

## SECTION **HA**

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**When you read wiring diagrams:**

- Read GI section, "HOW TO READ WIRING DIAGRAMS".
- See EL section, "POWER SUPPLY ROUTING" for power distribution circuit.

**When you perform trouble diagnoses, read GI section, "HOW TO FOLLOW FLOW CHART IN TROUBLE DIAGNOSES" and "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT".**

## PRECAUTIONS AND PREPARATION

### Supplemental Restraint System (SRS) "AIR BAG"

The Supplemental Restraint System "Air Bag", used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bag modules (located in the center of the steering wheel and on the instrument panel on the passenger side), a diagnosis sensor unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **RS section** of this Service Manual.

#### WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance must be performed by an authorized NISSAN dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses are covered with yellow insulation either just before the harness connectors or for the complete harness, for easy identification.

### Precautions for Working with HFC-134a (R-134a)

#### WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed, compressor failure is likely to occur.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - a: When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - b: When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.
  - c: Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.
  - d: Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove R-134a from the A/C system, using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
  - e: Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

### General Refrigerant Precautions

#### WARNING:

- Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.
- Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.
- Do not store or heat refrigerant containers above 52°C (125°F).
- Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.
- Do not intentionally drop, puncture, or incinerate refrigerant containers.
- Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.
- Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.
- Do not introduce compressed air to any refrigerant container or refrigerant component.

# PRECAUTIONS AND PREPARATION

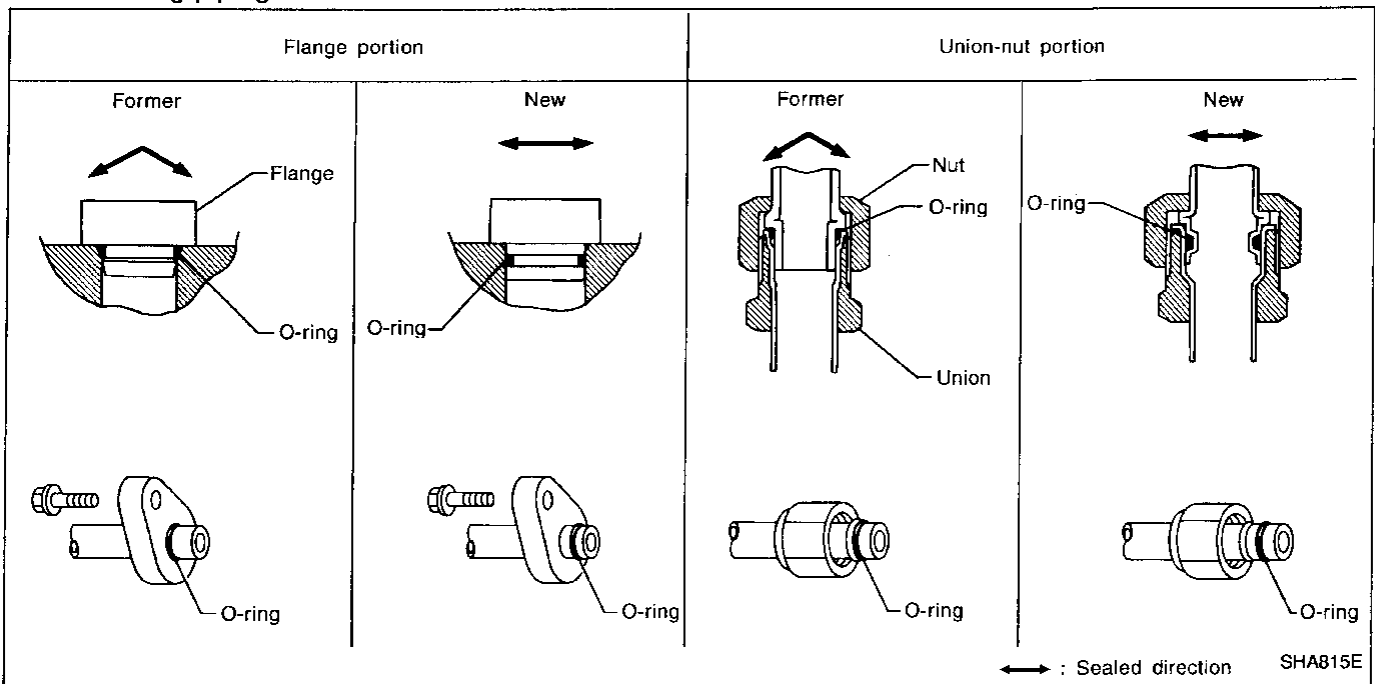
## Precautions for Refrigerant Connection

A new type refrigerant connection has been introduced to all refrigerant lines except the following portion.

- Expansion valve to cooling unit

### FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.
- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



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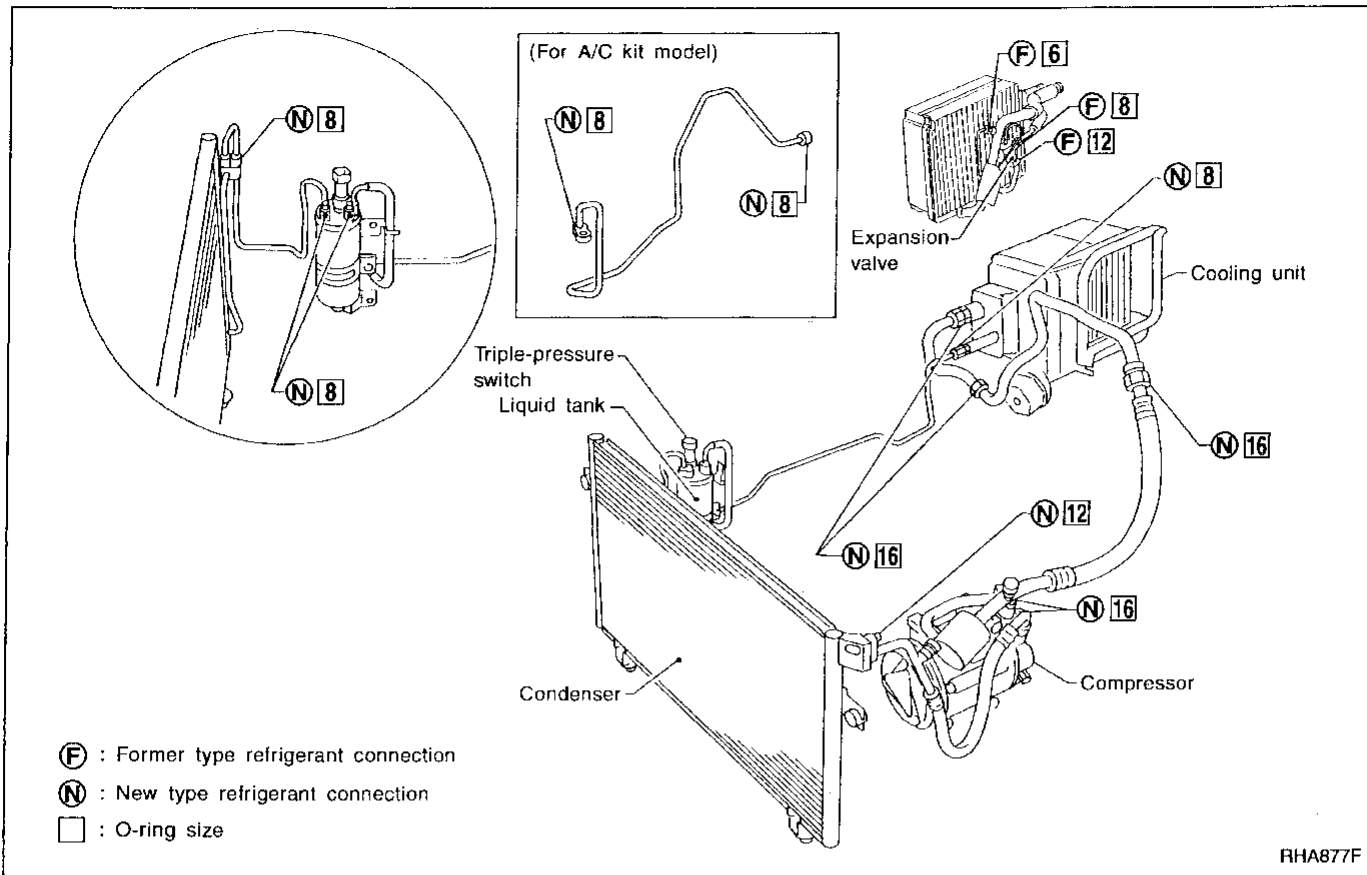
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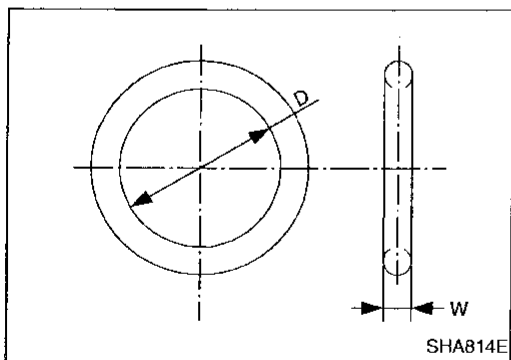
# PRECAUTIONS AND PREPARATION

## Precautions for Refrigerant Connection (Cont'd) O-RING AND REFRIGERANT CONNECTION



### CAUTION:

The new and former refrigerant connections use different O-ring configurations. Do not confuse O-rings since they are not interchangeable. If a wrong O-ring is installed, refrigerant will leak at, or around, the connection.



### O-ring part numbers and specifications

Connection type	O-ring size	Part number	D mm (in)	W mm (in)
Former	6	92472 N8200	4.5 (0.177)	1.40 (0.0551)
New	8	92471 N8210	6.8 (0.268)	1.85 (0.0728)
Former		92470 N8200	6.07 (0.2390)	1.78 (0.0701)
New	12	92472 N8210	10.9 (0.429)	2.43 (0.0957)
Former		92471 N8200	10.8 (0.425)	1.78 (0.0701)
New	16	92473 N8210	13.6 (0.535)	2.43 (0.0957)

In accordance with the adoption of the new type refrigerant connection, the following components are not interchangeable between the former year model (1996 year model) and the current year model (1997 year model).

- Compressor
- Condenser
- Cooling unit
- Liquid tank
- Tubes and flexible hoses

# PRECAUTIONS AND PREPARATION

## Precautions for Refrigerant Connection (Cont'd)

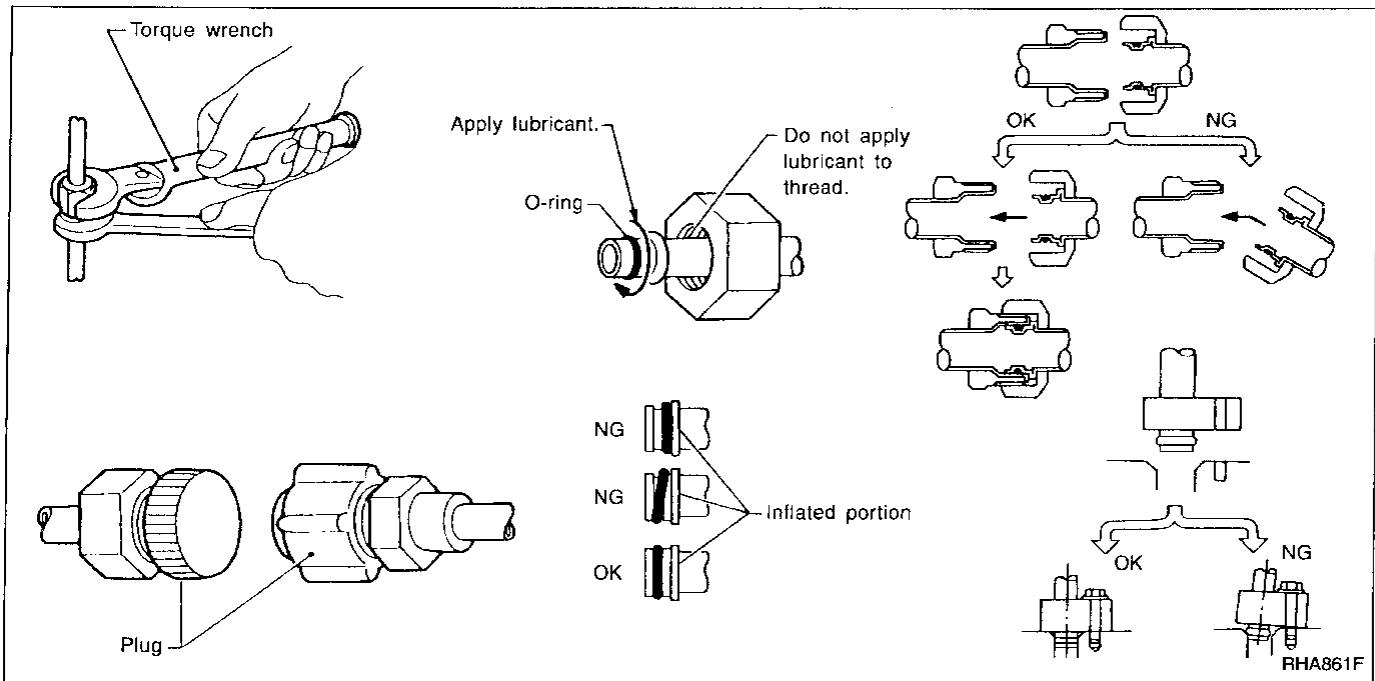
### WARNING:

Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.

### CAUTION:

When replacing or cleaning refrigerant cycle components, observe the following.

- When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.
  - When connecting tubes, always use a torque wrench and a back-up wrench.
  - After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
  - When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.
  - Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.
  - Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
  - Always replace used O-rings.
  - When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.
- Lubricant name: Nissan A/C System Oil Type S  
Part number: KLH00-PAGS0
- O-ring must be closely attached to dented portion of tube.
  - When replacing the O-ring, be careful not to damage O-ring and tube.
  - Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.
  - After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.



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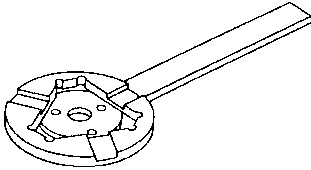
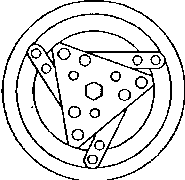
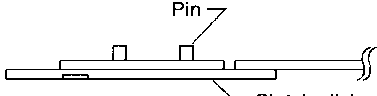
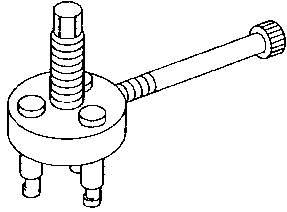
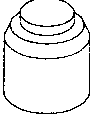
# PRECAUTIONS AND PREPARATION

## Precautions for Servicing Compressor

- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same position as it is when mounted on the car.
- When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to HA-65.
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

## Special Service Tools

The actual shapes of Kent-Moore tools may differ from those of special service tools illustrated here.

Tool number (Kent-Moore No.) Tool name	Description
KV99106100 (J-41260) Clutch disc wrench	<div style="text-align: right;">Removing center bolt</div> <div style="text-align: center;">  <p>NT232</p> </div> <div style="text-align: center;">  <p>When replacing the magnet clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.</p>  <p>Pin Clutch disk wrench</p> <p>NT378</p> </div>
KV99232340 (J-38874) or KV992T0001 ( — ) Clutch disc puller	<div style="text-align: right;">Removing clutch disc</div> <div style="text-align: center;">  <p>NT376</p> </div>
KV99106200 (J-41261) Pulley installer	<div style="text-align: right;">Installing pulley</div> <div style="text-align: center;">  <p>NT235</p> </div>

# PRECAUTIONS AND PREPARATION

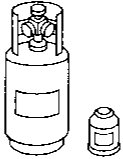

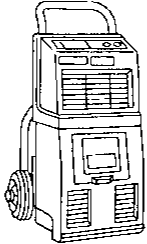
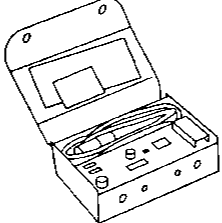
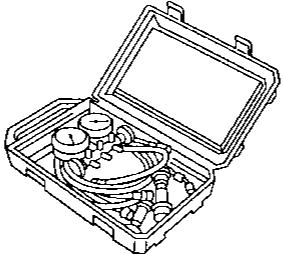
## HFC-134a (R-134a) Service Tools and Equipment

Never mix HFC-134a refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

Separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.

Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor failure will result.

Tool number (Kent-Moore No.) Tool name	Description	Note
HFC-134a (R-134a) refrigerant	 NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size • large container 1/2"-16 ACME
KLH00-PAGS0 ( — ) Nissan A/C System Oil Type S	 NT197	Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/Recycling equipment (ACR4)	 NT195	Function: Refrigerant Recovery and Recycling and Recharging
(J-39400) Electrical leak detector	 NT198	Power supply: • DC 12 V (Cigarette lighter)
(J-39183) Manifold gauge set (with hoses and couplers)	 NT199	Identification: • The gauge face indicates R-134a. Fitting size: Thread size • 1/2"-16 ACME

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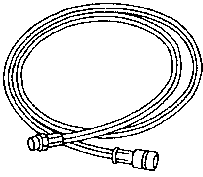
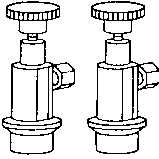
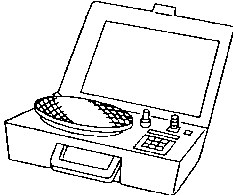
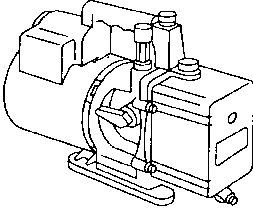
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## PRECAUTIONS AND PREPARATION

### HFC-134a (R-134a) Service Tools and Equipment (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	Note
Service hoses <ul style="list-style-type: none"> <li>● High side hose (J-39501-72)</li> <li>● Low side hose (J-39502-72)</li> <li>● Utility hose (J-39476-72)</li> </ul>	 NT201	Hose color: <ul style="list-style-type: none"> <li>● Low hose: Blue with black stripe</li> <li>● High hose: Red with black stripe</li> <li>● Utility hose: Yellow with black stripe or green with black stripe</li> </ul> Hose fitting to gauge: <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>
Service couplers <ul style="list-style-type: none"> <li>● High side coupler (J-39500-20)</li> <li>● Low side coupler (J-39500-24)</li> </ul>	 NT202	Hose fitting to service hose: <ul style="list-style-type: none"> <li>● M14 x 1.5 fitting is optional or permanently attached.</li> </ul>
(J-39650) Refrigerant weight scale	 NT200	For measuring of refrigerant Fitting size: Thread size <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>
(J-39649) Vacuum pump (Including the isolator valve)	 NT203	Capacity: <ul style="list-style-type: none"> <li>● Air displacement: 4 CFM</li> <li>● Micron rating: 20 microns</li> <li>● Oil capacity: 482 g (17 oz)</li> </ul> Fitting size: Thread size <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>



# PRECAUTIONS AND PREPARATION

## Precautions for Service Equipment

### RECOVERY/RECYCLING EQUIPMENT

Follow the manufacturer's instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

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### ELECTRONIC LEAK DETECTOR

Follow the manufacturer's instructions for tester operation and tester maintenance.

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### VACUUM PUMP

The lubricant contained inside the vacuum pump is not compatible with the specified lubricant for HFC-134a (R-134a) A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. So the vacuum pump lubricant may migrate out of the pump into the service hose. This is possible when the pump is switched off after evacuation (vacuuming) and hose is connected to it.

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To prevent this migration, use a manual valve situated near the hose-to-pump connection, as follows.

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- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has an automatic shut off valve, disconnect the hose from the pump: as long as the hose is connected, the valve is open and lubricating oil may migrate.

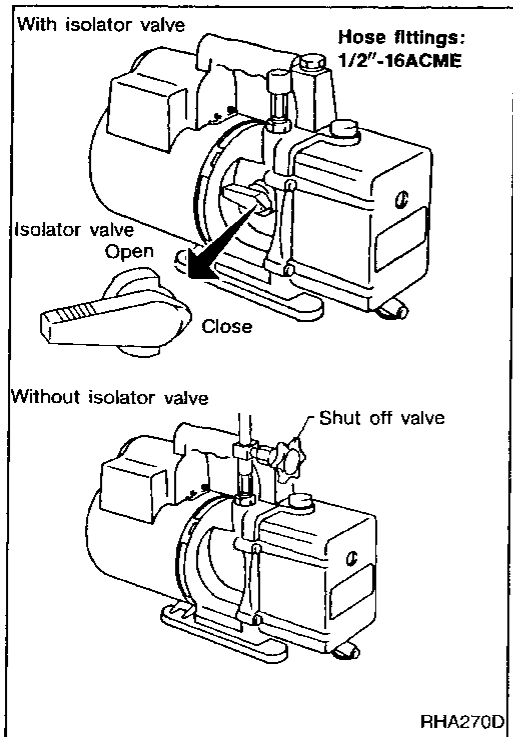
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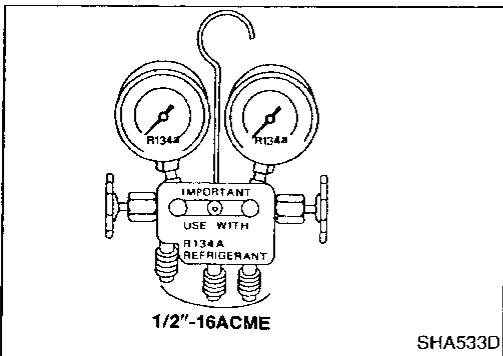
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.

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### MANIFOLD GAUGE SET

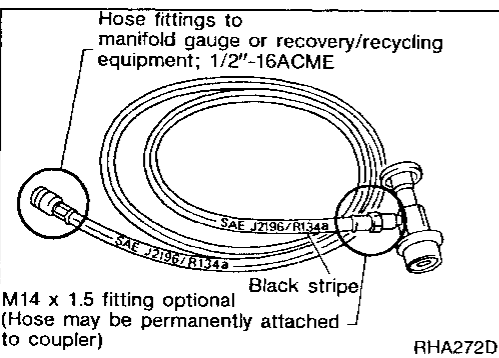
Be certain that the gauge face indicates R-134a or 134a. Make sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified lubricant.

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### SERVICE HOSES

Be certain that the service hoses display the markings described (colored hose with black stripe). All hoses must include positive shut off devices (either manual or automatic) near the end of the hoses opposite the manifold gauge.

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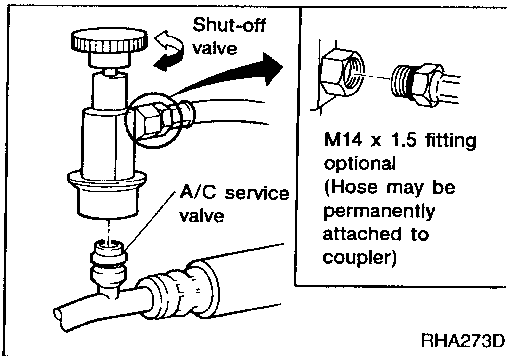
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## PRECAUTIONS AND PREPARATION

### Precautions for Service Equipment (Cont'd)

#### SERVICE COUPLERS

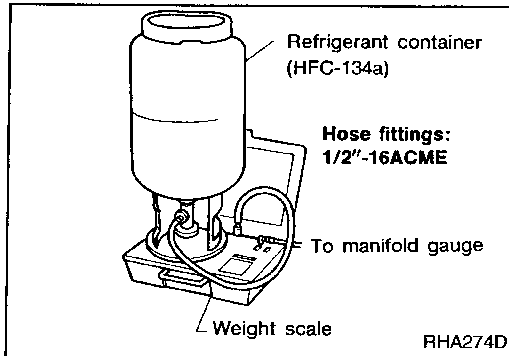
Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.



Shut off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

#### REFRIGERANT WEIGHT SCALE

Verify that no refrigerant other than HFC-134a (R-134a) and specified lubricants have been used with the scale. If the scale controls refrigerant flow electronically, the hose fitting must be 1/2"-16 ACME.



#### CHARGING CYLINDER

Using a charging cylinder is not recommended. Refrigerant may be vented into air from cylinder's top valve when filling the cylinder with refrigerant. Also, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

# DESCRIPTION

## Refrigeration Cycle

### REFRIGERANT FLOW

The refrigerant flows in the standard pattern. It flows from compressor through condenser, liquid tank, evaporator and back to compressor.

The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

### FREEZE PROTECTION

The compressor cycles on and off to maintain the evaporator temperature within a specified range. When the evaporator coil temperature falls below a specified point, the thermo control amplifier interrupts the compressor operation. When the evaporator coil temperature rises above the specification, the thermo control amplifier allows compressor operation.

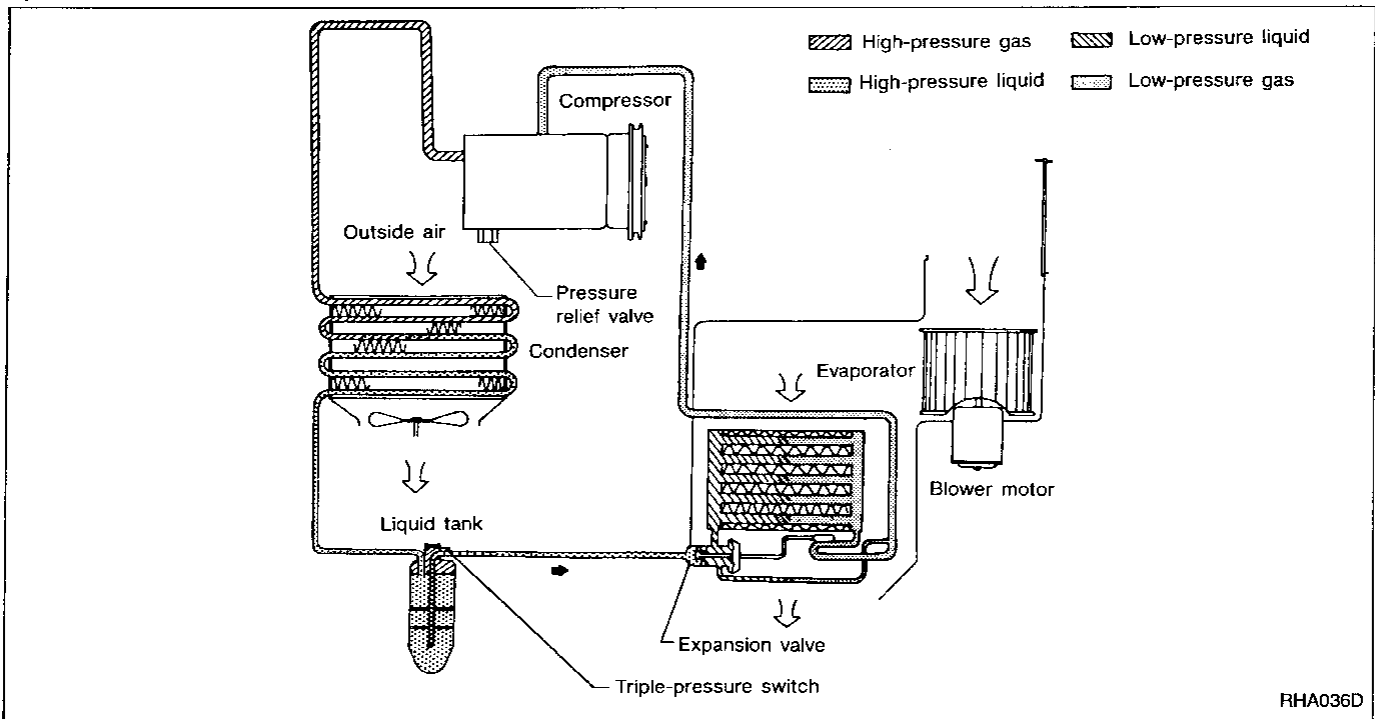
### REFRIGERANT SYSTEM PROTECTION

#### Triple-pressure switch

The refrigerant system is protected against excessively high or low pressure. The protection is effected by the triple pressure switch located on the liquid tank. If the pressure rises or falls out of specifications, the switch opens to interrupt the compressor operation. Also, triple-pressure switch operates the cooling fan motor.

#### Pressure relief valve

The refrigerant system is also protected by a pressure relief valve. The valve is located on the bottom of the compressor. When refrigerant pressure in the system increases abnormally [over 3,727 kPa (38 kg/cm<sup>2</sup>, 540 psi)], the relief valve's release port opens automatically. The valve then releases refrigerant into the atmosphere.



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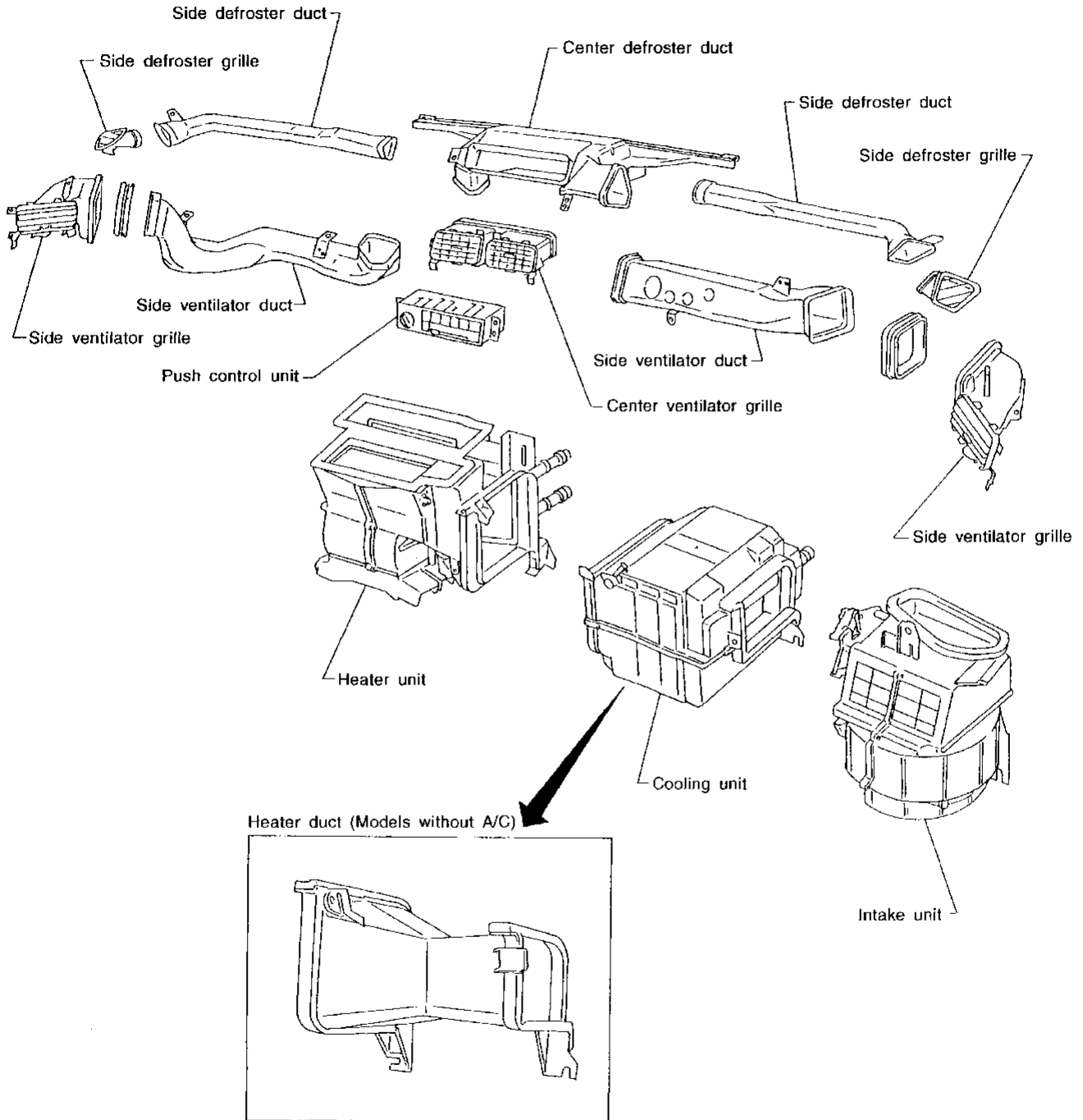
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# DESCRIPTION

## Component Layout

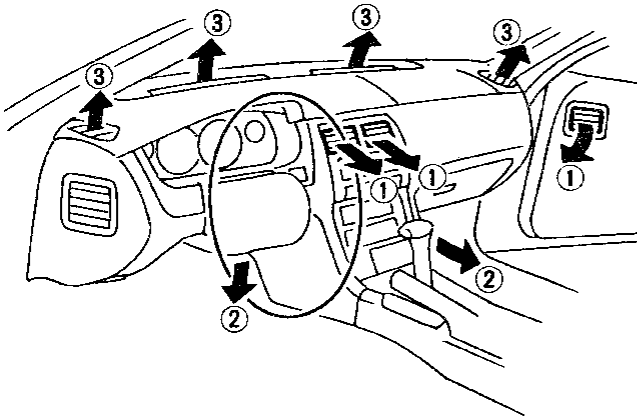
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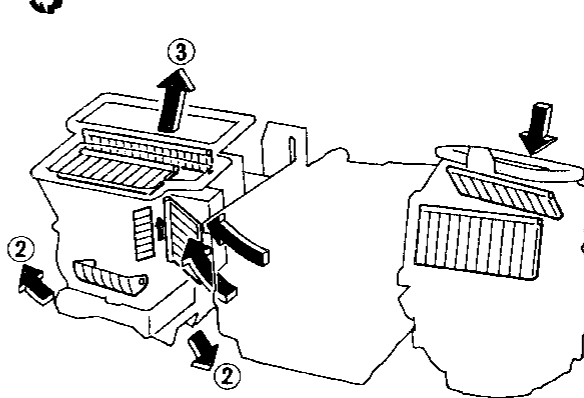
# DESCRIPTION

## Discharge Air Flow

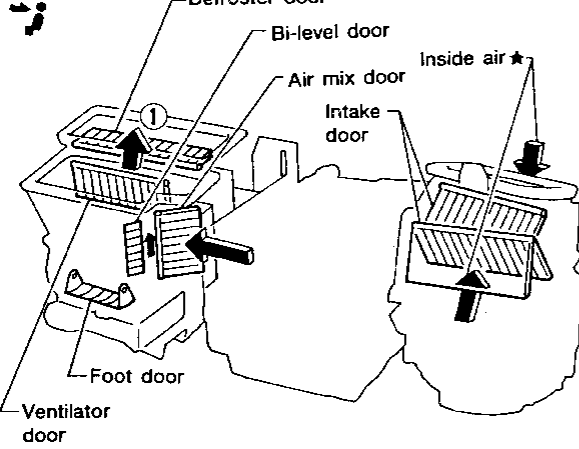
**Air outlets**



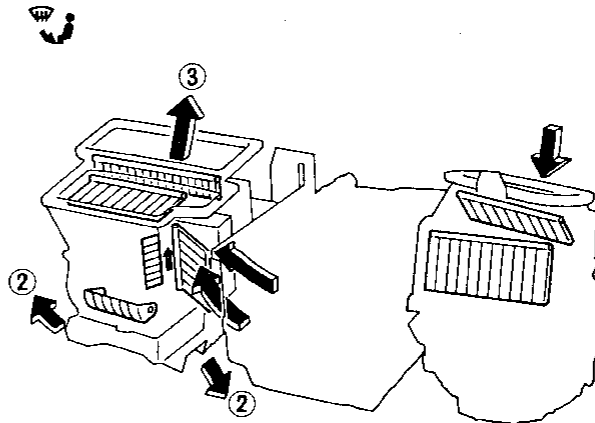
**Foot**



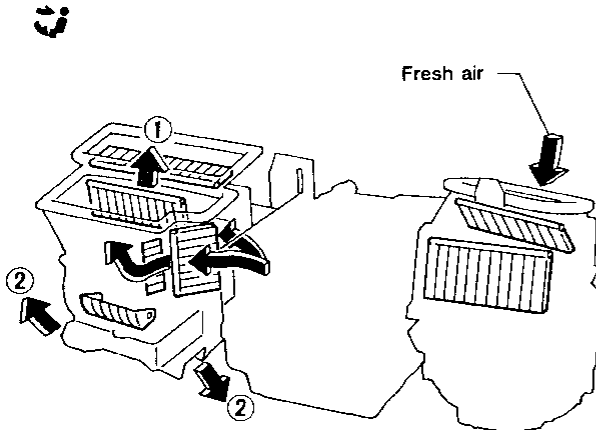
**Face**



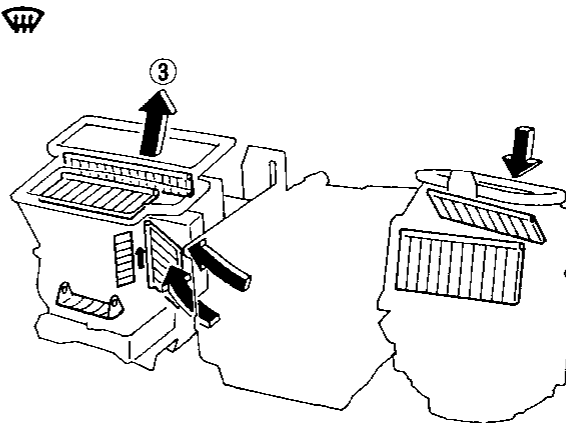
**Foot and defroster**



**Bi-level**



**Defroster**



- ① : To face
- ② : To foot
- ③ : To defroster
- ★ : When recirculation switch is ON

For air flow %, refer to "Operational Check",  
"TROUBLE DIAGNOSES".

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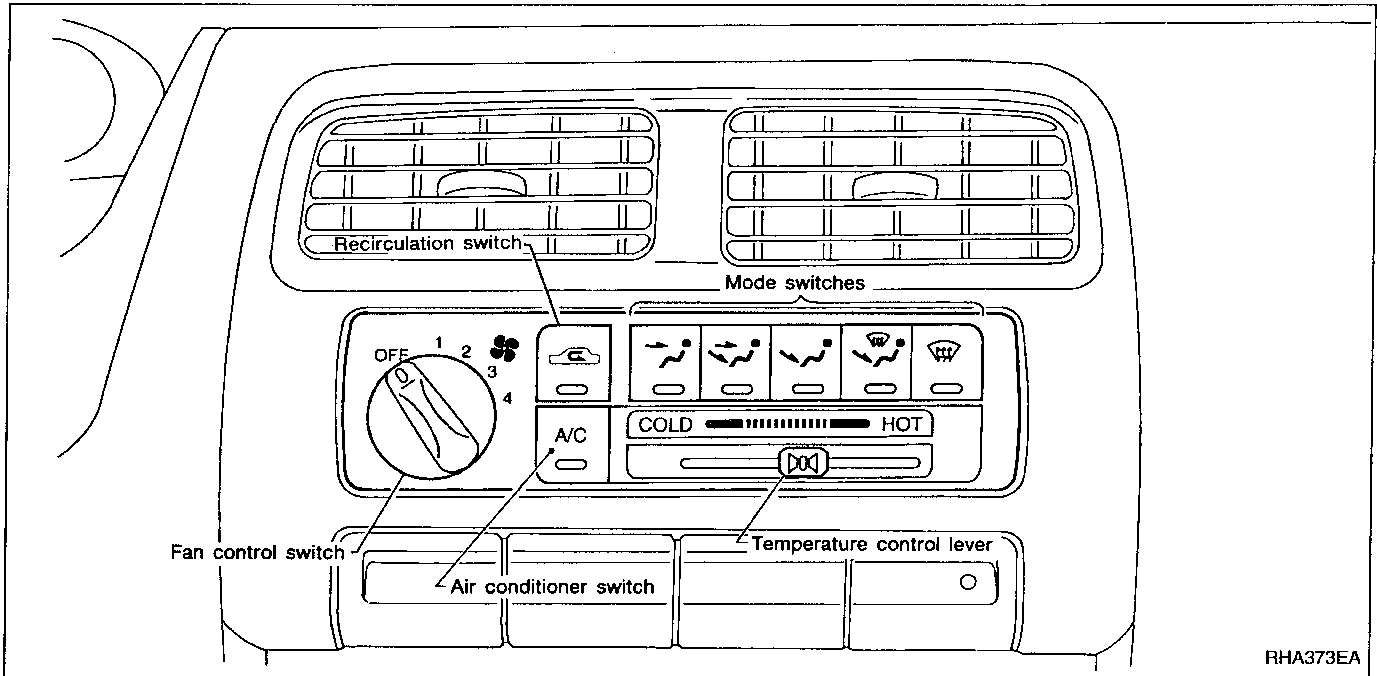
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## Control Operation



### FAN CONTROL SWITCH

This switch turns the fan ON and OFF, and controls fan speed.

### MODE SWITCHES

These switches control the outlet air flow.

In "DEFROSTER (DEF)" or "F/D" mode, the intake door is set to "FRESH". The compressor turns on in the "DEF" mode.

### TEMPERATURE CONTROL LEVER

This lever allows adjustment of the temperature of the outlet air.

### RECIRCULATION (REC) SWITCH

OFF position:

Outside air is drawn into the passenger compartment.

ON position:

Interior air is recirculated inside the vehicle.

Recirculation is canceled when DEF or F/D is selected, recirculation resumes when another mode is chosen.

### AIR CONDITIONER SWITCH

The air conditioner switch controls the A/C system. When the switch is depressed with the fan ON, the compressor will turn ON. The indicator lamp will also light.

**The air conditioner cooling function operates only when the engine is running.**

# DESCRIPTION

## V-6 Variable Displacement Compressor

### GENERAL INFORMATION

1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:
  - evaporator intake air temperature is less than 20°C (68°F)
  - engine is running at speeds less than 1,500 rpm.This is because the V-6 compressor provides a means of "capacity" control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. When ambient temperatures are low, it may not produce high refrigerant pressure discharge (compared to previous units).
3. A "clanking" sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the swash plate has changed and is not a problem.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm<sup>2</sup>, 21 to 26 psi) under varying conditions. In previous compressors, however, suction pressure was reduced with increases in engine speed.

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# DESCRIPTION

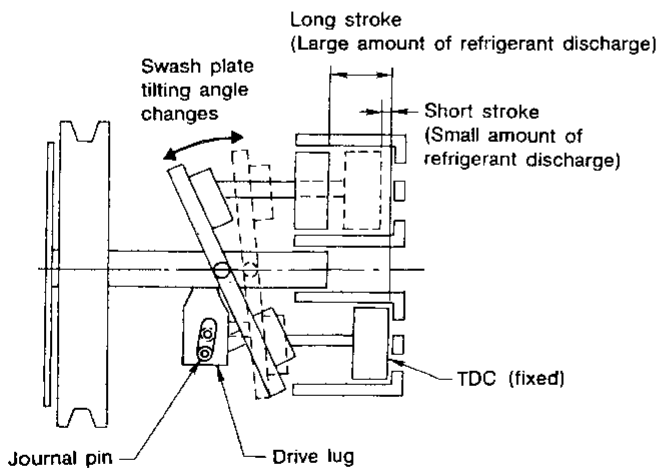
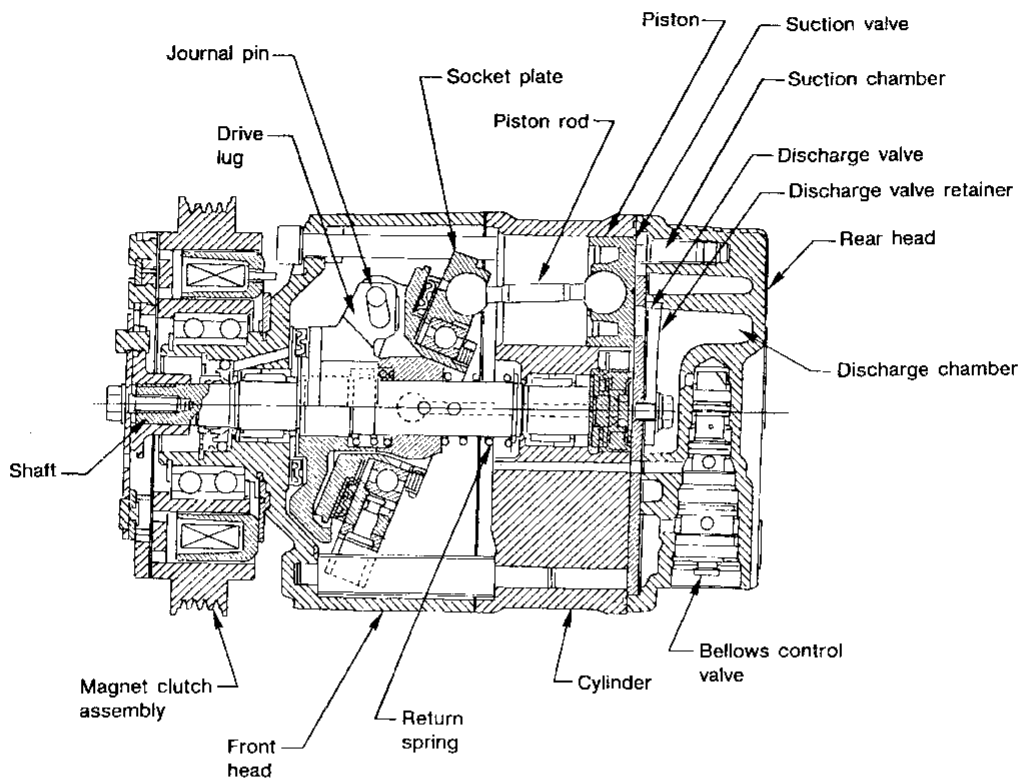
## V-6 Variable Displacement Compressor (Cont'd)

### DESCRIPTION

#### General

The variable compressor is basically a swash plate type that changes piston stroke in response to the required cooling capacity.

The tilt of the swash plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 10.5 to 165 cm<sup>3</sup> (0.641 to 10.07 cu in).



Discharge control	Discharge capacity cm <sup>3</sup> (cu in)/rev.	Piston stroke length mm (in)
Minimum	10.5 (0.641)	1.6 (0.063)
Maximum	165 (10.07)	25.6 (1.008)

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# DESCRIPTION

## V-6 Variable Displacement Compressor (Cont'd)

### Operation

#### 1. Operation control valve

Operation control valve is located in the suction port (low-pressure) side, and opens or closes in response to changes in refrigerant suction pressure.

Operation of the valve controls the internal pressure of the crankcase.

The angle of the swash plate is controlled between the crankcase's internal pressure and the piston cylinder pressure.

#### 2. Maximum cooling

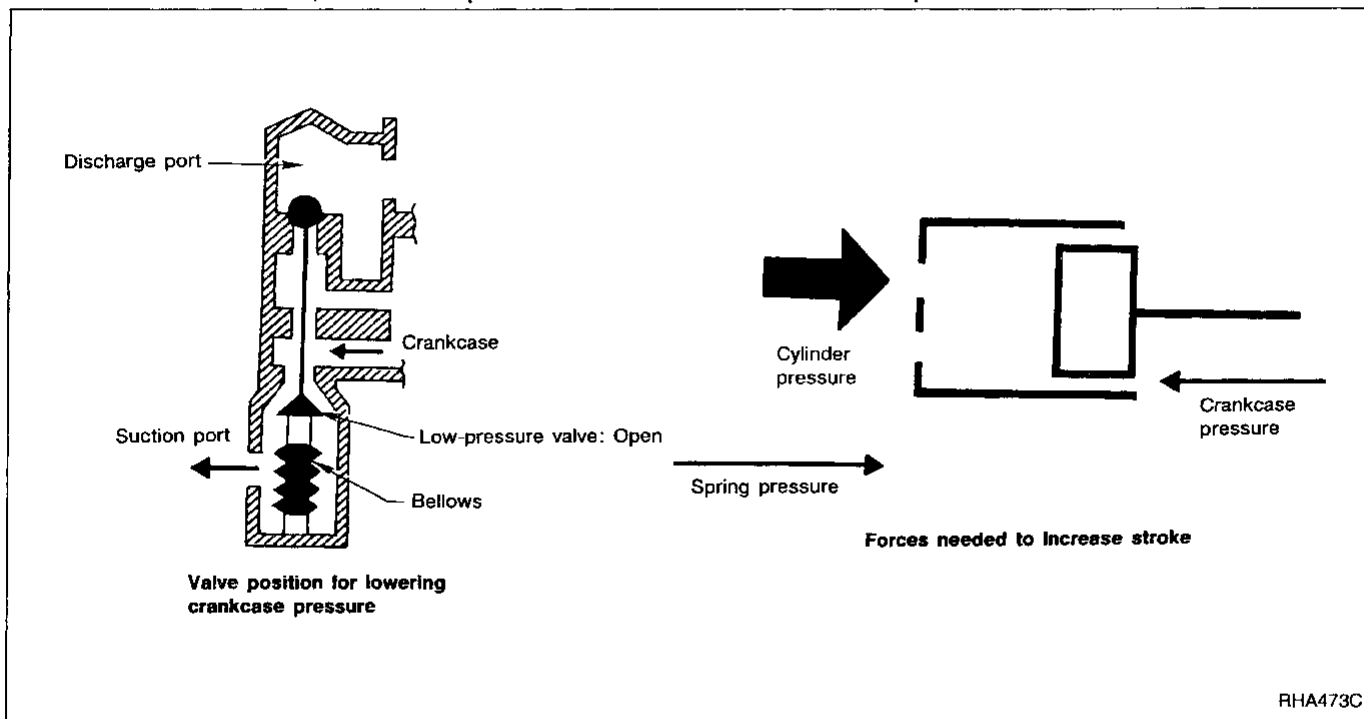
Refrigerant pressure on the low-pressure side increases with an increase in heat loads.

When this occurs, the control valve's bellows compress to open the low-pressure side valve and close the high-pressure side valve.

This causes the following pressure changes:

- the crankcase's internal pressure to equal the pressure on the low-pressure side;
- the cylinder's internal pressure to be greater than the crankcase's internal pressure.

Under this condition, the swash plate is set to the maximum stroke position.



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## DESCRIPTION

### V-6 Variable Displacement Compressor (Cont'd)

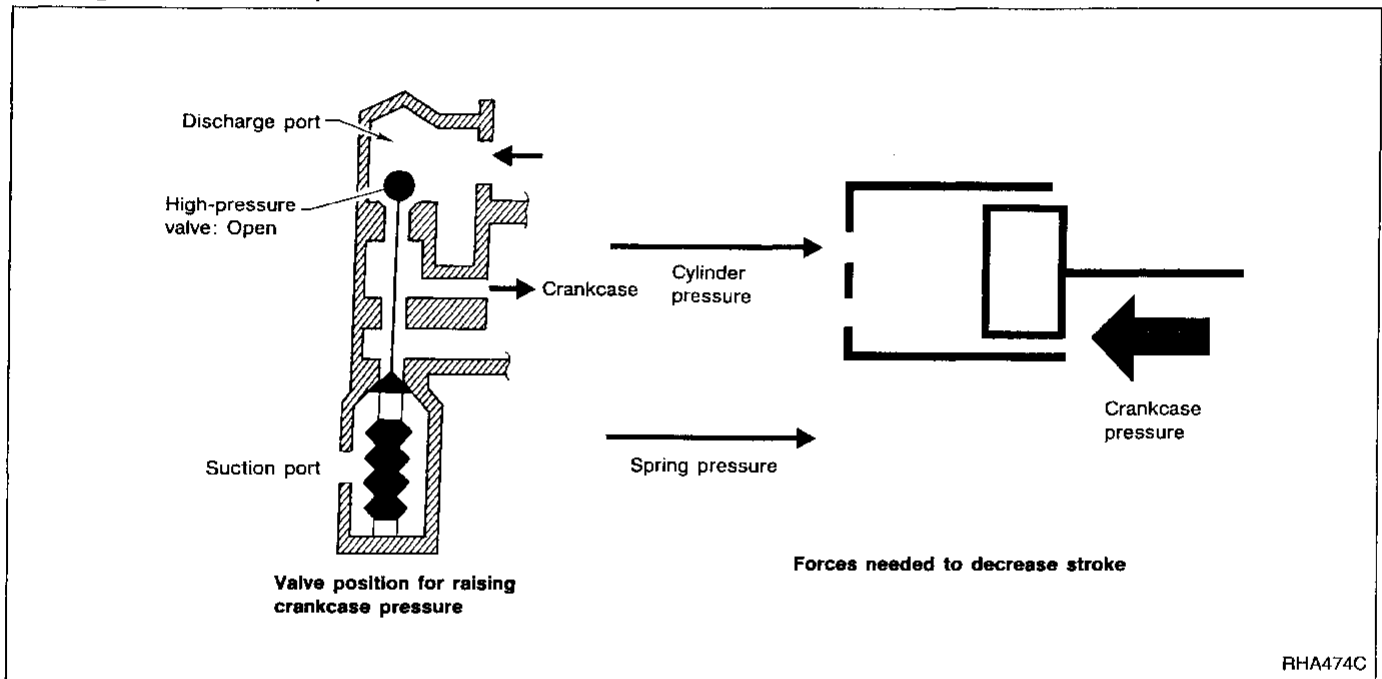
#### 3. Capacity control

- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
- The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.8 kg/cm<sup>2</sup>, 26 psi).

Since suction pressure is low, it makes the suction port close and the discharge port open. Thus, crankcase pressure becomes high as high pressure enters the crankcase.

- The force acts around the journal pin near the swash plate, and is generated by the pressure difference before and behind the piston.

The drive lug and journal pin are located where the piston generates the highest pressure. Piston pressure is between suction pressure  $P_s$  and discharge pressure  $P_d$ , which is near suction pressure  $P_s$ . If crankcase pressure  $P_c$  rises due to capacity control, the force around the journal pin makes the swash plate angle decrease and also the piston stroke decrease. In other words, crankcase pressure increase triggers pressure difference between the piston and the crankcase. The pressure difference changes the angle of the swash plate.



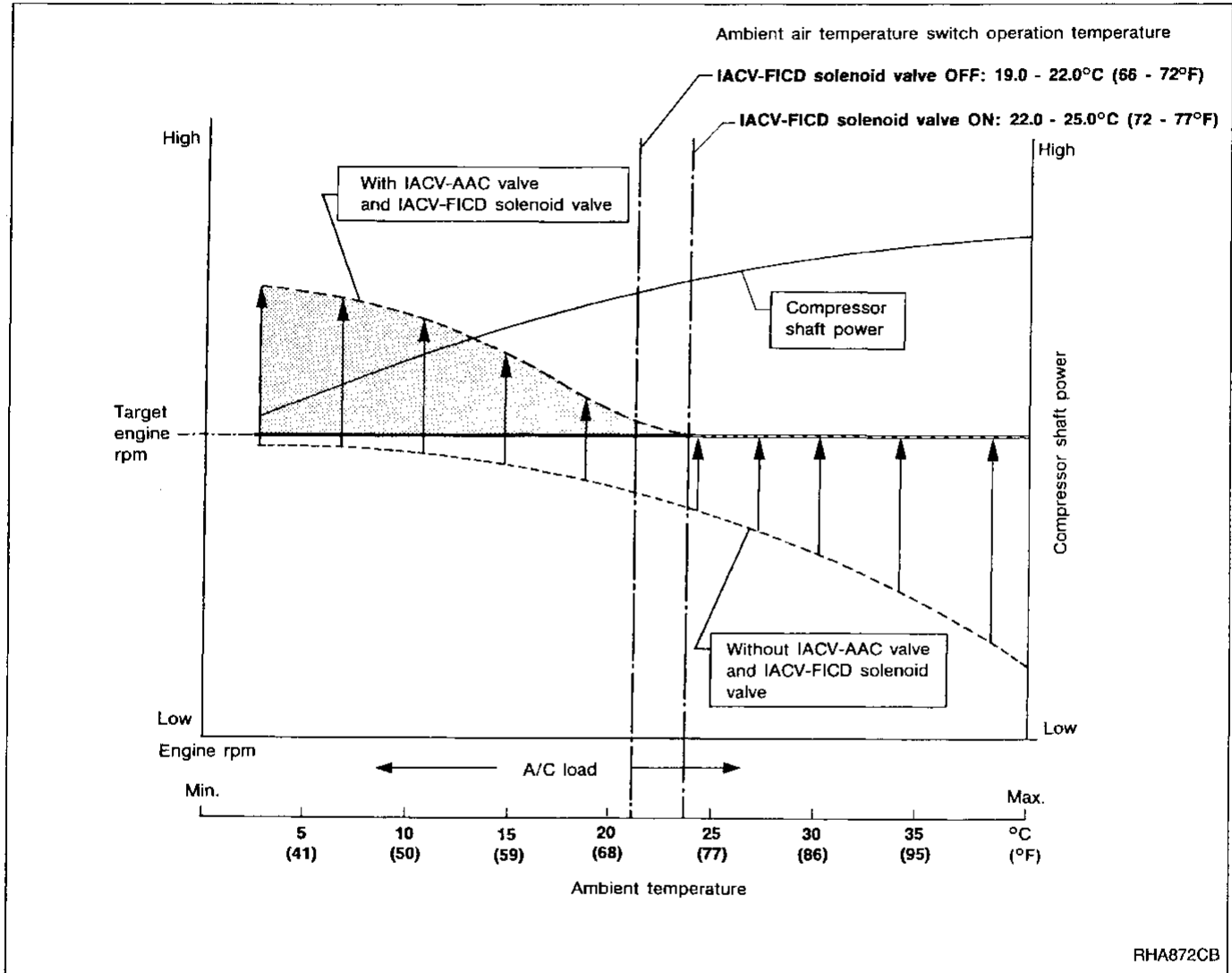
# DESCRIPTION

## V-6 Variable Displacement Compressor (Cont'd)

### FICD CONTROL SYSTEM

#### General

With the variable displacement compressor, the compressor power requirements differ from when the ambient temperature is high and maximum cooling effect is required (i.e., when refrigerating load is large and the tilt angle of the compressor swash plate is large) to when the ambient temperature is low and less cooling effect is required (i.e., when refrigerating load is small and the tilt angle of the swash plate is small). To correspond correctly to this change in compressor power requirements, it is also necessary to control the operation of the IACV-FICD according to the refrigerating load. Thus, an ambient air temperature switch is provided on the front face of the condenser so that the IACV-FICD can be controlled depending on the ambient temperature.



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# DESCRIPTION

## V-6 Variable Displacement Compressor (Cont'd)

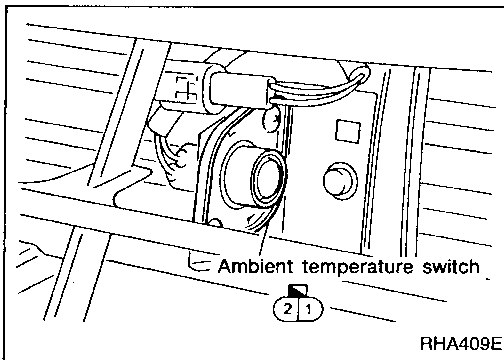
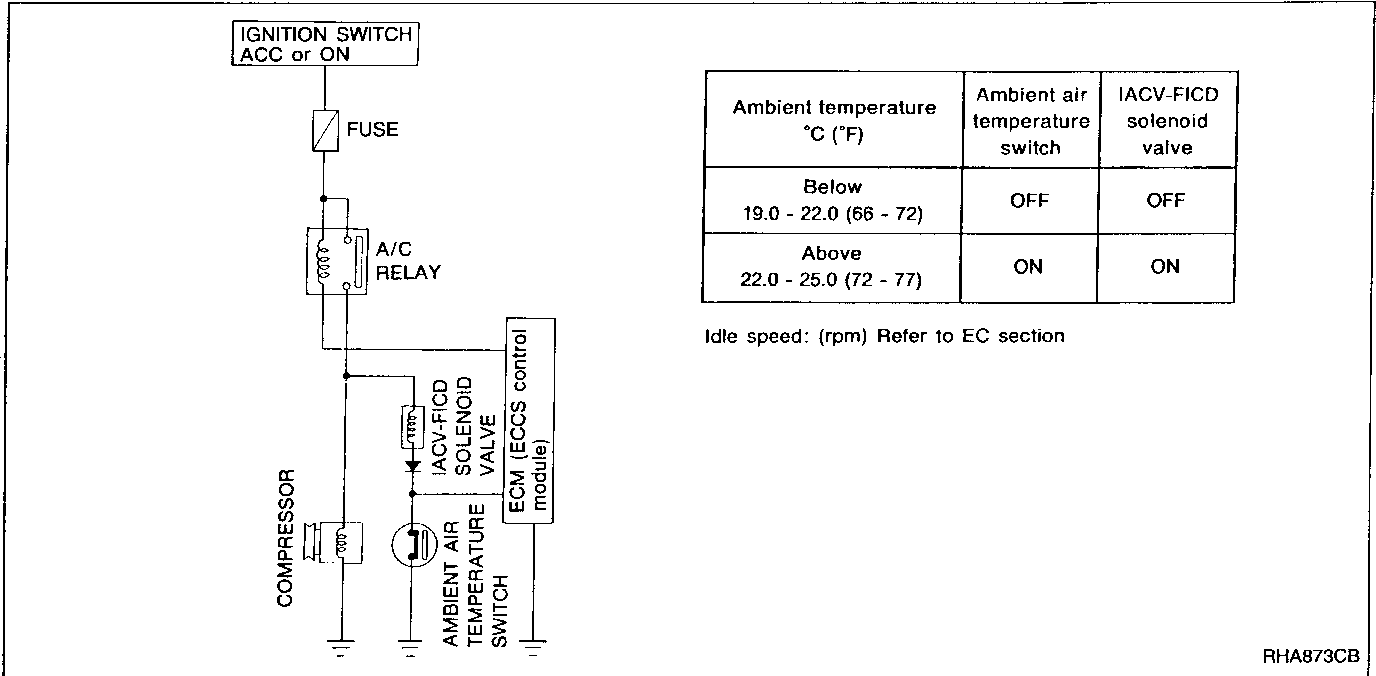
### Operation

When the air conditioner is OFF, the ECM (ECCS control module) detects the load applied to the engine, and controls the IACV-AAC valve to adjust the engine idling speed to the appropriate rpm by supplying additional air from the IACV-AAC valve.

When the air conditioner is ON (A/C relay is ON), and when the ambient air temperature switch is ON (this switch turns ON automatically when the ambient temperature rises to approx. 25.0°C (77°F) or higher), the IACV-FICD solenoid valve is energized and additional air is supplied to the engine.

If the appropriate engine speed is not reached, the IACV-AAC valve supplies the additional air required to increase the engine rpm.

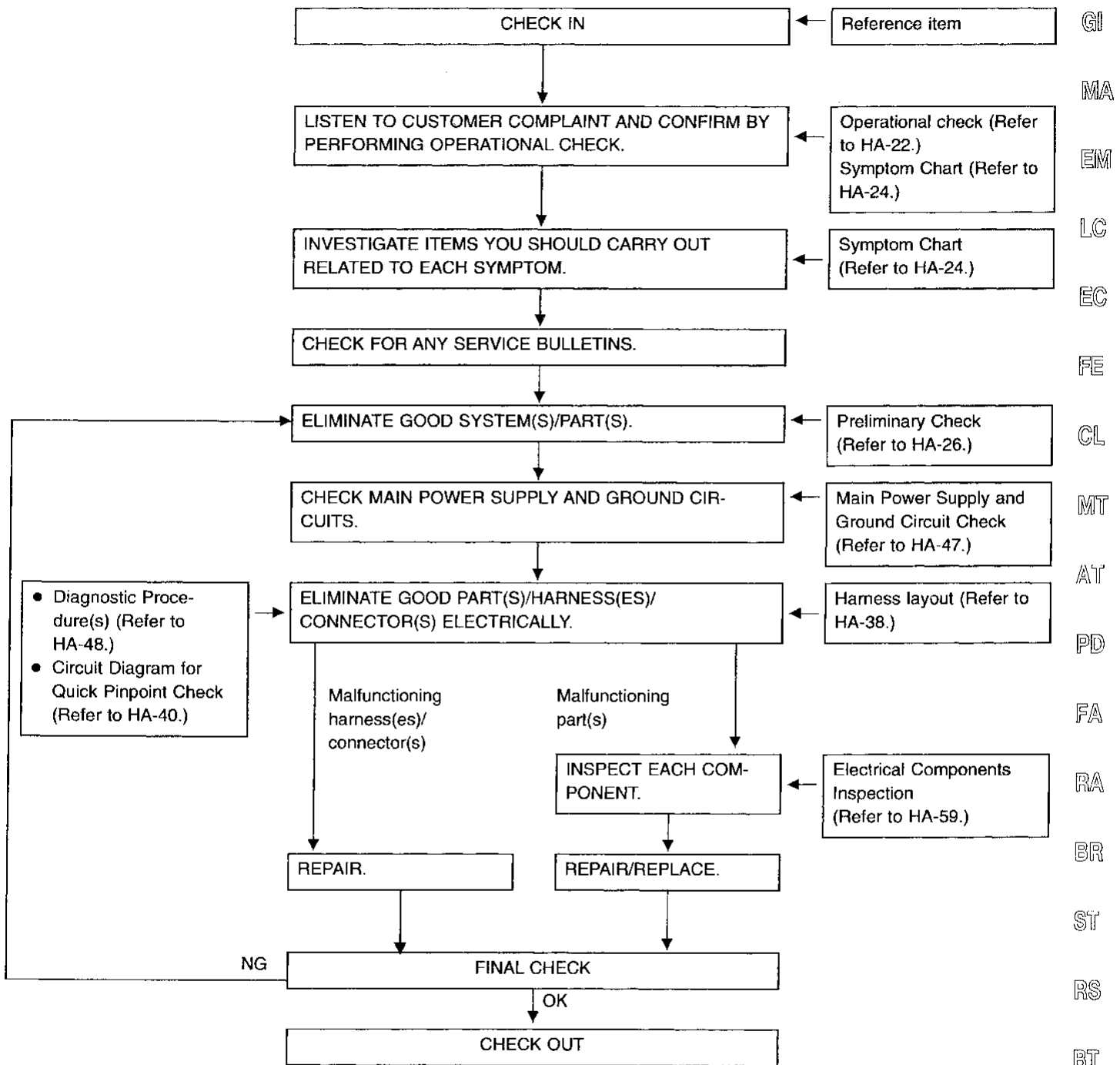
If the ambient air temperature switch is OFF (this switch turns OFF when the ambient temperature is below 19.0°C (66°F) even when the air conditioner is ON (A/C relay is ON), the IACV-FICD solenoid valve is deenergized, and the idling speed is controlled so that the appropriate rpm can be achieved by operation of the IACV-AAC valve only.



# TROUBLE DIAGNOSES

## How to Perform Trouble Diagnoses for Quick and Accurate Repair

### WORK FLOW



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## Operational Check

The purpose of the operational check is to confirm that the system is as it should be. The systems which will be checked are the blower, mode (discharge air), intake air, temperature decrease, temperature increase and A/C switch.

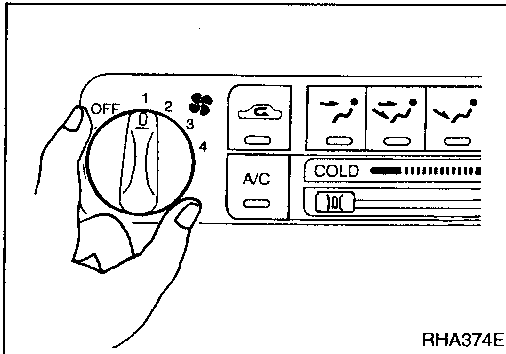
### CONDITIONS:

- Engine running and at normal operating temperature.

### PROCEDURE:

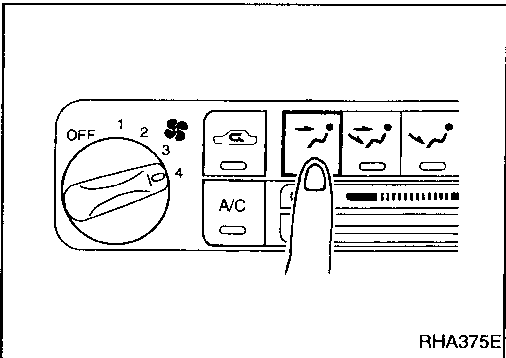
#### 1. Check blower

- 1) Turn fan switch to 1-speed.  
Blower should operate on low speed.
- 2) Then turn fan switch to 2-speed.
- 3) Continue checking blower speed until all speeds are checked.
- 4) Leave blower on speed 4.



#### 2. Check discharge air.

- 1) Press each mode switch.



- 2) Confirm that discharge air comes out according to the air distribution table at left.

Refer to "Discharge Air Flow", "DESCRIPTION" (HA-13).

#### NOTE:

Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when the DEF button is pressed.

Confirm that the intake door position is at FRESH when the F/D button is pressed.

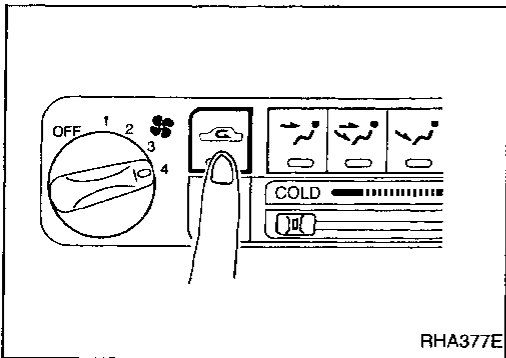
Intake door position is checked in the next step.

#### Discharge air flow


Switch mode/ indicator	Air outlet/distribution		
	Face	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	80%	20%
	—	63%	37%
	—	—	100%

# TROUBLE DIAGNOSES

## Operational Check (Cont'd)



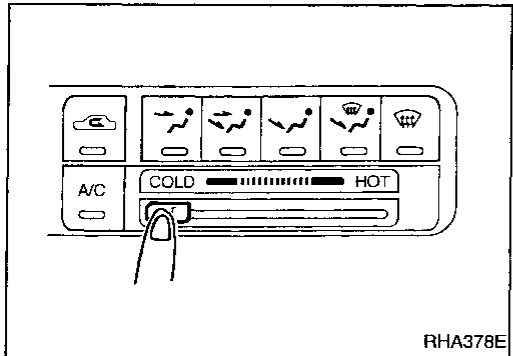
### 3. Check recirculation

- 1) Press REC  switch. Recirculation indicator should illuminate.
- 2) Listen for intake door position change (you should hear blower sound change slightly).

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### 4. Check temperature decrease

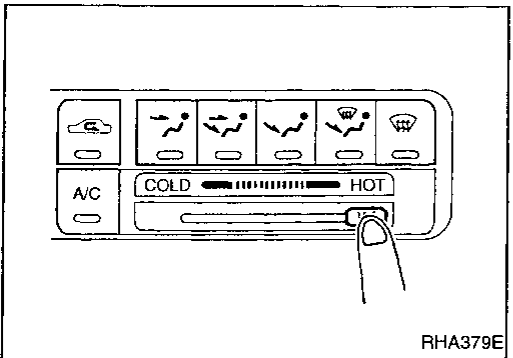
- 1) Slide temperature control lever to full cold.
- 2) Check for cold air at discharge air outlets.

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### 5. Check temperature increase

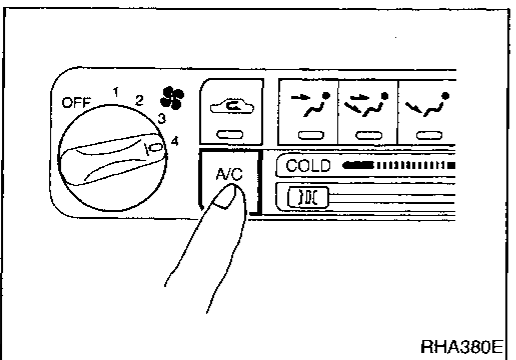
- 1) Slide temperature control lever to full hot.
- 2) Check for hot air at discharge air outlets.

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### 6. Check air conditioning switch

Move the fan control switch to the desired (1 to 4 speed) position and push the A/C switch to turn ON the air conditioner. The indicator lamp should come on when air conditioner is ON.

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# TROUBLE DIAGNOSES

## Symptom Chart

### DIAGNOSTIC TABLE

PROCEDURE	Preliminary Check						Diagnostic Procedure						Main Power Supply and Ground Circuit Check			
	HA-26	HA-27	HA-28	HA-29	HA-30	HA-31	HA-48	HA-50	HA-52	HA-53	HA-55	HA-56	HA-47	HA-47	HA-47	HA-47
REFERENCE PAGE	HA-26	HA-27	HA-28	HA-29	HA-30	HA-31	HA-48	HA-50	HA-52	HA-53	HA-55	HA-56	HA-47	HA-47	HA-47	HA-47
SYMPTOM	Preliminary check 1	Preliminary check 2	Preliminary check 3	Preliminary check 4	Preliminary check 5	Preliminary check 6	Diagnostic procedure 1	Diagnostic procedure 2	Diagnostic procedure 3	Diagnostic procedure 4	Diagnostic procedure 5	Diagnostic procedure 6	15A Fuses (#19, #20)	7.5A Fuse (#21)	7.5A Fuse (#48)	Push control unit
A/C does not blow cold air.		①					○			○			○	○		
Insufficient heating.						①	○					○				
Blower motor does not rotate.		①					②						○			
Air outlet does not change.				①				②						○		○
Intake door does not change in VENT, B/L or FOOT mode.									①					○		○
Intake door does not change.	①								○					○		○
Air mix door does not change.		①								②						
Bi-level door does not change.											①					
Magnet clutch does not engage when A/C switch and fan switch are ON.		①										②		○	○	
Magnet clutch does not engage in DEF mode.		①	②									○		○	○	
Noise				①												

①, ② : The number means checking order.

○ : Checking order depends on malfunction in each flow chart.



# TROUBLE DIAGNOSES

## Symptom Chart (Cont'd)

### Electrical Components Inspection

	Blower motor	Resistor	A/C switch	REC switch	VENT switch	B/L switch	FOOT switch	F/D switch	DEF switch	Fan switch	Mode door motor	Intake door motor	Air mix door motor	BI-LEVEL (B/L) door motor	A/C relay	Triple-pressure switch	Compressor (Magnet clutch)	Compressor	ECM (ECCS control module)	Harness
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Refer to EC section.																				
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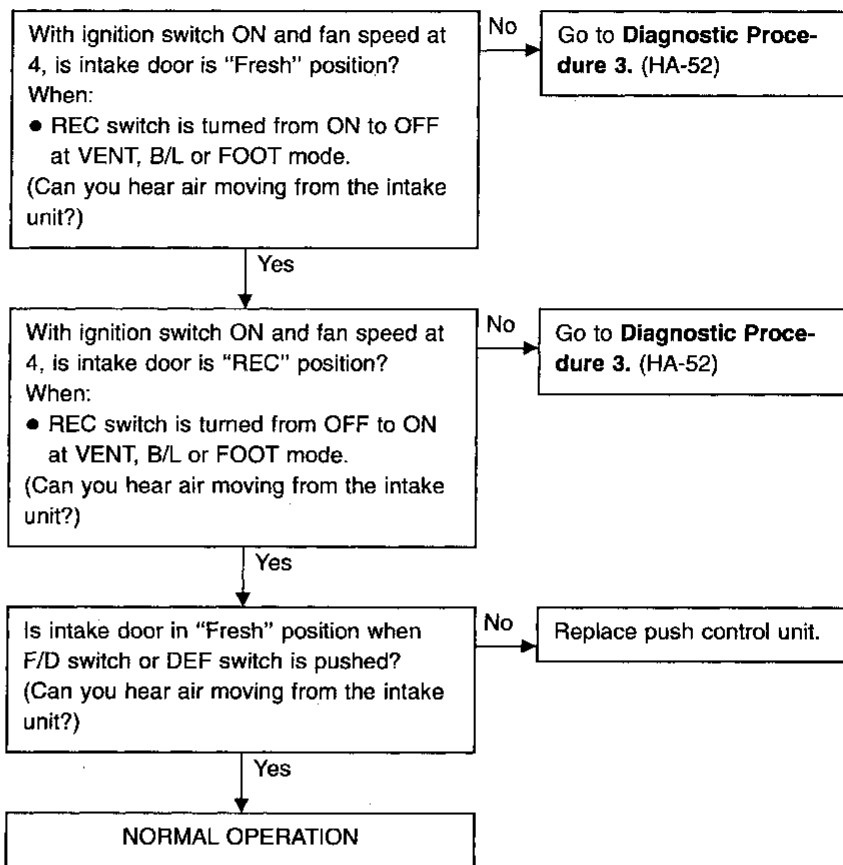
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# TROUBLE DIAGNOSES

## Preliminary Check

### PRELIMINARY CHECK 1

Intake door does not change.

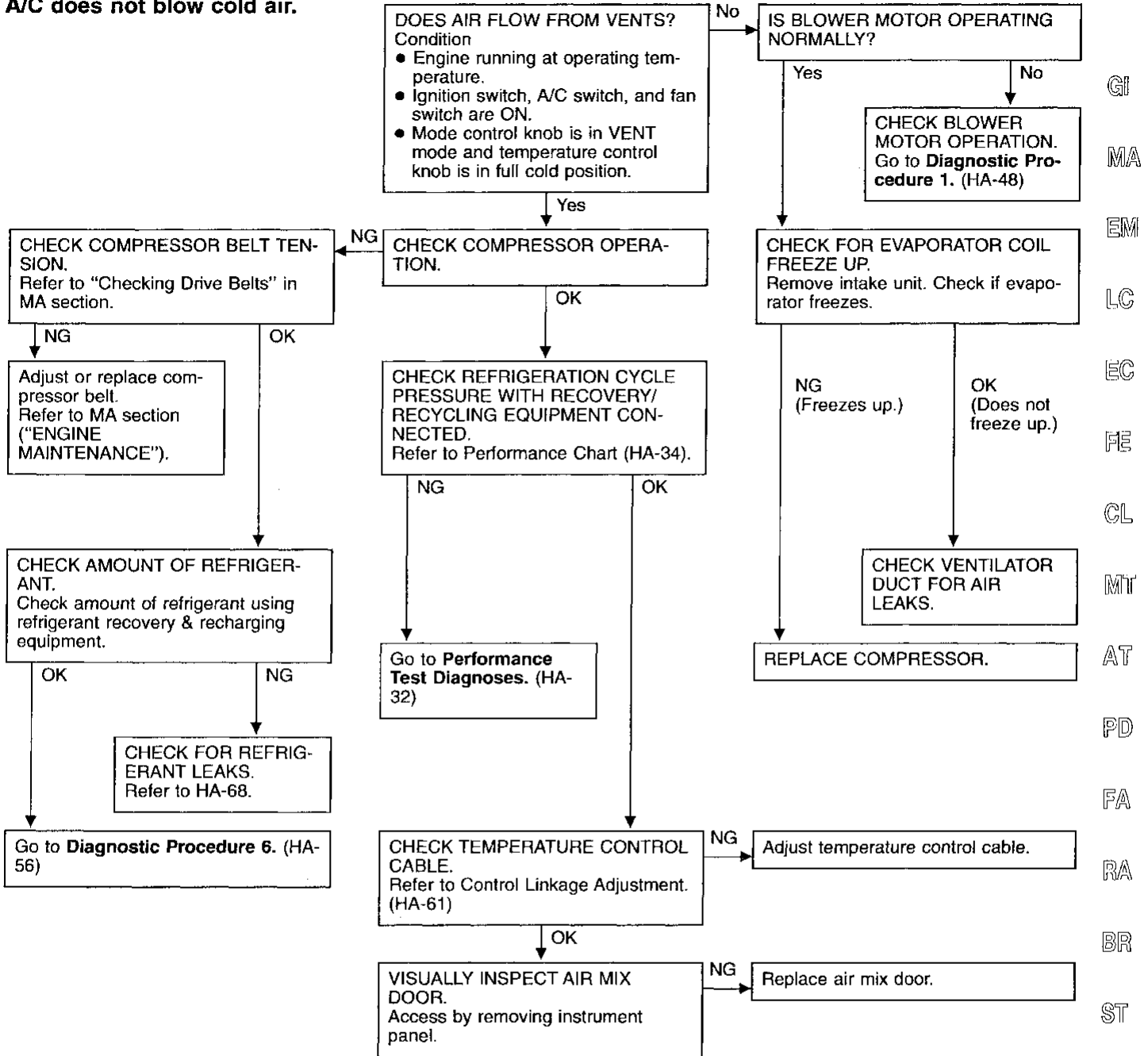


# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 2

A/C does not blow cold air.



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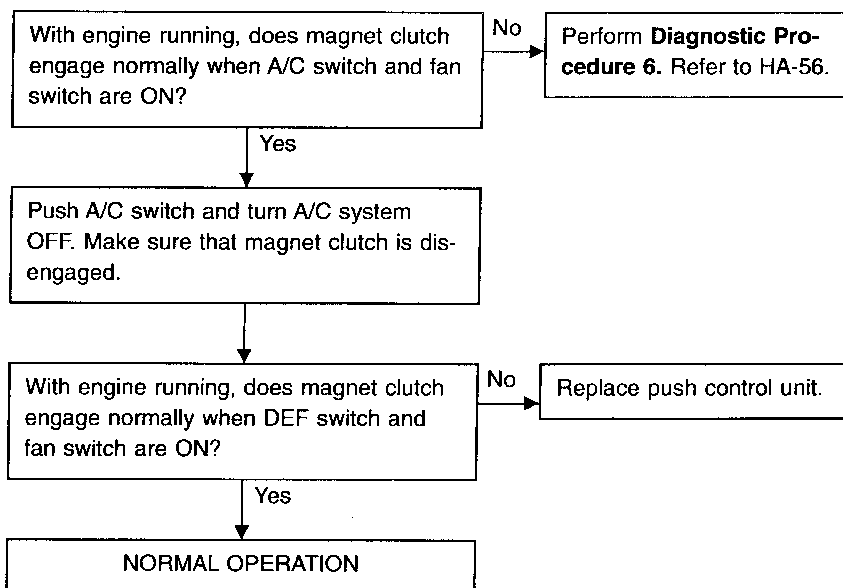
# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 3

Magnet clutch does not engage in DEF mode.

- Perform PRELIMINARY CHECK 2 before referring to the following flow chart.








# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 4

Air outlet does not change.

TURN IGNITION SWITCH ON. DOES AIR COME OUT NORMALLY FROM EACH DUCT WHEN EACH MODE SWITCH IS PUSHED?

Switch mode/ Indicator	Air outlet/distribution		
	Face	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	80%	20%
	—	63%	37%
	—	—	100%

No → Perform **Diagnostic Procedure 2**. Refer to HA-50.

Yes ↓  
NORMAL OPERATION

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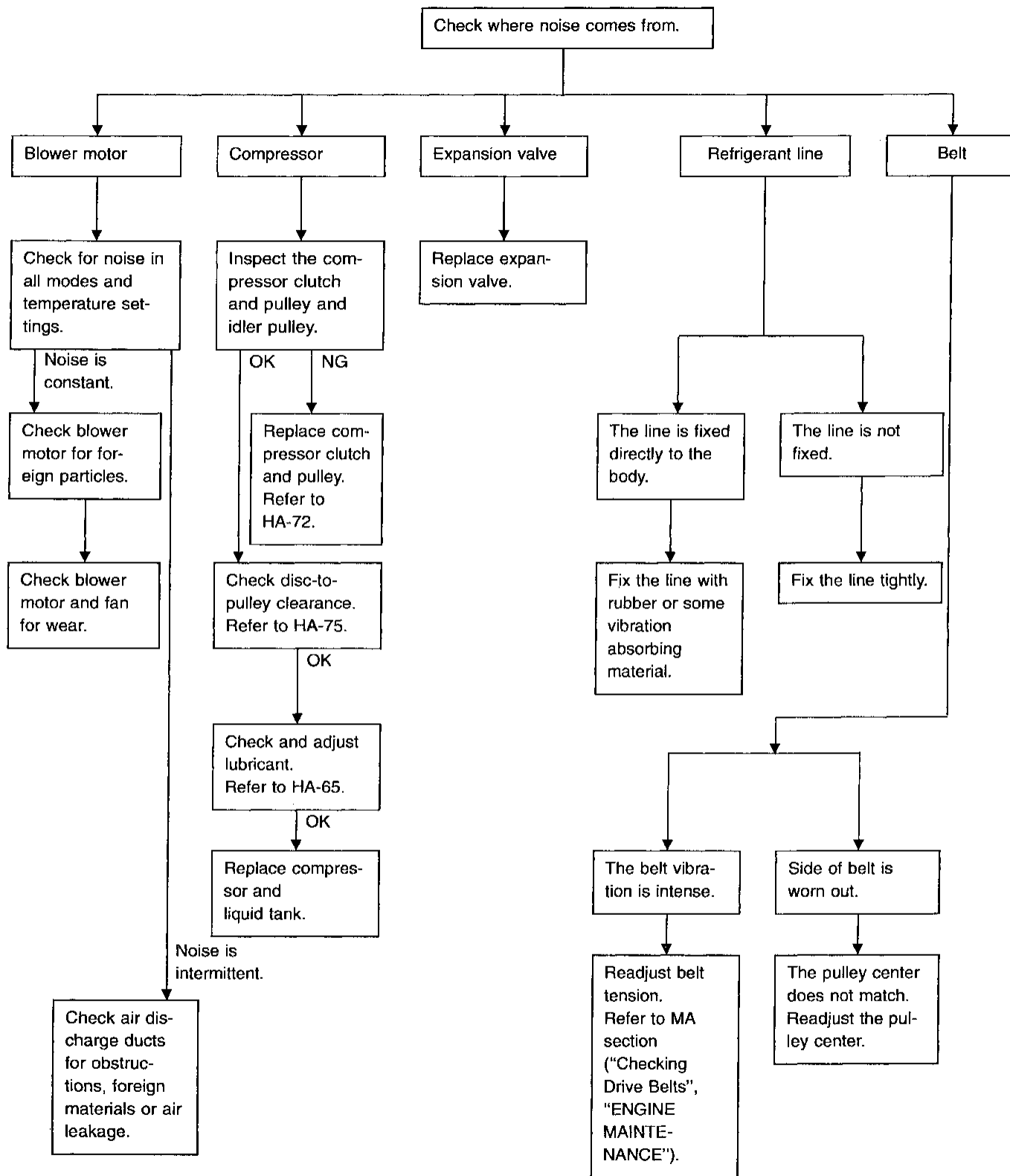
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# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 5

#### Noise

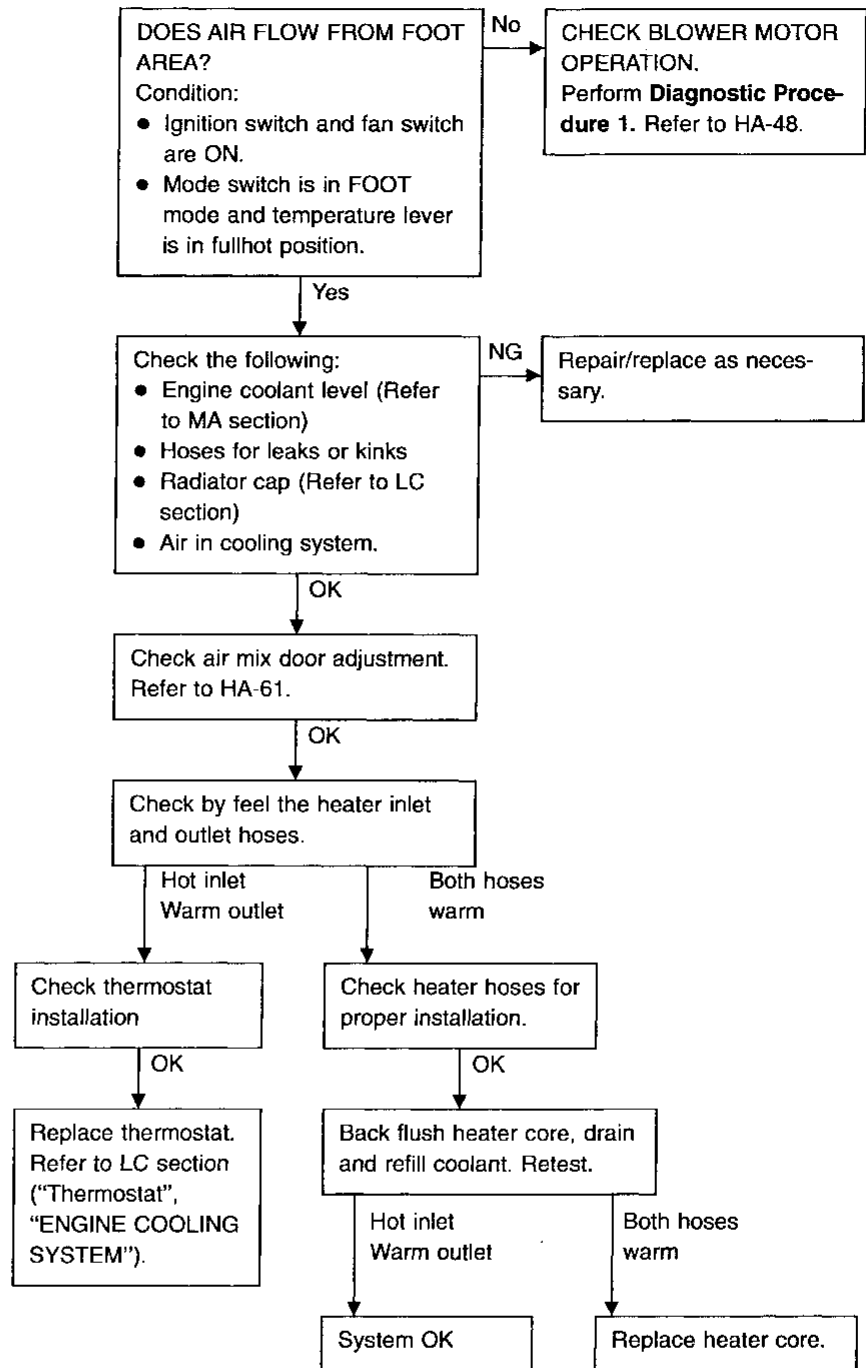


# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 6

#### Insufficient heating



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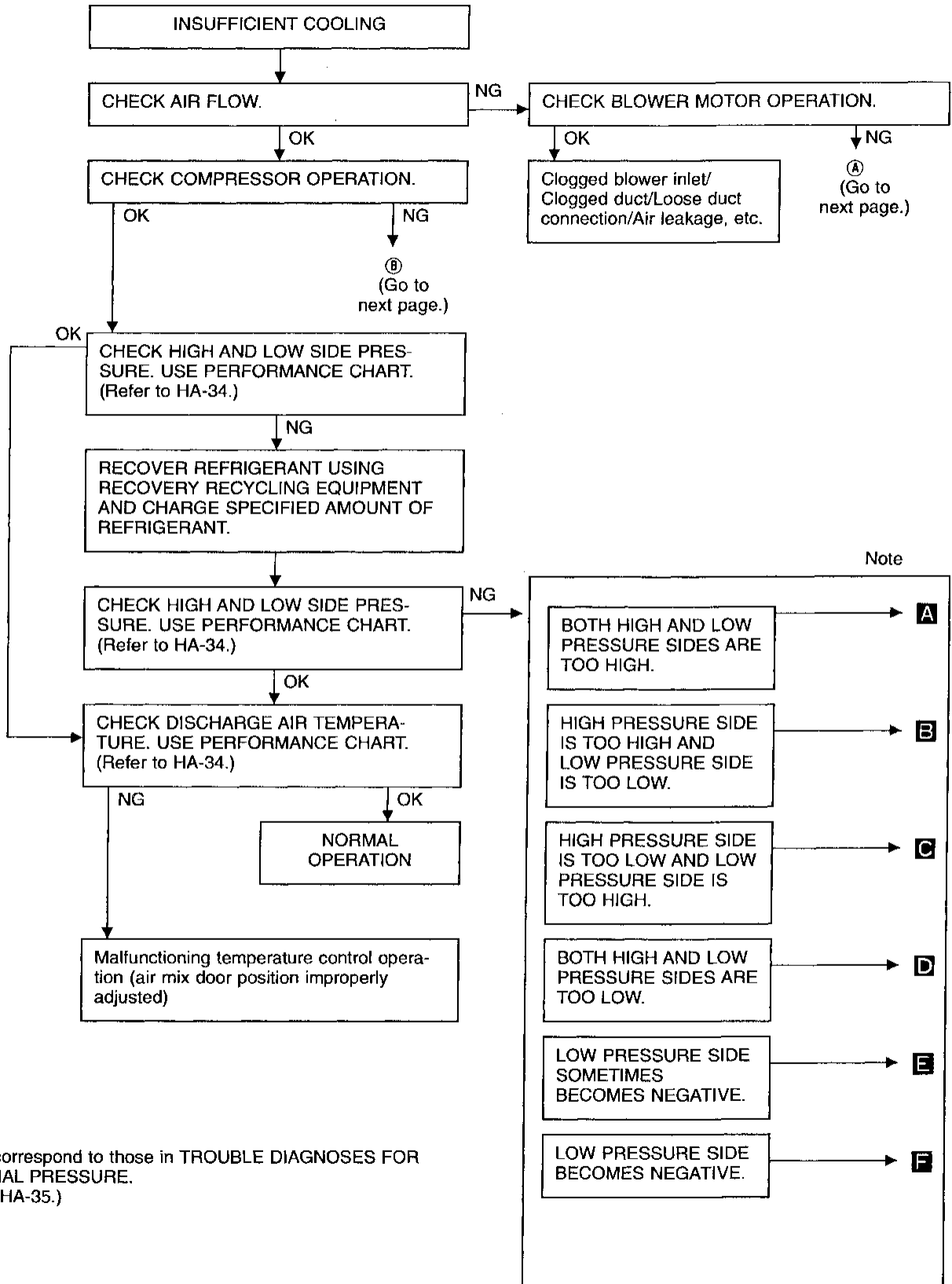
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# TROUBLE DIAGNOSES

## Performance Test Diagnoses INSUFFICIENT COOLING

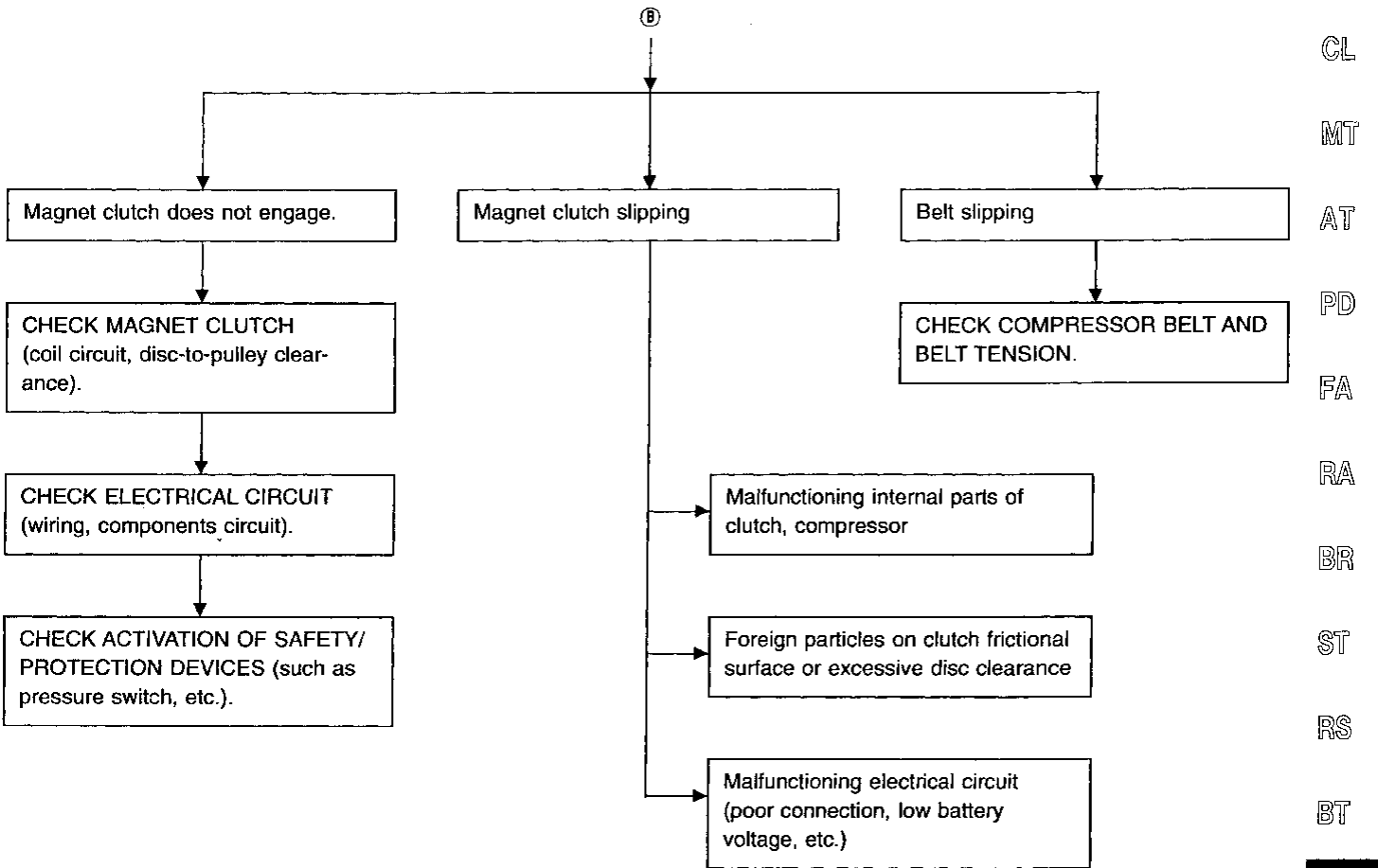
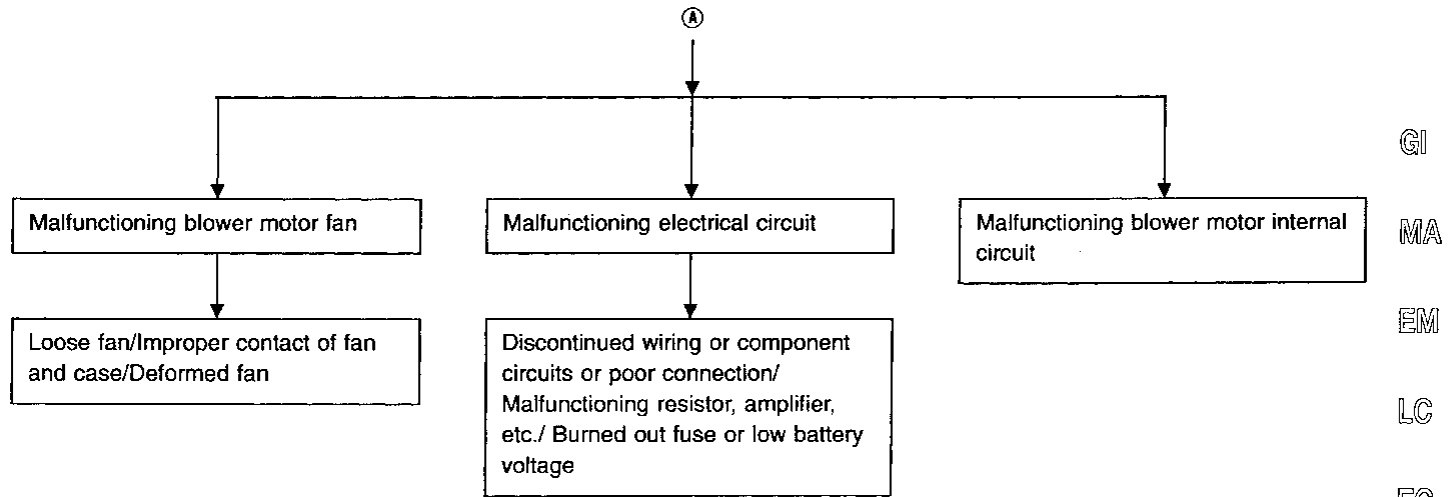


Note: **A-F** correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. (Refer to HA-35.)



# TROUBLE DIAGNOSES

## Performance Test Diagnoses (Cont'd)



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# TROUBLE DIAGNOSES

## Performance Chart

### TEST CONDITION

Testing must be performed as follows:

Vehicle location: Indoors or in the shade (in a well ventilated place)

Doors: Closed

Door window: Open (Front driver side only)

Hood: Open

TEMP. setting: Max. COLD

Discharge Air: Face Vent

Recirculation switch: (Recirculation) ON

FAN speed: 4-speed

A/C switch: ON

Engine speed: 1,000 rpm

Operate the air conditioning system for 10 minutes before taking measurements.

### TEST READING

#### Recirculating-to-discharge air temperature table

Inside air at blower assembly inlet for recirculation*		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	20 (68)	3.7 - 6.3 (39 - 43)
	25 (77)	8.3 - 11.5 (47 - 53)
	30 (86)	13.0 - 16.6 (55 - 62)
	35 (95)	17.6 - 21.8 (64 - 71)
	40 (104)	22.2 - 27.0 (72 - 81)
60 - 70	20 (68)	6.3 - 9.2 (43 - 49)
	25 (77)	11.5 - 14.9 (53 - 59)
	30 (86)	16.6 - 20.5 (62 - 69)
	35 (95)	21.8 - 26.1 (71 - 79)
	40 (104)	27.0 - 31.8 (81 - 89)

\* Thermometer should be placed at intake unit under RH side of instrument panel.

#### Ambient air temperature-to-operating pressure table

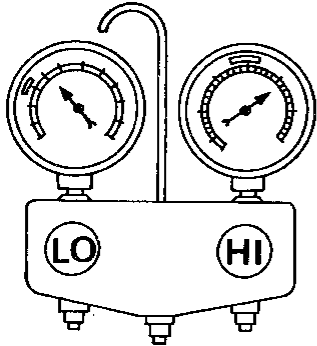
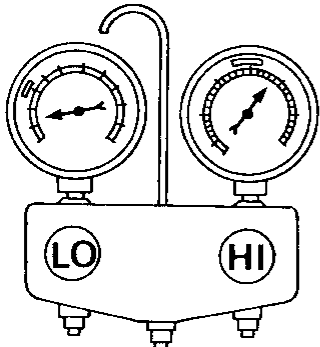
Ambient air		High-pressure (Discharge side) kPa (kg/cm <sup>2</sup> , psi)	Low-pressure (Suction side) kPa (kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	20 (68)	736 - 892 (7.5 - 9.1, 107 - 129)	147 - 226 (1.5 - 2.3, 21 - 33)
	25 (77)	922 - 1,118 (9.4 - 11.4, 134 - 162)	147 - 226 (1.5 - 2.3, 21 - 33)
	30 (86)	1,157 - 1,393 (11.8 - 14.2, 168 - 202)	147 - 226 (1.5 - 2.3, 21 - 33)
	35 (95)	1,393 - 1,687 (14.2 - 17.2, 202 - 245)	157 - 265 (1.6 - 2.7, 23 - 38)
	40 (104)	1,638 - 2,001 (16.7 - 20.4, 237 - 290)	196 - 324 (2.0 - 3.3, 28 - 47)

If pressure is not within range, refer to HA-35, "Trouble Diagnoses for Abnormal Pressure".

# TROUBLE DIAGNOSES

## Trouble Diagnoses for Abnormal Pressure

Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker on top of the gauge scale (see illustrations below) indicates the standard (normal) pressure range for each side. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to HA-34 ("Ambient air temperature-to-operating pressure table").

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too high.</p> <p><b>A</b></p>  <p style="text-align: right;">AC359A</p>	<ul style="list-style-type: none"> <li>Pressure is reduced soon after water is splashed on condenser.</li> </ul>	<p>Excessive refrigerant charge in refrigeration cycle</p>	<p>Reduce refrigerant until specified pressure is obtained.</p>
	<p>Air suction by cooling fan is insufficient.</p>	<p>Insufficient condenser cooling performance</p> <p style="text-align: center;">↓</p> <p>① Condenser fins are clogged. ② Improper fan rotation of cooling fan</p>	<ul style="list-style-type: none"> <li>Clean condenser.</li> <li>Check and repair cooling fan as necessary.</li> </ul>
	<ul style="list-style-type: none"> <li>Low-pressure pipe is not cold.</li> <li>When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm<sup>2</sup>, 28 psi). It then decreases gradually thereafter.</li> </ul>	<p>Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.)</p> <p style="text-align: center;">↓</p> <p>Air in refrigeration cycle</p>	<p>Evacuate repeatedly and recharge system.</p>
	<p>Engine tends to overheat.</p>	<p>Engine cooling systems malfunction.</p>	<p>Check and repair each engine cooling system.</p>
	<ul style="list-style-type: none"> <li>An area of the low-pressure pipe is colder than areas near the evaporator.</li> <li>Plates are sometimes covered with frost.</li> </ul>	<ul style="list-style-type: none"> <li>Excessive liquid refrigerant on low-pressure side</li> <li>Excessive refrigerant discharge flow</li> <li>Expansion valve is open a little compared with the specification.</li> </ul> <p style="text-align: center;">↓</p> <p>① Improper thermal valve installation ② Improper expansion valve adjustment</p>	<p>Replace expansion valve.</p>
<p>High-pressure side is too high and low-pressure side is too low.</p> <p><b>B</b></p>  <p style="text-align: right;">AC360A</p>	<p>Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.</p>	<p>High-pressure tube or parts located between compressor and condenser are clogged or crushed.</p>	<ul style="list-style-type: none"> <li>Check and repair or replace malfunctioning parts.</li> <li>Check lubricant for contamination.</li> </ul>

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RS

BT

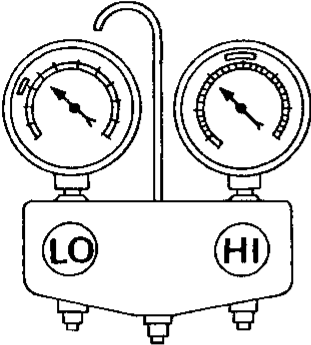
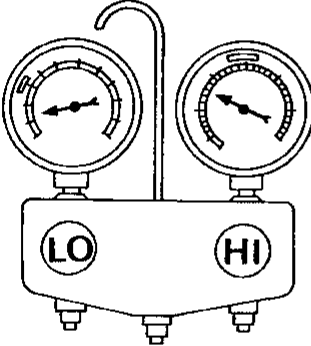
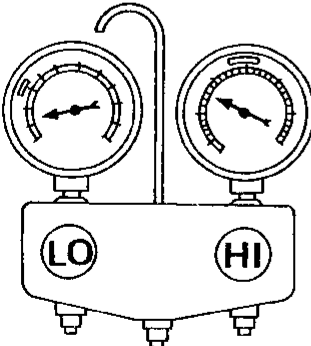
HA

EL

IDX

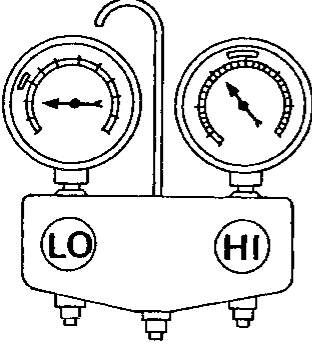
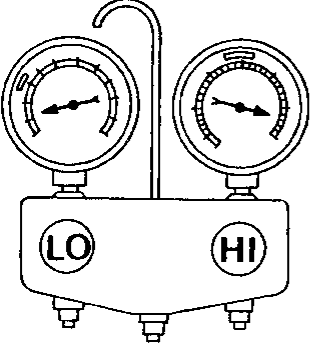
# TROUBLE DIAGNOSES

## Trouble Diagnoses for Abnormal Pressure (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too low and low-pressure side is too high.</p> <p><b>C</b></p>  <p style="text-align: center;">AC356A</p>	<p>High and low-pressure sides become equal soon after compressor operation stops.</p>	<p>Compressor pressure operation is improper.</p> <p style="text-align: center;">↓</p> <p>Damaged inside compressor packings</p>	<p>Replace compressor.</p>
	<p>No temperature difference between high and low-pressure sides</p>	<p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)</p>	<p>Replace compressor.</p>
<p>Both high- and low-pressure sides are too low.</p> <p><b>D</b></p>  <p style="text-align: center;">AC353A</p>	<ul style="list-style-type: none"> <li>• There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low.</li> <li>• Liquid tank inlet and expansion valve are frosted.</li> </ul>	<p>Liquid tank inside is clogged a little.</p>	<ul style="list-style-type: none"> <li>• Replace liquid tank.</li> <li>• Check lubricant for contamination.</li> </ul>
	<ul style="list-style-type: none"> <li>• Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank.</li> <li>• Expansion valve inlet may be frosted.</li> <li>• Temperature difference occurs somewhere in high-pressure side</li> </ul>	<p>High-pressure pipe located between liquid tank and expansion valve is clogged.</p>	<ul style="list-style-type: none"> <li>• Check and repair malfunctioning parts.</li> <li>• Check lubricant for contamination.</li> </ul>
<p>Both high- and low-pressure sides are too low.</p> <p><b>D</b></p>  <p style="text-align: center;">AC353A</p>	<ul style="list-style-type: none"> <li>• Expansion valve and liquid tank are warm or only cool when touched.</li> </ul>	<p>Low refrigerant charge</p> <p style="text-align: center;">↓</p> <p>Leaking fittings or components</p>	<ul style="list-style-type: none"> <li>• Check refrigerant for leaks. Refer to "Checking Refrigerant Leaks", HA-68.</li> </ul>
	<p>There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.</p>	<p>Expansion valve closes a little compared with the specification.</p> <p style="text-align: center;">↓</p> <ul style="list-style-type: none"> <li>① Improper expansion valve adjustment</li> <li>② Malfunctioning thermal valve</li> <li>③ Outlet and inlet may be clogged.</li> </ul>	<ul style="list-style-type: none"> <li>• Remove foreign particles by using compressed air.</li> <li>• Check lubricant for contamination.</li> </ul>
	<p>An area of the low-pressure pipe is colder than areas near the evaporator outlet.</p>	<p>Low-pressure pipe is clogged or crushed.</p>	<ul style="list-style-type: none"> <li>• Check and repair malfunctioning parts.</li> <li>• Check lubricant for contamination.</li> </ul>
<p>Air flow volume is not enough or is too low.</p>	<p>Compressor operation is improper.</p>	<p>Replace compressor.</p>	

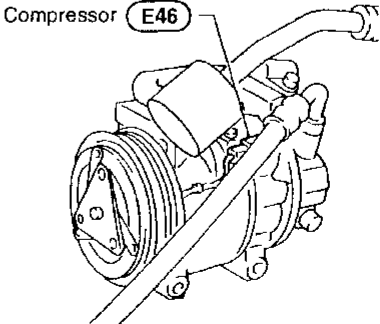
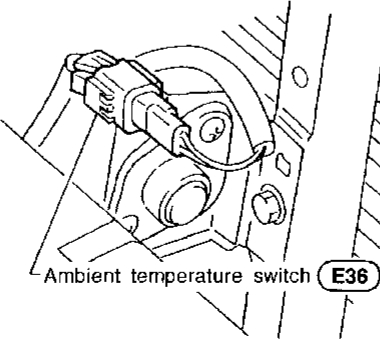
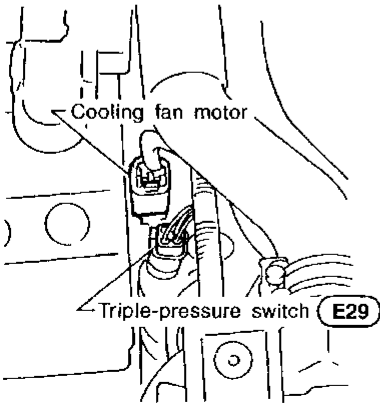
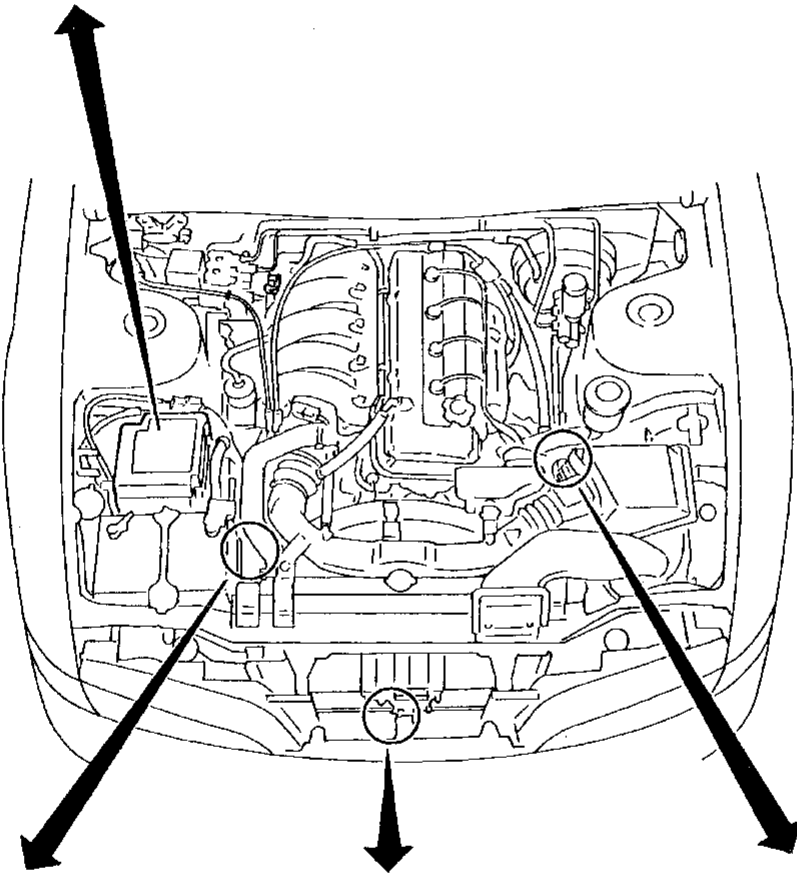
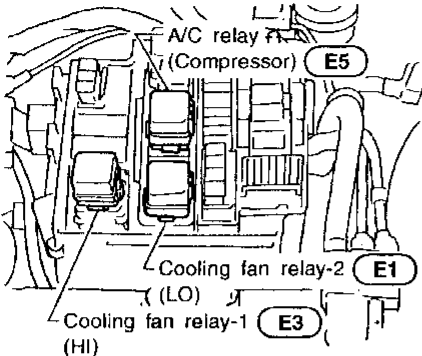
# TROUBLE DIAGNOSES

## Trouble Diagnoses for Abnormal Pressure (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action	
<p>Low-pressure side sometimes becomes negative.</p> <p><b>E</b></p>  <p style="text-align: right; font-size: small;">AC354A</p>	<ul style="list-style-type: none"> <li>• Air conditioning system does not function and does not cyclically cool the compartment air.</li> <li>• The system constantly functions for a certain period of time after compressor is stopped and restarted.</li> </ul>	<p>Refrigerant does not discharge cyclically.</p> <p style="text-align: center;">↓</p> <p>Moisture is frozen at expansion valve outlet and inlet.</p> <p style="text-align: center;">↓</p> <p>Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> <li>• Drain water from refrigerant or replace refrigerant.</li> <li>• Replace liquid tank.</li> </ul>	<p>GI</p> <p>MA</p> <p>EM</p> <p>LC</p> <p>EC</p> <p>FE</p>
<p>Low-pressure side becomes negative.</p> <p><b>F</b></p>  <p style="text-align: right; font-size: small;">AC362A</p>	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow.</p> <p style="text-align: center;">↓</p> <p>Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the problem is caused by water or foreign particles.</p> <ul style="list-style-type: none"> <li>• If water is the cause, initially cooling is okay. Then the water freezes, causing a blockage. Drain water from refrigerant or replace refrigerant.</li> <li>• If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air.</li> <li>• If either of the above methods cannot correct the problem, replace expansion valve.</li> <li>• Replace liquid tank.</li> <li>• Check lubricant for contamination.</li> </ul>	<p>CL</p> <p>MT</p> <p>AT</p> <p>PD</p> <p>FA</p> <p>RA</p> <p>BR</p> <p>ST</p> <p>RS</p> <p>BT</p> <p><b>HA</b></p> <p>EL</p> <p>IDX</p>

Harness Layout

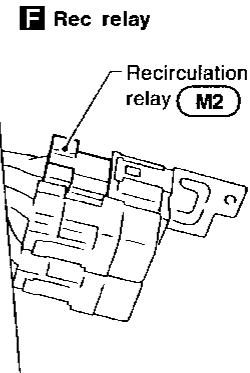
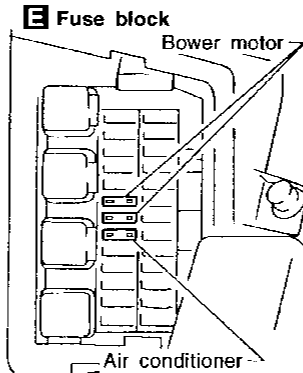
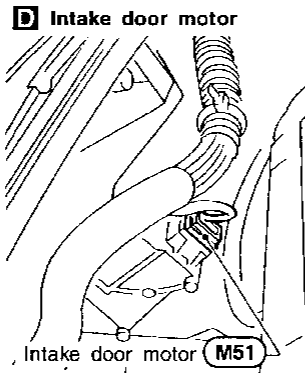
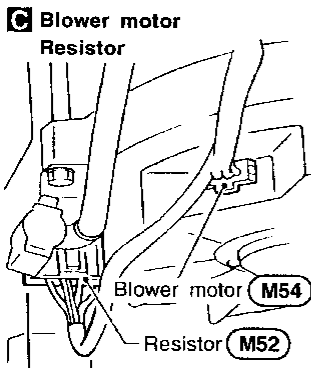
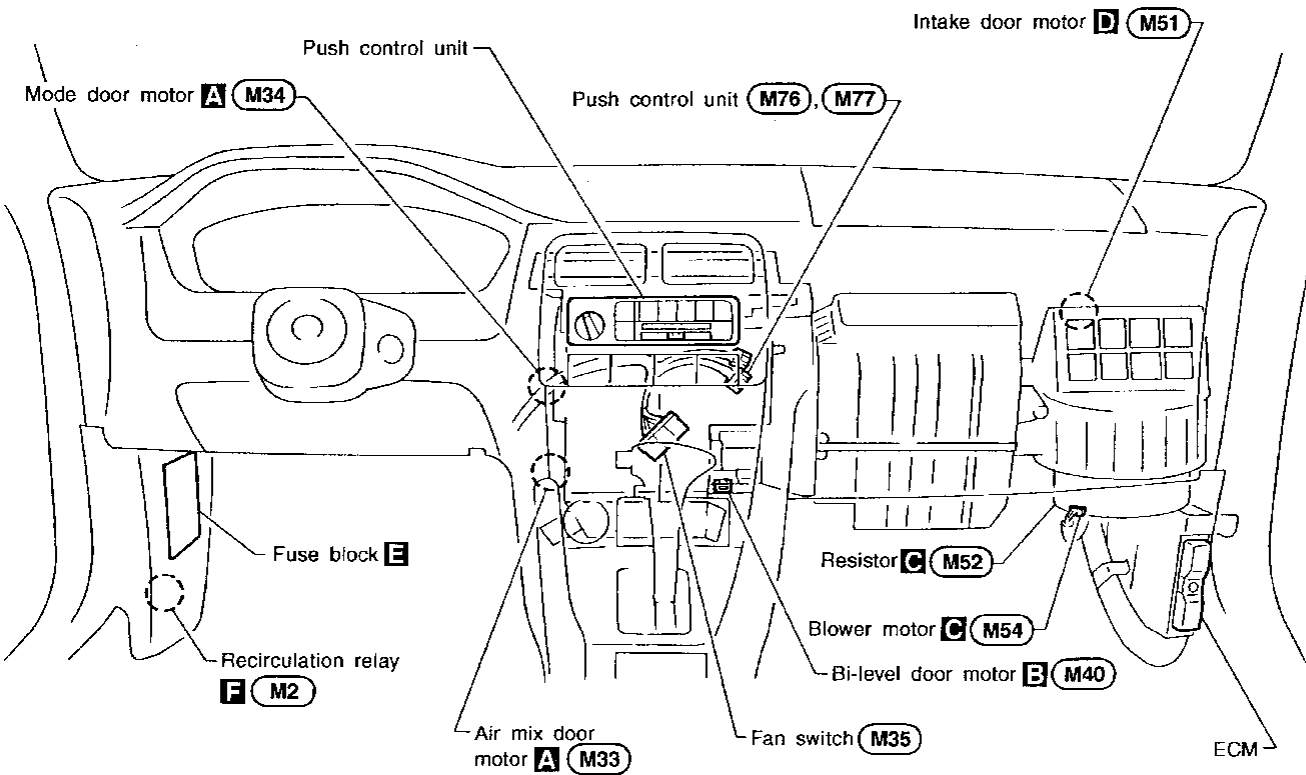
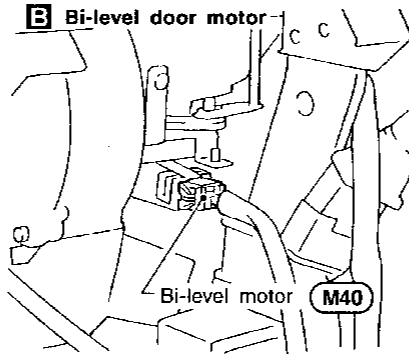
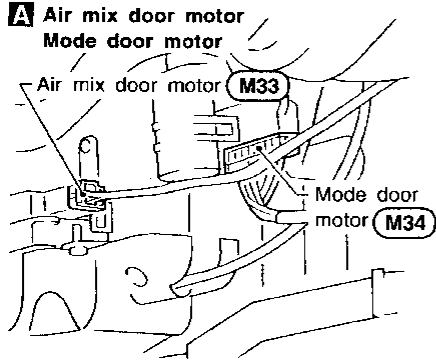
Engine compartment



# TROUBLE DIAGNOSES

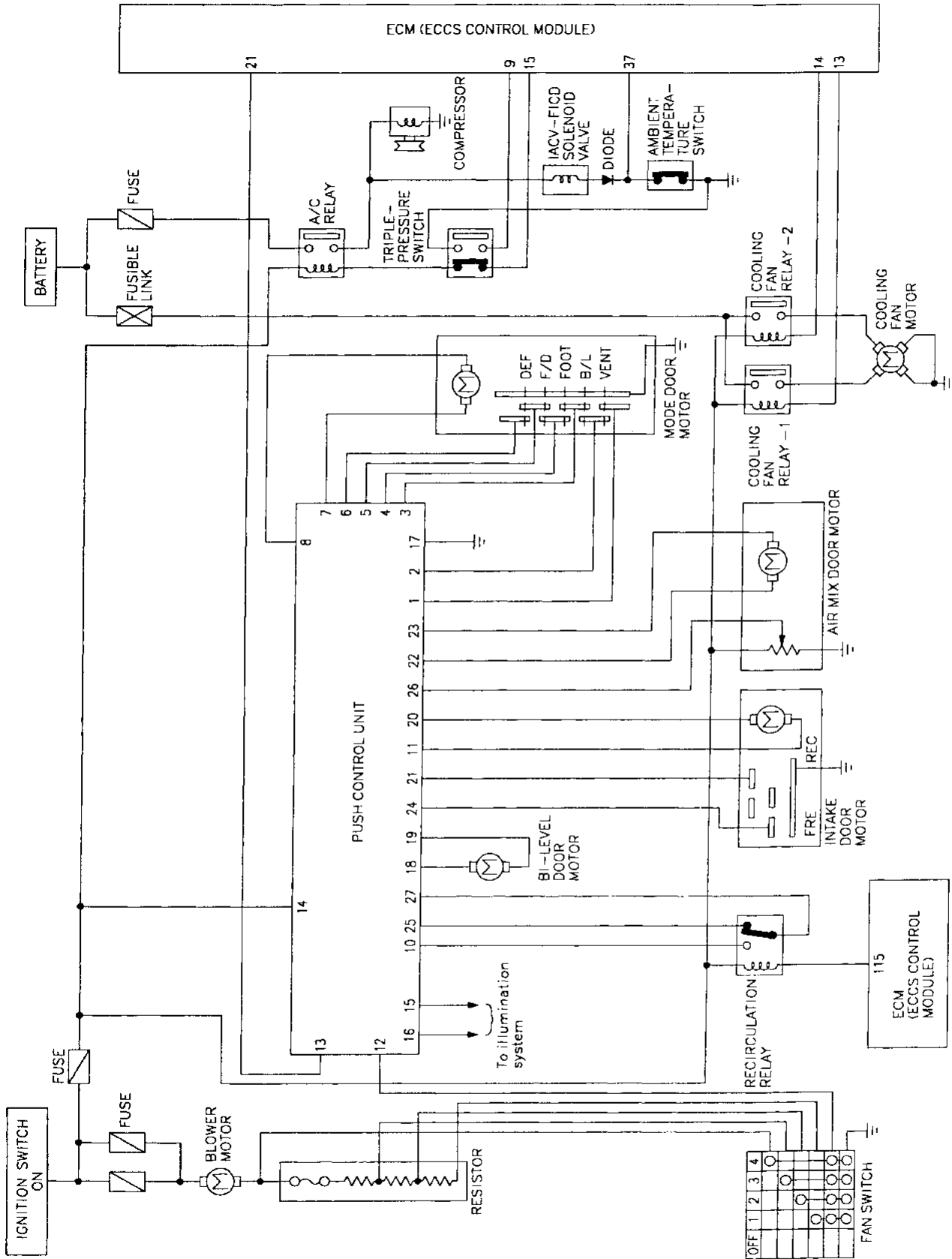
## Harness Layout (Cont'd)

### Passenger compartment



GI  
MA  
EM  
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HA  
EL  
IDX

Circuit Diagram

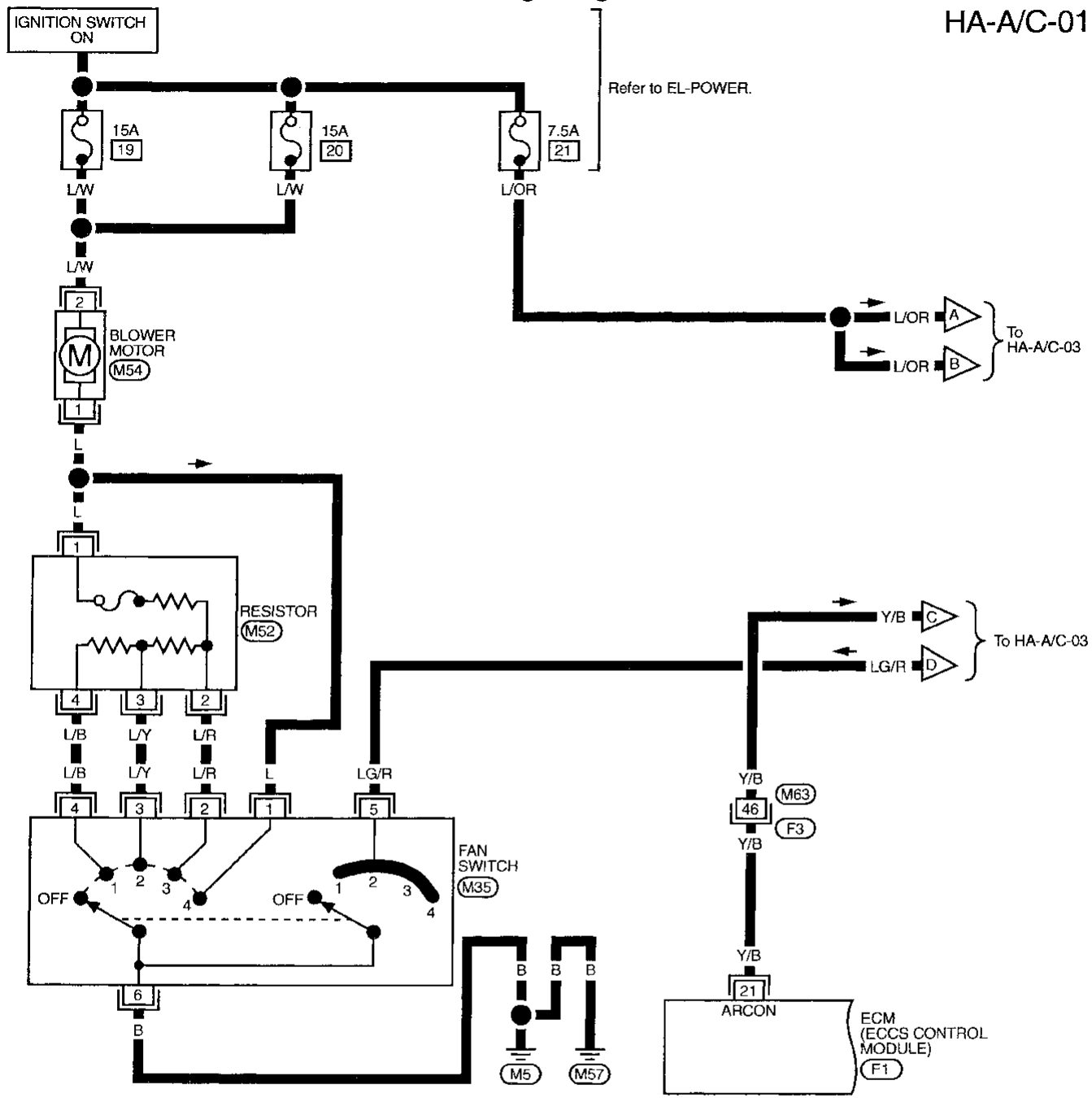




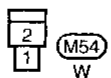
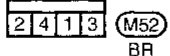
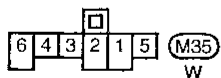
# TROUBLE DIAGNOSES

## Wiring Diagram — A/C —

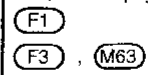
HA-A/C-01



- GI
- MA
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- BT
- HA**
- EL
- IDX



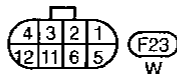
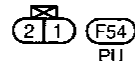
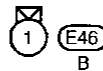
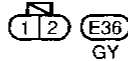
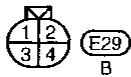
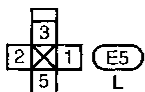
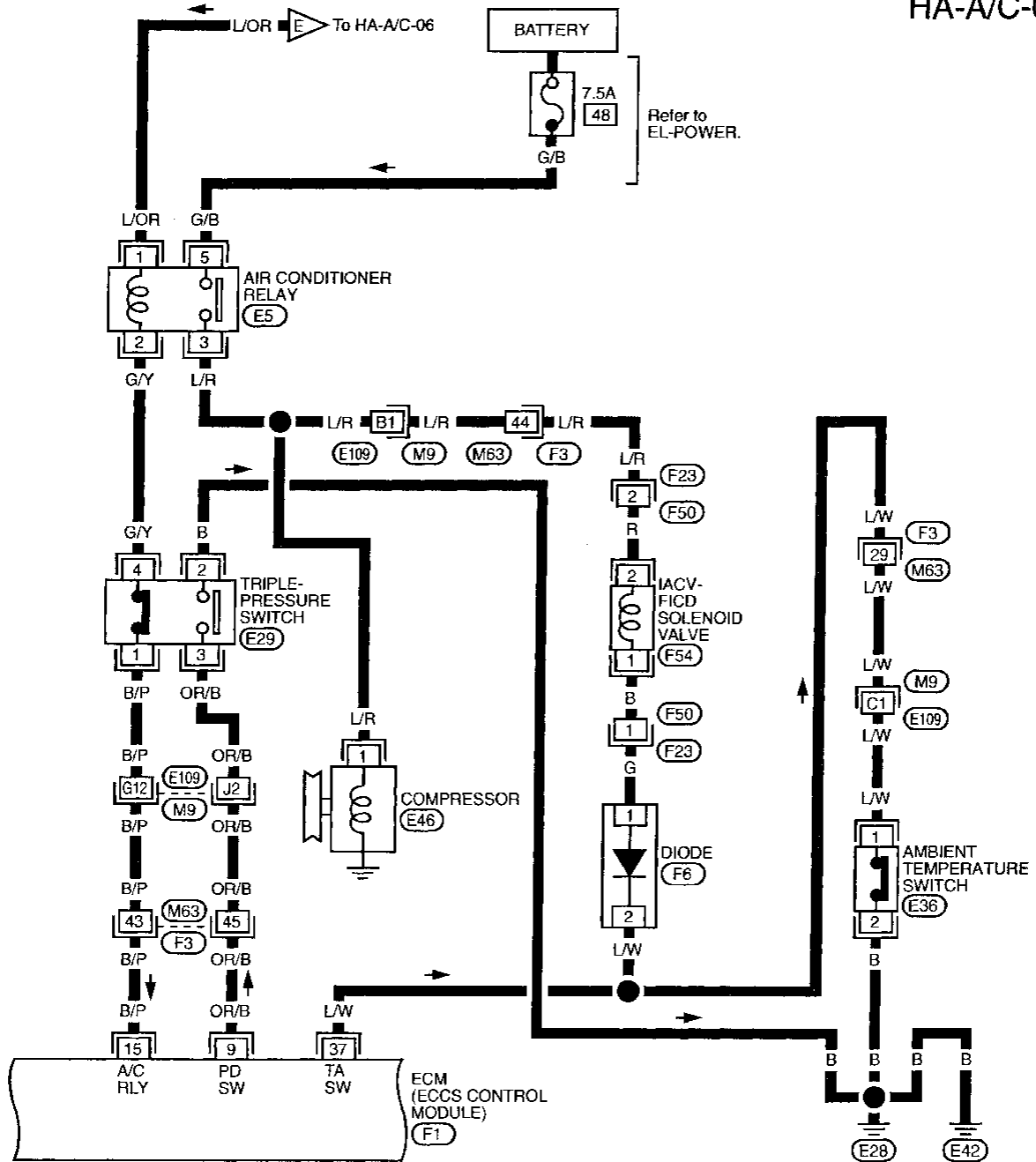
Refer to last page (Foldout page).



# TROUBLE DIAGNOSES

## Wiring Diagram — A/C — (Cont'd)

HA-A/C-02



Refer to last page (Foldout page).

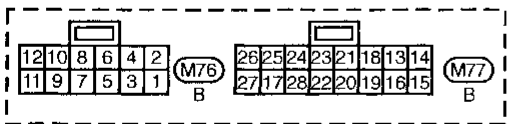
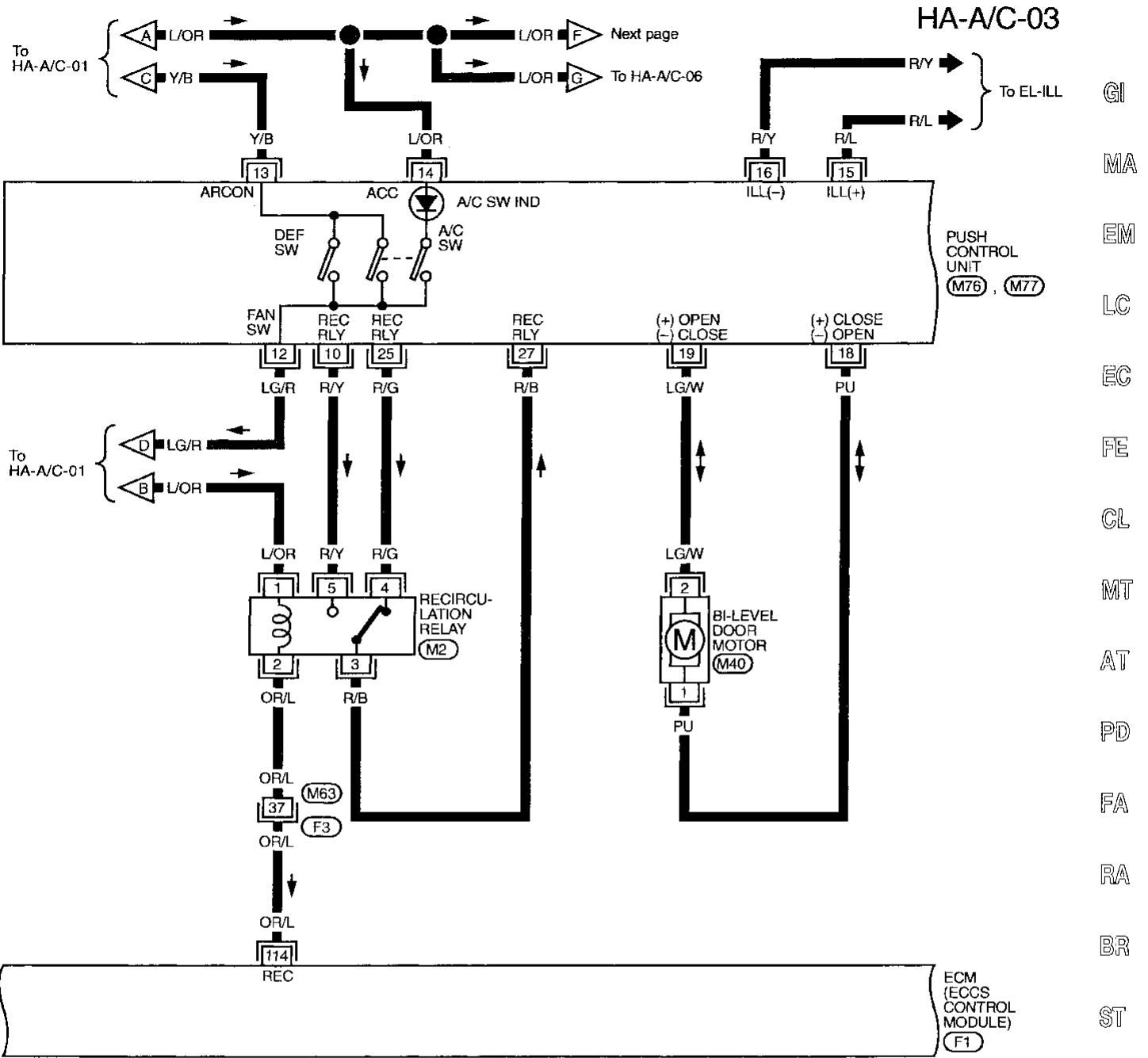
M9, E109

F1

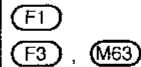
F3, M63

# TROUBLE DIAGNOSES

## Wiring Diagram — A/C — (Cont'd)



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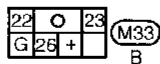
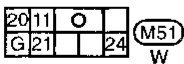
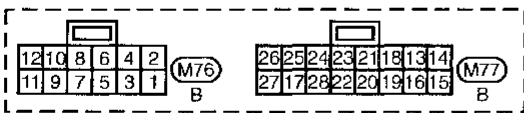
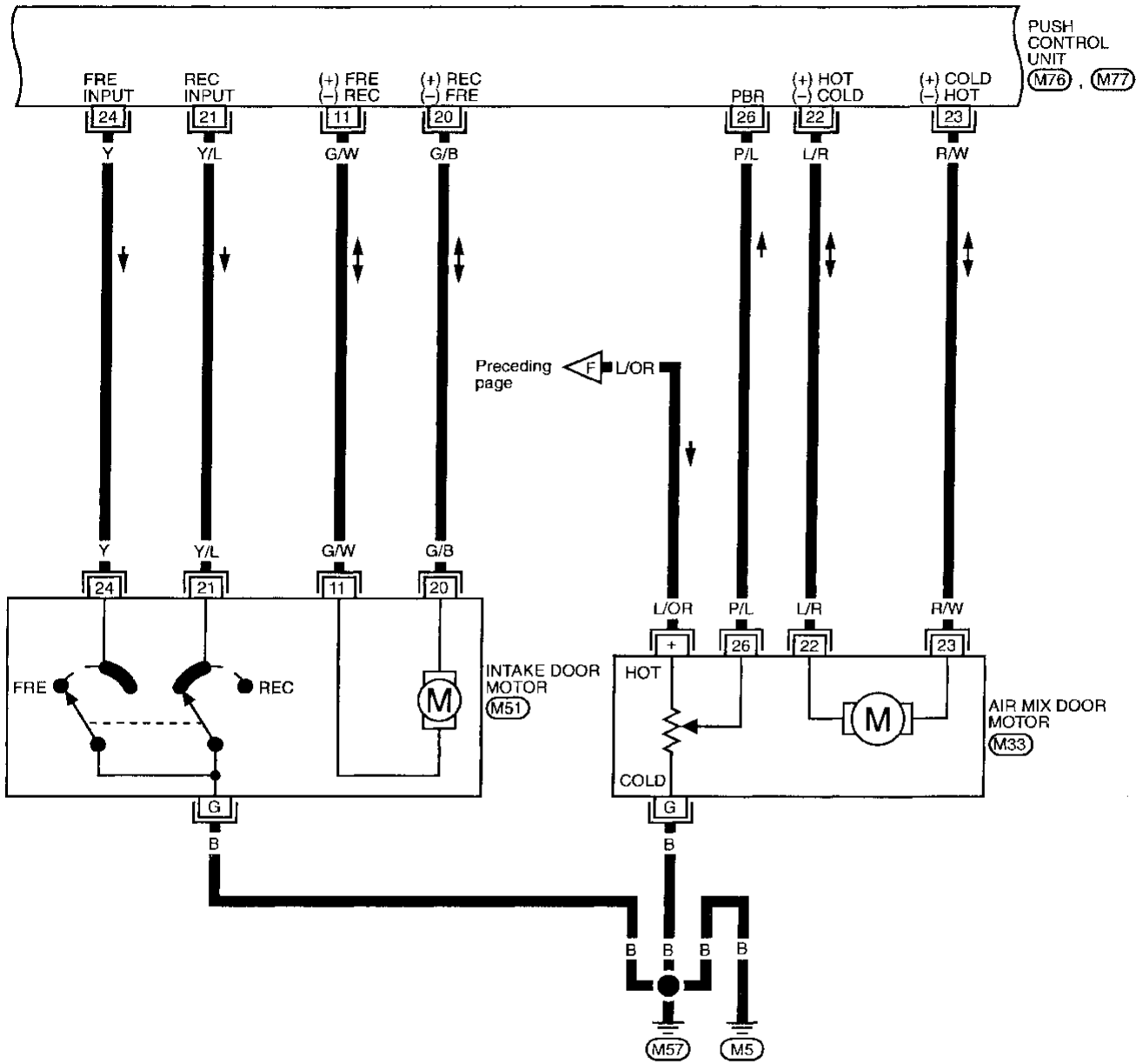


- GI
- MA
- EM
- LC
- EC
- FE
- CL
- MT
- AT
- PD
- FA
- RA
- BR
- ST
- RS
- BT
- HA**
- EL
- IDX

# TROUBLE DIAGNOSES

## Wiring Diagram — A/C — (Cont'd)

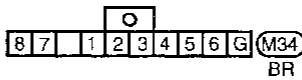
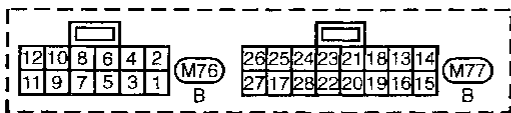
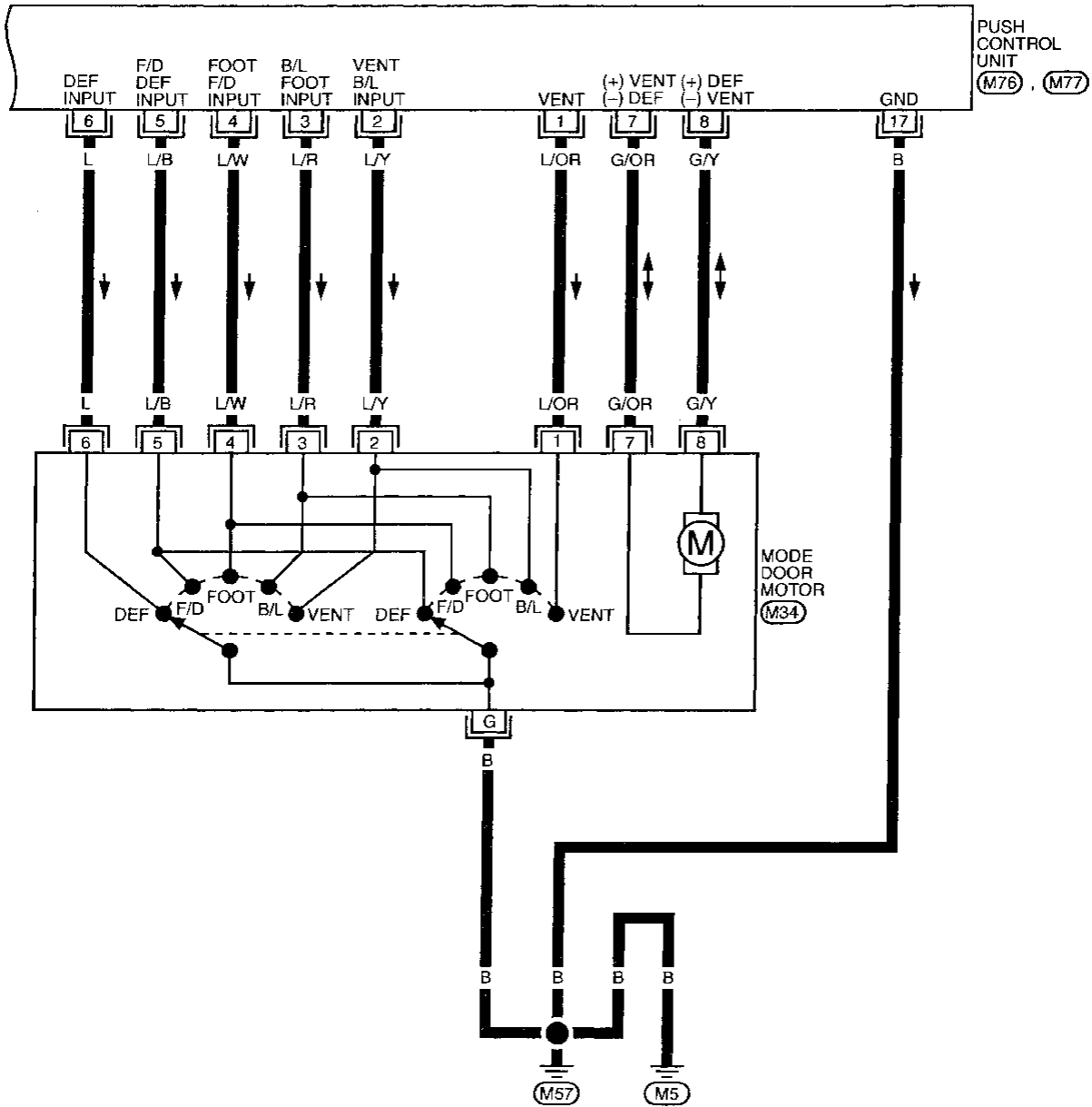
HA-A/C-04



# TROUBLE DIAGNOSES

## Wiring Diagram — A/C — (Cont'd)

HA-A/C-05

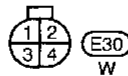
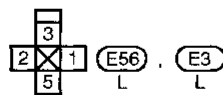
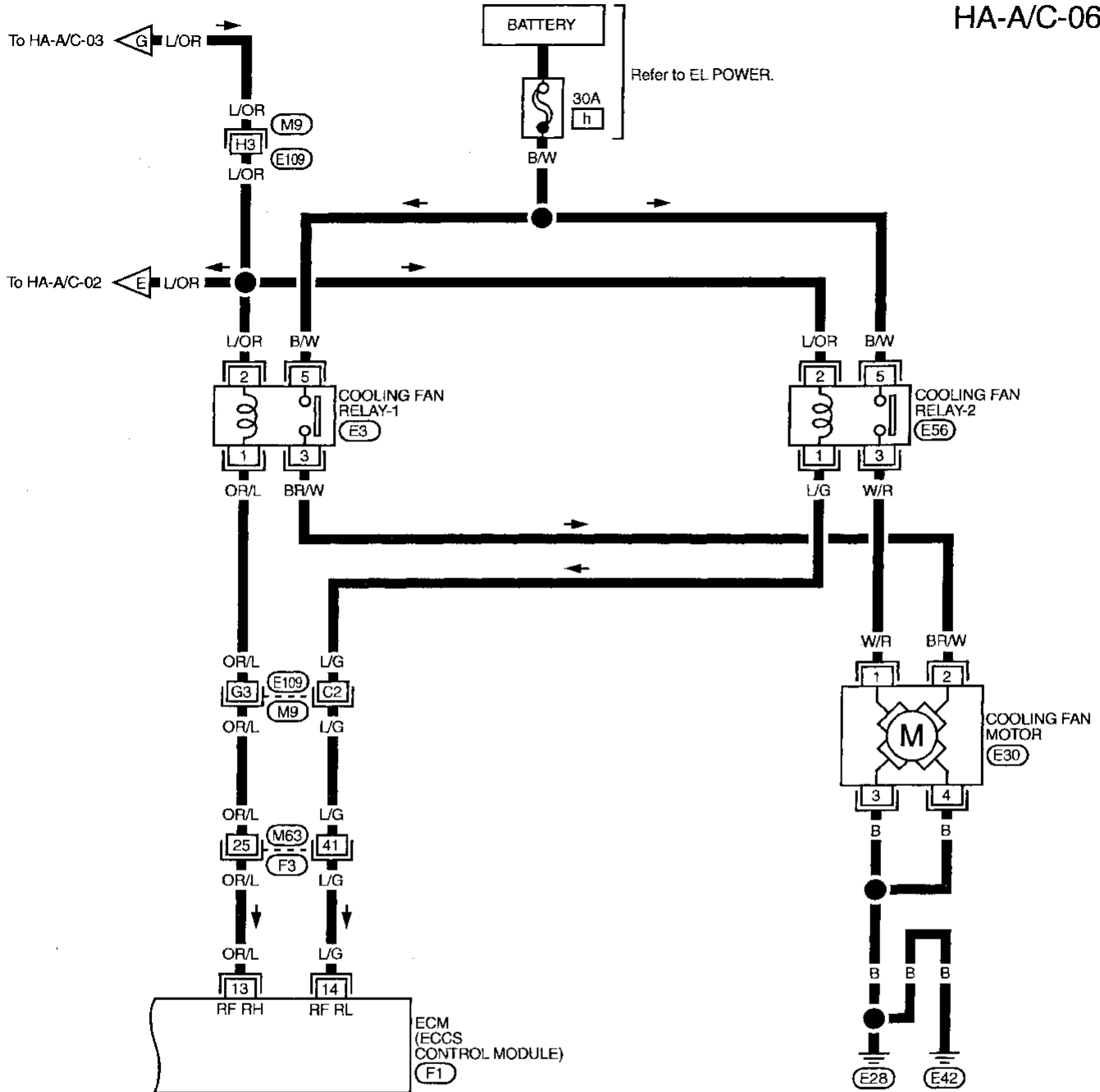


- GI
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- EC
- FE
- CL
- MT
- AT
- PD
- FA
- RA
- BR
- ST
- RS
- BT
- HA
- EL
- IDX

# TROUBLE DIAGNOSES

## Wiring Diagram — A/C — (Cont'd)

HA-A/C-06



Refer to last page (Foldout page).

(M9) . (E109)

(F1)

(F3) . (M63)

# TROUBLE DIAGNOSES

## Main Power Supply and Ground Circuit Check

### POWER SUPPLY CIRCUIT CHECK

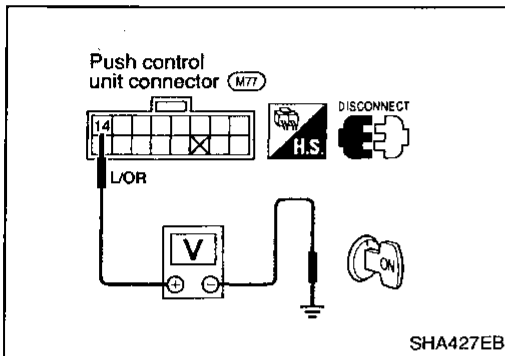
Check power supply circuit for air conditioning system.

Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").

GI

MA

EM



### PUSH CONTROL UNIT CHECK

Check power supply circuit for push control unit with ignition switch at ON.

LC

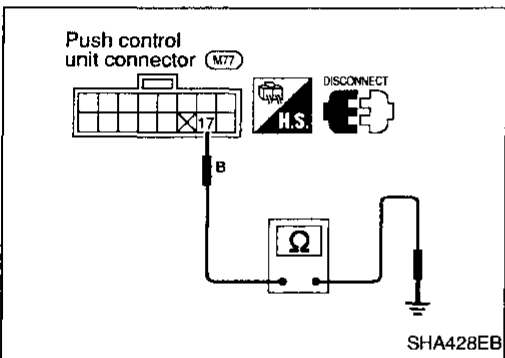
1. Disconnect push control unit harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ⑭ and body ground.

EC

Voltmeter terminal		Voltage
⊕	⊖	
⑭	Body ground	Approx. 12V

FE

CL



Check body ground circuit for push control unit.

MT

1. Disconnect push control unit harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ⑰ and body ground.

AT

Ohmmeter terminal		Continuity
⊕	⊖	
⑰	Body ground	Yes

PD

FA

RA

BR

ST

RS

BT

HA

EL

IDX

# TROUBLE DIAGNOSES

	INCIDENT	Flow chart No.
1	Fan fails to rotate.	①
2	Fan does not rotate at 1-speed.	②
3	Fan does not rotate at 2-speed.	③
4	Fan does not rotate at 3-speed.	④
5	Fan does not rotate at 4-speed.	⑤

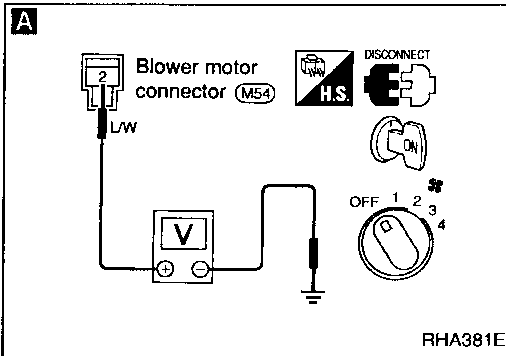
## Diagnostic Procedure 1

**SYMPTOM: Blower motor does not rotate.**

- Perform **PRELIMINARY CHECK 2** before referring to the following flow chart.

Check if blower motor rotates properly at each fan speed.  
Conduct check as per flow chart at left.

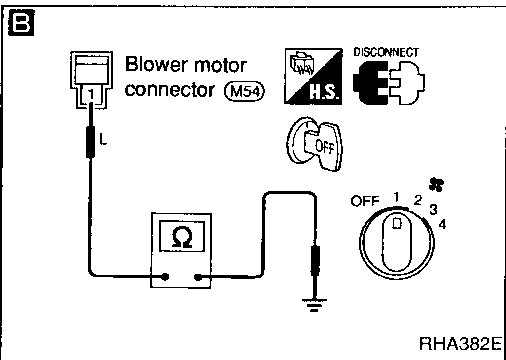
② ③ ④ ⑤  
(Go to next page.)



**A**

**CHECK POWER SUPPLY FOR BLOWER MOTOR.**  
Disconnect blower motor harness connector.  
Do approx. 12 volts exist between blower motor harness terminal No. ② and body ground?

No → Check power supply circuit and 15A fuses (No. ⑱ and ⑳, located in the fuse block).  
Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").



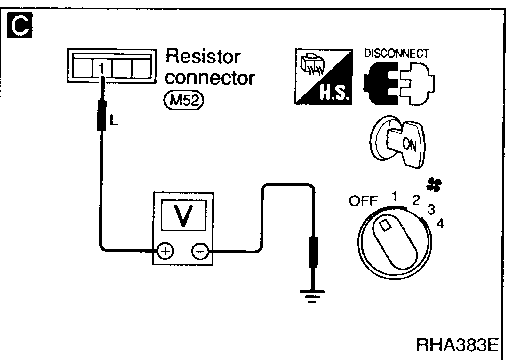
**B**

Check circuit continuity between blower motor harness terminal No. ① and body ground.

OK → **CHECK BLOWER MOTOR.**  
(Refer to HA-59.)

NG → Reconnect blower motor harness connector.

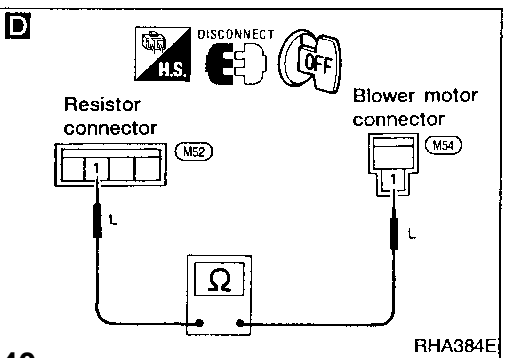
NG → Replace blower motor.



**C**

**CHECK BLOWER MOTOR CIRCUIT BETWEEN BLOWER MOTOR AND RESISTOR.**  
Do approx. 12 volts exist between resistor harness terminal No. ① and body ground?

No → Disconnect blower motor and resistor harness connectors.



Yes → (Go to next page.)

**D** Note

Check circuit continuity between blower motor harness terminal No. ① and resistor harness terminal No. ①.  
**Continuity should exist.**  
If OK, check harness for short.

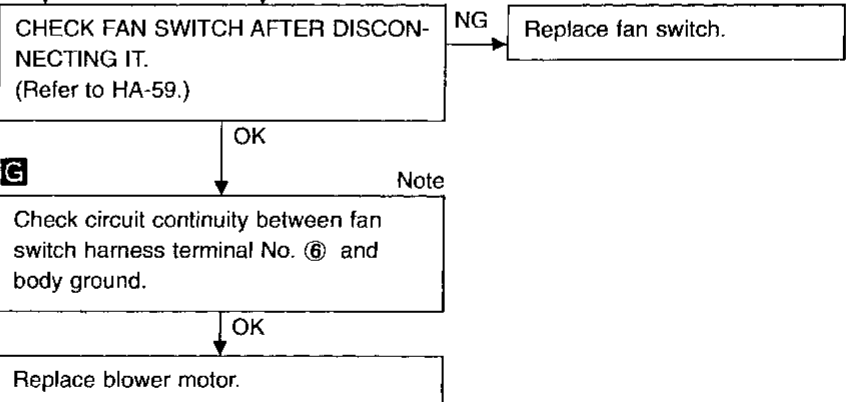
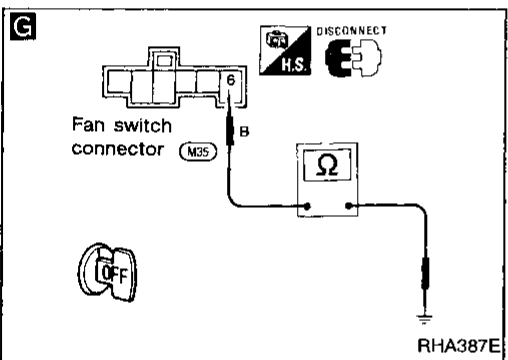
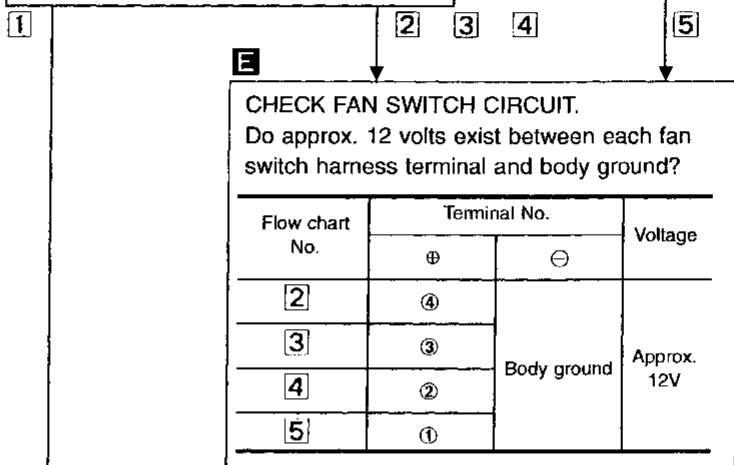
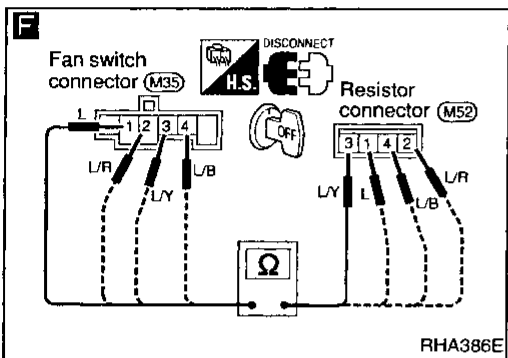
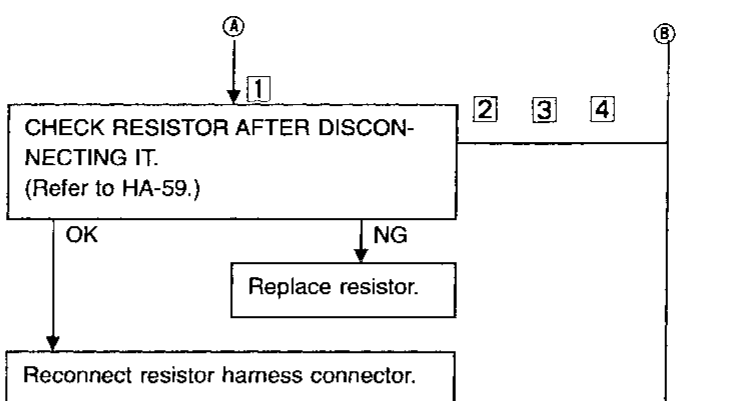
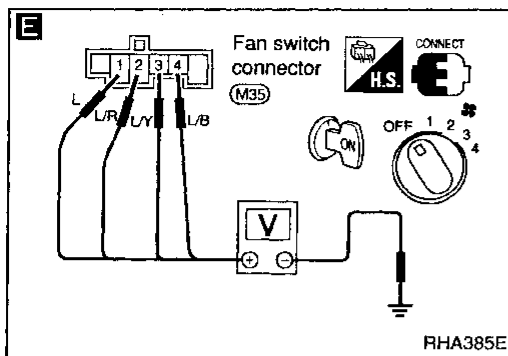
(Go to next page.)

**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.



# TROUBLE DIAGNOSES

## Diagnostic Procedure 1 (Cont'd)



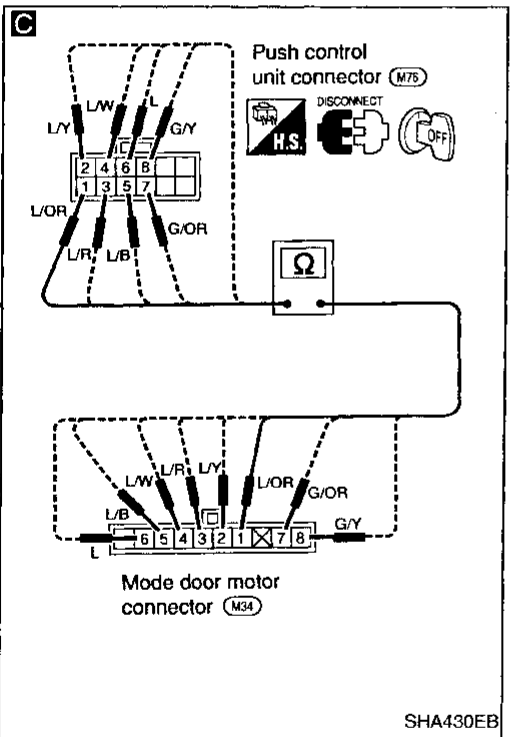
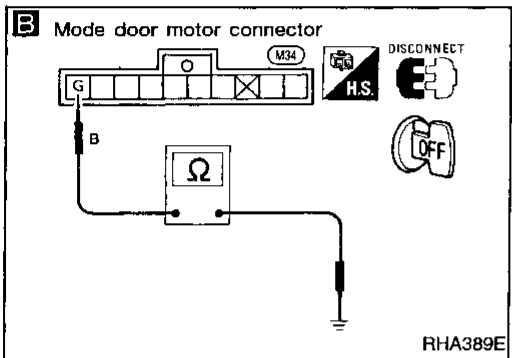
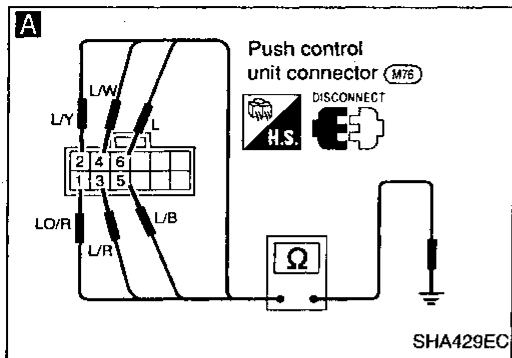
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

GI  
MA  
EM  
LC  
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RS  
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HA  
EL  
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## Diagnostic Procedure 2

**SYMPTOM: Air outlet does not change.**

- Perform **PRELIMINARY CHECK 4, Main Power Supply and Ground Circuit Check** before referring to flow chart below.



**A**  
CHECK MODE DOOR MOTOR POSITION SWITCH.

1. Turn VENT switch ON with ignition switch at ON position.
2. Turn ignition switch OFF.  
Disconnect push control unit connector.
3. Check for continuity between terminal ① or ② of push control unit harness connector and body ground.
4. Using above procedures, check for continuity in any other mode, as indicated in chart.

Mode switch	Terminal No.		Continuity
	⊕	⊖	
VENT	① or ②	Body ground	Yes
B/L	② or ③		
FOOT	③ or ④		
F/D	④ or ⑤		
DEF	⑤ or ⑥		

OK

**CHECK SIDE LINK.**  
Refer to Control Linkage Adjustment. (HA-61)

NG → Disconnect mode door motor harness connector.

**B** Note  
**CHECK BODY GROUND CIRCUIT FOR MODE DOOR MOTOR.**  
Does continuity exist between mode door motor harness terminal No. ⑥ and body ground?

Yes

**C** Note

Check circuit continuity between each terminal on push control unit and on mode door motor.

Terminal No.	Continuity	
	⊕	⊖
Push control unit	Mode door motor	Yes
①	①	
②	②	
③	③	
④	④	
⑤	⑤	
⑥	⑥	
⑦	⑦	

If OK, check harness for short.

OK

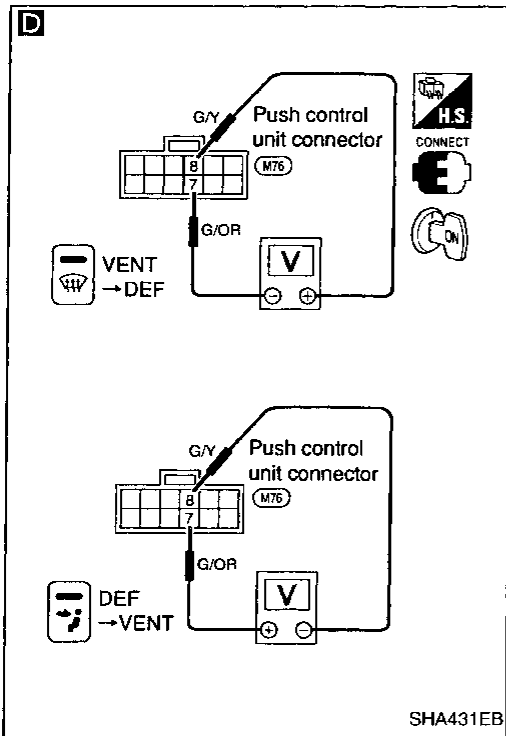
A

(Go to next page.)

**Note:**  
If the result is NG or No after checking circuit continuity, repair harness or connector.

# TROUBLE DIAGNOSES

## Diagnostic Procedure 2 (Cont'd)



SHA431EB

Reconnect push control unit and mode door motor harness connectors.

**D** CHECK FOR OUTPUT OF PUSH CONTROL UNIT.  
Change the mode from VENT to DEF, and from DEF to VENT. Do approx. 12 volts exist between push control unit harness terminals ⑦ and ⑧ in both cases?

Terminal No.		Mode switch operation	Voltage
⑦	⑧		
Each side		Stop	0V
⊖	⊕	VENT → DEF	Approx. 12V
⊕	⊖	DEF → VENT	

Replace mode door motor.

Replace push control unit.

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**HA**

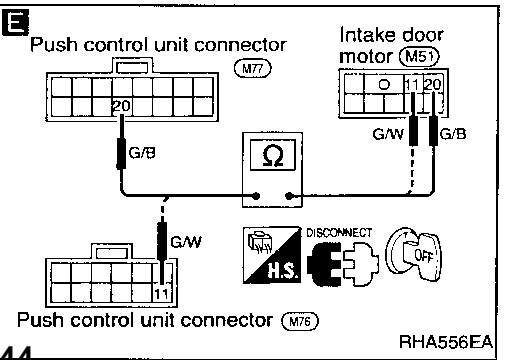
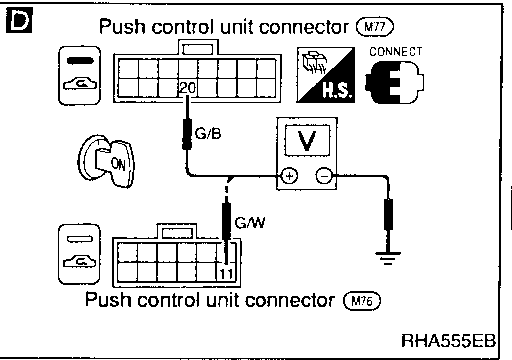
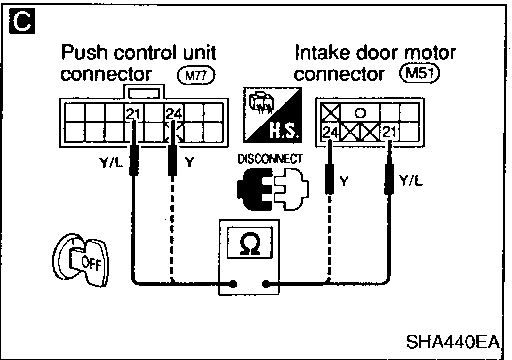
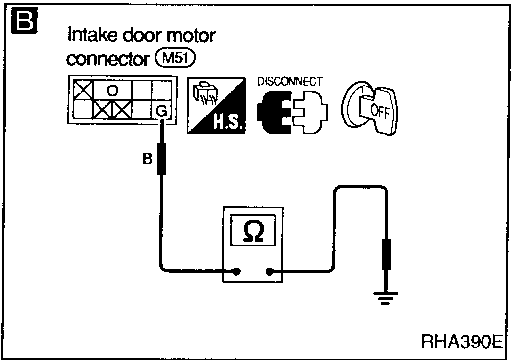
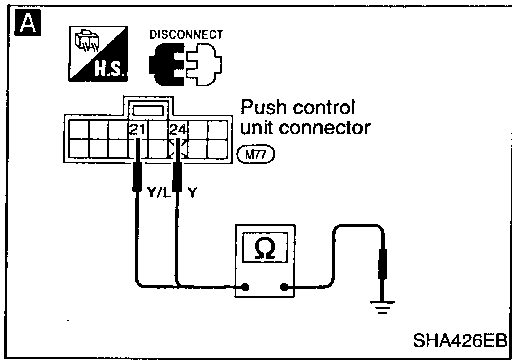
EL

IDX

## Diagnostic Procedure 3

**SYMPTOM:** Intake door does not change in VENT, B/L or FOOT mode.

- Perform **PRELIMINARY CHECK 1, Main Power Supply and Ground Circuit Check** before referring to flow chart below.



**A** CHECK INTAKE DOOR MOTOR POSITION SWITCH.

1. Turn REC switch ON with ignition switch at ON position.
2. Turn ignition switch OFF.
3. Check for continuity between terminal ② of push control unit harness connector and body ground.
4. Using above procedures, check for REC switch OFF position as indicated in chart.

REC switch	Terminal No.		Continuity
	⊕	⊖	
ON	②	Body ground	Yes
OFF	②	Body ground	Yes

OK → CHECK INTAKE DOOR LINK. Refer to HA-61.

**E** Note: Check for continuity between push control unit harness connector terminal ② (⑪) and intake door motor harness terminal ② (⑪). **Continuity should exist.** If OK, check harness for short.

OK → Replace intake door motor.

NG → Disconnect intake door motor harness connector.

**B** Note: CHECK BODY GROUND CIRCUIT FOR INTAKE DOOR MOTOR. Does continuity exist between intake door motor harness terminal No. ③ and body ground?

Yes →

**C** Note: Check continuity between push control unit harness terminal ② (②) and intake door motor harness terminal ② (②). **Continuity should exist.** If OK, check harness for short.

OK →

Reconnect push control unit and intake door motor harness connector.

**D** Note: CHECK FOR OUTPUT OF PUSH CONTROL UNIT. Turn REC switch ON or OFF. Do approx. 12 volts exist between push control unit harness connector terminals ② or ⑪ and body ground?

REC Switch	Terminal No.		Voltage
	⊕	⊖	
ON	②	Body ground	Approx. 12V
OFF	⑪	Body ground	Approx. 12V

No →

Replace push control unit.

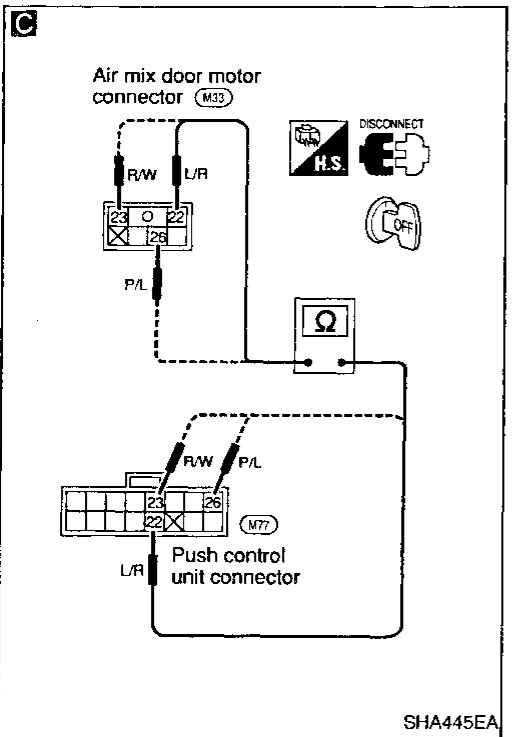
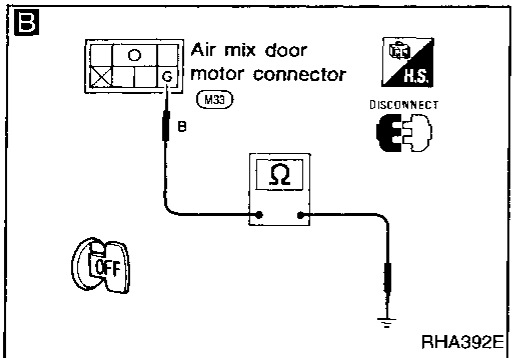
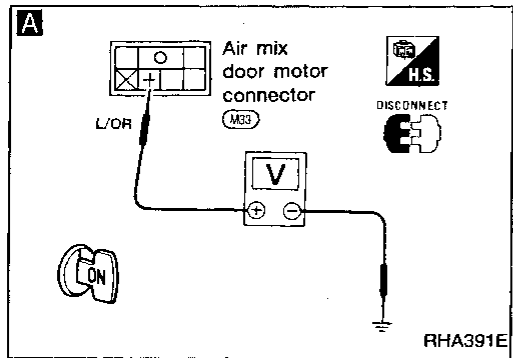
**Note:** If the result is NG or No after checking circuit continuity, repair harness or connector.

# TROUBLE DIAGNOSES

## Diagnostic Procedure 4

**SYMPTOM:** Air mix door does not change.

**Perform Main Power Supply and Ground Circuit Check before referring to the following chart.**



**A**  
**CHECK POWER SUPPLY FOR AIR MIX DOOR MOTOR.**  
 Disconnect air mix door motor harness connector.  
 Do approx. 12V exist between air mix door motor harness terminal No. ⊕ and body ground?

No → Check power supply circuit and 7.5A fuse (No. 21, located in the fuse block). Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").

Yes  
**B**  
**Note**  
 Check circuit continuity between air mix door motor harness terminal No. ⊕ and body ground.

OK  
 Disconnect push control unit harness connector.

**C**  
**Note**  
 Check circuit continuity between each terminal on push control unit and air mix door motor.  
**Continuity should exist.**  
 If OK, check harness for short.

OK  
 Reconnect push control unit and air mix door motor harness connector.

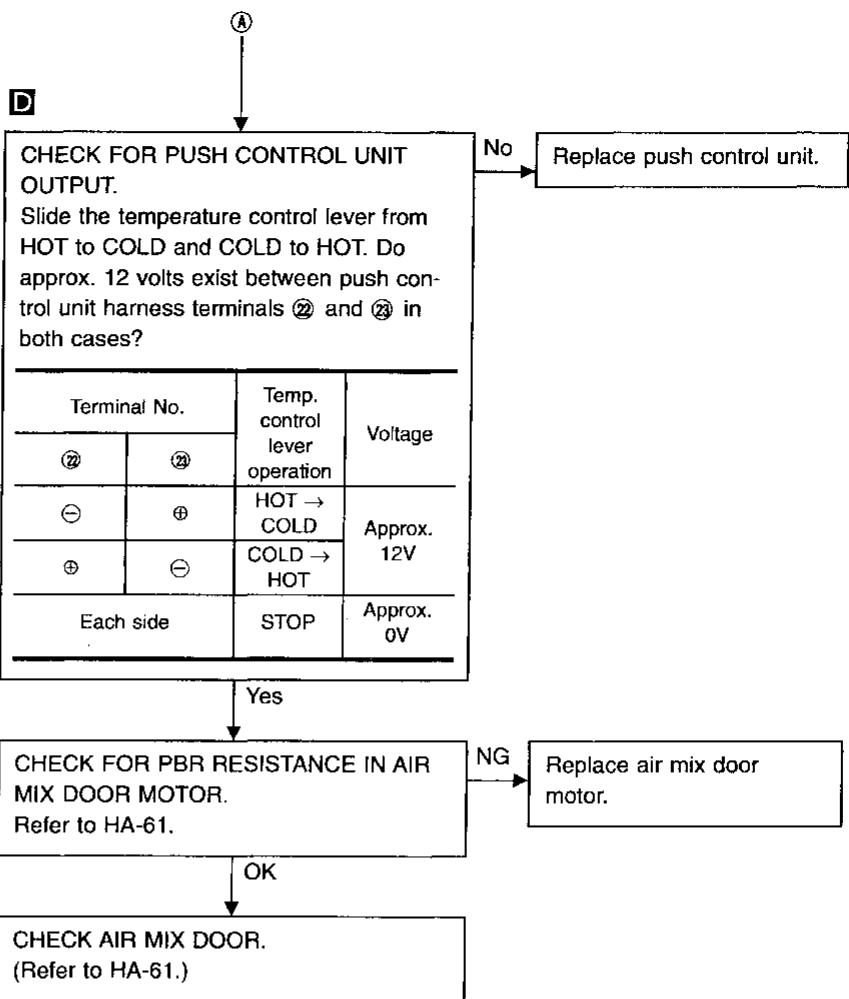
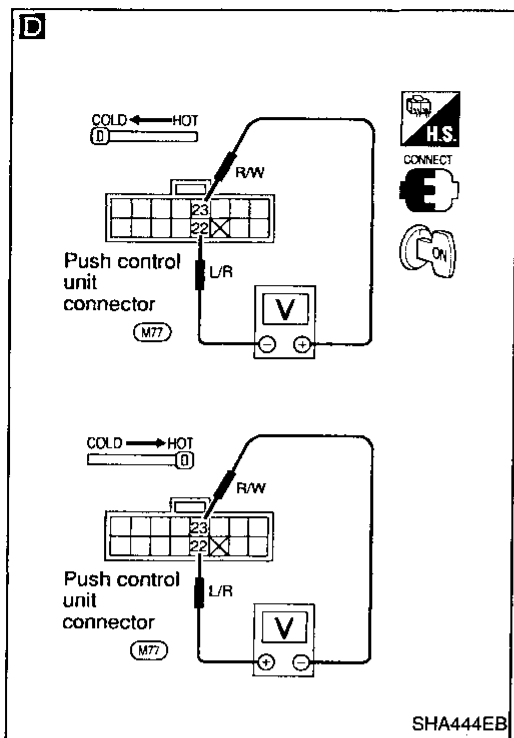
Ⓐ  
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**Note:**  
 If the result is NG after checking circuit continuity, repair harness or connector.

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# TROUBLE DIAGNOSES

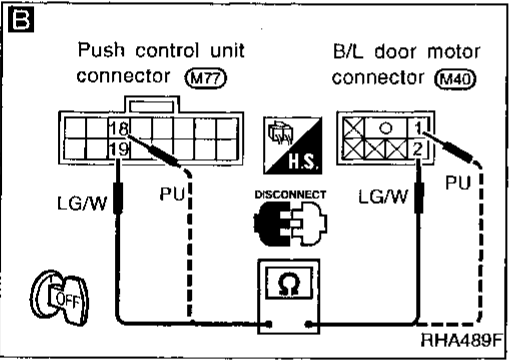
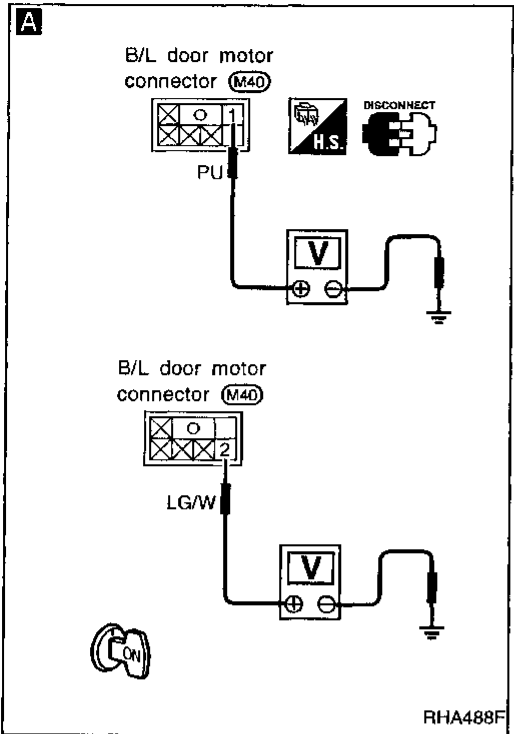
## Diagnostic Procedure 4 (Cont'd)



## Diagnostic Procedure 5

**SYMPTOM: Bi-level (B/L) door does not operate.**

- Perform Main Power Supply and Ground Circuit Check before referring to the following chart.



**A**

CHECK POWER SUPPLY FOR B/L DOOR MOTOR.  
Disconnect B/L door motor harness connector.  
Do approx. 12 volts exist between B/L door motor harness terminal No. ① and body ground when B/L SWITCH is pressed ON?  
Do approx. 12 volts exist between B/L door motor harness terminal No. ② and body ground when B/L SWITCH is pressed OFF?

No → Disconnect push control unit connector.

**B** Note

Check circuit continuity between B/L door motor harness terminal No. ① (②) and push control unit harness terminal No. ⑱ (⑲).  
**Continuity should exist.**  
If OK, check harness for short.

Yes → Replace B/L door motor.

OK → Replace push control unit.

**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

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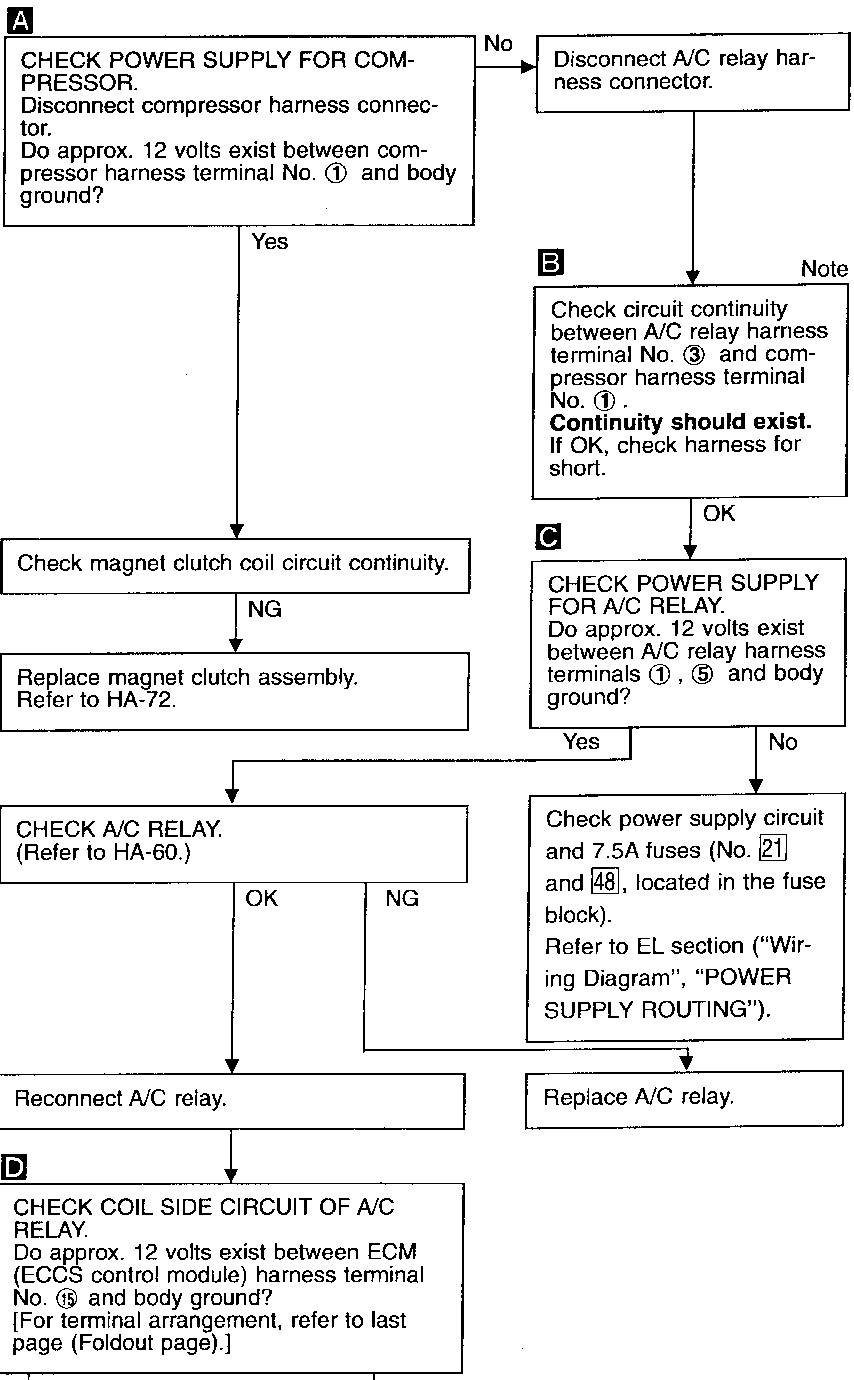
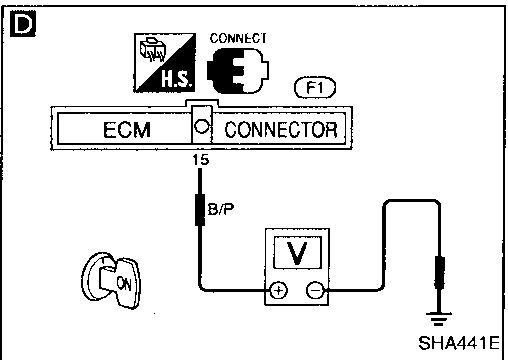
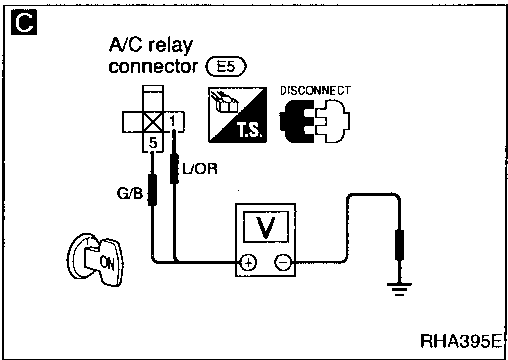
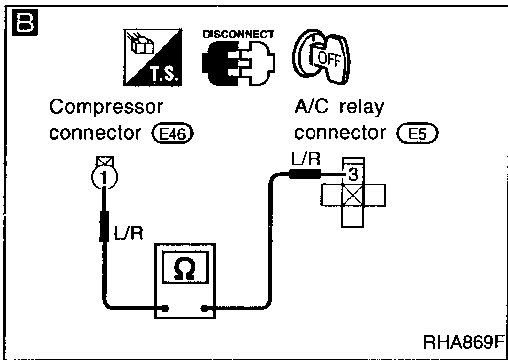
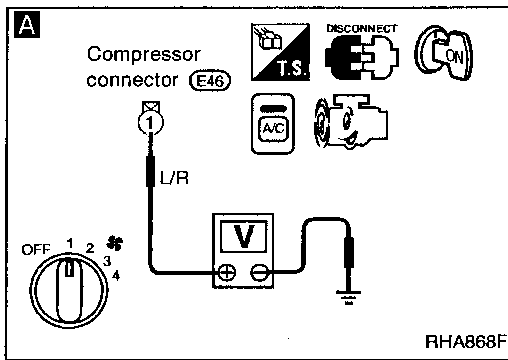


# TROUBLE DIAGNOSES

## Diagnostic Procedure 6

**SYMPTOM:** Magnet clutch does not engage when A/C switch and fan switch are ON.

- Perform **PRELIMINARY CHECK 2** before referring to the following chart.



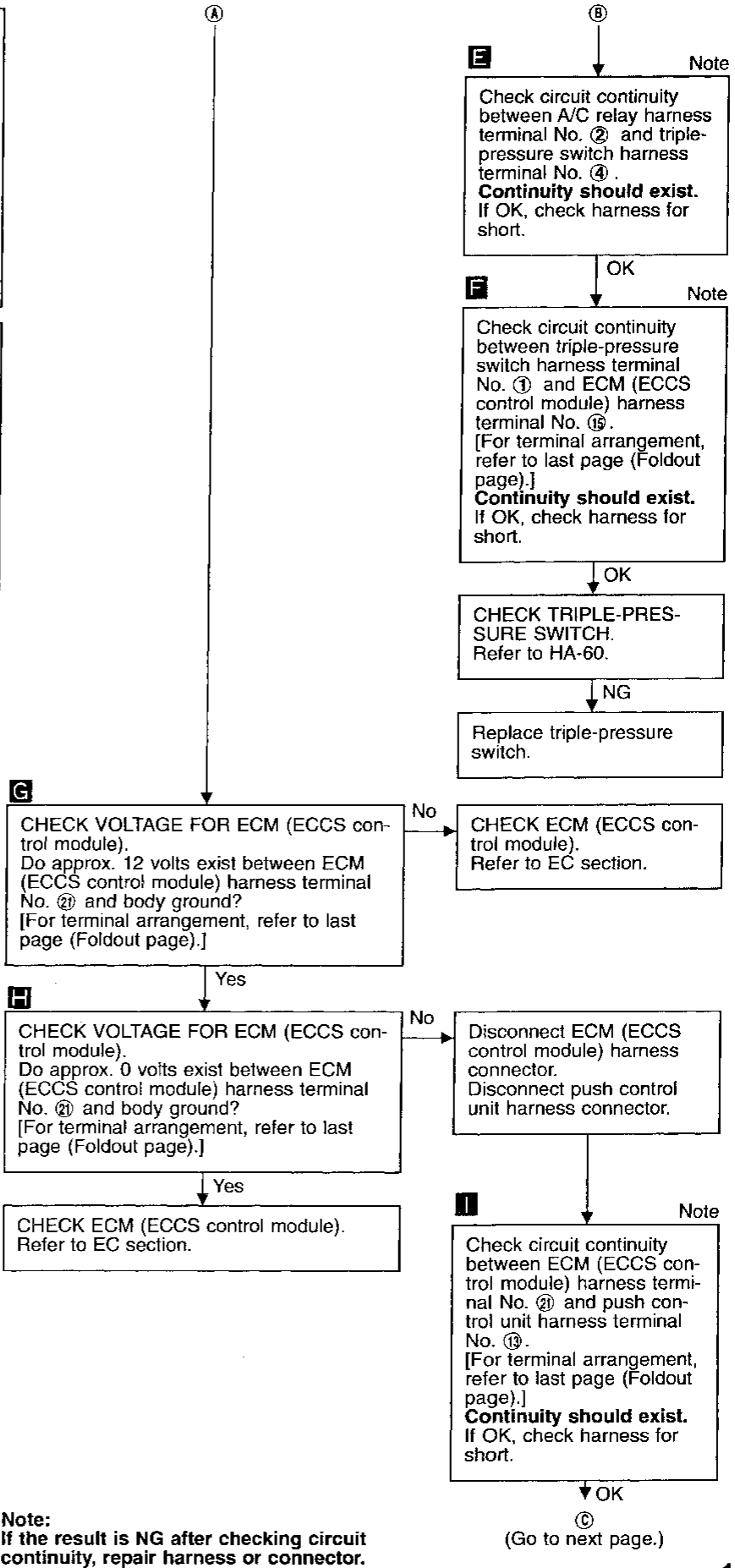
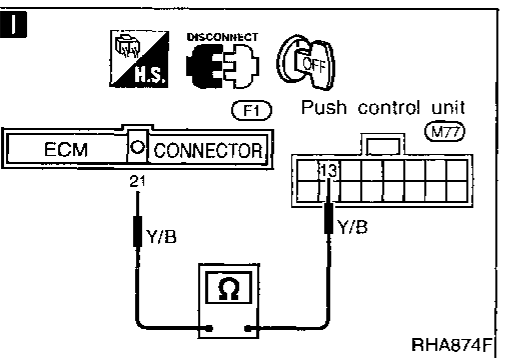
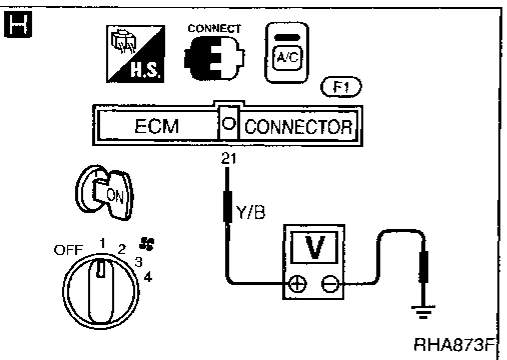
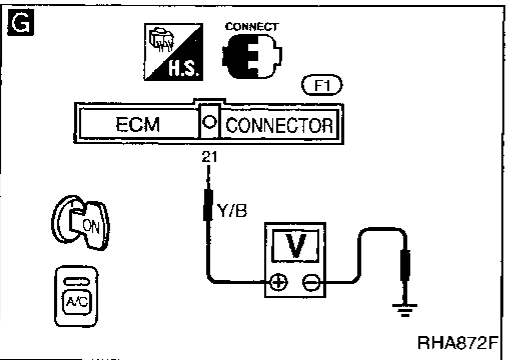
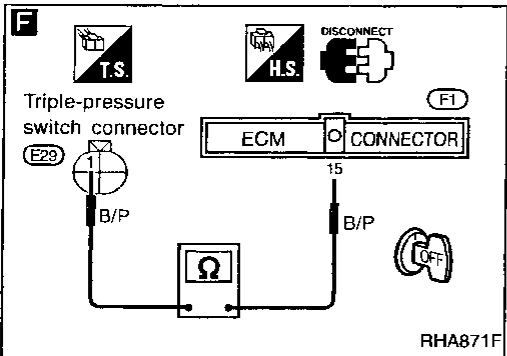
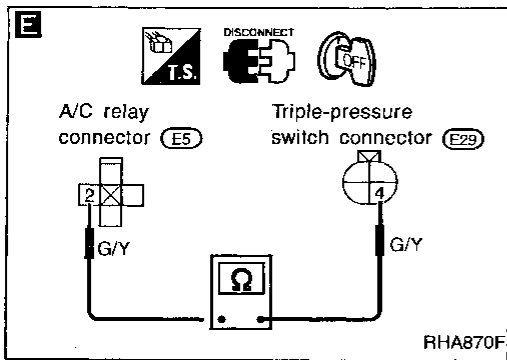
▼ Yes (A) (Go to next page.) ▼ No (B)

**Note:** If the result is NG after checking circuit continuity, repair harness or connector.



# TROUBLE DIAGNOSES

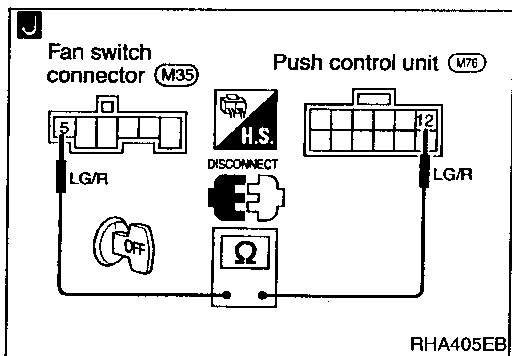
## Diagnostic Procedure 6 (Cont'd)



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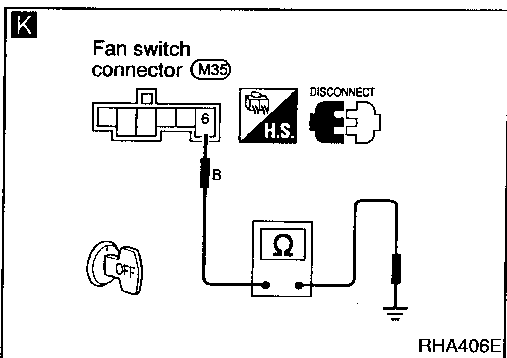
# TROUBLE DIAGNOSES

## Diagnostic Procedure 6 (Cont'd)



③  
↓  
Disconnect fan switch harness connector.

OK  
↓  
**J** Note  
Check circuit continuity between push control unit terminal No. ⑫ and fan switch harness terminal No. ⑤.  
**Continuity should exist.**  
If OK, check harness for short.



OK  
↓  
**K** Note  
CHECK BODY GROUND CIRCUIT FOR FAN SWITCH.  
Check for continuity between fan switch harness terminal ⑥ and body ground.

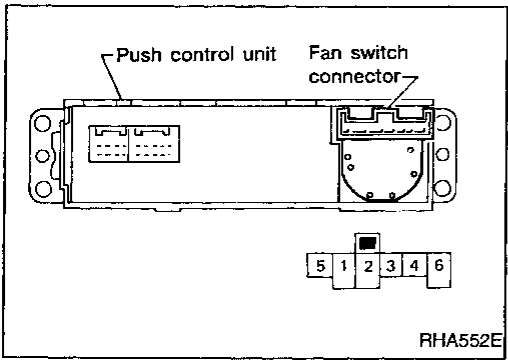
OK  
↓  
CHECK FAN SWITCH.  
(Refer to HA-59.)

NG → Replace fan switch.

OK  
↓  
Replace push control unit.

**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

# TROUBLE DIAGNOSES



## Electrical Components Inspection

### FAN SWITCH

Check continuity between terminals at each position.

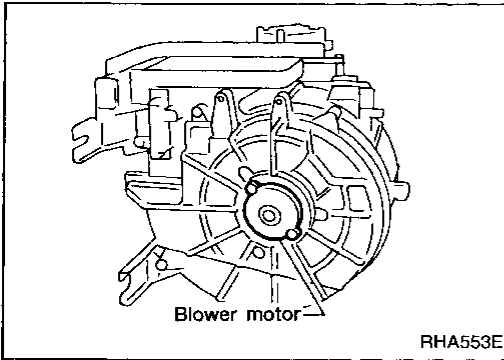
POSITION	TERMINAL	
OFF		GI
1	④ - ⑤ - ⑥	MA
2	③ - ⑤ - ⑥	
3	② - ⑤ - ⑥	EM
4	① - ⑤ - ⑥	

LC

EC

FE

CL



### BLOWER MOTOR

Check blower motor for smooth rotation.

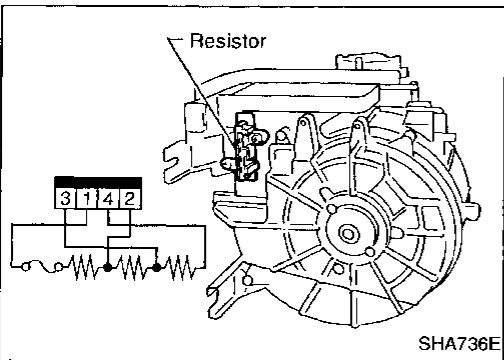
- Ensure that there are no foreign particles inside the intake unit.

MT

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### BLOWER RESISTOR

Check continuity between terminals.

RA

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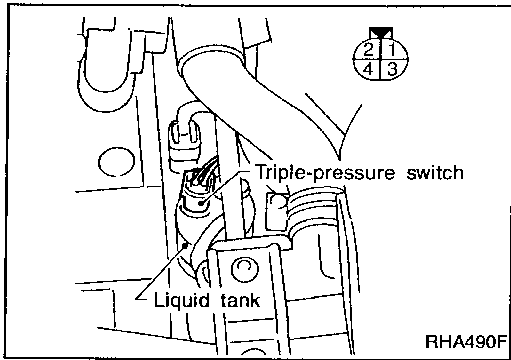
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# TROUBLE DIAGNOSES

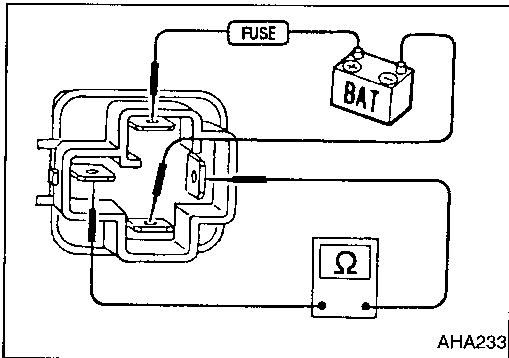
## Electrical Components Inspection (Cont'd)

### TRIPLE-PRESSURE SWITCH



	Terminals	High-pressure side line pressure kPa (kg/cm <sup>2</sup> , psi)	Operation	Continuity
Low-pressure side	① - ④	Increasing to 157 - 226 (1.6 - 2.3, 23 - 33)	ON	Exist
		Decreasing to 152.0 - 201.0 (1.55 - 2.05, 22.0 - 29.2)	OFF	Does not exist
Medium-pressure side*	② - ③	Increasing to 1,422 - 1,618 (14.5 - 16.5, 206 - 235)	ON	Exist
		Decreasing to 1,128 - 1,422 (11.5 - 14.5, 164 - 206)	OFF	Does not exist
High-pressure side	① - ④	Decreasing to 1,667 - 2,059 (17 - 21, 242 - 299)	ON	Exist
		Increasing to 2,648 - 2,844 (27 - 29, 384 - 412)	OFF	Does not exist

\* For cooling fan motor operation.



### A/C RELAY

Check circuit continuity between terminals by supplying 12 volts to coil side terminals of the relay.

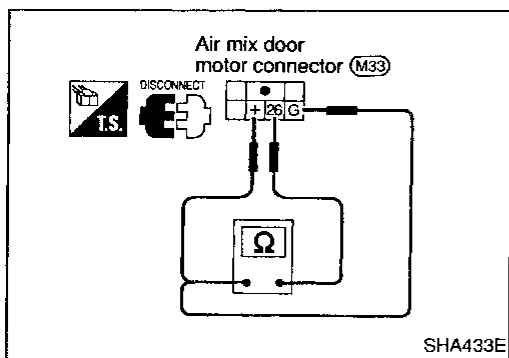
# TROUBLE DIAGNOSES

## Electrical Components Inspection (Cont'd)

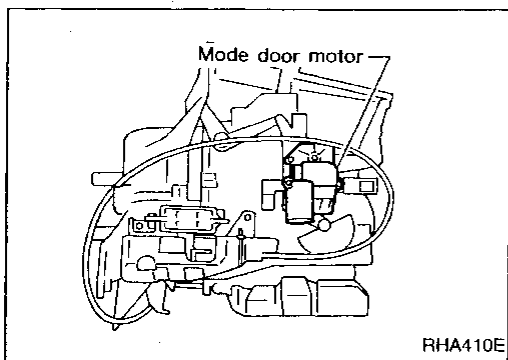
### AIR MIX DOOR MOTOR

Check for PBR resistance.

1. Turn ignition switch ON and temperature control lever to FULL HOT position.
2. Turn ignition switch OFF.
3. Disconnect air mix door motor connector.
4. Check for resistance between air mix door motor harness terminal ⊕ and ⊖.
5. Using above procedures, check for each terminal as indicated in chart below.



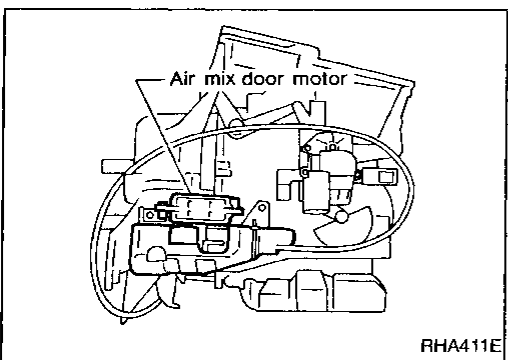
Terminal No.		Temp. control lever position	Resistance
⊕	⊖	FULL HOT	Approx. 0Ω
⊕	⊖	FULL COLD	Approx. 3 kΩ
ⓐ	ⓑ	FULL HOT	Approx. 3 kΩ
ⓐ	ⓑ	FULL COLD	Approx. 0Ω



### Control Linkage Adjustment

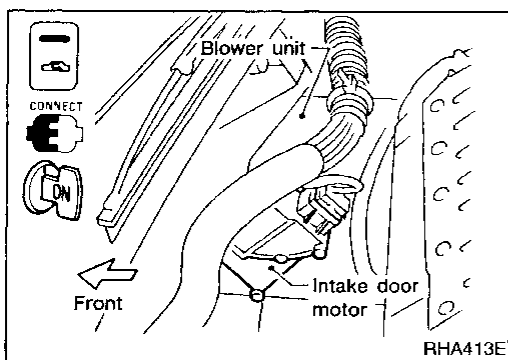
#### MODE DOOR

1. Move side link by hand and hold mode door in DEF mode.
2. Install mode door motor on heater unit and connect it to main harness.
3. Turn ignition switch to ON.
4. Turn VENT switch ON.
5. Attach mode door motor rod to side link rod holder.
6. Turn DEF switch ON. Check that side link operates at the fully-open position. Also turn DEF switch ON to check that side link operates at the fully-open position.



#### AIR MIX DOOR

1. Move air mix link by hand and hold air mix door in full cold position.
2. Install air mix door motor on heater unit and connect sub-harness.
3. Turn ignition switch to ON.
4. Slide temperature control lever to full cold.
5. Attach air mix door motor rod to air mix door link rod holder.
6. Check that air mix door operates properly when temperature control lever is slid to full hot and full cold.




#### INTAKE DOOR

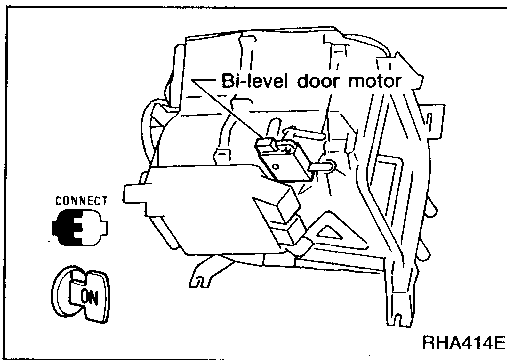
1. Connect intake door motor harness connector before installing intake door motor.
2. Turn ignition switch to ON.
3. Turn REC switch ON.
4. Install intake door motor on intake unit.
5. Install intake door lever.
6. Set intake door rod in REC position and fasten door rod to holder on intake door lever.
7. Check that intake door operates properly when REC switch is turned ON and OFF.

## TROUBLE DIAGNOSES

### Control Linkage Adjustment (Cont'd)

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

1. Connect B/L door motor harness connector before installing B/L door motor.
2. Turn ignition switch to ON.
3. Install B/L door motor on heater unit.
4. Attach B/L door rod to B/L door link rod holder.
5. Check that B/L door operates properly when bi-level switch  is turned ON and OFF with the temperature control lever in the middle position.



# SERVICE PROCEDURES

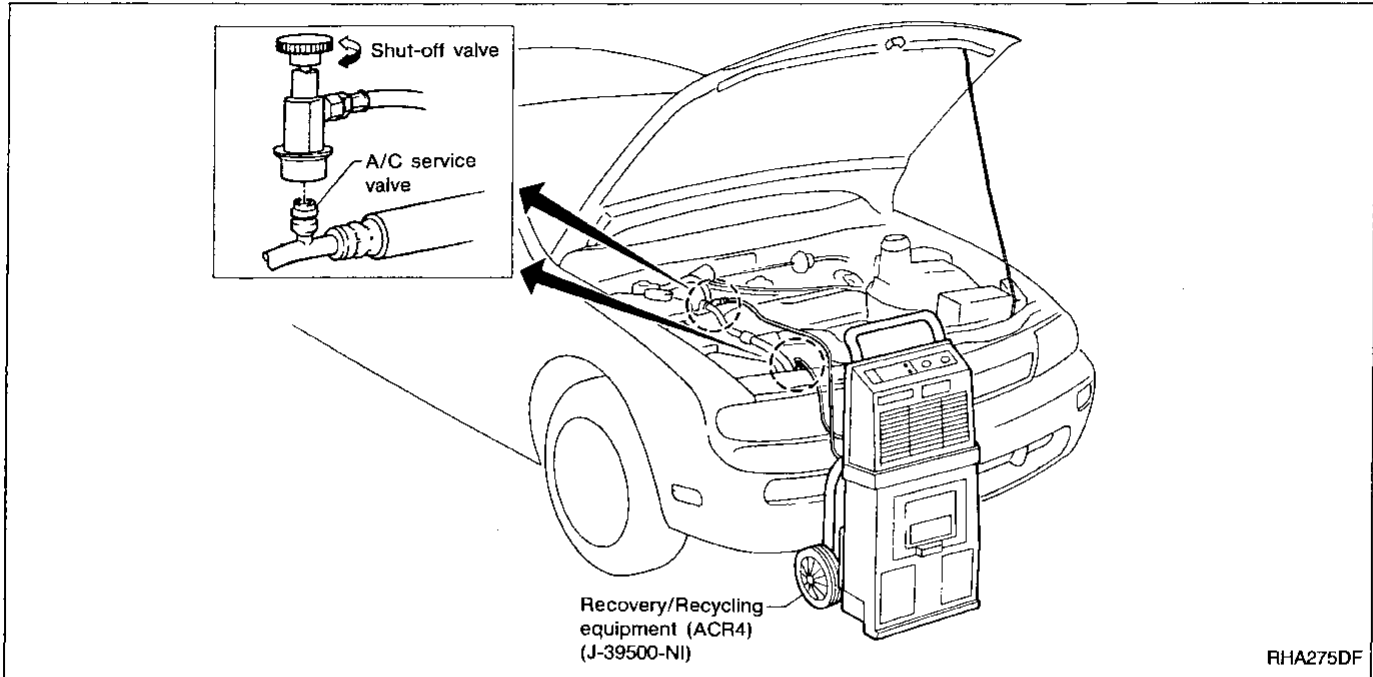
## HFC-134a (R-134a) Service Procedure

### SETTING OF SERVICE TOOLS AND EQUIPMENT

#### DISCHARGING REFRIGERANT

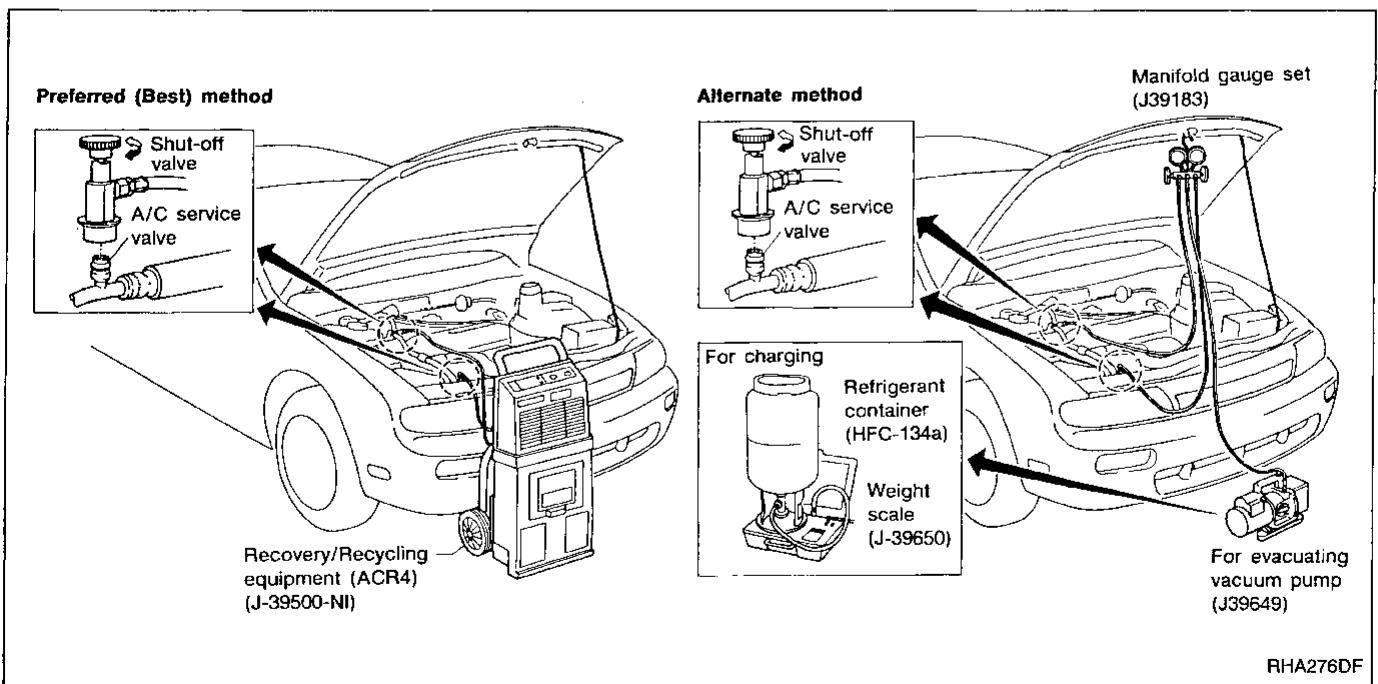
##### WARNING:

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove R-134a from A/C system, using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



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#### EVACUATING SYSTEM AND CHARGING REFRIGERANT

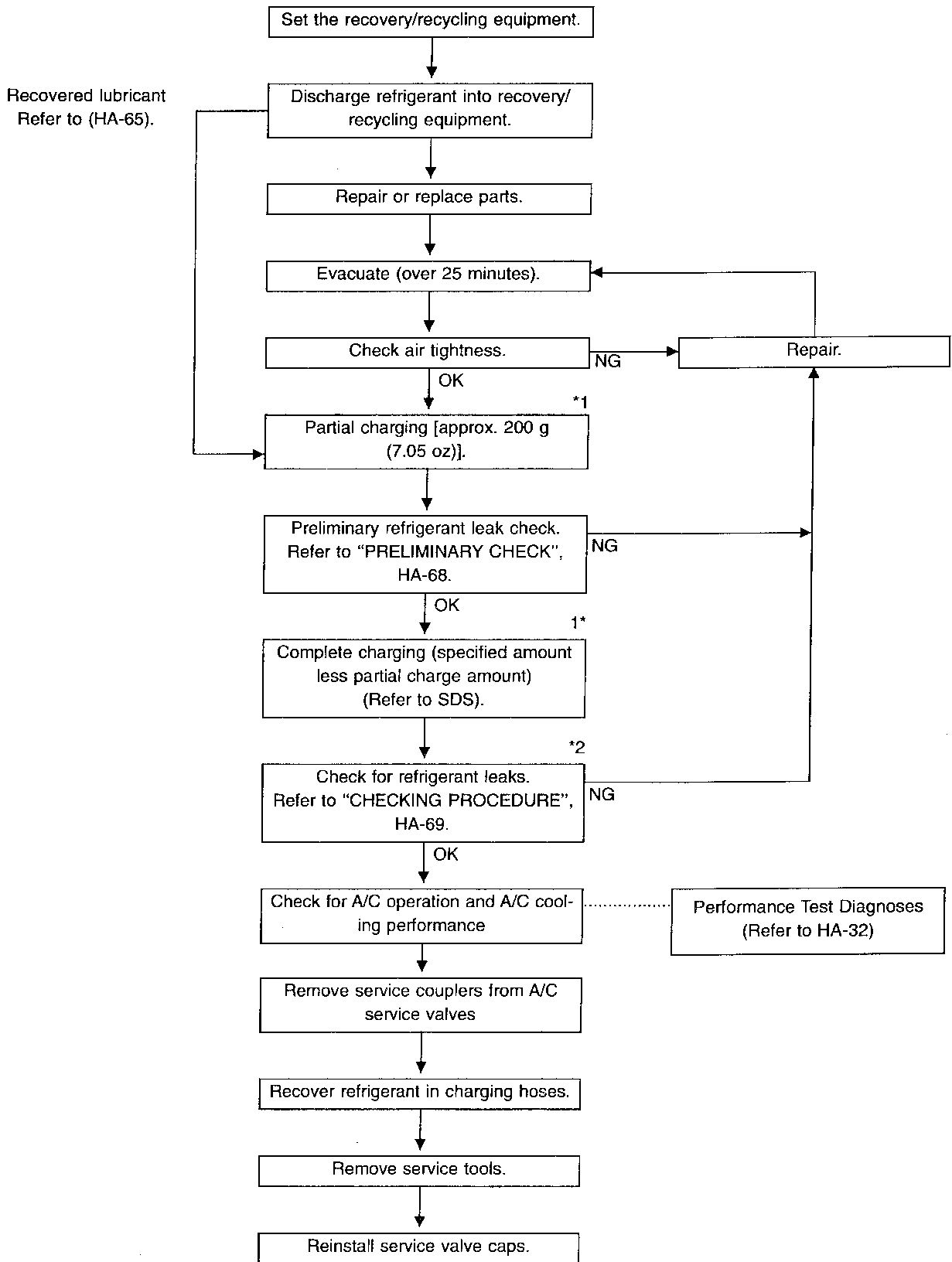


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# SERVICE PROCEDURES

## HFC-134a (R-134a) Service Procedure (Cont'd)



Note: \*1 Before charging refrigerant, ensure engine is off.

\*2 Before checking for leaks, start engine to activate air conditioning system then turn engine off.  
Service valve caps must be installed to prevent leakage.



## Maintenance of Lubricant Quantity in Compressor

The lubricant used in the compressor circulates through the system with the refrigerant. Add lubricant to the compressor to maintain the specified amount when: replacing any component of the system, or a large amount of gas leakage occurs.

If lubricant quantity is not maintained properly, the following malfunctions may result:

- Lack of lubricant: May lead to a seized compressor
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

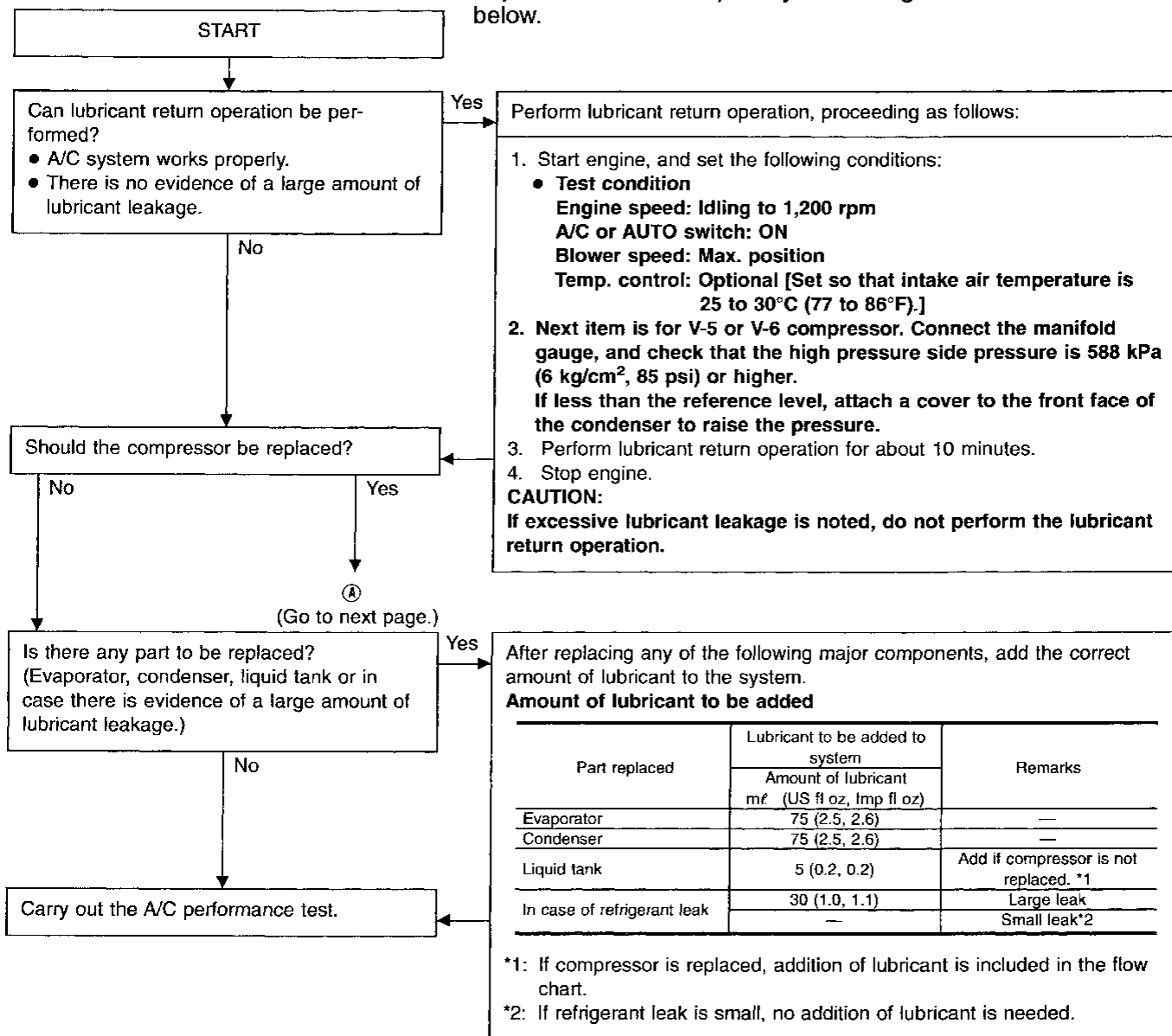
### LUBRICANT

**Name: Nissan A/C System Oil Type S**

**Part number: KLH00-PAGS0**

### CHECKING AND ADJUSTING

Adjust the lubricant quantity according to the flowchart shown below.



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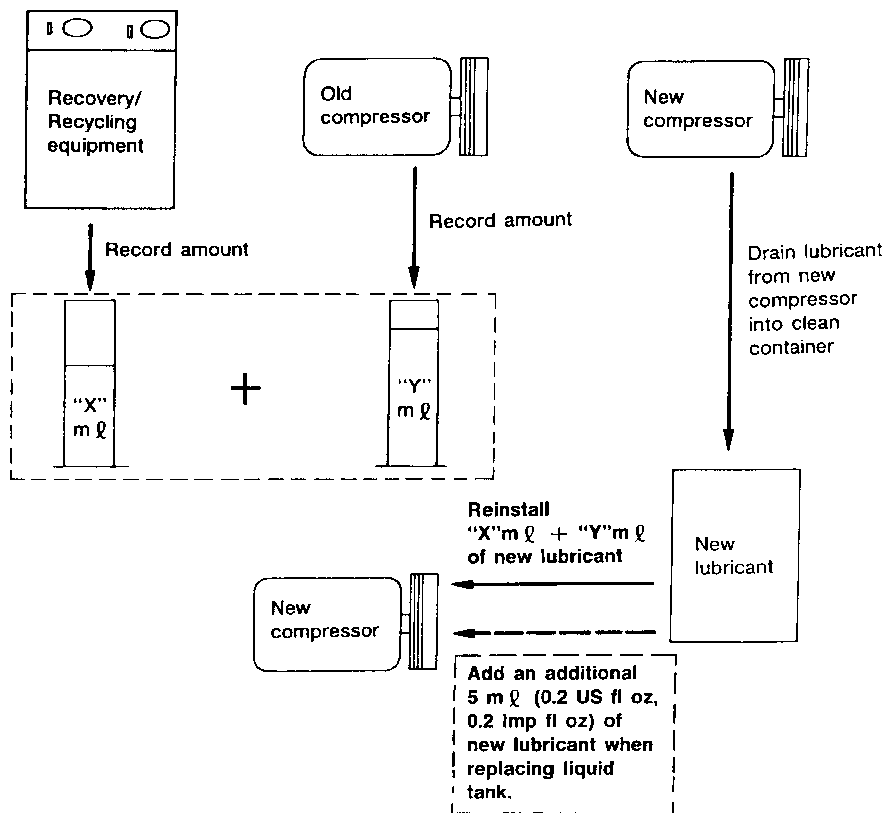
# SERVICE PROCEDURES

## Maintenance of Lubricant Quantity in Compressor (Cont'd)



1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/ recycling equipment.
2. Remove the drain plug of the "old" (removed) compressor (applicable only to V-5, V-6 or DKS-16H compressor). Drain the lubricant into a graduated container and record the amount of drained lubricant.
3. Remove the drain plug and drain the lubricant from the "new" compressor into a separate, clean container.
4. Put the same amount (refer to 2. above) of new lubricant into the new compressor. Put it through the drain plug or suction port opening.
5. Also add the old lubricant amount [discharged from A/C system (refer to 1. above)] of the new lubricant to the new compressor.
6. Torque the drain plug.  
**V-5 or V-6 compressor: 18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)**  
**DKS-16H compressor: 14 - 16 N·m (1.4 - 1.6 kg·m, 10 - 12 ft·lb)**
7. If the liquid tank also needs to be replaced, add an additional 5 mℓ (0.2 US fl oz, 0.2 imp fl oz) of lubricant at this time.  
**Do not add this 5 mℓ (0.2 US fl oz, 0.2 imp fl oz) of lubricant if only replacing the compressor.**

### Lubricant adjusting procedure for compressor replacement



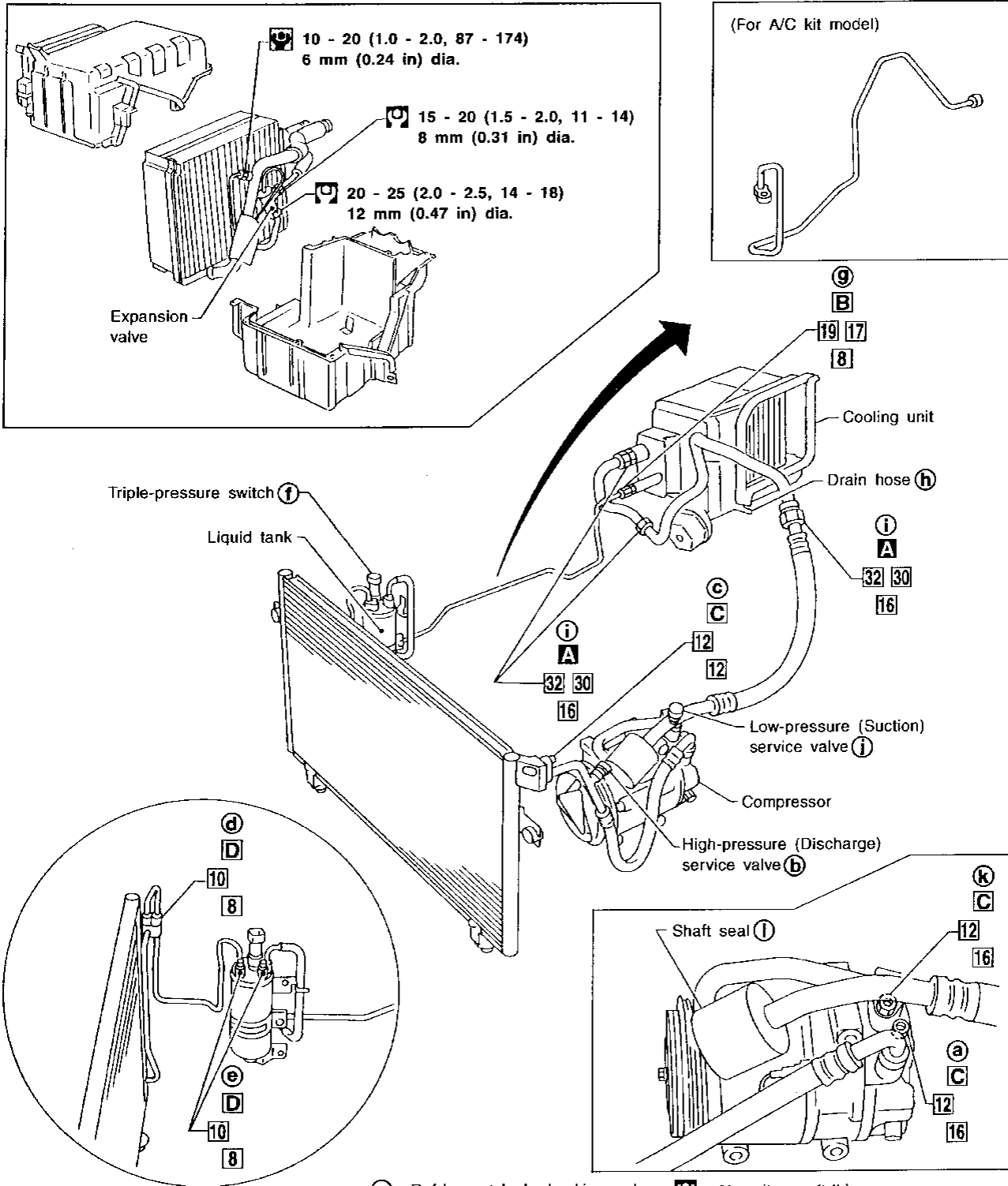
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# SERVICE PROCEDURES

## Refrigerant Lines

- Refer to "Precautions for Refrigerant Connection", HA-3.

SEC. 271•272•276



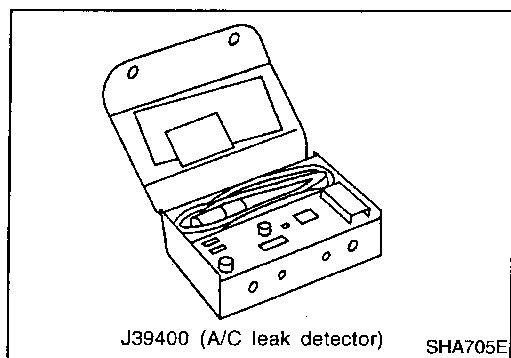
- : Refrigerant leak checking order
- : (Tightening torque)
- : (Wrench size)
- : (O-ring size)
- Ⓟ : N·m (kg-m, ft-lb)
- Ⓐ : 25 - 34 (2.5 - 3.5, 18 - 25)
- Ⓢ : N·m (kg-m, in-lb)
- Ⓑ : 10 - 20 (1.0 - 2.0, 87 - 174)
- Ⓒ : 8 - 11 (0.8 - 1.1, 69 - 95)
- Ⓓ : 2.9 - 3.9 (0.3 - 0.4, 26 - 35)

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## Checking Refrigerant Leaks

### PRELIMINARY CHECK

Perform a visual inspection of all refrigeration parts, fittings, hoses, and components for signs of A/C lubricant leakage, damage and corrosion.

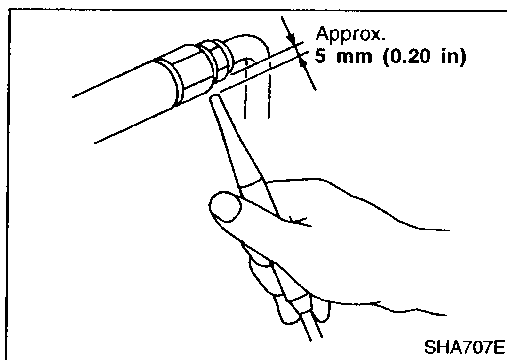


### PRECAUTIONS FOR HANDLING LEAK DETECTOR

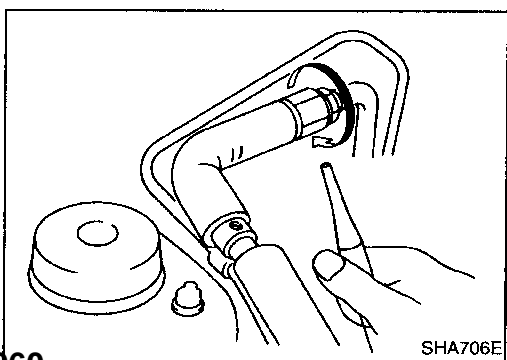
When performing a refrigerant leak check, use a J39400 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.

**Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and cleaners, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean. Do not allow the sensor tip of the detector to come into contact with any substance. This can also cause false readings and may damage the detector.**



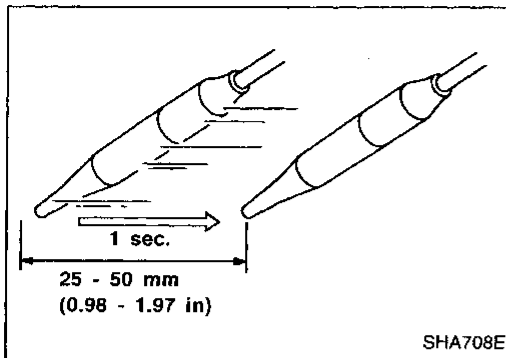
1. Position probe approximately 5 mm (0.20 in) away from point to be checked.



2. When testing, circle each fitting completely with probe.

## SERVICE PROCEDURES

### Checking Refrigerant Leaks (Cont'd)

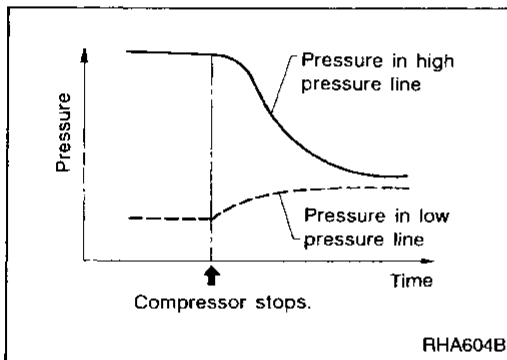


3. Move probe along component approximately 25 to 50 mm (0.98 to 1.97 in)/sec.

### CHECKING PROCEDURE

To prevent inaccurate or false readings, make sure there is no refrigerant vapor or tobacco smoke in the vicinity of the vehicle. Perform the leak test in calm area (low air/wind movement so that the leaking refrigerant is not dispersed).

1. Charge the system with the specified amount of refrigerant.
2. Run the engine with the A/C compressor ON for at least 2 minutes.
3. Stop engine.



Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector on the high pressure line. The pressure in the high pressure line will gradually drop after refrigerant circulation stops and pressure in the low pressure line will gradually rise, as shown in the graph. Leaks are more easily detected when pressure is high.

4. Conduct the leak test from the high side to the low side at points ① through ④. Refer to HA-67. Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detector probe completely around the connection/component.
  - **Compressor**  
Check the fitting of high and low pressure hoses, relief valve and shaft seal.
  - **Liquid tank**  
Check the pressure switch, tube fitting and the fusible plug mounts.
  - **Service valves**  
Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).
  - **Cooling unit**  
Turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Insert the leak detector probe into the drain hose immediately after stopping the engine. (Keep the probe inserted for at least ten seconds.)
5. If leak detector detects a leak, confirm the leak using soapy water.

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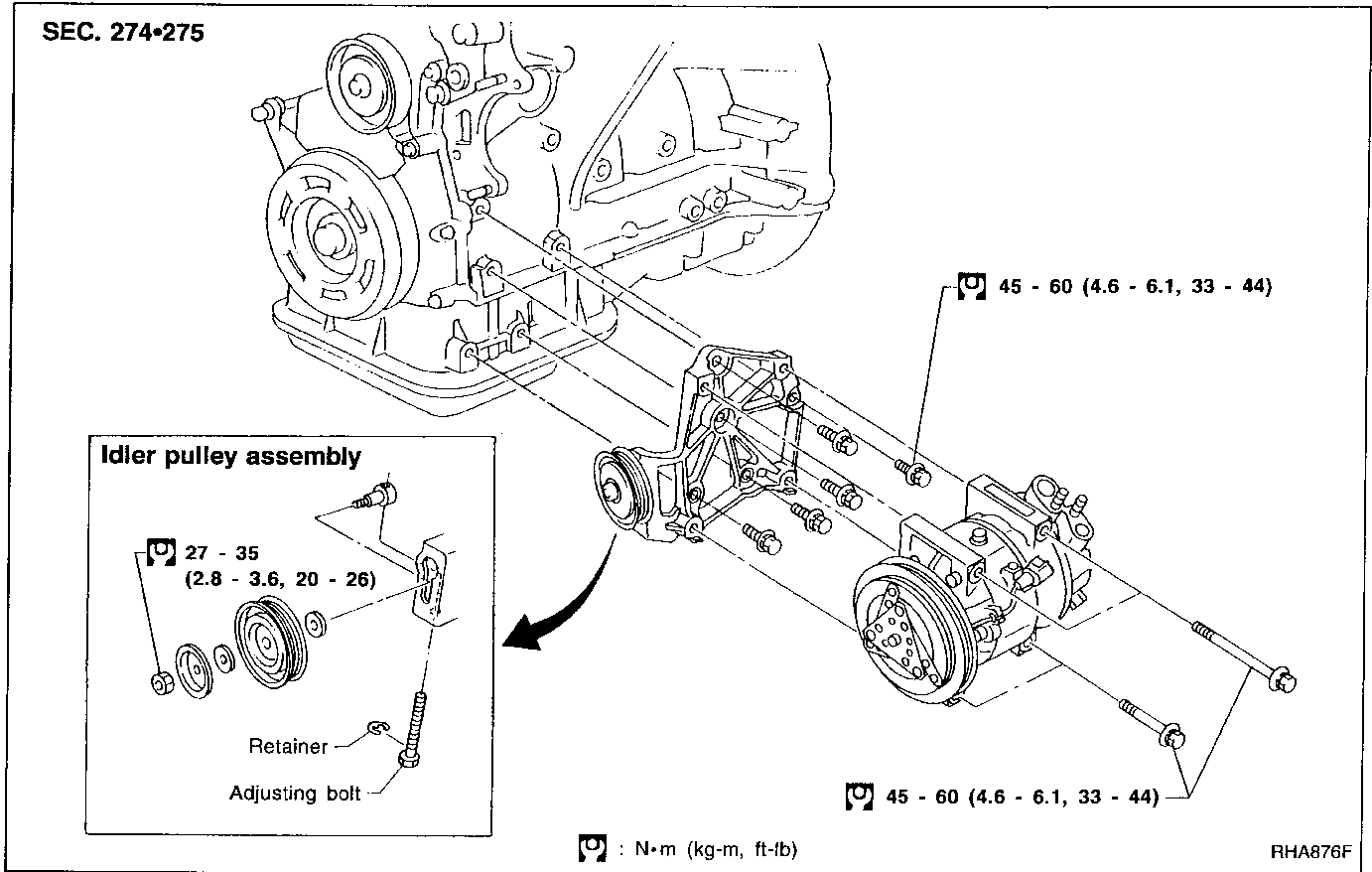
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## SERVICE PROCEDURES

### Checking Refrigerant Leaks (Cont'd)

6. Discharge A/C system and repair the leaking fitting or component as necessary.
7. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.

### Compressor Mounting



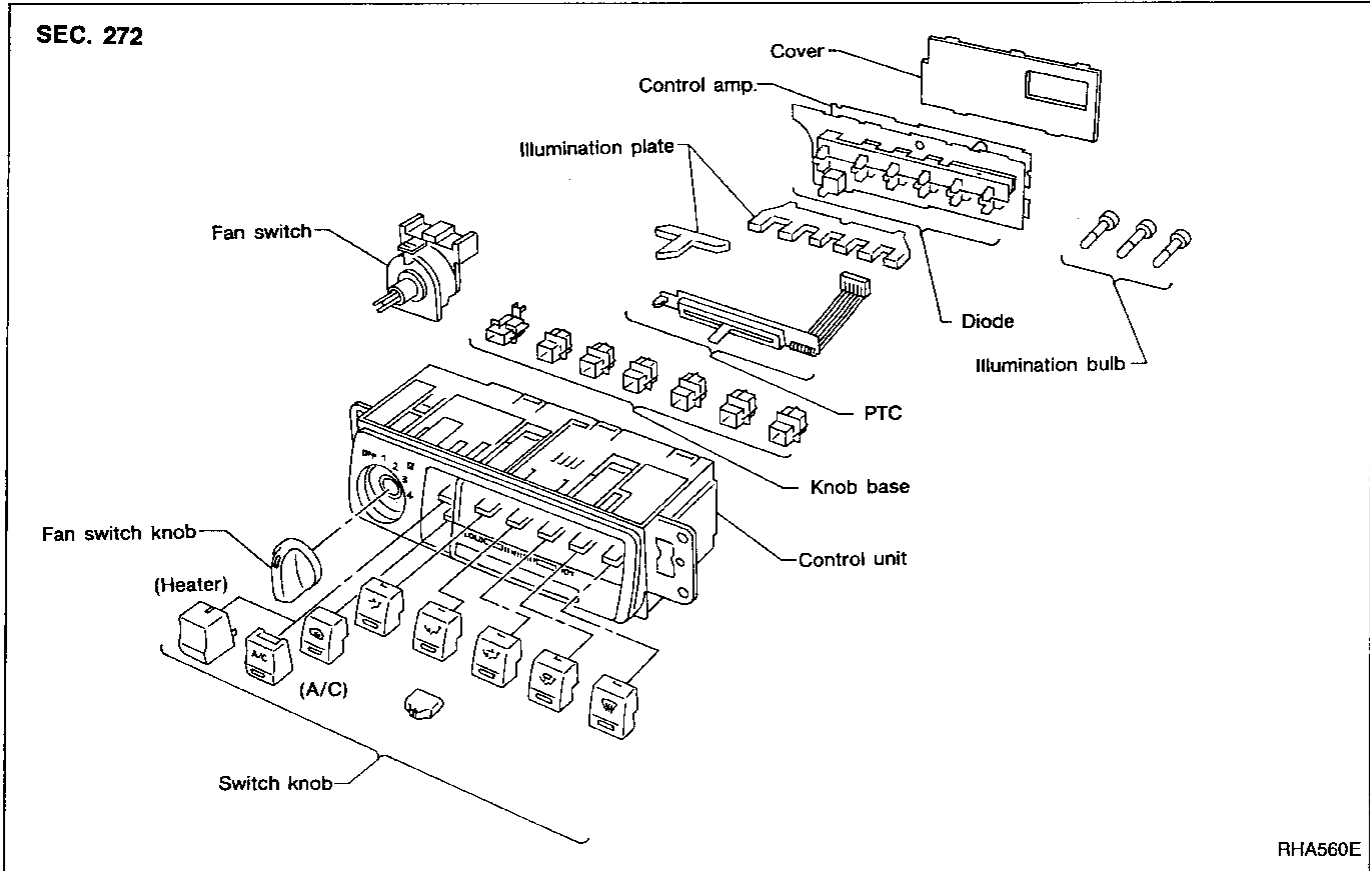
### Belt Tension

- Refer to MA section (“Checking Drive Belts”, “ENGINE MAINTENANCE”).

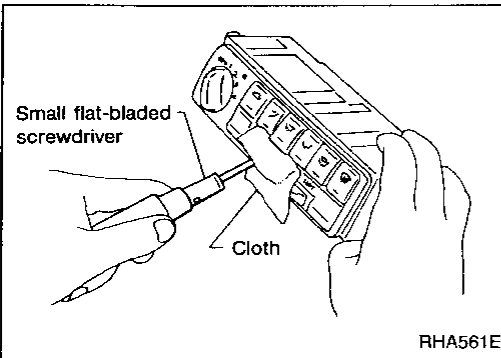
### Fast Idle Control Device (FICD)

- Refer to EC section (“IACV-FICD SOLENOID VALVE”, “TROUBLE DIAGNOSES FOR NON-DETECTIVE ITEMS”).

Push Control Unit

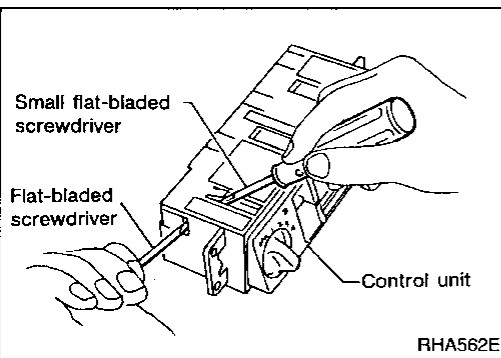


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**DISASSEMBLY**

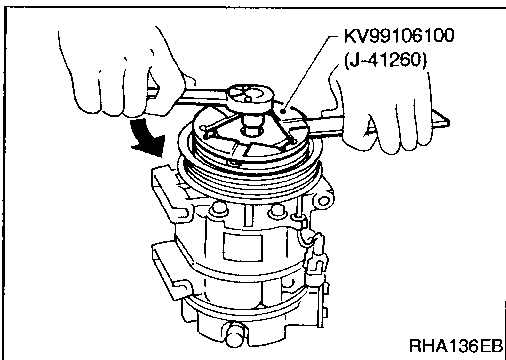
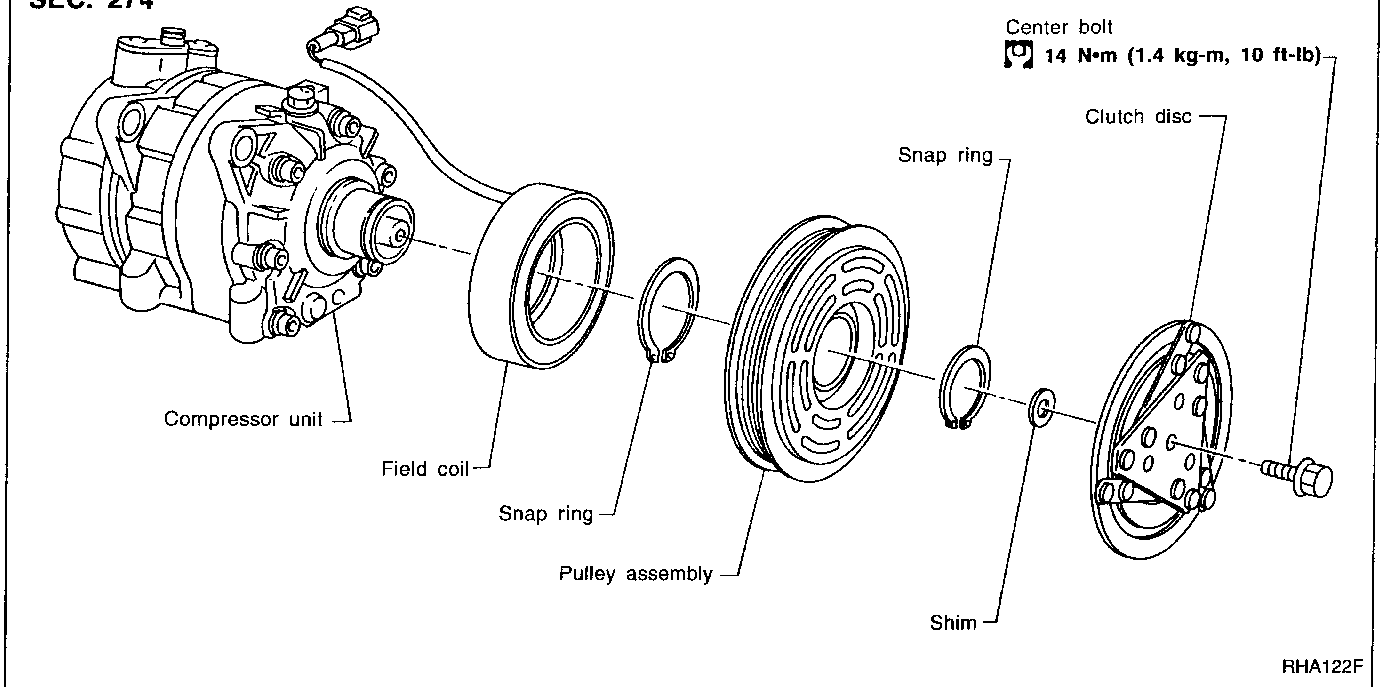
1. Remove switch knobs.  
**Be careful not to scratch knobs during removal.**



2. Remove fan switch knob.

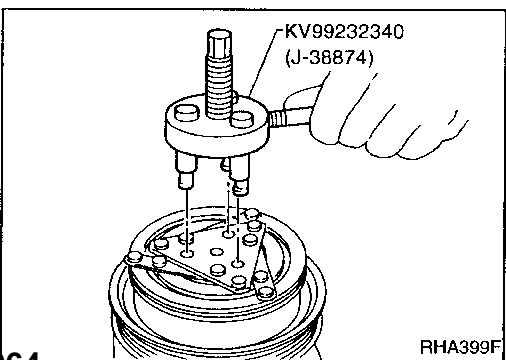
## Compressor

### SEC. 274



### Compressor Clutch REMOVAL

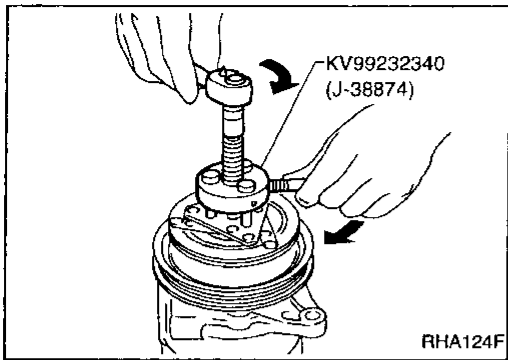
- When removing center bolt, hold clutch disc with clutch disc wrench.





# SERVICE PROCEDURES

## Compressor Clutch (Cont'd)

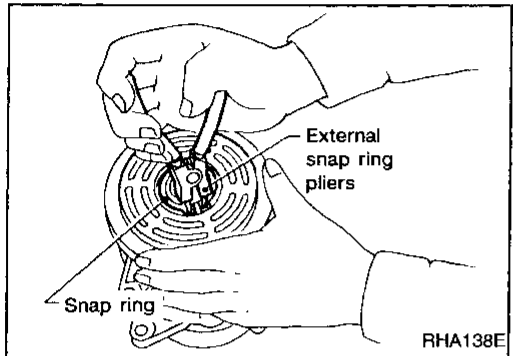


- Remove the clutch disc using the clutch disc puller. Insert the holder's three pins into the holes in the clutch disc. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the clutch disc. After removing the clutch disc, remove the shims from either the drive shaft or the clutch disc.

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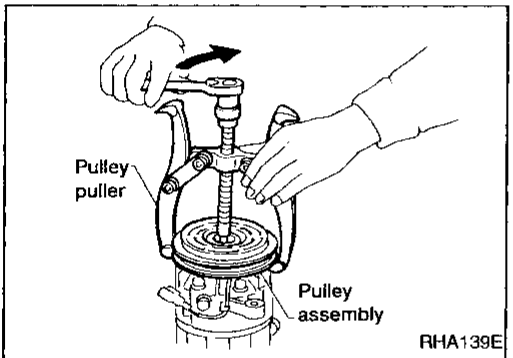
- Remove the snap ring using external snap ring pliers.

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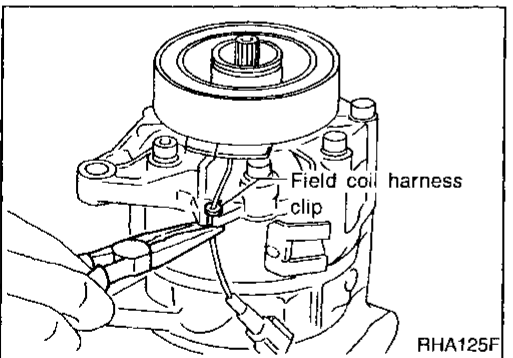
- Pulley removal  
Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller. **To prevent the pulley groove from being deformed, the puller claws should be positioned onto the edge of the pulley assembly.**

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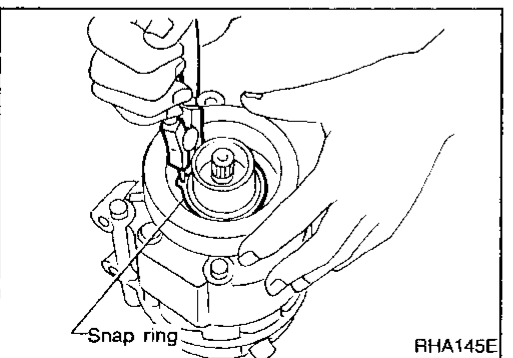
- Remove the field coil harness clip using a pair of pliers.

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- Remove the snap ring using external snap ring pliers.

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## SERVICE PROCEDURES

### Compressor Clutch (Cont'd)

#### INSPECTION

##### Clutch disc

If the contact surface shows signs of damage due to excessive heat, replace clutch disc and pulley.

##### Pulley

Check the appearance of the pulley assembly. If the contact surface of pulley shows signs of excessive grooving, replace clutch disc and pulley. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.

##### Coil

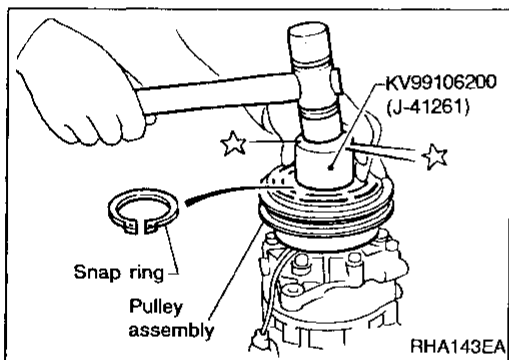
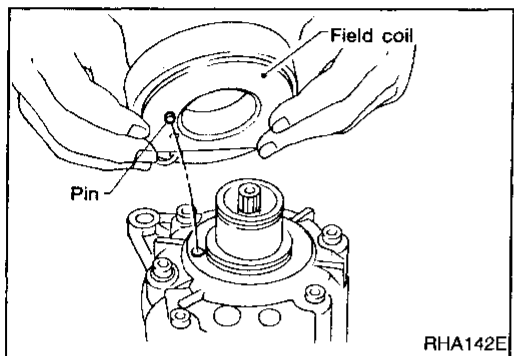
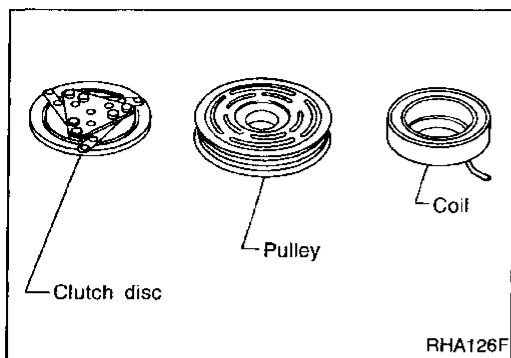
Check coil for loose connection or cracked insulation.

#### INSTALLATION

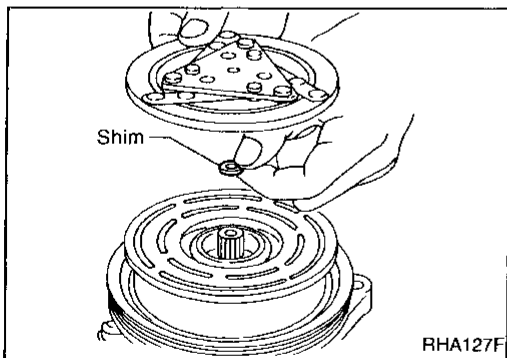
- Install the field coil.

**Be sure to align the coil's pin with the hole in the compressor's front head.**

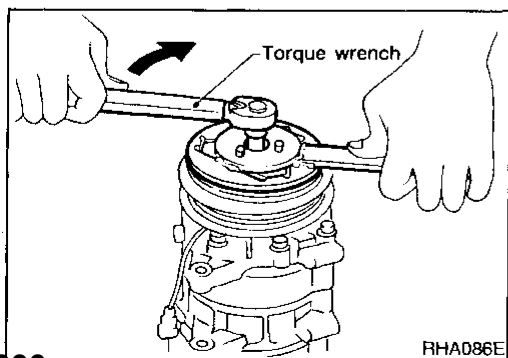
- Install the field coil harness clip using a screwdriver.



- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.



- Install the clutch disc on the drive shaft, together with the original shim(s). Press the clutch disc down by hand.

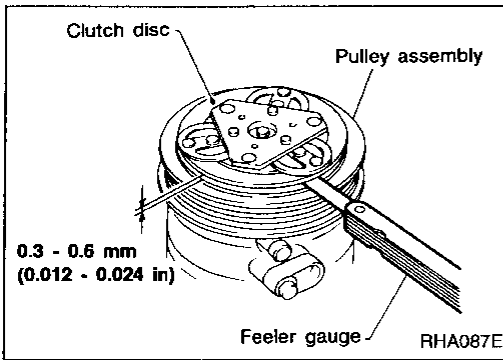


- Using the holder to prevent clutch disc rotation, tighten the bolt to 14 N·m (1.4 kg·m, 10 ft·lb) torque.

**After tightening the bolt, check that the pulley rotates smoothly.**

# SERVICE PROCEDURES

## Compressor Clutch (Cont'd)



- Check clearance around the entire periphery of clutch disc.

### Disc-to-pulley clearance:

0.3 - 0.6 mm (0.012 - 0.024 in)

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

## BREAK-IN OPERATION

When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.

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# SERVICE DATA AND SPECIFICATIONS (SDS)

## General Specifications

### COMPRESSOR

Model	CALSONIC make V-6
Type	V-6 variable displacement
Displacement	cm <sup>3</sup> (cu in)/rev.
Max.	165 (10.07)
Min.	10.5 (0.641)
Cylinder bore x stroke	37 (1.46)
	mm (in) x [1.6 - 25.6 (0.063 - 1.008)]
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

### LUBRICANT

Model	CALSONIC make V-6
Name	Nissan A/C System Oil Type S
Part number	KLH00-PAGS0
Capacity	ml (US fl oz, Imp fl oz)
Total in system	250 (8.5, 8.8)
Compressor (Service part) charging amount	250 (8.5, 8.8)

### REFRIGERANT

Type	HFC-134a (R-134a)
Capacity	kg (lb)
	0.60 - 0.70 (1.32 - 1.54)

## Inspection and Adjustment

### ENGINE IDLING SPEED

#### When A/C is ON

- Refer to EC section ("Inspection and Adjustments", "SERVICE DATA AND SPECIFICATIONS").

### BELT TENSION

- Refer to MA section ("Checking Drive Belts", "ENGINE MAINTENANCE").

### COMPRESSOR CLUTCH

Model	CALSONIC make V-6
Clutch disc-pulley clearance	0.3 - 0.6
	mm (in) (0.012 - 0.024)