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Supplemental Restraint System (SRS) "AIR BAG"

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

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance 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 are covered with yellow insulation either just before the harness connectors or for the complete harness, for easy identification.

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

NAHA0002

WARNING:

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

General Refrigerant Precautions

NAHA0003

WARNING:

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

Precautions for Refrigerant Connection

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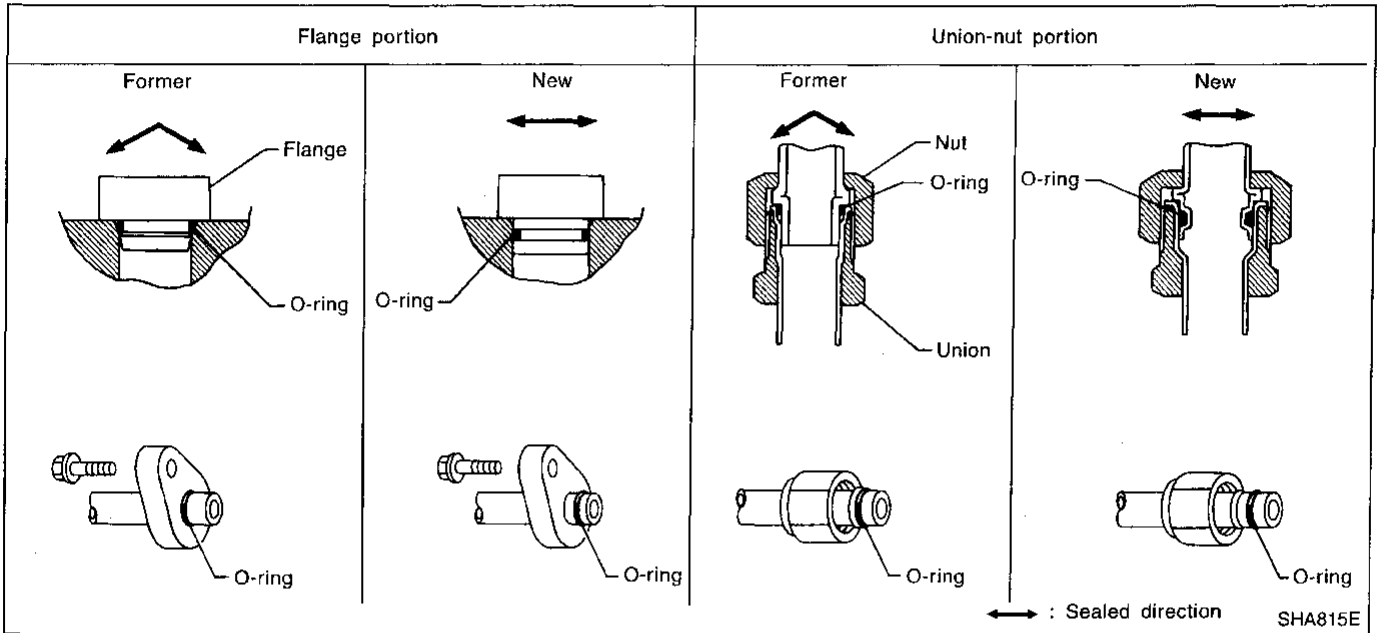
A new type refrigerant connection has been introduced to all refrigerant lines except the following portion.

- Expansion valve to cooling unit

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

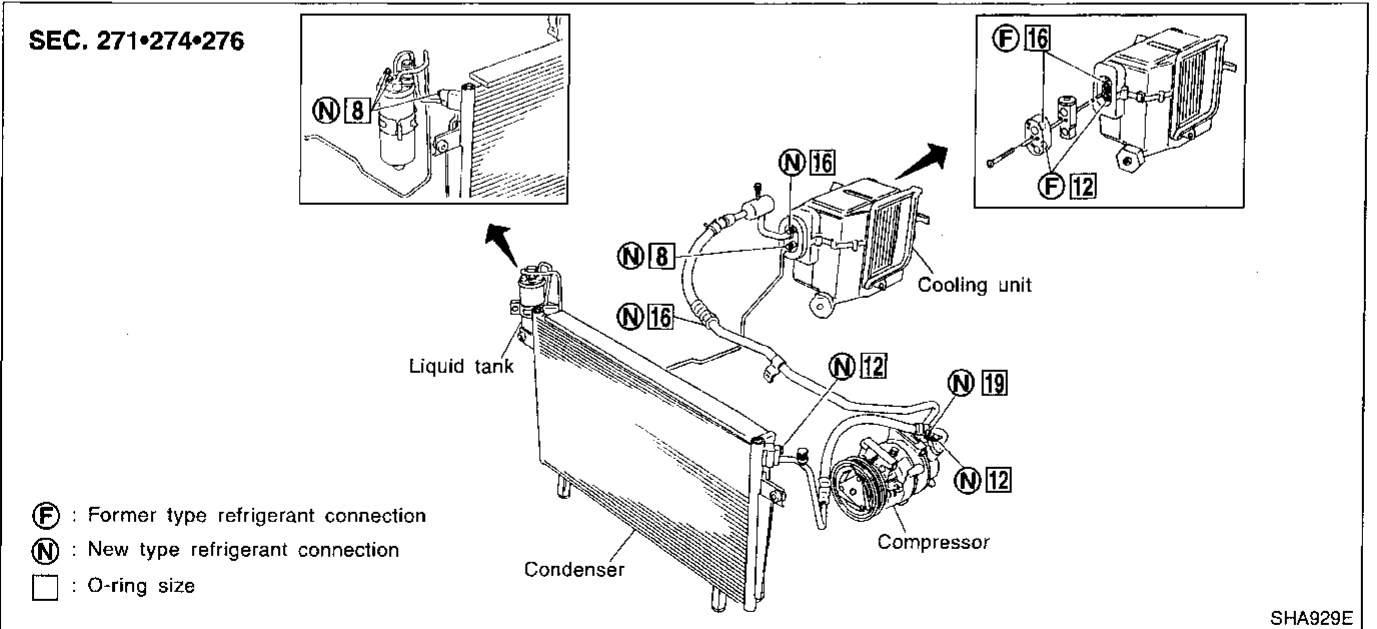
NAHA0004S01

- 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

NAHA0004S02

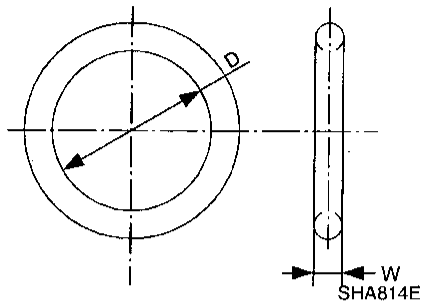


CAUTION:

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

NAHA0004S0201



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)

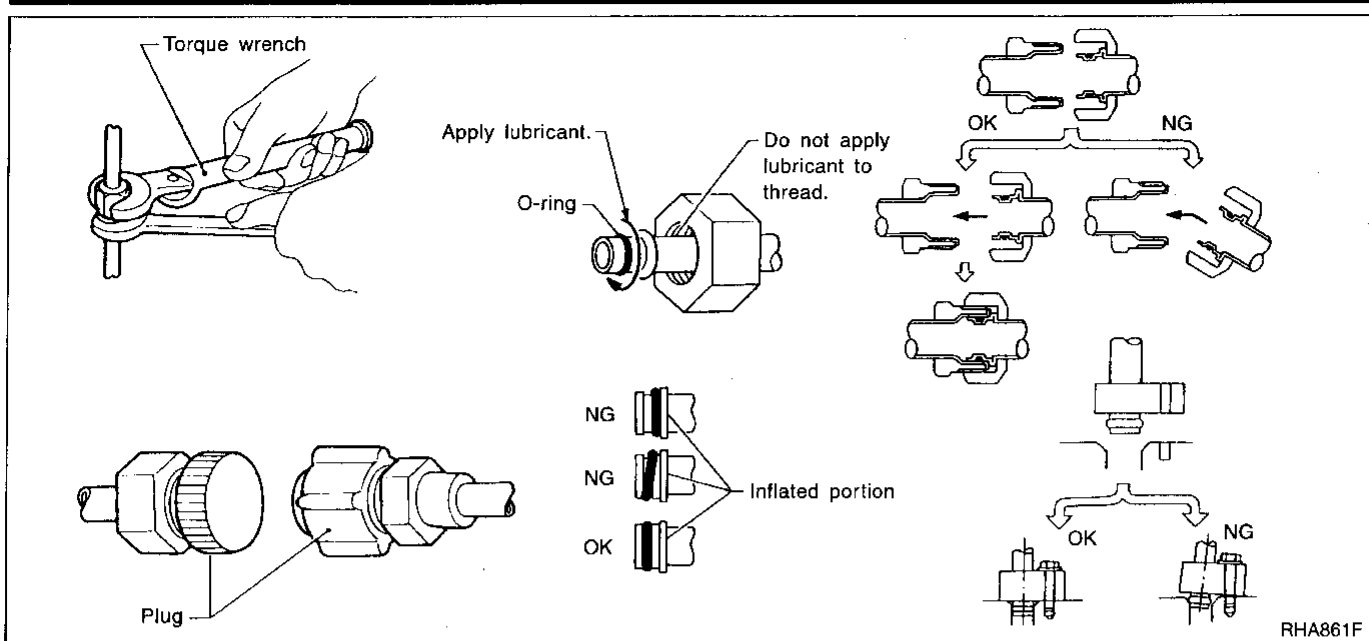
WARNING:

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.

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

NAHA0005

- 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-87.
- 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

NAHA0006

RECOVERY/RECYCLING EQUIPMENT

NAHA0006S01

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

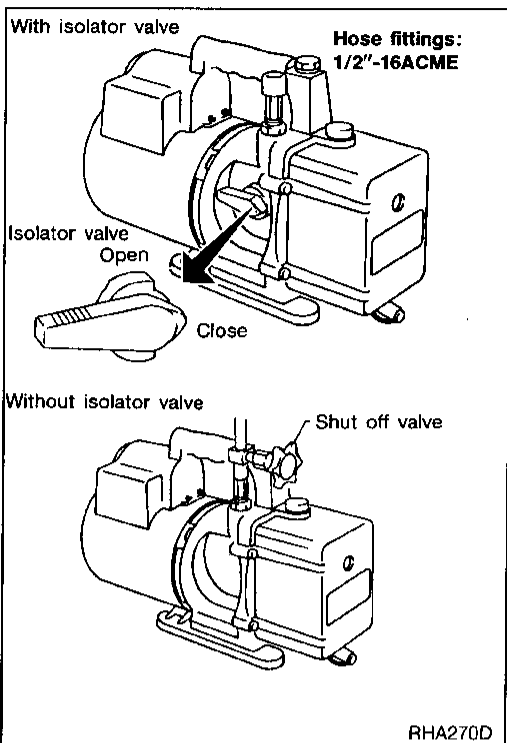
NAHA0006S02

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

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PRECAUTIONS

Precautions for Service Equipment (Cont'd)



VACUUM PUMP

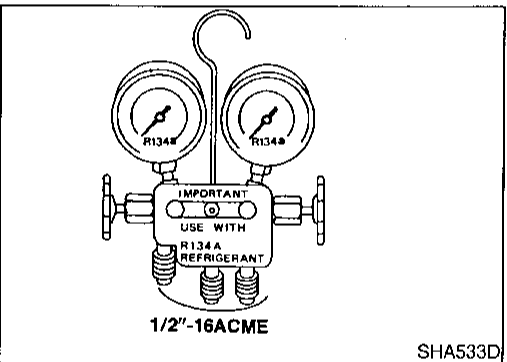
NAHA0006S03

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.

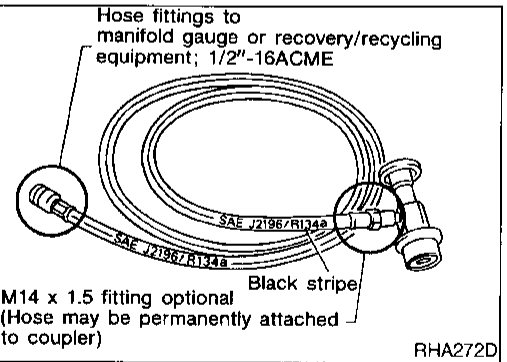
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



MANIFOLD GAUGE SET

NAHA0006S04

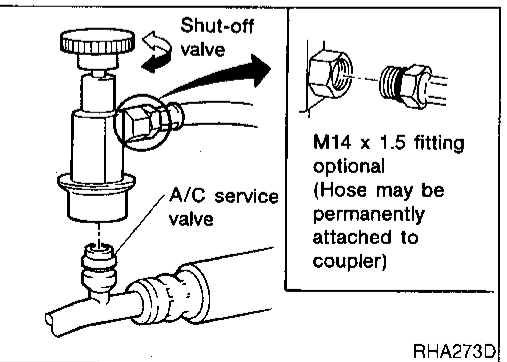
Be certain that the gauge face indicates R-134a or 134a. Make sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified lubricant.



SERVICE HOSES

NAHA0006S05

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.

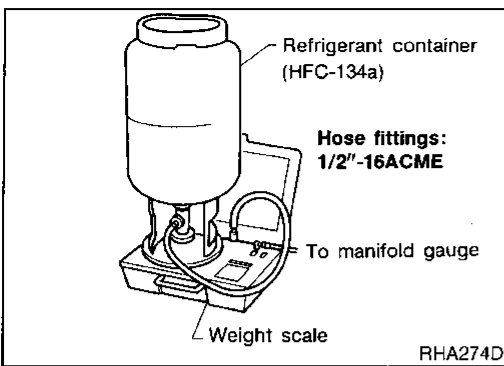


SERVICE COUPLERS

NAHA0006S06

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

NAHA0006S07

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.

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CHARGING CYLINDER

NAHA0006S08

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.

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Wiring Diagrams and Trouble Diagnosis

NAHA0007

When you read wiring diagrams, refer to the followings:

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

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When you perform trouble diagnosis, refer to the followings:

- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

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Special Service Tools

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

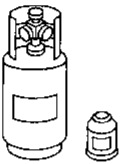

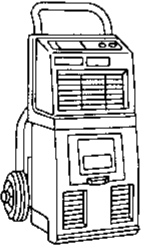
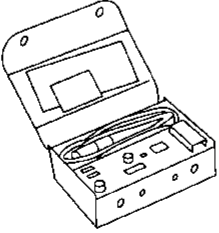
Tool number (Kent-Moore No.) Tool name	Description
KV99106100 (J-41260) Clutch disc wrench	<div style="display: flex; justify-content: space-between;"> <div data-bbox="406 525 470 556">NT232</div> <div data-bbox="519 336 836 514"> </div> <div data-bbox="941 325 1185 367">Removing center bolt</div> </div> <div style="display: flex; justify-content: space-between; margin-top: 20px;"> <div data-bbox="406 1039 470 1071">NT378</div> <div data-bbox="446 567 893 1018"> </div> </div> <p data-bbox="487 756 812 892">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>
KV99232340 (J-38874) or KV992T0001 (—) Clutch disc puller	<div style="display: flex; justify-content: space-between;"> <div data-bbox="406 1302 470 1333">NT376</div> <div data-bbox="519 1081 812 1291"> </div> <div data-bbox="941 1071 1185 1113">Removing clutch disc</div> </div>
KV99106200 (J-41261) Pulley installer	<div style="display: flex; justify-content: space-between;"> <div data-bbox="406 1480 470 1512">NT235</div> <div data-bbox="617 1354 714 1480"> </div> <div data-bbox="941 1333 1185 1375">Installing pulley</div> </div>

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

=NAHA0009

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 failure will result.

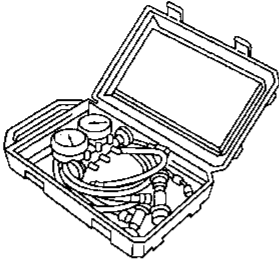

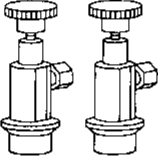

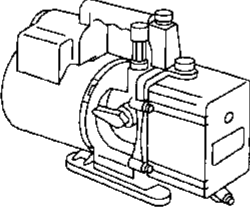
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Tool number (Kent-Moore No.) Tool name	Description
HFC-134a (R-134a) refrigerant	 <p>Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size</p> <ul style="list-style-type: none"> ● large container 1/2"-16 ACME <p>NT196</p>
KLH00-PAGSO () Nissan A/C System Oil Type S	 <p>Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)</p> <p>NT197</p>
(J-39500-NI) Recovery/Recycling Recharging equipment (ACR4)	 <p>Function: Refrigerant Recovery and Recycling and Recharging</p> <p>NT195</p>
(J-39400) Electrical leak detector	 <p>Power supply:</p> <ul style="list-style-type: none"> ● DC 12V (Cigarette lighter) <p>NT198</p>

PREPARATION

AUTO

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

Tool number (Kent-Moore No.) Tool name	Description	
(J-39183) Manifold gauge set (with hoses and couplers)		Identification: <ul style="list-style-type: none"> ● The gauge face indicates R-134a. Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME
	NT199	
Service hoses <ul style="list-style-type: none"> ● High side hose (J-39501-72) ● Low side hose (J-39502-72) ● Utility hose (J-39476-72) 		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
	NT201	
Service couplers <ul style="list-style-type: none"> ● High side coupler (J-39500-20) ● Low 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.
	NT202	
(J-39650) Refrigerant weight scale		For measuring of refrigerant Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME
	NT200	
(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
	NT203	

Refrigeration System

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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.

NAHA0010

NAHA0010S01

Freeze Protection

Under Normal Operating Conditions, When The A/C Is Switched On, The Compressor Runs Continuously, And The Evaporator Pressure, And Therefore Temperature, Is Controlled By The V-6 Variable Displacement Compressor To Prevent Freeze Up.

NAHA0010S02

Refrigerant System Protection

Dual-Pressure Switch

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

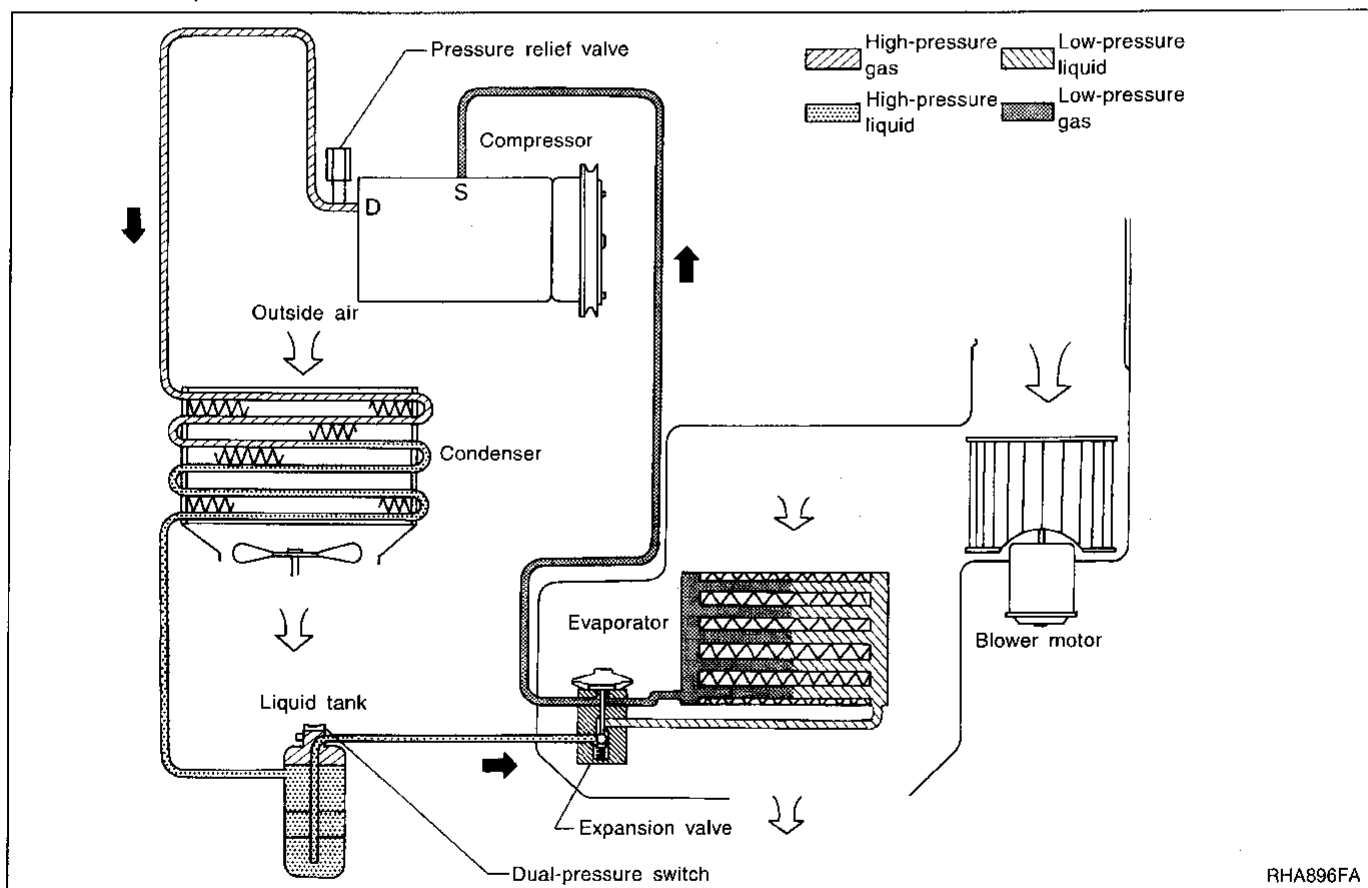
NAHA0010S03

NAHA0010S0301

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 abnormal level [more than 3,727 kPa (38 kg/cm², 540 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.

NAHA0010S0302



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

-NAHA0011

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.

DESCRIPTION

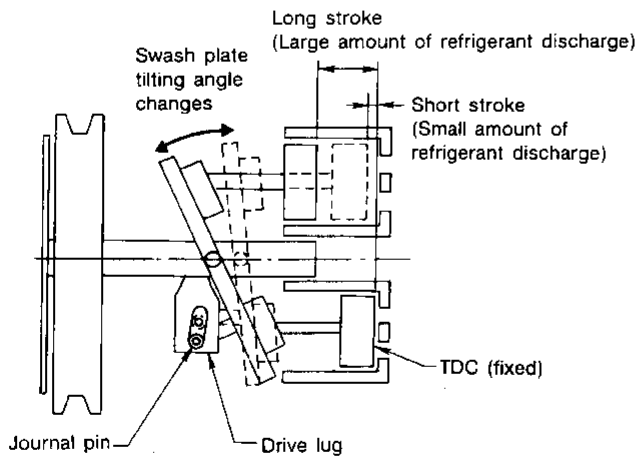
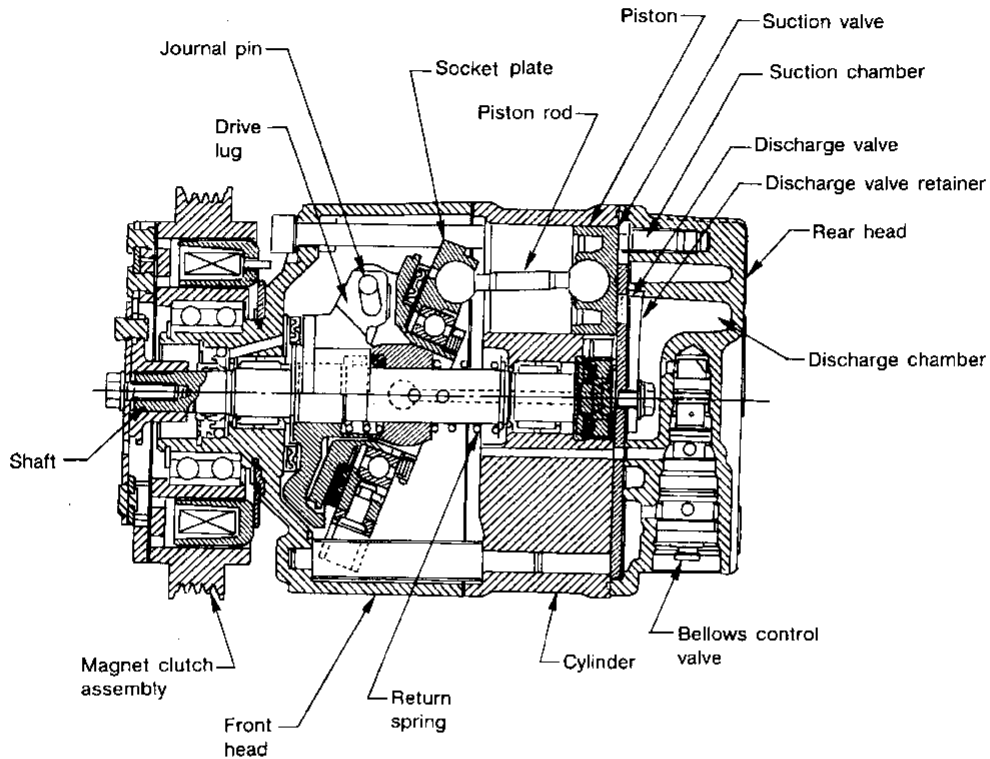
General

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

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

-NAHA0110

NAHA0110S01



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)

RHA037DB

Operation**1. Operation Control Valve**

-NAHA0110S02

NAHA0110S0201

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

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

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

2. Maximum Cooling

NAHA0110S0202

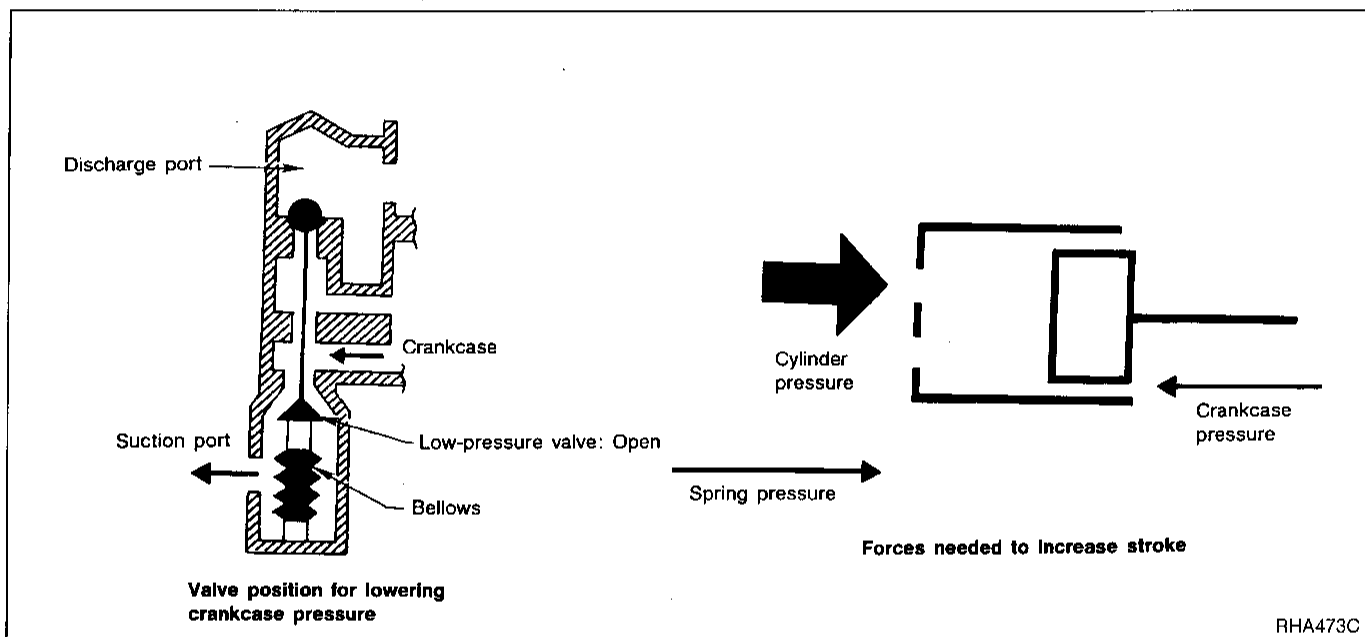
Refrigerant pressure on the low-pressure side increases with an increase in heat loads.

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

This causes the following pressure changes:

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

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



3. Capacity Control

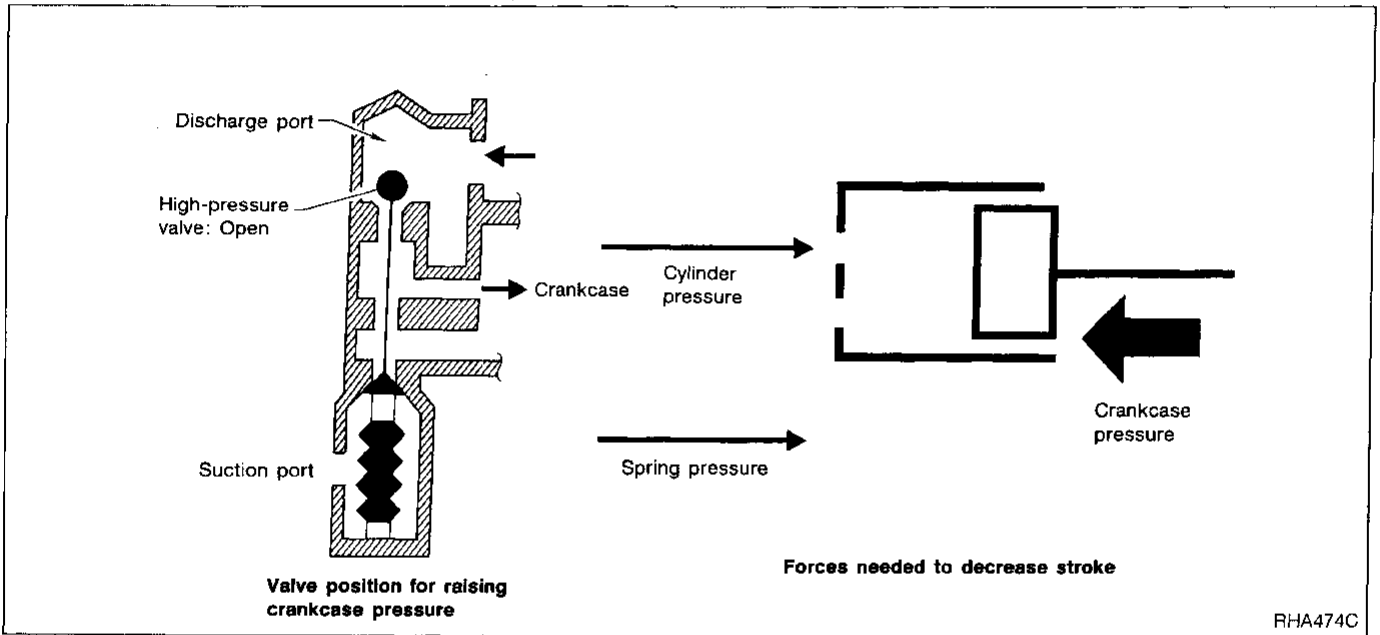
-NAHA011050203

- 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 swash plate, and is generated by the pressure difference before and behind the piston.

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



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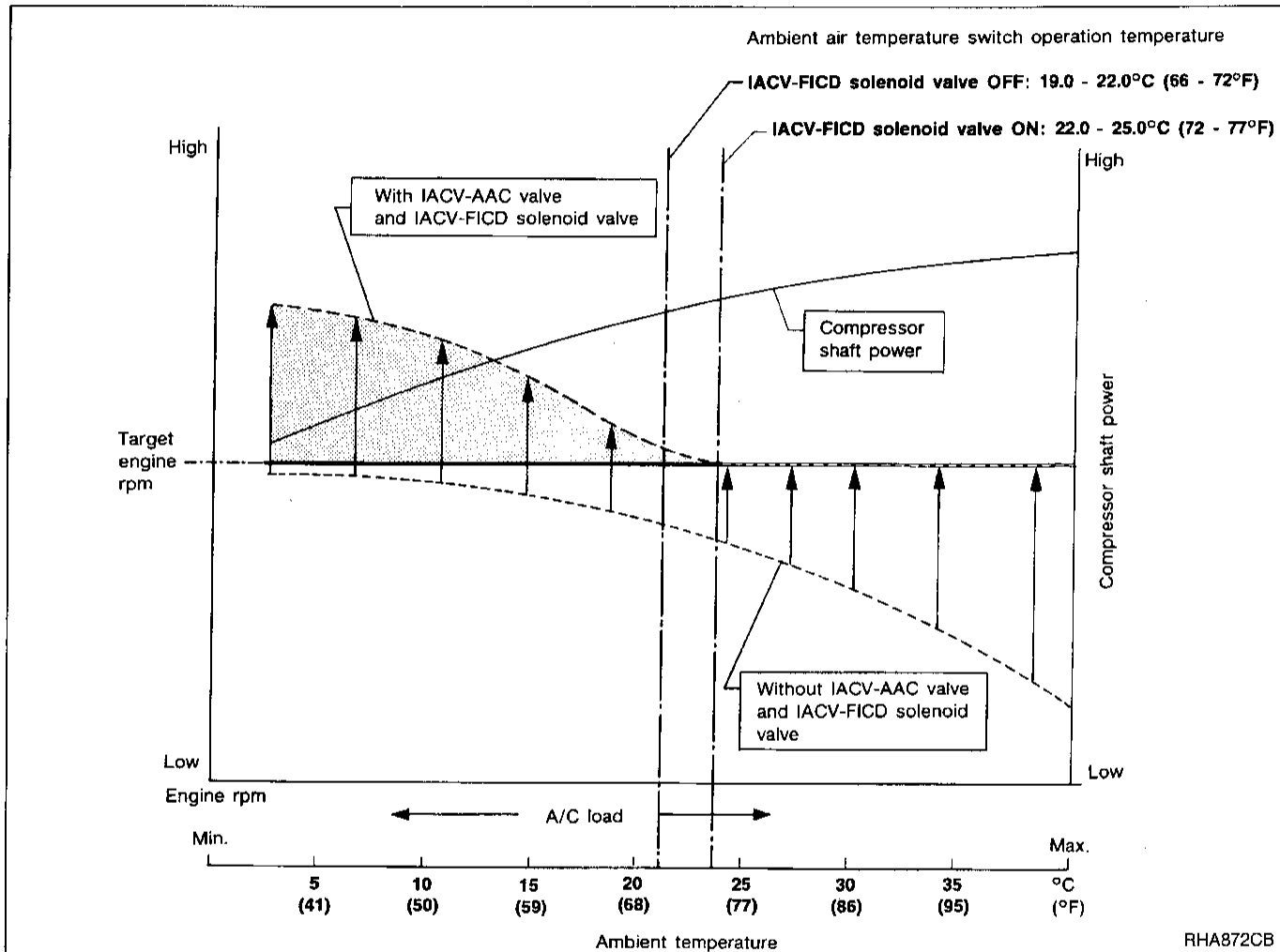
FICD CONTROL SYSTEM

-NAHA0111

General

NAHA0111S01

With the variable displacement compressor, the compressor power requirements differ from when the ambient temperature is high and maximum cooling effect is required (i.e., when refrigerating load is large and the tilt angle of the compressor swash plate is large) to when the ambient temperature is low and less cooling effect is required (i.e., when refrigerating load is small and the tilt angle of the swash plate is small). To correspond correctly to this change in compressor power requirements, it is also necessary to control the operation of the IACV-FICD according to the refrigerating load. Thus, an ambient air temperature switch is provided on the front face of the condenser so that the IACV-FICD can be controlled depending on the ambient temperature.



RHA872CB

Operation

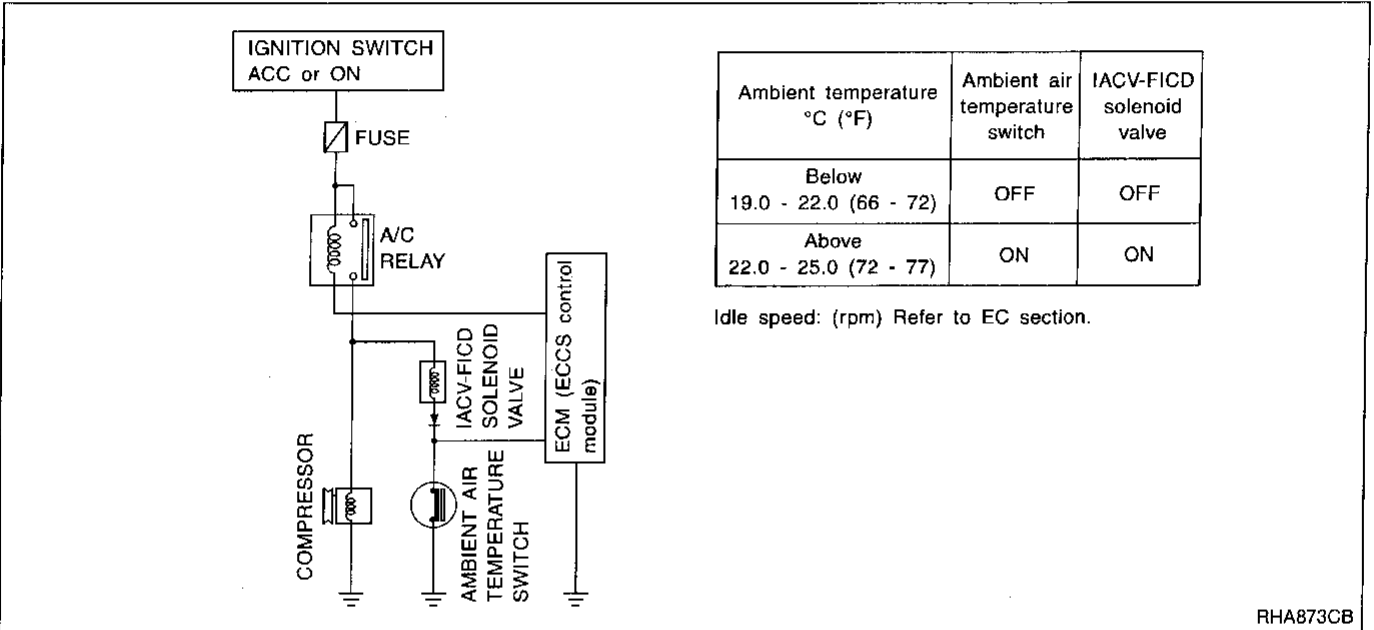
-NAHA0111S02

When the air conditioner is OFF, the ECM (ECCS control module) detects the load applied to the engine, and controls the IACV-AAC valve to adjust the engine idling speed to the appropriate rpm by supplying additional air from the IACV-AAC valve.

When the air conditioner is ON (A/C relay is ON), and when the ambient air temperature switch is ON (this switch turns ON automatically when the ambient temperature rises to approx. 25.0°C (77°F) or higher), the IACV-FICD solenoid valve is energized and additional air is supplied to the engine.

If the appropriate engine speed is not reached, the IACV-AAC valve supplies the additional air required to increase the engine rpm.

If the ambient air temperature switch is OFF [this switch turns OFF when the ambient temperature is below 19.0°C (66°F)] even when the air conditioner is ON (A/C relay is ON), the IACV-FICD solenoid valve is deenergized, and the idling speed is controlled so that the appropriate rpm can be achieved by operation of the IACV-AAC valve only.

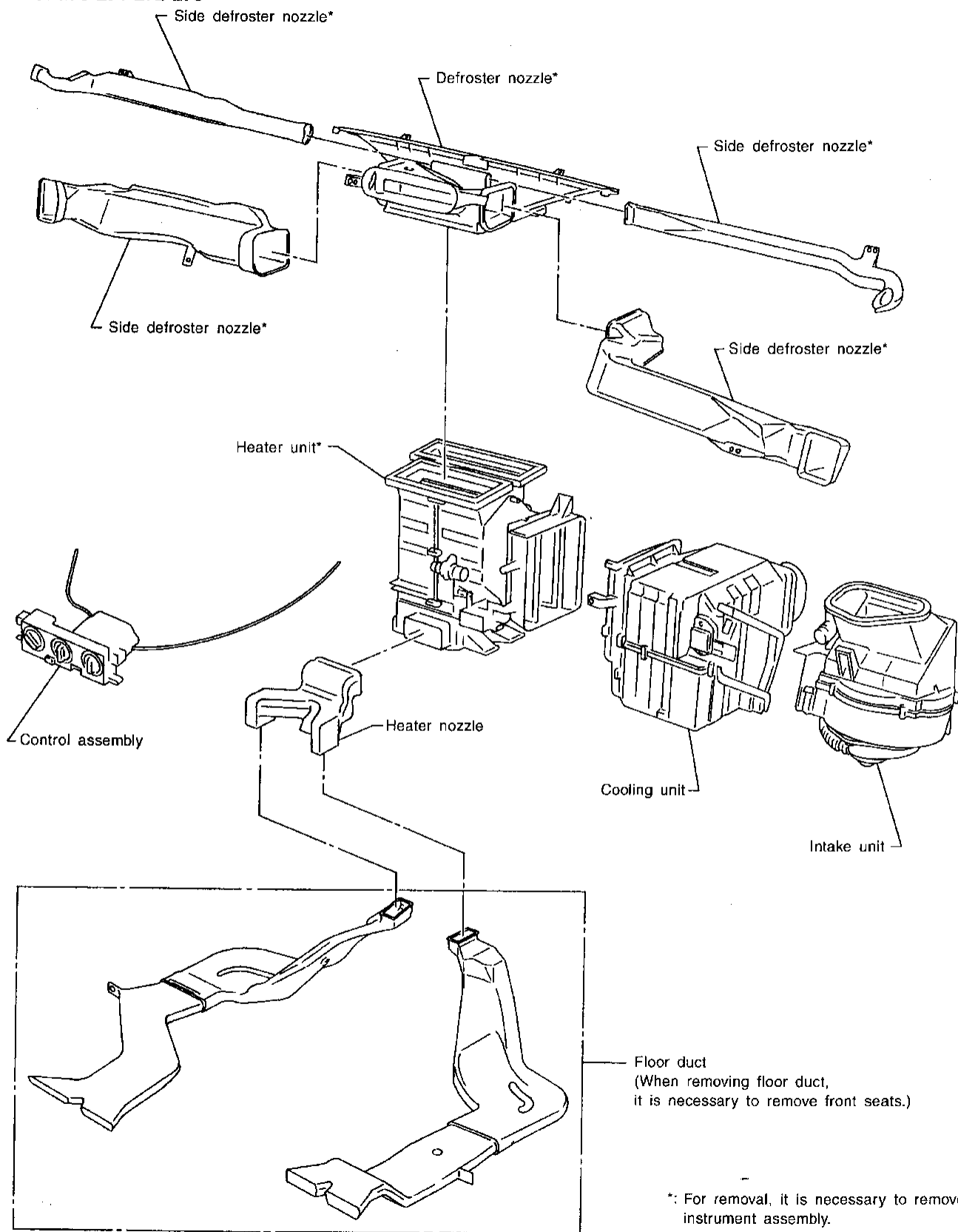


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Component Layout

NAHA0012

SEC. 270•271•272•273



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

RHA573F

Introduction

The automatic temperature control (ATC) system provides automatic regulation of the discharged air temperature and the discharged air volume (Blower speed).
The air outlet door, intake door and compressor magnet clutch are controlled by the manual operation of each switch.

Features

AIR MIX DOOR CONTROL (AUTOMATIC TEMPERATURE CONTROL)

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

FAN SPEED CONTROL

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

STARTING FAN SPEED CONTROL

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

OUTLET DOOR CONTROL

This can be selected by operation of the mode knob.

INTAKE DOOR CONTROL

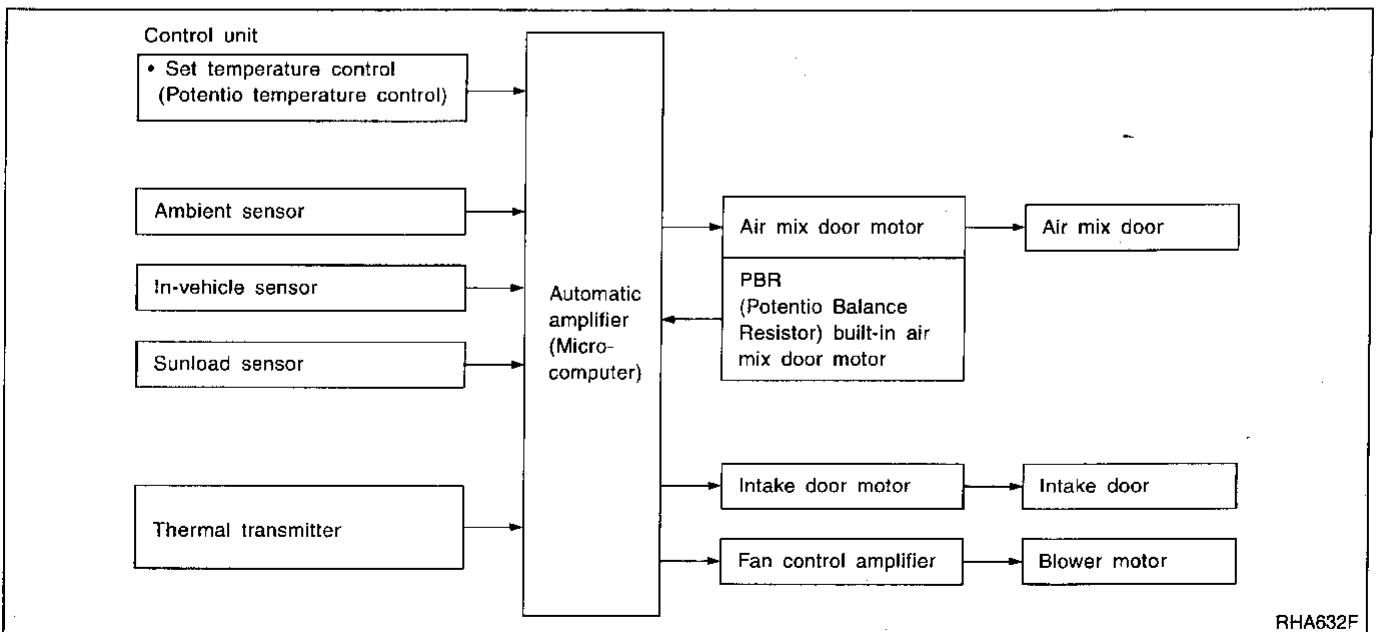
This can be selected by changing the REC switch position.

COMPRESSOR MAGNET CLUTCH CONTROL

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

Overview of Control System

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



SWITCHES AND THEIR CONTROL FUNCTIONS

NAHA0015S01

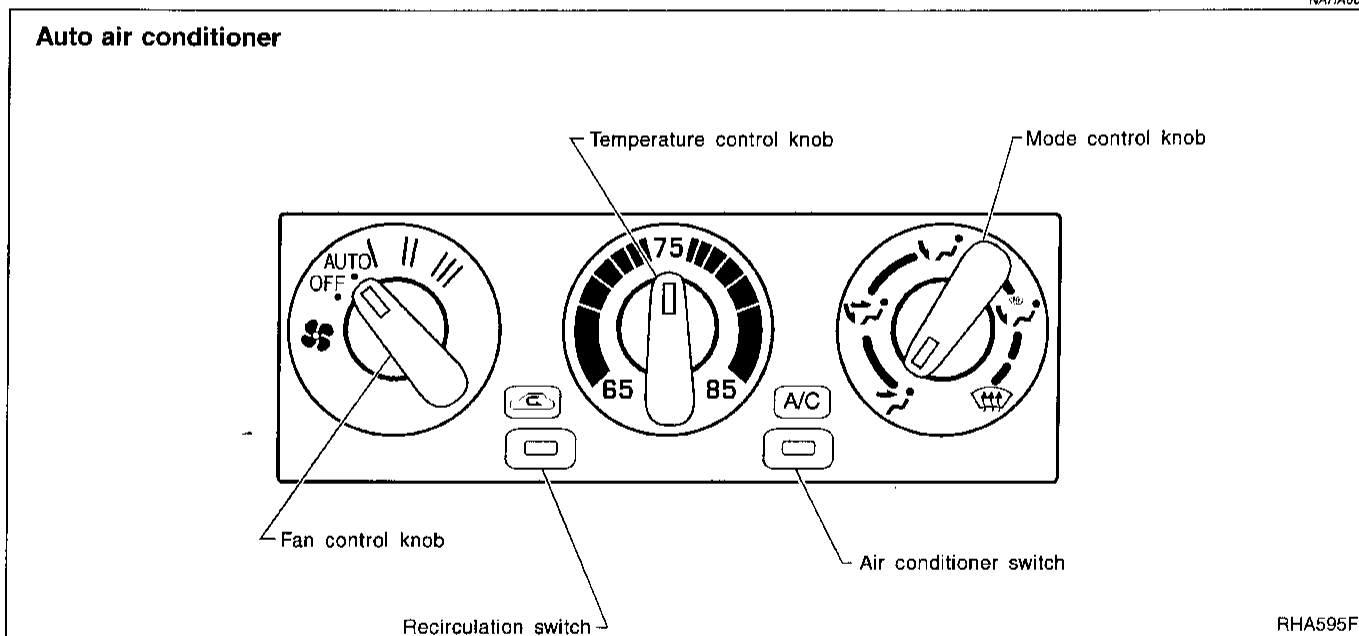
Knob/Switch	Knob/Switch position							Air outlet	Intake air	Compressor
	A/C									
A/C	<input type="radio"/>							—	—	ON*1
Mode			<input type="radio"/>					VENT	—	—
				<input type="radio"/>				B/L	—	—
					<input type="radio"/>			FOOT	—	—
						<input type="radio"/>		D/F	FRE	—
							<input type="radio"/>	DEF	FRE	ON*1
							<input type="radio"/>	—	REC*2	—

*1: Compressor is operated by dual-pressure switch.

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

Control Operation

NAHA0016



RHA595F

FAN CONTROL KNOB

This knob controls fan speed. (The fan turns ON when the fan control knob is set in all but the OFF position.) When AUTO position is selected, fan speed and air mix door position are automatically controlled.

NAHA0016S01

MODE CONTROL KNOB

This knob controls the outlet air flow. In "DEF" or "D/F" mode, the intake door is set to "FRESH".

NAHA0016S02

TEMPERATURE CONTROL KNOB

This knob allows the temperature of the outlet air to be adjusted.

NAHA0016S03

RECIRCULATION (REG) SWITCH

NAHA0016S04

GI

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

ON position: Interior air is recirculated inside the vehicle. The indicator lamp will also light.

AIR CONDITIONER SWITCH

NAHA0016S05

MA

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 also illuminates.

EM

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

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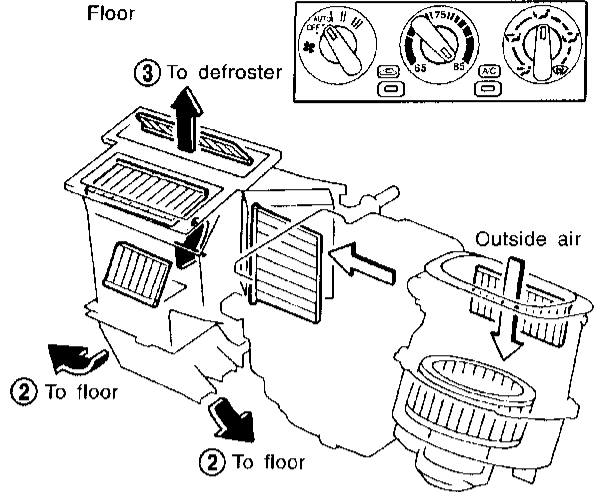
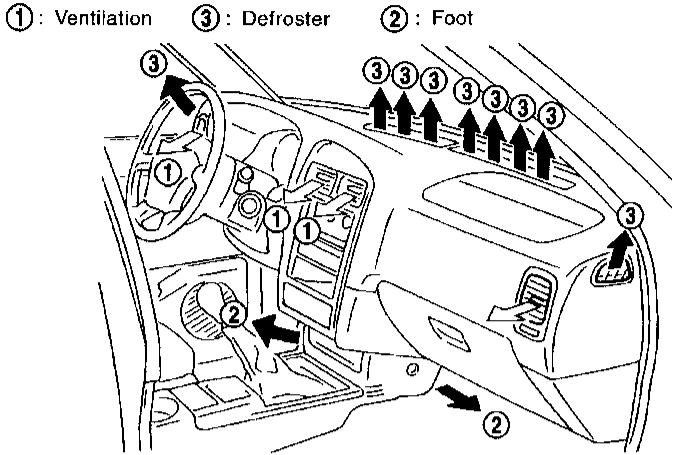
SC

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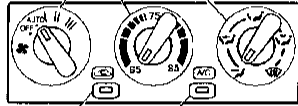
Discharge Air Flow

NAHA0017

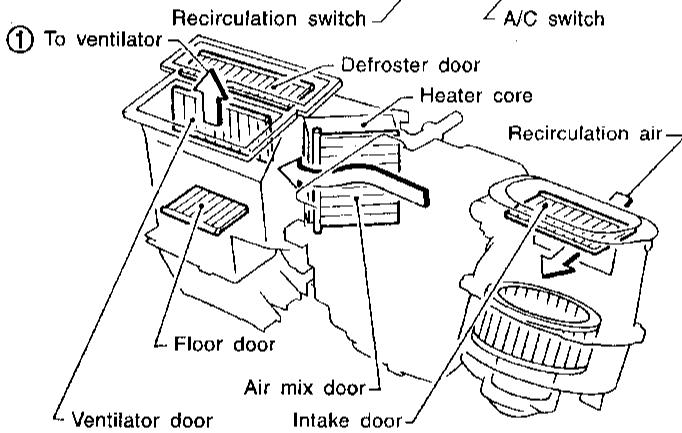
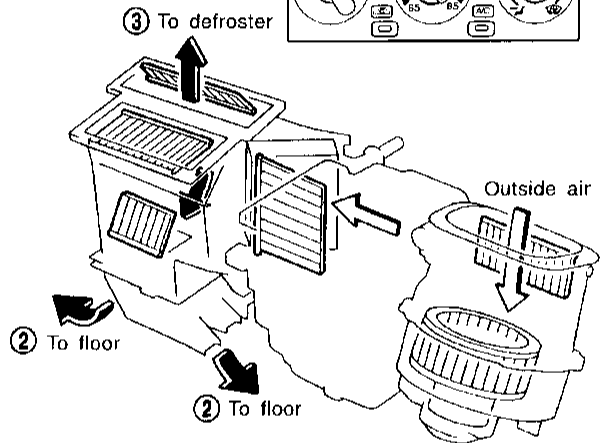


Ventilation
(switch "ON")

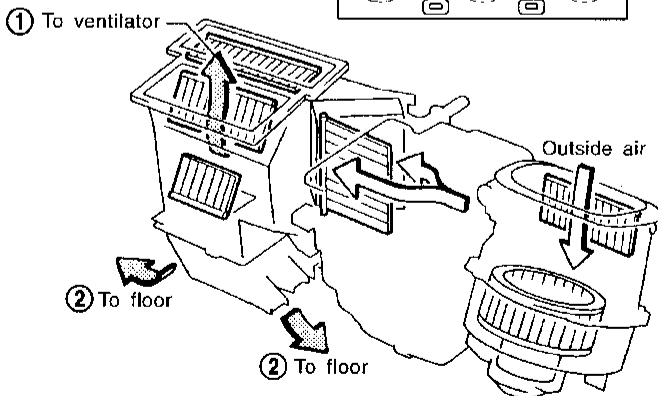
Fan control knob Temperature control knob Mode control knob



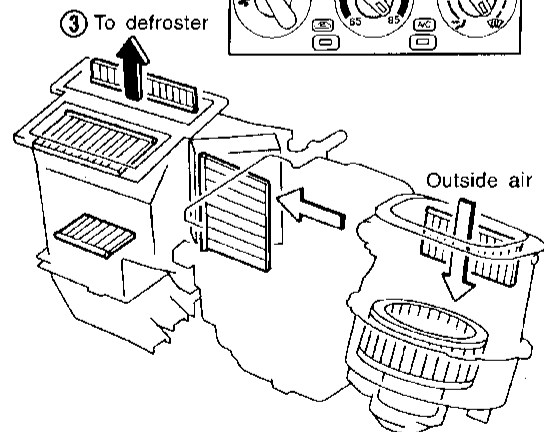
Floor and defroster



Bi-level
(switch "OFF")



Defroster

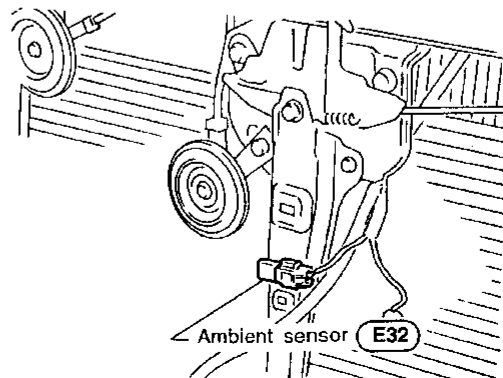
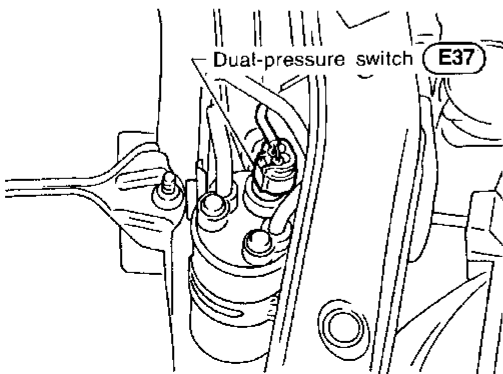
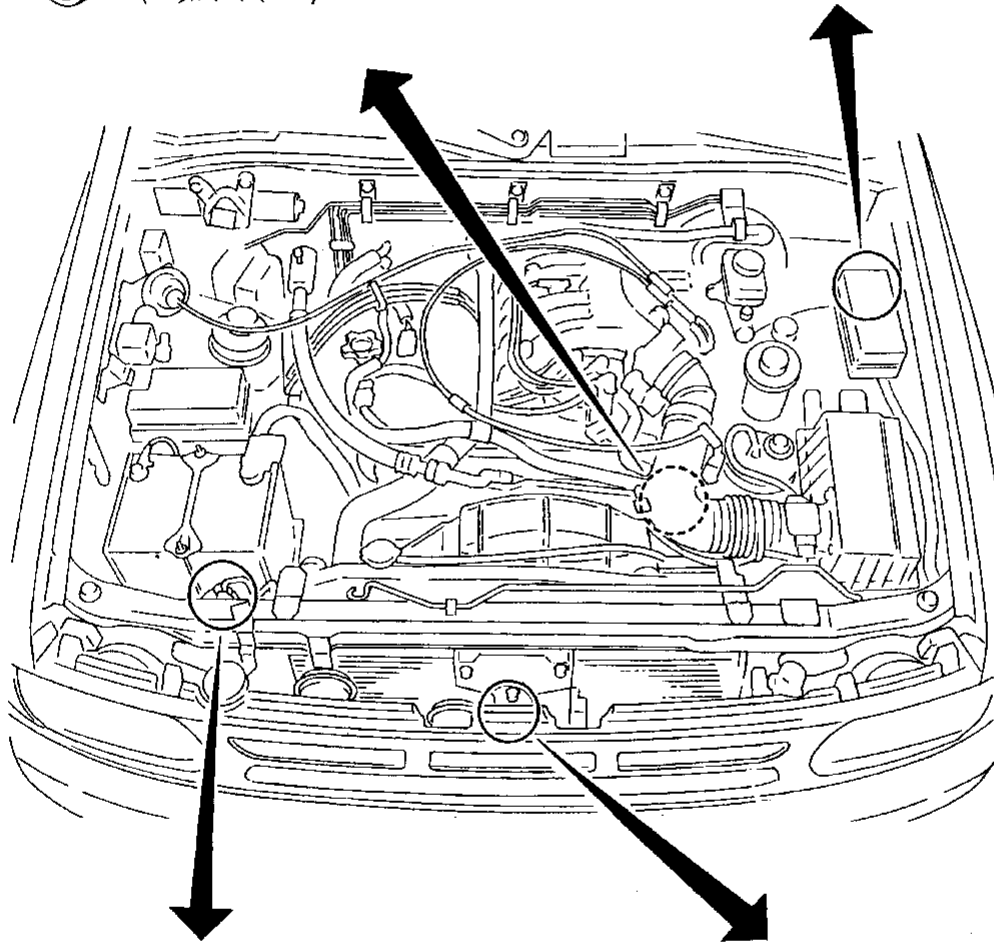
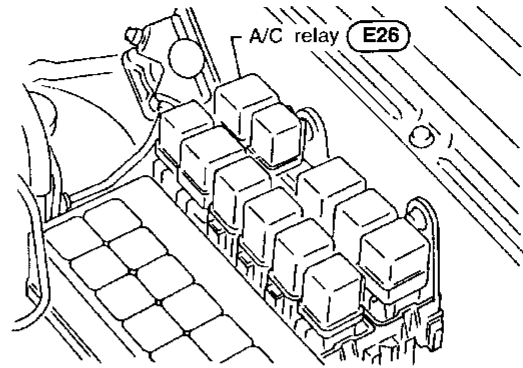
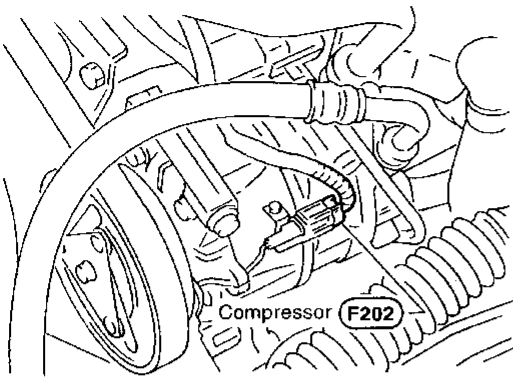


- : Air passed through heater core
- : Mixed air (+)
- : Air not passed through heater core

Harness Layout
ENGINE COMPARTMENT

NAHA0029

NAHA0029S01

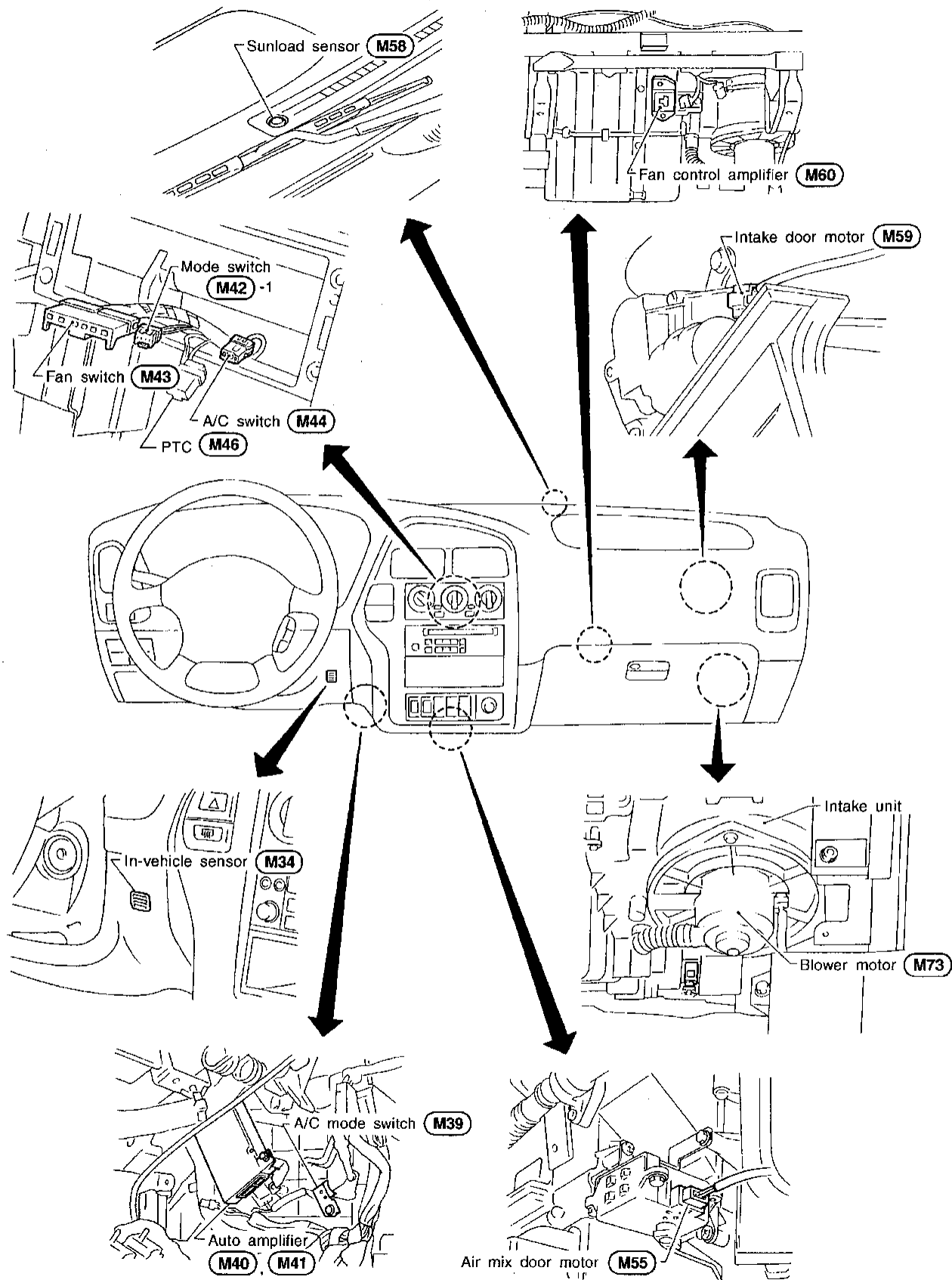


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- IDX

RHA705FA

PASSENGER COMPARTMENT

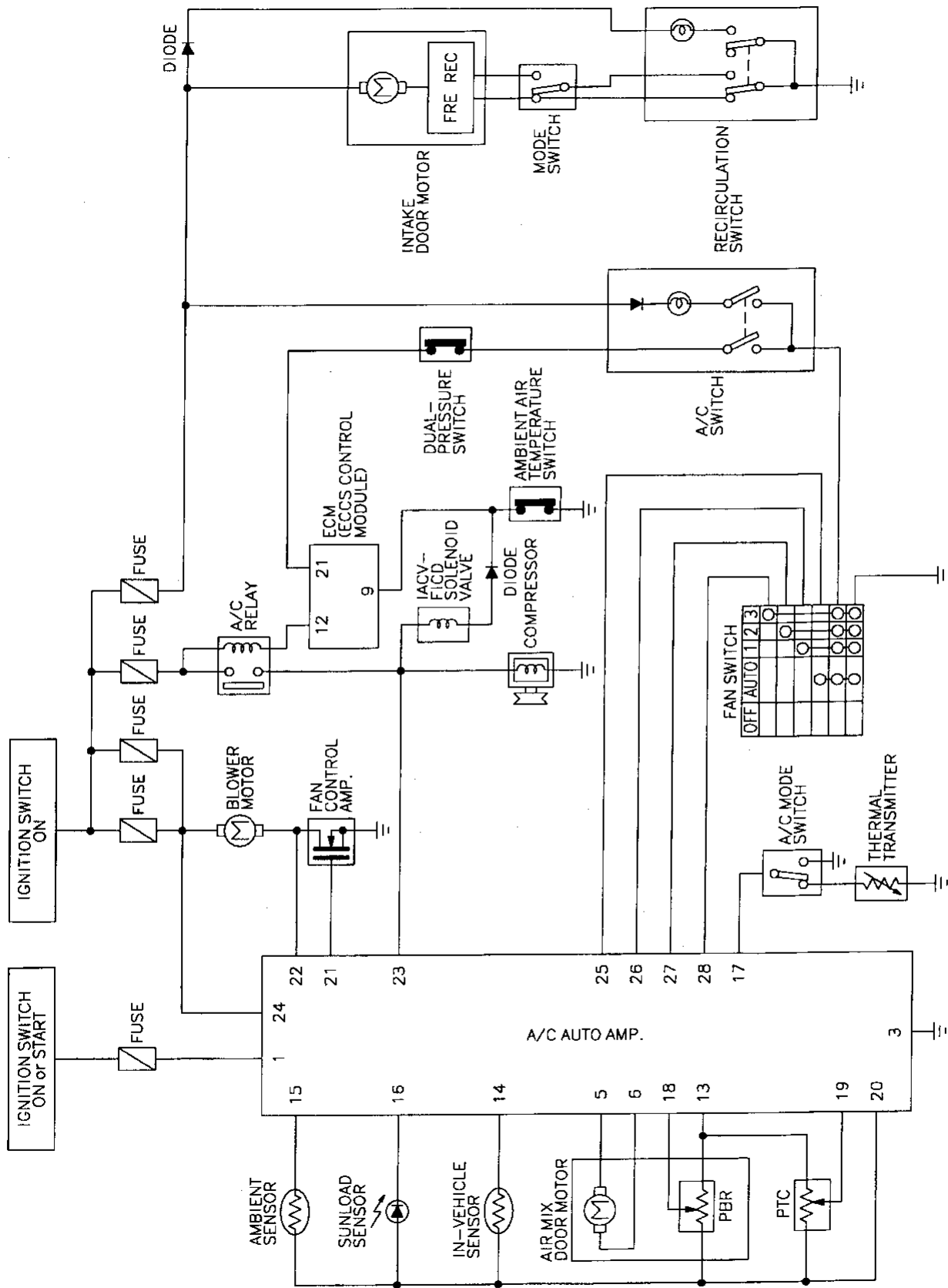
NAHA0029S02



RHA706F

Circuit Diagram — Auto Air Conditioner

NAHA0030

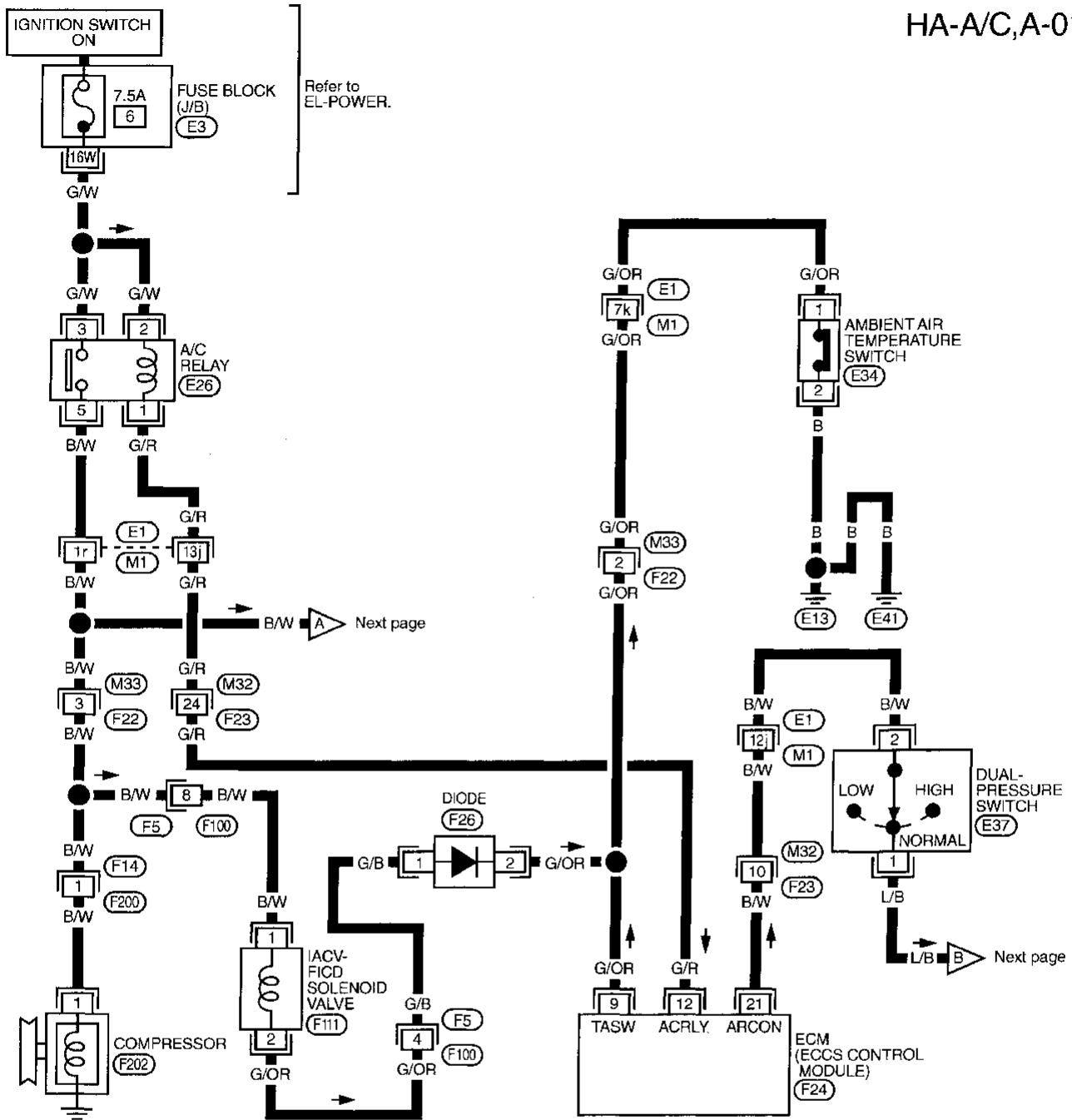


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Wiring Diagram — A/C, A —

NAHA0031

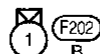
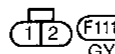
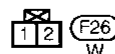
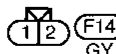
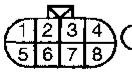
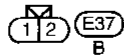
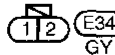
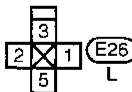
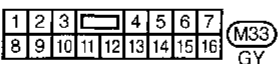
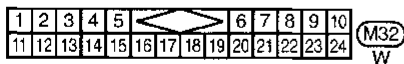
HA-A/C,A-01



Refer to EL-POWER.

Next page

Next page

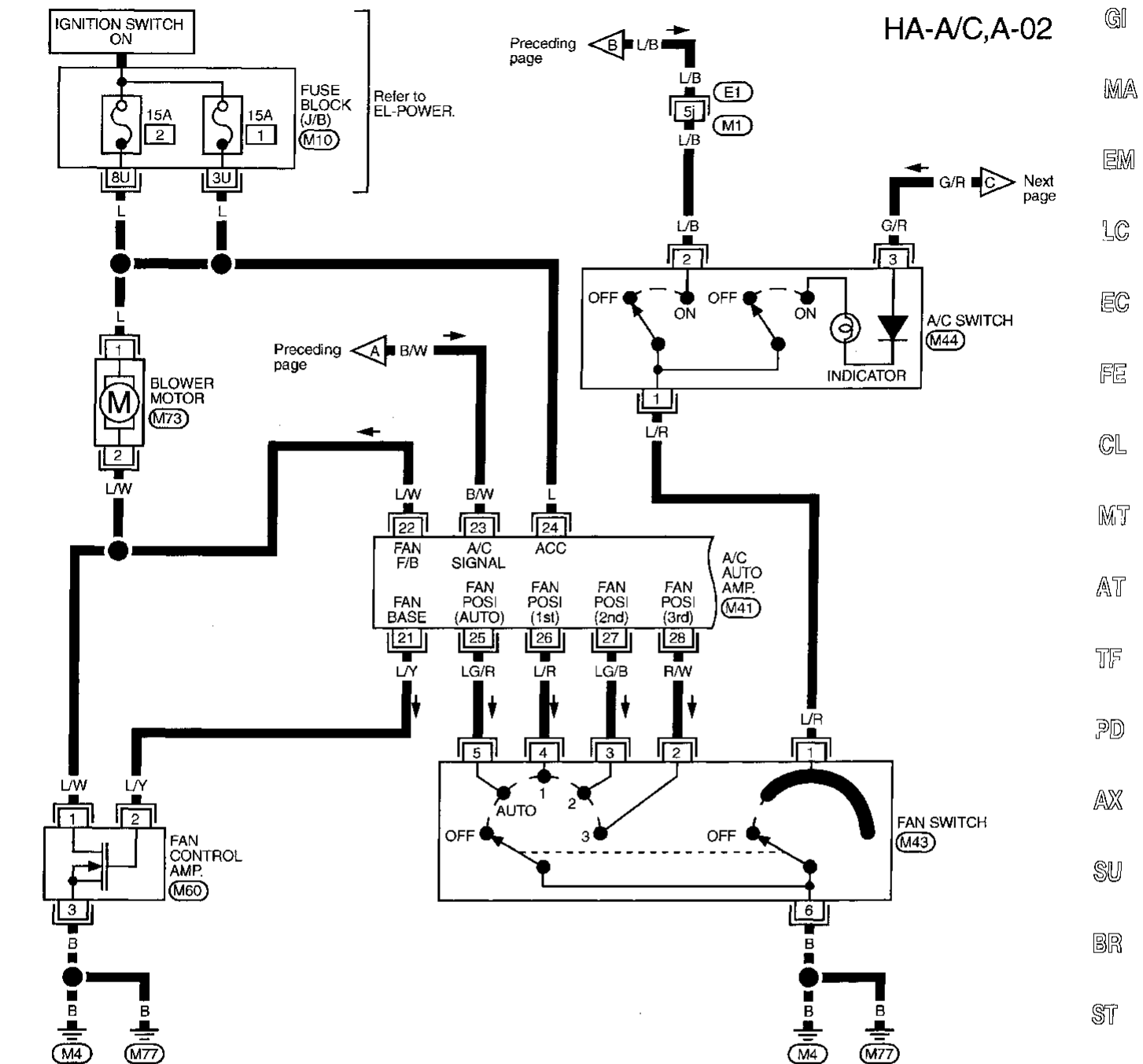


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M1, E1

E3

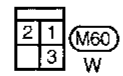
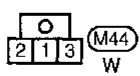
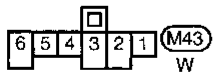
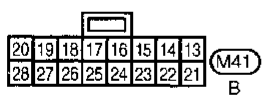
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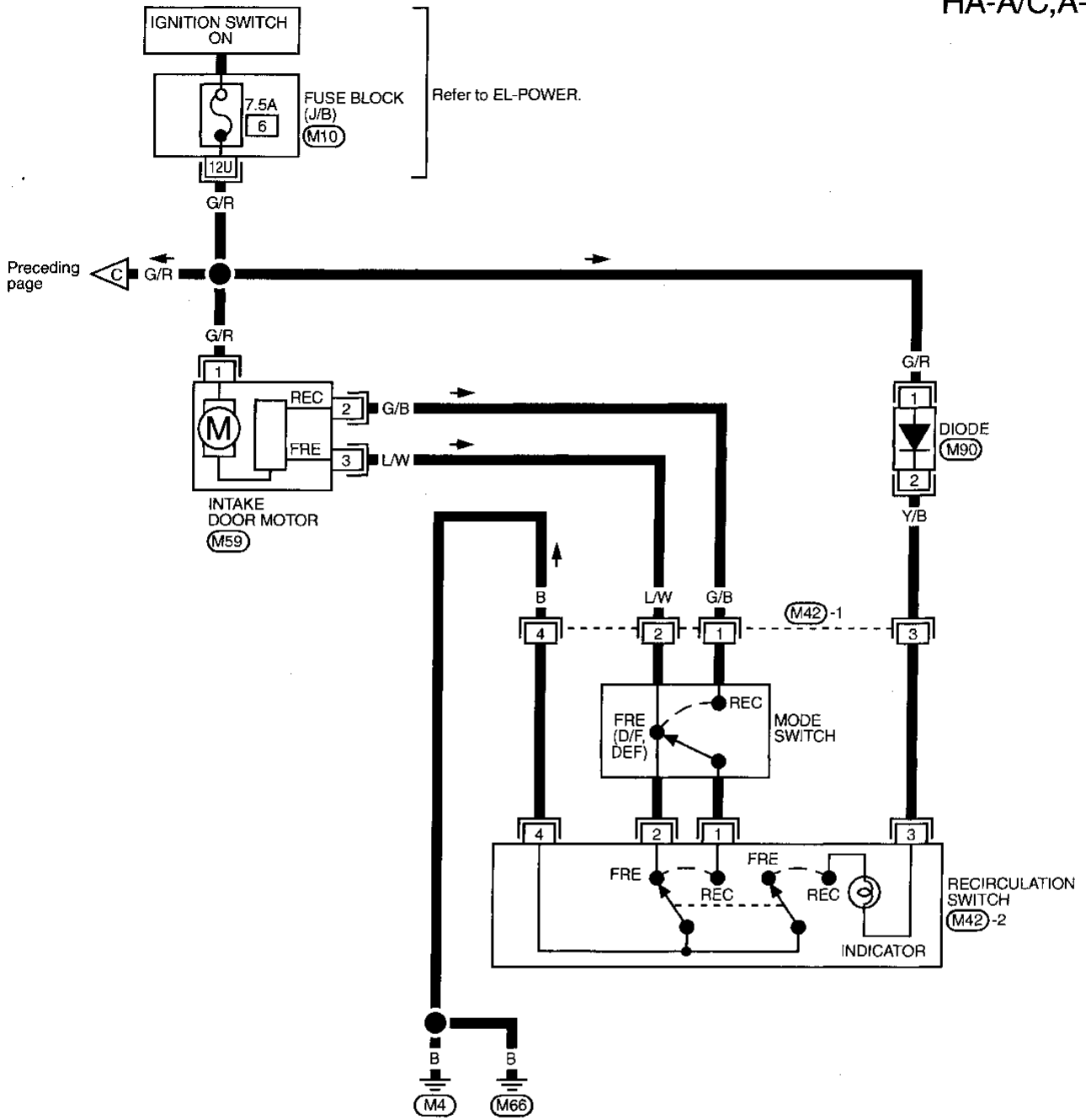


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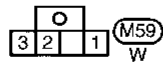
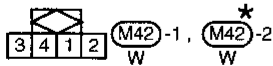
(M1), (E1)
(M10)





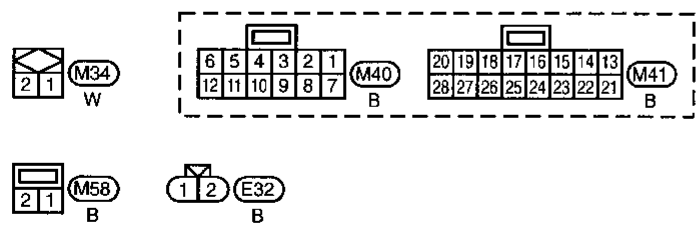
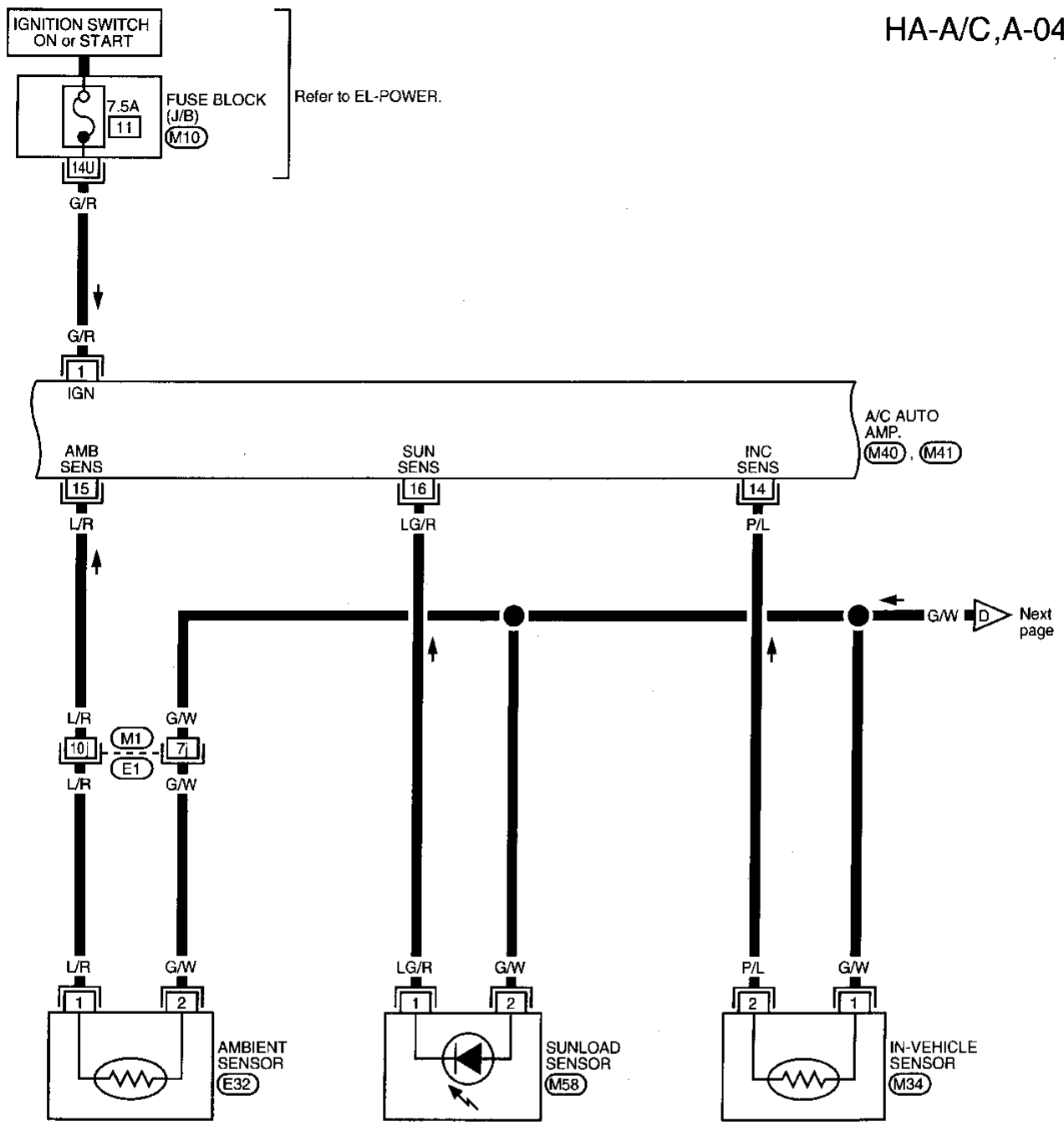
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(M10)



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

HA-A/C,A-04



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 (M1), (E1)
 (M10)

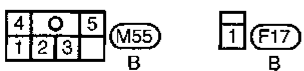
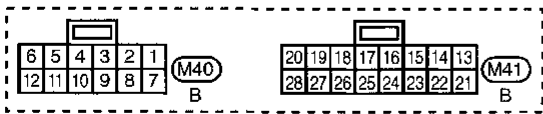
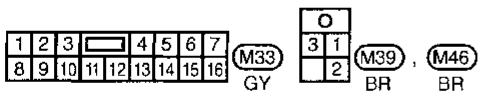
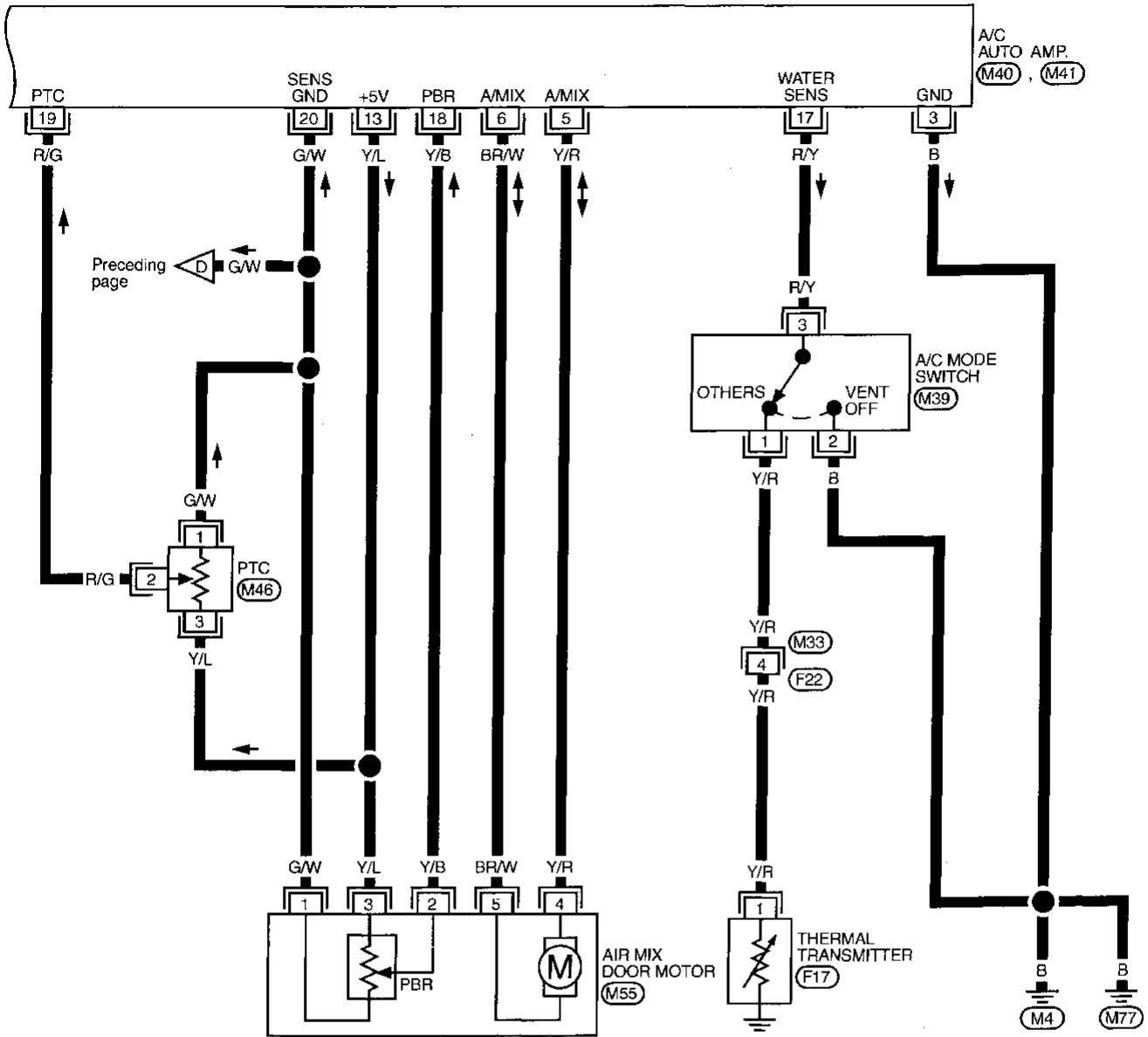
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TROUBLE DIAGNOSES

AUTO

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C,A-05

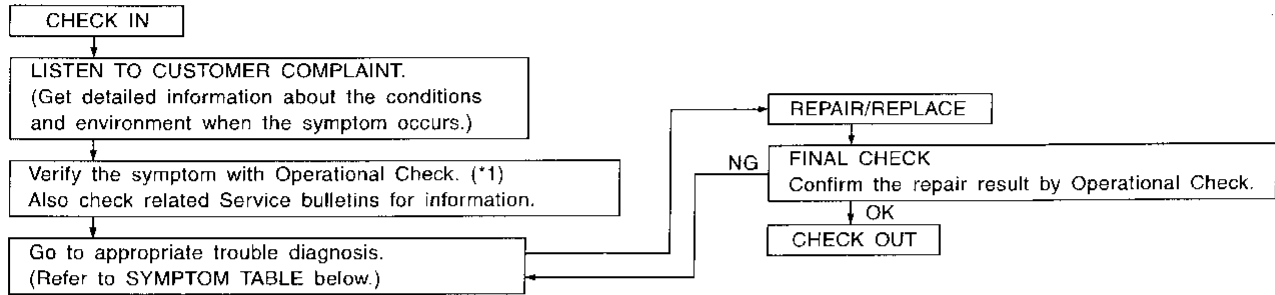


MHA689A

How to Perform Trouble Diagnoses for Quick and Accurate Repair WORK FLOW

NAHA0021

NAHA0021S01



SHA900E

*1: HA-32

SYMPTOM TABLE

NAHA0021S02

Symptom	Reference page
<ul style="list-style-type: none"> ● A/C system does not come on. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for A/C System. <p>HA-34</p>
<ul style="list-style-type: none"> ● Intake door does not change in VENT, B/L or FOOT mode. ● Intake door is not set at "FRESH" in DEF or D/F mode. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Intake Door Motor Circuit. <p>HA-36</p>
<ul style="list-style-type: none"> ● Blower motor does not rotate at all (Fan switch [AUTO] [1] [2] [3]) 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Blower Motor. <p>HA-43</p>
<ul style="list-style-type: none"> ● Blower motor does not rotate at all when the fan speed is in AUTO. (It operates in 1, 2 or 3-speed only) 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Blower Motor (Main Power Supply and Ground Circuit Check). <p>HA-50</p>
<ul style="list-style-type: none"> ● Magnet clutch does not engage when A/C switch and fan switch are ON. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Magnet Clutch. <p>HA-52</p>
<ul style="list-style-type: none"> ● Insufficient cooling 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Insufficient Cooling. <p>HA-57</p>
<ul style="list-style-type: none"> ● Insufficient heating 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Insufficient Heating. <p>HA-65</p>
<ul style="list-style-type: none"> ● Starting fan speed control does not operate. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Starting Fan Speed Control. <p>HA-66</p>
<ul style="list-style-type: none"> ● There is too much difference between setting temp. on PTC and in-vehicle temp. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Setting Temp. on PTC and In-vehicle Temp. <p>HA-68</p>
<ul style="list-style-type: none"> ● Air mix door motor does not operate normally. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Air Mix Door Motor. <p>HA-71</p>
<ul style="list-style-type: none"> ● Noise. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Noise. <p>HA-76</p>
<ul style="list-style-type: none"> ● Ambient sensor circuit is open or shorted. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Ambient Sensor Circuit. <p>HA-78</p>
<ul style="list-style-type: none"> ● In-vehicle sensor circuit is open or shorted. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for In-vehicle Sensor Circuit. <p>HA-80</p>
<ul style="list-style-type: none"> ● Sunload sensor circuit is open or shorted. 	<ul style="list-style-type: none"> ● Go to Trouble Diagnosis Procedure for Sunload Sensor Circuit. <p>HA-83</p>

Operational Check

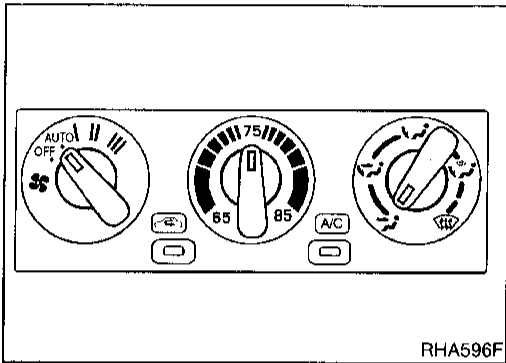
-NAHA0022

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

CONDITIONS:

NAHA0022S01

Engine running and at normal operating temperature.



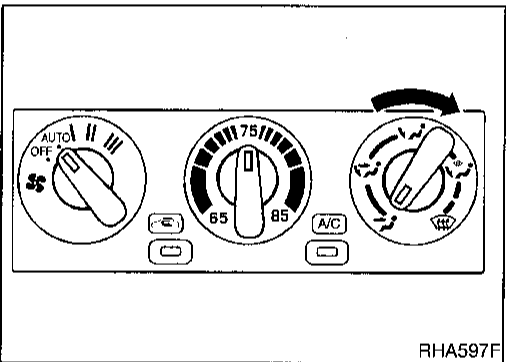
PROCEDURE:

NAHA0022S02

1. Check Blower

NAHA0022S01

- 1) Turn fan control knob to AUTO.
Blower should operate at speed of AUTO.
- 2) Then turn knob to speed 1.
- 3) Continue checking blower speed until all speeds are checked.



2. Check Discharge Air

NAHA0022S0202

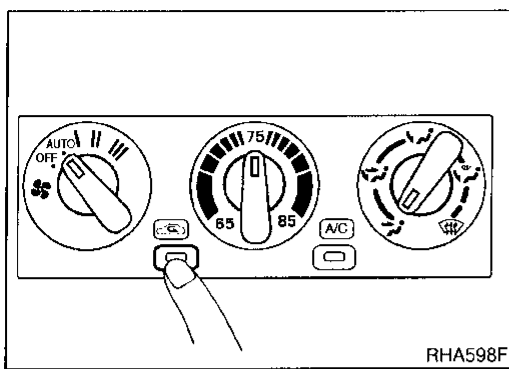
- 1) Turn mode control knob.

Discharge air flow

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

RHA654F

- 2) Confirm that discharge air comes out according to the air distribution table at left.
Refer to "Discharge Air Flow" in "DESCRIPTION" (HA-22).



3. Check Recirculation

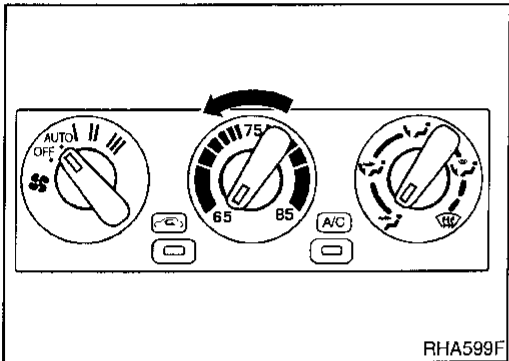
-NAHA0022S0203

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

NOTE:

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

GI
MA
EM
LC

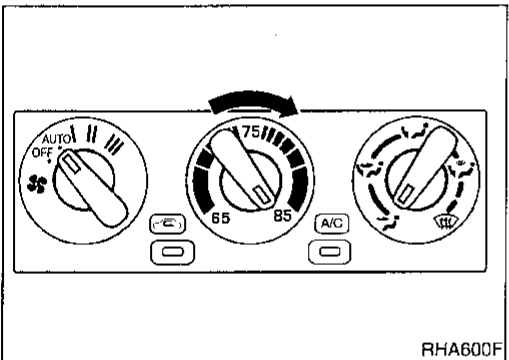


4. Check Temperature Decrease

NAHA0022S0204

- 1) Turn temperature control knob to full cold [18°C (65°F)].
- 2) Check for cold air at discharge air outlets.

EC
FE
CL
MT

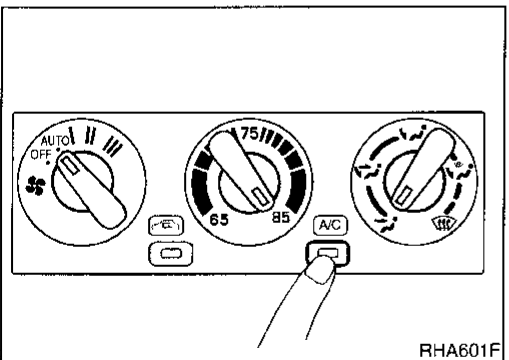


5. Check Temperature Increase

NAHA0022S0205

- 1) Turn temperature control knob to full hot [30°C (85°F)].
- 2) Check for hot air at discharge air outlets.

AT
TF
PD
AX



6. Check A/C Switch

NAHA0022S0206

Move fan control knob to the desired position (AUTO to 3) and press air conditioner switch to turn ON air conditioner. Indicator light will come on when air conditioner is ON.

SU
BR
ST
RS
BT

HA

SC
EL
IDX

A/C System

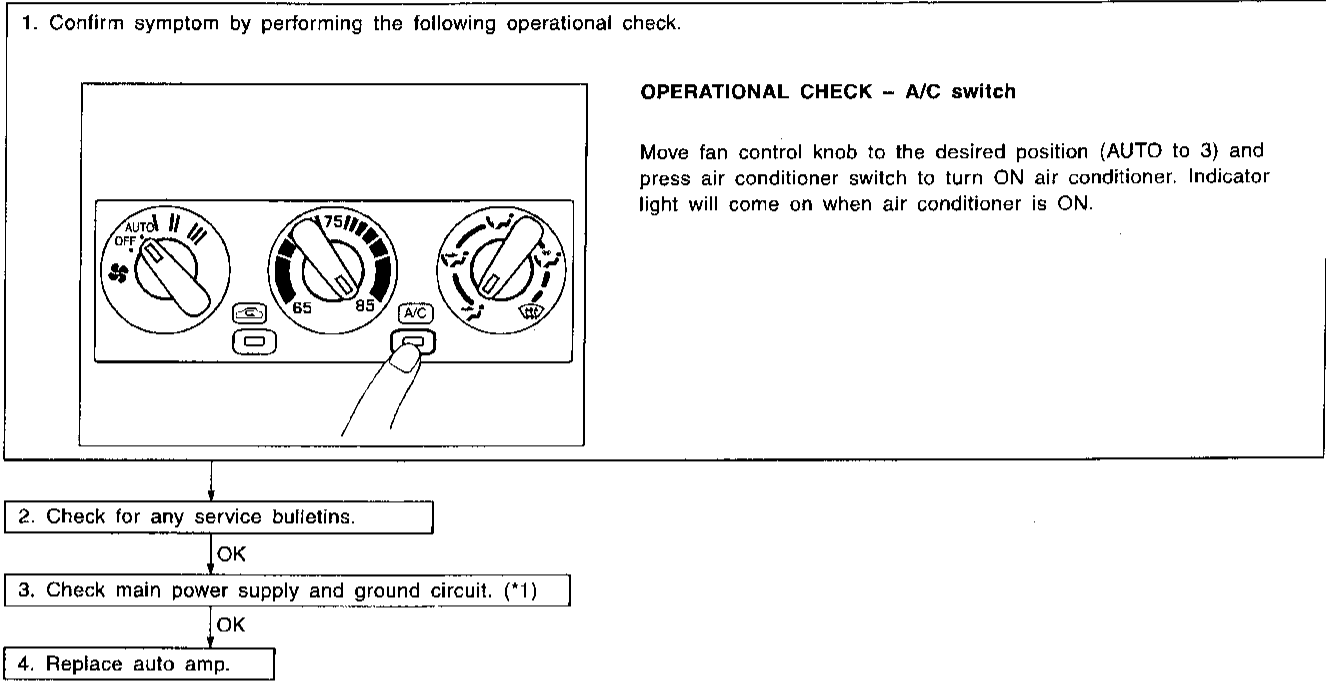
TROUBLE DIAGNOSIS PROCEDURE FOR A/C SYSTEM

=NAHA0112

Symptom:

- A/C system does not come on.

Inspection Flow



SHA901E

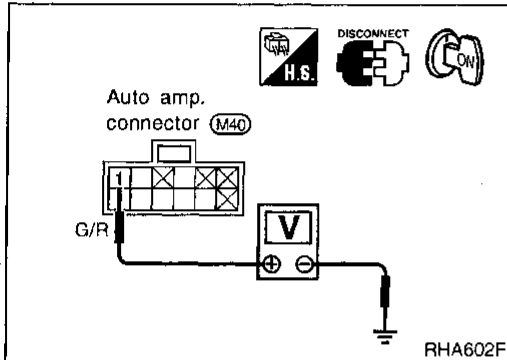
*1: HA-35

MAIN POWER SUPPLY AND GROUND CIRCUIT CHECK

Power Supply Circuit Check for Auto A/C System

Check Power Supply Circuit For Auto Air Conditioning System. Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.

GI
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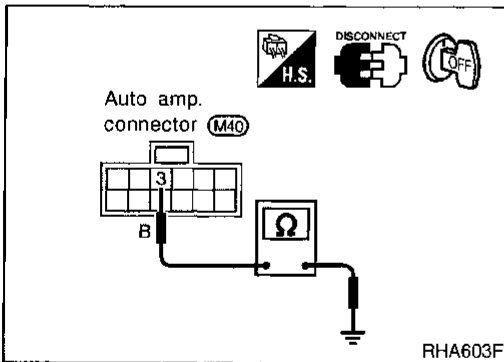
Auto Amp. Check

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

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

Voltmeter terminal		Voltage
(+)	(-)	
1	Body ground	Approx. 12V

If NG, check 7.5A fuse (#11) at fuse block.



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

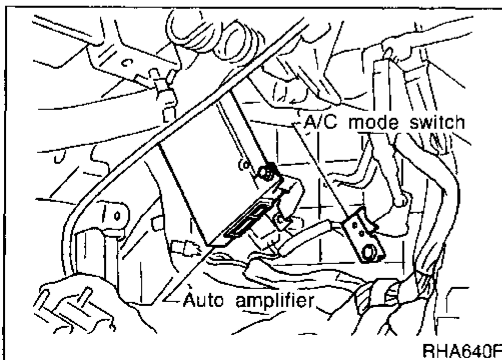
- 1) Disconnect auto amp. harness connector.
- 2) Connect ohmmeter from harness side.
- 3) Check for continuity between terminal No. 3 and body ground.

Ohmmeter terminal		Continuity
(+)	(-)	
3	Body ground	Yes

If NG, repair harness or connector.

CONTROL SYSTEM AUTO AMPLIFIER (AUTO AMP.)

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



Intake Door

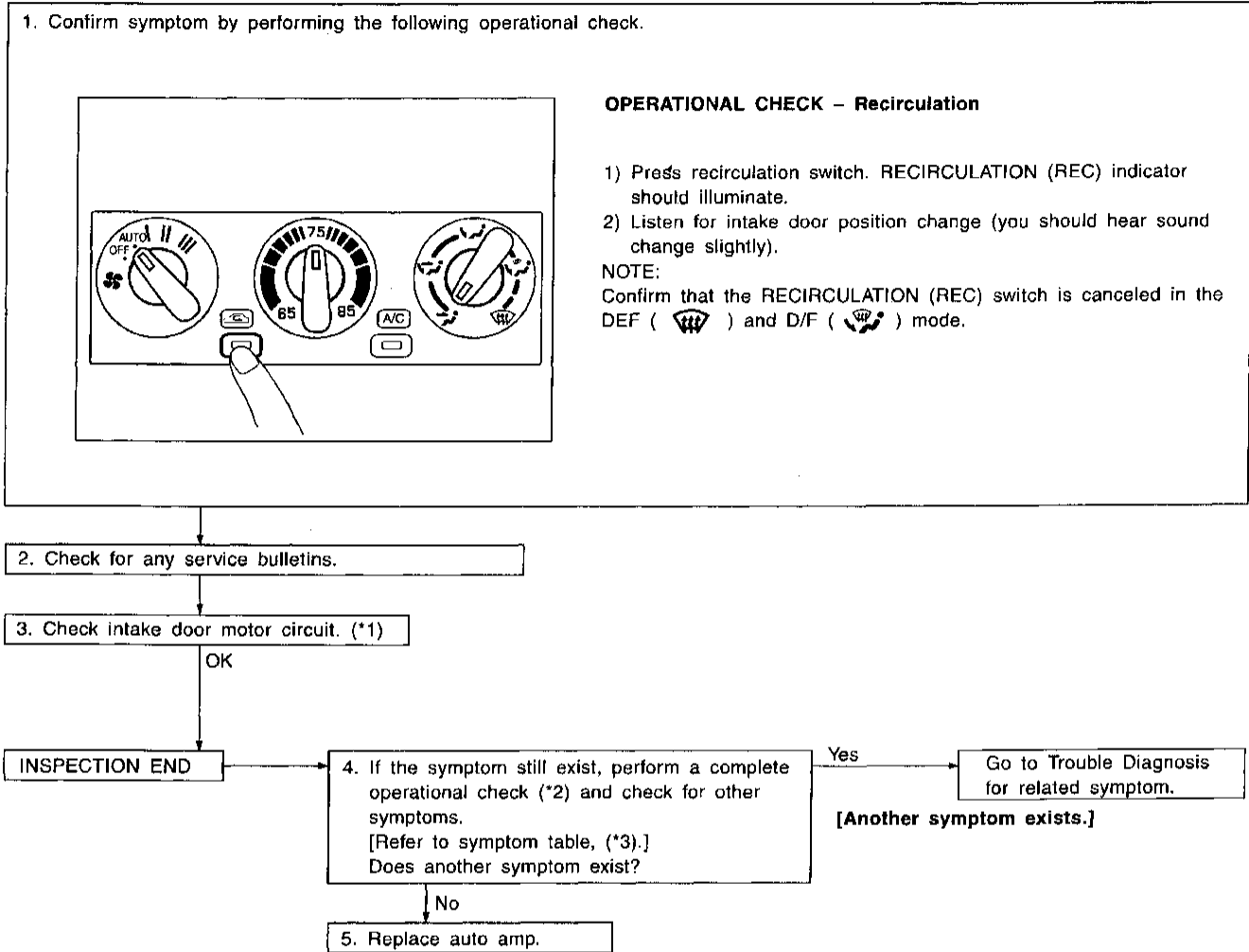
TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR MOTOR CIRCUIT

=NAHA0113

Symptom:

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

Inspection Flow



*1: HA-39

*2: HA-32

*3: HA-31

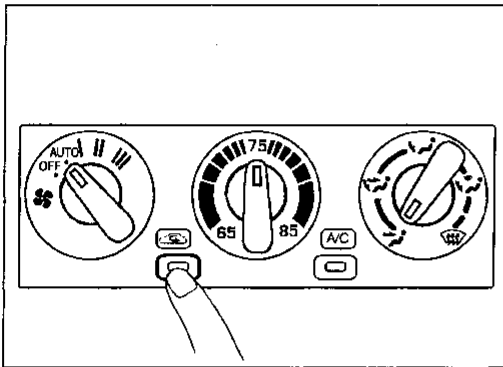
TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

Symptom:

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

Inspection Flow



1. Confirm symptom by performing the following operational check.

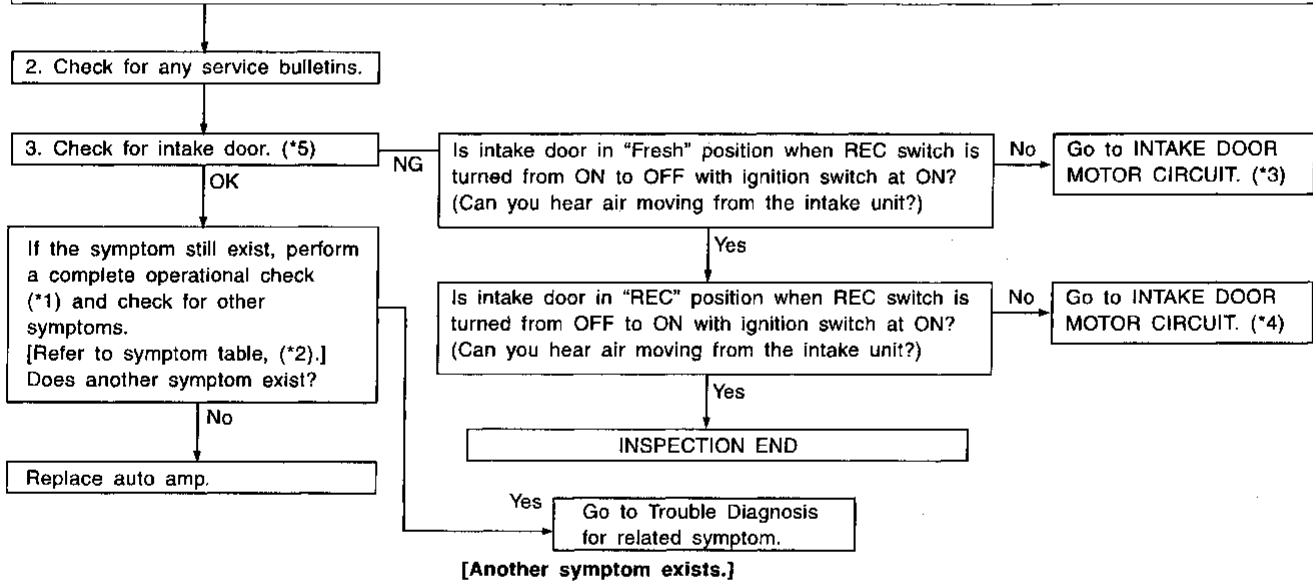


OPERATIONAL CHECK - Recirculation

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

NOTE:

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



[Another symptom exists.]

SHA941E

*1: HA-32

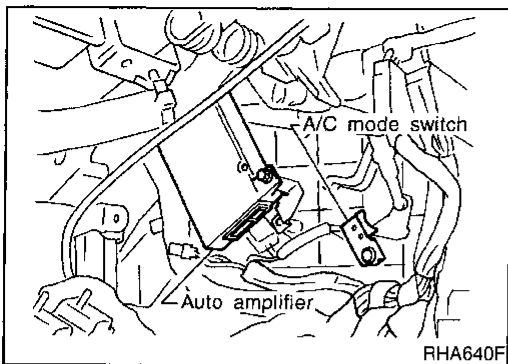
*3: HA-39

*5: HA-38

*2: HA-31

*4: HA-39

Intake Door (Cont'd)



CONTROL SYSTEM INPUT COMPONENTS

A/C Mode Switch

NAHA0114

NAHA0114S01

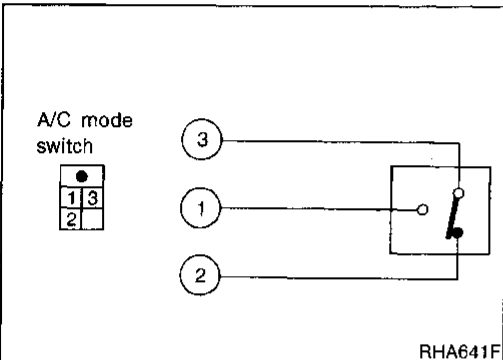
The microswitch is installed around the side link of the heater unit and operates the link in response to the position of the mode switch.

The operation of this microswitch is as shown below:

A/C Mode Switch Operation

NAHA0114S0101

MODE	VENT	B/L	FOOT	DEF/FOOT	DEF
Terminal No.	3 - 1	3 - 2	3 - 2	3 - 2	3 - 1



CONTROL SYSTEM OUTPUT COMPONENTS

Intake Door Motor

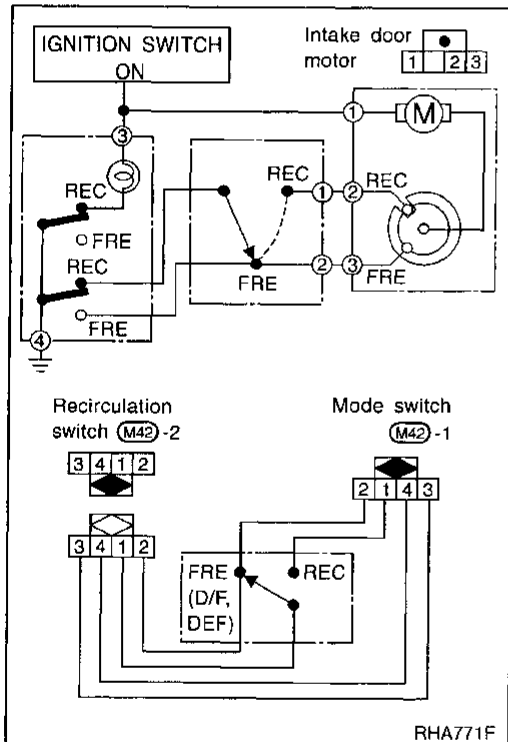
NAHA0115

NAHA0115S01

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

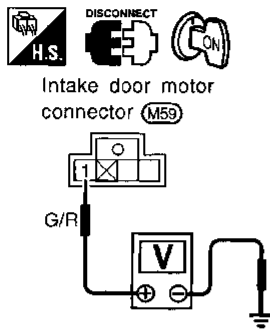
When RECIRCULATION switch is at REC (except DEF and D/F modes), the ground line of the motor is switched from intake door motor terminal 3 to 2. This starts the motor because the position switch contacts built into it make current flow. When RECIRCULATION switch is at FRE (except DEF and D/F modes), 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.

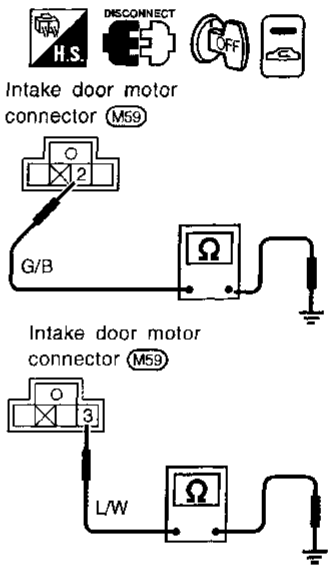
RECIRCULATION switch is canceled by MODE switch in DEF and D/F modes.



INTAKE DOOR MOTOR CIRCUIT

-NAHA0037

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 terminal No. 1 and body ground?</p>	
 <p style="text-align: center;">RHA350FA</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ Check 7.5A (No. 6) fuse at fuse block. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

2	CHECK GROUND CIRCUIT FOR INTAKE DOOR MOTOR																	
<p>Check continuity between intake door motor harness terminals and body ground.</p>																		
<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th rowspan="2">Recirculation switch condition</th> <th colspan="2">Terminal No.</th> <th rowspan="2">Continuity</th> </tr> <tr> <th>(+)</th> <th>(-)</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;">Body 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> <p style="text-align: right;">MTBL0037</p>	Recirculation switch condition	Terminal No.		Continuity	(+)	(-)	REC	(2)	Body ground	Yes	(3)	No	FRE	(2)	No	(3)	Yes	
Recirculation switch condition		Terminal No.			Continuity													
	(+)	(-)																
REC	(2)	Body ground	Yes															
	(3)		No															
FRE	(2)		No															
	(3)		Yes															
 <p style="text-align: center;">RHA580F</p>																		
OK or NG																		
OK	▶ GO TO 3.																	
NG	▶ Disconnect mode switch harness connector. And GO TO 4.																	

3	CHECK INTAKE DOOR LINKAGE
<p>Refer to Control Linkage Adjustment. (HA-42)</p>	
OK or NG	
OK	▶ Replace intake door motor.
NG	▶ Repair/adjust as necessary.

GI
MA
EM
LC
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EL
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Intake Door (Cont'd)

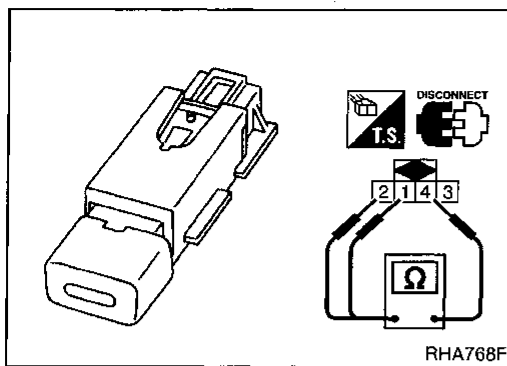
4	CHECK CONTINUITY BETWEEN MODE SWITCH HARNESS TERMINAL NO. 1 (2) AND INTAKE DOOR MOTOR HARNESS TERMINAL NO. 2 (3)
<p>Continuity should exist. If OK, check harness for short.</p>	
<p style="text-align: center;">Mode switch connector (M42) -1</p> <p style="text-align: center;">Intake door motor connector (M59)</p>	
RHA581F	
OK or NG	
OK	▶ GO TO 5.
NG	▶ Repair harness or connector.

5	CHECK MODE SWITCH
<p>(Refer to Electrical Components Inspection.) (HA-41)</p>	
OK or NG	
OK	▶ GO TO 6.
NG	▶ Replace mode switch.

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

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

8	CHECK RECIRCULATION SWITCH
<p>(Refer to Electrical Components Inspection.) (HA-41)</p>	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Replace recirculation switch.



ELECTRICAL COMPONENTS INSPECTION

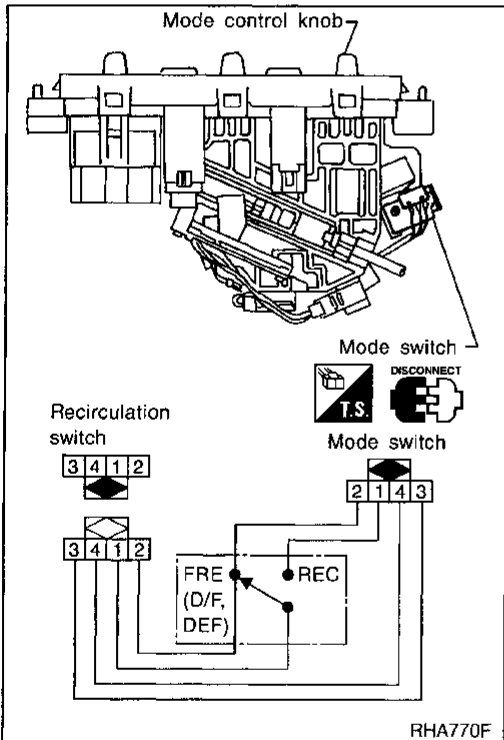
NAHA0116

Recirculation Switch

NAHA0116S01

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

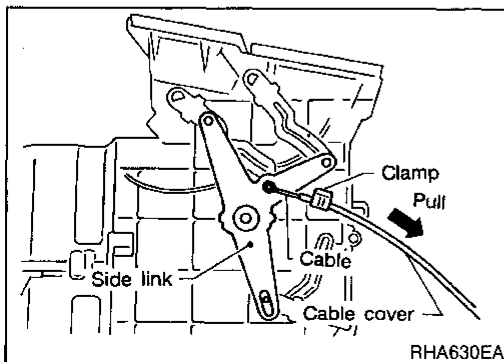


Mode Switch

NAHA0116S02

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



CONTROL LINKAGE ADJUSTMENT

NAHA0129

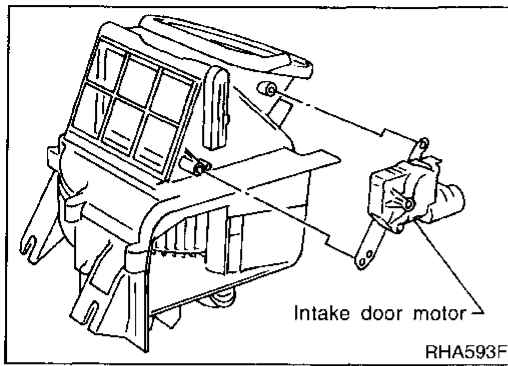
Mode Control Cable

NAHA0129S01

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.

Intake Door (Cont'd)



Intake Door

NA11A0129S02

1. Install intake door motor onto intake unit and connect it to intake door motor harness.
2. Turn ignition switch to ACC.
3. Push REC switch OFF.
4. Set intake door switch in FRE.
5. Check that intake door operates properly when REC switch is turned ON and OFF.

Blower Motor

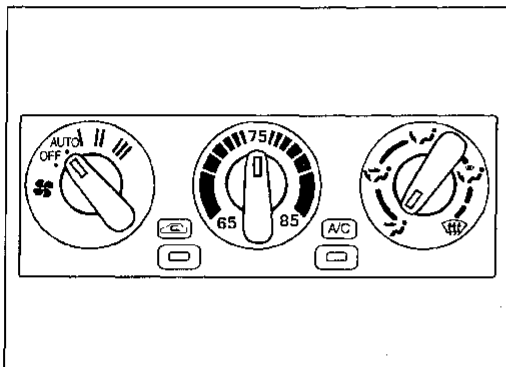
TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

Symptom:

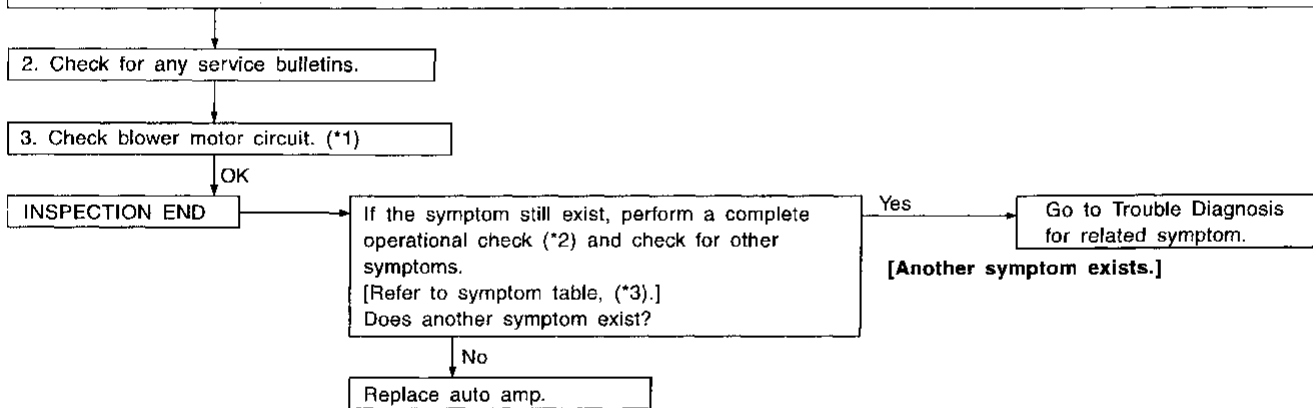
- Blower motor does not rotate at all.
(Fan switch [AUTO] [1] [2] [3])

Inspection Flow

1. Confirm symptom by performing the following operational check.


OPERATIONAL CHECK – Blower motor

- 1) Turn fan control knob to AUTO.
Blower should operate at speed of AUTO.
- 2) Then turn knob to speed 1.
- 3) Continue checking blower speed until all speeds are checked.



*1: HA-46

*2: HA-32

*3: HA-31

GI
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CONTROL SYSTEM OUTPUT COMPONENTS

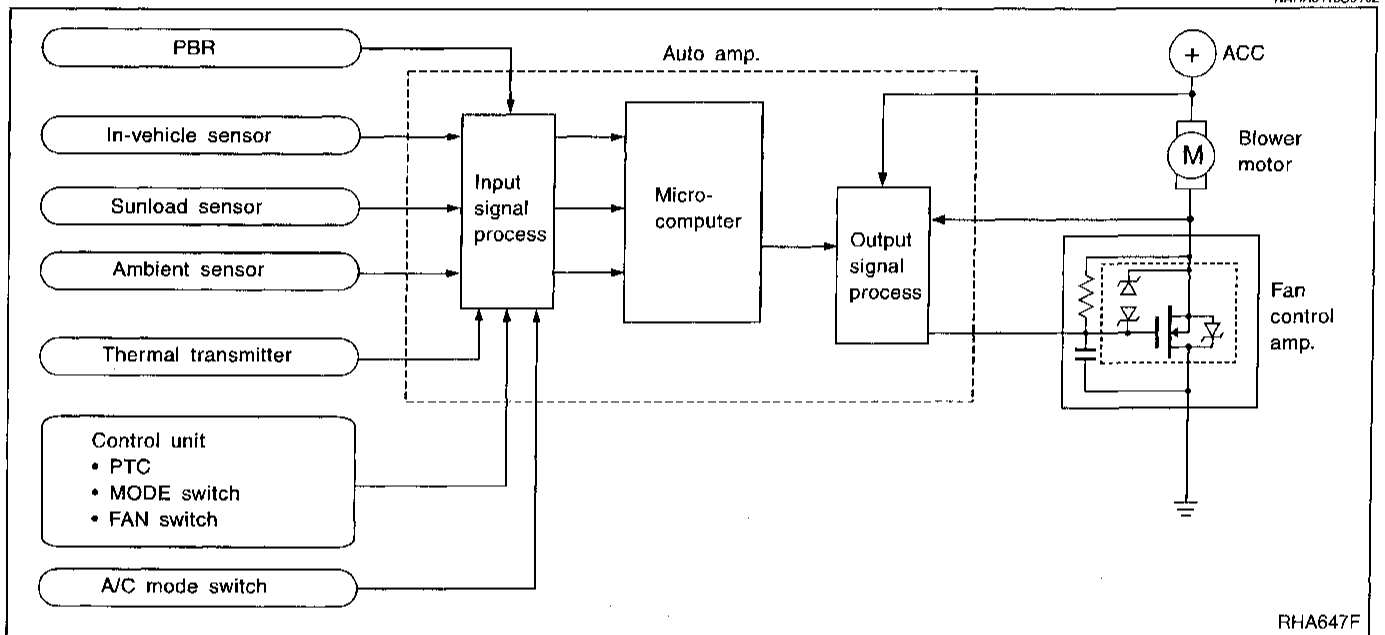
Fan Speed Control

Component Parts

Fan speed control system components are:

- 1) Auto amp.
- 2) Fan control amplifier
- 3) PBR
- 4) In-vehicle sensor
- 5) Ambient sensor
- 6) Sunload sensor
- 7) Thermal transmitter
- 8) A/C mode switch

System Operation



Automatic Mode

In the automatic mode, the blower motor speed is calculated by the auto amp. based on inputs from the PBR, in-vehicle sensor, sunload sensor, and ambient sensor. The blower motor applied voltage ranges from approximately 5.0 volts (lowest speed) to 12 volts (highest speed).

To control blower speed (in the range of 5V to 12V), the auto amp. supplies a signal to the fan control amplifier. Based on this signal, the fan control amplifier controls the current flow from the blower motor to ground.

Starting Fan Speed Control

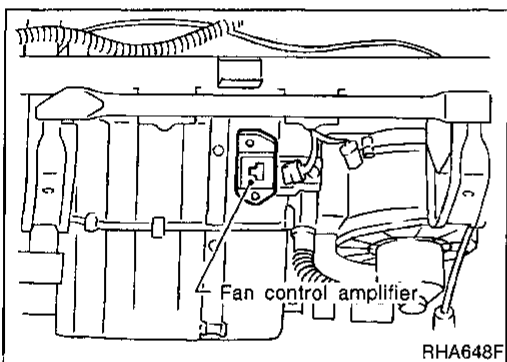
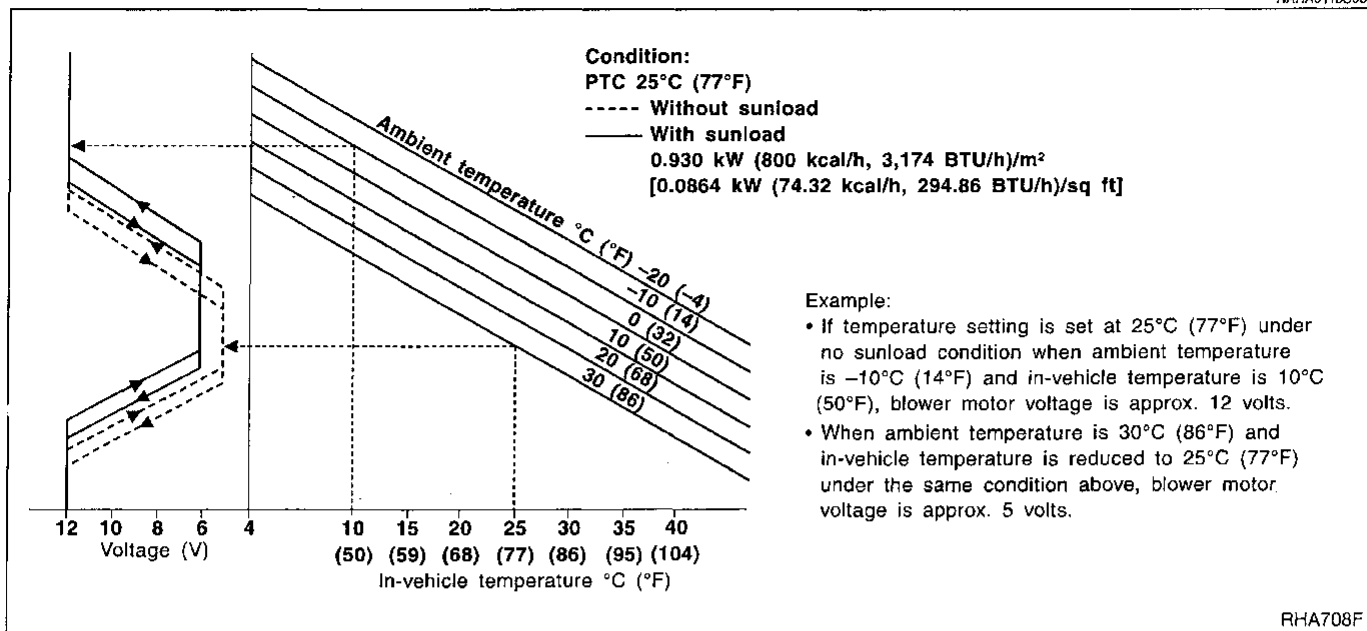
Start Up From "Cold Soak" Condition (Automatic Mode)

In a cold start up condition where the engine coolant temperature is below 50°C (122°F) (except VENT and DEF modes), the blower will not operate for a short period of time (up to 126 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 126 seconds. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 55°C (131°F). Then the blower speed will increase to the objective speed.

Fan Speed Control Specification

NAHA0118S0302



Fan Control Amplifier

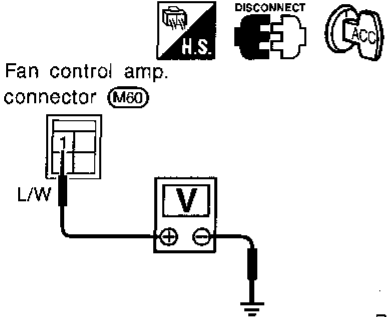
NAHA0118S04

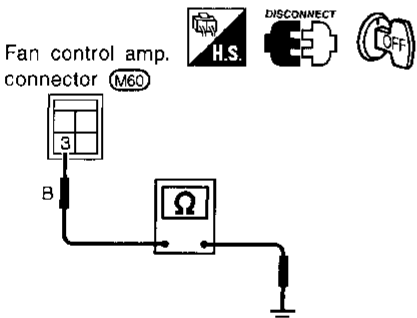
The fan control amplifier is located on the cooling unit. It amplifies a 12-step base current flowing from the auto amp. to change the blower speed within the range of 5V to 12V.

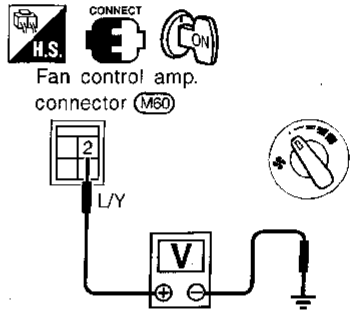
GI
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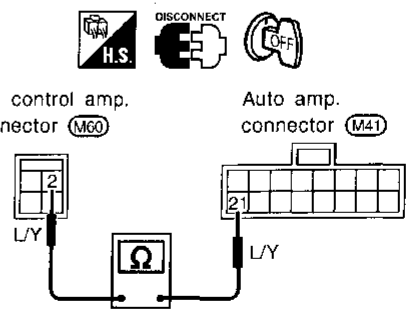
BLOWER MOTOR CIRCUIT

-NAHA0033

1	CHECK POWER SUPPLY FOR FAN CONTROL AMP.
Disconnect fan control amp. harness connector. Do approx. 12 volts exist between fan control amp. harness terminal No. 1 and body ground?	
	
RHA604F	
Yes or No	
Yes	▶ GO TO 2.
No	▶ GO TO 7.

2	CHECK BODY GROUND CIRCUIT FOR FAN CONTROL AMP.
Does continuity exist between fan control amp. harness terminal No. 3 and body ground?	
	
RHA605F	
Yes or No	
Yes	▶ Reconnect fan control amp. harness connector. And GO TO 3.
No	▶ Repair harness or connector.

3	CHECK FOR OUTPUT OF AUTO AMP.		
Measure voltage across fan control amp. harness terminal No. 2 and body ground.			
Fan control knob condition	Terminal No.		Voltage
	(+)	(-)	
Speed 1			Approx. 2.5 - 3.0V
	(2)	Body ground	
Speed 3			Approx. 8.5 - 9.0V
MTBL0034			
			
RHA704F			
OK or NG			
OK	▶ Replace fan control amp.		
NG	▶ GO TO 4.		

4	CHECK CONTINUITY BETWEEN AUTO AMP. AND FAN CONTROL AMP.	
1. Disconnect auto amp. and fan control amp. harness connector. 2. Does continuity exist between auto amp. harness terminal No. 21 and fan control amp. harness terminal No. 2? Continuity should exist. If OK, check harness for short.		
		
RHA609F		
Yes or No		
Yes	▶ GO TO 5.	
No	▶ Repair harness or connector.	

5	CHECK FAN FEED BACK CIRCUIT
Do approx. 12 volts exist between auto amp. harness terminal No. 24 and body ground?	
SHA843E	
Yes or No	
Yes	▶ GO TO 6.
No	▶ Check power supply circuit and 15A fuses (No. 1 and 2, located in the fuse block). Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").

7	CHECK POWER SUPPLY FOR BLOWER MOTOR
1. Disconnect blower motor harness connector. 2. Do approx. 12 volts exist between blower motor harness terminal No. 1 and body ground?	
RHA607F	
Yes or No	
Yes	▶ GO TO 8.
No	▶ Check 15A (No. 1, 2) fuses at fuse block. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

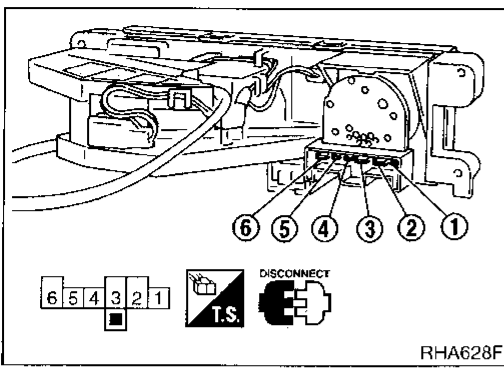
6	CHECK POWER SUPPLY FOR AUTO AMP.
Do approx. 12 volts exist between auto amp. harness terminal No. 22 and body ground?	
SHA844E	
Yes or No	
Yes	▶ Replace auto amp.
No	▶ GO TO 10.

8	CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR HARNESS TERMINAL NO. 2 AND FAN CONTROL AMP. HARNESS TERMINAL NO. 1
Continuity should exist. If OK, check harness for short.	
RHA608F	
OK or NG	
OK	▶ GO TO 9.
NG	▶ Repair harness or connector.

9	CHECK BLOWER MOTOR
(Refer to Electrical Components Inspection.) (HA-49)	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Replace blower motor.

Blower Motor (Cont'd)

10	CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR HARNESS TERMINAL NO. 2 AND AUTO AMP. HARNESS TERMINAL NO. 22
<p>Continuity should exist. If OK, check harness for short.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">SHA845E</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ INSPECTION END
NG	▶ Repair harness or connector.



ELECTRICAL COMPONENTS INSPECTION

-NAHA0042

Fan Switch

NAHA0042S01

Check continuity between terminals at each switch position.

KNOB POSITION	Continuity between terminals
OFF	
AUTO	5 — 1 — 6
1	4 — 1 — 6
2	3 — 1 — 6
3	2 — 1 — 6

Blower Motor

NA11A0042S02

Confirm smooth rotation of the blower motor.

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

GI
MA
EM
LC
EC
FE
CL
MT
AT
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PD
AX
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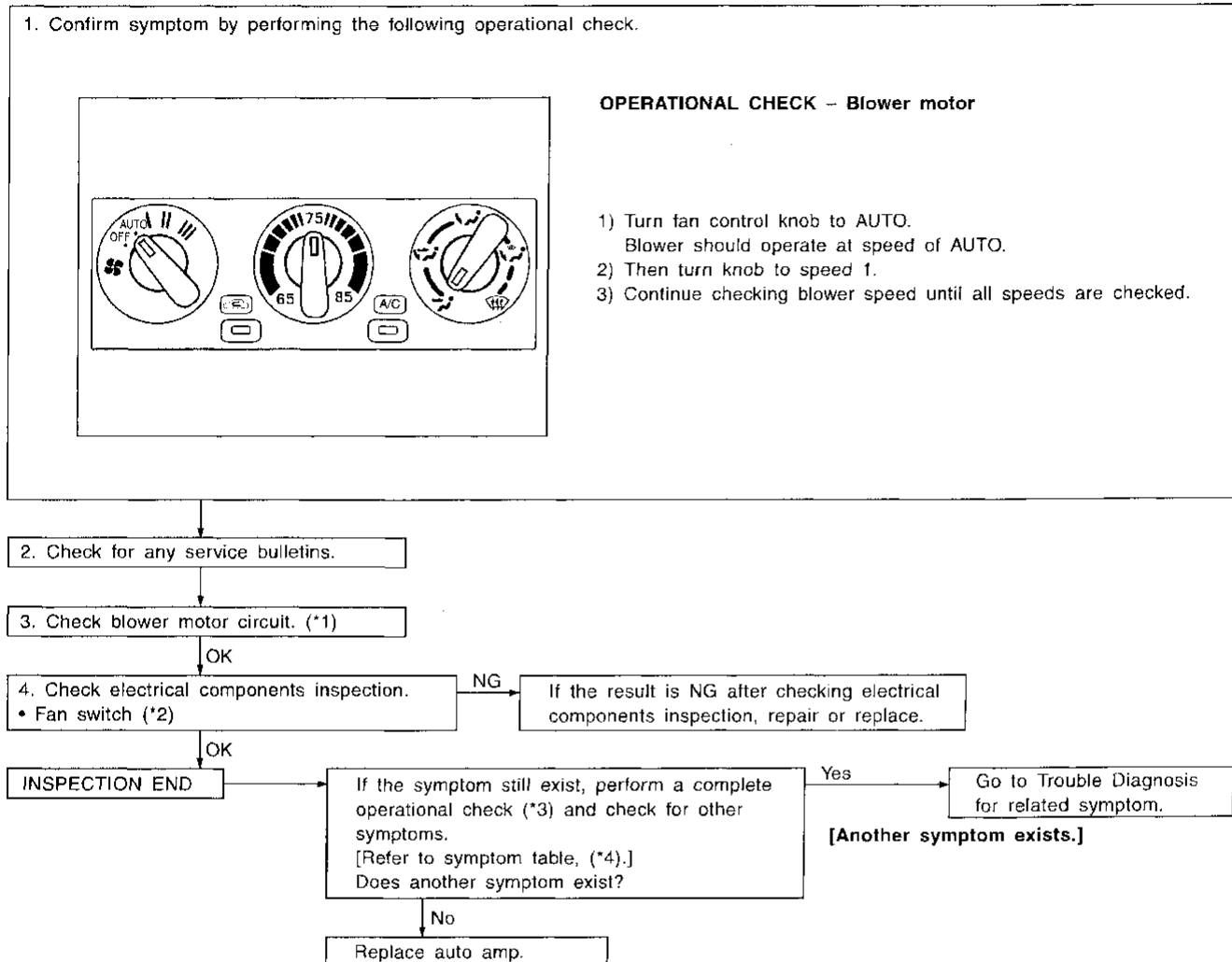
TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

-NAHA0120

Symptom:

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

Inspection Flow



*1: HA-51
*2: HA-49

*3: HA-32

*4: HA-31

BLOWER MOTOR CIRCUIT

-NAHA0144

GI
MA
EM
LC
EC
FE
CL
MT
AT
TF
PD
AX
SU
BR
ST
RS
BT
HA
SC
EL
IDX

1	CHECK FOR OUTPUT OF AUTO AMP.		
Measure voltage across fan control amp. harness terminal No. 2 and body ground.			
Fan control knob condition	Terminal No.		Voltage
	(+)	(-)	
AUTO	(2)	Body ground	Approx. 2.5 - 9.0V

MTBL0062

Fan control amp. connector (M60)

RHA704F

OK	▶	GO TO 2.
NG	▶	Replace fan control amp.

2	CHECK CIRCUIT CONTINUITY BETWEEN FAN SWITCH HARNESS TERMINAL No. 5 AND AUTO AMP. HARNESS TERMINAL No. 25		
Disconnect fan switch harness connector. Continuity should exist.			
<p style="text-align: center;">Fan switch connector (M43) Auto amp. connector (M41)</p> <p style="text-align: center;">SHA942E</p>			
If OK, check harness for short.			
NOTE: If the result is NG or No after checking circuit continuity, repair harness or connector.			
OK	▶	GO TO 3.	

3	CHECK BODY GROUND CIRCUIT FOR FAN SWITCH		
1. Disconnect fan switch harness connector.			
2. Does continuity exist between fan switch harness terminal No. 6 and body ground? Continuity should exist.			
<p style="text-align: center;">Fan switch connector (M43)</p> <p style="text-align: center;">RHA618F</p>			
If OK, check harness for short.			
NOTE: If the result is NG or No after checking circuit continuity, repair harness or connector.			
Yes	▶	GO TO 4.	

4	CHECK FAN SWITCH		
Refer to HA-49.			
OK or NG			
OK	▶	Replace auto amp.	
NG	▶	Replace fan switch.	

Magnet Clutch

TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

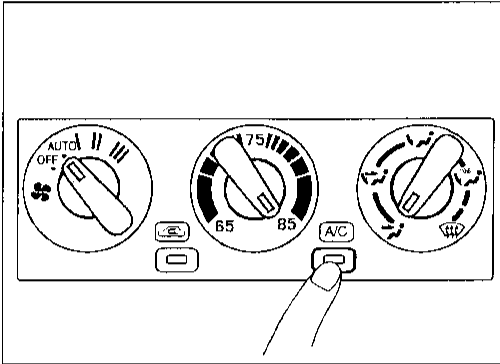
NAHA0121

Symptom:

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

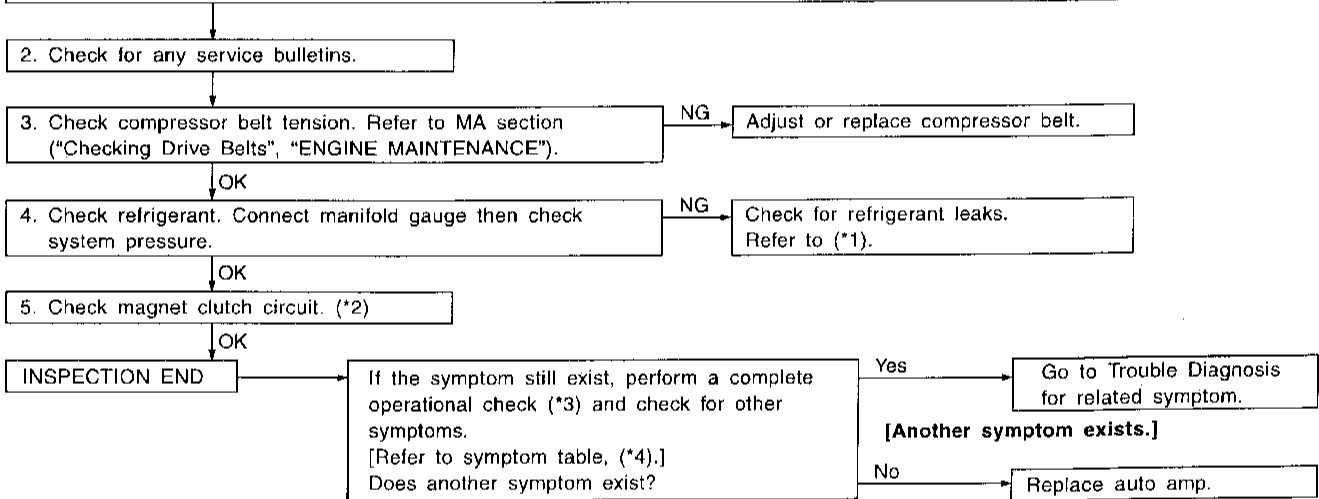
Inspection Flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – A/C switch

Move fan control knob to the desired position (AUTO to 3) and press air conditioner switch to turn ON air conditioner. Indicator light will come on when air conditioner is ON.



SHA905E

*1: HA-95
*2: HA-53

*3: HA-32

*4: HA-31

CONTROL SYSTEM OUTPUT COMPONENTS

NAHA0122

Magnet Clutch Control

NAHA0122S01

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

Acceleration Cut Control

NAHA0122S0101

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

MAGNET CLUTCH CIRCUIT

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 terminal No. 1 and body ground?</p>	
<p style="text-align: center;">Compressor connector (F202)</p> <p style="text-align: right;">RHA747FA</p>	
Yes or No	
Yes	▶ Check magnet clutch coil. If OK, replace magnet clutch. Refer to HA-90.
No	▶ Disconnect A/C relay. And GO TO 2.

2	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. 5 AND COMPRESSOR HARNESS TERMINAL NO. 1
<p>Continuity should exist. If OK, check harness for short.</p>	
<p style="text-align: center;">Compressor connector (F202) A/C relay connector (E26)</p> <p style="text-align: right;">RHA748FA</p>	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair harness or connector.

3	CHECK POWER SUPPLY FOR A/C RELAY
<p>Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness terminal Nos. 2, 3 and body ground?</p>	
<p style="text-align: center;">A/C relay connector (E26)</p> <p style="text-align: right;">RHA614F</p>	
Yes or No	
Yes	▶ GO TO 4.
No	▶ GO TO 14.

4	CHECK A/C RELAY AFTER DISCONNECTING IT
<p>Refer to HA-56.</p>	
OK or NG	
OK	▶ Reconnect A/C relay. And GO TO 5.
NG	▶ Replace A/C relay.

Magnet Clutch (Cont'd)

5	CHECK COIL SIDE CIRCUIT OF A/C RELAY
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. 12 and body ground?	
<p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>12</p> <p>G/R</p> <p>V</p>	
SHA932E	
Yes or No	
Yes	▶ GO TO 6.
No	▶ Disconnect A/C relay. Disconnect ECM (ECCS control module) harness connector. And GO TO 15.

6	CHECK VOLTAGE FOR ECM (ECCS CONTROL MODULE)
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. 21 and body ground?	
<p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>21</p> <p>B/W</p> <p>V</p>	
RHA701F	
Yes or No	
Yes	▶ Disconnect ECM (ECCS control module) harness connector. Disconnect dual-pressure switch harness connector. And GO TO 7.
No	▶ GO TO 16.

7	CHECK CIRCUIT CONTINUITY BETWEEN DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. 2 AND ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. 21
Continuity should exist. If OK, check harness for short.	
<p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>21</p> <p>B/W</p> <p>Dual-pressure switch connector (E37)</p> <p>2</p> <p>B/W</p> <p>Ω</p>	
RHA585F	
OK or NG	
OK	▶ GO TO 8.
NG	▶ Repair harness or connector.

8	CHECK DUAL-PRESSURE SWITCH
Refer to HA-11, HA-56.	
OK or NG	
OK	▶ Disconnect A/C switch harness connector. And GO TO 9.
NG	▶ Replace dual-pressure switch.

9	CHECK CIRCUIT CONTINUITY BETWEEN A/C SWITCH HARNESS TERMINAL No. 2 AND DUAL-PRESSURE SWITCH HARNESS TERMINAL No. 1
Continuity should exist. If OK, check harness for short.	
<p>Dual-pressure switch connector (E37)</p> <p>A/C switch connector (M44)</p> <p>1</p> <p>L/B</p> <p>2</p> <p>L/B</p> <p>Ω</p>	
RHA586FB	
OK or NG	
OK	▶ GO TO 10.
NG	▶ Repair harness or connector.

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10	CHECK A/C SWITCH
Refer to HA-56.	
OK or NG	
OK	▶ GO TO 11.
NG	▶ Replace A/C switch.

13	CHECK FAN SWITCH
Refer to HA-49.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Replace fan switch.

11	CHECK CIRCUIT CONTINUITY BETWEEN A/C SWITCH HARNESS TERMINAL NO. 1 AND FAN SWITCH HARNESS TERMINAL NO. 1
Disconnect fan switch harness connector. Continuity should exist. If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 12.
NG	▶ Repair harness or connector.

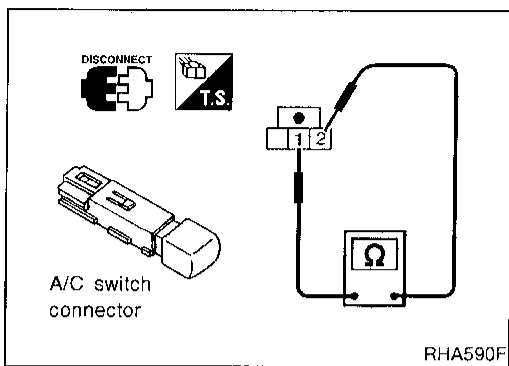
14	CHECK POWER SUPPLY CIRCUIT AND 7.5A (No. 6) FUSE AT FUSE BLOCK
Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").	
▶ INSPECTION END	

15	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. 1 AND ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. 12
Continuity should exist. If OK, check harness for short.	
OK or NG	
OK	▶ Check harness for short.
NG	▶ Repair harness or connector.

12	CHECK BODY GROUND CIRCUIT FOR FAN SWITCH
Does continuity exist between fan switch harness terminal No. 6 and body ground? Continuity should exist. If OK, check harness for short.	
Yes or No	
Yes	▶ GO TO 13.
No	▶ Repair harness or connector.

16	CHECK ECM (ECCS CONTROL MODULE)
Refer to EC section.	
▶ INSPECTION END	

Magnet Clutch (Cont'd)



ELECTRICAL COMPONENTS INSPECTION

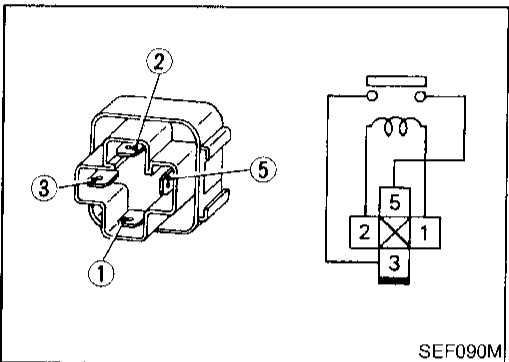
NAHA0123

A/C Switch

NAHA0123S01

Check continuity between terminals at each switch position.

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



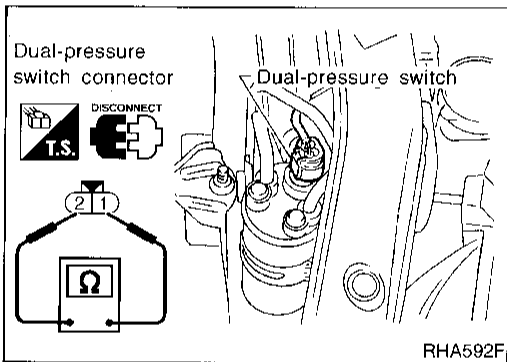
A/C Relay

NAHA0123S02

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.



Dual-pressure Switch

NAHA0123S03

	ON kPa (kg/cm ² , psi)	OFF kPa (kg/cm ² , psi)
Low-pressure side	Increasing to 157 - 216 (1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 1,863 - 2,256 (19 - 23, 270 - 327)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

Insufficient Cooling

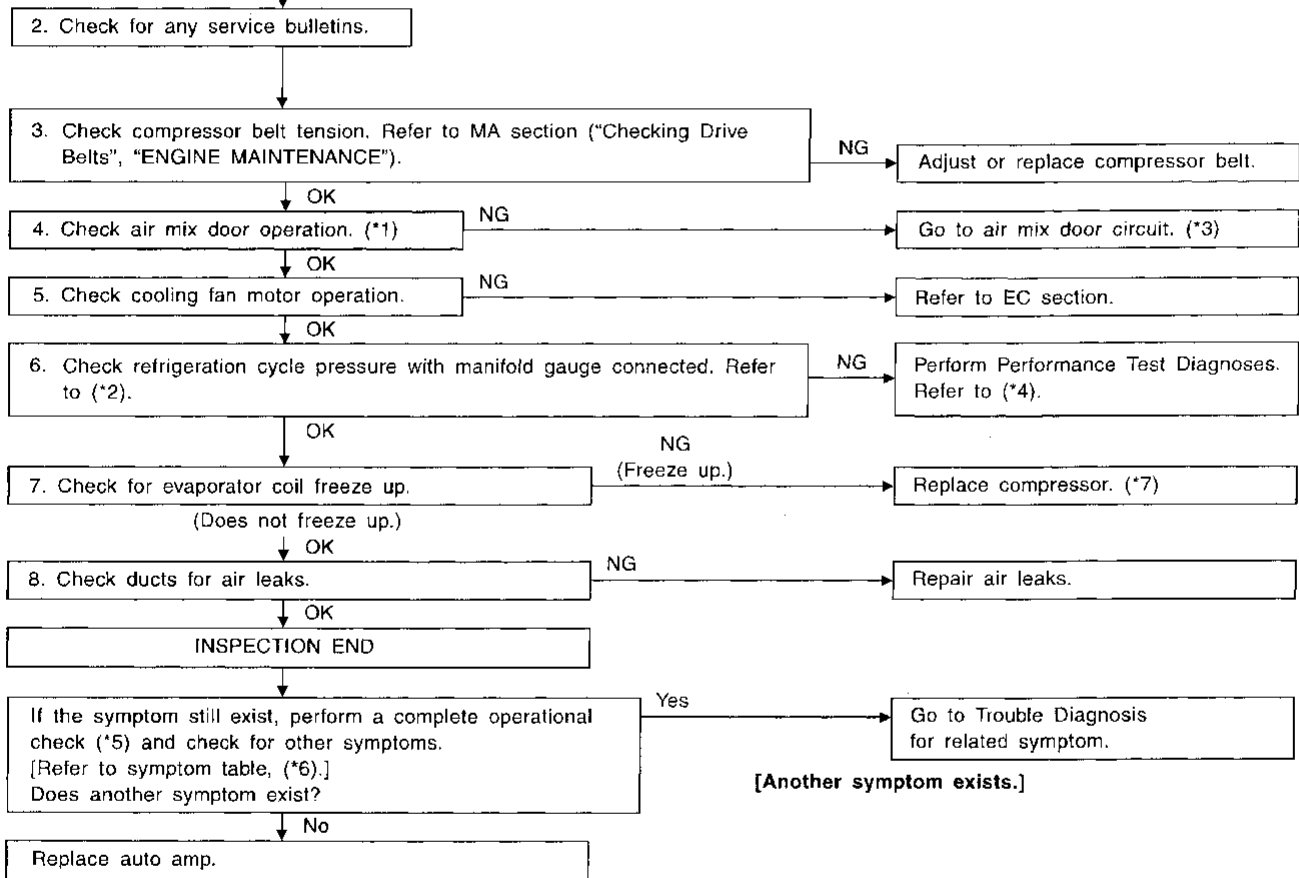
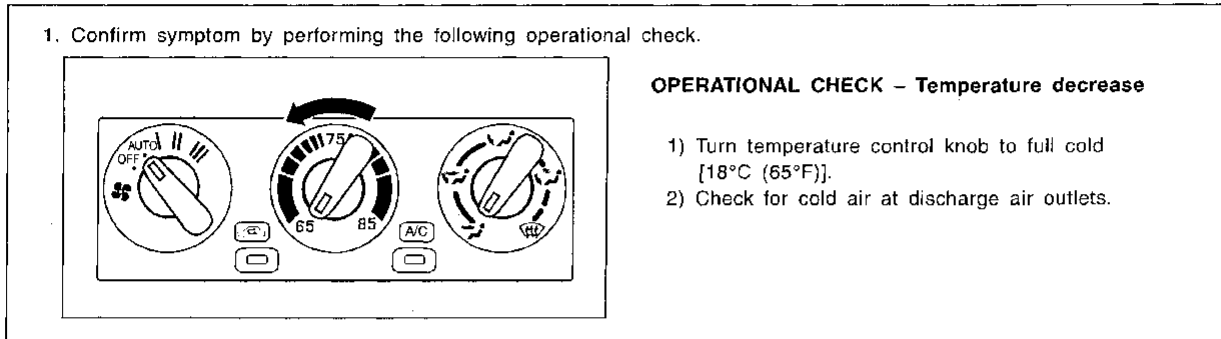
TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

Symptom:

- Insufficient Cooling.

Inspection Flow

-NAHA0145



SHA939E

- *1: HA-72
- *2: HA-60
- *3: HA-74

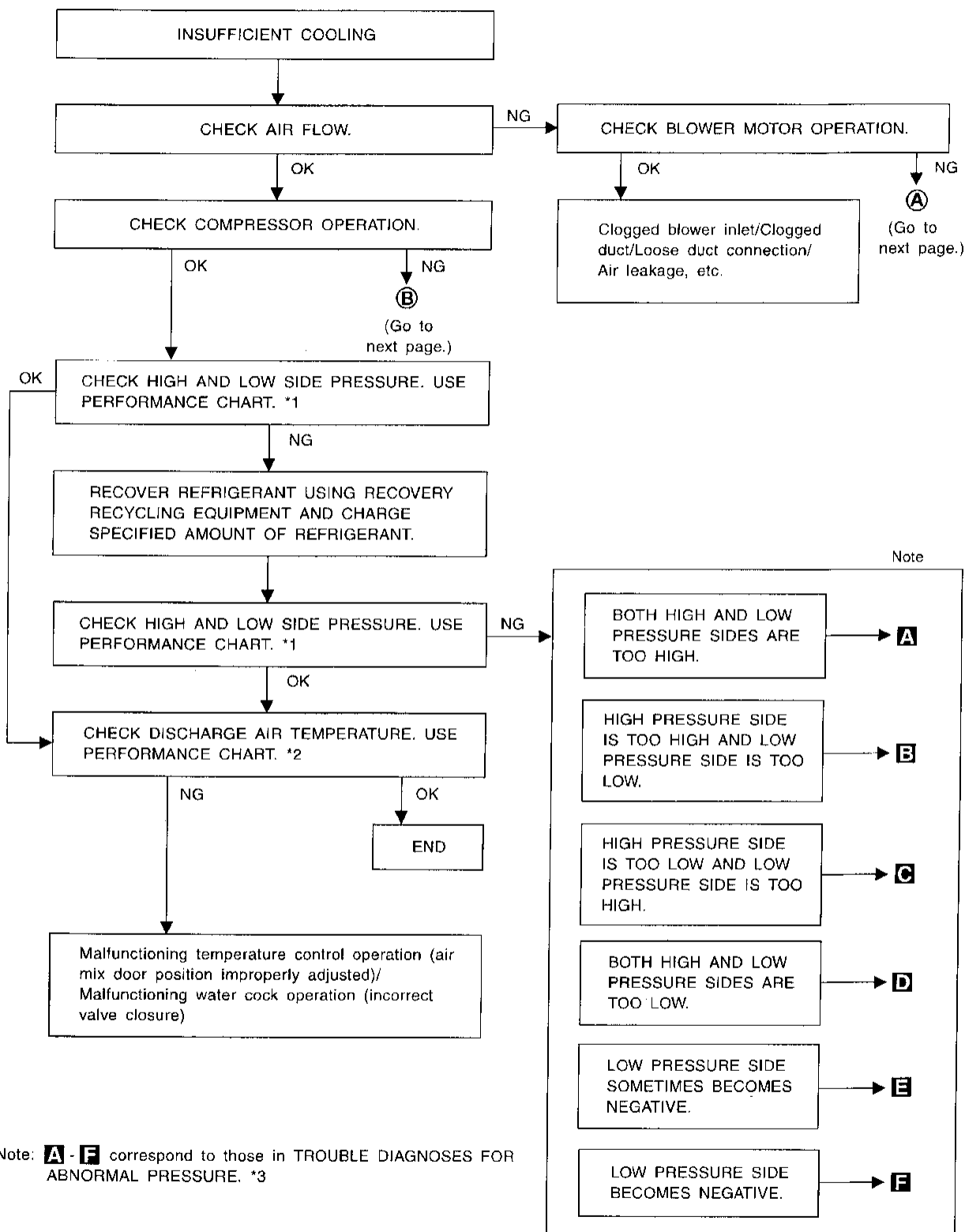
- *4: HA-58
- *5: HA-32

- *6: HA-31
- *7: HA-89

PERFORMANCE TEST DIAGNOSES Insufficient Cooling

NAHA0146

NAHA0146S01



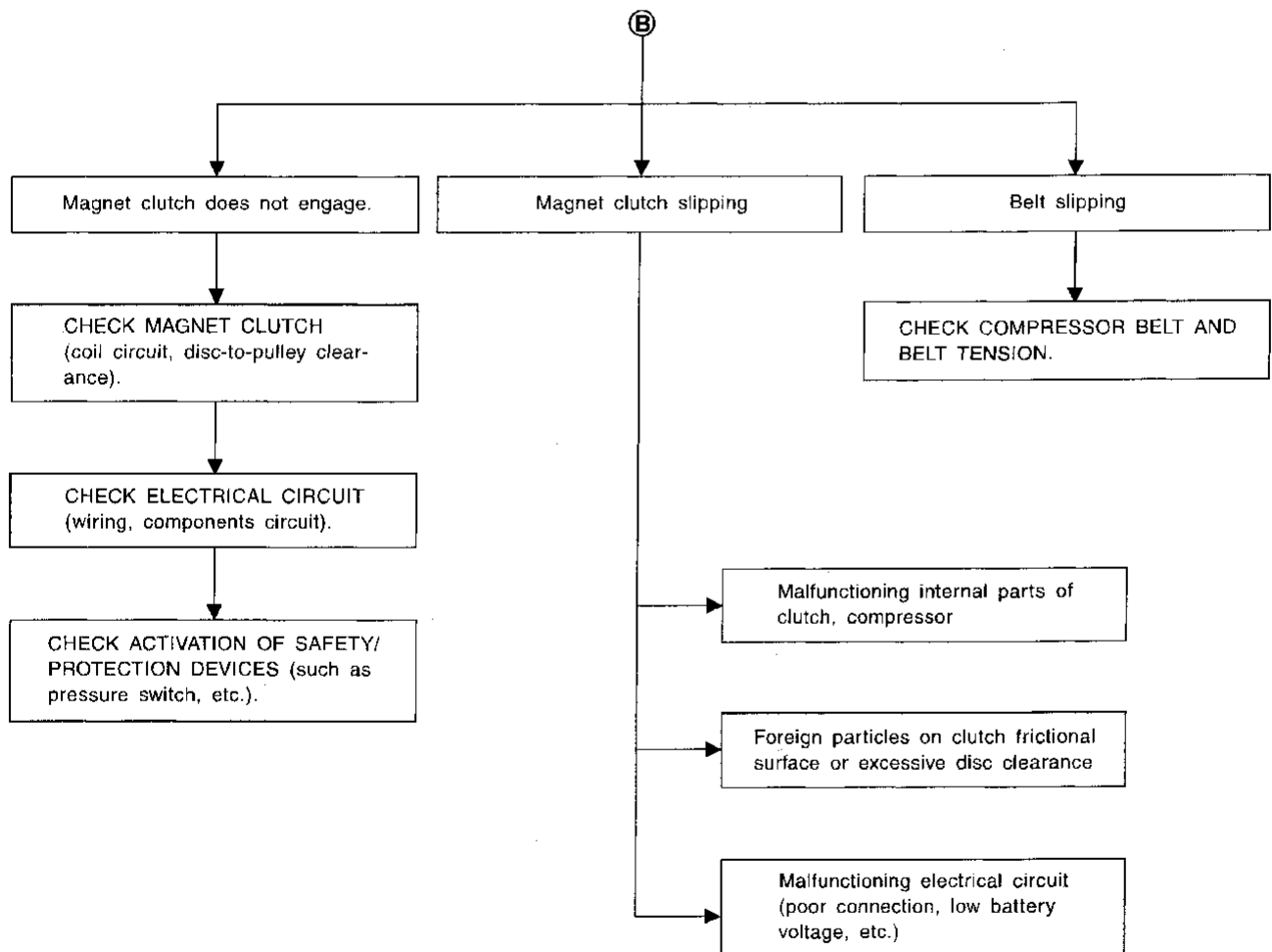
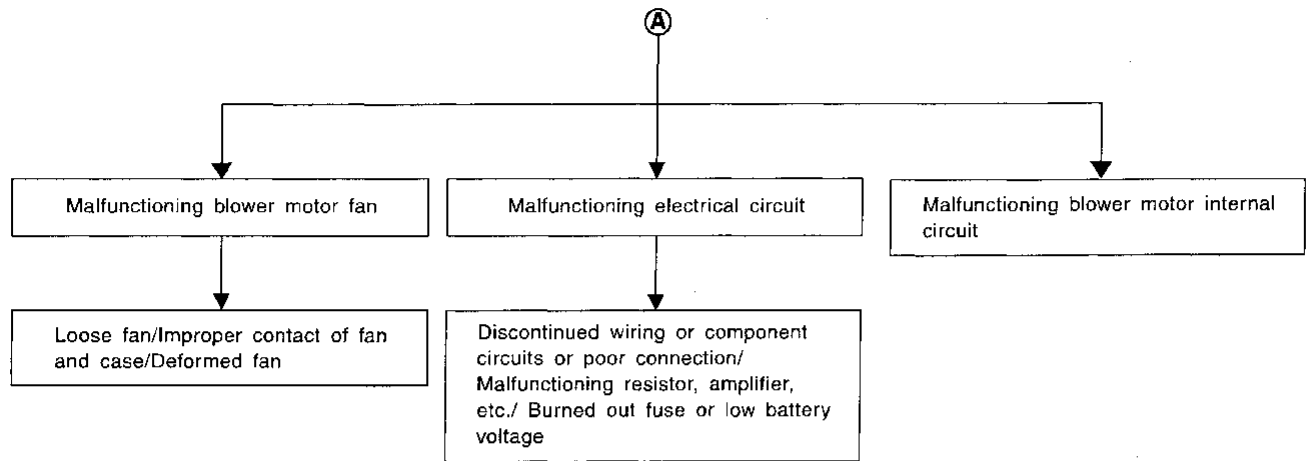
Note: **A - F** correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. *3

MHA649A

*1: HA-60

*2: HA-60

*3: HA-61



MHA650A

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PERFORMANCE CHART

-NAHA0027

Test Condition

NAHA0027S01

Testing must be performed as follows:

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

Doors: Closed

Door window: Open

Hood: Open

TEMP.: Max. COLD

Discharge Air: Face Vent

REC switch: (Recirculation) set

FAN speed: High speed

Engine speed: Idle speed

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

Test Reading

NAHA0027S02

Recirculating-to-discharge Air Temperature Table

NAHA0027S0201

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

NAHA0027S0202

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)

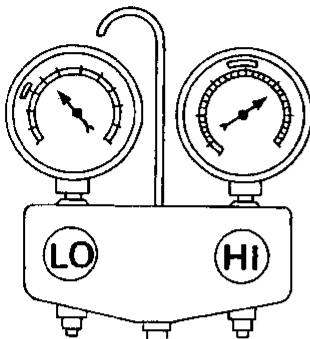
TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE

NAHA0028

Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to HA-60 ("Ambient air temperature-to-operating pressure table").

Both High and Low-pressure Sides are Too High.

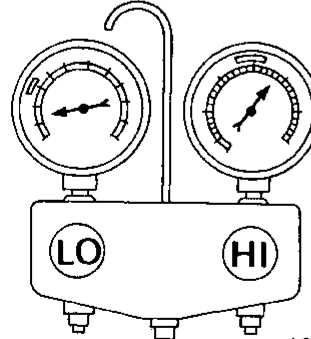
NAHA0026S01

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 thermal valve installation Improper expansion valve adjustment 	<p>Replace expansion valve.</p>

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

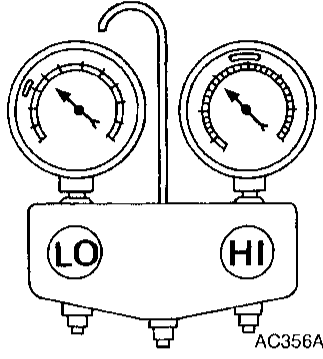
NAHA0026S02

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.

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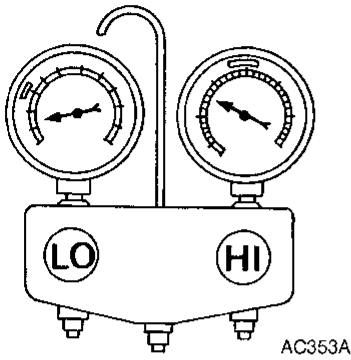
High-pressure Side is Too Low and Low-pressure Side is Too High.

NAI1A0026S03

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.

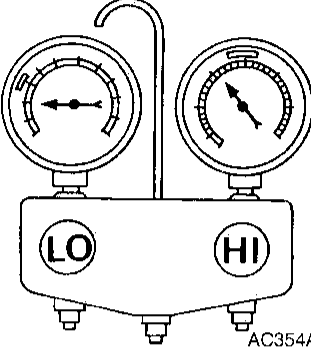
NAHA0028S04

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; font-size: small;">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 ↓ Leaking fittings or components</p>	<p>Check refrigerant for leaks. Refer to "Checking Refrigerant Leaks", HA-95.</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. ↓ 1. Improper expansion valve adjustment 2. Malfunctioning thermal valve 3. Outlet and inlet may be clogged.</p>	<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. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)</p>	<p>Replace compressor.</p>

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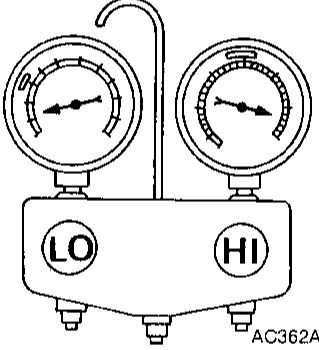
Low-pressure Side Sometimes Becomes Negative.

NAHA0028S05

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative. E 	<ul style="list-style-type: none"> • Air conditioning system does not function and does not cyclically cool the compartment air. • The system constantly functions for a certain period of time after compressor is stopped and restarted. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> • Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Low-pressure Side Becomes Negative.

NAHA0028S06

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. F 	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	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. <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

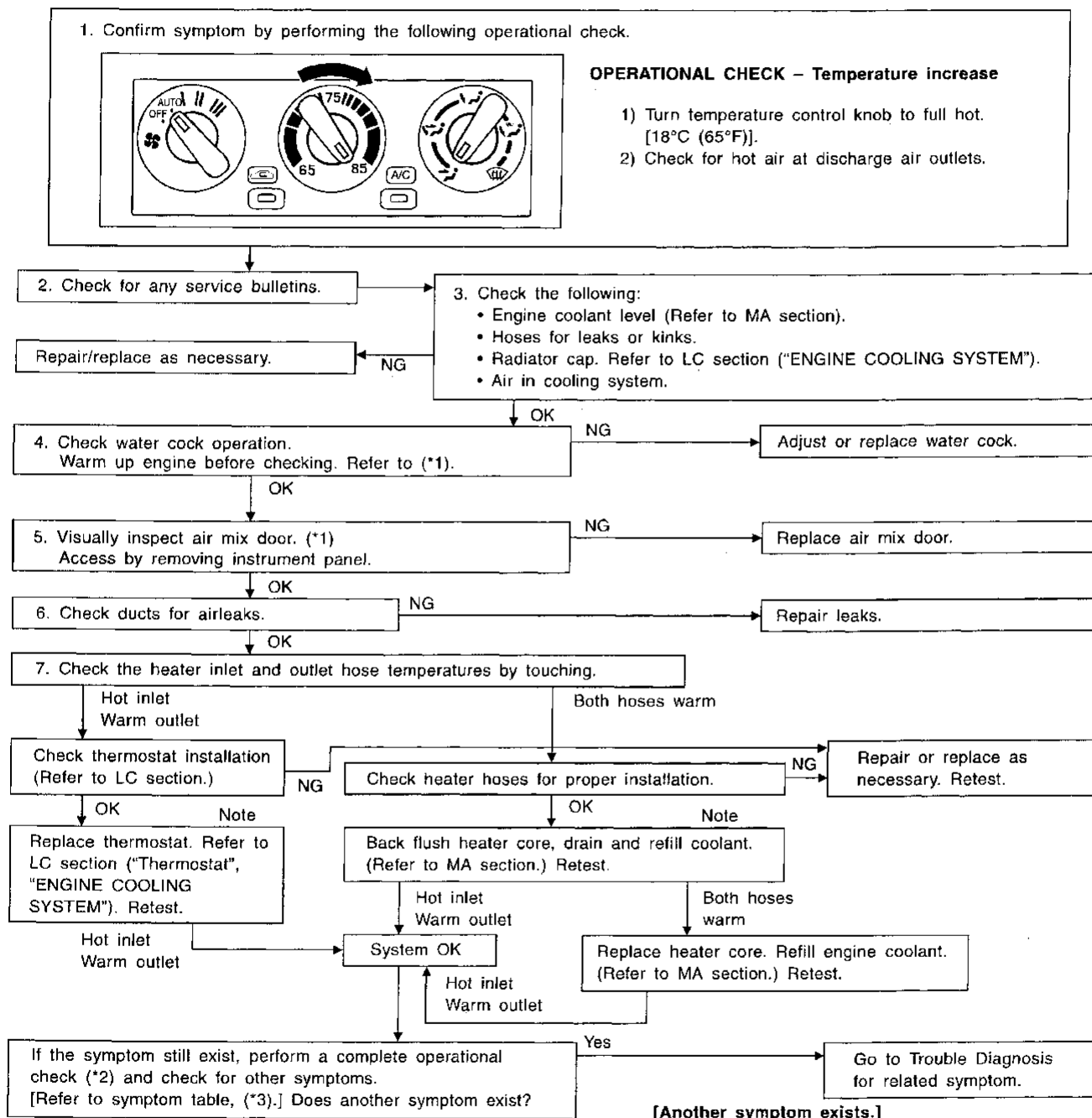
TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

Symptom:

- Insufficient Heating.

Inspection Flow

=NAHA0152



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SHA964E

*1: HA-75

*2: HA-32

*3: HA-31

Starting Fan Speed Control

TROUBLE DIAGNOSIS PROCEDURE FOR STARTING FAN SPEED CONTROL

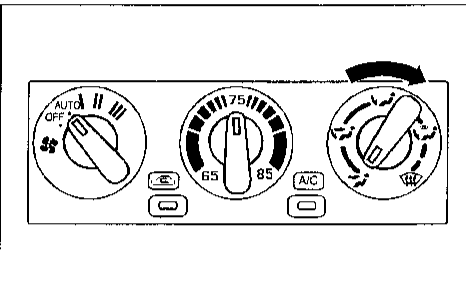
=NAHA0124

Symptom:

- Starting fan speed control does not operate.

Inspection Flow






1. Confirm symptom by performing the following operational check.

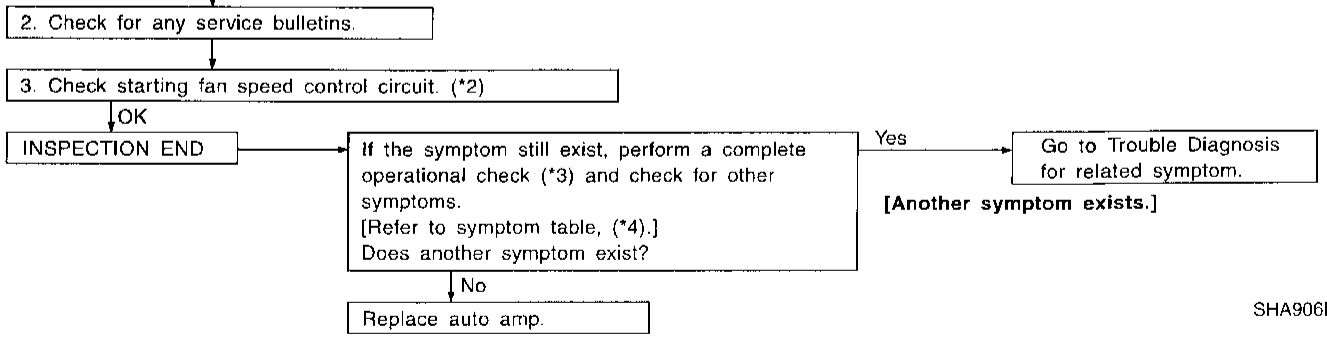


OPERATIONAL CHECK – Discharge Air

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" (*1).

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



SHA906E

*1: HA-22
*2: HA-67

*3: HA-32

*4: HA-31

STARTING FAN SPEED CONTROL CIRCUIT

-NAHA0034

SYMPTOM:

- Starting fan speed control does not operate.

1	CHECK THERMAL TRANSMITTER CIRCUIT BETWEEN THERMAL TRANSMITTER AND A/C MODE SWITCH
<p>Disconnect thermal transmitter harness connector and A/C mode switch harness connector. Check circuit continuity between thermal transmitter harness terminal No. 1 and A/C mode switch harness terminal No. 1. Continuity should exist. If OK, check harness for short.</p>	
RHA610F	
OK or NG	
OK	▶ GO TO 2.
NG	▶ Repair harness or connector.

2	CHECK A/C MODE SWITCH								
<p>Check circuit continuity between each terminal on mode switch.</p>									
	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr> <th style="width: 20%;">Mode switch position</th> <th style="width: 40%;">Terminal No.</th> <th style="width: 40%;">Continuity</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;">VENT DEF</td> <td style="text-align: center;">(2) and (3)</td> <td rowspan="2" style="text-align: center;">Yes</td> </tr> <tr> <td style="text-align: center;">Others</td> <td style="text-align: center;">(1) and (3)</td> </tr> </tbody> </table>	Mode switch position	Terminal No.	Continuity	VENT DEF	(2) and (3)	Yes	Others	(1) and (3)
Mode switch position	Terminal No.	Continuity							
VENT DEF	(2) and (3)	Yes							
Others	(1) and (3)								
MTBL0035									
RHA611FA									
OK or NG									
OK	▶ GO TO 3.								
NG	▶ Replace A/C mode switch.								

3	CHECK THERMAL TRANSMITTER
Refer to EL section.	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Replace thermal transmitter.

4	CHECK CIRCUIT CONTINUITY BETWEEN A/C AUTO AMP. CONNECTOR HARNESS TERMINAL NO. 17 AND A/C MODE SWITCH HARNESS TERMINAL NO. 3
<p>Disconnect A/C auto amp. harness connector and A/C mode switch connector. Continuity should exist. If OK, check harness for short.</p>	
SHA771E	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Repair harness or connector.

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Setting Temp. on PTC and In-vehicle Temp.

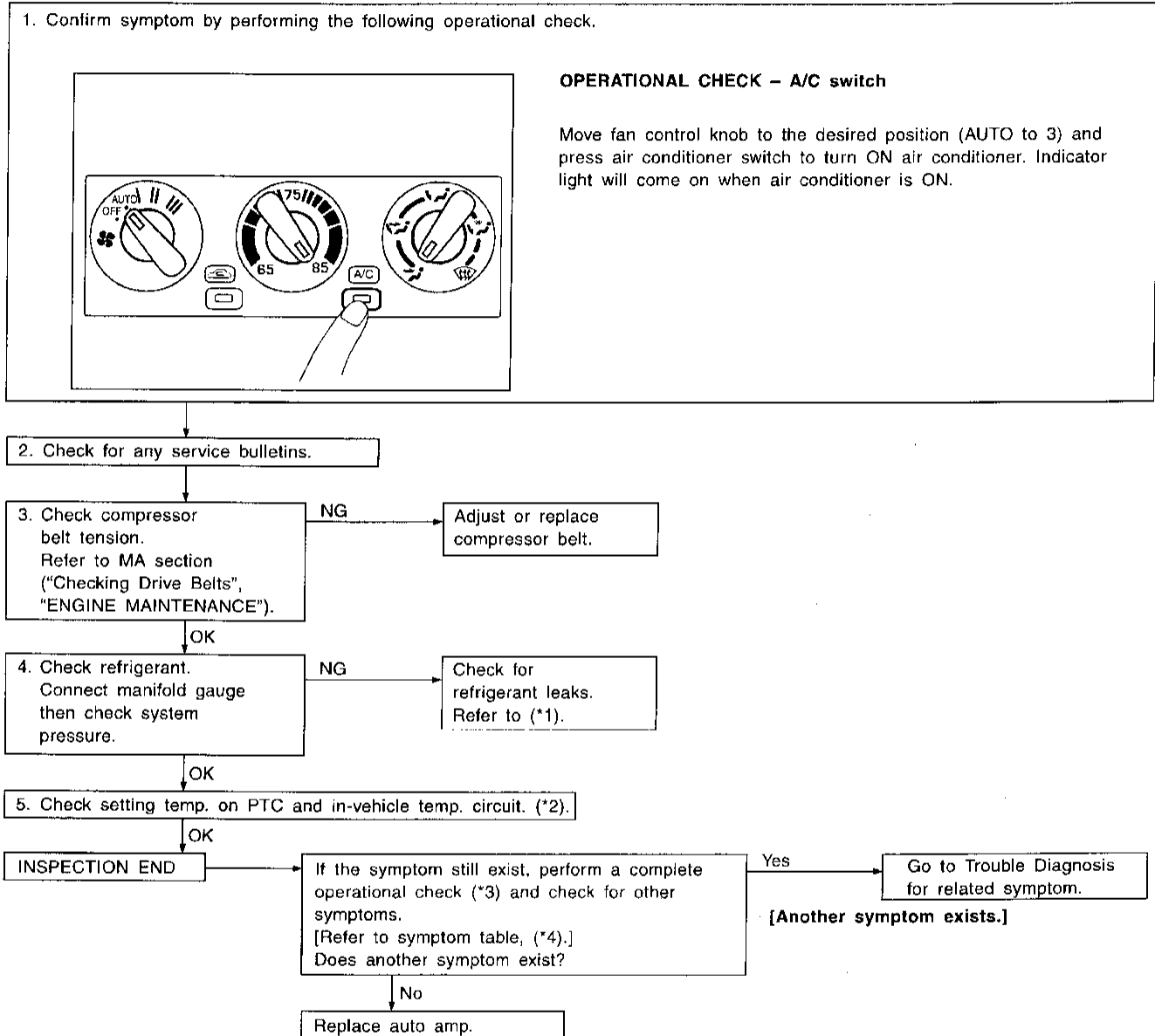
Setting Temp. on PTC and In-vehicle Temp.

TROUBLE DIAGNOSIS PROCEDURE FOR SETTING TEMP. ON PTC AND IN-VEHICLE TEMP. =NAHA0125

Symptom:

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

Inspection Flow

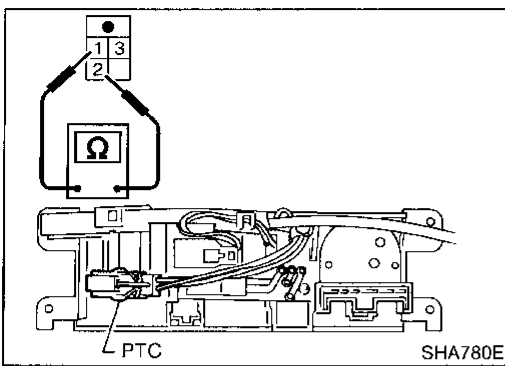


*1: HA-95

*2: HA-70

*3: HA-32

*4: HA-31



SHA780E

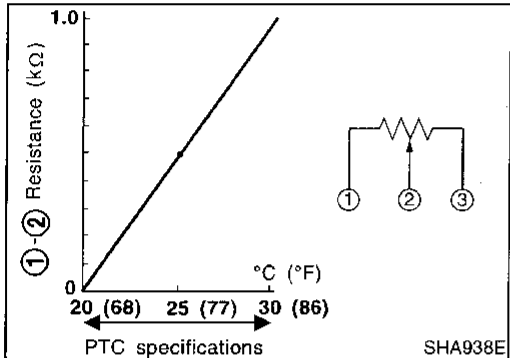
CONTROL SYSTEM INPUT COMPONENTS

Potential Temperature Control (PTC)

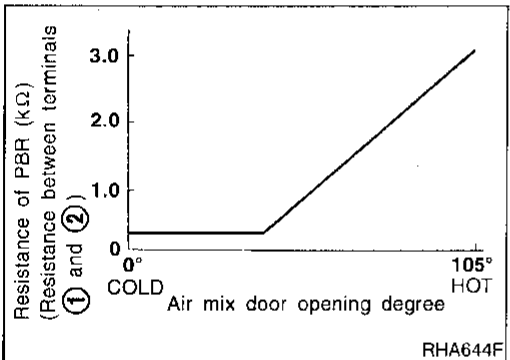
The PTC is built into the control unit. It has a variable resistance which changes according to the set temperature. This resistance is connected to the temperature knob.

PTC

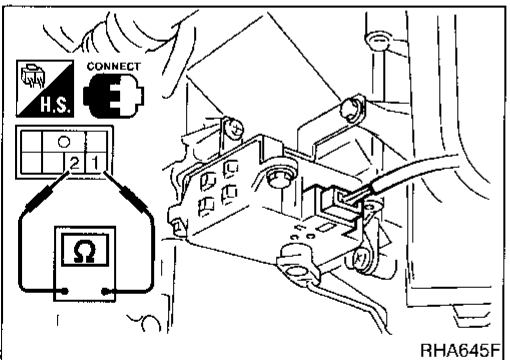
After disconnecting PTC harness connector, measure resistance between terminals 1 and 2 at PTC harness side.



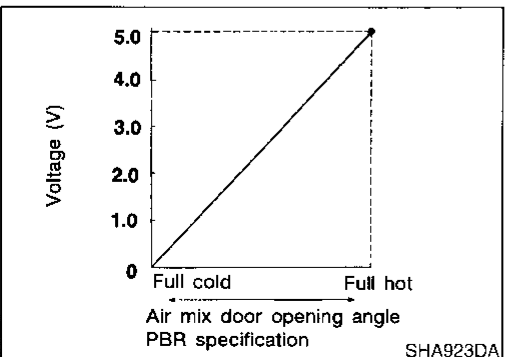
SHA938E



RHA644F



RHA645F



SHA923DA

PBR

Measure resistance between terminals 1 and 2 at vehicle harness side.

Ignition Switch: ON

- Ensure tester pointer deflects smoothly when PTC is moved from 20°C (65°F) to 30°C (85°F) and vice versa.

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TROUBLE DIAGNOSES

AUTO

Setting Temp. on PTC and In-vehicle Temp. (Cont'd)

SETTING TEMP. ON PTC AND IN-VEHICLE TEMP. CIRCUIT

-NAHA0035

SYMPTOM:

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

1	CHECK PBR
(Refer to HA-69.)	
OK or NG	
OK	▶ GO TO 2.
NG	▶ GO TO 7.

5	CHECK SUNLOAD SENSOR
Go to Sunload Sensor Circuit (HA-83).	
OK or NG	
OK	▶ GO TO 6.
NG	▶ Replace sunload sensor or auto amp.

2	CHECK ASPIRATOR AND DUCT
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair or replace.

6	CHECK AUTO AMP. POWER SUPPLY AND GROUND CIRCUIT
Go to Main Power Supply and Ground Circuit Check (HA-35).	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Repair harness or connector.

3	CHECK IN-VEHICLE SENSOR
Go to In-vehicle Sensor Circuit (HA-80).	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Repair or replace.

7	CHECK PTC
(Refer to HA-69.)	
OK or NG	
OK	▶ GO TO 8.
NG	▶ Replace PTC.

4	CHECK AMBIENT SENSOR
Go to Ambient Sensor Circuit (HA-78).	
OK or NG	
OK	▶ GO TO 5.
NG	▶ Repair or replace.

8	CHECK AIR MIX DOOR MECHANISM
Refer to Control Linkage Adjustment (HA-75).	
OK or NG	
OK	▶ Replace PBR.
NG	▶ Repair or adjust.

Air Mix Door

TROUBLE DIAGNOSIS PROCEDURE FOR AIR MIX DOOR MOTOR

=NAHA0127

Symptom:

- Air mix door motor does not operate normally.

Inspection Flow

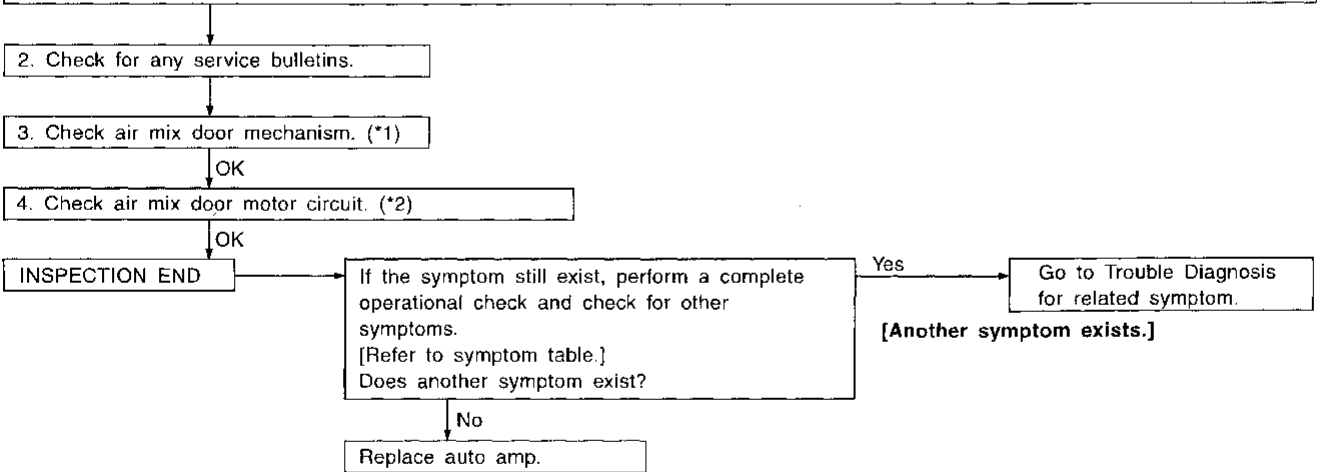
1. Confirm symptom by performing the following operational check.

The diagram shows two stages of an operational check. In the first stage, the temperature control knob is turned to the '18' mark, which corresponds to 65°F. In the second stage, the knob is turned to the '30' mark, which corresponds to 85°F. The diagram also shows the mode selector knob and the fan speed knob.

OPERATIONAL CHECK – Temperature decrease and increase

1. Check Temperature Decrease
 - 1) Turn temperature control knob to full cold [18°C (65°F)].
 - 2) Check for cold air at discharge air outlets.

2. Check Temperature Increase
 - 1) Turn temperature control knob to full hot [30°C (85°F)].
 - 2) Check for hot air at discharge air outlets.



*1: HA-75

*2: HA-74

CONTROL SYSTEM OUTPUT COMPONENTS

Air Mix Door Control (Automatic Temperature Control)

NAI1A0020
NAHA0020S01

Component Parts

NAHA0020S0101

Air mix door control system components are:

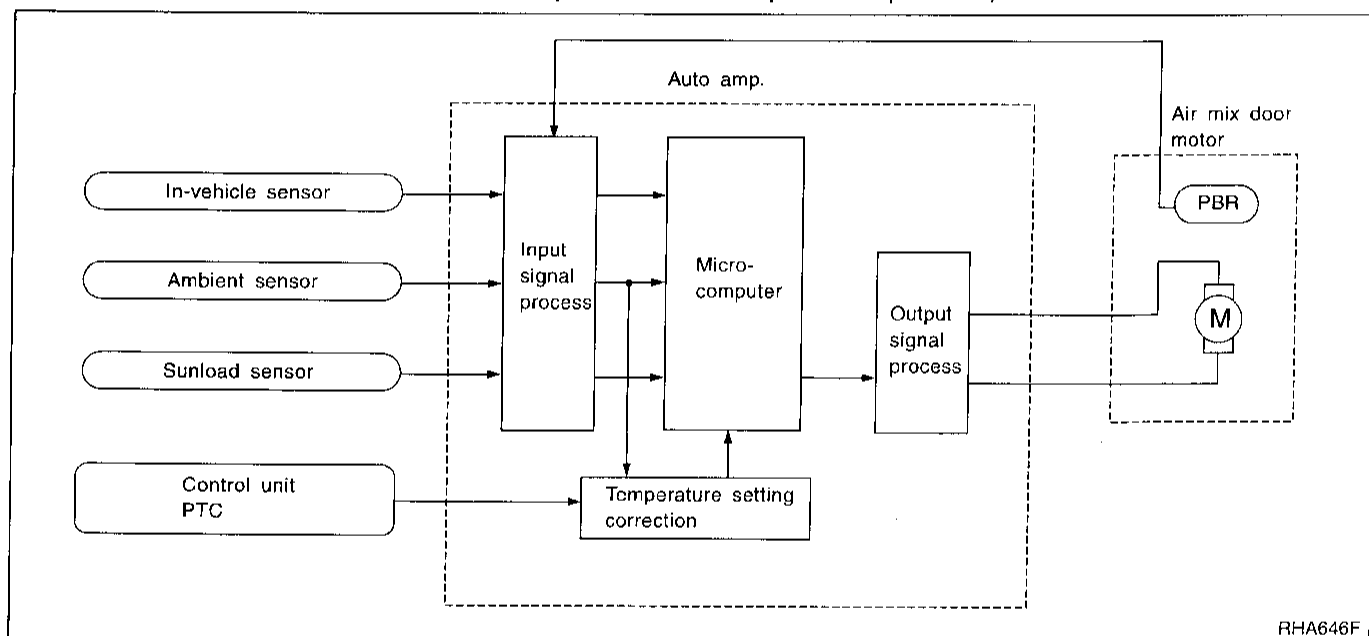
- 1) Auto amp.
- 2) Air mix door motor (PBR)
- 3) In-vehicle sensor
- 4) Ambient sensor
- 5) Sunload sensor

System Operation

NAHA0020S0102

Temperature set by Potentio Temperature Control (PTC) is compensated through setting temperature correction circuit to determine target temperature.

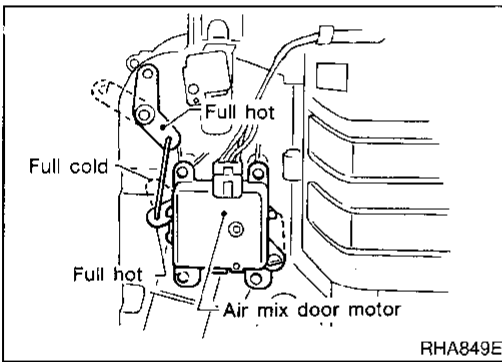
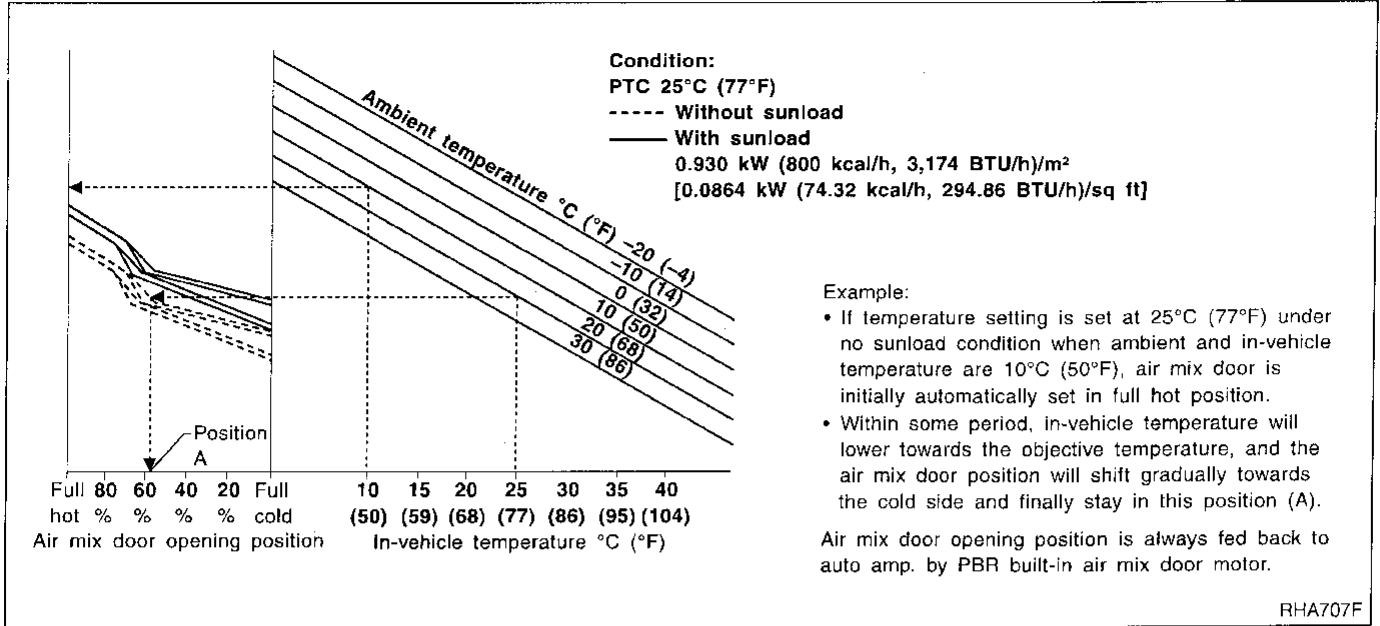
Auto amp. will operate air mix door motor to set air conditioning system in HOT or COLD position, depending upon relationship between conditions (target temperature, sunload, in-vehicle temperature and ambient temperature) and conditions (air mix door position and compressor operation).



RHA646F

Air Mix Door Control Specification

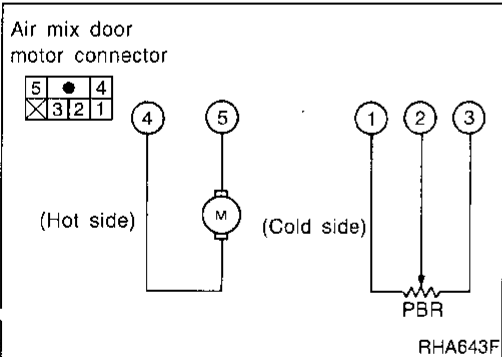
NAHA0020S0103



Air Mix Door Motor

NAHA0020S02

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



4	5	Air mix door operation	Direction of lever movement
(+)	(-)	COLD → HOT	Clockwise (Toward passenger compartment)
—	—	STOP	STOP
(-)	(+)	HOT → COLD	Counterclockwise (Toward engine compartment)

AIR MIX DOOR MOTOR CIRCUIT

-NAHA0036

SYMPTOM:

- Air mix door motor does not operate normally.

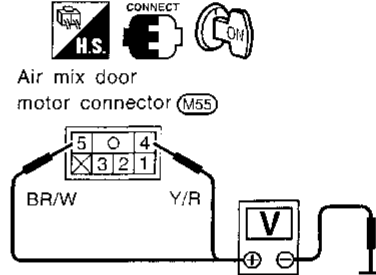
1	CHECK POWER SUPPLY FOR AUTO AMP.
Refer to Main Power Supply and Ground Circuit Check (HA-35).	
OK or NG	
OK	▶ GO TO 2.
NG	▶ Repair or replace.

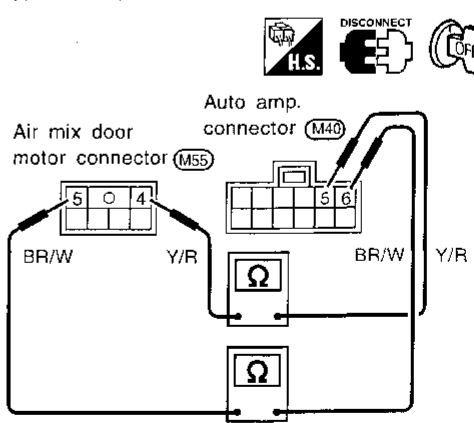
2	CHECK AMBIENT SENSOR CIRCUIT
Go to Ambient Sensor Circuit (HA-78).	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair or replace.

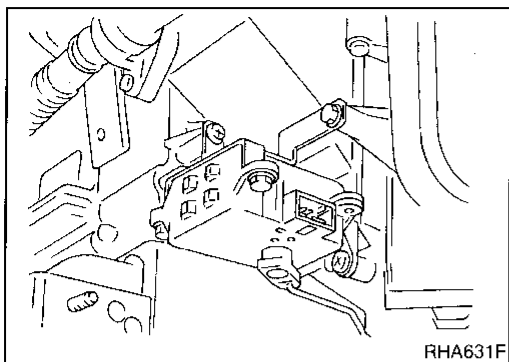
3	CHECK IN-VEHICLE SENSOR CIRCUIT
Go to In-vehicle Sensor Circuit (HA-80).	
OK or NG	
OK	▶ GO TO 4.
NG	▶ Repair or replace.

4	CHECK PTC
Refer to HA-69.	
OK or NG	
OK	▶ GO TO 5.
NG	▶ Replace PTC.

5	CHECK PBR
Refer to HA-69.	
OK or NG	
OK	▶ GO TO 6.
NG	▶ Replace PBR.

6	CHECK FOR OUTPUT OF AUTO AMP.		
Do approx. 10.5 volts exist between air mix door motor harness terminal Nos. 4, 5 and body ground?			
Air mix door operation	Terminal No.	Voltage	
	(+)	(-)	
Cold → Hot	(4)	Body ground	Approx. 10.5V
Hot → Cold	(5)		
MTBL0036			
 <p style="text-align: center;">Air mix door motor connector (M55)</p>			
RHA612F			
Yes or No			
Yes	▶	GO TO 7.	
No	▶	Replace auto amp.	

7	CHECK CIRCUIT CONTINUITY BETWEEN AIR MIX DOOR MOTOR HARNESS TERMINAL NOS. (4), 5 AND AUTO AMP. HARNESS TERMINAL NOS. (5), 6	
Continuity should exist. If OK, check harness for short.		
 <p style="text-align: center;">Auto amp. connector (M40)</p>		
SHA934E		
OK or NG		
OK	▶	Replace air mix door motor.
NG	▶	Repair harness or connector.



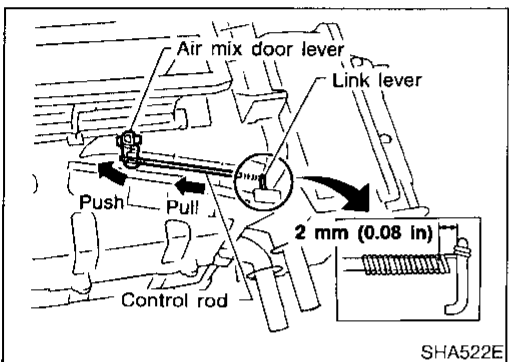
CONTROL LINKAGE ADJUSTMENT

Air Mix Door

NAHA0043

NAHA0043S02

1. Install air mix door motor on heater unit and connect it to the air mix door motor harness.
2. Set PTC at 18°C (65°F) and air mix door motor at "full cold".
3. Move air mix door lever by hand and hold it at the full-cold position.
4. Attach air mix door lever to rod holder.
5. Check that air mix door operates properly when PTC is moved from 20 to 30°C (65 to 85°F).



Water Cock Control Rod

NAHA0043S04

- Reinstall the air mix door motor after adjusting water cock control rod.

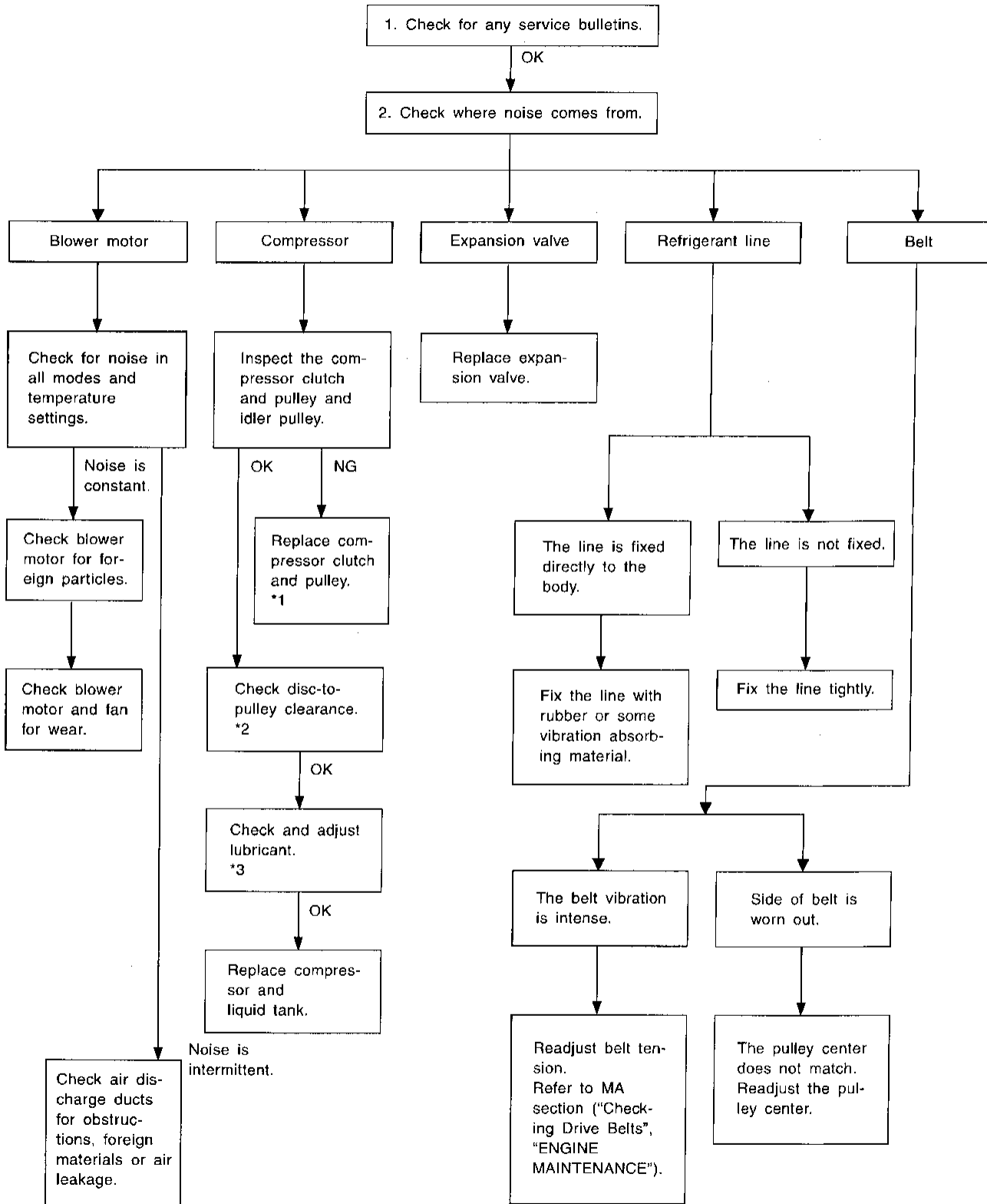
1. Push air mix door lever in direction of arrow.
2. Pull control rod of water cock in direction of arrow so as to make clearance of about 2 mm (0.08 in) between ends of rod and link lever and connect the rod to door lever.

After connecting control rod, check it operates properly.

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Noise TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

NAHA0026

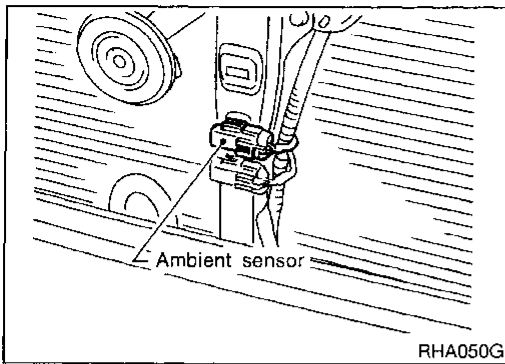


SHA909E

*1: HA-90

*2: HA-92

*3: HA-87



Ambient Sensor
CONTROL SYSTEM INPUT COMPONENTS

NAHA0130

Ambient Sensor

NAHA0130S01

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

Ambient Temperature Input Process

NAHA0130S02

The auto amp. includes a "processing circuit" for the ambient sensor input. When the ambient temperature increases quickly, the processing circuit controls the input from the ambient sensor. It allows the auto amp. to recognize the increase of temperature only 0.2°C (0.4°F) per 100 seconds.

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

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TROUBLE DIAGNOSIS PROCEDURE FOR AMBIENT SENSOR CIRCUIT

-NAHA0039

SYMPTOM:

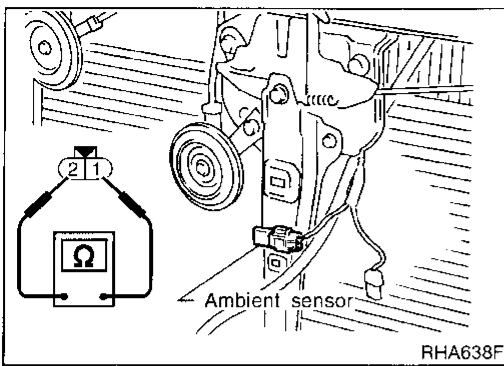
- Ambient sensor circuit is open or shorted.

1	CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP.
Disconnect ambient sensor harness connector. Do approx. 5 volts exist between ambient sensor harness terminal No. 1 and body ground?	
<p style="text-align: center;">Ambient sensor connector (E32)</p> <p style="text-align: right;">RHA022G</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ GO TO 4.

2	CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. HARNESS TERMINAL NO. 20 AND AMBIENT SENSOR HARNESS TERMINAL NO. 2
Disconnect auto amp. harness connector. Continuity should exist. If OK, check harness for short.	
<p style="text-align: center;">Auto amp. connector (M41) Ambient sensor connector (E32)</p> <p style="text-align: right;">RHA024G</p>	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair harness or connector.

3	CHECK AMBIENT SENSOR
(Refer to HA-77.)	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Replace ambient sensor.

4	CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR HARNESS TERMINAL NO. 1 AND AUTO AMP. HARNESS TERMINAL NO. 15
Disconnect auto amp. harness connector. Continuity should exist. If OK, check harness for short.	
<p style="text-align: center;">Auto amp. connector (M41) Ambient sensor connector (E32)</p> <p style="text-align: right;">RHA023G</p>	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Repair harness or connector.



COMPONENT INSPECTION

NAHA0147

Ambient Sensor

NAHA0147S01

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

Temperature °C (°F)	Resistance kΩ
-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

In-vehicle Sensor

CONTROL SYSTEM INPUT COMPONENTS

NAHA0131

In-vehicle Sensor

NAHA0131S01

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

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TROUBLE DIAGNOSIS PROCEDURE FOR IN-VEHICLE SENSOR CIRCUIT

-NAHA0040

SYMPTOM:

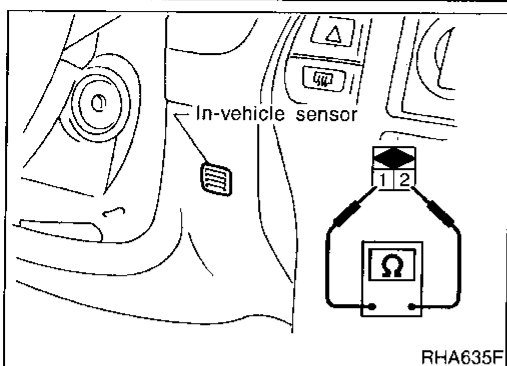
- In-vehicle sensor circuit is open or shorted.

1	CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.
Disconnect in-vehicle sensor harness connector. Do approx. 5 volts exist between in-vehicle sensor harness terminal No. 2 and body ground?	
Yes or No	
Yes	▶ GO TO 2.
No	▶ GO TO 4.

2	CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. HARNESS TERMINAL NO. 20 AND IN-VEHICLE SENSOR HARNESS TERMINAL NO. 1
Disconnect auto amp. harness connector. Continuity should exist. If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair harness or connector.

3	CHECK IN-VEHICLE SENSOR
(Refer to HA-79.)	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Replace in-vehicle sensor.

4	CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR HARNESS TERMINAL NO. 2 AND AUTO AMP. HARNESS TERMINAL NO. 14
Disconnect auto amp. harness connector. Continuity should exist. If OK, check harness for short.	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Repair harness or connector.



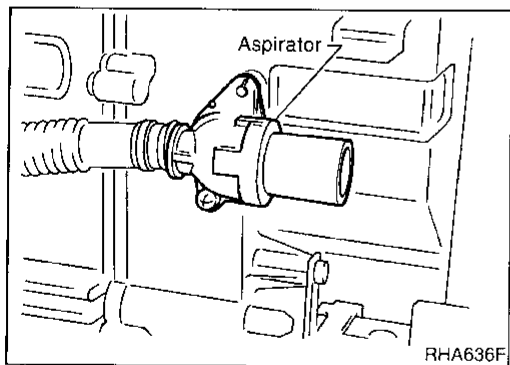
COMPONENT INSPECTION

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.

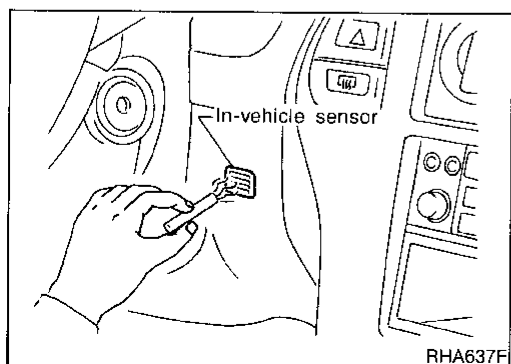
Temperature °C (°F)	Resistance kΩ
-15 (5)	12.73
-10 (14)	9.92
-5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07

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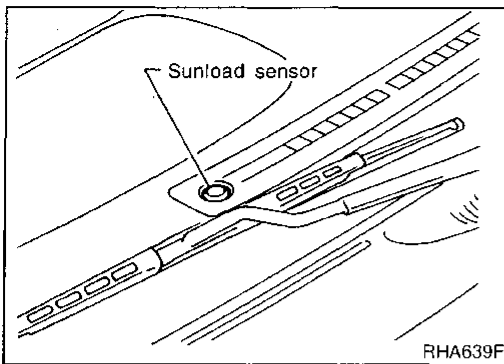
Aspirator

The aspirator is located in front of the heater unit. The aspirator continuously draws compartment air into the in-vehicle sensor while the ignition switch is ON.



Check that smoke is properly sucked into in-vehicle sensor when a lighted cigarette is moved close to the sensor.

Sunload Sensor

**Sunload Sensor****CONTROL SYSTEM INPUT COMPONENTS**

NAHA0128

Sunload Sensor

NAHA0128S01

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

Sunload Input Process

NAHA0128S02

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 ATC system operation due to small or quick variations in detected sunload.

For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time. As a result, the effect the above mentioned does not cause any change in the ATC 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.

TROUBLE DIAGNOSIS PROCEDURE FOR SUNLOAD SENSOR CIRCUIT

SYMPTOM:

- Sunload sensor circuit is open or shorted.

=NAHA0041

1	CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP.
<p>Disconnect sunload sensor harness connector. Do approx. 5 volts exist between sunload sensor harness terminal No. 1 and body ground?</p>	
<p style="text-align: center;">Sunload sensor connector (M58)</p> <p style="text-align: center;">LG/R</p> <p style="text-align: right;">RHA025G</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ GO TO 4.

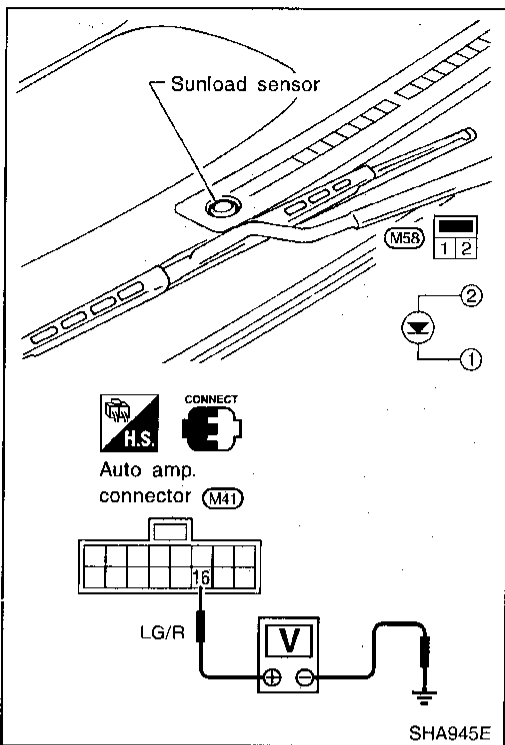
2	CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR HARNESS TERMINAL NO. 2 AND AUTO AMP. HARNESS TERMINAL NO. 20
<p>Disconnect auto amp. harness connector. Continuity should exist. If OK, check harness for short.</p>	
<p style="text-align: center;">Auto amp. connector (M40)</p> <p style="text-align: center;">Sunload sensor connector (M58)</p> <p style="text-align: center;">G/W</p> <p style="text-align: right;">RHA026G</p>	
OK or NG	
OK	▶ GO TO 3.
NG	▶ Repair harness or connector.

3	CHECK SUNLOAD SENSOR
<p>(Refer to HA-82.)</p> <p style="text-align: center;">OK or NG</p>	
OK	▶ Replace auto amp.
NG	▶ Replace sunload sensor.

4	CHECK CIRCUIT CONTINUITY BETWEEN AUTO AMP. HARNESS TERMINAL NO. 16 AND SUNLOAD SENSOR HARNESS TERMINAL NO. 1
<p>Disconnect auto amp. harness connector. Continuity should exist. If OK, check harness for short.</p>	
<p style="text-align: center;">Auto amp. connector (M41)</p> <p style="text-align: center;">Sunload sensor connector (M58)</p> <p style="text-align: center;">LG/R</p> <p style="text-align: right;">RHA027G</p>	
OK or NG	
OK	▶ Replace auto amp.
NG	▶ Repair harness or connector.

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Sunload Sensor (Cont'd)



COMPONENT INSPECTION

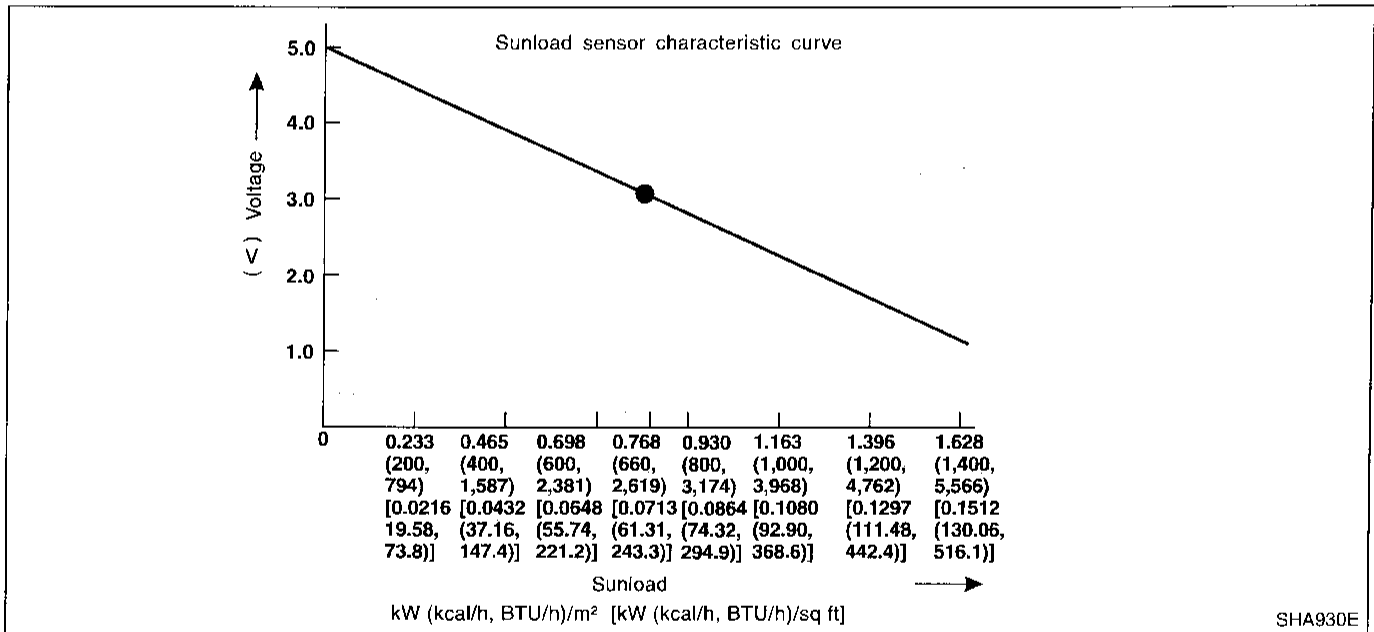
Sunload Sensor

NAHA0149

NBHA0149S01

Measure voltage between auto amp. terminal 16 and body ground. If NG, replace sunload sensor.

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



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

SETTING OF SERVICE TOOLS AND EQUIPMENT

NAHA0044

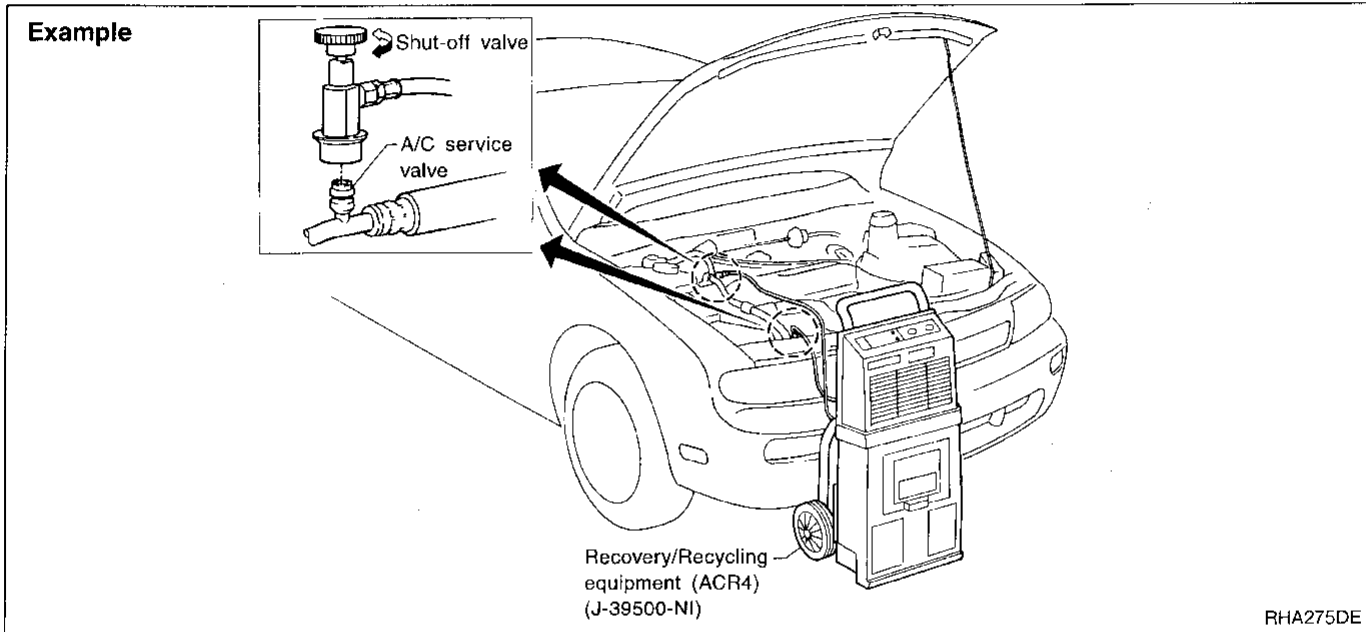
NAHA0044S01

NAHA0044S0101

Discharging Refrigerant

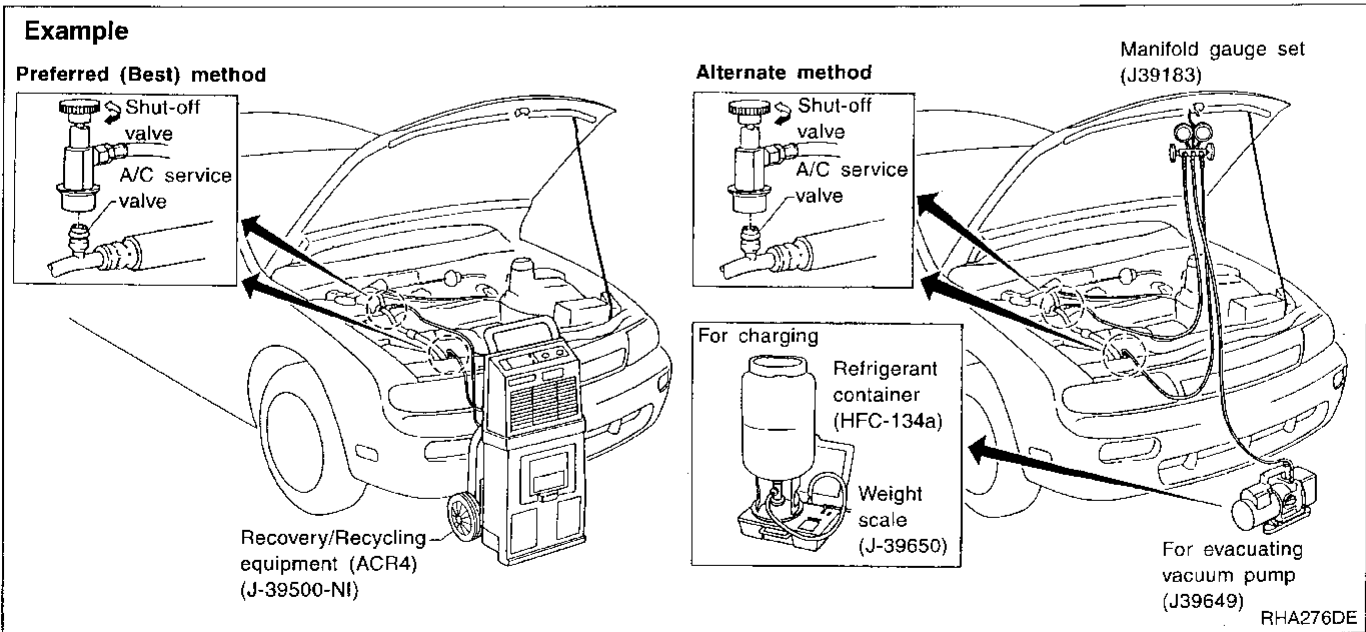
WARNING:

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.



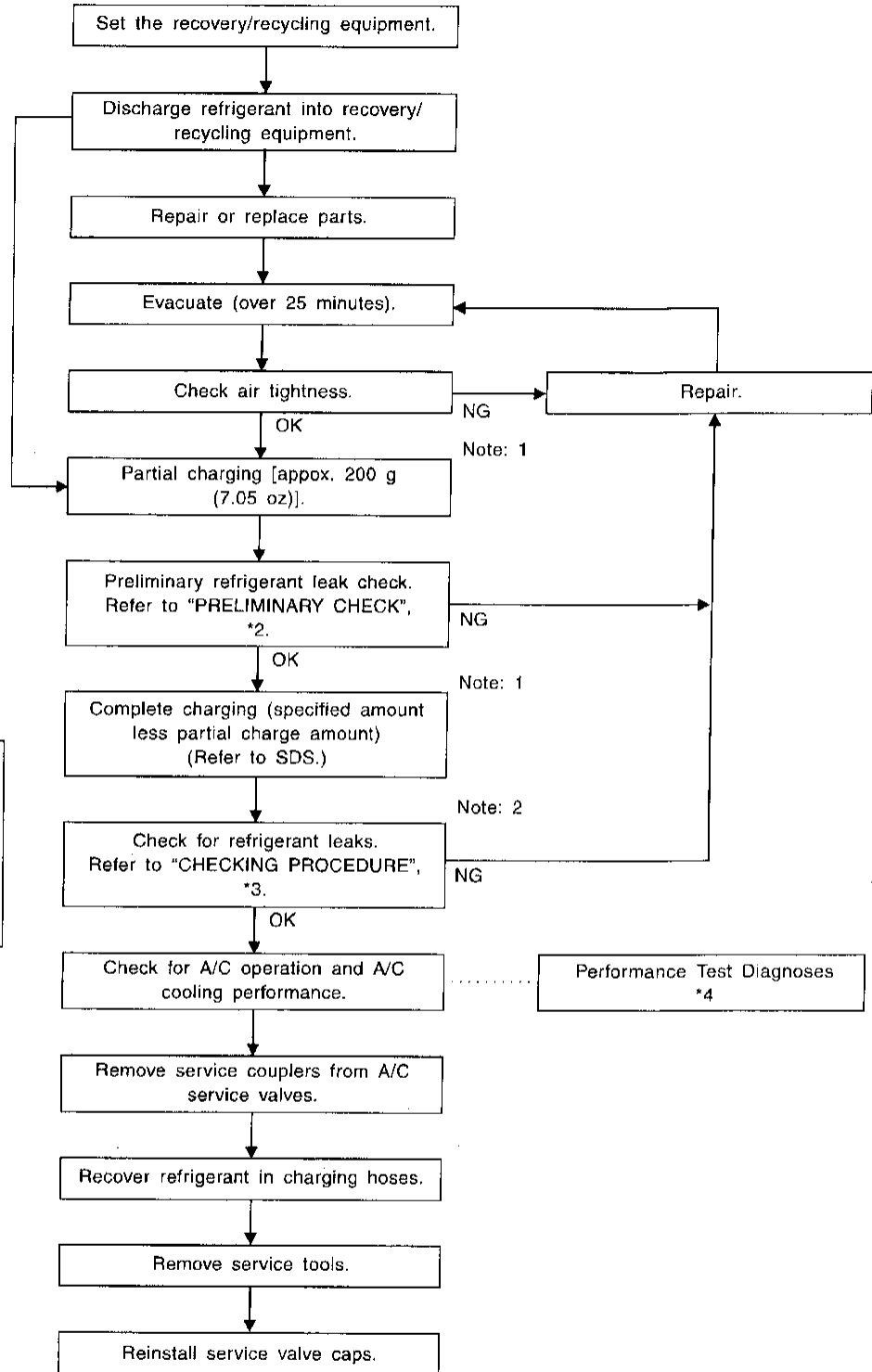
Evacuating System and Charging Refrigerant

NAHA0044S0102



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Recovered lubricant. Refer to "CHECKING AND ADJUSTING", *1.



Note: 1 Before charging refrigerant, ensure engine is off.
 Note: 2 Before checking for leaks, start engine to activate air conditioning system then turn engine off. Service valve caps must be installed to prevent leakage.

*1: HA-87
 *2: HA-95

*3: HA-96

*4: HA-139

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 flowchart shown below.

1	LUBRICANT RETURN OPERATION	
Can lubricant return operation be performed? • A/C system works properly. • There is no evidence of a large amount of lubricant leakage.		
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 or 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).]		
2. Next item is for V-5 or 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.		
CAUTION:		
If excessive lubricant leakage is noted, do not perform the lubricant return operation.		
▶		GO TO 3.

3	CHECK COMPRESSOR	
Should the compressor be replaced? Yes or No		
Yes	▶	GO TO HA-88.
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-88.
No	▶	Carry out the A/C performance test.

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Lubricant Adjusting Procedure for Components Replacement Except Compressor

=NAHA0045S0201

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 flow chart.

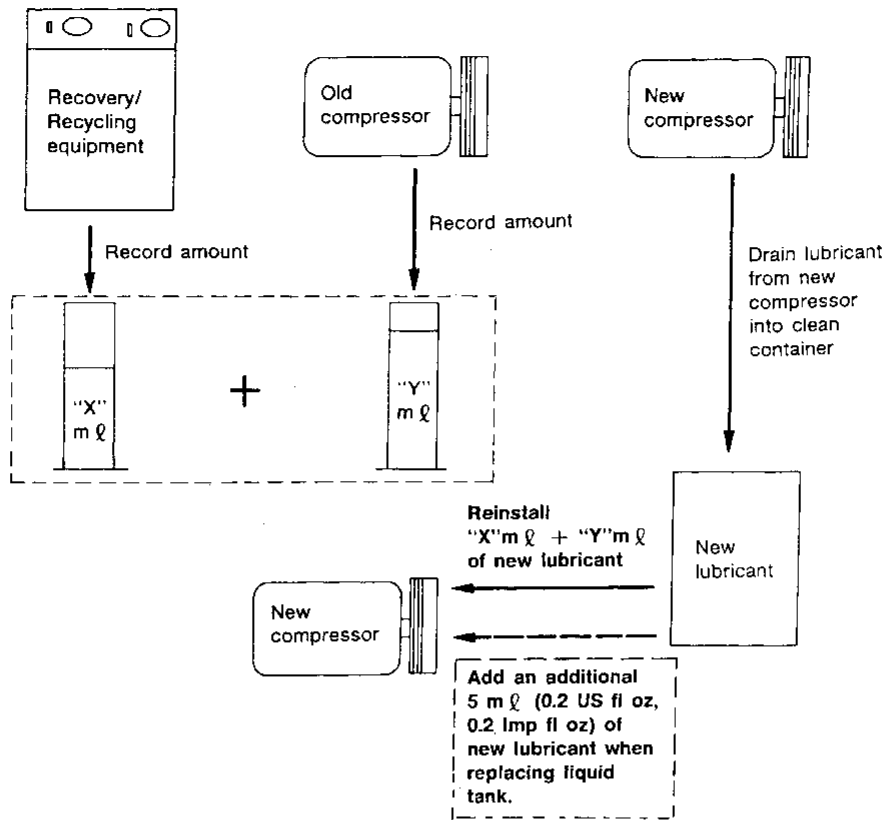
*2: If refrigerant leak is small, no addition of lubricant is needed.

Lubricant Adjustment Procedure for Compressor Replacement

NAHA0045S0202

- 1) Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
- 2) Remove the drain plug of the "old" (removed) compressor (applicable only to V-5 or V-6 or DKS-16H compressor). Drain the lubricant into a graduated container and record the amount of drained lubricant.
- 3) Remove the drain plug and drain the lubricant from the "new" compressor into a separate, clean container.
- 4) Measure an amount of new lubricant installed equal to amount drained from "old" compressor. Add this lubricant to "new" compressor through the suction port opening.
- 5) Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to "new" compressor through the suction port opening.
- 6) Torque the drain plug.
 - V-5 or V-6 compressor:**
18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)
 - DKS-16H compressor:**
14 - 16 N·m (1.4 - 1.6 kg·m, 10 - 12 ft·lb)
- 7) If the liquid tank also needs to be replaced, add an additional 5 ml (0.2 US fl oz, 0.2 Imp fl oz) of 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

NAHA0046

SEC. 274•275

16 - 22 (1.6 - 2.2, 12 - 16)

23 - 26 (2.3 - 2.7, 17 - 20)

16 - 19 (1.6 - 1.9, 12 - 14)

23 - 26 (2.3 - 2.7, 17 - 20)

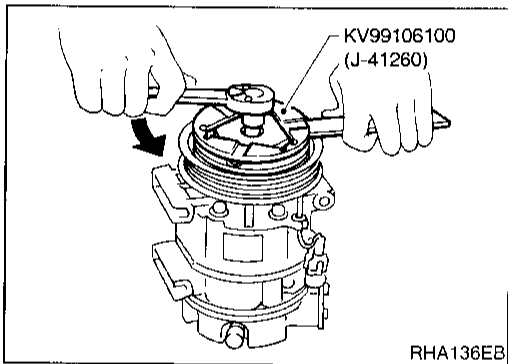
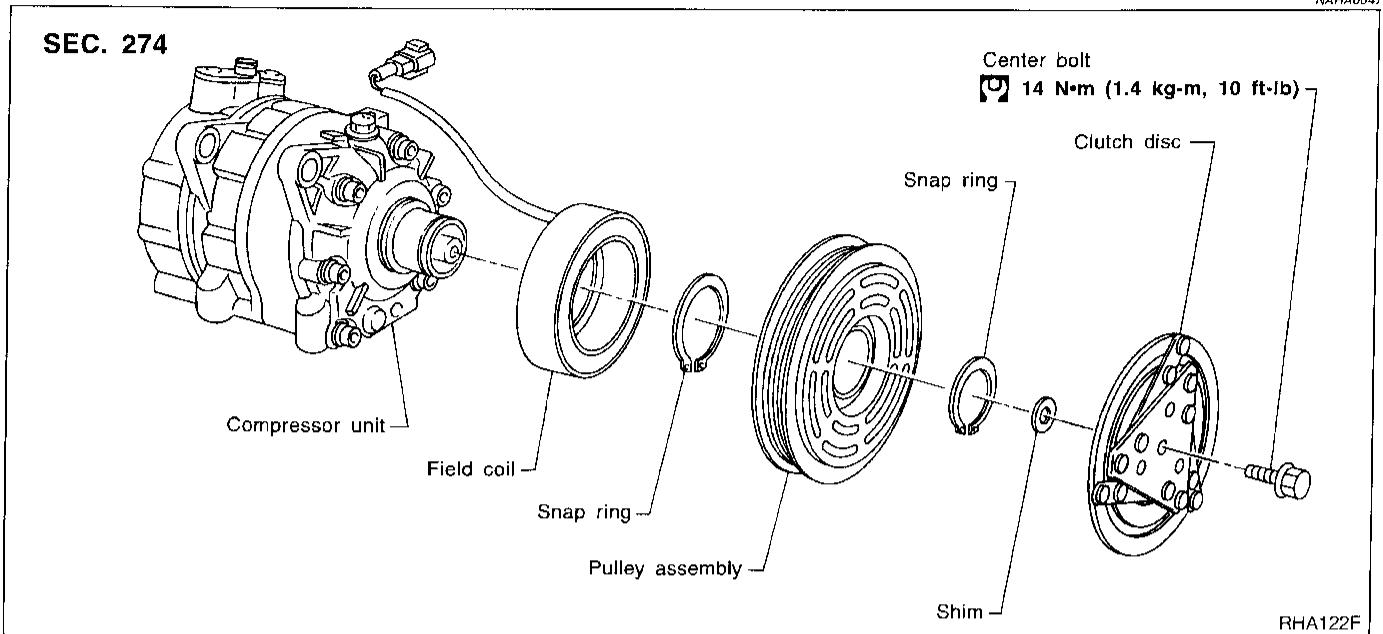
: N•m (kg-m, ft-lb)

45 - 60 (4.6 - 6.1, 33 - 44)

RHA650F

**Compressor Clutch
OVERHAUL**

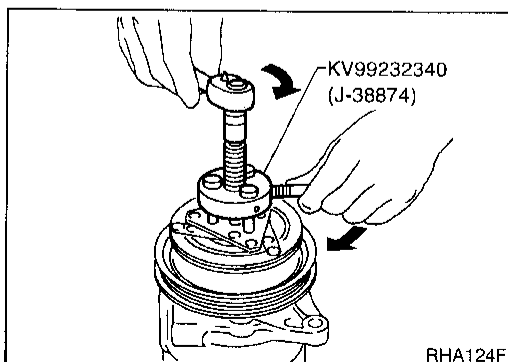
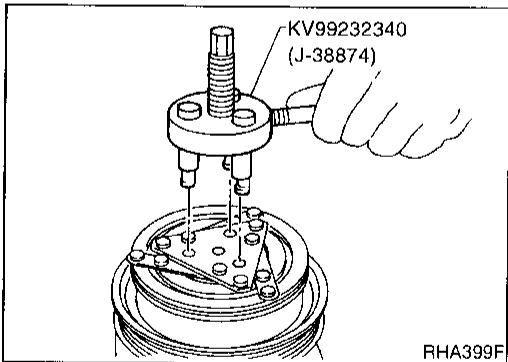
NAHA0047



REMOVAL

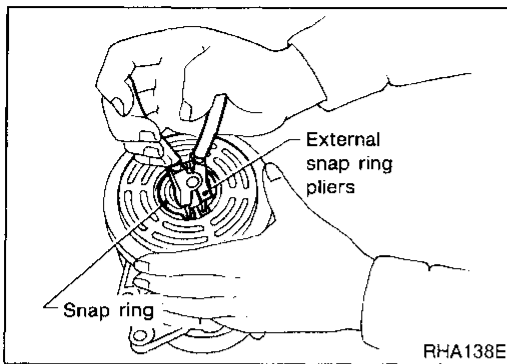
NAHA0048

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

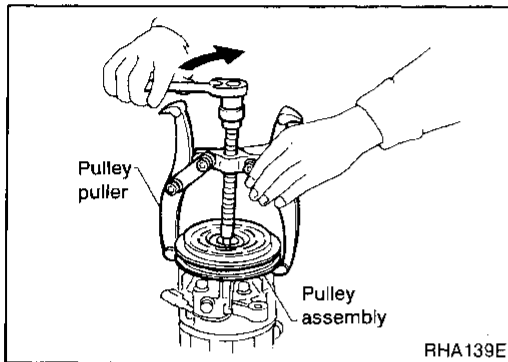


- Remove the clutch disc using the clutch disc puller. Insert the holder's three pins into the holes in the clutch disc. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the clutch disc. After removing the clutch disc, remove the shims from either the drive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

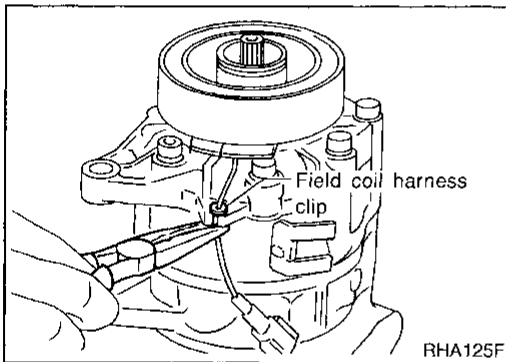
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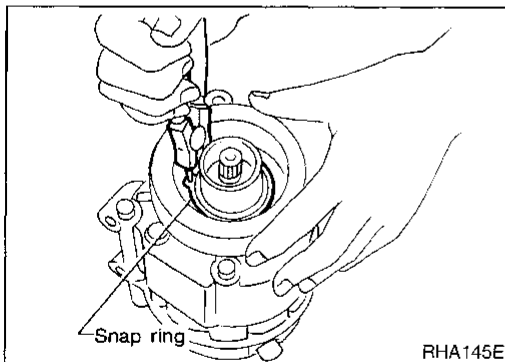
- Remove the snap ring using external snap ring pliers.



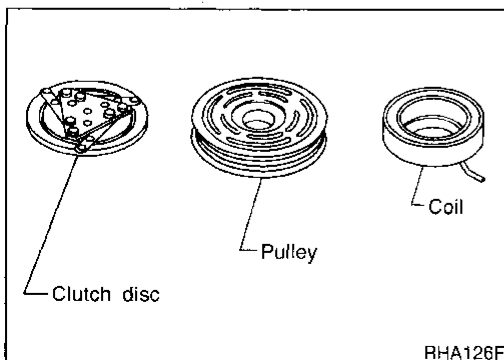
- Pulley removal
Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller.
To prevent the pulley groove from being deformed, the puller claws should be positioned onto the edge of the pulley assembly.



- Remove the field coil harness clip using a pair of pliers.



- Remove the snap ring using external snap ring pliers.



INSPECTION

Clutch Disc

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

Pulley

Check the appearance of the pulley assembly. 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.

NAHA0049

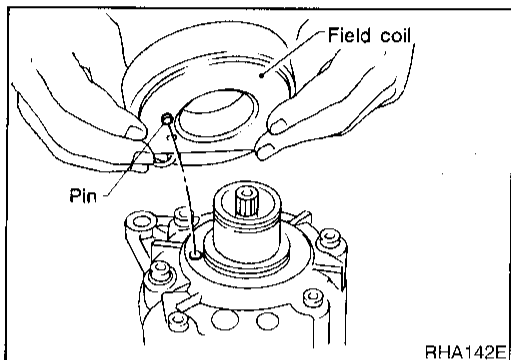
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NAHA0049S02

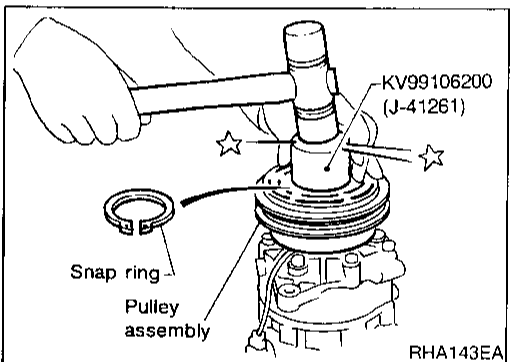
Coil

Check coil for loose connection or cracked insulation.

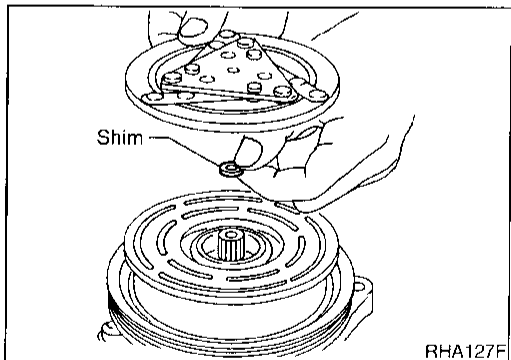
NAHA0049S03



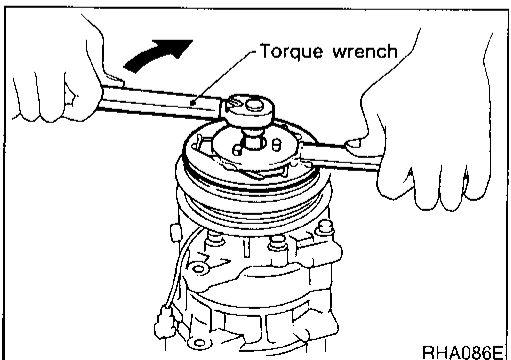
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RHA143EA



RHA127F

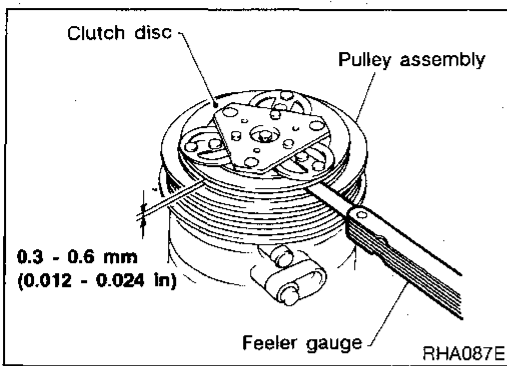


RHA086E

INSTALLATION

NAHA0050

- 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.

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Break-in Operation

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

NAHA0050501

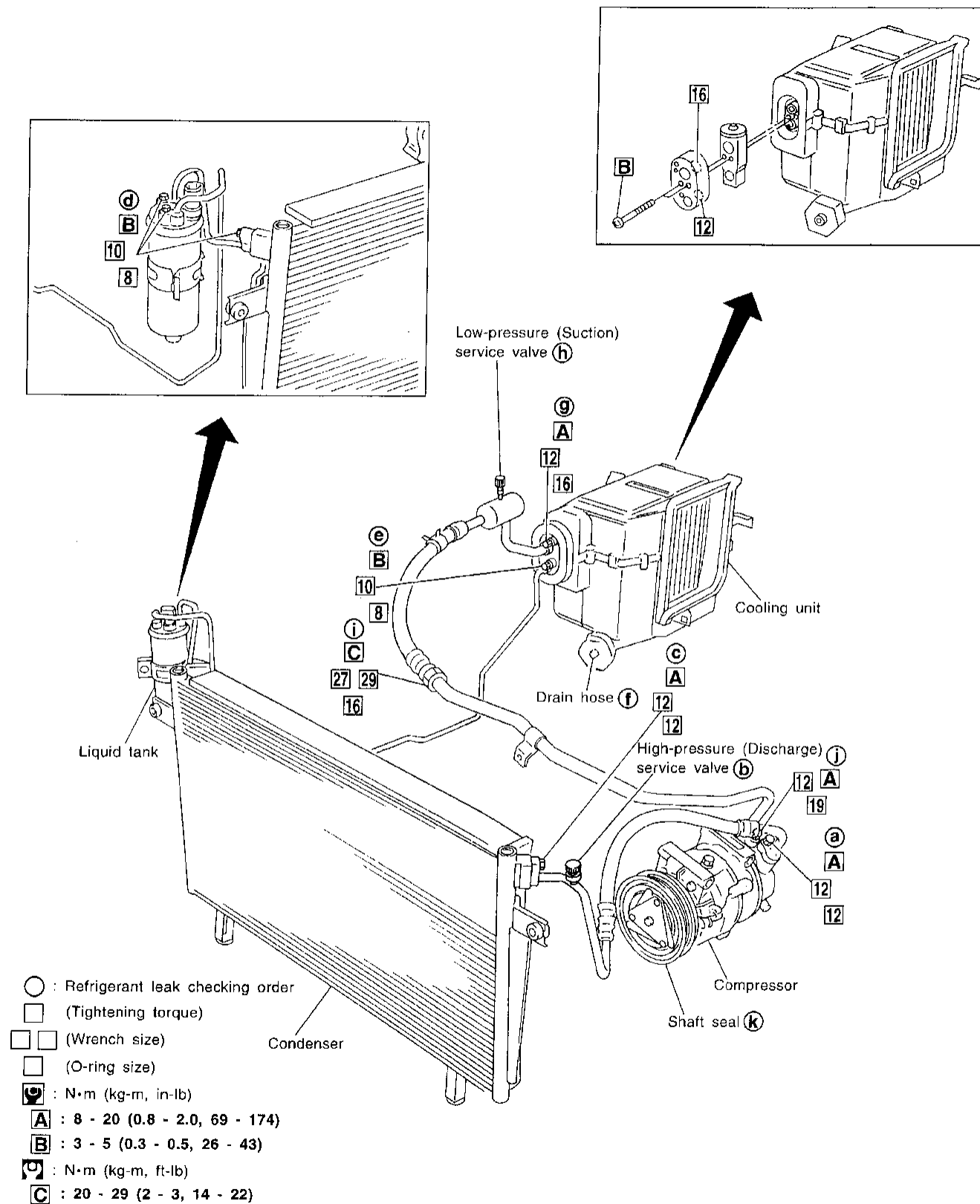
Refrigerant Lines

REMOVAL AND INSTALLATION

- Refer to page HA-3 regarding "Precautions for Refrigerant Connection".

NAHA0051

SEC. 271•274•276



SHA935E

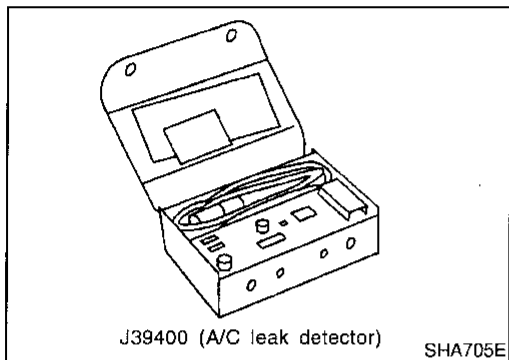
CHECKING REFRIGERANT LEAKS

NAHA0052

Preliminary Check

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

NAHA0052SD1



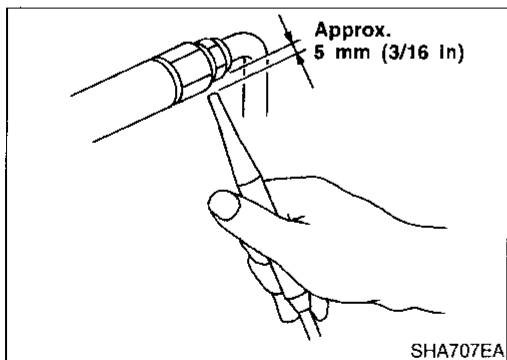
Precautions for Handling Leak Detector

NAHA0052S02

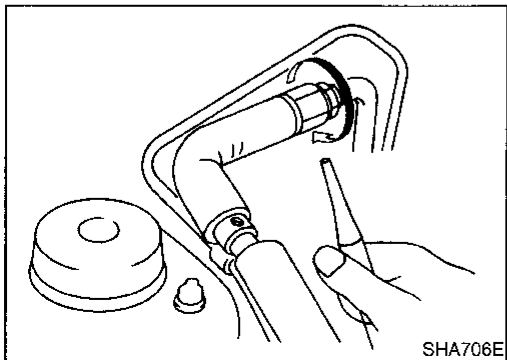
When performing a refrigerant leak check, use a J39400 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

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

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



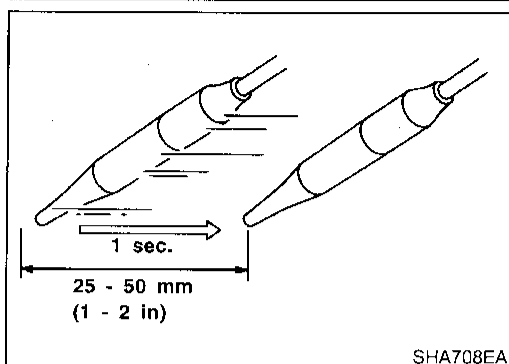
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



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

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Refrigerant Lines (Cont'd)



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

Checking Procedure

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

NAHA0052S03

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, 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 to the low side at points **a** through **k**. Refer to HA-93. Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detector probe completely around the connection/component.

- **Compressor**

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

- **Liquid tank**

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

- **Service valves**

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

NOTE:

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

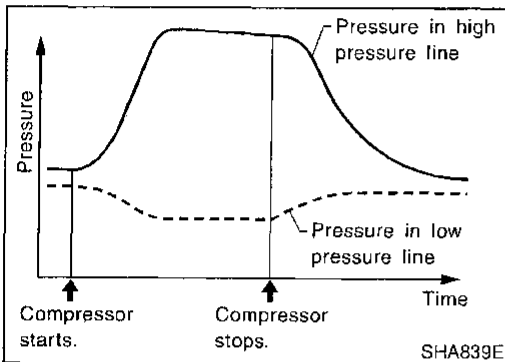
- **Cooling unit (Evaporator)**

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

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
7. Start engine.
8. Set the heater A/C control as follows:

- a. A/C switch ON
 - b. Face mode
 - c. Recirculation switch ON
 - d. Max cold temperature
 - e. Fan speed high
9. Run engine at 1,500 rpm for at least 2 minutes.
 10. Turn engine off and perform leak check again following steps 4 through 6 above.

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

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

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Belt TENSION ADJUSTMENT

- Refer to MA section.

NA1/A0053

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Fast Idle Control Device (FICD) INSPECTION

- Refer to EC section.

NAHA0054

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Supplemental Restraint System (SRS) "AIR BAG"

NAHA0060

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

WARNING:

- To avoid rendering the SRS inoperative, which could increase the risk of personal injury or death in the event of a collision which would result in air bag inflation, all maintenance 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 are covered with yellow insulation either just before the harness connectors or for the complete harness, for easy identification.

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

NAHA0061

WARNING:

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

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

Precautions for Refrigerant Connection

NAHA0063

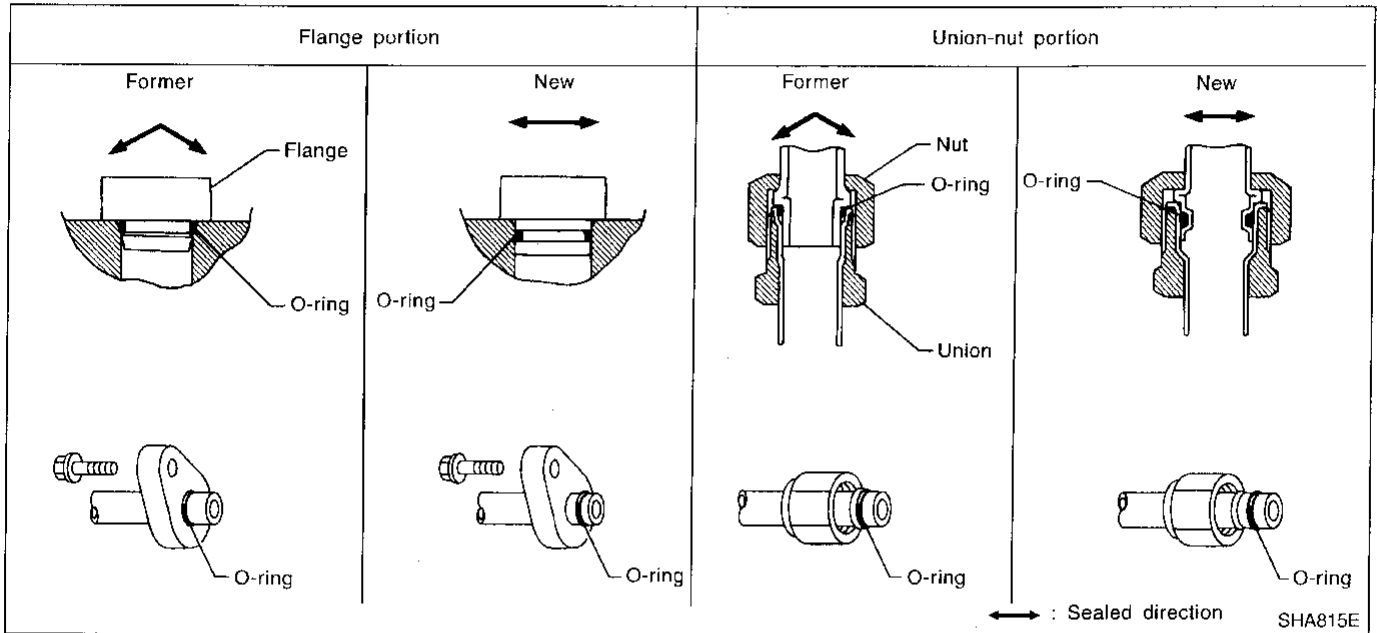
A new type refrigerant connection has been introduced to all refrigerant lines except the following portion.

- Expansion valve to cooling unit

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

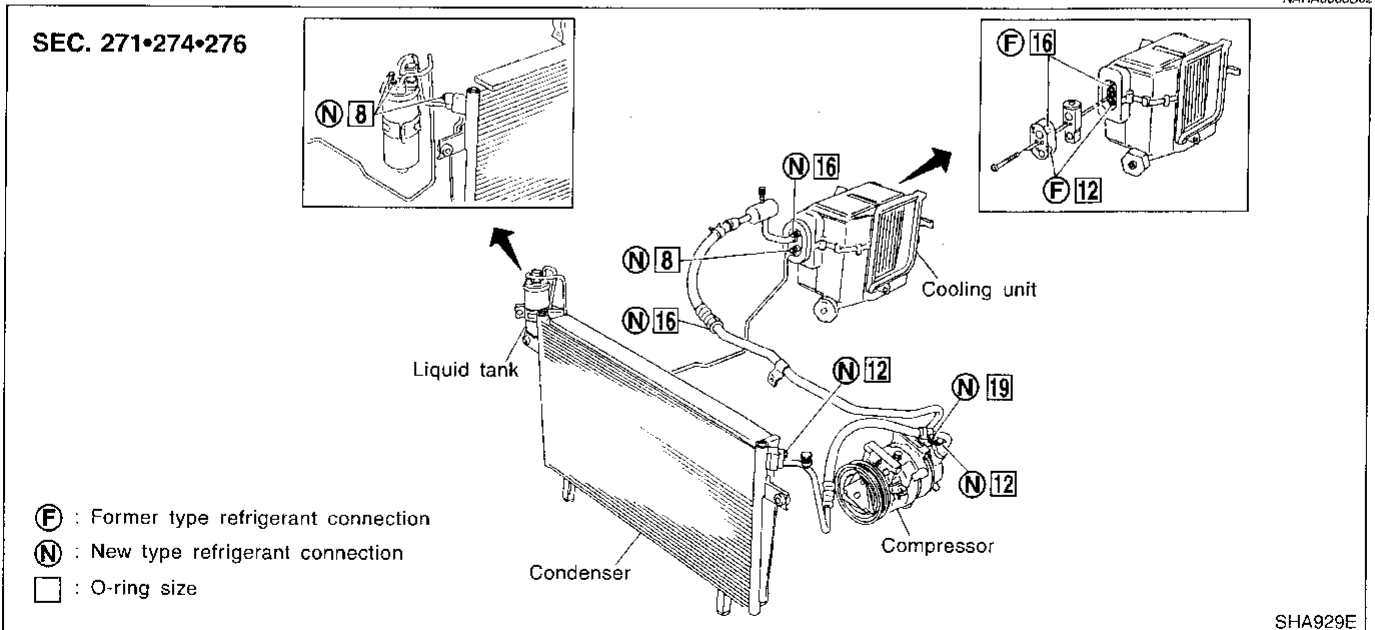
NAHA0063S01

- 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

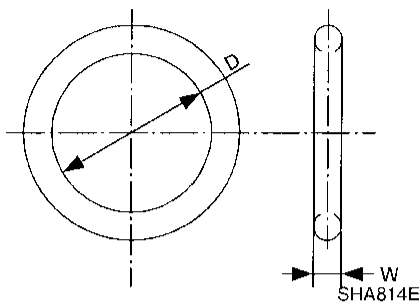


CAUTION:

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

NAHA006350201



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)

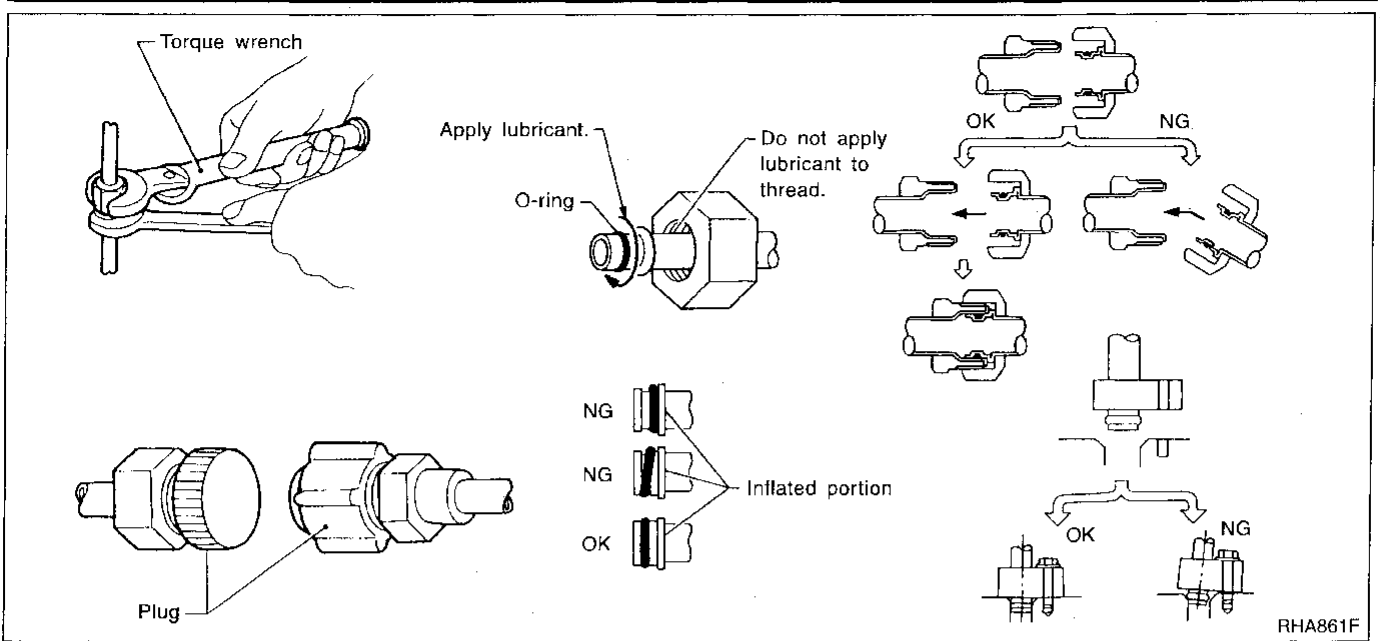
WARNING:

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.

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-158.
- 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

NAHA0065

RECOVERY/RECYCLING EQUIPMENT

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

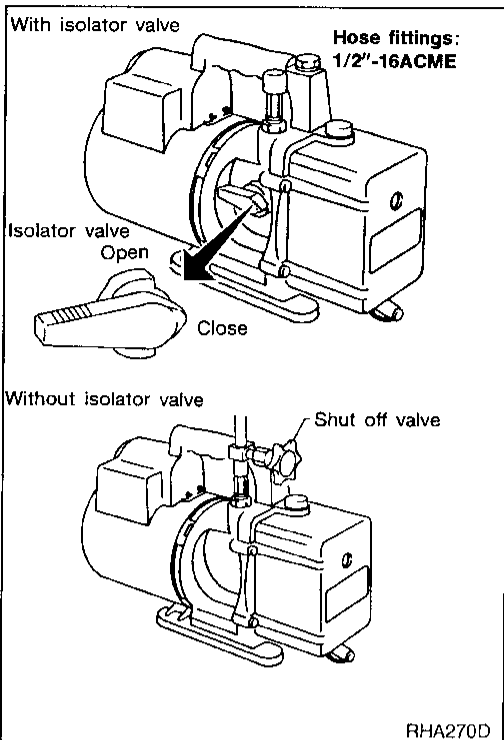
NAHA0065S02

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

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PRECAUTIONS

Precautions for Service Equipment (Cont'd)



VACUUM PUMP

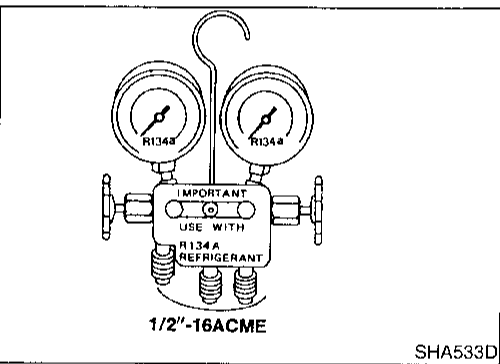
NAHA0065S03

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.

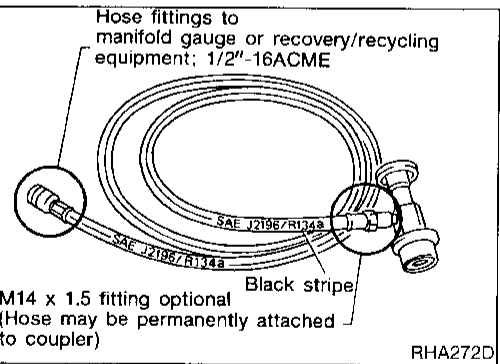
Some one-way valves open when vacuum is applied and close under a no vacuum condition. Such valves may restrict the pump's ability to pull a deep vacuum and are not recommended.



MANIFOLD GAUGE SET

NAHA0065S04

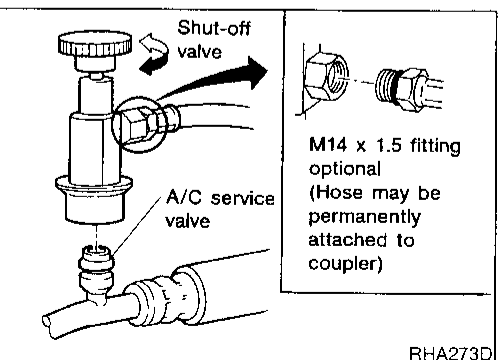
Be certain that the gauge face indicates R-134a or 134a. Make sure the gauge set has 1/2"-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified lubricant.



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.

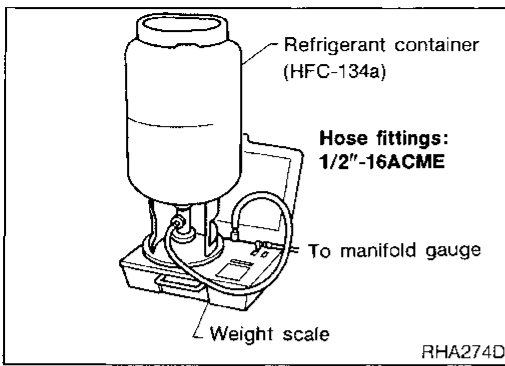


SERVICE COUPLERS

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\"-16 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 Diagnosis

NA11A0066

When you read wiring diagrams, refer to the followings:

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

When you perform trouble diagnosis, refer to the followings:

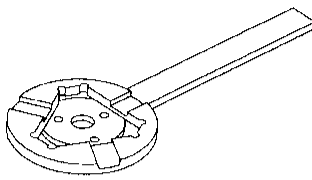
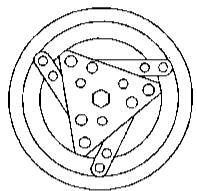
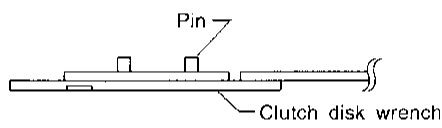
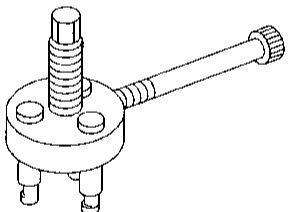
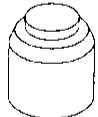
- "HOW TO FOLLOW TEST GROUP IN TROUBLE DIAGNOSIS" in GI section
- "HOW TO PERFORM EFFICIENT DIAGNOSIS FOR AN ELECTRICAL INCIDENT" in GI section

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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	<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>NT232</p> </div> <div style="width: 50%; text-align: center;">  </div> <div style="width: 25%;"> <p>Removing center bolt</p> </div> </div> <div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>NT378</p> </div> <div style="width: 50%; text-align: center;">  <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 style="width: 25%;"></div> </div>
KV99232340 (J-38874) or KV992T0001 (—) Clutch disc puller	<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>NT376</p> </div> <div style="width: 50%; text-align: center;">  </div> <div style="width: 25%;"> <p>Removing clutch disc</p> </div> </div>
KV99106200 (J-41261) Pulley installer	<div style="display: flex; justify-content: space-between;"> <div style="width: 20%;"> <p>NT235</p> </div> <div style="width: 50%; text-align: center;">  </div> <div style="width: 25%;"> <p>Installing pulley</p> </div> </div>

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

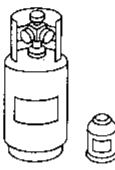

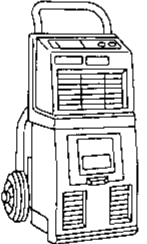
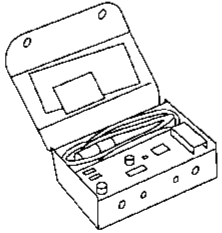
-NAHA0068

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.

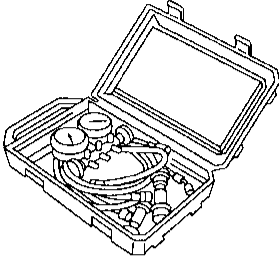
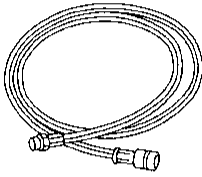
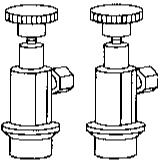
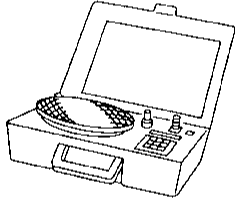
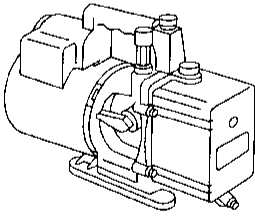
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor failure 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 • large container 1/2"-16 ACME</p> <p>NT196</p>
KLH00-PAGSO (—) Nissan A/C System Oil Type S	 <p>Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 ml (1.4 US fl oz, 1.4 Imp fl oz)</p> <p>NT197</p>
(J-39500-NI) Recovery/Recycling Recharging equipment (ACR4)	 <p>Function: Refrigerant Recovery and Recycling and Recharging</p> <p>NT195</p>
(J-39400) Electrical leak detector	 <p>Power supply: • DC 12V (Cigarette lighter)</p> <p>NT198</p>

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

Tool number (Kent-Moore No.) Tool name	Description	
(J-39183) Manifold gauge set (with hoses and couplers)		Identification: <ul style="list-style-type: none"> ● The gauge face indicates R-134a. Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME
NT199		
Service hoses <ul style="list-style-type: none"> ● High side hose (J-39501-72) ● Low side hose (J-39502-72) ● Utility hose (J-39476-72) 		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
NT201		
Service couplers <ul style="list-style-type: none"> ● High side coupler (J-39500-20) ● Low 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.
NT202		
(J-39650) Refrigerant weight scale		For measuring of refrigerant Fitting size: Thread size <ul style="list-style-type: none"> ● 1/2"-16 ACME
NT200		
(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
NT203		

Refrigeration System

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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 Normal Operating Conditions, When The A/C Is Switched On, The Compressor Runs Continuously, And The Evaporator Pressure, And Therefore Temperature, Is Controlled By The V-6 Variable Displacement Compressor To Prevent Freeze Up.

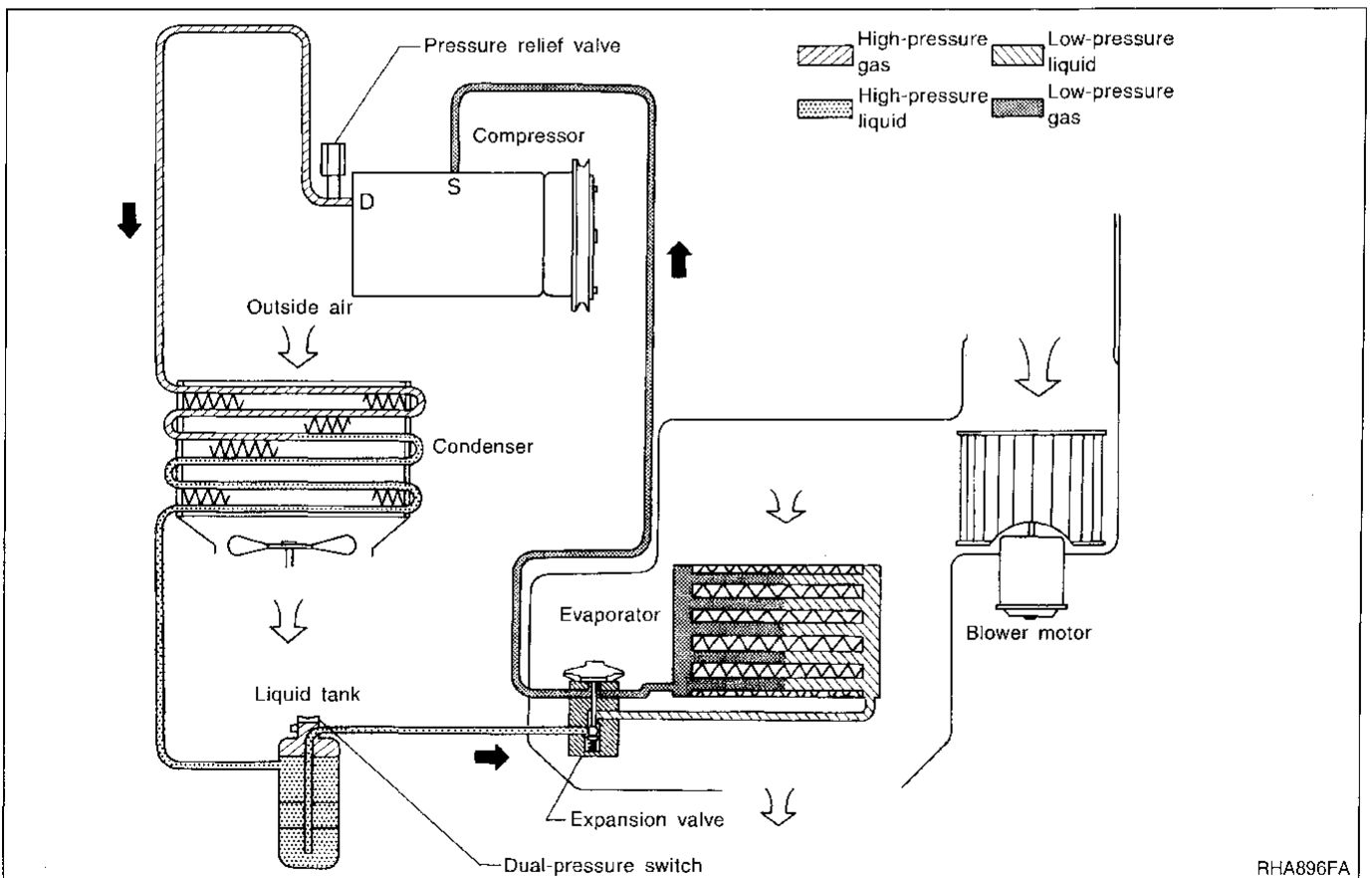
Refrigerant System Protection

Dual-pressure Switch

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

Pressure Relief Valve

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



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.

DESCRIPTION

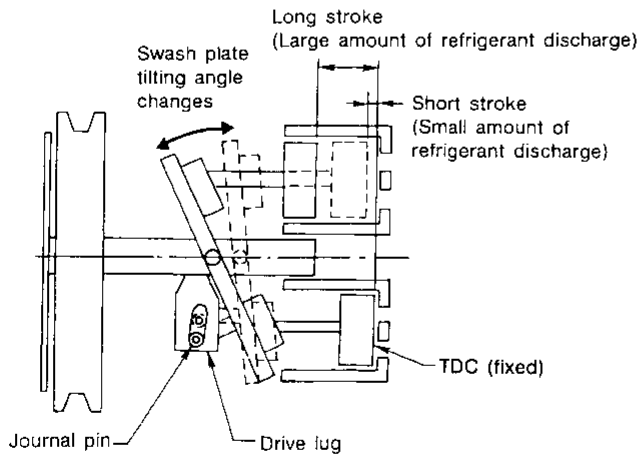
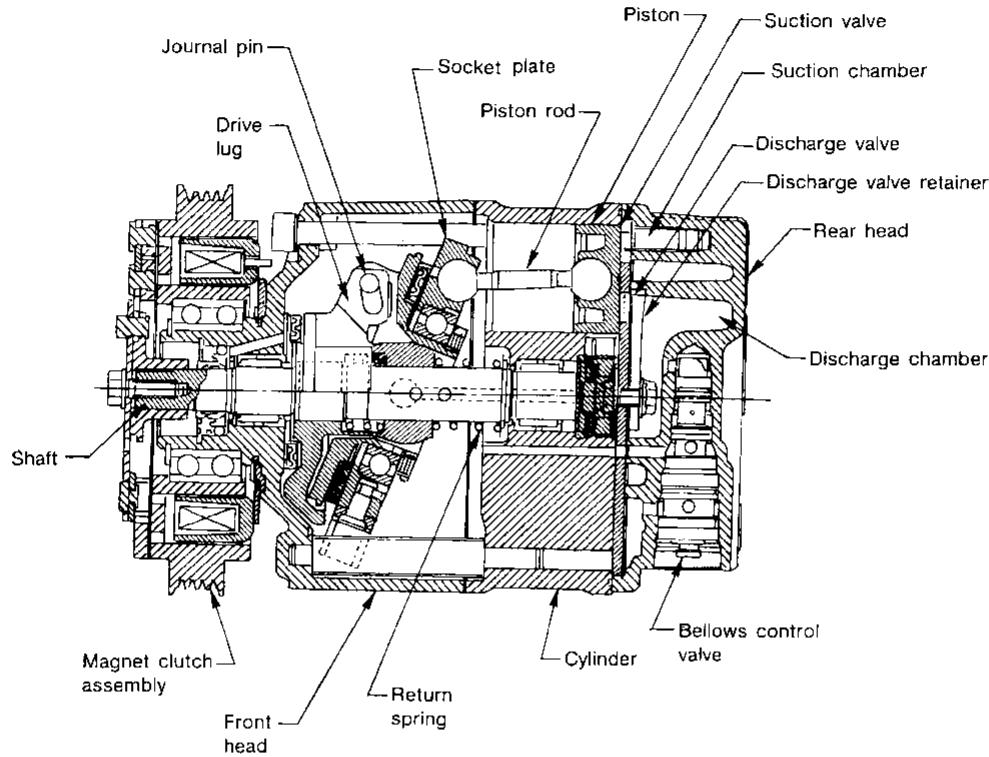
General

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

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

=NAHA0132

NAHA0132S01



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)

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Operation

1. Operation Control Valve

=NAHA0132S02

NAHA0132S0201

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

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

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

2. Maximum Cooling

NAHA0132S0202

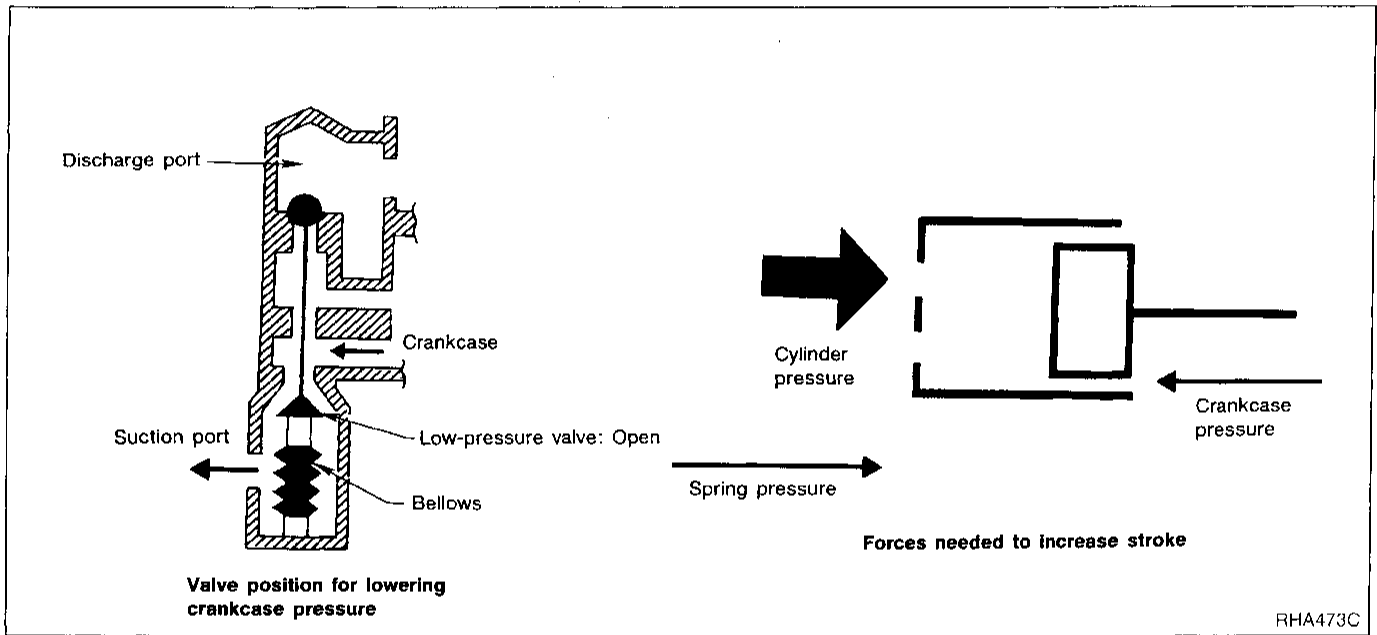
Refrigerant pressure on the low-pressure side increases with an increase in heat loads.

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

This causes the following pressure changes:

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

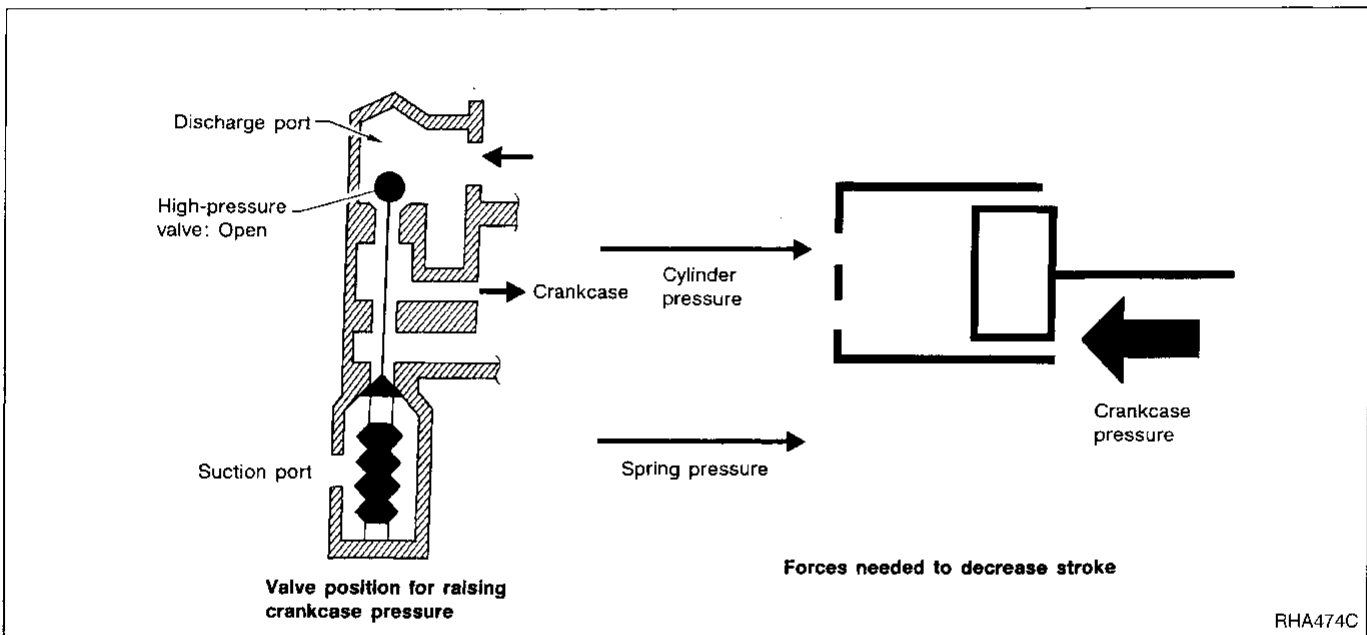
Under this condition, the swash plate is set to the maximum stroke position.



3. Capacity Control

=NAHA013250203

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



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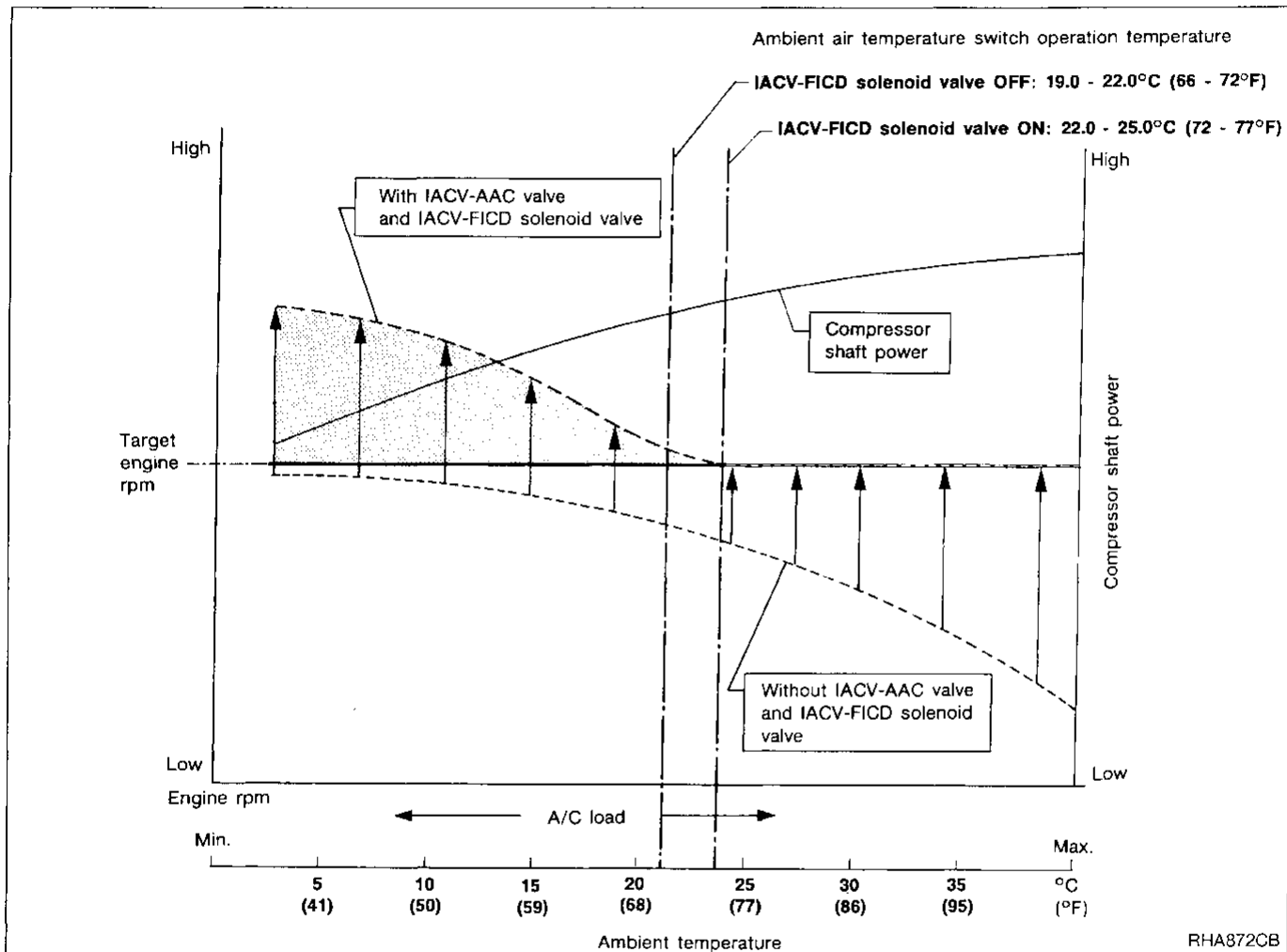
FICD CONTROL SYSTEM

=NAHA0133

General

NAHA0133S01

With the variable displacement compressor, the compressor power requirements differ from when the ambient temperature is high and maximum cooling effect is required (i.e., when refrigerating load is large and the tilt angle of the compressor swash plate is large) to when the ambient temperature is low and less cooling effect is required (i.e., when refrigerating load is small and the tilt angle of the swash plate is small). To correspond correctly to this change in compressor power requirements, it is also necessary to control the operation of the IACV-FICD according to the refrigerating load. Thus, an ambient air temperature switch is provided on the front face of the condenser so that the IACV-FICD can be controlled depending on the ambient temperature.



Operation

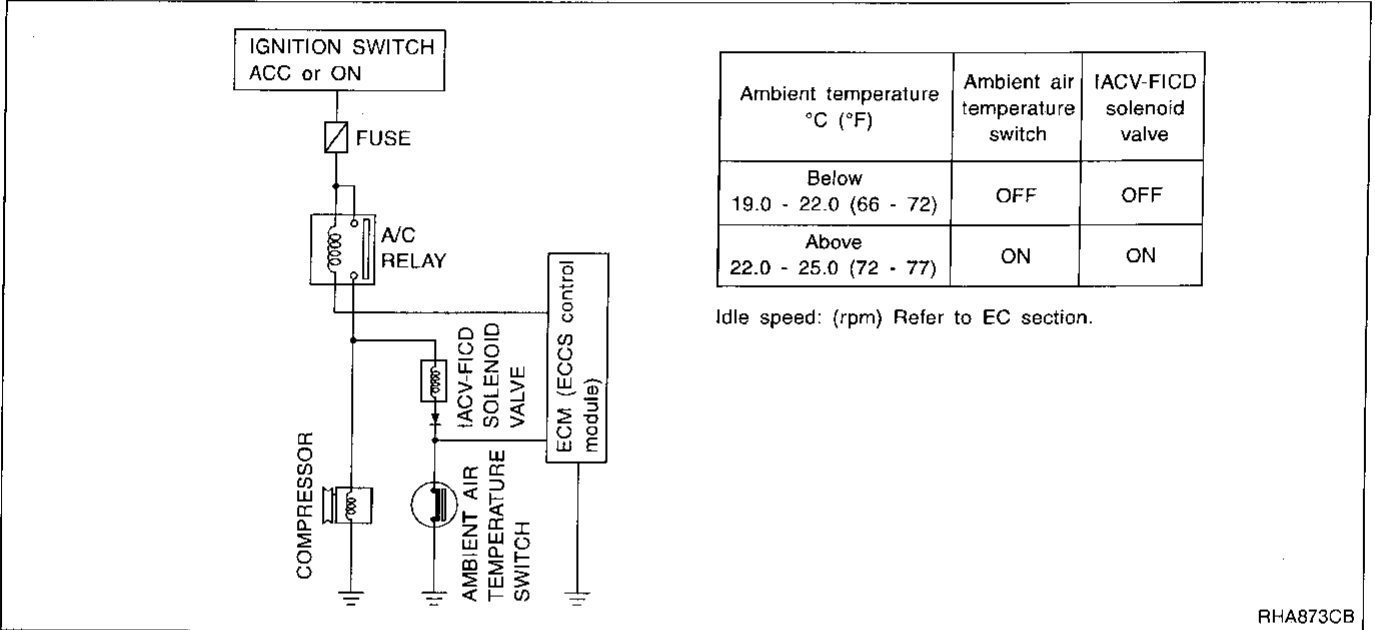
=NAHA0133S02

When the air conditioner is OFF, the ECM (ECCS control module) detects the load applied to the engine, and controls the IACV-AAC valve to adjust the engine idling speed to the appropriate rpm by supplying additional air from the IACV-AAC valve.

When the air conditioner is ON (A/C relay is ON), and when the ambient air temperature switch is ON (this switch turns ON automatically when the ambient temperature rises to approx. 25.0°C (77°F) or higher), the IACV-FICD solenoid valve is energized and additional air is supplied to the engine.

If the appropriate engine speed is not reached, the IACV-AAC valve supplies the additional air required to increase the engine rpm.

If the ambient air temperature switch is OFF [this switch turns OFF when the ambient temperature is below 19.0°C (66°F)] even when the air conditioner is ON (A/C relay is ON), the IACV-FICD solenoid valve is deenergized, and the idling speed is controlled so that the appropriate rpm can be achieved by operation of the IACV-AAC valve only.

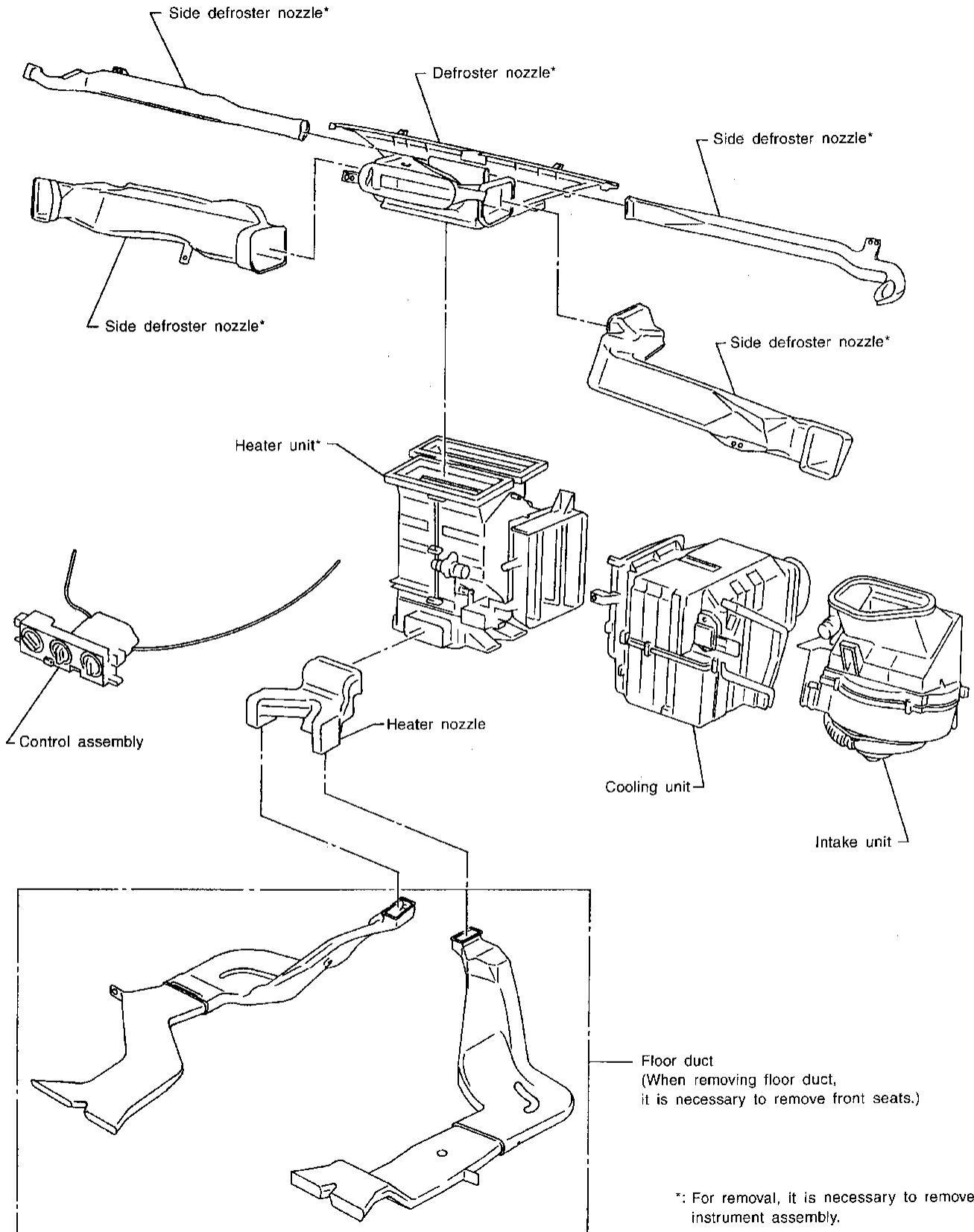


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Component Layout

NAHA0071

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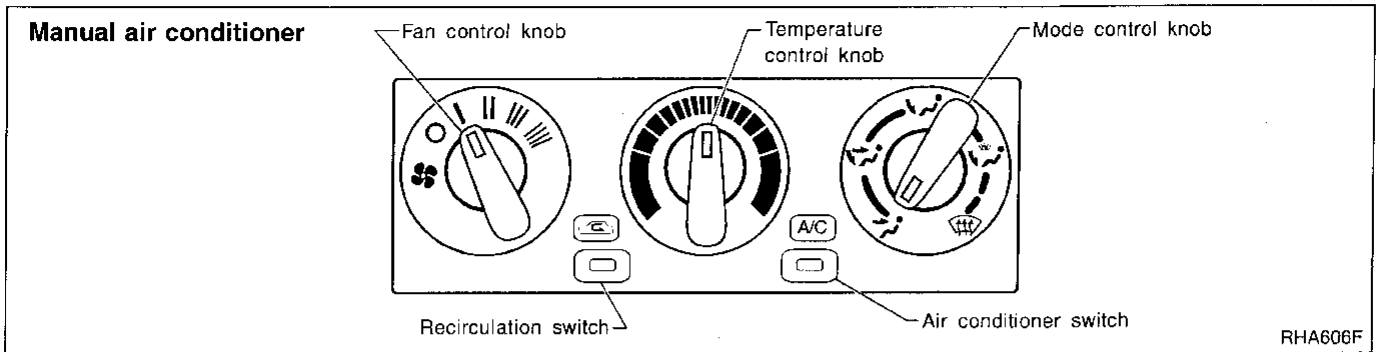
Floor duct
(When removing floor duct,
it is necessary to remove front seats.)

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

RHA573F

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.

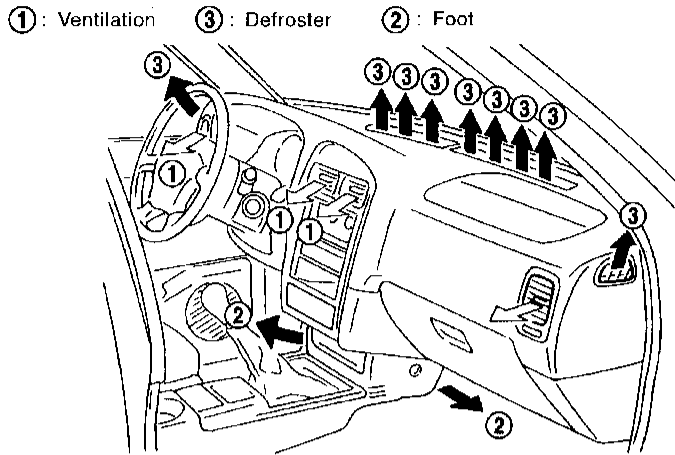
NAHA0072S05

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

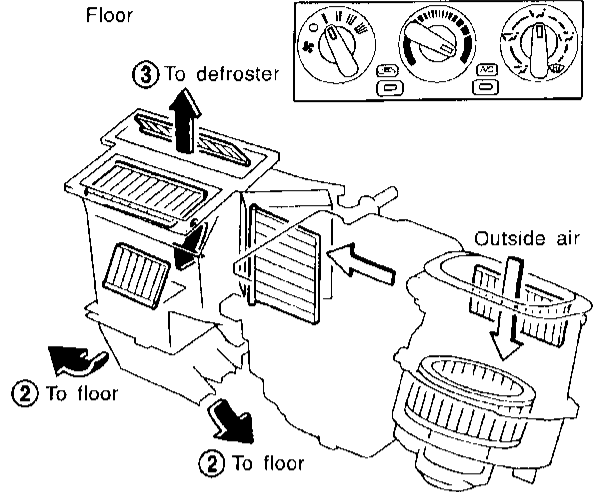
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Discharge Air Flow

NAHA0073

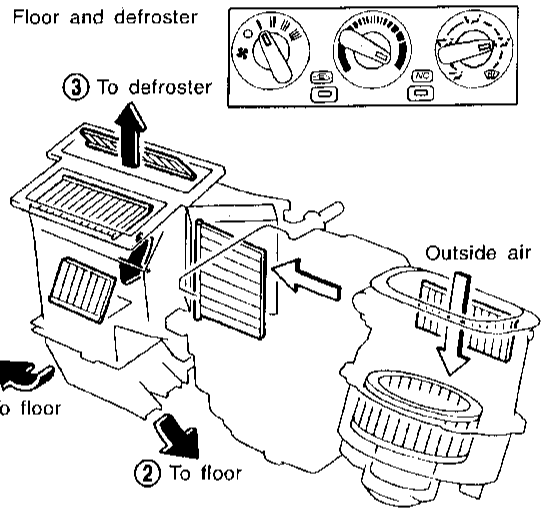
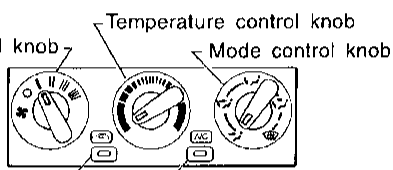


① : Ventilation ③ : Defroster ② : Foot

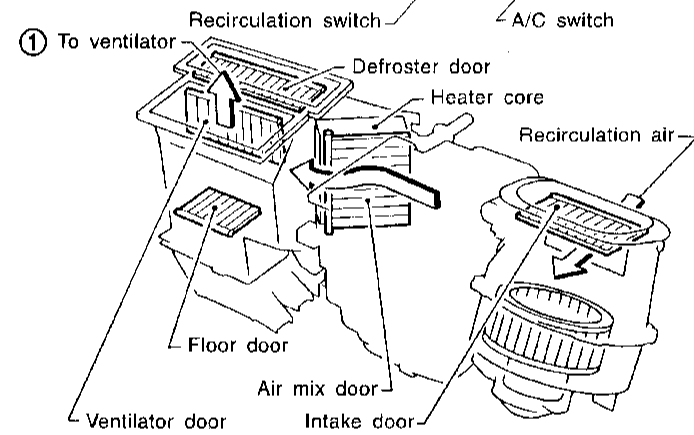


Floor

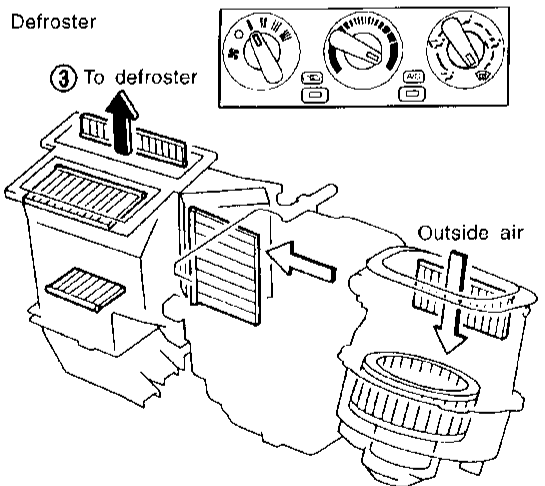
Ventilation
(switch "ON")



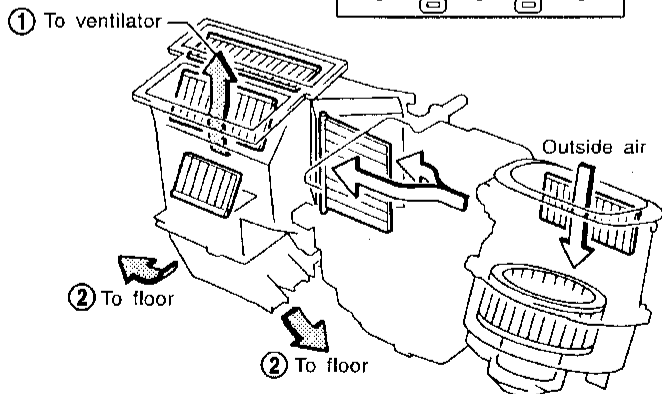
Floor and defroster



Bi-level
(switch "OFF")



Defroster



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

SHA963E

System Description
SWITCHES AND THEIR CONTROL FUNCTIONS

NAHA0074

NAHA0074S02

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	ON*1
							○	—	REC*2	—

*1: Compressor is operated by dual-pressure switch.

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

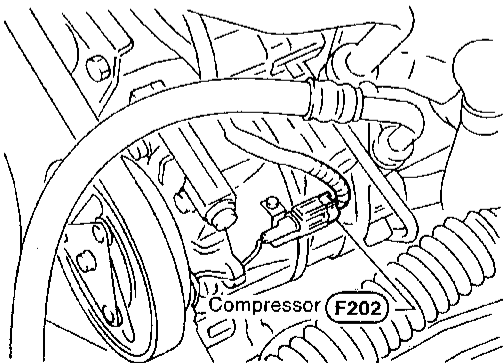
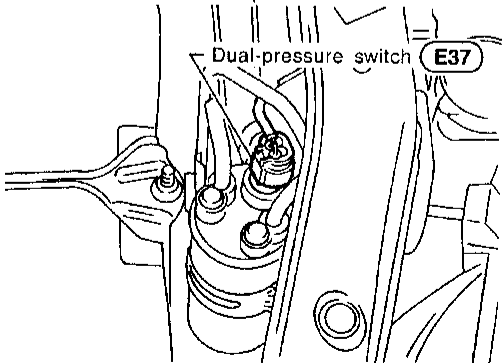
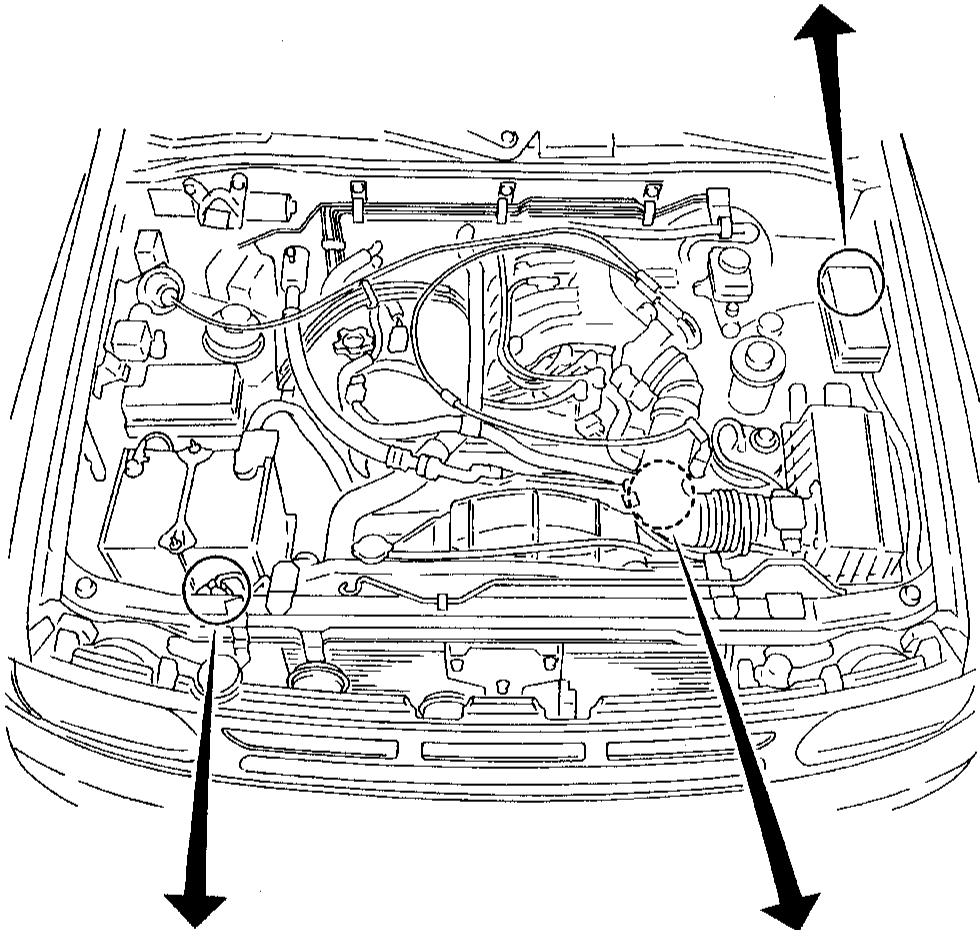
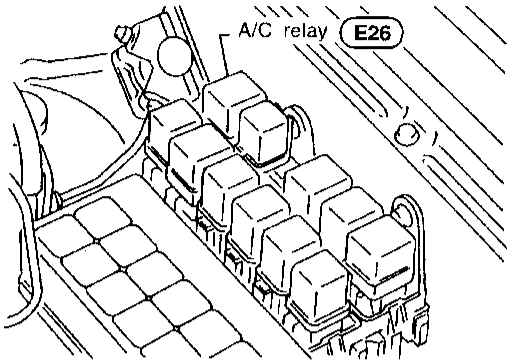
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Harness Layout

ENGINE COMPARTMENT

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NAHA0085S01

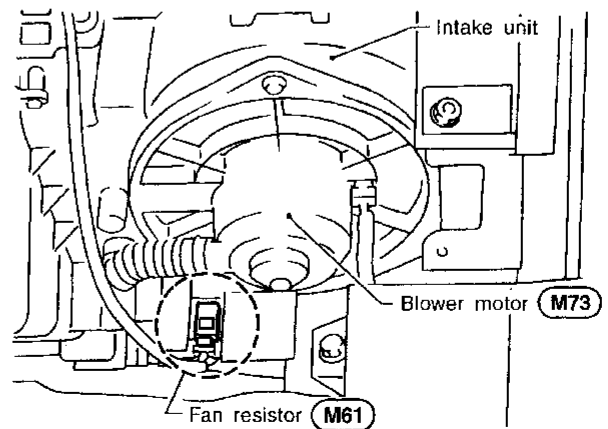
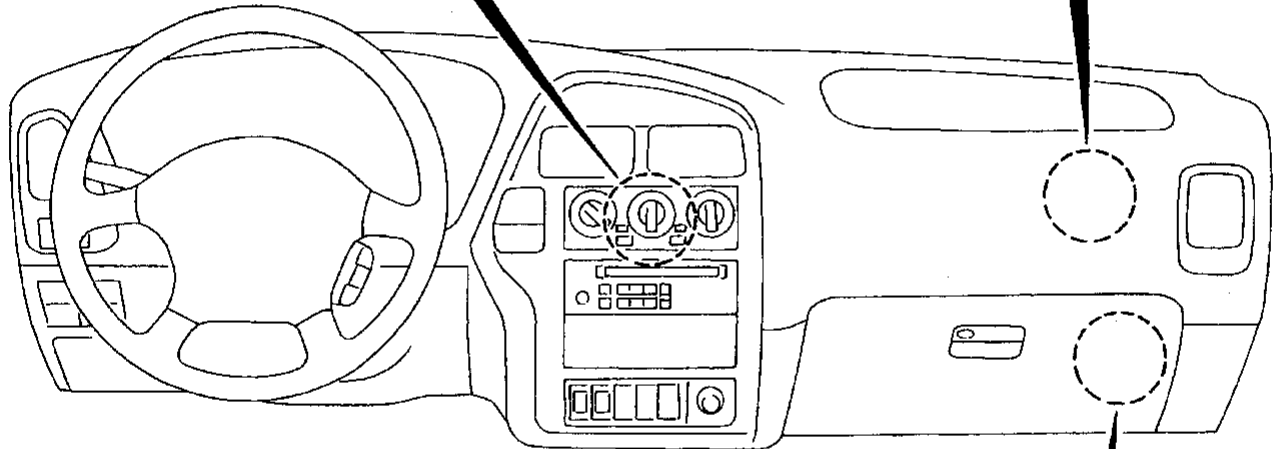
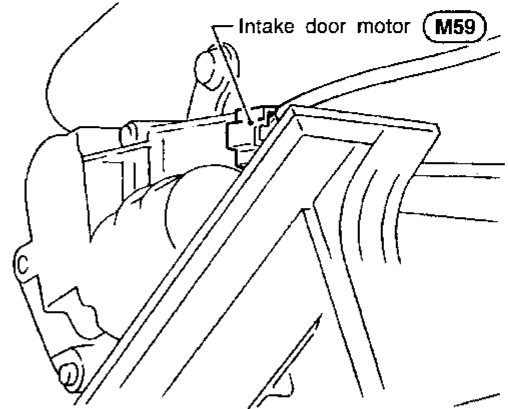
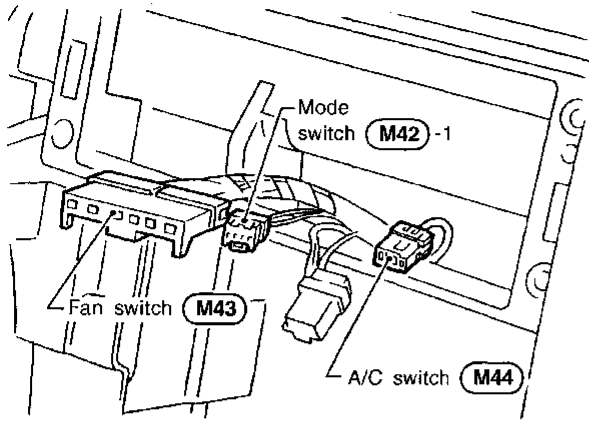


RHA659FA

PASSENGER COMPARTMENT

NAHA0085S02

- GI
- MA
- EM
- LC
- EC
- FE
- CL
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- AT
- TF
- PD
- AX
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- BT
- HA**
- SC
- EL
- IDX

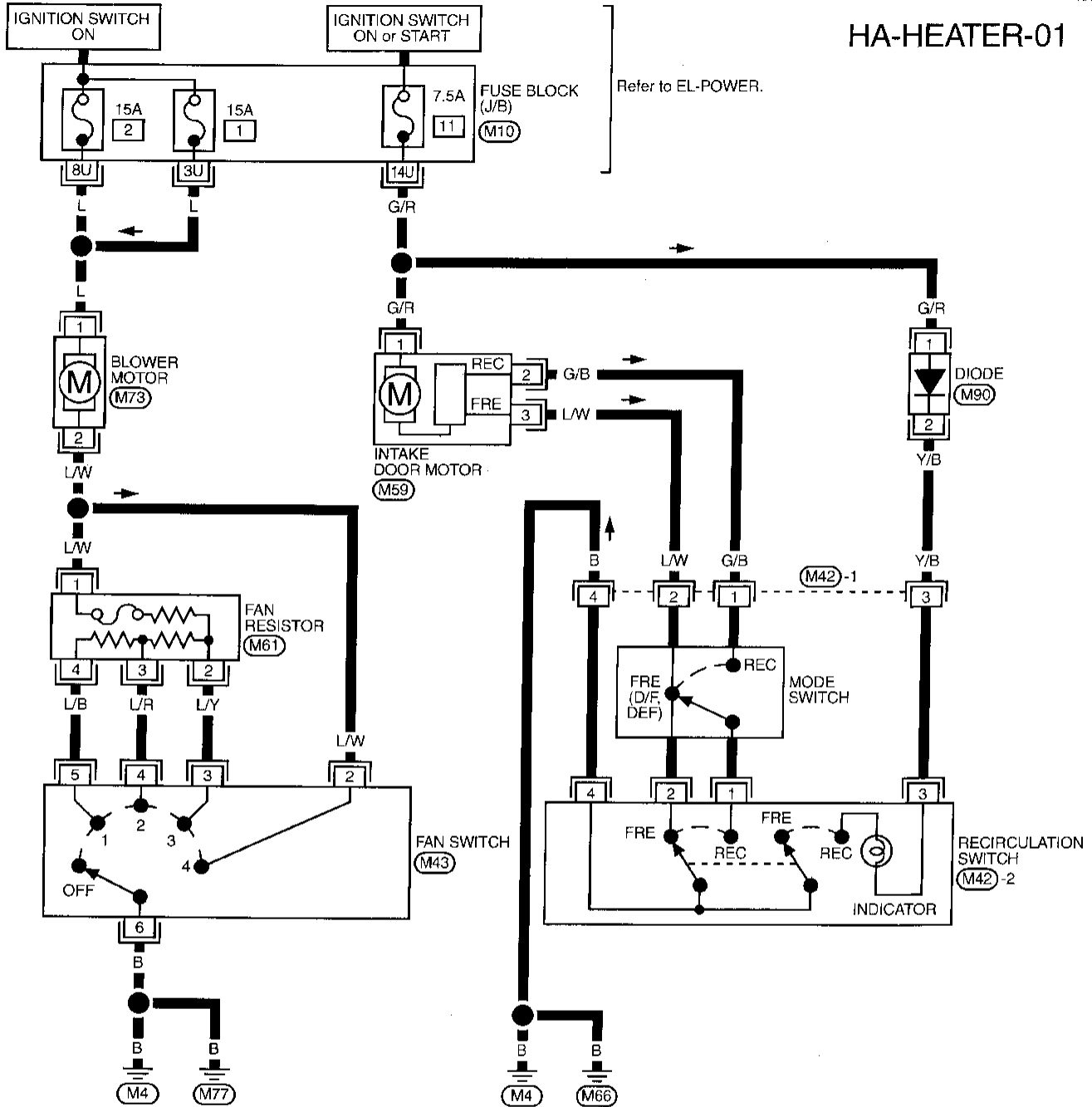


RHA660F

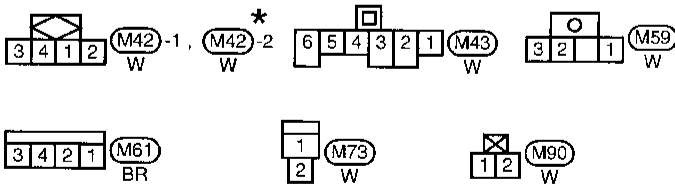
Wiring Diagram — HEATER —

NAHA0086

HA-HEATER-01



Refer to last page (Foldout page).

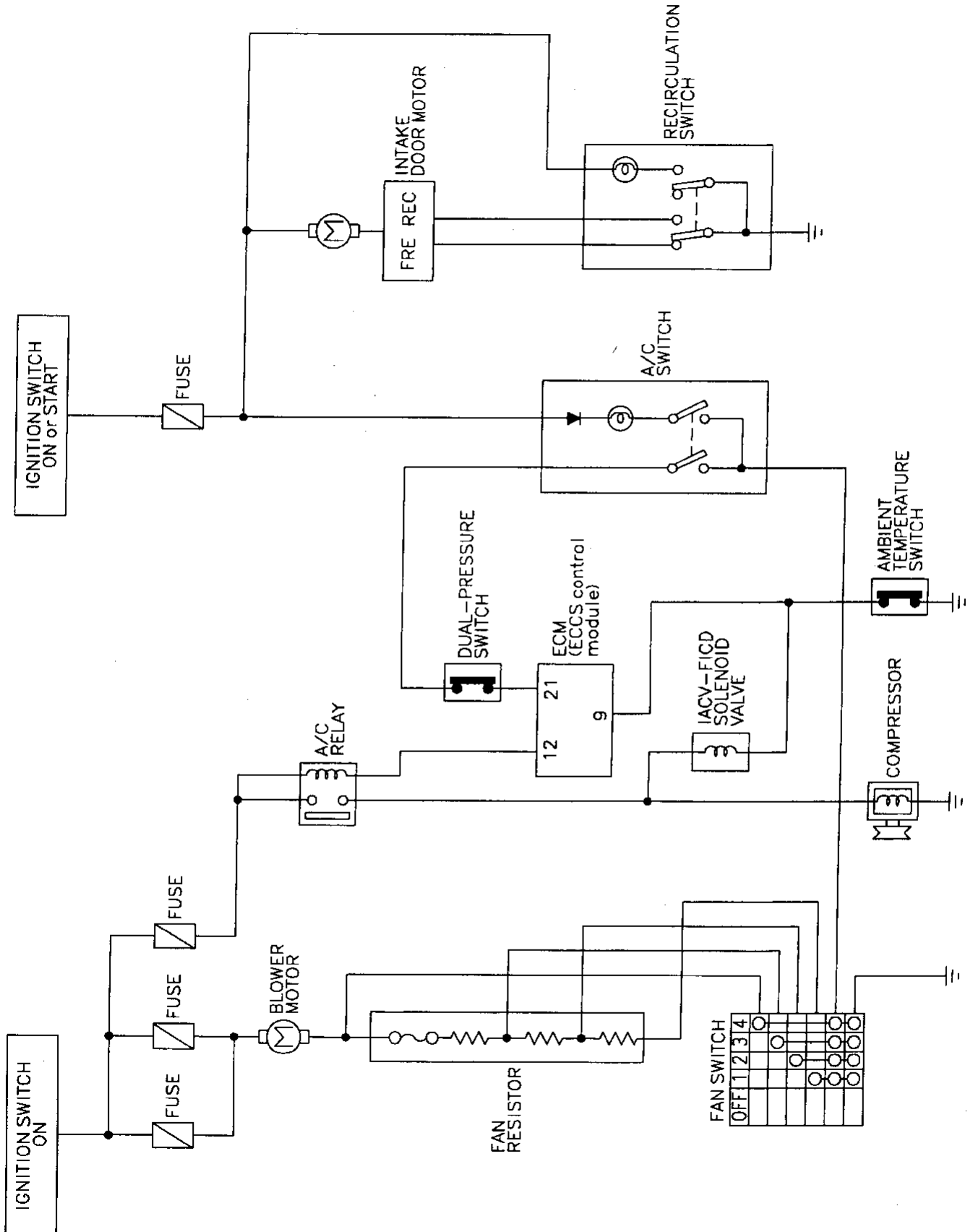


* : This connector is not shown in "HARNESS LAYOUT" of EL section.

(M10)

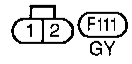
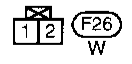
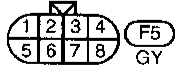
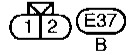
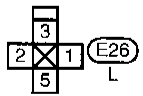
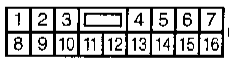
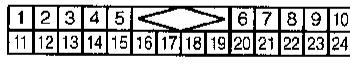
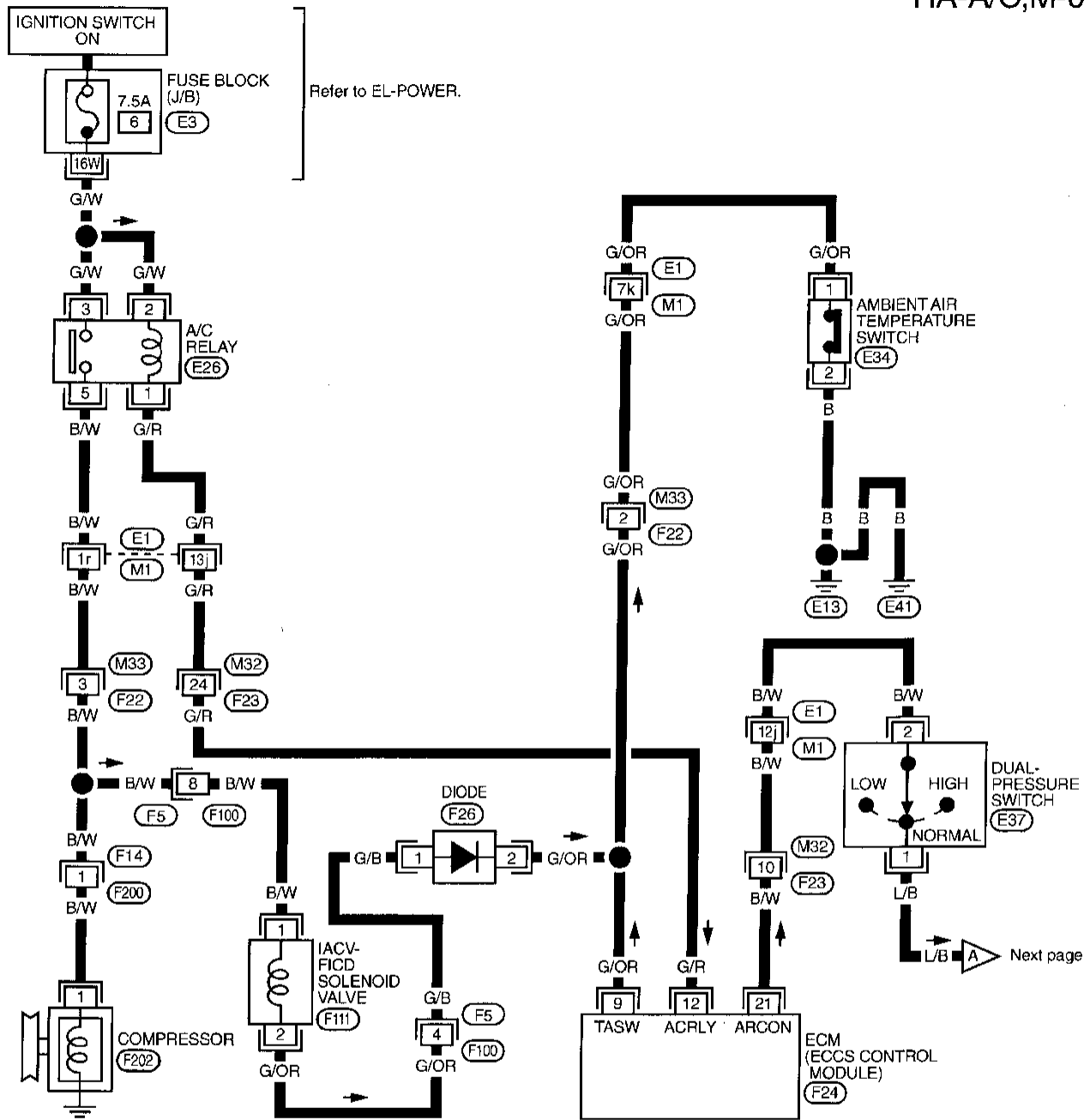
Circuit Diagram — Air Conditioner

NAHA0087



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MHA680A



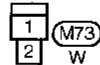
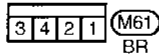
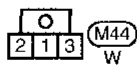
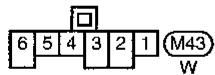
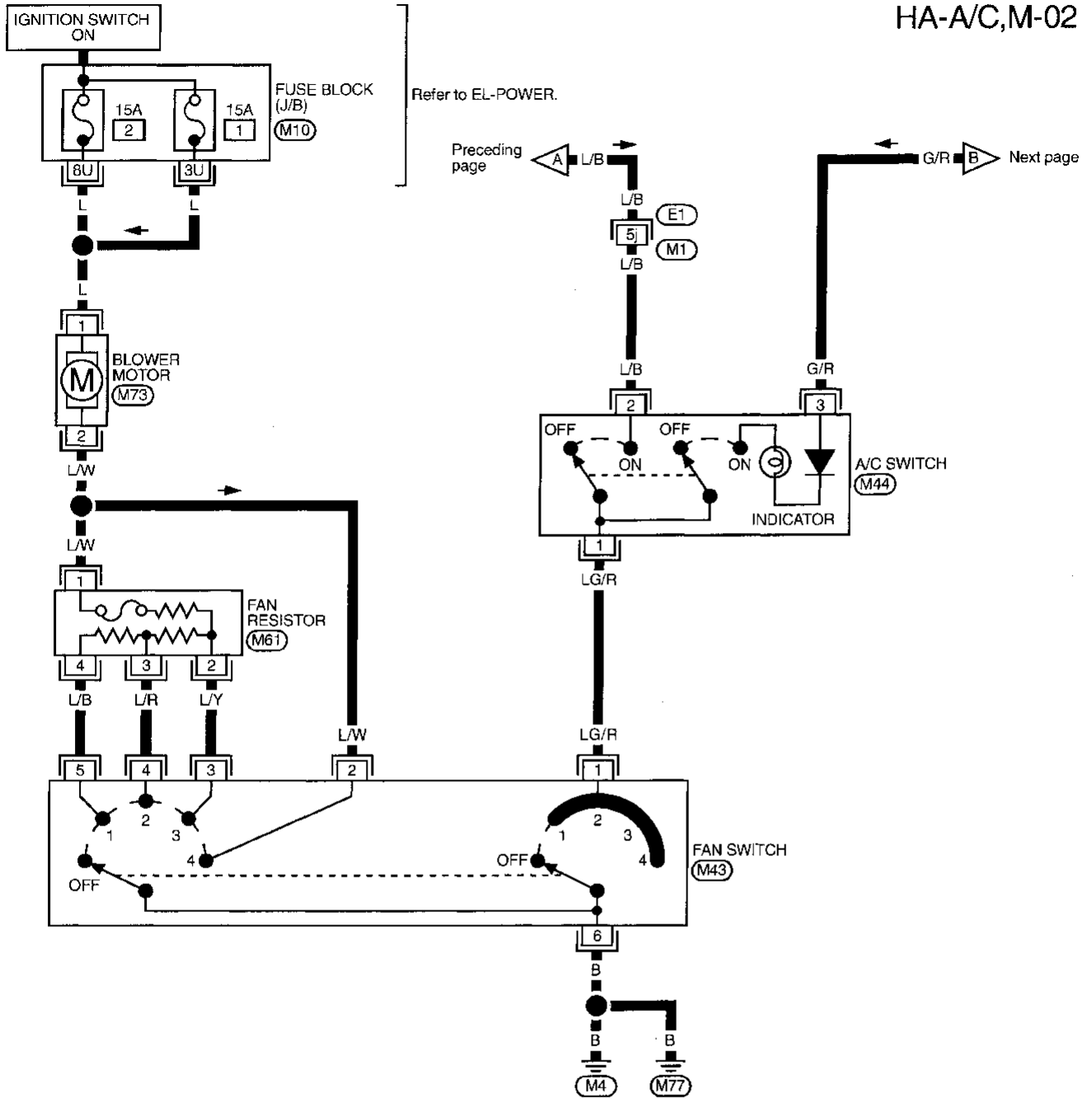
Refer to last page (Foldout page).

M1 . E1

E3

F24

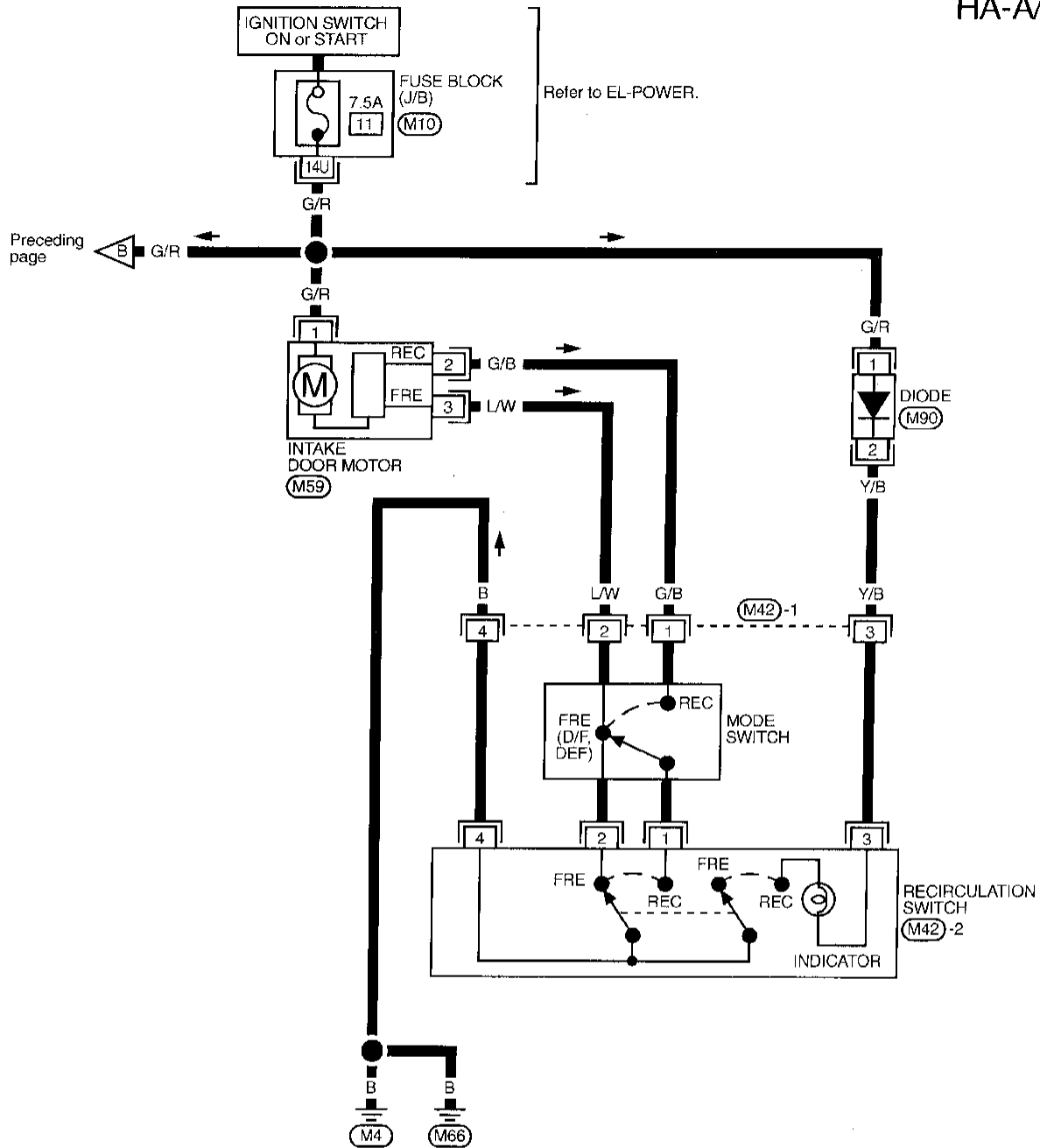
HA-A/C, M-02



Refer to last page (Foldout page).

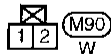
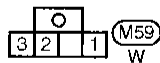
- (M1) (E1)
- (M10)

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Refer to EL-POWER.

Refer to last page (Foldout page).



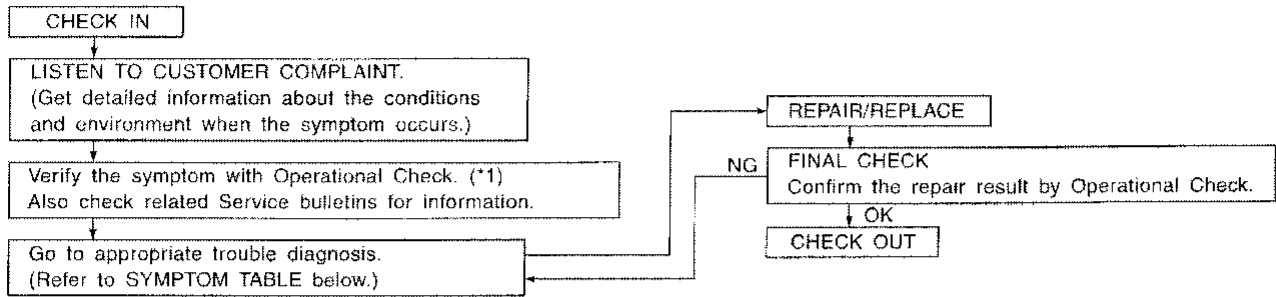
* : This connector is not shown in "HARNES LAYOUT" of EL section.

(M10)

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

NAHA0075

NAHA0075S01



SHA900E

*1: HA-126

SYMPTOM TABLE

NAHA0075S02

Symptom	Reference page
<ul style="list-style-type: none"> Intake door does not change in VENT, B/L or FOOT mode. 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Intake Door. HA-128
<ul style="list-style-type: none"> Blower motor does not rotate at all. 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Blower Motor. HA-133
<ul style="list-style-type: none"> Insufficient cooling. 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Insufficient cooling. HA-138
<ul style="list-style-type: none"> Insufficient heating. 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Insufficient heating. HA-146
<ul style="list-style-type: none"> Air outlet does not change. 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Air Outlet. HA-148
<ul style="list-style-type: none"> Magnet clutch does not engage when A/C switch and fan switch are ON. 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Magnet Clutch. HA-150
<ul style="list-style-type: none"> Noise 	<ul style="list-style-type: none"> Go to Trouble Diagnosis Procedure for Noise. HA-155

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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

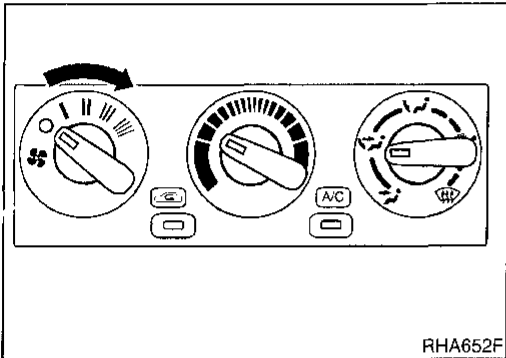
PROCEDURE:

NAHA0076S02

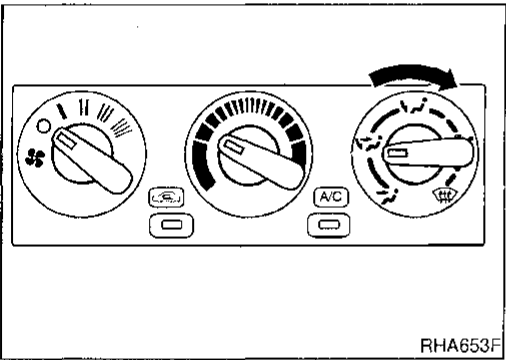
1. Check Blower

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

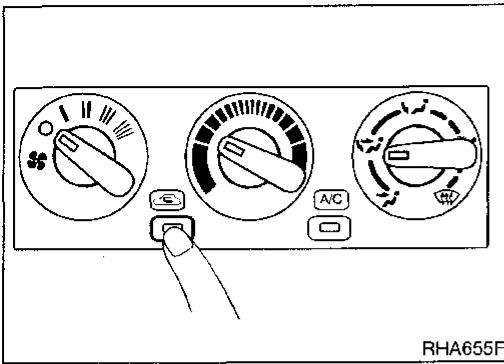
1. Turn mode control knob.

2. Confirm that discharge air comes out according to the air distribution table at left. Refer to "Discharge Air Flow" in "DESCRIPTION" (HA-116).

Discharge air flow

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

RHA654F



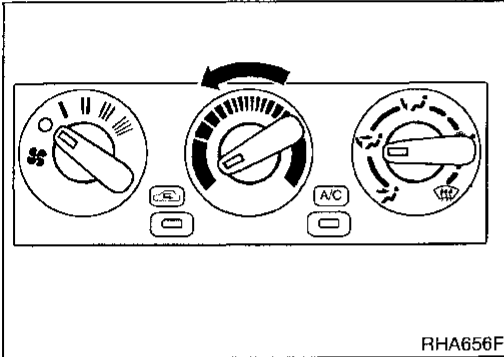
3. Check Recirculation

NAHA0076S0203

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

NOTE:

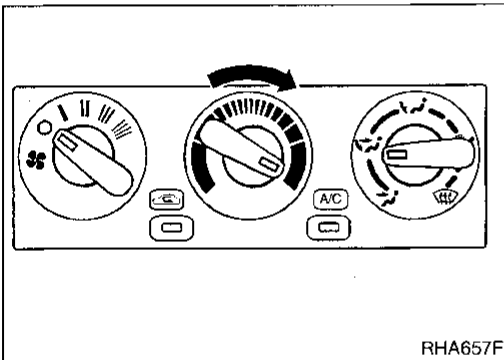
Confirm that the RECIRCULATION (REC) switch is canceled in the DEF (☞) and D/F (☞) mode.



4. Check Temperature Decrease

NAHA0076S0204

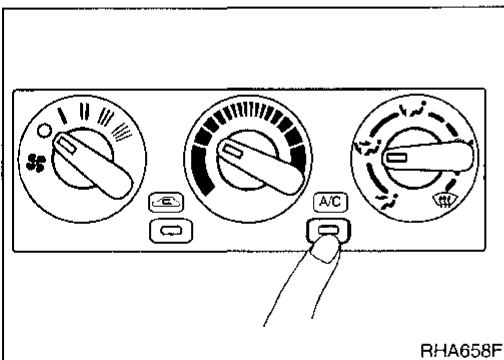
1. Turn temperature control knob to full cold.
2. Check for cold air at discharge air outlets.



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.

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Intake Door

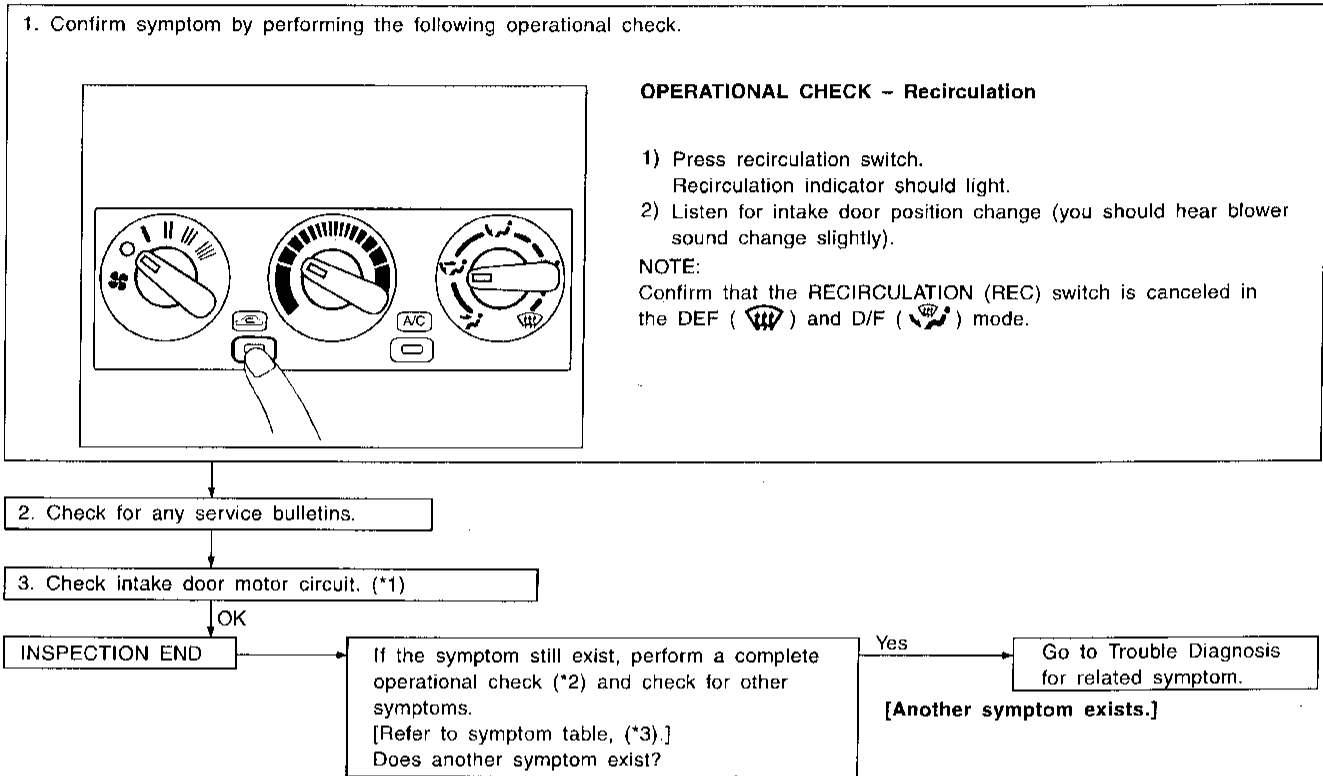
TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

=NAHA0135

Symptom:

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

Inspection Flow

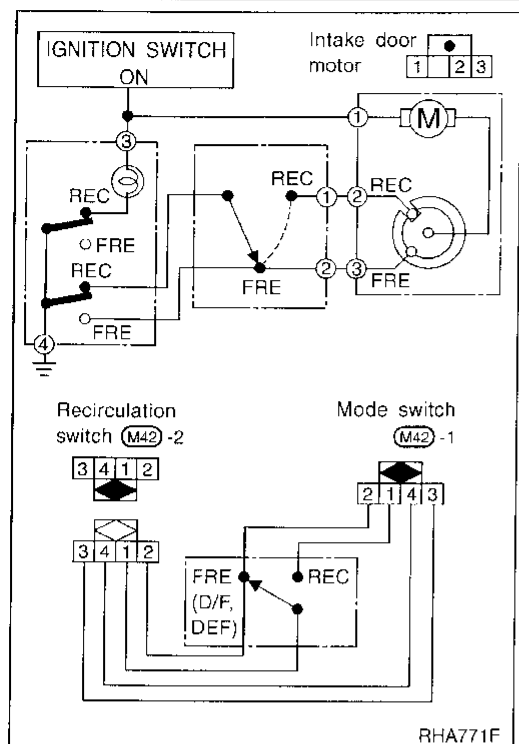


SHA912E

*1: HA-130

*2: HA-126

*3: HA-125



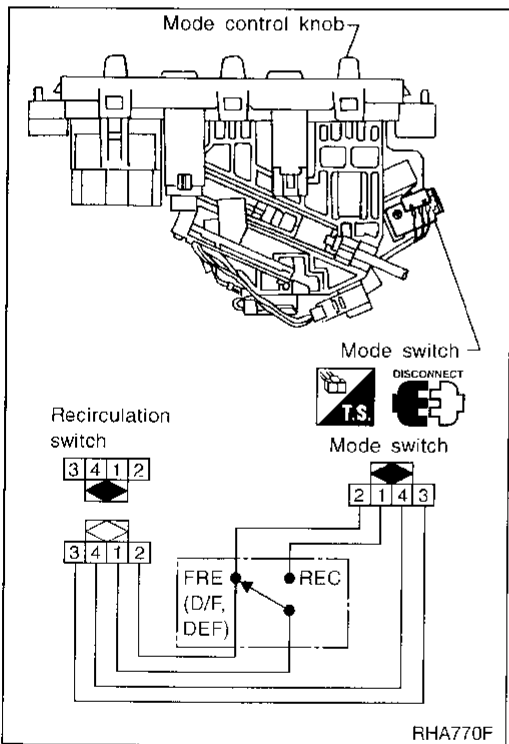
SYSTEM DESCRIPTION

Intake Door Motor

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 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

Mode Switch

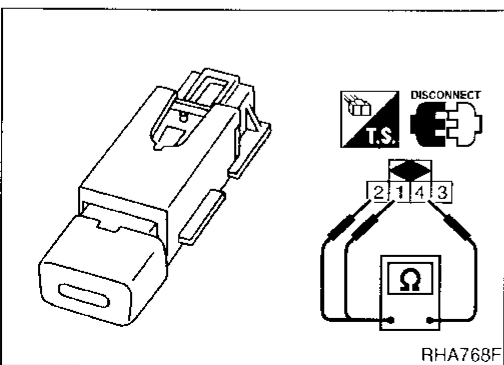
Check continuity between terminals at each switch position.

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
3	3	All	Yes

Recirculation Switch

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



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INTAKE DOOR MOTOR CIRCUIT

=NA11A0090

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 terminal No. 1 and body ground?</p>	
<p>Intake door motor connector (M59)</p> <p>G/R</p> <p>V</p> <p>RHA350FA</p>	
Yes or No	
Yes	▶ GO TO 2.
No	▶ Check 7.5A (No. 11) fuse at fuse block. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

2	CHECK GROUND CIRCUIT FOR INTAKE DOOR MOTOR																		
<p>Check continuity between intake door motor harness terminals and body ground.</p>																			
<table border="1"> <thead> <tr> <th rowspan="2">Recirculation switch condition</th> <th colspan="2">Terminal No.</th> <th rowspan="2">Continuity</th> </tr> <tr> <th>(+)</th> <th>(-)</th> </tr> </thead> <tbody> <tr> <td rowspan="2">REC</td> <td>(2)</td> <td rowspan="2">Body ground</td> <td>Yes</td> </tr> <tr> <td>(3)</td> <td>No</td> </tr> <tr> <td rowspan="2">FRE</td> <td>(2)</td> <td rowspan="2">Body ground</td> <td>No</td> </tr> <tr> <td>(3)</td> <td>Yes</td> </tr> </tbody> </table>	Recirculation switch condition	Terminal No.		Continuity	(+)	(-)	REC	(2)	Body ground	Yes	(3)	No	FRE	(2)	Body ground	No	(3)	Yes	MTBL0033
Recirculation switch condition		Terminal No.			Continuity														
	(+)	(-)																	
REC	(2)	Body ground	Yes																
	(3)		No																
FRE	(2)	Body ground	No																
	(3)		Yes																
<p>Intake door motor connector (M59)</p> <p>G/B</p> <p>Ω</p> <p>Intake door motor connector (M59)</p> <p>LW</p> <p>Ω</p>																			
<p>Continuity should exist when test leads are connected as shown, it should not exist when test leads are reversed.</p>																			
OK or NG																			
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-132)</p>	
OK or NG	
OK	▶ Replace intake door motor.
NG	▶ Repair or adjust.

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4	CHECK CONTINUITY BETWEEN MODE SWITCH HARNESS TERMINAL NO. 1 (2) AND INTAKE DOOR MOTOR HARNESS TERMINAL NO. 2 (3)
<p>Continuity should exist. If OK, check harness for short.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">RHA581F</p>	
OK or NG	
OK	▶ GO TO 5.
NG	▶ Repair harness or connector.

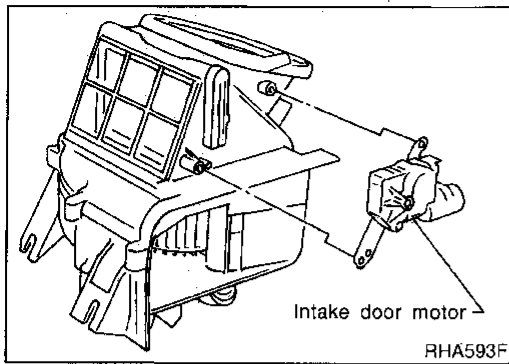
5	CHECK MODE SWITCH
<p>(Refer to Electrical Components Inspection.) (HA-129)</p>	
OK or NG	
OK	▶ GO TO 6.
NG	▶ Replace mode switch.

6	CHECK CIRCUIT CONTINUITY BETWEEN MODE SWITCH HARNESS TERMINAL NO. 4 AND RECIRCULATION SWITCH HARNESS TERMINAL NO. 4
<p>Continuity should exist. If OK, check harness for short.</p> <div style="text-align: center;"> </div> <p style="text-align: right;">RHA769FB</p>	
OK or NG	
OK	▶ GO TO 7.
NG	▶ Replace mode switch.

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

8	CHECK RECIRCULATION SWITCH
<p>(Refer to Electrical Components Inspection.) (HA-129)</p>	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Replace recirculation switch.

Intake Door (Cont'd)

**CONTROL LINKAGE ADJUSTMENT**

NAHA0093

Intake Door Motor

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.

Blower Motor

TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

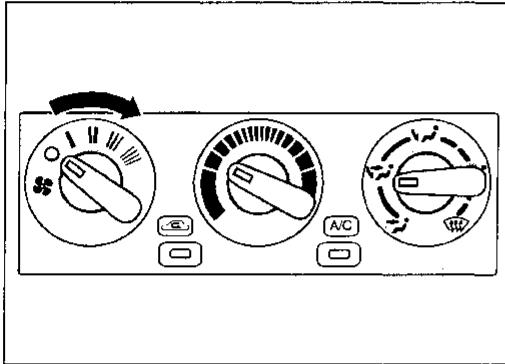
Symptom:

- Blower motor does not rotate at all.

Inspection Flow

-NAHA0138

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK - Blower motor

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

SHA913E

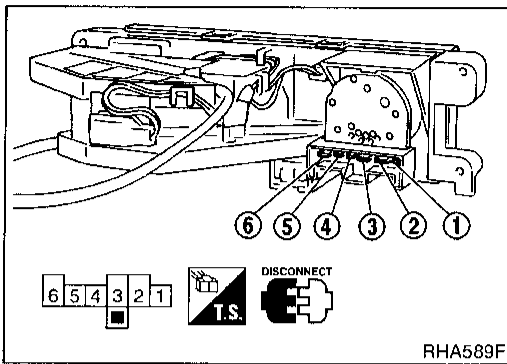
*1: HA-135

*2: HA-126

*3: HA-125

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Blower Motor (Cont'd)



ELECTRICAL COMPONENTS INSPECTION

-NAHA0139

Fan Switch

NAHA0139S01

Check continuity between terminals at each switch position.

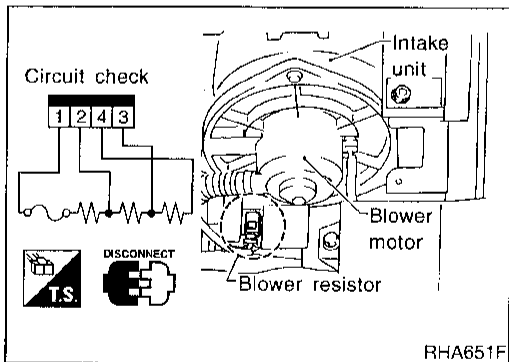
KNOB POSITION	Continuity between terminals
OFF	
1	5 — 1 — 6
2	4 — 1 — 6
3	3 — 1 — 6
4	2 — 1 — 6

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

BLOWER MOTOR CIRCUIT

-NAHA0089

SYMPTOM:

- Blower motor does not rotate.

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

1 DIAGNOSTIC PROCEDURE	
Check if blower motor rotates properly at each fan speed. Conduct checks as per flow chart 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 terminal No. 1 and body ground?	
Yes or No	
Yes	▶ GO TO 3.
No	▶ Check 15A (No. 1 and No. 2) fuses at fuse block. (Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

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

4 CHECK BLOWER MOTOR	
(Refer to Electrical Components Inspection.) (HA-134)	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Replace blower motor.

Blower Motor (Cont'd)

5	CHECK BLOWER MOTOR CIRCUIT BETWEEN BLOWER MOTOR AND RESISTOR
<p>Do approx. 12 volts exist between resistor harness terminal No. 1 and body ground?</p>	
<p>Resistor connector (M61)</p> <p style="text-align: right;">RHA575F</p>	
Yes or No	
Yes	▶ Disconnect fan switch harness connector. GO TO 7.
No	▶ Disconnect blower motor and resistor harness connectors. GO TO 6.

7	CHECK GROUND CIRCUIT FOR FAN SWITCH
<p>Check circuit continuity between fan switch harness terminal No. 6 and body ground.</p>	
<p>Fan switch connector (M43)</p> <p style="text-align: right;">RHA577F</p>	
OK or NG	
OK	▶ GO TO 8.
NG	▶ Repair harness or connector.

6	CHECK CIRCUIT CONTINUITY BETWEEN BLOWER MOTOR HARNESS TERMINAL NO. 2 AND RESISTOR HARNESS TERMINAL NO. 1
<p>Continuity should exist.</p>	
<p>Resistor connector (M61)</p> <p>Blower motor connector (M73)</p> <p style="text-align: right;">RHA576F</p>	
OK or NG	
OK	▶ Check harness for short.
NG	▶ Repair harness or connector.

8	CHECK RESISTOR AFTER DISCONNECTING IT
<p>(Refer to Electrical Components Inspection.) (HA-134)</p>	
OK or NG	
OK	▶ GO TO 9.
NG	▶ Replace resistor.

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

10	CHECK FAN SWITCH CIRCUIT	
Do approx. 12 volts exist between each fan switch harness terminal and body ground?		
Flow chart No.	Terminal No.	Voltage
	(+) (-)	
2	(5)	Body ground Approx. 12V
3	(4)	
4	(3)	
5	(2)	
MTBL0031		
RHA578F		
Yes or No		
Yes	▶	GO TO 12.
No	▶	GO TO 11.

11	CHECK CIRCUIT CONTINUITY BETWEEN FAN SWITCH HARNESS TERMINAL AND RESISTOR HARNESS TERMINAL	
Terminal No.		Continuity
Fan Switch	Resistor	
(2)	(1)	Yes
(3)	(2)	
(4)	(3)	
(5)	(4)	
MTBL0032		
RHA579F		
OK or NG		
OK	▶	Check harness for short.
NG	▶	Repair harness or connector.

12	CHECK FAN SWITCH AFTER DISCONNECTING IT	
(Refer to Electrical Components Inspection.) (HA-134)		
OK or NG		
OK	▶	INSPECTION END
NG	▶	Replace fan switch.

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Insufficient Cooling

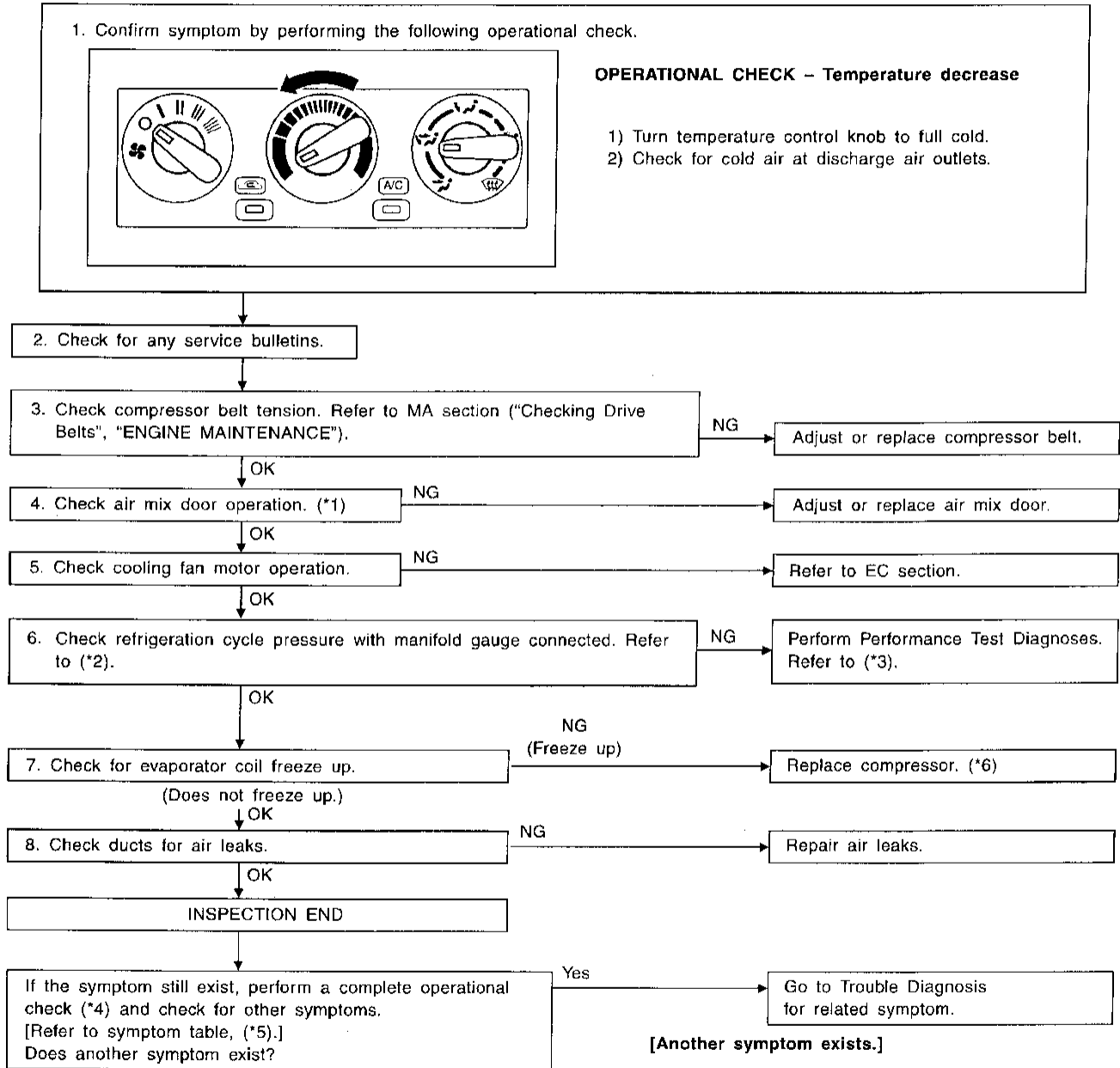
TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

=NAHA0150

Symptom:

- Insufficient Cooling.

Inspection Flow



SHA946E

*1: HA-147

*3: HA-139

*5: HA-125

*2: HA-141

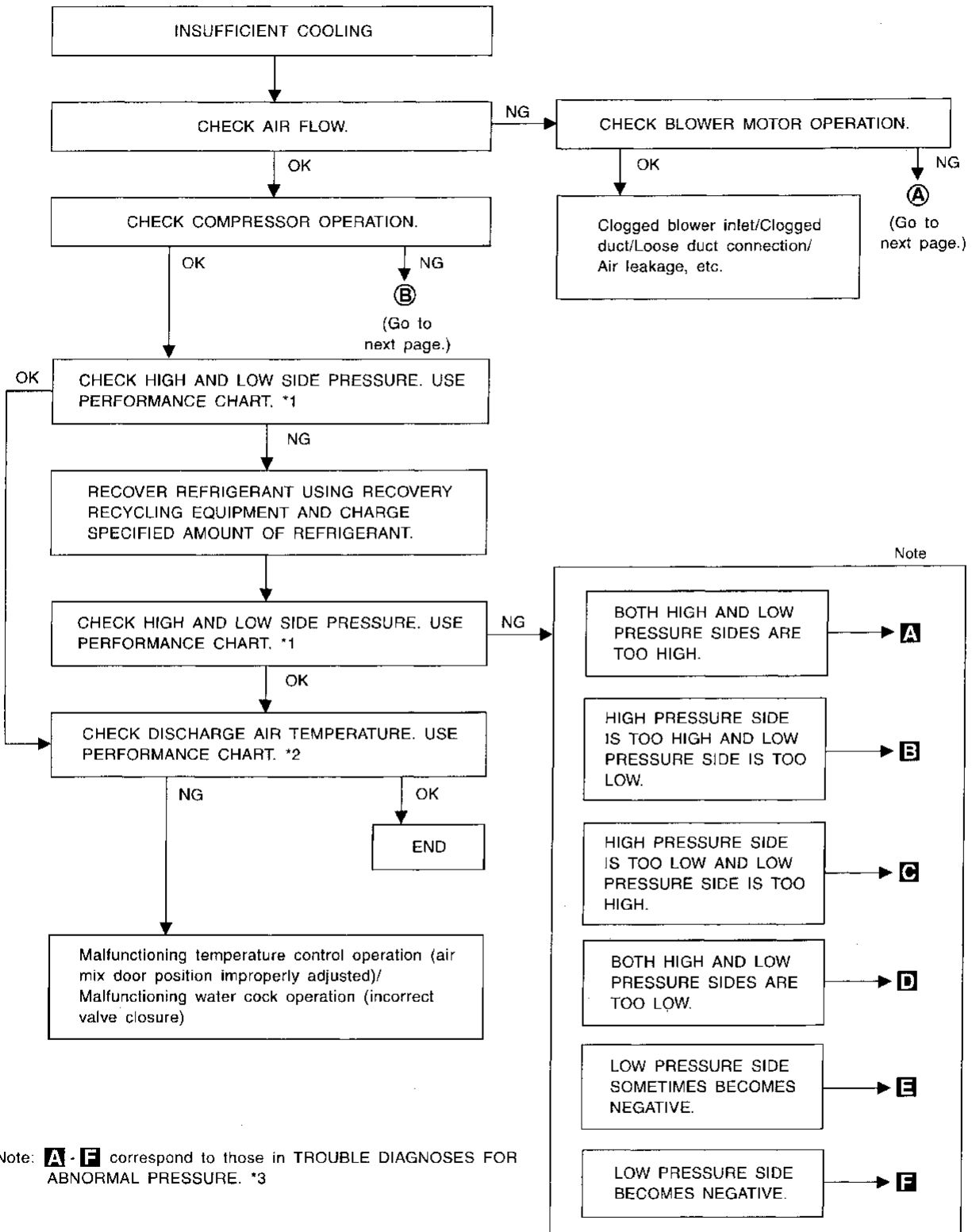
*4: HA-126

*6: HA-160

PERFORMANCE TEST DIAGNOSES
Insufficient Cooling

NAHA0062

NAHA0062S01



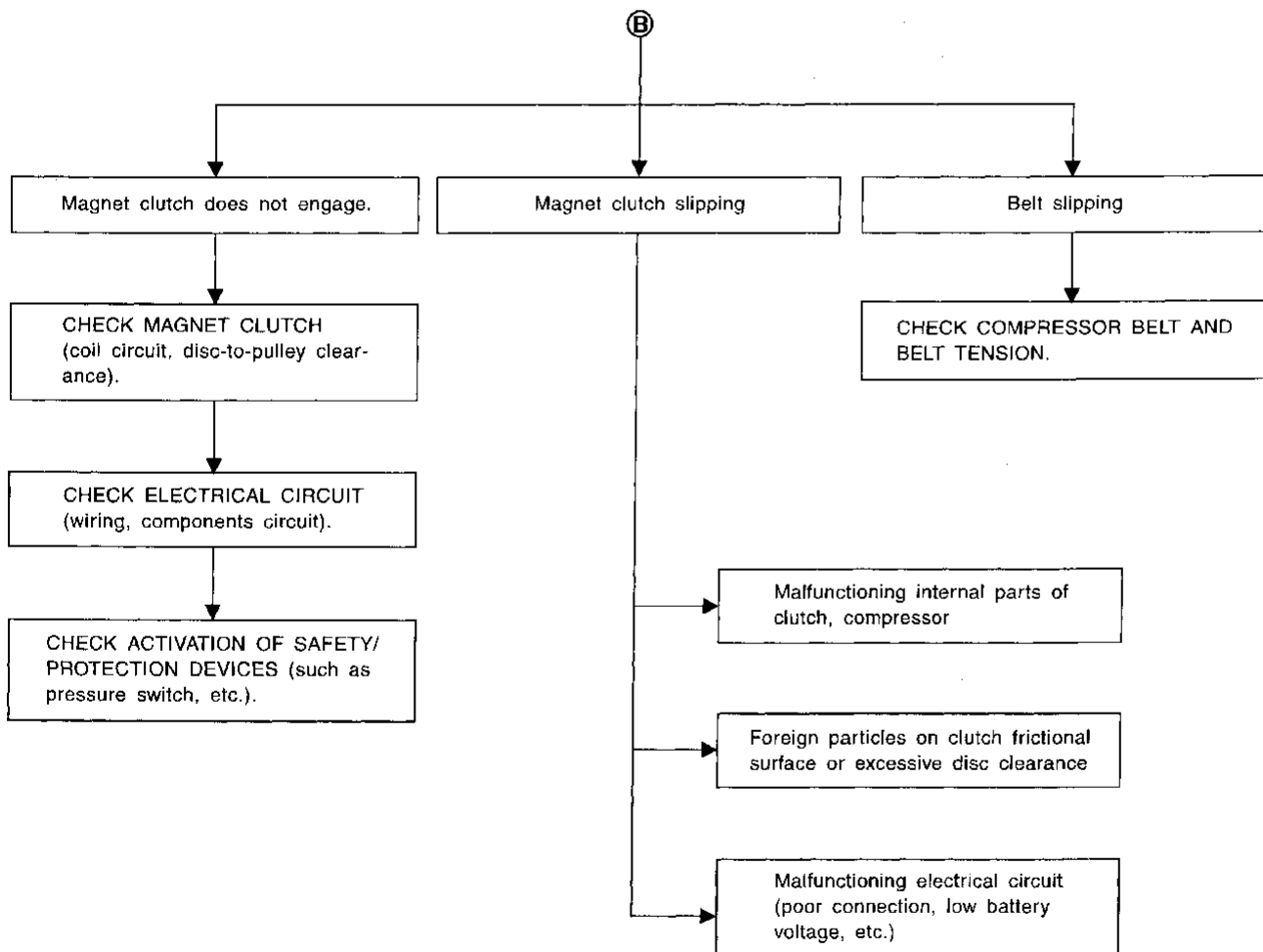
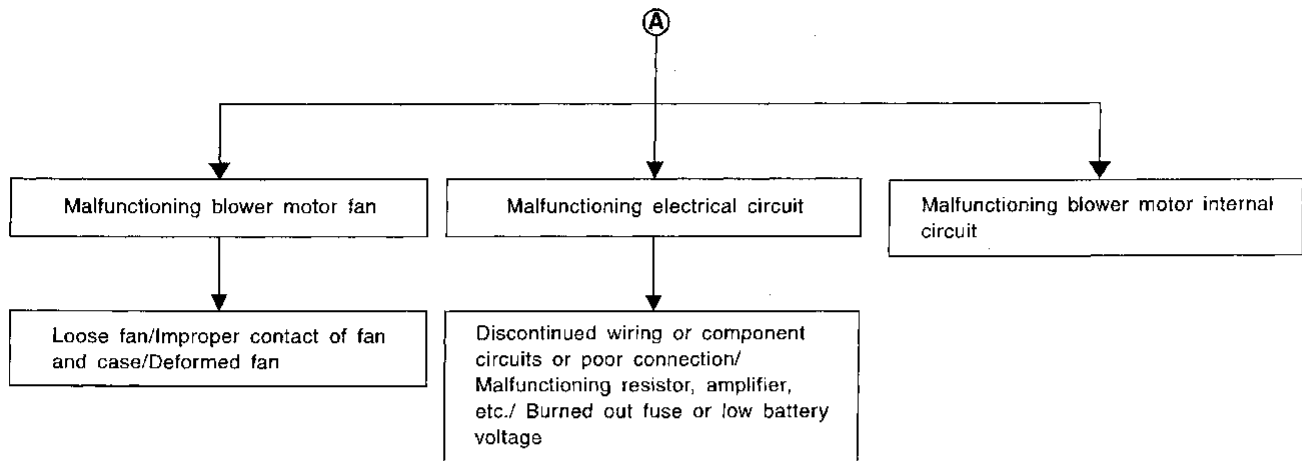
Note: **A - F** correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. *3

MHA649A

*1: HA-141

*2: HA-141

*3: HA-142



MHA650A

PERFORMANCE CHART

Test Condition

Testing must be performed as follows:

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

Doors: Closed

Door window: Open

Hood: Open

TEMP.: Max. COLD

Discharge Air: Face Vent

REC switch: (Recirculation) set

FAN speed: 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

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

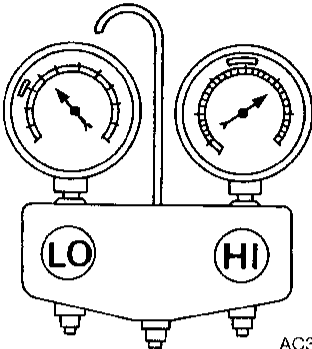
Ambient air		High-pressure (Discharge side) kPa (kg/cm ² , psi)	Low-pressure (Suction side) kPa (kg/cm ² , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	1,226 - 1,638 (12.5 - 16.7, 178 - 237)	172 - 250 (1.75 - 2.55, 25 - 36)
	30 (86)	1,422 - 1,883 (14.5 - 19.2, 206 - 273)	196 - 275 (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 ABNORMAL PRESSURE

Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to HA-141 ("Ambient air temperature-to-operating pressure table").

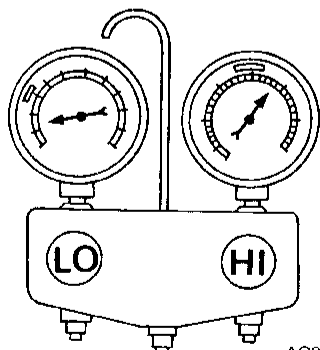
Both High and Low-pressure Sides are Too High.

NAHA0084501

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 thermal valve installation Improper expansion valve adjustment 	<p>Replace expansion valve.</p>


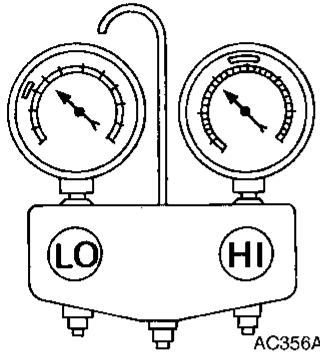
High-pressure Side is Too High and Low-pressure Side is Too Low.

NAHA0084502

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.

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

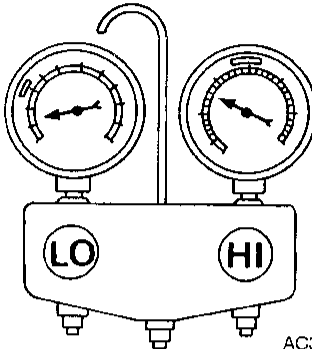
NAHA0084S03

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too low and low-pressure side is too high.</p> <p></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>

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

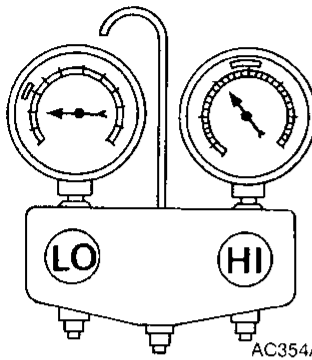
NAHA0004304

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p> <p>D</p>  <p>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 ↓ Leaking fittings or components</p>	<p>Check refrigerant for leaks. Refer to "Checking Refrigerant Leaks", HA-166.</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. ↓ 1. Improper expansion valve adjustment 2. Malfunctioning thermal valve 3. Outlet and inlet may be clogged.</p>	<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. ↓ Compressor discharge capacity does not change. (Compressor stroke is set at maximum length.)</p>	<p>Replace compressor.</p>

Low-pressure Side Sometimes Becomes Negative.

NAHA0084S05

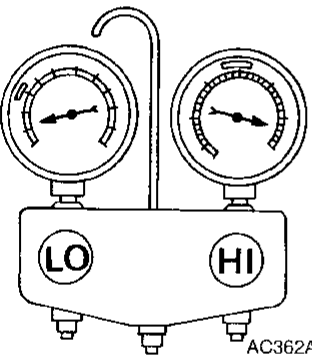
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Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative. E  <p style="text-align: right; margin-right: 50px;">AC354A</p>	<ul style="list-style-type: none"> • Air conditioning system does not 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. 	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> • Drain water from refrigerant or replace refrigerant. • Replace liquid tank.

Low-pressure Side Becomes Negative.

NAHA0084S06

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Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side becomes negative. F  <p style="text-align: right; margin-right: 50px;">AC362A</p>	Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.	High-pressure side is closed and refrigerant does not flow. ↓ Expansion valve or liquid tank is frosted.	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. <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.

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Insufficient Heating

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

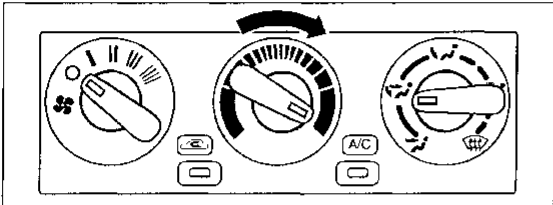
=NAHA0140

Symptom:

- Insufficient Heating.

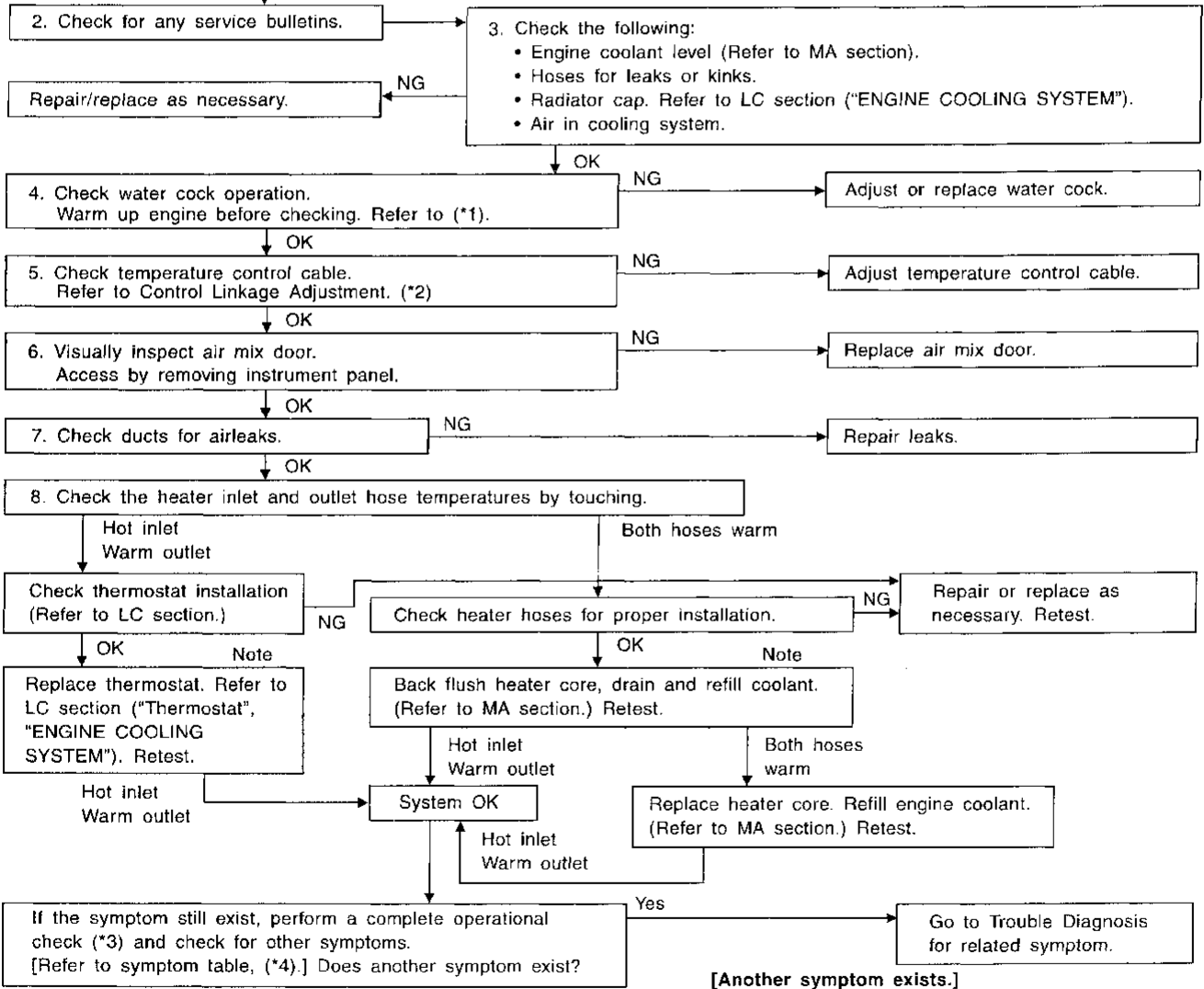
Inspection Flow

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.

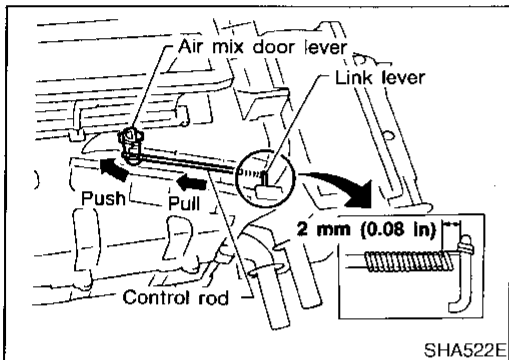


*1: HA-147

*2: HA-147

*3: HA-126

*4: HA-125



CONTROL LINKAGE ADJUSTMENT Water Cock Control Rod

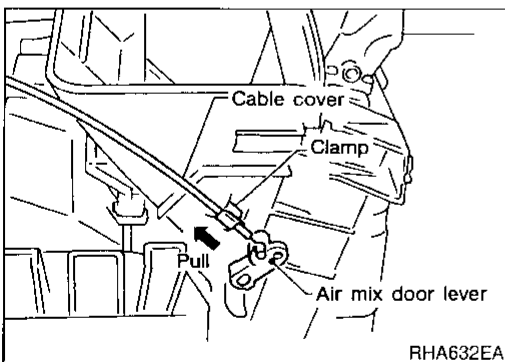
NAHA0141

NAHA0141S01

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

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

After connecting control rod, check it operates properly.



Temperature Control Cable

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.

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Air Outlet

TROUBLE DIAGNOSIS PROCEDURE FOR AIR OUTLET

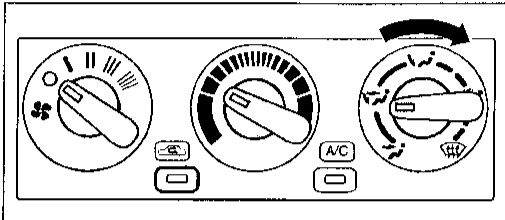
=NAHA0142

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).

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)

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.]

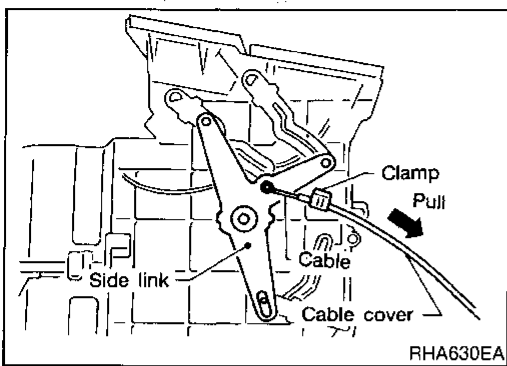
SHA948E

*1: HA-149

*3: HA-125

*4: HA-116

*2: HA-126



CONTROL LINKAGE ADJUSTMENT

Mode Control Cable

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.

NAHA0151

NAHA0151S01

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Magnet Clutch

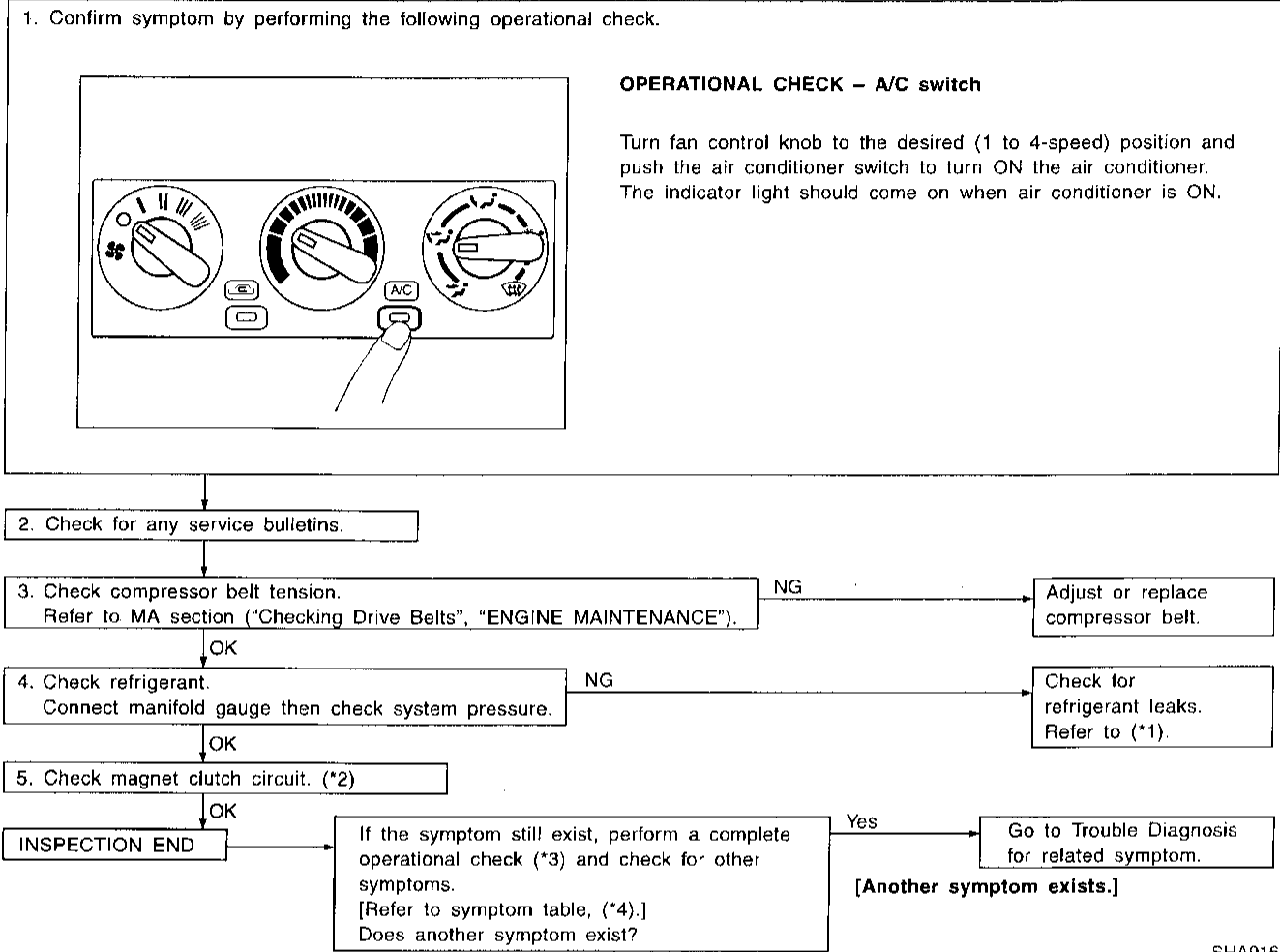
TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

=NAHA0119

Symptom:

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

Inspection Flow



SHA916E

*1: HA-166

*3: HA-126

*4: HA-125

*2: HA-151

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 terminal No. 1 and body ground?</p>	
<p>Compressor connector (F202)</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-161.

3	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. 5 AND COMPRESSOR HARNESS TERMINAL NO. 1
Continuity should exist.	
<p>Compressor connector (F202) A/C relay connector (E26)</p>	
RHA748FA	
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
<p>Disconnect A/C relay. Do approx. 12 volts exist between A/C relay harness terminal Nos. 2, 3 and body ground?</p>	
<p>A/C relay connector (E26)</p>	
RHA583F	
Yes or No	
Yes	▶ GO TO 5.
No	▶ Check power supply circuit and 7.5A (No. 6) fuse at fuse block. Refer to EL section ("Wiring Diagram", "POWER SUPPLY ROUTING").

5	CHECK A/C RELAY AFTER DISCONNECTING IT
Refer to HA-154.	
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 (ECCS control module) harness terminal No. 12 and body ground?	
<p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>12</p> <p>G/R</p> <p>V</p>	
SHA936E	
Yes or No	
Yes	▶ GO TO 8.
No	▶ Disconnect A/C relay. Disconnect ECM (ECCS control module) harness connector. GO TO 7.

8	CHECK VOLTAGE FOR ECM (ECCS CONTROL MODULE)
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. 21 and body ground?	
<p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>21</p> <p>B/W</p> <p>V</p> <p>RHA701F</p>	
Yes or No	
Yes	▶ Disconnect ECM (ECCS control module) harness connector. Disconnect dual-pressure switch harness connector. GO TO 9.
No	▶ Check ECM (ECCS control module). Refer to EC section.

7	CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. 1 AND ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. 12
Continuity should exist.	
<p>A/C relay connector (E26)</p> <p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>12</p> <p>G/R</p> <p>G/R</p> <p>Ω</p>	
SHA937E	
OK or NG	
OK	▶ Check harness for short.
NG	▶ Repair harness or connector.

9	CHECK CIRCUIT CONTINUITY BETWEEN ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. 21 AND DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. 2
Continuity should exist.	
<p>ECM (ECCS control module) connector (F24)</p> <p>ECM CONNECTOR</p> <p>21</p> <p>B/W</p> <p>Dual-pressure switch connector (E37)</p> <p>2</p> <p>B/W</p> <p>Ω</p> <p>RHA585F</p>	
If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 10.
NG	▶ Repair harness or connector.

10	CHECK DUAL-PRESSURE SWITCH
Refer to HA-154.	
OK or NG	
OK	▶ Disconnect A/C switch harness connector. GO TO 11.
NG	▶ Replace dual-pressure switch.

11	CHECK CIRCUIT CONTINUITY BETWEEN DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. 1 AND A/C SWITCH HARNESS TERMINAL NO. 2
Continuity should exist.	
<p style="font-size: small;">Dual-pressure switch connector (E37) A/C switch connector (M44)</p> <p style="font-size: small;">L/B L/B</p> <p style="text-align: right; font-size: small;">RHA586FB</p>	
If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 12.
NG	▶ Repair harness or connector.

12	CHECK A/C SWITCH
Refer to HA-154.	
OK or NG	
OK	▶ Disconnect fan switch harness connector. GO TO 13.
NG	▶ Replace A/C switch.

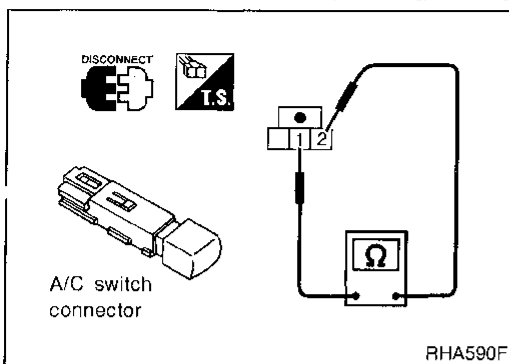
13	CHECK CIRCUIT CONTINUITY BETWEEN A/C SWITCH HARNESS TERMINAL NO. 1 AND FAN SWITCH HARNESS TERMINAL NO. 1
<p style="font-size: small;">A/C switch connector (M44) Fan switch connector (M43)</p> <p style="font-size: small;">LG/R LG/R</p> <p style="text-align: right; font-size: small;">RHA617F</p>	
If OK, check harness for short.	
OK or NG	
OK	▶ GO TO 14.
NG	▶ Repair harness or connector.

14	CHECK BODY GROUND CIRCUIT FOR FAN SWITCH
Does continuity exist between fan switch harness terminal No. 6 and body ground?	
<p style="font-size: small;">Fan switch connector (M43)</p> <p style="font-size: small;">6</p> <p style="font-size: small;">B</p> <p style="text-align: right; font-size: small;">RHA588F</p>	
Yes or No	
Yes	▶ GO TO 15.
No	▶ Repair harness or connector.

15	CHECK FAN SWITCH
Refer to HA-134.	
OK or NG	
OK	▶ INSPECTION END
NG	▶ Replace fan switch.

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Magnet Clutch (Cont'd)



ELECTRICAL COMPONENTS INSPECTION

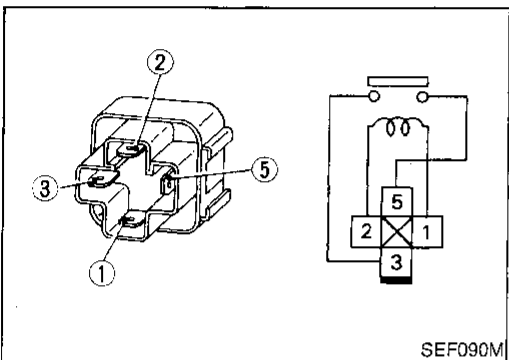
A/C Switch

=NAHA0082

NAHA0092S04

Check continuity between terminals at each switch position.

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



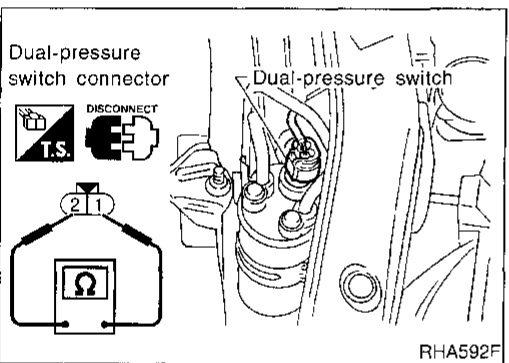
A/C Relay

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.



Dual-pressure Switch

NAHA0092S08

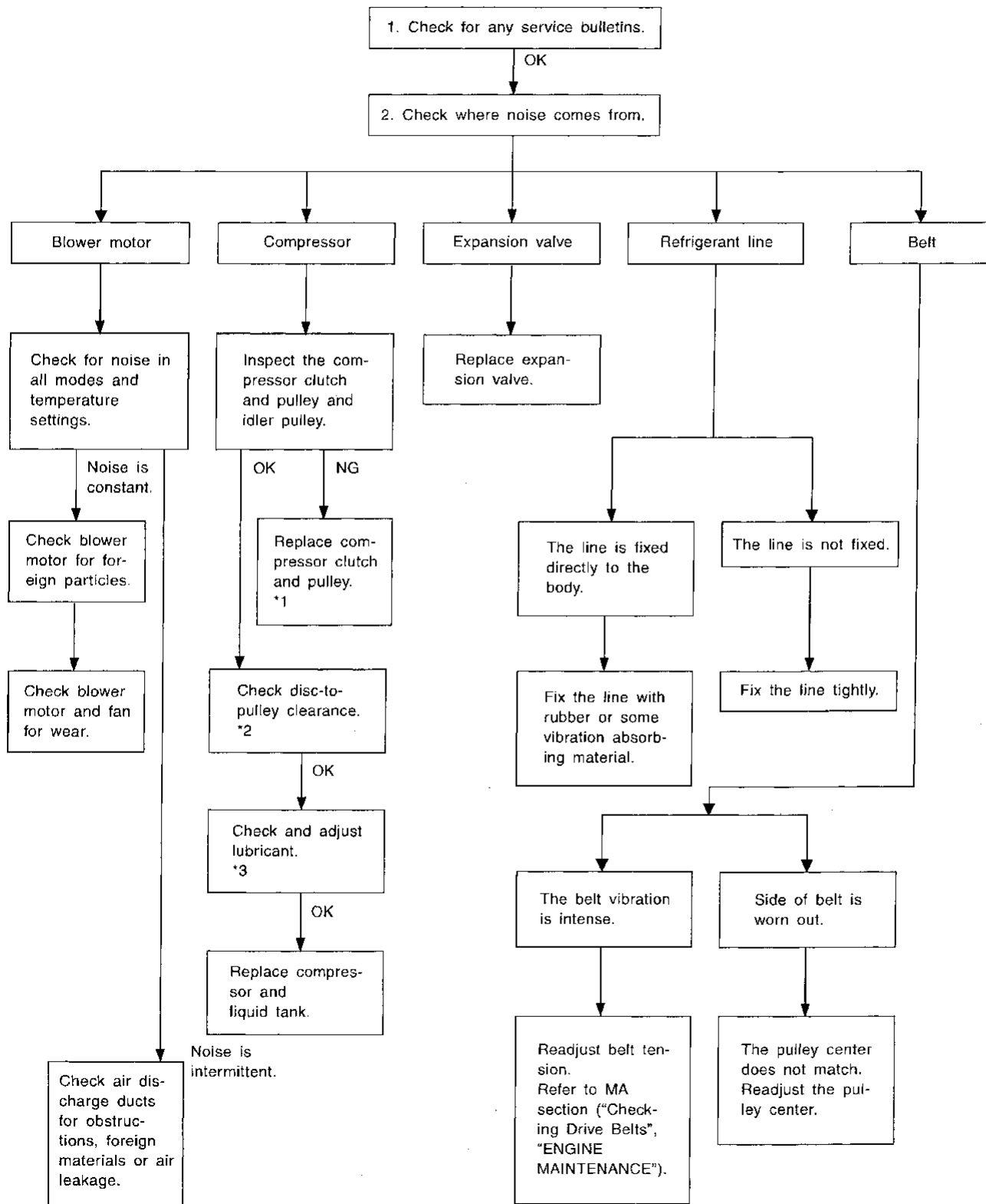
	ON kPa (kg/cm ² , psi)	OFF kPa (kg/cm ² , psi)
Low-pressure side	Increasing to 157 - 216 (1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 1,863 - 2,256 (19 - 23, 270 - 327)	Increasing to 2,452 - 2,844 (25 - 29, 356 - 412)

Noise
TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

Symptom:

- Noise

Inspection Flow



*1: HA-163

*2: HA-163

*3: HA-158

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

NAHA0094

NAHA0094S01

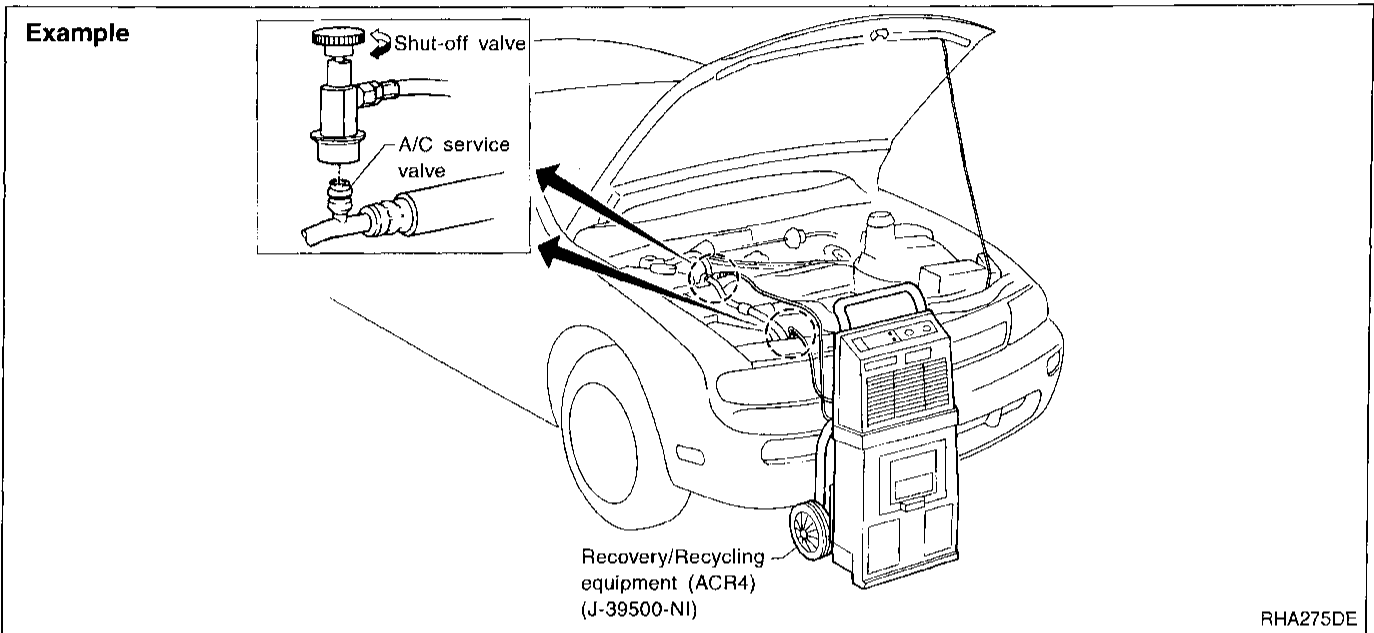
NAHA0094S0101

SETTING OF SERVICE TOOLS AND EQUIPMENT

Discharging Refrigerant

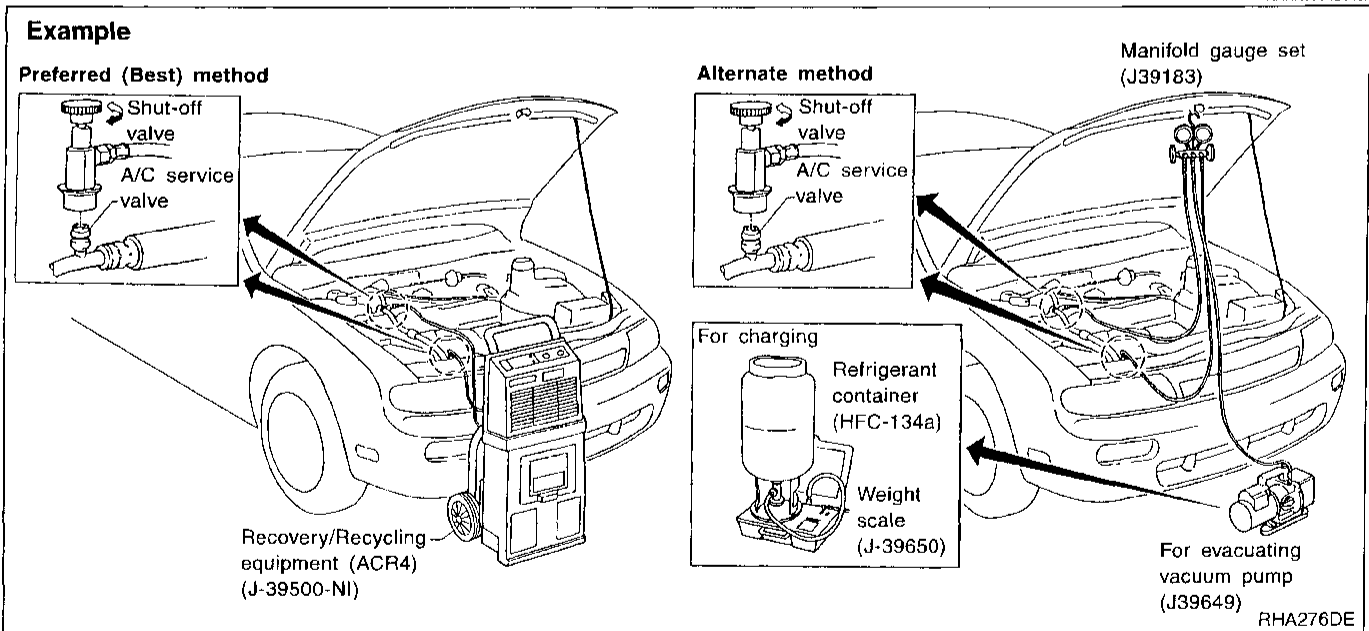
WARNING:

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.

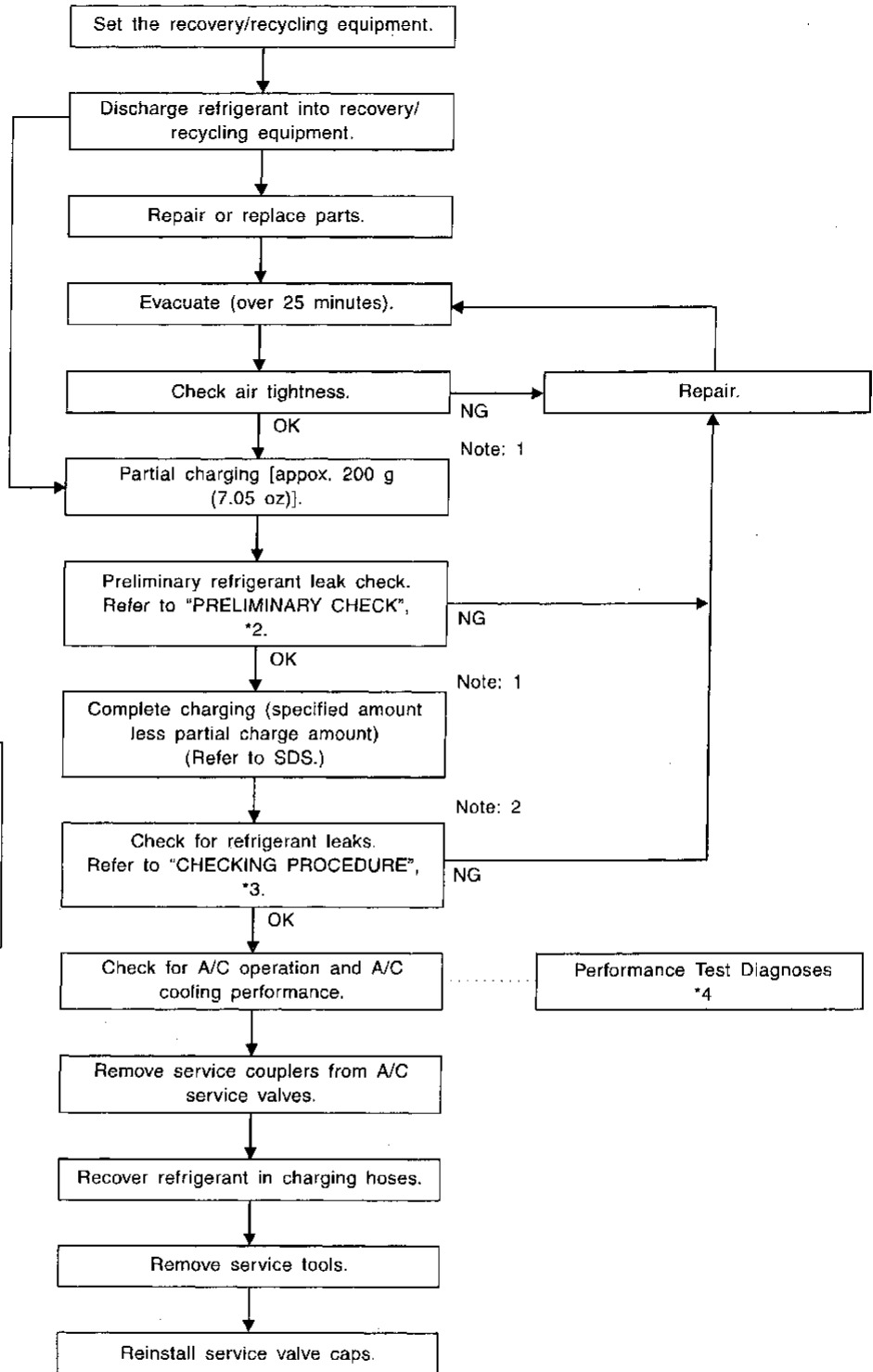


Evacuating System and Charging Refrigerant

NAHA0094S0102



Recovered lubricant. Refer to "CHECKING AND ADJUSTING", *1.



Note: 1 Before charging refrigerant, ensure engine is off.
 Note: 2 Before checking for leaks, start engine to activate air conditioning system then turn engine off. Service valve caps must be installed to prevent leakage.

*1: HA-158
 *2: HA-164

*3: HA-167

*4: HA-139

MHA644A

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Maintenance of Lubricant Quantity in Compressor

NAHA0095

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

NAHA0095S01

Name: Nissan A/C System Oil Type S

Part number: KLH00-PAGS0

CHECKING AND ADJUSTING

NAHA0095S02

Adjust the lubricant quantity according to the flowchart shown below.

1	LUBRICANT RETURN OPERATION
Can lubricant return operation be performed? • A/C system works properly. • There is no evidence of a large amount of lubricant leakage.	
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 or 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).]	
2. Next item is for V-5 or 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.	
CAUTION: If excessive lubricant leakage is noted, do not perform the lubricant return operation.	
▶ GO TO 3.	

3	CHECK COMPRESSOR
Should the compressor be replaced?	
Yes or No	
Yes	▶ GO TO HA-159.
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-159.
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 flow chart.

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

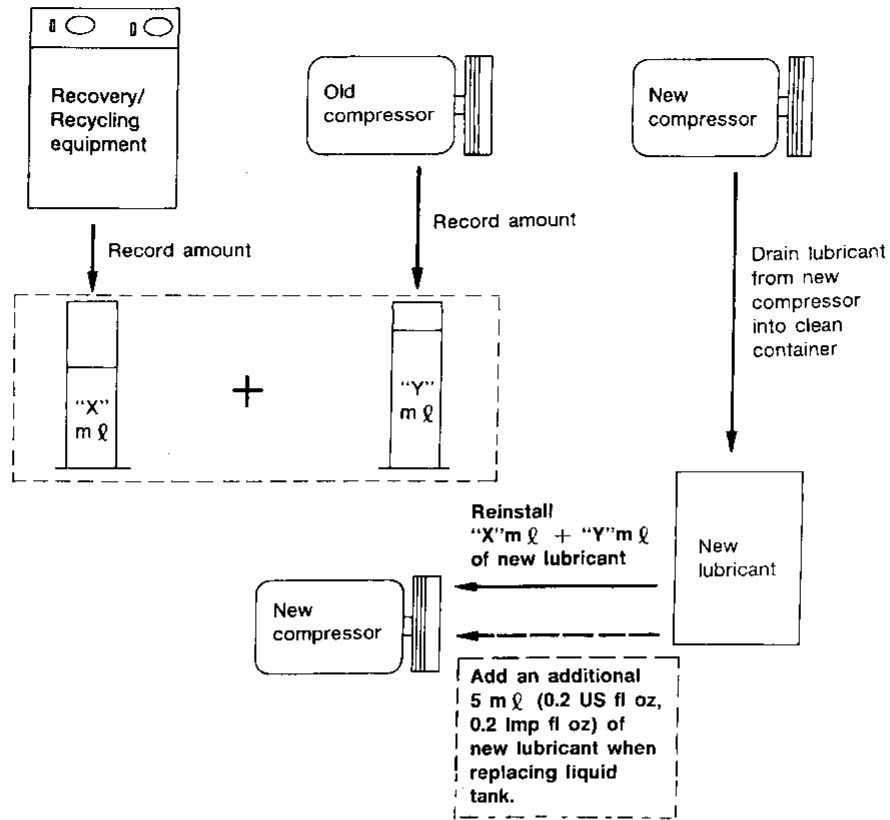
Lubricant Adjustment Procedure for Compressor Replacement

NAHA0095S0202

- 1) Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
- 2) Remove the drain plug of the "old" (removed) compressor (applicable only to V-5 or V-6 or DKS-16H compressor). Drain the lubricant into a graduated container and record the amount of drained lubricant.
- 3) Remove the drain plug and drain the lubricant from the "new" compressor into a separate, clean container.
- 4) Measure an amount of new lubricant installed equal to amount drained from "old" compressor. Add this lubricant to "new" compressor through the suction port opening.
- 5) Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to "new" compressor through the suction port opening.
- 6) Torque the drain plug.
 - V-5 or V-6 compressor:**
18 - 19 N·m (1.8 - 1.9 kg·m, 13 - 14 ft·lb)
 - DKS-16H compressor:**
14 - 16 N·m (1.4 - 1.6 kg·m, 10 - 12 ft·lb)
- 7) If the liquid tank also needs to be replaced, add an additional 5 ml (0.2 US fl oz, 0.2 Imp fl oz) of 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.**

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Lubricant adjusting procedure for compressor replacement



RHA065DD

Compressor REMOVAL AND INSTALLATION

NAHA0096

SEC. 274•275

16 - 22 (1.6 - 2.2, 12 - 16)

23 - 26 (2.3 - 2.7, 17 - 20)

16 - 19 (1.6 - 1.9, 12 - 14)

23 - 26 (2.3 - 2.7, 17 - 20)

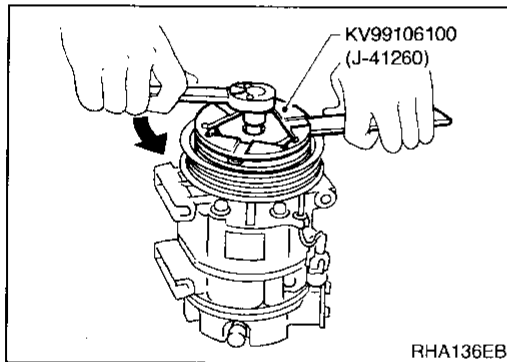
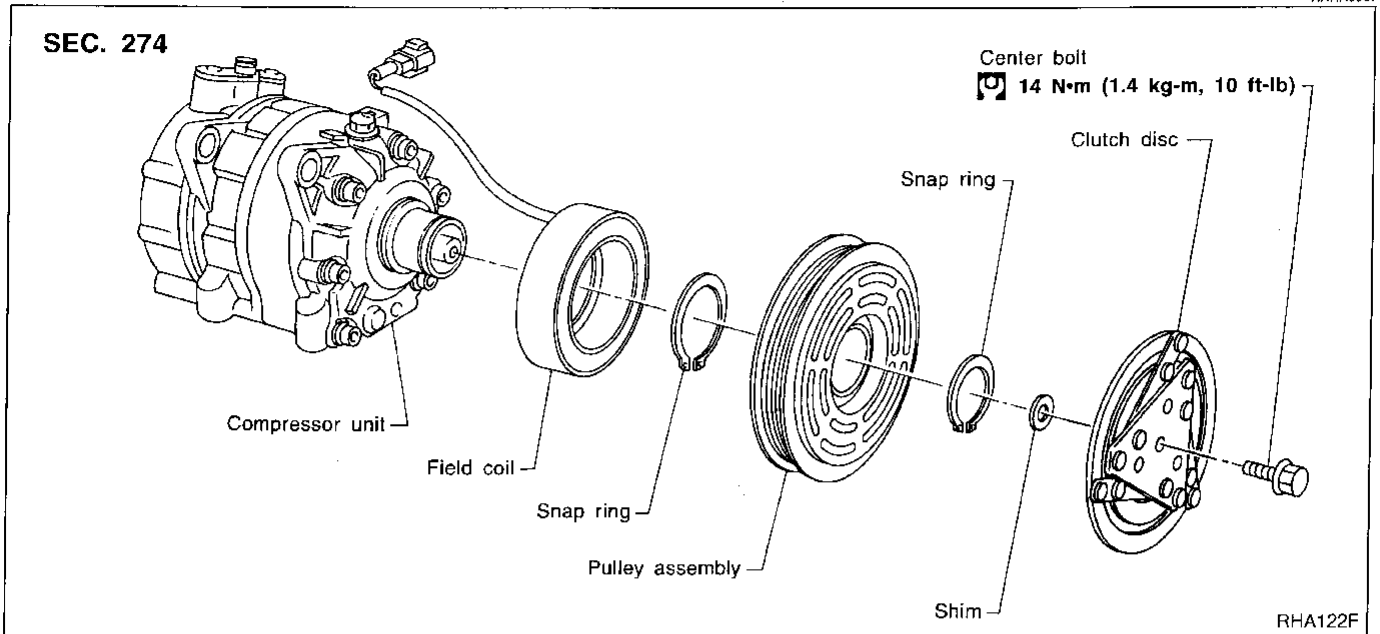
: N•m (kg-m, ft-lb)

45 - 60 (4.6 - 6.1, 33 - 44)

RHA650F

Compressor Clutch
OVERHAUL

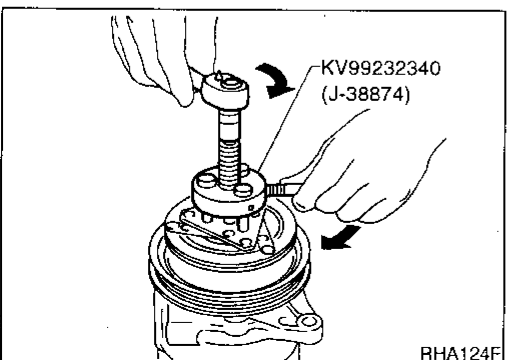
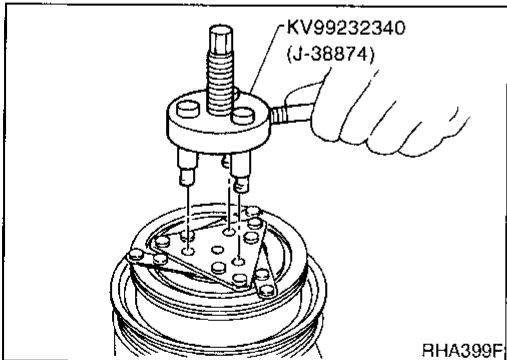
NAHA0097



REMOVAL

NAHA0098

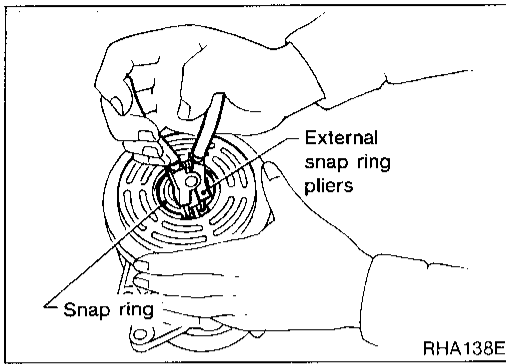
- When removing center bolt, hold clutch disc with clutch disc wrench.



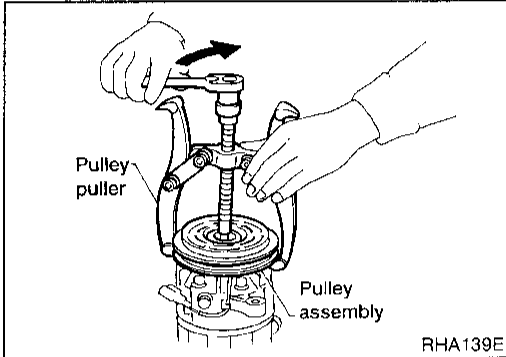
- Remove the clutch disc using the clutch disc puller. Insert the holder's three pins into the holes in the clutch disc. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the clutch disc. After removing the clutch disc, remove the shims from either the drive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

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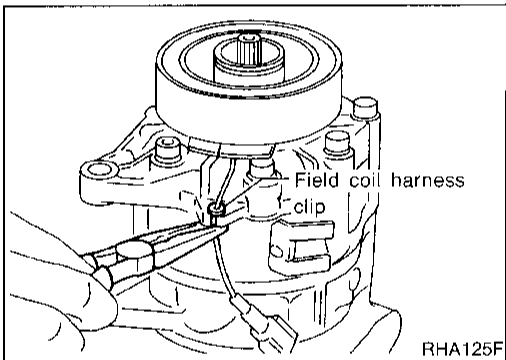
Compressor Clutch (Cont'd)



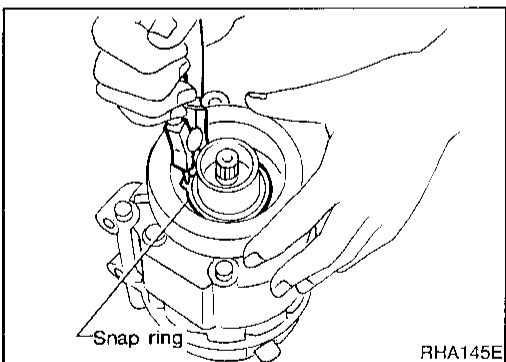
- Remove the snap ring using external snap ring pliers.



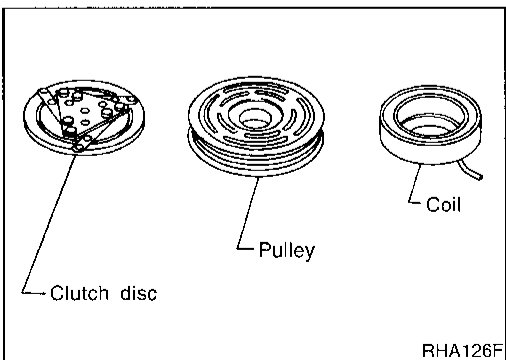
- Pulley removal
Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller.
To prevent the pulley groove from being deformed, the puller claws should be positioned onto the edge of the pulley assembly.



- Remove the field coil harness clip using a pair of pliers.



- Remove the snap ring using external snap ring pliers.



INSPECTION

Clutch Disc

NAHA0099

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

NAHA0099S01

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

Check coil for loose connection or cracked insulation.

NAHA0099S03

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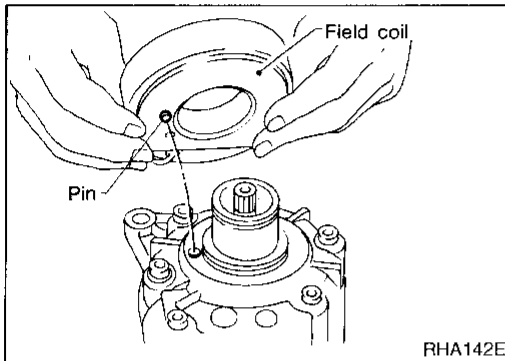
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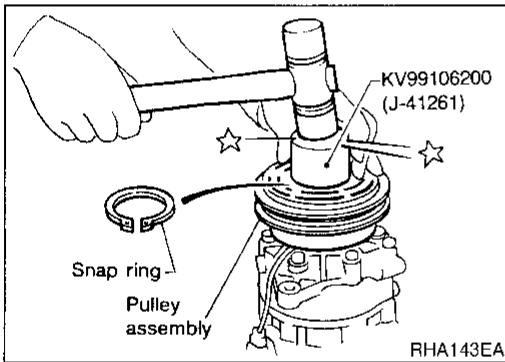
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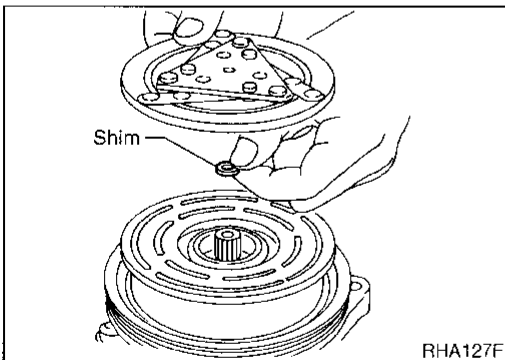


INSTALLATION

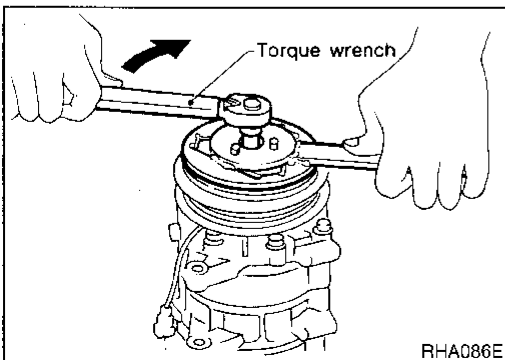
- Install the field coil.
Be sure to align the coil's pin with the hole in the compressor's front head.
- Install the field coil harness clip using a screwdriver.



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

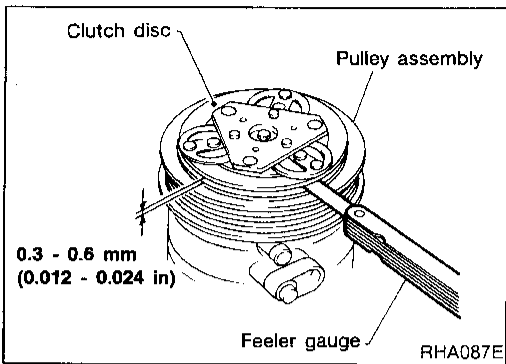


- Install the clutch disc on the drive shaft, together with the original shim(s). Press the clutch disc down by hand.



- Using the holder to prevent clutch disc rotation, tighten the bolt to 14 N·m (1.4 kg·m, 10 ft·lb) torque.
After tightening the bolt, check that the pulley rotates smoothly.

Compressor Clutch (Cont'd)



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

Break-in Operation

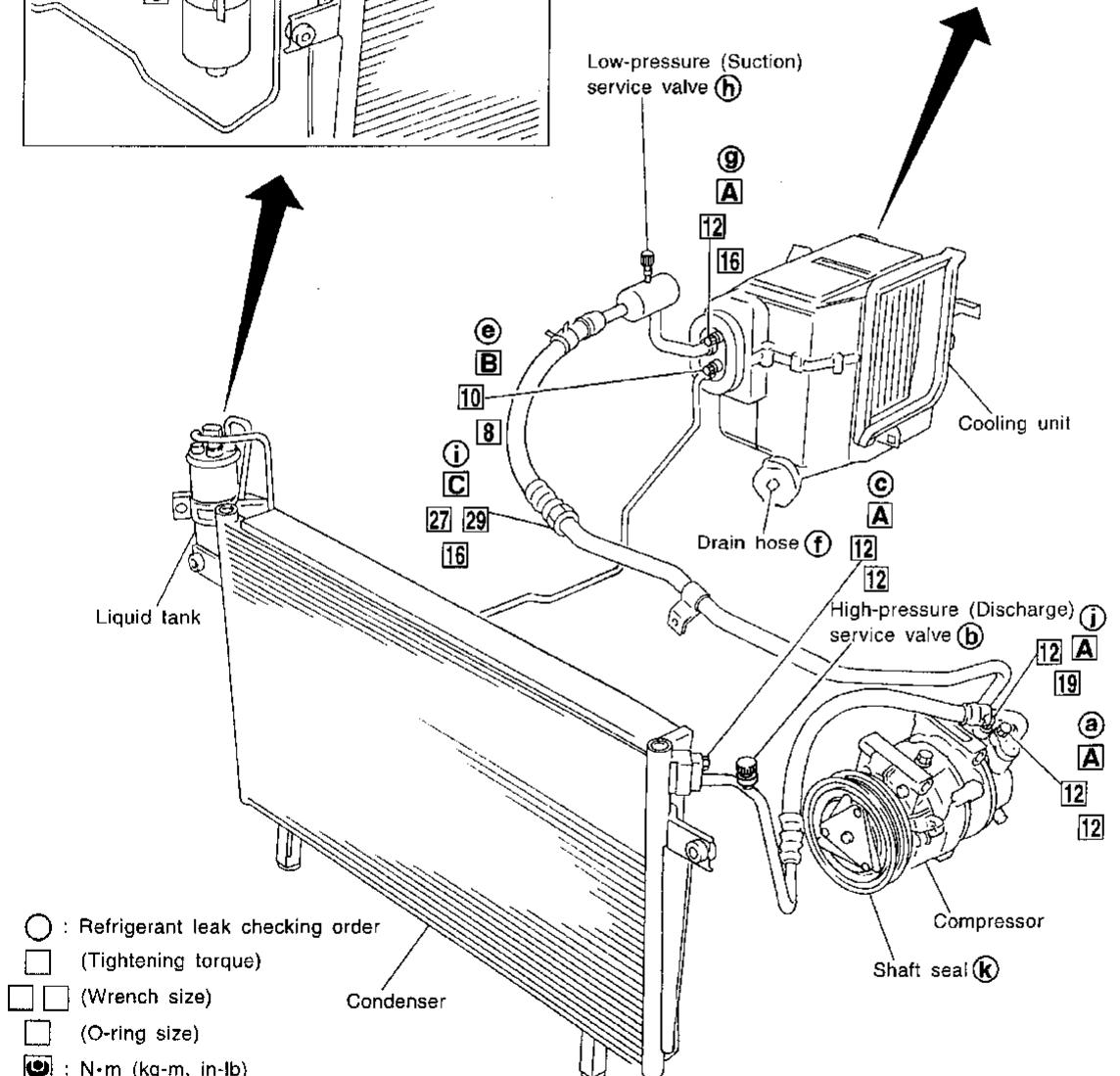
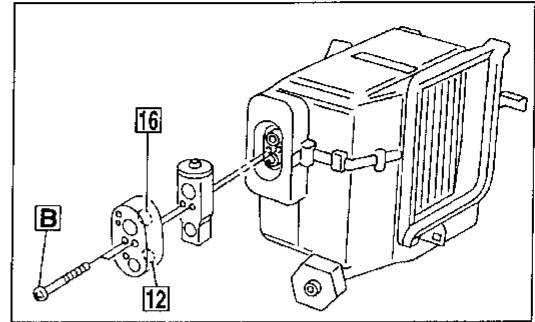
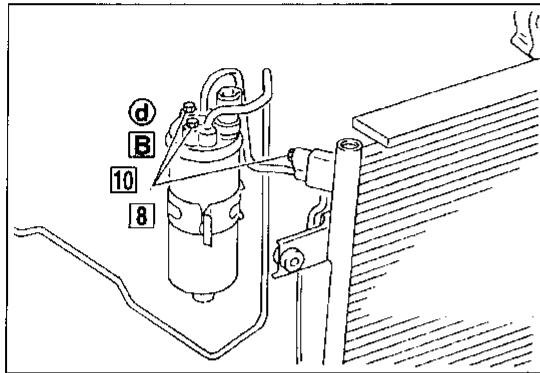
When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque. NAHA010DS01

Refrigerant Lines

REMOVAL AND INSTALLATION

- Refer to page HA-99 regarding "Precautions for Refrigerant Connection". NAHA0101

SEC. 271•274•276



- : Refrigerant leak checking order
- (Tightening torque)
- (Wrench size)
- (O-ring size)
- ⊙ : N·m (kg-m, in-lb)
- A** : 8 - 20 (0.8 - 2.0, 69 - 174)
- B** : 3 - 5 (0.3 - 0.5, 26 - 43)
- C** : N·m (kg-m, ft-lb)
- C** : 20 - 29 (2 - 3, 14 - 22)

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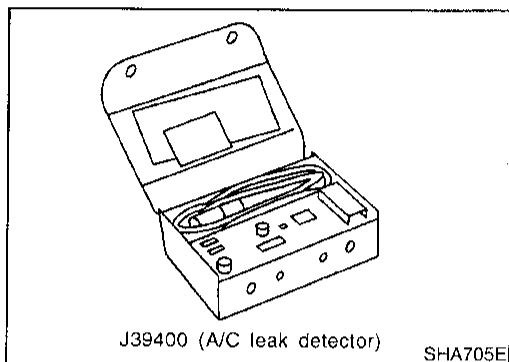
SHA935E

CHECKING REFRIGERANT LEAKS**Preliminary Check**

NAHA0102

NAHA0102S01

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

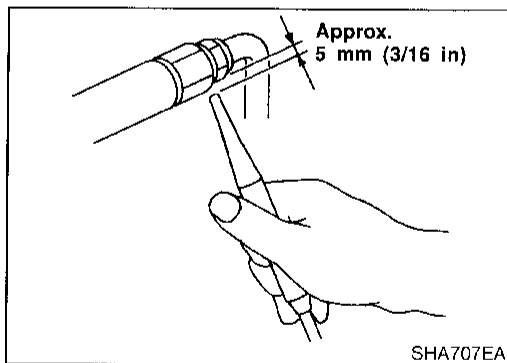
**Precautions for Handling Leak Detector**

NAHA0102S02

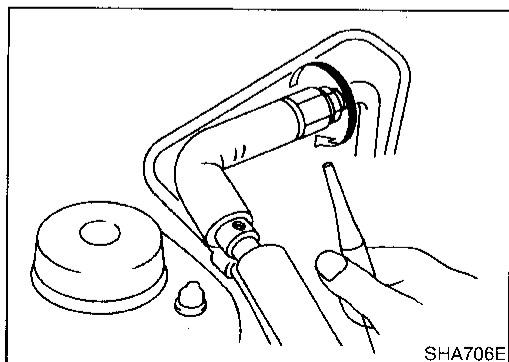
When performing a refrigerant leak check, use a J39400 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.

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

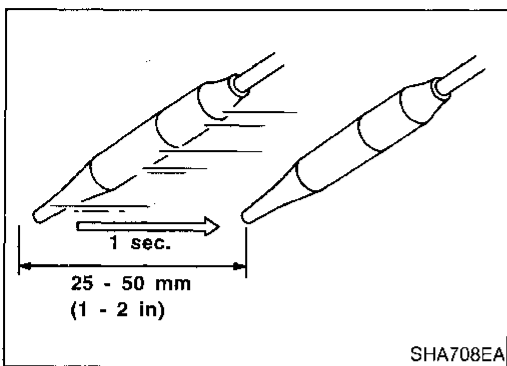
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and cleaners, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean. Do not allow the sensor tip of the detector to come into contact with any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



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



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



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

GI

MA

EM

LC

EC

Checking Procedure

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

NAHAD102S03

FE

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, evacuate and recharge the system with the specified amount of refrigerant.

CL

MT

AT

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).

TF

4. Conduct the leak test from the high side to the low side at points a through k. Refer to HA-164. 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.

PD

AX

- **Compressor**

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

SU

- **Liquid tank**

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

BR

- **Service valves**

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

ST

NOTE:

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

RS

- **Cooling unit (Evaporator)**

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

BT

HA

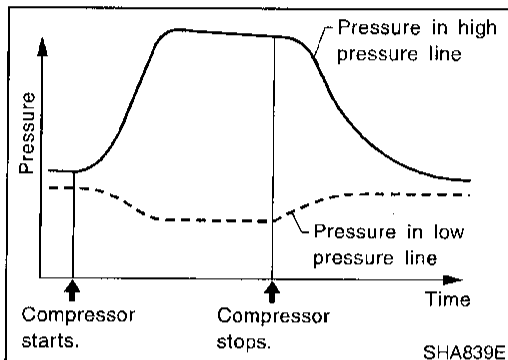
5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components.
7. Start engine.
8. Set the heater A/C control as follows:

SC

EL

IDX

- a. A/C switch ON
- b. Face mode
- c. Recirculation switch ON
- d. Max cold temperature
- e. 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 on the high pressure line. The pressure in the high pressure line will gradually drop after refrigerant circulation stops and pressure in the low pressure line will gradually rise, as shown in the graph. Leaks are more easily detected when pressure is high.

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

Belt

TENSION ADJUSTMENT

- Refer to MA section.

NAHA0103

Fast Idle Control Device (FICD)

INSPECTION

- Refer to EC section.

NAHA0104

SERVICE DATA AND SPECIFICATIONS (SDS)

Auto

Auto

COMPRESSOR

NAHA0055

Model	CALSONIC 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

NAHA0056

Model	CALSONIC make V-6	
Name	Nissan A/C System Oil Type S	
Part number	KLH00-PAGS0	
Capacity ml (US fl oz, Imp fl oz)	Total in system	200 (6.8, 7.0)
	Compressor (Service part) charging amount	200 (6.8, 7.0)

REFRIGERANT

NAHA0057

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.60 - 0.70 (1.32 - 1.54)

ENGINE IDLING SPEED (WHEN A/C IS ON)

NAHA0058

- Refer to EC section.

BELT TENSION

NAHA0059

- Refer to Checking Drive Belts (MA section).

Manual

COMPRESSOR

NAHA0105

Model	CALSONIC 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	

SERVICE DATA AND SPECIFICATIONS (SDS)

Manual (Cont'd)

LUBRICANT

NAHA0106

Model	CALSONIC make V-6	
Name	Nissan A/C System Oil Type S	
Part number	KLH00-PAGS0	
Capacity ml (US fl oz, Imp fl oz)	Total in system	200 (6.8, 7.0)
	Compressor (Service part) charging amount	200 (6.8, 7.0)

REFRIGERANT

NAHA0107

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.60 - 0.70 (1.32 - 1.54)

ENGINE IDLING SPEED (WHEN A/C IS ON)

NAHA0108

- Refer to EC section.

BELT TENSION

NAHA0109

- Refer to Checking Drive Belts (MA section).