

HEATER & AIR CONDITIONER

SECTION HA

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

NAHA0153

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 composition which is available to NISSAN MODEL R50 is as follows:

- For a frontal collision
The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger 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 side air bag module (located in the outer side of front seat), side curtain air bag module (located in the headlining side of front and rear 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).

WARNING:

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

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

NAHA0154

WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor failure is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely 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 HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment, or J2209 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.
 - e) Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

CONTAMINATED REFRIGERANT

NAHA0154S01

If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, your options are:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.

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- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended.
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact Nissan Customer Affairs for further assistance.

General Refrigerant Precautions

NAHA0155

WARNING:

- **Do not release refrigerant into the air. Use approved recovery/recycling equipment to capture the refrigerant every time an air conditioning system is discharged.**
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.**
- **Do not store or heat refrigerant containers above 52°C (125°F).**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.**

Precautions for Leak Detection Dye

NAHA0247

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant leak detector (J-41995).
- Always remove any dye from the leak area after repairs are complete to avoid a misdiagnosis during a future service.
- Do not allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed.
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.).
- Do not use more than one refrigerant dye bottle (1/4 ounce /7.4 cc) per A/C system.
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C systems or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor malfunction occurs.

AIR CONDITIONER		NISSAN
REFRIGERANT KÜHLMITTEL FLUIDE FRIGORIGENE REFRIGERANTE REFRIGERANTE	COMPRESSOR LUBRICANT KOMPRESSOR ÖL LUBRIFIANT DU COMPRESSEUR OLEO DO COMPRESSOR LUBRICANTE COMPRESOR	
HFC-134a (R134a)	Nissan UV Luminous Oil Type S [KLH00-PAGS0]	

RJA2721E

Precaution for Identification Label on Vehicle

NAHA0248

- Vehicles with factory installed fluorescent dye have this identification label on the under side of hood.
- Vehicles with factory installed fluorescent dye have a green label.
- Vehicles without factory installed fluorescent dye have a blue label.

Precautions for Refrigerant Connection

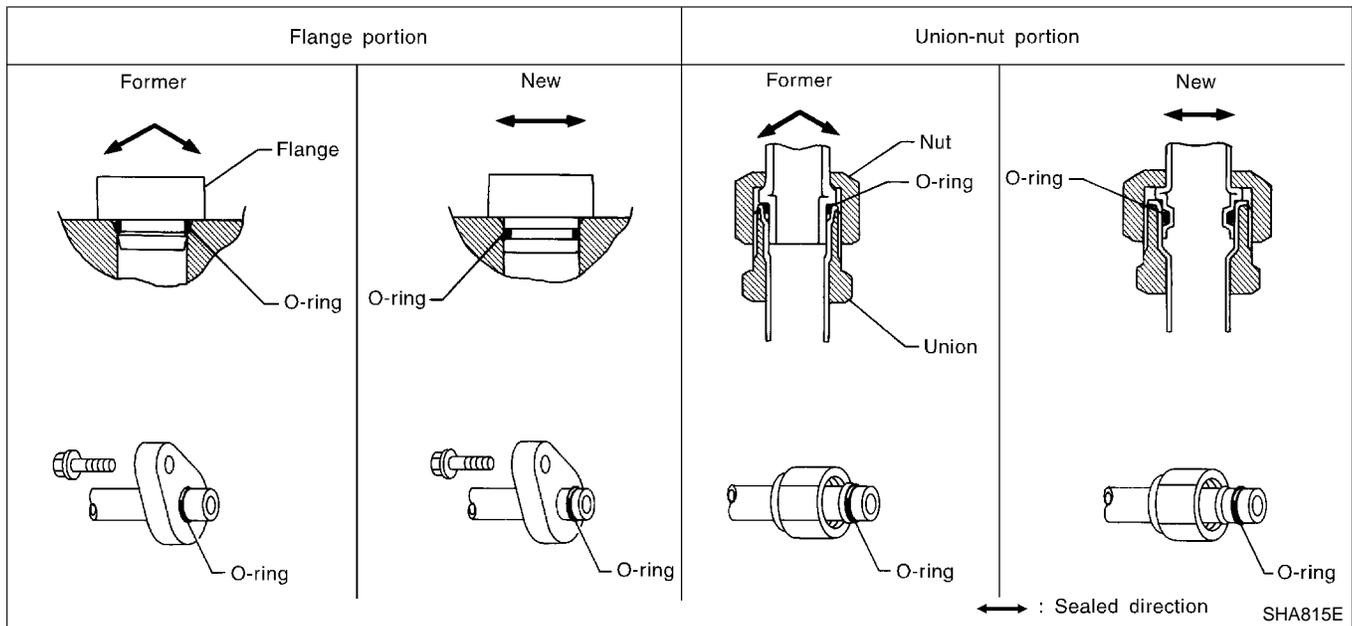
NAHA0156

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

- Expansion valve to evaporator

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

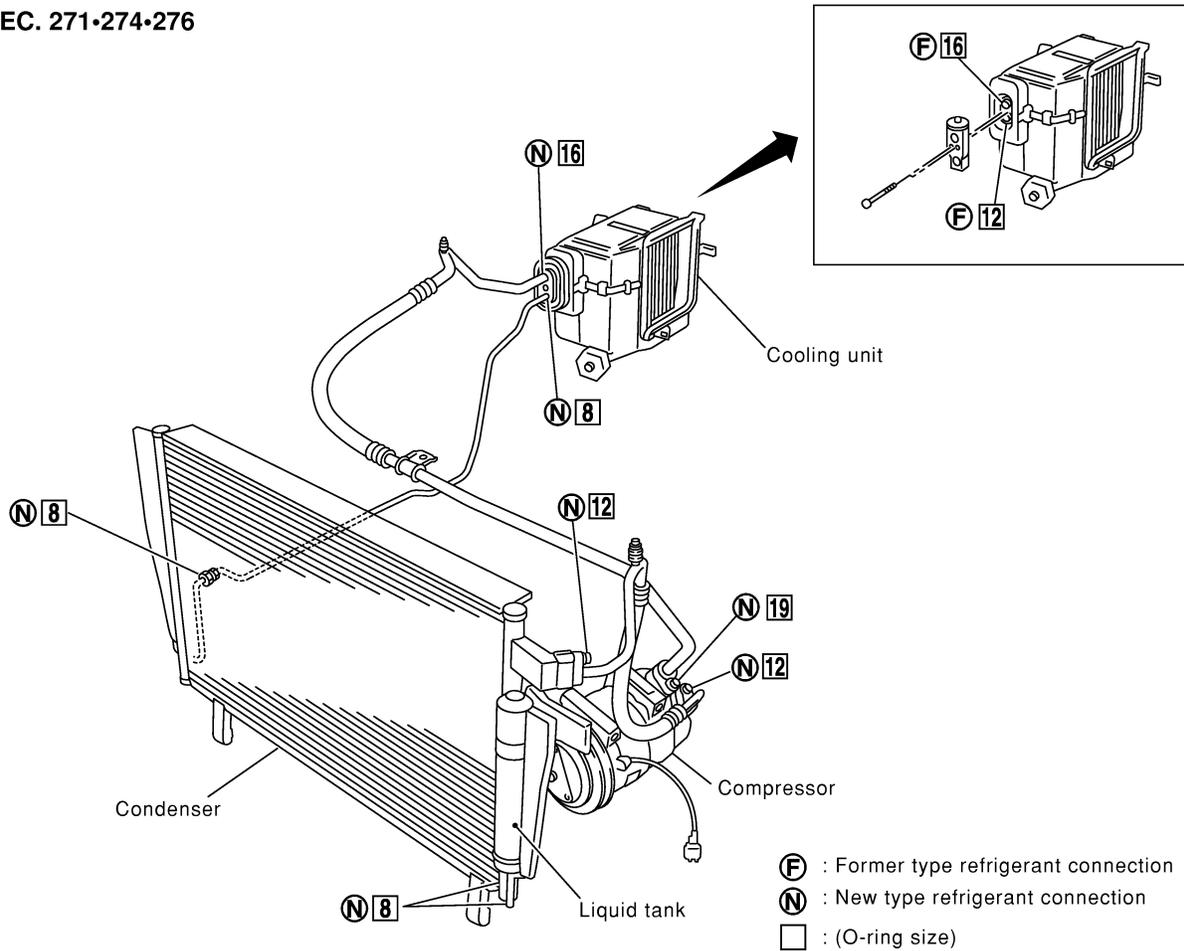
- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part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



O-RING AND REFRIGERANT CONNECTION

NAHA0156S02

SEC. 271•274•276



RHA068I

CAUTION:

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

O-Ring Part Numbers and Specifications

NAHA0156S0201

	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	92472 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 (0.0906)
SHA814E	New	19	92474 N8210	16.5 (0.650)	2.43 (0.0957)
	Former		92477 N8200	17.12 (0.6740)	1.78 (0.0701)

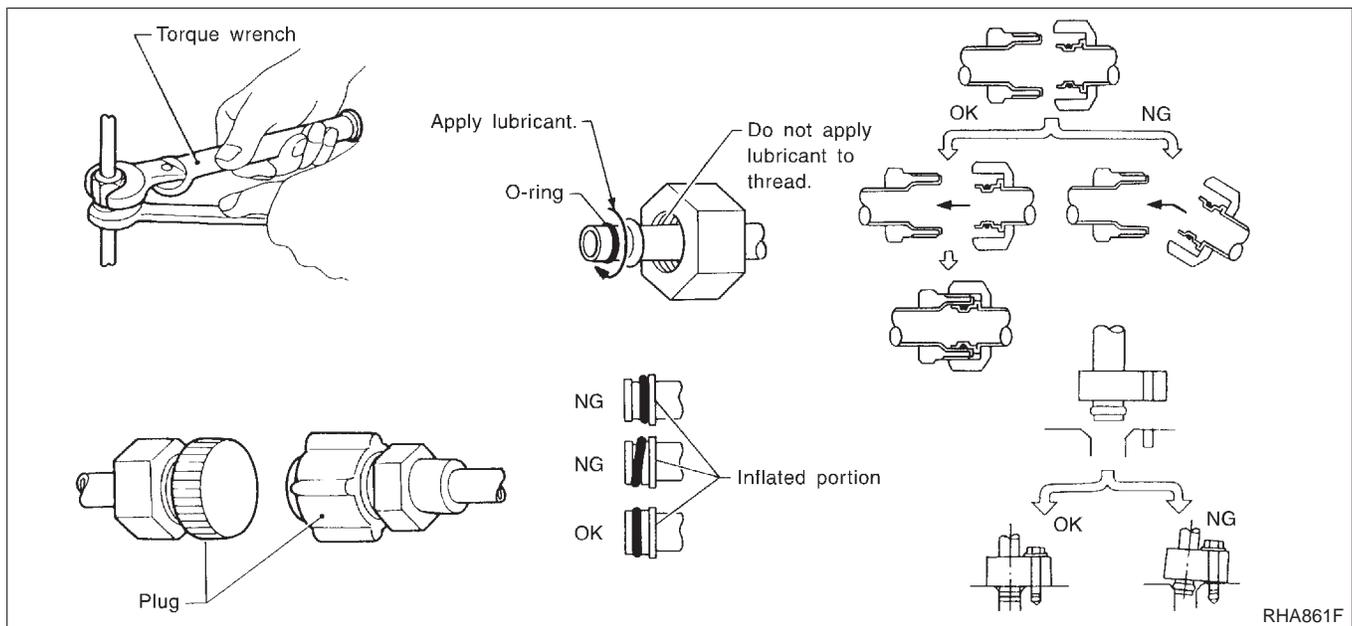
WARNING:

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



Precautions for Servicing Compressor

NAHA0157

- 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-136.
- 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 usual operation.

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**Precautions for Service Equipment
RECOVERY/RECYCLING EQUIPMENT**

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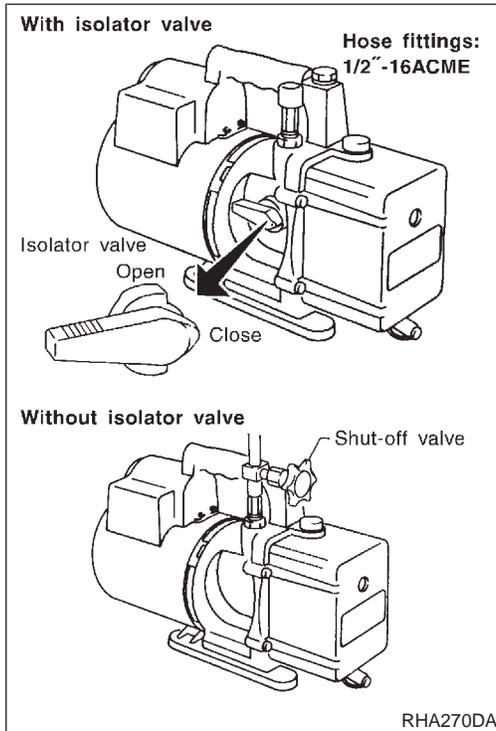
NAHA0158S01

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

ELECTRONIC LEAK DETECTOR

NAHA0158S02

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



VACUUM PUMP

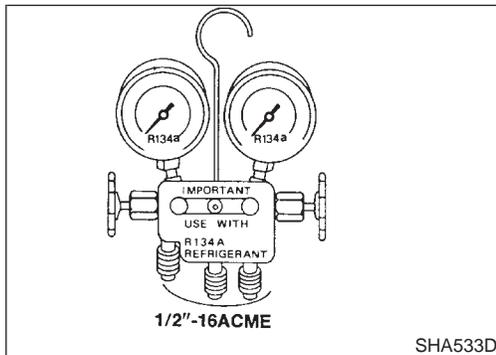
NAHA0158S03

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.

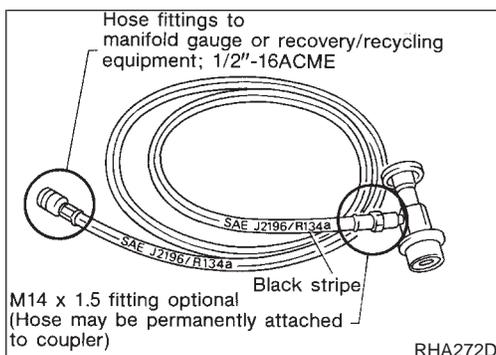
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



MANIFOLD GAUGE SET

NAHA0158S04

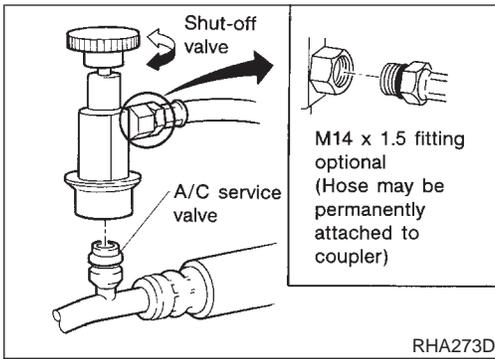
Be certain that the gauge face indicates HFC-134a or R-134a. Be sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) and specified lubricants.



SERVICE HOSES

NAHA0158S05

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.

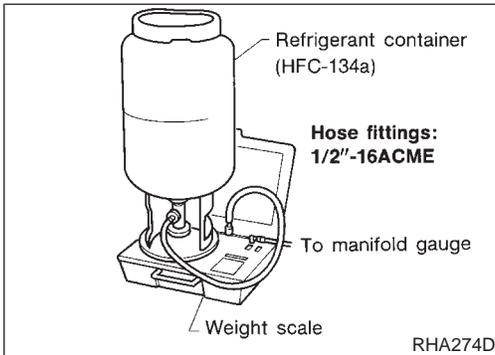


SERVICE COUPLERS

NAHA0158S06

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

NAHA0158S07

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

NAHA0158S09

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.

Wiring Diagrams and Trouble Diagnoses

NAHA0159

When you read wiring diagrams, refer to the following:

- GI-11, "HOW TO READ WIRING DIAGRAMS"
- EL-12, "Wiring Diagram — POWER —".

When you perform trouble diagnoses, refer to the following:

- GI-34, "HOW TO FOLLOW TROUBLE DIAGNOSES"
- GI-24, "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT"

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Special Service Tools

NAHA0160

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

Tool number (Kent-Moore No.) Tool name	Description
KV99106100 (J-41260) Clutch disc wrench	<div style="display: flex; justify-content: space-between;"> <div data-bbox="407 520 477 548">NT232</div> <div data-bbox="516 338 829 506"> </div> <div data-bbox="943 327 1170 359">Removing center bolt</div> </div> <div style="margin-top: 20px;"> <div data-bbox="537 569 727 751"> </div> <div data-bbox="488 753 808 884"> <p>When replacing the magnet clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.</p> </div> <div data-bbox="456 892 889 1010"> <p style="margin-left: 100px;">Pin</p> <p style="margin-left: 200px;">Clutch disc wrench</p> </div> <div data-bbox="407 1037 477 1062">NT378</div> </div>
KV99232340 (J-38874) or KV992T0001 (—) Clutch disc puller	<div style="display: flex; justify-content: space-between;"> <div data-bbox="407 1302 477 1329">NT376</div> <div data-bbox="532 1077 816 1287"> </div> <div data-bbox="943 1073 1170 1104">Removing clutch disc</div> </div>
KV99106200 (J-41261) Pulley installer	<div style="display: flex; justify-content: space-between;"> <div data-bbox="407 1480 477 1507">NT235</div> <div data-bbox="626 1346 721 1465"> </div> <div data-bbox="943 1339 1109 1371">Installing pulley</div> </div>

PREPARATION

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

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

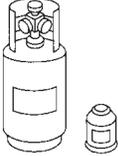
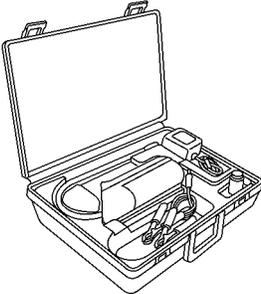
=NAHA0161

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

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

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

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

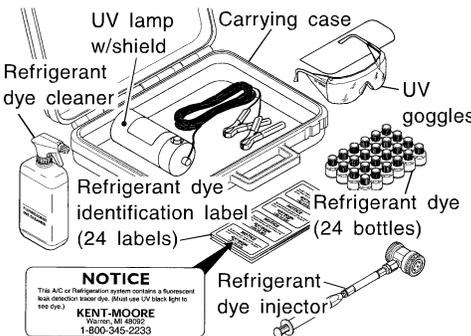
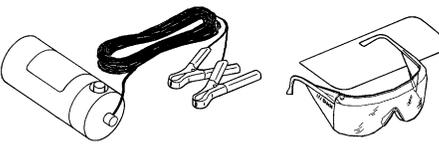
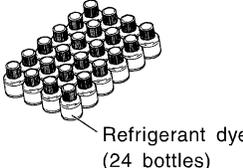
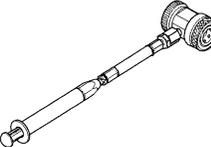
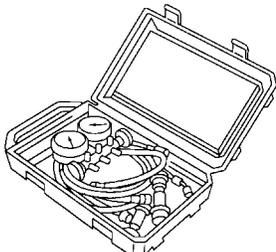
Tool number (Kent-Moore No.) Tool name	Description
HFC-134a (R-134a) refrigerant	 <p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size</p> <ul style="list-style-type: none"> ● Large container 1/2"-16 ACME <p>NT196</p>
KLH00-PAGS0 (—) Nissan A/C System Oil Type S	 <p>Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) wobble (swash) plate (piston) compressors (Nissan only) Lubricity: 40 mℓ (1.4 US fl oz, 1.4 Imp fl oz)</p> <p>NT197</p>
(J-43600) Recovery/Recycling Recharging equipment (ACR2000)	 <p>Function: Refrigerant Recovery and Recycling and Recharging</p> <p>WJIA0293E</p>
(J-41995) Electrical leak detector	 <p>Power supply:</p> <ul style="list-style-type: none"> ● DC 12V (Cigarette lighter) <p>AHA281A</p>

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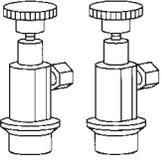
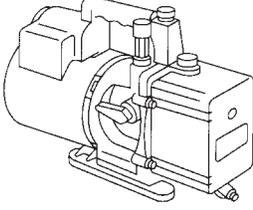
HFC-134a (R-134a) Service Tools and Equipment (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description	
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) Refrigerant dye injector (J-41447) qty. 24 R-134a refrigerant dye (J-43872) Refrigerant dye cleaner	 <p style="font-size: small; margin-top: 10px;">NOTICE This A/C or Refrigeration system contains a fluorescent leak detection tracer dye. (Must use UV black light to see dye). KENT-MOORE Wentz, MO 65052 1-800-345-2233</p>	Power supply: DC 12V (Battery terminal)
	ZHA200H	
(J-42220) UV lamp and UV safety goggles		Power supply: DC12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system. Includes: UV lamp and UV safety goggles
	SHA438F	
(J-41447) R-134a Fluorescent Leak Detection Dye (Box of 24, 1/4 ounce bottles)	 <p style="text-align: center;">Refrigerant dye (24 bottles)</p>	Application: For R-134a PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
	SHA439F	
(J-41459) R-134a Dye Injector Use with J-41447, 1/4 ounce bottle	<p style="text-align: center;">Dye injector</p> 	For injecting 1/4 ounce of Fluorescent Leak Detection Dye into A/C system.
	SHA440F	
(J-43872) Dye cleaner		For cleaning dye spills.
	SHA441F	
(J-39183) Manifold gauge set (with hoses and couplers)		Identification: ● The gauge face indicates R-134a. Fitting size: Thread size ● 1/2"-16 ACME
	NT199	

PREPARATION

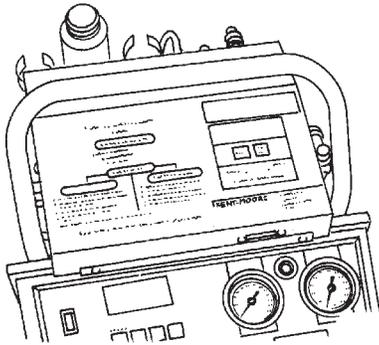
AUTO

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

Tool number (Kent-Moore No.) Tool name	Description	
Service hoses <ul style="list-style-type: none"> ● High-pressure side hose (J-39501-72) ● Low-pressure side hose (J-39502-72) ● Utility hose (J-39476-72) 	 <p>NT201</p>	GI MA EM LC EC
Service couplers <ul style="list-style-type: none"> ● High-pressure side coupler (J-39500-20) ● Low-pressure side coupler (J-39500-24) 	 <p>NT202</p>	FE CL
(J-39650) Refrigerant weight scale	 <p>NT200</p>	MT AT TF
(J-39649) Vacuum pump (Including the isolator valve)	 <p>NT203</p>	PD AX SU

COMMERCIAL SERVICE TOOL

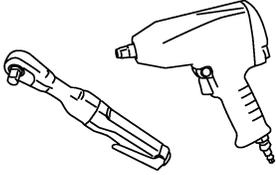
NAHA0161S01

Tool name	Description	
Refrigerant identifier equipment	 <p>NT765</p>	BR ST RS BT HA SC

PREPARATION

AUTO

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

Tool name	Description
Power tool	<p data-bbox="954 205 1211 233">Loosening bolts and nuts</p>  <p data-bbox="423 436 524 464">PBIC0190E</p>

Refrigeration System

REFRIGERATION CYCLE

Refrigerant Flow

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser, the liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

Freeze Protection

Under usual operating conditions, when the a/c is switched on, the compressor runs continuously, and the evaporator pressure, and therefore temperature, is controlled by the V-6 variable displacement compressor to prevent freeze up.

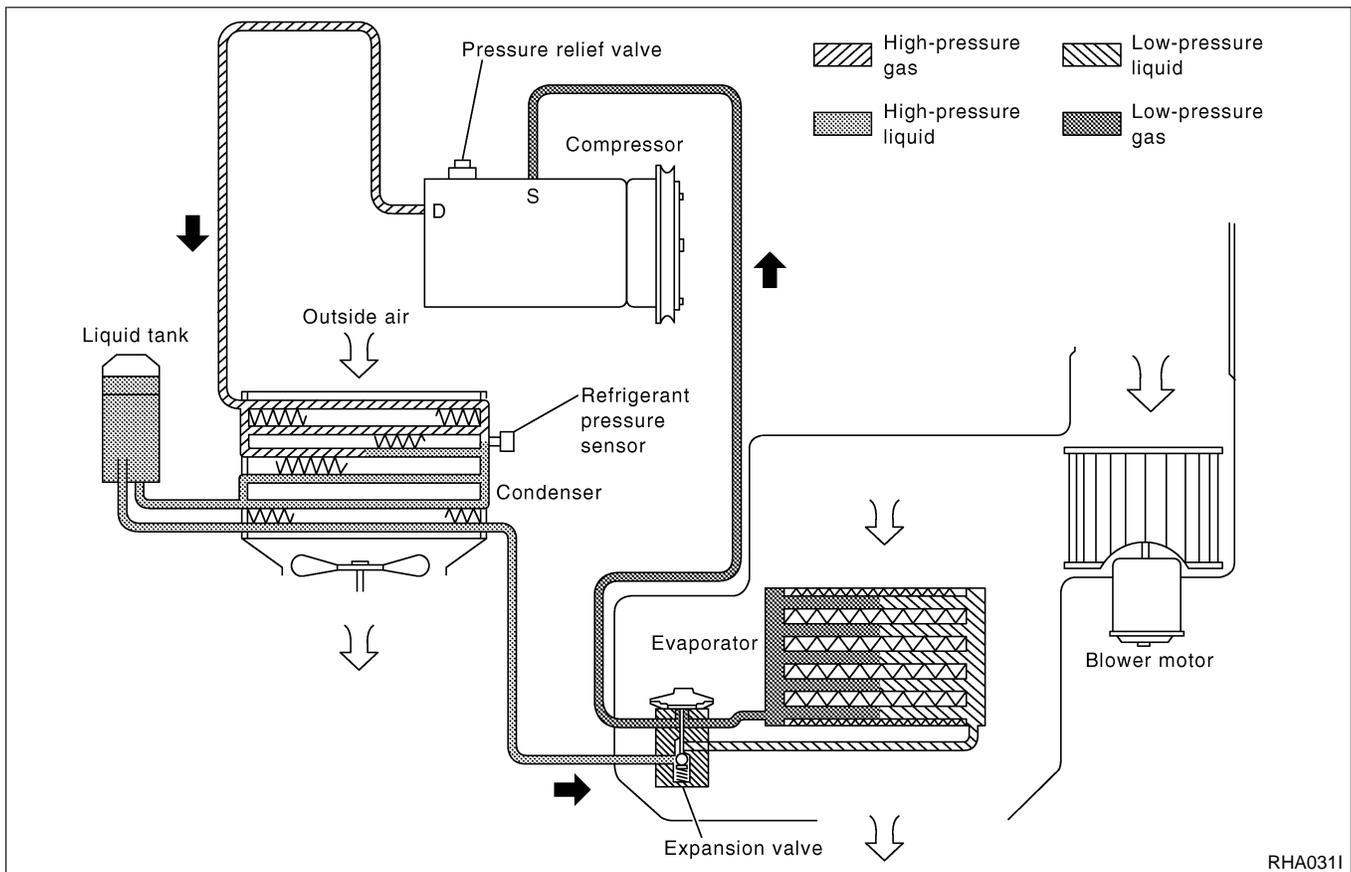
Refrigerant System Protection

Refrigerant Pressure Sensor

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm², 398 psi) or below about 177 kPa (1.8 kg/cm², 26 psi).

Pressure Relief Valve

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 unusual 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.



V-6 Variable Displacement Compressor**GENERAL INFORMATION**

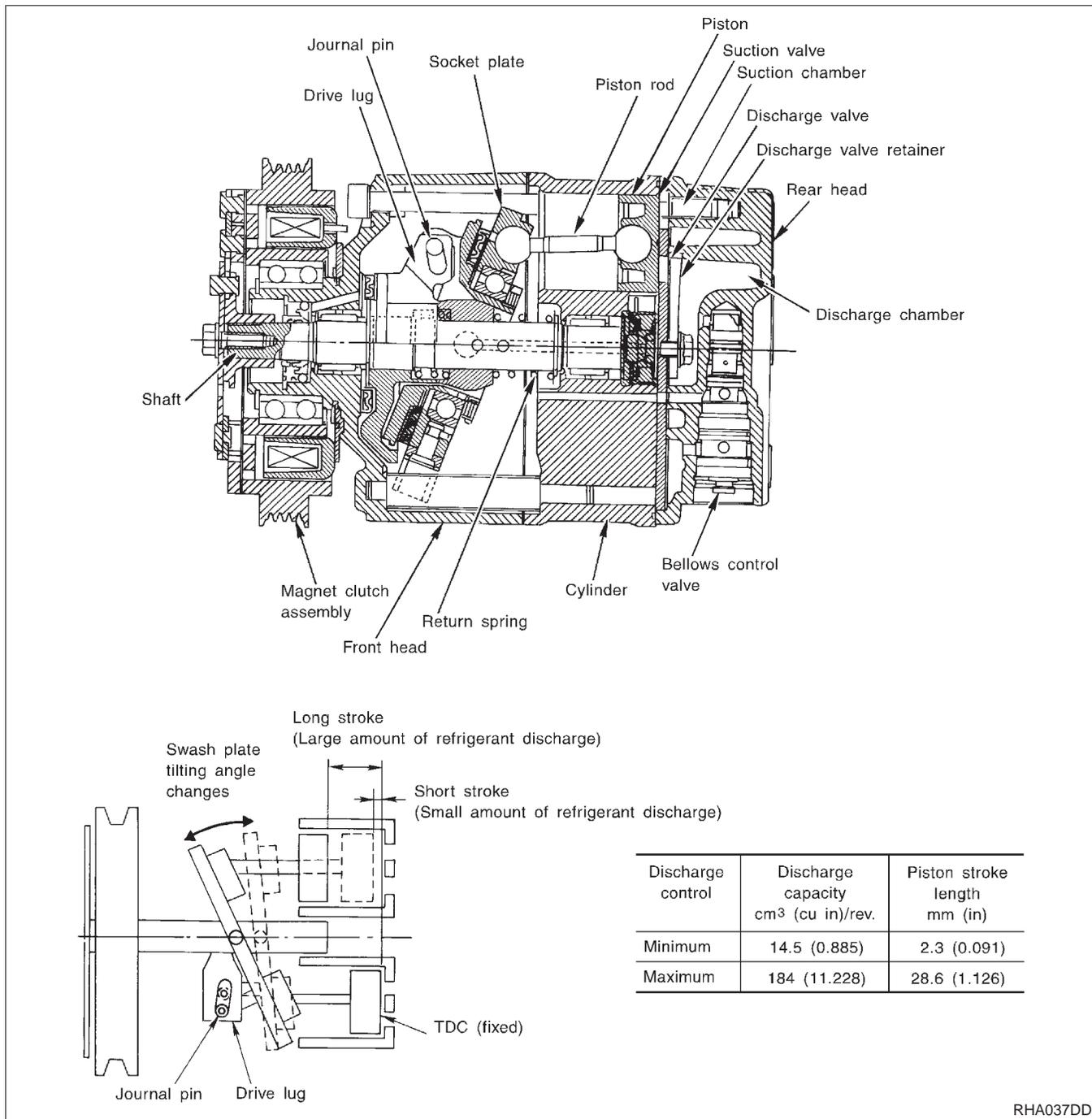
1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:
 - evaporator intake air temperature is less than 20°C (68°F)
 - engine is running at speeds less than 1,500 rpm.This is because the V-6 compressor provides a means of “capacity” control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. 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 wobble (swash) plate has changed and is not a problem.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm², 21 to 26 psi) under varying conditions. In previous compressors, however, suction pressure was reduced with increases in engine speed.

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 wobble (swash) plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 14.5 to 184 cm³ (0.885 to 11.228 cu in).



Discharge control	Discharge capacity cm ³ (cu in)/rev.	Piston stroke length mm (in)
Minimum	14.5 (0.885)	2.3 (0.091)
Maximum	184 (11.228)	28.6 (1.126)

RHA037DD

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Operation

=NAHA0164S02

1. Operation Control Valve

NAHA0164S0201

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 wobble (swash) plate is controlled between the crankcase's internal pressure and the piston cylinder pressure.

2. Maximum Cooling

NAHA0164S0202

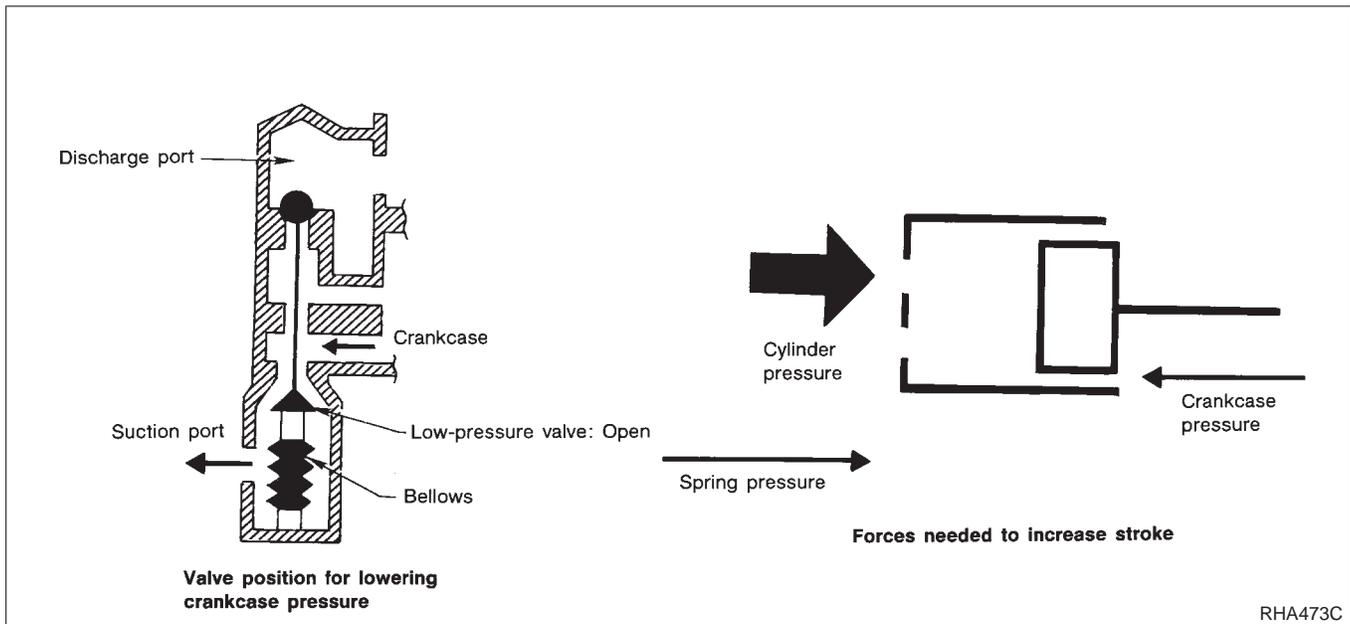
Refrigerant pressure on the low-pressure side increases with an increase in heat loads.

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 wobble (swash) plate is set to the maximum stroke position.



3. Capacity Control

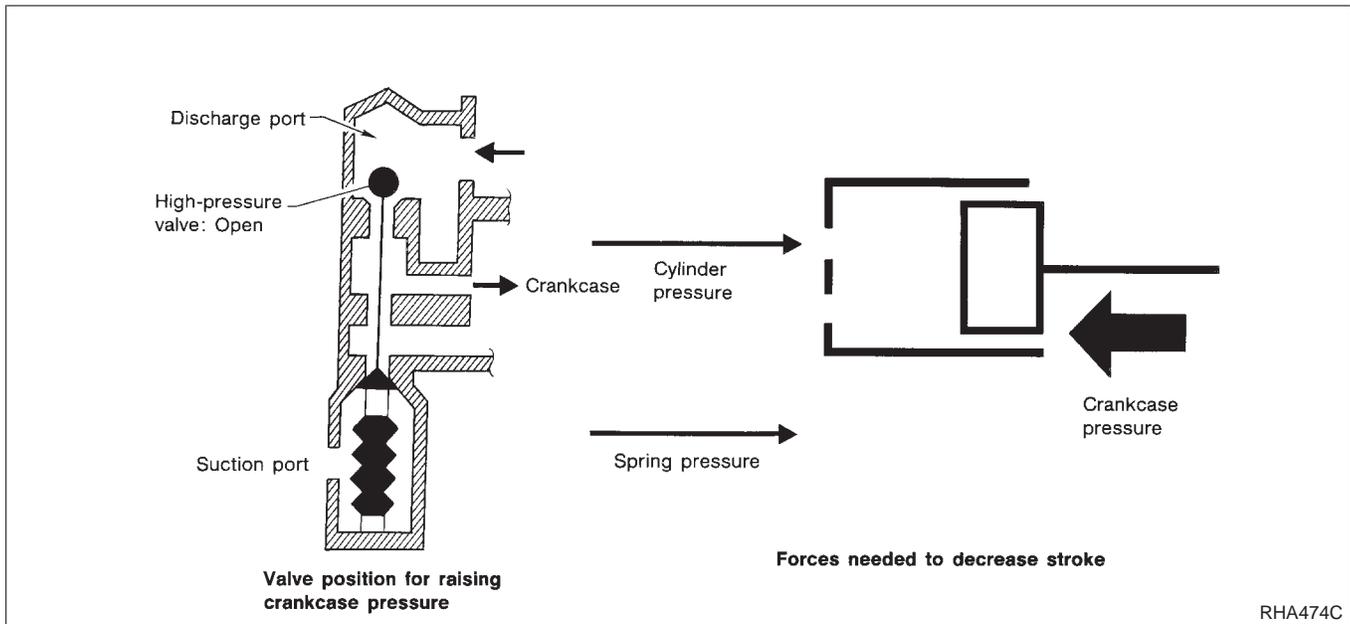
=NAHA0164S0203

- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
- The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.8 kg/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 wobble (swash) plate, and is generated by the pressure difference before and behind the piston.

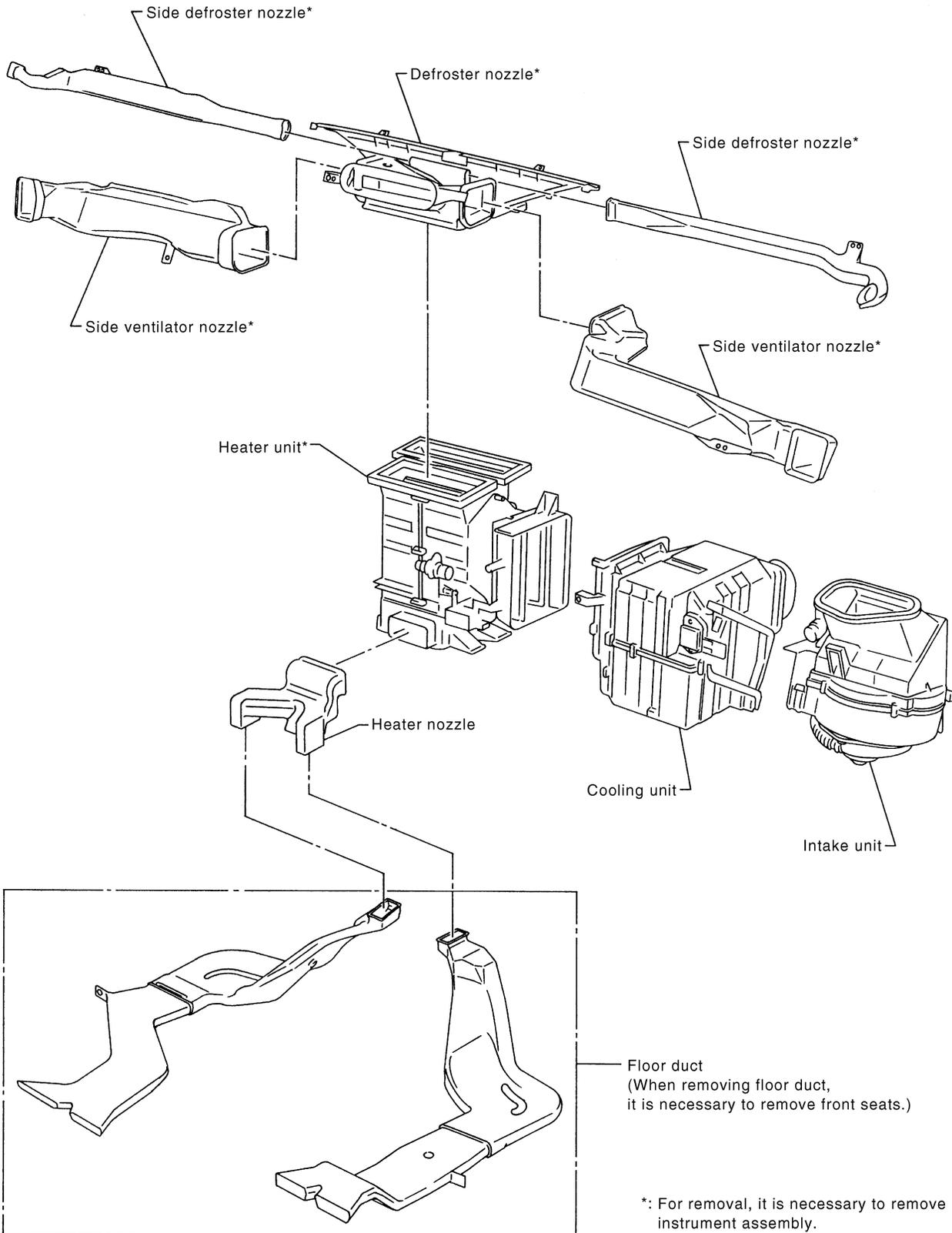
The drive lug and journal pin are located where the piston generates the highest pressure. Piston pressure is between suction pressure P_s and discharge pressure P_d , which is near suction pressure P_s . If crankcase pressure P_c rises due to capacity control, the force around the journal pin makes the wobble (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 wobble (swash) plate.



Component Layout

NAHA0166

SEC. 270•271•272•273



*: For removal, it is necessary to remove instrument assembly.

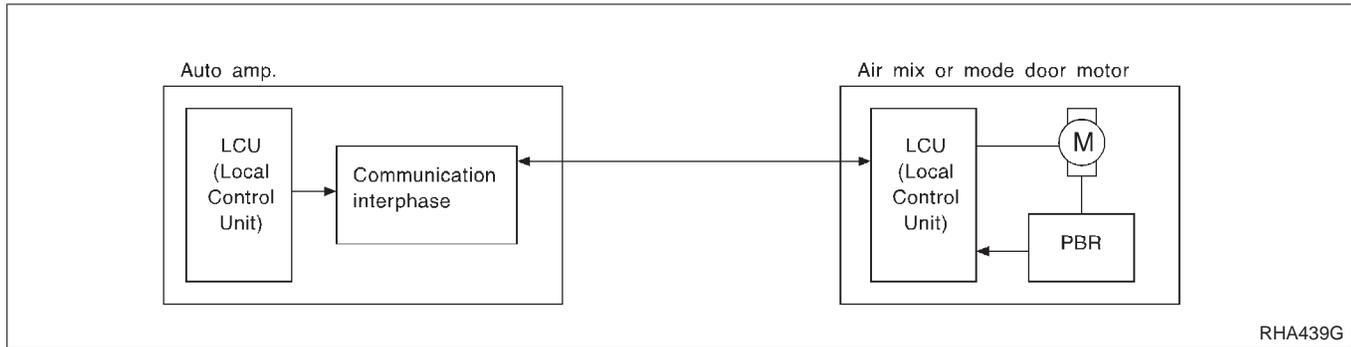
Introduction

AIR CONDITIONER LAN SYSTEM OVERVIEW CONTROL SYSTEM

NAHA0167

NAHA0167S01

The LAN system consists of auto amp., mode door motor and air mix door motor. A configuration of these components is shown in the diagram below.



Features

NAHA0168

CAN COMMUNICATION SYSTEM DESCRIPTION

NAHA0168S10

CAN (Controller Area Network) is a serial communication line for real time application. It is an on-vehicle multiplex communication line with high data communication speed and excellent error detection ability. Many electronic control units are equipped onto a vehicle, and each control unit shares information and links with other control units during operation (not independent). In CAN communication, control units are connected with 2 communication lines (CAN H line, CAN L line) allowing a high rate of information transmission with less wiring. Each control unit transmits/receives data but selectively reads required data only.

SYSTEM CONSTRUCTION (LAN)

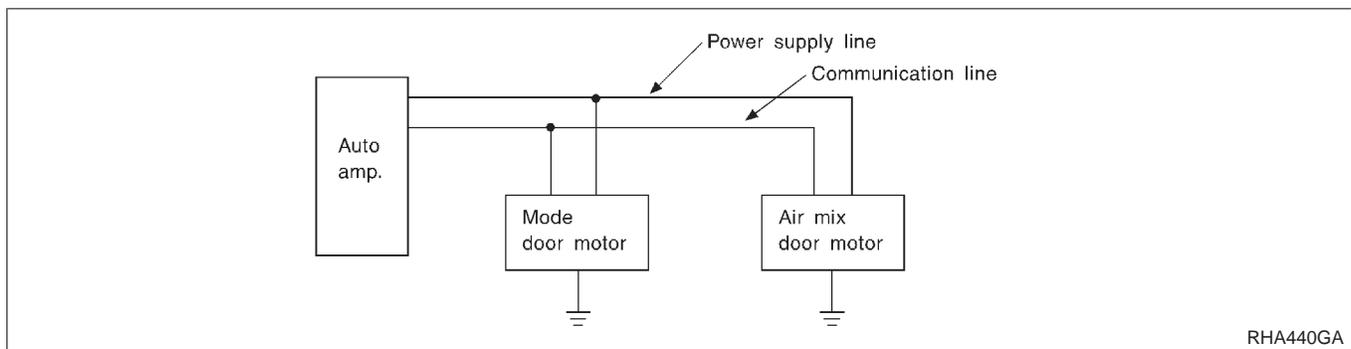
NAHA0168S01

A small network is constructed between the auto amplifier, mode door motor and air mix door motor. The auto amplifier and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of the two motors.

Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the auto amplifier and two motors.

The following functions are contained in LCUs built into the mode door motor and the air mix door motor.

- Address
- Motor opening angle signals
- Data transmission
- Motor stop and drive decision
- Opening angle sensor (PBR function)
- Comparison
- Decision (Auto amplifier indicated value and motor opening angle comparison)



Operation

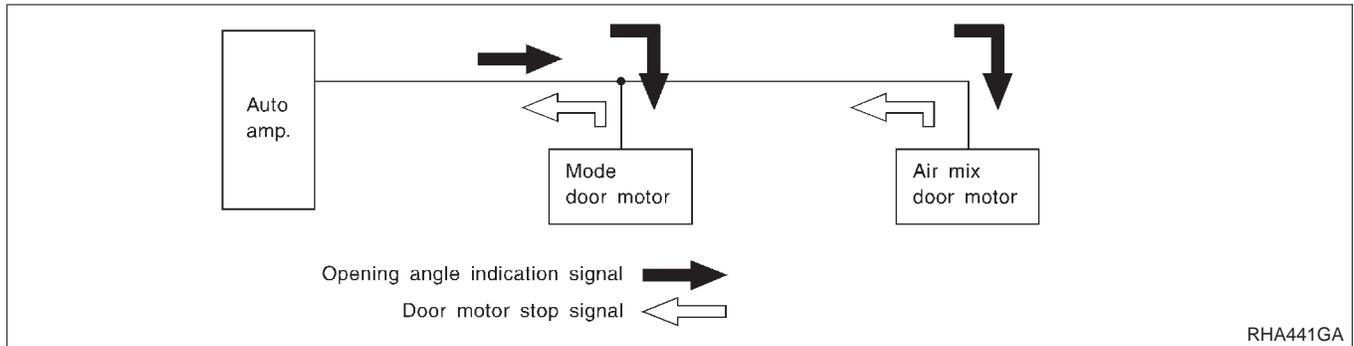
NAHA0168S0101

The auto amplifier receives data from each of the sensors. The amplifier sends mode door and air mix door opening angle data to the mode door motor LCU and air mix door motor LCU.

The mode door motor and air mix door motor read their respective signals according to the address signal.

Features (Cont'd)

Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/ COLD or DEFROST/VENT operation is selected. The new selection data is returned to the auto amplifier.



Transmission Data and Transmission Order

NAHA0168S0102

Amplifier data is transmitted consecutively to each of the door motors following the form shown in figure below. Start: Initial compulsory signal sent to each of the door motors.

Address: Data sent from the auto amplifier is selected according to data-based decisions made by the mode door motor and air mix door motor.

If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data is usual, door control begins.

If an error exists, the received data is rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.

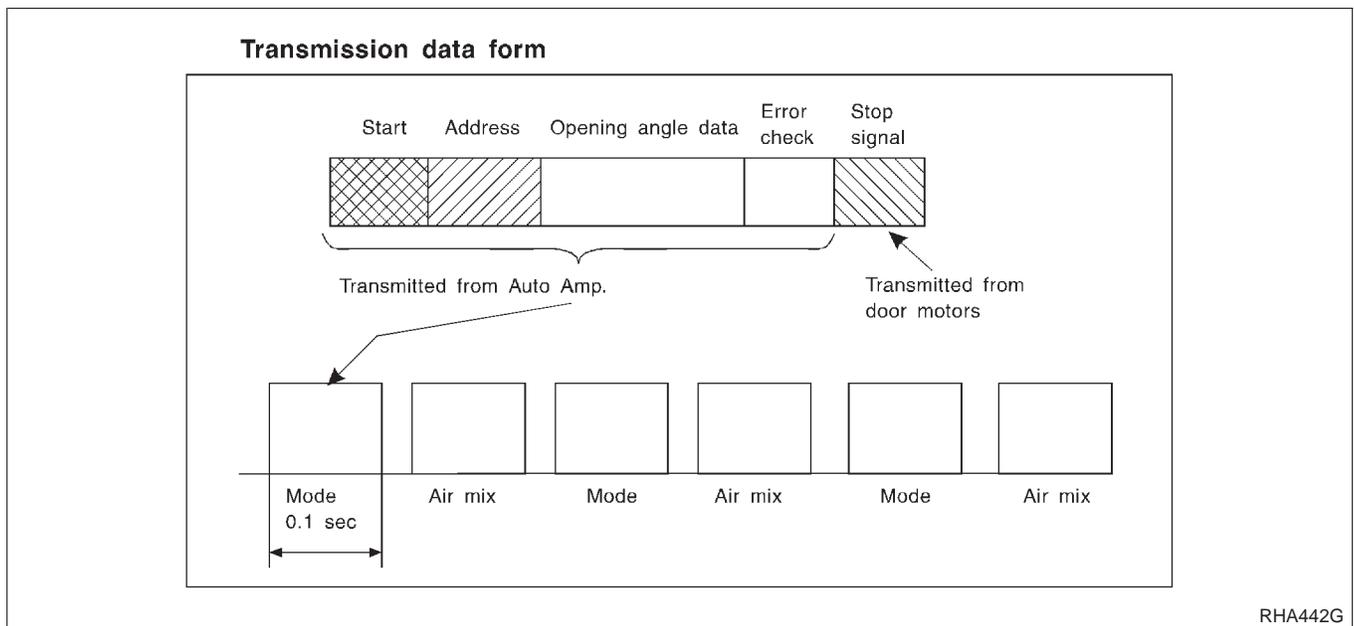
Opening angle: Data that shows the indicated door opening angle of each door motor.

Error check: Procedure by which sent and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the mode door motor and air mix door motor.

Error data can be related to the following symptoms.

- Unusual electrical frequency
- Poor electrical connections
- Signal leakage from transmission lines
- Signal level fluctuation

Stop signal: At the end of each transmission, a stop operation, in-operation, or internal malfunction message is delivered to the auto amplifier. This completes one data transmission and control cycle.



Air Mix Door Control (Automatic Temperature Control)

NAHA0168S0103

The air mix door is automatically controlled so that in-vehicle temperature is maintained at a predetermined value by: The temperature setting, ambient temperature, in-vehicle temperature and amount of sunload.

Fan Speed Control

NAHA0168S0104

Blower speed is automatically controlled based on temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.

With FAN switch set to "AUTO", the blower motor starts to gradually increase air flow volume.

When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

Intake Door Control

NAHA0168S0105

The intake doors are automatically controlled by: The temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and ON-OFF operation of the compressor.

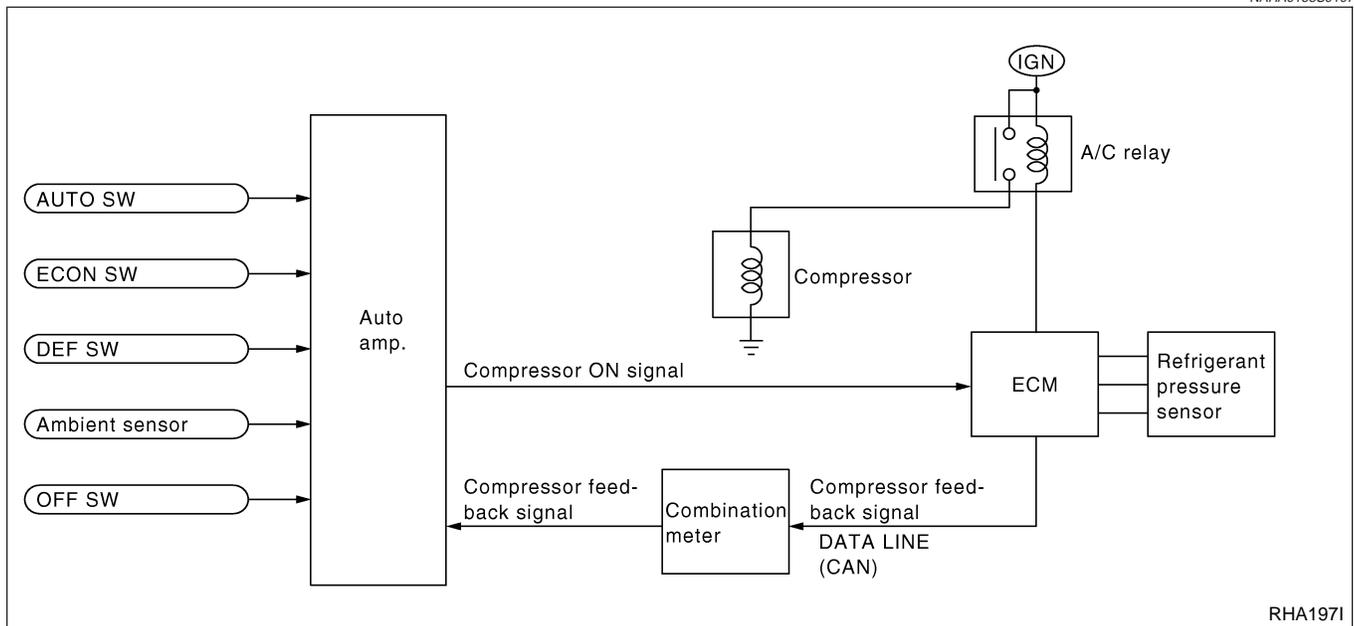
Outlet Door Control

NAHA0168S0106

The outlet door is automatically controlled by: The temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

Magnet Clutch Control

NAHA0168S0107



The ECM controls compressor operation using input signals from the throttle position sensor, refrigerant pressure sensor and auto amplifier.

Self-diagnostic System

NAHA0168S0108

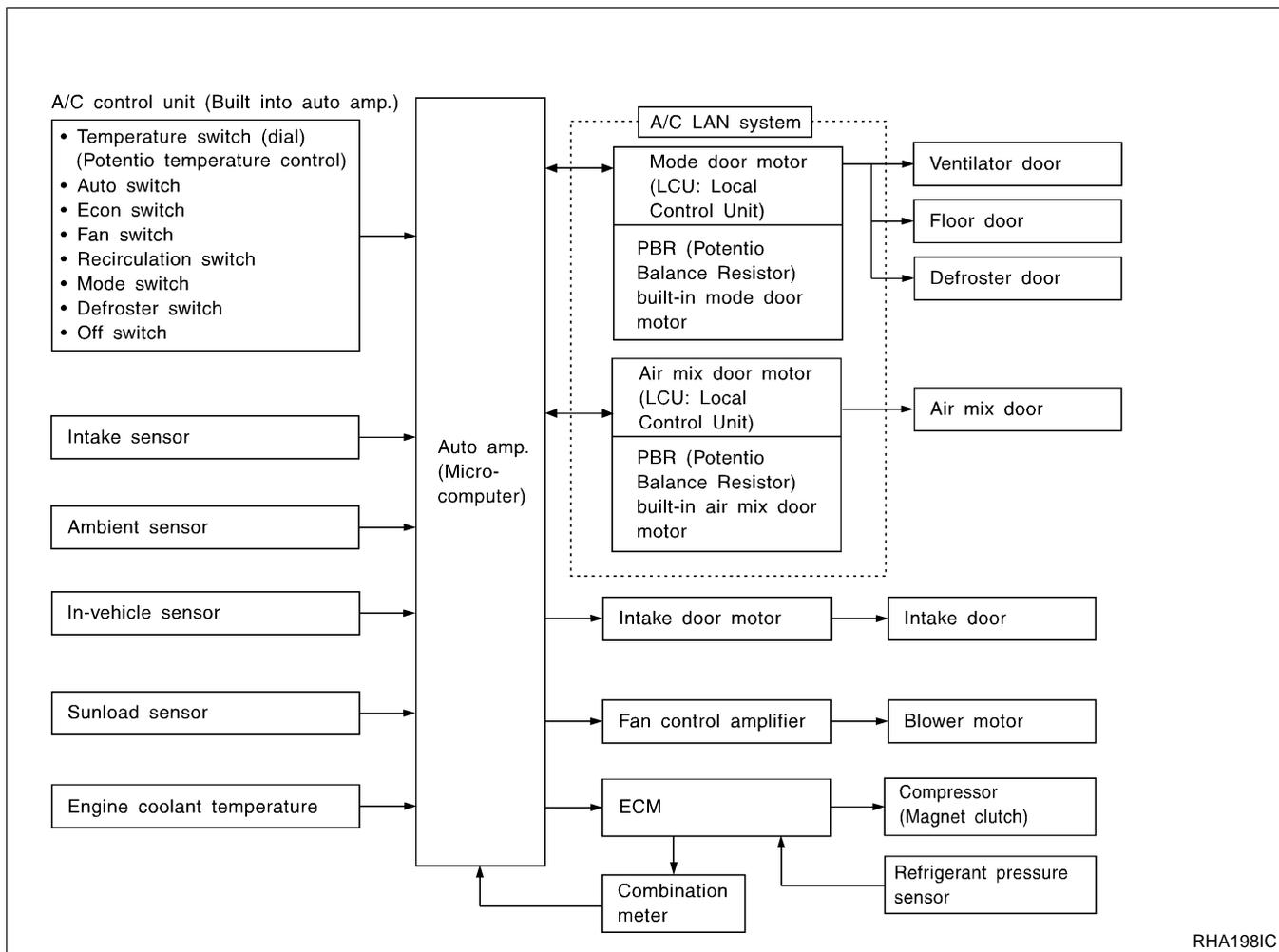
The self-diagnostic system is built into the auto amplifier (LCU) to quickly locate the cause of malfunctions.

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Overview of Control System

=NAHA0169

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



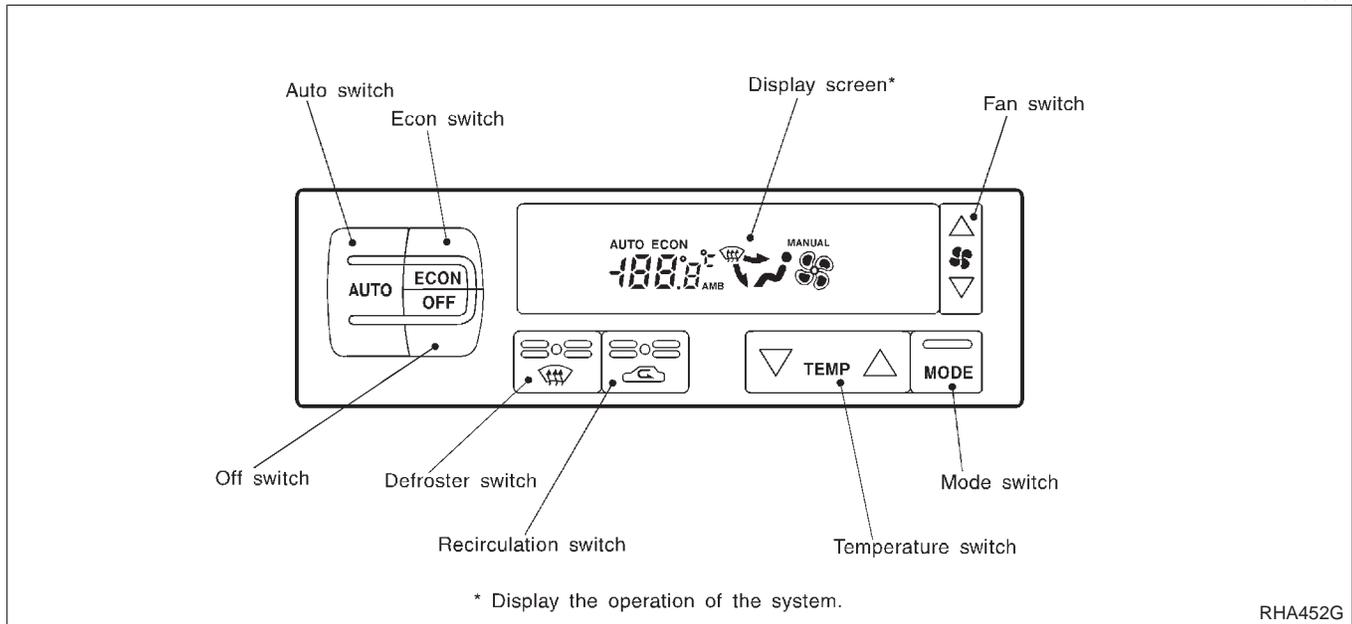
RHA198IC

Control Operation

EXCEPT LE GRADE

NAHA0170

NAHA0170S10

**Display Screen**

Displays the operational status of the system.

NAHA0170S1010

AUTO Switch

The compressor, intake doors, air mix door, outlet doors, 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.

NAHA0170S1011

ECON Switch

By pressing the ECON switch, the display should indicate ECON and the compressor always turns OFF. With the compressor OFF, the system will not remove heat (cool) or de-humidify. The system will maintain the in-vehicle temperature at the set temperature when the set temperature is above the ambient (outside) temperature. The system will set the intake doors to the outside air position.

NAHA0170S1012

Temperature Switch (Potentio Temperature Control)

Increases or decreases the set temperature.

NAHA0170S1013

OFF Switch

The compressor and blower are OFF, the intake doors are set to the outside air position, and the air outlet doors are set to the foot (80% foot and 20% defrost) position.

NAHA0170S1014

FAN Switch

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

NAHA0170S1015

low , medium low , medium high , high 

Recirculation (REC) Switch

OFF position: Set the inlet to automatic control. Intake doors are set to FRE (Fresh) position automatically when switched to D/F or DEF and compressor turns OFF.

NAHA0170S1016

ON position: Interior air is recirculated inside the vehicle.

Defroster (DEF) Switch

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position.

NAHA0170S1017

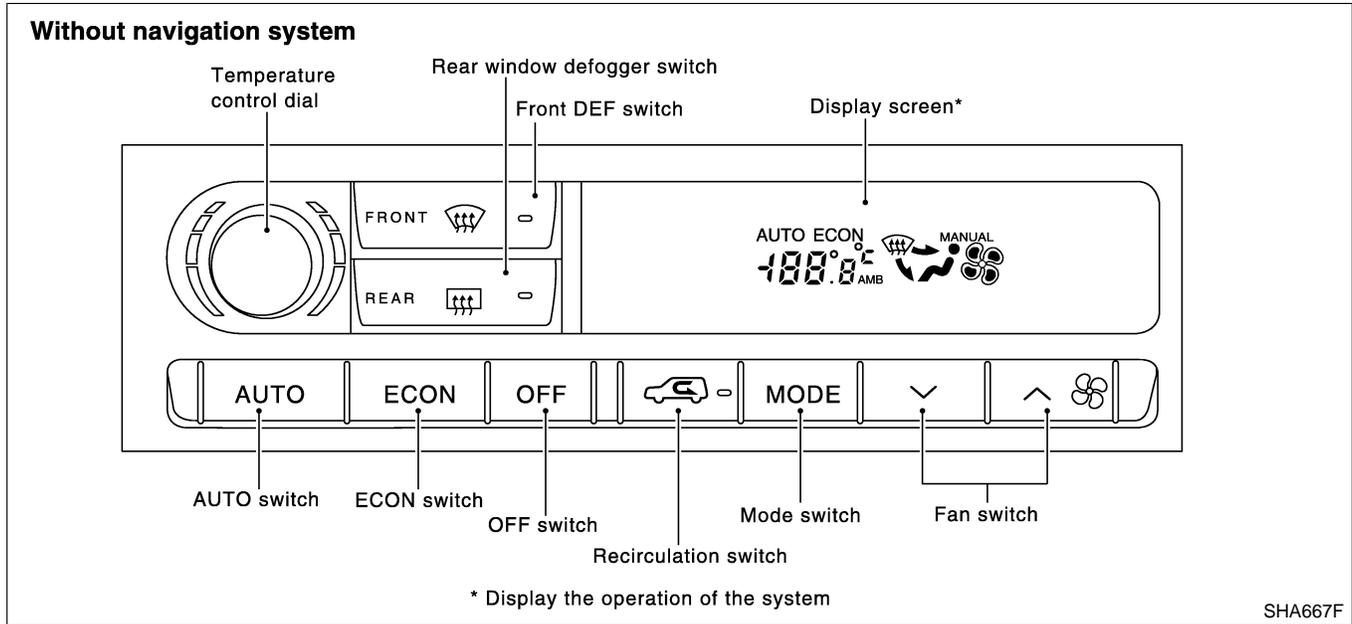
MODE Switch

Controls the air discharge outlets.

NAHA0170S1018

LE GRADE

NAHA0170S13

**Display Screen**

Displays the operational status of the system.

NAHA0170S1301

AUTO Switch

The compressor, intake doors, air mix door, outlet doors, 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.

NAHA0170S1302

ECON Switch

By pressing the ECON switch, the display should indicate ECON and the compressor always turns OFF. With the compressor OFF, the system will not remove heat (cool) or de-humidify. The system will maintain the in-vehicle temperature at the set temperature when the set temperature is above the ambient (outside) temperature. The system will set the intake doors to the outside air position.

NAHA0170S1303

OFF Switch

The compressor and blower are OFF, the intake doors are set to the outside air position, and the air outlet doors are set to the foot (80% foot and 20% defrost) position.

NAHA0170S1304

FAN Switch

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

NAHA0170S1305

low , medium low , medium high , high 

RECIRCULATION (REC) Switch

OFF position: Outside air is drawn into the passenger compartment. Intake doors are set to FRE (Fresh) position automatically when switched to D/F or DEF and compressor turns OFF.
ON position: Interior air is recirculated inside the vehicle.

NAHA0170S1306

DEFROSTER (DEF) Switch

Positions the air outlet doors to the defrost position. Also positions the intake doors to the outside air position.

NAHA0170S1307

MODE Switch

Controls the air discharge outlets.

NAHA0170S1308

Temperature Control Dial (Potentio Temperature Control)

Increases or decreases the set temperature.

NAHA0170S1309

Rear Window Defogger Switch

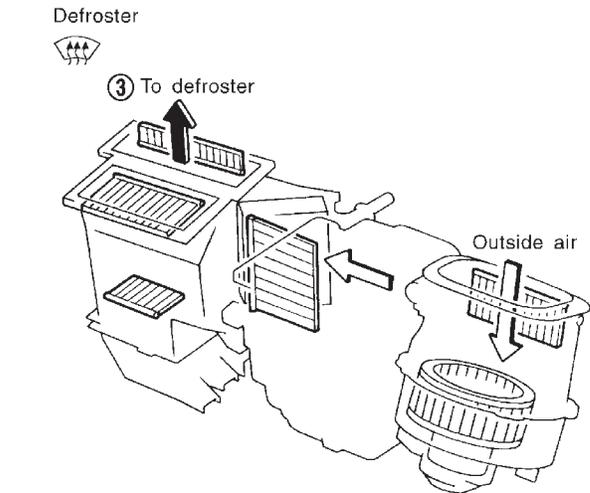
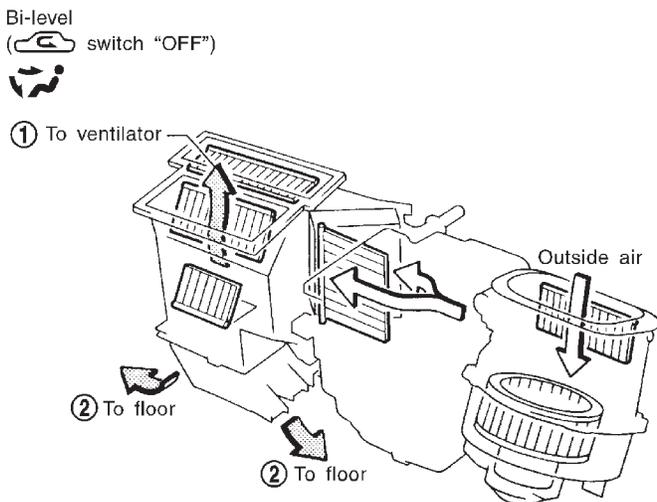
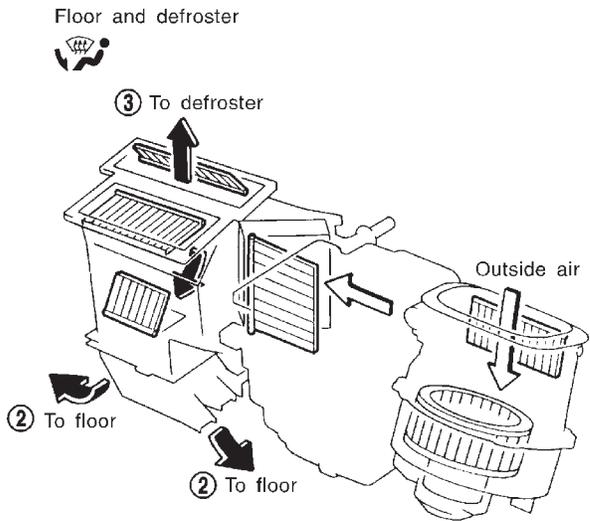
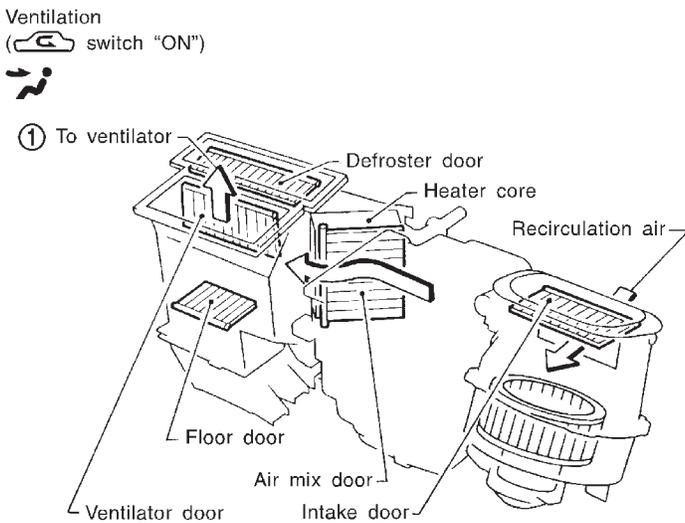
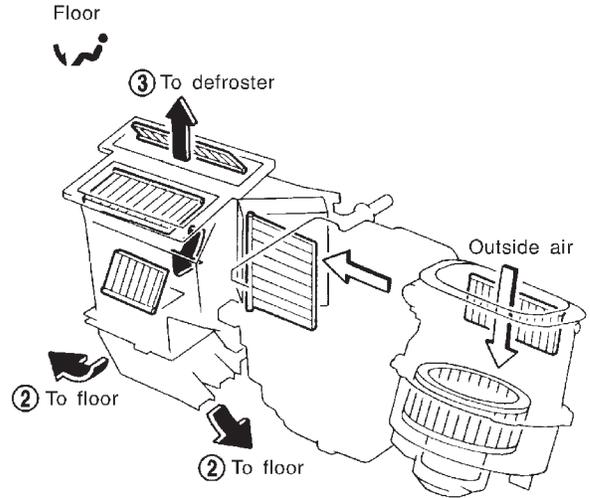
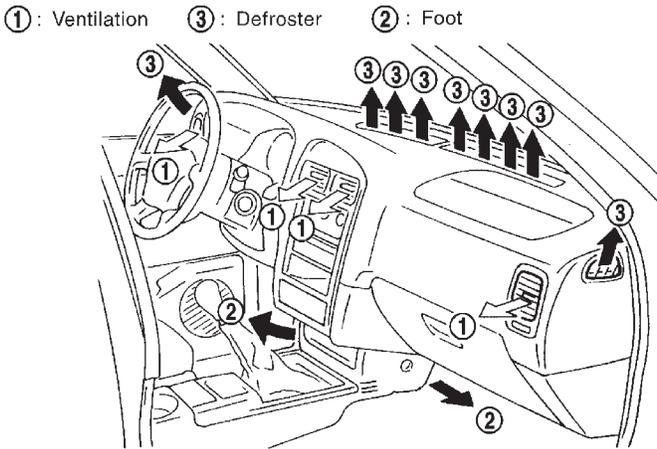
When illumination is ON, rear window is defogged.

NAHA0170S1310

Discharge Air Flow

NAHA0171

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← : Air passed through heater core
 ← + ← : Mixed air
 ← : Air not passed through heater core

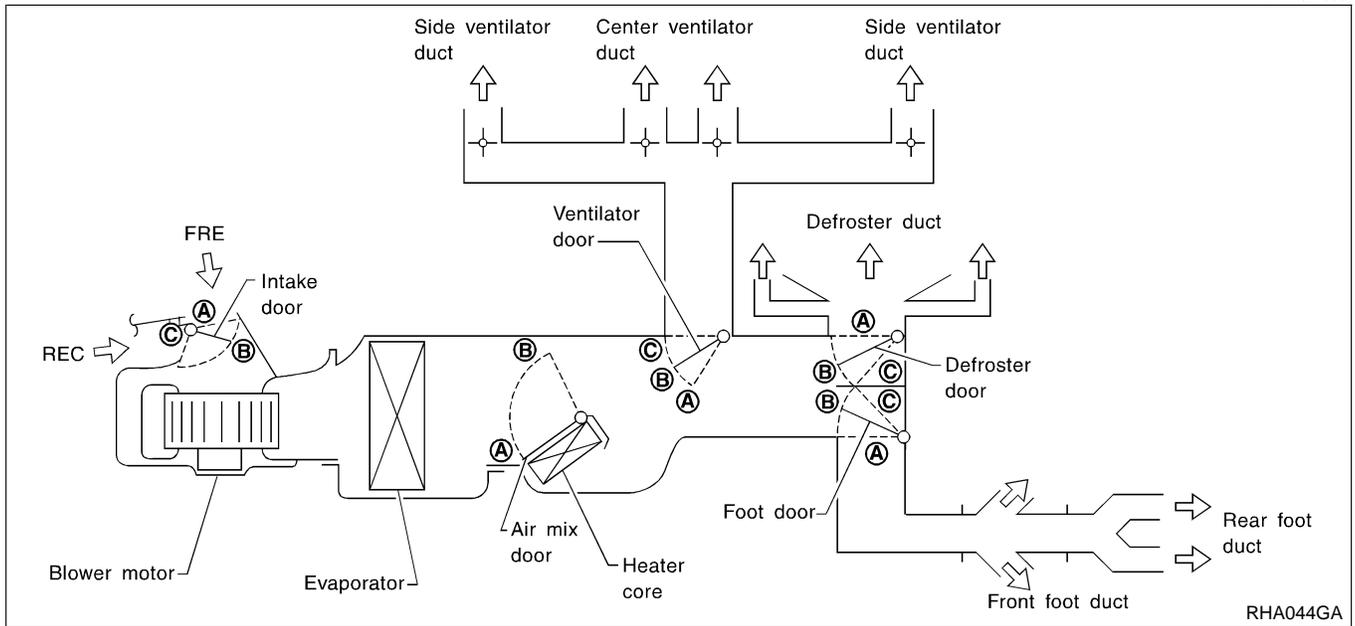
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System Description

SWITCHES AND THEIR CONTROL FUNCTIONS

NAHA0246

NAHA0246S01



RHA044GA

	MODE SW				DEF SW		AUTO SW	ECON SW	REC SW		Temperature SW or dial		
	VENT	B/L	FOOT	D/F	ON	OFF			ON	OFF	▼ TEMP ▲		
Position or switch							AUTO	ECON			▼ TEMP ▲		
Door													
Ventilator door	A	B	C	C	C	—	AUTO	AUTO	—		—		
Foot door	A	B	C	C	A				—		—		
Defroster door	A	A	B	C	C				—		—		
Air mix door	—				—				—		—		A
Intake door	—			C	C	—		A	AUTO*1	—			

*1: Automatically controlled when REC switch is OFF.

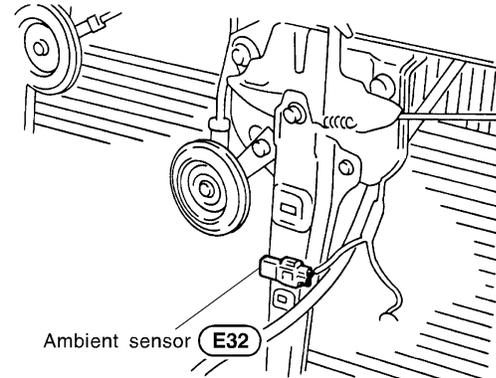
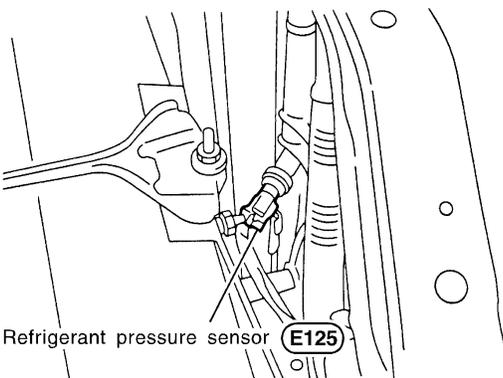
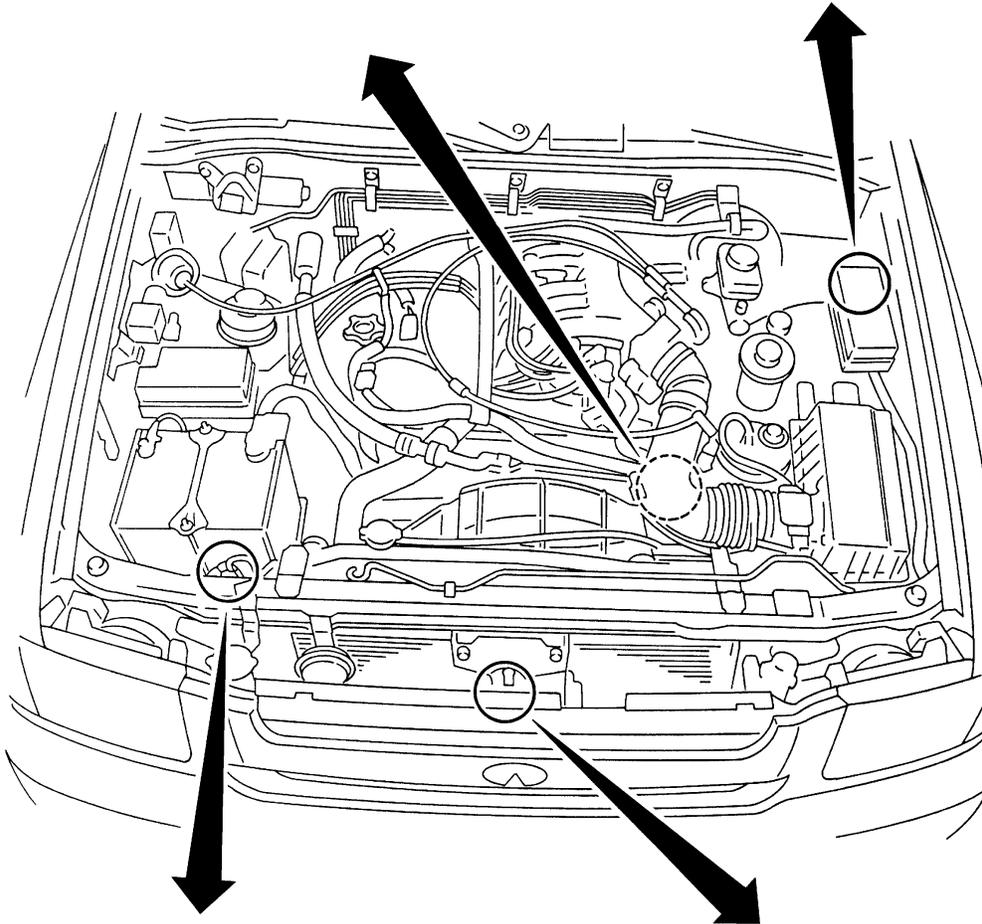
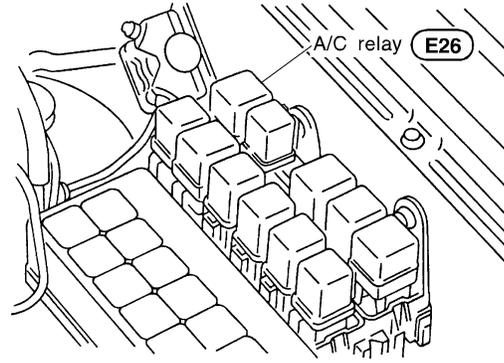
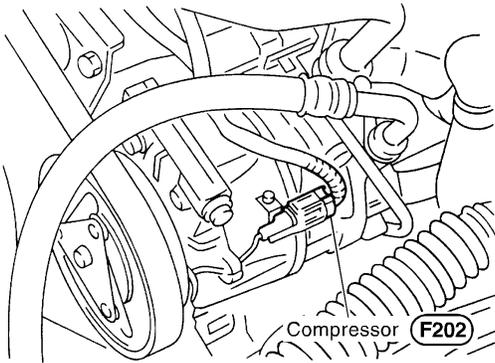
Component Location

ENGINE COMPARTMENT

NAHA0172

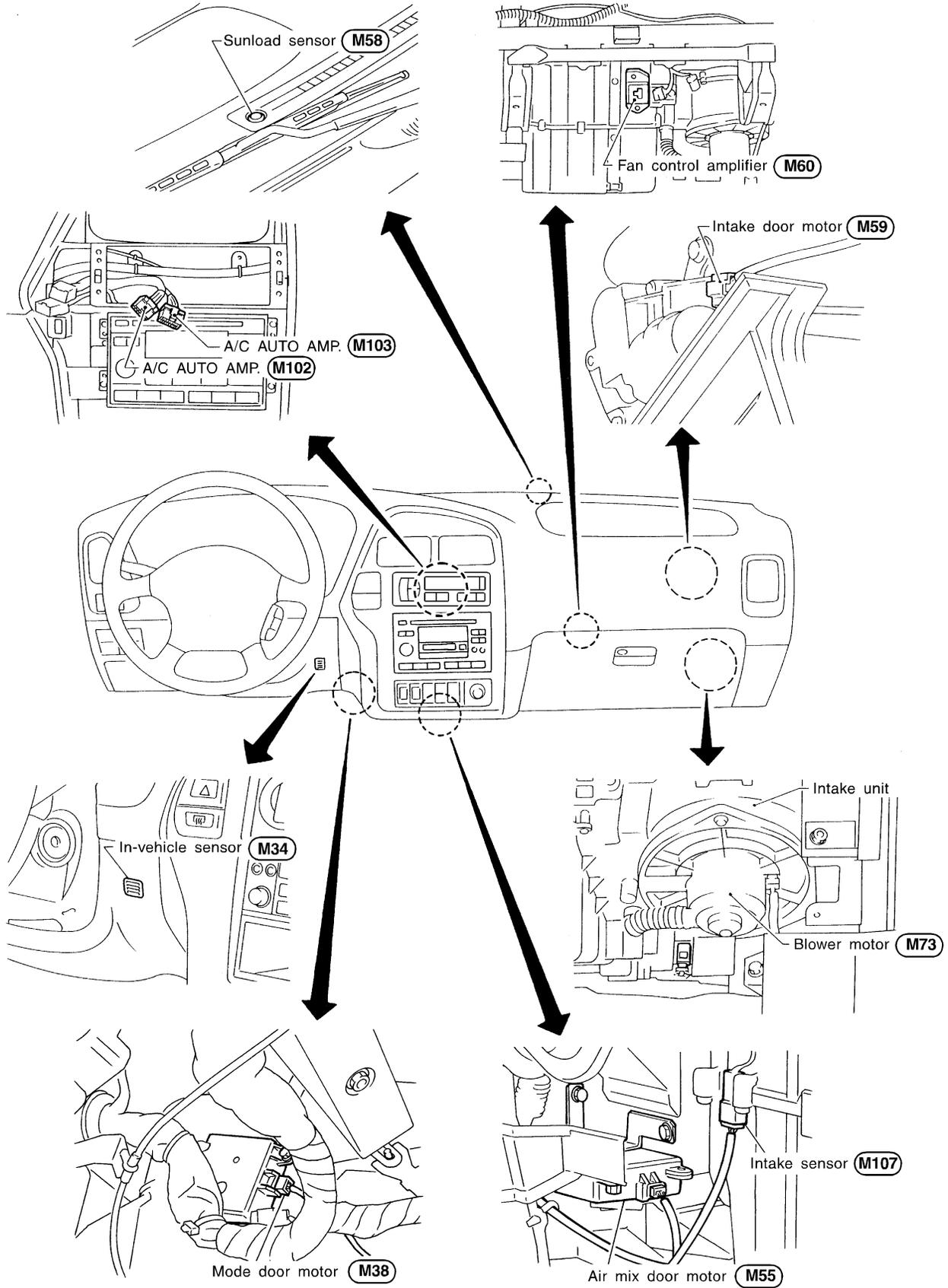
NAHA0172S01

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PASSENGER COMPARTMENT

NAHA0172S02



RHA498GC

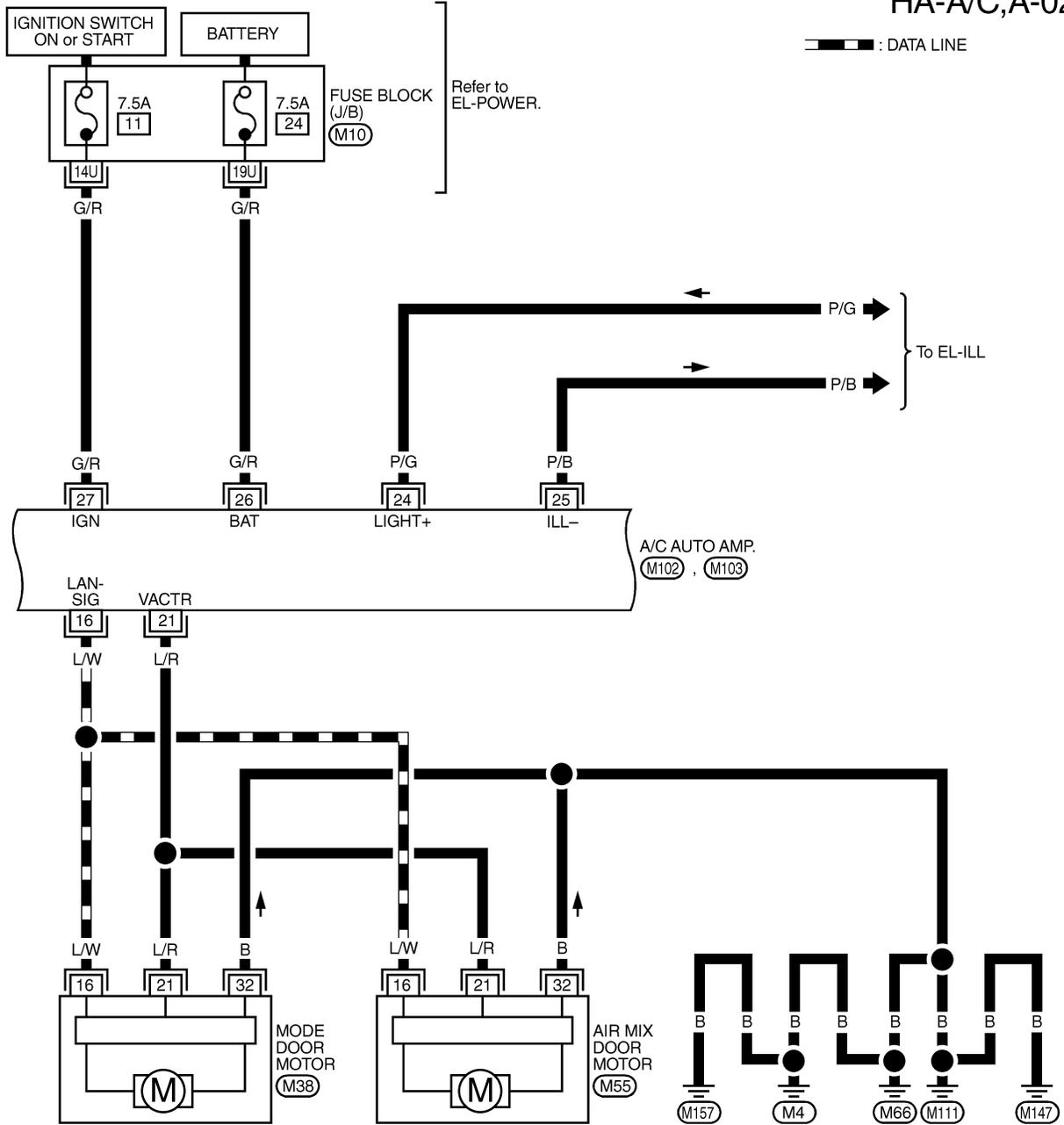
TROUBLE DIAGNOSES

AUTO

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C,A-02

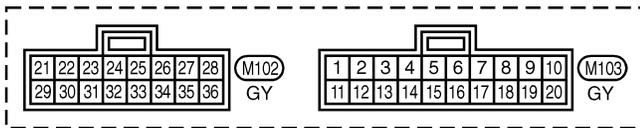
— : DATA LINE



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(M102) GY

(M103) GY

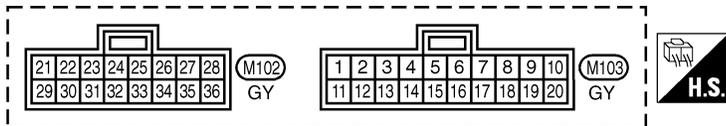
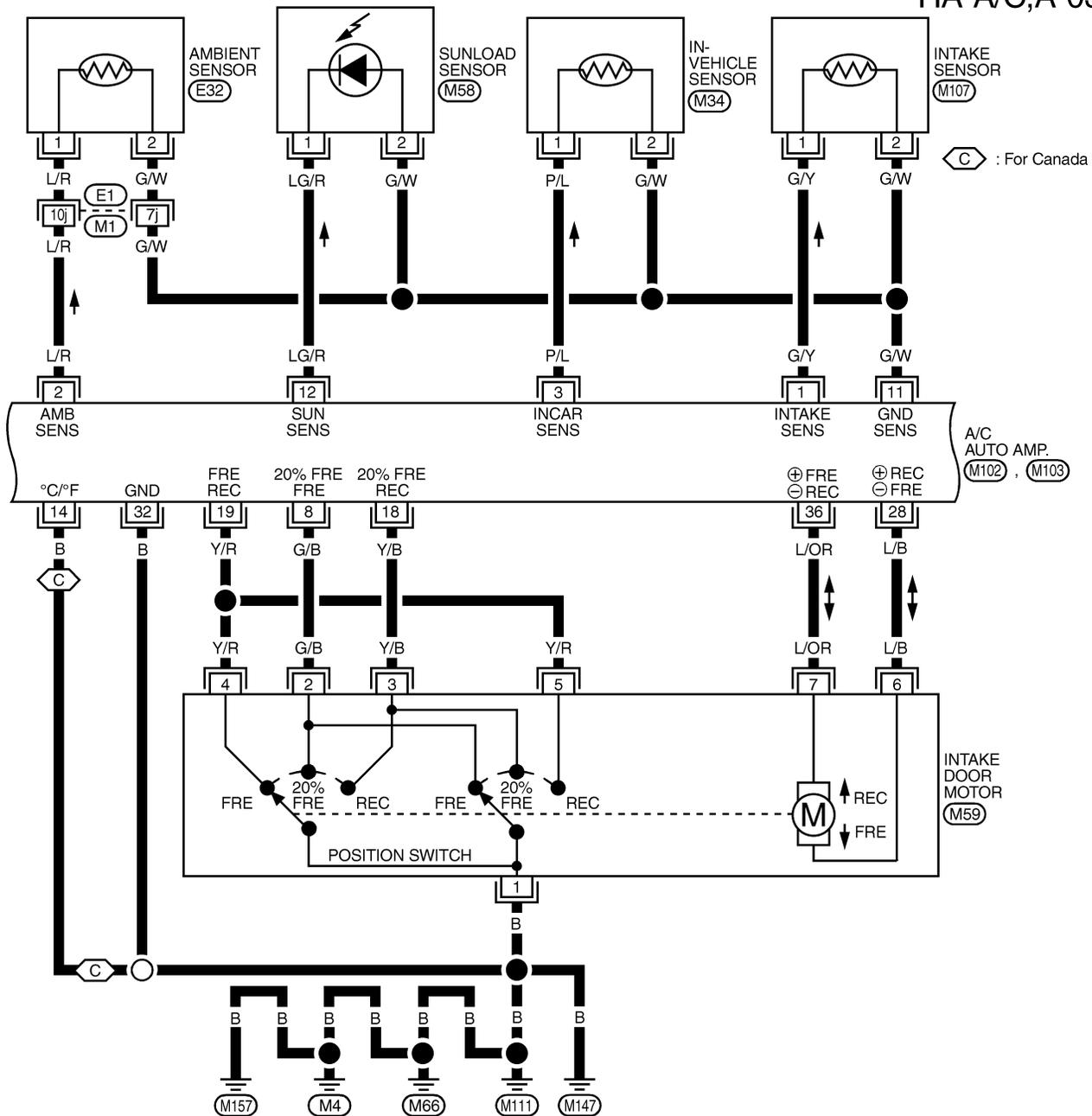


REFER TO THE FOLLOWING.

(M10) - FUSE BLOCK-
JUNCTION BOX (J/B)

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C,A-03



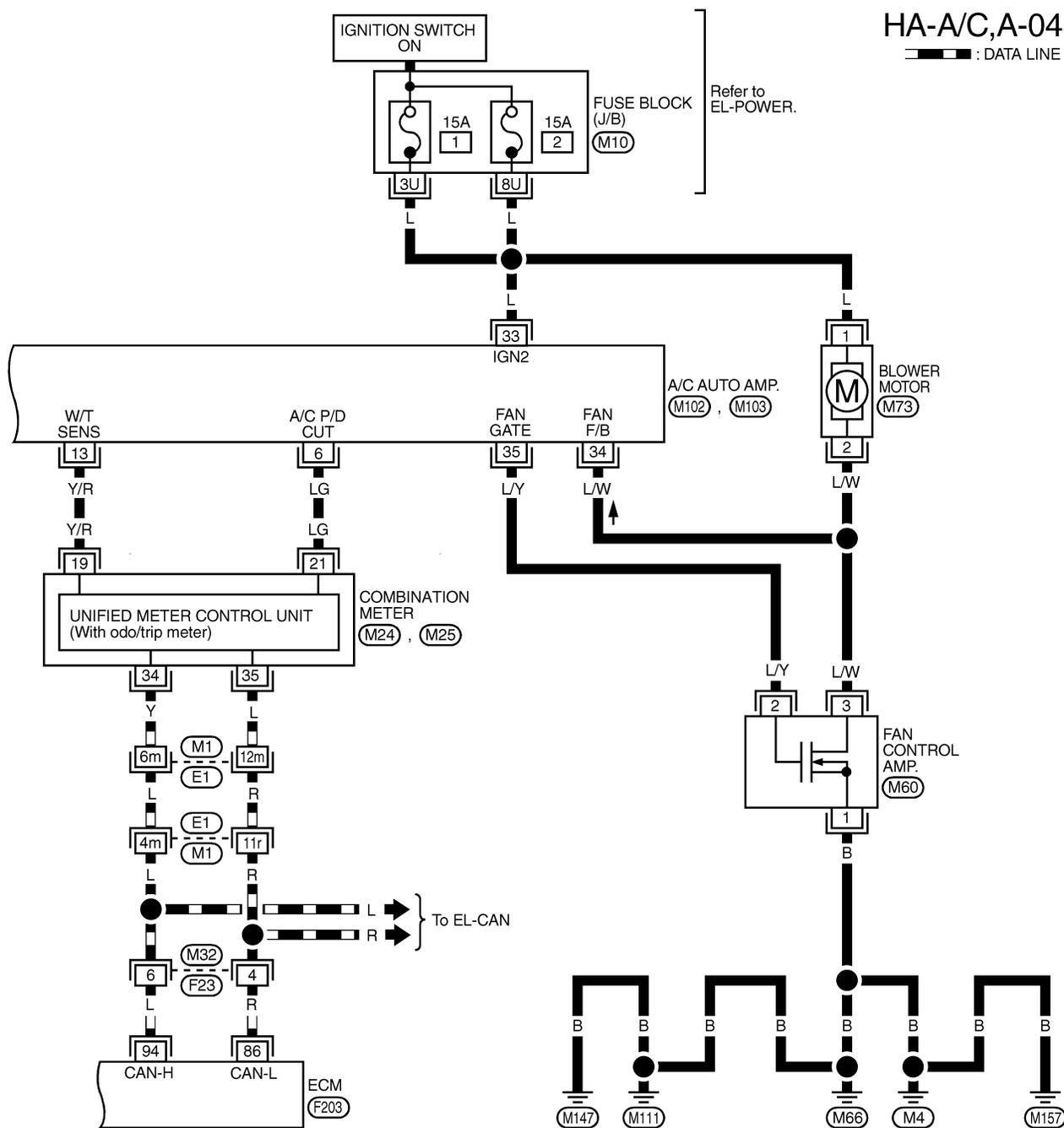
REFER TO THE FOLLOWING.

(E1) - SUPER MULTIPLE JUNCTION (SMJ)

TROUBLE DIAGNOSES

AUTO

Wiring Diagram — A/C, A — (Cont'd)

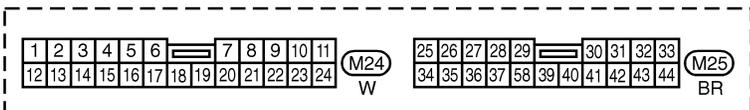


HA-A/C, A-04

— : DATA LINE

Refer to EL-POWER.

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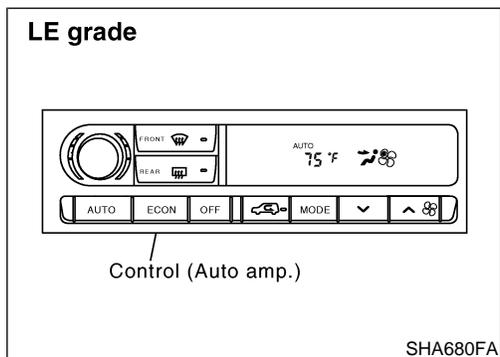
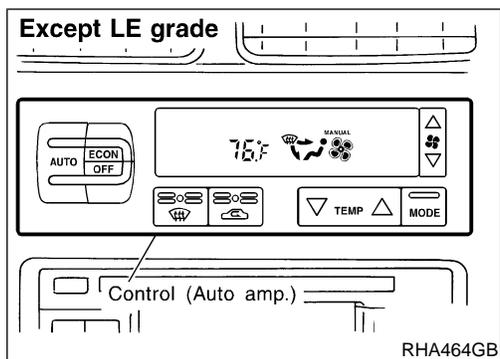


REFER TO THE FOLLOWING.

- (E1) - SUPER MULTIPLE
- JUNCTION (SMJ)
- (M10) - FUSE BLOCK- JUNCTION BOX (J/B)
- (F203) - ELECTRICAL UNITS



Auto Amp. Terminals and Reference Value



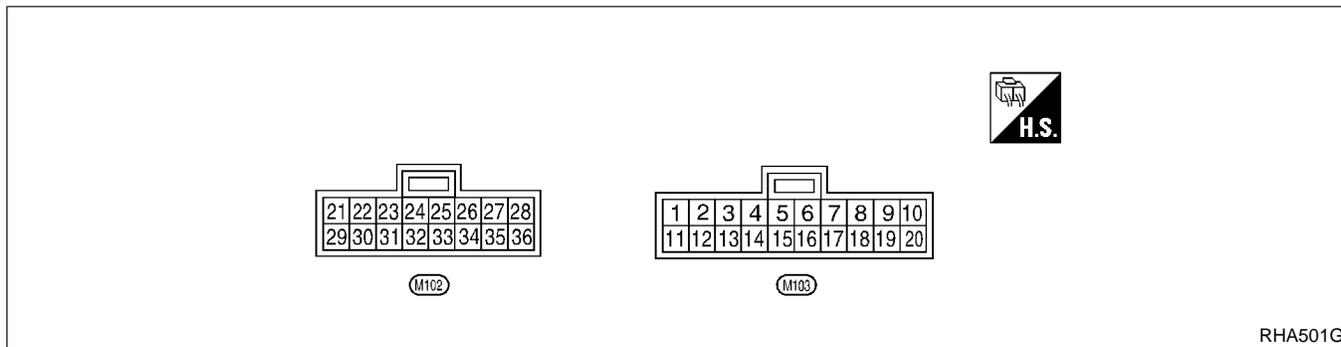
Auto Amp. Terminals and Reference Value INSPECTION OF AUTO AMP.

NAHA0175

NAHA0175S01

- Measure voltage between each terminal and body ground by following "AUTO AMP. INSPECTION TABLE".

- Pin connector terminal layout



AUTO AMP. INSPECTION TABLE

NAHA0175S02

TERMINAL NO. (Wire color)	ITEM	CONDITION	Voltage V	
1 (G/Y)	Intake sensor	—	—	
2 (L/R)	Ambient sensor	—	—	
3 (P/L)	In-vehicle sensor	—	—	
6 (LG)	Compressor feedback signal	AUTO SW: ON		Approximately 0
		AUTO SW: ON	Disconnect refrigerant pressure sensor connector	Approximately 5
8 (G/B)	Intake door position switch	Intake door position	FRESH or 20% FRESH	Approximately 0
			RECIRCULATION	Approximately 5
11 (G/W)	Sensor ground	—	Approximately 0	

TROUBLE DIAGNOSES

AUTO

Auto Amp. Terminals and Reference Value (Cont'd)

TERMINAL NO. (Wire color)	ITEM	CONDITION		Voltage V	
12 (LG/R)	Sunload sensor	—		—	
13 (Y/R)	Water temperature signal	—		—	
14 (B)	Ground (for Canada)	—		Approximately 0	
16 (L/W)	A/C LAN signal	—		Approximately 5.5	
18 (Y/B)	Intake door position switch		Intake door position	20% FRE or RECIRCULATION	Approximately 0
				FRESH	Approximately 5
19 (Y/R)	Intake door position switch		Intake door position	RECIRCULATION or FRESH	Approximately 0
				20% FRE	Approximately 5
21 (L/R)	Power supply for mode door motor and air mix door motor	—		Approximately 12	
22 (B/OR)	Compressor ON signal		Compressor	ON	Approximately 0
				OFF	Approximately 5
24 (P/G)	Power supply for illumination		Lighting switch	OFF	Approximately 0
				1st	Approximately 12
25 (P/B)	Illumination ground	—		Approximately 0	
26 (G/R)	Power supply for BAT		—		BATTERY VOLTAGE

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TROUBLE DIAGNOSES

AUTO

Auto Amp. Terminals and Reference Value (Cont'd)

TERMINAL NO. (Wire color)	ITEM		CONDITION	Voltage V	
27 (G/R)	Power supply for IGN		—	Approximately 12	
28 (L/B)	Power supply for intake door motor		Intake door position	FRE → REC	Approximately 12
				REC → FRE	Approximately 0
30 (B/L)	Rear defogger feedback signal (LE grade)		Rear window defogger switch: ON		Approximately 12
			Rear window defogger switch: OFF		Approximately 0
31 (OR)	Rear defogger ON signal (LE grade)		Rear window defogger switch: ON		Approximately 0
			Rear window defogger switch: OFF		Approximately 12
32 (B)	Ground		—		Approximately 0
33 (L)	Power source for A/C		Ignition voltage feedback		Approximately 12
34 (L/W)	Blower motor feedback		Fan speed: Low		Approximately 7 - 10
35 (L/Y)	Fan control AMP. control signal		Fan speed	Low, Middle low or Middle high	Approximately 2.5 - 3.0
				High	Approximately 9 - 10
36 (L/OR)	Power supply for intake door motor		Intake door position	FRE → REC	Approximately 0
				REC → FRE	Approximately 12

Self-diagnosis

=NAHA0176

NAHA0176S01

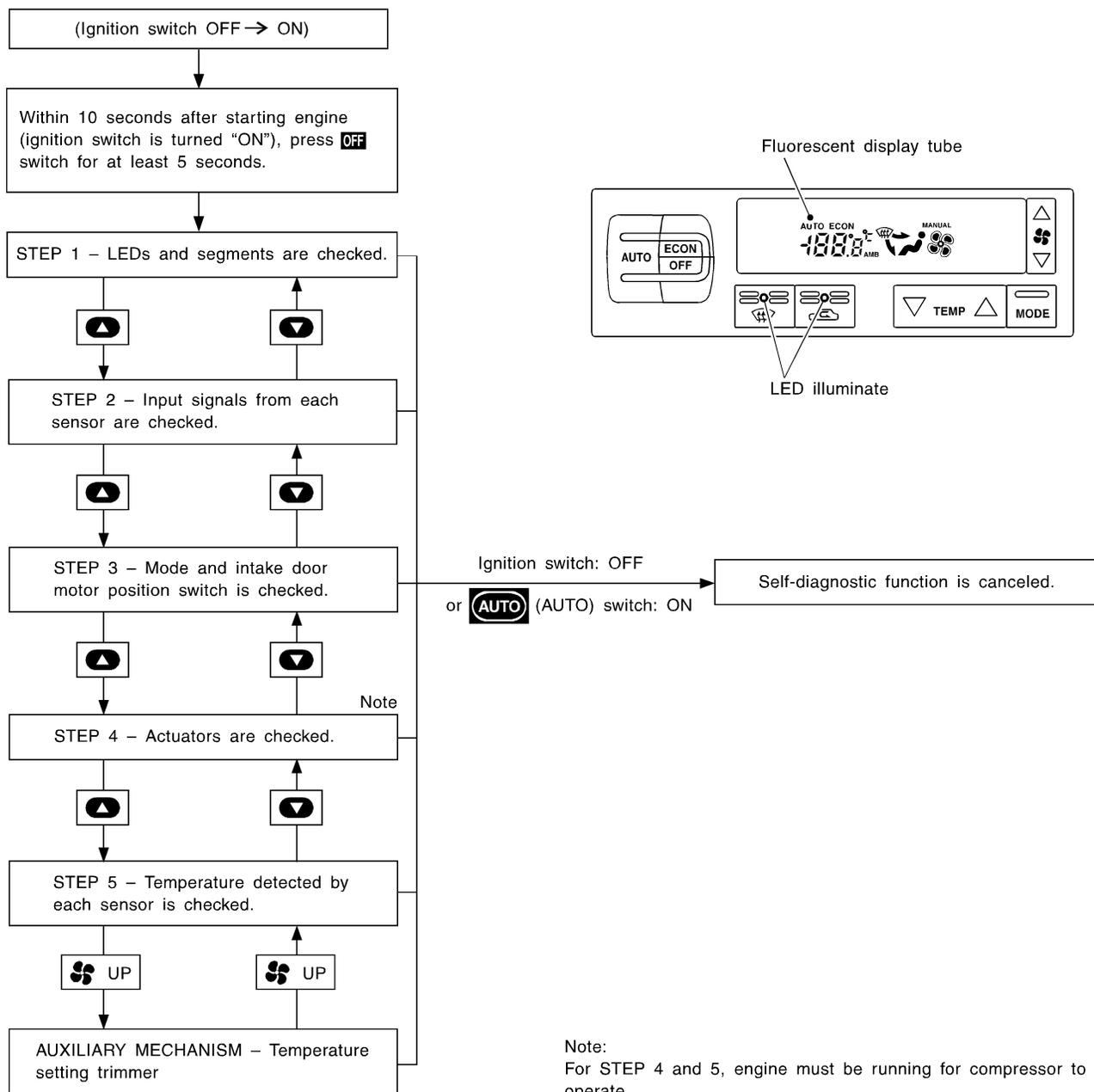
INTRODUCTION AND GENERAL DESCRIPTION

The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch from "OFF" to "ON") and pressing "OFF" switch for at least 5 seconds. The "OFF" switch must be pressed within 10 seconds after starting the engine (ignition switch is turned "ON"). This system will be canceled by either pressing **AUTO** (AUTO) switch or turning the ignition switch "OFF". Shifting from one step to another is accomplished by means of pushing **HOT** or **COLD** switch, as required.

Additionally shifting from STEP 5 to AUXILIARY MECHANISM is accomplished by means of pushing **fan** UP switch.

Except LE Grade

NAHA0176S0101



Note:
For STEP 4 and 5, engine must be running for compressor to operate.

RHA453GA

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Self-diagnosis (Cont'd)

STEP-BY-STEP PROCEDURE

Except LE Grade

=NAHA0176S02

NAHA0176S0201

1	SET IN SELF-DIAGNOSTIC MODE
<ol style="list-style-type: none"> 1. Turn ignition switch ON. 2. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned "ON"), press OFF switch for at least 5 seconds. 	
	GO TO 2.

2	STEP 1 - ALL LEDs AND SEGMENT ARE CHECKED
<p>Do all LEDs and segments illuminate?</p> <p style="text-align: center;">Display malfunction</p> <div style="text-align: center;"> </div> <p style="text-align: center;">Part of segment does not illuminate.</p> <p style="text-align: right;">RHA454G</p> <p style="text-align: center;">Yes or No</p>	
Yes	GO TO 3.
No	Malfunctioning OFF switch, LED or fluorescent display tube. Replace A/C auto amp.

3	CHECK TO ADVANCE SELF-DIAGNOSIS STEP 2
<ol style="list-style-type: none"> 1. Press (H) (HOT) switch. 2. Advance to self-diagnosis STEP 2? <p style="text-align: center;">Yes or No</p>	
Yes	GO TO 4.
No	Malfunctioning (H) (HOT) switch. Replace A/C auto amp.

4	CHECK TO RETURN SELF-DIAGNOSIS STEP 1
<ol style="list-style-type: none"> 1. Press (C) (COLD) switch. 2. Return to self-diagnosis STEP 1? <p style="text-align: center;">Yes or No</p>	
Yes	GO TO 5.
No	Malfunctioning (C) (COLD) switch. Replace A/C auto amp.

TROUBLE DIAGNOSES

AUTO

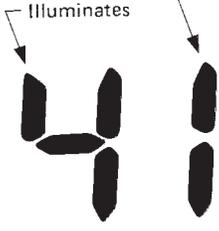
Self-diagnosis (Cont'd)

5	STEP 2 - SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT	
<p>Press (HOT) switch. Does code No. appear on the display?</p>		
<p>Display (when all sensors are in good order)</p> <p style="font-size: small;">Illuminates 25 seconds after "2" is illuminated.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="text-align: center; margin-right: 20px;"> <p style="font-size: x-small;">Illuminates</p> </div> <div style="text-align: center;"> </div> </div>		
RHA970DB		
Yes or No		
Yes	▶	GO TO 6.
No	▶	GO TO 13.

6	STEP 3 - MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED	
<p>Press (HOT) switch. Does code No. appear on the display?</p>		
<p>Display (when all doors are in good order)</p> <p style="font-size: small;">Illuminates 50 seconds after "3" is shown on display.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="text-align: center; margin-right: 20px;"> <p style="font-size: x-small;">Illuminates</p> </div> <div style="text-align: center;"> </div> </div>		
RHA869DD		
Yes or No		
Yes	▶	GO TO 7.
No	▶	GO TO 14.

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Self-diagnosis (Cont'd)

7	STEP 4 - OPERATION OF EACH ACTUATOR IS CHECKED
<p>Press  (HOT) switch. Engine running. Press DEF switch, code No. of each actuator test is indicated on the display.</p> <p style="text-align: center;">Changes from "1" to "E".</p> <div style="text-align: center;"><p>Illuminates</p></div> <p style="text-align: right;">RHA495A</p>	
▶	GO TO 8.

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8 CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor voltage and compressor operation.

Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.

Code No.	Actuator test pattern				
	Mode door	Intake door	Air mix door	Blower motor	Compressor
41	VENT 	REC	Full Cold	4 - 5V	ON
42	B/L 	REC	Full Cold	9 - 11V	ON
43	B/L 	20% FRE	Full Hot	7 - 9V	OFF
44	FOOT 	FRE	Full Hot	7 - 9V	OFF
45	D/F 	FRE	Full Hot	7 - 9V	ON
46	DEF 	FRE	Full Hot	10 - 12V	ON

MTBL0200

Discharge air flow

Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	80%	20%
	—	60%	40%
	—	—	100%

MTBL1831

OK or NG

OK ▶

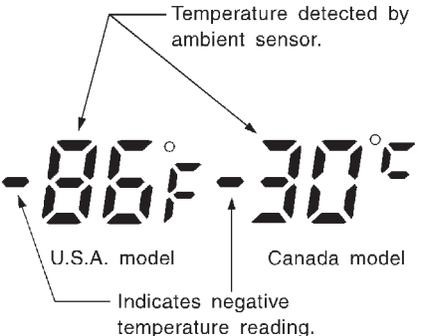
GO TO 9.

NG ▶

- Air outlet does not change.
Go to "Mode Door Motor" (HA-68).
- Discharge air temperature does not change.
Go to "Air Mix Door Motor" (HA-75).
- Intake door does not change.
Go to "Intake Door Motor" (HA-79).
- Blower motor operation is malfunctioning.
Go to "Blower Motor" (HA-87).
- Magnet clutch does not engage.
Go to "Magnet Clutch" (HA-97).

Self-diagnosis (Cont'd)

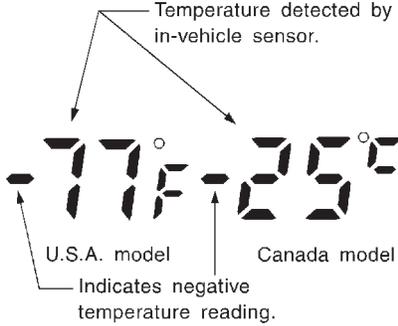
9	STEP 5 - TEMPERATURE OF EACH SENSOR IS CHECKED
<p>Press (HOT) switch. Code No. 5 appears on the display.</p> <div style="text-align: center; margin: 20px 0;"> <p>“5” appears on display.</p>  </div> <p style="text-align: right; margin-top: 20px;">RHA492A</p>	
▶	GO TO 10.

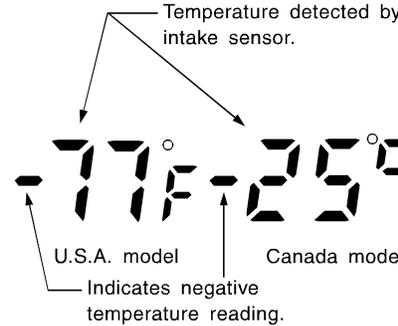
10	CHECK AMBIENT SENSOR
<p>Press (DEF) switch one time, temperature detected by ambient sensor is indicated on the display. ECON shown in display indicates negative temperature reading.</p> <p>NOTE: If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.</p> <div style="text-align: center; margin: 20px 0;">  </div> <p style="text-align: center; margin-top: 10px;">OK or NG</p>	
▶	GO TO 11.
▶	Go to Ambient Sensor Circuit (HA-121).

TROUBLE DIAGNOSES

AUTO

Self-diagnosis (Cont'd)

11	CHECK IN-VEHICLE SENSOR	<p>Press  (DEF) switch the second time, temperature detected by in-vehicle sensor is indicated on the display screen. ECON shown in display indicates negative temperature reading.</p> <p>NOTE: If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">RHA500G</p> <p style="text-align: center;">OK or NG</p>	GI MA EM LC EC FE CL MT
OK	▶	GO TO 12.	
NG	▶	Go to In-vehicle Sensor Circuit (HA-124).	

12	CHECK INTAKE SENSOR	<p>Press  (DEF) switch the third time, temperature detected by intake sensor is indicated on the display.</p> <p>NOTE: If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.</p> <div style="text-align: center;">  </div> <p style="text-align: right;">RHA500GB</p> <p style="text-align: center;">OK or NG</p>	AT TF PD AX SU BR ST RS
OK	▶	1. Press  (DEF) switch the fourth time. Display returns to original presentation 5. 2. Turn ignition switch OFF or  (AUTO) switch ON. 3. END	
NG	▶	Go to Intake Sensor Circuit (HA-131).	

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13 CHECK MALFUNCTIONING SENSOR

Refer to the following chart for malfunctioning code No.
(If two or more sensors malfunction, corresponding code Nos. blink respectively two times.)

Code No.	Malfunctioning sensor (including circuits)	Reference page
21	Ambient sensor	*2
-21		
22	In-vehicle sensor	*3
-22		
24	Intake sensor	*4
-24		
25	Sunload sensor*1	*5
-25		
26	Air mix door motor (LCU) PBR	*6
-26		

MTBL0083

***1: Conduct self-diagnosis STEP 2 under sunshine.**

When conducting indoors, aim a light (more than 60W) at sunload sensor, otherwise Code No. 25 will indicate despite that sunload sensor is functioning properly.

*2: HA-121

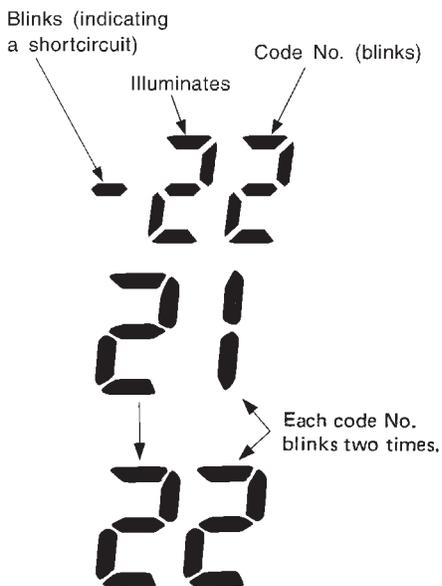
*3: HA-124

*4: HA-131

*5: HA-128

*6: HA-133

Display (when sensor malfunctions)



RHA455G

RHA501A



INSPECTION END

14 CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode or (and) intake door motor position switch(es) is (are) malfunctioning.
 (If two or more mode or intake doors are out of order, corresponding code numbers blink respectively two times.)

Code No. *1 *2	Mode or intake door position		Reference page
31	VENT		*3
32	B/L		
34	FOOT		
35	D/F		
36	DEF		
37	FRE		*4
38	20% FRE		
39	REC		

MTBL0514

*1: If mode door motor harness connector is disconnected, the following display pattern will appear.

31 → 32 → 34 → 35 → 36 → Return to 31

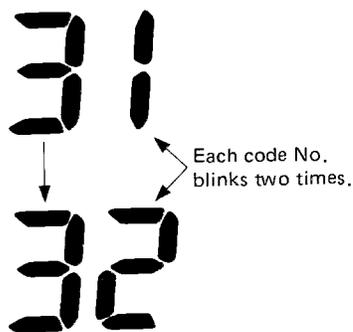
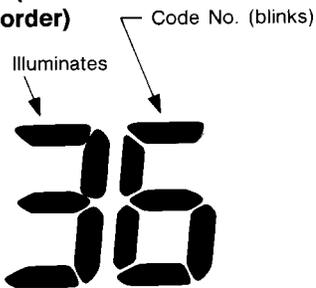
*2: If intake door motor harness connector is disconnected, the following display pattern will appear.

37 → 38 → 39 → Return to 37

*3: HA-68

*4: HA-79

Display (when a door is out of order)



RHA168DA

RHA498A

▶ INSPECTION END

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Self-diagnosis (Cont'd)

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

=NAHA0176S03

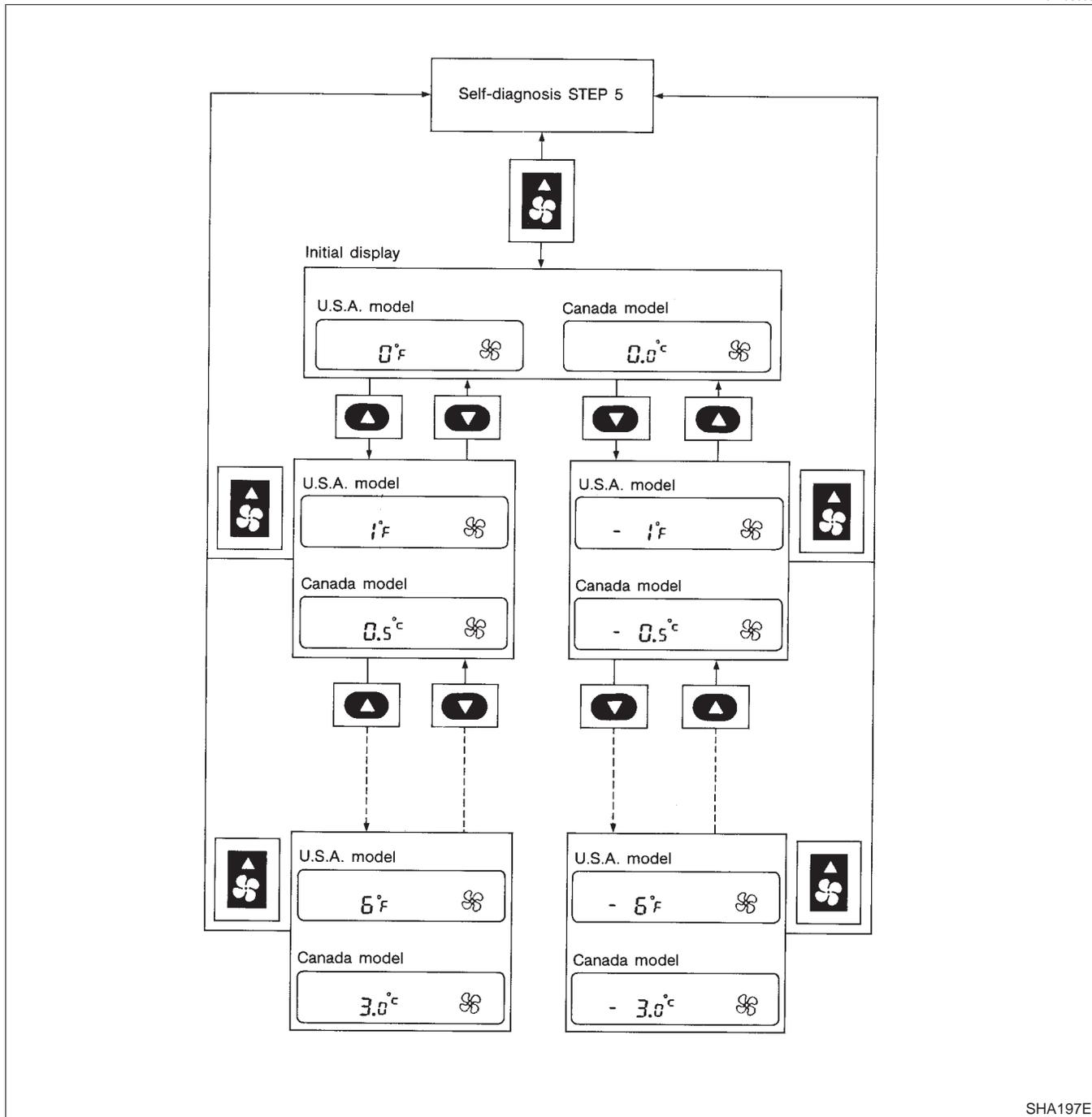
The trimmer compensates for differences in range of $\pm 3^{\circ}\text{C}$ ($\pm 6^{\circ}\text{F}$) between temperature setting (displayed digitally) and temperature felt by driver.

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP 5 mode.
- Press  (fan) UP switch to set system in auxiliary mode.
- Display shows "5!" in auxiliary mechanism. It takes approximately 3 seconds.
- Press either  (HOT) or  (COLD) switch as desired. Temperature will change at a rate of 0.5°C (1°F) each time a switch is pressed.

Except LE Grade

NAHA0176S0301



SHA197E

When battery cable is disconnected, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

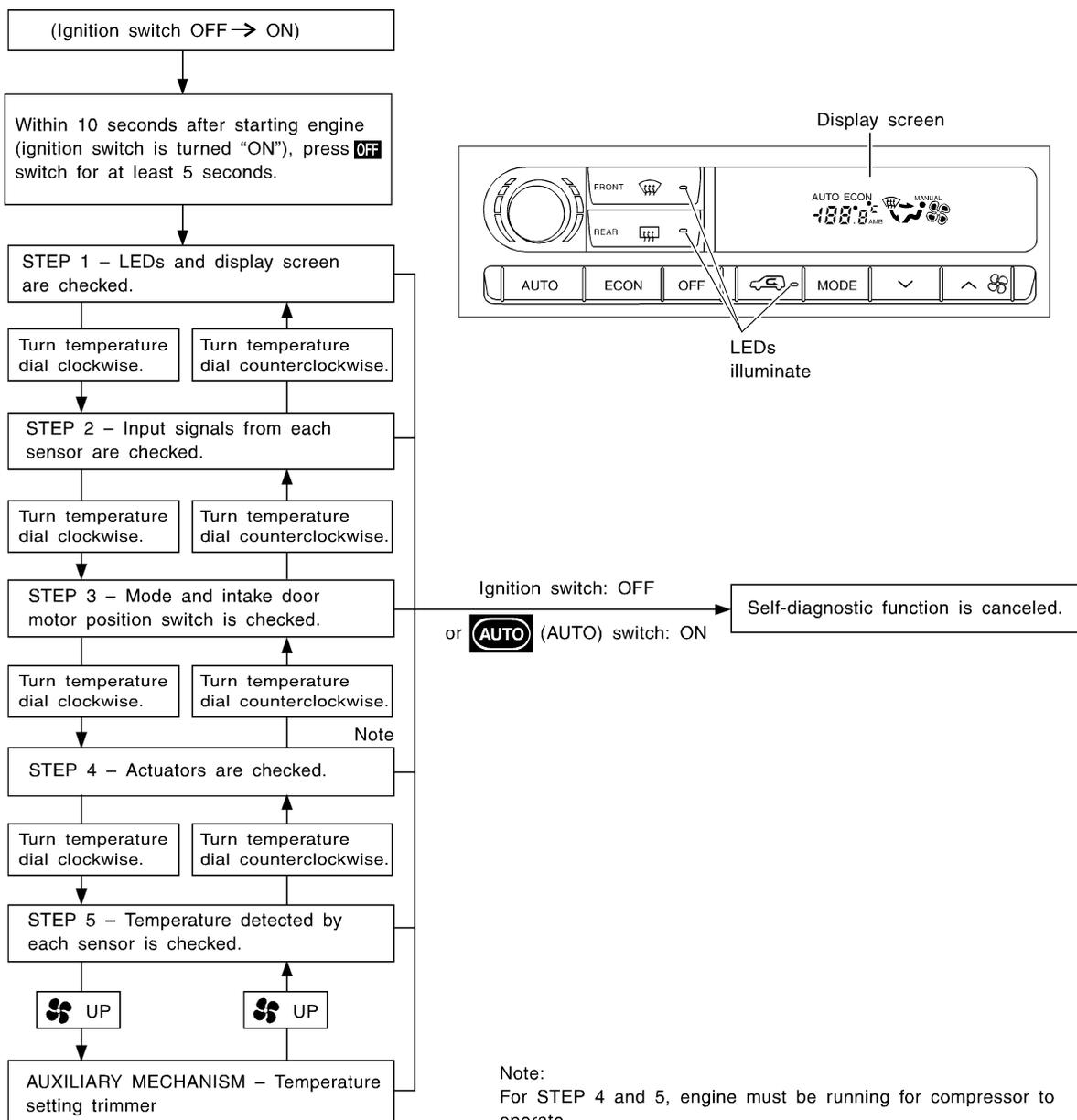
INTRODUCTION AND GENERAL DESCRIPTION

NAHA0176S07

The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from usual control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch from "OFF" to "ON") and pressing "OFF" switch for at least 5 seconds. The "OFF" switch must be pressed within 10 seconds after starting the engine (ignition switch is turned "ON"). This system will be canceled by either pressing **AUTO** (AUTO) switch or turning the ignition switch "OFF". Shifting from one step to another is accomplished by means of turning temperature dial, as required. Additionally shifting from STEP 5 to AUXILIARY MECHANISM is accomplished by means of pushing **UP** (fan) UP switch.

LE Grade

NAHA0176S0702



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SHA668F

Self-diagnosis (Cont'd)

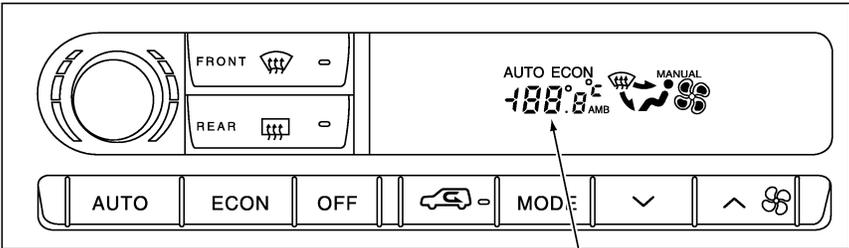
STEP-BY-STEP PROCEDURE

=NAHA0176S08

LE Grade

NAHA0176S0802

1	SET IN SELF-DIAGNOSTIC MODE
1. Turn ignition switch ON. 2. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned "ON".), press OFF switch for at least 5 seconds.	
▶	GO TO 2.

2	STEP 1 - ALL LEDs AND SEGMENT ARE CHECKED
Do all LEDs and segments illuminate?	
Display malfunction	 <p style="text-align: right; margin-right: 50px;">Part of segment does not illuminate.</p>
Yes or No	
Yes	▶ GO TO 3.
No	▶ Malfunctioning OFF switch, LED or fluorescent display tube. Replace A/C auto amp.

SHA669F

3	VERIFY ADVANCE TO SELF-DIAGNOSIS STEP 2
1. Turn the temperature control dial clockwise. 2. Does advance to self-diagnosis STEP 2?	
Yes or No	
Yes	▶ GO TO 4.
No	▶ Malfunctioning temperature control dial. Replace A/C auto amp.

4	VERIFY RETURN TO SELF-DIAGNOSIS STEP 1
1. Turn the temperature dial counterclockwise. 2. Does return to self-diagnosis STEP 1?	
Yes or No	
Yes	▶ GO TO 5.
No	▶ Malfunctioning temperature control dial. Replace A/C auto amp.

TROUBLE DIAGNOSES

AUTO

Self-diagnosis (Cont'd)

5	STEP 2 - SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT	
<p>Turn the temperature control dial clockwise, go to STEP 2. Does code No. 20 appear on the display?</p>		
<p>Display (when all sensors are in good order)</p> <p style="font-size: small;">Illuminates 25 seconds after "2" is illuminated.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="text-align: center; margin-right: 20px;"> <p style="font-size: x-small;">Illuminates</p>  </div> <div style="text-align: center;"> <p style="font-size: x-small;">Illuminates 25 seconds after "2" is illuminated.</p>  </div> </div> <div style="text-align: center; margin: 20px 0;">  </div>		
RHA970DB		
Yes or No		
Yes	▶	GO TO 6.
No	▶	GO TO 13.

6	STEP 3 - MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED	
<p>Turn the temperature control dial clockwise, go to STEP 3. Does code No. 30 appear on the display?</p>		
<p>Display (when all doors are in good order)</p> <p style="font-size: small;">Illuminates 50 seconds after "3" is shown on display.</p> <div style="display: flex; justify-content: center; align-items: center;"> <div style="text-align: center; margin-right: 20px;"> <p style="font-size: x-small;">Illuminates</p>  </div> <div style="text-align: center;"> <p style="font-size: x-small;">Illuminates 50 seconds after "3" is shown on display.</p>  </div> </div> <div style="text-align: center; margin: 20px 0;">  </div>		
RHA869DD		
Yes or No		
Yes	▶	GO TO 7.
No	▶	GO TO 14.

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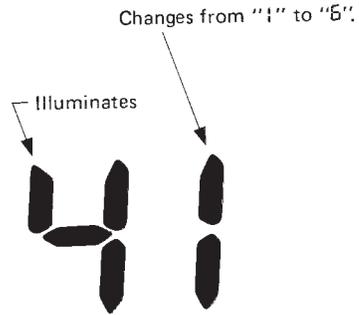
Self-diagnosis (Cont'd)

7 STEP 4 - OPERATION OF EACH ACTUATOR IS CHECKED

Turn the temperature control dial clockwise, go to STEP 4.

Engine running.

Press DEF switch, code No. of each actuator test is indicated on the display.



RHA495A



GO TO 8.

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8 CHECK ACTUATORS

Refer to the following chart and confirm discharge air flow, air temperature, blower motor voltage and compressor operation.

Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.

Code No.	Actuator test pattern				
	Mode door	Intake door	Air mix door	Blower motor	Compressor
41	VENT 	REC	Full Cold	4 - 5V	ON
42	B/L 	REC	Full Cold	9 - 11V	ON
43	B/L 	20% FRE	Full Hot	7 - 9V	OFF
44	FOOT 	FRE	Full Hot	7 - 9V	OFF
45	D/F 	FRE	Full Hot	7 - 9V	ON
46	DEF 	FRE	Full Hot	10 - 12V	ON

MTBL0200

Discharge air flow

Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	—	—
	60%	40%	—
	—	80%	20%
	—	60%	40%
	—	—	100%

MTBL1831

OK or NG

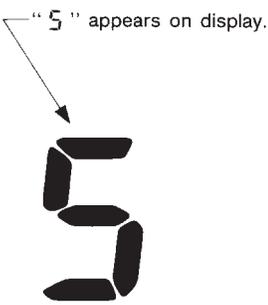
OK ▶

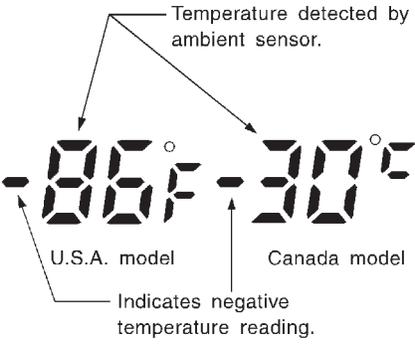
GO TO 9.

NG ▶

- Air outlet does not change.
Go to "Mode Door Motor" (HA-68).
- Discharge air temperature does not change.
Go to "Air Mix Door Motor" (HA-75).
- Intake door does not change.
Go to "Intake Door Motor" (HA-79).
- Blower motor operation is malfunctioning.
Go to "Blower Motor" (HA-87).
- Magnet clutch does not engage.
Go to "Magnet Clutch" (HA-98).

Self-diagnosis (Cont'd)

9	STEP 5 - TEMPERATURE OF EACH SENSOR IS CHECKED
Turn the temperature control dial clockwise, go to STEP 5. Code No. 5 appears on the display.	
	
RHA492A	
▶	GO TO 10.

10	CHECK AMBIENT SENSOR
Press  (DEF) switch one time, temperature detected by ambient sensor is indicated on the display. ECON shown in display indicates negative temperature reading.	
NOTE: If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.	
	
OK or NG	
OK	▶ GO TO 11.
NG	▶ Go to Ambient Sensor Circuit (HA-121).
RHA499G	

11	CHECK IN-VEHICLE SENSOR	
		<p>Press (DEF) switch the second time, temperature detected by in-vehicle sensor is indicated on the display screen. ECON shown in display indicates negative temperature reading.</p> <p>NOTE: If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">RHA500G</p> <p style="text-align: center;">OK or NG</p>
OK	▶	GO TO 12.
NG	▶	Go to In-vehicle Sensor Circuit (HA-124).

12	CHECK INTAKE SENSOR	
		<p>Press (DEF) switch the third time, temperature detected by intake sensor is indicated on the display.</p> <p>NOTE: If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">RHA500GB</p> <p style="text-align: center;">OK or NG</p>
OK	▶	<ol style="list-style-type: none"> 1. Press (DEF) switch the fourth time. Display returns to original presentation 5. 2. Turn ignition switch OFF or (AUTO) switch ON. 3. END
NG	▶	Go to Intake Sensor Circuit (HA-131).

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13 CHECK MALFUNCTIONING SENSOR

Refer to the following chart for malfunctioning code No.
(If two or more sensors malfunction, corresponding code Nos. blink respectively two times.)

Code No.	Malfunctioning sensor (including circuits)	Reference page
21	Ambient sensor	*2
-21		
22	In-vehicle sensor	*3
-22		
24	Intake sensor	*4
-24		
25	Sunload sensor*1	*5
-25		
26	Air mix door motor (LCU) PBR	*6
-26		

MTBL0083

***1: Conduct self-diagnosis STEP 2 under sunshine.**

When conducting indoors, aim a light (more than 60W) at sunload sensor, otherwise Code No. 25 will indicate despite that sunload sensor is functioning properly.

*2: HA-122

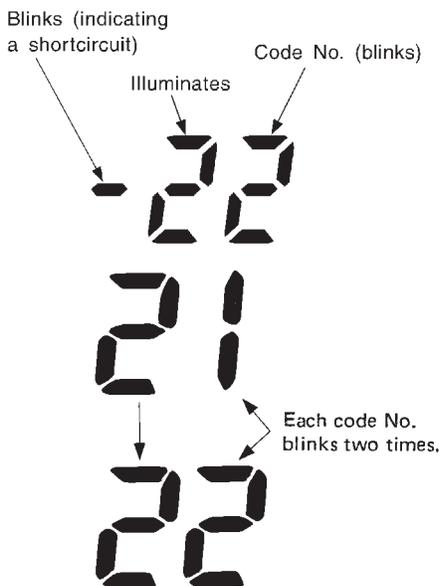
*3: HA-125

*4: HA-132

*5: HA-128

*6: HA-133

Display (when sensor malfunctions)



RHA455G

RHA501A


INSPECTION END

14 CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode or (and) intake door motor position switch(es) is (are) malfunctioning.
 (If two or more mode or intake doors are out of order, corresponding code numbers blink respectively two times.)

Code No. *1 *2	Mode or intake door position		Reference page
31	VENT		*3
32	B/L		
34	FOOT		
35	D/F		
36	DEF		
37	FRE		*4
38	20% FRE		
39	REC		

MTBL0508

*1: If mode door motor harness connector is disconnected, the following display pattern will appear.

31 → 32 → 34 → 35 → 36 → Return to 31

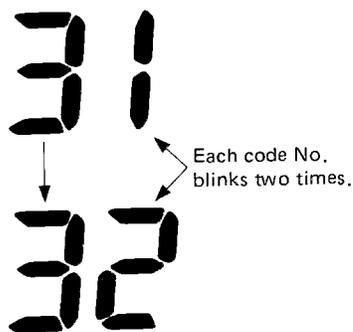
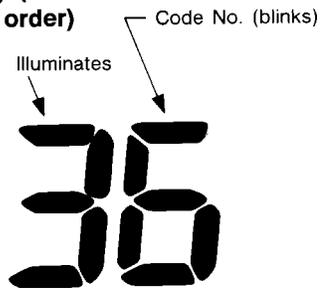
*2: If intake door motor harness connector is disconnected, the following display pattern will appear.

37 → 38 → 39 → Return to 37

*3: HA-69

*4: HA-80

Display (when a door is out of order)



RHA168DA

RHA498A

▶ INSPECTION END

GI
MA
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LC
EC
FE
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AX
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IDX

Self-diagnosis (Cont'd)

AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

=NAHA0176S09

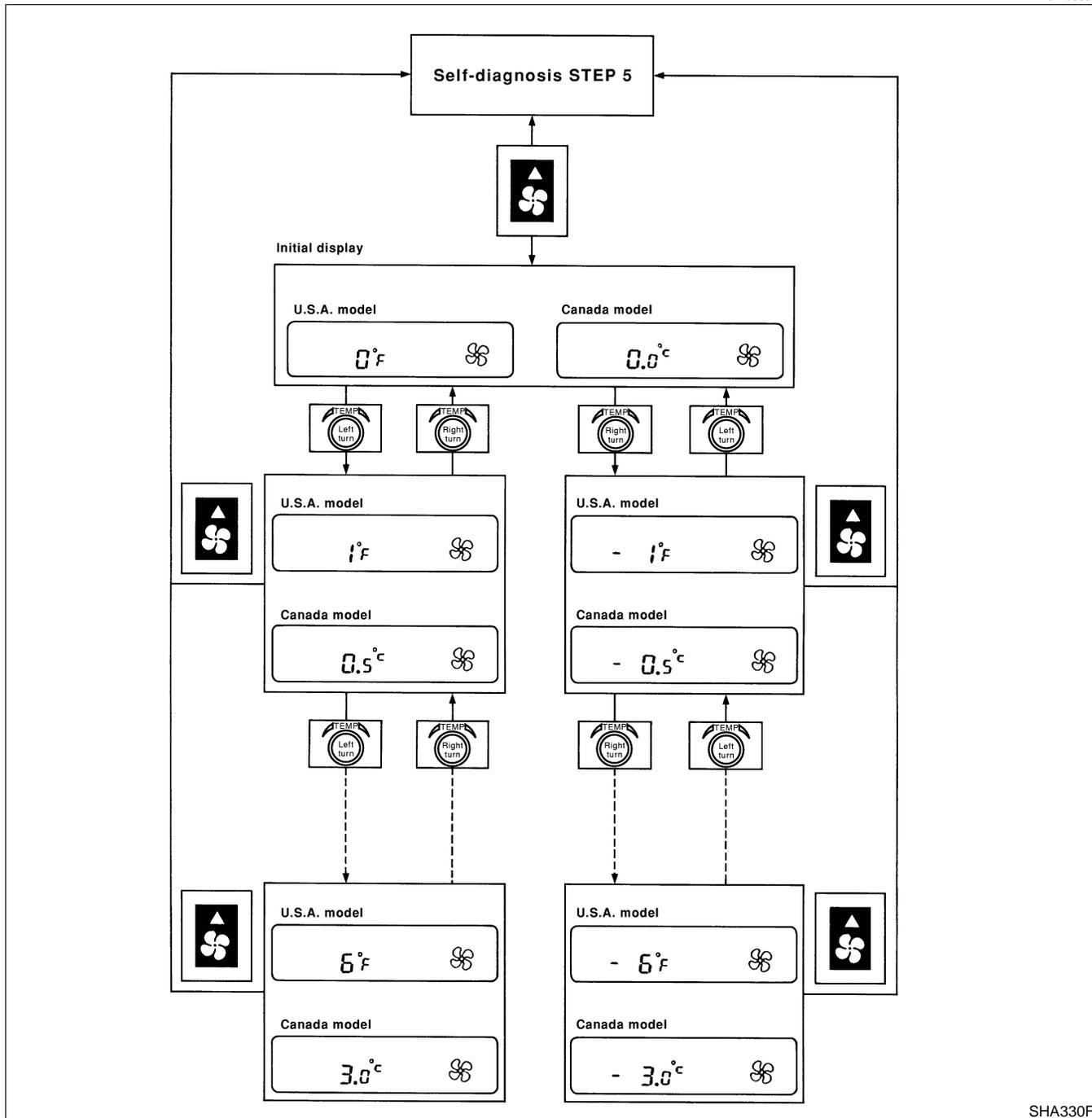
The trimmer compensates for differences in range of $\pm 3^{\circ}\text{C}$ ($\pm 6^{\circ}\text{F}$) between temperature setting (displayed digitally) and temperature felt by driver.

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP 5 mode.
- Press  (fan) UP switch to set system in auxiliary mode.
- Display shows "5!" in auxiliary mechanism.
It takes approximately 3 seconds.
- Turn temperature control dial clockwise or counterclockwise. Temperature will change at a rate of 0.5°C (1°F) each time a switch is pressed.

LE Grade

NAHA0176S0902



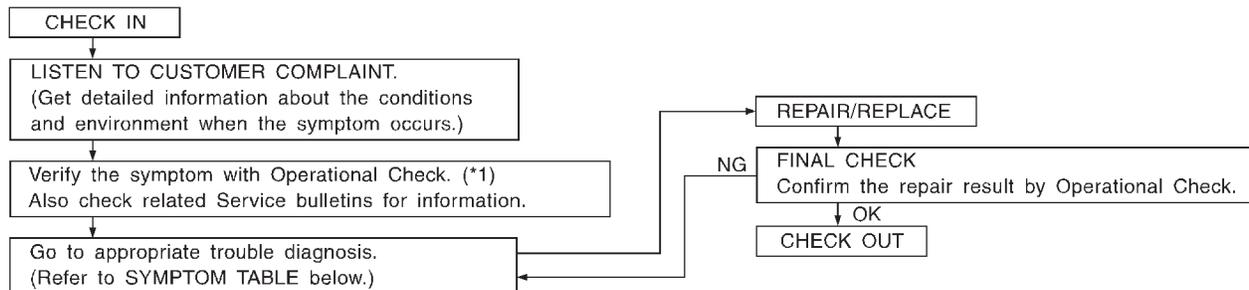
When battery cable is disconnected, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e. 0°C (0°F).

How to Perform Trouble Diagnoses for Quick and Accurate Repair

=NAHA0177

NAHA0177S01

WORK FLOW



SHA900E

*1: Operational Check (HA-60)

SYMPTOM TABLE

NAHA0177S02

Symptom	Reference Page
● A/C system does not come on.	● Go to Trouble Diagnosis Procedure for A/C System. HA-65
● Air outlet does not change.	● Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) HA-68
● Mode door motor does not operate normally.	
● Discharge air temperature does not change.	● Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN) HA-75
● Air mix door motor does not operate normally.	
● Intake door does not change.	● Go to Trouble Diagnosis Procedure for Intake Door Motor. HA-79
● Intake door motor does not operate normally.	
● Blower motor operation is malfunctioning.	● Go to Trouble Diagnosis Procedure for Blower Motor. HA-87
● Blower motor operation is malfunctioning under out of starting fan speed control.	
● Magnet clutch does not engage.	● Go to Trouble Diagnosis Procedure for Magnet Clutch. HA-97
● Insufficient cooling.	● Go to Trouble Diagnosis Procedure for Insufficient Cooling. HA-104
● Insufficient heating.	● Go to Trouble Diagnosis Procedure for Insufficient Heating. HA-113
● Noise.	● Go to Trouble Diagnosis Procedure for Noise. HA-115
● Self-diagnosis cannot be performed.	● Go to Trouble Diagnosis Procedure for Self-diagnosis. HA-116
● Memory function does not operate.	● Go to Trouble Diagnosis Procedure for Memory Function. HA-118
● ECON mode does not operate.	● Go to Trouble Diagnosis Procedure for ECON (ECONOMY) — mode. HA-120

Operational Check

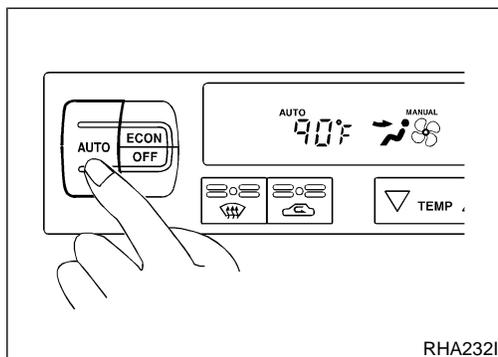
NAHA0178

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

CONDITIONS:

NAHA0178S01

- Engine running and at normal operating temperature.



PROCEDURE: (EXCEPT LE GRADE)

NAHA0178S02

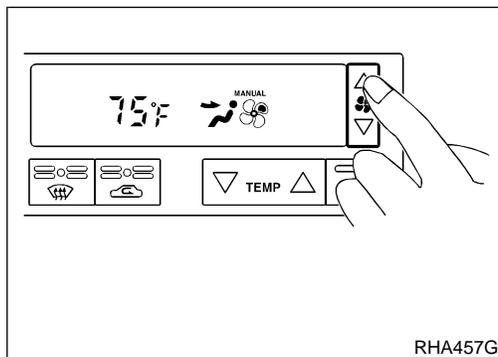
1. Check Memory Function

NAHA0178S0201

1. Set the temperature 90°F or 32°C.
2. Press OFF switch.
3. Turn the ignition off.
4. Turn the ignition on.
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

If NG, go to trouble diagnosis procedure for memory function (HA-118).

If OK, continue with next check.



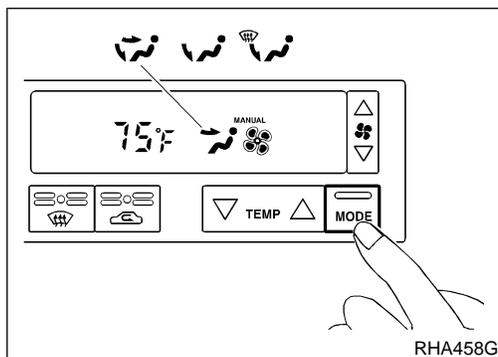
2. Check Blower

NAHA0178S0202

1. Press fan switch (up side) one time.
Blower should operate on low speed.
The fan symbol should have one blade lit ☼.
2. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on MAX speed ☼☼.

If NG, go to trouble diagnosis procedure for blower motor (HA-87).

If OK, continue with next check.



3. Check Discharge Air

NAHA0178S0203

1. Press mode switch four times and DEF button.
2. Each position indicator should change shape.

Discharge air flow

Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	–	–
	60%	40%	–
	–	80%	20%
	–	60%	40%
	–	–	100%

RHA654FL

- Confirm that discharge air comes out according to the air distribution table at left.
Refer to “Discharge Air Flow” (HA-27).

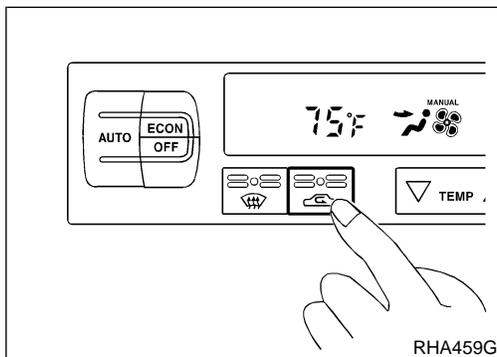
NOTE:

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

Intake door position is checked in the next step.

If NG, go to trouble diagnosis procedure for mode door motor (HA-68).

If OK, continue with next check.



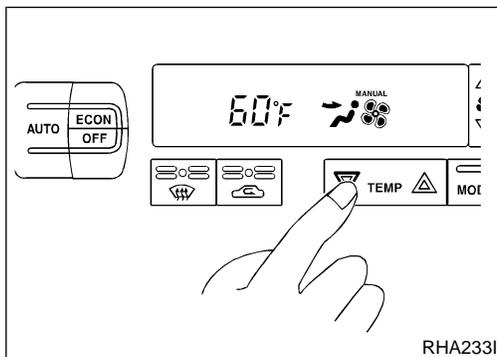
4. Check Recirculation

NAHA0178S0204

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

If NG, go to trouble diagnosis procedure for intake door (HA-79).

If OK, continue with next check.



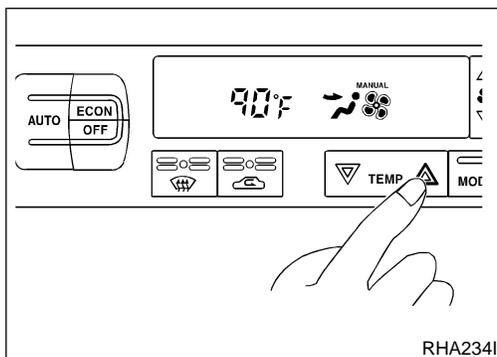
5. Check Temperature Decrease

NAHA0178S0205

- Press the temperature decrease button until 18°C (60°F) is displayed.
- Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for insufficient cooling (HA-104).

If OK, continue with next check.



6. Check Temperature Increase

NAHA0178S0206

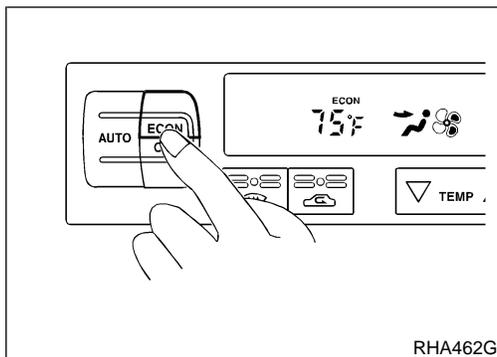
- Press the temperature increase button until 32°C (90°F) is displayed.
- Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for insufficient heating (HA-113).

If OK, continue with next check.

GI
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Operational Check (Cont'd)



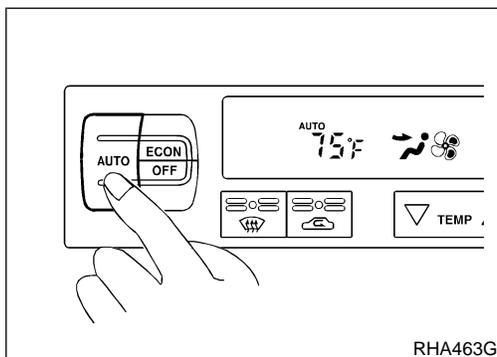
7. Check ECON (Economy) Mode

NAHA0178S0207

1. Set the temperature 75°F or 25°C.
2. Press ECON switch.
3. Display should indicate ECON (not AUTO).
Confirm that the compressor clutch is not engaged (sound or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If NG, go to trouble diagnosis procedure for ECON (Economy) mode (HA-120).

If OK, continue with next check.



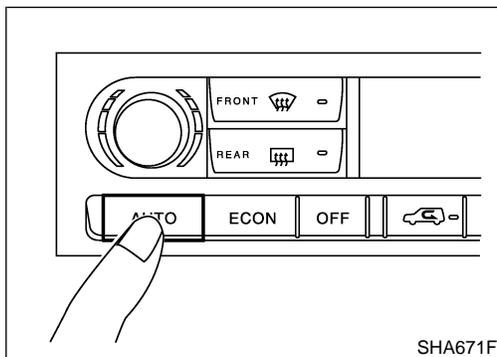
8. Check AUTO Mode

NAHA0178S0208

1. Press AUTO switch.
2. Display should indicate AUTO (no ECON).
Confirm that the compressor clutch engages (sound or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If NG, go to trouble diagnosis procedure for A/C system (HA-65), then if necessary, trouble diagnosis procedure for magnet clutch (HA-97).

If all operational check are OK (symptom can not be duplicated), go to "Incident Simulation Tests" (GI-25) and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to "Symptom Table" (HA-59) and perform applicable trouble diagnosis procedures.



PROCEDURE: (LE GRADE)

NAHA0178S04

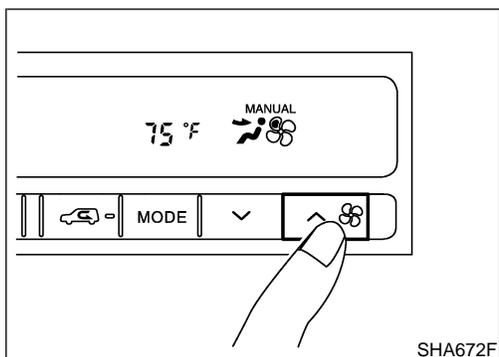
1. Check Memory Function

NAHA0178S0401

1. Set the temperature 90°F or 32°C.
2. Press OFF switch.
3. Turn the ignition off.
4. Turn the ignition on.
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

If NG, go to trouble diagnosis procedure for memory function (HA-119).

If OK, continue with next check.

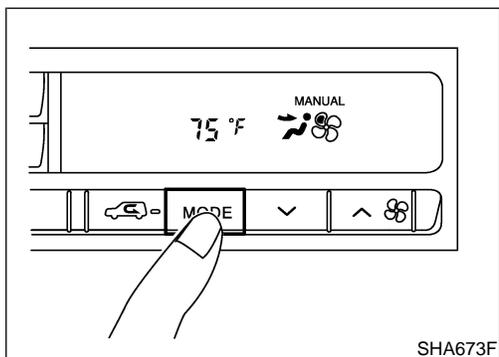


2. Check Blower

NAHA0178S0402

1. Press fan switch (up side) one time.
Blower should operate on low speed.
The fan symbol should have one blade lit .
2. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on MAX speed .

If NG, go to trouble diagnosis procedure for blower motor (HA-88).
If OK, continue with next check.



3. Check Discharge Air

NAHA0178S0403

1. Press MODE switch four times and DEF button.
2. Each position indicator should change shape.

Discharge air flow

Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	-	-
	60%	40%	-
	-	80%	20%
	-	60%	40%
	-	-	100%

RHA654FL

3. Confirm that discharge air comes out according to the air distribution table at left.
Refer to "Discharge Air Flow" (HA-69).

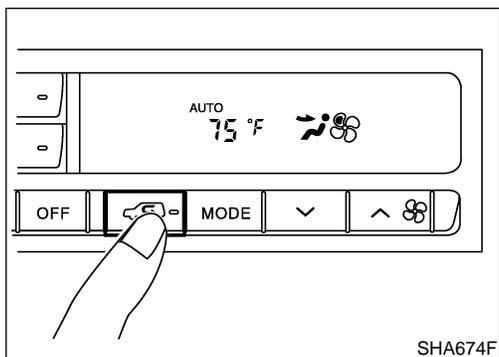
NOTE:

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

Intake door position is checked in the next step.

If NG, go to trouble diagnosis procedure for mode door motor (HA-69).

If OK, continue with next check.



4. Check Recirculation

NAHA0178S0404

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

If NG, go to trouble diagnosis procedure for intake door (HA-80).
If OK, continue with next check.

GI

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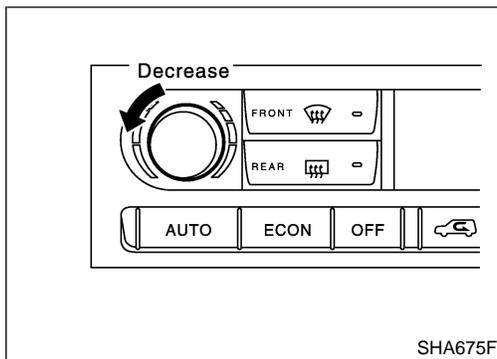
BT

HA

SC

EL

IDX



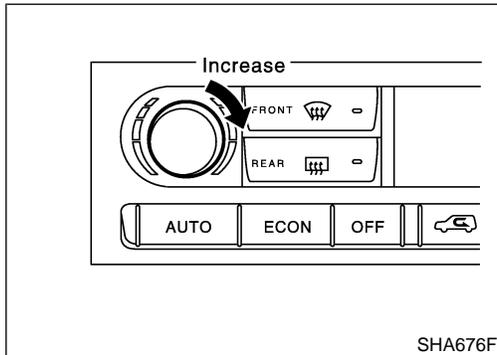
5. Check Temperature Decrease

NAHA0178S0405

1. Turn temperature control dial counterclockwise until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.

If NG, go to trouble diagnosis procedure for insufficient cooling (HA-105).

If OK, continue with next check.



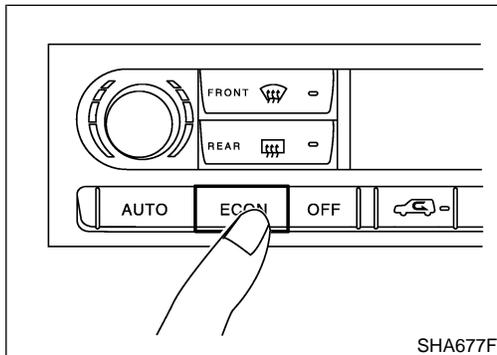
6. Check Temperature Increase

NAHA0178S0406

1. Turn the temperature control dial clockwise until 32°C (90°F) is displayed.
2. Check for hot air at discharge air outlets.

If NG, go to trouble diagnosis procedure for insufficient heating (HA-114).

If OK, continue with next check.



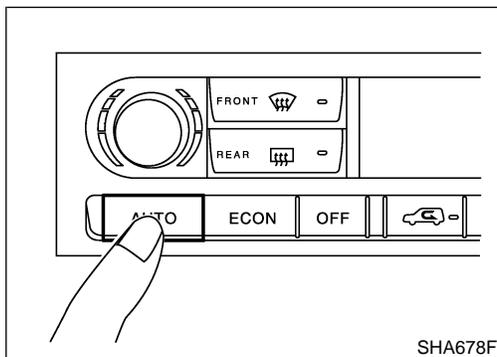
7. Check ECON (Economy) Mode

NAHA0178S0407

1. Set the temperature 75°F or 25°C.
2. Press ECON switch.
3. Display should indicate ECON (not AUTO).
Confirm that the compressor clutch is not engaged (sound or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If NG, go to trouble diagnosis procedure for ECON (Economy) mode (HA-121).

If OK, continue with next check.



8. Check AUTO Mode

NAHA0178S0408

1. Press AUTO switch.
2. Display should indicate AUTO (not ECON).
Confirm that the compressor clutch engages (sound or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If NG, go to trouble diagnosis procedure for A/C system (HA-65), then if necessary, trouble diagnosis procedure for magnet clutch (HA-98).

If all operational check are OK (symptom can not be duplicated), go to "Incident Simulation Tests" (GI section) and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to "Symptom Table" (HA-59) and perform applicable trouble diagnosis procedures.

A/C System

TROUBLE DIAGNOSIS PROCEDURE FOR A/C SYSTEM

=NAHA0179

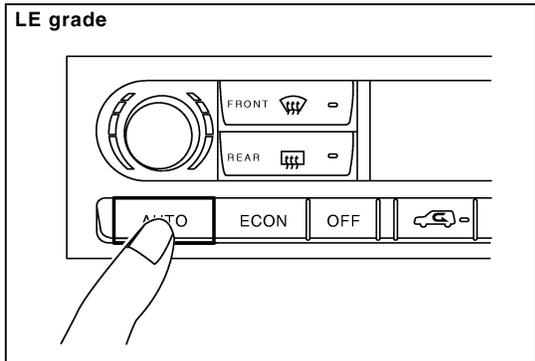
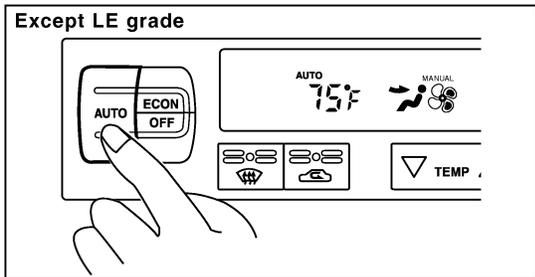
SYMPTOM:

- A/C system does not come on.

INSPECTION FLOW

GI
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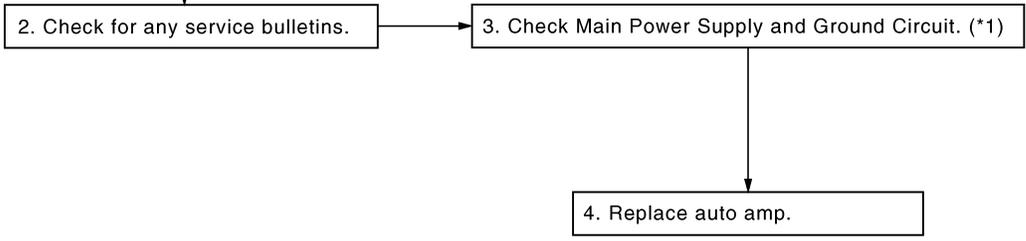
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – AUTO mode

- a. Press AUTO switch.
- b. Display should indicate AUTO (not ECON). Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

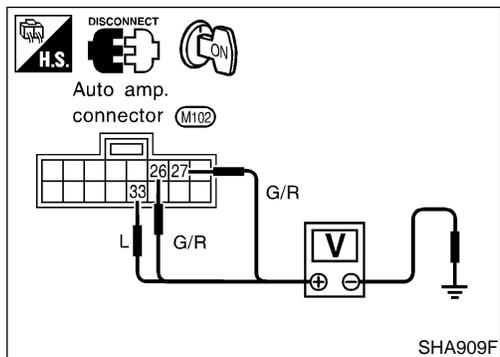
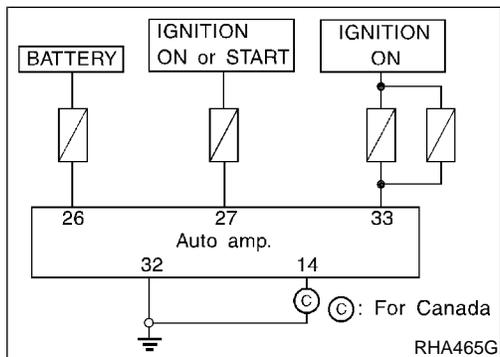
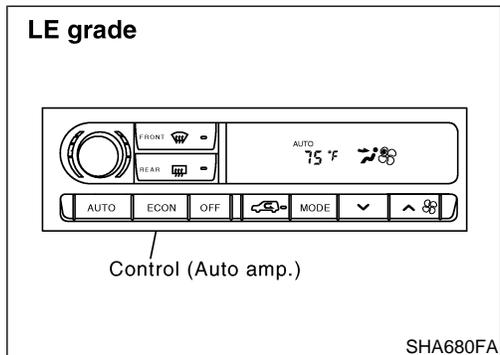
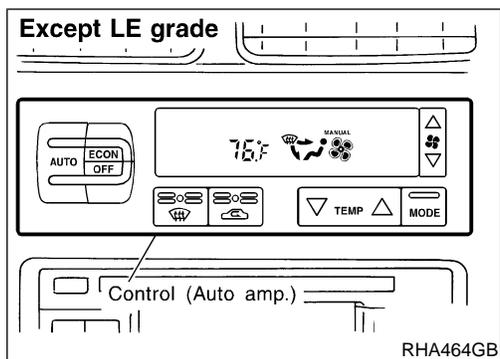
**If OK (symptom cannot be duplicated), perform complete operational check (*2).
 If NG (symptom is confirmed), continue with STEP-2 following.**



*1: HA-66

*2: HA-60

A/C System (Cont'd)



MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

Component Description

NAHA0180

Automatic Amplifier (Auto Amp.)

NAHA0180S01

NAHA0180S0101

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

The auto amplifier is unitized with control mechanisms. Signals from various switches and Potentio Temperature Control (PTC) are directly entered into auto amplifier.

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

Potentio Temperature Control (PTC)

NAHA0180S0102

The PTC is built into the A/C auto amp. It can be set at an interval of 0.5°C (1.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by pushing the temperature button. The set temperature is digitally displayed.

DIAGNOSTIC PROCEDURE

NAHA0181

SYMPTOM:

- A/C system does not come on.

Auto Amp. Check

NAHA0181S01

Check power supply circuit for auto amp. with ignition switch ON. Measure voltage across terminal Nos. 26, 27, 33 and ground.

Voltmeter terminal		Voltage
(+)	(-)	
26	Ground	Battery voltage
27		
33		

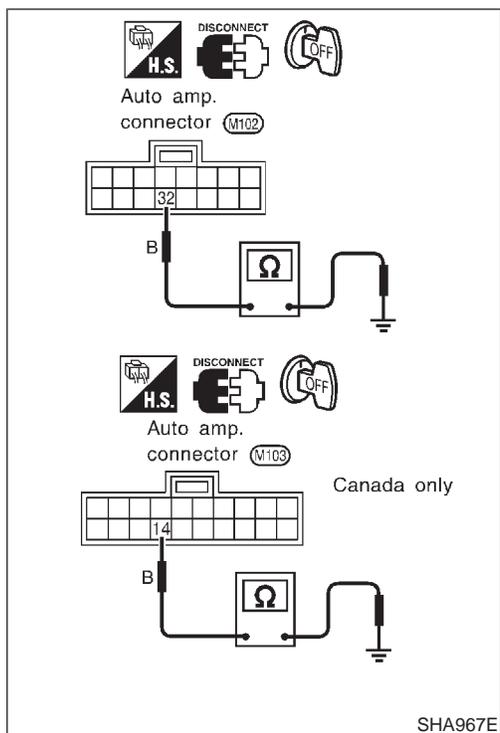
If OK, check auto amp.

- If NG, check 7.5A fuses [Nos. 11 and 24, located in the fuse block — junction box (J/B)] and 15A fuses [Nos. 1 and 2, located in the fuse block — junction box (J/B)].
- If fuses are OK, check for open circuit in wiring harness. Repair or replace as necessary.
- If fuses are NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

TROUBLE DIAGNOSES

AUTO

A/C System (Cont'd)



Check ground circuit for auto amp. with ignition switch OFF.
Check for continuity between auto amp. harness connector M102, M103 terminal Nos. 32, 14 and ground.

Ohmmeter terminal		Continuity
(+)	(-)	
32	Ground	Yes
14 (Canada only)		

NOTE:

If OK, replace auto amp.
If NG, repair or replace harness.

GI

MA

EM

LC

EC

FE

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MT

AT

TF

PD

AX

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BR

ST

RS

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HA

SC

EL

IDX

Mode Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR (LAN)

=NAHA0182

SYMPTOM:

- Air outlet does not change.
- Mode door motor does not operate normally.

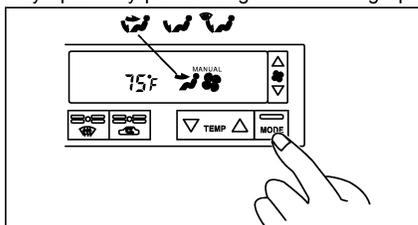
Inspection Flow

NAHA0182S01

Except LE Grade

NAHA0182S0101

1. Confirm symptom by performing the following operational check.


OPERATIONAL CHECK – Discharge air

- a. Press mode switch four times and DEF button.
- b. Each position indicator should change shape.

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

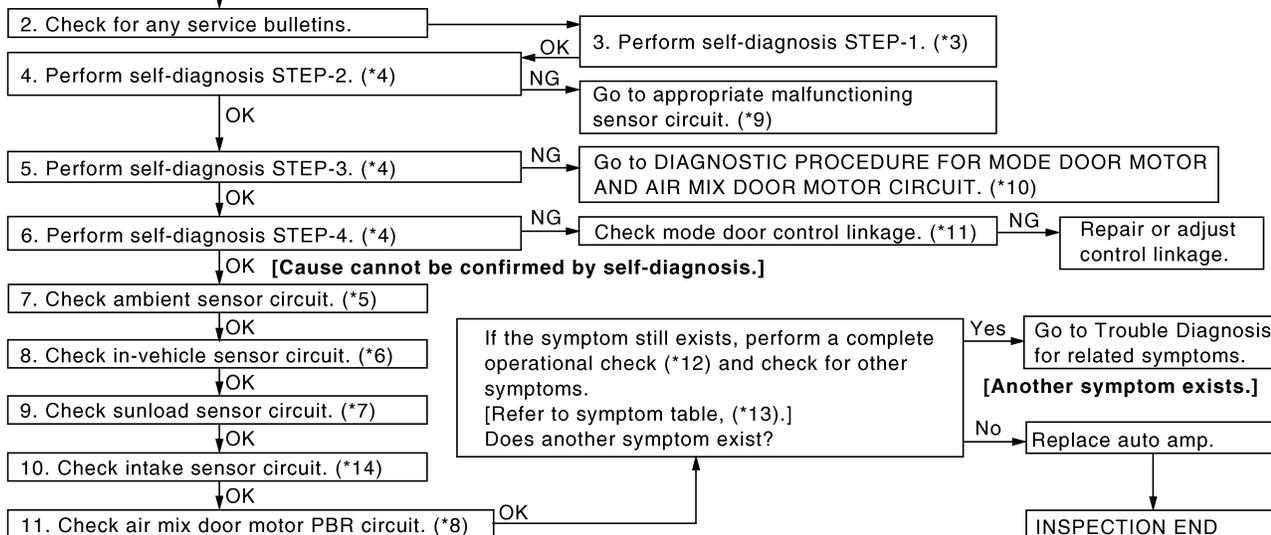
Refer to “Discharge Air Flow” (*1).

NOTE:

- If OK (symptom cannot be duplicated), perform complete operational check (*2).
- If NG (symptom is confirmed), continue with STEP-2 following.
- Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when DEF is selected. Intake door position is checked in the next step.

Discharge air flow

Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	–	–
	60%	40%	–
	–	80%	20%
	–	60%	40%
	–	–	100%



SHA917FA

- *1: HA-27
- *2: HA-60
- *3: HA-39
- *4: HA-40
- *5: HA-121

- *6: HA-124
- *7: HA-128
- *8: HA-133
- *9: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.

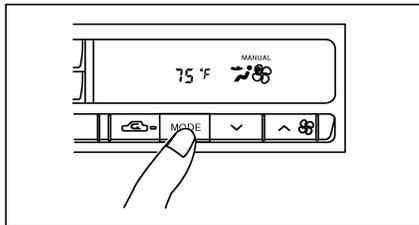
- *10: HA-71
- *11: HA-74
- *12: HA-60
- *13: HA-59
- *14: HA-131

LE Grade

NAHA0182S0103

GI
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1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

- a. Press mode switch four times and DEF button.
- b. Each position indicator should change shape.

Discharge air flow

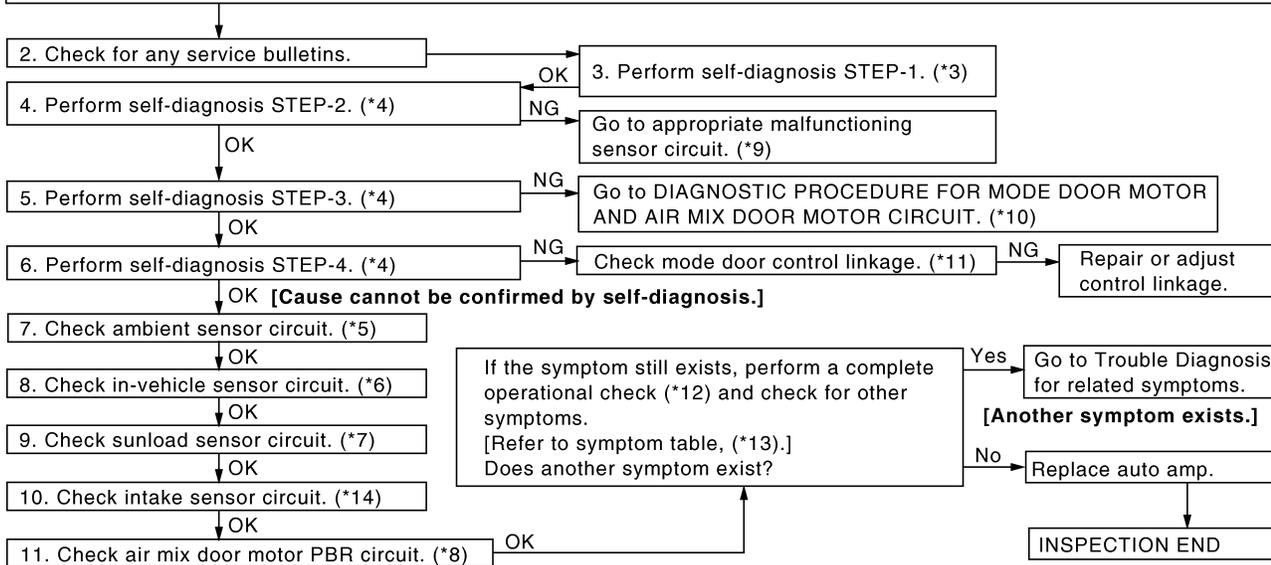
Mode door position	Air outlet/distribution		
	Face	Foot	Defroster
	100%	-	-
	60%	40%	-
	-	80%	20%
	-	60%	40%
	-	-	100%

c. Confirm that discharge air comes out according to the air distribution table at left.

Refer to “Discharge Air Flow” (*1).

NOTE:

- If OK (symptom cannot be duplicated), perform complete operational check (*2).
- If NG (symptom is confirmed), continue with STEP-2 following.
- Confirm that the compressor clutch is engaged (sound or visual inspection) and intake door position is at FRESH when DEF is selected. Intake door position is checked in the next step.



RHA1521B

- *1: HA-27
- *2: HA-62
- *3: HA-50
- *4: HA-50
- *5: HA-121

- *6: HA-124
- *7: HA-128
- *8: HA-133
- *9: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.

- *10: HA-71
- *11: HA-74
- *12: HA-62
- *13: HA-59
- *14: HA-131

Mode Door Motor (Cont'd)

SYSTEM DESCRIPTION

Component Parts

Mode door control system components are:

- 1) Auto amp.
- 2) Mode door motor (LCU)
- 3) In-vehicle sensor
- 4) Ambient sensor
- 5) Sunload sensor
- 6) Intake sensor

=NAHA0183

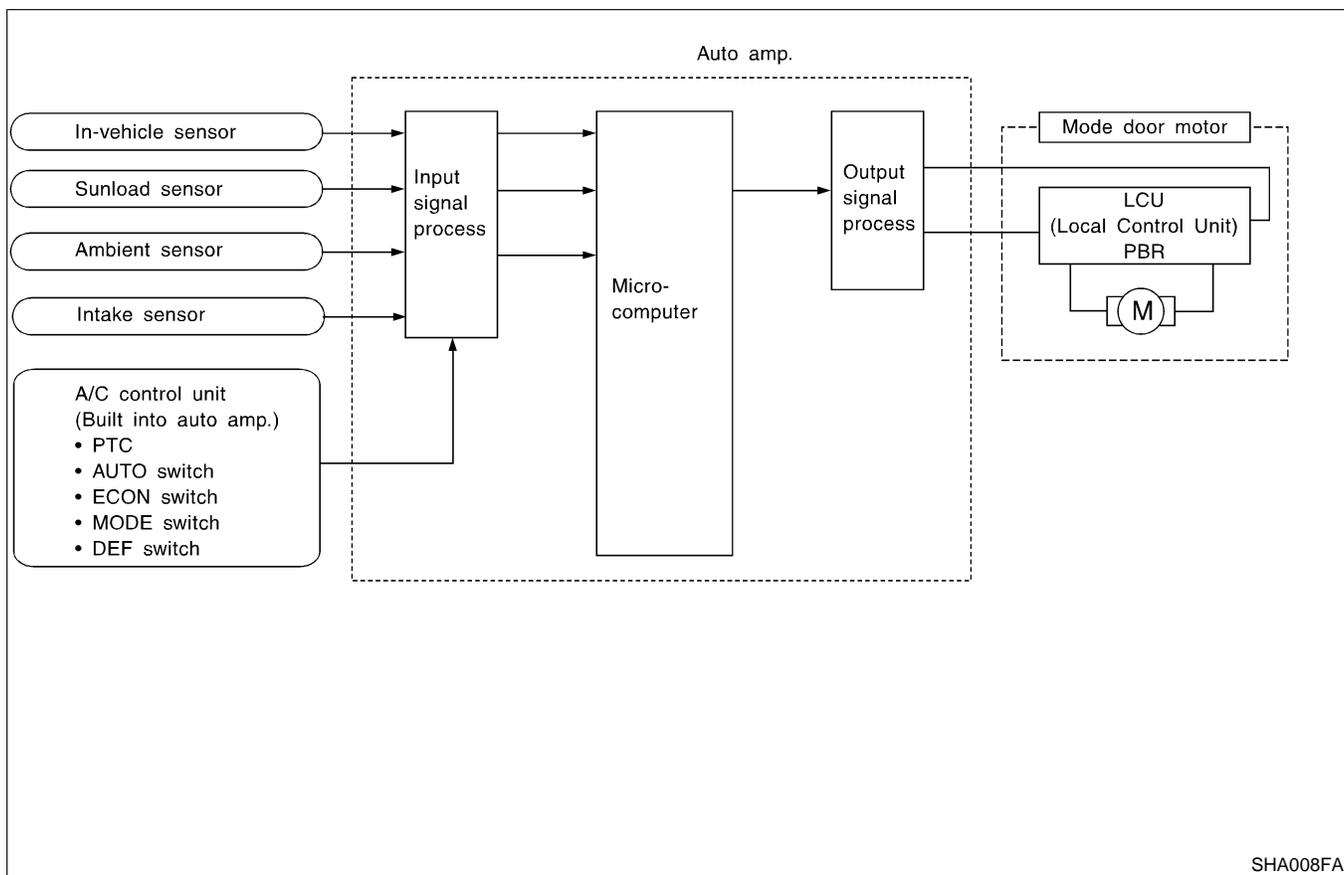
NAHA0183S01

System Operation

The auto amplifier receives data from each of the sensors. The amplifier sends mode door and air mix door opening angle data to the mode door motor LCU and air mix door motor LCU.

NAHA0183S02

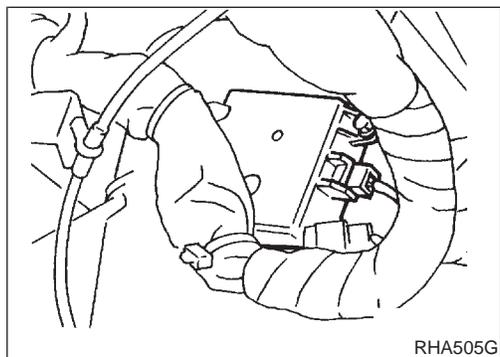
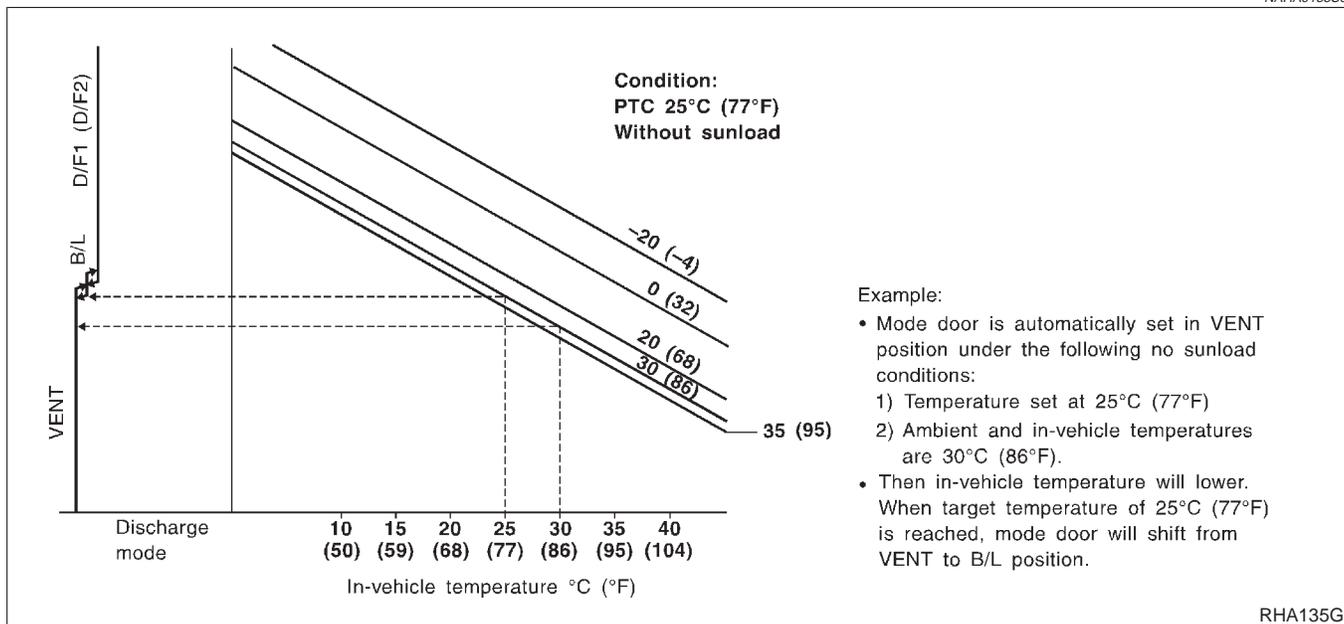
The mode door motor and air mix door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/ COLD or DEFROST/VENT operation is selected. The new selection data is returned to the auto amplifier.



SHA008FA

Mode Door Control Specification

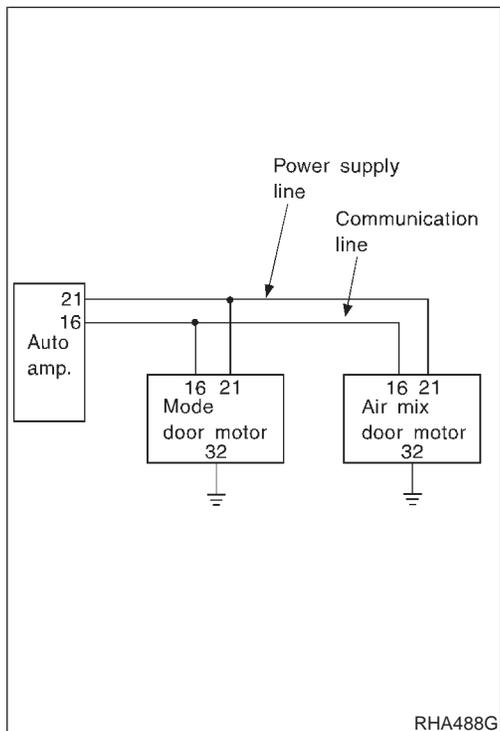
NAHA0183S03



COMPONENT DESCRIPTION

NAHA0184

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



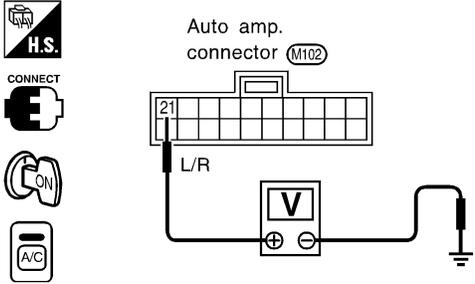
DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR AND AIR MIX DOOR MOTOR CIRCUIT

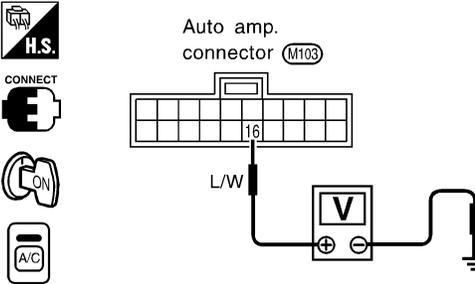
NAHA0185

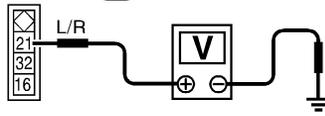
SYMPTOM: Mode door motor and/or air mix door motor does not operate normally.

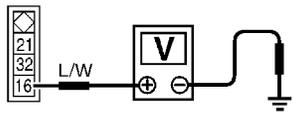
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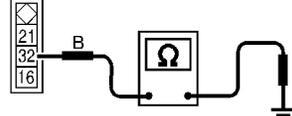
Mode Door Motor (Cont'd)

1	CHECK POWER SUPPLY FOR AUTO AMP. (LCU) SIDE	
Do approx. 12 volts exist between auto amp. (LCU) harness connector M102 terminal No. 21 and ground?		
		
SHA910F		
NOTE:		
If the result is NG or No after checking circuit continuity, repair harness or connector.		
Yes or No		
Yes	▶	GO TO 2.
No	▶	Replace auto amp. (LCU).

2	CHECK SIGNAL FOR AUTO AMP. (LCU) SIDE	
Do approx. 5.5 volts exist between auto amp. (LCU) harness connector M103 terminal No. 16 and ground?		
		
SHA911F		
NOTE:		
If the result is NG or No after checking circuit continuity, repair harness or connector.		
Yes or No		
Yes	▶	GO TO 3.
No	▶	Replace auto amp. (LCU).

3	CHECK POWER SUPPLY FOR MOTOR SIDE	<p>Do approx. 12 volts exist between door motor (LCU) harness connector M38 or M55 terminal No. 21 and ground?</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center;">Mode door motor connector (M38) or air mix door motor connector (M55)</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: right; margin-right: 20px;">RHA489GC</p> <p style="text-align: center;">Yes or No</p>	GI MA EM LC EC FE CL
Yes	▶	GO TO 4.	
No	▶	Repair harness or connector.	

4	CHECK SIGNAL FOR MOTOR SIDE	<p>Do approx. 5.5 volts exist between door motor (LCU) harness connector M38 or M55 terminal No. 16 and ground?</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center;">Mode door motor connector (M38) or air mix door motor connector (M55)</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: right; margin-right: 20px;">RHA490G</p> <p style="text-align: center;">Yes or No</p>	MT AT TF PD AX SU
Yes	▶	GO TO 5.	
No	▶	Repair harness or connector.	

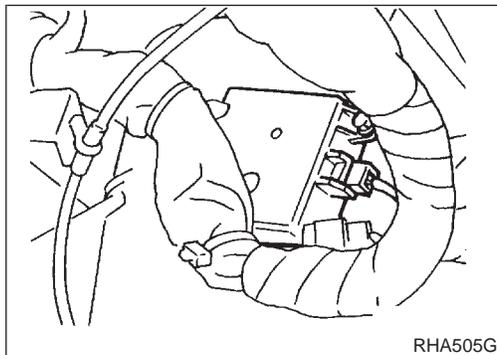
5	CHECK MOTOR GROUND CIRCUIT	<p>Does continuity exist between door motor (LCU) harness connector M38 or M55 terminal No. 32 and ground?</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: center;">Mode door motor connector (M38) or air mix door motor connector (M55)</p> <div style="text-align: center; margin: 10px 0;">  </div> <p style="text-align: right; margin-right: 20px;">RHA491G</p> <p style="text-align: center;">Yes or No</p>	BR ST RS BT HA SC EL IDX
Yes	▶	GO TO 6.	
No	▶	Repair harness or connector.	

Mode Door Motor (Cont'd)

6	CHECK MOTOR OPERATION	
Disconnect and reconnect the motor connector and confirm the motor operation.		
OK or NG		
OK (Return to operate normally)	▶	Poor contacting the motor connector
NG (Does not operate normally)	▶	GO TO 7.

7	CHECK MODE DOOR MOTOR OPERATION	
1. Disconnect the mode door motor and air mix door motor connector. 2. Reconnect the mode door motor and confirm the motor operation.		
OK or NG		
OK (Mode door motor operates normally)	▶	Replace the air mix door motor.
NG (Mode door motor does not operate normally)	▶	GO TO 8.

8	CHECK AIR MIX DOOR MOTOR OPERATION	
1. Disconnect the mode door motor connector. 2. Reconnect the air mix door motor and confirm the air mix door motor operation.		
OK or NG		
OK (Air mix door motor operates normally)	▶	Replace mode door motor.
NG (Air mix door motor does not operate normally)	▶	Replace auto amp.



CONTROL LINKAGE ADJUSTMENT

NAHA0186

Mode Door

NAHA0186S01

1. Install mode door motor on heater unit and connect it to main harness.
2. Set up code No. in Self-diagnosis STEP 4. Refer to HA-40 (Except LE grade), HA-50 (LE grade).
3. Move side link by hand and hold mode door in DEF mode.
4. Attach mode door motor rod to side link rod holder.
5. Make sure mode door operates properly when changing from code No. 41 to 45 by pushing DEF switch.

41	42	43	44	45	46
VENT	B/L	B/L	FOOT	D/F	DEF

Air Mix Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR AIR MIX DOOR (LAN)

=NAHA0187

SYMPTOM:

- Discharge air temperature does not change.
- Air mix door motor does not operate.

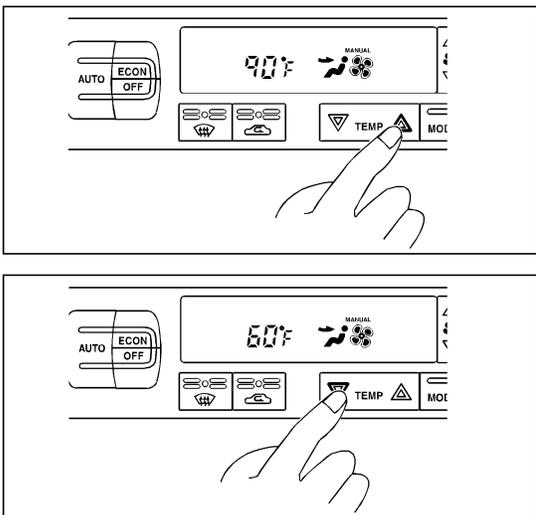
Inspection Flow

Except LE Grade

NAHA0187S01

NAHA0187S0101

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK

Temperature increase

a. Press the temperature increase button until 32°C (90°F) is displayed.

b. Check for hot air at discharge air outlets.

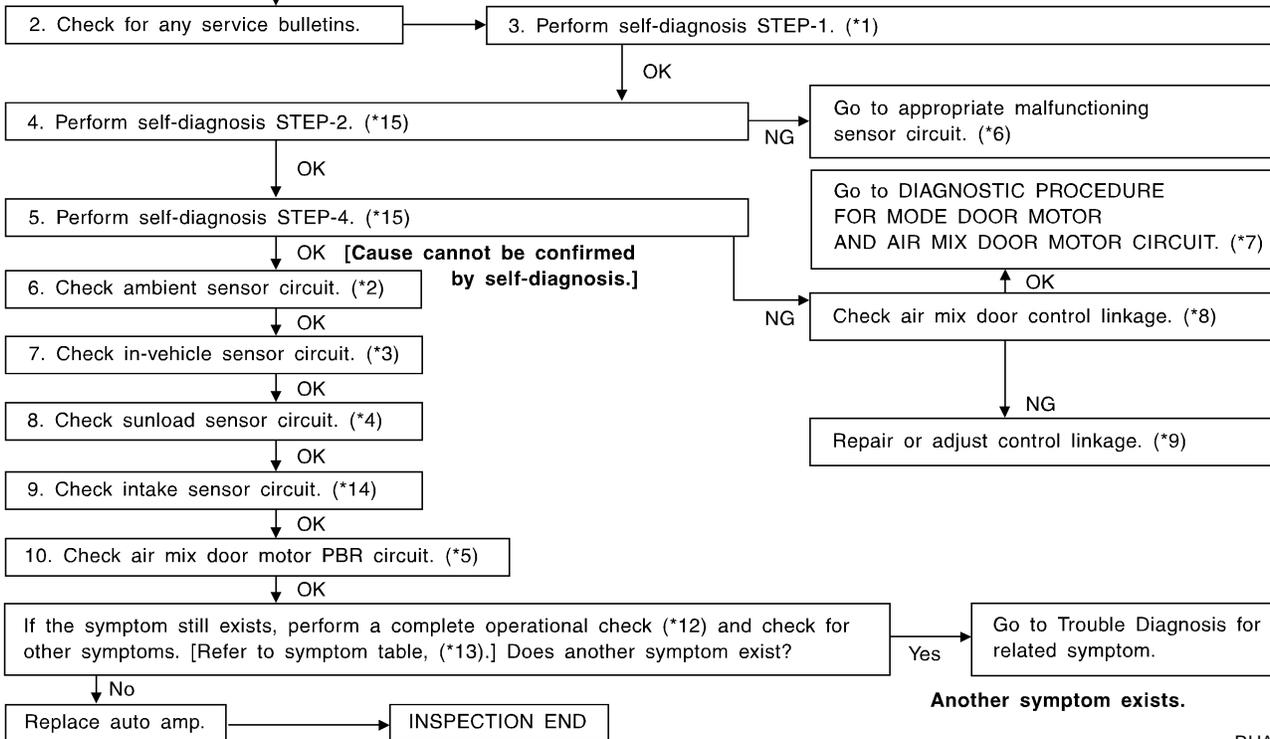
Temperature decrease

a. Press the temperature decrease button until 18°C (60°F) is displayed.

b. Check for cold air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*10).

If NG (symptom is confirmed), continue with STEP-2 following.



*1: HA-39
 *2: HA-121
 *3: HA-124
 *4: HA-128
 *5: HA-133

*6: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.
 *7: HA-71
 *8: HA-78
 *9: HA-78

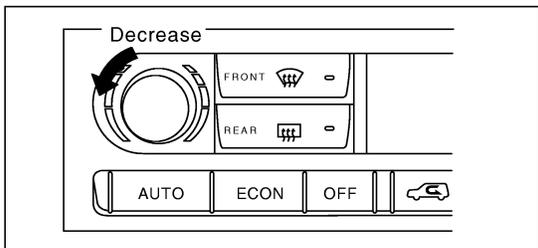
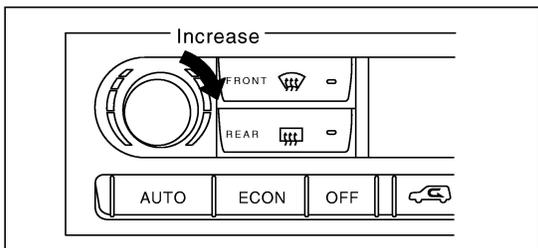
*10: HA-60
 *12: HA-60
 *13: HA-59
 *14: HA-131
 *15: HA-40

RHA2391

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LE Grade

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK

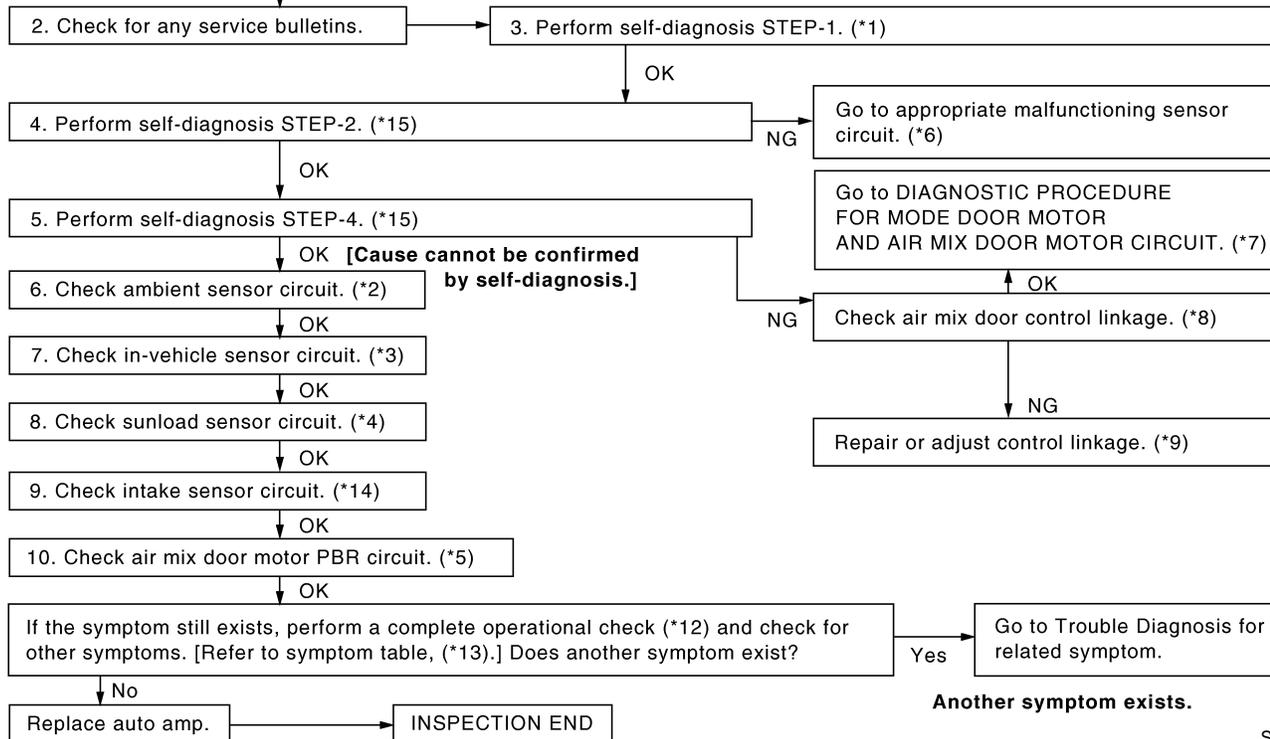
Temperature increase

- a. Turn the temperature dial clockwise until 32°C (90°F) is displayed.
- b. Check for hot air at discharge air outlets.

Temperature decrease

- a. Turn the temperature dial counterclockwise until 18°C (60°F) is displayed.
- b. Check for cold air at discharge air outlets.

**If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.**



- *1: HA-50
- *2: HA-121
- *3: HA-124
- *4: HA-128
- *5: HA-133

- *6: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.
- *7: HA-71
- *8: HA-78
- *9: HA-78

- *10: HA-62
- *12: HA-62
- *13: HA-59
- *14: HA-131
- *15: HA-50

SYSTEM DESCRIPTION

Component Parts

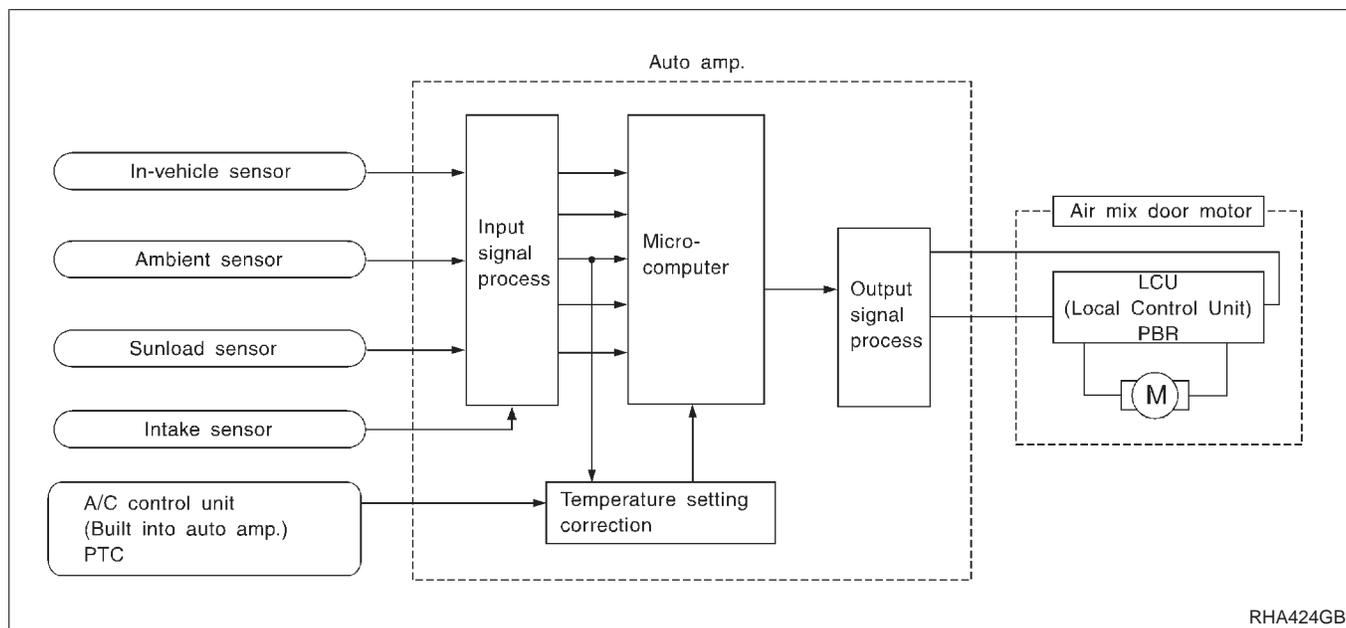
Air mix door control system components are:

- 1) Auto amp.
- 2) Air mix door motor (LCU)
- 3) In-vehicle sensor
- 4) Ambient sensor
- 5) Sunload sensor
- 6) Intake sensor

System Operation

The auto amplifier receives data from each of the sensors. The amplifier sends air mix door and mode door opening angle data to the air mix door motor LCU and mode door motor LCU.

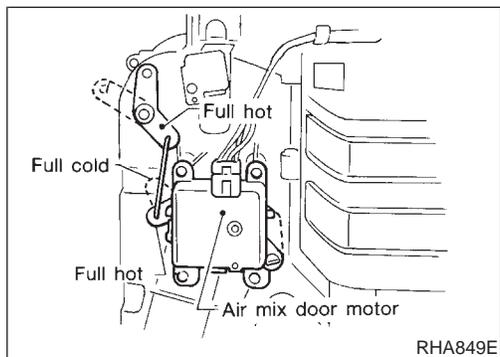
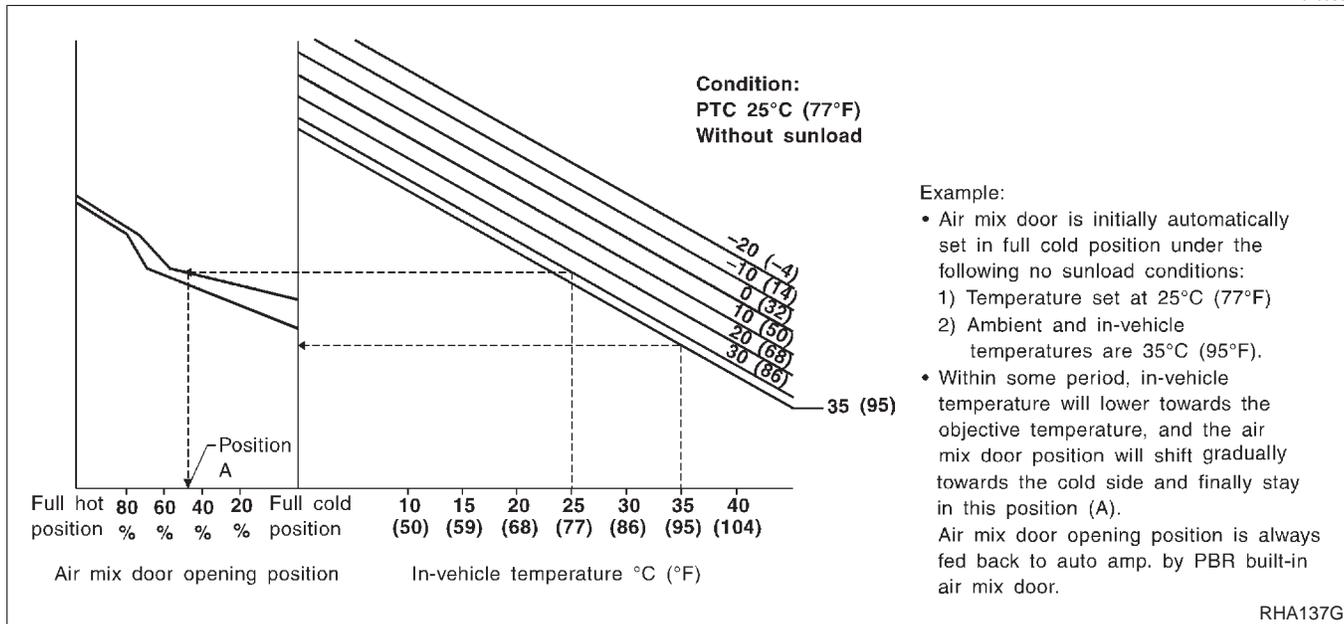
The air mix door motor and mode door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT operation is selected. The new selection data is returned to the auto amplifier.



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Air Mix Door Control Specification

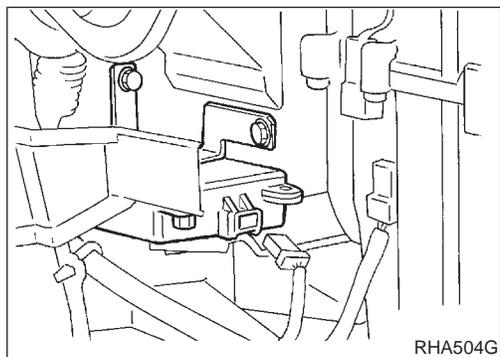
NAHA0188S03



COMPONENT DESCRIPTION

NAHA0189

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



CONTROL LINKAGE ADJUSTMENT

NAHA0190

Air Mix Door

NAHA0190S01

- Install air mix door motor on heater unit and connect it to main harness.
- Set up code No. 41 in Self-diagnosis STEP 4. Refer to HA-39 (Except LE grade), HA-50 (LE grade).
- Move air mix door lever by hand and hold it in full cold position.
- Attach air mix door lever to rod holder.
- Make sure air mix door operates properly when changing from code No. 41 to 45 by pushing DEF switch.

41	42	43	44	45	46
Full cold			Full hot		

Intake Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

SYMPTOM:

- Intake door does not change.
- Intake door motor does not operate normally.

Inspection Flow

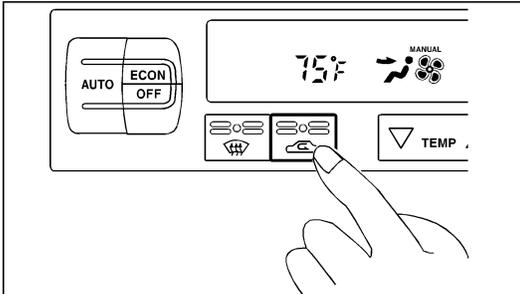
Except LE Grade

=NAHA0191

NAHA0191S01

NAHA0191S0101

1. Confirm symptom by performing the following operational check.

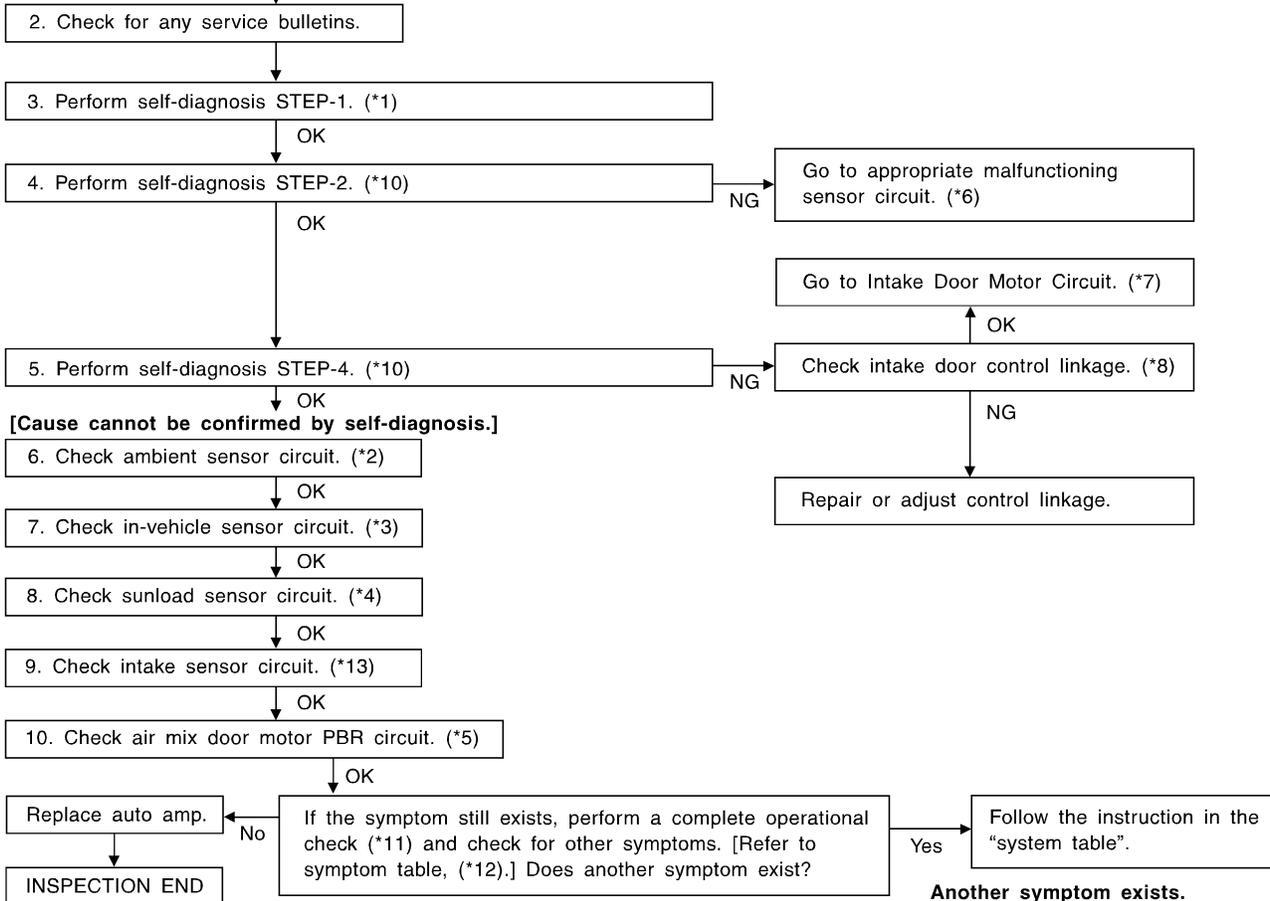


OPERATIONAL CHECK – Recirculation

a. Press REC switch.
Recirculation indicator should illuminate.

b. Listen for intake door position change (you should hear blower sound change slightly).

**If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.**



*1: HA-39
 *2: HA-121
 *3: HA-124
 *4: HA-128
 *5: HA-133

*6: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.
 *7: HA-82
 *8: HA-86
 *9: HA-60

*10: HA-40
 *11: HA-60
 *12: HA-59
 *13: HA-131

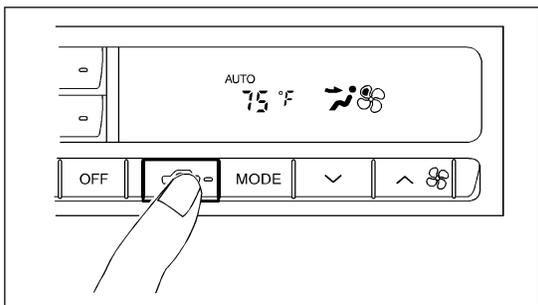
SHA247F

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LE Grade

NAHA0191S0103

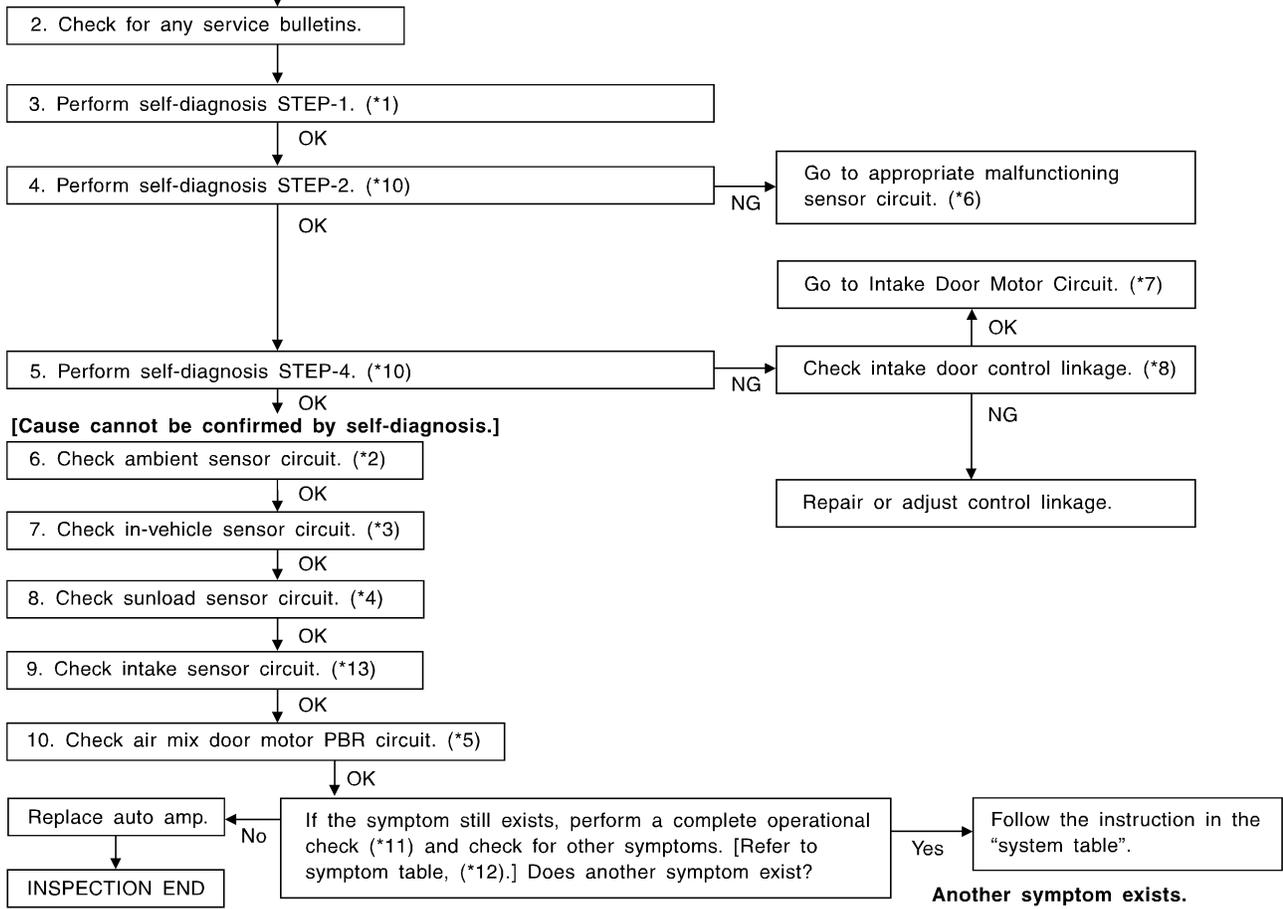
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Recirculation

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

If OK (symptom cannot be duplicated), perform complete operational check (*9).
If NG (symptom is confirmed), continue with STEP-2 following.



*1: HA-50
 *2: HA-121
 *3: HA-124
 *4: HA-128
 *5: HA-133

*6: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.
 *7: HA-82
 *8: HA-86
 *9: HA-62

*10: HA-50
 *11: HA-62
 *12: HA-59
 *13: HA-131

RHA154I

SYSTEM DESCRIPTION

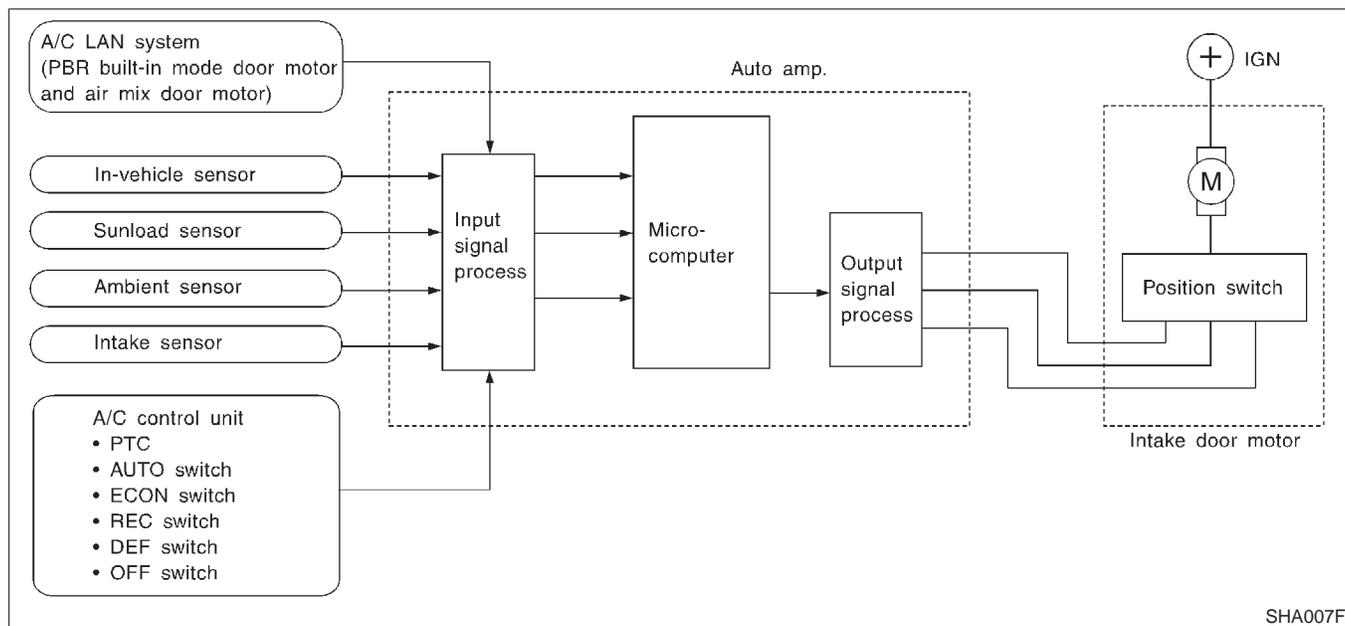
Component Parts

Intake door control system components are:

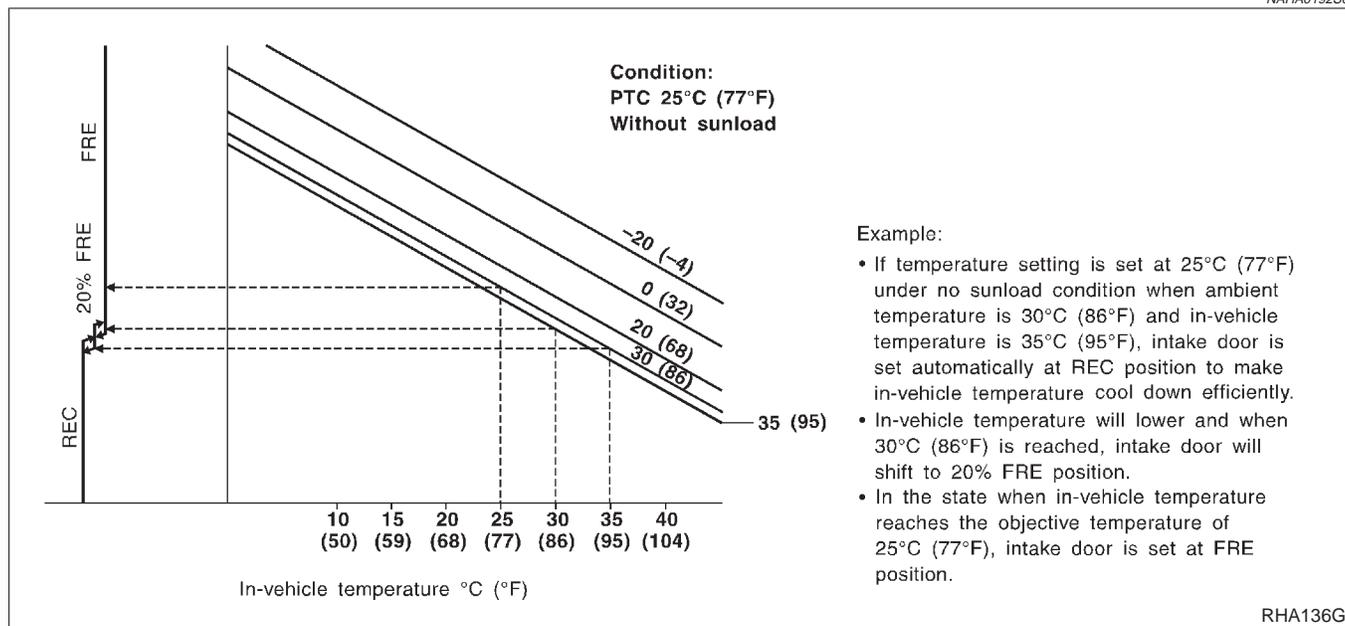
- 1) Auto amp.
- 2) Intake door motor
- 3) A/C LAN system (PBR built-in mode motor and air mix door motor)
- 4) In-vehicle sensor
- 5) Ambient sensor
- 6) Sunload sensor
- 7) Intake sensor

System Operation

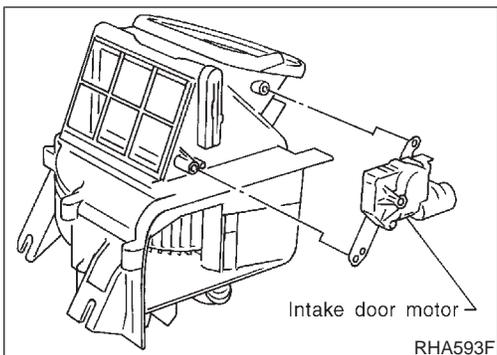
The intake door control determines intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When the ECON, DEFROST, or OFF switches are pushed, the auto amplifier sets the intake door at the "Fresh" position.



Intake Door Control Specification

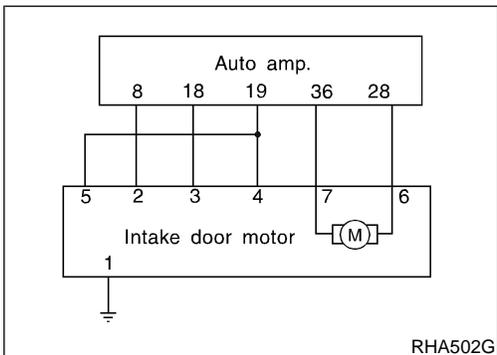


Intake Door Motor (Cont'd)



COMPONENT DESCRIPTION

The intake door motor is attached to the intake unit. It rotates so that air is drawn from inlets set by the auto amplifier. Motor rotation is conveyed to a lever which activates the intake door. NAHA0193



DIAGNOSTIC PROCEDURE

SYMPTOM: Intake door motor does not operate normally. NAHA0194

1	CHECK BODY GROUND CIRCUIT FOR INTAKE DOOR MOTOR
<p>Does continuity exist between intake door harness connector M59 terminal No. 1 and ground?</p> <div style="text-align: center; margin: 10px 0;"> </div> <p style="text-align: right; font-size: small;">RHA492G</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ Repair harness or connector.

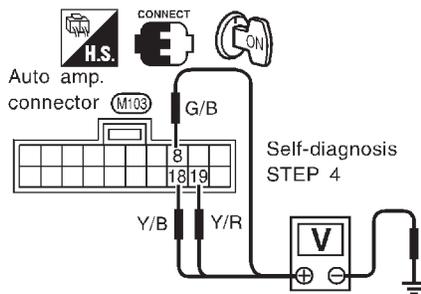
TROUBLE DIAGNOSES

AUTO

Intake Door Motor (Cont'd)

2 CHECK FOR AUTO AMP. OUTPUT

Set up Self-diagnosis STEP 4.
Measure voltage across auto amp. harness connector M103 terminals 8, 18, 19 and ground.



RHA493G

Code No.	Terminals No.		Condition	Voltage V
	(+)	(-)		
41	8	Ground	REC	5
42	18 or 19			0
43	19		20% FRE	5
	8 or 18			0
44	18		FRE	5
45	8 or 19			0
46				

0V: Approx. 0V
5V: Approx. 5V

MTBL1832

OK or NG

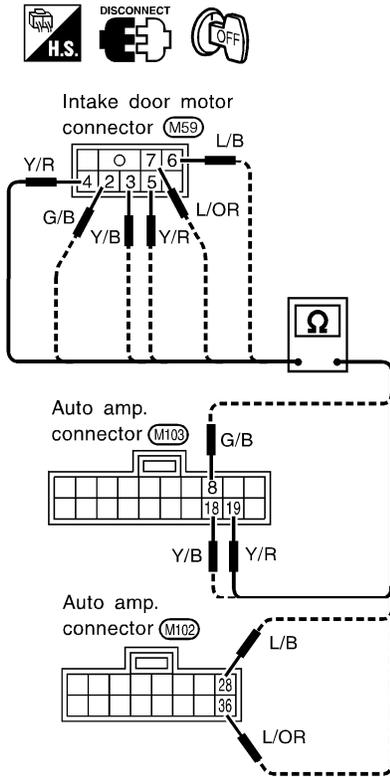
OK ► INSPECTION END

NG ► GO TO 3.

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3 CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. AND INTAKE DOOR MOTOR

Check circuit continuity between each terminal on auto amp. and on intake door motor.



SHA912F

Terminal No.		Continuity
Auto amp.	Intake door motor	
19	4	Yes
8	2	
18	3	
19	5	
28	6	
36	7	

MTBL1833

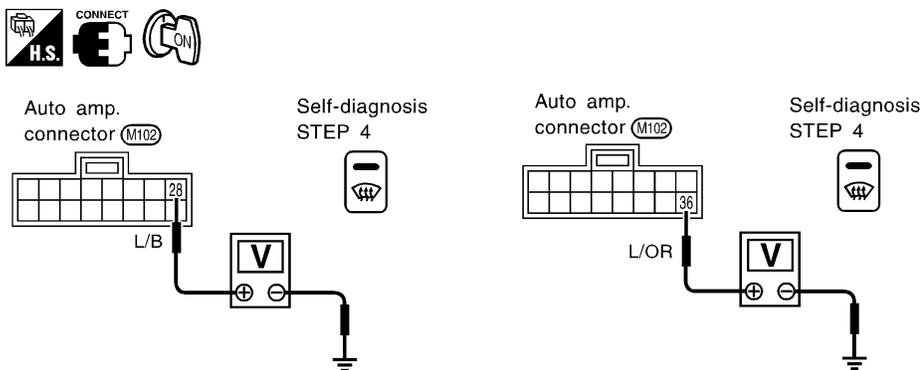
If OK, check harness for short.

OK or NG

OK	▶	GO TO 4.
NG	▶	Repair harness or connector.

4 CHECK FOR AUTO AMP. OUTPUT

Set up Self-diagnosis STEP 4.
Measure voltage across auto amp. harness connector M102 terminals 28, 36 and ground.



SHA913F

Code No.	Terminals No.		Condition	Voltage V
	(+)	(-)		
41	28	Ground	REC	12
42	36			0
44	28	Ground	FRE	0
45 46	36			12

0V: Approx. 0V
12V: Approx. 12V

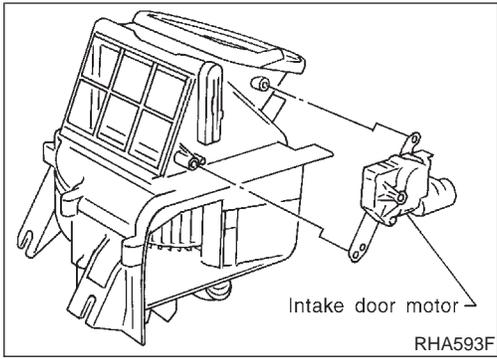
MTBL1834

OK or NG

- | | | |
|----|---|----------------------------|
| OK | ▶ | Replace intake door motor. |
| NG | ▶ | Replace auto amp. |

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Intake Door Motor (Cont'd)



CONTROL LINKAGE ADJUSTMENT

=NAHA0195

Intake Door

NAHA0195S01

1. Install intake door motor on intake unit and connect it to main harness.
2. Set up code No. 41 in Self-diagnosis STEP 4. Refer to HA-40 (Except LE grade), HA-50 (LE grade).
3. Move intake door link by hand and hold it in REC position.
4. Attach intake door lever to rod holder.
5. Make sure intake door operates properly when changing from code No. 41 to 45 by pushing DEF switch.

41	42	43	44	45	46
REC		20% FRE	FRE		

Blower Motor

TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

=NAHA0196

SYMPTOM:

- Blower motor operation is malfunctioning.
- Blower motor operation is malfunctioning under out of starting fan speed control.

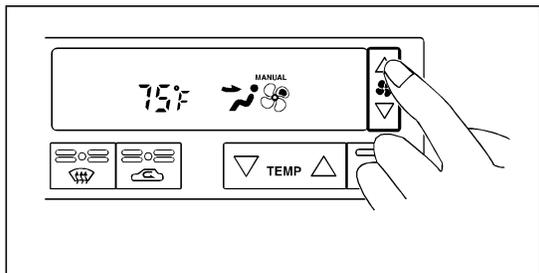
Inspection Flow

Except LE Grade

NAHA0196S01

NAHA0196S0101

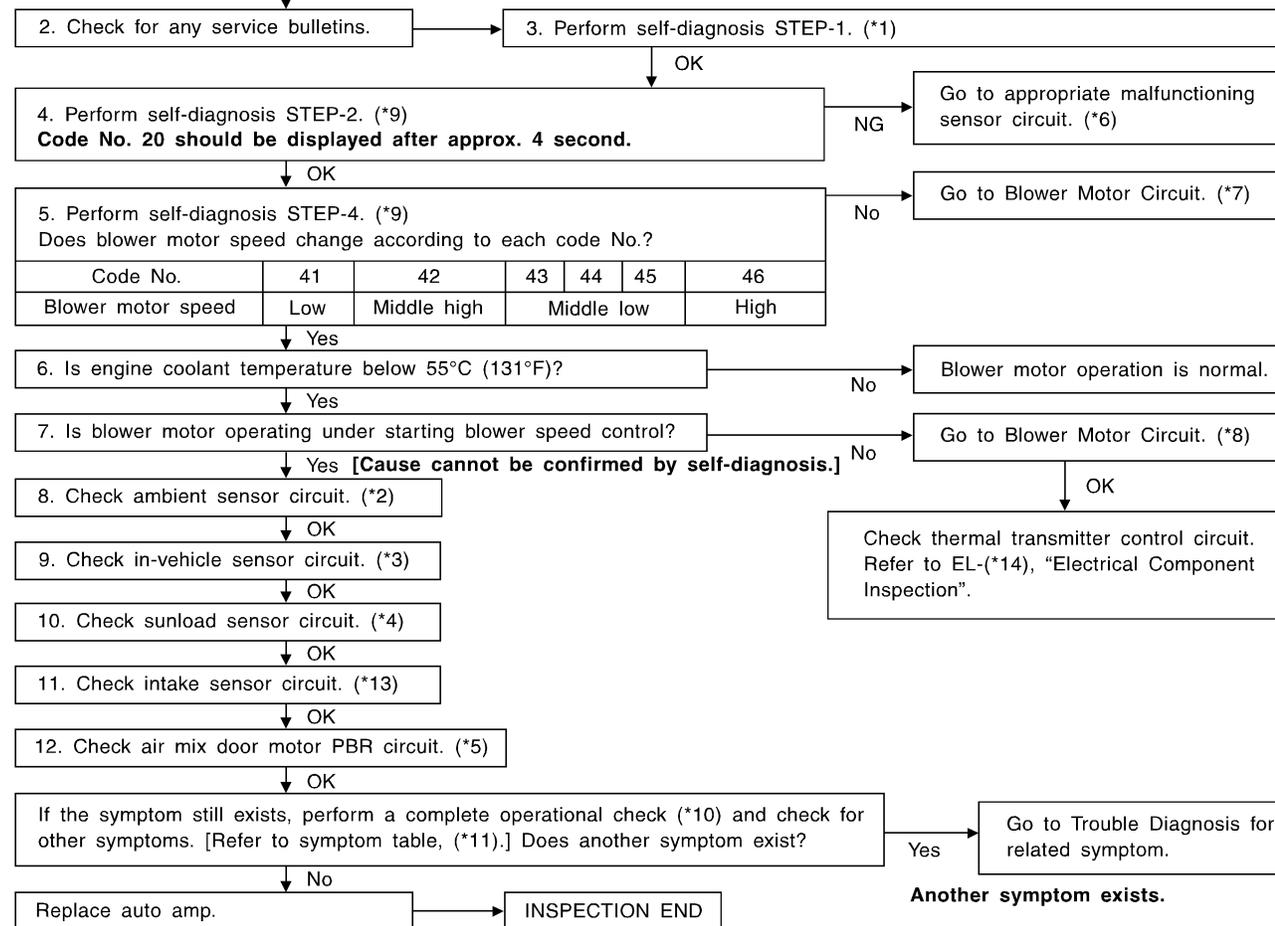
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Blower

- a. Press fan switch (up side) one time. Blower should operate on low speed. The fan symbol should have one blade lit.
- b. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
- c. Leave blower on MAX speed.

**If OK (symptom cannot be duplicated), perform complete operational check (*12).
If NG (symptom is confirmed), continue with STEP-2 following.**



*1: HA-39
*2: HA-121
*3: HA-124
*4: HA-128
*5: HA-133

*6: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.
*7: HA-90
*8: HA-90
*9: HA-40

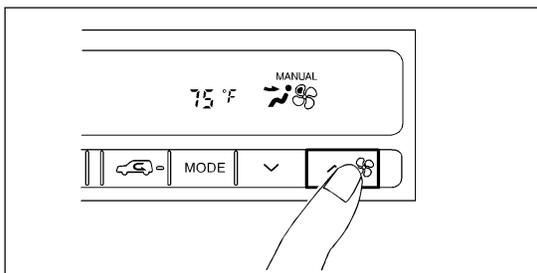
*10: HA-60
*11: HA-59
*12: HA-60
*13: HA-131
*14: EL-140

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LE Grade

NAHA0196S0103

1. Confirm symptom by performing the following operational check.

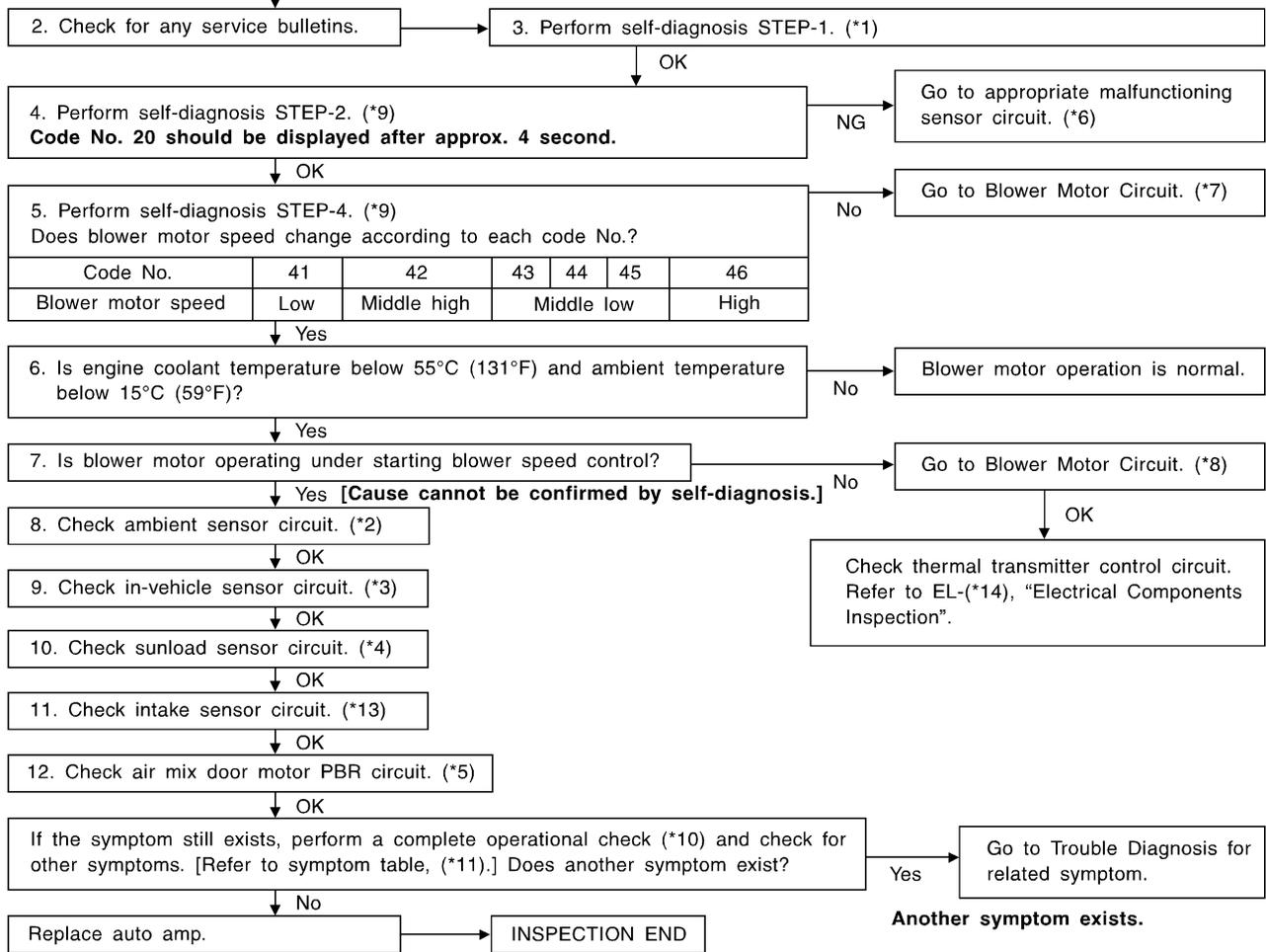


OPERATIONAL CHECK – Blower

- a. Press fan switch (up side) one time. Blower should operate on low speed. The fan symbol should have one blade lit.
- b. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
- c. Leave blower on MAX speed.

If OK (symptom cannot be duplicated), perform complete operational check (*12).

If NG (symptom is confirmed), continue with STEP-2 following.



*1: HA-50
*2: HA-121
*3: HA-124
*4: HA-128
*5: HA-133

*6: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.
*7: HA-90
*8: HA-90
*9: HA-50

*10: HA-62
*11: HA-59
*12: HA-62
*13: HA-131
*14: EL-87

SHA683F

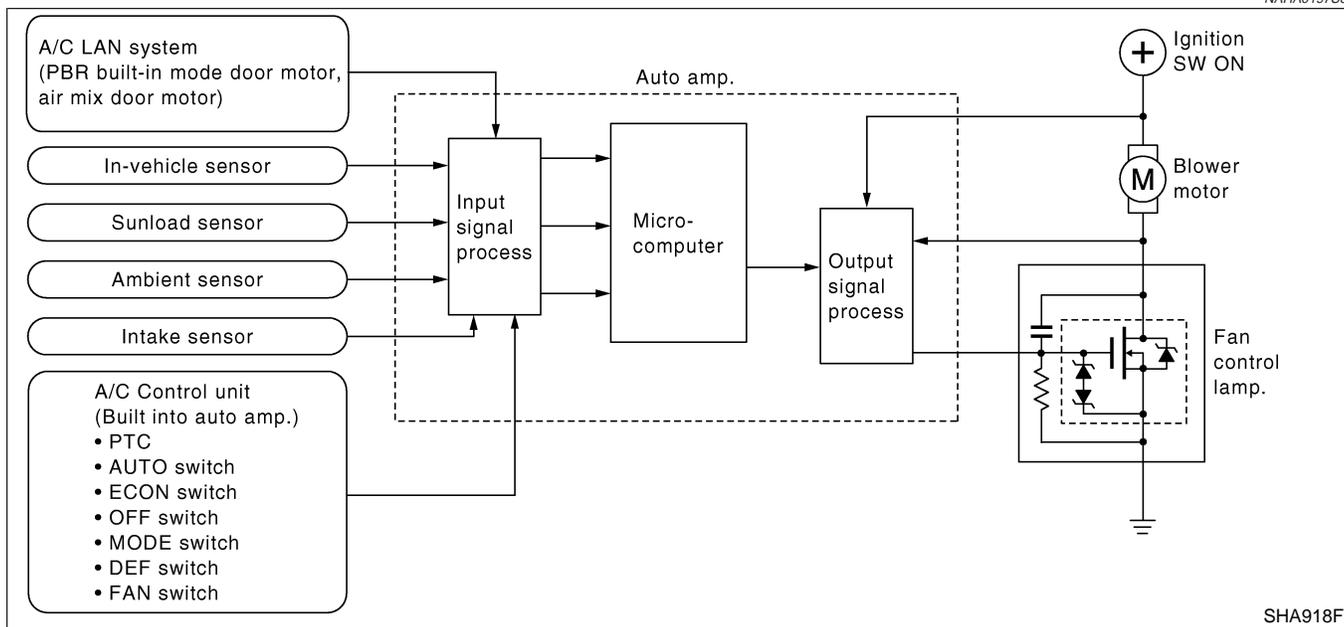
SYSTEM DESCRIPTION

Component parts

Fan speed control system components are:

- 1) Auto amp.
- 2) Fan control amp.
- 3) A/C LAN system (PBR built-in mode door motor and air mix door motor)
- 4) In-vehicle sensor
- 5) Ambient sensor
- 6) Sunload sensor
- 7) Intake sensor

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the automatic amplifier based on inputs from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor. The blower motor applied voltage ranges from approximately 5 volts (lowest speed) to 12 volts (highest speed). The control blower speed (in the range of 5 to 12V), the automatic amplifier supplies a gate voltage to the fan control amplifier. Based on this voltage, the fan control amplifier controls the voltage supplied to the blower motor.

Starting Fan Speed Control

Start Up From "COLD SOAK" Condition (Automatic mode)

In a cold start up condition where the engine coolant temperature is below 55°C (131°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.

In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 55°C (131°F), at which time the blower speed will increase to the objective speed.

Start Up From Normal or "HOT SOAK" Condition (Automatic mode)

The blower will begin operation momentarily after the AUTO button is pushed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

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Blower Motor (Cont'd)

Blower Speed Compensation

Sunload

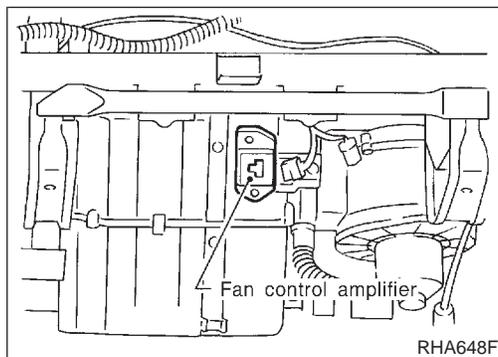
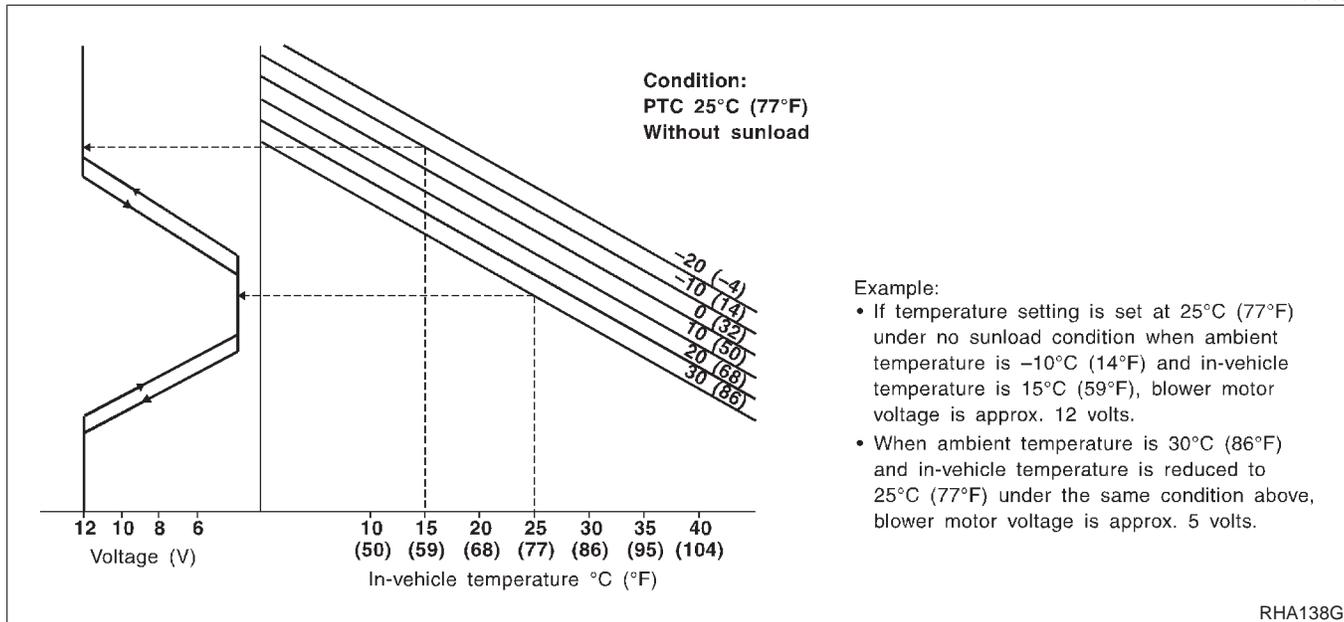
When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of high sunload, the blower low speed is "usual" low speed (approx. 6V). During low or no sunload conditions, the low speed will drop to "low" low speed (approx. 5V).

NAHA0197S05

NAHA0197S0501

Fan Speed Control Specification

NAHA0197S06



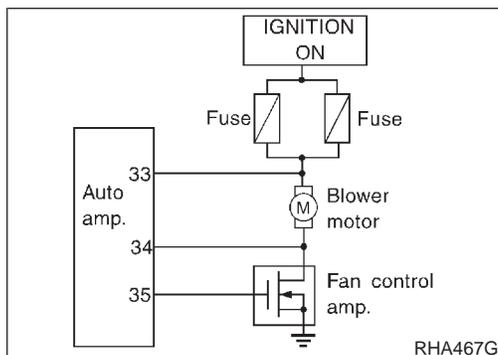
COMPONENT DESCRIPTION

NAHA0198

Fan Control Amplifier

NAHA0198S01

The fan control amplifier is located on the cooling unit. The fan control amp. receives a gate voltage from the auto amp. to steplessly maintain the blower fan motor voltage in the 5 to 12 volt range (approx.).



DIAGNOSTIC PROCEDURE

NAHA0199

SYMPTOM: Blower motor operation is malfunctioning under Starting Fan Speed Control.

1	CHECK POWER SUPPLY FOR FAN CONTROL AMP.	
<p>Disconnect fan control amp. harness connector. Do approx. 12 volts exist between fan control amp. harness connector M60 terminal No. 3 and ground?</p> <div style="text-align: center;"> <p>Fan control amp. connector (M60) H.S. DISCONNECT ON</p> </div> <p style="text-align: right;">RHA480G</p> <p style="text-align: center;">Yes or No</p>		
Yes	▶	GO TO 2.
No	▶	GO TO 8.

2	CHECK GROUND CIRCUIT FOR FAN CONTROL AMP.	
<p>Does continuity exist between fan control amp. harness connector M60 terminal No. 1 and ground?</p> <div style="text-align: center;"> <p>Fan control amp. connector (M60) H.S. DISCONNECT OFF</p> </div> <p style="text-align: right;">RHA089G</p> <p style="text-align: center;">Yes or No</p>		
Yes	▶	Reconnect fan control amp. harness connector. And GO TO 3.
No	▶	Repair harness or connector.

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Blower Motor (Cont'd)

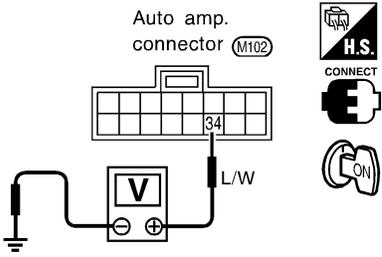
3	CHECK VOLTAGE FOR FAN CONTROL AMP.											
<p>Set up Self-diagnosis STEP 4. Measure voltage across fan control amp. harness connector M60 terminal No. 2 and ground.</p>												
RHA481GC												
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Code No.</th> <th colspan="2">Terminal No.</th> <th rowspan="2">Voltage</th> </tr> <tr> <th>(+)</th> <th>(-)</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">41 - 45</td> <td style="text-align: center;">(2)</td> <td style="text-align: center;">Ground</td> <td style="text-align: center;">Approx. 2.5 - 3V</td> </tr> </tbody> </table>			Code No.	Terminal No.		Voltage	(+)	(-)	41 - 45	(2)	Ground	Approx. 2.5 - 3V
Code No.	Terminal No.			Voltage								
	(+)	(-)										
41 - 45	(2)	Ground	Approx. 2.5 - 3V									
MTBL1835												
OK or NG												
OK	▶	GO TO 6.										
NG	▶	<ul style="list-style-type: none"> ● The voltage is less than 2.5V. Replace fan control amp. ● The voltage is more than 3.0V. GO TO 4. 										

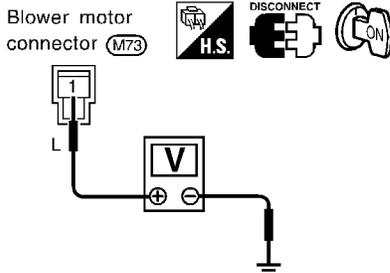
4	CHECK FAN CONTROL AMP.	
Refer to HA-96		
OK or NG		
OK	▶	GO TO 5.
NG	▶	<ol style="list-style-type: none"> 1. Replace fan control amp. 2. Go to "STEP-BY-STEP PROCEDURE", HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP 4. Confirm that blower motor operation is usual.

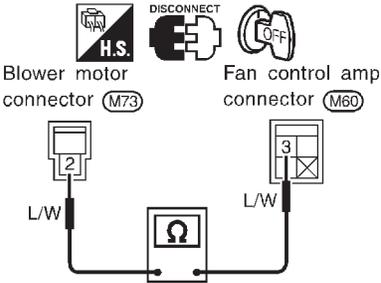
5	CHECK FAN CONTROL AMP. CIRCUIT BETWEEN FAN CONTROL AMP. AND AUTO AMP.
<p>1. Disconnect auto amp. and fan control amp. harness connector. 2. Check circuit continuity between auto amp. harness connector M102 terminal No. 35 and fan control amp. harness connector M60 terminal No. 2.</p>	
<p>Continuity should exist. If OK, check harness for short.</p>	
OK or NG	
OK	▶ GO TO 6.
NG	▶ Repair harness or connector.

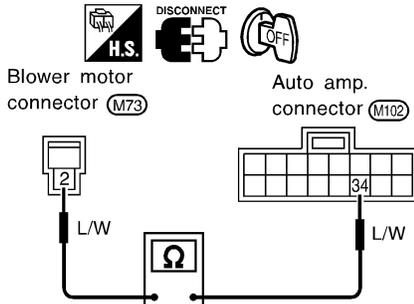
6	CHECK POWER SUPPLY FOR AUTO AMP.
<p>Reconnect auto amp. harness connector. Does battery voltage exist between auto amp. harness connector M102 terminal No. 33 and ground?</p>	
Yes or No	
Yes	▶ GO TO 7.
No	<p>▶ Check power supply circuit and 15A fuses [Nos. 1 and 2, located in the fuse block — junction box (J/B)]. Refer to EL-12, "Wiring Diagram — POWER —".</p> <ul style="list-style-type: none"> ● If OK, check for open circuit in wiring harness. Repair or replace as necessary. ● If NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

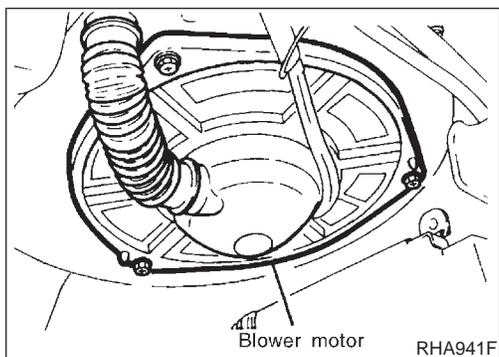
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7	CHECK FAN FEED BACK CIRCUIT	
Do approx. 12 volts exist between auto amp. harness connector M102 terminal No. 34 and ground?		
		
RHA903H		
Yes or No		
Yes	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-4. Confirm that blower motor operation is usual.
No	▶	GO TO 10.

8	CHECK POWER SUPPLY FOR BLOWER MOTOR	
Disconnect blower motor harness connector. Do approx. 12 volts exist between blower motor harness connector M73 terminal No. 1 and ground?		
		
RHA091G		
Yes or No		
Yes	▶	GO TO 9.
No	▶	Check power supply circuit and 15A fuses [Nos. 1 and 2, located in the fuse block — junction box (J/B)]. <ul style="list-style-type: none"> ● If OK, check for open circuit in wiring harness. Repair or replace as necessary. ● If NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

9	CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND FAN CONTROL AMP.	
<p>Disconnect blower motor connector and auto amp. connector. Check circuit continuity between blower motor harness connector M73 terminal No. 2 and fan control amp. harness connector M60 terminal No. 3.</p>		
		
RHA472G		
OK or NG		
OK	▶	<p>Check blower motor. (Refer to HA-95.)</p> <ol style="list-style-type: none"> 1. If NG, replace blower motor. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-4. Confirm that blower motor operation is usual.
NG	▶	Repair harness or connector.

10	CHECK BLOWER MOTOR CIRCUIT BETWEEN BLOWER MOTOR AND AUTO AMP.	
<p>Check circuit continuity between blower motor harness connector M73 terminal No. 2 and auto amp. harness connector M102 terminal No. 34.</p>		
		
RHA904H		
OK or NG		
Continuity should exist.		
OK	▶	Check harness for short.
NG	▶	Repair harness or connector.



COMPONENT INSPECTION

Blower Motor

Confirm smooth rotation of the blower motor.

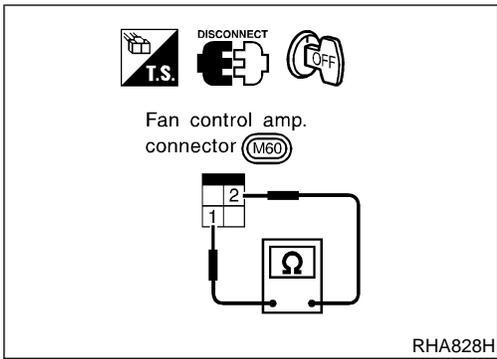
- Ensure that there are no foreign particles inside the intake unit.

NAHA0200

NAHA0200S01

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Blower Motor (Cont'd)



Fan Control Amp.

NAHA0200S02

Check continuity between terminals.

Ohmmeter terminal		Continuity
(+)	(-)	
Terminal Nos.		Yes
2	1	

Magnet Clutch

TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

SYMPTOM:

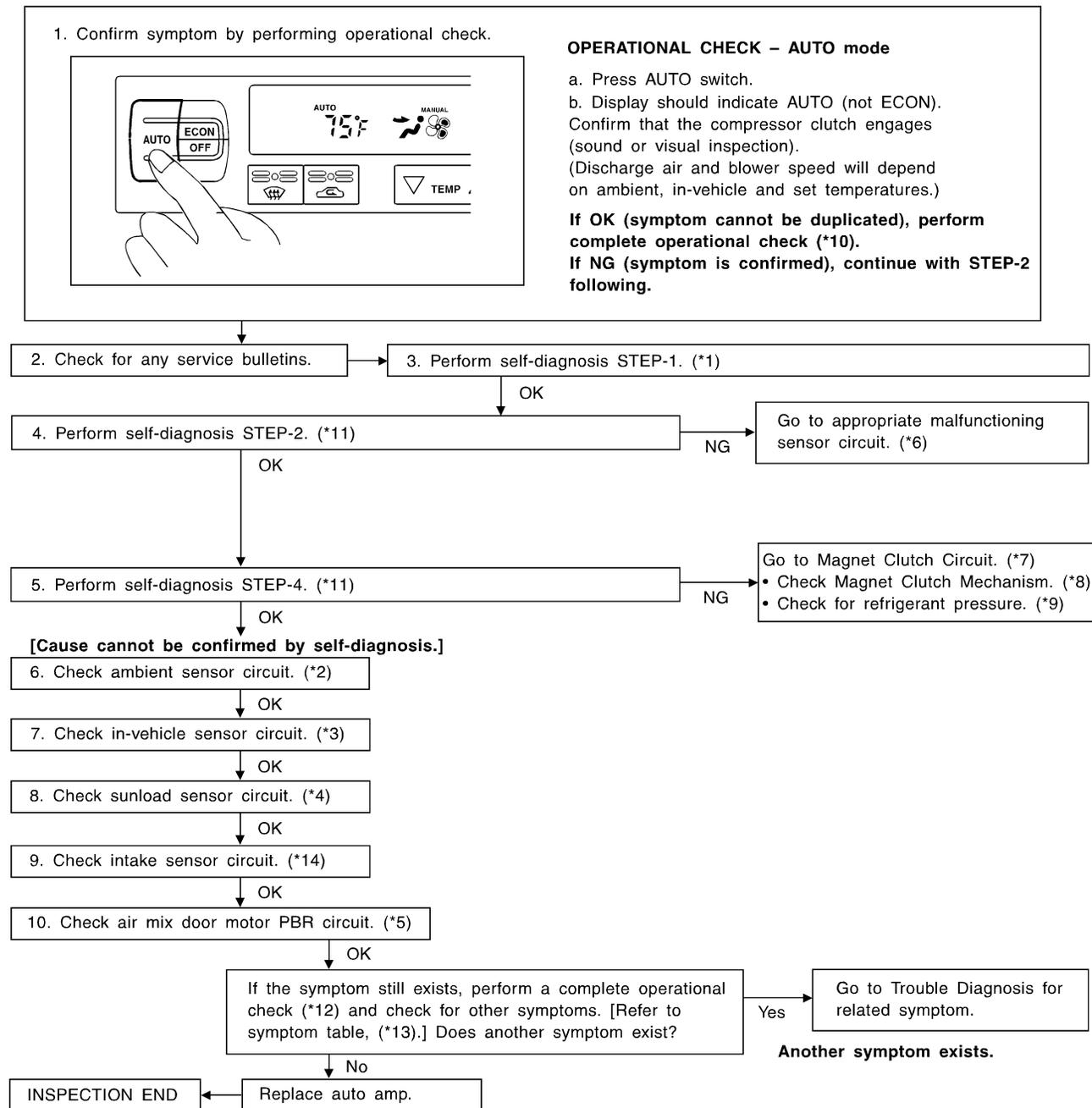
- Magnet clutch does not engage.

Inspection Flow Except LE Grade

=NAHA0201

NAHA0201S01

NAHA0201S0101



*1: STEP-BY-STEP PROCEDURE (HA-39)
 *2: HA-121
 *3: HA-124
 *4: HA-128
 *5: HA-133

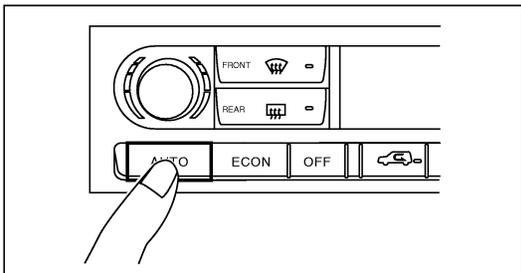
*6: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.
 *7: HA-99
 *8: HA-139
 *9: HA-108
 *10: HA-60

*11: HA-40
 *12: HA-60
 *13: HA-59
 *14: HA-131

SHA249FB

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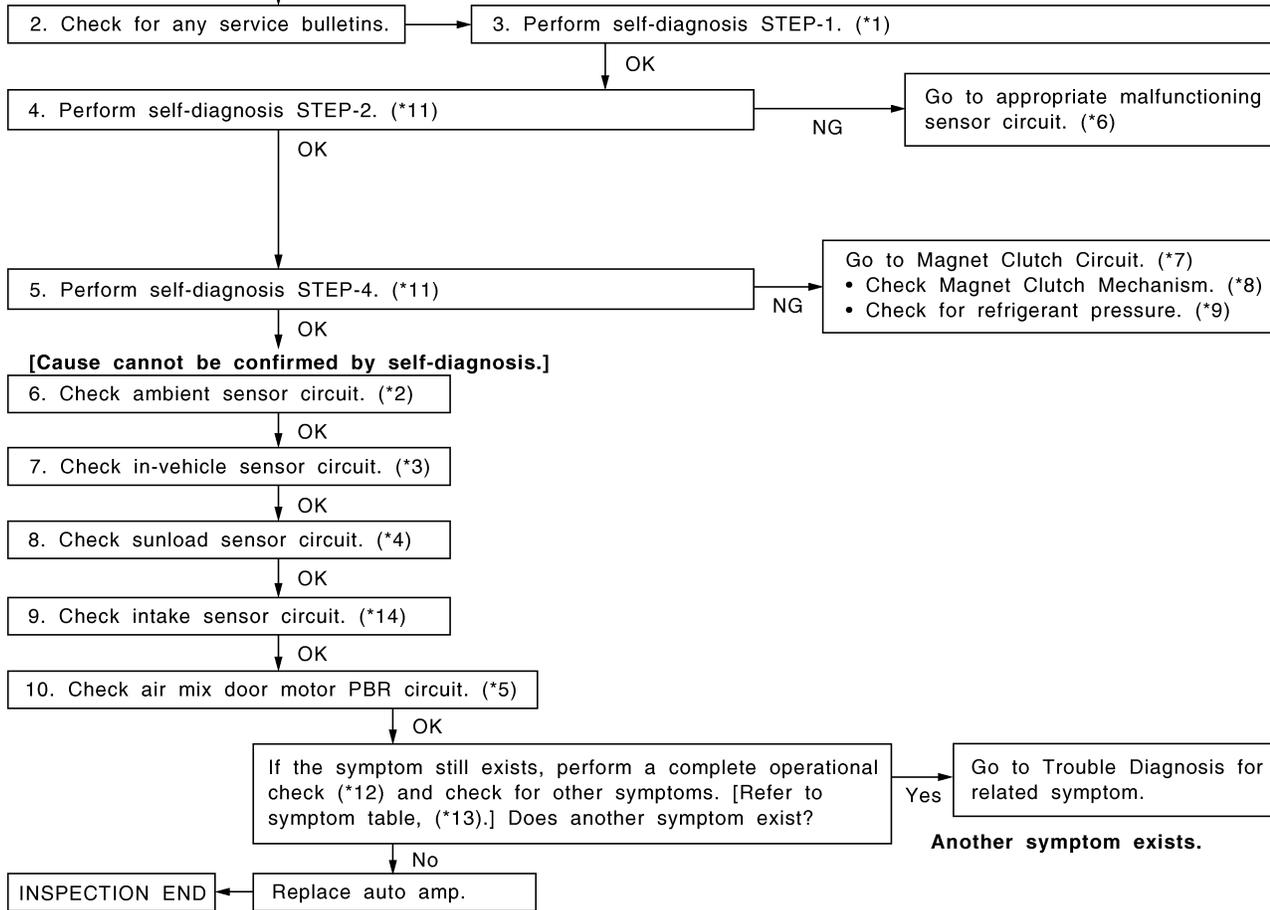
1. Confirm symptom by performing operational check.



OPERATIONAL CHECK – AUTO mode

- a. Press AUTO switch.
- b. Display should indicate AUTO (not ECON). Confirm that the compressor clutch engages (audio or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

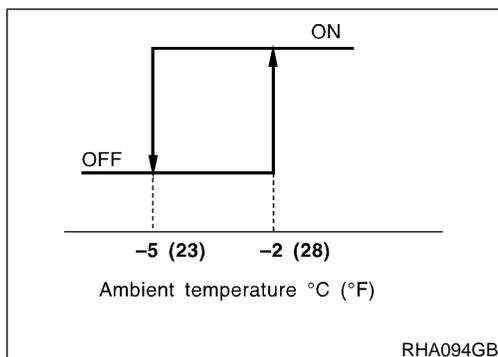
**If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.**



*1: STEP-BY-STEP PROCEDURE (HA-50)
 *2: HA-121
 *3: HA-124
 *4: HA-128
 *5: HA-133

*6: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.
 *7: HA-99
 *8: HA-139
 *9: HA-108
 *10: HA-62

*11: HA-50
 *12: HA-62
 *13: HA-59
 *14: HA-131

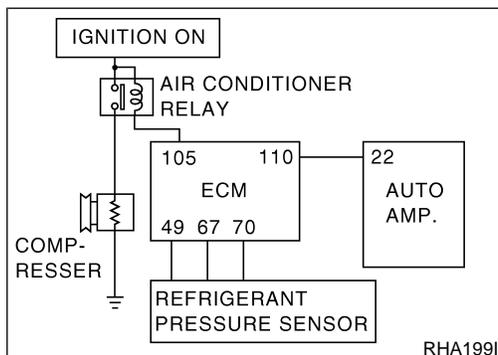


SYSTEM DESCRIPTION

Auto amplifier controls compressor operation by ambient temperature and signal from ECM. =NAHA0202

Low Temperature Protection Control

Auto amplifier will turn the compressor "ON" or "OFF" as determined by a signal detected by ambient sensor. NAHA0202S01
 When ambient temperatures are greater than -2°C (28°F), the compressor turns "ON". The compressor turns "OFF" when ambient temperatures are less than -5°C (23°F).

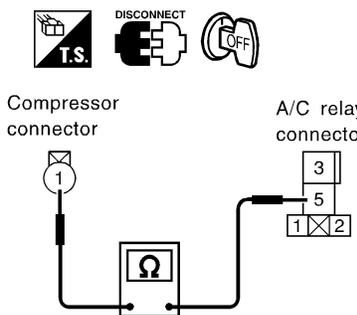


DIAGNOSTIC PROCEDURE

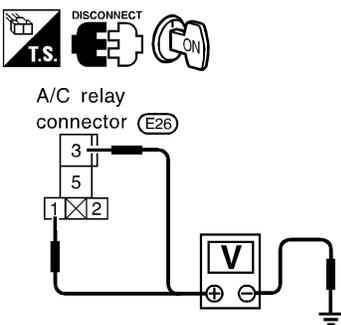
SYMPTOM: Magnet clutch does not engage when **AUTO** switch is ON. NAHA0203

1	CHECK POWER SUPPLY FOR COMPRESSOR	<p>Disconnect compressor harness connector. Do approx. 12 volts exist between compressor harness connector F202 terminal No. 1 and ground?</p> <div style="text-align: center;"> <p>Compressor connector (F202)</p> </div> <p style="text-align: right;">RHA096G</p>
		Yes or No
Yes	▶	<p>Check magnet clutch coil.</p> <ol style="list-style-type: none"> 1. If NG, replace magnet clutch. Refer to HA-139. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is usual.
No	▶	Disconnect A/C relay. And GO TO 2.

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2	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY AND COMPRESSOR	
<p>Check circuit continuity between A/C relay harness connector E26 terminal No. 5 (B/W) and compressor harness connector terminal No. 1 (B/W).</p>		
		
<p>Continuity should exist. If OK, check harness for short.</p>		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

SHA476F

3	CHECK POWER SUPPLY FOR A/C RELAY	
<p>Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness connector E26 terminal Nos. 1 (G/W), 3 (G/W) and ground?</p>		
		
Yes or No		
Yes	▶	GO TO 4.
No	▶	<p>Check power supply circuit and 7.5A (No. 6) fuse at fuse block — junction box (J/B). Refer to EL-12, "Wiring Diagram — POWER —".</p> <ul style="list-style-type: none"> ● If OK, check for open circuit in wiring harness. Repair or replace as necessary. ● If NG, replace fuse and check wiring harness for short circuit. Repair or replace as necessary.

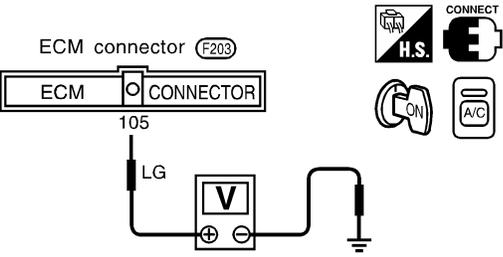
SHA477F

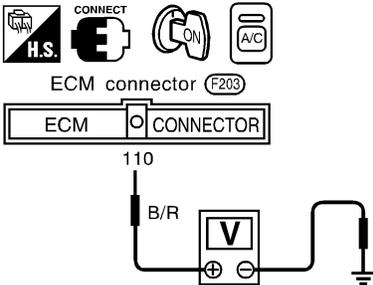
4	CHECK A/C RELAY AFTER DISCONNECTING IT	
<p>Refer to HA-103.</p>		
OK or NG		
OK	▶	Reconnect A/C relay. And GO TO 5.
NG	▶	<ol style="list-style-type: none"> 1. Replace A/C relay. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is usual.

TROUBLE DIAGNOSES

AUTO

Magnet Clutch (Cont'd)

5	CHECK COIL SIDE CIRCUIT OF A/C RELAY	
Do approx. 12 volts exist between ECM harness connector F203 terminal No. 105 and ground?		
		
RHA200I		
Yes or No		
Yes	▶	GO TO 6.
No	▶	Disconnect A/C relay. Disconnect ECM harness connector. GO TO 9.

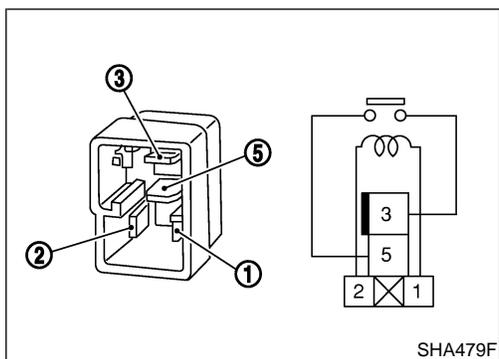
6	CHECK VOLTAGE FOR ECM	
Do approx. 5 volts exist between ECM harness connector F203 terminal No. 110 and ground?		
		
RHA201I		
Yes or No		
Yes	▶	Disconnect ECM harness connector. Disconnect auto amp. harness connector. GO TO 7.
No	▶	Check ECM. Refer to EC-141, "ECM Terminals and Reference Value".

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7	CHECK CIRCUIT CONTINUITY BETWEEN ECM AND AUTO AMP.	
Check circuit continuity between ECM harness connector F203 terminal No. 110 and auto amp. harness connector M102 terminal No. 22.		
SHA914F		
<p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 8.
NG	▶	1. Repair harness or connector. 2. Go to "SETP-BY-STEP PROCEDURE", "Self-diagnosis", HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is usual.

8	CHECK REFRIGERANT PRESSURE SENSOR	
Refer to HA-103.		
OK or NG		
OK	▶	Replace auto amp.
NG	▶	Replace refrigerant pressure sensor.

9	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY AND ECM	
Check circuit continuity between A/C relay harness connector E26 terminal No. 2 (G/R) and ECM harness connector F203 terminal No. 105 (LG).		
RHA203I		
<p>Continuity should exist.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	Check harness for short.
NG	▶	Repair harness or connector.



COMPONENT INSPECTION

A/C Relay

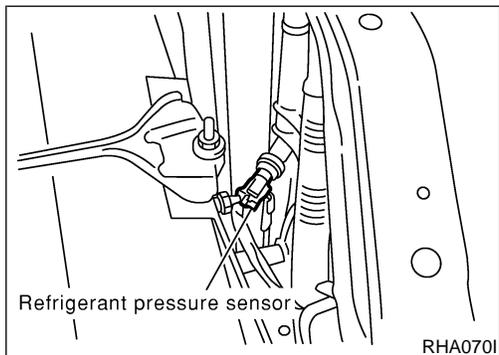
NAHA0204

NAHA0204S01

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.



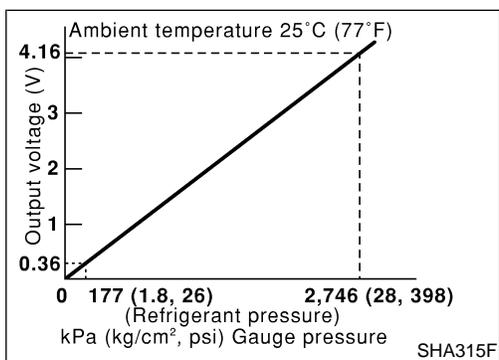
Refrigerant Pressure Sensor

NAHA0204S02

Make sure that higher A/C refrigerant-pressure results in higher refrigerant-pressure sensor output voltage.

Check voltage between ECM harness terminal No. 70 and body ground.

Refer to EC-738, "Diagnostic Procedure".



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Insufficient Cooling

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

=NAHA0205

SYMPTOM:

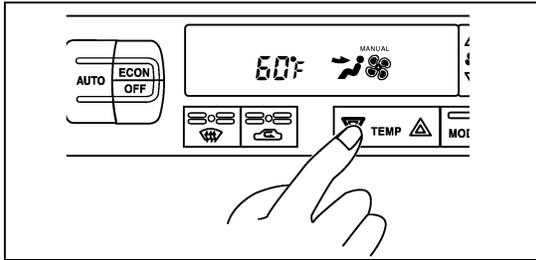
- Insufficient cooling

Inspection Flow
Except LE Grade

NAHA0205S01

NAHA0205S0101

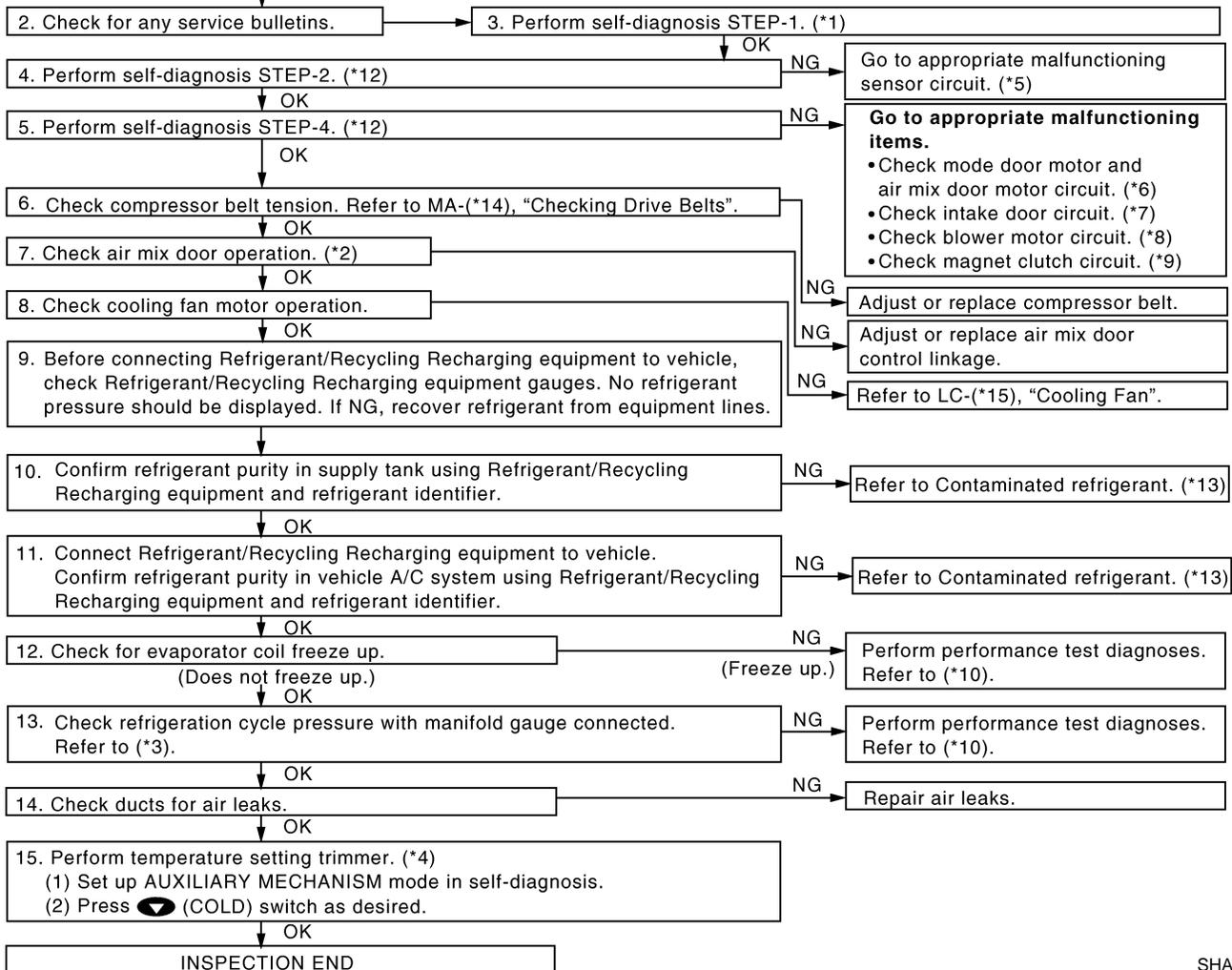
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

- Press the temperature decrease button until 18°C (60°F) is displayed.
- Check for cold air at discharge air outlets.

**If OK (symptom cannot be duplicated), perform complete operational check (*11).
If NG (symptom is confirmed), continue with STEP-2 following.**



SHA919F

- *1: HA-39
- *2: HA-78
- *3: HA-108
- *4: HA-48
- *5: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.

- *6: HA-70
- *7: HA-81
- *8: HA-89
- *9: HA-99
- *10: HA-106

- *11: HA-60
- *12: HA-40
- *13: HA-3
- *14: MA-14
- *15: LC-23

TROUBLE DIAGNOSES

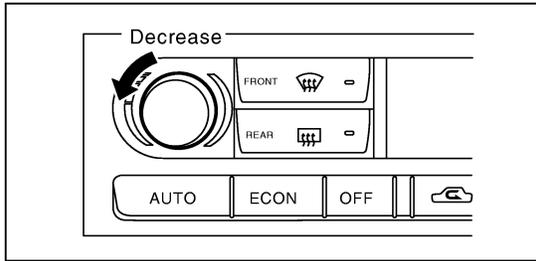
AUTO

Insufficient Cooling (Cont'd)

LE Grade

NAHA0205S0103

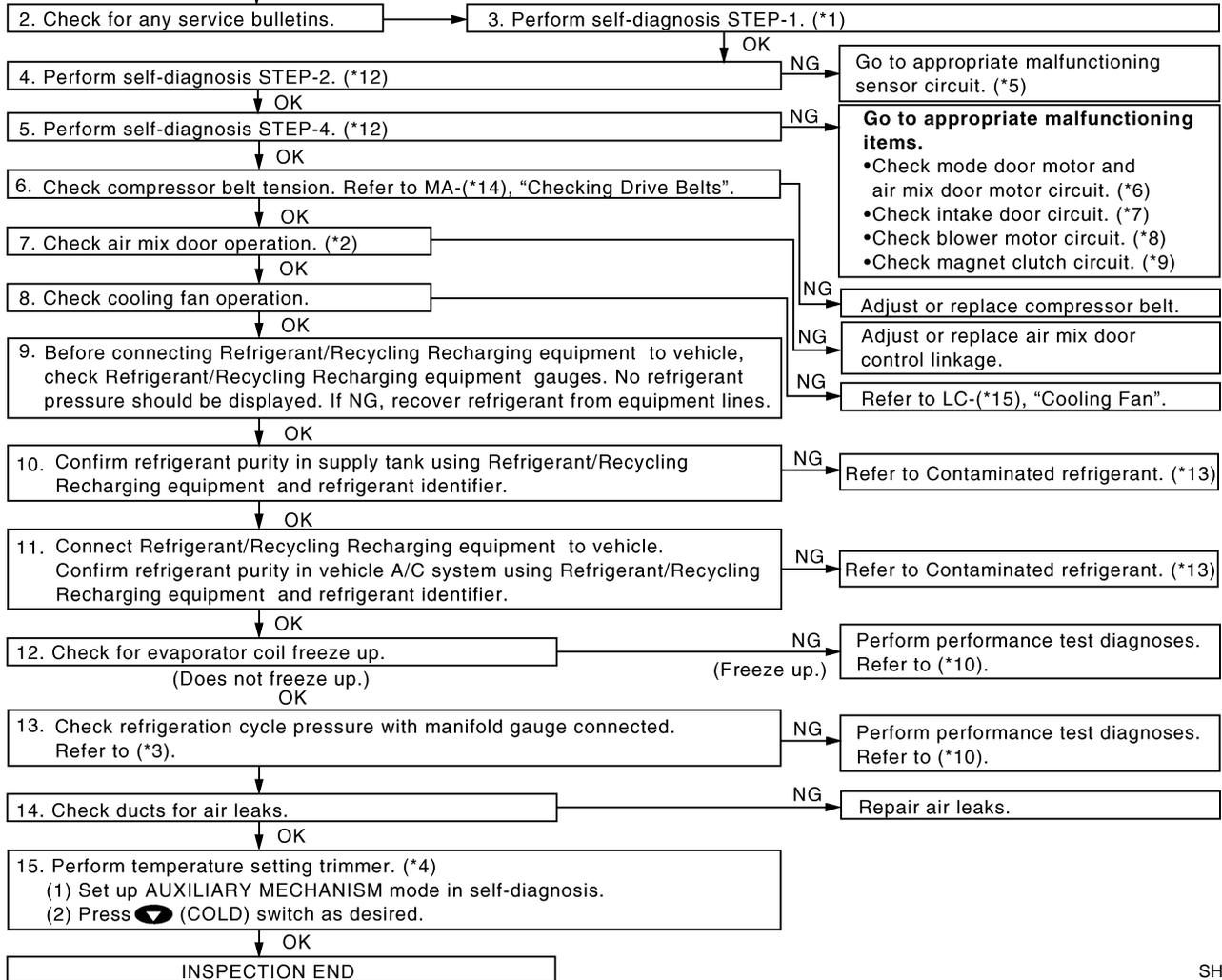
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

- Turn the temperature dial counterclockwise until 18°C (60°F) is displayed.
- Check for cold air at discharge air outlets.

**If OK (symptom cannot be duplicated), perform complete operational check (*11).
If NG (symptom is confirmed), continue with STEP-2 following.**



- *1: HA-50
- *2: HA-77
- *3: HA-108
- *4: HA-58
- *5: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.

- *6: HA-71
- *7: HA-82
- *8: HA-90
- *9: HA-99
- *10: HA-106

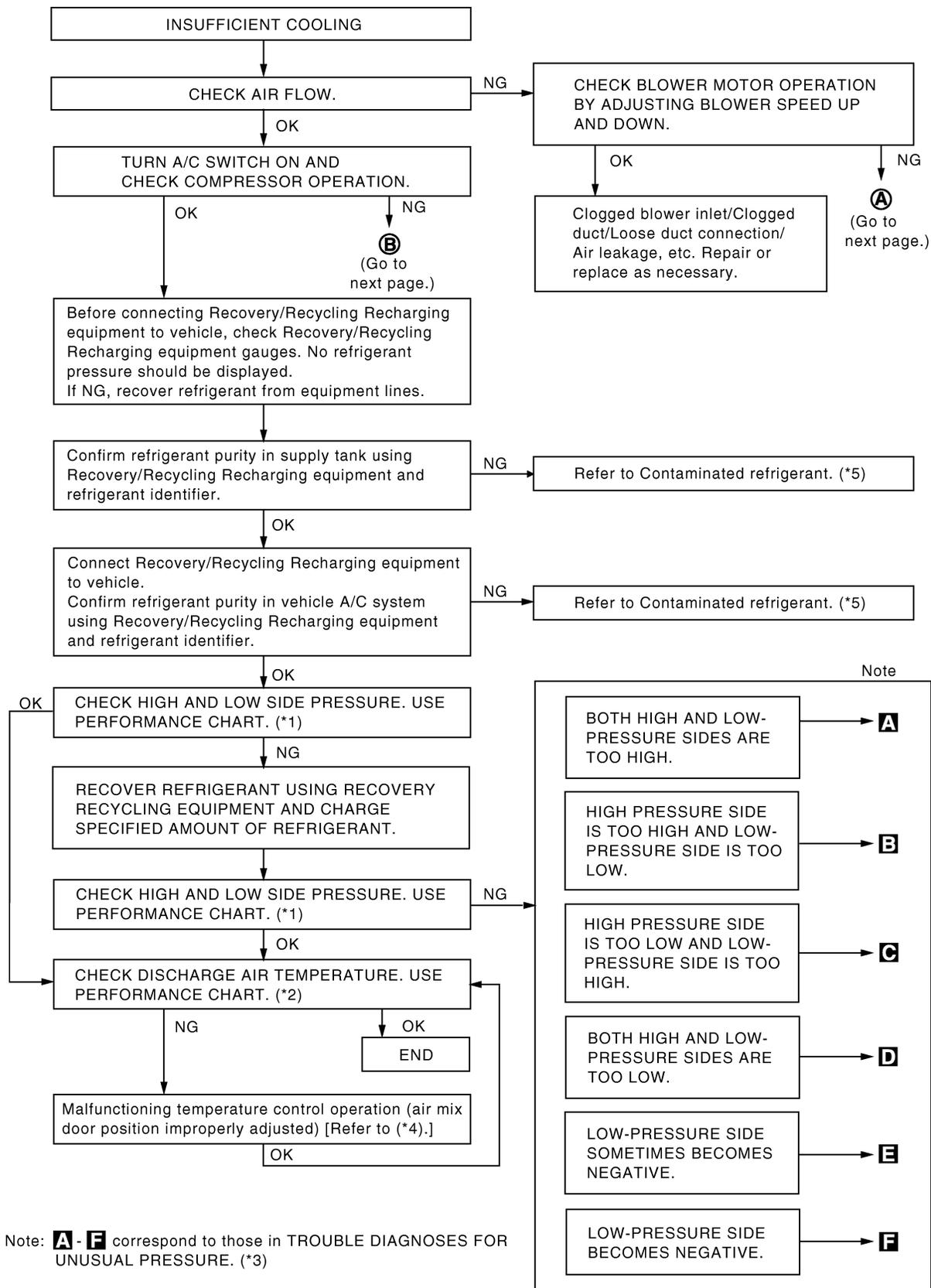
- *11: HA-62
- *12: HA-50
- *13: HA-3
- *14: MA-14
- *15: LC-23

SHA920F

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PERFORMANCE TEST DIAGNOSES

NAHA0206



TROUBLE DIAGNOSES

AUTO

Insufficient Cooling (Cont'd)

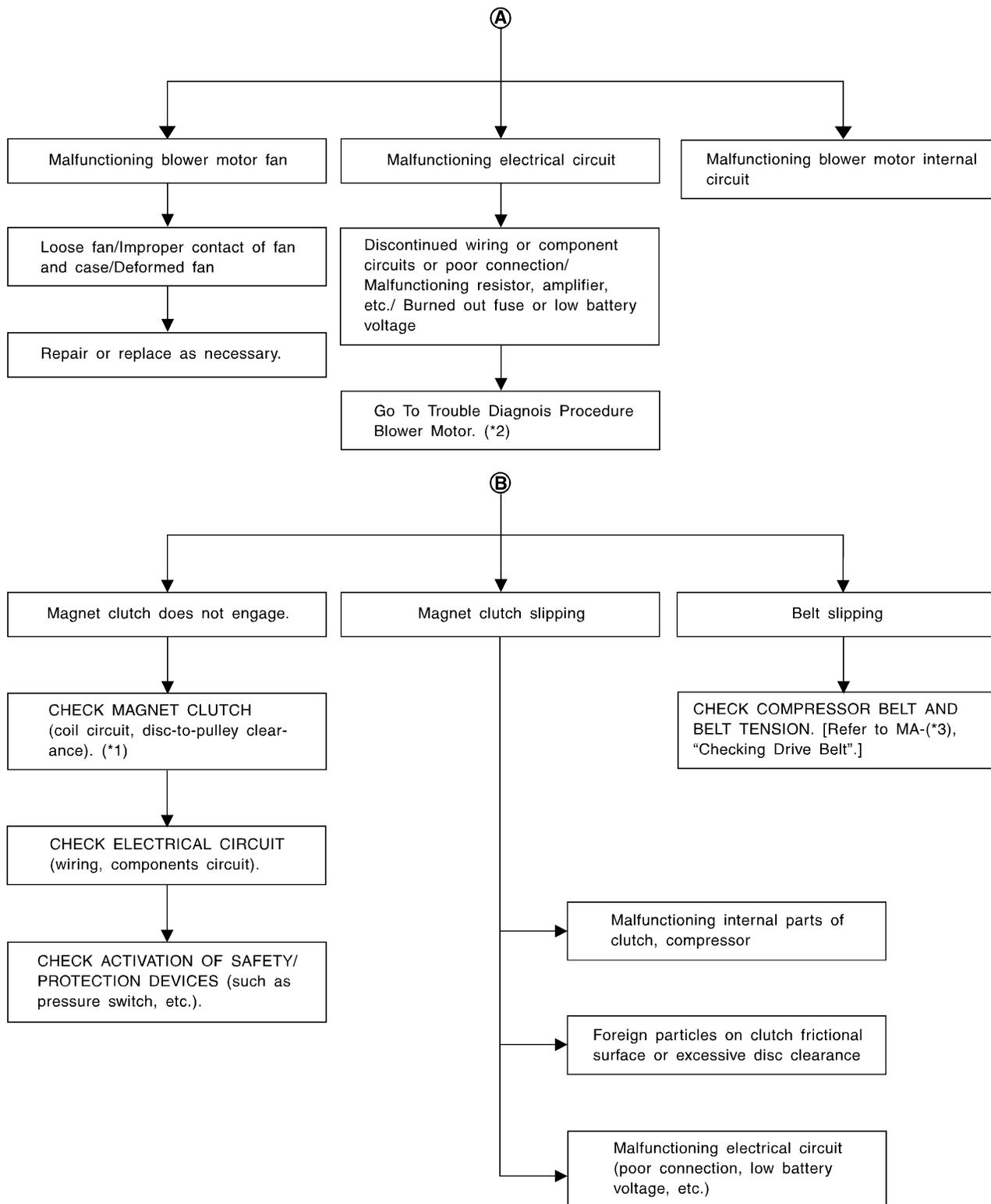
*1: HA-108

*3: HA-108

*5: HA-3

*2: HA-108

*4: HA-78



*1: HA-139

*2: HA-87

*3: MA-14

SHA329F

GI
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IDX

TROUBLE DIAGNOSES

AUTO

Insufficient Cooling (Cont'd)

PERFORMANCE CHART

NAHA0207

Test Condition

NAHA0207S01

Testing must be performed as follows:

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Mode switch	 (Ventilation) set
REC switch	 (Recirculation) set
 (blower) speed	Max. speed set
Engine speed	Idle speed

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

Test Reading

NAHA0207S02

Recirculating-to-discharge Air Temperature Table

NAHA0207S0201

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	6.0 - 9.0 (43 - 48)
	30 (86)	10.0 - 13.6 (50 - 56)
	35 (95)	15.2 - 19.5 (59 - 67)
	40 (104)	22.5 - 27.1 (73 - 81)
60 - 70	25 (77)	9.0 - 12.2 (48 - 54)
	30 (86)	13.6 - 17.2 (56 - 63)
	35 (95)	19.5 - 23.7 (67 - 75)
	40 (104)	27.1 - 32.3 (81 - 90)

Ambient Air Temperature-to-operating Pressure Table

NAHA0207S0202

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	1,226 - 1,638 (12.5 - 16.7, 178 - 237)	172 - 250 (1.75 - 2.55, 25 - 36)
	30 (86)	1,422 - 1,883 (14.5 - 19.2, 206 - 273)	196 - 275 (2.0 - 2.8, 28 - 40)
	35 (95)	1,657 - 2,187 (16.9 - 22.3, 240 - 317)	231 - 309 (2.35 - 3.15, 33 - 45)
	40 (104)	1,922 - 2,501 (19.6 - 25.5, 279 - 363)	280 - 373 (2.85 - 3.8, 41 - 54)

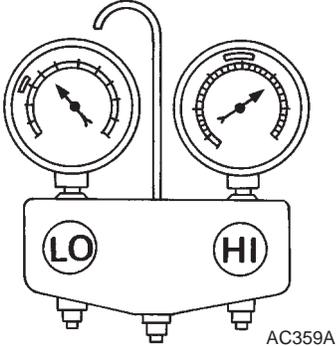
TROUBLE DIAGNOSES FOR UNUSUAL PRESSURE

NAHA0208

Whenever system's high and/or low side pressure is unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to HA-108 ("Ambient air temperature-to-operating pressure table").

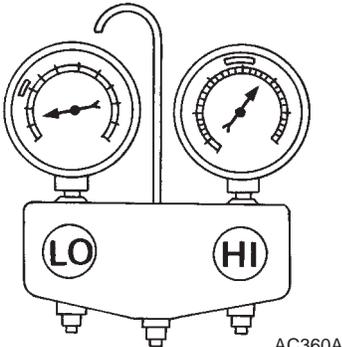
Both High and Low-pressure Sides are Too High.

NAHA0208S01

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too high.</p> <p>A</p>  <p style="text-align: right;">AC359A</p>	<ul style="list-style-type: none"> Pressure is reduced soon after water is splashed on condenser. 	<p>Excessive refrigerant charge in refrigeration cycle</p>	<p>Reduce refrigerant until specified pressure is obtained.</p>
	<p>Air suction by cooling fan is insufficient.</p>	<p>Insufficient condenser cooling performance</p> <p style="text-align: center;">↓</p> <ol style="list-style-type: none"> Condenser fins are clogged. Improper fan rotation of cooling fan 	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan as necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	<p>Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.)</p> <p style="text-align: center;">↓</p> <p>Air in refrigeration cycle</p>	<p>Evacuate repeatedly and recharge system.</p>
	<p>Engine tends to overheat.</p>	<p>Engine cooling systems malfunction.</p>	<p>Check and repair each engine cooling system.</p>
	<ul style="list-style-type: none"> 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 style="text-align: center;">↓</p> <ol style="list-style-type: none"> Improper expansion valve installation Improper expansion valve adjustment 	<p>Replace expansion valve.</p>

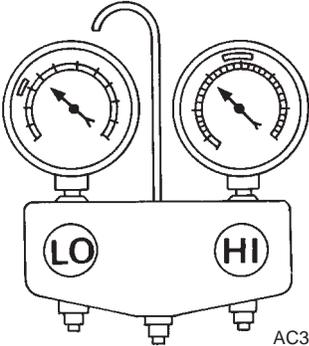
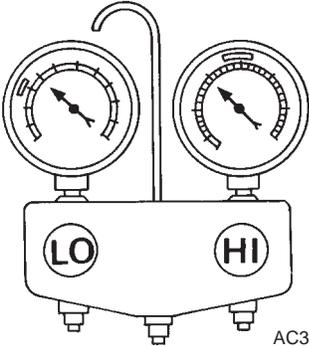
High-pressure Side is Too High and Low-pressure Side is Too Low.

NAHA0208S02

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p> <p>B</p>  <p style="text-align: right;">AC360A</p>	<p>Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.</p>	<p>High-pressure tube or parts located between compressor and condenser are clogged or crushed.</p>	<ul style="list-style-type: none"> Check and repair or replace malfunctioning parts. Check lubricant for contamination.

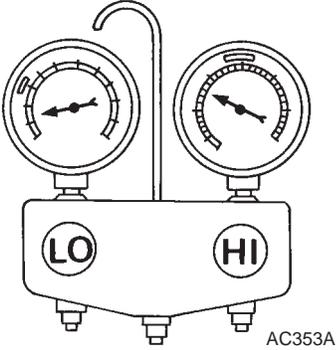
High-pressure Side is Too Low and Low-pressure Side is Too High.

NAHA0208S03

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high. 	High and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings	Replace compressor.
	No temperature difference between high and low-pressure sides	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace compressor.

Both High- and Low-pressure Sides are Too Low.

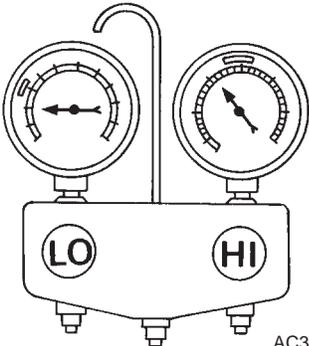
NAHA0208S04

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p> <p>D</p>  <p style="text-align: right;">AC353A</p>	<ul style="list-style-type: none"> There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	<p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)</p>	<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 	<p>High-pressure pipe located between receiver drier and expansion valve is clogged.</p>	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check lubricant for contamination.
	<ul style="list-style-type: none"> Expansion valve and liquid tank are warm or only cool when touched. 	<p>Low refrigerant charge</p> <p style="text-align: center;">↓</p> <p>Leaking fittings or components</p>	<p>Check refrigerant for leaks. Refer to "Checking Refrigerant Leaks", HA-144.</p>
	<p>There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.</p>	<p>Expansion valve closes a little compared with the specification.</p> <p style="text-align: center;">↓</p> <ol style="list-style-type: none"> Improper expansion valve adjustment Malfunctioning expansion valve Outlet and inlet may be clogged. 	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check lubricant for contamination.
	<p>An area of the low-pressure pipe is colder than areas near the evaporator outlet.</p>	<p>Low-pressure pipe is clogged or crushed.</p>	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check lubricant for contamination.
	<p>Air flow volume is not enough or is too low.</p>	<p>Evaporator is frozen.</p> <p style="text-align: center;">↓</p> <p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)</p>	<ul style="list-style-type: none"> Check intake sensor circuit. Refer to HA-131. Replace compressor.

GI
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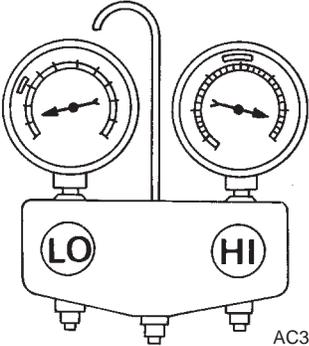
Low-pressure Side Sometimes Becomes Negative.

NAHA0208S05

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side sometimes becomes negative.</p> <p>E</p>  <p style="text-align: right; margin-right: 20px;"><small>AC354A</small></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.

Low-pressure Side Becomes Negative.

NAHA0208S06

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p> <p>F</p>  <p style="text-align: right; margin-right: 20px;"><small>AC362A</small></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, initially 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.

Insufficient Heating

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

SYMPTOM:

- Insufficient heating

Inspection Flow
Except LE Grade

=NAHA0209

NAHA0209S01

NAHA0209S0101

GI

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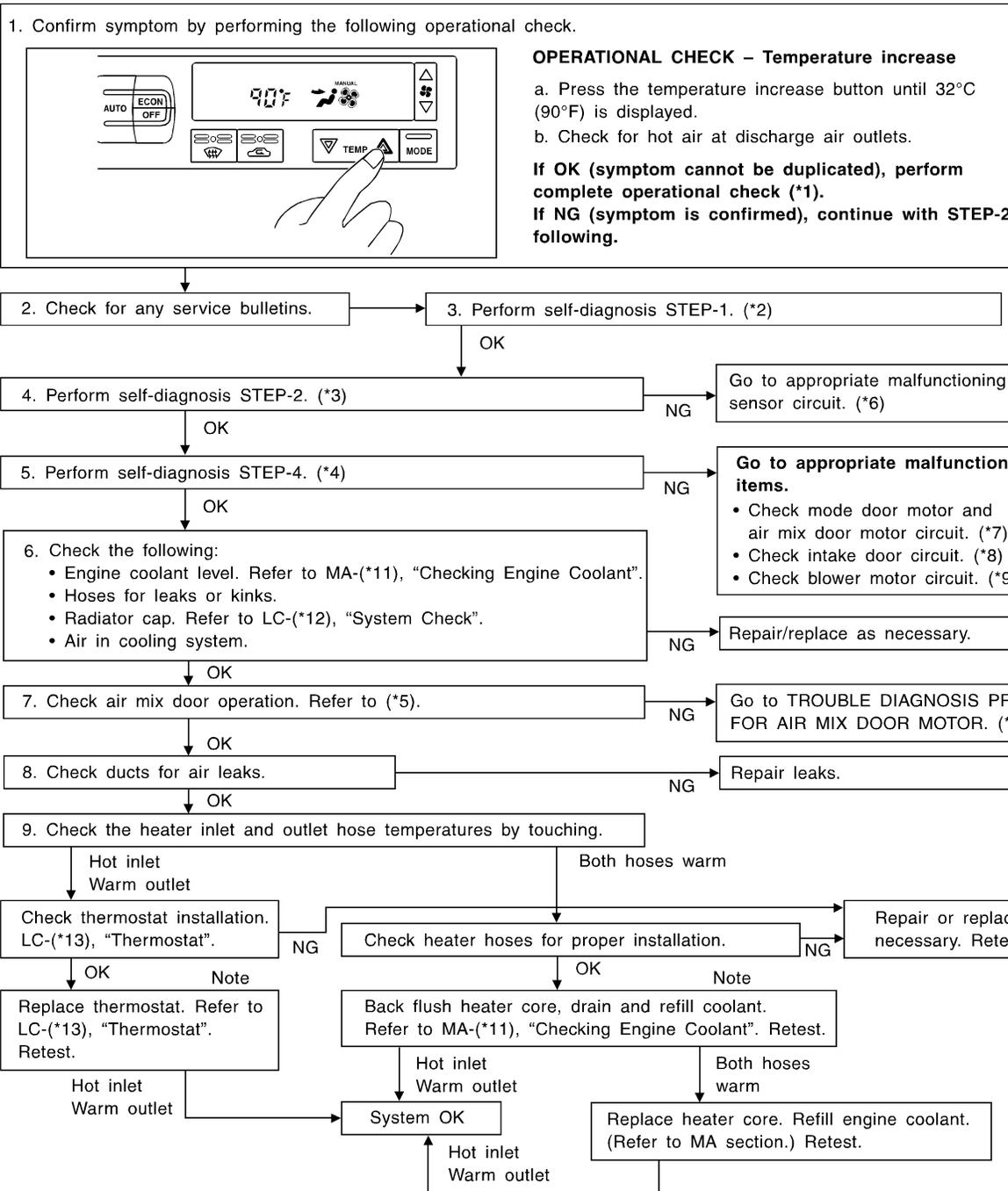
HA

RHA242I

SC

EL

IDX



- *1: HA-60
- *2: HA-39
- *3: HA-40
- *4: HA-40
- *5: HA-78

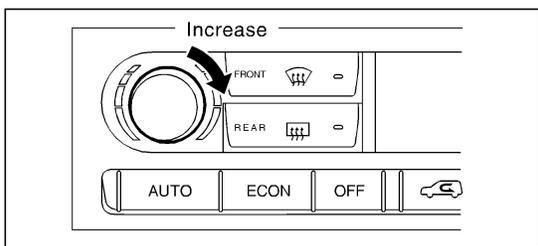
- *6: STEP-BY-STEP PROCEDURE (HA-40), see No. 13.
- *7: HA-71
- *8: HA-82
- *9: HA-90

- *10: HA-75
- *11: MA-15
- *12: LC-12
- *13: LC-19

LE Grade

NAHA0209S0103

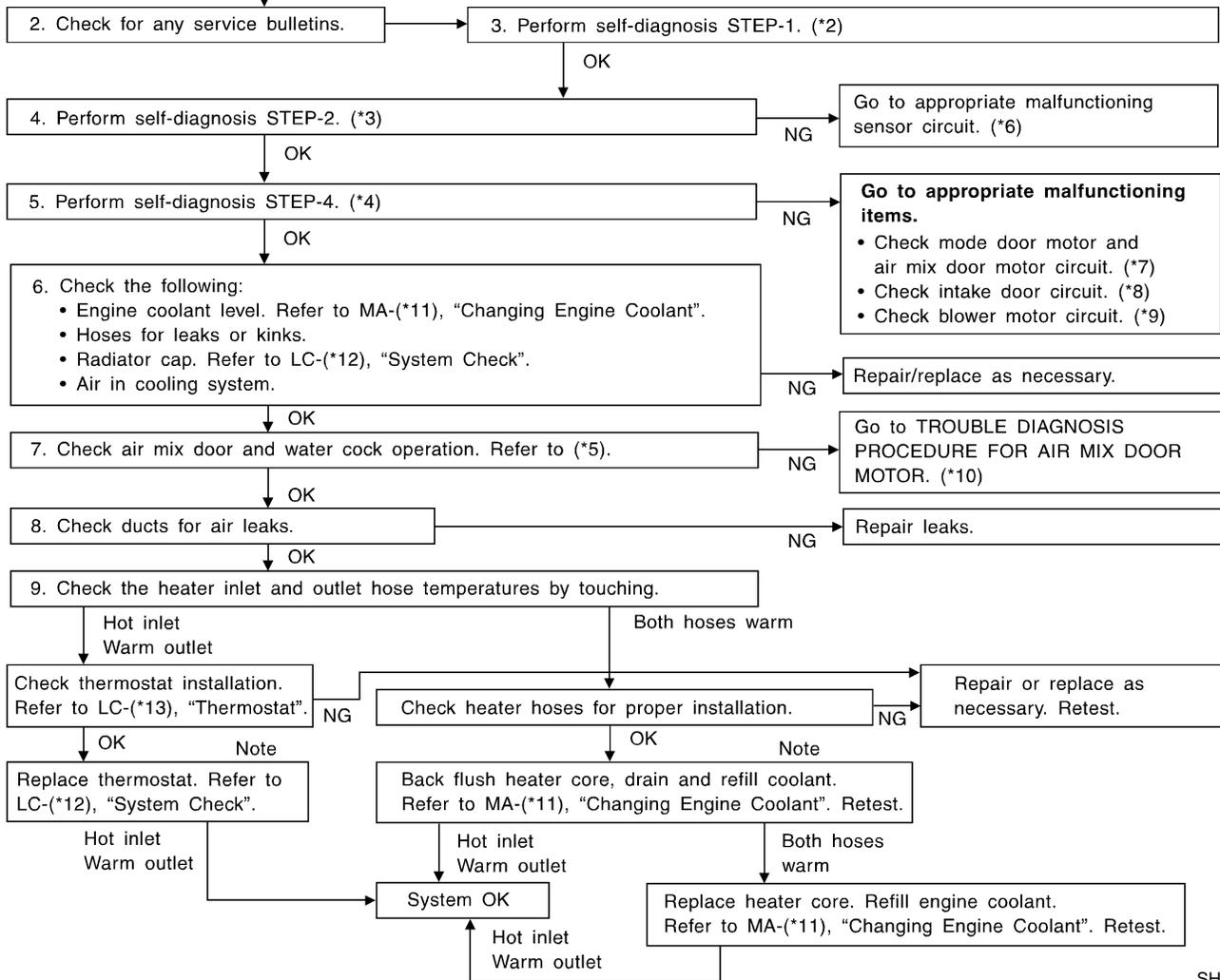
1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature increase

- a. Turn the temperature dial clockwise until 32°C (85°F) is displayed.
- b. Check for hot air at discharge air outlets.

If OK (symptom cannot be duplicated), perform complete operational check (*1).
If NG (symptom is confirmed), continue with STEP-2 following.



SHA687F

- *1: HA-62
- *2: HA-50
- *3: HA-50
- *4: HA-50
- *5: HA-77

- *6: STEP-BY-STEP PROCEDURE (HA-50), see No. 13.
- *7: HA-71
- *8: HA-82
- *9: HA-90

- *10: HA-71
- *11: MA-15
- *12: LC-12
- *13: LC-19

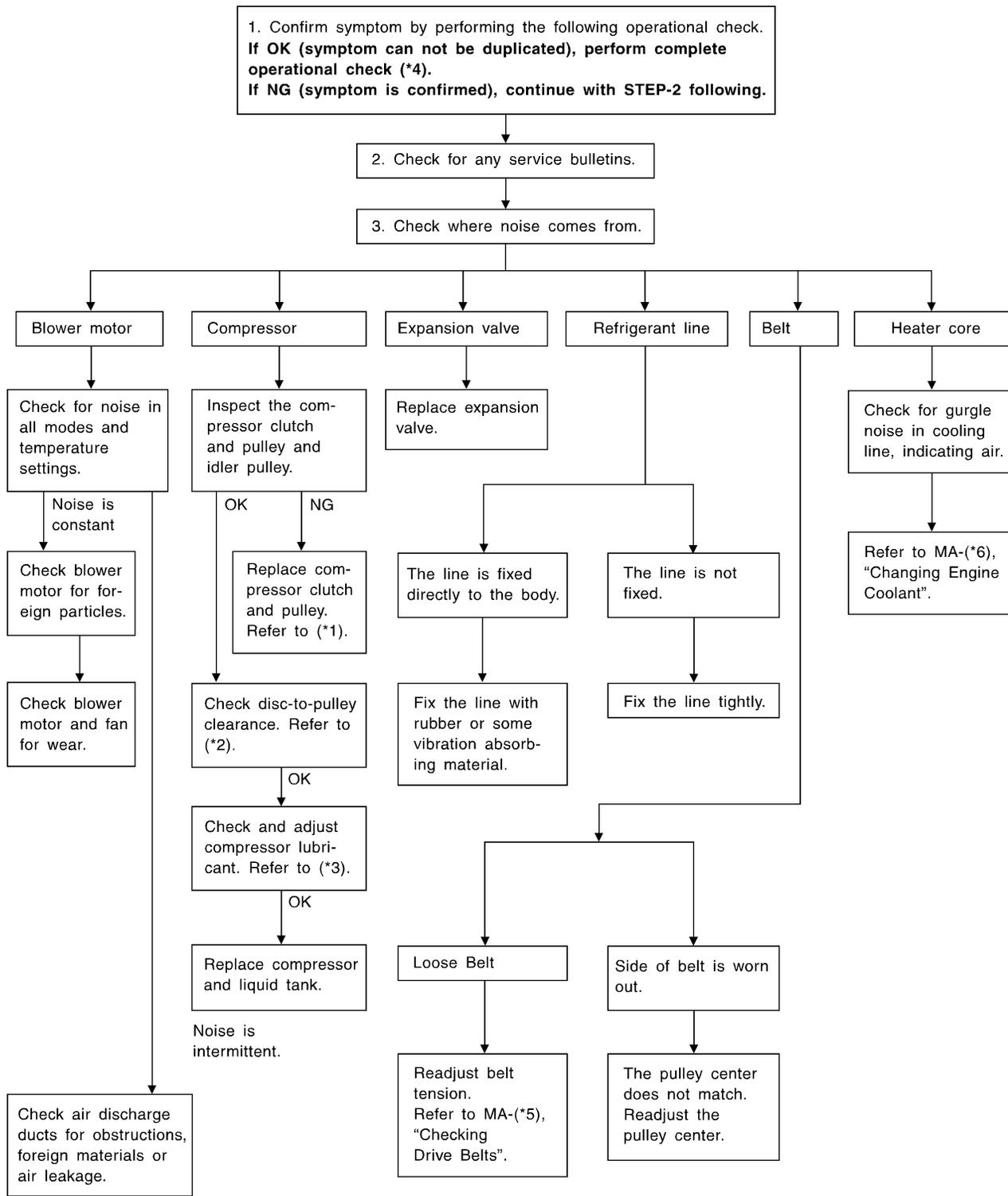
Noise

TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

SYMPTOM:

- Noise

=NAHA0210



*1: HA-139
*2: HA-141

*3: HA-136
*4: HA-60

*5: MA-14
*6: MA-15

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Self-diagnosis

TROUBLE DIAGNOSIS PROCEDURE FOR SELF-DIAGNOSIS

=NAHA0211

SYMPTOM:

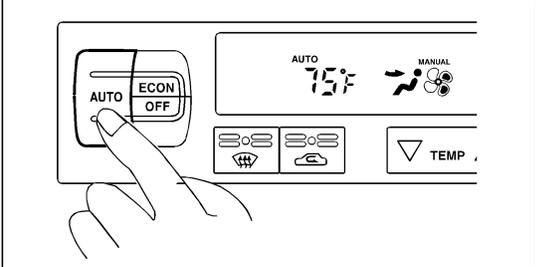
- Self-diagnosis cannot be performed.

Inspection Flow
Except LE Grade

NAHA0211S01

NAHA0211S0101

1. Confirm symptom by performing operational check.



OPERATIONAL CHECK – AUTO mode

a. Press AUTO switch.

b. Display should indicate AUTO (not ECON). Confirm that the compressor clutch engages (sound or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If OK (symptom cannot be duplicated), perform complete operational check (*9).

If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

OK Cause cannot be confirmed by self-diagnosis.

4. Check ambient sensor circuit. (*2)

OK

5. Check in-vehicle sensor circuit. (*3)

OK

6. Check sunload sensor circuit. (*4)

OK

7. Check intake sensor circuit. (*5)

OK

8. Check air mix door motor PBR circuit. (*6)

OK

If the symptom still exists, perform a complete operational check (*7) and check for other symptoms. [Refer to symptom table, (*8).] Does another symptom exist?

No

Replace auto amp.

Yes

Go to Trouble Diagnosis for related symptom.

INSPECTION END

Another symptom exists.

SHA250FA

*1: HA-66

*2: HA-121

*3: HA-124

*4: HA-128

*5: HA-131

*6: HA-133

*7: HA-60

*8: HA-59

*9: HA-60

LE Grade

NAHA0211S0103

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SHA688F

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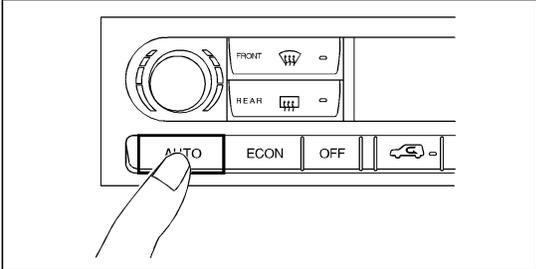
HA

SC

EL

IDX

1. Confirm symptom by performing operational check.



OPERATIONAL CHECK – AUTO mode

a. Press AUTO switch.

b. Display should indicate AUTO (not ECON). Confirm that the compressor clutch engages (audio or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If OK (symptom cannot be duplicated), perform complete operational check (*9).

If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

OK Cause cannot be confirmed by self-diagnosis.

4. Check ambient sensor circuit. (*2)

OK

5. Check in-vehicle sensor circuit. (*3)

OK

6. Check sunload sensor circuit. (*4)

OK

7. Check intake sensor circuit. (*5)

OK

8. Check air mix door motor PBR circuit. (*6)

If the symptom still exists, perform a complete operational check (*7) and check for other symptoms. [Refer to symptom table, (*8).] Does another symptom exist?

OK
No
Yes

Replace auto amp.

Go to Trouble Diagnosis for related symptom.

INSPECTION END

Another symptom exists.

- *1: HA-66
- *2: HA-121
- *3: HA-124

- *4: HA-128
- *5: HA-131
- *6: HA-133

- *7: HA-62
- *8: HA-59
- *9: HA-62

Memory Function

TROUBLE DIAGNOSIS PROCEDURE FOR MEMORY FUNCTION

=NAHA0212

SYMPTOM:

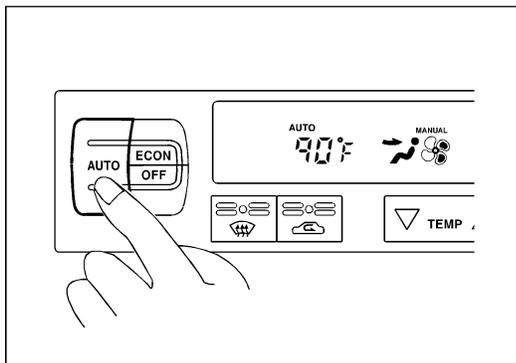
- Memory function does not operate.

Inspection Flow
Except LE Grade

NAHA0212S01

NAHA0212S0101

1. Confirm symptom by performing the following operational check.

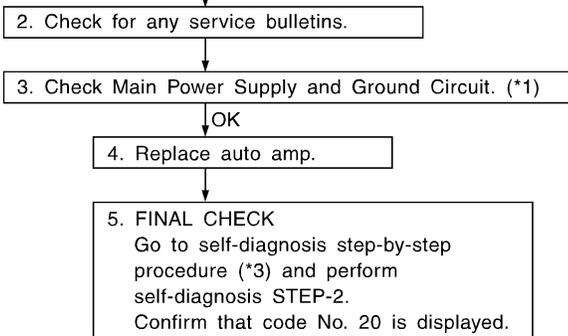


OPERATIONAL CHECK – Memory function

- a. Set the temperature 90°F or 32°C.
- b. Press OFF switch.
- c. Turn the ignition off.
- d. Turn the ignition on.
- e. Press the AUTO switch.
- f. Confirm that the set temperature remains at previous temperature.
- g. Press OFF switch.

If OK (symptom cannot be duplicated), perform complete operational check (*2).

If NG (symptom is confirmed), continue with STEP-2 following.



RHA2441

*1: HA-66

*2: HA-60

*3: HA-40

LE Grade

NAHA0212S0103

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PD

AX

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RS

BT

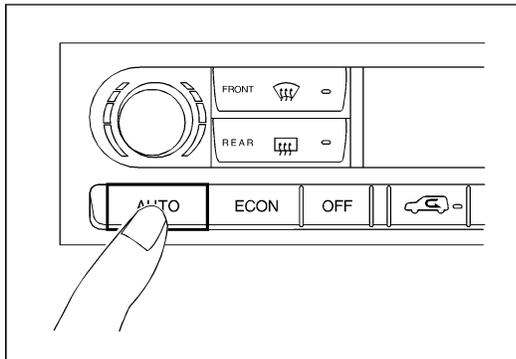
HA

SC

EL

IDX

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Memory function

- a. Set the temperature 85°F or 32°C.
- b. Press OFF switch.
- c. Turn the ignition off.
- d. Turn the ignition on.
- e. Press the AUTO switch.
- f. Confirm that the set temperature remains at previous temperature.
- g. Press OFF switch.

If OK (symptom cannot be duplicated), perform complete operational check (*2).

If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

↓OK

4. Replace auto amp.

5. FINAL CHECK

Go to self-diagnosis step-by-step procedure (*3) and perform self-diagnosis STEP-2.
Confirm that code No. 20 is displayed.

SHA689F

*1: HA-66

*2: HA-62

*3: HA-50

ECON (ECONOMY) Mode

TROUBLE DIAGNOSIS PROCEDURE FOR ECON (ECONOMY) MODE

=NAHA0213

SYMPTOM:

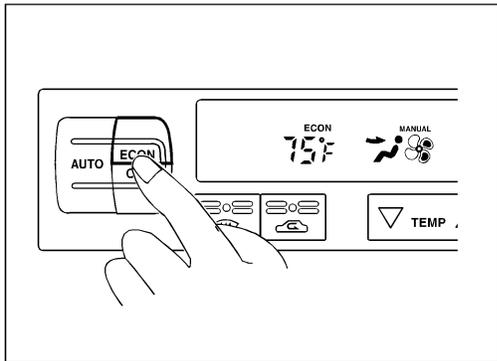
- ECON mode does not operate.

Inspection Flow
Except LE Grade

NAHA0213S01

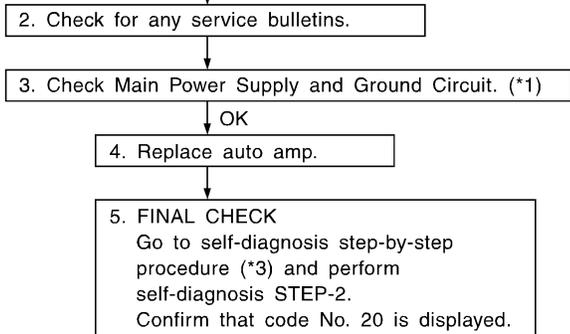
NAHA0213S0101

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – ECON (ECONOMY) mode

- a. Set the temperature 75°F or 25°C.
 - b. Press ECON switch.
 - c. Display should indicate ECON (not AUTO).
- Confirm that the compressor clutch is not engaged (sound or visual inspection).
 (Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)
- If OK (symptom cannot be duplicated), perform complete operational check (*2).**
If NG (symptom is confirmed), continue with STEP-2 following.



SHA920EB

*1: HA-66

*2: HA-60

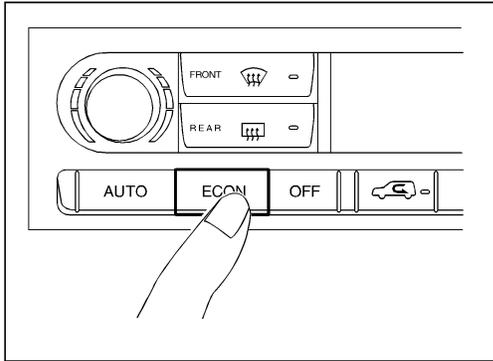
*3: HA-40

LE Grade

NAHA0213S0103

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MA
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IDX

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – ECON (ECONOMY) mode

- a. Set the temperature 75°F or 25°C.
 - b. Press ECON switch.
 - c. Display should indicate ECON (not AUTO).
- Confirm that the compressor clutch is not engaged (visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

If OK (symptom cannot be duplicated), perform complete operational check (*2).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.

3. Check Main Power Supply and Ground Circuit. (*1)

OK

4. Replace auto amp.

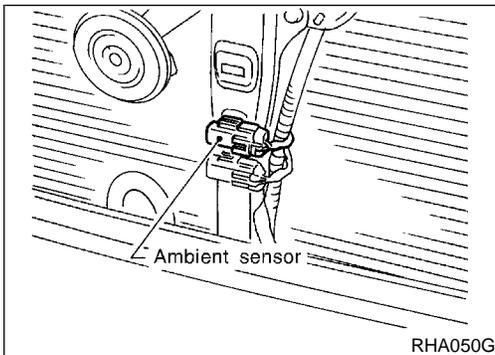
5. FINAL CHECK
Go to self-diagnosis step-by-step procedure (*3) and perform self-diagnosis STEP-2.
Confirm that code No. 20 is displayed.

SHA690F

*1: HA-66

*2: HA-62

*3: HA-50



Ambient Sensor Circuit COMPONENT DESCRIPTION

NAHA0214

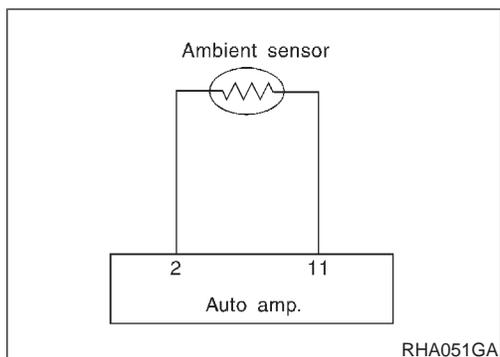
The ambient sensor is located on the hood lock stay. It detects ambient temperature and converts it into a resistance value which is then input into the auto amplifier.

AMBIENT TEMPERATURE INPUT PROCESS

NAHA0215

The automatic amplifier includes a “processing circuit” for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the auto amp. function. It only allows the auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds. As an example, consider stopping for a cup of coffee after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by the ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of the ambient sensor.

Ambient Sensor Circuit (Cont'd)



DIAGNOSTIC PROCEDURE

SYMPTOM: Ambient sensor circuit is open or shorted. (2 or -2 is indicated on the display as a result of conducting Self-diagnosis STEP 2.) NAHA0216

1	CHECK VOLTAGE BETWEEN AMBIENT SENSOR HARNESS CONNECTOR AND GROUND
<p>Disconnect ambient sensor harness connector. Do approx. 5 volts exist between ambient sensor harness connector E32 terminal No. 1 and ground?</p>	
RHA052G	
Yes or No	
Yes	▶ GO TO 2.
No	▶ GO TO 4.

2	CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP.
<p>1. Disconnect auto amp. harness connector. 2. Check circuit continuity between ambient sensor harness connector E32 terminal No. 2 and auto amp. harness connector M103 terminal No. 11.</p>	
RHA475G	
Continuity should exist.	
If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair harness or connector.

3	CHECK AMBIENT SENSOR	
Refer to HA-124.		
OK or NG		
OK	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	Replace ambient sensor.

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4	CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP.	
1. Disconnect auto amp. harness connector. 2. Check circuit continuity between ambient sensor harness connector E32 terminal No. 1 and auto amp. harness connector M103 terminal No. 2.		
<p style="color: blue;">Continuity should exist.</p> <p>If OK, check harness for short.</p>		
RHA906H		
OK or NG		
OK	▶	1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	Repair harness or connector.

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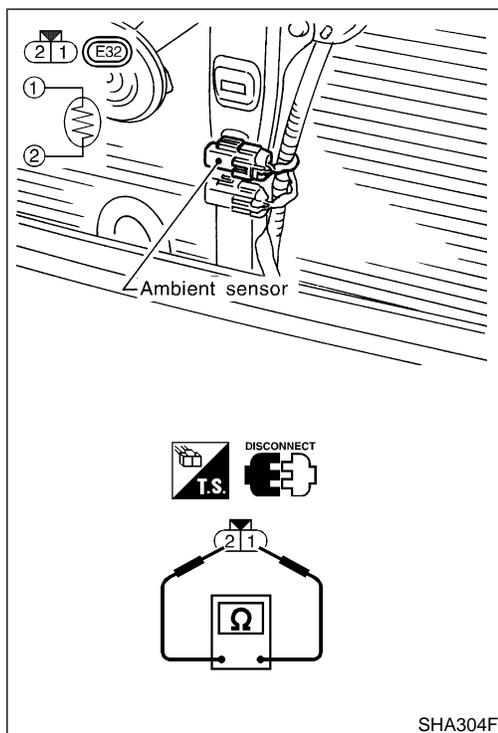
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Ambient Sensor Circuit (Cont'd)



COMPONENT INSPECTION

=NAHA0217

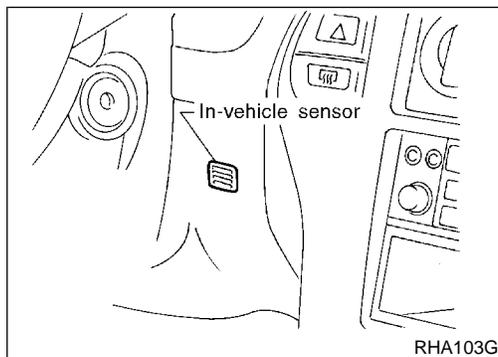
Ambient Sensor

NAHA0217S01

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

Temperature °C (°F)	Resistance kΩ
-15 (5)	12.73
-10 (14)	9.92
-5 (23)	7.80
0 (32)	6.19
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
45 (113)	1.07

If NG, replace ambient sensor.



In-vehicle Sensor Circuit

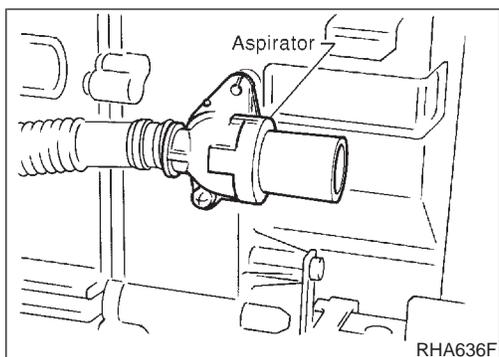
COMPONENT DESCRIPTION

NAHA0218

In-vehicle sensor

NAHA0218S01

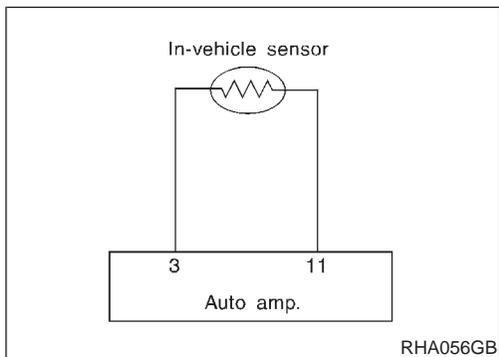
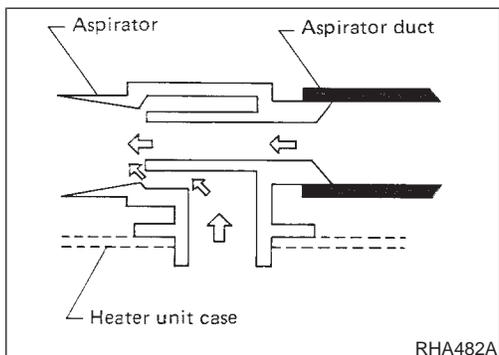
The in-vehicle sensor is located on instrument lower panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the auto amplifier.



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.

NAHA0218S02



DIAGNOSTIC PROCEDURE

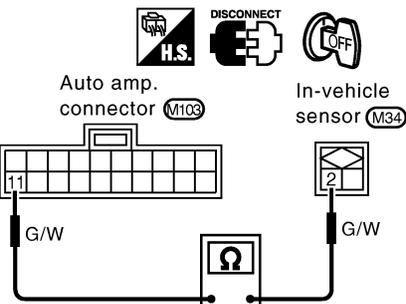
SYMPTOM: In-vehicle sensor circuit is open or shorted. (P₂₂ or -P₂₂ is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

NAHA0219

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1	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND GROUND
<p>Disconnect in-vehicle sensor harness connector. Do approx. 5 volts exist between in-vehicle sensor harness connector M34 terminal No. 1 and ground?</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ GO TO 4.

RHA579H

2	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.	
<ol style="list-style-type: none"> 1. Disconnect auto amp. harness connector. 2. Check circuit continuity between in-vehicle sensor harness connector M34 terminal No. 2 and auto amp. harness connector M103 terminal No. 11. 		
		
<p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: right;">RHA478GG</p>		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK IN-VEHICLE SENSOR	
Refer to HA-127.		
OK or NG		
OK	▶	<ol style="list-style-type: none"> 1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	<ol style="list-style-type: none"> 1. Replace in-vehicle sensor. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.
<p>1. Disconnect auto amp. harness connector. 2. Check circuit continuity between in-vehicle sensor harness connector M34 terminal No. 1 and auto amp. harness connector M103 terminal No. 3.</p>	
<p>Continuity should exist. If OK, check harness for short.</p>	
RHA479GE	
OK or NG	
OK	<p>▶ 1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-58 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.</p>
NG	▶ Repair harness or connector.

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COMPONENT INSPECTION

In-vehicle Sensor

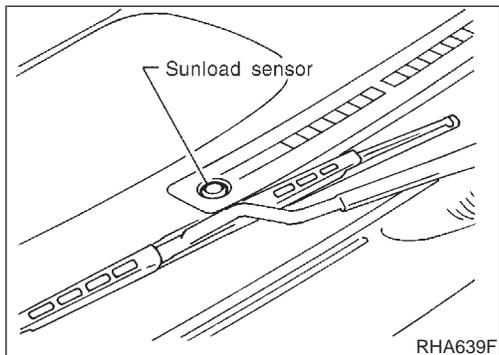
After disconnecting in-vehicle sensor harness connector, measure resistance between terminals 1 and 2 at sensor harness side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	12.73
-10 (14)	9.92
-5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81

RHA905H

Temperature °C (°F)	Resistance kΩ
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

If NG, replace in-vehicle sensor.



Sunload Sensor Circuit
COMPONENT DESCRIPTION

NAHA0221

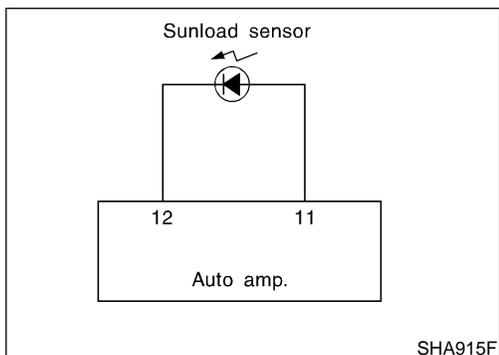
The sunload sensor is located on the right defroster grille. It detects sunload entering through windshield by means of a photo diode. The sensor converts the sunload into a current value which is then input into the auto amplifier.

SUNLOAD INPUT PROCESS

NAHA0222

The auto amp. also includes a processing circuit which "average" the variations in detected sunload over a period of time. This prevents drastic swings in the A/C system operation due to small or quick variations in detected sunload.

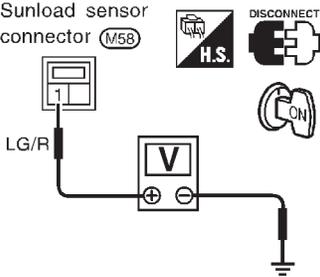
For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the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

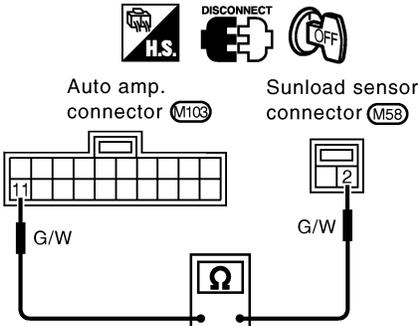


DIAGNOSTIC PROCEDURE

NAHA0223

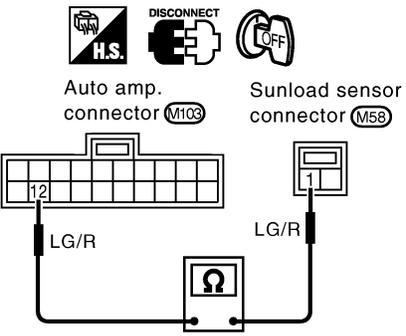
SYMPTOM: Sunload sensor circuit is open or shorted. (25 or -25 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

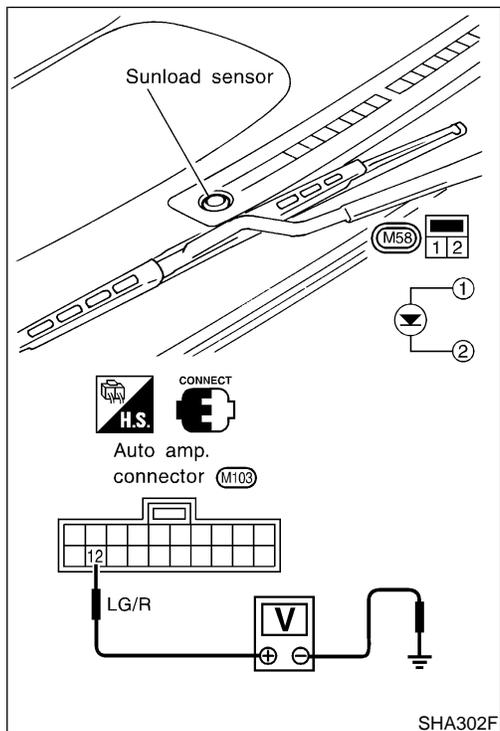
1	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND GROUND	
<p>Disconnect sunload sensor harness connector. Do approx. 5 volts exist between sunload sensor harness connector M58 terminal No. 1 and ground?</p>		
		
RHA062G		
Yes or No		
Yes	▶	GO TO 2.
No	▶	GO TO 4.

2	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP.	
<p>1. Disconnect auto amp. harness connector. 2. Check circuit continuity between sunload sensor harness connector M58 terminal No. 2 and auto amp. harness connector M103 terminal No. 11.</p>		
		
RHA483GH		
Continuity should exist.		
If OK, check harness for short.		
OK or NG		
OK	▶	GO TO 3.
NG	▶	Repair harness or connector.

3	CHECK SUNLOAD SENSOR	
Refer to HA-130.		
OK or NG		
OK	▶	<ol style="list-style-type: none"> 1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	<ol style="list-style-type: none"> 1. Replace sunload sensor. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

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4	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP.
<ol style="list-style-type: none"> 1. Disconnect auto amp. harness connector. 2. Check circuit continuity between sunload sensor harness connector M58 terminal No. 1 and auto amp. harness connector M103 terminal No. 12. 	
	
<p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: right;">RHA484GF</p>	
OK or NG	
OK	<ol style="list-style-type: none"> 1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	Repair harness or connector.



COMPONENT INSPECTION

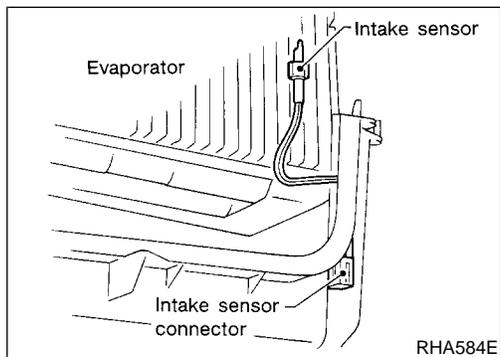
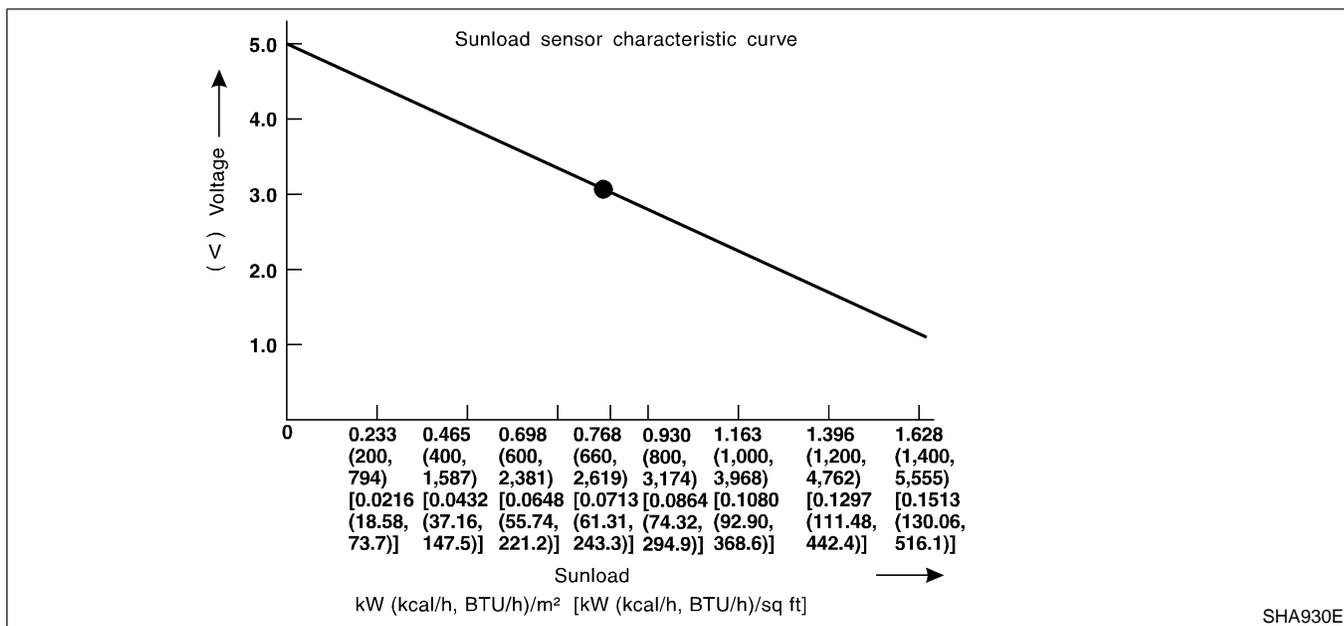
Sunload Sensor

NAHA0224

NAHA0224S01

Measure voltage between auto amp. terminal No. 12 and ground. If NG, replace sunload sensor.

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



Intake Sensor Circuit

COMPONENT DESCRIPTION

Intake Sensor

NAHA0225

NAHA0225S01

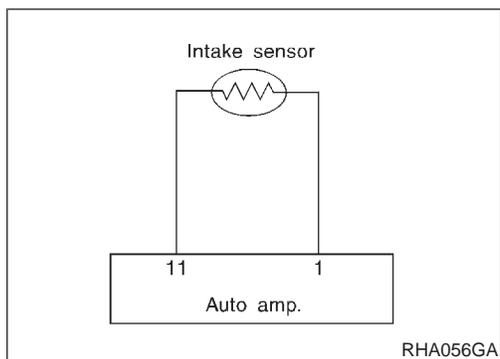
The intake sensor is located on the cooling unit. It converts temperature of air after it passes through the evaporator into a resistance value which is then input to the auto amp.

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

Temperature °C (°F)	Resistance kΩ
-15 (5)	12.34
-10 (14)	9.62
-5 (23)	7.56
0 (32)	6.00
5 (41)	4.80
10 (50)	3.87
15 (59)	3.15
20 (68)	2.57
25 (77)	2.12
30 (86)	1.76
35 (95)	1.47
40 (104)	1.23
45 (113)	1.04

If NG, replace intake sensor.

Intake Sensor Circuit (Cont'd)



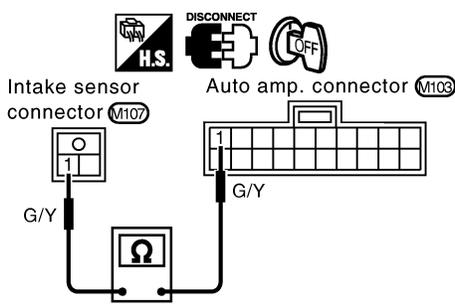
DIAGNOSTIC PROCEDURE

SYMPTOM: Intake sensor circuit is open or shorted. (24 or -24 is indicated on the display as a result of conducting Self-diagnosis STEP 2.) NAHA0226

1	CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND GROUND						
<p>Disconnect intake sensor harness connector. Do approx. 5 volts exist between intake sensor harness connector M107 terminal No. 1 and ground?</p> <div style="text-align: center;"> <p>Intake sensor connector (M107)</p> <p style="text-align: right;">RHA0711</p> </div> <p style="text-align: center;">Yes or No</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">Yes</td> <td style="width: 5%; text-align: center;">▶</td> <td>GO TO 2.</td> </tr> <tr> <td>No</td> <td style="text-align: center;">▶</td> <td>GO TO 4.</td> </tr> </table>		Yes	▶	GO TO 2.	No	▶	GO TO 4.
Yes	▶	GO TO 2.					
No	▶	GO TO 4.					

2	CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND AUTO AMP.						
<p>1. Disconnect auto amp. harness connector. 2. Check circuit continuity between intake sensor harness connector M107 terminal No. 2 and auto amp. harness connector M103 terminal No. 11.</p> <div style="text-align: center;"> <p>Intake sensor connector (M107)</p> <p>Auto amp. connector (M103)</p> <p style="text-align: right;">RHA496G</p> </div> <p style="text-align: center;">Continuity should exist. If OK, check harness for short.</p> <p style="text-align: center;">OK or NG</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 20%;">OK</td> <td style="width: 5%; text-align: center;">▶</td> <td>GO TO 3.</td> </tr> <tr> <td>NG</td> <td style="text-align: center;">▶</td> <td>Repair harness or connector.</td> </tr> </table>		OK	▶	GO TO 3.	NG	▶	Repair harness or connector.
OK	▶	GO TO 3.					
NG	▶	Repair harness or connector.					

3	CHECK INTAKE SENSOR	
Refer to HA-131.		
OK or NG		
OK	▶	<ol style="list-style-type: none"> 1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	<ol style="list-style-type: none"> 1. Replace intake sensor. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

4	CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND AUTO AMP.	
<ol style="list-style-type: none"> 1. Disconnect auto amp. harness connector. 2. Check circuit continuity between intake sensor harness connector M107 terminal No. 1 and auto amp. harness connector M103 terminal No. 1. 		
		
<p style="color: blue;">Continuity should exist.</p> <p>If OK, check harness for short.</p>		
OK or NG		
OK	▶	<ol style="list-style-type: none"> 1. Replace auto amp. 2. Go to self-diagnosis step-by-step procedure HA-40 (Except LE grade), HA-50 (LE grade) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
NG	▶	Repair harness or connector.

Air Mix Door Motor PBR Circuit DIAGNOSTIC PROCEDURE

NAHA0227

For description of mode door motor and air mix door motor circuit, refer to HA-77.

SYMPTOM: If PBR circuit is open or shorted. (–25 or 25 is indicated on the display as a result of conducting Self-diagnosis STEP 2.)

Perform diagnostic procedure for mode door motor and air mix door motor. Refer to HA-71.

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

NAHA0228

NAHA0228S01

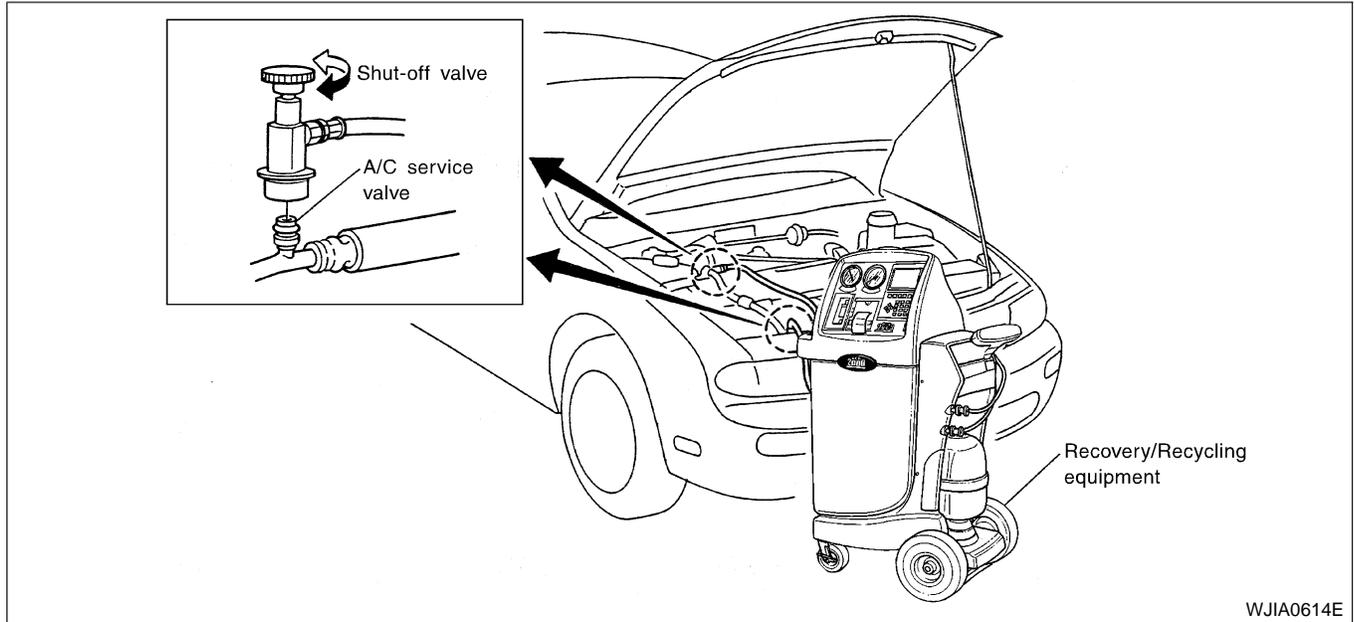
NAHA0228S0101

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

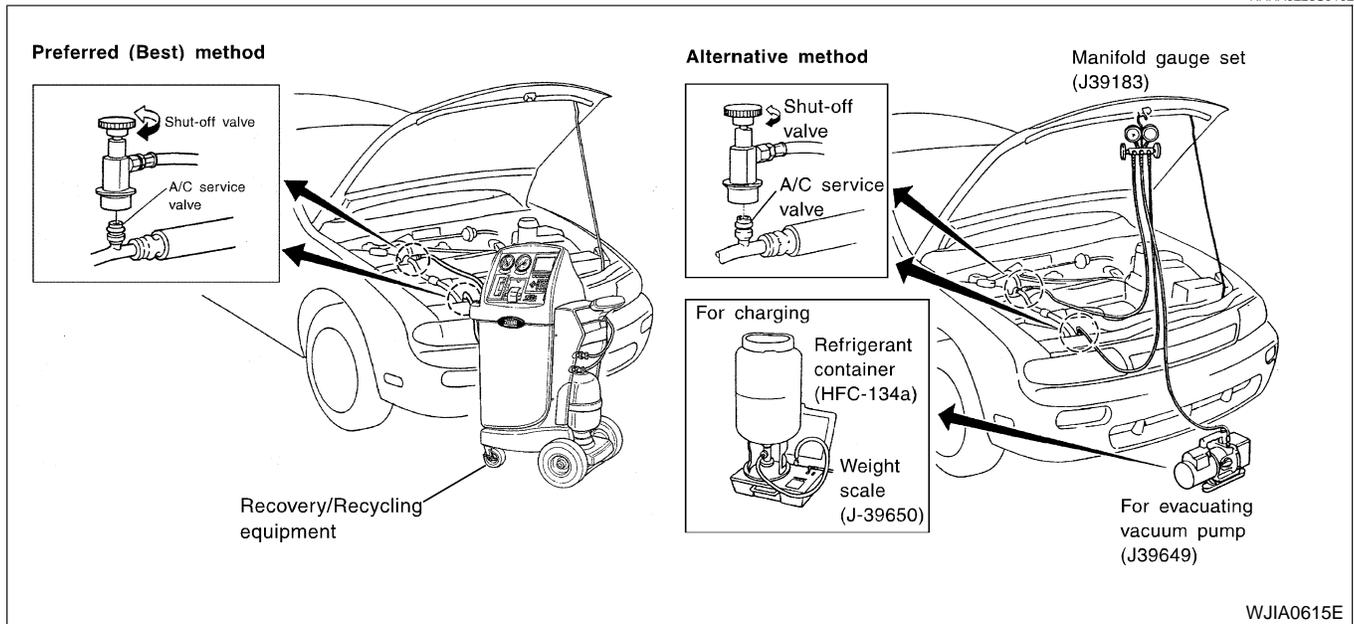
WARNING:

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 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.



Evacuating System and Charging Refrigerant

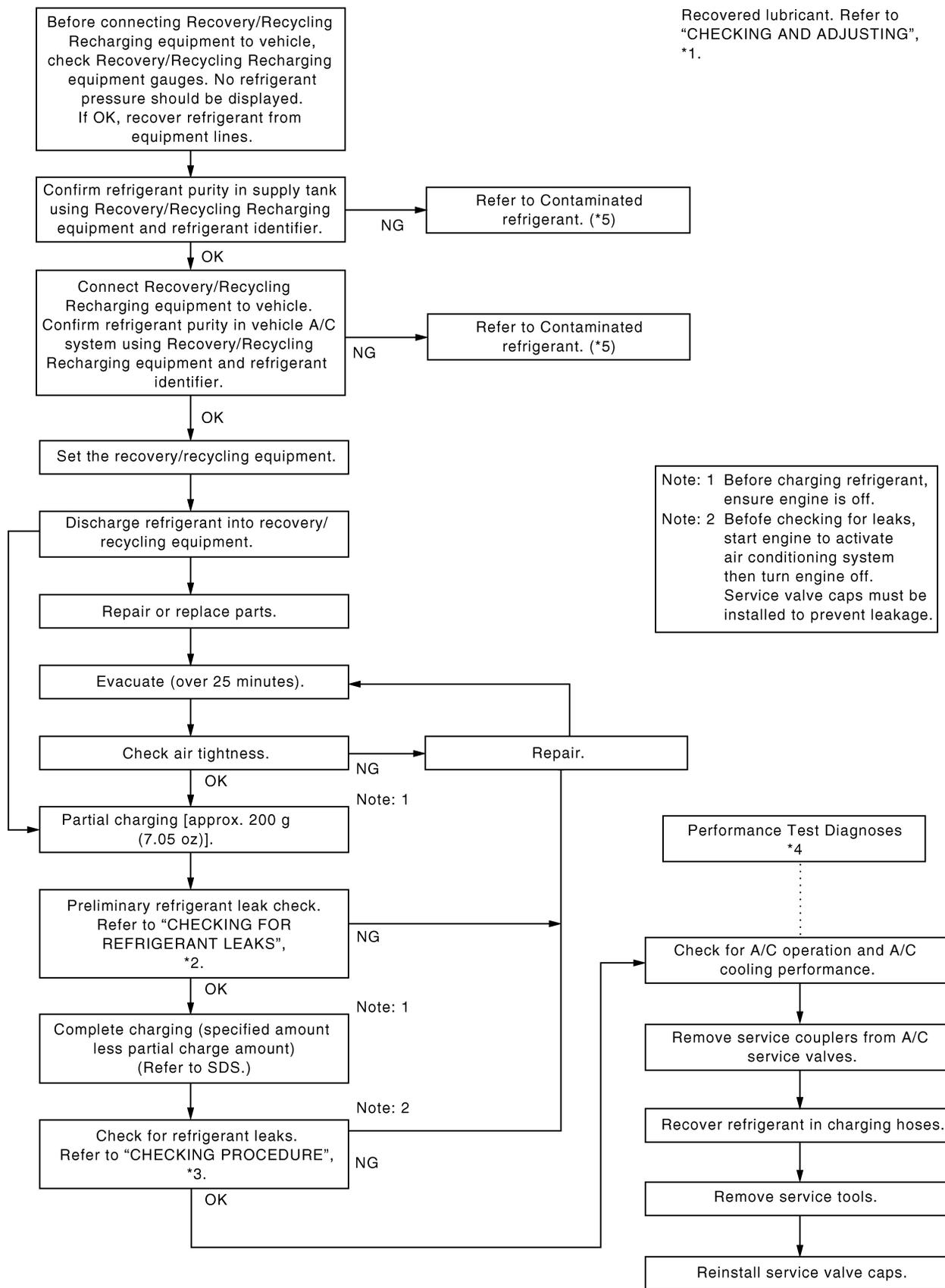
NAHA0228S0102



SERVICE PROCEDURE

AUTO

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



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*1: HA-136
*2: HA-144

*3: HA-145
*4: HA-106

*5: HA-3

Maintenance of Lubricant Quantity in Compressor

The lubricant in 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.

NAHA0229

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

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

LUBRICANT

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

NAHA0229S01

CHECKING AND ADJUSTING

Adjust the lubricant quantity according to the test group shown below.

NAHA0229S02

1	CHECK LUBRICANT RETURN OPERATION
<p>Can lubricant return operation be performed?</p> <ul style="list-style-type: none"> ● A/C system works properly. ● There is no evidence of a large amount of lubricant leakage. <p>CAUTION: If excessive lubricant leakage is noted, do not perform the lubricant return operation.</p> <p style="text-align: center;">Yes or No</p>	
Yes	▶ GO TO 2.
No	▶ GO TO 3.

2	PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS:
<p>1. Start engine, and set the following conditions:</p> <ul style="list-style-type: none"> ● Test condition Engine speed: Idling to 1,200 rpm AUTO switch: ON Blower speed: Max. position Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).] <p>2. Next item is for V-6 compressor. Connect the manifold gauge, and check that the high pressure side pressure is 588 kPa (6 kg/cm², 85 psi) or higher. If less than the reference level, attach a cover to the front face of the condenser to raise the pressure.</p> <p>3. Perform lubricant return operation for about 10 minutes.</p> <p>4. Stop engine.</p>	
OK	▶ GO TO 3.

3	CHECK COMPRESSOR	
Should the compressor be replaced?		
Yes or No		
Yes	▶	Go to “Lubricant Adjustment Procedure for Compressor Replacement”, (HA-137).
No	▶	GO TO 4.

4	CHECK ANY PART	
Is there any part to be replaced? (Evaporator, condenser, liquid tank or in case there is evidence of a large amount of lubricant leakage.)		
Yes or No		
Yes	▶	Go to “Lubricant Adjusting Procedure for Components Replacement Except Compressor”, (HA-137).
No	▶	Carry out the A/C performance test.

Lubricant Adjusting Procedure for Components Replacement Except Compressor

NAHA0229S0201

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant ml (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	75 (2.5, 2.6)	—
Liquid tank	5 (0.2, 0.2)	Add if compressor is not replaced. *1
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *2

*1: If compressor is replaced, addition of lubricant is included in the table.

*2: If refrigerant leak is small, no addition of lubricant is needed.

Lubricant Adjusting Procedure for Compressor Replacement

NAHA0229S0202

1. Before connecting Recovery/Recycling Recharging equipment to vehicle, check Recovery/Recycling Recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect Recovery/Recycling Recharging equipment to vehicle. Confirm refrigerant purity in supply tank using Recovery/Recycling Recharging equipment and refrigerant identifier. If NG, refer to “CONTAMINATED REFRIGERANT”, HA-3.
3. Confirm refrigerant purity in vehicle A/C system using Recovery/Recycling Recharging equipment and refrigerant identifier. If NG, refer to “CONTAMINATED REFRIGERANT”, HA-3.
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Remove the drain plug of the “old” (removed) compressor.

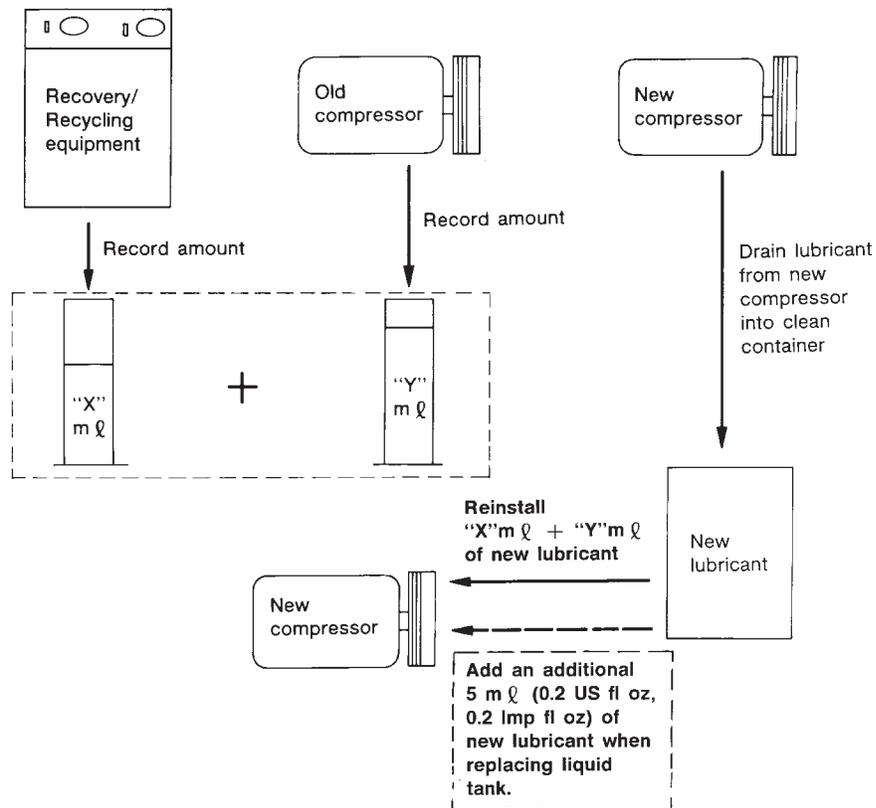
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- Drain the lubricant into a graduated container and record the amount of drained lubricant.
6. Remove the drain plug and drain the lubricant from the “new” compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from “old” compressor. Add this lubricant to “new” compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to “new” compressor through the suction port opening.
9. Torque the drain plug.

18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)
10. If the liquid tank also needs to be replaced, add an additional 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.

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

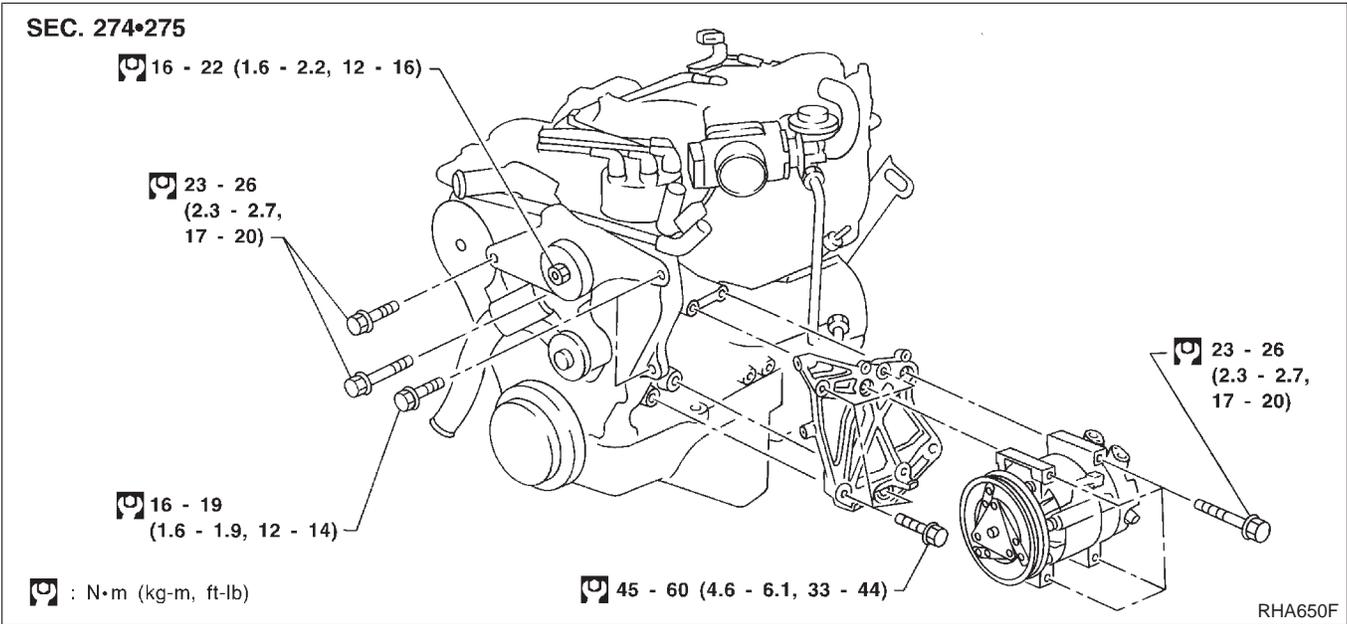
Lubricant adjusting procedure for compressor replacement



RHA065DD

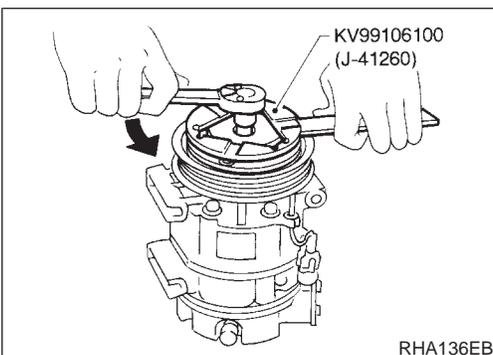
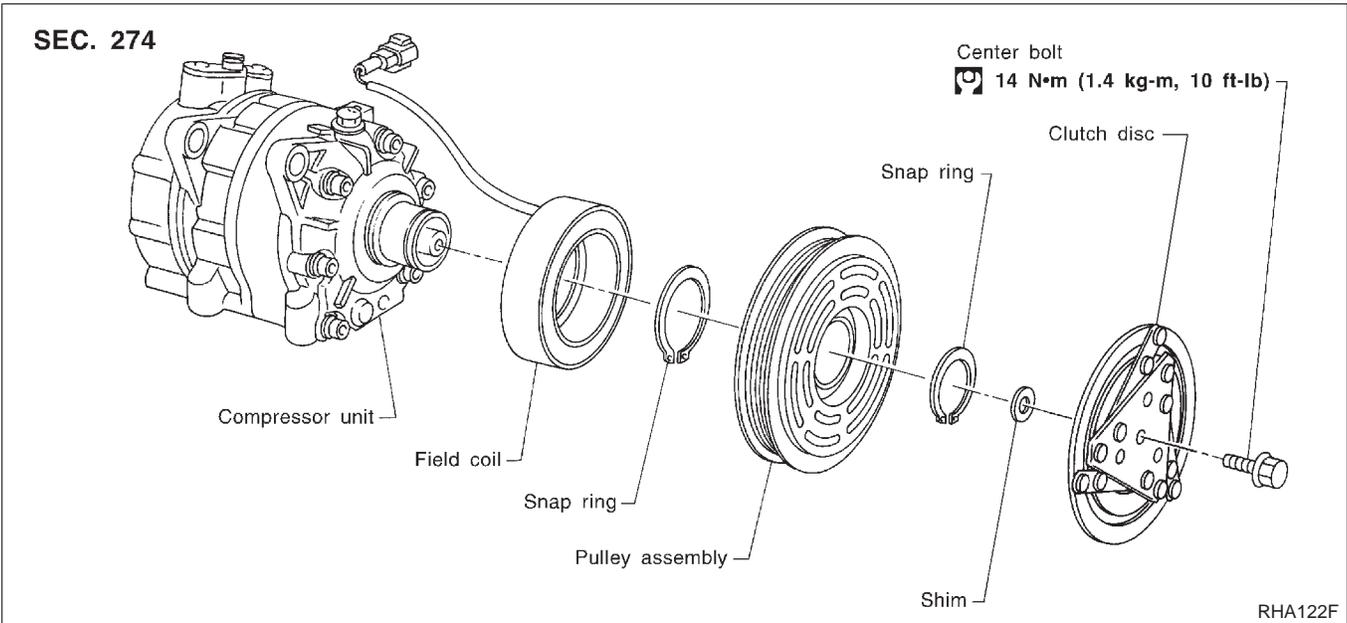
**Compressor
REMOVAL AND INSTALLATION**

NAHA0230



**Compressor Clutch
OVERHAUL**

NAHA0231



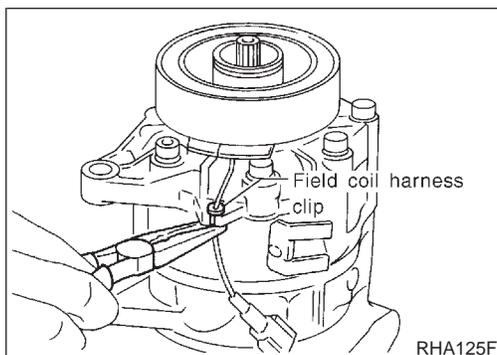
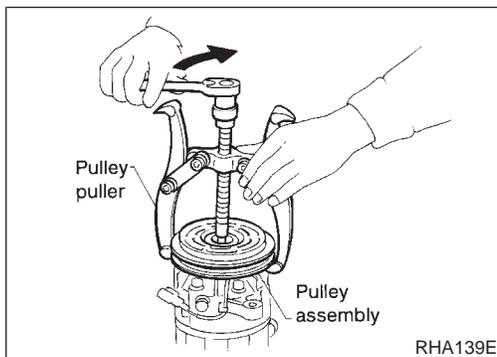
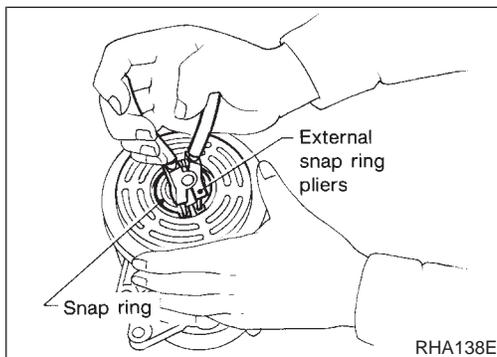
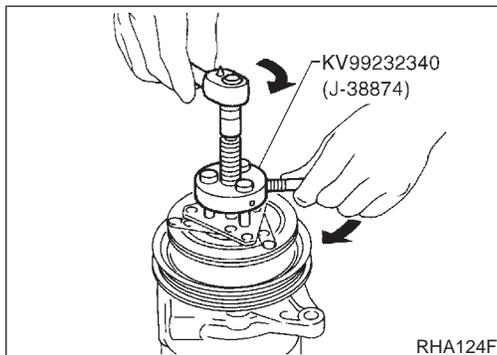
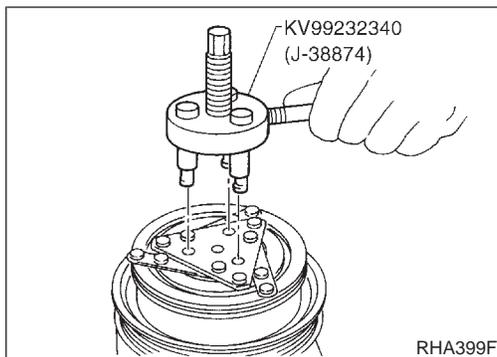
REMOVAL

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

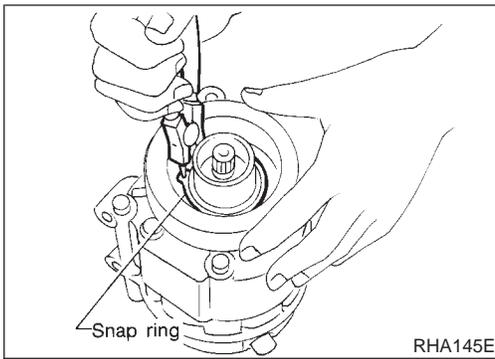
NAHA0232

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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 using a pair of pliers.



- Remove the snap ring using external snap ring pliers.

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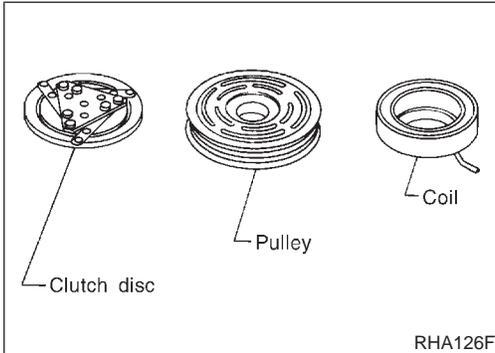
LC

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NAHA0233

NAHA0233S01

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INSPECTION

Clutch Disc

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

Pulley

NAHA0233S02

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

Coil

NAHA0233S03

Check coil for loose connection or cracked insulation.

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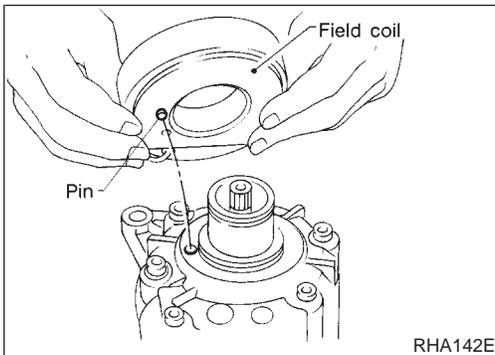
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INSTALLATION

NAHA0234

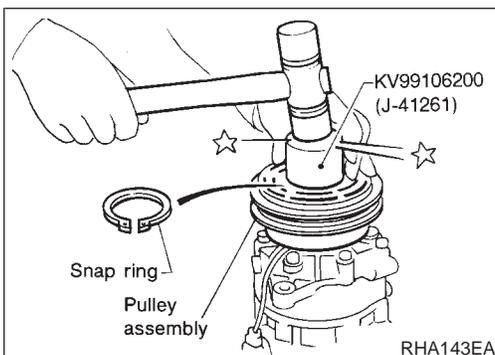
- Install the field coil.
Be sure to align the coil's pin with the hole in the compressor's front head.
- Install the field coil harness clip using a screwdriver.

BR

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

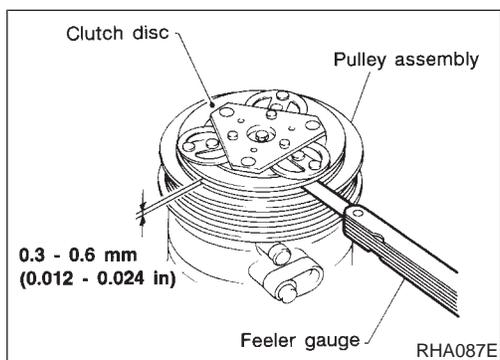
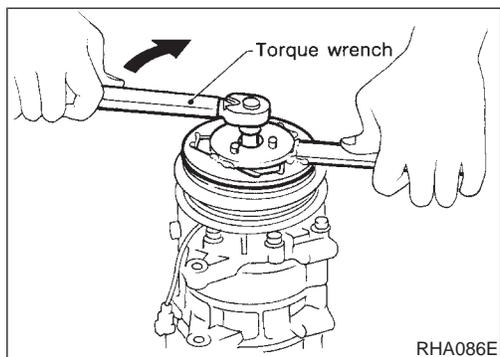
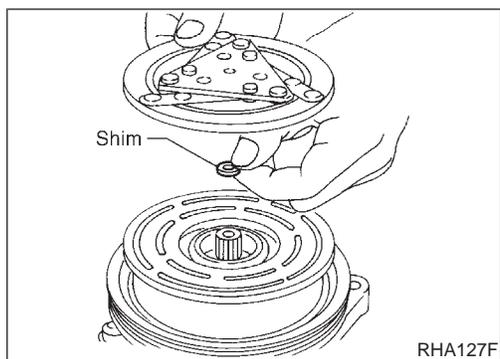
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Compressor Clutch (Cont'd)



- 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

NAHA0234S01

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.

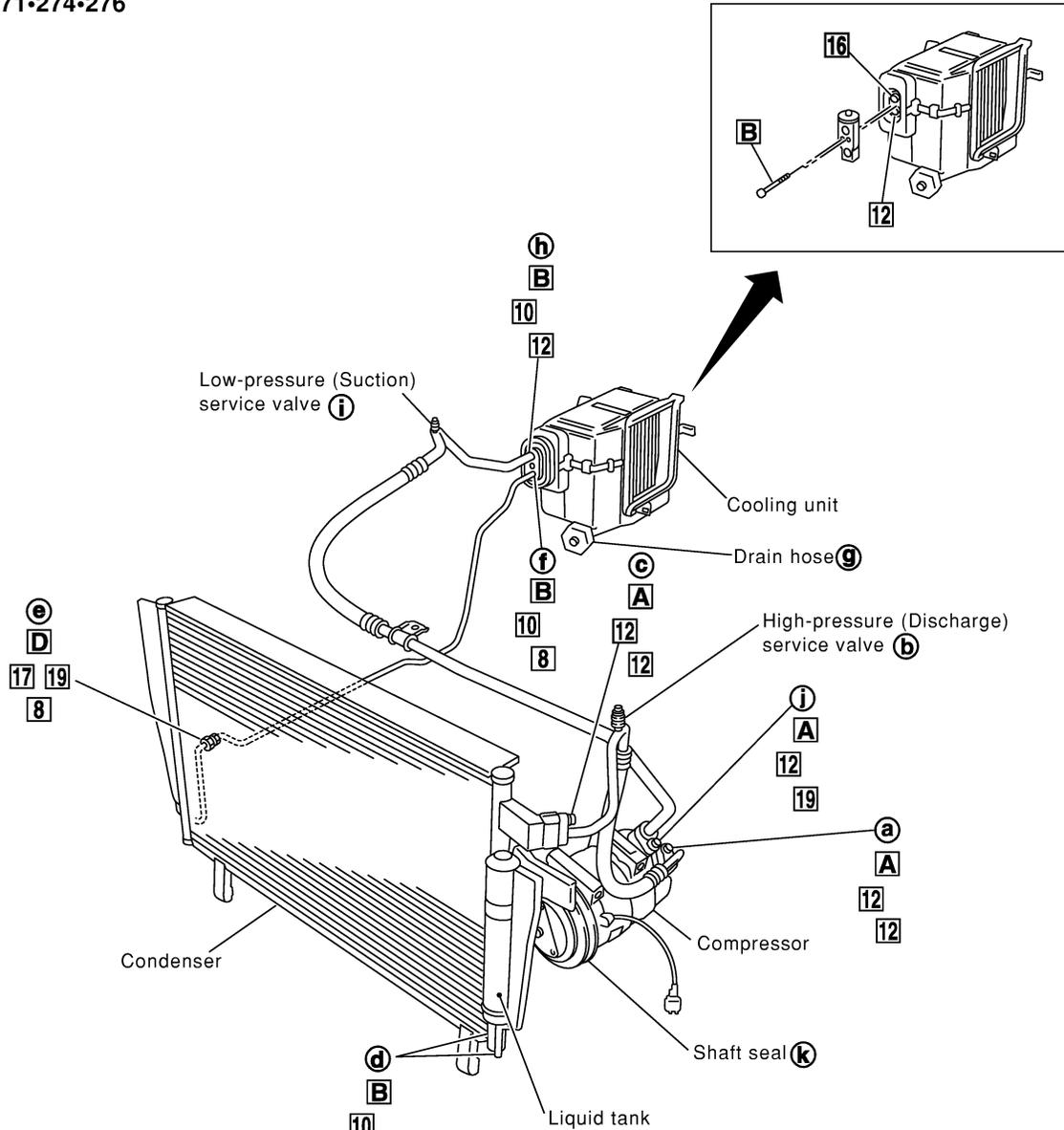
Refrigerant Lines

REMOVAL AND INSTALLATION

=NAHA0235

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

SEC. 271•274•276



- : Refrigerant leak checking order
- : (Tightening torque)
- □ : (Wrench size)
- : (O-ring size)
- Ⓜ : N•m (kg-m, in-lb)
- ⓐ : 8 - 20 (0.8 - 2.0, 69 - 174)
- ⓑ : 3 - 5 (0.3 - 0.5, 26 - 43)
- Ⓝ : N•m (kg-m, ft-lb)
- Ⓞ : 20 - 29 (2 - 3, 14 - 22)
- Ⓟ : 14 - 18 (1.4 - 1.8, 10 - 13)

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RHA0721

Checking for Refrigerant Leaks

=NAHA0236

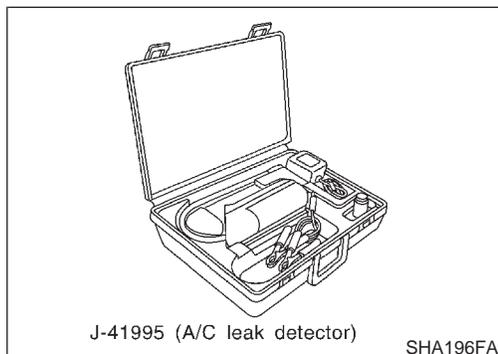
PRELIMINARY CHECK

NAHA0236S04

- Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector or fluorescent dye leak detector.
- If dye is observed, confirm the leak with an electronic refrigerant leak detector. It is possible a prior leak was repaired and not properly cleaned.
- When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
- When searching for refrigerant leaks using an electronic leak detector, move the probe along the suspected leak area at 25 to 50 mm (1 to 2 in) per second and no further than 1/4 inch from the component.

NOTE:

Moving the electronic leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.



J-41995 (A/C leak detector)

SHA196FA

Electronic Refrigerant Leak Detector

NAHA0250

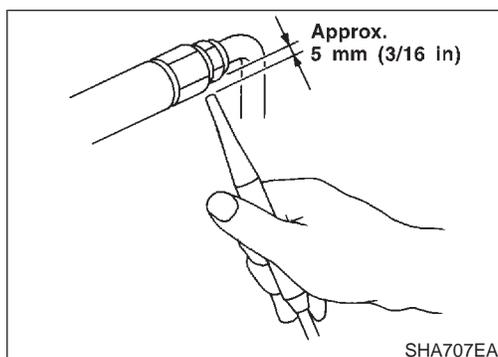
PRECAUTIONS FOR HANDLING LEAK DETECTOR

NAHA0250S01

When performing a refrigerant leak check, use a J-41995 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

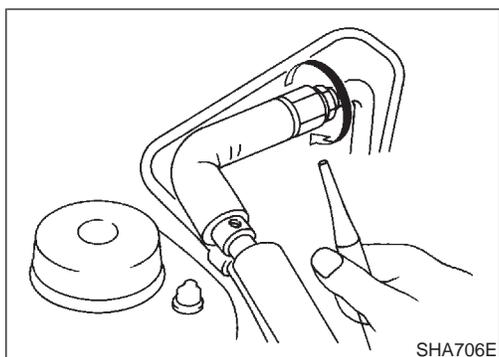
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.

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

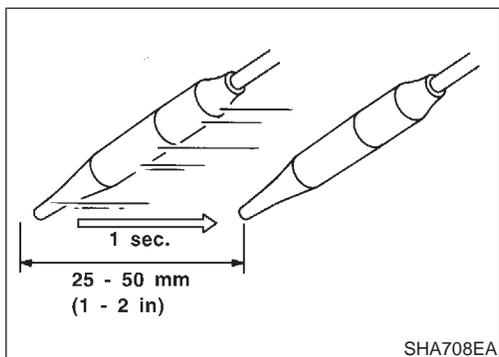


SHA707EA

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



SHA706E



SHA708EA

- When testing, circle each fitting completely with probe.

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

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CHECKING PROCEDURE

NAHA0250S02

To prevent inaccurate or false readings, make sure there is no refrigerant vapor, shop chemicals, or cigarette 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.

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- Turn engine off.
- Connect a suitable A/C manifold gauge set to the A/C service ports.
- Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

AX

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NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm², 50 psi).

BR

- Conduct the leak test from the high side (compressor discharge **a** to evaporator inlet **f**) to the low side (evaporator drain hose **g** to shaft seal **k**). Refer to HA-143. 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.

ST

RS

- **Compressor**
Check the fitting of high and low pressure hoses, relief valve and shaft seal.
- **Liquid tank**
Check the tube fitting.
- **Service valves**
Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

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NOTE:

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

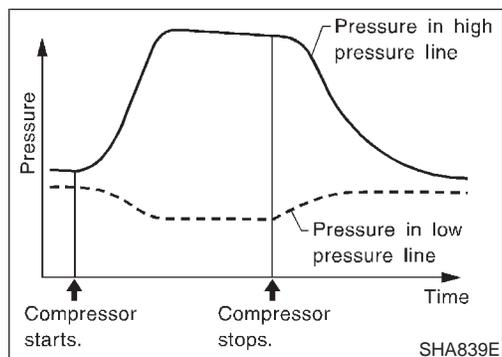
EL

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- **Cooling unit (Evaporator)**

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose. Keep the probe inserted for at least ten seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start engine.
8. Set the A/C control as follows:
 - 1) AUTO switch ON.
 - 2) Ventilation (VENT)
 - 3) Recirculation switch ON
 - 4) Max cold temperature
 - 5) Fan speed high
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again following steps 4 through 6 above.



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

11. Before connecting Recovery/Recycling Recharging equipment to vehicle, check Recovery/Recycling Recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using Recovery/Recycling Recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using Recovery/Recycling Recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery

- equipment. Repair the leaking fitting or component as necessary.
- 15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
- 16. Conduct A/C performance test to ensure system works properly.

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Fluorescent Dye Leak Detector

PRECAUTIONS FOR FLUORESCENT DYE LEAK DETECTION

- The fluorescent dye leak detector is not a replacement for an electronic refrigerant leak detector. The fluorescent dye leak detector should be used in conjunction with an electronic refrigerant leak detector (J-41995) to pinpoint refrigerant leaks.
- For your safety and your customer’s satisfaction, read and follow all manufacturer’s operating instructions and precautions prior to performing the work.
- Refer to “Precautions for Leak Detection Dye”, HA-4.

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CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

1. Check A/C system for leaks using the UV lamp and safety goggles (J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or expansion valve) leak.
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, then check the cloth with the UV lamp for dye residue.
3. Confirm any suspected leaks with an approved electronic refrigerant leak detector.
4. After the leak is repaired, remove any residual dye using dye cleaner (J-43872) to prevent future misdiagnosis.
5. Perform a system performance check and verify the leak repair with an approved electronic refrigerant leak detector.

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DYE INJECTION

(This procedure is only necessary when re-charging the system or when the compressor has seized and was replaced.)
Refer to “Precautions for Leak Detection Dye”, HA-4.

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (J-41459).
3. Connect the injector tool to the A/C LOW-PRESSURE side service fitting.
4. Start engine and switch A/C ON.
5. With the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool J-41459 (refer to the manufacturer’s operating instructions).

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6. With the engine still running, disconnect the injector tool from the service fitting.

CAUTION:

Be careful not to allow dye to spray or drip when disconnecting the injector from the system.

NOTE:

If repairing the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.

Belt

TENSION ADJUSTMENT

- Refer to MA-14, "Checking Drive Belts".

NAHA0237

Auto

COMPRESSOR

NAHA0241

Model		Calsonic Kansei make V-6
Type		V-6 variable displacement
Displacement cm ³ (cu in)/rev.	Max.	184 (11.228)
	Min.	14.5 (0.885)
Cylinder bore x stroke mm (in)		37 (1.46) x [2.3 - 28.6 (0.091 - 1.126)]
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

LUBRICANT

NAHA0242

Model		Calsonic Kansei make V-6
Name		Nissan A/C System Oil Type S
Part number*		KLH00-PAGSO
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	180 (6.1, 6.3)
	Compressor (Service part) charging amount	180 (6.1, 6.3)

*: Always check with the Parts Department for the latest parts information.

REFRIGERANT

NAHA0243

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 (0.99)

ENGINE IDLING SPEED (WHEN A/C IS ON)

NAHA0244

- Refer to EC-758, "Idle Speed and Ignition Timing".

BELT TENSION

NAHA0245

- Refer to MA-14, "Checking Drive Belts".

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

NAHA0060

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 composition which is available to NISSAN MODEL R50 is as follows:

- For a frontal collision
The Supplemental Restraint System consists of driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger 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 side air bag module (located in the outer side of front seat), side curtain air bag module (located in the headlining side of front and rear 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).

WARNING:

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

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

NAHA0061

WARNING:

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor malfunction is likely to occur, refer to "CONTAMINATED REFRIGERANT" below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely 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 HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment, or J2209 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.
 - e) Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

CONTAMINATED REFRIGERANT

NAHA0061S01

If a refrigerant other than pure HFC-134a (R-134a) is identified in a vehicle, your options are:

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.

- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred. GI
- If you choose to perform the repair, recover the refrigerant using only **dedicated equipment and containers. Do not recover contaminated refrigerant into your existing service equipment.** If your facility does not have dedicated recovery equipment, you may contact a local refrigerant product retailer for available service. This refrigerant must be disposed of in accordance with all federal and local regulations. In addition, replacement of all refrigerant system components on the vehicle is recommended. MA
- If the vehicle is within the warranty period, the air conditioner warranty is void. Please contact Nissan Customer Affairs for further assistance. EM

General Refrigerant Precautions

NAHA0062

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.** EC
- **Always wear eye and hand protection (goggles and gloves) when working with any refrigerant or air conditioning system.** FE
- **Do not store or heat refrigerant containers above 52°C (125°F).** CL
- **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.** CL
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.** MT
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.** MT
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.** AT
- **Do not pressure test or leak test HFC-134a (R-134a) service equipment and/or vehicle air conditioning systems with compressed air during repair. Some mixtures of air and HFC-134a (R-134a) have been shown to be combustible at elevated pressures. These mixtures, if ignited, may cause injury or property damage. Additional health and safety information may be obtained from refrigerant manufacturers.** TF

Precautions for Leak Detection Dye

NAHA0251

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks. AX
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye. SU
- A compressor shaft seal should not be repaired because of dye seepage. The compressor shaft seal should only be repaired after confirming the leak with an electronic refrigerant leak detector (J-41995). SU
- Always remove any dye from the leak area after repairs are complete to avoid a misdiagnosis during a future service. BR
- Do not allow dye to come into contact with painted body panels or interior components. If dye is spilled, clean immediately with the approved dye cleaner. Fluorescent dye left on a surface for an extended period of time cannot be removed. ST
- Do not spray the fluorescent dye cleaning agent on hot surfaces (engine exhaust manifold, etc.). RS
- Do not use more than one refrigerant dye bottle (1/4 ounce / 7.4 cc) per A/C system. RS
- Leak detection dyes for HFC-134a (R-134a) and CFC-12 (R-12) A/C systems are different. Do not use HFC-134a (R-134a) leak detection dye in CFC-12 (R-12) A/C system or CFC-12 (R-12) leak detection dye in HFC-134a (R-134a) A/C systems or A/C system damage may result. BT
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor malfunction occurs. HA

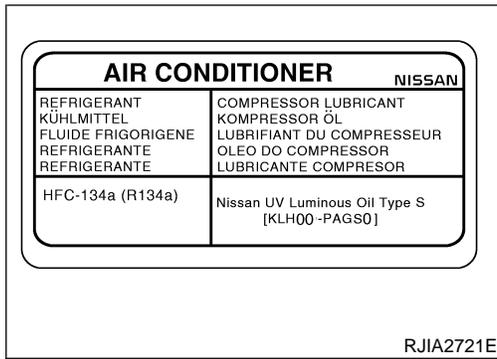
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Precaution for Identification Label on Vehicle



Precaution for Identification Label on Vehicle

NAHA0252

- Vehicles with factory installed fluorescent dye have this identification label on the under side of hood.
- Vehicles with factory installed fluorescent dye have a green label.
- Vehicles without factory installed fluorescent dye have a blue label.

Precautions for Refrigerant Connection

NAHA0063

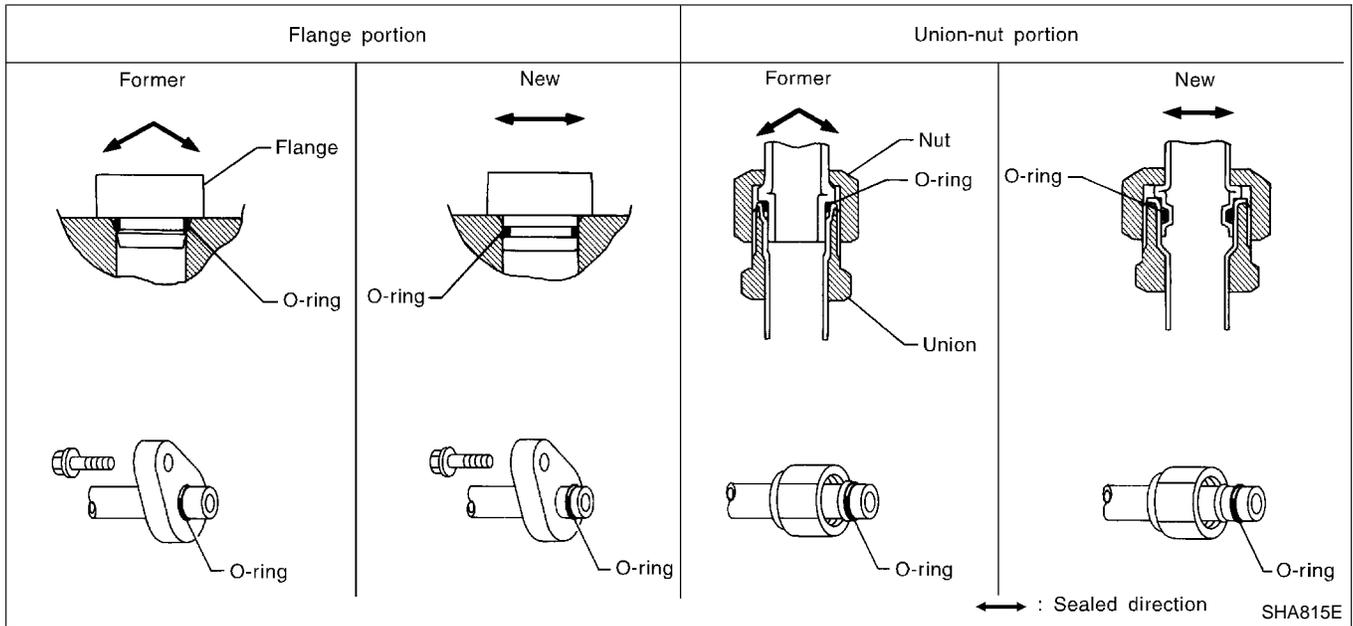
A new type refrigerant connection has been introduced to all refrigerant lines except the following portion.

- Expansion valve to evaporator

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

NAHA0063S01

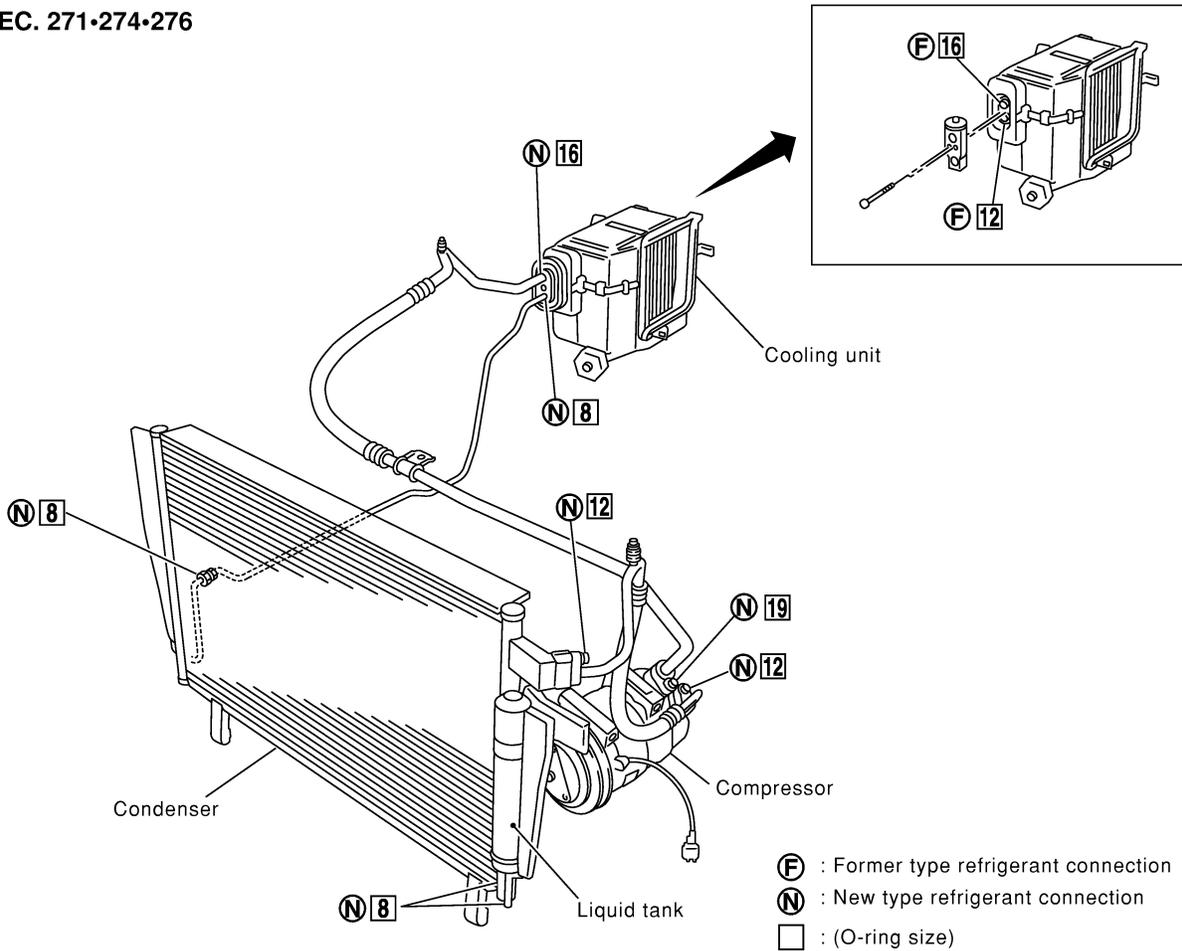
- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part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



O-RING AND REFRIGERANT CONNECTION

NAHA0063S02

SEC. 271•274•276



RHA068I

CAUTION:

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

O-Ring Part Numbers and Specifications

NAHA0063S0201

	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	92472 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 (0.0906)
	New	19	92474 N8210	16.5 (0.650)	2.43 (0.0957)
	Former		92477 N8200	17.12 (0.6740)	1.78 (0.0701)

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.

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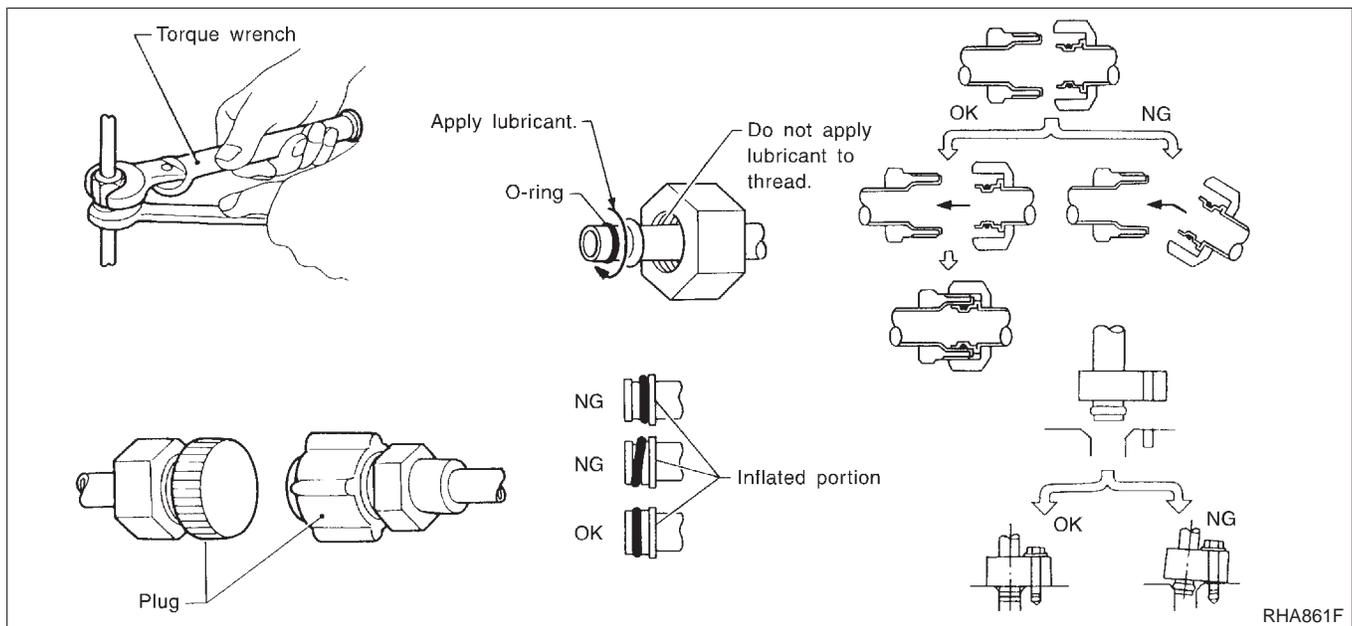
CAUTION:

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

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

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

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



Precautions for Servicing Compressor

NAHA0064

- 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-217.
- 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.

Precautions for Service Equipment

RECOVERY/RECYCLING EQUIPMENT

NAHA0065

NAHA0065S01

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

NAHA0065S02

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

VACUUM PUMP

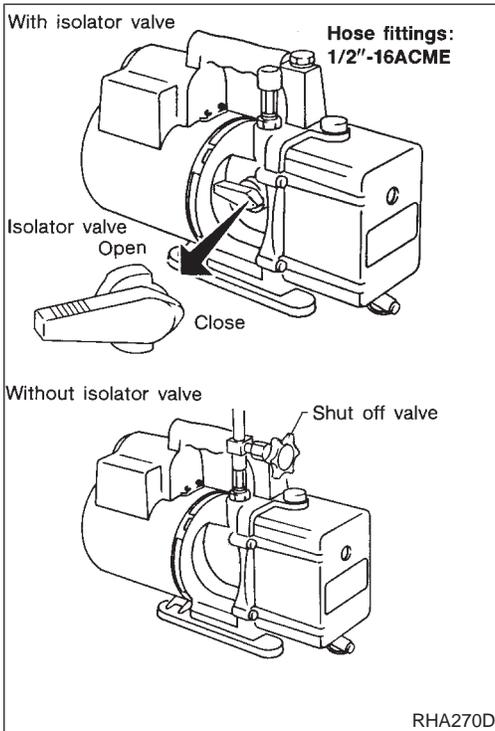
NAHA0065S03

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 situated near the hose-to-pump connection, as follows.

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

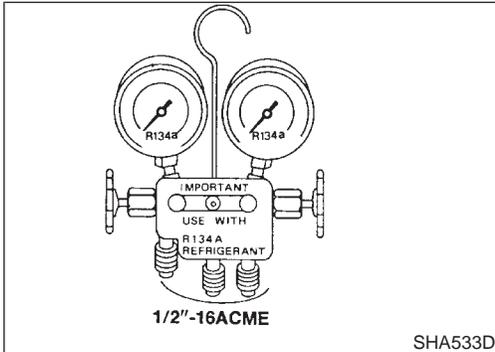
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



MANIFOLD GAUGE SET

NAHA0065S04

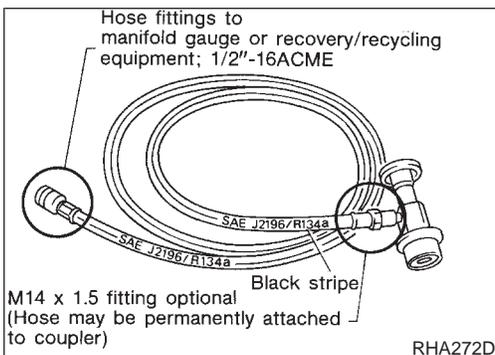
Be certain that the gauge face indicates HFC-134a or R-134a. Make sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified lubricant.



SERVICE HOSES

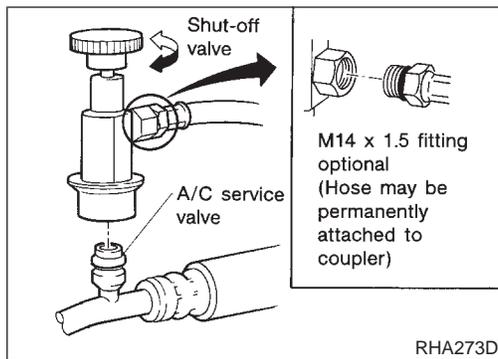
NAHA0065S05

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



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Precautions for Service Equipment (Cont'd)

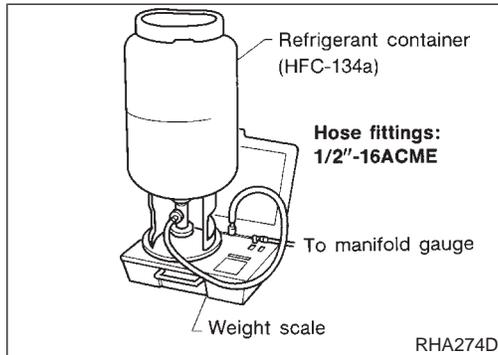


SERVICE COUPLERS

NAHA0065S06

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

NAHA0065S07

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" ACME.

CHARGING CYLINDER

NAHA0065S08

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.

Wiring Diagrams and Trouble Diagnoses

NAHA0066

When you read wiring diagrams, refer to the following:

- GI-11, "HOW TO READ WIRING DIAGRAMS"
- EL-12, "Wiring Diagram — POWER —"

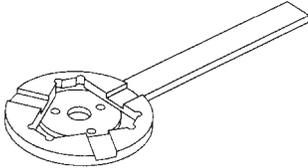
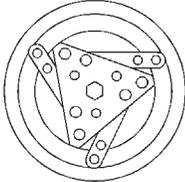
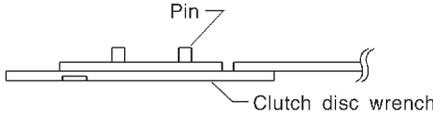
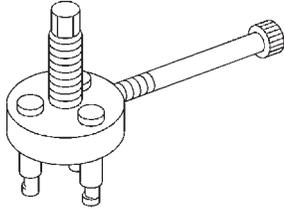
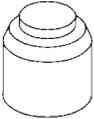
When you perform trouble diagnoses, refer to the following:

- GI-34, "HOW TO FOLLOW TROUBLE DIAGNOSES"
- GI-24, "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT"

Special Service Tools

NAHA0067

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

Tool number (Kent-Moore No.) Tool name	Description	
KV99106100 (J-41260) Clutch disc wrench	 <p>NT232</p>  <p>When replacing the magnet clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.</p>  <p>NT378</p>	GI MA EM LC EC FE CL MT AT TF PD
KV99232340 (J-38874) or KV992T0001 (—) Clutch disc puller	 <p>NT376</p>	AX SU BR
KV99106200 (J-41261) Pulley installer	 <p>NT235</p>	ST RS

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

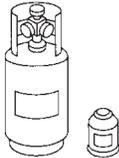
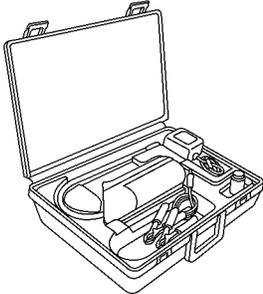
=NAHA0068

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

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

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

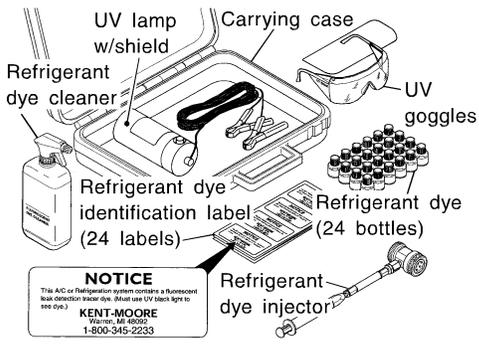
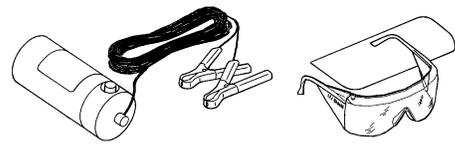
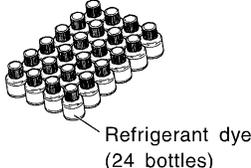
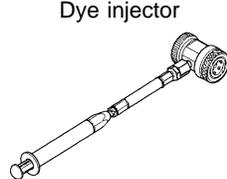
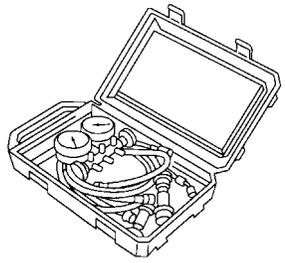
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number (Kent-Moore No.) Tool name	Description
HFC-134a (R-134a) refrigerant	 <p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size</p> <ul style="list-style-type: none"> ● Large container 1/2"-16 ACME <p>NT196</p>
KLH00-PAGS0 (—) Nissan A/C System Oil Type S	 <p>Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) wobble (swash) plate (piston) compressors (Nissan only) Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)</p> <p>NT197</p>
(J-43600) Recovery/Recycling Recharging equipment (ACR2000)	 <p>Function: Refrigerant Recovery and Recycling and Recharging</p> <p>WJIA0293E</p>
(J-41995) Electrical leak detector	 <p>Power supply:</p> <ul style="list-style-type: none"> ● DC 12V (Cigarette lighter) <p>AHA281A</p>

PREPARATION

MANUAL

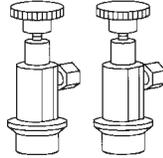
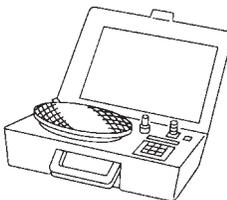
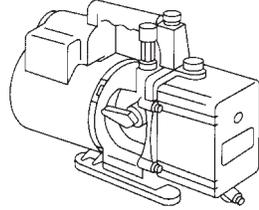
HFC-134a (R-134a) Service Tools and Equipment (Cont'd)

Tool number (Kent-Moore No.) Tool name	Description		
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) Refrigerant dye injector (J-41447) qty. 24 R-134a refrigerant dye (J-43872) Refrigerant dye cleaner	 <p>NOTICE This A/C or Refrigeration system contains a fluorescent leak detection tracer dye. Must use UV light (light to see dye.) KENT-MOORE Waukegan, IL 60087 1-800-345-2233</p>	Power supply: DC 12V (Battery terminal)	GI MA EM LC EC FE
(J-42220) UV lamp and UV safety goggles		Power supply: DC12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system. Includes: UV lamp and UV safety goggles	CL MT
(J-41447) R134a Fluorescent Leak Detection Dye (Box of 24, 1/4 ounce bottles)	 <p>Refrigerant dye (24 bottles)</p>	Application: For R-134a PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)	AT TF PD
(J-41459) R134a Dye Injector Use with J-41447, 1/4 ounce bottle	 <p>Dye injector</p>	For injecting 1/4 ounce of Fluorescent Leak Detection Dye into A/C system.	AX SU BR
(J-43872) Dye cleaner		For cleaning dye spills.	ST RS
(J-39183) Manifold gauge set (with hoses and couplers)		Identification: ● The gauge face indicates R-134a. Fitting size: Thread size ● 1/2"-16 ACME	BT HA SC EL

PREPARATION

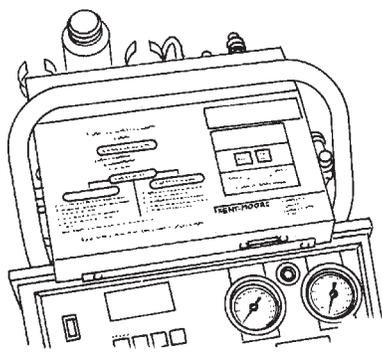
MANUAL

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

Tool number (Kent-Moore No.) Tool name	Description	
Service hoses <ul style="list-style-type: none"> ● High-pressure side hose (J-39501-72) ● Low-pressure side hose (J-39502-72) ● Utility hose (J-39476-72) 		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-pressure side coupler (J-39500-20) ● Low-pressure side coupler (J-39500-24) 		Hose fitting to service hose: <ul style="list-style-type: none"> ● M14 x 1.5 fitting is optional or permanently attached.
(J-39650) Refrigerant weight scale		For measuring of refrigerant Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME
(J-39649) Vacuum pump (Including the isolator valve)		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

COMMERCIAL SERVICE TOOL

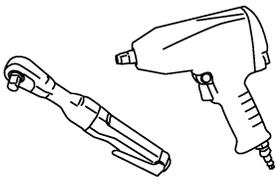
NAHA0068S01

Tool name	Description	
Refrigerant identifier equipment		For checking refrigerant purity and for system contamination

PREPARATION

MANUAL

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

Tool name	Description
Power tool	 <p data-bbox="950 205 1209 235">Loosening bolts and nuts</p> <p data-bbox="418 436 516 466">PBIC0190E</p>

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Refrigeration System

REFRIGERATION CYCLE

Refrigerant Flow

The refrigerant flows in the standard pattern, that is, through the compressor, the condenser, the liquid tank, through the evaporator, and back to the compressor. The refrigerant evaporation through the evaporator coil is controlled by an externally equalized expansion valve, located inside the evaporator case.

NAHA0069

NAHA0069S01

Freeze Protection

Under usual operating conditions, when the A/C is switched on, the compressor runs continuously, and the evaporator pressure, and therefore temperature, is controlled by the V-6 variable displacement compressor to prevent freeze up.

NAHA0069S02

Refrigerant System Protection

Refrigerant Pressure Sensor

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm², 398 psi) or below about 177 kPa (1.8 kg/cm², 26 psi).

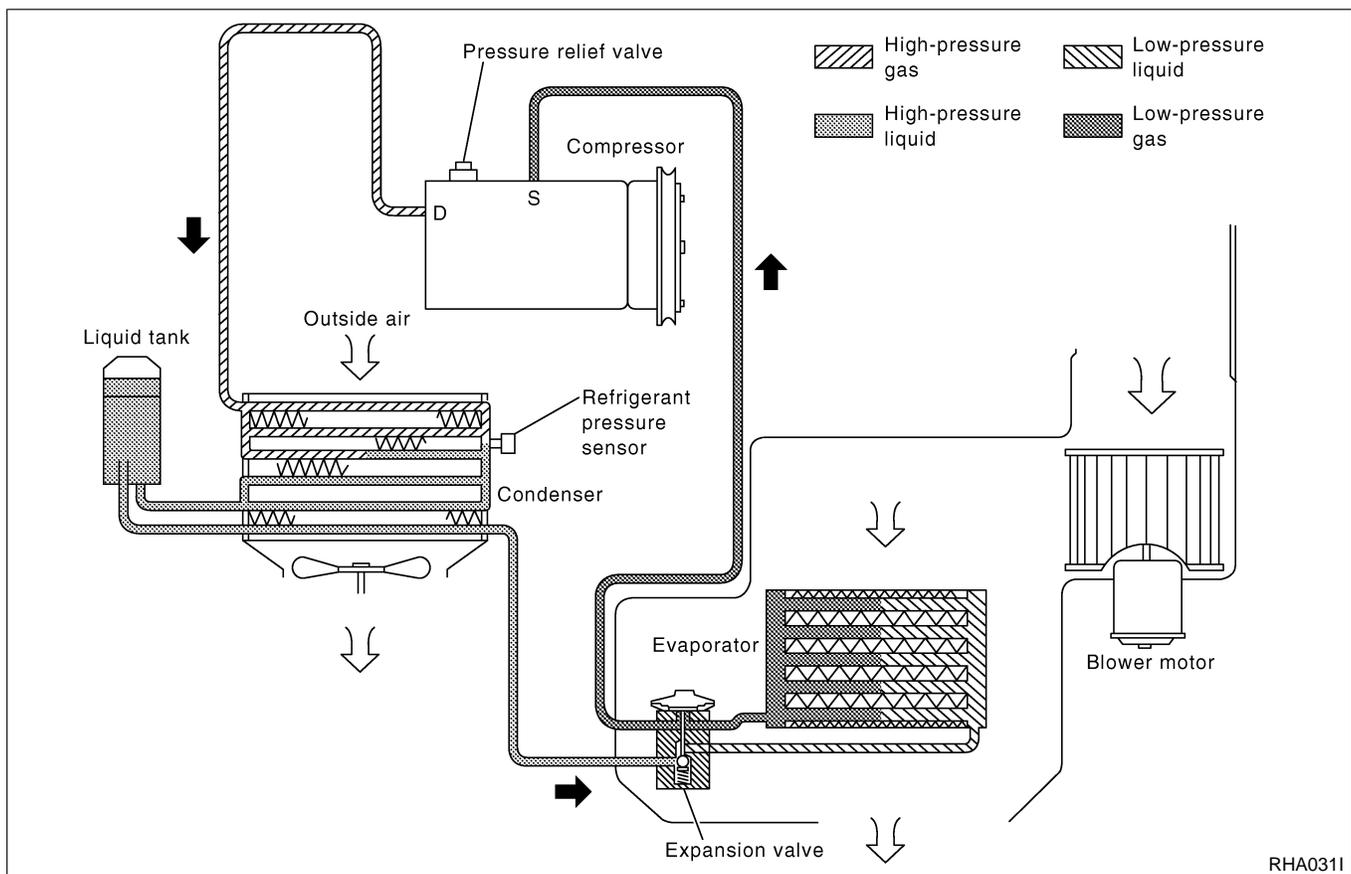
NAHA0069S03

NAHA0069S0301

Pressure Relief Valve

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 unusual 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.

NAHA0069S0302



V-6 Variable Displacement Compressor

GENERAL INFORMATION

1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:
 - evaporator intake air temperature is less than 20°C (68°F)
 - engine is running at speeds less than 1,500 rpm.

This is because the V-6 compressor provides a means of “capacity” control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. 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 V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm², 21 to 26 psi) under varying conditions. In previous compressors, however, suction pressure was reduced with increases in engine speed.

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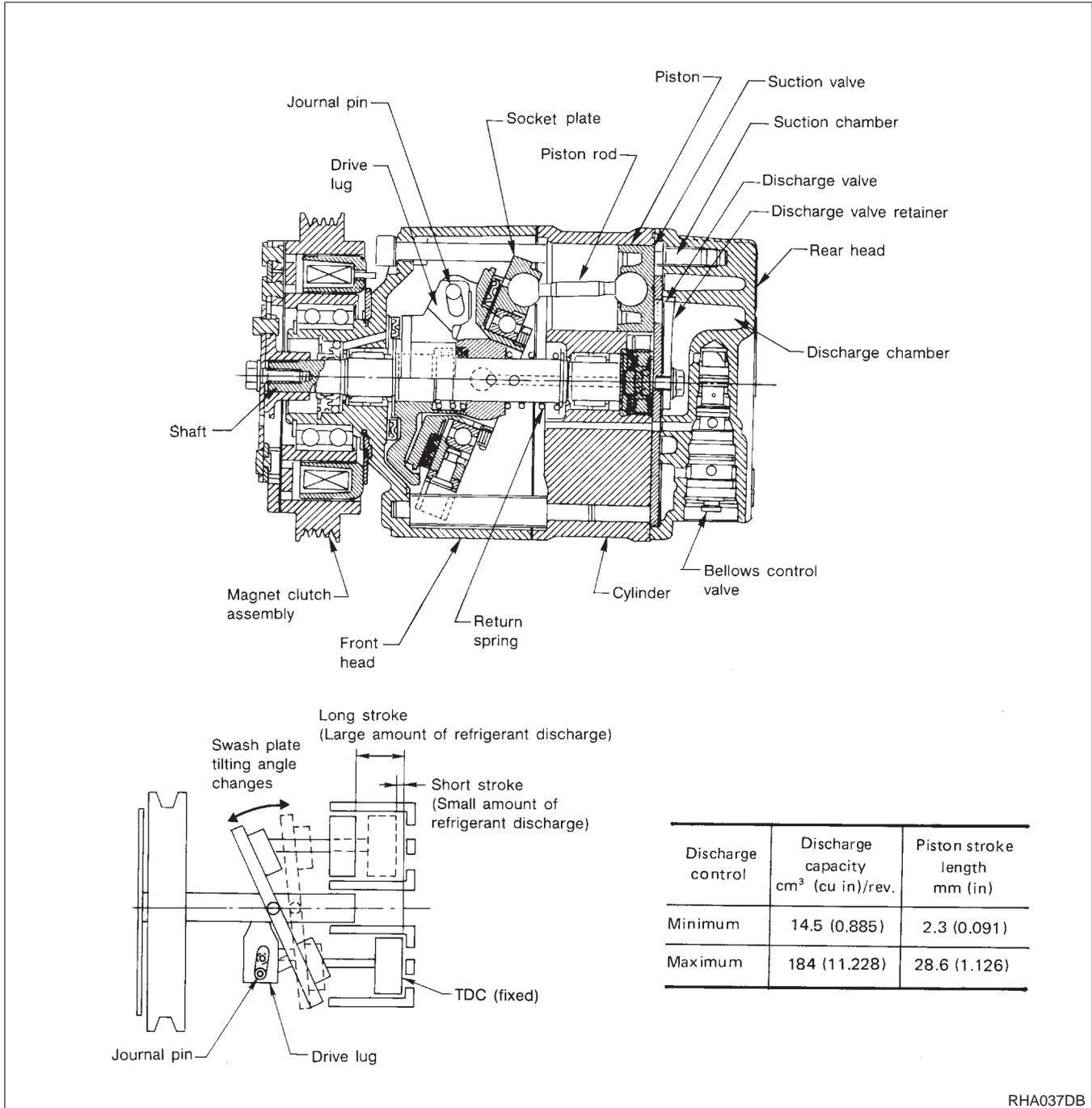
NAHA0132S01

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 wobble (swash) plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 14.5 to 184 cm³ (0.885 to 11.228 cu in).



RHA037DB

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 wobble (swash) plate is controlled between the crankcase's internal pressure and the piston cylinder pressure.

2. Maximum Cooling

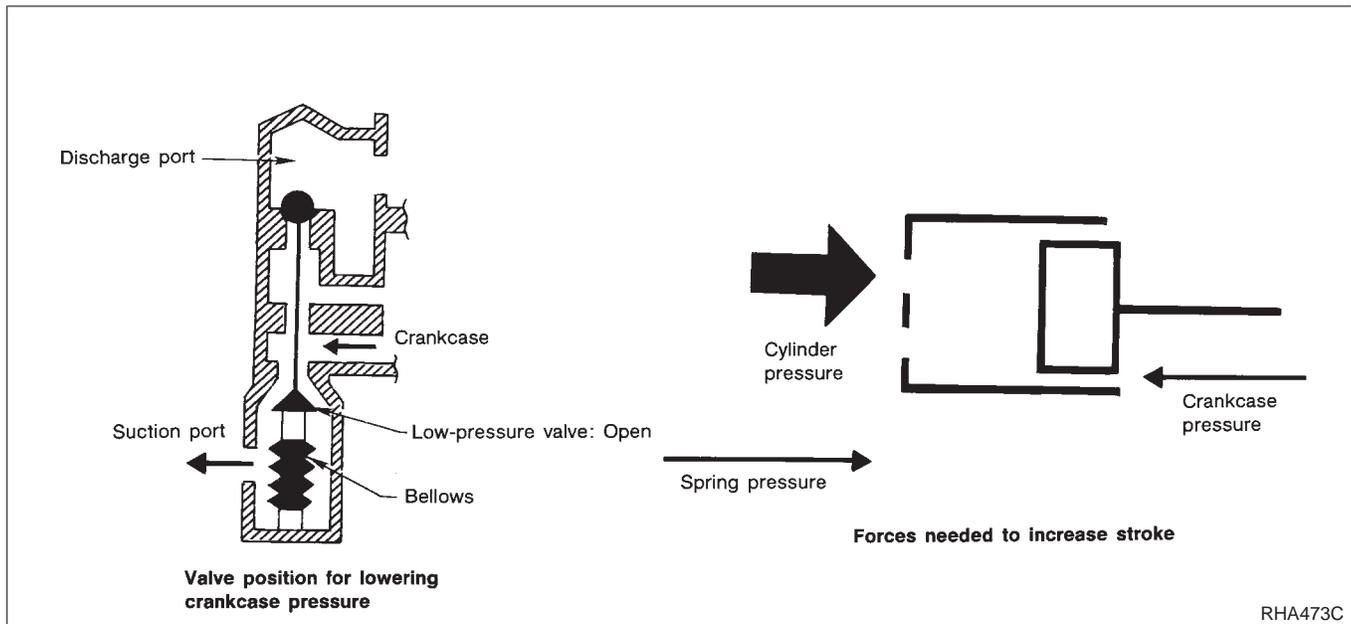
Refrigerant pressure on the low-pressure side increases with an increase in heat loads.

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:

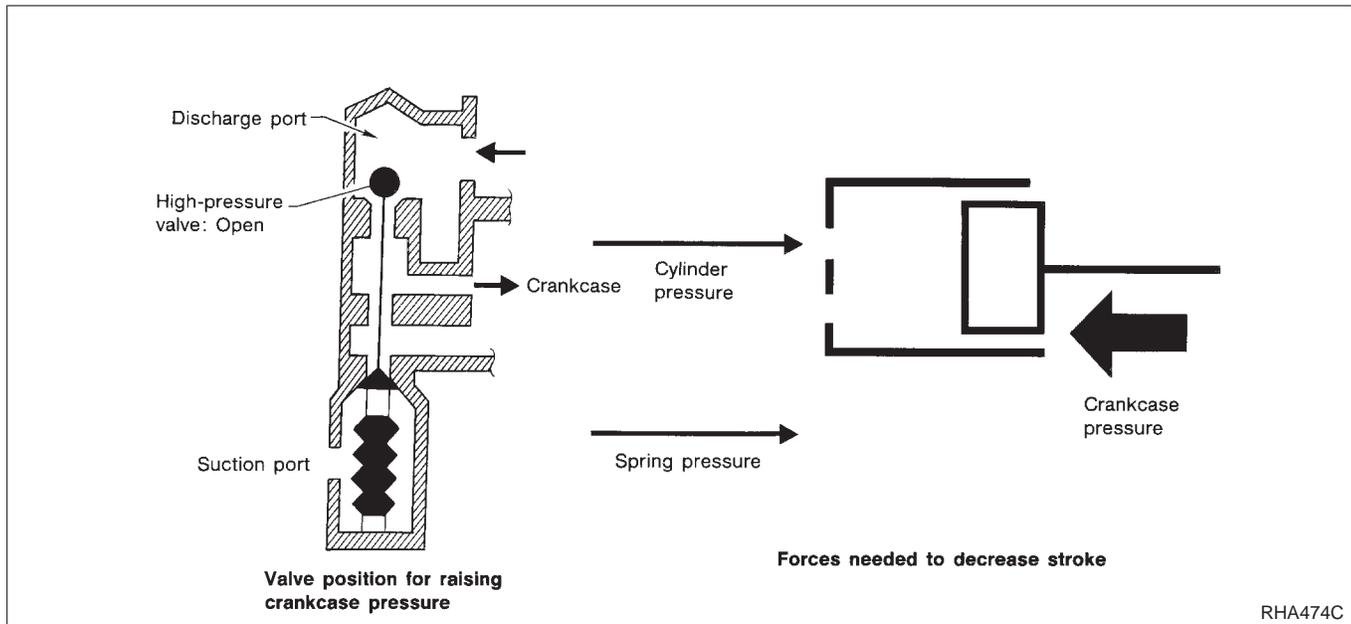
- the crankcase's internal pressure to equal the pressure on the low-pressure side;
- the cylinder's internal pressure to be greater than the crankcase's internal pressure.

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



3. Capacity Control

- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
- The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.8 kg/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 wobble (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 wobble (swash) plate.

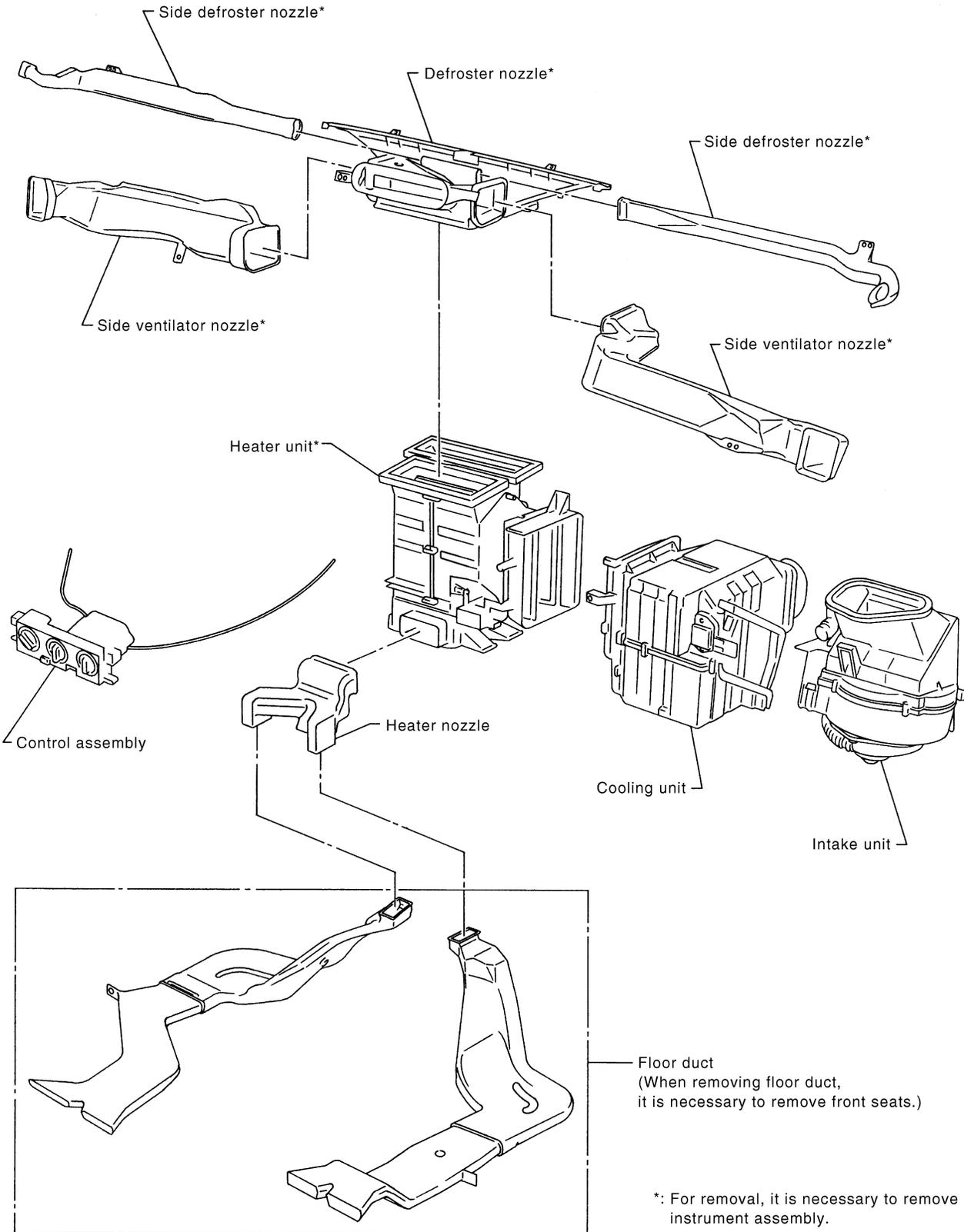


Component Layout

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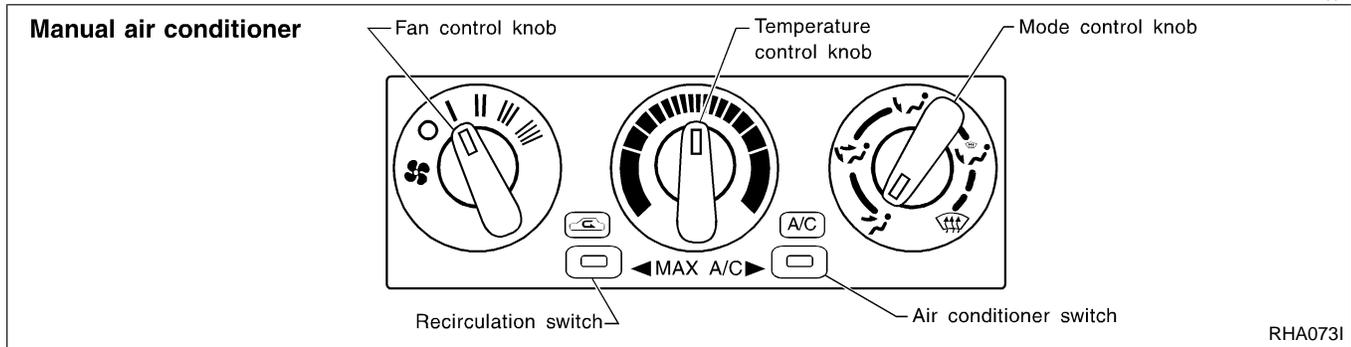


*: For removal, it is necessary to remove instrument assembly.

SHA926F

Control Operation

NAHA0072

**FAN CONTROL KNOB**

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

NAHA0072S01

MODE CONTROL KNOB

This knob controls the outlet air flow.

In "DEF" or "D/F" mode, the intake door is set to "FRESH".

NAHA0072S02

TEMPERATURE CONTROL KNOB

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

NAHA0072S03

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.

NAHA0072S04

AIR CONDITIONER SWITCH

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

NAHA0072S05

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

MAX A/C POSITION

The A/C system operates at maximum performance when the REC switch and A/C switch are both ON.

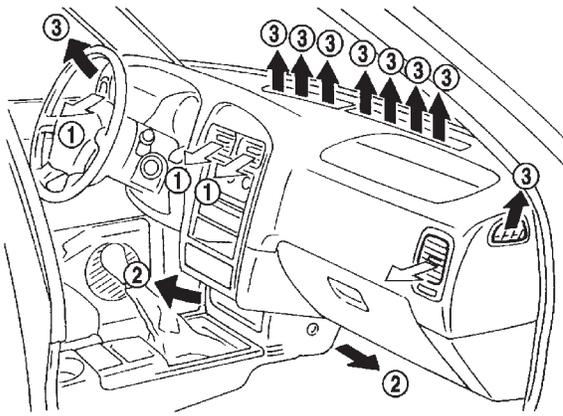
NAHA0072S06

Discharge Air Flow

NAHA0073

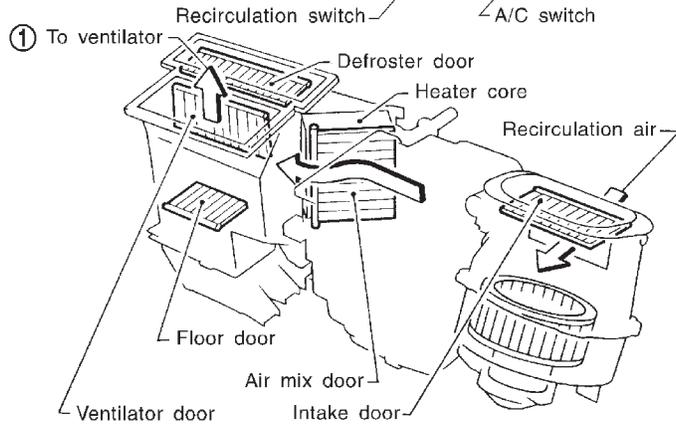
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IDX

① : Ventilation ③ : Defroster ② : Foot

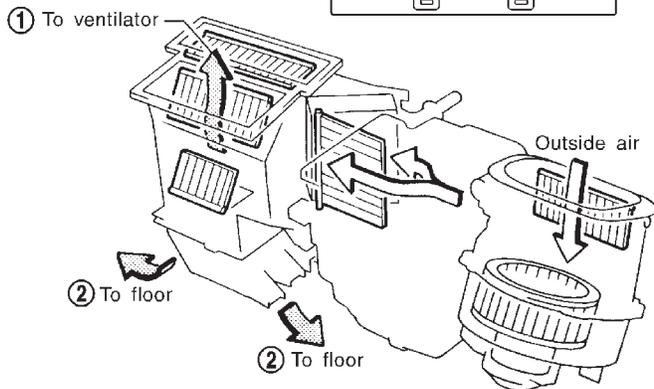


Ventilation
(switch "ON")

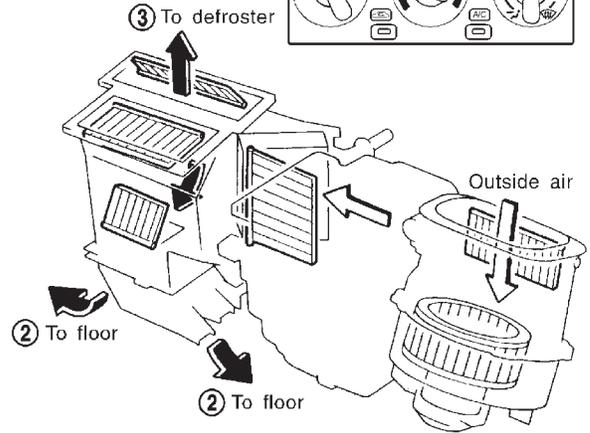
Fan control knob Temperature control knob Mode control knob



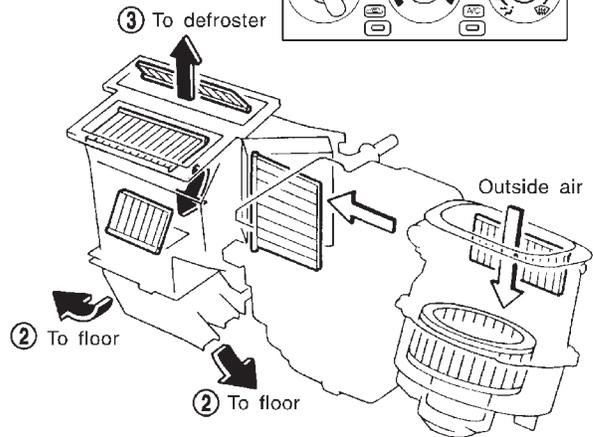
Bi-level
(switch "OFF")



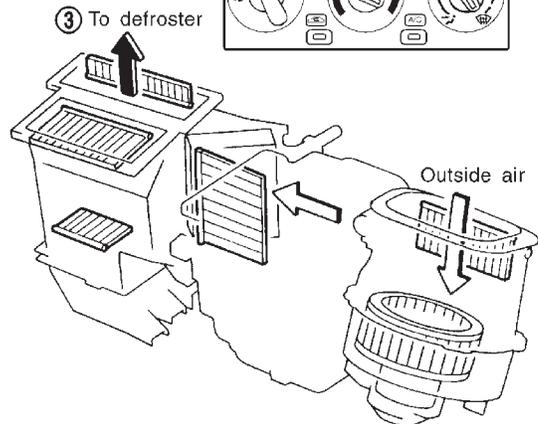
Floor



Floor and defroster



Defroster



➡ : Air passed through heater core

➡➡ : Mixed air (➡ + ➡)

➡ : Air not passed through heater core

SHA963E

System Description
SWITCHES AND THEIR CONTROL FUNCTIONS

NAHA0074

NAHA0074S01

Knob/Switch	Knob/Switch position							Air outlet	Intake air	Compressor
	A/C									
A/C	○							—	—	ON*1
Mode			○					VENT	—	—
				○				B/L	—	—
					○			FOOT	—	—
						○		D/F	FRE	—
							○	DEF	FRE	—
							○	—	REC*2	—

*1: Compressor is operated by ECM.

*2: In DEF and D/F modes, REC switch is canceled.

Component Location

ENGINE COMPARTMENT

NAHA0085

NAHA0085S01

GI

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LC

EC

FE

CL

MT

AT

TF

PD

AX

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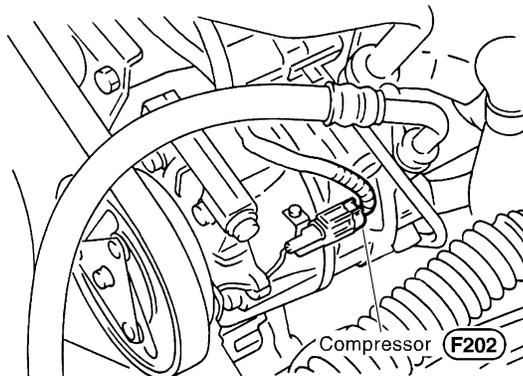
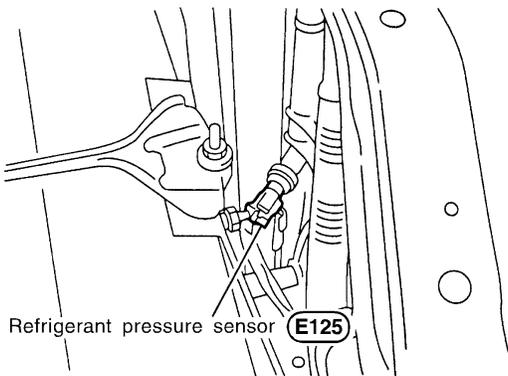
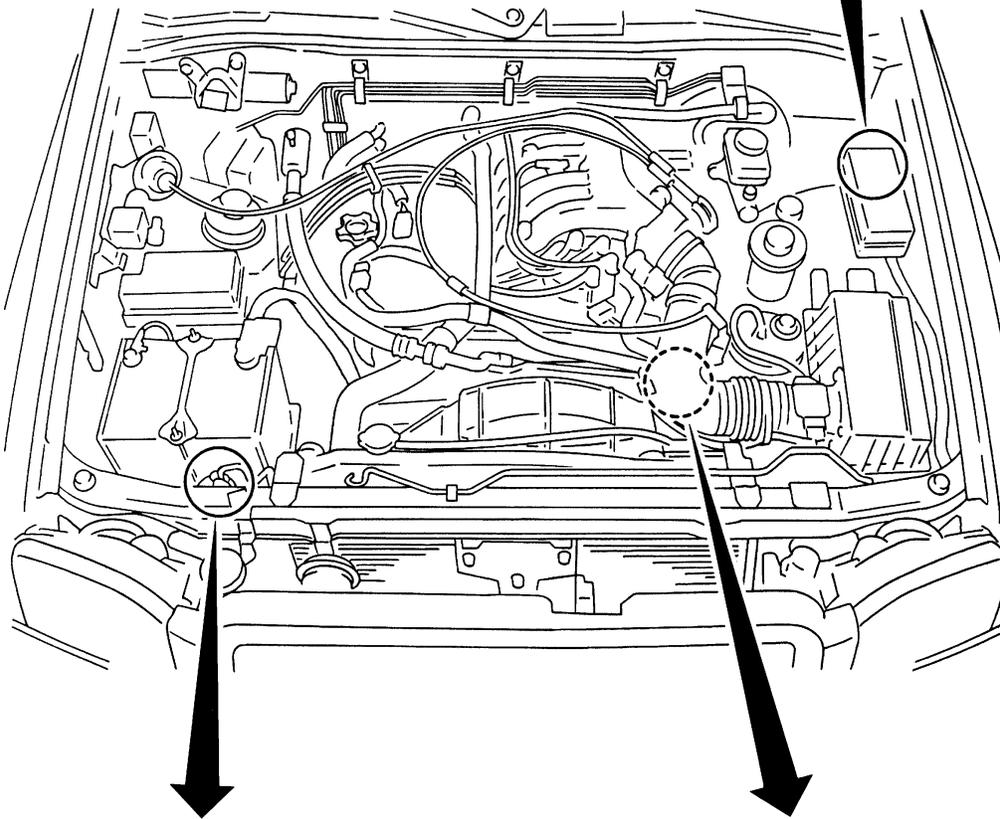
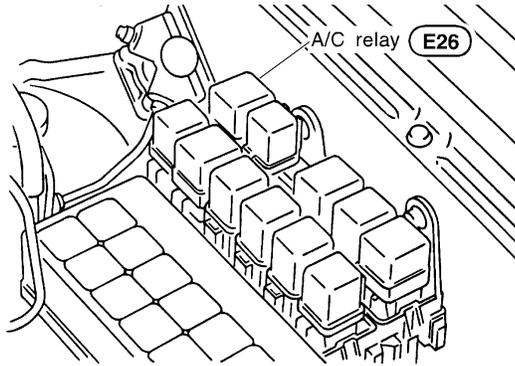
BT

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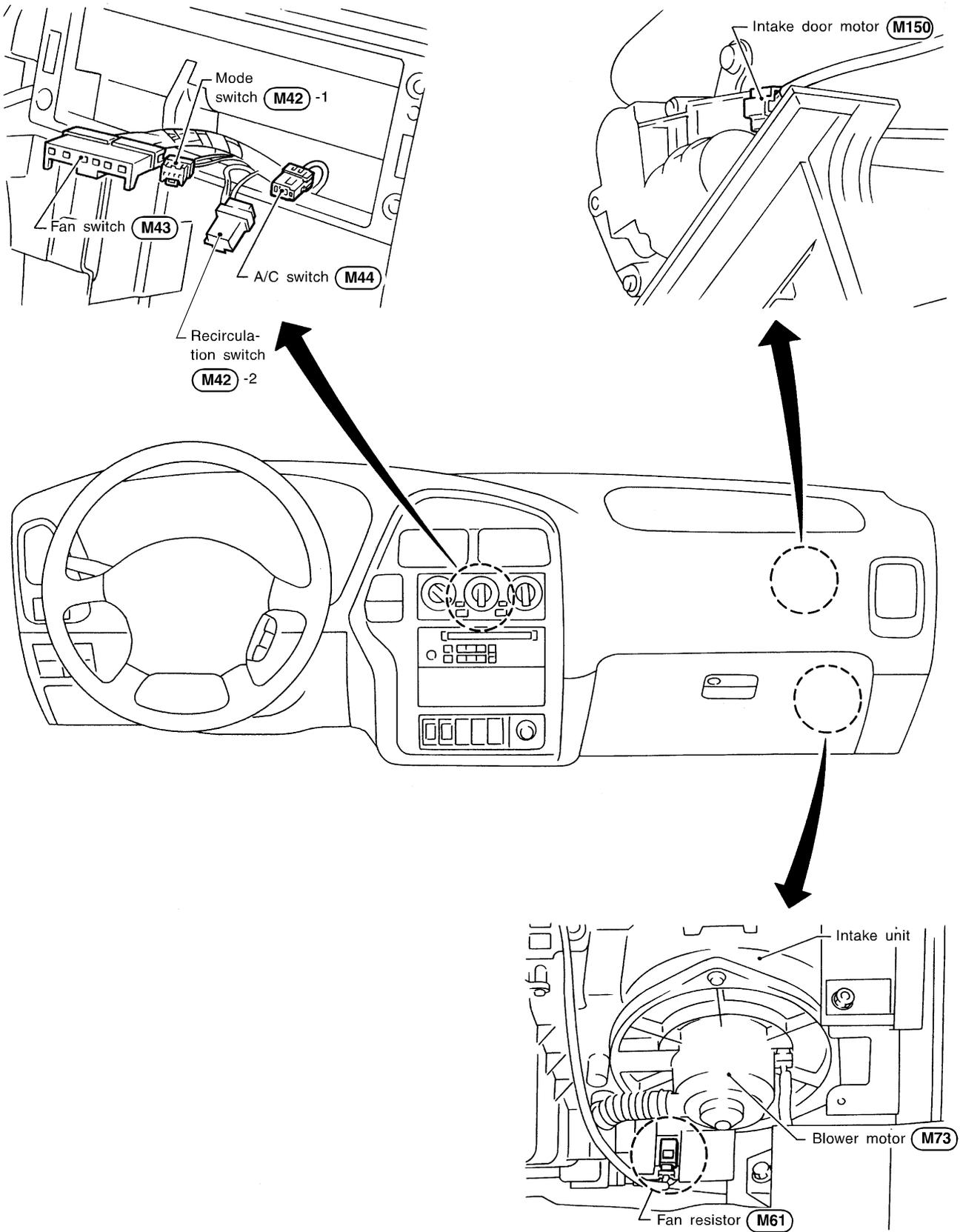
IDX



RHA0741

PASSENGER COMPARTMENT

NAHA0085S02

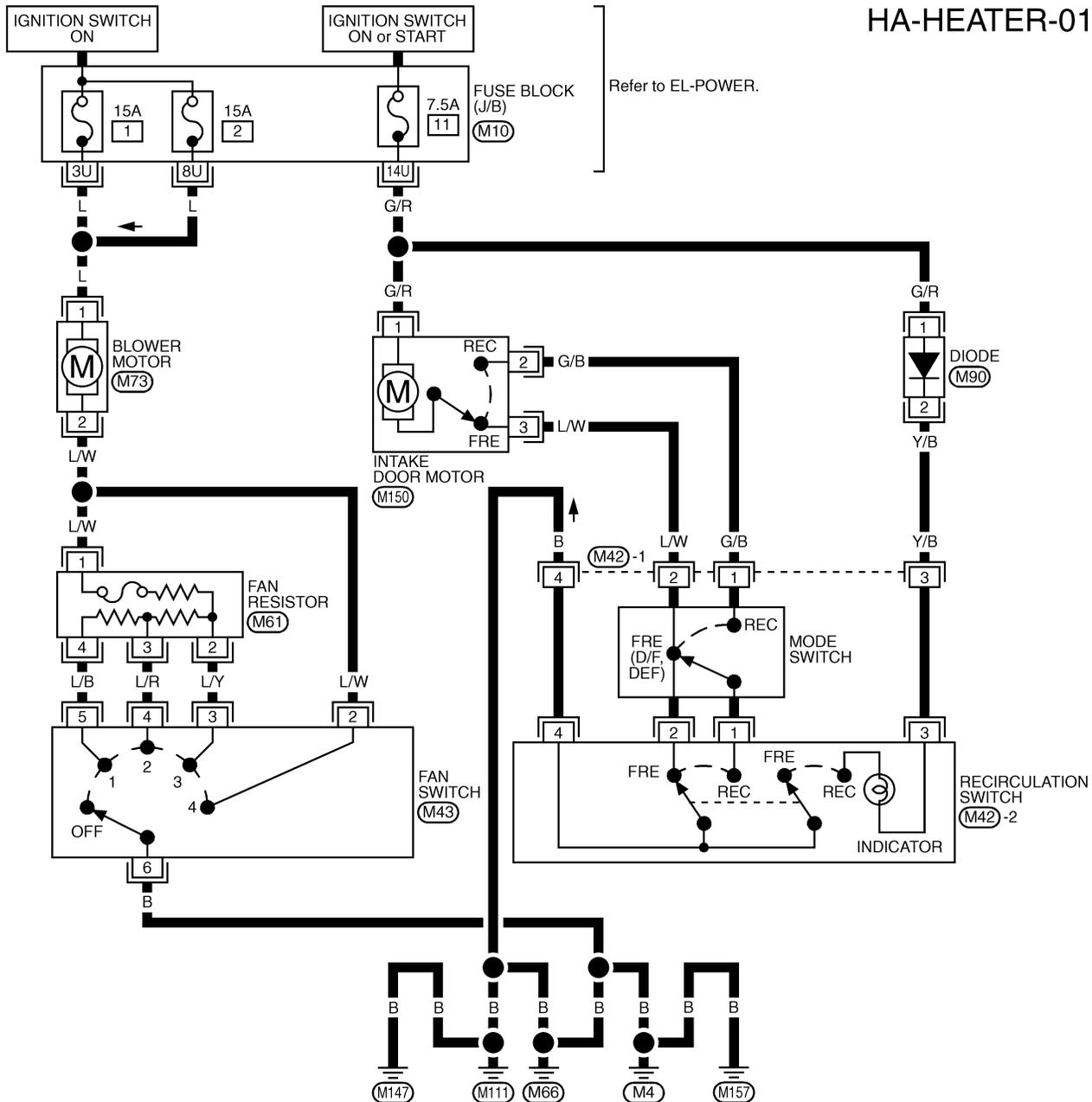


RHA2041

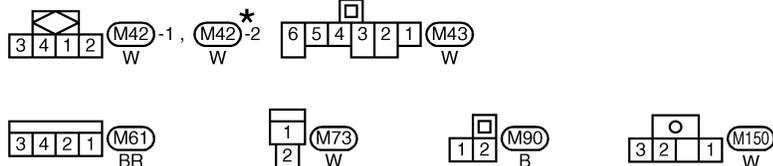
Wiring Diagram — HEATER —

NAHA0086

HA-HEATER-01



GI
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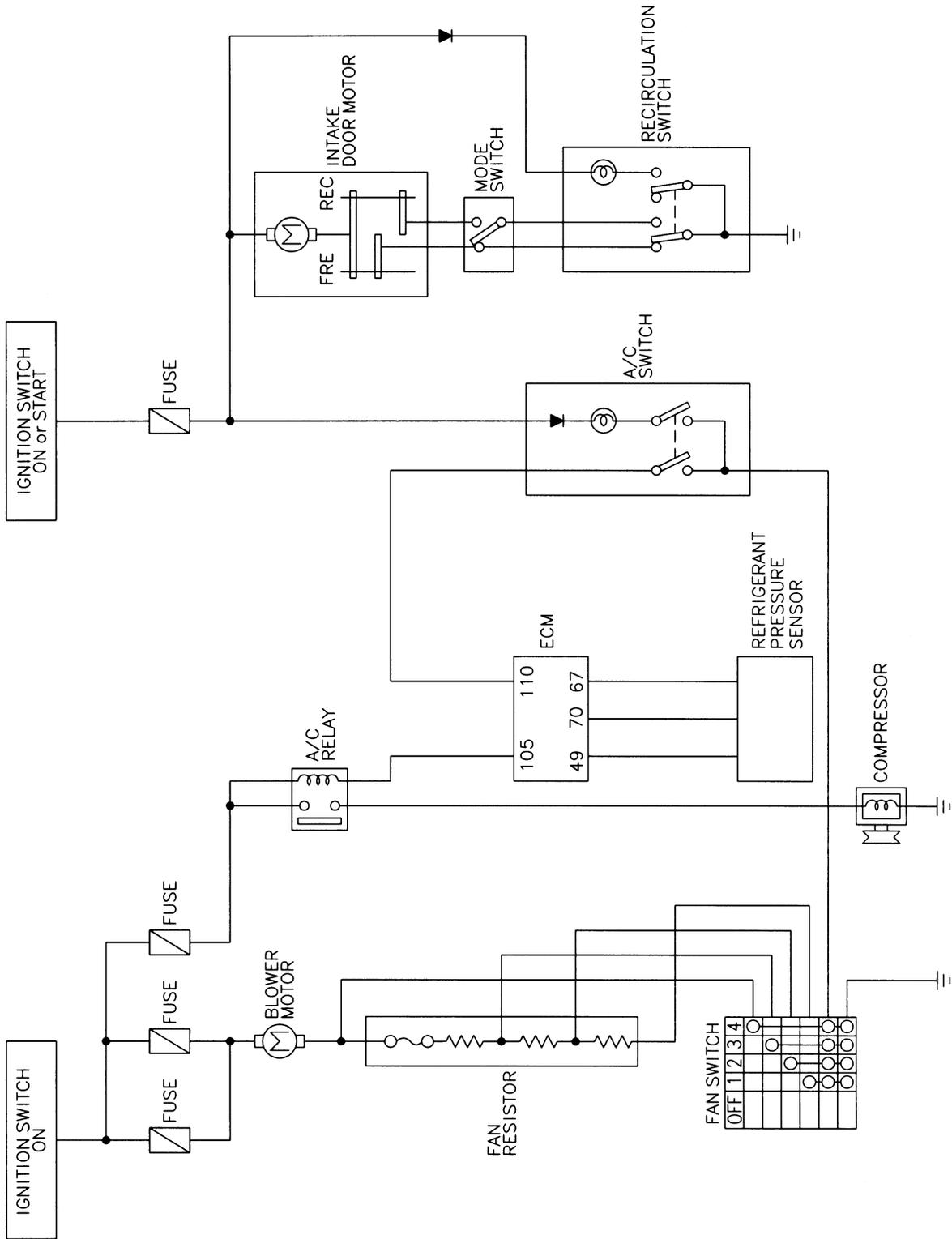


* : This connector is not shown in "HARNESS LAYOUT", EL section.

REFER TO THE FOLLOWING.
 (M10) - FUSE BLOCK-
 JUNCTION BOX (J/B)

Circuit Diagram — Air Conditioner

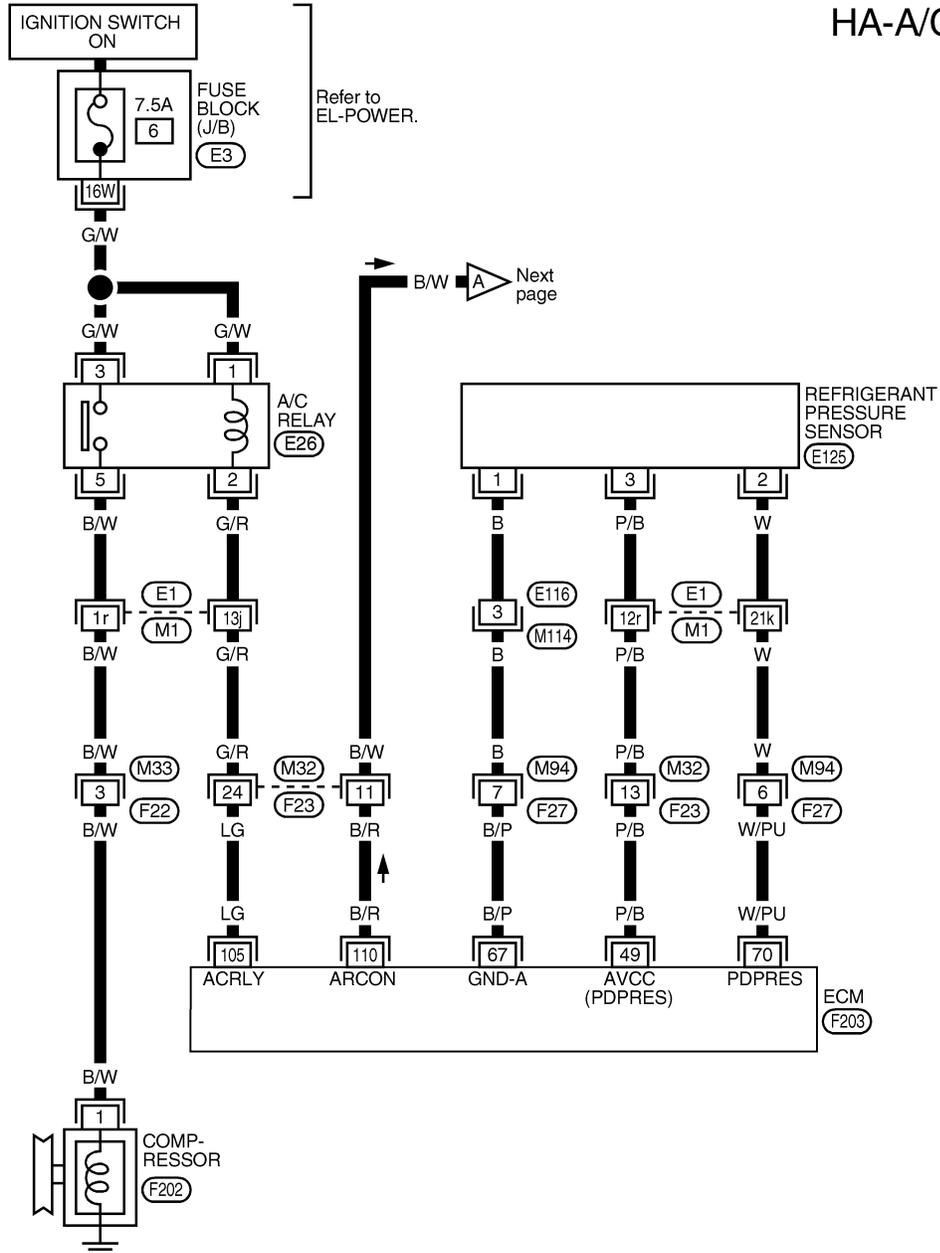
NAHA0087



Wiring Diagram — A/C, M —

NAHA0088

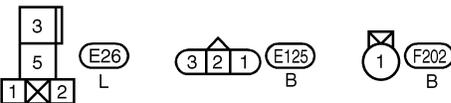
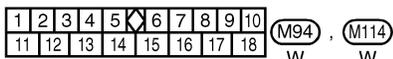
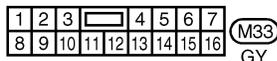
HA-A/C,M-01



Refer to EL-POWER.

Next page

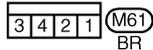
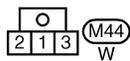
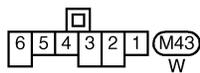
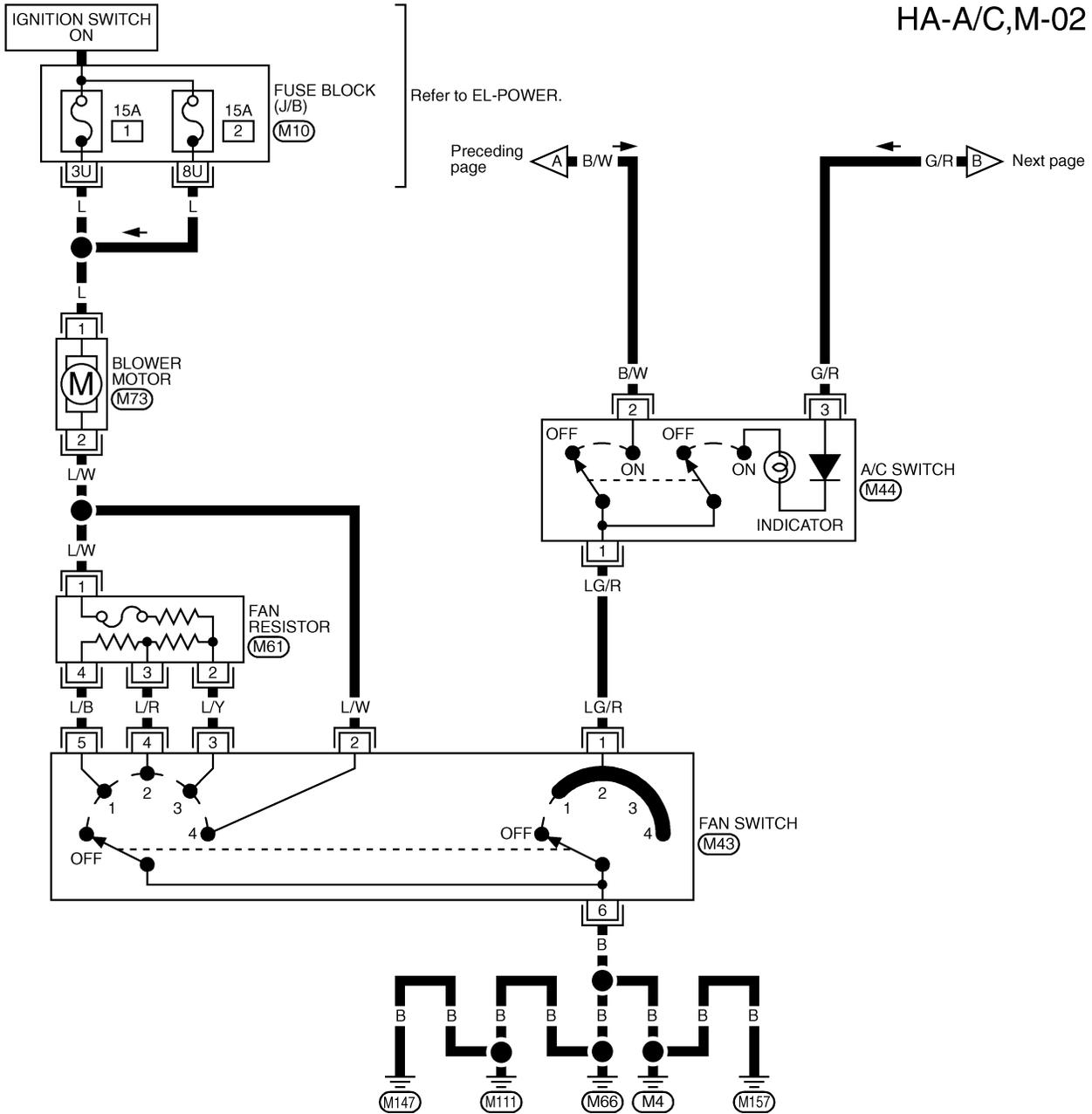
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REFER TO THE FOLLOWING.

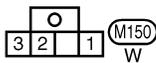
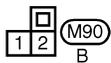
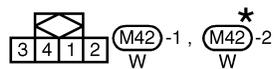
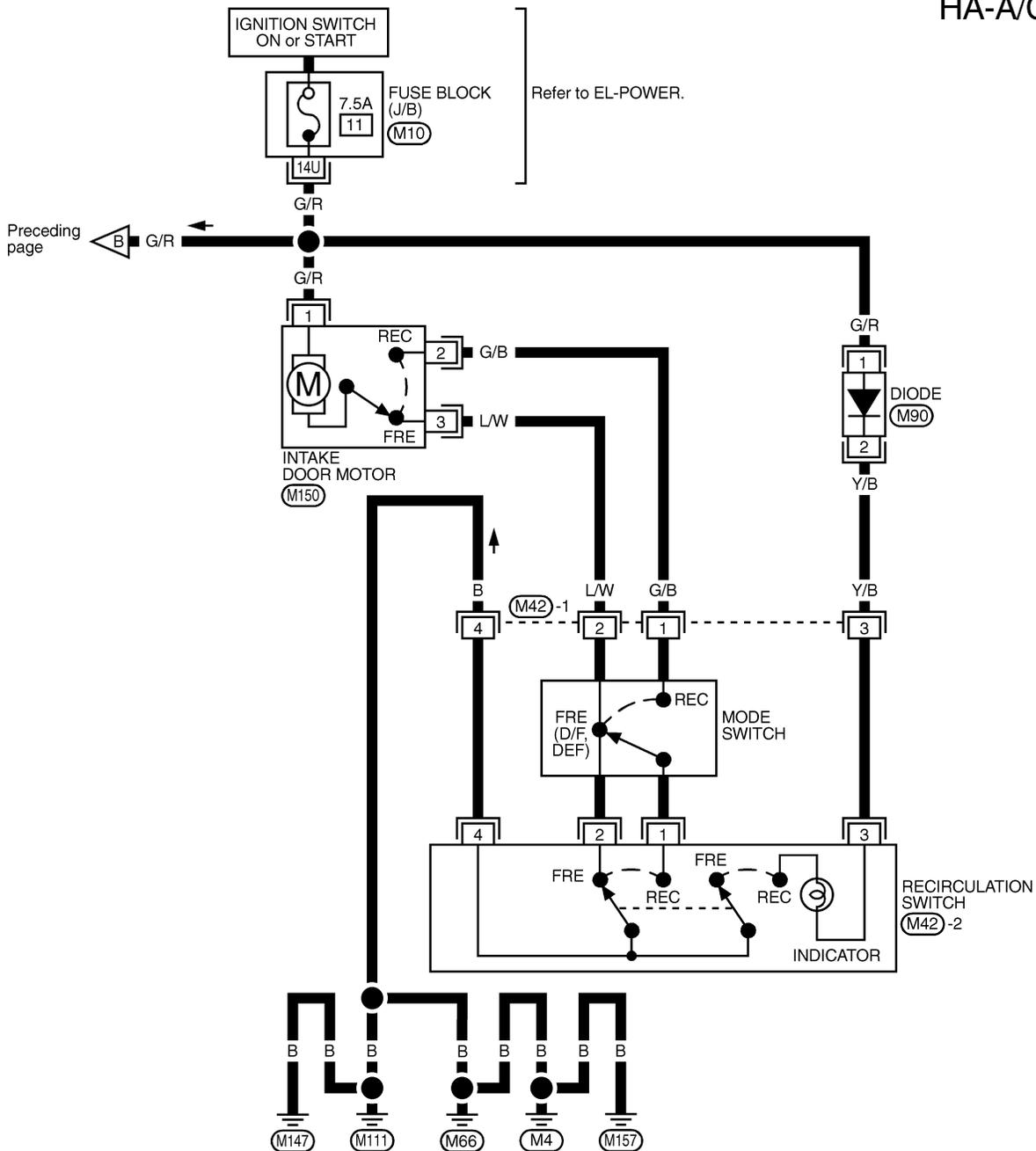
- (E1) -SUPER
- (E3) -FUSE BLOCK-
- (E125) -JUNCTION BOX (J/B)
- (F203) -ELECTRICAL UNITS

HA-A/C,M-02



REFER TO THE FOLLOWING.
 (M10) - FUSE BLOCK-
 JUNCTION BOX (J/B)

HA-A/C,M-03



REFER TO THE FOLLOWING.

(M10) - FUSE BLOCK-
JUNCTION BOX (J/B)

★ : This connector is not shown in "HARNESS LAYOUT", EL section.

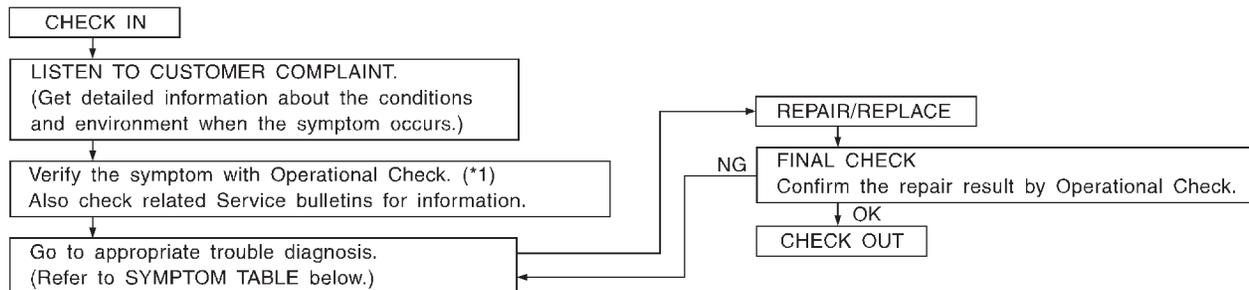
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How to Perform Trouble Diagnoses for Quick and Accurate Repair

NAHA0075

NAHA0075S01

WORK FLOW



SHA900E

*1: HA-179

SYMPTOM TABLE

NAHA0075S02

Symptom	Reference page	
● Intake door does not change in VENT, B/L or FOOT mode.	● Go to Trouble Diagnosis Procedure for Intake Door.	HA-181
● Blower motor does not rotate at all.	● Go to Trouble Diagnosis Procedure for Blower Motor.	HA-188
● Insufficient cooling.	● Go to Trouble Diagnosis Procedure for Insufficient cooling.	HA-195
● Insufficient heating.	● Go to Trouble Diagnosis Procedure for Insufficient heating.	HA-203
● Air outlet does not change.	● Go to Trouble Diagnosis Procedure for Air Outlet.	HA-205
● Magnet clutch does not engage when A/C switch and fan switch are ON.	● Go to Trouble Diagnosis Procedure for Magnet Clutch.	HA-207
● Noise	● Go to Trouble Diagnosis Procedure for Noise.	HA-214

Operational Check

=NAHA0076

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.

NAHA0076S01

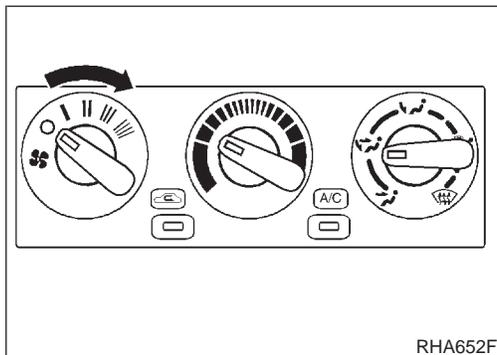
PROCEDURE:

1. Check Blower

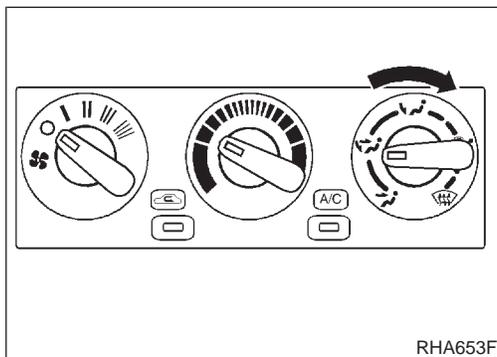
NAHA0076S02

NAHA0076S0201

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.



RHA652F



RHA653F

2. Check Discharge Air

NAHA0076S0202

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-169).

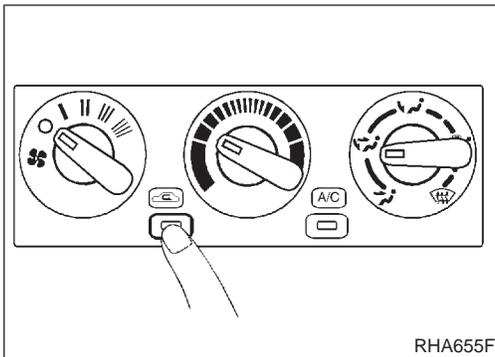
Discharge air flow

Mode control knob	Air outlet/distribution		
	Face	Foot	Defroster
	100%	-	-
	60%	40%	-
	-	80%	20%
	-	60%	40%
	-	-	100%

RHA654F

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Operational Check (Cont'd)



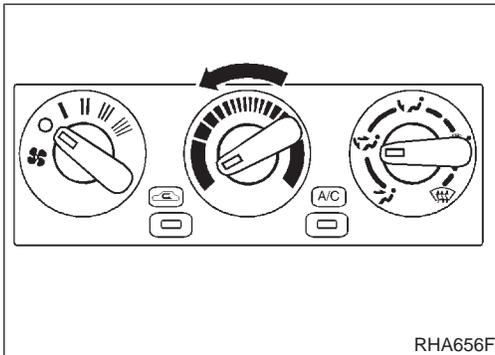
3. Check Recirculation

NAHA0076S0203

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

NOTE:

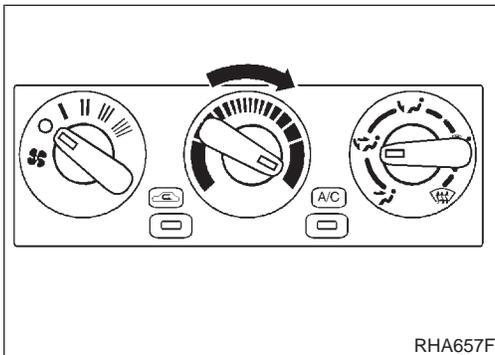
Confirm that the RECIRCULATION (REC) switch is canceled in the DEF (☃) and D/F (☃) mode.



4. Check Temperature Decrease

NAHA0076S0204

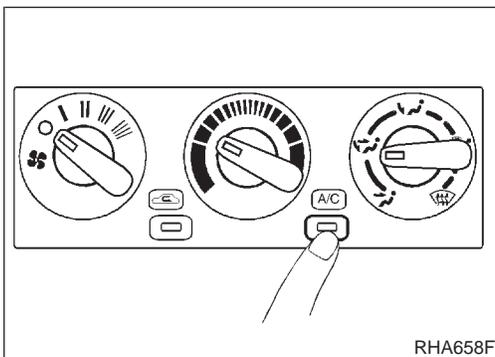
1. Turn temperature control knob to full cold.
2. Check for cold air at discharge air outlets.



5. Check Temperature Increase

NAHA0076S0205

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



6. Check Air Conditioner Switch

NAHA0076S0206

Turn fan control knob to the desired (1 to 4-speed) position and push the air conditioner switch to turn ON the air conditioner. The indicator light should come on when air conditioner is ON.

Intake Door

TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

=NAHA0135

Symptom:

- Intake door does not change in VENT, B/L or FOOT mode.

Inspection Flow

GI

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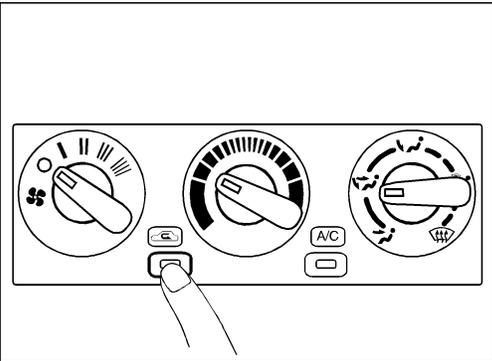
AX

SU

SHA260F

BR

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Recirculation

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

NOTE:
Confirm that the RECIRCULATION (REC) switch is canceled in the DEF () and D/F () mode.

ST

RS

BT

HA

SC

EL

IDX

2. Check for any service bulletins.

3. Check intake door motor circuit. (*1)

INSPECTION END

OK

If the symptom still exist, perform a complete operational check (*2) and check for other symptoms.
[Refer to symptom table, (*3).]
Does another symptom exist?

Yes

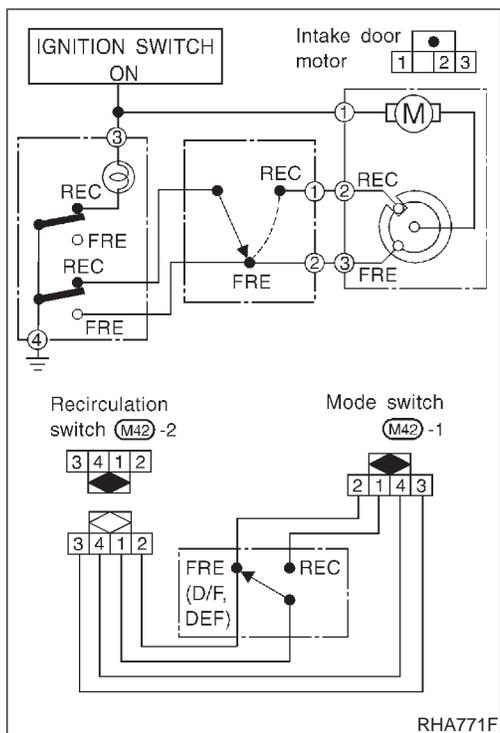
Go to Trouble Diagnosis for related symptom.
[Another symptom exists.]

*1: HA-183

*2: HA-179

*3: HA-178

Intake Door (Cont'd)



SYSTEM DESCRIPTION

Intake Door Motor

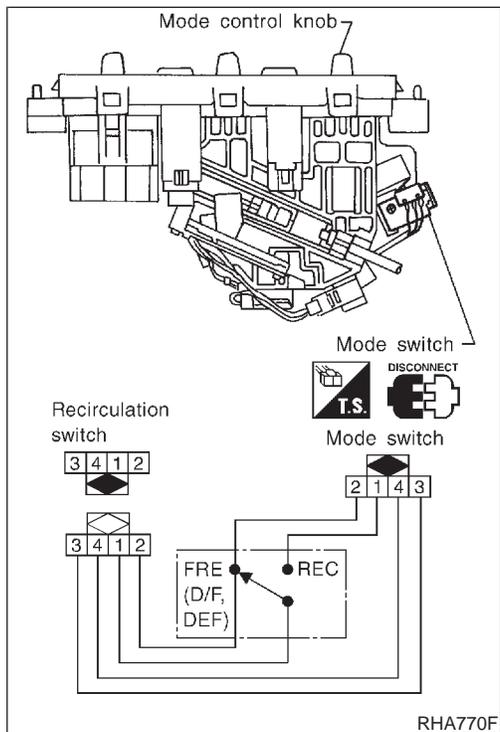
NAHA0136

NAHA0136S01

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

When RECIRCULATION switch is at REC (except DEF and D/F modes), the ground line of the motor is switched from intake door motor terminal 3 to 2. This starts the motor flow because the position switch contacts built into it make current flow. When RECIRCULATION switch is at FRE (except DEF and D/F modes), the ground line is switched from intake door motor terminal 2 to 3. The contacts turn along with the motor. When they reach the non-current flow position, the motor will stop. The motor always turns in the same direction.

RECIRCULATION switch is canceled by MODE switch in DEF and D/F modes.



ELECTRICAL COMPONENTS INSPECTION

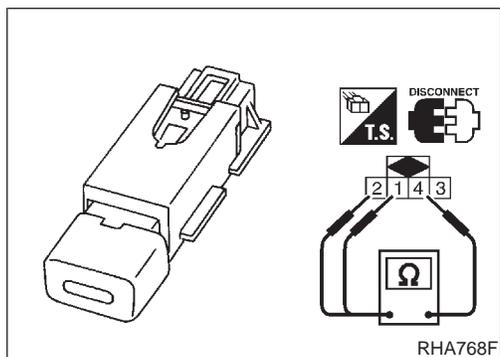
NAHA0137

Mode Switch

NAHA0137S01

Check continuity between terminals at each switch position.

Terminal No.		Mode control knob condition	Continuity
Mode switch (+)	Recirculation switch connector (-)		
1	1	VENT, B/L, FOOT	Yes
		D/F, DEF	No
2	1	VENT, B/L, FOOT	No
		D/F, DEF	Yes
2	2	All	Yes
3	3	All	Yes
4	4	All	Yes



Recirculation Switch

NAHA0137S02

Check continuity between terminals at each switch position.

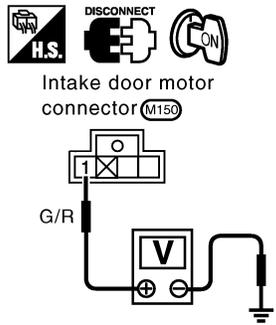
Terminal No.		Recirculation switch condition	Continuity
(+)	(-)		
1	4	REC	Yes
		FRE	No
2	4	REC	No
		FRE	Yes

INTAKE DOOR MOTOR CIRCUIT

=NAHA0090

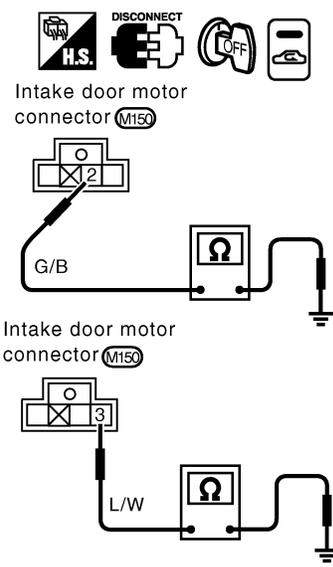
SYMPTOM:

- Intake door does not change in VENT, B/L or FOOT mode.

1	CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR	
<p>Disconnect intake door motor harness connector. Do approx. 12 volts exist between intake door motor harness connector M150 terminal No. 1 and ground?</p> <div style="text-align: center;">  <p style="text-align: center;">Intake door motor connector (M150)</p> <p style="text-align: right;">RHA350FD</p> </div> <p style="text-align: center;">Yes or No</p>		
Yes	▶	GO TO 2.
No	▶	Check 7.5A (No. 11) fuse at fuse block. (Refer to EL-12, "Wiring Diagram — POWER —".)

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Intake Door (Cont'd)

2	CHECK GROUND CIRCUIT FOR INTAKE DOOR MOTOR																	
<p>Check continuity between intake door motor harness connector M150 terminals and ground.</p> <div style="text-align: center;">  </div> <p style="text-align: center;">Continuity should exist when test leads are connected as shown, it should not exist when test leads are reversed.</p> <div style="text-align: right; margin-top: 10px;">RHA580FB</div>																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2" style="text-align: center;">Recirculation switch condition</th> <th colspan="2" style="text-align: center;">Terminal No.</th> <th rowspan="2" style="text-align: center;">Continuity</th> </tr> <tr> <th style="text-align: center;">(+)</th> <th style="text-align: center;">(-)</th> </tr> </thead> <tbody> <tr> <td rowspan="2" style="text-align: center;">REC</td> <td style="text-align: center;">2</td> <td rowspan="4" style="text-align: center;">Ground</td> <td style="text-align: center;">Yes</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">No</td> </tr> <tr> <td rowspan="2" style="text-align: center;">FRE</td> <td style="text-align: center;">2</td> <td style="text-align: center;">No</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">Yes</td> </tr> </tbody> </table>		Recirculation switch condition	Terminal No.		Continuity	(+)	(-)	REC	2	Ground	Yes	3	No	FRE	2	No	3	Yes
Recirculation switch condition	Terminal No.		Continuity															
	(+)	(-)																
REC	2	Ground	Yes															
	3		No															
FRE	2		No															
	3		Yes															
<p>OK or NG</p>																		
OK	▶ GO TO 3.																	
NG	▶ Disconnect mode switch harness connector. GO TO 4.																	

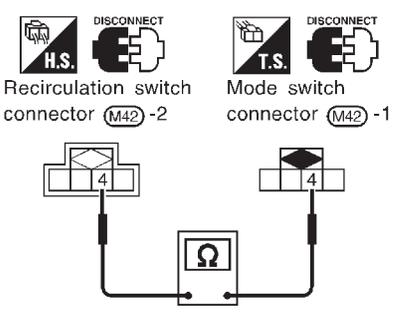
3	CHECK INTAKE DOOR LINKAGE
<p>Refer to Control Linkage Adjustment. (HA-187)</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ Replace intake door motor.
NG	▶ Repair or adjust.

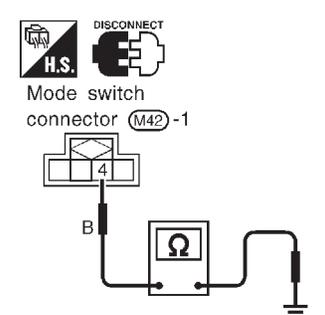
4	CHECK CONTINUITY BETWEEN MODE SWITCH AND INTAKE DOOR MOTOR		GI
<p>Check circuit continuity between mode switch harness connector M42-1 terminal No. 1, (2) and intake door motor harness connector M150 terminal No. 2, (3).</p>			
RHA581FB			
<p>Continuity should exist. If OK, check harness for short.</p>			
OK or NG			
OK	▶	GO TO 5.	PD
NG	▶	Repair harness or connector.	AX

5	CHECK MODE SWITCH		SU
<p>(Refer to Electrical Components Inspection.) (HA-182)</p>			
OK or NG			
OK	▶	GO TO 6.	BR
NG	▶	Replace mode switch.	ST

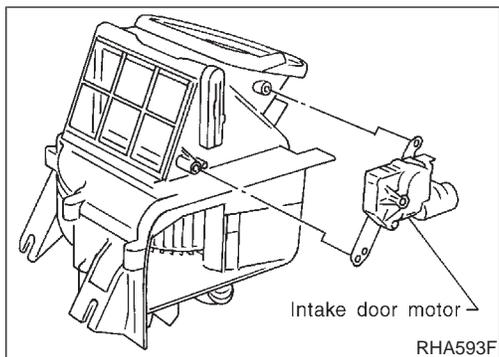
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Intake Door (Cont'd)

6	CHECK CIRCUIT CONTINUITY BETWEEN MODE SWITCH AND RECIRCULATION SWITCH	
<p>Check circuit continuity between mode switch harness connector M42-1 terminal No. 4 and recirculation switch harness connector M42-2 terminal No. 4.</p>		
 <p style="text-align: center;">Recirculation switch connector (M42) -2 Mode switch connector (M42) -1</p>		
RHA769FB		
<p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 7.
NG	▶	Replace mode switch.

7	CHECK GROUND CIRCUIT FOR MODE SWITCH	
<p>Check circuit continuity between mode switch harness connector M42-1 terminal No. 4 and ground.</p>		
 <p style="text-align: center;">Mode switch connector (M42) -1</p>		
RHA582F		
<p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 8.
NG	▶	Repair harness or connector.

8	CHECK RECIRCULATION SWITCH	
<p>(Refer to Electrical Components Inspection.) (HA-182)</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	INSPECTION END
NG	▶	Replace recirculation switch.



CONTROL LINKAGE ADJUSTMENT

Intake Door Motor

NAHA0093

NAHA0093S04

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.
4. Check that intake door operates properly when RECIRCULATION switch is turned ON and OFF.

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Blower Motor

TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

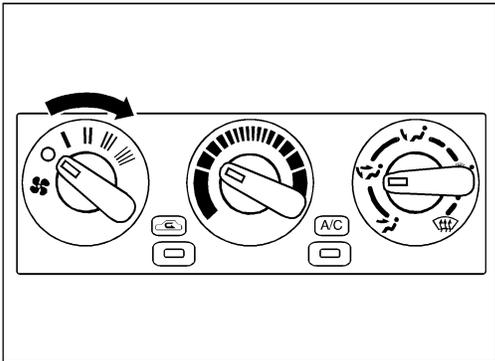
=NAHA0138

Symptom:

- Blower motor does not rotate at all.

Inspection Flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Blower motor

- 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 for any service bulletins.

3. Check blower motor circuit. (*1)

OK

INSPECTION END

If the symptom still exist, perform a complete operational check (*2) and check for other symptoms.
[Refer to symptom table, (*3).]
Does another symptom exist?

Yes

Go to Trouble Diagnosis for related symptom.

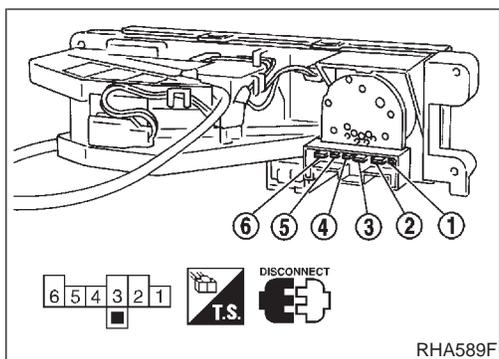
[Another symptom exists.]

SHA261F

*1: HA-190

*2: HA-179

*3: HA-178



ELECTRICAL COMPONENTS INSPECTION

=NAHA0139

Fan Switch

NAHA0139S01

Check continuity between terminals at each switch position.

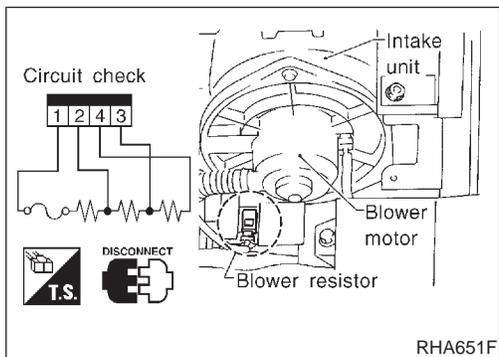
KNOB POSITION	Continuity between terminals
OFF	No continuity
1	5 — 1 — 6
2	4 — 1 — 6
3	3 — 1 — 6
4	2 — 1 — 6

Blower Motor

NAHA0139S02

Confirm smooth rotation of the blower motor.

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



Blower Resistor

NAHA0139S03

Check resistance between terminals.

Terminal No.		Resistance
(+)	(-)	
3	1	Approx. 1.4 - 1.6Ω
4		Approx. 2.5 - 2.8Ω
2		Approx. 0.5 - 0.6Ω

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BLOWER MOTOR CIRCUIT

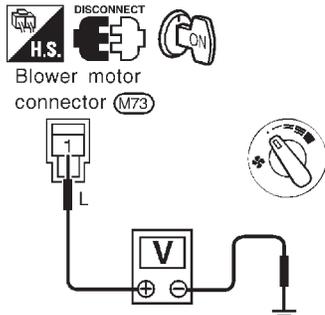
=NAHA0089

SYMPTOM:

- Blower motor does not rotate.

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

1		DIAGNOSTIC PROCEDURE
Check if blower motor rotates properly at each fan speed. Conduct checks as per table at above.		
1	▶	GO TO 2.
2, 3, 4	▶	GO TO 8.
5	▶	GO TO 10.

2		CHECK POWER SUPPLY FOR BLOWER MOTOR
1. Disconnect blower motor harness connector. 2. Do approx. 12 volts exist between blower motor harness connector M73 terminal No. 1 and ground?		
		
RHA343FA		
Yes or No		
Yes	▶	GO TO 3.
No	▶	Check 15A (Nos. 1 and No. 2) fuses at fuse block. (Refer to EL-12, "Wiring Diagram — POWER".)

3	CHECK CIRCUIT CONTINUITY FOR BLOWER MOTOR	
<p>1. Turn fan control knob to any position except OFF. 2. Check circuit continuity between blower motor harness connector M73 terminal No. 2 and ground.</p>		
RHA344FA		
Continuity should exist.		
OK or NG		
OK	▶	GO TO 4.
NG	▶	Reconnect blower motor harness connector. GO TO 5.

4	CHECK BLOWER MOTOR	
<p>(Refer to Electrical Components Inspection.) (HA-189)</p>		
OK or NG		
OK	▶	INSPECTION END
NG	▶	Replace blower motor.

5	CHECK BLOWER MOTOR CIRCUIT BETWEEN BLOWER MOTOR AND RESISTOR	
<p>Do approx. 12 volts exist between resistor harness connector M61 terminal No. 1 and ground?</p>		
RHA575F		
Yes or No		
Yes	▶	Disconnect fan switch harness connector. GO TO 7.
No	▶	Disconnect blower motor and resistor harness connectors. GO TO 6.

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Blower Motor (Cont'd)

6	CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR AND RESISTOR	
<p>Check circuit continuity between blower motor harness M73 terminal No. 2 and resistor harness connector M61 terminal No. 1.</p>		
<p>Continuity should exist.</p>		
<p>OK or NG</p>		
OK	▶	Check harness for short.
NG	▶	Repair harness or connector.

RHA576F

7	CHECK GROUND CIRCUIT FOR FAN SWITCH	
<p>Check circuit continuity between fan switch harness connector M43 terminal No. 6 and ground.</p>		
<p>OK or NG</p>		
OK	▶	GO TO 8.
NG	▶	Repair harness or connector.

RHA577F

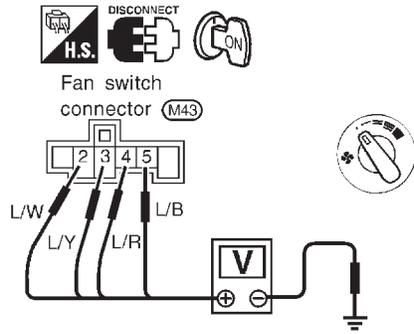
8	CHECK RESISTOR AFTER DISCONNECTING IT	
<p>(Refer to Electrical Components Inspection.) (HA-189)</p>		
<p>OK or NG</p>		
OK	▶	GO TO 9.
NG	▶	Replace resistor.

9	CHECK RESISTOR HARNESS CONNECTOR	
<p>Reconnect resistor harness connector.</p>		
<p>OK or NG</p>		
1	▶	GO TO 12.
2, 3, 4	▶	GO TO 10.

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10 CHECK FAN SWITCH CIRCUIT

Do approx. 12 volts exist between each fan switch harness connector M43 terminal and ground?



RHA578F

Test group No.	Terminal No.		Voltage
	(+)	(-)	
2	5	Ground	Approx. 12V
3	4		
4	3		
5	2		

MTBL1837

Yes or No

- | | | |
|-----|---|-----------|
| Yes | ▶ | GO TO 12. |
| No | ▶ | GO TO 11. |

Blower Motor (Cont'd)

11	CHECK CIRCUIT CONTINUITY BETWEEN FAN SWITCH AND RESISTOR														
<p>Check circuit continuity between fan switch harness connector M43 terminal and resistor harness connector M61 terminal.</p>															
RHA579F															
<table border="1" style="margin: auto; border-collapse: collapse;"> <thead> <tr> <th colspan="2">Terminal No.</th> <th rowspan="2">Continuity</th> </tr> <tr> <th>Fan Switch</th> <th>Resistor</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">1</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Yes</td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> </tr> <tr> <td style="text-align: center;">4</td> <td style="text-align: center;">3</td> </tr> <tr> <td style="text-align: center;">5</td> <td style="text-align: center;">4</td> </tr> </tbody> </table>		Terminal No.		Continuity	Fan Switch	Resistor	2	1	Yes	3	2	4	3	5	4
Terminal No.		Continuity													
Fan Switch	Resistor														
2	1	Yes													
3	2														
4	3														
5	4														
MTBL1838															
<p style="text-align: center; color: blue;">Continuity should exist.</p>															
OK or NG															
OK	▶	Check harness for short.													
NG	▶	Repair harness or connector.													

12	CHECK FAN SWITCH AFTER DISCONNECTING IT	
<p>(Refer to Electrical Components Inspection.) (HA-189)</p>		
OK or NG		
OK	▶	INSPECTION END
NG	▶	Replace fan switch.

Insufficient Cooling

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

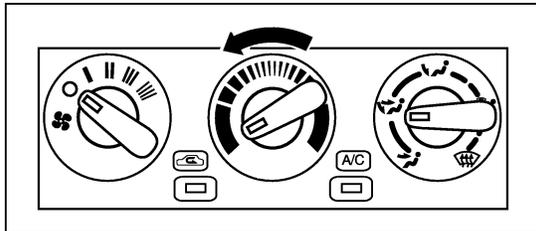
=NAHA0150

Symptom:

- Insufficient Cooling.

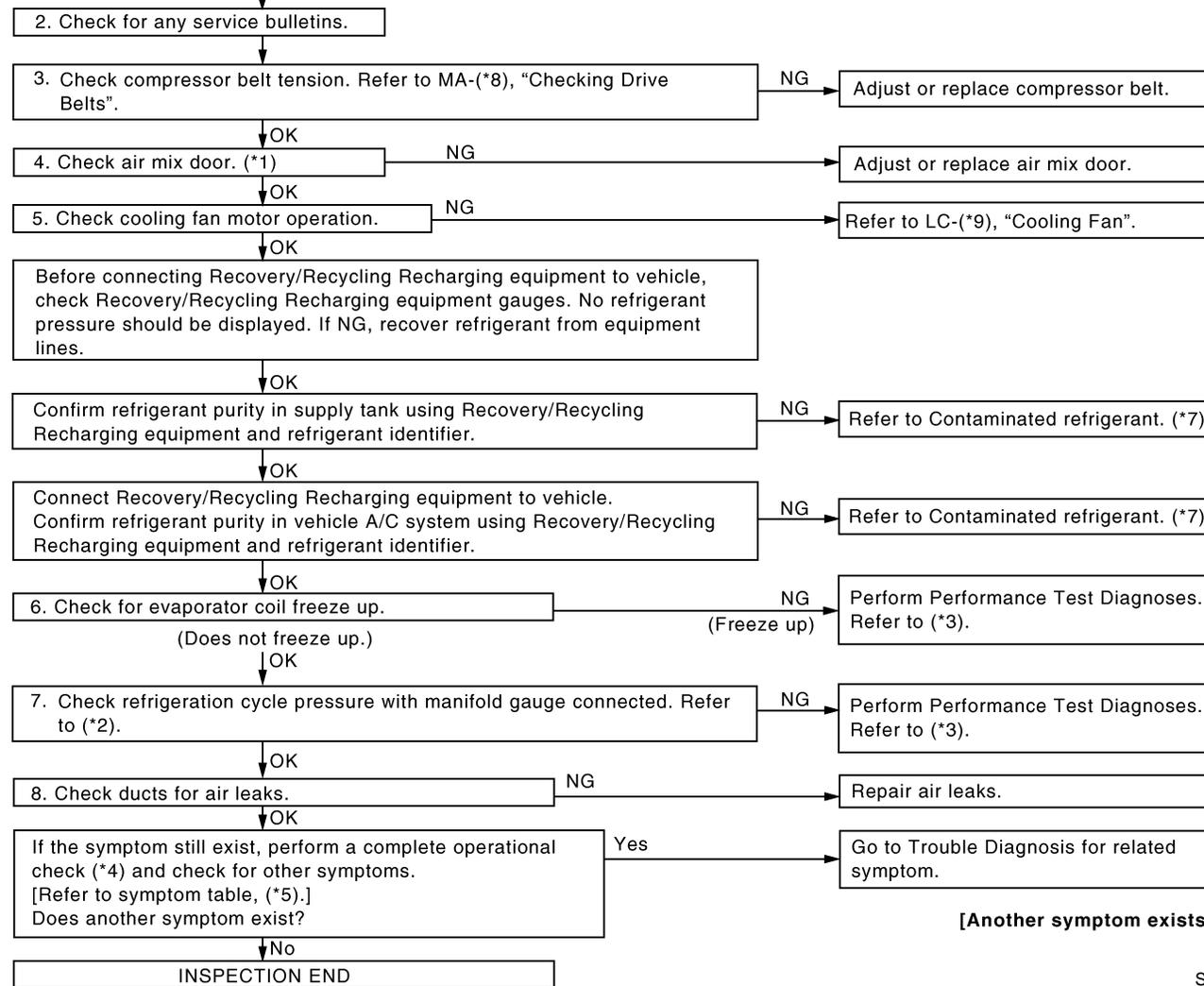
Inspection Flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature decrease

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



*1: HA-204
*2: HA-198
*3: HA-196

*4: HA-179
*5: HA-178
*6: HA-220

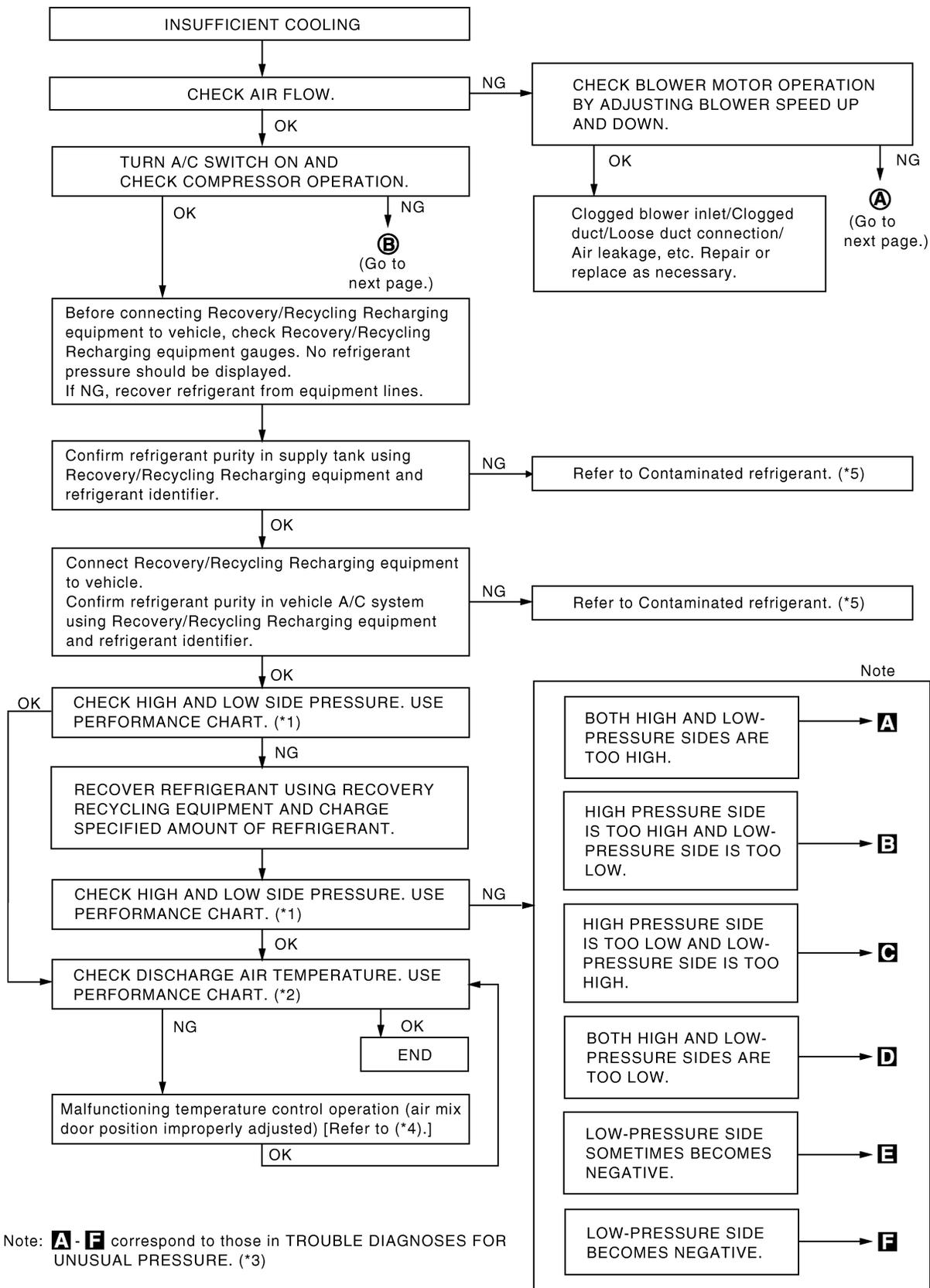
*7: HA-150
*8: MA-14
*9: LC-23

SHA923F

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PERFORMANCE TEST DIAGNOSES

NAHA0082



Note: **A - F** correspond to those in TROUBLE DIAGNOSES FOR UNUSUAL PRESSURE. (*3)

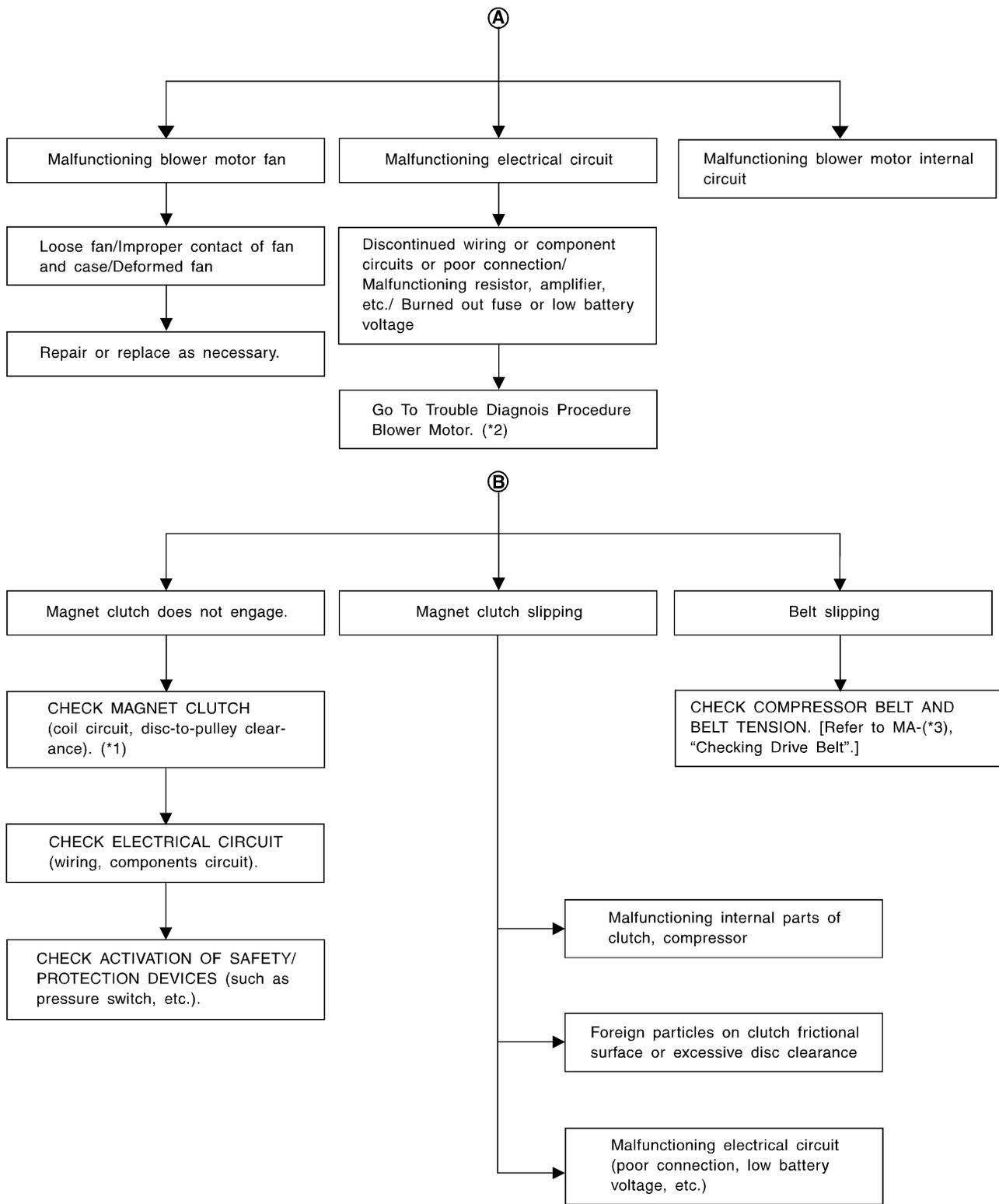
*1: HA-198

*3: HA-198

*5: HA-150

*2: HA-198

*4: HA-204



*1: HA-222

*2: HA-188

*3: MA-14

SHA329F

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Insufficient Cooling (Cont'd)

PERFORMANCE CHART

Test Condition

=NAHA0083

NAHA0083S01

Testing must be performed as follows:

Vehicle location	Indoors or in the shade (in a well-ventilated place)
Doors	Closed
Door windows	Open
Hood	Open
TEMP.	Max. COLD
Discharge Air	Face (Ventilation) set
REC switch	(Recirculation) set
FAN speed	High speed
Engine speed	Idle speed

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

Test Reading

Recirculating-to-discharge Air Temperature Table

NAHA0083S02

NAHA0083S0201

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	6.0 - 9.0 (43 - 48)
	30 (86)	10.0 - 13.6 (50 - 56)
	35 (95)	15.2 - 19.5 (59 - 67)
	40 (104)	22.5 - 27.1 (73 - 81)
60 - 70	25 (77)	9.0 - 12.2 (48 - 54)
	30 (86)	13.6 - 17.2 (56 - 63)
	35 (95)	19.5 - 23.7 (67 - 75)
	40 (104)	27.1 - 32.3 (81 - 90)

Ambient Air Temperature-to-operating Pressure Table

NAHA0083S0202

Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	1,226 - 1,638 (12.5 - 16.7, 178 - 237)	172 - 250 (1.75 - 2.55, 25 - 36)
	30 (86)	1,422 - 1,883 (14.5 - 19.2, 206 - 273)	196 - 275 (2.0 - 2.8, 28 - 40)
	35 (95)	1,657 - 2,187 (16.9 - 22.3, 240 - 317)	231 - 309 (2.35 - 3.15, 33 - 45)
	40 (104)	1,922 - 2,501 (19.6 - 25.5, 279 - 363)	280 - 373 (2.85 - 3.8, 41 - 54)

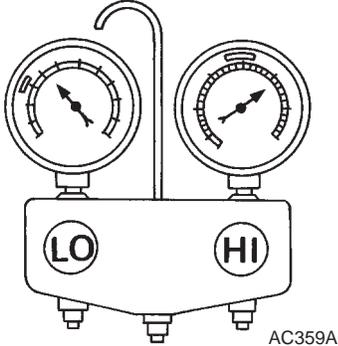
TROUBLE DIAGNOSES FOR UNUSUAL PRESSURE

NAHA0084

Whenever system's high and/or low side pressure is unusual, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (usual) pressure range. Since the standard (usual) pressure, however, differs from vehicle to vehicle, refer to HA-198 ("Ambient air temperature-to-operating pressure table").

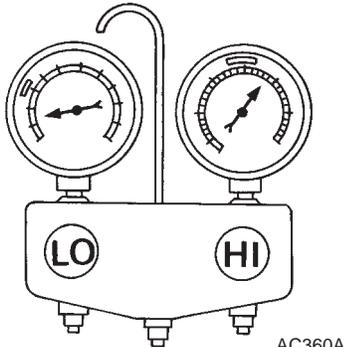
Both High and Low-pressure Sides are Too High.

NAHA0084S01

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> <ol style="list-style-type: none"> Condenser fins are clogged. Improper fan rotation of cooling fan 	<ul style="list-style-type: none"> Clean condenser. Check and repair cooling fan as necessary.
	<ul style="list-style-type: none"> Low-pressure pipe is not cold. When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm², 28 psi). It then decreases gradually thereafter. 	<p>Poor heat exchange in condenser (After compressor operation stops, high pressure decreases too slowly.)</p> <p>↓</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> <ol style="list-style-type: none"> Improper expansion valve installation Improper expansion valve adjustment 	<p>Replace expansion valve.</p>

High-pressure Side is Too High and Low-pressure Side is Too Low.

NAHA0084S02

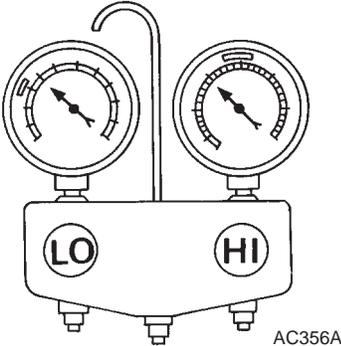
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p> <p>B</p>  <p>AC360A</p>	<p>Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.</p>	<p>High-pressure tube or parts located 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.

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Insufficient Cooling (Cont'd)

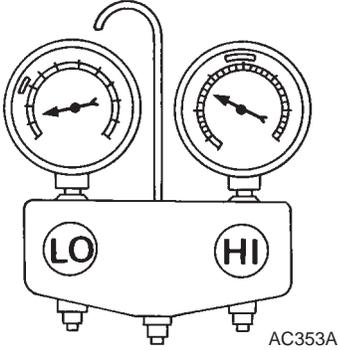
High-pressure Side is Too Low and Low-pressure Side is Too High.

NAHA0084S03

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too low and low-pressure side is too high.</p> <p>C</p>  <p>AC356A</p>	<p>High and low-pressure sides become equal soon after compressor operation stops.</p>	<p>Compressor pressure operation is improper.</p> <p>↓</p> <p>Damaged inside compressor packings</p>	<p>Replace compressor.</p>
	<p>No temperature difference between high and low-pressure sides</p>	<p>Compressor pressure operation is improper.</p> <p>↓</p> <p>Damaged inside compressor packings.</p>	<p>Replace compressor.</p>

Both High- and Low-pressure Sides are Too Low.

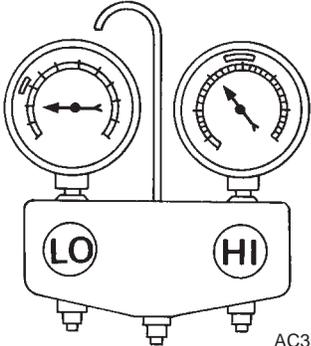
NAHA0084S04

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p> <p>D</p> 	<ul style="list-style-type: none"> There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low. Liquid tank inlet and expansion valve are frosted. 	<p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum.)</p>	<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 	<p>High-pressure pipe located between receiver drier and expansion valve is clogged.</p>	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check lubricant for contamination.
	<ul style="list-style-type: none"> Expansion valve and liquid tank are warm or only cool when touched. 	<p>Low refrigerant charge</p> <p style="text-align: center;">↓</p> <p>Leaking fittings or components</p>	<p>Check refrigerant for leaks. Refer to "Checking Refrigerant Leaks", HA-225.</p>
	<p>There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.</p>	<p>Expansion valve closes a little compared with the specification.</p> <p style="text-align: center;">↓</p> <ol style="list-style-type: none"> Improper expansion valve adjustment Malfunctioning expansion valve Outlet and inlet may be clogged. 	<ul style="list-style-type: none"> Remove foreign particles by using compressed air. Check lubricant for contamination.
	<p>An area of the low-pressure pipe is colder than areas near the evaporator outlet.</p>	<p>Low-pressure pipe is clogged or crushed.</p>	<ul style="list-style-type: none"> Check and repair malfunctioning parts. Check lubricant for contamination.
	<p>Air flow volume is not enough or is too low.</p>	<p>Evaporator is frozen.</p> <p style="text-align: center;">↓</p> <p>Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)</p>	<ul style="list-style-type: none"> Check intake sensor circuit. Replace compressor.

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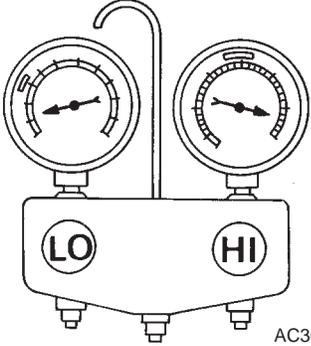
Low-pressure Side Sometimes Becomes Negative.

NAHA0084S05

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>↓</p> <p>Moisture is frozen at expansion valve outlet and inlet.</p> <p>↓</p> <p>Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> ● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.

Low-pressure Side Becomes Negative.

NAHA0084S06

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<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>↓</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, initially 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 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.

Insufficient Heating

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

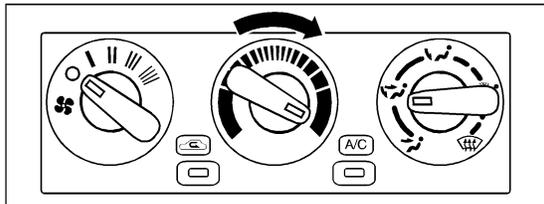
=NAHA0140

Symptom:

- Insufficient Heating.

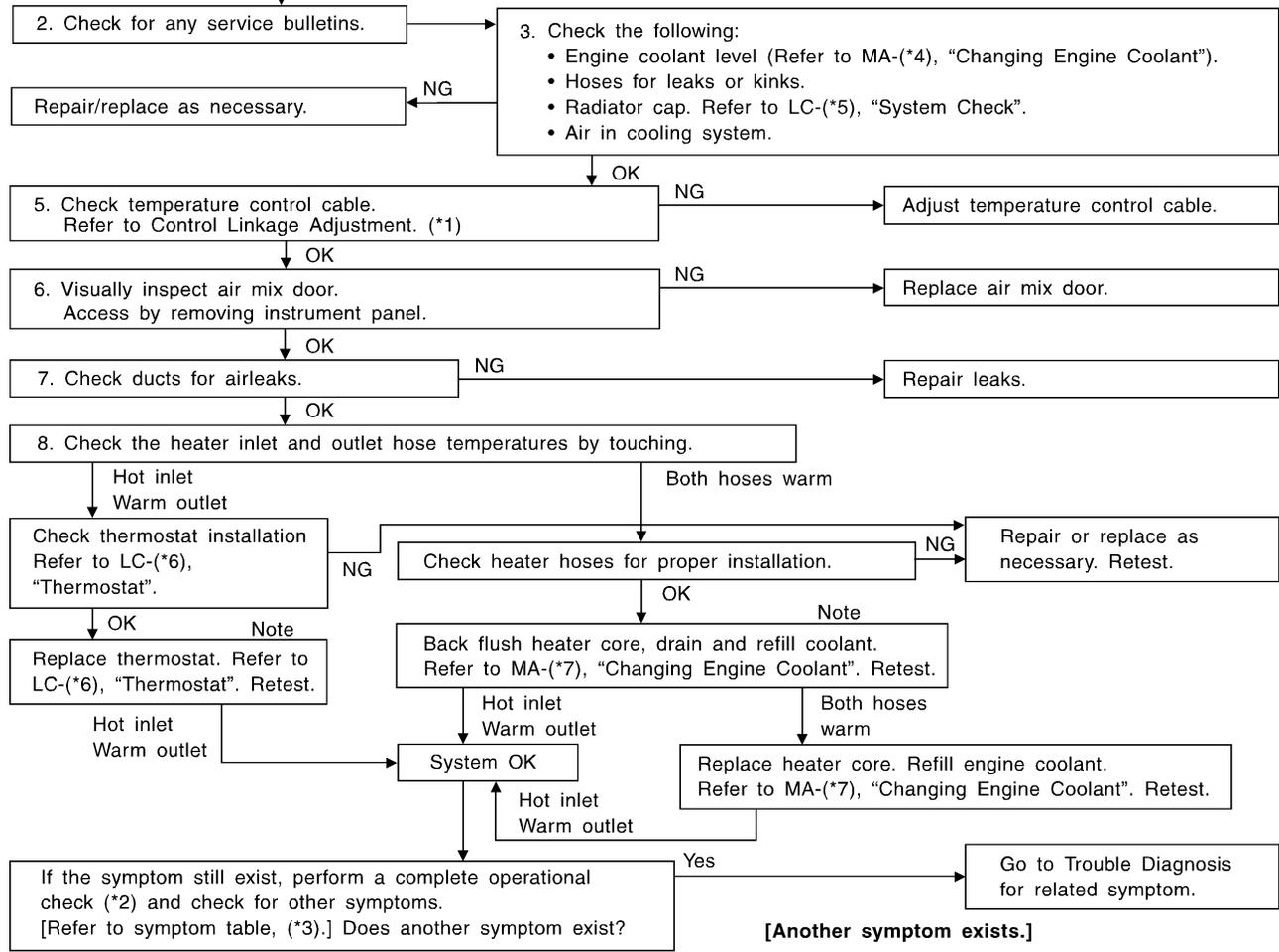
Inspection Flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Temperature increase

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



*1: HA-204
*2: HA-179
*3: HA-178

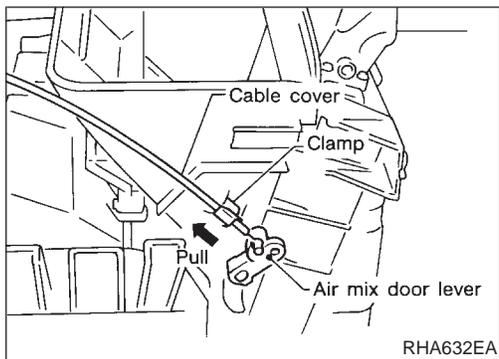
*4: MA-15
*5: LC-12

*6: LC-19
*7: MA-15

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Insufficient Heating (Cont'd)

**CONTROL LINKAGE ADJUSTMENT****Temperature Control Cable**

NAHA0141

. NAHA0141S02

1. Move the temperature control knob to the full hot position.
2. Set the air mix door lever in the full hot position.
3. Pull on the cable cover in the direction of the arrow, then clamp it.

After positioning control cable, check that it operates properly.

Air Outlet

TROUBLE DIAGNOSIS PROCEDURE FOR AIR OUTLET

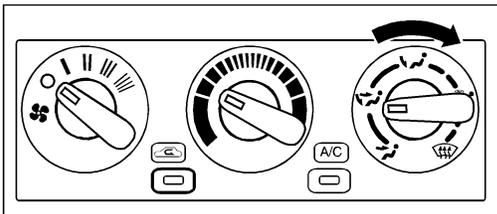
=NAHA0142

Symptom:

- Air outlet does not change.

Inspection Flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL 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” (*4).

Discharge air flow

Mode control knob	Air outlet/distribution		
	Face	Foot	Defroster
	100%	–	–
	60%	40%	–
	–	80%	20%
	–	60%	40%
	–	–	100%

2. Check for any service bulletins.

3. Check mode control cable. (*1)

INSPECTION END

OK

If the symptom still exist, perform a complete operational check (*2) and check for other symptoms. [Refer to symptom table, (*3).] Does another symptom exist?

Yes

Go to Trouble Diagnosis for related symptom.

[Another symptom exists.]

SHA263F

*1: HA-206

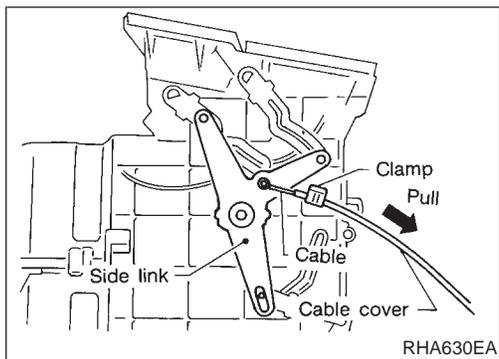
*3: HA-178

*4: HA-169

*2: HA-179

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Air Outlet (Cont'd)



CONTROL LINKAGE ADJUSTMENT

Mode Control Cable

NAHA0151

NAHA0151S01

1. Turn the mode control knob to the DEF position.
2. 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 properly.

Magnet Clutch

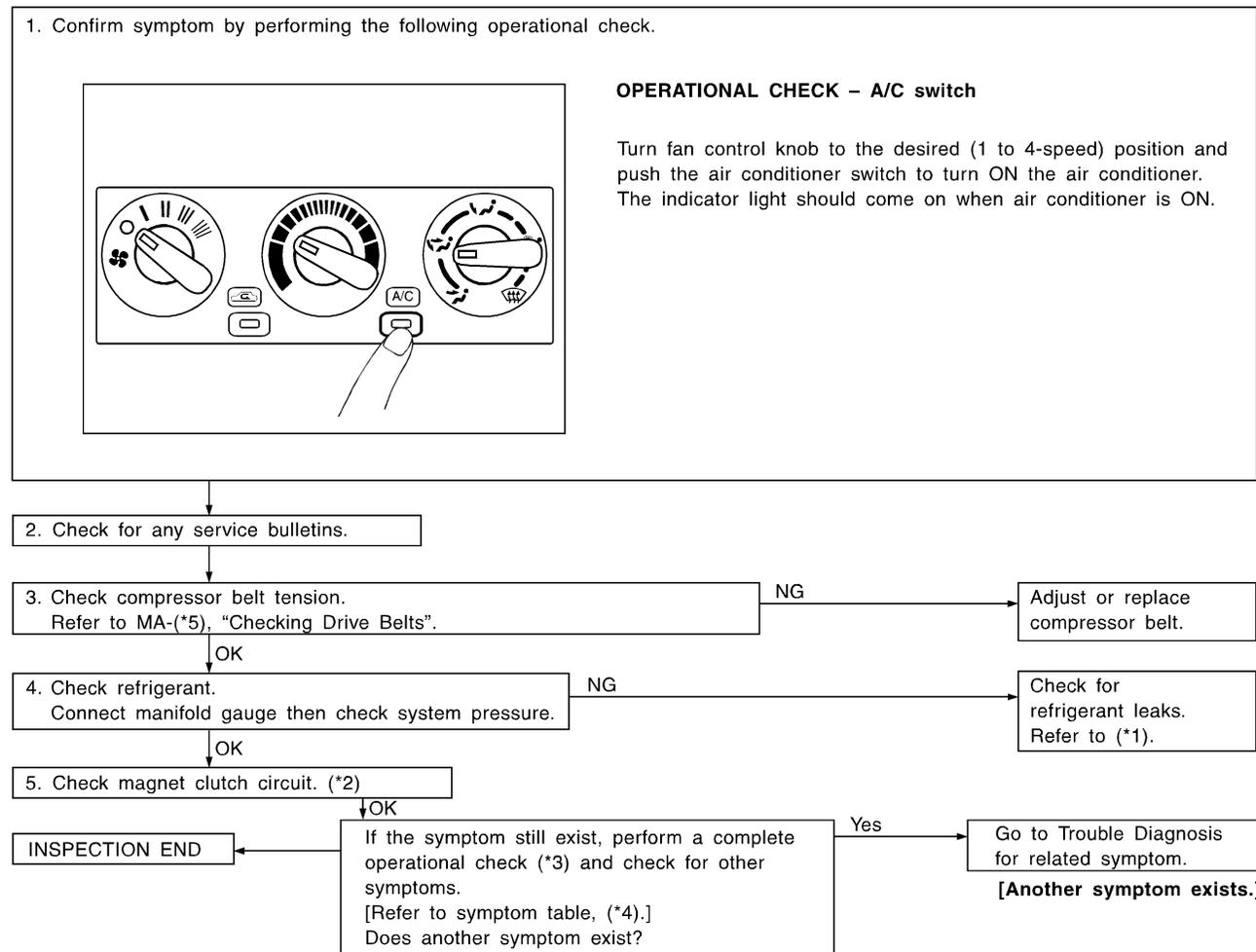
TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

=NAHA0119

Symptom:

- Magnet clutch does not operate when A/C switch and fan switch are ON.

Inspection Flow



*1: HA-225
*2: HA-208

*3: HA-179
*4: HA-178

*5: MA-14

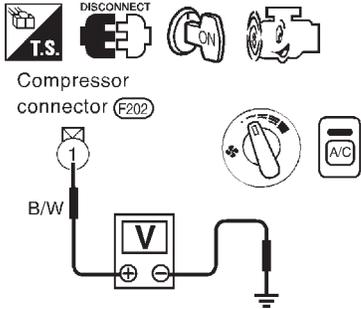
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MAGNET CLUTCH CIRCUIT

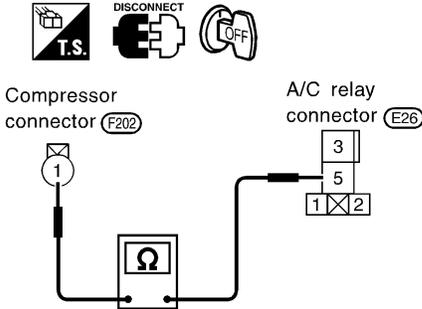
=NAHA0091

SYMPTOM:

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

1	CHECK POWER SUPPLY FOR COMPRESSOR
<p>Disconnect compressor harness connector. Do approx. 12 volts exist between compressor harness connector F202 terminal No. 1 and ground?</p>	
	
RHA747FA	
Yes or No	
Yes	▶ GO TO 2.
No	▶ Disconnect A/C relay. GO TO 3.

2	CHECK MAGNET CLUTCH COIL
OK or NG	
NG	▶ Replace magnet clutch. Refer to HA-220.

3	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY AND COMPRESSOR
<p>Check circuit continuity between A/C relay harness connector E26 terminal No. 5 (B/W) and compressor harness connector F202 terminal No. 1 (B/W).</p>	
	
SHA480F	
Continuity should exist.	
If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Repair harness or connector.

4	CHECK POWER SUPPLY FOR A/C RELAY	
Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness connector E26 terminal Nos. 1 (G/W), 3 (G/W) and ground?		
<p style="text-align: center;">A/C relay connector (E26)</p>		
SHA481F		
Yes or No		
Yes	▶	GO TO 5.
No	▶	Check power supply circuit and 7.5A (No. 6) fuse at fuse block. Refer to EL-12, "Wiring Diagram — POWER —".

5	CHECK A/C RELAY AFTER DISCONNECTING IT	
Refer to HA-213.		
OK or NG		
OK	▶	Reconnect A/C relay. GO TO 6.
NG	▶	Replace A/C relay.

6	CHECK COIL SIDE CIRCUIT OF A/C RELAY	
Do approx. 12 volts exist between ECM harness connector F203 terminal No. 105 and ground?		
<p style="text-align: center;">ECM connector (F203)</p>		
RHA200I		
Yes or No		
Yes	▶	GO TO 8.
No	▶	Disconnect A/C relay. Disconnect ECM harness connector. GO TO 7.

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7	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY AND ECM
<p>Check circuit continuity between A/C relay harness connector F203 terminal No. 2 (GR) and ECM harness connector F203 terminal No. 105 (LG).</p>	
<p>Continuity should exist.</p> <p>OK or NG</p>	
OK	▶ Check harness for short.
NG	▶ Repair harness or connector.

RHA203I

8	CHECK VOLTAGE FOR ECM
<p>Do approx. 5 volts exist between ECM harness connector F203 terminal No. 110 and ground?</p>	
<p>Yes or No</p>	
Yes	▶ GO TO 9.
No	▶ Check ECM. Refer to EC-141, "ECM Terminals and Reference Value".

RHA201I

9	CHECK REFRIGERANT PRESSURE SENSOR
<p>Refer to HA-213.</p>	
<p>OK or NG</p>	
OK	▶ Disconnect A/C switch harness connector. GO TO 10.
NG	▶ Replace refrigerant pressure sensor.

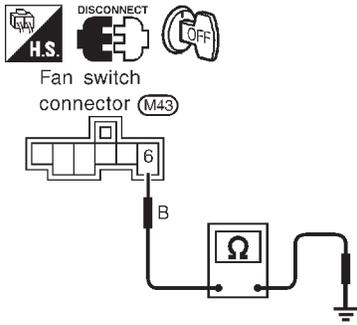
10	CHECK CIRCUIT CONTINUITY BETWEEN ECM AND A/C SWITCH	
<p>Check circuit continuity between ECM harness connector F203 terminal No. 110 and A/C switch harness connector M44 terminal No. 2.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">RHA205I</p> <p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 11.
NG	▶	Repair harness or connector.

11	CHECK A/C SWITCH	
<p>Refer to HA-213.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	Disconnect fan switch harness connector. GO TO 12.
NG	▶	Replace A/C switch.

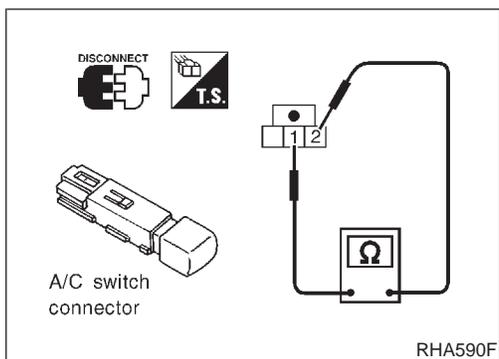
12	CHECK CIRCUIT CONTINUITY BETWEEN A/C SWITCH AND FAN SWITCH	
<p>Check circuit continuity between A/C switch harness connector M44 terminal No. 1 and fan switch harness connector M43 terminal No. 1.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">RHA617F</p> <p>Continuity should exist. If OK, check harness for short.</p> <p style="text-align: center;">OK or NG</p>		
OK	▶	GO TO 13.
NG	▶	Repair harness or connector.

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Magnet Clutch (Cont'd)

13	CHECK BODY GROUND CIRCUIT FOR FAN SWITCH	
Does continuity exist between fan switch harness connector M43 terminal No. 6 and ground?		
		
RHA588F		
Yes or No		
Yes	▶	GO TO 14.
No	▶	Repair harness or connector.

14	CHECK FAN SWITCH	
Refer to HA-189.		
OK or NG		
OK	▶	INSPECTION END
NG	▶	Replace fan switch.



ELECTRICAL COMPONENTS INSPECTION

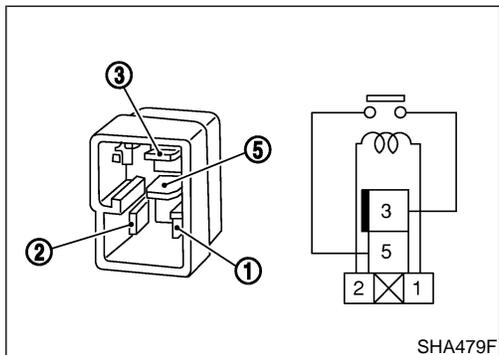
=NAHA0092

A/C Switch

NAHA0092S04

Check continuity between terminals at each switch position.

Switch condition	Terminal No.		Continuity
	(+)	(-)	
A/C ON	2	1	Yes
A/C OFF			No



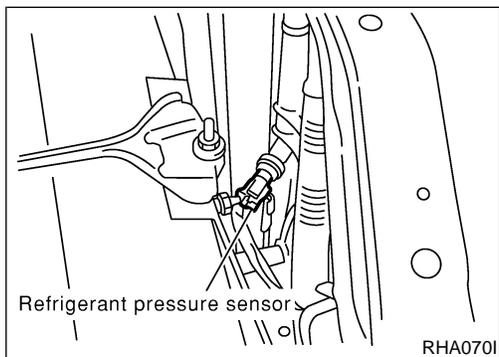
A/C Relay

NAHA0092S07

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.



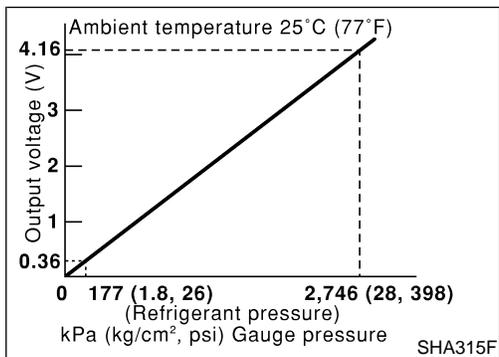
Refrigerant Pressure Sensor

NAHA0092S08

Make sure that higher A/C refrigerant pressure results in higher refrigerant-pressure sensor output voltage.

Check voltage between ECM harness terminal No. 70 and body ground.

Refer to EC-738, "Diagnostic Procedure".



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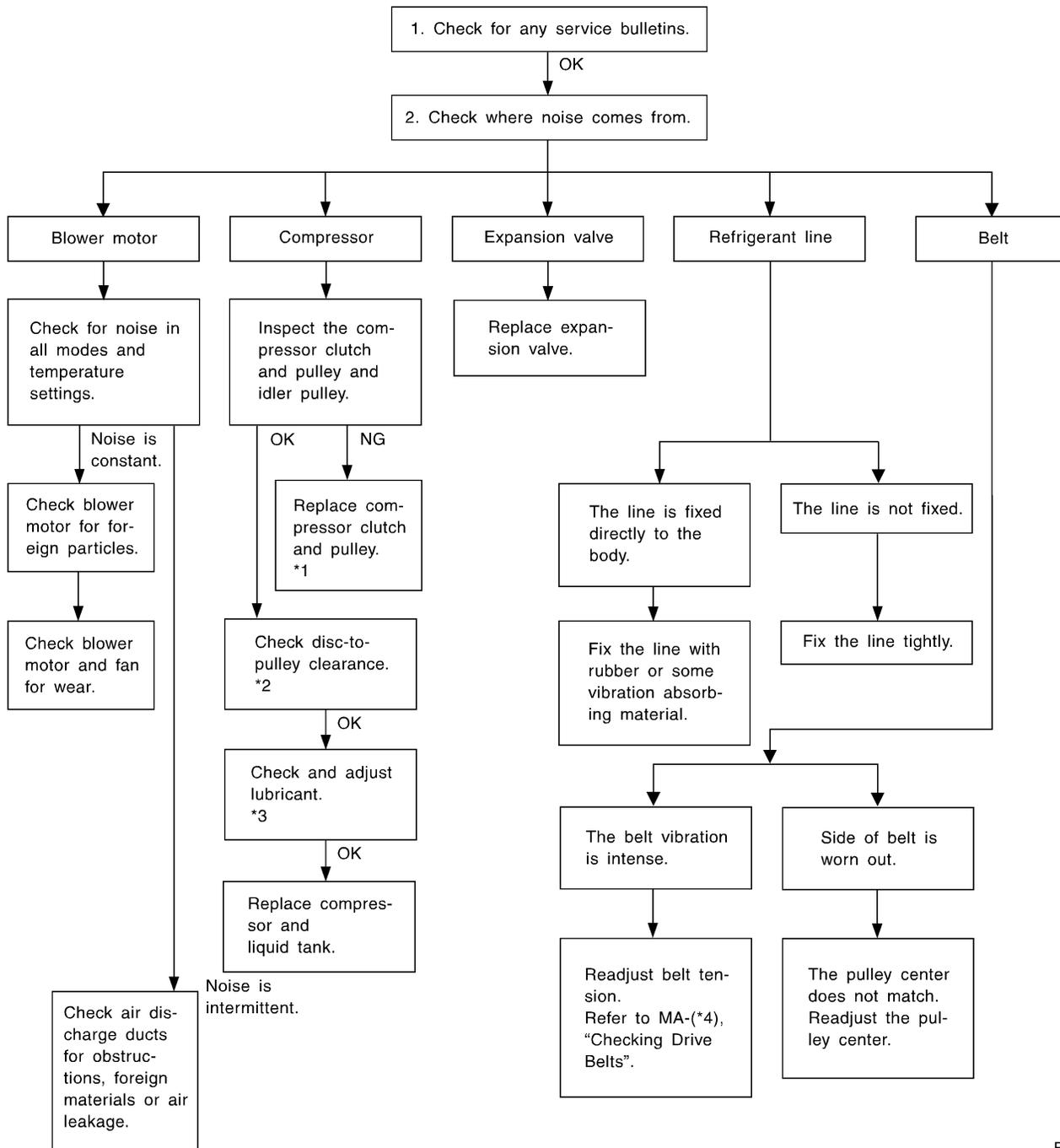
Noise
TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

=NAHA0080

Symptom:

- Noise

Inspection Flow



RHA586H

*1: HA-222

*3: HA-217

*4: MA-14

*2: HA-222

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

NAHA0094

NAHA0094S01

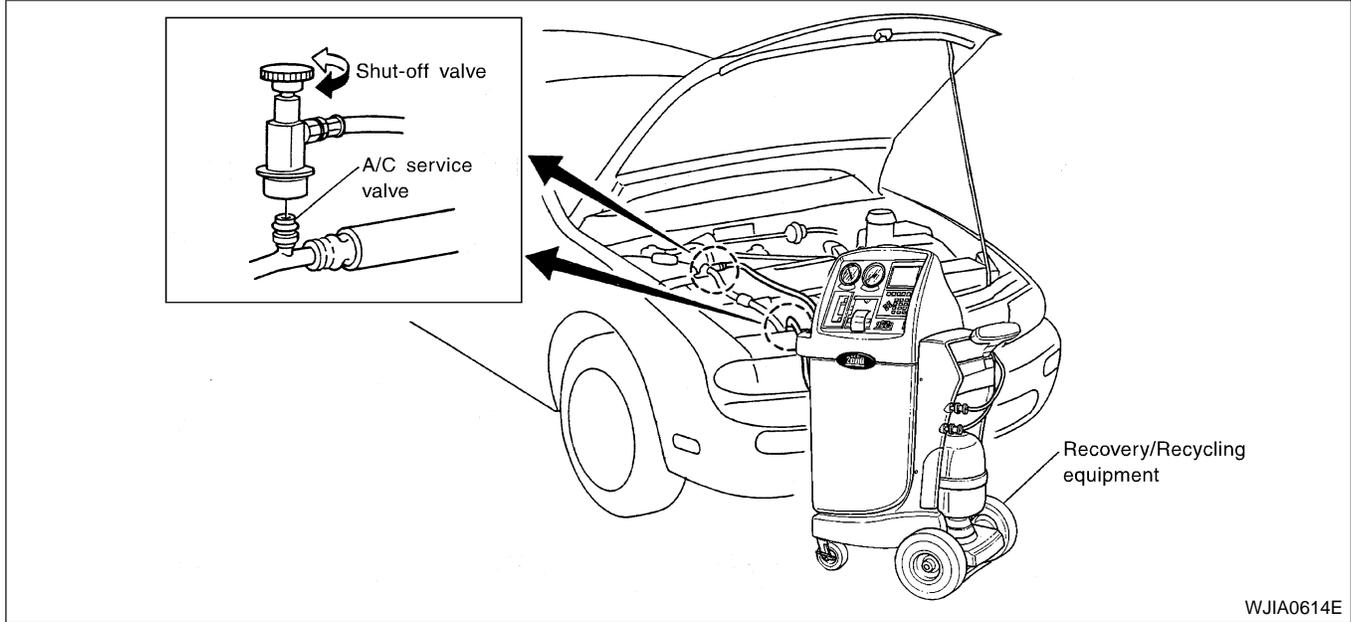
NAHA0094S0101

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

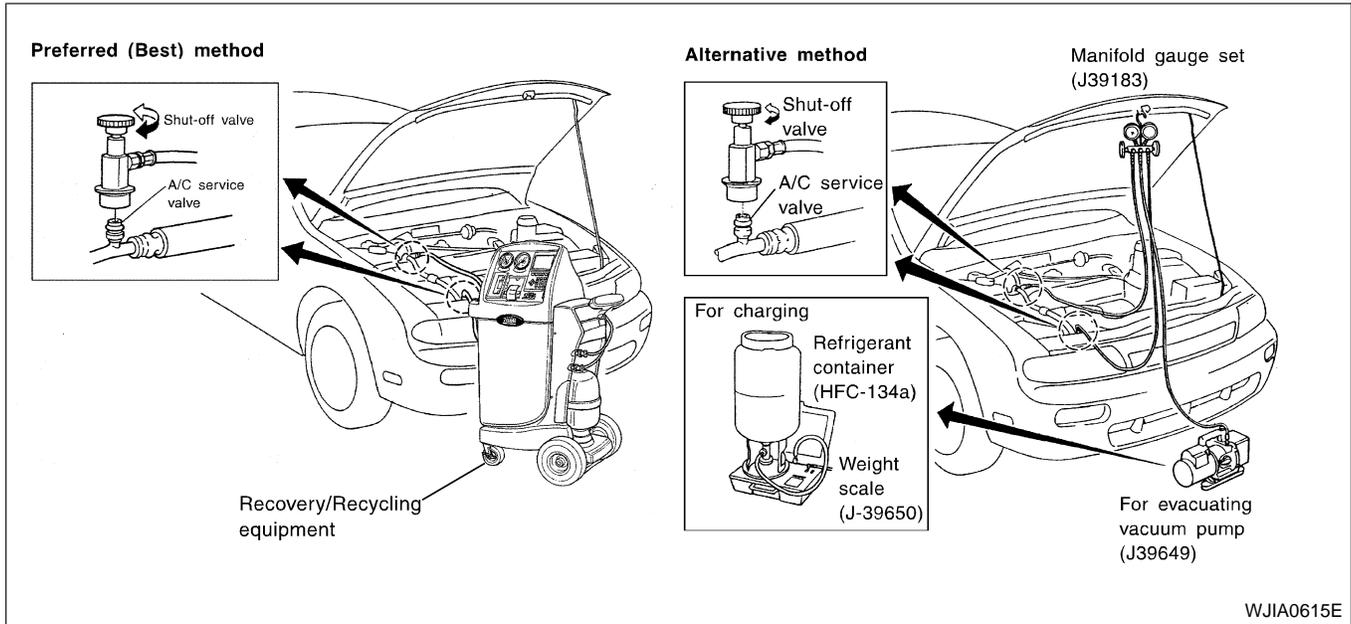
WARNING:

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 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.

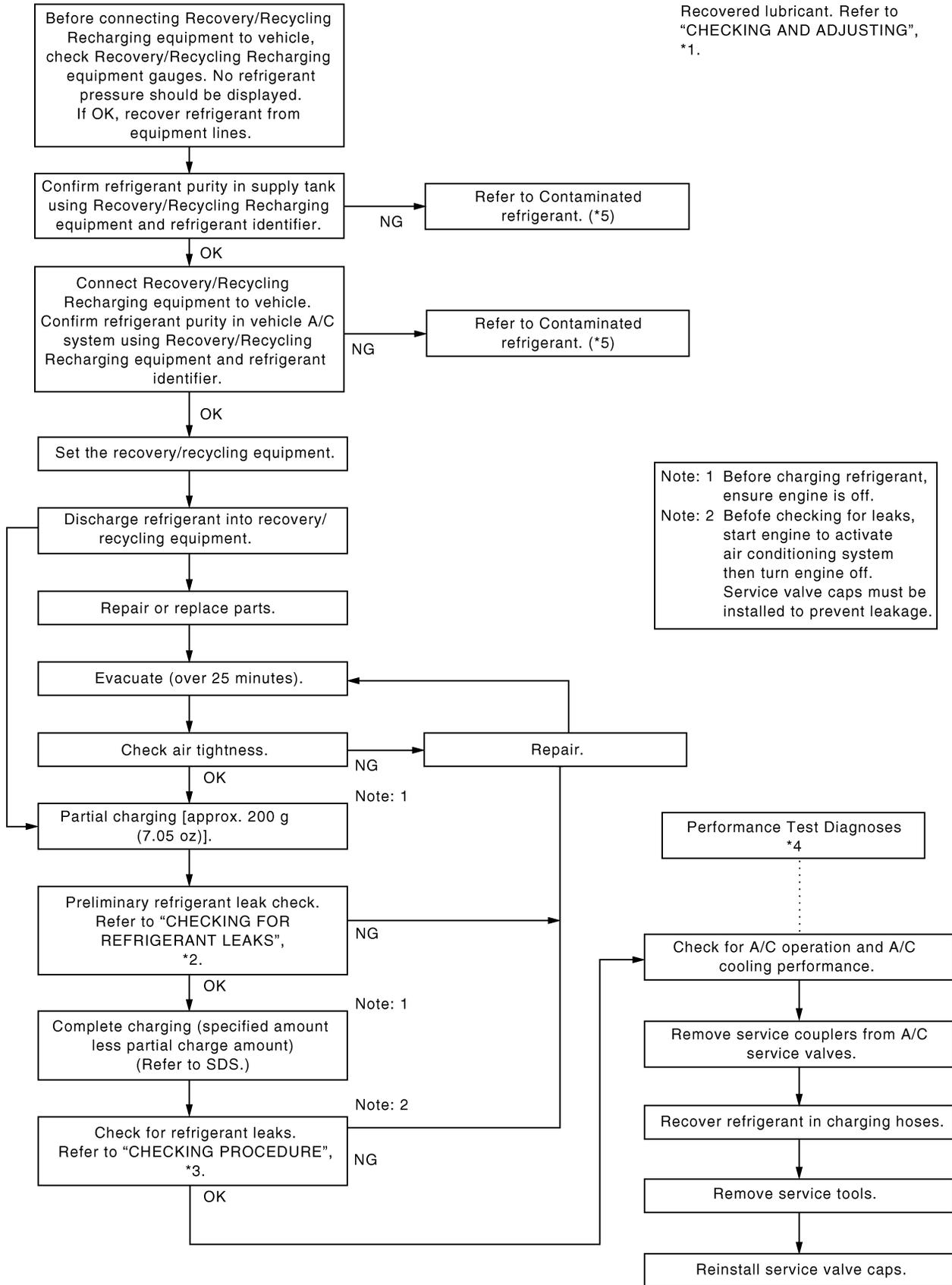


Evacuating System and Charging Refrigerant

NAHA0094S0102



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*1: HA-217
*2: HA-225

*3: HA-226
*4: HA-196

*5: HA-150

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Maintenance of Lubricant Quantity in Compressor

The lubricant in 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

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

CHECKING AND ADJUSTING

Adjust the lubricant quantity according to the test group shown below.

1	LUBRICANT RETURN OPERATION	
Can lubricant return operation be performed?		
<ul style="list-style-type: none"> ● A/C system works properly. ● There is no evidence of a large amount of lubricant leakage. 		
CAUTION:		
If excessive lubricant leakage is noted, do not perform the lubricant return operation.		
Yes or No		
Yes	▶	GO TO 2.
No	▶	GO TO 3.

2	PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS	
1. Start engine, and set the following conditions:		
● Test condition		
Engine speed: Idling to 1,200 rpm		
A/C switch: ON		
Blower speed: Max. position		
Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]		
2. Next item is for V-6 compressor. Connect the manifold gauge, and check that the high pressure side pressure is 588 kPa (6 kg/cm ² , 85 psi) or higher.		
If less than the reference level, attach a cover to the front face of the condenser to raise the pressure.		
3. Perform lubricant return operation for about 10 minutes.		
4. Stop engine.		
	▶	GO TO 3.

3	CHECK COMPRESSOR	
Should the compressor be replaced?		
Yes or No		
Yes	▶	GO TO HA-218.
No	▶	GO TO 4.

4	CHECK ANY PART	
Is there any part to be replaced? (Evaporator, condenser, liquid tank or in case there is evidence of a large amount of lubricant leakage.)		
Yes or No		
Yes	▶	GO TO HA-218.
No	▶	Carry out the A/C performance test.

Lubricant Adjusting Procedure for Components Replacement Except Compressor

NAHA0095S0201

After replacing any of the following major components, add the correct amount of lubricant to the system.

Amount of lubricant to be added

Part replaced	Lubricant to be added to system	Remarks
	Amount of lubricant ml (US fl oz, Imp fl oz)	
Evaporator	75 (2.5, 2.6)	—
Condenser	75 (2.5, 2.6)	—
Liquid tank	5 (0.2, 0.2)	Add if compressor is not replaced. *1
In case of refrigerant leak	30 (1.0, 1.1)	Large leak
	—	Small leak *2

*1: If compressor is replaced, addition of lubricant is included in the table.

*2: If refrigerant leak is small, no addition of lubricant is needed.

Lubricant Adjustment Procedure for Compressor Replacement

NAHA0095S0202

1. Before connecting Recovery/Recycling Recharging equipment to vehicle, check Recovery/Recycling Recharging equipment gauges. No refrigerant pressure should be displayed. If OK, recover refrigerant from equipment lines.
2. Confirm refrigerant purity in supply tank using Recovery/Recycling Recharging equipment and refrigerant identifier. If NG, refer to "CONTAMINATED REFRIGERANT", HA-150.
3. Connect Recovery/Recycling Recharging equipment to vehicle. Confirm refrigerant purity in vehicle A/C system using Recovery/Recycling Recharging equipment and refrigerant identifier. If NG, refer to "CONTAMINATED REFRIGERANT", HA-150.
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Remove the drain plug of the "old" (removed) compressor. Drain the lubricant into a graduated container and record the amount of drained lubricant.

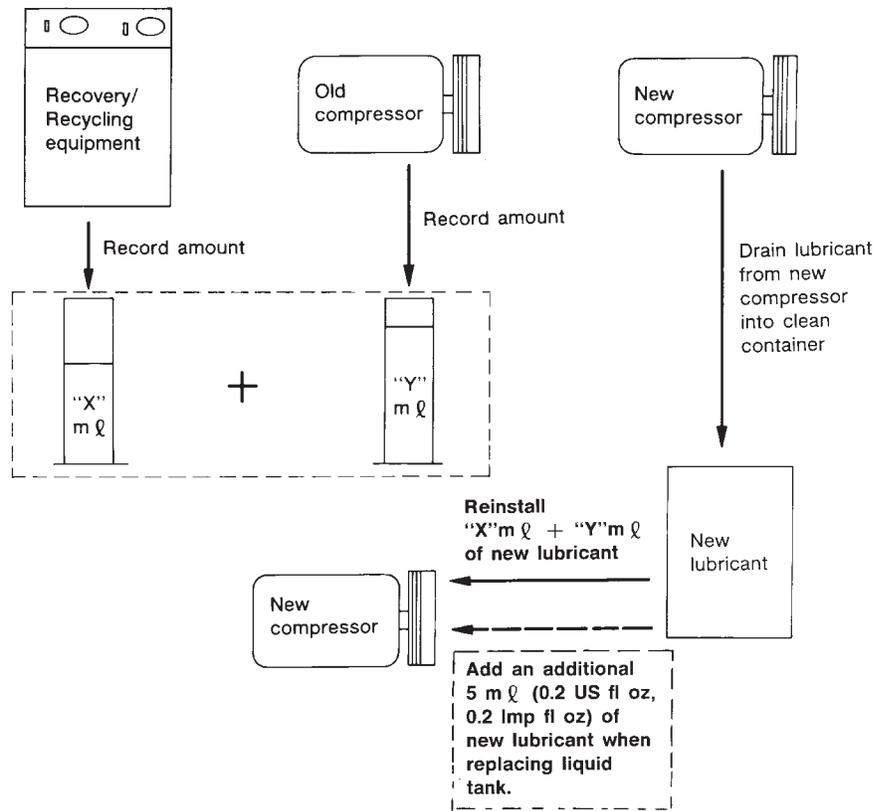
6. Remove the drain plug and drain the lubricant from the “new” compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from “old” compressor. Add this lubricant to “new” compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to “new” compressor through the suction port opening.
9. Torque the drain plug.

V-6 compressor:

18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)

10. If the liquid tank also needs to be replaced, add an additional 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.
Do not add this 5 mℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant if only replacing the compressor.

Lubricant adjusting procedure for compressor replacement

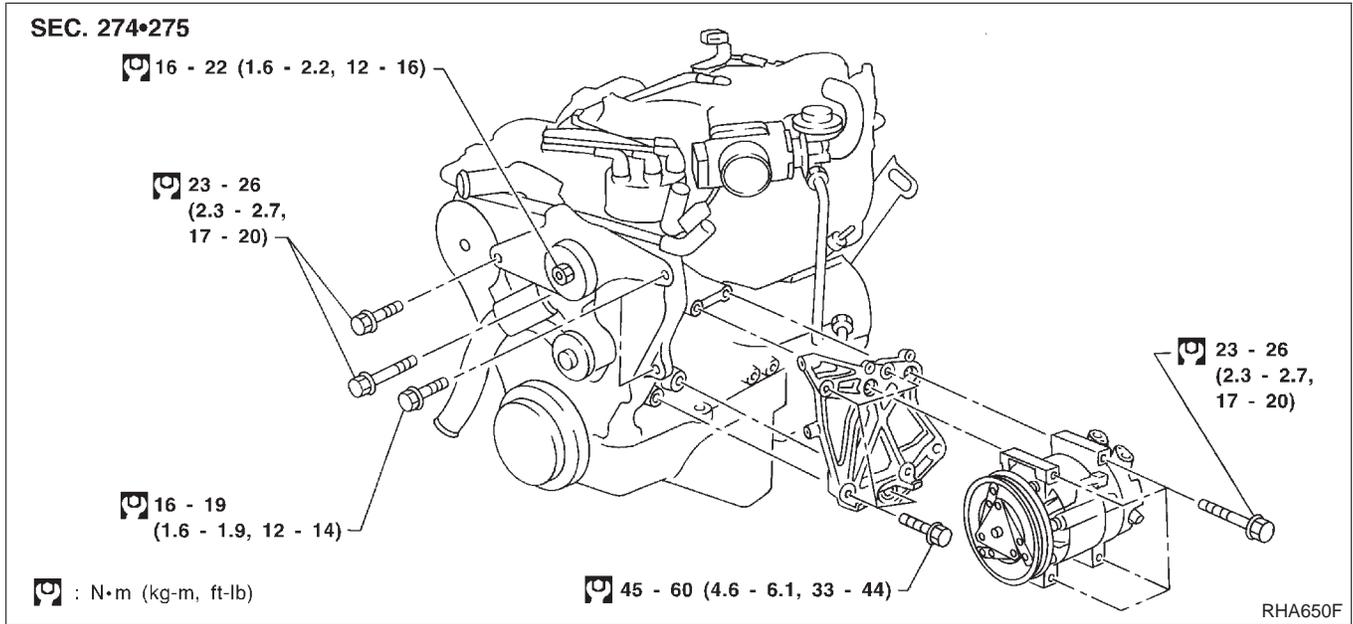


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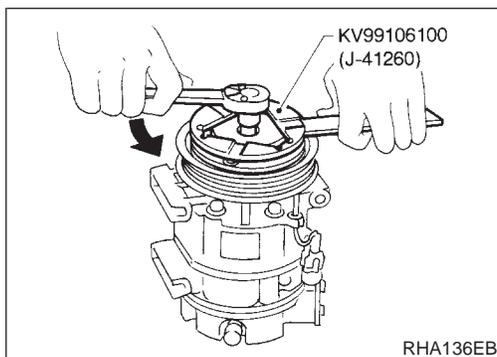
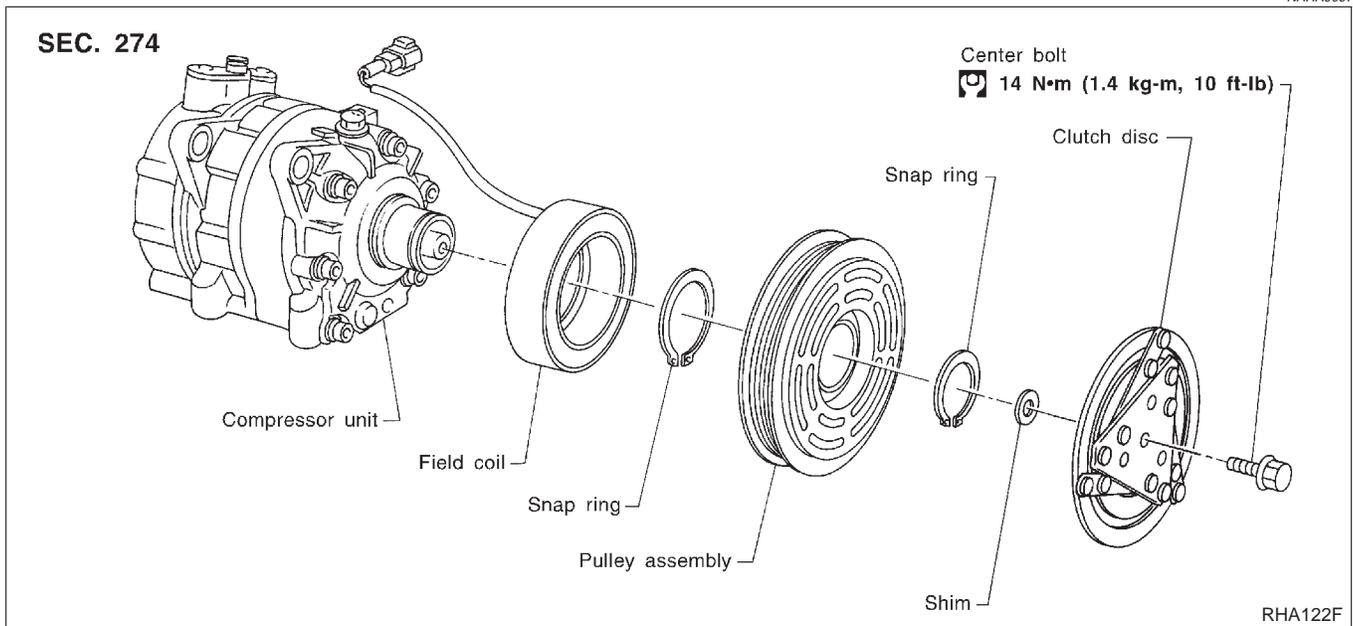
Compressor REMOVAL AND INSTALLATION

NAHA0096



Compressor Clutch OVERHAUL

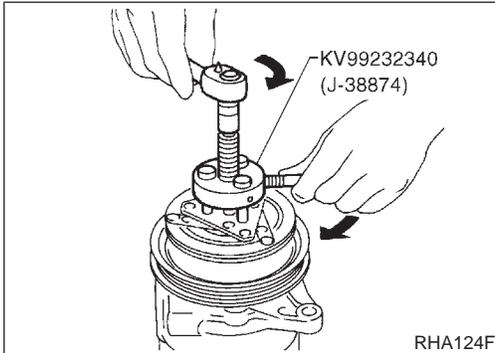
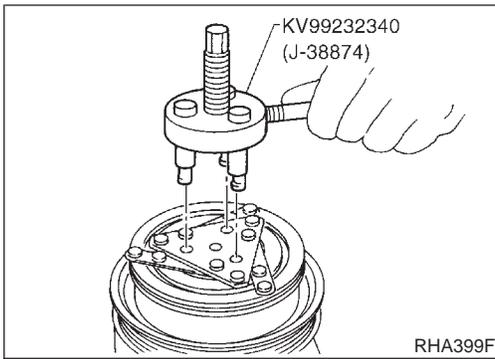
NAHA0097



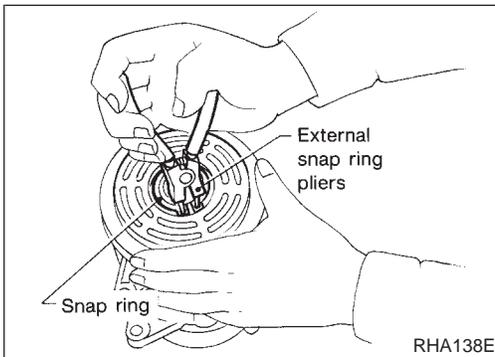
REMOVAL

NAHA0098

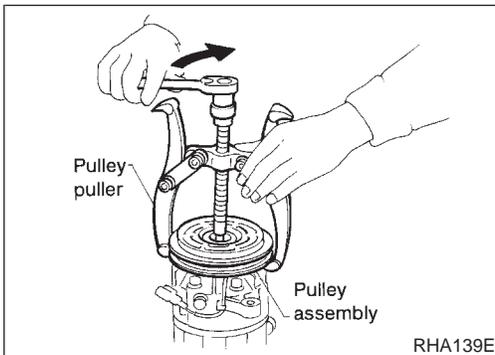
- When removing center bolt, hold clutch disc with clutch disc wrench.



- 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.

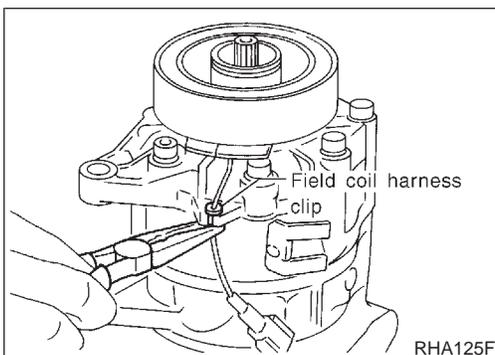


- Remove the snap ring using external snap ring pliers.



- 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 using a pair of pliers.

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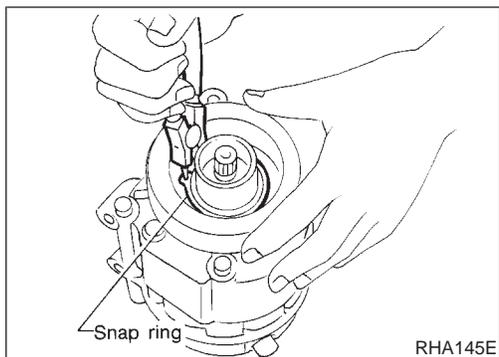
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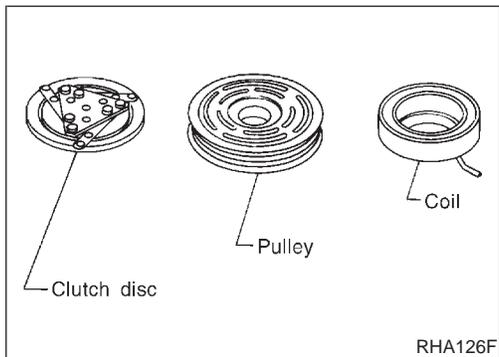
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Compressor Clutch (Cont'd)



- Remove the snap ring using external snap ring pliers.



INSPECTION

Clutch Disc

NAHA0099

NAHA0099S01

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

Pulley

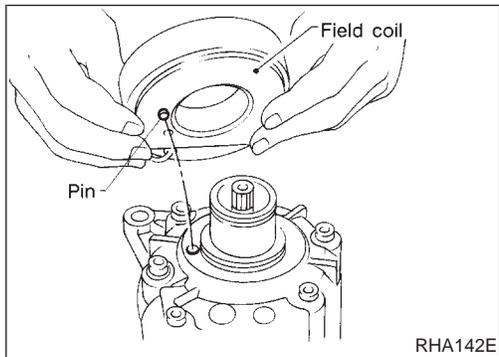
NAHA0099S02

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

Coil

NAHA0099S03

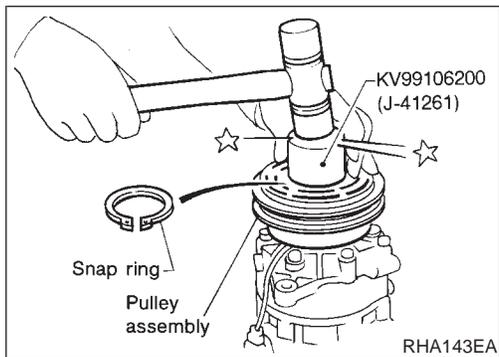
Check coil for loose connection or cracked insulation.



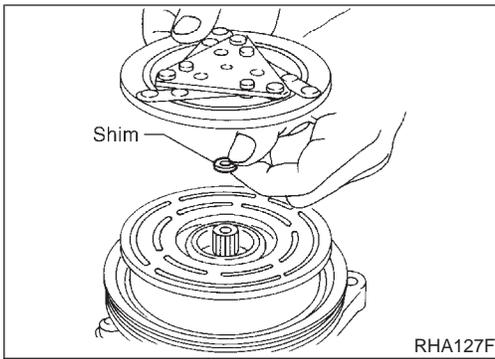
INSTALLATION

NAHA0100

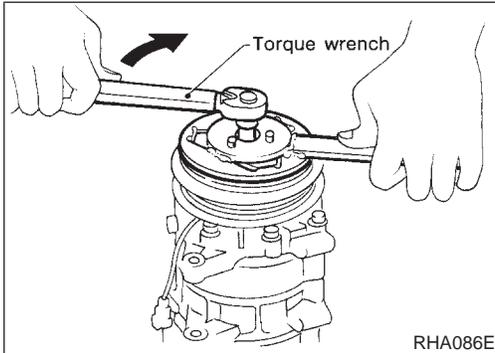
- Install the field coil.
Be sure to align the coil's pin with the hole in the compressor's front head.
- Install the field coil harness clip using a screwdriver.



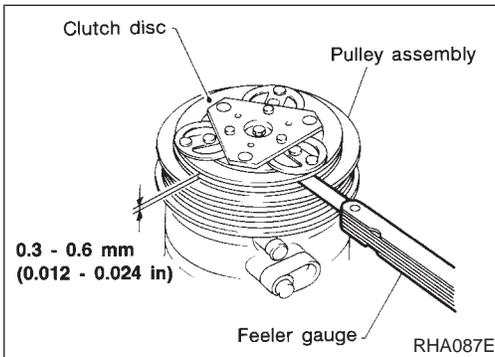
- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.



- 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

NAHA0100S01

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

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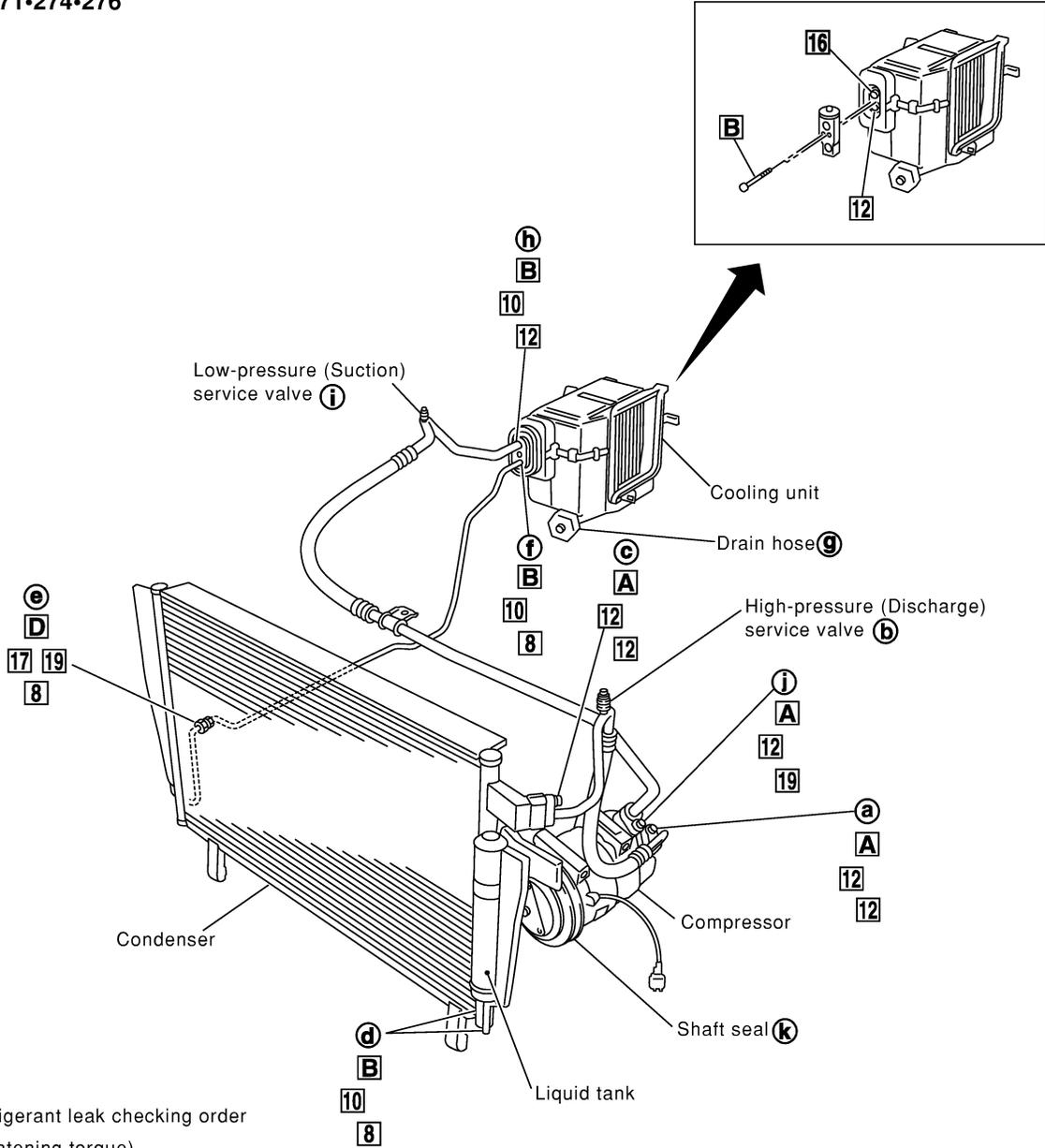
Refrigerant Lines

REMOVAL AND INSTALLATION

=NAHA0101

- Refer to page HA-152 regarding "Precautions for Refrigerant Connection".

SEC. 271•274•276



- : Refrigerant leak checking order
- : (Tightening torque)
- □ : (Wrench size)
- : (O-ring size)
- ⊗ : N•m (kg-m, in-lb)
- Ⓐ : 8 - 20 (0.8 - 2.0, 69 - 174)
- Ⓑ : 3 - 5 (0.3 - 0.5, 26 - 43)
- Ⓢ : N•m (kg-m, ft-lb)
- Ⓒ : 20 - 29 (2 - 3, 14 - 22)
- Ⓓ : 14 - 18 (1.4 - 1.8, 10 - 13)

RHA0721

Checking for Refrigerant Leaks

=NAHA0102

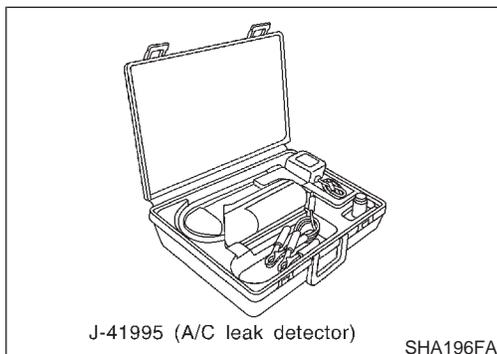
PRELIMINARY CHECK

NAHA0102S04

- Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector or fluorescent dye leak detector.
- If dye is observed, confirm the leak with an electronic refrigerant leak detector. It is possible a prior leak was repaired and not properly cleaned.
- When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.
- When searching for refrigerant leaks using an electronic leak detector, move the probe along the suspected leak area at 25 to 50 mm (1 to 2 in) per second and no further than 1/4 inch from the component.

NOTE:

Moving the electronic leak detector probe slower and closer to the suspected leak area will improve the chances of finding a leak.



J-41995 (A/C leak detector)

SHA196FA

Electronic Refrigerant Leak Detector

NAHA0254

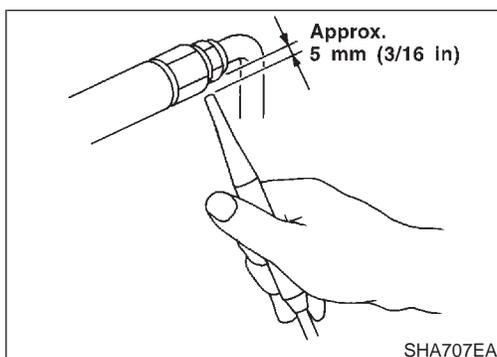
PRECAUTIONS FOR HANDLING LEAK DETECTOR

NAHA0254S01

When performing a refrigerant leak check, use a J-41995 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 lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean. Clean with a dry cloth or blow off with shop air.**
- **Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.**



SHA707EA

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

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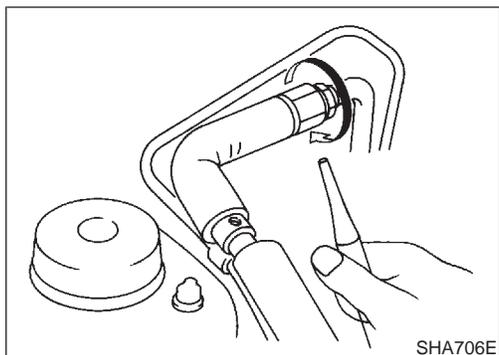
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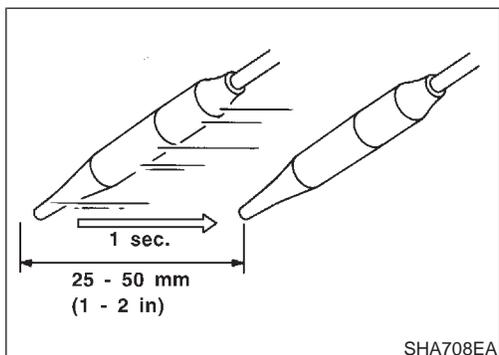
EL

IDX

Electronic Refrigerant Leak Detector (Cont'd)



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



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

CHECKING PROCEDURE

NAHA0254S02

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

1. Turn engine off.
2. Connect a suitable A/C manifold gauge set to the A/C service ports.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.52 kg/cm², 50 psi) above 16°C (61°F). If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm², 50 psi).

4. Conduct the leak test from the high side (compressor discharge **a** to evaporator inlet **f**) to the low side (evaporator drain hose **g** to shaft seal **k**). Refer to HA-224. 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 tube fitting.
- **Service valves**
Check all around the service valves. Ensure service valve caps are secured on the service valves (to prevent leaks).

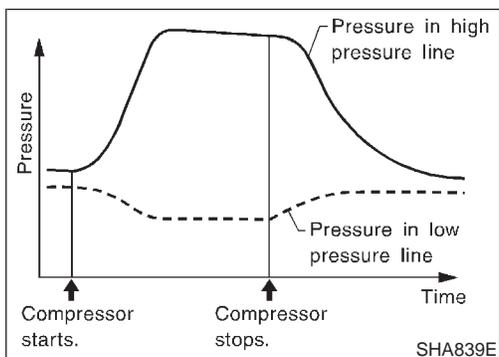
NOTE:

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

● **Cooling unit (Evaporator)**

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose. Keep the probe inserted for at least ten seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start engine.
8. Set the A/C control as follows:
 - 1) A/C switch ON.
 - 2) Ventilation (VENT)
 - 3) Recirculation switch ON
 - 4) Max cold temperature
 - 5) Fan speed high
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again following steps 4 through 6 above.



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

11. Before connecting Recovery/Recycling Recharging equipment to vehicle, check Recovery/Recycling Recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using Recovery/Recycling Recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using Recovery/Recycling Recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery

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- equipment. Repair the leaking fitting or component as necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm no refrigerant leaks.
 16. Conduct A/C performance test to ensure system works properly.

Fluorescent Dye Leak Detector

PRECAUTIONS FOR FLUORESCENT DYE LEAK DETECTION

- The fluorescent dye leak detector is not a replacement for an electronic refrigerant leak detector. The fluorescent dye leak detector should be used in conjunction with an electronic refrigerant leak detector (J-41995) to pinpoint refrigerant leaks. NAHA0266
- For your safety and your customer's satisfaction, read and follow all manufacturer's operating instructions and precautions prior to performing the work.
- Refer to "Precautions for Leak Detection Dye", HA-151.

CHECKING SYSTEM FOR LEAKS USING THE FLUORESCENT LEAK DETECTOR

1. Check A/C system for leaks using the UV lamp and safety goggles (J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or TXV) leak. NAHA0267
2. If the suspected area is difficult to see, use an adjustable mirror or wipe the area with a clean shop rag or cloth, then check the cloth with the UV lamp for dye residue.
3. Confirm any suspected leaks with an approved electronic refrigerant leak detector.
4. After the leak is repaired, remove any residual dye using dye cleaner (J-43872) to prevent future misdiagnosis.
5. Perform a system performance check and verify the leak repair with an approved electronic refrigerant leak detector.

DYE INJECTION

(This procedure is only necessary when re-charging the system or when the compressor has seized and was replaced.)

Refer to "Precautions for Leak Detection Dye", HA-151. NAHA0268

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.52 kg/cm², 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (J-41459).
3. Connect the injector tool to the A/C LOW PRESSURE side service fitting.
4. Start engine and switch A/C ON.
5. With the A/C operating (compressor running), inject one bottle (1/4 ounce / 7.4 cc) of fluorescent dye through the low-pressure service valve using dye injector tool J-41459 (refer to the manufacturer's operating instructions).

- 6. With the engine still running, disconnect the injector tool from the service fitting.

GI

CAUTION:

Be careful not to allow dye to spray or drip when disconnecting the injector from the system.

MA

NOTE:

If repairing the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.

EM

- 7. Operate the A/C system for a minimum of 20 minutes to mix the dye with the system oil. Depending on the leak size, operating conditions and location of the leak, it may take from minutes to days for the dye to penetrate a leak and become visible.

LC

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FE

CL

MT

AT

Belt

TENSION ADJUSTMENT

- Refer to MA-14, "Checking Drive Belts".

NAHA0103

TF

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Manual

COMPRESSOR

NAHA0105

Model		Calsonic Kansei make V-6
Type		V-6 variable displacement
Displacement cm ³ (cu in)/rev.	Max.	184 (11.228)
	Min.	14.5 (0.885)
Cylinder bore x stroke mm (in)		37 (1.46) x [2.3 - 28.6 (0.091 - 1.126)]
Direction of rotation		Clockwise (viewed from drive end)
Drive belt		Poly V

LUBRICANT

NAHA0106

Model		Calsonic Kansei make V-6
Name		Nissan A/C System Oil Type S
Part number*		KLH00-PAGSO
Capacity mℓ (US fl oz, Imp fl oz)	Total in system	180 (6.1, 6.3)
	Compressor (Service part) charging amount	180 (6.1, 6.3)

*: Always check with the Parts Department for the latest parts information.

REFRIGERANT

NAHA0107

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.45 (0.99)

ENGINE IDLING SPEED (WHEN A/C IS ON)

NAHA0108

- Refer to EC-758, "Idle Speed and Ignition Timing".

BELT TENSION

NAHA0109

- Refer to MA-14, "Checking Drive Belts".