HEATER & AIR CONDITIONER

SECTION HA

CONTENTS

MANUAL AND AUTO

When you read wiring diagrams:
- **Read GI section, "HOW TO READ WIRING DIAGRAMS".**
- **See EL section, "POWER SUPPLY ROUTING" for power distribution circuit.**

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

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

The Supplemental Restraint System such as "AIR BAG" and "SEAT BELT PRE-TENSIONER" used along with a seat belt, helps to reduce the risk or severity of injury to the driver and front passenger in a frontal collision. The SRS system composition which is available to NISSAN MODEL Y61 is as follows (The composition varies according to the destination.):
Driver air bag module (located in the center of the steering wheel), front passenger air bag module (located on the instrument panel on passenger side), seat belt pre-tensioner, 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. For removal of Spiral Cable and Air Bag Module, see the RS section.**
- **Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. Spiral cable and wiring harnesses covered with yellow insulation either just before the harness connectors or for the complete harness are related to the SRS.**

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

WARNING:

- **CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. These refrigerants must never be mixed, even in the smallest amounts. If the refrigerants are mixed, compressor failure is likely to occur.**
- **Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.**
- **The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:**
  - **a: When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.**
  - **b: When installing refrigerant components to a vehicle, do not remove the caps (unseal) until just before connecting the components. Connect all refrigerant loop components as quickly as possible to minimize the entry of moisture into system.**
  - **c: Only use the specified lubricant from a sealed container. Immediately reseal containers of lubricant. Without proper sealing, lubricant will become moisture saturated and should not be used.**
  - **d: Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Use only approved recovery/recycling equipment to discharge HFC-134a (R-134a) refrigerant. 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

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.**
- **Do not heat a refrigerant container with an open flame; if container warming is required, place the bottom of the container in a warm pail of water.**
- **Do not intentionally drop, puncture, or incinerate refrigerant containers.**
- **Keep refrigerant away from open flames: poisonous gas will be produced if refrigerant burns.**
- **Refrigerant will displace oxygen, therefore be certain to work in well ventilated areas to prevent suffocation.**
- **Do not introduce compressed air to any refrigerant container or refrigerant component.**

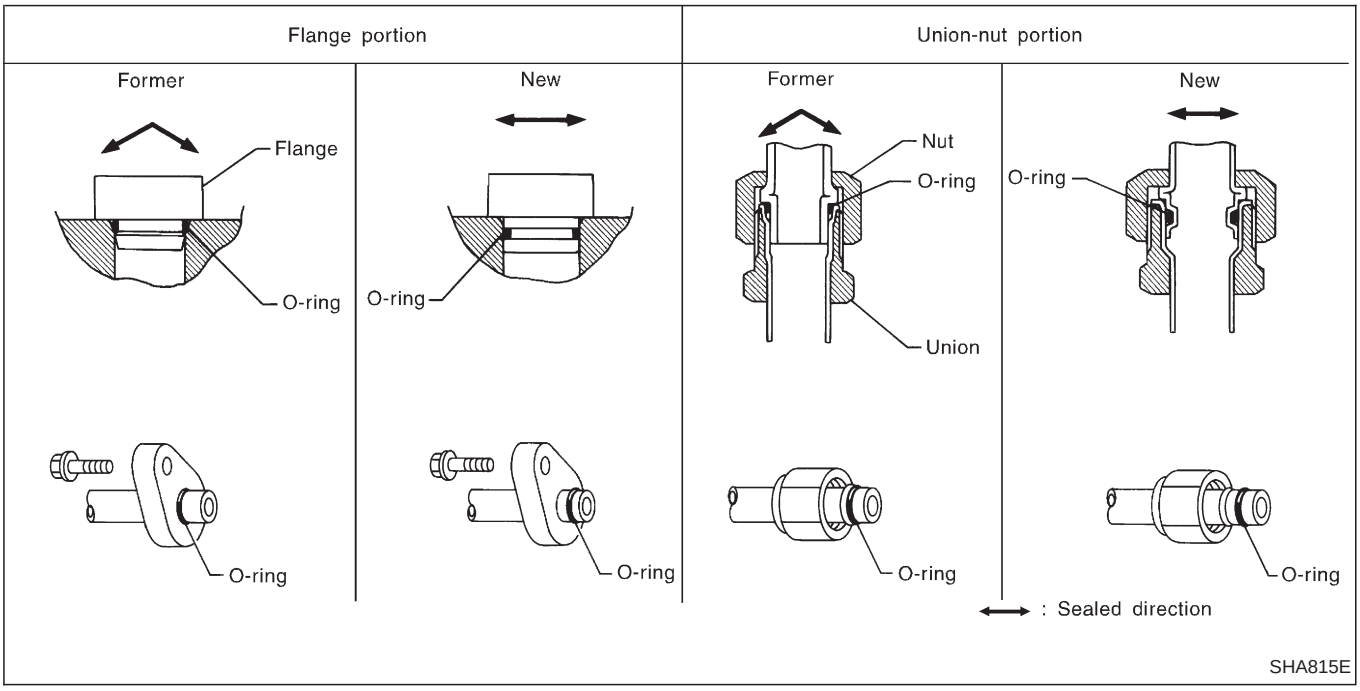
Precautions for Refrigerant Connection

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

- Expansion valve to cooling unit
- A part of high-pressure line

FEATURES OF NEW TYPE REFRIGERANT CONNECTION

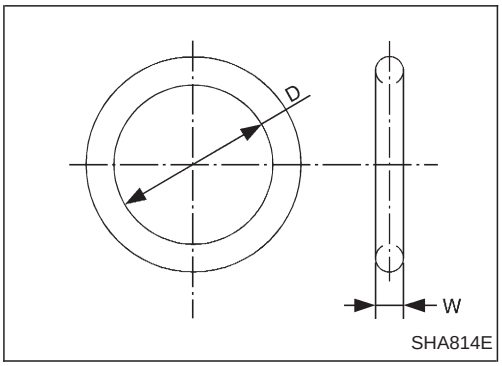
- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part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



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.

Precautions for Refrigerant Connection (Cont'd)



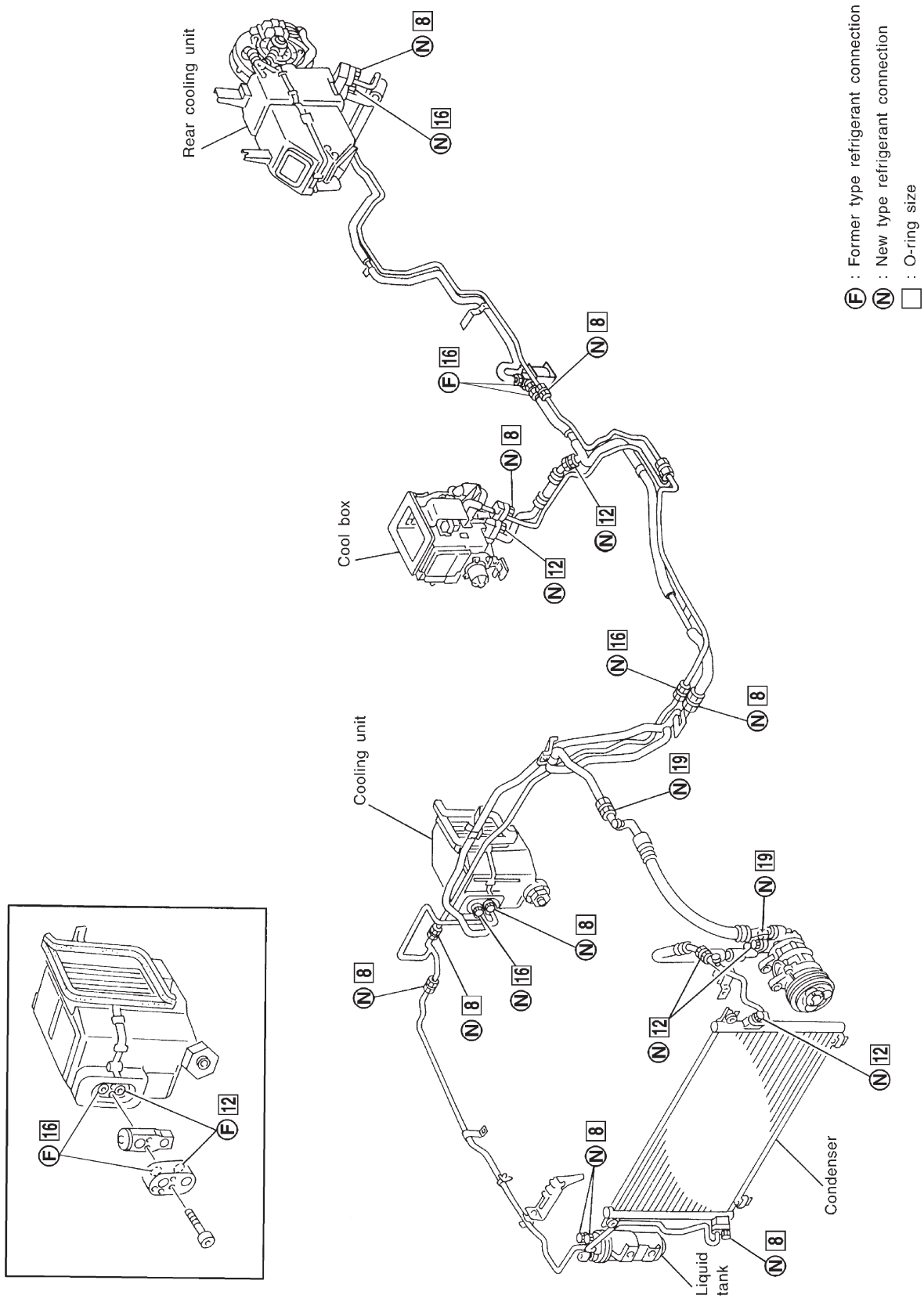
O-ring part numbers and specifications

Connection type	O-ring size	Part number	D mm (in)	W mm (in)
New	8	92471 N8210	6.8 (0.268)	1.85 (0.0728)
Former		92470 N8200	6.07 (0.2390)	1.78 (0.0701)
New	12	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 (0.091)
New	19	92474 N8210	16.5 (0.650)	2.43 (0.0957)
Former		92477 N8200	17.12 (0.6740)	1.78 (0.0701)

Precautions for Refrigerant Connection (Cont'd)

O-RING AND REFRIGERANT CONNECTION

LHD models



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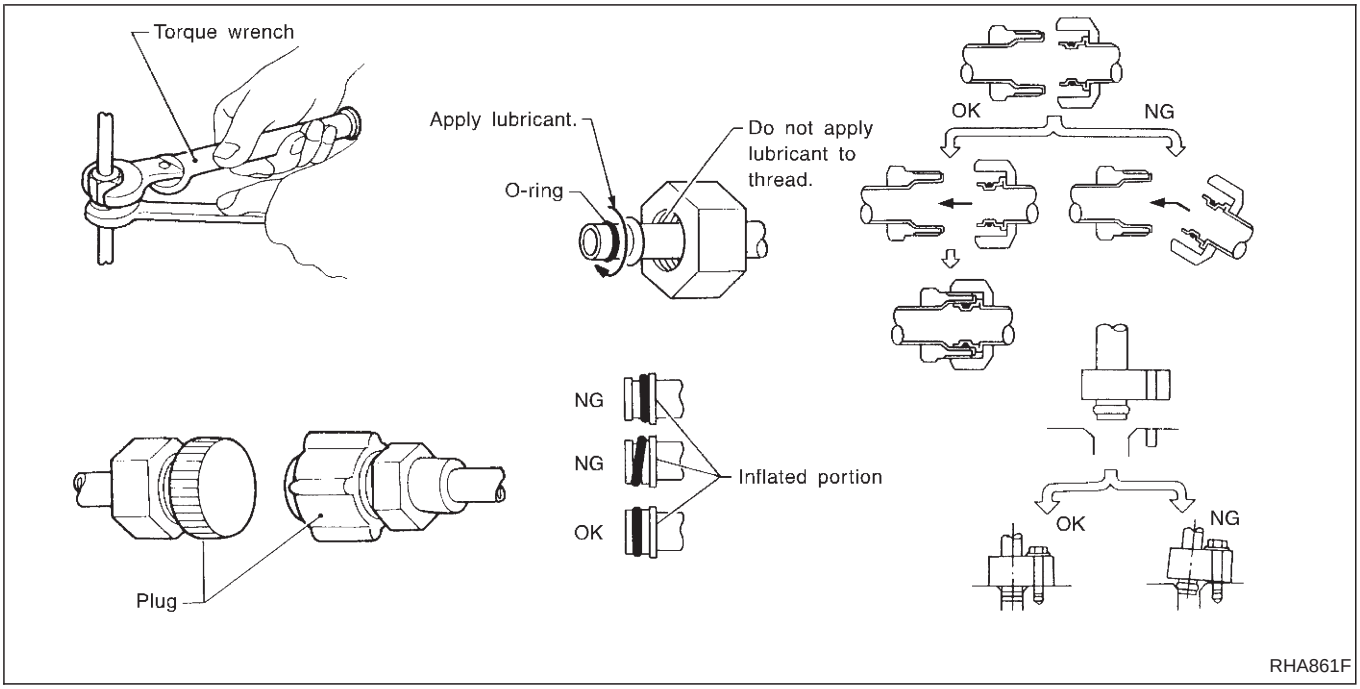
Precautions for Refrigerant Connection (Cont'd)

WARNING:
Make sure all refrigerant is discharged into the recycling equipment and the pressure in the system is less than atmospheric pressure. Then gradually loosen the discharge side hose fitting and remove it.
CAUTION:
When replacing or cleaning refrigerant cycle components, observe the following.

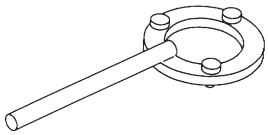
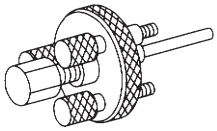
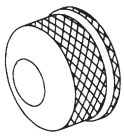
- **When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.**
- **When connecting tubes, always use a torque wrench and a back-up wrench.**
- **After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.**
- **When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before 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 portions 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 inflated portion of tube.**
- **After inserting tube into union until O-ring is no longer visible, tighten nut to specified torque.**
- **After connecting line, conduct leak test and make sure that there is no leakage from connections. When the gas leaking point is found, disconnect that line and replace the O-ring. Then tighten connections of seal seat to the specified torque.**



Precautions for Servicing Compressor

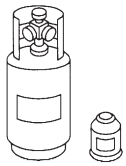
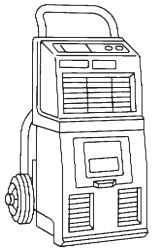
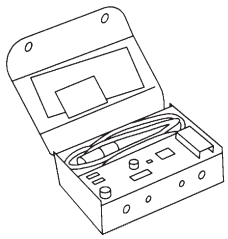
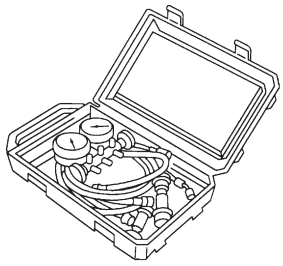
- **Plug all openings to prevent moisture and foreign matter from entering.**
- **When the compressor is removed, store it in the same position as it is when mounted on the car.**
- **When replacing or repairing compressor, follow "Maintenance of Lubricant Quantity in Compressor" exactly. Refer to HA-114.**
- **Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.**
- **After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.**
- **After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.**

Special Service Tools

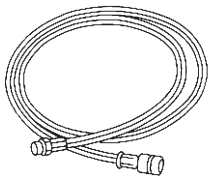
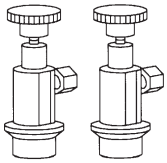
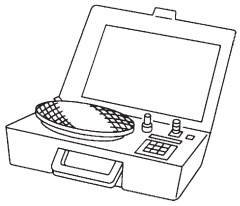
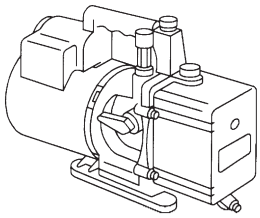
Tool number Tool name	Description	
KV99231260 Clutch disc wrench	 NT204	Removing shaft nut and clutch disc
KV992T0001 Clutch disc puller	 NT206	Removing clutch disc
KV992T0002 Pulley installer	 NT207	Installing pulley

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

Never mix HFC-134a refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.
Separate and non-interchangeable service equipment must be used for each type of refrigerant/lubricant.
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor failure will result.

Tool name	Description	Note
HFC-134a (R-134a) refrigerant	 NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● large container 1/2″-16 ACME
Nissan A/C System Oil Type S	 NT197	Type: Poly alkylene glycol oil (PAG), type S Application: HFC-134a (R-134a) swash plate (piston) compressors (Nissan only) Lubricity: 40 mℓ (1.4 Imp fl oz)
Recovery/Recycling/ Recharging equipment	 NT195	Function: Refrigerant Recovery and Recycling and Recharging
Electrical leak detector	 NT198	Power supply: ● DC 12V (Cigarette lighter)
Manifold gauge set (with hoses and couplers)	 NT199	Identification: ● The gauge face indicates R-134a. Fitting size: Thread size ● 1/2″-16 ACME

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

Tool name	Description	Note
Service hoses ● High side hose ● Low side hose ● Utility hose	 NT201	Hose color: ● Low hose: Blue with black stripe ● High hose: Red with black stripe ● Utility hose: Yellow with black stripe or green with black stripe Hose fitting to gauge: ● 1/2″-16 ACME
Service couplers ● High side coupler ● Low side coupler	 NT202	Hose fitting to service hose: ● M14 x 1.5 fitting is optional or permanently attached.
Refrigerant weight scale	 NT200	For measuring of refrigerant Fitting size: Thread size ● 1/2″-16 ACME
Vacuum pump (Including the isolator valve)	 NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2″-16 ACME

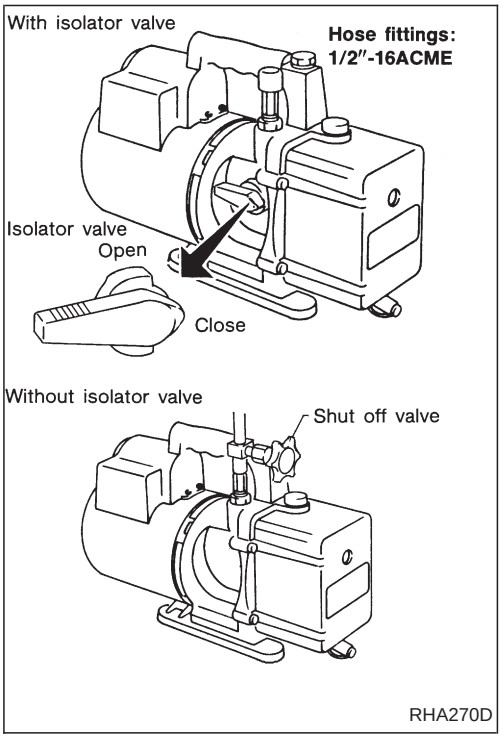
Precautions for Service Equipment

RECOVERY/RECYCLING EQUIPMENT

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

ELECTRONIC LEAK DETECTOR

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



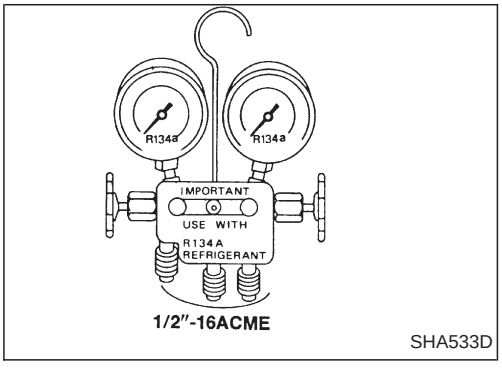
VACUUM PUMP

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

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

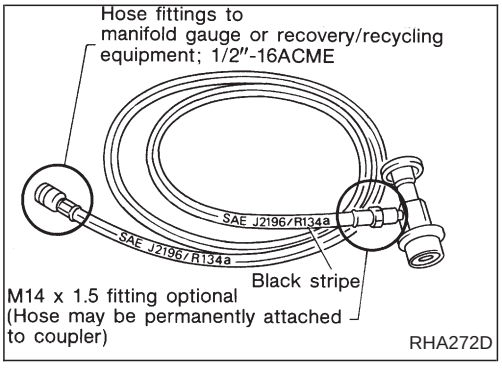
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has 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

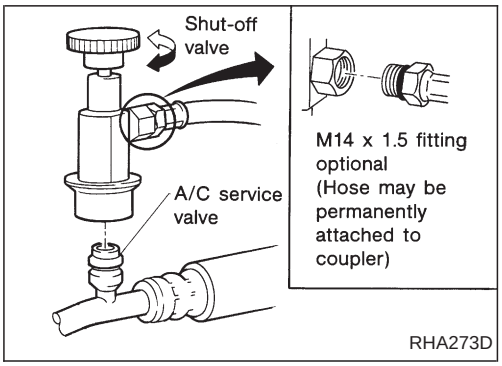
Be certain that the gauge face indicates R-134a or 134a. Make sure the gauge set has 1/2″-16 ACME threaded connections for service hoses. Confirm the set has been used only with refrigerant HFC-134a (R-134a) along with specified lubricant.



SERVICE HOSES

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

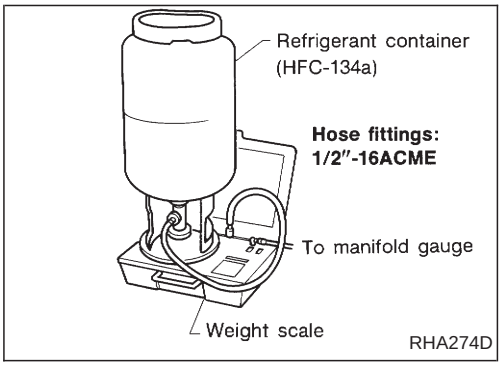
Precautions for Service Equipment (Cont'd)



SERVICE COUPLERS

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

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



REFRIGERANT WEIGHT SCALE

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

CHARGING CYLINDER

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

Refrigeration Cycle

REFRIGERANT FLOW

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

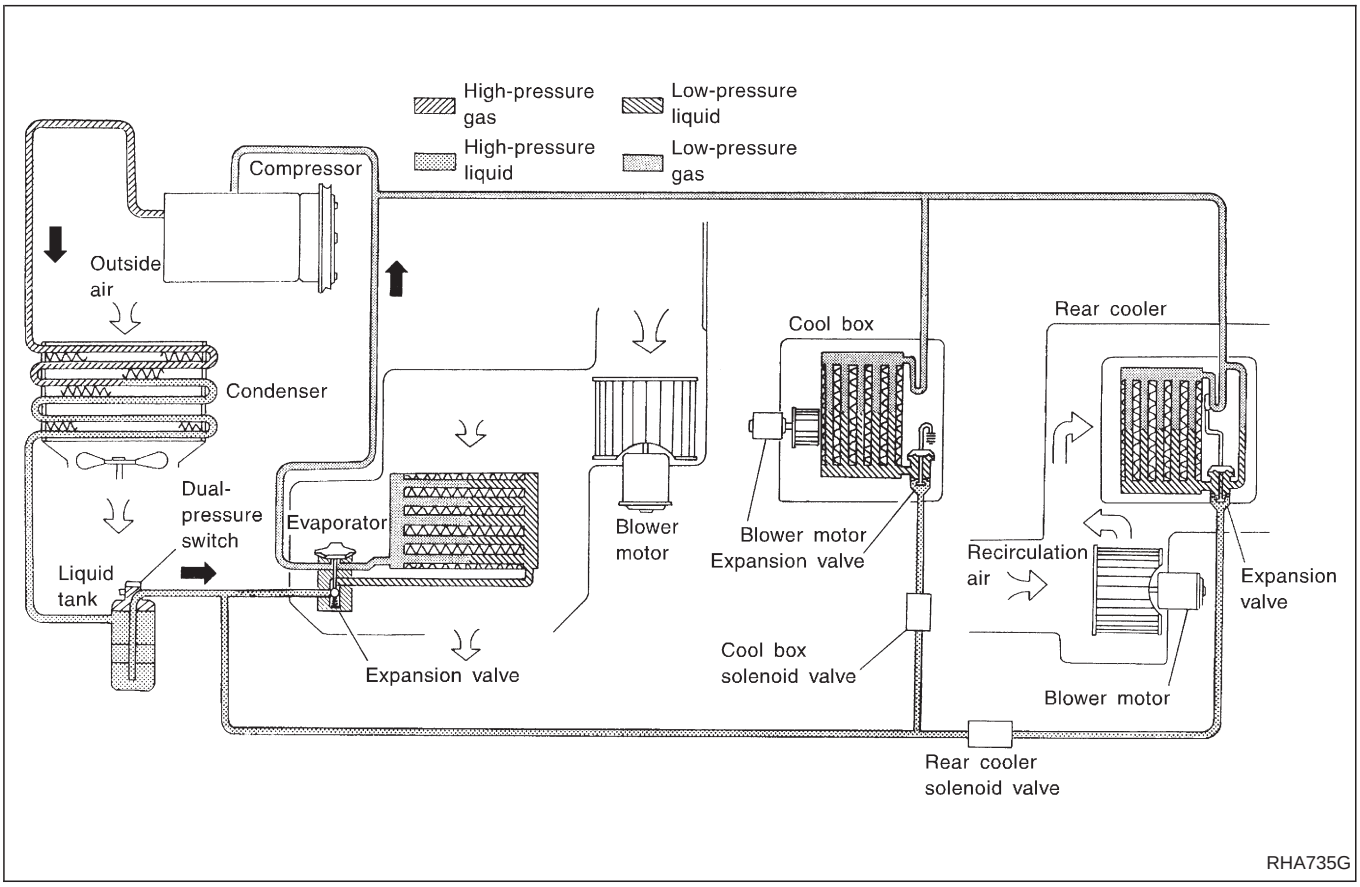
FREEZE PROTECTION

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

REFRIGERANT SYSTEM PROTECTION

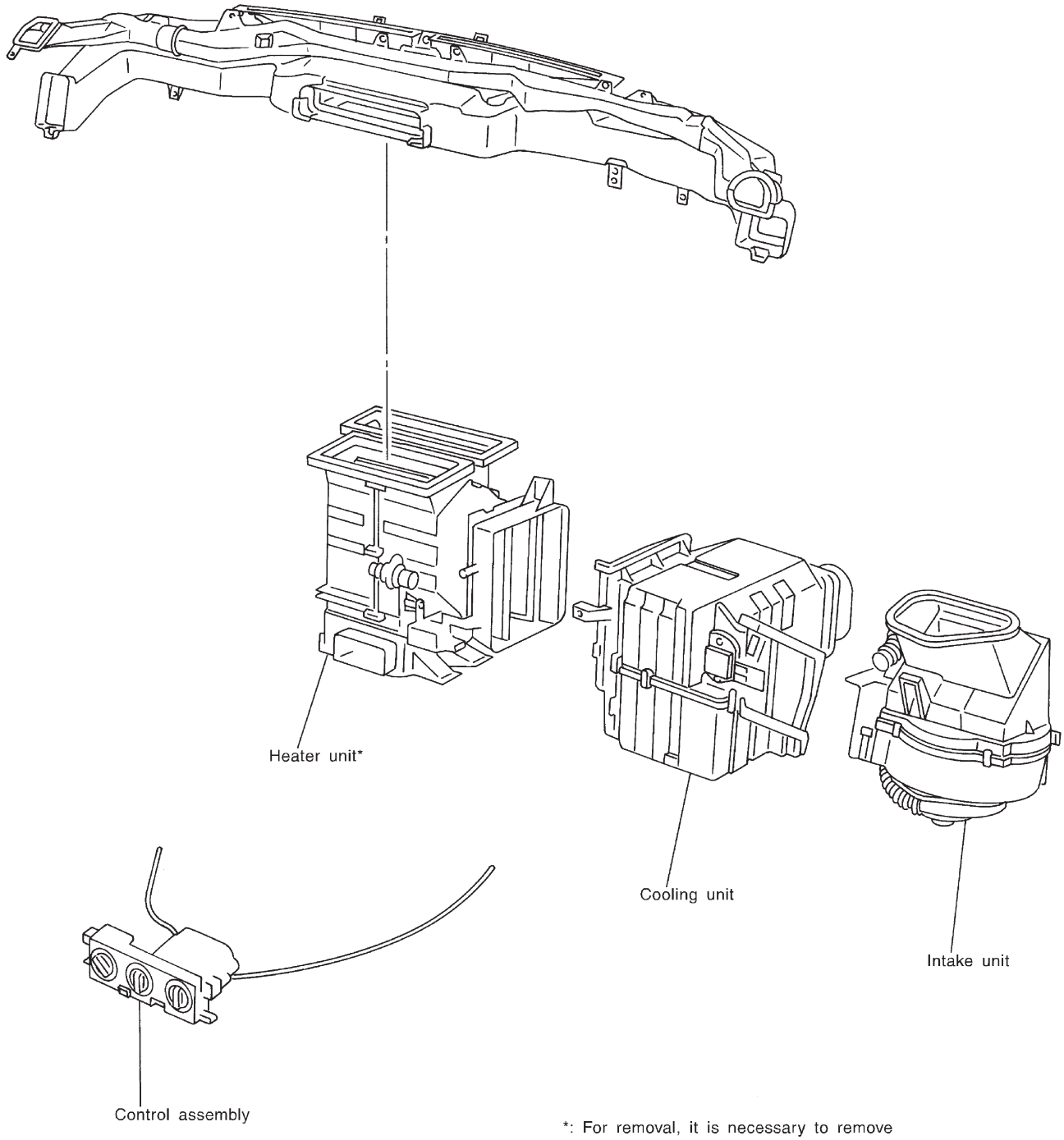
Dual-pressure switch

The dual-pressure switch is located on the liquid tank. If the system pressure rises or falls out of specifications, the switch opens to interrupt compressor clutch operation.



Component Layout

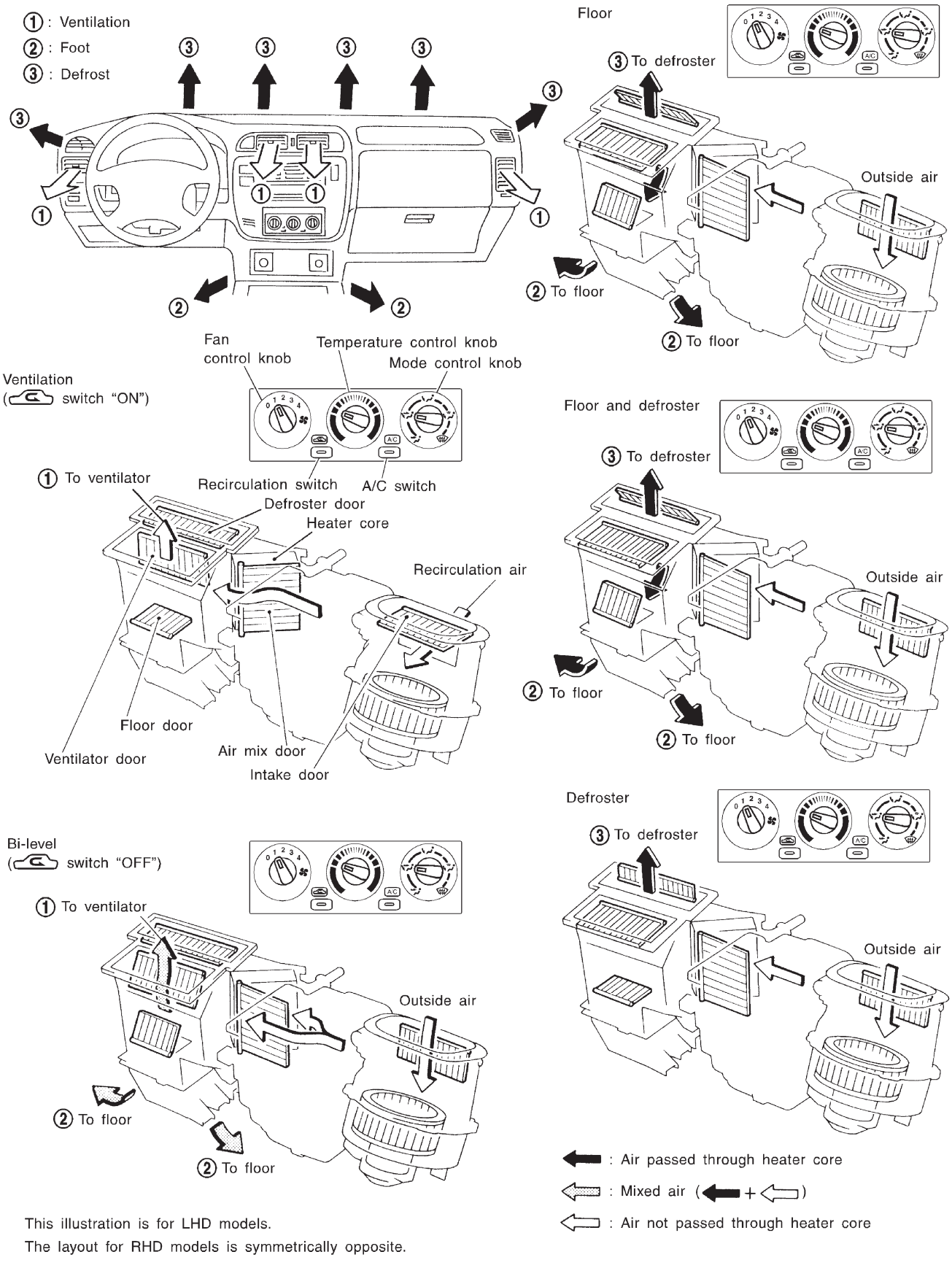
SEC. 270•271•272•273



*: For removal, it is necessary to remove instrument assembly.
This illustration is for LHD models.
The layout for RHD models is symmetrically opposite.

RHA699G

Discharge Air Flow

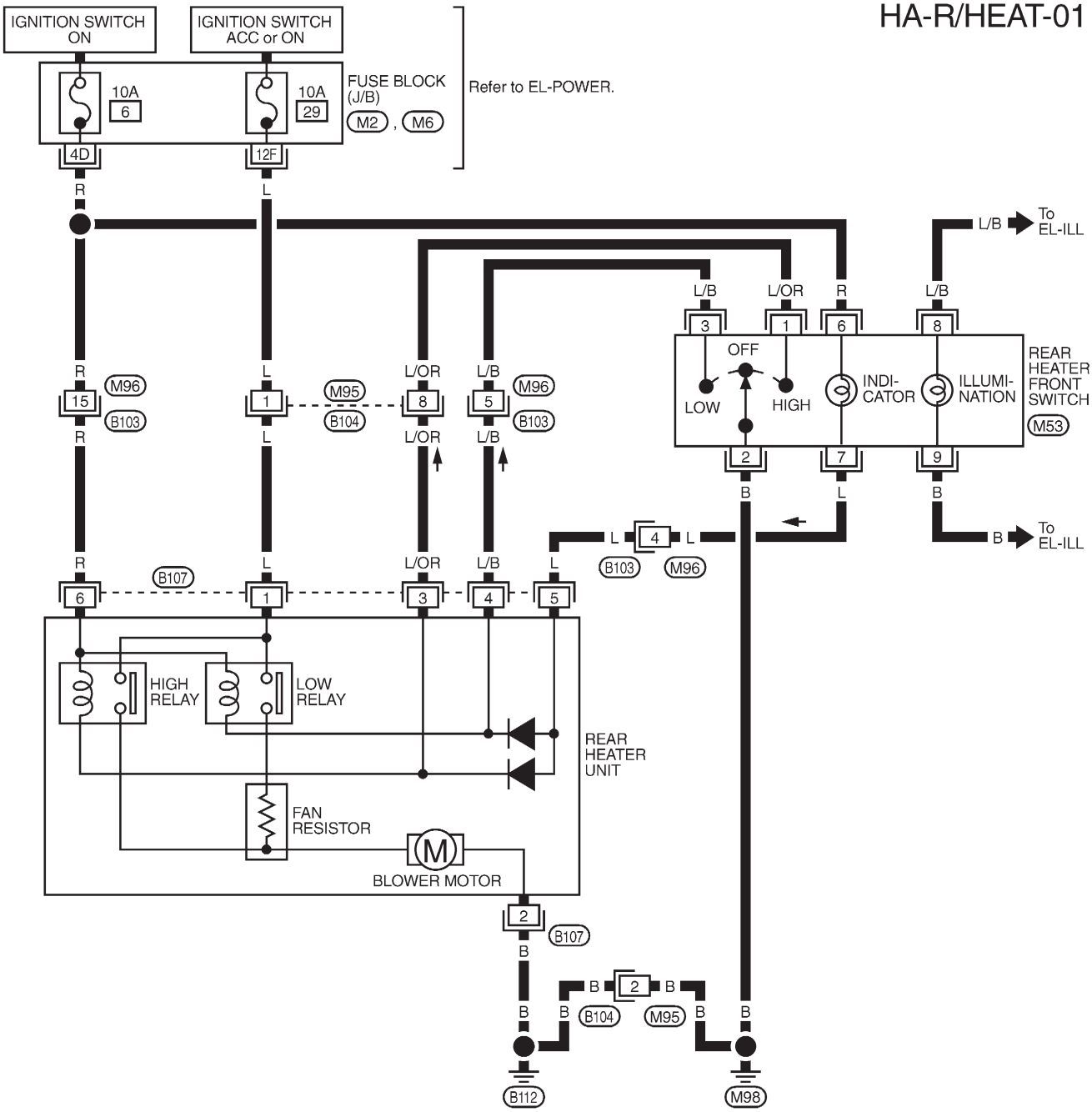


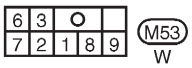
This illustration is for LHD models.
The layout for RHD models is symmetrically opposite.

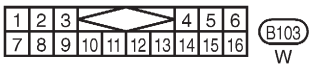
RHA700G

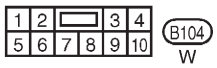
Wiring Diagram — R/HEAT —/LHD Models

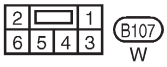
HA-R/HEAT-01











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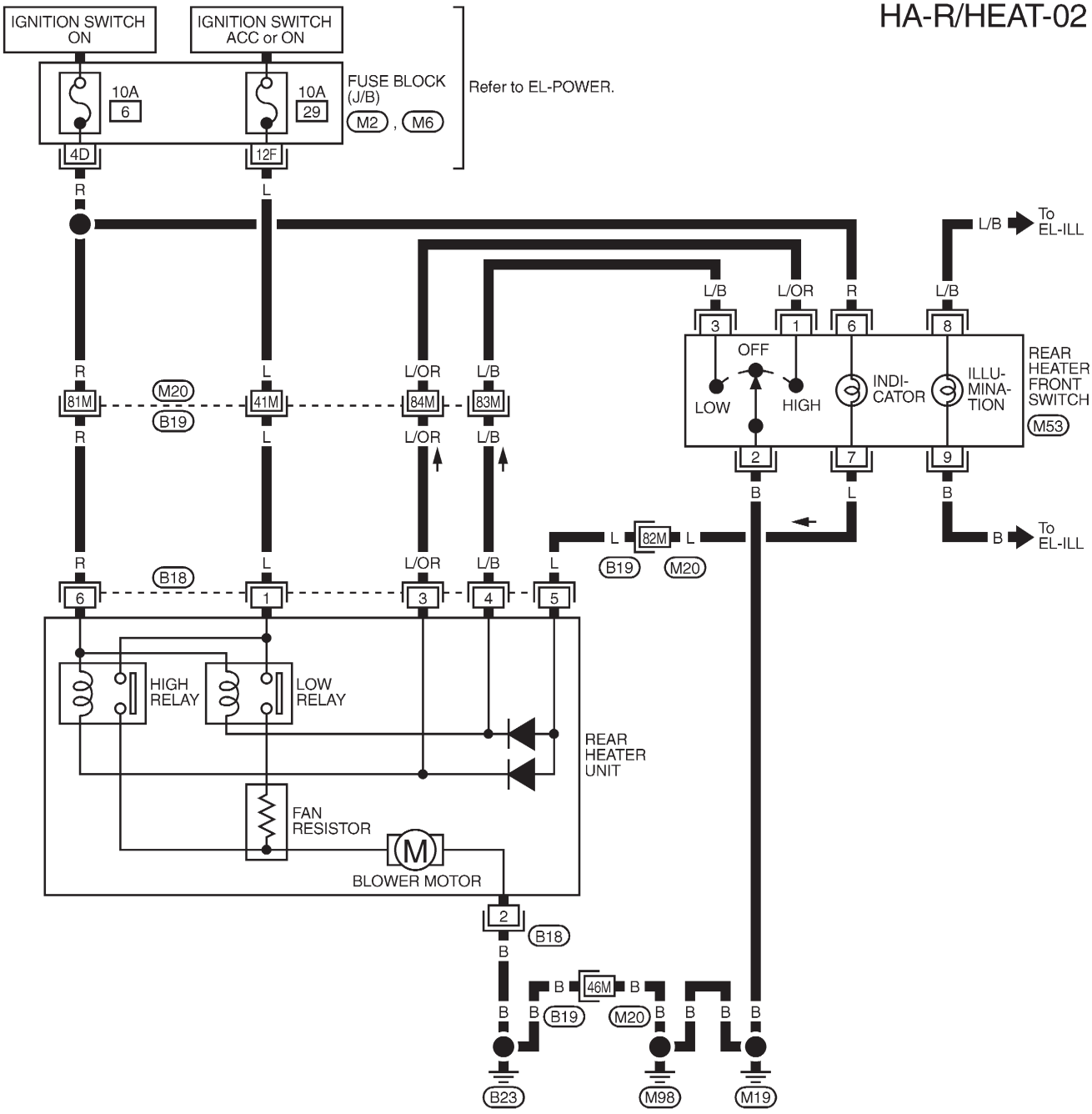
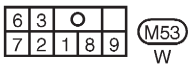
M6

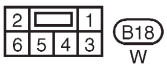
THA165

Wiring Diagram — R/HEAT —/RHD Models

HA-R/HEAT-02







Refer to last page (Foldout page).
M20 , B19
M2
M6

THA166

System Description

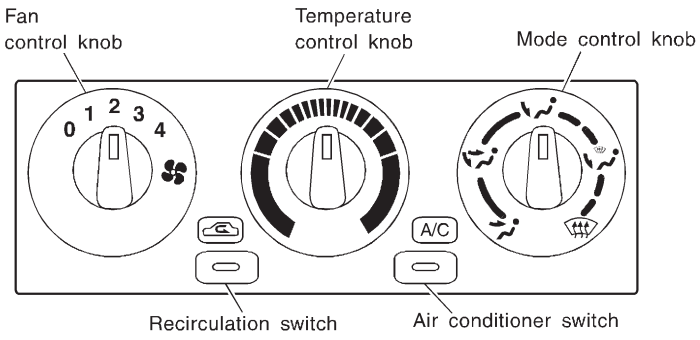
SWITCH AND THEIR CONTROL FUNCTIONS

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

*: Compressor is operated by dual-pressure switch.

Control Operation

For LHD models with manual A/C



RHA582G

FAN CONTROL KNOB

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

MODE CONTROL KNOB

This knob controls the outlet air flow.

TEMPERATURE CONTROL KNOB

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

RECIRCULATION (REC) SWITCH

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

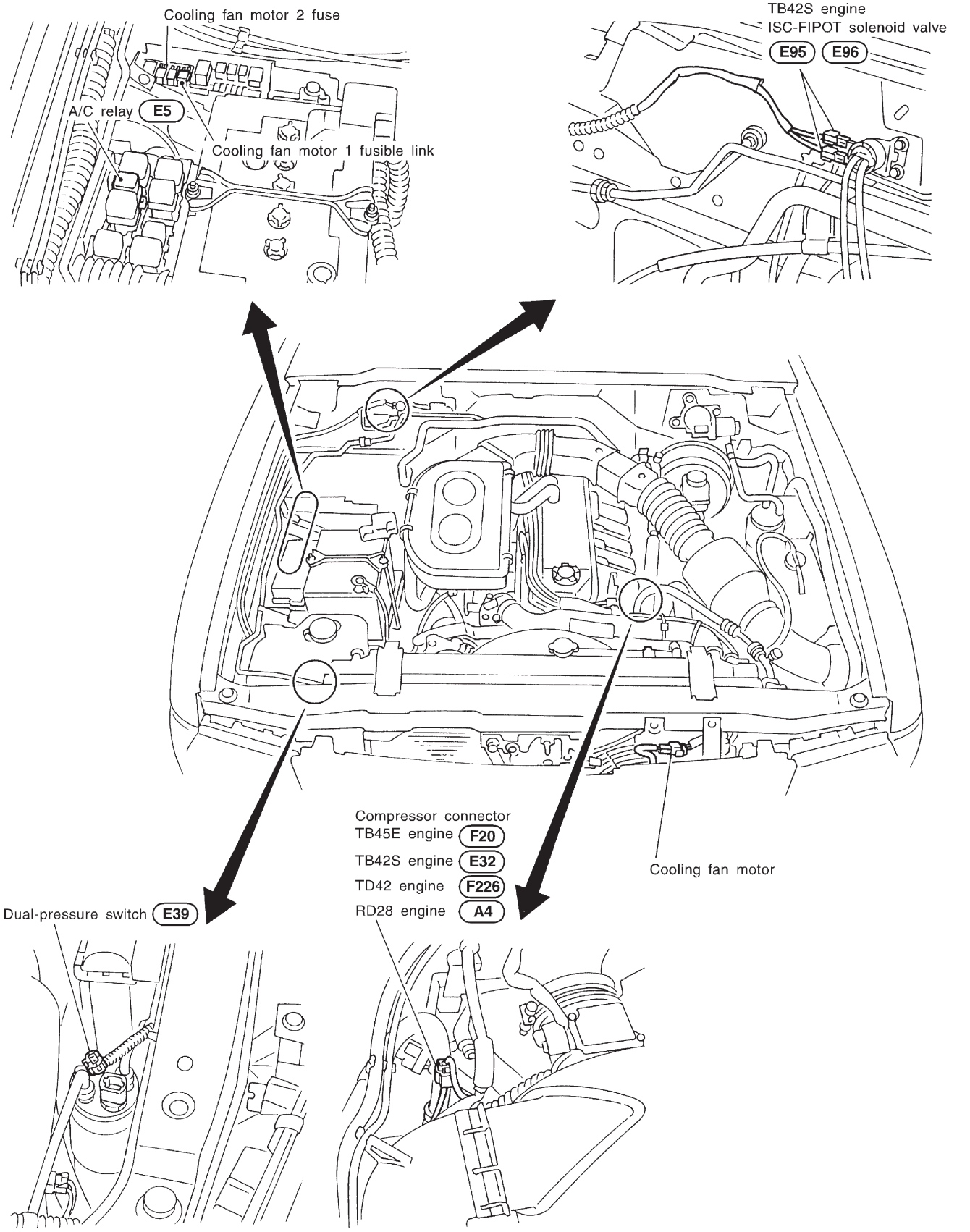
AIR CONDITIONER SWITCH

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

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

Component Location

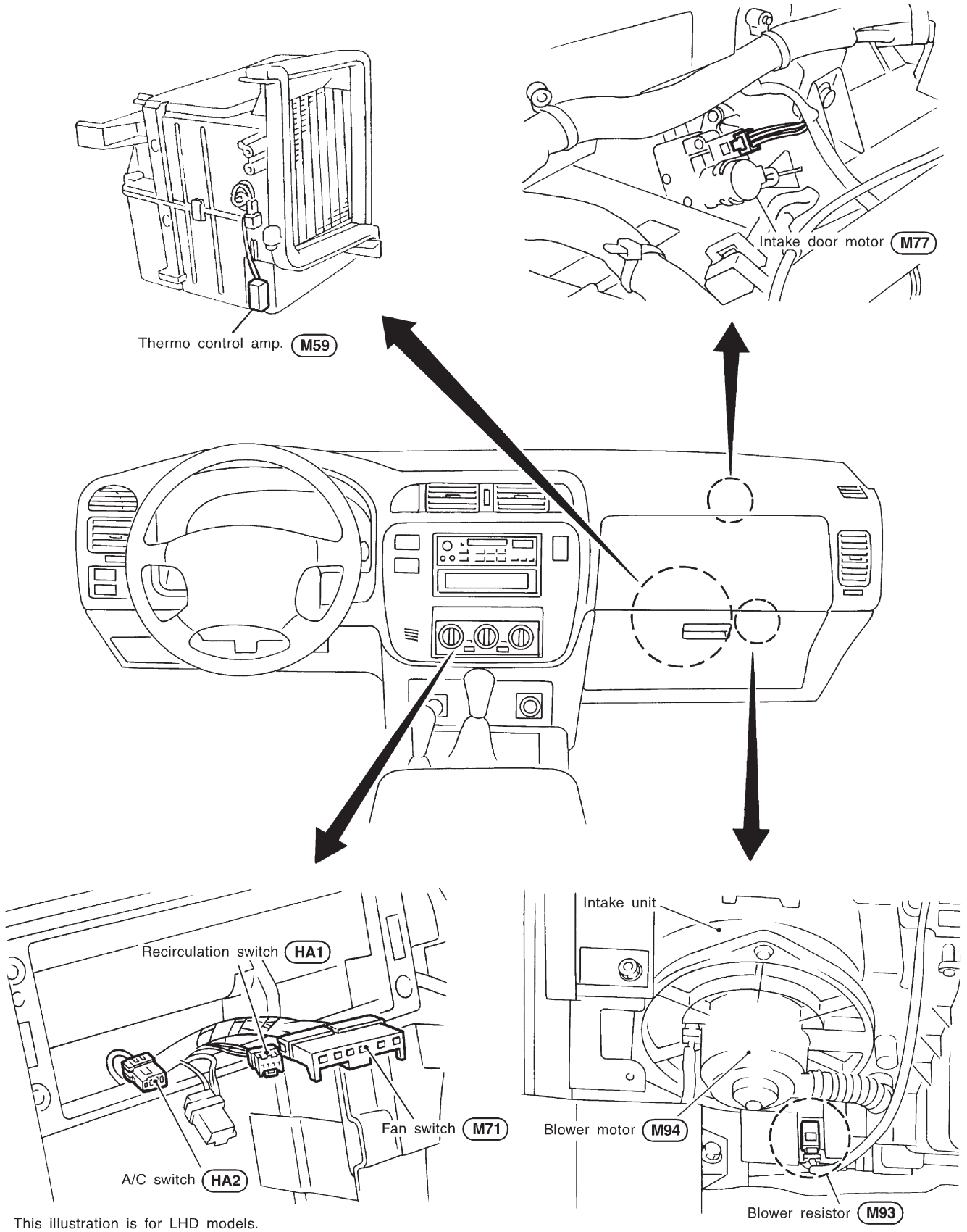
ENGINE COMPARTMENT



RHA641G

Component Location (Cont'd)

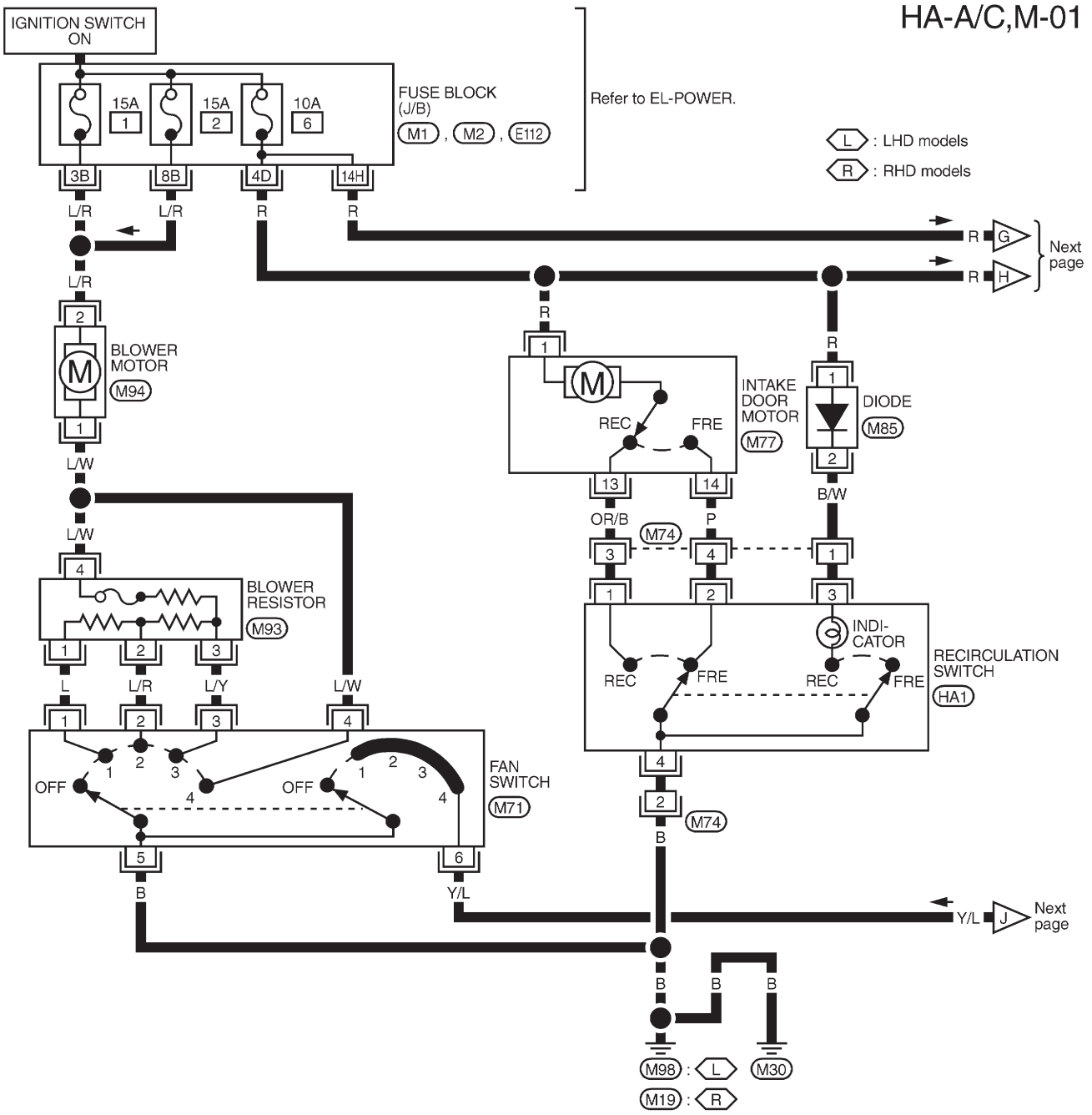
PASSENGER COMPARTMENT

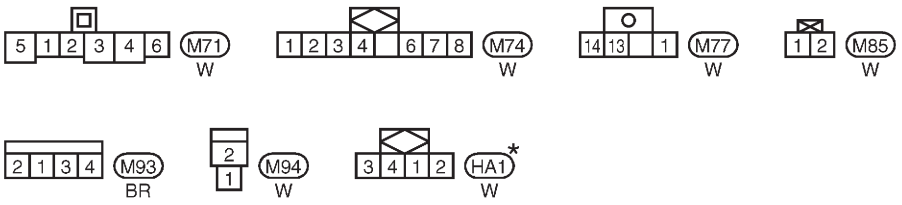


This illustration is for LHD models.
The layout for RHD models is symmetrically opposite.

SHA063F

Wiring Diagram — A/C, M —



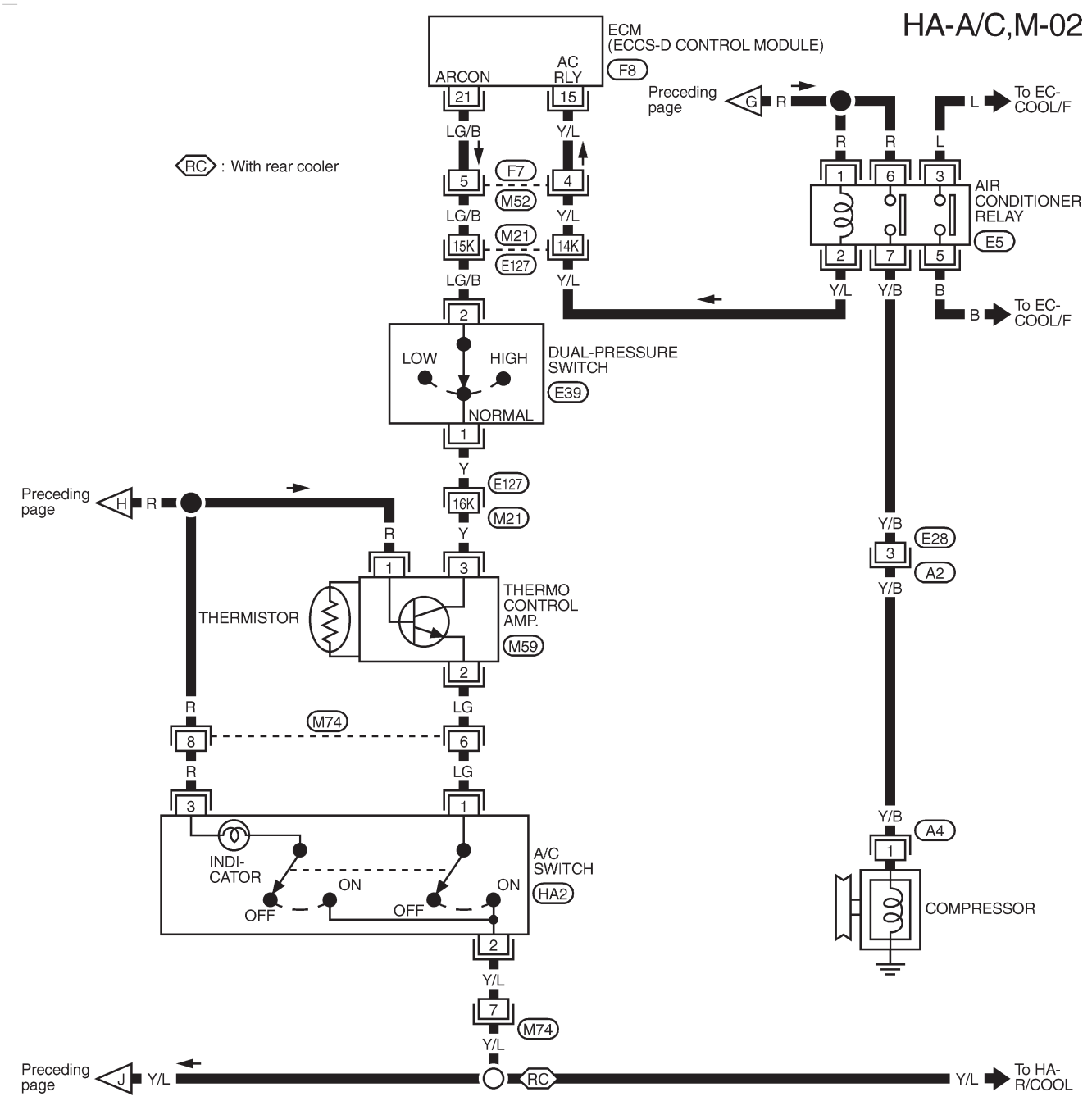


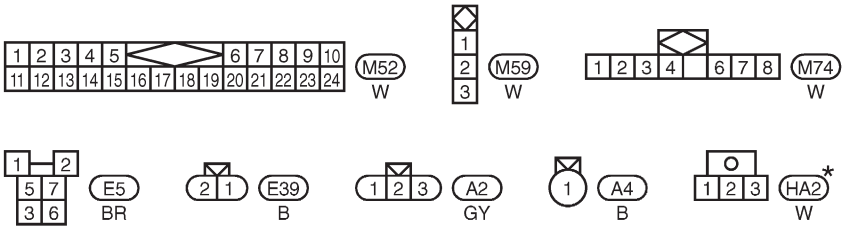
*: This connector is not shown in "HARNESS LAYOUT", EL section.

Refer to last page (Foldout page).
M1
M2
E112

YHA157

Wiring Diagram — A/C, M — (Cont'd)





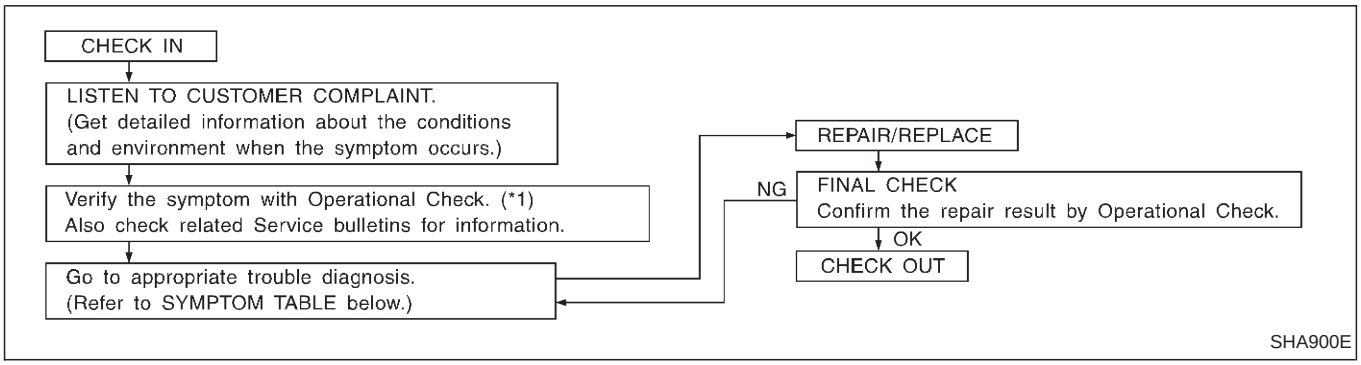
∗: This connector is not shown in "HARNESS LAYOUT", EL section.

Refer to last page (Foldout page).
M21 , E127
F8

YHA158

How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



*1: HA-22

SYMPTOM TABLE

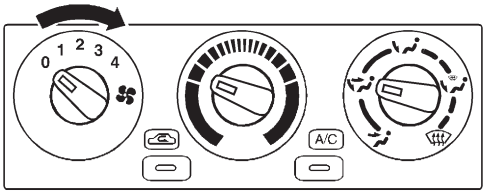
Symptom	Reference page	
● Intake door does not change.	● Go to Trouble Diagnosis Procedure for Intake Door Motor Circuit.	HA-24
● Blower motor does not rotate at all.	● Go to Trouble Diagnosis Procedure for Blower Motor Circuit.	HA-28
● Insufficient cooling.	● Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HA-32
● Insufficient heating.	● Go to Trouble Diagnosis Procedure for Insufficient Heating.	HA-32
● Air outlet does not change.	● Go to Trouble Diagnosis Procedure for Air Outlet.	HA-41
● Magnet clutch does not engage when A/C switch and fan switch are ON.	● Go to Trouble Diagnosis Procedure for Magnet Clutch Circuit.	HA-43
● Noise	● Go to Trouble Diagnosis Procedure for Noise.	HA-48

Operational Check

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

CONDITIONS

Engine running at normal operating temperature.

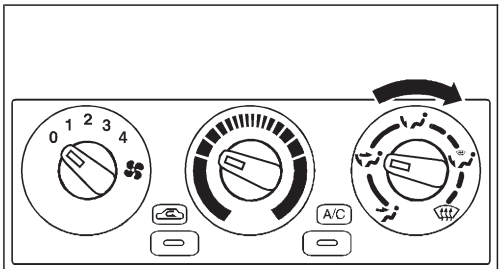


RHA583G

PROCEDURE

1. Check blower

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



RHA584G

2. Check discharge air

a. Turn mode control knob.

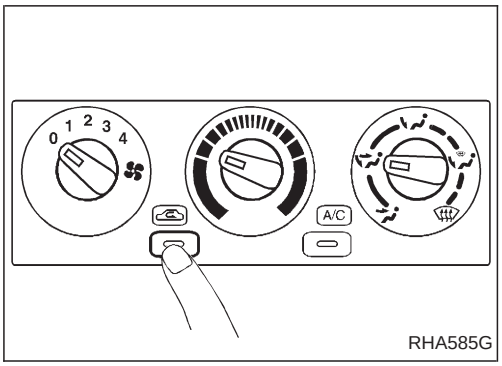
Discharge air flow

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

RHA654F

b. Confirm that discharge air comes out according to the air distribution table at left.
   Refer to ‘‘Discharge Air Flow’’ in ‘‘DESCRIPTION’’ (HA-13).

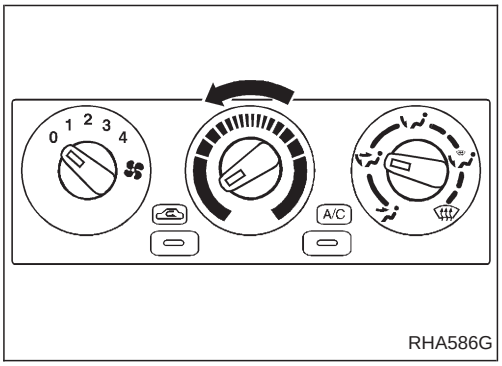
Operational Check (Cont'd)



RHA585G

3. Check recirculation

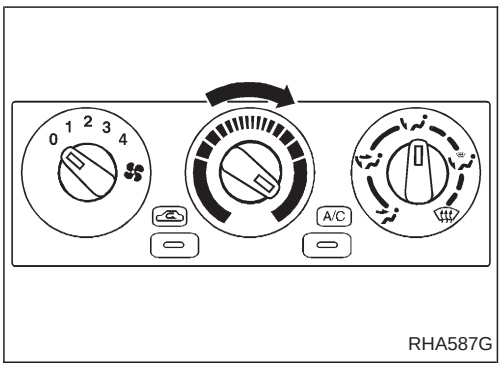
a. Press recirculation switch.
   Recirculation indicator should light.
b. Listen for intake door position change (you should hear blower sound change slightly).



RHA586G

4. Check temperature decrease

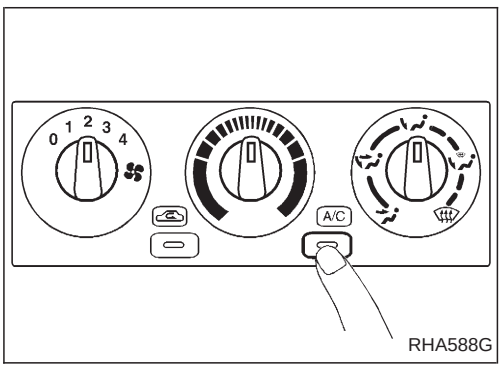
a. Turn temperature control knob to full cold.
b. Check for cold air at discharge air outlets.



RHA587G

5. Check temperature increase

a. Turn temperature control knob to full hot.
b. Check for hot air at discharge air outlets.



RHA588G

6. Check air conditioner switch

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

Intake Door Motor

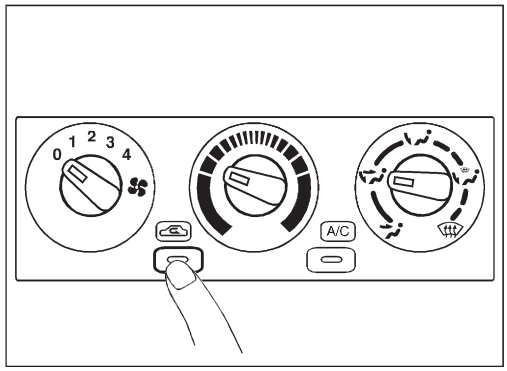
TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

SYMPTOM:

- **Intake door does not change.**

Inspection flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Recirculation

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

2. Check for any service bulletins.

3. Check intake door 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?

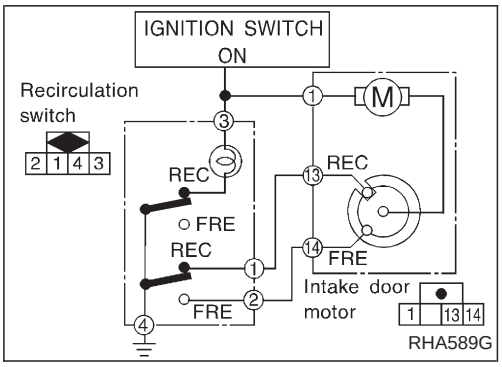
Yes → Go to Trouble Diagnosis for related symptom.

[Another symptom exists.]

RHA592G

*1: HA-26 *2: HA-22 *3: HA-21

Intake Door Motor (Cont'd)



SYSTEM DESCRIPTION

Intake door motor

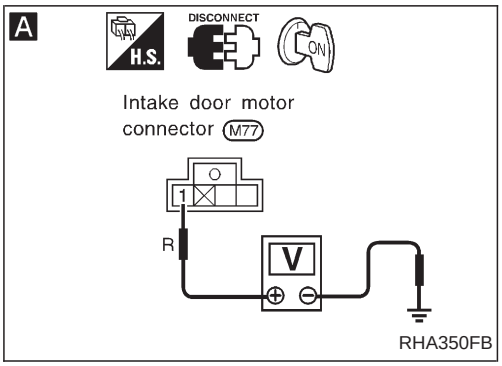
The intake door motor is installed on the intake unit. Using a link it opens and closes the intake door.
When RECIRCULATION switch is at REC, the ground line of the motor is switched from terminal ⑭ to ⑬. This starts the motor because the position switch contacts built into it make current flow.
When RECIRCULATION switch is at FRE, the ground line is switched from terminal ⑬ to ⑭. 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.

Intake Door Motor (Cont'd)

DIAGNOSTIC PROCEDURE

SYMPTOM: Intake door does not change.

A

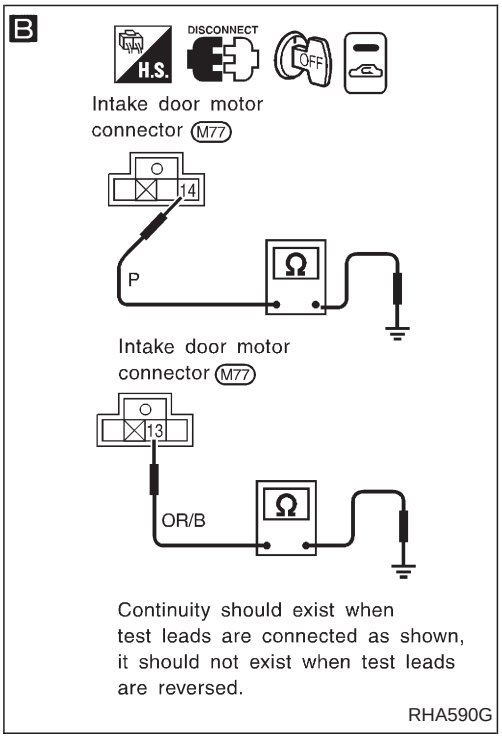


CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR.
Disconnect intake door motor harness connector.
Do approx. 12 volts exist between intake door motor harness terminal No. ① and body ground?

No → Check 10A (No. 6) fuse at fuse block.
(Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

Yes ↓

B



CHECK GROUND CIRCUIT FOR INTAKE DOOR MOTOR.
Check continuity between intake door motor harness terminal and body ground.

Terminal		Recirculation switch condition
Body ground	⑭	FRE
	⑬	REC

Continuity should exist.

NG → Disconnect recirculation switch harness connector.

C

Note
Check continuity between recirculation switch harness terminal No. ① (②) and intake door motor harness terminal No. ⑬ (⑭).
Continuity should exist.
If OK, check harness for short.

OK ↓

Ⓐ

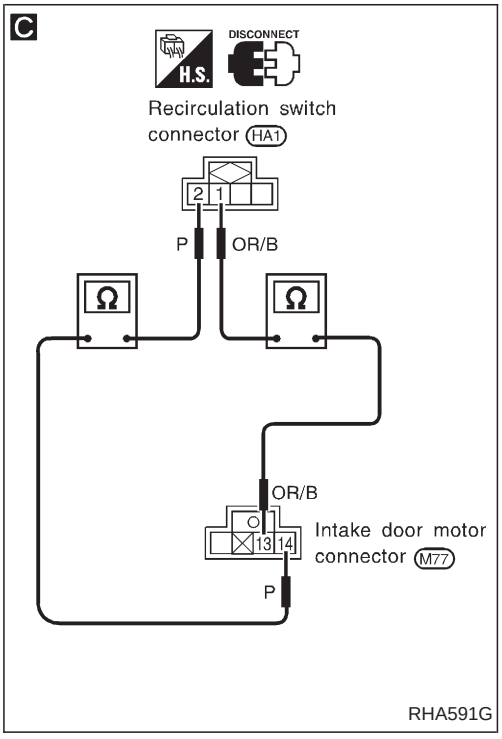
OK ↓

CHECK INTAKE DOOR LINKAGE.
Refer to Control Linkage Adjustment. (HA-27)

OK ↓

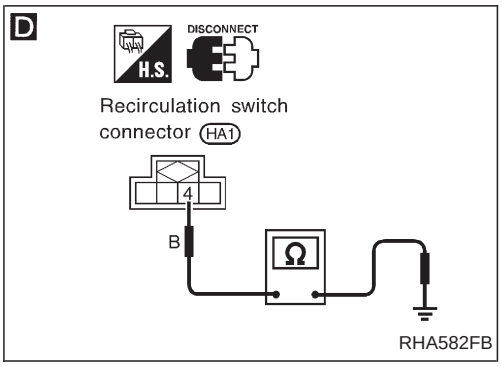
Replace intake door motor.

C



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

Intake Door Motor (Cont'd)



Ⓐ

D

Note

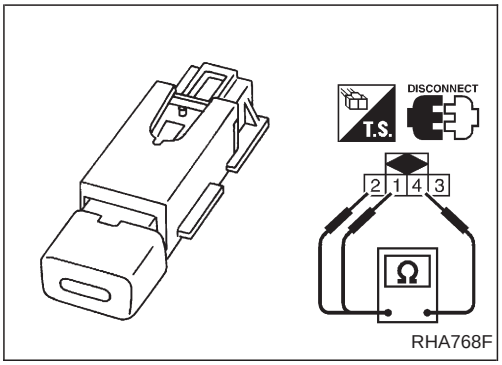
CHECK GROUND CIRCUIT FOR RECIRCULATION SWITCH.
Check circuit continuity between recirculation switch harness terminal No. ④ and body ground.
Continuity should exist.
If OK, check harness for short.

OK

CHECK RECIRCULATION SWITCH.
(Refer to Electrical Components Inspection.) (HA-27)

NG → Replace recirculation switch.

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

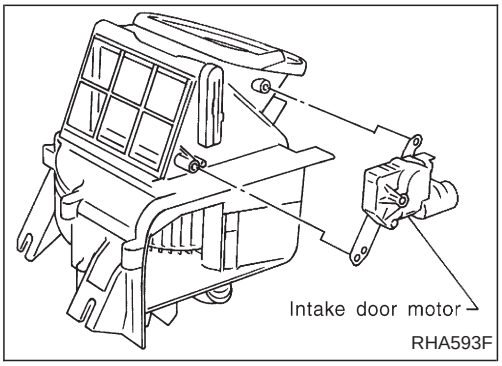


ELECTRICAL COMPONENTS INSPECTION

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



CONTROL LINKAGE ADJUSTMENT

Intake door motor

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

Blower Motor

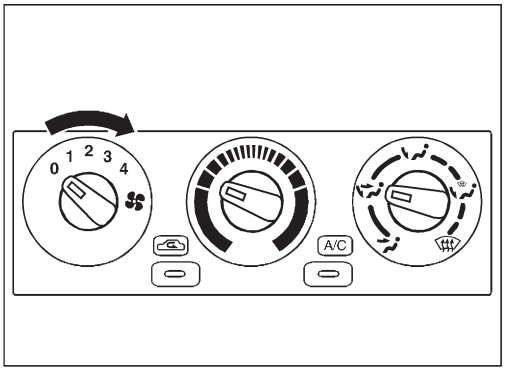
TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

SYMPTOM:

- **Blower motor does not rotate at all.**

Inspection flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Blower motor

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

2. Check for any service bulletins.

3. Check blower motor circuit. (*1)

OK

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

Yes → Go to Trouble Diagnosis for related symptom.

[Another symptom exists.]

RHA593G

*1: HA-31 *2: HA-22 *3: HA-21

Blower Motor (Cont'd)

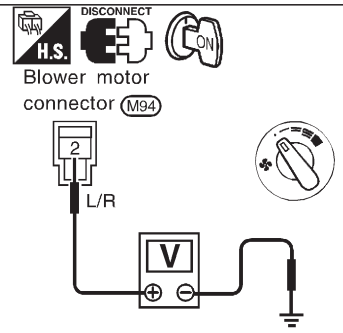
DIAGNOSTIC PROCEDURE

SYMPTOM: Blower motor does not rotate.

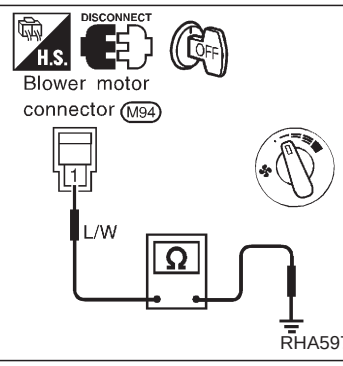
- **Perform PRELIMINARY CHECK 1 before referring to the following flow chart.**

	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

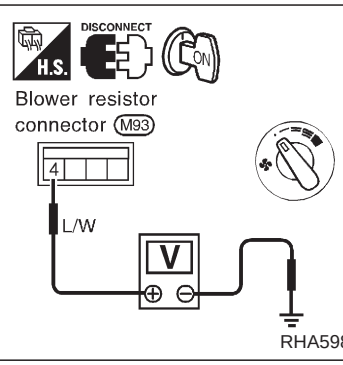
A



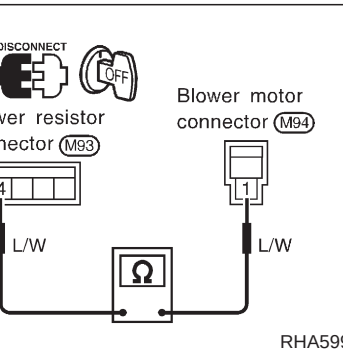
B



C



D



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

5 → Ⓔ
4 → Ⓓ
3 → Ⓒ
2 → Ⓑ

(Go to next page.)

1

A

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

No → Check 15A (No. 1 and No. 2) fuses at fuse block.
(Refer to "POWER SUPPLY ROUTING" in EL section and Wiring Diagram.)

Yes

B

1. Turn fan control knob to any position except OFF.
2. Check circuit continuity between blower motor harness terminal No. ① and body ground.
   Continuity should exist.

NG → Reconnect blower motor harness connector.

OK

CHECK BLOWER MOTOR.
(Refer to Electrical Components Inspection.) (HA-31)

NG

Replace blower motor.

C

CHECK BLOWER MOTOR CIRCUIT BETWEEN BLOWER MOTOR AND RESISTOR.
Do approx. 12 volts exist between resistor harness terminal No. ④ and body ground?

No → Disconnect blower motor and resistor harness connectors.

Yes

Disconnect fan switch harness connector.

D

Note

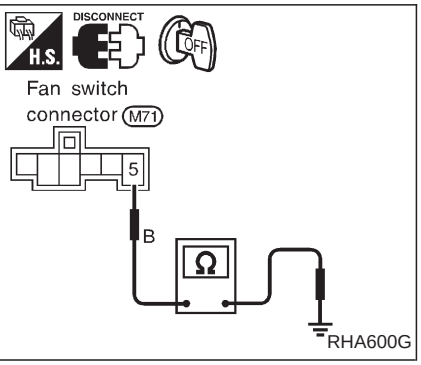
Check circuit continuity between blower motor harness terminal No. ① and resistor harness terminal No. ④ .
Continuity should exist.
If OK, check harness for short.

Ⓐ
(Go to next page.)

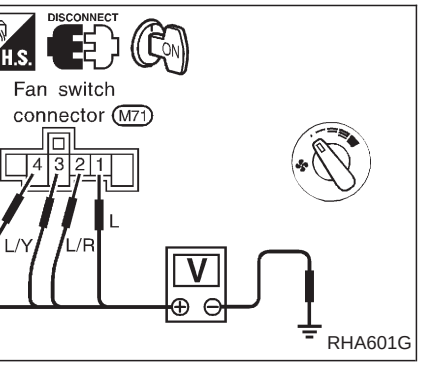
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Blower Motor (Cont'd)

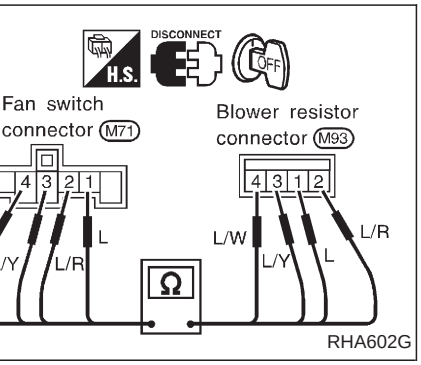
E



F



G



Ⓐ

E Note

CHECK GROUND CIRCUIT FOR FAN SWITCH.
Check circuit continuity between fan switch harness terminal No. ⑤ and body ground.

OK

CHECK RESISTOR AFTER DISCONNECTING IT.
(Refer to Electrical Components Inspection.) (HA-31)

2 → Ⓑ
3 → Ⓒ
4 → Ⓓ

OK

NG

Replace resistor.

Ⓔ

Reconnect resistor harness connector.

1 2 3 4 5

F

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

Flow chart No.	Terminal No. ⊕	Terminal No. ⊖	Voltage
2	①	Body ground	Approx. 12V
3	②		
4	③		
5	④		

Yes

No

G Note

Check circuit continuity between fan switch harness terminal and resistor harness terminal.

Terminal No. Fan switch	Terminal No. Resistor	Continuity
④	④	Yes
③	③	
②	②	
①	①	

If OK, check harness for short.

CHECK FAN SWITCH AFTER DISCONNECTING IT.
(Refer to Electrical Components Inspection.) (HA-31)

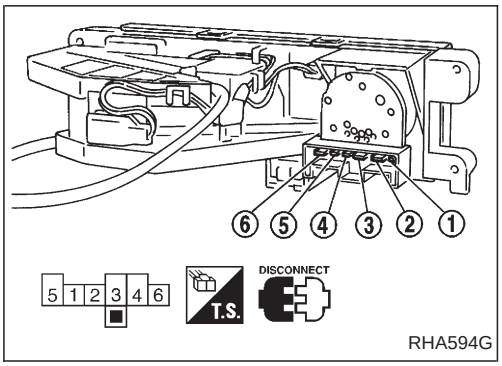
NG

Replace fan switch.

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

Blower Motor (Cont'd)

ELECTRICAL COMPONENTS INSPECTION



Fan switch

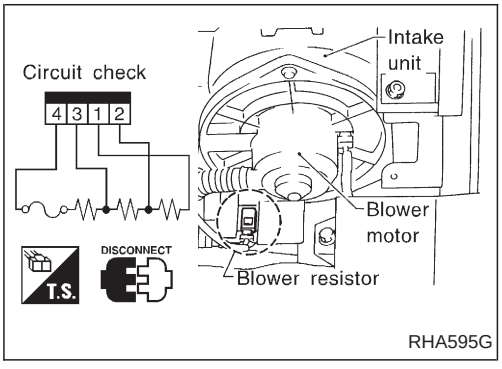
Check continuity between terminals at each switch position.

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

Blower motor

Confirm smooth rotation of the blower motor.

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



Blower resistor

Check resistance between terminals.

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

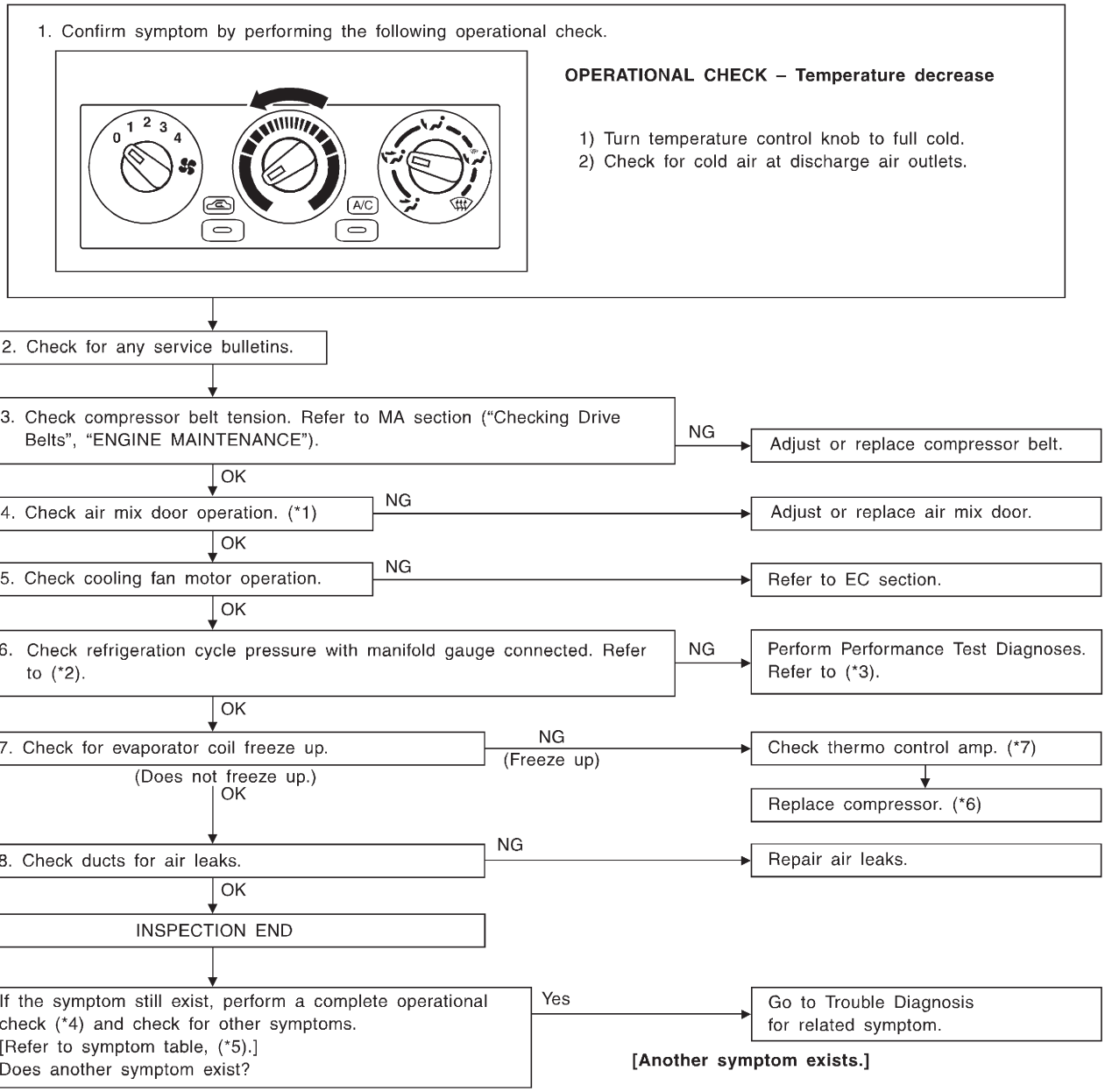
Insufficient Cooling

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

SYMPTOM:

- **Insufficient cooling.**

Inspection flow

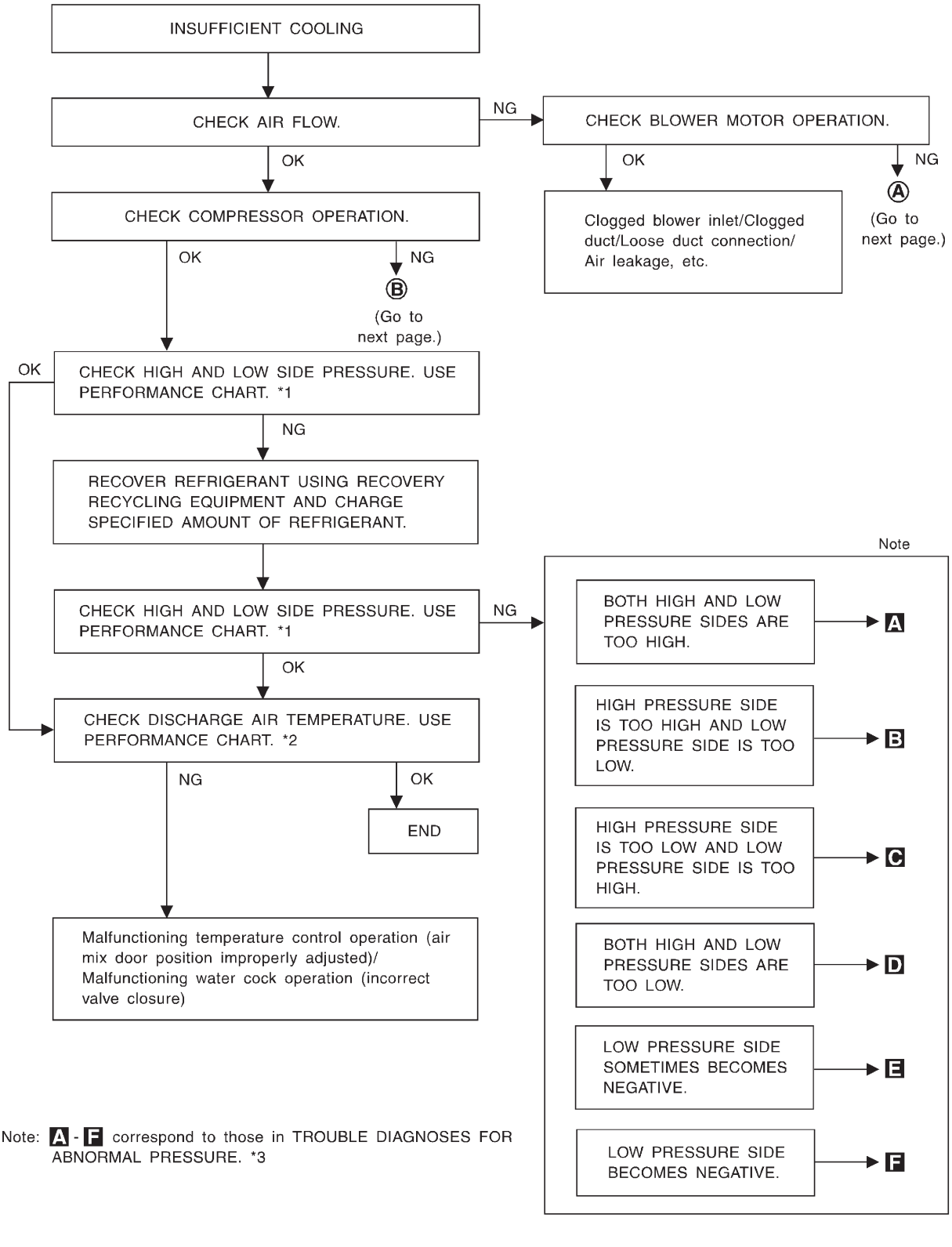


RHA603G

*1: HA-40
*2: HA-35
*3: HA-33
*4: HA-22
*5: HA-21
*6: HA-0
*7: HA-47

Insufficient Cooling (Cont'd)

PERFORMANCE TEST DIAGNOSES

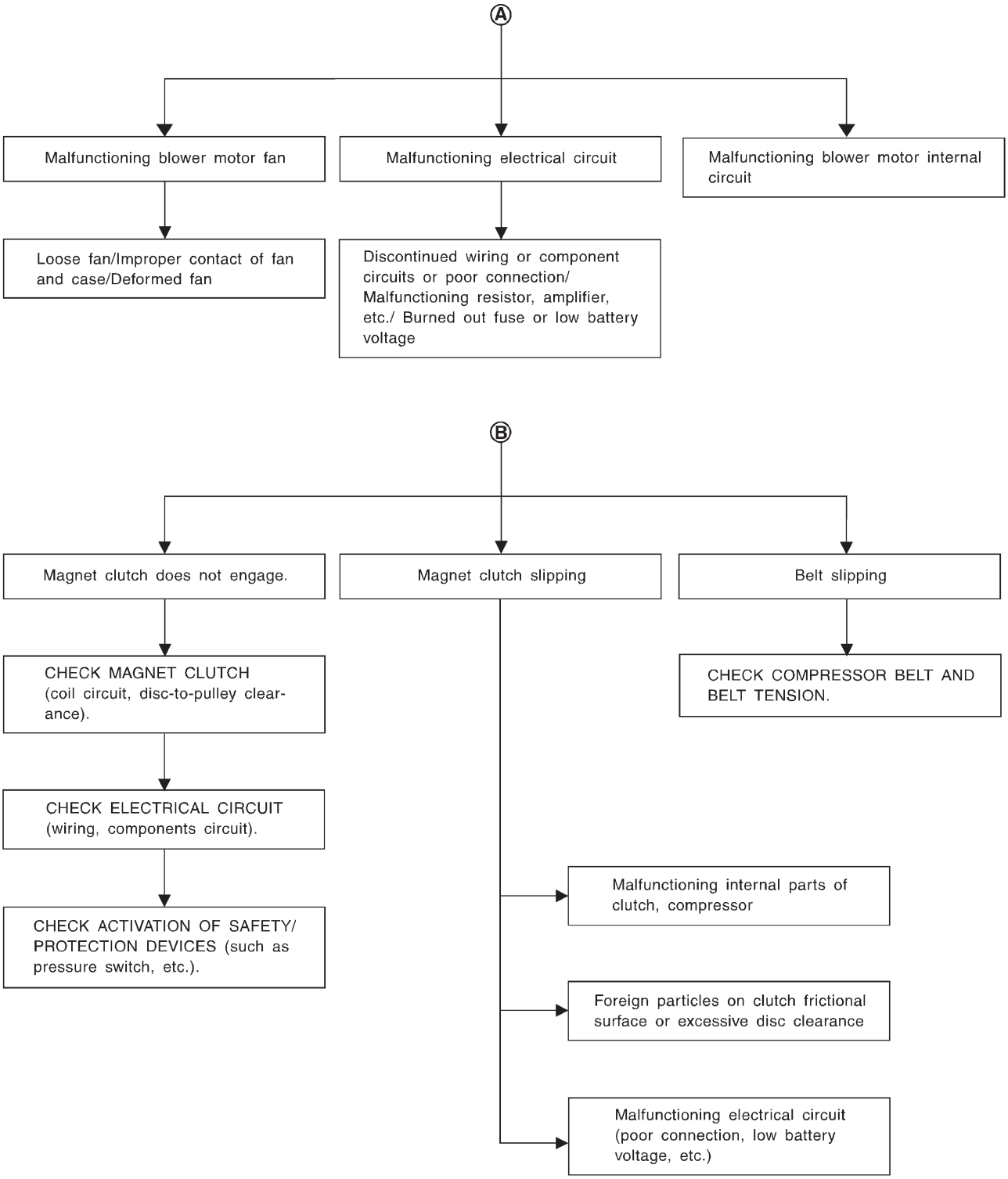


Note: A - F correspond to those in TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE. *3

MHA649A

*1: HA-35 *2: HA-35 *3: HA-36

Insufficient Cooling (Cont'd)



MHA650A

Insufficient Cooling (Cont'd)

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 to 10 minutes before taking measurements.
Rear cooler: ON (For rear cooler equipped model only)

Test reading (Single A/C equipped model)

Recirculating-to-discharge air temperature table

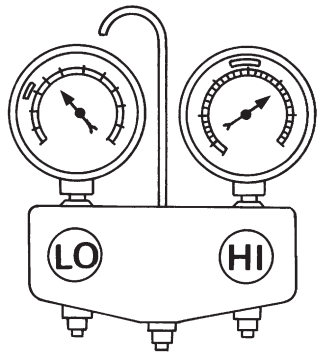
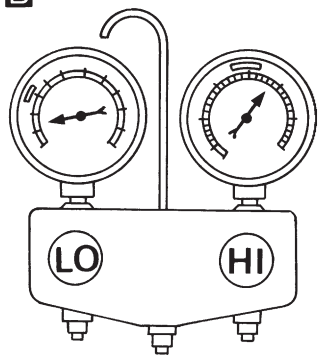
Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	8.0 - 10.0 (46 - 50)
	30 (86)	12.0 - 15.0 (54 - 59)
	35 (95)	16.0 - 20.0 (61 - 68)
	40 (104)	20.5 - 24.5 (69 - 76)
60 - 70	25 (77)	10.4 - 13.0 (51 - 55)
	30 (86)	15.0 - 18.0 (59 - 64)
	35 (95)	19.5 - 23.4 (67 - 74)
	40 (104)	24.5 - 28.5 (76 - 83)

Ambient air temperature-to-operating pressure table

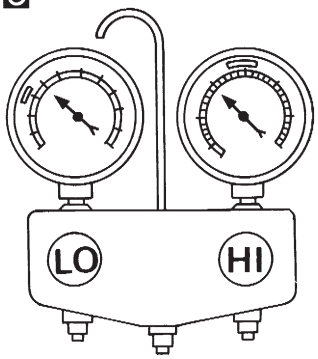
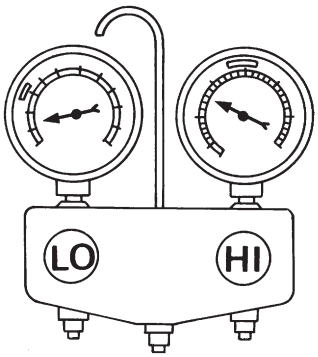
Ambient air		High-pressure (Discharge side) kPa (bar, kg/cm^2, psi)	Low-pressure (Suction side) kPa (bar, kg/cm^2, psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	25 (77)	1,373 - 1,471 (13.73 - 14.71, 14.0 - 15.0, 199 - 213)	196 - 245 (1.96 - 2.45, 2.0 - 2.5, 28 - 36)
	30 (86)	1,275 - 1,520 (12.75 - 15.20, 13.0 - 15.5, 185 - 220)	226 - 284 (2.26 - 2.84, 2.3 - 2.9, 33 - 41)
	35 (95)	1,412 - 1,716 (14.12 - 17.16, 14.4 - 17.5, 205 - 249)	255 - 314 (2.55 - 3.14, 2.6 - 3.2, 37 - 46)
	40 (104)	1,608 - 1,932 (16.08 - 19.32, 16.4 - 19.7, 233 - 280)	294 - 353 (2.94 - 3.53, 3.0 - 3.6, 43 - 51)

Trouble Diagnoses for Abnormal Pressure

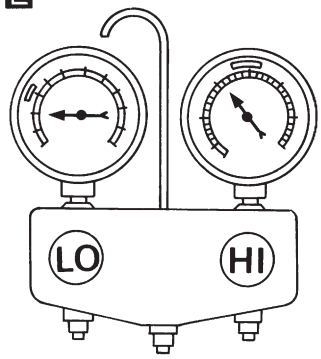
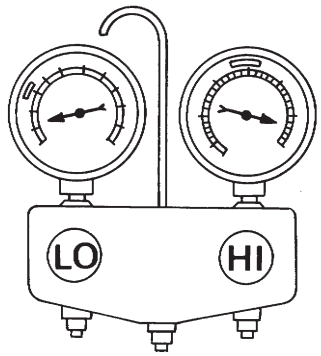
Whenever system's high or low-pressure side is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following table indicates the standard (normal) pressure range. Since the standard (normal) pressure differs from vehicle to vehicle, refer to HA-35 (''Ambient air temperature-to-operating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

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high and low-pressure sides are too high. A  AC359A	● Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle.	Reduce refrigerant until specified pressure is obtained.
	Air suction by cooling fan is insufficient.	Insufficient condenser cooling performance. ↓ ① Condenser fins are clogged. ② Improper fan rotation of cooling fan.	● Clean condenser. ● Check and repair cooling fan as necessary.
	● Low-pressure pipe is not cold. ● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2.0 bar, 2 kg/cm^2, 28 psi). It then decreases gradually thereafter.	Poor heat exchange in condenser. (After compressor operation stops, high pressure decreases too slowly.) ↓ Air in refrigeration cycle.	Evacuate repeatedly and recharge system.
	Engine tends to overheat.	Engine cooling systems malfunction.	Check and repair each engine cooling system.
	● An area of the low-pressure pipe is colder than areas near the evaporator outlet. ● Plates are sometimes covered with frost.	● Excessive liquid refrigerant on low-pressure side. ● Excessive refrigerant discharge flow. ● Expansion valve is open a little compared with the specification. ↓ ① Improper thermal valve installation. ② Improper expansion valve adjustment.	Replace expansion valve.
High-pressure side is too high and low-pressure side is too low. B  AC360A	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor and condenser are clogged or crushed.	● Check and repair or replace malfunctioning parts. ● Check lubricant for contamination.

Trouble Diagnoses for Abnormal Pressure (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high. C  AC356A	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. D  AC353A	● 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.	Liquid tank inside is clogged a little.	● Replace liquid tank. ● Check lubricant for contamination.
	● Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank. ● Expansion valve inlet may be frosted. ● Temperature difference occurs somewhere in high-pressure side.	High-pressure pipe located between liquid tank and expansion valve is clogged.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	● Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge. ↓ Leaking fittings or components.	Check refrigerant for leaks. Refer to ''Checking Refrigerant Leaks'', HA-119.
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ ① Improper expansion valve adjustment. ② Malfunctioning thermal valve. ③ Outlet and inlet may be clogged.	● Remove foreign particles by using compressed air. ● Check lubricant for contamination.
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	● Check and repair malfunctioning parts. ● Check lubricant for contamination.
	Air flow volume is not enough or is too low.	Compressor pressure operation is improper.	Replace compressor.

Trouble Diagnoses for Abnormal Pressure (Cont'd)

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Low-pressure side sometimes becomes negative. E  AC354A	● Air conditioner 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.	● Drain water from refrigerant or replace refrigerant. ● Replace liquid tank.
Low-pressure side becomes negative. F  AC362A	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. Start it again to check whether or not the problem is caused by water or foreign particles. ● If water is the cause, initially cooling is okay. Then the water freezes, causing a blockage. Drain water from refrigerant or replace refrigerant. ● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air. ● If either of the above methods cannot correct the problem, replace expansion valve. ● Replace liquid tank. ● Check lubricant for contamination.

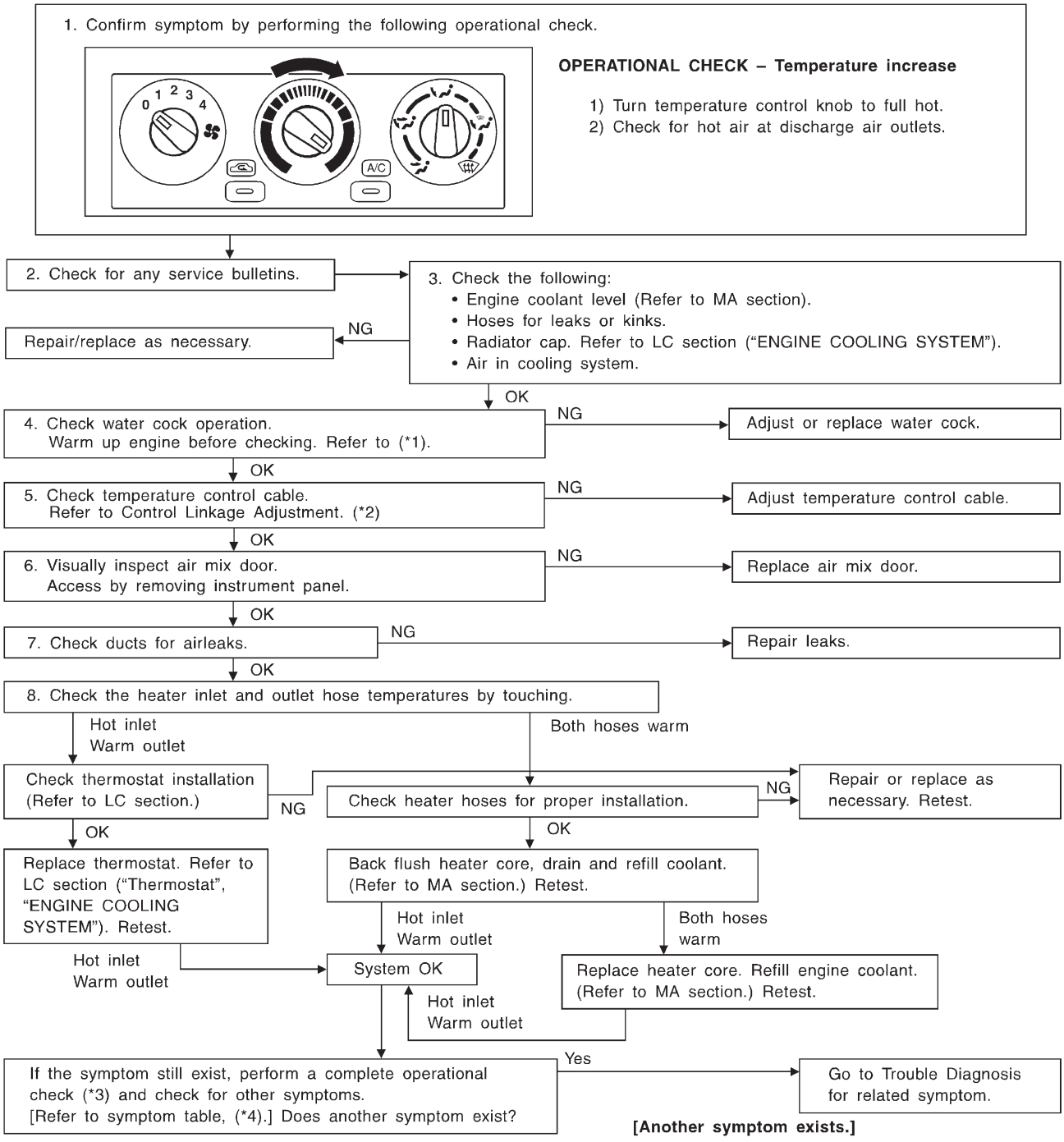
Insufficient Heating

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

SYMPTOM:

- **Insufficient heating.**

Inspection flow

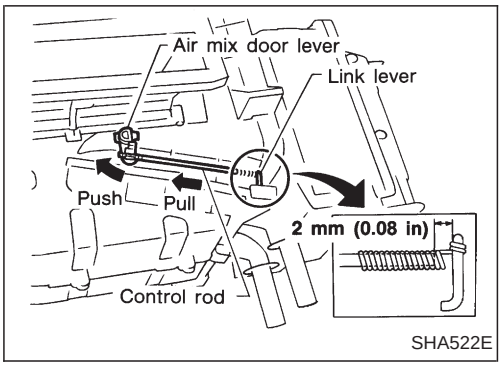


RHA604G

*1: HA-40
*2: HA-40
*3: HA-22
*4: HA-21

Insufficient Heating (Cont'd)

CONTROL LINKAGE ADJUSTMENT

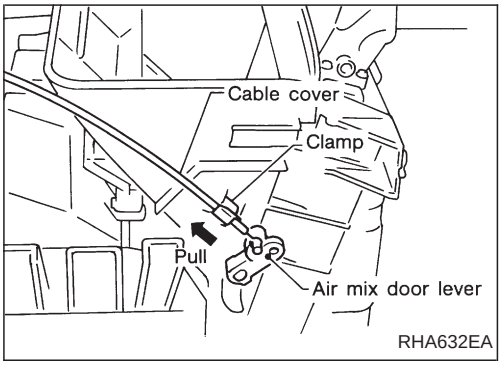


Water cock control rod

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

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

After connecting control rod, check it operates properly.



Temperature control cable

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

After positioning control cable, check that it operates properly.

Air Outlet

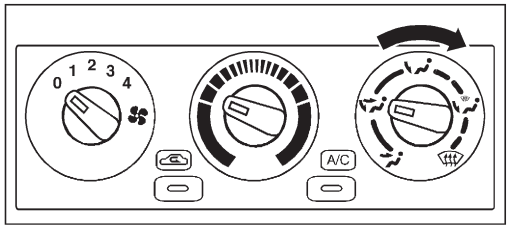
TROUBLE DIAGNOSIS PROCEDURE FOR AIR OUTLET

SYMPTOM:

- **Air does not change.**

Inspection flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air.

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%

2) Confirm that discharge air comes out according to the air distribution table at left.
Refer to “Discharge Air Flow” in “DESCRIPTION” (*4).

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.

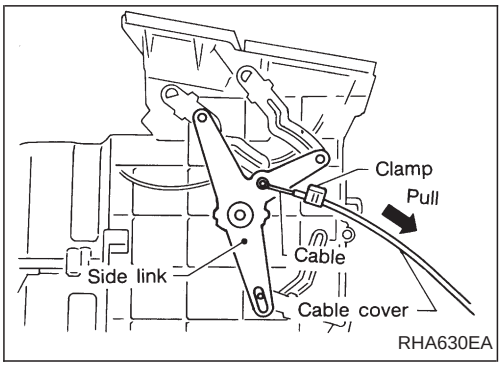
[Another symptom exists.]

RHA605G

*1: HA-42
*2: HA-22
*3: HA-21
*4: HA-13

Air Outlet (Cont'd)

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.

Magnet Clutch

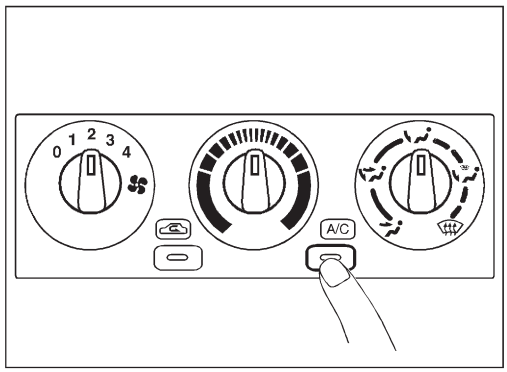
TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

SYMPTOM:

- **Magnet clutch does not operate 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

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.

2. Check for any service bulletins.

3. Check compressor belt tension.
   Refer to MA section ("Checking Drive Belts", "ENGINE MAINTENANCE").
   - NG → Adjust or replace compressor belt.
   - OK ↓

4. Check refrigerant.
   Connect manifold gauge then check system pressure.
   - NG → Check for refrigerant leaks. Refer to (*1).
   - OK ↓

5. Check magnet clutch circuit. (*2)
   - OK ↓

INSPECTION END → If the symptom still exist, perform a complete operational check (*3) and check for other symptoms.
[Refer to symptom table, (*4).]
Does another symptom exist?

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

RHA606G

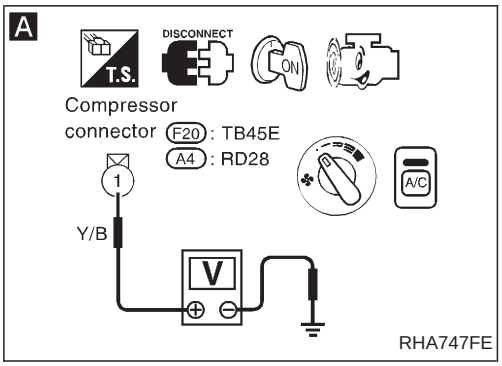
*1: HA-119
*2: HA-44
*3: HA-22
*4: HA-21

Magnet Clutch (Cont'd)

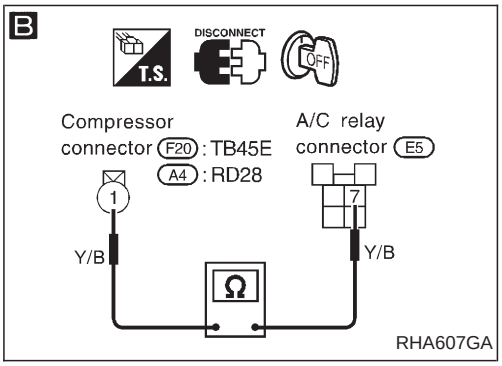
DIAGNOSTIC PROCEDURE

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

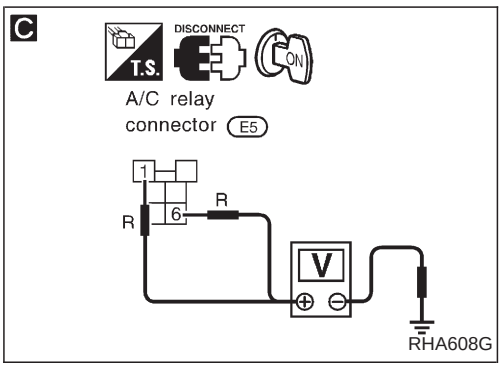
A



B



C



A

CHECK POWER SUPPLY FOR COMPRESSOR.
Disconnect compressor harness connector.
Do approx. 12 volts exist between compressor harness terminal No. ① and body ground?

Yes → Check magnet clutch coil.
NG → Replace magnet clutch. Refer to HA-123.

No ↓

Disconnect A/C relay.

B

CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. ⑦ AND COMPRESSOR HARNESS TERMINAL NO. ① .
Continuity should exist.
If OK, check harness for short.

Note

OK ↓

C

CHECK POWER SUPPLY FOR A/C RELAY.
Disconnect A/C relay.
Do approx. 12 volts exist between A/C relay harness terminal Nos. ① , ⑥ and body ground?

No → CHECK POWER SUPPLY CIRCUIT AND 10A (No. 6) FUSES AT FUSE BLOCK. Refer to EL section (“Wiring Diagram”, “POWER SUPPLY ROUTING”).

Yes ↓

CHECK A/C RELAY AFTER DISCONNECTING IT.
Refer to HA-47.

NG → Replace A/C relay.

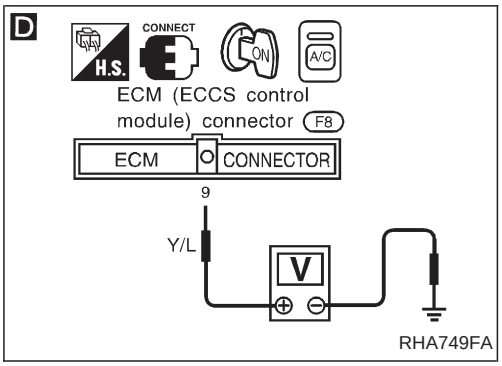
OK ↓

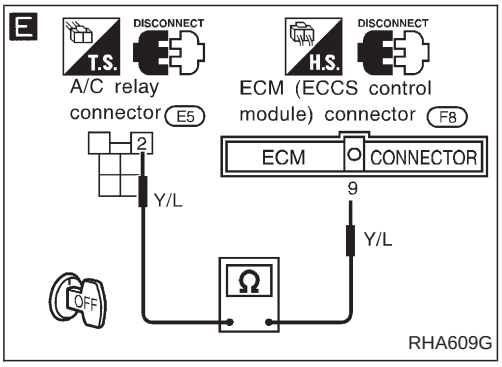
Ⓐ

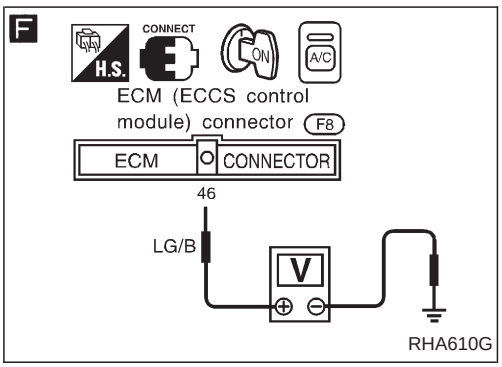
(Go to next page.)

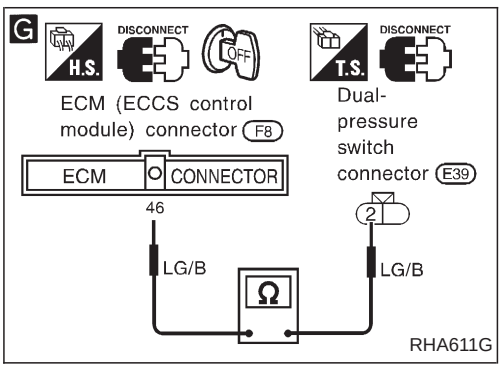
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

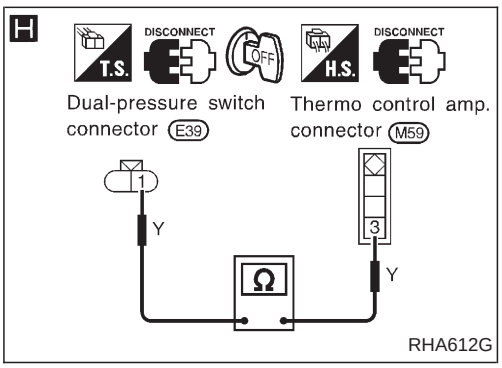
Magnet Clutch (Cont'd)











Ⓐ

Reconnect A/C relay.

D

CHECK COIL SIDE CIRCUIT OF A/C RELAY.
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. ⑨ and body ground?

No → Disconnect A/C relay. Disconnect ECM (ECCS control module) harness connector.

E Note

CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. ② AND ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. ⑨ .
Continuity should exist.
If OK, check harness for short.

Yes

F

CHECK VOLTAGE FOR ECM (ECCS control module).
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. ㊻ and body ground?

No → CHECK ECM (ECCS control module). Refer to EC section.

Yes

Disconnect ECM (ECCS control module) harness connector.
Disconnect dual-pressure switch harness connector.

G Note

CHECK CIRCUIT CONTINUITY BETWEEN ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. ㊻ AND DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. ② .
Continuity should exist.
If OK, check harness for short.

OK

CHECK DUAL-PRESSURE SWITCH.
Refer to HA-47.

NG → Check refrigerant charge amount.

OK → Replace dual-pressure switch.

OK

Disconnect thermo control amp. switch harness connector.

H Note

CHECK CIRCUIT CONTINUITY BETWEEN DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. ① AND THERMO CONTROL AMP. HARNESS TERMINAL NO. ③ .
Continuity should exist.
If OK, check harness for short.

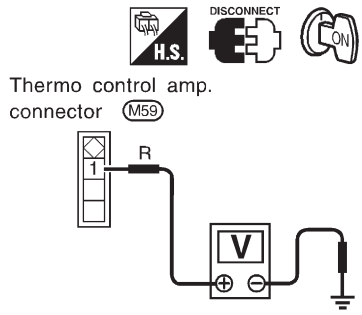
OK

Ⓑ

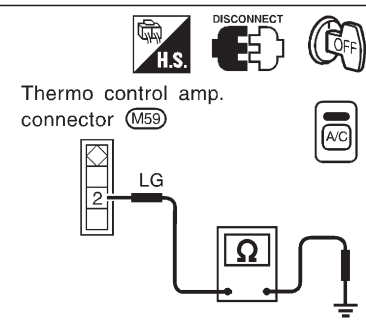
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Magnet Clutch (Cont'd)

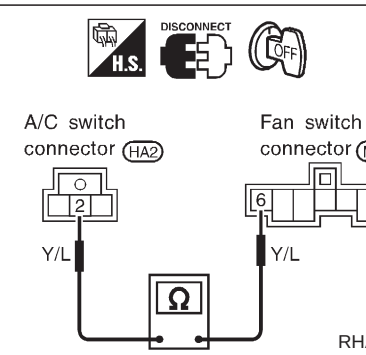
I



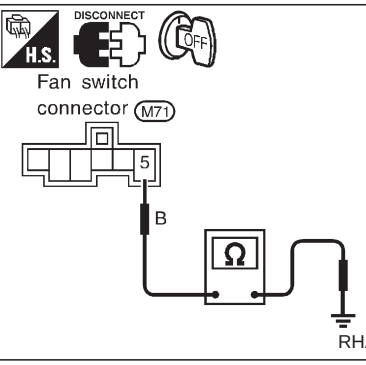
J



K



L



Ⓑ

I

CHECK POWER SUPPLY FOR THERMO CONTROL AMP.
Disconnect thermo control amp. harness connector.
Do approx. 12 volts exist between thermo control amp. harness terminal No. ① and body ground?

No → CHECK POWER SUPPLY CIRCUIT AND 10A FUSES AT FUSE BLOCK.
Refer to EL section (“Wiring Diagram”, “POWER SUPPLY ROUTING”).

Yes

J

CHECK BODY GROUND CIRCUIT FOR THERMO CONTROL AMP.
Turn A/C switch ON.
Does continuity exist between thermo control amp. harness terminal ② and body ground?

No → CHECK THERMO CONTROL AMP.
Refer to HA-47.

Yes

Disconnect A/C switch harness connector.

CHECK A/C SWITCH.
Refer to HA-47.

NG → Replace A/C switch.

OK

Disconnect fan switch harness connector.

K

Note

CHECK CIRCUIT CONTINUITY BETWEEN A/C SWITCH HARNESS TERMINAL NO. ② AND FAN SWITCH HARNESS TERMINAL NO. ⑥ .
Continuity should exist.
If OK, check harness for short.

OK

L

Note

CHECK BODY GROUND CIRCUIT FOR FAN SWITCH.
Does continuity exist between fan switch harness terminal No. ⑤ and body ground?

Yes

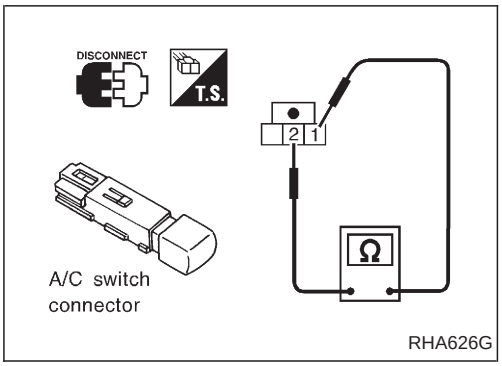
CHECK FAN SWITCH.
Refer to HA-31.

NG → Replace fan switch.

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

Magnet Clutch (Cont'd)

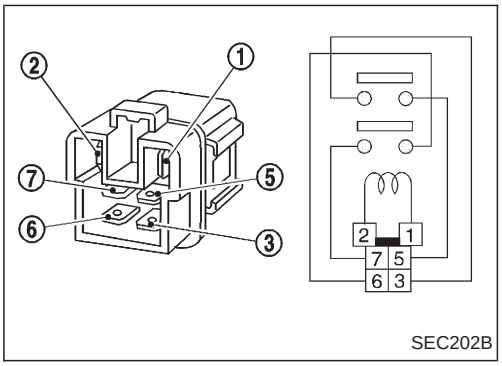
ELECTRICAL COMPONENTS INSPECTION



A/C switch

Check continuity between terminals at each switch position.

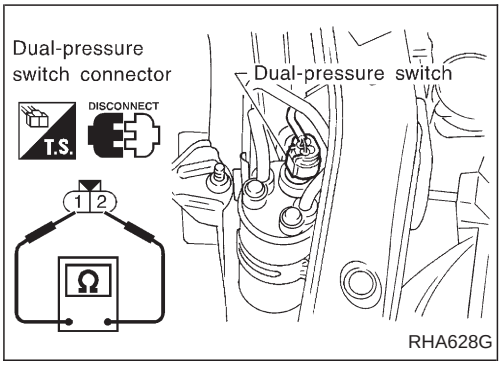
Switch condition	Terminal No.		Continuity
A/C	(+)	(−)	
ON	②	①	Yes
OFF			No



A/C relay

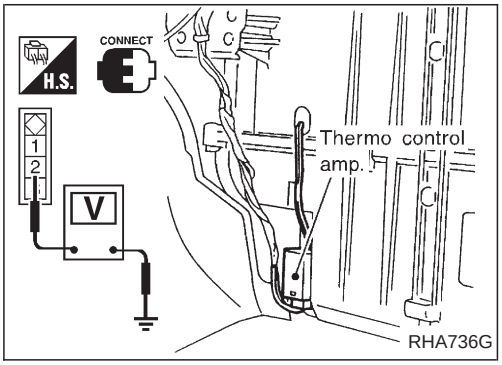
Check continuity between terminals ③ and ⑤, ⑥ and ⑦.

Condition	Continuity
12V direct current supply between terminals ① and ②	Yes
No current supply	No



Dual-pressure switch

	ON kPa (bar, kg/cm^2, psi)	OFF kPa (bar, kg/cm^2, psi)
Low-pressure side	Increasing to 157 - 216 (1.57 - 2.16, 1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.57 - 1.96, 1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 1,863 - 2,256 (18.6 - 22.6, 19 - 23, 270 - 327)	Increasing to 2,452 - 2,844 (24.5 - 28.4, 25 - 29, 356 - 412)



Thermo control amp.

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

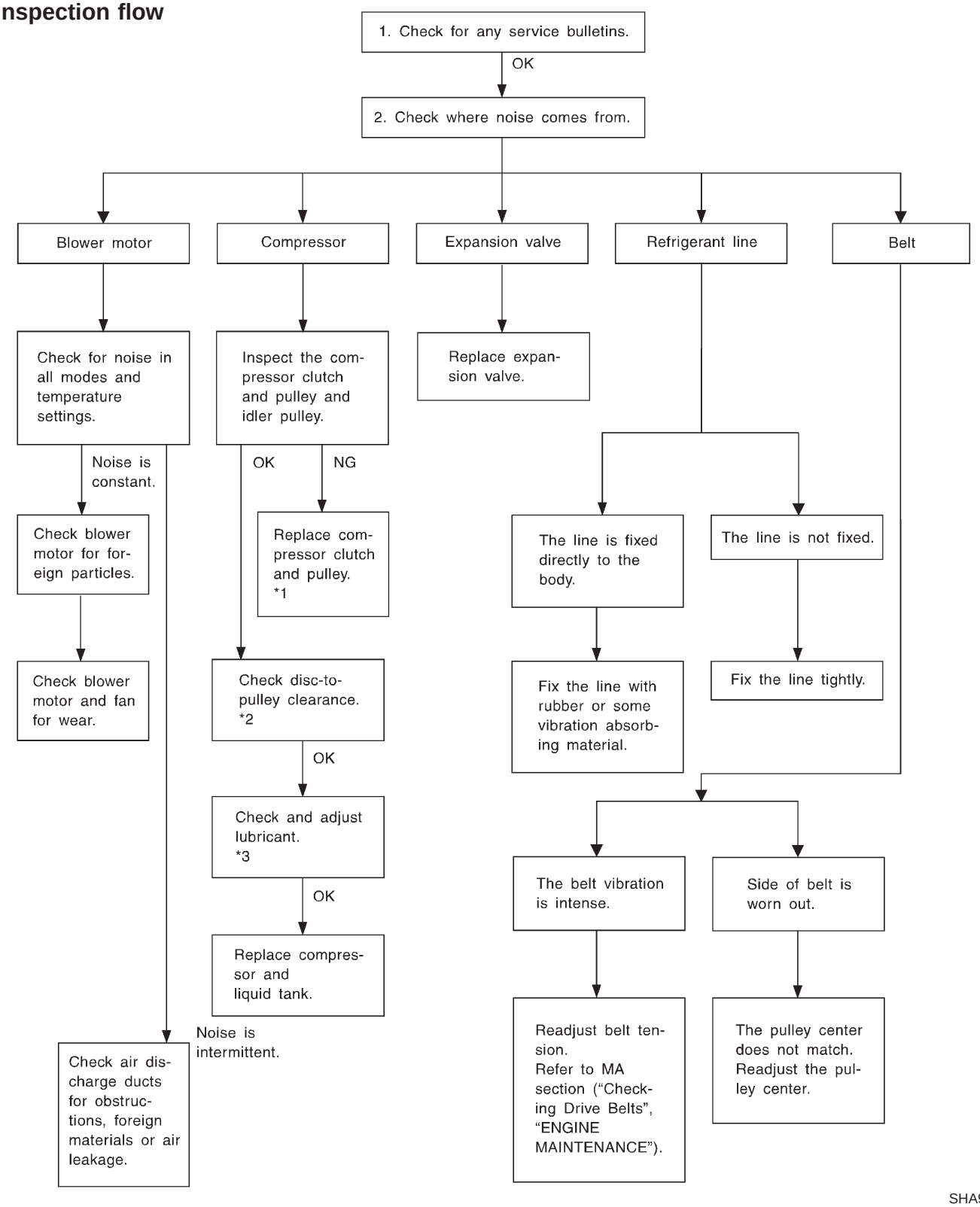
Noise

TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

SYMPTOM:

- **Noise**

Inspection flow



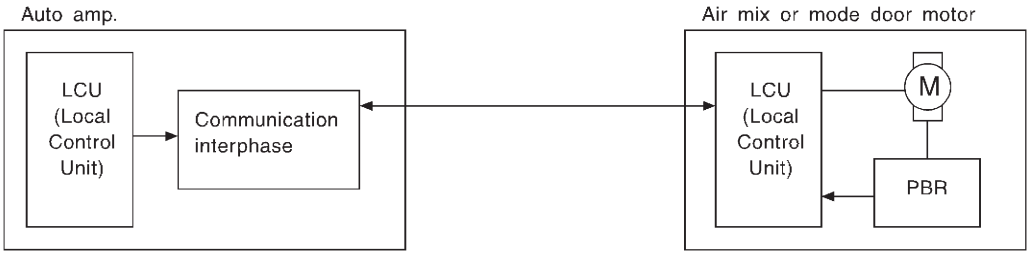
SHA909E

*1: HA-123 *2: HA-125 *3: HA-120

Introduction

AIR CONDITIONER LAN SYSTEM OVERVIEW CONTROL SYSTEM

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



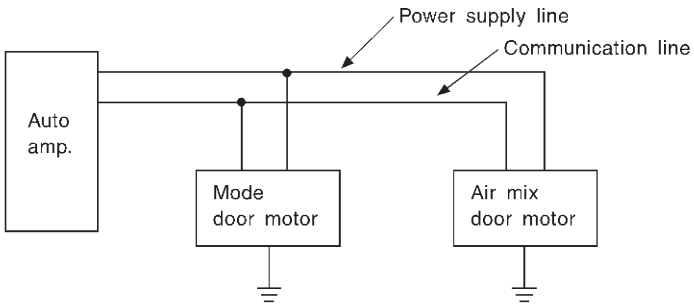
RHA439G

Features

SYSTEM CONSTRUCTION (LAN)

A small network is constructed between the auto amplifier, air mix door motor and mode door motor. The auto amplifier and motors are connected by data transmission lines and motor power supply lines. The LAN network is built through the ground circuits of the two motors.
Addresses, motor opening angle signals, motor stop signals and error checking messages are all transmitted through the data transmission lines connecting the auto amplifier and two motors.
The following functions are contained in LCUs built into the air mix door motor and the mode door motor.

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

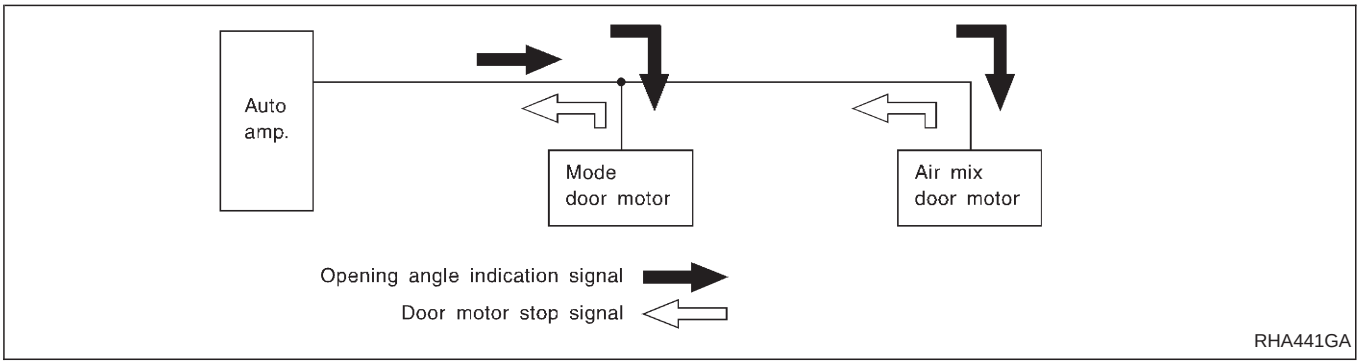


RHA440GA

Features (Cont'd)

Operation

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



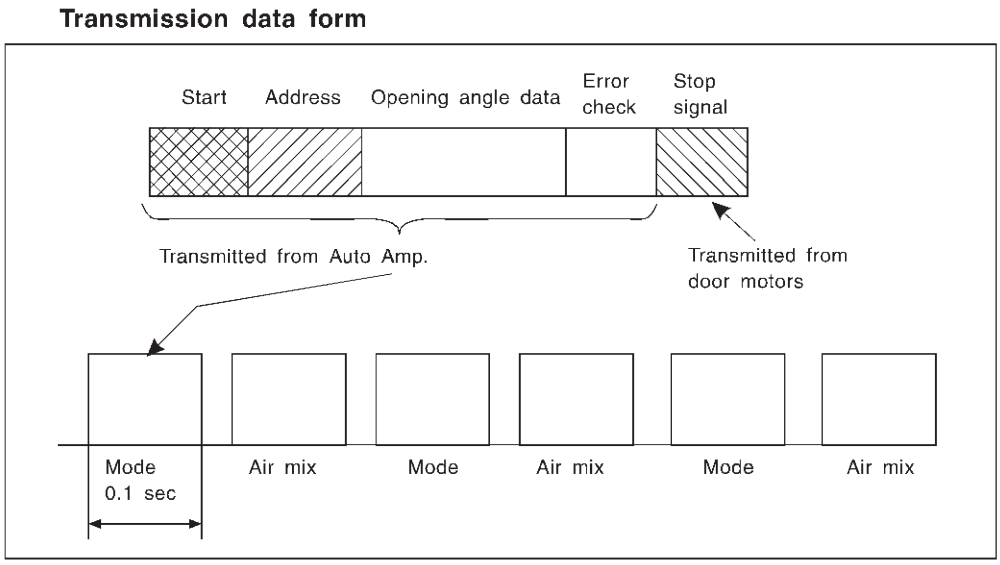
Transmission data and transmission order

Amplifier data is transmitted consecutively to each of the door motors following the form shown in figure below.
Start: Initial compulsory signal sent to each of the door motors.
Address: Data sent from the auto amplifier is selected according to data-based decisions made by the air mix door motor and mode door motor.
If the addresses are identical, the opening angle data and error check signals are received by the door motor LCUs. The LCUs then make the appropriate error decision. If the opening angle data is normal, door control begins.
If an error exists, the received data is rejected and corrected data received. Finally, door control is based upon the corrected opening angle data.
Opening angle: Data that shows the indicated door opening angle of each door motor.
Error check: Procedure by which sent and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the air mix door motor and mode door motor. Error data can be related to the following problems.

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

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

Features (Cont'd)



RHA442G

Air mix door control (Automatic temperature control)

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

Fan speed control

Blower speed is automatically controlled based on temperature setting, ambient temperature, in-vehicle temperature, intake temperature, amount of sunload and air mix door position.
With FAN switch set to ''AUTO'', the blower motor starts to gradually increase air flow volume.
When engine coolant temperature is low, the blower motor operation is delayed to prevent cool air from flowing.

Intake door control

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

Outlet door control

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

Magnet clutch control

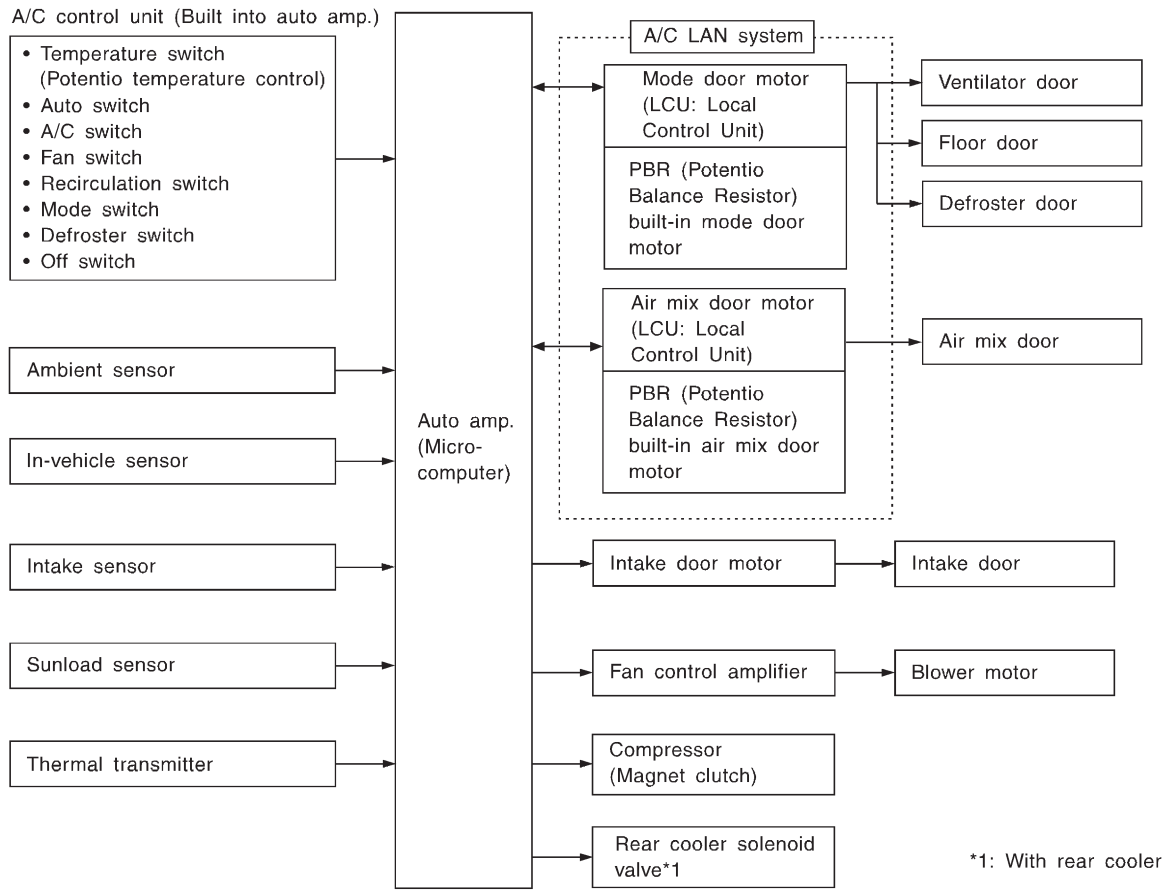
The ECM (ECCS control module) controls compressor operation using input signals from the throttle position sensor and auto amplifier.

Self-diagnostic system

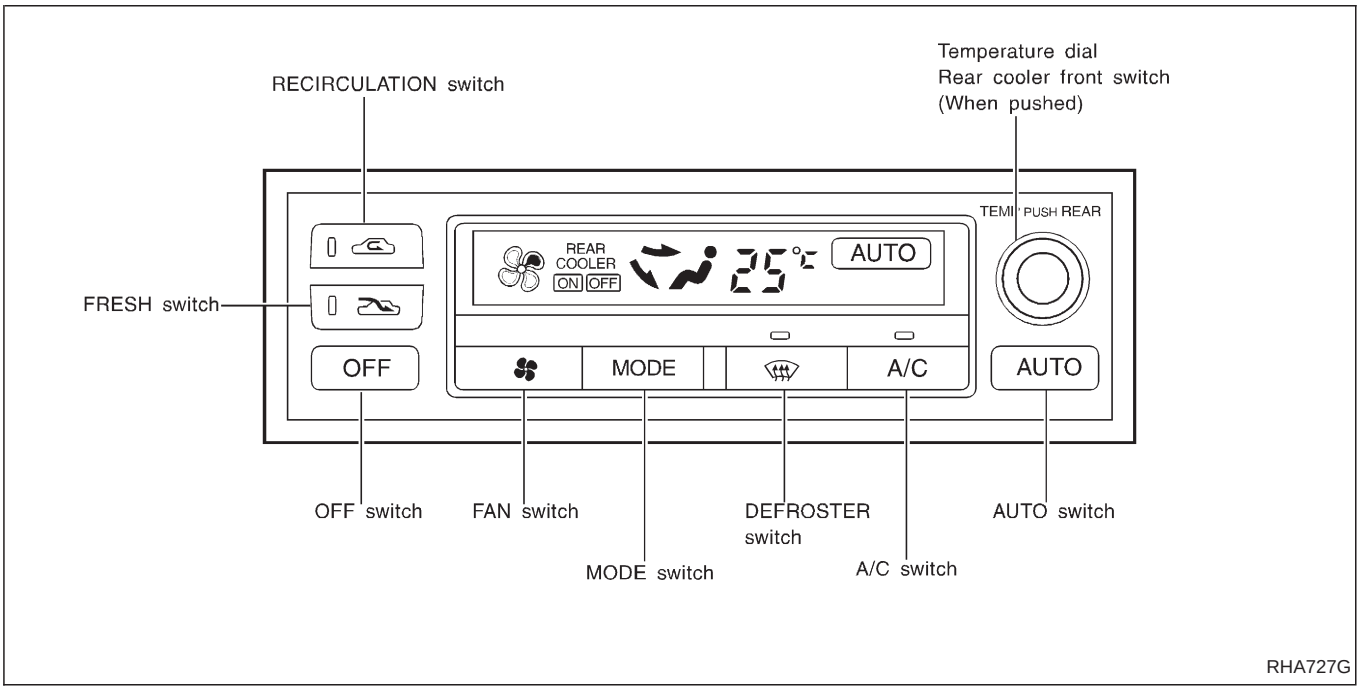
The self-diagnostic system is built into the auto amplifier (LCU) to quickly locate the cause of problems.

Overview of Control System

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



Control Operation



Display screen

Displays the operational status of the system.

AUTO switch

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

Temperature dial (Potentio Temperature Control)

Increases or decreases the set temperature.

OFF switch

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

FAN switch

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

RECIRCULATION switch

OFF position: Automatic control resumes.
ON position: Interior air is recirculated inside the vehicle.

DEFROSTER switch

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

MODE switch

Control the air discharge outlets.

Control Operation (Cont'd)

FRESH switch

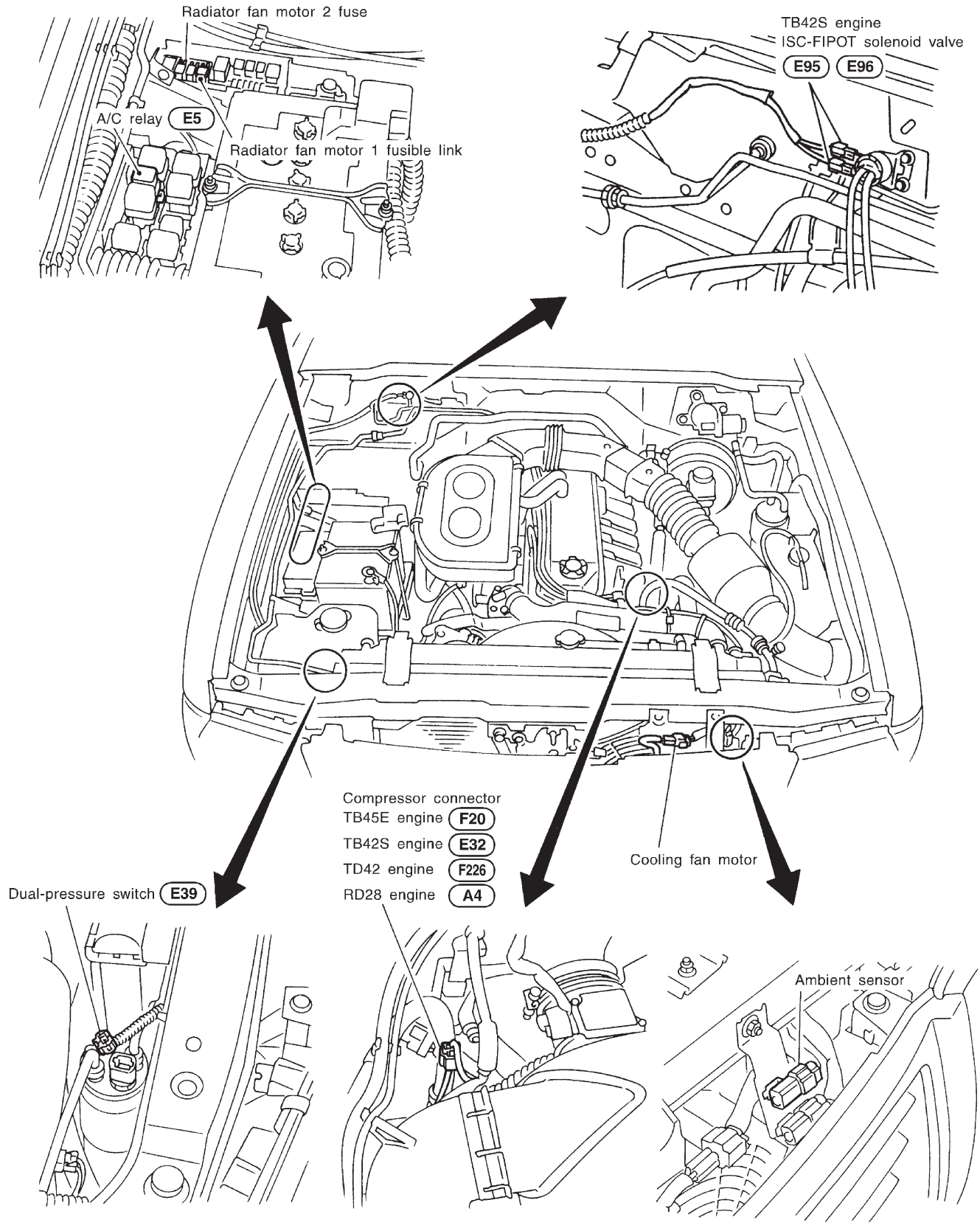
OFF position: Automatic control resumes.
ON position: Outside air is drawn into the passenger compartment.

A/C switch

Manual control of the compressor operation. When the A/C switch indicator illuminates, compressor operation is being carried out.

Component Location

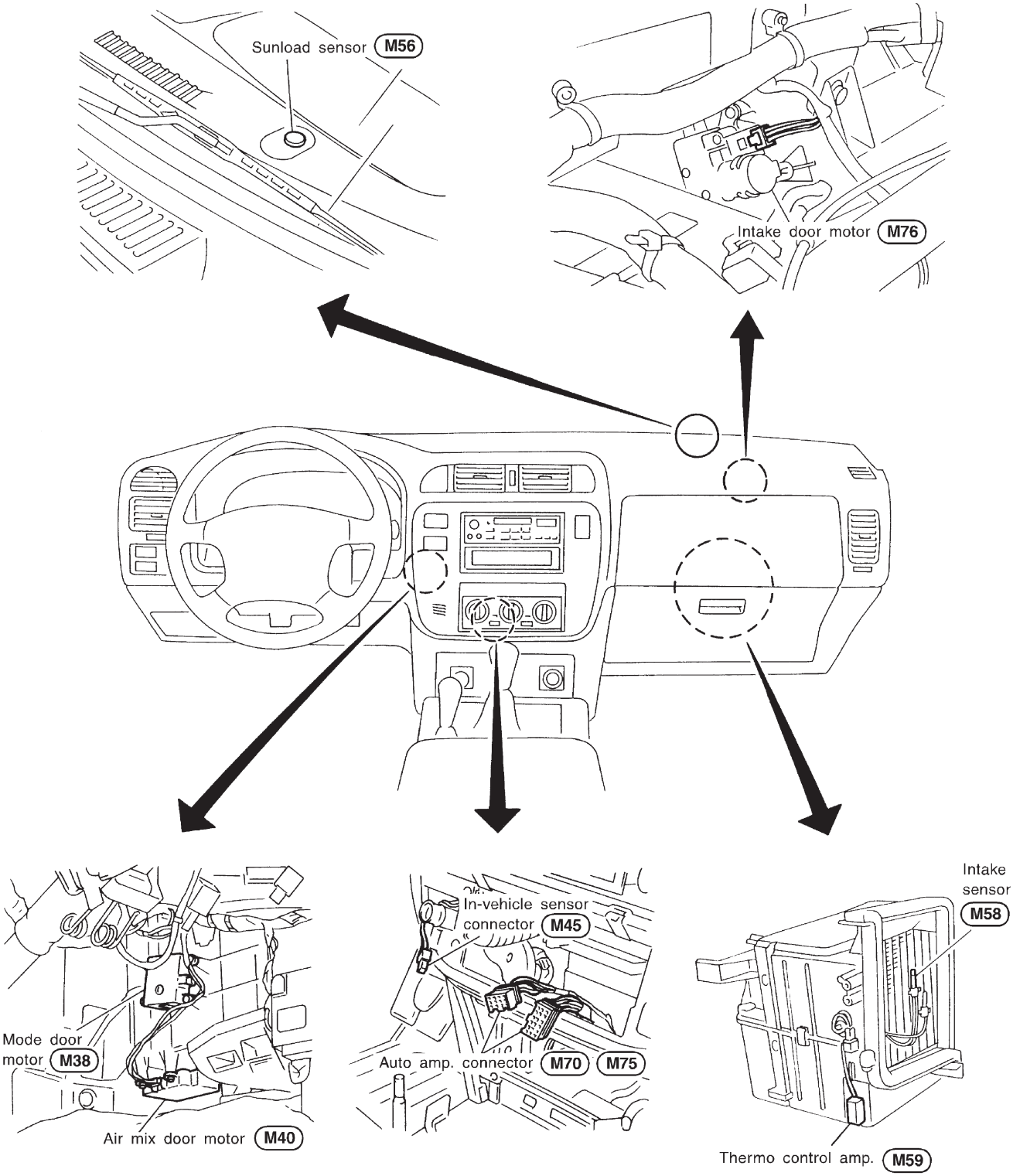
ENGINE COMPARTMENT



RHA697G

Component Location (Cont'd)

PASSENGER COMPARTMENT

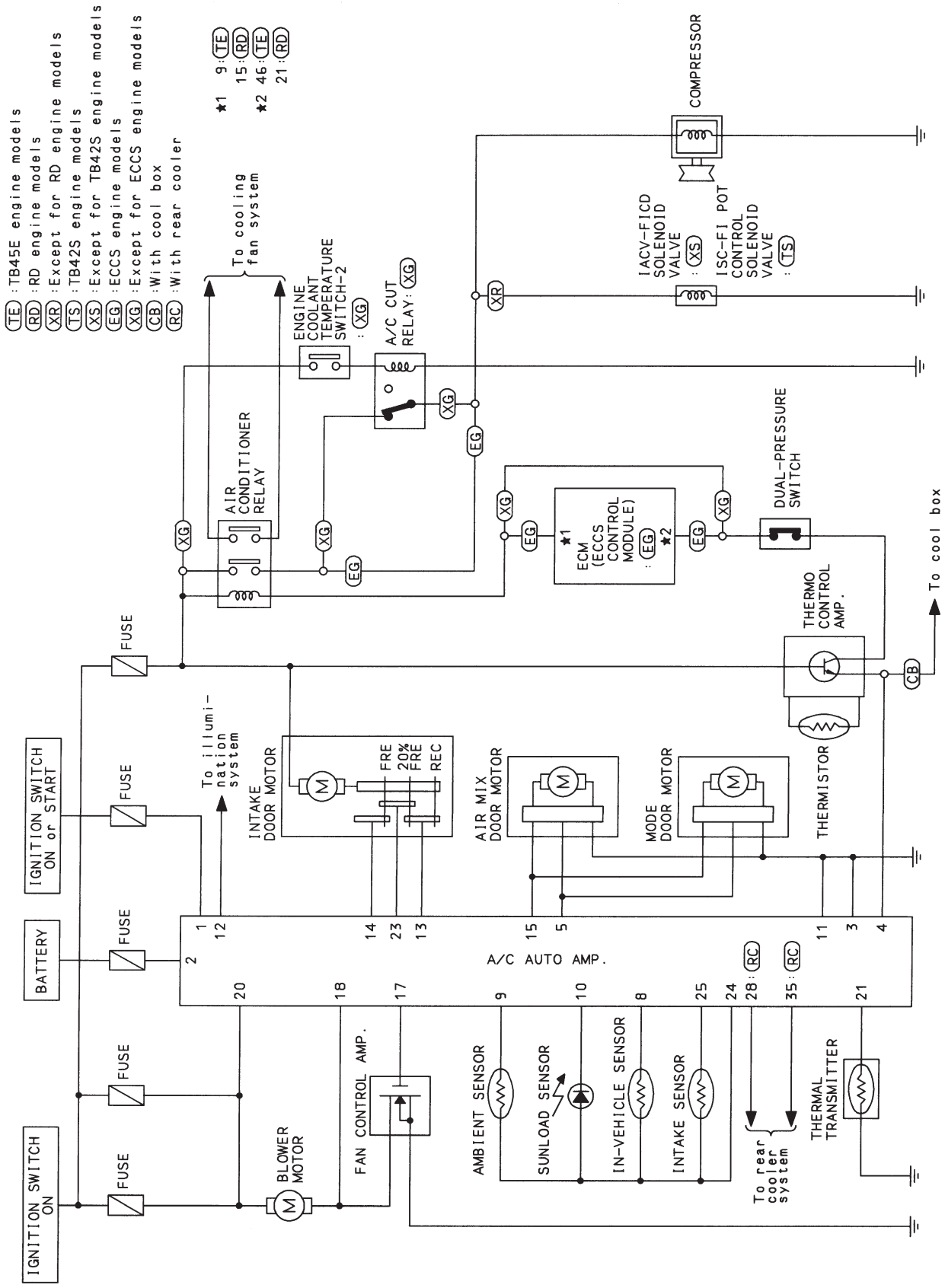


This illustration is for LHD models.

The layout for RHD models is symmetrically opposite.

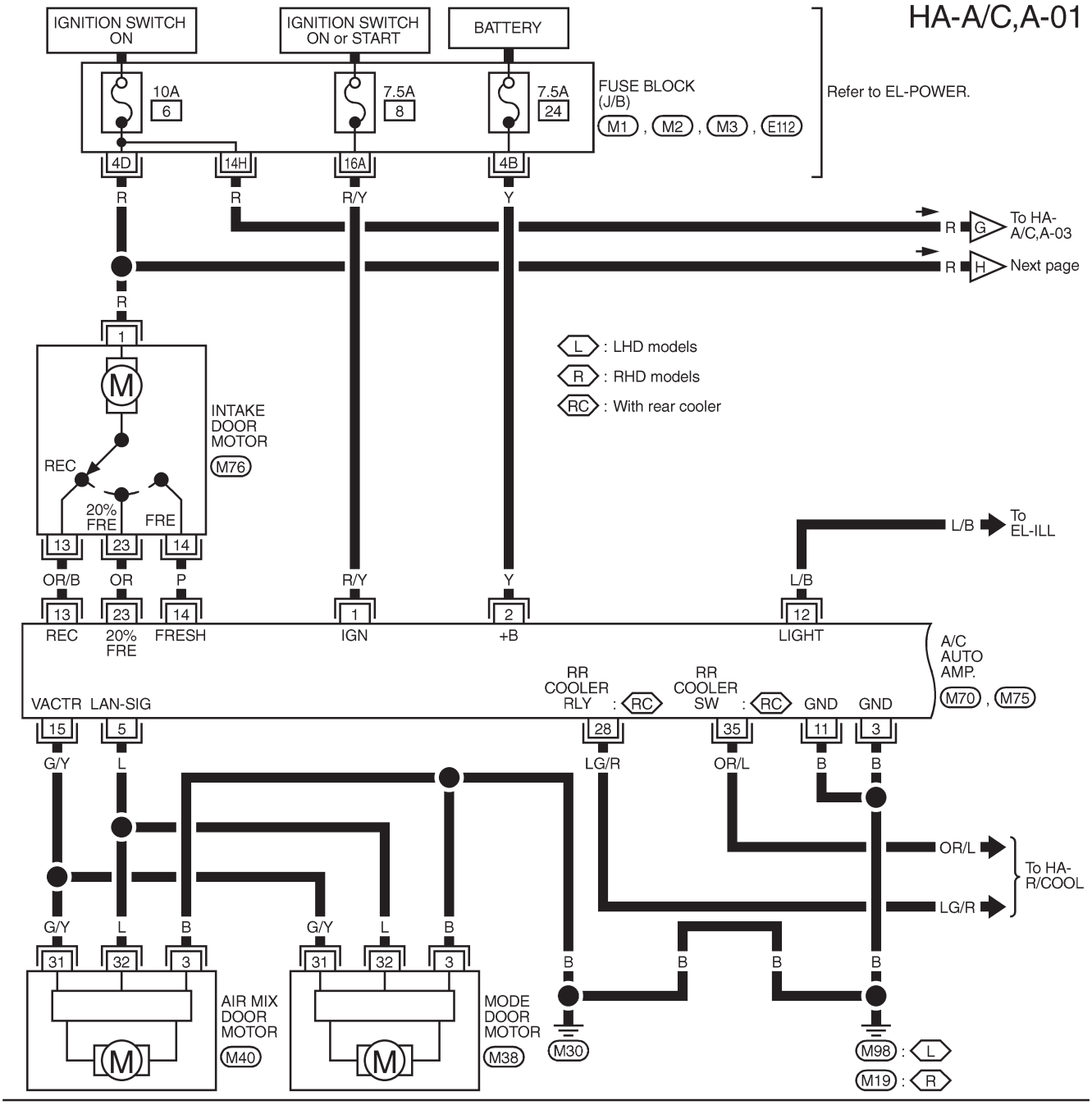
RHA698G

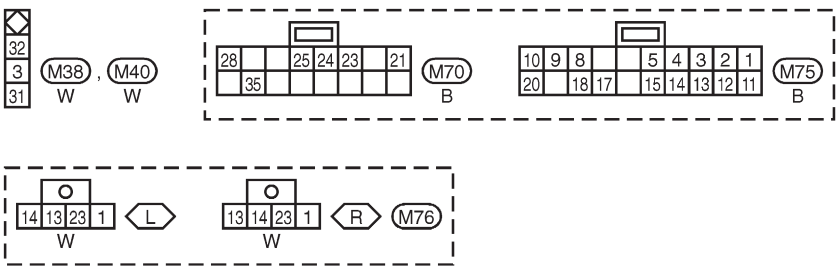
Circuit Diagram



THA153

Wiring Diagram — A/C, A —





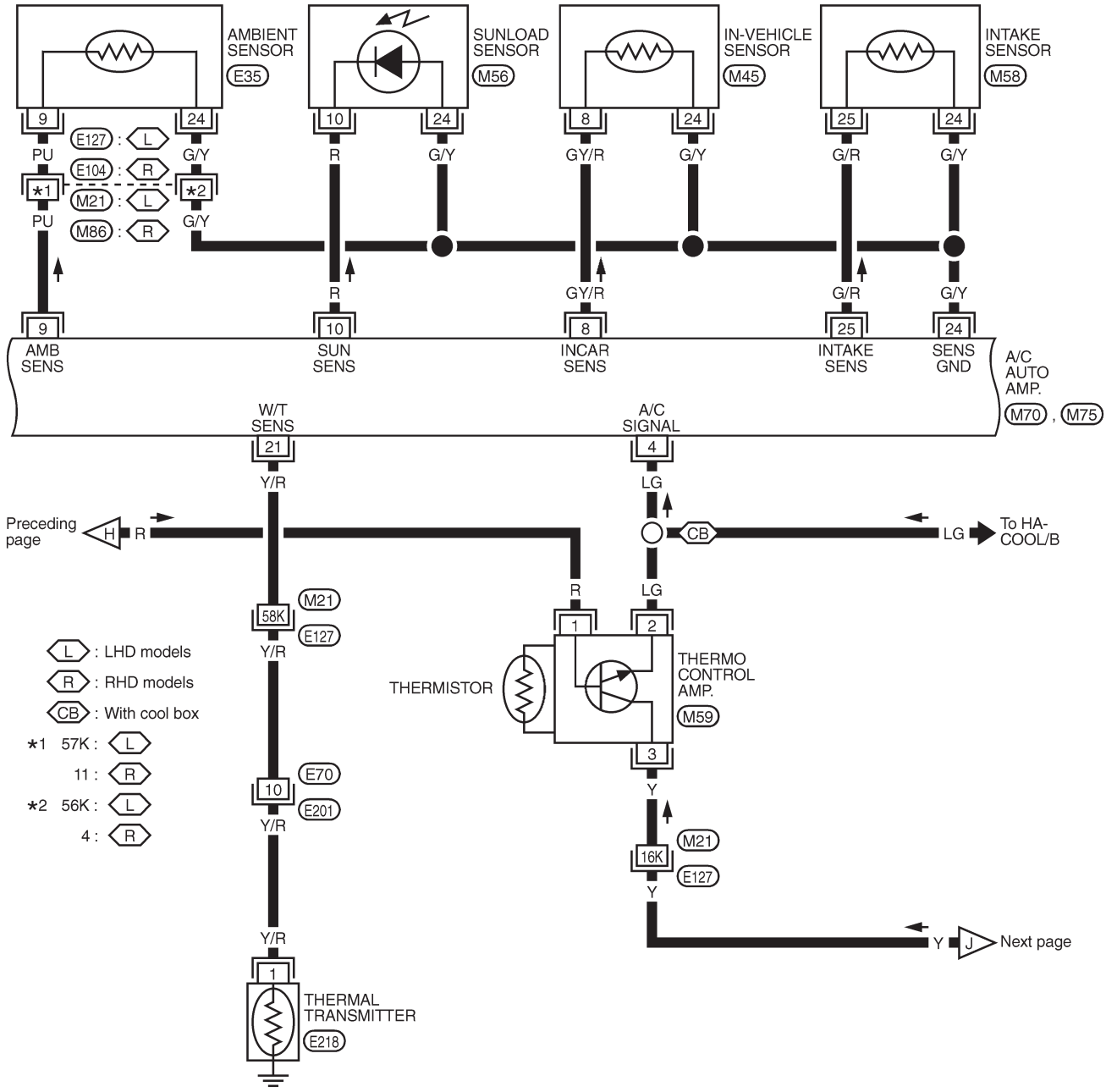
Refer to last page (Foldout page).

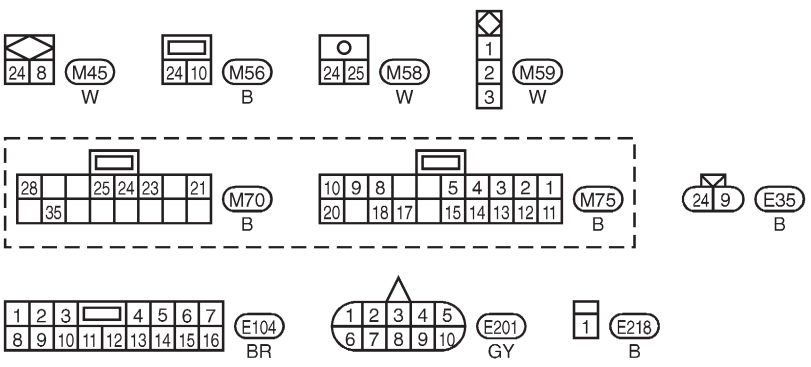
M1
M2
M3
E112

YHA159

Wiring Diagram — A/C, A — (Cont'd)

HA-A/C,A-02

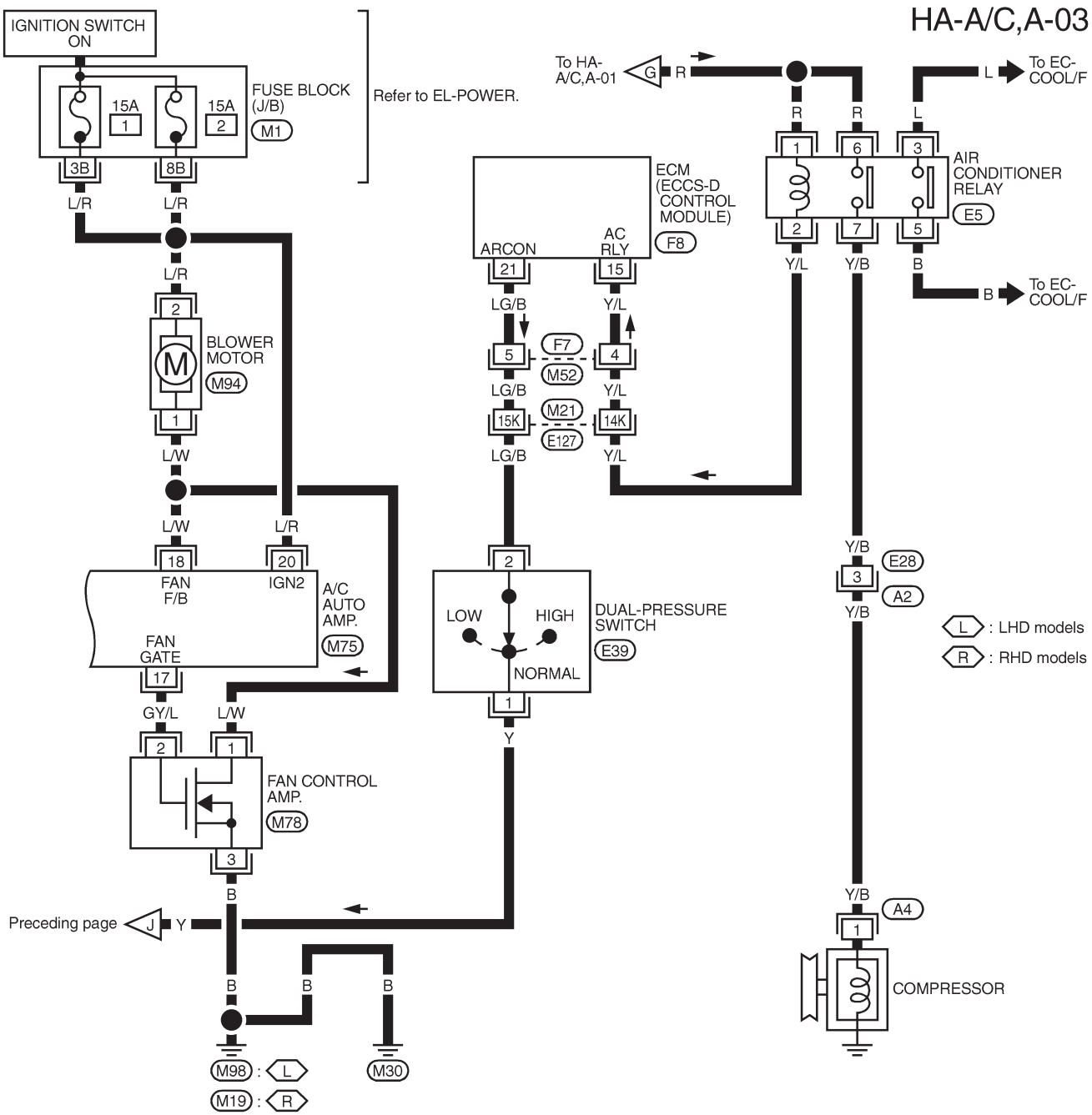


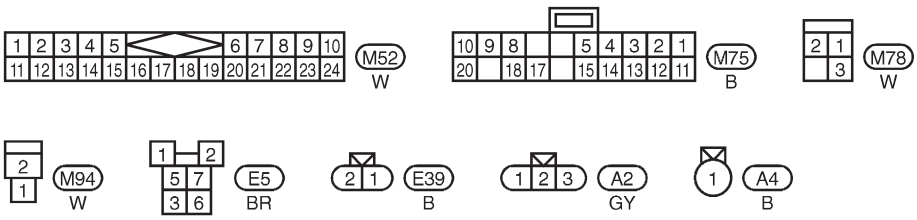


Refer to last page (Foldout page).
M21 , E127

YHA160

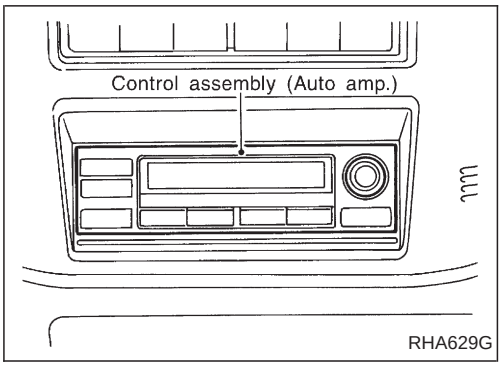
Wiring Diagram — A/C, A — (Cont'd)





Refer to last page (Foldout page).
M21 , E127
M1
F8

YHA161

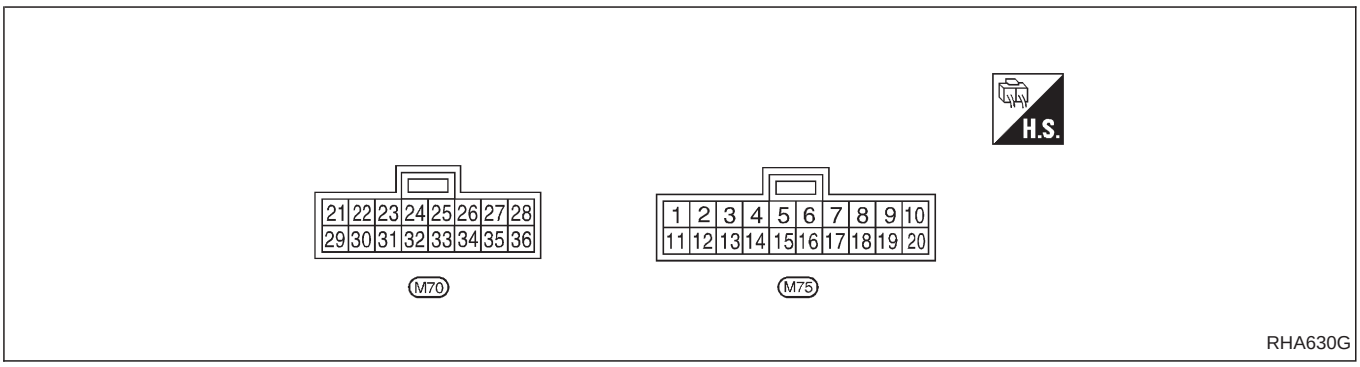


Auto Amp. Terminals and Reference Value

INSPECTION OF AUTO AMP.

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

- Pin connector terminal layout



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

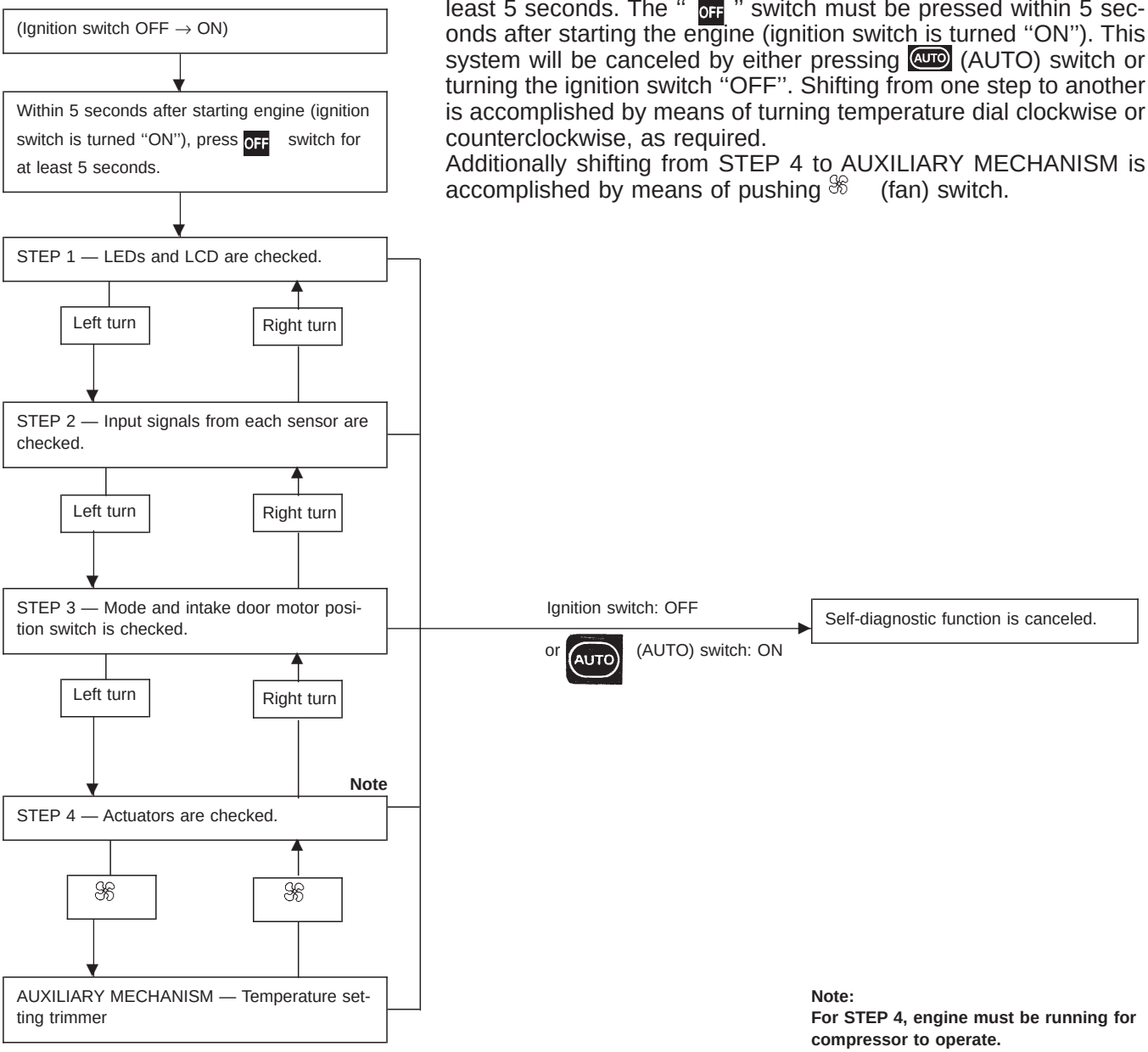
AUTO AMP. INSPECTION TABLE

TERMINAL No.	ITEM	CONDITION			Voltage V
1	Power supply for IGN		—		Approximately 12
2	Power supply for BAT		—		Approximately 12
3	Ground	—			—
4	Compressor ON signal		Compressor	ON	Approximately 0
				OFF	Approximately 12
5	Power supply for mode and air mix door motor		—		Approximately 12
8	In-vehicle sensor	—			—
9	Ambient sensor	—			—
10	Sunload sensor	—			—
11	Ground	—			—
12	Power supply for illumination		Illumination switch ON		Approximately 12
13	Intake door position switch		RECIRCULATION		Approximately 0
			FRESH or 20% FRESH		Approximately 12
14	Intake door position switch		FRESH		Approximately 0
			RECIRCULATION or 20% FRESH		Approximately 12
15	LAN signal		—		Approximately 5.5
17	Fan control amp. control signal		Fan speed	Low, middle low or middle high	Approximately 2.5 - 3.0
				High	Approximately 9 - 10
18	Blower motor feed back	—			Approximately 12
20	Power supply for blower motor		—		Approximately 12
21	Thermal transmitter	—			—
23	Intake door position switch		20% FRESH		Approximately 0
			RECIRCULATION or FRESH		Approximately 12
24	Sensor ground	—			—
25	Intake sensor	—			—
28	Rear cooler relay		Rear cooler ON		Approximately 0
			Rear cooler OFF		Approximately 12
35	Rear cooler switch		Rear cooler switch ON		Approximately 0
			Rear cooler switch OFF		Approximately 12

Self-diagnosis

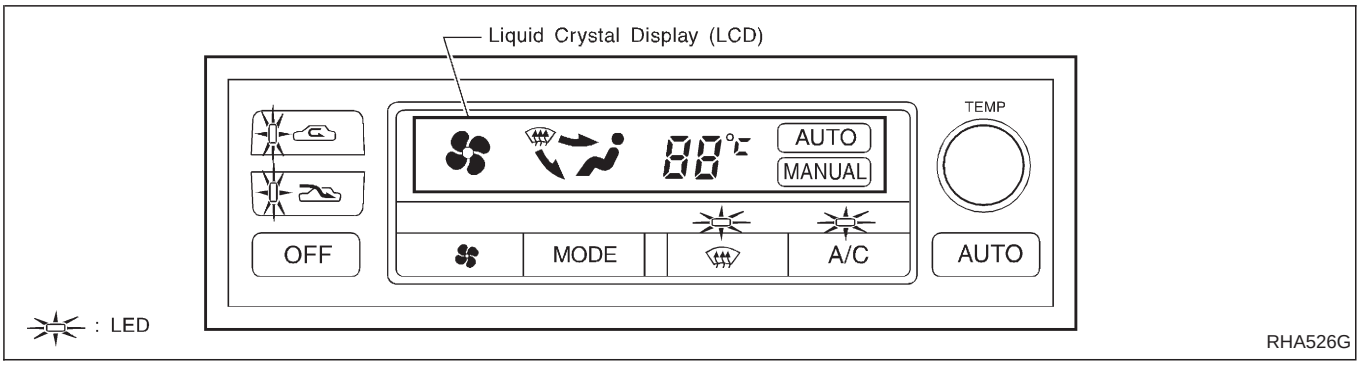
INTRODUCTION AND GENERAL DESCRIPTION

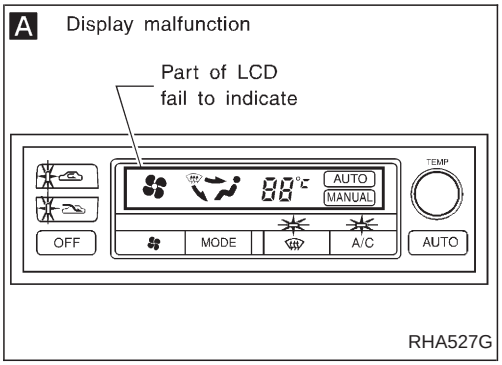
The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. by system line. Refer to applicable sections (items) for details. Shifting from normal control to the self-diagnostic system is accomplished by starting the engine (turning the ignition switch from "OFF" to "ON") and pressing " OFF " switch for at least 5 seconds. The " OFF " switch must be pressed within 5 seconds after starting the engine (ignition switch is turned "ON"). This system will be canceled by either pressing AUTO (AUTO) switch or turning the ignition switch "OFF". Shifting from one step to another is accomplished by means of turning temperature dial clockwise or counterclockwise, as required.
Additionally shifting from STEP 4 to AUXILIARY MECHANISM is accomplished by means of pushing (fan) switch.



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

Self-diagnosis (Cont'd)





STEP-BY-STEP PROCEDURE

Turn ignition switch ON.

↓

Set in self-diagnostic mode. Within 5 seconds after starting engine (ignition switch is turned "ON".), press **OFF** switch for at least 5 seconds.

↓

A

STEP 1 - LEDs AND LCD ARE CHECKED. Do all LEDs and LCD illuminate?

No → Malfunctioning **OFF** switch, LED or LCD. Replace A/C auto amp.

Yes ↓

Turn temperature dial clockwise.

↓

Advance to self-diagnosis STEP 2?

No → Malfunctioning temperature dial. Replace A/C auto amp.

Yes ↓

Turn temperature dial counterclockwise.

↓

Return to self-diagnosis STEP 1?

No → Malfunctioning temperature dial. Replace A/C auto amp.

Yes ↓

Turn temperature dial clockwise.

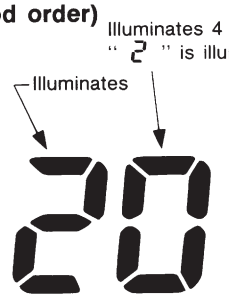
↓

Ⓐ

(Go to next page.)

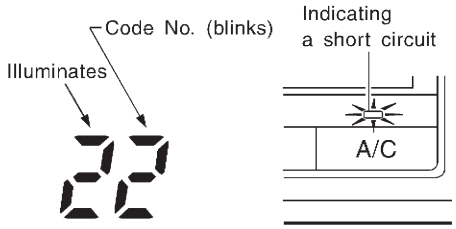
Self-diagnosis (Cont'd)

B Display (when all sensors are in good order)



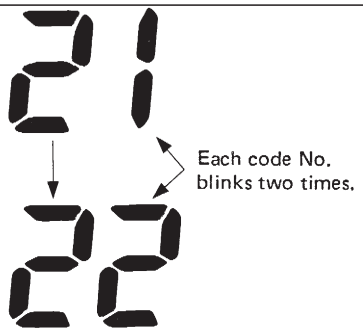
RHA970DA

Display (when sensor malfunctions)



RHA528G

C



RHA501A

Ⓐ

B

STEP 2 - SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT.
Does code No. 20 appear on the display?

No → **C**

Yes → Turn temperature dial clockwise.

Ⓑ
(Go to next page.)

C

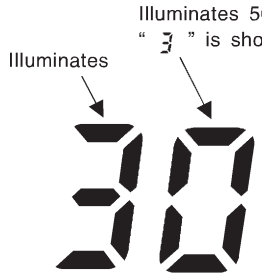
Refer to the following chart for malfunctioning code No.
(If two or more sensors malfunction, corresponding code Nos. blink respectively two times.)

Code No.	Malfunctioning sensor (including circuits)	Reference page
21 / 21 A/C LED	Ambient sensor	HA-103
22 / 22 A/C LED	In-vehicle sensor	HA-105
25 / 25 A/C LED	Sunload sensor*1	HA-107
26 / 26 A/C LED	Air mix door motor (LCU) PBR	HA-79

***1: Conduct self-diagnosis STEP 2 under sunshine.**
When conducting indoors, aim a light (more than 60W) at sunload sensor, otherwise Code No. 25 will indicate despite that sunload sensor is functioning properly.

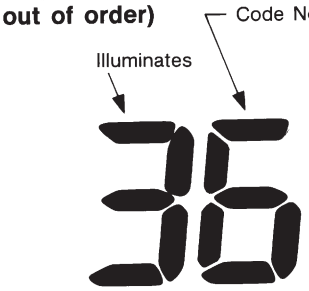
Self-diagnosis (Cont'd)

D **Display (when all doors are in good order)**



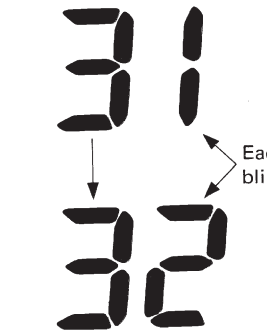
RHA869DC

E **Display (when a door is out of order)**



RHA168DA

E



RHA498A

Ⓑ

D

STEP 3 - MODE DOOR POSITIONS ARE CHECKED.
Does code No. 30 appear on the display?

No → **E**

Yes → Turn temperature dial clockwise.

Ⓒ
(Go to next page.)

E

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

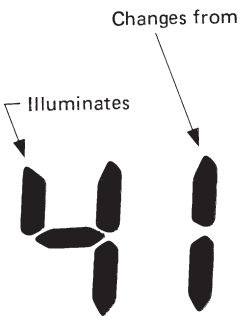
Code No.*1	Mode door position	Reference page
31	VENT	HA-75
32	B/L	
34	FOOT	
35	F/D	
36	DEF	

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

→ 31 → 32 → 34 → 35 → 36 →

Self-diagnosis (Cont'd)

F



RHA495A

G

Discharge air flow

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

RHA654FF

Ⓒ

F

STEP 4 - OPERATION OF EACH ACTUATOR IS CHECKED.
Engine running.
Press DEF switch, code No. of each actuator test is indicated on the display.

G

Refer to the following chart and confirm discharge air flow, air temperature, blower motor voltage and compressor operation.
Checks must be made visually, by listening to any noise, or by touching air outlets with your hand, etc. for improper operation.

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

NG →
- Air outlet does not change.
  Go to HA-75.
- Intake door does not change.
  Go to HA-82.
- Discharge air temperature does not change.
  Go to HA-79.
- Magnet clutch does not engage.
  Go to HA-92.
- Blower motor operation is malfunctioning.
  Go to HA-86.

OK ↓

Turn ignition switch OFF or AUTO switch ON.

↓

END

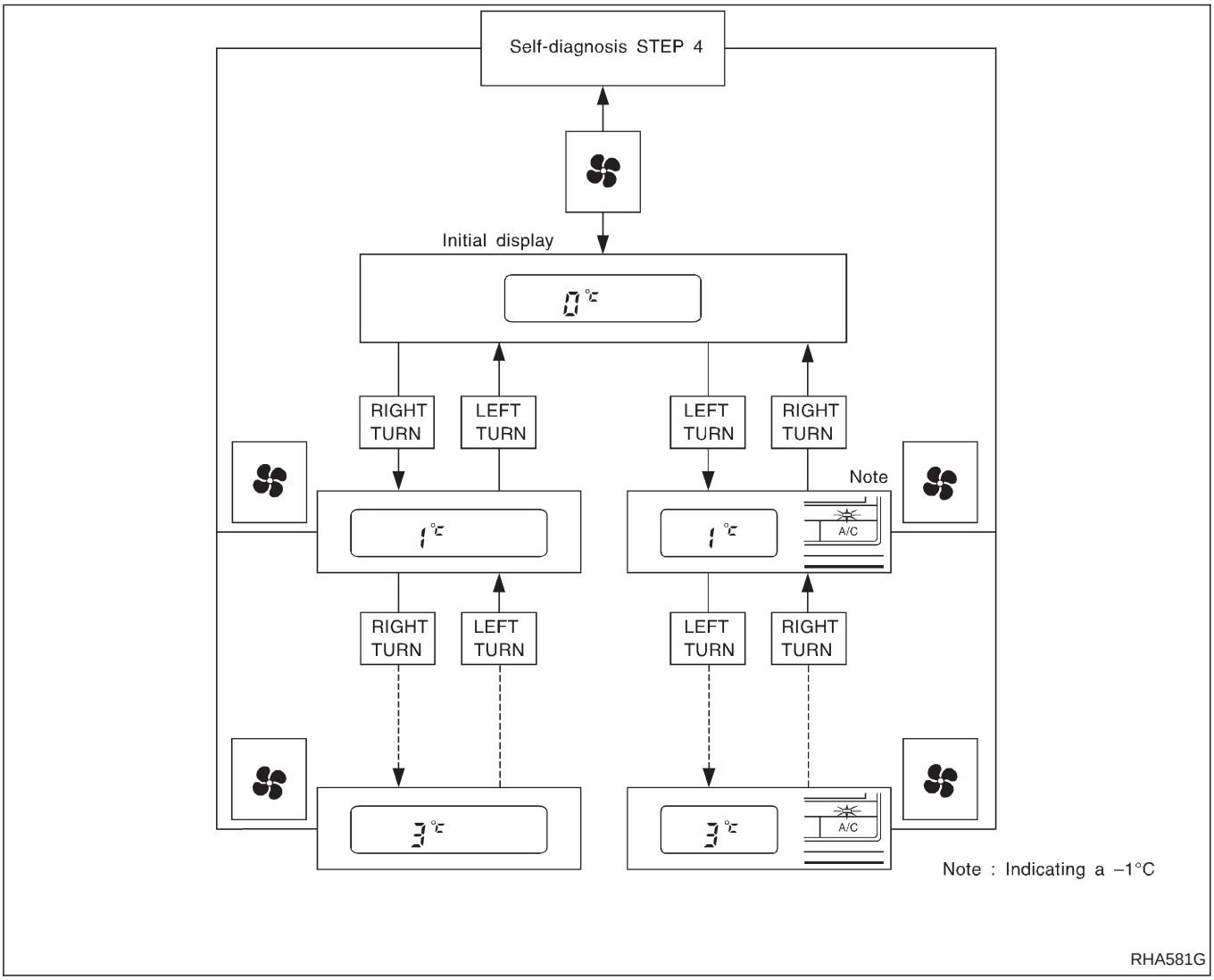
Self-diagnosis (Cont'd)

AUXILIARY MECHANISM: Temperature setting trimmer

The trimmer compensates for differences in range of ±3°C between temperature setting (displayed digitally) and temperature felt by driver.

Operating procedures for this trimmer are as follows:

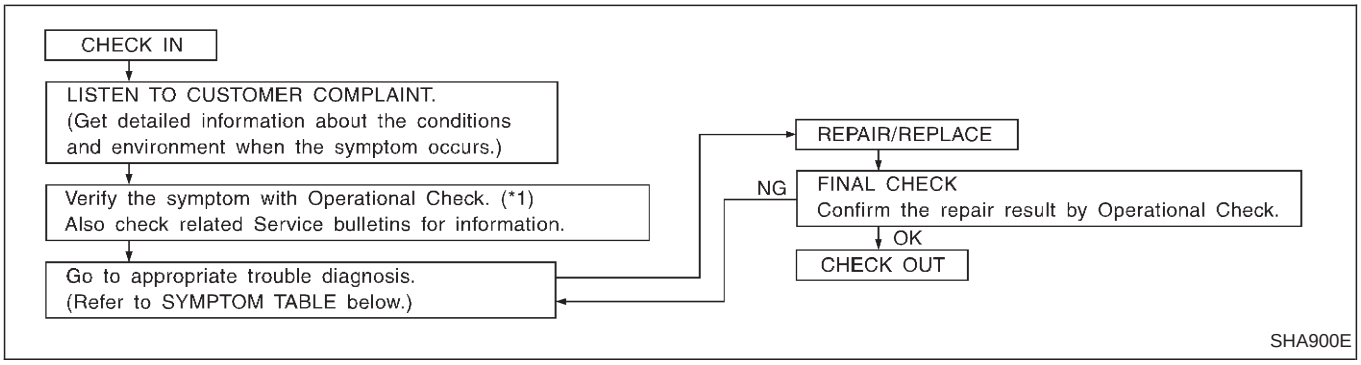
- Begin Self-diagnosis STEP 4 mode.
- Press (fan) switch to set system in auxiliary mode.
- Turn temperature dial clockwise or counterclockwise as desired. Temperature will change at a rate of 1°C each time a switch is pressed.



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

How to Perform Trouble Diagnoses for Quick and Accurate Repair

WORK FLOW



*1: Operational Check (HA-70)

SYMPTOM TABLE

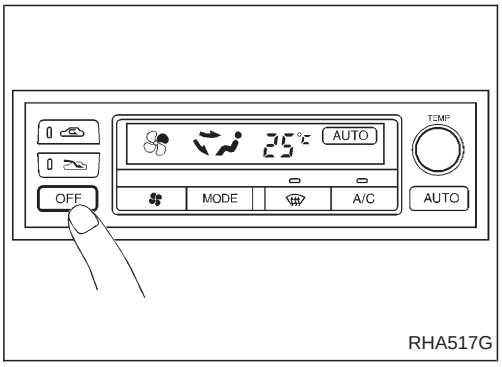
Symptom	Reference page	
● A/C system does not come on.	● Go to Trouble Diagnosis Procedure for A/C system.	HA-73
● Air outlet does not change. ● Mode door motor does not operate normally.	● Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN).	HA-75
● Discharge air temperature does not change. ● Air mix door motor does not operate normally.	● Go to Trouble Diagnosis Procedure for Air Mix Door Motor (LAN).	HA-79
● Intake door does not change. ● Intake door motor does not operate normally.	● Go to Trouble Diagnosis Procedure for Intake Door Motor.	HA-82
● Blower motor operation is malfunctioning. ● Blower motor operation is malfunctioning under out of starting fan speed control.	● Go to Trouble Diagnosis Procedure for Blower Motor.	HA-86
● Magnet clutch does not engage.	● Go to Trouble Diagnosis Procedure for Magnet Clutch.	HA-92
● Insufficient cooling.	● Go to Trouble Diagnosis Procedure for Insufficient Cooling.	HA-98
● Insufficient heating.	● Go to Trouble Diagnosis Procedure for Insufficient Heating.	HA-99
● Noise.	● Go to Trouble Diagnosis Procedure for Noise.	HA-100
● Self-diagnosis cannot be performed.	● Go to Trouble Diagnosis Procedure for Self-diagnosis.	HA-101
● Memory function does not operate.	● Go to Trouble Diagnosis Procedure for Memory Function.	HA-102

Operational Check

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

CONDITIONS

- **Engine running and at normal operating temperature.**

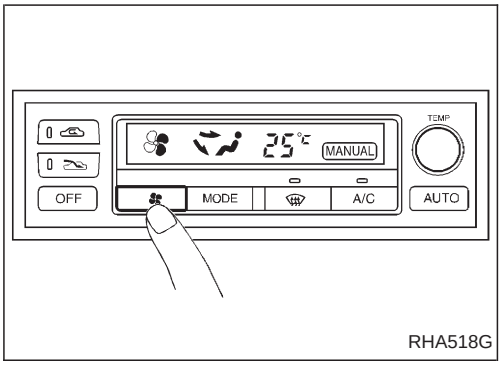


RHA517G

PROCEDURE

1. Check memory function

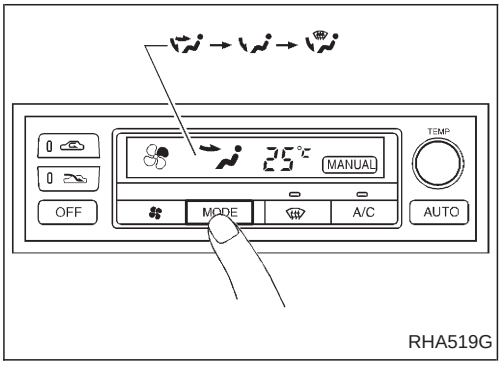
a. Set the temperature 25°C.
b. Press OFF switch.
c. Turn the ignition off.
d. Turn the ignition on.
e. Press the AUTO switch.
f. Confirm that the set temperature remains at previous temperature.
g. Press OFF switch.



RHA518G

2. Check blower

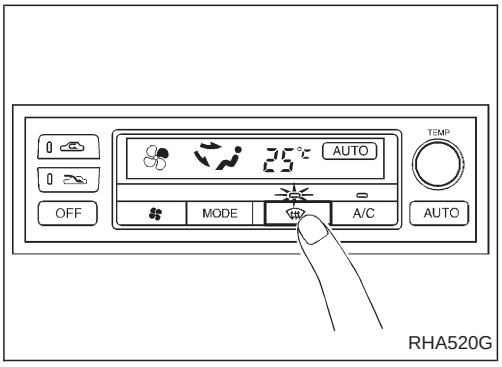
a. Press fan switch one time.
Blower should operate on low speed.
The fan symbol should have one blade lit .
b. Press fan switch one more time, and continue checking blower speed and fan symbol until all speeds are checked.
c. Leave blower on MAX speed .



RHA519G

3. Check discharge air

a. Press mode switch four times and DEF button.



RHA520G

Operational Check (Cont'd)

Discharge air flow

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

RHA654FD

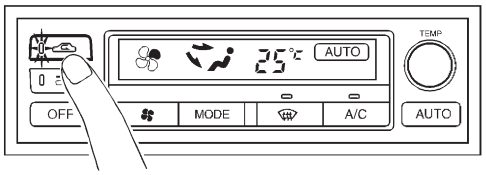
b. Confirm that discharge air comes out according to the air distribution table at left.

Refer to "Discharge Air Flow" (HA-13).

NOTE:

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

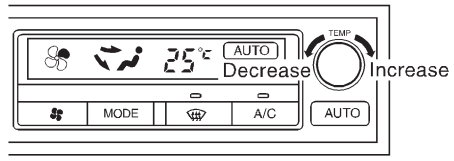
Intake door position is checked in the next step.



RHA521G

4. Check recirculation

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

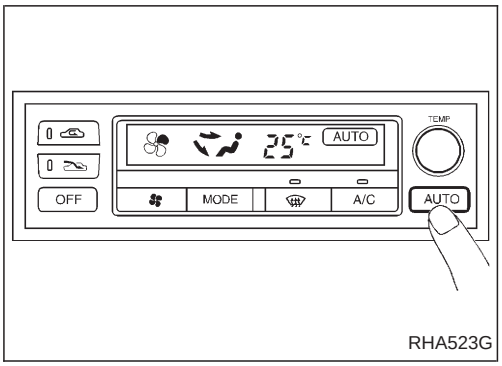


RHA522G

5. Check temperature dial

a. Turn temperature dial counterclockwise until 18°C is displayed.
b. Check for cold air at discharge air outlets.
c. Turn temperature dial clockwise until 32°C is displayed.
d. Check for hot air at discharge air outlets.

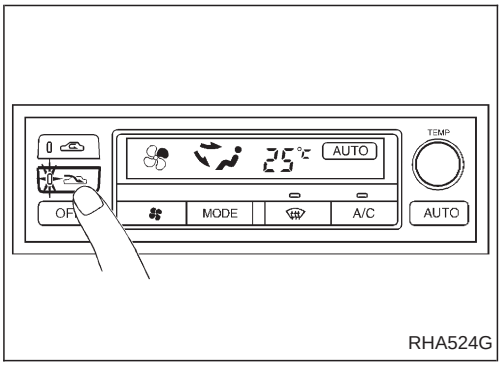
Operational Check (Cont'd)



RHA523G

6. Check AUTO mode

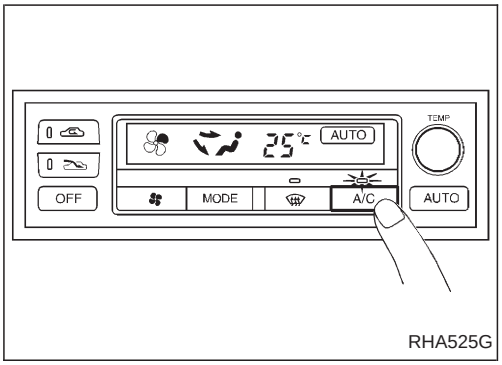
a. Press AUTO switch.
b. Display should indicate AUTO.
Confirm that the compressor clutch engages (audio or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)



RHA524G

7. Check FRESH switch

a. Press FRE switch.
FRESH indicator should illuminate.
b. Listen for intake door position change. (You should hear a slight change in blower sound.)



RHA525G

8. Check A/C switch

a. Press A/C switch.
A/C indicator should illuminate.
b. Confirm that the compressor clutch is engaged.

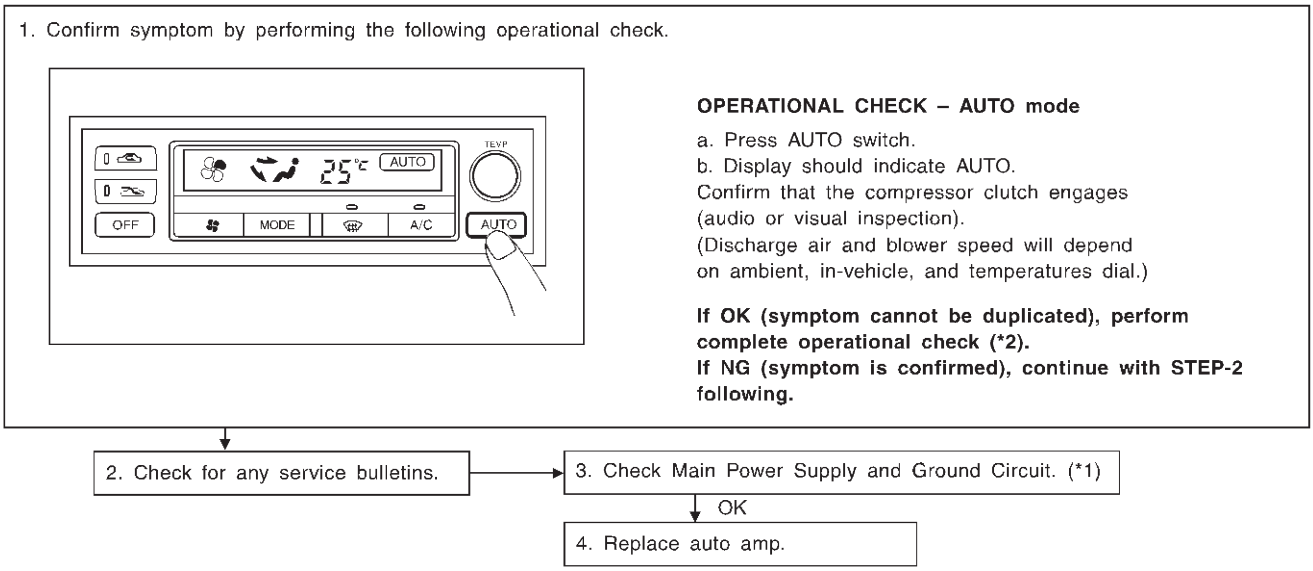
A/C System

TROUBLE DIAGNOSIS PROCEDURE FOR A/C SYSTEM

SYMPTOM:

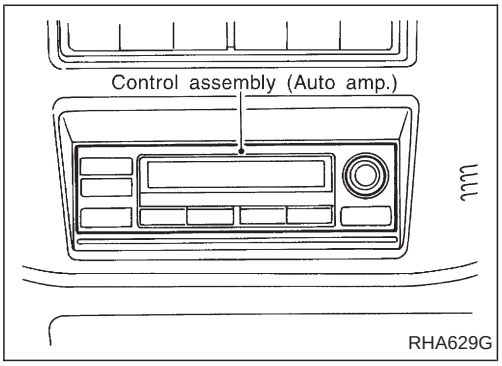
- **A/C system does not come on.**

Inspection flow

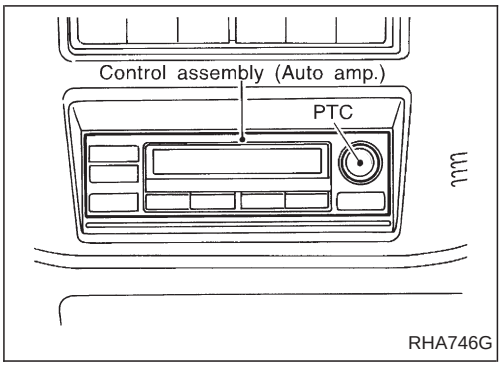


SHA019F

*1: HA-74 *2: HA-70



RHA629G



RHA746G

COMPONENT DESCRIPTION

Automatic amplifier (Auto amp.)

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

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

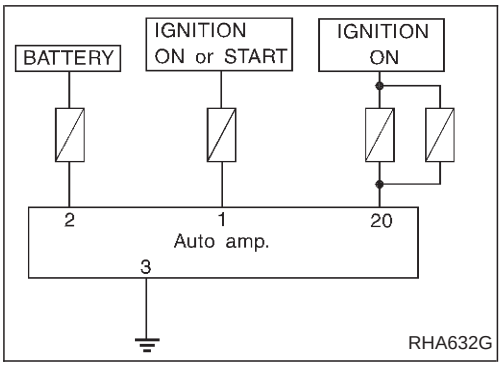
Self-diagnostic functions are also built into auto amplifier to provide quick check of malfunctions in the auto air conditioner system.

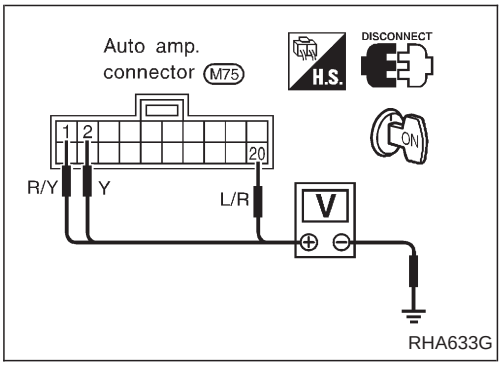
Potentio temperature control (PTC)

The PTC is built into the A/C auto amp. It can be set at an interval of 1°C in the 18°C to 32°C temperature range by turning the temperature dial. The set temperature is digitally displayed.

A/C System (Cont'd)

DIAGNOSTIC PROCEDURE





Auto amp. check

Check power supply circuit for auto amp. with ignition switch ON. Measure voltage across terminal Nos. ①, ②, ⑳ and body ground.

Voltmeter terminal		Voltage
⊕	⊖	
①	Body ground	Approx. 12V
②		
⑳		

Mode Door Motor

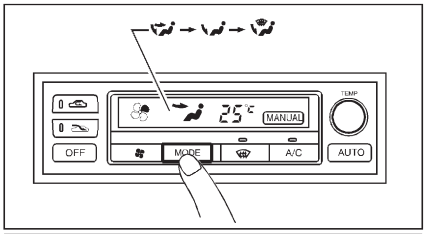
TROUBLE DIAGNOSIS PROCEDURE FOR MODE DOOR MOTOR (LAN)

SYMPTOM:

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

Inspection flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Discharge air

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

Discharge air flow

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

c. Confirm that discharge air comes out according to the air distribution table at left.
Refer to "Discharge Air Flow" (*1).

NOTE:

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

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*3) — OK
4. Perform self-diagnosis STEP-2. (*4) — NG → Go to appropriate malfunctioning sensor circuit. (*12)
5. Perform self-diagnosis STEP-3. (*5) — NG → Go to DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR AND AIR MIX DOOR MOTOR CIRCUIT. (*11)
6. Perform self-diagnosis STEP-4. (*6) — NG → Check mode door control linkage. (*13) — NG → Repair or adjust control linkage.

[Cause cannot be confirmed by self-diagnosis.]

7. Check ambient sensor circuit. (*7)
8. Check in-vehicle sensor circuit. (*8)
9. Check sunload sensor circuit. (*9)
10. Check intake sensor circuit. (*10)
11. Check air mix door motor PBR circuit. (*11) — OK → INSPECTION END

If the symptom still exists, perform a complete operational check (*14) and check for other symptoms.
[Refer to symptom table, (*15).]
Does another symptom exist?

- Yes → Go to Trouble Diagnosis for related symptoms.
  [Another symptom exists.]
- No → Replace auto amp.

SHA020F

*1: HA-13
*2: HA-70
*3: HA-64
*4: HA-65
*5: HA-66
*6: HA-67
*7: HA-103
*8: HA-105
*9: HA-107
*10: HA-110
*11: HA-79
*12: HA-65
*13: HA-77
*14: HA-70
*15: HA-69

Mode Door Motor (Cont'd)

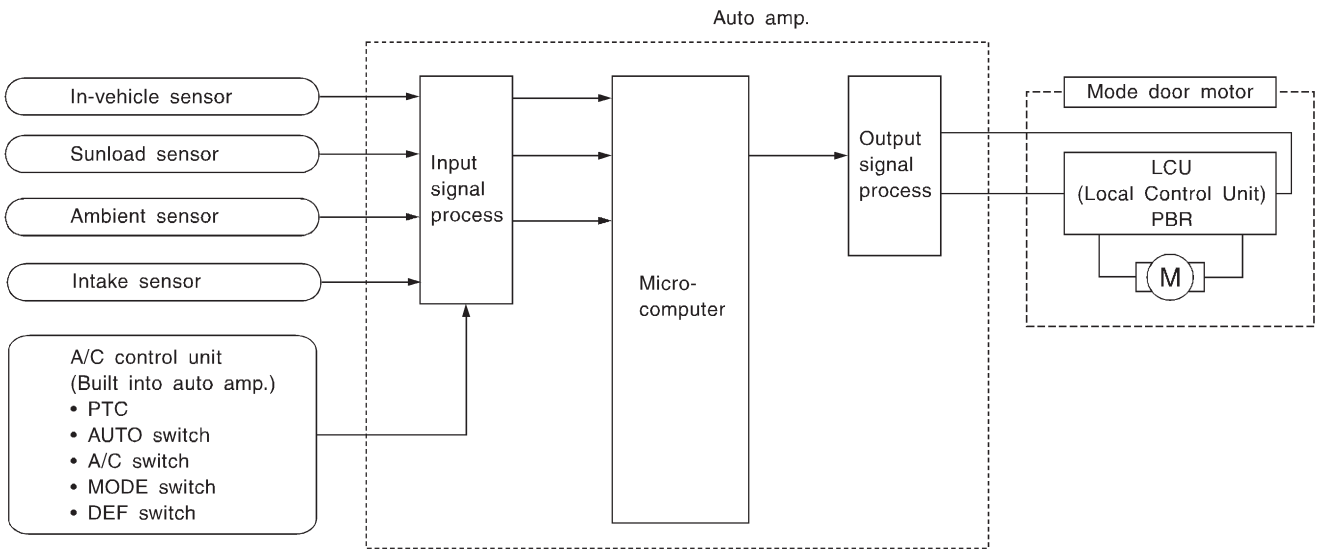
SYSTEM DESCRIPTION

Component parts

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

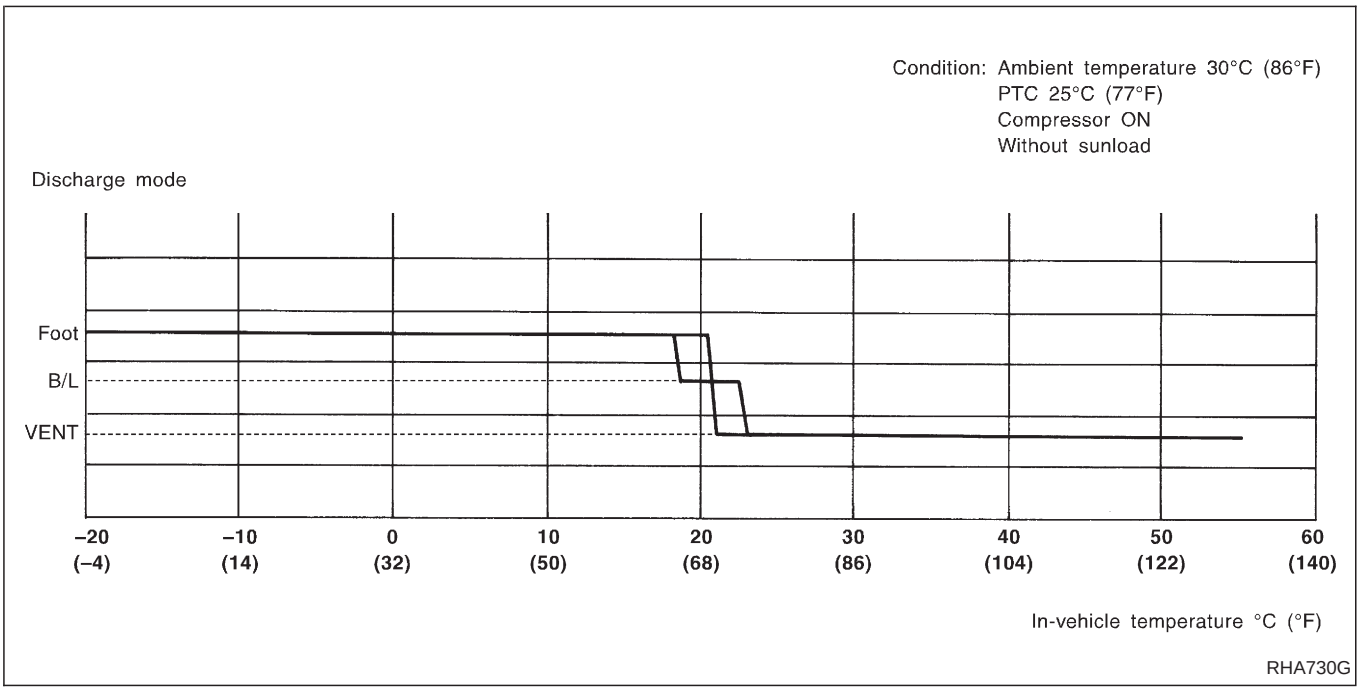
System operation

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



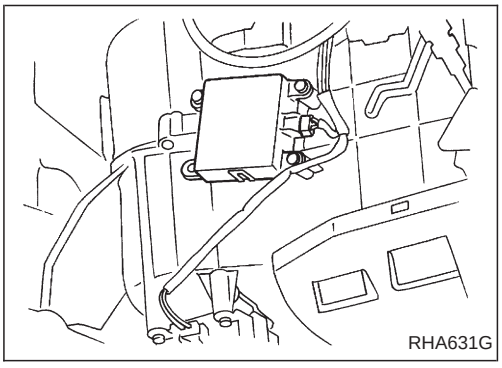
Mode Door Motor (Cont'd)

Mode door control specification



COMPONENT DESCRIPTION

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



CONTROL LINKAGE ADJUSTMENT

Mode door

1. Install mode door motor on heater unit and connect it to main harness.
2. Set up code No. 46 in Self-diagnosis STEP 4. Refer to HA-67.
3. Move side link by hand and hold mode door in DEF mode.
4. Make sure mode door operates properly when changing from code No. 41 to 46 by pushing DEF switch.

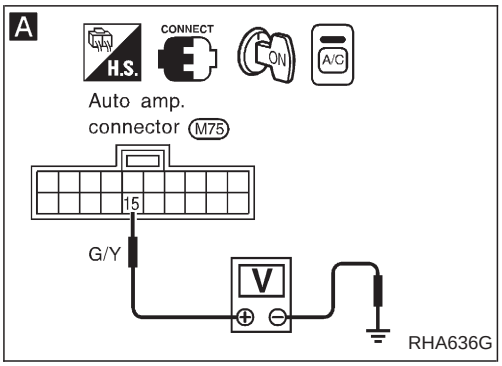
41	42	43	44	45	46
VENT	B/L	B/L	FOOT	F/D	DEF

Mode Door Motor (Cont'd)

DIAGNOSTIC PROCEDURE

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

A

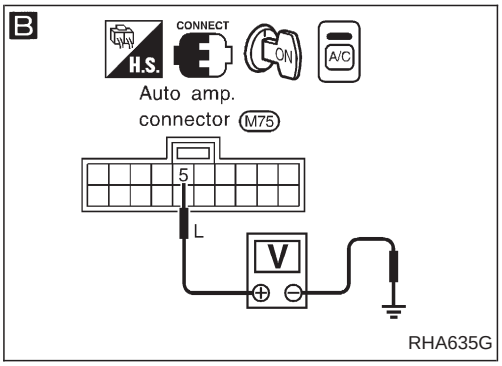


CHECK POWER SUPPLY FOR AUTO AMP. (LCU) SIDE.
Do approx. 12 volts exist between auto amp. (LCU) terminal ⑮ and body ground?

No → Replace auto amp. (LCU).

Yes ↓

B

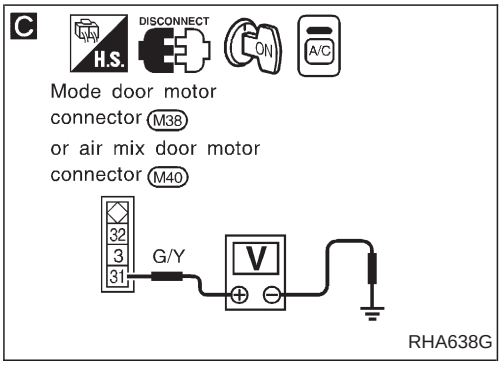


CHECK SIGNAL AUTO AMP. (LCU) SIDE.
Do approx. 5.5 volts exist between auto amp. (LCU) terminal ⑤ and body ground?

No → Replace auto amp. (LCU).

Yes ↓

C

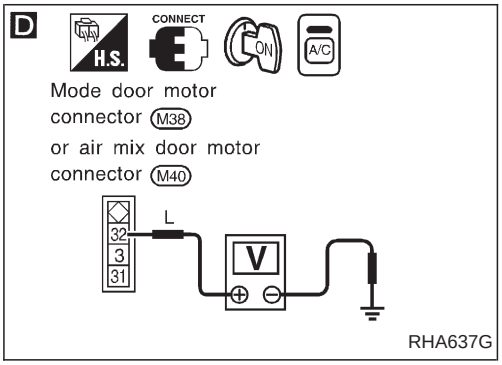


CHECK POWER SUPPLY FOR MOTOR SIDE.
Do approx. 12 volts exist between door motor (LCU) harness terminal ㉛ and body ground?

Note

Yes ↓

D

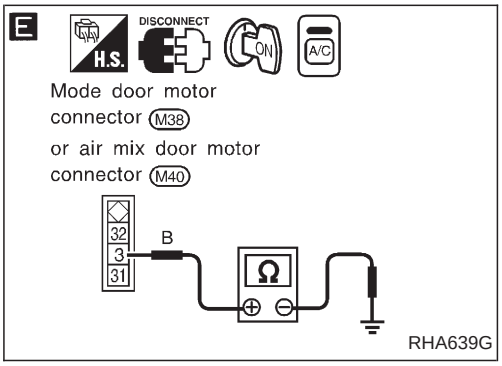


CHECK SIGNAL MOTOR SIDE.
Do approx. 5.5 volts exist between door motor (LCU) terminal ㉜ and body ground?

Note

Yes ↓

E



CHECK MOTOR GROUND CIRCUIT.
Check harness continuity between door motor (LCU) harness terminal ③ and body ground.

Note

OK ↓

Disconnect the mode door motor and air mix door motor connector.

↓

CHECK THE MODE DOOR MOTOR OPERATION.
Reconnect the mode door motor and confirm the motor operation.

Mode door motor operates normally.

OK → Replace the air mix door motor.

NG ↓

Disconnect the mode door motor.

↓

CHECK THE AIR MIX DOOR MOTOR OPERATION.
Reconnect the air mix door motor and confirm the motor operation.

Air mix door motor operates normally.

OK → Replace the mode door motor.

NG ↓

Replace the auto amp. (LCU).

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

Air Mix Door Motor

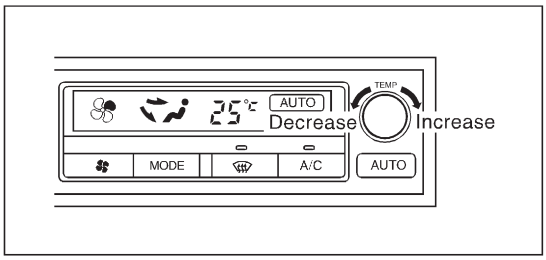
TROUBLE DIAGNOSIS PROCEDURE FOR AIR MIX DOOR (LAN)

SYMPTOM:

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

Inspection flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK

Temperature increase

a. Turn the temperature dial increase until 32°C is displayed.
b. Check for hot air at discharge air outlets.

Temperature decrease

a. Turn the temperature dial decrease button until 18°C is displayed.
b. Check for cold air at discharge air outlets.

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

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*2)
NG → Go to appropriate malfunctioning sensor circuit. (*2)
OK
5. Perform self-diagnosis STEP-4. (*3)
NG → Check air mix door control linkage. (*11)
OK → Go to DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR AND AIR MIX DOOR MOTOR CIRCUIT. (*10)
Cause cannot be confirmed by self-diagnosis.
NG → Repair or adjust control linkage. (*11)
OK
6. Check ambient sensor circuit. (*4)
OK
7. Check in-vehicle sensor circuit. (*5)
OK
8. Check sunload sensor circuit. (*6)
OK
9. Check intake sensor circuit. (*7)
OK
10. Check air mix door motor PBR circuit. (*8)
OK → INSPECTION END
If the symptom still exists, perform a complete operational check (*12) and check for other symptoms. [Refer to symptom table, (*9).] Does another symptom exist?
Yes → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
No
Replace auto amp.

SHA021F

*1: HA-64
*2: HA-65
*3: HA-67
*4: HA-103
*5: HA-105
*6: HA-107
*7: HA-110
*8: HA-79
*9: HA-69
*10: HA-78
*11: HA-81
*12: HA-70

Air Mix Door Motor (Cont'd)

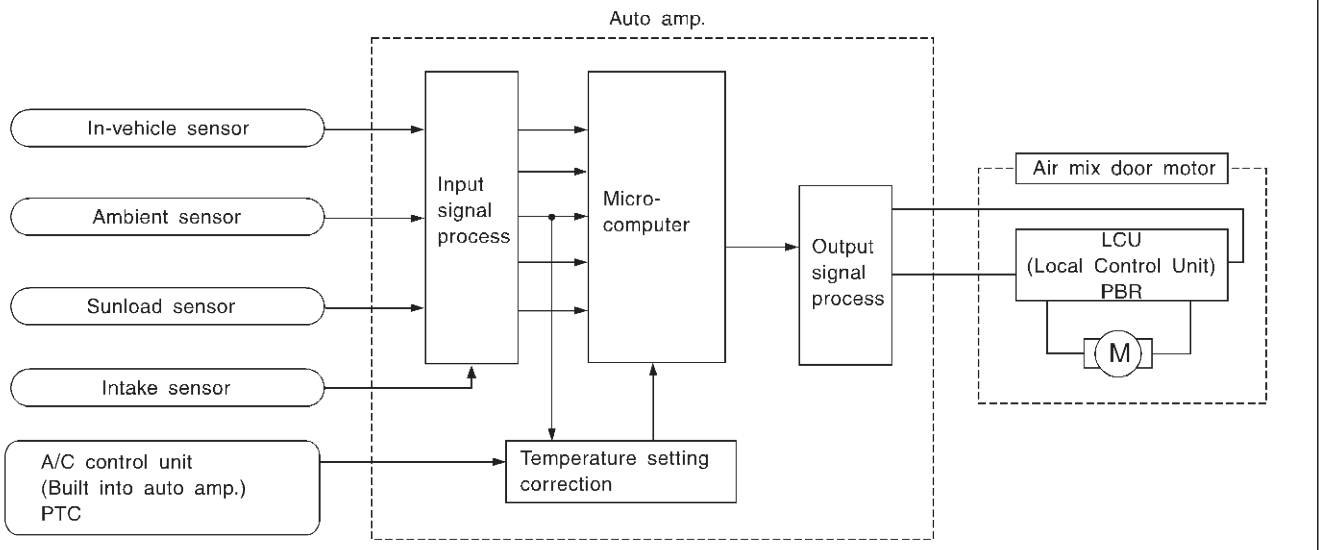
SYSTEM DESCRIPTION

Component parts

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

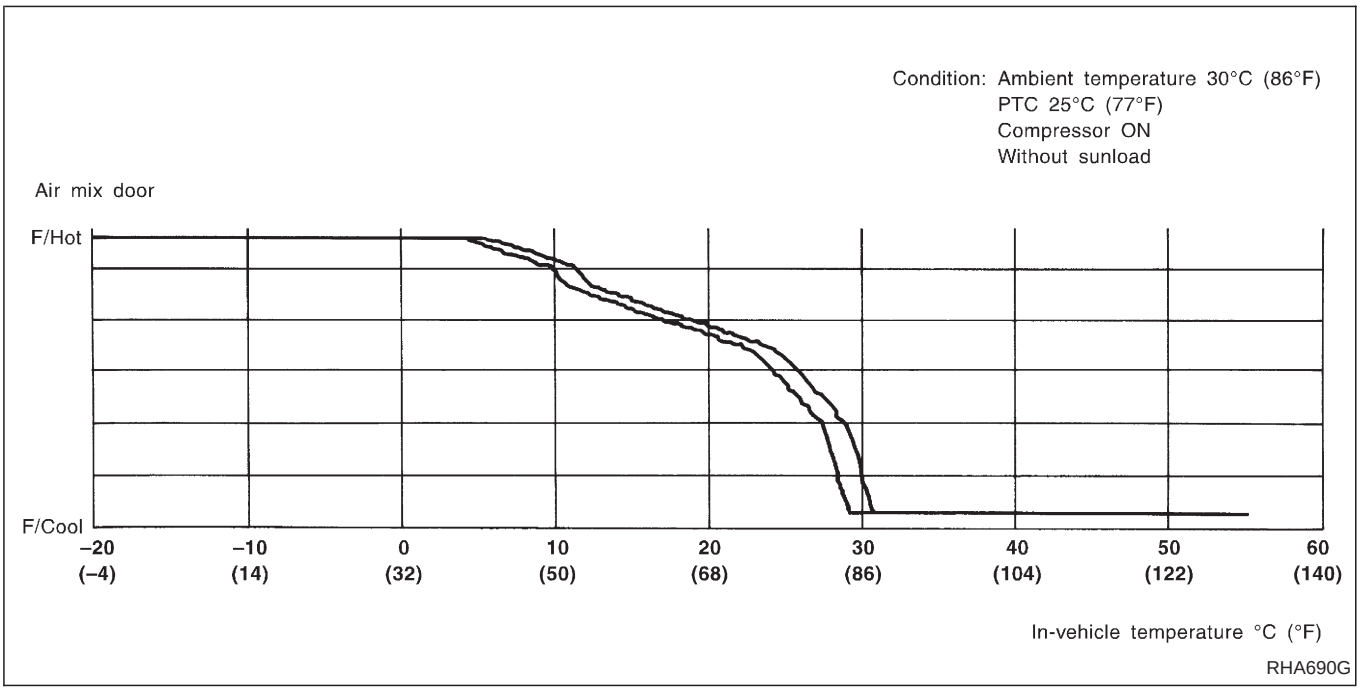
System operation

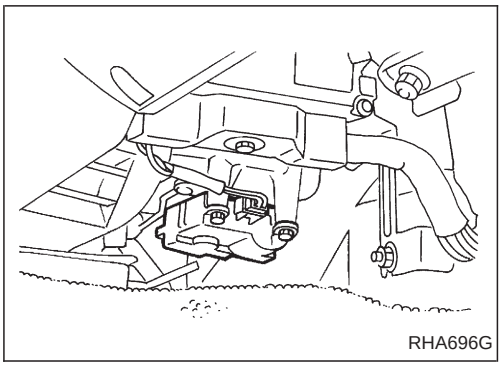
The auto amplifier receives data from each of the sensors. The amplifier sends air mix door and mode door opening angle data to the air mix door motor LCU and mode door motor LCU.
The air mix door motor and mode door motor read their respective signals according to the address signal. Opening angle indication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

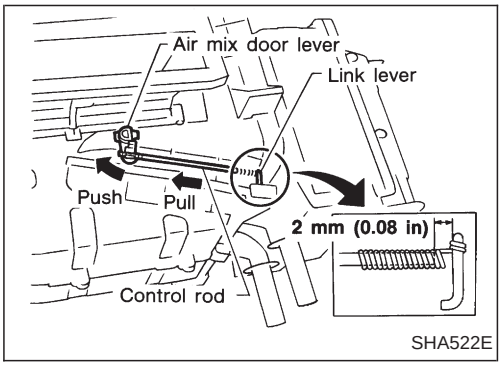


Air Mix Door Motor (Cont'd)

Air mix door control specification







COMPONENT DESCRIPTION

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

CONTROL LINKAGE ADJUSTMENT

Air mix door (Water cock)

1. Install air mix door motor on heater unit and connect it to main harness.
2. Set up code No. 41 in Self-diagnosis STEP 4. Refer to HA-67.
3. Move air mix door lever by hand and hold it in full cold position.
4. Attach air mix door lever to rod holder.
5. Make sure air mix door operates properly when changing from code No. 41 to 46 by pushing DEF switch.

41	42	43	44	45	46
Full cold		Full hot			

6. Set up code No. 41 in Self-diagnosis STEP 4.
7. Attach water cock cable to air mix door linkage and secure with clip.
8. Rotate and hold water cock lever AND plate in the full cold position (CLOCKWISE completely).
9. Attach water cock cable to plate and secure with clip (white mark on cable housing should be centered under the retaining clip).
10. Check that water cock operates properly when changing from code No. 41 to 46 by pushing DEF switch. (After several cycles, water cock lever should be midpoint of plate opening when code No. 41 is set.)

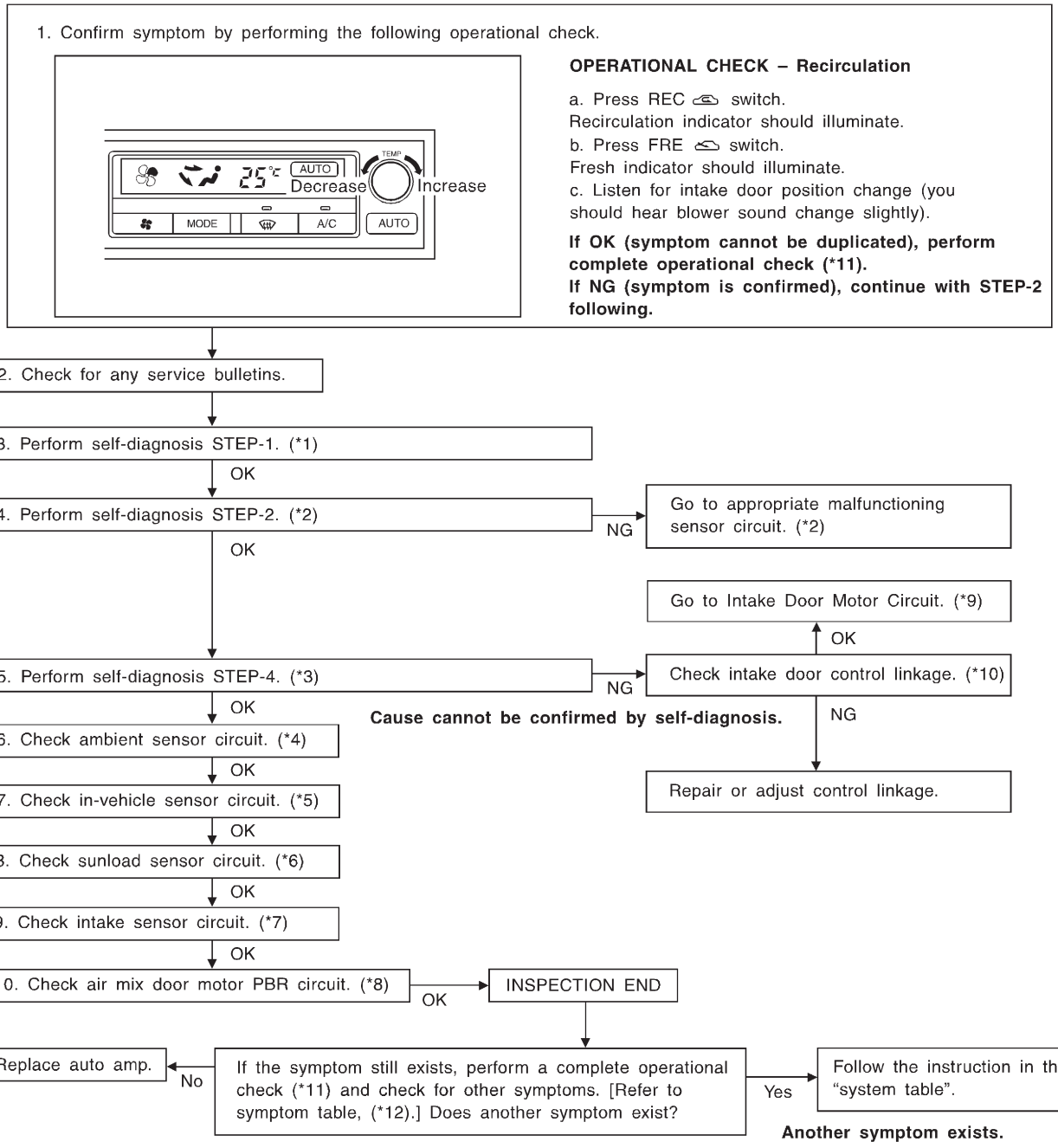
Intake Door Motor

TROUBLE DIAGNOSIS PROCEDURE FOR INTAKE DOOR

SYMPTOM:

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

Inspection flow



SHA022F

*1: HA-64
*2: HA-65
*3: HA-67
*4: HA-103
*5: HA-105
*6: HA-107
*7: HA-110
*8: HA-79
*9: HA-85
*10: HA-84
*11: HA-70
*12: HA-69

Intake Door Motor (Cont'd)

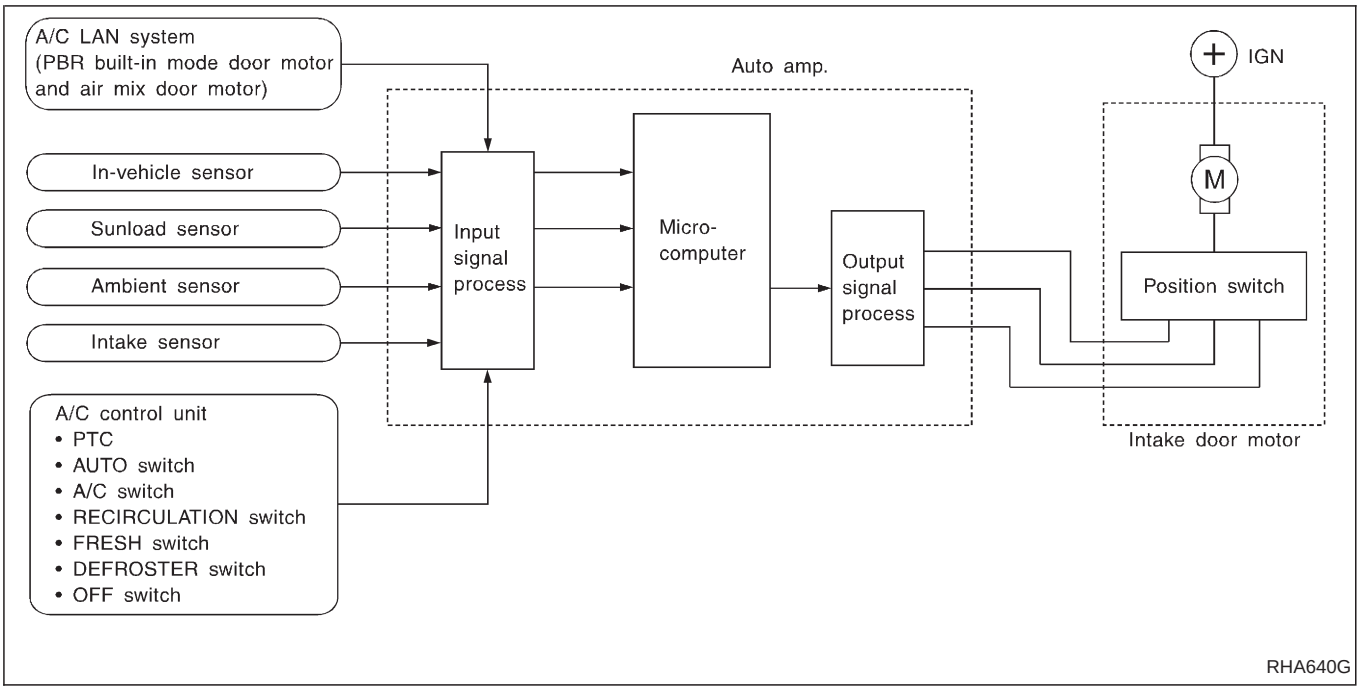
SYSTEM DESCRIPTION

Component parts

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

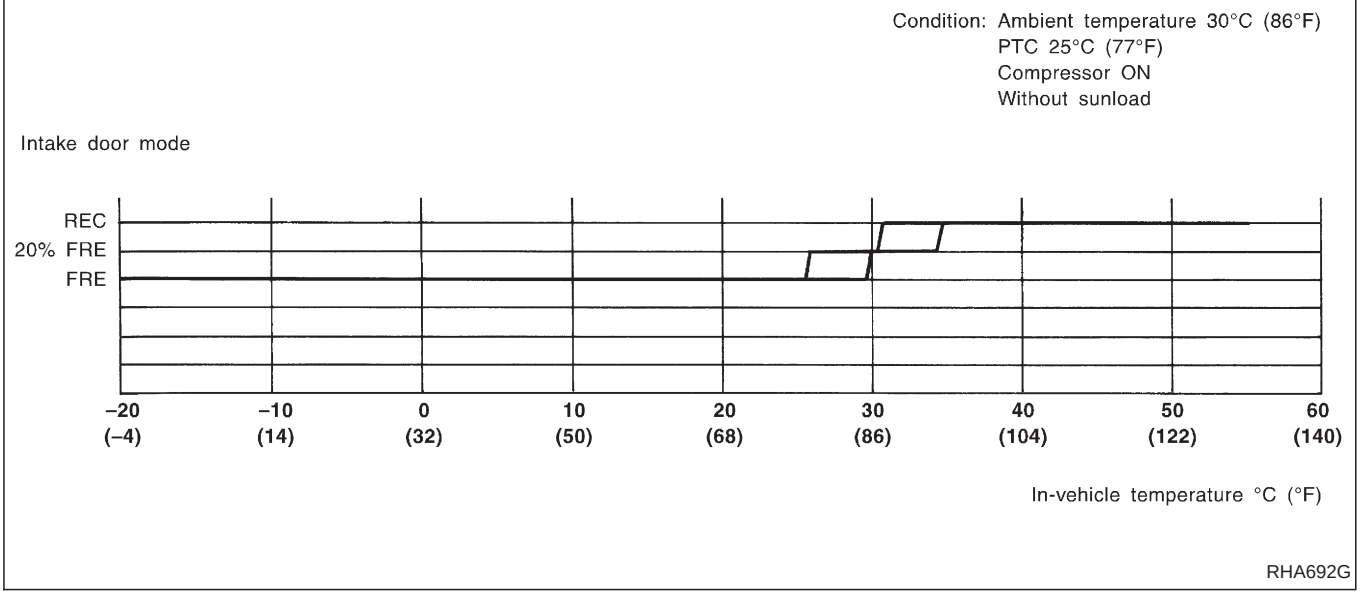
System operation

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



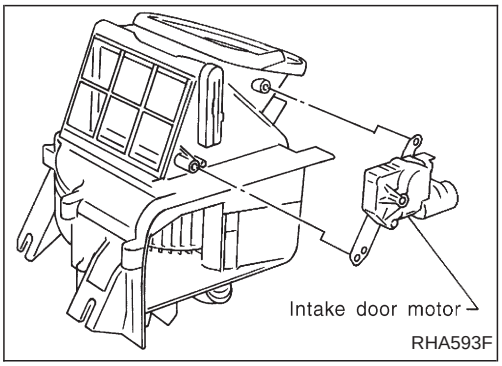
Intake Door Motor (Cont'd)

Intake door control specification



COMPONENT DESCRIPTION

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



CONTROL LINKAGE ADJUSTMENT

Intake door

1. Install intake door motor on intake unit and connect it to main harness.
2. Set up code No. 41 in Self-diagnosis STEP 4. Refer to HA-67.
3. Move intake door link by hand and hold it in REC position.
4. Attach intake door lever to rod holder.
5. Make sure intake door operates properly when changing from code No. 41 to 46 by pushing DEF switch.

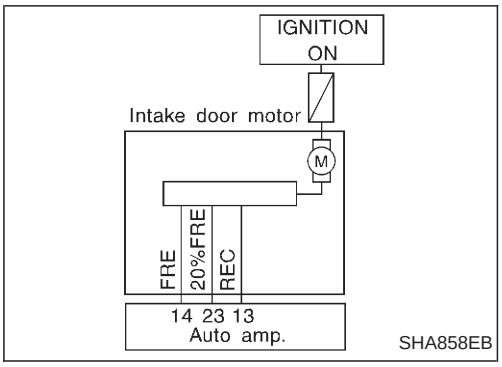
41	42	43	44	45	46
REC		20% FRE	FRE		

Intake Door Motor (Cont'd)

DIAGNOSTIC PROCEDURE

SYMPTOM: Intake door motor does not operate normally.

- **Perform Self-diagnosis STEP 4 before referring to the flow chart.**

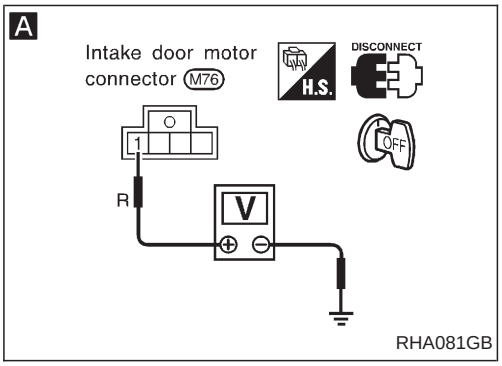


A

CHECK POWER SUPPLY FOR INTAKE DOOR MOTOR.
Disconnect intake door motor harness connector.
Do approx. 12 volts exist between intake door motor harness terminal No. ① and body ground?

No → Check power supply circuit and 10A fuse (No. 6, located in the fuse block).

Yes ↓



B

CHECK FOR AUTO AMP. OUTPUT.
Set up Self-diagnosis STEP 4.
Measure voltage across auto amp. harness terminals and body ground.

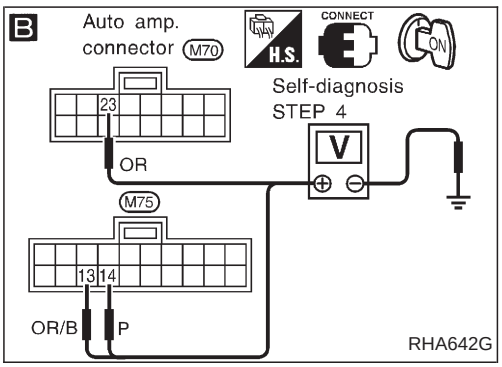
Code No.	Terminal No. ⊕	Terminal No. ⊖	Condition	Voltage V
41 42	⑬	Body ground	REC	0
	㉓			12
	⑭			12
43	⑬		20% FRE	12
	㉓			0
	⑭			12
44 45 46	⑬		FRE	12
	㉓			12
	⑭			0

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

NG → C

OK ↓

Replace intake door motor.



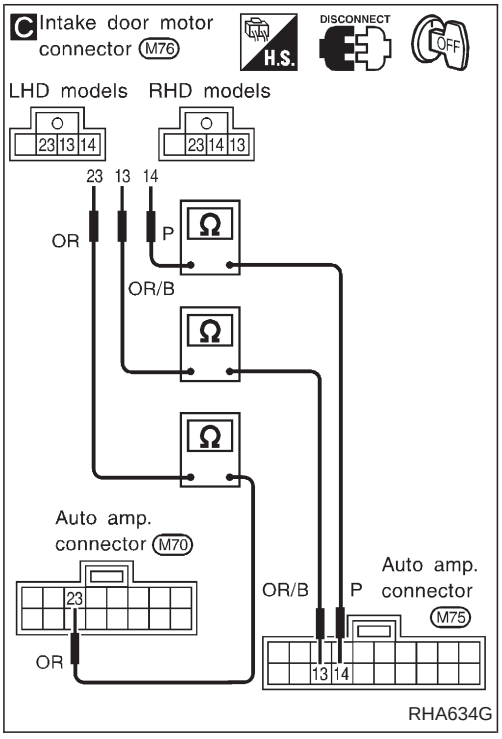
C Note

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

Terminal No. ⊕ (Auto amp.)	Terminal No. ⊖ (Intake door motor)	Continuity
⑬	⑬	Yes
㉓	㉓	
⑭	⑭	

OK ↓

Replace auto amp.



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

Blower Motor

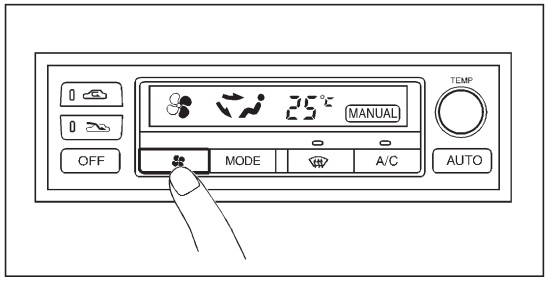
TROUBLE DIAGNOSIS PROCEDURE FOR BLOWER MOTOR

SYMPTOM:

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

Inspection flow

1. Confirm symptom by performing the following operational check.



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

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

2. Check for any service bulletins.

3. Perform self-diagnosis STEP-1. (*1)

OK

4. Perform self-diagnosis STEP-2. (*2)

NG → Go to appropriate malfunctioning sensor circuit. (*2)

OK

5. Perform self-diagnosis STEP-4. (*3)
Does blower motor speed change according to each code No.?

Code No.	41	42	43	44	45	46
Blower motor speed	Low	Middle high	Middle low			High

No → Go to Blower Motor Circuit. (*4)

Yes

6. Is engine coolant temperature below 50°C (122°F) and ambient temperature below 15°C (59°F)?

No → Blower motor operation is normal.

Yes

7. Is blower motor operating under starting blower speed control?

No → Go to Blower Motor Circuit. (*4)

Cause cannot be confirmed by self-diagnosis.

OK → Check thermal transmitter control circuit. Refer to EL section (“Thermal Transmitter Check”, “METERS AND GAUGES”).

Yes

8. Check ambient sensor circuit. (*5)

OK

9. Check in-vehicle sensor circuit. (*6)

OK

10. Check sunload sensor circuit. (*7)

OK

11. Check intake sensor circuit. (*8)

OK

12. Check air mix door motor PBR circuit. (*9)

OK → INSPECTION END

If the symptom still exists, perform a complete operational check (*10) and check for other symptoms. [Refer to symptom table, (*11).] Does another symptom exist?

Yes → Go to Trouble Diagnosis for related symptom.

Another symptom exists.

No

Replace auto amp.

SHA026F

*1: HA-64
*2: HA-65
*3: HA-67
*4: HA-89
*5: HA-103
*6: HA-105
*7: HA-107
*8: HA-110
*9: HA-79
*10: HA-70
*11: HA-69

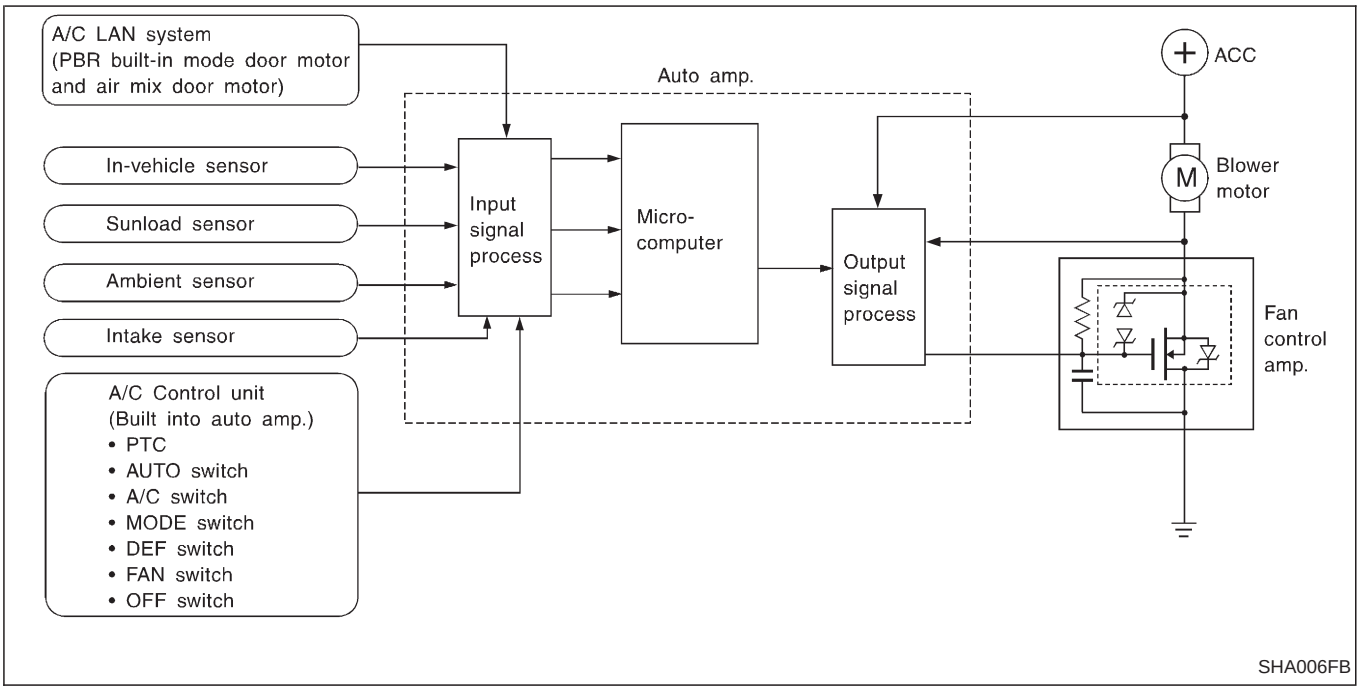
Blower Motor (Cont'd)

SYSTEM DESCRIPTION

Component parts

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

System operation



Automatic mode

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

Starting fan speed control

Start up from "COLD SOAK" condition (Automatic mode)

In a cold start up condition where the engine coolant temperature is below 50°C, the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.
In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 55°C, at which time the blower speed will increase to the objective speed.

Start up from normal or "HOT SOAK" condition (Automatic mode)

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

Blower Motor (Cont'd)

Blower speed compensation

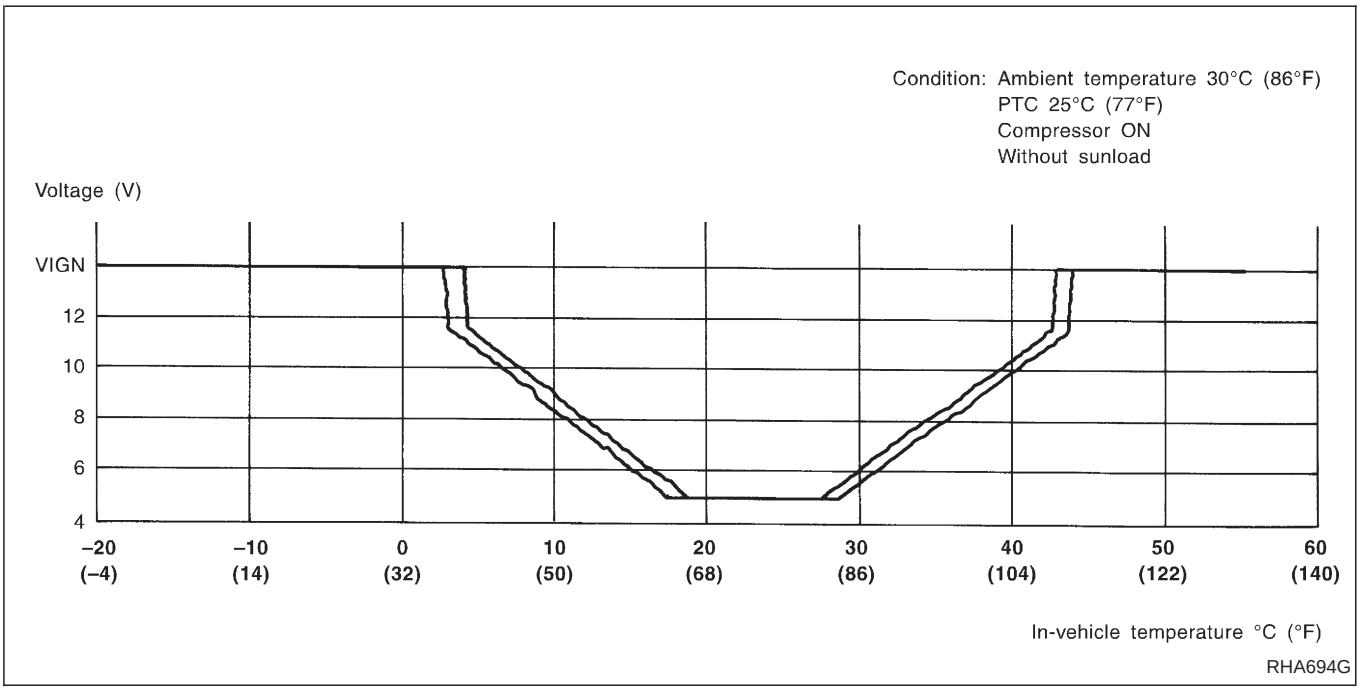
Sunload

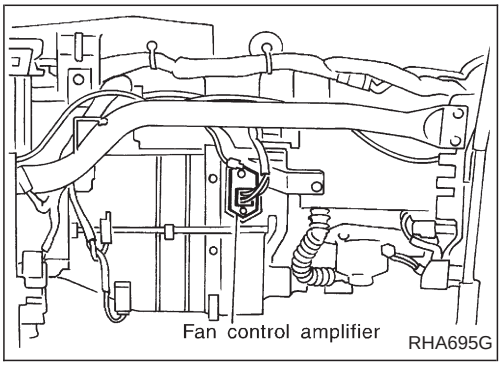
When the in-vehicle temperature and the set temperature are very close, the blower will be operating at low speed. The low speed will vary depending on the sunload. During conditions of high sunload, the blower low speed is ''normal'' low speed (approx. 6V). During low or no sunload conditions, the low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

Ambient

When the ambient temperature is in the ''moderate'' range [10 − 15°C], the computed blower voltage will be compensated (reduced) by up to 3.5V (depending on the blower speed). In the ''extreme'' ambient ranges [below 0°C and above 20°C] the computed objective blower voltage is not compensated at all. In the ambient temperature ranges between ''moderate'' and ''extreme'' [0 - 10°C and 15 - 20°C], the amount of compensation (for a given blower speed) varies depending on the ambient temperature.

Fan speed control specification





COMPONENT DESCRIPTION

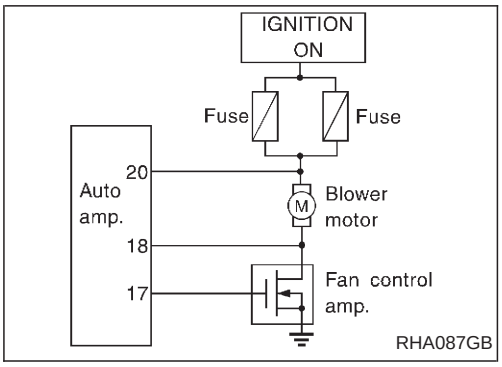
Fan control amplifier

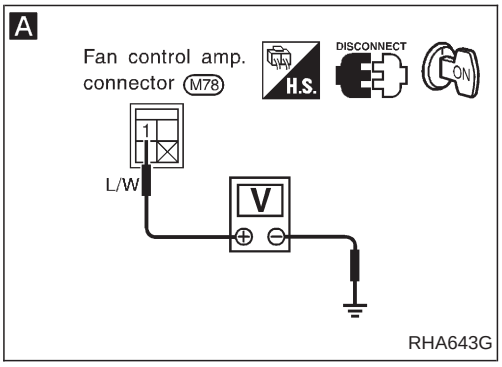
The fan control amplifier is located on the cooling unit. The fan control amp. receives a gate voltage from the auto amp. to steplessly maintain the blower fan motor voltage in the 5 to 12 volt range (approx.).

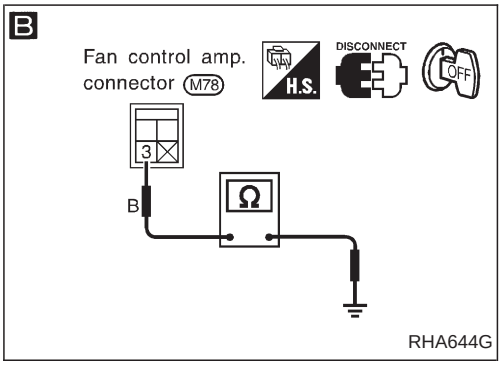
Blower Motor (Cont'd)

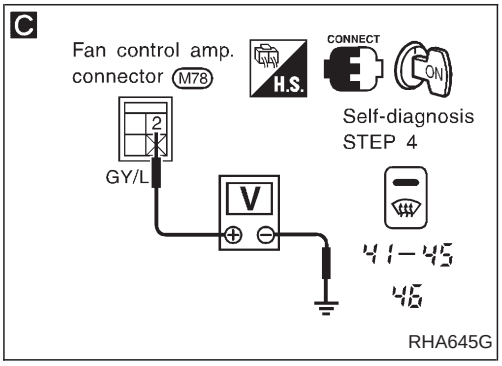
DIAGNOSTIC PROCEDURE

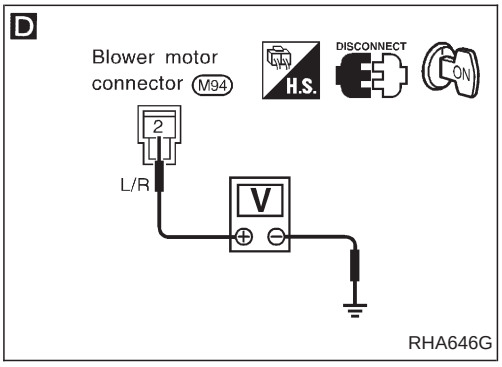
SYMPTOM: Blower motor operation is malfunctioning under Starting Fan Speed Control.











A

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?

No → **D**

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

Yes → **B**

Note

CHECK BODY GROUND CIRCUIT FOR FAN CONTROL AMP.
Does continuity exist between fan control amp. harness terminal No. ③ and body ground?

Yes

Reconnect fan control amp. harness connector.

C

CHECK FOR AUTO AMP. OUTPUT.
Set up Self-diagnosis STEP 4.
Measure voltage across fan control amp. harness terminal No. ② and body ground.

Code No.	Terminal No. ⊕	Terminal No. ⊖	Voltage
41 - 45	②	Body ground	Approx. 2.5 - 3V
46	②	Body ground	Approx. 9 - 10V

NG → Ⓐ (Go to next page.)

OK

Replace fan control amp.

No → **D**

Yes → **E**

Note

Check circuit continuity between blower motor harness terminal No. ① and fan control amp. harness terminal No. ① .

OK

CHECK BLOWER MOTOR.
(Refer to HA-91.)

NG

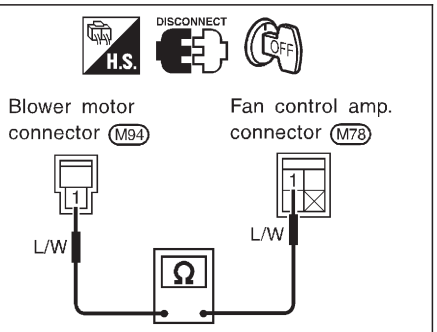
Replace blower motor.

Yes → Check power supply circuit and 15A fuses (No. 1 and 2, located in the fuse block).

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

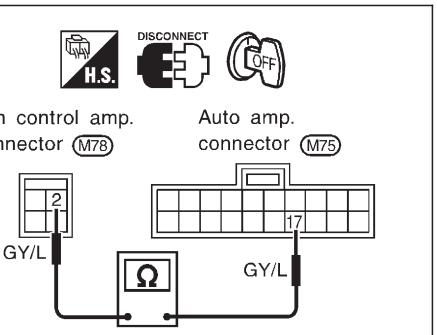
Blower Motor (Cont'd)

E



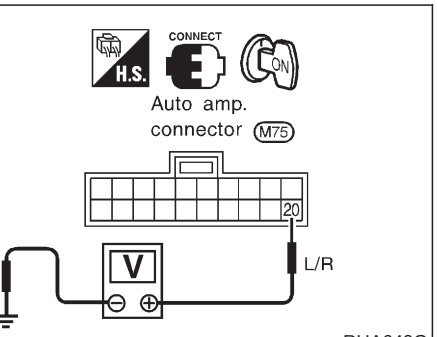
RHA647G

F



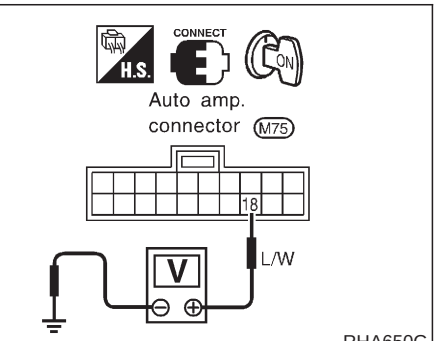
RHA648G

G



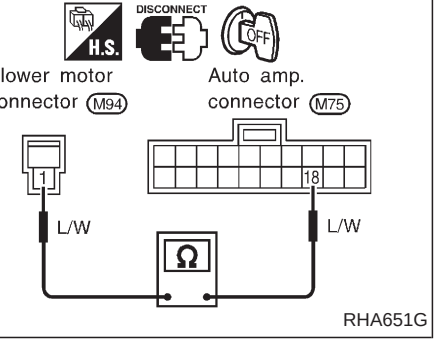
RHA649G

H



RHA650G

I



RHA651G

Ⓐ

Disconnect auto amp. and fan control amp. harness connector.

F — Note

Does continuity exist between auto amp. harness terminal No. ⑰ and fan control amp. harness terminal No. ② ?
Continuity should exist.
If OK, check harness for short.

Yes

G

CHECK FAN FEED BACK CIRCUIT.
Do approx. 12 volts exist between auto amp. harness terminal No. ⑳ and body ground?

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'').

Yes

H — I — Note

Do approx. 12 volts exist between auto amp. harness terminal No. ⑱ and body ground?

No → Check circuit continuity between blower motor harness terminal No. ① and auto amp. harness terminal No. ⑱.
Continuity should exist.
If OK, check harness for short.

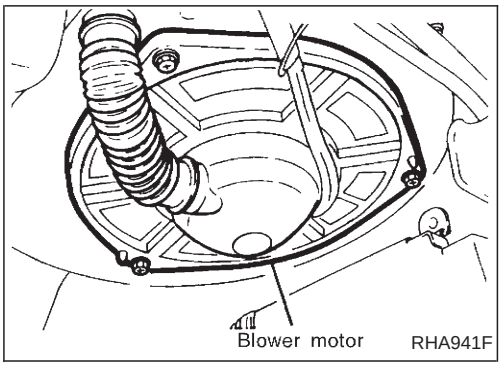
Yes

Replace auto amp.

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

Blower Motor (Cont'd)

COMPONENT INSPECTION



Blower motor

Confirm smooth rotation of the blower motor.

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

Magnet Clutch

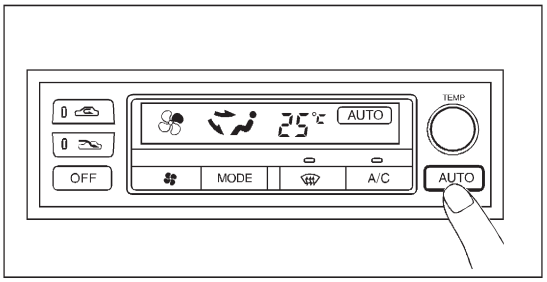
TROUBLE DIAGNOSIS PROCEDURE FOR MAGNET CLUTCH

SYMPTOM:

- **Magnet clutch does not engage.**

Inspection flow

1. Confirm symptom by performing operational check.



OPERATIONAL CHECK – AUTO mode

a. Press AUTO switch.
b. Display should indicate AUTO.
Confirm that the compressor clutch engages (audio or visual inspection).
(Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

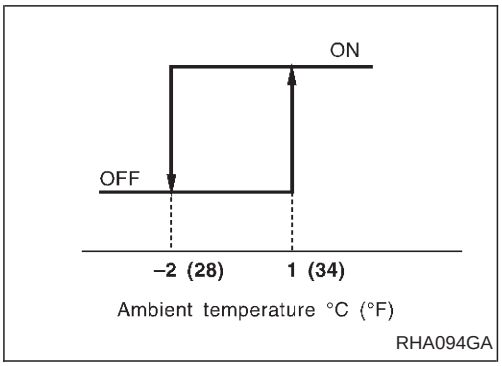
If OK (symptom cannot be duplicated), perform complete operational check (*10).
If NG (symptom is confirmed), continue with STEP-2 following.

2. Check for any service bulletins.
3. Perform self-diagnosis STEP-1. (*1)
OK
4. Perform self-diagnosis STEP-2. (*2)
NG → Go to appropriate malfunctioning sensor circuit. (*2)
OK
5. Perform self-diagnosis STEP-4. (*3)
NG → Check Magnet Clutch Mechanism.
OK → Go to Magnet Clutch Circuit. (*4)
Cause cannot be confirmed by self-diagnosis.
NG → Check for refrigerant pressure. (*12)
OK
6. Check ambient sensor circuit. (*5)
OK
7. Check in-vehicle sensor circuit. (*6)
OK
8. Check sunload sensor circuit. (*7)
OK
9. Check intake sensor circuit. (*8)
OK
10. Check air mix door motor PBR circuit. (*9)
OK
INSPECTION END
If the symptom still exists, perform a complete operational check (*10) and check for other symptoms. [Refer to symptom table, (*11).] Does another symptom exist?
Yes → Go to Trouble Diagnosis for related symptom.
Another symptom exists.
No
Replace auto amp.

SHA023F

*1: HA-64
*2: HA-65
*3: HA-67
*4: HA-94
*5: HA-103
*6: HA-105
*7: HA-107
*8: HA-110
*9: HA-79
*10: HA-70
*11: HA-69
*12: HA-35

Magnet Clutch (Cont'd)



SYSTEM DESCRIPTION

Auto amplifier controls compressor operation by ambient temperature and signal from ECM (ECCS control module).

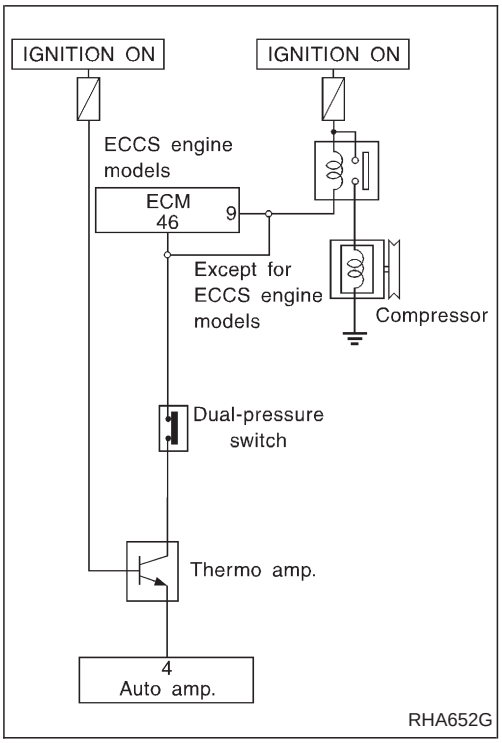
Low temperature protection control

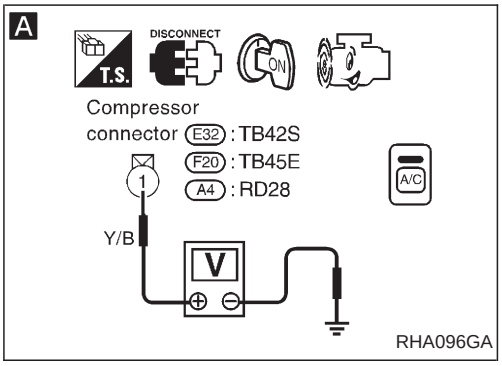
Auto amplifier will turn the compressor "ON" or "OFF" as determined by a signal detected by ambient sensor.
When ambient temperatures are greater than 1°C, the compressor turns "ON". The compressor turns "OFF" when ambient temperatures are less than −2°C.

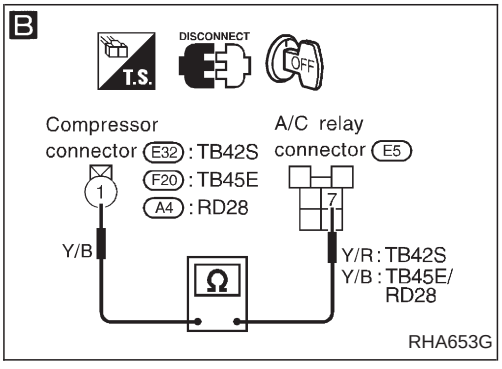
Magnet Clutch (Cont'd)

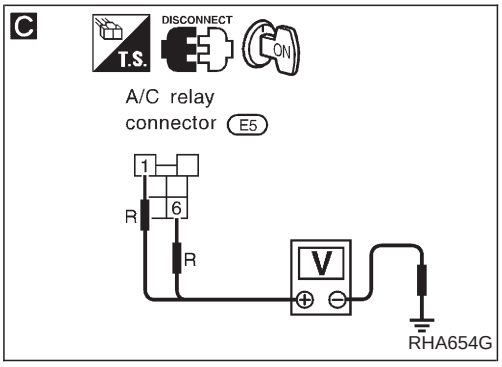
DIAGNOSTIC PROCEDURE

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









A

CHECK POWER SUPPLY FOR COMPRESSOR.
Disconnect compressor harness connector.
Do approx. 12 volts exist between compressor harness terminal No. ① and body ground?

Yes → Check magnet clutch coil.

NG → Replace magnet clutch. Refer to HA-123.

No → Disconnect A/C relay.

B

Note

CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. ⑦ AND COMPRESSOR HARNESS TERMINAL NO. ① .
Continuity should exist.
If OK, check harness for short.

OK

C

CHECK POWER SUPPLY FOR A/C RELAY.
Disconnect A/C relay.
Do approx. 12 volts exist between A/C relay harness terminal Nos. ① , ⑥ and body ground?

No → CHECK POWER SUPPLY CIRCUIT AND 10A (No. 6) FUSE AT FUSE BLOCK.
Refer to EL section (“Wiring Diagram”, “POWER SUPPLY ROUTING”).

Yes

CHECK A/C RELAY AFTER DISCONNECTING IT.
Refer to HA-97.

NG → Replace A/C relay.

OK

ECCS engine models → Ⓐ (Go to next page.)

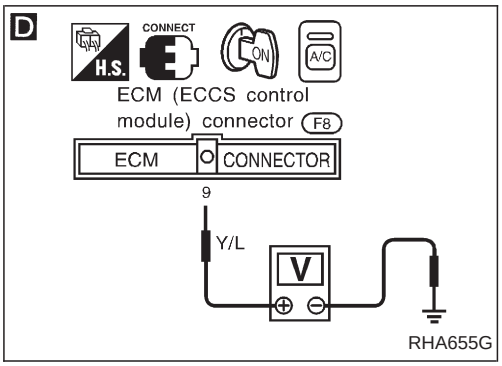
OK

Except for ECCS engine models → Ⓑ

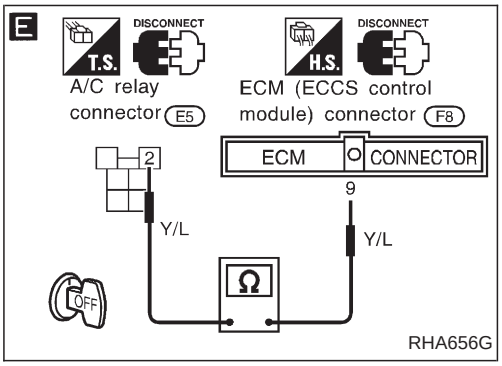
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Magnet Clutch (Cont'd)

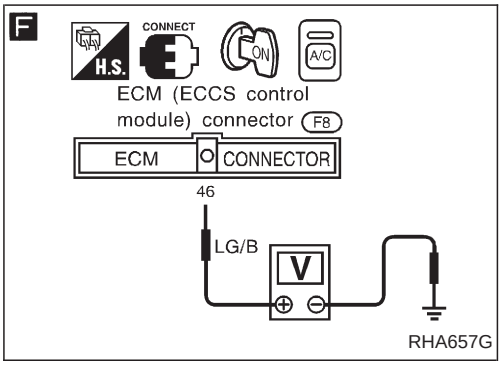
D



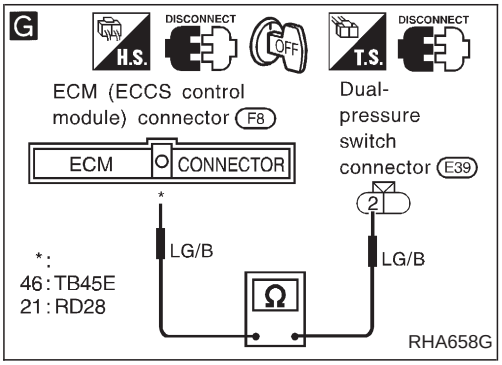
E



F



G



Ⓐ

Reconnect A/C relay.

D

CHECK COIL SIDE CIRCUIT OF A/C RELAY.
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. ⑨ and body ground?

No → Disconnect A/C relay. Disconnect ECM (ECCS control module) harness connector.

Yes

E Note

CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY HARNESS TERMINAL NO. ② AND ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. ⑨ .
Continuity should exist.
If OK, check harness for short.

F

CHECK VOLTAGE FOR ECM (ECCS control module).
Do approx. 12 volts exist between ECM (ECCS control module) harness terminal No. ㊻ and body ground?

No → CHECK ECM (ECCS control module). Refer to EC section.

Yes

Disconnect ECM (ECCS control module) harness connector.
Disconnect dual-pressure switch harness connector.

G Note

CHECK CIRCUIT CONTINUITY BETWEEN ECM (ECCS CONTROL MODULE) HARNESS TERMINAL NO. ㊻, ㉑ AND DUAL-PRESSURE SWITCH HARNESS TERMINAL NO. ② .
Continuity should exist.
If OK, check harness for short.

OK

CHECK DUAL-PRESSURE SWITCH.
Refer to HA-97.

NG → Replace dual-pressure switch.

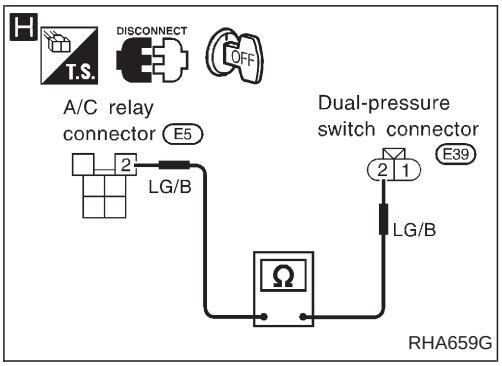
OK

Ⓒ

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

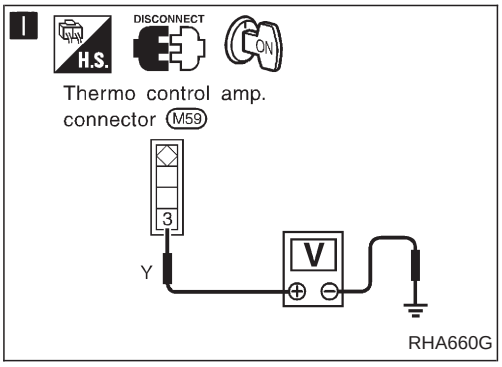
Magnet Clutch (Cont'd)

H



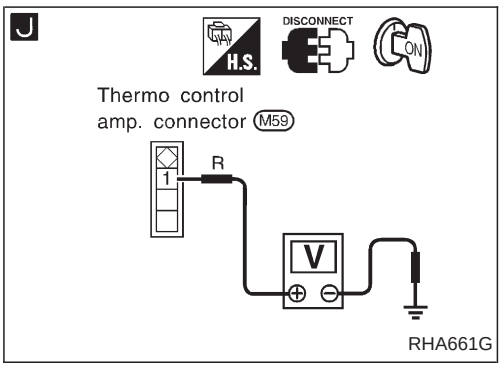
RHA659G

I



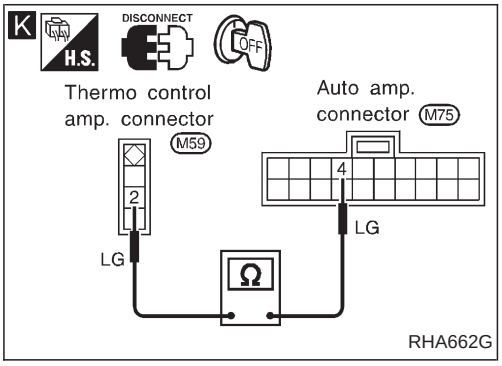
RHA660G

J



RHA661G

K



RHA662G

Ⓑ

H

Note

Check circuit continuity between A/C relay harness terminal No. ② and dual-pressure switch harness terminal No. ② .
Continuity should exist.
If OK, check harness for short.

Yes

CHECK DUAL-PRESSURE SWITCH.
Refer to HA-97.

NG → Replace dual-pressure switch.

OK

Ⓒ

I

CHECK THERMO CONTROL AMP. CIRCUIT.
Do approx. 12 volts exist between thermo control amp. harness terminal No. ③ and body ground?

No → Ⓓ

Yes

J

CHECK POWER SUPPLY FOR THERMO AMP.
Do approx. 12 volts exist between thermo control amp. harness terminal No. ① and body ground?

No → Check power supply circuit and 10A fuse (No. 6 , located in the fuse block).

Yes

K

Note

Check circuit continuity between thermo control amp. harness terminal No. ② and auto amp. harness terminal No. ④ .
Continuity should exist.
If OK, check harness for short.

OK

CHECK THERMO CONTROL AMP.
Refer to HA-47.

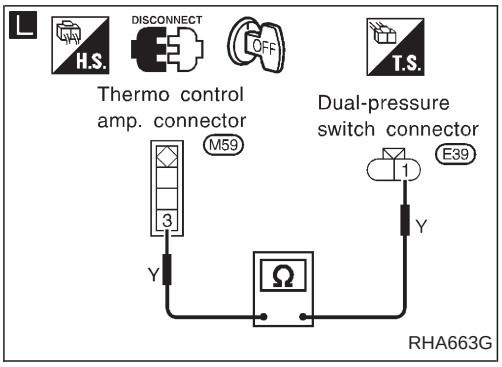
NG → Replace thermo amp.

OK

Replace auto amp.

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

Magnet Clutch (Cont'd)

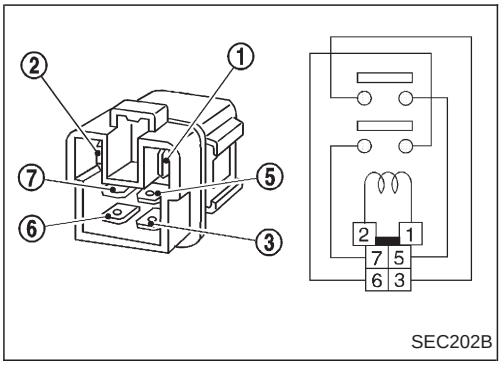


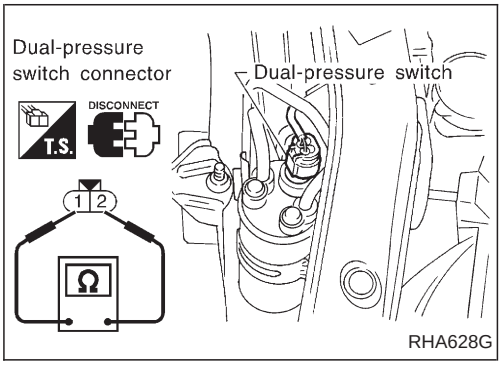
Ⓓ

Note

Check circuit continuity between dual-pressure switch harness terminal No. ① and thermo control amp. harness terminal No. ③.
Continuity should exist.
If OK, check harness for short.

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





COMPONENT INSPECTION

A/C relay

Check continuity between terminal Nos. ③ and ⑤, ⑥ and ⑦.

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

If NG, replace relay.

Dual-pressure switch

	ON kPa (bar, kg/cm^2, psi)	OFF kPa (bar, kg/cm^2, psi)
Low-pressure side	Increasing to 157 - 216 (1.57 - 2.16, 1.6 - 2.2, 23 - 31)	Decreasing to 157 - 196 (1.57 - 1.96, 1.6 - 2.0, 23 - 28)
High-pressure side	Decreasing to 1,863 - 2,256 (18.6 - 22.6, 19 - 23, 270 - 327)	Increasing to 2,452 - 2,844 (24.5 - 28.4, 25 - 29, 356 - 412)

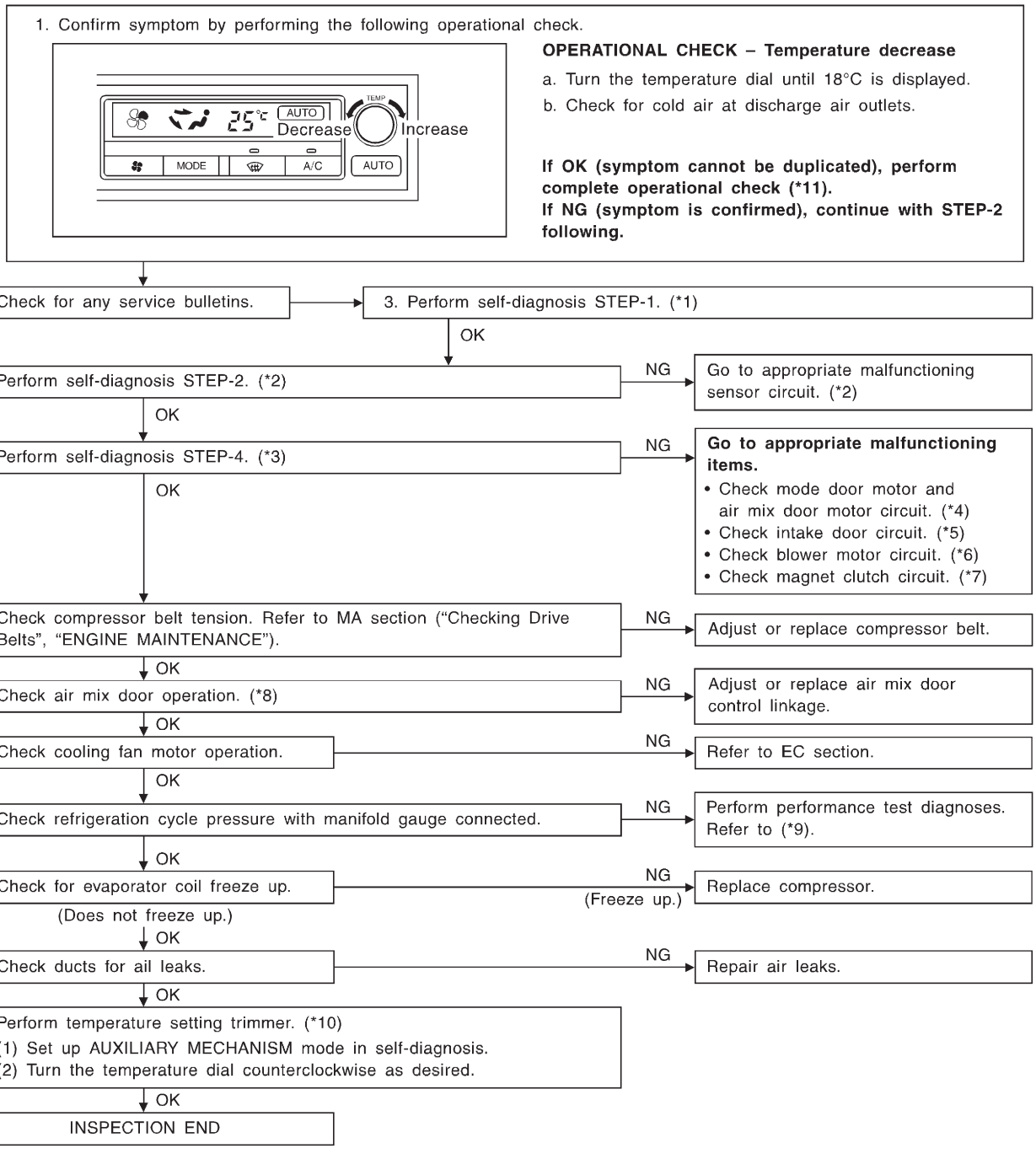
Insufficient Cooling

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT COOLING

SYMPTOM:

- **Insufficient cooling.**

Inspection flow



SHA053F

*1: HA-64
*2: HA-65
*3: HA-67
*4: HA-78
*5: HA-82
*6: HA-89
*7: HA-94
*8: HA-79
*9: HA-33
*10: HA-68
*11: HA-70

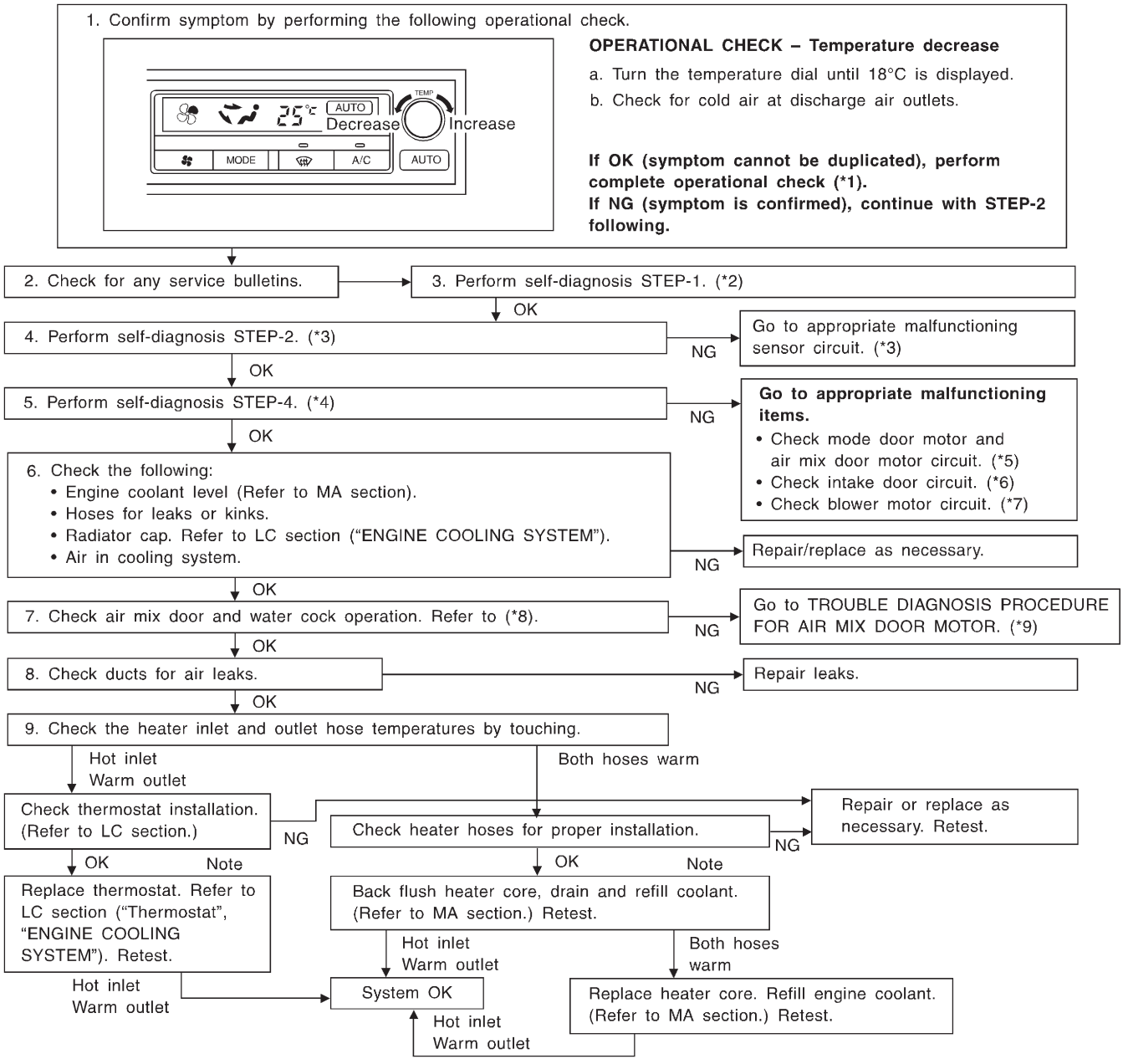
Insufficient Heating

TROUBLE DIAGNOSIS PROCEDURE FOR INSUFFICIENT HEATING

SYMPTOM:

- **Insufficient heating.**

Inspection flow



Note: To avoid unnecessary service of heating system, first perform TEMPERATURE SETTING TRIMMING. Refer to “AUXILIARY MECHANISM”, “Self-diagnosis”. (*10)

SHA024F

*1: HA-70
*2: HA-64
*3: HA-65
*4: HA-67
*5: HA-75
*6: HA-85
*7: HA-89
*8: HA-94
*9: HA-79
*10: HA-68

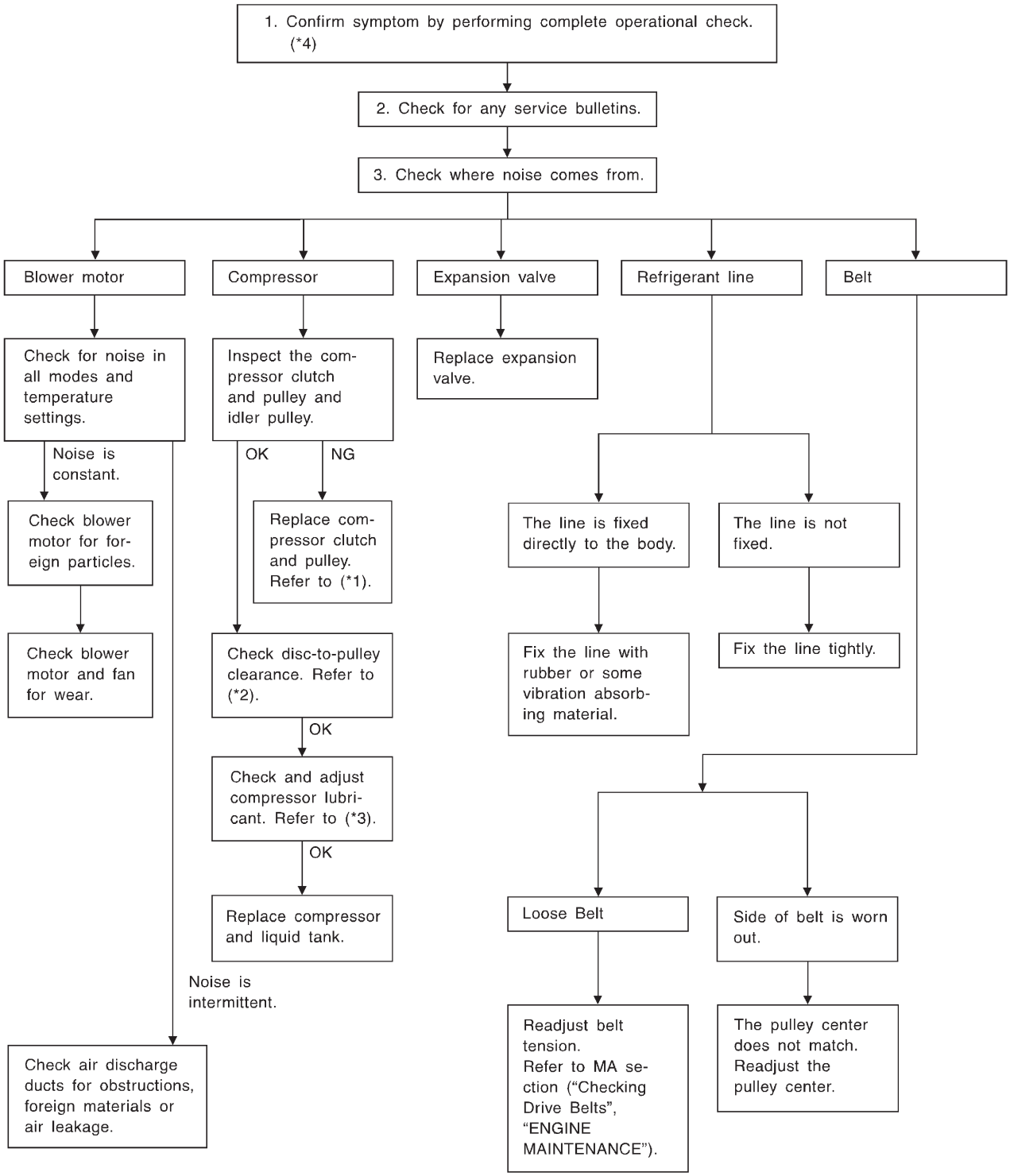
Noise

TROUBLE DIAGNOSIS PROCEDURE FOR NOISE

SYMPTOM:

- **Noise**

Inspection flow



SHA896EA

*1: HA-123
*2: HA-125
*3: HA-114
*4: HA-70

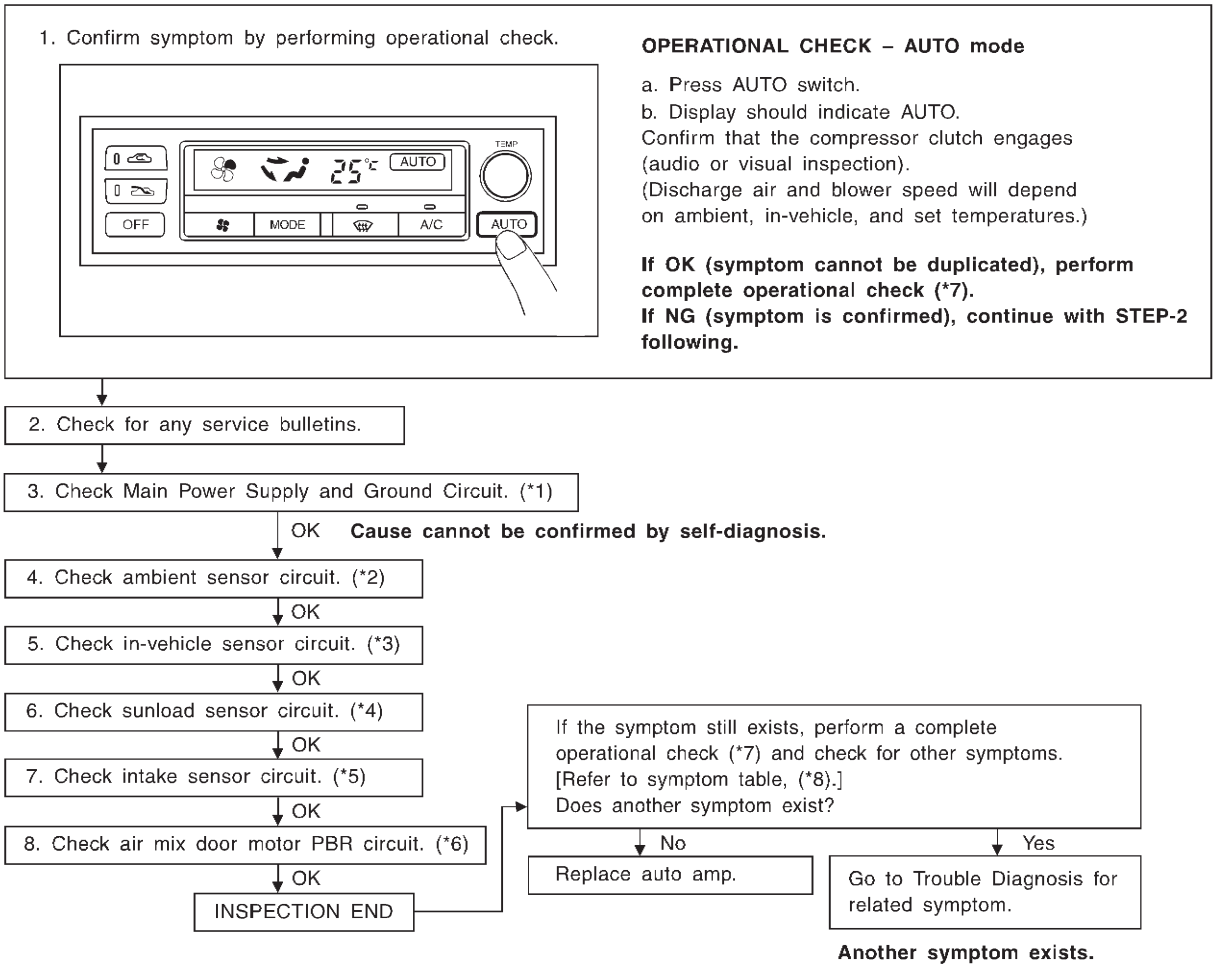
Self-diagnosis

TROUBLE DIAGNOSIS PROCEDURE FOR SELF-DIAGNOSIS

SYMPTOM:

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

Inspection flow



SHA037F

*1: HA-74
*2: HA-103
*3: HA-105
*4: HA-107
*5: HA-110
*6: HA-79
*7: HA-70
*8: HA-69

Memory Function

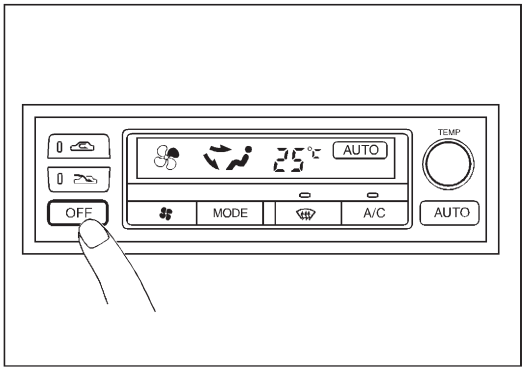
TROUBLE DIAGNOSIS PROCEDURE FOR MEMORY FUNCTION

SYMPTOM:

- **Memory function does not operate.**

Inspection flow

1. Confirm symptom by performing the following operational check.



OPERATIONAL CHECK – Memory function

a. Set the temperature 25°C.
b. Press OFF switch.
c. Turn the ignition off.
d. Turn the ignition on.
e. Press the AUTO switch.
f. Confirm that the set temperature remains at previous temperature.
g. Press OFF switch.

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

↓

2. Check for any service bulletins.

↓

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

↓ OK

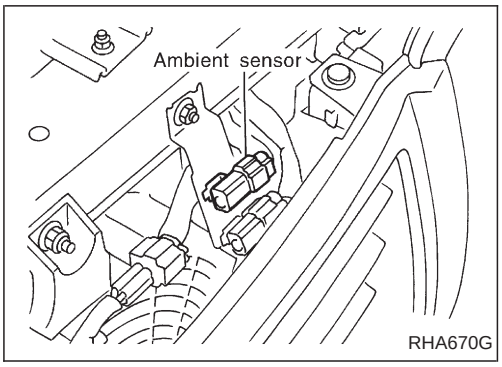
4. Replace auto amp.

↓

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

SHA027F

*1: HA-74 *2: HA-70 *3: HA-64



Ambient Sensor

COMPONENT DESCRIPTION

The ambient sensor is attached in front of the driver's side condenser. It detects ambient temperature and converts it into a resistance value which is then input into the auto amplifier.

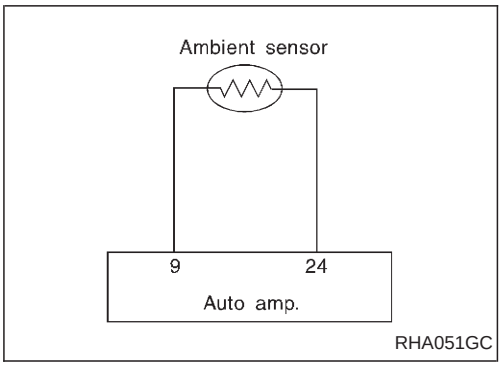
AMBIENT TEMPERATURE INPUT PROCESS

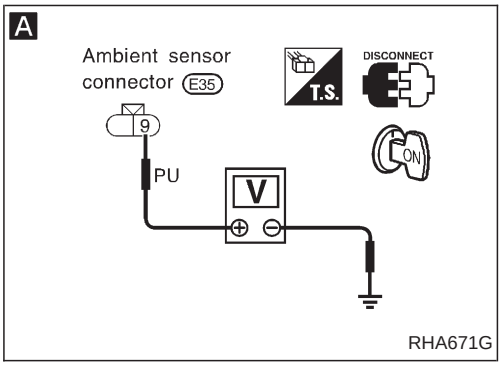
The automatic amplifier includes a ''processing circuit'' for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the auto amp. function. It only allows the auto amp. to recognize an ambient temperature increase of 0.33°C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

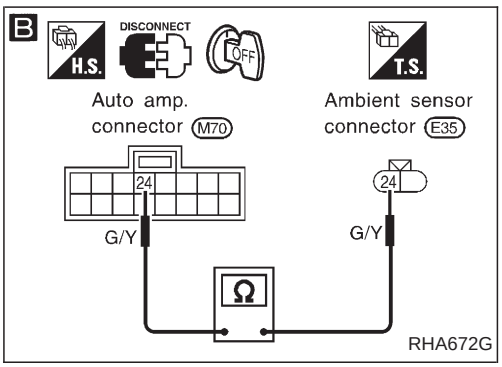
Ambient Sensor (Cont'd)

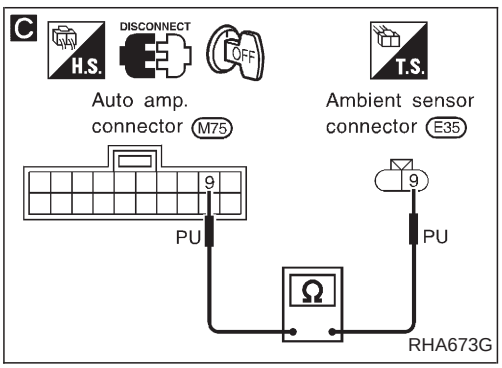
DIAGNOSTIC PROCEDURE

SYMPTOM: Ambient sensor circuit is open or shorted. (21 or 21 A/C LED is indicated on auto amp. as a result of conducting Self-diagnosis STEP 2.)









A

CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP.
Disconnect ambient sensor harness connector.
Do approx. 5 volts exist between ambient sensor harness terminal No. ⑨ and body ground?

No → Disconnect auto amp. harness connector.

C

Note: Check circuit continuity between ambient sensor harness terminal No. ⑨ and auto amp. harness terminal No. ⑨ .

OK → Replace auto amp.

Yes → Disconnect auto amp. harness connector.

B

Note: Check circuit continuity between ambient sensor harness terminal No. ㉔ and auto amp. harness terminal No. ㉔.

OK → CHECK AMBIENT SENSOR. (Refer to HA-105.)

NG → Replace ambient sensor.

OK → Replace auto amp.

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

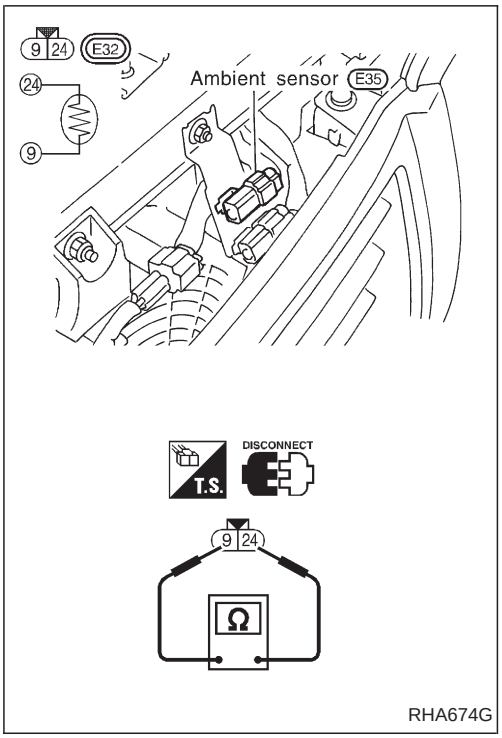
Ambient Sensor (Cont'd)

COMPONENT INSPECTION

Ambient sensor

After disconnecting ambient sensor harness connector, measure resistance between terminals ⑨ and ㉔ 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

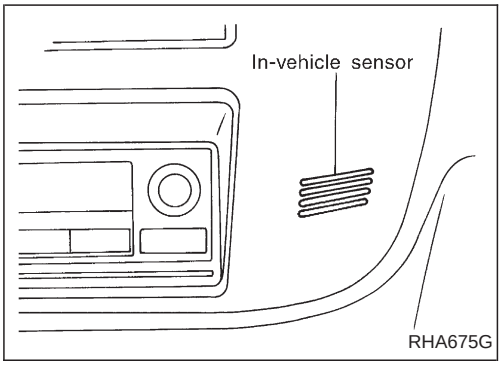


In-vehicle Sensor

COMPONENT DESCRIPTION

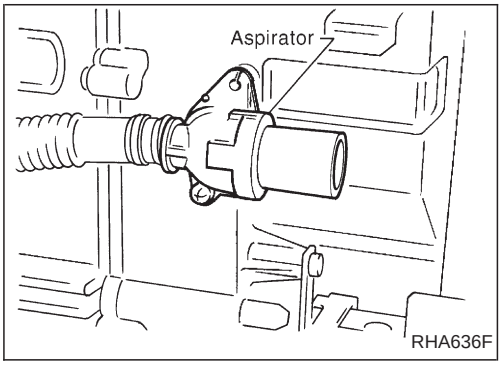
In-vehicle sensor

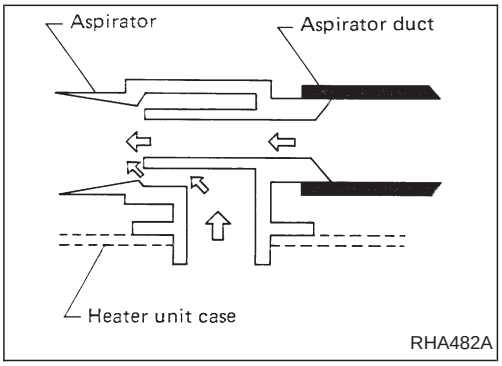
The in-vehicle sensor is located on instrument lower panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the auto amplifier.



Aspirator

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

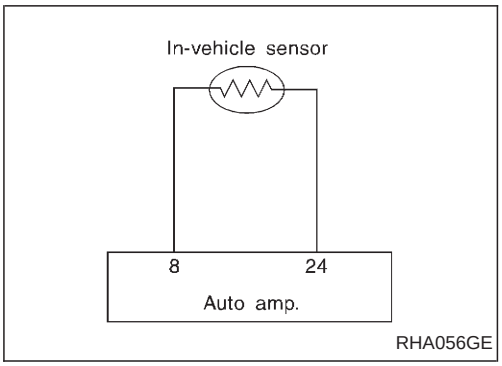


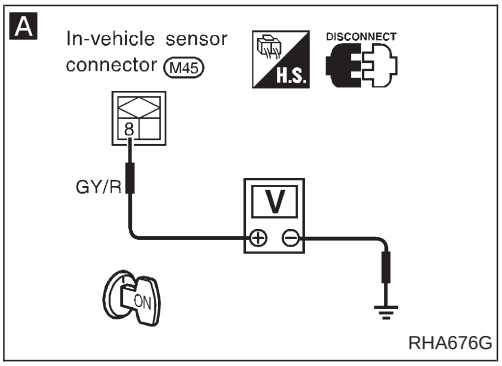


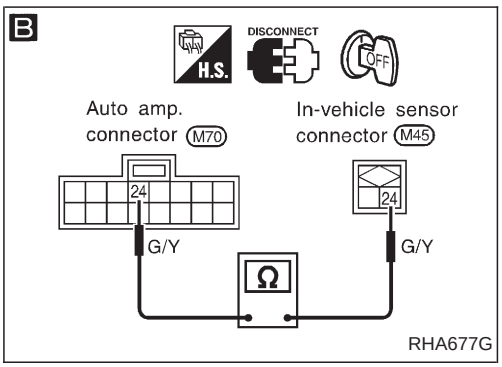
In-vehicle Sensor (Cont'd)

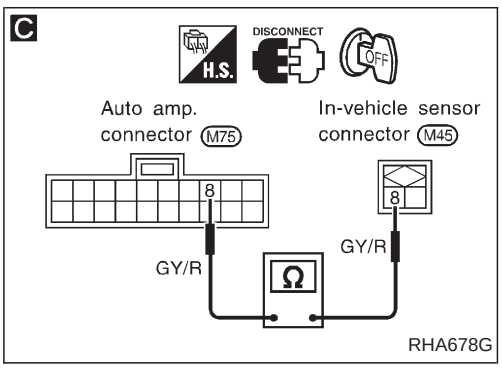
DIAGNOSTIC PROCEDURE

SYMPTOM: In-vehicle sensor circuit is open or shorted. (22 or 22 A/C LED is indicated on auto amp. as a result of conducting Self-diagnosis STEP 2.)









A

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. ⑧ and body ground?

No → Disconnect auto amp. harness connector.

C

Note: Check circuit continuity between in-vehicle sensor harness terminal No. ⑧ and auto amp. harness terminal No. ⑧ .

OK → Replace auto amp.

Yes → Disconnect auto amp. harness connector.

B

Note: Check circuit continuity between in-vehicle sensor harness terminal No. ㉔ and auto amp. harness terminal No. ㉔.

OK → CHECK IN-VEHICLE SENSOR. (Refer to HA-107.)

NG → Replace in-vehicle sensor.

OK → Replace auto amp.

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

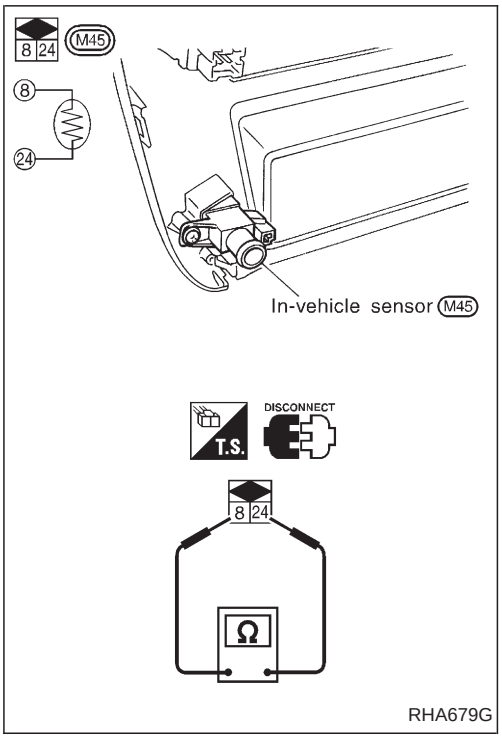
In-vehicle Sensor (Cont'd)

COMPONENT INSPECTION

In-vehicle sensor

After disconnecting in-vehicle sensor harness connector, measure resistance between terminals ⑧ and ㉔ at sensor harness side, using the table below.

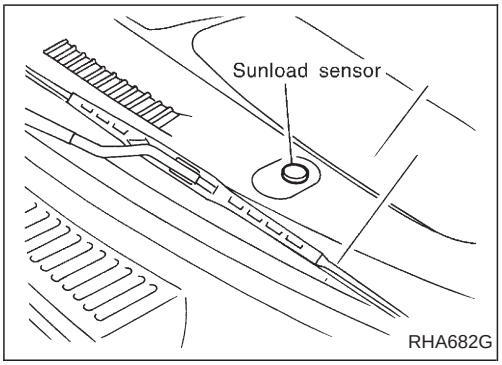
Temperature °C (°F)	Resistance kΩ
−15 (5)	12.73
−10 (14)	9.92
−5 (23)	7.80
0 (32)	6.19
5 (41)	4.95
10 (50)	3.99
15 (59)	3.24
20 (68)	2.65
25 (77)	2.19
30 (86)	1.81
35 (95)	1.51
40 (104)	1.27
45 (113)	1.07



Sunload Sensor

COMPONENT DESCRIPTION

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



SUNLOAD INPUT PROCESS

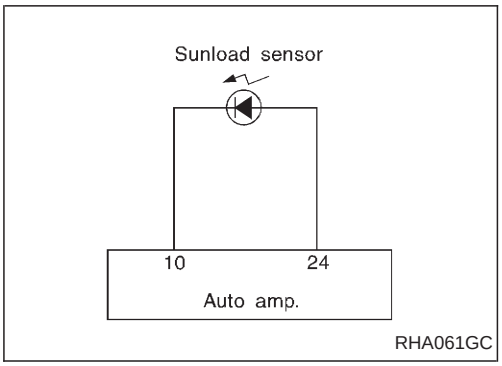
The auto amp. also includes a processing circuit which ''average'' the variations in detected sunload over a period of time. This prevents drastic swings in the ATC system operation due to small or quick variations in detected sunload.

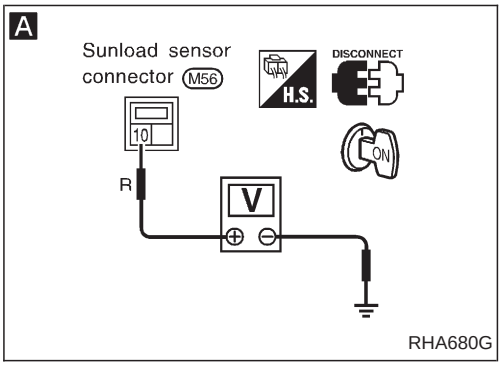
For example, consider driving along a road bordered by an occasional group of large trees. The sunload detected by the sunload sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight 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.

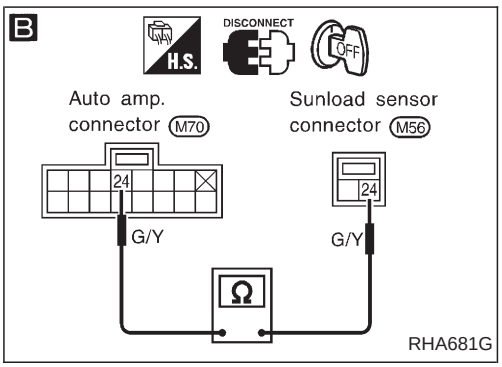
Sunload Sensor (Cont'd)

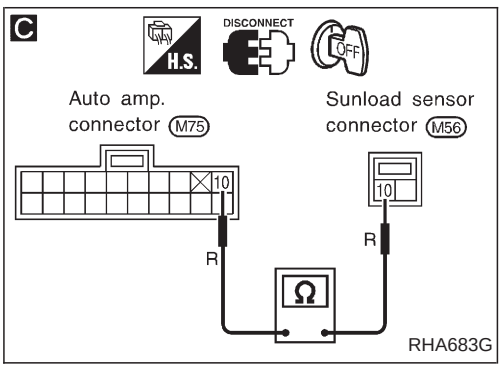
DIAGNOSTIC PROCEDURE

SYMPTOM: Sunload sensor circuit is open or shorted. (25 or 25 A/C LED is indicated on auto amp. as a result of conducting Self-diagnosis STEP 2.)









A

CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP.
Disconnect sunload sensor harness connector.
Do approx. 5 volts exist between sunload sensor harness terminal No. ⑩ and body ground?

No → Disconnect auto amp. harness connector.

C

Note: Check circuit continuity between sunload sensor harness terminal No. ⑩ and auto amp. harness terminal No. ⑩.

OK → Replace auto amp.

Yes → Disconnect auto amp. harness connector.

B

Note: Check circuit continuity between sunload sensor harness terminal No. ㉔ and auto amp. harness terminal No. ㉔.

OK → CHECK SUNLOAD SENSOR. (Refer to HA-109.)

NG → Replace sunload sensor.

OK → Replace auto amp.

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

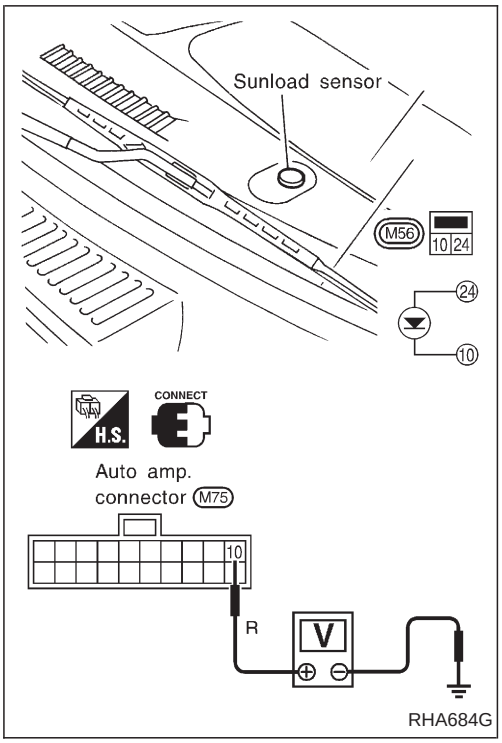
Sunload Sensor (Cont'd)

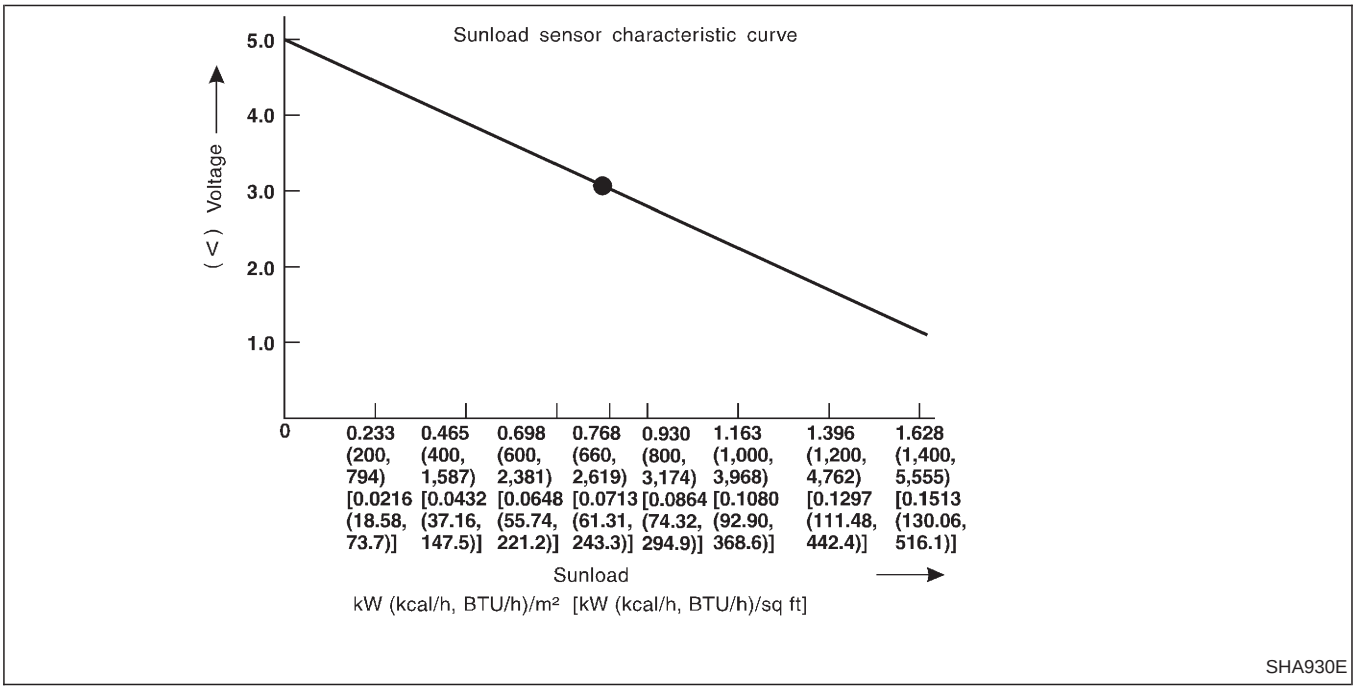
COMPONENT INSPECTION

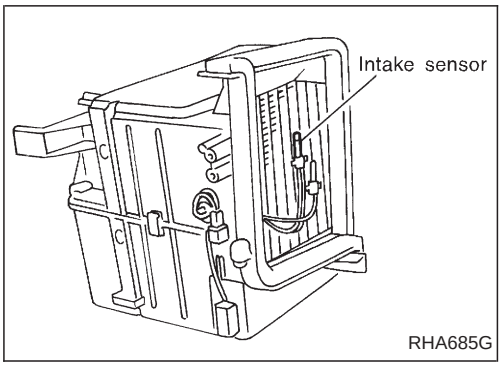
Sunload sensor

Measure voltage between auto amp. terminal ⑩ and body ground.

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







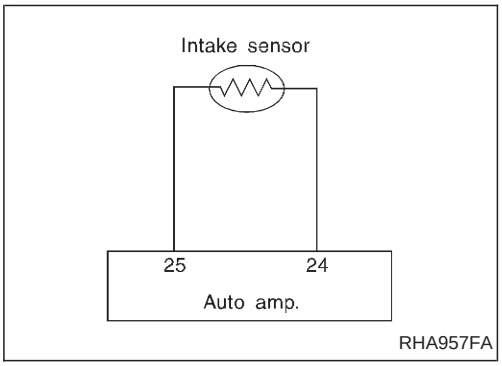
Intake Sensor

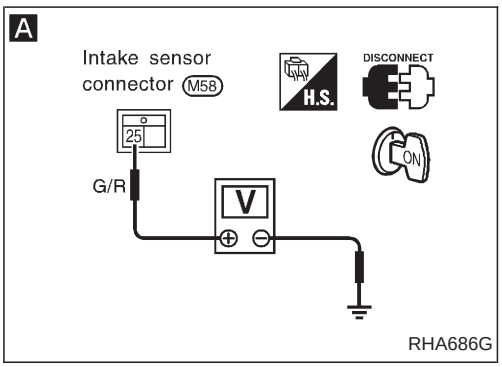
COMPONENT DESCRIPTION

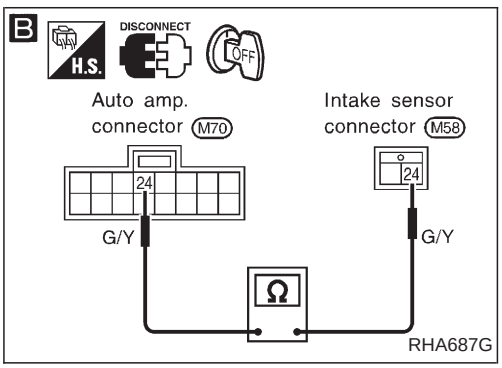
The intake sensor is located on the cooling unit. It converts temperature of air after it passes through the evaporator into a resistance value. The value is then input to the auto amplifier.

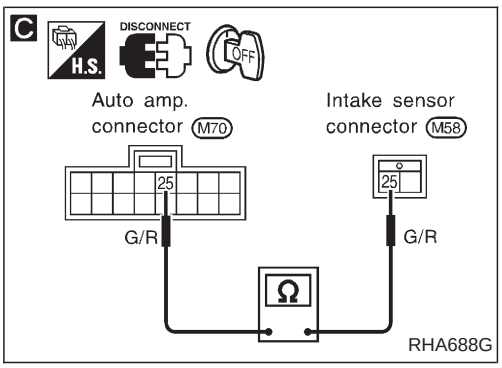
DIAGNOSTIC PROCEDURE

SYMPTOM: Intake sensor circuit is open or shorted.









A

CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND AUTO AMP.
Disconnect intake sensor harness connector.
Do approx. 5 volts exist between intake sensor harness terminal No. ㉕ and body ground?

No → Disconnect auto amp. harness connector.

C Note: Check circuit continuity between intake sensor harness terminal No. ㉕ and auto amp. harness terminal No. ㉕.
Continuity should exist.
If OK, check harness for short.

OK → Replace auto amp.

Yes → Disconnect auto amp. harness connector.

B Note: Check circuit continuity between intake sensor harness terminal No. ㉔ and auto amp. harness terminal No. ㉔.
Continuity should exist.
If OK, check harness for short.

OK → CHECK INTAKE SENSOR. (Refer to HA-111.)

NG → Replace intake sensor.

OK → Replace auto amp.

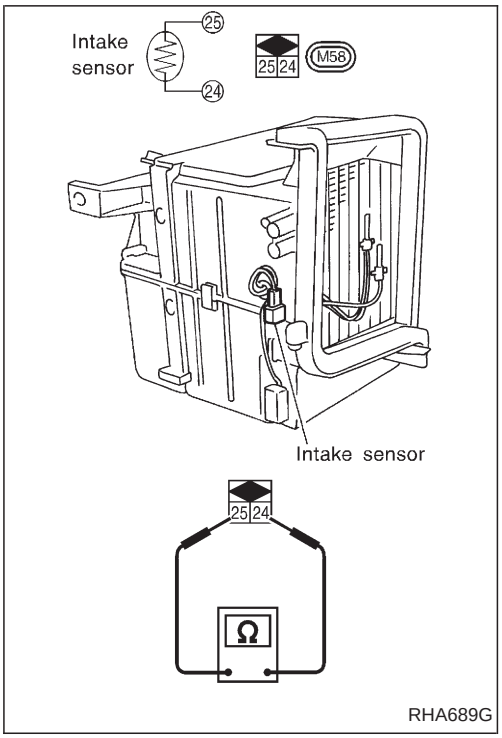
Note:
If the result is NG or No after checking circuit continuity, repair harness or connector.

Intake Sensor (Cont'd)

COMPONENT INSPECTION

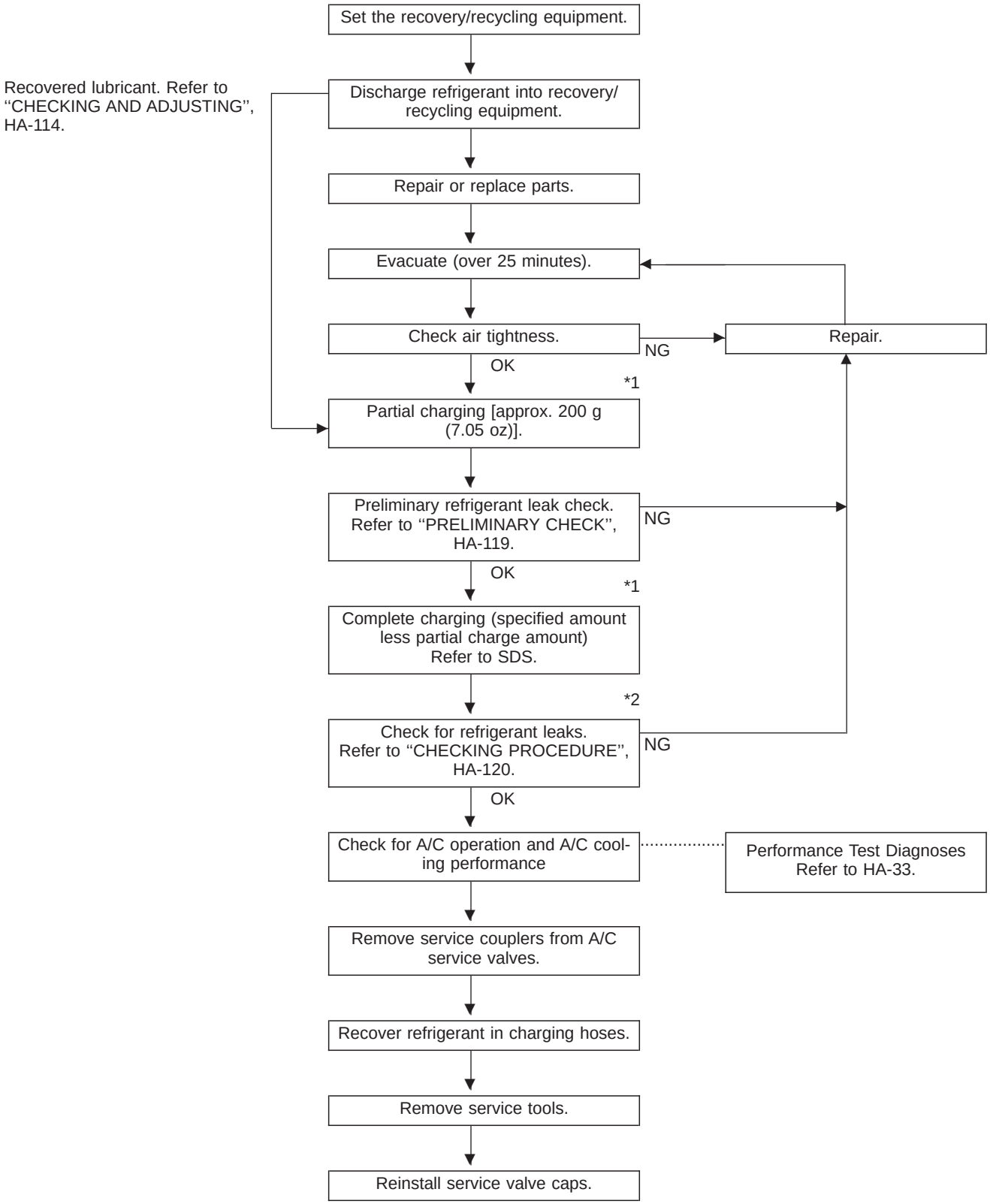
Intake sensor

After disconnecting intake sensor harness connector, measure resistance between terminals ㉕ and ㉔ at sensor harness side, using the table below.



Temperature °C (°F)	Resistance kΩ
−20 (−4)	16.2
−10 (14)	9.8
0 (32)	6.0
10 (50)	3.94
20 (68)	2.64
25 (77)	2.12
30 (86)	1.82
40 (104)	1.27

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



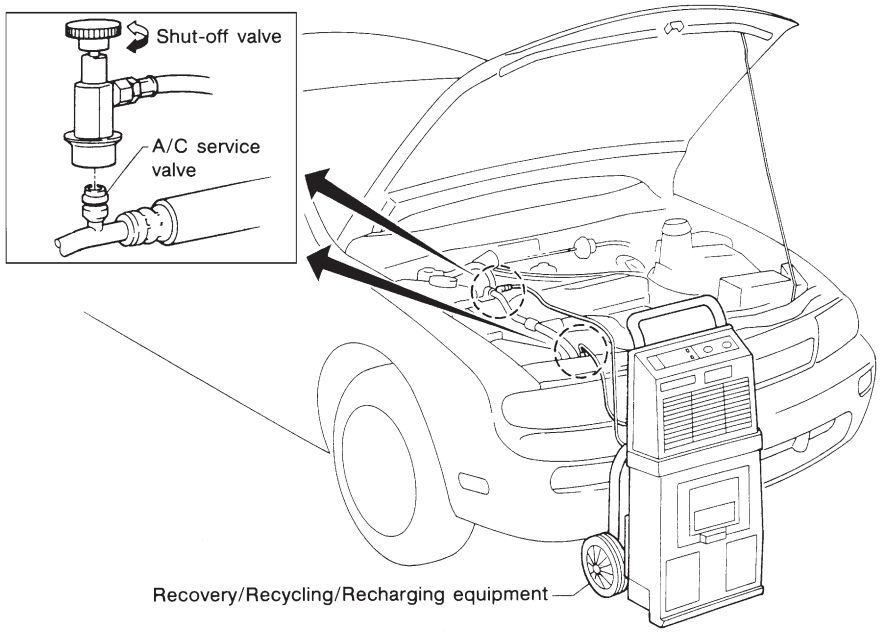
Note: *1 Before charging refrigerant, ensure engine is OFF.
*2 Before checking for leaks, start engine to activate air conditioner system then turn engine OFF. Service valve caps must be installed to prevent leakage.

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

DISCHARGING REFRIGERANT

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

Example

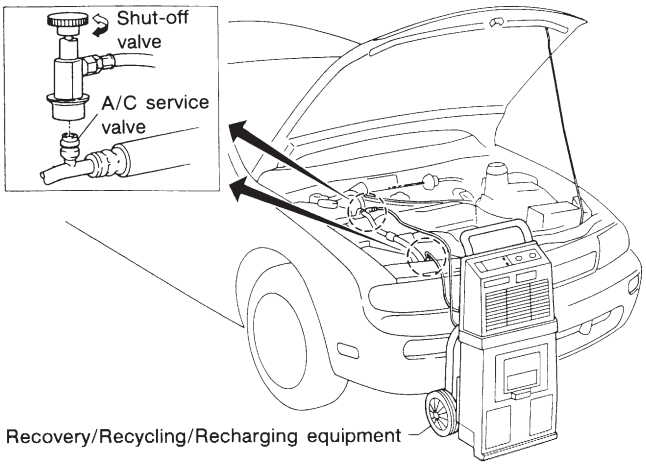


SHA539DC

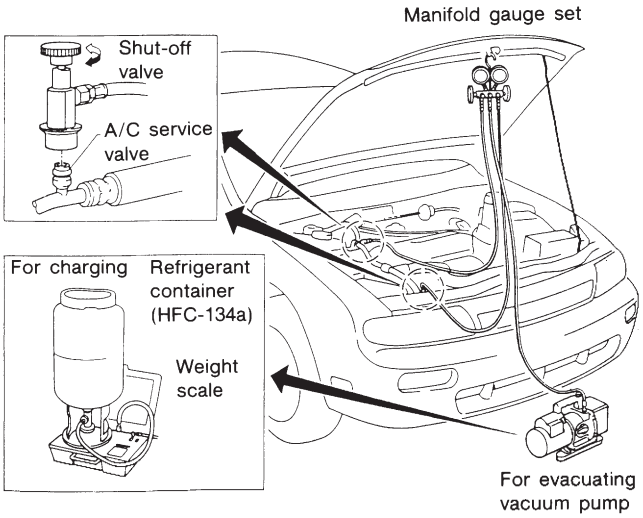
EVACUATING SYSTEM AND CHARGING REFRIGERANT

Example

Preferred (Best) method



Alternate method



SHA540DC

Maintenance of Lubricant Quantity in Compressor

The lubricant used to lubricate the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large gas leakage occurred. It is important to maintain the specified amount.
If lubricant quantity is not maintained properly, the following malfunctions may result:

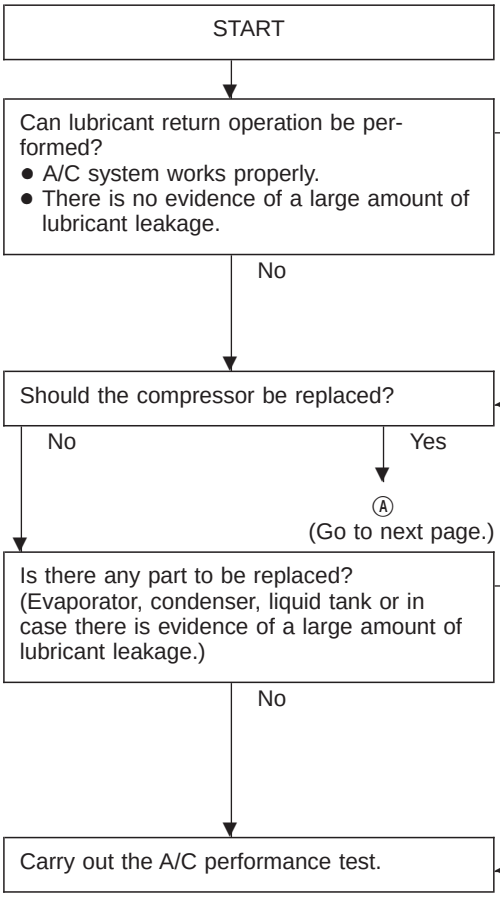
- Lack of lubricant: May lead to a seized compressor
- Excessive lubricant: Inadequate cooling (thermal exchange interference)

LUBRICANT

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.



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. Perform lubricant return operation for about 10 minutes.
3. Stop engine.

CAUTION:
If excessive lubricant leakage is noted, do not perform the lubricant return operation.

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 Amount of lubricant mℓ (Imp fl oz)	Remarks
Evaporator	75 (2.6)	—
Condenser	75 (2.6)	—
Liquid tank	5 (0.2)	Add if compressor is not replaced. *1
In case of refrigerant leak	30 (1.1)	Large leak
	—	Small leak*2

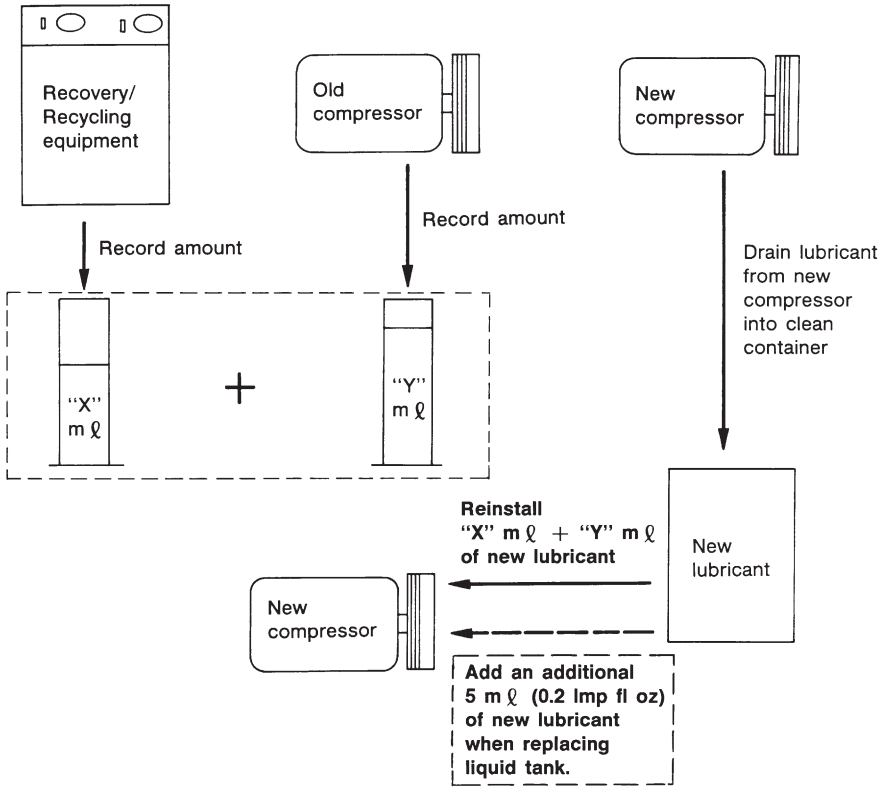
*1: If compressor is replaced, addition of lubricant is included in the flow chart.
*2: If refrigerant leak is small, no addition of lubricant is needed.

Maintenance of Lubricant Quantity in Compressor (Cont'd)

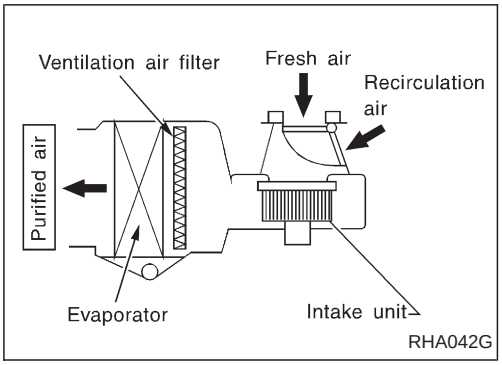
Ⓐ

1. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
2. Remove the drain plug of the "old" (removed) compressor. 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.
   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 Imp fl oz) of lubricant at this time.
   Do not add this 5 mℓ (0.2 Imp fl oz) of lubricant if only replacing the compressor.

Lubricant adjusting procedure for compressor replacement



RHA065DE

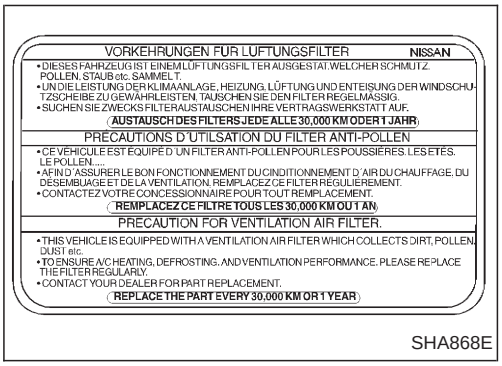


RHA042G

Ventilation Air Filter

FUNCTION

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

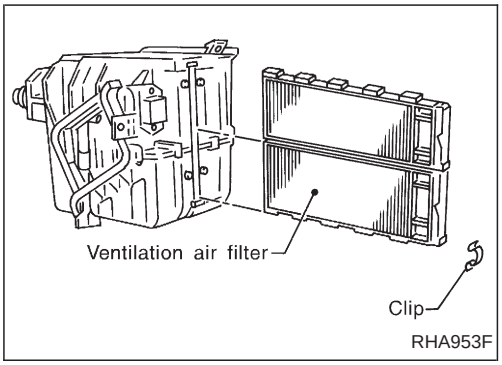

VORKEHRUNGEN FUR LUFTUNGSFILTER NISSAN
• DIESES FAHRZEUG IST EINEM LÜFTUNGSFILTER AUSGESTAT, WELCHER SCHMUTZ POLLEN, STAUB etc. SAMMELT.
• UN DIE LEISTUNG DER KLIMAANLAGE, HEIZUNG, LÜFTUNG UND ENTEISUNG DER WINDSCHUTZSCHEIBE ZU GEWÄHRLEISTEN, TAUSCHEN SIE DEN FILTER REGELMÄSSIG.
• SUCHEN SIE ZWECKS FILTERAUSTAUSCHEN IHRE VERTRAGSWERKSTATT AUF.
AUSTAUSCH DES FILTERS JEDE ALLE 30,000 KM ODER 1 JAHR

PRECAUTIONS D'UTILSATION DU FILTER ANTI-POLLEN
• CE VEHICULE EST EQUIPE D'UN FILTER ANTI-POLLEN POUR LES POUSSIERES, LES ETES, LE POLLEN, ...
• AFIN D'ASSURER LE BON FONCTIONNEMENT DU CINDITIONNEMENT D'AIR DU CHAUFFAGE, DU DESEMBUAGE ET DE LA VENTILATION, REMPLACEZ CE FILTER REGULIEREMENT.
• CONTACTEZ VOTRE CONCESSIONNAIRE POUR TOUT REMPLACEMENT.
REMPLACEZ CE FILTRE TOUS LES 30,000 KM OU 1 AN

PRECAUTION FOR VENTILATION AIR FILTER.
• THIS VEHICLE IS EQUIPPED WITH A VENTILATION AIR FILTER WHICH COLLECTS DIRT, POLLEN, DUST etc.
• TO ENSURE A/C HEATING, DEFROSTING, AND VENTILATION PERFORMANCE, PLEASE REPLACE THE FILTER REGULARLY.
• CONTACT YOUR DEALER FOR PART REPLACEMENT.
REPLACE THE PART EVERY 30,000 KM OR 1 YEAR
SHA868E

REPLACEMENT TIMING

Replace ventilation air filter.
Refer to "PERIODIC MAINTENANCE" in MA section.
Caution label is fixed inside the glove box.



RHA953F

REPLACEMENT PROCEDURES

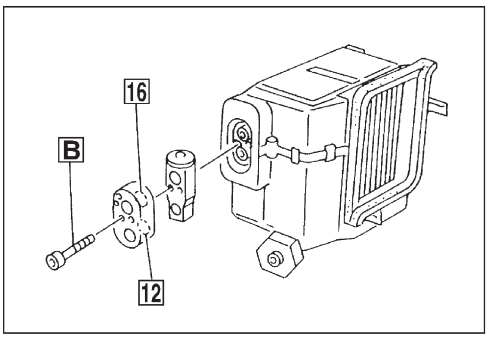
- Remove glove box.
- Remove instrument reinforcement from instrument panel.
- Remove ventilation air filter fixed clip.
- Take out ventilation air filter from cooling unit.
- Replace with new one and reinstall on cooling unit.
- Reinstall instrument reinforcement, glove box and undercover.

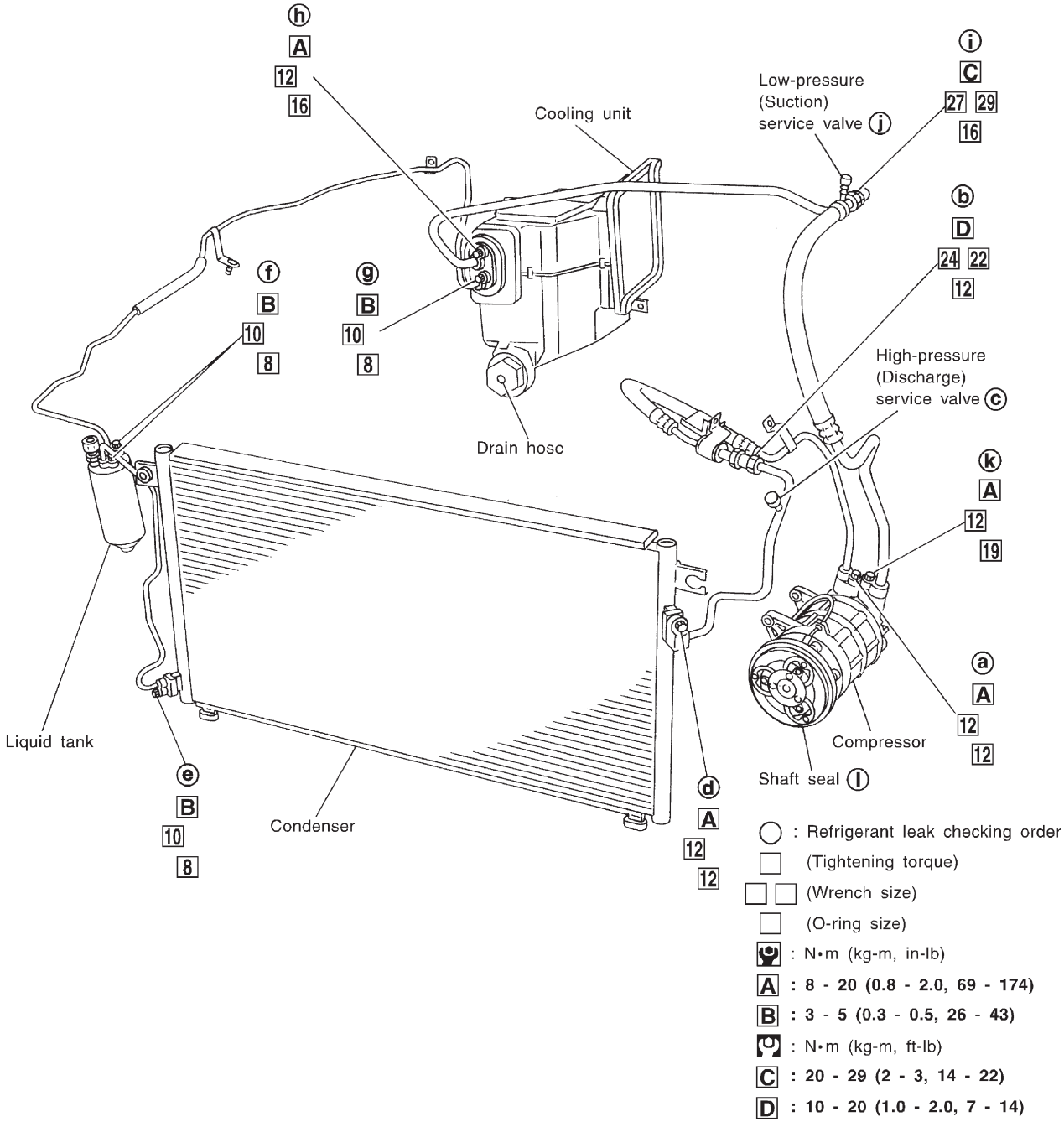
FOR LHD MODELS

RD engine

Refrigerant Lines

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



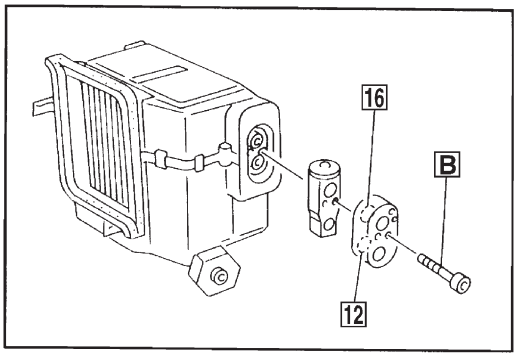


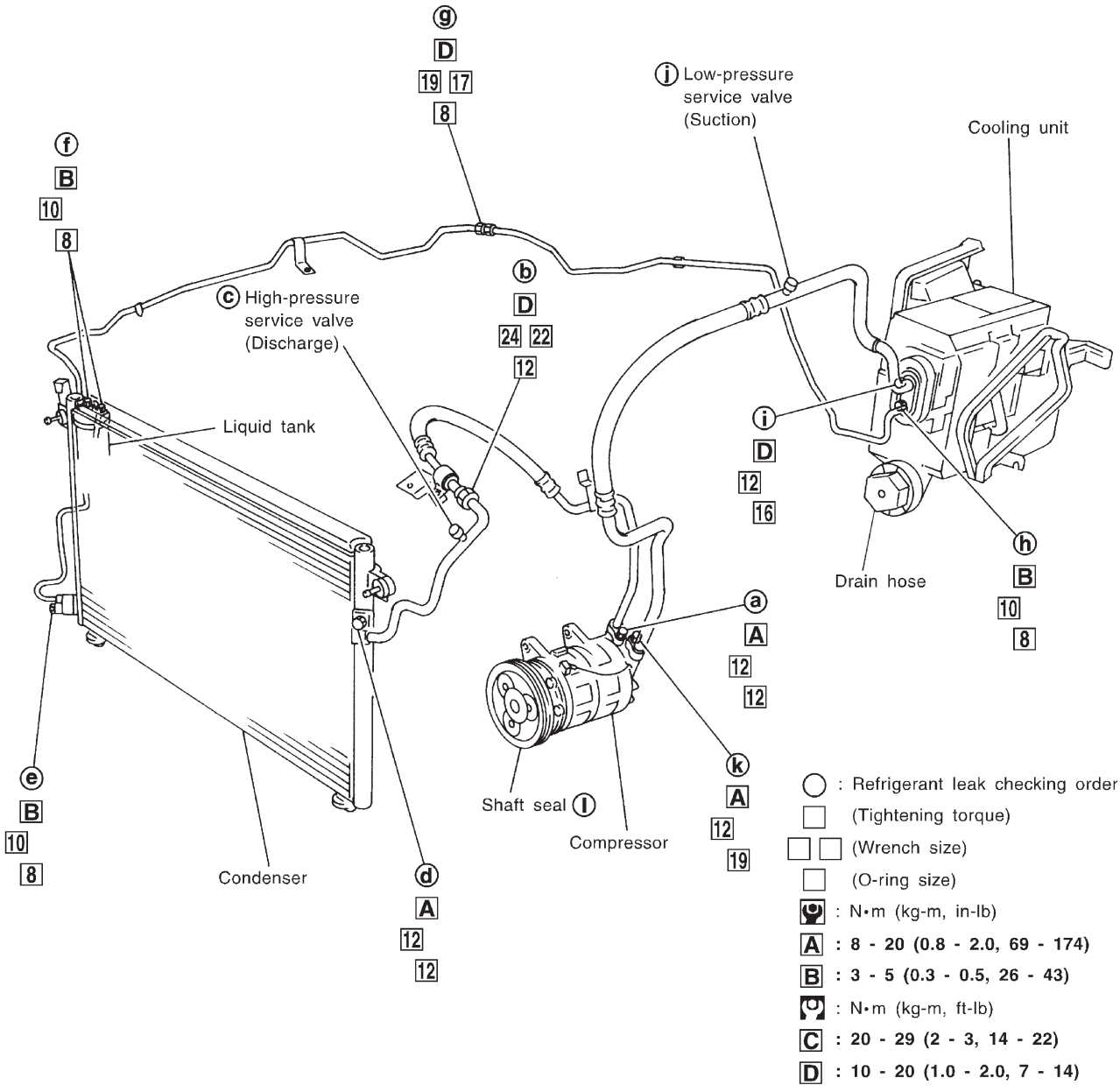
RHA747G

Refrigerant Lines (Cont'd)

FOR RHD MODELS

RD engine



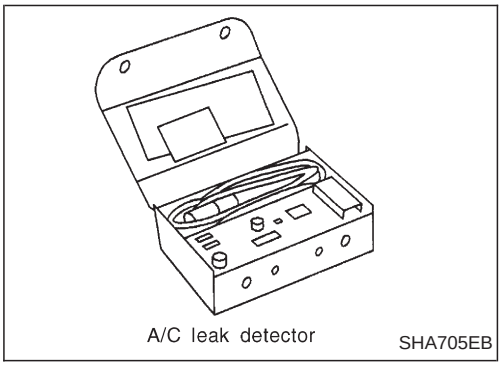


RHA740G

Checking Refrigerant Leaks

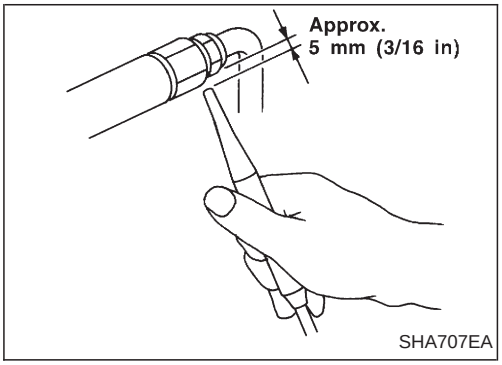
PRELIMINARY CHECK

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


A/C leak detector SHA705EB

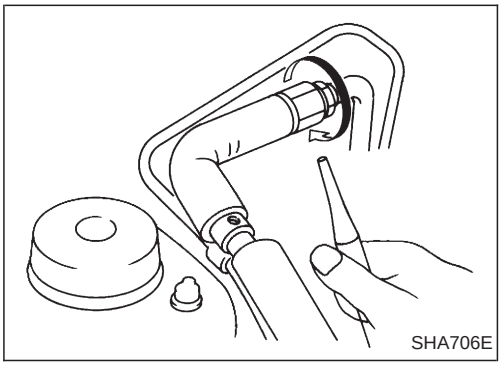
PRECAUTIONS FOR HANDLING LEAK DETECTOR

When performing a refrigerant leak check, use an A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly per the operating instructions.
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.
Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and cleaners, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean. Do not allow the sensor tip of the detector to come into contact with any substance. This can also cause false readings and may damage the detector.



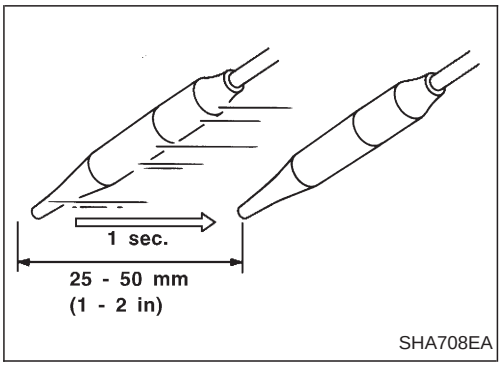
SHA707EA

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


SHA706E

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

Checking Refrigerant Leaks (Cont'd)



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

CHECKING PROCEDURE

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

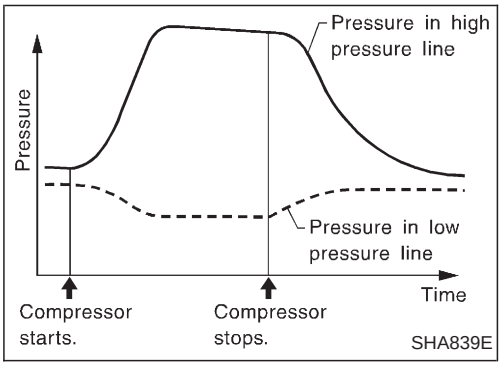
1. Turn engine off.
2. Connect a suitable A/C manifold gauge set to the A/C service ports.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.452 bar, 3.52 kg/cm^2, 50 psi) above 16°C (61°F). If less than specification, evacuate and recharge the system with the specified amount of refrigerant.
   NOTE: At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.452 bar, 3.52 kg/cm^2, 50 psi).
4. Conduct the leak test from the high side to the low side at points in alphabetical order (ⓐ, ⓑ .....). Refer to HA-117.
   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

Checking Refrigerant Leaks (Cont'd)

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.

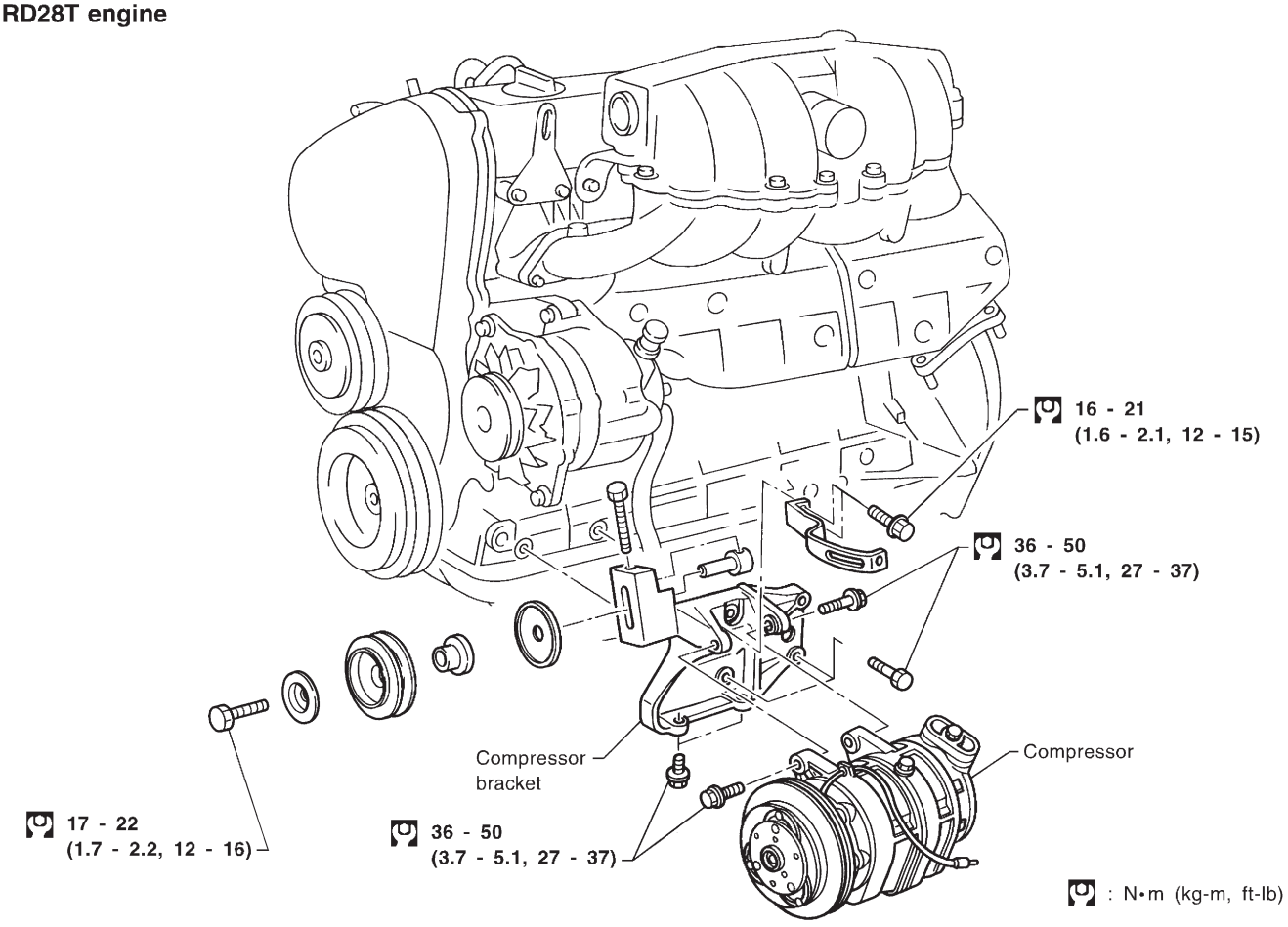


Refrigerant leaks should be checked immediately after stopping the engine. Begin with the leak detector on the high pressure line. The pressure in the high pressure line will gradually drop after refrigerant circulation stops and pressure in the low pressure line will gradually rise, as shown in the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

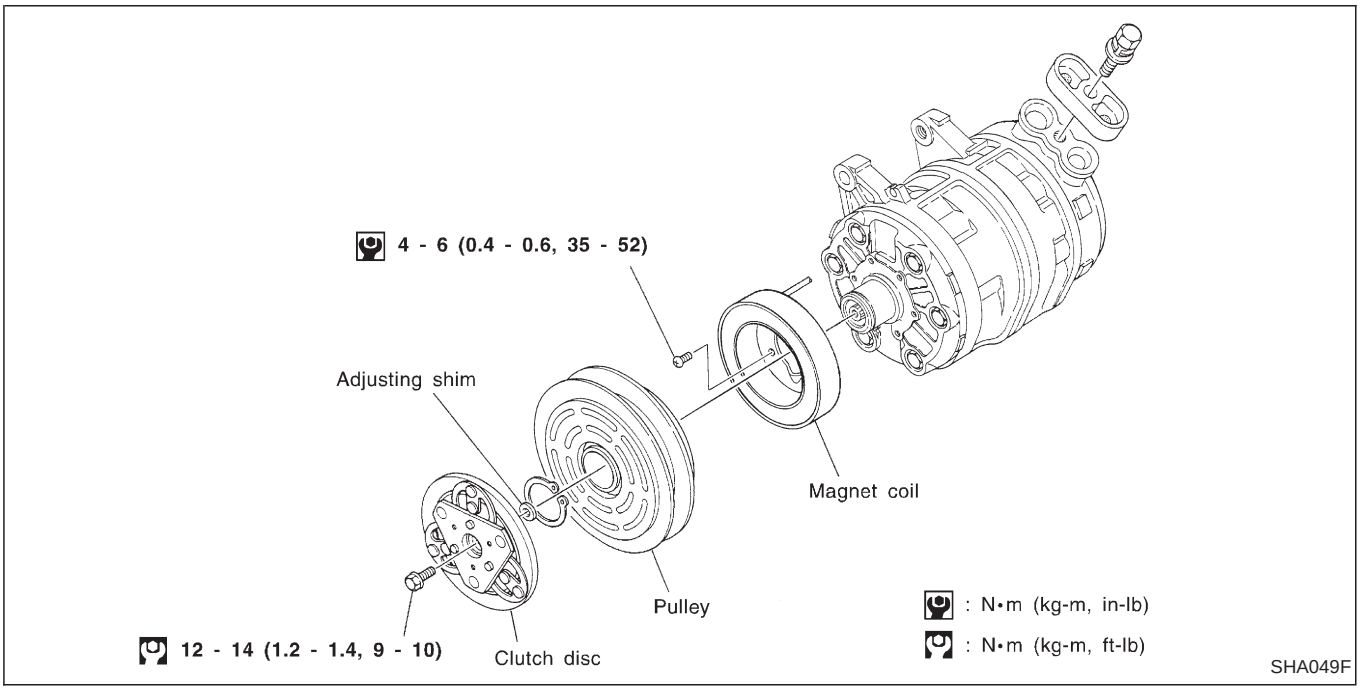
Compressor Mounting

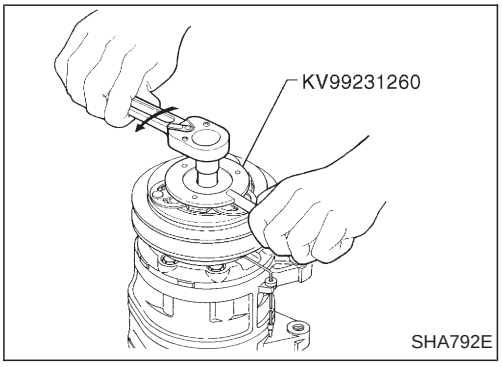
RD28T engine

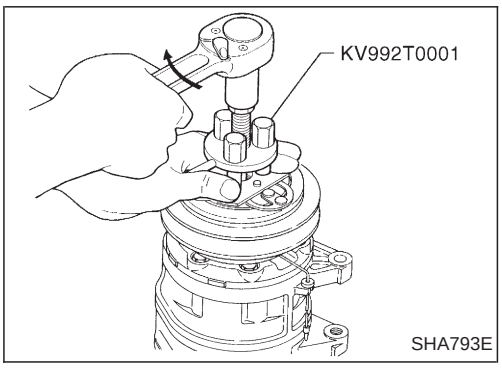


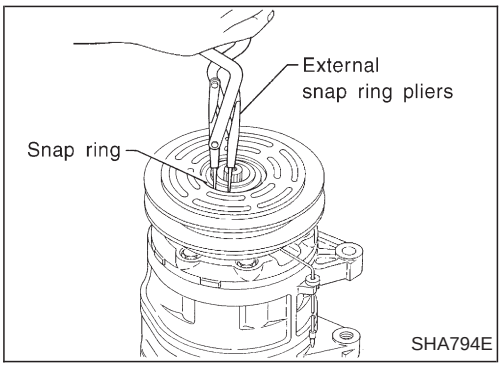
RHA842AA

Compressor — DKS-17CH









Compressor Clutch

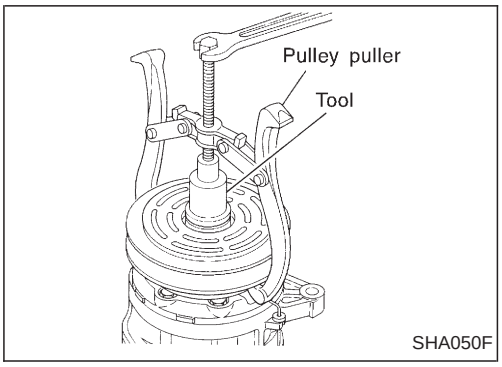
REMOVAL

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

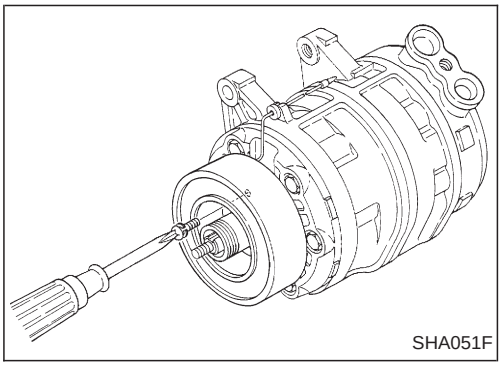
- Remove the drive plate using Tool.
  Insert holder's three pins into the drive plate. Rotate the holder clockwise to hook it onto the plate. Then, tighten the center bolt to remove the drive plate.
  After removing the drive plate, remove the shims from either the drive shaft or the drive plate.

- Remove the snap ring using external snap ring pliers.

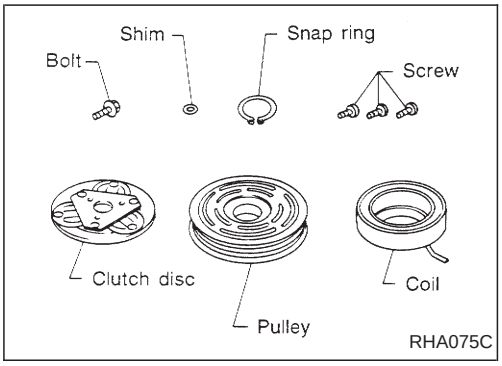
Compressor Clutch (Cont'd)



- Pulley removal
  Use any commercially available pulley puller and tool. Position the center of it on the end of the tool, and remove the pulley assembly.
  For pressed pulleys
  To prevent deformation of the pulley groove, the puller claws should be hooked under the pulley (not into the groove). For machine latched pulleys
  Align the pulley puller groove with the pulley groove, and then remove the pulley assembly.

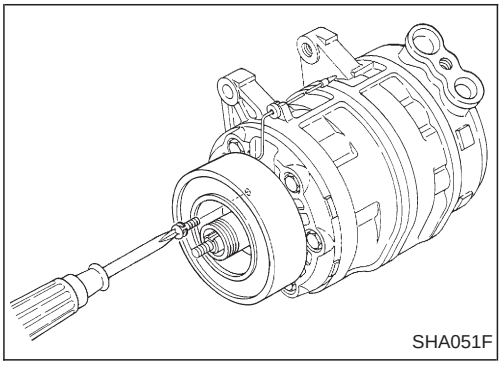


- Remove the three field coil fixing screws and remove the field coil.



INSPECTION

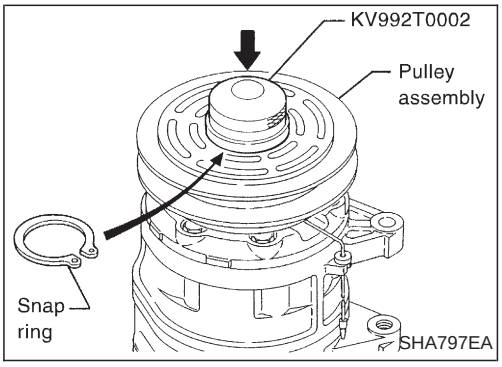
Clutch disc: If the contact surface shows signs of damage due to excessive heat, replace clutch disc and pulley.
Pulley: Check the appearance of the pulley assembly. Check the contact surface of the pulley for any sign of excessive grooving due to slippage. If any sign is found, replace both the pulley and clutch disc. The contact surfaces of the pulley assembly should be cleaned with a suitable solvent before reinstallation.
Coil: Check coil for loose connection or cracked insulation.



INSTALLATION

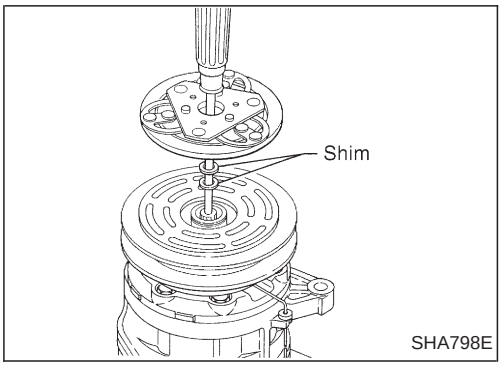
- Install the field coil.

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

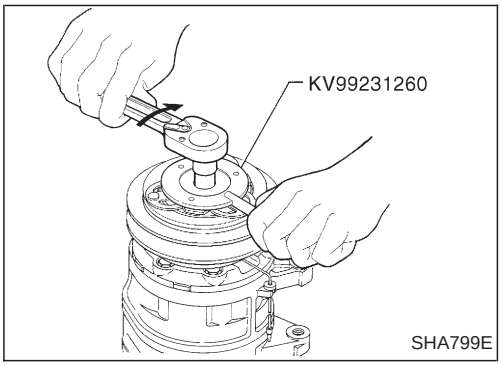


- Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.

Compressor Clutch (Cont'd)

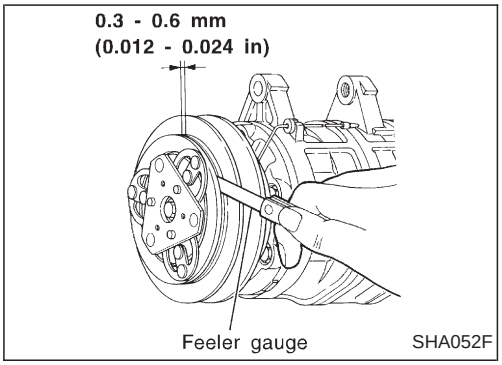


- Install the drive plate on the drive shaft, together with the original shim(s). Press the drive plate down by hand.



- Using the holder to prevent drive plate rotation, tighten the bolt to 12 to 14 N·m (1.2 to 1.4 kg-m, 9 to 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 shim and readjust.

BREAK-IN OPERATION

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

General Specifications

COMPRESSOR

Model	ZEXEL make DKS-17CH
Type	Swash plate
Displacement cm^3 (cu in)/rev.	168 (10.25)
Cylinder bore x stroke mm (in)	37.0 x 25.8 (1.457 x 1.016)
Direction of rotation	Clockwise (Viewed from drive end)
Drive belt	A Type

LUBRICANT

Model	ZEXEL make DKS-17CH
Type	KLH00-PAGS0
Capacity mℓ (Imp fl oz)	
Total in system	300 (10.6)
Compressor (Service parts) charging amount	300 (10.6)

Inspection and Adjustment

REFRIGERANT

	Front A/C
Type	HFC-134a (R-134a)
Capacity kg (lb)	0.75 - 0.85 (1.65 - 1.87)

COMPRESSOR

Model	DKS-17CH
Clutch disc-to-pulley clearance mm (in)	0.3 - 0.6 (0.012 - 0.024)

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

- **Refer to EC section.**

BELT TENSION

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