Replace receiver drier (twice if necessary).</li> <li>3. Evacuate system completely. (Repeat 30-minute evacuating three times.)</li> <li>4. Recharge system.</li> </ol>
<p><b>FAULTY CONDENSER</b></p>  <p>AC361A</p> <p>No cooling action: engine may overheat. Bubbles appear in sight glass of drier. Suction line is very-hot.</p>	<p>Malfunctioning condenser.</p>	<ul style="list-style-type: none"> <li>● Check fan belt and fluid coupling.</li> <li>● Check condenser for dirt accumulation.</li> <li>● Check engine cooling system for overheat.</li> <li>● Check for refrigerant overcharge.</li> </ul> <p>If pressure remains high in spite of all above actions taken, remove and inspect the condenser for possible oil clogging.</p>

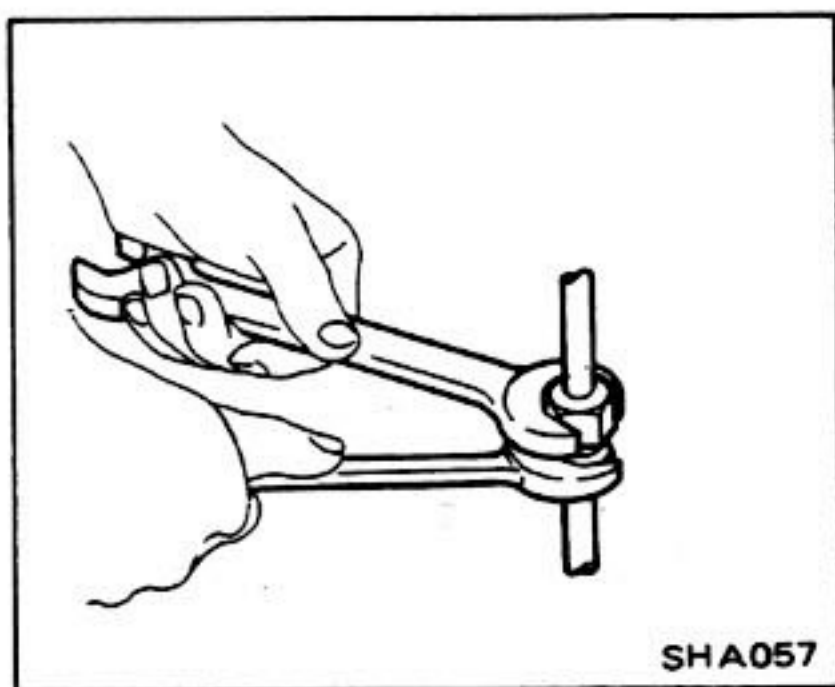
Condition	Probable cause	Corrective action
<p><b>HIGH PRESSURE LINE BLOCKED</b></p>  <p>AC362A</p> <p>Insufficient cooling. Frosted high pressure liquid line.</p>	<p>Drier clogged, or restriction in high pressure line</p>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Remove receiver drier or strainer and replace it.</li> <li>3. Evacuate and charge system.</li> </ol>
<p><b>FAULTY COMPRESSOR</b></p>  <p>AC363A</p> <p>Insufficient cooling.</p>	<p>Internal problem in compressor, or damaged gasket and valve.</p>	<ol style="list-style-type: none"> <li>1. Discharge system.</li> <li>2. Remove and check compressor.</li> <li>3. Repair or replace compressor.</li> <li>4. Check oil level.</li> <li>5. Replace receiver drier.</li> <li>6. Evacuate and charge system.</li> </ol>
<p><b>TOO MUCH OIL IN SYSTEM (Excessive)</b></p>  <p>AC364A</p> <p>Insufficient cooling.</p>	<p>Too much oil circulates with refrigerant, causing the cooling capacity of the system to be reduced.</p>	<p>Refer to Oil Level Check for correcting oil level.</p>

## SERVICE PROCEDURES

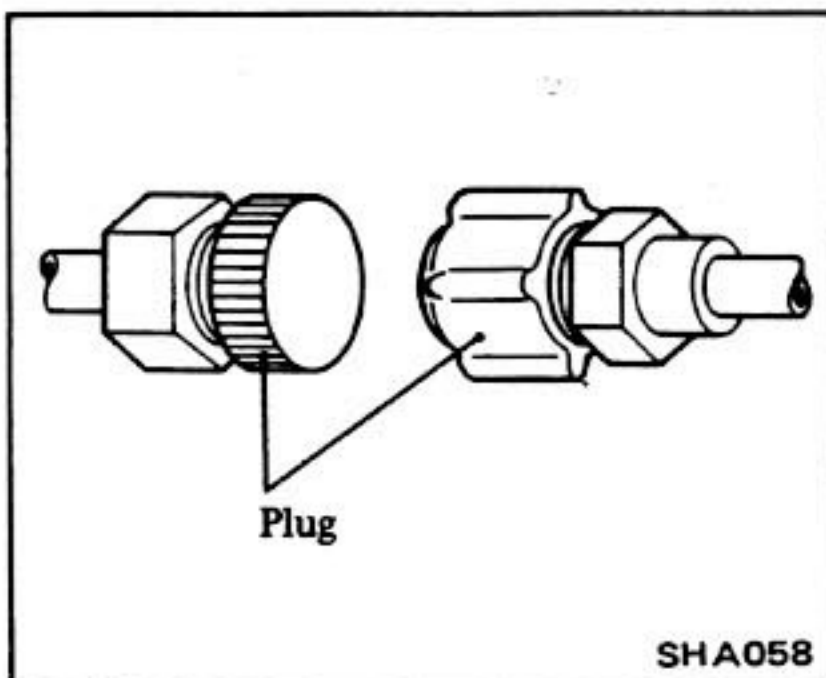
### PRECAUTIONS FOR REMOVAL AND INSTALLATION

When replacing refrigerant cycle component, observe the following:

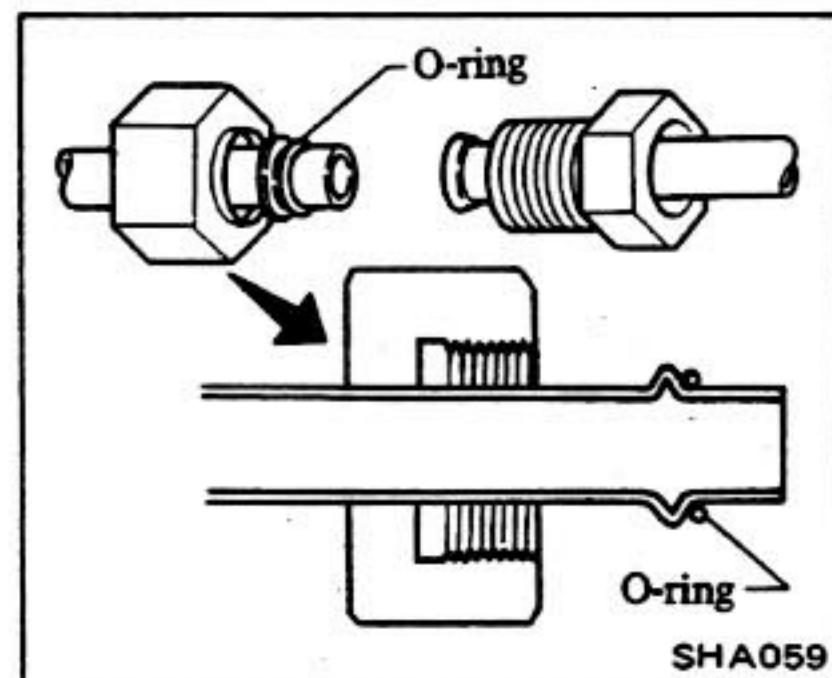
1. Disconnect battery ground cable.
2. Before starting work, be sure to discharge system.
3. When disconnecting or connecting tubes, be sure to use two wrenches on both tubes.



4. After disconnecting tubes, plug all openings immediately to prevent entrance of dirt and moisture.

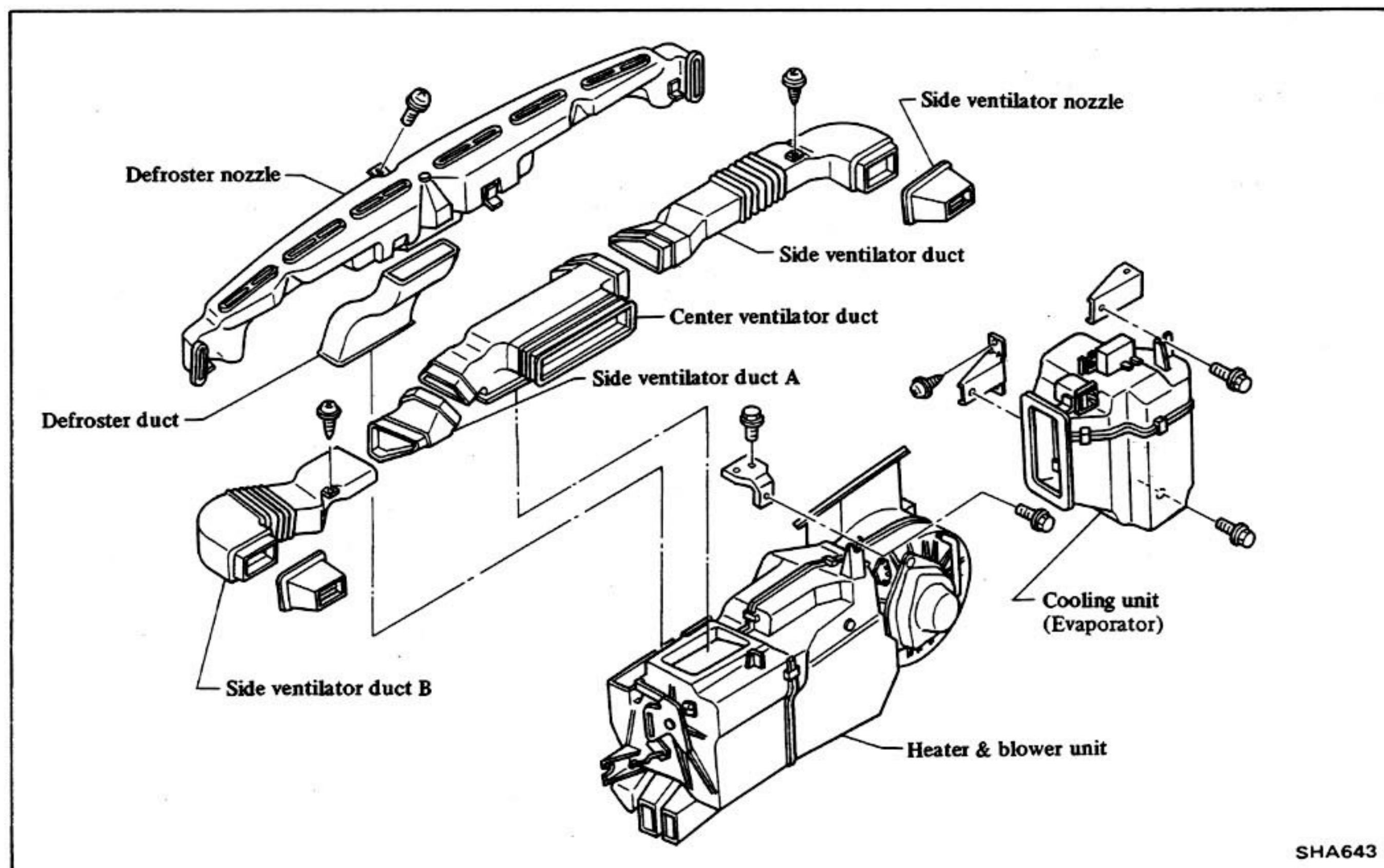


5. Compressed air must never be used to clean dirty line. Clean with refrigerant gas.
6. When connecting tubes, be sure to apply compressor oil to seating surface and O-ring.



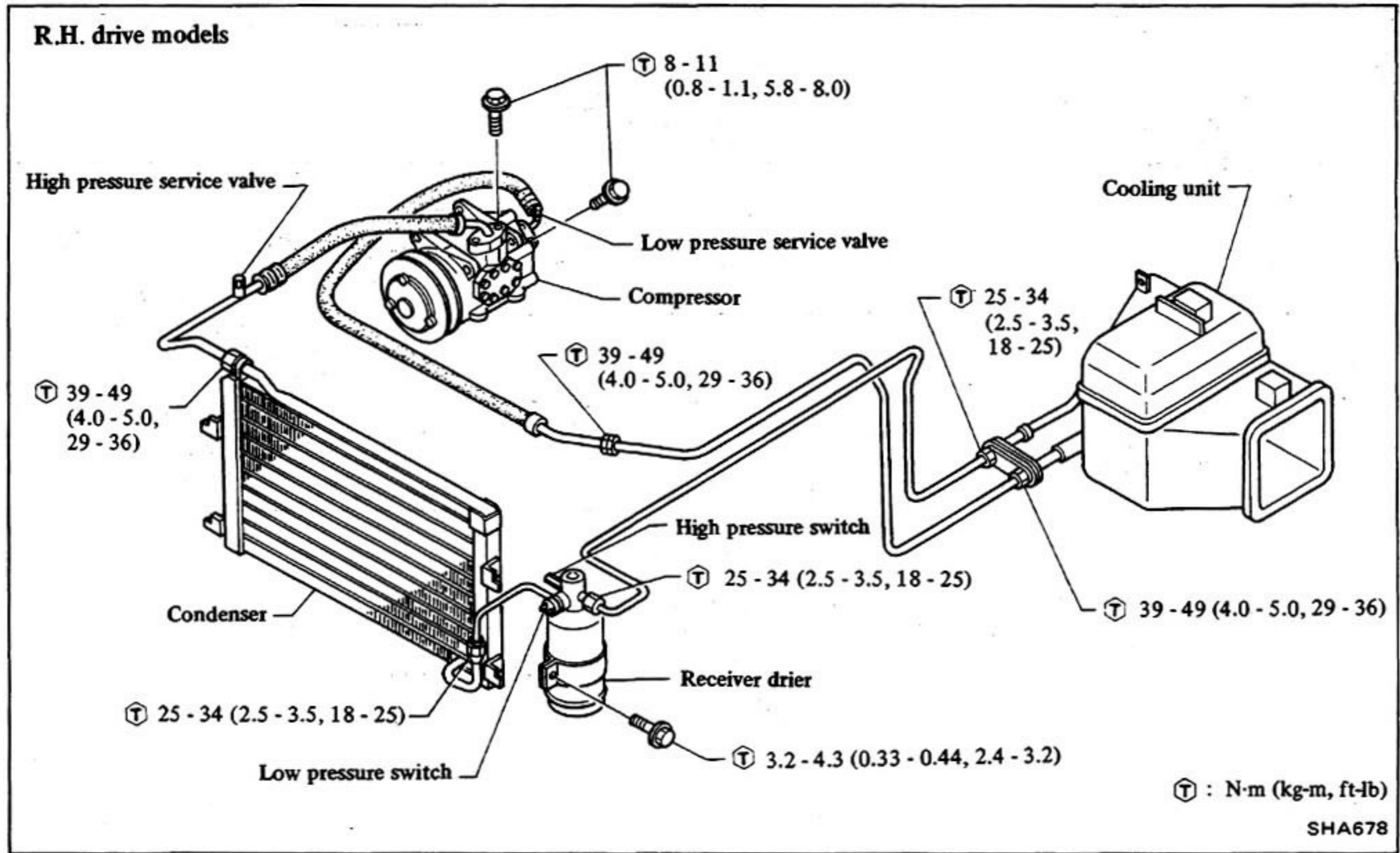
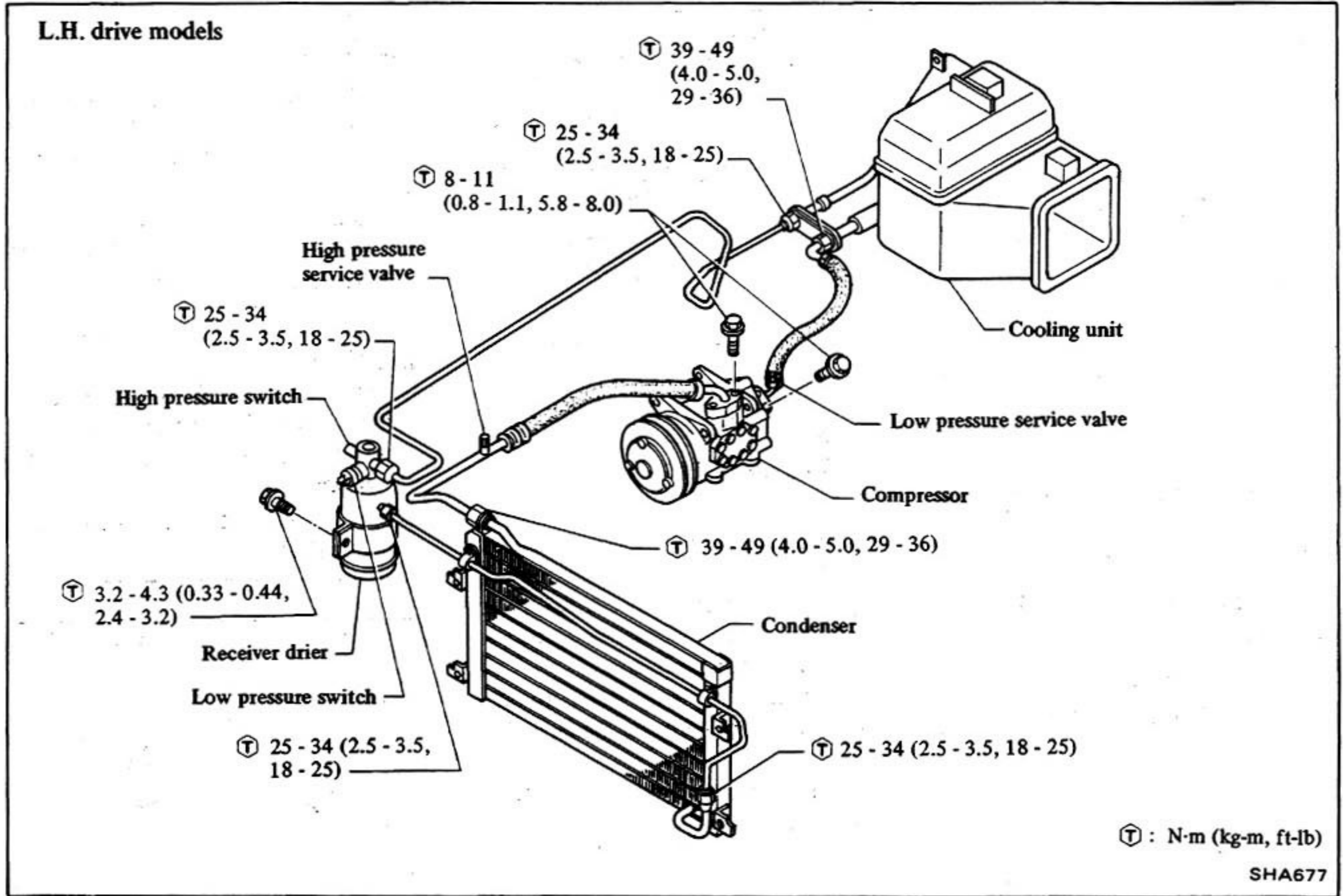
7. Check tightening torque of connections to specification.
8. Check all components to insure they are neither damaged nor interfere with adjacent parts.
9. Conduct leak test and make sure that there is no leak from connections.
10. Determine quantity of oil to be charged into compressor by referring to Compressor Oil Level Check in General Service.

### AIR CONDITIONER COMPONENTS

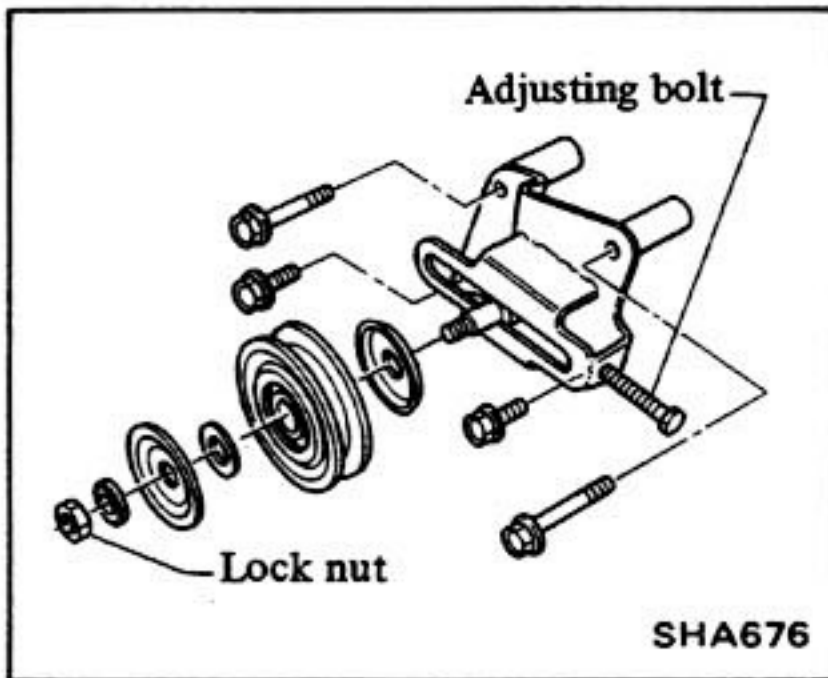




**REFRIGERANT LINES**



## COMPRESSOR IDLER PULLEY



## FAST IDLE CONTROL DEVICE (F.I.C.D.)

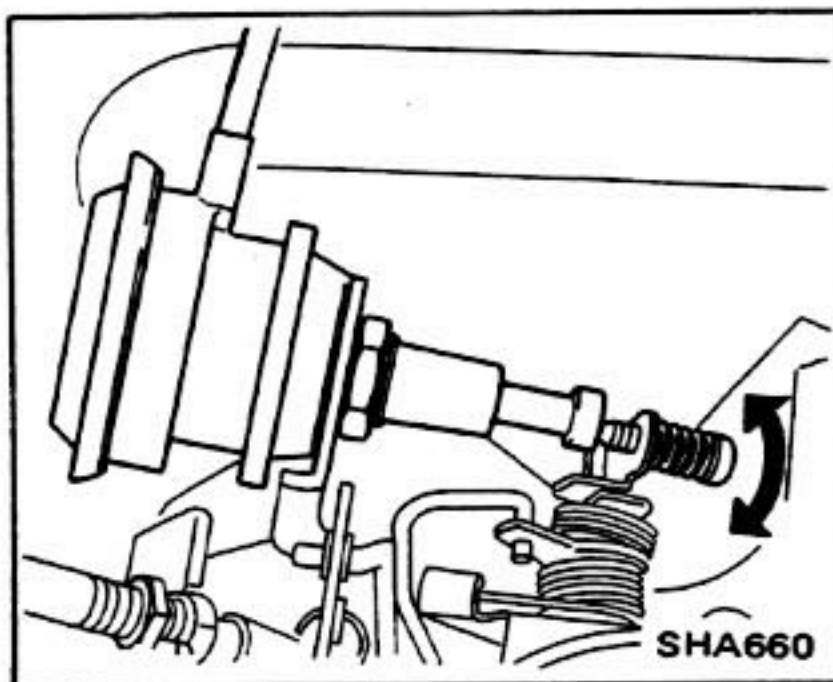
### ADJUSTMENT OF IDLE SPEED

1. Warm up engine.
2. Make sure engine is at correct idle speed with air conditioner in OFF position.

**Idle speed:**  
Refer to S.D.S. (MA section)

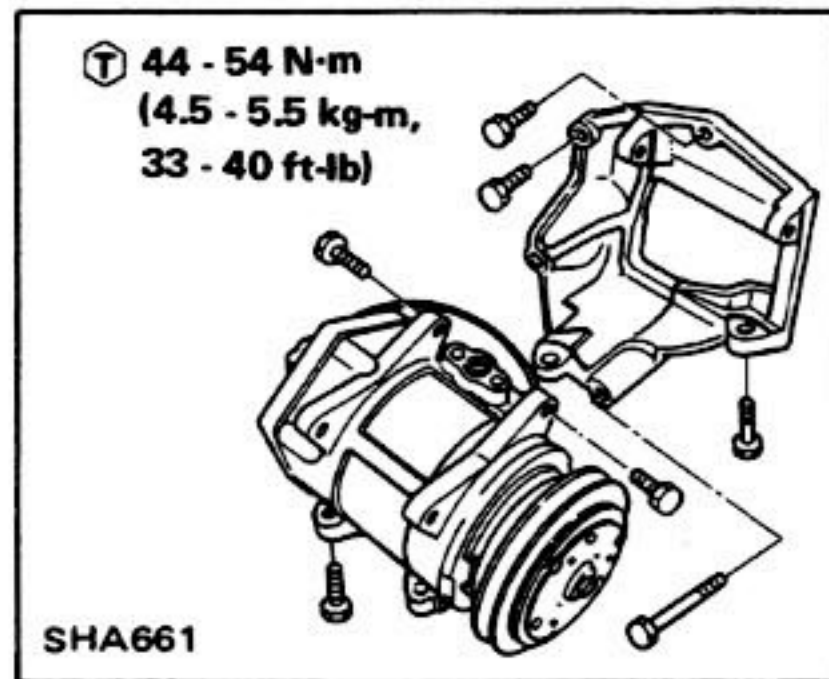
3. Set engine speed to the following specifications with air conditioner in ON position (when F.I.C.D. is actuated).
  - (1) To adjust, rotate adjusting screw located on accelerator lever.

**Engine rpm (Air conditioner: ON)**  
800 rpm



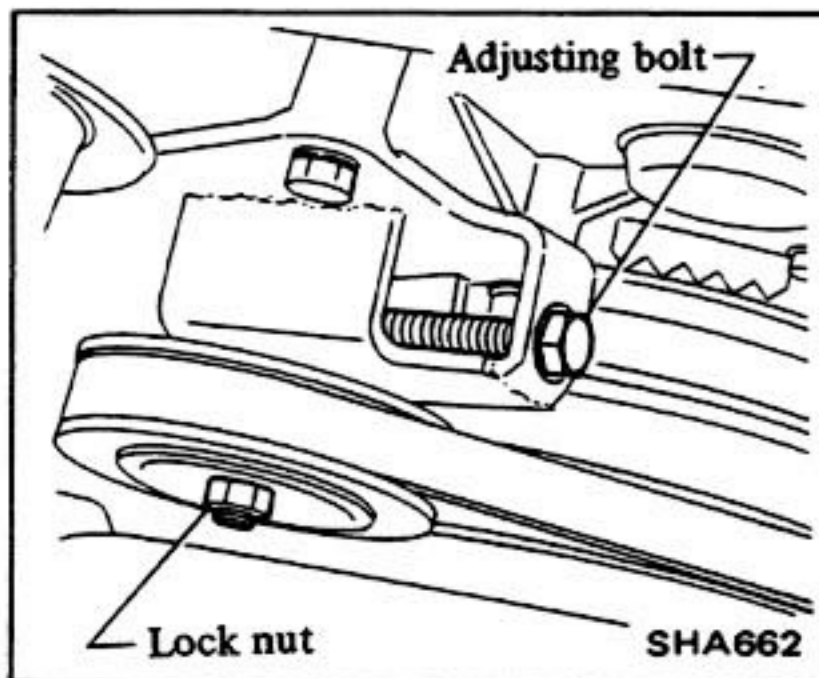
- (2) Depress and release accelerator pedal several times, and make sure that engine speed meets specifications with air conditioner in "OFF" and "ON" position.

## COMPRESSOR



### REMOVAL AND INSTALLATION

1. Operate compressor, if possible, at engine idling speed, with air conditioner controls set for maximum cooling and high blower speed, for 10 to 15 minutes with all windows open to return oil into compressor.
2. Discharge system. Refer to Discharging Refrigerant in General Service.
3. Remove compressor drive belt.
  - (1) Loosen idler pulley lock nut.
  - (2) Fully loosen adjusting bolt.



4. Disconnect high (discharge) and low (suction) flexible hoses from compressor.
5. Disconnect compressor clutch harness.
6. Remove compressor.

### CAUTION:

**Do not attempt to leave the compressor on its side or upside down for more than 10 minutes.**

7. Installation is in the reverse order of removal.

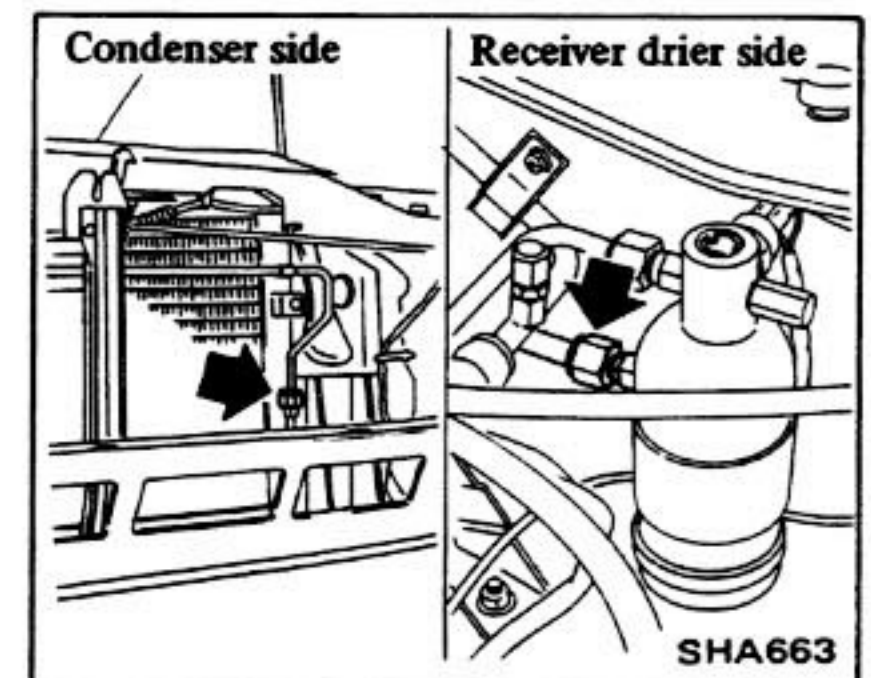
## CONDENSER

### REMOVAL AND INSTALLATION

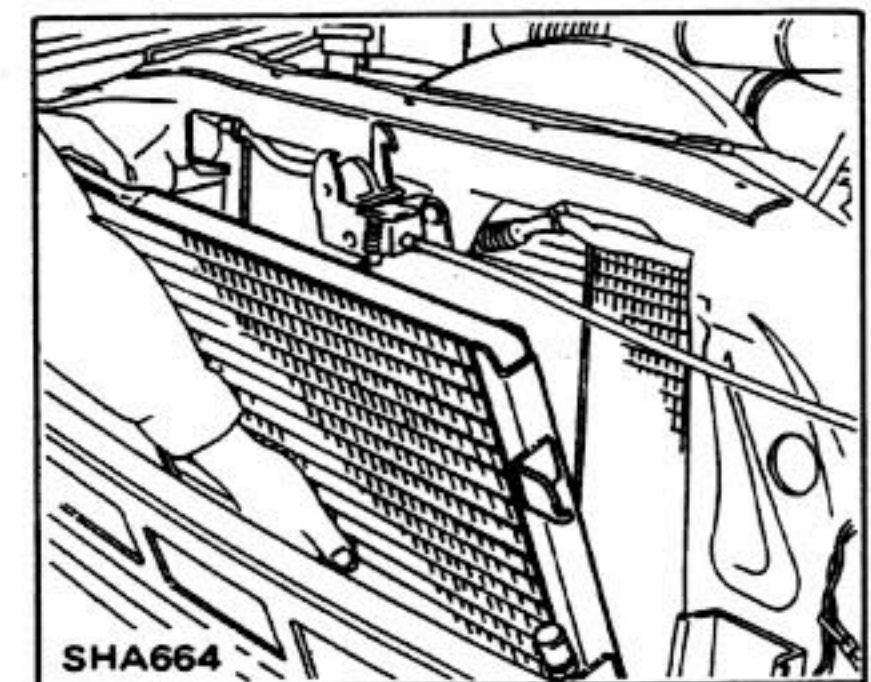
1. Disconnect battery ground cable.
2. Discharge system. Refer to Discharging Refrigerant in General Service.
3. Remove radiator grille.
4. Disconnect refrigerant lines from receiver drier and condenser.

### CAUTION:

- a. Use wrench to fix union on condenser, and then loosen flare nut of refrigerant line with another wrench.
- b. Plug up all openings in condenser and system.



5. Remove condenser.



### INSPECTION

Inspect joints of inlet and outlet pipes for cracks and scratches. Upon finding any problem which may cause gas to leak, repair or replace condenser.

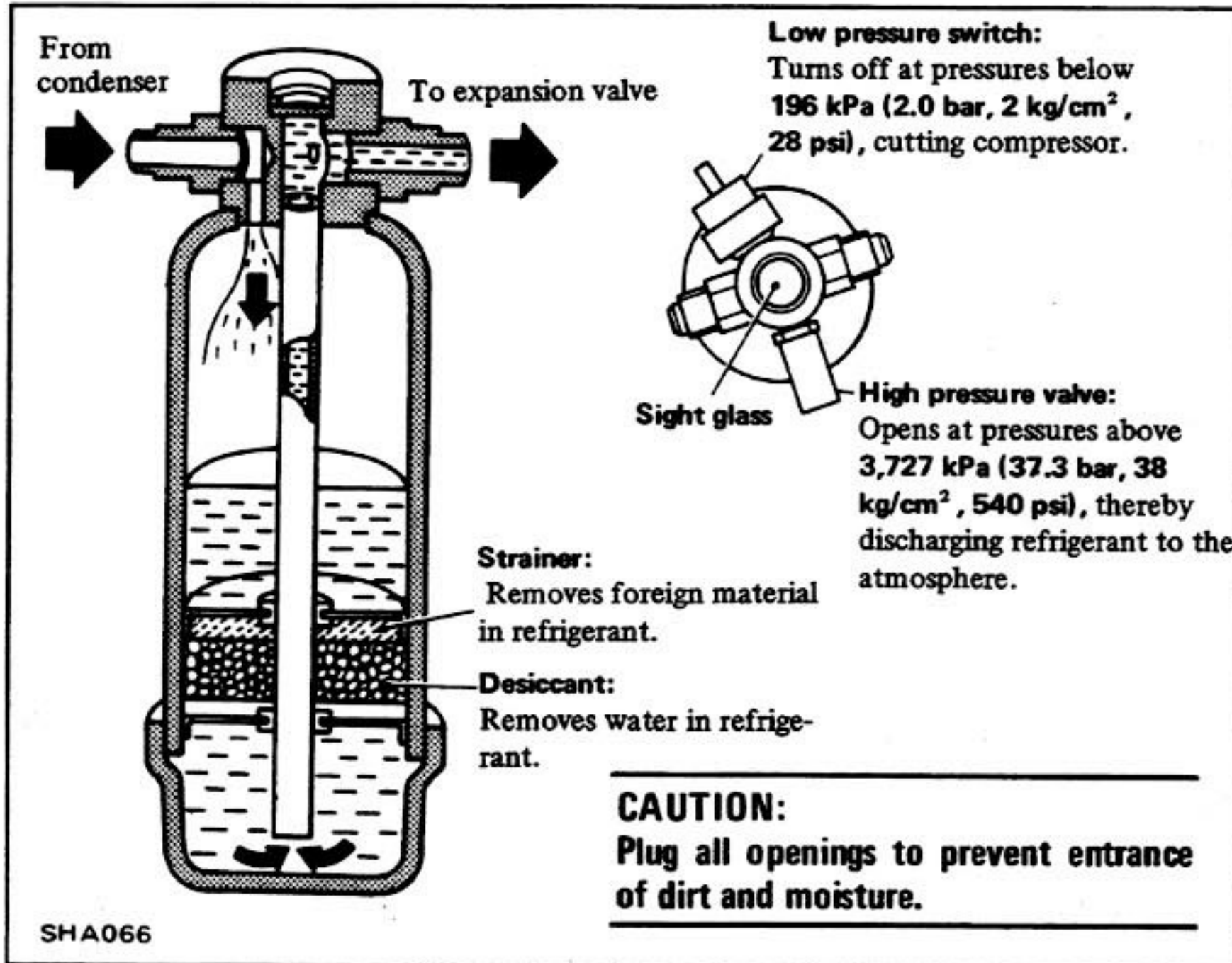
Condenser fins or air passages clogged with dirt, insects or leaves will reduce cooling efficiency of condenser. In such a case, clean fins or air passages with compressed air.

**CAUTION:**  
Do not clean condenser with steam. Be sure to use cold water or compressed air.

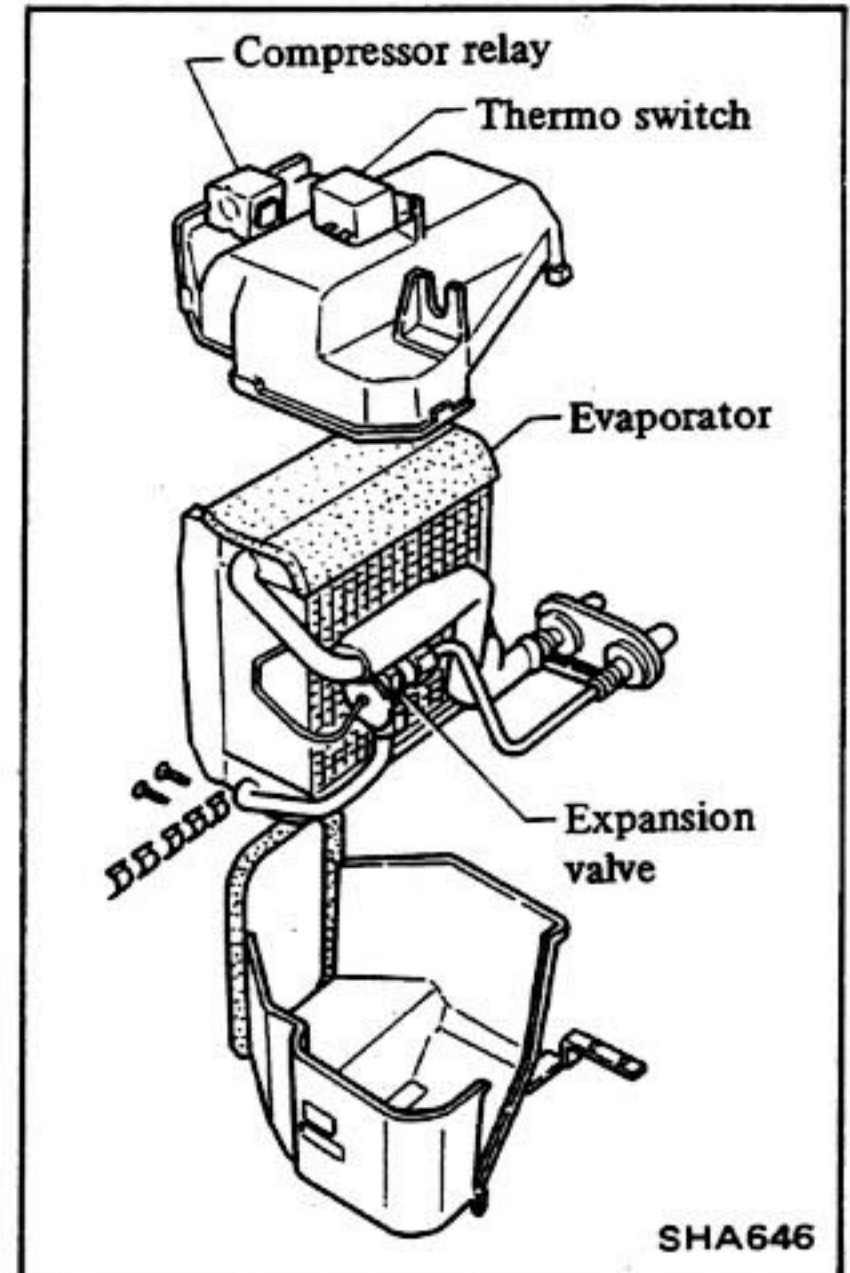
5. Installation is in the reverse order of removal.

Adjust air intake control cable. Refer to Adjusting Heater Control in Heater.

## RECEIVER DRIER (Liquid tank)



## DISASSEMBLY AND ASSEMBLY



## AIR CONDITIONER CONTROL

Refer to Heater/Air Conditioner Control in Heater.

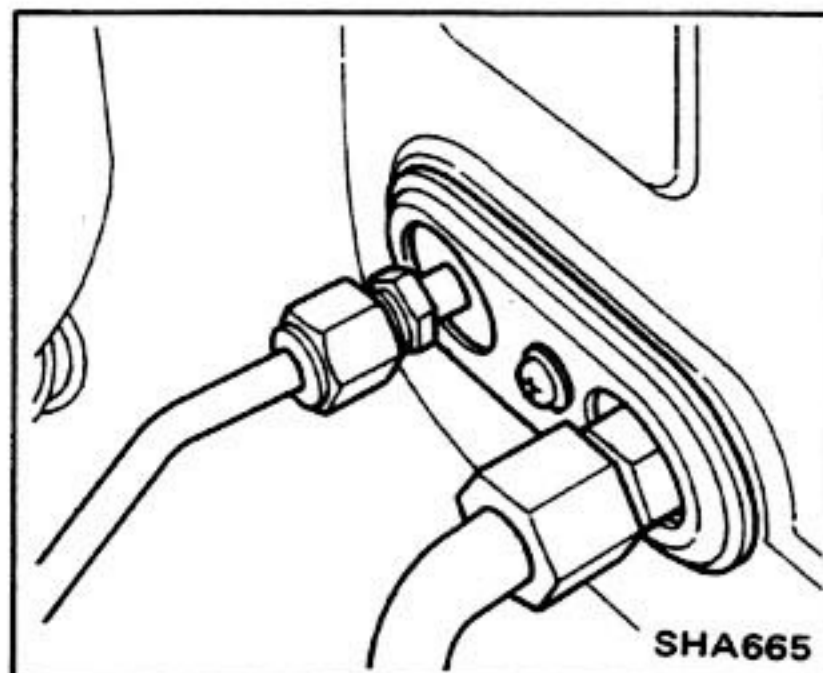
## COOLING UNIT

### REMOVAL AND INSTALLATION

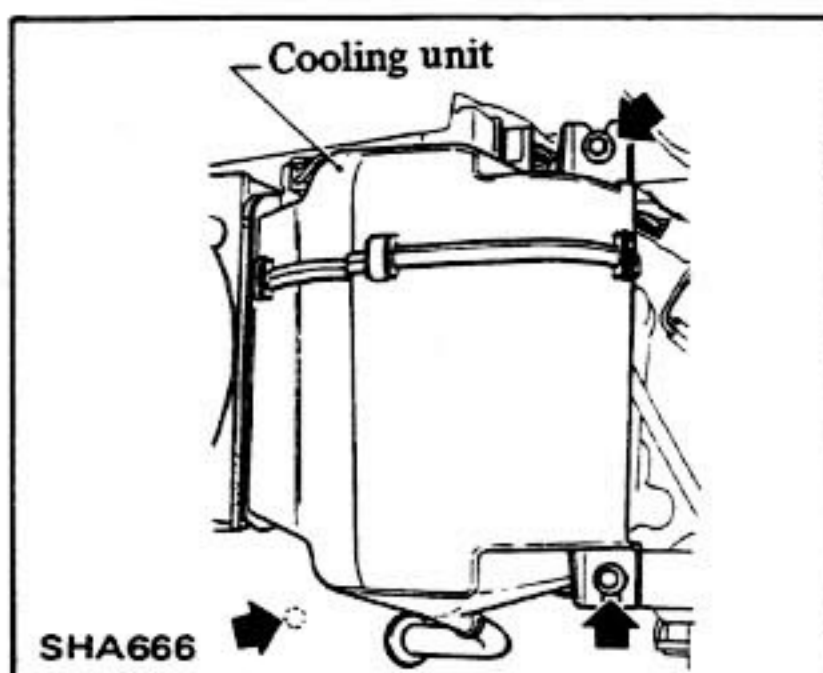
1. Remove battery ground cable.
2. Discharge system. Refer to Discharging Refrigerant in General Service.
3. Disconnect pipe.

**CAUTION:**

- a. Use wrench to fix union on condenser, and then loosen flare nut of refrigerant line with another wrench.
- b. Plug up all openings in condenser and system.



4. Remove bolt and then remove cooling unit.



## INSPECTION

### Evaporator assembly

1. Clean fins and check for crack or corrosion.

**CAUTION:**

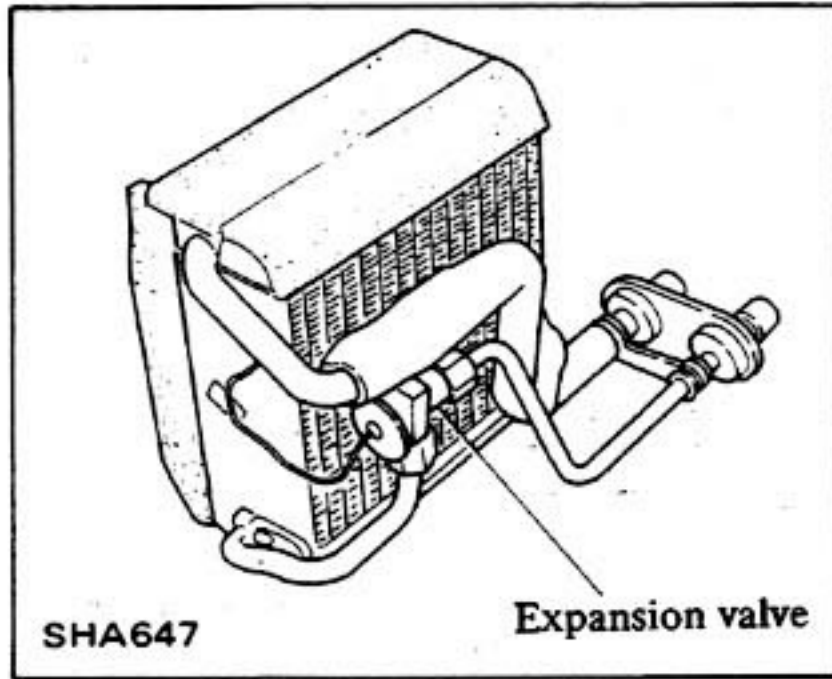
Do not clean evaporator with steam. Be sure to use cold water or compressed air.

2. Check for gas leaks at the fins and the expansion valves. If there are leaks, retighten or replace them.

### Case

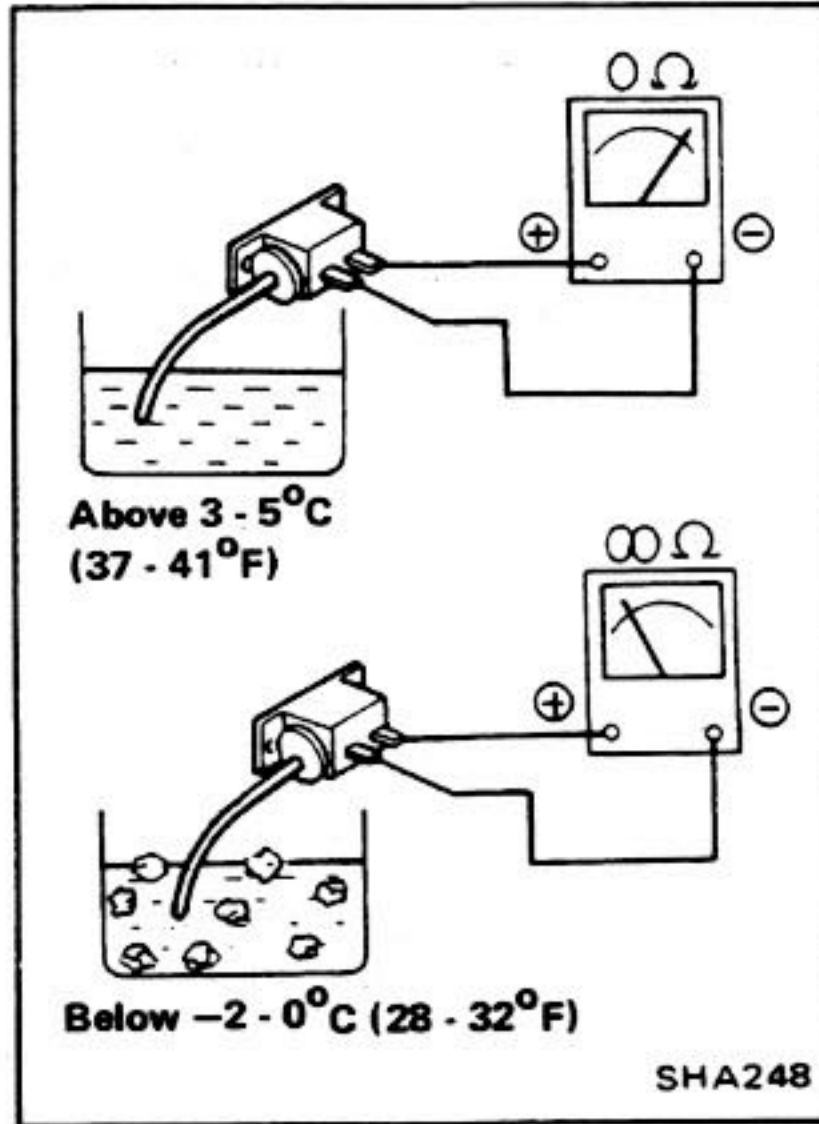
Replace case if it is cracked or deformed.

## EXPANSION VALVE



## INSPECTION

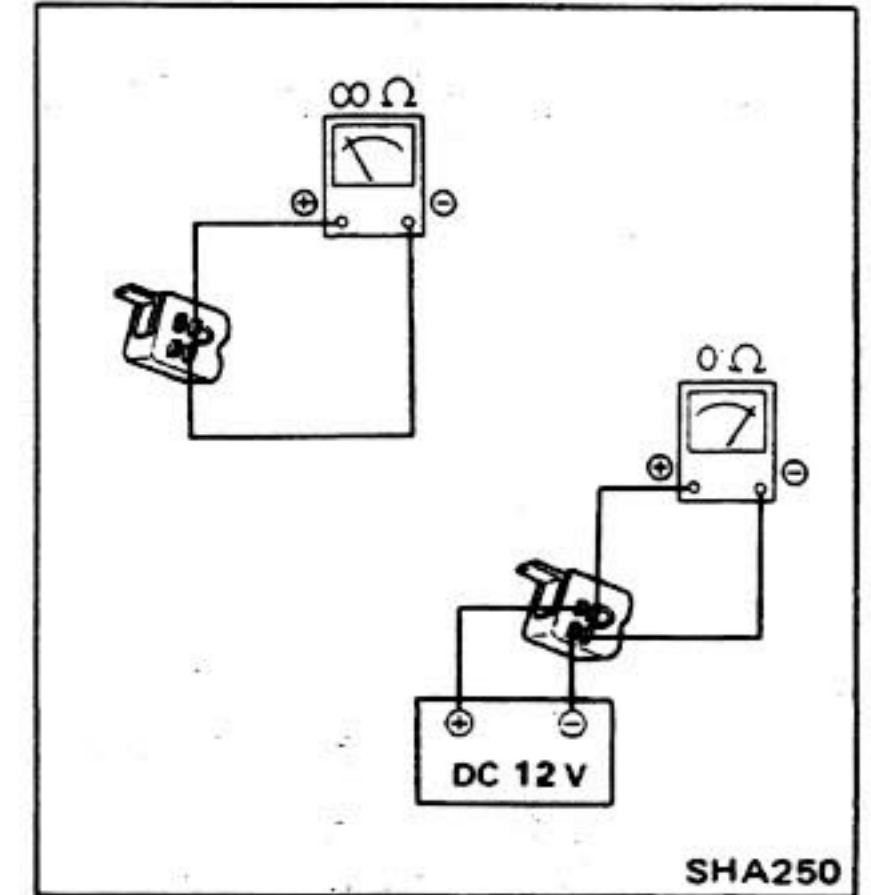
Test continuity through thermostat with a test lamp or ohmmeter.



3. Installation is in the reverse order of removal.

## INSPECTION

Test continuity through switch with a test lamp or ohmmeter.



## THERMOSTAT

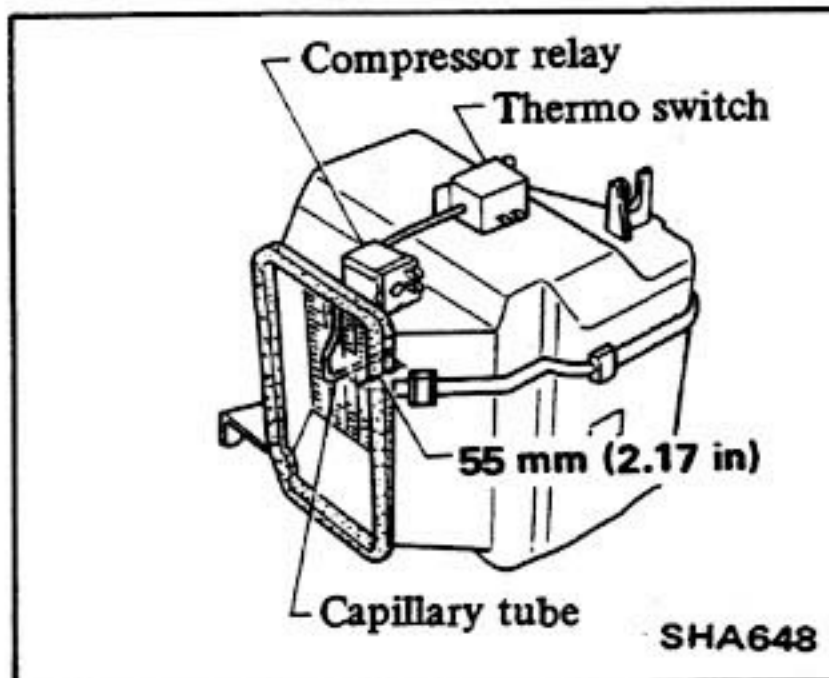
### REMOVAL AND INSTALLATION

1. Remove cooling unit.
2. Remove thermostat.

### CAUTION:

Capillary tube should not be bent too sharply.

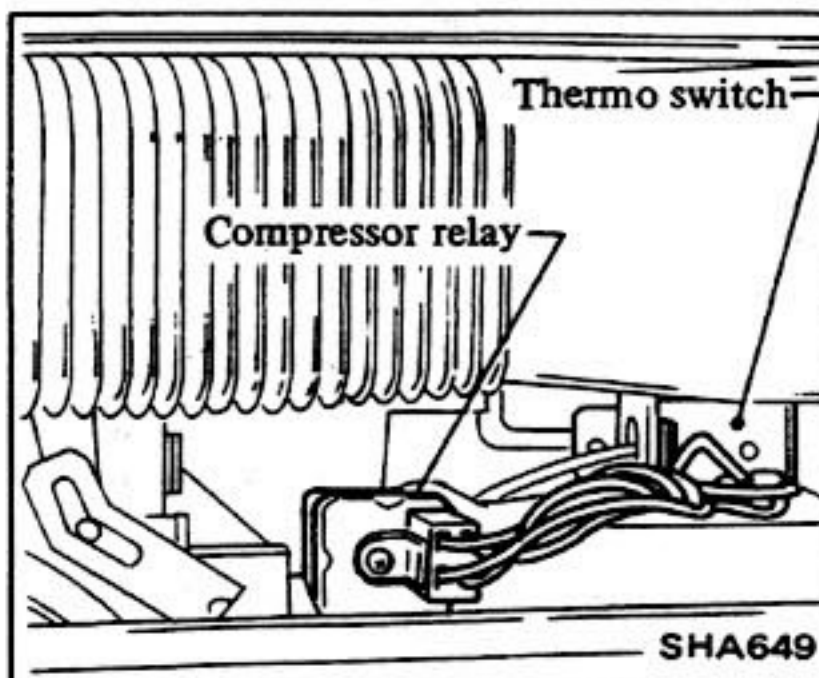
3. Install thermostat as follows.
  - Insert capillary tube end between the core fins at 55 mm (2.17 in) from end of the core.



## COMPRESSOR RELAY

### REMOVAL AND INSTALLATION

1. Remove cooling unit. Refer to Cooling Unit.
2. Disconnect relay connector and then remove relay.



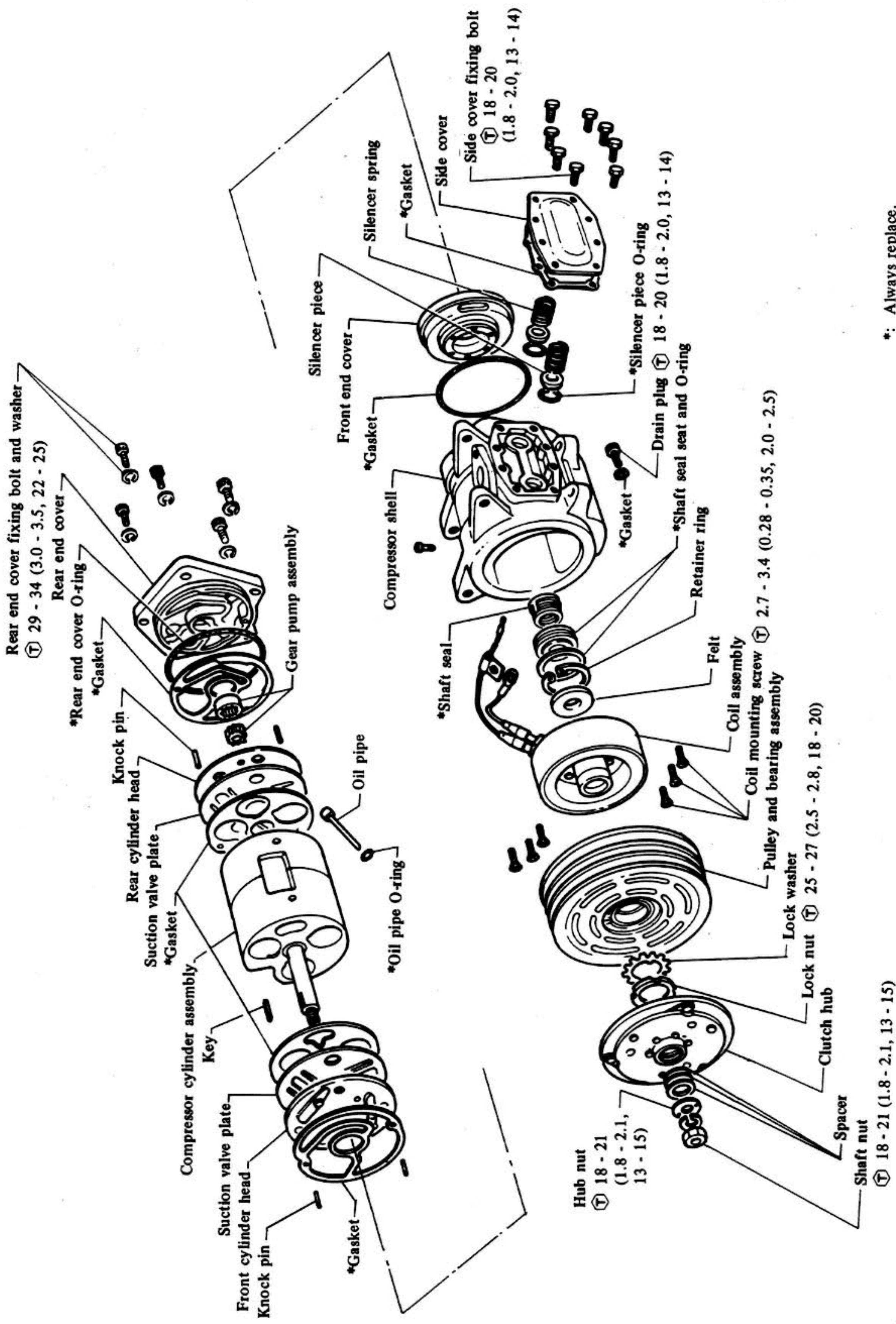
## ACCESSORY RELAY

Refer to Accessory Relay in EL section.

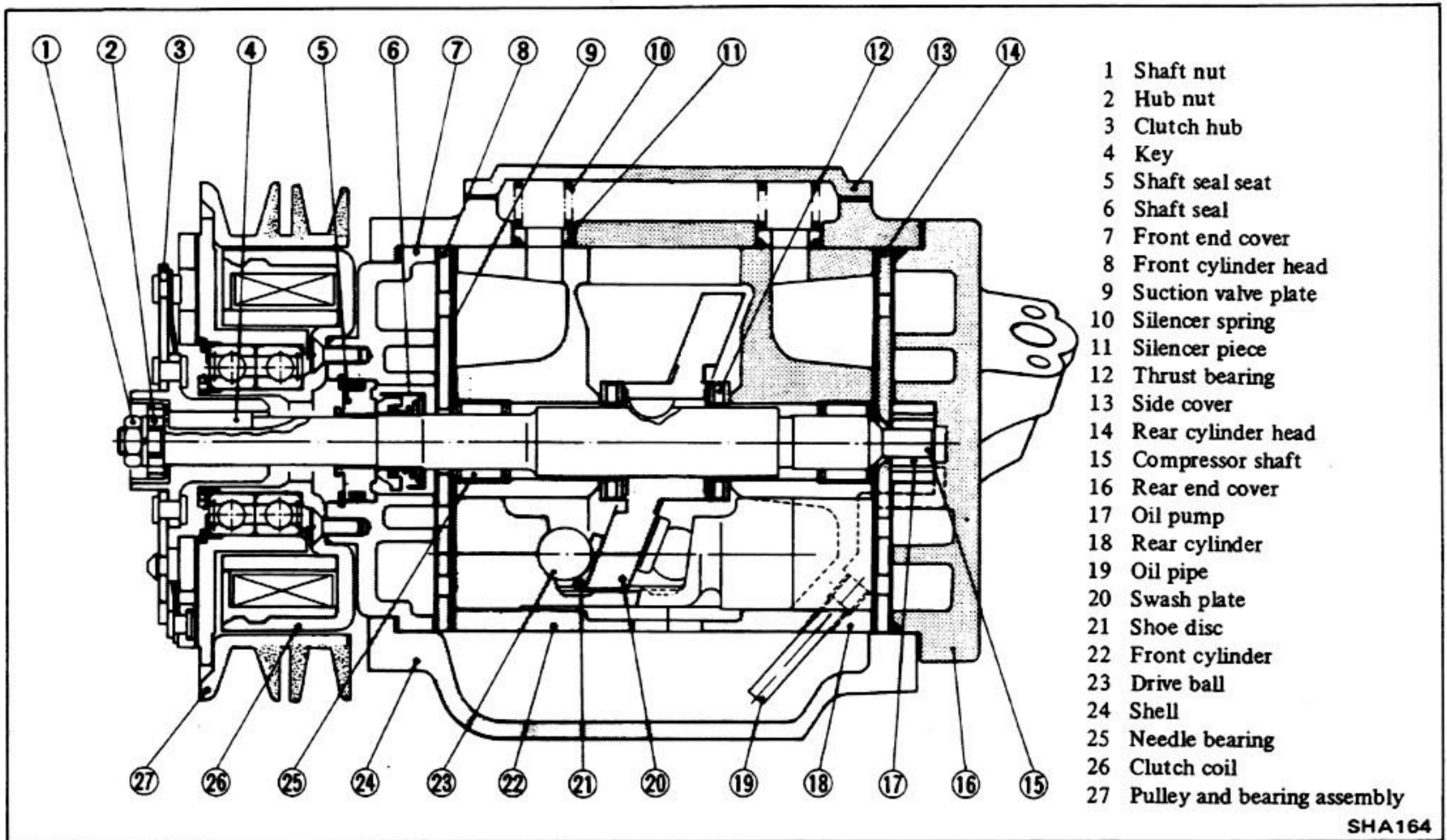
## BLOWER UNIT

Refer to Blower Unit in Heater.

# COMPRESSOR (Disassembly and assembly)



\*: Always replace.  
 T: N·m (kg-m, ft-lb)



## PRECAUTIONS

1. Plug all openings in the compressor to prevent moisture and foreign matter from entering.
2. Do not leave compressor on its side or upside down for more than 10 minutes.
3. Before replacing with the new compressor, completely drain oil from the new compressor and fill with an amount of oil equaling that remaining in the old compressor.
4. When replacing parts or oil, always replace gaskets, O-ring and oil seal.
5. When storing a compressor, be sure to fill it with refrigerant to prevent rusting. Add refrigerant at the low pressure side and purge air at the high pressure side.

## COMPRESSOR CLUTCH

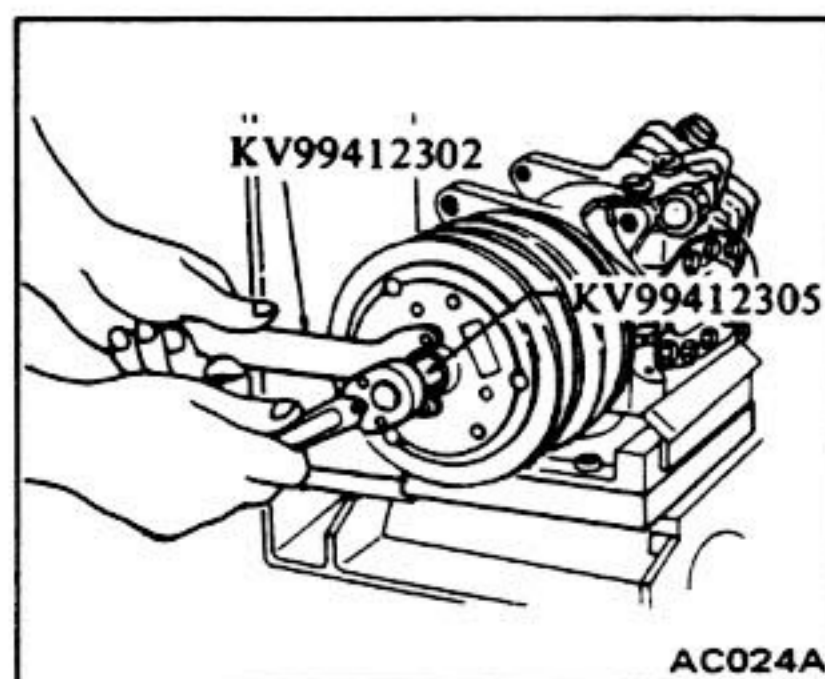
The most common problem is clutch slippage. Service procedures are listed below. Exercise care.

1. Clearance between clutch hub and pulley should be 0.5 to 0.8 mm (0.020 to 0.031 in) at all peripheral points.

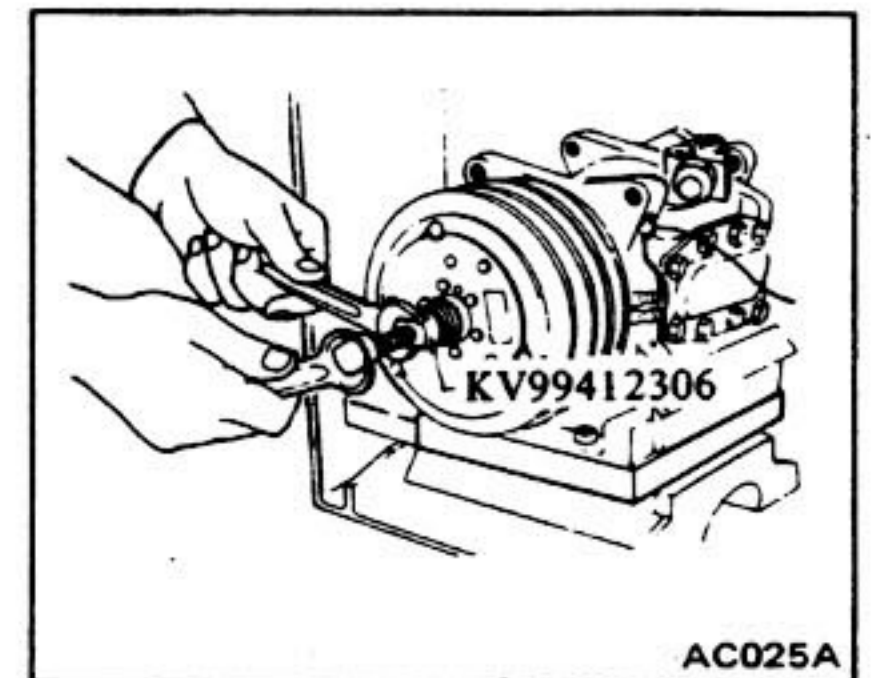
2. Make sure that there is no oil or dirt on friction surfaces of clutch disc (clutch hub) and pulley. Remove any oil or dirt with a dry rag.
3. Make sure that terminal voltage at magnetic coil is above 10.5V.

## REMOVAL

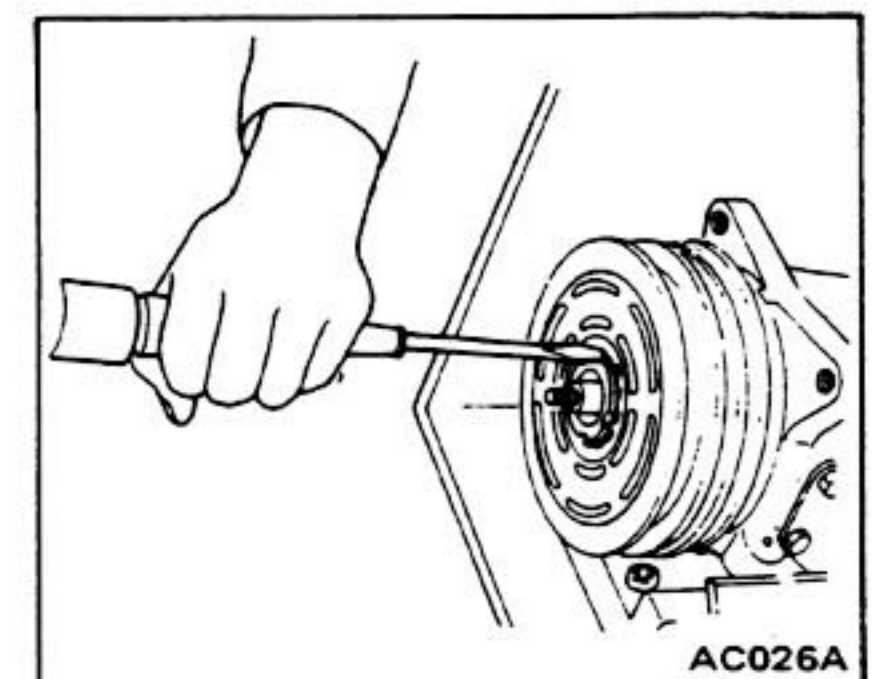
1. Using Tool KV99412302, hold clutch hub. With suitable socket wrench, remove shaft nut from shaft.
2. Then, using Tool KV99412305, remove clutch hub nut. Remove spacers.



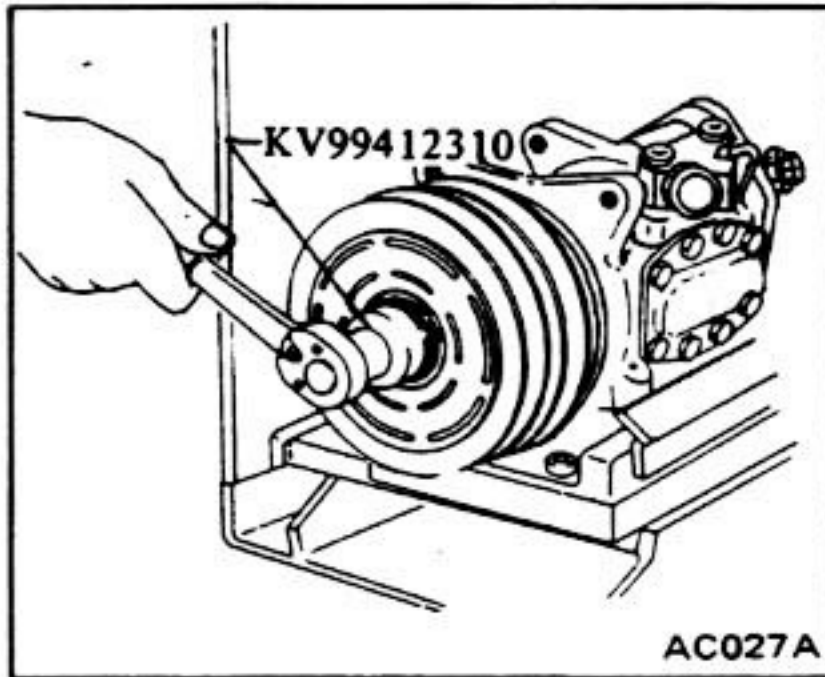
3. Using Tool, remove clutch hub. Thread tool into the bore of clutch hub, hold tool with wrench, and then thread in center bolt.



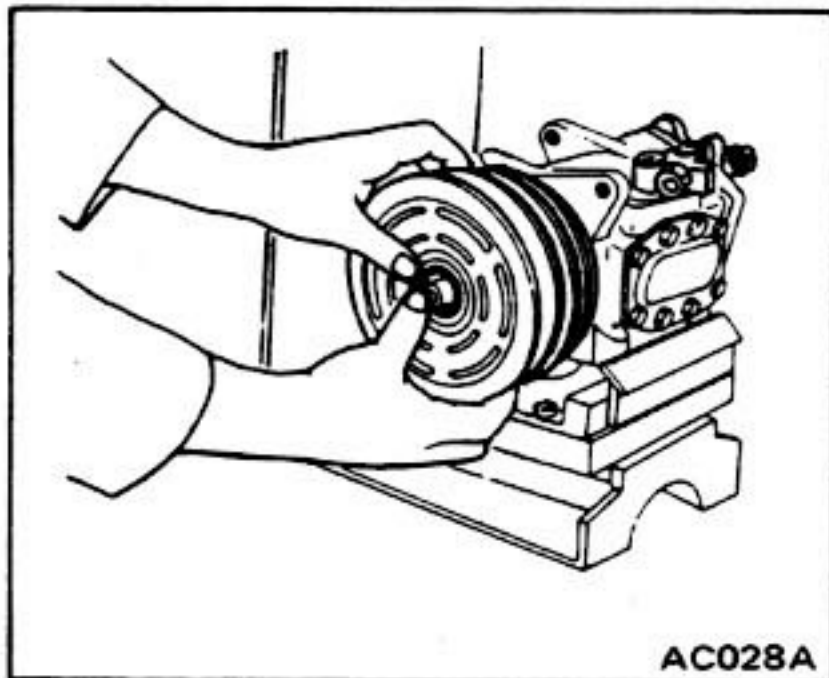
4. With an ordinary screwdriver, flatten lock washer tab.



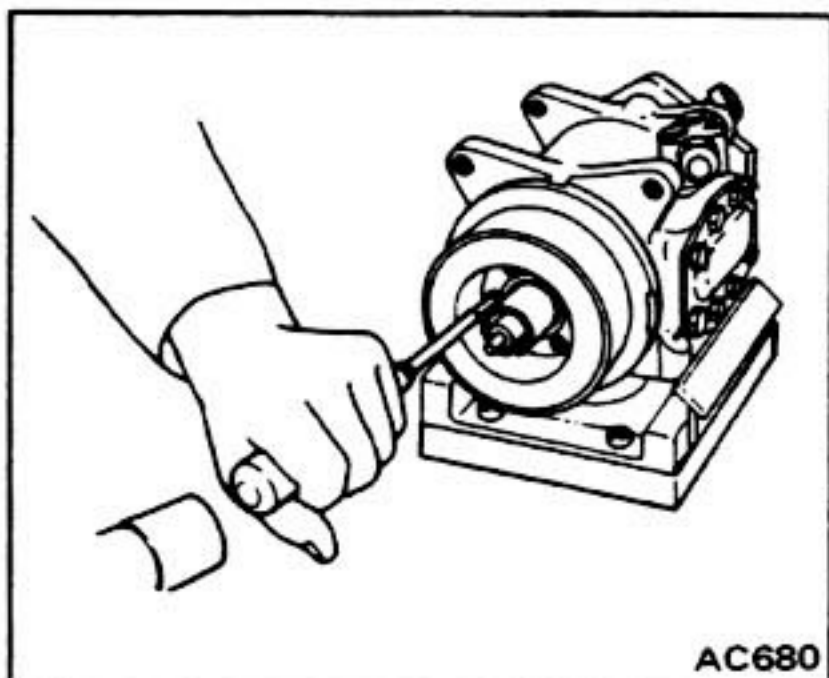
5. Using Tool, loosen lock nut. Remove lock nut and lock washer.



6. Remove pulley and bearing assembly. When the assembly can not be removed by hand, use a puller, Puller Adapter KV99412313 and Puller Pilot KV99412312.



7. Using an impact tool, loosen six coil mounting screws. Use of the impact tool is advisable as screws have been calked.



8. Remove coil mounting screws and separate coil assembly.

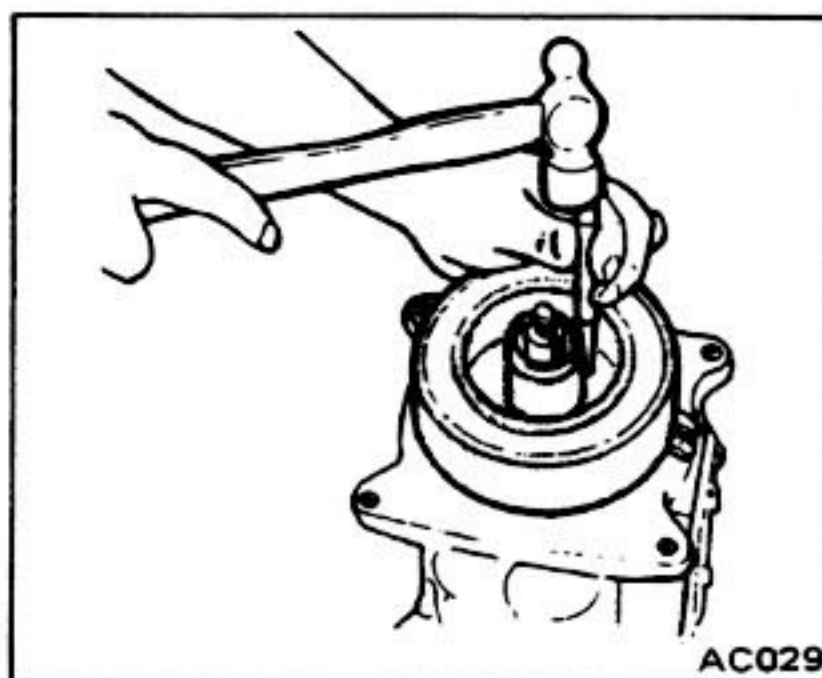
### INSPECTION

1. Check the friction surfaces of the clutch for damage due to excessive heat, or excessive grooving due to slippage. If necessary, replace coil, pulley and bearing assembly, and clutch hub as a set.
2. Oil or dirt on the friction surfaces should be cleaned with a suitable solvent and a dry rag.
3. Check coil for shorted or opened binding leads.

### INSTALLATION

1. Using a Phillips screwdriver, tighten coil assembly mounting screws in an alternating pattern. After screws have been firmly tightened, punch-lock each at one location to prevent loosening.

Ⓣ : Coil mounting screw  
2.7 - 3.4 N·m  
(0.28 - 0.35 kg·m,  
2.0 - 2.5 ft·lb)



2. Using a plastic mallet, drive pulley and bearing assembly onto the neck of the installed coil assembly. Turn the pulley, making sure that there is no noise and that rotation is free. Also make sure that there is no pulley play.
3. Position lock washer and lock nut in place. Using Tool KV99412310, tighten lock nut firmly. With lock washer tab and lock nut cutouts matched, bend the tab with the screwdriver. Proceed carefully to avoid bearing cage damage.

Ⓣ : Lock nut  
25 - 27 N·m  
(2.5 - 2.8 kg·m,  
18 - 20 ft·lb)

4. Fit key and clutch hub to the shaft. Select adjusting spacer which gives the correct clearance between the pulley and clutch hub.

Ⓣ : Hub nut  
18 - 21 N·m  
(1.8 - 2.1 kg·m,  
13 - 15 ft·lb)

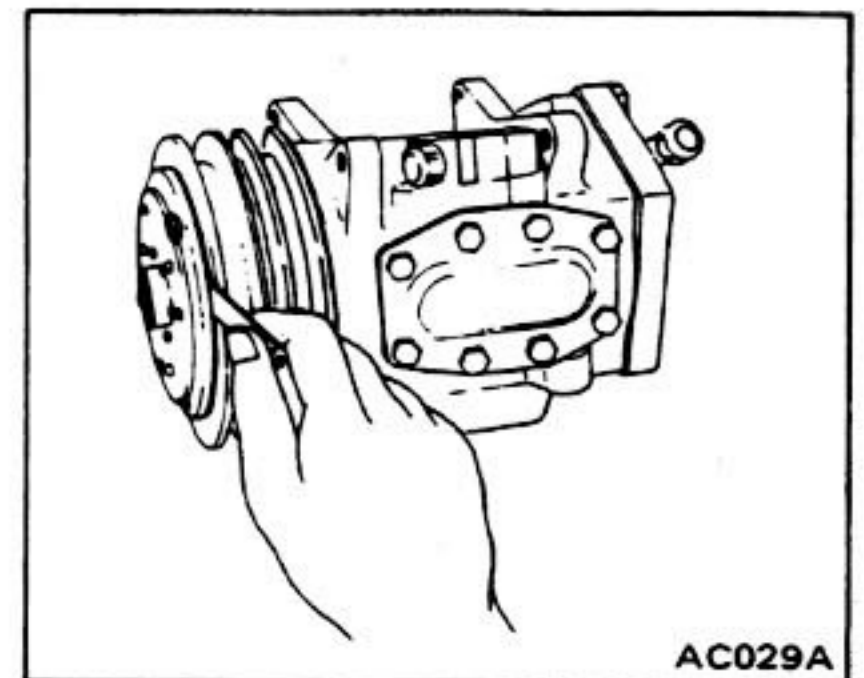
5. Tighten shaft nut with locking agent in place.

Ⓣ : Shaft nut  
18 - 21 N·m  
(1.8 - 2.1 kg·m,  
13 - 15 ft·lb)

6. Using a thickness gauge, measure the clutch hub-to-pulley clearance.

Hub-to-pulley clearance:  
0.5 - 0.8 mm  
(0.020 - 0.031 in)

If the specified clearance is not obtained, replace adjusting spacer and readjust.



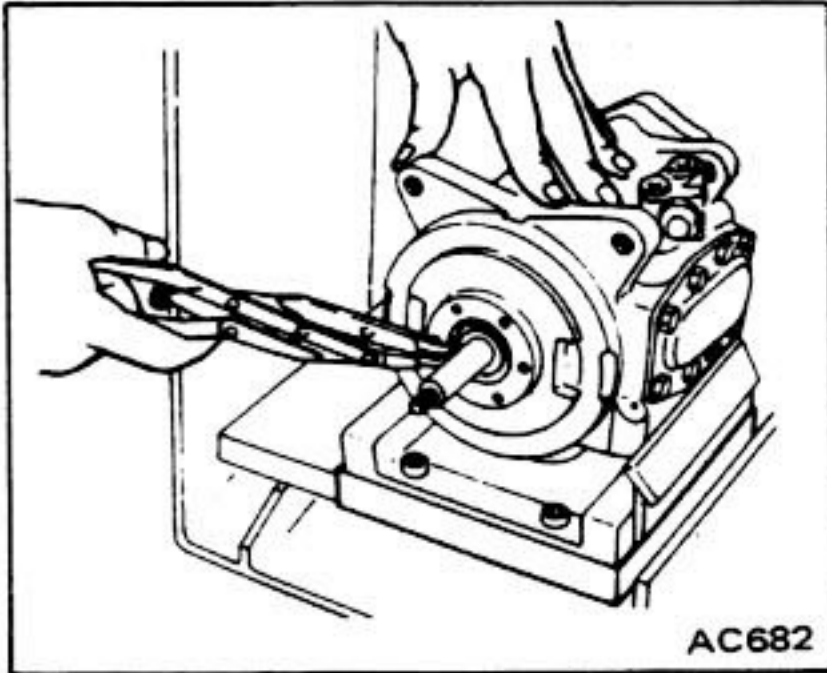
When replacing compressor clutch assembly, do not forget break-in operation, accomplished by engaging and disengaging the clutch some thirty times. Break-in operation raises the level of transmitted torque.

## SHAFT SEAL

### REMOVAL

1. Remove drain plug, thereby draining the oil.

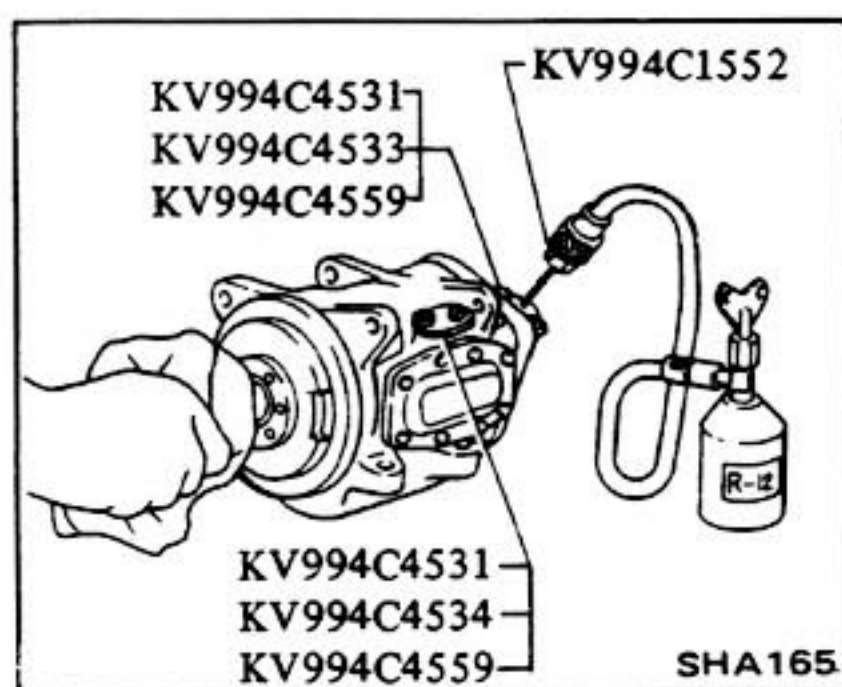
2. Remove clutch hub, pulley and bearing assembly, and coil assembly. Proceed according to information under "Compressor Clutch".
3. Using snap ring pliers, compress and remove retainer ring.



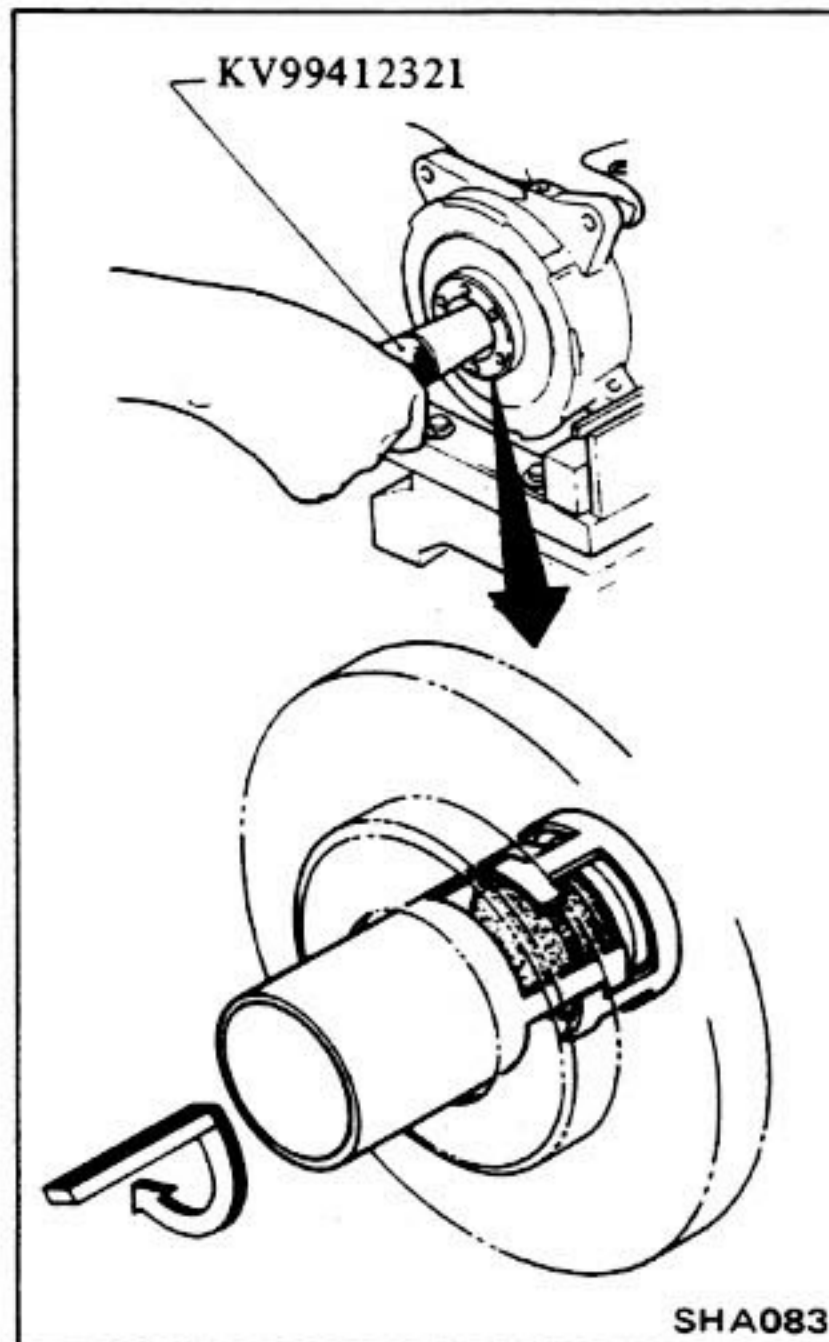
4. Plug high pressure (discharge) opening of compressor with Tools KV994C4531, KV994C4532 and KV994C4559 or blind plate and gasket located on service compressor.
5. Wrap shaft end with rag. Apply refrigerant pressure of 196 to 490 kPa (2.0 to 4.9 bar, 2 to 5 kg/cm<sup>2</sup>, 28 to 71 psi) through low pressure line of compressor until shaft seal seat is received at rag.

**CAUTION:**

- a. Do not use air to prevent entry of moisture, dust, etc.
- b. If shaft seal seat is not plucked out, install it again applying refrigerant pressure.

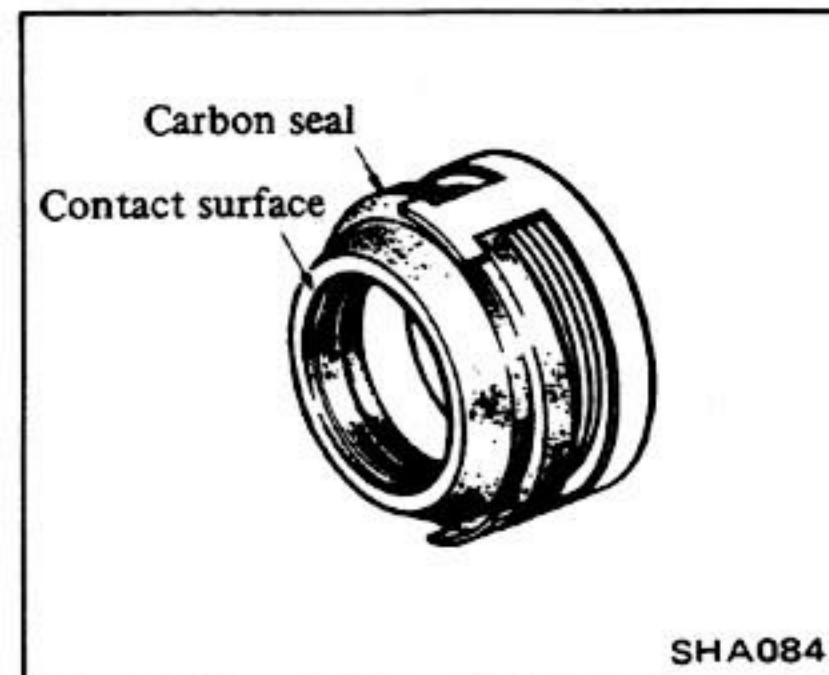


6. Insert Tool through the open end of front end cover. Depress the carbon seal and hook the Tool at the case projection of shaft seal. Slowly pull out the Tool, thereby removing shaft seal.

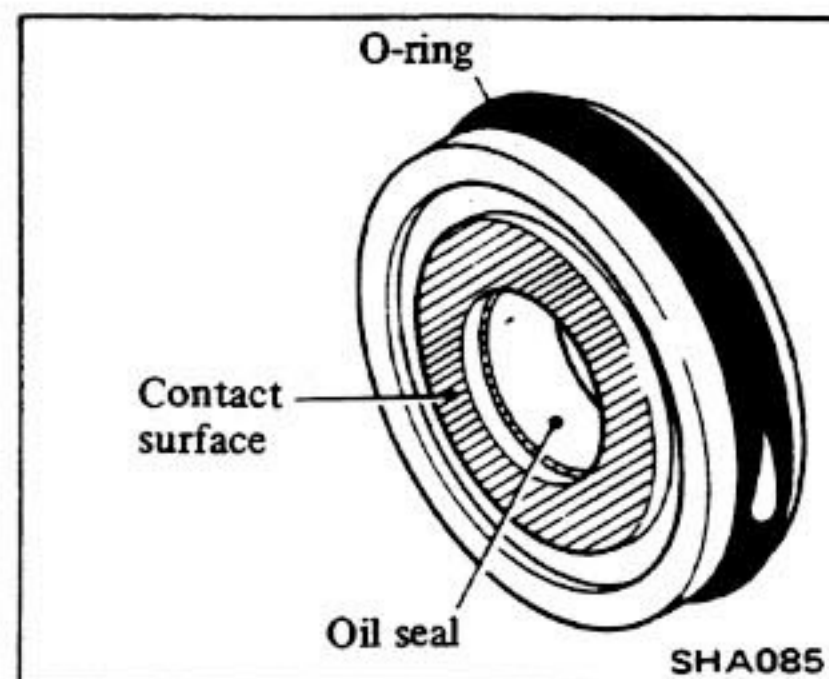


**INSPECTION**

1. Check the carbon seal surface of shaft seal for damage.



2. Check O-ring and the carbon seal contact surface of shaft seal seat for damage. Make sure that O-ring contact surface at front end cover is not damaged.



**INSTALLATION**

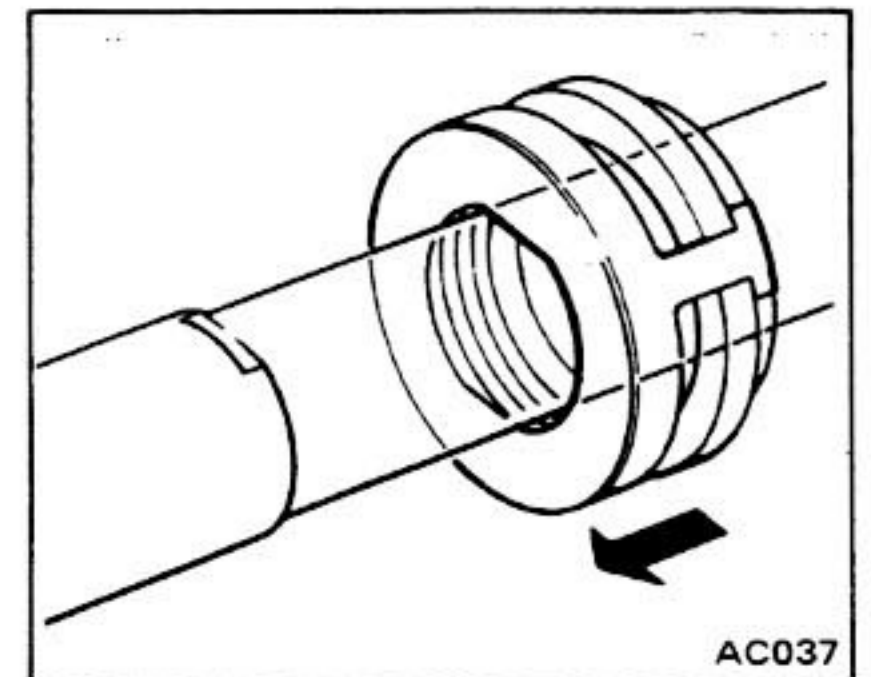
Do not re-use shaft seal seat and shaft seal.

**CAUTION:**

In placing a new seal on the workbench, make sure that the contact surface faces upward. Take necessary steps to avoid damage.

1. Make sure that the shaft seal contact surface is free of dirt and amply lubricated with compressor oil.
2. Cap Tool KV99412322 to the top end of compressor shaft.
3. Using Tool KV99412321, insert shaft seal with shaft seal case and shaft cutout aligned.

Apply force to turn the seal somewhat to the left and right. Insure that shaft seal seats properly in the shaft cutout.



4. Fit O-ring to the outside groove of shaft seal seat, making sure that it seats properly.
5. Apply an ample coat of oil to contact surface and shaft seal seat so that seat easily slides on inner side of front end cover.

Also apply a thin coat of grease or oil to shaft. Push shaft seal seat into front end cover until it bottoms up to land.

6. Using snap ring pliers, compress retainer ring and fit it into front end cover. Seat retainer ring firmly in the groove.

7. Install Tool KV99412329 to compressor shaft and turn shaft 5 to 6 turns clockwise. Then, check for gas leakage as follows:



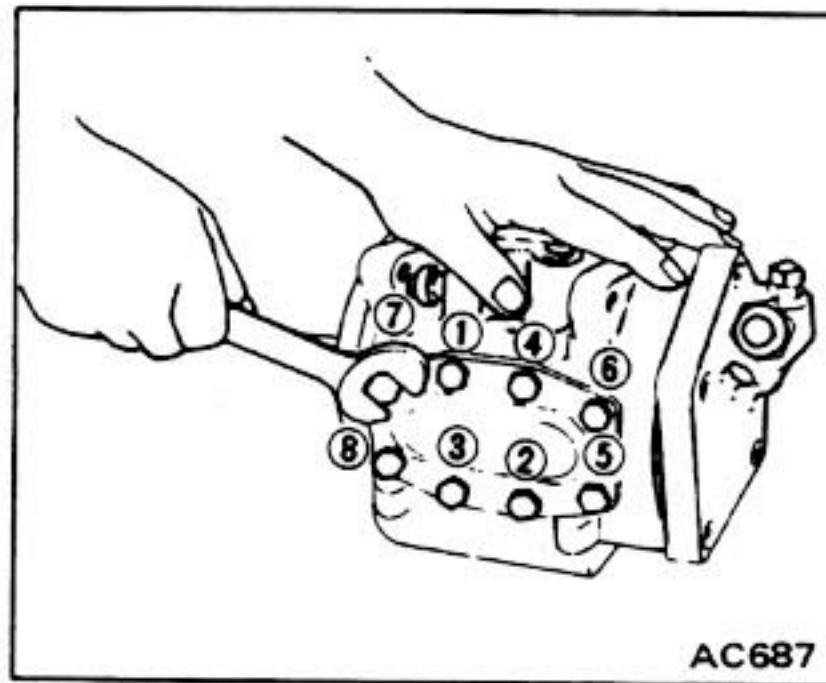
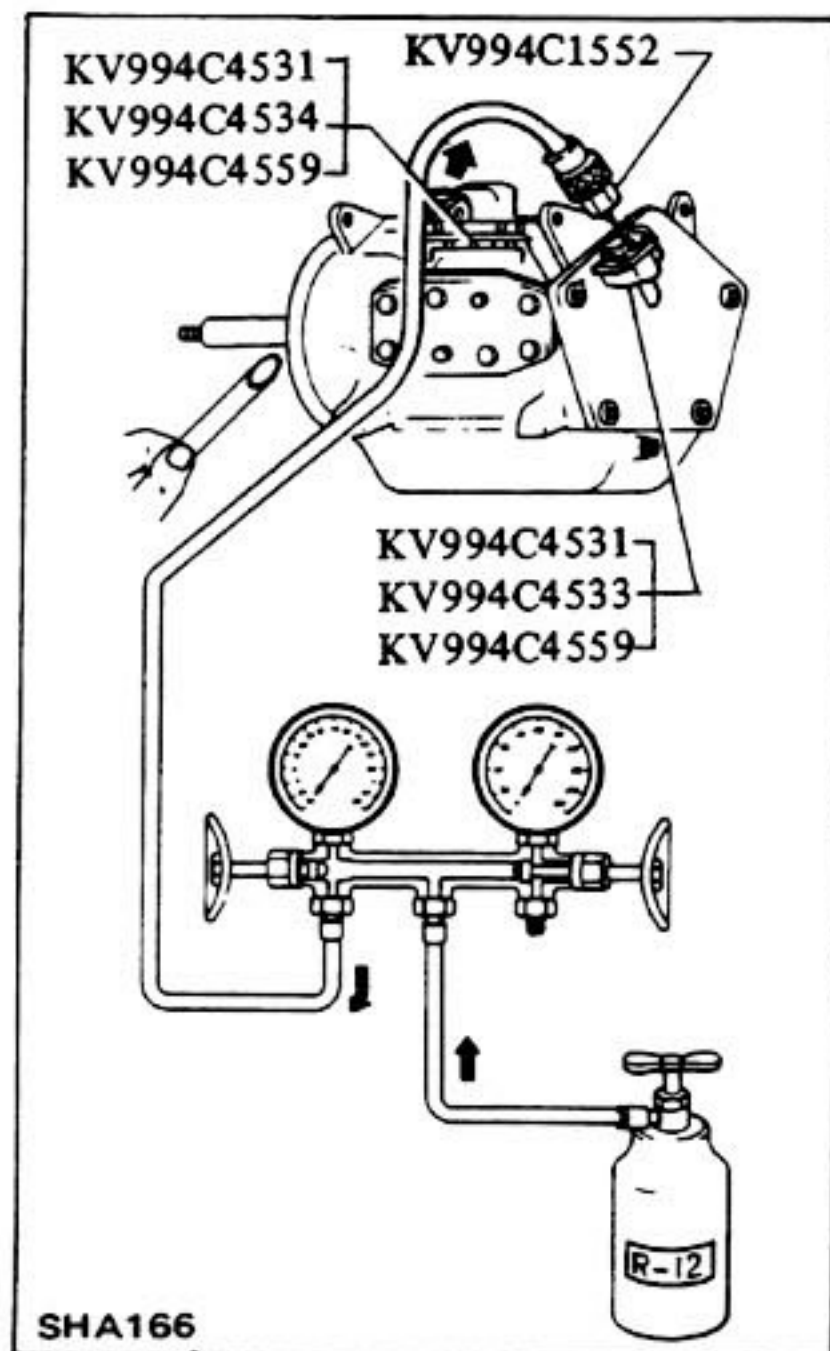
(1) Plug low-pressure joint into compressor with blind caps, and plug high pressure (discharge) joint into compressor with Tools KV994C4531, KV994C4532 and KV994C4559 or blind plate and gasket located on service compressor.

(2) Connect charging hose to low pressure gauge of manifold gauge and lower pressure (Suction) side of compressor.

Connect center hose of manifold gauge to refrigerant can.

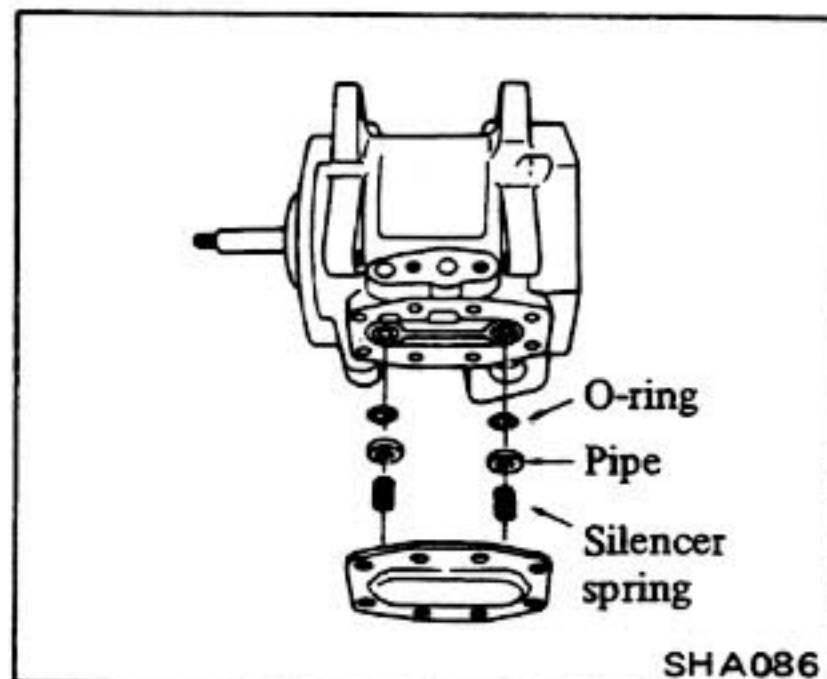
(3) Open valve of can tap, charge refrigerant from low pressure side and purge air from high pressure side by loosening blind plate.

(4) Conduct a leak test. If there is a leak, remove and then install again.



3. Remove side cover and side cover gasket. Discard the gasket.

4. Remove silencer springs, pieces, and O-rings. Do not damage O-ring surface of silencer piece during this process. Discard used O-rings.



### INSPECTION

1. Make sure that side cover gasket surface and shell gasket surface are not damaged.
2. Make sure that silencer pieces and shell contact surfaces in contact with O-ring are not damaged.

### INSTALLATION

Do not reuse old gasket and O-ring.

1. Place the mounting surface of side cover upward.
2. Make sure that holes of cylinder and shell are aligned and install O-rings.
3. Coat O-ring and the area around shell hole with an ample amount of compressor oil. Install O-ring into the shell hole with KV99412328. Then install silencer piece with Tool KV99412327.

4. Coat the gasket surface of shell with compressor oil and position gasket and side cover.

5. Hold side cover in place by hand and thread in eight mounting bolts. Tighten these bolts evenly in an alternating pattern.

Ⓣ : Side cover  
 18 - 20 N·m  
 (1.8 - 2.0 kg·m,  
 13 - 14 ft·lb)

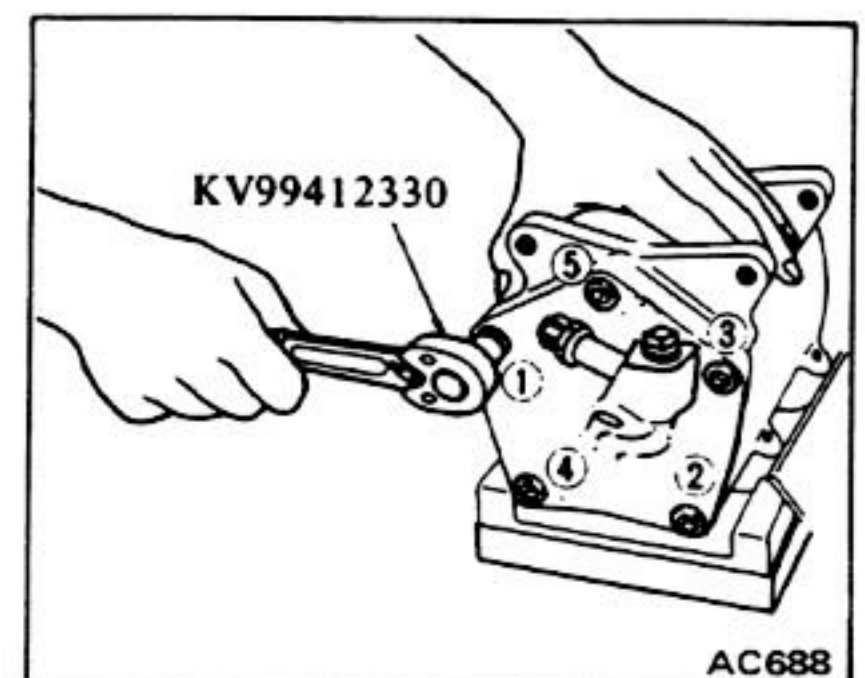
6. Fill with compressor oil.

7. Upon completion of the above operations, conduct a gas leak test by referring to the item "Installation" under the topic "Shaft Seal".

## REAR END COVER AND REAR CYLINDER HEAD

### REMOVAL

1. Drain oil.
2. Remove rear end cover mounting bolts with Tool. Starting at the top, loosen all bolts one turn in an alternating pattern. Then remove bolts in turn.

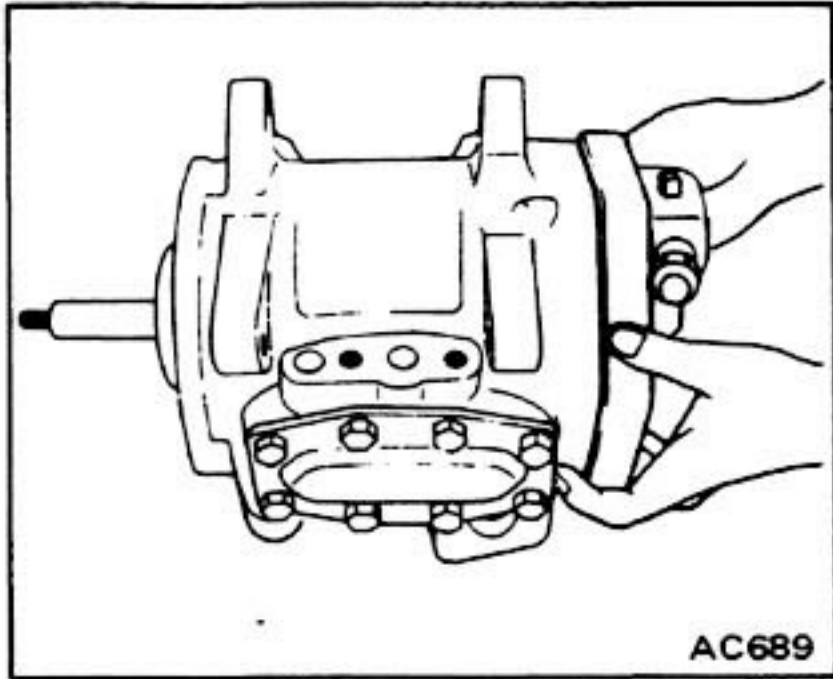


## SIDE COVER

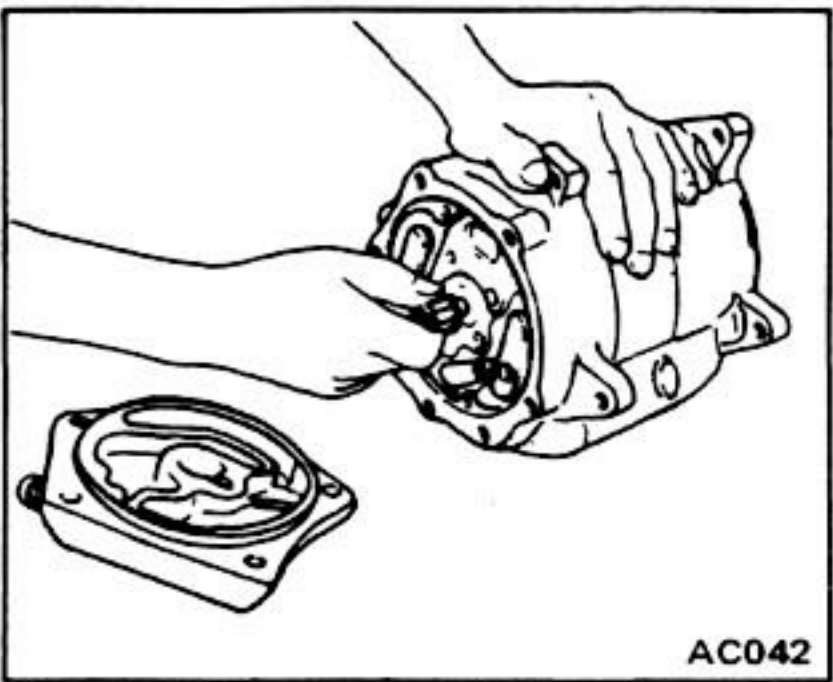
### REMOVAL

1. Drain oil.
2. Loosen and remove side cover mounting bolts in an alternate pattern. Note that two silencer springs inside the cover will force up side cover.

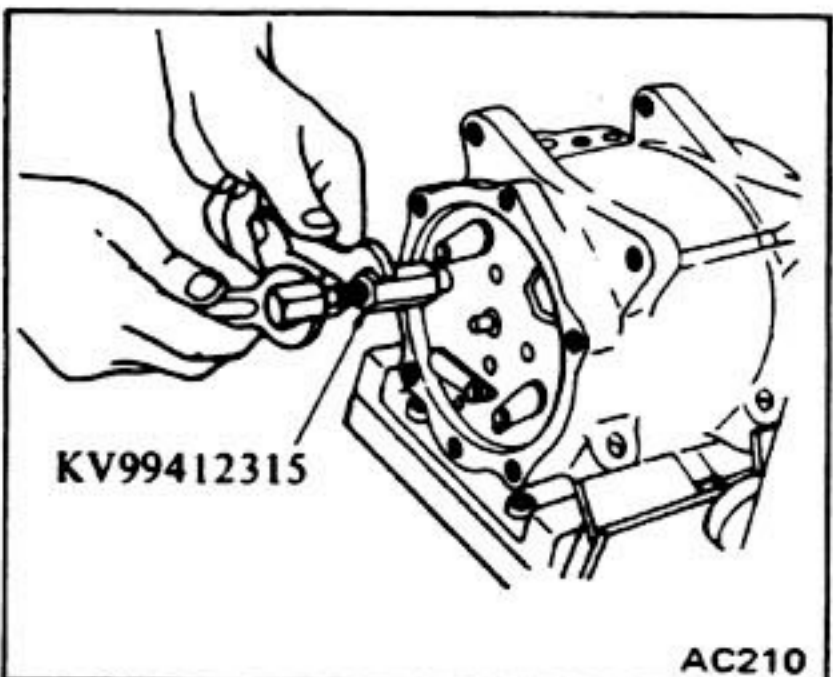
3. Grasp rear end cover and carefully separate it from compressor. Tap the flange lightly and alternately as required with a plastic mallet. Do not tap on the compressor shaft.



4. Remove pump gear. Do not allow pump gear to damage the surface.



5. Remove O-ring, gasket and two pins. Discard the O-ring and gasket.  
6. Remove rear cylinder head, suction valve plate and gasket. Discard the gasket. Carefully remove suction valve plate, avoiding deformation.  
7. When removal proves difficult, use Tool KV99412315. Insert Tool into hole in cylinder head. With the nut in firm contact with the back side of cylinder head, tighten the bolt slowly to break loose the head.



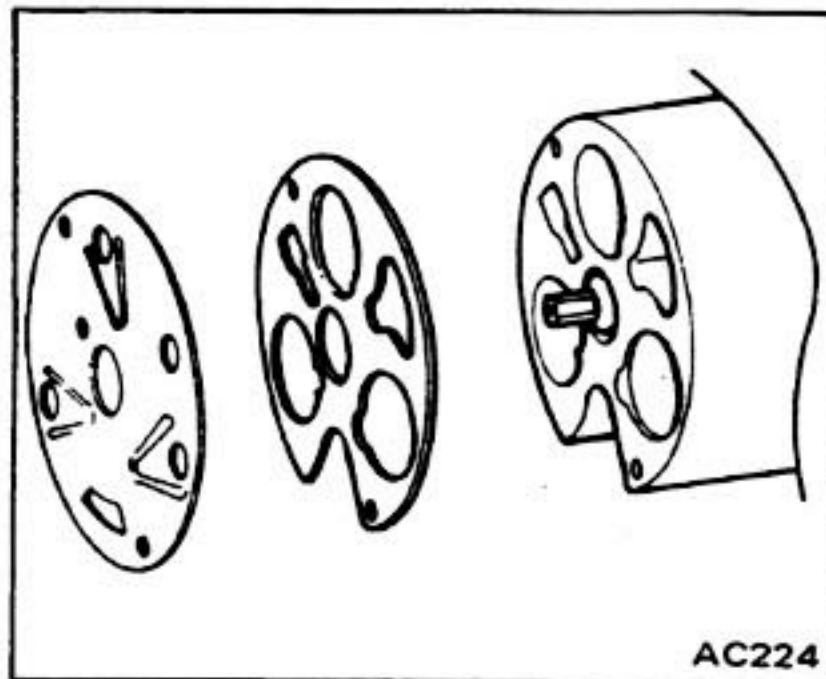
### INSPECTION

1. Make sure that the gasket contact surface is free of damage.
2. If replacement of rear end cover connector and check valve is necessary, replace rear end cover with a new one.
3. Check suction valve plate and cylinder head for broken valves.
4. Check pump gear for wear and damage.

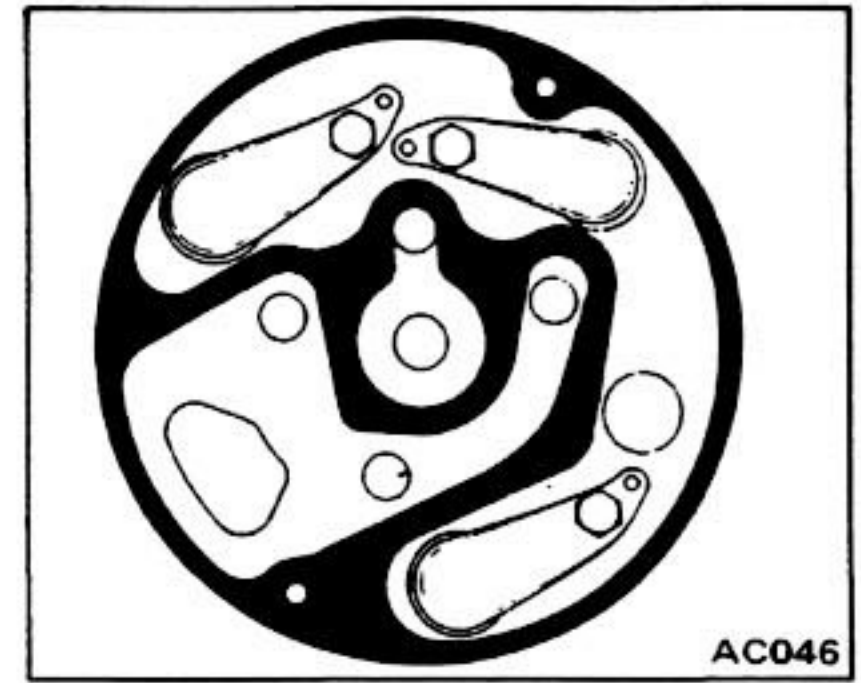
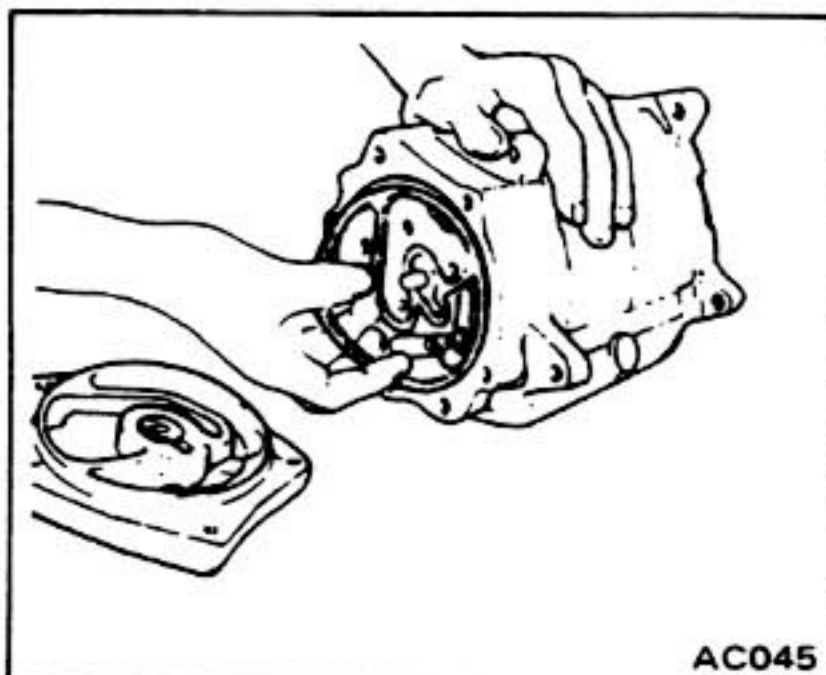
### INSTALLATION

Do not reuse old gasket and O-ring.

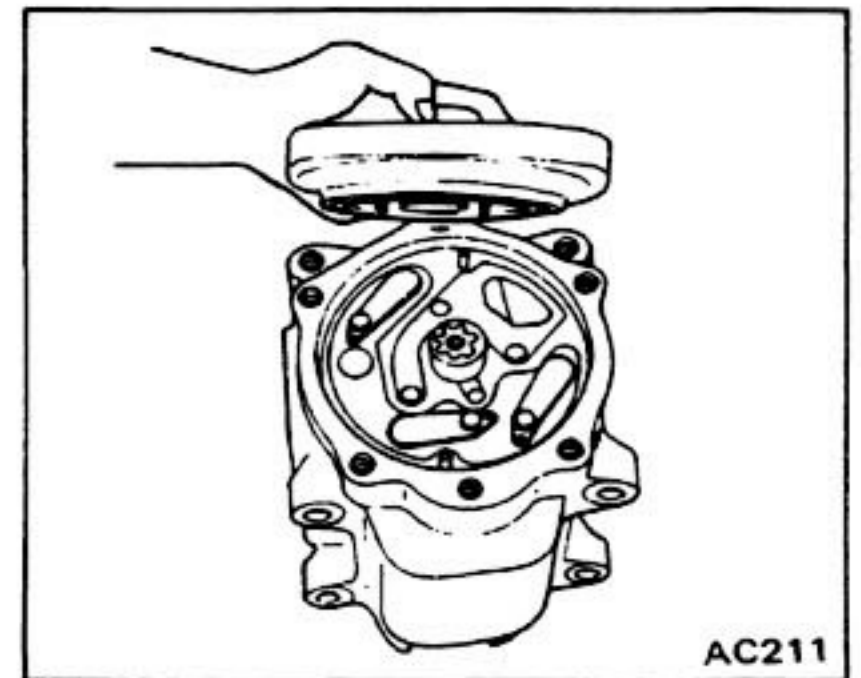
1. Using suitable blocks, position compressor with the front face downward and the rear upward.
2. Insert two pins in the rear of cylinder.
3. Coat both surfaces of cylinder head gasket with compressor oil and align gasket with cylinder.
4. Install suction valve plate, making sure that the three valves properly align with cylinders and gasket cut-outs.



5. Install cylinder head, gasket, and O-ring in the order listed. Coat gasket and O-ring beforehand with an ample amount of compressor oil.



6. Fit pump gear to rear end cover.
7. Carefully fit rear end cover to the rear of compressor.



8. Tighten up bolts in an alternating pattern, starting at the top with KV99412330. Do not forget lock washers.

Ⓣ : Rear end cover  
29 - 34 N·m  
(3.0 - 3.5 kg·m)  
(22 - 25 ft·lb)

9. Fill with compressor oil.
10. Upon completion of the above operation, conduct a leak test by referring to the topic under "Shaft Seal".

## REPLACEMENT OF CYLINDER

### REMOVAL

1. Drain oil.
2. Remove compressor clutch assembly. Refer to "Compressor Clutch".

3. Using snap ring pliers, remove shaft seal retainer ring. Then remove shaft seal seat. Refer to "Shaft Seal". Removal of shaft seal is not absolutely necessary. It may be removed when cylinder assembly is removed from front end cover. In fact, this approach facilitates work.

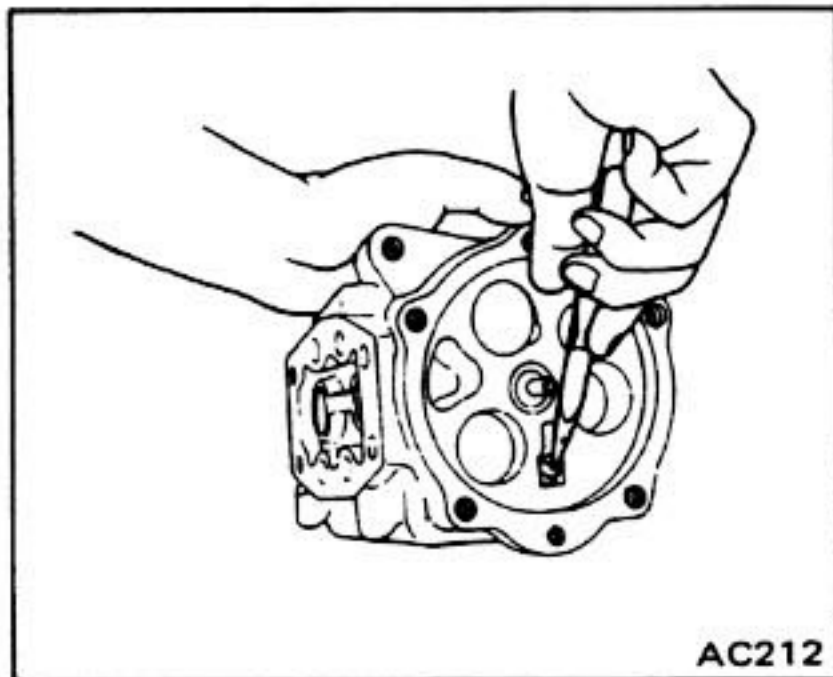
4. Remove side cover. Refer to "Side Cover".

5. Remove rear end cover. Refer to "Rear End Cover and Rear Cylinder Head". Remove O-ring, gasket, two pins, cylinder head, suction valve plate, and gasket in the order listed. This exposes the rear part of cylinder.

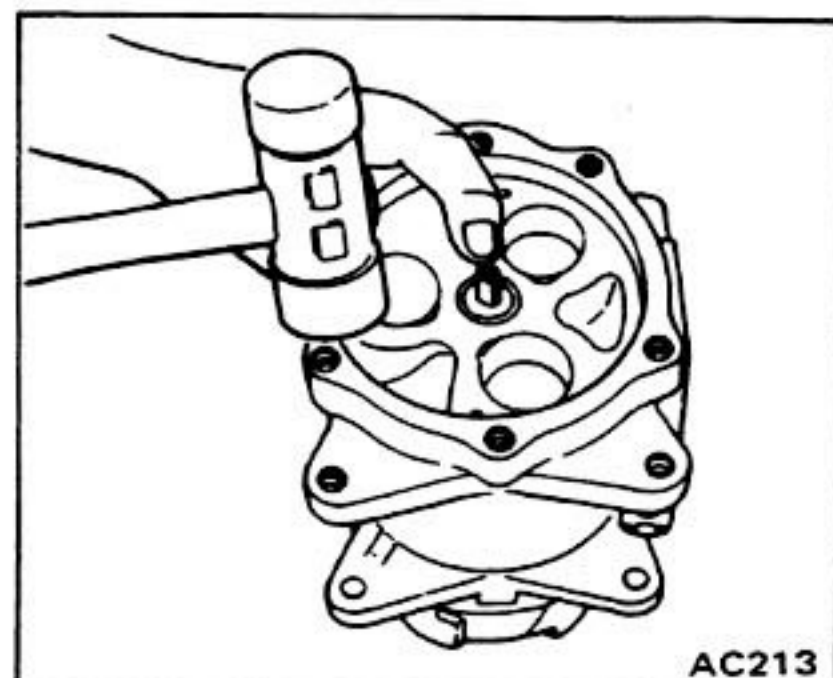
6. Using long nose pliers or other suitable tool, pull out oil pipe. Proceed carefully as oil pipe is easily bent.

**CAUTION:**

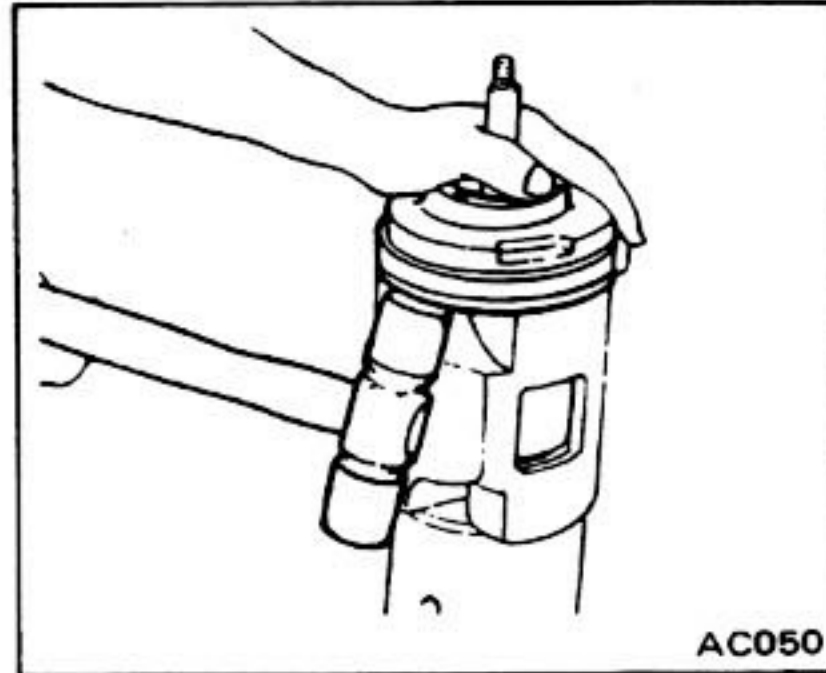
**Unless oil pipe has been removed, do not attempt the following steps.**



7. With the front facing downward support compressor shell. Using a plastic mallet, tap at the rear end of the shell flange, driving shell straight downward. Discard front end cover gasket.



8. Detach front end cover from cylinder assembly. Using a plastic mallet, drive end cover upward. Refrain from excessive force to avoid cover damage.



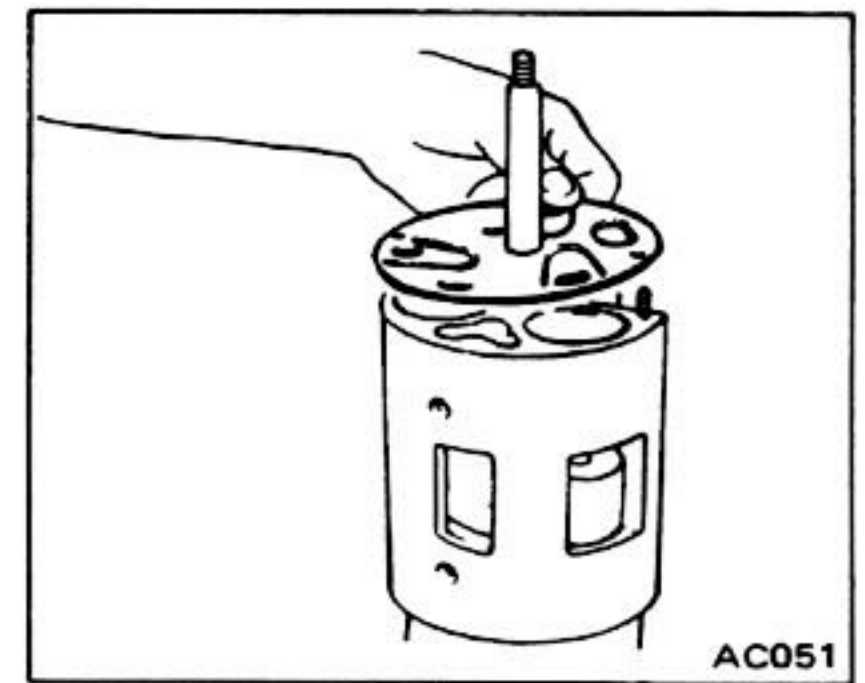
9. Remove shaft seal from the shaft.  
10. Remove two pins, gasket, cylinder head, suction valve plate, and gasket. In removing two pins, proceed carefully to avoid cylinder head damage. Do not deform suction valve plate in removing suction valve plate. Discard old gasket.

**CAUTION:**

**Do not deform suction valve plate when removing it.**

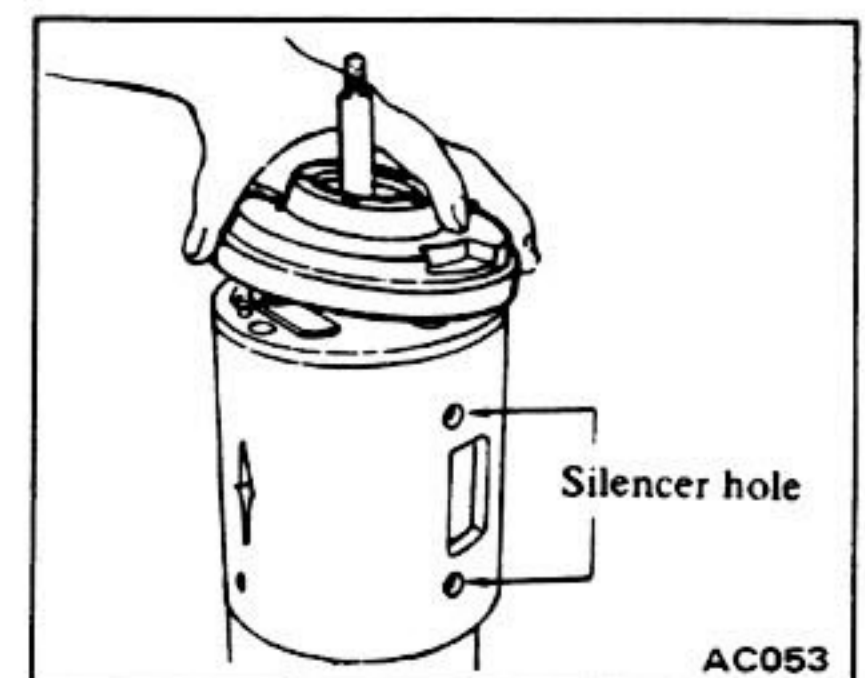
**INSTALLATION**

1. Using suitable blocks, face cylinder assembly upward. Insert two pins. Position gasket and suction valve plate in the order listed while making sure that three valves of suction valve plate are aligned with the cylinder and gasket cutouts. Coat gasket with compressor oil prior to assembly. Gaskets and suction valve plates are the same for front and rear. The cylinder head with the smaller numbers of holes goes to the front. Do not mix front and rear parts.



2. Align shaft seal with the shaft cutaway. Firmly seat shaft seal at the shaft land. Attempt to turn shaft seal to the left and right, confirming that it is seated properly.

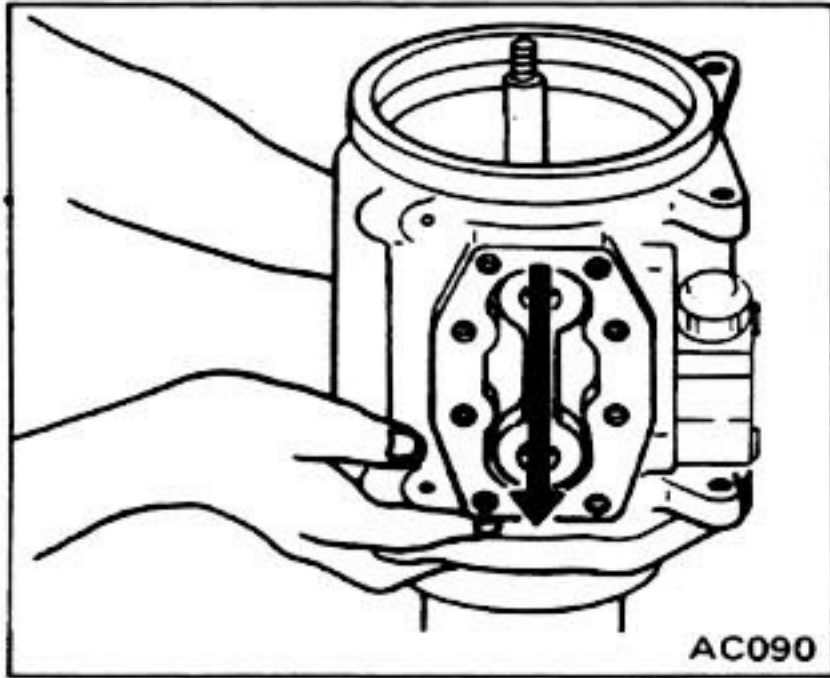
3. Place gasket on cylinder head and install front end cover. Coat gasket with compressor oil beforehand. Gasket differs for the front and rear. Make sure that the correct gasket is used. After completing this work, gasket protruding from front end cover and cylinder head should be adjusted by hand.



4. Fit gasket to front end cover. Then bring the shell into place over the cylinder assembly. At this time,

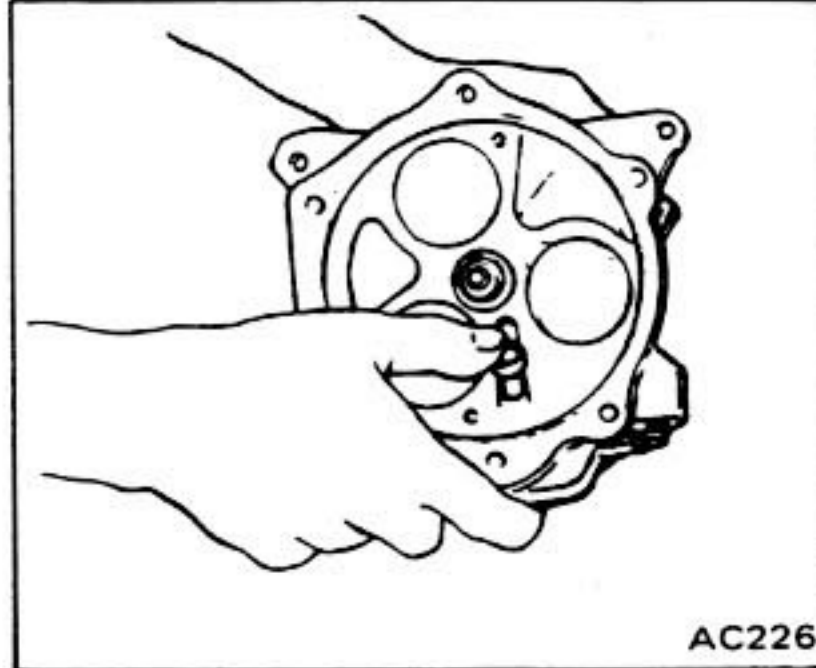
## Compressor (Disassembly and assembly) – AIR CONDITIONER

make sure that the two holes of side cover and the cylinder holes are matched. Note that later adjustment will no longer be possible, as inside and outside diameters of these are not perfectly round. Note that moving the shell up and down may cause the gasket to slip out of place.



5. Turn over the assembled shell and cylinder assembly, so that the front faces downward.

6. Coat oil pipe and O-ring with an ample amount of oil. Insert oil pipe at the rear of the cylinder. After making sure that the hole lines are matched as specified in step (4), continue with step (6) work.



7. Continue with work up to installation of rear end cover, according to "Installation" under "Rear End Cover and Rear Cylinder Head".

8. Continue with work up to installation of side cover, according to "Installation" under "Side Cover".

9. Install shaft seal seat according to instructions in "Installation" under "Shaft Seal".

10. Install and adjust compressor clutch according to instructions in "Installation" under "Compressor Clutch".

11. Fill with compressor oil, and tighten oil plug with copper gasket in place.

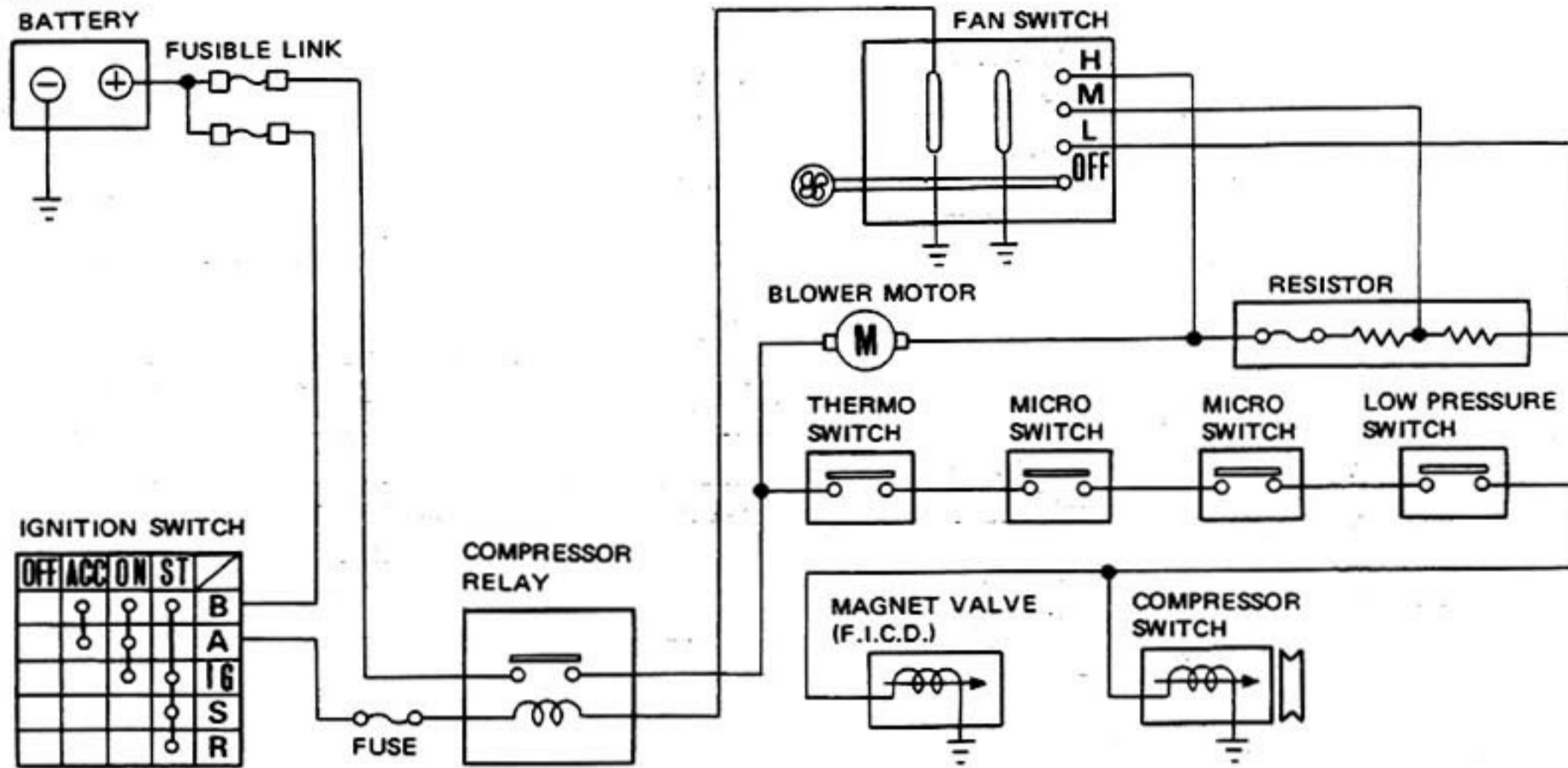
⊕ : Oil plug  
18 - 20 N·m  
(1.8 - 2.0 kg·m,  
13 - 14 ft·lb)

12. Conduct a leak test by referring to the topic under "Shaft Seal".

# ELECTRICAL CIRCUIT

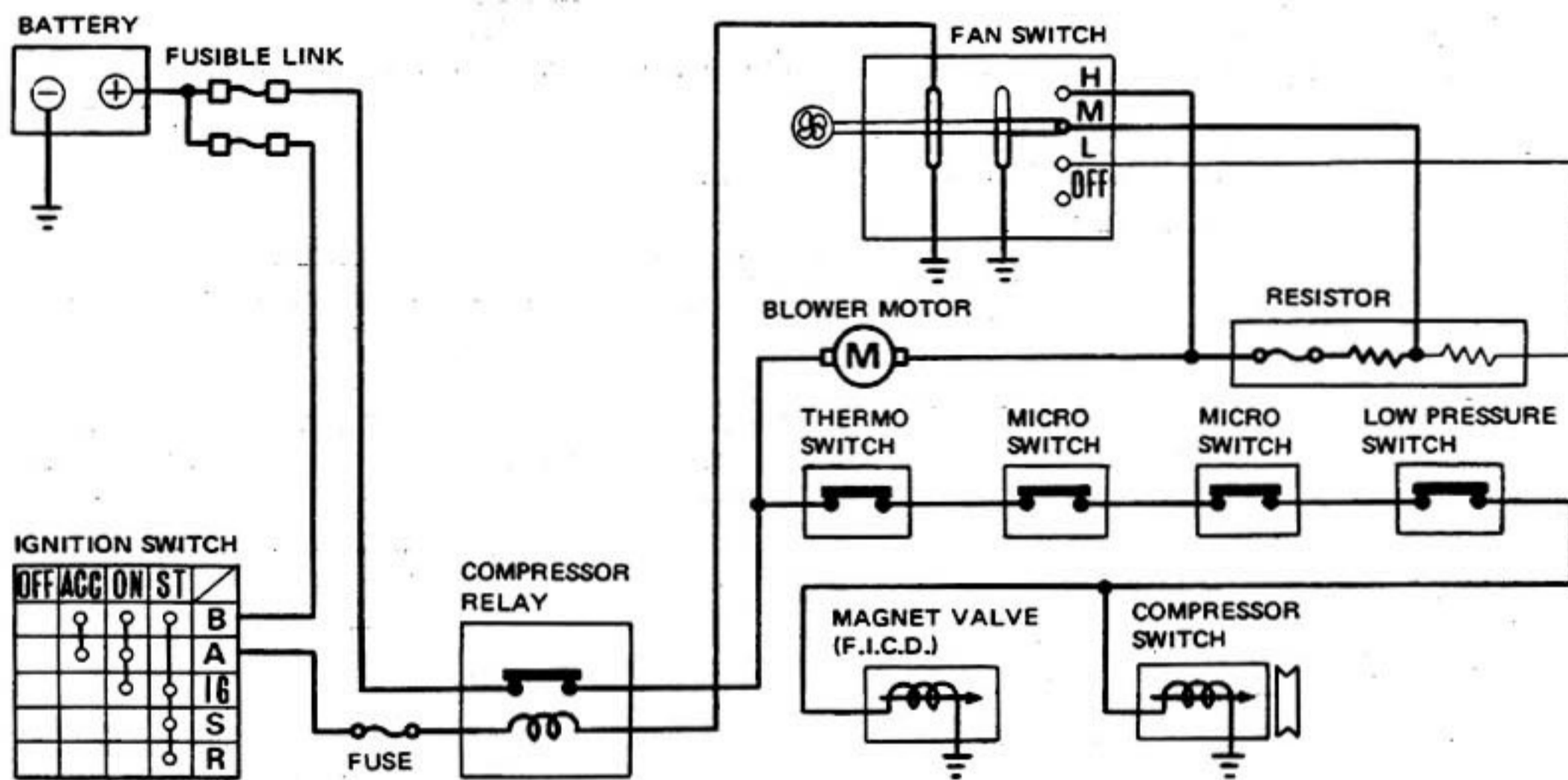
## SCHEMATIC

OFF



SHA613

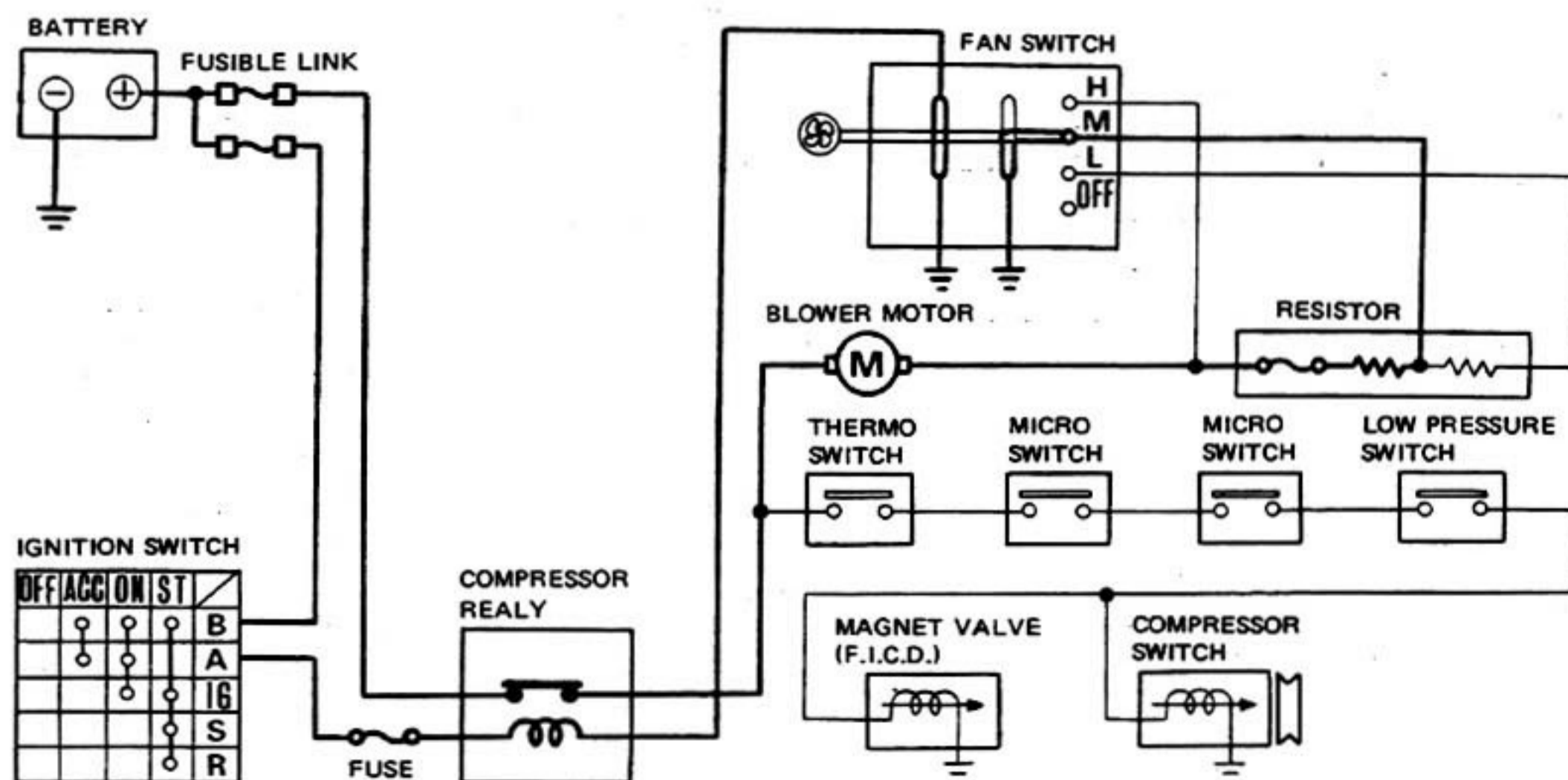
## VENT AND BI-LEVEL position



Note: Cooler compressor operates only when intake door is in "RECIRC" position.

SHA615

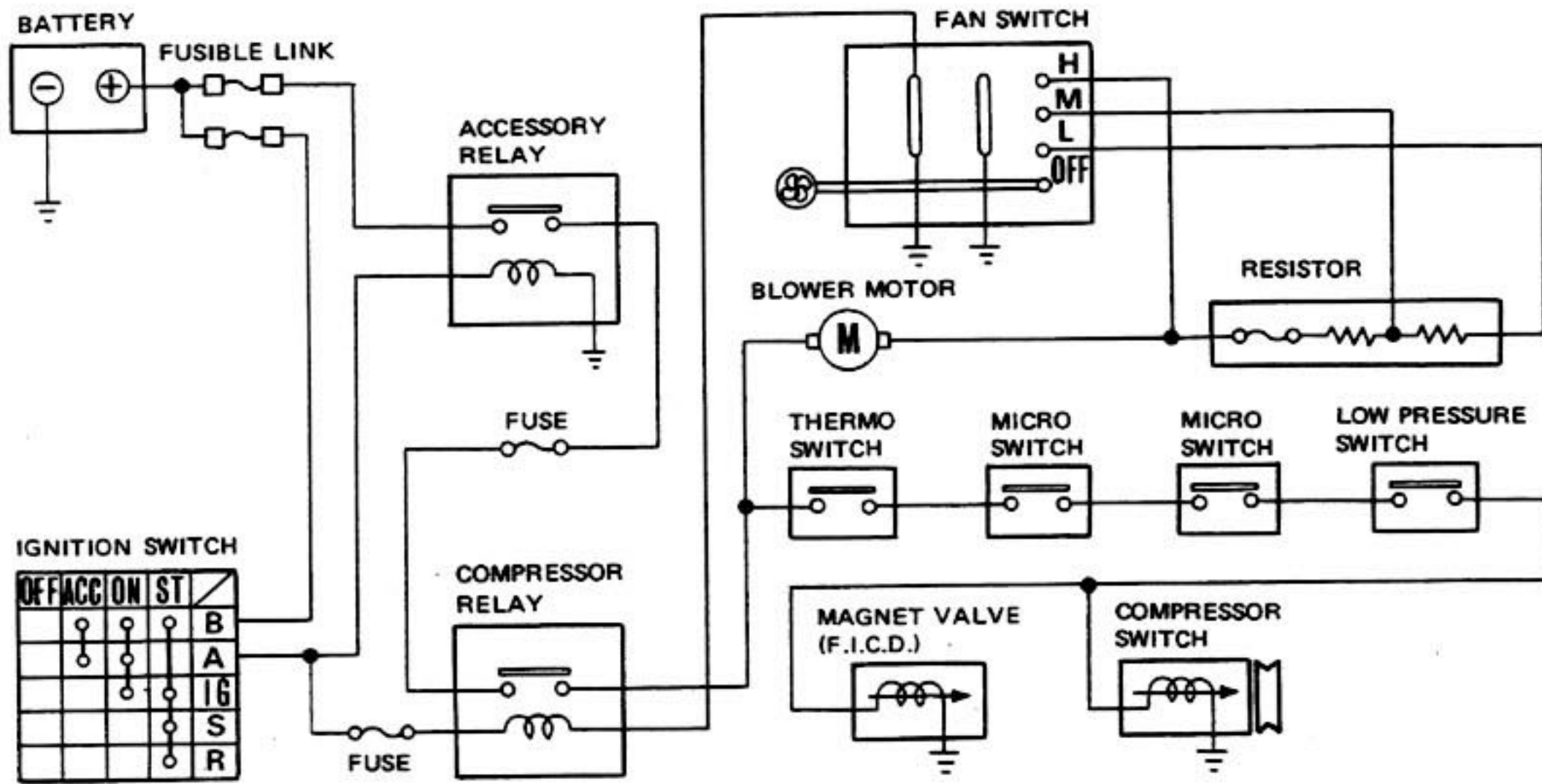
## HEAT AND position



SHA614

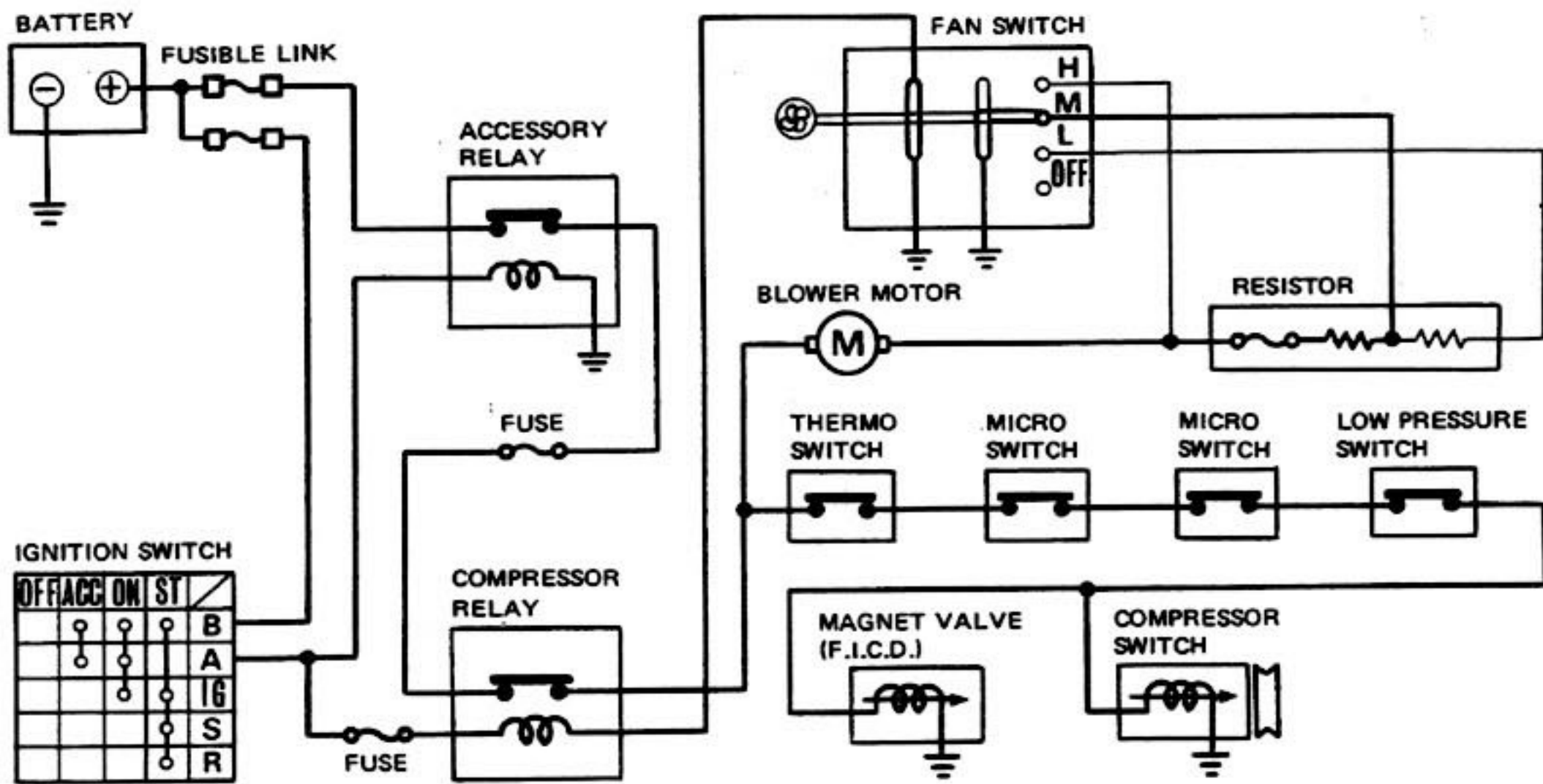
# Electrical Circuit – AIR CONDITIONER

## OFF



SHA616

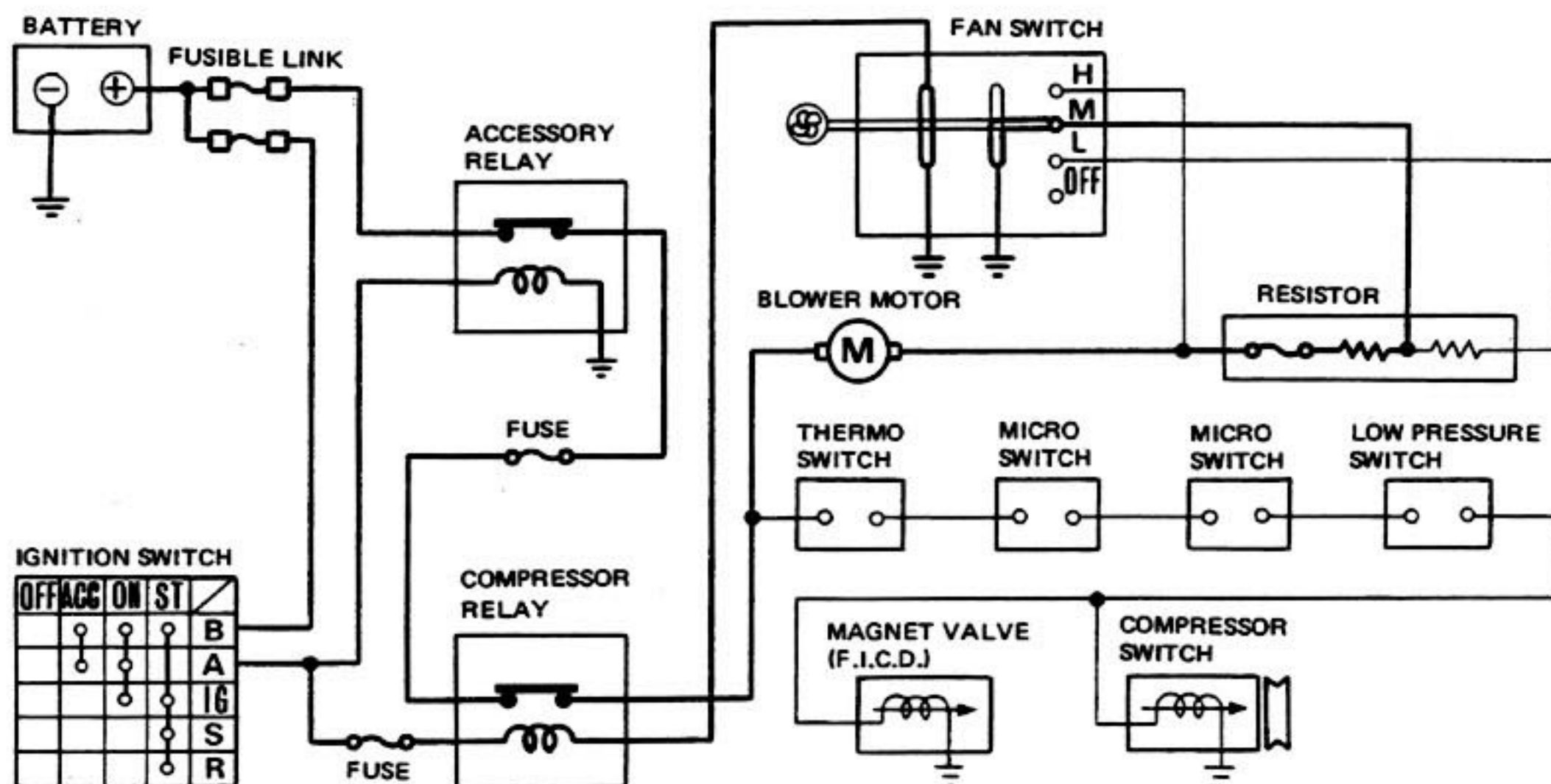
## VENT, BI-LEVEL, AND A/C position



Note: Cooler compressor operates only when intake door is in "RECIRC" position.

SHA617

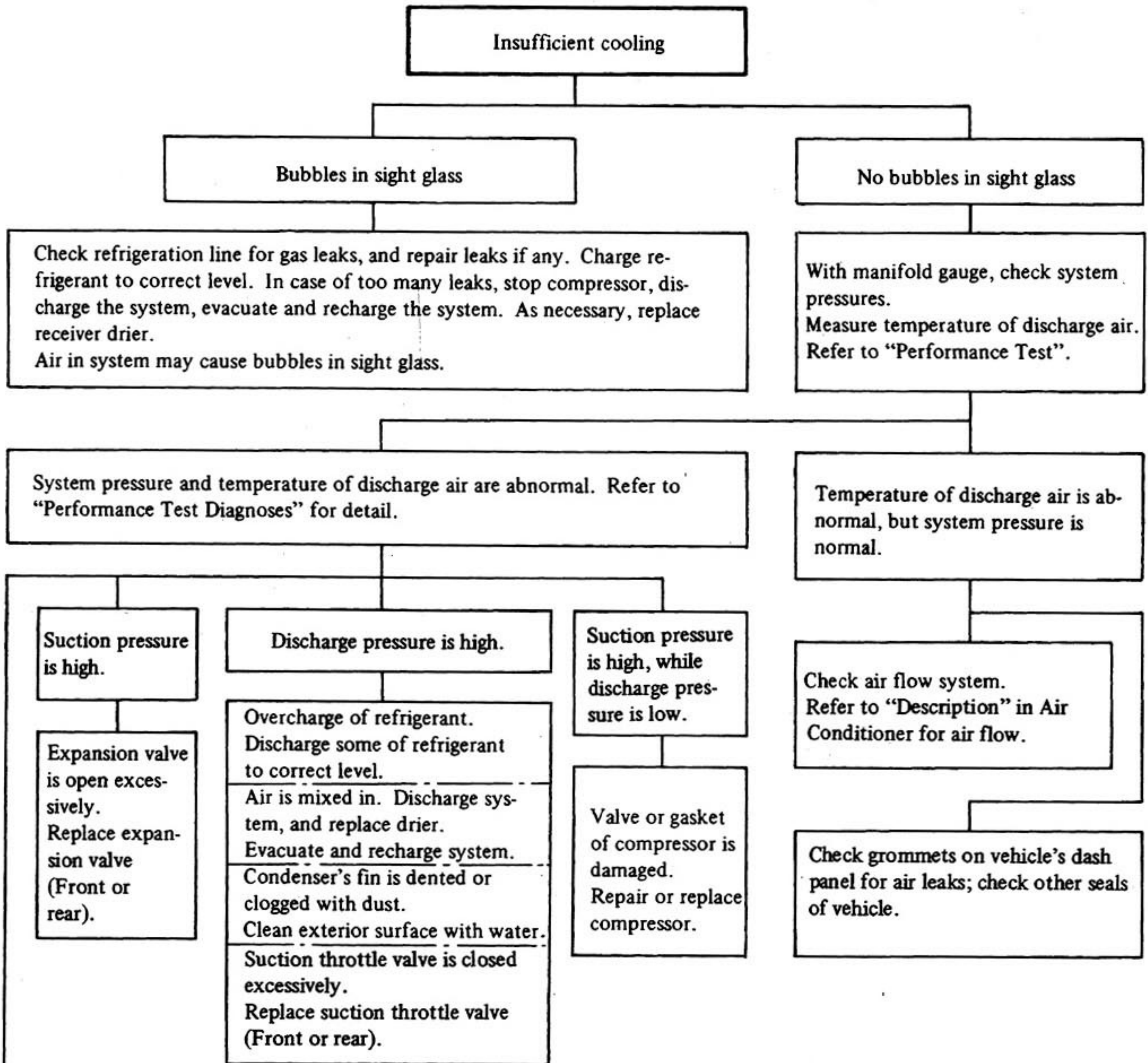
## HEAT AND position



SHA618

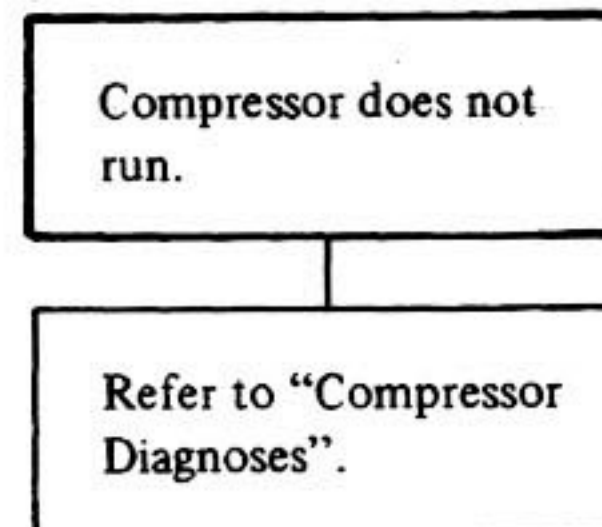
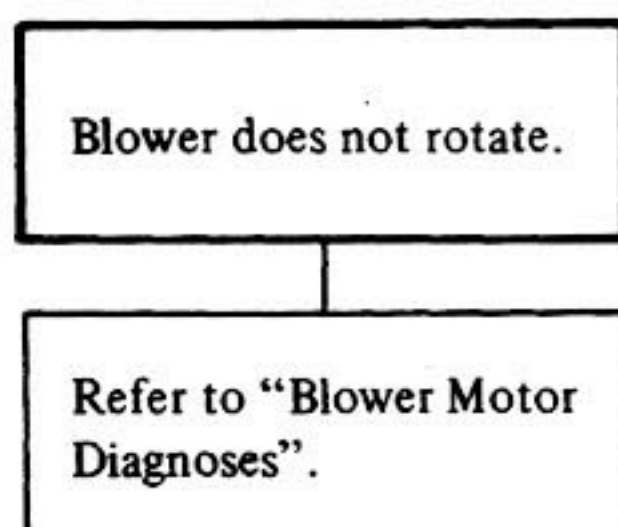
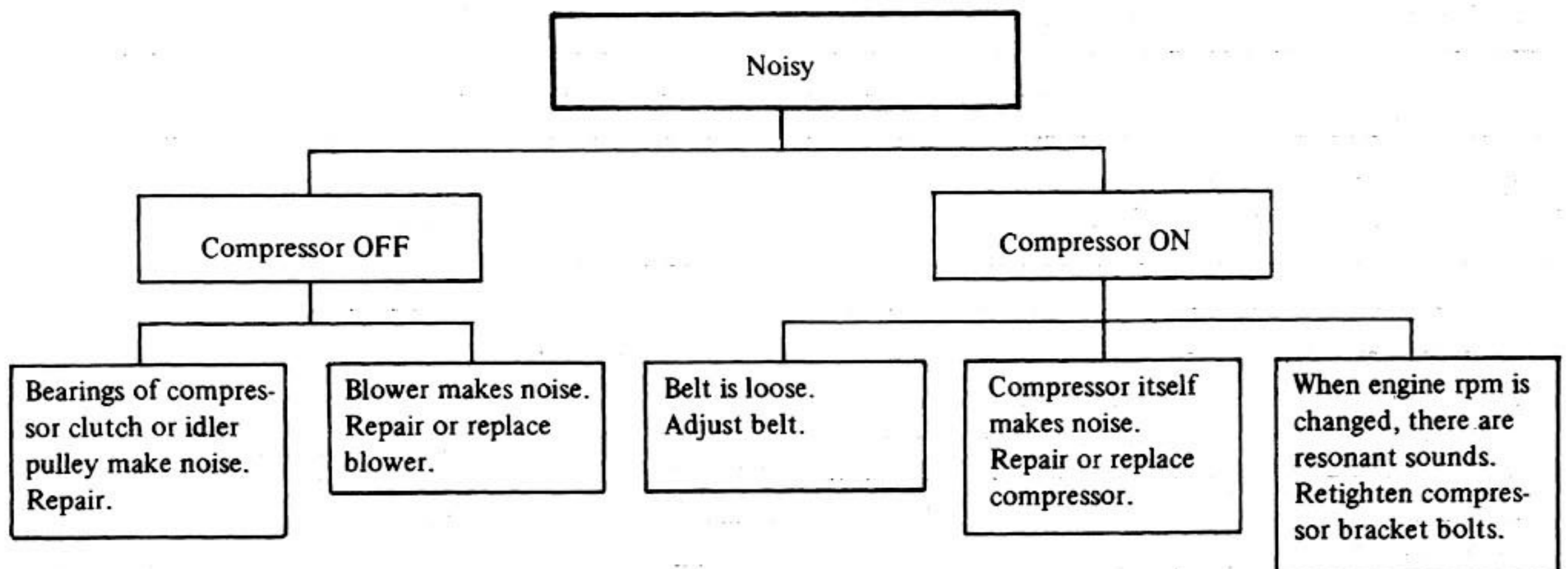
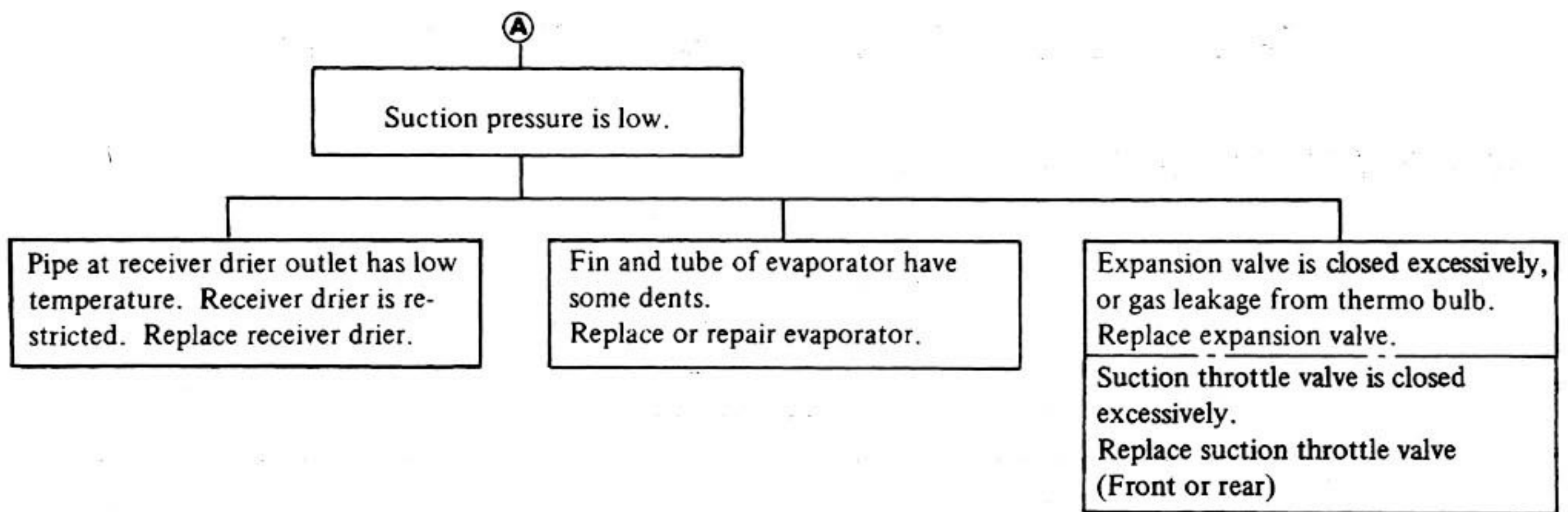
## TROUBLE DIAGNOSES AND CORRECTIONS

### AIR CONDITIONER DIAGNOSES



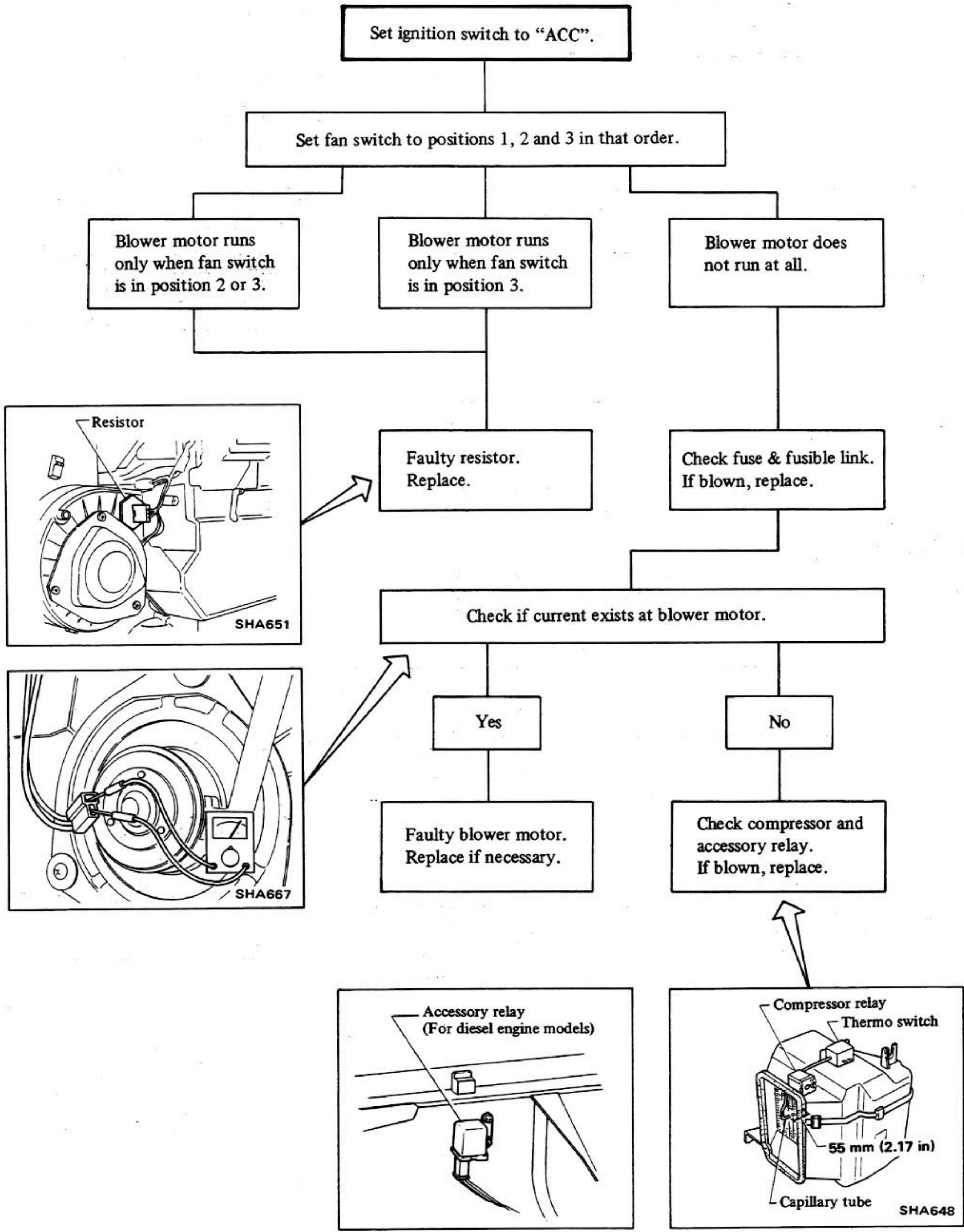
A

**Trouble Diagnoses and Corrections – AIR CONDITIONER**

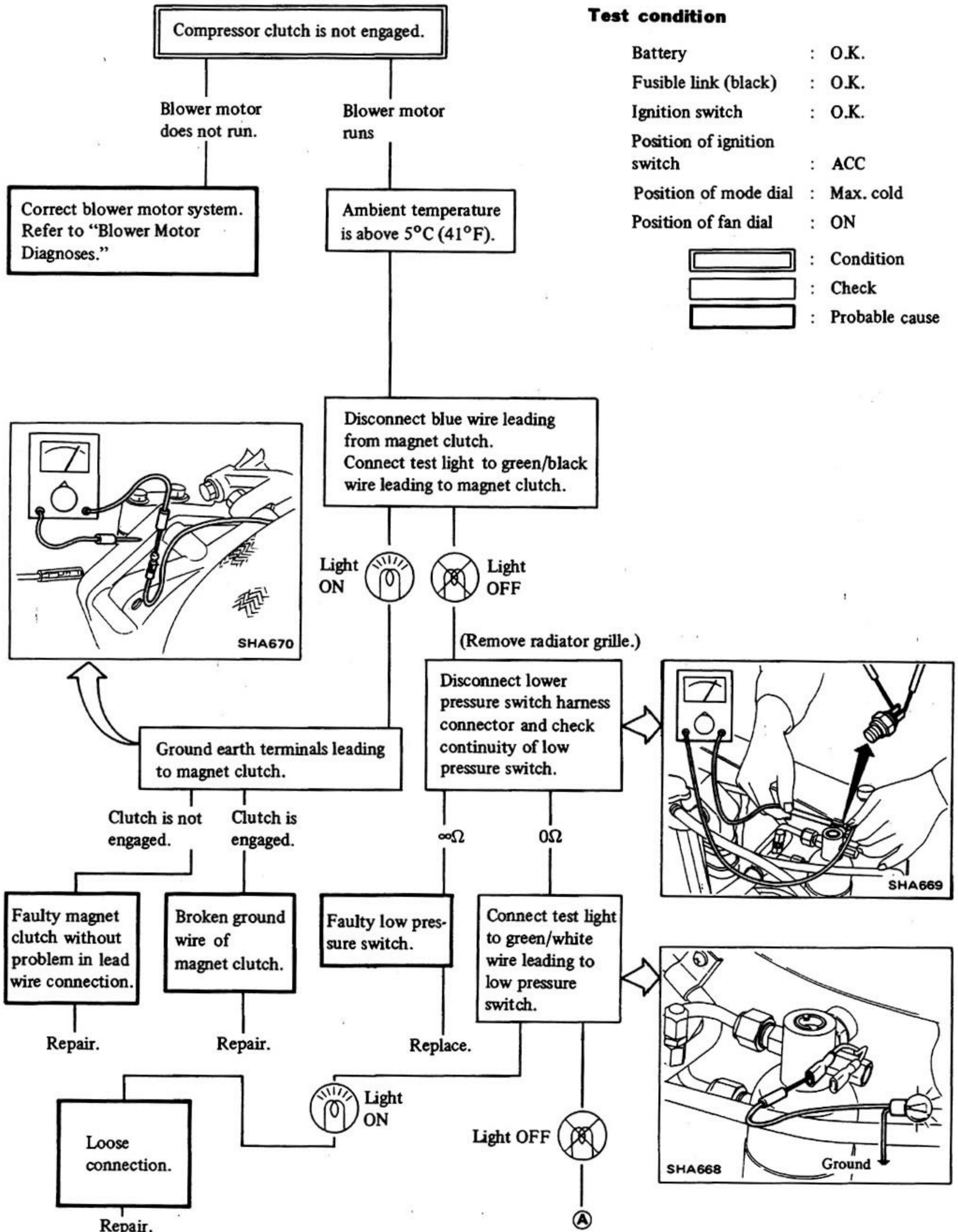


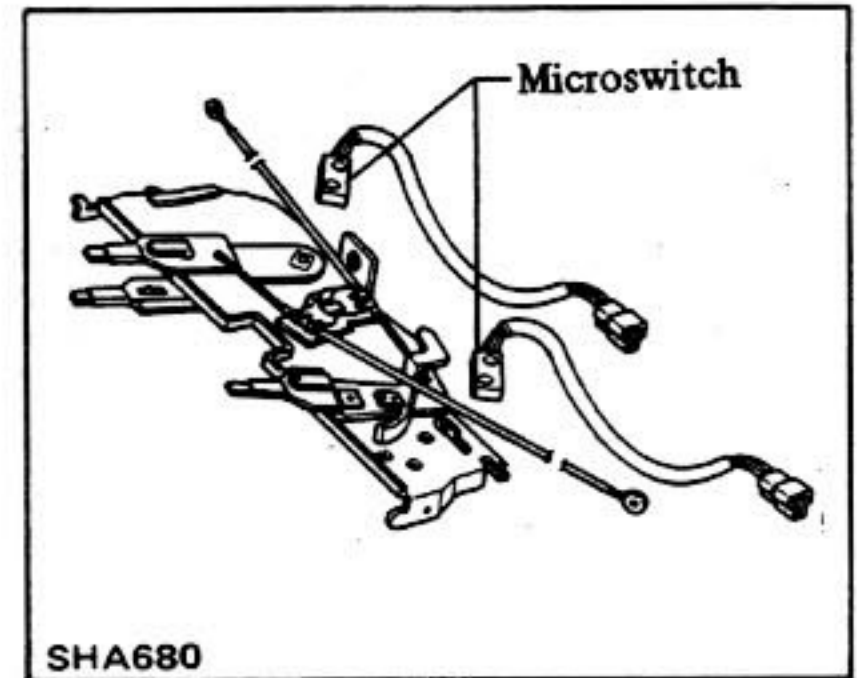
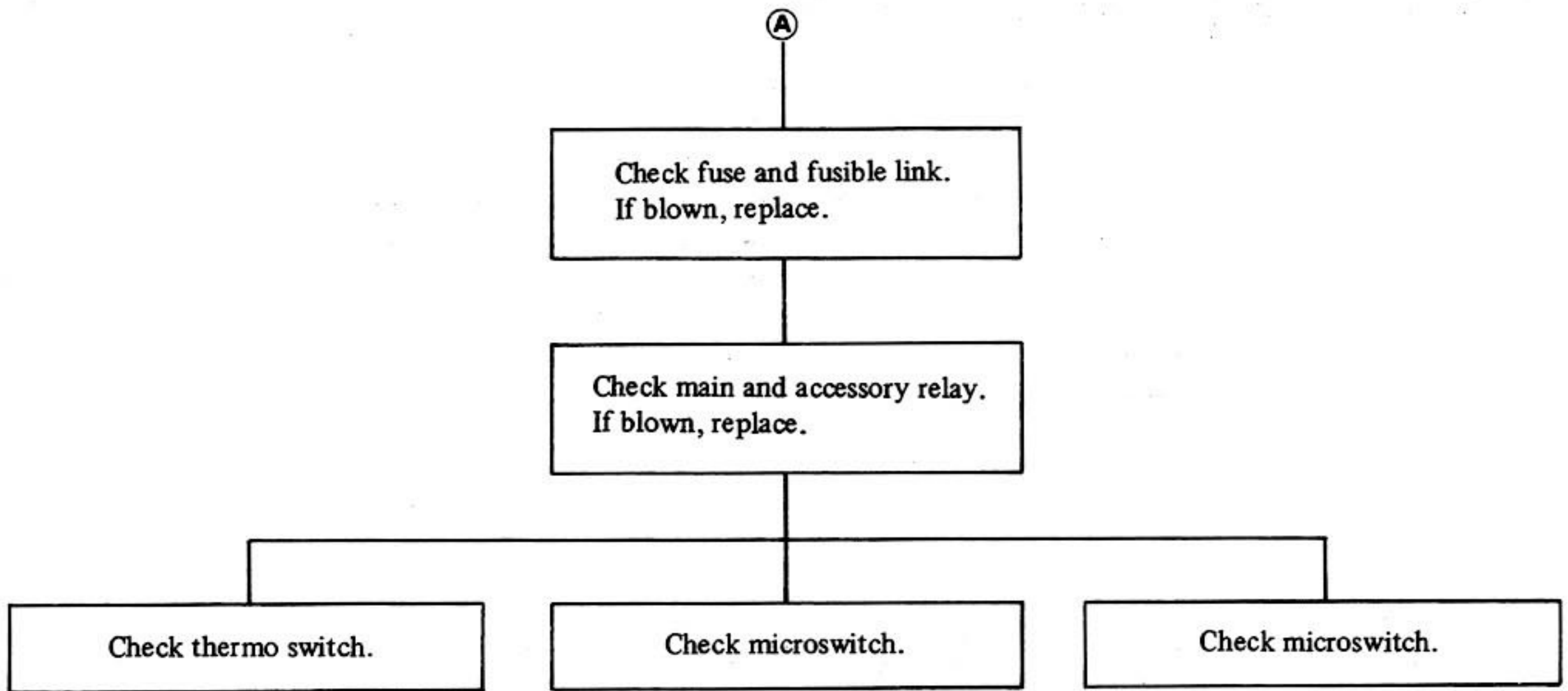


## BLOWER MOTOR DIAGNOSES

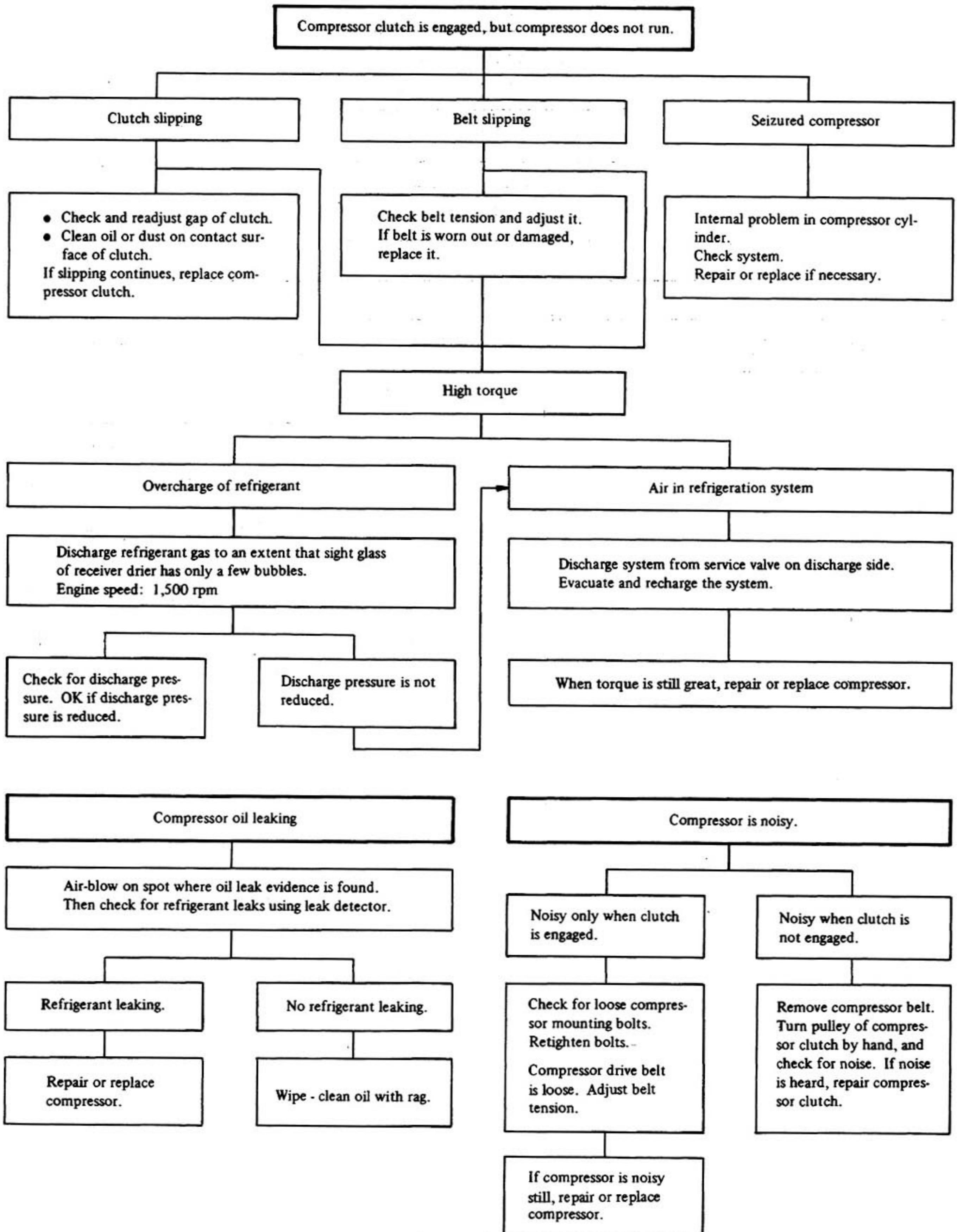


# COMPRESSOR CLUTCH DIAGNOSES

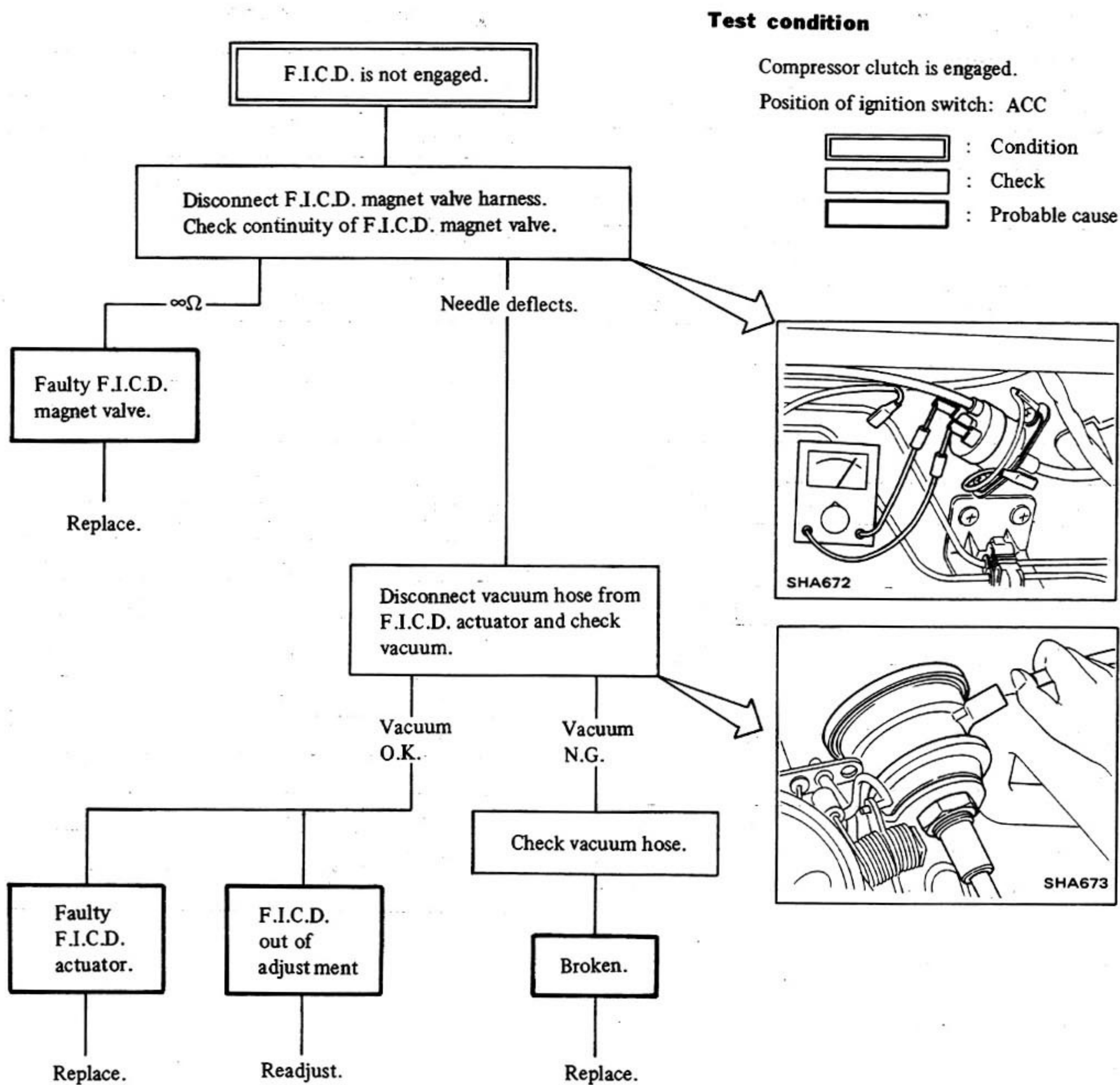




## COMPRESSOR DIAGNOSES



## FAST IDLE CONTROL DEVICE (F.I.C.D.) DIAGNOSES



## SERVICE DATA AND SPECIFICATIONS

### GENERAL SPECIFICATIONS

#### COMPRESSOR

Model	SWP167	SWP123
Type	Swash plate	
Displacement cm <sup>3</sup> (cu in)/rev.	167 (10.19)	123 (7.51)
Cylinder bore x stroke mm (in)	37.2 x 25.7 (1.465 x 1.012)	32.0 x 25.4 (1.260 x 1.000)
Direction of rotation	Clockwise	
Type of driving belt	A type	

#### LUBRICATING OIL

Type	SUNISO 5GS
Capacity mℓ (Imp fl oz)	270 (9.5)

#### REFRIGERANT

Type	R-12
Air conditioner kg (lb)	1.0 - 1.2 (2.2 - 2.6)

### INSPECTION AND ADJUSTMENT

#### ENGINE IDLE SPEED

Transmission	When A/C is ON
Manual rpm	800

#### BELT TENSION

Fan belt/Applied pressure mm (in)/N (kg, lb)	8 - 12 (0.31 - 0.47)/ 98 (10, 22)
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#### COMPRESSOR

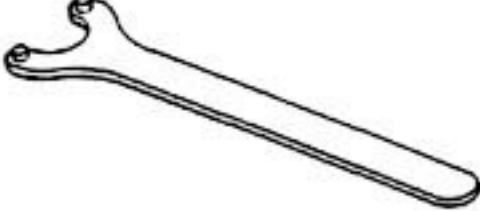
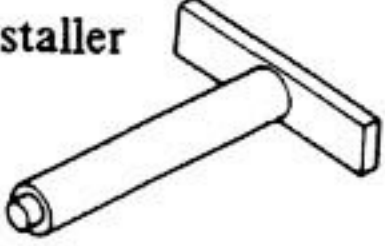

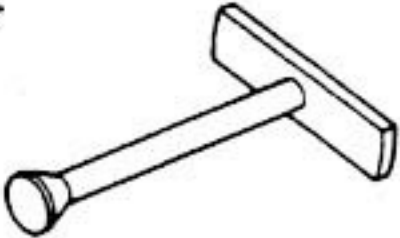

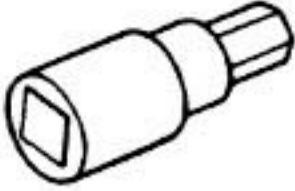
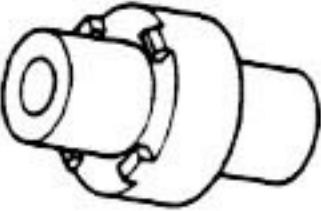
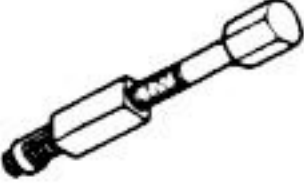
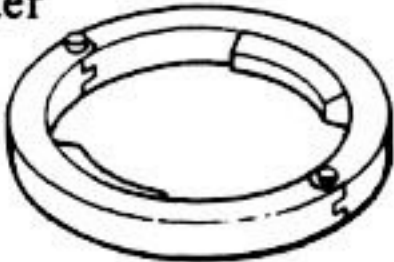
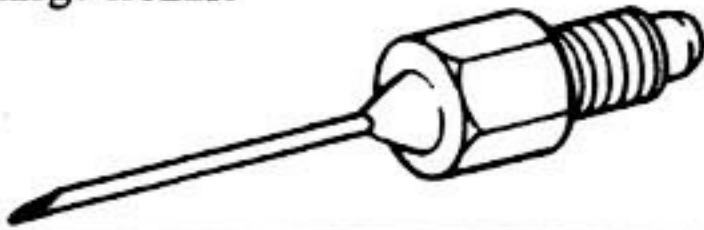

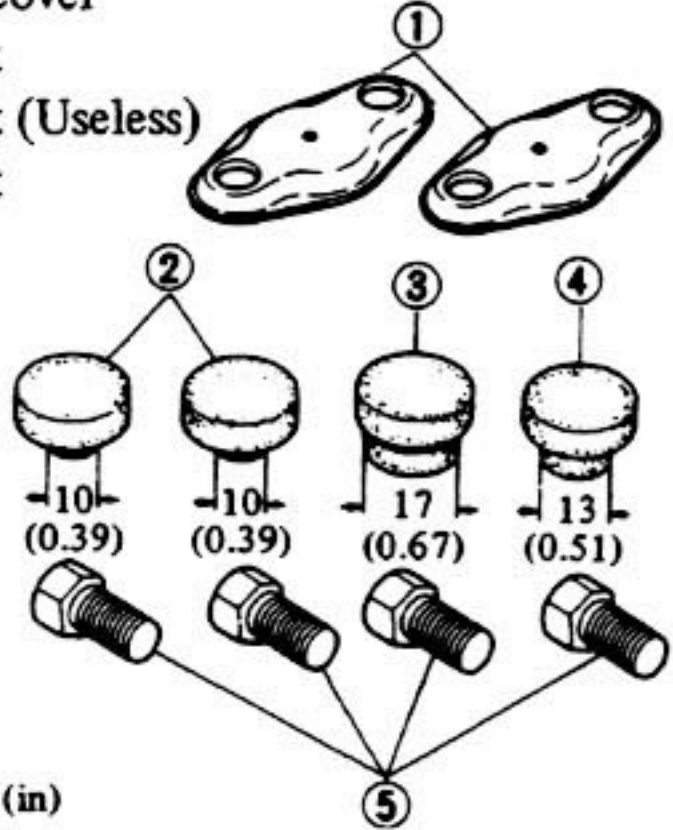
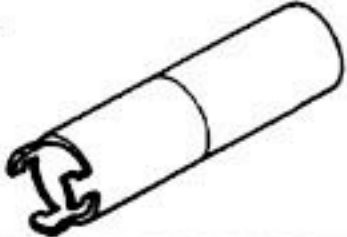

Clutch hub to pulley clearance mm (in)	0.5 - 0.8 (0.020 - 0.031)
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### TIGHTENING TORQUE

Unit	N-m	kg-m	ft-lb
Compressor bracket to cylinder block	44 - 54	4.5 - 5.5	33 - 40
Compressor to compressor bracket	44 - 54	4.5 - 5.5	33 - 40
Refrigerant line connection			
Condenser to high pressure line	39 - 49	4.0 - 5.0	29 - 36
Compressor to high pressure line	8 - 11	0.8 - 1.1	5.8 - 8.0
Cooling unit to low pressure line	39 - 49	4.0 - 5.0	29 - 36
Compressor to low pressure line	8 - 11	0.8 - 1.1	5.8 - 8.0
Cooling unit to tube	25 - 34	2.5 - 3.5	18 - 25
Receiver drier to tube	25 - 34	2.5 - 3.5	18 - 25
Condenser to tube	25 - 34	2.5 - 3.5	18 - 25
Compressor			
Shaft nut	18 - 21	1.8 - 2.1	13 - 15
Lock nut	25 - 27	2.5 - 2.8	18 - 20
Clutch hub nut	18 - 21	1.8 - 2.1	13 - 15
Clutch coil screw	2.7 - 3.4	0.28 - 0.35	2.0 - 2.5
Rear end cover bolt	29 - 34	3.0 - 3.5	22 - 25
Side cover bolt	18 - 20	1.8 - 2.0	13 - 14
Oil plug	18 - 20	1.8 - 2.0	13 - 14

## SPECIAL SERVICE TOOLS

The following table lists special tools designed for use with compressor.

Tool number	Tool name	Tool number	Tool name
KV99412302	Clutch hub wrench 	KV99412327	Silencer piece installer 
KV99412305	Hub nut socket 	KV99412328	O-ring installer 
KV99412306	Clutch hub puller 	KV99412330	Allen socket 
KV99412310	Lock nut socket 	KV99412315	Cylinder head remover 
KV99412313	Puller adapter 	KV994C1552	Charge nozzle 
KV99412312	Puller pilot 	KV994C4548 ① KV994C4531 ② KV994C4532 ③ KV994C4533 ④ KV994C4534 ⑤ KV994C4559	Blind cover set Blind cover Gasket Gasket (Useless) Gasket Bolt  Unit: mm (in)
KV99412321	Shaft seal remover and installer 		
KV99412322	Shaft seal pilot 		
KV99412329	Shaft handle socket 