

# HEATER & AIR CONDITIONER

## SECTION HA

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**When you read wiring diagrams:**

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

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

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**Supplemental Restraint System (SRS)  
“AIR BAG”**

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

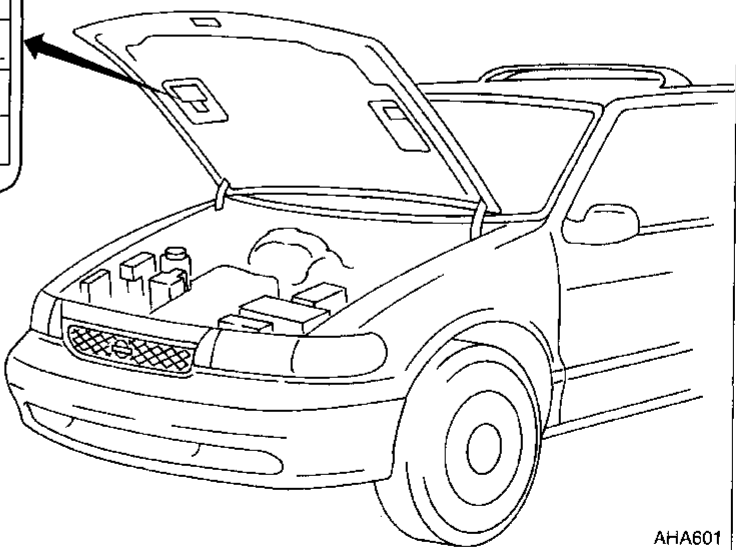
**WARNING:**

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

**Identification**

**IDENTIFICATION LABEL FOR VEHICLE**

<p><b>CAUTION</b> (IF A/C EQUIPPED)</p>		<p><b>MISE EN GARDE</b> (VÉHICULES CLIMATISÉS)</p>	
<p>REFRIGERANT UNDER HIGH PRESSURE. AIR CONDITIONING SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL. IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY. CONSULT SERVICE MANUAL.</p>		<p>LE FRIGOTIGENE EST SOUS FORTE PRESSION. NE CONFIER L'ENTRETIEN ET LA RÉPARATION DU CLIMATISEUR QU'À UN PERSONNEL QUALIFIÉ. L'EMPLOI DE MAUVAISES MÉTHODES PEUT CAUSER DES BLESSURES. CONSULTER LE MANUEL DE RÉPARATION.</p>	
<p>DISTR.: NISSAN— CARSON, CA.</p>			
	REFRIG. FRIGORIG.	LUBRICANT/LUBRIFIANT	
TYPE:	R-134a	POLYALKYLENE GLYCOL LUBRICANT/ LUBRIFIANT AU POLYALKYLENE GLYCOL	
AMOUNT: W/ FR A/C: QTE. CLIM. AV. :	2.0 LB	207 CC	
W/FR & RR A/C: CLIM. AV. ET AR.	3.25 LB	296 CC	
SAE J639			



AHA601

## Precautions for Working with R-134a

### WARNING:

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

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## Precautions for Refrigerant Connections

### 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:

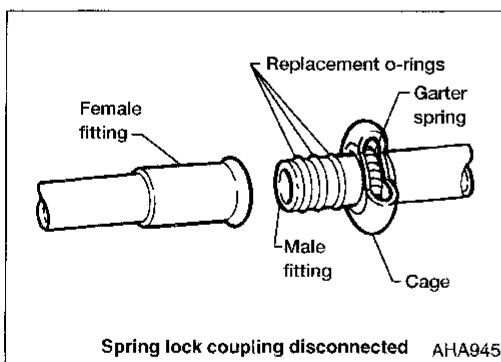
When replacing or cleaning refrigerant cycle components, observe the following.

- Do not leave compressor on its side or upside down for more than 10 minutes. Compressor lubricant will enter low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, plug all openings immediately to prevent entry of dirt and moisture.
- When installing air conditioner components in the vehicle, connect the pipes as the final stage of the operation. Do not remove seal caps from pipes and other components until just before required connection.
- Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.
- Thoroughly remove moisture from the refrigeration system before charging with refrigerant.
- Always replace O-rings.
- After connecting lines, conduct a leak test and make sure that there is no leakage. Refer to "Checking Refrigerant Leaks", "SERVICE PROCEDURES" HA-151. If a gas leaking point is found, disconnect that line and replace O-ring. Then tighten connections of seal seat to the specified torque.

### SPRING LOCK COUPLINGS

The spring lock coupling is a refrigerant line coupling held together by a garter spring inside a circular cage. When the coupling is connected, the flared end of the female fitting slips behind the garter spring inside the cage of the male fitting. The garter spring and cage prevent the flared end of the female fitting from pulling out of the cage.

Three green O-rings are used to seal the three halves of the coupling. **These O-rings are made of special material and must be replaced with an O-ring made of the same material.** The O-rings normally used in refrigerant system connections are not the same material and should not be used with the spring lock coupling. **Use only the specified O-rings for the spring lock coupling. For Removal and Installation, refer to HA-170.**



**Precautions for Servicing Compressor**

- Plug all openings to prevent moisture and foreign matter from entering. GI
- Do not keep the compressor in the upside down position or laid on its side for more than 10 minutes.
- When replacing or repairing compressor, be sure to remove lubricant from the compressor and check the lubricant quantity extracted. MA
- When replacing or repairing compressor, follow lubricant checking and adjusting procedure exactly. Refer to "Compressor Lubricant Quantity", "SERVICE PROCEDURES", HA-156. EM
- If the refrigerant becomes contaminated when replacing the compressor, also replace the accumulator. If equipped with rear A/C, also replace the filter in the rear evaporator inlet tube.
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated with oil, wipe it off by using a clean waste cloth moistened with thinner. LC
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour. EC
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation. FE

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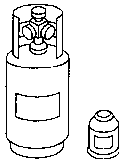

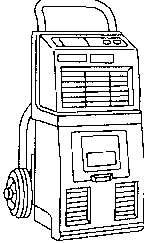
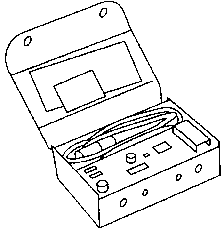
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**R-134a Service Tools and Equipment**

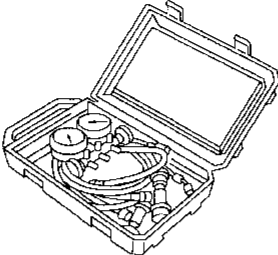
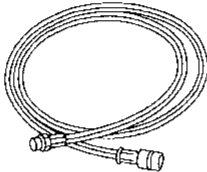
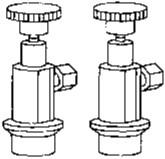

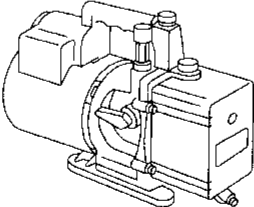
Never mix R-134a refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

Separate and non-interchangeable service equipment must be used for each type of refrigerant/lubricant. Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This avoids mixed use of the refrigerants/lubricants.

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

Tool number (Kent-Moore No.) Tool name	Description	Note
R-134a refrigerant	 NT196	Container color: Light blue Container marking: R-134a Fitting size: Thread size ● Large container 1/2"-16 ACME
KLH00-PAGQU ( — ) Nissan A/C System Lubricant Type F	 NT197	Type: Polyalkylene glycol (PAG), type F Application: R-134a swash plate (piston) compressor FS-10 Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-NI) Recovery/recycling equipment (ACR4)	 NT195	Function: Refrigerant recovery, recycling and recharging
(J-39400) Electronic leak detector	 NT198	Power supply: ● DC 12 V (Cigarette lighter)

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

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

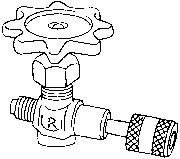
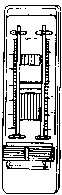
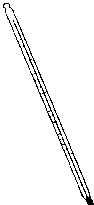
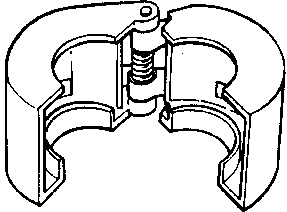
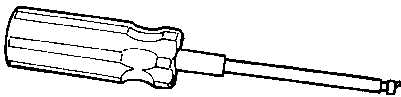
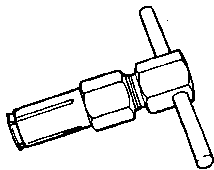
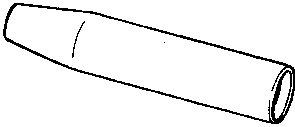
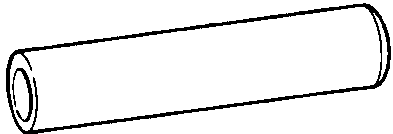
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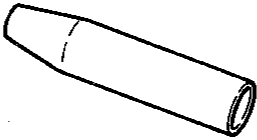
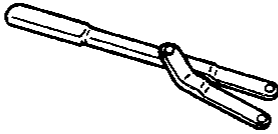
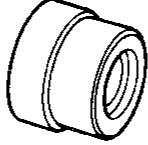
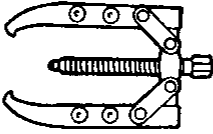
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**Commercial Service Tools**

Tool name	Description	Note
Additional valve	 <p>SHA898C</p>	For discharging, evacuating and charging refrigerant
Thermometer and hygrometer	  <p>Etched-stem type thermometer</p> <p>SHA900C</p>	For checking temperature and humidity
Spring lock coupling remover	 <p>AHA283</p>	For disconnecting spring lock coupling <ul style="list-style-type: none"> <li>● 3/8"</li> <li>● 1/2"</li> <li>● 5/8"</li> <li>● 3/4"</li> </ul>
Snap ring remover	 <p>AHA284</p>	For removing snap ring from compressor
Shaft seal remover	 <p>AHA285</p>	For removing shaft seal from compressor
Shaft seal protector	 <p>AHA286</p>	For protecting compressor shaft seal during shaft seal installation
Shaft seal installer	 <p>AHA287</p>	For installing compressor shaft seal

**Commercial Service Tools (Cont'd)**

Tool name	Description	Note
Coil remover	 AHA288	For removing compressor magnet clutch coil GI MA
Spanner wrench	 AHA289	For removing compressor clutch hub retaining bolt EM LC
Coil pressing tool	 AHA290	For installing compressor magnet clutch coil EC FE
Puller	 AHA291	For removing and installing compressor magnet clutch coil AT FA RA

For details of handling methods, refer to the Instruction Manual attached to each of the service tools.

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**Precautions for Service Equipment**

**RECOVERY/RECYCLING EQUIPMENT**

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

**ELECTRONIC LEAK DETECTOR**

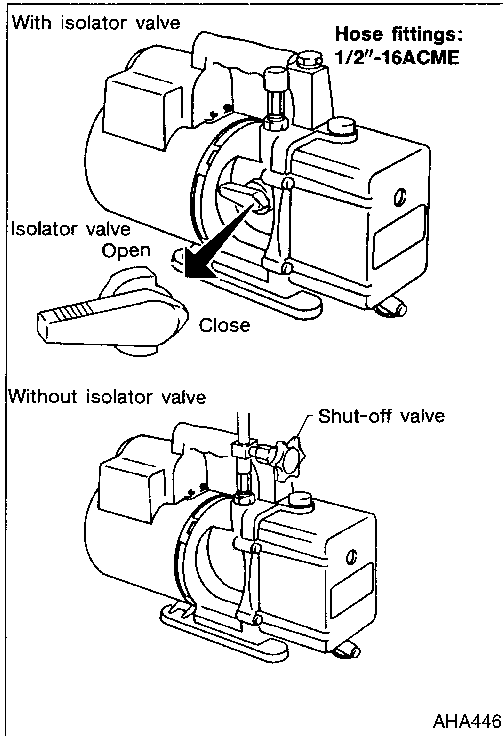
Follow the manufacturer's instructions for tester operation and tester maintenance.

**VACUUM PUMP**

The lubricating oil contained inside the vacuum pump is not compatible with the specified lubricant for R-134a A/C systems. The vent side of the vacuum pump is exposed to atmospheric pressure. Therefore, if the pump is switched off after evacuation the lubricating oil may migrate into the hose. To prevent this, isolate the pump from the hose after evacuation (vacuuming). This migration is avoided by placing a manual valve near the hose-to-pump connection, as follows:

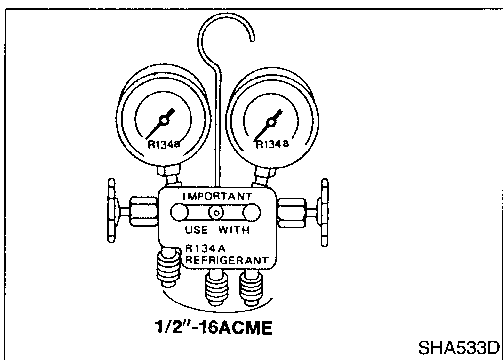
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



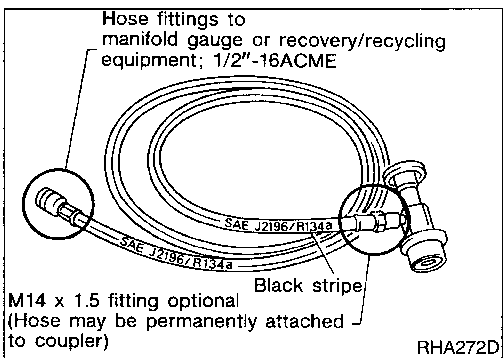
**MANIFOLD GAUGE SET**

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



**SERVICE HOSES**

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

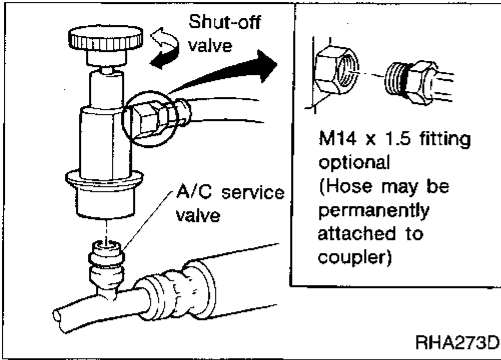


**Precautions for Service Equipment (Cont'd)**

**SERVICE COUPLERS**

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

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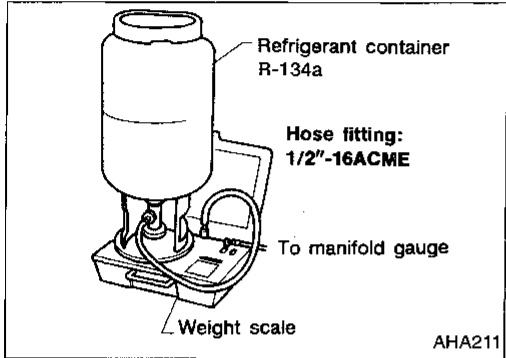
Shut-off valve rotation	A/C service valve
Clockwise	Open
Counterclockwise	Close

**REFRIGERANT WEIGHT SCALE**

When using a scale which controls refrigerant flow electronically, assure the following:

- Hose fitting size is 1/2"-16 ACME
- No refrigerant other than HFC-134a (R-134a) (along with specified lubricant) has been used with the scale

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**CHARGING CYLINDER**

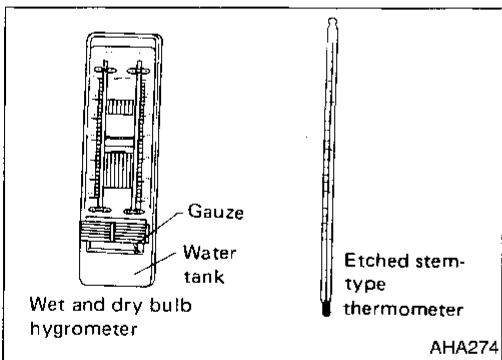
Using a charging cylinder is not recommended. Refrigerant may be vented into the air through the cylinder's top valve when filling the cylinder.

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**THERMOMETER AND HYGROMETER**

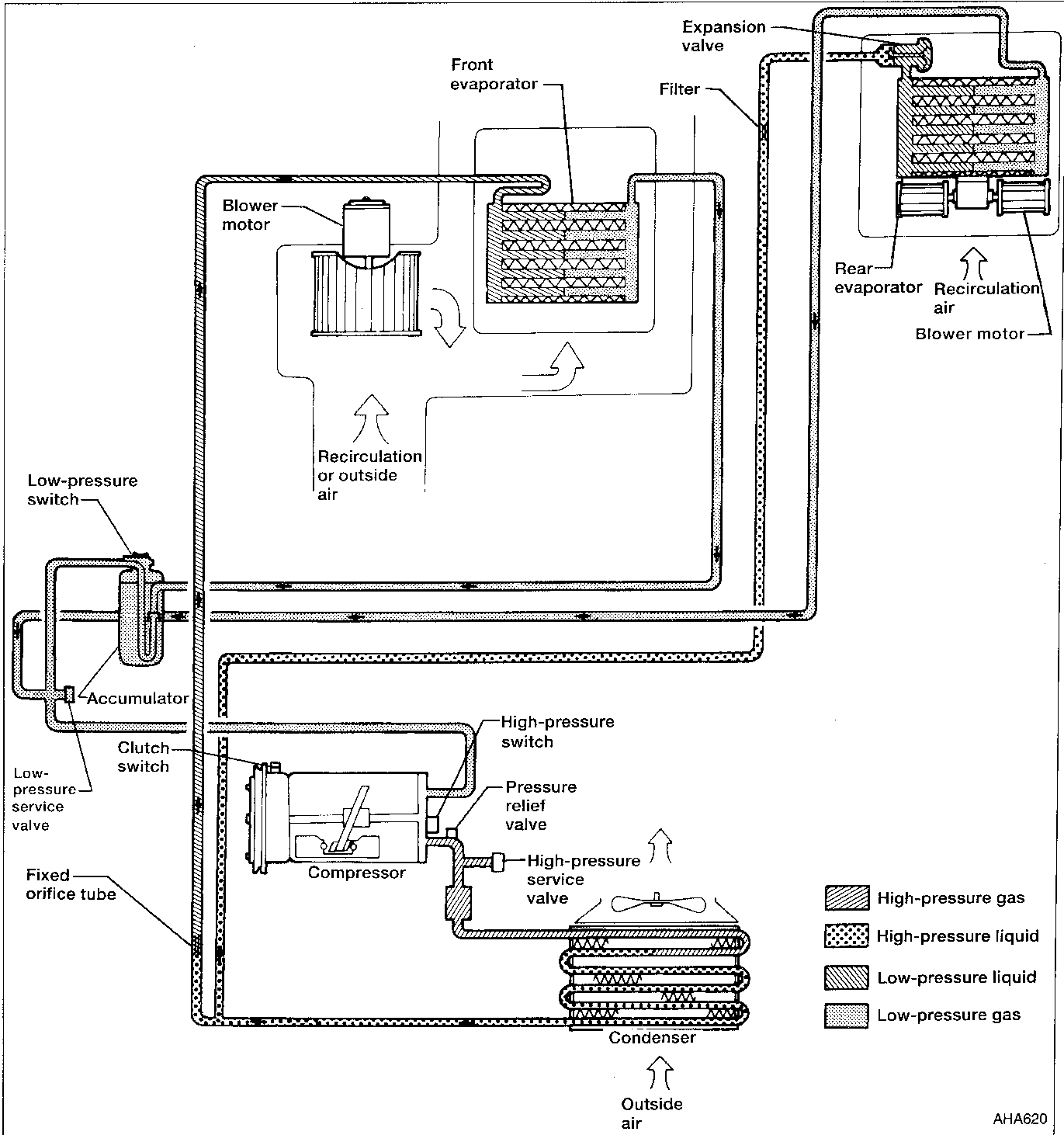
An etched stem-type thermometer and a hygrometer can be used to check the air conditioning system performance. A hygrometer is used because the air conditioning performance depends on the humidity.

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Refrigeration Cycle



REFRIGERANT FLOW

The refrigerant flows through the compressor and the condenser, through the evaporator in the cooling unit, into the accumulator, and back to the compressor. The refrigerant flow is regulated by a fixed orifice tube for the front evaporator and a thermal expansion valve for the rear evaporator.

## Refrigeration Cycle (Cont'd)

## REFRIGERANT SYSTEM PROTECTION

**High-pressure switch**

The refrigerant system is protected against excessively high pressure by a high-pressure switch, located on the end of compressor. If the system pressure rises above the specifications, the high-pressure switch opens to interrupt the compressor operation and a second set of contacts close to switch the cooling fan on high. Refer to EC section ("Air Conditioner High Pressure Switch", "TROUBLE DIAGNOSIS FOR NON-DETECTABLE ITEMS") and HA-64, 129.

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**Low-pressure switch**

The refrigerant system is protected against excessively low pressure by a low-pressure switch, located on the accumulator. If the system pressure falls below the specifications, the low-pressure switch opens to interrupt the compressor operation. When the outside temperature is below 4°C (40°F) the low-pressure switch opens to interrupt the compressor operation. Refer to HA-63, 129.

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**Pressure relief valve**

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

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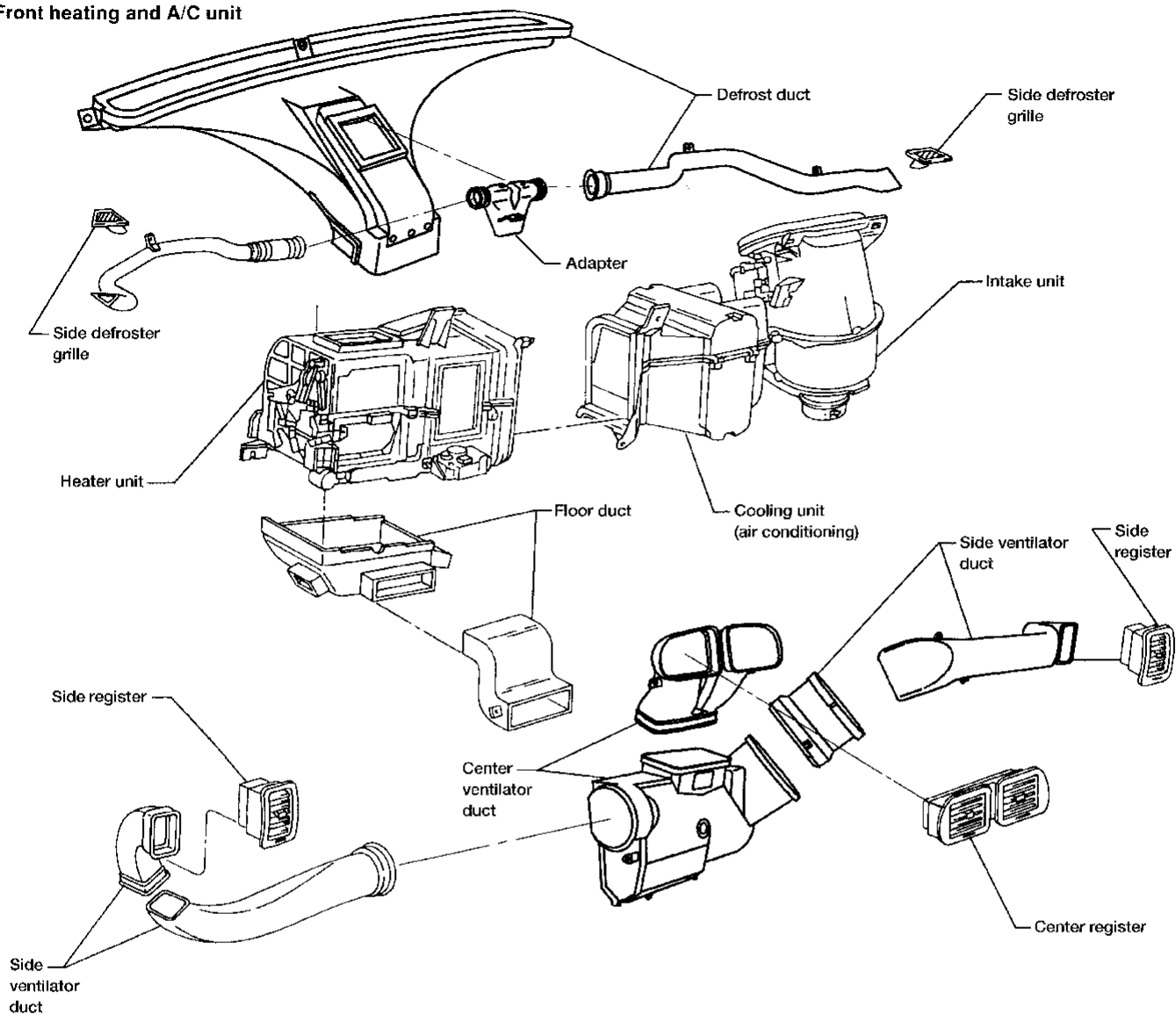
EL

IDX

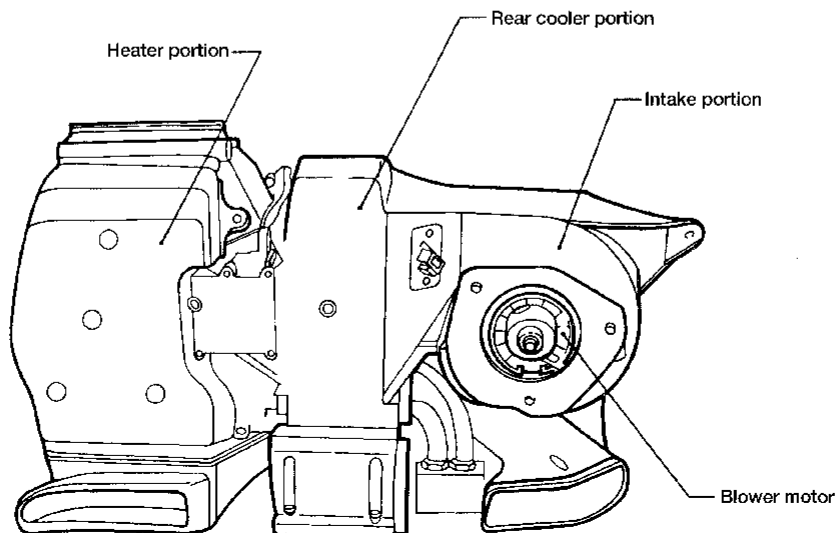
### Component Layout

SEC. 270-271-272-273-685

Front heating and A/C unit



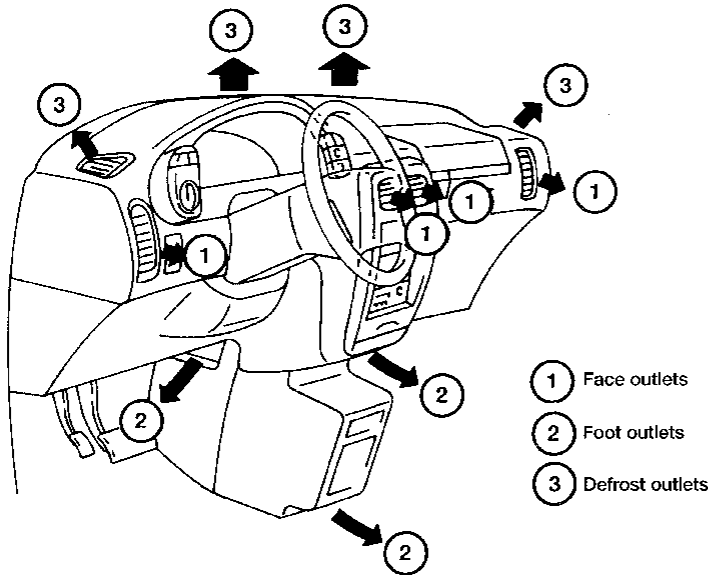
Rear heating and A/C unit



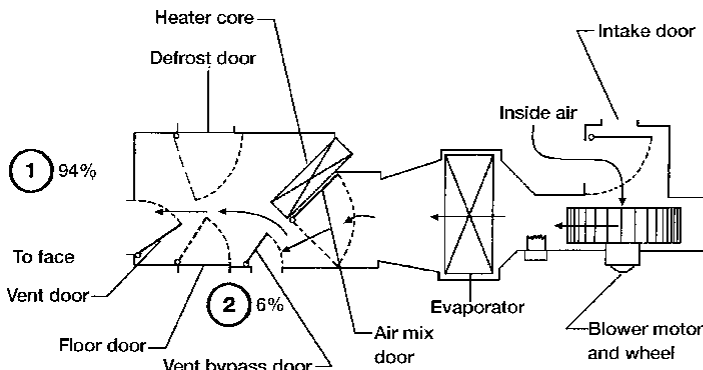
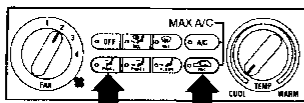
HA-14

Discharge Air Flow

MODELS WITHOUT REAR A/C

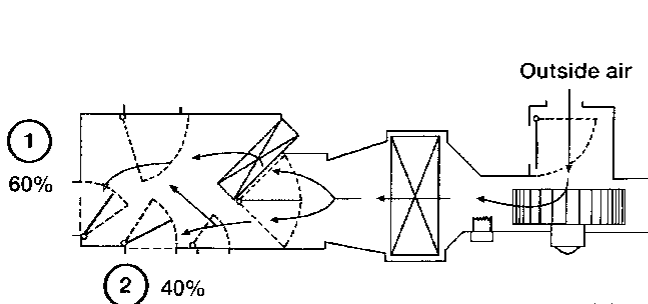
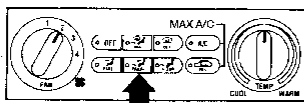


Face mode (recirc switch "ON")

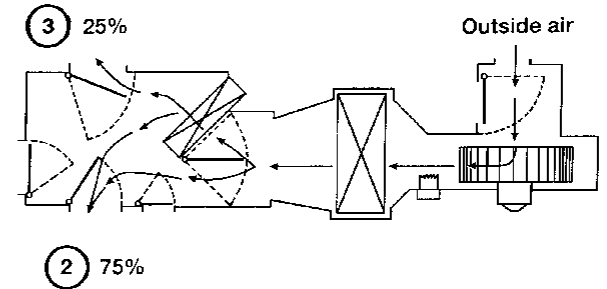
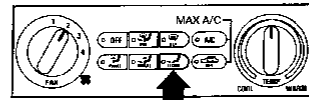


\*The vent bypass door is only open when face mode is selected and the temperature control switch is in the full cold position.

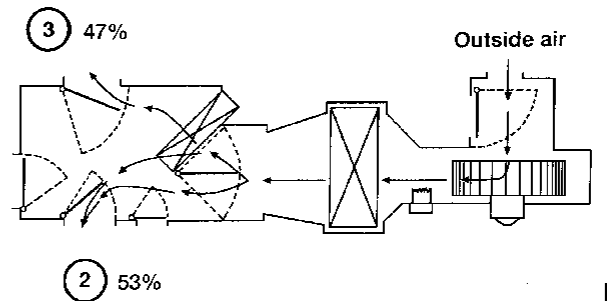
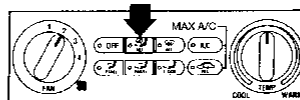
Bi-level mode



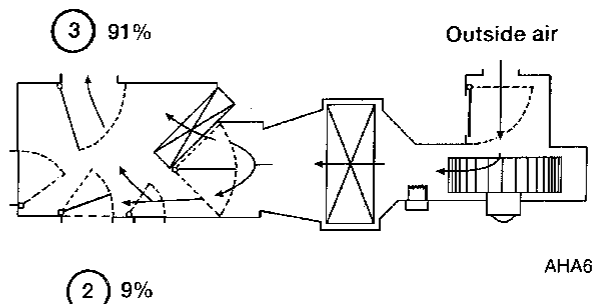
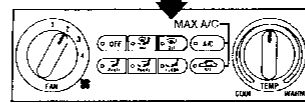
Foot mode



Foot and defrost mode



Defrost mode



GI

MA

EM

LC

EC

FE

AT

FA

RA

BR

ST

RS

BT

HA

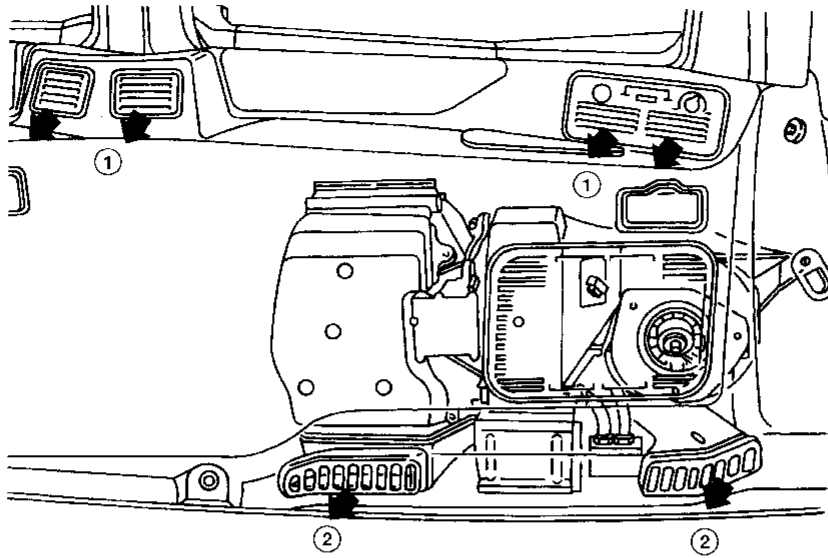
EL

IDX



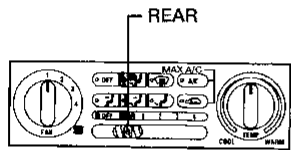
Discharge Air Flow (Cont'd)

MODELS WITH REAR A/C

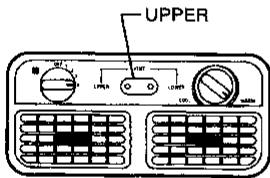


- ①: Upper outlets
- ②: Lower outlets

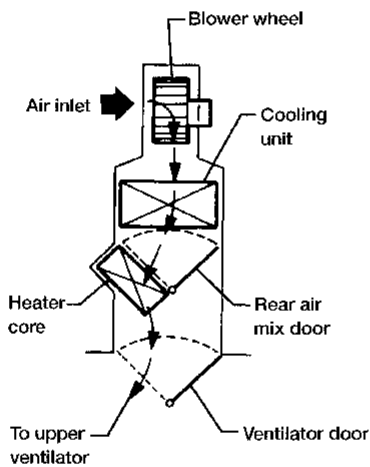
Ventilation and heat



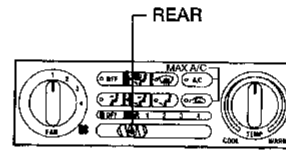
Front control assembly



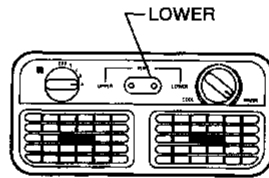
Rear control assembly



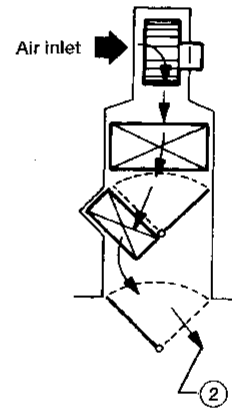
Floor and heat



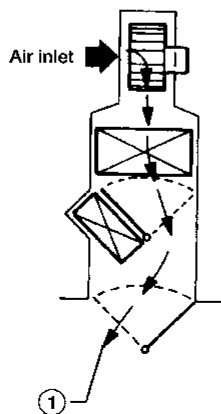
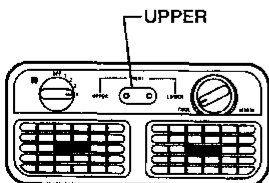
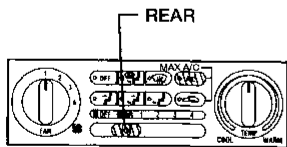
Front control assembly



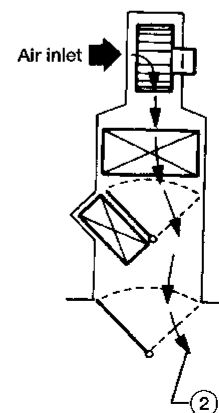
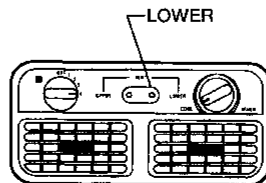
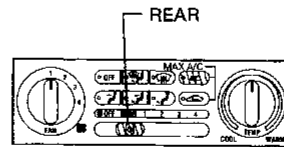
Rear control assembly



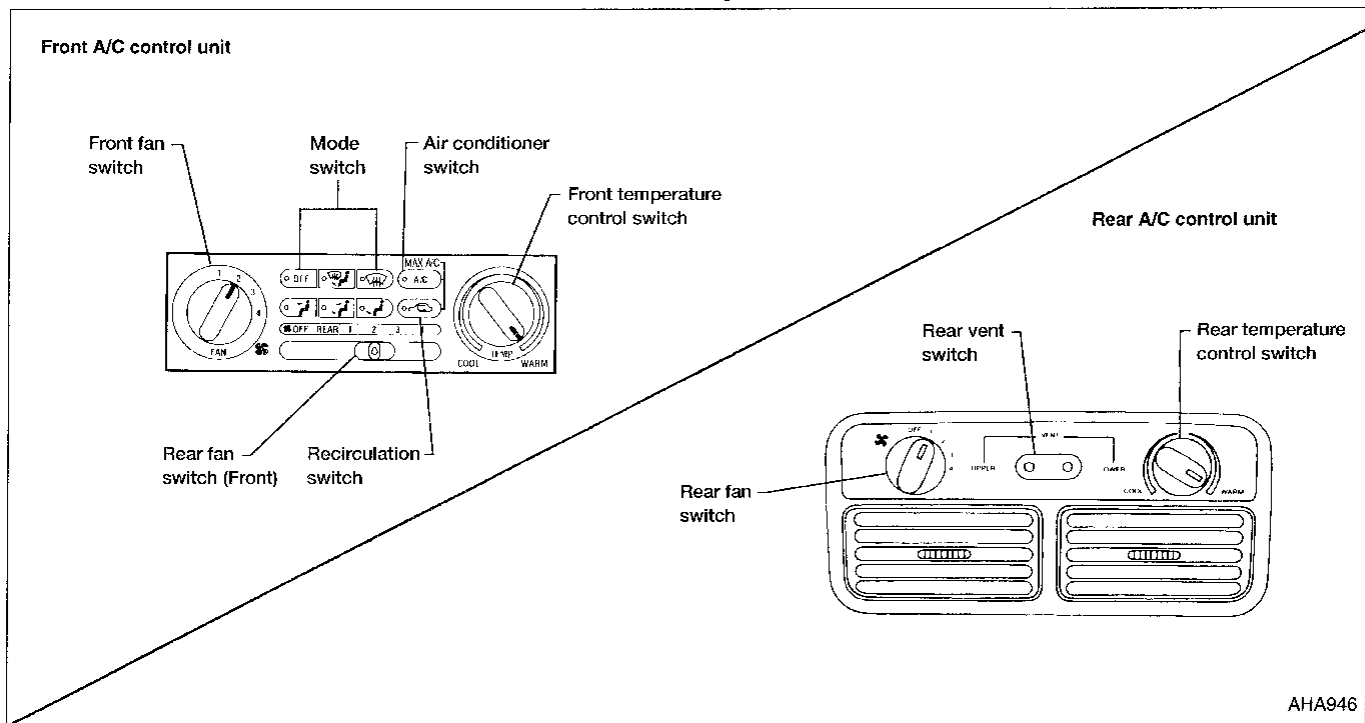
Ventilation and A/C



Floor and A/C



## Control Operation

**FRONT FAN SWITCH**

This switch controls front blower speed. The front blower motor will operate in any mode except OFF.

**REAR FAN SWITCH**

When the rear fan switch (front) is in the OFF position, the rear blower motor cannot operate.

When the rear fan switch (front) is in the REAR position, this allows the rear fan switch to control the rear blower speed.

In any other position (1-4), the rear fan switch (front) controls the rear blower speed, regardless of the rear fan switch position.

**MODE SWITCH**

These switches control the direction of air flow through the front discharge outlets.

**REAR VENT SWITCH**

This switch controls air flow through the rear upper or lower discharge outlets.

**FRONT TEMPERATURE CONTROL SWITCH**

This switch allows adjustment of the temperature of the air through the front discharge outlets.

**REAR TEMPERATURE CONTROL SWITCH**

This switch allows adjustment of the temperature of the air through the rear discharge outlets independent of the position of the front temperature control switch.

**RECIRCULATION (REC) SWITCH**

OFF position: Outside air is drawn into the passenger compartment.

ON position: Interior air is recirculated inside the vehicle.

Recirculation is canceled when DEF or F/D is selected.

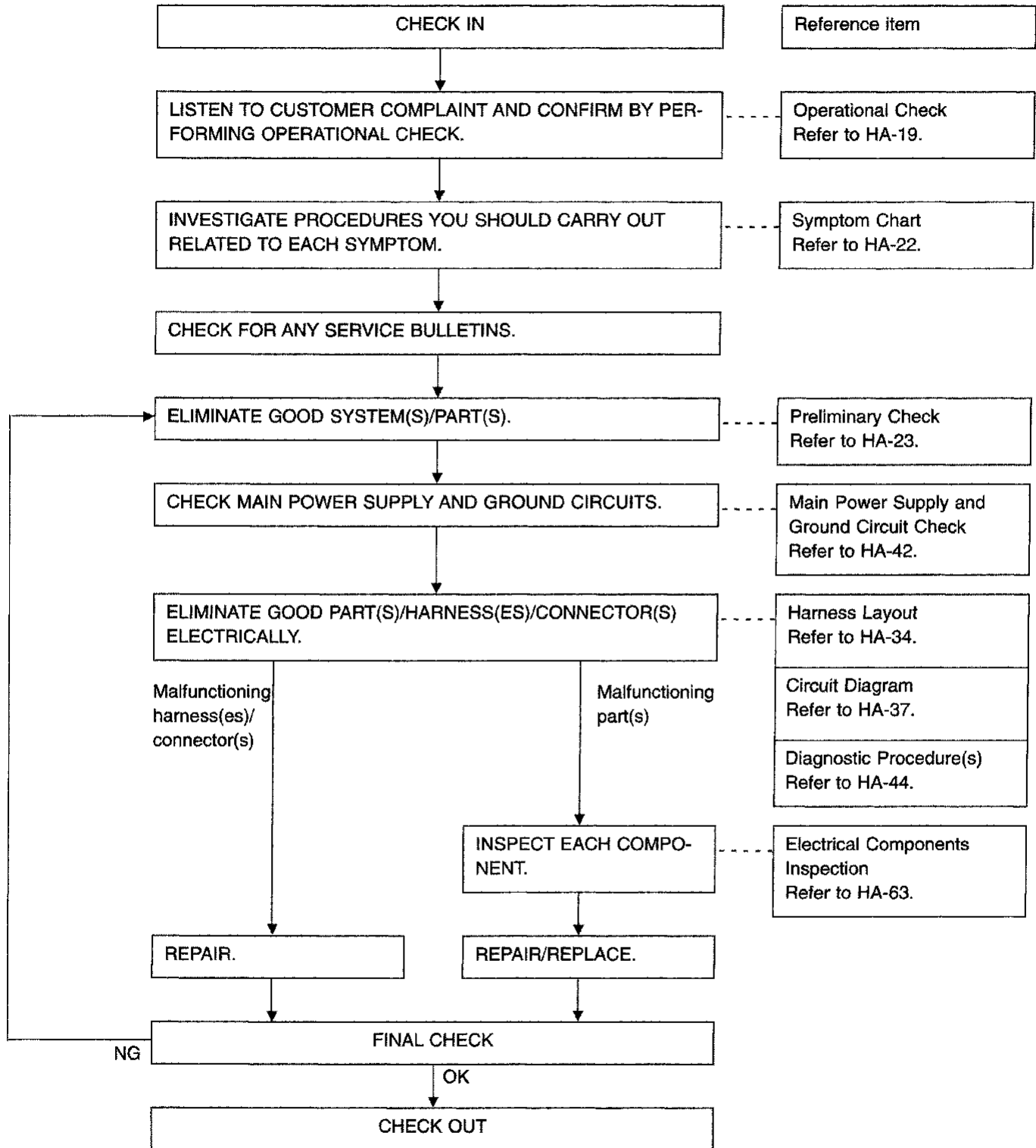
**AIR CONDITIONER SWITCH**

This switch controls A/C operation when any mode switch is selected except OFF. The A/C indicator will light and stay on when A/C is selected, until the air conditioner switch is turned off or OFF mode is selected.

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

How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



**Operational Check**

The purpose of the operational check is to confirm that the system operates properly.

**CONDITIONS:**

Engine running at normal operating temperature.

**PROCEDURE:**

**1. Check blower**

- a. Turn the front fan switch to 1-speed and press any mode switch except OFF. Blower should operate on 1-speed.
- b. Then turn the front fan switch to 2-speed and continue checking blower speed until all four speeds are checked.
- c. Leave blower on 4-speed.


**2. Check discharge air**

- a. Press each mode switch.

- b. Confirm that discharge air comes out according to the air distribution table at left and that the indicator lamp illuminates.

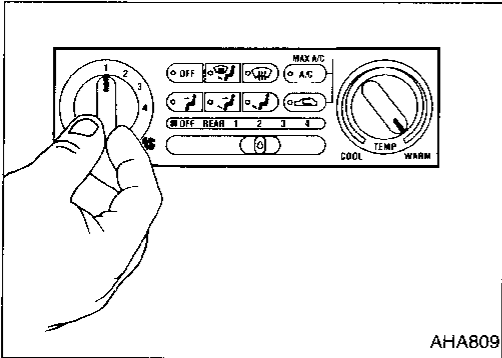
Refer to "Discharge Air Flow", "DESCRIPTION" (HA-15).

**NOTE:**

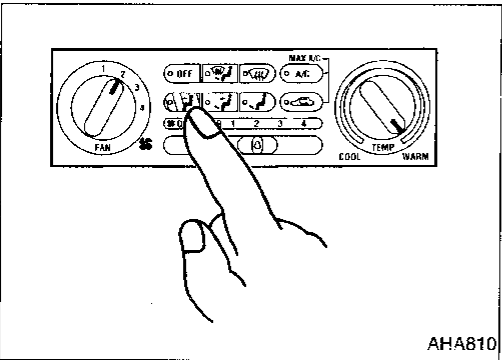
Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when the DEF  mode is selected.

Confirm that the intake door position is at FRESH when the F/D  mode is selected.

Intake door position is checked in the next step.








AHA809



AHA810

**Discharge air flow**

Switch mode/ indicator	Air outlet/distribution		
	Face	Foot	Defroster
	94%	6%	—
	60%	40%	—
	—	75%	25%
	—	53%	47%
	—	9%	91%

AHA275

GI

MA

EM

LG

EC

FE

AT

FA

RA

BR

ST

RS

BT


HA

EL

IDX

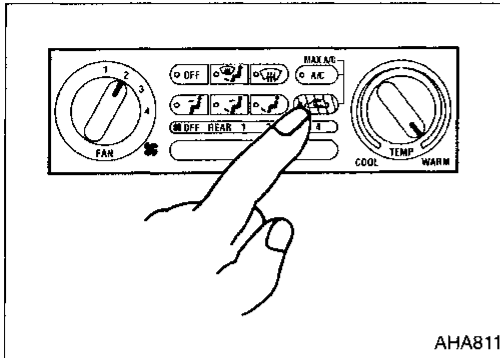
## Operational Check (Cont'd)

## 3. Check recirculation

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

**NOTE:**

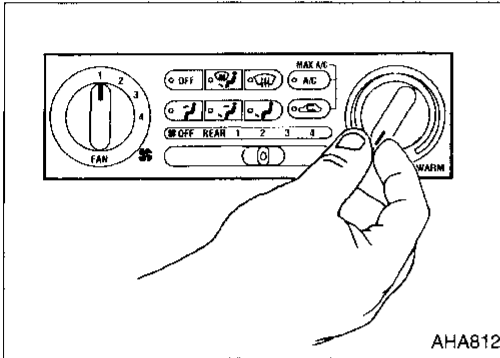
REC does not operate in DEF  and F/D  modes.



AHA811

## 4. Check temperature decrease

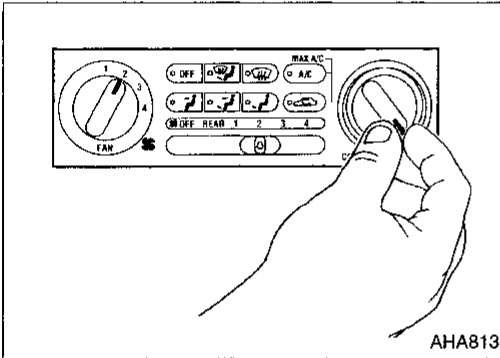
- Turn the front temperature control switch to full cool.
- Check for cold air at discharge air outlets.



AHA812

## 5. Check temperature increase

- Turn the front temperature control switch to full warm.
- Check for hot air at discharge air outlets.



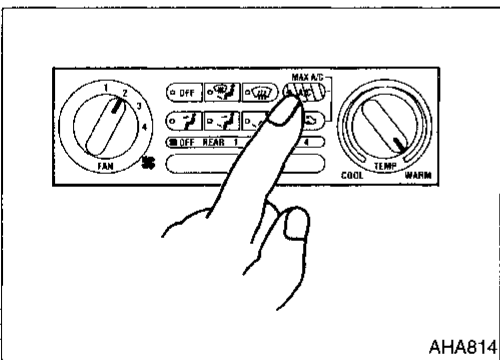
AHA813

## 6. Check air conditioner switch

Turn the front fan switch ON, press the desired mode switch, then press the air conditioner switch to turn ON the air conditioner.

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

Confirm that the compressor clutch engages.



AHA814

**Operational Check (Cont'd)****REAR A/C CONDITIONS:**

Engine running at normal operating temperature.

**PROCEDURE:****1. Check blower**

- a. Set rear fan switch (front) to REAR position.
- b. Press any mode switch except OFF.
- c. Press air conditioner switch ON.
- d. Turn rear fan switch to 1-speed.  
Blower should operate on 1-speed.
- e. Turn rear fan switch to 2-speed.
- f. Continue checking blower speed until all four speeds are checked.

**2. Check discharge air**

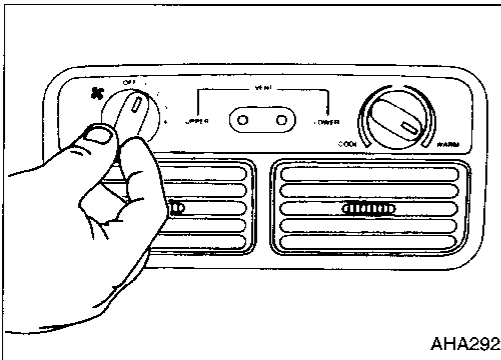
- a. Press the UPPER side of the rear vent switch.  
The indicator should light. Confirm air flow from the upper rear discharge outlets.
- b. Press the LOWER side of the rear vent switch.  
The indicator should light. Confirm air flow from the lower rear discharge outlets.

**3. Check temperature decrease**

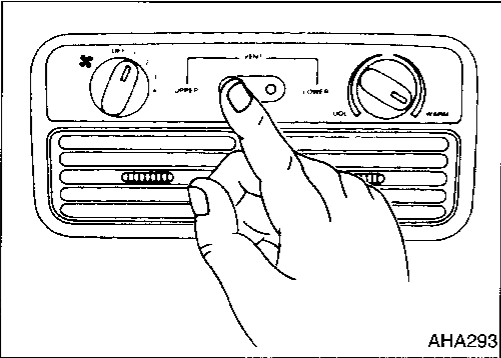
- a. Turn the rear temperature control switch to full cool.
- b. Check for cold air at rear discharge outlets.

**4. Check temperature increase**

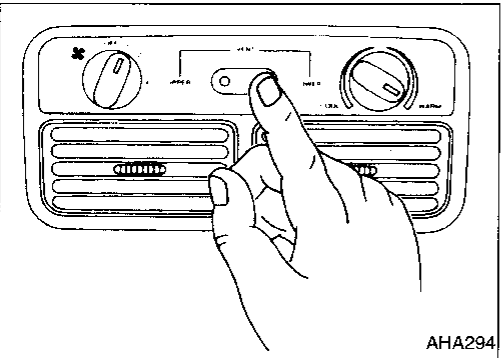
- a. Turn the rear temperature control switch to full warm.
- b. Check for hot air at rear discharge outlets.



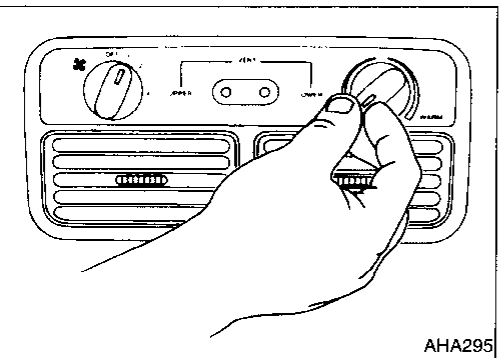
AHA292



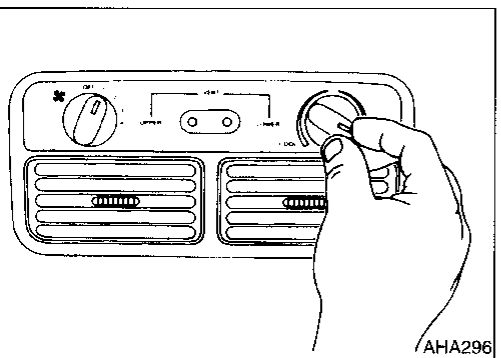
AHA293



AHA294



AHA295



AHA296

GI

MA

EM

LC

EC

FE

AT

FA

RA

BR

ST

RS

BT

HA

EL

IDX

Symptom Chart

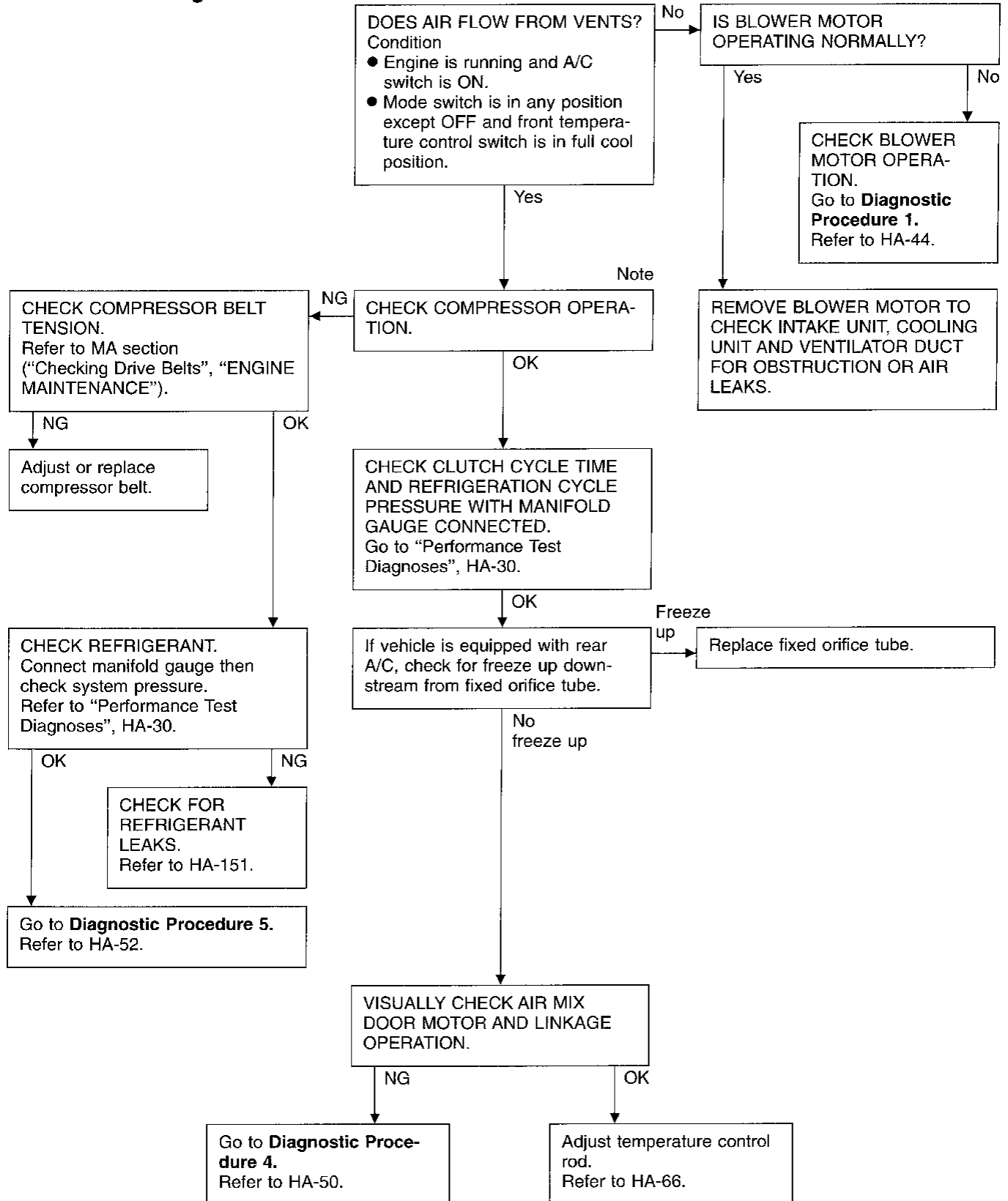
DIAGNOSTIC TABLE

PROCEDURE	Preliminary Check							Diagnostic Procedure										Main Power Supply and Ground Circuit Check				
	HA-23	HA-24	HA-25	HA-26	HA-27	HA-28	HA-29	HA-44	HA-47	HA-49	HA-50	HA-52	HA-55	HA-56	HA-59	HA-61	HA-62	HA-42	HA-42	HA-43	Refer to EC section	
REFERENCE PAGE																						
SYMPTOM	Preliminary check 1	Preliminary check 2	Preliminary check 3	Preliminary check 4	Preliminary check 5	Preliminary check 6	Preliminary check 7	Diagnostic procedure 1	Diagnostic procedure 2	Diagnostic procedure 3	Diagnostic procedure 4	Diagnostic procedure 5	Diagnostic procedure 6	Diagnostic procedure 7	Diagnostic procedure 8	Diagnostic procedure 9	Diagnostic procedure 10	Fuses	Front A/C control unit	Rear A/C control unit	ECM (ECCS control module)	Harness
Insufficient cooling - front	①							○			○	○						○	○	○	○	○
Insufficient cooling - rear	①	②						○			○		○	○	○			○	○	○	○	○
Insufficient heating - front			①					○			○							○	○	○	○	○
Insufficient heating - rear			①	②									○	○	○	○		○	○	○	○	○
Front blower motor does not rotate	①							②										○	○	○	○	○
Front air outlet does not change						①			②									○	○	○	○	○
Front air mix door does not change	①										②							○	○	○	○	○
Front intake door does not operate normally										①								○	○	○	○	○
Rear vent door motor does not operate normally																	①	○	○	○	○	○
Rear blower motor does not rotate when rear fan switch (front) for rear A/C is set to REAR position													①	○				○	○	○	○	○
Rear blower motor does not rotate when rear fan switch (front) for rear A/C is set at 1-4 speed													①	②				○	○	○	○	○
Rear air mix door does not operate normally				①											②			○	○	○	○	○
Magnet clutch does not engage					①						②							○	○	○	○	○
Noise							①															

①, ②: The number means checking order.  
 ○: Checking order depends on malfunction in flow chart.

Preliminary Check

**PRELIMINARY CHECK 1**  
Insufficient cooling - front



**Note:**  
If air flow gradually decreases with operation of A/C compressor, check low pressure switch and harness.

GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

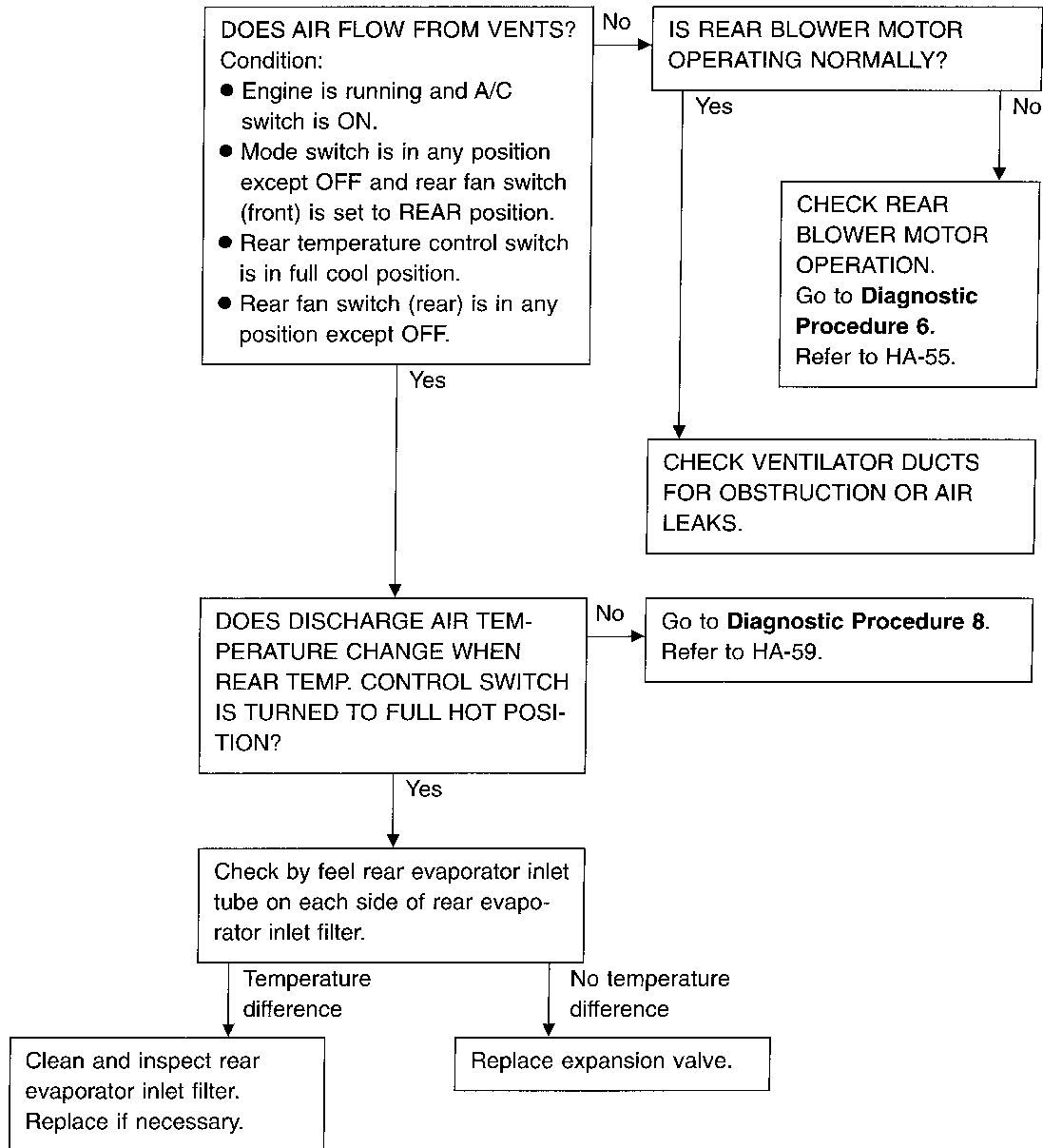


Preliminary Check (Cont'd)

PRELIMINARY CHECK 2

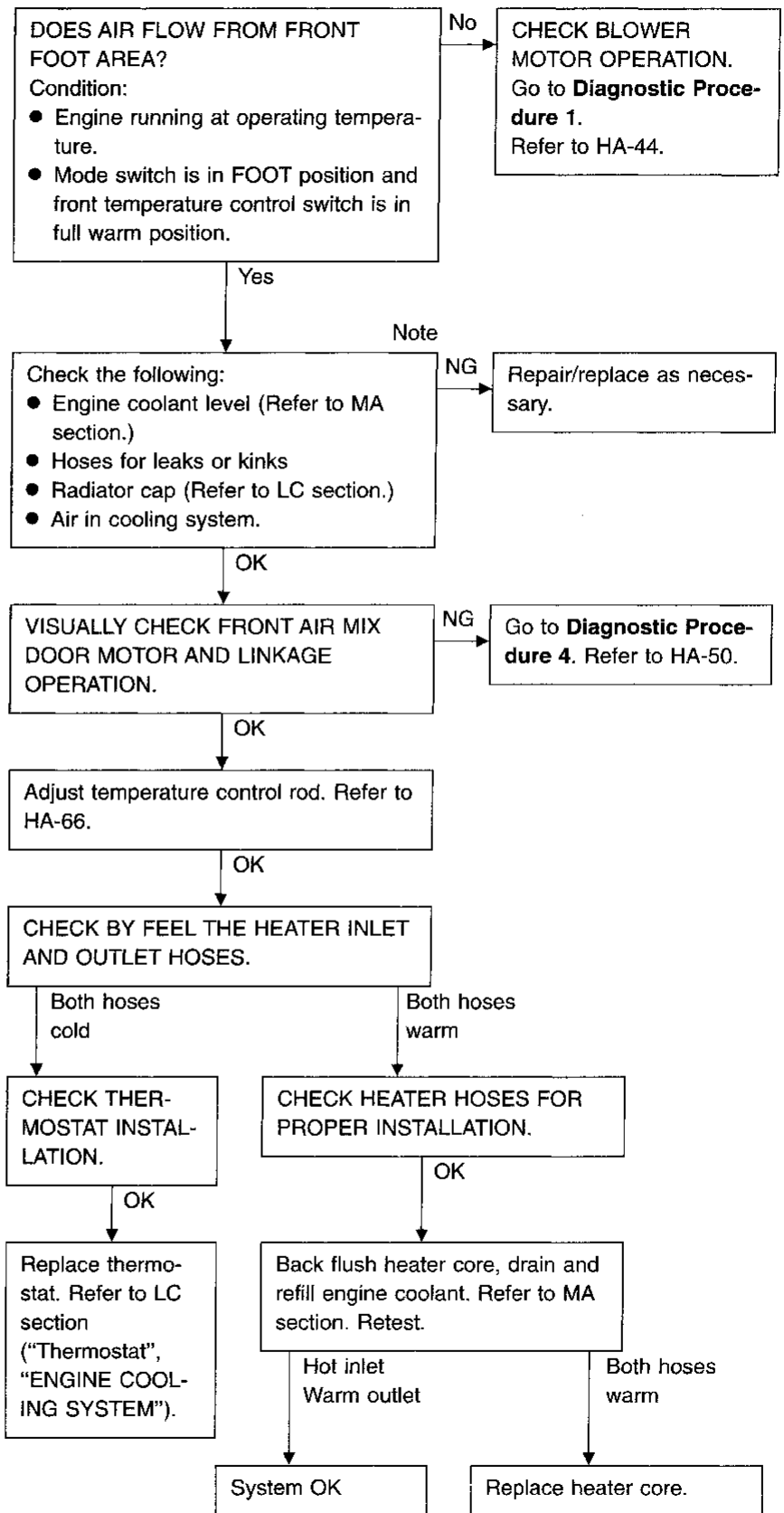
Insufficient cooling - rear

- Perform PRELIMINARY CHECK 1 before referring to the following flow chart.



Preliminary Check (Cont'd)

PRELIMINARY CHECK 3  
Insufficient heating - front



GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

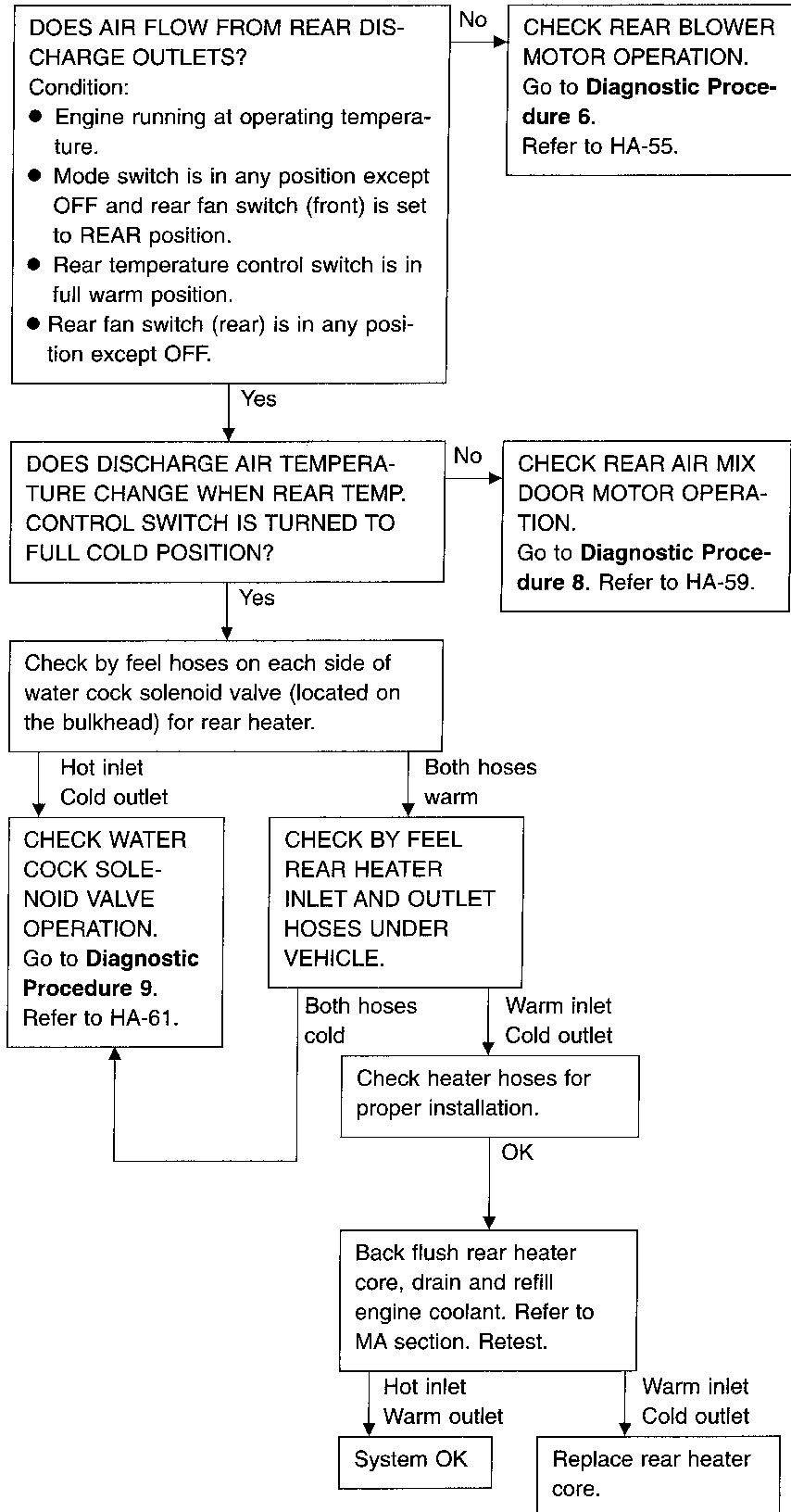
Note:  
If equipped with rear heater, and rear heat is OK, this step may not be necessary.

Preliminary Check (Cont'd)

PRELIMINARY CHECK 4

Insufficient heating - rear

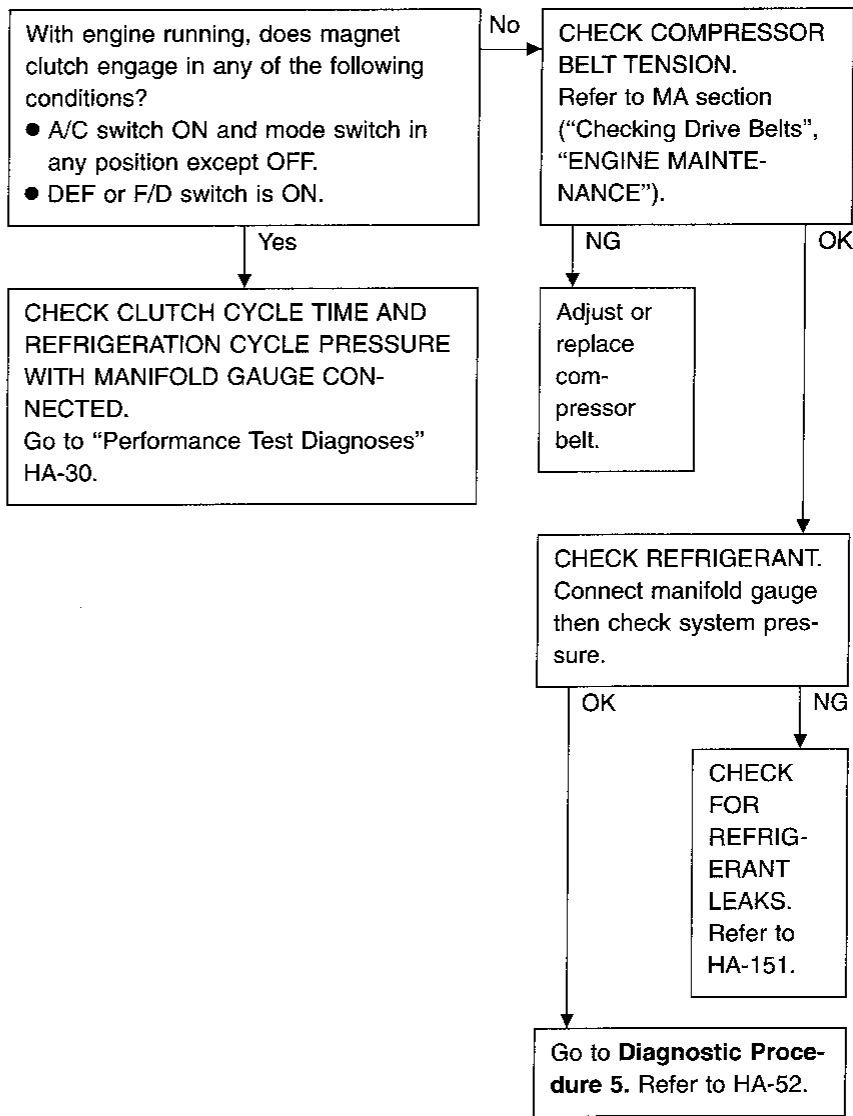
- Perform PRELIMINARY CHECK 3 before referring to the following flow chart.



Preliminary Check (Cont'd)

PRELIMINARY CHECK 5

Magnet clutch does not engage.



GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

**Preliminary Check (Cont'd)**






**PRELIMINARY CHECK 6**

**Front air outlet does not change.**

TURN IGNITION SWITCH AND FAN 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-47.

Switch mode/ Indicator	Air outlet/distribution		
	Face	Foot	Defroster
	94%	6%	—
	60%	40%	—
	—	75%	25%
	—	53%	47%
	—	9%	91%

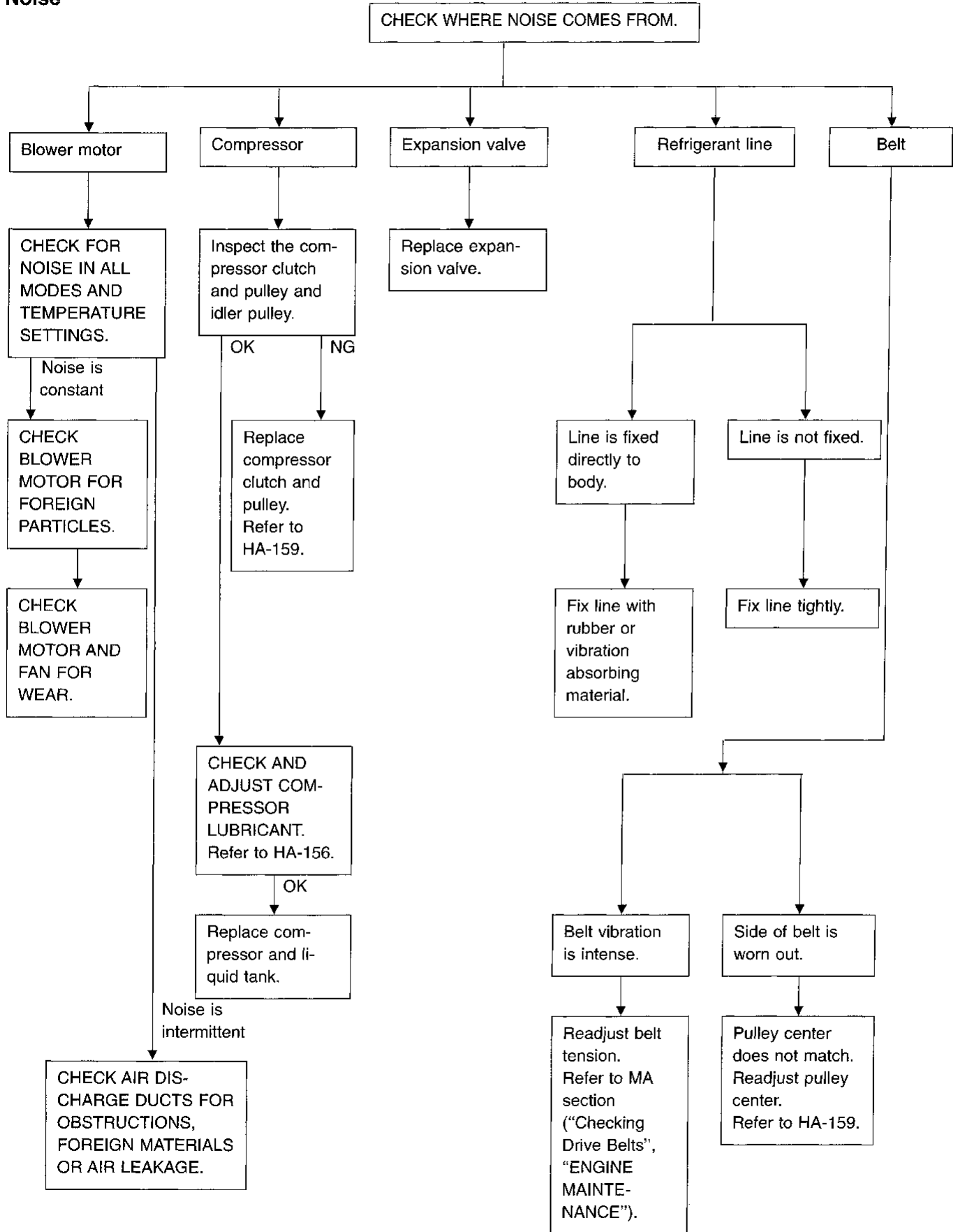
Yes

INSPECTION END

Preliminary Check (Cont'd)

PRELIMINARY CHECK 7

Noise



GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

## Performance Test Diagnoses

This A/C system is different from other Nissan A/C systems. The typical Nissan A/C system uses a thermal expansion valve to provide a restriction which causes a pressure change and also controls refrigerant flow through the evaporator.

This system uses a Fixed Orifice Tube (FOT) to cause a pressure change, by restricting the flow of refrigerant to the evaporator. The flow of refrigerant is controlled by engaging and disengaging the compressor clutch based on low side pressure. Therefore, it is critical to consider clutch engagement and disengagement times for proper diagnosis.

The refrigerant flow is regulated by a fixed orifice tube for the front evaporator and a thermal expansion valve for the rear evaporator.

The best way to diagnose a condition in the refrigerant system is to note the system pressures (shown by the manifold gauges) and the clutch cycle rate and times. Then, compare the findings to the charts.

- The system pressures are low (compressor suction) and high (compressor discharge).
- A clutch cycle is the time the clutch is engaged plus the time it is disengaged (time on plus time off).
- Clutch cycle times are the lengths of time (in seconds) that the clutch is ON and OFF.

### Important — Test conditions

The following test conditions must be established to obtain accurate clutch cycle rate and cycle time readings:

- Run engine at 1,500 rpm for 10 minutes.
- Operate A/C system on max A/C (recirculating air).
- Run blower at max speed.
- Stabilize in vehicle temperature at 21°C to 27°C (70°F to 80°F).

The following procedure is recommended for achieving accurate diagnosis results in the least amount of time.

1. Connect a manifold gauge set to the system. **The test conditions specified must be met to obtain accurate test results.**
  2. Start the engine and turn ON A/C system.
  3. As soon as the system is stabilized, record the high- and low-pressures as shown by the manifold gauges. The low side should cycle between approximately 168.9 kPa (1.723 kg/cm<sup>2</sup>, 24.5 psi) and 276 to 324 kPa (2.81 to 3.30 kg/cm<sup>2</sup>, 40 to 47 psi). (As low pressure drops, high pressure should rise.) When the clutch disengages, the low side should rise and the high side should drop.
  4. Determine the clutch cycle rate per minute (clutch on time plus off time is a cycle).
  5. Record clutch OFF time in seconds.
  6. Record clutch ON time in seconds.
  7. Record center register discharge temperature.
  8. Determine and record ambient temperature.
  9. Compare test readings with applicable chart.
- Plot a vertical line for recorded ambient temperature from scale at bottom of each chart to top of each chart.
  - Plot a horizontal line for each of the other test readings from scale at LH side of appropriate chart.

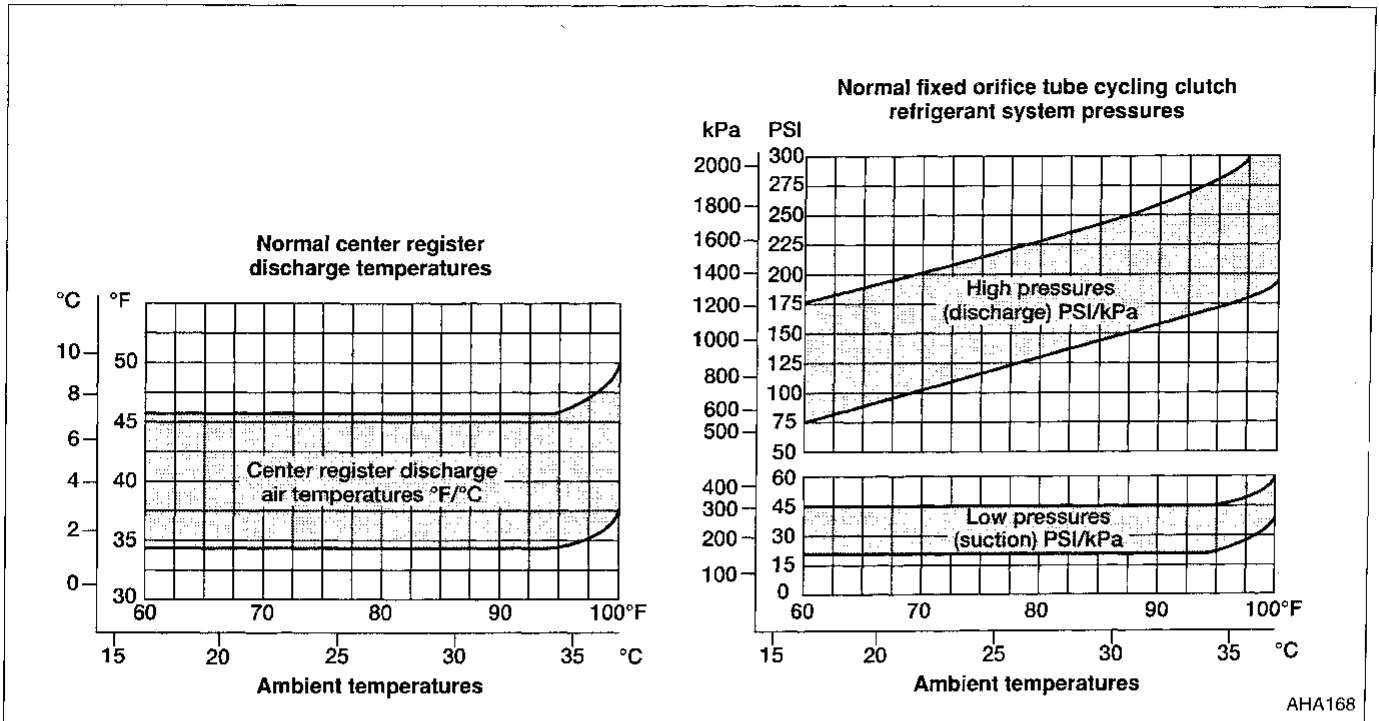
At the bottom of the chart (HA-32), additional cause components are listed for poor compressor operation or a damaged compressor condition.

The diagnosis charts provide the most direct and sure way to determine the cause of any concern in a poorly performing refrigerant system. However, if the vehicle is equipped with rear A/C, poor performance of the front or rear system may not cause abnormal pressures or clutch cycle time. In this case, poor performance may indicate a restriction of refrigerant flow to that system, or an evaporator problem.

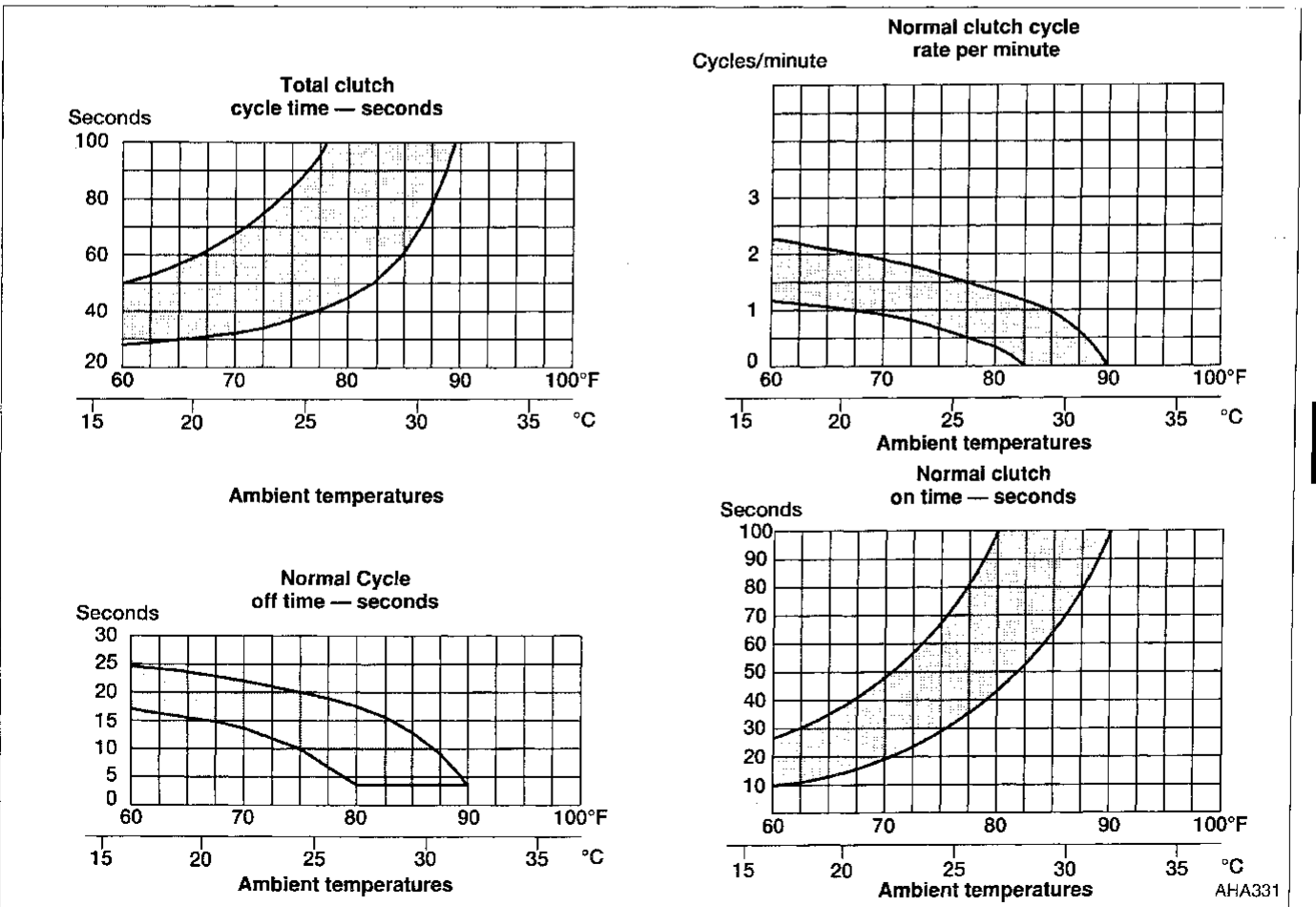
After servicing and correcting a refrigerant system concern, take additional pressure readings and observe the clutch cycle rate while meeting the conditional requirements (HA-32) to ensure the concern has been corrected.

Performance Test Diagnoses (Cont'd)

NORMAL FIXED ORIFICE TUBE REFRIGERANT SYSTEM PRESSURE/TEMPERATURE RELATIONSHIPS



NORMAL FIXED ORIFICE TUBE REFRIGERANT SYSTEM CLUTCH CYCLE TIMING RATES



GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX



## Performance Test Diagnoses (Cont'd)

REFRIGERANT SYSTEM PRESSURE AND CLUTCH CYCLE TIMING EVALUATION  
CHART FOR FIXED ORIFICE TUBE CYCLING CLUTCH SYSTEMS

System test conditions must be met to obtain accurate test readings for evaluation. Refer to the normal refrigerant system pressure/temperature and the normal clutch cycle rate and times charts on the previous page.

HIGH (DISCHARGE) PRESSURE	LOW (SUCTION) PRESSURE	CLUTCH CYCLE TIME			COMPONENT — CAUSES
		RATE	ON	OFF	
HIGH	HIGH	CONTINUOUS RUN			CONDENSER — Inadequate Airflow
HIGH	NORMAL TO HIGH				ENGINE OVERHEATING
NORMAL TO HIGH	NORMAL				REFRIGERANT OVERCHARGE (1) AIR IN REFRIGERANT HUMIDITY OR AMBIENT TEMP VERY HIGH (2)
NORMAL	HIGH				FIXED ORIFICE TUBE — Missing O-Rings Leaking/Missing
NORMAL TO HIGH	NORMAL TO HIGH	SLOW OR NO CYCLE	LONG OR CONTINUOUS	NORMAL OR NO CYCLE	MOISTURE IN REFRIGERANT SYSTEM EXCESSIVE REFRIGERANT LUBRICANT
NORMAL	LOW	SLOW	LONG	LONG	LOW-PRESSURE SWITCH — Low Cut-Out
NORMAL TO LOW	HIGH	CONTINUOUS RUN			COMPRESSOR — Low Performance
NORMAL TO LOW	NORMAL TO HIGH				A/C SUCTION LINE — Partially Restricted or Plugged (3)
NORMAL TO LOW	NORMAL	FAST	SHORT	NORMAL	EVAPORATOR — Low or Restricted Airflow
			SHORT TO VERY SHORT	NORMAL TO LONG	CONDENSER FIXED ORIFICE TUBE, OR A/C LIQUID LINE — Partially Restricted or Plugged
			SHORT TO VERT SHORT	SHORT TO VERY SHORT	LOW REFRIGERANT CHARGE
			SHORT TO VERY SHORT	LONG	EVAPORATOR CORE — Partially Restricted or Plugged
NORMAL TO LOW	LOW	CONTINUOUS RUN			A/C SUCTION LINE — Partially Restricted or Plugged (4) LOW-PRESSURE SWITCH — Sticking Closed
—	—	ERRATIC OPERATION OR COMPRESSOR NOT RUNNING			LOW-PRESSURE SWITCH — Dirty Contacts or Sticking Open. POOR CONNECTION AT A/C CLUTCH CONNECTOR OR CLUTCH CYCLING SWITCH CONNECTOR. A/C ELECTRICAL CIRCUIT ERRATIC

ADDITIONAL POSSIBLE CAUSE COMPONENTS  
ASSOCIATED WITH INADEQUATE COMPRESSOR OPERATION

- COMPRESSOR DRIVE BELT — Loose
- COMPRESSOR CLUTCH — Slipping
- CLUTCH COIL Open — Shorted, or Loose Mounting
- A/C RELAY — Dirty Contacts or Sticking Open
- CLUTCH WIRING CIRCUIT — High Resistance, Open or Blown Fuse
- COMPRESSOR OPERATION INTERRUPTED BY ENGINE CONTROL MODULE

ADDITIONAL POSSIBLE CAUSE COMPONENTS  
ASSOCIATED WITH A DAMAGED COMPRESSOR

- LOW-PRESSURE SWITCH — Sticking Closed or Compressor Clutch Seized
- ACCUMULATOR — Lubricant Bleed Hole Plugged
- REFRIGERANT LEAKS

(1) Compressor may make noise on initial run. This is slugging condition caused by excessive liquid refrigerant.

(2) Compressor clutch may not cycle in ambient temperatures above 27°C (80°F) depending on humidity conditions.

(3) Low pressure reading will be normal to high if pressure is taken at accumulator and if restriction is downstream of service valve.

(4) Low pressure reading will be low if pressure is taken near the compressor and restriction is upstream of service valve.

- Fixed orifice tube operation can be checked by touching the line each side of the locating crimp. One side should be warm the other should be cold.
- If the compressor is repaired due to the noise or seizure, we recommend replacing the fixed orifice tube, accumulator, and (if equipped with rear A/C) the rear evaporator inlet filter.

NOTES

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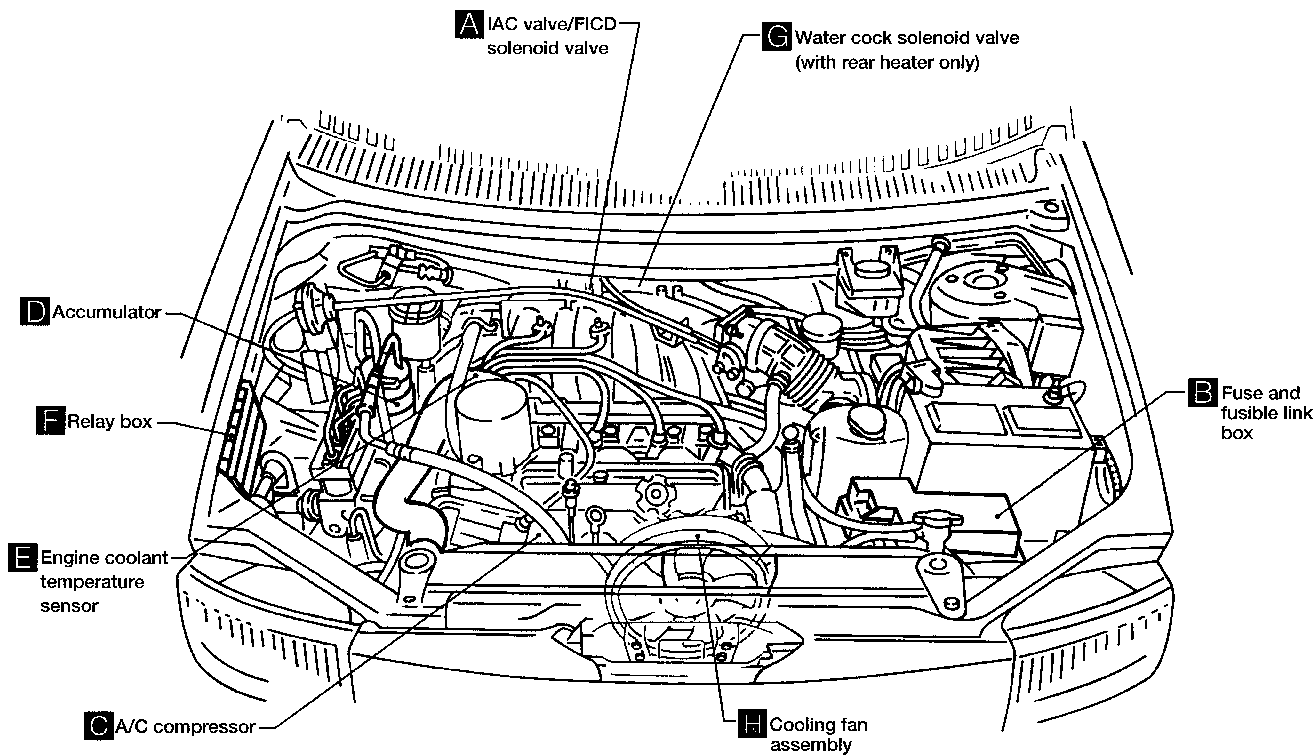
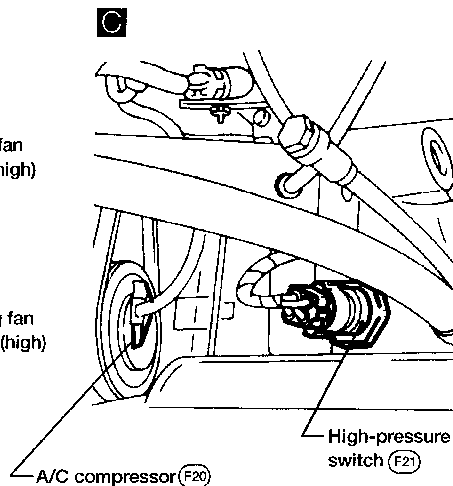
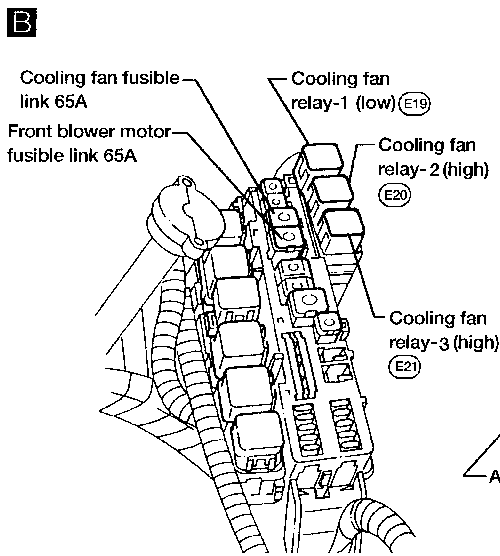
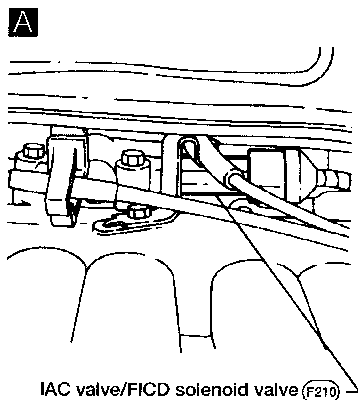
**HA**

EL

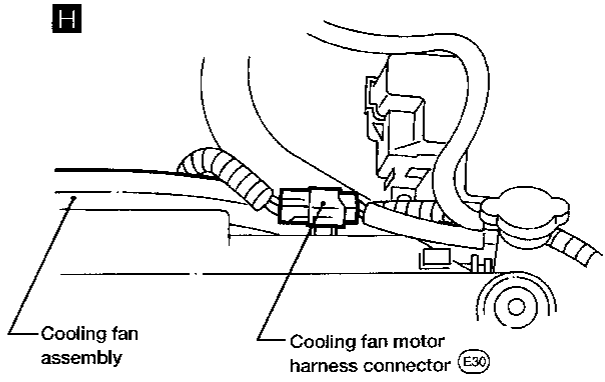
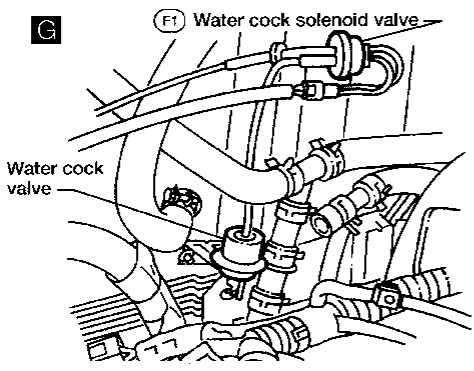
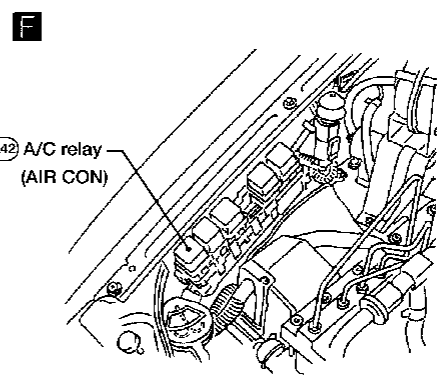
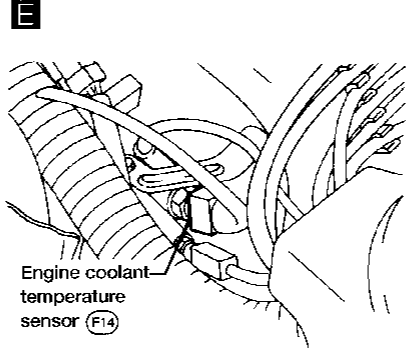
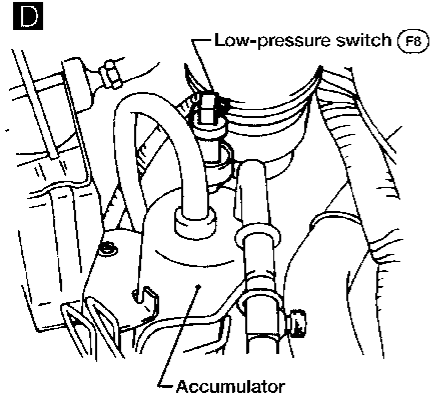
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Harness Layout

ENGINE COMPARTMENT



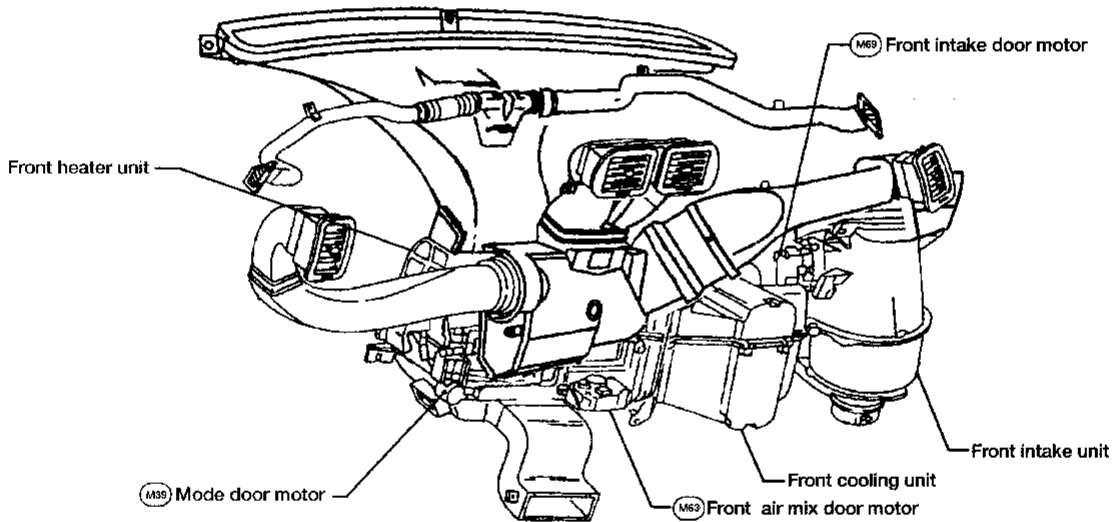
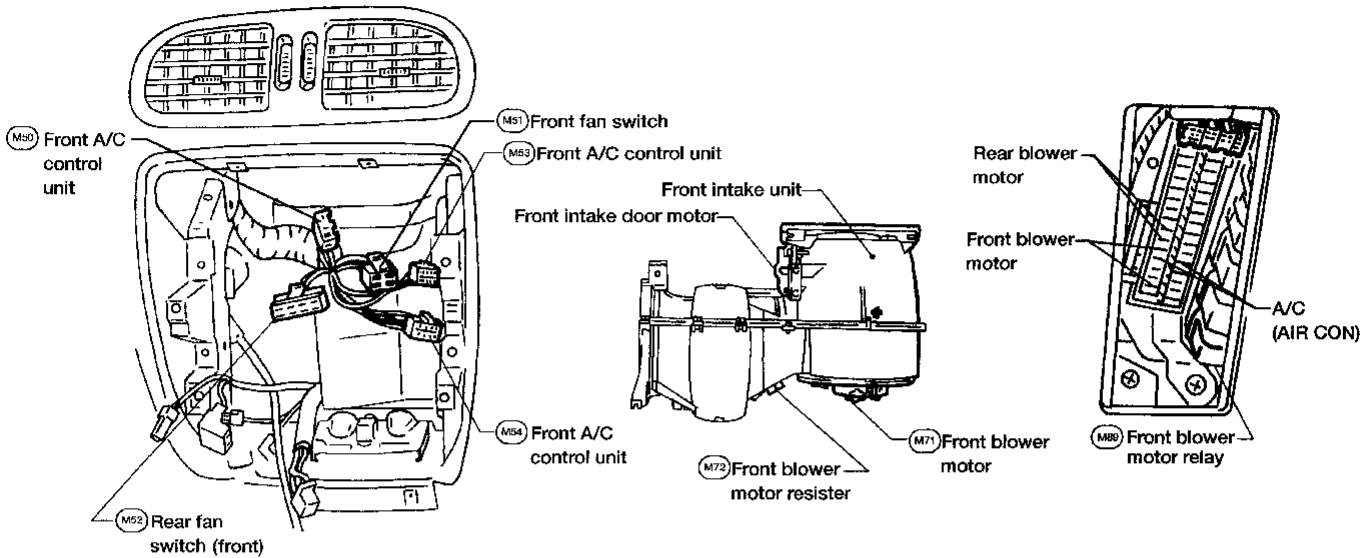
Harness Layout (Cont'd)



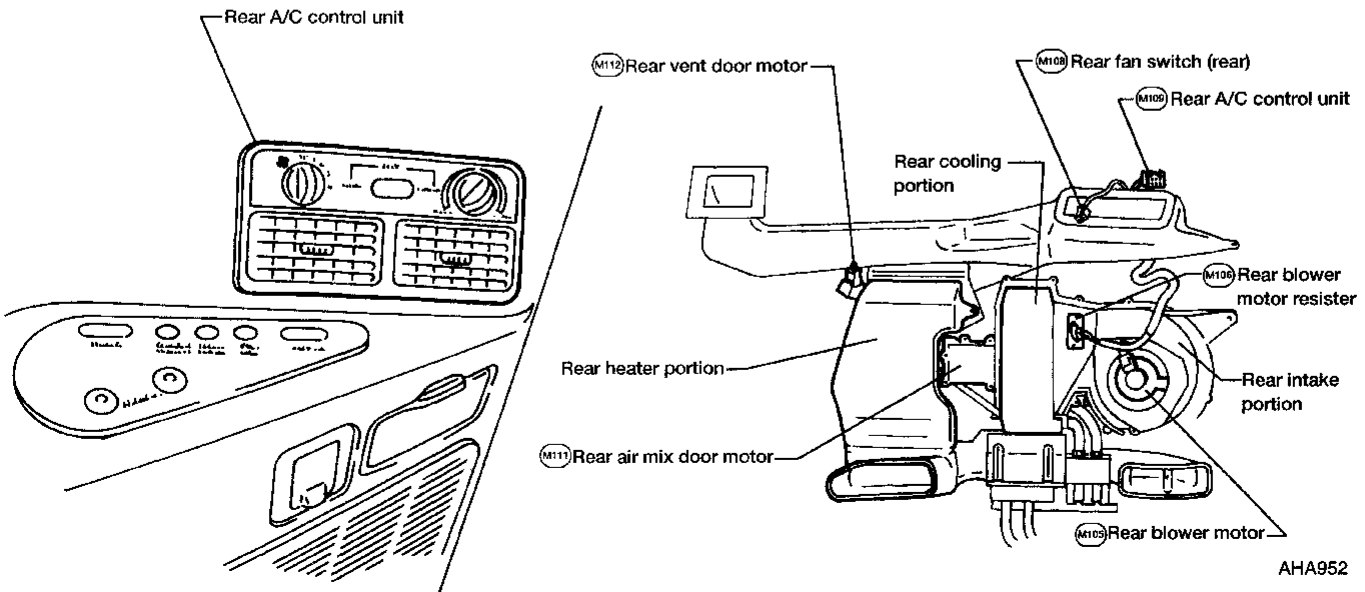
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### PASSENGER COMPARTMENT

#### Front heating and A/C unit

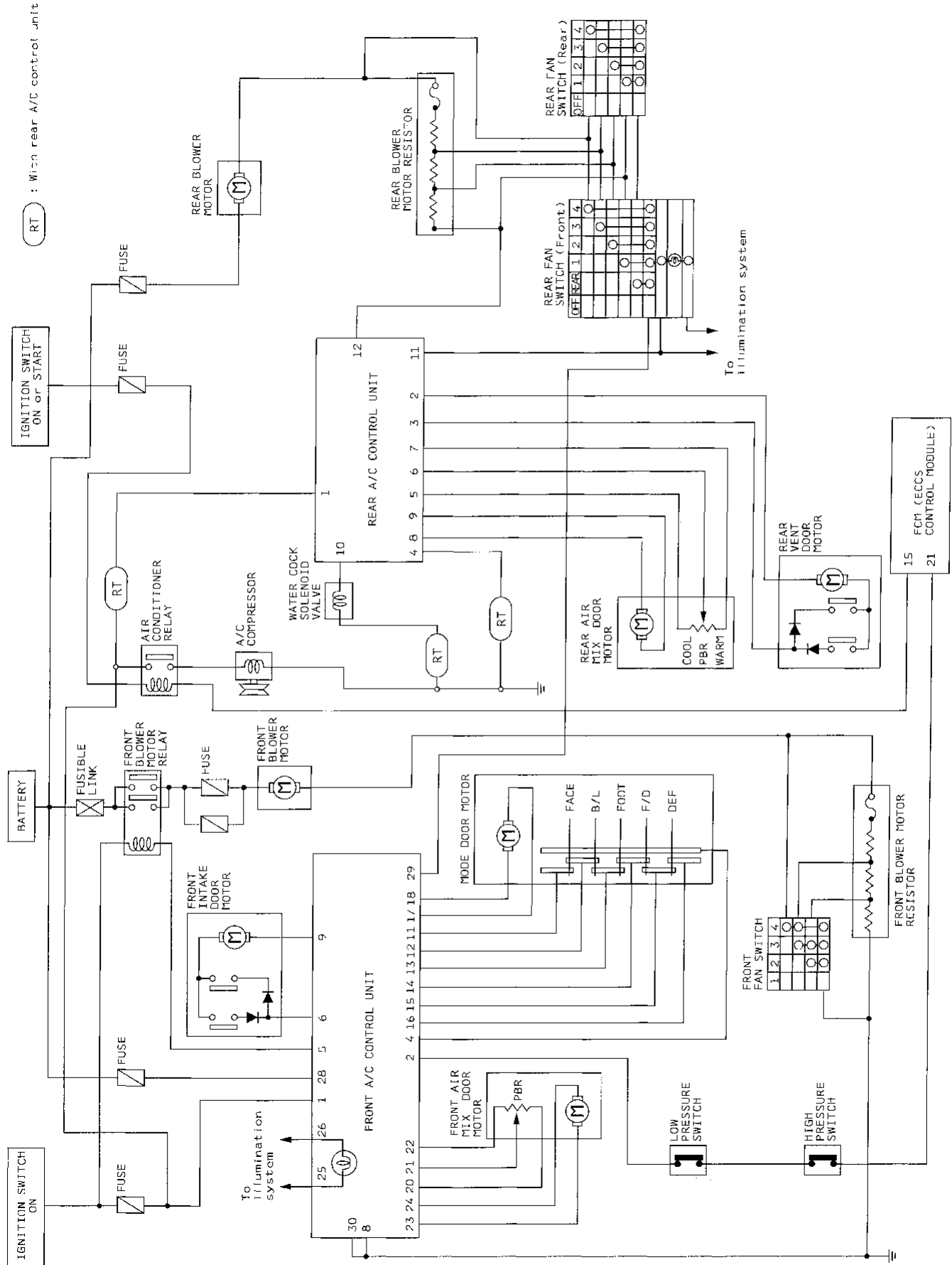


#### Rear heating and A/C unit



AHA952

Circuit Diagram

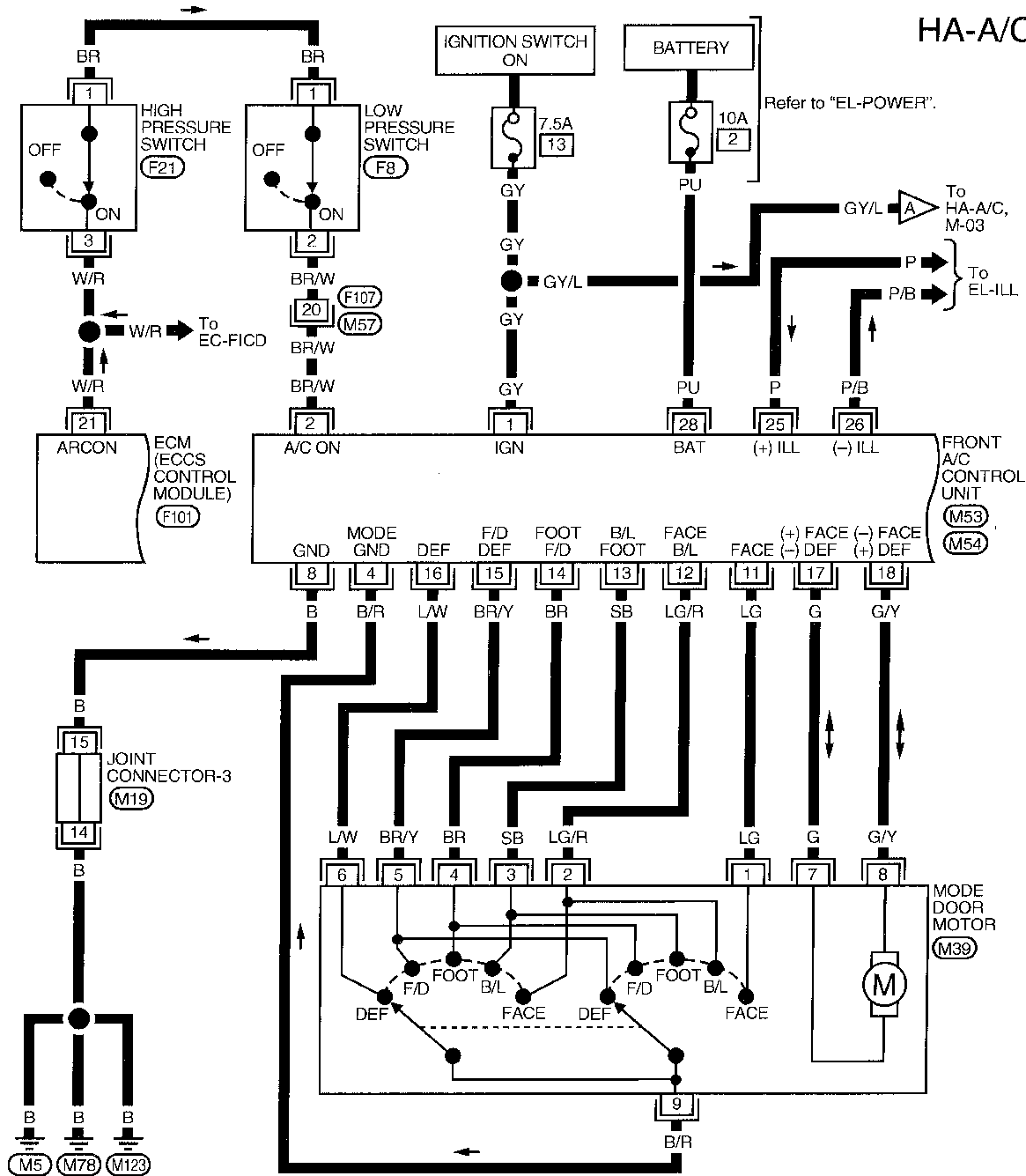


RT : With rear A/C control unit

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Wiring Diagram -A/C, M-

HA-A/C,M-01

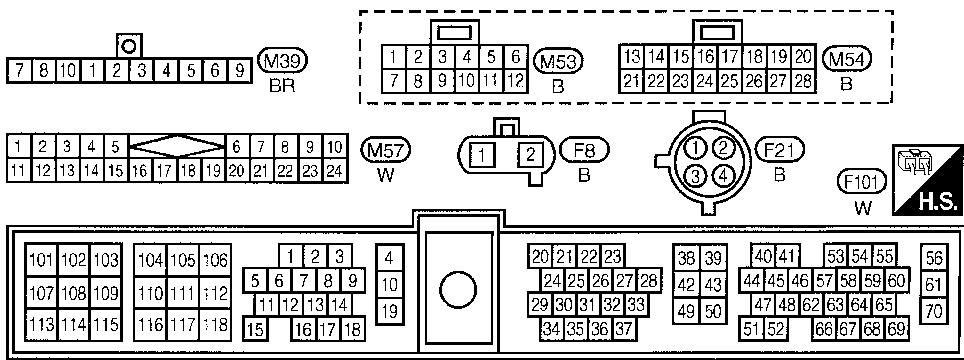


Refer to "EL-POWER".

To HA-A/C, M-03  
To EL-ILL

FRONT A/C CONTROL UNIT (M53, M54)

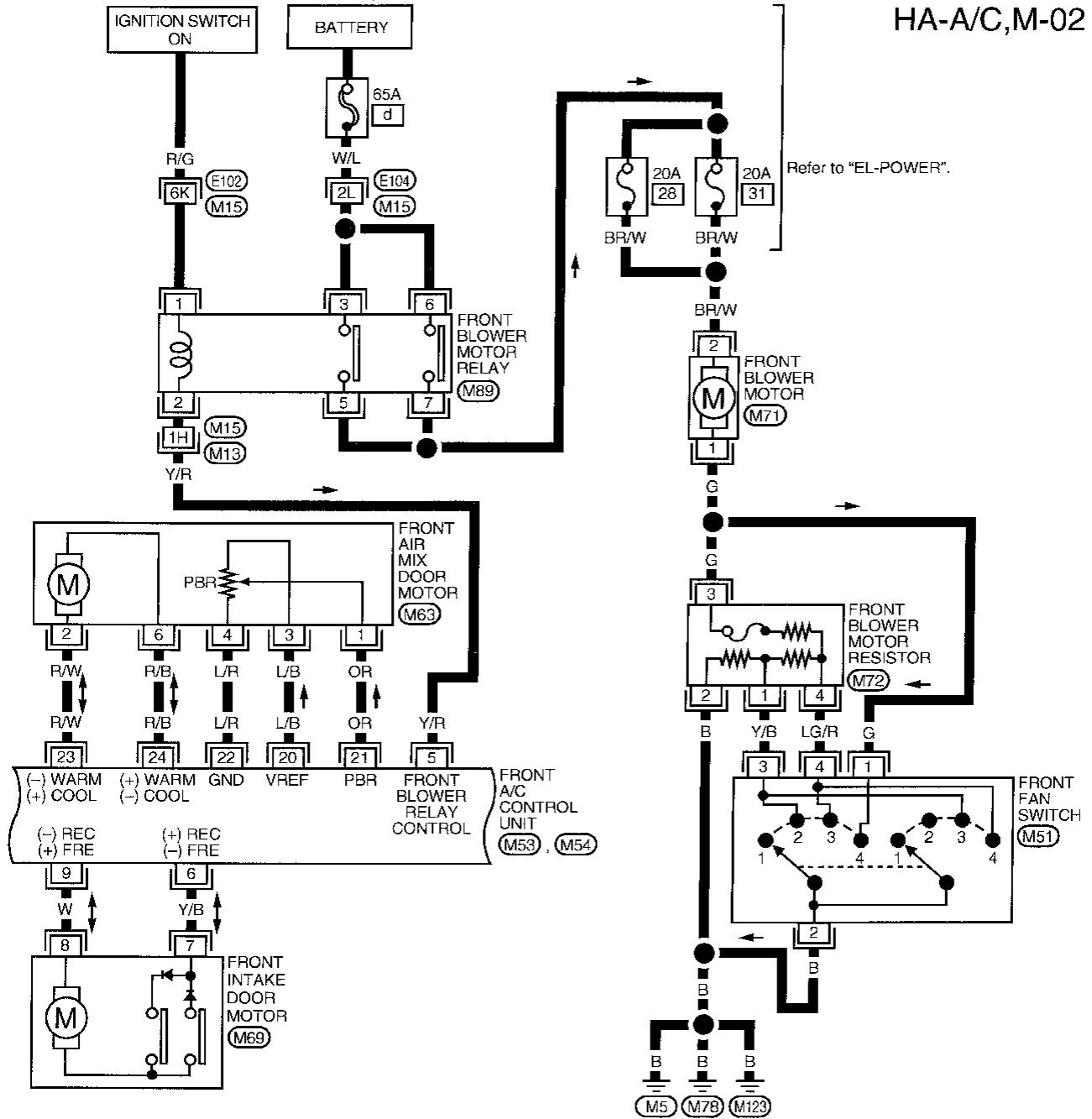
MODE DOOR MOTOR (M39)



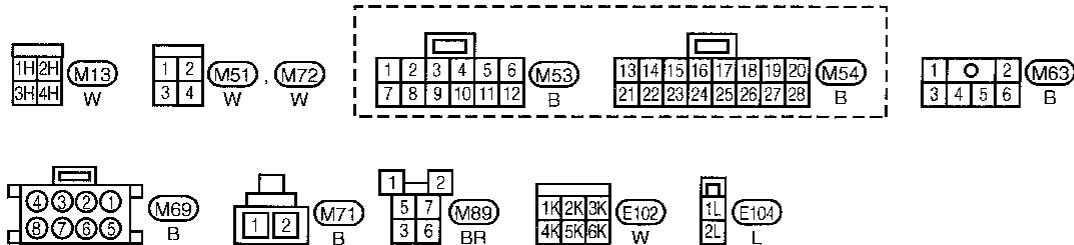
Refer to last page (Foldout page).

(M19)

Wiring Diagram -A/C, M- (Cont'd)



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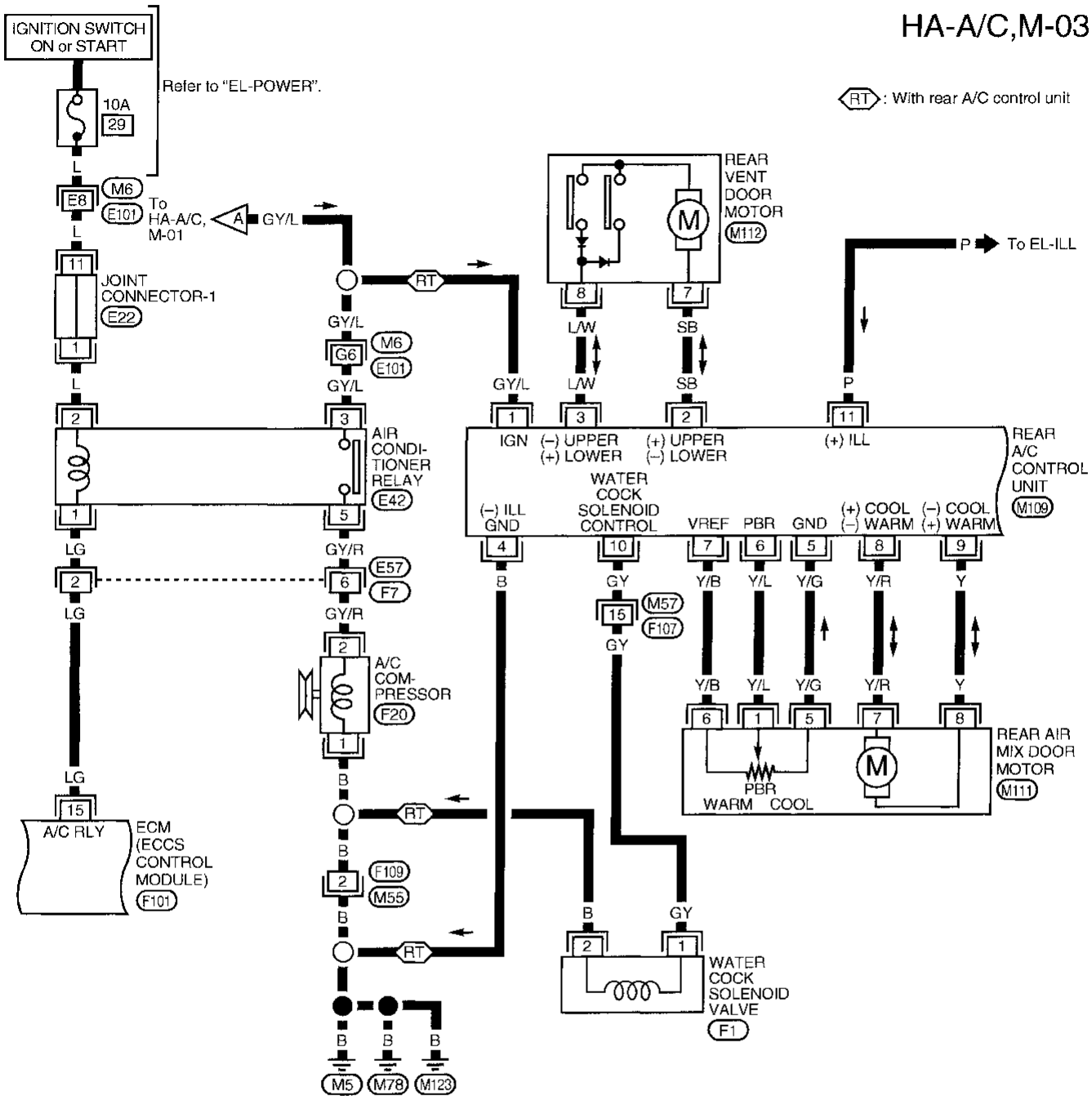


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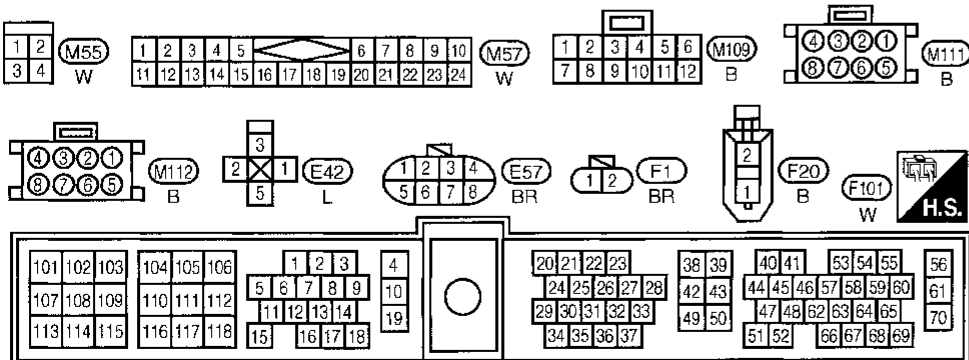


Wiring Diagram -A/C, M- (Cont'd)

HA-A/C,M-03



RT: With rear A/C control unit



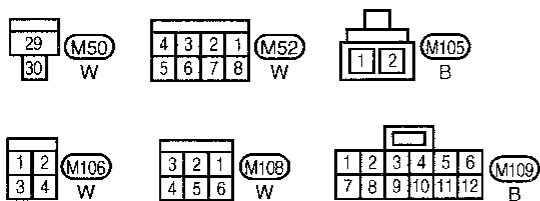
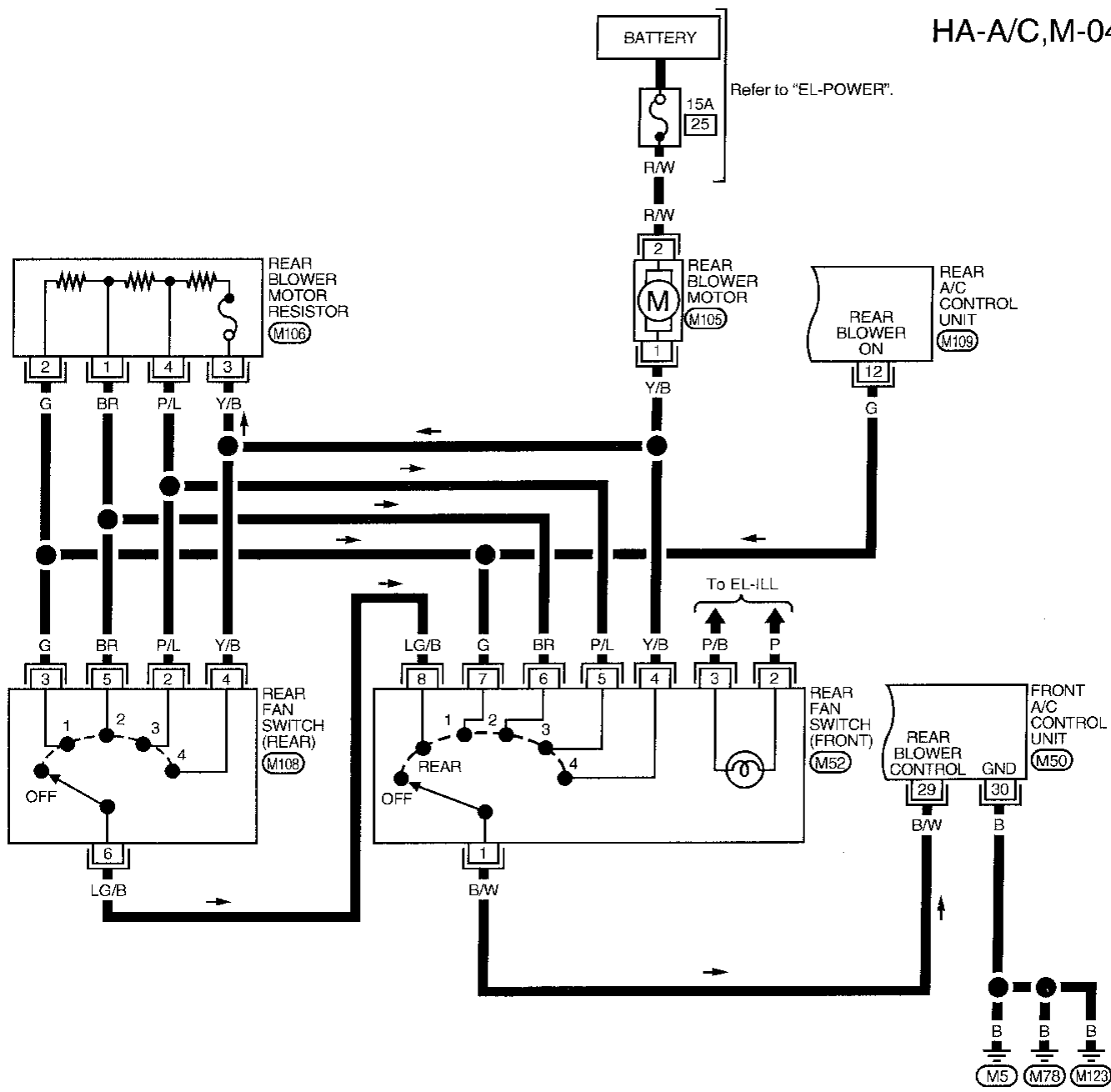
Refer to last page (Foldout page).

M5, E101, E22

Wiring Diagram -A/C, M- (Cont'd)

HA-A/C,M-04

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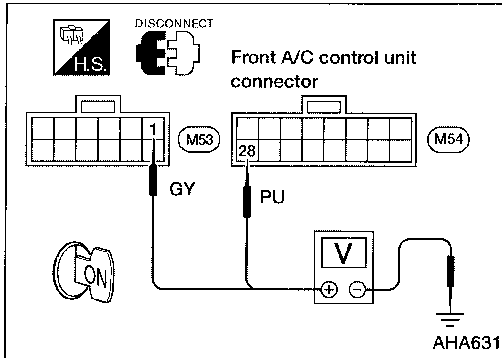


### Main Power Supply and Ground Circuit Check

#### POWER SUPPLY CIRCUIT CHECK

Check power supply circuit for air conditioner system.

Refer to EL section (“Wiring Diagram”, “POWER SUPPLY ROUTING”) and HA-38.

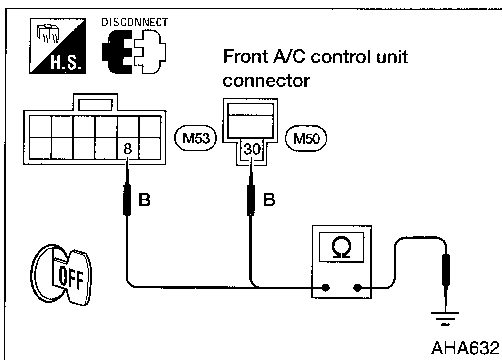


#### FRONT A/C CONTROL UNIT CHECK

Check power supply circuit for front A/C control unit with ignition switch ON.

1. Disconnect front A/C control unit harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ①, ⑳ and body ground.

Voltmeter terminal		Voltage
⊕	⊖	
①	Body ground	Approx. 12V
⑳		



Check body ground circuit for front A/C control unit with ignition switch OFF.

1. Disconnect front A/C control unit harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ⑧, ⑳ and body ground.

Ohmmeter terminal		Continuity
⊕	⊖	
⑧	Body ground	Yes
⑳		

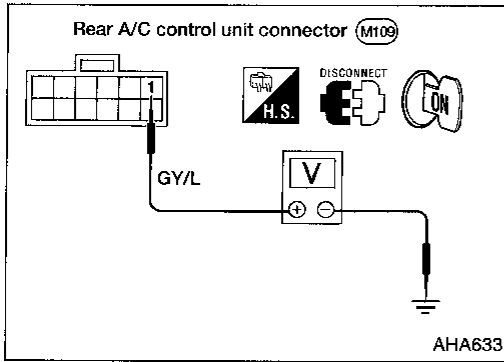
Ⓜ50 is for models with rear A/C.

**Main Power Supply and Ground Circuit Check (Cont'd)**

**REAR A/C CONTROL UNIT CHECK**

Check power supply circuit for rear A/C control unit with ignition switch ON.

1. Disconnect rear A/C control unit harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ① and body ground.



Voltmeter terminal		Voltage
⊕	⊖	
①	Body ground	Approx. 12V

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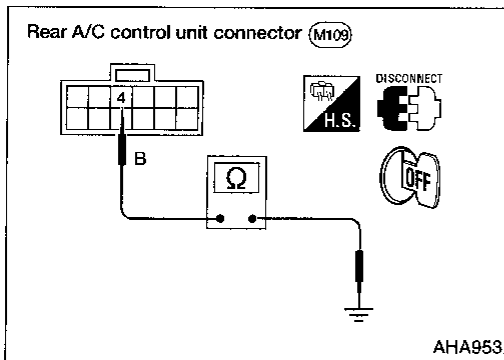
BR

ST

RS

Check body ground circuit for rear A/C control unit with ignition switch OFF.

1. Disconnect rear A/C control unit harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ④ and body ground.



Ohmmeter terminal		Continuity
⊕	⊖	
④	Body ground	Yes

BT

HA

EL

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	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

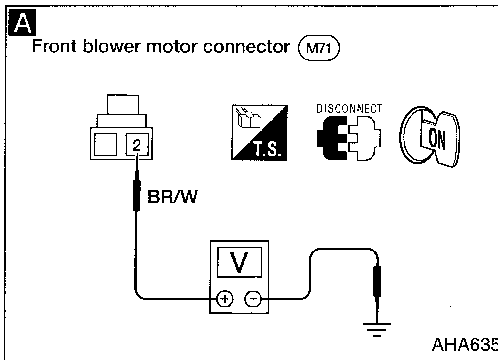
### Diagnostic Procedure 1

**SYMPTOM: Front blower motor does not rotate.**

- Perform **PRELIMINARY CHECK 1** before referring to the following flow chart.

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

② ③ ④ ⑤  
(Go to next page.) → **B**

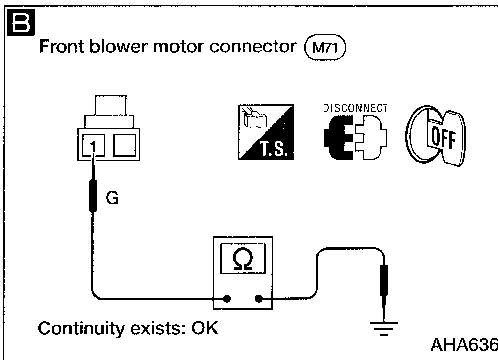


**A**

**CHECK POWER SUPPLY FOR FRONT BLOWER MOTOR.**  
Disconnect front blower motor harness connector.  
Turn the front A/C control unit ON (mode switch: any position except OFF).  
Do approx. 12 volts exist between front blower motor harness terminal No. ② and body ground?

No → **C** (Go to HA-46)

Yes



**B**

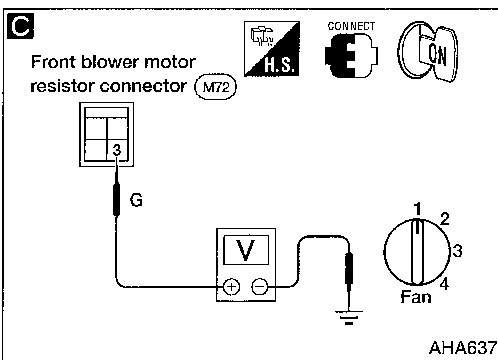
**CHECK CIRCUIT CONTINUITY BETWEEN FRONT BLOWER MOTOR HARNESS TERMINAL NO. ① AND BODY GROUND.**

OK → **CHECK FRONT BLOWER MOTOR.** Refer to HA-63.

NG

Replace front blower motor.

Reconnect front blower motor harness connector.

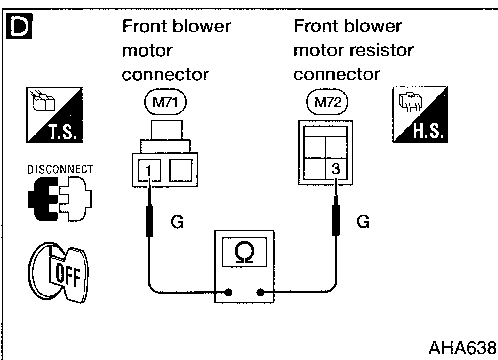


**C**

**CHECK FRONT BLOWER MOTOR CIRCUIT BETWEEN FRONT BLOWER MOTOR AND FRONT BLOWER MOTOR RESISTOR.**  
Turn the front A/C control unit ON (mode switch: any position except OFF).  
Do approx. 12 volts exist between front blower motor resistor harness terminal No. ③ and body ground?

No → Disconnect front blower motor and front blower motor resistor harness connectors.

Yes



**D**

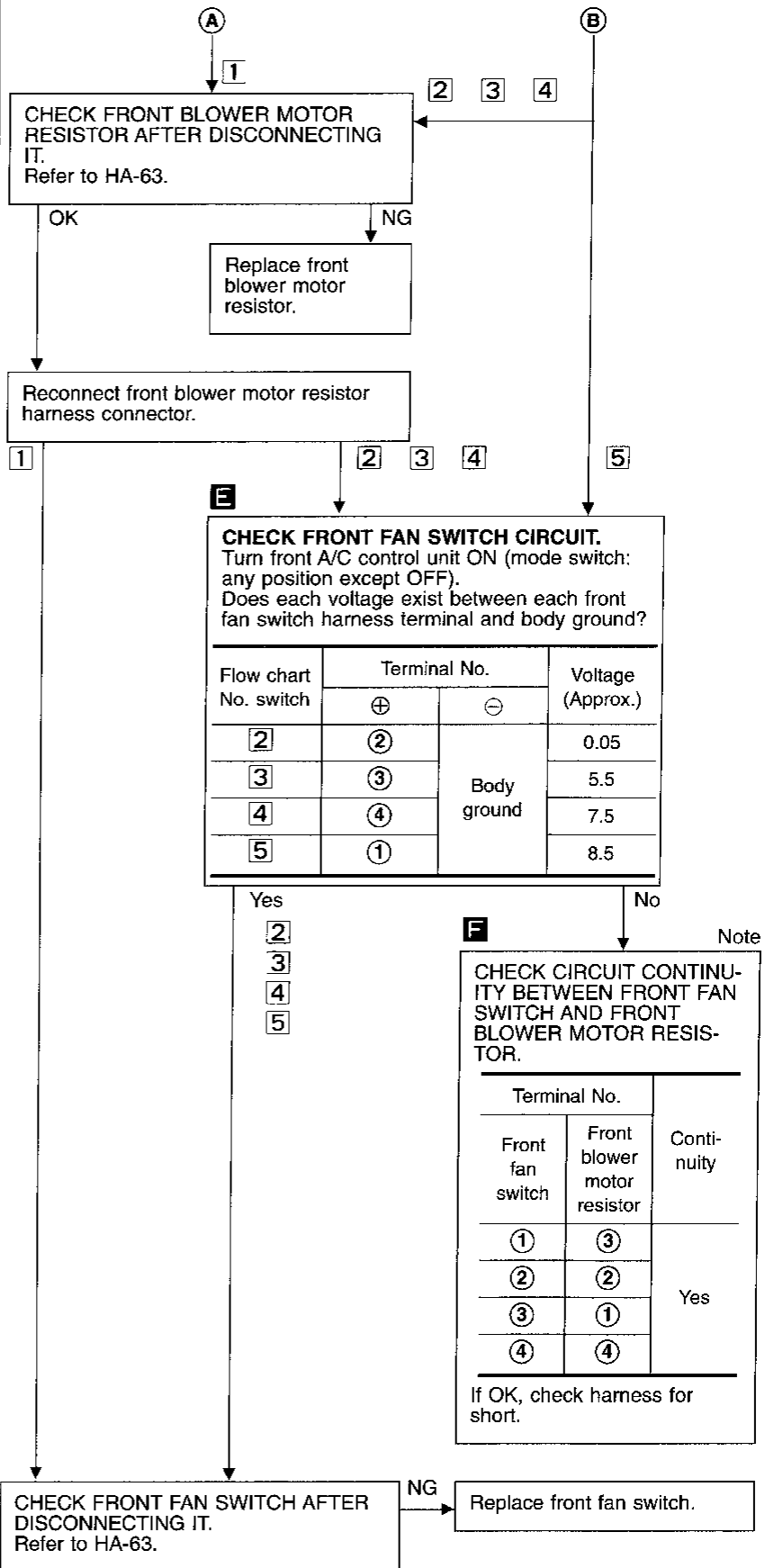
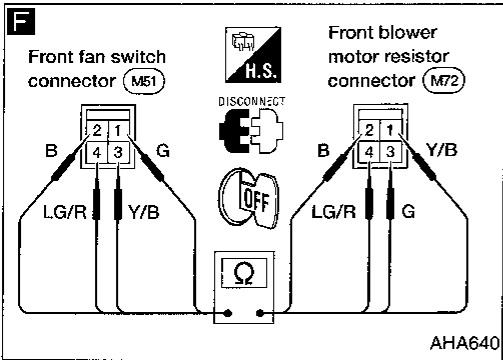
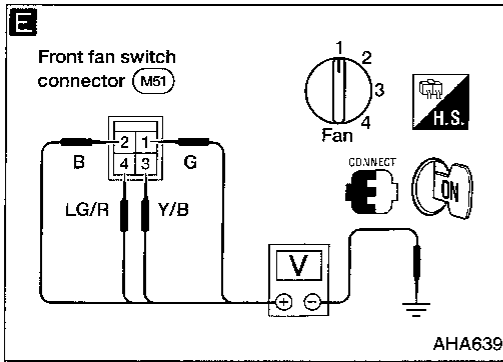
Note

**CHECK CIRCUIT CONTINUITY BETWEEN FRONT BLOWER MOTOR HARNESS TERMINAL NO. ① AND FRONT BLOWER MOTOR RESISTOR HARNESS TERMINAL NO. ③.**  
**Continuity should exist.**  
If OK, check harness for short.

→ **A**  
(Go to next page.)

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

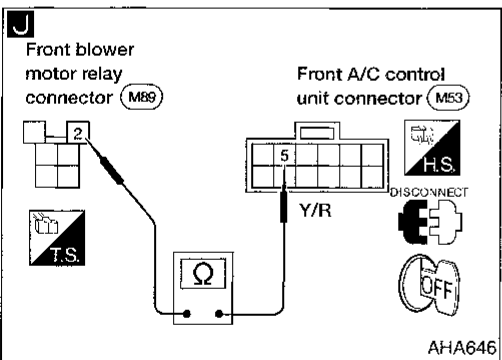
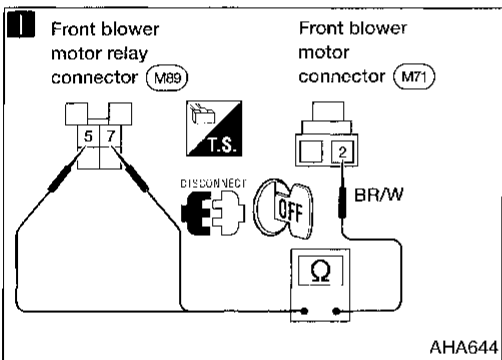
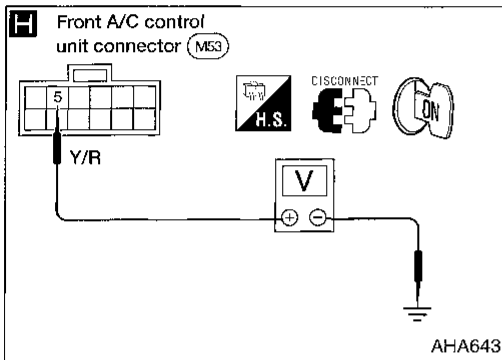
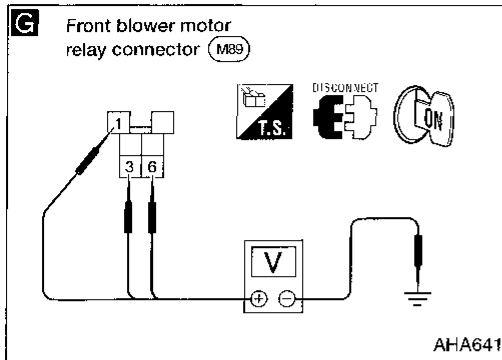
Diagnostic Procedure 1 (Cont'd)



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

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Diagnostic Procedure 1 (Cont'd)



**G**

**CHECK POWER SUPPLY FOR FRONT BLOWER MOTOR RELAY.**  
Disconnect front blower motor relay harness connector.  
Do approx. 12 volts exist between each front blower motor relay harness terminal and body ground?

Terminal No.		Voltage
⊕	⊖	
①	Body ground	Approx. 12V
③		
⑥		

No → Check 65A fusible link (Letter **d**, located in the fuse and fusible link box). Refer to EL section ("POWER SUPPLY ROUTING").

Yes →

**CHECK FRONT BLOWER MOTOR RELAY AFTER DISCONNECTING IT.**  
Refer to HA-64.

NG → Replace front blower motor relay.

OK → Reconnect front blower motor relay.

Check 20A fuses (No. **29** and **31**, located in the fuse block).

NG → Replace fuse.

OK →

**H**

**CHECK COIL SIDE OF FRONT BLOWER MOTOR RELAY.**  
Disconnect front A/C control unit harness connector.  
Do approx. 12 volts exist between front A/C control unit harness terminal No. **⑤** and body ground?

Yes **I** → Check circuit continuity between front blower motor relay harness terminal Nos. **⑤**, **⑦** and front blower motor harness terminal No. **②**. **Continuity should exist.** If OK, check harness for short.

Note

No →

**J**

Check circuit continuity between front A/C control unit harness terminal No. **⑤** and front blower motor relay harness terminal **②**. **Continuity should exist.** If OK, check harness for short.

OK →

**CHECK POWER SUPPLY FOR FRONT A/C CONTROL UNIT.**  
Refer to HA-42.

NG → Check 10A and 7.5A fuses (No. **2** and **13**, located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

OK →

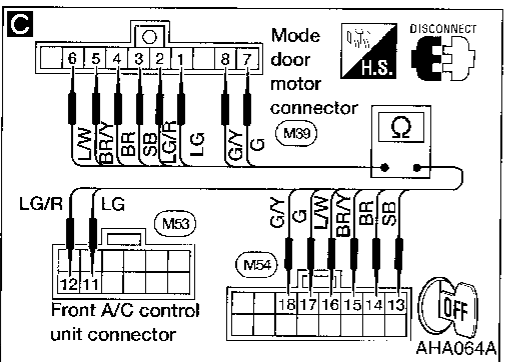
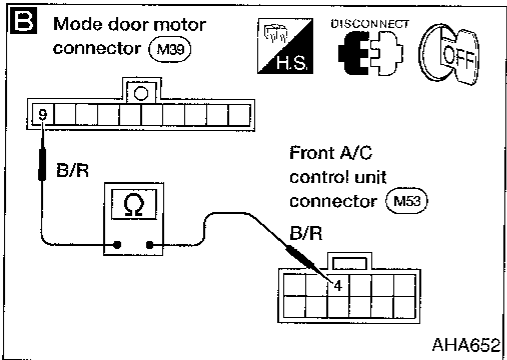
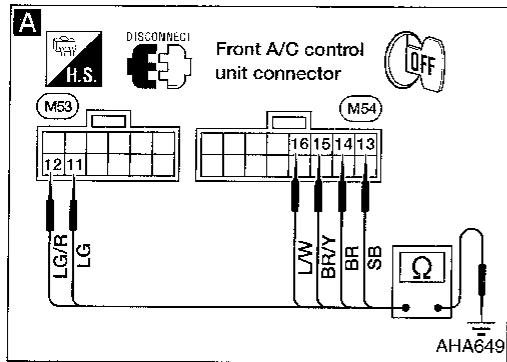
**CHECK BODY GROUND CIRCUIT FOR FRONT A/C CONTROL UNIT.**  
Refer to HA-42.

Note

OK →

Replace front A/C control unit.

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



### Diagnostic Procedure 2

**SYMPTOM: Front air outlet does not change.**

- Perform **PRELIMINARY CHECK 6, Main Power Supply and Ground Circuit Check** before referring to the following flow chart.

**A**

**CHECK MODE DOOR MOTOR POSITION SWITCH.**

1. Turn **FACE** switch ON with ignition switch at ON position.
2. Turn ignition switch OFF. Disconnect front A/C control unit connector.
3. Check if continuity exists between terminal No. ⑪ or ⑫ of front A/C 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
	⊕	⊖	
FACE	⑪ or ⑫	Body ground	Yes
B/L	⑫ or ⑬		
FOOT	⑬ or ⑭		
F/D	⑭ or ⑮		
DEF	⑮ or ⑯		

NG → Disconnect mode door motor harness connector.

**B** Note

**CHECK BODY GROUND CIRCUIT FOR MODE DOOR MOTOR.**

Check circuit continuity between mode door motor harness terminal No. ⑨ and front A/C control unit harness terminal No. ④. **Continuity should exist.** If OK, check harness for short.

**C** Note

Check circuit continuity between each terminal on front A/C control unit and on mode door motor.

Terminal No.	Continuity	
	⊕	⊖
Front A/C control unit	Mode door motor	Yes
⑪	①	
⑫	②	
⑬	③	
⑭	④	
⑮	⑤	
⑯	⑥	
⑰	⑦	
⑱	⑧	

If OK, check harness for short.

OK →

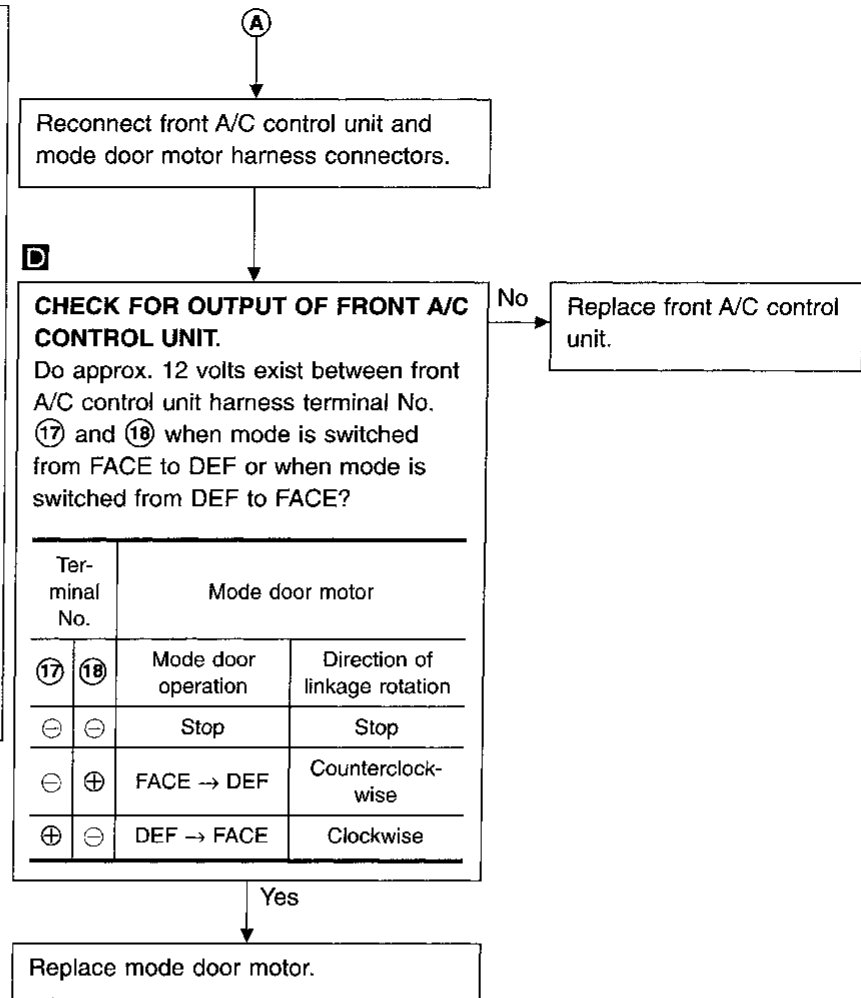
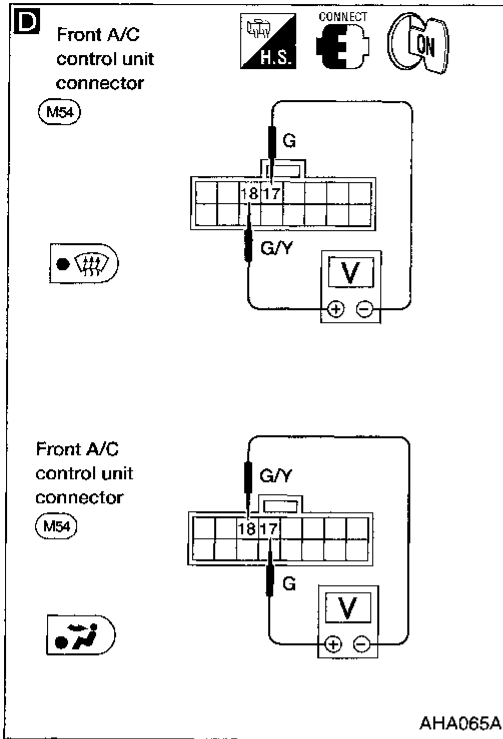
**CHECK CONTROL LINKAGE ADJUSTMENT.**  
Refer to HA-65.

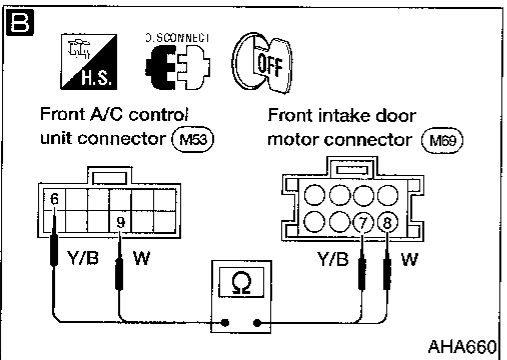
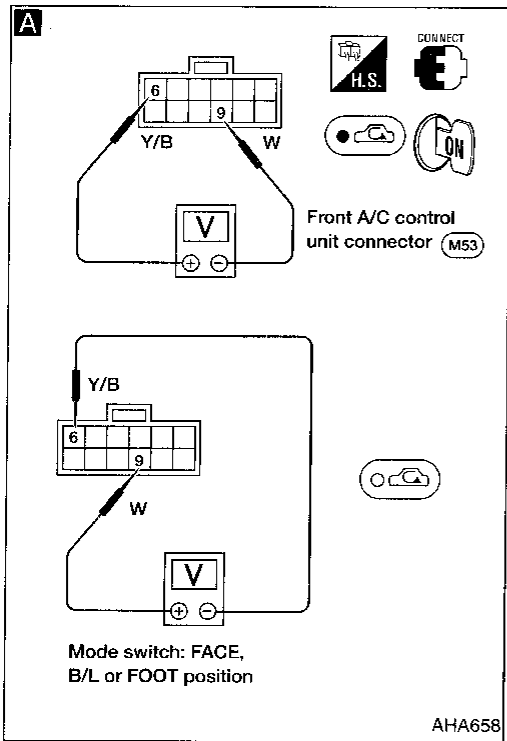
OK → **A**  
(Go to next page.)

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



Diagnostic Procedure 2 (Cont'd)





### Diagnostic Procedure 3

**SYMPTOM:** Front intake door motor does not operate normally.

**A**

**CHECK FOR OUTPUT OF FRONT A/C CONTROL UNIT.**  
Do approx. 12 volts exist between front A/C control unit harness terminals No. ⑥ and ⑨ when you turn REC switch ON or OFF?

REC switch position	Terminal No.		Voltage V
	⑥	⑨	
ON	⊕	⊖	Approx. 12
OFF	⊖	⊕	

No → **CHECK POWER SUPPLY FOR FRONT A/C CONTROL UNIT.**  
Refer to HA-42.

NG → Check 10A and 7.5A fuses (No. ② and ⑬, located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

OK → **CHECK BODY GROUND CIRCUIT FOR FRONT A/C CONTROL UNIT.**  
Refer to HA-42.

OK → **Replace front A/C control unit.**

Yes →

**Disconnect front intake door motor and front A/C control unit harness connector.**

**B** Note  
Check circuit continuity between front intake door motor harness terminal No. ⑦ (⑧) and front A/C control unit harness terminal No. ⑥ (⑨).  
**Continuity should exist.**  
If OK, check harness for short.

OK → **Replace front intake door motor.**

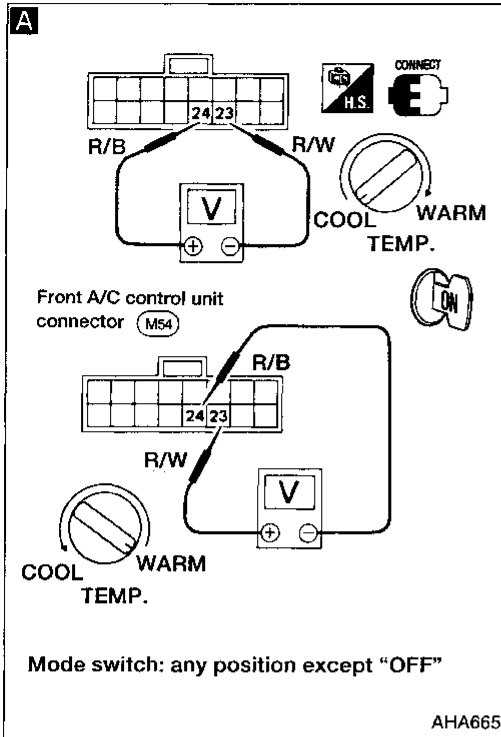
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

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**Diagnostic Procedure 4**

**SYMPTOM: Front air mix door does not change.**

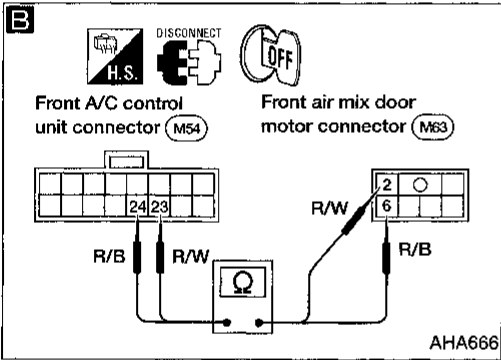
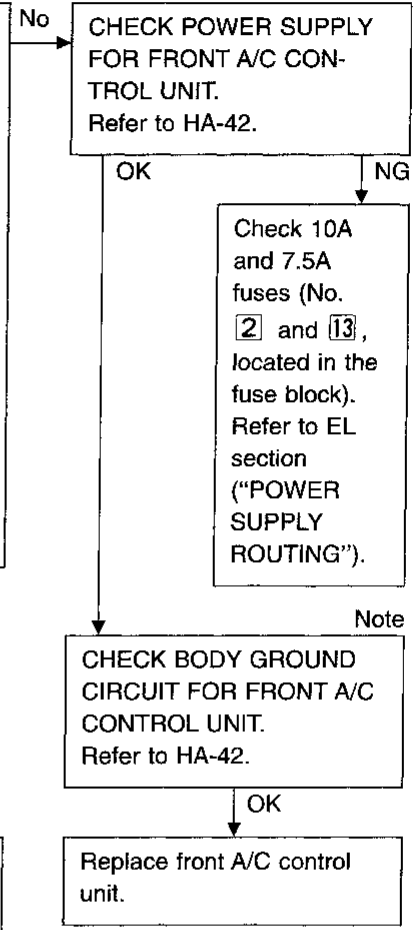
- Perform PRELIMINARY CHECK 1 before referring to the following flow chart.



**A**

**CHECK FOR OUTPUT OF FRONT A/C CONTROL UNIT.**  
Do approx. 12 volts exist between front A/C control unit harness terminals No. (23) and (24) when you turn front temp. control switch from full cool to full warm or when you turn front temp. control switch from full warm to full cool?

Front temp. control switch position	Terminal No.		Voltage V
	(23)	(24)	
Full cool → Full warm	⊖	⊕	Approx. 12
Full warm → Full cool	⊕	⊖	



Disconnect front air mix door motor and front A/C control unit harness connectors.

**B** Note

Check circuit continuity between front air mix door motor harness terminal No. (2) (6) and front A/C control unit harness terminal No. (23) (24).  
**Continuity should exist.**  
If OK, check harness for short.

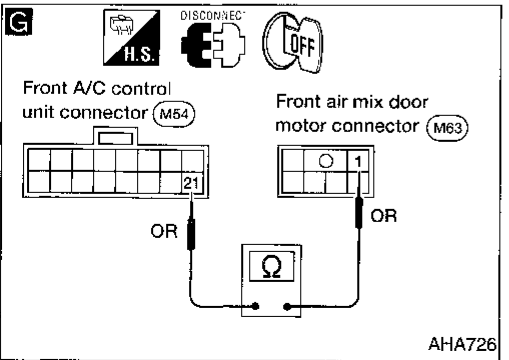
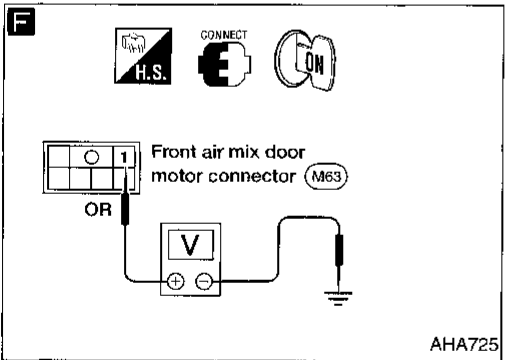
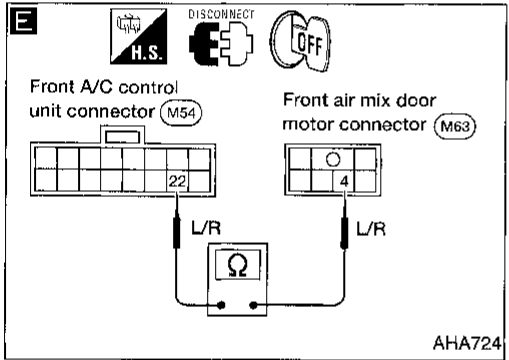
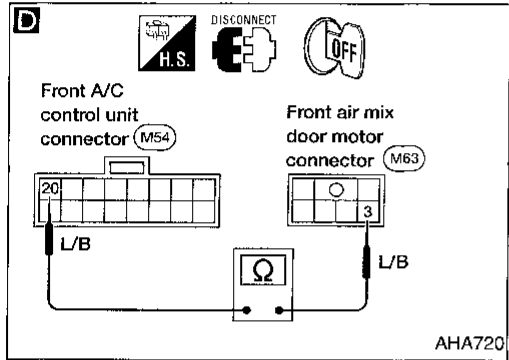
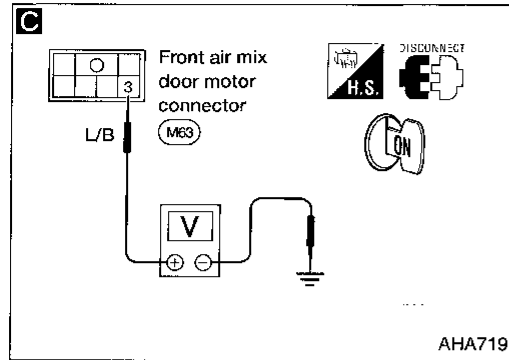
OK

**A**

(Go to next page.)

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

Diagnostic Procedure 4 (Cont'd)



**A**

**C** **CHECK PBR CIRCUIT BETWEEN FRONT AIR MIX DOOR MOTOR AND FRONT A/C CONTROL UNIT.**  
 Disconnect front air mix door motor harness connector.  
 Do approx. 5 volts exist between front air mix door motor harness terminal ③ and body ground?

No → Disconnect front A/C control unit harness connector.

**D** **Note**  
 Check circuit continuity between front air mix door motor harness terminal No. ③ and front A/C control unit harness terminal No. ⑳. **Continuity should exist.**  
 If OK, check harness for short.

OK → Replace front A/C control unit.

Yes → Disconnect front A/C control unit harness connector.

**E** **Note**  
 Check circuit continuity between front air mix door motor harness terminal No. ④ and front A/C control unit harness terminal No. ㉒. **Continuity should exist.**  
 If OK, check harness for short.

OK →

**F** **CHECK PBR CIRCUIT BETWEEN FRONT AIR MIX DOOR MOTOR AND FRONT A/C CONTROL UNIT.**  
 1. Reconnect front A/C control unit harness connector and front air mix door motor harness connector.  
 2. Set temperature control switch to full warm.  
 Do approx. 5 volts exist between front air mix door motor harness terminal ① and body ground?  
 3. Set temperature control switch to full cool.  
 Do approx. 0 volts exist between front air mix door motor harness terminal ① and body ground?

No → Disconnect front A/C control unit harness connector.

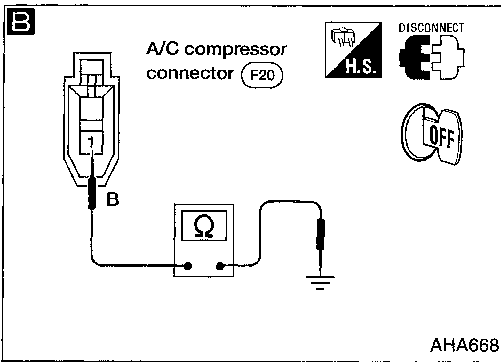
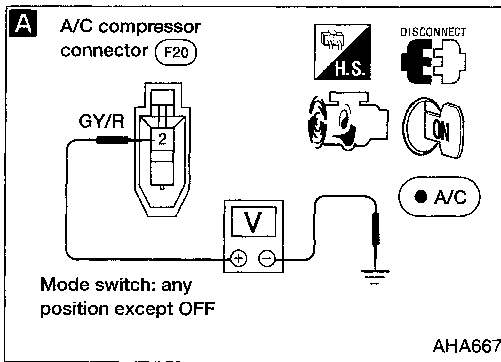
**G** **Note**  
 Check circuit continuity between front air mix door motor harness terminal No. ① and front A/C control unit harness terminal No. ㉑. **Continuity should exist.**  
 If OK, check harness for short.

OK → Replace front A/C control unit.

Yes → Replace front air mix door motor (PBR).

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

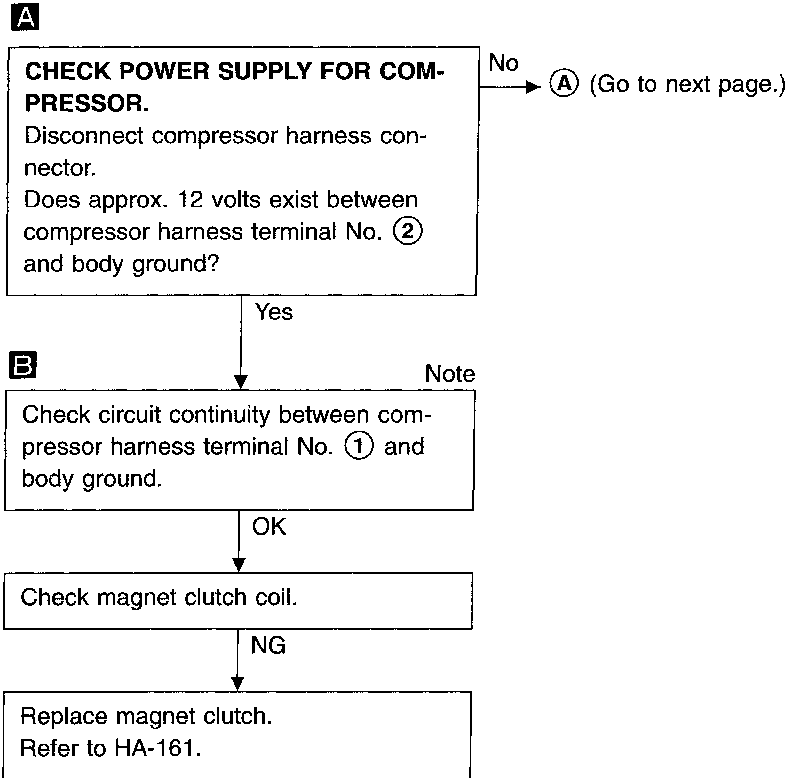
GI  
MA  
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HA  
EL  
IDX



### Diagnostic Procedure 5

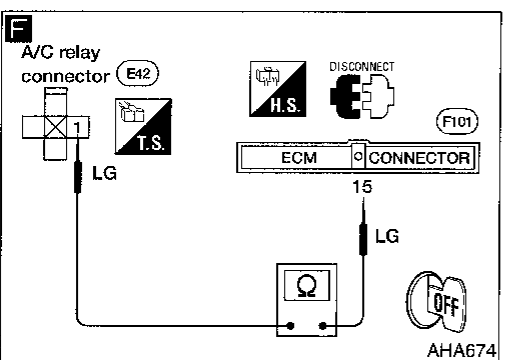
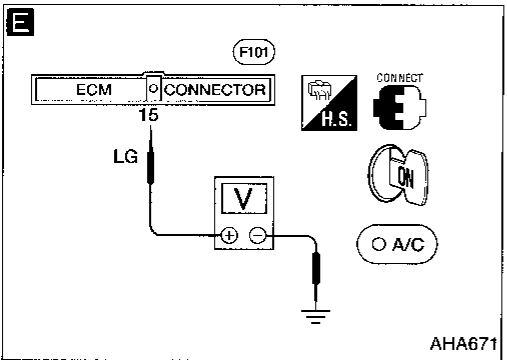
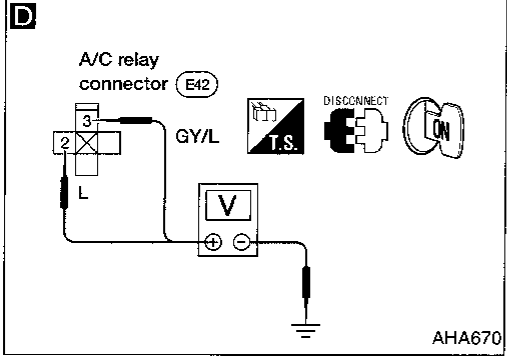
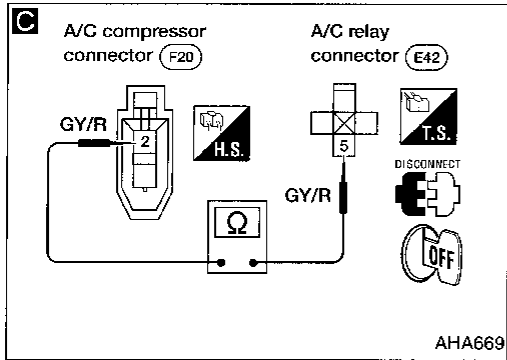
**SYMPTOM:** Magnet clutch does not engage after performing PRELIMINARY CHECK 5.

- Perform PRELIMINARY CHECK 5 before referring to the following flow chart.



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

Diagnostic Procedure 5 (Cont'd)



(A)  
Disconnect A/C relay.

(C) Note  
Check circuit continuity between A/C relay harness terminal No. ⑤ and A/C compressor harness terminal No. ②.  
**Continuity should exist.**  
If OK, check harness for short.

(D) **CHECK POWER SUPPLY FOR A/C RELAY.**  
Disconnect A/C relay.  
Do approx. 12 volts exist between A/C relay harness terminal No. ②, ③ and body ground?

No  
Check 10A and 7.5A fuses (No. ⑳ and ㉓, located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

Yes  
**CHECK A/C RELAY AFTER DISCONNECTING IT.** Refer to HA-64.

NG  
Replace A/C relay.

OK  
Reconnect A/C relay.

(E) **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 with A/C switch OFF?  
(For terminal arrangement, refer to HA-40.)

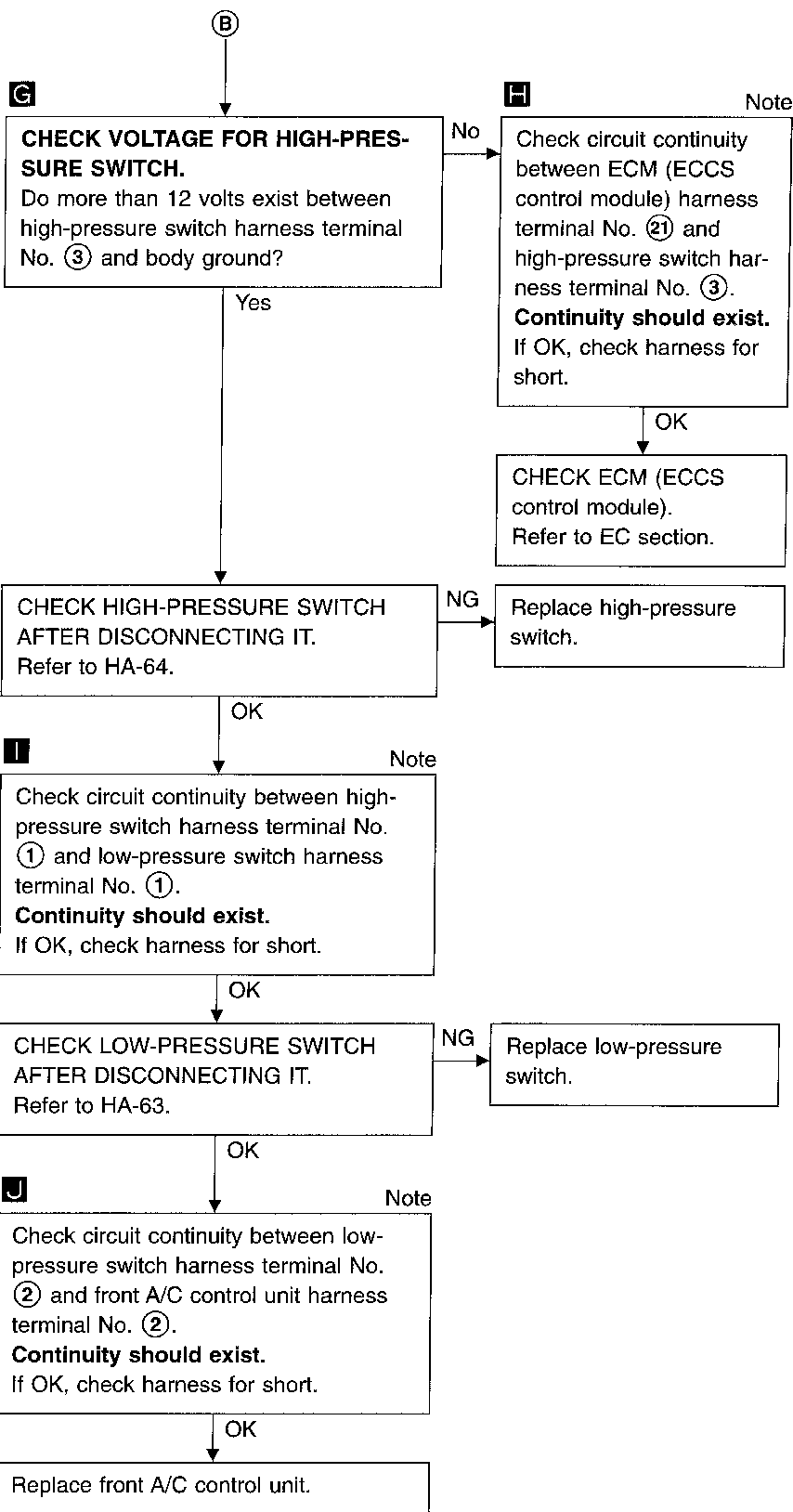
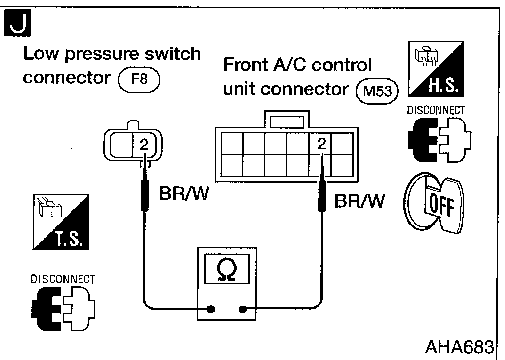
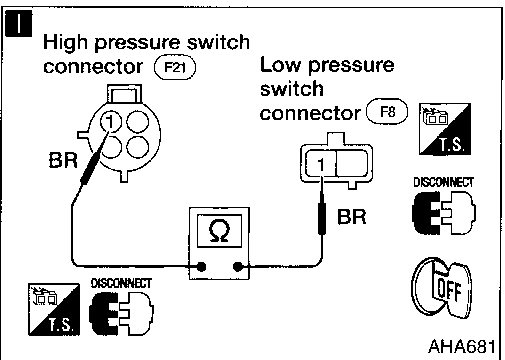
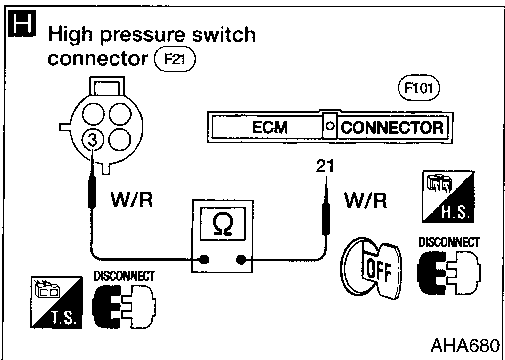
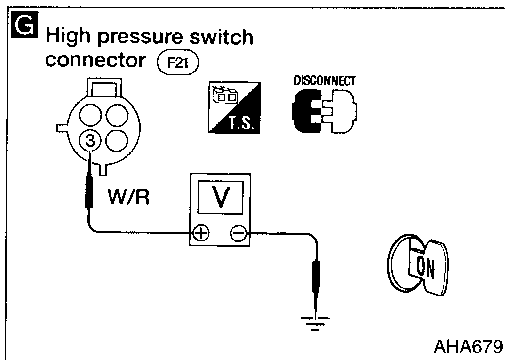
No (F) Note  
Check circuit continuity between A/C relay harness terminal No. ① and ECM (ECCS control module) harness terminal No. ⑮.  
**Continuity should exist.**  
If OK, check harness for short.  
(For terminal arrangement, refer to HA-40.)

(B)  
(Go to next page.)

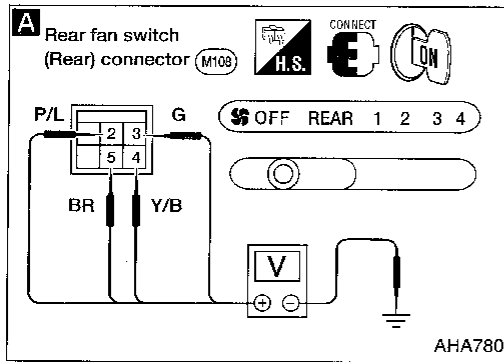
Note:  
If the result is NG after checking circuit continuity, repair harness or connector.

GI  
MA  
EM  
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BR  
ST  
RS  
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EL  
IDX

Diagnostic Procedure 5 (Cont'd)

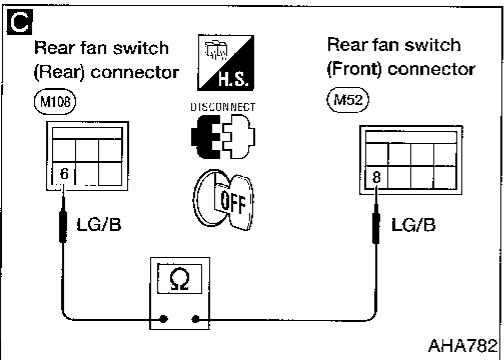
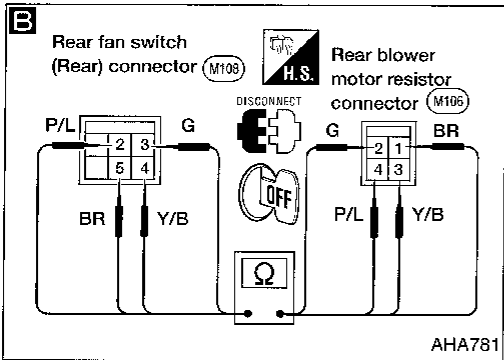


**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.



### Diagnostic Procedure 6

**SYMPTOM:** Rear blower motor does not rotate when rear fan switch (front) for rear A/C is set to REAR position.



Does rear blower motor rotate normally when rear fan switch (front) is set at 1 to 4-speed?

No → Go to **Diagnostic Procedure 7**. Refer to HA-56.

Yes →

**A**

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

Terminal No.		Voltage
⊕	⊖	
③	Body ground	Approx. 12V
⑤		
②		
④		

No →

**B** Note

Check circuit continuity between rear fan switch (rear) and rear blower motor resistor.

Terminal No.		Continuity
Rear fan switch (rear)	Rear blower motor resistor	
②	④	Yes
③	②	
④	③	
⑤	①	

If OK, check harness for short.

**CHECK REAR FAN SWITCH (REAR) AFTER DISCONNECTING IT.** Refer to HA-64.

NG → Replace rear fan switch (rear).

OK →

**C** Note

Check circuit continuity between rear fan switch (rear) harness terminal No. ⑥ and rear fan switch (front) harness terminal No. ⑧.  
**Continuity should exist.**  
If OK, check harness for short.

OK →

**CHECK REAR FAN SWITCH (FRONT) AFTER DISCONNECTING IT.** Refer to HA-64.

NG → Replace rear fan switch (front).

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



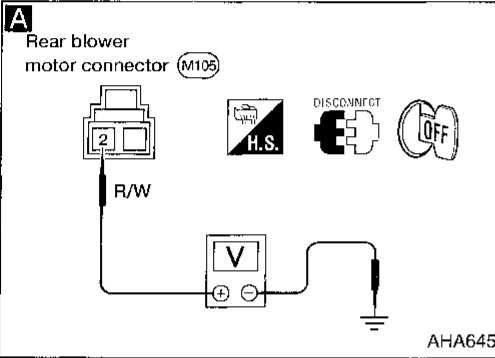
	INCIDENT	Flow chart No.
1	Fan fails to rotate.	1
2	Fan does not rotate at 1-speed.	2
3	Fan does not rotate at 2-speed.	3
4	Fan does not rotate at 3-speed.	4
5	Fan does not rotate at 4-speed.	5

**Diagnostic Procedure 7**

**SYMPTOM: Rear blower motor does not rotate when rear fan switch (front) is set at 1 to 4-speed.**

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

2 3 4 5  
(Go to next page.) → B

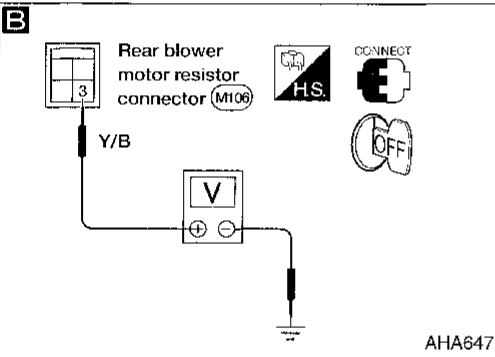


**A**

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

No → Check 15A fuse (No. 25, located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

Yes → Reconnect rear blower motor harness connector.



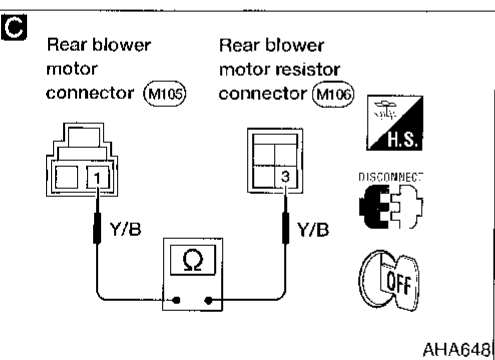
**B**

**CHECK REAR BLOWER MOTOR CIRCUIT BETWEEN REAR BLOWER MOTOR AND REAR BLOWER MOTOR RESISTOR.**  
Do approx. 12 volts exist between rear blower motor resistor harness terminal No. ③ and body ground?

No → Disconnect rear blower motor and rear blower motor resistor harness connectors.

Yes →

Disconnect rear blower motor and rear blower motor resistor harness connectors.



**C** Note

Check circuit continuity between rear blower motor harness terminal No. ① and rear blower motor resistor harness terminal No. ③.  
**Continuity should exist.**  
If OK, check harness for short.

OK →

**CHECK REAR BLOWER MOTOR.**  
Refer to HA-65.

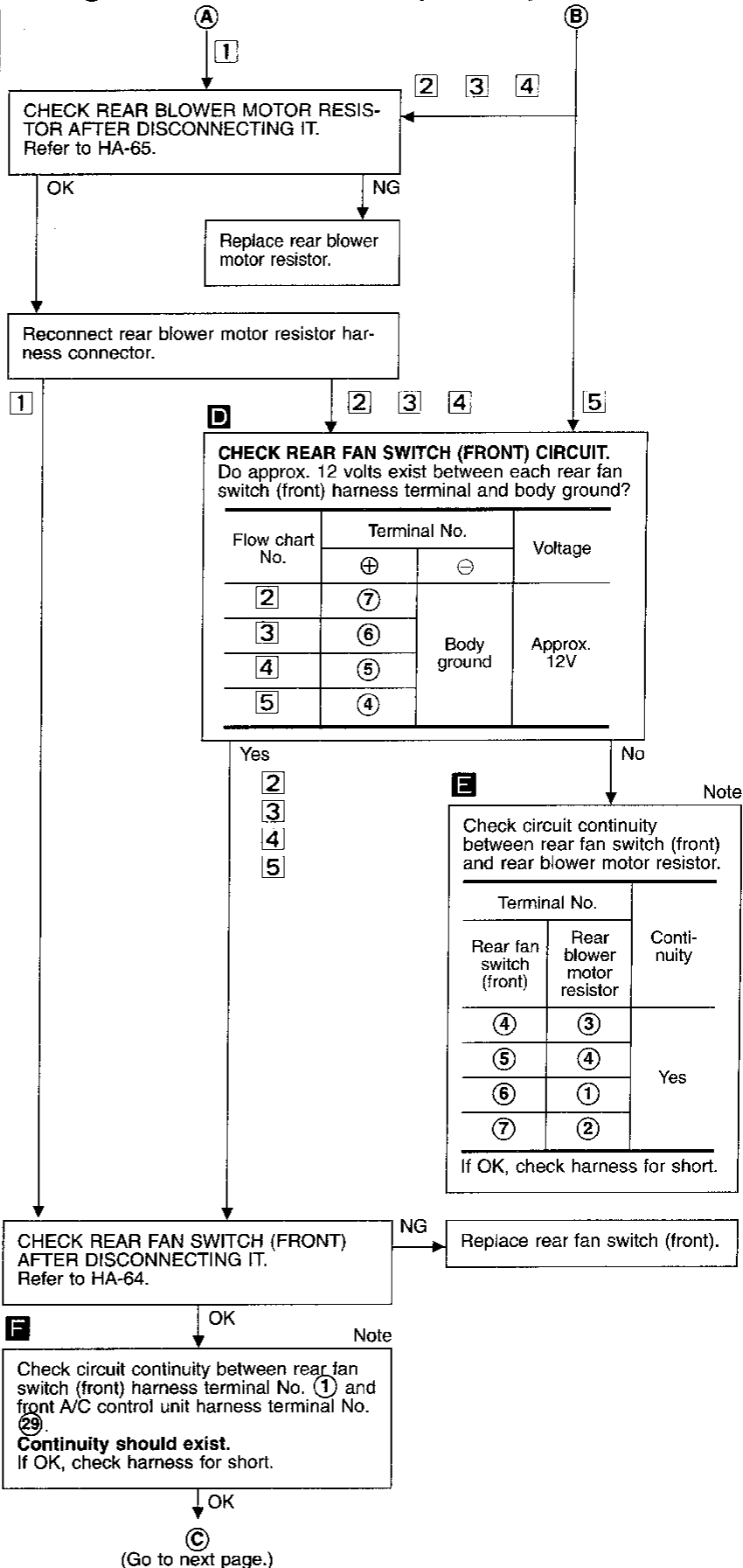
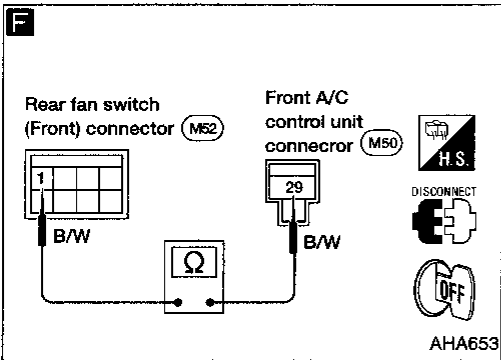
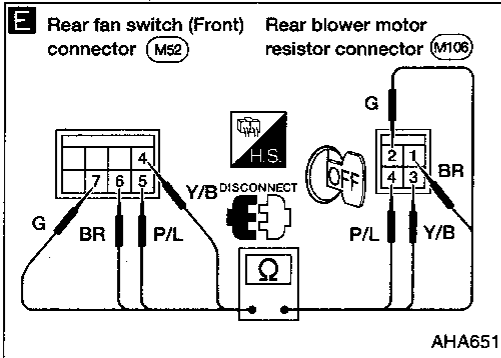
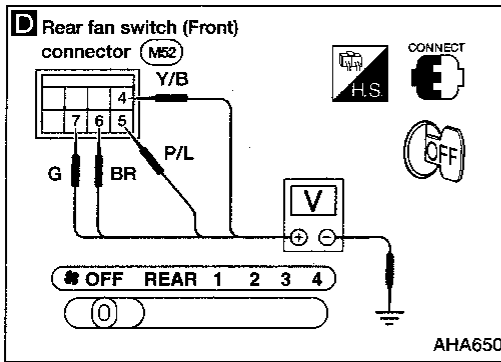
No →

Replace rear blower motor.

A  
(Go to next page.)

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

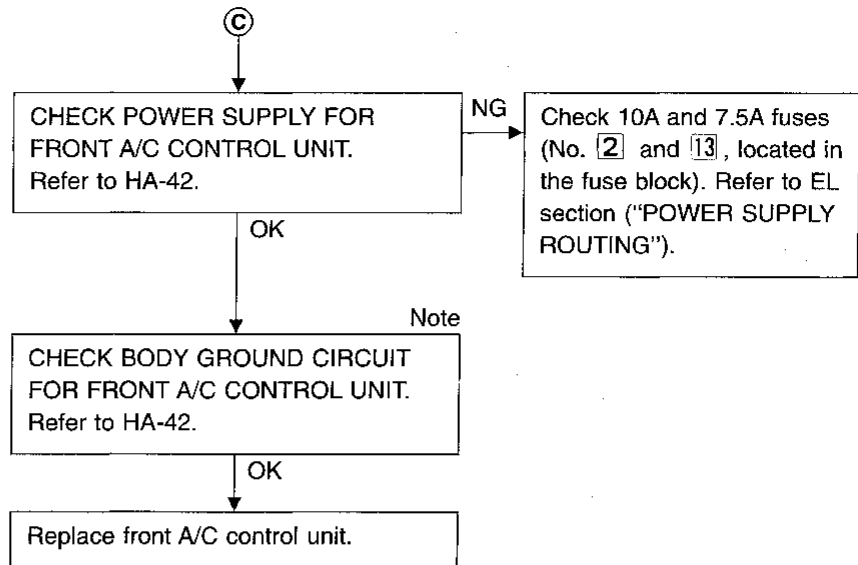
Diagnostic Procedure 7 (Cont'd)



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

GI  
MA  
EM  
LC  
EC  
FE  
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HA  
EL  
IOX

## Diagnostic Procedure 7 (Cont'd)

**Note:**

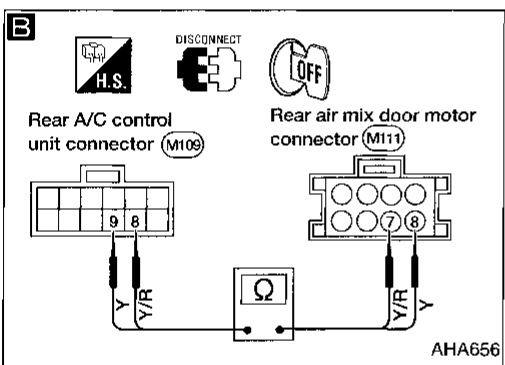
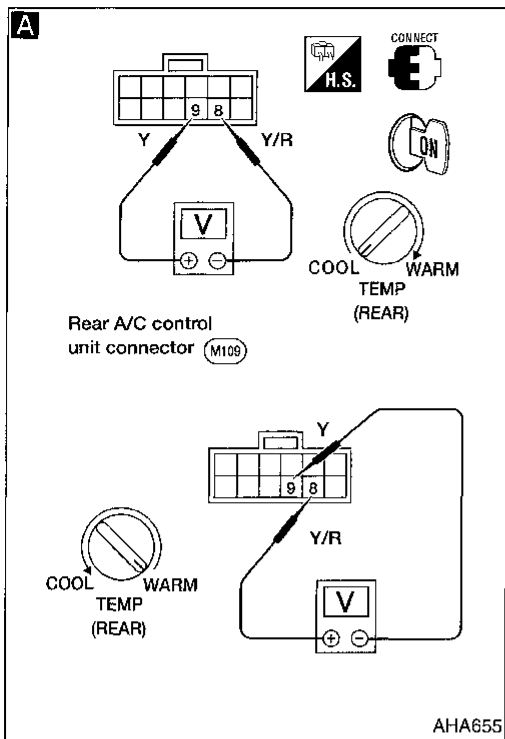
If the result is NG after checking circuit continuity, repair harness or connector.

GI  
WA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

### Diagnostic Procedure 8

**SYMPTOM:** Rear air mix door motor does not operate normally.

- Perform PRELIMINARY CHECK 4 before referring to the following flow chart.



**A**

**CHECK FOR OUTPUT OF REAR A/C CONTROL UNIT.**  
Do approx. 12 volts exist between rear A/C control unit harness terminals No. ⑧ and ⑨ when you turn rear temp. control switch from full cool to full warm or when you turn rear temp. control switch from full warm to full cool?

Rear temp. control switch position	Terminal No.		Voltage V
	⑧	⑨	
Full cool → Full warm	⊖	⊕	Approx. 12
Full warm → Full cool	⊕	⊖	

No

**CHECK POWER SUPPLY FOR REAR A/C CONTROL UNIT.**  
Refer to HA-43.

OK

NG

Check 7.5A fuse (No. 13, located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

Note

**CHECK BODY GROUND CIRCUIT FOR REAR A/C CONTROL UNIT.**  
Refer to HA-43.

OK

Replace rear A/C control unit.

Yes

Disconnect rear air mix door motor and rear A/C control unit harness connectors.

**B**

Note

Check circuit continuity between rear air mix door motor harness terminal No. ⑦ (⑧) and rear A/C control unit harness terminal No. ⑧ (⑨).  
**Continuity should exist.**  
If OK, check harness for short.

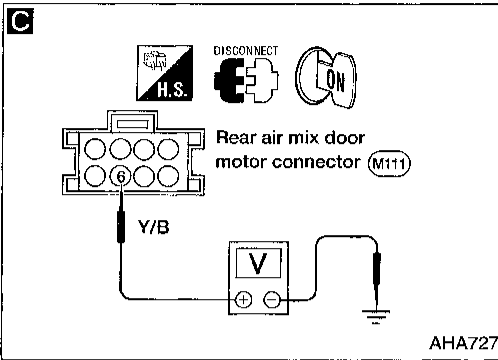
OK

**A**

(Go to next page.)

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

Diagnostic Procedure 8 (Cont'd)



**C**

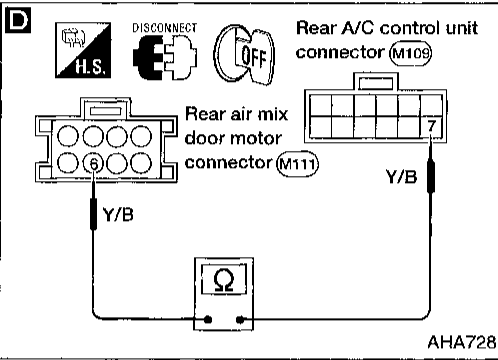
**CHECK PBR CIRCUIT BETWEEN REAR AIR MIX DOOR MOTOR AND REAR A/C CONTROL UNIT.**  
 Disconnect rear air mix door motor harness connector.  
 Do approx. 5 volts exist between rear air mix door motor harness terminal ⑥ and body ground?

No → Disconnect rear A/C control unit harness connector.

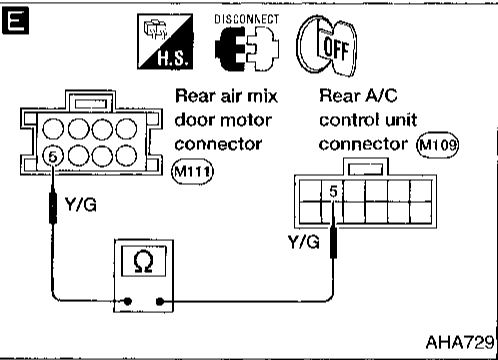
**D** Note

Check circuit continuity between rear air mix door motor harness terminal No. ⑥ and rear A/C control unit harness terminal No. ⑦. **Continuity should exist.** If OK, check harness for short.

OK → Replace rear A/C control unit.



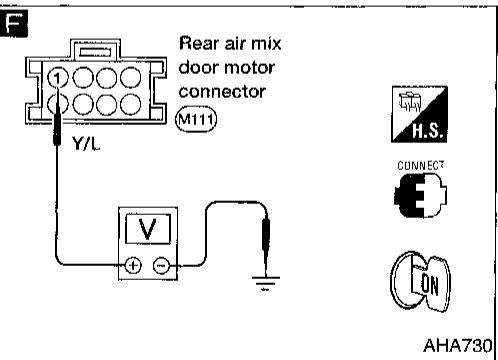
Yes → Disconnect rear A/C control unit harness connector.



**E** Note

Check circuit continuity between rear air mix door motor harness terminal No. ⑤ and rear A/C control unit harness terminal No. ⑤. **Continuity should exist.** If OK, check harness for short.

OK →



**F**

**CHECK PBR CIRCUIT BETWEEN REAR AIR MIX DOOR MOTOR AND REAR A/C CONTROL UNIT.**

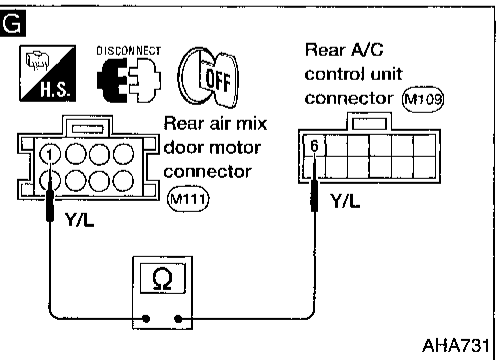
1. Reconnect rear A/C control unit harness connector and rear air mix motor door harness connector.
2. Set temperature control switch to full warm. Do approx. 5 volts exist between rear air mix door motor harness terminal ① and body ground?
3. Set temperature control switch to full cool. Do approx. 0 volts exist between rear air mix door motor harness terminal ① and body ground?

No → Disconnect rear A/C control unit harness connector.

**G** Note

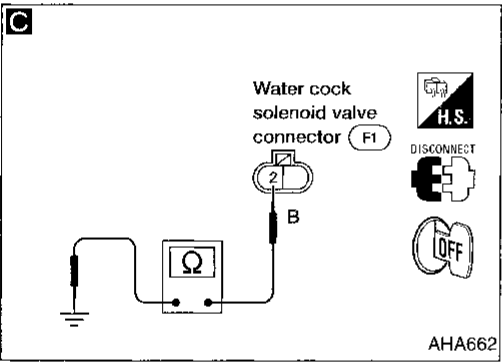
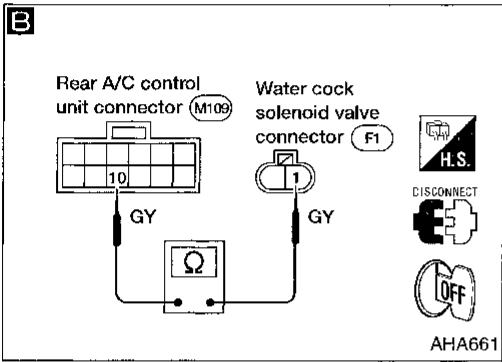
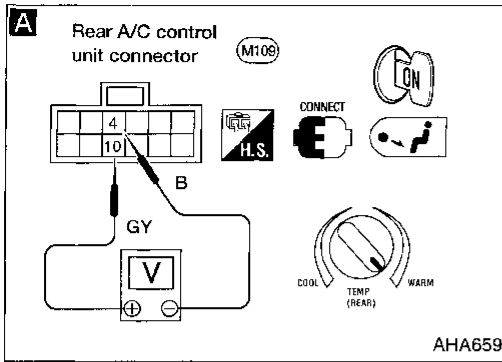
Check circuit continuity between rear air mix door motor harness terminal No. ① and rear A/C control unit harness terminal No. ⑥. **Continuity should exist.** If OK, check harness for short.

OK → Replace rear A/C control unit.



Yes → Replace rear air mix door motor (PBR).

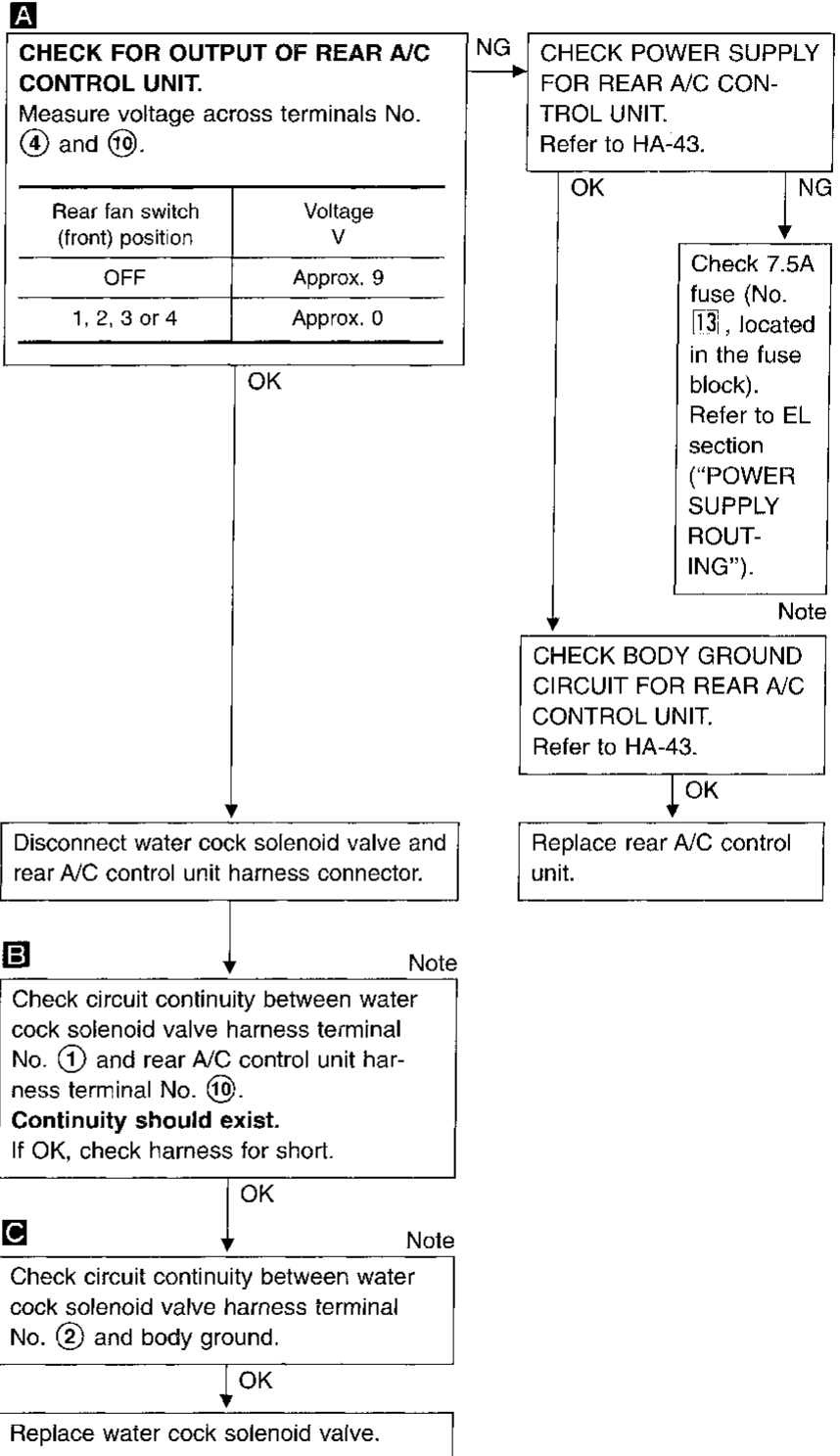
**Note:** If the result is NG after checking circuit continuity, repair harness or connector.



### Diagnostic Procedure 9

**SYMPTOM:** Water cock solenoid valve for rear heater does not operate normally.

- Perform PRELIMINARY CHECK 4 before referring to the following flow chart.

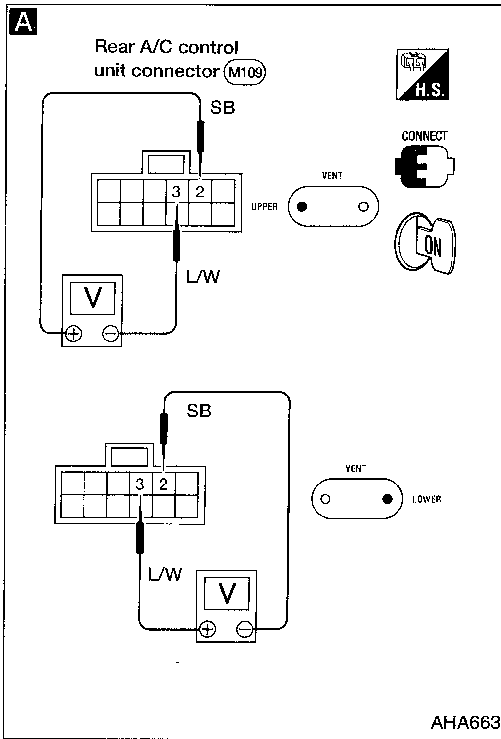


**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

GI  
MA  
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FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
DX

**Diagnostic Procedure 10**

**SYMPTOM: Rear vent door motor does not operate normally.**



**A**

**CHECK FOR OUTPUT OF REAR A/C CONTROL UNIT.**  
Measure voltage across terminals No. ② and ③.

Rear vent switch position	Terminal No.		Voltage V
	②	③	
Upper	⊕	⊖	Approx. 12
Lower	⊖	⊕	

NG → CHECK POWER SUPPLY FOR REAR A/C CONTROL UNIT. Refer to HA-43.

OK ↓ NG ↓

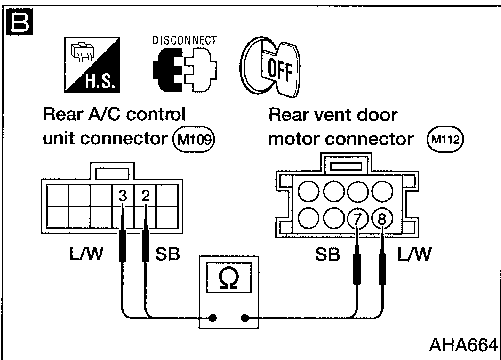
Check 7.5A fuse (No. 13), located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

Note

OK ↓ CHECK BODY GROUND CIRCUIT FOR REAR A/C CONTROL UNIT. Refer to HA-43.

OK ↓

Replace rear A/C control unit.



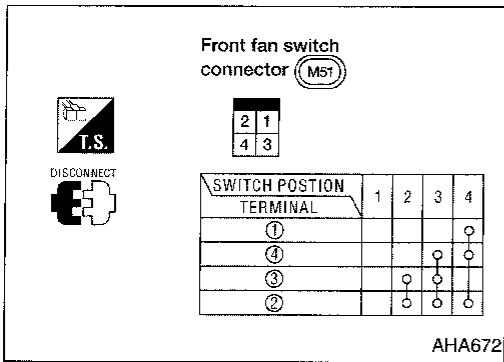
OK ↓ Disconnect rear vent door motor and rear A/C control unit harness connectors.

**B** Note  
Check circuit continuity between rear vent door motor harness terminal No. ⑦ (⑧) and rear A/C control unit harness terminal No. ② (③).  
**Continuity should exist.**  
If OK, check harness for short.

OK ↓

Replace rear vent door motor.

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



## Electrical Components Inspection

### FRONT FAN SWITCH

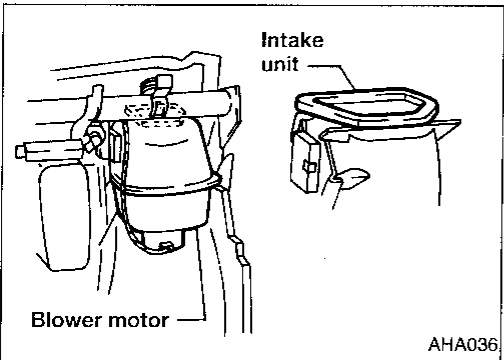
Check continuity between terminals at each position.

GI

MA

EM

LC



### FRONT BLOWER MOTOR

Confirm smooth rotation of the front blower motor.

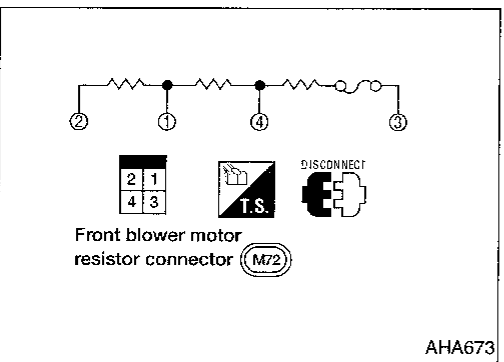
- Check that there are no foreign particles inside the intake unit.

EC

FE

AT

FA



### FRONT BLOWER MOTOR RESISTOR

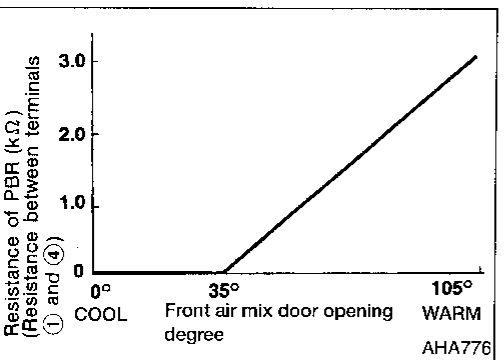
Check continuity between terminals.

RA

BR

ST

RS



### FRONT AIR MIX DOOR MOTOR

#### PBR characteristics

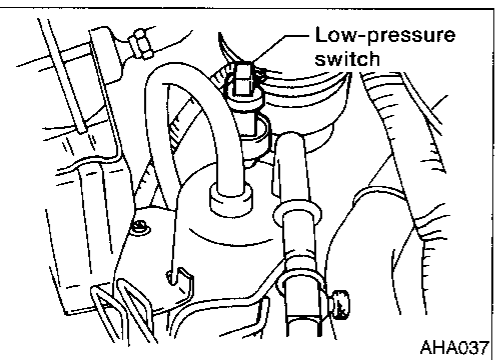
Measure resistance between terminals ① and ④ at vehicle harness side.

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### LOW-PRESSURE SWITCH

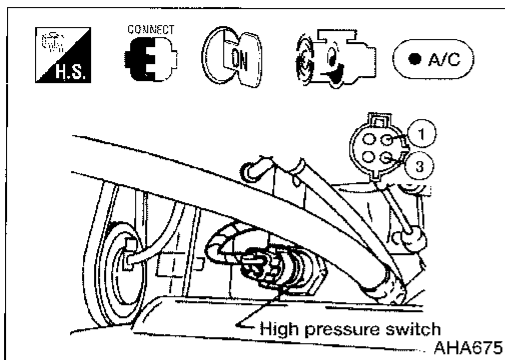
Check continuity between terminals.

Low-pressure side line pressure kPa (kg/cm <sup>2</sup> , psi)	Clutch operation	Continuity
Decreasing to 159 (1.6, 23)	Turn OFF	Does not exist
Increasing to 324 (3.3, 47)	Turn ON	Exists
Tightening torque	1.3 - 5.4 N·m (0.13 - 0.55 kg·m, 11.3 - 48 in·lb)	



### Electrical Components Inspection (Cont'd) HIGH-PRESSURE SWITCH

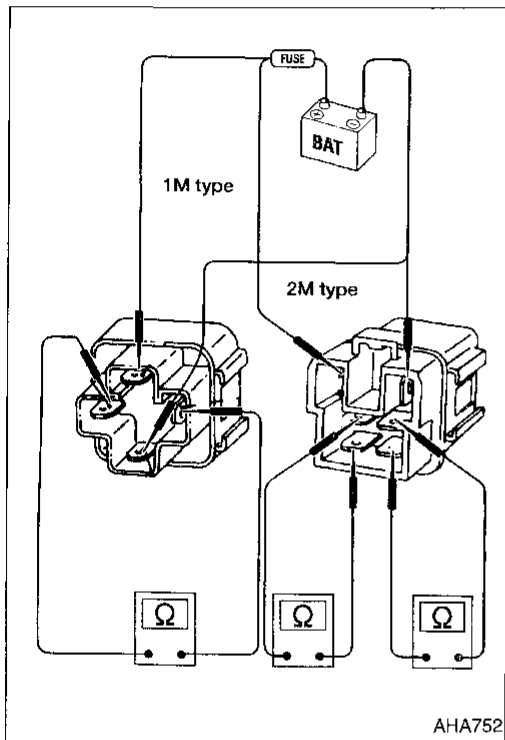
Check continuity between terminals ① and ③.



High-pressure side line pressure kPa (kg/cm <sup>2</sup> , psi)	Clutch operation	Continuity
Increasing to 2,785 (28.4, 404)	Turn OFF	Does not exist
Decreasing to 1,569 (16.0, 228)	Turn ON	Exists
Tightening torque	6.8 - 12.2 N·m (0.69 - 1.24 kg-m, 60 - 108 in-lb)	

### RELAYS

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



### REAR FAN SWITCH (Front)

Check continuity between terminals at each position.

1 2 3 4  
8 7 6 5 Rear fan switch (front) connector (M52)

T.S. DISCONNECT

LEVER POSITION TERMINAL	OFF	REAR	1	2	3	4
④						○
⑤						
⑥					○	
⑦			○			
⑧		○				
①				○		

AHA676

### REAR FAN SWITCH (Rear)

Check continuity between terminals at each position.

2 3  
6 5 4 Rear fan switch (rear) connector (M108)

T.S. DISCONNECT

SWITCH POSITION TERMINAL	OFF	1	2	3	4
④					○
②					
③				○	
⑤			○		
⑥		○			

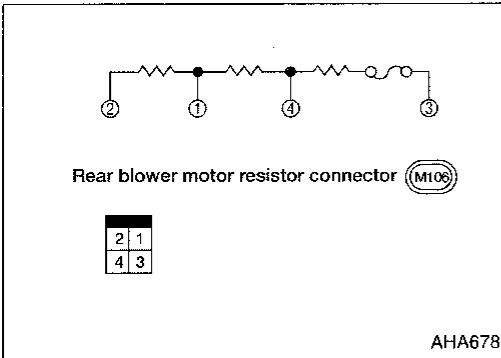
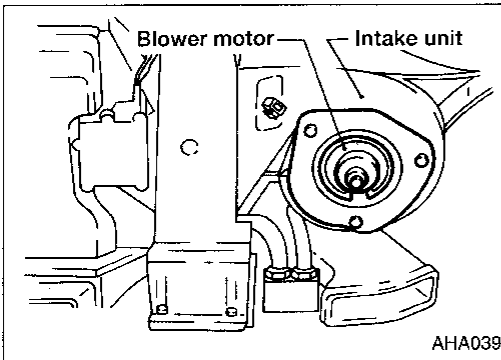
AHA677

Electrical Components Inspection (Cont'd)

REAR BLOWER MOTOR

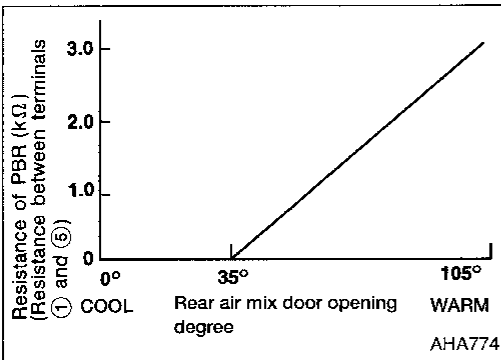
Confirm smooth rotation of the rear blower motor.

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



REAR BLOWER MOTOR RESISTOR

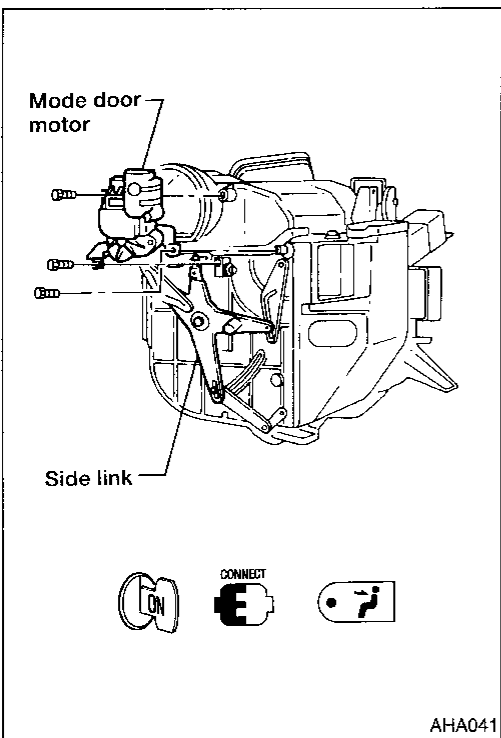
Check continuity between terminals.



REAR AIR MIX DOOR MOTOR

PBR characteristics

Measure resistance between terminals ① and ⑤ at vehicle harness side.



Control Linkage Adjustment

MODE DOOR

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

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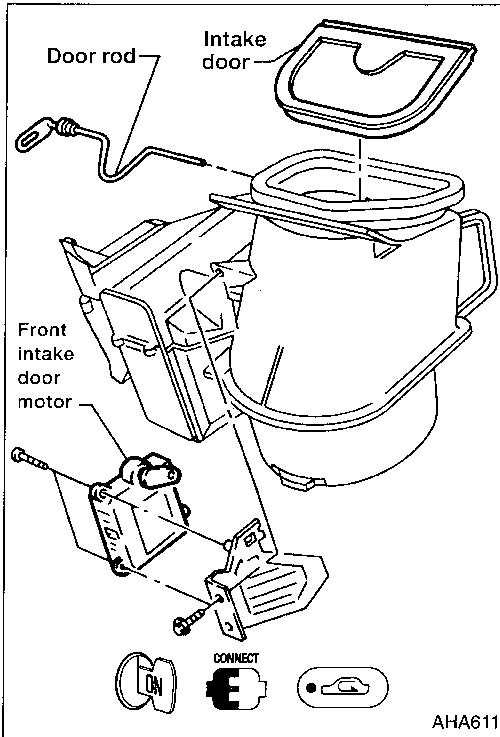
RS



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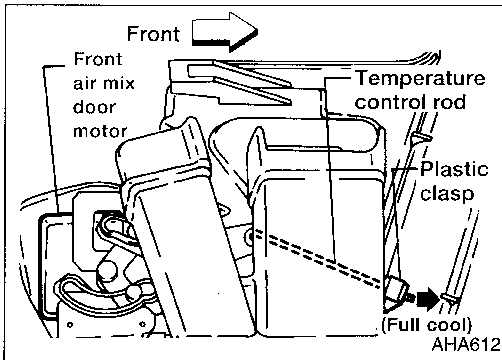
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**Control Linkage Adjustment (Cont'd)****FRONT INTAKE DOOR**

1. Connect the front intake door motor harness connector before installing the front intake door motor.
2. Turn ignition switch ON.
3. Select REC  mode.
4. Install the front intake door lever and the front intake door motor.
5. Set the front intake door rod in REC  position and fasten door rod to holder.
6. Check that the front intake door operates properly when REC mode is selected.

**TEMPERATURE CONTROL ROD**

**Before adjusting, push temperature control rod fully forward to front of vehicle. Note position of clasp.**

1. Install the front air mix door motor on heater unit and connect it to main harness.
2. Turn ignition switch ON.
3. Turn the front temperature control switch to maximum cool.
4. Move the front air mix door by hand to maximum cool position (door completely covers heater core) and hold it.
5. While holding the front air mix door, adjust the length of temperature control rod and connect it to the front air mix door lever.

**After connecting control rod, check for proper operation.**

## Introduction

The Electronic Automatic Temperature Control (EATC) system provides automatic regulation of the vehicle's interior temperature. This system is based on the operator selected "set temperature", regardless of the outside temperature changes. This is done by utilizing a microcomputer, also referred to as the EATC unit, which receives input signals from four sensors. The EATC unit uses these input signals (including the set temperature) to automatically control:

- Outlet air volume
- Air temperature
- Air distribution

## Features

- **Air mix door control (Electronic Automatic Temperature Control)**  
The front and rear air mix doors are automatically controlled so that in-vehicle temperature is maintained at a predetermined value by: The temperature setting, ambient temperature, in-vehicle temperature and amount of sunload. When the EATC unit rear fan switch (front) is set to REAR, the rear temperature is no longer controlled by the EATC unit.
- **Front fan speed control**  
The front blower speed is automatically controlled based on temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.  
When the EATC unit is set to AUTO, the blower motor starts to gradually increase air flow volume. When engine coolant temperature is low and vehicle interior warming is required under cold ambient conditions the blower motor operation is delayed to prevent cool air from flowing.
- **Rear fan speed control**  
The rear blower speed can be controlled from the EATC unit or from the rear A/C control unit, when the rear fan switch (front) is set to REAR.
- **Front intake door control**  
When AUTO mode is selected, the front intake door is automatically controlled by: The temperature setting, ambient temperature, in-vehicle temperature and amount of sunload. The ON-OFF operation of the recirculation switch will allow manual control of the front intake door. The front intake door is set to the FRESH position when DEF or F/D mode is selected.
- **Outlet door control**  
The front mode outlet doors are automatically controlled by: The temperature setting, ambient temperature, in-vehicle temperature, and amount of sunload.
- **Magnet clutch control**  
The ECM (ECCS control module) controls compressor ON-OFF operation using input signals from the throttle position sensor, low-pressure switch, high-pressure switch, engine coolant temperature sensor and EATC unit.
- **Self-diagnostic system**  
The self-diagnostic system is built into the EATC unit to quickly locate the cause of problems.

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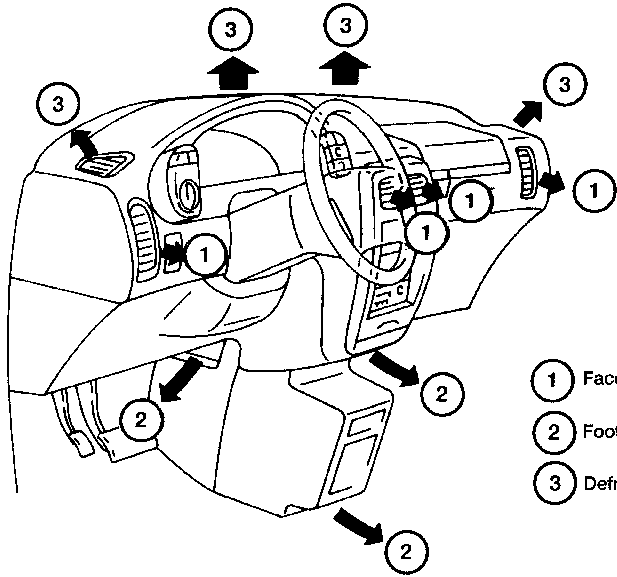
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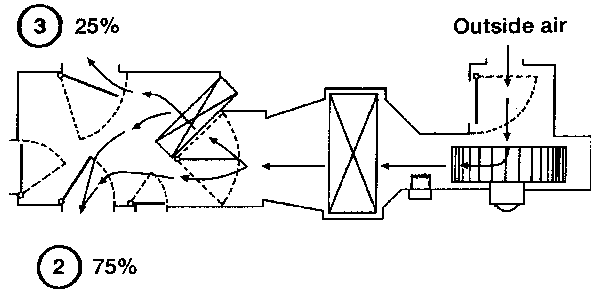
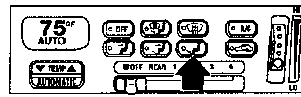
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Discharge Air Flow



- 1 Face outlets
- 2 Foot outlets
- 3 Defrost outlets

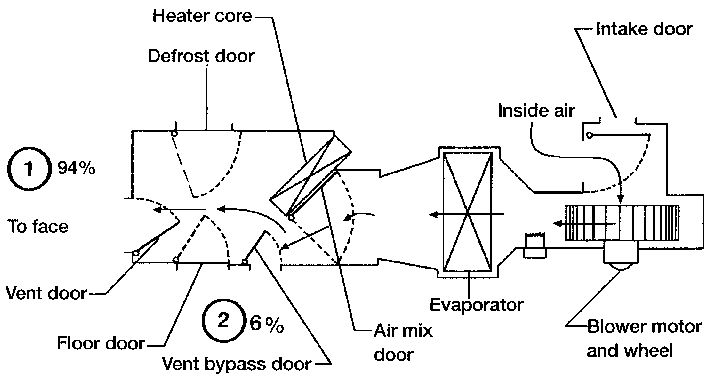
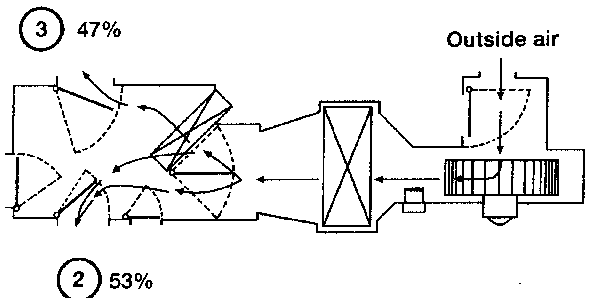
Foot mode



Face mode (recirc switch "ON")

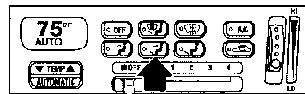


Foot and defrost mode

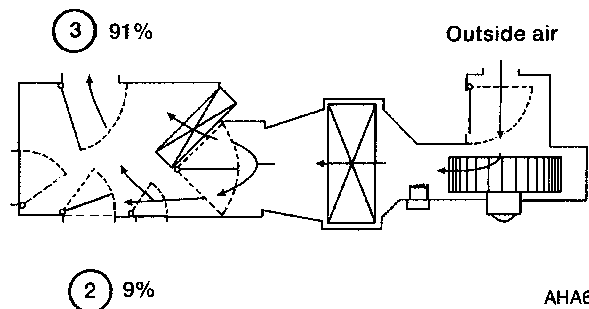
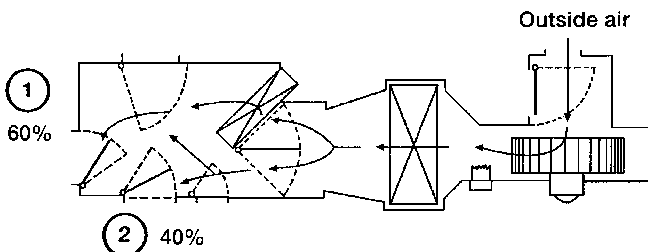


\*The vent bypass door is only open when face mode is selected and the temperature control switch is in the full cold position.

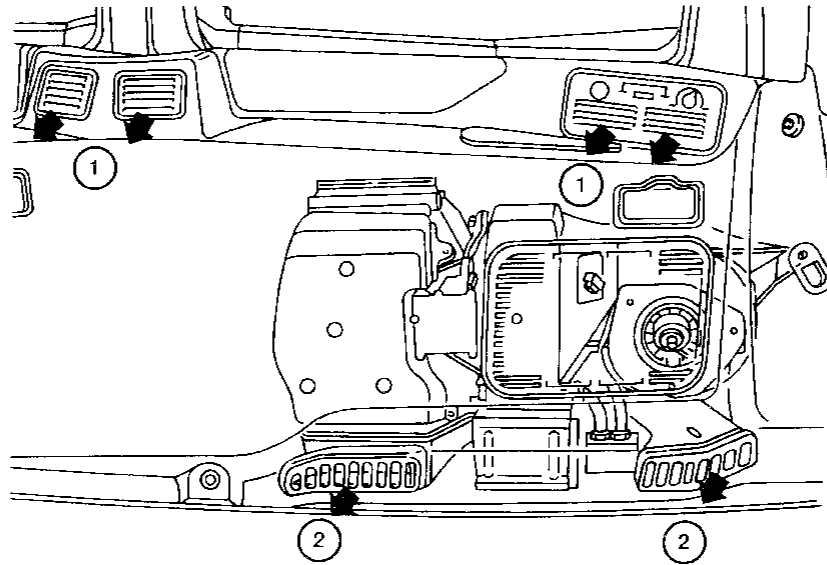
Bi-level mode



Defrost mode

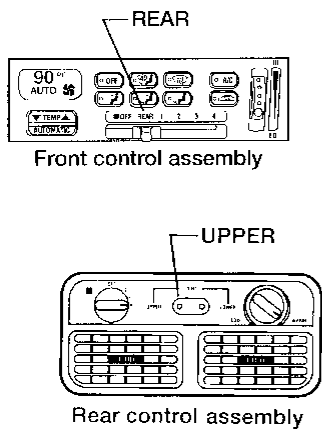


Discharge Air Flow (Cont'd)

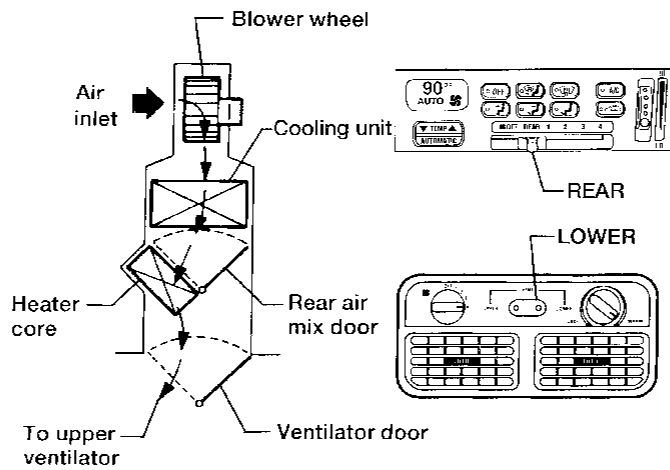


- 1 Upper outlets
- 2 Lower outlets

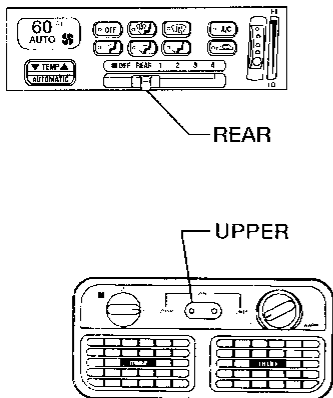
Ventilation and heat



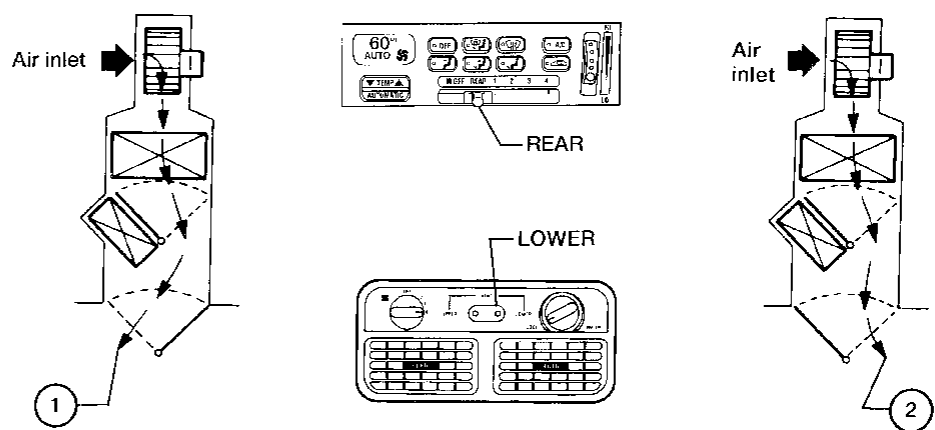
Floor and heat



Ventilation and A/C



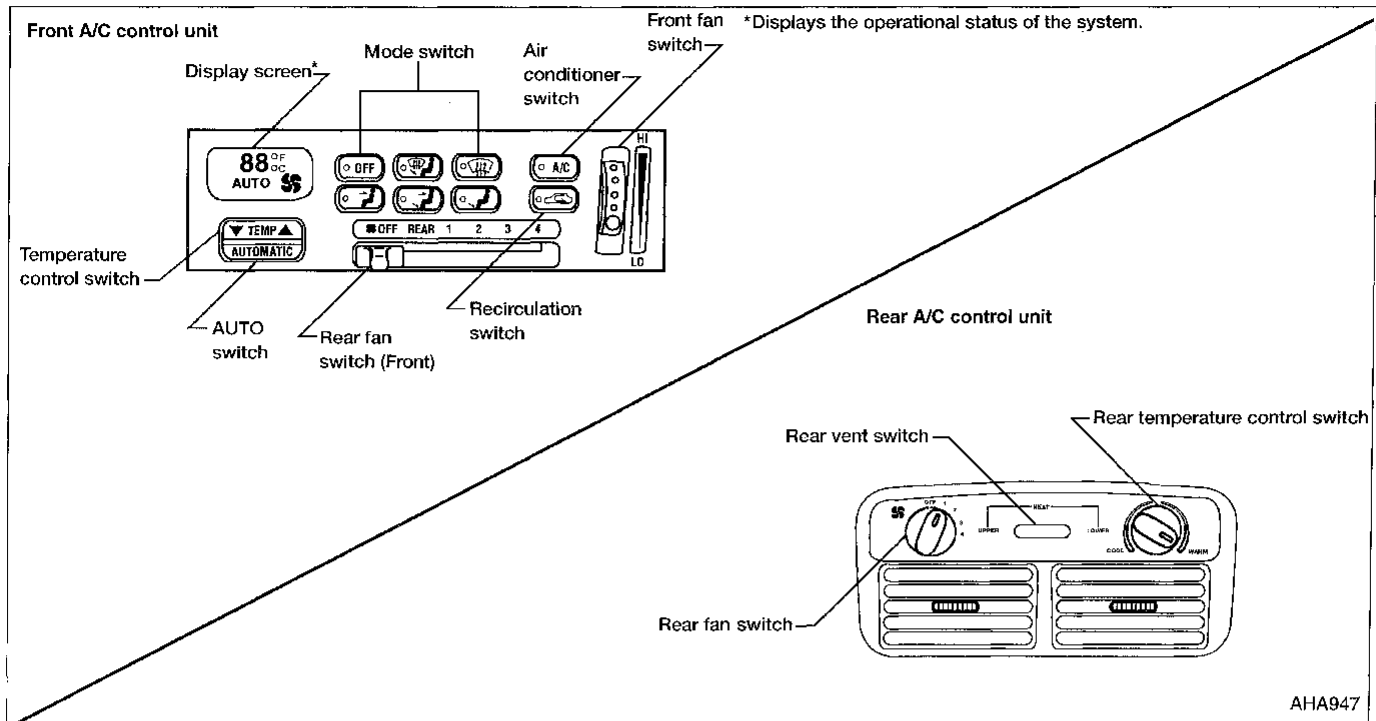
Floor and A/C



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## Control Operation



### AUTO SWITCH

The following components are automatically controlled so that the in-vehicle temperature will reach and maintain the set temperature.

- Compressor
- Air intake door
- Air mix door
- Mode doors
- Blower speed

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

### TEMPERATURE CONTROL SWITCH

Increases or decreases the set temperature.


### REAR TEMPERATURE CONTROL SWITCH

The switch allows adjustment of the temperature of the air through the rear discharge outlets independent of the position of the front temperature control switch, when the rear fan switch (front) is set to REAR.

### OFF SWITCH

The compressor, front and rear blower motors are off, the front intake door is set to the recirculation position, and the mode doors remain in their previous positions.

### FRONT FAN SWITCH

Manual control of the front blower speed can be obtained by rotating the front fan switch. The fan symbol  will be shown in the display screen.






### REAR FAN SWITCH



When the rear fan switch (front) is in the OFF position, the rear blower motor cannot operate. When the rear fan switch (front) is in the REAR position, it allows the rear fan switch to control the rear blower speed. In any other position (1-4), the rear fan switch (front) controls the rear blower speed, regardless of the rear fan switch position.

## Control Operation (Cont'd)

**MODE SWITCH**

Manual control of the air discharge outlets. Five selections are available:

FACE  , BI-LEVEL "B/L"  , FOOT  , FOOT and DEFROST "F/D"  , and DEFROST  GI

DEF  or F/D  positions the front intake door to the outside air FRESH position. The compressor operates at ambient temperature approx. 4°C (40°F) or above. MA



**REAR VENT SWITCH**

This switch controls air flow through the rear upper or lower discharge outlets. EM

**RECIRCULATION (REC) SWITCH**

ON position: Interior air is recirculated inside the vehicle. LC

OFF position: Automatic control resumes.

Recirculation is canceled when DEF  or F/D  is selected. EC

**AIR CONDITIONER SWITCH**

This switch controls A/C operation when any mode switch is selected except OFF or AUTO. When AUTO mode is selected the indicator light will be off and A/C operation is automatically controlled. FE

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

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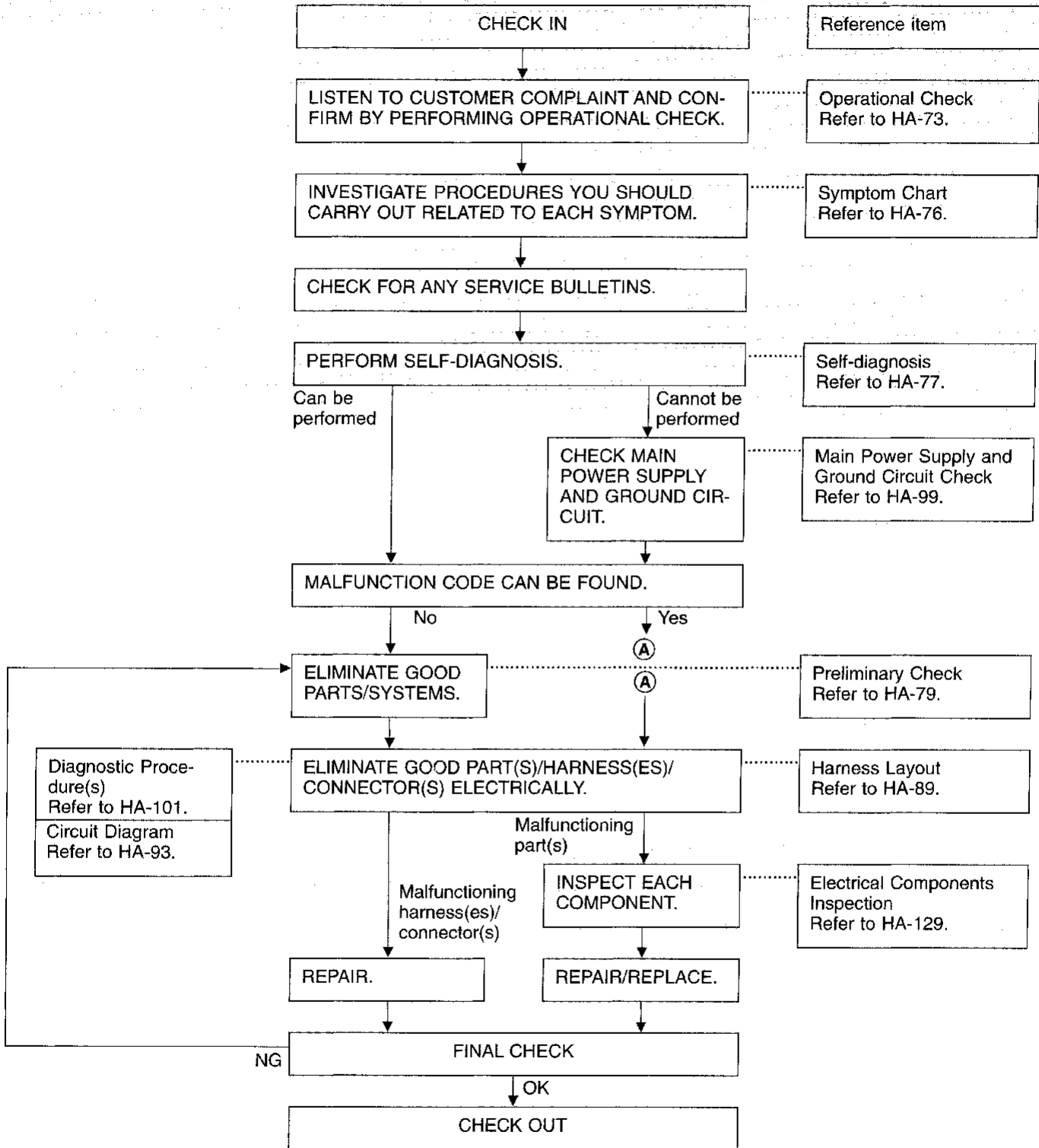
EL

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

**WORK FLOW**



**Operational Check**

The purpose of the operational check is to confirm that the system operates properly.


After Operational Check is completed, go to "How to Perform Trouble Diagnoses for Quick and Accurate Repair", HA-72.

**CONDITIONS:**

- Engine running and at normal operating temperature.

**PROCEDURE:**

**1. Check blower**

- Rotate the front fan switch up and check for blower operation. (Fan symbol lit in display screen).
- Continue checking that blower speed increases as the front fan switch is rotated up.
- Leave blower on MAX speed .


**2. Check discharge air**

- Press each mode switch.

- Confirm that discharge air comes out according to the air distribution table at left and that the indicator lamp illuminates.

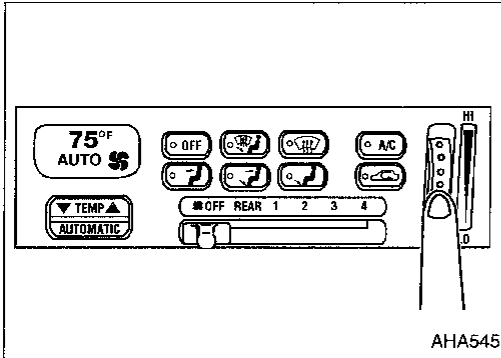
Refer to "Discharge Air Flow" (HA-68).

**NOTE:**

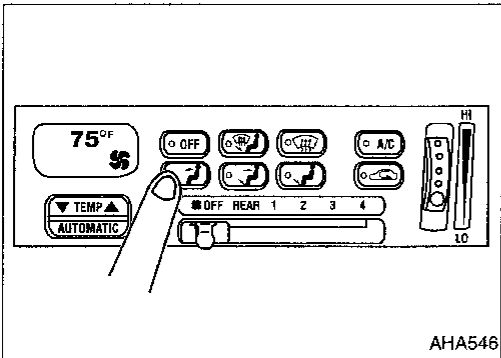
Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when the DEF  mode is selected.

Confirm that intake door position is at FRESH when the F/D  mode is selected.

Intake door position is checked in the next step.








AHA545



AHA546

**Discharge air flow**

Switch mode/ indicator	Air outlet/distribution		
	Face	Foot	Defroster
	94%	6%	—
	60%	40%	—
	—	75%	25%
	—	53%	47%
	—	9%	91%

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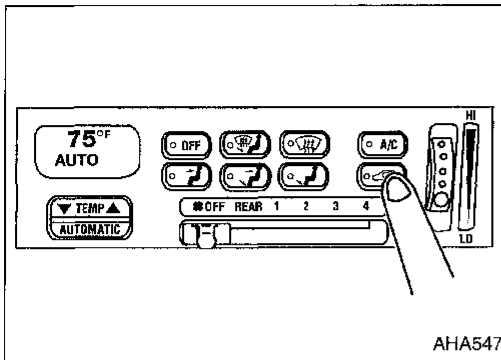
**Operational Check (Cont'd)**

**3. Check recirculation**

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

**NOTE:**

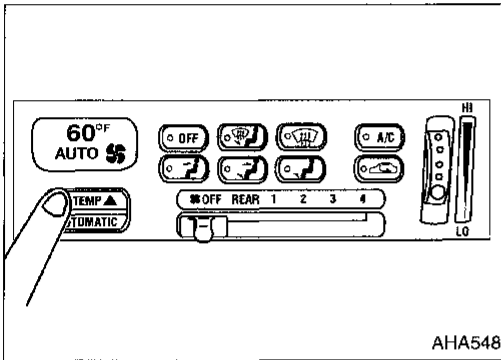
**REC does not operate in DEF  and F/D  modes.**



AHA547

**4. Check temperature decrease**

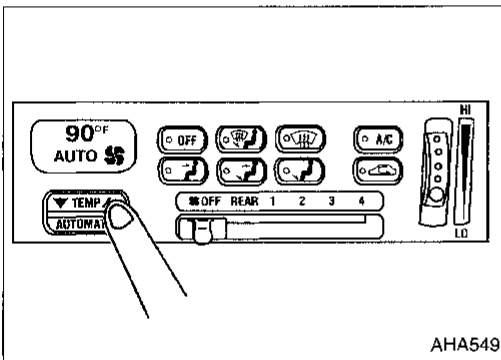
- a. Press the temperature control switch until 15°C (60°F) is displayed.
- b. Check for cold air at discharge air outlets.



AHA548


**5. Check temperature increase**

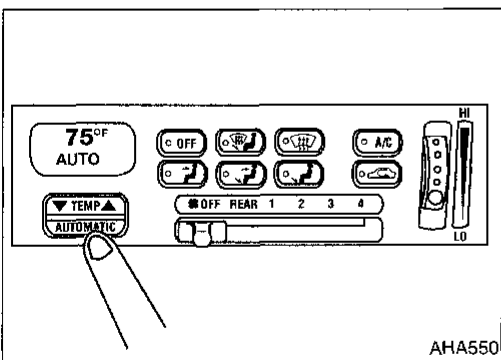
- a. Press the temperature control switch until 32°C (90°F) is displayed.
- b. Check for hot air at discharge air outlets.



AHA549

**6. Check AUTO mode**

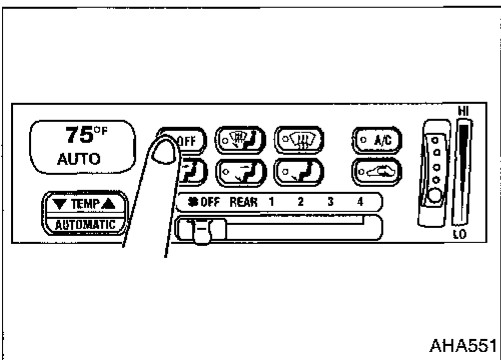
- a. Press AUTO switch.
- b. Display should indicate AUTO (no fan symbol  displayed).  
Confirm that the compressor clutch engages (audio or visual inspection).  
(Discharge air will depend on ambient, in-vehicle, and set temperatures).



AHA550

**7. Check memory function**

- a. Press OFF switch.
- b. Turn the ignition OFF.
- c. Turn the ignition ON.
- d. Press the AUTO switch.
- e. Confirm that the set temperature remains at previous temperature.



AHA551

**Operational Check (Cont'd)****REAR A/C CONDITIONS:**

Engine running at normal operating temperature.

**PROCEDURE:****1. Check blower**

- a. Set rear fan switch (front) to REAR position.
- b. Press any mode switch except OFF.
- c. Press air conditioner switch ON.
- d. Turn rear fan switch to 1-speed.  
Blower should operate on 1-speed.
- e. Turn rear fan switch to 2-speed.
- f. Continue checking blower speed until all four speeds are checked.

**2. Check discharge air**

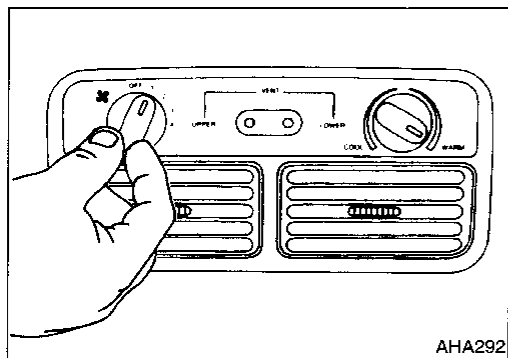
- a. Press the UPPER side of the rear vent switch.  
The indicator should light. Confirm air flow from the upper rear discharge outlets.
- b. Press the LOWER side of the rear vent switch.  
The indicator should light. Confirm air flow from the lower rear discharge outlets.

**3. Check temperature decrease**

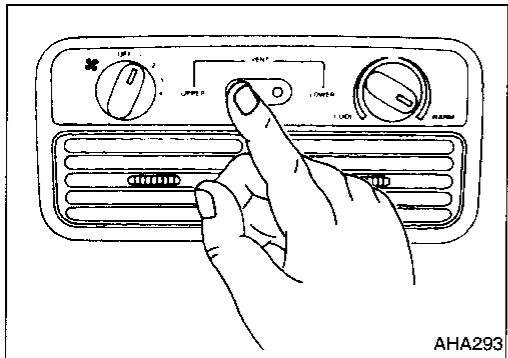
- a. Turn rear temperature control switch to full cool.
- b. Check for cold air at rear discharge outlets.

**4. Check temperature increase**

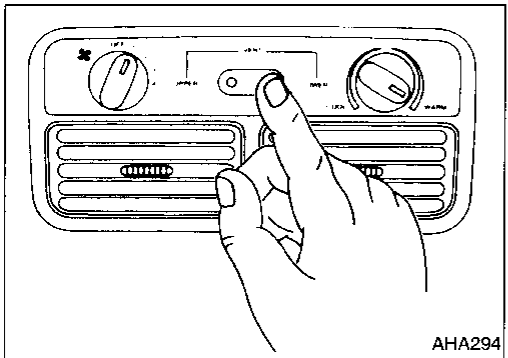
- a. Turn rear temperature control switch to full warm.
- b. Check for hot air at rear discharge outlets.



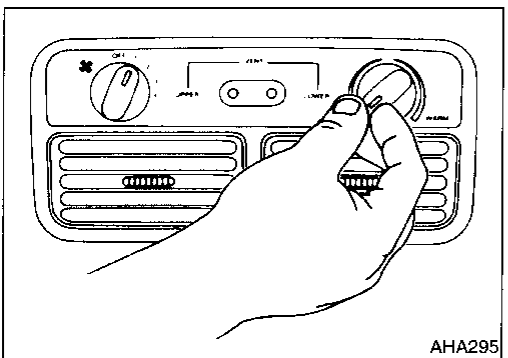
AHA292



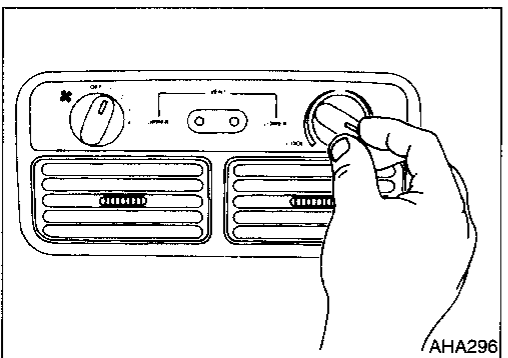
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AHA295



AHA296

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Symptom Chart

DIAGNOSTIC TABLE

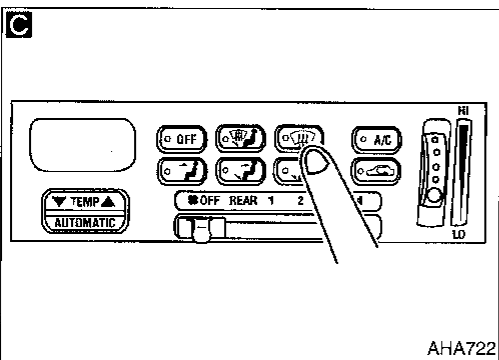
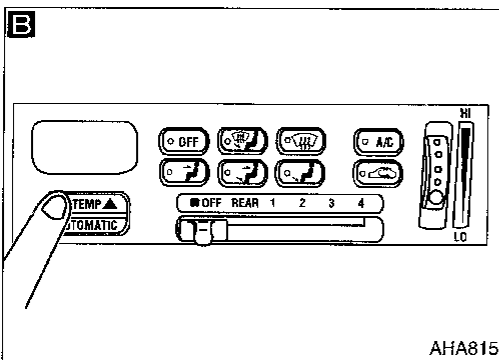
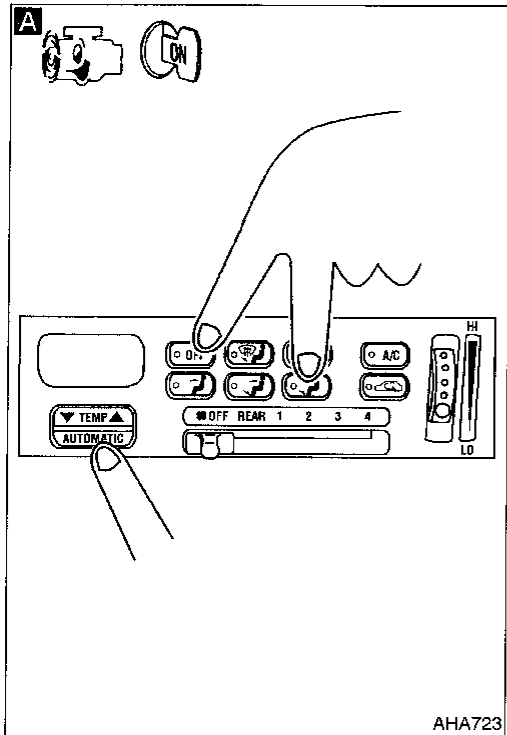
PROCEDURE	HA-77	HA-79	HA-80	HA-81	HA-82	HA-83	HA-84	HA-85	HA-101	HA-102	HA-103	HA-104	HA-105	HA-106	HA-108	HA-109	HA-110	HA-113	HA-116	HA-118	HA-121	HA-123	HA-125	HA-126	HA-127	HA-128	HA-128	HA-99	HA-99	HA-100	Refer to EC section				
REFERENCE PAGE																																			
SYMPTOM	Self-diagnosis	Preliminary check 1	Preliminary check 2	Preliminary check 3	Preliminary check 4	Preliminary check 5	Preliminary check 6	Preliminary check 7	Diagnostic procedure 1	Diagnostic procedure 2	Diagnostic procedure 3	Diagnostic procedure 4	Diagnostic procedure 5	Diagnostic procedure 6	Diagnostic procedure 7	Diagnostic procedure 8	Diagnostic procedure 9	Diagnostic procedure 10	Diagnostic procedure 11	Diagnostic procedure 12	Diagnostic procedure 13	Diagnostic procedure 14	Diagnostic procedure 15	Diagnostic procedure 16	Diagnostic procedure 17	Diagnostic procedure 18	Diagnostic Procedure 19	Fuses	EATC unit	Rear A/C control unit	ECM (ECCS control module)	Harness			
Insufficient cooling - front	①	②											○	○			○	○																	
Insufficient cooling - rear		①	②																																
Insufficient heating - front	○			①			○					○	○																						
Insufficient heating - rear				①	②																														
Front blower motor does not rotate	①	②															③																		
Mode door does not operate normally	①						②									⑤																			
Front air mix door does not operate normally	①	②										③	④																						
Front intake door does not operate normally	①															②	③																		
Rear vent door motor does not operate normally																									①										
Rear blower motor does not rotate when rear fan switch (front) for rear A/C is set to REAR position																				①	○														
Rear blower motor does not rotate when rear fan switch (front) for rear A/C is set at 1-4 speed																				①	②														
Rear air mix door does not operate normally	①																					②	③												
Magnet clutch does not engage						①																													
Noise							①																												
Mode switch button stuck	①																									②									
Self-diagnosis cannot be performed.																											①	②	○						

①, ②: The number means checking order.  
 ○: Checking order depends on malfunction in flow chart.

### Self-diagnosis

#### FUNCTION

The Self-diagnosis system monitors sensors and door motors. Shifting from normal mode to Self-diagnosis mode is accomplished by starting the engine (turning the ignition switch from OFF to ON) then simultaneously pressing the OFF and FOOT mode switches. The AUTO switch must be pressed within 2 seconds of releasing OFF and FOOT mode switches. The diagnostic trouble codes are displayed on the display screen at a rate of one code per second. The display starts 30 to 60 seconds after the sequence is initiated.



Turn the ignition switch ON. (Engine must be running for air conditioner to operate.)

**A** Set the interior temperature between 18°C (65°F) and 29°C (85°F). Simultaneously press OFF and FOOT switches then press AUTO switch within 2 seconds.

The display screen will have a pulse tracer going around the center of the display screen, while the EATC unit checks all sensor and mode door circuits. (The system goes to OFF mode and the mode doors are recalibrated.)

If Self-diagnosis cannot be performed, go to Diagnostic Procedure 19, HA-128.

The malfunction codes are displayed at a rate of one code per second. If no malfunction code exists, 88 and all symbols will be shown on the display screen. Press the DEFROST switch to exit Self-diagnosis.

**B** Verify the location of the malfunction using the Malfunction Code/Symptom Chart. Refer to HA-78. Press the TEMP DOWN switch to cancel Self-diagnosis without erasing malfunction codes.

**C** After the malfunctions are repaired, erase the malfunction codes by pressing the DEFROST switch.

Perform Self-diagnosis again to verify that no malfunction codes exist.

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EM  
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## Self-diagnosis (Cont'd)

## MALFUNCTION CODE/SYMPTOM CHART

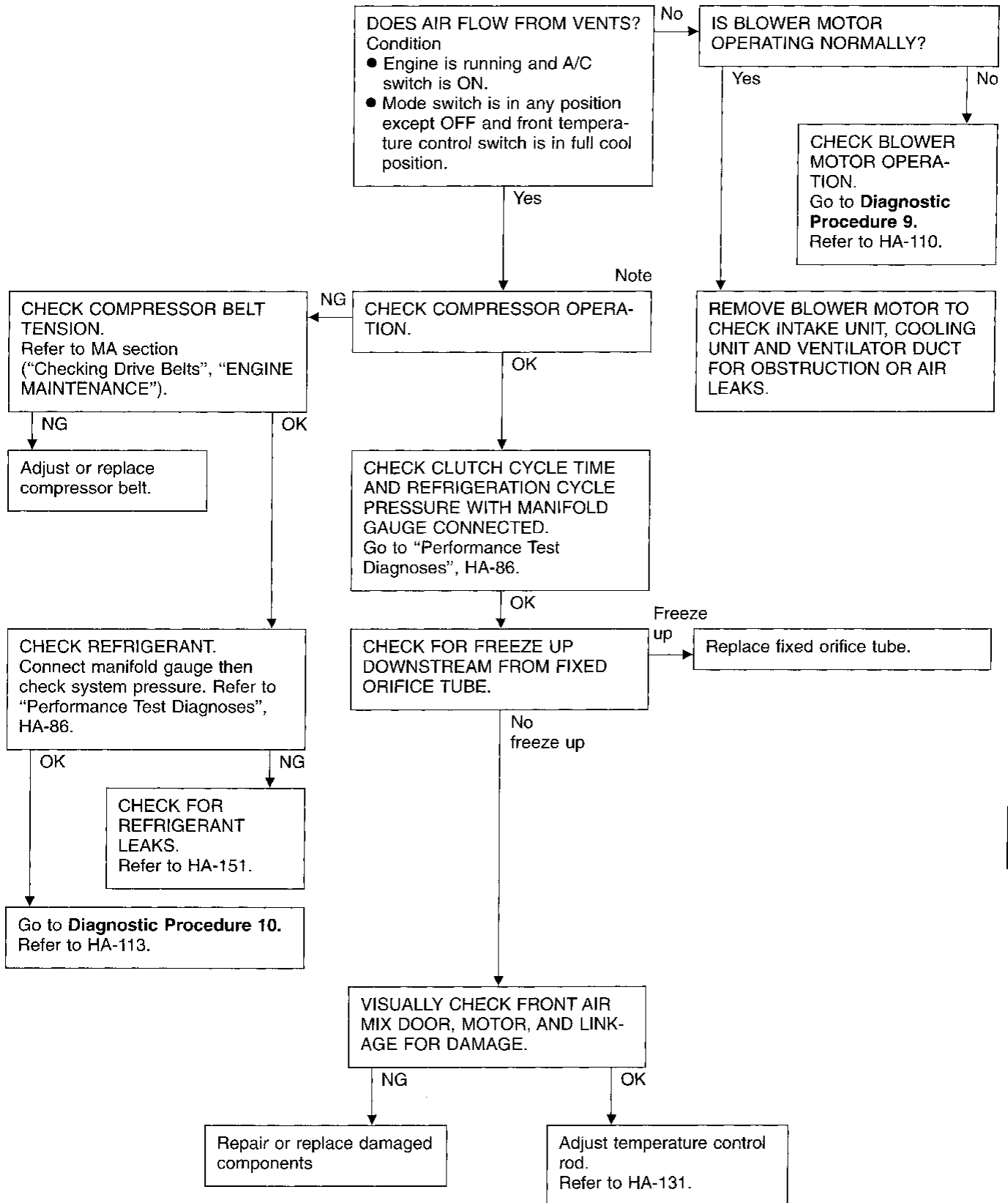
Diagnostic trouble code No. (Shown on display screen)	Malfunctioning part	Diagnostic Procedure	
Result of Self-diagnosis	12	Rear air mix door short	13
	16	Rear air mix door PBR circuit short	14
	17	Rear air mix door PBR circuit open or voltage too high (>0.8V)	14
	18	Rear air mix door time-out	13
	22	Front air mix door short	4
	26	Front air mix door PBR circuit short	5
	27	Front air mix door PBR circuit open or voltage too high (>0.8V)	5
	28	Front air mix door time-out	4
	30	In-vehicle temperature sensor short	2
	31	In-vehicle temperature sensor open	2
	40	Ambient temperature sensor short	1
	41	Ambient temperature sensor open	1
	50	Sunload sensor short	3
	82	Front intake door short	7
	86	Front intake door PBR circuit open or voltage too high (>0.8V)	8
	87	Front intake door PBR circuit short	8
	88	Front intake door time-out	7
92	Mode door short	6	
98	Mode door time-out	6	
Intermittent Diagnostic trouble code No. (Shown on display screen)			
Result of Self-diagnosis	10	Rear air mix door short	13
	20	Front air mix door short	4
	42	Ambient temperature sensor short	1
	43	Ambient temperature sensor open	1
	52	Sunload sensor short	3
	60	Mode switch button stuck	18
	61	Ignition over voltage	Refer to EL section ("Trouble Diagnoses", "CHARGING SYSTEM")
	80	Front intake door short	7
	90	Mode door short	6

Preliminary Check

PRELIMINARY CHECK 1

Insufficient cooling - front

- Perform Self-diagnosis before referring to the flow chart.



Note:

If air flow gradually decreases with operation of A/C compressor, check low pressure switch and harness.

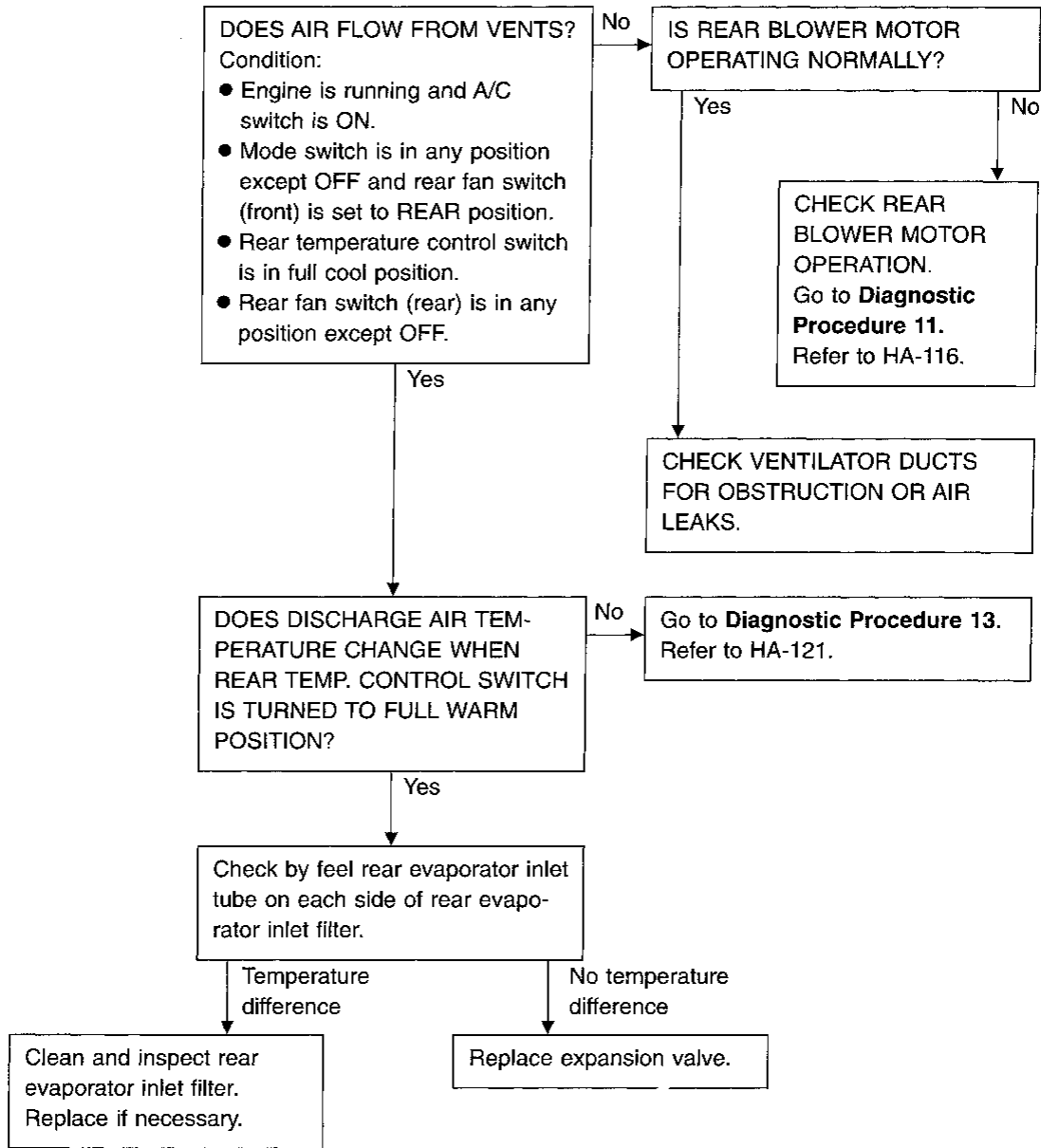


Preliminary Check (Cont'd)

PRELIMINARY CHECK 2

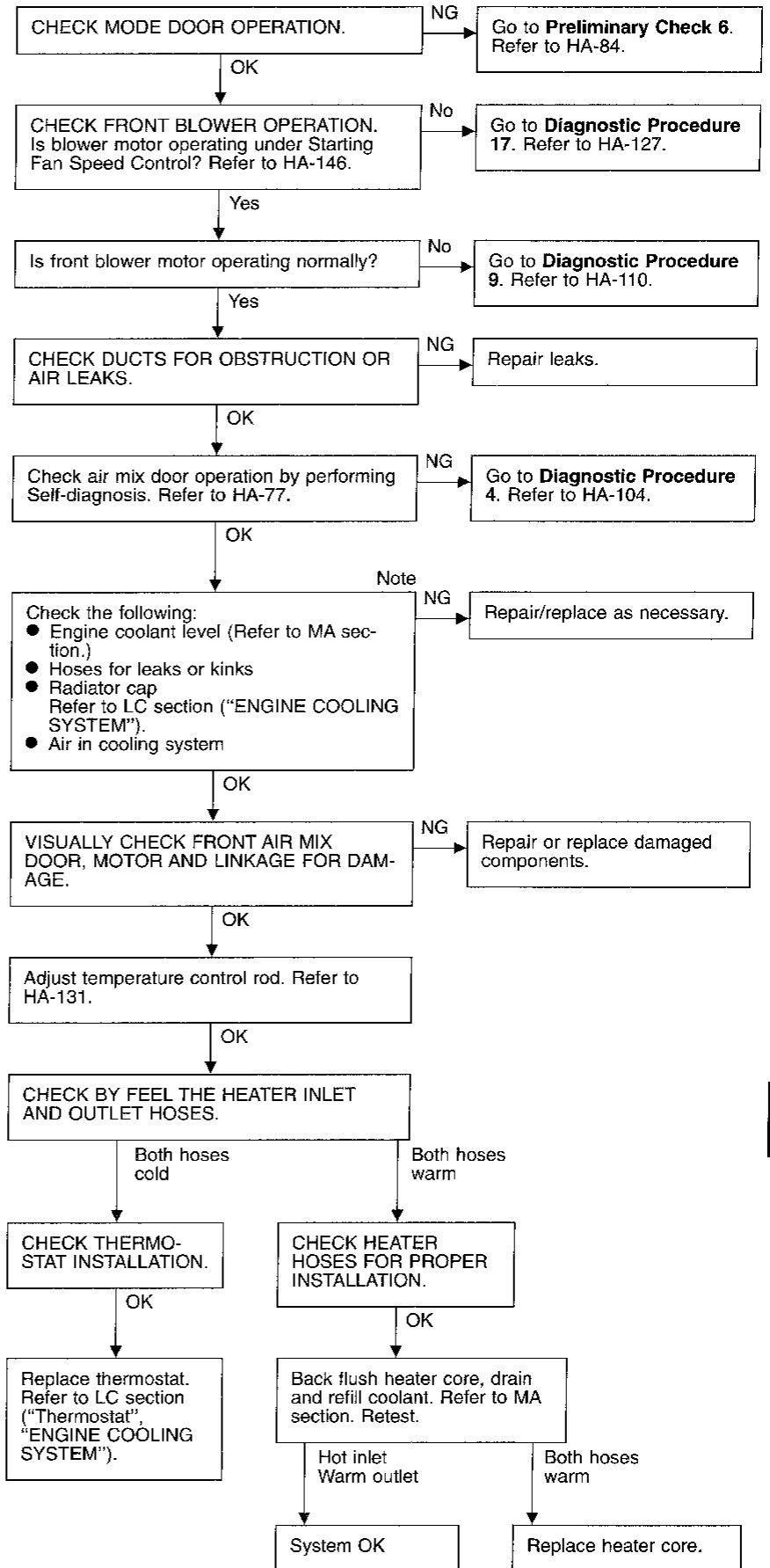
Insufficient cooling - rear

- Perform PRELIMINARY CHECK 1 before referring to the following flow chart.



**PRELIMINARY CHECK 3**  
**Insufficient heating - front**

**Preliminary Check (Cont'd)**



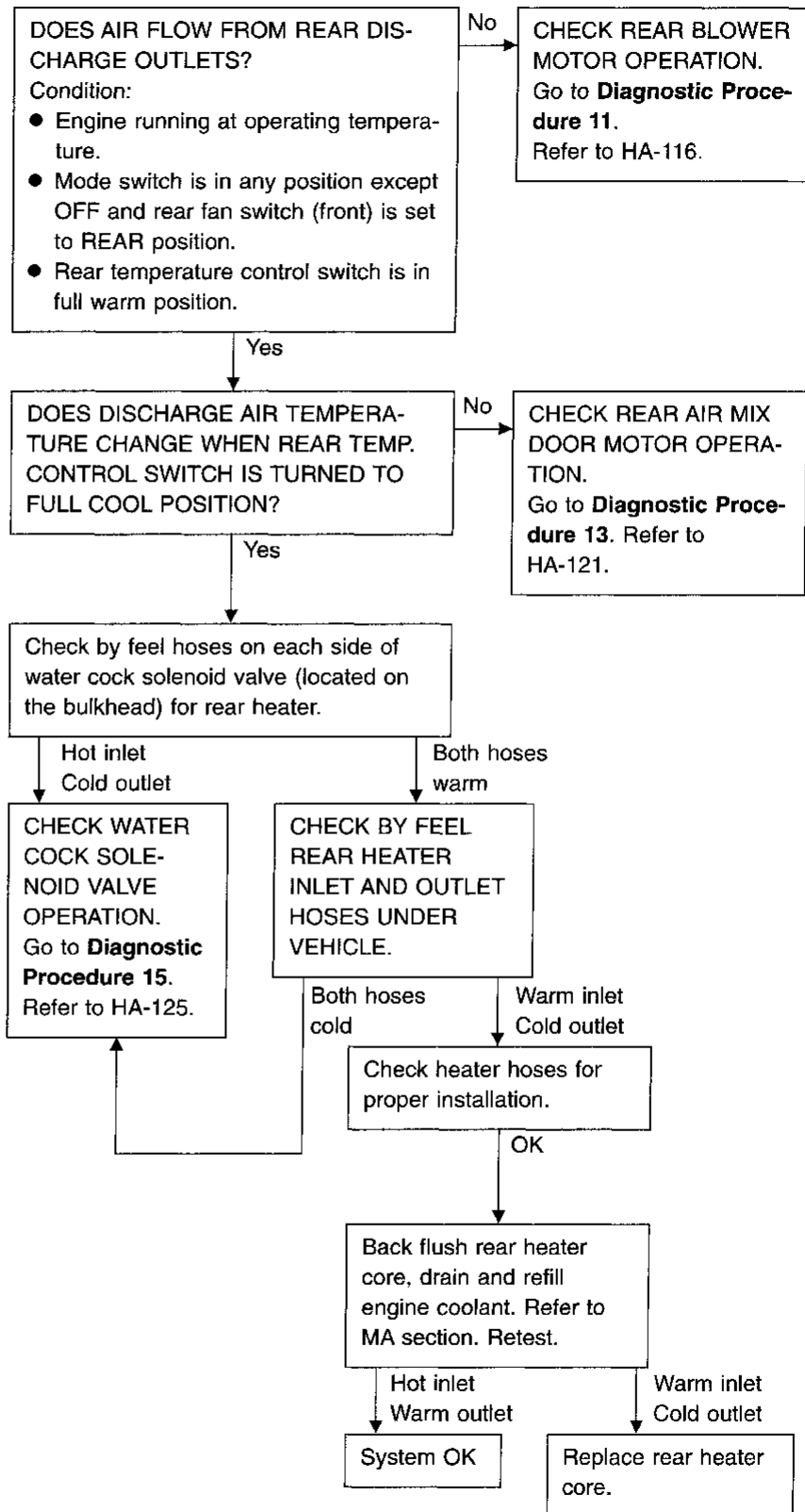
Note: If rear heat is OK, this step may not be necessary.

Preliminary Check (Cont'd)

PRELIMINARY CHECK 4

Insufficient heating - rear

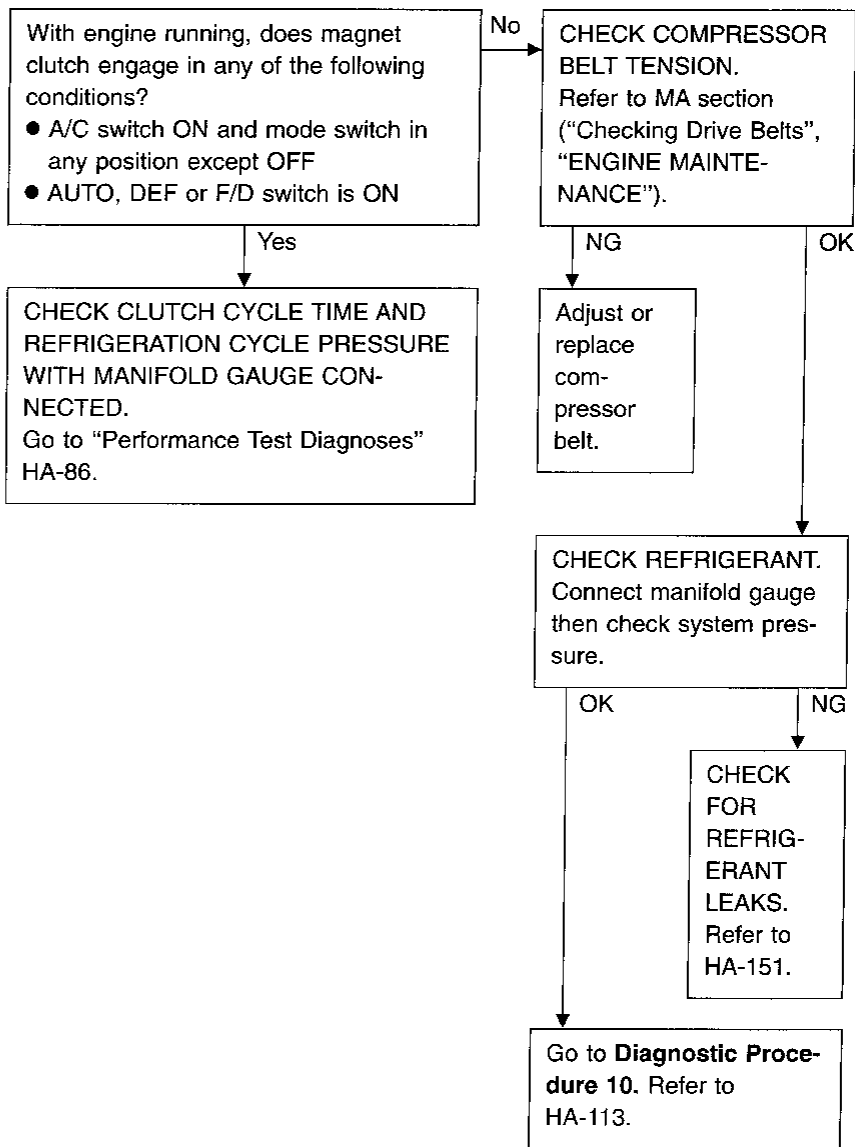
- Perform PRELIMINARY CHECK 3 before referring to the following flow chart.



Preliminary Check (Cont'd)

PRELIMINARY CHECK 5

Magnet clutch does not engage.



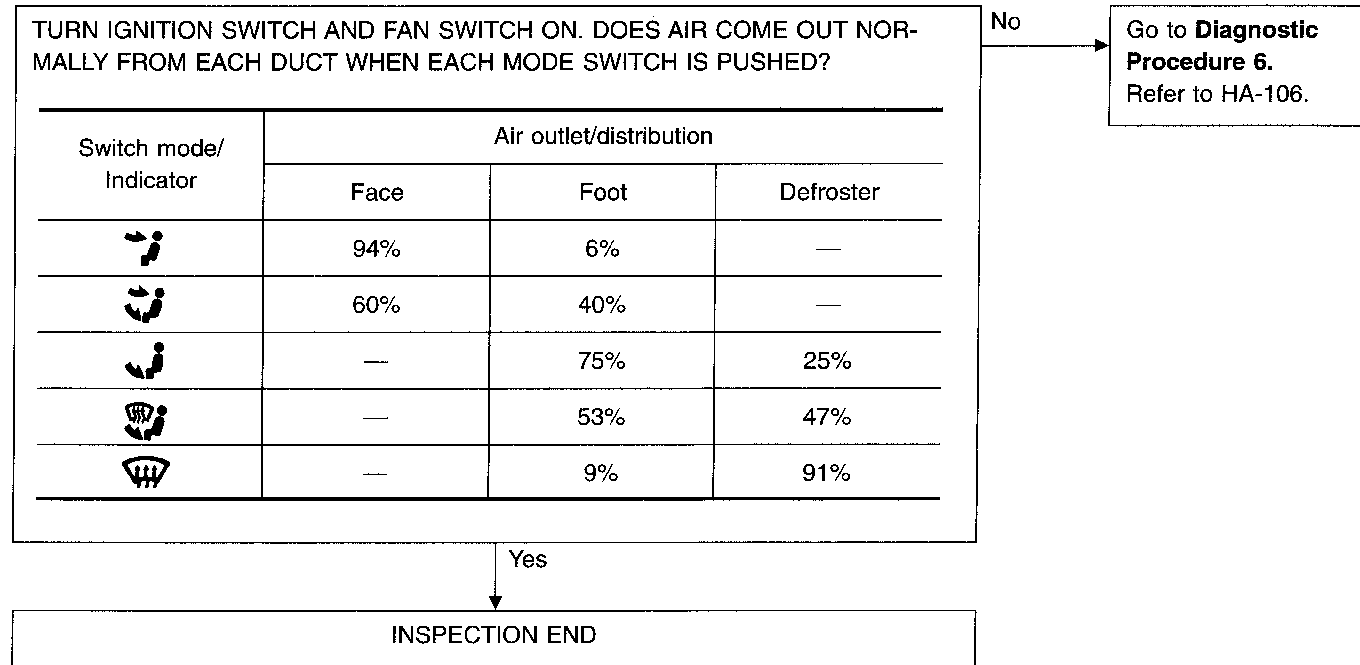
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**Preliminary Check (Cont'd)**

**PRELIMINARY CHECK 6**

Front air outlet does not change.

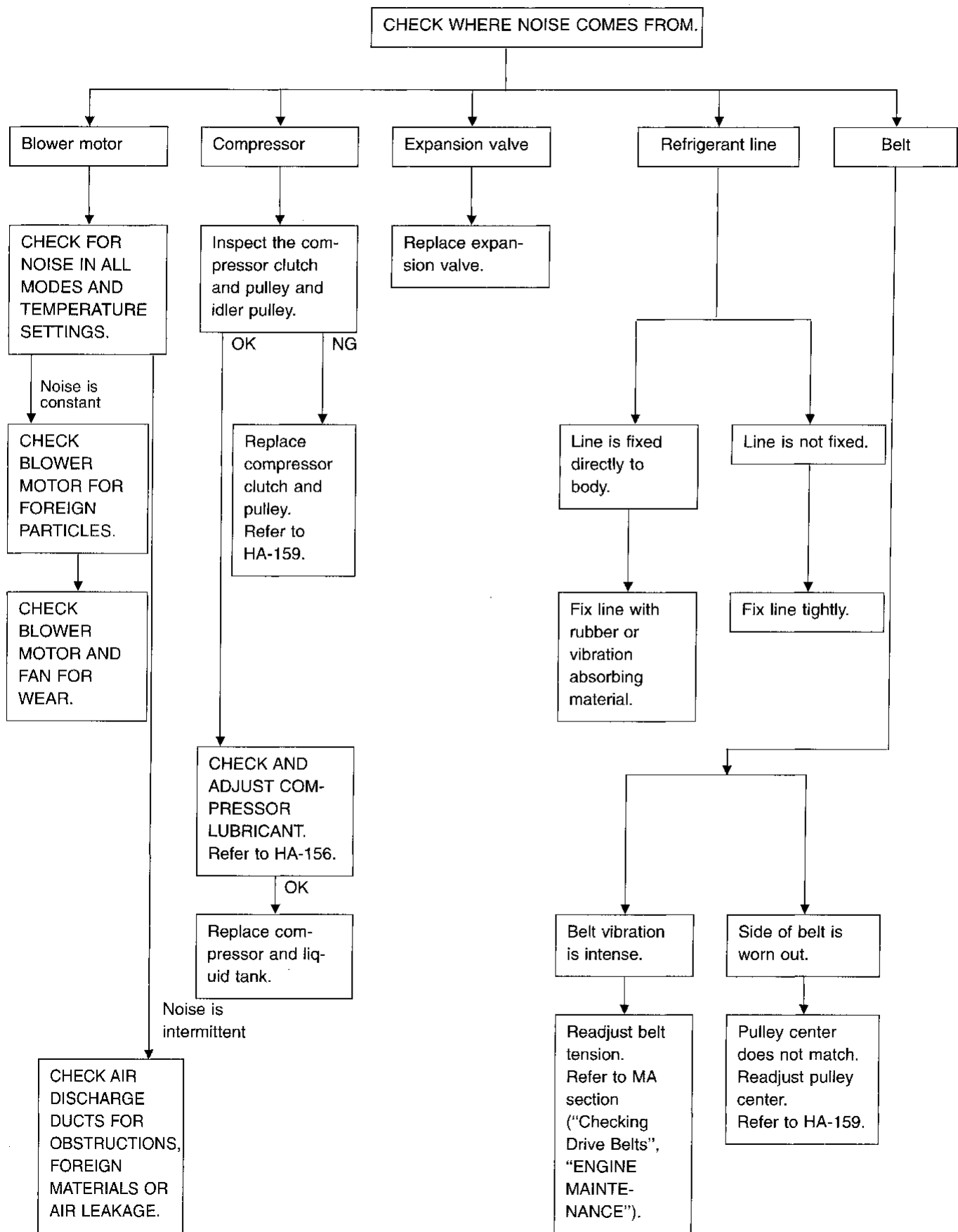
- Perform Self-diagnosis before referring to the following flow chart.



Preliminary Check (Cont'd)

PRELIMINARY CHECK 7

Noise



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## Performance Test Diagnoses

This A/C system is different from other Nissan A/C systems. The typical Nissan A/C system uses a thermal expansion valve to provide a restriction which causes a pressure change and also controls refrigerant flow through the evaporator.

This system uses a Fixed Orifice Tube (FOT) to cause a pressure change, by restricting the flow of refrigerant to the evaporator. The flow of refrigerant is controlled by engaging and disengaging the compressor clutch based on low side pressure. Therefore, it is critical to consider clutch engagement and disengagement times for proper diagnosis.

The refrigerant flow is regulated by a fixed orifice tube for the front evaporator and a thermal expansion valve for the rear evaporator.

The best way to diagnose a condition in the refrigerant system is to note the system pressures (shown by the manifold gauges) and the clutch cycle rate and times. Then, compare the findings to the charts.

- The system pressures are low (compressor suction) and high (compressor discharge).
- A clutch cycle is the time the clutch is engaged plus the time it is disengaged (time on plus time off).
- Clutch cycle times are the lengths of time (in seconds) that the clutch is ON and OFF.

### Important — Test conditions

The following test conditions must be established to obtain accurate clutch cycle rate and cycle time readings:

- Run engine at 1,500 rpm for 10 minutes.
- Operate A/C system on max A/C (recirculating air).
- Run blower at max speed.
- Stabilize in vehicle temperature at 21°C to 27°C (70°F to 80°F).

The following procedure is recommended for achieving accurate diagnosis results in the least amount of time.

1. Connect a manifold gauge set to the system. **The test conditions specified must be met to obtain accurate test results.**
2. Start the engine and turn ON A/C system.
3. As soon as the system is stabilized, record the high- and low-pressures as shown by the manifold gauges. The low side should cycle between approximately 168.9 kPa (1.723 kg/cm<sup>2</sup>, 24.5 psi) and 276 to 324 kPa (2.81 to 3.30 kg/cm<sup>2</sup>, 40 to 47 psi). (As low pressure drops, high pressure should rise.) When the clutch disengages, the low side should rise and the high side should drop.
4. Determine the clutch cycle rate per minute (clutch on time plus off time is a cycle).
5. Record clutch OFF time in seconds.
6. Record clutch ON time in seconds.
7. Record center register discharge temperature.
8. Determine and record ambient temperature.
9. Compare test readings with applicable chart.
  - Plot a vertical line for recorded ambient temperature from scale at bottom of each chart to top of each chart.
  - Plot a horizontal line for each of the other test readings from scale at LH side of appropriate chart.

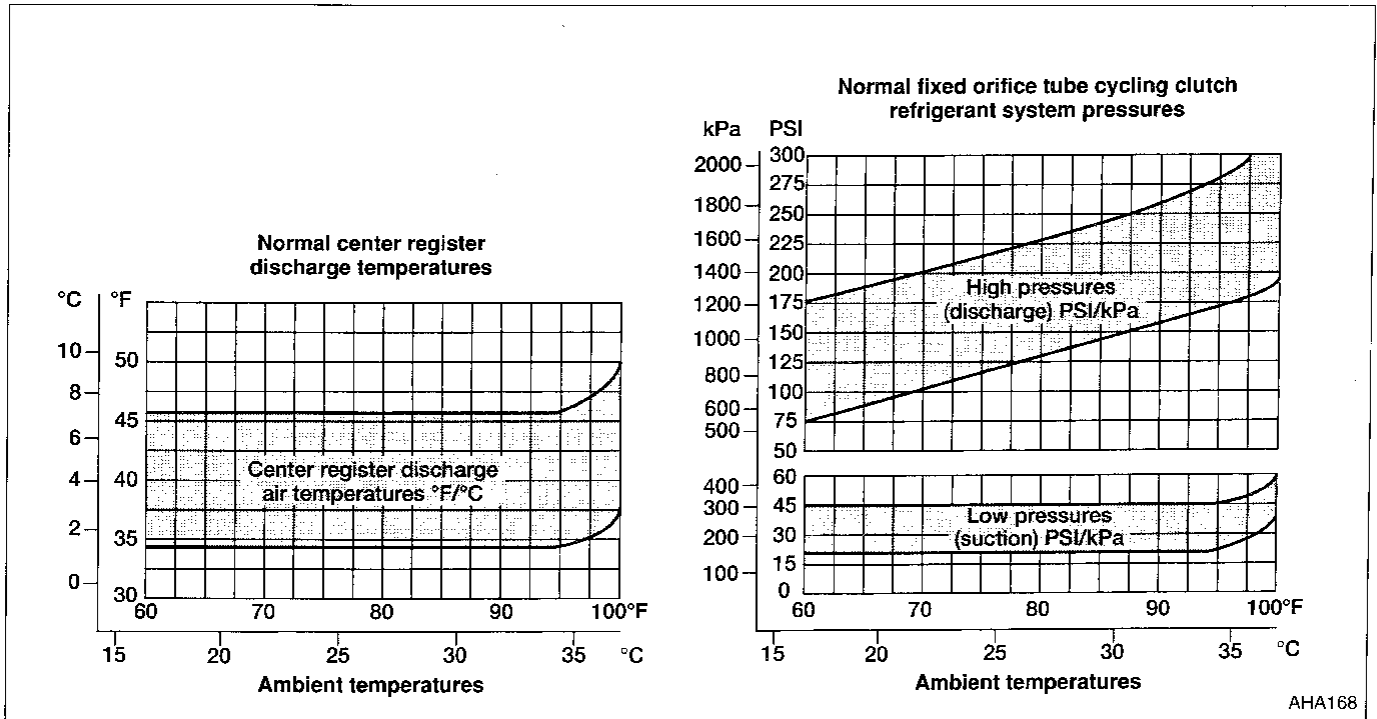
At the bottom of the chart (HA-88), additional cause components are listed for poor compressor operation or a damaged compressor condition.

The diagnosis charts provide the most direct and sure way to determine the cause of any concern in a poorly performing refrigerant system. However, if the vehicle is equipped with rear A/C, poor performance of the front or rear system may not cause abnormal pressures or clutch cycle time. In this case, poor performance may indicate a restriction of refrigerant flow to that system, or an evaporator problem.

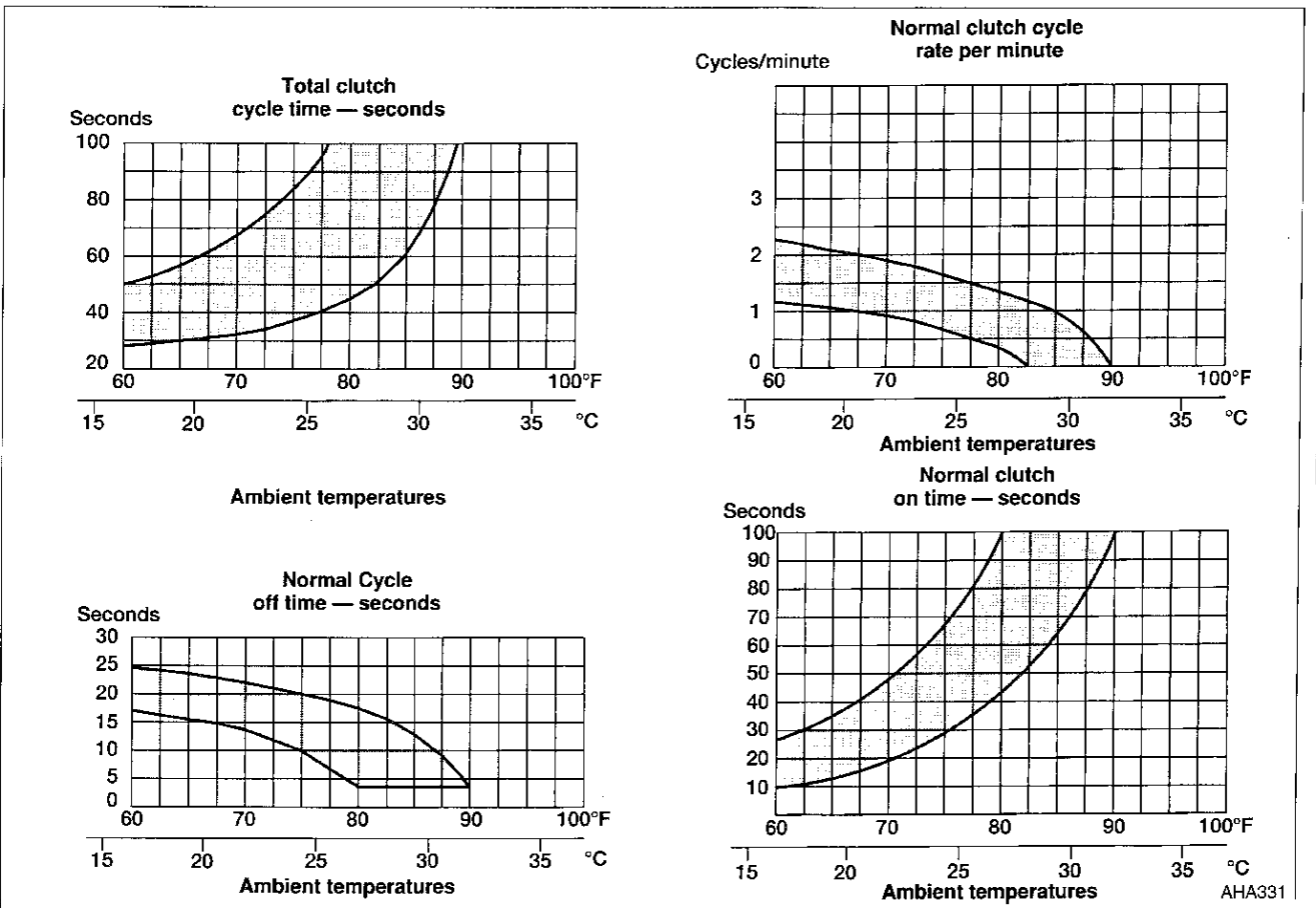
After servicing and correcting a refrigerant system concern, take additional pressure readings and observe the clutch cycle rate while meeting the conditional requirements (HA-88) to ensure the concern has been corrected.

Performance Test Diagnoses (Cont'd)

NORMAL FIXED ORIFICE TUBE REFRIGERANT SYSTEM PRESSURE/TEMPERATURE RELATIONSHIPS



NORMAL FIXED ORIFICE TUBE REFRIGERANT SYSTEM CLUTCH CYCLE TIMING RATES



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**Performance Test Diagnoses (Cont'd)**

**REFRIGERANT SYSTEM PRESSURE AND CLUTCH CYCLE TIMING EVALUATION CHART FOR FIXED ORIFICE TUBE CYCLING CLUTCH SYSTEMS**

System test conditions must be met to obtain accurate test readings for evaluation. Refer to the normal refrigerant system pressure/temperature and the normal clutch cycle rate and times charts on the previous page.

HIGH (DISCHARGE) PRESSURE	LOW (SUCTION) PRESSURE	CLUTCH CYCLE TIME			COMPONENT — CAUSES		
		RATE	ON	OFF			
HIGH	HIGH	CONTINUOUS RUN			CONDENSER — Inadequate Airflow		
HIGH	NORMAL TO HIGH				ENGINE OVERHEATING		
NORMAL TO HIGH	NORMAL				REFRIGERANT OVERCHARGE (1) AIR IN REFRIGERANT HUMIDITY OR AMBIENT TEMP VERY HIGH (2)		
NORMAL	HIGH				FIXED ORIFICE TUBE — Missing O-Rings Leaking/Missing		
NORMAL TO HIGH	NORMAL TO HIGH	SLOW OR NO CYCLE	LONG OR CONTINUOUS	NORMAL OR NO CYCLE	MOISTURE IN REFRIGERANT SYSTEM EXCESSIVE REFRIGERANT LUBRICANT		
NORMAL	LOW	SLOW	LONG	LONG	LOW-PRESSURE SWITCH — Low Cut-Out		
NORMAL TO LOW	HIGH	CONTINUOUS RUN			COMPRESSOR — Low Performance		
NORMAL TO LOW	NORMAL TO HIGH				A/C SUCTION LINE — Partially Restricted or Plugged (3)		
NORMAL TO LOW	NORMAL	FAST	SHORT	NORMAL	EVAPORATOR — Low or Restricted Airflow		
			SHORT TO VERY SHORT	NORMAL TO LONG	CONDENSER FIXED ORIFICE TUBE, OR A/C LIQUID LINE — Partially Restricted or Plugged		
			SHORT TO VERY SHORT	SHORT TO VERY SHORT	LOW REFRIGERANT CHARGE		
			SHORT TO VERY SHORT	LONG	EVAPORATOR CORE — Partially Restricted or Plugged		
NORMAL TO LOW	LOW	CONTINUOUS RUN			A/C SUCTION LINE — Partially Restricted or Plugged (4) LOW-PRESSURE SWITCH — Sticking Closed		
—	—	ERRATIC OPERATION OR COMPRESSOR NOT RUNNING			LOW-PRESSURE SWITCH — Dirty Contacts or Sticking Open. POOR CONNECTION AT A/C CLUTCH CONNECTOR OR CLUTCH CYCLING SWITCH CONNECTOR. A/C ELECTRICAL CIRCUIT ERRATIC		

**ADDITIONAL POSSIBLE CAUSE COMPONENTS ASSOCIATED WITH INADEQUATE COMPRESSOR OPERATION**

- COMPRESSOR DRIVE BELT — Loose
- COMPRESSOR CLUTCH — Slipping
- CLUTCH COIL Open — Shorted, or Loose Mounting
- A/C RELAY — Dirty Contacts or Sticking Open
- CLUTCH WIRING CIRCUIT — High Resistance, Open or Blown Fuse
- COMPRESSOR OPERATION INTERRUPTED BY ENGINE CONTROL MODULE

**ADDITIONAL POSSIBLE CAUSE COMPONENTS ASSOCIATED WITH A DAMAGED COMPRESSOR**

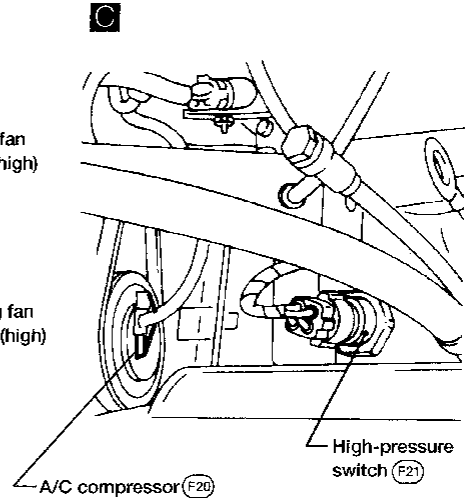
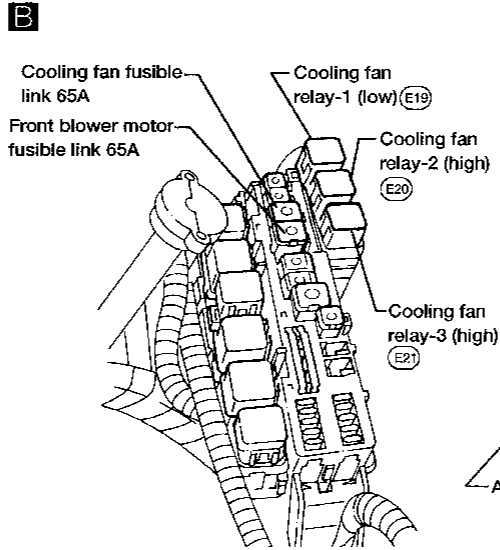
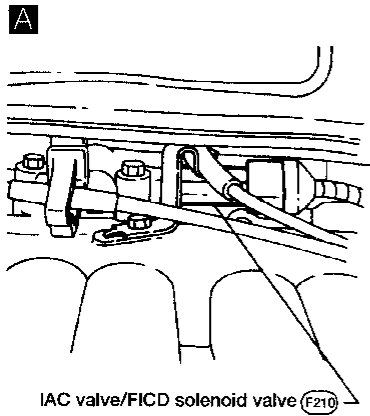
- LOW-PRESSURE SWITCH — Sticking Closed or Compressor Clutch Seized
- ACCUMULATOR — Lubricant Bleed Hole Plugged
- REFRIGERANT LEAKS

(1) Compressor may make noise on initial run. This is slugging condition caused by excessive liquid refrigerant.  
 (2) Compressor clutch may not cycle in ambient temperatures above 27°C (80°F) depending on humidity conditions.  
 (3) Low pressure reading will be normal to high if pressure is taken at accumulator and if restriction is downstream of service valve.  
 (4) Low pressure reading will be low if pressure is taken near the compressor and restriction is upstream of service valve.

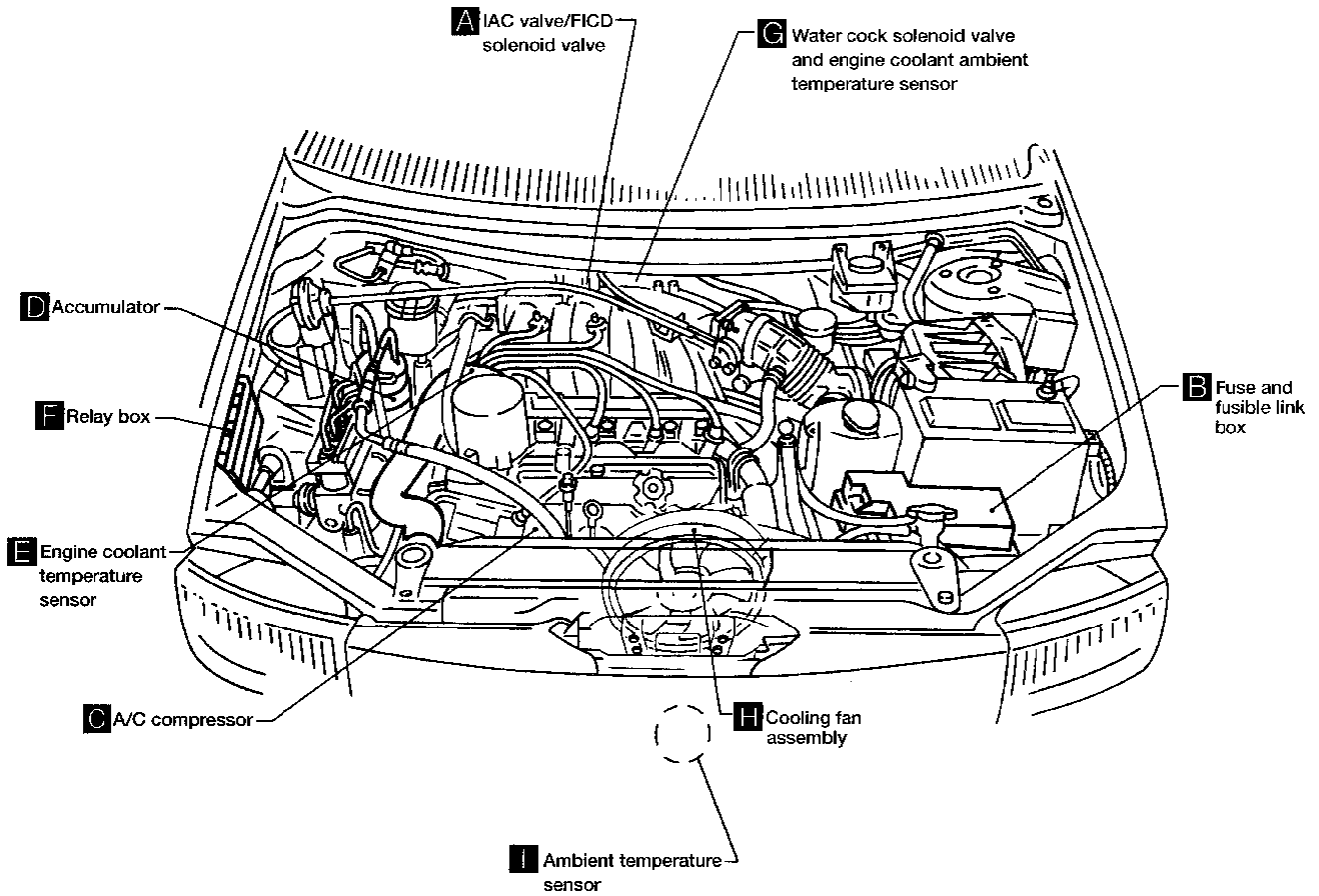
- Fixed orifice tube operation can be checked by touching the line on each side of the locating crimp. One side should be warm the other should be cold.
- If the compressor is repaired due to the noise or seizure, we recommend replacing the fixed orifice tube, accumulator, and (if equipped with rear A/C) the rear evaporator inlet filter.

Harness Layout

ENGINE COMPARTMENT



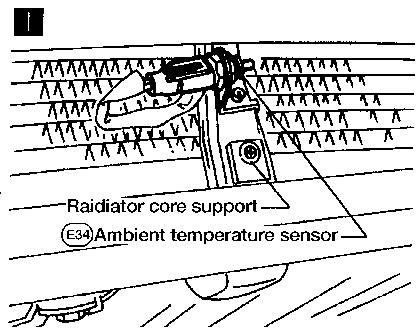
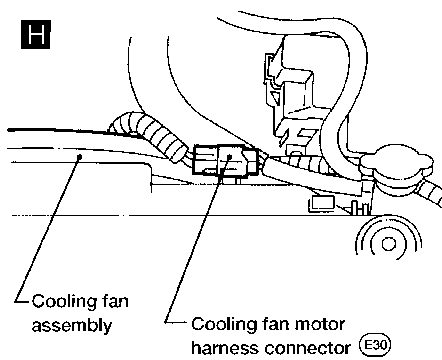
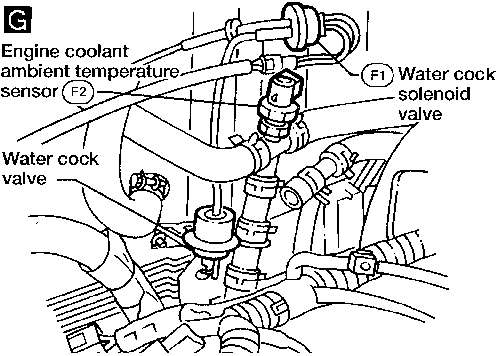
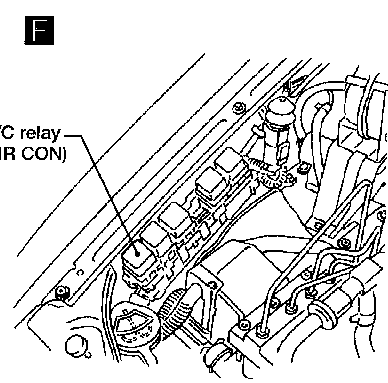
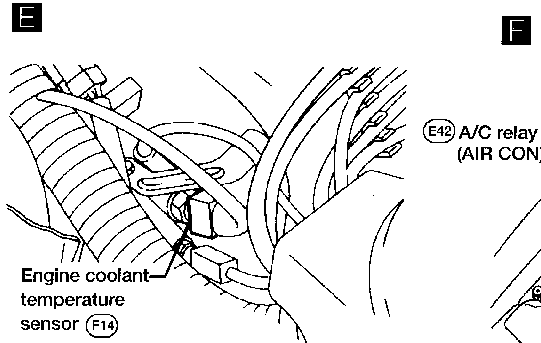
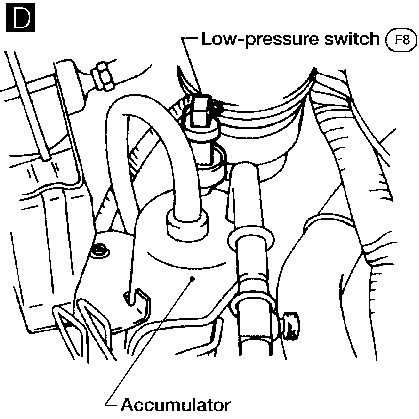
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# TROUBLE DIAGNOSES

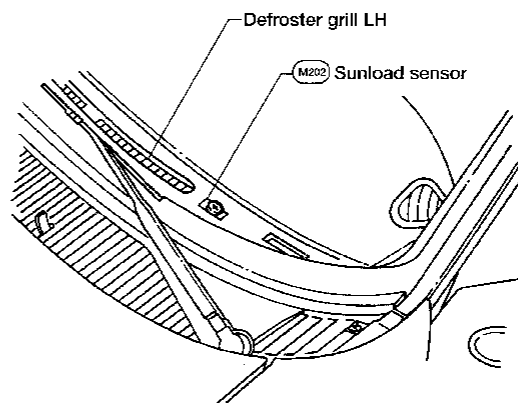
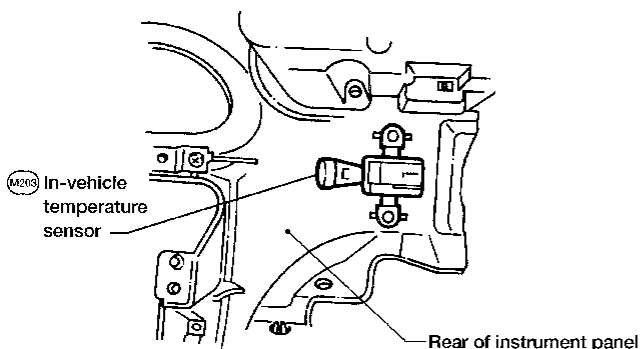
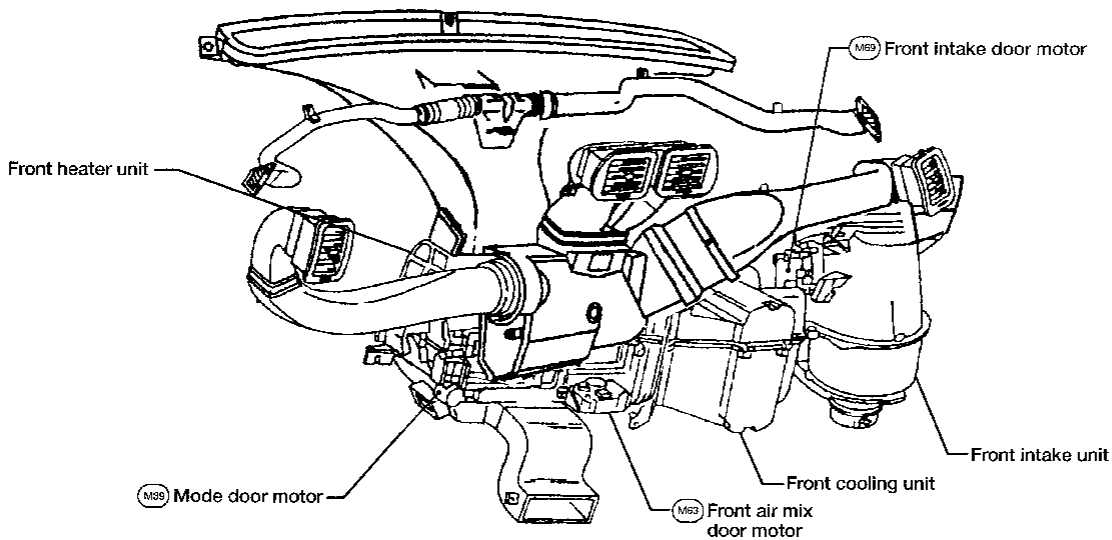
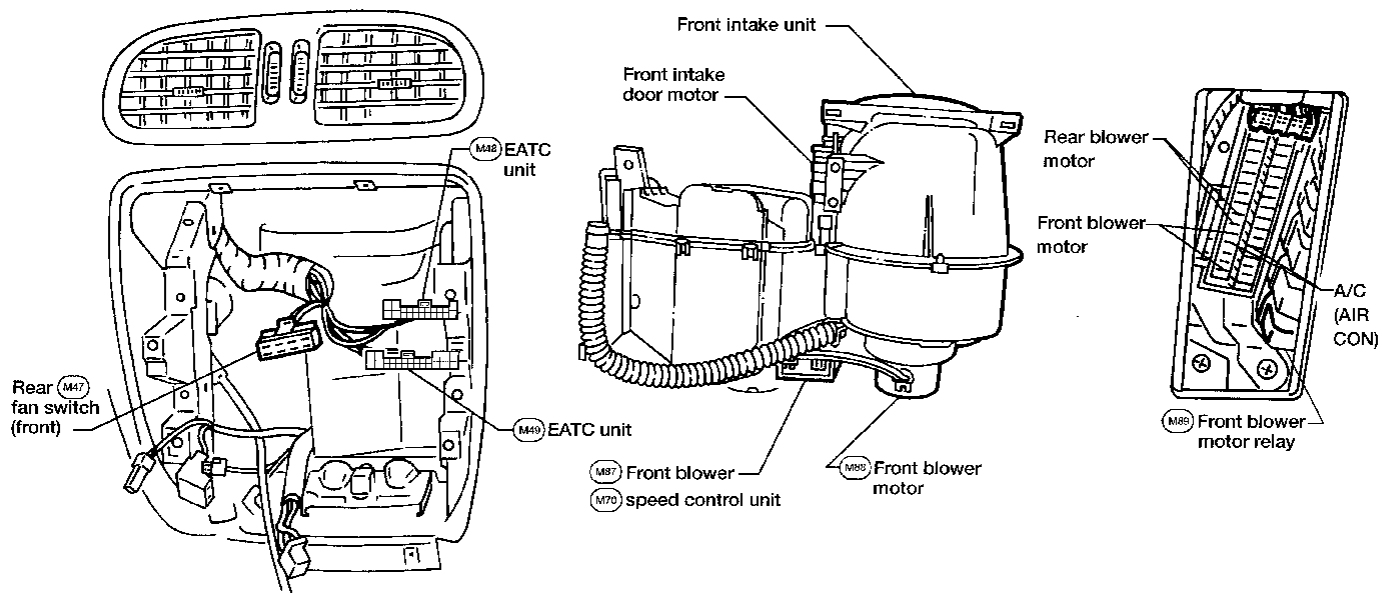
## Harness Layout (Cont'd)

AUTO



Harness Layout (Cont'd)

PASSENGER COMPARTMENT



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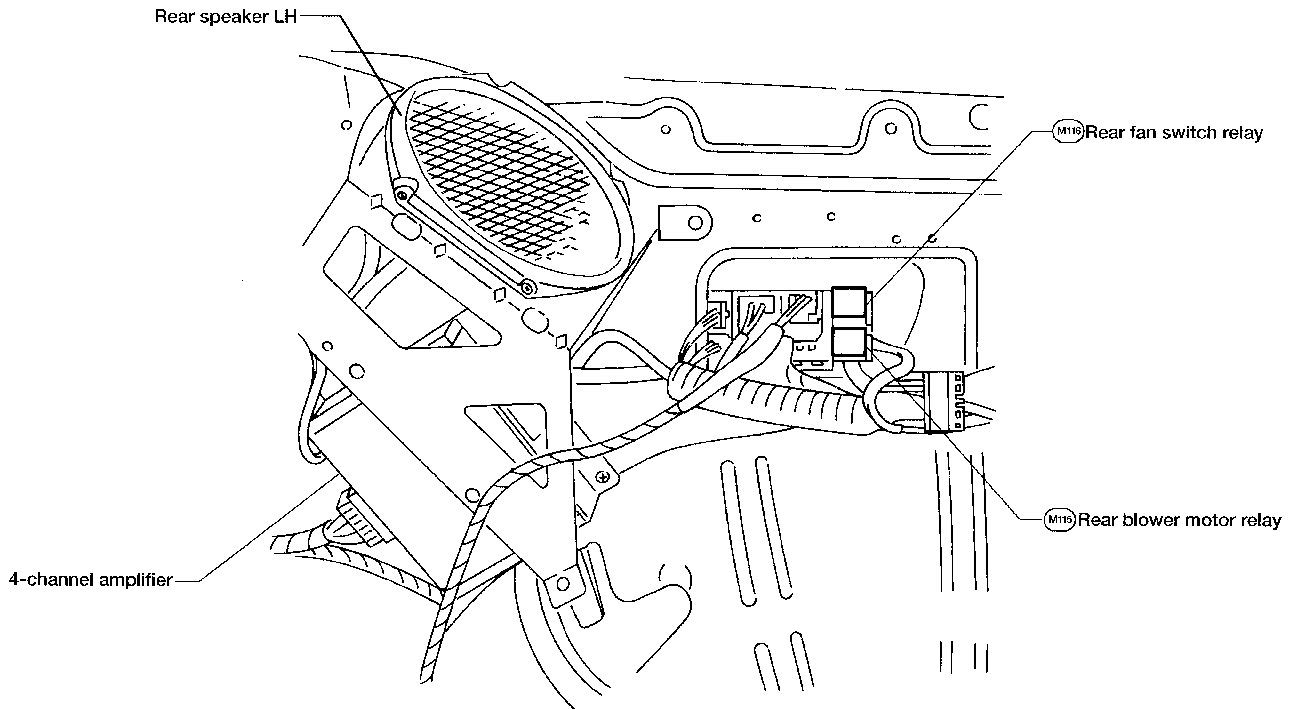
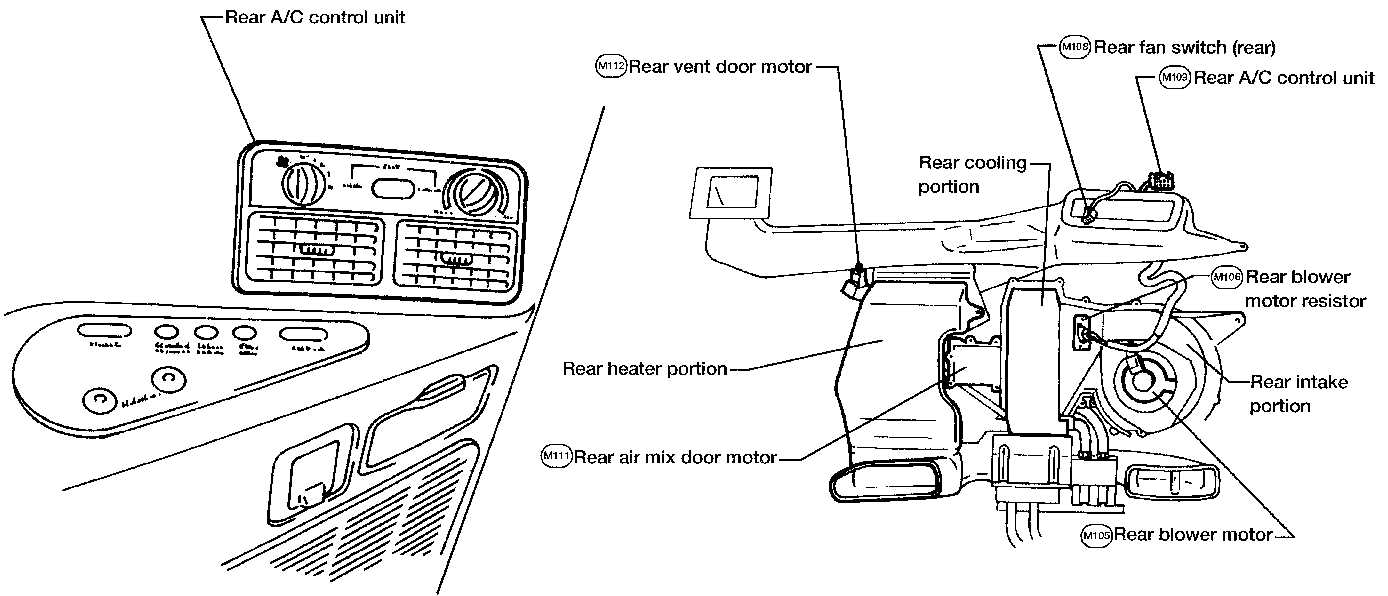
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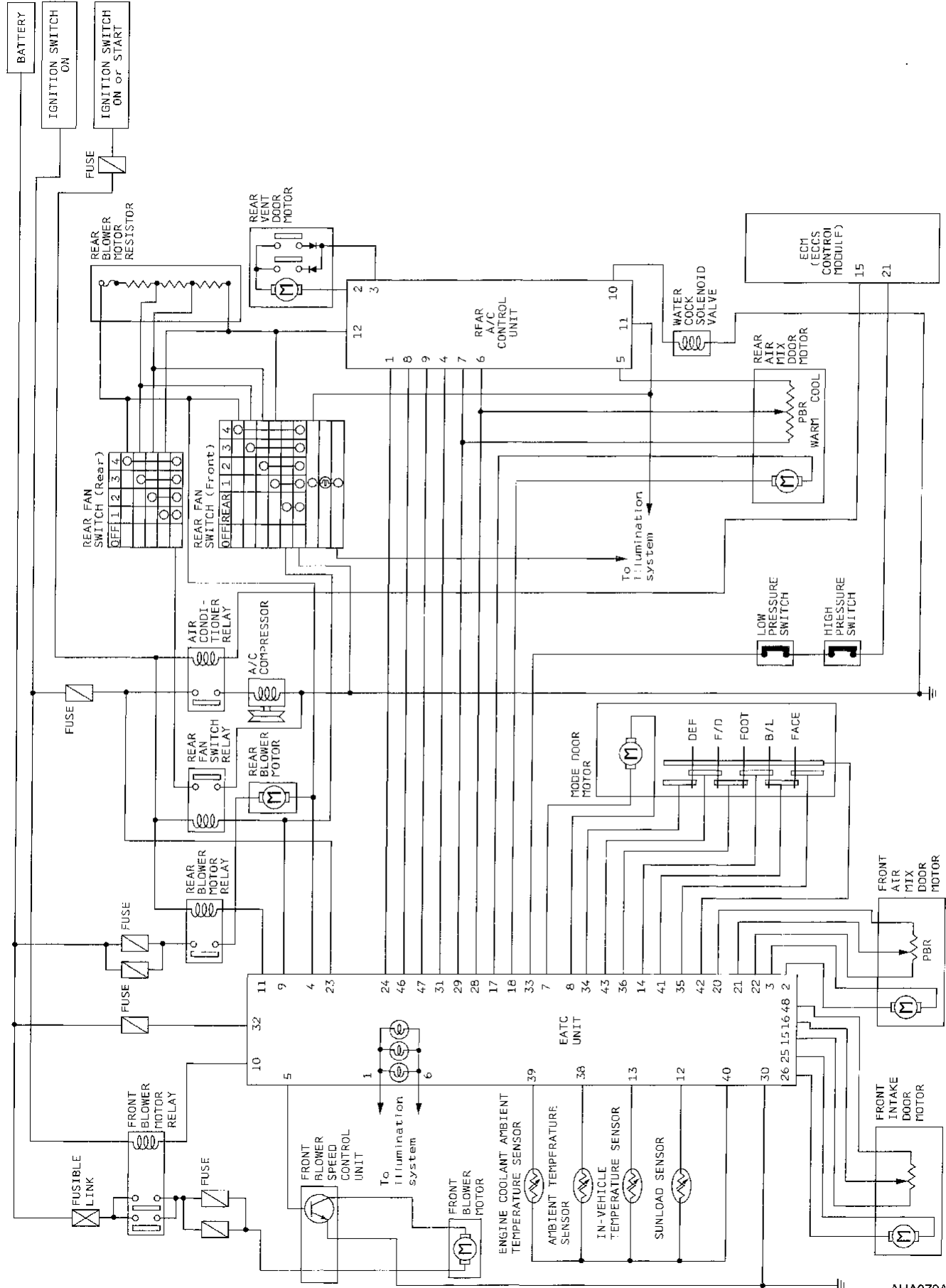
## Harness Layout (Cont'd)

AUTO

### Rear heating and A/C unit



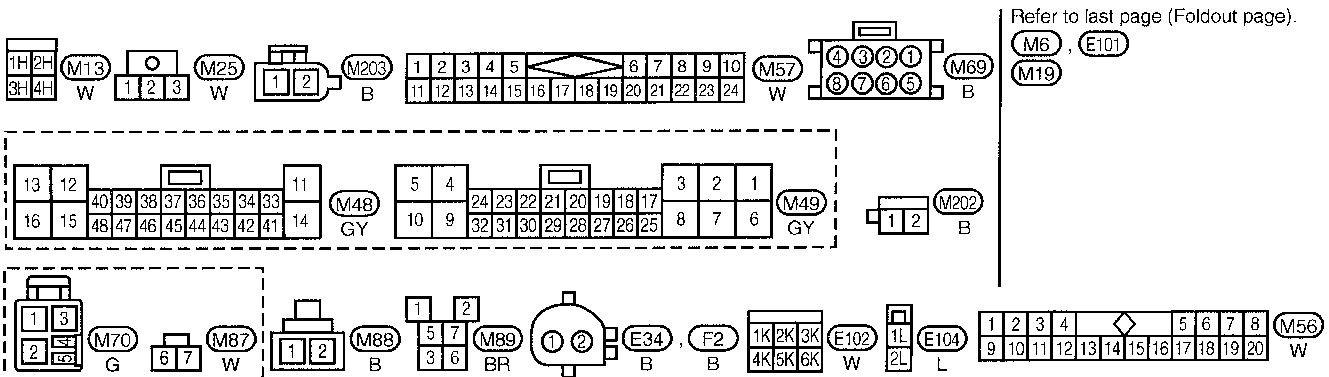
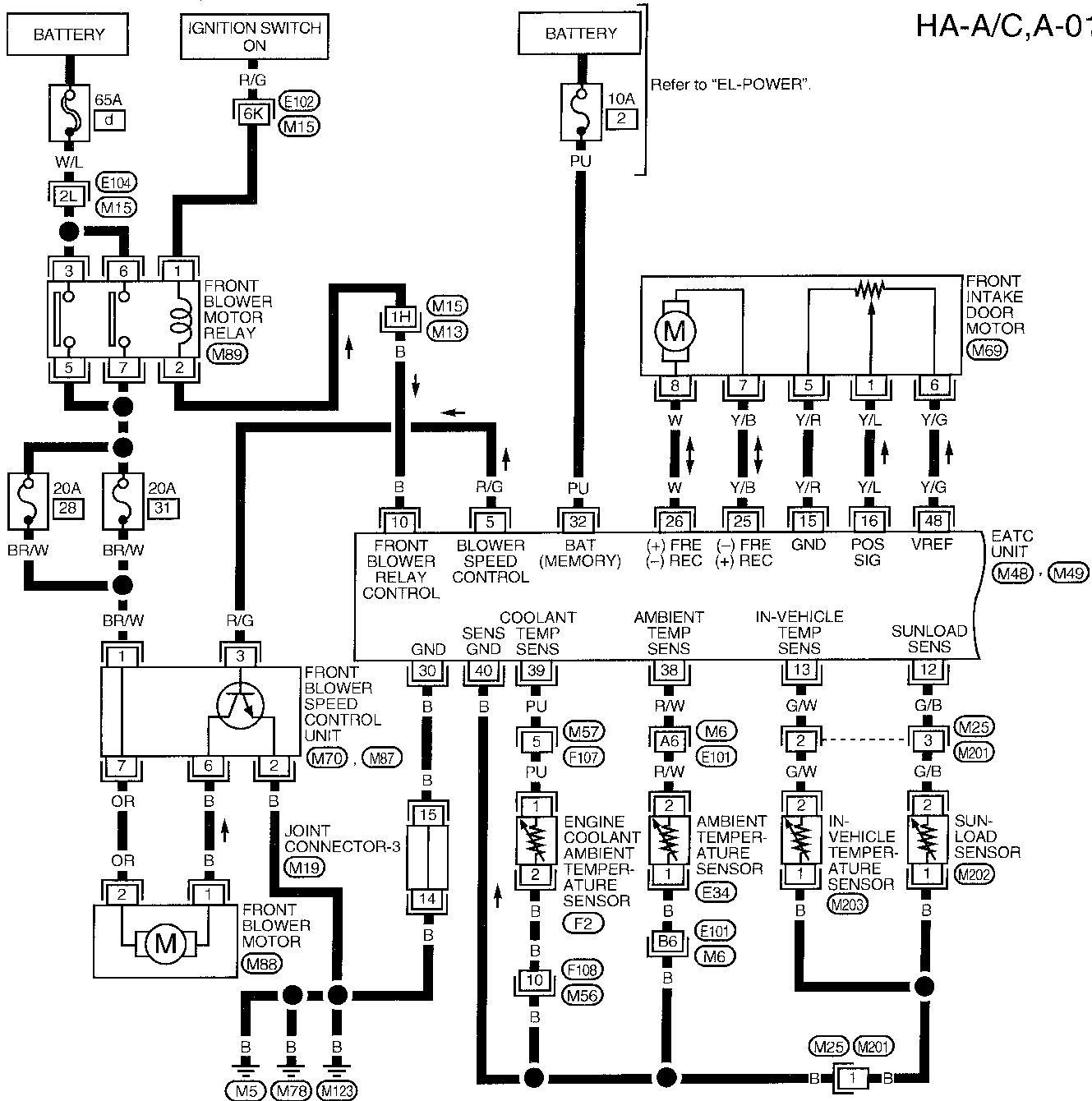
Circuit Diagram



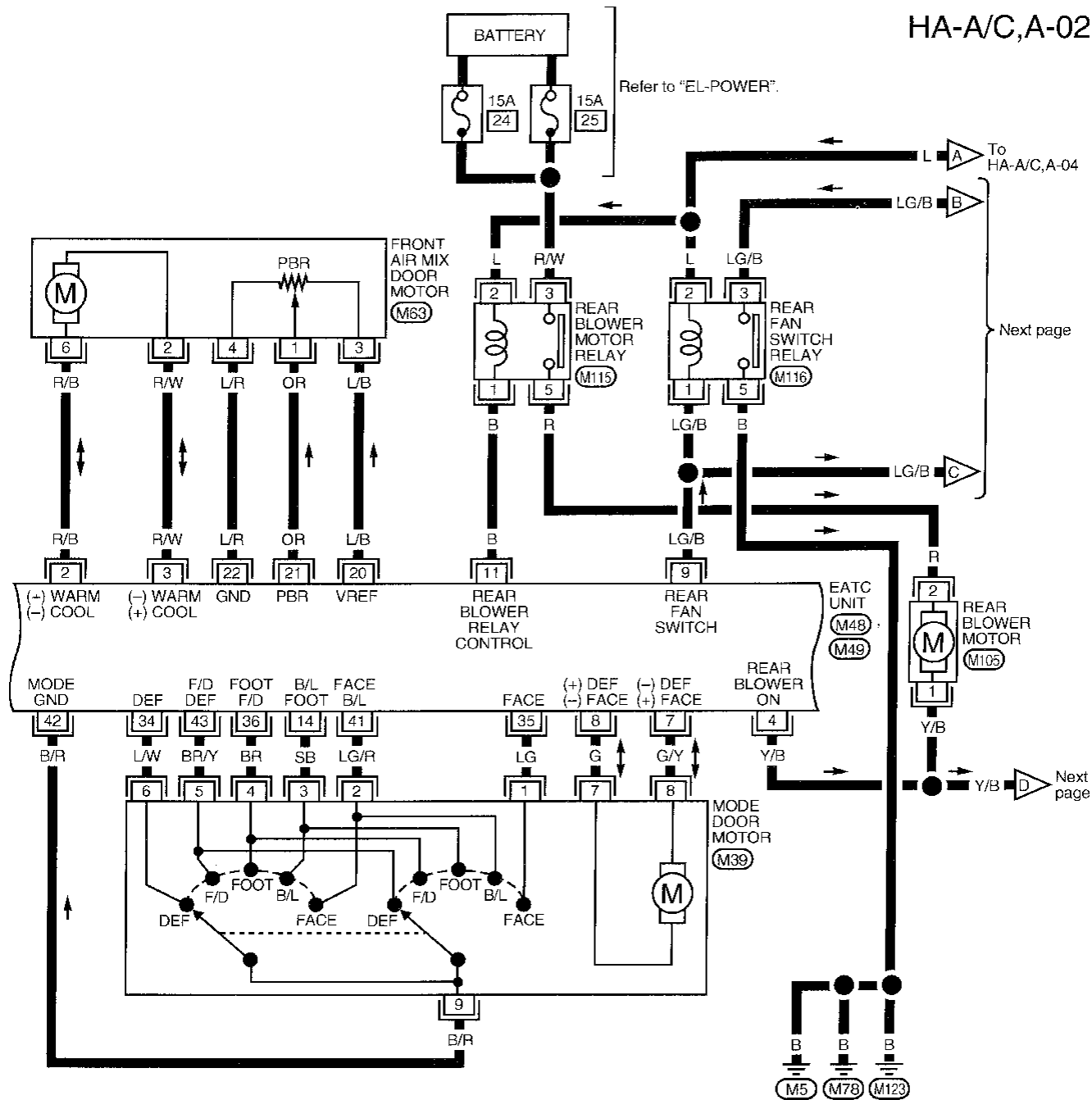
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Wiring Diagram -A/C, A-

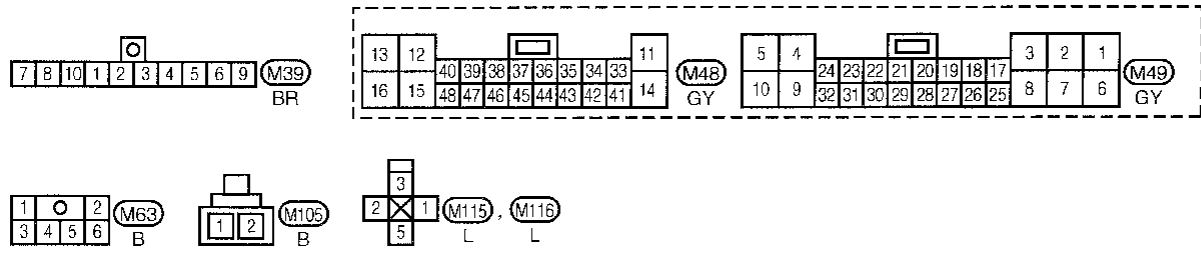
HA-A/C,A-01



Wiring Diagram -A/C, A- (Cont'd)



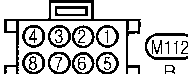
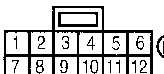
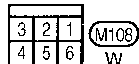
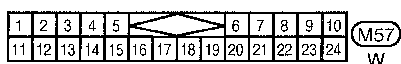
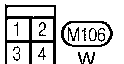
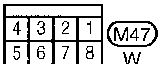
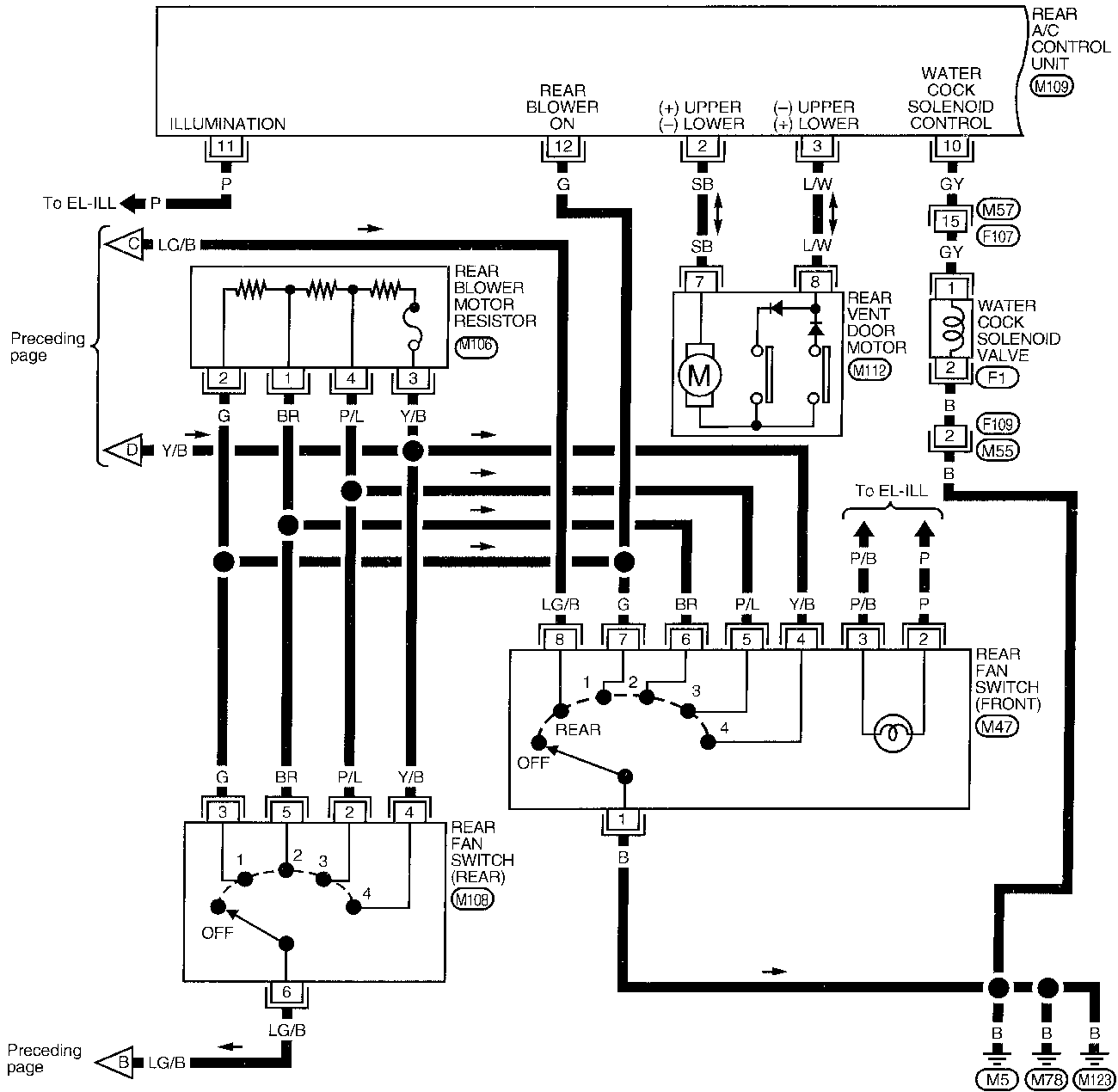
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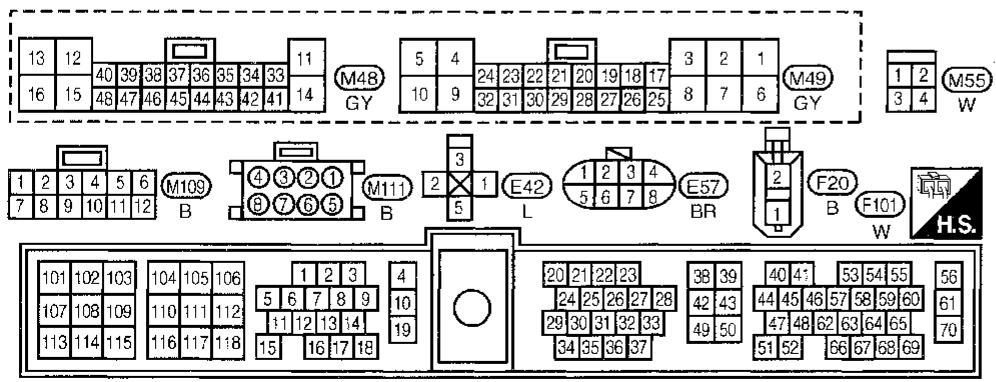
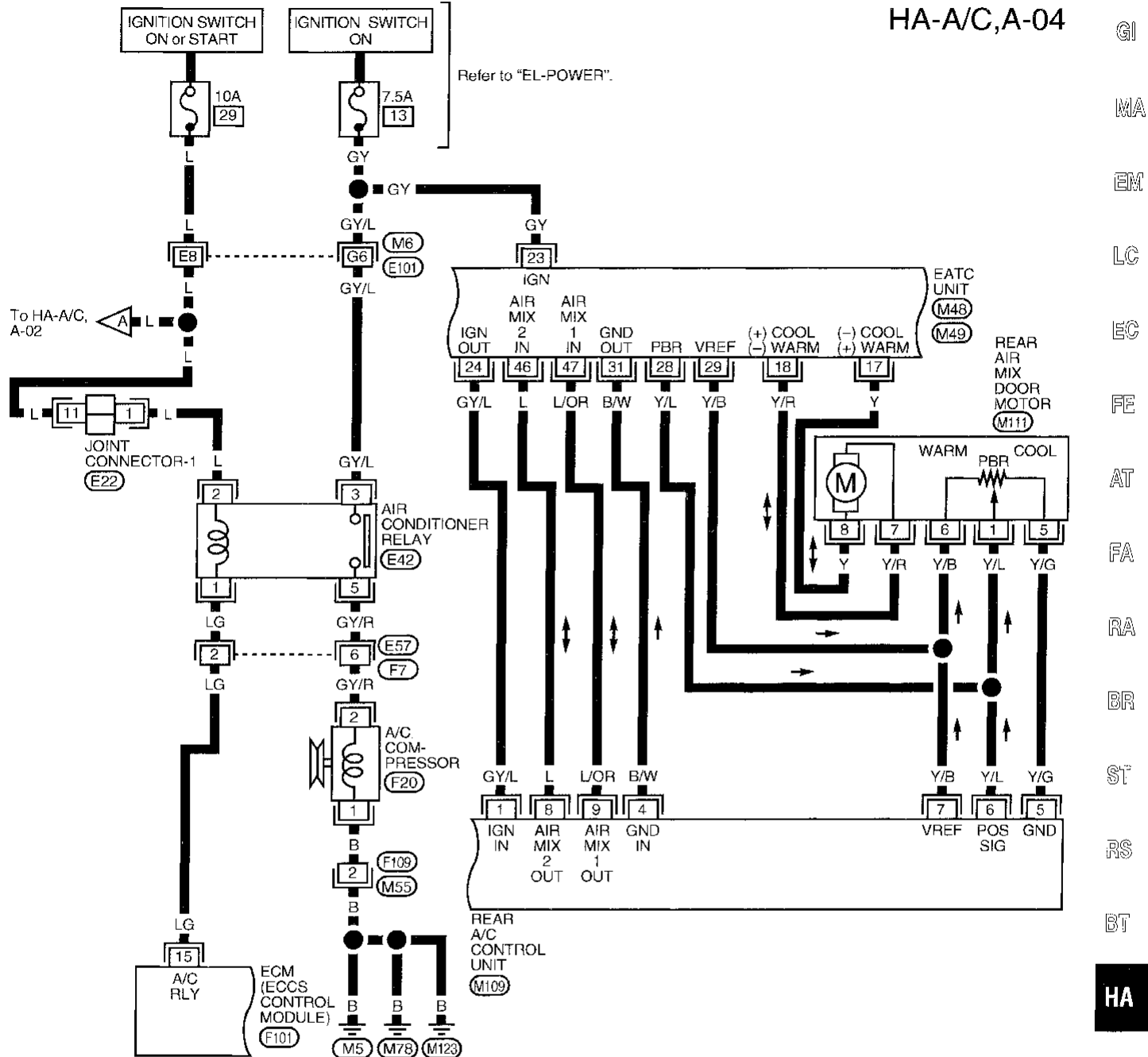
Wiring Diagram -A/C, A- (Cont'd)

HA-A/C,A-03



Wiring Diagram -A/C, A- (Cont'd)

HA-A/C,A-04



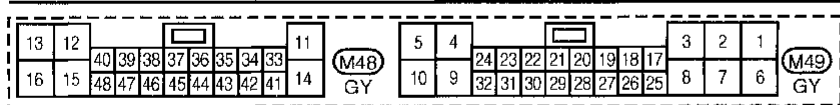
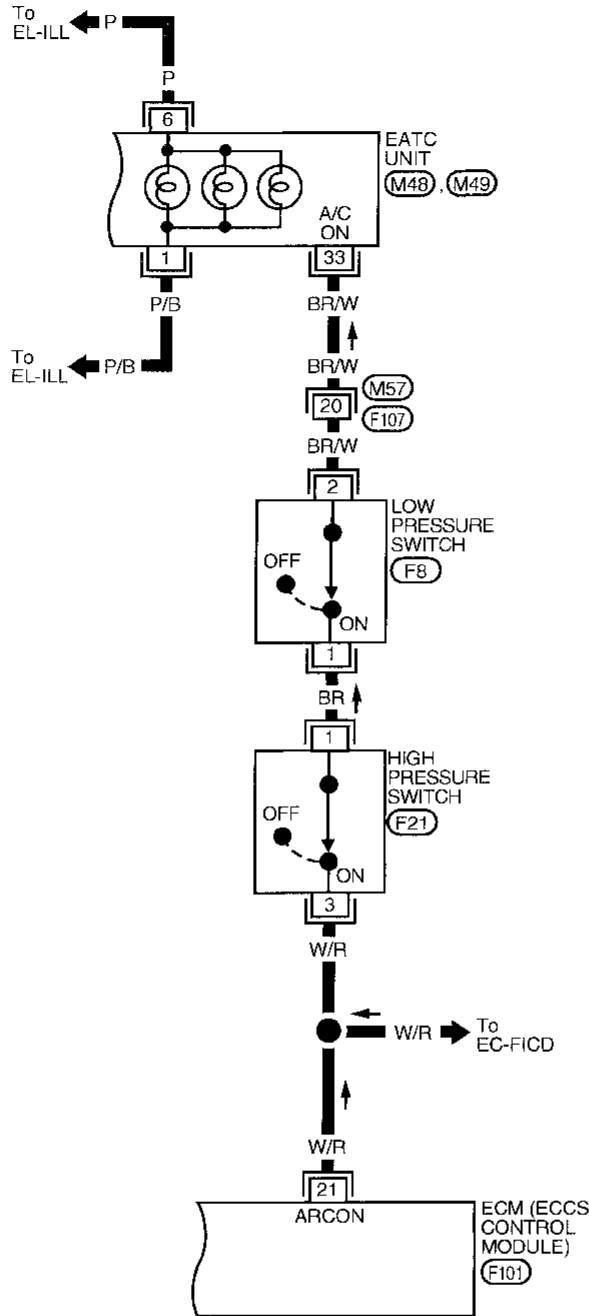
Refer to last page (Foldout page).

M6, E101, E22

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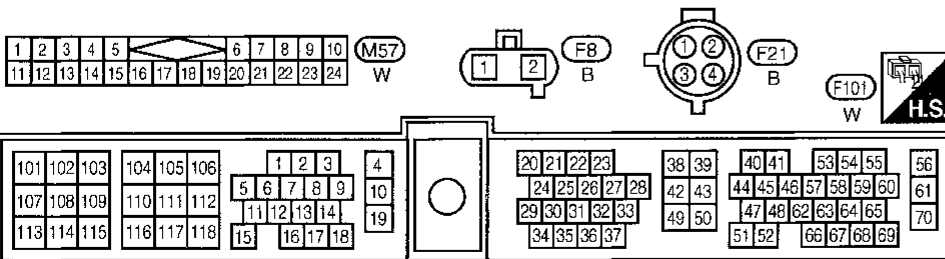
Wiring Diagram -A/C, A- (Cont'd)

HA-A/C,A-05



Refer to last page (Foldout page).

(M6) (E101)



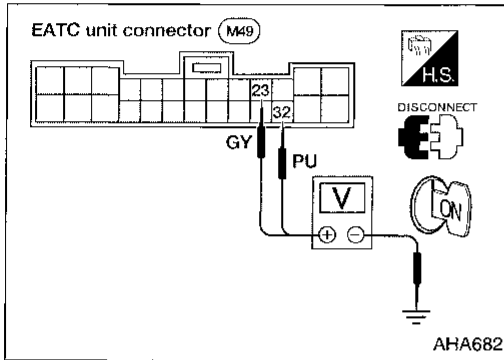
**Main Power Supply and Ground Circuit Check**

**POWER SUPPLY CIRCUIT CHECK FOR AUTO A/C SYSTEM**

Check power supply circuit for auto air conditioner system.

Refer to EL section (“Wiring Diagram”, “POWER SUPPLY ROUTING”) and HA-94.

GI  
MA  
EM



**EATC UNIT CHECK**

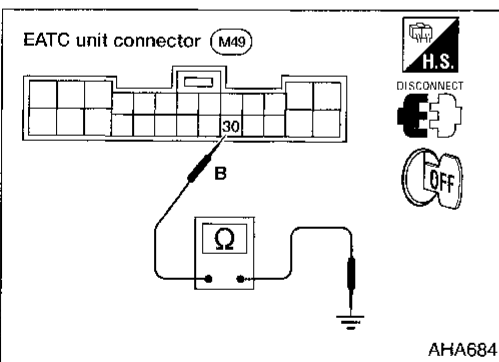
Check power supply circuit for EATC unit with ignition switch ON.

1. Disconnect EATC unit harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ②③, ③② and body ground.

LC  
EC  
FE

Voltmeter terminal		Voltage
⊕	⊖	
②③	Body ground	Approx. 12V
③②		

AT  
FA  
RA



Check body ground circuit for EATC unit with ignition switch OFF.

1. Disconnect EATC unit harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ③① and body ground.

RS  
BT

Ohmmeter terminal		Continuity
⊕	⊖	
③①	Body ground	Yes

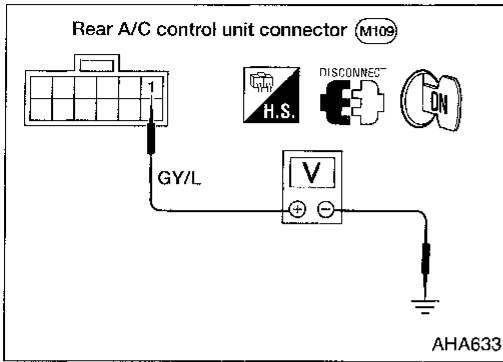
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EL  
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**Main Power Supply and Ground Circuit Check (Cont'd)**

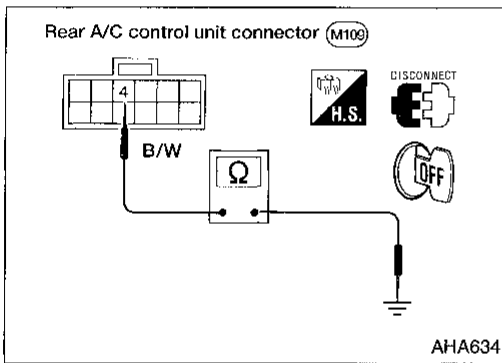
**REAR A/C CONTROL UNIT CHECK**

Check power supply circuit for rear A/C control unit with ignition switch ON.

1. Disconnect rear A/C control unit harness connector.
2. Connect voltmeter from harness side.
3. Measure voltage across terminal No. ① and body ground.



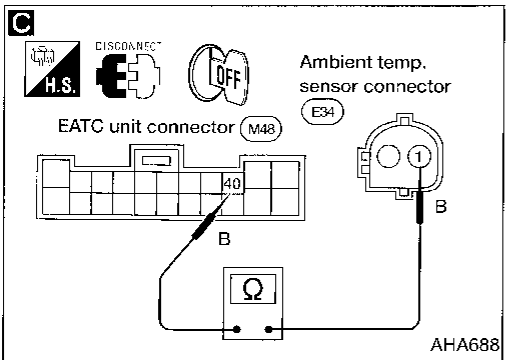
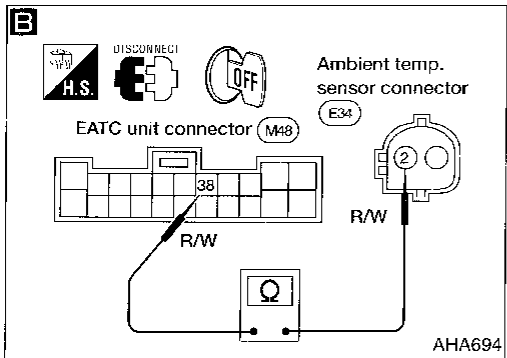
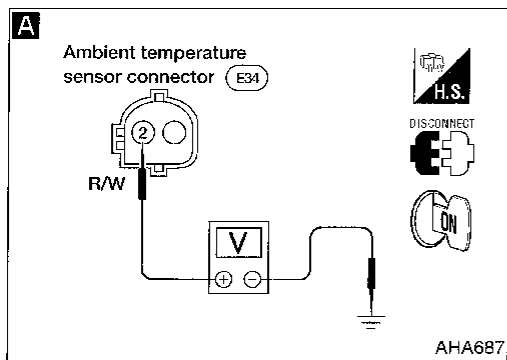
Voltmeter terminal		Voltage
⊕	⊖	
①	Body ground	Approx. 12V



Check body ground circuit for rear A/C control unit with ignition switch OFF.

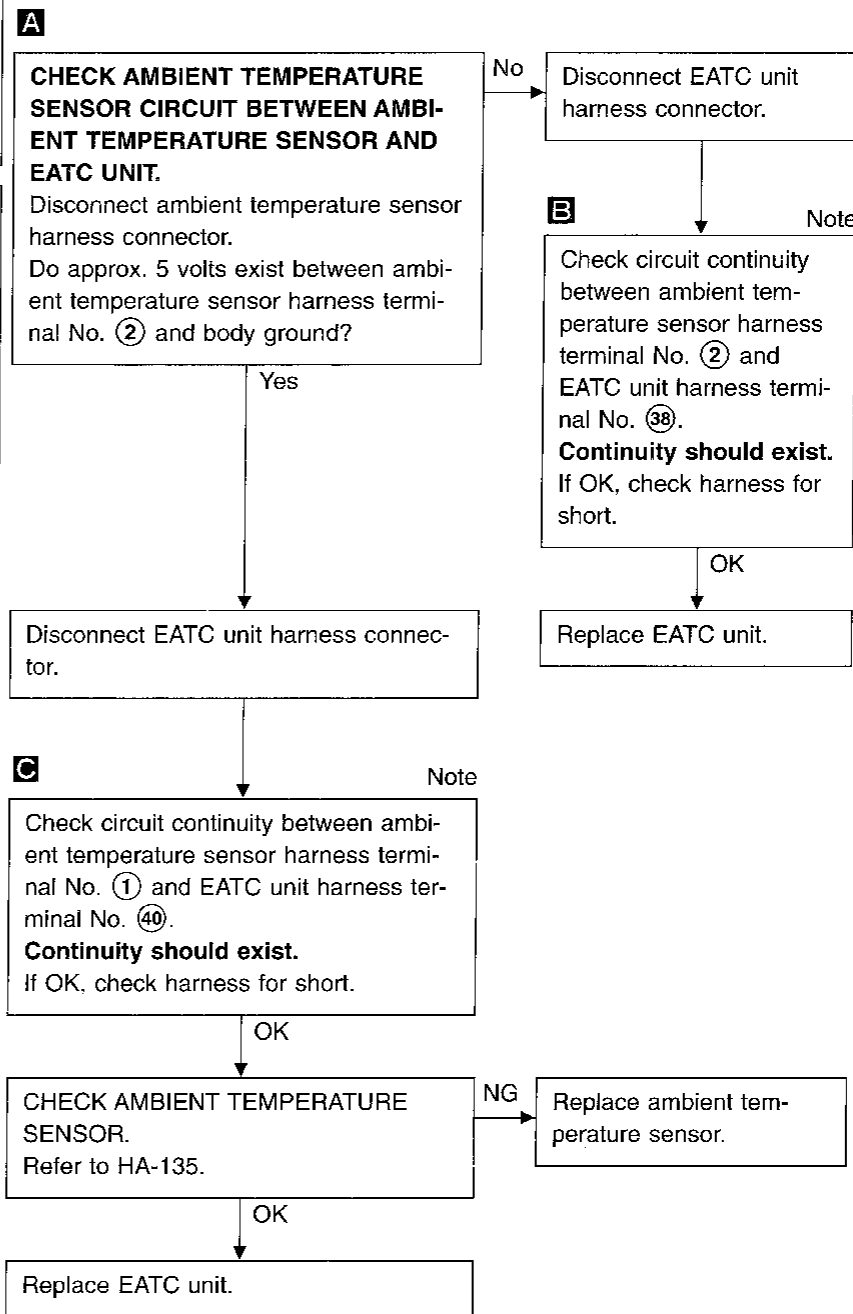
1. Disconnect rear A/C control unit harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ④ and body ground.

Ohmmeter terminal		Continuity
⊕	⊖	
④	Body ground	Yes

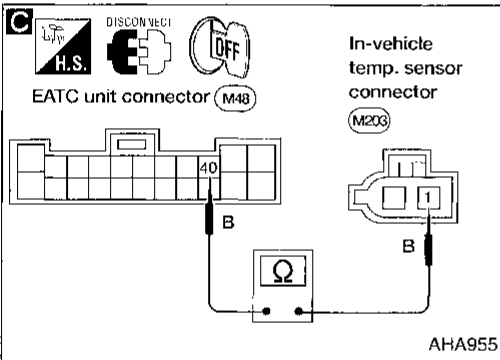
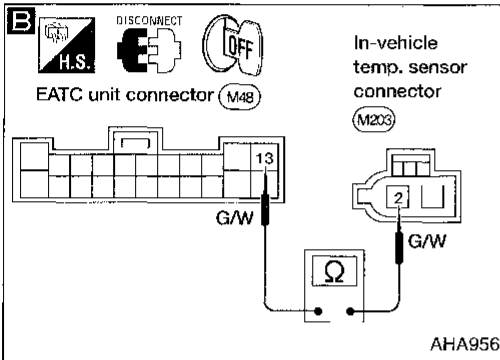
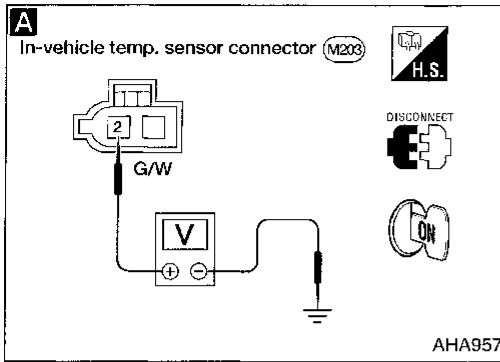


### Diagnostic Procedure 1

**SYMPTOM: Ambient temperature sensor circuit is open or shorted. (40, 41, 42, or 43 is indicated on the EATC unit as a result of conducting Self-diagnosis.)**

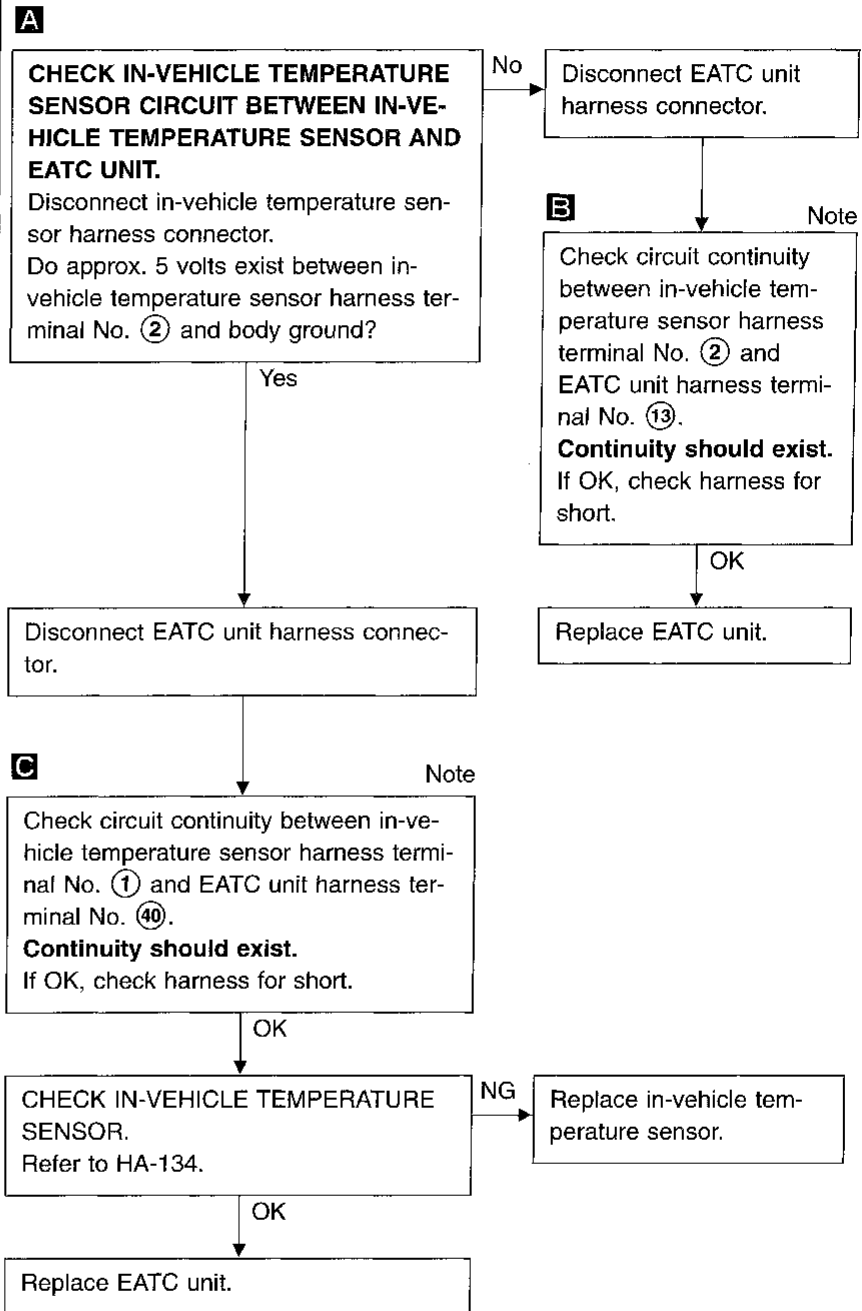


**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.

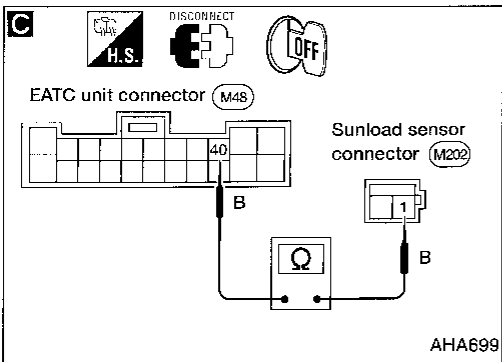
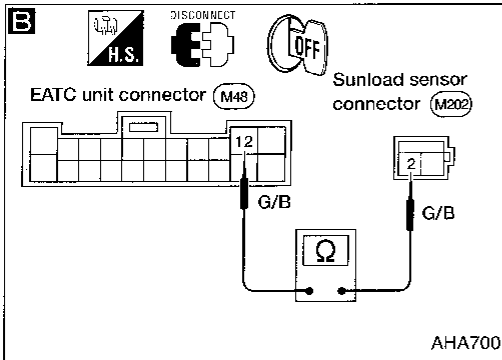
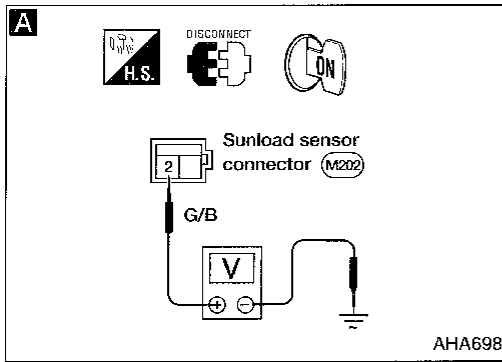


## Diagnostic Procedure 2

**SYMPTOM:** In-vehicle temperature sensor circuit is open or shorted. ( 30 or 31 is indicated on the EATC unit as a result of conducting Self-diagnosis.)



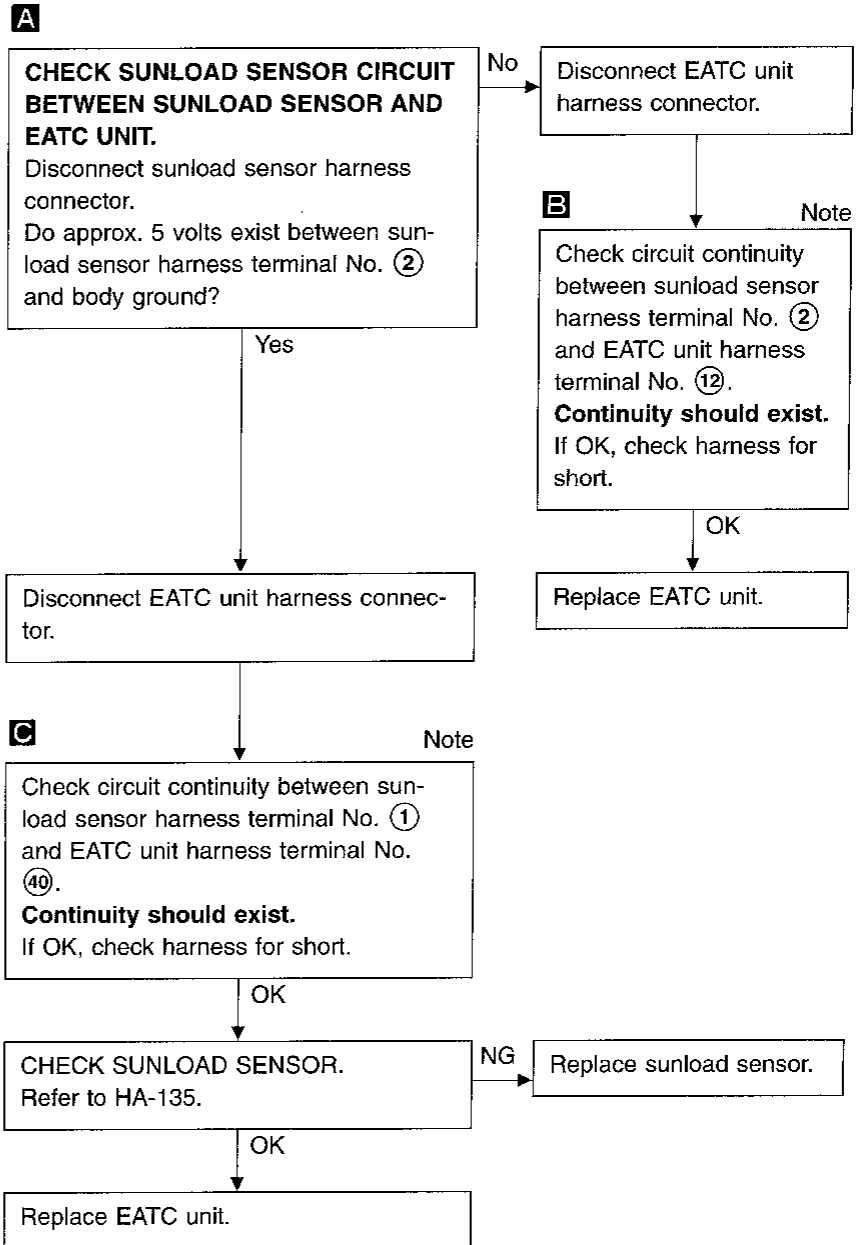
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.



### Diagnostic Procedure 3

**SYMPTOM:** Sunload sensor circuit is shorted.

(5B or 52 is indicated on the EATC unit as a result of conducting Self-diagnosis.)



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

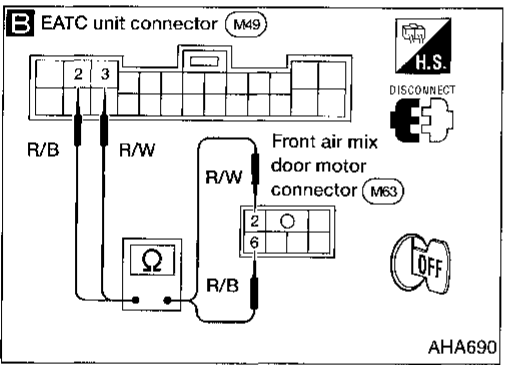
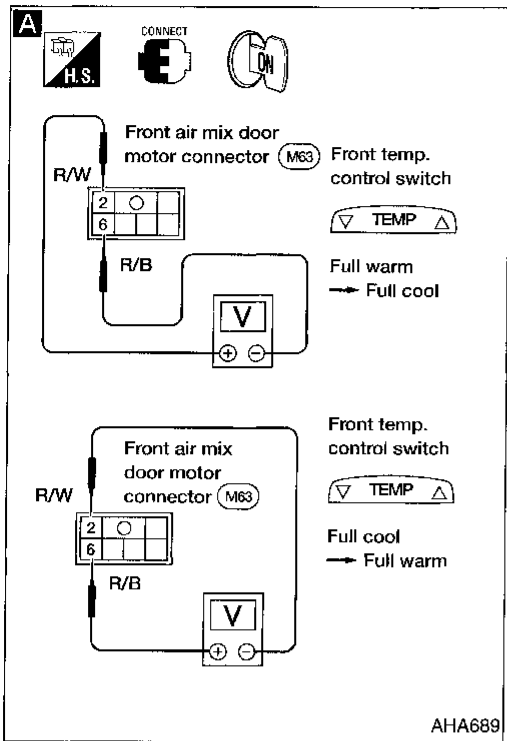
GI  
MA  
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HA  
EL  
IDX



**Diagnostic Procedure 4**

**SYMPTOM:** Front air mix door motor does not operate normally. (20, 22, or 28 is indicated on the EATC unit as a result of conducting Self-diagnosis.)

- Perform **PRELIMINARY CHECK 1** before referring to the following flow chart.



IS PBR OPERATING NORMALLY?  
Refer to Self-diagnosis, HA-77.

No → CHECK PBR CIRCUIT. Go to **Diagnostic Procedure 5**. Refer to HA-105.

Yes

**A**

**CHECK FOR OUTPUT OF EATC CONTROL UNIT.**  
Do approx. 10.5 volts exist between front air mix door motor harness terminals No. ② and ⑥ when you press front temp. control switch from full cool to full warm or when you press front temp. control switch from full warm to full cool?

Front temp control switch position	Terminal No.		Voltage V
	②	⑥	
Full cool → Full warm	⊖	⊕	Approx. 10.5
Full warm → Full cool	⊕	⊖	

No → Disconnect EATC unit and front air mix door motor harness connectors.

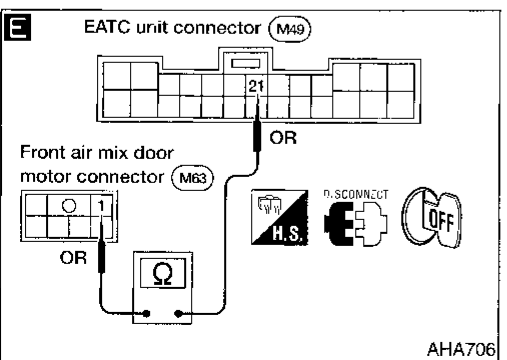
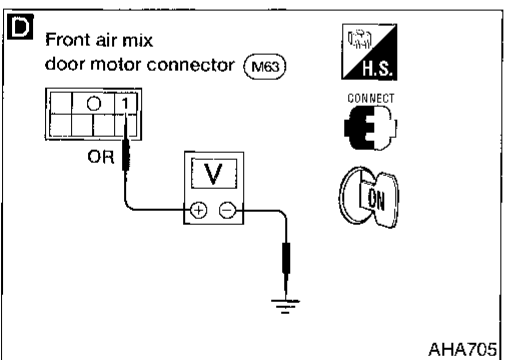
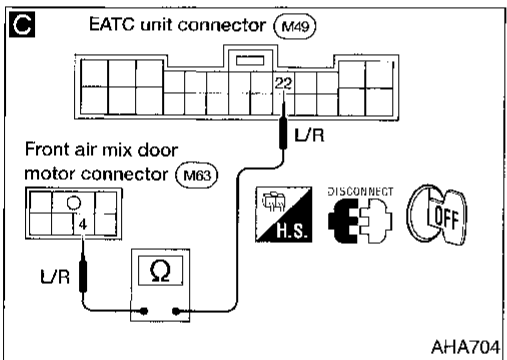
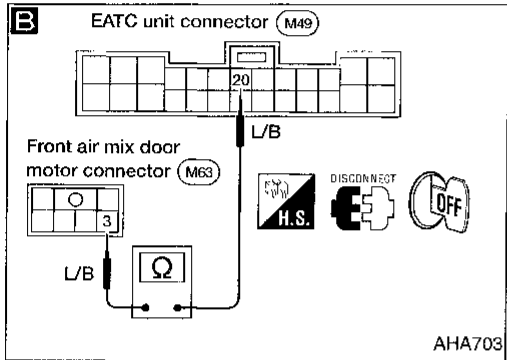
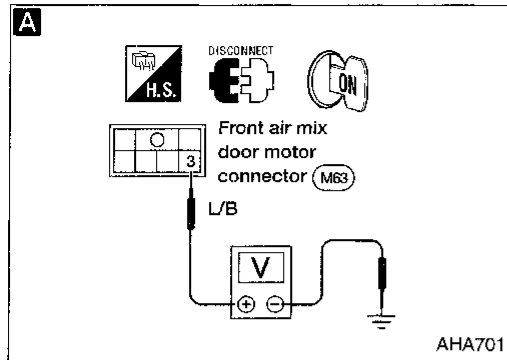
**B** Note

Check circuit continuity between EATC unit harness terminal No. ② (③) and front air mix door harness terminal No. ⑥ (②).  
**Continuity should exist.** If OK, check harness for short.

Yes → Replace front air mix door motor.

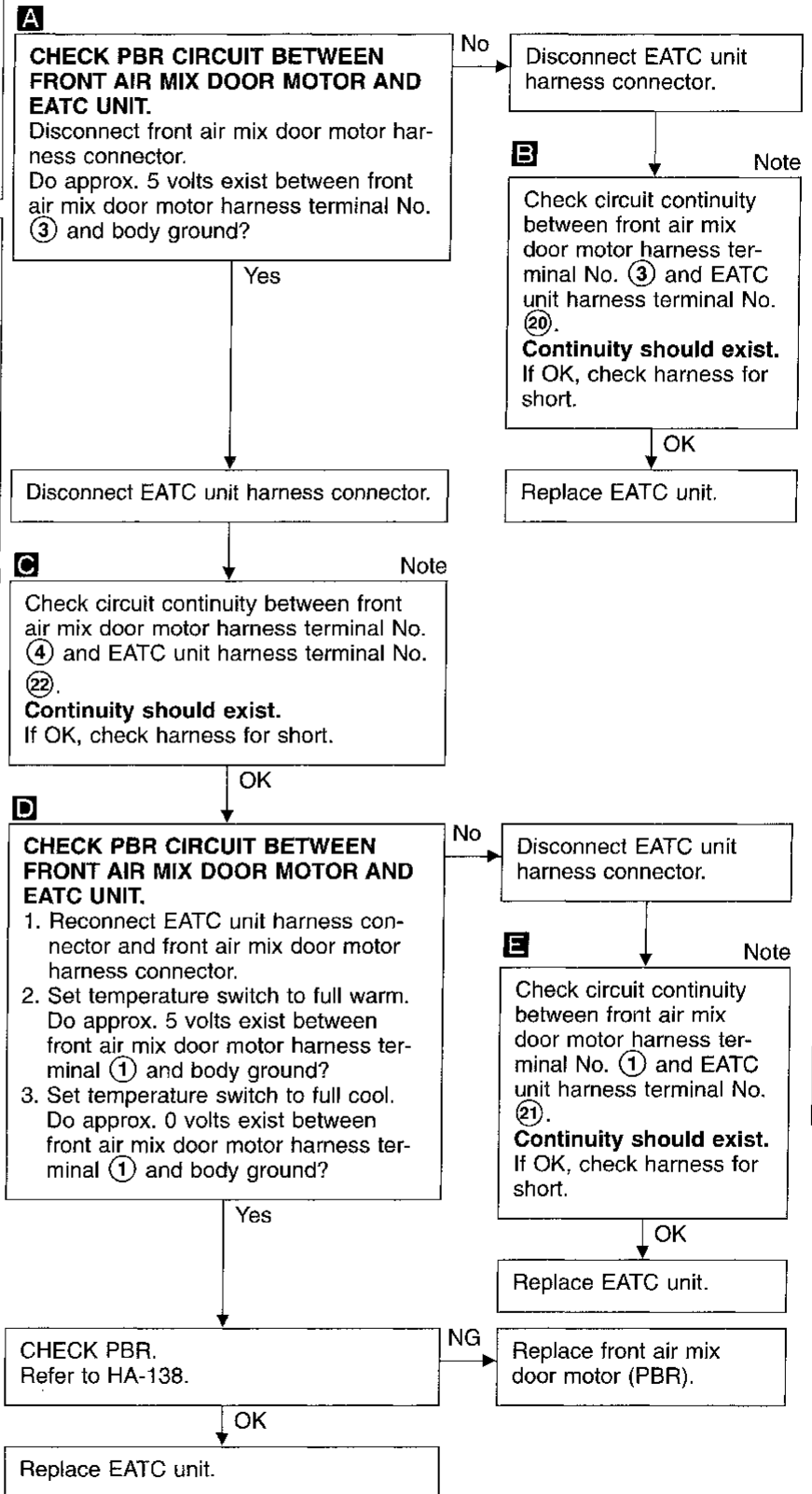
OK → Replace EATC unit.

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

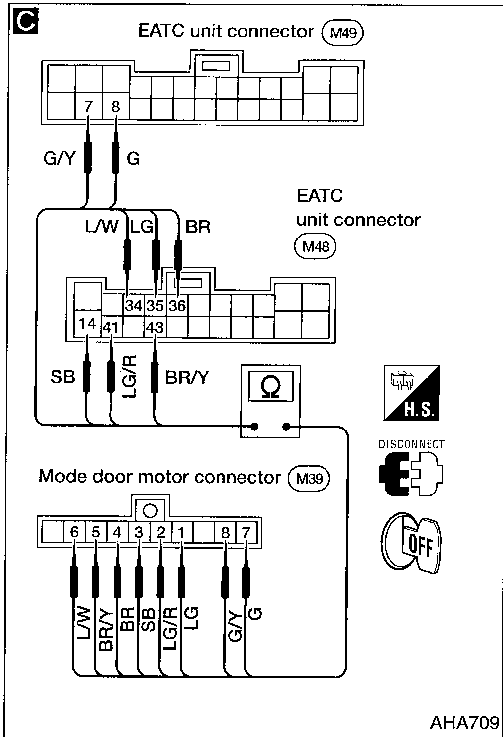
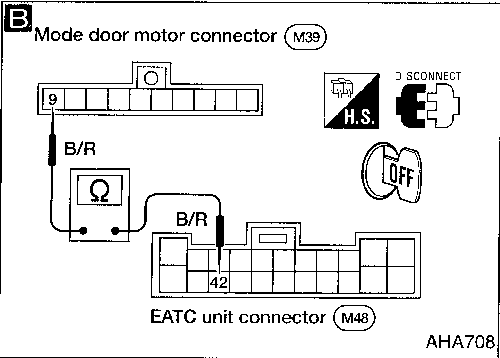
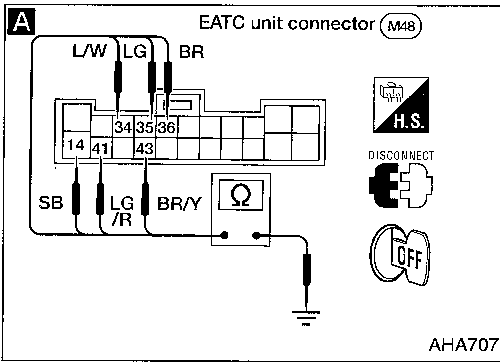


### Diagnostic Procedure 5

**SYMPTOM:** Front air mix door motor PBR circuit is open or shorted. ( 26 or 27 is indicated on the EATC unit as a result of conducting Self-diagnosis.)



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



### Diagnostic Procedure 6

**SYMPTOM: Mode door motor does not operate normally.**  
(90, 92 or 98 is indicated on the EATC unit as a result of conducting Self-diagnosis.)

- Perform **PRELIMINARY CHECK 6, Main Power Supply and Ground Circuit Check for EATC unit** before referring to the following flow chart.

**A**

**CHECK MODE DOOR MOTOR POSITION SWITCH.**

1. Press FACE switch ON with ignition switch at ON position.
2. Turn ignition switch OFF.  
Disconnect EATC unit connector.
3. Check if continuity exists between terminal No. ③⑤ or ④① of EATC 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
	⊕	⊖	
FACE	③⑤ or ④①	Body ground	Yes
B/L	①④ or ④①		
FOOT	①④ or ③⑥		
F/D	③⑥ or ④③		
DEF	③④ or ④③		

NG → Disconnect mode door motor harness connector.

**B** Note

**CHECK BODY GROUND CIRCUIT FOR MODE DOOR MOTOR.**  
Check circuit continuity between mode door motor harness terminal No. ⑨ and EATC unit harness terminal No. ④②.  
**Continuity should exist.**  
If OK, check harness for short.

OK → **C** Note

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

Terminal No.		Continuity
⊕	⊖	
EATC unit	Mode door motor	Yes
③⑤	①	
④①	②	
①④	③	
③⑥	④	
④③	⑤	
③④	⑥	
⑧	⑦	
⑦	⑧	

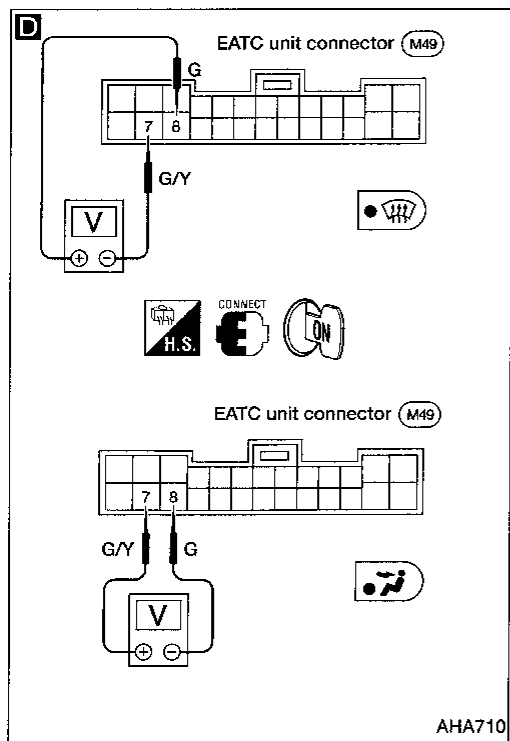
If OK, check harness for short.

OK → CHECK CONTROL LINKAGE ADJUSTMENT.  
Refer to HA-131.

OK → **A**  
(Go to next page.)

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

Diagnostic Procedure 6 (Cont'd)



A

Reconnect EATC unit and mode door motor harness connectors.

D

**CHECK FOR OUTPUT OF EATC UNIT.**  
Do approx. 12 volts exist between EATC unit harness terminal No. ⑦ and ⑧ when mode is switched from FACE to DEF or when mode is switched from DEF to FACE?

No → Replace EATC unit.

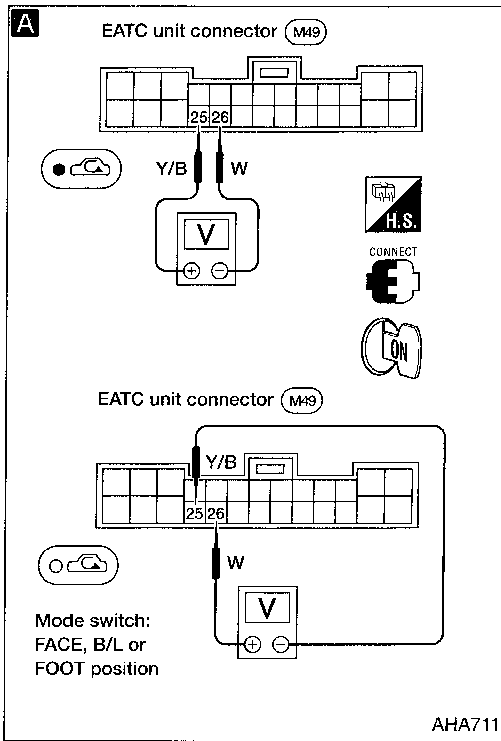
Terminal No.		Mode door motor	
⑦	⑧	Mode door operation	Direction of linkage rotation
⊖	⊖	Stop	Stop
⊖	⊕	FACE → DEF	Counterclockwise
⊕	⊖	DEF → FACE	Clockwise

Yes → Replace mode door motor.

GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA  
EL  
IDX

### Diagnostic Procedure 7

**SYMPTOM: Front intake door motor does not operate normally. ( 80, 82 or 88 is indicated on the EATC unit as a result of conducting Self-diagnosis.)**



IS PBR OPERATING NORMALLY?  
Refer to Self-diagnosis, HA-77.

No → CHECK PBR CIRCUIT. Go to Diagnostic Procedure 8. Refer to HA-109.

Yes ↓

**A**

**CHECK FOR OUTPUT OF EATC CONTROL UNIT.**  
Do approx. 12 volts exist between EATC unit harness terminals No. (25) and (26) when you turn REC switch ON or OFF?

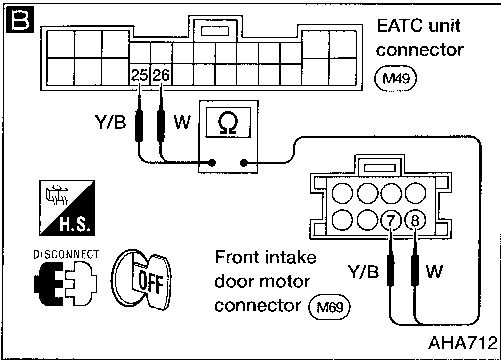
No → Disconnect EATC unit and front intake door motor harness connectors.

REC switch position	Terminal No.		Voltage V
	(25)	(26)	
ON	⊕	⊖	Approx. 12
OFF	⊖	⊕	

**B** Note

Check circuit continuity between EATC unit harness terminal No. (25) (26) and front intake door motor harness terminal No. (7) (8). **Continuity should exist.** If OK, check harness for short.

OK ↓



Yes ↓

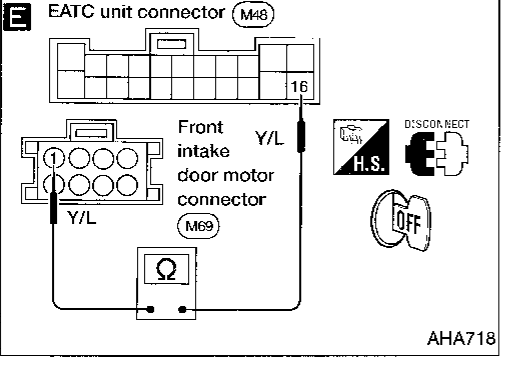
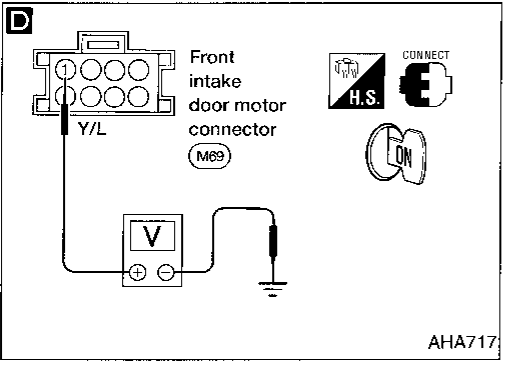
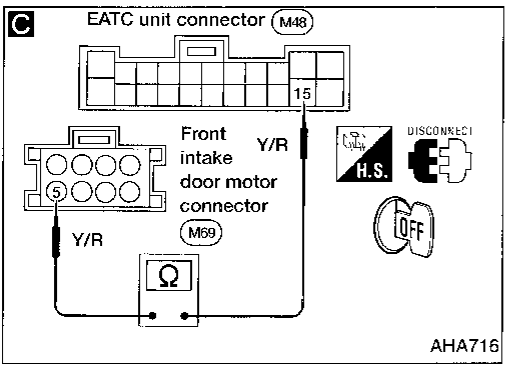
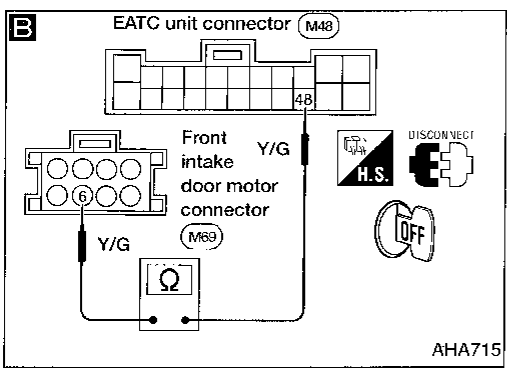
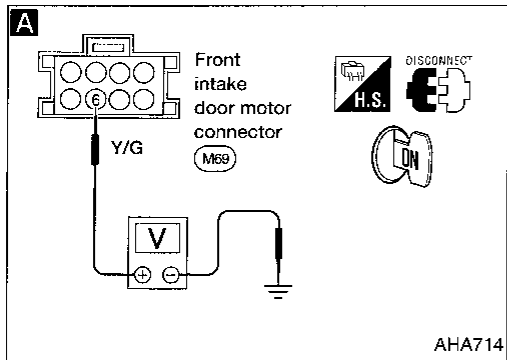
Replace front intake door motor.

Replace EATC unit.

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

### Diagnostic Procedure 8

**SYMPTOM: Front intake door motor PBR circuit is open or shorted. ( 86 or 87 is indicated on the EATC unit as a result of conducting Self-diagnosis.)**



**A** CHECK PBR CIRCUIT BETWEEN FRONT INTAKE DOOR MOTOR AND EATC UNIT.  
Disconnect front intake door motor harness connector.  
Do approx. 5 volts exist between front intake door motor harness terminal No. ⑥ and body ground?

No → Disconnect EATC unit harness connector.

Yes → Disconnect EATC unit harness connector.

**B** Check circuit continuity between front intake door motor harness terminal No. ⑥ and EATC unit harness terminal No. ④⑧.  
**Continuity should exist.**  
If OK, check harness for short.  
OK → Replace EATC unit.

**C** Check circuit continuity between front intake door motor harness terminal No. ⑤ and EATC unit harness terminal No. ①⑤.  
**Continuity should exist.**  
If OK, check harness for short.  
OK →

**D** CHECK PBR CIRCUIT BETWEEN FRONT INTAKE DOOR MOTOR AND EATC UNIT.  
1. Reconnect EATC unit harness connector and front intake door motor harness connector.  
2. Press REC switch ON.  
Do approx. 5 volts exist between front intake door motor harness terminal No. ① and body ground?  
3. Press REC switch OFF.  
Do approx. 0 volts exist between front intake door motor harness terminal No. ① and body ground?

No → Disconnect EATC unit harness connector.

Yes → CHECK PBR. Refer to HA-142.  
OK → Replace EATC unit.  
NG → Replace front intake door motor (PBR).

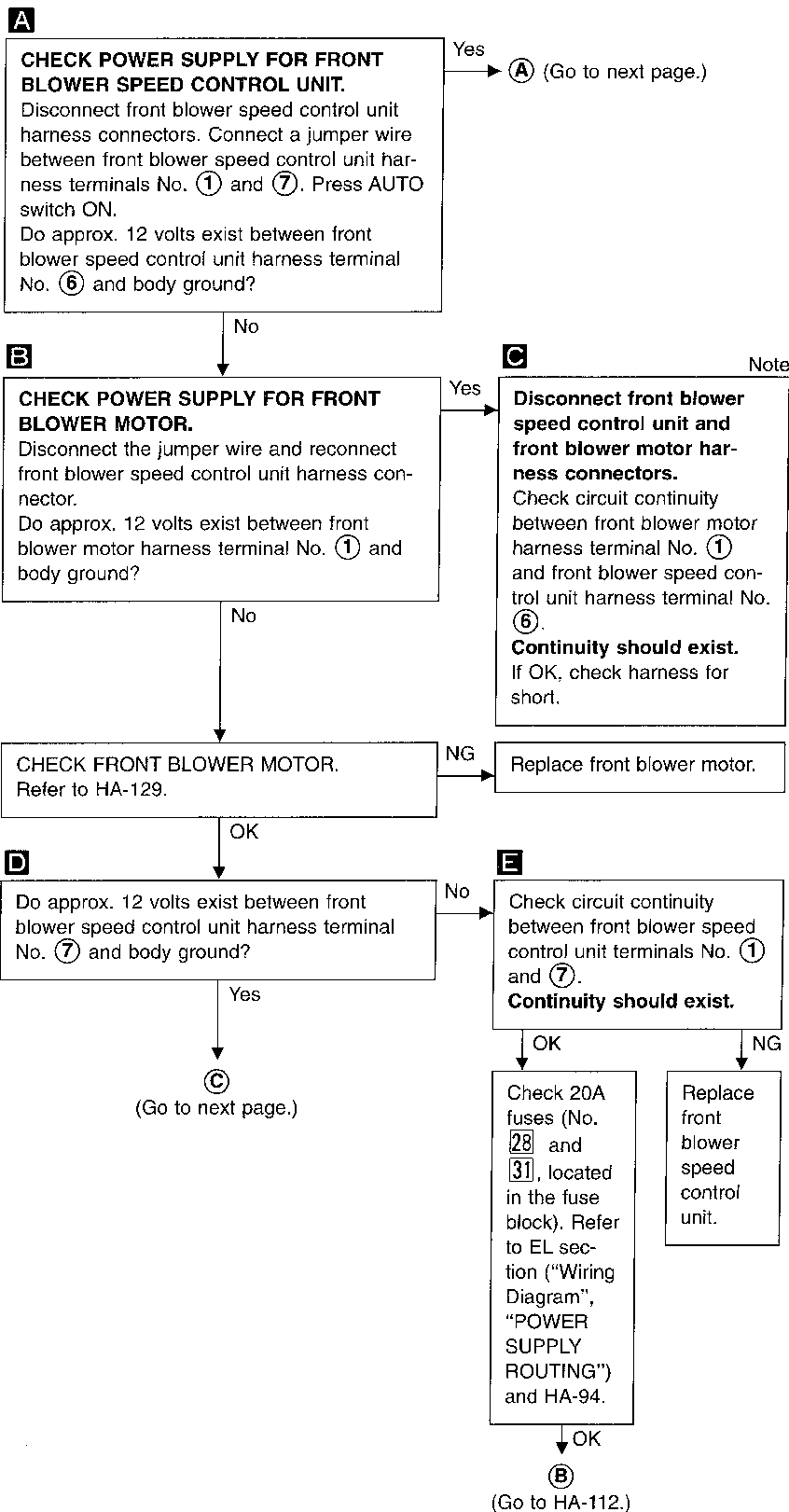
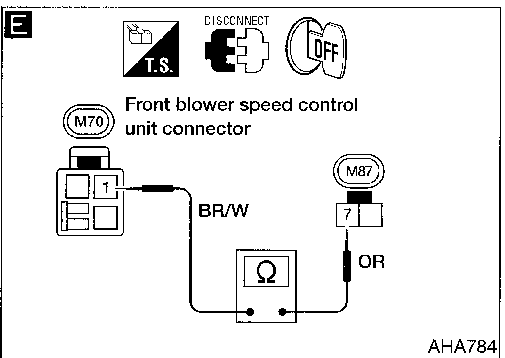
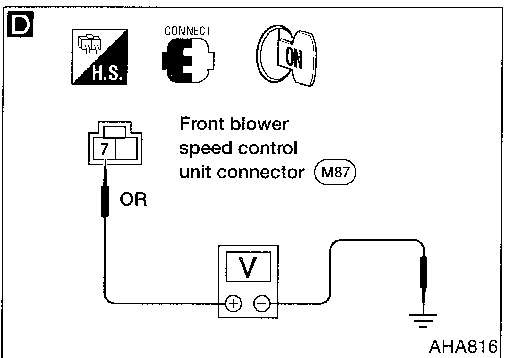
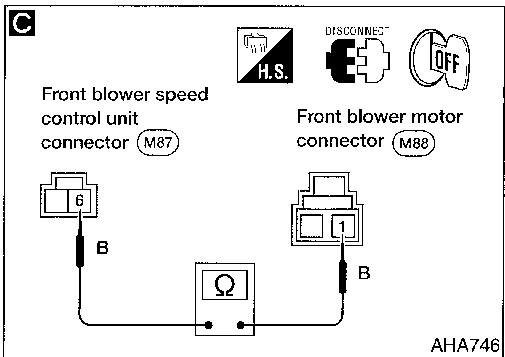
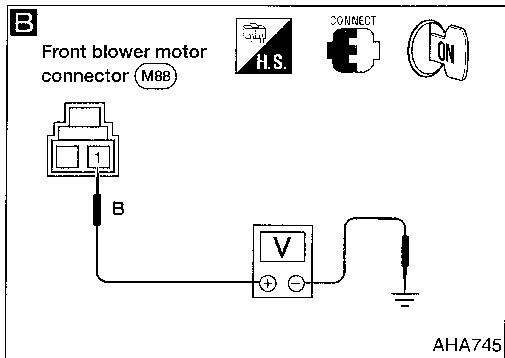
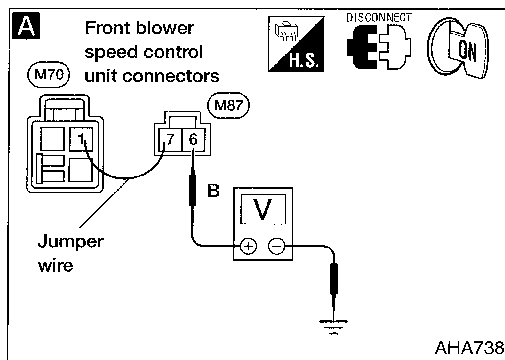
**E** Check circuit continuity between front intake door motor harness terminal No. ① and EATC unit harness terminal No. ①⑥.  
**Continuity should exist.**  
If OK, check harness for short.  
OK → Replace EATC unit.

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

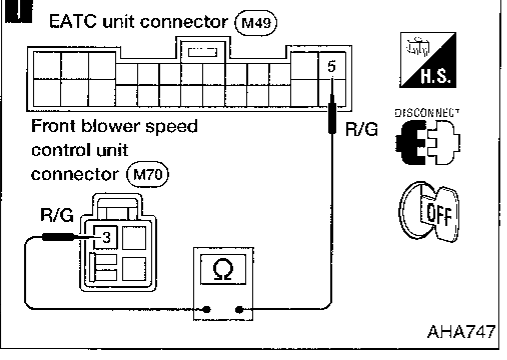
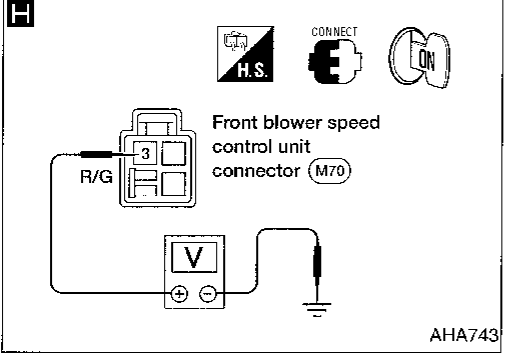
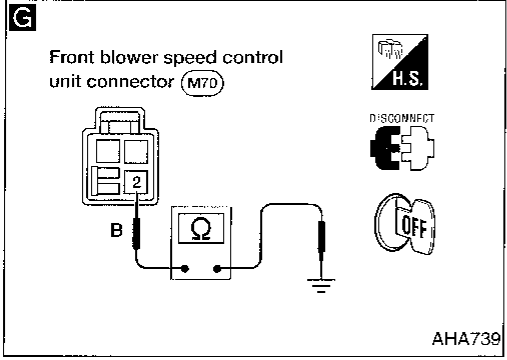
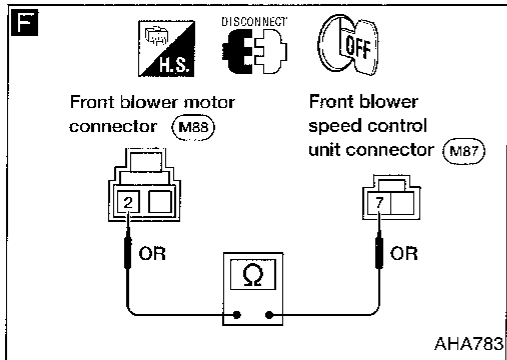
### Diagnostic Procedure 9

**SYMPTOM:** Front blower motor does not rotate.

- Perform PRELIMINARY CHECK 1 before referring to the following flow chart.



Diagnostic Procedure 9 (Cont'd)



**A**

**G** Note

**CHECK BODY GROUND CIRCUIT FOR FRONT BLOWER SPEED CONTROL UNIT.**  
Does continuity exist between front blower speed control unit harness terminal No. ② and body ground?

Yes

Reconnect front blower speed control unit harness connectors.

**H**

**CHECK FOR EATC UNIT OUTPUT.**  
Measure voltage across front blower speed control unit harness terminal No. ③ and body ground.

Fan speed	Terminal No.		Voltage
	⊕	⊖	
Low-high	③	Body ground	Approx. 1 - 3V

OK

Replace front blower speed control unit.

**C**

**F** Note

Disconnect the jumper wire.  
Check circuit continuity between front blower motor harness terminal No. ② and front blower speed control unit harness terminal No. ⑦.  
**Continuity should exist.**  
If OK, check harness for short.

**I** Note

Disconnect EATC unit and front blower speed control unit harness connector.

Check circuit continuity between EATC unit harness terminal No. ⑤ and front blower speed control unit harness terminal No. ③.  
**Continuity should exist.**  
If OK, check harness for short.

OK

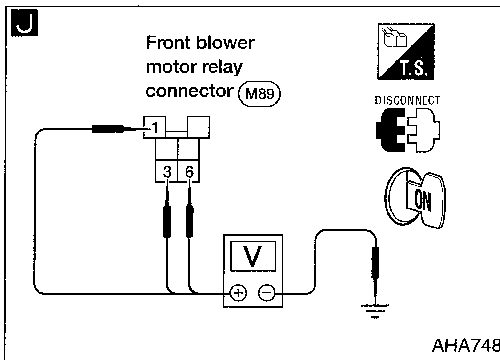
Replace EATC unit.

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

GI  
MA  
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SI  
RS  
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HA  
EL  
IDX



Diagnostic Procedure 9 (Cont'd)

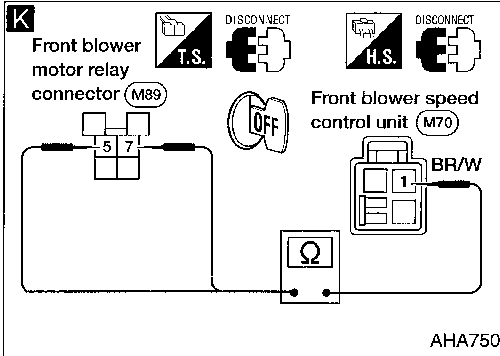


**J**

**CHECK POWER SUPPLY FOR FRONT BLOWER MOTOR RELAY.**  
Do approx. 12 volts exist between front blower motor relay harness terminal No. ①, ③, ⑥ and body ground?

No → Check 65A fusible link (Letter **d**, located in the fuse and fusible link box) and ignition switch. Refer to EL section ("Wiring Diagram, "POWER SUPPLY ROUTING") and HA-94

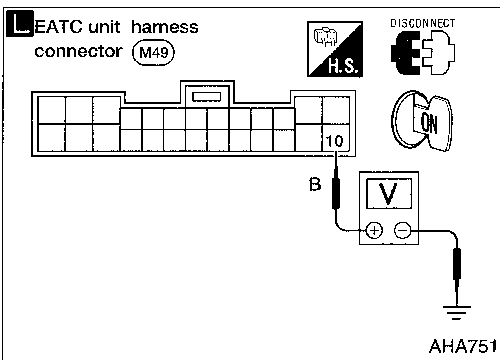
Yes →



**K**

**CHECK CIRCUIT CONTINUITY BETWEEN FRONT BLOWER MOTOR RELAY AND FRONT BLOWER SPEED CONTROL UNIT.**  
Does continuity exist between front blower motor relay harness terminals No. ⑤, ⑦ and front blower speed control unit harness terminal No. ①.  
**Continuity should exist.**  
If OK, check harness for short.

OK →

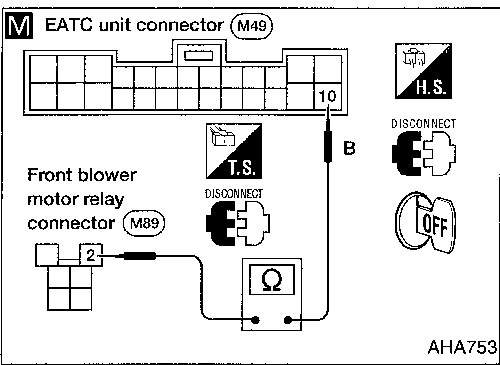


**L**

**CHECK FRONT BLOWER MOTOR RELAY AFTER DISCONNECTING IT.** Refer to HA-129.

NG → Replace front blower motor relay.

OK → Reconnect front blower motor relay.



**M**

**CHECK FOR EATC UNIT OUTPUT**  
Measure voltage across EATC unit harness terminal No. ⑩ and body ground.

Terminal No.		Voltage
⊕	⊖	Approx. 12V
⑩	Body ground	

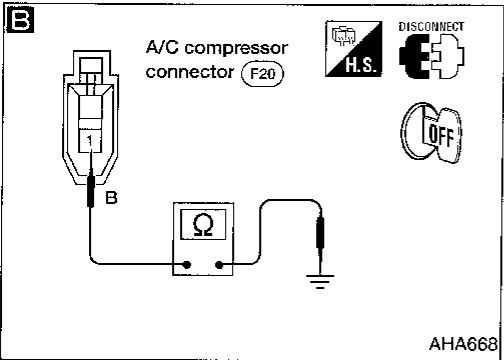
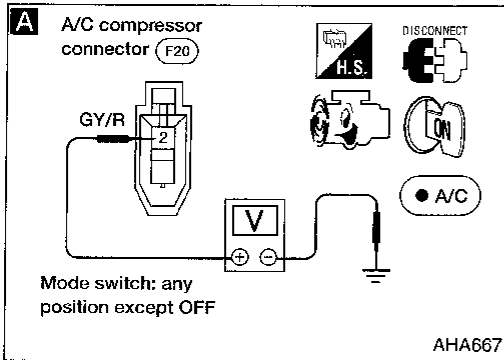
NG → Disconnect front blower motor relay and EATC unit harness connectors.

**Note**

Check circuit continuity between front blower motor relay harness terminal No. ② and EATC unit harness terminal No. ⑩.  
**Continuity should exist.**  
If OK, check harness for short.

Yes → Replace EATC unit.

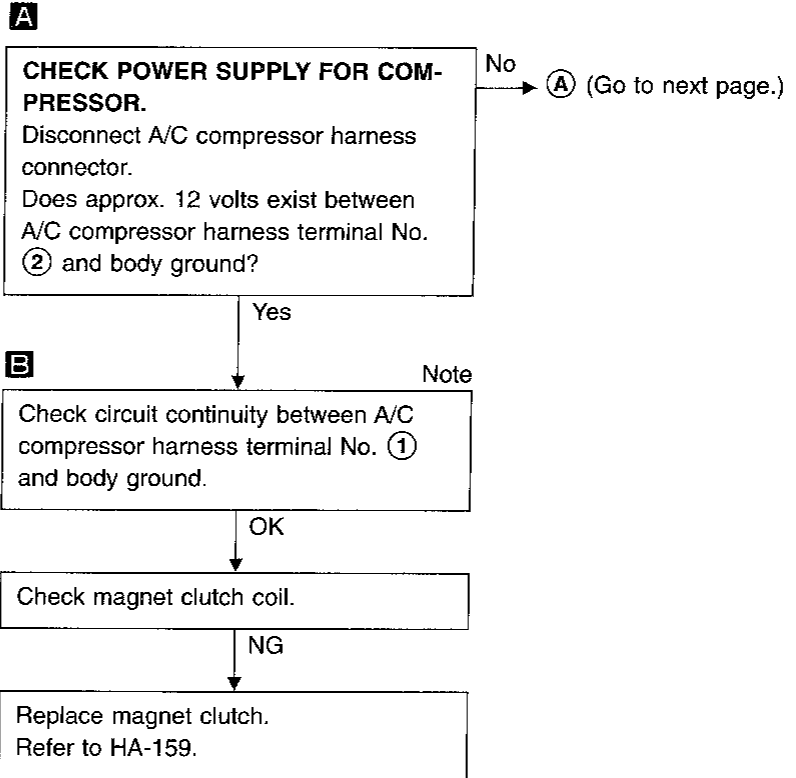
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.



**Diagnostic Procedure 10**

**SYMPTOM:** Magnet clutch does not engage after performing PRELIMINARY CHECK 5.

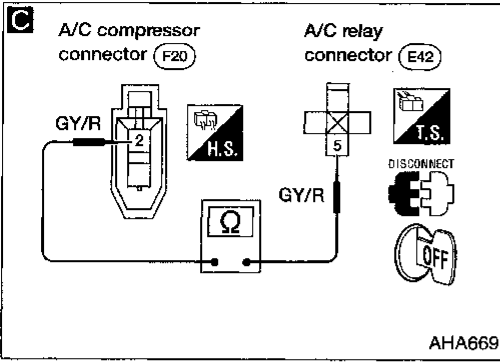
- Perform PRELIMINARY CHECK 5 before referring to the following flow chart.



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

GI  
 MA  
 EM  
 LC  
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 FE  
 AT  
 FA  
 RA  
 BR  
 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

Diagnostic Procedure 10 (Cont'd)

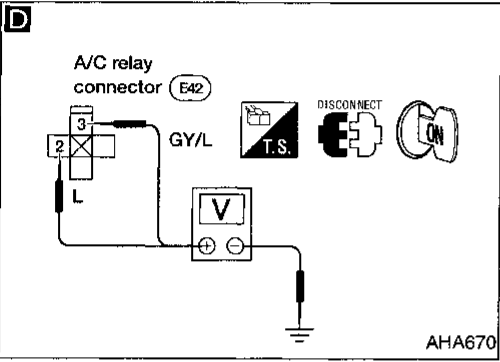


**A**

Disconnect A/C relay.

**C** Note

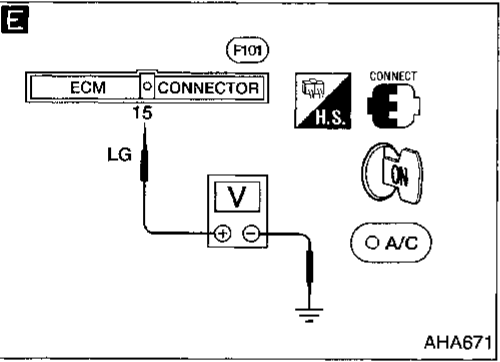
Check circuit continuity between A/C relay harness terminal No. ⑤ and A/C compressor harness terminal No. ②. **Continuity should exist.** If OK, check harness for short.



**D**

**CHECK POWER SUPPLY FOR A/C RELAY.** Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness terminal No. ②, ③ and body ground?

No → Check 10A and 7.5A fuses (No. 29 and 13, located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING") and HA-97.

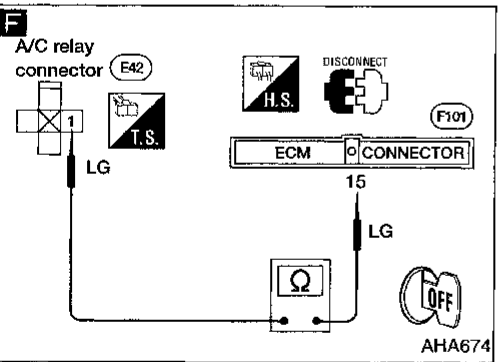


**E**

**CHECK A/C RELAY AFTER DISCONNECTING IT.** Refer to HA-129.

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 with A/C switch OFF? (For terminal arrangement, refer to HA-97.)

No Note

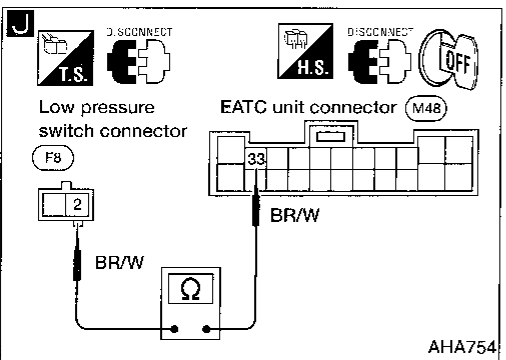
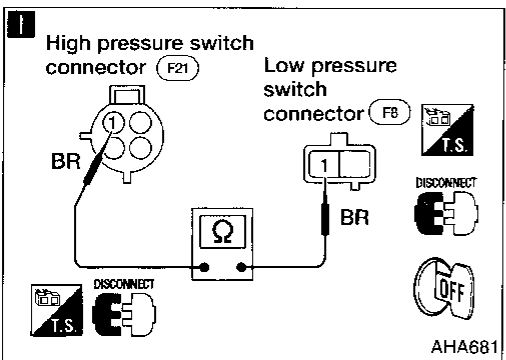
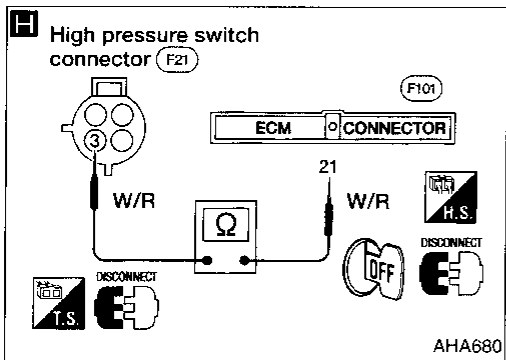
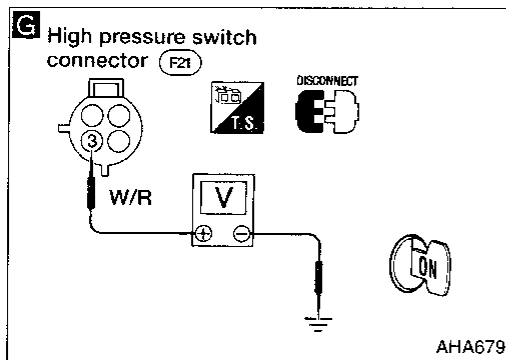
Check circuit continuity between A/C relay harness terminal No. ① and ECM (ECCS control module) harness terminal No. ⑮. **Continuity should exist.** If OK, check harness for short. (For terminal arrangement, refer to HA-97.)

**B**

(Go to next page.)

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

Diagnostic Procedure 10 (Cont'd)



**B**

**G** **Check Voltage for High-Pressure Switch.**  
Do approx. 12 volts exist between high-pressure switch harness terminal No. ③ and body ground?

**No** → **H** **Note**  
Check circuit continuity between ECM (ECCS control module) harness terminal No. ②① and high-pressure switch harness terminal No. ③.  
**Continuity should exist.**  
If OK, check harness for short.

**Yes** → **I** **Check High-Pressure Switch After Disconnecting It.**  
Refer to HA-129.

**NG** → **Replace high-pressure switch.**

**OK** → **I** **Note**  
Check circuit continuity between high-pressure switch harness terminal No. ① and low-pressure switch harness terminal No. ①.  
**Continuity should exist.**  
If OK, check harness for short.

**OK** → **J** **Check Low-Pressure Switch After Disconnecting It.**  
Refer to HA-129.

**NG** → **Replace low-pressure switch.**

**OK** → **J** **Note**  
Check circuit continuity between low-pressure switch harness terminal No. ② and EATC unit harness terminal No. ③③.  
**Continuity should exist.**  
If OK, check harness for short.

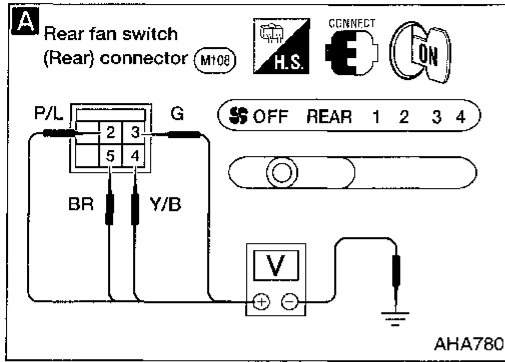
**OK** → **Replace EATC unit.**

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

GI  
MA  
EM  
LC  
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FE  
AT  
FA  
RA  
BR  
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RS  
BT  
HA  
EL  
IDX

**Diagnostic Procedure 11**

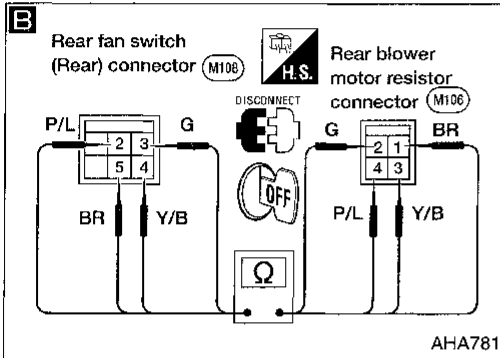
**SYMPTOM:** Rear blower motor does not rotate when rear fan switch (front) for rear A/C is set to REAR position.



Does rear blower motor rotate normally when rear fan switch (front) is set at 1 to 4-speed?

No → Go to **Diagnostic Procedure 12**. Refer to HA-118.

Yes →



**A** **CHECK REAR FAN SWITCH (REAR) CIRCUIT.**  
EATC unit is in any mode except OFF. Do approx. 12 volts exist between each rear fan switch (rear) harness terminal and body ground?

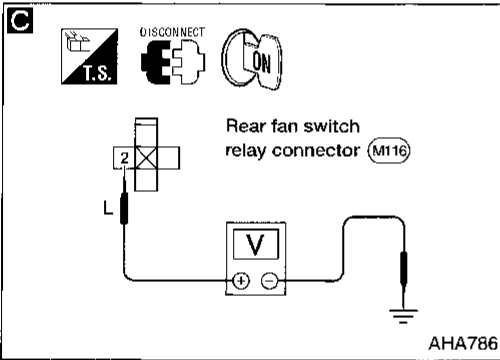
Terminal No.		Voltage
⊕	⊖	
③	Body ground	Approx. 12V
⑤		
②		
④		

**B** Note

Check circuit continuity between rear fan switch (rear) and rear blower motor resistor.

Terminal No.		Continuity
Rear fan switch (rear)	Rear blower motor resistor	
②	④	Yes
③	②	
④	③	
⑤	①	

If OK, check harness for short.



**Yes** → **CHECK REAR FAN SWITCH (REAR) AFTER DISCONNECTING IT.** Refer to HA-130.

**NG** → Replace rear fan switch (rear).

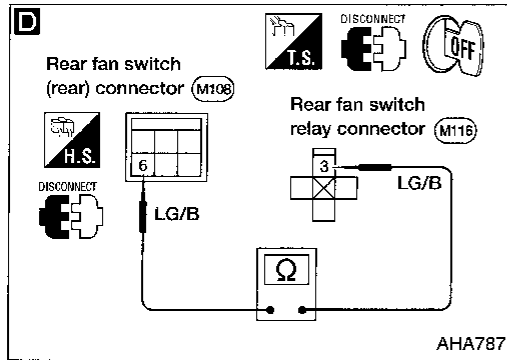
**OK** → **C** **CHECK POWER SUPPLY FOR REAR FAN SWITCH RELAY.** Disconnect rear fan switch relay harness connector. Do approx. 12 volts exist between rear fan switch relay harness terminal No. ② and body ground?

No → Check 10A fuse (No. 29), located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").

Yes → **A**  
(Go to next page.)

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

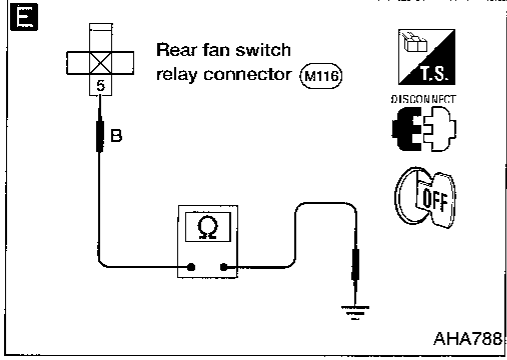
Diagnostic Procedure 11 (Cont'd)



**D**

Note

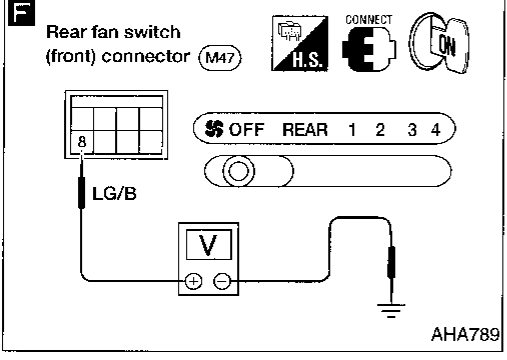
Check continuity between rear fan switch (rear) harness terminal No. ⑥ and rear fan switch relay harness terminal No. ③.  
**Continuity should exist.**  
 If OK, check harness for short.



OK

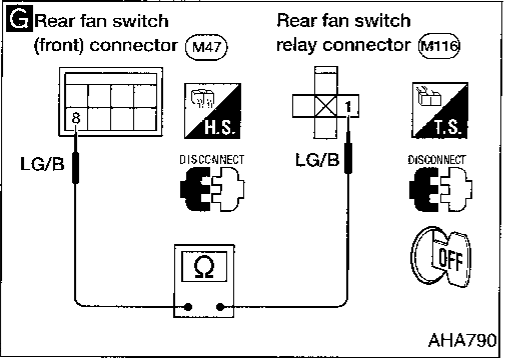
**CHECK REAR FAN SWITCH RELAY AFTER DISCONNECTING IT.**  
 Refer to HA-129.

NG → Replace rear fan switch relay.



Note

Check circuit continuity between rear fan switch relay harness terminal No. ⑤ and body ground.  
**Continuity should exist.**  
 If OK, check harness for short.



**F**

**CHECK COIL SIDE CIRCUIT OF REAR FAN SWITCH RELAY.**  
 Do approx. 12V exist between rear fan switch (front) harness terminal No. ⑧ and body ground?

No → **G**

**G**

Check circuit continuity between rear fan switch (front) harness terminal No. ⑧ and rear fan switch relay harness terminal No. ①.  
**Continuity should exist.**  
 If OK, check harness for short.

Yes

**CHECK REAR FAN SWITCH (FRONT) AFTER DISCONNECTING IT.**  
 Refer to HA-130.

NG → Replace rear fan switch (front).

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

GI  
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 RA  
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 ST  
 RS  
 BT  
 HA  
 EL  
 IDX

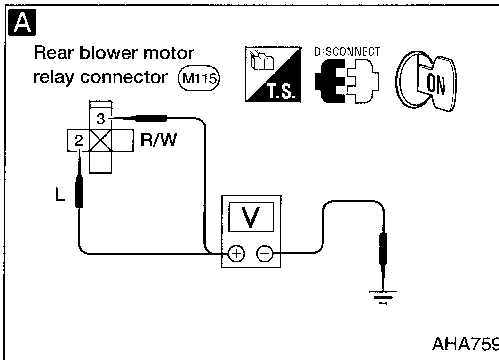
	INCIDENT	Flow chart No.
1	Fan fails to rotate.	1
2	Fan does not rotate at 1-speed.	2
3	Fan does not rotate at 2-speed.	3
4	Fan does not rotate at 3-speed.	4
5	Fan does not rotate at 4-speed.	5

## Diagnostic Procedure 12

**SYMPTOM: Rear blower motor does not rotate when rear ran switch (front) is set at 1 to 4-speed.**

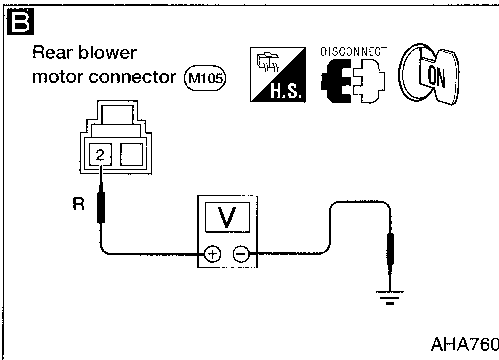
Check if blower motor rotates properly at each fan speed.  
Conduct check as per flow chart at left.

2 3 4 5  
(Go to next page.) →



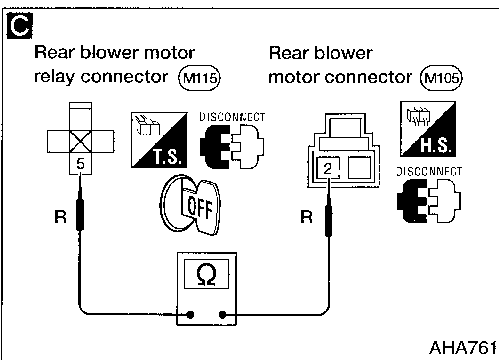
**CHECK POWER SUPPLY FOR REAR BLOWER MOTOR RELAY.**  
Disconnect rear blower motor relay harness connector.  
Do approx. 12 volts exist between rear blower motor relay harness terminal No. ②, ③ and body ground?

No → Check 15A and 10A fuses (No. 24, 25 and 29), located in the fuse block). Refer to EL section ("POWER SUPPLY ROUTING").



**CHECK POWER SUPPLY FOR REAR BLOWER MOTOR.**  
Disconnect rear blower motor harness connector.  
EATC unit is in any mode except OFF.  
Do approx. 12 volts exist between blower motor harness terminal No. ② and body ground?

No → **Check circuit continuity between rear blower motor harness terminal No. ② and rear blower motor relay harness terminal No. ⑤.**  
**Continuity should exist.**  
If OK, check harness for short.



Yes → **Reconnect rear blower motor harness connector.**

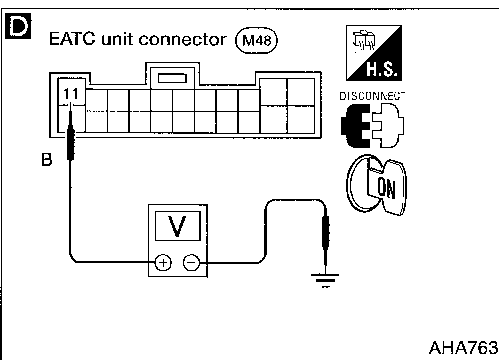
(Go to next page.)

**D**

**CHECK COIL SIDE CIRCUIT OF REAR BLOWER MOTOR RELAY.**  
Do approx. 12V exist between EATC unit harness terminal No. ⑪ and body ground.

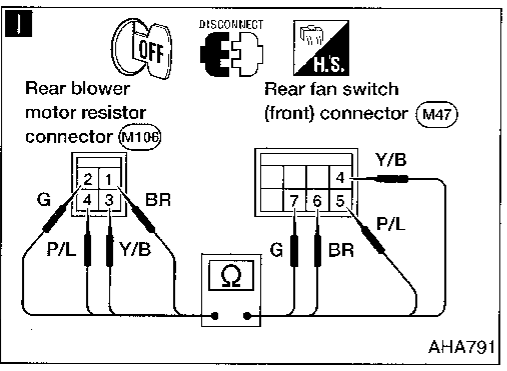
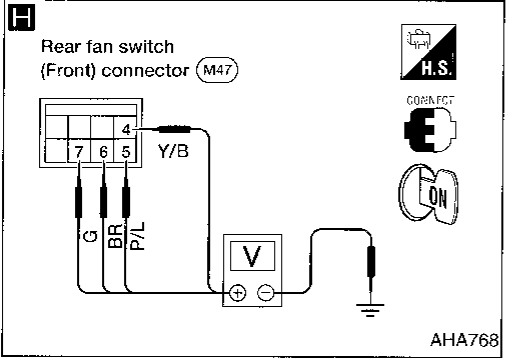
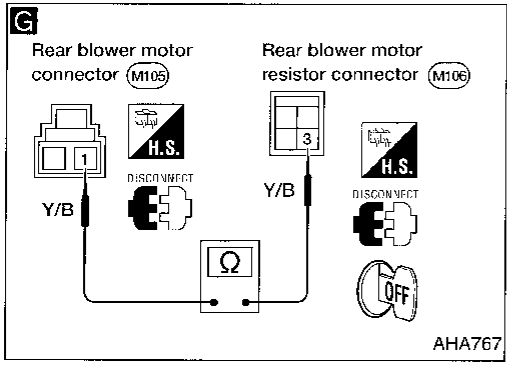
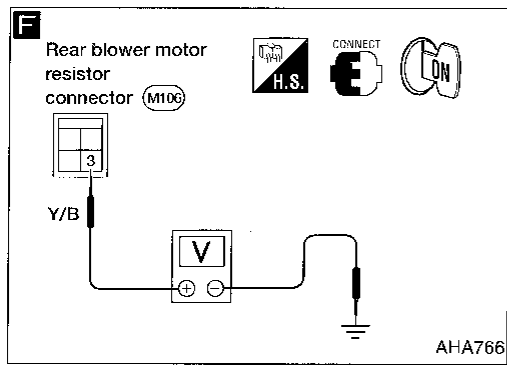
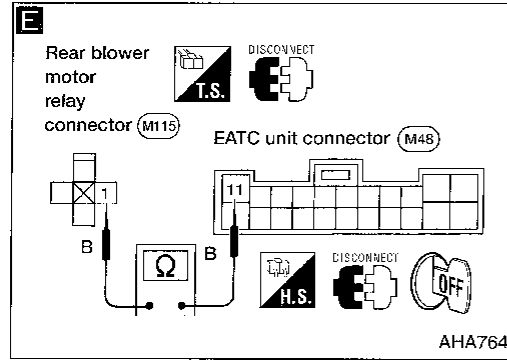
Yes → **Replace EATC unit.**

No → **(Go to next page.)**



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

Diagnostic Procedure 12 (Cont'd)



**F** CHECK REAR BLOWER MOTOR CIRCUIT BETWEEN REAR BLOWER MOTOR AND REAR BLOWER MOTOR RESISTOR. Do approx. 12 volts exist between rear blower motor resistor harness terminal No. ③ and body ground?

Yes ①

No

**E** Check circuit continuity between rear blower motor relay harness terminal No. ① and EATC unit harness terminal No. ⑪. **Continuity should exist.** If OK, check harness for short.

OK

**E** CHECK REAR BLOWER MOTOR RELAY AFTER DISCONNECTING IT. Refer to HA-129.

NG

Replace rear blower motor relay.

Disconnect rear blower motor and rear blower motor resistor harness connectors.

**G** Check circuit continuity between rear blower motor harness terminal No. ① and rear blower motor resistor harness terminal No. ③. **Continuity should exist.** If OK, check harness for short.

OK

**H** CHECK REAR BLOWER MOTOR. Refer to HA-130.

NG

Replace rear blower motor.

**A** CHECK REAR FAN SWITCH (FRONT) CIRCUIT. Set rear fan switch (front) to OFF position. Do approx. 12 volts exist between each rear fan switch (front) harness terminal and body ground?

Flow chart No.	Terminal No.		Voltage
	⊕	⊖	
②	⑦	Body ground	Approx. 12V
③	⑥		
④	⑤		
⑤	④		

Yes ② ③ ④ ⑤

No

**I** Check circuit continuity between rear fan switch (front) and rear blower motor resistor.

Terminal No.		Continuity
Rear fan switch (front)	Rear blower motor resistor	
④	③	Yes
⑤	④	
⑥	①	
⑦	②	

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

① ② ③ ④ ⑤

(Go to next page.)

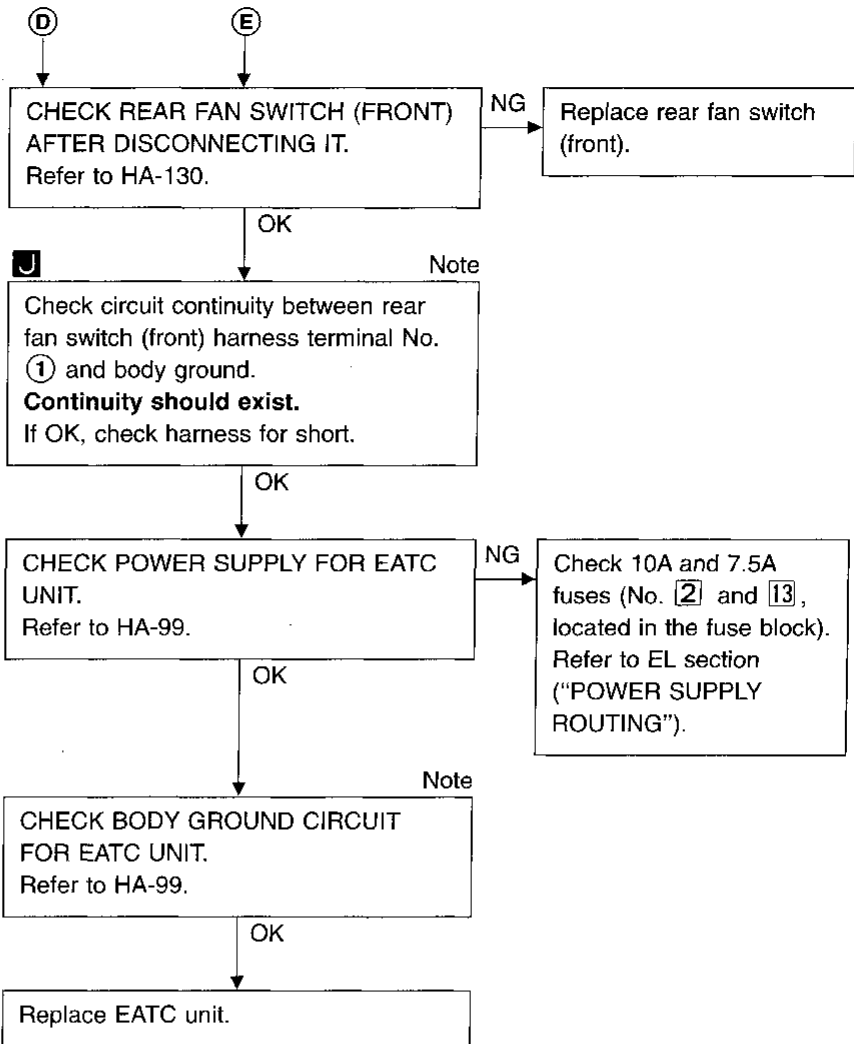
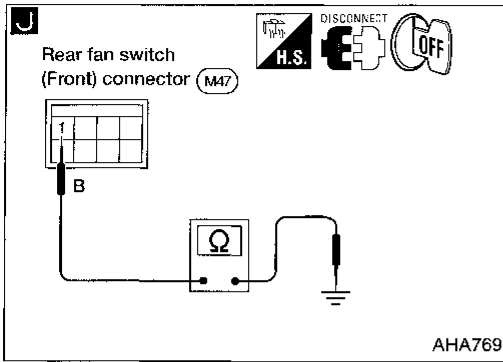
**D** **E**

GI  
MA  
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EC  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA

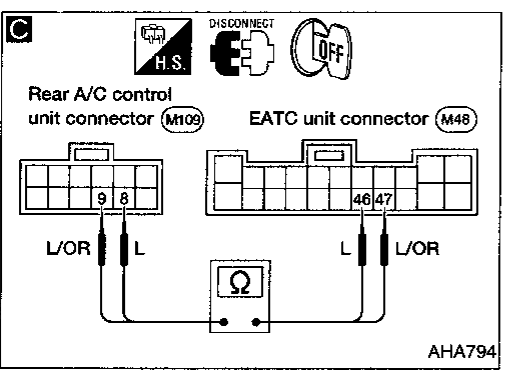
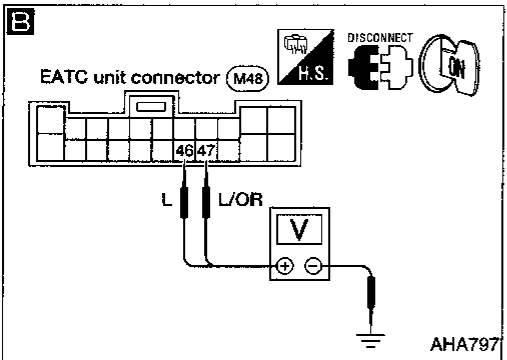
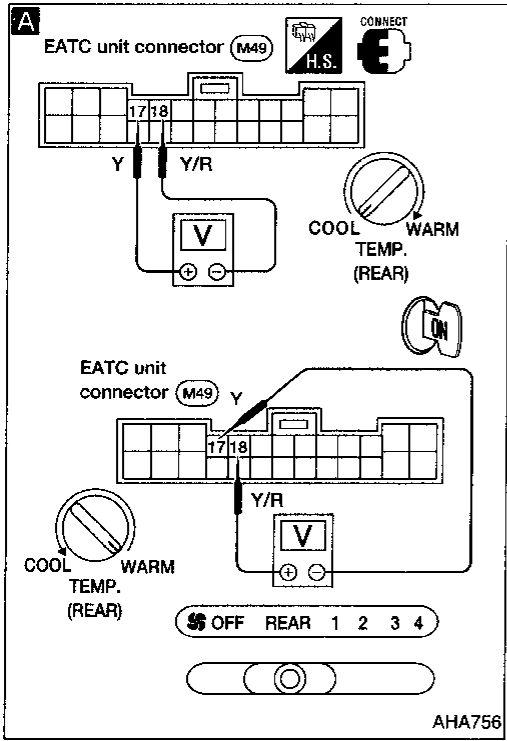
EL  
IDX



Diagnostic Procedure 12 (Cont'd)



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



**Diagnostic Procedure 13**

**SYMPTOM:** Rear air mix door motor does not operate normally. (10, 12 or 18 is indicated on the EATC unit as a result of conducting Self-diagnosis.)

- Perform Main Power Supply and Ground Circuit Check for EATC unit and rear A/C control unit.

IS PBR OPERATING NORMALLY?  
Perform Self-diagnosis. Refer to HA-77.

No → CHECK PBR CIRCUIT. Go to Diagnostic Procedure 14. Refer to HA-123.

Yes →

**A** CHECK FOR OUTPUT OF EATC UNIT.  
Do approx. 12 volts exist between EATC unit harness terminals No. 17 and 18 when rear fan switch (front) is set to REAR and rear temp. control switch is turned from full cool to full warm or when rear temp. control switch is turned from full warm to full cool?

Rear temp. control switch position	Terminal No.		Voltage V
	18	17	
Full cool → Full warm	⊖	⊕	Approx. 12
Full warm → Full cool	⊕	⊖	

**B** Disconnect EATC unit harness connector (M48). Leave EATC unit harness connector (M49) connected. Do approx. 12V exist between EATC unit harness terminals No. 46 and 47 and body ground?

OK →

NG →

Replace EATC unit.

**C** Check circuit continuity between EATC unit harness terminal No. 46 (47) and rear A/C control unit harness terminal No. 8 (9). **Continuity should exist.** If OK, check harness for short.

OK →

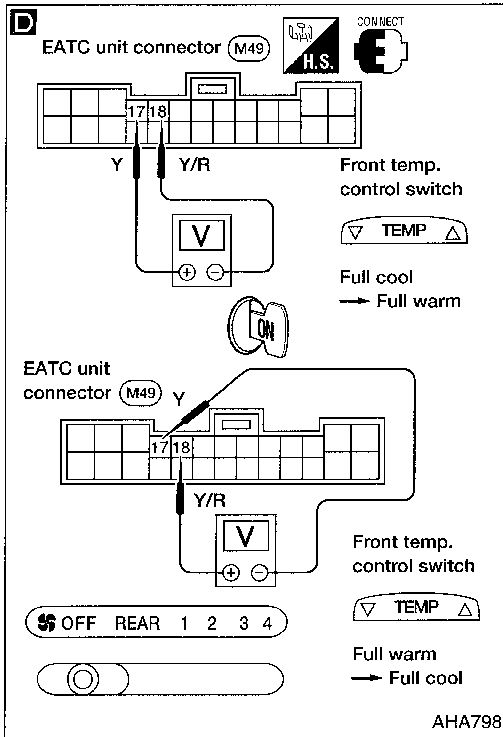
Replace rear A/C control unit.

Yes → **A** (Go to next page.)

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

CI  
MA  
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BR  
ST  
RS  
BT  
HA  
EL

Diagnostic Procedure 13 (Cont'd)



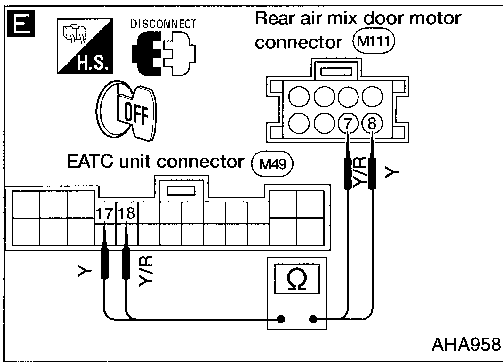
**D**

**CHECK FOR OUTPUT OF EATC UNIT.**

Do approx. 12 volts exist between EATC unit harness terminals No. ⑰ and ⑱ when rear fan switch (front) is in any position except REAR and temp. control switch is pressed from full cool to full warm or when temp. control switch is pressed from full warm to full cool.

Temp. control switch position	Terminal No.		Voltage V
	⑱	⑰	
Full cool → Full warm	⊖	⊕	Approx. 12
Full warm → Full cool	⊕	⊖	

No → Replace EATC unit.



Yes

Disconnect rear air mix door motor and EATC unit harness connectors.

**E**

**Note**

Check circuit continuity between rear air mix door motor harness terminal No. ⑦ (⑧) and EATC unit harness terminal No. ⑱ (⑰).

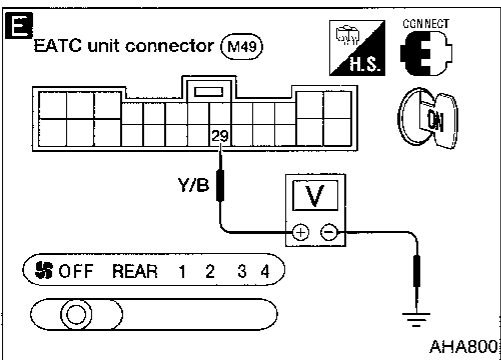
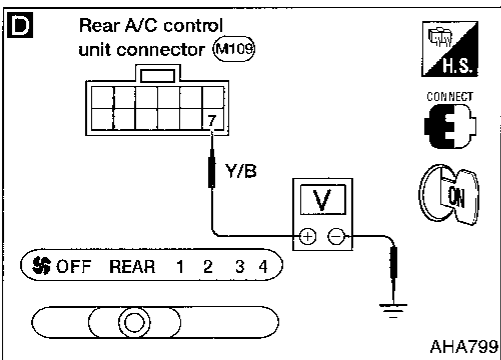
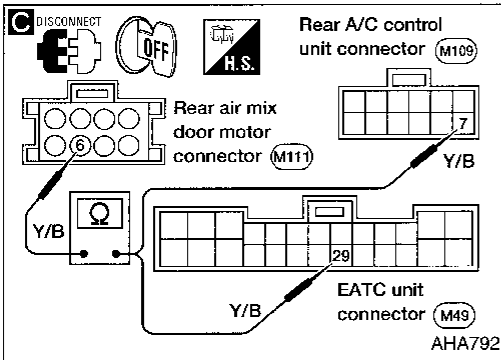
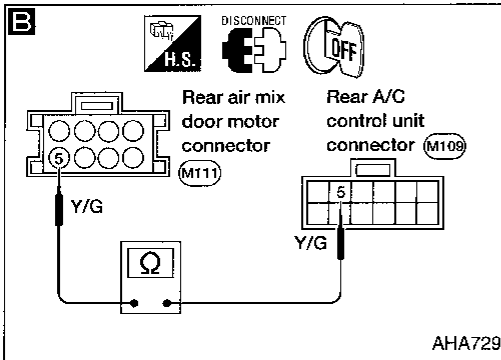
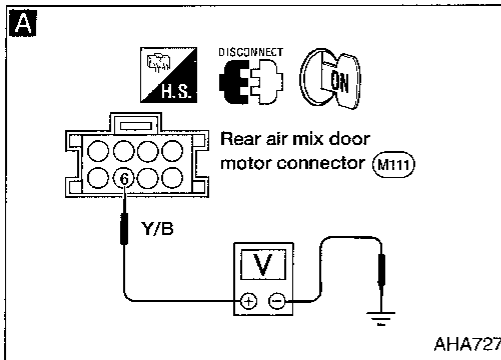
**Continuity should exist.**

If OK, check harness for short.

OK

Replace rear air mix door motor.

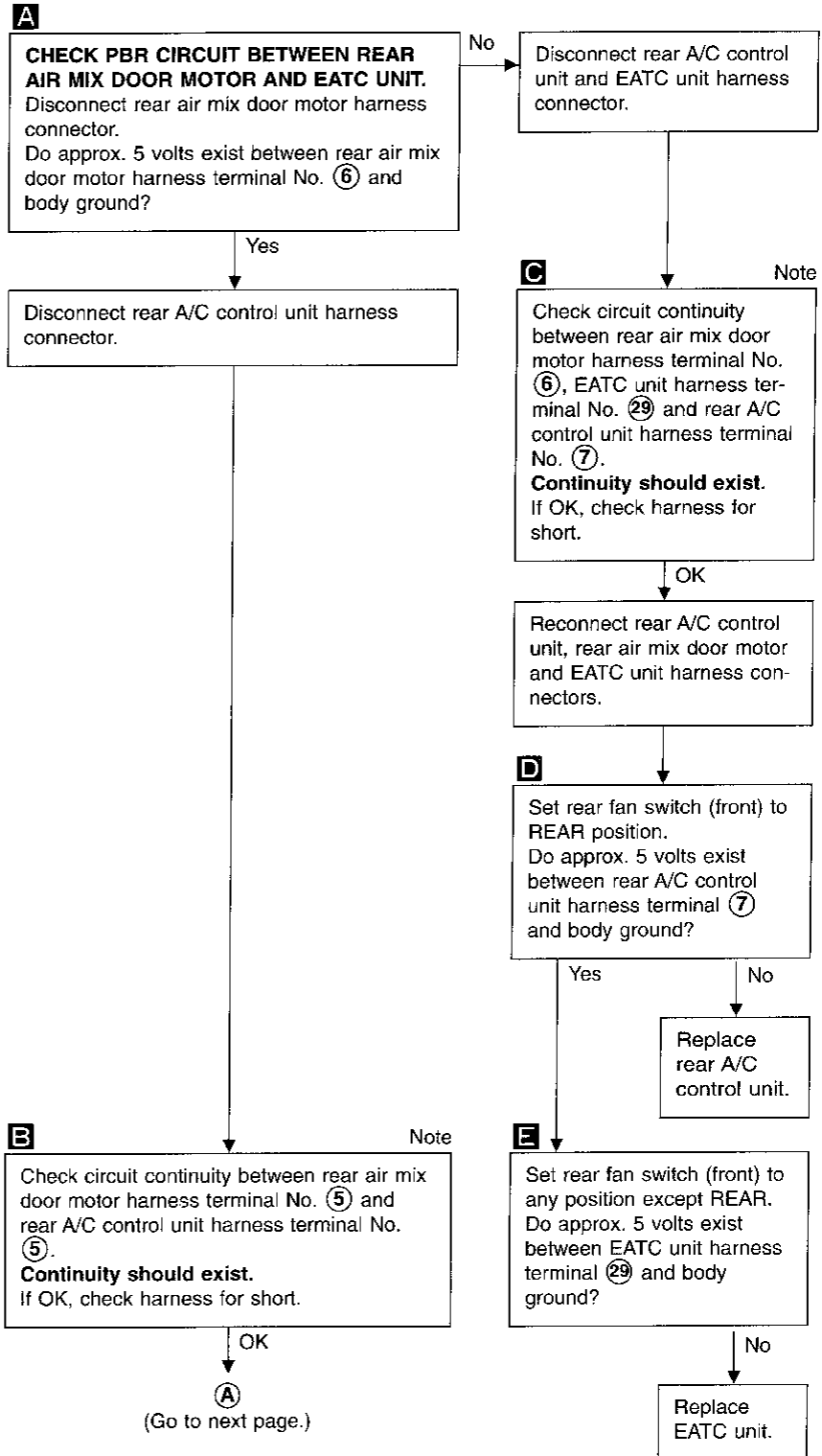
**Note:**  
If the result is NG after checking circuit continuity, repair harness or connector.



**Diagnostic Procedure 14**

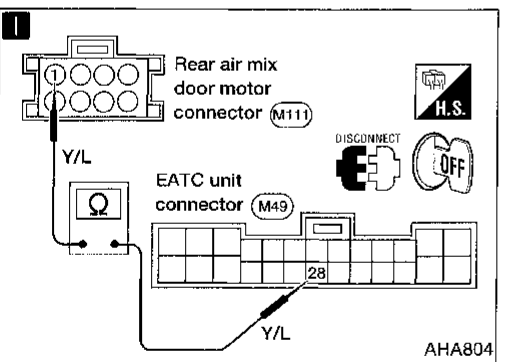
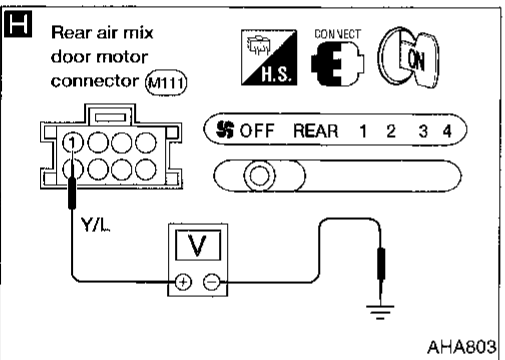
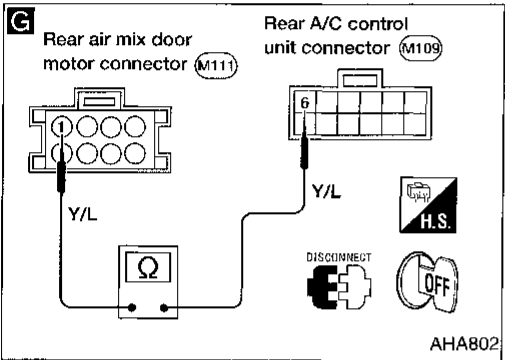
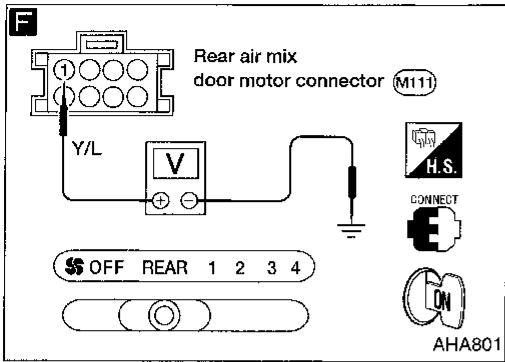
**SYMPTOM:** Rear air mix door motor PBR circuit is open or shorted. (15 or 17 is indicated on the EATC unit as a result of conducting Self-diagnosis.)

- Perform Main Power Supply and Ground Circuit Check for rear A/C control unit before referring to the following flow chart.



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

Diagnostic Procedure 14 (Cont'd)



**F**

**CHECK PBR CIRCUIT BETWEEN REAR AIR MIX DOOR MOTOR AND REAR A/C CONTROL UNIT.**

1. Reconnect rear A/C control unit harness connector and rear air mix door motor harness connector.
2. Set rear fan switch (front) to REAR position.
3. Turn rear temperature control switch to full warm.  
Do approx. 5 volts exist between rear air mix door motor harness terminal ① and body ground?
4. Turn rear temperature control switch to full cool.  
Do approx. 0 volts exist between rear air mix door motor harness terminal ① and body ground?

No → Disconnect rear A/C control unit and rear air mix door motor harness connectors.

**G** Note  
Check circuit continuity between rear air mix door motor harness terminal No. ① and rear A/C control unit harness terminal No. ⑥.  
**Continuity should exist.**  
If OK, check harness for short.

OK → Replace rear A/C control unit.

**H**

**CHECK PBR CIRCUIT BETWEEN REAR AIR MIX DOOR MOTOR AND EATC UNIT.**

1. Set rear fan switch (front) to any position except REAR.
2. Press front temperature control switch to full warm.  
Do approx. 5 volts exist between rear air mix door motor harness terminal ① and body ground?
3. Press front temperature control switch to full cool.  
Do approx. 0 volts exist between rear air mix door motor harness terminal ① and body ground?

No → Disconnect EATC unit and rear air mix door motor harness connectors.

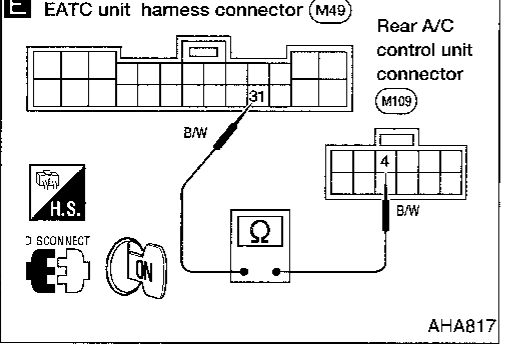
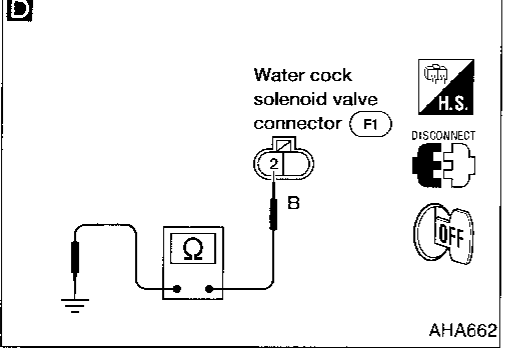
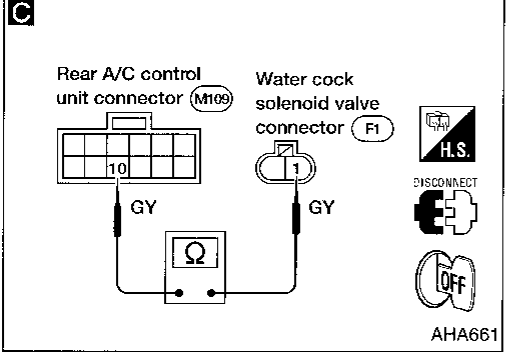
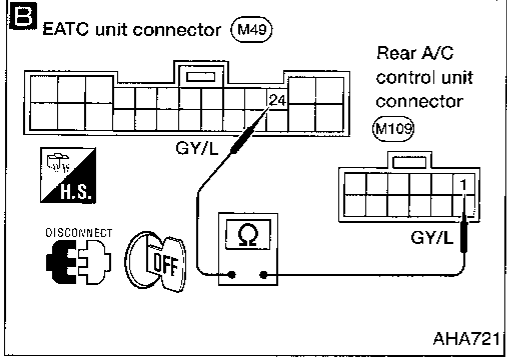
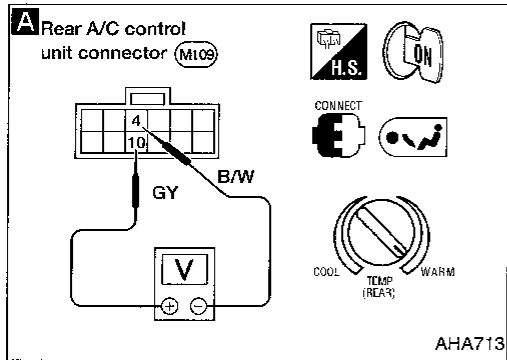
**I** Note  
Check circuit continuity between rear air mix door motor harness terminal No. ① and EATC unit harness terminal No. ⑳.  
**Continuity should exist.**  
If OK, check harness for short.

OK → Replace EATC unit.

CHECK PBR.  
Refer to HA-144.

NG → Replace rear air mix door motor (PBR).

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



**Diagnostic Procedure 15**

**SYMPTOM:** Water cock solenoid valve for rear heater does not operate normally.

- Perform PRELIMINARY CHECK 4, Main Power Supply and Ground Circuit Check for EATC unit before referring to the following flow chart.

**A**

**CHECK FOR OUTPUT OF REAR A/C CONTROL UNIT.**  
Measure voltage across terminals No. ④ and ⑩.

Rear fan switch (front) position	Voltage V
OFF	Approx. 9
1, 2, 3 or 4	Approx. 0

OK

NG

**CHECK POWER SUPPLY FOR REAR A/C CONTROL UNIT.**  
Refer to HA-100.

OK

NG

**B** Note

Check circuit continuity between rear A/C control unit harness terminal ① and EATC unit harness terminal ②④. **Continuity should exist.** If OK, check harness for short.

OK

Replace EATC unit.

NG

**CHECK BODY GROUND CIRCUIT FOR REAR A/C CONTROL UNIT.**  
Refer to HA-100.

OK

Replace rear A/C control unit.

NG

**E** Note

Check circuit continuity between rear A/C control unit harness terminal ④ and EATC unit harness terminal ③①. **Continuity should exist.** If OK, check harness for short.

OK

Replace EATC unit.

OK

**C** Note

Check circuit continuity between water cock solenoid valve harness terminal No. ① and rear A/C control unit harness terminal No. ⑩. **Continuity should exist.** If OK, check harness for short.

OK

**D** Note

Check circuit continuity between water cock solenoid valve harness terminal No. ② and body ground.

OK

Replace water cock solenoid valve.

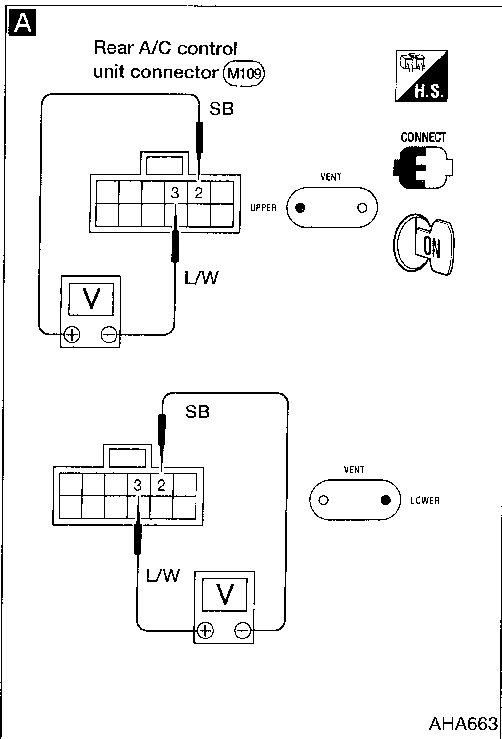
**Note:** If the result is NG after checking circuit continuity, repair harness or connector.

GI  
MA  
EM  
LC  
EG  
FE  
AT  
FA  
RA  
BR  
ST  
RS  
BT  
HA

### Diagnostic Procedure 16

**SYMPTOM: Rear vent door motor does not operate normally.**

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



**A**

**CHECK FOR OUTPUT OF REAR A/C CONTROL UNIT.**  
Measure voltage across terminals No. ② and ③.

Rear vent switch position	Terminal No.		Voltage V
	②	③	
Upper	⊕	⊖	Approx. 12
Lower	⊖	⊕	

NG → CHECK POWER SUPPLY FOR REAR A/C CONTROL UNIT. Refer to HA-100.

**B** Note  
Check circuit continuity between rear A/C control unit harness terminal ① and EATC unit harness terminal ②④. **Continuity should exist.** If OK, check harness for short.

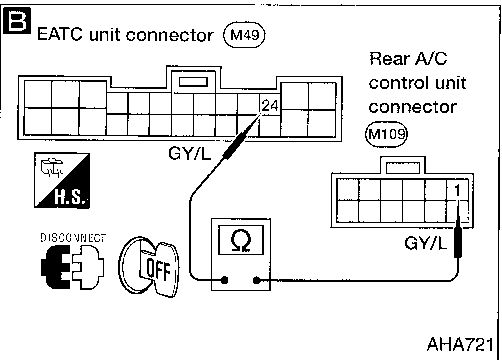
OK → Replace EATC unit.

OK → CHECK BODY GROUND CIRCUIT FOR REAR A/C CONTROL UNIT. Refer to HA-100.

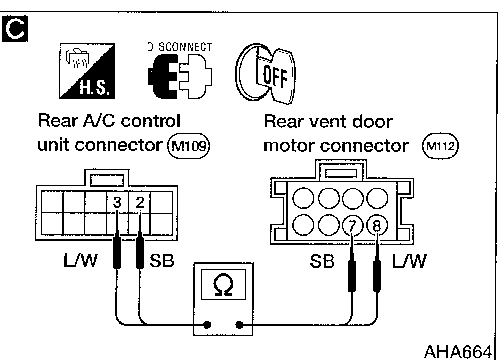
OK → Replace rear A/C control unit.

**D** Note  
Check circuit continuity between rear A/C control unit harness terminal ④ and EATC unit harness terminal ③①. **Continuity should exist.** If OK, check harness for short.

OK → Replace EATC unit.

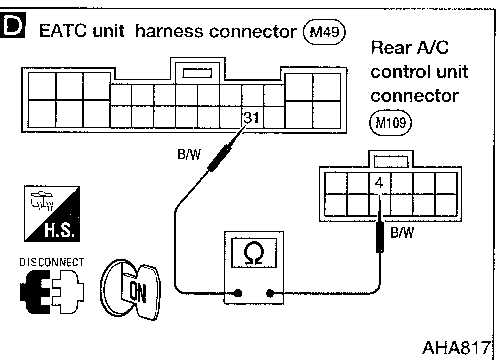


OK → Disconnect rear vent door motor and rear A/C control unit harness connectors.

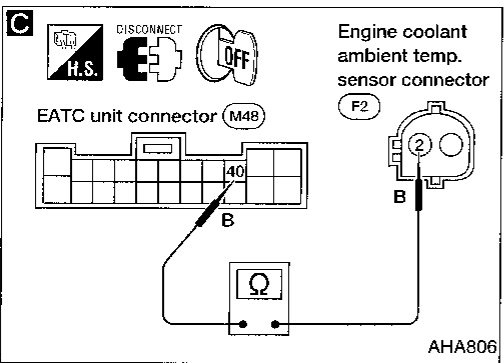
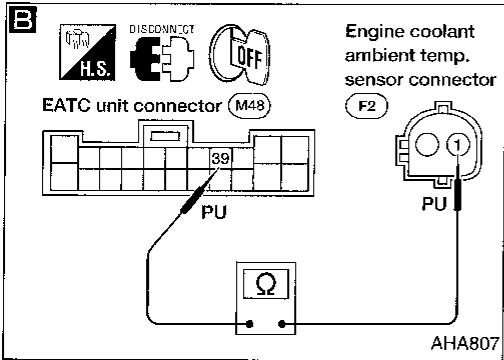
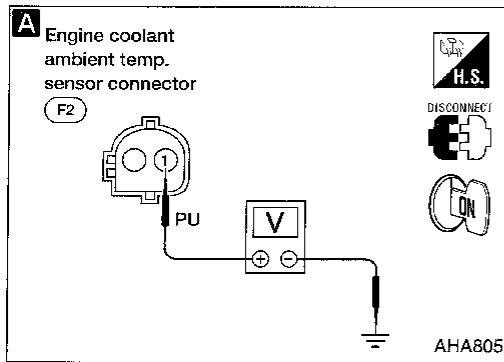


**C** Note  
Check circuit continuity between rear vent door motor harness terminal No. ⑦ (⑧) and rear A/C control unit harness terminal No. ② (③). **Continuity should exist.** If OK, check harness for short.

OK → Replace rear vent door motor.

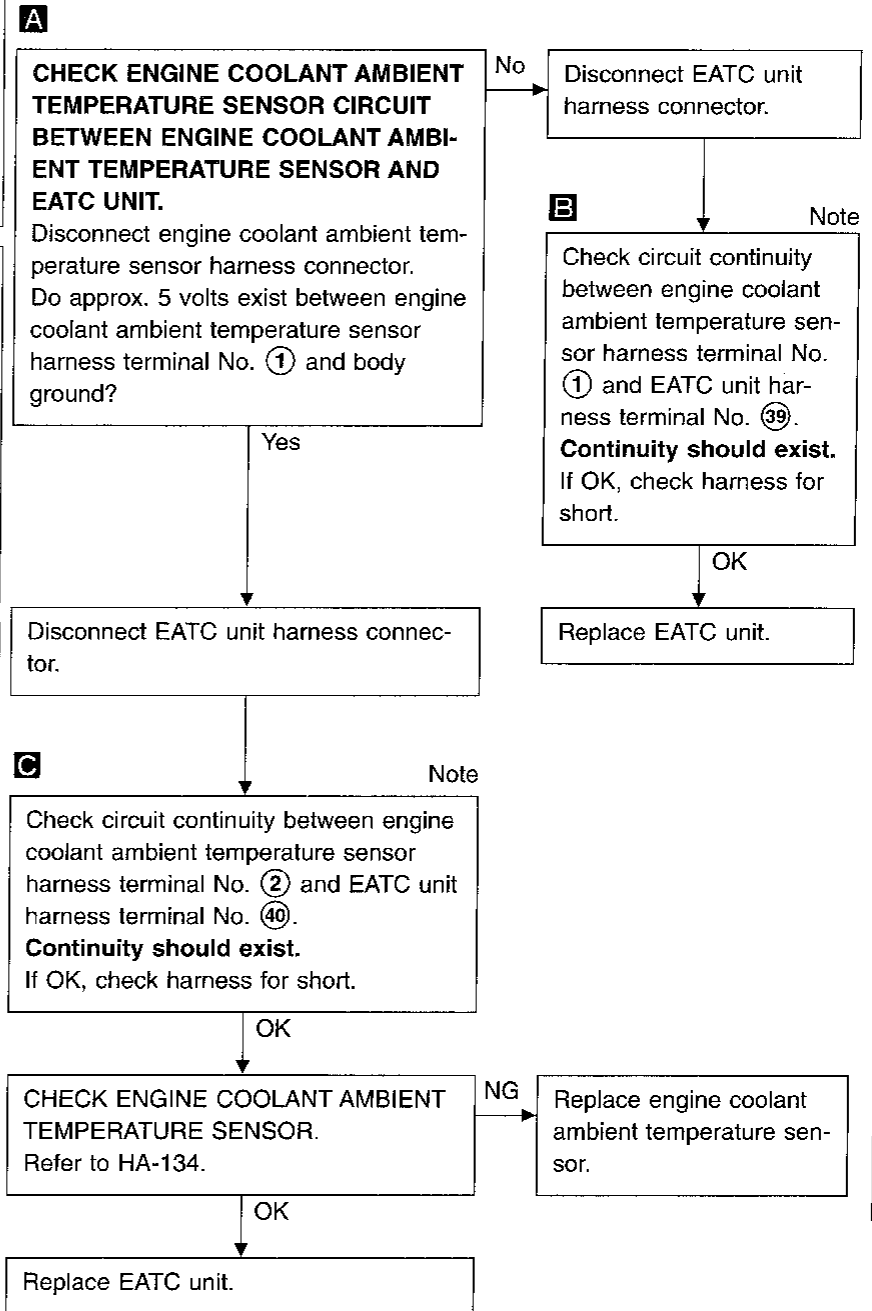


**Note:** If the result is NG after checking circuit continuity, repair harness or connector.



### Diagnostic Procedure 17

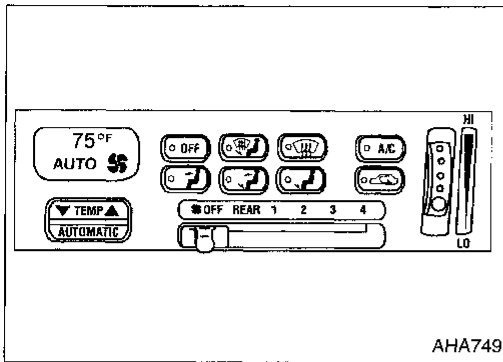
**SYMPTOM: Engine coolant ambient temperature sensor circuit is open or shorted.**



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

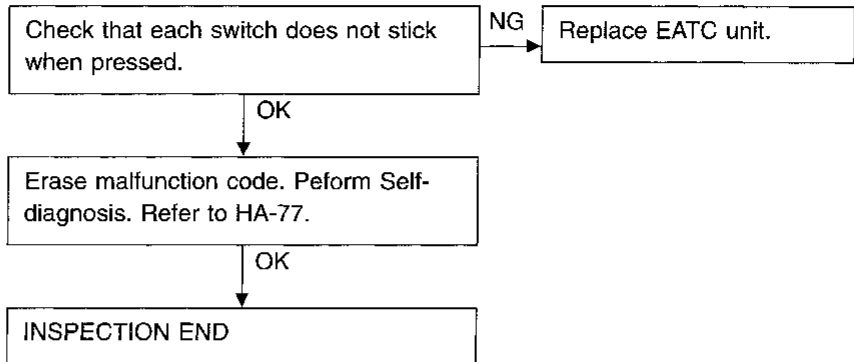
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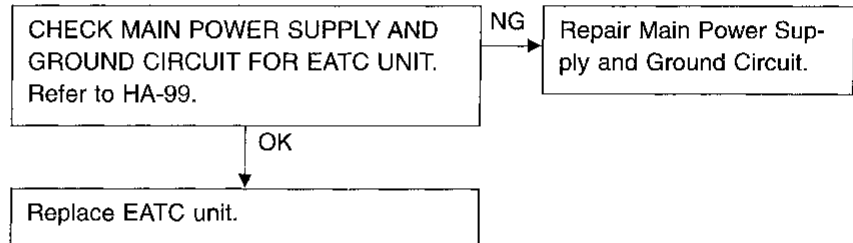
**Diagnostic Procedure 18**

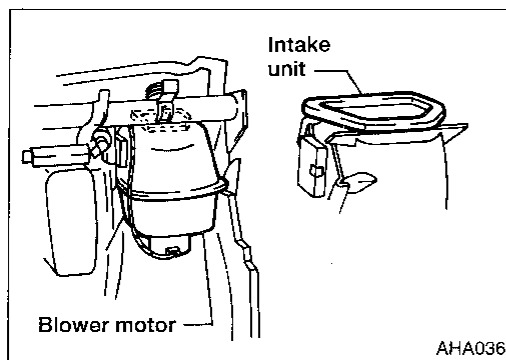
**SYMPTOM: Mode switch button is stuck.**  
 ( 68 is indicated on the EATC unit as a result of conducting Self-diagnosis.)



**Diagnostic Procedure 19**

**SYMPTOM: Self-diagnosis cannot be performed.**



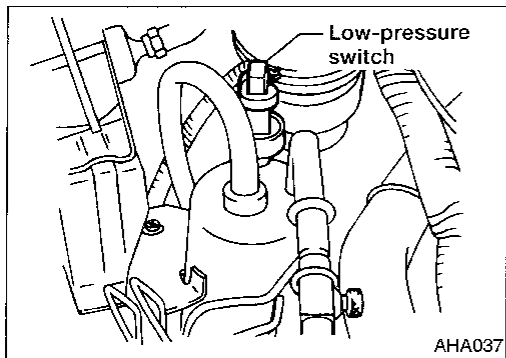


## Electrical Components Inspection

### FRONT BLOWER MOTOR

Confirm smooth rotation of the front blower motor.

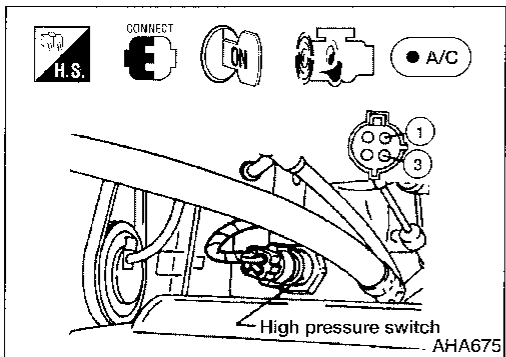
- Check that there are no foreign particles inside the intake unit.



### LOW-PRESSURE SWITCH

Check continuity between terminals.

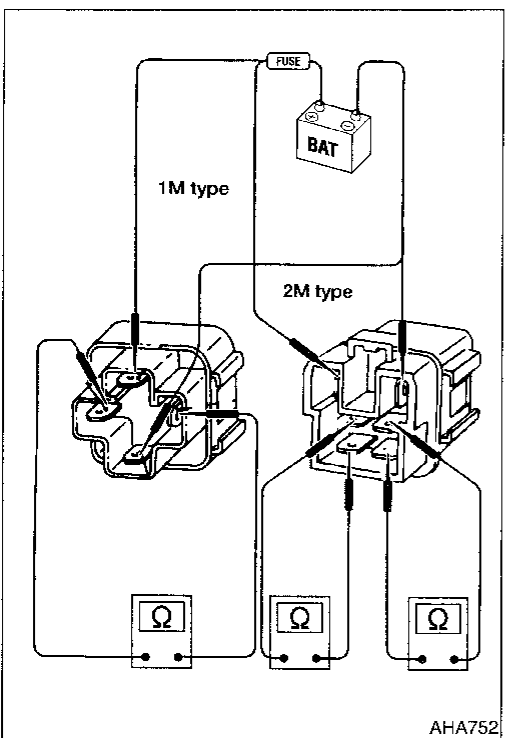
Low-pressure side line pressure kPa (kg/cm <sup>2</sup> , psi)	Clutch operation	Continuity
Decreasing to 159 (1.6, 23)	Turn OFF	Does not exist
Increasing to 324 (3.3, 47)	Turn ON	Exists
Tightening torque	1.3 - 5.4 N·m (0.13 - 0.55 kg-m, 11.3 - 48 in-lb)	



### HIGH-PRESSURE SWITCH

Check continuity between terminals ① and ③.

High-pressure side line pressure kPa (kg/cm <sup>2</sup> , psi)	Clutch operation	Continuity
Increasing to 2,785 (28.4, 404)	Turn OFF	Does not exist
Decreasing to 1,569 (16.0, 228)	Turn ON	Exists
Tightening torque	6.8 - 12.2 N·m (0.69 - 1.24 kg-m, 60 - 108 in-lb)	



### RELAYS

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

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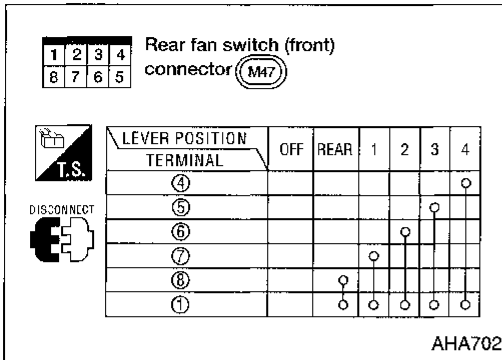
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**Electrical Components Inspection (Cont'd)**

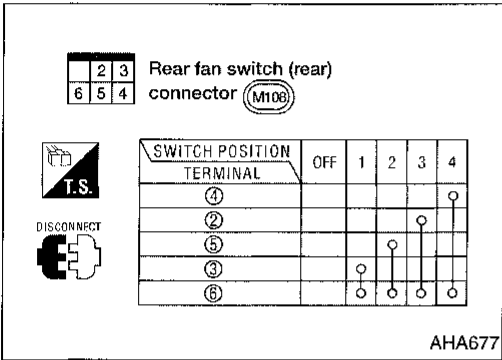
**REAR FAN SWITCH (Front)**

Check continuity between terminals at each position.



**REAR FAN SWITCH (Rear)**

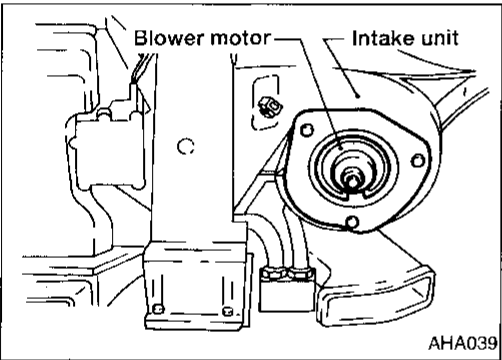
Check continuity between terminals at each position.



**REAR BLOWER MOTOR**

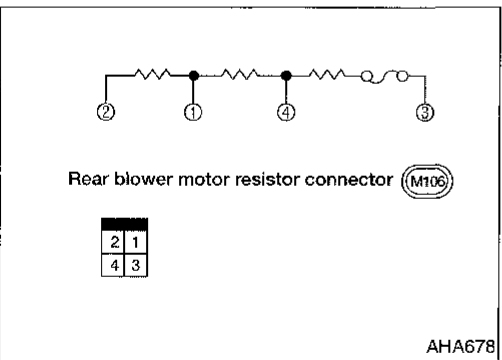
Confirm smooth rotation of the rear blower motor.

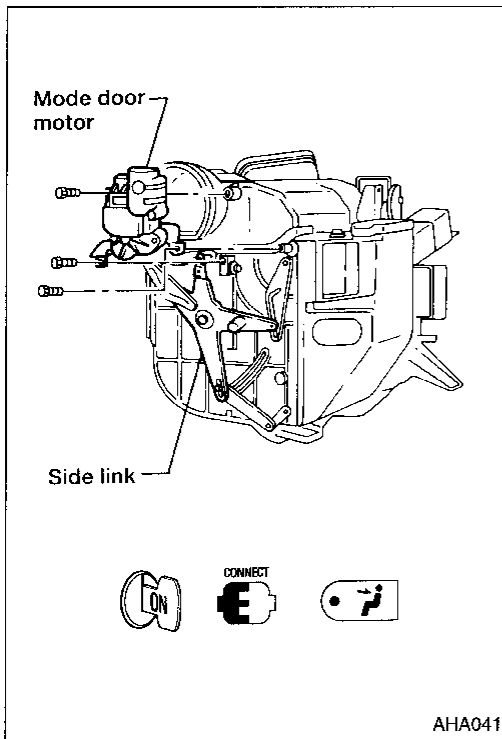
- Check that there are no foreign particles inside the intake unit.



**REAR BLOWER MOTOR RESISTOR**

Check continuity between terminals.





## Control Linkage Adjustment

### MODE DOOR

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

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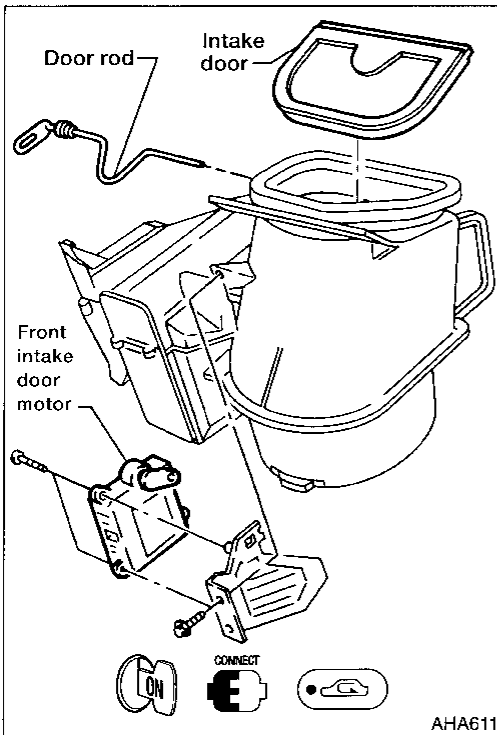
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### FRONT INTAKE DOOR

1. Connect the front intake door motor harness connector before installing the front intake door motor.
2. Turn ignition switch ON.
3. Select REC mode.
4. Install the front intake door lever and the front intake door motor.
5. Set the front intake door rod in REC position and fasten door rod to holder.
6. Check that the front intake door operates properly when REC mode is selected.

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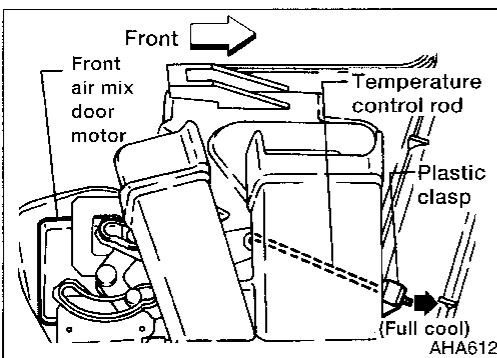
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### TEMPERATURE CONTROL ROD

Before adjusting, push temperature control rod fully forward to front of vehicle. Note position of clasp.

1. Install the front air mix door motor on heater unit and connect it to main harness.
2. Turn ignition switch ON.
3. Press the temperature control switch until 15°C (60°F) is displayed.
4. Move the front air mix door by hand to maximum cold position (door completely covers heater core) and hold it.

---

**Control Linkage Adjustment (Cont'd)**

5. While holding the front air mix door, adjust the length of temperature control rod and connect it to the front air mix door lever.

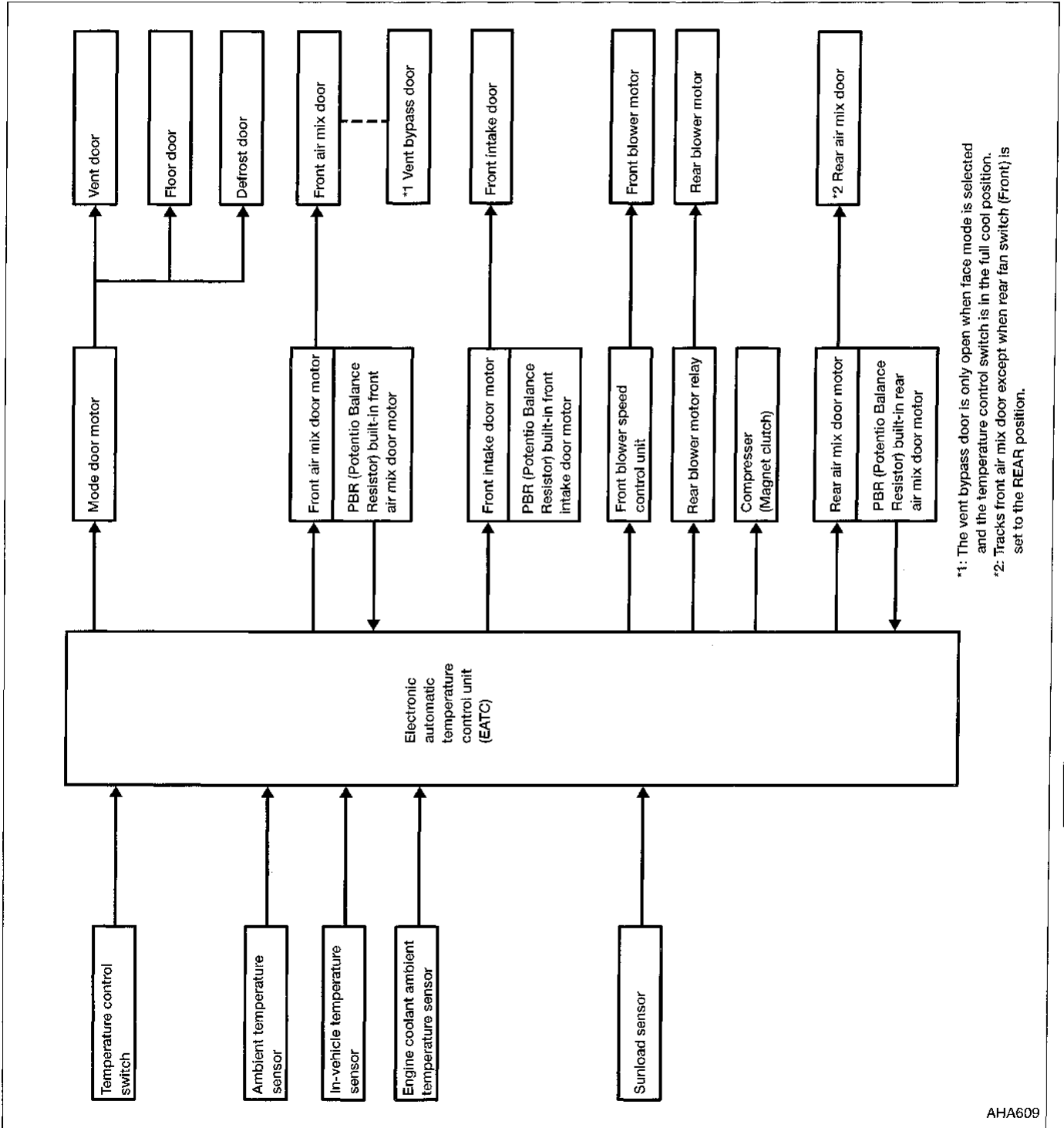
**After connecting control rod, check for proper operation.**

### Overview of Control System

The control system consists of:

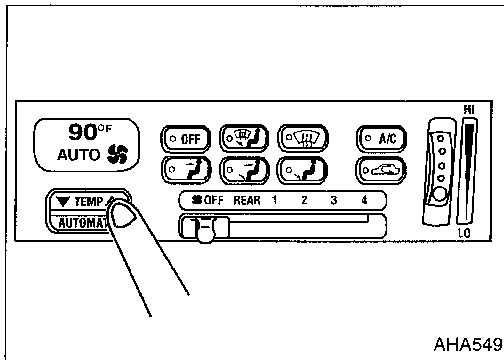
- input sensors and switches,
- the Electronic Automatic Temperature Control unit (microcomputer), and
- outputs.

The relationship of these components is shown in the diagram below:



AHA609

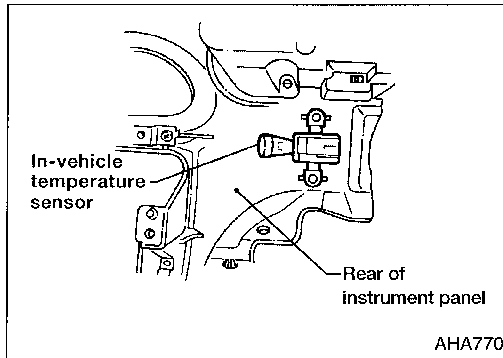
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### Control System Input Components

#### FRONT TEMPERATURE CONTROL SWITCH

It can be set at an interval of 1°C (1°F) through 18°C (65°F) and 29°C (85°F), then at an interval of 3°C (5°F) to obtain the full cool and full warm positions. Setting temperature is digitally displayed.

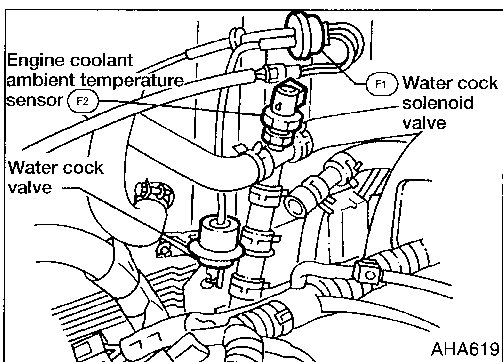


#### IN-VEHICLE TEMPERATURE SENSOR

The in-vehicle temperature sensor is attached to the instrument panel. It converts variations in temperature of compartment air drawn by the blower motor into a resistance value. This value is then input into the EATC unit.

After disconnecting in-vehicle temperature sensor harness connector, measure resistance between sensor terminals ① and ②, using the table below.

Temperature °C (°F)	Resistance kΩ
-40 (-40)	925.02
-20 (4)	276.96
0 (32)	95.85
20 (68)	37.34
40 (104)	16.11
60 (140)	7.55
100 (212)	2.08
120 (248)	1.19



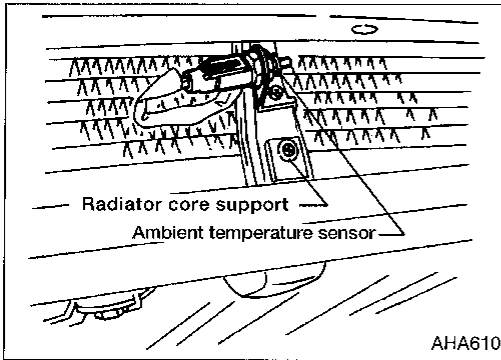
#### ENGINE COOLANT AMBIENT TEMPERATURE SENSOR

The engine coolant ambient temperature sensor is located on the heater inlet line between the engine and the heater core. It detects coolant temperature and converts it into a resistance value which is then input to the EATC unit. After disconnecting engine coolant ambient temperature sensor harness connector, measure resistance between sensor terminals ① and ②, using the table below.

Temperature °C (°F)	Resistance kΩ
10 to 20 (50 to 68)	37 to 50
20 to 30 (68 to 88)	24 to 37
30 to 40 (88 to 104)	16 to 24

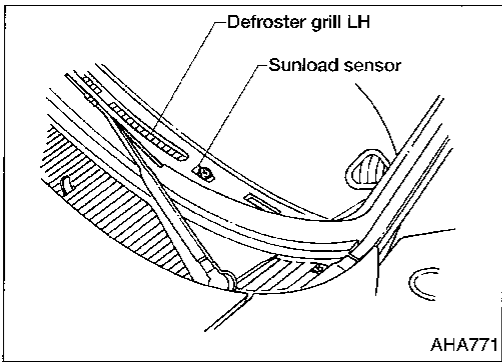
Control System Input Components (Cont'd)

AMBIENT TEMPERATURE SENSOR



The ambient temperature sensor is attached to the radiator core support. It detects ambient temperature and converts it into a resistance value which is then input to the EATC unit. After disconnecting ambient temperature sensor harness connector, measure resistance between sensor terminals ① and ②, using the table below.

Temperature °C (°F)	Resistance kΩ
-40 (-40)	925.02
-20 (4)	276.96
0 (32)	95.85
20 (68)	37.34
40 (104)	16.11
60 (140)	7.55
100 (212)	2.08
120 (248)	1.19



SUNLOAD SENSOR

The sunload sensor is located on the left defroster grille. It detects sunload entering through the windshield by means of a photo diode. The sensor then converts it into a current value which is then input to the EATC unit. Measure resistance between sensor terminals ① and ②, the resistance should be greater than 0 ohms depending on the amount of sunlight.

- When checking sunload sensor, place it in direct sunlight.

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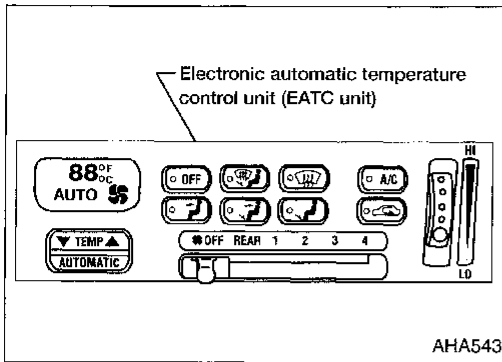
BT

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### Control System Electronic Automatic Temperature Control Unit (EATC Unit)

The EATC unit has a built-in microcomputer which processes information sent from various sensors needed for air conditioner operation. The front air mix door motor, mode door motor, front intake door motor, front blower motor and compressor are then controlled.

The EATC unit is unitized with control mechanisms. Signals from various switches and the Temperature Control Switch are directly entered into EATC unit.

Self-diagnostic functions are also built into EATC unit to provide a quick check of malfunctions in the auto air conditioner system.

### AMBIENT TEMPERATURE INPUT PROCESS

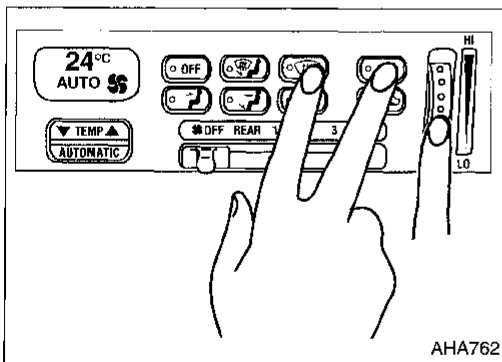
The EATC unit includes a "processing circuit" for the ambient temperature sensor input. When a temperature increase less than -12°C (20°F) is detected by the ambient temperature sensor, the "processing circuit" allows the EATC unit to recognize the temperature increase after 80 seconds and when the temperature increase is greater than -12°C (20°F) 5 minutes is required.

As an example, consider stopping for a cup of coffee after high speed driving. Even though the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase because heat radiated from the engine compartment can radiate to the front grille area (where the ambient sensor is located).

### SUNLOAD INPUT PROCESS

The EATC unit also includes a processing circuit to "average" variations in detected sunload over a period of time. This prevents drastic swings in the EATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time. The (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the EATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.



### ENGLISH/METRIC MODE

It can be accessed by simultaneously pressing the DEFROST and A/C switches and holding the blower switch in the upward position for 1 second.

Control System Output Components

FRONT AIR MIX DOOR CONTROL (Automatic temperature control)

Component parts

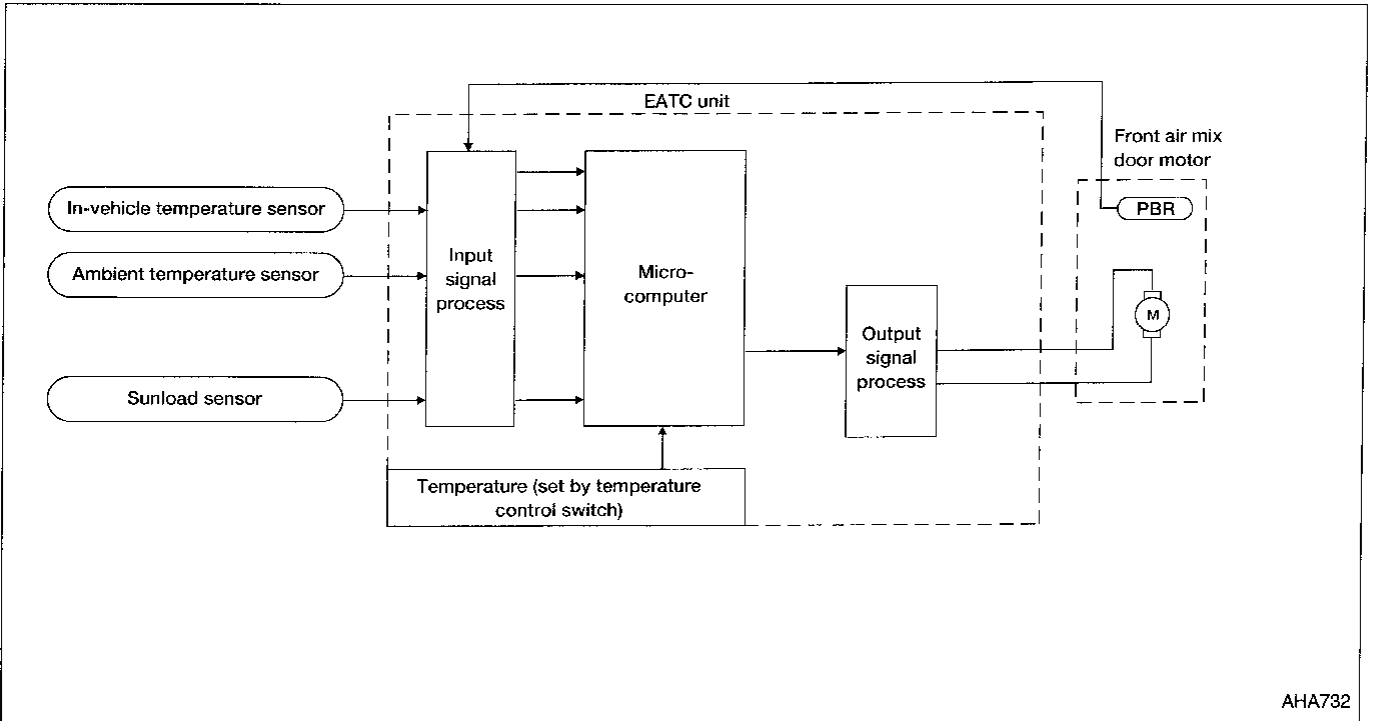
Front air mix door control system components are:

- EATC unit
- Front air mix door motor (PBR)
- In-vehicle temperature sensor
- Ambient temperature sensor
- Sunload sensor

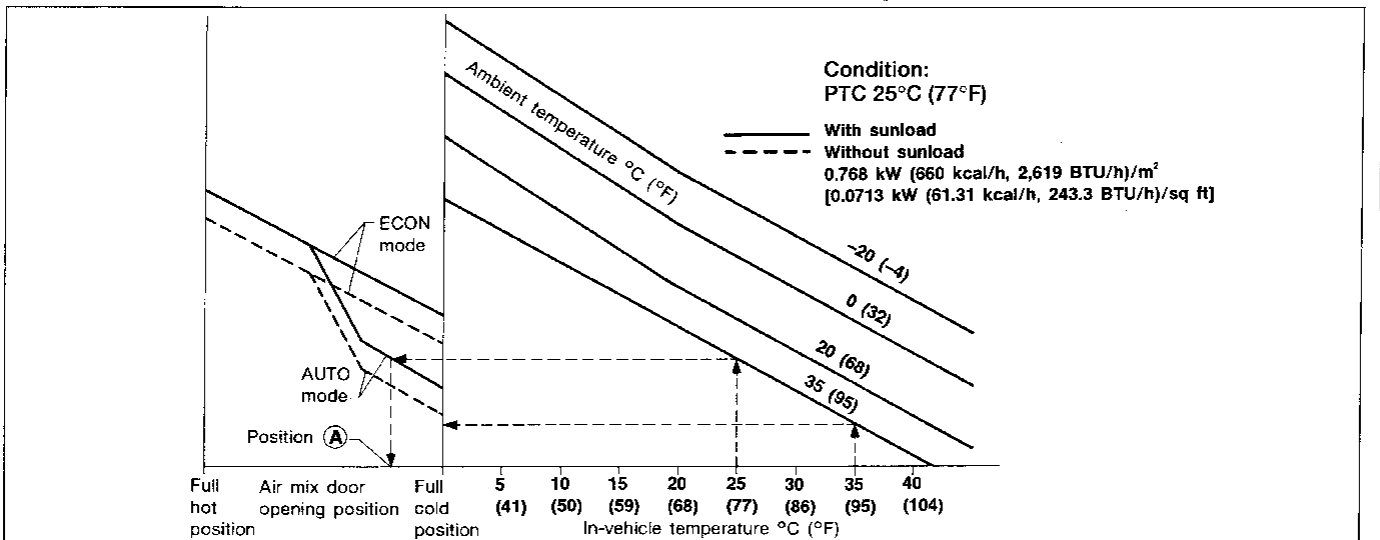
System operation

Temperature set by the Temperature Control Switch is compensated through the EATC unit to determine target temperature.

EATC unit will operate the front air mix door motor to set air conditioner system in WARM or COOL position, depending upon relationship between conditions.



Air mix door control specification

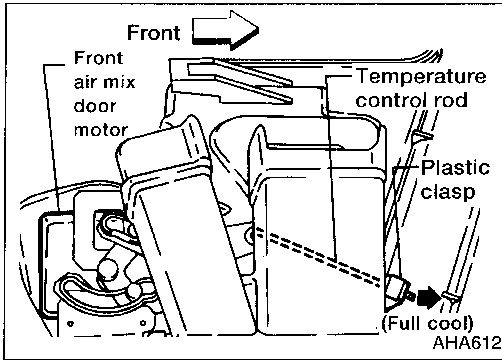


Example:

- If temperature setting is set at 25°C (77°F) under no sunload condition when ambient and in-vehicle temperature is 35°C (95°F), air mix door is initially automatically set in full cold position.
- Within some period, in-vehicle temperature will lower towards the objective temperature, and the air mix door position will shift incrementally towards the hot side and finally stay in this position (A) if mode is at AUTO position (No. ECON mode). Air mix door opening position is always fed back to auto amplifier by PBR built-in air mix door motor.

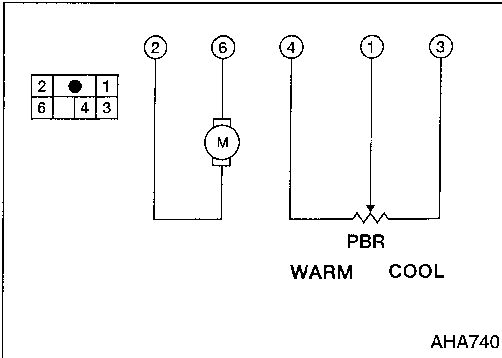
Control System Output Components (Cont'd)

FRONT AIR MIX DOOR MOTOR



The front air mix door motor is attached to the bottom of the heater unit. It rotates so that the front air mix door is opened to a position set by the EATC unit. Motor rotation is conveyed through a rod which activates the front air mix door. It is then fed back to the EATC unit by PBR built-in the front air mix door motor.

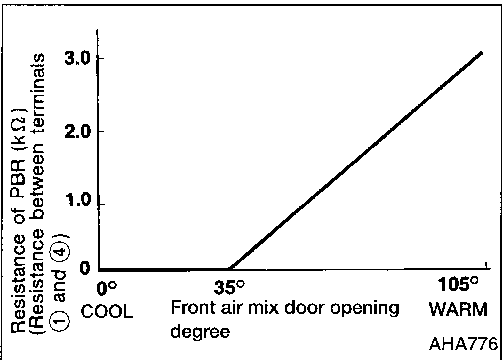
Front air mix door motor operation



⑥	②	Air mix door operation	Movement of rod
⊖	⊕	WARM → COOL	Clockwise
⊖	⊖	STOP	STOP
⊕	⊖	COOL → WARM	Counterclockwise

PBR characteristics

Measure resistance between terminals ① and ④ at vehicle harness side.



Control System Output Components (Cont'd)

MODE DOOR CONTROL

Component parts

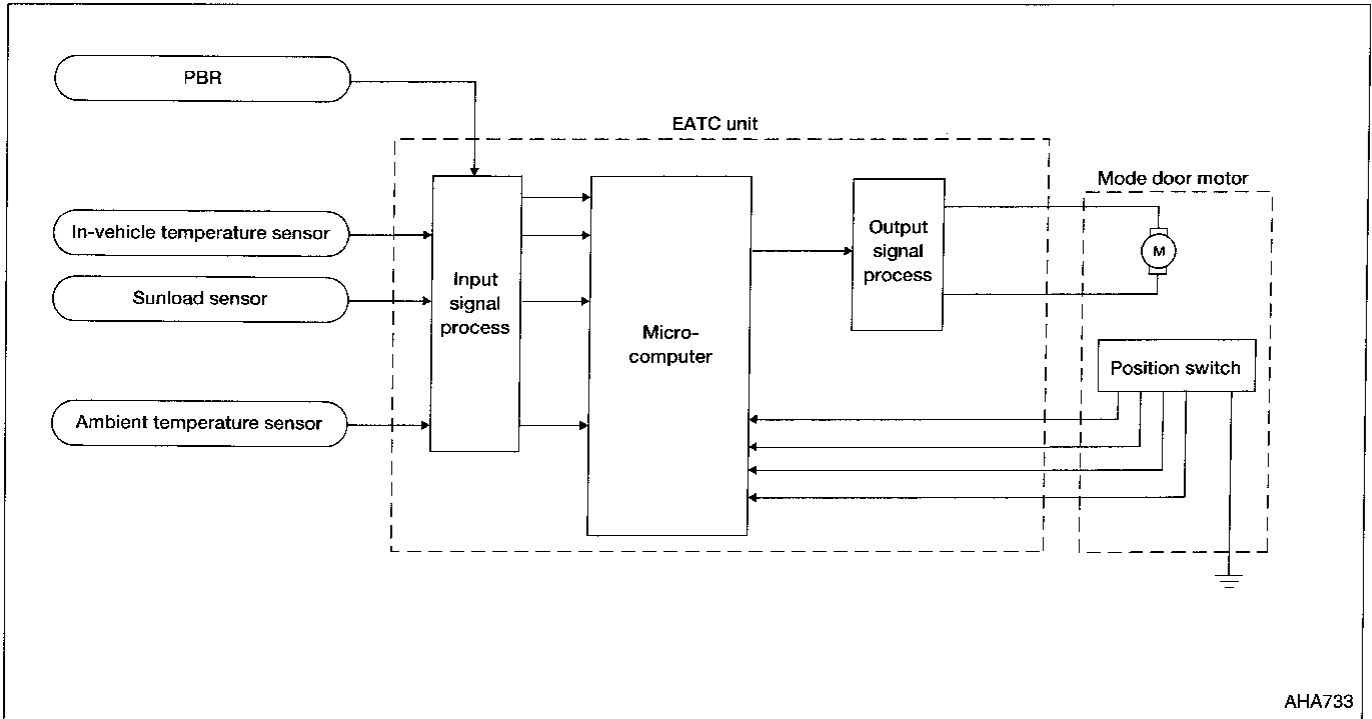
Mode door control system components are:

- EATC unit
- Mode door motor
- PBR
- In-vehicle temperature sensor
- Ambient temperature sensor
- Sunload sensor

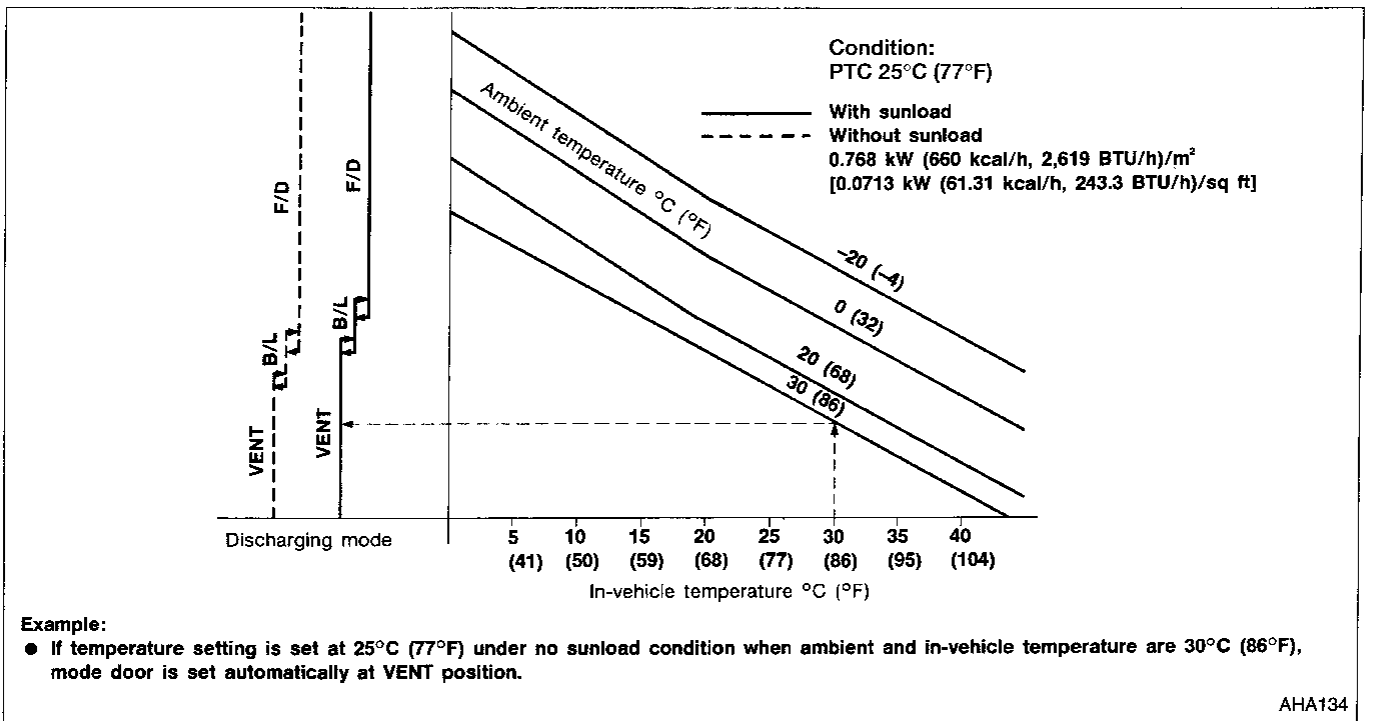
System operation

The EATC unit computes the air discharge conditions according to the ambient temperature and the in-vehicle temperature. The computed discharge conditions are then corrected for sunload to determine through which outlets air will flow into the passenger compartment.

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Mode door control specification



Example:

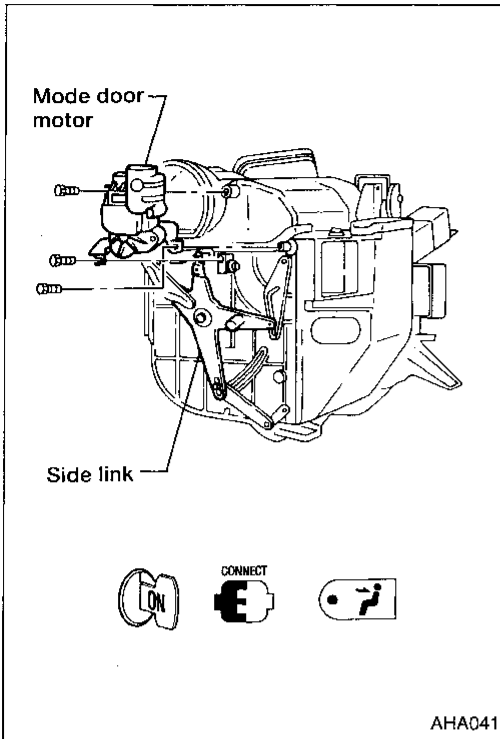
- If temperature setting is set at 25°C (77°F) under no sunload condition when ambient and in-vehicle temperature are 30°C (86°F), mode door is set automatically at VENT position.

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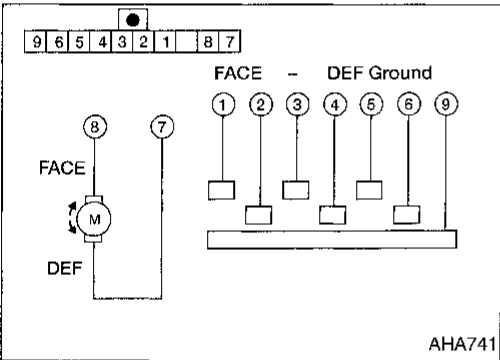
Control System Output Components (Cont'd)

MODE DOOR MOTOR

The mode door motor is attached to the heater unit. It rotates so that air is discharged from the outlet set by the EATC unit. Motor rotation is conveyed to a link which activates the mode door.



Mode door motor operation



⑦	⑧	Mode door operation	Direction of side link rotation
⊖	⊕	FACE → DEF	Counterclockwise
⊖	⊖	STOP	STOP
⊕	⊖	DEF → FACE	Clockwise

Control System Output Components (Cont'd)

FRONT INTAKE DOOR CONTROL

System operation

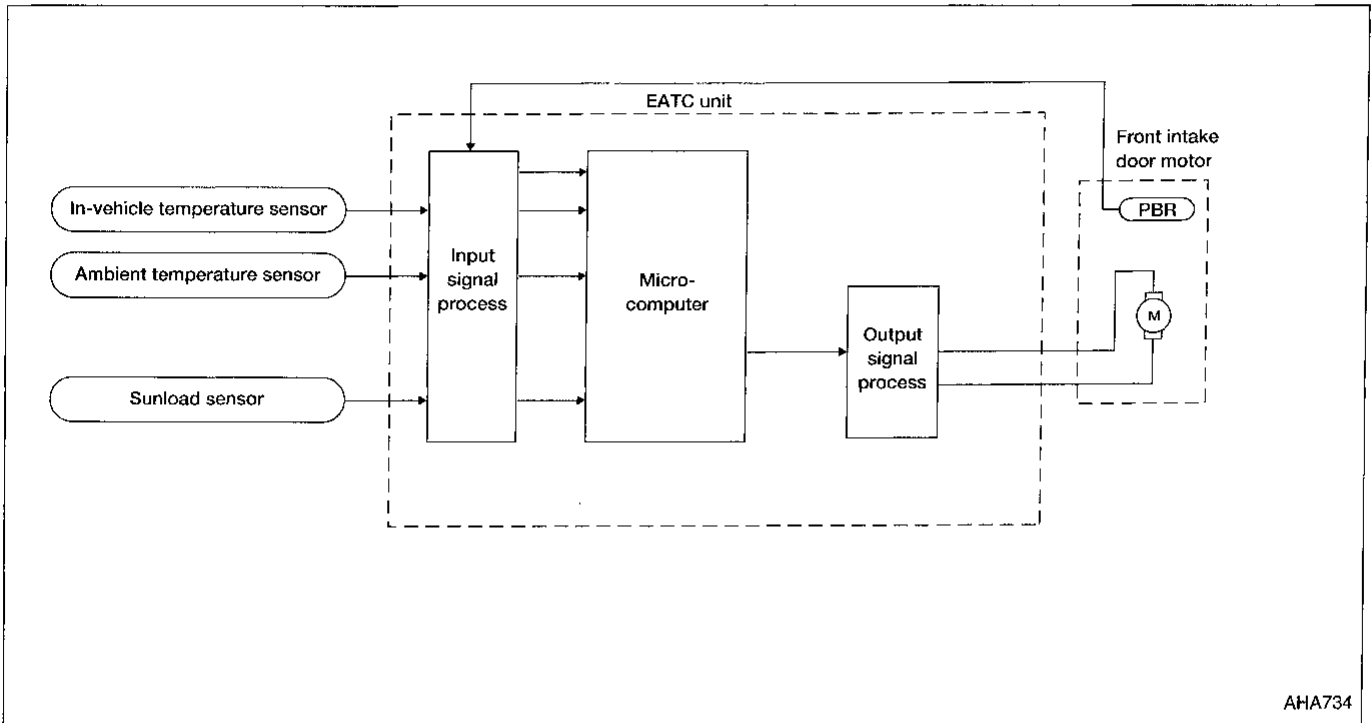
Components parts

Front intake door control system components are:

- EATC unit
- Front intake door motor
- PBR
- In-vehicle temperature sensor
- Ambient temperature sensor
- Sunload sensor

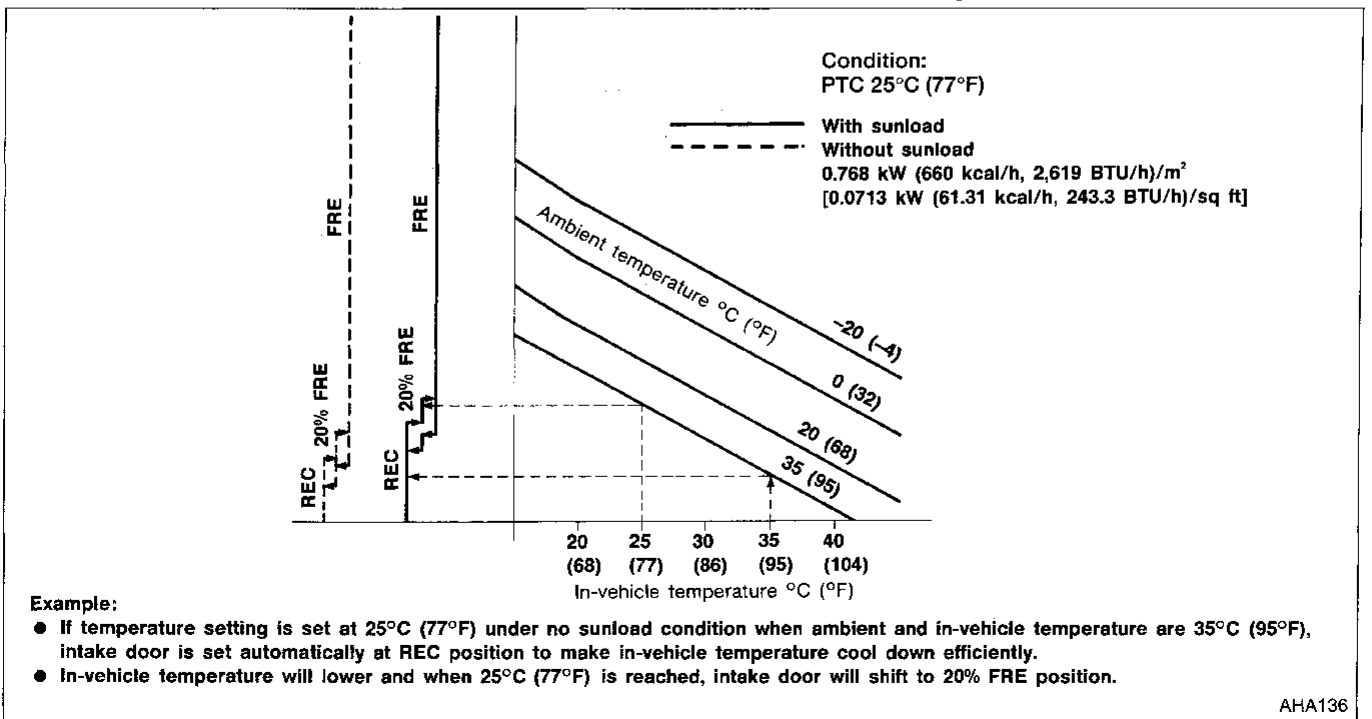
When AUTO mode is selected the EATC unit determines intake door position based on the ambient temperature and the in-vehicle temperature. When the DEF or F/D switch is pushed, the EATC UNIT sets the intake door at the FRESH position.

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Front intake door control specification



Example:

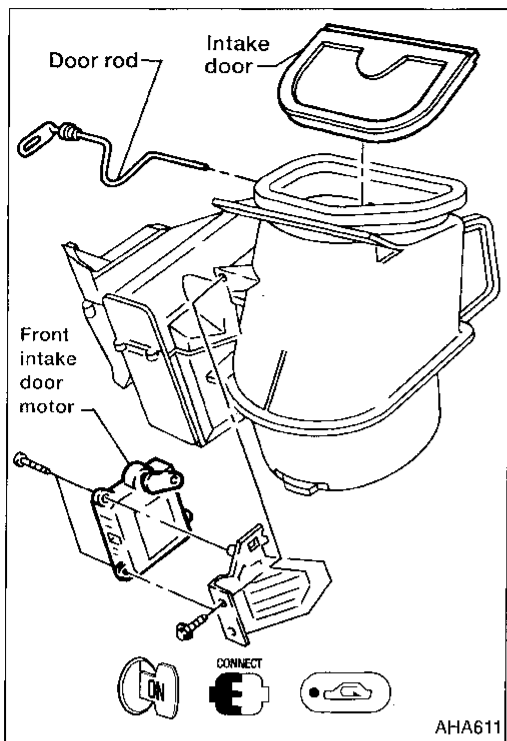
- If temperature setting is set at 25°C (77°F) under no sunload condition when ambient and in-vehicle temperature are 35°C (95°F), intake door is set automatically at REC position to make in-vehicle temperature cool down efficiently.
- In-vehicle temperature will lower and when 25°C (77°F) is reached, intake door will shift to 20% FRE position.

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Control System Output Components (Cont'd)

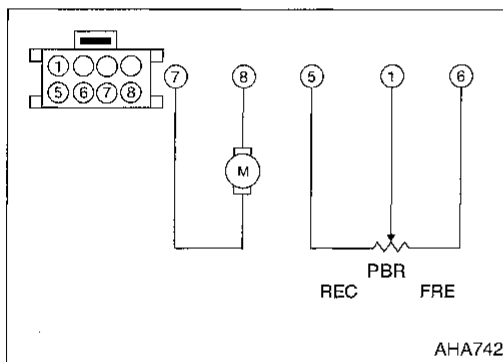
FRONT INTAKE DOOR MOTOR

The front intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the EATC unit. Motor rotation is conveyed to a rod which activates the front intake door.



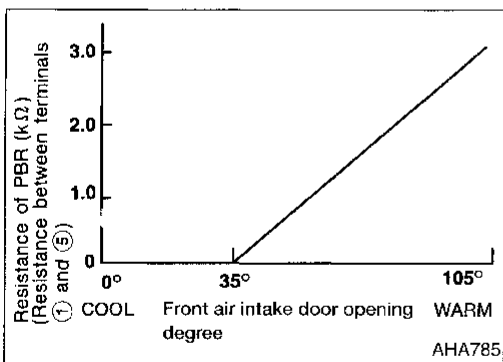
Front intake door motor operation

⑧	⑦	Intake door operation	Movement of link rotation
⊕	⊖	REC → FRE	Clockwise
⊖	⊖	STOP	STOP
⊖	⊕	FRE → REC	Counterclockwise



PBR characteristics

Measure resistance between terminals ① and ⑤ at vehicle harness side.



Control System Output Components (Cont'd)

REAR AIR MIX DOOR CONTROL

Components parts

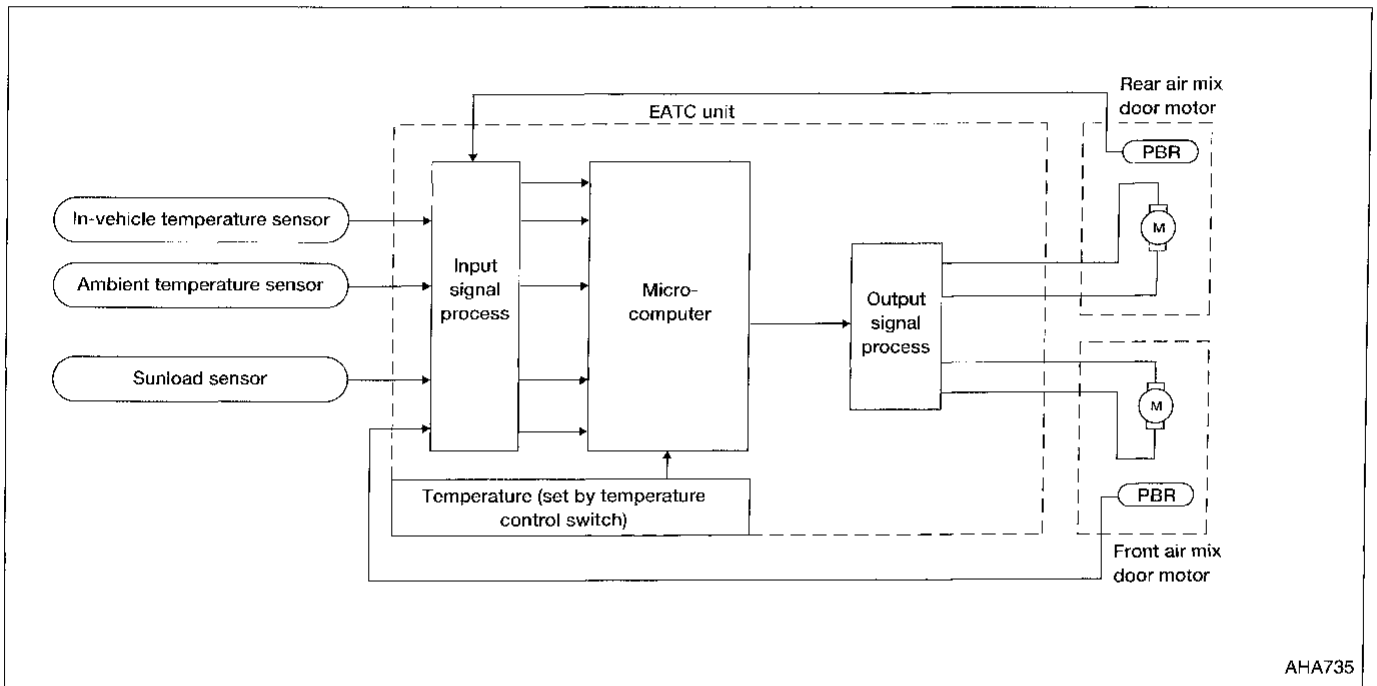
Rear air mix door control system components are:

- EATC unit
- Rear air mix door motor (PBR)
- In-vehicle temperature sensor
- Ambient temperature sensor
- Sunload sensor
- Front air mix door motor (PBR)

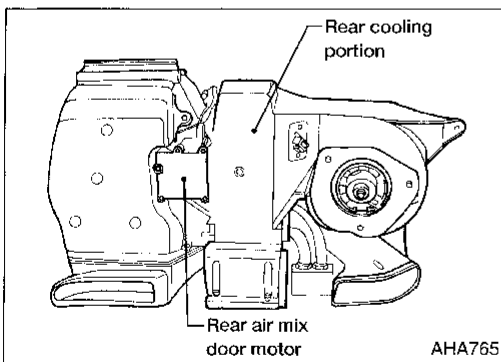
System operation

Temperature set by the Temperature Control Switch is compensated through the EATC unit to determine target temperature.

The rear air mix door motor will track the front air mix door motor when the rear fan switch (front) is set to any position except REAR.

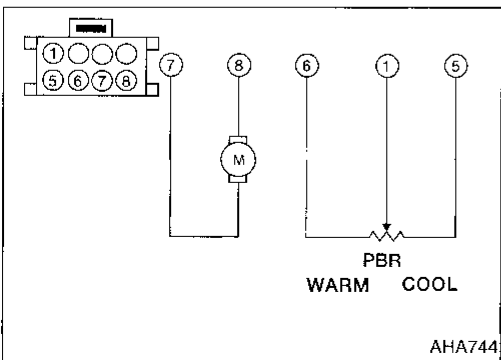


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REAR AIR MIX DOOR MOTOR

The rear air mix door motor is attached to the rear cooling unit. It rotates so that the rear air mix door is open to the same position as the front air mix door when the rear fan switch (front) is set to any position except REAR. Motor rotation activates the rear air mix door. It is then fed back to the EATC unit by PBR built-in the rear air mix door motor.



Rear air mix door motor operation

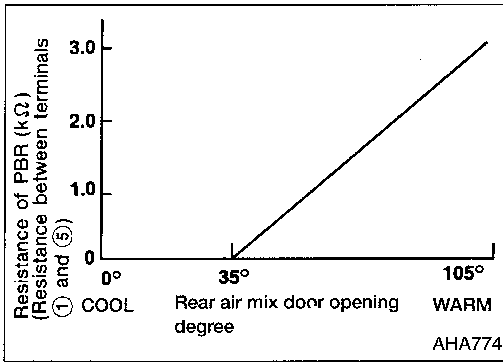
⑧	⑦	Air mix door operation	Direction of lever movement
⊕	⊖	COOL → WARM	Clockwise
⊖	⊖	STOP	STOP
⊖	⊕	WARM → COOL	Counterclockwise



Control System Output Components (Cont'd)

PBR characteristics

Measure resistance between terminals ① and ⑤ at vehicle harness side.



Control System Output Components (Cont'd)

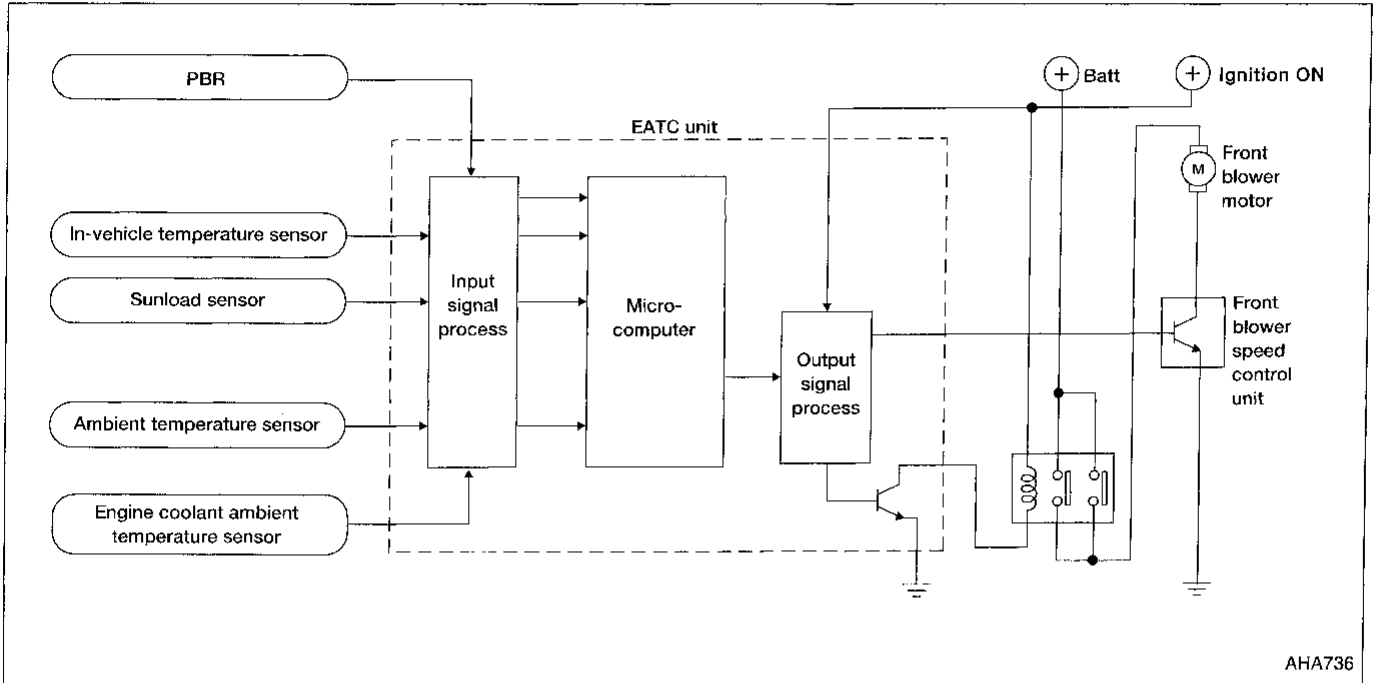
FAN SPEED CONTROL

Component parts

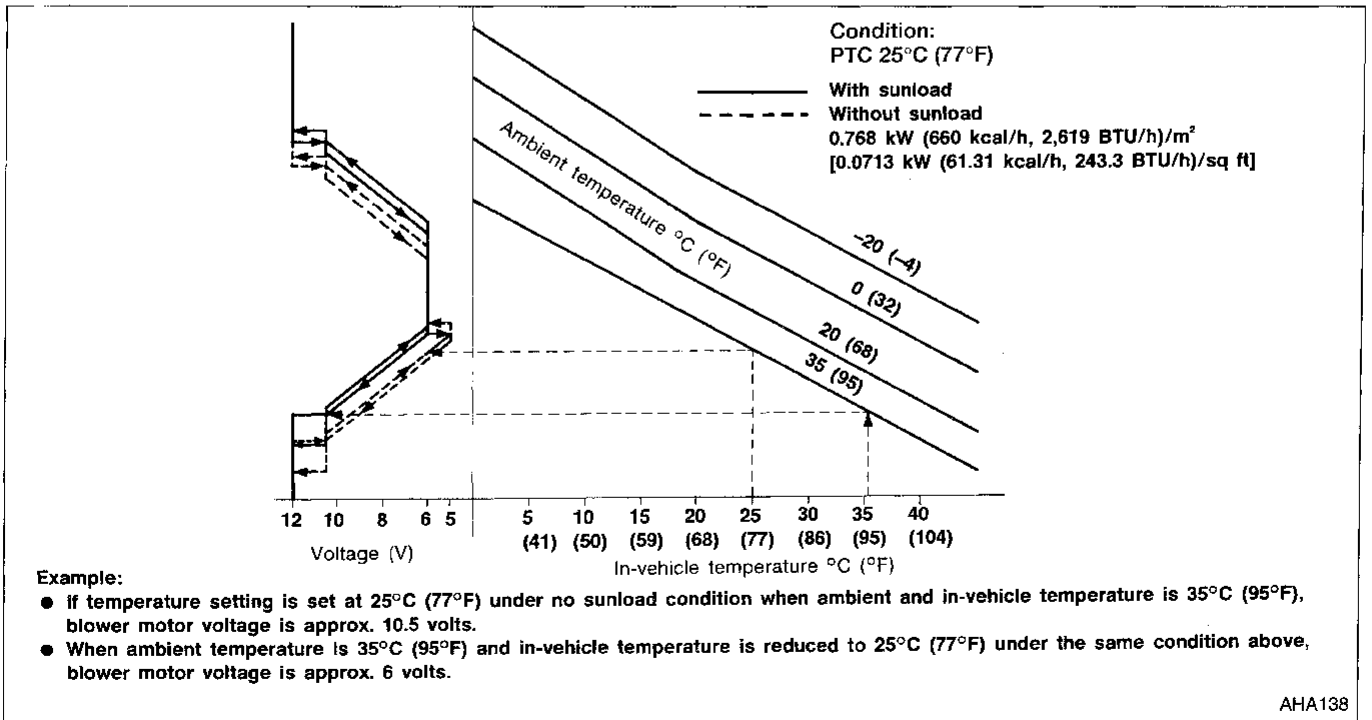
Fan speed control system components are:

- EATC unit
- Front blower speed control unit
- PBR
- In-vehicle temperature sensor
- Ambient temperature sensor
- Sunload sensor
- Blower relay
- Engine coolant ambient temperature sensor

System operation



Fan speed control specification



Example:

- If temperature setting is set at 25°C (77°F) under no sunload condition when ambient and in-vehicle temperature is 35°C (95°F), blower motor voltage is approx. 10.5 volts.
- When ambient temperature is 35°C (95°F) and in-vehicle temperature is reduced to 25°C (77°F) under the same condition above, blower motor voltage is approx. 6 volts.

**Control System Output Components (Cont'd)****AUTOMATIC MODE**

In the automatic mode, the blower motor speed is calculated by the EATC unit based on inputs from the:

- PBR
- in-vehicle temperature sensor
- sunload sensor
- ambient temperature sensor
- Engine coolant ambient temperature sensor

The blower motor applied voltage ranges from approximately 4.5 volts (lowest speed) to 12 volts (highest speed).

To control blower speed the EATC unit supplies a signal to the front blower speed control unit. Based on this signal, the front blower speed control unit controls the current flow from the blower motor to ground.

**STARTING FAN SPEED CONTROL****Start up from “COLD SOAK” condition (Automatic mode)**

When the engine coolant temperature is below 50°C (122°F), the front blower will operate at a minimum voltage of (4.5V) and the DEF mode will be selected by the EATC unit. This operating mode will continue approximately 180 seconds under low ambient conditions. When engine coolant temperature reaches 50°C (122°F) the system goes to FOOT mode and the blower speed slowly increases to the required speed based on coolant temperature.

**Start up from normal or “HOT SOAK” condition (Automatic mode)**

The EATC unit should remain at the same setting as it was when the ignition switch is turned OFF. The blower will begin operation momentarily after the AUTO button is pushed. The blower speed will gradually rise to the objective speed over a time period of 5 seconds or less (actual time depends on the objective blower speed).

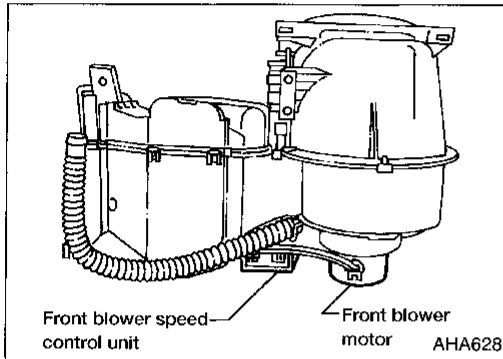
Control System Output Components (Cont'd)

**BLOWER SPEED COMPENSATION**

**Sunload**

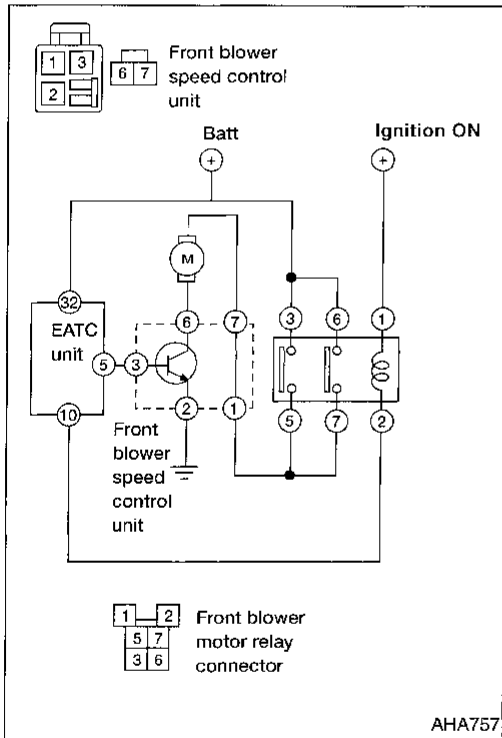
When the in-vehicle temperature and the set temperature are very close, the front blower will operate at low speed. The low speed varies depending on the sunload. During conditions of high sunload, the front blower low speed is "normal" low speed (approx. 5.5V). During lesser sunload conditions, the low speed will drop to "low" low speed (approx. 4.5V).

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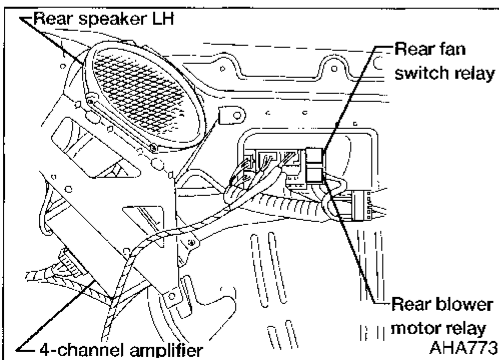
**FRONT BLOWER SPEED CONTROL UNIT**

The front blower speed control unit is located on the cooling unit. It amplifies a 11-step base current flowing from the EATC unit to change the blower speed within the range of 4.5V to 12V.



**REAR BLOWER MOTOR RELAY AND REAR FAN SWITCH RELAY**

The rear blower motor and rear fan switch relays are located behind the quarter trim finisher LH. They receive a signal from the EATC unit to operate the rear blower motor.



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**Control System Output Components (Cont'd)****MAGNET CLUTCH CONTROL**

The ECM (ECCS control module) controls compressor operation using inputs from the throttle position sensor and EATC unit.

**Acceleration cut control**

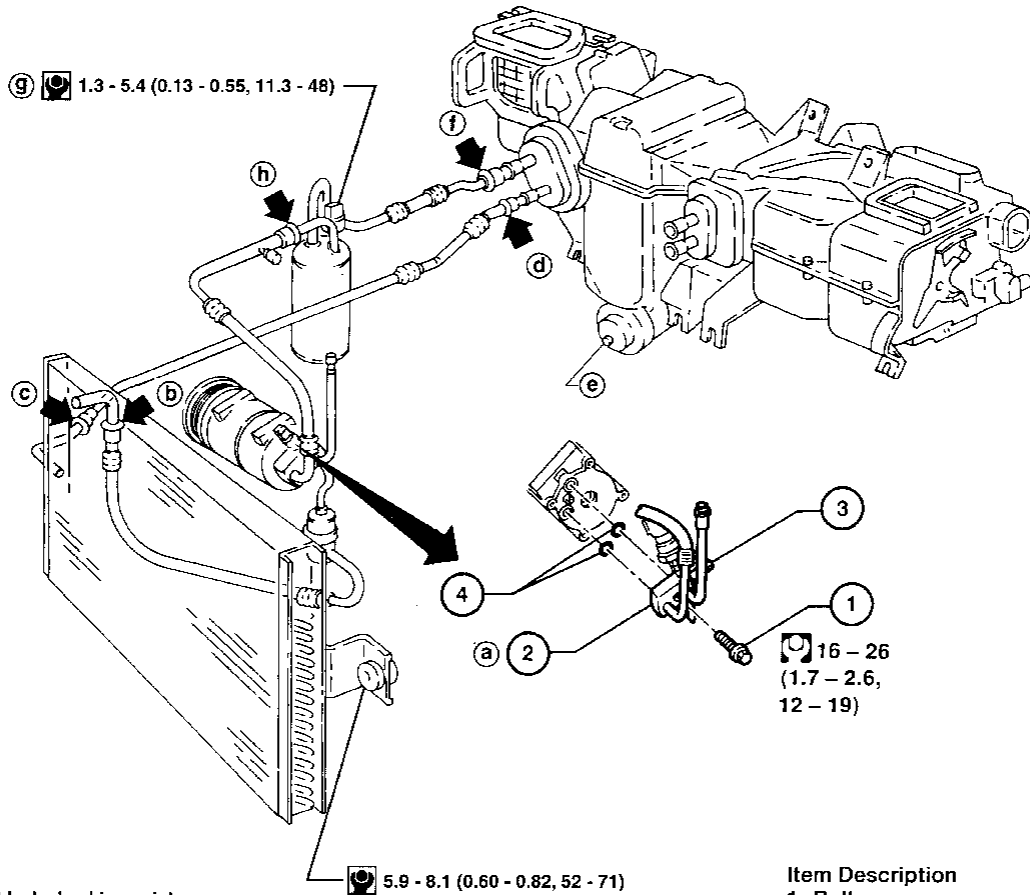
The ECM (ECCS control module) will turn the compressor ON or OFF based on the signal from the throttle position sensor.

Refrigerant Lines

• Refer to HA-4.

MODELS WITHOUT REAR A/C

SEC. 271•274•276



- : Refrigerant leak checking points
- ◄ : Spring lock coupling
- ⊙ : N·m (kg-m, in-lb)
- ⊚ : N·m (kg-m, ft-lb)

- Item Description
- 1. Bolt
  - 2. Manifold
  - 3. Pressure relief valve
  - 4. O-ring

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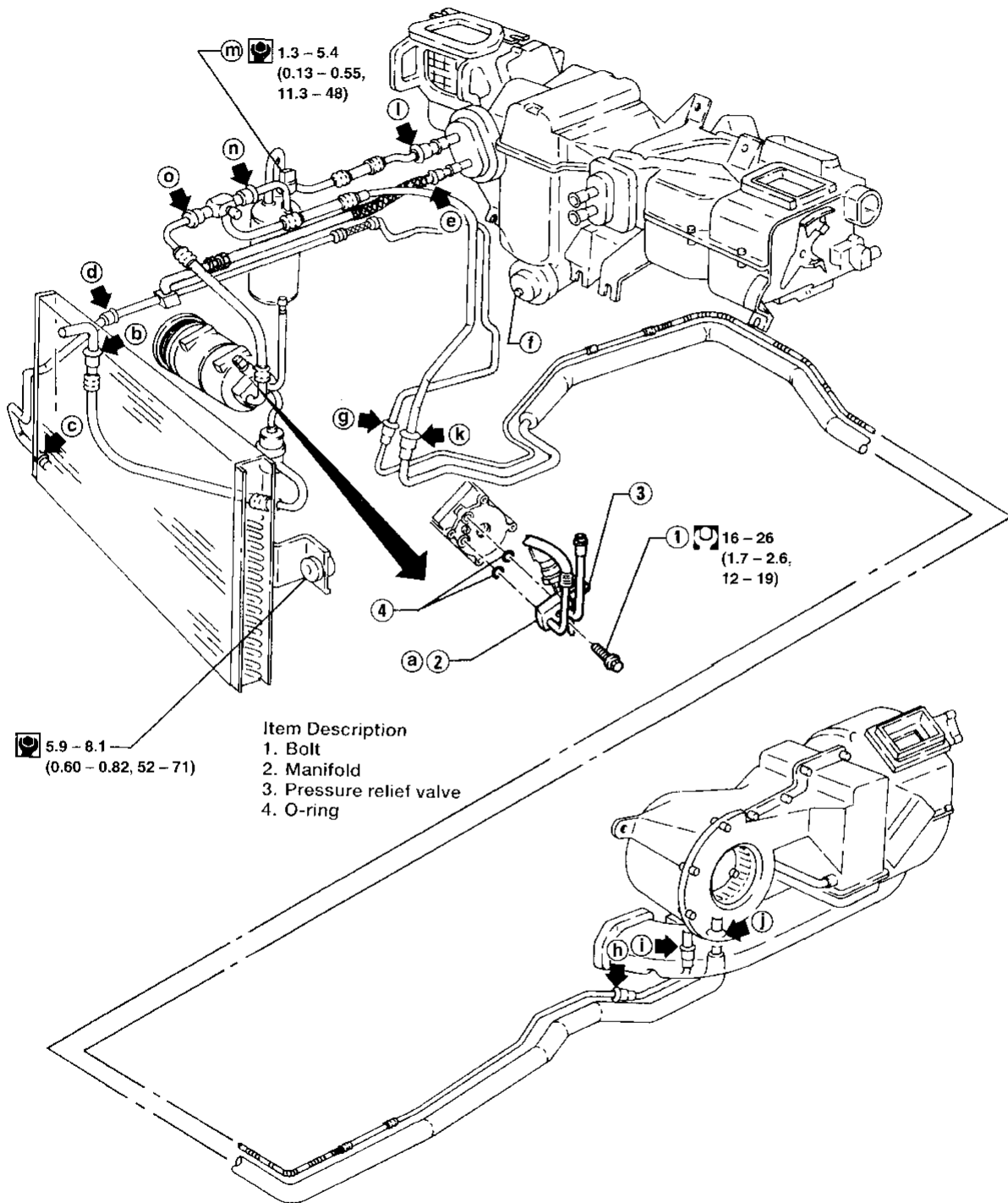
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Refrigerant Lines (Cont'd)

MODELS WITH REAR A/C

SEC. 271•274•276



- Item Description
- 1. Bolt
  - 2. Manifold
  - 3. Pressure relief valve
  - 4. O-ring

○ : Refrigerant leak checking points

◄ : Spring lock coupling

⊙ : N·m (kg·m, in-lb)

⊙ : N·m (kg·m, ft-lb)

## Checking Refrigerant Leaks

### PRELIMINARY CHECK

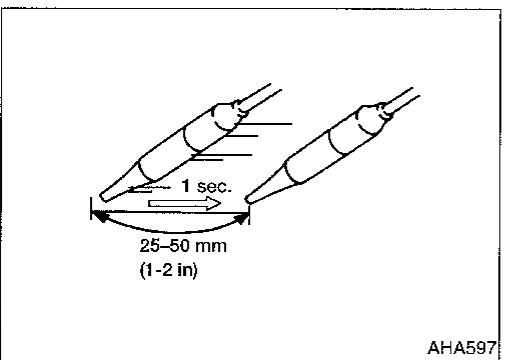
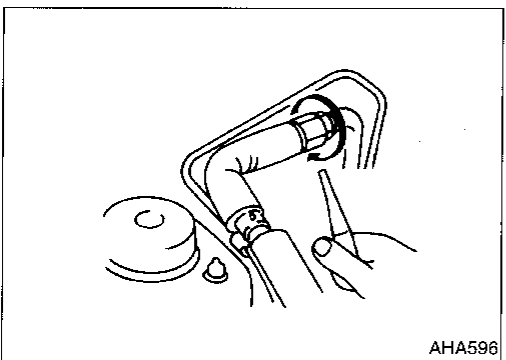
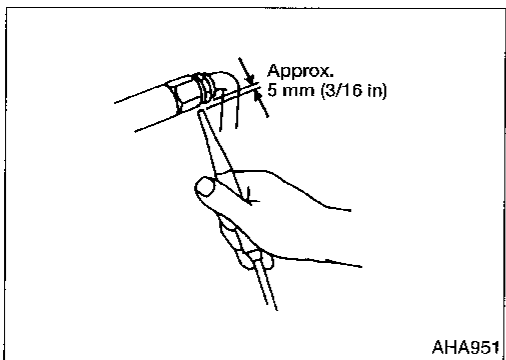
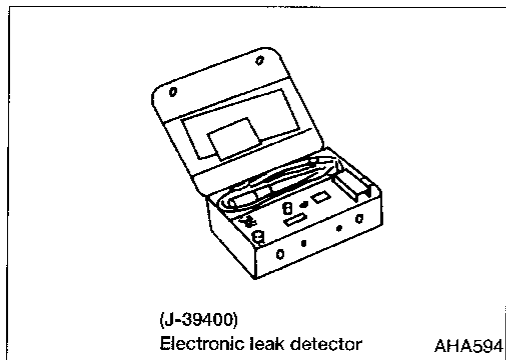
Perform a visual inspection of all refrigeration parts, fittings, hoses, and components for signs of A/C lubricant leakage, damage and corrosion.

### PRECAUTIONS FOR HANDLING LEAK DETECTOR

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

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

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



1. Position probe approximately 5 mm (3/16 in) away from point to be checked.
2. When testing, circle each fitting completely with probe.
3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.

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**Checking Refrigerant Leaks (Cont'd)****CHECKING PROCEDURE**

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

1. Turn engine off.
2. Connect a suitable A/C manifold gauge set to the A/C service ports.
3. Check if the A/C refrigerant pressure is at least 345 kPa (50 psi) above 16°C (60°F). If less than specification, evacuate and recharge the system with the specified amount of refrigerant.

NOTE: At temperatures below 16°C (60°F), leaks may not be detected since the system may not reach 345 kPa (50 psi).

4. Conduct the leak test from the high side to the low side at points (a) through (k). Refer to HA-150.

Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detector probe completely around the connection/component.

- **Compressor**

Check the fittings of high and low pressure hoses, relief valve, and shaft seal.

- **Accumulator**

Check the pressure switch, tube fitting, weld seams and the fusible plug mounts.

- **Service valves**

Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

NOTE: After removing A/C manifold gauge set from service valves, wipe any residue from valves to prevent any false readings by leak detector.

- **Cooling unit (Evaporator)**

Turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Insert the leak detector probe into the drain hose immediately after stopping the engine. (Keep the probe inserted for at least ten seconds.)

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.

**Checking Refrigerant Leaks (Cont'd)**

7. Start engine.
8. Set the heater A/C controls as follows:
  - a. A/C switch ON
  - b. Face mode
  - c. Recirculation switch ON
  - d. Max cold temperature
  - e. Fan speed high
9. Run engine at 1500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again following steps 4 through 6 above.

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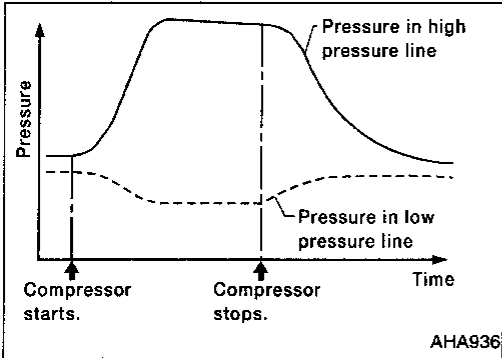
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Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector on the high pressure line. The pressure in the high pressure line will gradually drop after refrigerant circulation stops and pressure in the low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

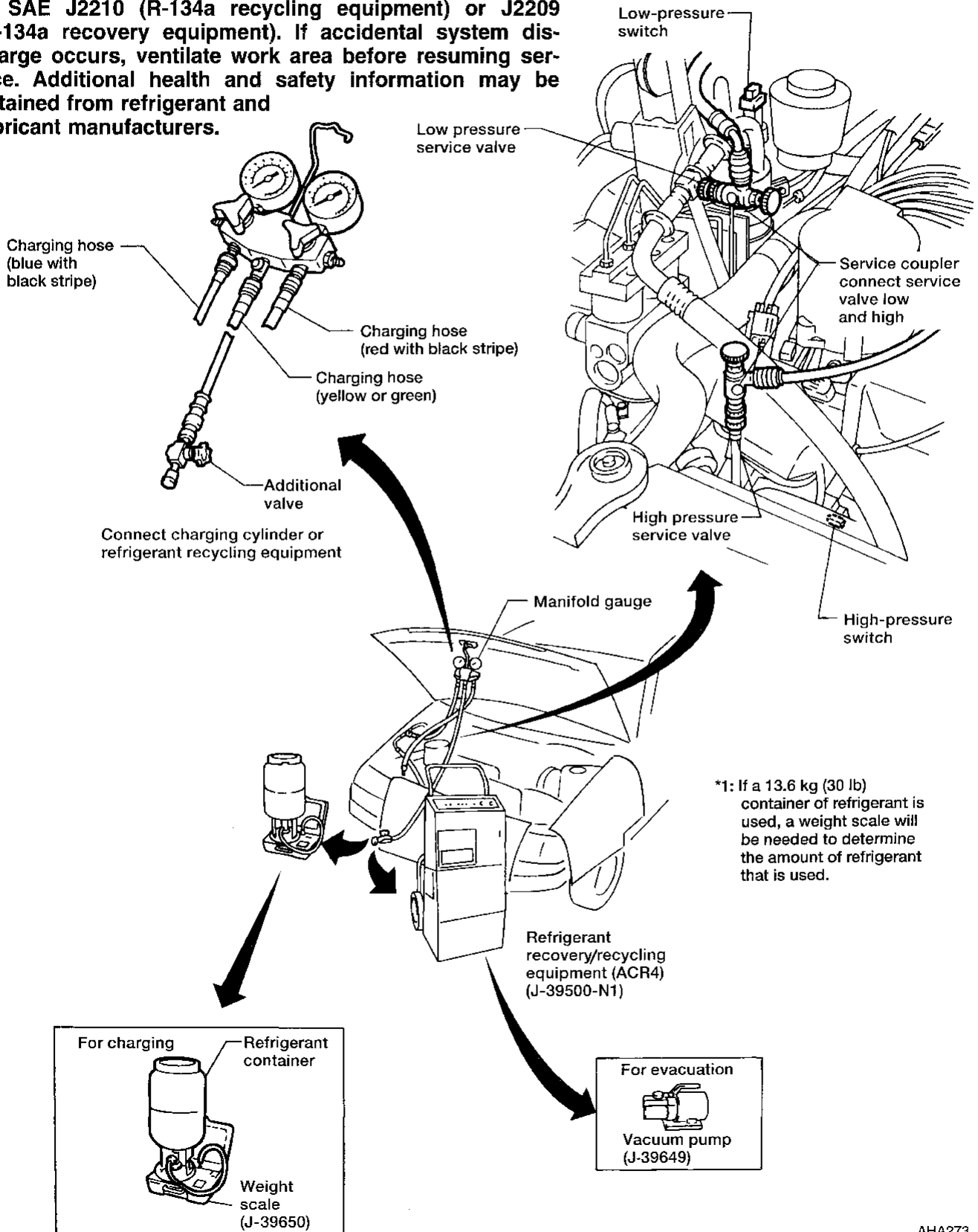
11. Discharge A/C system using approved refrigerant recovery equipment. Repair the leaking fitting or component as necessary.
12. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
13. Conduct A/C performance test to ensure system works properly.

R-134a Service Procedure

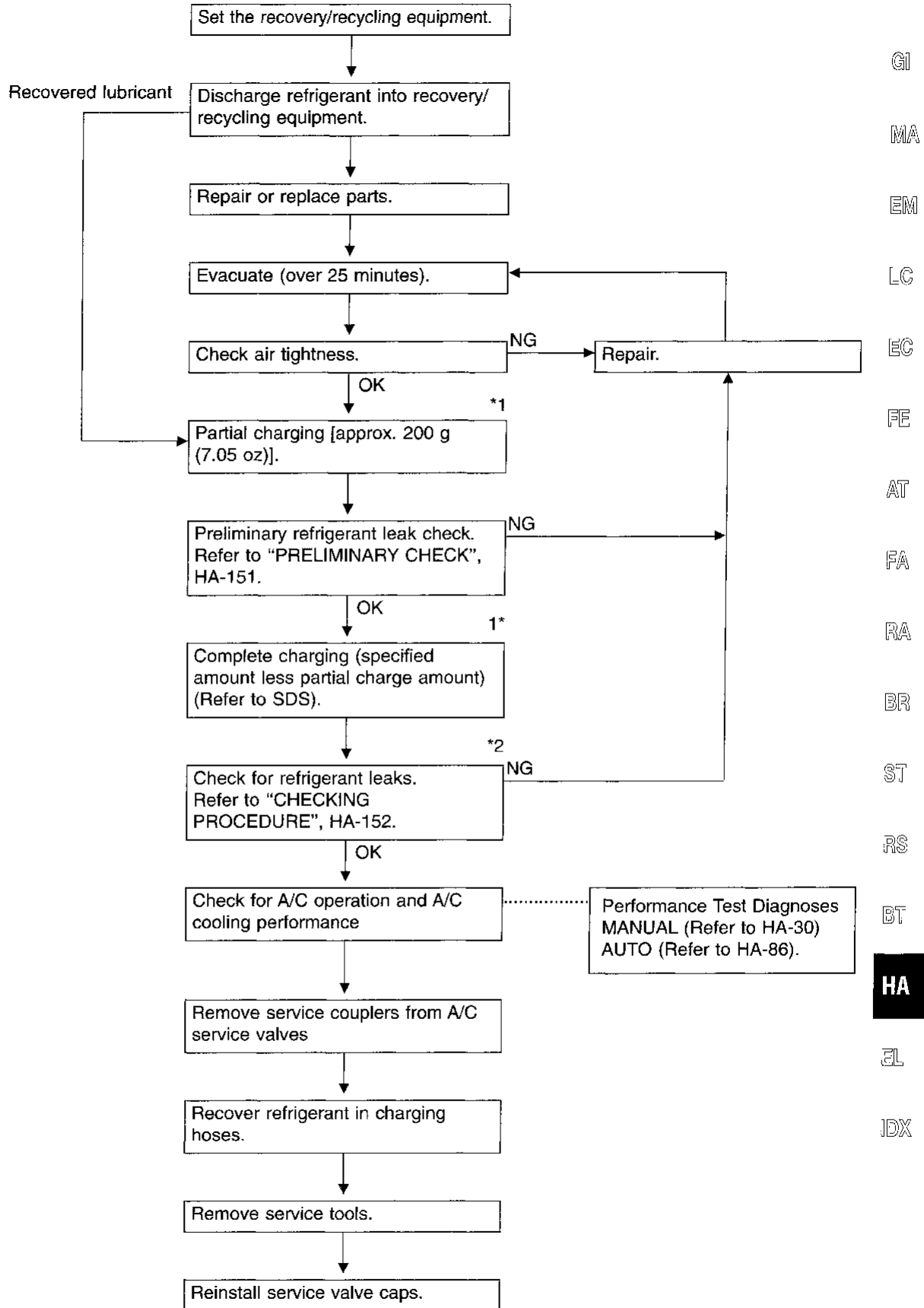
DISCHARGING, EVACUATING AND CHARGING REFRIGERANT

WARNING:

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



R-134a Service Procedure (Cont'd)



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

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

### Compressor Lubricant Quantity

The lubricant used in the compressor circulates through the system with the refrigerant. Whenever any A/C component is replaced or a gas leakage occurs, lubricant must be added.

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

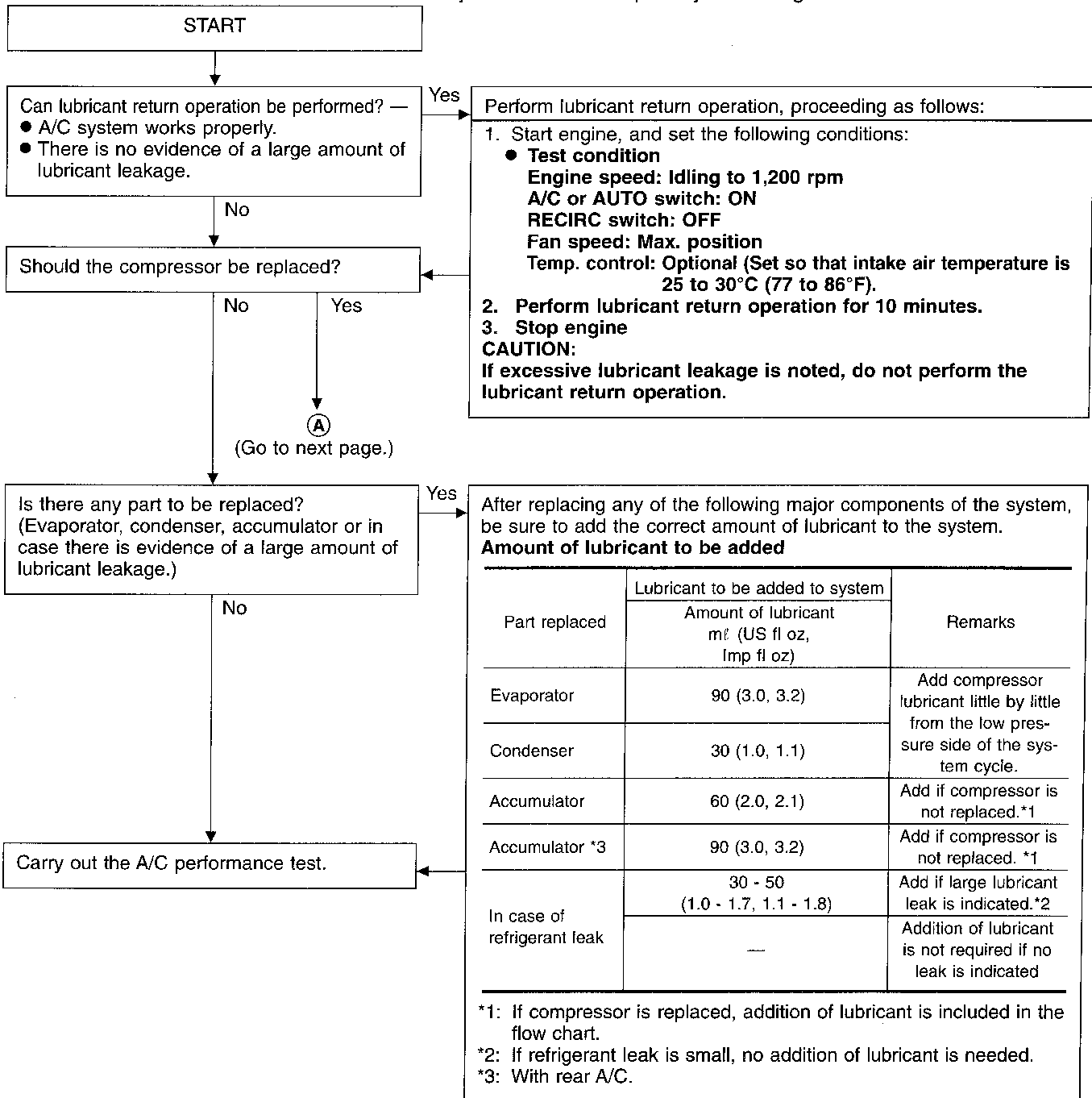
- Lack of lubricant: May lead to a seized compressor
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

#### LUBRICANT

Name: Nissan A/C System Lubricant PAG Type F  
Part No.: KLH00-PAGQU

#### CHECKING AND ADJUSTING

Adjust the lubricant quantity according to the flowchart shown below.

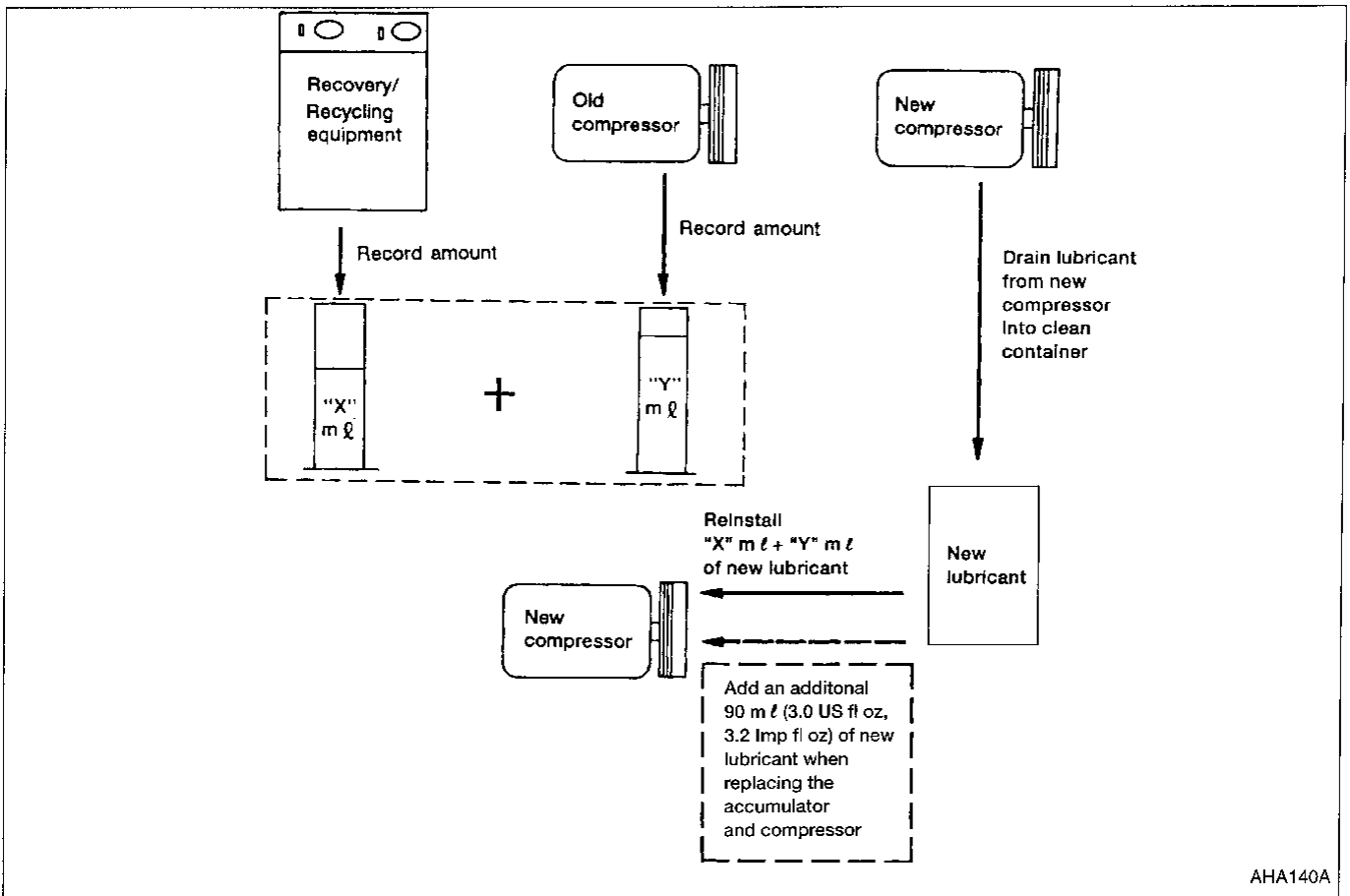


Compressor Lubricant Quantity (Cont'd)

(A)

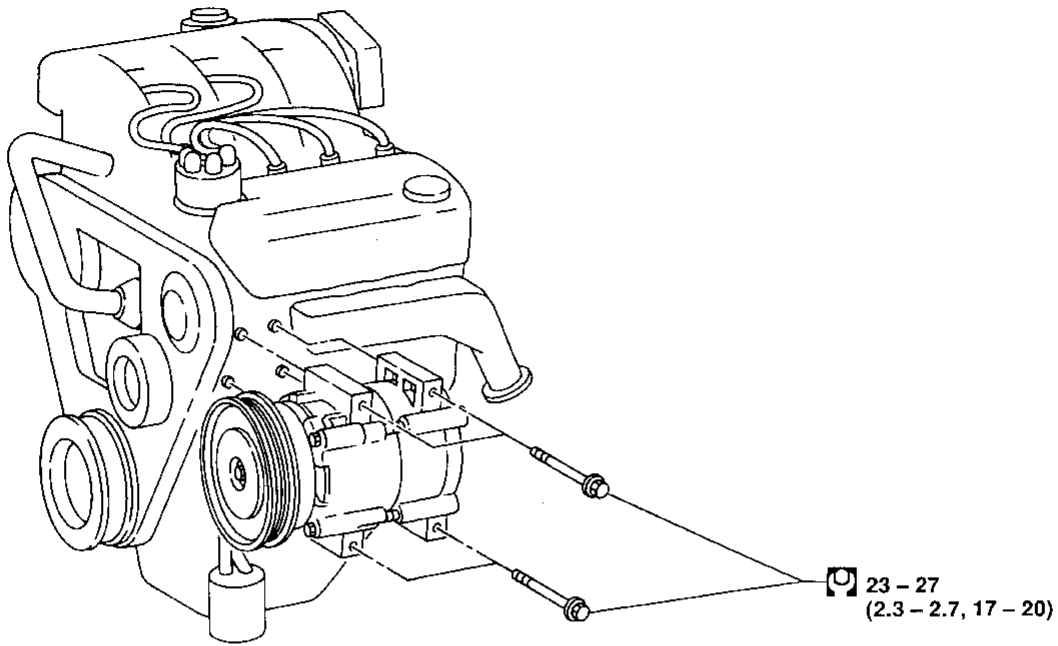
1. Discharge refrigerant into refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
2. Drain the lubricant from the "old" (removed) compressor into a graduated container and record the amount of lubricant drained.
3. Drain the lubricant from the "new" compressor into a separate, clean container.
4. Measure an amount of new lubricant installed equal to amount drained from "old" compressor. Add this lubricant to "new" compressor through the suction port opening.
5. Measure an amount of "new" lubricant equal to the amount recovered during discharging. Add this lubricant to "new" compressor through the suction port opening.
6. If the accumulator and compressor also needs to be replaced, add an additional 90 ml (3.0 US fl oz, 3.2 Imp fl oz) of lubricant at this time.  
**Do not add this 90 ml (3.0 US fl oz, 3.2 Imp fl oz) of lubricant if only replacing the compressor.**

Lubricant adjusting procedure for compressor replacement



Compressor (Ford Model FS-10)

SEC. 274-275

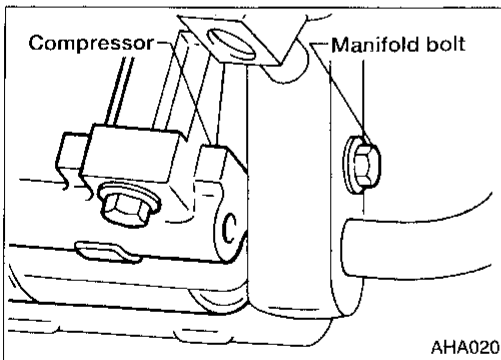


: N·m (kg-m, ft-lb)

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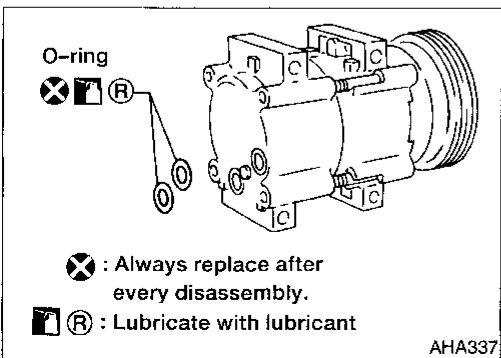
REMOVAL

1. Disconnect battery cable.
2. Discharge refrigerant into refrigerant recycling equipment. Refer to HA-154.
3. Remove manifold bolt.
4. Remove manifold and inlet/outlet compressor cap.
5. Loosen idler pulley adjusting bolt.
6. Remove compressor drive belt.
7. Disconnect compressor harness connectors.
8. Remove four compressor fixing bolts.
9. Remove compressor.



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10. Remove manifold O-rings from compressor housing.



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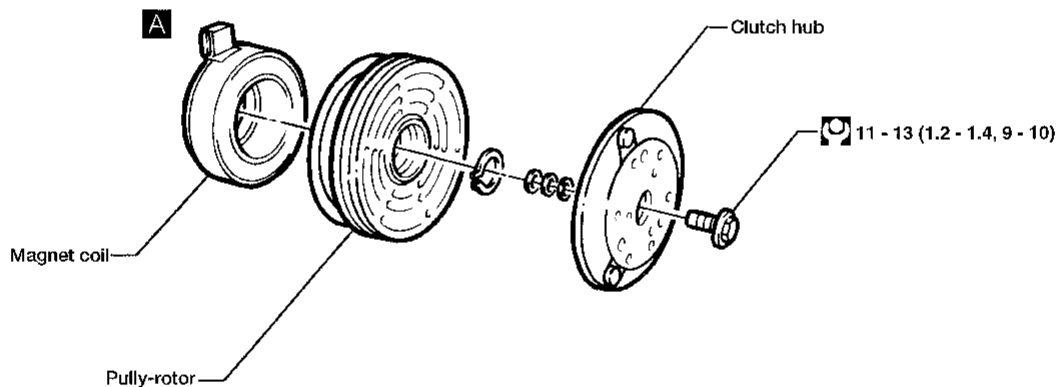
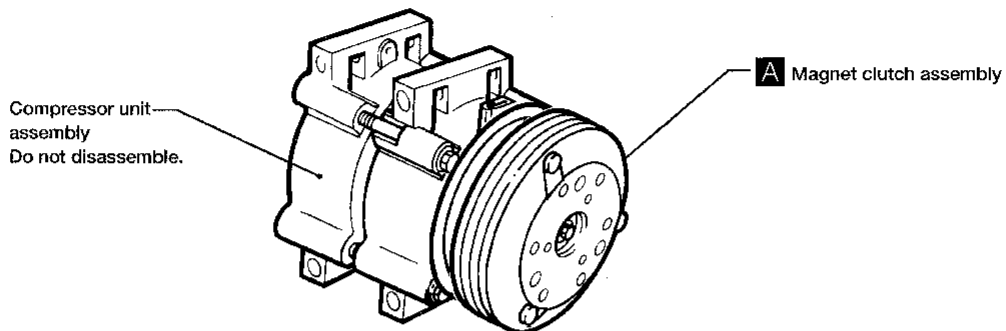
Compressor (Ford Model FS-10) (Cont'd)

INSTALLATION

Installation is the reverse order of removal.

Clutch Hub and Pulley

SEC. 274



: N·m (kg-m, ft-lb)

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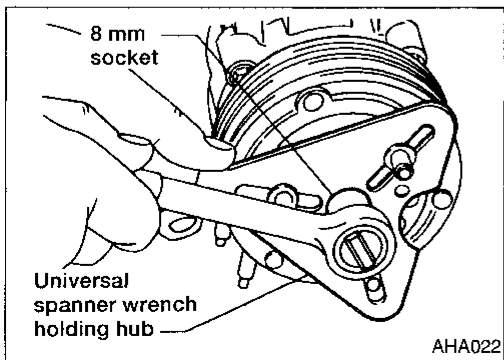
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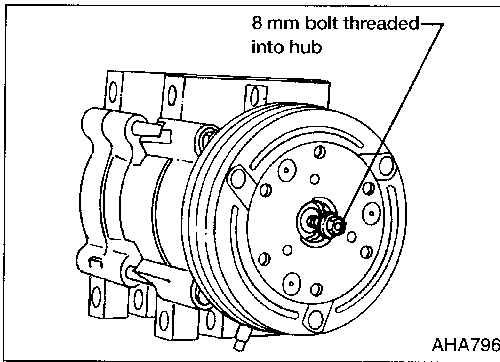


REMOVAL

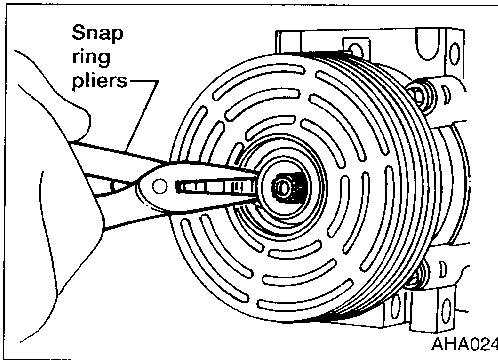
1. Remove the clutch hub retaining bolt. Use Spanner Wrench or equivalent.



**Clutch Hub and Pulley (Cont'd)**



2. Remove clutch hub and shims from compressor shaft. If hub cannot be removed from compressor shaft, screw an 8 mm bolt into the shaft hole of the clutch hub to force the hub from the shaft.



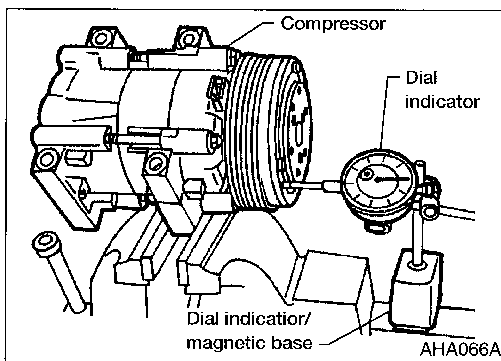
3. Remove pulley retaining snap ring.
4. Remove the pulley and bearing assembly from compressor.

**INSTALLATION**

**CAUTION:**

**Do not use air tools.**

1. Clean pulley bearing surface of compressor head to remove any dirt or corrosion.
2. Install pulley and bearing assembly on compressor. The bearing is a slip fit on the compressor head and, if properly aligned, it should slip on easily.
3. Install pulley retaining snap ring with bevel side of snap ring out.
4. Install clutch hub onto compressor shaft, together with original shim(s).
5. Thread a new hub retaining bolt into end of compressor shaft. Tighten hub retaining bolt to 11 to 14 N·m (1.1 to 1.4 kg·m, 8 to 10 ft·lb).
6. When installing a new clutch, cycle it ten times at idle to burnish the clutch and prevent slippage.



**Clutch Air Gap Adjustment**

1. Remove the compressor.
2. Place compressor in a vise.
3. Install dial indicator and set to zero. Make sure the plunger of the dial indicator contacts the A/C compressor clutch disc.
4. Measure A/C compressor clutch disc to pulley clearance using jumper wires to energize the A/C compressor field coil and engage the A/C compressor clutch disc.

**Disc to pulley clearance:**

**0.45 - 0.85 mm (0.020 - 0.033 in)**

5. If the specified clearance cannot be obtained, add or remove shims as required.

### Magnet Clutch Coil

The magnet clutch coil is pressed on the front head of the compressor. Special service tools are required to remove and install the coil.

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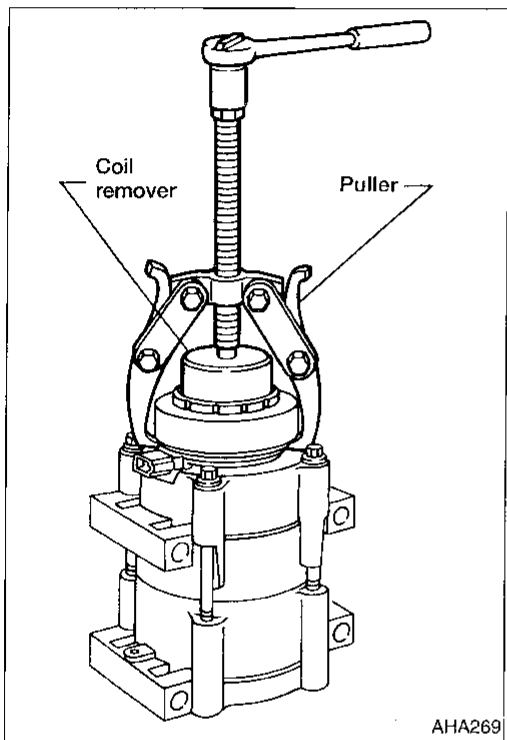
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#### REMOVAL

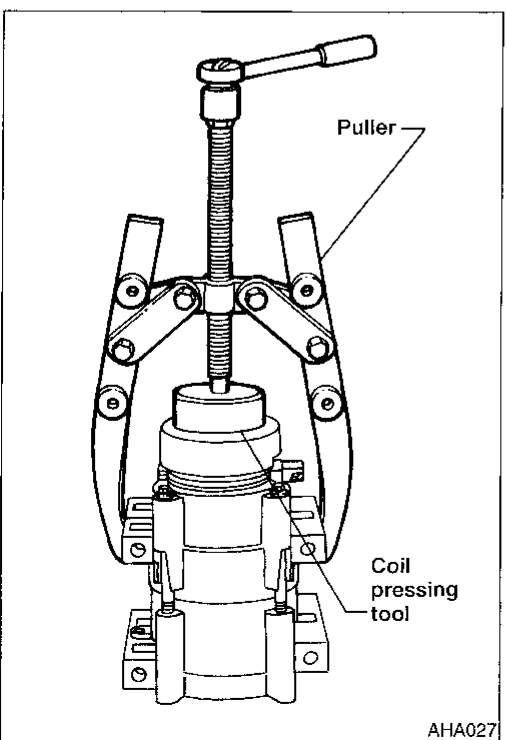
##### CAUTION:

Do not use air tools.

1. Install coil remover Tool on the nose opening of the compressor.
2. Install a puller on the compressor. Place the tip of the puller forcing screw in the center pilot of the coil remover Tool and the jaws of the puller around the back edge of the field coil.

**Note the electrical connector location prior to coil removal. There are two possible locations and it is important to align the coil in the correct position during assembly.**

3. Tighten the puller forcing screw to pull the coil from the compressor head.



#### INSTALLATION

##### CAUTION:

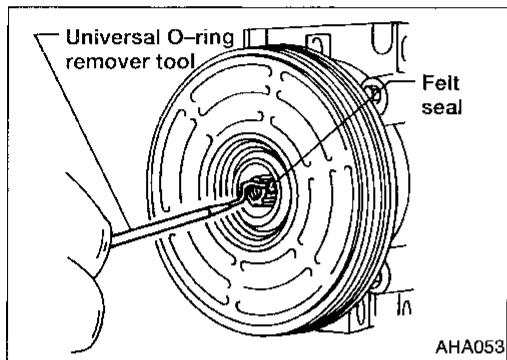
Do not use air tools.

1. Clean the coil mounting surface on the front head to remove any dirt or corrosion.
2. With the compressor in a vertical position (nose up), place the magnet coil in position on the compressor front head. Check to ensure that the coil electrical connector is positioned correctly.
3. Place the coil pressing (installer) Tool in position over the compressor nose and to the inner radius of the field coil.
4. Position 2-jaw puller Tool on the compressor and the coil pressing Tool as shown in the figure. The jaws of the puller should be firmly engaged with the rear side of the compressor front mounts. The forcing screw must be piloted on the center mark of the pressing tool.
5. Tighten the forcing screw with a hand wrench until the coil is pressed on the compressor front head. Check to ensure that the magnet coil bottoms against the head at all points around the coil outer diameter.
6. Install the clutch pulley and hub on the compressor as outlined. Adjust the air gap, as necessary. Refer to HA-160.

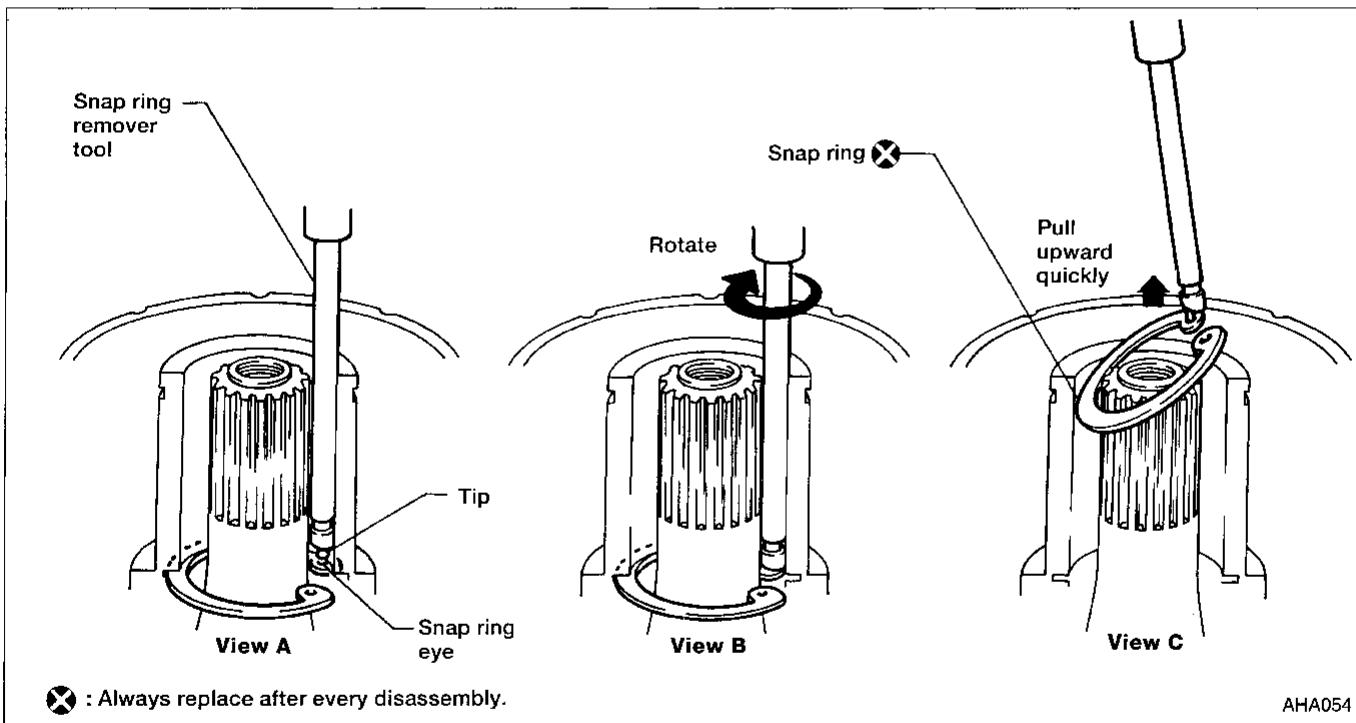
### Shaft Seal

#### REMOVAL

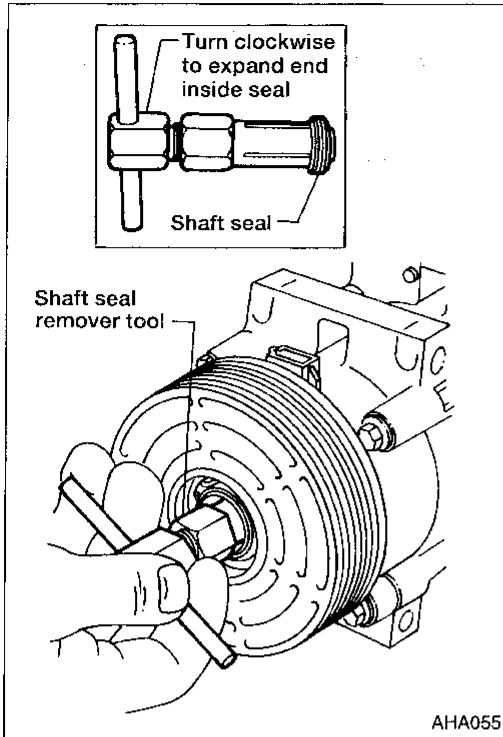
1. Discharge the A/C system. Refer to HA-154.
2. Remove the compressor from the vehicle. Refer to HA-158.
3. Remove the clutch hub and pulley. Refer to HA-159.



4. Remove shaft seal felt with O-ring tool.
5. Remove shaft seal snap ring with snap ring remover.



Shaft Seal (Cont'd)



6. Insert end of shaft seal remover Tool into nose of compressor. Hold the hex base and turn handle clockwise to expand tool.
7. Remove the shaft seal.

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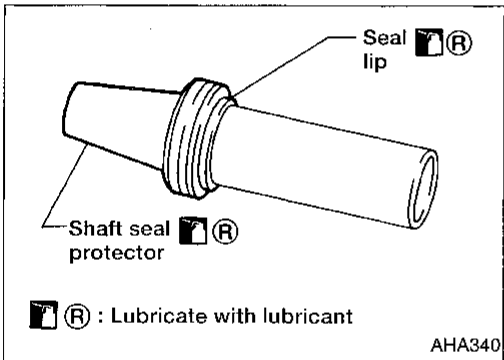
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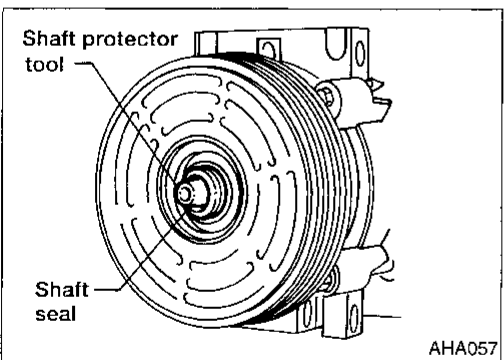
INSTALLATION

1. Dip shaft seal and shaft seal protector in refrigerant lubricant. Install shaft seal on protector with lip of seal facing large end of protector.

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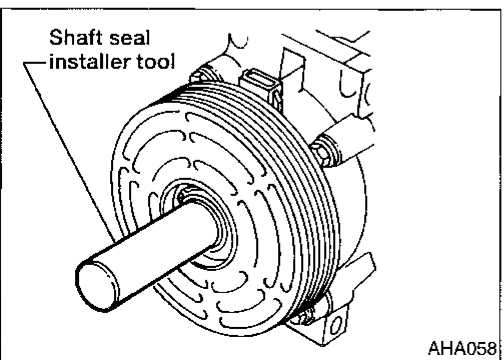
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2. Install shaft seal protector and shaft seal over end of compressor shaft.

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3. Slowly push shaft seal down protector into compressor shaft with shaft seal installer. Be careful that shaft seal is seated properly.
4. Remove shaft seal installer and shaft seal protector from compressor shaft.
5. Install shaft seal snap ring. Be careful that snap ring is correctly seated.
6. Install shaft seal felt in compressor nose.
7. Install clutch hub and pulley.
8. Inspect compressor for refrigerant leaks. Refer to HA-151.

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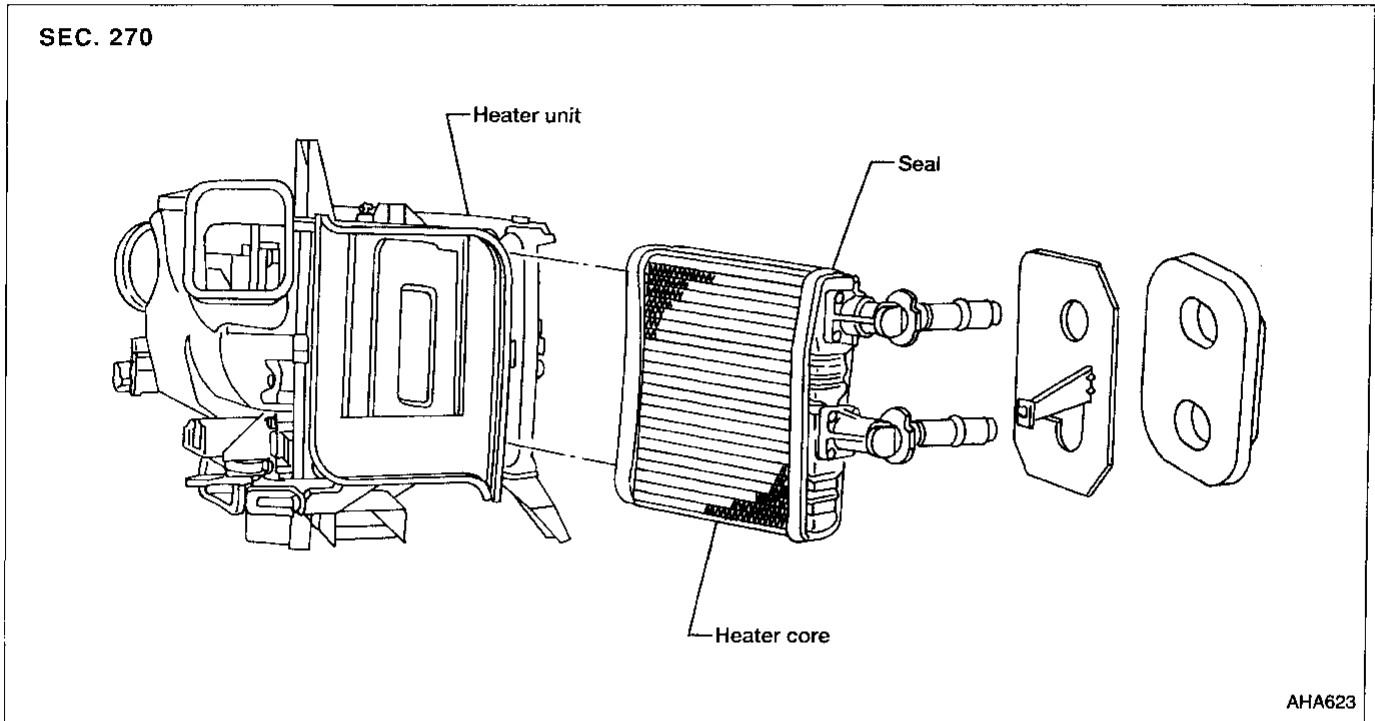
**Belt Tension**

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

**Fast Idle Control Device (FICD)**

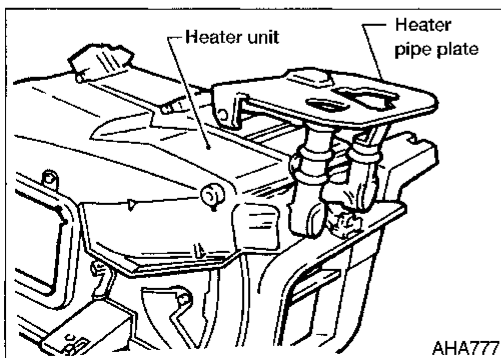
- Refer to EC section.

**Front Heater Core**



**REMOVAL**

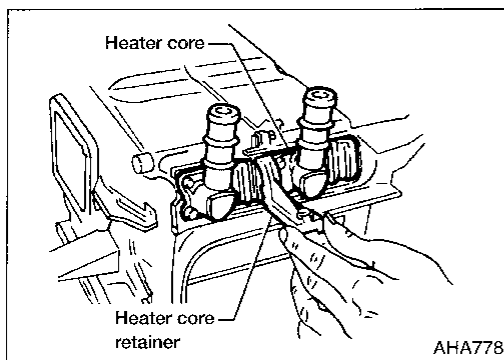
1. Drain cooling system. Refer to MA section (“Changing Engine Coolant”, “ENGINE MAINTENANCE”).
2. Disconnect two heater hoses in engine compartment.
3. Disconnect heater unit ducts.
4. Remove two heater unit bolts.
5. Disconnect door motor electrical connectors.
6. Remove heater unit.



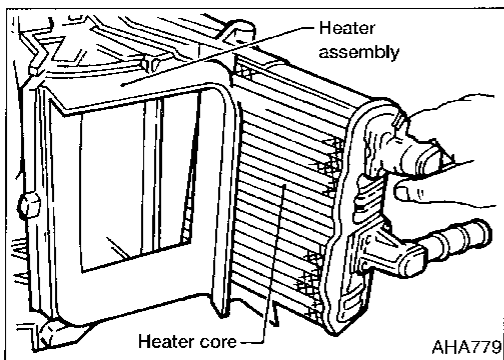
7. Remove heater pipe plate.

Front Heater Core (Cont'd)

8. Remove heater core retainer.



9. Remove heater core from heater unit.



INSTALLATION

Installation is the reverse order of removal. Inspect system for coolant leaks. Refer to MA section ("Changing Engine Coolant", "ENGINE MAINTENANCE").

GI

MA

EM

LC

EC

PE

AT

FA

RA

BR

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RS

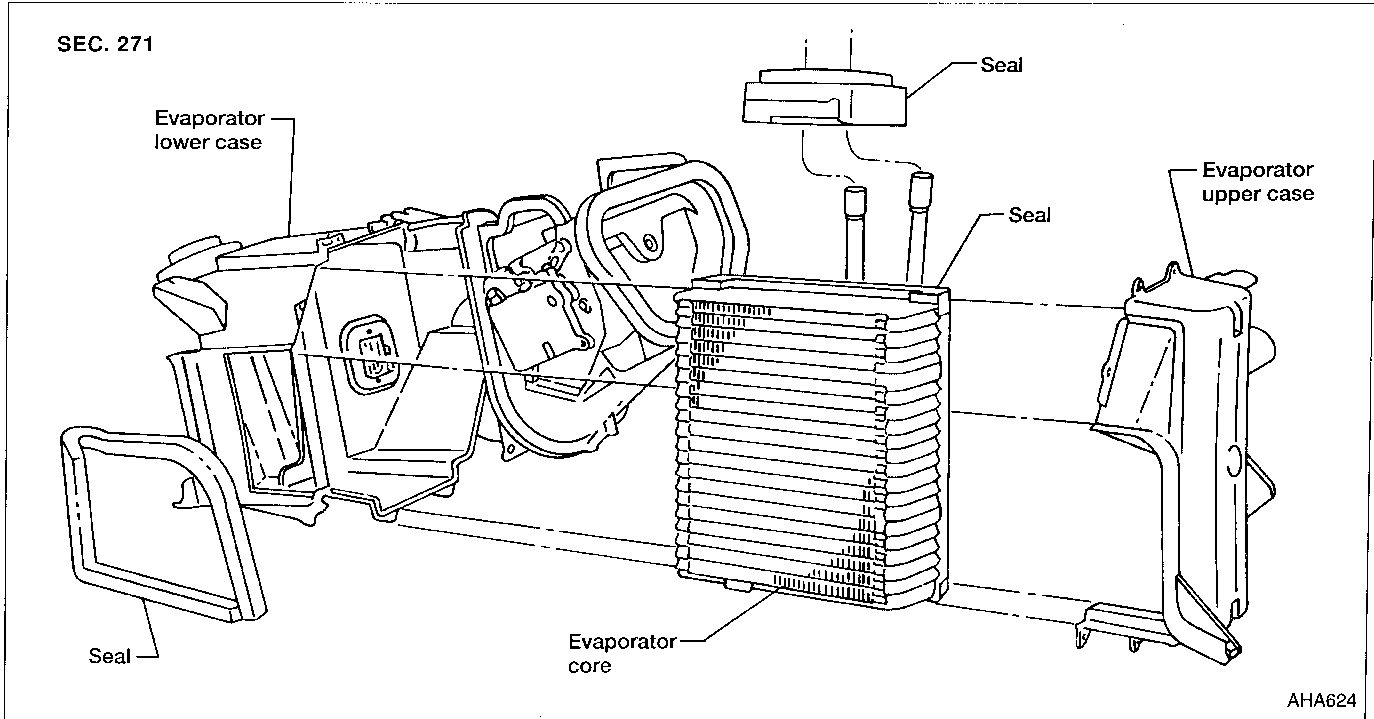
BT

**HA**

EL

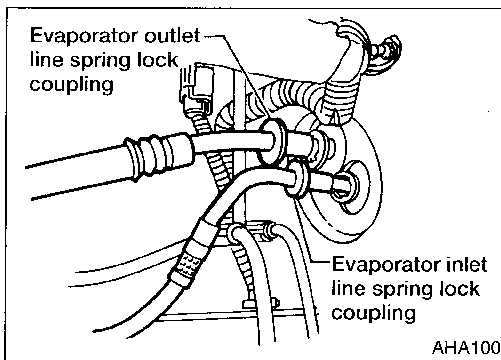
IDX

Front Evaporator Core



REMOVAL

1. Discharge the A/C system. Refer to HA-154.



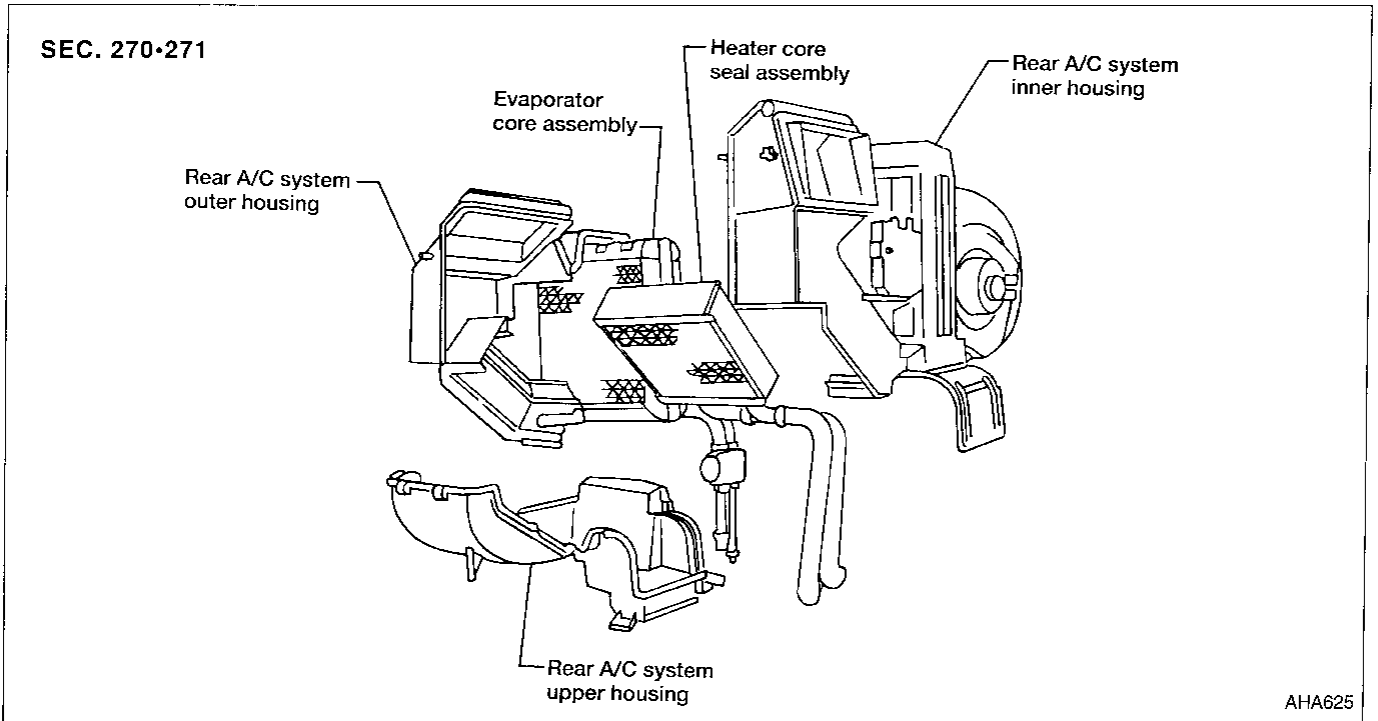
2. Use tool to disconnect spring lock couplings in engine compartment.

3. Remove instrument panel RH.
4. Remove duct from heater unit to register RH.
5. Disconnect blower motor and electrical connector.
6. Remove evaporator.

INSTALLATION

Installation is the reverse order of removal.  
Inspect system for refrigerant leaks. Refer to HA-151.

Rear Heater Core and Evaporator Core



GI  
MA  
EM  
LC  
EC  
FE  
AT  
FA

**REMOVAL**

1. Drain the engine coolant. Refer to MA section (“Changing Engine Coolant”, “ENGINE MAINTENANCE”).
2. Discharge and recover refrigerant from the A/C system. Refer to HA-154.
3. Remove driver’s side trim panel and loosen bolts fixing each housing.
4. Remove upper housing and outer housing.
5. Remove heater core and evaporator.

RA  
BR  
ST

**INSTALLATION**

Installation is the reverse order of removal.

RS  
BT

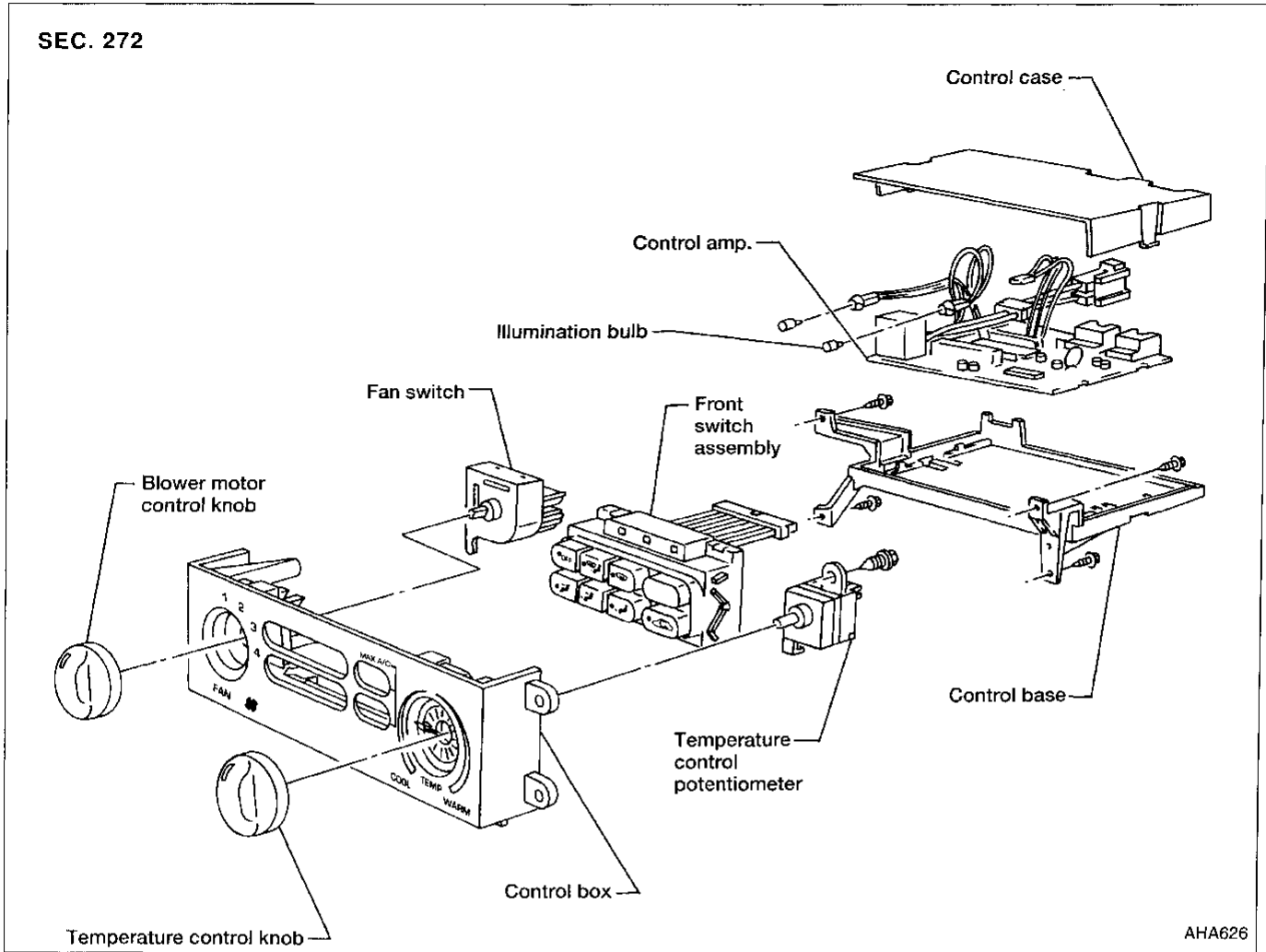
**HA**

EL  
IDX

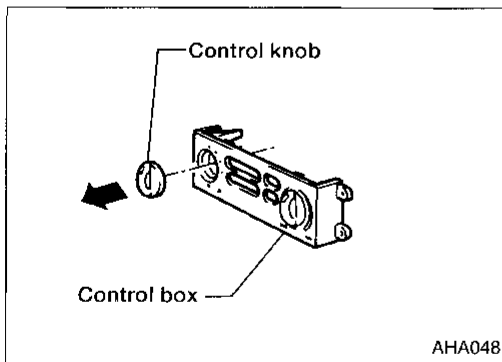


Fan Switch and Illumination Bulbs

SEC. 272



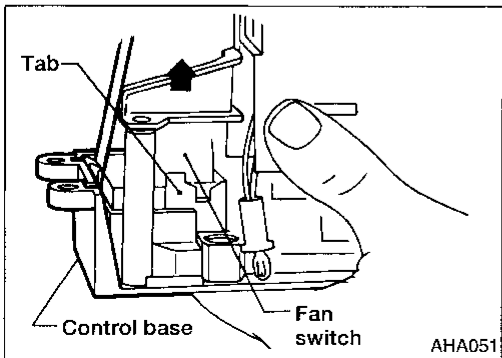
AHA626



AHA048

REMOVAL

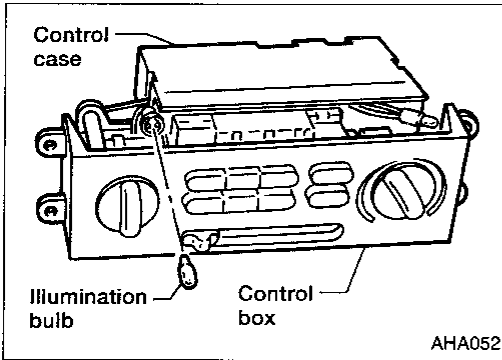
1. Remove fan control knob and temperature control knob. **Wrap knob with a cloth and pull in direction indicated by arrow as shown in figure at left. Be careful not to scratch knob during removal.**



AHA051

2. Remove fan switch by pressing in on tabs with a small, flat-bladed screwdriver.

Fan Switch and Illumination Bulbs (Cont'd)



3. Remove illumination bulbs.

**Never disassemble the push control assembly. It may damage the printed circuit board.**

**INSTALLATION**

Installation is the reverse order of removal.

GI

MA

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RS

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**HA**

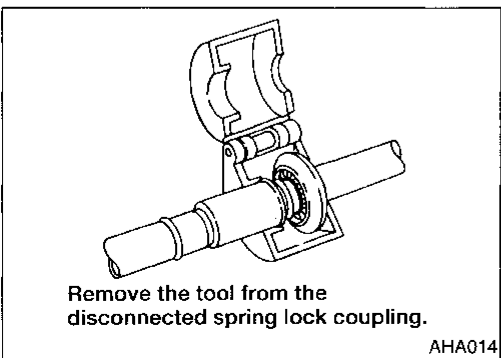
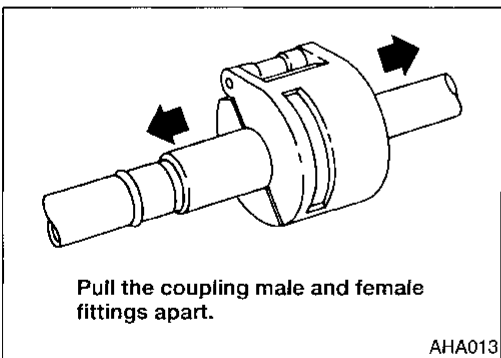
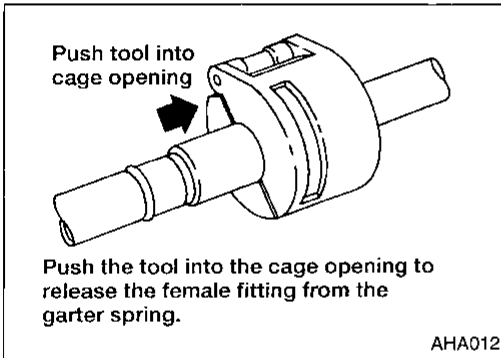
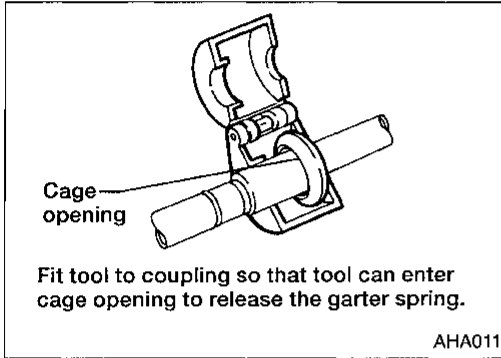
EL

IDX

### Spring Lock Coupling

- Refer to “Precautions for Refrigerant Connections” on page HA-4.

A plastic indicator ring is used on spring lock couplings during vehicle assembly to indicate that the coupling is connected. After the coupling is connected, the indicator ring is not necessary but will stay near the cage opening.



### REMOVAL

1. Discharge refrigerant from system. Fit spring lock coupling tools (9.53 mm [3/8 in], 12.70 mm [1/2 in], 15.88 mm [5/8 in] or 19.05 mm [3/4 in]) to the coupling.

2. Close tool and push into open side of cage to expand garter spring and release female fitting.

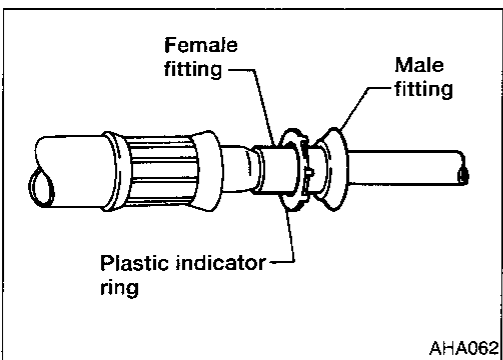
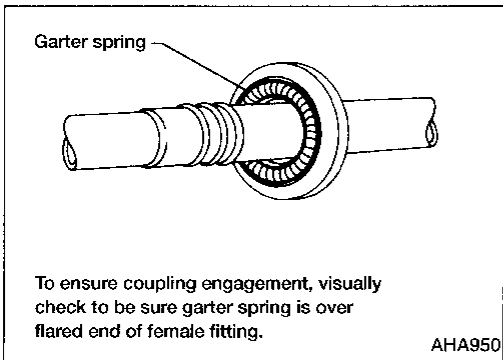
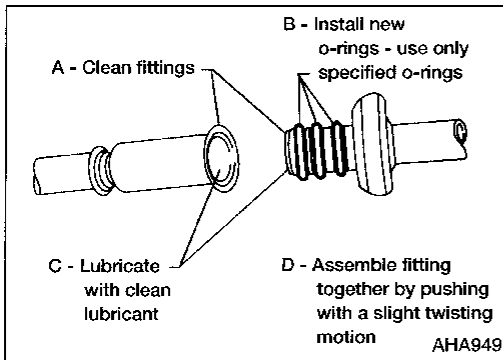
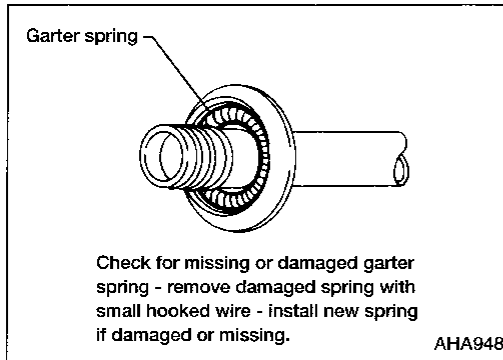
**If the tool is cocked while pushing it into the cage opening, the garter spring may not release.**

3. After garter spring is expanded, pull fitting apart.

4. Remove tool from disconnected coupling.

Spring Lock Coupling (Cont'd)

INSTALLATION



1. Check to ensure that garter spring is in cage of male fitting. If garter spring is missing, install a new spring by pushing it into cage opening. If garter spring is damaged, remove it from cage with a small wire hook (do not use a screwdriver) and install a new spring. Check for burrs on the end of the male tube to avoid scratching the female tube.
2. Clean all dirt or foreign material from both pieces of coupling.
3. Install new O-rings on male fitting. **O-rings are made of a special material. Use only the specified O-rings.** The use of any O-ring other than the specified O-ring may allow the connection to leak intermittently during vehicle operation.
4. Lubricate male fitting and O-rings and inside of female fitting with clean lubricant. Check for scratches on the inner surface of the female fitting.
5. Install plastic indicator ring into cage opening if indicator ring is to be used.
6. Fit female fitting to male fitting and push until garter spring snaps over flared end of female fitting. If plastic indicator ring is used, it will snap out of cage opening when coupling is connected to indicate engagement.
7. If indicator ring is not used, ensure coupling engagement by visually checking to verify garter spring is over flared end of female fitting.

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**General Specifications**

**COMPRESSOR**

Model	FS-10
Type	Swash plate
Displacement cm <sup>3</sup> (cu in)/rev.	170 (10.37)
Cylinder bore x stroke mm (in)	29.0 x 25.7 (1.142 x 1.012)
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

**LUBRICANT**

Model	Only front A/C models	Front A/C & rear A/C models
	FS-10 compressor	
Type	Nissan A/C System Lubricant PAG Type F or equivalent*1	
Capacity ml (US fl oz, Imp fl oz)		
	Total in system	207 (7.0, 7.3)      325 (11.0, 11.5)

\*1: Suniso 5GS is not acceptable for use in this vehicle.

**REFRIGERANT**

Type	R134a	
Capacity kg (lb)		
	Only front A/C models	0.907 (2.0)
	Front A/C & rear A/C models	1.474 (3.25)

**Inspection and Adjustment**

**ENGINE IDLING SPEED  
(When A/C is ON)**

- Refer to EC section ["Inspection and Adjustment", "SERVICE DATA AND SPECIFICATIONS (SDS)"].

**BELT TENSION**

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

**COMPRESSOR**

Model	FS-10
Off vehicle Clutch hub-pulley clearance mm (in)	0.45 - 0.85 (0.0177 - 0.0335)