

# HEATER & AIR CONDITIONER

# 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".

# PRECAUTIONS

## Supplemental Restraint System "AIR BAG"

The Supplemental Restraint System "Air Bag" helps to reduce the risk or severity of injury to the driver in a frontal collision. The Supplemental Restraint System consists of an air bag (located in the center of the steering wheel), sensors, a control unit, warning lamp, wiring harness and spiral cable. Information necessary to service the system safely is included in the **BF section** of this Service Manual.

### WARNING:

- a. To avoid rendering the SRS inoperative, which could lead to personal injury or death in the event of a severe frontal collision, all maintenance must be performed by an authorized NISSAN dealer.
- b. Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.
- c. All SRS electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS "Air Bag".

## Introduction

To prevent the ozone layer from being destroyed, the HFC-134a (R-134a) refrigerant has replaced the previously used CFC-12 (R-12).

The new and previous service tools, refrigerant, lubricant, etc. are not interchangeable due to differences in their physical properties and characteristics.

Always service the HFC-134a (R-134a) air conditioning system using the specified tools, lubricant and refrigerant, observing the following precautions:

## Identification

### IDENTIFICATION LABEL FOR VEHICLE

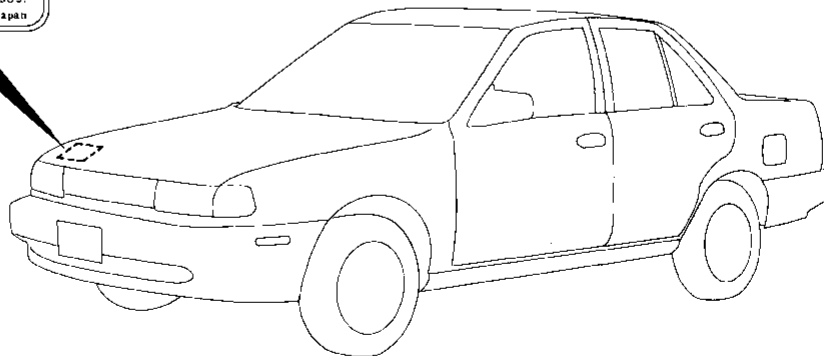
AIR CONDITIONER		NISSAN
	REFRIGERANT	COMPRESSOR LUBRICANT
TYPE (PART NO.)	R134a	①
AMOUNT	③	②

**CAUTION PRÉCAUTION**

- REFRIGERANT UNDER HIGH PRESSURE
- SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL
- IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY.
- CONSULT SERVICE MANUAL.
- THIS AIR CONDITIONER SYSTEM COMPLIES WITH SAE J-639.

NISSAN MOTOR CO., LTD. Tokyo, Japan

- ① : Lubricant type and service part number
- ② : Amount of lubricant
- ③ : Amount of refrigerant



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# PRECAUTIONS

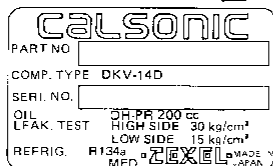
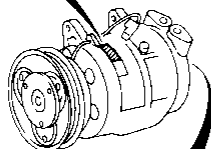
## Identification (Cont'd)

### PARTS IDENTIFICATION

#### 1. Compressor label

R134a label

R134a用  
USE FOR R134a



#### 2. Other component parts label

R134a label

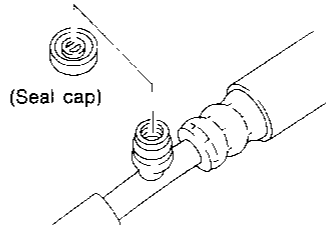
R134a用  
USE FOR R134a



Base color: Light blue

Part name	Identification
1. Compressor	R134a label or Compressor label
2. Cooling unit	R134a label
3. Expansion valve	Stamp
4. Condenser	R134a label
5. Liquid tank	R134a label
6. Hose or pipe	R134a label

#### 3. Service valves (suction/discharge)



The service valves are specially designed for the HFC-134a (R134a) system. Those for the CFC-12 (R-12) system are different in size and configuration. Refer to "PREPARATION".

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

#### WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant must never be mixed, even in the smallest amounts, as they are incompatible with each other. If the refrigerants are mixed, compressor failure is likely to occur.
- Use only specified lubrication oil for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubrication oil other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) lubrication oil absorbs moisture from the atmosphere at a rapid rate, therefore 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. Also, complete the connection of all refrigerant loop components as quickly as possible to minimize the entry of moisture into the system.
  - c: Use the specified lubrication oil from a sealed container only. Containers must be re-sealed immediately after dispensing the lubrication oil. Lubrication oil in containers which are not properly sealed will become moisture saturated, and such lubrication oil is no longer suitable for use and should be properly disposed of.
  - d: Avoid breathing A/C refrigerant and lubrication oil vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) systems. If accidental system discharge occurs, ventilate work area before resuming work.
  - e: Do not allow lubrication oil (Nissan A/C System Oil Type R) to come in contact with styrofoam parts. Damage may result.

# PRECAUTIONS

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## 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 for Refrigerant Connection

### WARNING:

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

### CAUTION:

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

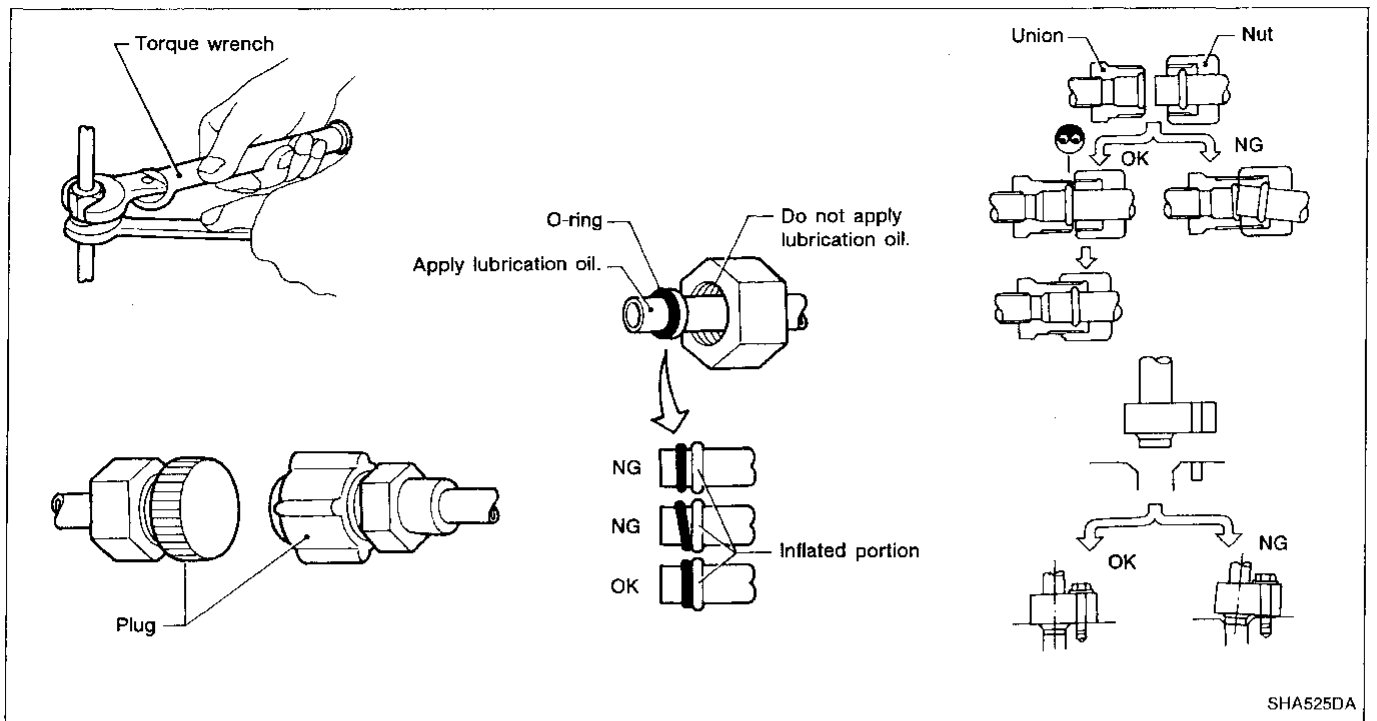
- Do not leave compressor on its side or upside down for more than 10 minutes, as compressor oil will enter low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, plug all openings immediately to prevent entrance of dirt and moisture.
- When installing an air conditioner in the vehicle, the pipes must be connected as the final stage of the operation. The seal caps of the pipes and other components must not be removed until their removal is required for connection.
- To prevent the condensation of moisture inside A/C components, components stored in cool areas should be allowed to warm to the working area temperature before removing the seal caps.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubrication oil to portions shown in illustration. Be careful not to apply oil to threaded portion.

Lubrication oil name: Nissan A/C System Oil Type R

Part number: KLH00-PAGR0

- O-ring must be closely attached to inflated portion of tube.
- After inserting tube into union until O-ring is no longer visible, tighten nut to specified torque.
- 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.

# PRECAUTIONS



## Precautions for Servicing Compressor

- Attach a blind plug to the suction port (low pressure) and discharge port (high pressure) of the compressor to prevent oil from leaking out and dust from getting inside.
- When the compressor is removed, store it in the same position as it was mounted on the car.
- When replacing the compressor, be sure to remove oil from the compressor and check the oil quantity extracted.
- When replacing with a new compressor, be sure to remove oil from the new compressor so that the quantity of oil remaining in the new compressor is equal to the quantity collected from the removed compressor. See the section "LUBRICATION OIL".
- Pay attention so as not to allow dirt and oil to attach on the friction surfaces between clutch and pulley. If the surface is contaminated with oil, wipe it off by using a clean waste cloth moistened with thinner.
- After completing the compressor service operation, be sure to rotate the compressor shaft more than five turns in both directions by hand to equalize oil distribution inside the compressor, then run the compressor for about one hour by idling the engine.

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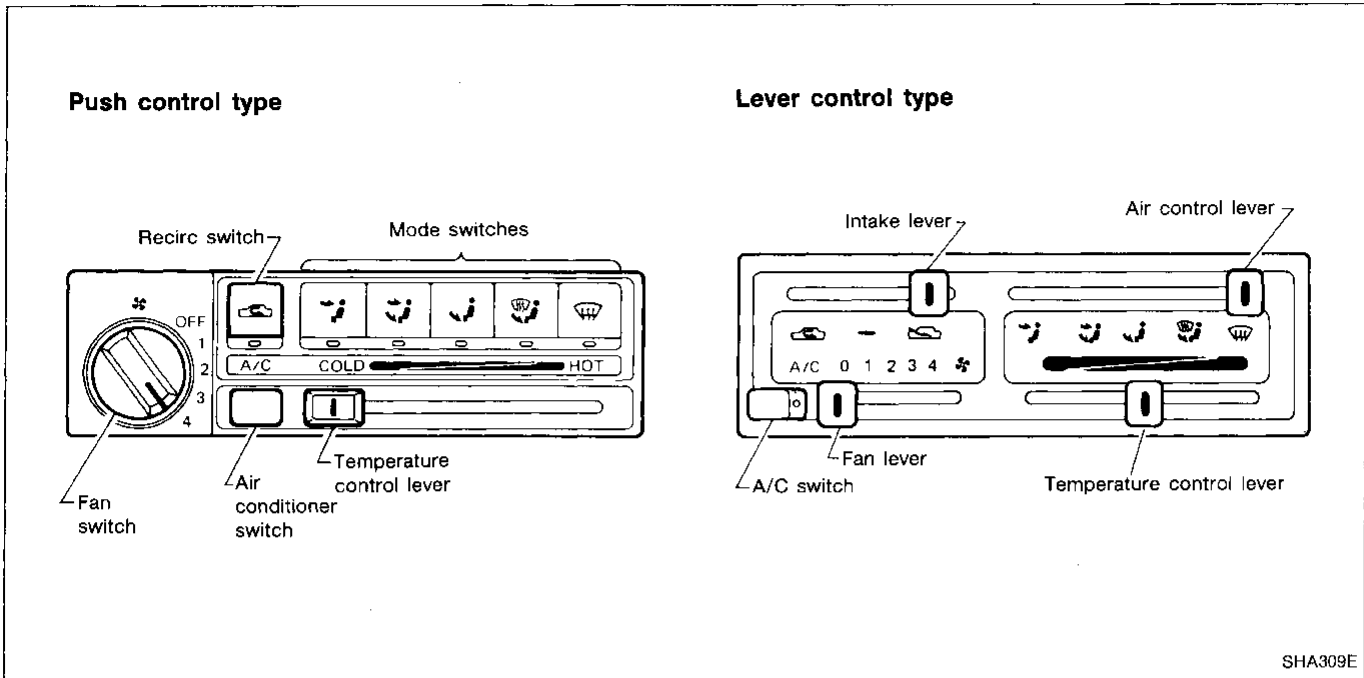
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Control Operation



SHA309E

**FAN SWITCH OR FAN LEVER**

This switch or lever controls fan speed. (The fan turns ON when the fan switch or fan lever is in all but the OFF or "0" position.)

**MODE SWITCHES OR AIR CONTROL LEVER**


These switches or air control lever allow you to select the outlet air flow.

When the MODE is set to "DEF" or "F/D", the push control unit sets the intake door to "FRE (Fresh)". The compressor turns on when the MODE switch is set to "DEF" (Push control type).


**TEMPERATURE CONTROL LEVER**

This lever allows you to adjust the temperature of the outlet air.

**RECIRC SWITCH OR INTAKE LEVER**

OFF position or slide to 

Outside air is drawn into the passenger compartment when this switch is OFF.

ON position or slide to 

Interior air is recirculated inside the vehicle.

RECIRC is canceled when "DEF" or "F/D" is selected. RECIRC resumes when another mode is chosen.

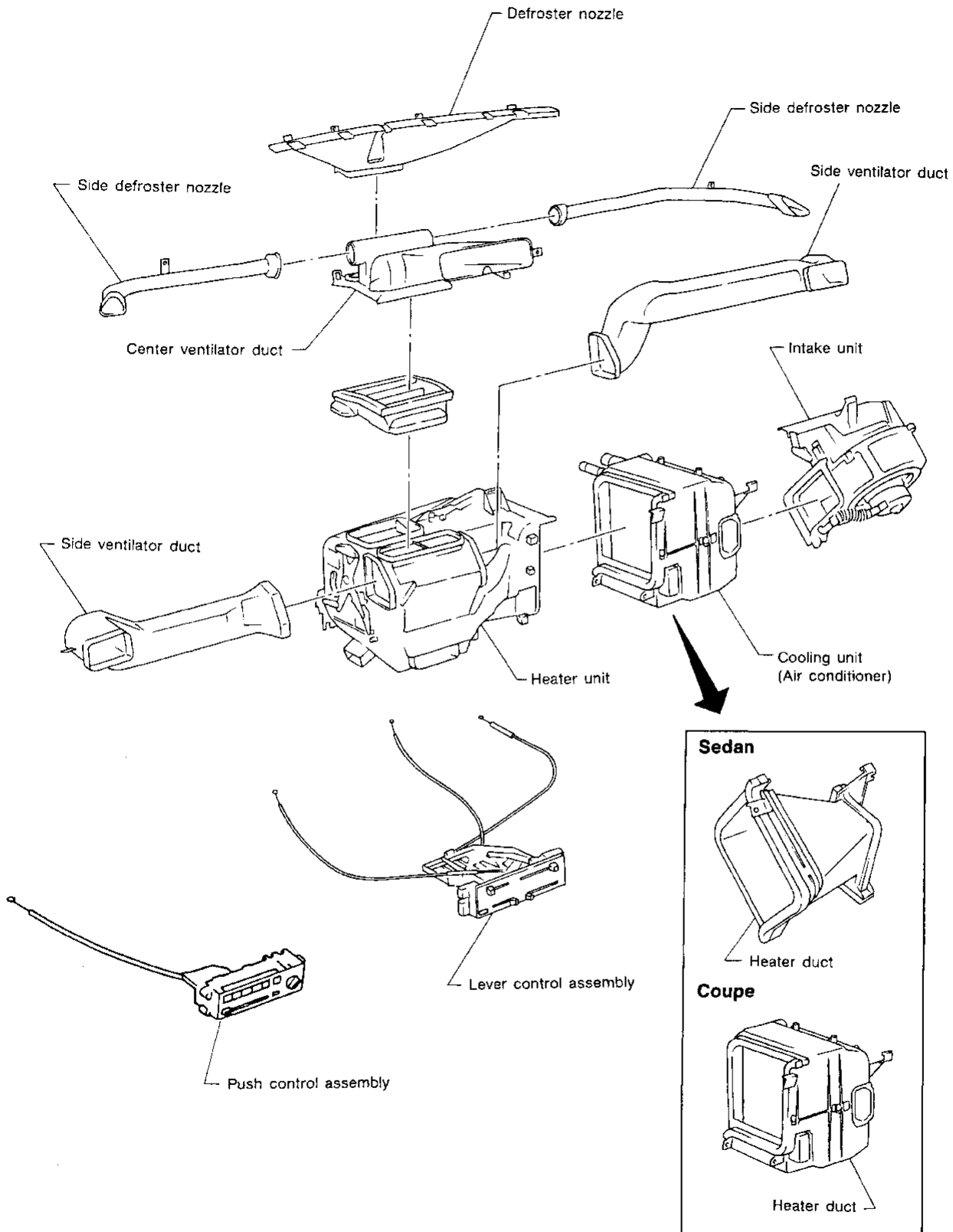
**AIR CONDITIONER SWITCH**

Start the engine, move the fan control lever to the desired (1 to 4) position and push the air conditioner switch to turn ON the air conditioner. The indicator light will come on when the air conditioner is ON. To stop the air conditioner, push the switch again to return it to the original position.

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

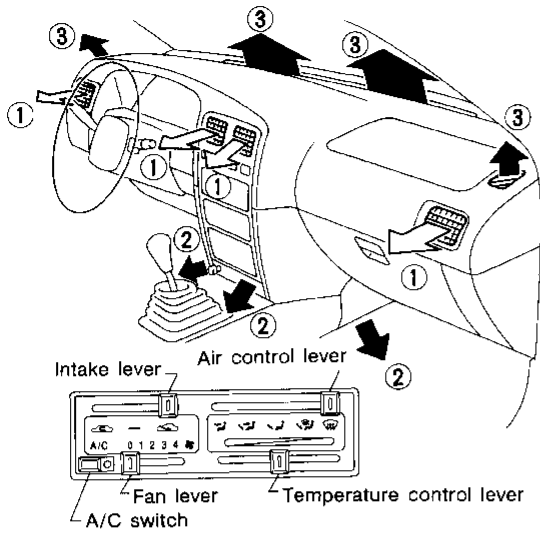
# DESCRIPTION — Overall System

## Component Layout

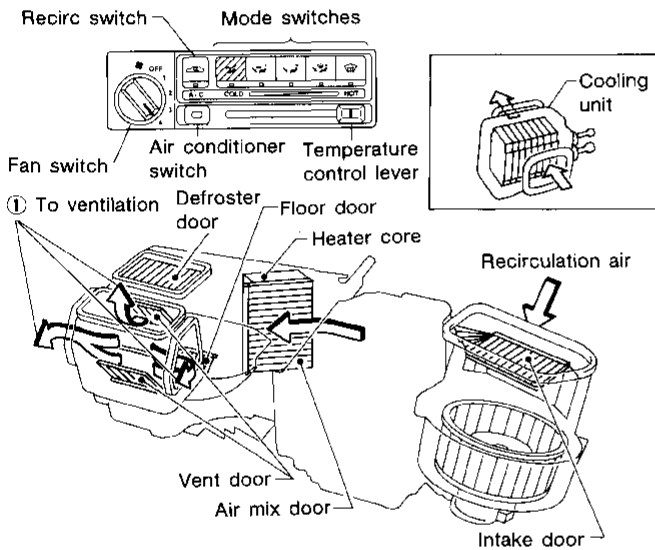


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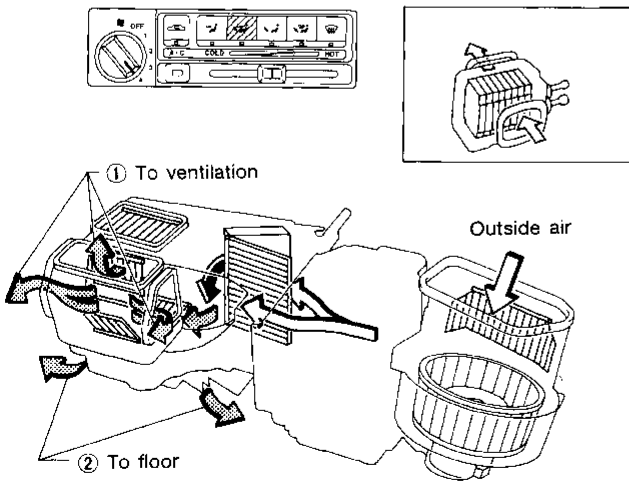
**Air Flow**



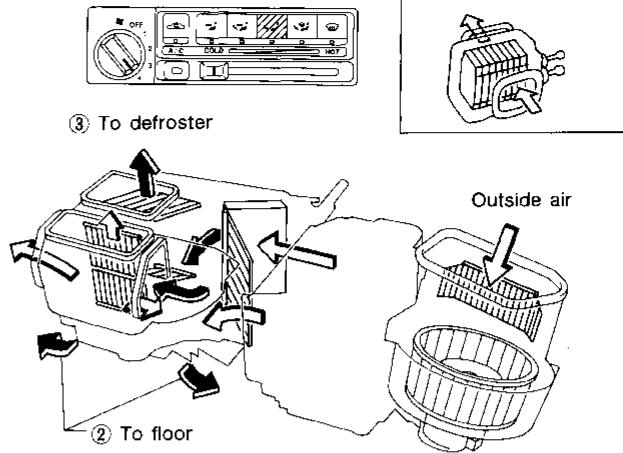
**Ventilation (RECIRC "ON")**



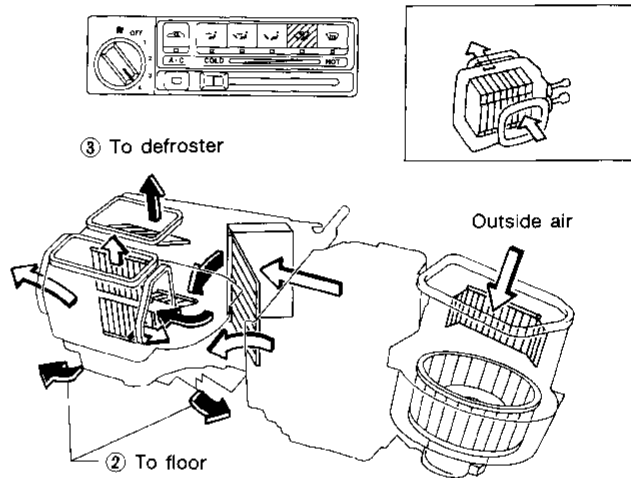
**Bi-level**



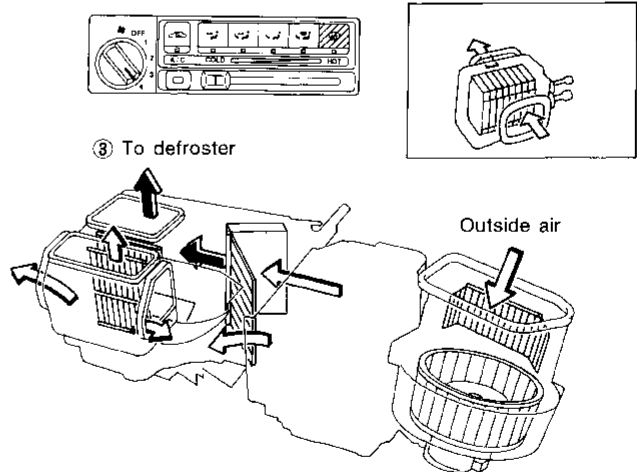
**Floor**



**Floor and defroster**



**Defroster**



- ← : Air passed through heater core
- ← + ← : Mixed air ( ← + ← )
- ← : Air not passed through heater core

These illustrations are for push control models. Lever control models are basically the same.



## Refrigeration Cycle

### REFRIGERANT FLOW

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

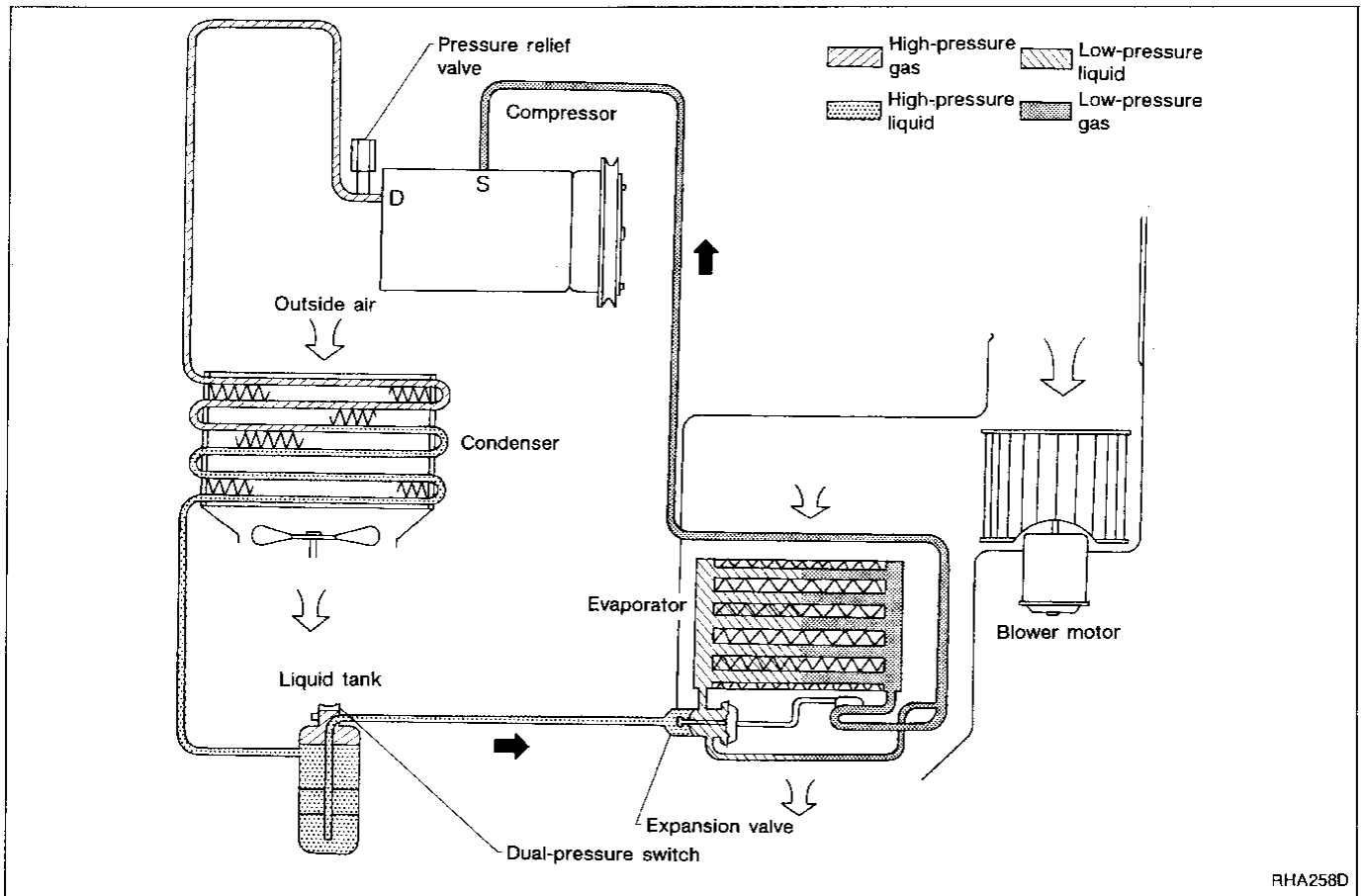
### REFRIGERANT SYSTEM PROTECTION

#### Dual-pressure switch

The refrigerant system is protected against excessively high or low pressures by the dual-pressure switch, located on the liquid tank. If the system pressure rises above, or falls below the specifications, the dual-pressure switch opens to interrupt the compressor operation.

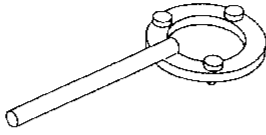
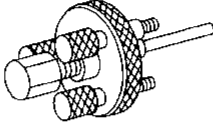
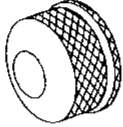
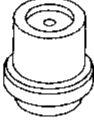
#### Pressure relief valve

The refrigerant system is also protected by a pressure relief valve, located on the end of high flexible hose near compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 3,727 kPa (38 kg/cm<sup>2</sup>, 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



# PREPARATION

## Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description
KV99231260 (J-38874) Clutch disc wrench	 <p>NT204</p> <p>Removing shaft nut and clutch disc</p>
KV99232340 (J-38874) Clutch disc puller	 <p>NT206</p> <p>Removing clutch disc</p>
KV99234330 (J-39024) Pulley installer	 <p>NT207</p> <p>Installing pulley</p>
KV99233130 (J-39023) Pulley puller	 <p>NT208</p> <p>Removing pulley</p>

# PREPARATION

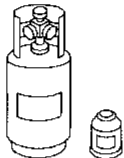

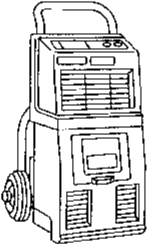
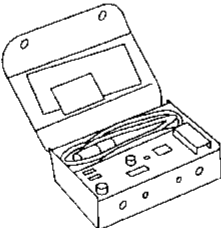
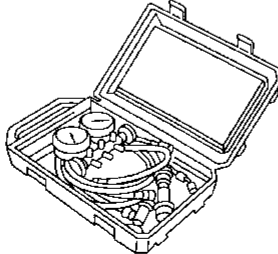
## HFC-134a (R-134a) Service Tools and Equipment

It is important to understand that HFC-134a (R-134a) refrigerant, and the specified lubricant which must be used with HFC-134a (R-134a), must never be mixed with CFC-12 (R-12) refrigerant and/or the CFC-12 (R-12) lubricant.

This means that separate and non-interchangeable service equipment must be used for handling each type of refrigerant/lubricant.

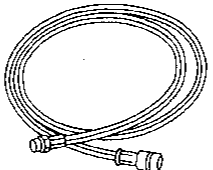
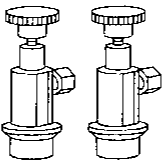

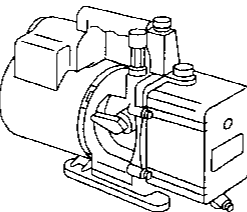
To prevent the mixing of refrigerants/lubricants, refrigerant container fittings, service hose fittings, and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a).

Adaptors to convert from one size fitting to the other 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-PAGR0 ( — ) Nissan A/C System Oil Type R	 NT197	Type: Poly alkaline glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (Nissan only) Lubricity: 40 mL (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-INF) 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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EM  
LC  
EF & EC  
FE  
CL  
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RA  
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BF  
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IDX

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

Tool number (Kent-Moore No.) Tool name	Description	Note
Service hoses ● High side hose (J-39501-72) ● Low side hose (J-39502-72) ● Utility hose (J-39476-72)	NT201 	Hose color: ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Fitting size: Thread size ● 1/2"-16 ACME
Service couplers ● High side coupler (J-39500-20) ● Low side coupler (J-39500-24)	NT202 	Fitting size: ● M14 x 1.5 fitting is optional
(J-39650) Refrigerant weight scale	NT200 	For measuring of refrigerant Fitting size: Thread size ● 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)	NT203 	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2"-16 ACME

# PREPARATION

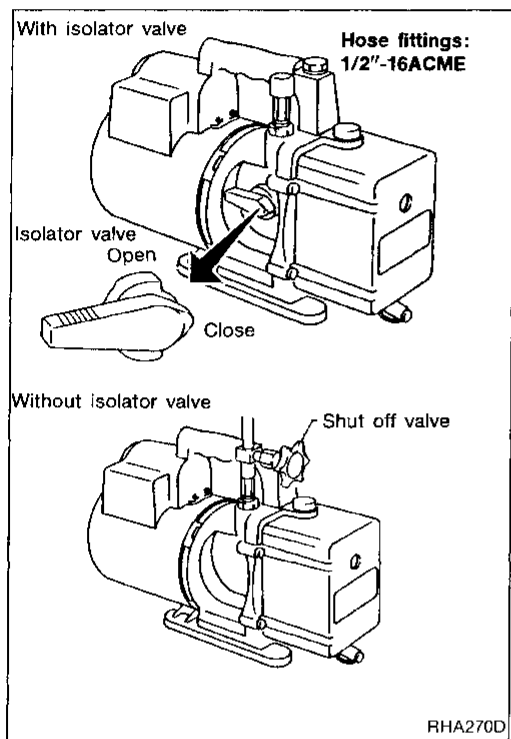
## Precautions for Service Equipment

### RECOVERY/RECYCLING EQUIPMENT

Be certain to follow the manufacturers instructions for machine operation and machine maintenance. Never introduce any refrigerant other than that specified into the machine.

### ELECTRICAL LEAK DETECTOR

Be certain to follow the manufactures instructions for tester operation and tester maintenance.



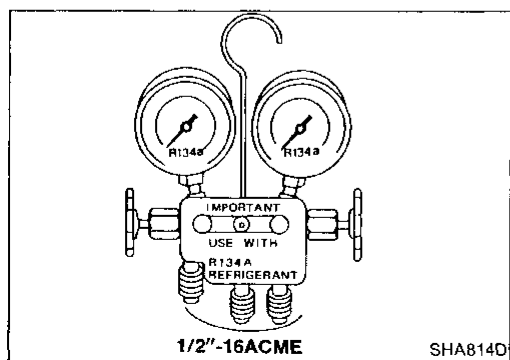
### VACUUM PUMP

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

To prevent the migration of vacuum pump lubricant into service hoses, it is necessary to use a valve (which can be manually opened or closed) near the connection of the service hose to the pump.

- On a vacuum pump which is equipped with an isolator valve (usually part of the vacuum pump), closing this valve will isolate the service hose from the pump.
- For pumps without an isolator valve, be certain that the service hose is equipped with a manual shut off valve near the pump end of the hose.
- Hoses which contain an automatic shut off valve at the end of the service hose must be disconnected from the vacuum pump to prevent the migration of lubricant: as long as the hose is connected, the valve is open and lubricant may migrate.

One-way valves which open when vacuum is applied and close under a no vacuum condition are not recommended, because this valve may restrict the pump's ability to pull a deep vacuum.



### MANIFOLD GAUGE SET

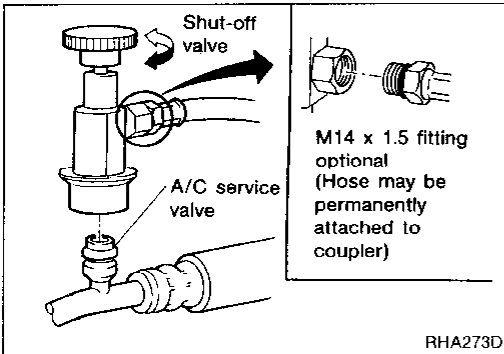
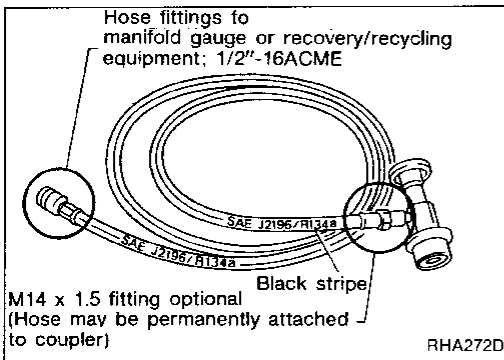
Be certain that the gauge face indicates R-134a or 134a. Be certain that the manifold gauge set has the 1/2"-16 ACME threaded connections for service hoses, and that no refrigerants other than HFC-134a (R-134a) (along with only specified lubricants) have been used with the manifold gauge set.

## PREPARATION

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

#### SERVICE HOSES

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



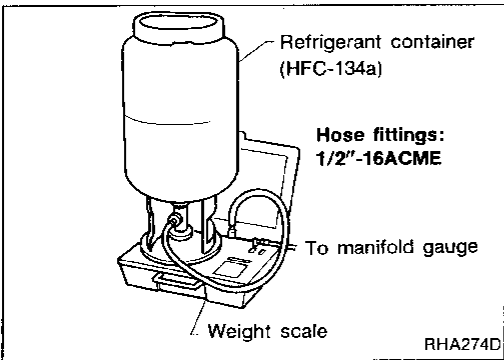
#### SERVICE COUPLERS

Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. Although the HFC-134a (R-134a) couplers will not secure on to the CFC-12 (R-12) system, CFC-12 (R-12) refrigerant and lubricant will be discharged into the HFC-134a (R-134a) coupler, causing contamination.

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

#### REFRIGERANT WEIGHT SCALE

If the scale allows electronic control of the flow of refrigerant through the scale, be certain that the hose fitting size is 1/2"-16 ACME, and that no refrigerant other than HFC-134a (R-134a) (along with only specified lubricant) has been used with the scale.



#### CHARGING CYLINDER

The charging cylinder is not recommended because refrigerant may be vented into the air from the top valve of the cylinder when filling the cylinder with refrigerant. Additionally, the accuracy of the cylinder is generally less than that of an electronic scale or of quality recycle/recharge equipment.

# SERVICE PROCEDURES

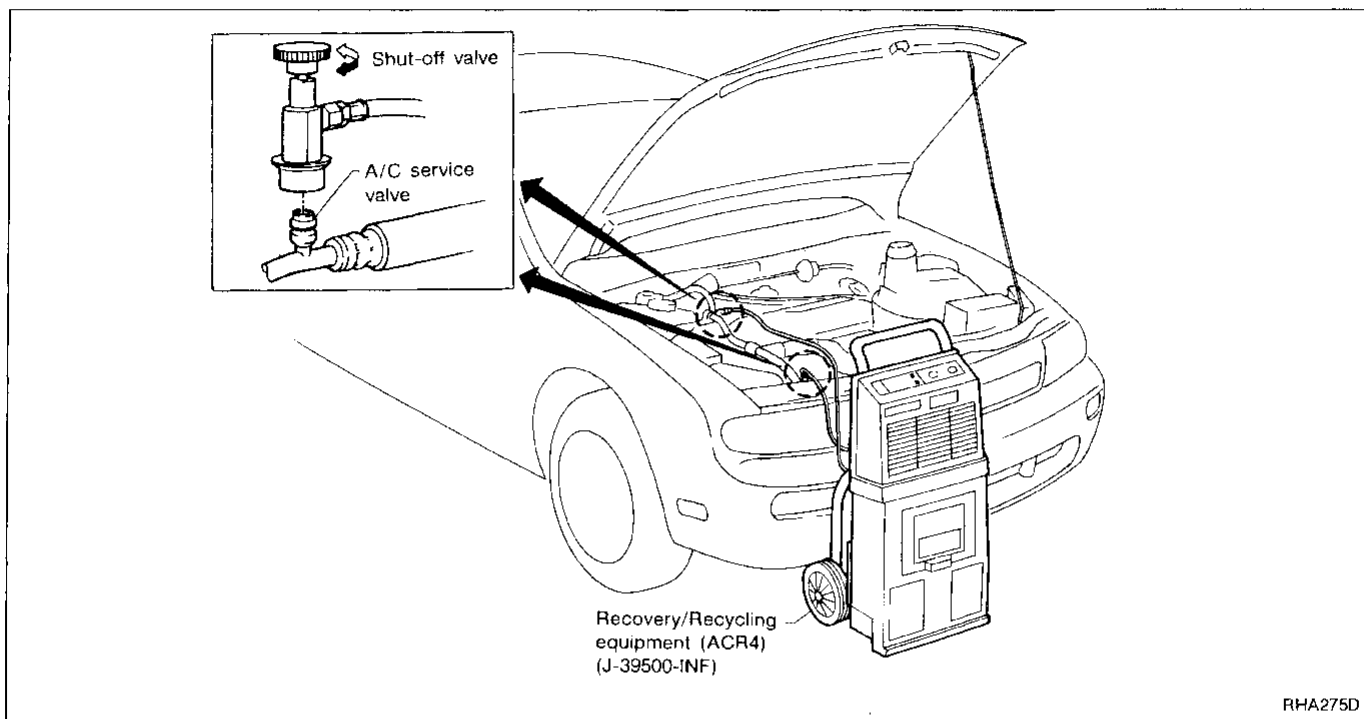
## HFC-134a (R-134a) Service Procedure

### SETTING OF SERVICE TOOLS AND EQUIPMENT

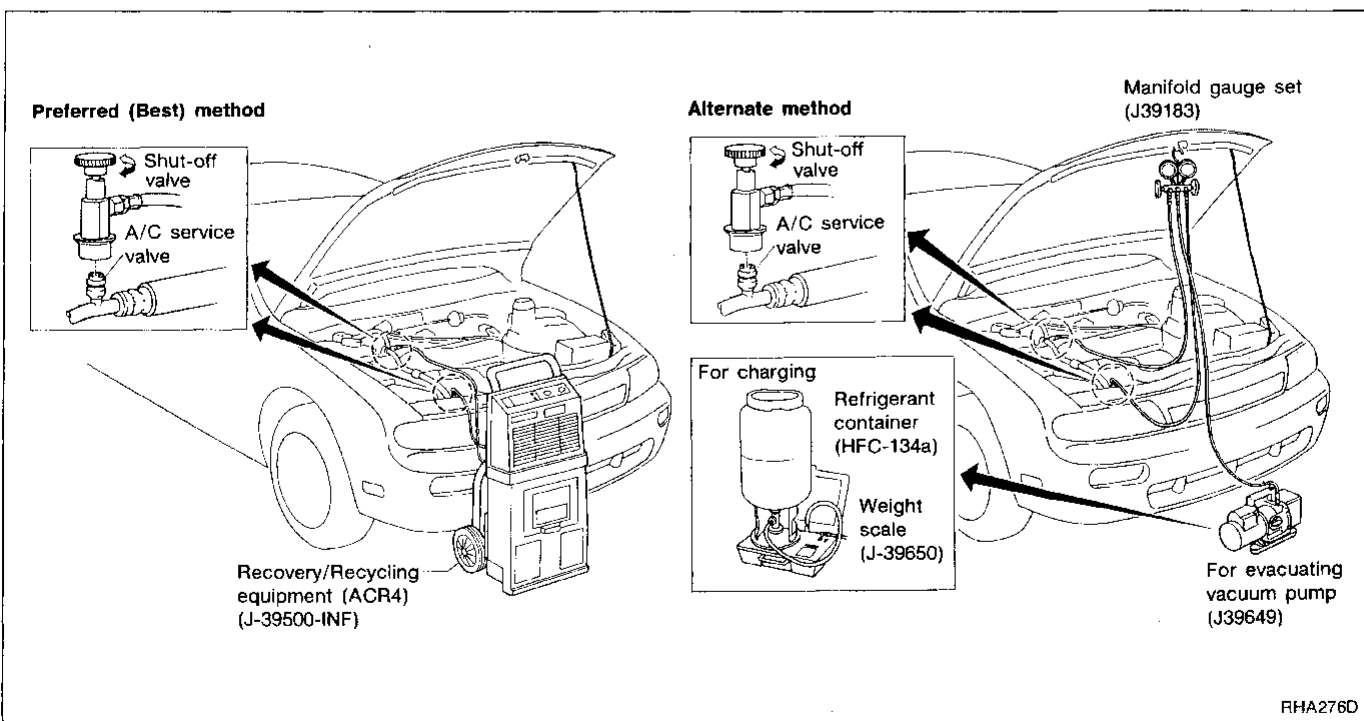
#### DISCHARGING REFRIGERANT

##### WARNING:

Avoid breathing A/C refrigerant and lubrication oil vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) systems. If accidental system discharge occurs, ventilate work area before resuming work.



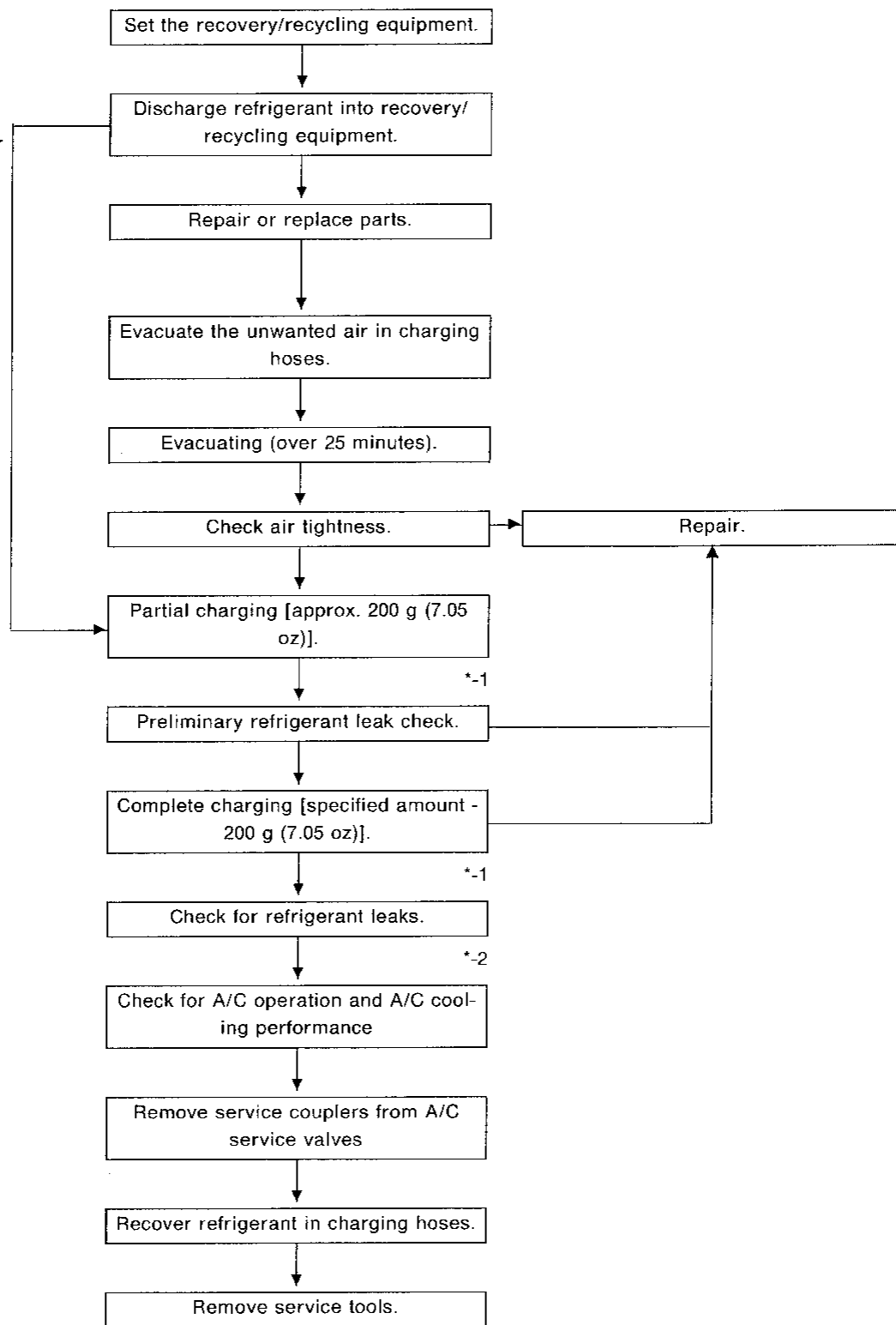
#### EVACUATING SYSTEM AND CHARGING REFRIGERANT



# SERVICE PROCEDURES

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

Recovered lubrication oil  
Refer to **LUBRICATION OIL**  
— **Checking and Adjusting**  
(HA-21).



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 attached to valves (to prevent leak).

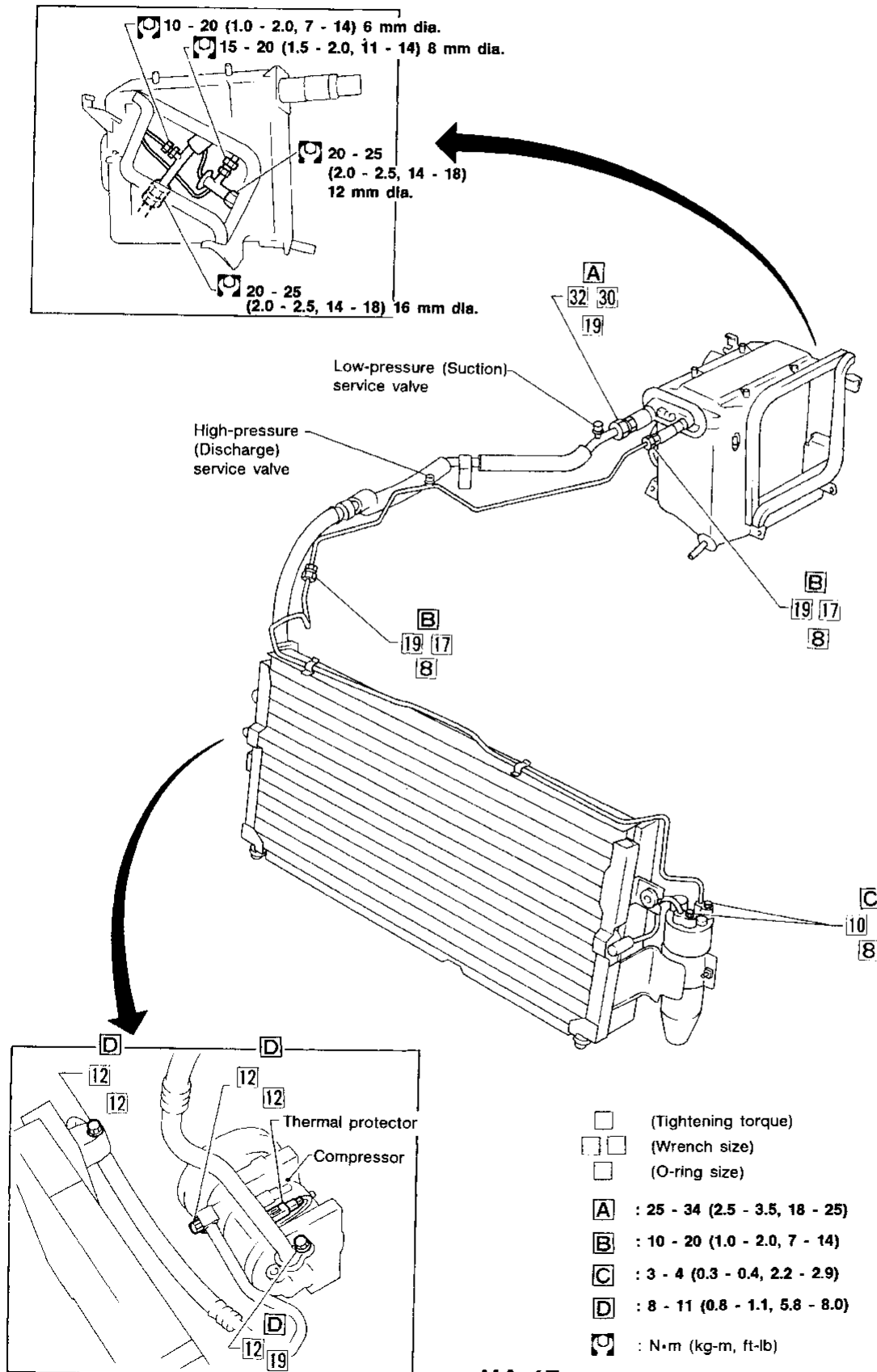


# SERVICE PROCEDURES

## Refrigerant Lines

- Refer to "Precautions for Refrigerant Connection" on page HA-4.

### GA16DE ENGINE MODELS



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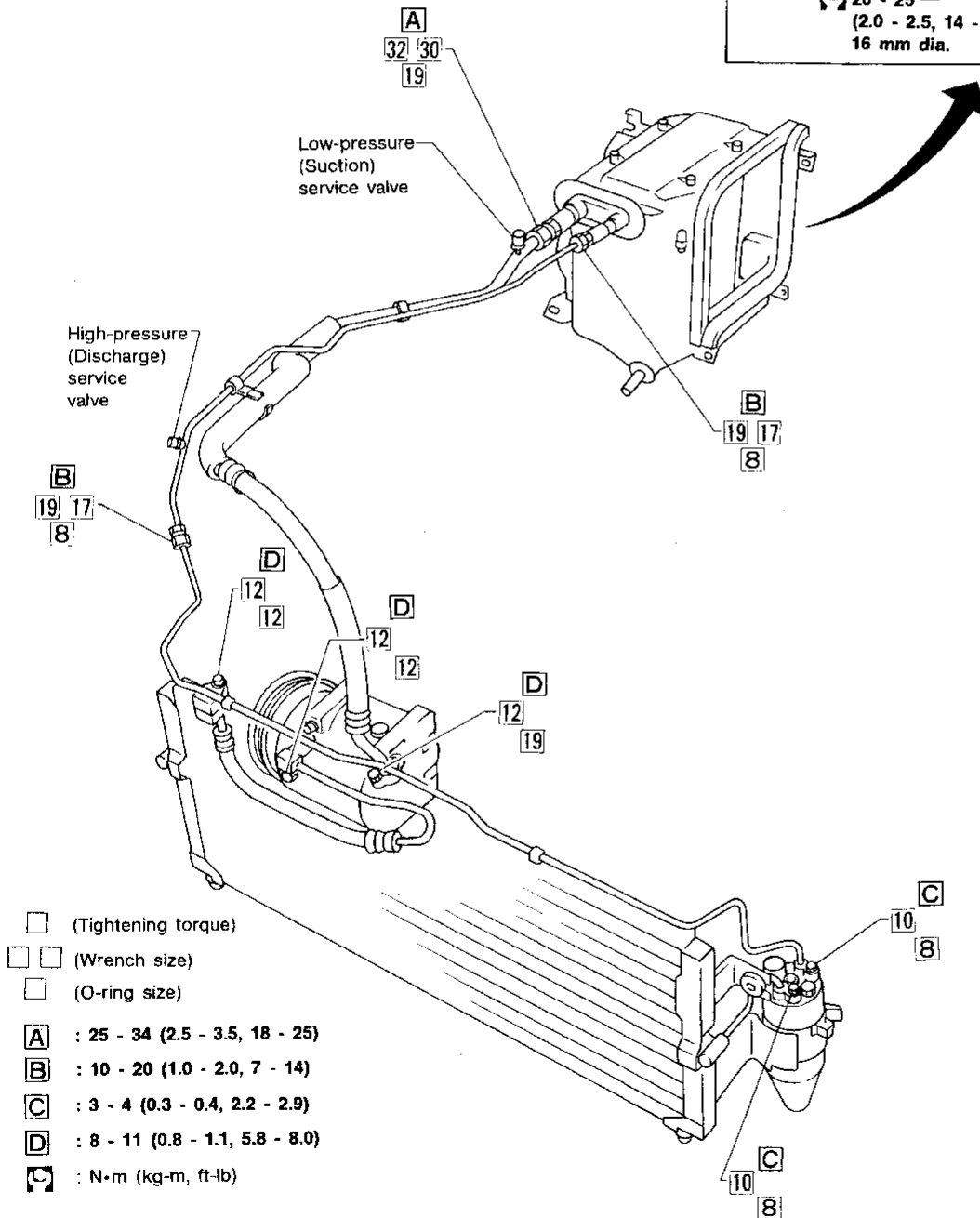
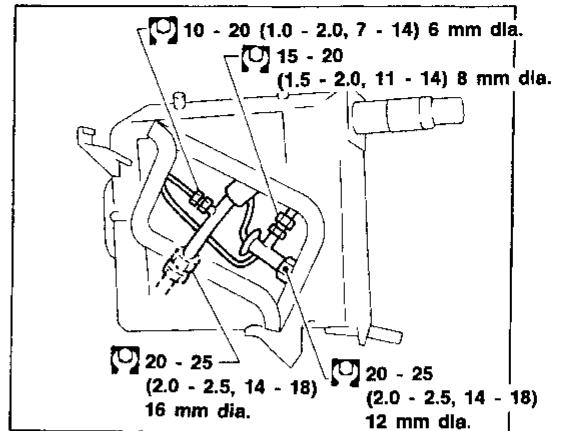
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# SERVICE PROCEDURES

## Refrigerant Lines (Cont'd)

SR20DE ENGINE MODELS

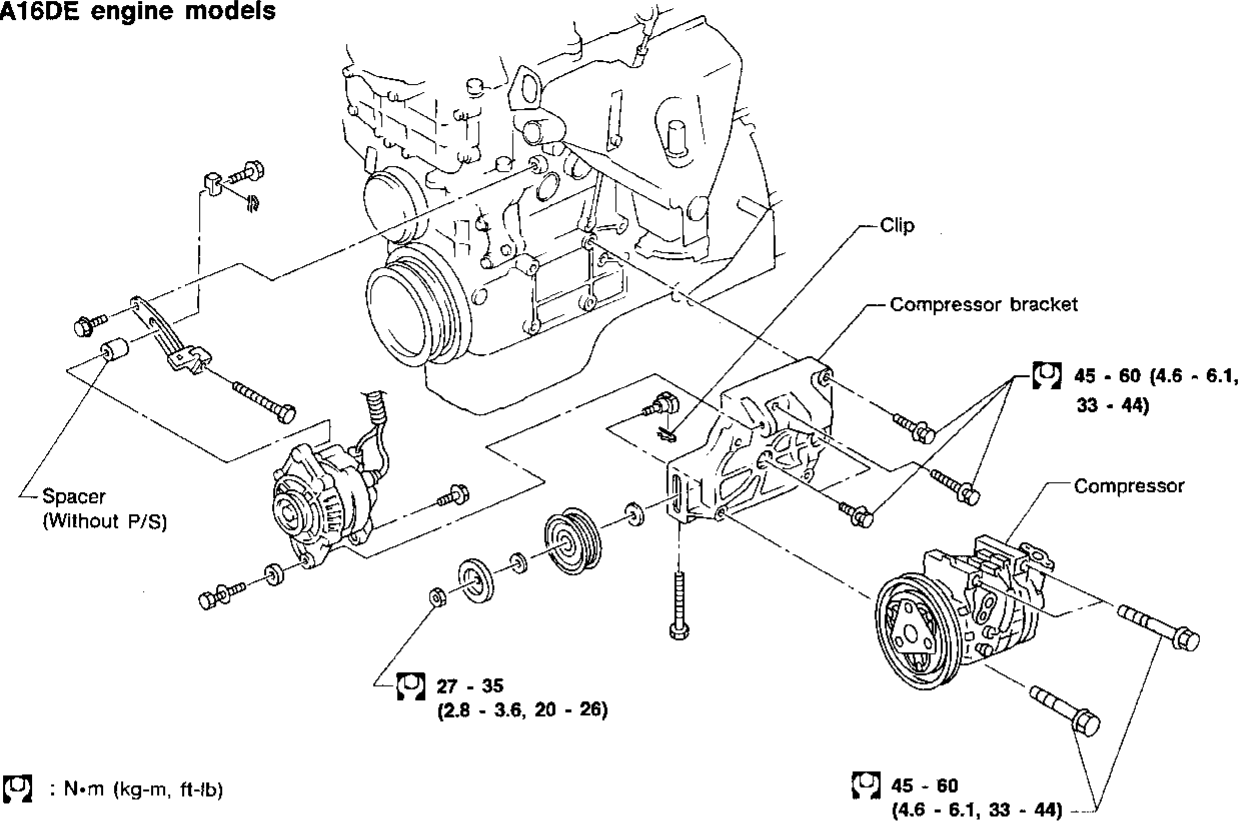


- (Tightening torque)
- □ (Wrench size)
- (O-ring size)
- A** : 25 - 34 (2.5 - 3.5, 18 - 25)
- B** : 10 - 20 (1.0 - 2.0, 7 - 14)
- C** : 3 - 4 (0.3 - 0.4, 2.2 - 2.9)
- D** : 8 - 11 (0.8 - 1.1, 5.8 - 8.0)
- ⊗ : N·m (kg-m, ft-lb)

# SERVICE PROCEDURES

## Compressor Mounting

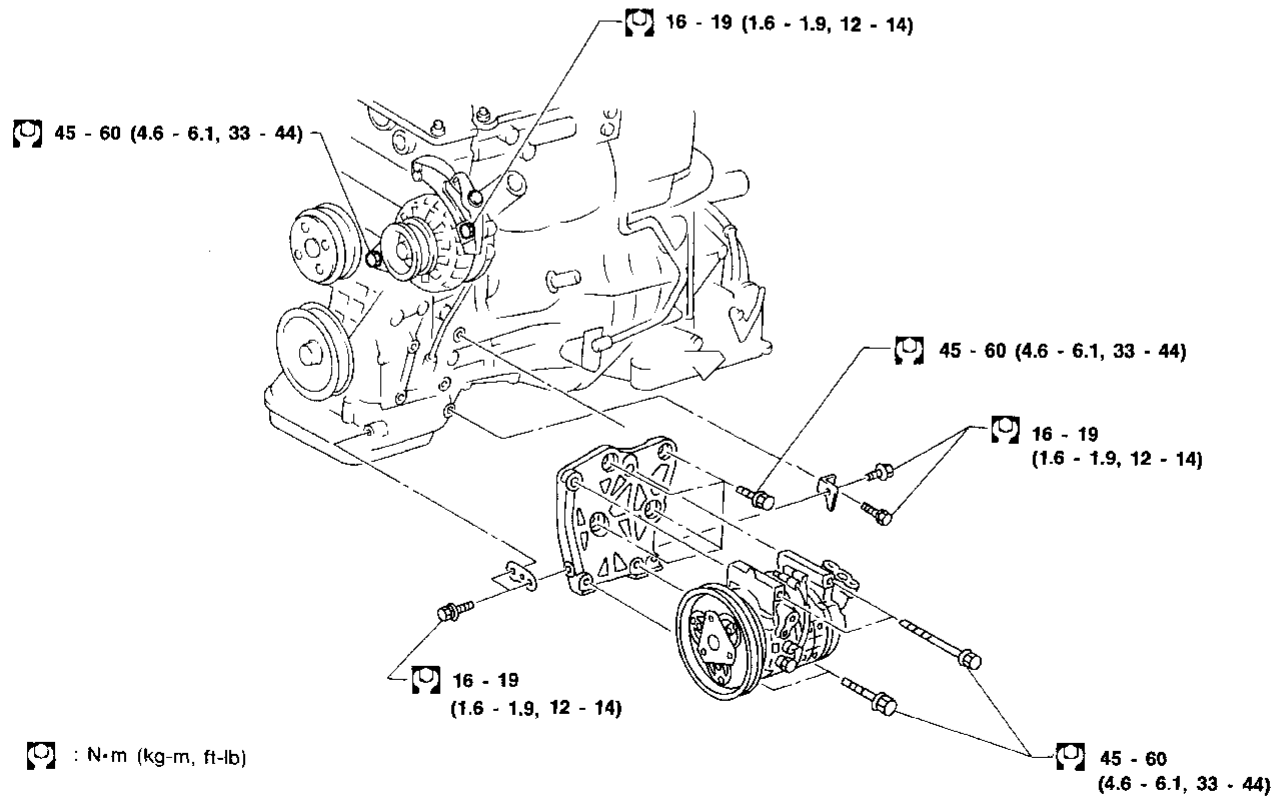
### GA16DE engine models



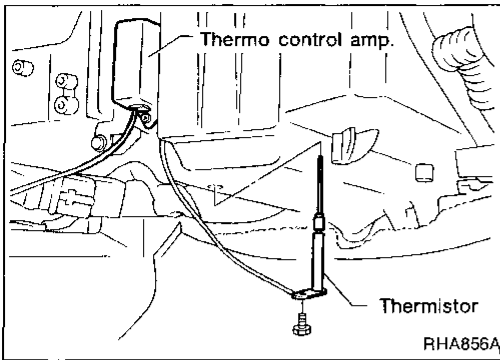
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### SR20DE engine models



RHA497D



### Thermo Control Amp.

#### REPLACEMENT

Remove screws, which secure thermistor locating stay, from front of cooling unit. Replace thermo control amp. assembly with a new one. (Cooling unit need not be removed during the replacement.)

### Belt Tension

- Refer to Checking Drive Belts in MA section.

### Fast Idle Control Device (FICD)

- Refer to EF & EC section.

## Lubrication Oil

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

**Part number:** KLH00-PAGR0

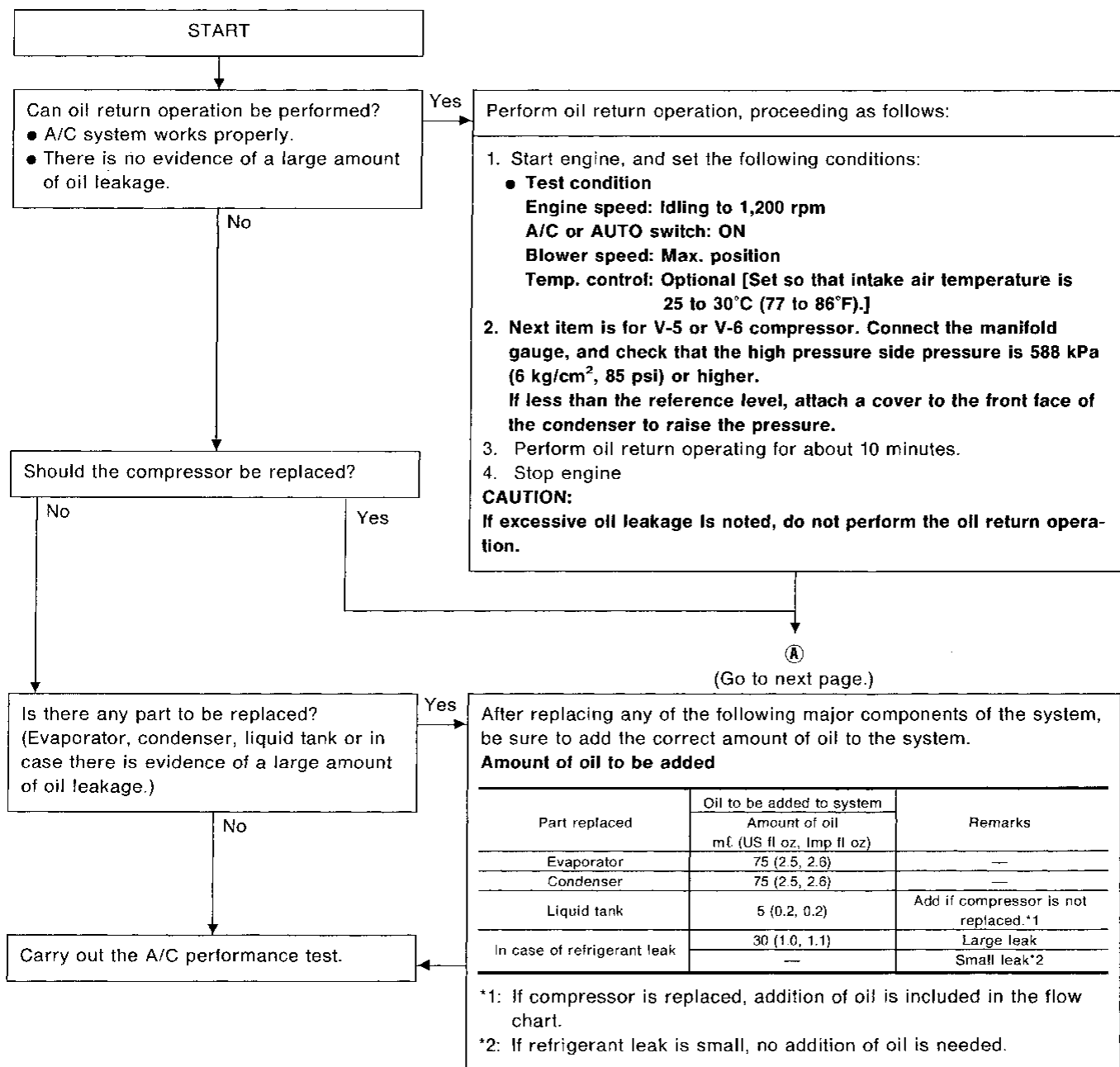
### Maintenance of Oil Quantity in Compressor

The oil used to lubricate the compressor circulates through the system with the refrigerant. Whenever any component of the system is replaced or a large amount of gas leakage occurs, add oil to the compressor to maintain the specified amount. If oil quantity is not maintained properly, the following malfunctions may result:

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

### Checking and Adjusting

Adjust the oil quantity according to the flowchart shown below.



# LUBRICATION OIL — Checking and Adjusting

## Checking and Adjusting (Cont'd)

(A)



1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.
2. Remove the drain plug (for V-5, V-6 or DKS-16H compressor) and drain the oil from the "old" (removed) compressor into a graduated container, and record the amount of oil drained.
3. Remove the drain plug and drain the oil from the "new" compressor into a separate, clean container.
4. Measure an amount of the new oil equivalent to that drained from the "old" compressor, and add this oil to the "new" compressor through the drain plug or suction port opening.
5. Measure an amount of the "new" oil equivalent to that recovered during discharging, and add this oil to the "new" compressor through the drain plug or suction port opening.
6. Torque the drain plug.

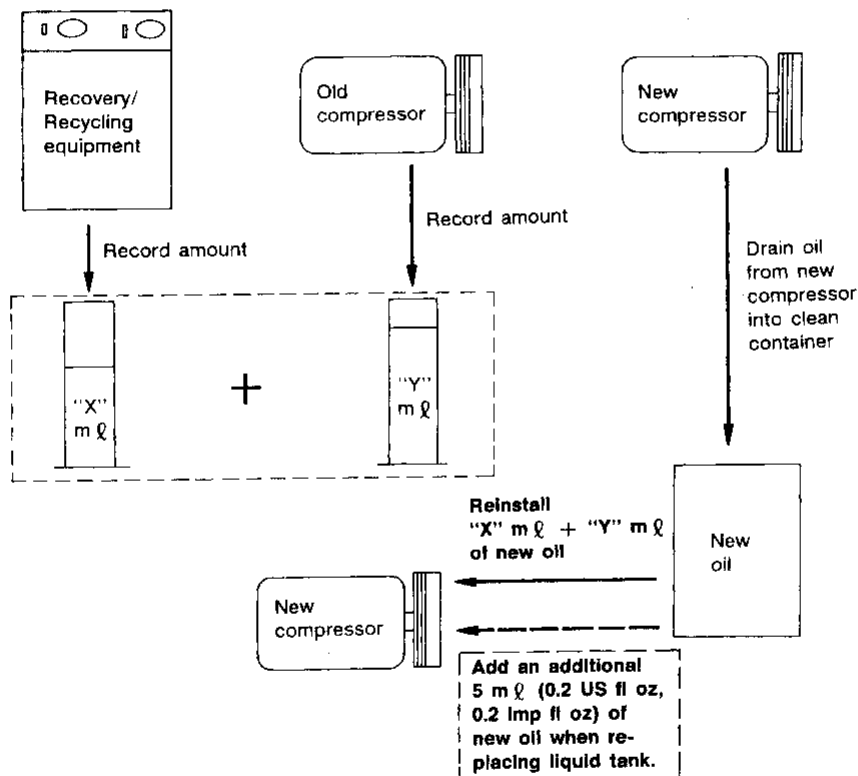
**V-5 or V-6 compressor: 18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)**

**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 oil at this time.

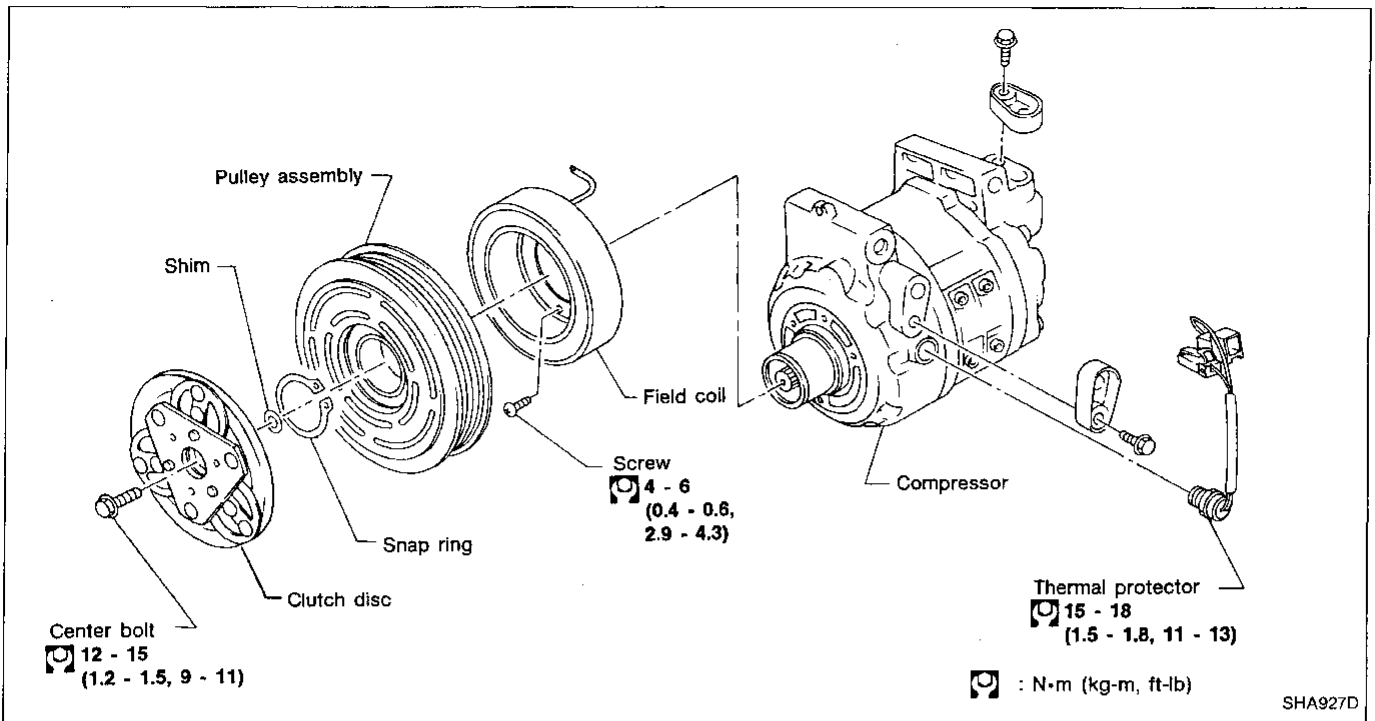
**Do not add this 5 ml (0.2 US fl oz, 0.2 Imp fl oz) of oil if only replacing the compressor.**

### Oil adjusting procedure for compressor replacement

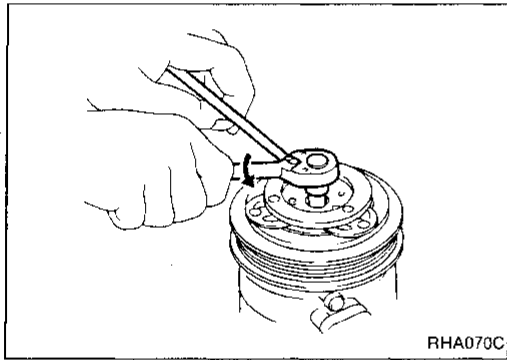


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# COMPRESSOR — Model DKV-14D (ZEXEL make)



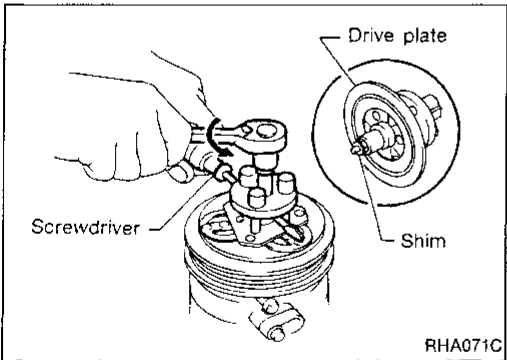
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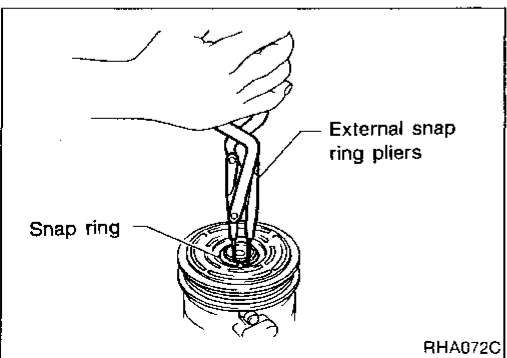
## Compressor Clutch

### REMOVAL

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



- Remove the drive plate using the drive plate puller. Insert the holder's three pins into the holes in the drive plate, and rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the drive plate. When tightening the center bolt, insert a round bar (screwdriver, etc.) between two of the pins (as shown in the left-hand figure) to prevent drive plate rotation. After removing the drive plate, remove the shims from either the drive shaft or the drive plate.

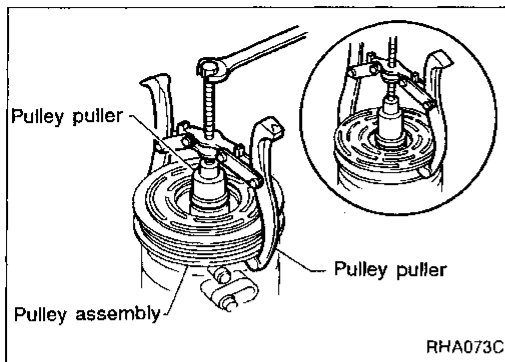


- Remove the snap ring using external snap ring pliers.

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# COMPRESSOR — Model DKV-14D (ZEXEL make)

## Compressor Clutch (Cont'd)



- 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.

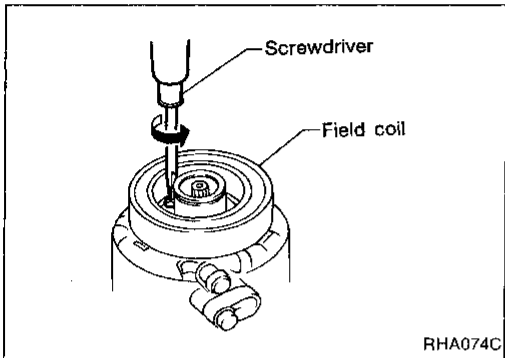
### For pressed pulleys

To prevent deformation of the pulley groove, the puller claws should be hooked into (not under) the pulley groove.

### For machine latched pulleys

Align the pulley puller groove with the pulley groove, and then remove the pulley assembly.

- Remove the field coil harness clip using a screwdriver.
- Remove the three field coil fixing screws and remove the field coil.



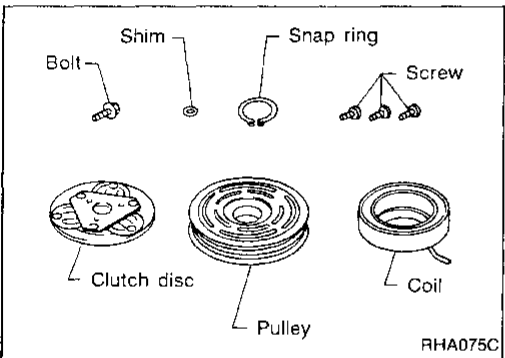
## INSPECTION

### Clutch disc

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

### Pulley

Check the appearance of the pulley assembly. If the contact surface of the pulley shows signs of excessive grooving due to slippage, both the pulley and clutch disc should be replaced. 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.

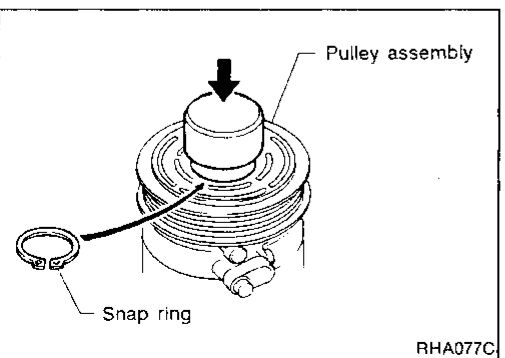
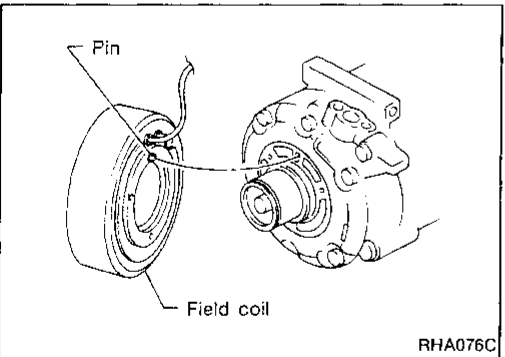
## INSTALLATION

- 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.

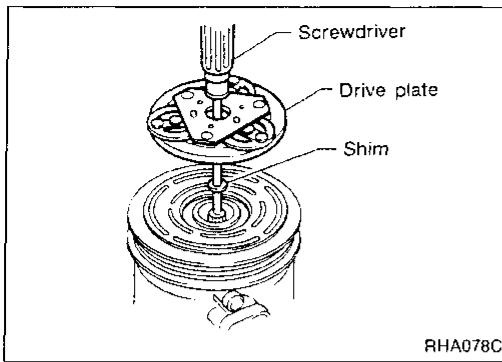
- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.





# COMPRESSOR — Model DKV-14D (ZEXEL make)

## Compressor Clutch (Cont'd)



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

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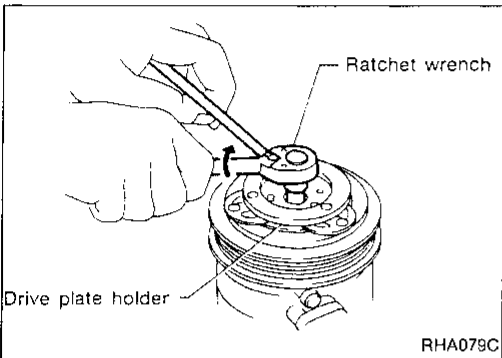
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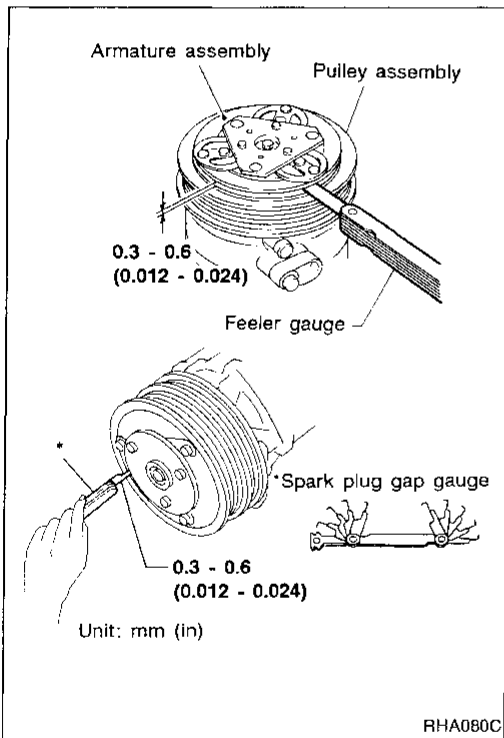
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- Using the holder to prevent drive plate rotation, tighten the bolt to 12 to 15 N·m (1.2 to 1.5 kg-m, 9 to 11 ft-lb) torque. **After tightening the bolt, check that the pulley rotates smoothly.**



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

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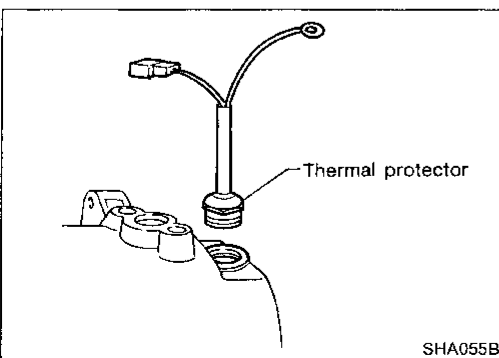
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## Thermal Protector

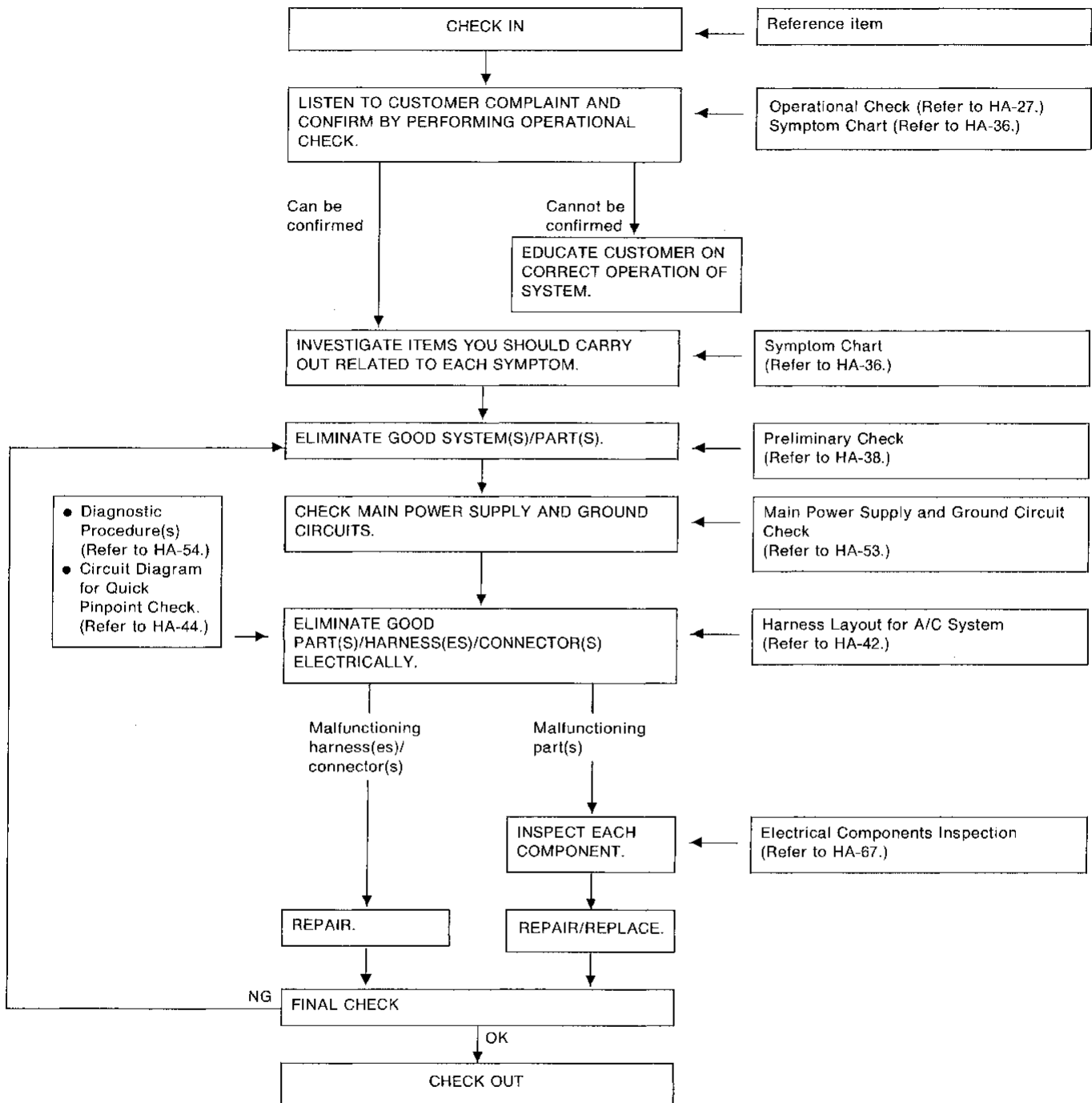
### INSPECTION

- When servicing, do not allow foreign matter to get into compressor.
- Check continuity between two terminals.



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

### WORK FLOW



## Operational Check

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

### CONDITIONS:

Engine running at normal operating temperature.

### PROCEDURE:

#### 1. Check blower

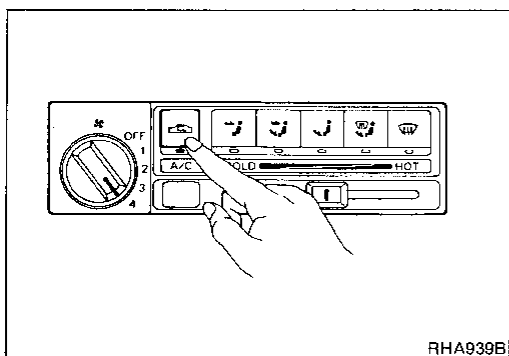
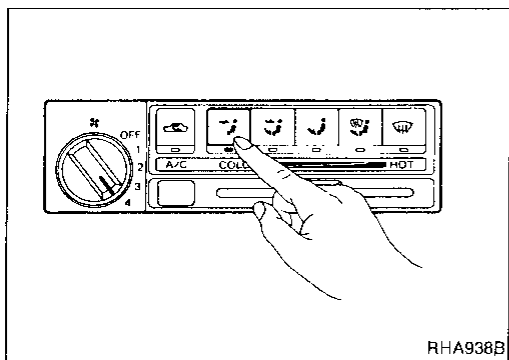
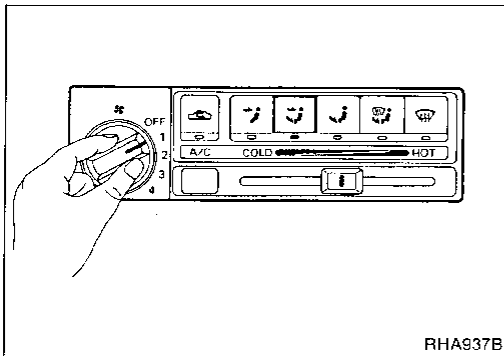
- 1) Turn or slide fan lever to 1-speed.  
Blower should operate on 1-speed.
- 2) Then turn or slide fan lever to 2-speed.
- 3) Continue checking blower speed until all four speeds are checked.
- 4) Leave blower on 4-speed.

#### 2. Check discharge air

- 1) Press the VENT button or slide air control lever to VENT.  
VENT indicator should light. (Push control type only)
- 2) Confirm that all discharge air comes out of face vents.
- 3) Press the B/L button or slide air control lever to B/L.  
B/L indicator should light. (Push control type only)
- 4) Confirm that discharge air comes out of face vents and foot vents.
- 5) Press the FOOT button or slide air control lever to FOOT.  
FOOT indicator should light. (Push control system only)
- 6) Confirm that discharge air comes out of foot vents, with some air from defroster vents.
- 7) Press the F/D button or slide air control lever to F/D.  
F/D indicator should light. (Push control type only)
- 8) Confirm that discharge air comes out of foot vents, with some air from defroster vents. Intake door position is at FRESH.
- 9) Press the DEF button or slide air control lever to DEF.  
DEF indicator should light. (Push control type only)
- 10) The discharge air should be coming only from defroster vents. At the same time compressor should turn ON and intake door position should be at FRESH. (Push control type only).

#### 3. Check RECIRC

- 1) Press RECIRC button or slide intake lever to RECIRC.  
RECIRC indicator should illuminate. (Push control type only)
- 2) Listen for intake door position change (you should hear blower sound change slightly).

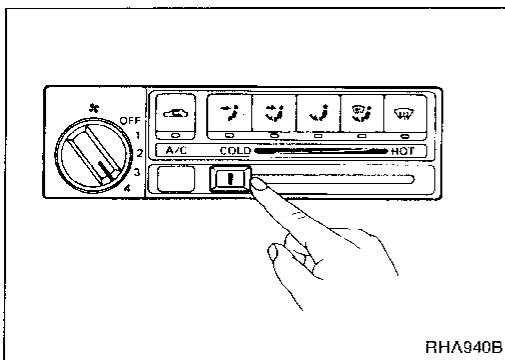


## DIAGNOSES — Overall System

### Operational Check (Cont'd)

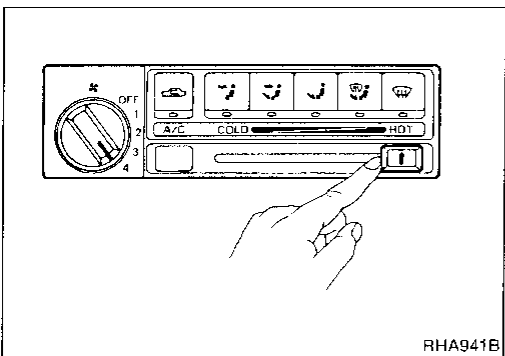
#### 4. Check temperature decrease

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



#### 5. Check temperature increase

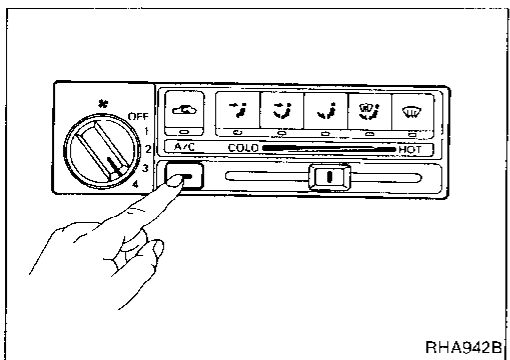
- 1) Slide temperature control lever to full hot.
- 2) Check for hot air at discharge air outlets.



#### 6. Check air conditioner switch

Move the fan control lever to the desired (1 to 4-speed) position and push the air conditioner button to turn ON the air conditioner.

The indicator light should come on when air conditioner is ON.



# DIAGNOSES — Overall System

## Performance Chart

### TEST CONDITION

Testing must be performed as follows:


Vehicle location: In doors or in the shade (in a well-ventilated place)


Doors: Closed

Door window: Open (Front driver side only)

Hood: Open

TEMP. lever position: Max. COLD

Air control lever position or mode switch:  (Ventilation)

INTAKE lever position :  (Recirculation)

FAN lever position or FAN switch: Max. position

Engine speed: 1,500 rpm

Time required before starting testing after air conditioner starts operating: More than 10 minutes

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### TEST READING

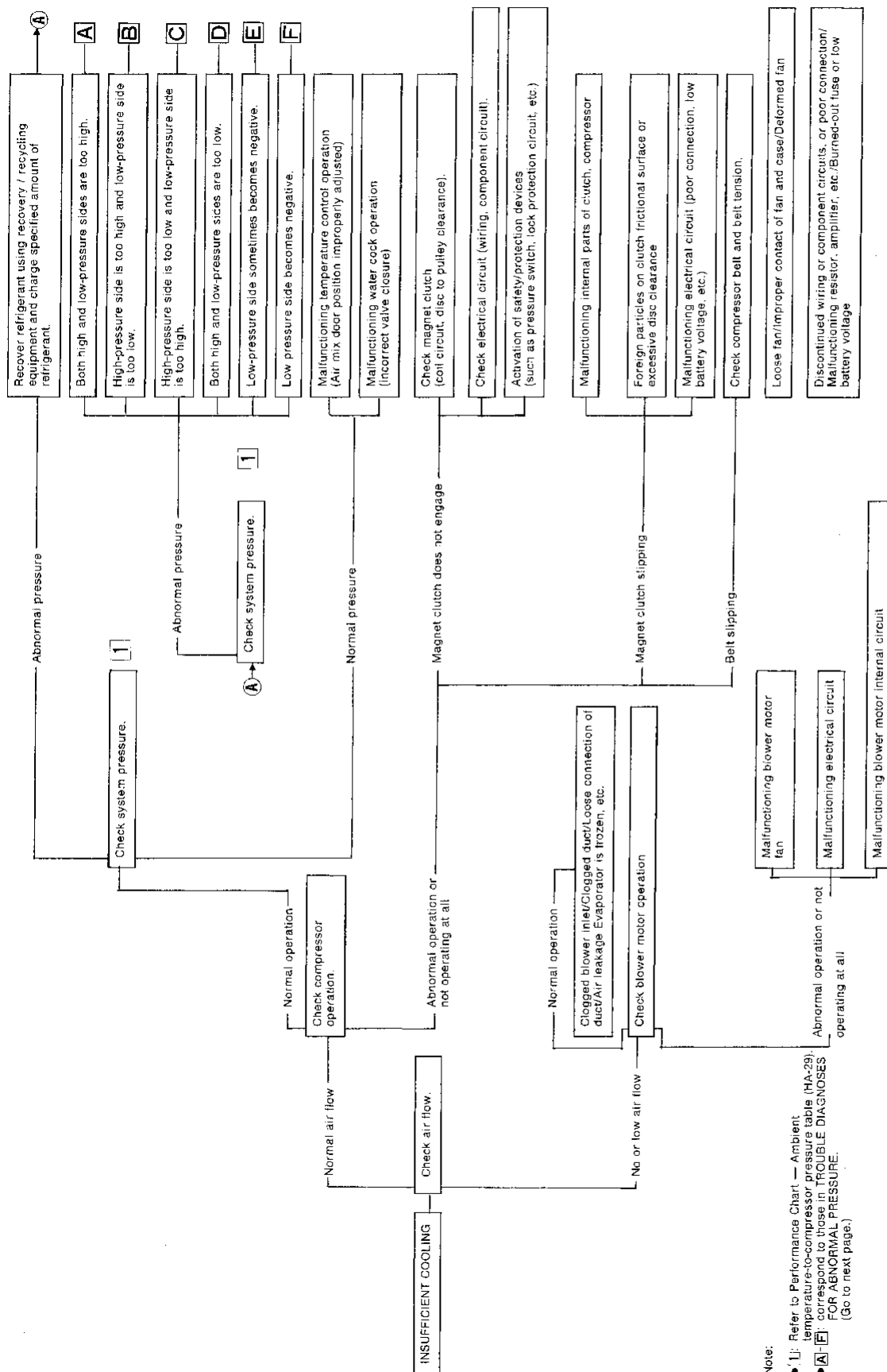
#### Recirculating-to-discharge air temperature table

Inside air(Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	8.8 - 11.3 (48 - 52)
	30 (86)	12.3 - 15.2 (54 - 59)
	35 (95)	15.6 - 19.3 (60 - 67)
60 - 70	25 (77)	11.3 - 14.0 (52 - 57)
	30 (86)	15.2 - 18.6 (59 - 65)
	35 (95)	19.3 - 23.5 (67 - 74)

#### Ambient air temperature-to-compressor 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	25 (77)	892 - 1,255 (9.1 - 12.8, 129 - 182)	167 - 275 (1.7 - 2.8, 24 - 40)
	30 (86)	1,118 - 1,334 (11.4 - 13.6, 162 - 193)	177 - 294 (1.8 - 3.0, 26 - 43)
	35 (95)	1,344 - 1,804 (13.7 - 18.4, 195 - 262)	186 - 314 (1.9 - 3.2, 27 - 46)

Performance Test Diagnoses  
INSUFFICIENT COOLING



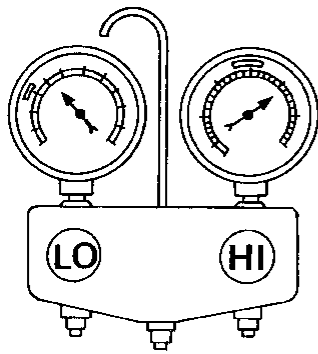
Note:  
 • [1]: Refer to Performance Chart — Ambient temperature-to-compressor pressure table (HA-29).  
 • [A] [F]: correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. (Go to next page.)

# DIAGNOSES — Overall System

## Performance Test Diagnoses (Cont'd)

### TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE

Whenever abnormal pressure of high and/or low sides of the system is noted, diagnosis must be conducted by using a manifold gauge. The large-line zone on the gauge scale (see illustrations.) shown in the following table refers to the standard (normal) pressure range for the corresponding pressure side (high or low). Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to the "Ambient Temperature-Pressure Characteristics" chart.

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: center;">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 Cooling fan is clogged. ② Improper 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>● Areas near low-pressure pipe connection and service valves are considerably cold compared with areas near expansion valve outlet or 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>

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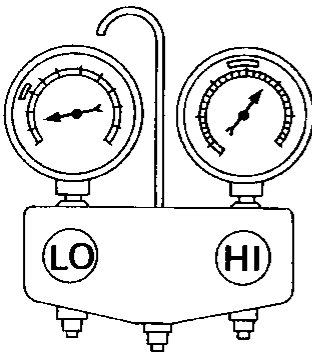
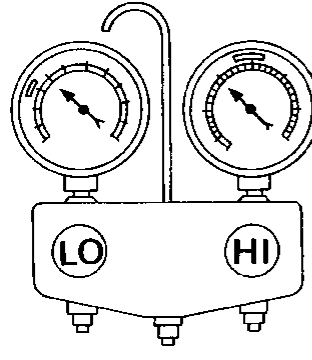
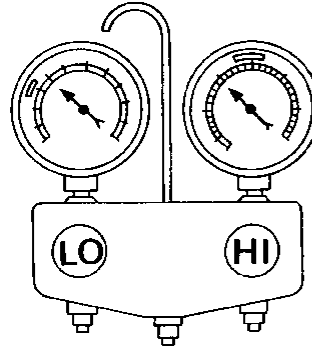
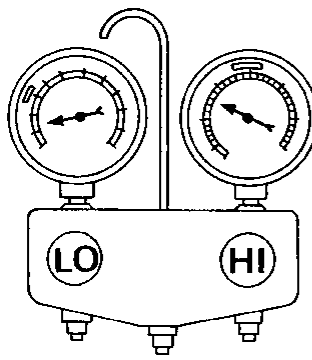
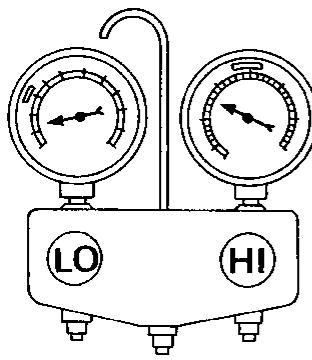
HA

EL

DX

## DIAGNOSES — Overall System

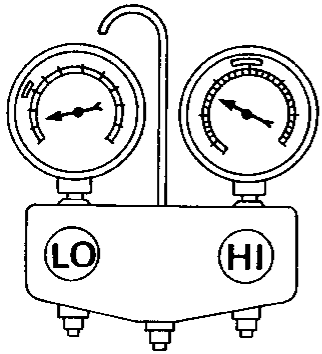
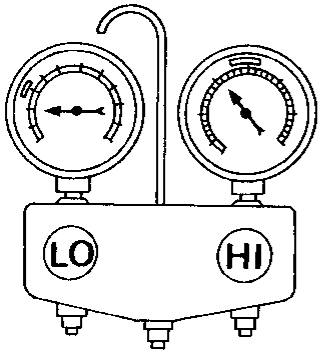
### Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<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; font-size: small;">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 compressor oil for contamination.</li> </ul>
<p>High-pressure side is too low and low-pressure side is too high.</p> <p><b>C</b></p>  <p style="text-align: right; font-size: small;">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>High-pressure side is too low and low-pressure side is too high.</p> <p><b>C</b></p>  <p style="text-align: right; font-size: small;">AC356A</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: right; font-size: small;">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 compressor oil for contamination.</li> </ul>
<p>Both high-and low-pressure sides are too low.</p> <p><b>D</b></p>  <p style="text-align: right; font-size: small;">AC353A</p>	<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 compressor oil for contamination.</li> </ul>



# DIAGNOSES — Overall System

## Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too low.</p> <p><b>D</b></p>  <p style="text-align: center;">AC353A</p>	<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> <p>① Improper expansion valve adjustment ② Malfunctioning thermal valve ③ Outlet and inlet may be clogged.</p>	<ul style="list-style-type: none"> <li>● Remove foreign particles by using compressed air.</li> <li>● Check compressor oil for contamination.</li> </ul>
	<p>Areas near low-pressure pipe connection and service valve are extremely cold as compared with areas near expansion valve outlet and evaporator.</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 compressor oil for contamination.</li> </ul>
	<p>Air flow volume is not enough or is too low.</p>	<p>Evaporator is frozen.</p> <p style="text-align: center;">↓</p> <p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)</p>	<p>Replace compressor.</p>
<p>Low-pressure side sometimes becomes negative.</p> <p><b>E</b></p>  <p style="text-align: center;">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>

GI

VA

EM

LC

FP &amp; EC

FE

CL

MT

AT

FA

RA

BR

ST

BF

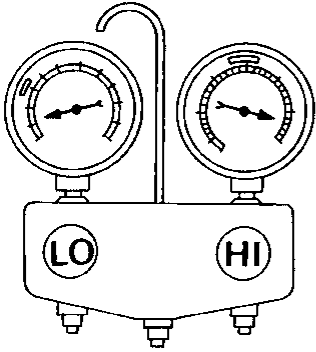
HA

EL

DX

## DIAGNOSES — Overall System

### Performance Test Diagnoses (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p> <p><b>F</b></p>  <p style="text-align: right; margin-right: 50px;">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>After the system is left at rest, start it again in order to confirm whether or not problem is caused by water or foreign particles.</p> <ul style="list-style-type: none"> <li>● If the problem is due to water, drain water from refrigerant or replace refrigerant.</li> <li>● If it is due to foreign particles, remove expansion valve and remove them 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 compressor oil for contamination.</li> </ul>

# TROUBLE DIAGNOSES

## Contents

<b>Symptom Chart</b> .....	HA-36	
<b>Preliminary Check</b> .....	HA-38	
<b>PRELIMINARY CHECK 1</b> (Intake door is not set at "FRESH" in DEF or F/D mode.).....	HA-38	GI
<b>PRELIMINARY CHECK 2</b> (A/C does not blow cold air.).....	HA-39	MA
<b>PRELIMINARY CHECK 3</b> (Magnet clutch does not engage in DEF mode.).....	HA-40	
<b>PRELIMINARY CHECK 4</b> (Air outlet does not change.).....	HA-40	EM
<b>PRELIMINARY CHECK 5</b> (Noise).....	HA-41	LC
<b>Harness Layout for A/C System</b> .....	HA-42	
<b>Circuit Diagram for Quick Pinpoint Check</b> .....	HA-44	EF & EC
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<b>Main Power Supply and Ground Circuit Check</b> .....	HA-53	
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<b>Diagnostic Procedure 2</b> (SYMPTOM: Air outlet does not change. — For push control type).....	HA-56	CL
<b>Diagnostic Procedure 3</b> (SYMPTOM: Intake door does not change. — For push control type).....	HA-58	MT
<b>Diagnostic Procedure 4</b> (SYMPTOM: Magnet clutch does not operate when A/C switch and fan switch are ON.).....	HA-59	AT
<b>Diagnostic Procedure 5</b> (SYMPTOM: Illumination or indicators of push control unit do not come on. — For push control type).....	HA-63	FA
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<b>Control Linkage Adjustment — Lever control type</b> .....	HA-70	RA
<b>Control Linkage Adjustment — Push control type</b> .....	HA-71	
		BR
		ST
		BF
		<b>HA</b>
		EL
		DX

# TROUBLE DIAGNOSES

## Symptom Chart

### DIAGNOSTIC TABLE

PROCEDURE	Preliminary Check					Diagnostic Procedure					Main Power Supply and Ground Circuit Check			
	HA-38	HA-39	HA-40	HA-40	HA-41	HA-54	HA-56	HA-58	HA-59	HA-63	HA-53	HA-53	HA-53	HA-53
REFERENCE PAGE														
SYMPTOM	Preliminary check 1	Preliminary check 2	Preliminary check 3	Preliminary check 4	Preliminary check 5	Diagnostic procedure 1	Diagnostic procedure 2: For push control type	Diagnostic procedure 3: For push control type	Diagnostic procedure 4	Diagnostic procedure 5: For push control type	15A Fuses	10A Fuse	Push control unit	Thermo control amp.
A/C does not blow cold air.		①				○			○		○	○		○
Blower motor does not rotate.		①				②					○			
Air outlet does not change.				①			②					○	○	
Intake door does not change.								①				○	○	
Intake door is not set at "FRESH" in DEF or F/D mode.	①							○				○	○	
Magnet clutch does not operate when A/C switch and fan switch are ON.		①							②			○		○
Magnet clutch does not engage in DEF mode.		①	②						○					○
Illumination or indicators of push control unit do not come on.										①		○		
Noise					①									

① , ② : The number means checking order.

○: As for checking order, refer to each flow chart. (It depends on malfunctioning portion.)

# TROUBLE DIAGNOSES

## Symptom Chart (Cont'd)

### Electrical Components Inspection

																						HA-69
																						HA-69
																						HA-67
																						HA-68
																						HA-67
																						—
																						—
																						—
																						—
																						—
																						—
																						HA-68
																						HA-74
																						HA-74
																						HA-68
																						HA-68
																						HA-67
																						HA-23
																						HA-67
																						Refer to EF & EC section
																						Refer to EL section
																						—
																						—

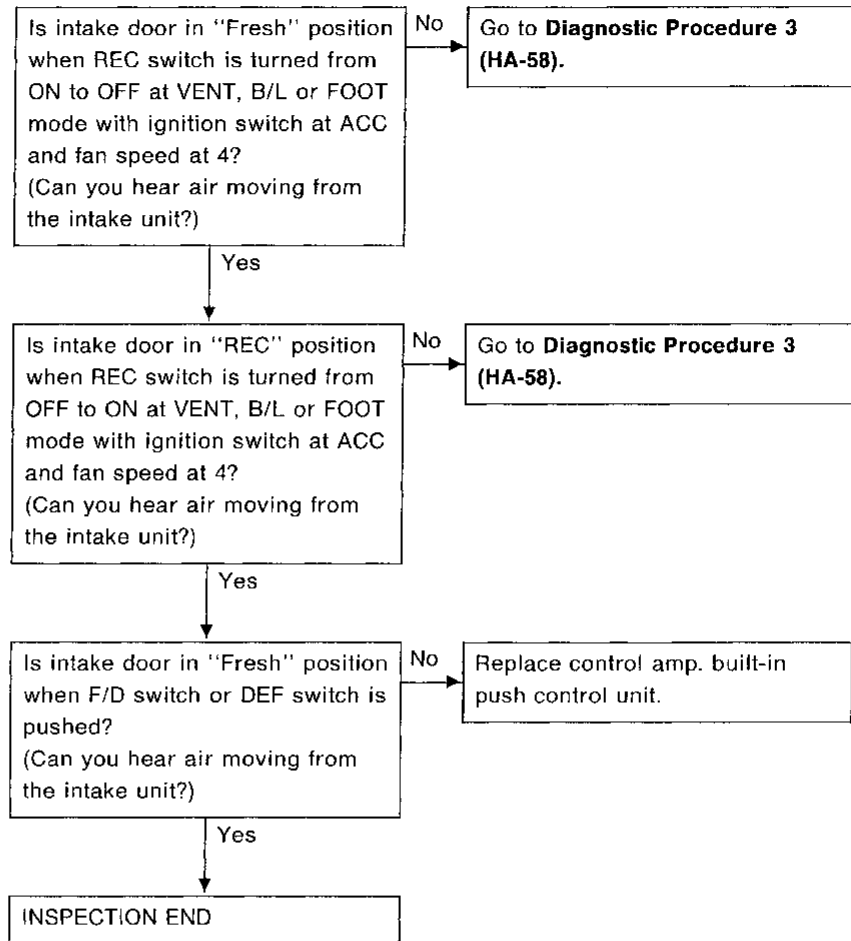
GI  
MA  
EM  
LC  
EF & EC  
FE  
CL  
MT  
AT  
FA  
RA  
BR  
ST  
BF  
HA  
EL  
IDX

# TROUBLE DIAGNOSES

## Preliminary Check

### PRELIMINARY CHECK 1

Intake door is not set at "FRESH" in DEF or F/D mode.

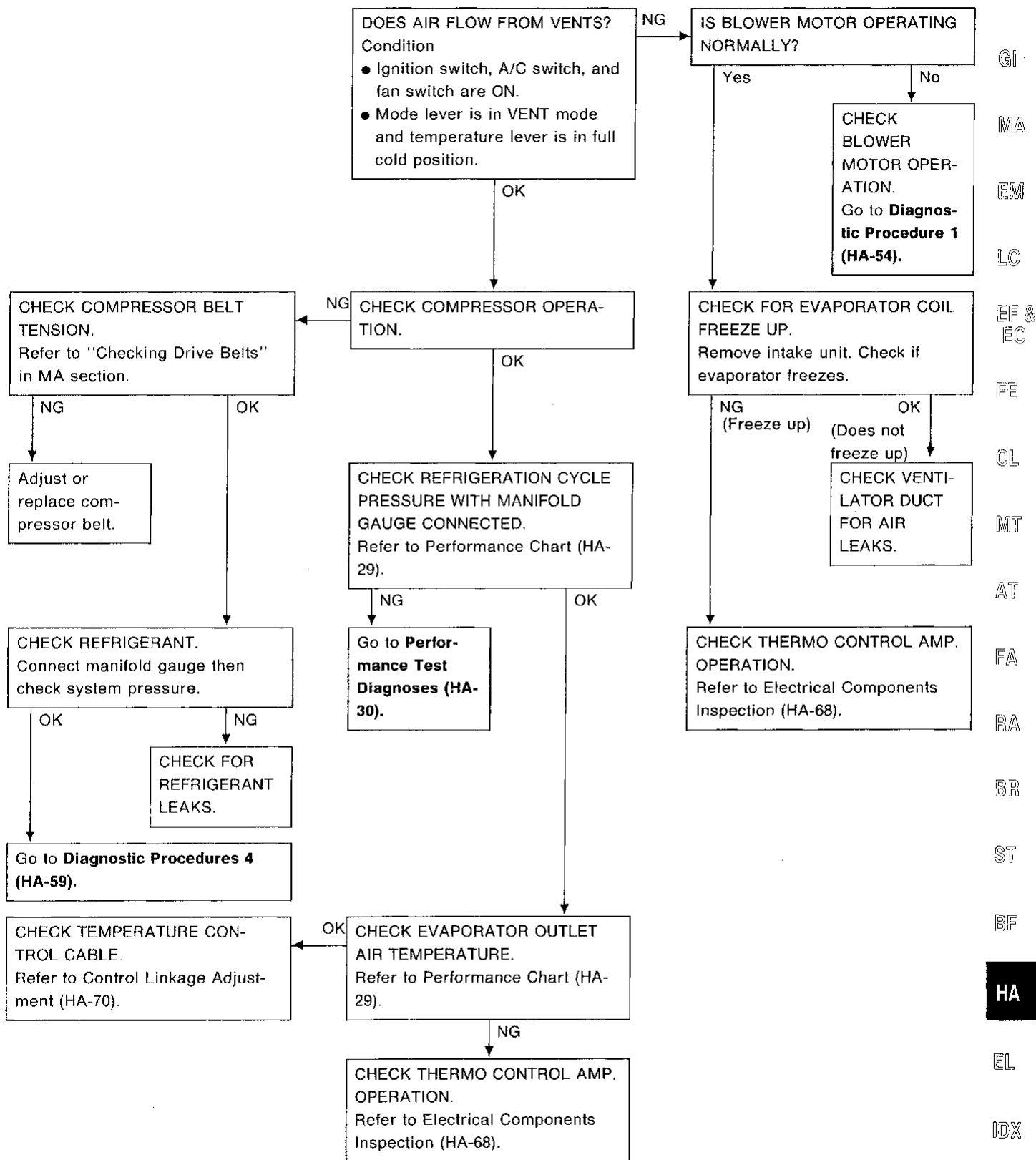


# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 2

A/C does not blow cold air.



GI

MA

EM

LC

EF & EC

FE

CL

MT

AT

FA

RA

BR

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BF

HA

EL

IDX

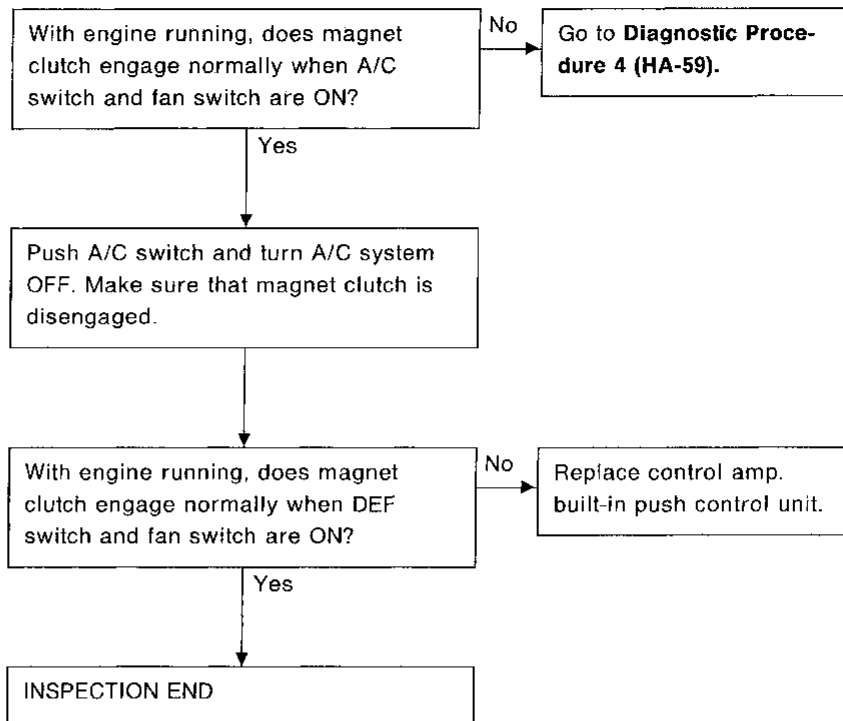
# TROUBLE DIAGNOSES

## 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.



### PRELIMINARY CHECK 4

**Air outlet does not change.**

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

Switch		Indicator illuminates					Air outlet
Mode		○					VENT
			○				FOOT & VENT
				○			FOOT & DEF
					○		FOOT & DEF
						○	DEF

Yes

INSPECTION END

No

Go to Diagnostic Procedure 2 (HA-56).

**Air distribution ratios**

VENT	B/L	FOOT	F/D	DEF	(%)
					100
					70
					50
					40
					0

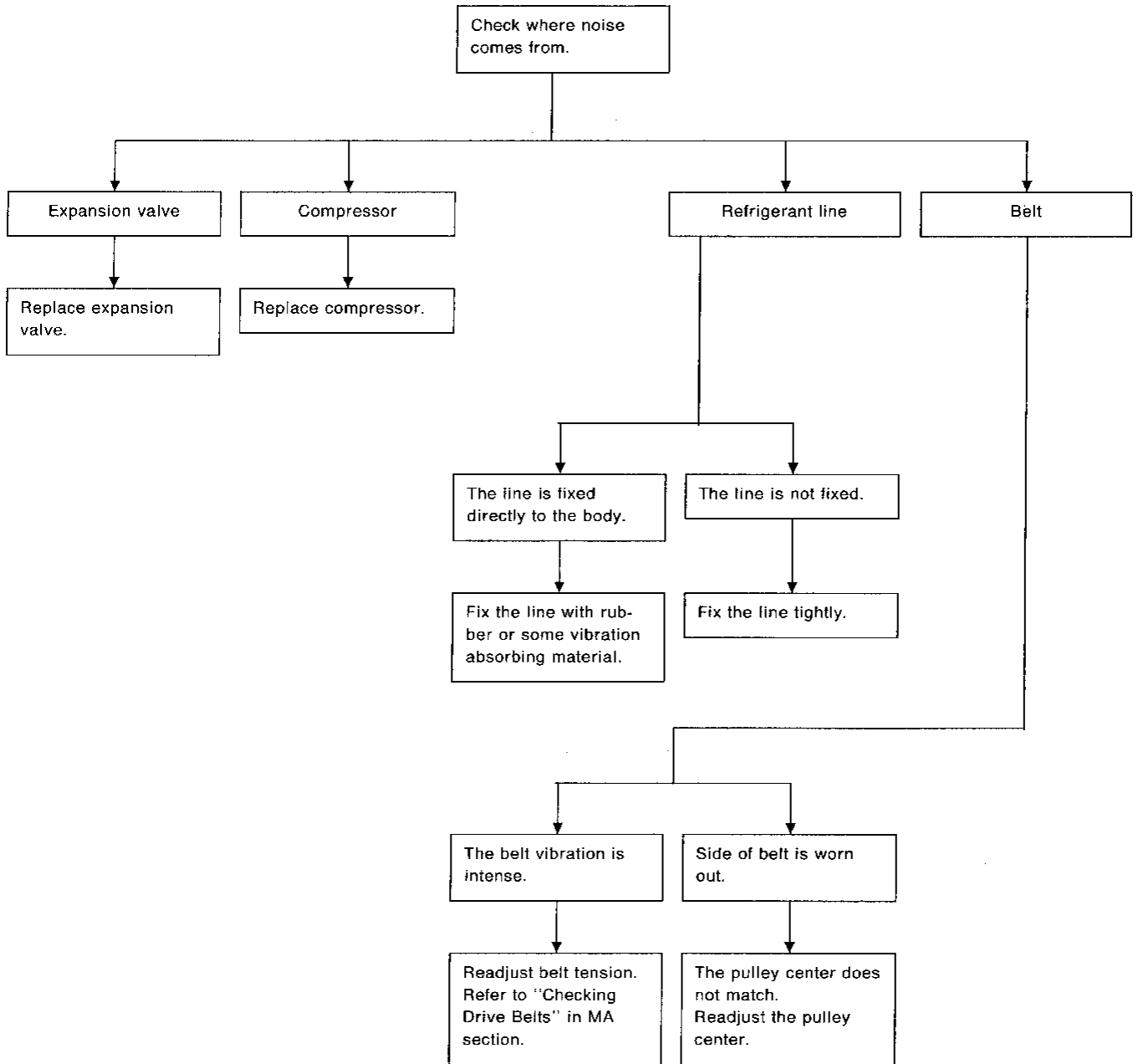


# TROUBLE DIAGNOSES

## Preliminary Check (Cont'd)

### PRELIMINARY CHECK 5

#### Noise



GI

MA

EM

LC

EF &  
EC

FE

CL

MT

AT

FA

RA

BR

ST

BF

**HA**

EL

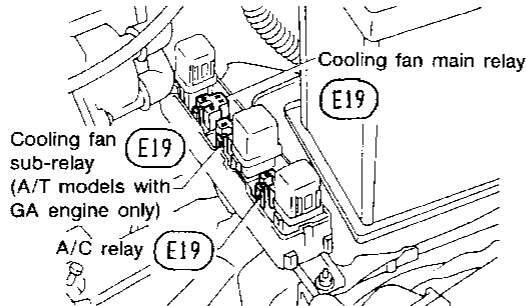
IDX

# TROUBLE DIAGNOSES

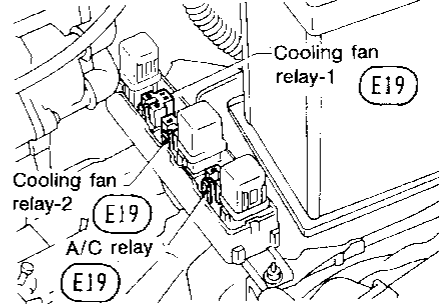
## Harness Layout for A/C System

### Engine compartment

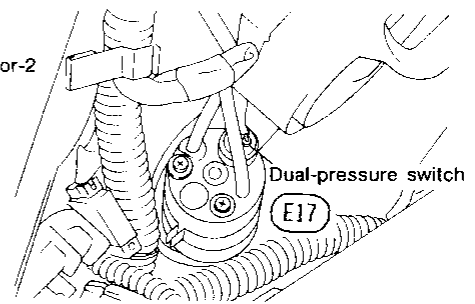
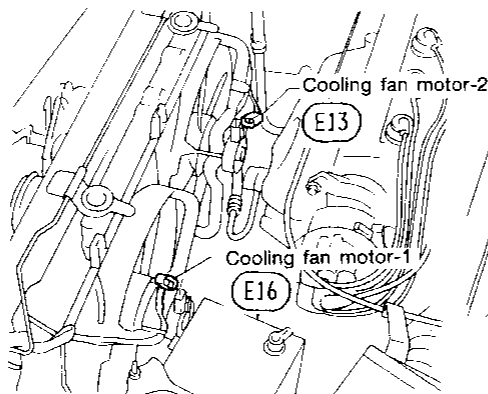
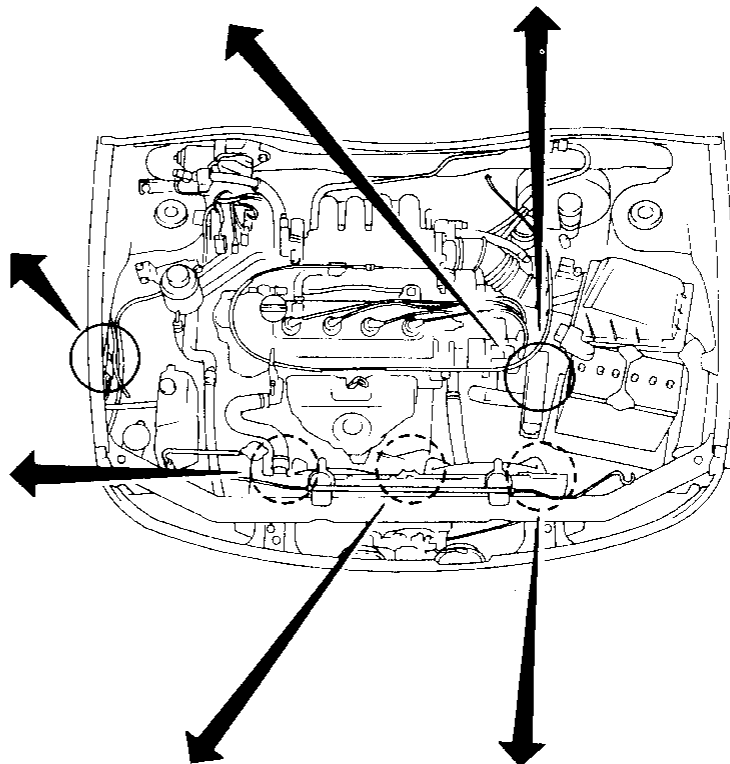
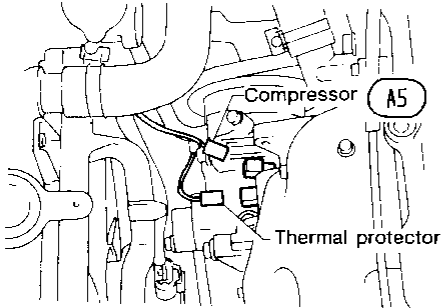
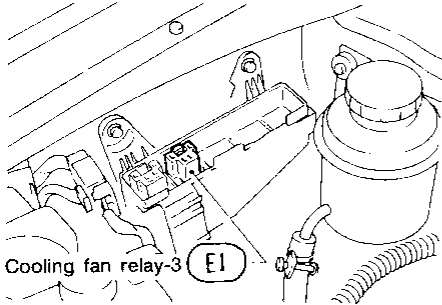
Except for A/T models with SR engine



A/T models with SR engine



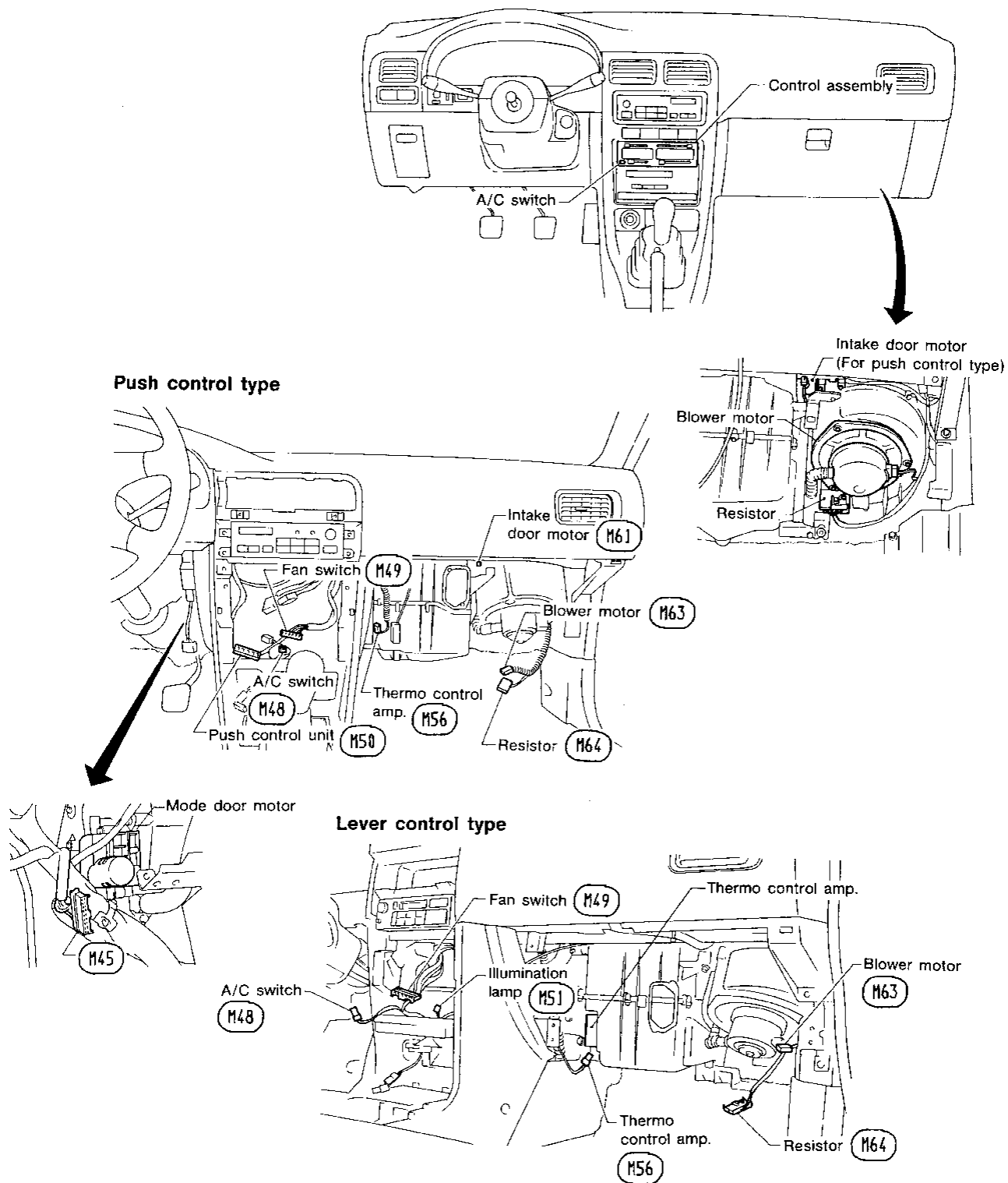
A/T models with SR engine



# TROUBLE DIAGNOSES

## Harness Layout for A/C System (Cont'd)

Passenger compartment



GI

MA

EM

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EF &  
EC

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FA

RA

BR

ST

BF

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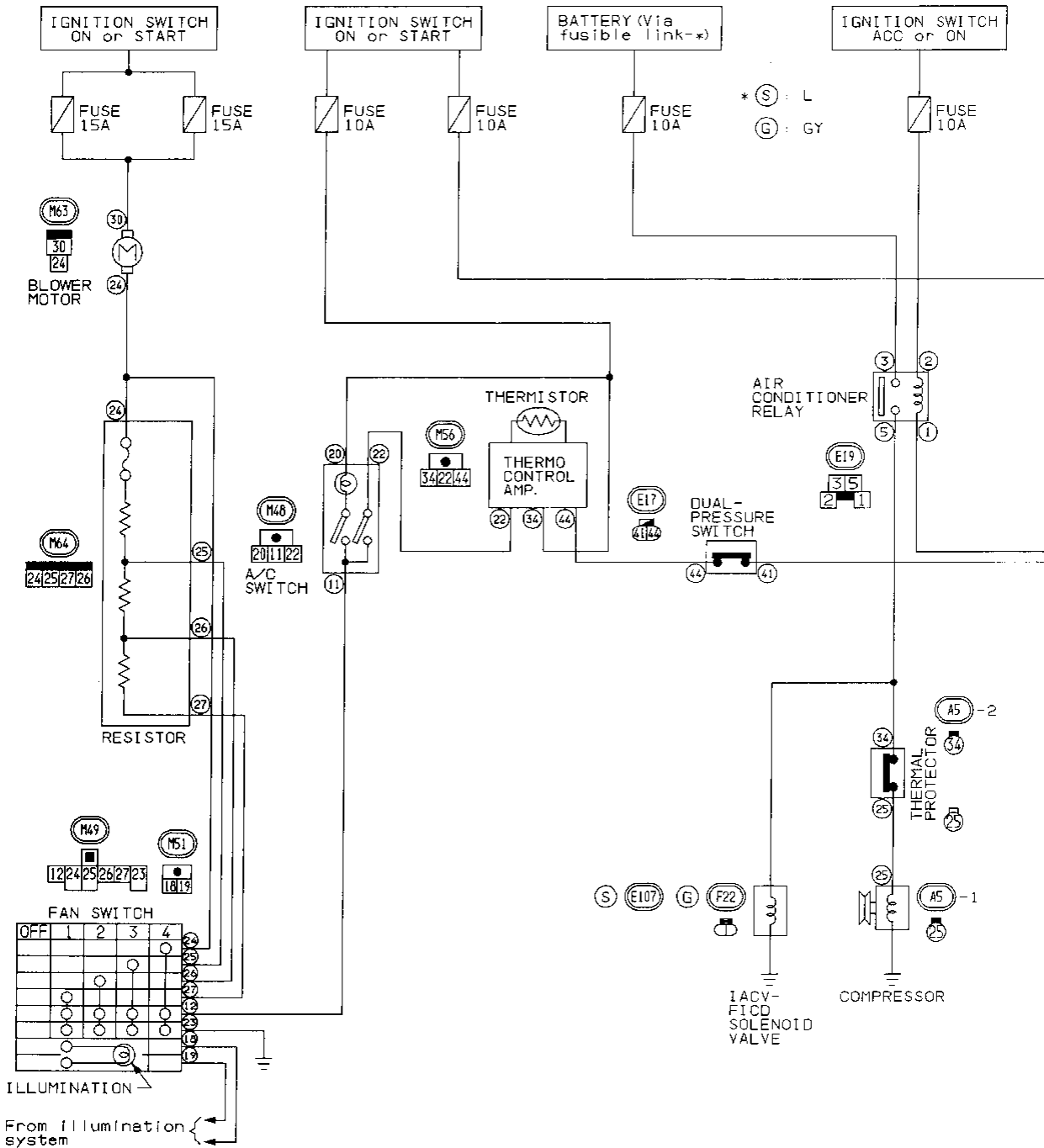
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# TROUBLE DIAGNOSES

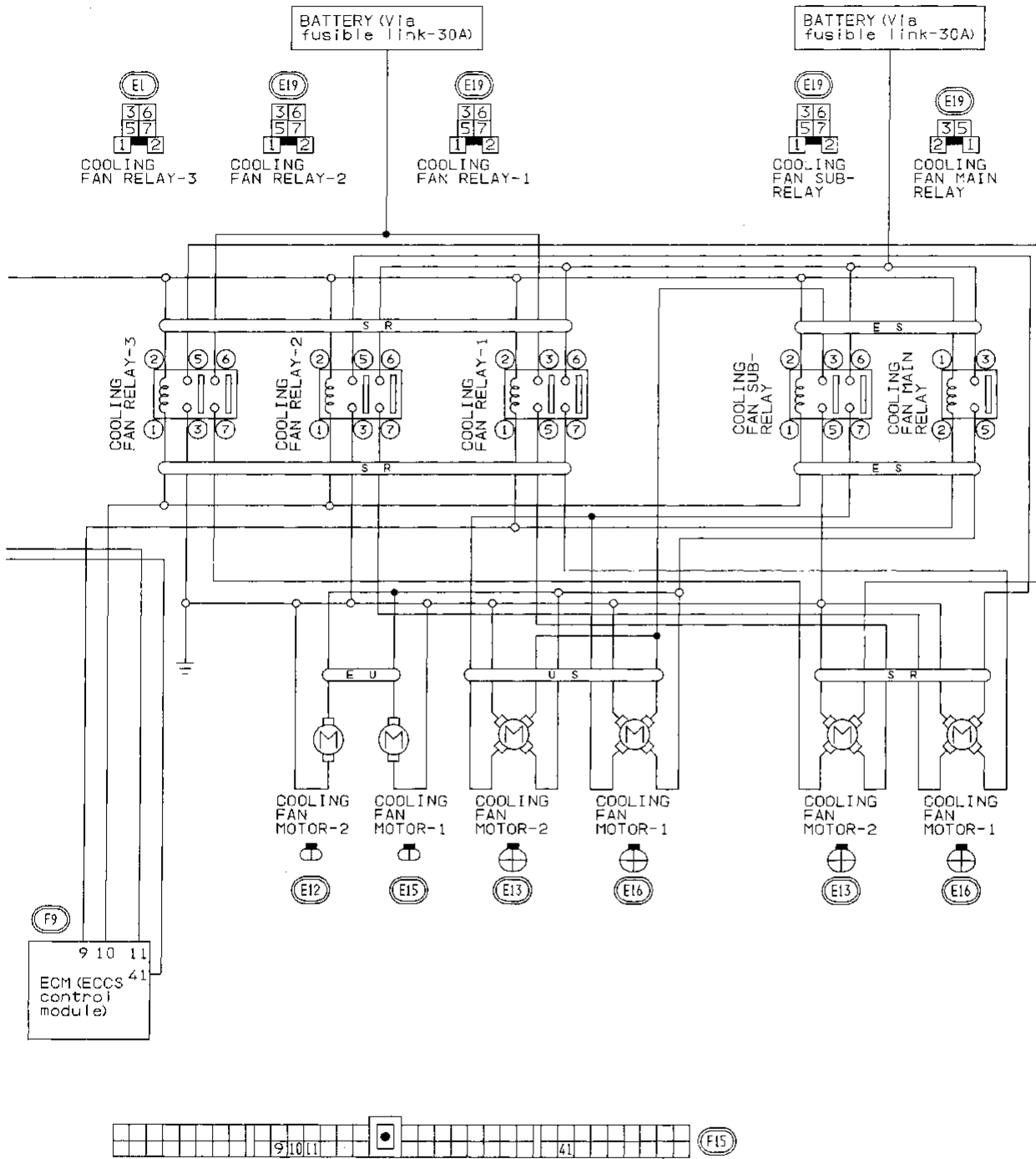
## Circuit Diagram for Quick Pinpoint Check

### LEVER CONTROL TYPE



# TROUBLE DIAGNOSES

## Circuit Diagram for Quick Pinpoint Check (Cont'd)



GI  
MA  
EM  
LC  
EF &  
EC  
FE  
CL  
MT  
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FA  
RA  
BR  
ST  
BF

HA

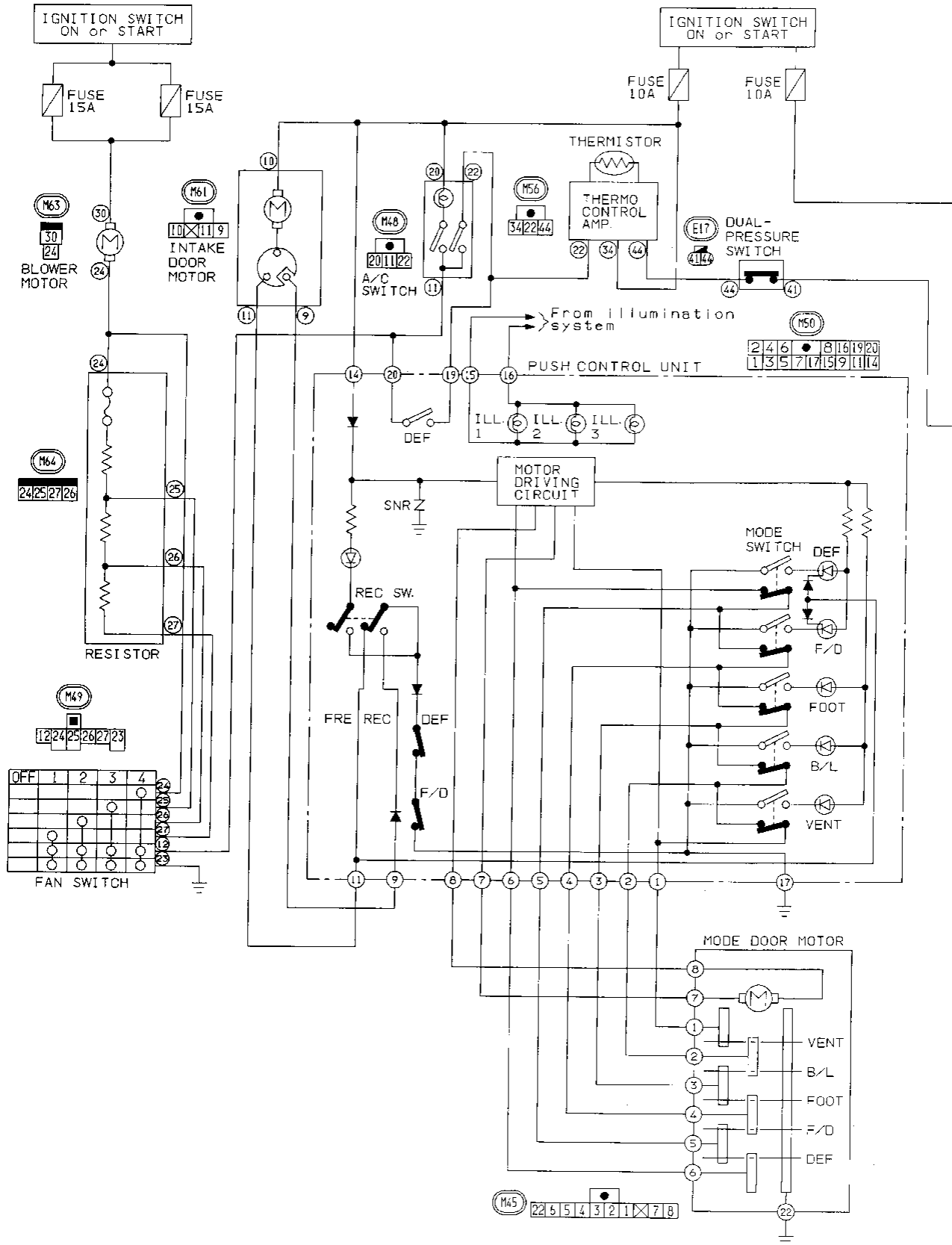
EL

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# TROUBLE DIAGNOSES

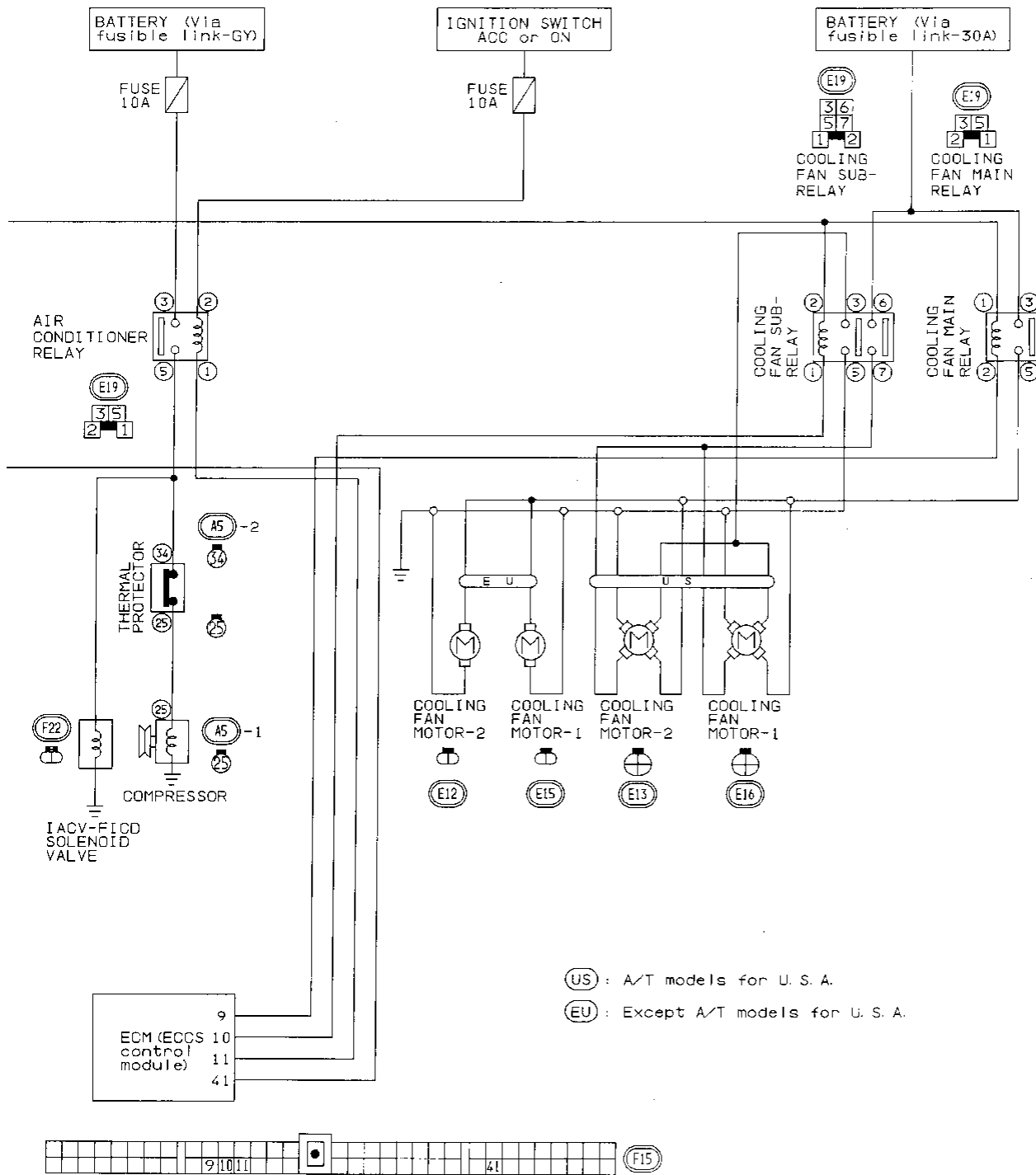
## Circuit Diagram for Quick Pinpoint Check (Cont'd)

### PUSH CONTROL TYPE



# TROUBLE DIAGNOSES

## Circuit Diagram for Quick Pinpoint Check (Cont'd)

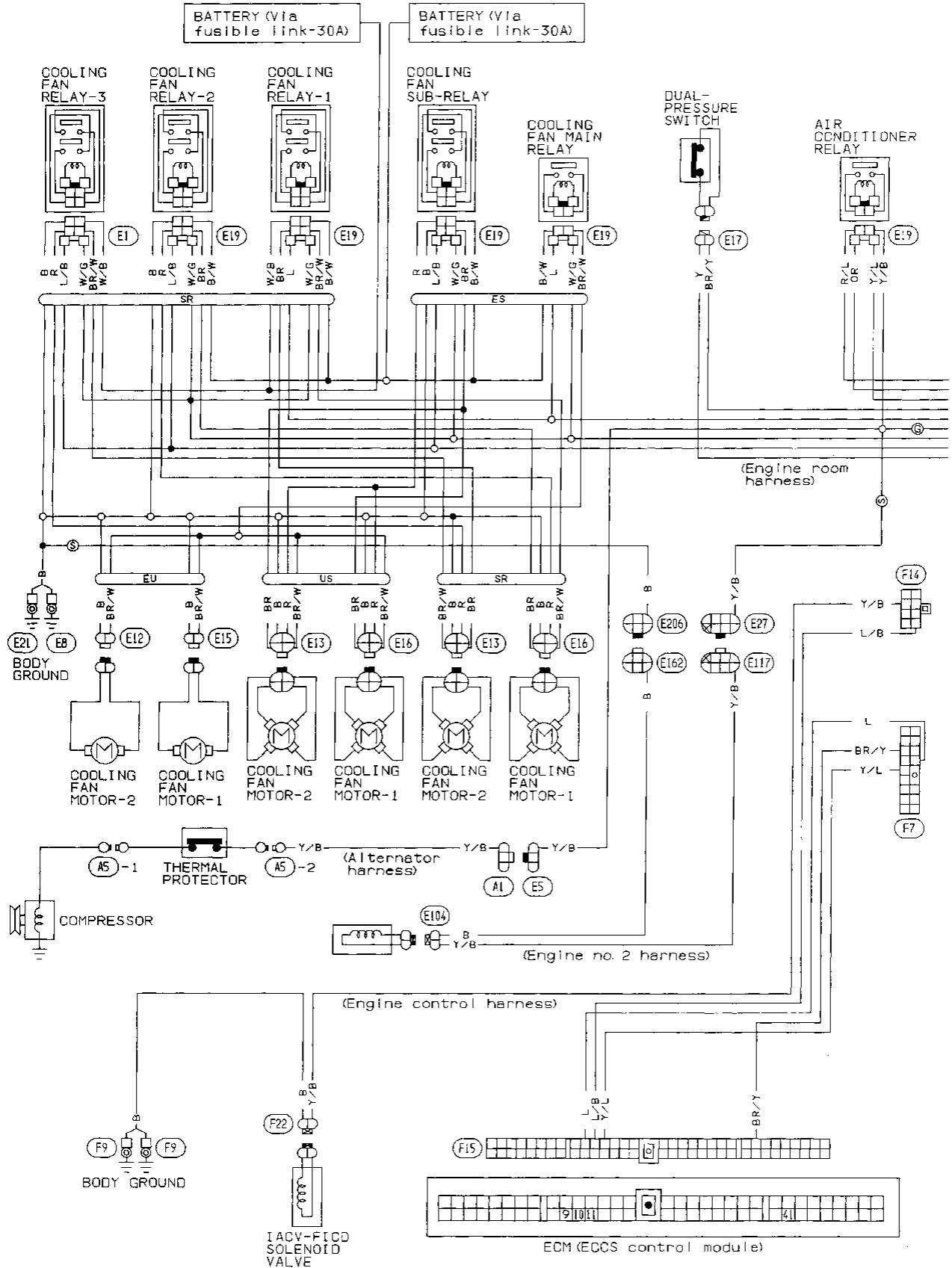


GI  
WA  
FM  
LC  
EF &  
EC  
FE  
CL  
MT  
AT  
FA  
RA  
BR  
ST  
BF  
HA  
EL  
IDX

# TROUBLE DIAGNOSES

## Wiring Diagram

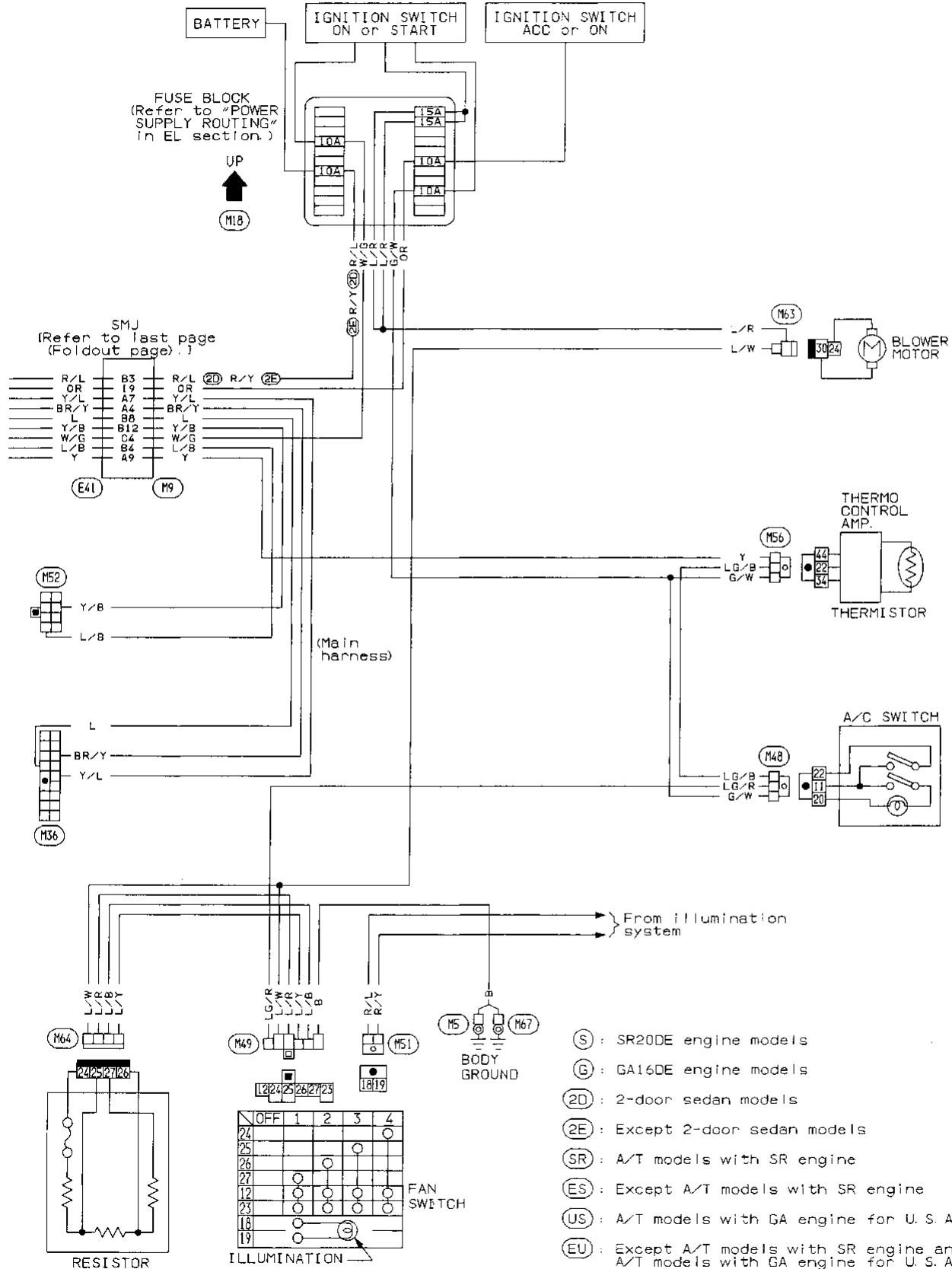
### LEVER CONTROL TYPE (A/C model)





# TROUBLE DIAGNOSES

## Wiring Diagram (Cont'd)



GI  
MA  
EM  
LC  
EF &  
EC  
FE  
CL  
MT  
AT  
FA  
RA  
BR  
ST  
BF

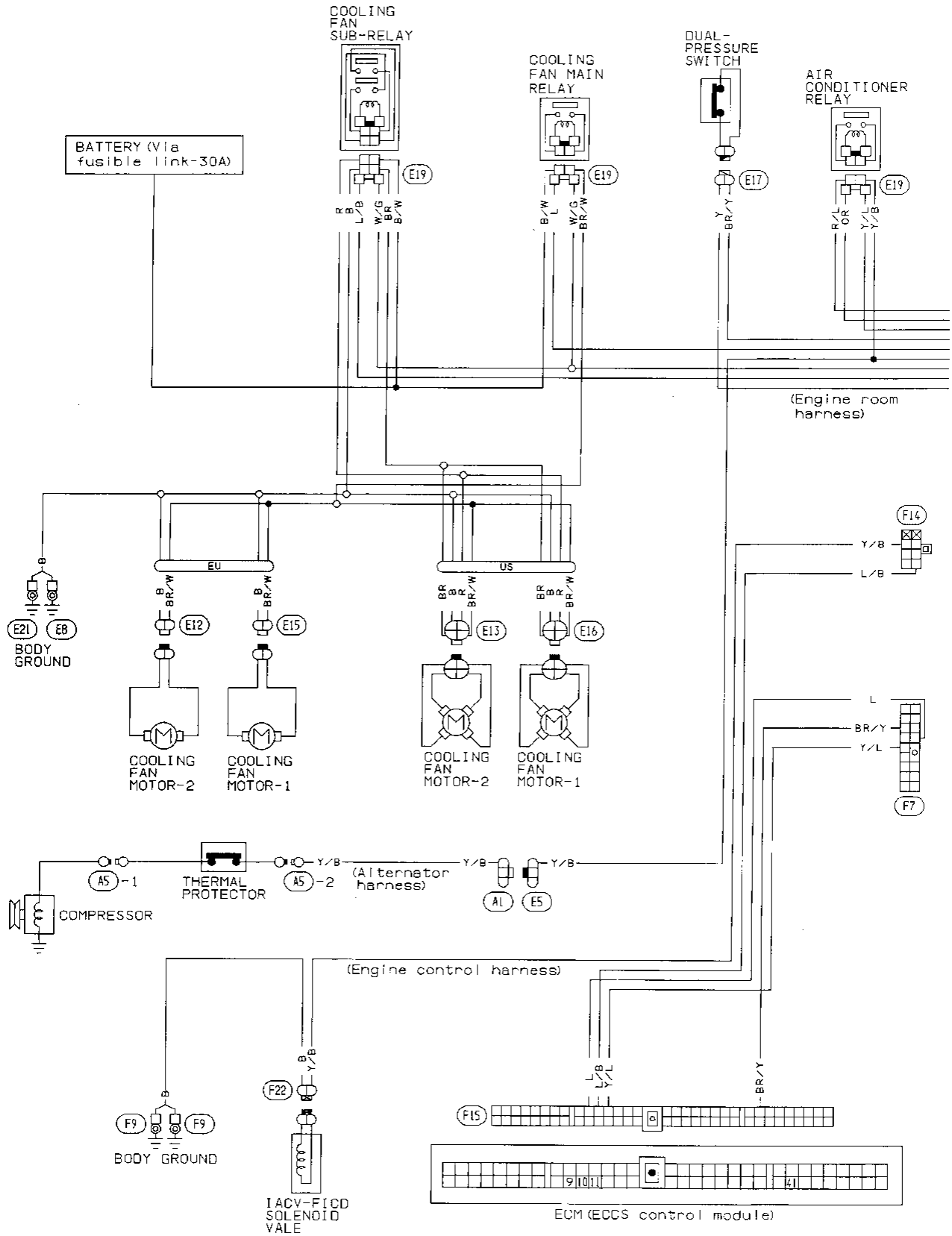
**HA**

EL  
IDX

# TROUBLE DIAGNOSES

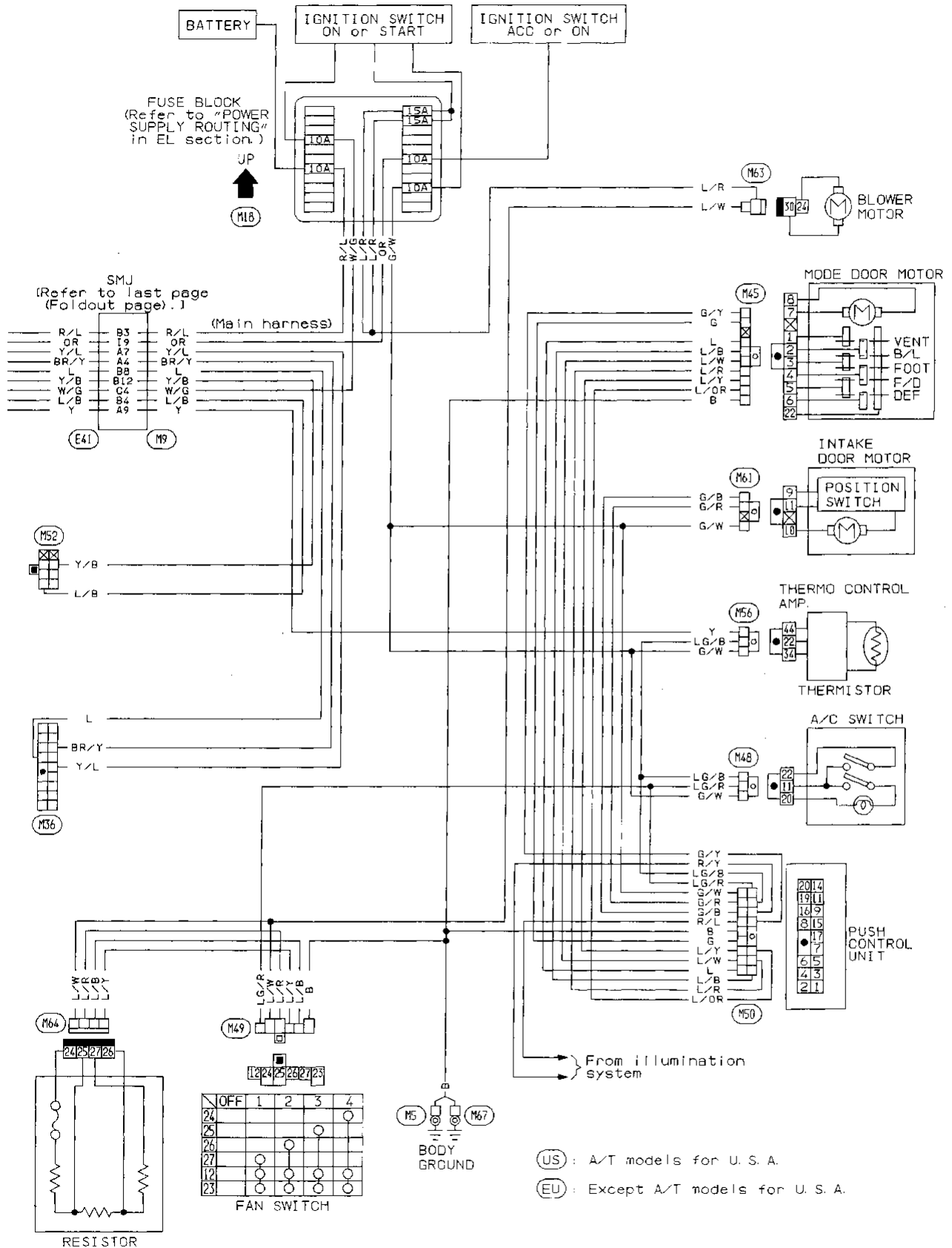
## Wiring Diagram (Cont'd)

### PUSH CONTROL TYPE (A/C model)



# TROUBLE DIAGNOSES

## Wiring Diagram (Cont'd)



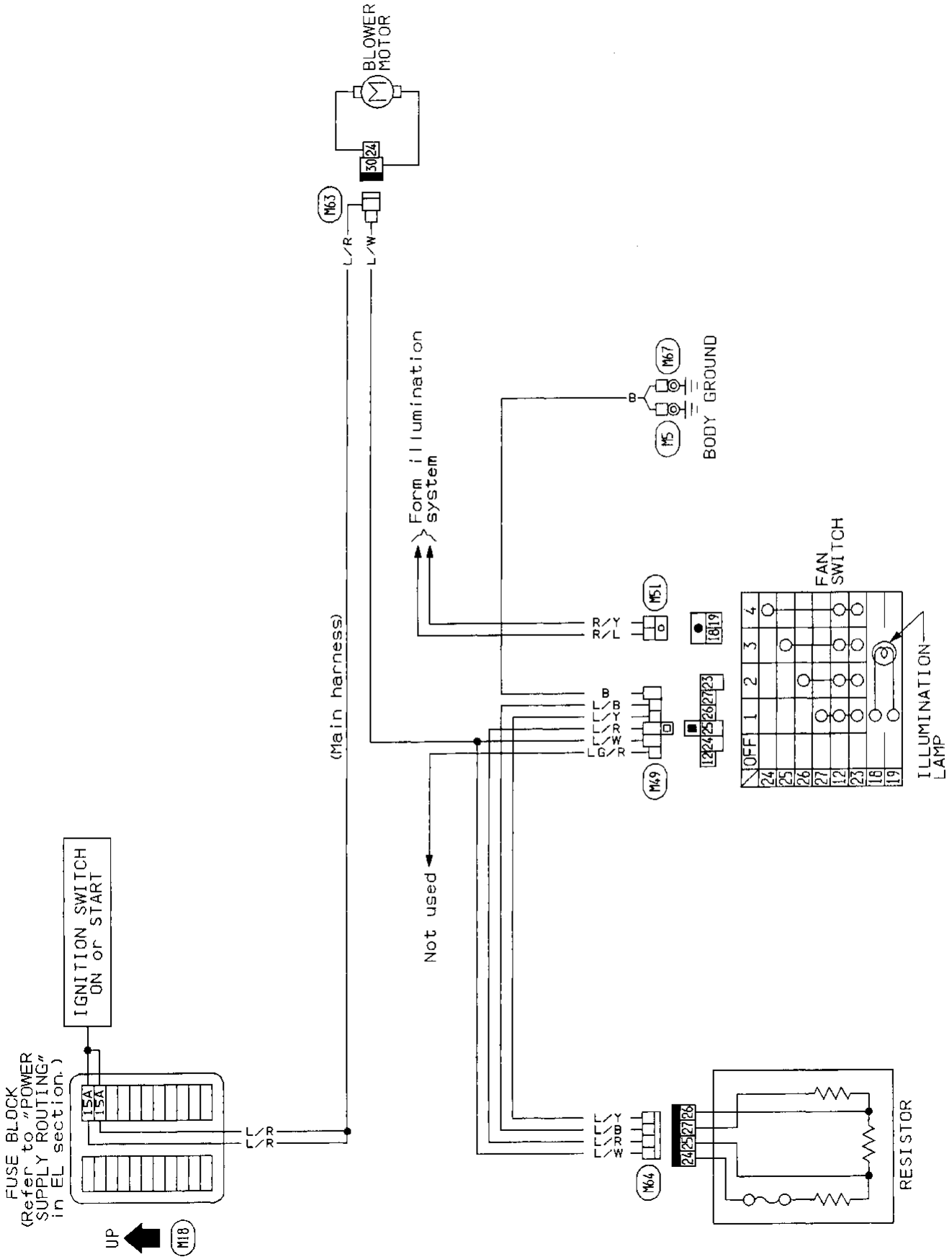
(US) : A/T models for U. S. A.  
 (EU) : Except A/T models for U. S. A.

GI  
 WA  
 EM  
 LC  
 EF & EC  
 FE  
 CL  
 MT  
 AT  
 FA  
 RA  
 BR  
 ST  
 BF  
**HA**  
 EL  
 DX

# TROUBLE DIAGNOSES

## Wiring Diagram (Cont'd)

### LEVER CONTROL TYPE (Heater model)



MHA143A

# TROUBLE DIAGNOSES

## Main Power Supply and Ground Circuit Check

### POWER SUPPLY CIRCUIT CHECK FOR A/C SYSTEM

Check power supply circuit for air conditioning system.

Refer to "POWER SUPPLY ROUTING" in EL section and "Wiring Diagram".

GI

MA

EM

LC

EF &  
EC

FE

CL

MT

AT

FA

RA

BR

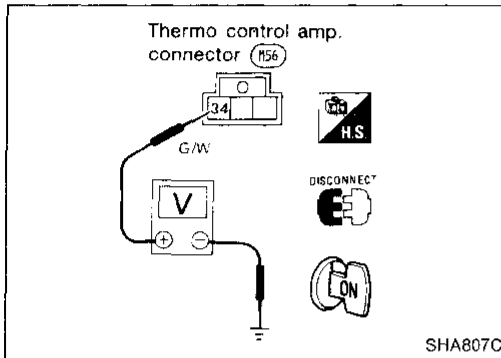
ST

BF

HA

EL

IDX

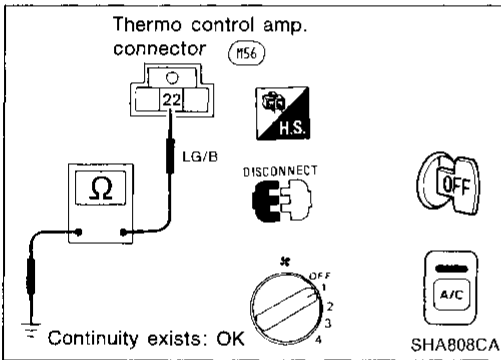


### THERMO CONTROL AMP. CHECK

Check power supply circuit for thermo control amp. with ignition switch ON.

1. Disconnect thermo control amp. harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ③④ and body ground.

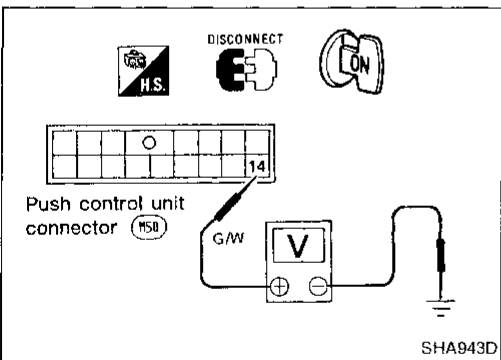
Voltmeter terminal		Voltage
⊕	⊖	
③④	Body ground	Approx. 12V



Check body ground circuit for thermo control amp. with ignition switch OFF, A/C switch ON and fan switch ON.

1. Disconnect thermo control amp. harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ②② and body ground.

Ohmmeter terminal		Continuity
⊕	⊖	
②②	Body ground	Yes

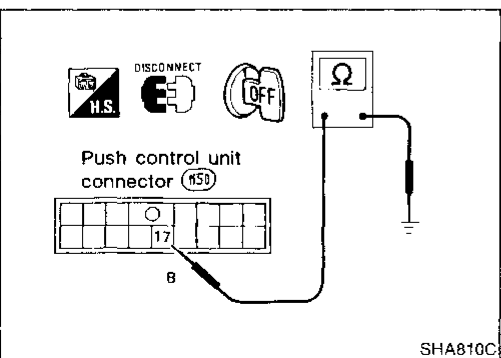


### PUSH CONTROL UNIT CHECK

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

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

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



Check body ground circuit for push control unit with ignition switch OFF.

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

Ohmmeter terminal		Continuity
⊕	⊖	
⑰	Body ground	Yes

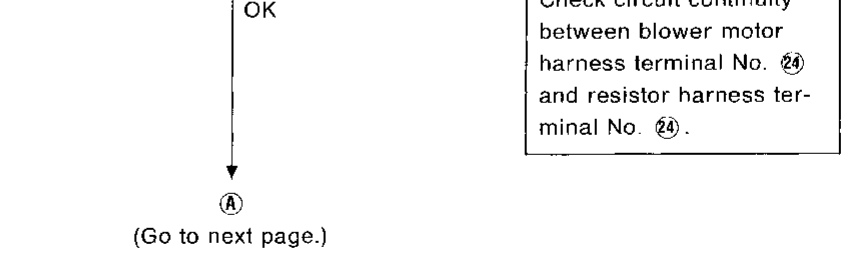
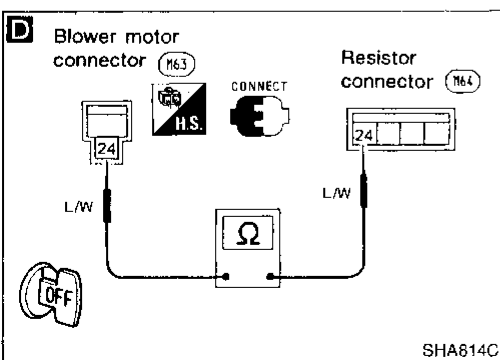
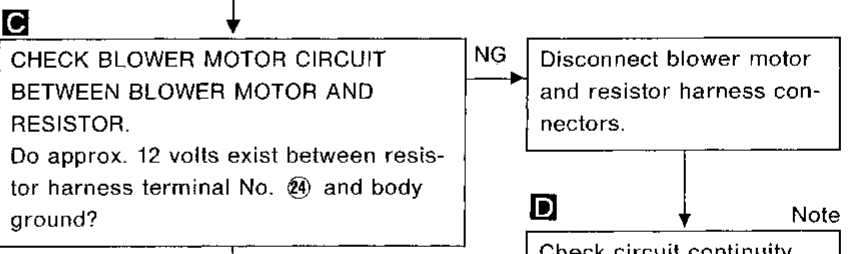
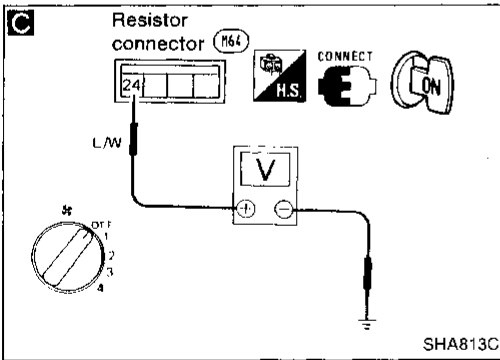
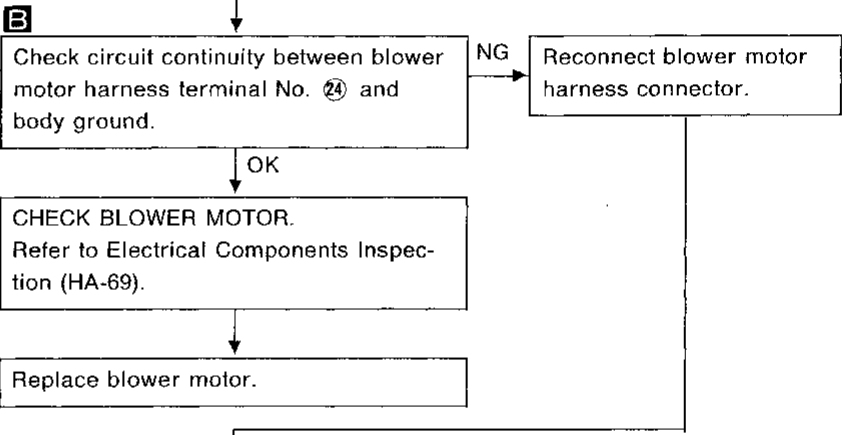
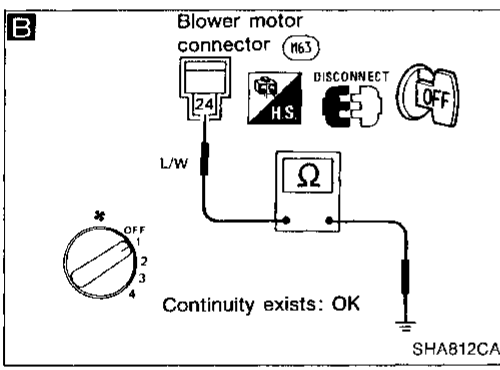
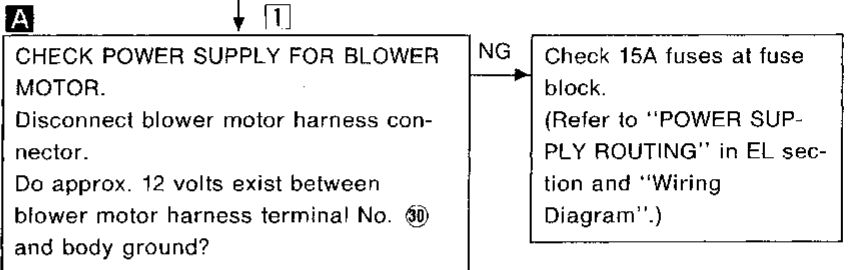
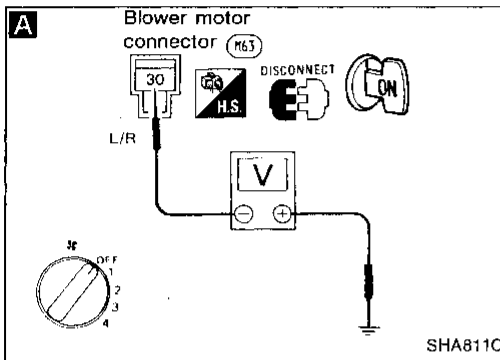
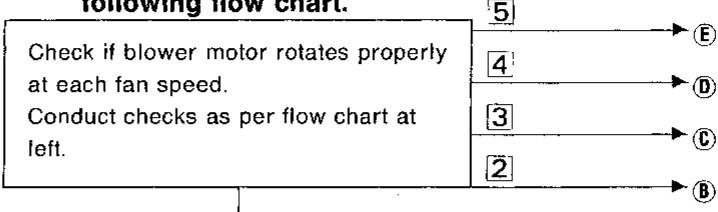
# TROUBLE DIAGNOSES

	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.

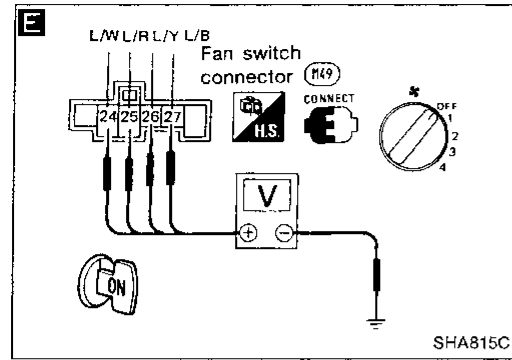
- Perform **PRELIMINARY CHECK 2** before referring to the following flow chart.



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

# TROUBLE DIAGNOSES

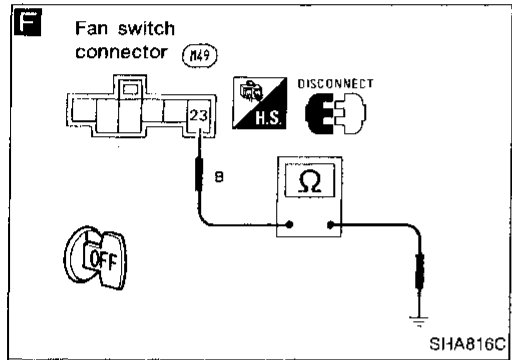
## Diagnostic Procedure 1 (Cont'd)



1 → A  
2 → B  
3 → C  
4 → D

**1** CHECK RESISTOR AFTER DISCONNECTING IT. Refer to Electrical Components Inspection (HA-69).

OK →  
NG → Replace resistor.  
Reconnect resistor harness connector.

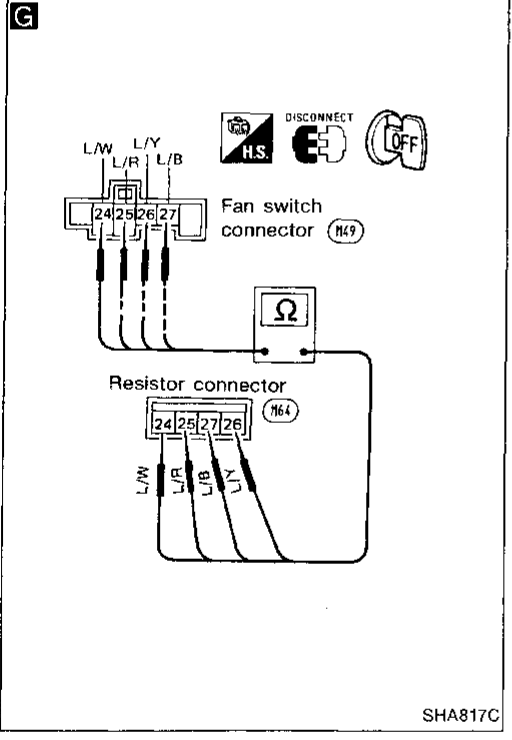


1 →  
2 →  
3 →  
4 →  
5 →

**E** CHECK FAN SWITCH CIRCUIT. Do approx. 12 volts exist between each fan switch harness terminal and body ground?

Flow chart No.	Terminal No.		Voltage
	⊕	⊖	
2	27	Body ground	Approx. 12V
3	26		
4	25		
5	24		

OK →  
NG → **G** Check circuit continuity between fan switch and resistor. Note



NG → **G** Check circuit continuity between fan switch and resistor. Note  
Replace fan switch.

OK → **F** Check circuit continuity between fan switch harness terminal No. 23 and body ground. Note

OK →  
NG → Replace blower motor.

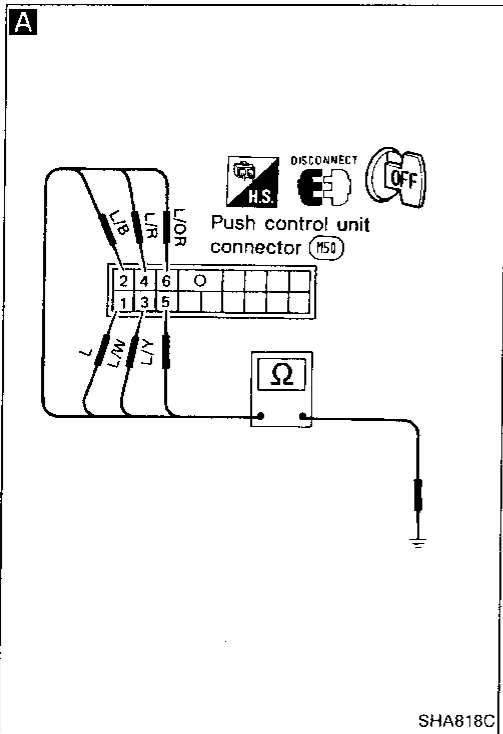
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

CI  
MA  
EM  
LC  
EF & EC  
FE  
CL  
MT  
AT  
FA  
RA  
BR  
ST  
BF  
HA  
EL  
IDX

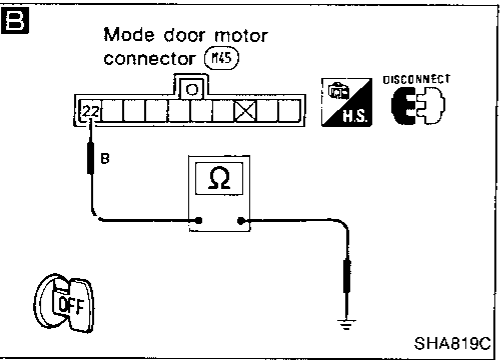
## Diagnostic Procedure 2

**SYMPTOM: Air outlet does not change. — For push control type**

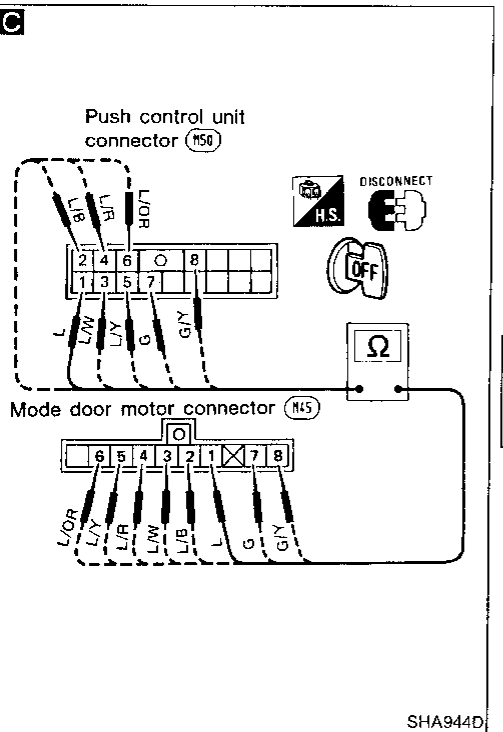
- Perform **PRELIMINARY CHECK 3** and **Main Power Supply and Ground Circuit Check** before referring to the following flow chart.



SHA818C



SHA819C



SHA944D

**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 if continuity exists between terminal No. 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-71).

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

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. ② and body ground?

OK

**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	
⑧	⑧	

OK

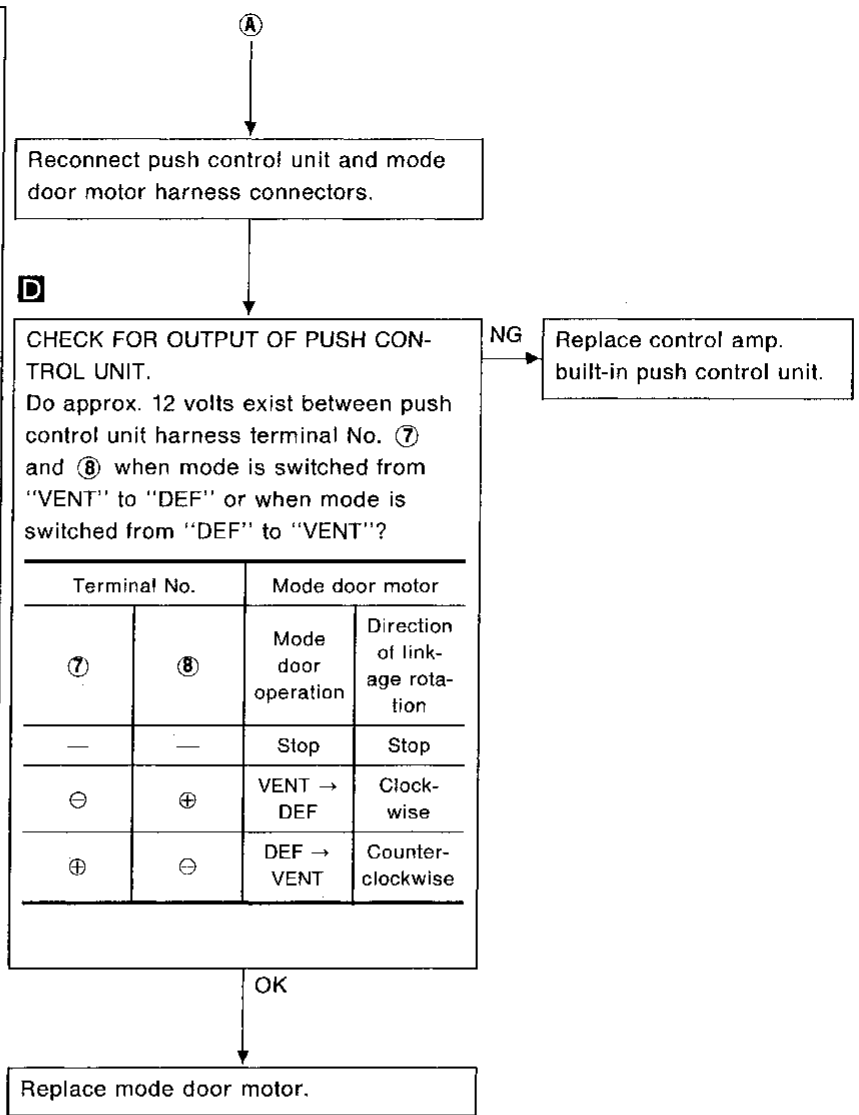
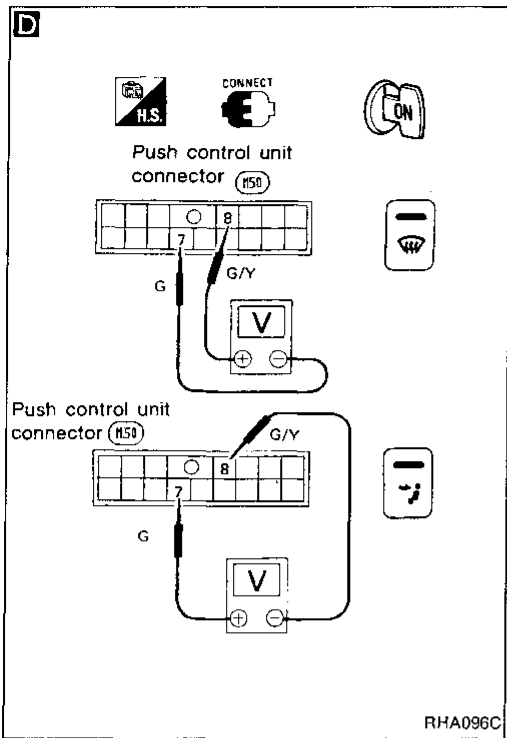
Ⓐ

(Go to next page.)



# TROUBLE DIAGNOSES

## Diagnostic Procedure 2 (Cont'd)



GI

MA

EM

LC

EF &  
EC

FE

CL

MT

AT

FA

RA

BR

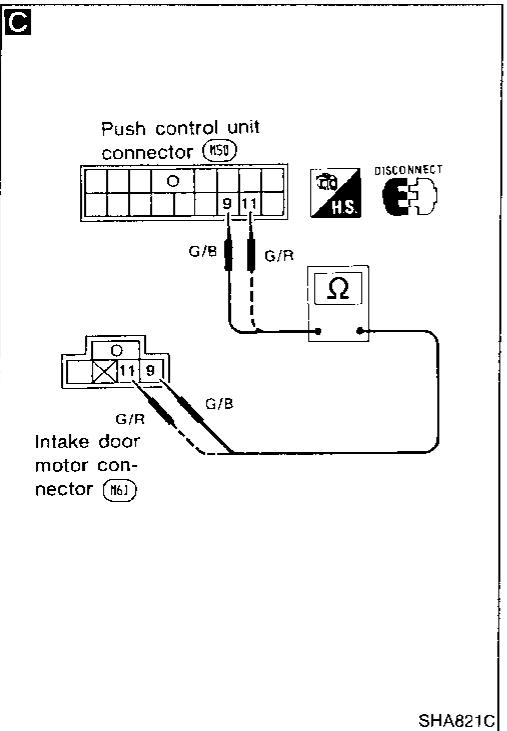
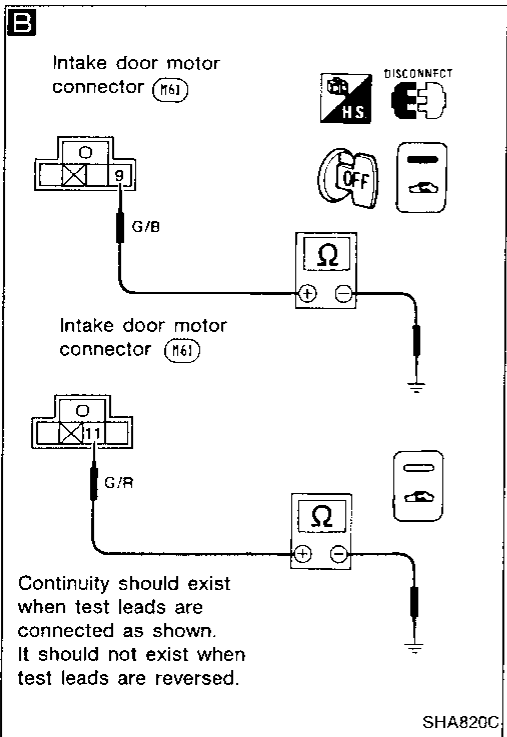
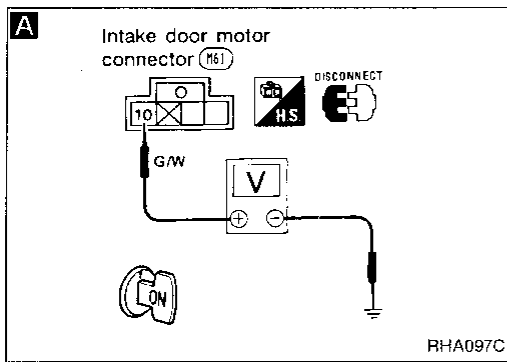
ST

BF

HA

EL

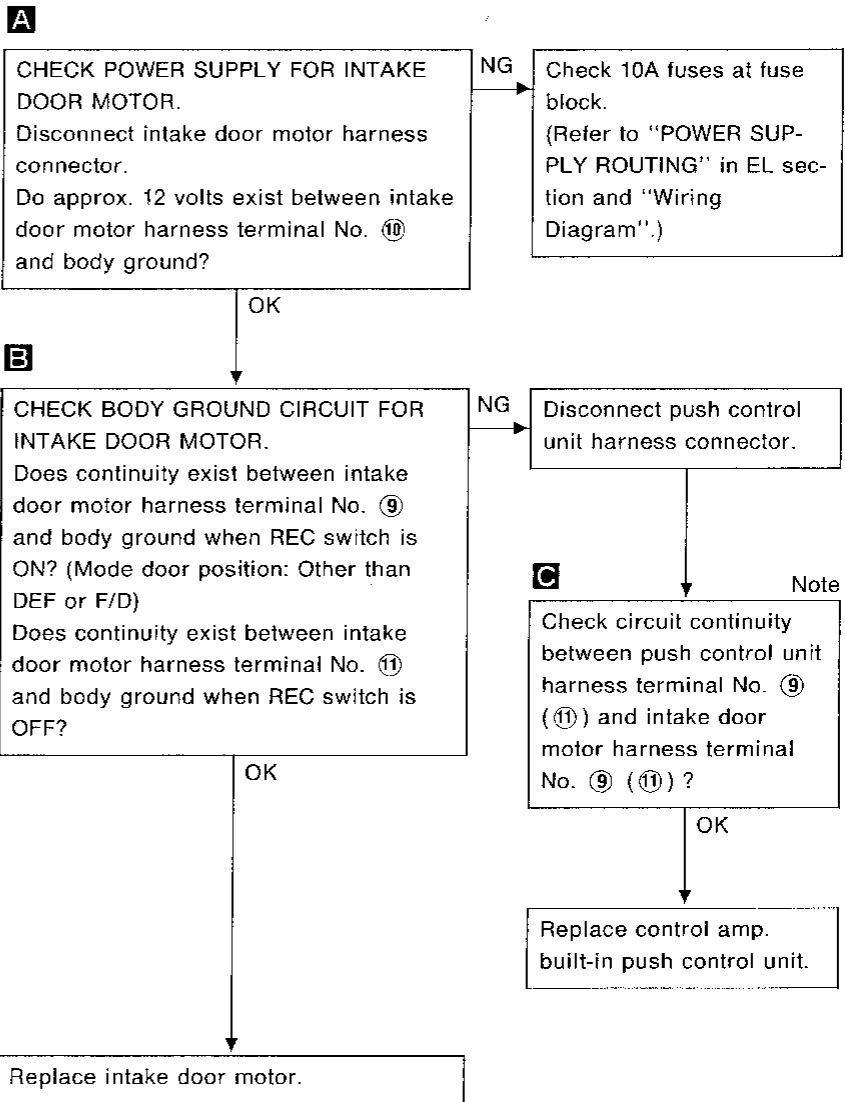
IDX



## Diagnostic Procedure 3

**SYMPTOM: Intake door does not change. — For push control type**

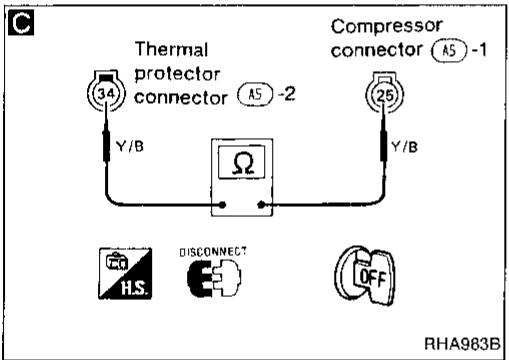
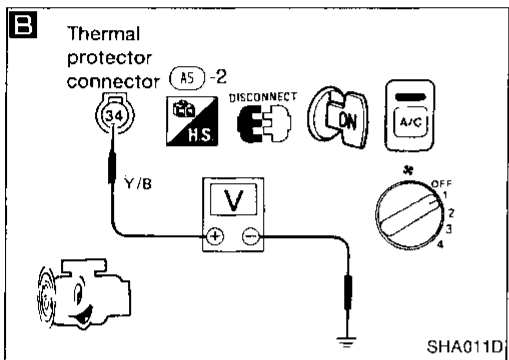
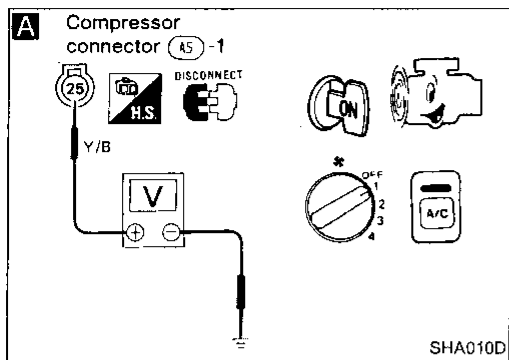
- Perform **PRELIMINARY CHECK 1** and **Main Power Supply and Ground Circuit Check** before referring to the following flow chart.



**Note:**

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

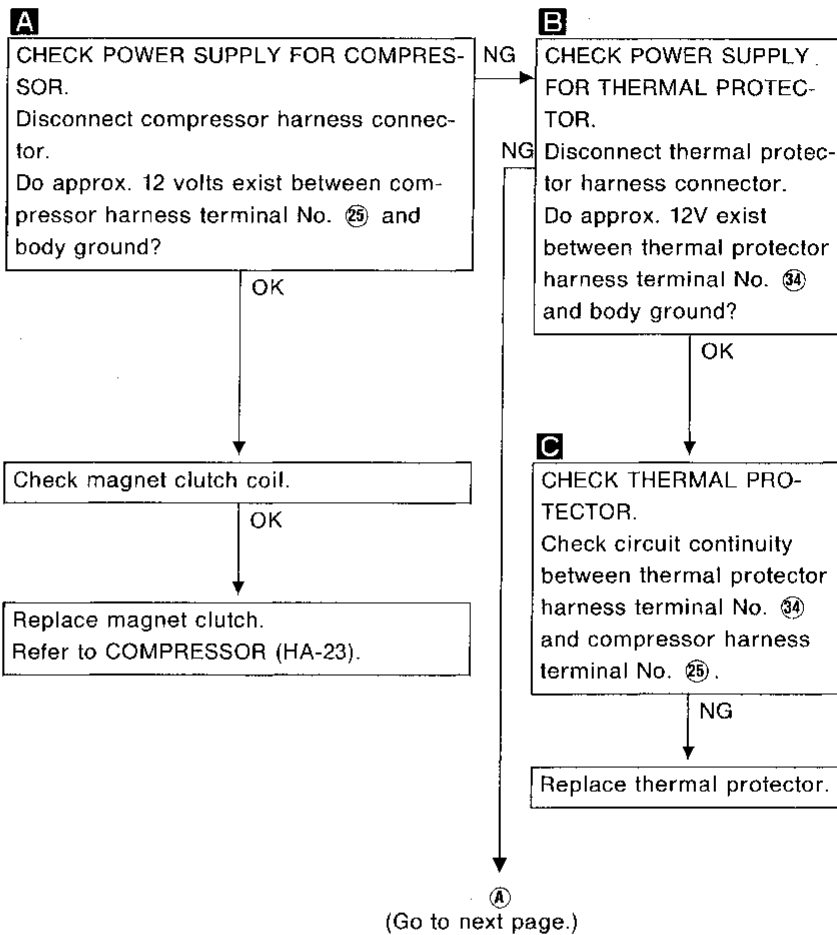
# TROUBLE DIAGNOSES



## Diagnostic Procedure 4

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

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



GI

MA

EM

LC

EF & EC

FE

CL

WT

AT

FA

RA

BR

ST

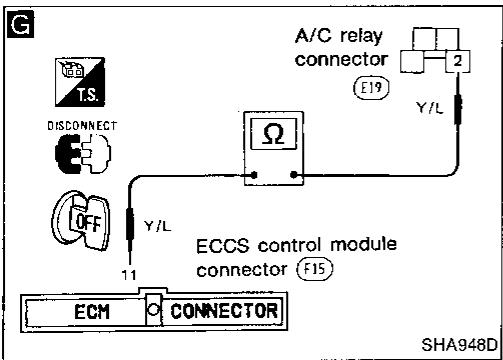
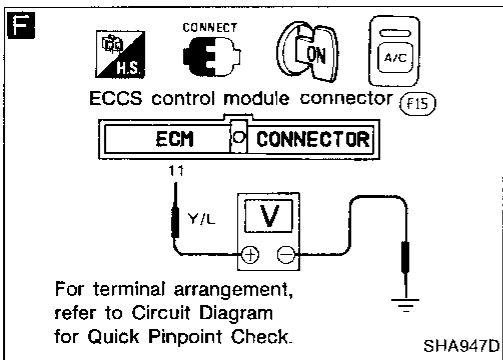
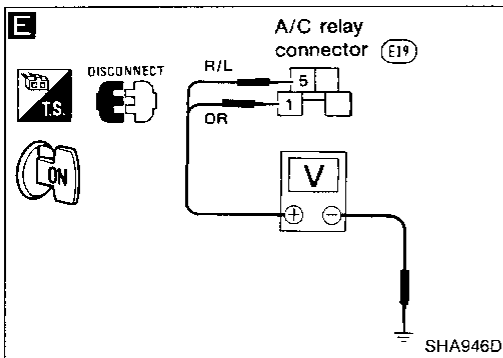
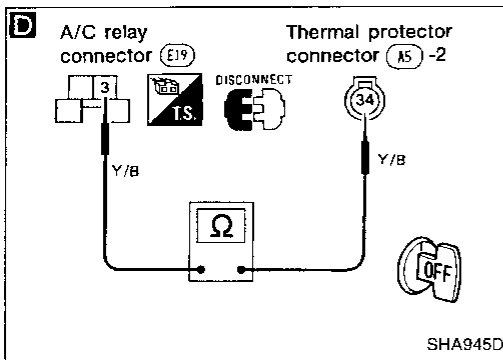
BF

HA

EL

# TROUBLE DIAGNOSES

## Diagnostic Procedure 4 (Cont'd)



**A**

Disconnect A/C relay harness connector.

**D**

Check circuit continuity between A/C relay harness terminal No. ③ and thermal protector harness terminal No. ③④.

**E**

**Note**

OK

CHECK POWER SUPPLY FOR A/C RELAY. Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness terminal No. ①, ⑤ and body ground?

OK

NG

CHECK POWER SUPPLY CIRCUIT AND 10A FUSE AT FUSE BLOCK. (Refer to "POWER SUPPLY ROUTING" in EL section and "Wiring Diagram".)

CHECK A/C RELAY AFTER DISCONNECTING IT. Refer to Electrical Components Inspection (HA-68).

NG

Replace A/C relay.

OK

Reconnect A/C relay.

**F**

CHECK COIL SIDE CIRCUIT OF A/C RELAY. Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. ⑪ and body ground?

**G**

**Note**

NG

Check circuit continuity between A/C relay harness terminal No. ② and ECM (ECCS control module) harness terminal No. ⑪.

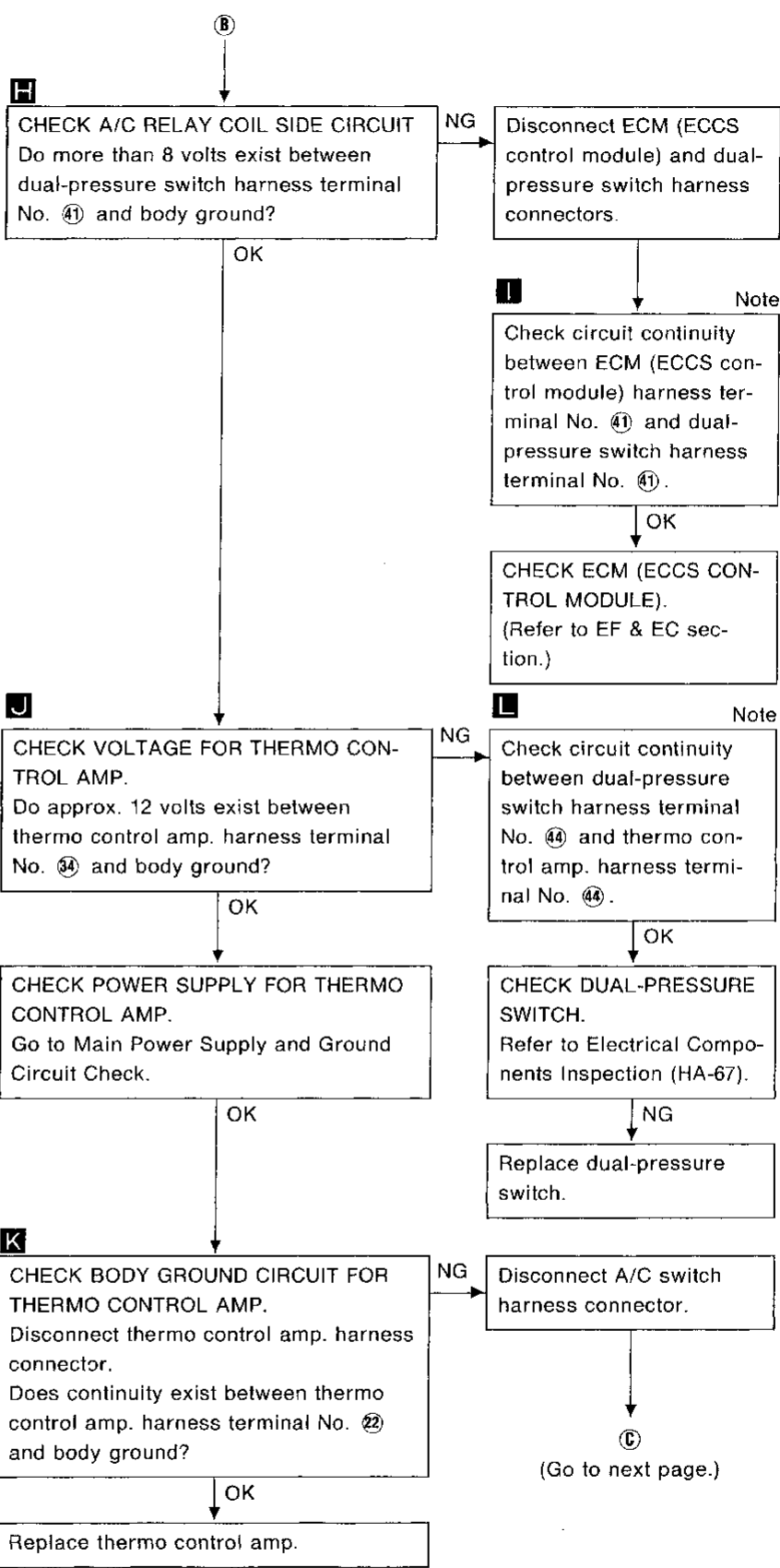
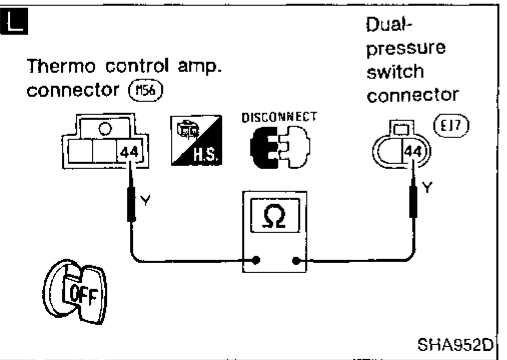
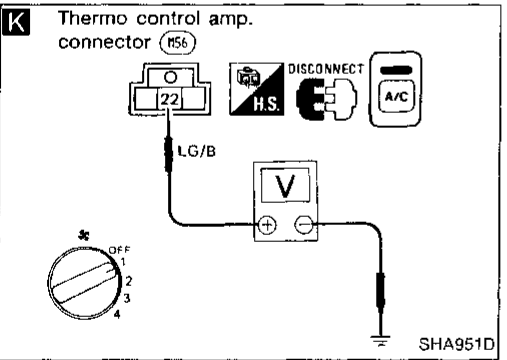
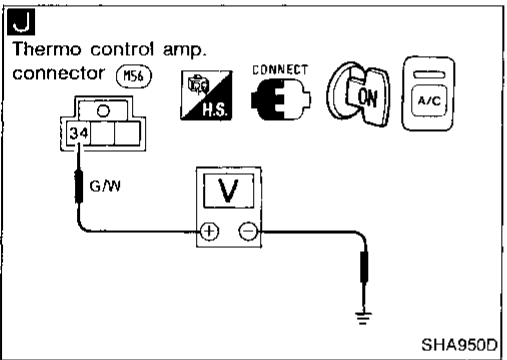
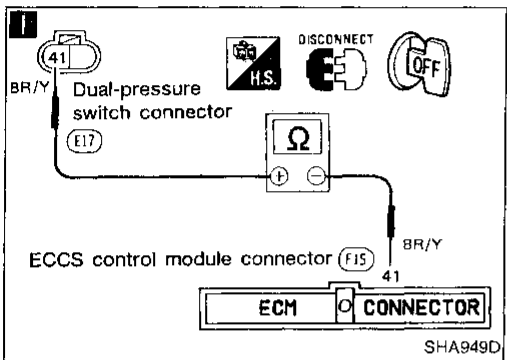
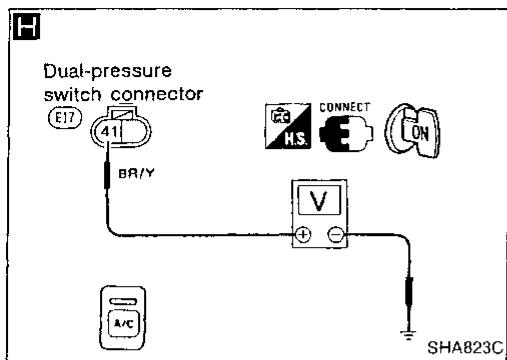
**B**

(Go to next page.)

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

# TROUBLE DIAGNOSES

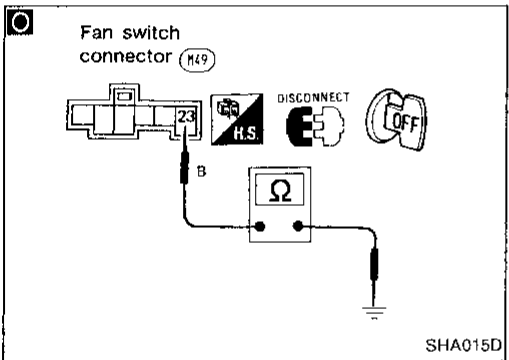
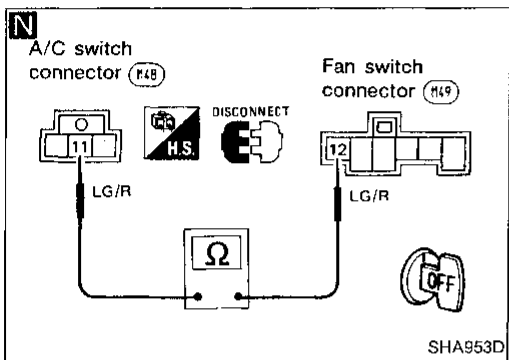
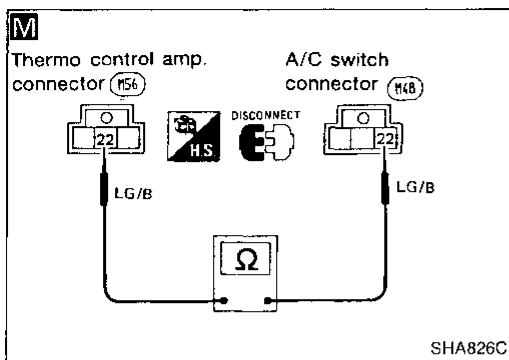
## Diagnostic Procedure 4 (Cont'd)



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

# TROUBLE DIAGNOSES

## Diagnostic Procedure 4 (Cont'd)



**C**

**M** Note

Check circuit continuity between thermo control amp. harness terminal No. ②② and A/C switch harness terminal No. ②②.

OK

**CHECK A/C SWITCH.**  
Refer to Electrical Components Inspection (HA-67).

NG → Replace A/C switch.

OK

Disconnect fan switch harness connector.

OK

**N** Note

Check circuit continuity between A/C switch harness terminal No. ①① and fan switch harness terminal No. ①②.

OK

**O** Note

**CHECK BODY GROUND CIRCUIT FOR FAN SWITCH.**  
Does continuity exist between fan switch harness terminal No. ②③ and body ground?

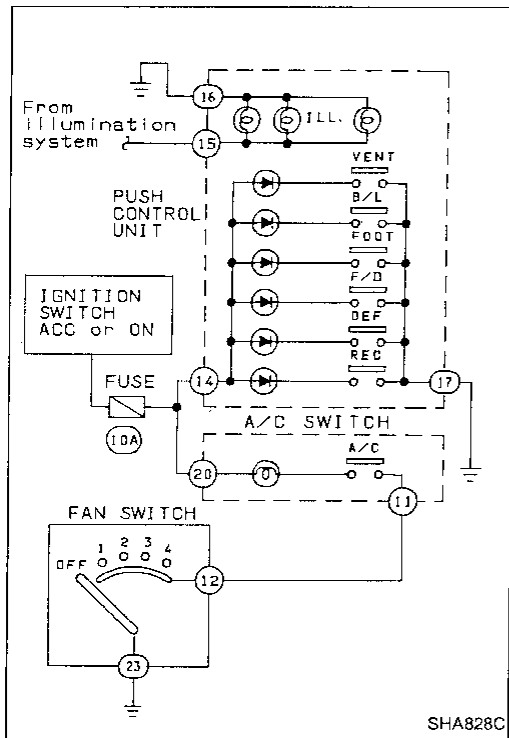
OK

**CHECK FAN SWITCH.**  
Refer to Electrical Components Inspection (HA-68).

NG

Replace fan switch.

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



## Diagnostic Procedure 5

**SYMPTOM: Illumination or indicators of push control unit do not come on. — For push control type**

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

Turn ignition switch and lighting switch ON.

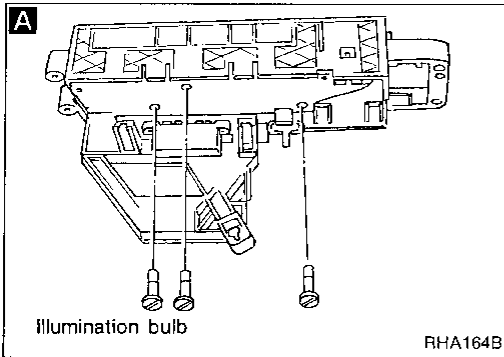
CHECK ILLUMINATION AND INDICATORS.

- Turn A/C, REC and fan switches ON.
- Push VENT, B/L, FOOT, F/D and DEF switches in order.
- Check for incidents and follow the repairing methods as shown:

INCIDENTS								"How to repair"
ILL.	VENT	B/L	FOOT	F/D	DEF	REC	A/C	
X	○	○	○	○	○	○	—	Go to DIAGNOSTIC PROCEDURE 5-1.
—	○	○	○	○	○	○	X	Go to DIAGNOSTIC PROCEDURE 5-2.
○	X	X	X	X	X	X	—	Go to DIAGNOSTIC PROCEDURE 5-3.
—	△						—	Replace control amp. built-in push control unit.
○	X	X	X	X	X	X	○	Replace control amp. built-in push control unit.

X : Illumination or indicator does not come on.

△ : Some indicators for VENT, B/L, FOOT, F/D, DEF or REC come on.



## DIAGNOSTIC PROCEDURE 5-1

CHECK OTHER ILLUMINATION SYSTEMS EXCEPT FOR A/C SYSTEM.  
Does other illumination come on with ignition switch and lighting switch ON?

NG → CHECK ILLUMINATION SYSTEM.  
Refer to illumination/Wiring Diagram in EL section.

OK → Turn ignition switch and lighting switch OFF.

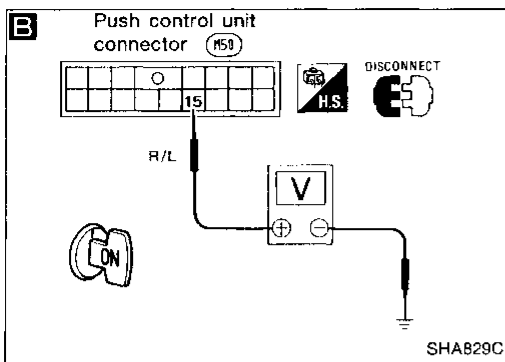
A → CHECK ILLUMINATION BULB.  
Remove push control unit and disconnect harness connectors. (Refer to HA-75).  
Remove illumination bulb(s) and check them.

NG → Replace illumination bulb(s).

OK → (A)  
(Go to next page.)

# TROUBLE DIAGNOSES

## Diagnostic Procedure 5 (Cont'd)

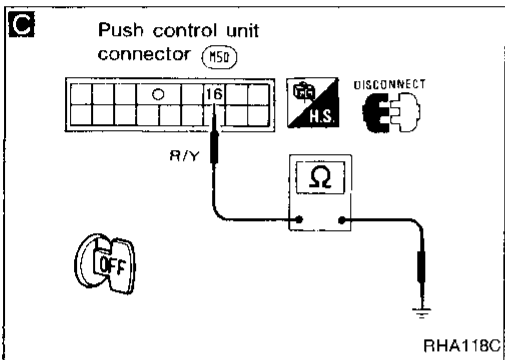


**B**

CHECK POWER SUPPLY FOR ILLUMINATION WITH LIGHTING SWITCH ON. Do approx. 12 volts exist between push control unit harness terminal No. ⑮ and body ground?

NG

CHECK POWER SUPPLY FOR A/C ILLUMINATION SYSTEM. Refer to Illumination/Wiring Diagram in EL section.



**C** Note

CHECK BODY GROUND CIRCUIT FOR ILLUMINATION. Does continuity exist between push control unit harness terminal No. ⑯ and body ground?

OK

Replace control amp. built-in push control unit.

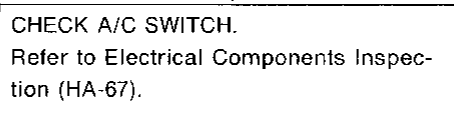
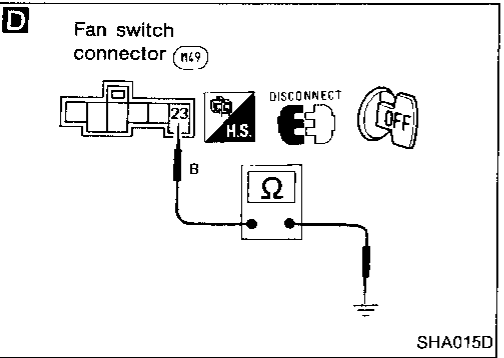
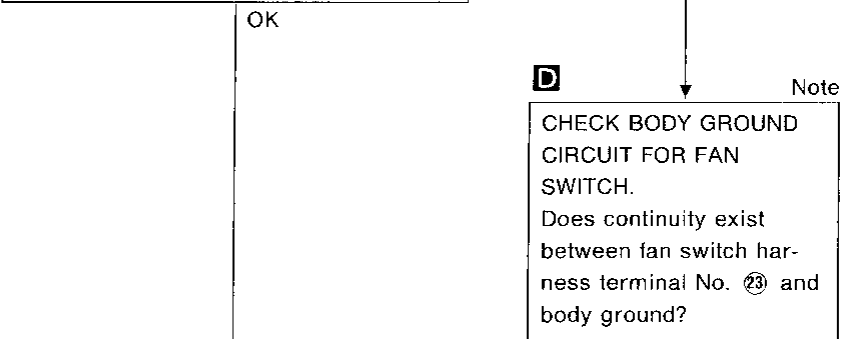
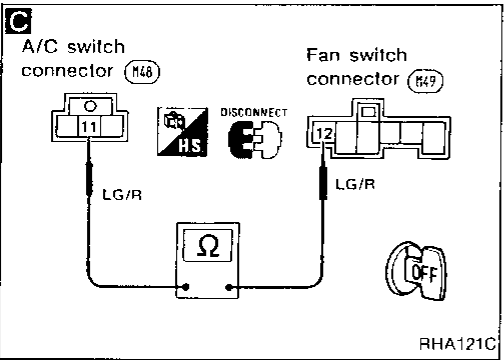
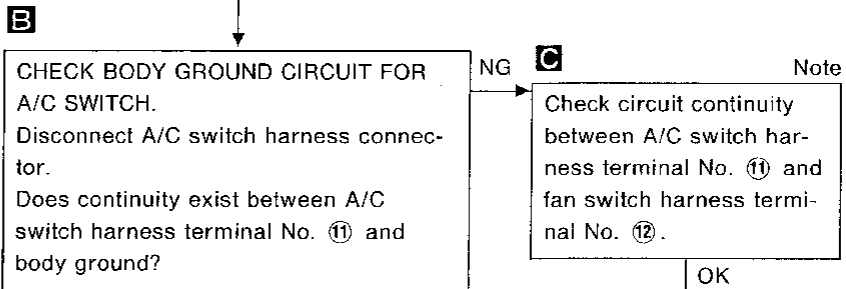
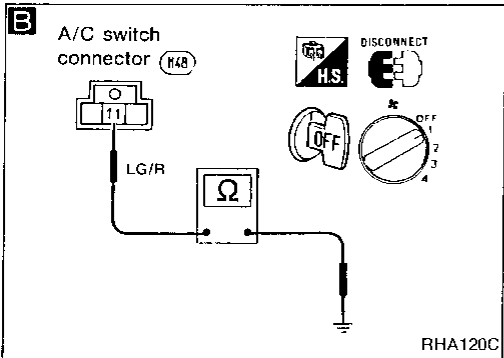
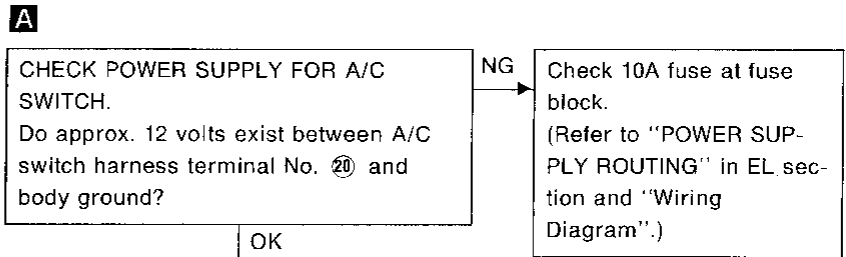
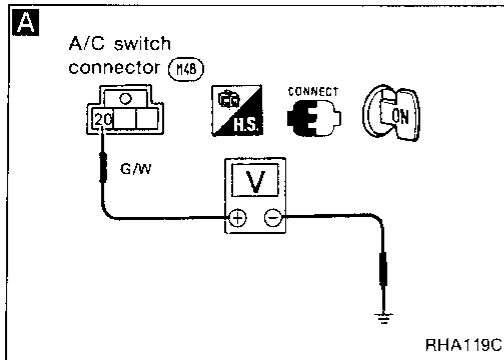
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.



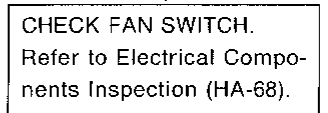
# TROUBLE DIAGNOSES

## Diagnostic Procedure 5 (Cont'd)

### DIAGNOSTIC PROCEDURE 5-2



Replace A/C switch.



Replace fan switch.

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

GI

MA

EW

LC

EF & EC

RE

CL

VT

AT

FA

RA

BR

ST

BF

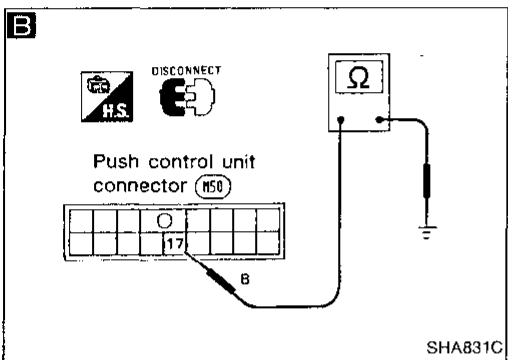
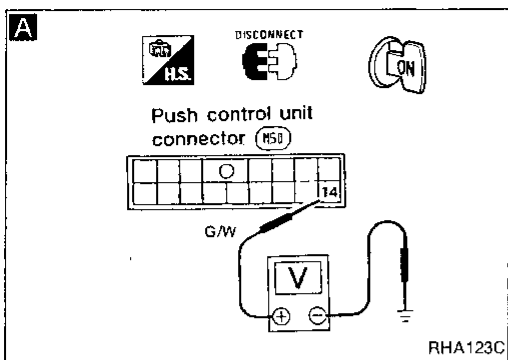
HA

EL

# TROUBLE DIAGNOSES

## Diagnostic Procedure 5 (Cont'd)

### DIAGNOSTIC PROCEDURE 5-3



Turn ignition switch and lighting switch OFF.

Disconnect push control unit harness connector.

**A**

CHECK POWER SUPPLY FOR PUSH CONTROL UNIT.  
Do approx. 12 volts exist between push control unit harness terminal No. ⑭ and body ground?

NG

Check 10A fuse at fuse block.  
(Refer to "POWER SUPPLY ROUTING" in EL section and "Wiring Diagram".)

**B**

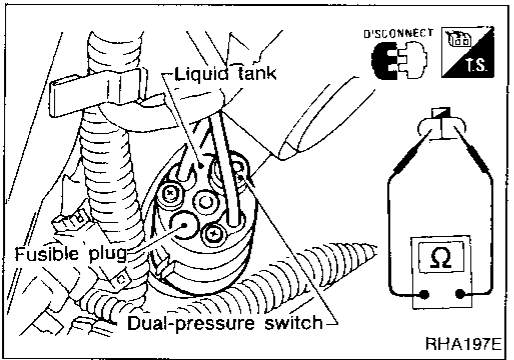
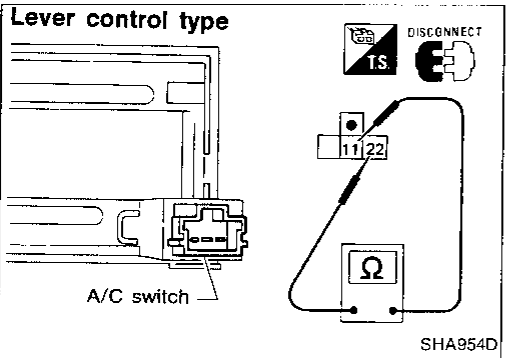
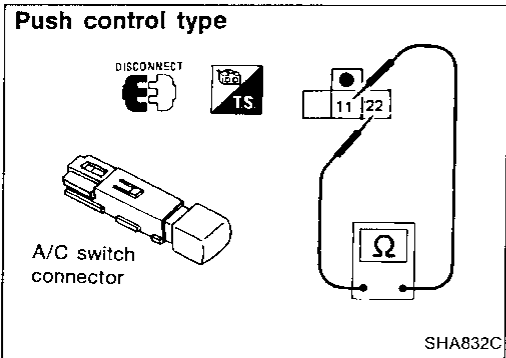
CHECK BODY GROUND CIRCUIT FOR PUSH CONTROL UNIT.  
Does continuity exist between push control unit harness terminal No. ⑰ and body ground?

Note

Replace control amp. built-in push control unit.

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

# TROUBLE DIAGNOSES



## Electrical Components Inspection

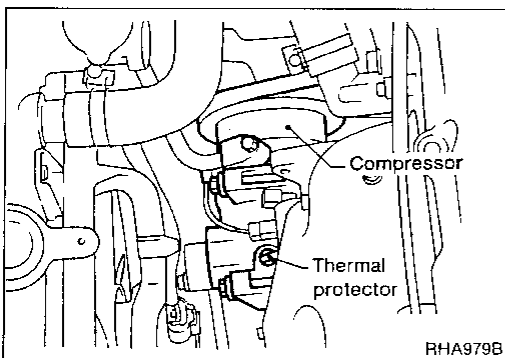
### A/C SWITCH

Check continuity between terminals at each switch position.

Switch condition	Terminal No.		Continuity
	⊕	⊖	
A/C			Yes
ON	②②	①①	
OFF			

### DUAL-PRESSURE SWITCH

High-pressure side line pressure kPa (kg/cm <sup>2</sup> , psi)	Operation	Continuity
Decreasing to 157 - 196 (1.6 - 2.0, 23 - 28) Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)	Turn OFF	Does not exist
Increasing to 157 - 216 (1.6 - 2.2, 23 - 31) Decreasing to 1,765 - 2,354 (18 - 24, 256 - 341)	Turn ON	Exists



### THERMAL PROTECTOR

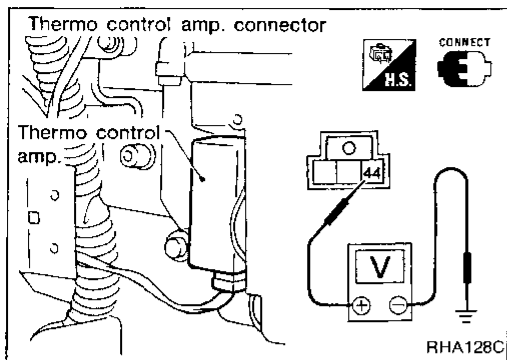
Temperature of compressor °C (°F)	Operation
Increasing to approx. 135 - 145 (275 - 293)	Turn OFF
Decreasing to approx. 120 - 130 (248 - 266)	Turn ON

# TROUBLE DIAGNOSES

## Electrical Components Inspection (Cont'd)

### THERMO CONTROL AMP.

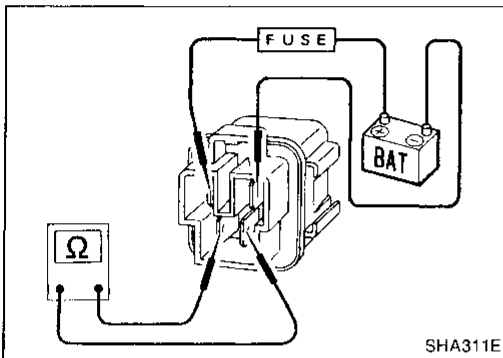
1. Run engine, and operate A/C system.
2. Connect the voltmeter from harness side.
3. Check thermo control amp. operation shown in the table.



Evaporator outlet air temperature °C (°F)	Thermo amp. operation	Tester
Decreasing to 2.5 - 3.5 (37 - 38)	Turn OFF	Approx. 12V
Increasing to 4.0 - 5.0 (39 - 41)	Turn ON	Approx. 0V

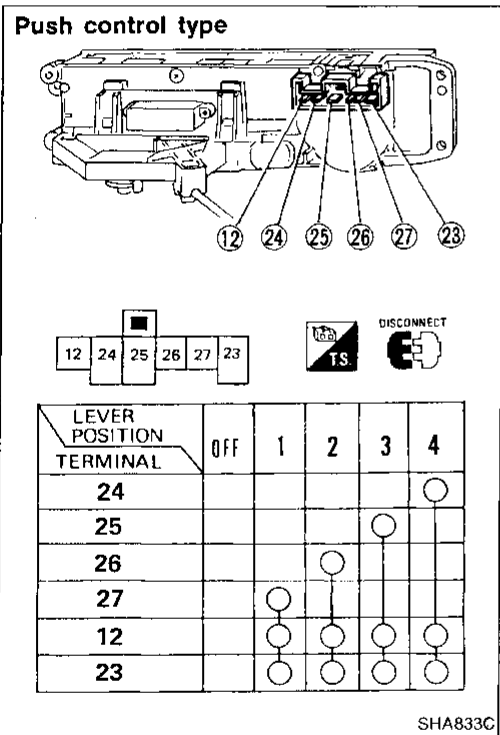
### A/C RELAY

Check circuit continuity between terminals by supplying 12 volts to coil side terminal of A/C relay.



### FAN SWITCH

Check continuity between terminals as each switch position.



# TROUBLE DIAGNOSES

## Electrical Components Inspection (Cont'd)

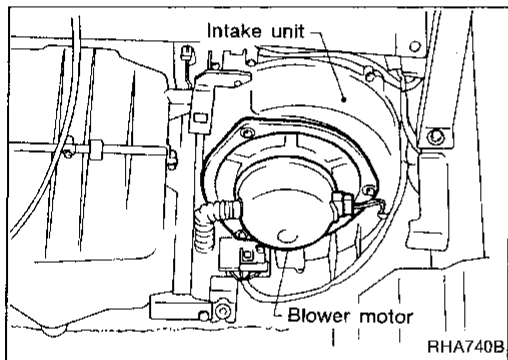
**Lever control type**

12 24 25 26 27 23

DISCONNECT

LEVER POSITION TERMINAL	Off	1	2	3	4
24					○
25				○	○
26			○	○	○
27		○	○	○	○
12		○	○	○	○
23		○	○	○	○

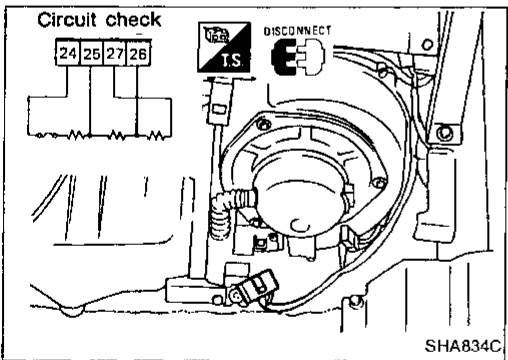
RHA130C



### BLOWER MOTOR

Confirm smooth rotation of the blower motor.

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



### BLOWER RESISTOR

Check continuity between terminals.

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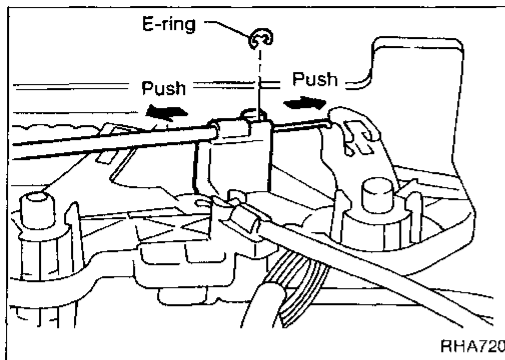
BF

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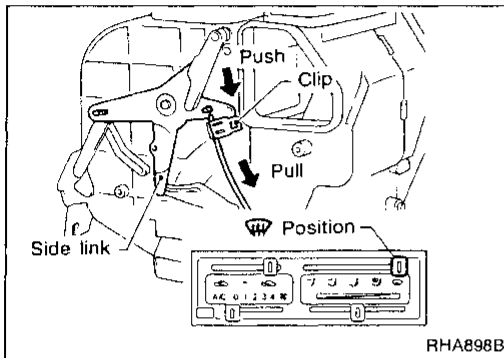
IDX

## TROUBLE DIAGNOSES




### Control Linkage Adjustment — Lever control type

- When disconnecting the control cable, remove the E-ring and take off the cable by pushing the outer cable in the direction of the arrow.



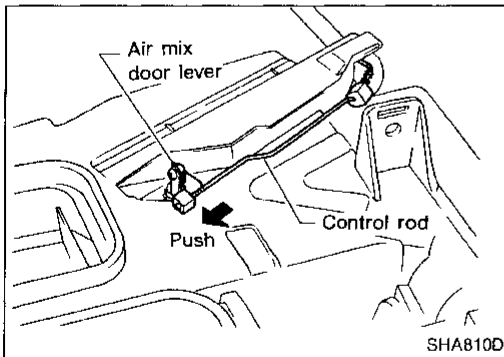
### AIR CONTROL CABLE

- Move air control lever to the  position to set side link in DEF mode. Pull on the outer cable in the direction of the arrow and then clamp it.

After positioning control cable, check it operates properly.

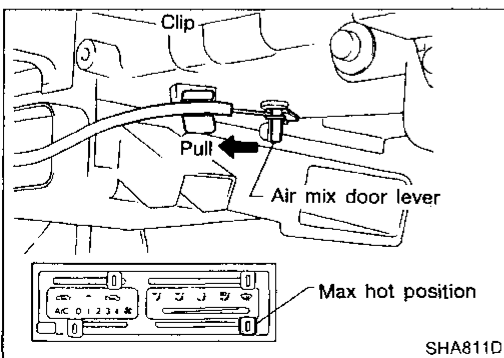
### WATER COCK CONTROL ROD

- When adjusting water cock control rod, first disconnect temperature control cable from air mix door lever. Reconnect and readjust temperature control cable.



1. Push air mix door lever in direction of arrow.
2. Pull control rod of water cock in direction of arrow so as to make clearance of about 2 mm (0.08 in) between ends of rod and link lever and connect the rod to door lever.

After connecting control rod, check it operates properly.



### TEMPERATURE CONTROL CABLE


- Move temperature control lever to the max. hot position to set air mix door lever in full hot mode. Pull on the outer cable in the direction of the arrow and then clamp it.

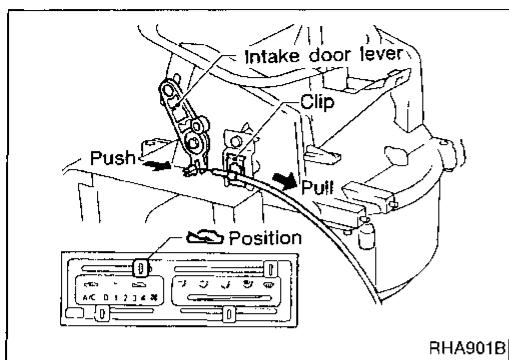
After positioning control cable, check it operates properly.

## TROUBLE DIAGNOSES

### Control Linkage Adjustment — Lever control type (Cont'd)

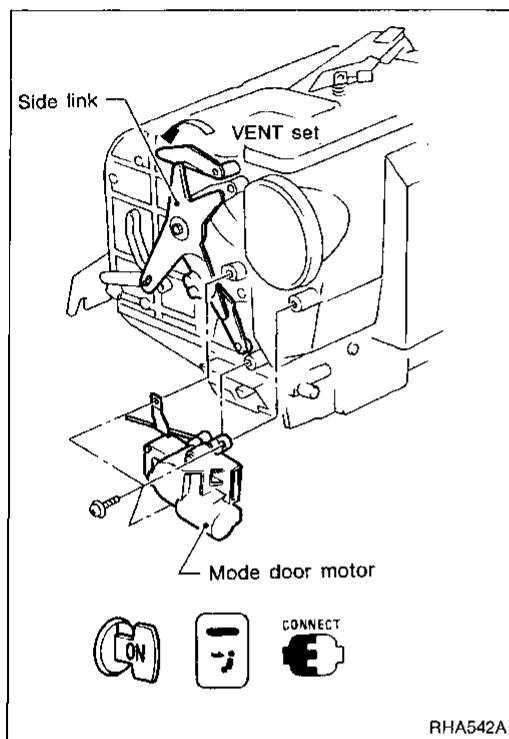
#### INTAKE DOOR CONTROL CABLE

- Move intake door lever to the  position. Pull on the outer cable in the direction of the arrow and then clamp it. After positioning control cable, check it operates properly.



### Control Linkage Adjustment — Push control type MODE DOOR

1. Move side link with hand and hold mode door in VENT mode.
2. Install mode door motor on heater unit and connect it to body 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 VENT switch ON to check that side link operates at the fully-open position.



### TEMPERATURE CONTROL CABLE

Refer to "TEMPERATURE CONTROL CABLE" in "Control Linkage Adjustment — Lever control type" on page HA-70.

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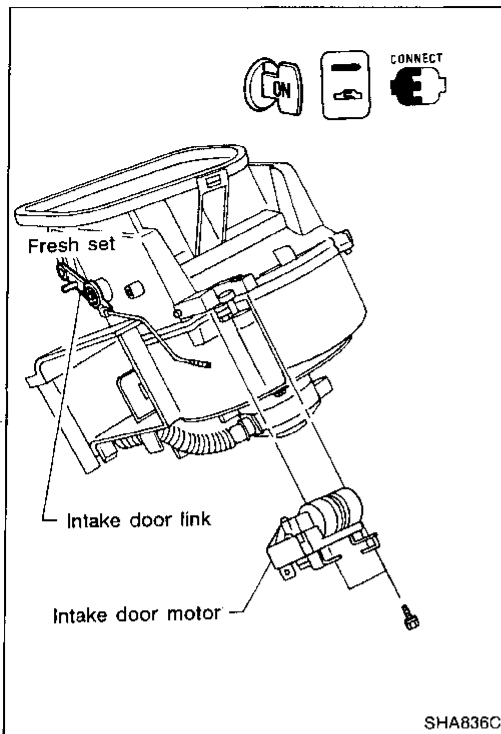
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## TROUBLE DIAGNOSES

### Control Linkage Adjustment — Push control type (Cont'd)

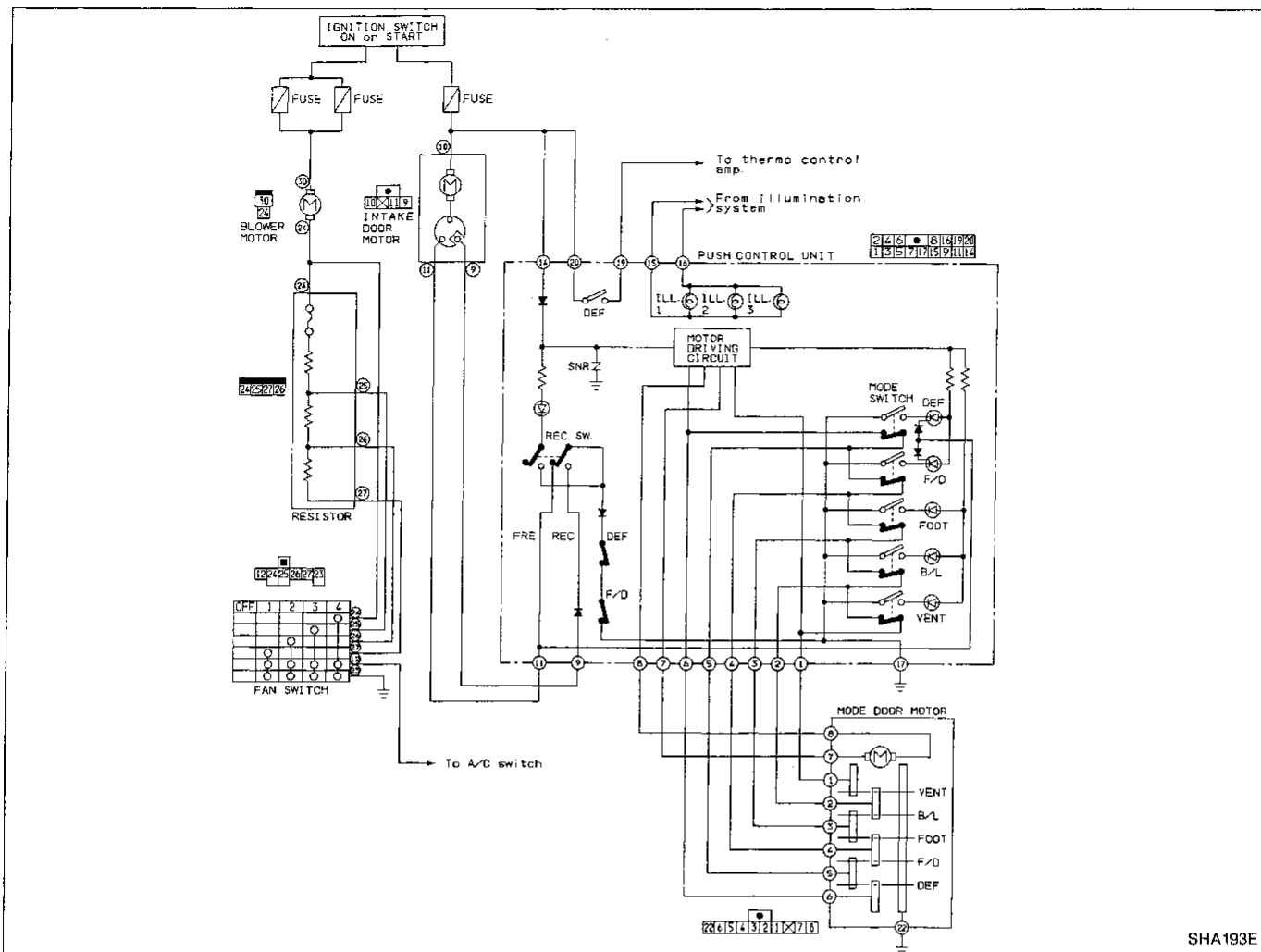
#### INTAKE DOOR

1. Connect the intake door motor harness connector before installing to the 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.





Push Control System



SHA193E

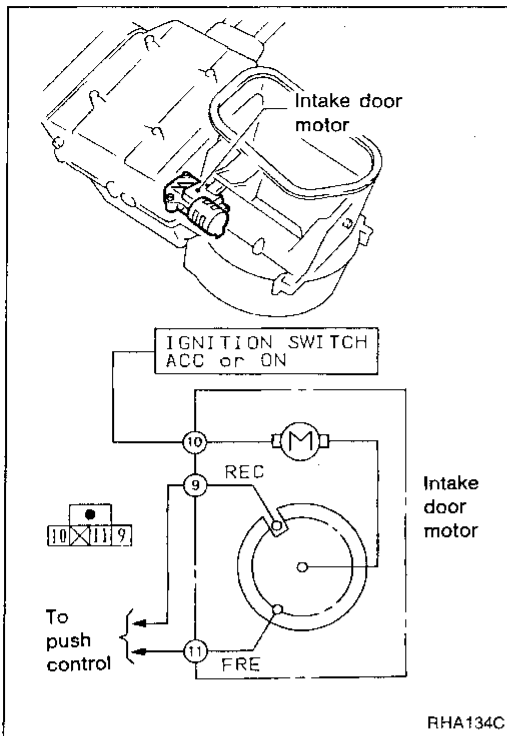
This push control system operates the intake and mode door motors to activate their corresponding doors.

Switches and their control functions

Switch	Indicator illuminates							Air outlet	Intake air	Compressor
	A/C									
A/C	○								—	ON*1
Mode			○					Refer to "Air Flow". (See page HA-8).	—	—
				○					—	—
					○				—	—
						○			FRE	—
							○		FRE	ON*1
							○*2	REC*2	—	

\*1: Compressor is operated by thermo control amp.

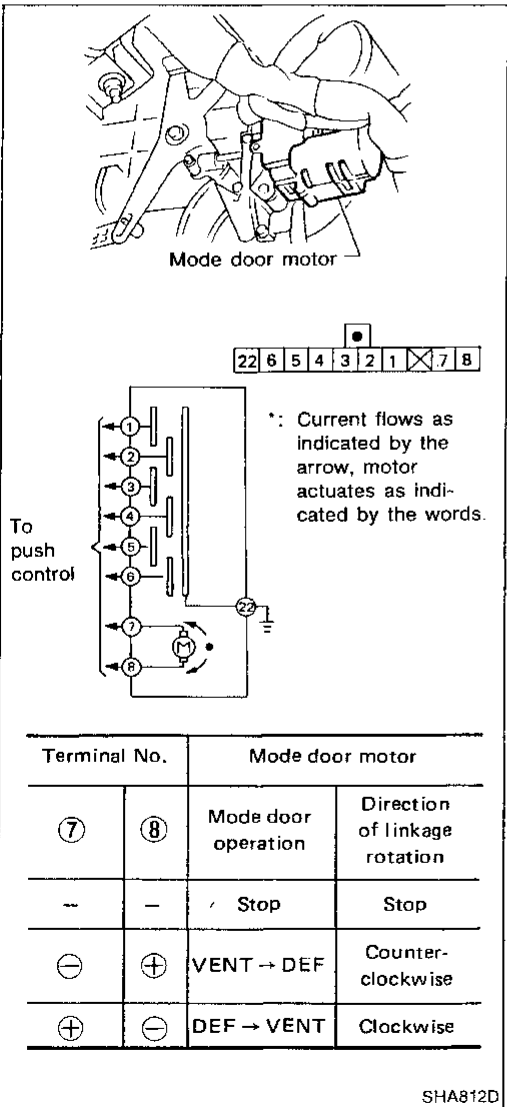
\*2: Depending on mode switch position



### Intake Door Motor

The intake door motor is installed on the front portion of the intake unit. Using a rod and link it opens and closes the intake door.

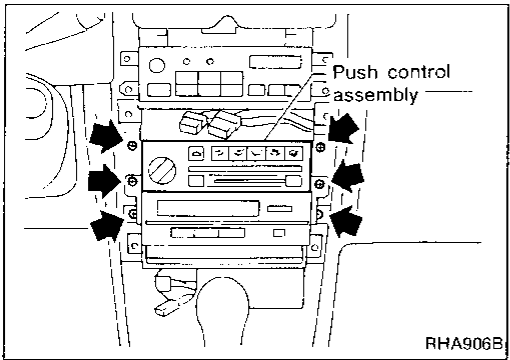
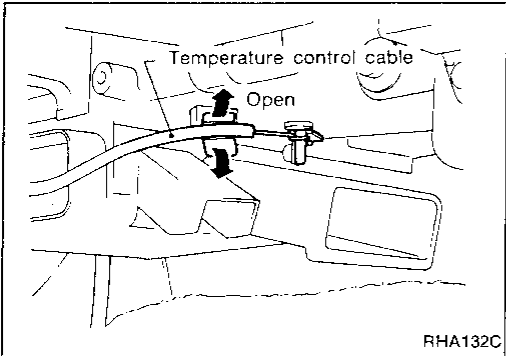
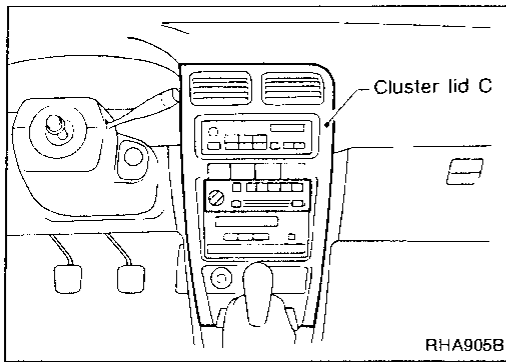
When the REC switch is ON (OFF), the ground line of the intake door motor is switched from terminal ⑩ to ⑨ (⑨ to ⑩). This causes the motor to start because the position switch contacts built into it are set to the current flow position. The contacts turn along with the motor. When they reach the non-current flow position, the motor will stop. The motor always turns in the same direction.



### Mode Door Motor

The mode door motor is located on the left side of the heater unit. Through the side link it opens and closes the vent, foot and defroster door.

When one mode switch is pushed, the position switch built into it reads the corresponding mode to determine the direction of the motor rotation. As soon as the desired mode is set, the position switch stops the motor.



## Removal and Installation

1. Remove cluster lid C and shift cover.
2. Disconnect temperature control cable at heater unit side.
3. Remove the 6 bracket screws.
4. Disconnect push control unit harness connectors.
5. Remove push control unit.
6. Installation is in the reverse order of removal.  
Refer to "Control Linkage Adjustment" (HA-71) for temperature control cable.

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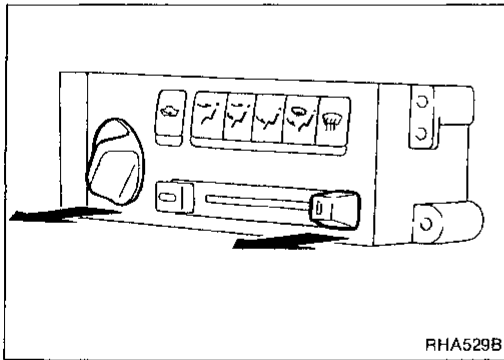
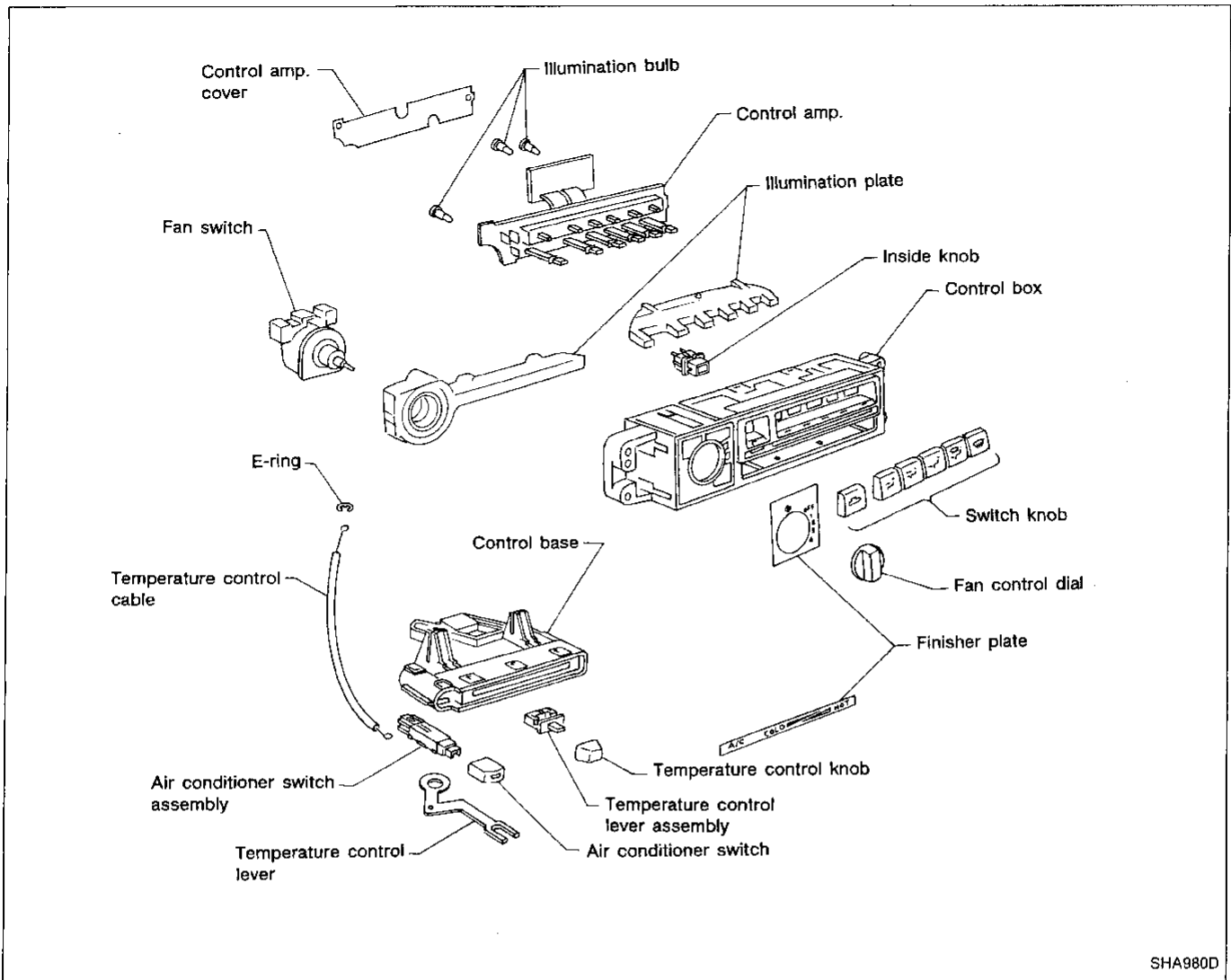
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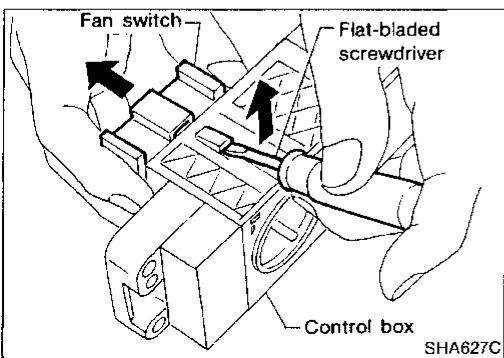
# SYSTEM DESCRIPTION — Push Control

## Removal and Installation (Cont'd)



### Disassembly

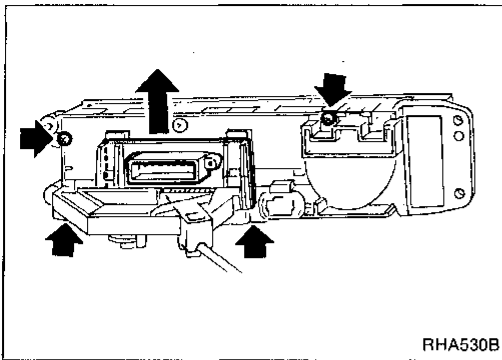
1. Remove temperature control knob & fan control dial. **Wrap temperature knob & fan control dial with a cloth and pull in direction indicated by arrow as shown in figure at left. Be careful not to scratch knobs during removal.**



2. Remove fan switch.

# SYSTEM DESCRIPTION — Push Control

## Disassembly (Cont'd)



3. Remove control base & control amp. cover.

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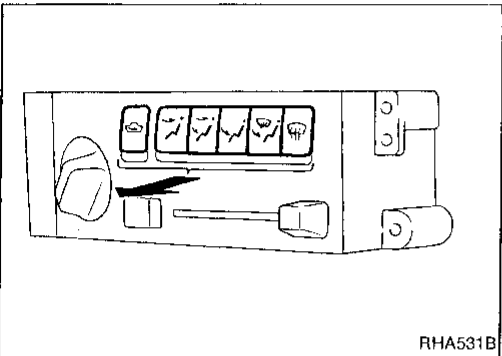
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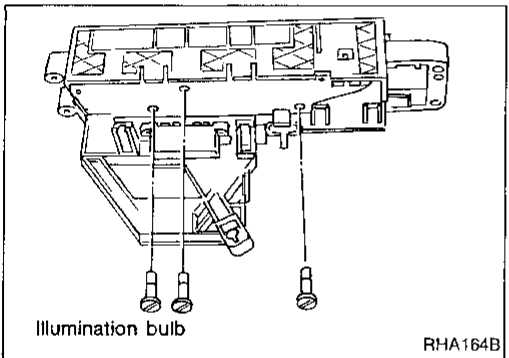
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4. Remove control knobs.

**Wrap finisher with a cloth and remove knobs using flat-bladed screwdriver or similar tool. Be careful not to scratch finisher surface.**



5. Remove illumination bulbs.

6. Remove control amp.

**Be careful not to damage substrate when removing.**

7. Remove illumination plate.

8. Remove finisher plate.

9. Disconnect temperature control cable.

10. Assembly is in reverse order of disassembly.

# SERVICE DATA AND SPECIFICATIONS (SDS)

## General Specifications

### COMPRESSOR

Model	DKV-14D
Type	Vane rotary
Displacement cm <sup>3</sup> (cu in)/Rev	140 (8.54)
Direction of rotation	Clockwise (Viewed from drive end)
Drive belt	Poly V type

### LUBRICATION OIL

Model	ZEXEL make DKV-14D
Name	Nissan A/C System Oil Type R
Part number	KLH00-PAGR0
Capacity ml (US fl oz, Imp fl oz)	
Total in system	200 (6.8, 7.0)
Compressor (Service parts) charging amount	200 (6.8, 7.0)

### 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 EF & EC section.

### BELT TENSION

- Refer to Checking Drive Belts (MA section).

### COMPRESSOR

Model	DKV-14D
Clutch disc-pulley clearance mm (in)	0.3 - 0.6 (0.012 - 0.024)