

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".

Supplemental Restraint System “AIR BAG” and “SEAT BELT PRE-TENSIONER”

The Supplemental Restraint System “Air Bag” and “Seat Belt Pre-tensioner”, used along with a seat belt, help to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The Supplemental Restraint System consists of air bags (located in the center of the steering wheel and on the instrument panel on the passenger side), seat belt pre-tensioners, 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:

- 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 INFINITI dealer.
- Improper maintenance, including incorrect removal and installation of the SRS, can lead to personal injury caused by unintentional activation of the system.
- All SRS air bag electrical wiring harnesses and connectors are covered with yellow outer insulation. Do not use electrical test equipment on any circuit related to the SRS SYSTEM.

PRECAUTIONS AND PREPARATION

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. They are different in 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

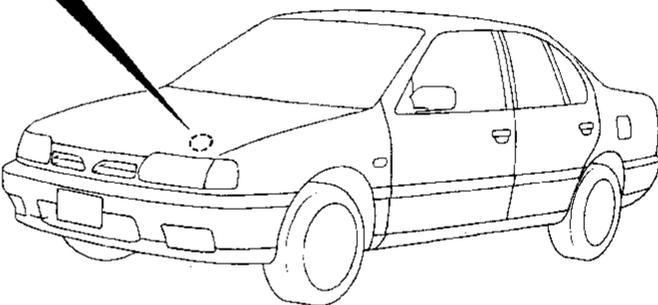
- REFRIGERANT UNDER HIGH PRESSURE
- SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL
- IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY
- CONSULT SERVICE MANUAL.
- THIS AIR CONDITIONER SYSTEM COMPLIES WITH SAE J-639.

NISSAN MOTOR CO., LTD., Tokyo, Japan

① : Lubricant type and service part number

② : Amount of lubricant

③ : Amount of refrigerant



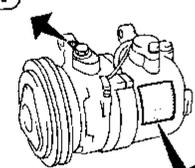
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PARTS IDENTIFICATION

1. Compressor label

R134a label

R134a用
USE FOR R134a



CALSONIC

TYPE DKV-14C

PART NO. _____

SERI. NO. _____

REFRIG. R-134a

OIL DH-PR
200cm³ (200cc)
(NISSAN PART No. KLHOO-PAGRO)

MIN. TEST PRESSURE
LOW SIDE 1.6MPa (15kgf/cm²G)
HIGH SIDE 3.0MPa (30kgf/cm²G)

MFD. ZEXEL CORPORATION
MADE IN JAPAN

2. Other component parts label

R134a label

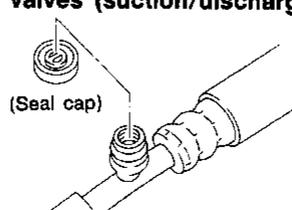
R134a用
USE FOR R134a

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)



(Seal cap)

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

RHA254D

PRECAUTIONS AND PREPARATION

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

WARNING:

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

General Refrigerant Precautions

WARNING:

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

PRECAUTIONS AND PREPARATION

Precautions for Refrigerant Connection

WARNING:

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

CAUTION:

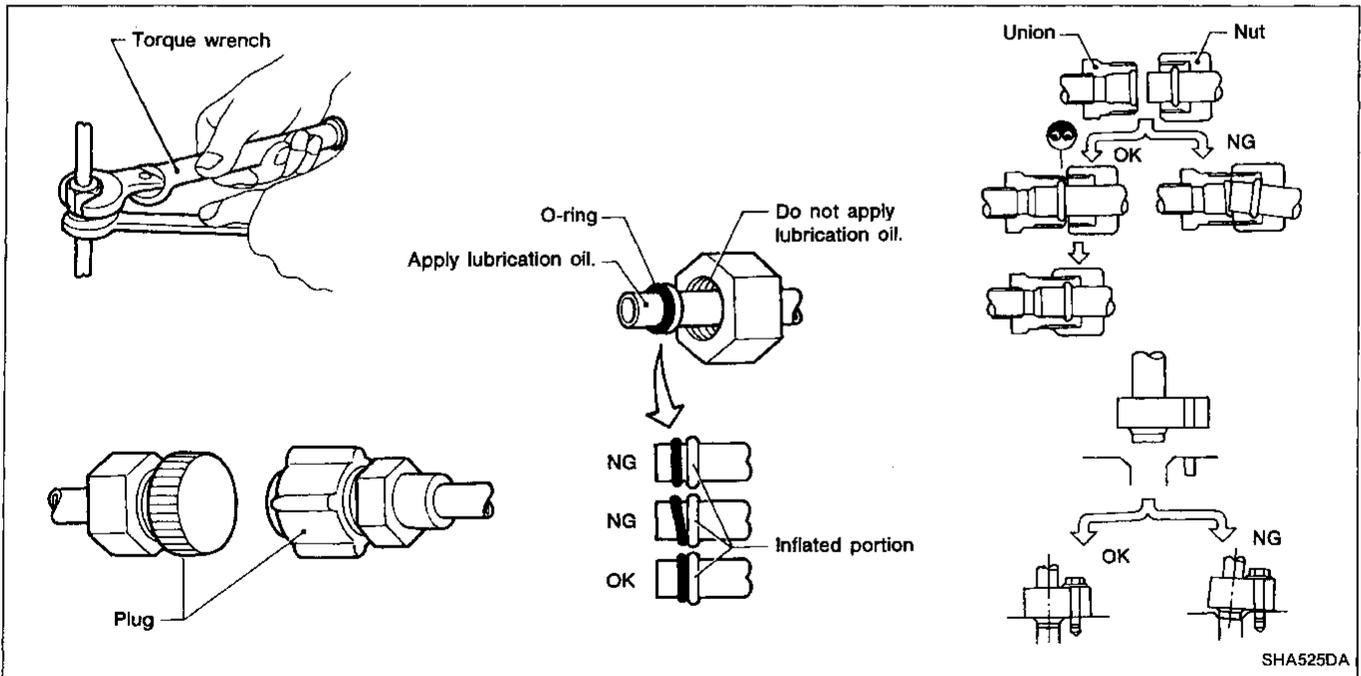
When replacing or cleaning refrigerant cycle components, observe the following.

- Do not leave compressor on its side or upside down for more than 10 minutes. Doing so will cause compressor oil to enter the low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
- When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Remove the seal caps of the pipes and other components just before connecting such pipes and components.
- Allow components stored in cool areas to warm to working area temperature before removing the seal caps. This is to prevent the condensation of moisture inside A/C components.
- 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.

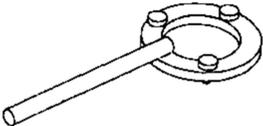
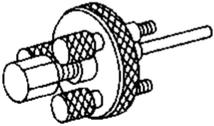
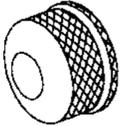
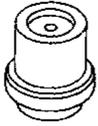


PRECAUTIONS AND PREPARATION

Precautions for Servicing Compressor

- Attach a blind plug to the suction port (low pressure) and discharge port (high pressure) of the compressor. This will prevent oil from leaking and dust from getting inside.
- When the compressor is removed, store it in the same position as it is when mounted on the car.
- When replacing or repairing compressor, remove oil from the compressor and check the oil quantity extracted.
- Remove oil from new compressor so that the oil quantity is equal to that of removed compressor. See the section "LUBRICATION OIL".
- Do not allow dirt or 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 compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equalize oil distribution inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- When replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

Special Service Tools

Tool number (Kent-Moore No.) Tool name	Description
KV99231260 (J-38874) Clutch disc wrench	<div style="text-align: right;">Removing shaft nut and clutch disc</div> <div style="text-align: center;">  </div> <div style="text-align: left;">NT204</div>
KV99232340 (J-38874) Clutch disc puller	<div style="text-align: right;">Removing clutch disc</div> <div style="text-align: center;">  </div> <div style="text-align: left;">NT206</div>
KV99234330 (J-39024) Pulley installer	<div style="text-align: right;">Installing pulley</div> <div style="text-align: center;">  </div> <div style="text-align: left;">NT207</div>
KV99233130 (J-39023) Center pulley puller	<div style="text-align: right;">Removing pulley</div> <div style="text-align: center;">  </div> <div style="text-align: left;">NT208</div>

PRECAUTIONS AND PREPARATION

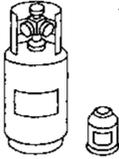
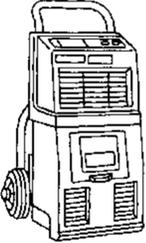
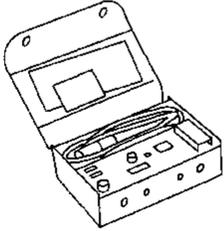
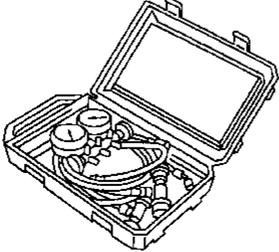
HFC-134a (R-134a) Service Tools and Equipment

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

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

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

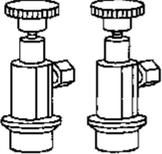
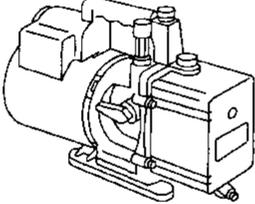
Adapters that convert one size fitting to another must never be used: refrigerant/lubrication oil contamination will occur and compressor failure will result.

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-PAGRO (—) Nissan A/C System Oil Type R	 NT197	Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotor plate (piston) compressors (Nissan only) Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/Recycling equipment (ACR4)	 NT195	Function: Refrigerant Recovery and Recycling and Recharging
(J-39400) Electrical leak detector	 NT198	Power supply: ● DC 12 V (Cigarette lighter)
(J-39183) Manifold gauge set (with hoses and couplers)	 NT199	Identification: ● The gauge face indicates R-134a. Fitting size: Thread size ● 1/2"-16 ACME

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PRECAUTIONS AND PREPARATION

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

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

PRECAUTIONS AND 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.

ELECTRONIC LEAK DETECTOR

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

VACUUM PUMP

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

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

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

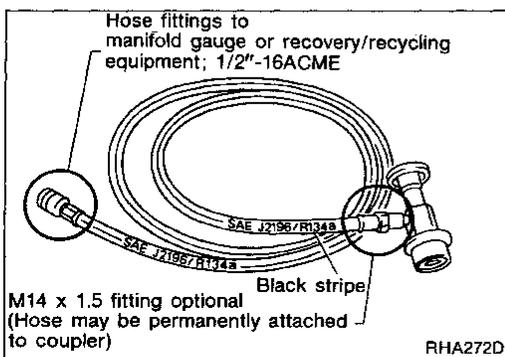
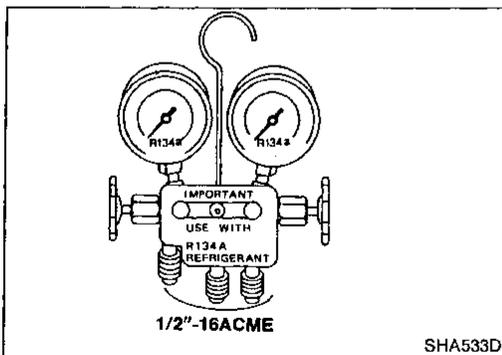
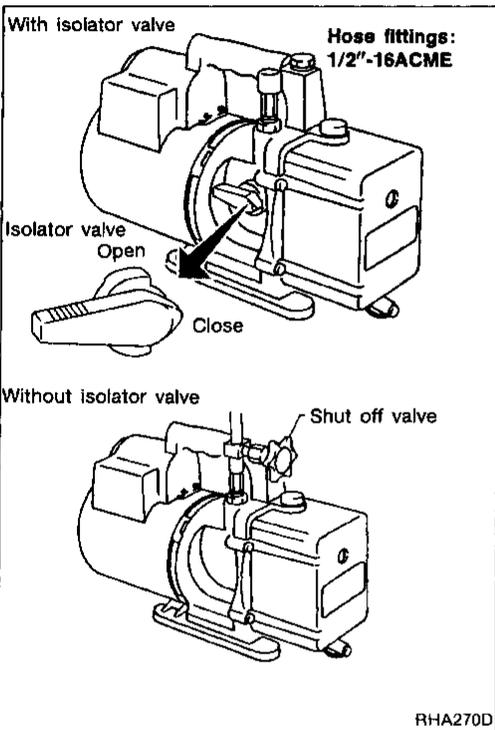
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.

MANIFOLD GAUGE SET

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

SERVICE HOSES

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

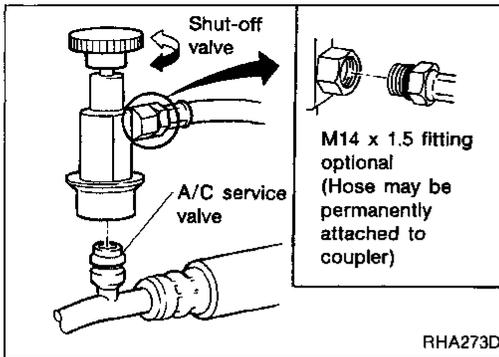


PRECAUTIONS AND PREPARATION

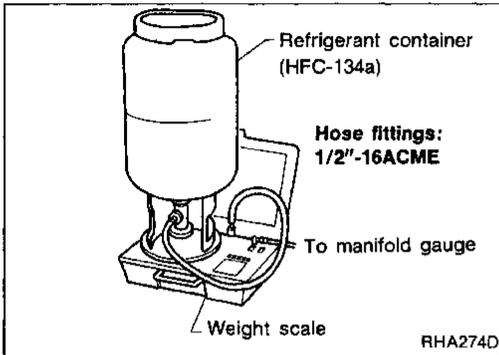
Precautions for Service Equipment (Cont'd)

SERVICE COUPLERS

Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not connect to the CFC-12 (R-12) system. Even so, CFC-12 (R-12) refrigerant and lubrication oil can 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

When using a scale which controls refrigerant flow electronically, assure the following: hose fitting size is 1/2"-16 ACME and refrigerant other than HFC-134a (R-134a) (along with specified lubrication oil) has not been used with the scale.

CHARGING CYLINDER

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

Refrigeration Cycle

REFRIGERANT FLOW

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

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

FREEZE PROTECTION

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

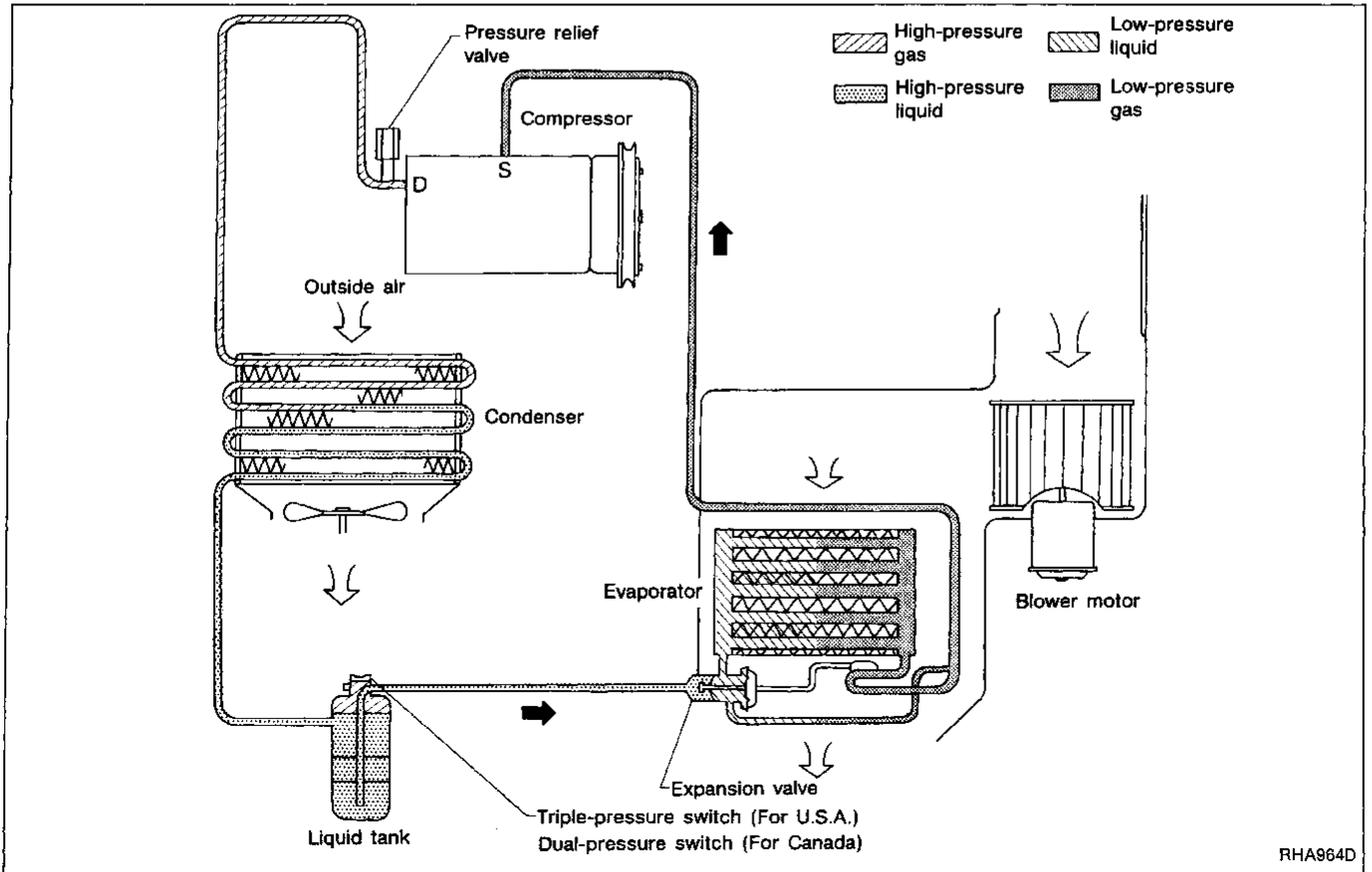
REFRIGERANT SYSTEM PROTECTION

Triple-pressure switch (For U.S.A.) or Dual-pressure switch (For Canada)

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

Pressure relief valve

The refrigerant system is also protected by a pressure relief valve. The valve is located on the end of high flexible hose near compressor. When refrigerant pressure in the system increases abnormally [over 3,727 kPa (38 kg/cm², 540 psi)], the relief valve's release port opens automatically. The valve then releases refrigerant into the atmosphere.

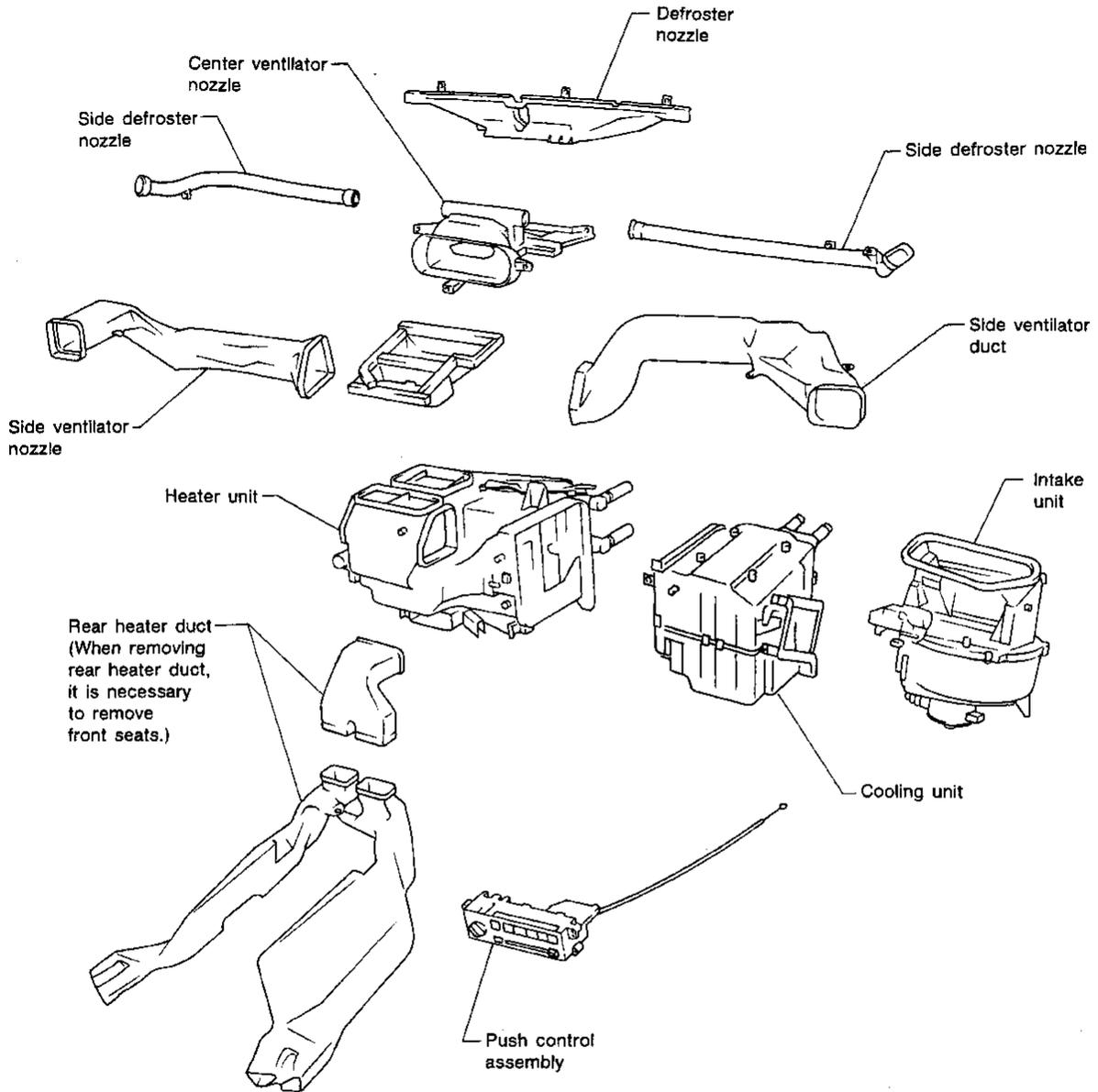


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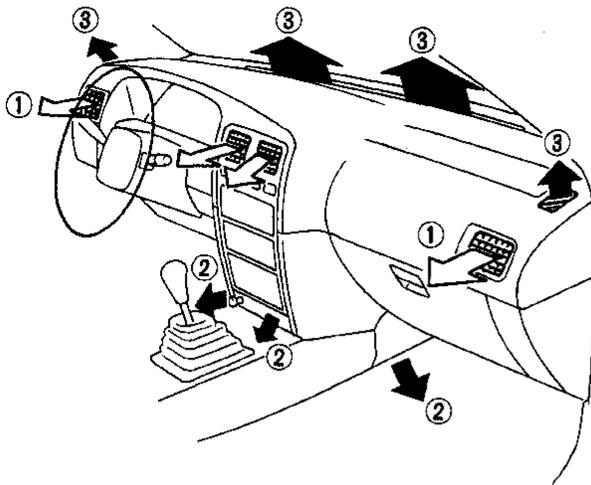
DESCRIPTION

Component Layout

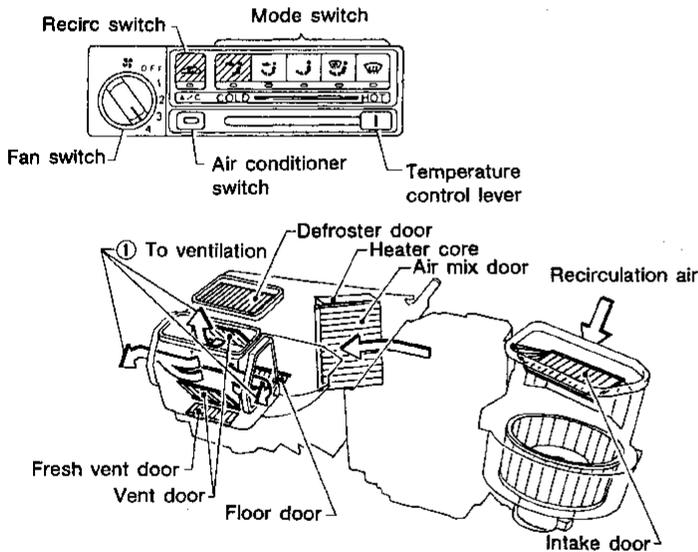


DESCRIPTION

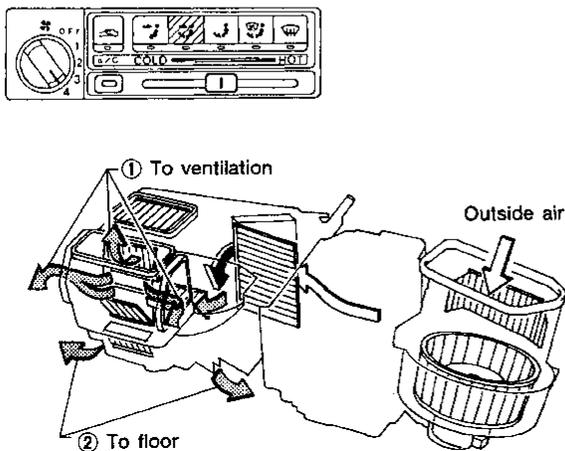
Discharge Air Flow



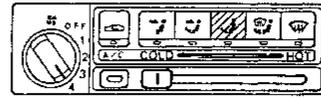
Ventilation (Recirc "ON")



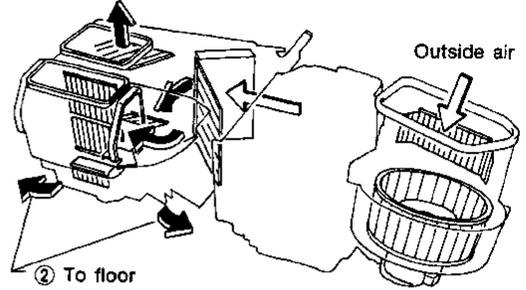
Bi-level



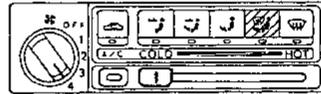
Floor



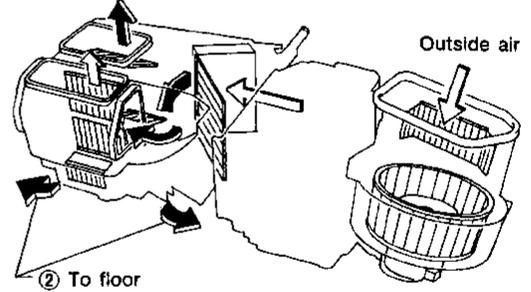
③ To defroster



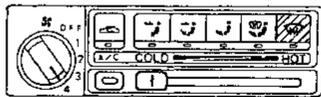
Floor and defroster



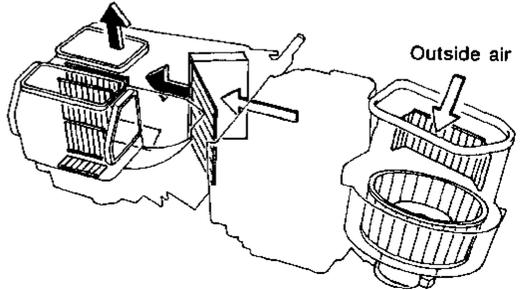
③ To defroster



Defroster



③ To defroster



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

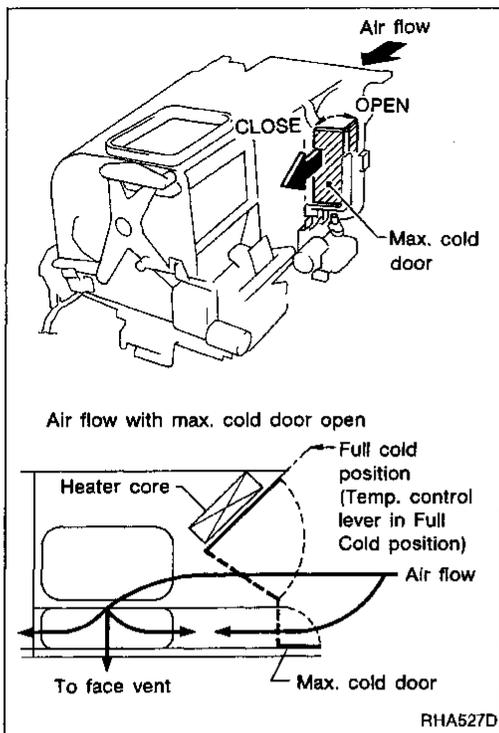
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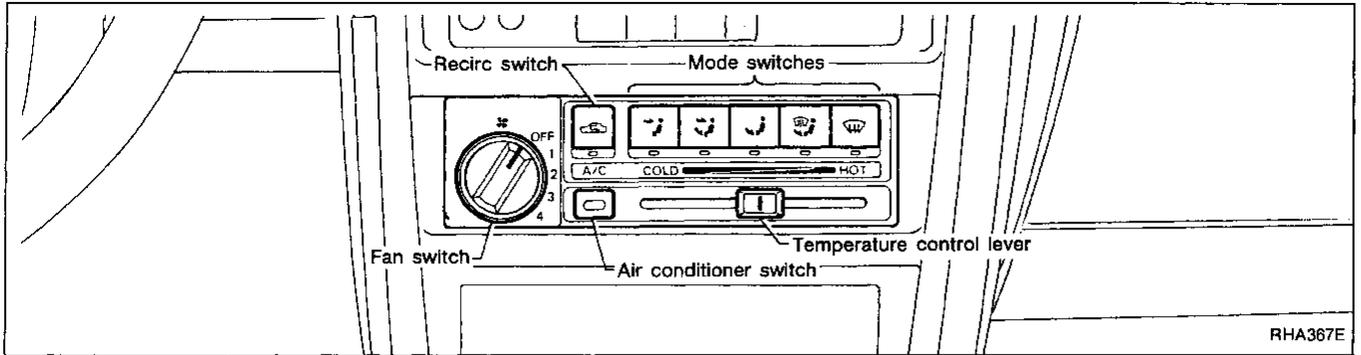
Discharge Air Flow (Cont'd)

MAX. COLD DOOR OPERATION SYSTEM

Max. cold door operation system works as follows in FULL COOL mode (i.e. VENT button pushed, with temp. control lever at FULL COOL). It opens both the max. cold door and the heater unit vent door. Cooled air, after passing through the cooling unit, goes through both doors before blowing out through ventilators. Thus resistance to airflow is reduced, and air noise is reduced.



Control Operation



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FAN SWITCH

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

MODE SWITCHES

These switches control the outlet air flow.

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

TEMPERATURE CONTROL LEVER

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

RECIRC SWITCH

OFF position:

Outside air is drawn into the passenger compartment.

ON position:

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

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

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

TROUBLE DIAGNOSES

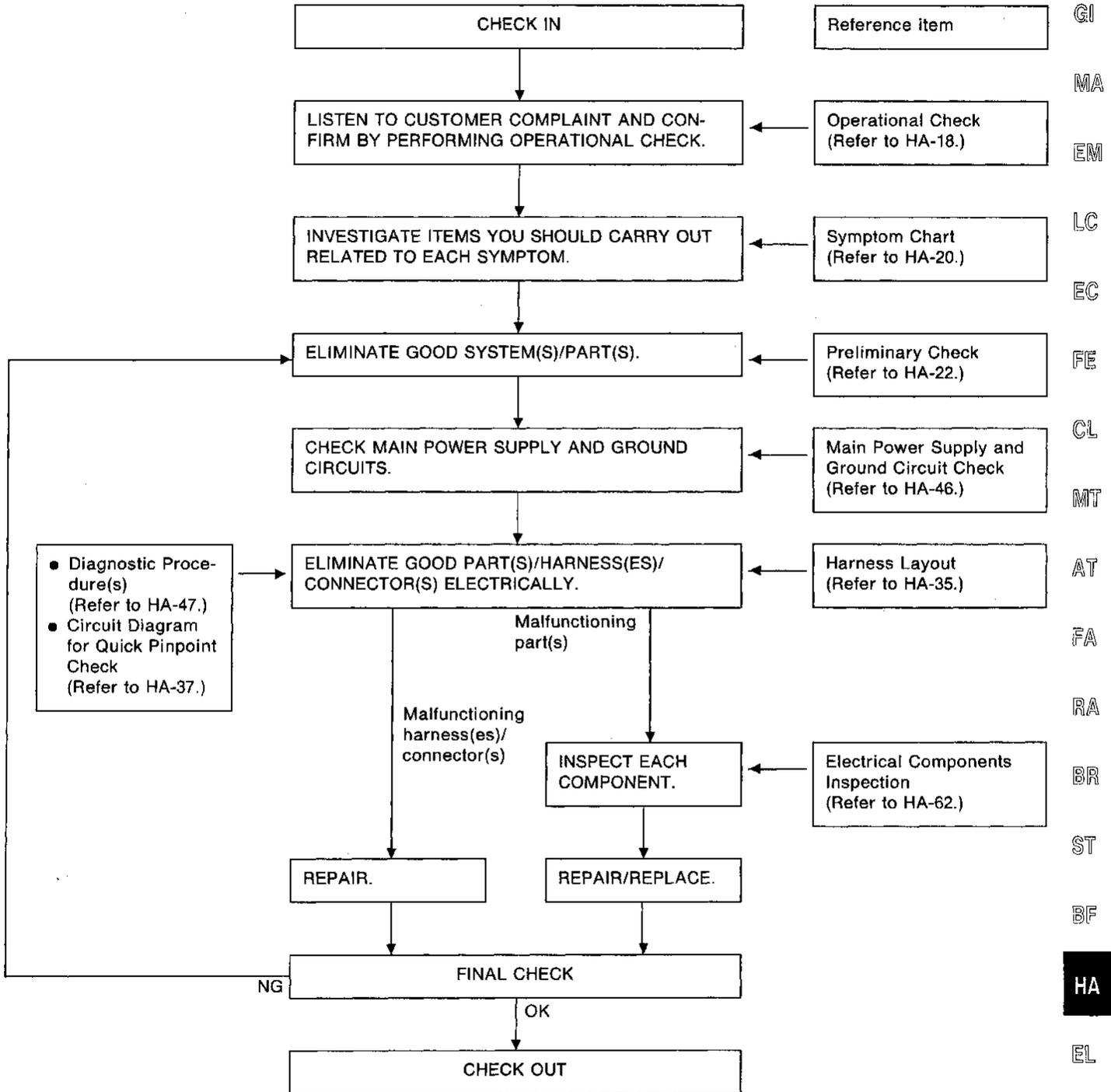
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TROUBLE DIAGNOSES

How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



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TROUBLE DIAGNOSES

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, temperature increase.

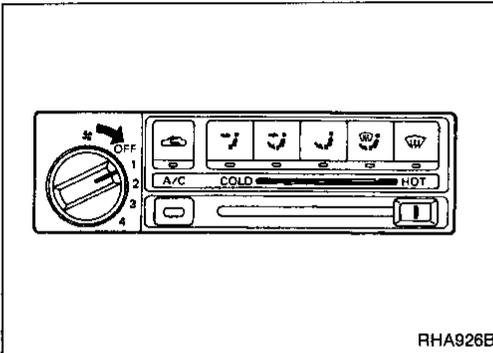
CONDITIONS:

Engine running at normal operating temperature.

PROCEDURE:

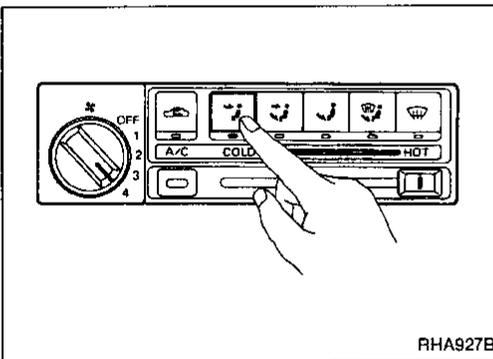
1. Check blower

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



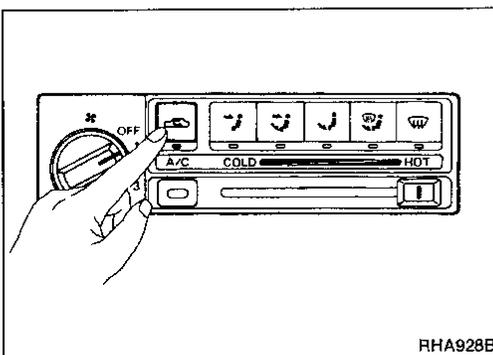
2. Check discharge air

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



3. Check RECIRC

- 1) Press RECIRC button.
RECIRC indicator should light.
- 2) Listen for intake door position change (you should hear blower sound change slightly).

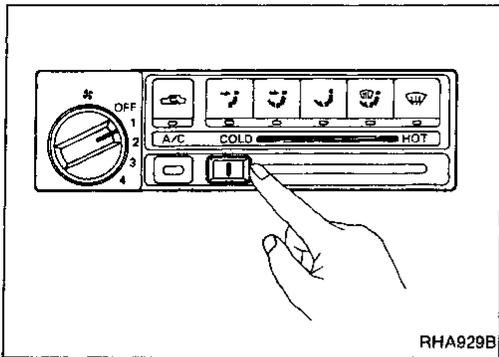


TROUBLE DIAGNOSES

Operational Check (Cont'd)

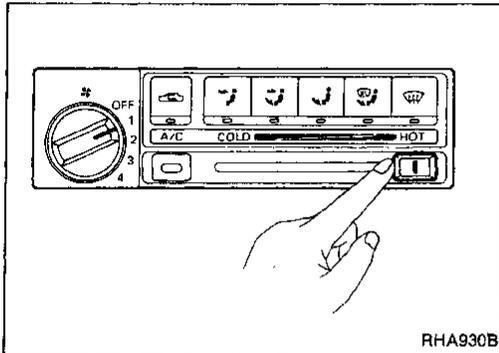
4. Check temperature decrease

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



5. Check temperature increase

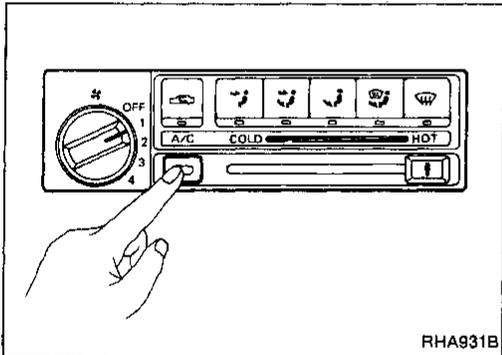
- 1) Slide temperature control lever to full hot.
- 2) Check for hot air at discharge air outlets.



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.



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TROUBLE DIAGNOSES

Symptom Chart

DIAGNOSTIC TABLE

PROCEDURE	Preliminary Check						Diagnostic Procedure					Main Power Supply and Ground Circuit Check			
	HA-22	HA-23	HA-24	HA-25	HA-26	HA-27	HA-47	HA-50	HA-52	HA-53	HA-58	HA-46	HA-46	HA-46	HA-46
REFERENCE PAGE															
SYMPTOM	Preliminary check 1	Preliminary check 2	Preliminary check 3	Preliminary check 4	Preliminary check 5	Preliminary check 6	Diagnostic procedure 1	Diagnostic procedure 2	Diagnostic procedure 3	Diagnostic procedure 4	Diagnostic procedure 5	15A Fuses	10A Fuses	Push control unit	Thermo control amp.
A/C does not blow cold air.		①					○			○		○	○		○
Blower motor does not rotate.		①					②					○			
Insufficient heating						①	○								
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 operate in DEF mode.		①	②						○				○		○
Illumination or indicators of push control unit do not come on.											①		○		
Noise					①										

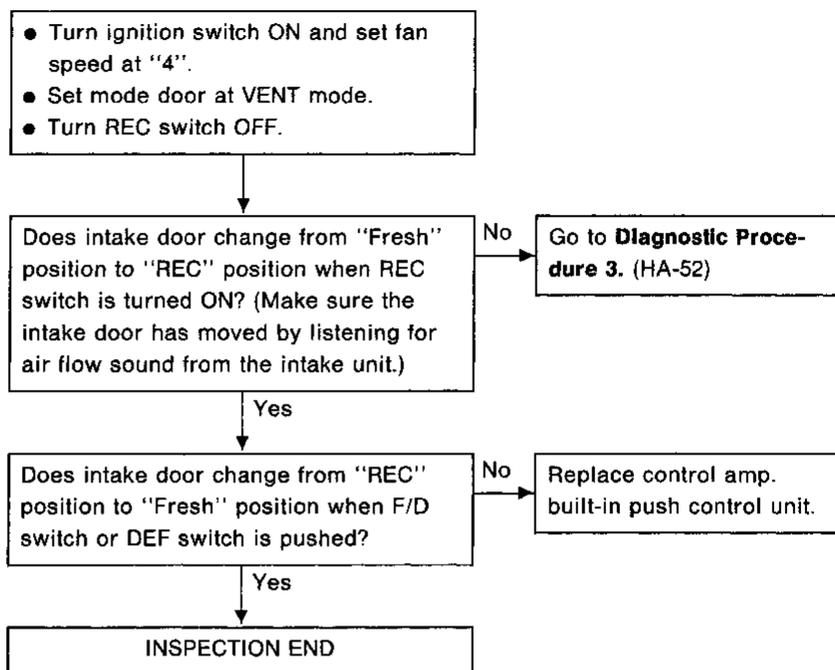
①, ②: The number means checking order.
 ○: As for checking order, refer to each flow chart. (It depends on malfunctioning portion.)

TROUBLE DIAGNOSES

Preliminary Check

PRELIMINARY CHECK 1

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

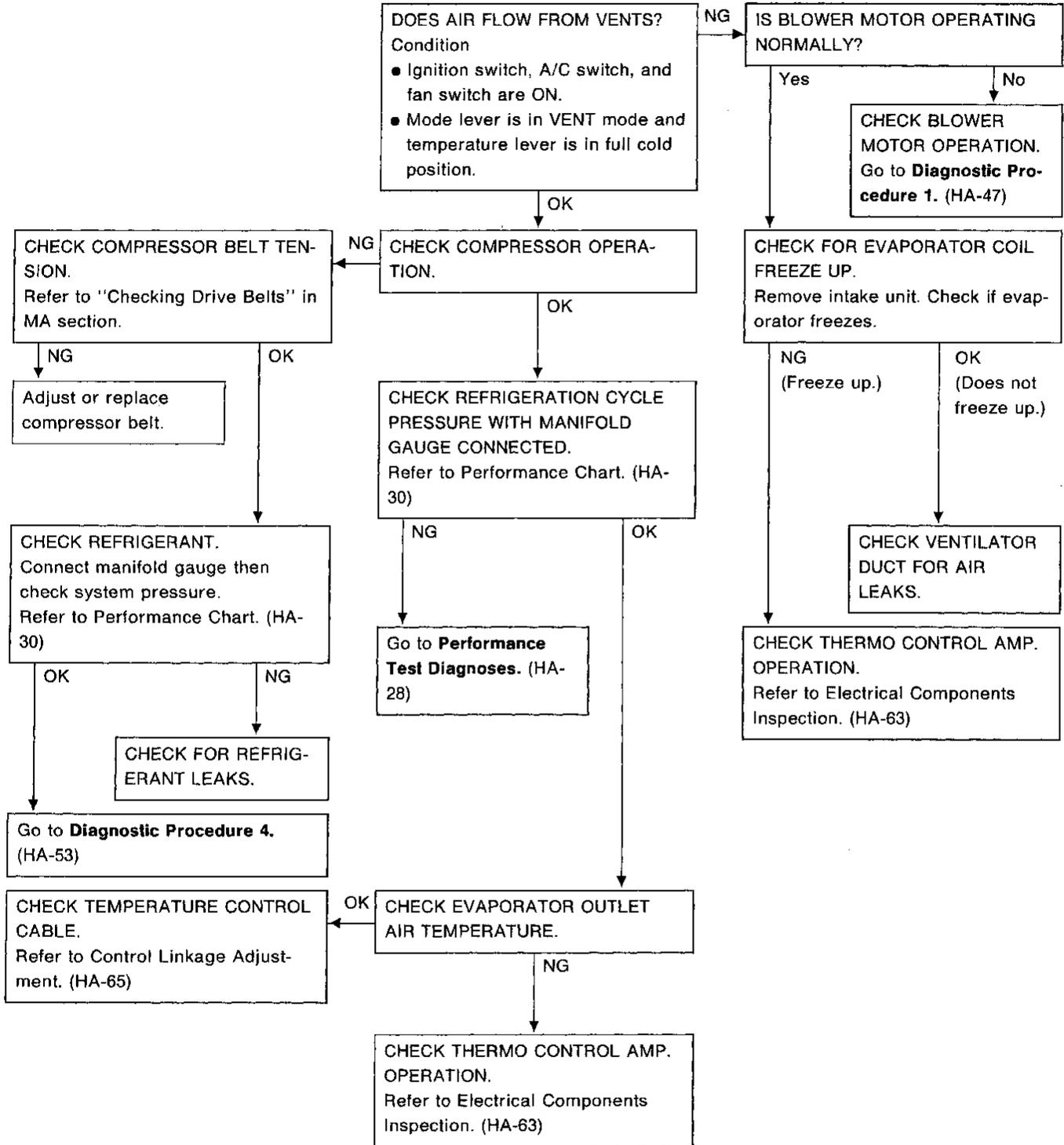


TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

PRELIMINARY CHECK 2

A/C does not blow cold air.



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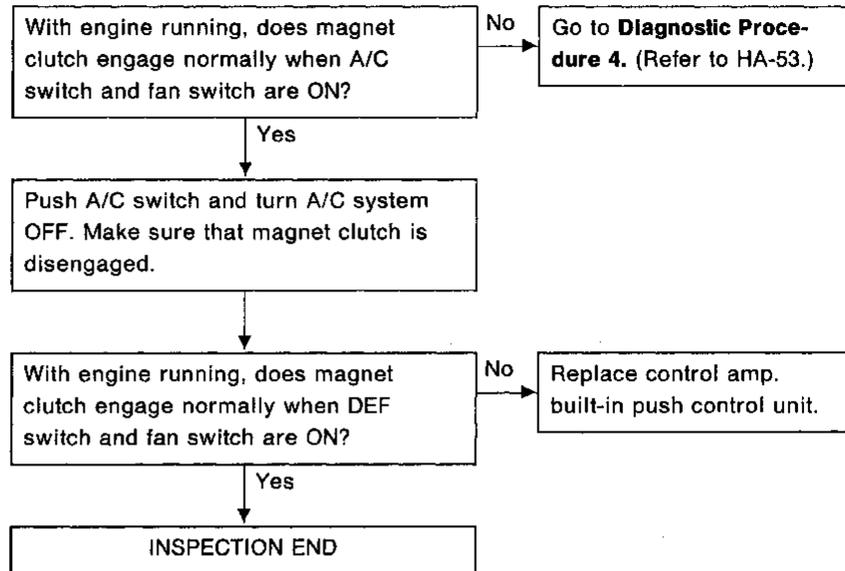
TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

PRELIMINARY CHECK 3

Magnet clutch does not operate in DEF mode.

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



TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

PRELIMINARY CHECK 4

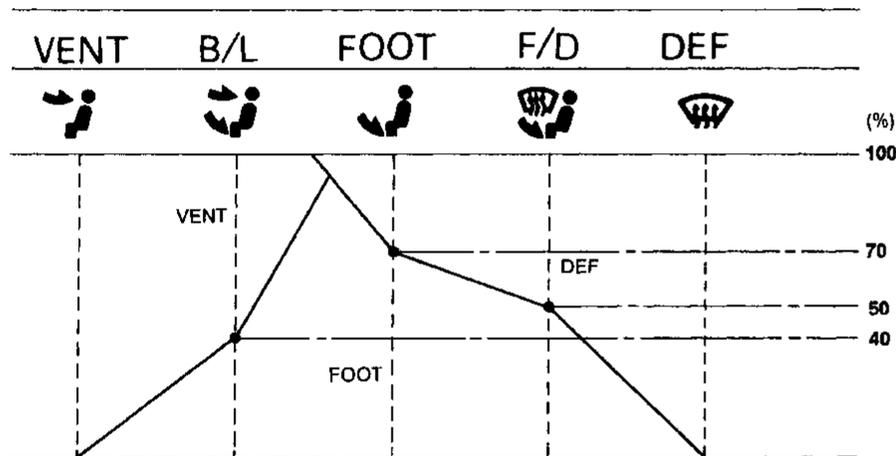
Air outlet does not change.

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

No → Go to **Diagnostic Procedure 2.**
(Refer to HA-50.)

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

Air distribution ratios



RHA368E

Yes

INSPECTION END

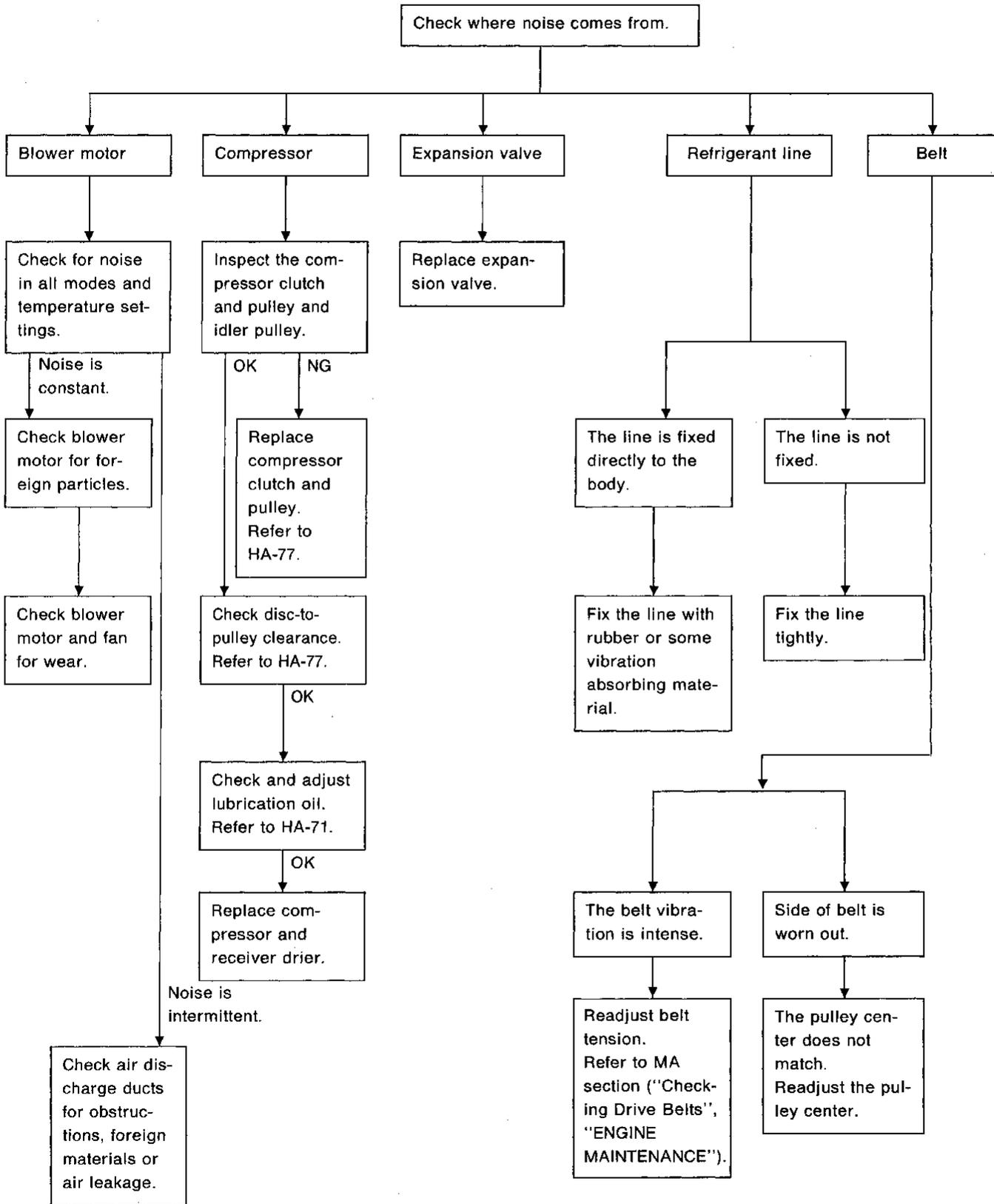
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TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

PRELIMINARY CHECK 5

Noise

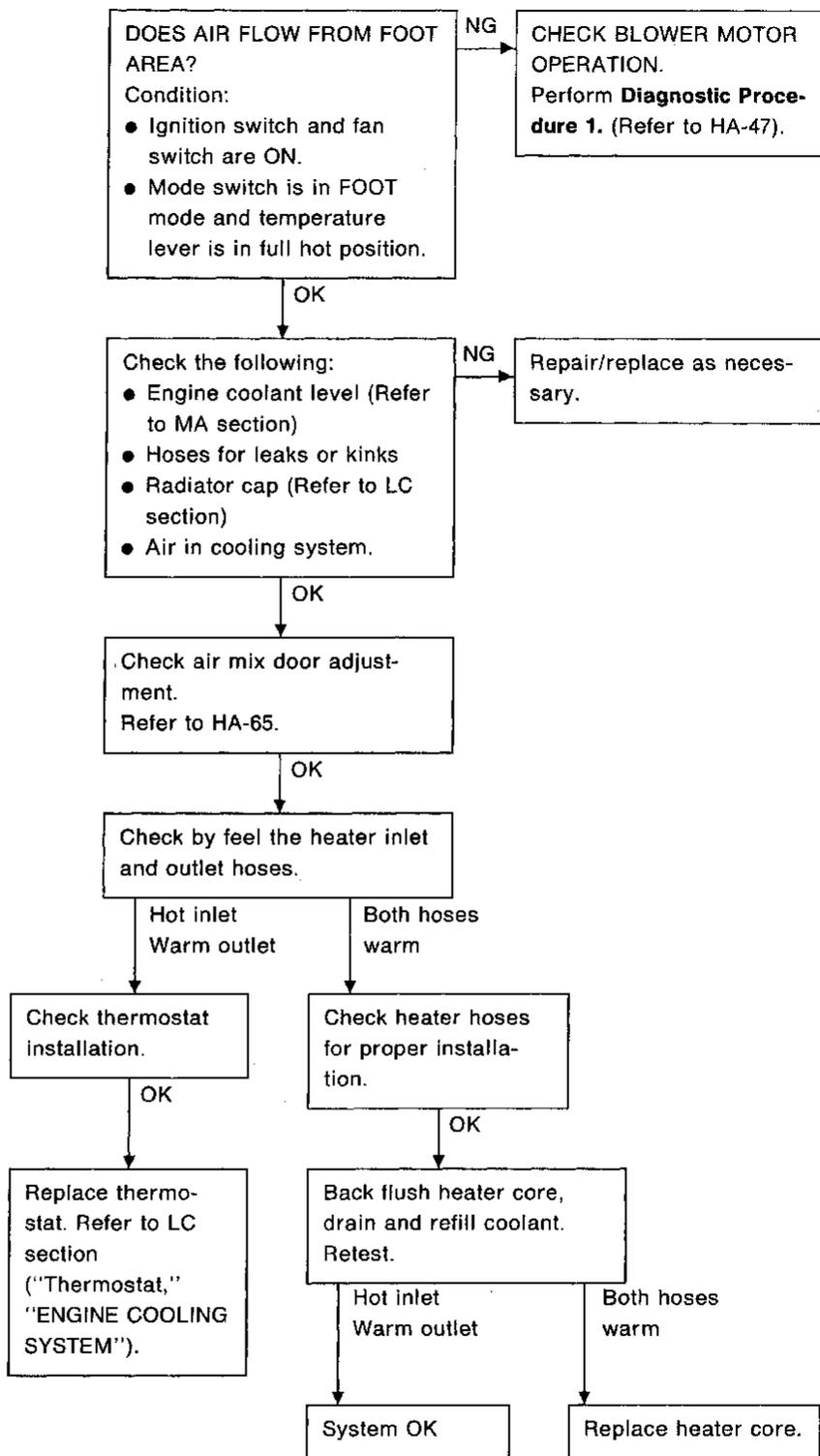


TROUBLE DIAGNOSES

Preliminary Check (Cont'd)

PRELIMINARY CHECK 6

Insufficient heating



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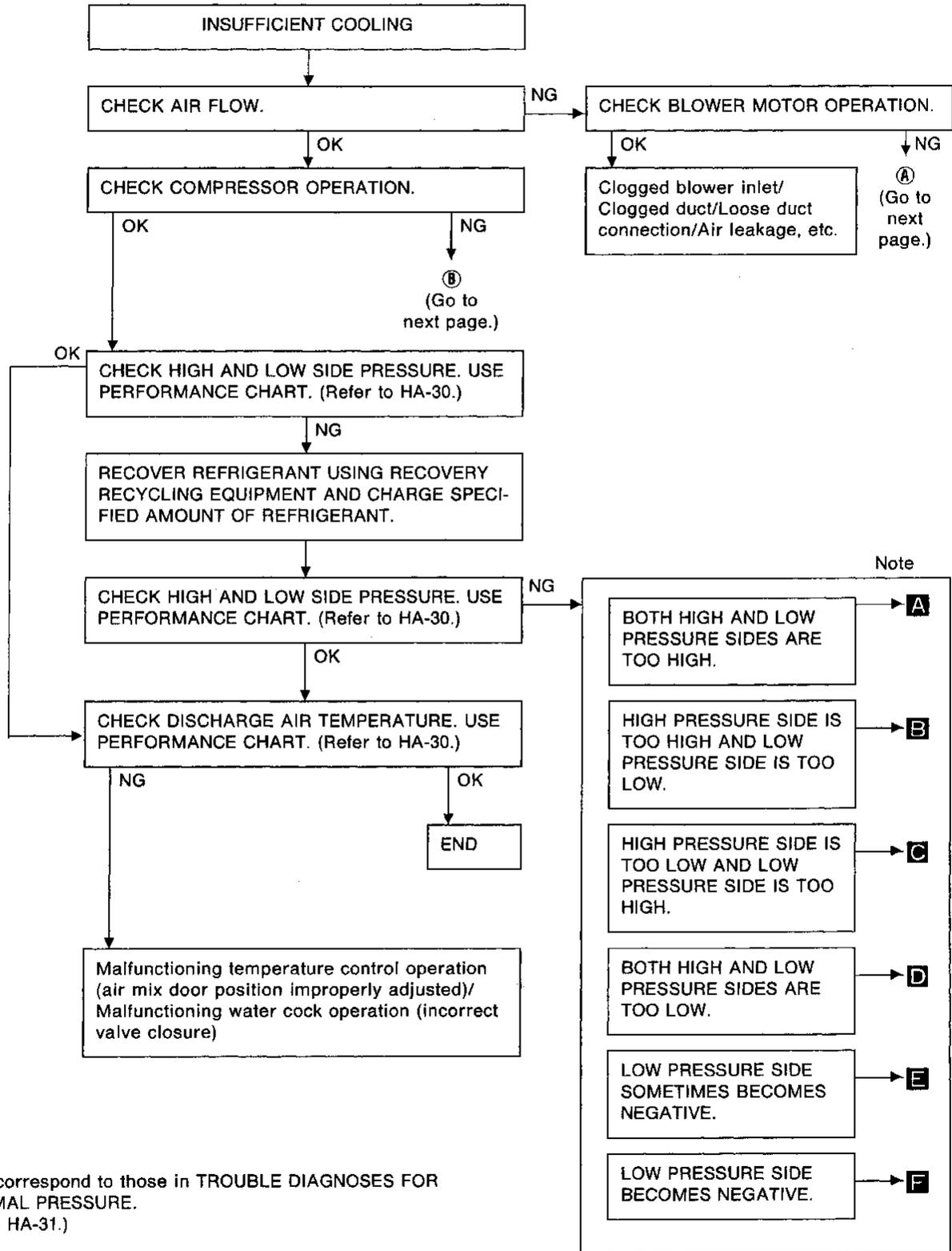
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TROUBLE DIAGNOSES

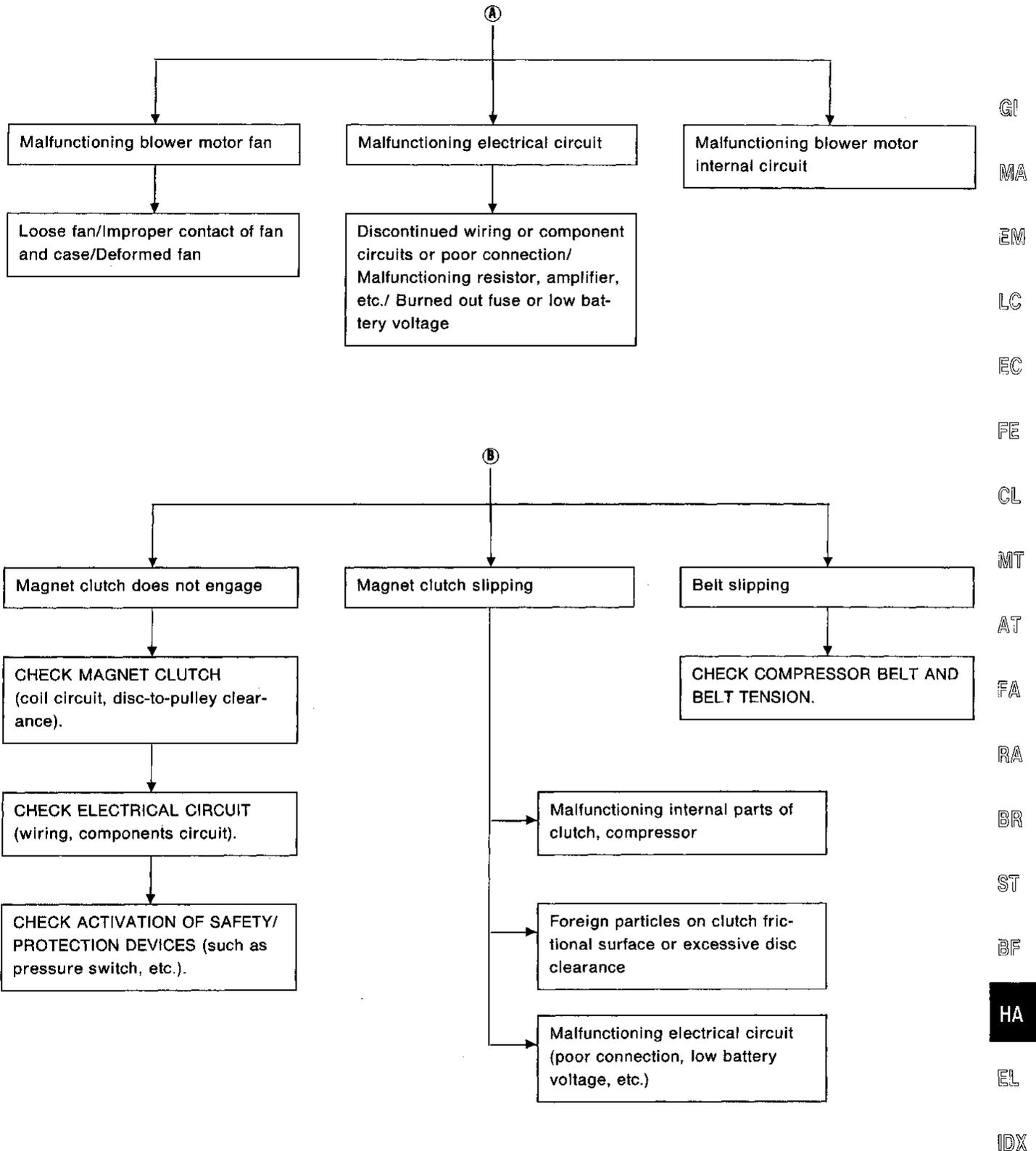
Performance Test Diagnoses INSUFFICIENT COOLING



Note: **A-F** correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. (Refer to HA-31.)

TROUBLE DIAGNOSES

Performance Test Diagnoses (Cont'd)



TROUBLE DIAGNOSES

Performance Chart

TEST CONDITION

Testing must be performed as follows:

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

Doors: Closed

Door window: Open

Hood: Open

TEMP.: Max. COLD

Discharge Air: Face Vent

REC switch: (Recirculation) set

FAN speed: 4-speed

Engine speed: 1,500 rpm

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

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)	7.8 - 10.4 (46 - 51)
	30 (86)	11.8 - 15.0 (53 - 59)
	35 (95)	15.8 - 19.4 (60 - 67)
60 - 70	25 (77)	10.4 - 13.0 (51 - 55)
	30 (86)	15.0 - 18.4 (59 - 65)
	35 (95)	19.4 - 24.0 (67 - 75)

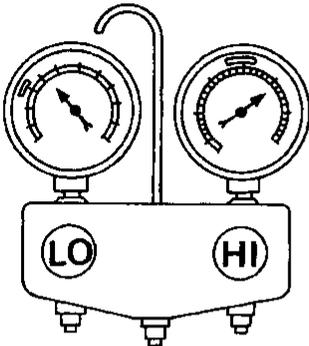
Ambient air temperature-to-compressor pressure table

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	941 - 1,138 (9.6 - 11.6, 137 - 165)	167 - 206 (1.7 - 2.1, 24 - 30)
	30 (86)	1,079 - 1,314 (11.0 - 13.4, 156 - 191)	186 - 245 (1.9 - 2.5, 27 - 36)
	35 (95)	1,216 - 1,491 (12.4 - 15.2, 176 - 216)	206 - 284 (2.1 - 2.9, 30 - 41)
	40 (104)	1,363 - 1,657 (13.9 - 16.9, 198 - 240)	226 - 324 (2.3 - 3.3, 33 - 47)

TROUBLE DIAGNOSES

Trouble Diagnoses for Abnormal Pressure

Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker on top of the gauge scale (see illustrations below) indicates the standard (normal) pressure range for each side. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to HA-30 ("Ambient air temperature-to-compressor pressure table").

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too high.</p> <p>A</p>  <p style="text-align: center;">AC359A</p>	<ul style="list-style-type: none"> ● Pressure is reduced soon after water is splashed on condenser. 	<p>Excessive refrigerant charge in refrigeration cycle</p>	<p>Reduce refrigerant until specified pressure is obtained.</p>
	<p>Air suction by cooling fan is insufficient.</p>	<p>Insufficient condenser cooling performance</p> <p style="text-align: center;">↓</p> <p>① Condenser fins are clogged. ② Improper fan rotation of cooling fan</p>	<ul style="list-style-type: none"> ● Clean condenser. ● Check and repair cooling fan as necessary.
	<ul style="list-style-type: none"> ● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	<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"> ● Areas near low-pressure pipe connection and service valves are considerably cold compared with areas near expansion valve outlet or evaporator. ● Plates are sometimes covered with frost. 	<ul style="list-style-type: none"> ● Excessive liquid refrigerant on low-pressure side ● Excessive refrigerant discharge flow ● Expansion valve is open a little compared with the specification. <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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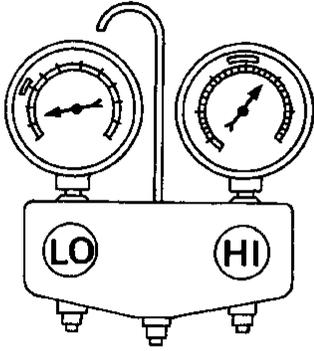
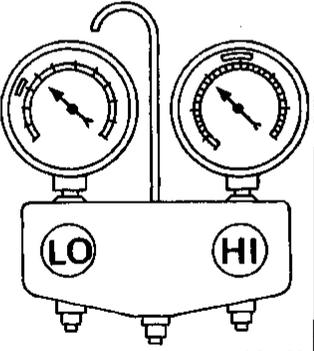
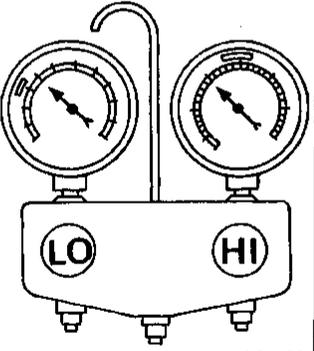
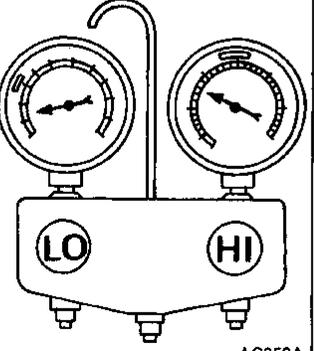
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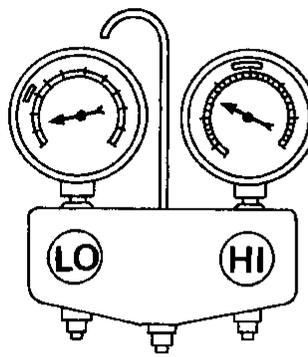
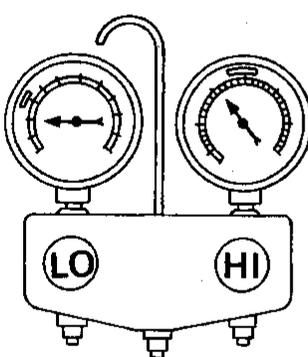
TROUBLE DIAGNOSES

Trouble Diagnoses for Abnormal Pressure (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</p>  <p style="text-align: center;">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"> ● Check and repair or replace malfunctioning parts. ● Check compressor oil for contamination.
<p>High-pressure side is too low and low-pressure side is too high.</p> <p>C</p>  <p style="text-align: center;">AC356A</p>	<p>High and low-pressure sides become equal soon after compressor operation stops.</p>	<p>Compressor pressure operation is improper.</p> <p style="text-align: center;">↓</p> <p>Damaged inside compressor packings</p>	<p>Replace compressor.</p>
<p>High-pressure side is too low and low-pressure side is too high.</p> <p>C</p>  <p style="text-align: center;">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>D</p>  <p style="text-align: center;">AC353A</p>	<ul style="list-style-type: none"> ● There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low. ● Liquid tank inlet and expansion valve are frosted. ● Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. ● Expansion valve inlet may be frosted. ● Temperature difference occurs somewhere in high-pressure side 	<p>Liquid tank inside is clogged a little.</p> <p>High-pressure pipe located between receiver drier and expansion valve is clogged.</p>	<ul style="list-style-type: none"> ● Replace liquid tank. ● Check compressor oil for contamination. ● Check and repair malfunctioning parts. ● Check compressor oil for contamination.

TROUBLE DIAGNOSES

Trouble Diagnoses for Abnormal Pressure (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low. D  AC353A	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ ① Improper expansion valve adjustment ② Malfunctioning thermal valve ③ Outlet and inlet may be clogged.	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check compressor oil for contamination.
	Areas near low-pressure pipe connection and service valve are extremely cold as compared with areas near expansion valve outlet and evaporator.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check compressor oil for contamination.
Low-pressure side sometimes becomes negative. E  AC354A	Air flow volume is not enough or is too low.	Evaporator is frozen. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)	Replace compressor.
	<ul style="list-style-type: none"> Air conditioning system does not function and does not cyclically cool the compartment air. The system constantly functions for a certain period of time after compressor is stopped and restarted. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> Drain water from refrigerant or replace refrigerant. Replace liquid tank.

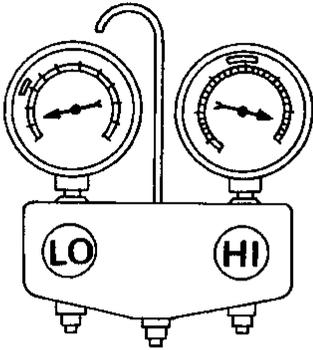
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TROUBLE DIAGNOSES

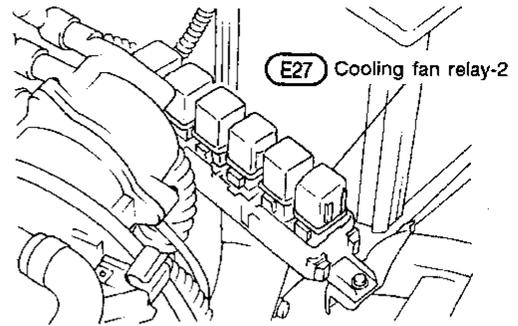
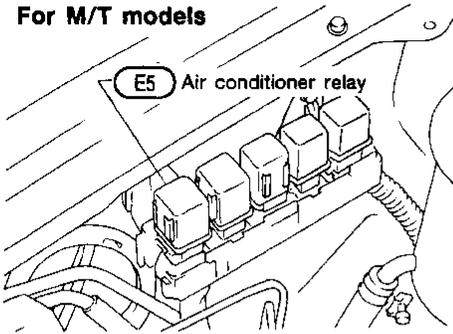
Trouble Diagnoses for Abnormal Pressure (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p> <p>F</p>  <p style="text-align: right;">AC362A</p>	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow.</p> <p style="text-align: center;">↓</p> <p>Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest. Start it again to check whether or not the problem is caused by water or foreign particles.</p> <ul style="list-style-type: none"> ● If the problem is due to water, drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air. ● If either of the above methods cannot correct the problem, replace expansion valve. ● Replace liquid tank. ● Check compressor oil for contamination.

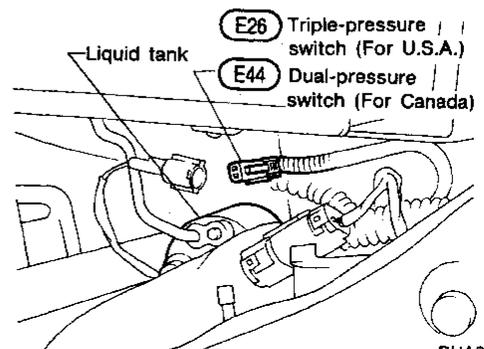
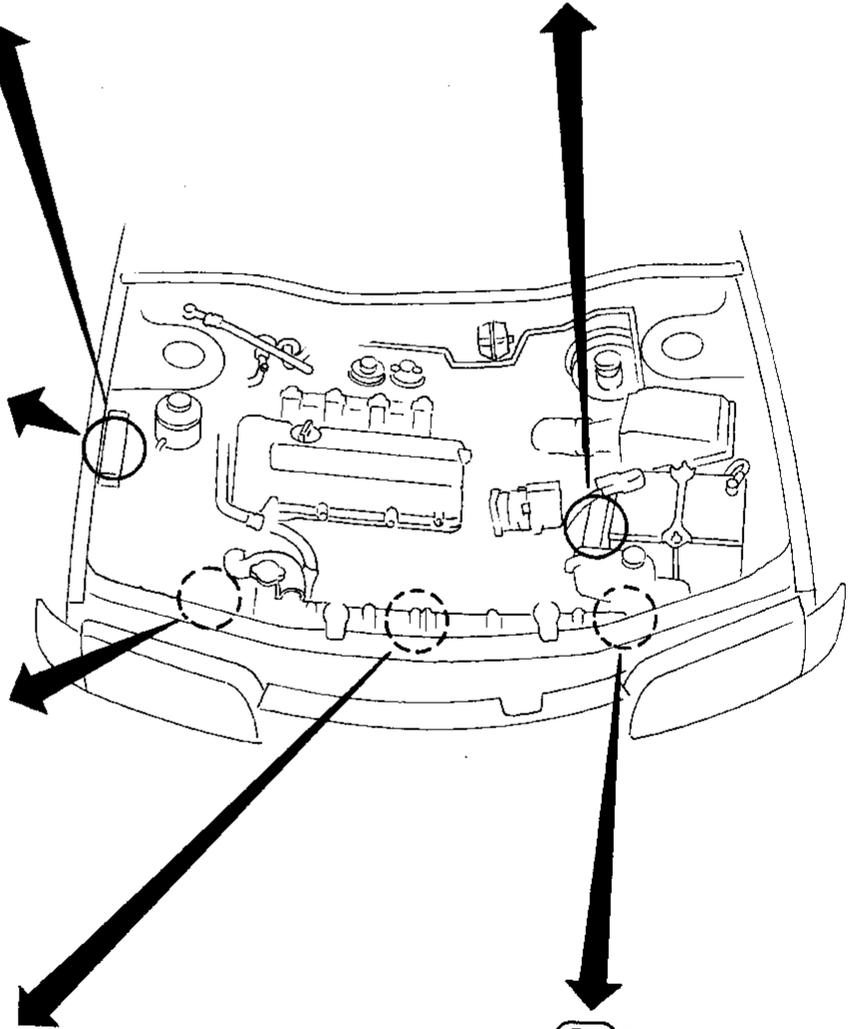
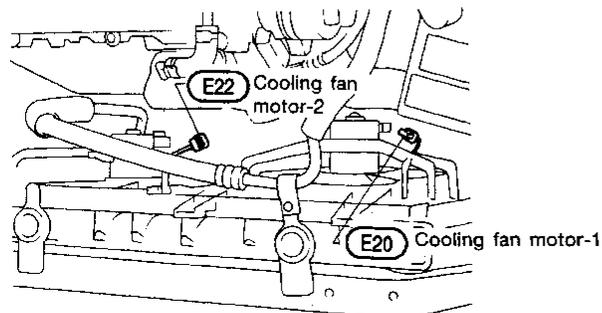
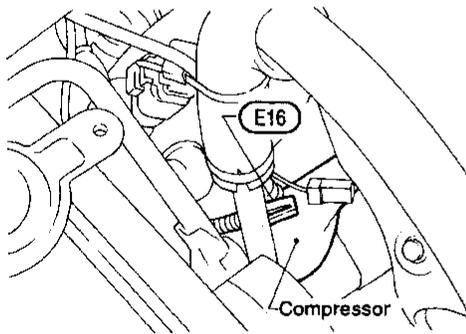
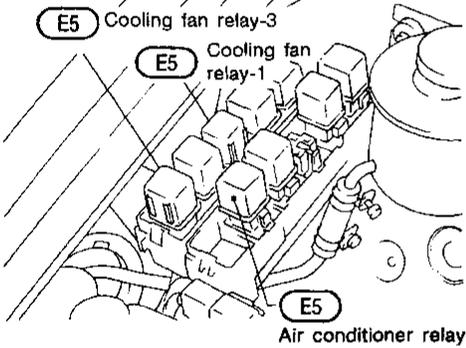
Harness Layout

ENGINE COMPARTMENT

For M/T models



For A/T models



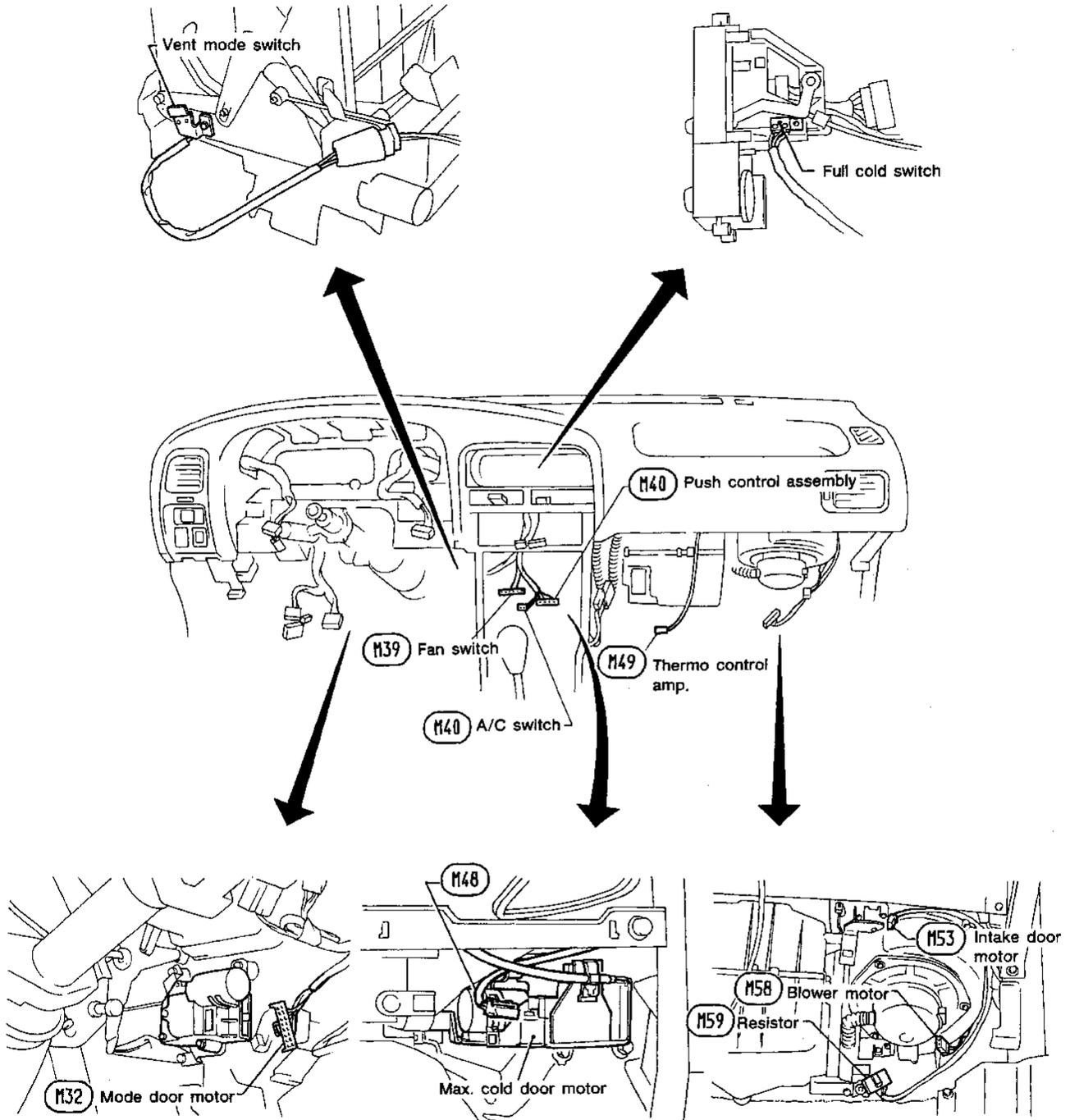
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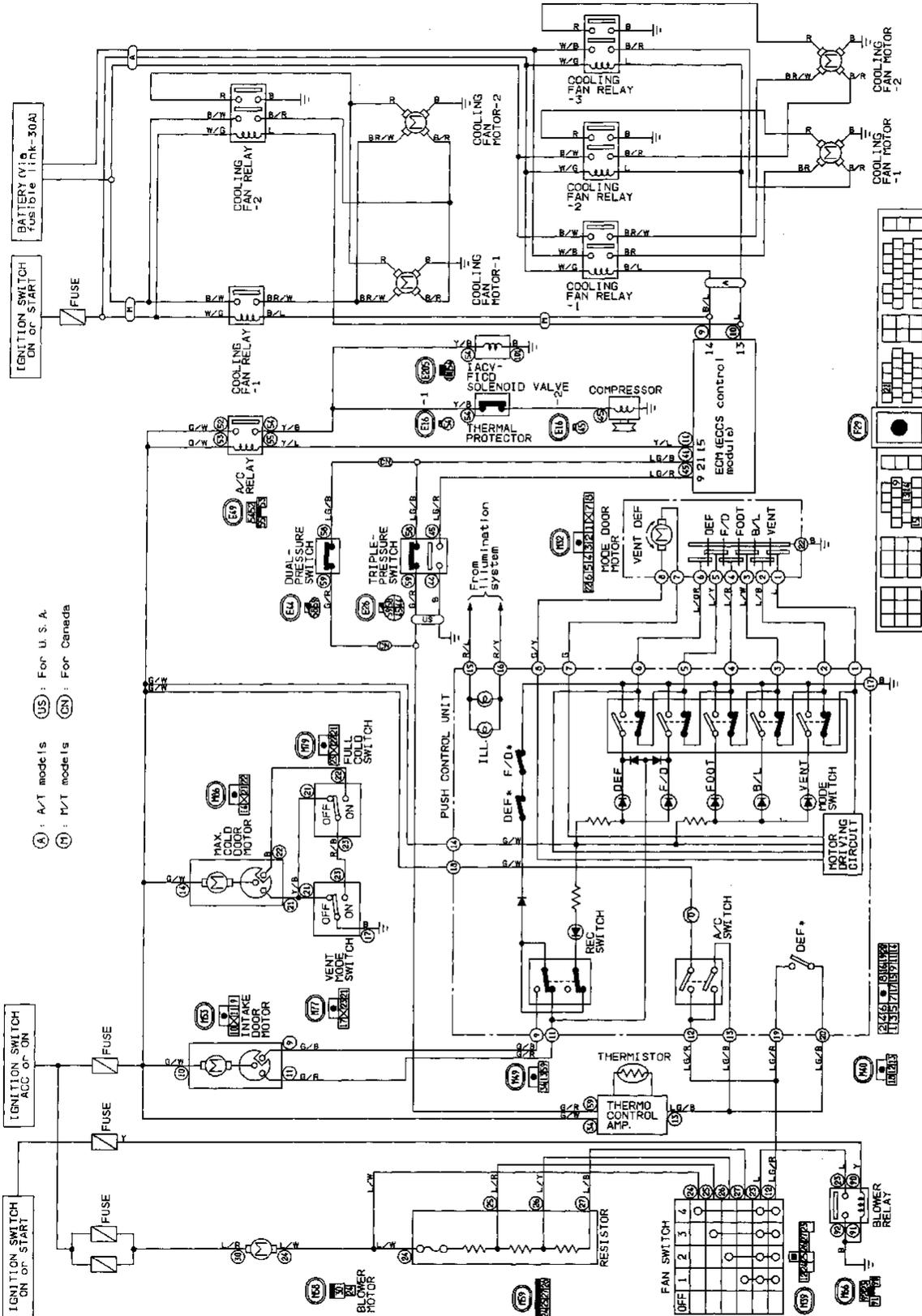
TROUBLE DIAGNOSES

Harness Layout (Cont'd)

PASSENGER COMPARTMENT



Circuit Diagram for Quick Pinpoint Check

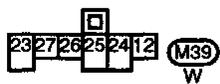
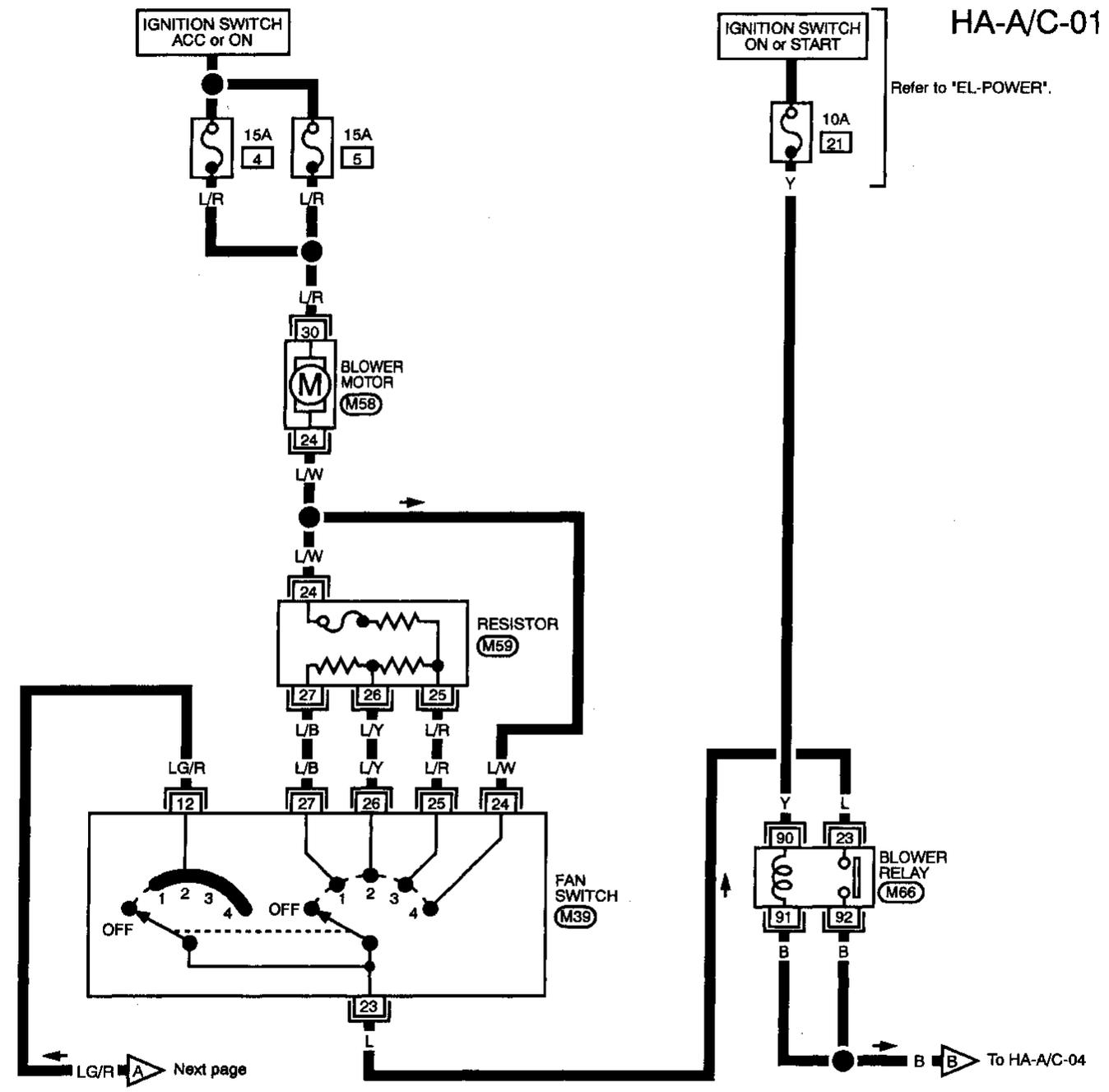


- All connectors shown in this illustration are unit side connectors.
- The unit side connectors with a double circle "⊖" are connected to the harness side connectors shown in the "HARNES LAYOUT". (See page HA-35.)
- The terminal numbers in the connector coincide with the circuit numbers surrounded by a single circle "○".
- Those switches are built into push control unit and mechanically linked to corresponding switches.

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TROUBLE DIAGNOSES

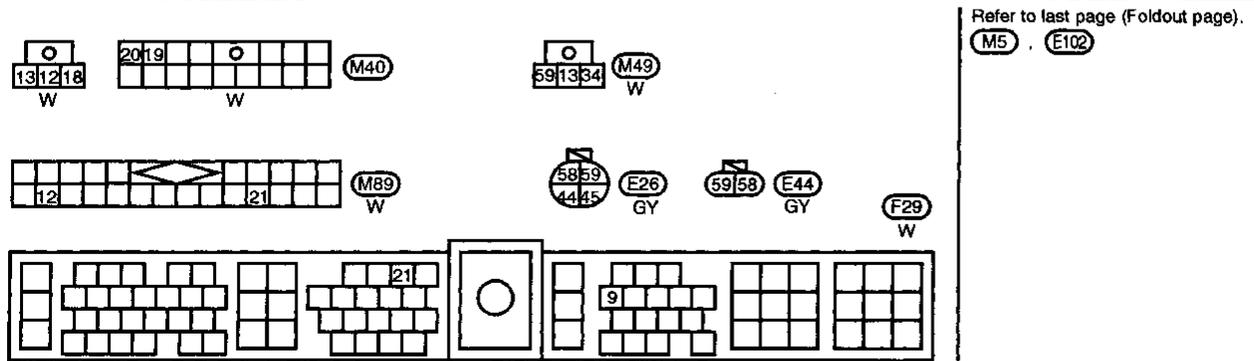
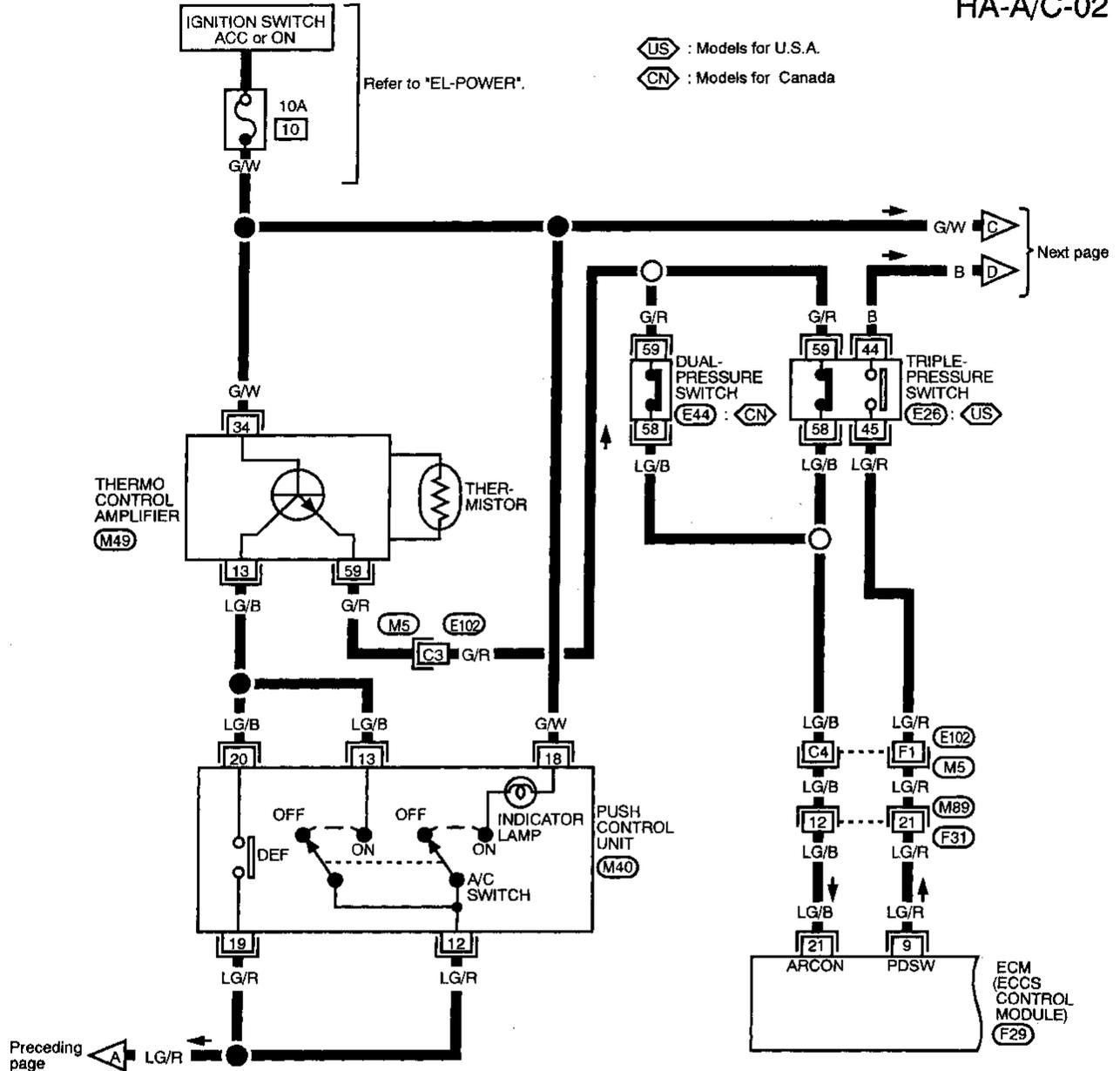
Wiring Diagram — A/C —



TROUBLE DIAGNOSES

Wiring Diagram — A/C — (Cont'd)

HA-A/C-02



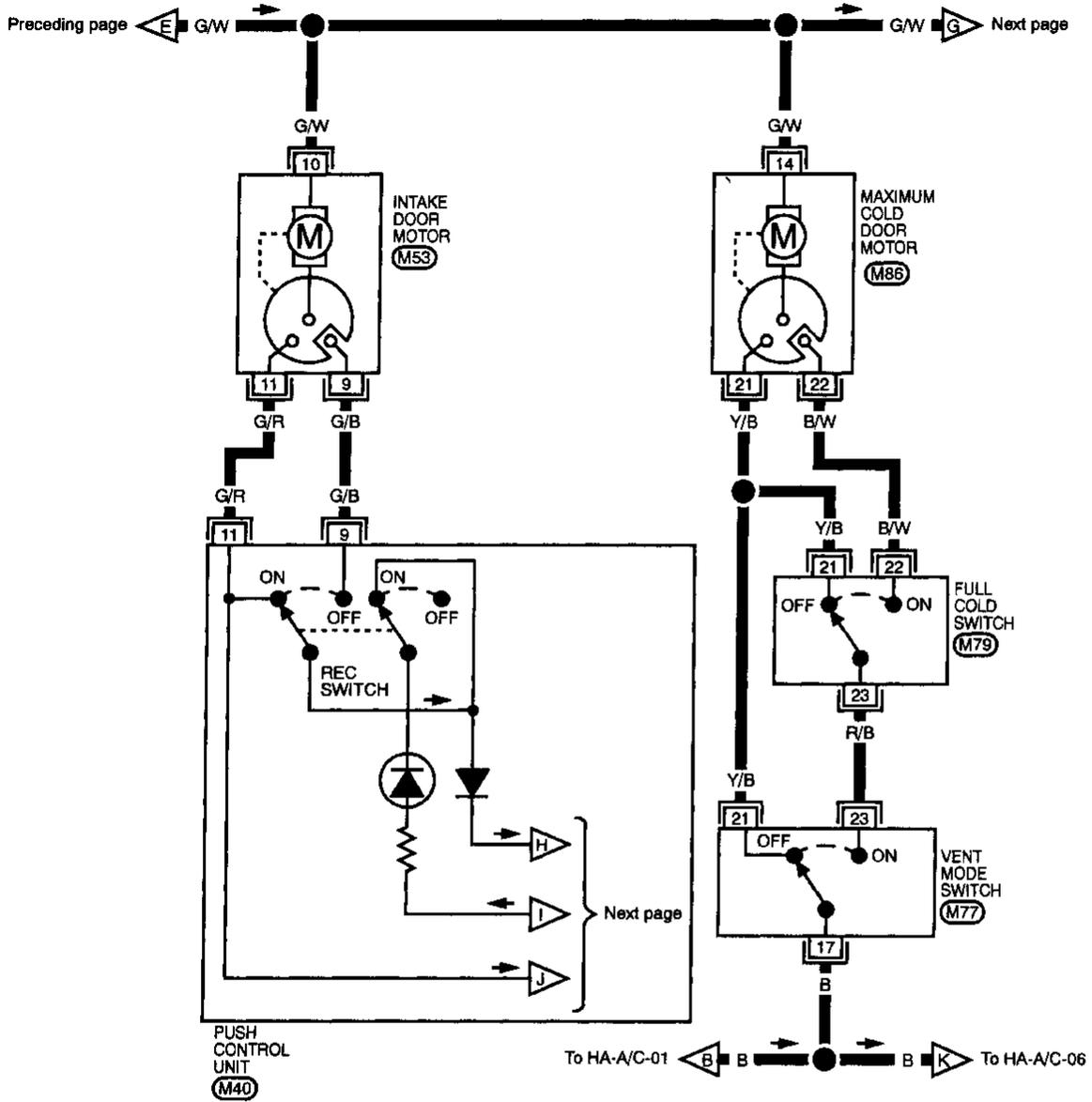
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TROUBLE DIAGNOSES

Wiring Diagram — A/C — (Cont'd)

HA-A/C-04

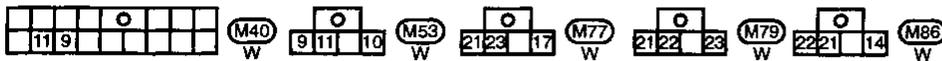


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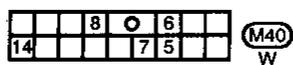
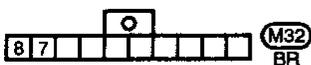
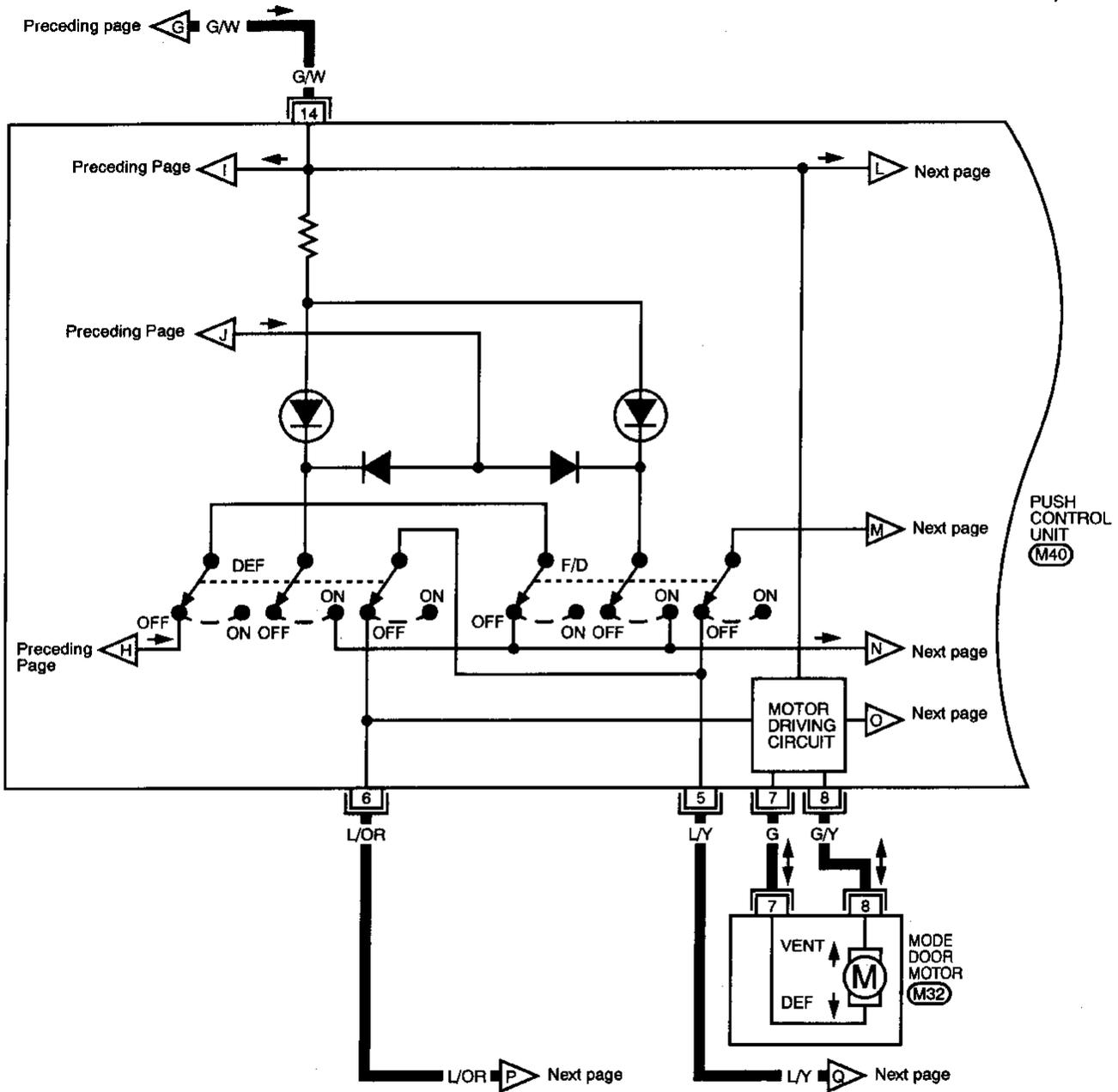
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TROUBLE DIAGNOSES

Wiring Diagram — A/C — (Cont'd)

HA-A/C-05



TROUBLE DIAGNOSES

Wiring Diagram — A/C — (Cont'd)

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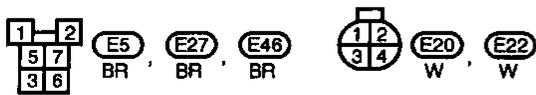
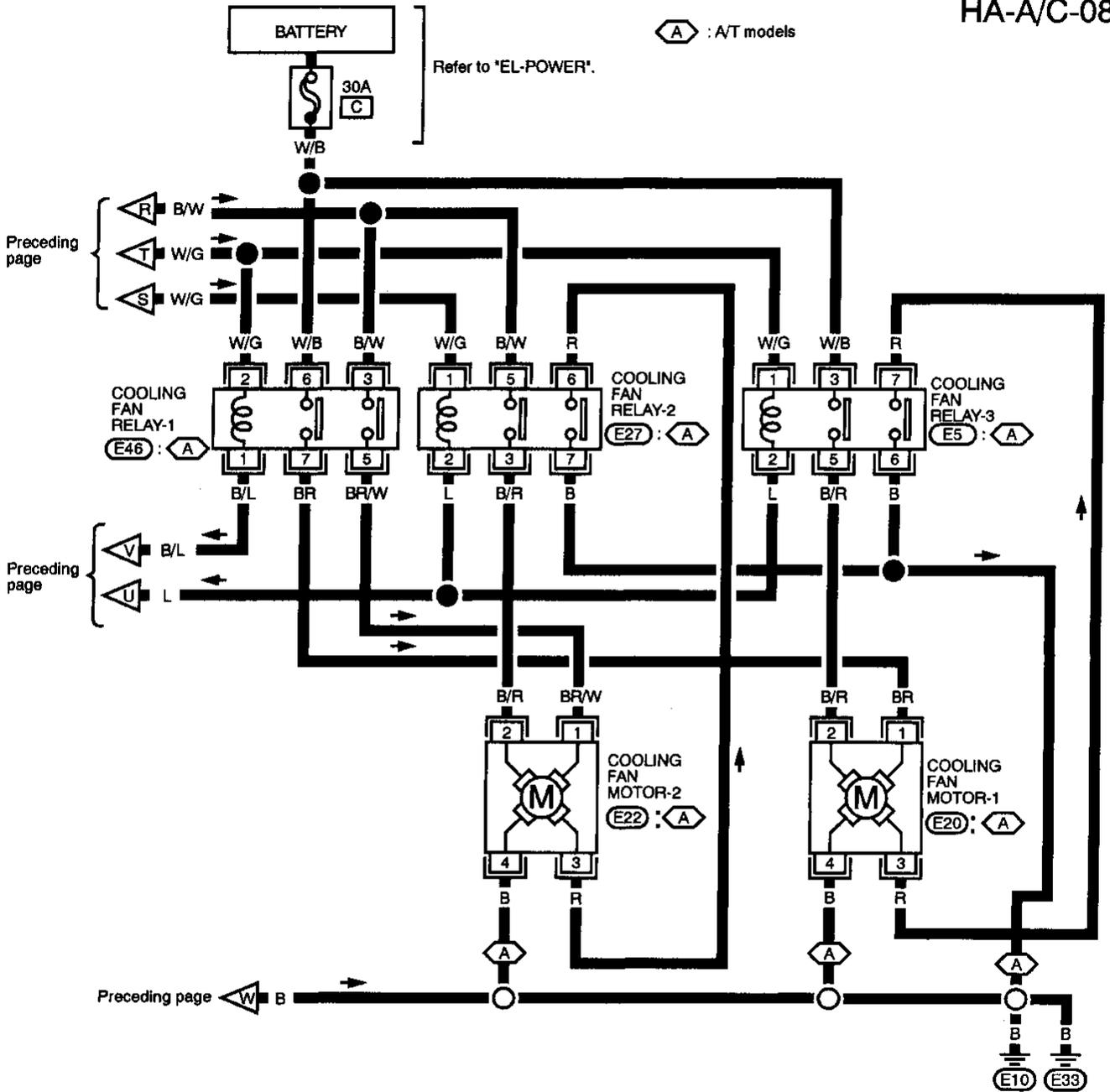
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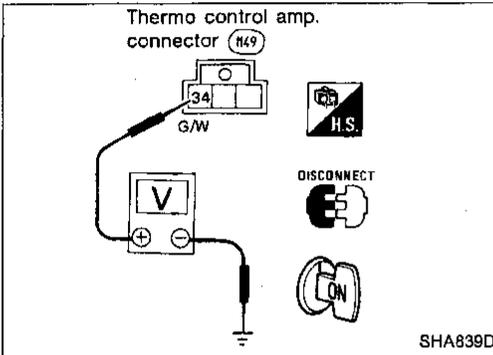


Main Power Supply and Ground Circuit Check

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.

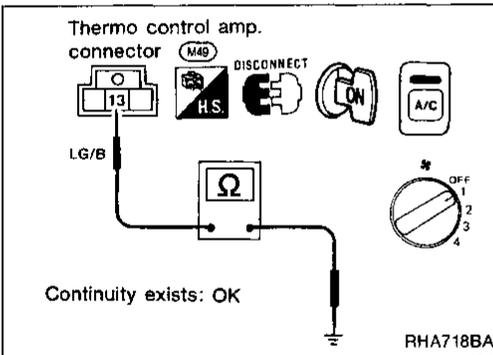


Thermo control amp. CHECK

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.

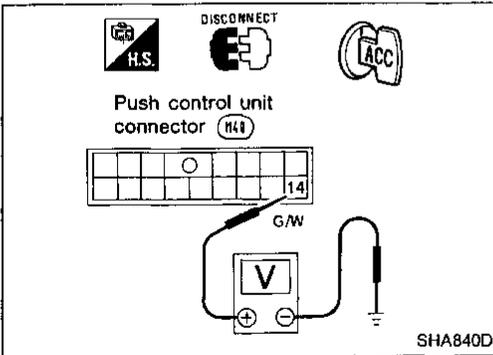
Voltmeter terminal		Voltage
⊕	⊖	
34	Body ground	Approx. 12V



Turn ignition, A/C and fan switches ON. Check body ground circuit for thermo control amp.

1. Disconnect thermo control amp. harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. 13 and body ground.

Ohmmeter terminal		Continuity
⊕	⊖	
13	Body ground	Yes

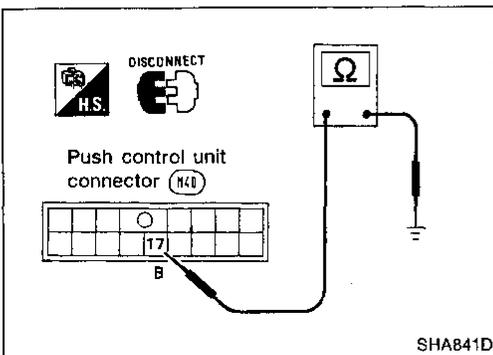


PUSH CONTROL UNIT CHECK

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

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.

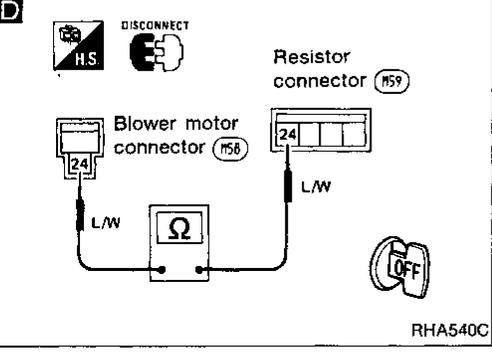
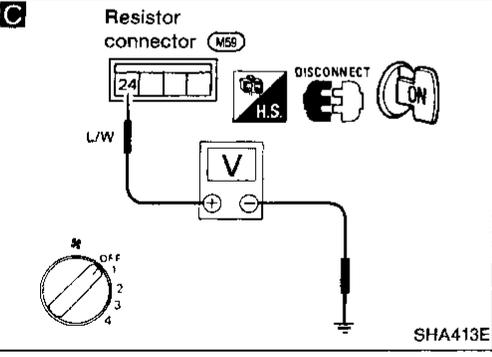
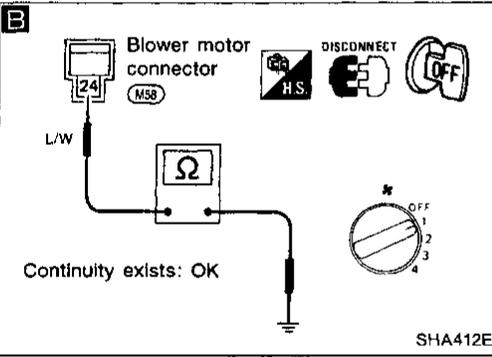
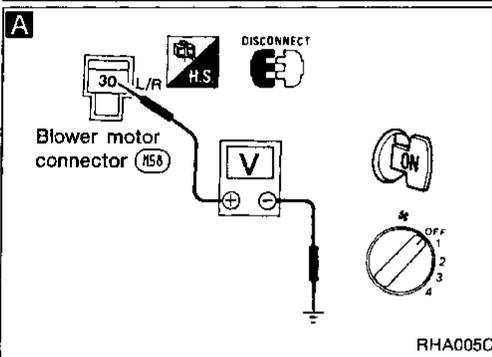
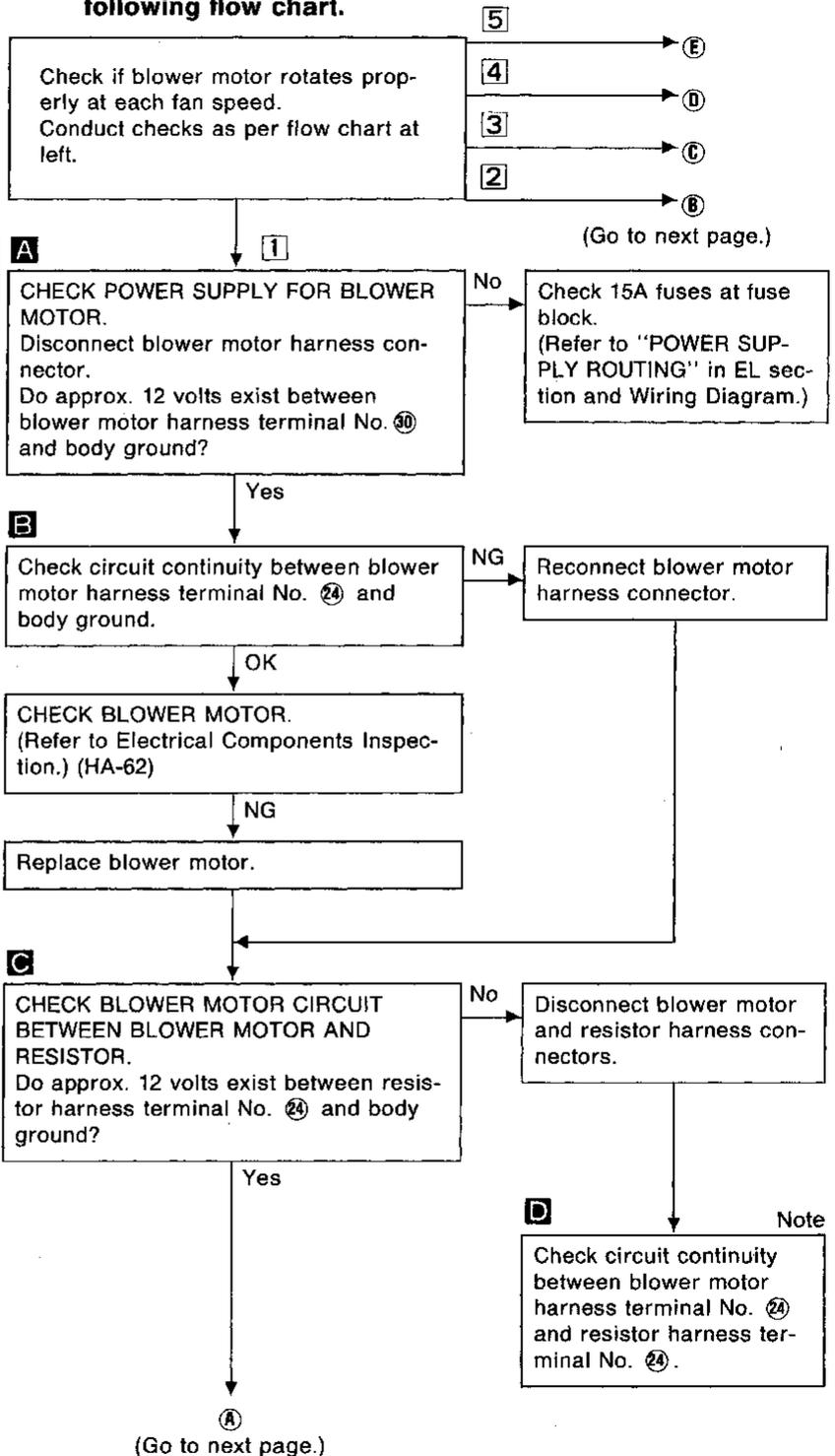
TROUBLE DIAGNOSES

	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.

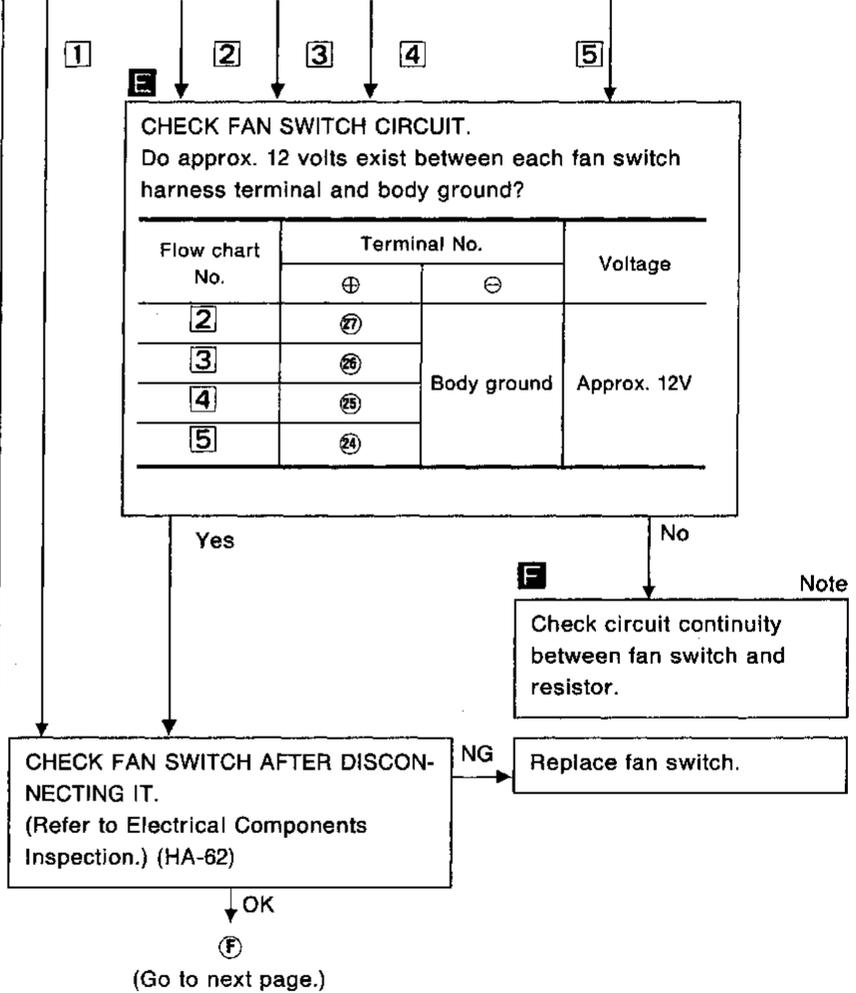
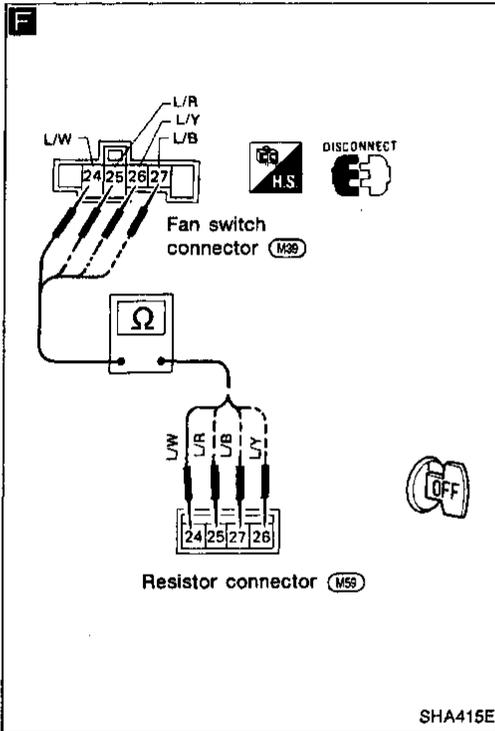
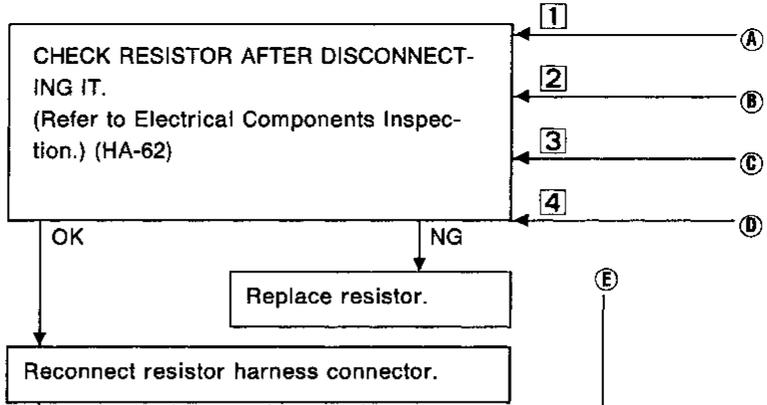
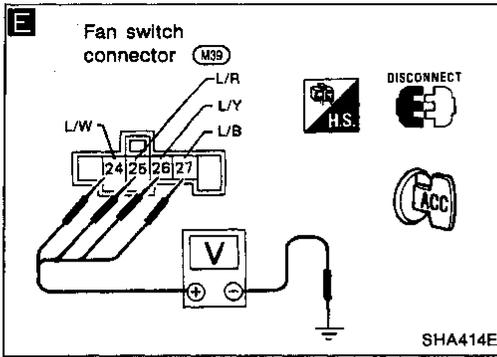


Note:
If the result is NG after checking circuit continuity, repair harness or connector.

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TROUBLE DIAGNOSES

Diagnostic Procedure 1 (Cont'd)

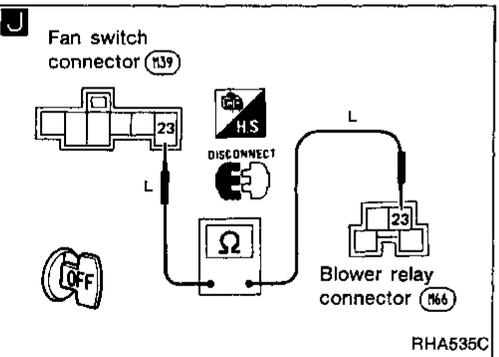
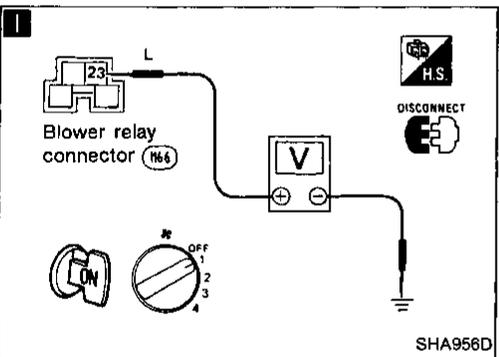
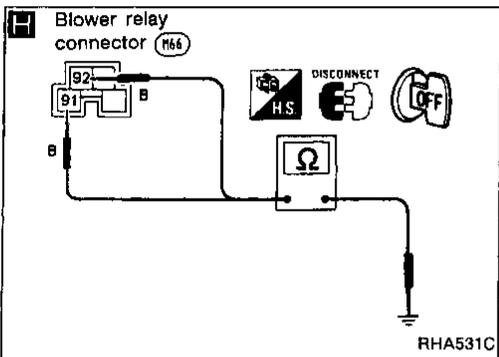
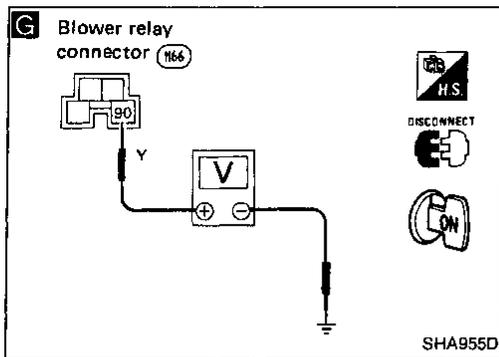


Note:

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

TROUBLE DIAGNOSES

Diagnostic Procedure 1 (Cont'd)



F

G CHECK POWER SUPPLY FOR BLOWER RELAY.
Disconnect blower relay harness connector.
Do approx. 12 volts exist between blower relay harness terminal No. 90 and body ground?

No → Check 10A fuse at fuse block. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

Yes

H Note
Check circuit continuity between blower relay harness terminal No. 91, 92 and body ground.

OK

Reconnect fan switch harness connector.

I CHECK FAN SWITCH CIRCUIT BETWEEN FAN SWITCH AND BLOWER RELAY.
Do approx. 12 volts exist between blower relay harness terminal No. 23 and body ground?

No → Disconnect fan switch harness connector.

Yes

J Note
Check circuit continuity between fan switch harness terminal No. 23 and blower relay harness terminal No. 23.

CHECK BLOWER RELAY AFTER DISCONNECTING IT.
(Refer to Electrical Components Inspection.) (HA-63)

NG

Replace blower relay.

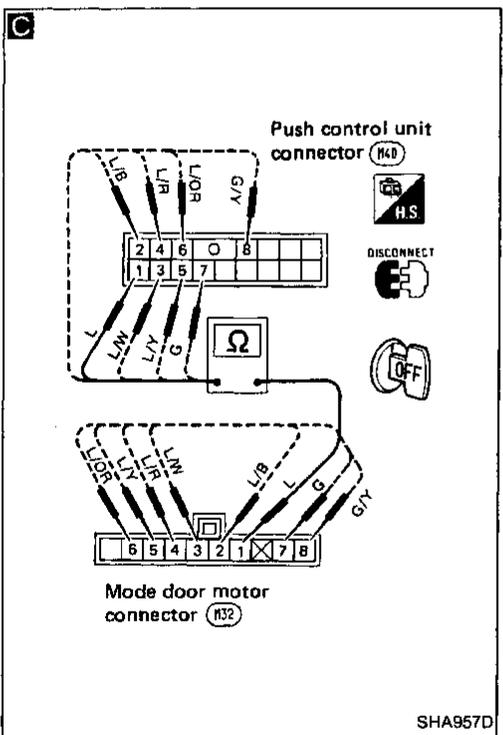
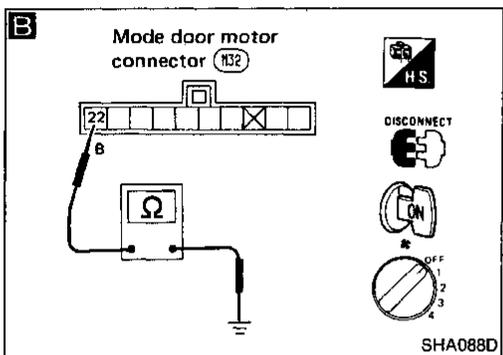
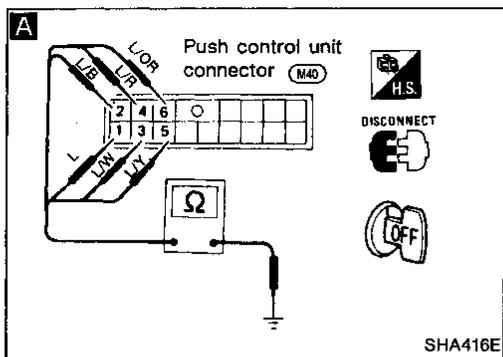
Note:
If the result is NG after checking circuit continuity, repair harness or connector.

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Diagnostic Procedure 2

SYMPTOM: Air outlet does not change.

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



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

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

OK

CHECK SIDE LINK.
Refer to Control Linkage Adjustment. (HA-64)

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. ②② and body ground?

Yes

C Note

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

Terminal No.		Continuity
⊕	⊖	
Push control unit	Mode door motor	Yes
①	①	
②	②	
③	③	
④	④	
⑤	⑤	
⑥	⑥	
⑦	⑦	
⑧	⑧	

OK

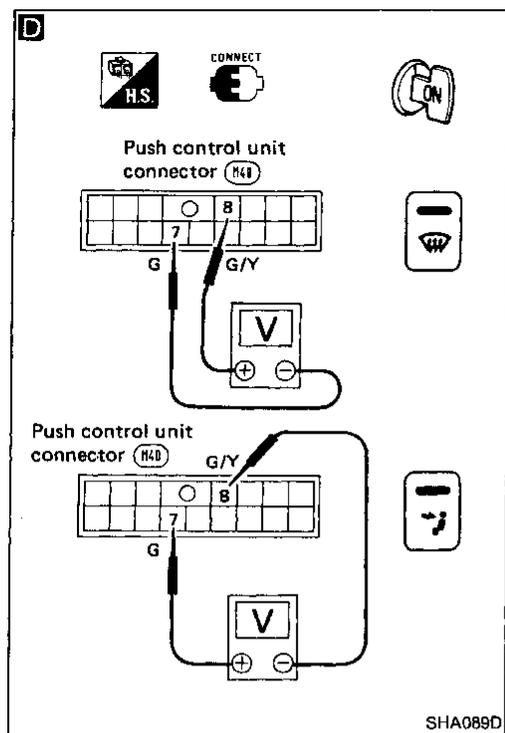
A

(Go to next page.)

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

TROUBLE DIAGNOSES

Diagnostic Procedure 2 (Cont'd)



A

Reconnect push control unit and mode door motor harness connectors.

D

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

No → Replace control amp. built-in push control unit.

Terminal No.		Mode door motor	
⑦	⑧	Mode door operation	Direction of linkage rotation
—	—	Stop	Stop
⊖	⊕	VENT → DEF	Clockwise
⊕	⊖	DEF → VENT	Counterclockwise

Yes

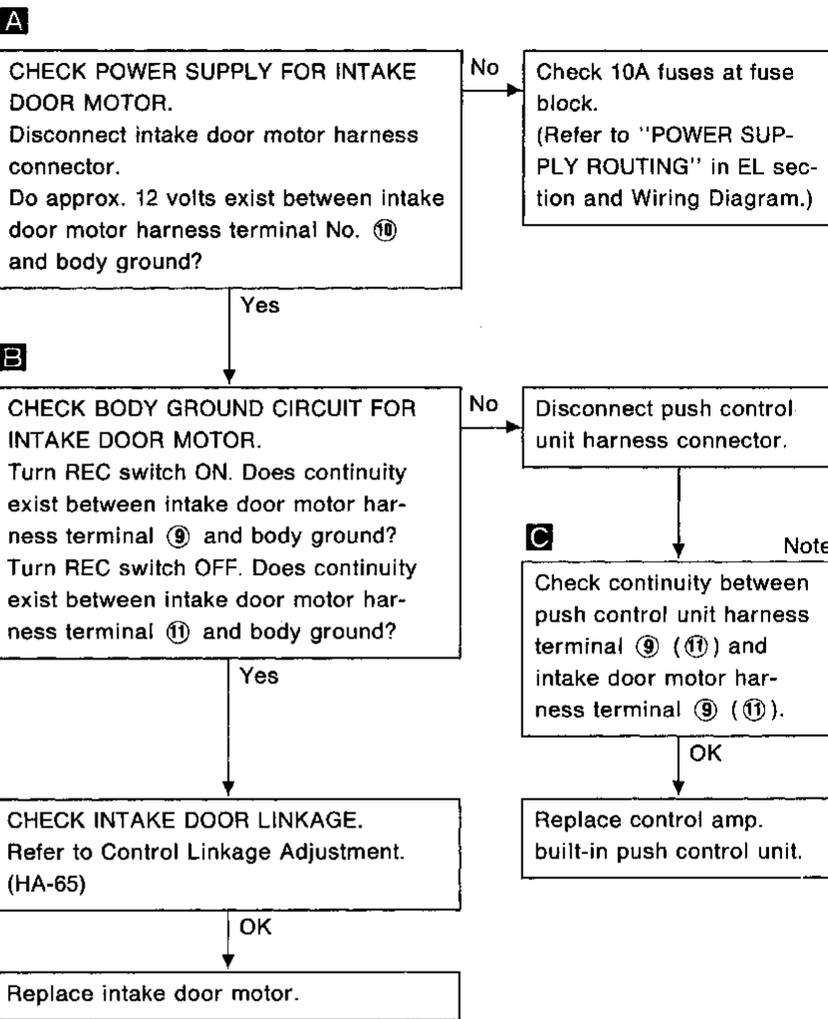
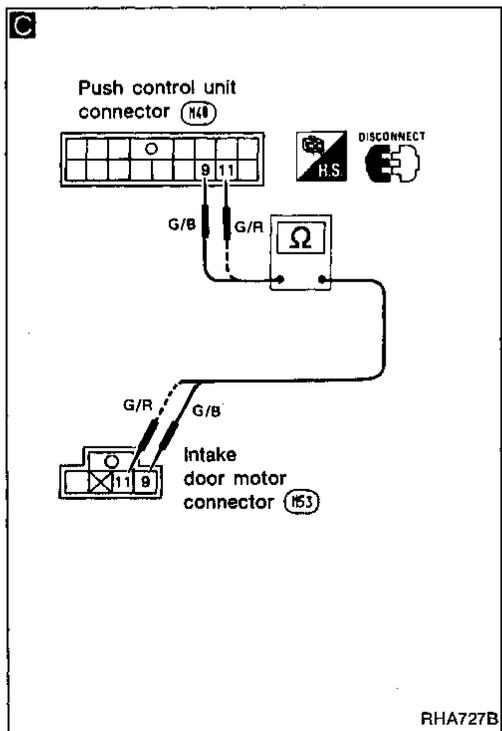
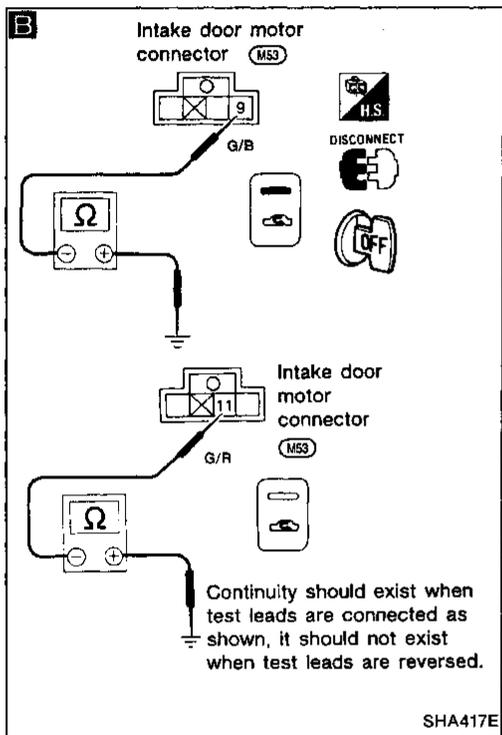
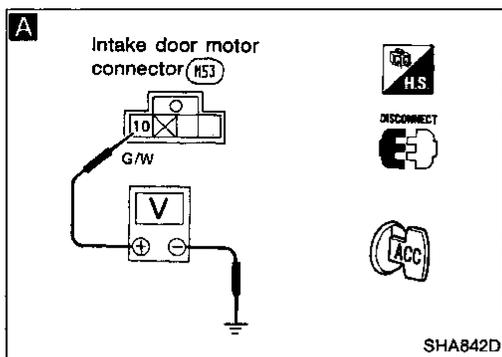
Replace mode door motor.

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Diagnostic Procedure 3

SYMPTOM: Intake door does not change.

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

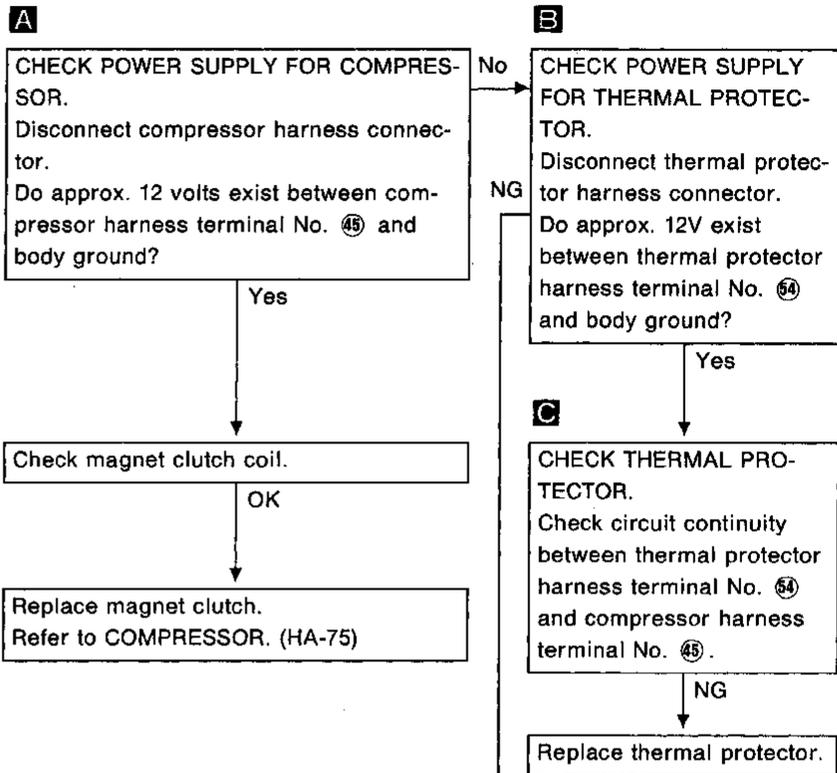
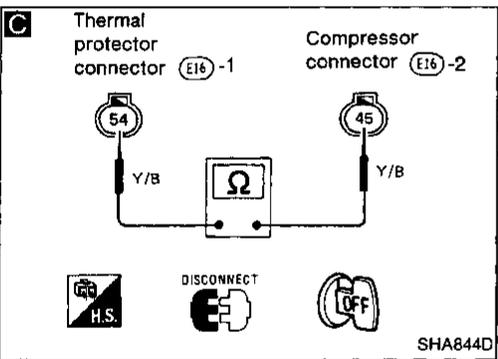
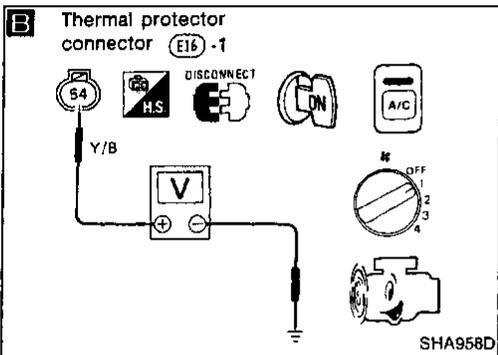
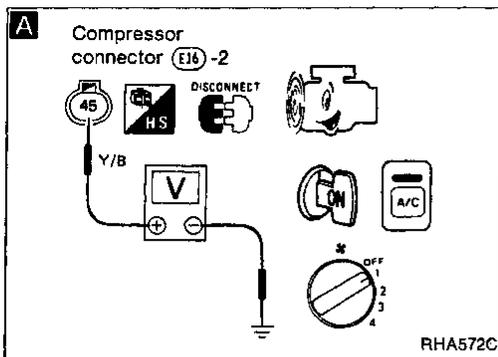


Note:
If the result is NG after checking circuit continuity, repair harness or connector.

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.

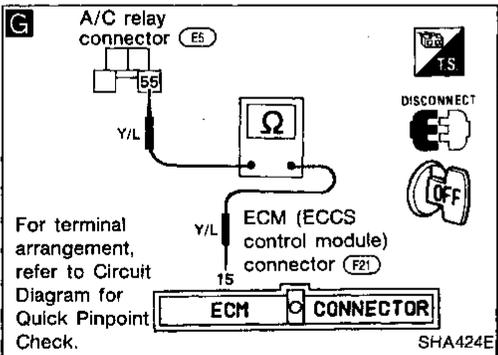
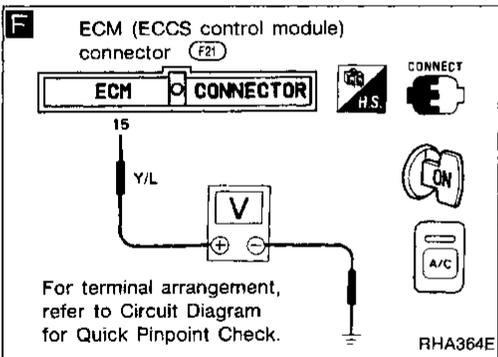
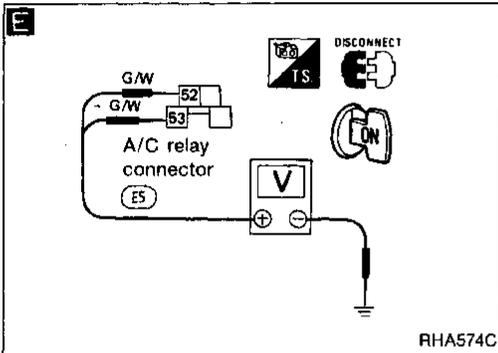
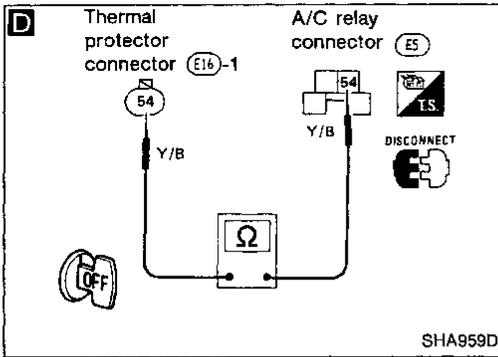


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TROUBLE DIAGNOSES

Diagnostic Procedure 4 (Cont'd)



(A)
Disconnect A/C relay harness connector.

D Note
Check circuit continuity between A/C relay harness terminal No. 54 and thermal protector harness terminal No. 54.

E
CHECK POWER SUPPLY FOR A/C RELAY. Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness terminal No. 52, 53 and body ground?

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-63)

NG Replace A/C relay.

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. 15 and body ground?

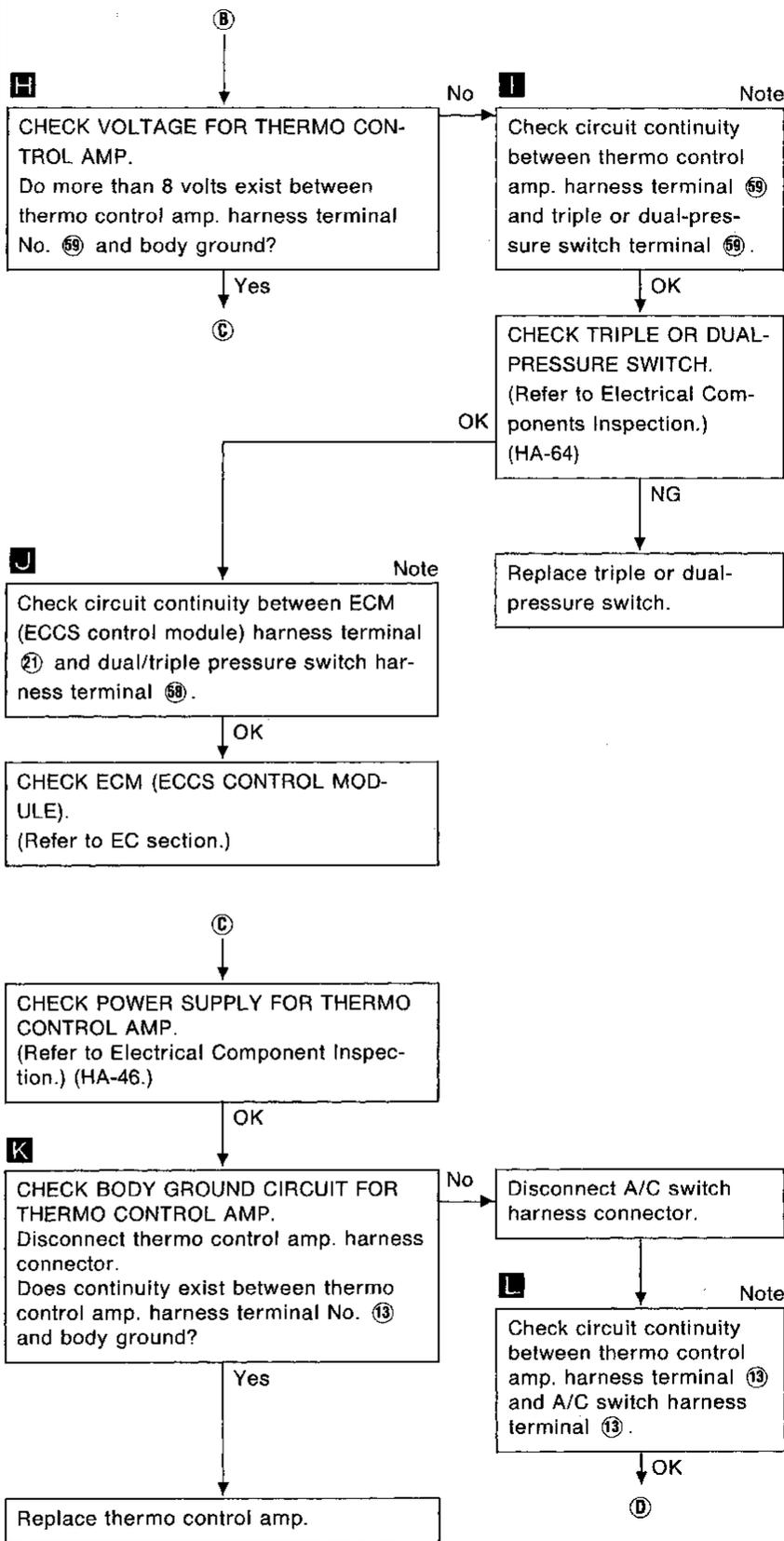
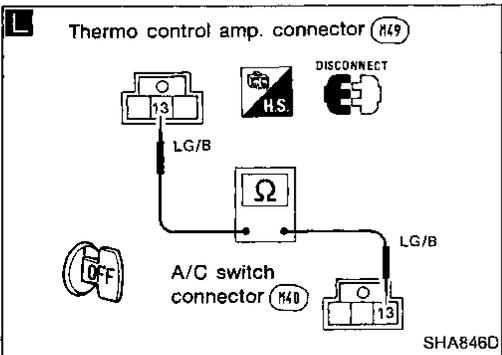
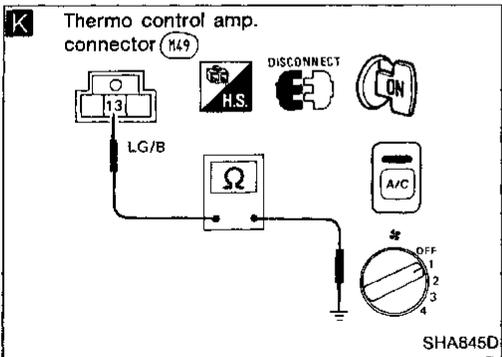
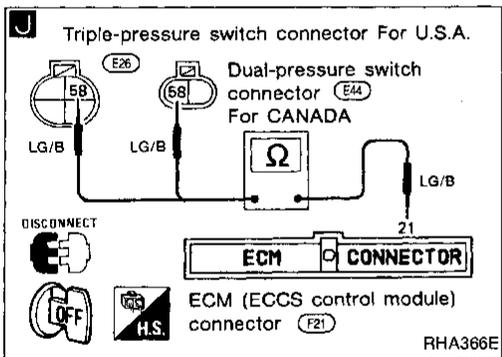
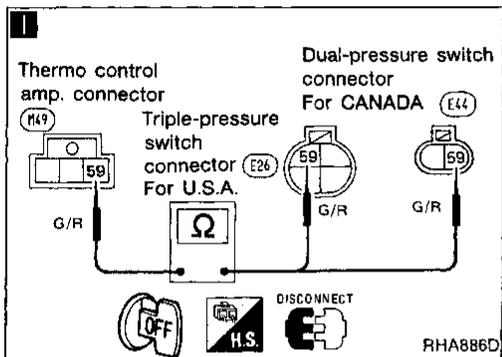
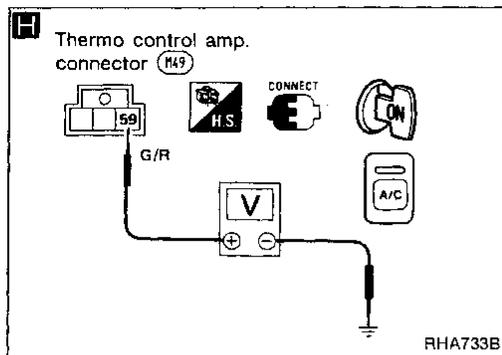
G
Check circuit continuity between A/C relay harness terminal No. 55 and ECM (ECCS control module) harness terminal No. 15.

(B)
(Go to next page.)

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

TROUBLE DIAGNOSES

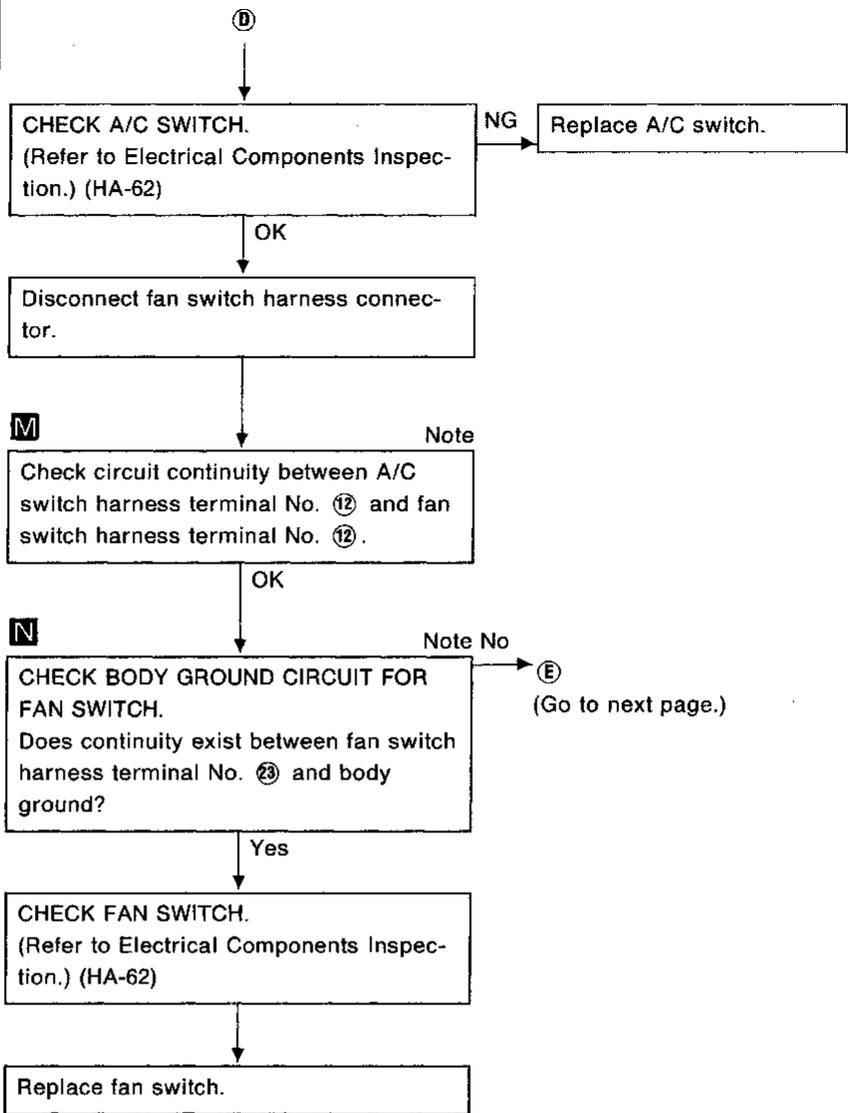
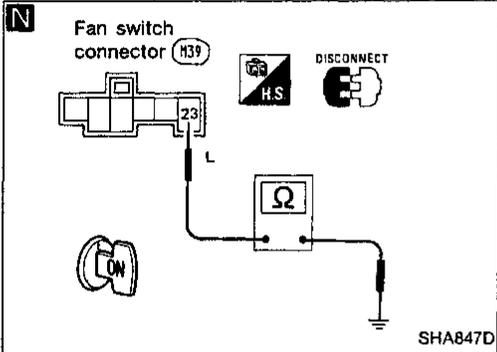
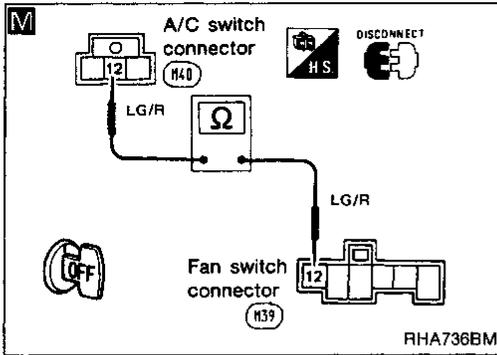
Diagnostic Procedure 4 (Cont'd)



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

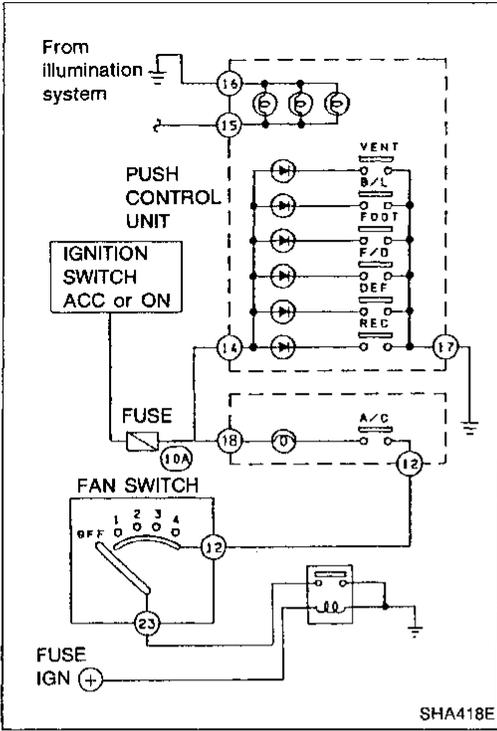
TROUBLE DIAGNOSES

Diagnostic Procedure 4 (Cont'd)



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

TROUBLE DIAGNOSES



Diagnostic Procedure 5

SYMPTOM: Illumination or indicators of push control unit do not come on.

- 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:

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

○: Illumination or indicator comes on.

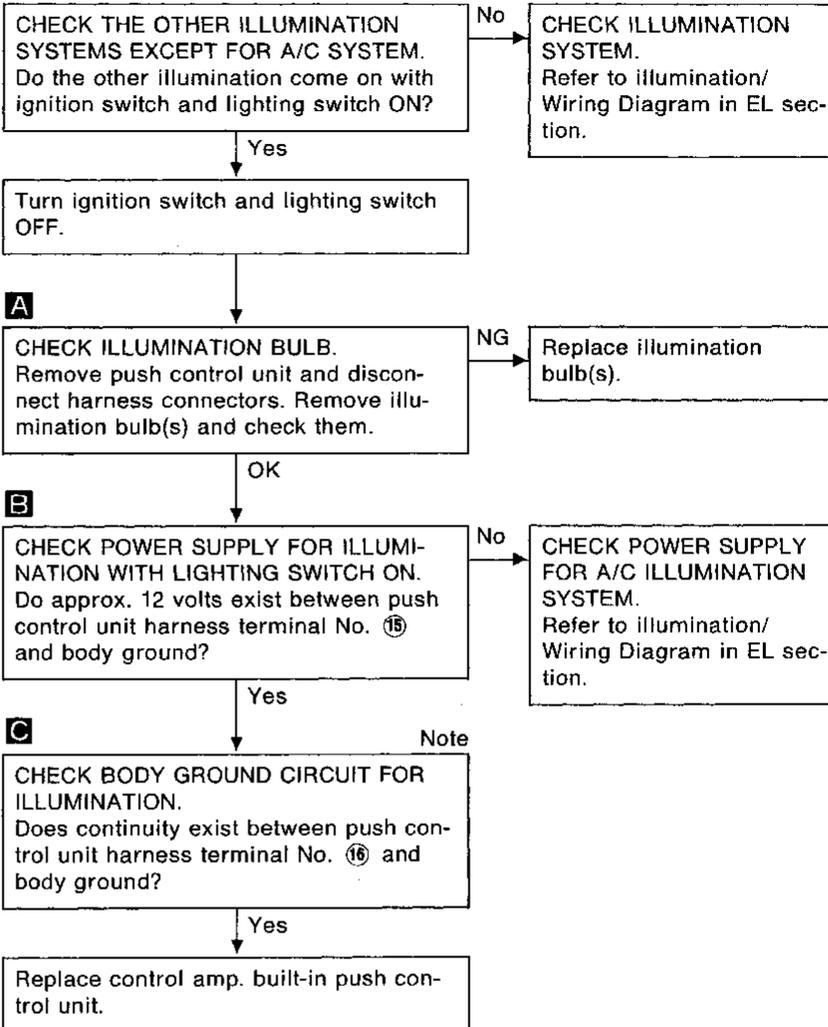
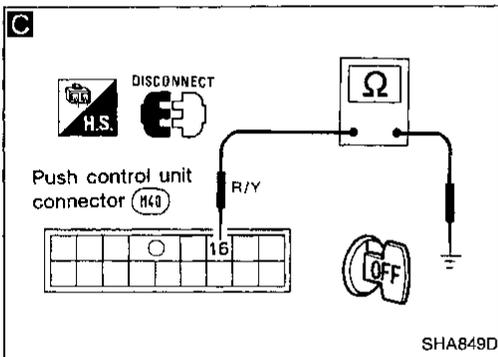
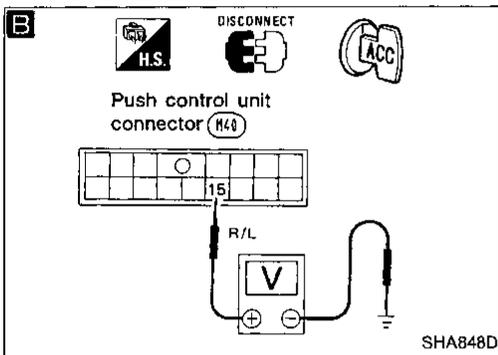
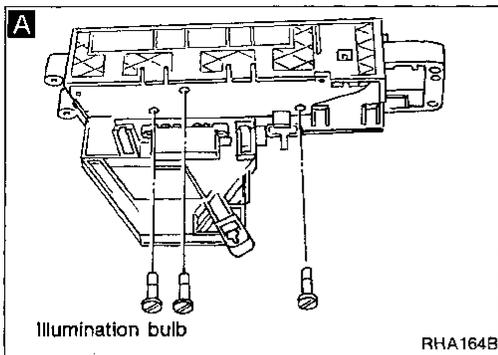
×: Illumination or indicator does not come on.

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

TROUBLE DIAGNOSES

Diagnostic Procedure 5 (Cont'd)

DIAGNOSTIC PROCEDURE 5-1



Note:

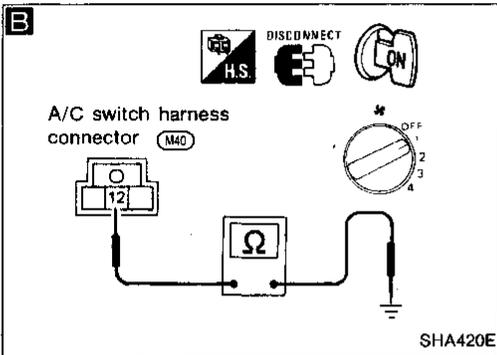
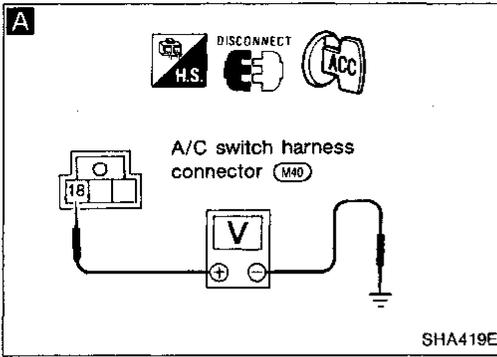
If the result is NG after checking circuit continuity, repair harness or connector.

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TROUBLE DIAGNOSES

Diagnostic Procedure 5 (Cont'd)

DIAGNOSTIC PROCEDURE 5-2



Turn ignition switch OFF.

Disconnect A/C switch harness connector.

A

CHECK POWER SUPPLY FOR A/C SWITCH.
Do approx. 12 volts exist between A/C switch harness terminal No. ⑱ and body ground?

No

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

B

CHECK BODY GROUND CIRCUIT FOR A/C SWITCH.
Does continuity exist between A/C switch harness terminal No. ⑫ and body ground?

Note

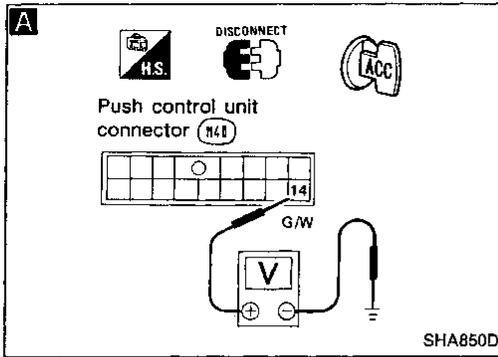
Replace A/C switch assembly.

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

TROUBLE DIAGNOSES

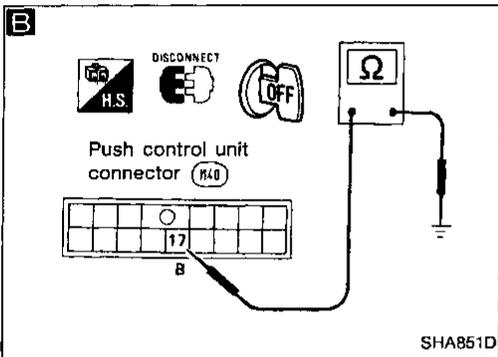
Diagnostic Procedure 5 (Cont'd)

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?

No → 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

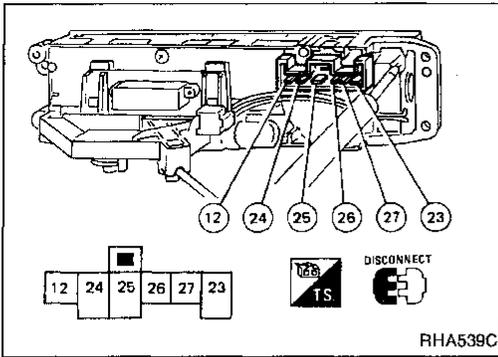
Yes → Replace control amp. built-in push control unit.

Note:

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

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TROUBLE DIAGNOSES

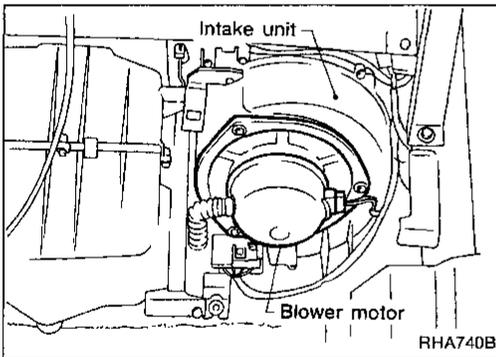


Electrical Components Inspection

FAN SWITCH

Check continuity between terminals at each switch position.

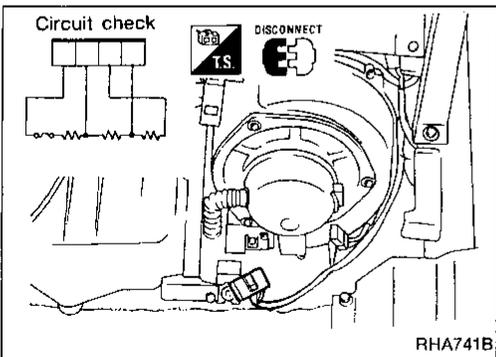
LEVER POSITION	Continuity between terminals
OFF	
1	27 — 23 — 12
2	26 — 23 — 12
3	25 — 23 — 12
4	24 — 23 — 12



BLOWER MOTOR

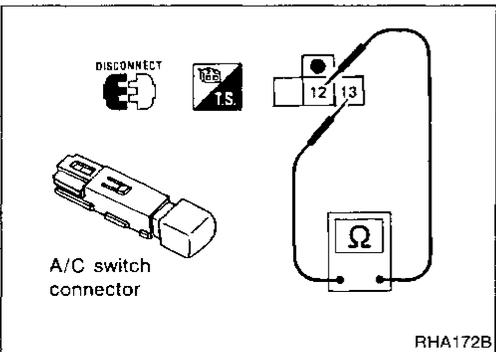
Confirm smooth rotation of the blower motor.

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



BLOWER RESISTOR

Check continuity between terminals.



A/C SWITCH

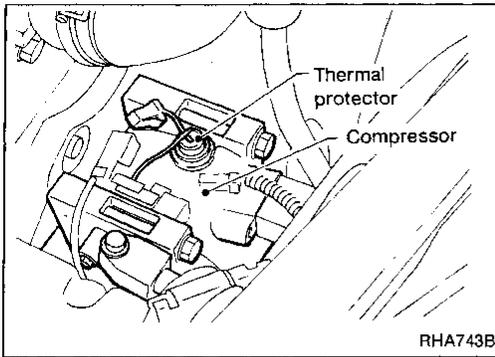
Check continuity between terminals at each switch position.

Switch condition		Terminal No.		Continuity
A/C	DEF	⊕	⊖	
ON	ON	13	12	Yes
ON	OFF			
OFF	ON			

TROUBLE DIAGNOSES

Electrical Components Inspection (Cont'd)

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

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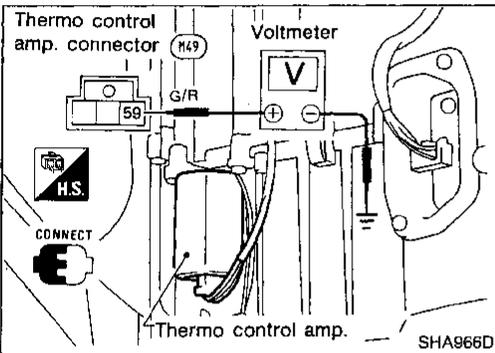
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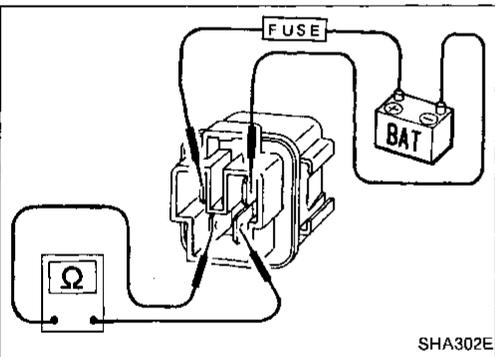
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THERMO CONTROL AMP.

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



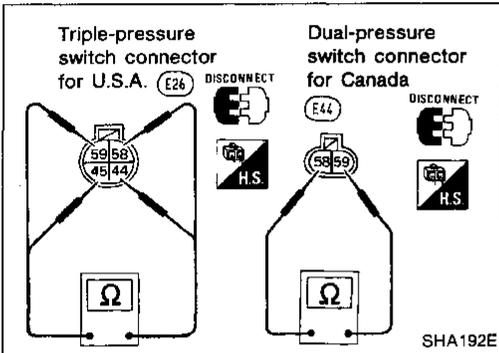
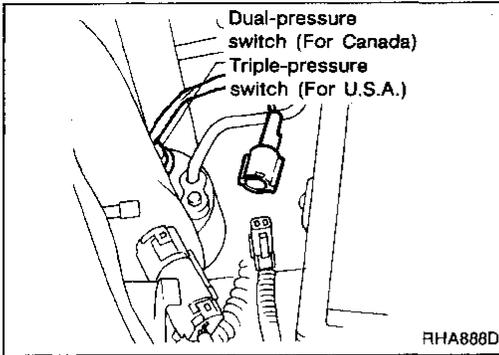
A/C RELAY AND BLOWER MOTOR RELAY

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

TROUBLE DIAGNOSES

Electrical Components Inspection (Cont'd)

TRIPLE-PRESSURE SWITCH (For U.S.A.)

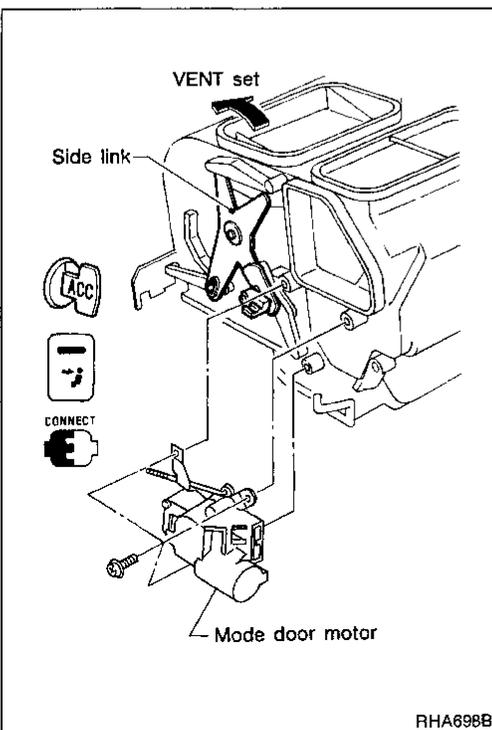


	Terminals	ON kPa (kg/cm ² , psi)	OFF kPa (kg/cm ² , psi)
Low-pressure side	59 - 58	Increasing to 157 - 226 (1.6 - 2.3, 23 - 33)	Decreasing to 152.0 - 201.0 (1.55 - 2.05, 22.0 - 29.2)
Medium-pressure side*	45 - 44	Increasing to 1,422 - 1,618 (14.5 - 16.5, 206 - 235)	Decreasing to 1,030 - 1,422 (10.5 - 14.5, 149 - 206)
High-pressure side	59 - 58	Decreasing to 1,667 - 2,452 (17 - 25, 242 - 356)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

* For cooling fan motor operation

DUAL-PRESSURE SWITCH (For Canada)

	ON kPa (kg/cm ² , psi)	OFF kPa (kg/cm ² , psi)
Low-pressure side	Increasing to 157 - 216 (1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 392 - 785 (4.0 - 8.0, 57 - 114)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)



Control Linkage Adjustment

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 ACC.
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.

TROUBLE DIAGNOSES

Control Linkage Adjustment (Cont'd)

TEMPERATURE CONTROL CABLE

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

After positioning control cable, check it operates properly.

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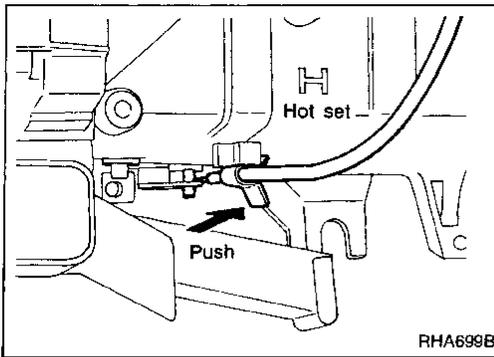
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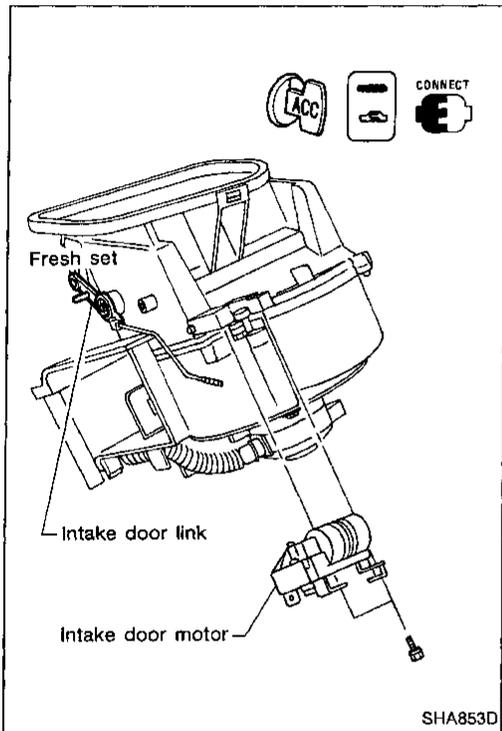
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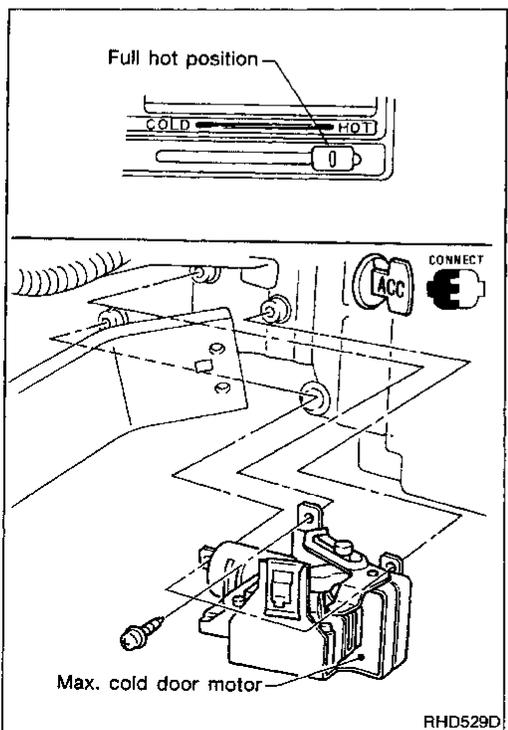
INTAKE DOOR

1. Connect the intake door motor harness connector before installing to the intake door motor.
2. Turn ignition switch to ACC.
3. Turn REC switch OFF.
4. Install intake door motor on intake unit.
5. Install intake door lever.
6. Set intake door rod in Fresh 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.



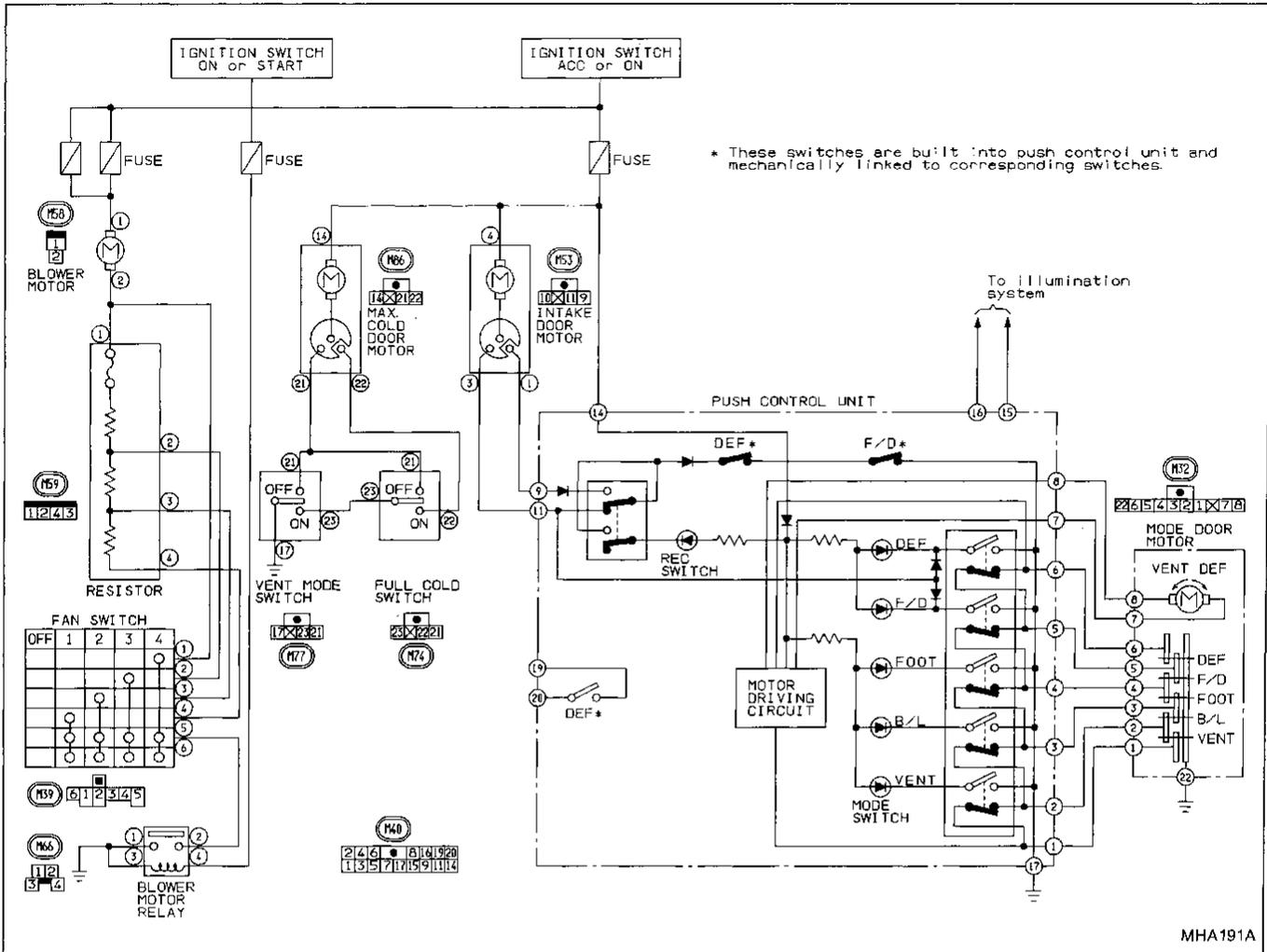
MAX. COLD DOOR

1. Connect max. cold door motor harness connector before installing max. cold door motor.
2. Turn ignition switch to ACC.
3. Turn DEF switch ON.
4. Set temperature control lever to full hot position.
5. Install max. cold door motor on heater unit.
6. Attach max. cold door lever to rod holder.
7. Check that max. cold door operates properly when mode switch is turned to VENT and DEF.



SYSTEM DESCRIPTION

Push Control System



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 "Discharge Air Flow". (HA-13)	—	—
				○			—		—	
					○		FRE		—	
						○	FRE		ON*1	
						○*2	REC*2		—	

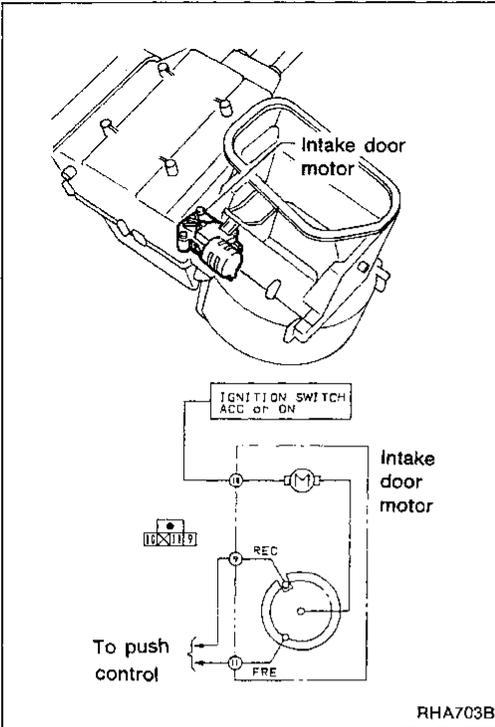
*1: Compressor is operated by thermo control amp.

*2: Depending on mode switch position

SYSTEM DESCRIPTION

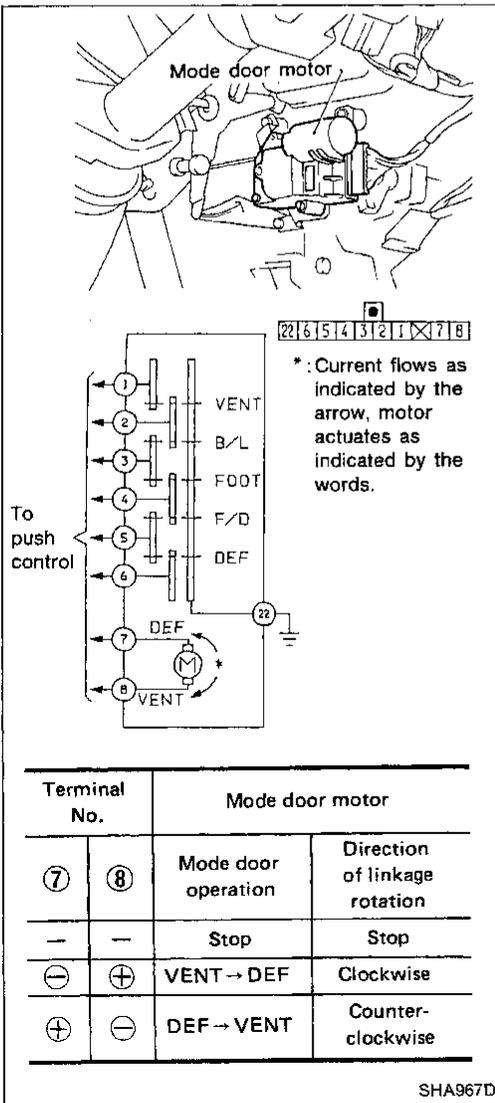
Push Control System (Cont'd)

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 REC switch is ON, the ground line of the motor is switched from terminal ⑪ to ⑨. This starts the motor because the position switch contacts built into it make current flow. When REC switch is OFF, the ground line is switched from terminal ⑨ to ⑪. 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. It then determines the direction of the motor rotation. As soon as the desired mode is set, the position switch stops the motor.

Terminal No.		Mode door motor	
⑦	⑧	Mode door operation	Direction of linkage rotation
—	—	Stop	Stop
⊖	⊕	VENT → DEF	Clockwise
⊕	⊖	DEF → VENT	Counter-clockwise

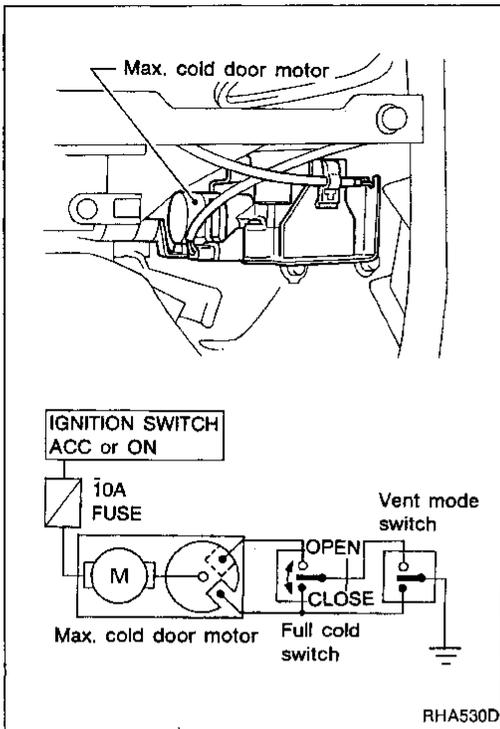
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SYSTEM DESCRIPTION

Push Control System (Cont'd)

MAX. COLD DOOR MOTOR

Max. cold door system is set to operate during FULL COOL mode. This mode is set with temp. control lever at FULL COOL and mode switch turned to VENT. In this mode both the vent mode and full cold switches go ON. Therefore, max. cold relay coil is energized and the relay switch turns ON for OPEN side. The max. cold door motor starts rotating to open the door. The door is kept closed unless this operation is performed.



Vent mode switch operation	Max. cold switch operation	Max. cold door operation
ON	ON	OPEN
	OFF	CLOSE
OFF	ON	
	OFF	

SERVICE PROCEDURES

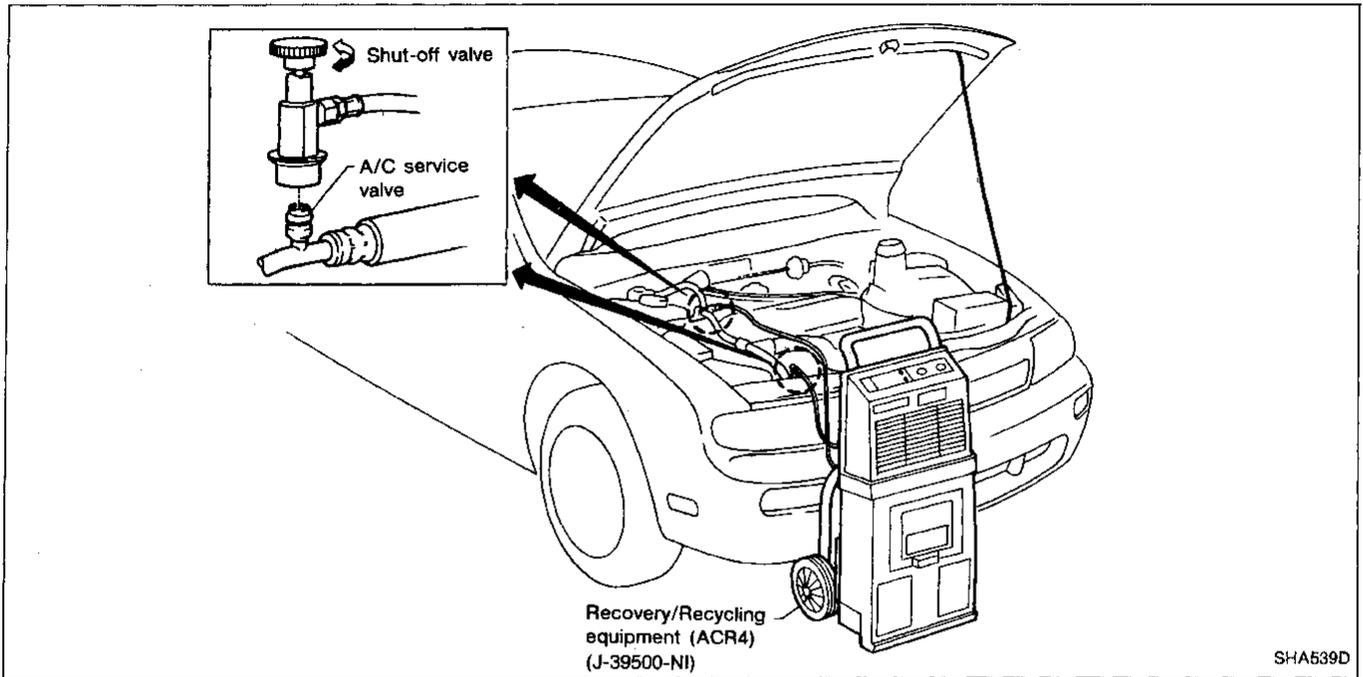
HFC-134a (R-134a) Service Procedure SETTING OF SERVICE TOOLS AND EQUIPMENT

DISCHARGING REFRIGERANT

WARNING:

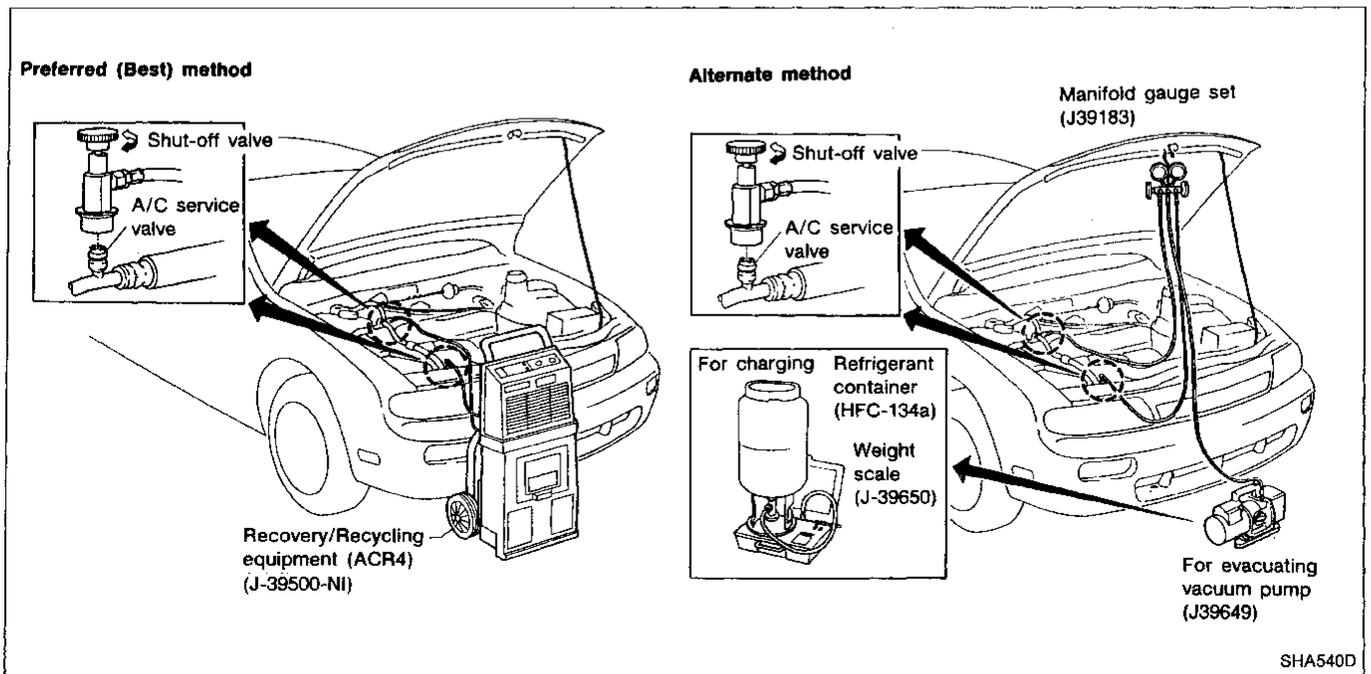
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. To remove HFC-134a (R-134a) from the A/C system, use certified service equipment to meet SAE J2210 [HFC-134a (R-134a) recycling equipment] or J2209 [HFC-134a (R-134a) recovery equipment] requirements.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

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EVACUATING SYSTEM AND CHARGING REFRIGERANT

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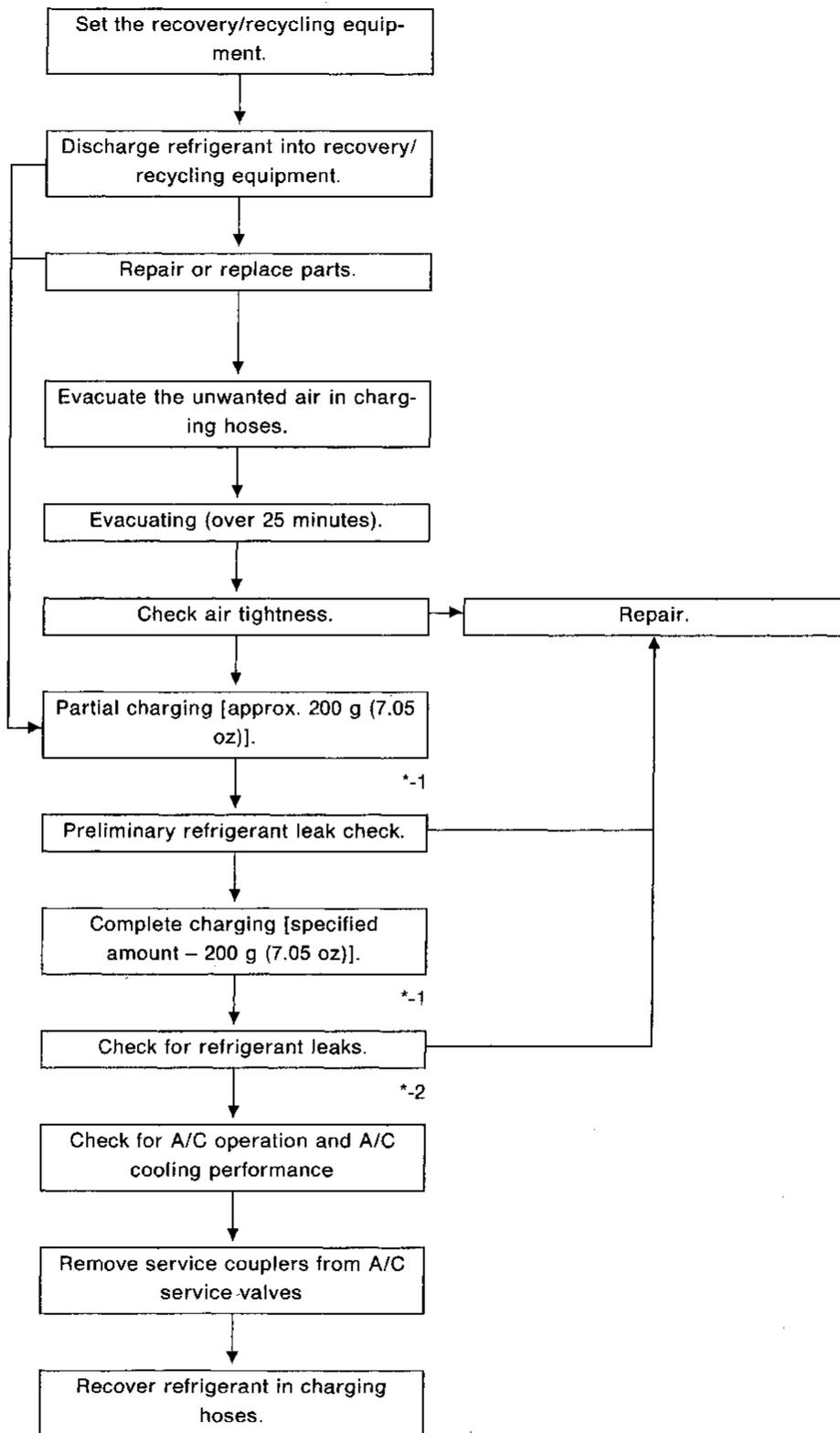


SERVICE PROCEDURES

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

WORK PROCEDURE

Recovered lubrication oil
Refer to **LUBRICATION OIL — Checking and Adjusting**. (HA-71)



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

*-2 Before checking for leaks, start engine to activate air conditioning system then turn in off. Service valve caps must be attached to valves (to prevent leakage).

Maintenance of Oil Quantity in Compressor

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

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 interference)

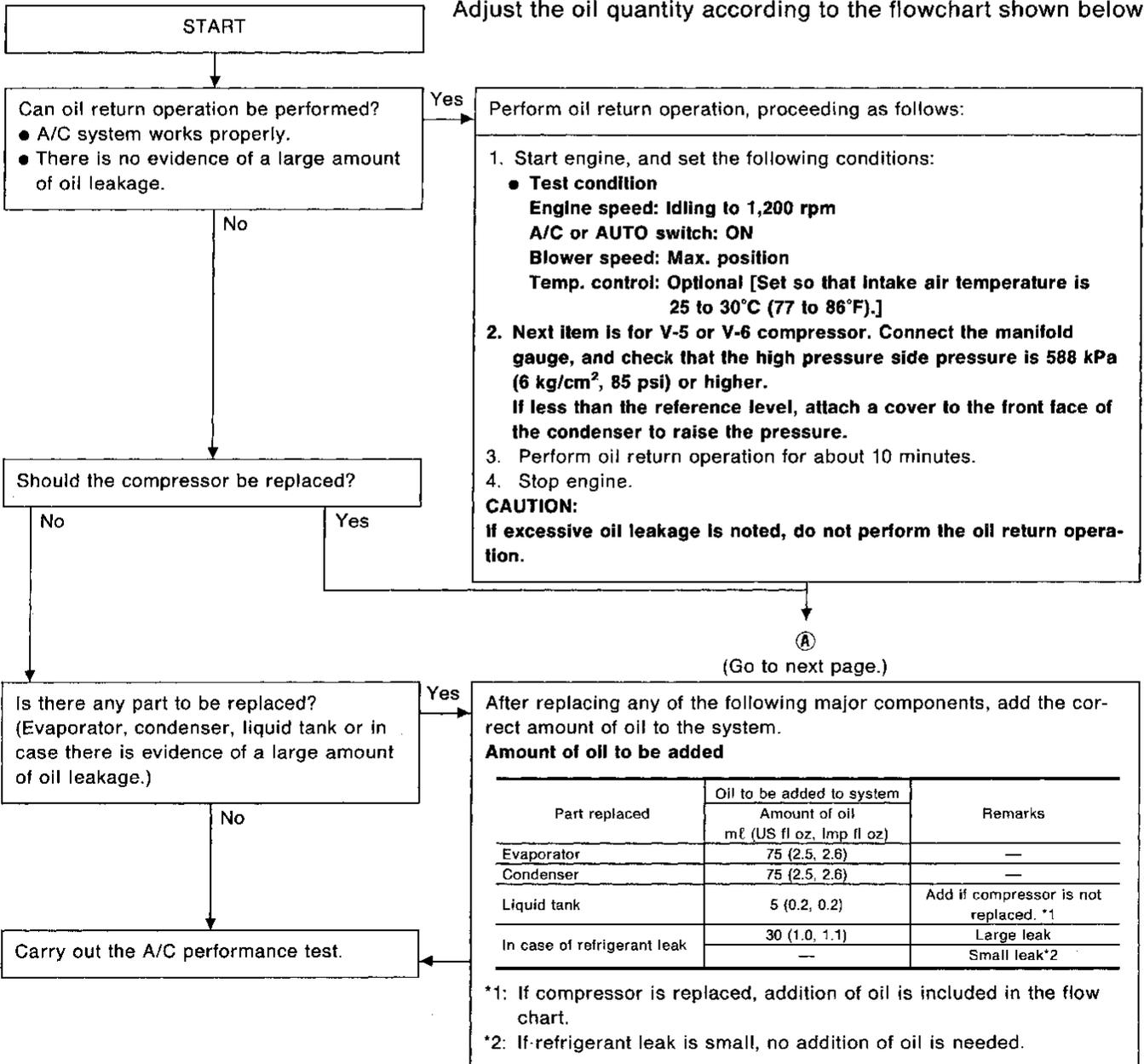
CHECKING AND ADJUSTING

LUBRICATION OIL

Name: Nissan A/C System Oil Type R

Part number: KLH00-PAGR0

Adjust the oil quantity according to the flowchart shown below.



SERVICE PROCEDURES

Maintenance of Oil Quantity in Compressor (Cont'd)

A

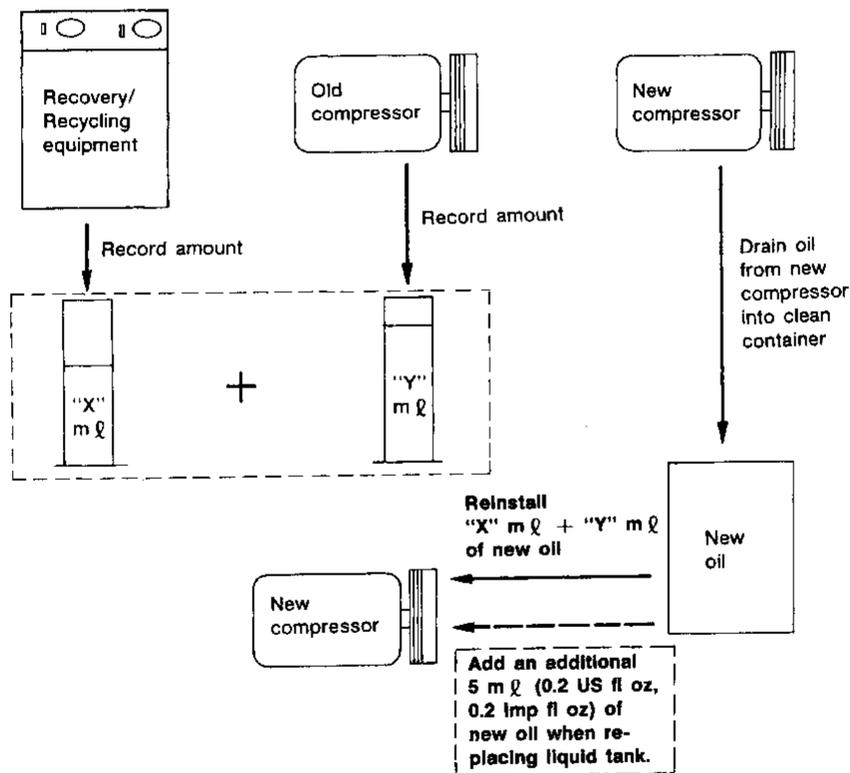
1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure oil discharged into the recovery/recycling equipment.
2. Remove the drain plug of the "old" (removed) compressor (applicable only to V-5, V-6 or DKS-16H compressor). Drain the oil into a graduated container and record the amount of drained oil.
3. Remove the drain plug and drain the oil from the "new" compressor into a separate, clean container.
4. Put the same amount (refer to 2. above) of new oil into the new compressor. Put it through the drain plug or suction port opening.
5. Also add the old oil amount [discharged from A/C system (refer to 1. above)] of the new oil to the new compressor.
6. Torque the drain plug.

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

DKS-16H compressor: 14 - 16 N·m (1.4 - 1.6 kg·m, 10 - 12 ft·lb)

7. If the liquid tank also needs to be replaced, add an additional 5 ml (0.2 US fl oz, 0.2 Imp fl oz) of 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

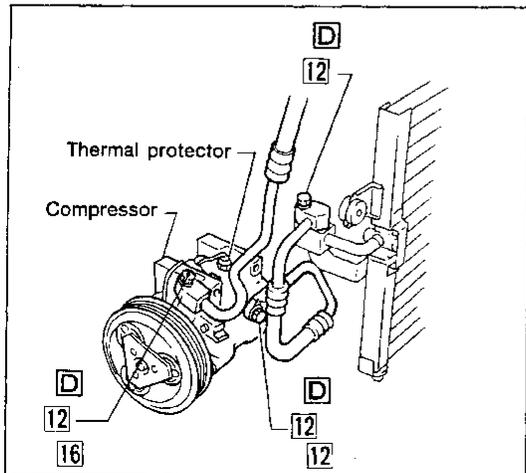
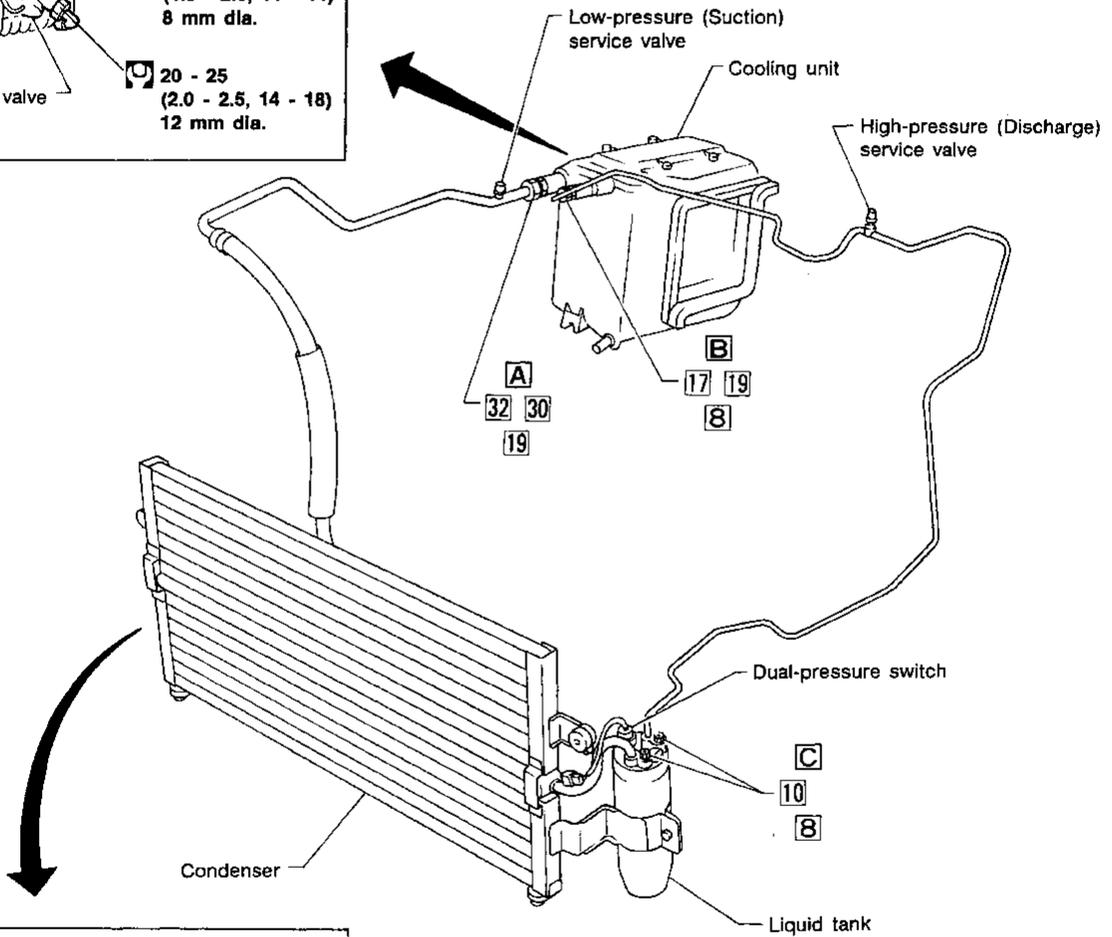
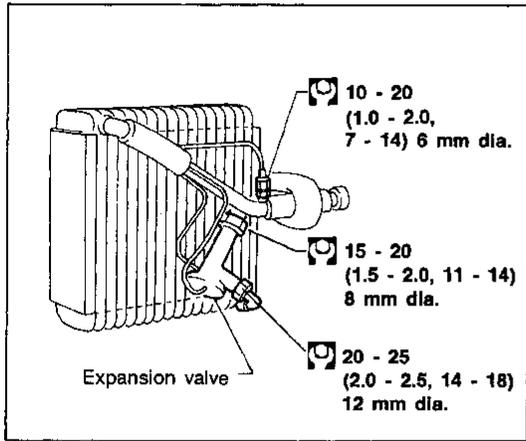


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SERVICE PROCEDURES

Refrigerant Lines

- Refer to page HA-5 regarding "Precautions for Refrigerant Connection".

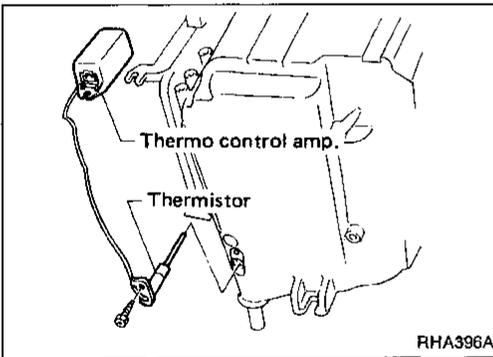
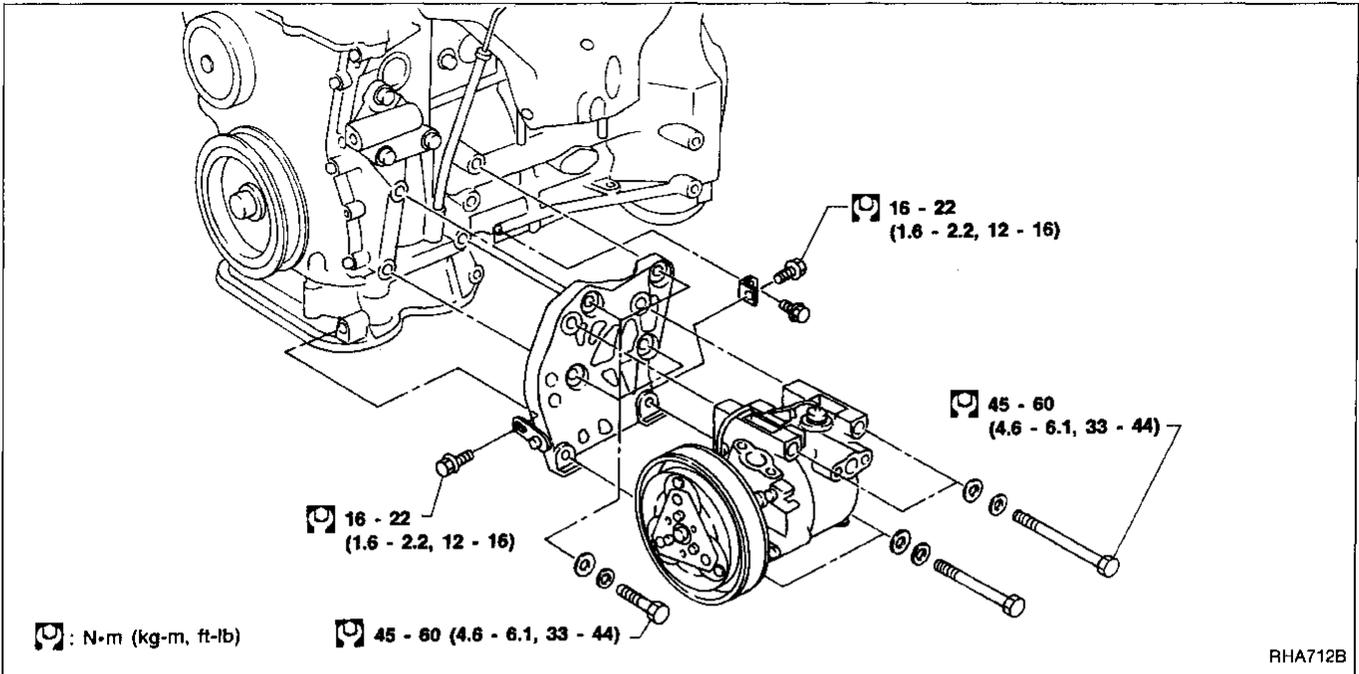


- (Tightening torque)
- (Wrench size)
- (O-ring size)
- A** 25 - 35 (2.5 - 3.5, 18 - 24)
- B** 10 - 20 (1.0 - 2.0, 7 - 14)
- C** 3.2 - 4.2 (0.33 - 0.43, 2.4 - 3.1)
- D** 13.3 - 18.0 (1.36 - 1.84, 9.8 - 13.3)
- : N·m (kg·m, ft·lb)

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Compressor Mounting



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.)

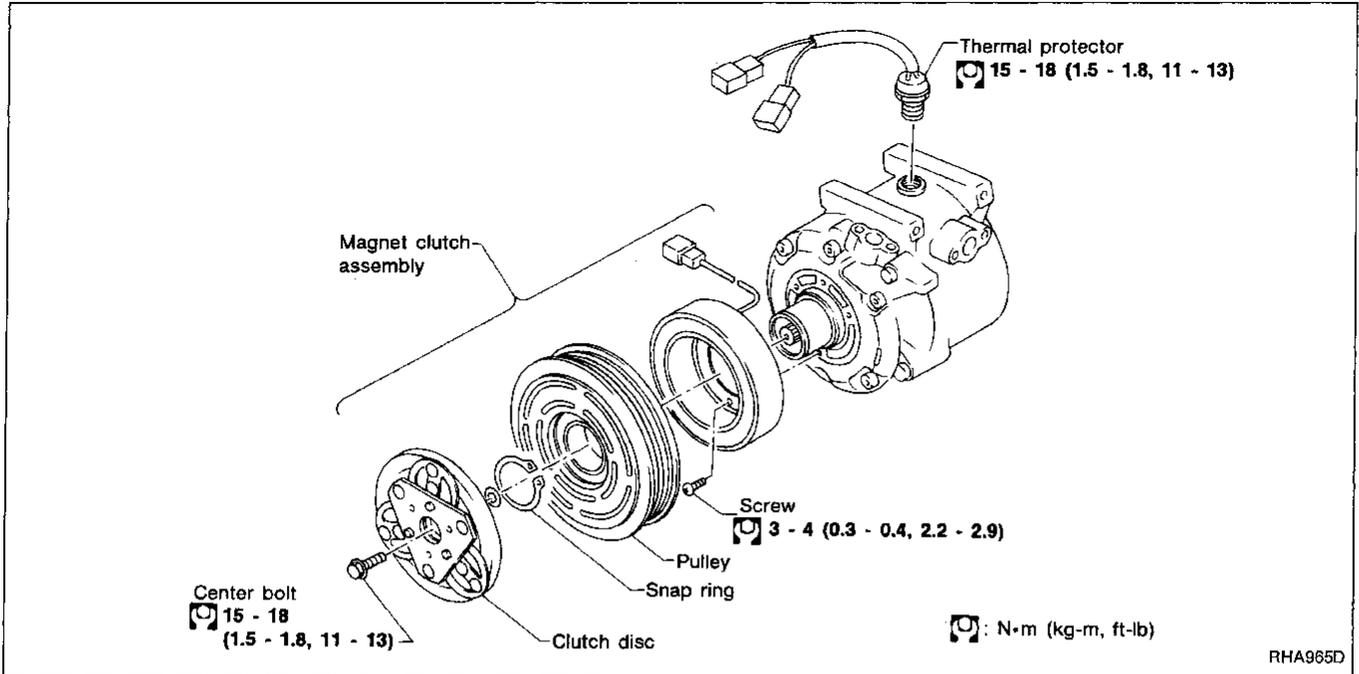
Belt Tension

- Refer to MA section.

Fast Idle Control Device (FICD)

- Refer to EC section.

Compressor



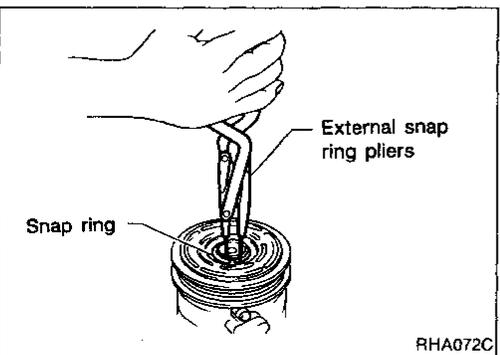
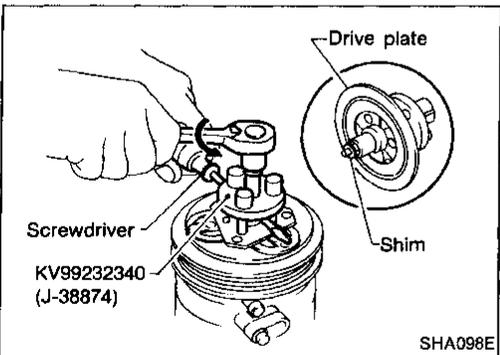
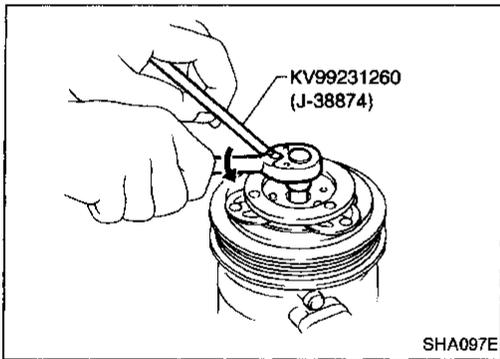
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Compressor Clutch

REMOVAL

- When removing center bolt, hold clutch disc with clutch disc wrench.
- Remove the drive plate using Tool KV99232340. Insert holder's three pins into the drive plate. 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.

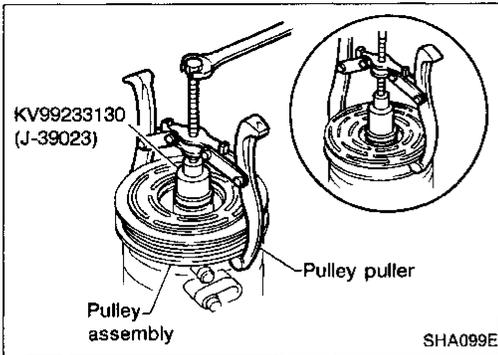
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SERVICE PROCEDURES

Compressor Clutch (Cont'd)



- Pulley removal
Use any commercially available pulley puller. Position the center of it on the end of the drive shaft, and remove the pulley assembly.

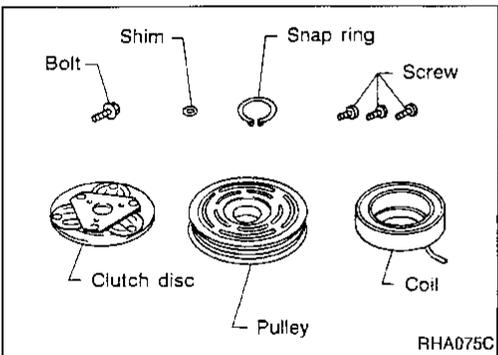
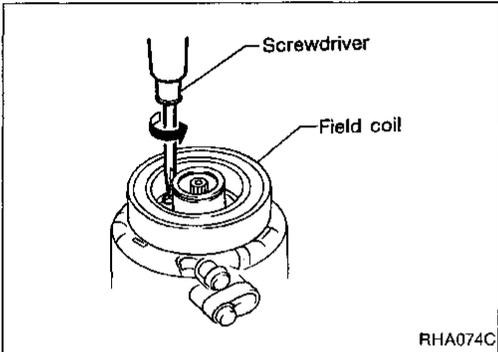
For pressed pulleys

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, replace clutch disc and pulley.

Pulley : Check the appearance of the pulley assembly. Check the contact surface of the pulley for any sign of excessive grooving due to slippage. If any sign is found, replace both the pulley and clutch disc. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.

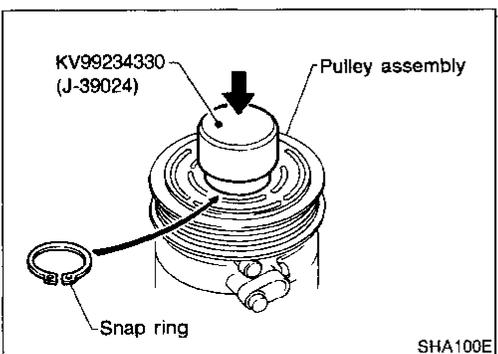
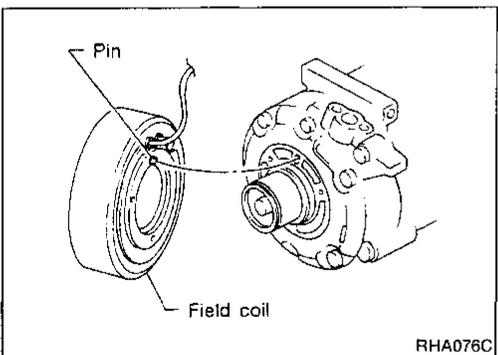
Coil : Check coil for loose connection or cracked insulation.

INSTALLATION

- Install the field coil.

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

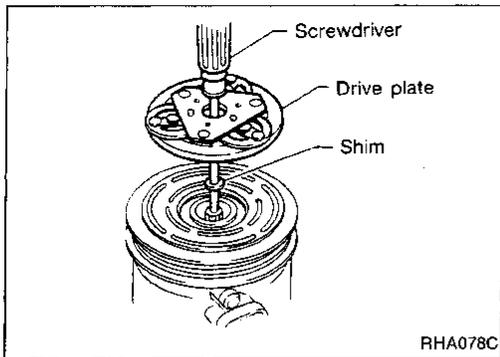
- Install the field coil harness clip using a screwdriver.



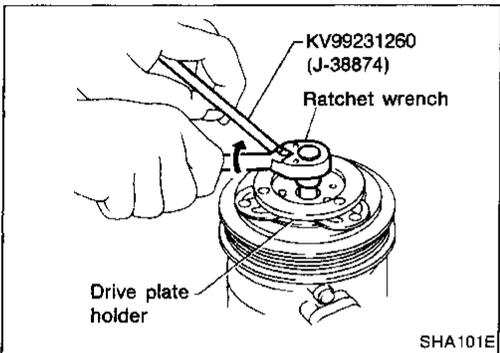
- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.

SERVICE PROCEDURES

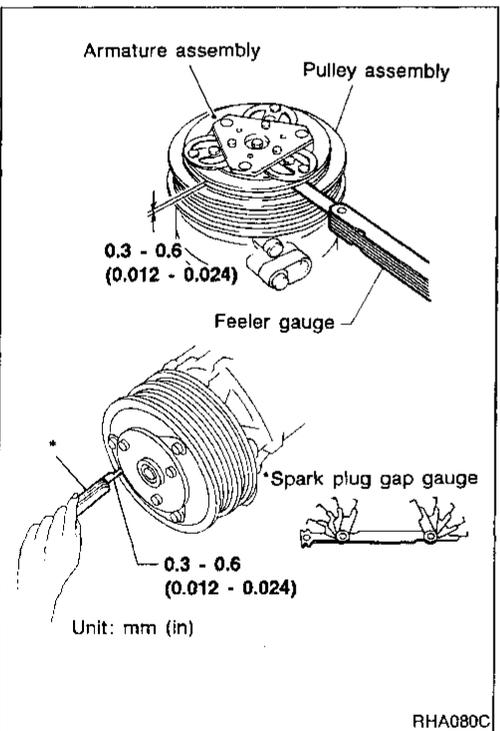
Compressor Clutch (Cont'd)



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



- 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.**



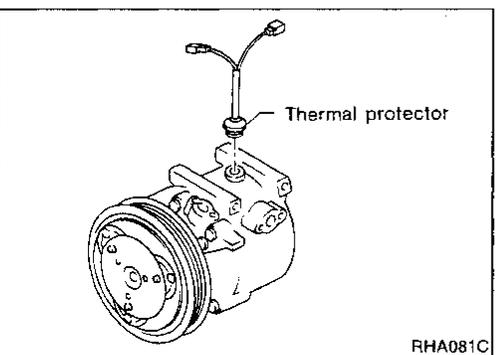
- Check clearance around the entire periphery of clutch disc. **Disc-to-pulley clearance:**

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, always conduct the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.



Thermal Protector

INSPECTION

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

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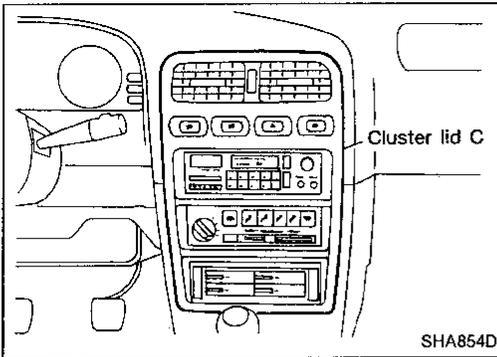
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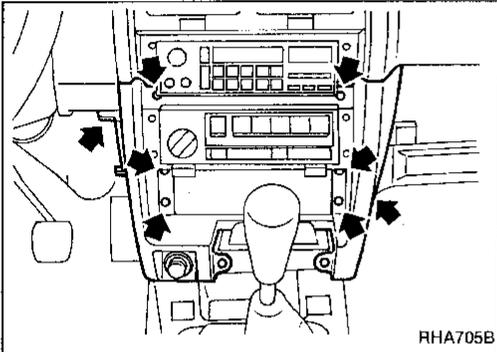
SERVICE PROCEDURES



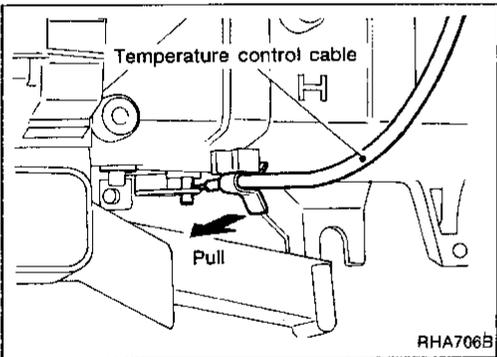
Push Control System

REMOVAL AND INSTALLATION

1. Remove cluster lid C.
2. Remove driver's side lower panel.
3. Remove glove box.



4. Remove the 8 bracket screws.



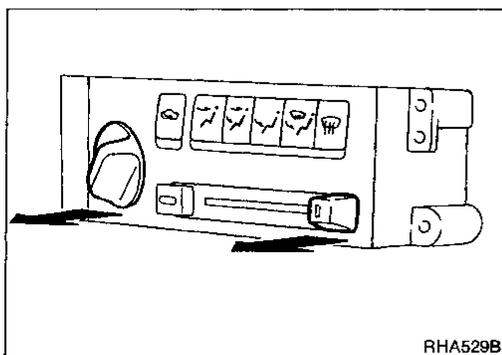
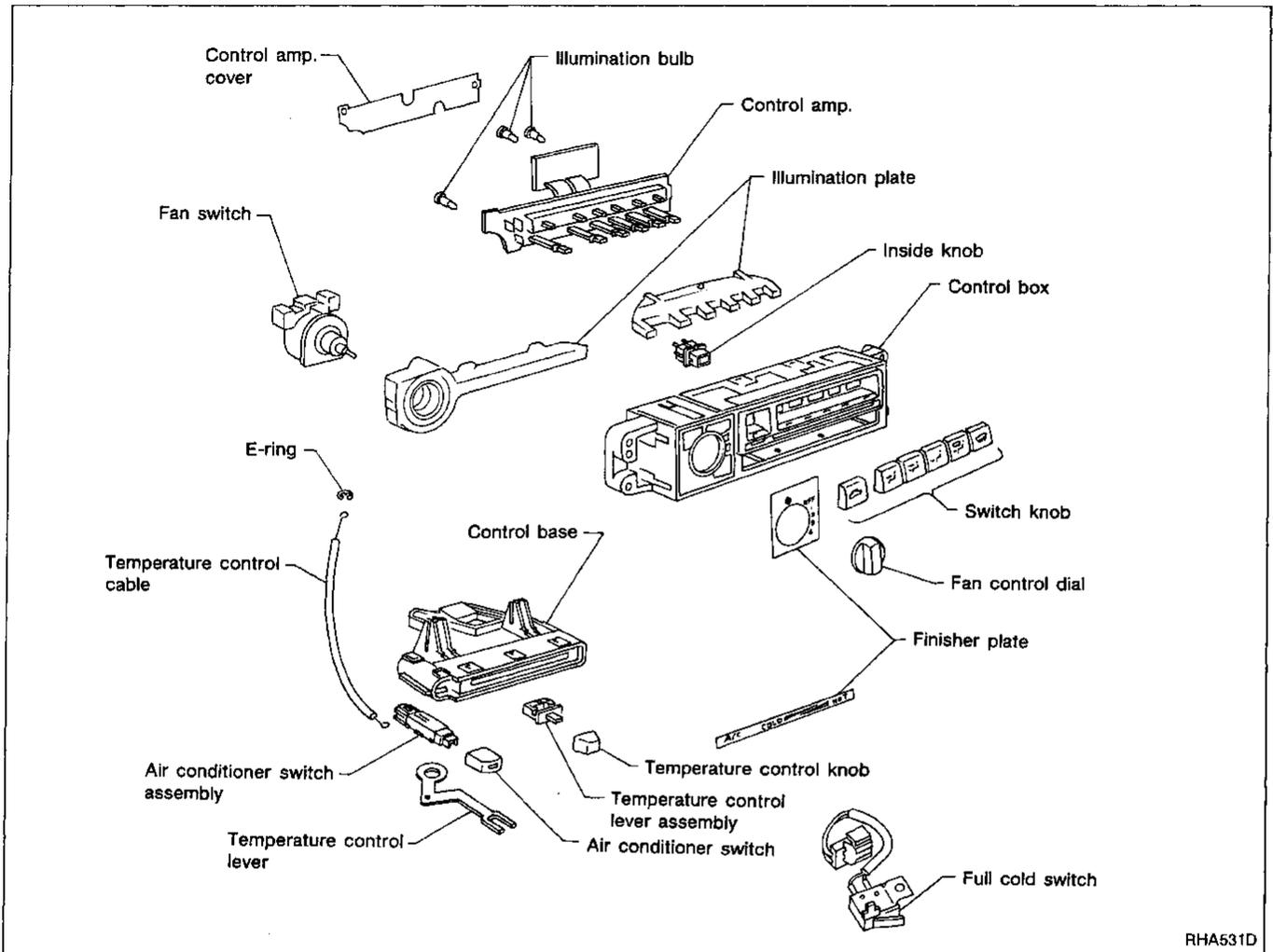
5. Disconnect temperature control cable at heater unit side.

SERVICE PROCEDURES

Push Control System (Cont'd)

6. Disconnect push control unit harness connectors.
7. Remove bracket with push control unit.
8. Remove push control unit.
9. Installation is in the reverse order of removal.

Refer to "Control Linkage Adjustment" for temperature control cable. (HA-65)



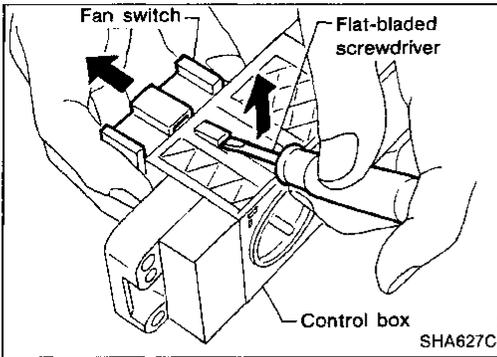
DISASSEMBLY

1. Remove temperature control knob & fan control dial.

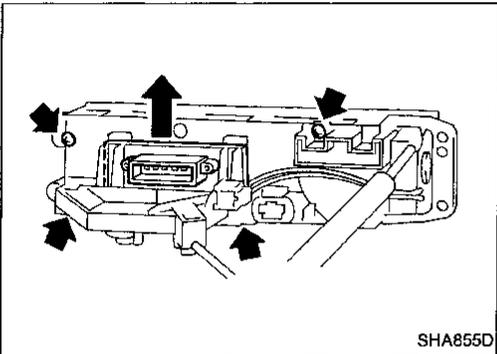
Wrap the temperature control knob and the fan control dial with a piece of cloth. Pull them forward in the direction indicated by the arrows shown in the figure. Be careful not to scratch knobs during removal.

SERVICE PROCEDURES

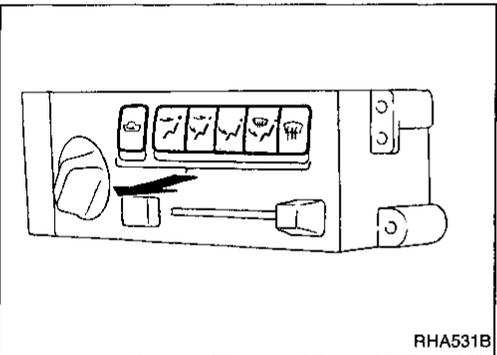
Push Control System (Cont'd)



2. Remove fan switch.

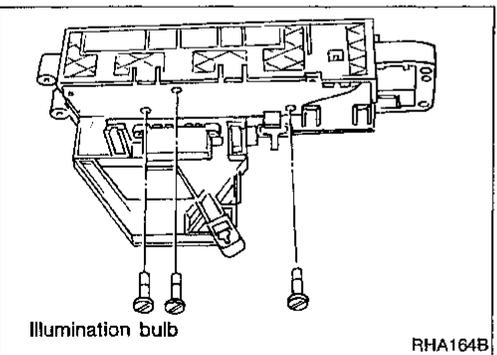


3. Remove control base & control amp. cover.



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-14C
Type	Vane rotary
Displacement cm ³ (cu in)/Rev	140 (8.54)
Direction of rotation	Clockwise (Viewed from drive end)
Drive belt	Poly V

LUBRICATION OIL

Model	ZEXEL make DKV-14C
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	R134a
Capacity kg (lb)	0.70 - 0.80 (1.54 - 1.76)

Inspection and Adjustment

ENGINE IDLING SPEED

When A/C is ON
Refer to EC section.

BELT TENSION

Refer to Checking Drive Belts (MA section).

COMPRESSOR

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

GI

MA

EM

LC

EC

FE

CL

MT

AT

FA

RA

BR

ST

BF

HA

EL

IDX