

HEATER & AIR CONDITIONER

SECTION HA

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PRECAUTIONS AND PREPARATION

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

The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER” used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. The SRS system composition which is available to NISSAN MODEL P11 is as follows (The composition varies according to optional equipment):

- For a frontal collision
The Supplemental Restraint System consists of driver’s air bag module (located in the center of the steering wheel), front passenger’s air bag module (located on the instrument panel on passenger’s side), seat belt pre-tensioners, a diagnosis sensor unit, warning lamp, wiring harness and spiral cable.
- For a side collision
The Supplemental Restraint System consists of front side air bag module (located in the outer side of front seat), satellite sensor, diagnosis sensor unit (one of components of air bags for a frontal collision), wiring harness, warning lamp (one of components of air bags for a frontal collision).

Information necessary to service the system safely is included in the **RS section** of this Service Manual.

WARNING:

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

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

WARNING:

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

PRECAUTIONS AND PREPARATION

General Refrigerant Precautions

WARNING:

- Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.
- Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.
- Do not store or heat refrigerant containers above 52°C (126°F).
- Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.
- Do not intentionally drop, puncture, or incinerate refrigerant containers.
- Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.
- Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.
- Do not introduce compressed air to any refrigerant container or refrigerant component.

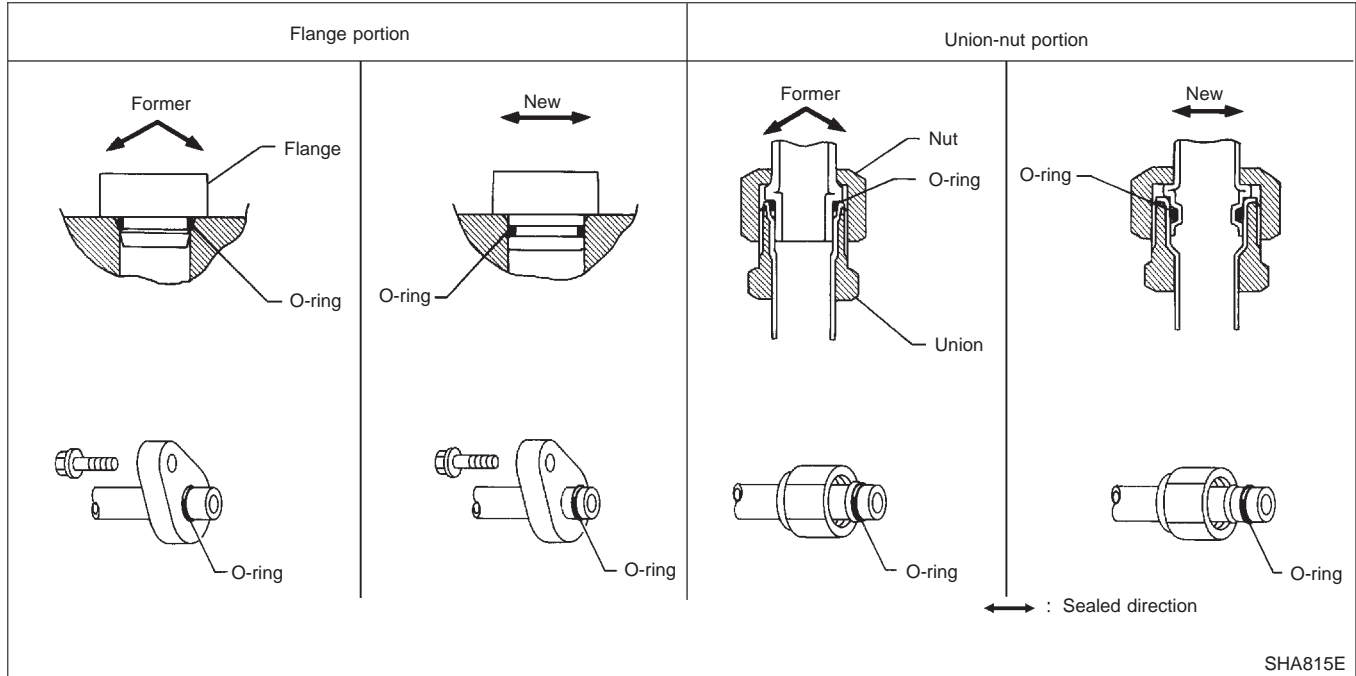
Precautions for Refrigerant Connection

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

- Expansion valve to cooling unit.

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

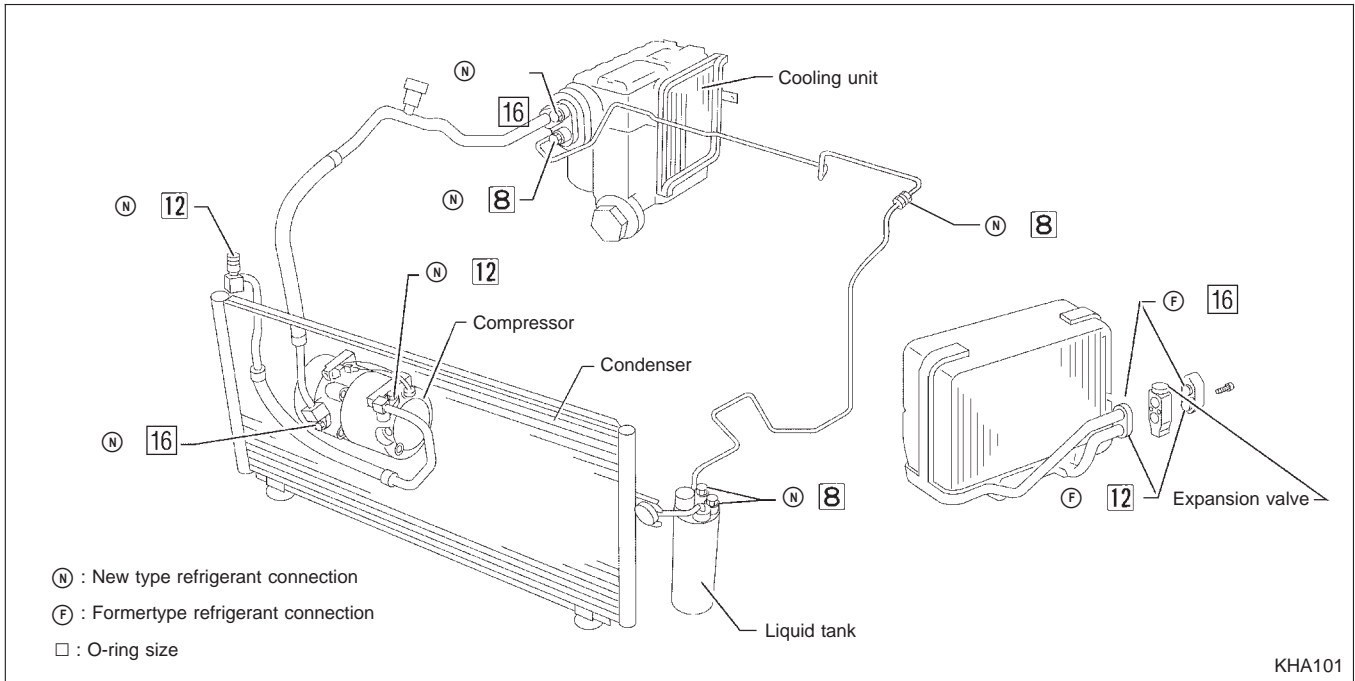
- The O-ring is relocated in a groove for proper installation. This eliminates the change of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the connecting surface of the mating part to improve sealing characteristics.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



PRECAUTIONS AND PREPARATION

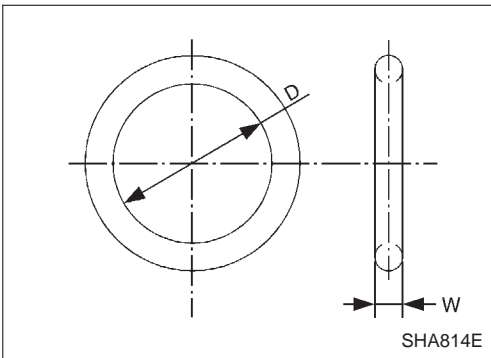
Precautions for Refrigerant Connection (Cont'd)

O-RING AND REFRIGERANT CONNECTION



CAUTION:

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



O-ring parts number and specifications

| Connection type | O-ring size | Part number | D mm (in) | W mm (in) |
|-----------------|-------------|-------------|---------------|---------------|
| New | 8 | 92471 N8210 | 6.8 (0.268) | 1.85 (0.0728) |
| Former | | 92470 N8200 | 6.07 (0.2390) | 1.78 (0.0701) |
| New | 12 | 9247 N8210 | 10.9 (0.429) | 2.43 (0.0957) |
| Former | | 92475 71L00 | 11.0 (0.433) | 2.4 (0.094) |
| New | 16 | 92473 N8210 | 13.6 (0.535) | 2.43 (0.0957) |
| Former | | 92475 72L00 | 14.3 (0.563) | 2.3 (0.091) |
| New | 19 | 92474 72L00 | 14.3 (0.563) | 2.43 (0.0957) |

PRECAUTIONS AND PREPARATION

Precautions for Refrigerant Connection (Cont'd)

WARNING:

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

CAUTION:

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

- When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
- When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before connection.
- Allow components stored in cool areas to warm to ambient temperature before removing seal caps. This prevents condensation from forming inside A/C components.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.

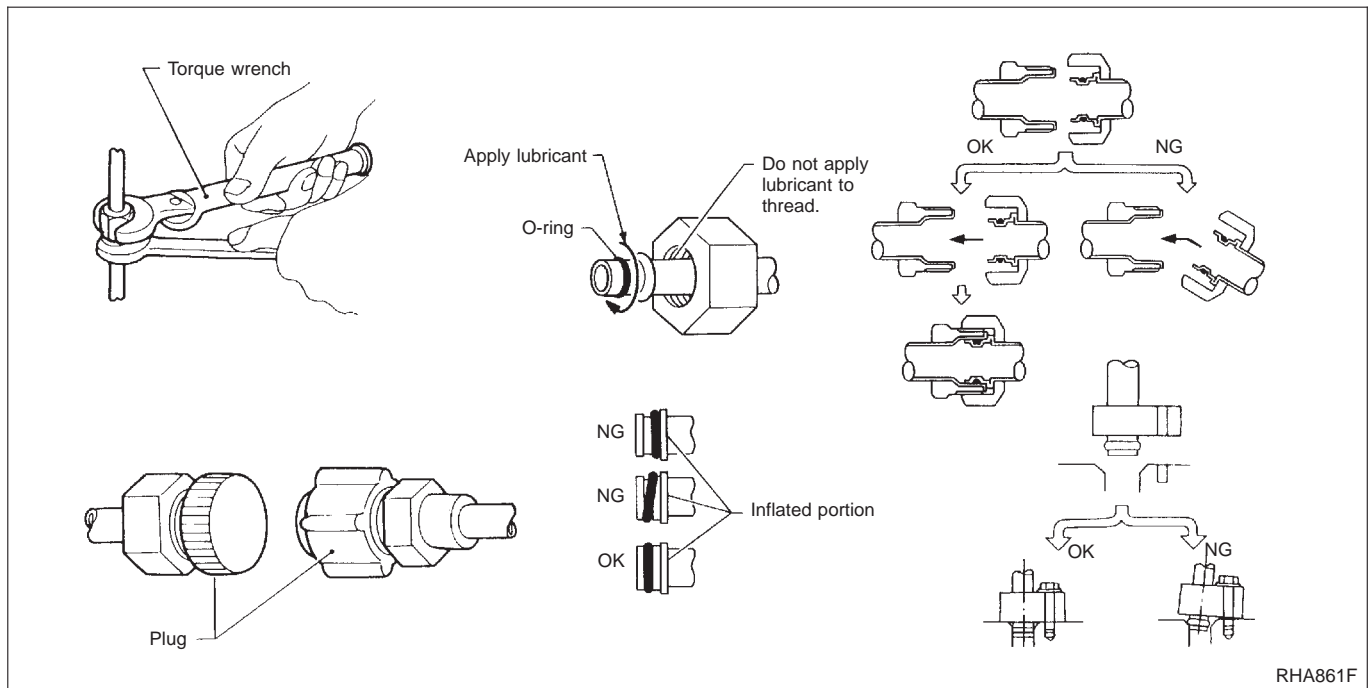
Lubricant name: Nissan A/C System Oil Type R for compressor-model CR-14

Part number: KLH00-PAGR0

Lubricant name: Nissan A/C System Oil Type S for compressor-model CSV613

Part number: KLH00-PAGS0

- O-ring must be closely attached to dented portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.
- After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.



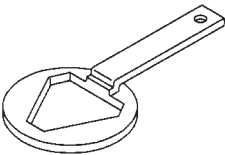
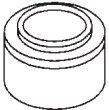
PRECAUTIONS AND PREPARATION

Precautions for Servicing Compressor

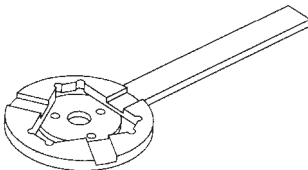
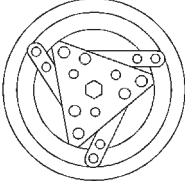
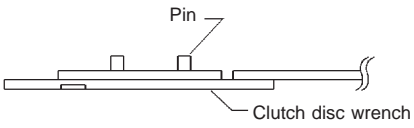
- Plug all openings to prevent moisture and foreign matter from entering.
- When the compressor is removed, store it in the same position as it is when mounted on the car.
- When replacing or repairing compressor, follow “Maintenance of Lubricant Quantity in Compressor” exactly. Refer to HA-102.
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.

Special Service Tools

CR-14 compressor

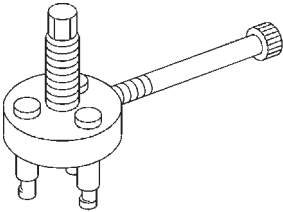
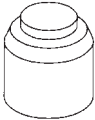
| Tool number Tool name | Description |
|----------------------------------|--|
| KV99106700 Clutch disc wrench |  Removing shaft nut and clutch disc NT351 |
| KV99106800 Pulley installer |  Installing pulley NT352 |

CSV613 compressor

| Tool number Tool name | Description |
|----------------------------------|--|
| KV99106100 Clutch disc wrench |  Removing center bolt NT232 |
| |  When replacing the magnet clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.  NT378 |

PRECAUTIONS AND PREPARATION

Special Service Tools (Cont'd)

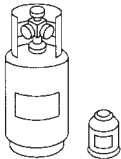

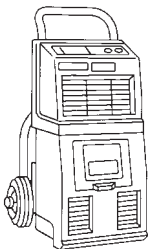
| Tool number Tool name | Description |
|--|--|
| KV99232340 or KV99107400 Clutch disc puller |  Removing clutch disc NT376 |
| KV99106200 Pulley installer |  Installing pulley NT235 |

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

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

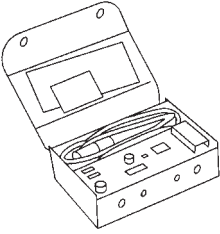
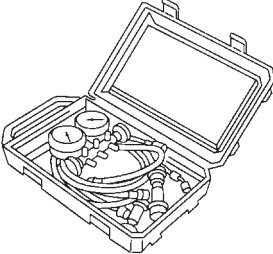
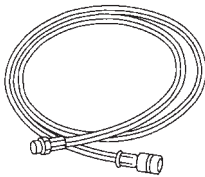
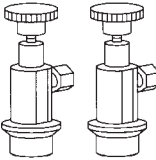

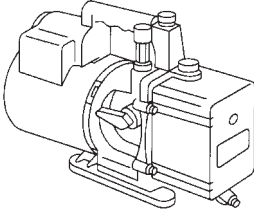
Separate and non-interchangeable service equipment must be used for each type of refrigerant/lubricant. Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a).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

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

| Tool name | Description | Note |
|--|--|--|
| HFC-134a (R-134a) refrigerant |  NT196 | Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● large container 1/2"-16 ACME |
| Nissan A/C System Oil Type R (Part No.: KLH00-PAGR0) Type S (Part No: KLH00-PAGS0) |  NT197 | Type: Poly alkylene glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (Nissan only) Capacity: 40mℓ (1.4 Imp fl oz) |
| Recovery/Recycling/ Recharging equipment |  NT195 | Function: Refrigerant Recovery and Recycling and Recharging |

PRECAUTIONS AND PREPARATION

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

| Tool name | Description | Note |
|---|--|---|
| Electrical leak detector |  <p style="text-align: center;">NT198</p> | Power supply: <ul style="list-style-type: none"> ● DC 12 V (Cigarette lighter) |
| Manifold gauge set (with hoses and couplers) |  <p style="text-align: center;">NT199</p> | Identification: <ul style="list-style-type: none"> ● The gauge face indicates R-134a. Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME |
| Service hoses <ul style="list-style-type: none"> ● High side hose ● Low side hose ● Utility hose |  <p style="text-align: center;">NT201</p> | Hose color: <ul style="list-style-type: none"> ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: <ul style="list-style-type: none"> ● 1/2"-16 ACME |
| Service couplers <ul style="list-style-type: none"> ● High side coupler ● Low side coupler |  <p style="text-align: center;">NT202</p> | Hose fitting to service hose: <ul style="list-style-type: none"> ● M14 x 1,5 fitting is optional or permanently attached. |
| Refrigerant weight scale |  <p style="text-align: center;">NT200</p> | For measuring of refrigerant Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME |
| Vacuum pump (Including the isolator valve) |  <p style="text-align: center;">NT203</p> | Capacity: <ul style="list-style-type: none"> ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME |

PRECAUTIONS AND PREPARATION

Precautions for Service Equipment

RECOVERY/RECYCLING/RECHARGING EQUIPMENT

Be certain to 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

Be certain to follow the manufacturer's instructions for tester operation and tester maintenance.

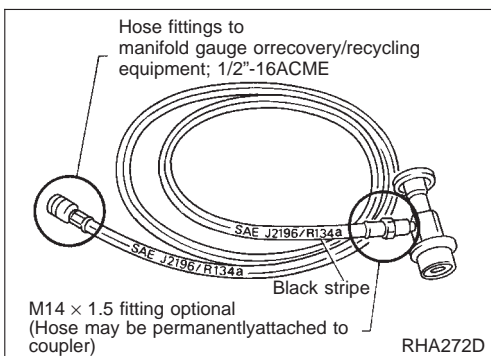
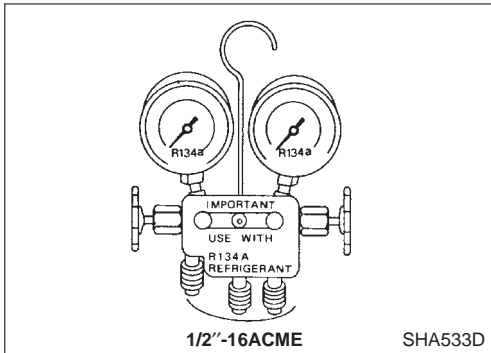
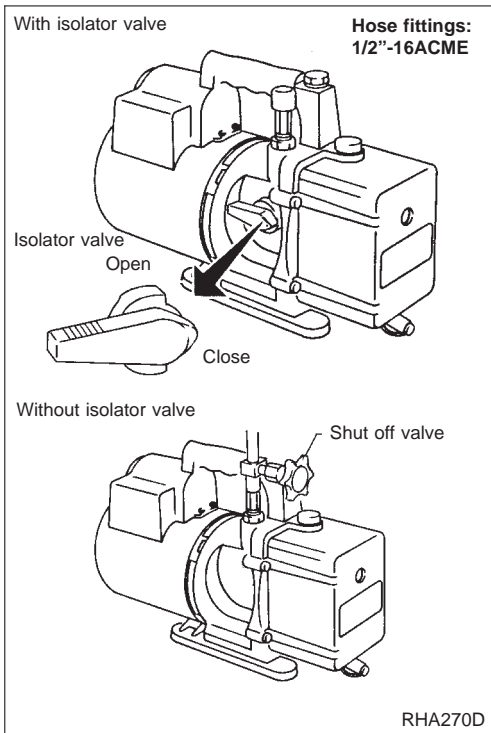
VACUUM PUMP

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

To prevent this migration, use a manual valve placed 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.



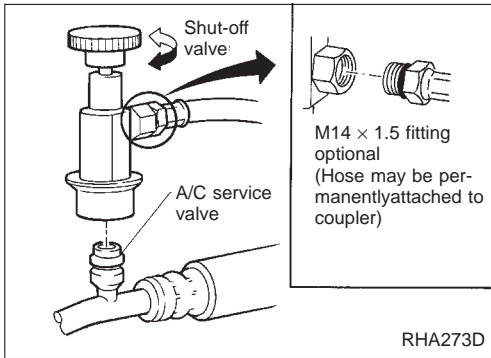
MANIFOLD GAUGE SET

Be certain that the gauge face indicates R-134a or 134a. 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) and specified lubricants.

SERVICE HOSES

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

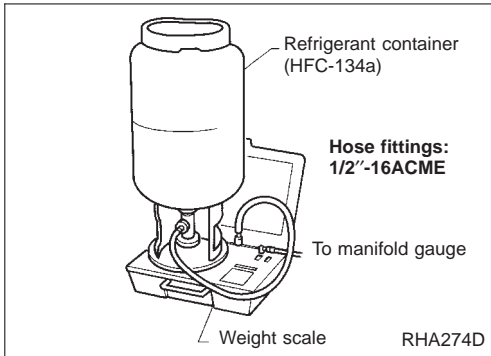
PRECAUTIONS AND PREPARATION



Precautions for Service Equipment (Cont'd) SERVICE COUPLERS

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

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



REFRIGERANT WEIGHT SCALE

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

CHARGING CYLINDER

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

Refrigeration Cycle

REFRIGERANT FLOW

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

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

FREEZE PROTECTION

Variable displacement (CSV613)

Under normal operating conditions, when the A/C is switched on, the compressor runs continuously, and the evaporator pressure, therefore temperature, is controlled by the CSV613 variable displacement compressor to prevent freeze up.

Vane rotary (CR-14)

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

REFRIGERANT SYSTEM PROTECTION

Dual-pressure switch (System with CR-14 compressor)

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

Pressure sensor (System with CSV613 compressor)

The pressure sensor is located on the liquid tank. It converts the system pressure into a voltage value which is then input into ECM.

If the system pressure rises above, or falls below the specifications, ECM interrupt the compressor operation.

Fusible plug

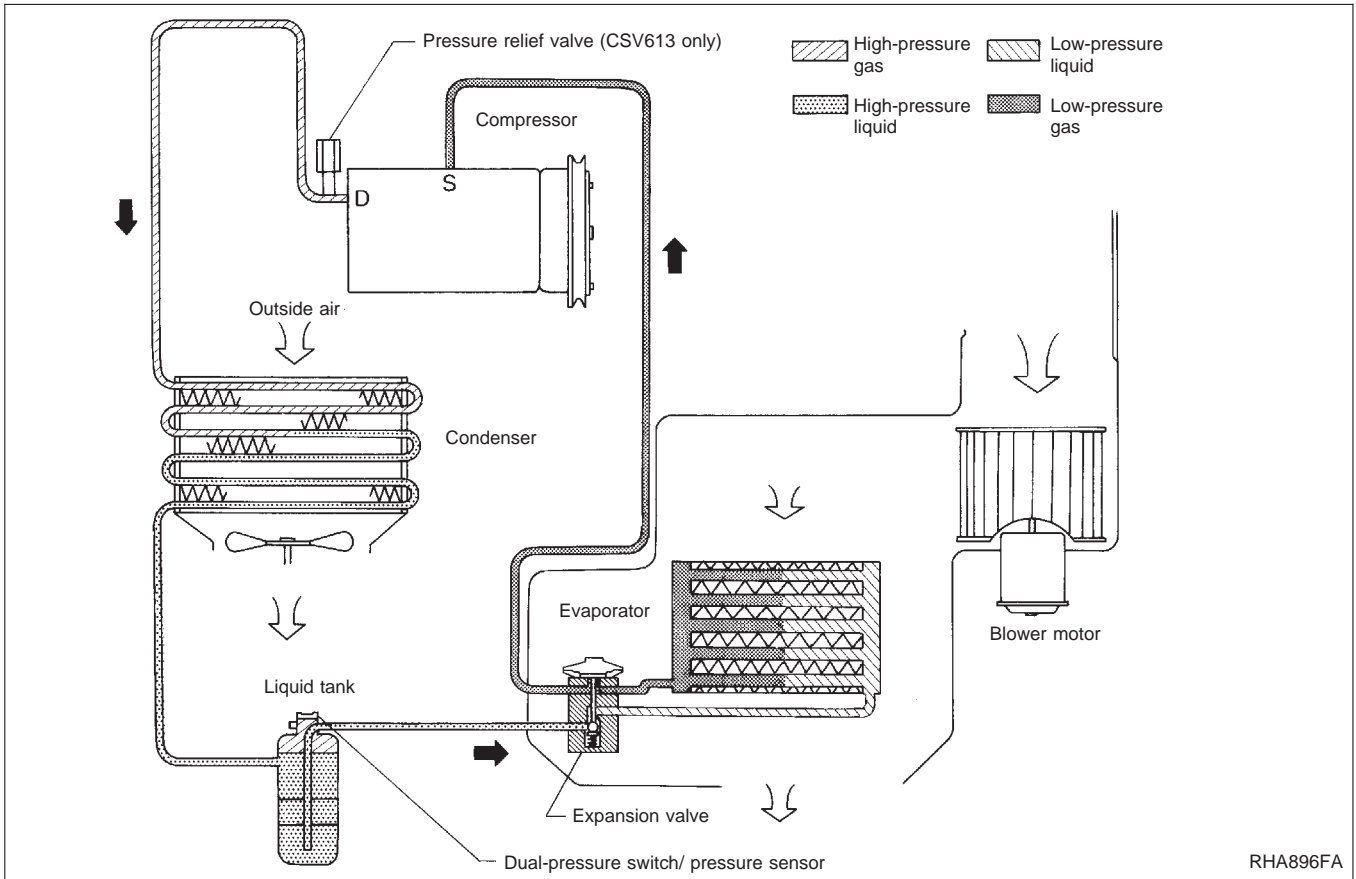
Open at temperatures above 105°C (221°F), thereby discharging refrigerant to the atmosphere. If this plug is melted and opened, check the refrigerant line and replace liquid tank.

Pressure relief valve (CSV613 compressor)

The refrigerant system is also protected by a pressure relief valve, located in the rear head of the compressor. When the pressure of refrigerant in the system increases to an abnormal level [more than 3,727 kPa (38 kg/cm², 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

DESCRIPTION

Refrigeration Cycle (Cont'd)



CSV613 Variable Displacement Compressor

GENERAL INFORMATION

1. The CSV613 compressor differs from previous units. The vent temperatures of the CSV613 compressor do not drop too far below 5°C (41°F) when:
 - evaporator intake air temperature is less than 20°C (68°F)
 - engine is running at speeds less than 1,500 rpm.This is because the CSV613 compressor provides a means of “capacity” control.
2. The CSV613 compressor provides refrigerant control under varying conditions. During cold winters, it may not produce high refrigerant pressure discharge (compared to previous units) when used with air conditioning systems.
3. A “clanking” sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the swash plate has changed and is not a problem.
4. For air conditioning systems with the CSV613 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.47 to 1.77 bar, 1.5 to 1.8 kg/cm², 21 to 26 psi) under varying conditions.
In previous compressors, however, suction pressure was reduced with increases in engine speed.

DESCRIPTION

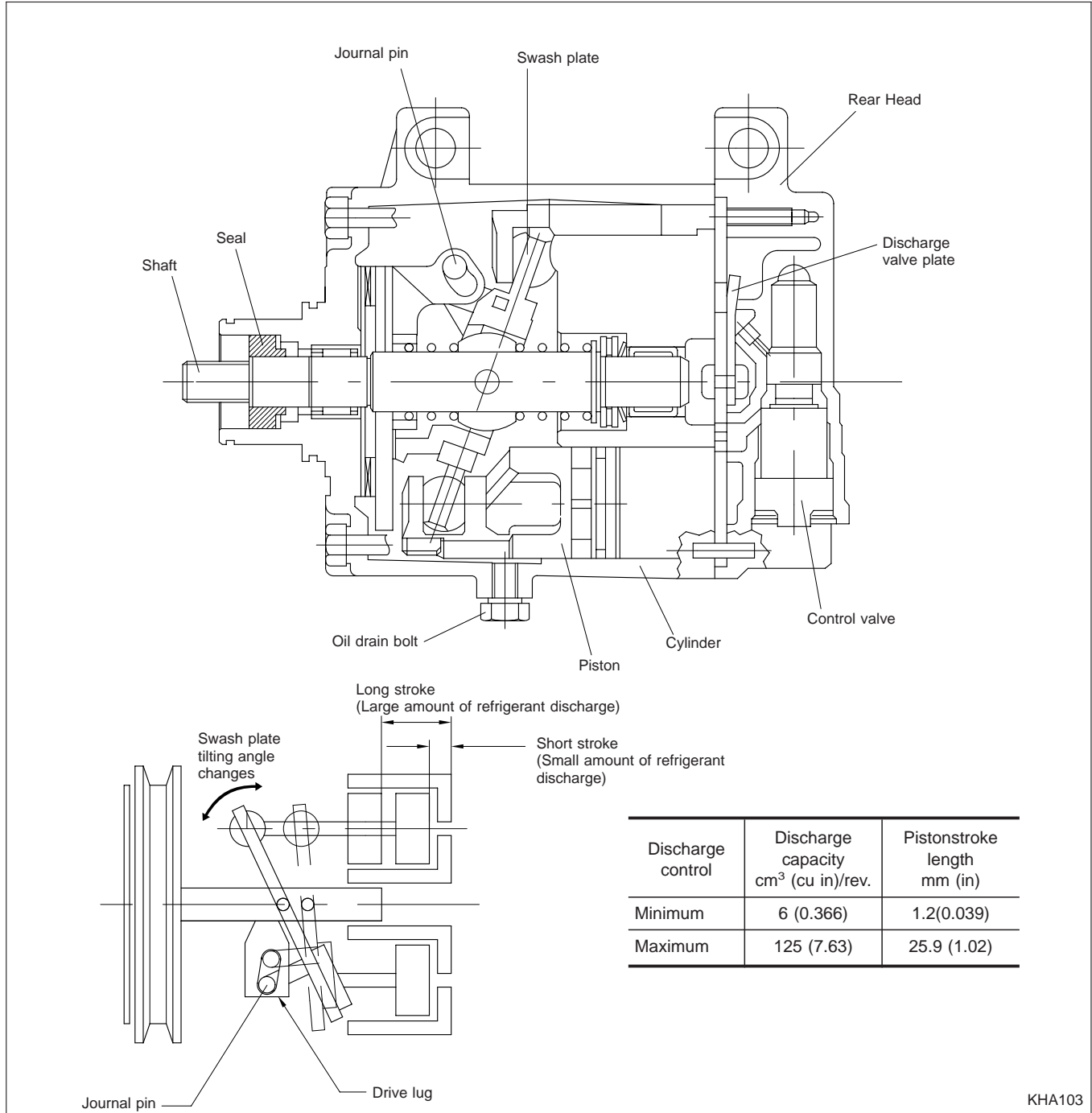
CSV613 Variable Displacement Compressor (Cont'd)

DESCRIPTION

General

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

The tilt of the swash plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 6 to 125 cm³ (0.366 to 7.63 cu in).



KHA103

DESCRIPTION

CSV613 Variable Displacement Compressor (Cont'd)

Operation

1. Operation control valve

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

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

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

2. Maximum cooling

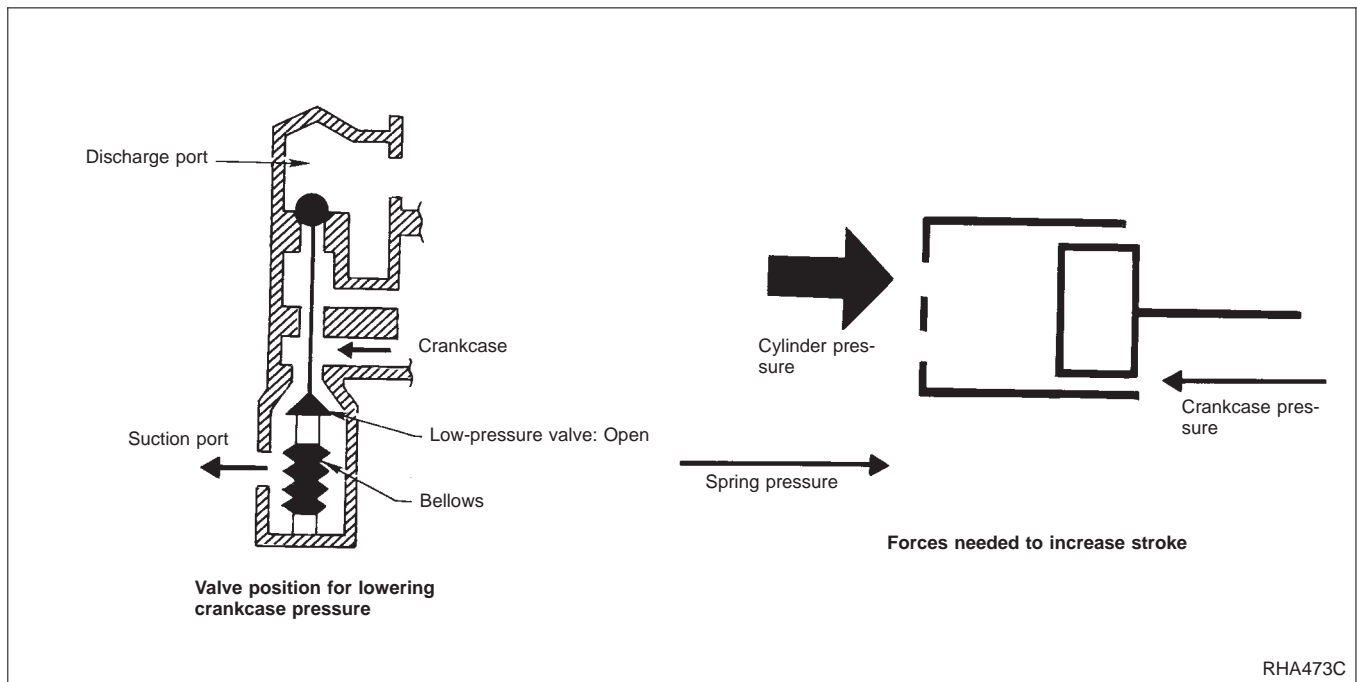
Refrigerant pressure on the low-pressure side increases with an increase in heat loads.

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

This causes the following pressure changes:

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

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



DESCRIPTION

CSV613 Variable Displacement Compressor (Cont'd)

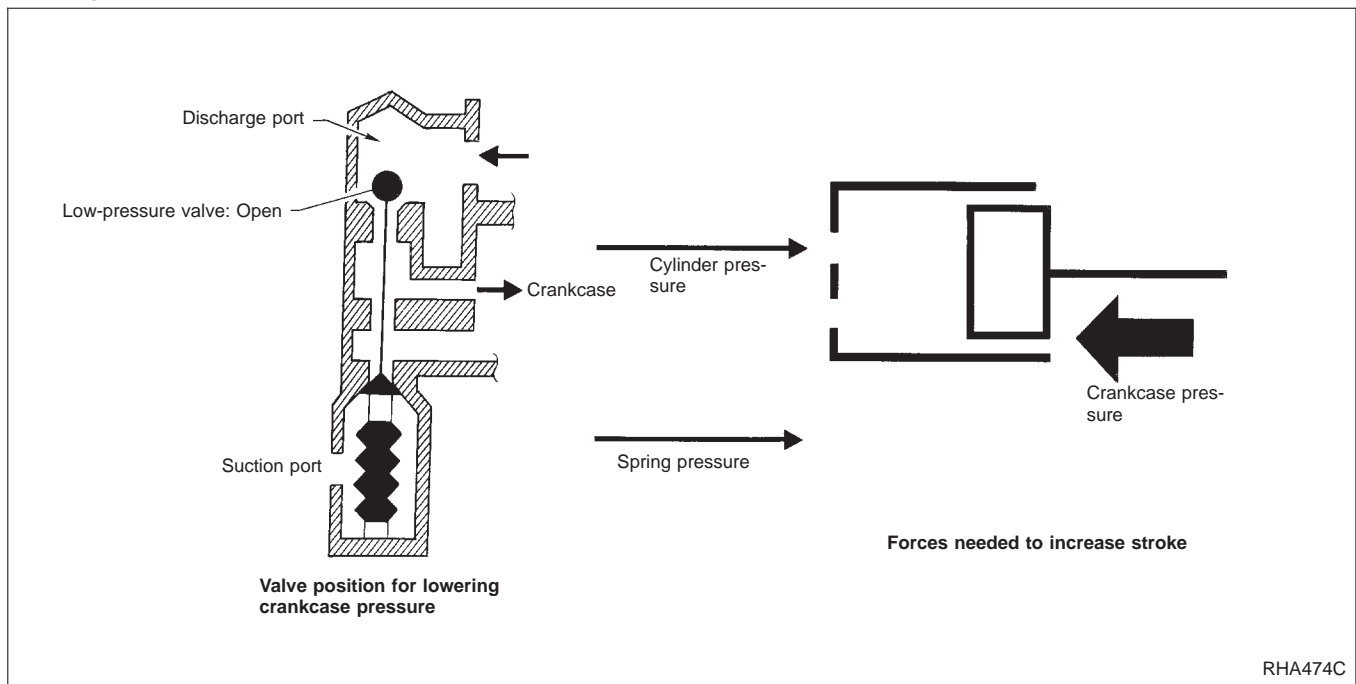
3. Capacity control

- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
- The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.77 bar, 1.8 kg/cm², 26 psi).

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

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

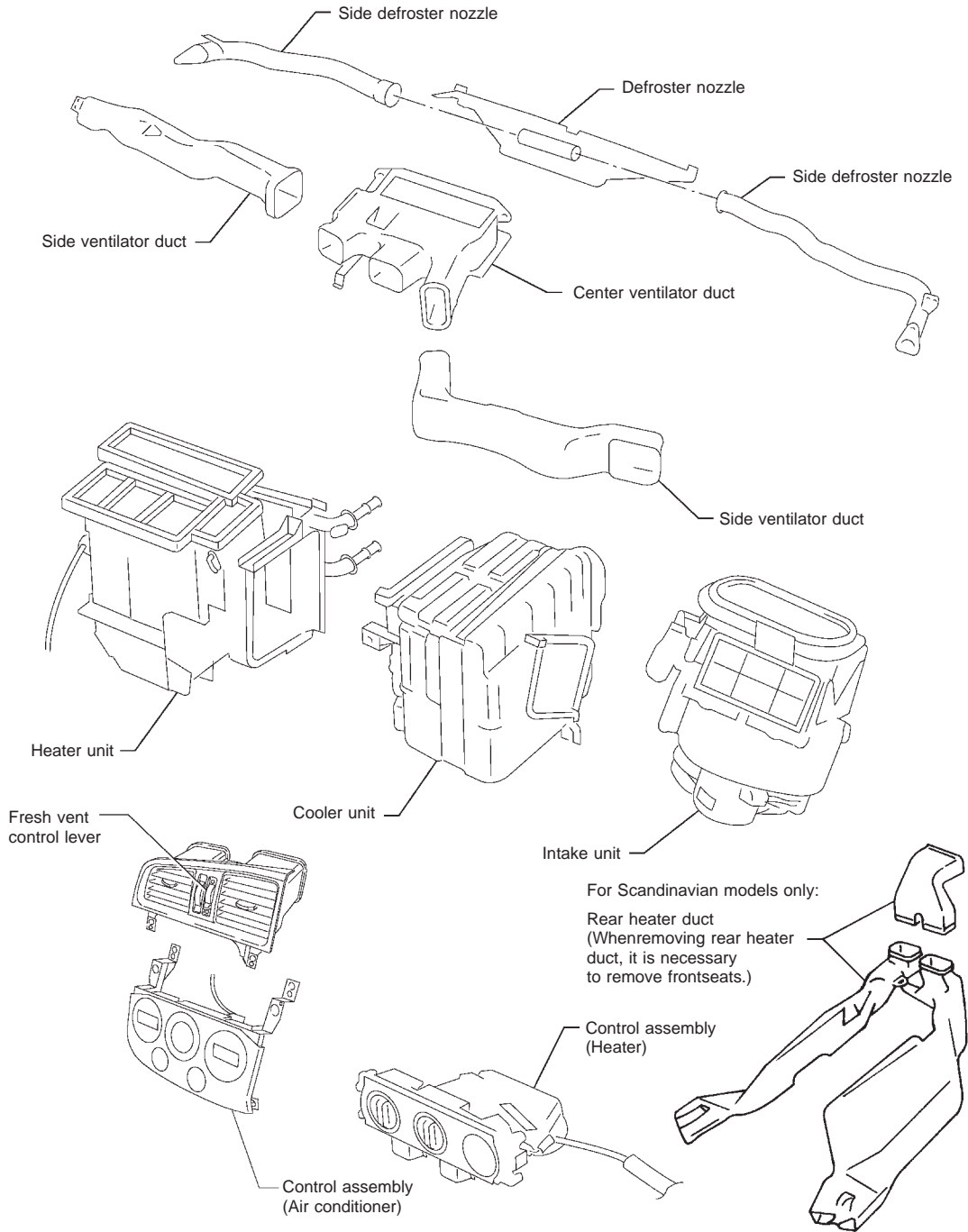
The drive lug and journal pin are located where the piston generates the highest pressure. Piston pressure is between suction pressure P_s and discharge pressure P_d , which is near suction pressure P_s . If crankcase pressure P_c rises due to capacity control, the force around the journal pin makes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



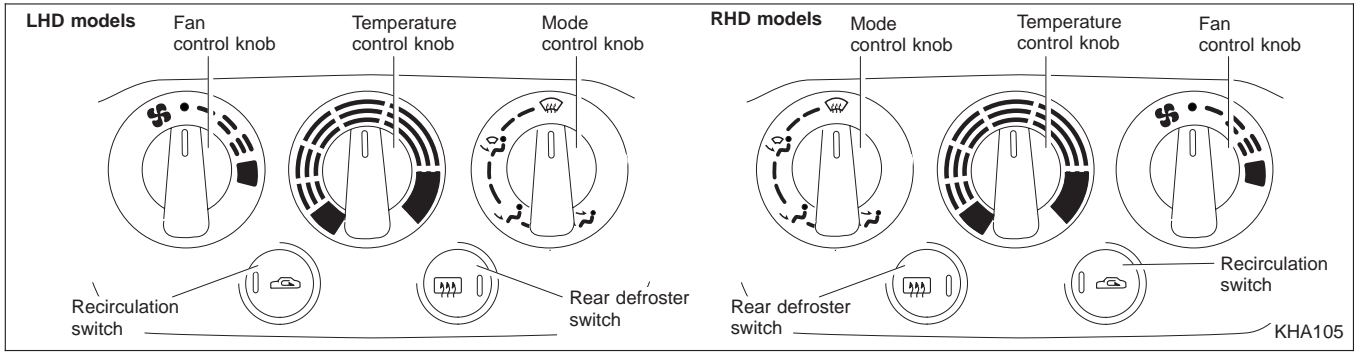
DESCRIPTION

Component Layout

SEC. 270-271-272-273



Control Operation



FAN CONTROL KNOB

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

MODE CONTROL KNOB

This knob controls the outlet air flow.

TEMPERATURE CONTROL KNOB

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

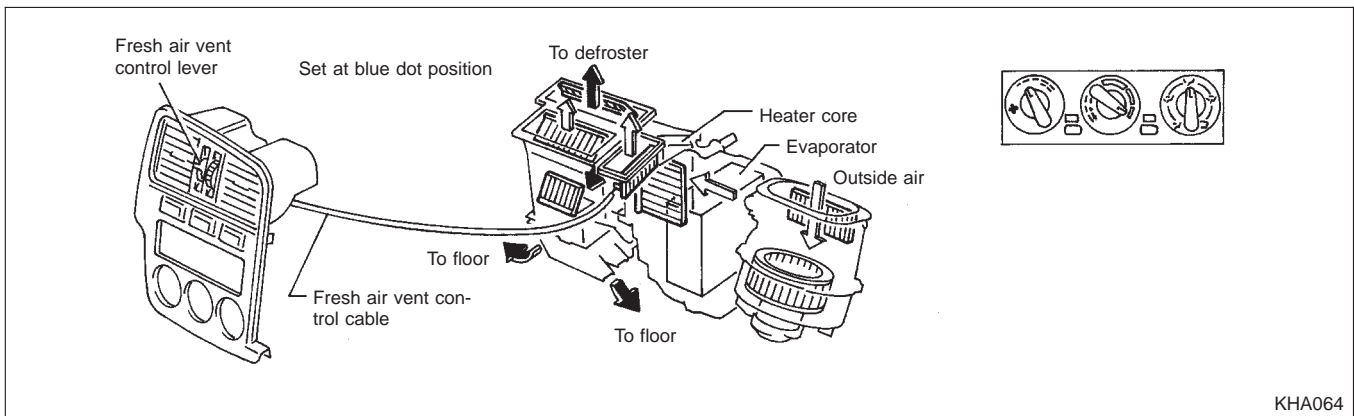
RECIRCULATION (REC) SWITCH

OFF position:
Outside air is drawn into the passenger compartment.
ON position:
Interior air is recirculated inside the vehicle.
The indicator lamp will also light.

Air Flow

FRESH VENT SYSTEM

This system is controlled by means of the fresh air vent lever which is mechanically linked to the fresh vent door by the control cable. Fresh vent air always comes from the center vent in any mode when the fresh air vent lever is set at the blue dot position.



Introduction

The automatic temperature control (ATC) system provides automatic regulation of the discharged air temperature and the discharged air volume (Blower speed).

The air outlet door, intake door and compressor magnet clutch are controlled by the manual operation of each switch.

Features

Air mix door control (Automatic temperature control)

The air mix door is automatically controlled so that in-vehicle temperature will reach, and be maintained at the operator selected "set temperature". For a given set temperature, the air mix door position will depend on: Ambient temperature, in-vehicle temperature, amount of sunload, set temperature and A/C switch signals.

Fan speed control

When the fan control switch is in the Auto position, the blower speed is automatically controlled, depending on: Ambient temperature, in-vehicle temperature, amount of sunload, set temperature, and A/C switch signals. It is also controlled by the manual operation of the fan control switch.

Starting fan speed control

When engine coolant temperature is low, the air outlet door position is detected by the A/C control panel and if this is set in B/L, FOOT or FOOT/DEF blower speed is controlled to prevent a large amount of cold air from being discharged into the floor area.

Outlet door control

This can be selected by operation of the mode control knob.

Intake door control

This can be selected by changing the REC switch position.

Compressor magnet clutch control

System with CR-14 compressor

When the A/C switch is ON, the thermistor detects evaporator temperature. The thermo control amplifier controls clutch ON/OFF operation depending on the evaporator temperature.

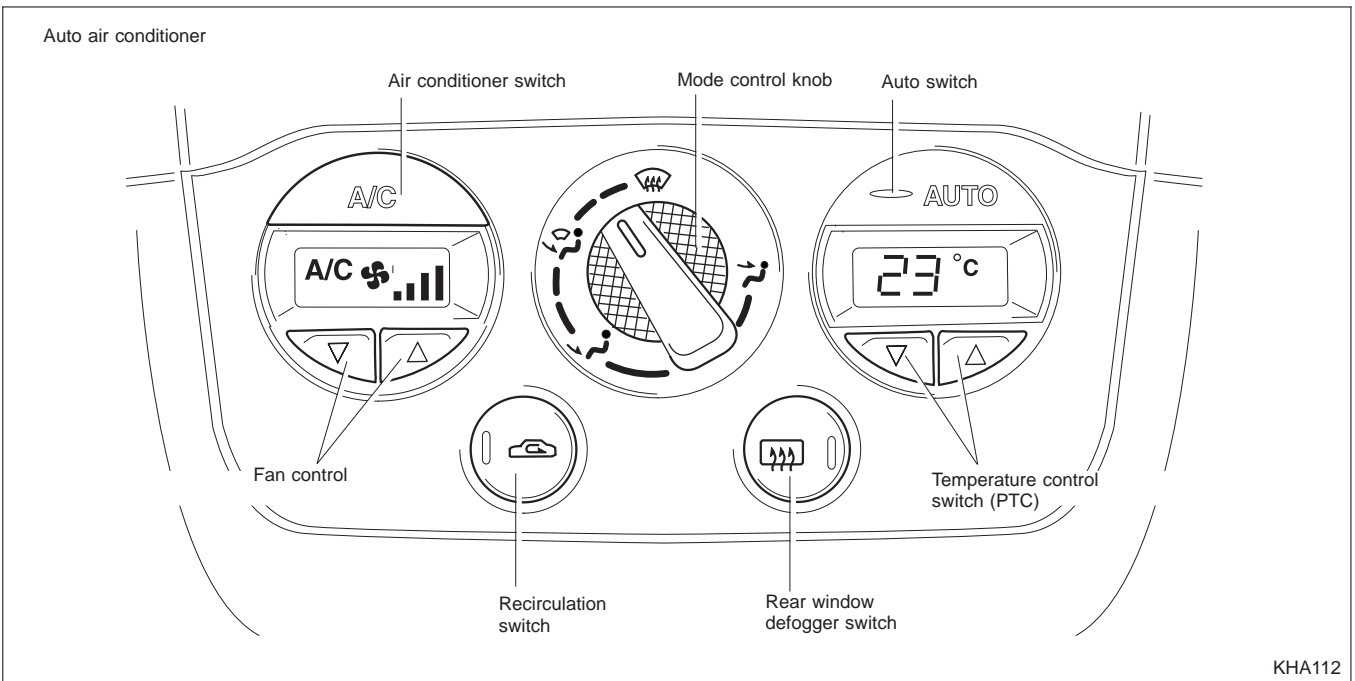
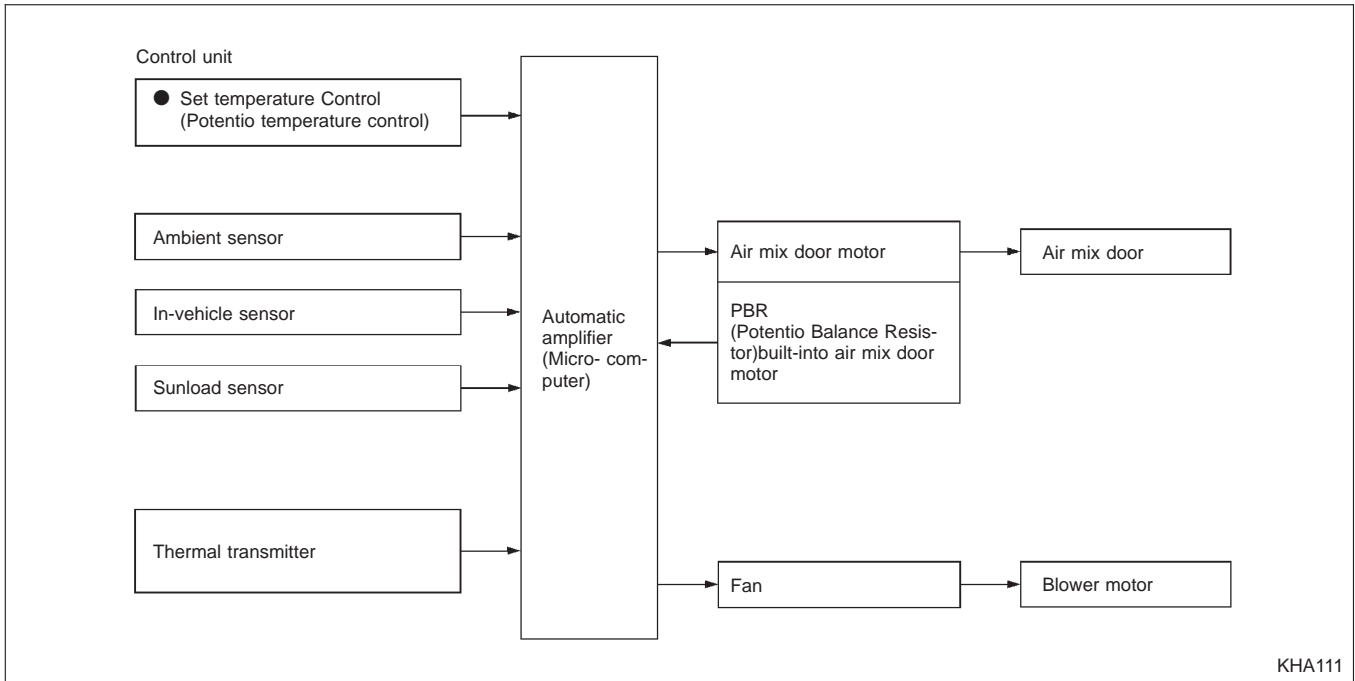
System with CSV613 compressor

Under normal operating conditions, when the A/C is switched on, the compressor runs continuously, and the evaporator pressure, and therefore temperature, is controlled by the CSV613 variable displacement compressor to prevent freeze up.

Control Operation

The control system consist of a) input sensors and switches, b) the automatic amplifier (microcomputer), and c) outputs.

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




Control Operation (Cont'd)**FAN CONTROL SWITCH**

Manual control of the blower speed. Four speeds are available for manual control (as shown on the display screen):

low ■, medium low ■■, medium high ■■■, high ■■■■

MODE CONTROL KNOB

This knob controls outlet air flow.

In "DEF" () mode, the intake door is set to "FRESH", and the A/C on.

AUTO SWITCH

The air mix door, and blower speed are automatically controlled so that the in-vehicle temperature will reach, and be maintained at the set temperature selected by the operator.

TEMPERATURE CONTROL SWITCH (POTENTIO TEMPERATURE CONTROL)

Increases or decreases the set temperature.

RECIRCULATION (REC) SWITCH

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

ON position: Interior air is recirculated inside the vehicle.

RECIRC is canceled when DEF mode is selected.

AIR CONDITIONING SWITCH

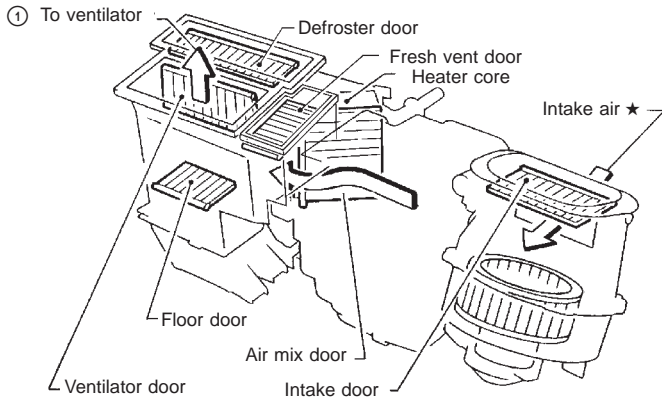
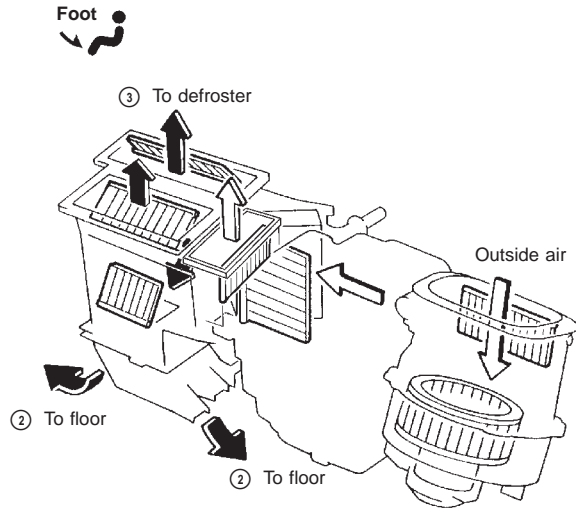
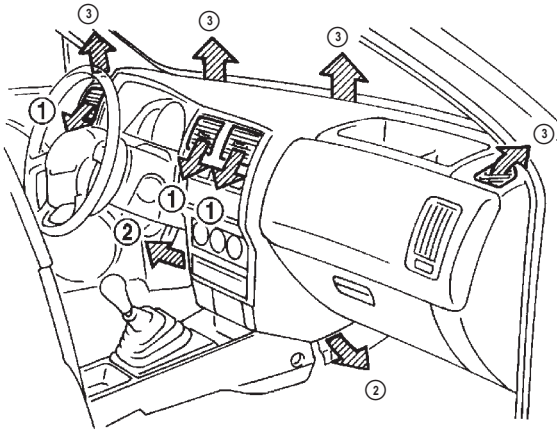
The air conditioner switch controls the A/C system. When the switch is depressed with the fan ON, the compressor will turn ON. The display screen indicates "A/C".

A/C switch will turn on when DEF mode is selected.

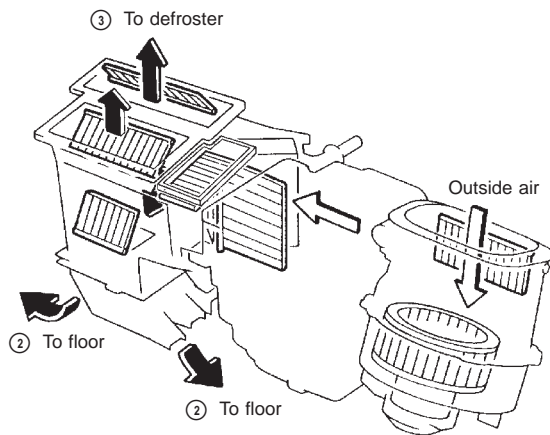
The air conditioner cooling function operates only when the engine is running.

Discharge Air Flow

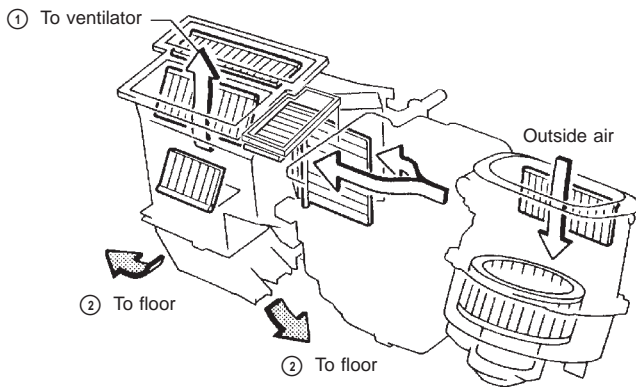
- ① : Ventilation ③ : Defroster
- ② : Foot ★ : Air flow in REC position



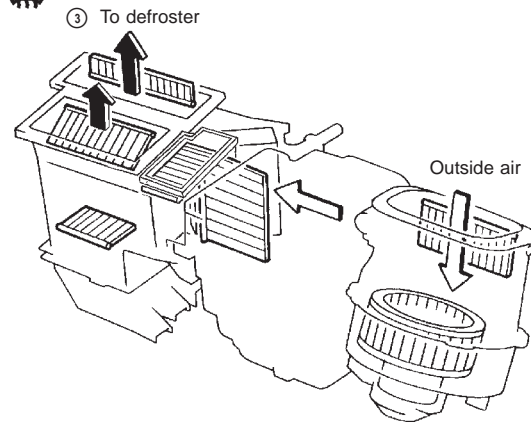
Foot and defroster



Bi-level



Defroster



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

This illustration is for LHD models.
The layout for RHD models is symmetrically opposite.

Operational Check

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

CONDITIONS:

Engine running at normal operating temperature.

PROCEDURE:

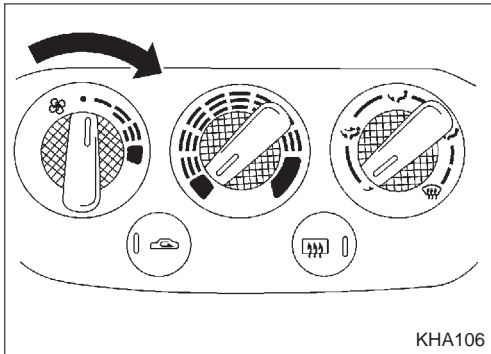
1. Check blower

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

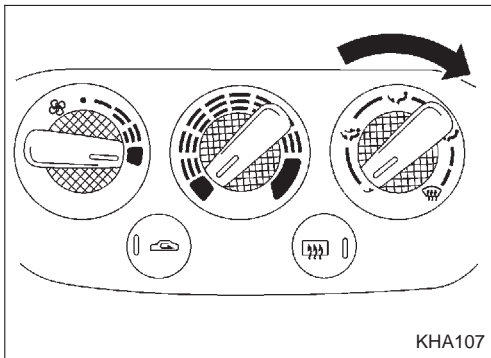
2. Check discharge air

- 1) Turn mode control knob.

- 2) Confirm that discharge air comes out according to the air distribution table at left.
Refer to "Discharge Air Flow" in "DESCRIPTION" (HA-23).



KHA106



KHA107

Discharge airflow

| Switch mode/indicator | Airoutlet/distribution | | |
|-----------------------|------------------------|------|-----------|
| | Face | Foot | Defroster |
| | 100% | — | — |
| | 60% | 40% | — |
| | 15%* | 65% | 20% |
| | 15%* | 55% | 30% |
| | 15%* | — | 85% |

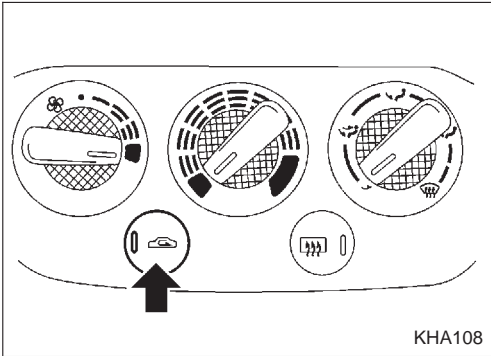
* Face air from SIDE VENT only

KHA032

Operational Check (Cont'd)

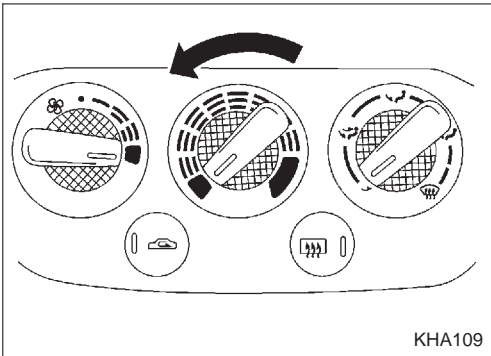
3. Check recirculation

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



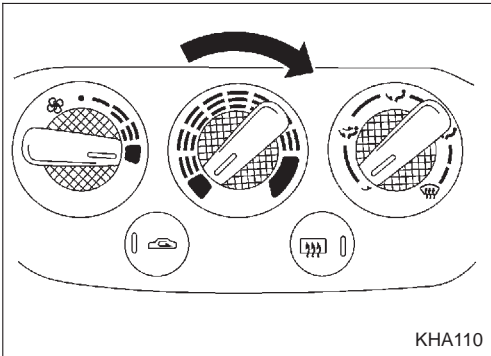
4. Check temperature decrease

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



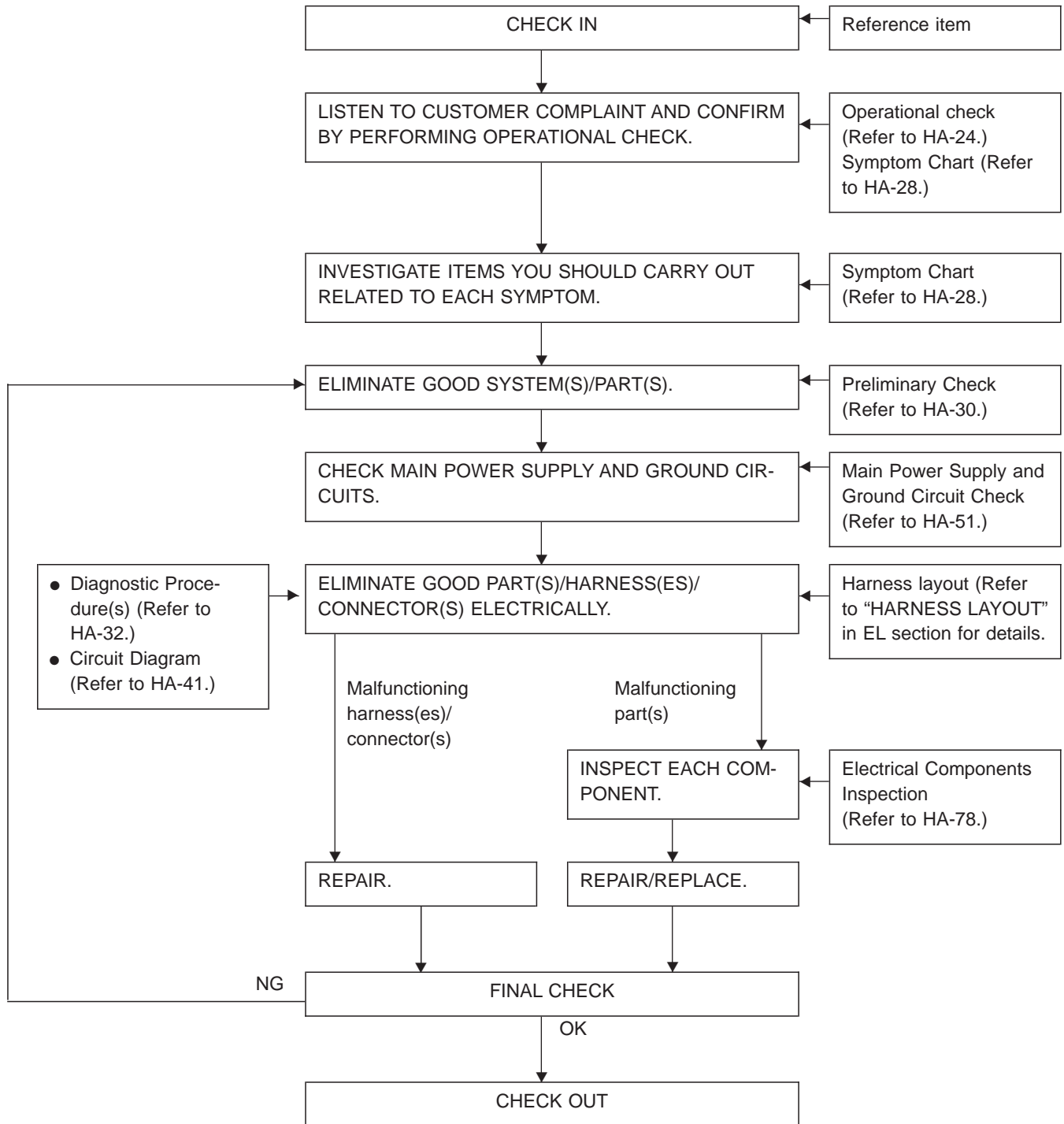
5. Check temperature increase

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



How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



NOTE

Symptom Chart

DIAGNOSTIC TABLE

| PROCEDURE | Preliminary Check | | | Diagnostic Procedure | | | | | | | | | | | | | | Main Power Supply and Ground Circuit Check | | | |
|---|---------------------|---------------------|---------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-------------------------|-----------|--|-------------------|-----------|--|
| | HA-30 | HA-31 | HA-32 | HA-52 | HA-56 | HA-57 | HA-61 | HA-65 | HA-66 | HA-68 | HA-69 | HA-70 | HA-74 | HA-75 | HA-76 | HA-77 | HA-51 | HA-51 | HA-51 | HA-51 | |
| REFERENCE PAGE | HA-30 | HA-31 | HA-32 | HA-52 | HA-56 | HA-57 | HA-61 | HA-65 | HA-66 | HA-68 | HA-69 | HA-70 | HA-74 | HA-75 | HA-76 | HA-77 | HA-51 | HA-51 | HA-51 | HA-51 | |
| SYMPTOM | Preliminary check 1 | Preliminary check 2 | Preliminary check 3 | Diagnostic Procedure 1 | Diagnostic Procedure 2 | Diagnostic Procedure 3 | Diagnostic Procedure 4 | Diagnostic Procedure 5 | Diagnostic Procedure 6 | Diagnostic Procedure 7 | Diagnostic Procedure 9 | Diagnostic Procedure 10 | Diagnostic Procedure 11 | Diagnostic Procedure 12 | Diagnostic Procedure 13 | Diagnostic Procedure 14 | 15A Fuses | 7.5A Fuse | A/C control panel | Auto amp. | |
| A/C does not blow cold air. | | ○ | | ○ | | | | | | | | ○ | | | | | ○ | ○ | ○ | ○ | |
| Blower motor does not rotate at all. (Fan switch [AUTO] [1] [2] [3] [4]) | | ① | | ② | | | | | | | | | | | | | ○ | ○ | | | |
| Blower motor does not rotate at all when the fan speed is in AUTO. (It operates in 1, 2, 3 or 4-speed.) | | | | | ① | | | | | | | | | | | | ○ | ○ | | ○ | |
| Blower motor fan speed does not change when fan speed is in AUTO. (Fan speed is fixed in Hi or MH.) | | | | | | ① | | | | | | | | | | | ○ | ○ | | ○ | |
| Blower motor fan speed does not change when fan speed is in AUTO. (Fan speed is fixed in LO.) | | | | | | | ① | | | | | | | | | | ○ | ○ | | ○ | |
| Starting fan speed control does not operate. | | | | | | | | ① | | | | | | | | | | ○ | | ○ | |
| There is too much difference between setting temp. on P.T.C. and in-vehicle temp. | | ① | | | | | | | ② | | | | | | | | | ○ | | ○ | |
| Air mix door motor does not operate normally. | | ① | | | | | | | | ② | | | | | | | | ○ | | ○ | |
| Intake door does not change in VENT, B/L FOOT DEF or FOOT mode. | ① | | | | | | | | | | ① | | | | | | | ○ | | | |
| Magnetic clutch does not engage when A/C switch and fan switch are ON. | | | | | | | | | | | | ① | | | | | | ○ | | | |
| Ambient sensor circuit is open or shorted. | | | | | | | | | | | | | ① | | | | | ○ | | ○ | |
| In-vehicle sensor circuit is open or shorted. | | | | | | | | | | | | | | ① | | | | ○ | | ○ | |
| Sunload sensor circuit is open or shorted. | | | | | | | | | | | | | | | ① | | | ○ | | ○ | |
| Thermal transmitter circuit is open or shorted. | | | | | | | | | | | | | | | | ① | | ○ | | ○ | |
| Illumination or indicators of control unit do not come on. | | | | | | | | | | | | | | | | | | ○ | ○ | | |
| Noise | | | ① | | | | | | | | | | | | | | | | | | |

①, ② : The number means checking order.

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

Checking Resistor

Checking resistors are used for trouble diagnoses of blower motor operation and air mix door motor operation. Use checking resistor when inspecting portions with [C/R] *1, [C/R] *2 in flow chart.

CAUTION:

Select checking resistors which have resistance values corresponding with those indicated in table below, and connect to respective sensors.

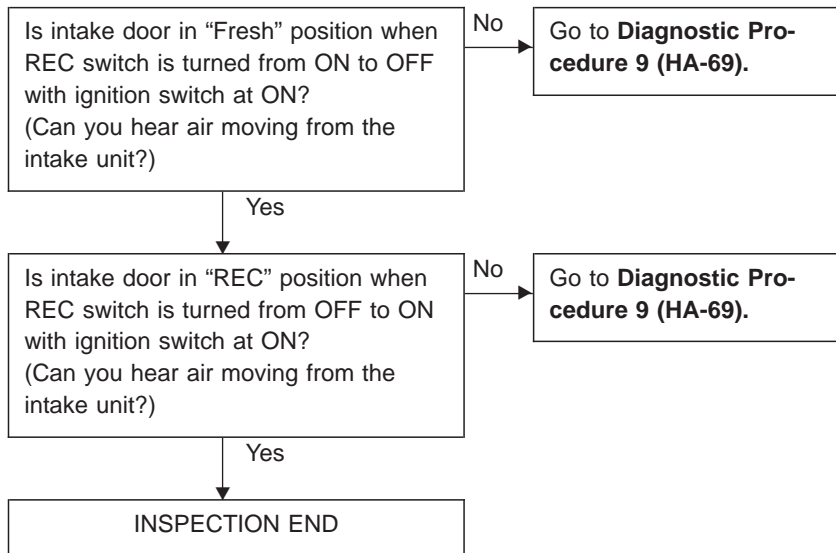
| | Checking resistor | Ambient sensor | In-vehicle sensor | Wattage |
|------------------------------------|-------------------|----------------|-------------------|---------|
| Blower motor operation check | [C/R] *1 | 1,000Ω | 1,500Ω | 1/4W |
| Air mix door motor operation check | [C/R] *2 | | 2,490Ω | |

1. Disconnect ambient sensor and in-vehicle sensor harness connectors.
2. Connect checking resistors to ambient sensor harness connector and in-vehicle sensor harness connector when inspecting portions with [C/R] *1, [C/R] *2 in flow chart in trouble diagnoses.
3. Turn ignition switch ON.
4. Turn A/C switch ON.
5. Turn VENT mode.
6. Keep sunload sensor away from sunlight by covering it.

Preliminary Check

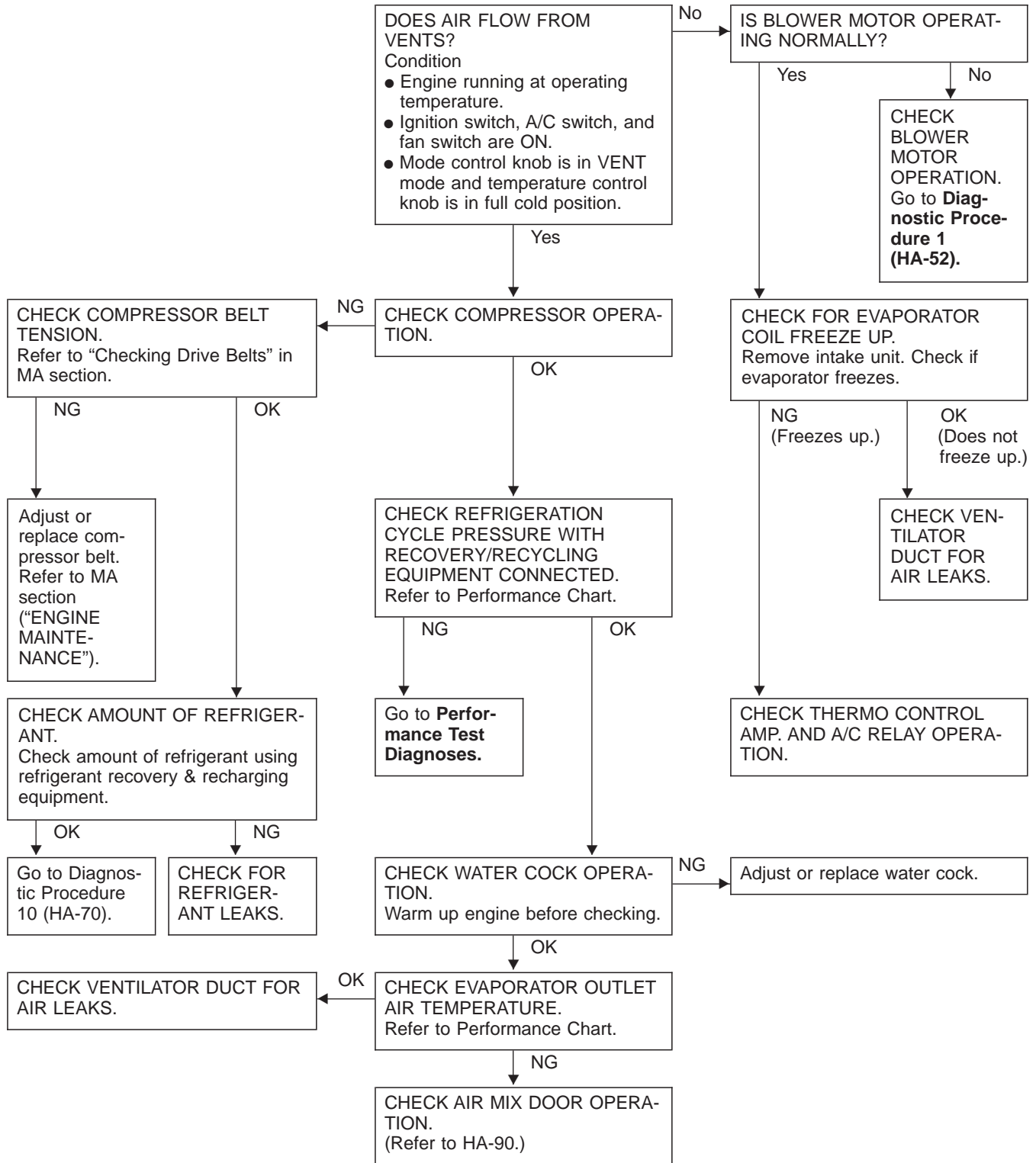
PRELIMINARY CHECK 1

Intake door is not set at "FRESH".



Preliminary Check (Cont'd)

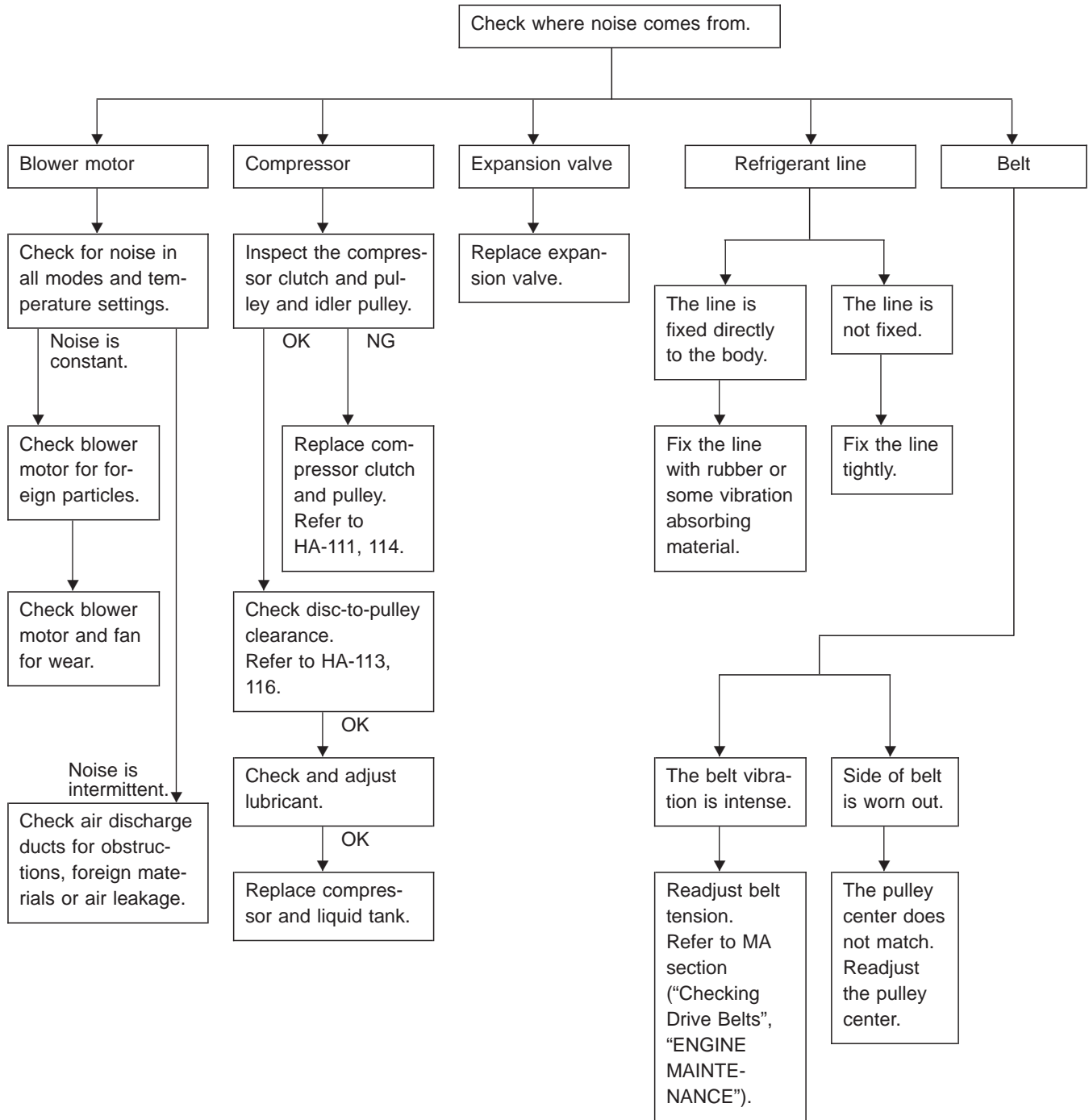
PRELIMINARY CHECK 2
A/C does not blow cold air.



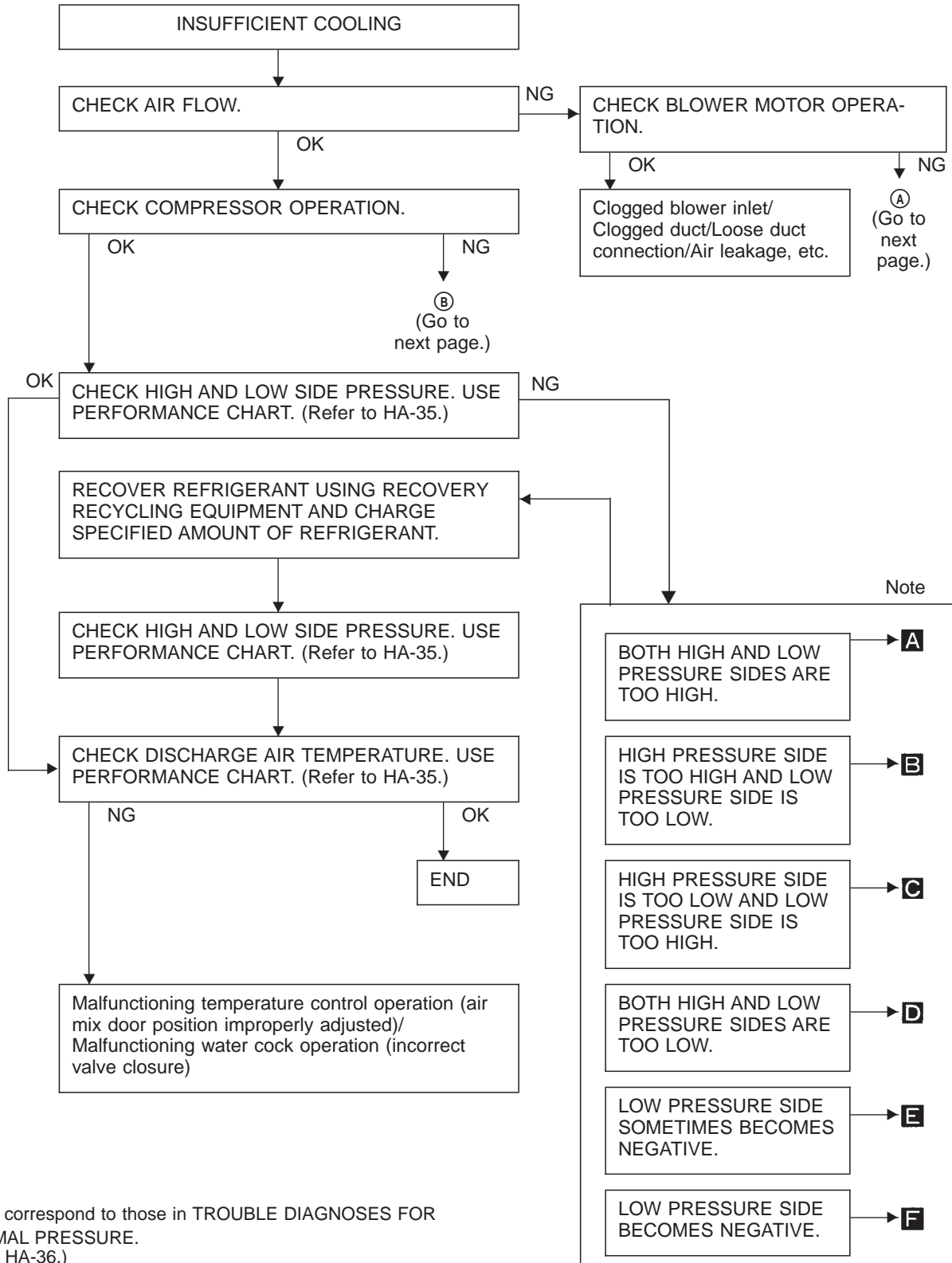
Preliminary Check (Cont'd)

PRELIMINARY CHECK 3

Noise

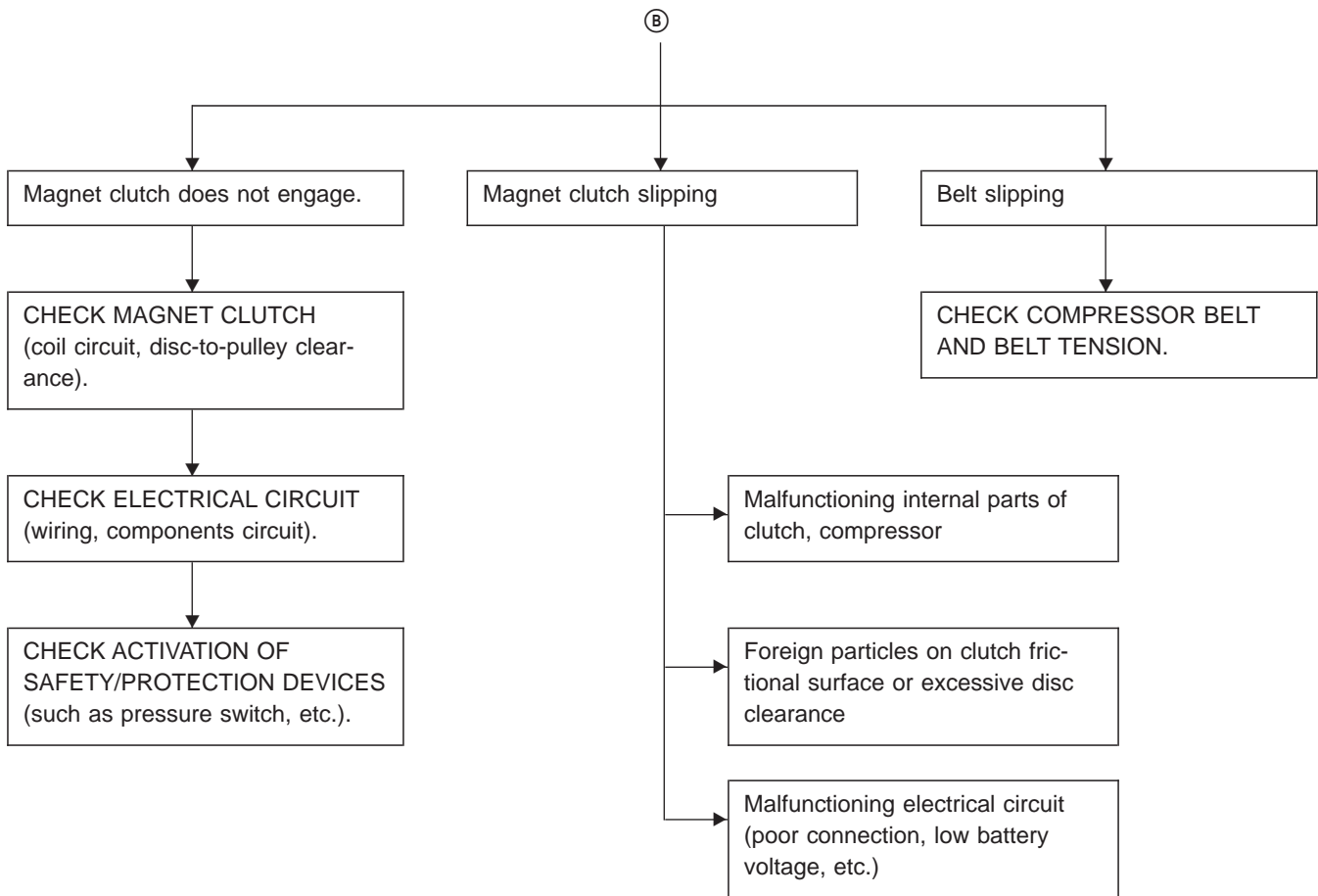
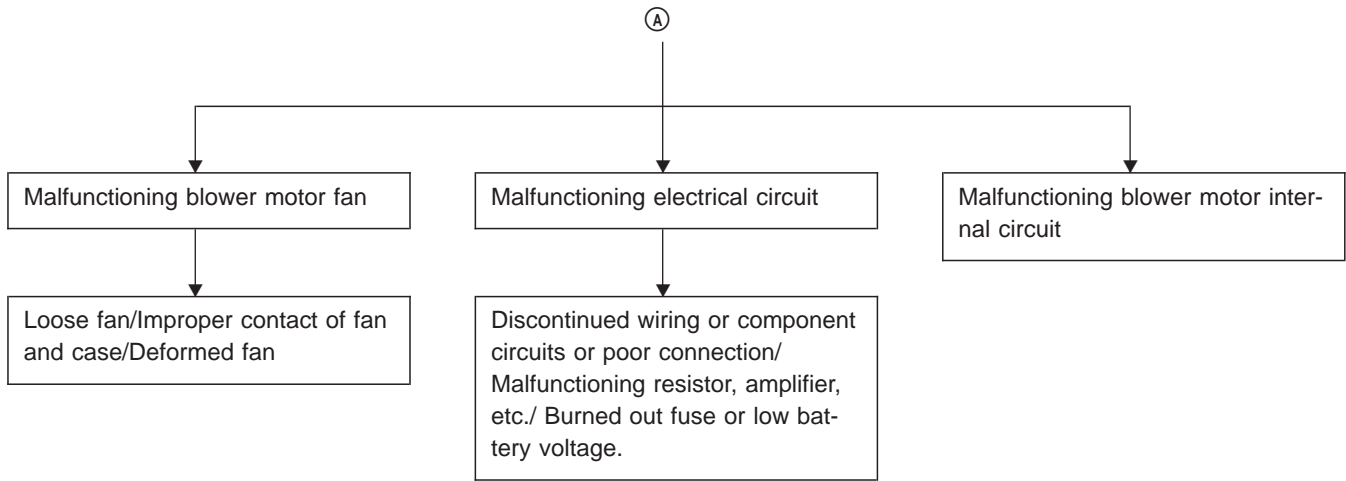


**Performance Test Diagnoses
INSUFFICIENT COOLING**



Note: **A – F** correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. (Refer to HA-36.)

Performance Test Diagnoses (Cont'd)



A/C Performance Chart

TEST CONDITION

Testing must be performed as follows:

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

Doors: Closed

Door window: Open

Temp lever position: Max COLD

Mode switch position: Ventilation

Intake switch position: Recirculation

Fan switch position: Max

Engine speed: Idling 825-850 rpm

TEST READING (RHD & LHD MODELS)

Recirculating-to-discharge air temperature table

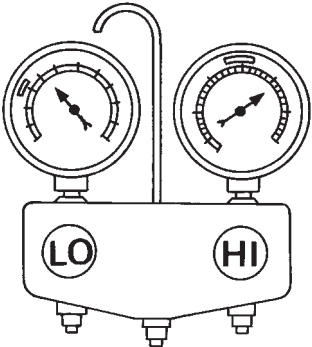
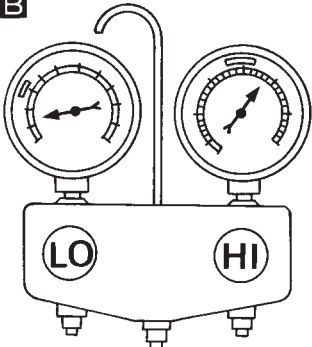
| Inside air (Recirculating air) at blower assembly inlet | | Discharge air temperature at center ventilator °C (°F) |
|--|----------------------------|---|
| Relative humidity % | Air temperature °C (°F) | |
| 50 - 60 | 20 (68) | 6.4 - 8.0 (44 - 46) |
| | 25 (77) | 10.6 - 12.4 (51 - 54) |
| | 30 (86) | 14.6 - 17.0 (58 - 63) |
| | 35 (95) | 19.0 - 22.0 (66 - 72) |
| | 40 (104) | 23.3 - 27.2 (74 - 81) |
| 60 - 70 | 20 (68) | 8.0 - 9.6 (46 - 49) |
| | 25 (77) | 12.4 - 14.6 (54 - 58) |
| | 30 (86) | 17.0 - 19.7 (63 - 67) |
| | 35 (95) | 22.0 - 24.9 (72 - 77) |
| | 40 (104) | 27.2 - 30.2 (81 - 86) |

Ambient air temperature-to-operating pressure table

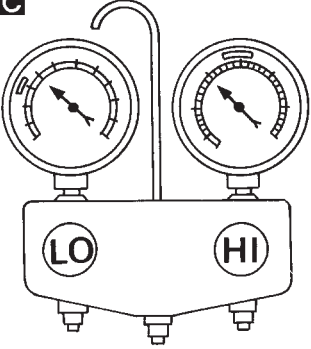
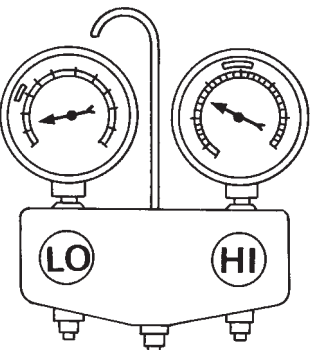
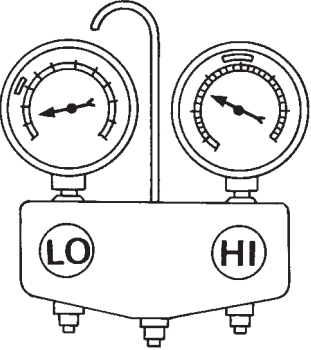
| Ambient air | | High-pressure (Discharge side) kPa (bar, kg/cm ² , psi) | Low-pressure (Suction side) kPa (bar, kg/cm ² , psi) |
|------------------------|----------------------------|---|--|
| Relative humidity % | Air temperature °C (°F) | | |
| 50 - 70 | 20 (68) | 736 - 902 (7.36 - 9.02, 7.5 - 9.2, 107 - 131) | 118 - 186 (1.18 - 1.86, 1.2 - 1.9, 17 - 27) |
| | 25 (77) | 873 - 1098 (8.73 - 10.98, 8.9 - 11.2, 127 - 159) | 137 - 216 (1.37 - 2.16, 1.4 - 2.2, 20 - 31) |
| | 30 (86) | 1,079 - 1,275 (10.79 - 12.75, 11.0 - 13.0, 156 - 185) | 157 - 245 (1.57 - 2.45, 1.6 - 2.5, 23 - 36) |
| | 35 (95) | 1,304 - 1,608 (13.04 - 16.08, 13.3 - 16.4, 189 - 233) | 206 - 304 (2.06 - 3.04, 2.1 - 3.1, 30 - 44) |
| | 40 (104) | 1,550 - 1,912 (15.50 - 19.13, 15.8 - 19.5, 225 - 277) | 255 - 363 (2.55 - 3.63, 2.6 - 3.7, 37 - 53) |

Trouble Diagnoses for Abnormal Pressure

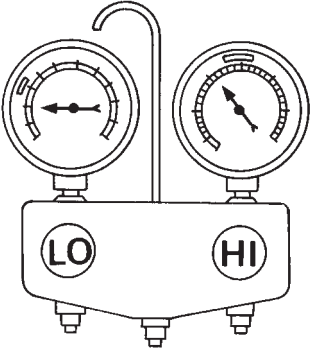
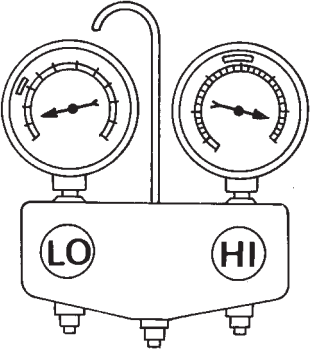
Whenever the system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, differs from vehicle to vehicle, refer to HA-35 ("Ambient air temperature-to-operating pressure table").

| Gauge indication | Refrigerant cycle | Probable cause | Corrective action |
|---|---|---|---|
| <p>Both high and low-pressure sides are too high.</p> <p>A</p>  <p>AC359A</p> | <ul style="list-style-type: none"> Pressure is reduced soon after water is splashed on condenser. | <p>Excessive refrigerant charge in refrigeration cycle.</p> | <p>Reduce refrigerant until specified pressure is obtained.</p> |
| | <p>Air suction by cooling fan is insufficient.</p> | <p>Insufficient condenser cooling performance</p> <p>↓</p> <p>① Condenser fins are clogged.</p> <p>② Improper cooling fan rotation.</p> | <ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan as necessary. |
| | <ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2.0 bar, 2 kg/cm², 28 psi). It then decreases gradually thereafter. | <p>Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.)</p> <p>↓</p> <p>Air in refrigeration cycle.</p> | <p>Evacuate repeatedly and recharge system.</p> |
| | <p>Engine tends to overheat.</p> | <p>Engine cooling systems malfunction.</p> | <p>Check and repair each engine cooling system.</p> |
| | <ul style="list-style-type: none"> An area of the low-pressure pipe is colder than areas near the evaporator outlet. Plates are sometimes covered with frost. | <ul style="list-style-type: none"> Excessive liquid refrigerant on low-pressure side Excessive refrigerant discharge flow Expansion valve is open a little compared with the specification. <p>↓</p> <p>① Improper thermal valve installation.</p> <p>② Improper expansion valve adjustment.</p> | <p>Replace expansion valve.</p> |
| <p>High-pressure side is too high and low-pressure side is too low.</p> <p>B</p>  <p>AC360A</p> | <p>Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.</p> | <p>High-pressure tube or parts located between compressor and condenser are clogged or crushed.</p> | <ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check lubricant for contamination. |

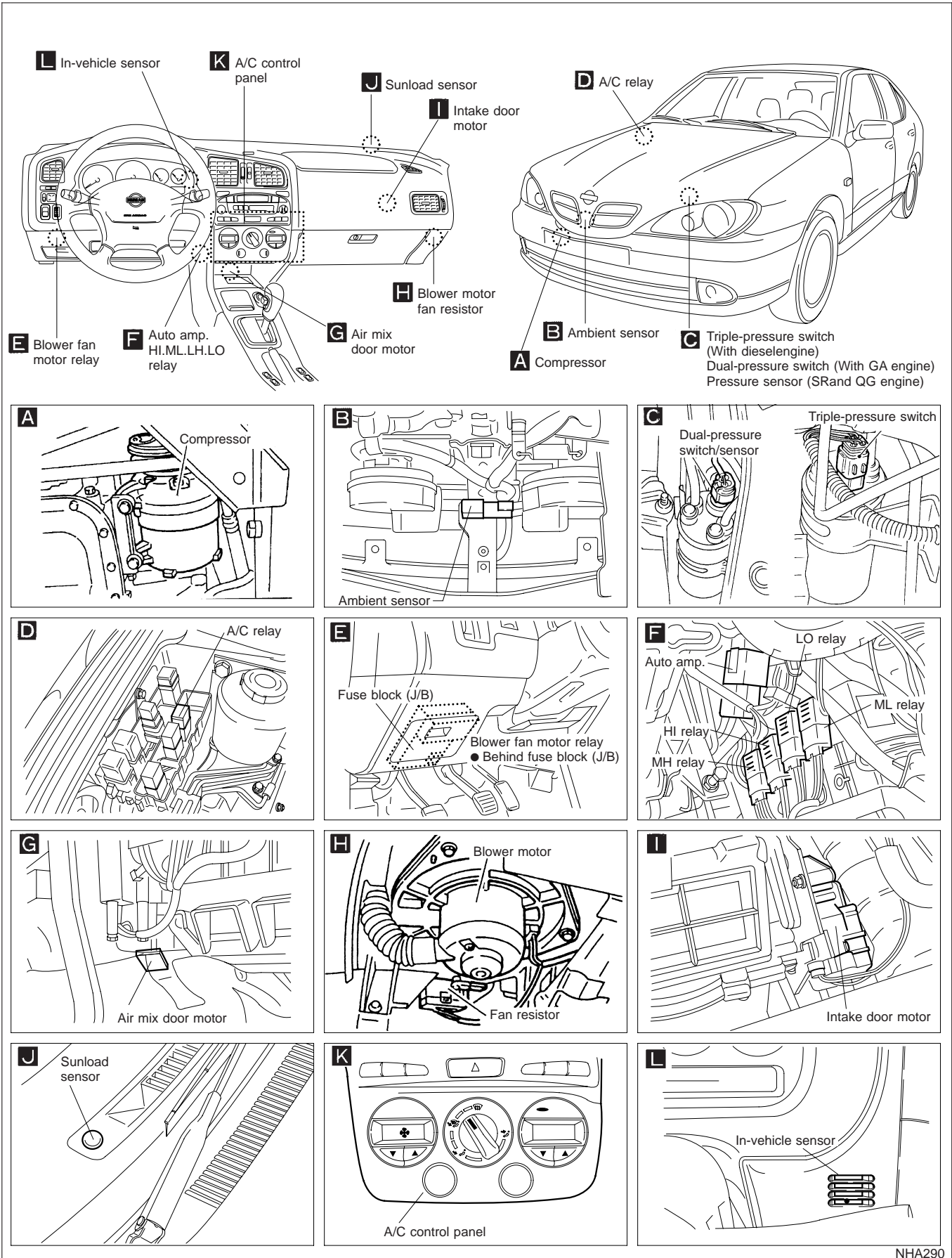
Trouble Diagnoses for Abnormal Pressure (Cont'd)

| Gauge indication | Refrigerant cycle | Probable cause | Corrective action |
|--|---|--|---|
| High-pressure side is too low and low-pressure side is too high. C  <p>AC356A</p> | High and low-pressure sides become equal soon after compressor operation stops. | Compressor pressure operation is incorrect. ↓ Damage inside compressor packings. | Replace compressor. |
| | No temperature difference between high and low-pressure sides. | Compressor operation is incorrect. ↓ Damage inside compressor packings. | Replace compressor. |
| Both high- and low-pressure sides are too low. D  <p>AC353A</p> | <ul style="list-style-type: none"> • There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low. • Liquid tank inlet and expansion valve are frosted. | Liquid tank inside is clogged a little. | <ul style="list-style-type: none"> • Replace liquid tank. • Check lubricant for contamination. |
| | <ul style="list-style-type: none"> • Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. • Expansion valve inlet may be frosted. • Temperature difference occurs somewhere in high-pressure side. | High-pressure pipe located between liquid tank and expansion valve is clogged. | <ul style="list-style-type: none"> • Check and repair malfunctioning parts. • Check lubricant for contamination. |
| Both high- and low-pressure sides are too low. D  <p>AC353A</p> | There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted. | Expansion valve closes a little compared with the specification. ↓ ① Improper expansion valve adjustment. ② Malfunctioning thermal valve. ③ Outlet and inlet may be clogged. | <ul style="list-style-type: none"> • Remove foreign particles by using compressed air. • Check lubricant for contamination. |
| | An area of the low-pressure pipe is colder than areas near the evaporator outlet. | Low-pressure pipe is clogged or crushed. | <ul style="list-style-type: none"> • Check and repair malfunctioning parts. • Check lubricant for contamination. |
| | Air flow volume is not enough or is too low. | Compressor operation is incorrect. ↓ Damaged inside compressor packings. | Replace compressor. |

Trouble Diagnoses for Abnormal Pressure (Cont'd)

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

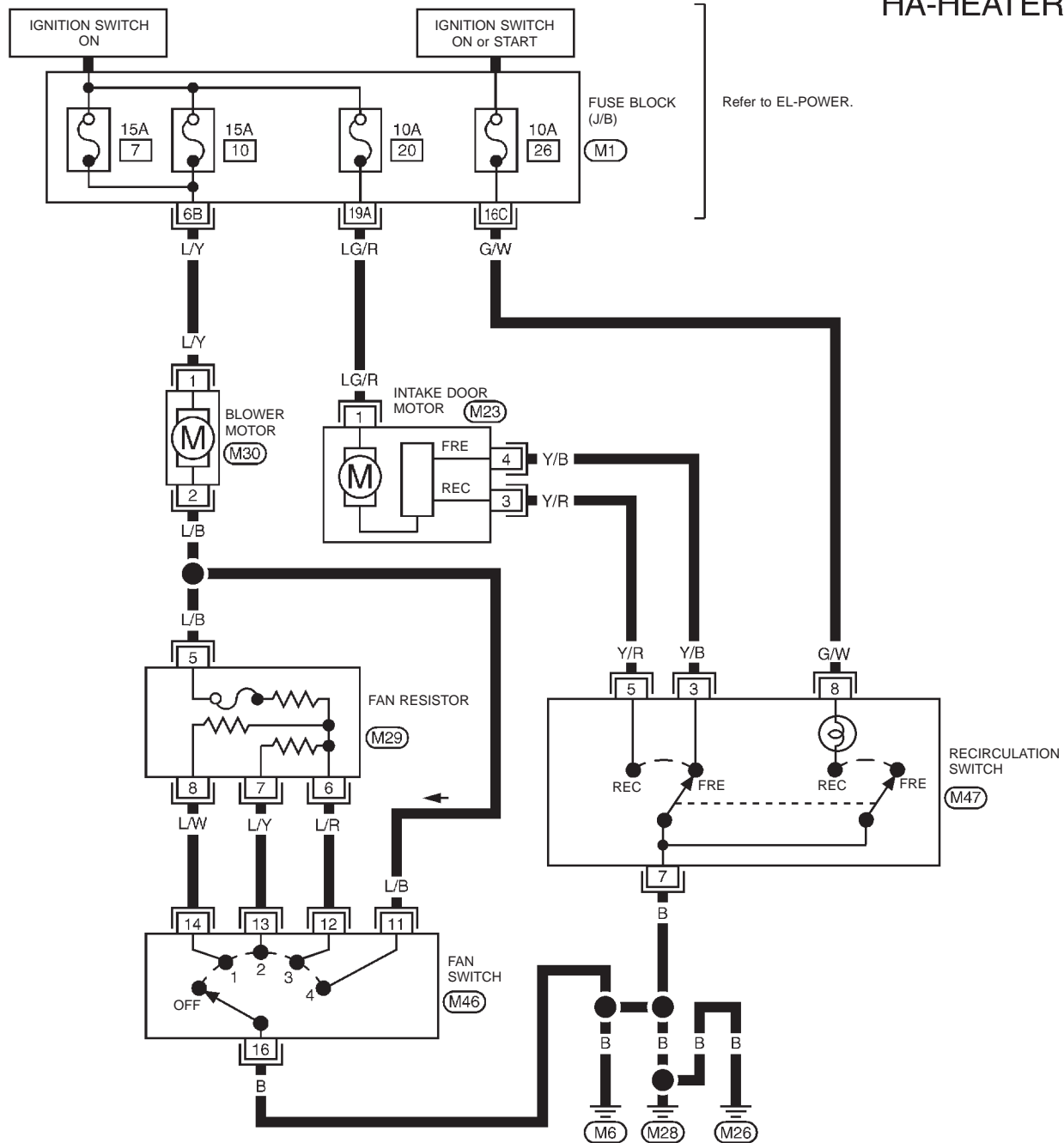
Component Location



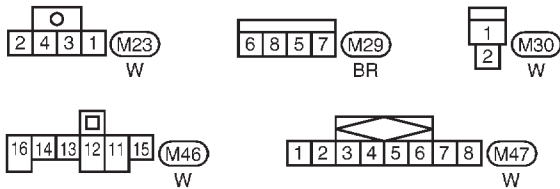
NHA290

Wiring Diagram — HEATER —

HA-HEATER-01



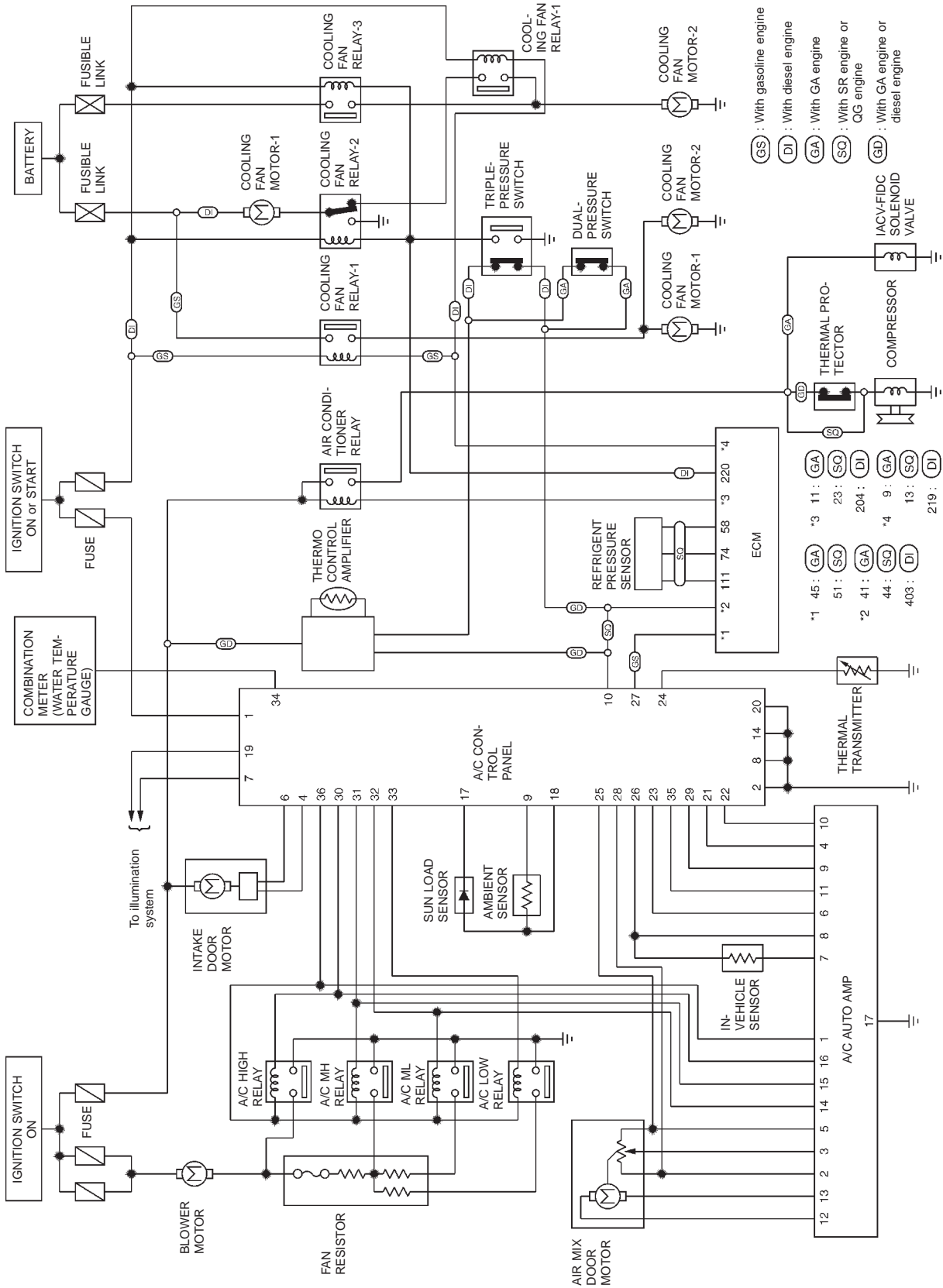
Refer to EL-POWER.



REFER TO THE FOLLOWING

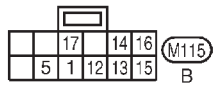
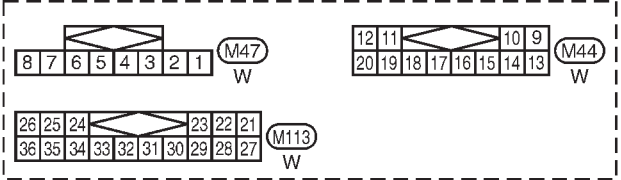
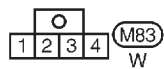
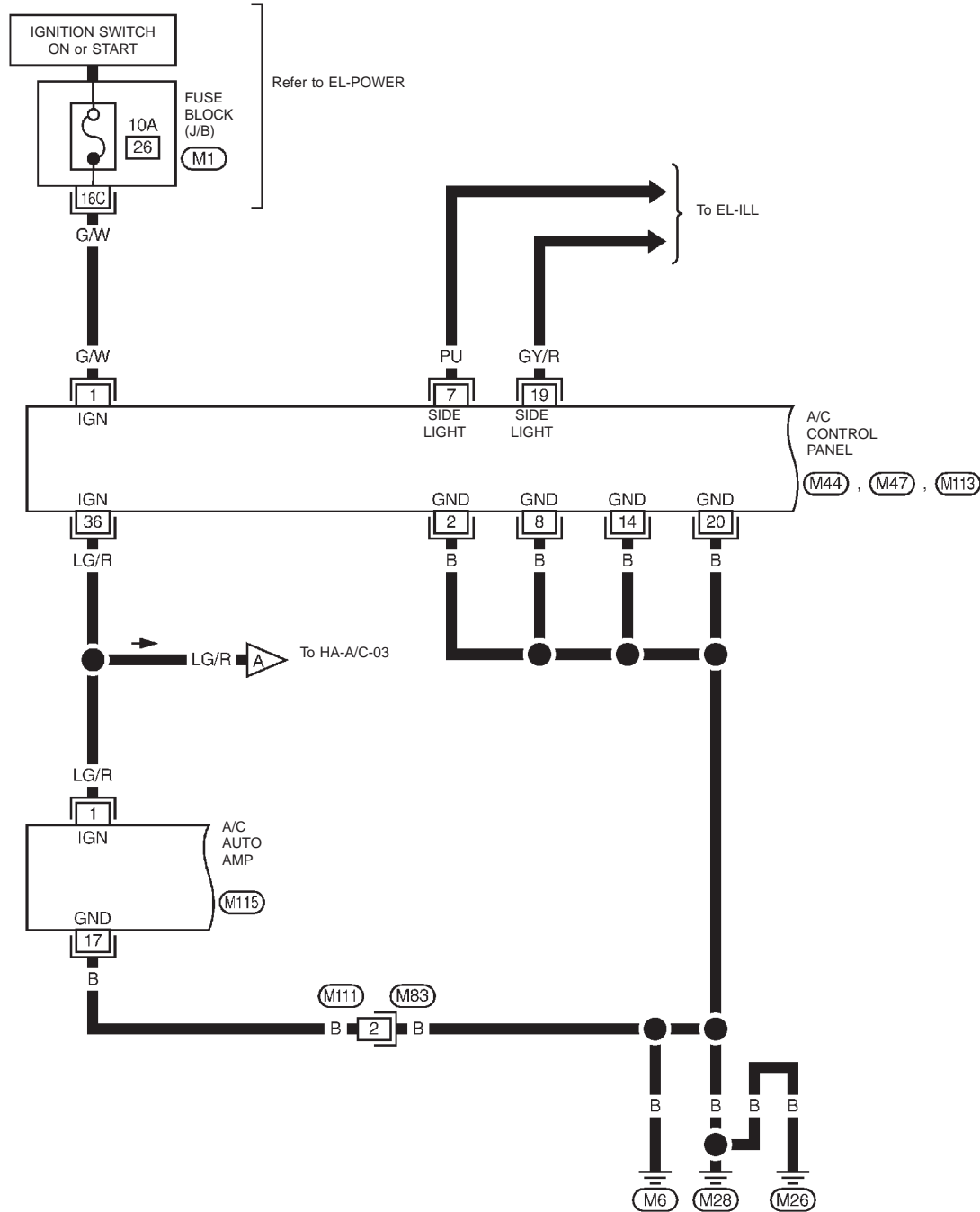
(M1) FUSE BLOCK - Junction Box (J/B)

Circuit Diagram — Air Conditioner



Wiring Diagram — A/C —

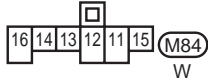
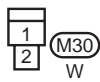
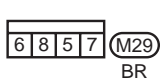
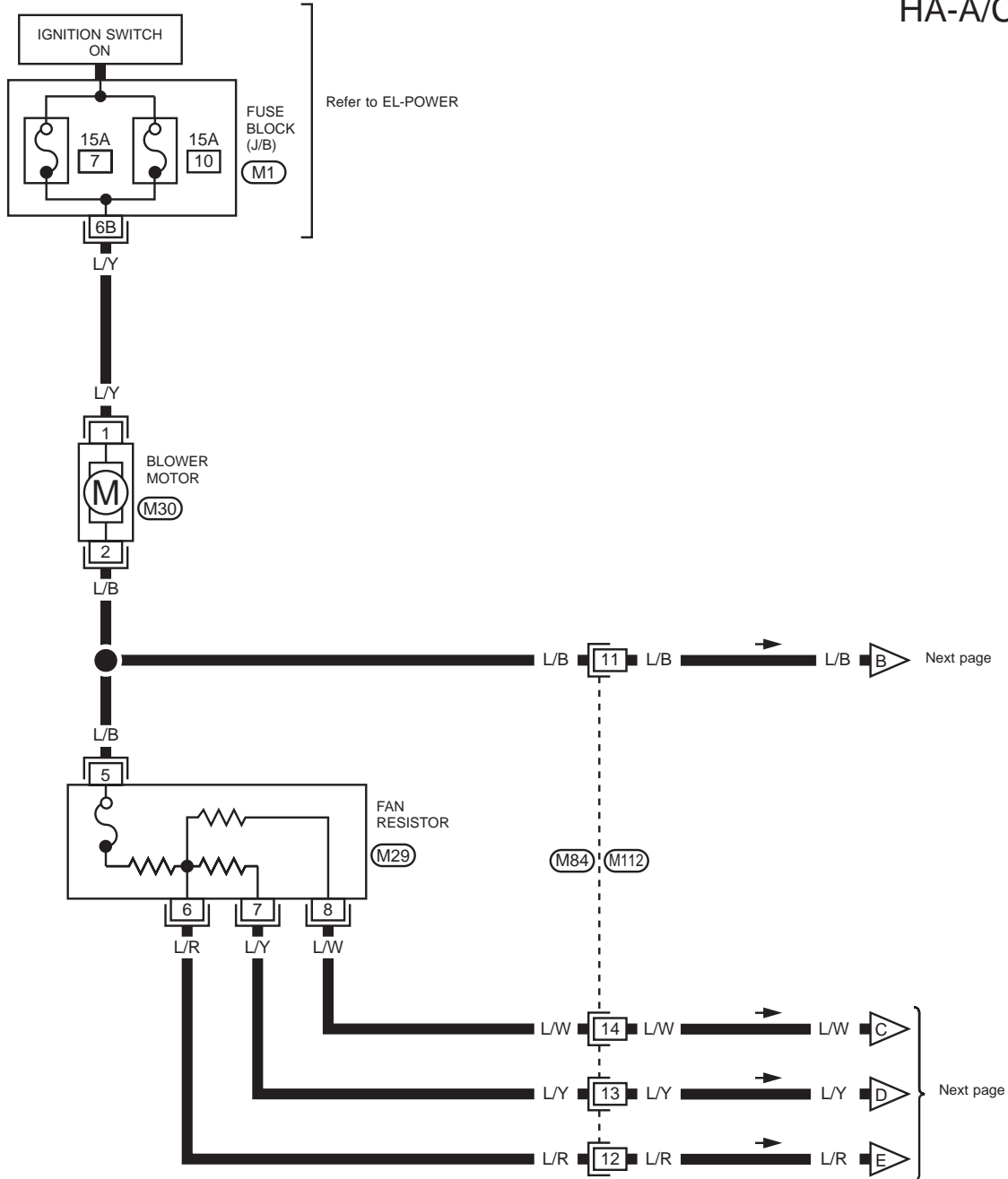
HA-A/C-01



REFER TO THE FOLLOWING
M1 FUSE BLOCK - Junction Box (J/B)

Wiring Diagram — A/C — (Cont'd)

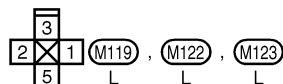
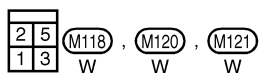
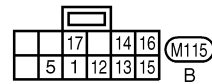
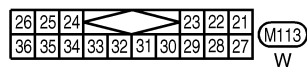
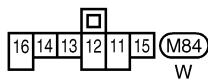
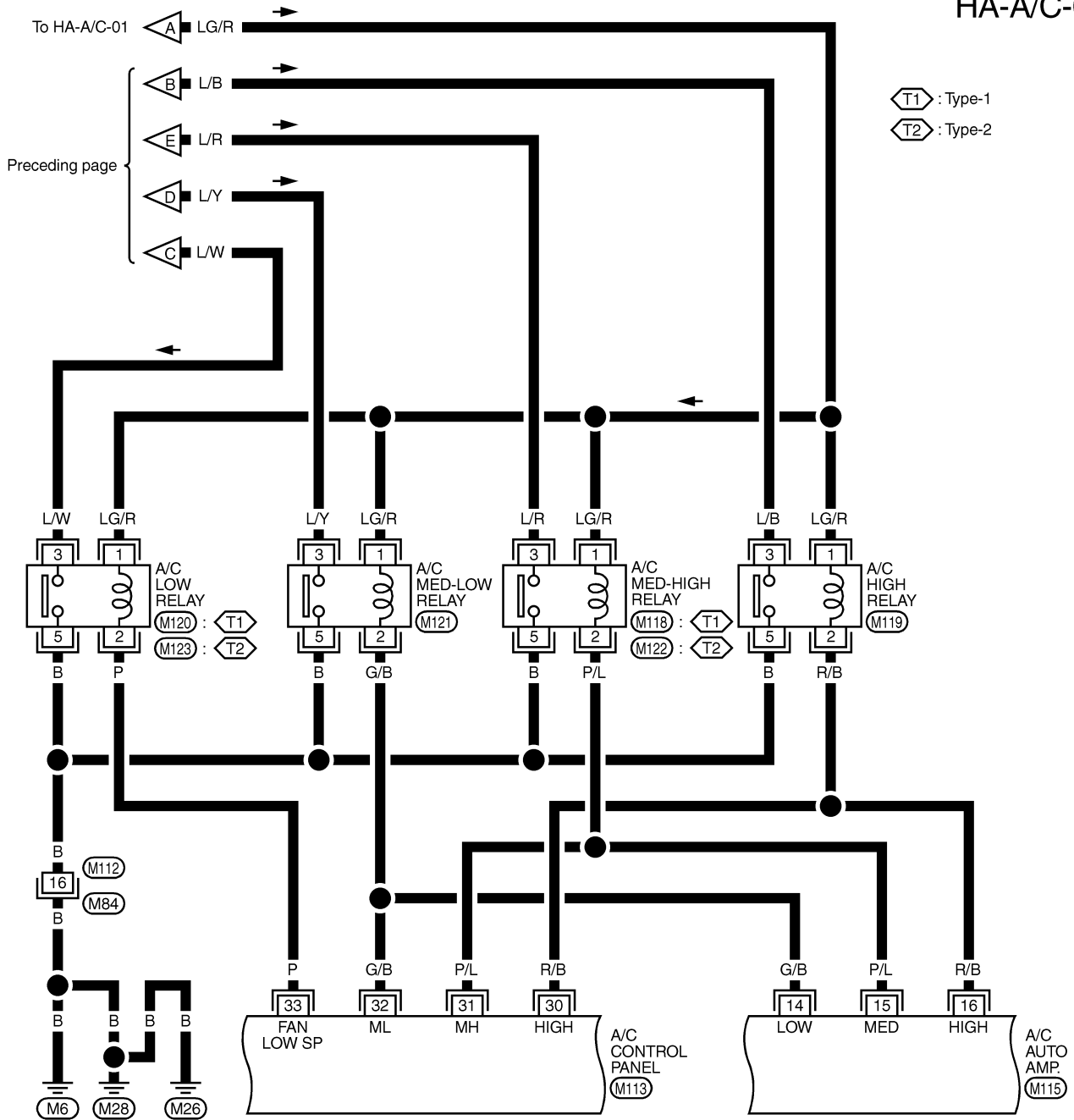
HA-A/C-02



REFER TO THE FOLLOWING
(M1) FUSE BLOCK - Junction Box (J/B)

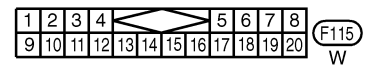
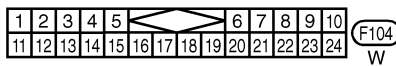
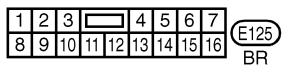
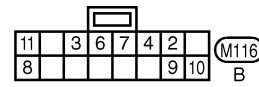
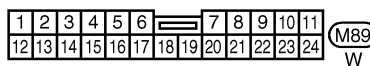
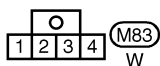
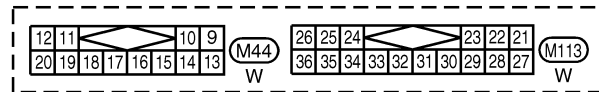
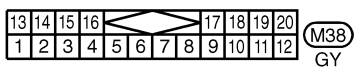
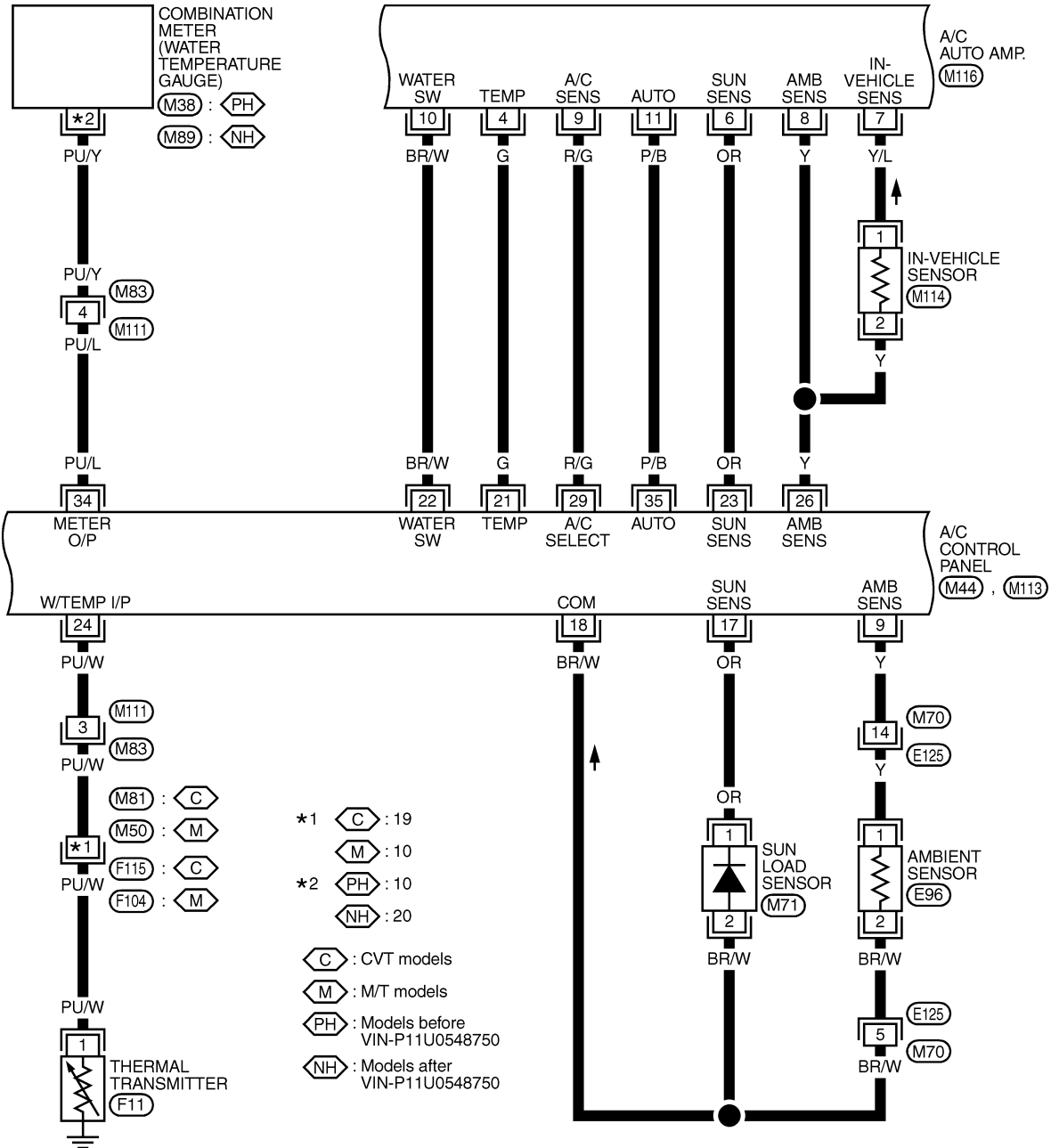
Wiring Diagram — A/C — (Cont'd)

HA-A/C-03



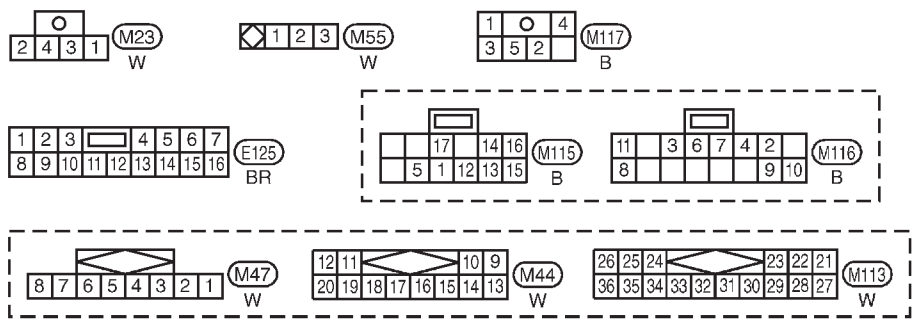
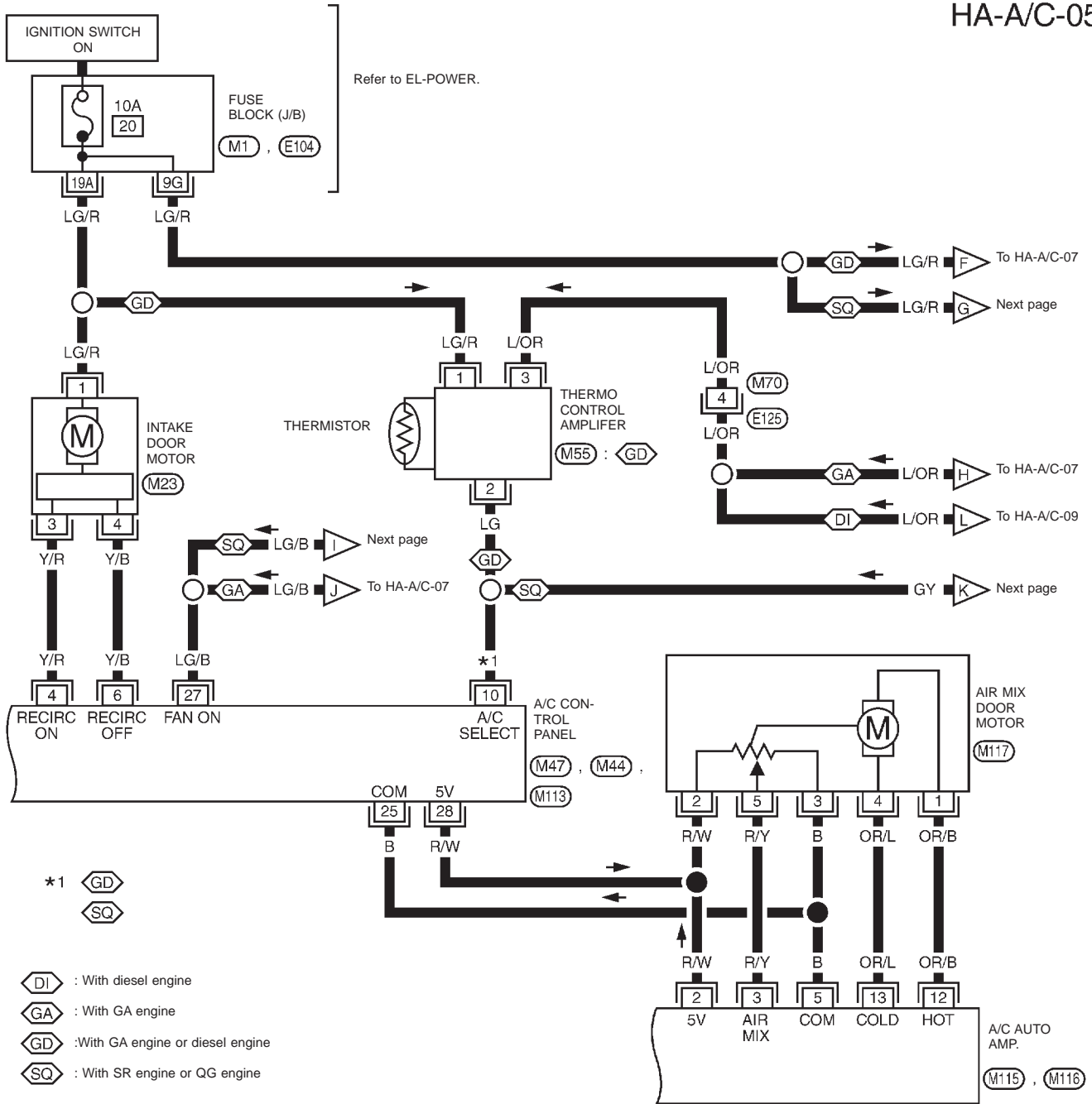
Wiring Diagram — A/C — (Cont'd)

HA-A/C-04



Wiring Diagram — A/C — (Cont'd)

HA-A/C-05



REFER TO THE FOLLOWING

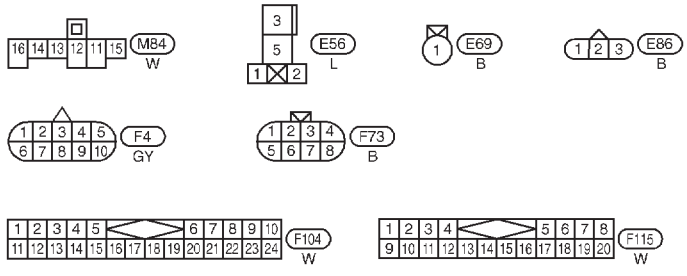
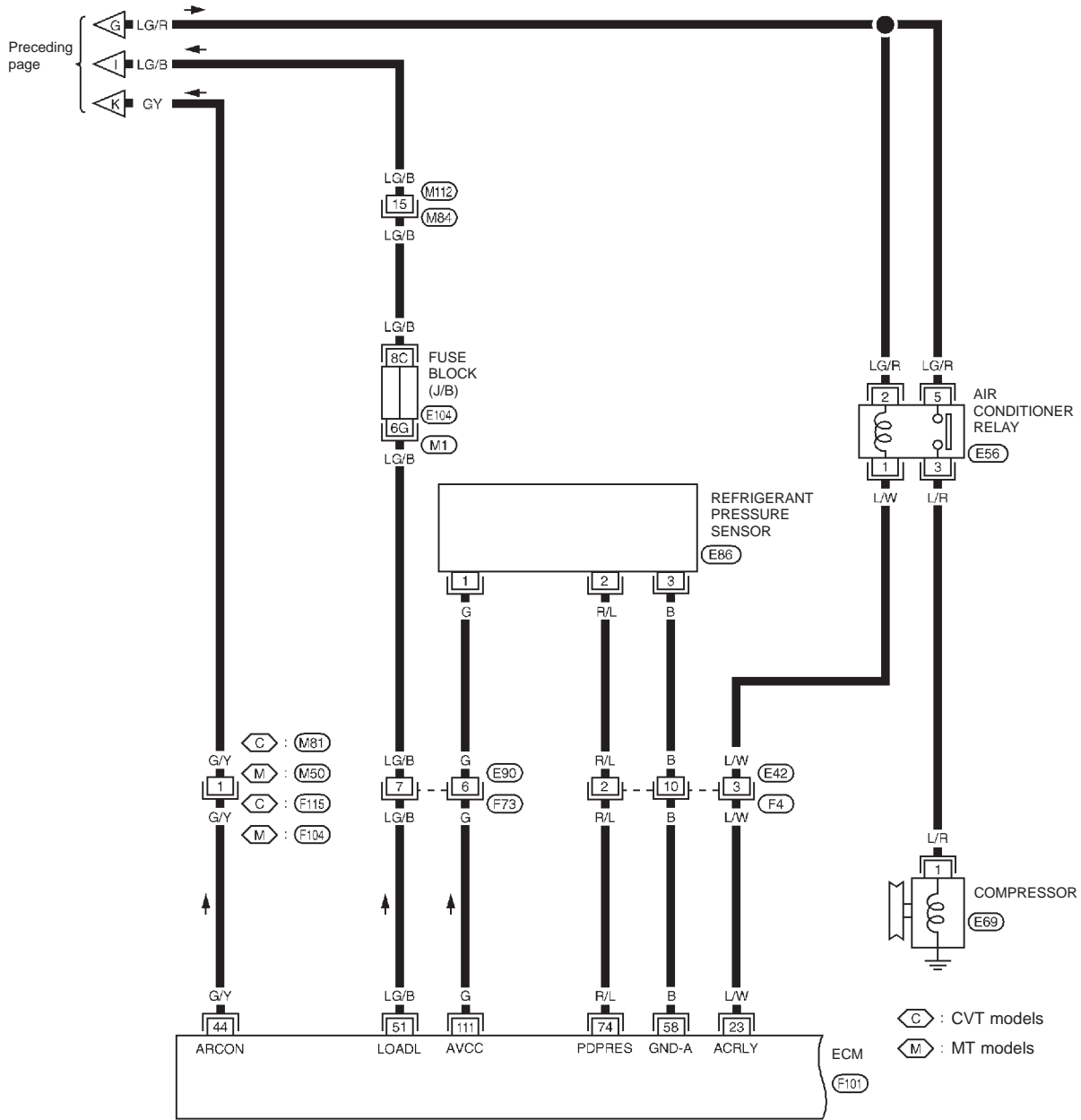
(M1) FUSE BLOCK - Junction Box (J/B)

(E104) FUSE BLOCK - Junction Box (J/B)

Wiring Diagram — A/C — (Cont'd)

WITH SR ENGINE or QG ENGINE

HA-A/C-06



REFER TO THE FOLLOWING

Ⓜ1 FUSE BLOCK - Junction Box (J/B)

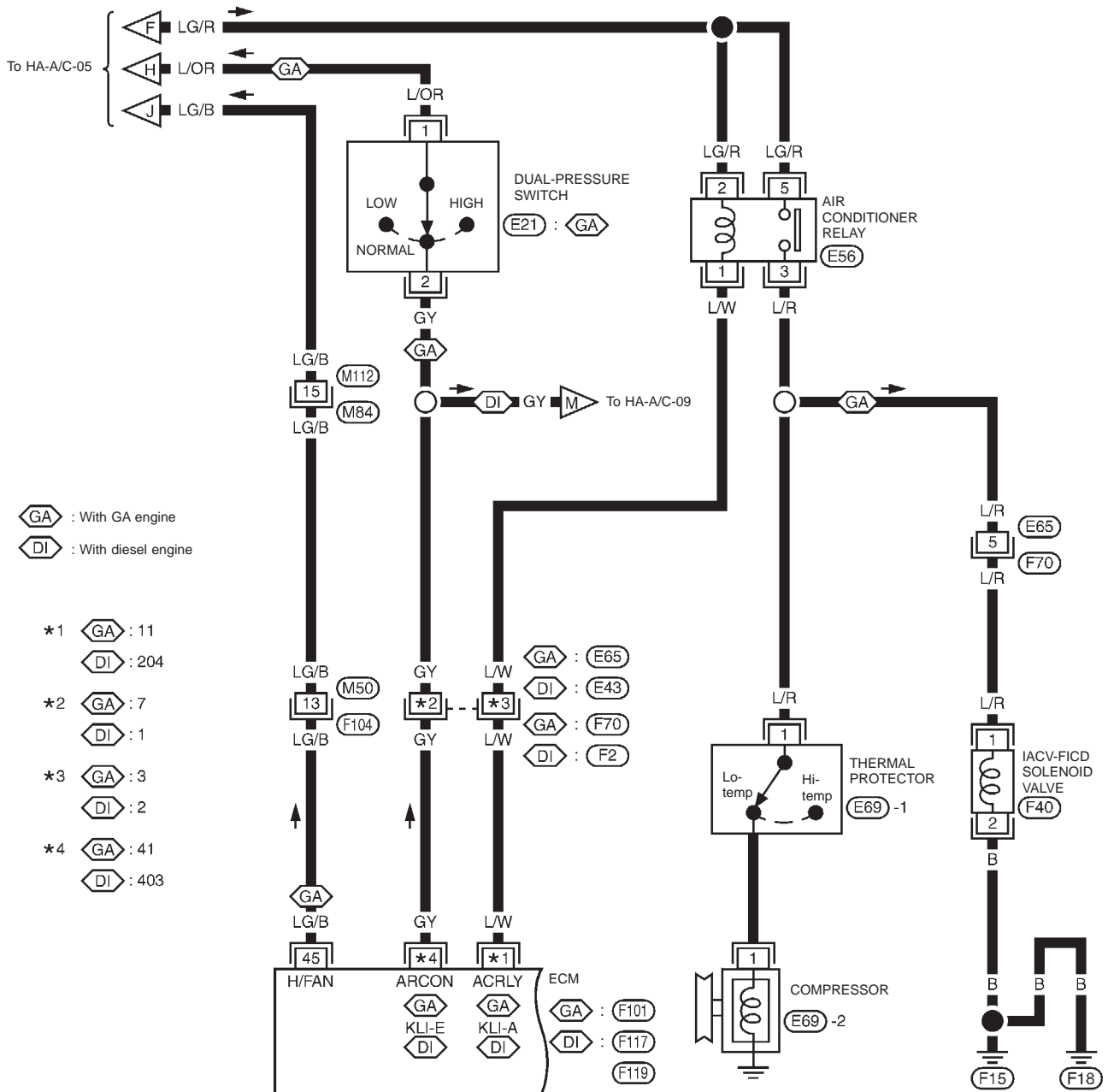
E104 FUSE BLOCK - Junction Box (J/B)

F101 ELECTRICAL UNITS

Wiring Diagram — A/C — (Cont'd)

WITH GA ENGINE or DIESEL ENGINE

HA-A/C-07

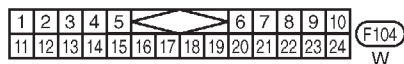
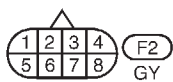
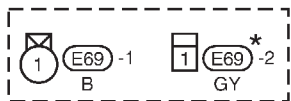
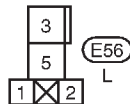
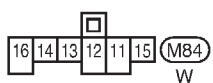


GA : With GA engine
DI : With diesel engine

- *1 GA : 11
DI : 204
- *2 GA : 7
DI : 1
- *3 GA : 3
DI : 2
- *4 GA : 41
DI : 403

- GA : E65
DI : E43
- GA : F70
DI : F2

- GA : F101
DI : F117
F119



REFER TO THE FOLLOWING

E101 ELECTRICAL UNITS

F117 ELECTRICAL UNITS

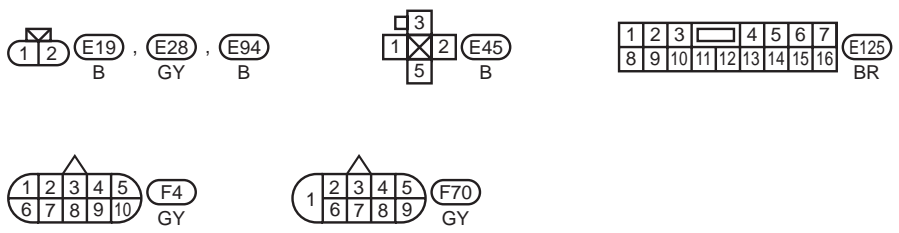
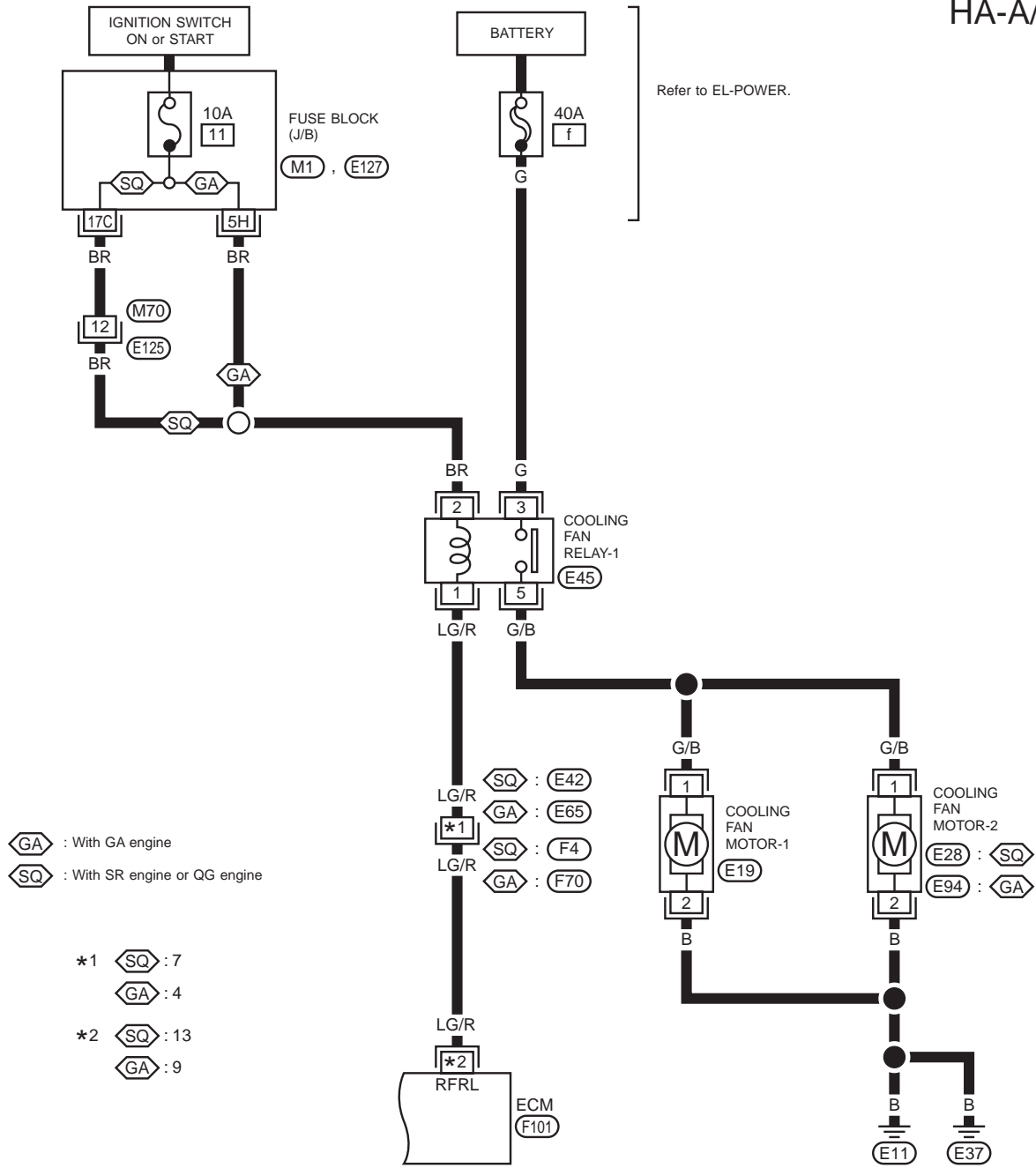
F119

* : This connector is not shown in "HARNESS LAYOUT" of EL section.

Wiring Diagram — A/C — (Cont'd)

WITH GASOLINE ENGINE

HA-A/C-08



REFER TO THE FOLLOWING

(M1) FUSE BLOCK - Junction Box (J/B)

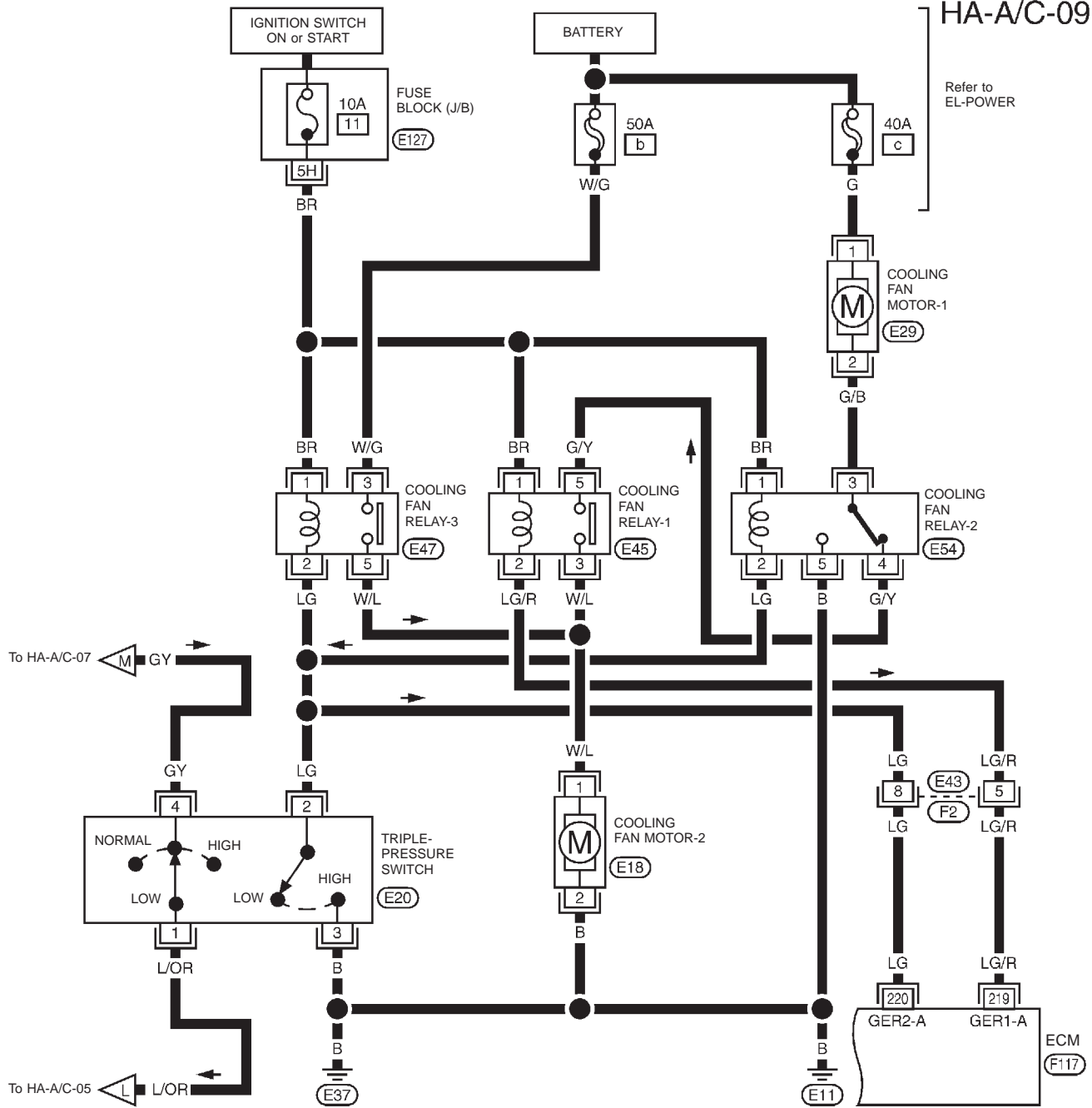
(E127) FUSE BLOCK - Junction Box (J/B)

(F101) ELECTRICAL UNITS

Wiring Diagram — A/C — (Cont'd)

WITH DIESEL ENGINE

HA-A/C-09



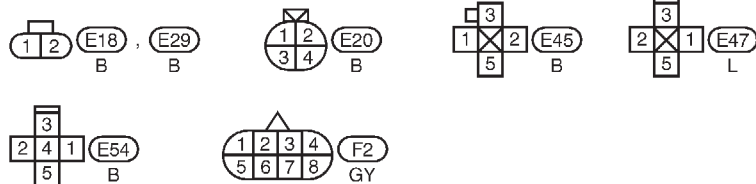
Refer to EL-POWER

To HA-A/C-07

To HA-A/C-05

REFER TO THE FOLLOWING

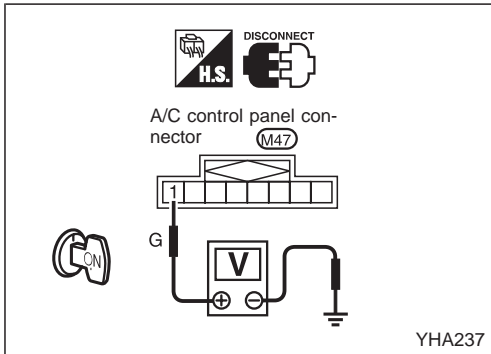
- (E127) FUSE BLOCK - Junction Box (J/B)
- (F117) ELECTRICAL UNITS



Main Power Supply and Ground Circuit Check

POWER SUPPLY CIRCUIT CHECK FOR AUTO A/C SYSTEM

Check power supply circuit for auto air conditioning system. Refer to “POWER SUPPLY ROUTING” in EL section and Wiring Diagram.

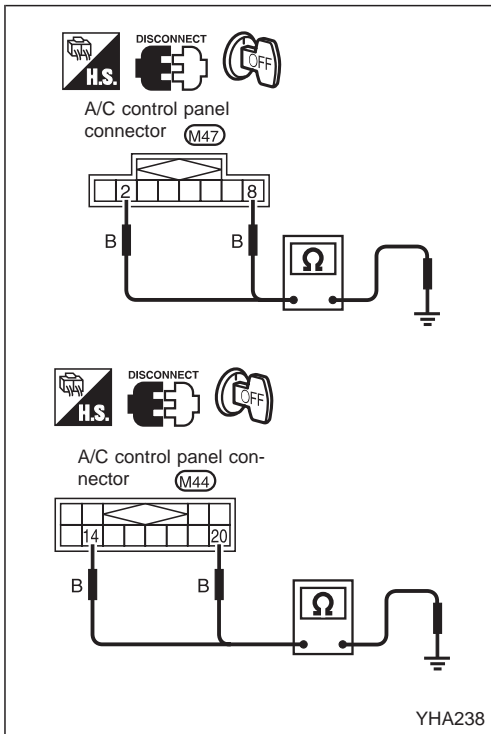


A/C CONTROL PANEL

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

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

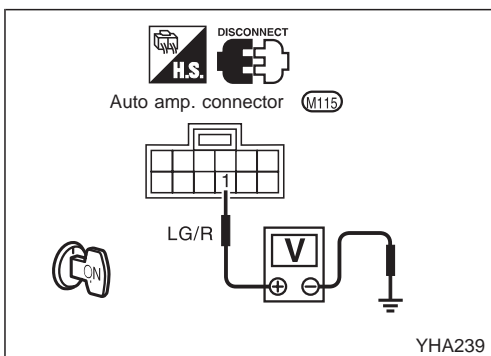
| Voltmeter terminal | | Voltage |
|--------------------|-------------|-------------|
| ⊕ | ⊖ | |
| ① | Body ground | Approx. 12V |



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

1. Disconnect A/C control panel harness connector.
2. Connect ohmmeter from harness side.
3. Check for continuity between terminal No. ②, ⑧, ⑭, ⑳ and body ground.

| Ohmmeter terminal | | Continuity |
|-------------------|-------------|------------|
| ⊕ | ⊖ | |
| ② | Body ground | Yes |
| ⑧ | | |
| ⑭ | | |
| ⑳ | | |



AUTO AMP. CHECK

Check power supply circuit for auto amp. with ignition switch ON.

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

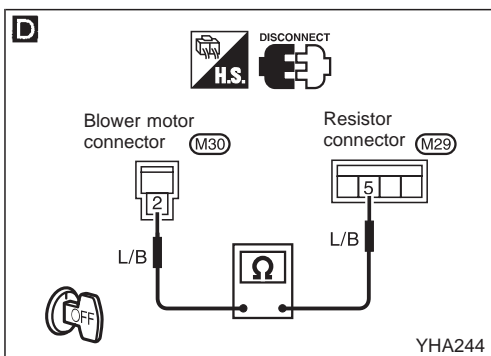
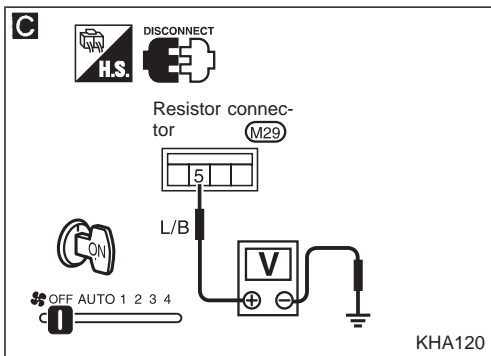
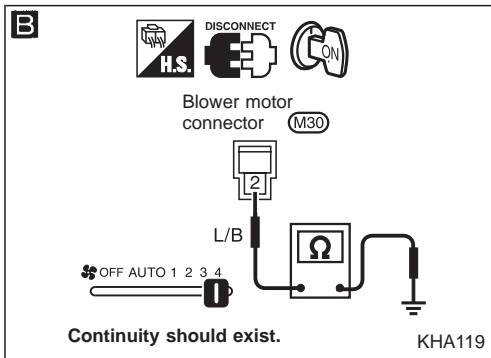
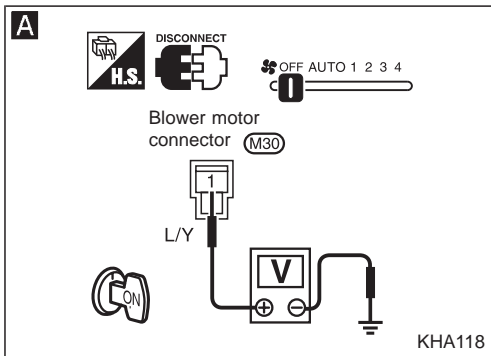
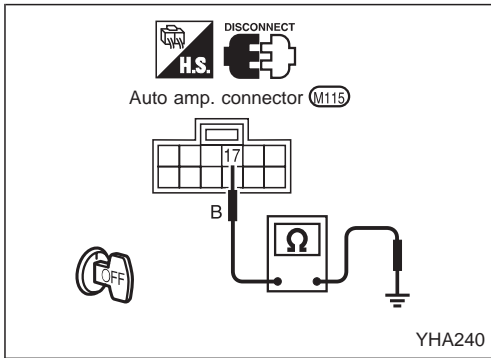
| Voltmeter terminal | | Voltage |
|--------------------|-------------|-------------|
| ⊕ | ⊖ | |
| ① | Body ground | Approx. 12V |

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

Check body ground circuit for auto amp. with ignition switch OFF.

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

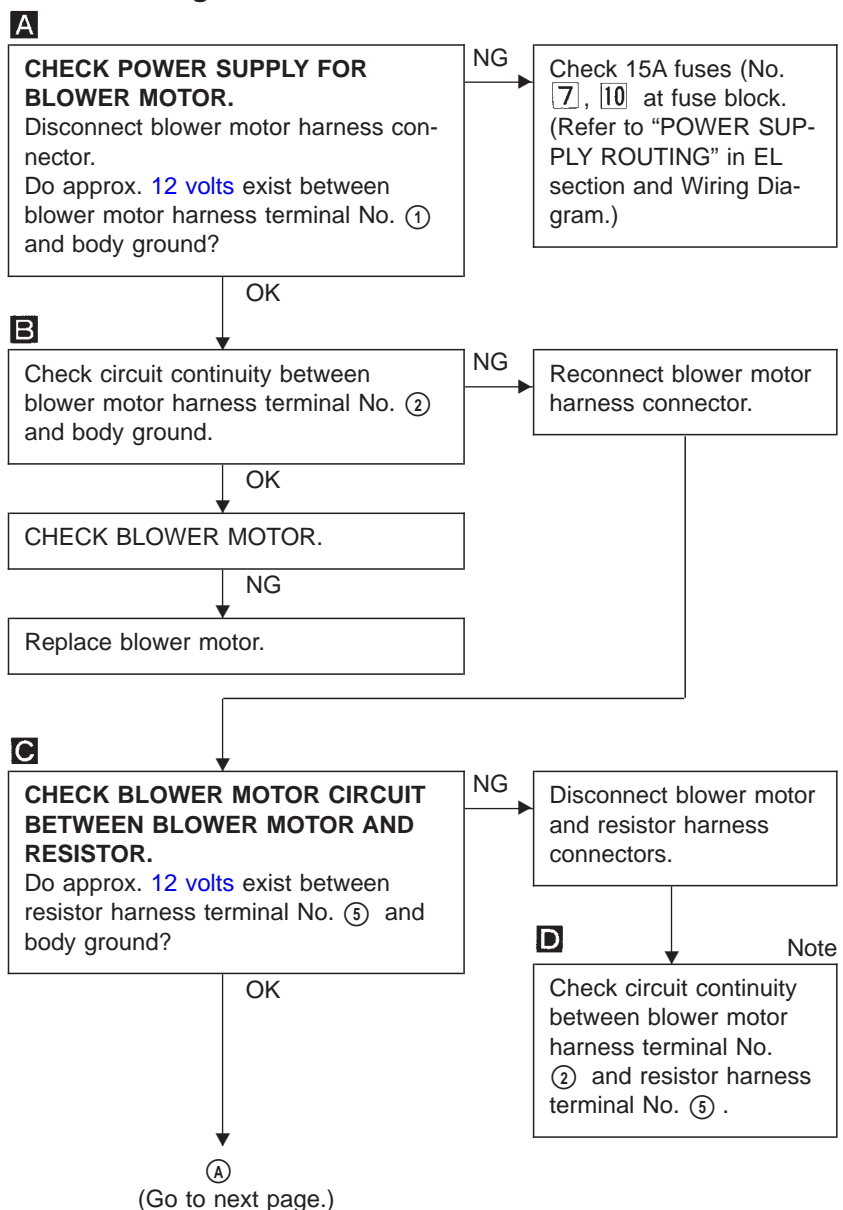
| Ohmmeter terminal | | Continuity |
|-------------------|-------------|------------|
| ⊕ | ⊖ | |
| ⑰ | Body ground | Yes |



Diagnostic Procedure 1

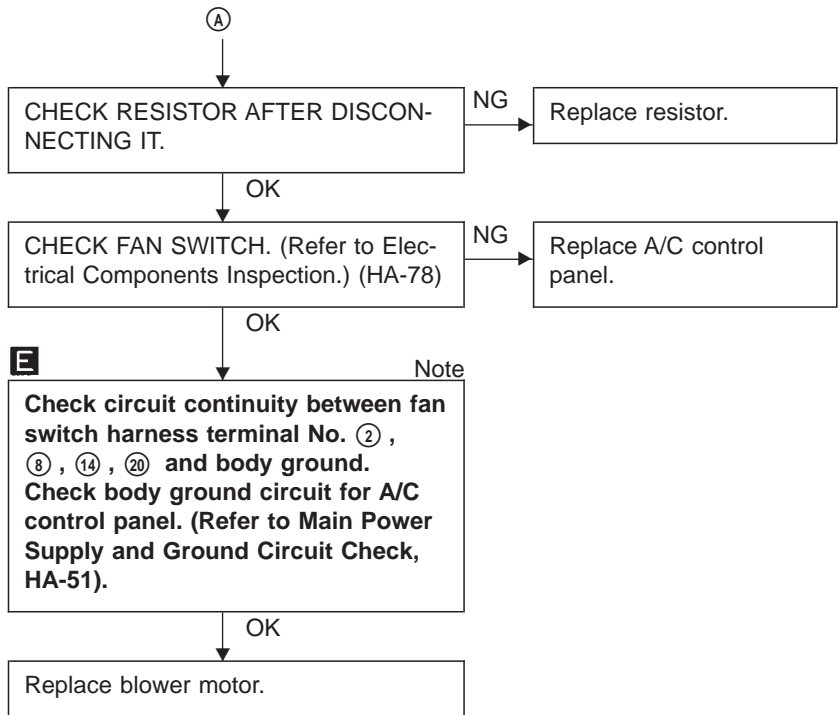
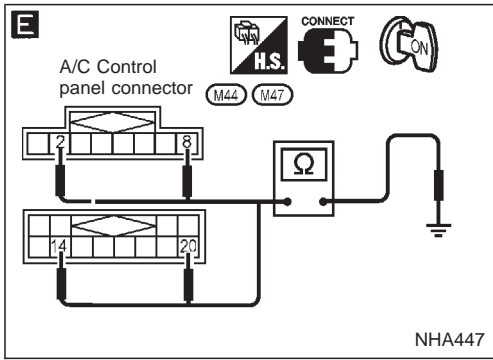
SYMPTOM: Blower motor does not rotate at all. (Fan switch "AUTO", "1", "2", "3", "4")

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



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

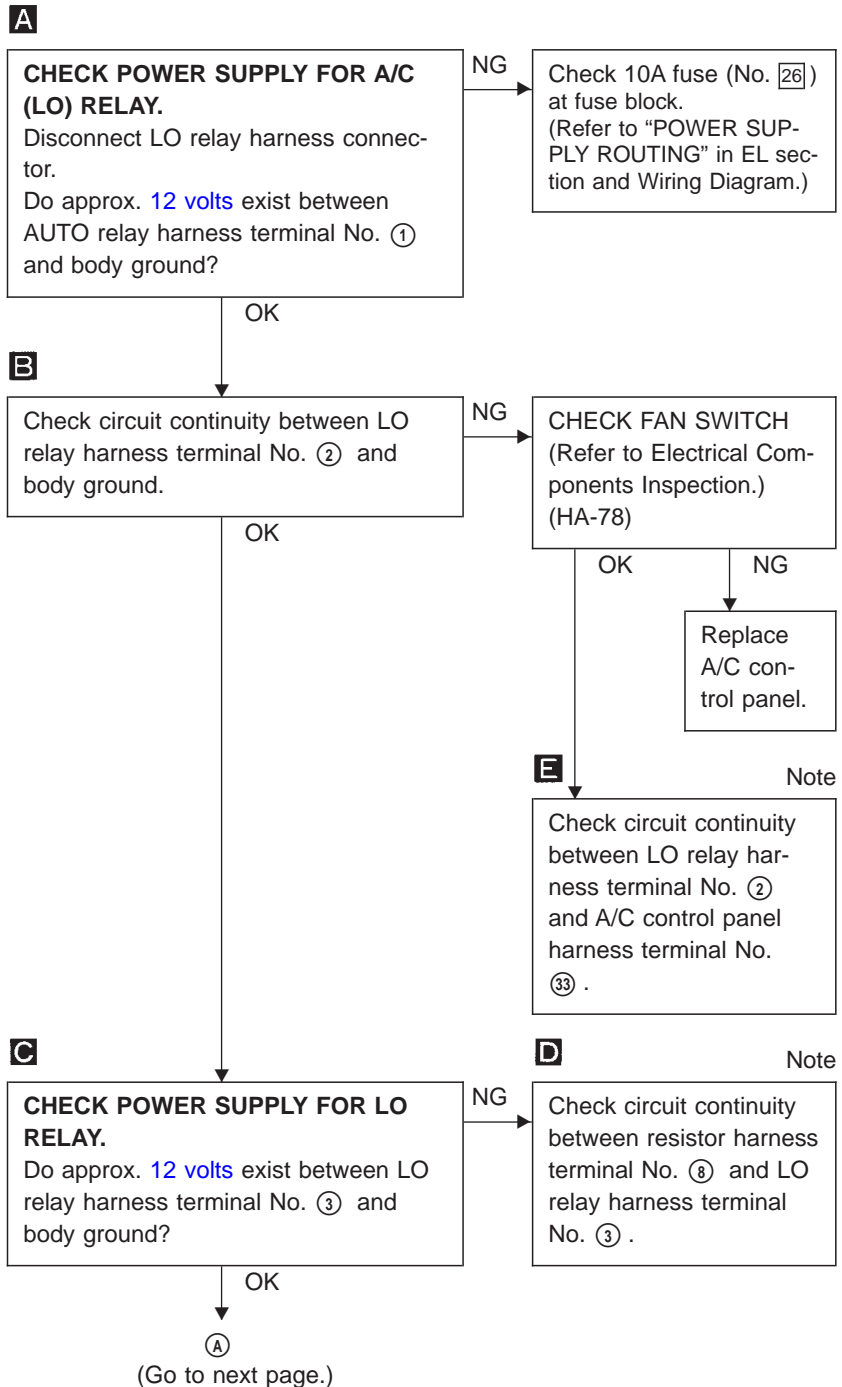
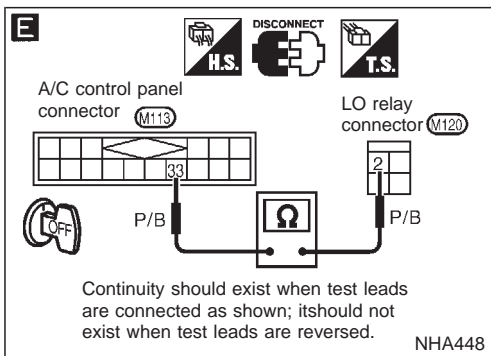
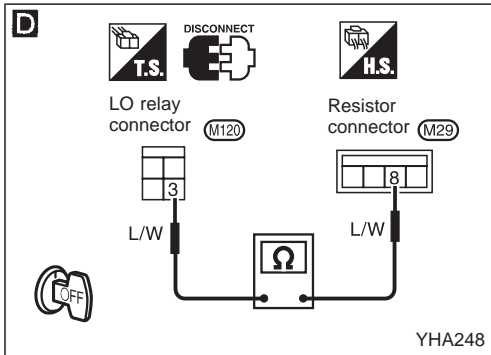
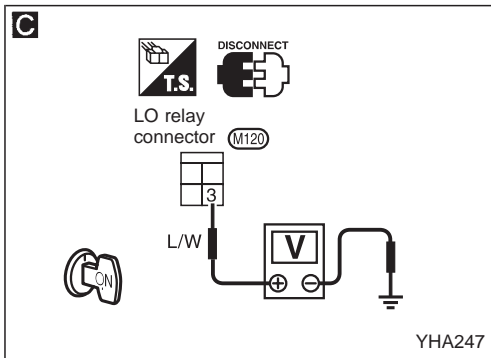
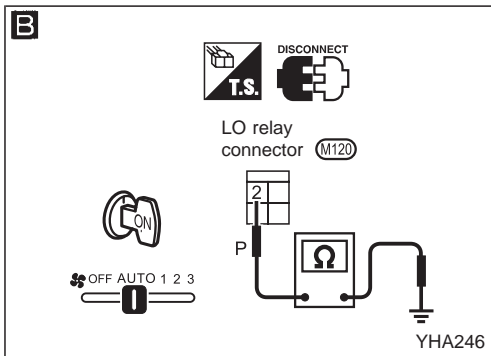
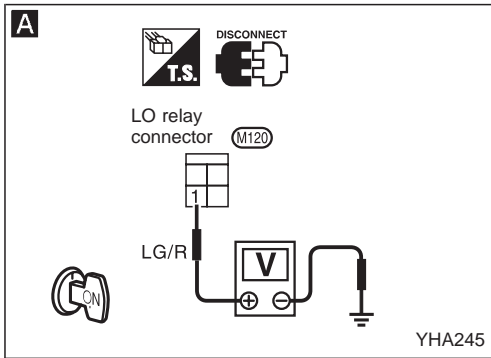
Diagnostic Procedure 1 (Cont'd)



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

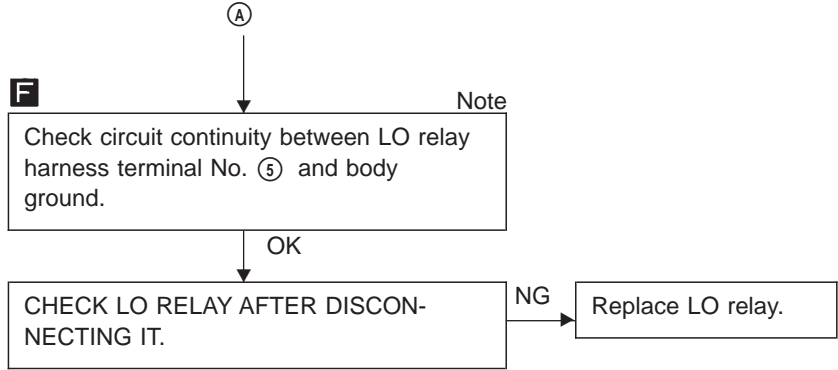
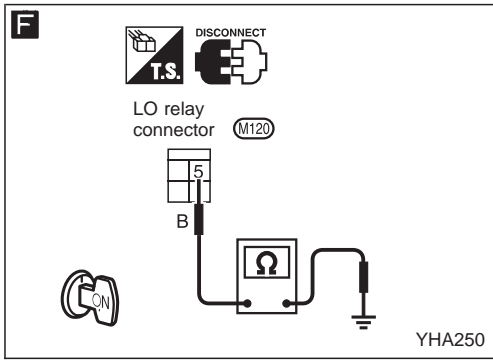
Diagnostic Procedure 2: Models with relay type 1

SYMPTOM: Blower motor does not rotate at all when the fan speed is in AUTO. (It operates in 1, 2, 3, or 4-speed only.)



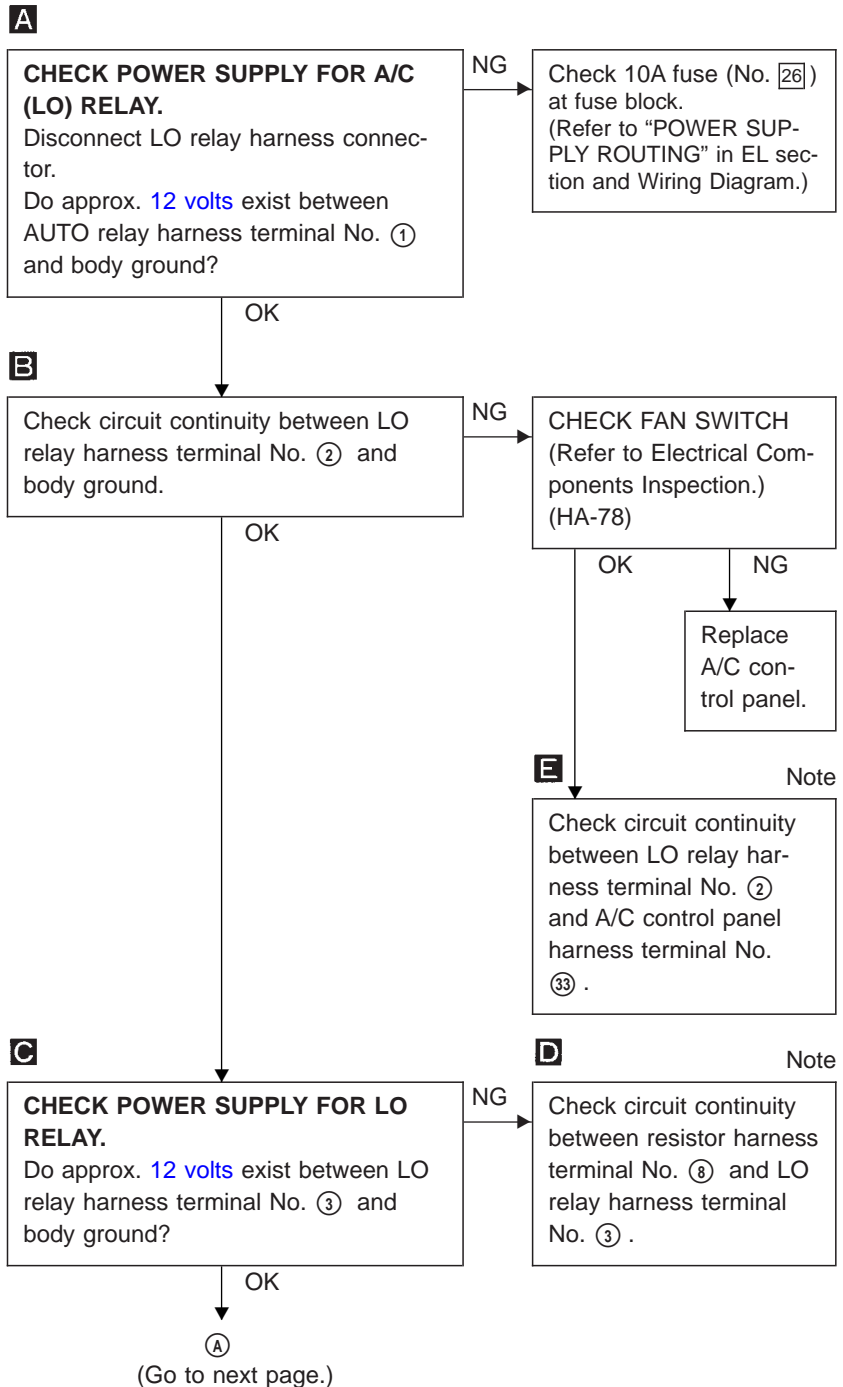
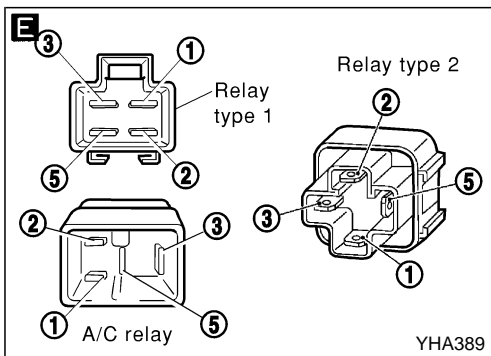
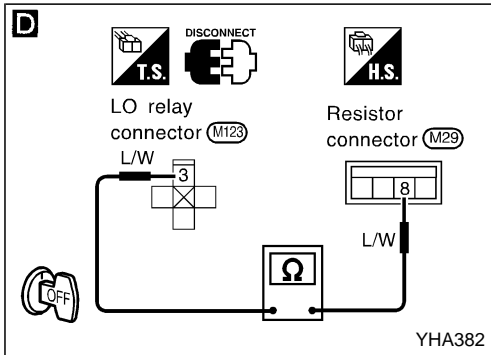
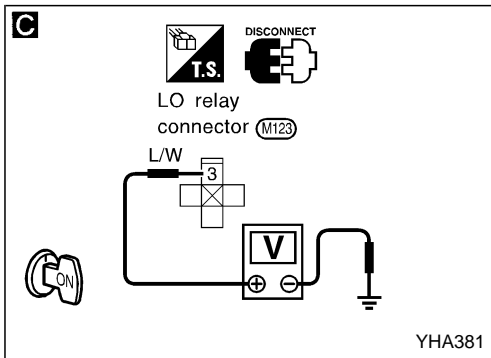
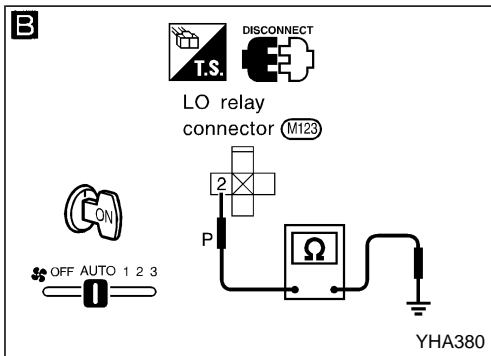
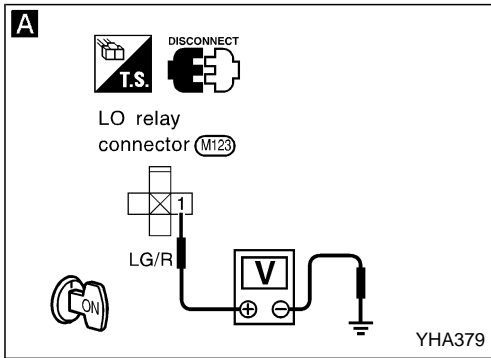
Note: If the result is NG or No after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 2: Models with relay type 1 (Cont'd)



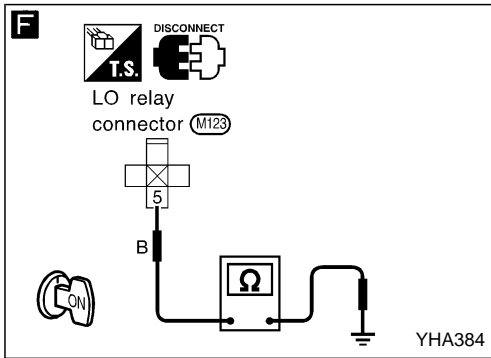
Diagnostic Procedure 2: Models with relay type 2

SYMPTOM: Blower motor does not rotate at all when the fan speed is in AUTO. (It operates in 1, 2, 3, or 4-speed only.)



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

Diagnostic Procedure 2: Models with relay type 2 (Cont'd)



F Note

Check circuit continuity between LO relay harness terminal No. ⑤ and body ground.

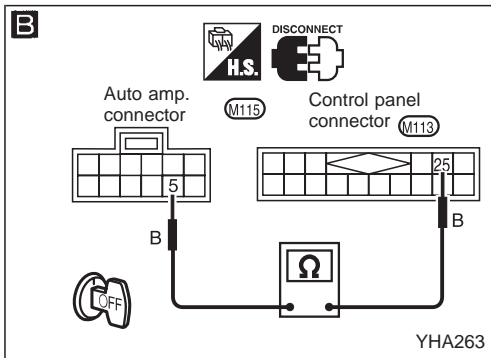
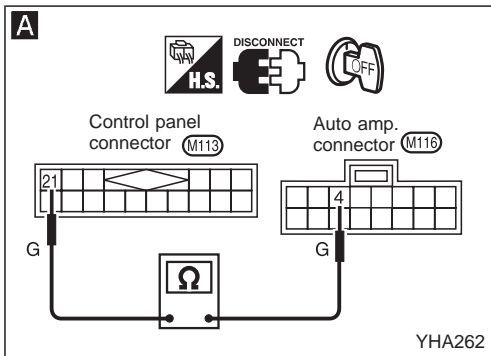
OK

CHECK LO RELAY AFTER DISCONNECTING IT.

NG → Replace LO relay.

Diagnostic Procedure 3: Models with relay type 1

SYMPTOM: Blower motor fan speed does not change when fan speed is in AUTO. (Fan speed is fixed in HIGH or MED.)



A Note

CHECK AUTO AMP. AND PTC. Connect checking resistor. (Refer to HA-51.) Does blower motor fan speed change when you move PTC from 18°C (64°F) to 32°C (90°F)?

C/R *1

NG → CHECK PTC CIRCUIT BETWEEN CONTROL PANEL AND AUTO AMP. Disconnect control panel and auto amp. harness connectors. Check circuit continuity between control panel harness terminal No. ⑳ and auto amp. harness terminal No. ④.

OK

B Note

Check circuit continuity between control panel harness terminal No. ⑳ and auto amp. harness terminal No. ④.

OK

CHECK A/C CONTROL PANEL. (Refer to HA-51.)

NG → Replace A/C Control panel.

OK → Reconnect control panel harness connector.

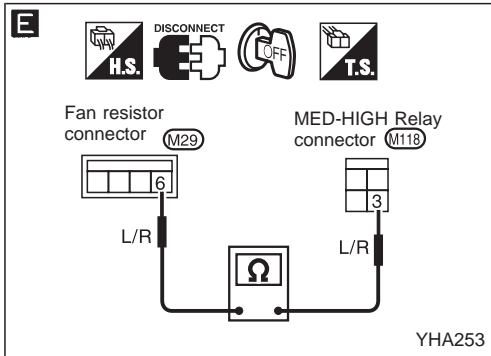
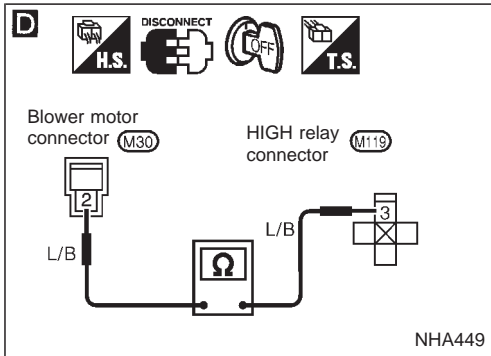
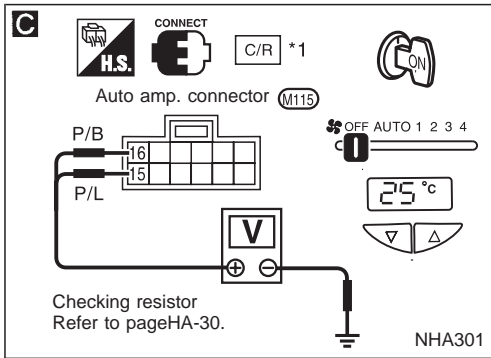
CHECK SENSOR CIRCUIT.

| | How to repair |
|---------------------------|--------------------------------|
| Ambient sensor circuit | Go to Diagnostic Procedure 11. |
| In-vehicle sensor circuit | Go to Diagnostic Procedure 12. |

OK → (Go to next page.)

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

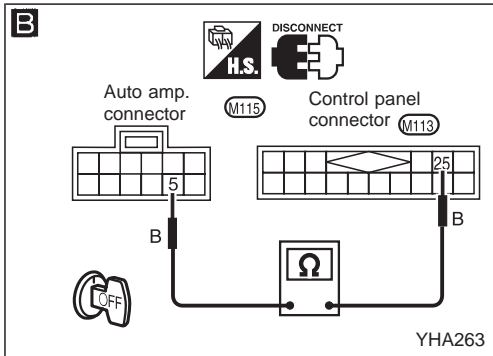
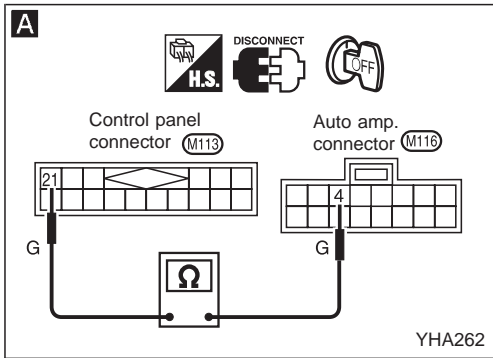
Diagnostic Procedure 3: Models with relay type 1 (Cont'd)



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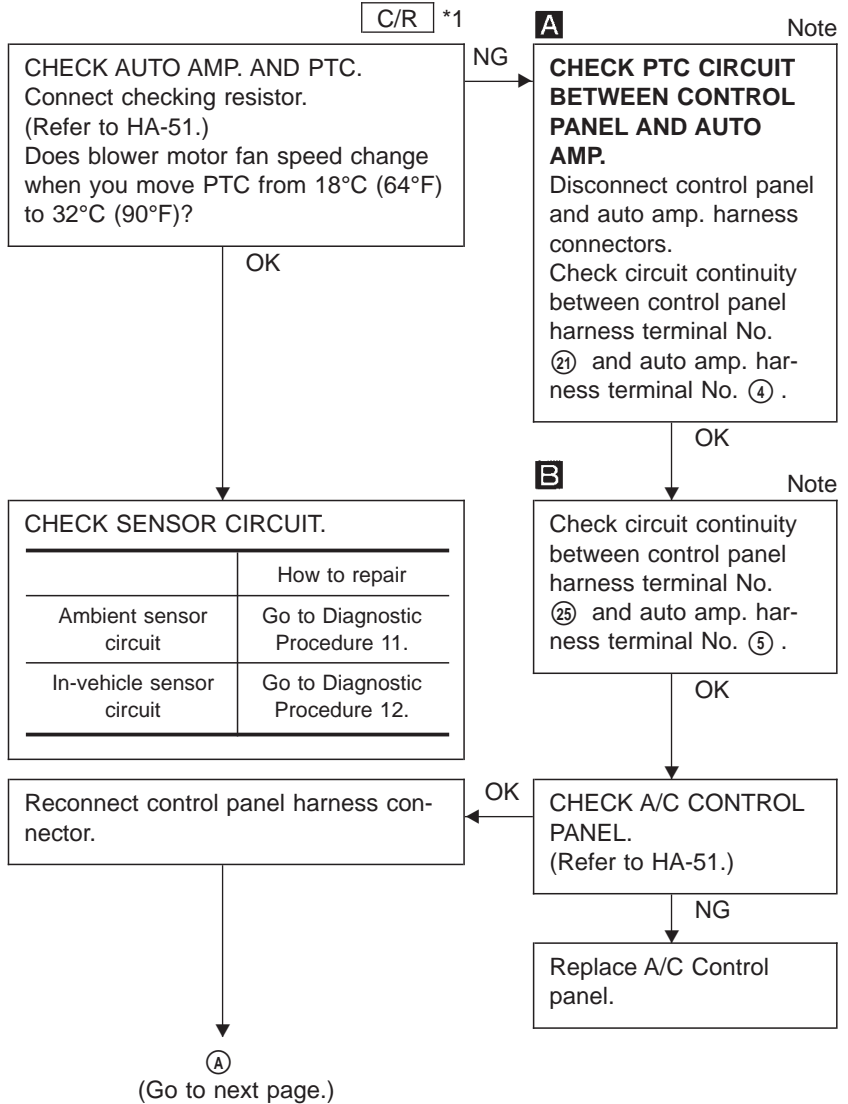
    graph TD
        A((A)) --> C[CHECK AUTO AMP.  
Connect checking resistor.  
(Refer to HA-30.)  
Do approx. 12 volts exist between auto amp. harness terminal No. 15, 16 and body ground?]
        C -- NG --> NG1[Replace auto amp.]
        C -- OK --> D[CHECK HIGH OR MED-HIGH, MED-LOW RELAY AFTER DISCONNECTING IT. (Refer to HA-78.)]
        D -- NG --> NG2[Replace HIGH relay or MED-HIGH, MED-LOW relay.]
        D -- OK --> D1[Does continuity exist between blower motor harness terminal No. 2 and HIGH relay terminal No. 3?]
        D1 -- Note --> D1
        D1 -- Yes --> D2[Does continuity exist between resistor harness terminal No. 6 and MED-HIGH relay harness terminal No. 3?]
        D2 -- Note --> D2
        D2 -- Yes --> NG3[Replace auto amp.]
    
```

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



Diagnostic Procedure 3: Models with relay type 2

SYMPTOM: Blower motor fan speed does not change when fan speed is in AUTO. (Fan speed is fixed in HIGH or MED.)



A Note

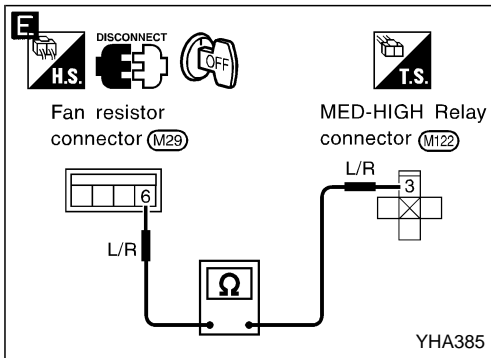
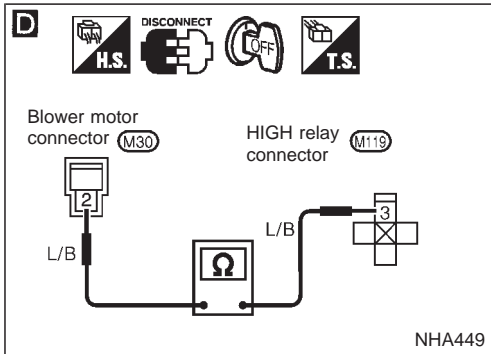
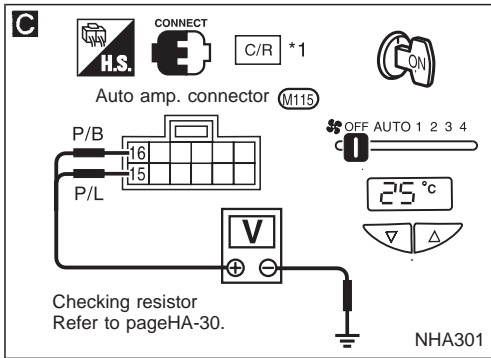
CHECK PTC CIRCUIT BETWEEN CONTROL PANEL AND AUTO AMP.
Disconnect control panel and auto amp. harness connectors.
Check circuit continuity between control panel harness terminal No. ⑳ and auto amp. harness terminal No. ④.

B Note

Check circuit continuity between control panel harness terminal No. ㉑ and auto amp. harness terminal No. ⑤.

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

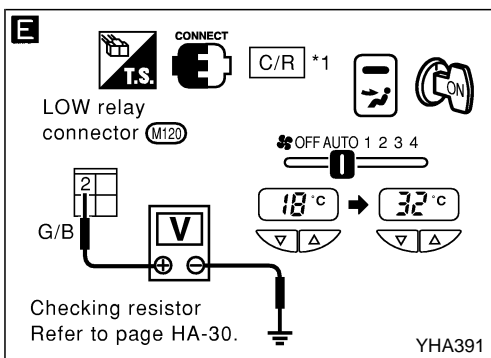
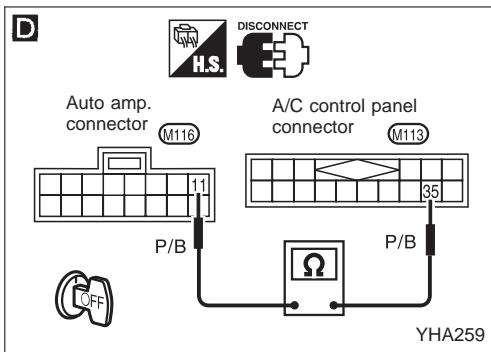
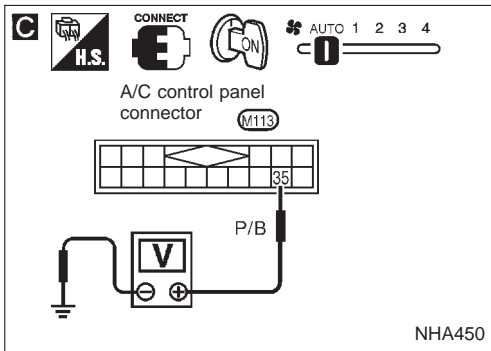
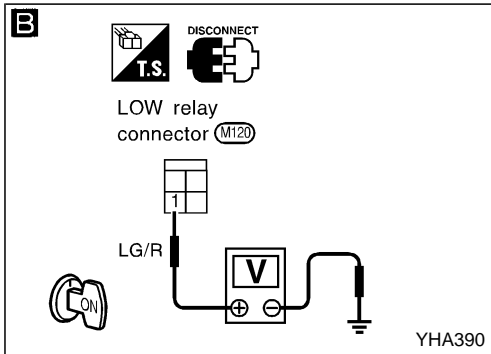
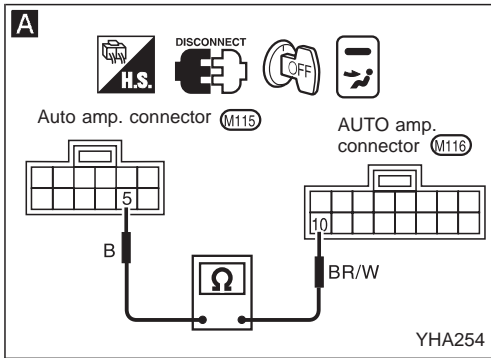
Diagnostic Procedure 3: Models with relay type 2 (Cont'd)



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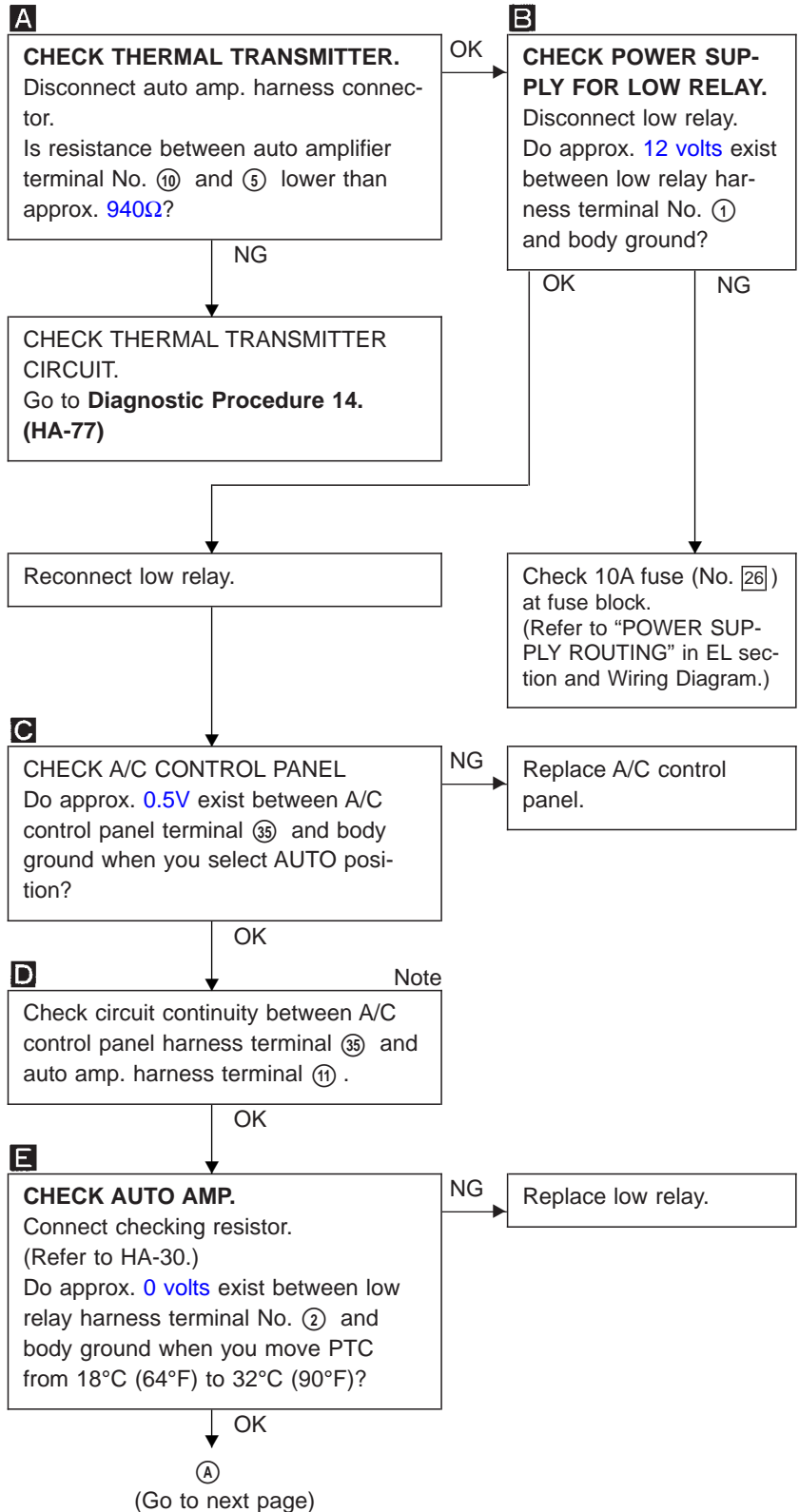
    graph TD
        A((A)) --> C[C CHECK AUTO AMP.  
Connect checking resistor.  
(Refer to HA-30.)  
Do approx. 12 volts exist between auto amp. harness terminal No. ⑮, ⑯ and body ground?]
        C -- NG --> NG1[Replace auto amp.]
        C -- OK --> D[D CHECK HIGH OR MED-HIGH, MED-LOW RELAY AFTER DISCONNECTING IT. (Refer to HA-78.)]
        D -- NG --> NG2[Replace HIGH relay or MED-HIGH, MED-LOW relay.]
        D -- OK --> D1[D Note  
Does continuity exist between blower motor harness terminal No. ② and HIGH relay terminal No. ③ ?]
        D1 -- Yes --> D2[E Note  
Does continuity exist between resistor harness terminal No. ⑥ and MED-HIGH relay harness terminal No. ③ ?]
        D2 -- Yes --> NG3[Replace auto amp.]
    
```

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



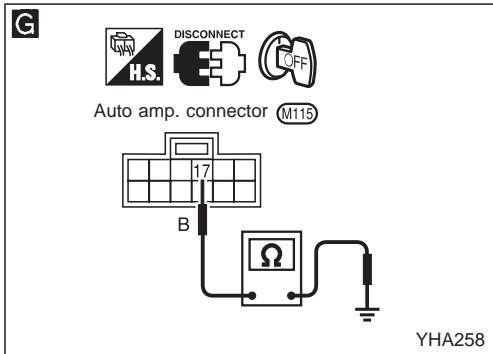
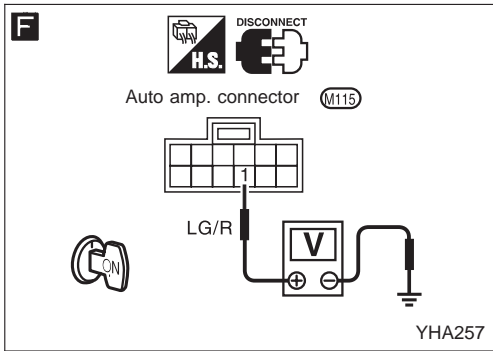
Diagnostic Procedure 4: Models with relay type 1

SYMPTOM: Blower motor fan speed does not change when fan speed is in AUTO. (Fan speed is fixed in LOW.)



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

Diagnostic Procedure 4: Models with relay type 1 (Cont'd)



F

CHECK POWER SUPPLY FOR AUTO AMP.
 Disconnect auto amp. harness connector.
 Do approx. 12 volts exist between auto amp. harness terminal No. ① and body ground?

NG → Check 10A fuse (No. 26) at fuse block. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

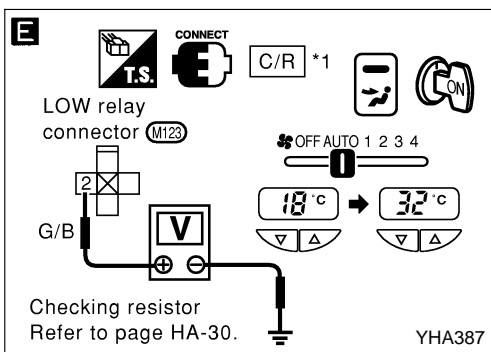
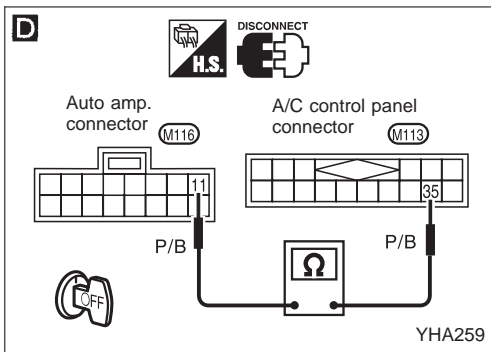
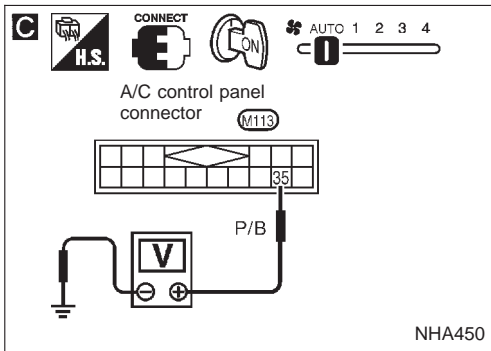
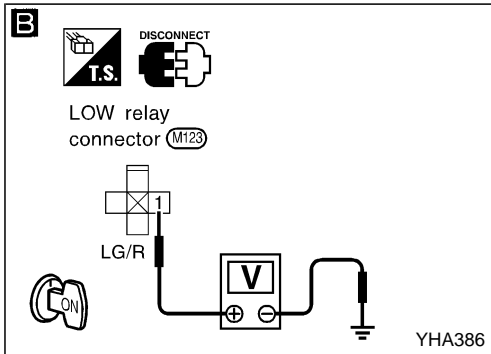
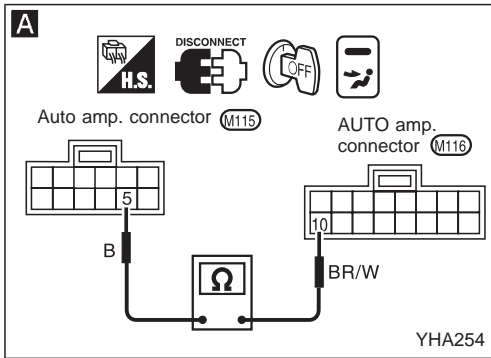
G

CHECK BODY GROUND CIRCUIT FOR AUTO AMP.
 Does continuity exist between auto amp. harness terminal No. ⑰ and body ground?

Note

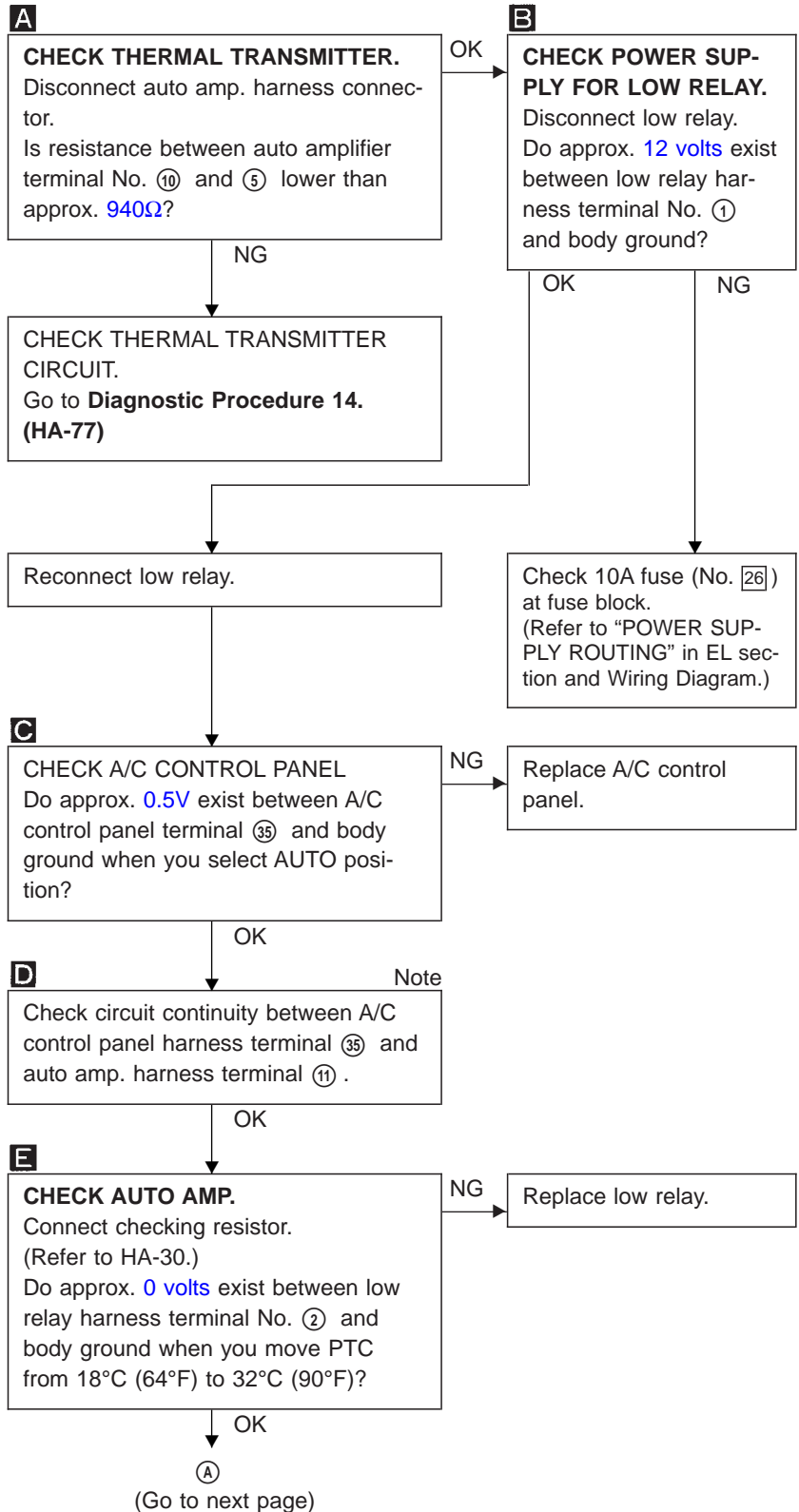
Replace auto amp.

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



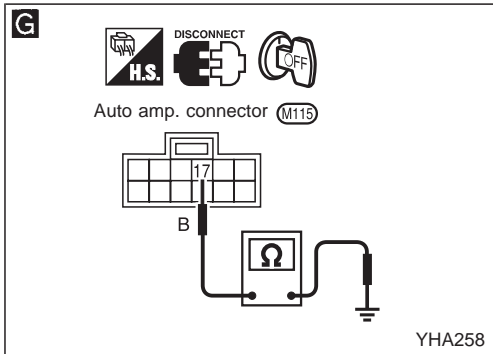
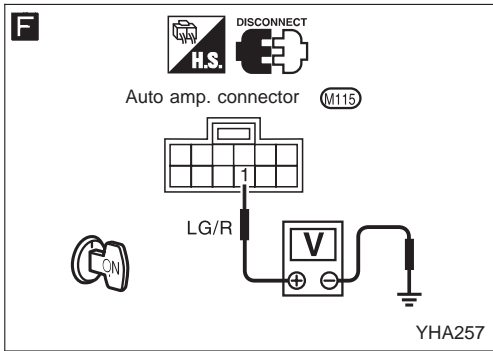
Diagnostic Procedure 4: Models with relay type 2

SYMPTOM: Blower motor fan speed does not change when fan speed is in AUTO. (Fan speed is fixed in LOW.)



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

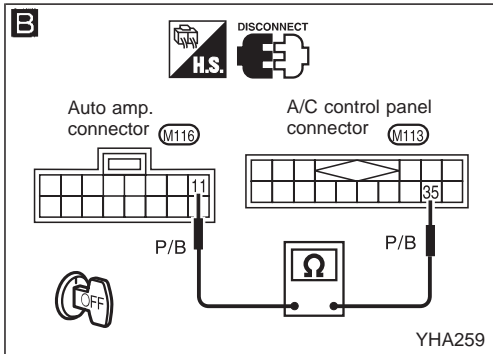
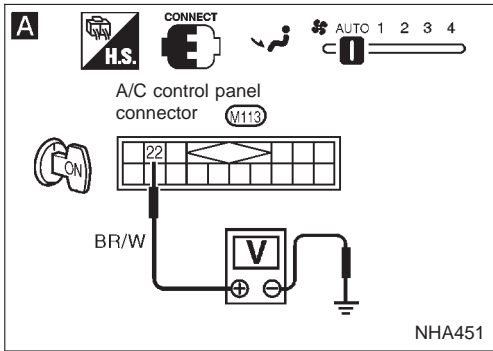
Diagnostic Procedure 4: Models with relay type 2 (Cont'd)



```

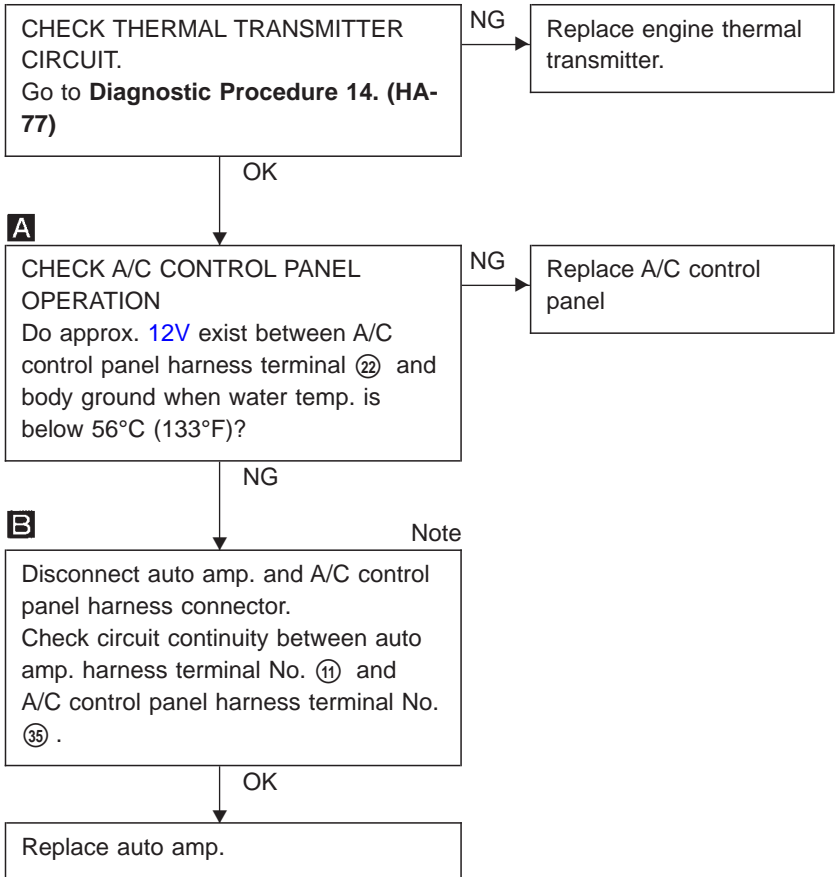
    graph TD
        A((A)) --> F
        subgraph F [F]
            F1[CHECK POWER SUPPLY FOR AUTO AMP.  
Disconnect auto amp. harness connector.  
Do approx. 12 volts exist between auto amp. harness terminal No. ① and body ground?]
        end
        F1 -- NG --> NG_Box[Check 10A fuse (No. 26) at fuse block.  
(Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)]
        F1 -- OK --> G
        subgraph G [G]
            G1[CHECK BODY GROUND CIRCUIT FOR AUTO AMP.  
Does continuity exist between auto amp. harness terminal No. ⑰ and body ground?]
        end
        G1 -- OK --> Replace[Replace auto amp.]
    
```

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

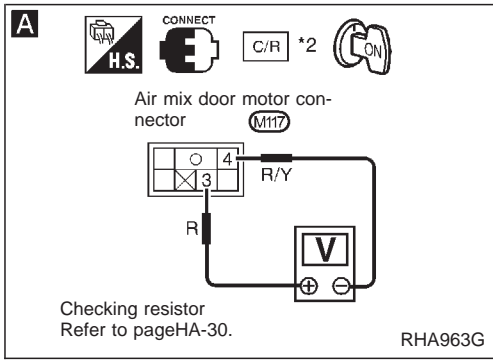


Diagnostic Procedure 5

SYMPTOM: Starting fan speed control does not operate.



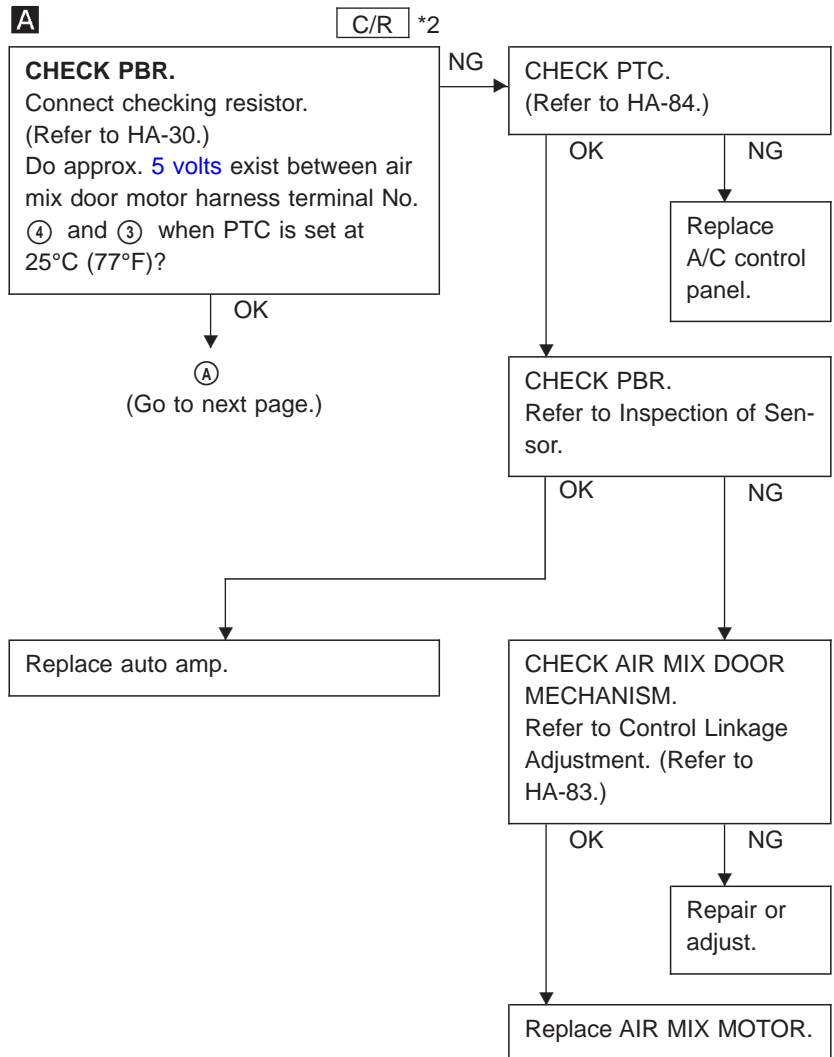
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.



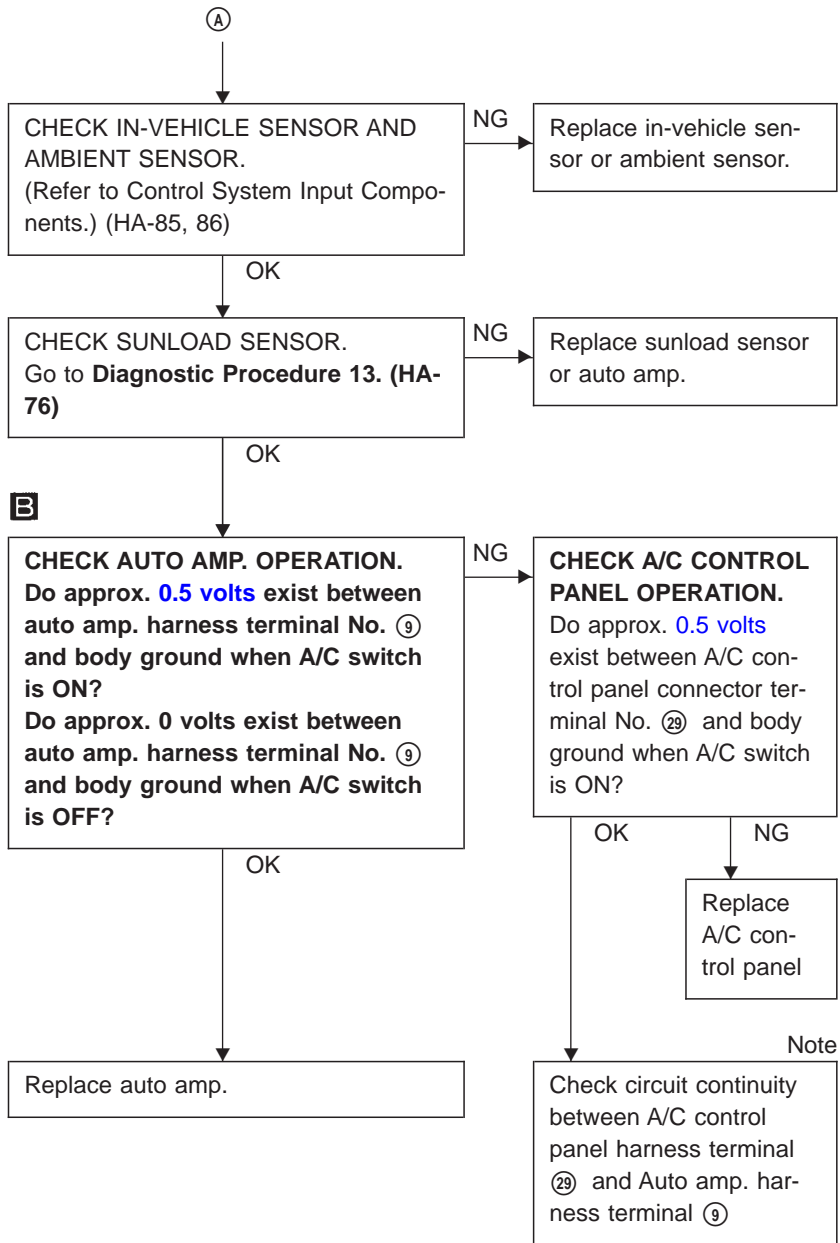
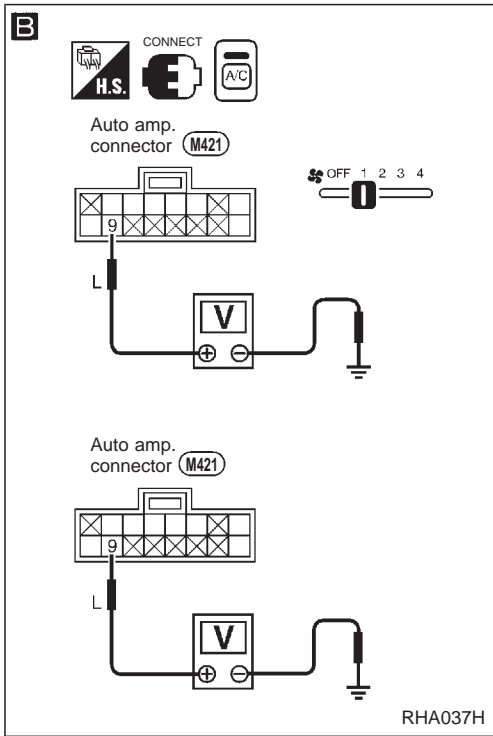
Diagnostic Procedure 6

SYMPTOM: There is too much difference between setting temp. on PTC and in-vehicle temperature.

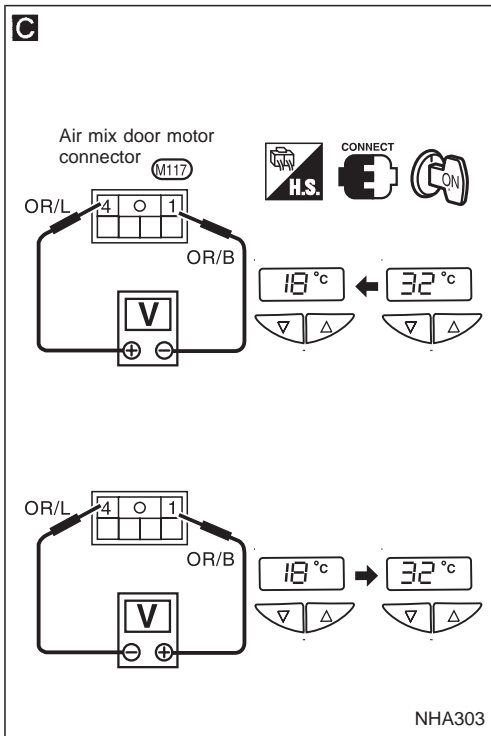
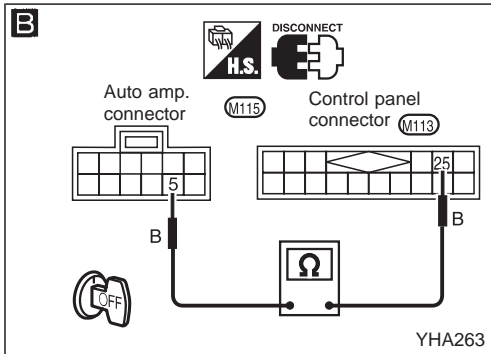
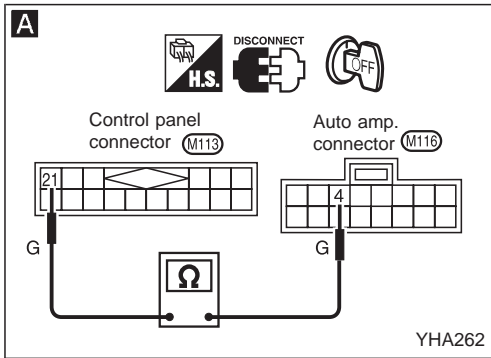
- Perform PRELIMINARY CHECK 2 before referring to the following flow chart.



Diagnostic Procedure 6 (Cont'd)



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



Diagnostic Procedure 7

SYMPTOM: Air mix door motor does not operate normally.

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

C/R *2

CHECK AUTO AMP. AND PTC.
Connect checking resistor.
(Refer to page HA-30.)
Does air outlet temperature change when you move PTC from 20°C (68°F) to 30°C (86°F)?

NG

CHECK PTC CIRCUIT BETWEEN PTC AND AUTO AMP.
Disconnect control panel and auto amp. harness connectors.
Check circuit continuity between control panel harness terminal No. ⑳ and auto amp. harness terminal No. ④.

OK

CHECK SENSOR CIRCUIT.

| | How to repair |
|---------------------------|--------------------------------|
| Ambient sensor circuit | Go to Diagnostic Procedure 11. |
| In-vehicle sensor circuit | Go to Diagnostic Procedure 12. |

OK

CHECK PTC.
(Refer to HA-84.)

NG

Replace A/C control panel.

OK

CHECK FOR OUTPUT OF AUTO AMP.
Connect checking resistor.
Do approx. 10.5 volts exist between air mix door motor harness terminals No. ④ and ① when you move PTC from 18°C (64°F) to 32°C (90°F) or when you move PTC from 32°C (90°F) to 18°C (64°F)?

NG

Disconnect auto amp. and air mix door motor harness connectors.

Note

Check circuit continuity between auto amp. harness terminal No. ⑫ (⑬) and air mix door motor harness terminal No. ① (④).

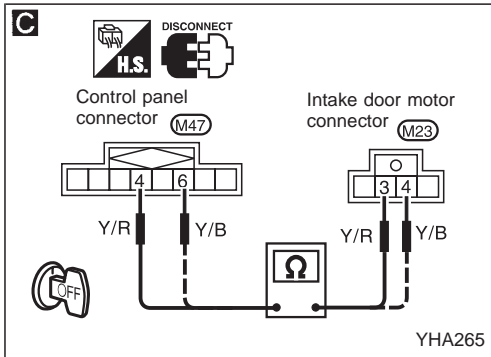
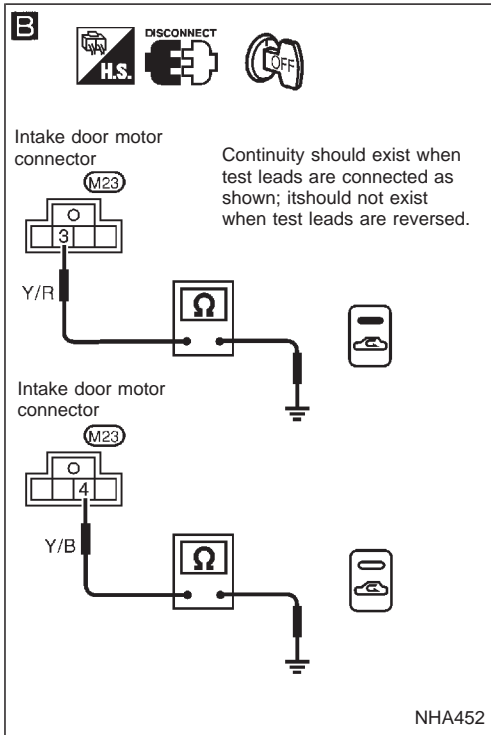
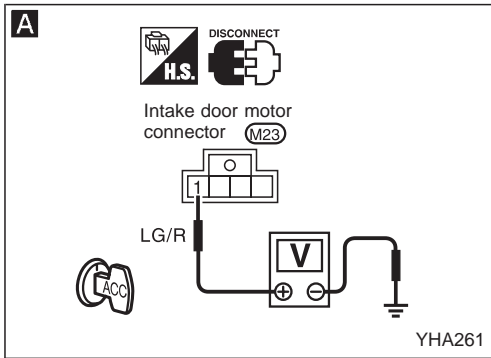
OK

Replace auto amp.

OK

Replace air mix door motor.

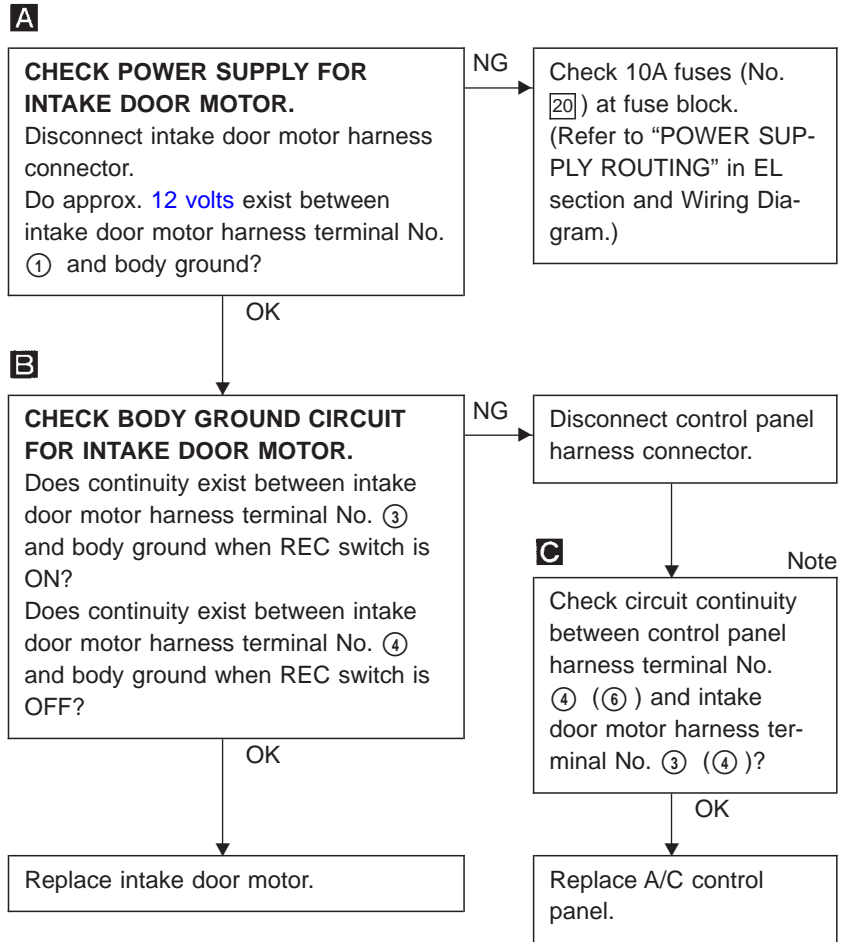
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.



Diagnostic Procedure 9

SYMPTOM: Intake door does not change.

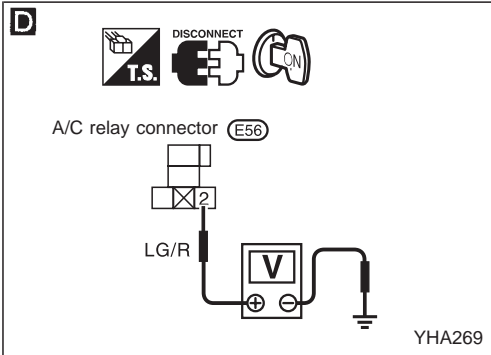
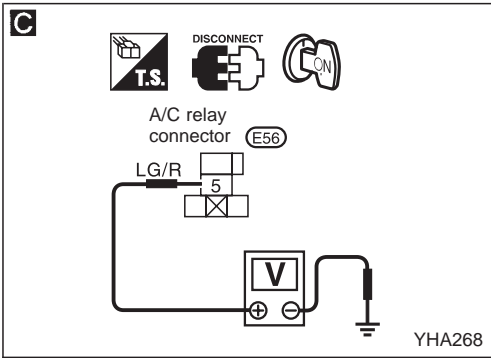
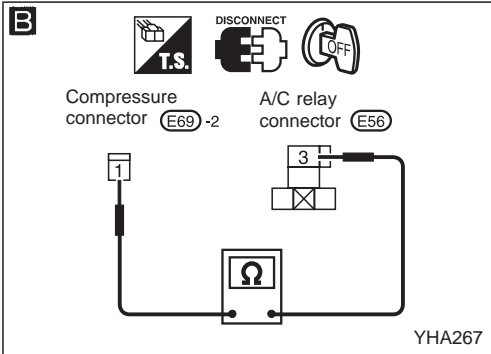
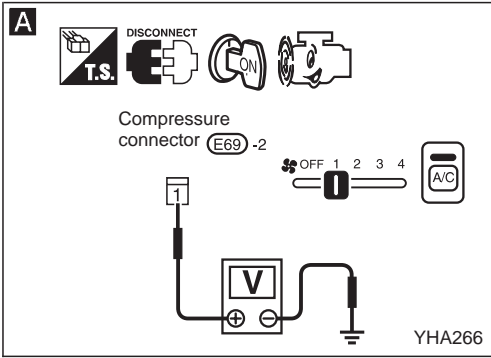
- Perform **PRELIMINARY CHECK 1** and **Main Power Supply and Ground Circuit Check** before referring to the following flow chart.



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

Diagnostic Procedure 10

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

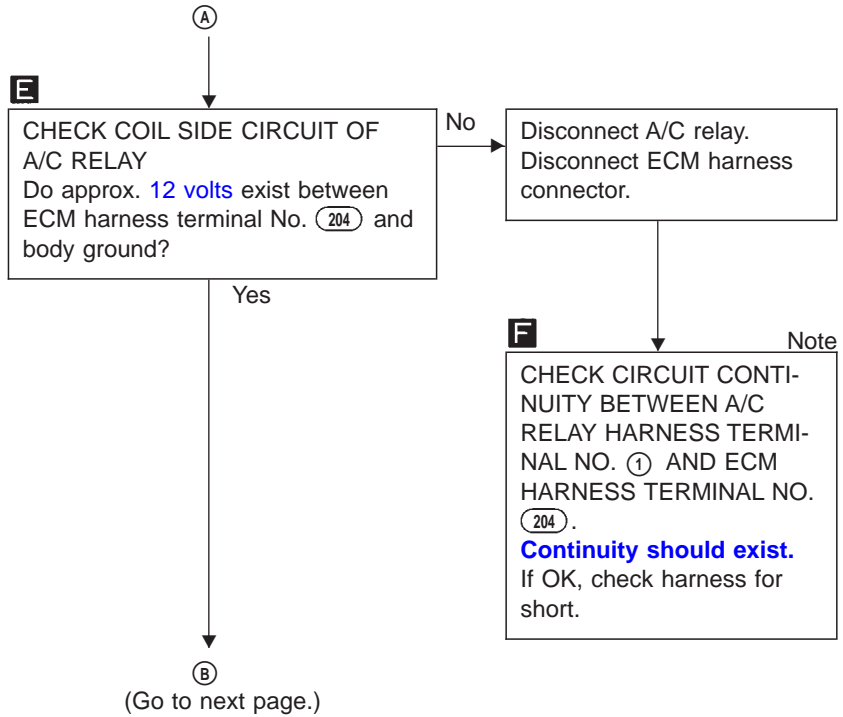
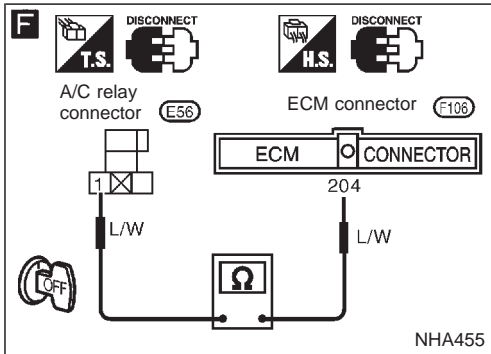
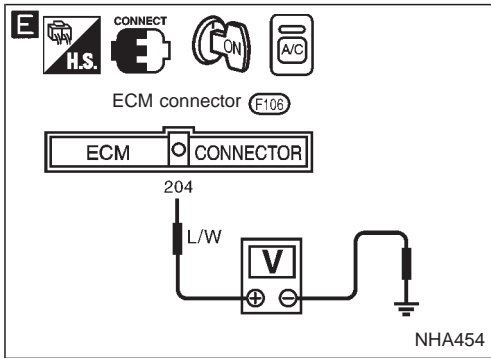


```

    graph TD
      A[A] -- Yes --> A_Yes[Check the following.  
• Magnet clutch coil]
      A -- No --> B[B]
      A_Yes -- NG --> A_Yes_NG[Replace magnet clutch.  
Refer to HA-111.]
      B -- Note --> B_Note[Check the following.  
• Thermal protector (GA,  
diesel engine)]
      B -- NG --> B_Note
      B -- OK --> C[C]
      C -- No --> C_No[Check power supply circuit  
and 10A fuse (No. 20),  
located in the fuse block).  
(Refer to "POWER SUPPLY  
ROUTING" in EL section  
and Wiring Diagram.)]
      C -- Yes --> D[D]
      D -- Yes --> D_Yes[Check power supply circuit  
and 10A fuse (No. 20),  
located in the fuse block).  
(Refer to "POWER SUPPLY  
ROUTING" in EL section  
and Wiring Diagram.)]
      D -- No --> D_No[CHECK A/C RELAY AFTER DIS-  
CONNECTING IT.  
Refer to HA-78.]
      D_No -- NG --> D_No_NG[Replace A/C relay.]
      D_No -- OK --> D_No_OK[Reconnect A/C relay.]
      D_No_OK -- For Diesel engine --> A
      D_No_OK -- For SR engine or QG engine --> C
  
```

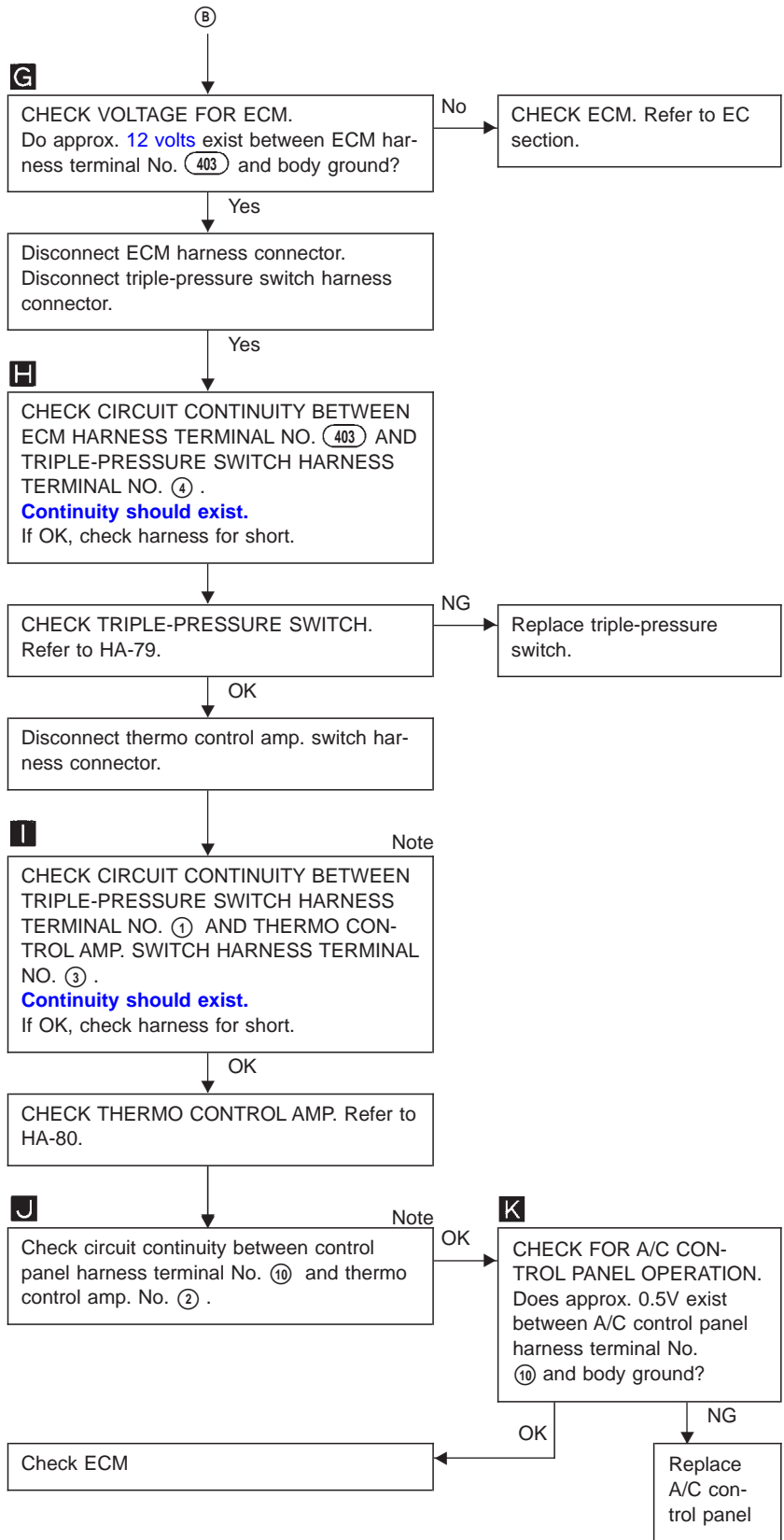
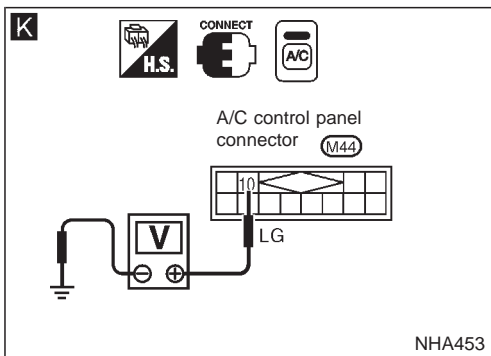
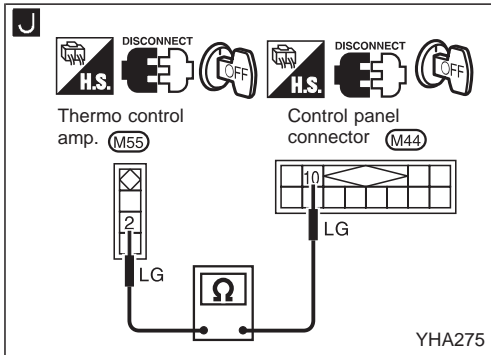
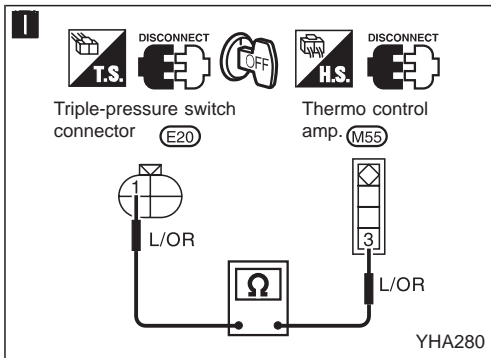
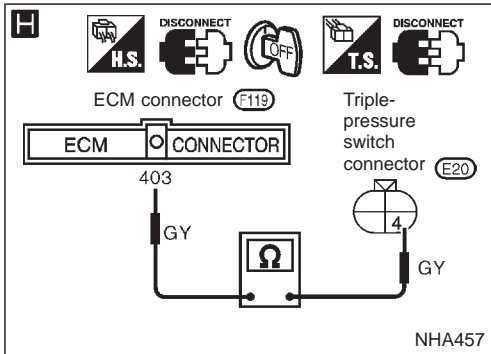
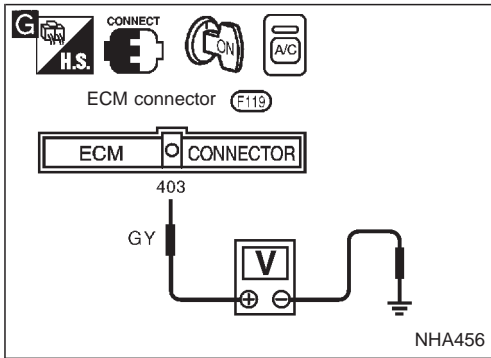
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 10 (Cont'd)



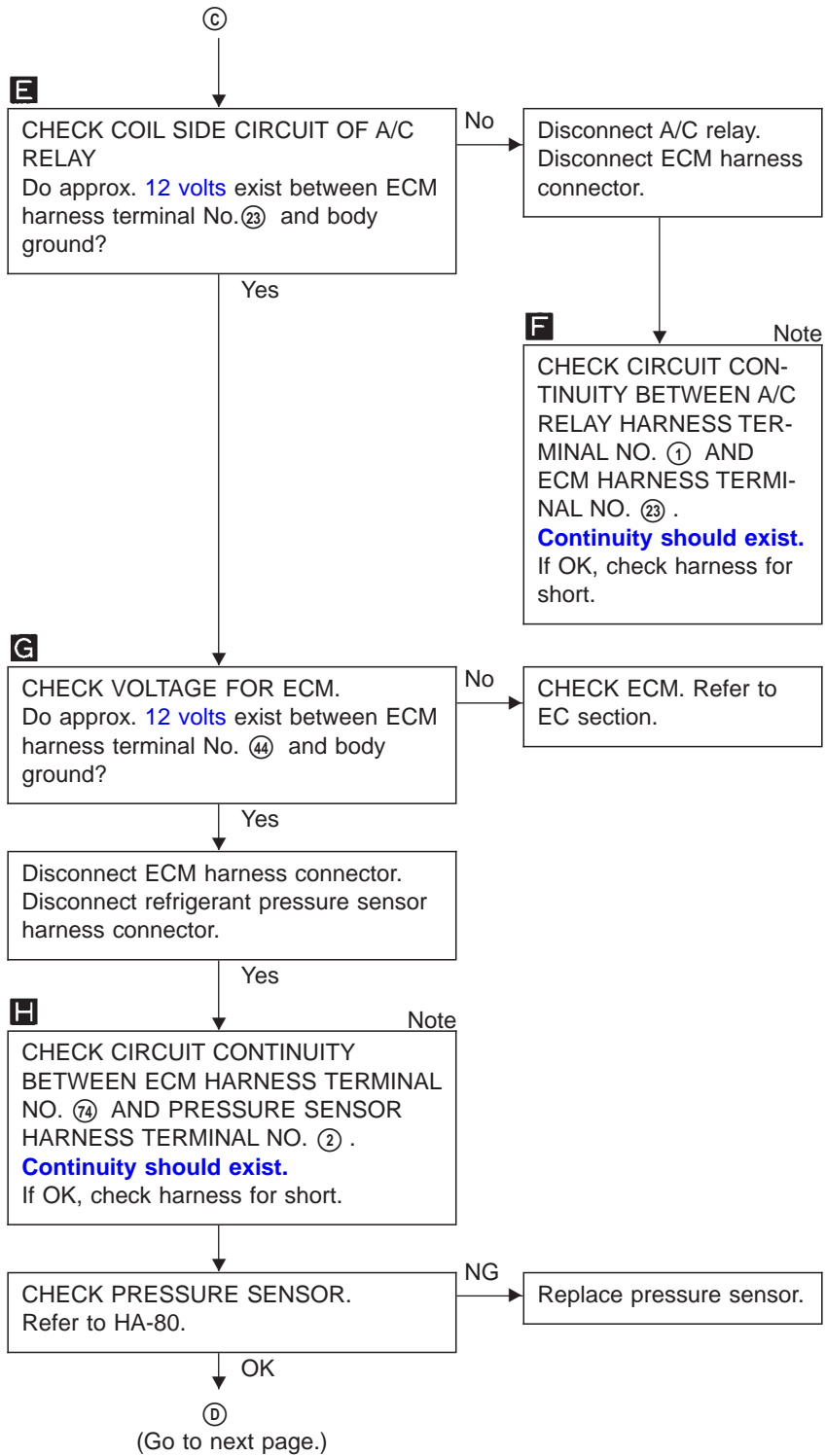
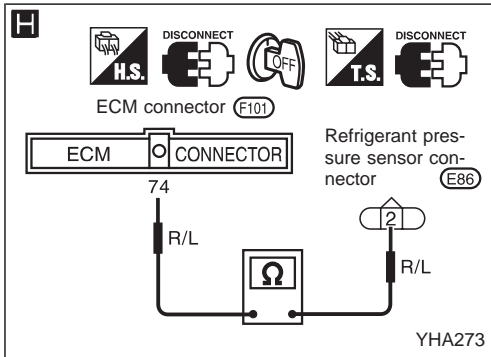
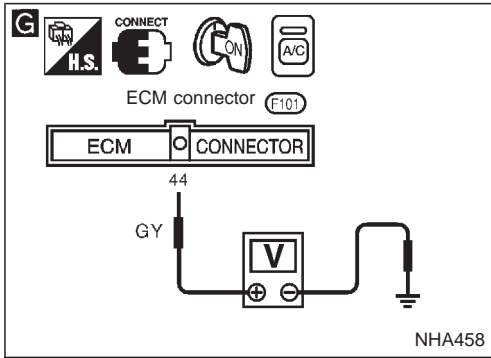
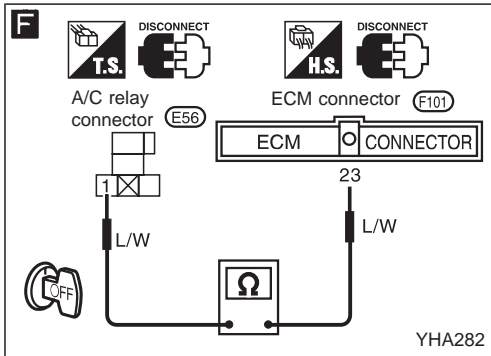
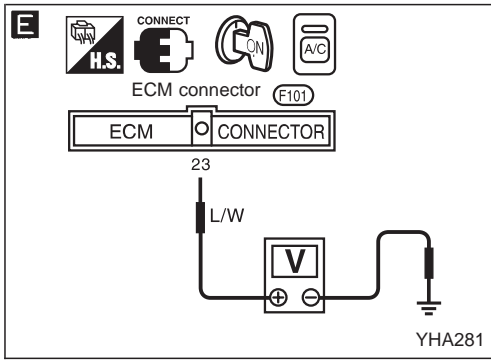
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 10 (Cont'd)

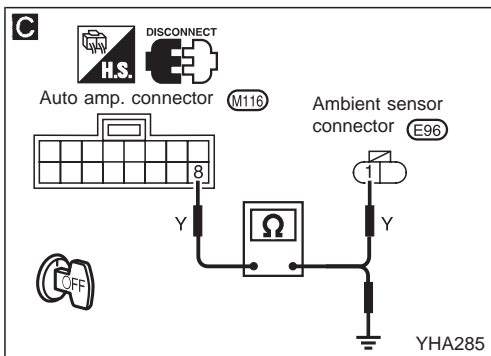
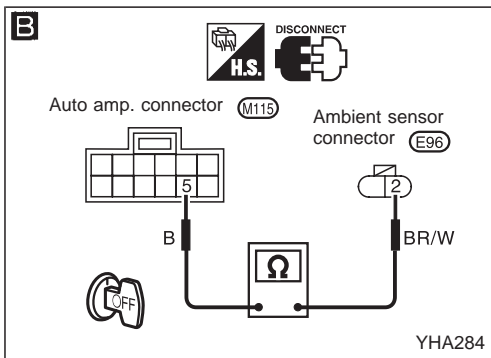
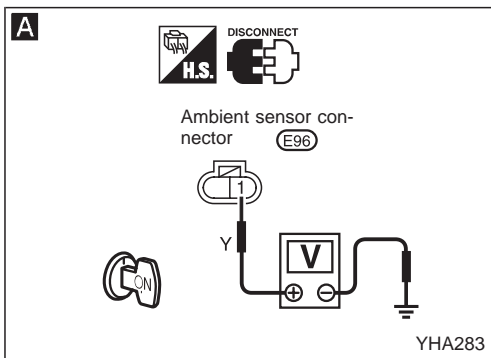
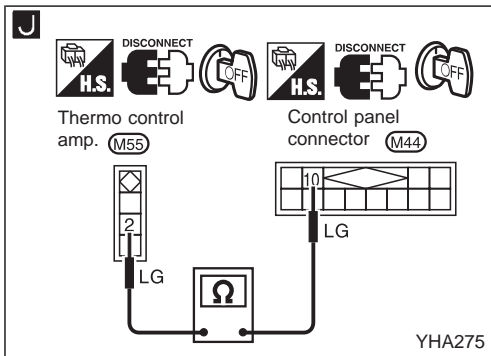
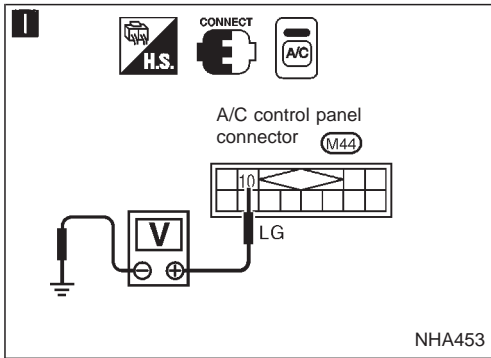


Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Diagnostic Procedure 10 (Cont'd)



Diagnostic Procedure 10 (Cont'd)



D

I CHECK FOR A/C CONTROL PANEL OPERATION.
Does approx. 0.5V exist between A/C control panel harness terminal No. ⑩ and body ground?

NG → Replace A/C control panel.

OK

J Note

Check circuit continuity between control panel harness terminal No. ⑩ and thermo control amp. No. ②.

OK

Check ECM.

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

Diagnostic Procedure 11

SYMPTOM: Ambient sensor circuit is open or shorted.

A

CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP.
Disconnect ambient sensor harness connector.
Do approx. 5 volts exist between ambient sensor harness terminal No. ① and body ground?

NG → Disconnect auto amp. harness connector.

OK

C Note

Check circuit continuity between auto amp. harness terminal No. ⑧ and ambient sensor harness terminal No. ①, and between auto amp. harness terminal No. ⑧ and body ground.

OK

Disconnect auto amp. harness connector.

Replace auto amp.

B Note

Check circuit continuity between ambient sensor harness terminal No. ② and auto amp. harness terminal No. ⑤.

OK

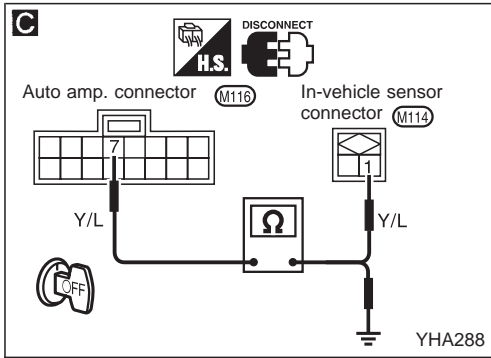
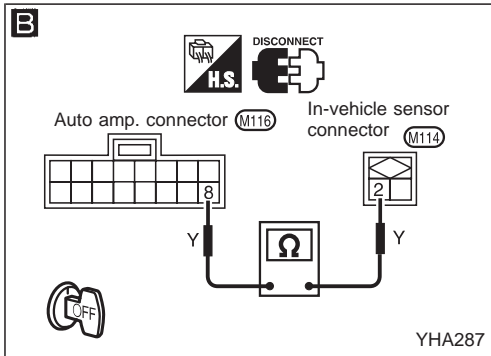
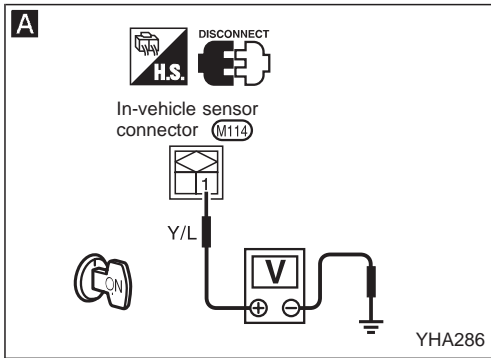
CHECK AMBIENT SENSOR.
(Refer to HA-86.)

NG → Replace ambient sensor.

OK

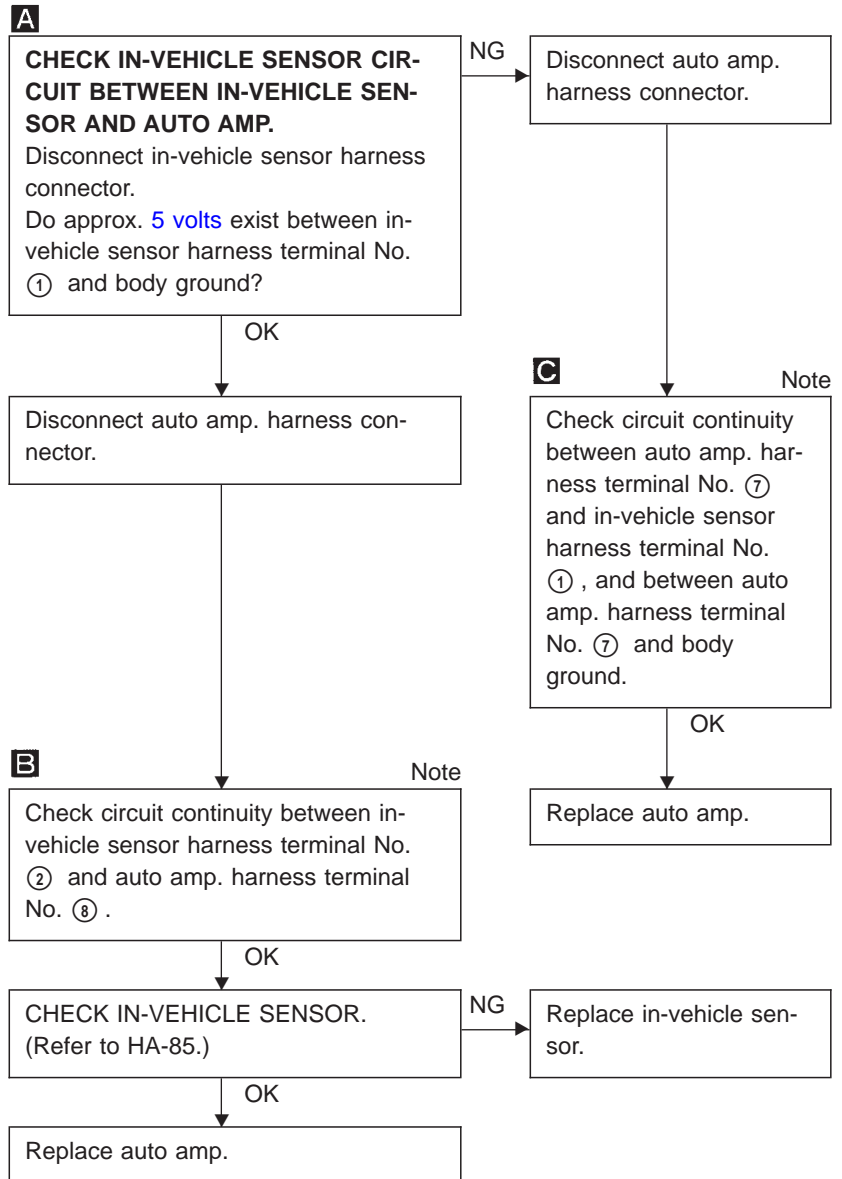
Replace auto amp.

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



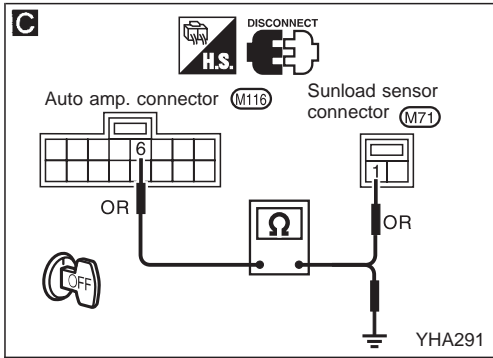
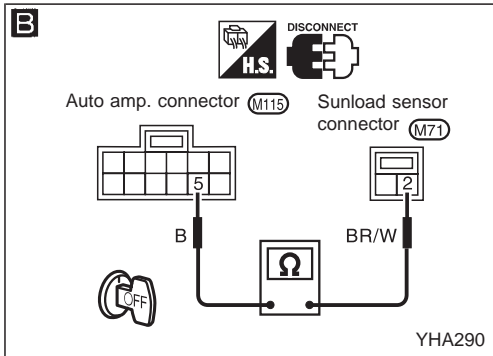
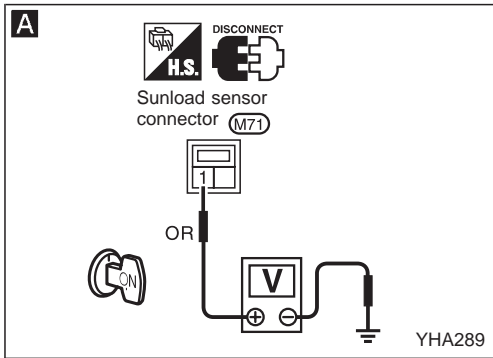
Diagnostic Procedure 12

SYMPTOM: In-vehicle sensor circuit is open or shorted.



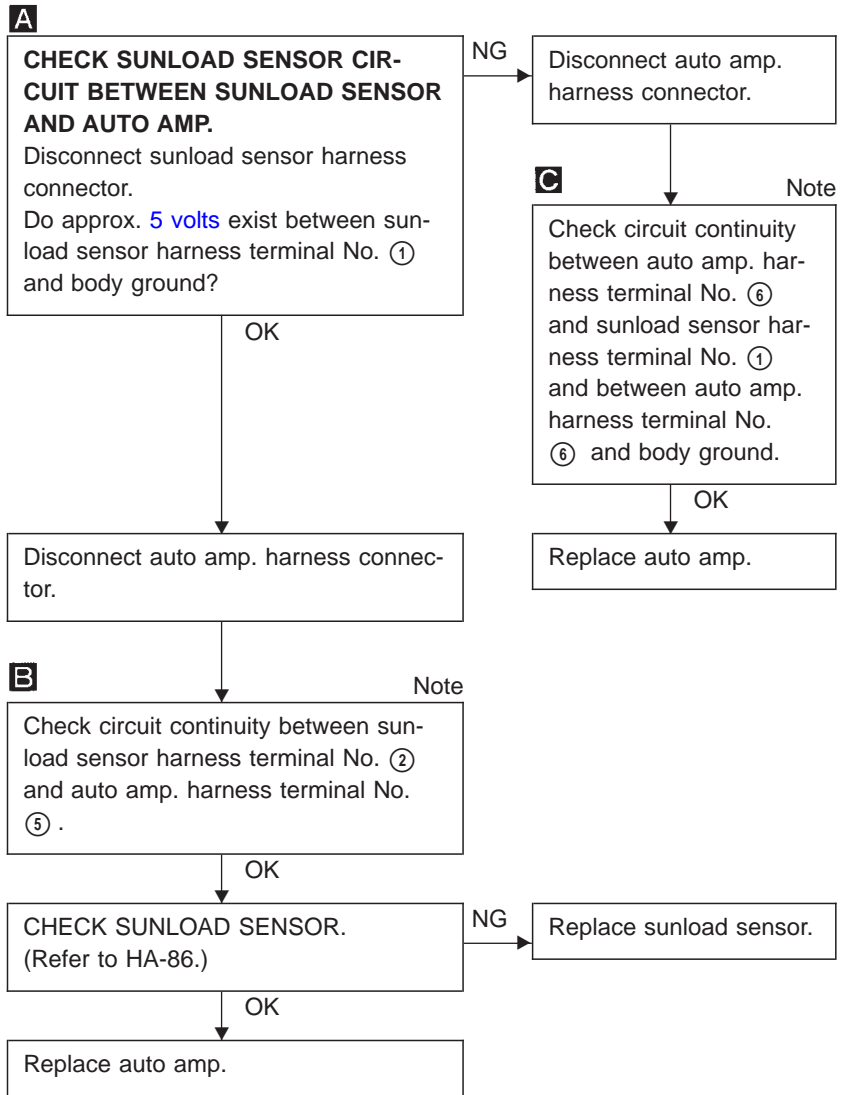
Note:

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

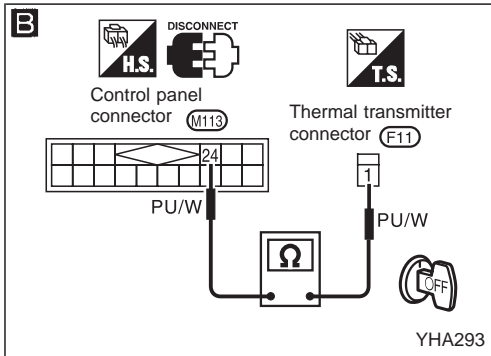
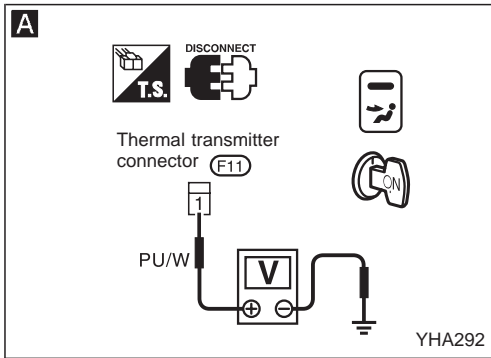


Diagnostic Procedure 13

SYMPTOM: Sunload sensor circuit is open or shorted.

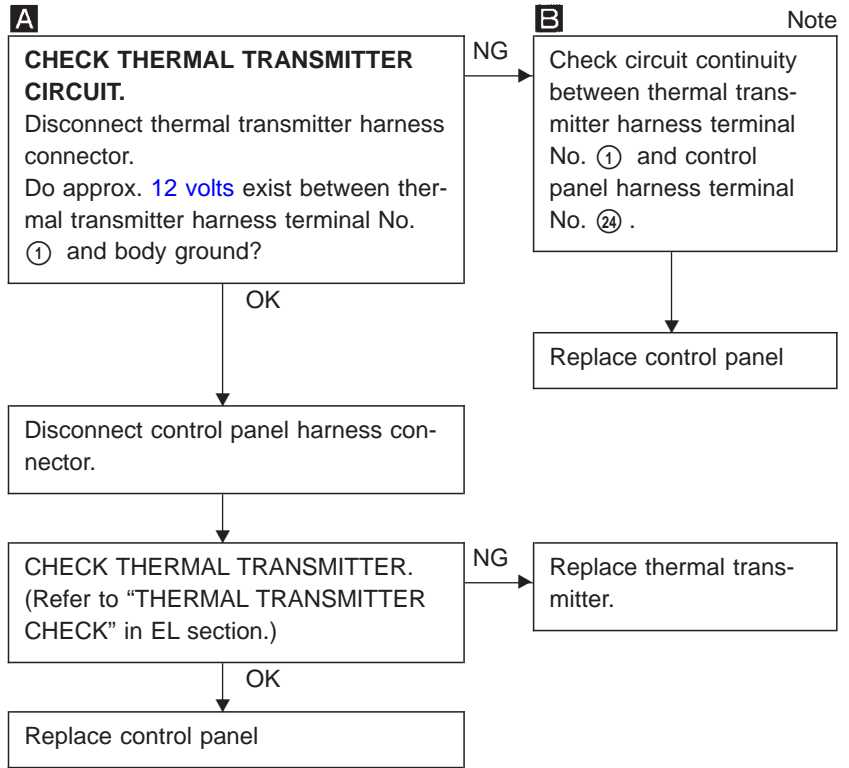


Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

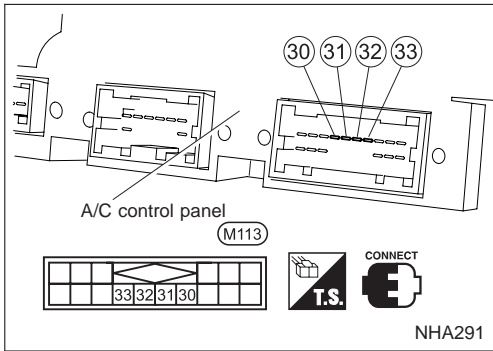


Diagnostic Procedure 14

SYMPTOM: Thermal transmitter circuit is open or shorted.



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

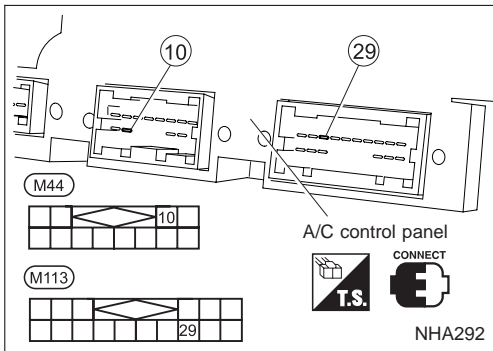


Electrical Components Inspection

FAN SWITCH

Check voltage terminals at each switch position.

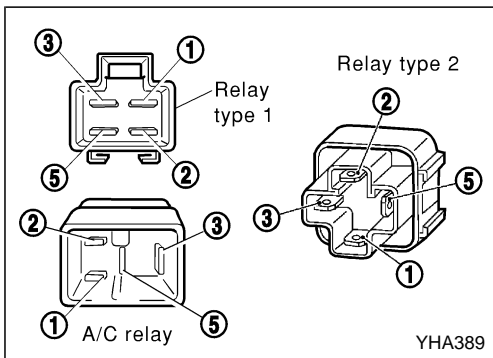
| FUNCTION | A/C CONTROL PANEL TERMINAL | SWITCH POSITION | | | | |
|---------------|----------------------------|-----------------|-------|------------|-------------|-------|
| | | OFF | LOW | MEDIUM LOW | MEDIUM HIGH | HIGH |
| OFF | — | — | — | — | — | — |
| FAN RELAY LO | 33 | 12V | <0.5V | <0.5V | <0.5V | <0.5V |
| FAN RELAY MLO | 32 | 12V | 12V | <0.5V | <0.5V | <0.5V |
| FAN RELAY MHI | 31 | 12V | 12V | 12V | <0.5V | <0.5V |
| FAN RELAY HI | 30 | 12V | 12V | 12V | 12V | <0.5V |



A/C SWITCH

Check voltage terminals at each switch position.

| Switch condition | Terminal No. | |
|------------------|--------------|--------|
| A/C | ⑩ | ⑲ |
| ON | < 0.5V | < 0.5V |
| OFF | 0 | 0 |



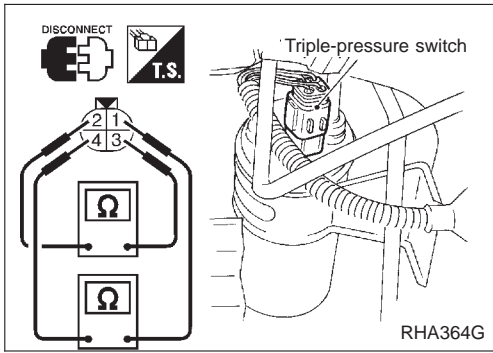
A/C, LOW, MED-LOW, MED-HIGH and HIGH RELAYS

Check continuity between terminal Nos. ③ and ⑤ .

| Conditions | Continuity |
|---|------------|
| 12V direct current supply between terminal Nos. ① and ② | Yes |
| No current supply | No |

If NG, replace relay.

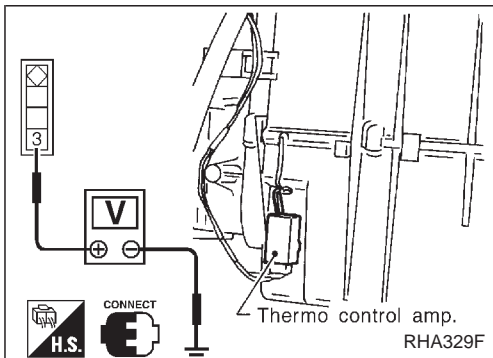
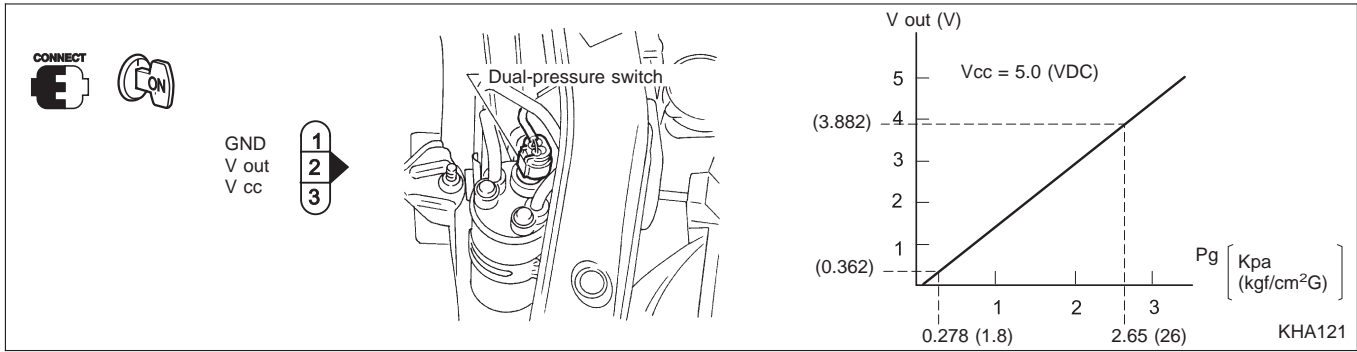
**Electrical Components Inspection (Cont'd)
TRIPLE-PRESSURE SWITCH (WITH DIESEL ENGINE)**



| | Terminals | High-pressure side line pressure kPa (bar, kg/cm ² , psi) | Operation | Continuity |
|-----------------------|-----------|---|-----------|-----------------|
| Low-pressure side | ① - ④ | Increasing to 152.0 - 201.0 (1.520 - 2.010, 1.55 - 2.05, 22.0 - 29.2) | ON | Exists. |
| | | Decreasing to 152.0 - 201.0 (1.520 - 2.010, 1.55 - 2.05, 22.0 - 29.2) | OFF | Does not exist. |
| Medium-pressure side* | ② - ③ | Increasing to 1,422 - 1,618 (14.22 - 16.18, 14.5 - 16.5, 206 - 235) | ON | Exists. |
| | | Decreasing to 1,128 - 1,422 (11.28 - 14.22, 11.5 - 14.5, 164 - 206) | OFF | Does not exist. |
| High-pressure side | ① - ④ | Decreasing to 2,059 - 2,256 (20.6 - 22.6, 21 - 23, 299 - 327) | ON | Exists. |
| | | Increasing to 2,648 - 2,844 (26.5 - 28.4, 27 - 29, 384 - 412) | OFF | Does not exist. |

* For cooling fan motor operation

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



THERMO CONTROL AMP.

| Evaporator outlet air temperature °C (°F) | Thermo amp. operation | Tester |
|---|-----------------------|-------------|
| Decreasing to 0.1 - 0.9 (32 - 34) | Turn OFF | Approx. 12V |
| Increasing to 2.5 - 3.5 (37 - 38) | Turn ON | Approx. 0V |

Control Panel System

This control panel system operates the intake door motor to activate their corresponding doors.

SWITCHES AND THEIR CONTROL FUNCTIONS

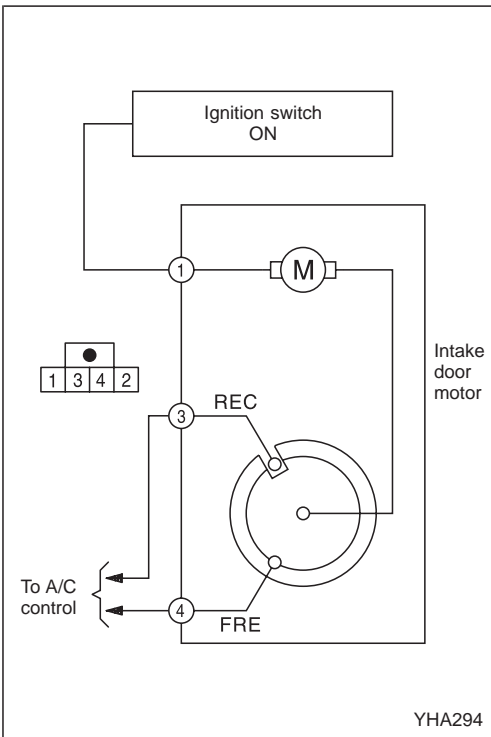
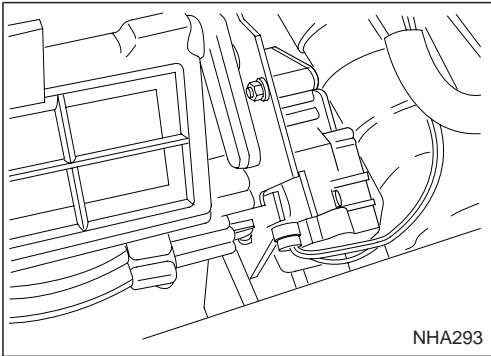
| Knob/Switch | Knob/Switch position | | | | | | | Air outlet | Intake air | Compressor |
|-------------|----------------------|---|---|---|---|---|--|------------|------------|------------|
| | A/C | | | | | | | | | |
| A/C | ○ | | | | | | | | | ON*1 |
| Mode | | ○ | | | | | | VENT | | |
| | | | ○ | | | | | B/L | | |
| | | | | ○ | | | | FOOT | | |
| | | | | | ○ | | | F/D | | |
| | | | | | | ○ | | DEF | FRE | ON*1 |
| | | | | | | ○ | | REC | | |

*1: Compressor is operated by thermo control amp. (With diesel engine)
Compressor is operated by ECM (with SR engine and QG engine).

Control Panel System (Cont'd)

INTAKE DOOR MOTOR

The intake door motor is installed on the intake unit. When the door position is determined by pushing the "REC" switch on the control panel, the motor rotates and the air inlet is changed.



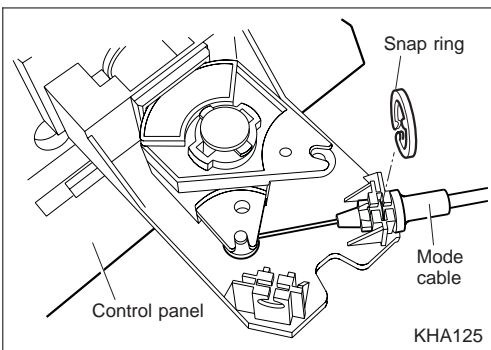
Removal and Installation

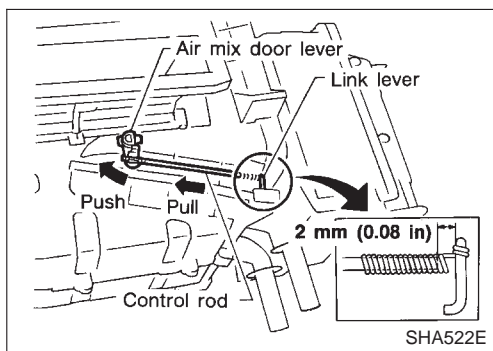
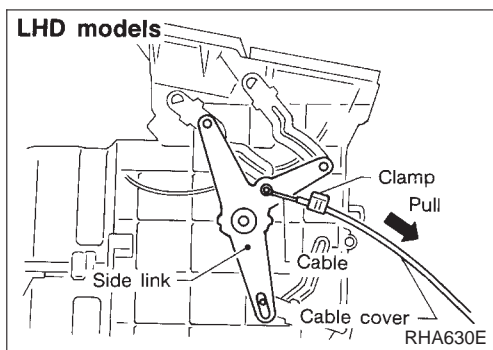
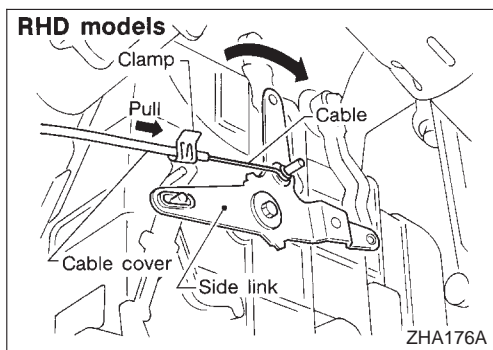
Refer to "INSTRUMENT PANEL" in BT section for details.

NOTE:

When removing the control panel, the Mode control cable should be disconnected from the control panel rather than from the heater.

Removal of the mode cable will result in breakage of the ferrule retaining clips. On reassembly, the cable is retained by a snap ring (Part number: 9-22504-1) which is pushed into a slot in the control base plate which aligns with a groove in the cable sleeve.





Control Linkage Adjustment

MODE CONTROL CABLE

1. For RHD models, turn the mode control knob to the VENT position.
For LHD models, turn the mode control knob to the DEF position.
2. For RHD models, set the side link in the VENT position by hand.
For LHD models, set the side link in the DEF position by hand.
3. Pull on the cable cover in the direction of the arrow, then clamp it.

After positioning control cable, check that it operates correctly.

WATER COCK CONTROL ROD

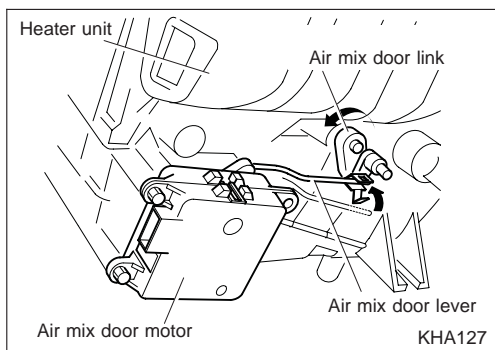
- **When adjusting water cock control rod, first disconnect temperature control cable from air mix door lever and then adjust control rod. Reconnect temperature control cable and readjust it. (Refer to TEMPERATURE CONTROL CABLE.)**

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

After connecting control rod, check it operates correctly.

Control Linkage Adjustment (Cont'd)

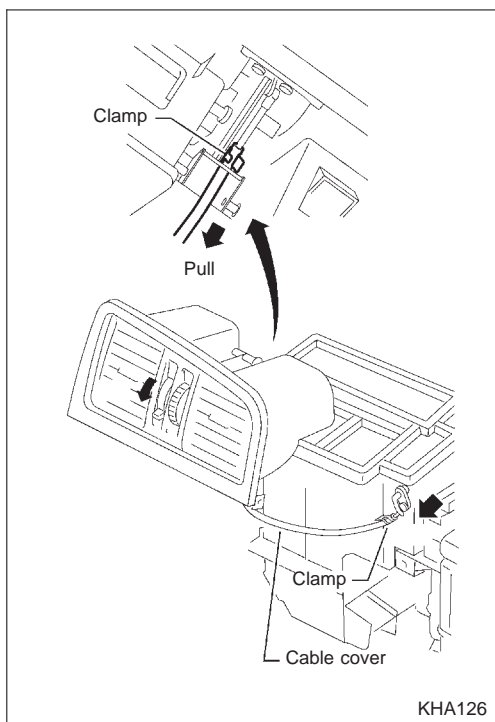
AIR MIX DOOR



1. Install air mix door motor on heater unit.
Ensure that the air mix door motor lever is fitted into slit portion of air mix door link.
2. Connect the air mix door motor harness connector.
3. Turn ignition switch to "ON" position.
4. Check that air mix door operates properly when PTC is moved from 18 to 32°C (64 to 90°F).

After positioning control cable, check that it operates correctly.

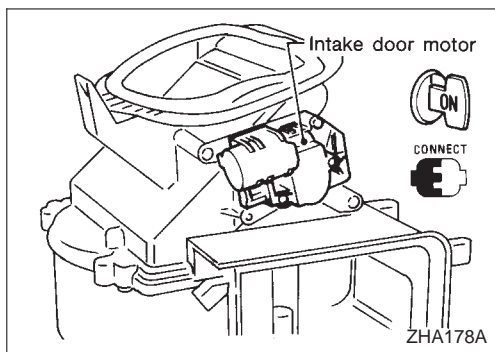
FRESH VENT CONTROL CABLE



1. Turn the fresh vent control knob to the shut position.
2. Set the fresh vent door lever in shut position.
3. Adjust the position of the cable cover for proper operation, then secure to the clamps.

After positioning control cables, check that it operates correctly.

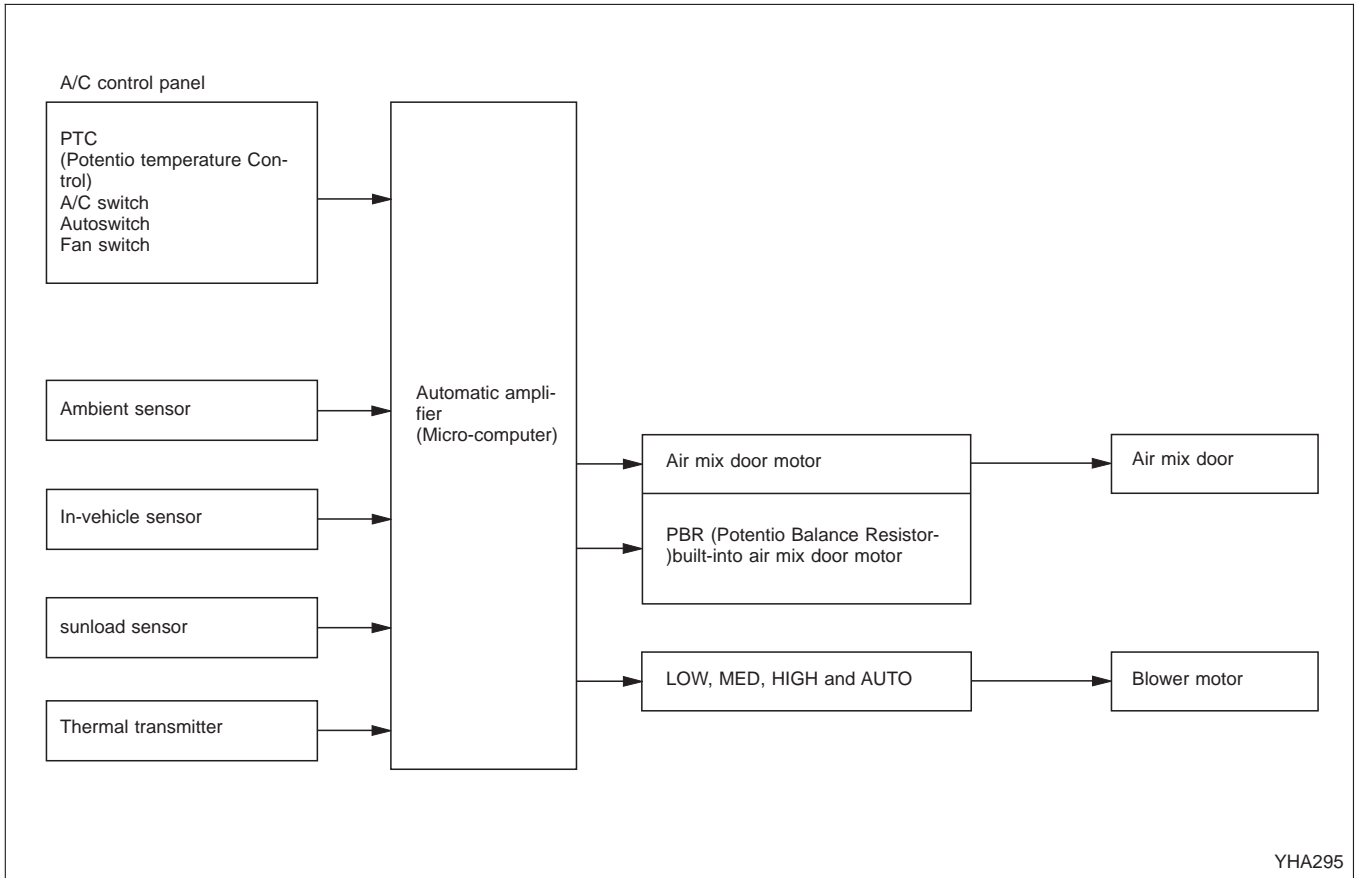
INTAKE DOOR MOTOR



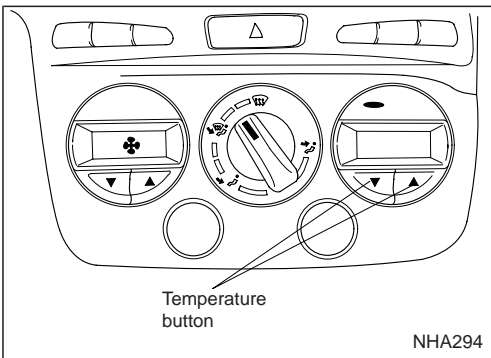
1. Install intake door motor on intake unit.
Ensure that the intake door motor lever is fitted into the slit portion of intake door link.
2. Connect the intake door motor harness connector.
3. Turn ignition switch to "ON" position.
4. Check that intake door operates properly when REC switch is turned ON and OFF.

Overview of Control System

The control system consists of a) input sensors and switches, b) the automatic amplifier (microcomputer), and c) outputs. The relationship of these components is shown in the diagram below.



YHA295

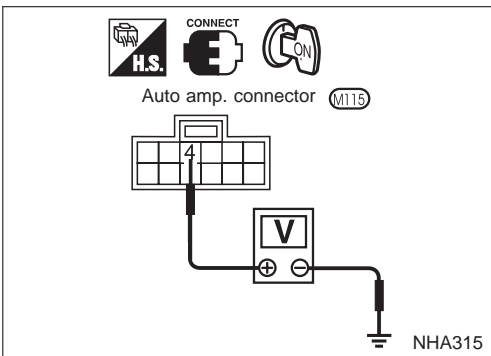


NHA294

Control System Input Components

POTENTIO TEMPERATURE CONTROL (PTC)

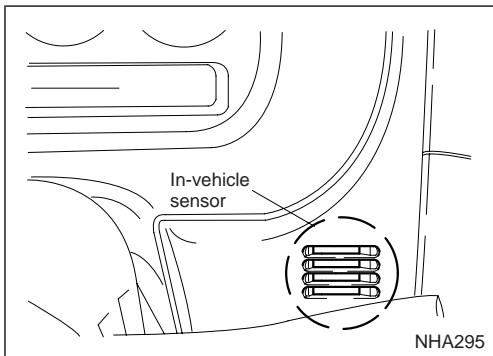
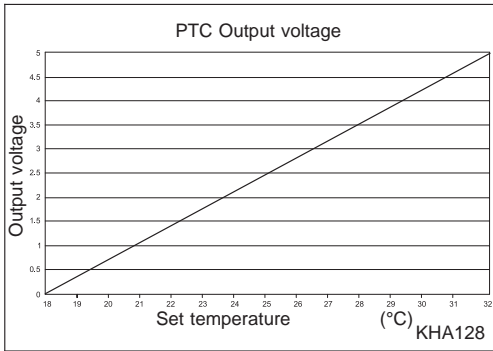
The PTC is built into the control panel. It can be set at an interval of 1°C in the 18°C to 32°C temperature range by pushing the temperature button. The set temperature is digitally displayed.



NHA315

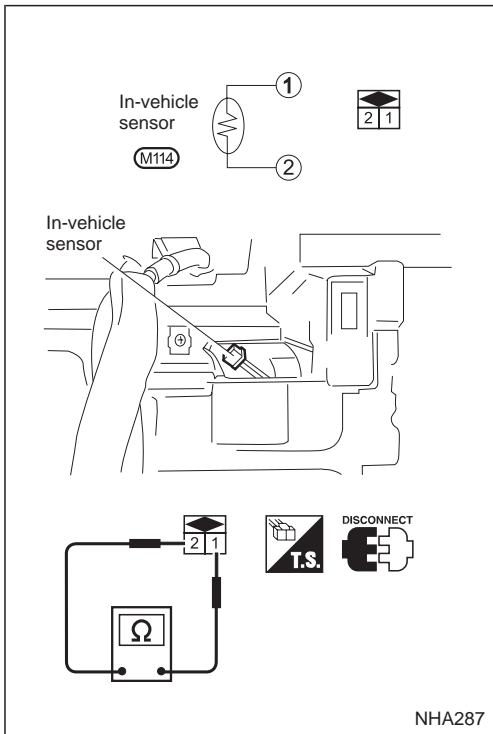
Measure voltage between auto amp. terminal ④ and body ground.

Control System Input Components (Cont'd)



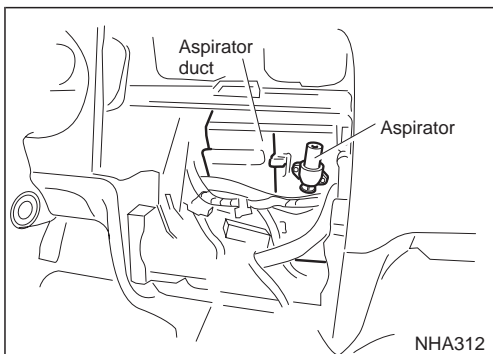
IN-VEHICLE SENSOR

The in-vehicle sensor is attached to the right side of the control unit. It converts variations in the temperature of the compartment air drawn in by the aspirator into a resistance value, which is then input into the auto amplifier.



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

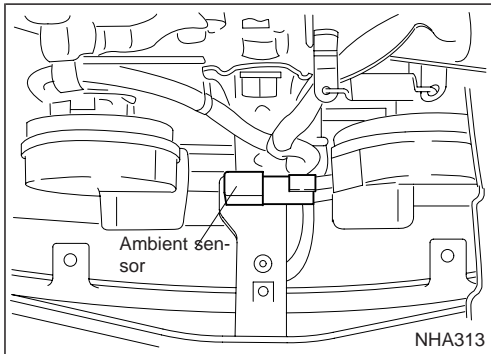
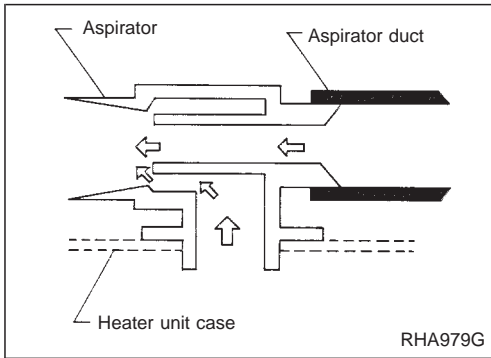
| Temperature °C (°F) | Resistance kΩ |
|---------------------|---------------|
| 0 (32) | 6.0 |
| 5 (41) | 4.95 |
| 10 (50) | 3.99 |
| 15 (59) | 3.24 |
| 20 (68) | 2.65 |
| 25 (77) | 2.19 |
| 30 (86) | 1.81 |
| 35 (95) | 1.51 |
| 40 (104) | 1.27 |



Aspirator

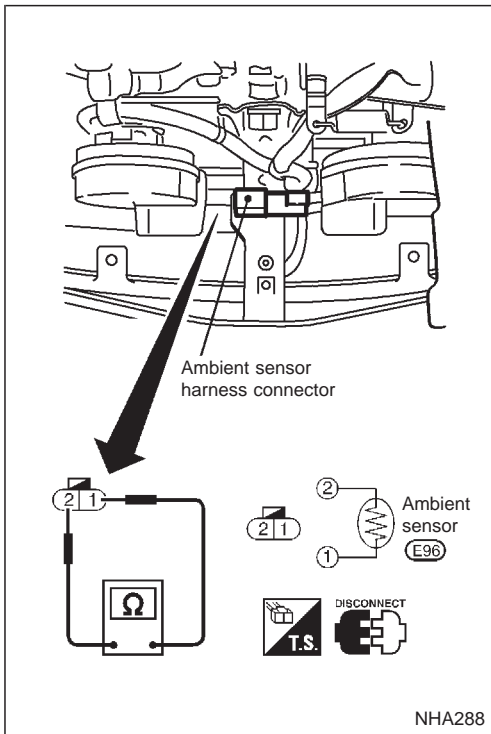
The aspirator is located in front of heater unit. It produces vacuum pressure due to air discharged from the heater unit, continuously taking compartment air in the aspirator.

Control System Input Components (Cont'd)



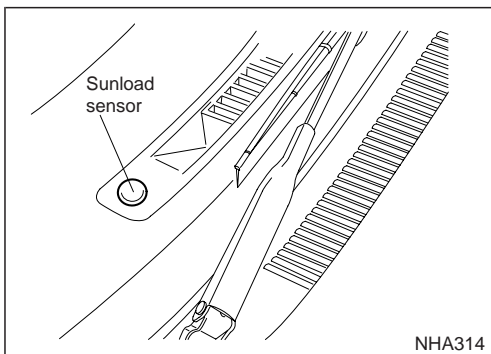
AMBIENT SENSOR

The ambient sensor is located on the hood lock stay. It detects the ambient temperature and converts it into a resistance value, which is then input into the auto amplifier.



After disconnecting ambient sensor harness connector, measure resistance between terminals ① and ② at sensor harness side, using the table below.

| Temperature °C (°F) | Resistance kΩ |
|---------------------|---------------|
| -20 (-4) | 9.98 |
| -10 (14) | 5.57 |
| 0 (32) | 3.26 |
| 10 (50) | 1.98 |
| 20 (68) | 1.25 |
| 25 (77) | 1.00 |
| 30 (86) | 0.81 |
| 40 (104) | 0.54 |



SUNLOAD SENSOR

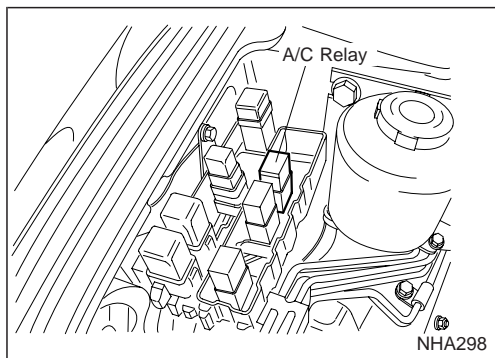
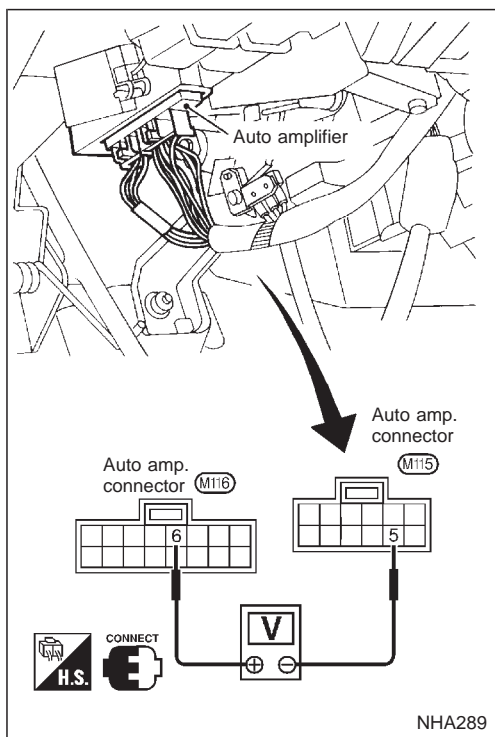
The sunload sensor is located on the center defroster grille. It detects sunload entering through the windshield by means of a photo diode and converts it into a current value which is then input to the auto amplifier.

Control System Input Components (Cont'd)

Measure voltage between terminals ⑤ and ⑥ at auto air conditioner harness side, using the table below.

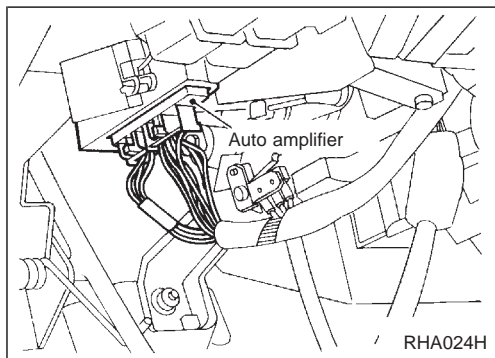
| Input current mA | Output voltage V |
|---------------------|---------------------|
| 0 | 5.00 |
| 0.1 | 4.09 |
| 0.2 | 3.18 |
| 0.3 | 2.27 |
| 0.4 | 1.36 |
| 0.5 | 0.45 |

- When checking sunload sensor, select a place where sun shines directly on it.



A/C RELAY

The A/C relay is located on the left side of the engine room. When the A/C remain and fan switch are ON, the A/C relay operates and transmits A/C operation signals to ECM.



Control System Auto Amplifier (Auto amp.)

The auto amplifier has a built-in microcomputer which processes the information sent from the various sensors needed for air conditioner operation. The air mix door motor and blower motor are then controlled.

Signals from the various switches and the Potentio Temperature Control (PTC) are directly entered into the auto amplifier.

SUNLOAD INPUT PROCESS

The auto amp. also includes a processing circuit which “averages” the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

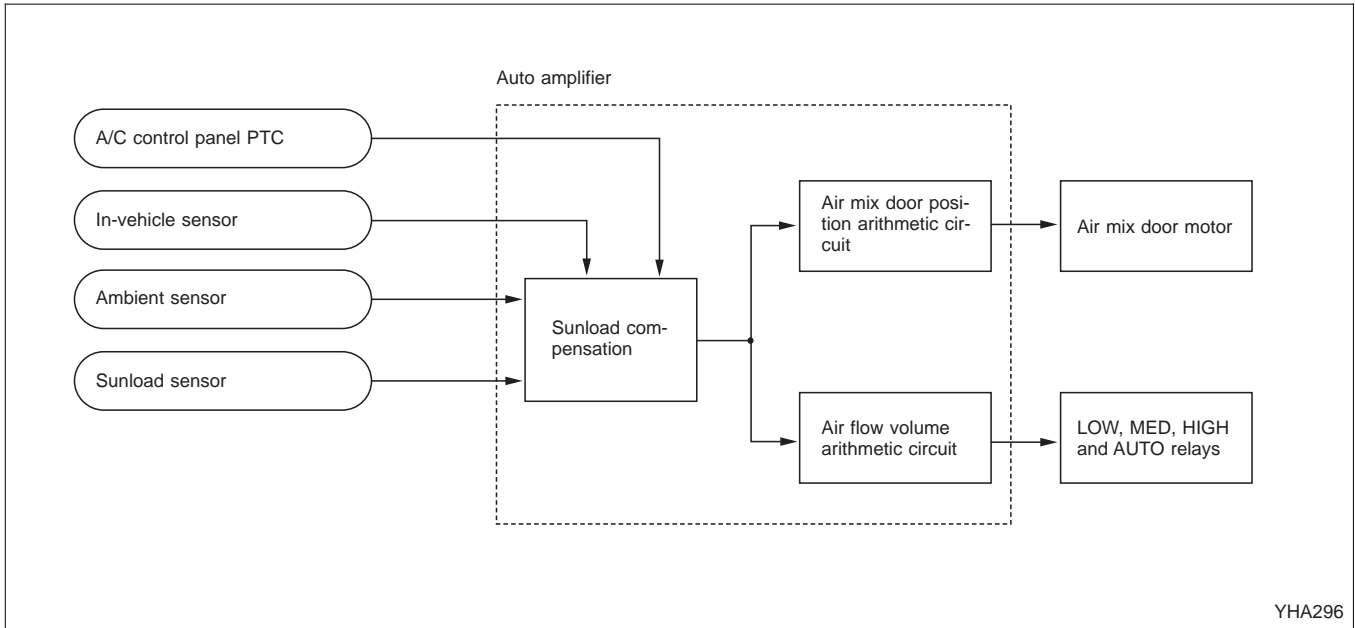
For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC

**Control System Auto Amplifier (Auto amp.)
(Cont'd)**

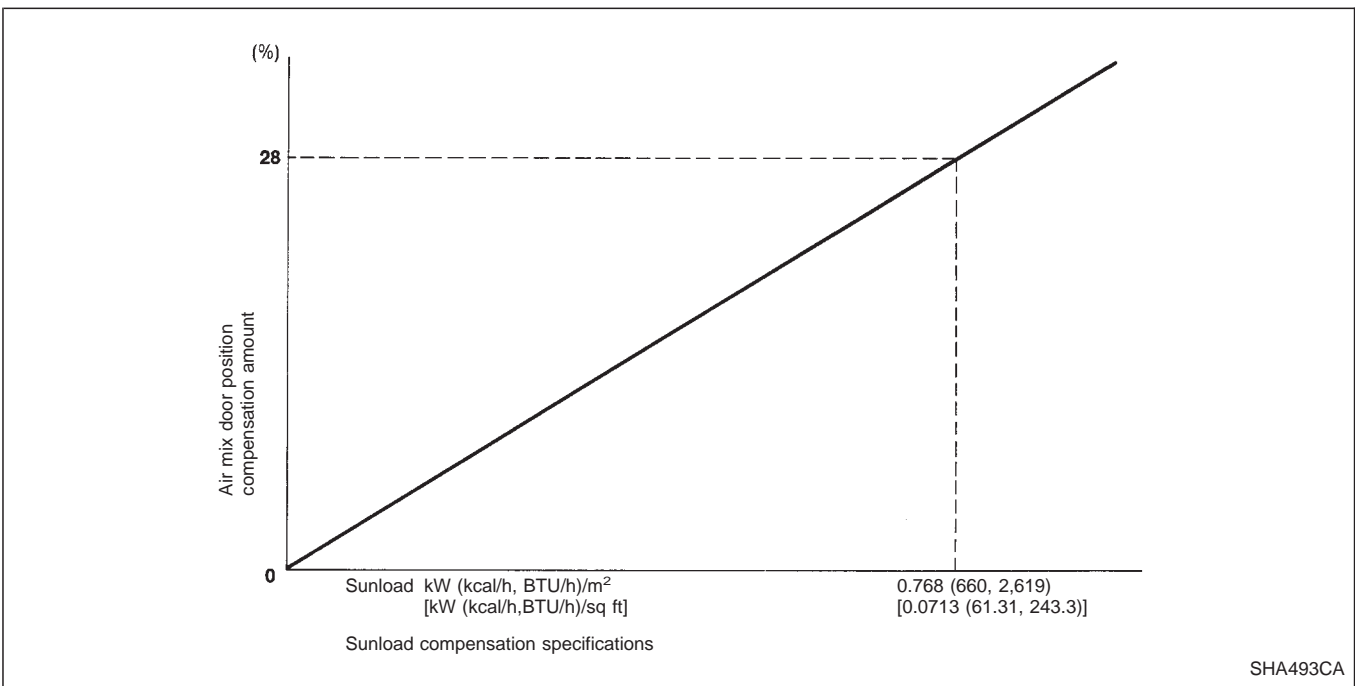
system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

SUNLOAD COMPENSATION

The auto amplifier compensates for sunload by altering the air mix door position and air flow volume according to the amount of sunload detected by the sunload sensor. When the amount of sunload is great, the air mix door is moved toward the "COLD" side. Along with this air mix door movement, air flow volume will also be changed.



YHA296



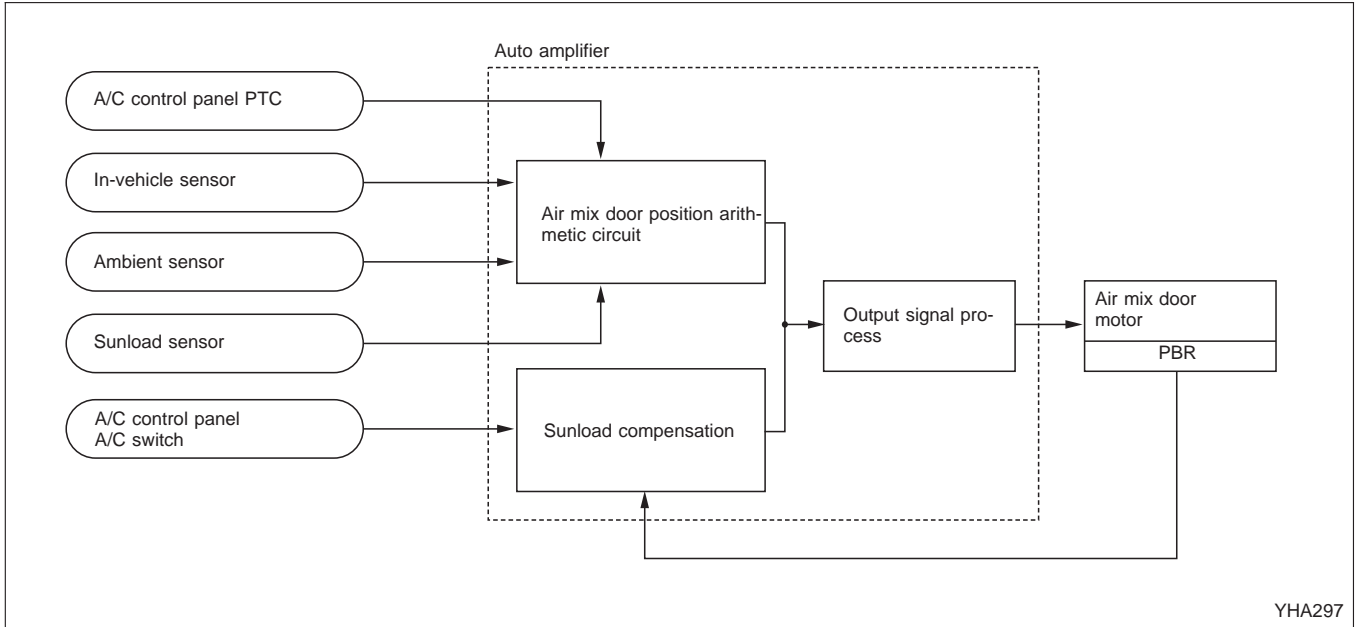
SHA493CA

**Control System Auto Amplifier (Auto amp.)
(Cont'd)**

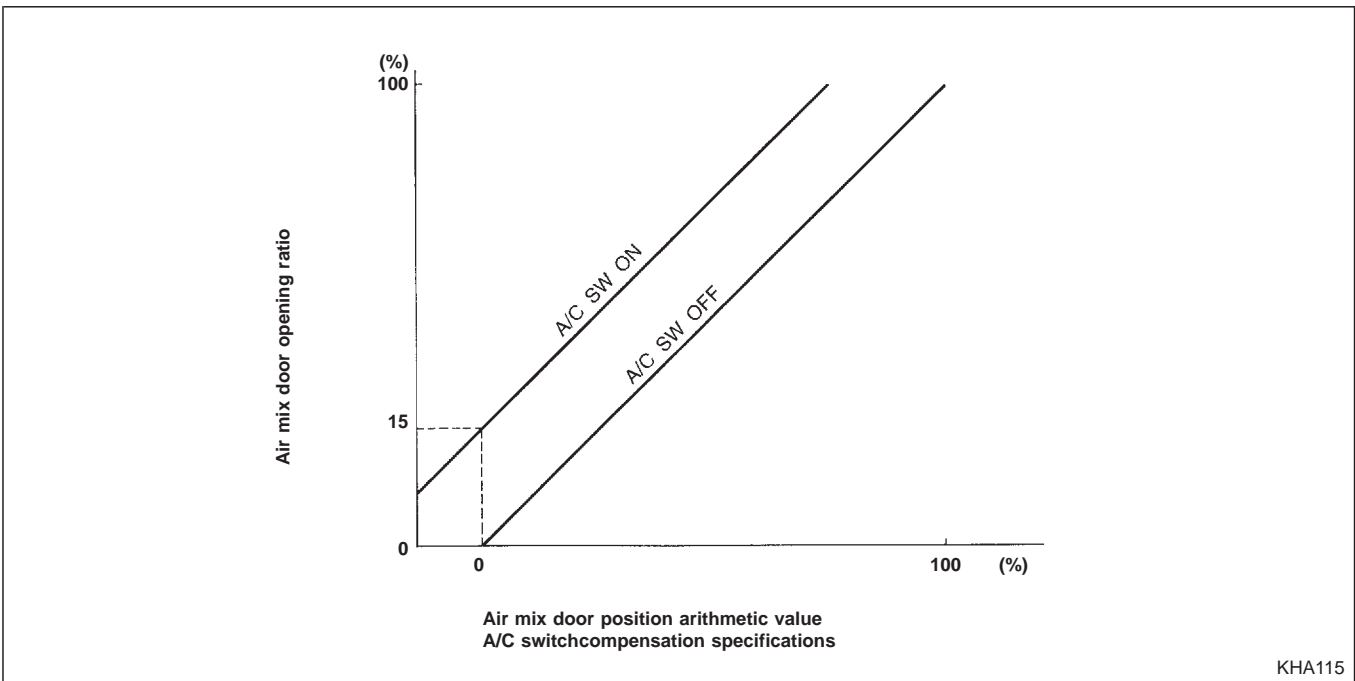
A/C SWITCH COMPENSATION

The auto amplifier alters the air mix door position and air flow volume according to a signal emitted from the A/C switch.

When the A/C switch is "ON", the auto amplifier compensates for the PBR's input signal and moves the air mix door toward the "HOT" side.



YHA297



KHA115

Control System Output Components

AIR MIX DOOR CONTROL (Automatic temperature control)

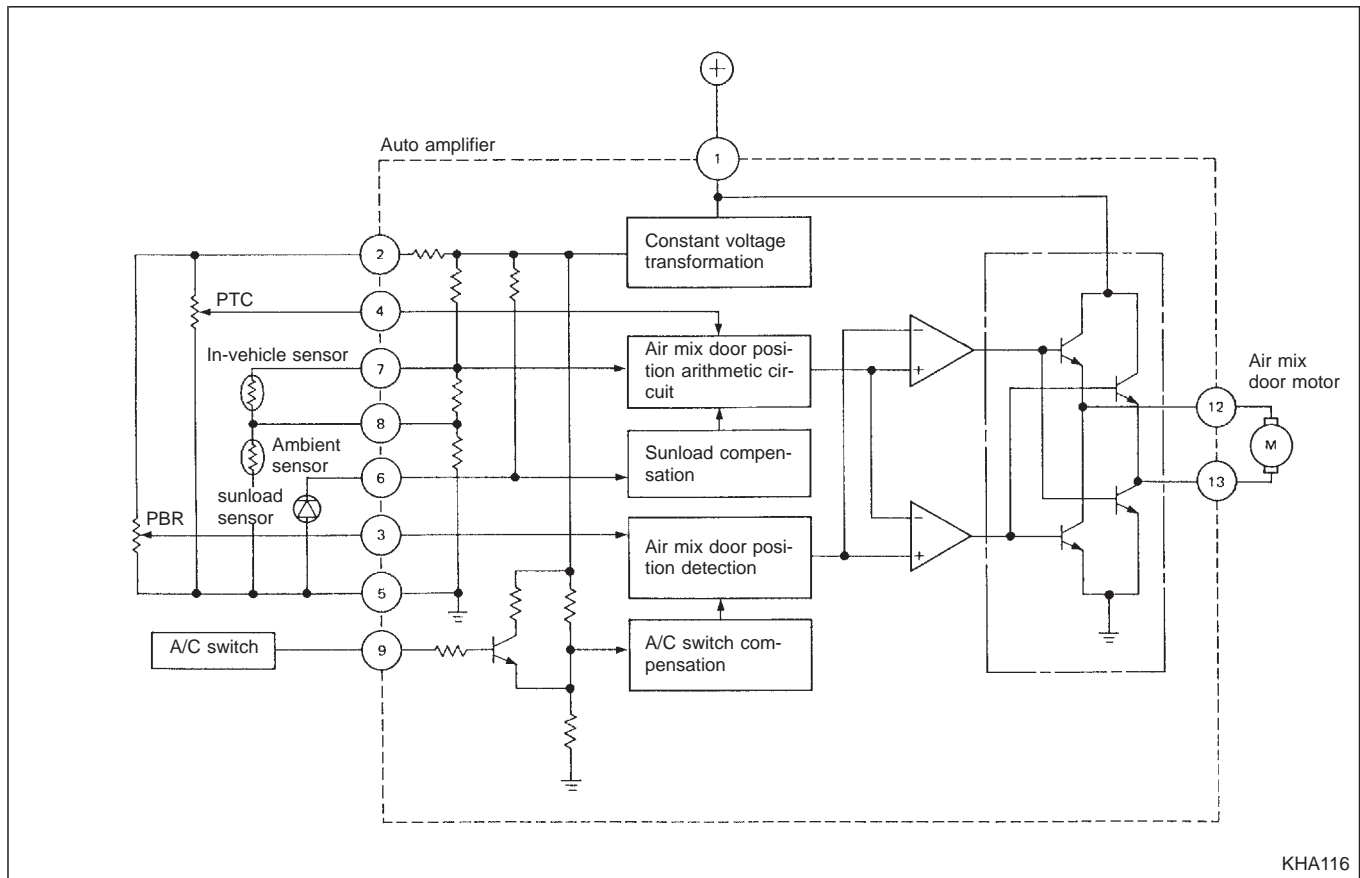
Component parts

Air mix door control system components are:

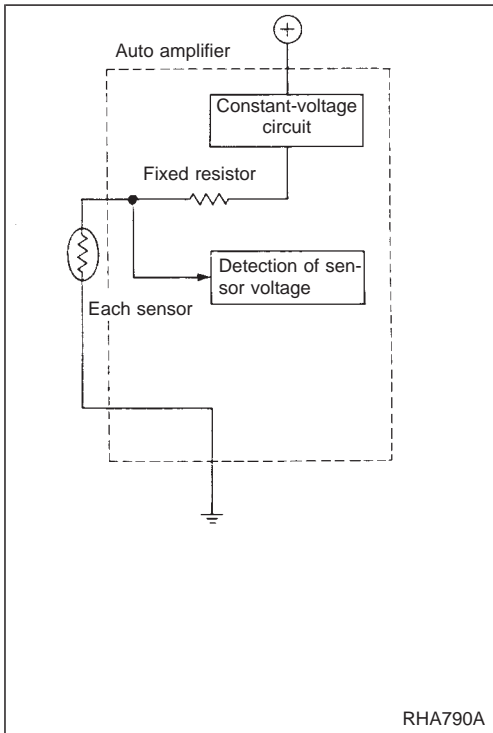
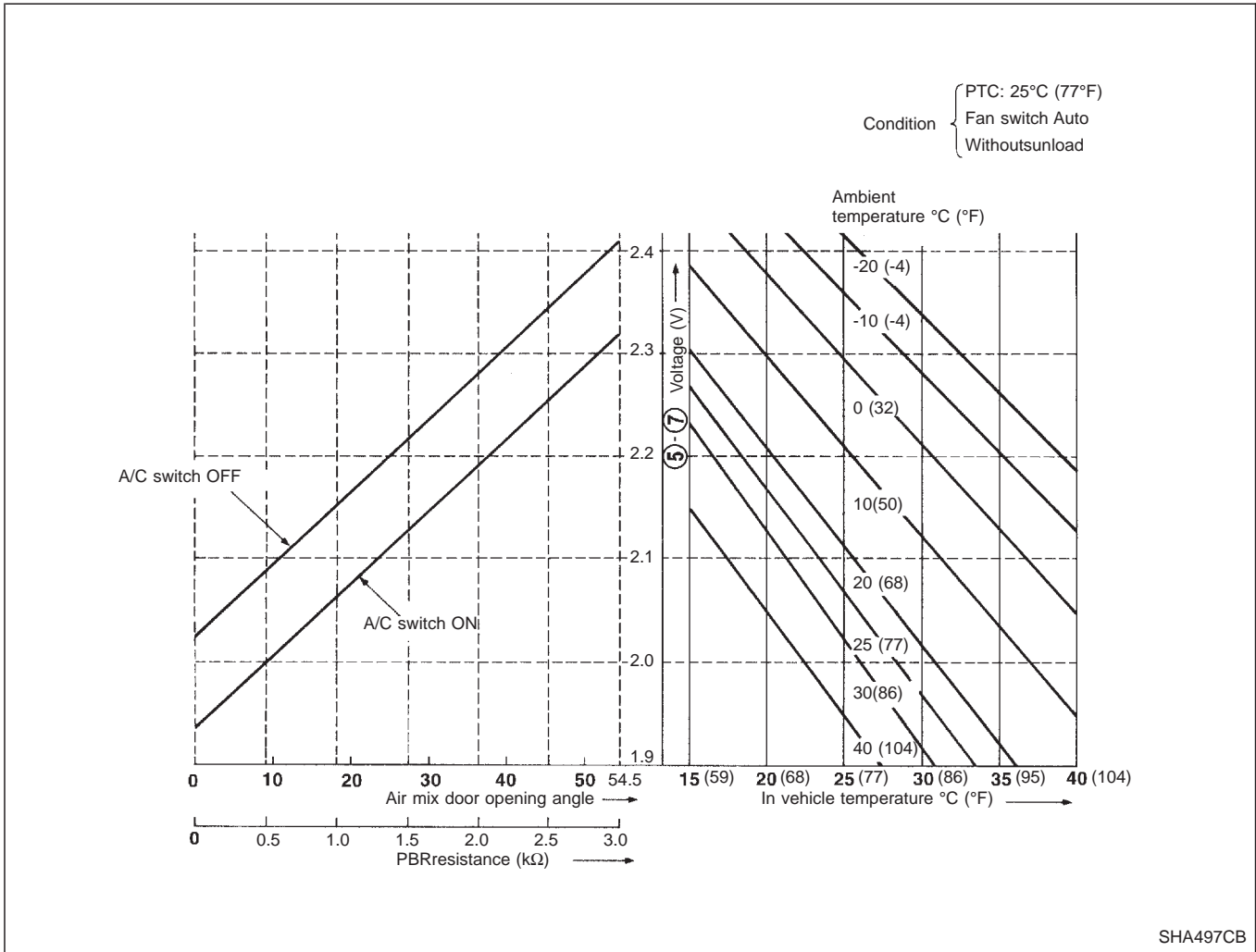
- 1) Auto amplifier
- 2) Ambient sensor
- 3) In-vehicle sensor
- 4) Sunload sensor
- 5) Air mix door motor (PBR)
- 6) A/C switch

System operation

The air mix door is automatically controlled so that in-vehicle temperature is maintained to the set temperature. The temperature set by the PTC (Potentio Temperature Control) and the temperature detected by the in-vehicle sensor and ambient sensor are compensated by the sunload sensor signal. The auto amplifier then determines the air mix door position. The air mix door position detected by the PBR is compensated by the ON-OFF operation of the A/C switch. The air mix door position determined by the auto amplifier is compared with that detected by the PBR. The auto amplifier then transmits the signal to the air mix door motor in order to activate it.



Control System Output Components (Cont'd)
Air mix door control specifications

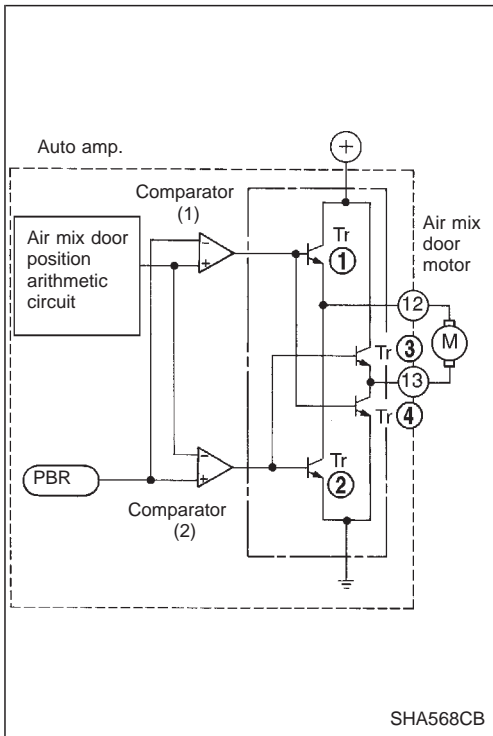
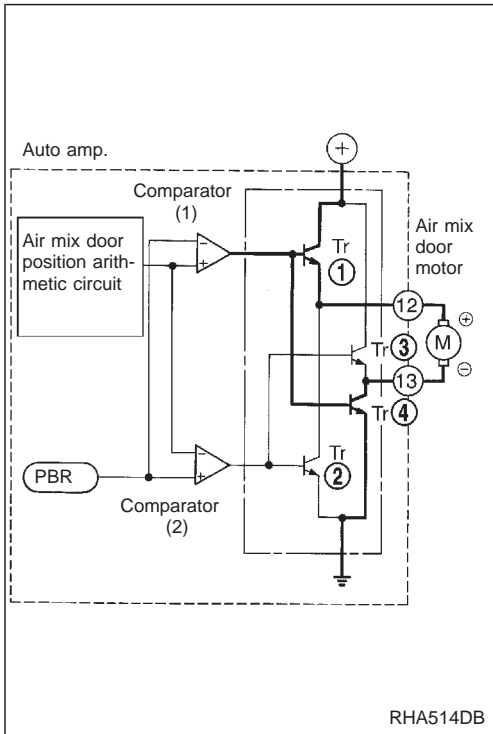


SENSOR INPUT PROCESS

The auto amplifier detects the voltage produced by each sensor, the PBR and fixed resistor. The fixed resistor is built into the auto amplifier. 12-volt power voltage is first converted to approximately 5 volts by the constant voltage circuit where it is then applied to the ground line of the auto amplifier via the fixed resistor and the sensor. In this manner, the auto amplifier monitors the voltages of the fixed resistor, each sensor and the PBR to determine sensor input.

**Control System Output Components (Cont'd)
OPERATION OF AIR MIX DOOR MOTOR**

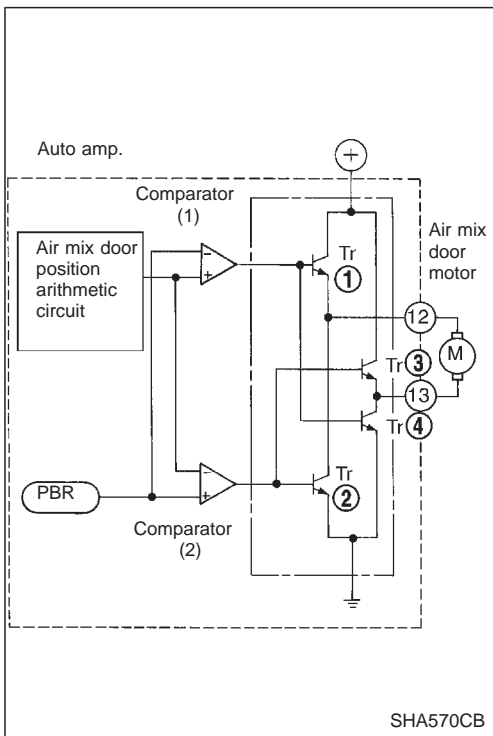
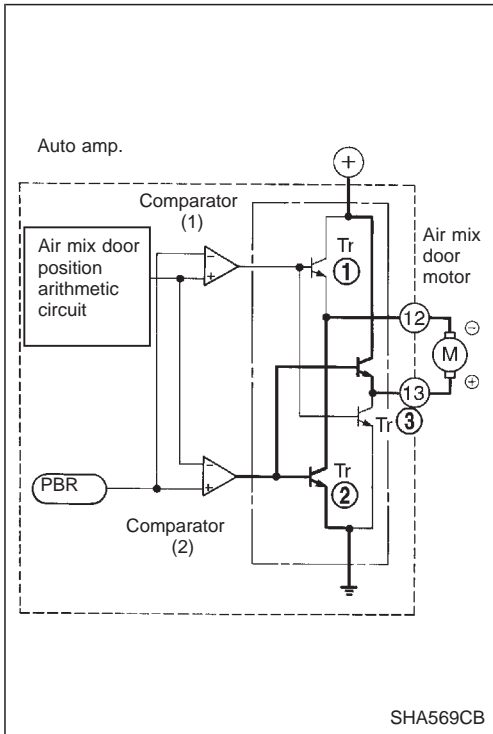
- Example ①
When the temperature in the vehicle is lower than the set temperature.
When the temperature in the vehicle is low, in-vehicle sensor resistance is great and the input voltage to the auto amplifier becomes great. As a result, the voltage from the air mix door position arithmetic circuit also becomes great.
When this voltage is greater than the voltage from the PBR, comparator (1), Tr ① and Tr ④ turn ON.
Accordingly terminal No. ⑫ becomes ⊕ and terminal No. ⑬ becomes ⊖. The air mix door motor rotates clockwise and the air mix door moves toward the "HOT" side.



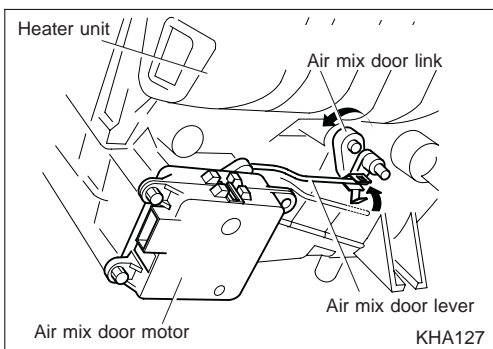
As the air mix door moves toward the "HOT" side, the voltage from the PBR becomes greater and consequently becomes equal to that from the air mix door position arithmetic circuit. As a result, comparator (1) turns OFF and the air mix door motor stops.

Control System Output Components (Cont'd)

- Example ②
 When the temperature in the vehicle is higher than the set temperature.
 When the temperature in the vehicle is high, in-vehicle sensor resistance is small and the input voltage to the auto amplifier becomes small. As a result, the voltage from the air mix door position arithmetic circuit also becomes small.
 When this voltage is smaller than the voltage from the PBR, comparator (2), Tr ② and Tr ③ turn ON.
 Accordingly terminal No. ⑬ becomes ⊕ and terminal No. ⑫ becomes ⊖. The air mix door motor rotates counterclockwise and the air mix door moves toward the "COLD" side.



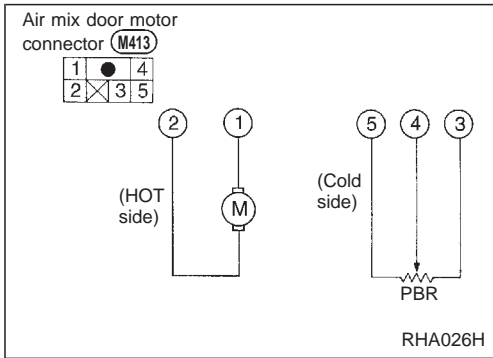
As the air mix door moves toward the "COLD" side, the voltage from the PBR becomes smaller and consequently becomes equal to that from the air mix door position arithmetic circuit. As a result, comparator (2) turns OFF and the air mix door motor stops.



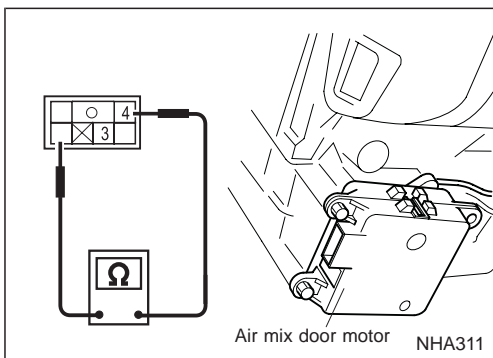
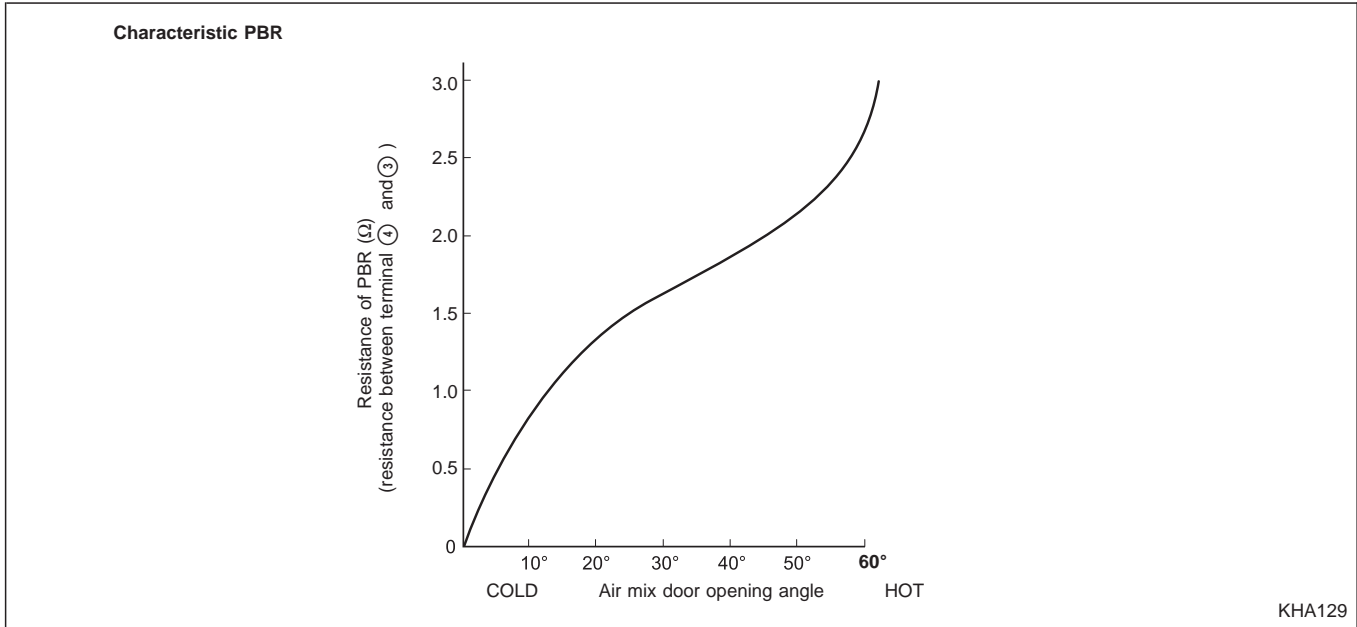
AIR MIX DOOR MOTOR

The air mix door motor is attached to the heater unit. It rotates so that the air mix door is opened to a position set by the auto amplifier. Motor rotation is conveyed through a shaft. The air mix door position is then fed back to the auto amplifier by the PBR built into the air mix door motor.

Control System Output Components (Cont'd)

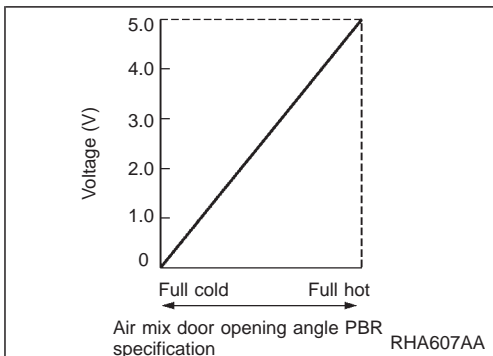


| | | | |
|---|---|------------------------|--|
| 2 | 1 | Air mix door operation | Direction of lever movement |
| ⊕ | ⊖ | COLD → HOT | Clockwise (Toward passenger compartment) |
| — | — | STOP | STOP |
| ⊖ | ⊕ | HOT → COLD | Counterclockwise (Toward engine compartment) |



PBR

Measure voltage between terminals ③ and ④ at vehicle harness side.



Ignition switch: ON

- Ensure tester pointer deflects smoothly when PTC is moved from 18°C (64°F) to 32°C (90°F) and vice versa.

Control System Output Components (Cont'd)

FAN SPEED CONTROL

Component parts

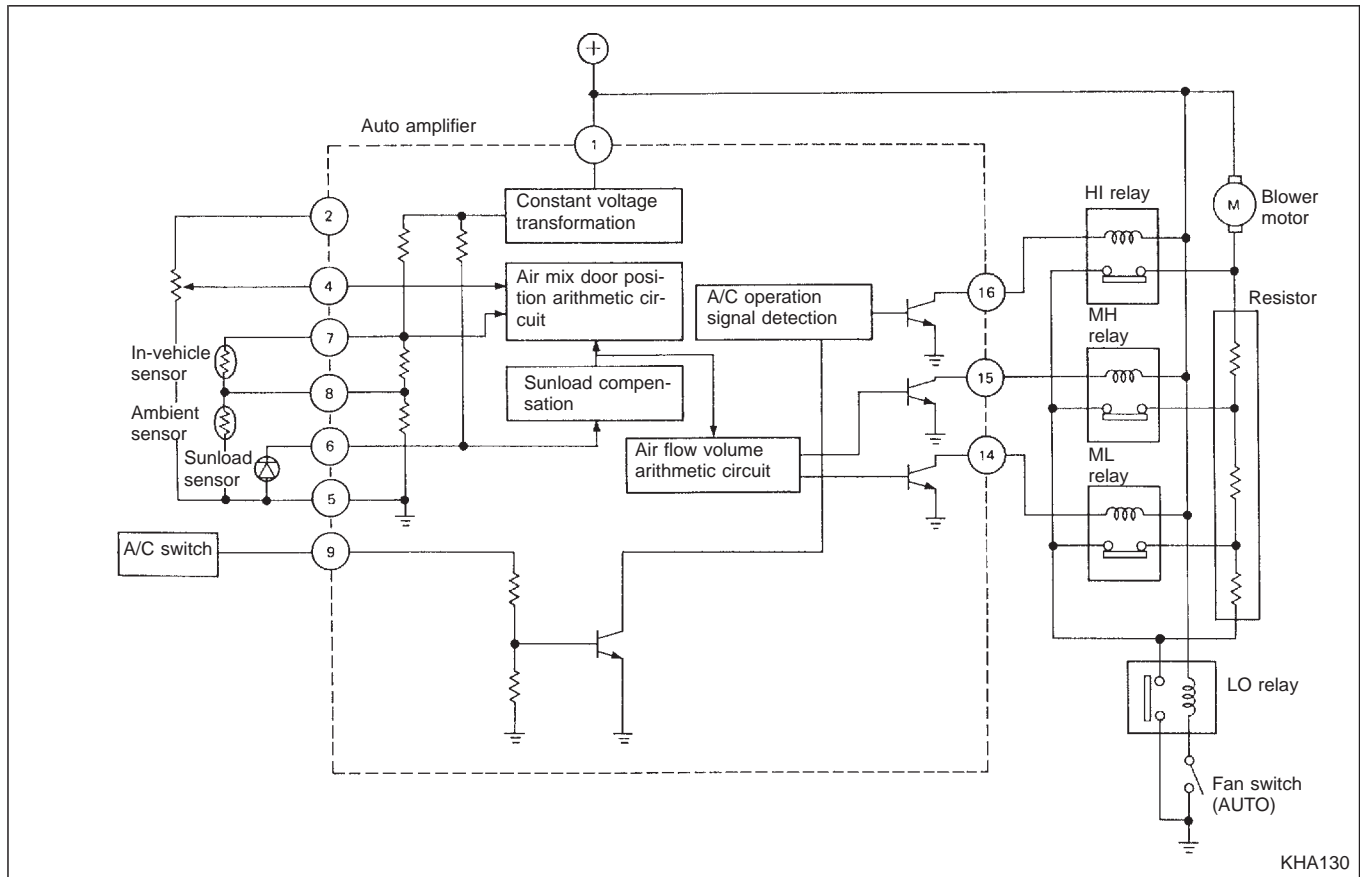
Fan speed control system components are:

- 1) Auto amplifier
- 2) In-vehicle sensor
- 3) Ambient sensor
- 4) Sunload sensor
- 5) A/C switch relay
- 6) A/C switch
- 7) Fan switch
- 8) Blower motor
- 9) Resistance
- 10) HI, MH, ML and LO relays

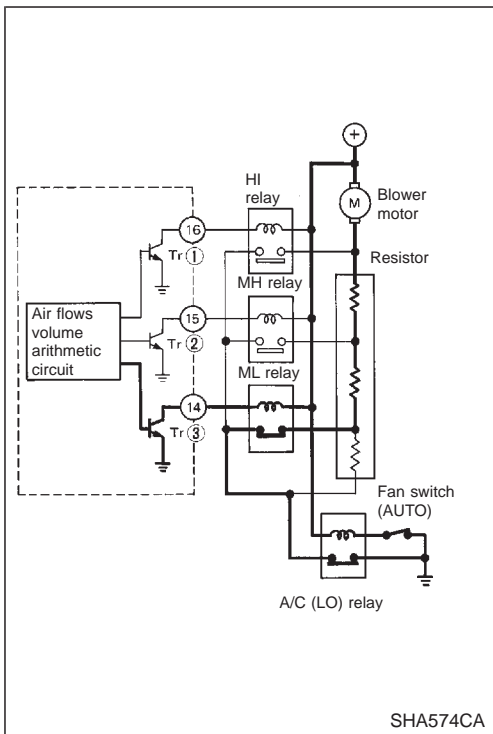
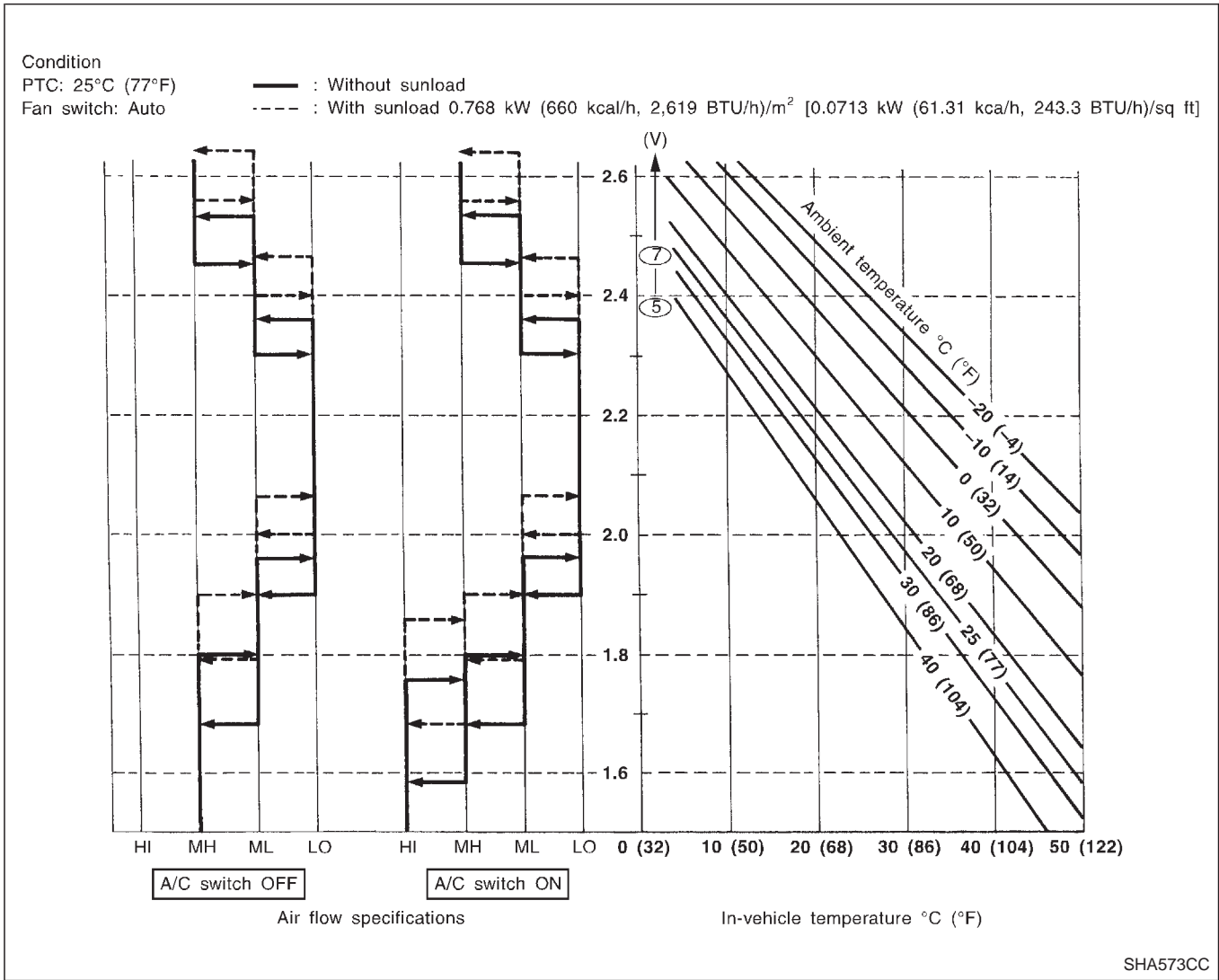
System operation

Blower fan speed is automatically controlled so that the in-vehicle temperature is maintained to the set temperature.

The temperature set by the PTC (Potentio Temperature Control) and the temperature detected by the in-vehicle sensor and ambient sensor are compensated by the sunload sensor signal. The auto amplifier then determines fan speed from the ON-OFF operation of the A/C switch. The fan speed decision by the auto amplifier activates the fan relay and the blower fan motor rotates. When the A/C switch is ON, fan speed is activated in 4 steps, HI, MH, ML, and LO. When the A/C switch is OFF, fan speed is activated in 3 steps, MH, ML, and LO.



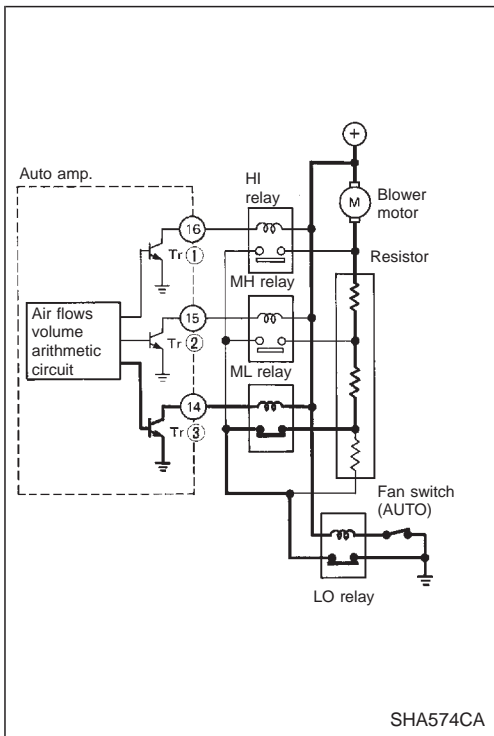
Control System Output Components (Cont'd)



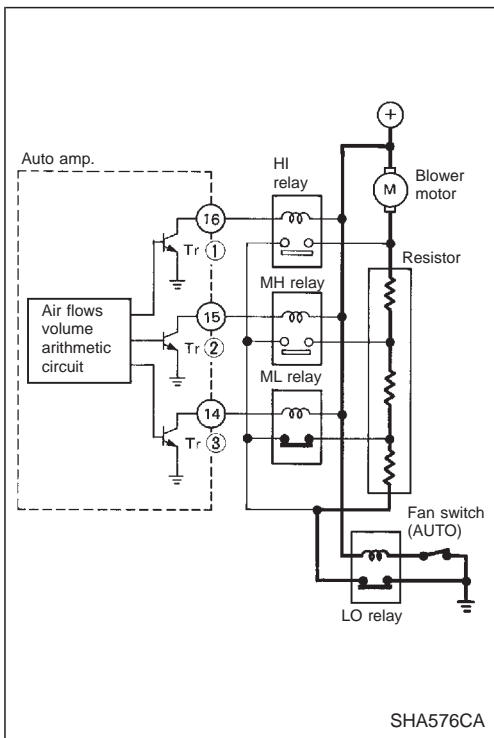
Signals from each sensor, PTC, A/C switch etc. are sent to the air flow volume arithmetic circuit in the auto amplifier. Air flow volume is determined by this circuit.

- (1) When the air flow volume is set to ML
 The air flow volume arithmetic circuit gives current to Tr (3), which turns the ML relay on. Thus, the blower motor rotates in the ML condition.

Control System Output Components (Cont'd)



(2) When set to HI
 The air flow volume arithmetic circuit gives current to Tr (1), which turns the HI relay on. Thus, the blower motor rotates in the HI condition. Also, Tr (2) and Tr (3) are receiving current and as a result the ML and MH relays are on.



(3) When set to LO
 The air flow volume arithmetic circuit does not give any current to Tr (1), (2) nor (3). Only the LO relay turns on and so the blower motor rotates in the LO condition.

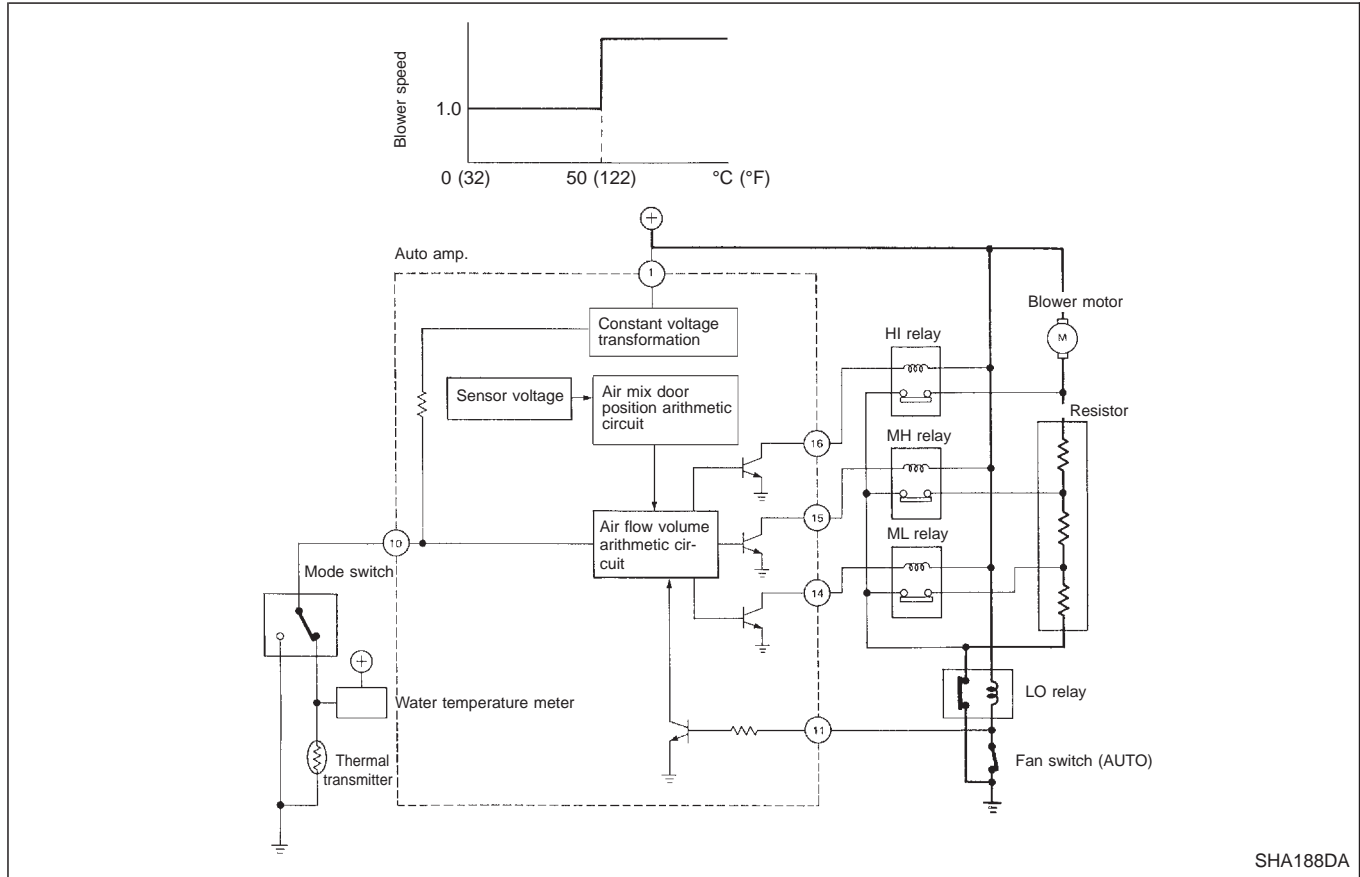
Control System Output Components (Cont'd)

STARTING FAN SPEED CONTROL

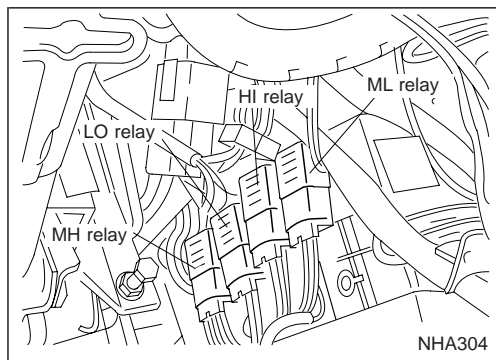
The starting fan control system is so designed to prevent excess cold air from being expelled after the engine is started when the engine coolant temperature is low.

The component parts related to this system are the water temperature sensor microswitch, HI, MH, ML and LO relays, blower motor, resistance and auto amplifier.

When the fan switch is set to AUTO, the mode is selected either B/L, FOOT or FOOT/DEF and the engine coolant temperature is below 56°C (133°F), the speed of the blower motor is fixed in the LO position.



SHA188DA

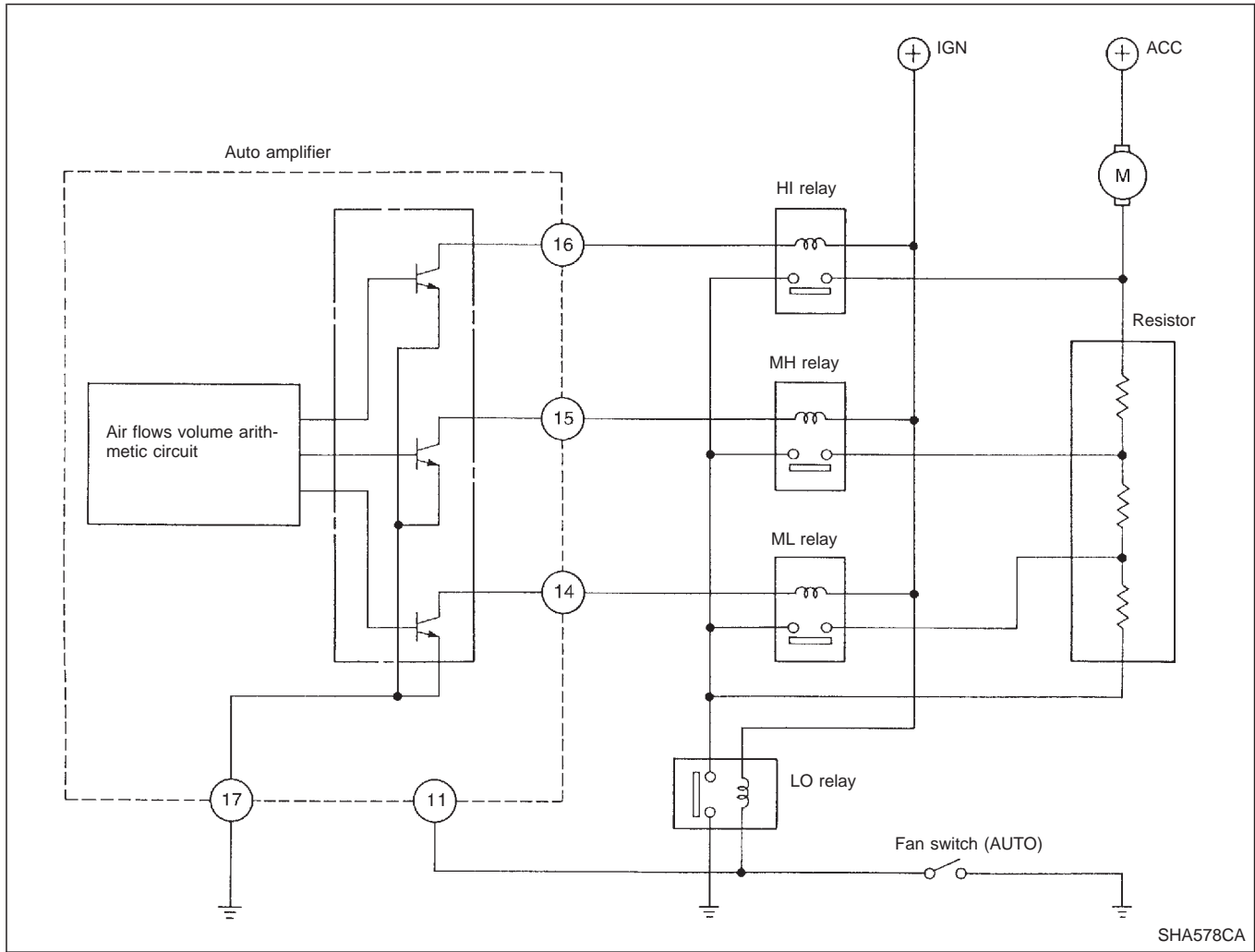


NHA304

LO, ML, MH AND HI RELAYS

The LO and ML relays are located on the auto amplifier bracket, and the MH and HI relays are installed on the back side of the audio unit. Each fan relay operates according to the air flow volume determined by the auto amplifier. The blower motor then operates accordingly.

Control System Output Components (Cont'd)



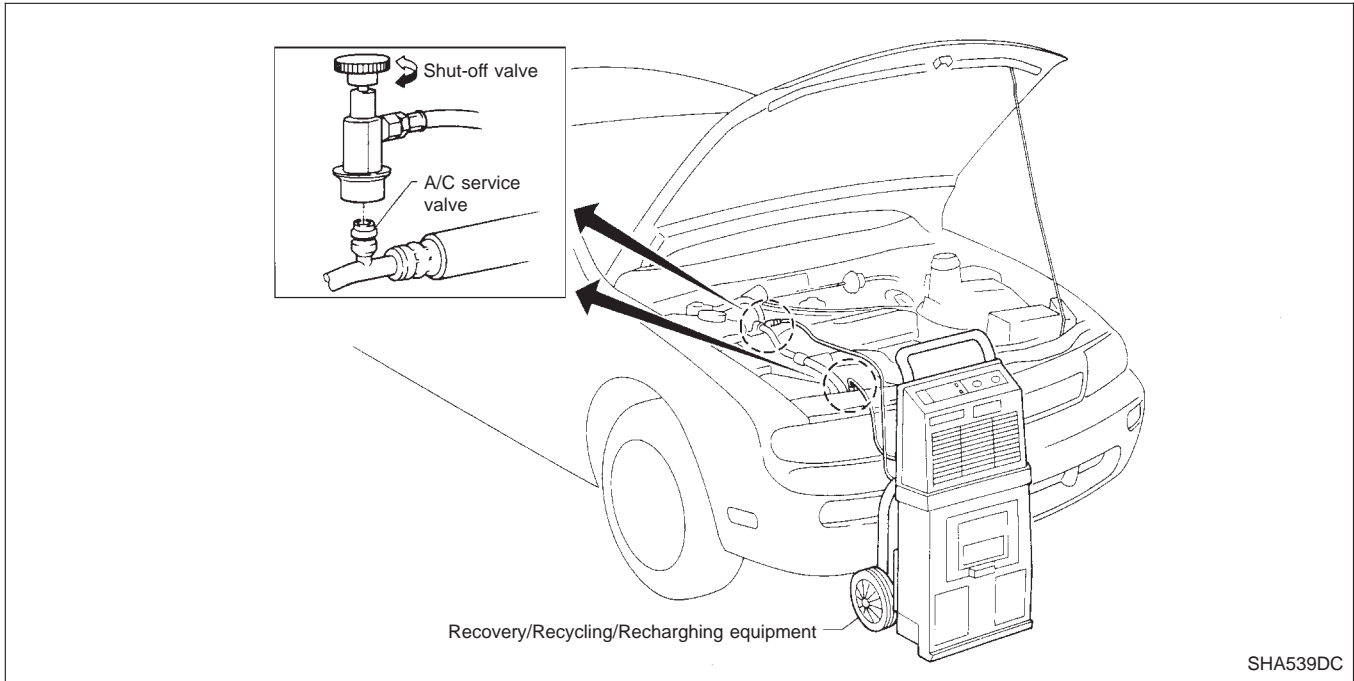
SHA578CA

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

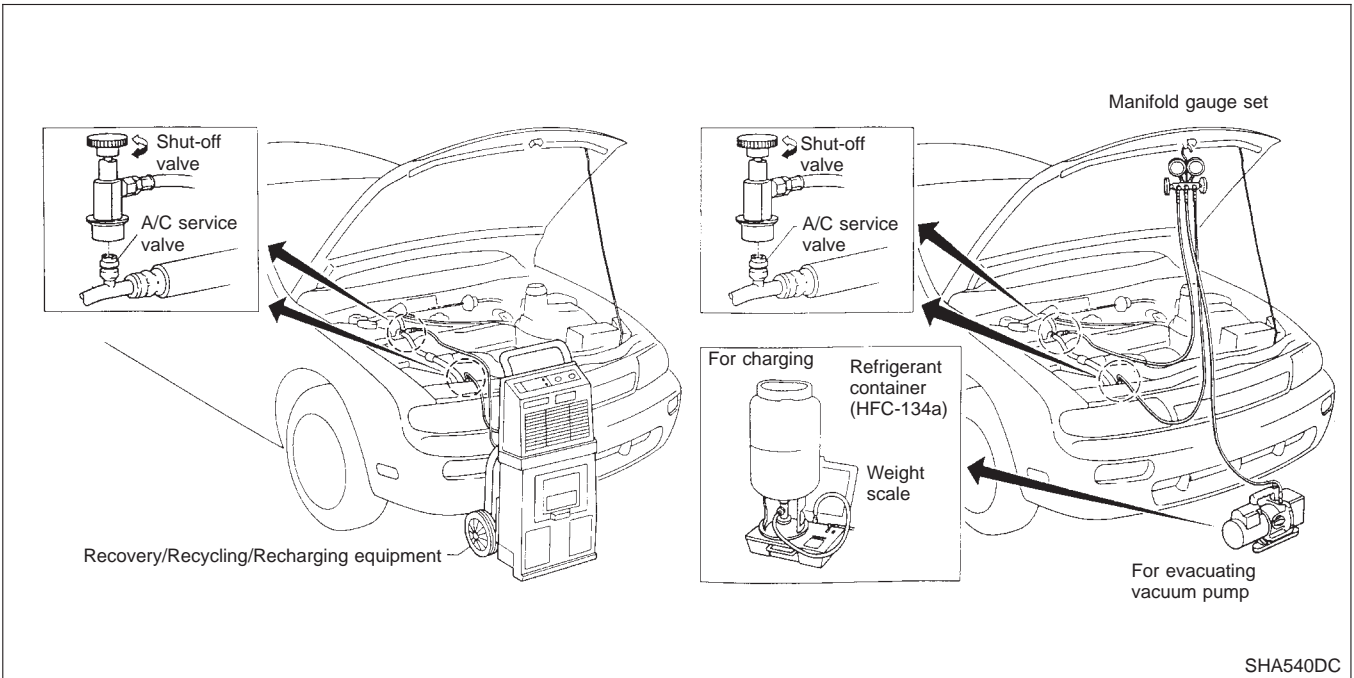
DISCHARGING REFRIGERANT

WARNING:

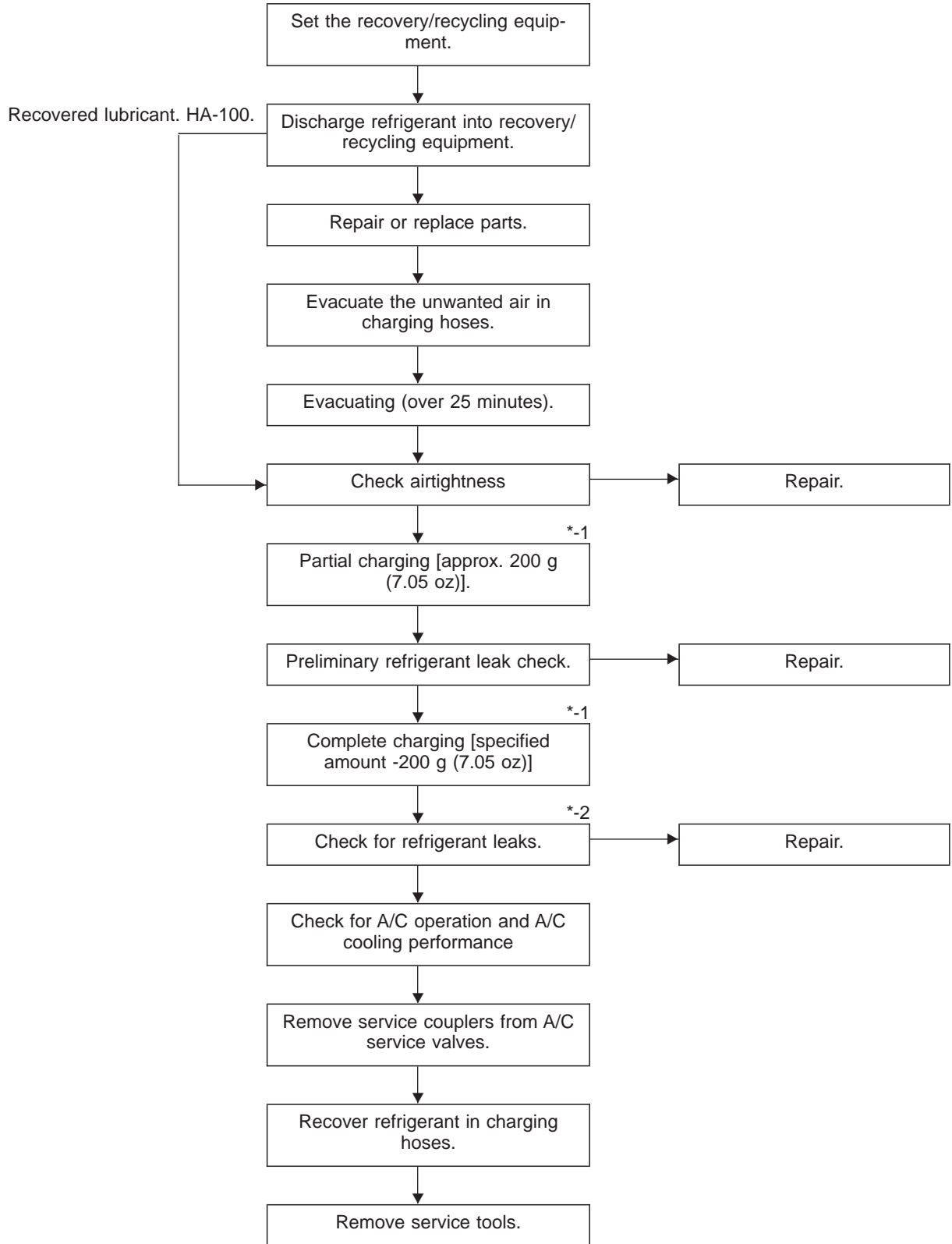
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of HFC-134a (R-134a) recycling equipment or HFC-134a (R-134a) recovery equipment. If accidental system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



EVACUATING SYSTEM AND CHARGING REFRIGERANT



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



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

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

Maintenance of Lubricant Quantity in Compressor

The lubricant used to lubricate the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large gas leakage occurred. It is important to maintain the specified amount.

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

CR-14

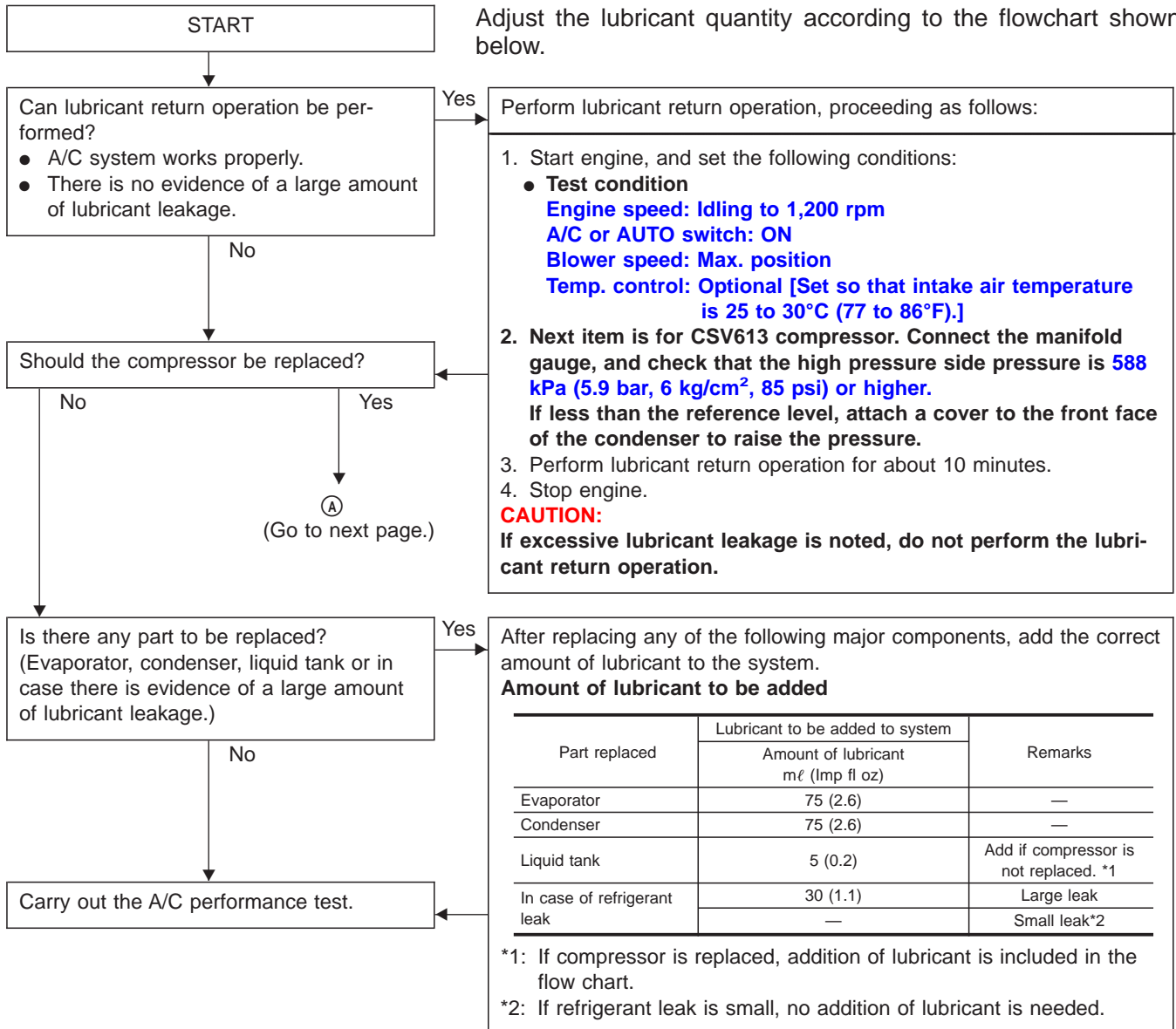
Name: Nissan A/C System Oil Type R
Part number: KLH00-PAGR0

CSV613

Name: Nissan A/C System Oil Type S
Part number: KLH00-PAGS0

CHECKING AND ADJUSTING

Adjust the lubricant quantity according to the flowchart shown below.



Maintenance of Lubricant Quantity in Compressor (Cont'd)



1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
2. Remove the drain plug of the "old"(removed) compressor (applicable only to V-5, V-6, DKS-16H or DKS-17CH compressor). Drain the lubricant into a graduated container and record the amount of drained lubricant.
3. Remove the drain plug and drain the lubricant from the "new" compressor into a separate, clean container.
4. 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. Torque the drain plug.

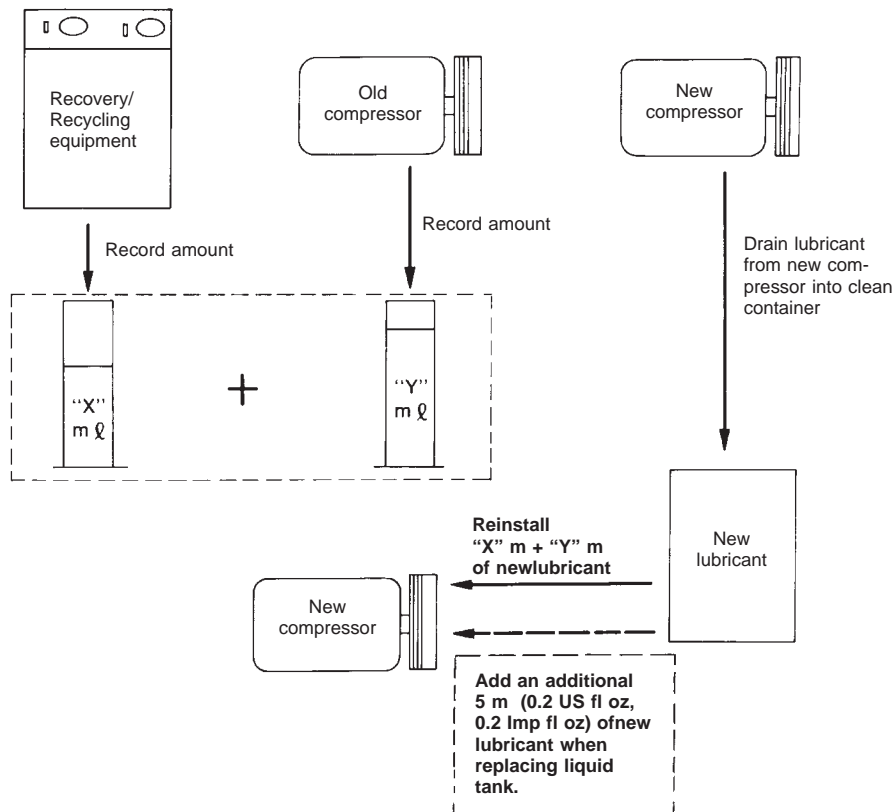
CWV618 or CSV613 compressor: 18 - 19 (1.8 - 1.9 kg-m, 13 - 14 ft-lb)

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

DKS-17CH compressor: 14 - 16 (1.4 - 1.6 kg-m, 10 - 12 ft-lb)

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

Do not add this 5 ml (0.2 Imp fl oz) of lubricant if only replacing the compressor.

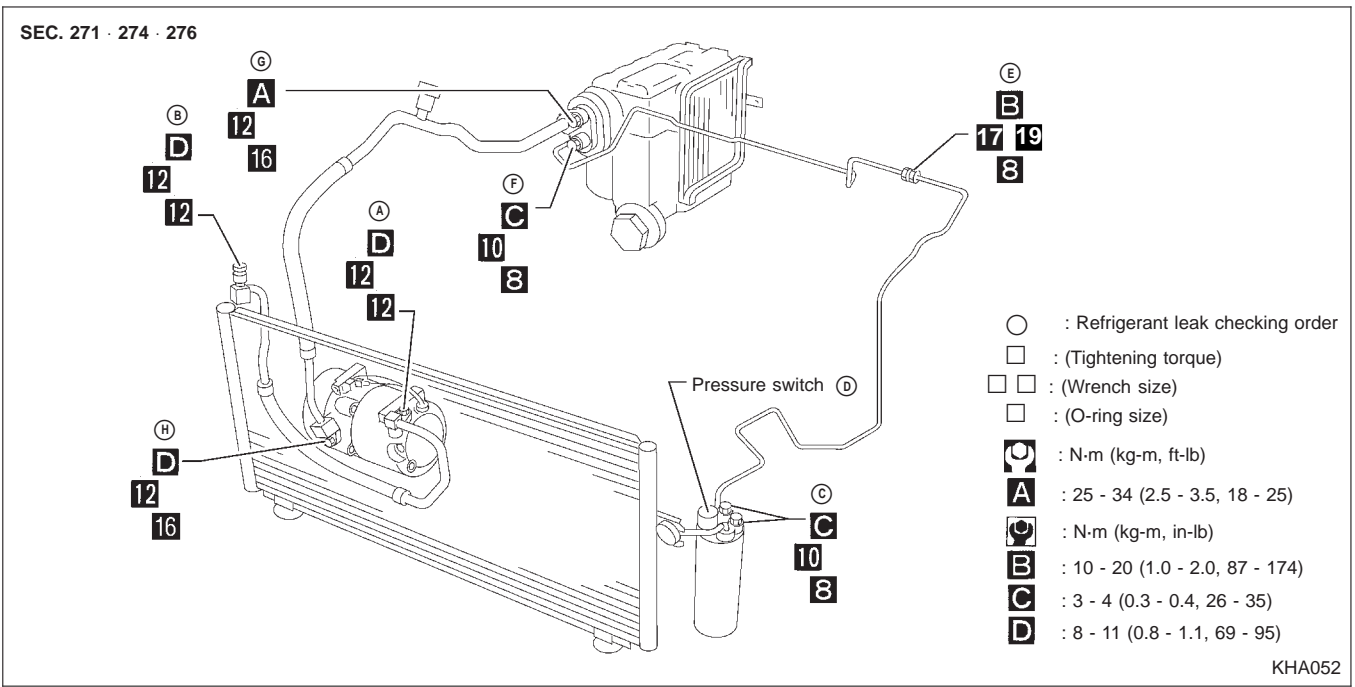
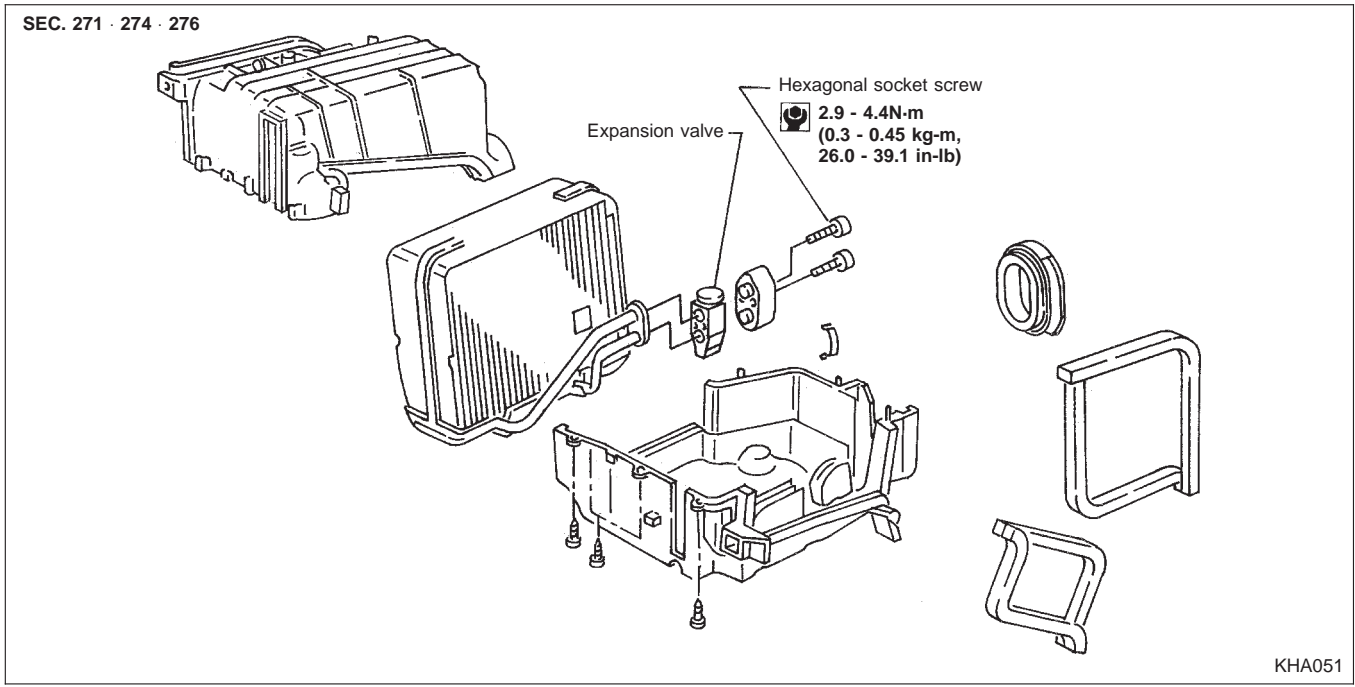


RHA065DD

Refrigerant Lines

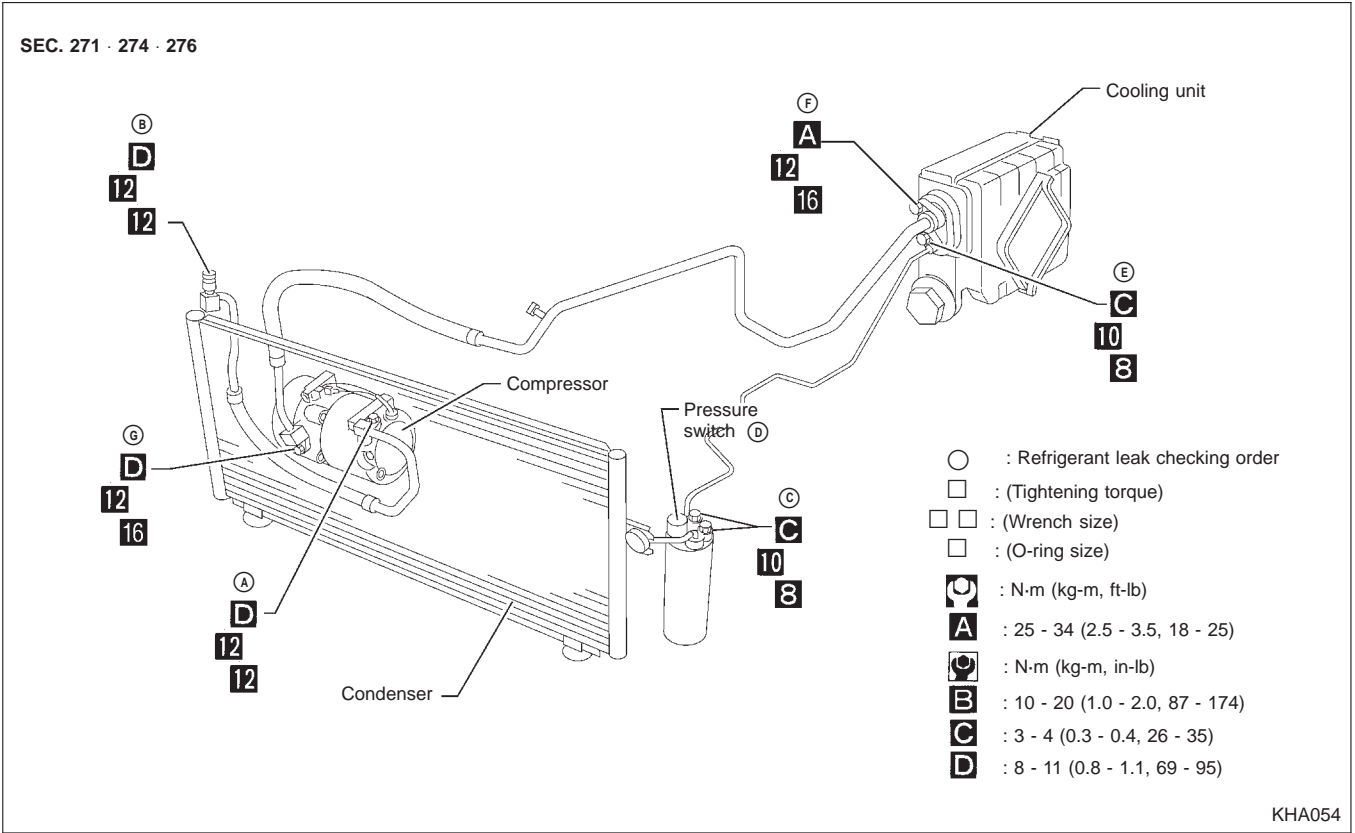
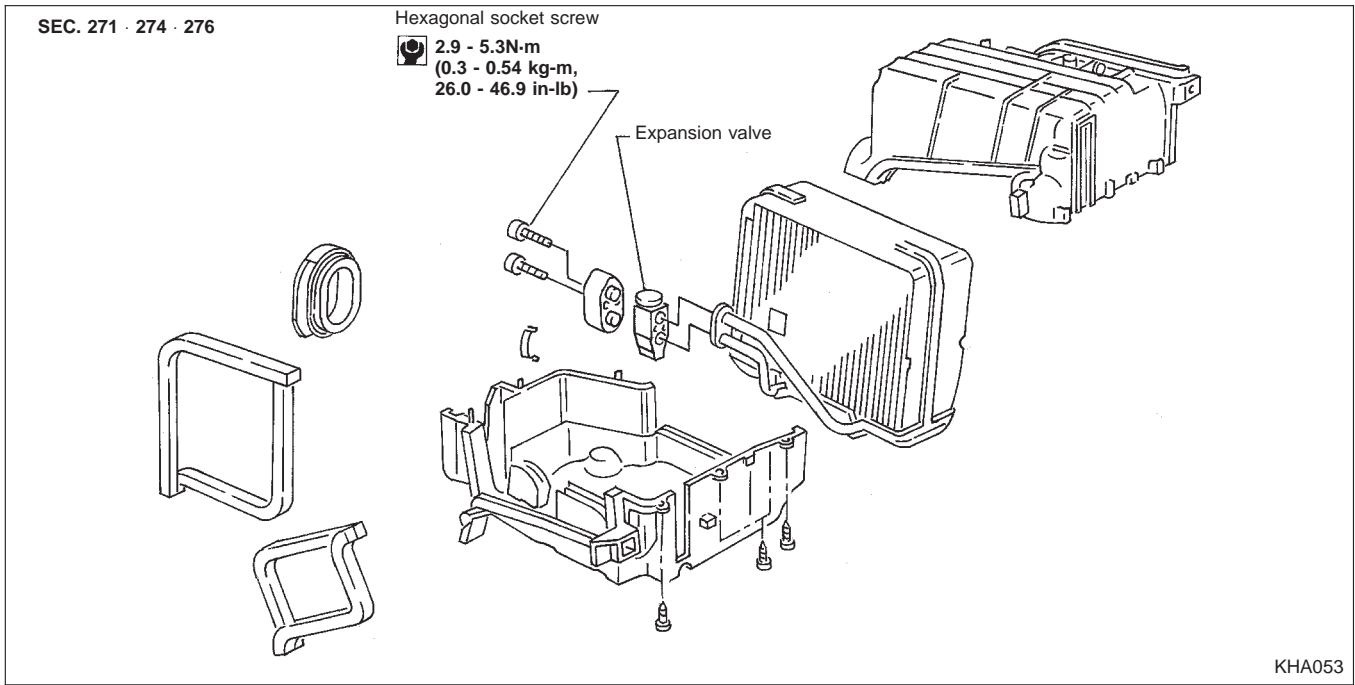
- Refer to page HA-4 regarding "Precautions for Refrigerant-Connection".

LHD MODELS



Refrigerant Lines (Cont'd)

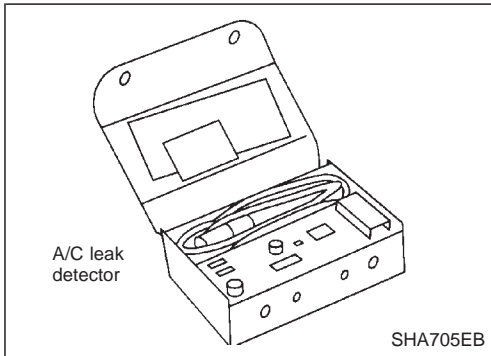
RHD MODELS



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.

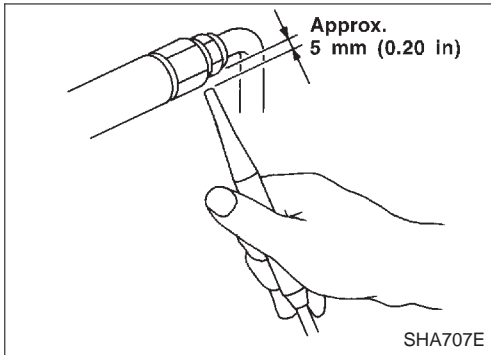


PRECAUTIONS FOR HANDLING LEAK DETECTOR

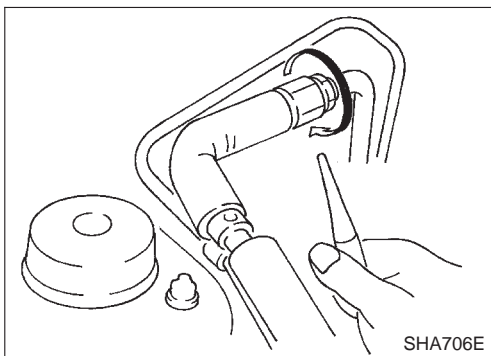
When performing a refrigerant leak check, use an A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

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

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



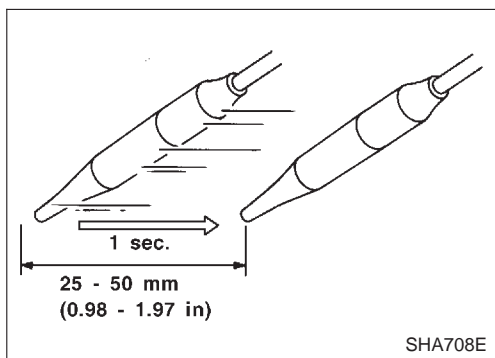
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



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

Checking Refrigerant Leaks (Cont'd)

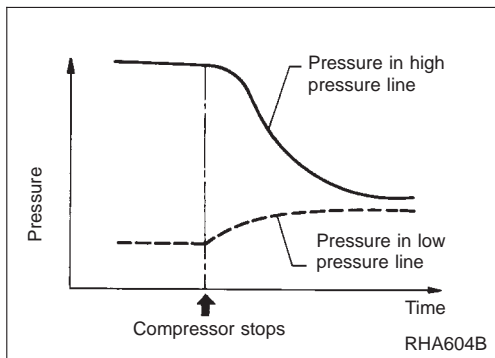
3. Move probe along component approximately 25 to 50 mm (1 to 2 in)/sec.



CHECKING PROCEDURE

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

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



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

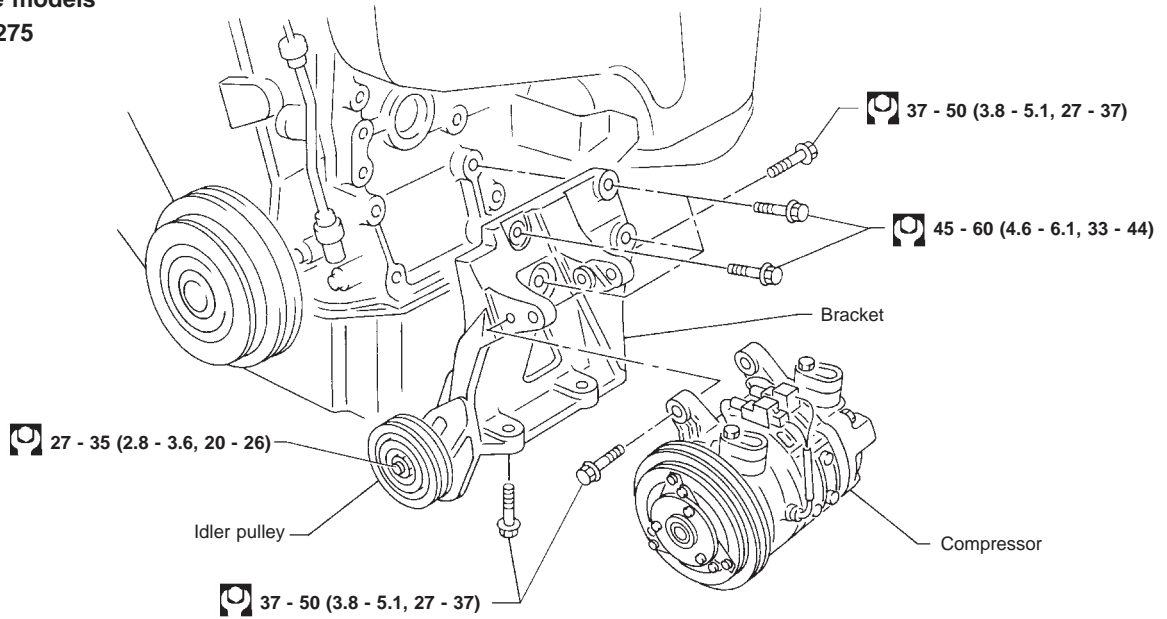
4. Conduct the leak test from the high side to the low side at points (A) through (H). Refer to HA-104, LHD models); (A) through (G) (Refer to HA-105, RHD models).
Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detector probe completely around the connection/component.
 - **Compressor**
Check the fitting of high and low pressure hoses, relief valve and shaft seal.
 - **Liquid tank**
Check the pressure switch, tube fitting and the fusible plug mounts.
 - **Service valves**
Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).
 - **Cooling unit (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.

Checking Refrigerant Leaks (Cont'd)

6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
7. Start engine.

Compressor Mounting

CD engine models
SEC. 274-275

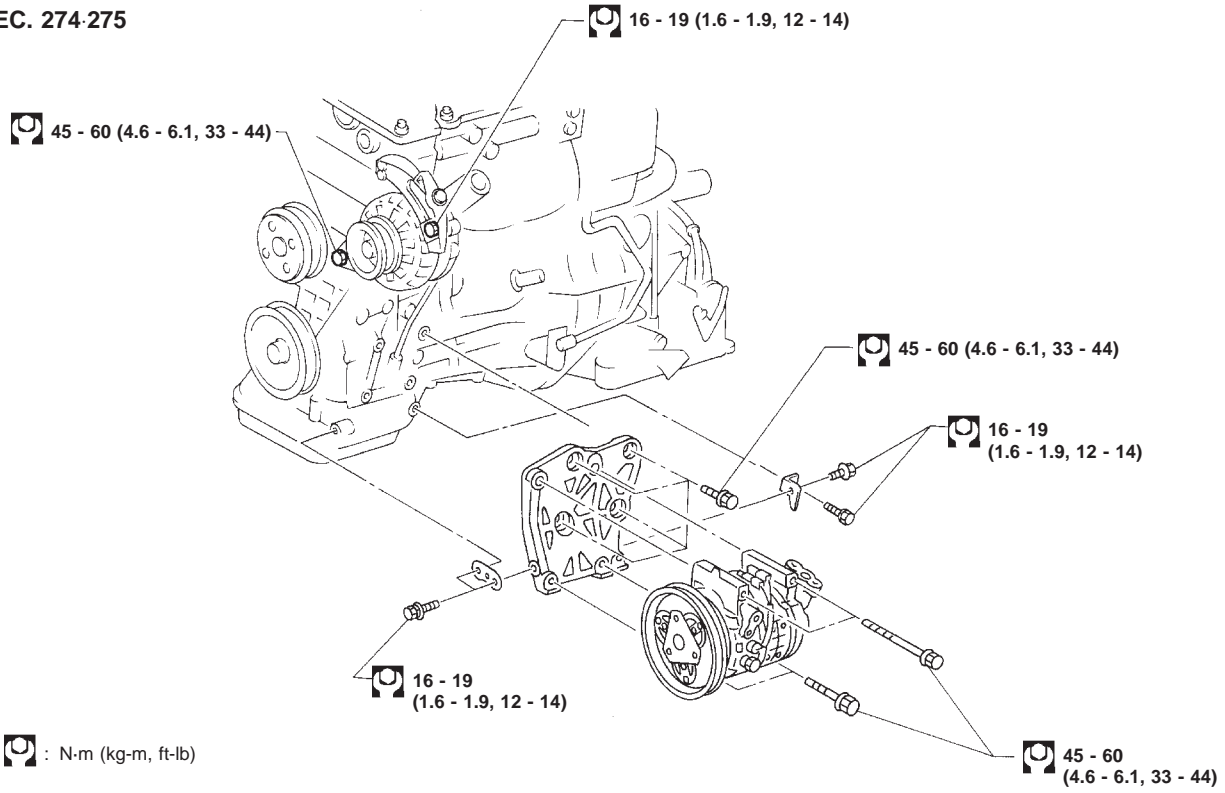


: N-m (kg-m, ft-lb)

KHA056

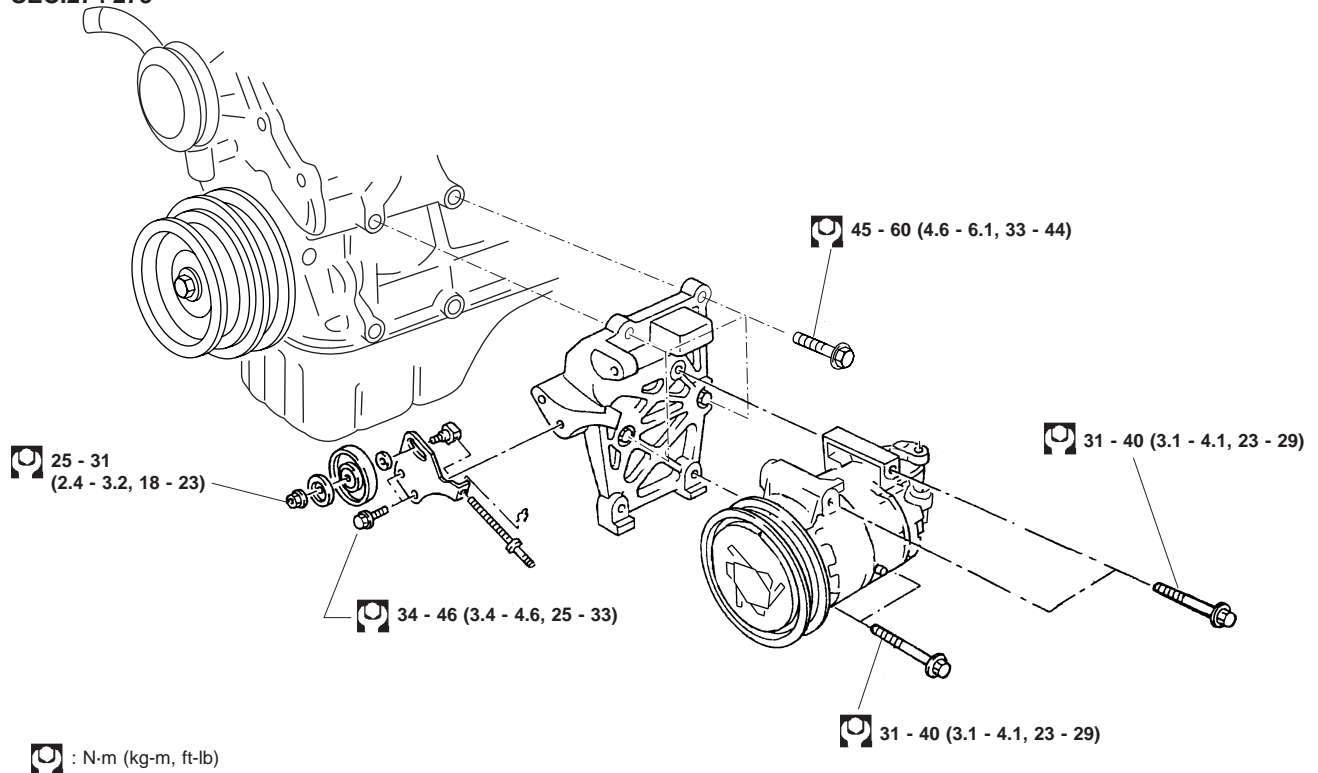
Compressor Mounting (Cont'd)

**SR engine models
SEC. 274-275**



KHA057

**QG engine models
SEC.274-275**



NHA316

Compressor Mounting (Cont'd)

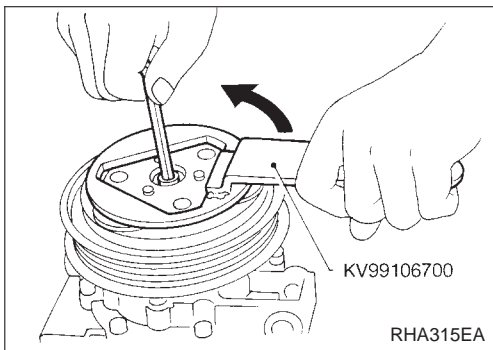
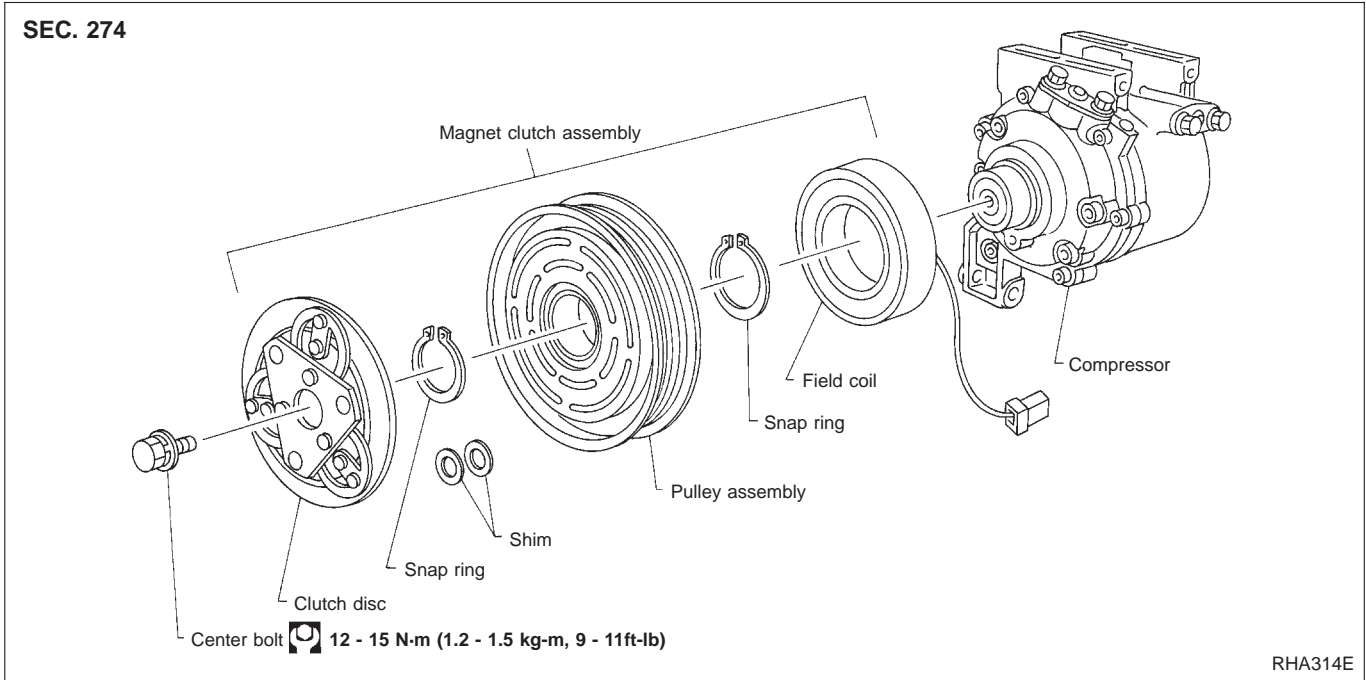
Belt tension

- Refer to MA section.

Fast Idle Control Device (FICD)

- refer to EC section.

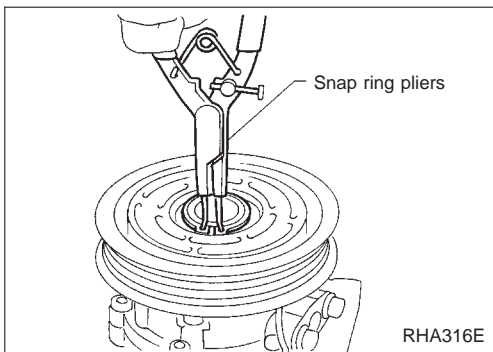
Compressor — Model CR-14 (Calsonic make)



Compressor Clutch

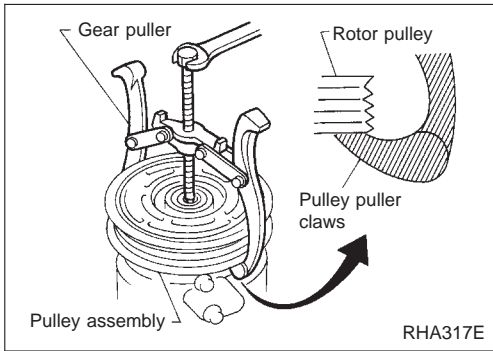
REMOVAL

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

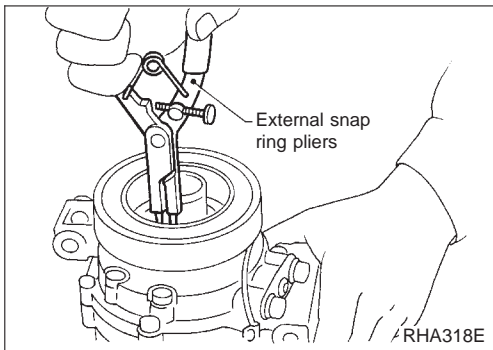


- Remove snap ring (which secures rotor pulley) by using external snap ring pliers.

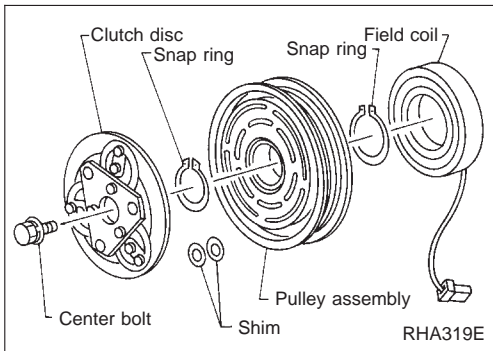
Compressor Clutch (Cont'd)



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



- Remove snap ring (which secures field coil) by using external snap ring pliers.



INSPECTION

Clutch disc

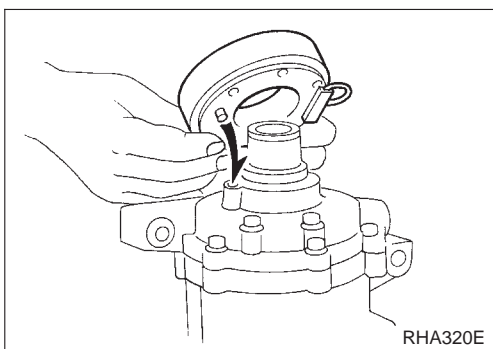
If the contact surface shows signs of damage due to excessive heat, the clutch disc and pulley should be replaced.

Pulley

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

Coil

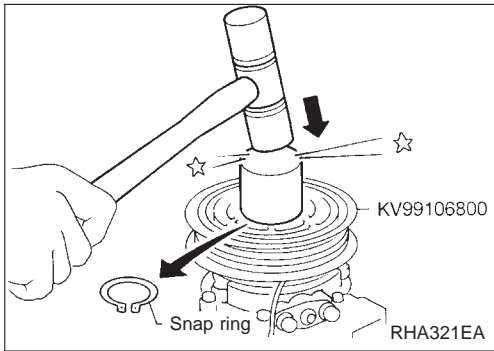
Check coil for loose connection or cracked insulation.



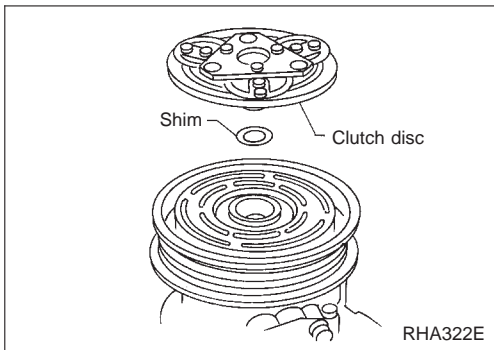
INSTALLATION

- Position the field coil.
Be sure to align the coil's pin with the hole in compressor's front head.
- Install snap ring (which secures field coil) by using external snap ring pliers.

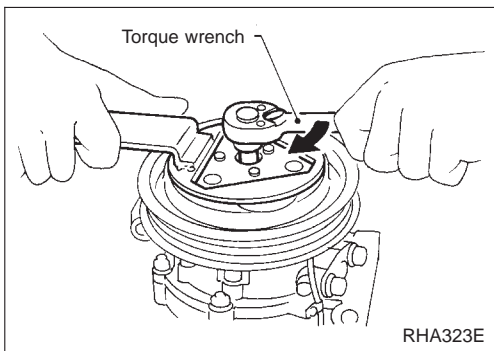
Compressor Clutch (Cont'd)



- Position and install pulley assembly securely by using plastic hammer.
- Install snap ring (which secures rotor pulley) by using external snap ring pliers.

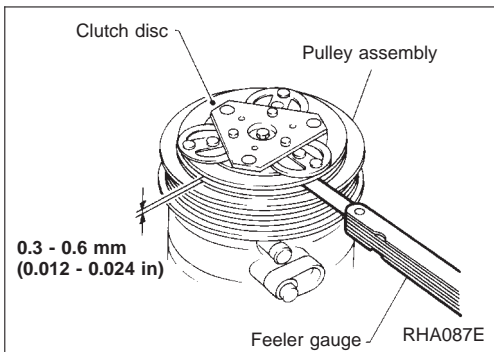


- Install the clutch disc on the drive shaft, together with the original shim(s). Press the disc down by hand.



- Using the clutch wrench disc to prevent clutch disc rotation, tighten the bolt to 12 to 15 N-m (1.2 to 1.5 kg-m, 9 to 11 ft-lb) torque.

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



- Check clearance around the entire periphery of clutch disc.
Disc-to-pulley clearance:
0.3 - 0.6 mm (0.012 - 0.024 in)
 If the specified clearance is not obtained, replace adjusting spacer and readjust.

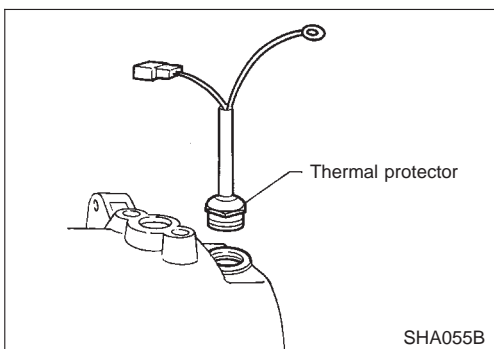
BREAK-IN OPERATION

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

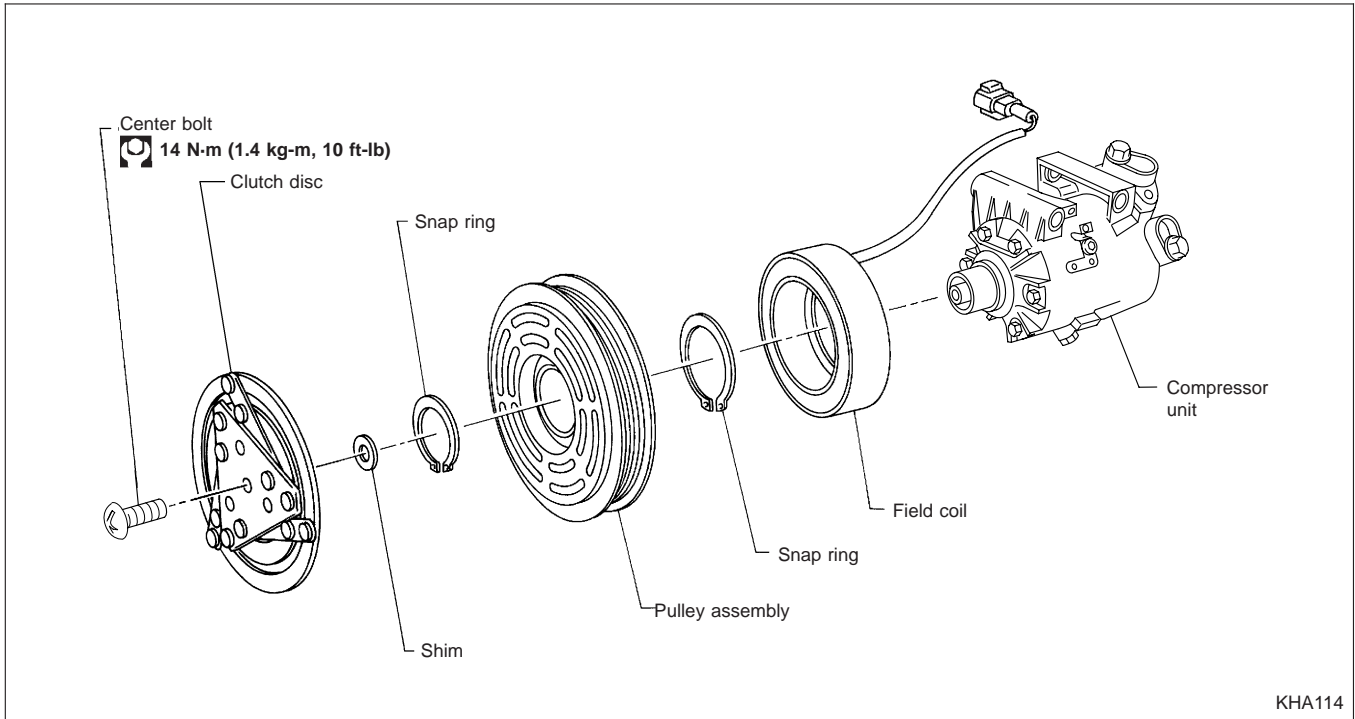
Thermal Protector

INSPECTION

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



CSV613 Compressor

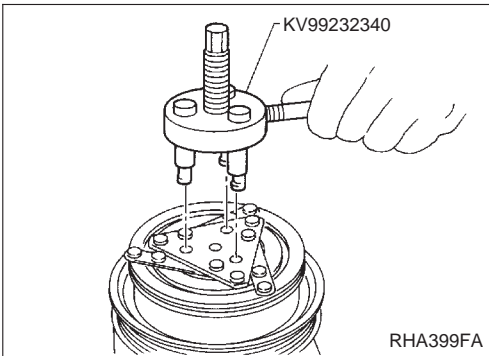
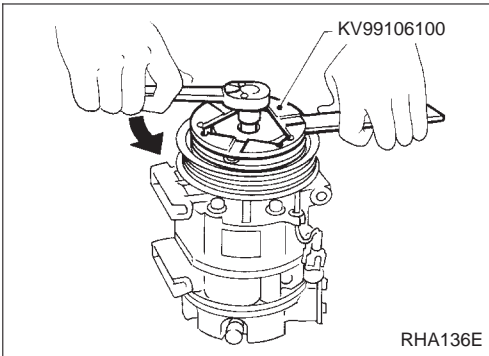


KHA114

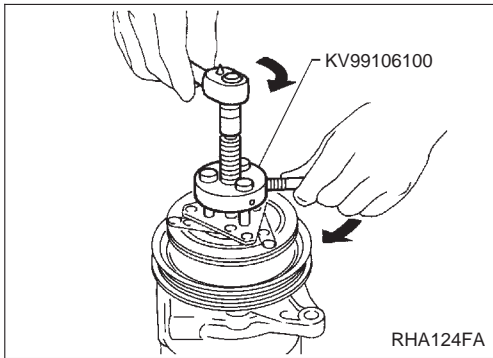
Compressor Clutch

REMOVAL

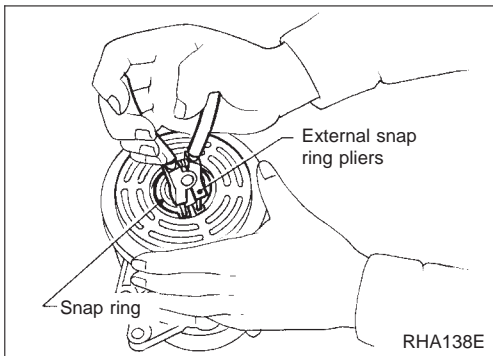
- When removing center bolt, hold clutch disc with clutch disc wrench.



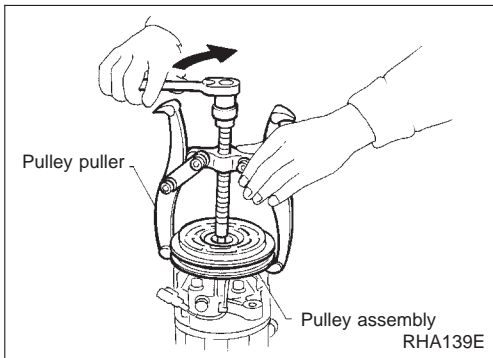
Compressor Clutch (Cont'd)



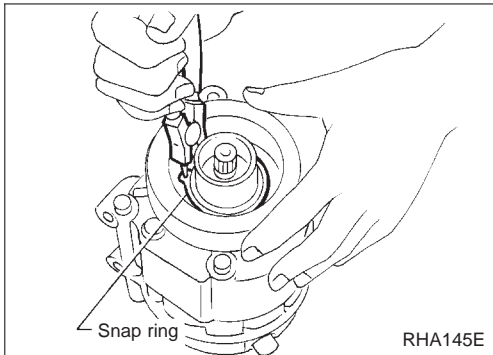
- Remove the clutch disc using the clutch disc puller. Insert the holder's three pins into the holes in the clutch disc. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the clutch disc. After removing the clutch disc, remove the shims from either the drive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



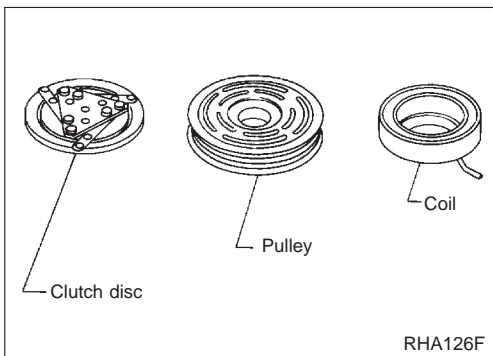
- Remove the snap ring using external snap ring pliers.



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



- Remove the field coil harness clip.
- Remove the snap ring using external snap ring pliers.



INSPECTION

Clutch disc

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

Pulley

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

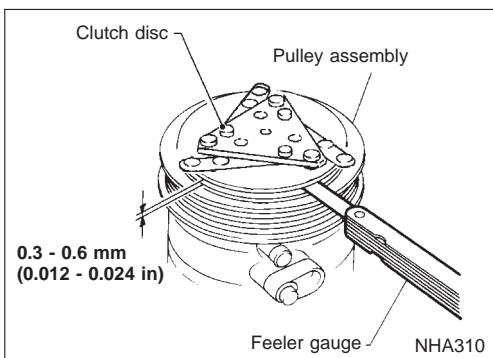
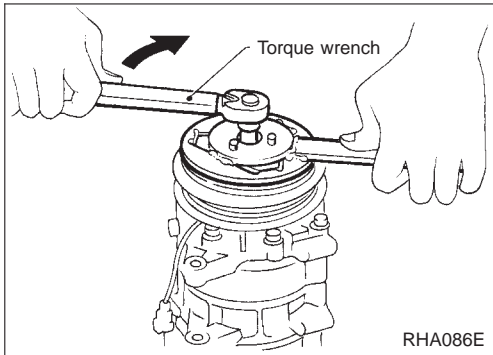
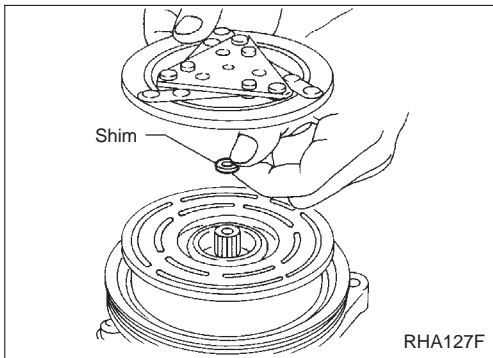
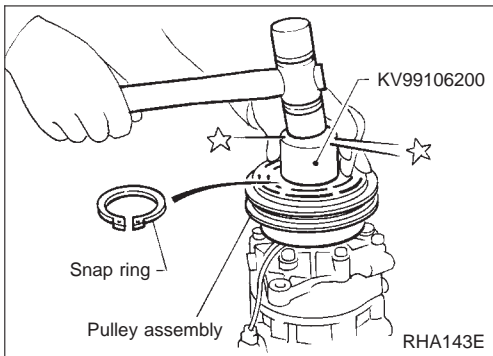
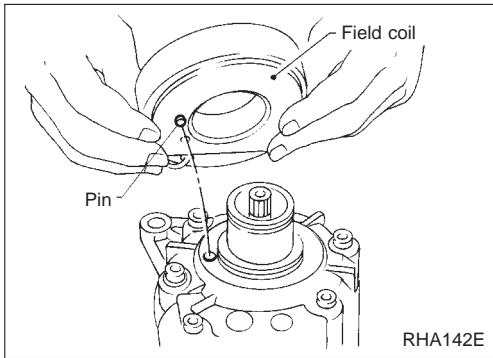
Compressor Clutch (Cont'd)

Coil

Check coil for loose connection or cracked insulation.

INSTALLATION

- Install the field coil.
Be sure to align the coil's pin with the hole in the compressor's front head.
- Install the field coil harness clip using a screwdriver.



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

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

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

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

- Check clearance around the entire periphery of clutch disc.
Disc-to-pulley clearance:
0.3 - 0.6 mm (0.012 - 0.024 in)
If the specified clearance is not obtained, replace adjusting spacer and readjust.

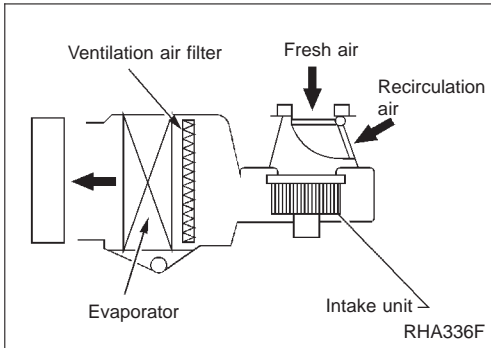
BREAK-IN OPERATION

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

Ventilation Air Filter

FUNCTION

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing ventilation air filter into cooling unit.



| |
|---|
| <p>VORBEREITUNGEN FÜR LUFTUNGSFILTER NISSAN</p> <p>• DIESES FAHRZEUG IST EINER LUFTUNGSFILTER AUSGESTATTET, WELCHER SCHMUTZ, POLLEN, STAUB etc. SAMMELT.</p> <p>• UM DIE LEISTUNG DER KLIMAAANLAGE, HEIZUNG, LÜFTUNG UND ENTEISUNG DER WINDSCHUTZSCHEIBE ZU GEWÄHRLEISTEN, TAUSCHEN SIE DEN FILTER REGELMÄSSIG.</p> <p>• SUCHE SIE ZWECKS FILTERAUSTAUSCHEN IHRE VERTRAGSWERKSTÄTT AUF.</p> <p>AUSTAUSCH DES FILTERS JEDE ALLE 30.000 KM ODER 1 JAHR.</p> <p>PRECAUTIONS D'UTILISATION DU FILTER ANTI-POLLEN</p> <p>• CE VEHICULE EST EQUIPE D UN FILTER ANTI-POLLEN POUR LES POUSSIERES, LES ETES, LE POLLEN...</p> <p>• AFIN D ASSURER LE BON FONCTIONNEMENT DU CONDITIONNEMENT D AIR, DU CHAUFFAGE, DU DESEMBLAGE ET DE LA VENTILATION, REMPLACEZ CE FILTER REGULIEREMENT.</p> <p>• CONTACTEZ VOTRE CONCESSIONNAIRE POUR TOUT REMPLACEMENT.</p> <p>REPLACEZ CE FILTRE TOUS LES 30.000 KM OU 1 AN.</p> <p>PRECAUTION FOR VENTILATION AIR FILTER</p> <p>• THIS VEHICLE IS EQUIPPED WITH A VENTILATION AIR FILTER WHICH COLLECTS DIRT, POLLEN, DUST etc.</p> <p>• TO ENSURE A/C HEATING, DEFROSTING, AND VENTILATION PERFORMANCE, PLEASE REPLACE THE FILTER REGULARLY.</p> <p>• CONTACT YOUR DEALER FOR PART REPLACEMENT.</p> <p>(REPLACE THE PART EVERY 30,000 KM OR 1 YEAR)</p> |
|---|

SHA868E

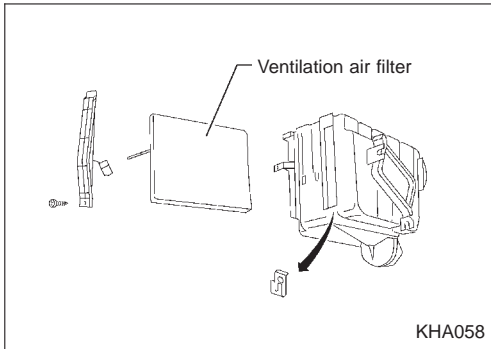
REPLACEMENT TIMING

Replace ventilation air filter every 2 years or 30,000 km (15,000 miles).

Caution label is fixed inside the glove box.

REPLACEMENT PROCEDURES

- Remove instrument lower cover with glove box. Refer to BT section.
- Take out ventilation air filter which is secured with one clip, from cooling unit.
- Replace with new one and reinstall instrument lower cover and glove box.



KHA058

General Specifications

COMPRESSOR

| | | |
|-----------------------|--------------------------------------|--------------------------|
| Model | CD20T engine | SR20DE, QG16-18DE engine |
| | CALSONIC make CR-14 | CALSONIC make CSV613 |
| Type | Vane rotary | Variable displacement |
| Displacement | cm ³ (cu in)/Rev | 144 (8.79) |
| Direction of rotation | Clockwise (Viewed from drive end) | |
| Drive belt | CD engine model: Type A | Poly V |

LUBRICANT

| | | |
|--|------------------------------|------------------------------|
| Model | CALSONIC make CR-14 | CALSONIC make CSV613 |
| Name | Nissan A/C System Oil Type R | Nissan A/C system Oil Type S |
| Part number | KLH00-PAGR0 | KLH00-PAGS0 |
| Capacity | mℓ (Imp fl oz) | |
| Total in system | 180 (6.3) | 200 (7.04) |
| Compressor (Service parts) charging amount | 180 (6.3) | 200 (7.04) |

REFRIGERANT

| | |
|----------|---------------------------|
| Type | HFC-134a |
| Capacity | kg (lb) |
| | 0.60 ± 0.05 (1.32 ± 0.11) |

Inspection and Adjustment

ENGINE IDLING SPEED

When A/C is ON
Refer to EC section.

BELT TENSION

Refer to Checking Drive Belts (MA section).

COMPRESSOR

| | |
|---------------------------------|-----------------|
| Model | CR-14/CSV613 |
| Clutch disc-to-pulley clearance | 0.3 - 0.6 |
| mm (in) | (0.012 - 0.024) |