

# SECTION **ATC**

## AUTOMATIC AIR CONDITIONER

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# PRECAUTIONS

## PRECAUTIONS

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

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The Supplemental Restraint System such as “AIR BAG” and “SEAT BELT PRE-TENSIONER”, used along with a front seat belt, helps to reduce the risk or severity of injury to the driver and front passenger for certain types of collision. This system includes seat belt switch inputs and dual stage front air bag modules. The SRS system uses the seat belt switches to determine the front air bag deployment, and may only deploy one front air bag, depending on the severity of a collision and whether the front occupants are belted or unbelted. Information necessary to service the system safely is included in the SRS and SB 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/INFINITI 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 SRS section.
- Do not use electrical test equipment on any circuit related to the SRS unless instructed to in this Service Manual. SRS wiring harnesses can be identified by yellow and/or orange harnesses or harness connectors.

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

AJS0006S

#### **WARNING:**

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor malfunction is likely to occur, refer to “CONTAMINATED REFRIGERANT” below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment and Refrigerant Identifier.
- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - 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.
  - 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.
  - Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 HFC-134a (R-134a) recycling equipment, or J-2209 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.
  - Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

### CONTAMINATED REFRIGERANT

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

- Explain to the customer that environmental regulations prohibit the release of contaminated refrigerant into the atmosphere.
- Explain that recovery of the contaminated refrigerant could damage your service equipment and refrigerant supply.
- Suggest the customer return the vehicle to the location of previous service where the contamination may have occurred.

# PRECAUTIONS

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

## General Refrigerant Precautions

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### WARNING:

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

## Lubricant Precautions

AJS0006U

- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor malfunction is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - When removing refrigerant components from a vehicle, immediately cap (seal) the component to minimize the entry of moisture from the atmosphere.
  - 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.
  - 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.
- Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from the A/C system, using certified service equipment meeting requirements of SAE J-2210 [HFC-134a (R-134a) recycling equipment], or J-2209 [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.
- Do not allow lubricant (Nissan A/C System Oil Type S) to come in contact with styrofoam parts. Damage may result.

## Precautions for Refrigerant Connection

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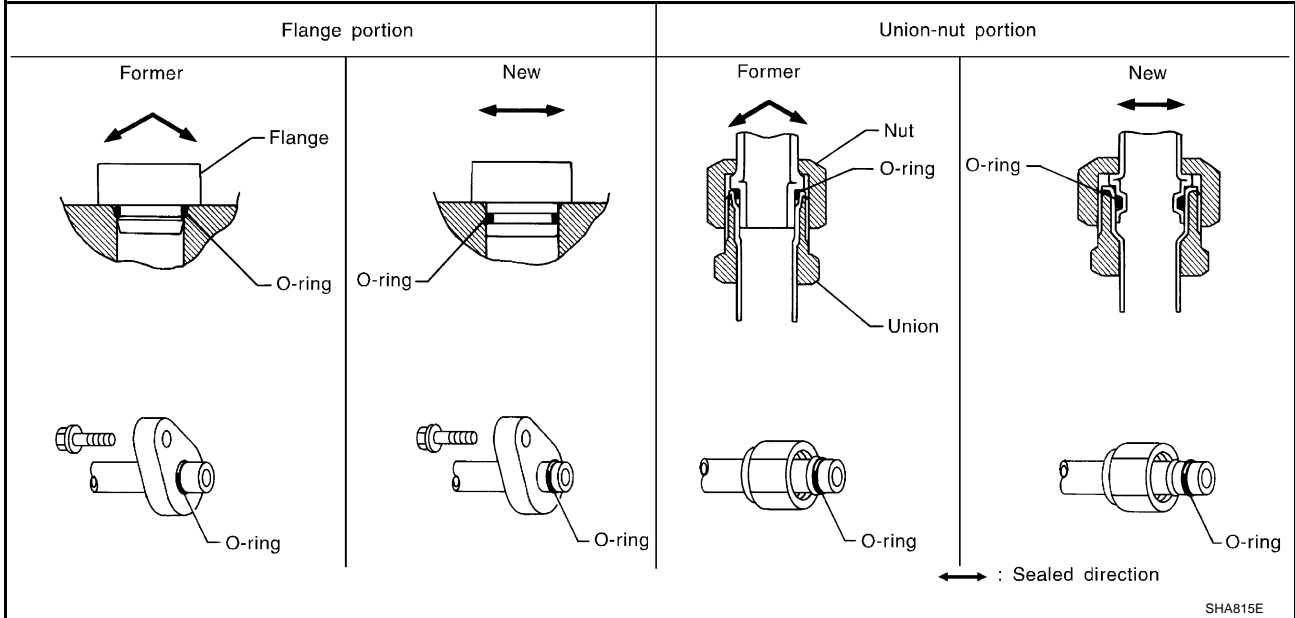
A new type refrigerant connection has been introduced to all refrigerant lines except the following location.

- Expansion valve to cooling unit
- Refrigerant pressure sensor to condenser

# PRECAUTIONS

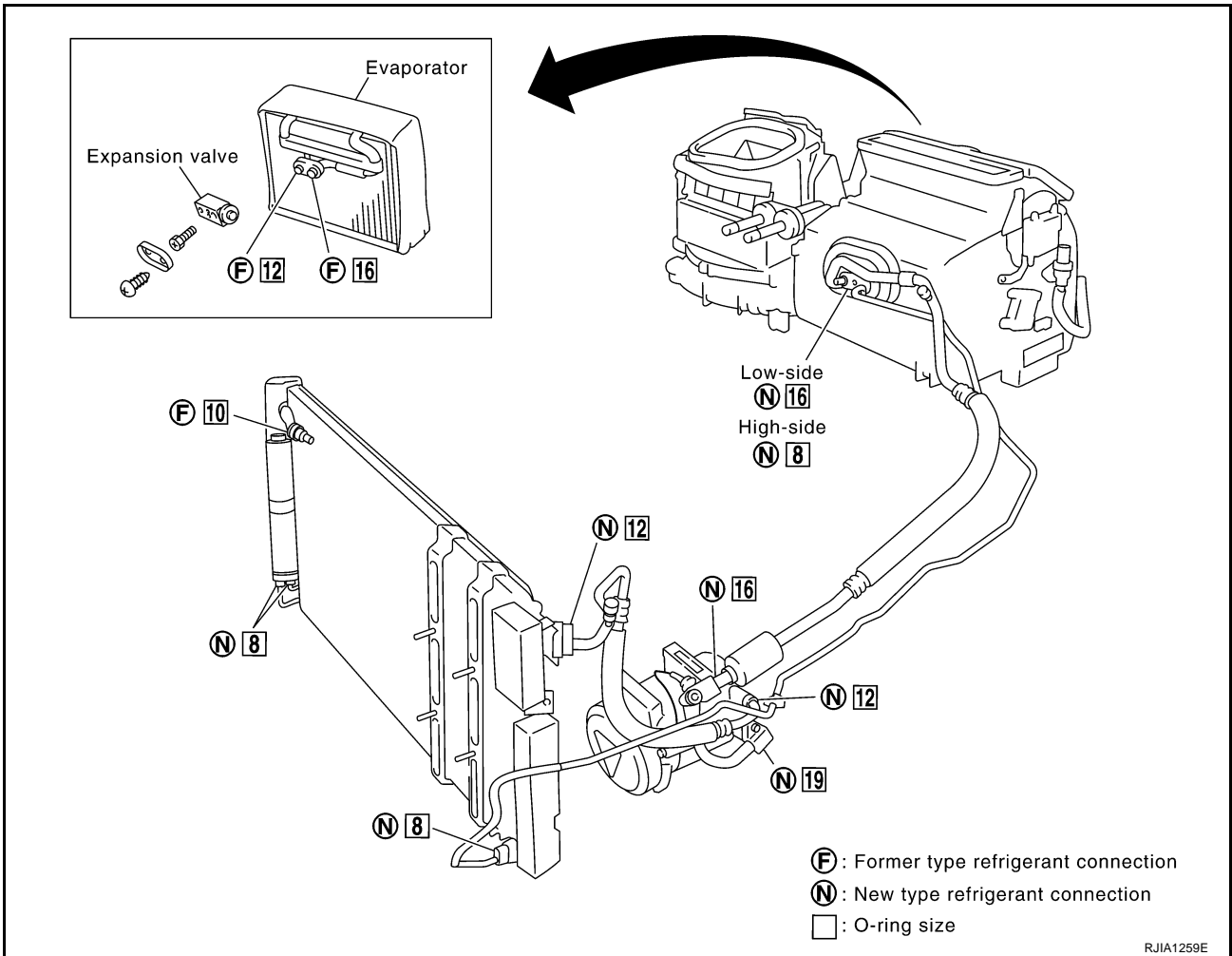
## FEATURES OF NEW TYPE REFRIGERANT CONNECTION

- 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.



# PRECAUTIONS

## O-RING AND REFRIGERANT CONNECTION



### CAUTION:

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

### O-Ring Part Numbers and Specifications

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)
Former	10	J2476 89956	9.25 (0.3642)	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)
New	24	92195 AH300	21.8 (0.858)	2.4 (0.094)

### 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.

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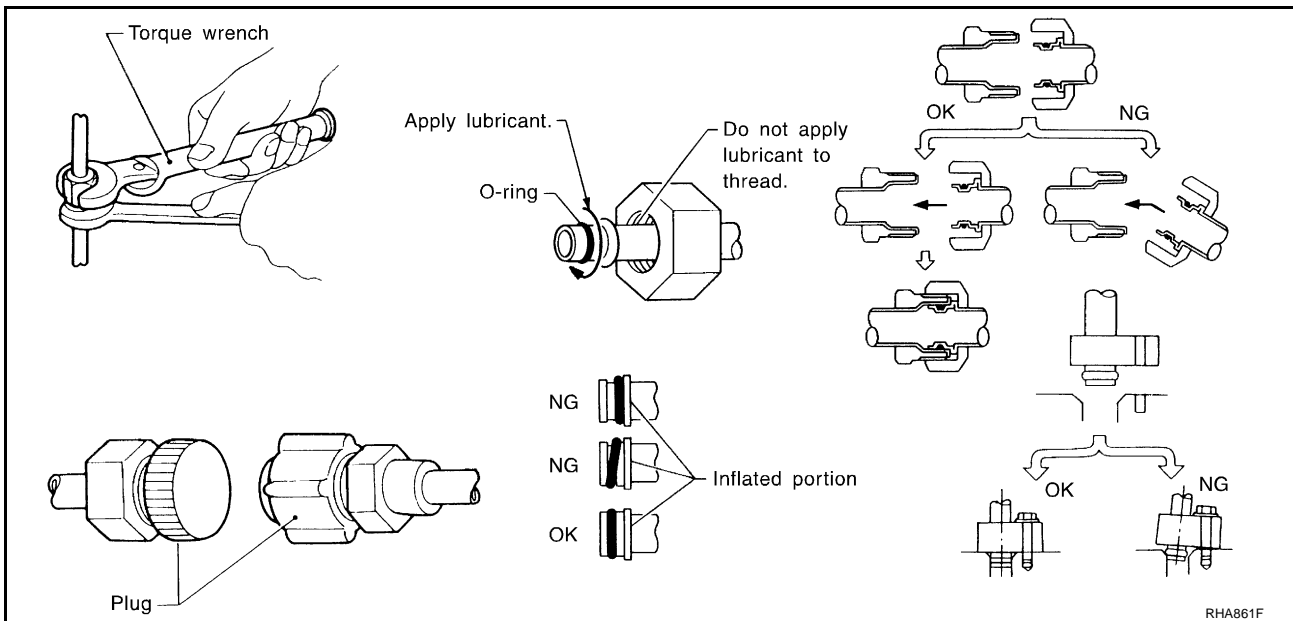
## PRECAUTIONS

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

Lubricant name : Nissan A/C System Oil Type S

Part number : KLH00-PAGS0

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



### Precautions for Servicing Compressor

AJS0006W

- 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 [ATC-22, "Maintenance of Lubricant Quantity in Compressor"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for normal operation.



# PRECAUTIONS

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## Precautions for Service Equipment RECOVERY/RECYCLING EQUIPMENT

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

### ELECTRONIC LEAK DETECTOR

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

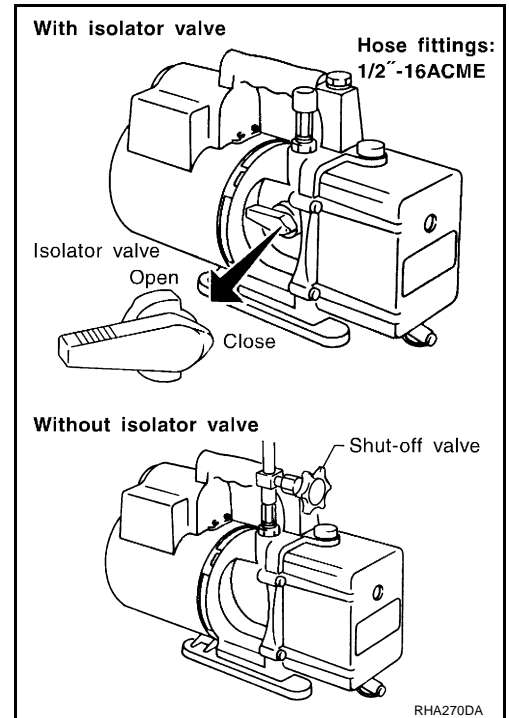
### VACUUM PUMP

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

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

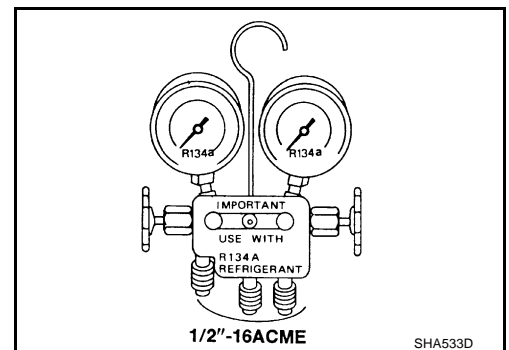
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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

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



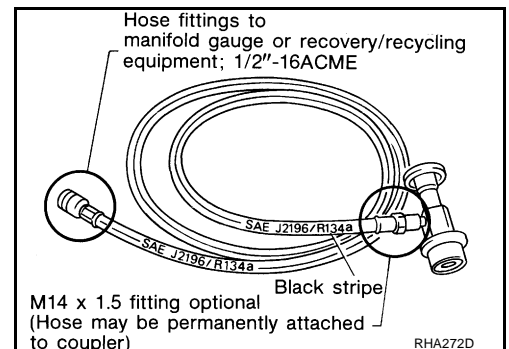
### MANIFOLD GAUGE SET

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



### SERVICE HOSES

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



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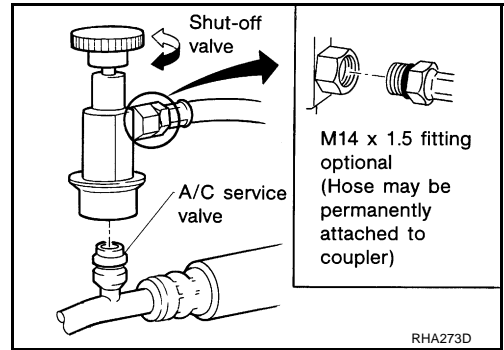
ATC

# PRECAUTIONS

## SERVICE COUPLERS

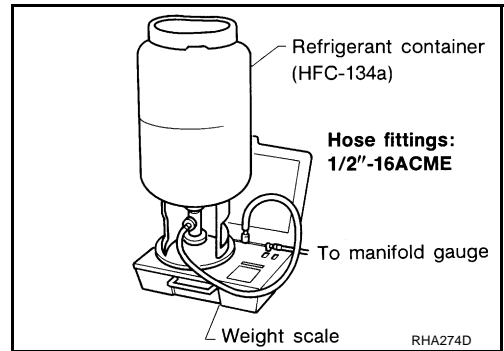
Never attempt to connect HFC-134a (R-134a) service couplers to a CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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.

# PRECAUTIONS

## Precautions for Leak Detection Dye

AJS0006Y

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

## IDENTIFICATION

### NOTE:

Vehicles with factory installed fluorescent dye have a green label.  
Vehicles without factory installed fluorescent dye have a blue label.

## IDENTIFICATION LABEL FOR VEHICLE

Vehicles with factory installed fluorescent dye have this identification label on the front side of hood.

AIR CONDITIONER NISSAN		
	REFRIGERANT	COMPRESSOR LUBRICANT
TYPE (PART NO.)	HFC134a (R134a)	Nissan UV Luminous Oil Type S [KLHOO-PAGSO]
AMOUNT		

**CAUTION PRECAUTION**

- REFRIGERANT UNDER HIGH PRESSURE.
- SYSTEM TO BE SERVICED BY QUALIFIED PERSONNEL.
- IMPROPER SERVICE METHODS MAY CAUSE PERSONAL INJURY.
- CONSULT SERVICE MANUAL.
- THIS AIR CONDITIONER SYSTEM COMPLIES WITH SAE J-639.

Nissan Motor Co., Ltd., TOKYO, Japan

27090 6P102

SHA436FA

## Wiring Diagrams and Trouble Diagnosis

AJS00070

When you read wiring diagrams, refer to the following:

- [GI-14, "How to Read Wiring Diagrams"](#) in GI section.
- [PG-3, "Wiring Diagram — POWER —"](#) in PG section.

When you perform trouble diagnosis, refer to the following:

- [GI-10, "How to Follow Trouble Diagnoses"](#) in GI section.
- [GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) in GI section.

# PREPARATION

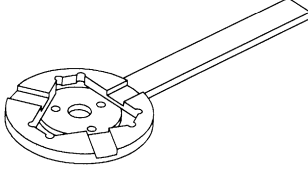
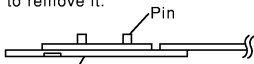
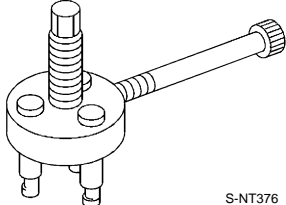
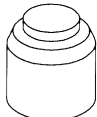
## PREPARATION

PFP:00002

### Special Service Tools

AJS000VL

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

Tool number (Kent-Moore No.) Tool name	Description
<p>KV99106100 (J-41260) Clutch disc wrench</p> <div style="text-align: center;">  <p>S-NT232</p> <p>When replacing the magnetic clutch in the above compressor, use a clutch disc wrench with the pin side on the clutch disc to remove it.</p>  <p>Pin Clutch disc wrench</p> <p>RJA0194E</p> </div>	<p>Removing shaft nut and clutch disc</p>
<p>KV99232340 (J-38874)</p> <div style="text-align: center;">  <p>S-NT376</p> </div>	<p>Removing clutch disc</p>
<p>KV99106200 (J-41261) Pulley installer</p> <div style="text-align: center;">  <p>S-NT235</p> </div>	<p>Installing pulley</p>

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

AJS000VM

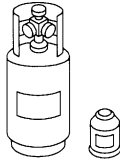


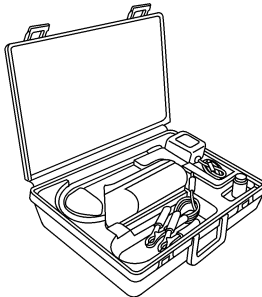
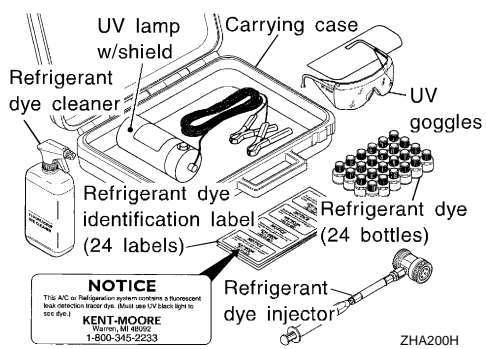
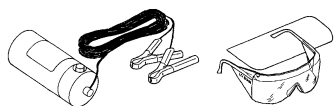
Never mix HFC-134a (R-134a) refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

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


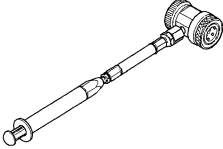

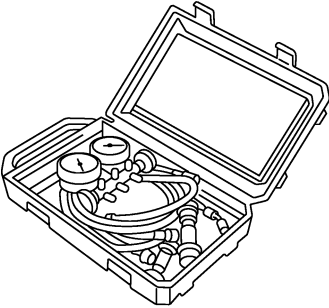
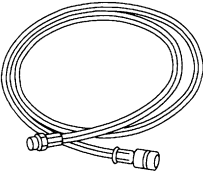
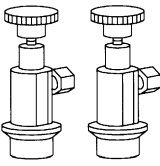
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

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

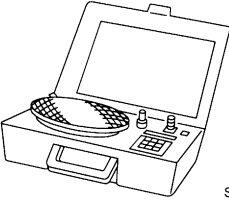
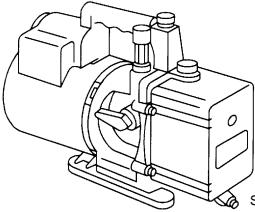
# PREPARATION

Tool number (Kent-Moore No.) Tool name	Description	A
HFC-134a (R-134a) refrigerant   S-NT196	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2"-16 ACME	B C
KLH00-PAGSO ( - ) Nissan A/C System Oil Type S   S-NT197	Type: Poly alkaline glycol oil (PAG), type S Application: HFC-134a (R-134a) swash (wobble) plate compressors (Nissan only) Lubricity: 40 m ℓ (1.4 US fl oz, 1.4 Imp fl oz)	D E
(J-43600) Recovery/Recycling Recharging equipment (ACR2000)   WJIA0293E	Function: Refrigerant recovery and recycling and recharging	F G
(J-41995) Electrical leak detector   AHA281A	Power supply: ● DC 12V (Cigarette lighter)	H I ATC
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner   ZHA200H	Power supply: DC 12V (Battery terminal)	L M
(J-42220) UV lamp and UV safety goggles   SHA438F	Power supply: DC 12V (Battery terminal) For checking refrigerant leak when fluorescent dye is installed in A/C system Includes: UV lamp and UV safety goggles	

# PREPARATION

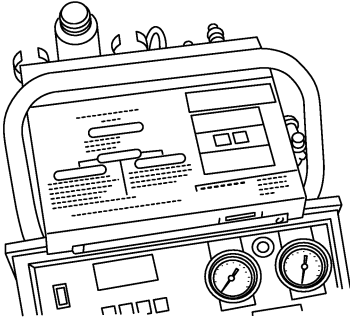
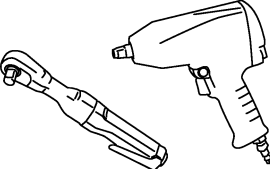
Tool number (Kent-Moore No.) Tool name	Description
(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)	 <p style="text-align: center;">Refrigerant dye (24 bottles)</p> <p style="text-align: center;">SHA439F</p> Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)
(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle	 <p style="text-align: center;">SHA440F</p> For injecting 1/4 ounce of fluorescent leak detection dye into A/C system
(J-43872) Refrigerant dye cleaner	 <p style="text-align: center;">SHA441F</p> For cleaning dye spills
(J-39183) Manifold gauge set (with hoses and couplers)	 <p style="text-align: center;">RJIA0196E</p> Identification: <ul style="list-style-type: none"> <li>● The gauge face indicates HFC-134a (R-134a).</li> </ul> Fitting size: Thread size <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>
Service hoses <ul style="list-style-type: none"> <li>● High-pressure side hose (J-39501-72)</li> <li>● Low-pressure side hose (J-39502-72)</li> <li>● Utility hose (J-39476-72)</li> </ul>	 <p style="text-align: center;">S-NT201</p> Hose color: <ul style="list-style-type: none"> <li>● Low hose: Blue with black stripe</li> <li>● High hose: Red with black stripe</li> <li>● Utility hose: Yellow with black stripe or green with black stripe</li> </ul> Hose fitting to gauge: <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>
Service couplers <ul style="list-style-type: none"> <li>● High-pressure side coupler (J-39500-20)</li> <li>● Low-pressure side coupler (J-39500-24)</li> </ul>	 <p style="text-align: center;">S-NT202</p> Hose fitting to service hose: <ul style="list-style-type: none"> <li>● M14 x 1.5 fitting is optional or permanently attached.</li> </ul>

# PREPARATION

Tool number (Kent-Moore No.) Tool name		Description	
(J-39650) Refrigerant weight scale	 S-NT200	For measuring of refrigerant Fitting size: Thread size ● 1/2"-16 ACME	A B C
(J-39649) Vacuum pump (Including the isolator valve)	 S-NT203	Capacity: ● Air displacement: 4 CFM ● Micron rating: 20 microns ● Oil capacity: 482 g (17 oz) Fitting size: Thread size ● 1/2"-16 ACME	D E F

## Commercial Service Tools

*AJS000VN*

Tool name		Description	
Refrigerant identifier equipment	 RJIA0197E	Checking for refrigerant purity and system contamination	G H I
Power tool	 PBIC0190E	For loosening bolts and nuts	K L M

ATC

# REFRIGERATION SYSTEM

## REFRIGERATION SYSTEM

PFP:KA990

### Refrigerant Cycle REFRIGERANT FLOW

AJS00074

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

### FREEZE PROTECTION

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

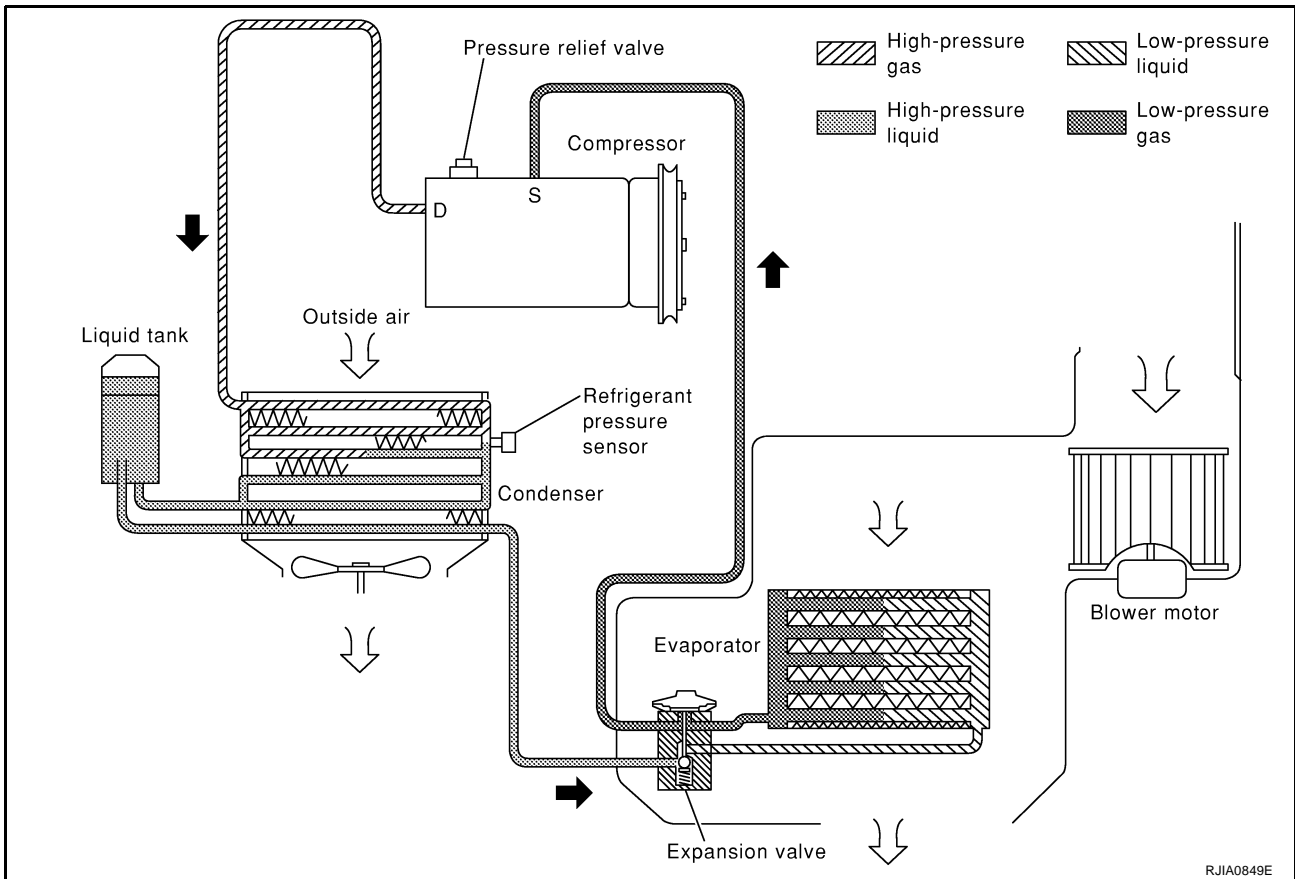
### Refrigerant System Protection REFRIGERANT PRESSURE SENSOR

AJS000BX

The refrigerant system is protected against excessively high- or low-pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above, or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends the voltage signal to the ECM. ECM makes the A/C relay go OFF and stops the compressor when pressure on the high-pressure side detected by refrigerant pressure sensor is over about 2,746 kPa (28 kg/cm<sup>2</sup>, 398 psi), or below about 134 kPa (1.4 kg/cm<sup>2</sup>, 20 psi).

### PRESSURE RELIEF VALVE

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





# REFRIGERATION SYSTEM

## V-6 Variable Displacement Compressor

AJS000BY

### GENERAL INFORMATION

1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:  
Evaporator intake air temperature is less than 20°C (68°F).  
Engine is running at speeds less than 1,500 rpm.  
This is because the V-6 compressor provides a means of “capacity” control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. During cold winters, it may not produce high refrigerant pressure discharge (compared to previous units) when used with air conditioning systems.
3. A “clanking” sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the wobble (swash) plate has changed and is not a problem.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.

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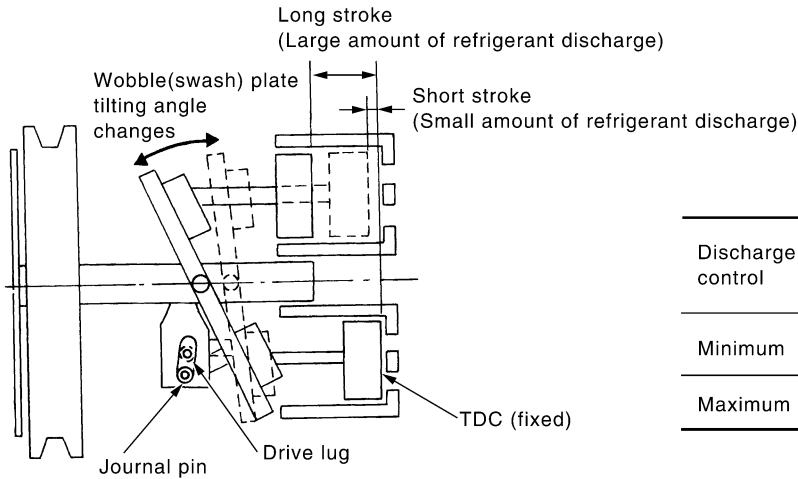
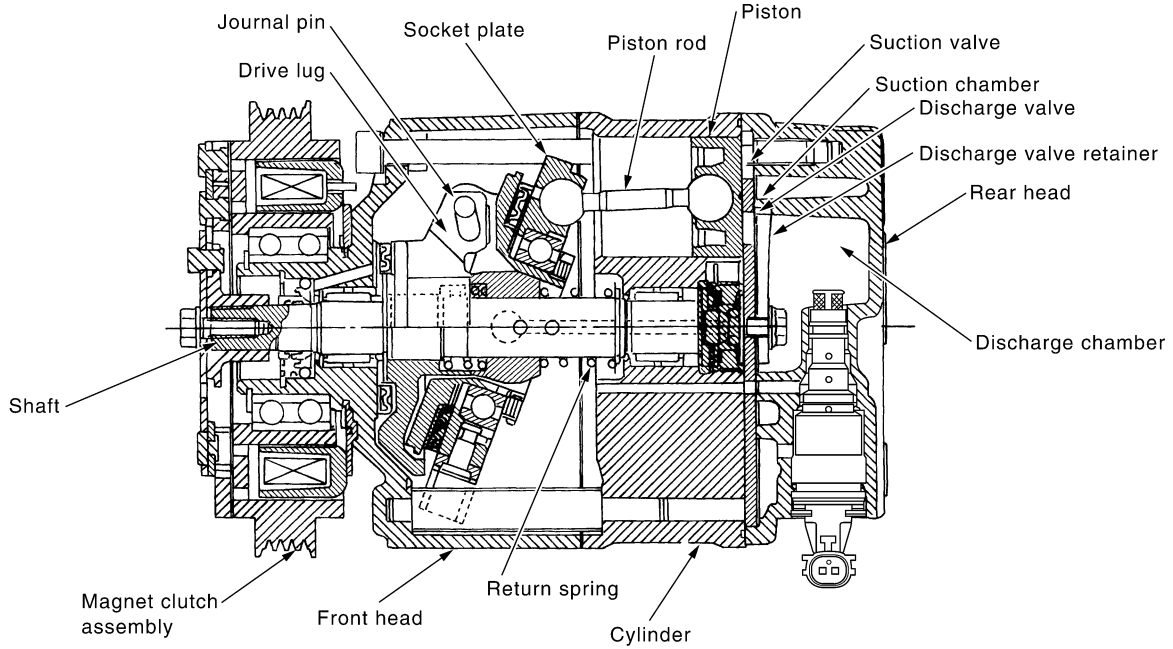
# REFRIGERATION SYSTEM

## DESCRIPTION

### General

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

The tilt of the wobble (swash) plate allows the piston's stroke to change so that refrigerant discharge can be continuously changed from 14.5 to 184 cm<sup>3</sup> (0.885 to 11.228 cu in).



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

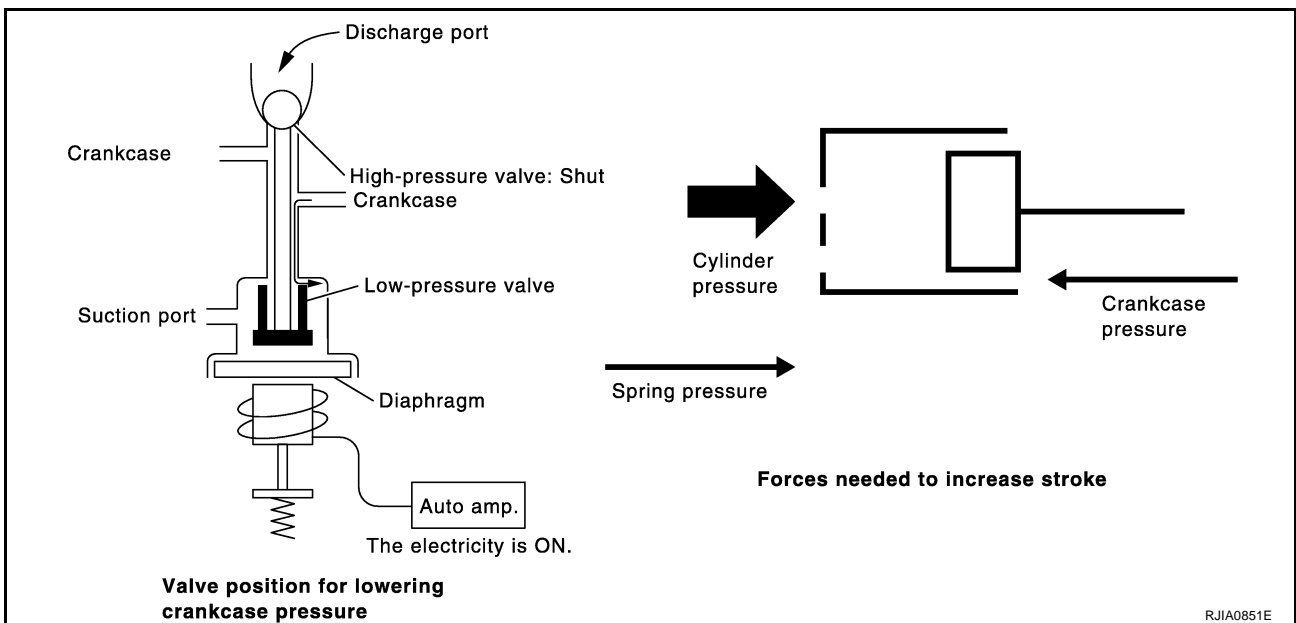
RJIA1260E

# REFRIGERATION SYSTEM

## Operation

1. Operation Control Valve
  - By changing high-pressure valve lift amount, built-in compressor control valve executes the following:
    - Controls high-pressure valve discharge amount.
    - Changes crankcase pressure in compressor.
    - Changes angle of wobble (swash) plate.
  - Amount of high-pressure valve lift is determined by factors below.
    - Low-pressure applied to diaphragm
    - Spring load of set spring
    - Balance of magnetic force generated in magnet coil
  - Electronic control valve (ECV) magnet coil receives electric signal (duty control) from auto amplifier. Then, magnetic force generated by electric current is changed to control high-pressure valve lift amount.
2. Maximum Cooling

High-pressure valve is closed by magnetic force generated by electric signal (duty control) sent from automatic amplifier. At this time, cylinder moves full stroke due to pressure balance between inside crankcase ( $P_c$ ) and suction line ( $P_s$ ).  
Under this condition, the wobble (swash) plate is set to the maximum stroke position.

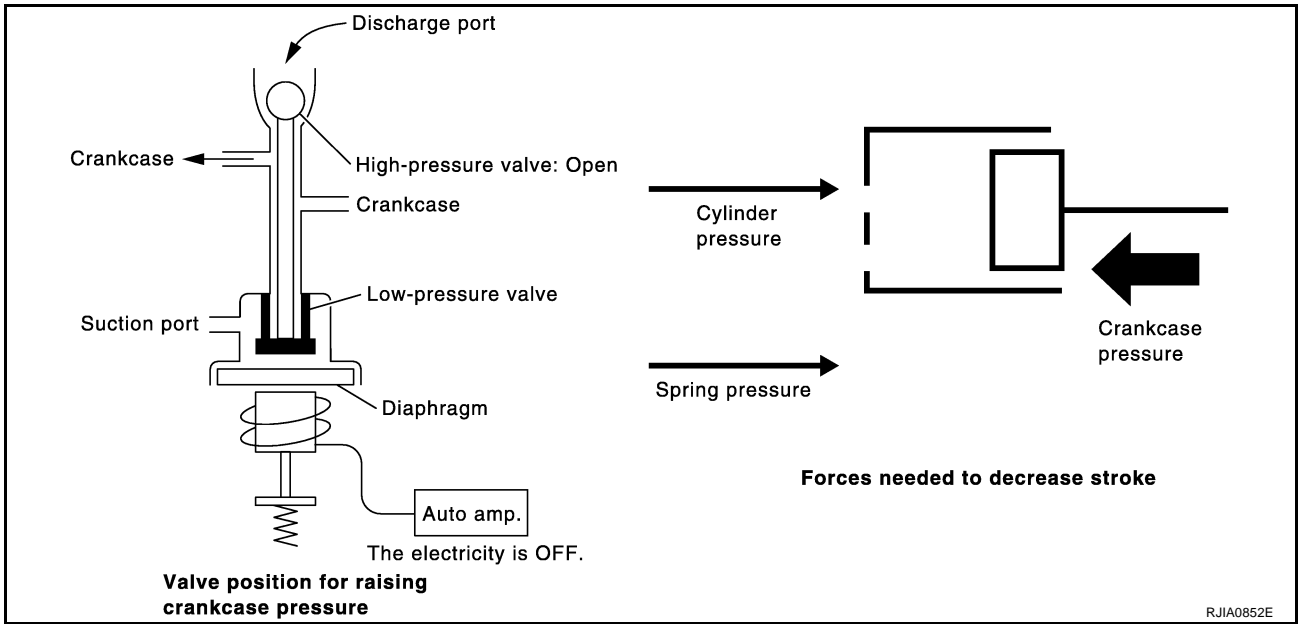


3. Capacity Control

When no electric signal is sent from automatic amplifier (current: OFF), high-pressure valve is opened by spring force.  
Since suction pressure is low, it makes the suction port close and the discharge port open. Thus, crankcase pressure becomes high as high-pressure enters the crankcase.

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

# REFRIGERATION SYSTEM

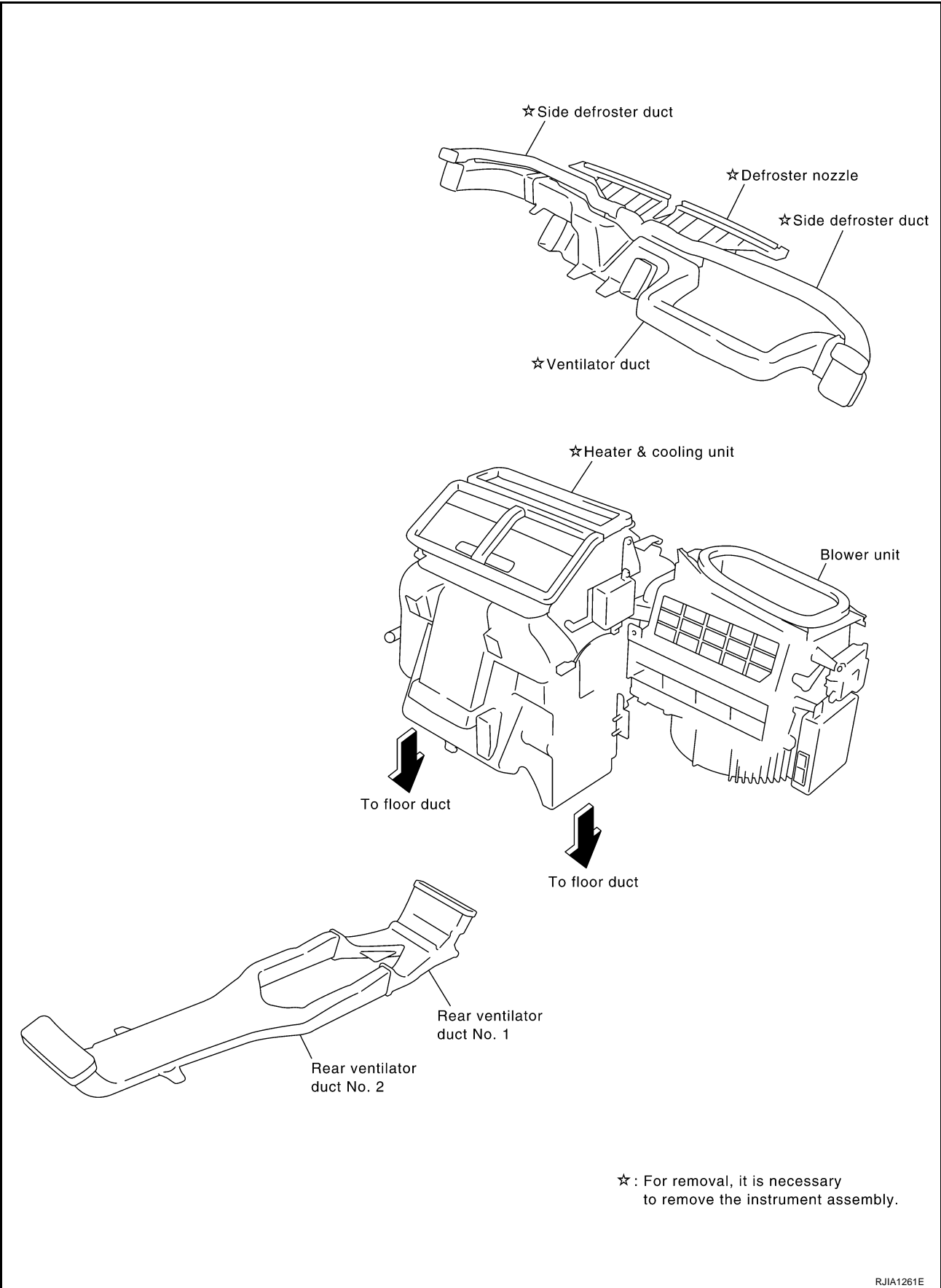


# REFRIGERATION SYSTEM

## Component Layout

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RJIA1261E

# LUBRICANT

## LUBRICANT

PFPP:KLG00

### Maintenance of Lubricant Quantity in Compressor

AJS00078

The lubricant in the compressor circulates through the system with the refrigerant. Add lubricant to compressor when replacing any component or after a large refrigerant 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

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

### LUBRICANT RETURN OPERATION

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

#### 1. CHECK LUBRICANT RETURN OPERATION

---

Can lubricant return operation be performed?

- A/C system works properly.
- There is no evidence of a large amount of lubricant leakage.

**CAUTION:**

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

OK or NG

- OK >> GO TO 2.  
NG >> GO TO 3.

#### 2. PERFORM LUBRICANT RETURN OPERATION, PROCEEDING AS FOLLOWS:

---

1. Start engine, and set the following conditions:
  - Test condition
  - Engine speed: Idling to 1,200 rpm
  - A/C or AUTO switch: ON
  - Blower speed: Max. position
  - Temp. control: Optional [Set so that intake air temperature is 25 to 30°C (77 to 86°F).]
  - Intake position: Recirculation (REC)
2. Perform lubricant return operation for about 10 minutes.
3. Stop engine.

>> GO TO 3.

#### 3. CHECK REPLACEMENT PART

---

Should the compressor be replaced?

- YES >> GO TO [ATC-23, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT"](#).
- NO >> GO TO [ATC-23, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR"](#).

# LUBRICANT

## LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR

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

### Amount of lubricant to be added

Part replaced	Lubricant to be added to system		Remarks
	Amount of lubricant m ℓ (US fl oz, Imp fl oz)		
Evaporator	75 (2.5, 2.6)		-
Condenser	35 (1.2, 1.2)		-
Liquid tank	10 (0.3, 0.4)		-
In case of refrigerant leak	30 (1.0, 1.1)		Large leak
	-		Small leak *1

\*1: If refrigerant leak is small, no addition of lubricant is needed.

## LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

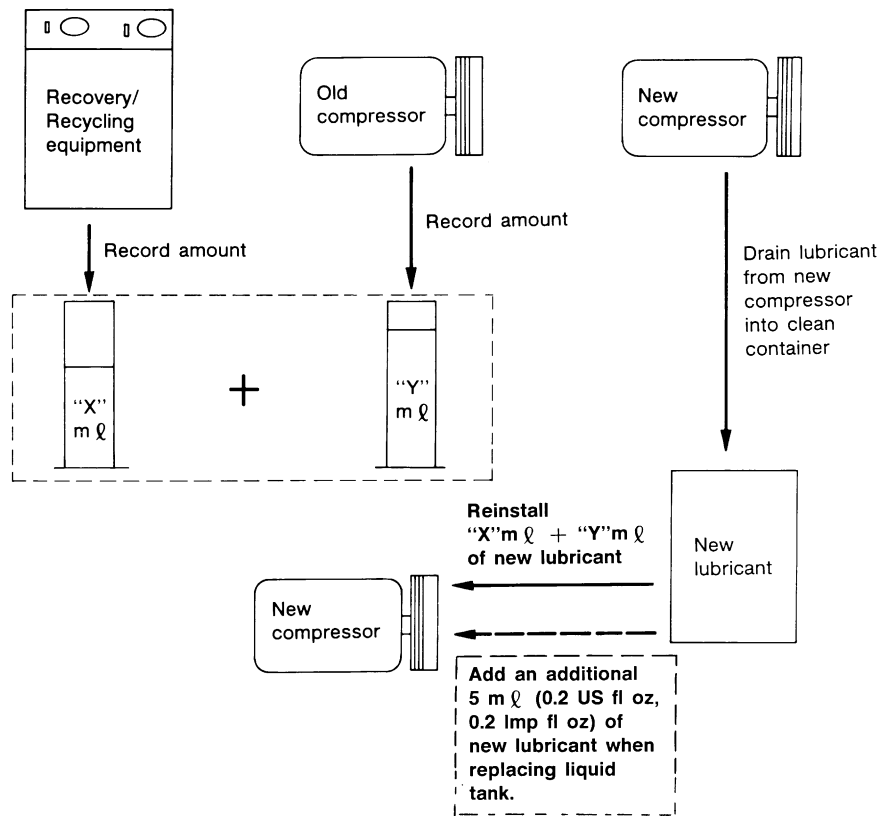
- Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
- Connect recovery/recycling recharging equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [ATC-4, "CONTAMINATED REFRIGERANT"](#).
- Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier. If NG, refer to [ATC-4, "CONTAMINATED REFRIGERANT"](#).
- Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
- Drain the lubricant from the old (removed) compressor into a graduated container and recovery the amount of lubricant drained.
- Drain the lubricant from the new compressor into a separate, clean container.
- 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.
- Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
- If the liquid tank also needs to be replaced, add an additional 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.  
Do not add this 5 m ℓ (0.2 US fl oz, 0.2 Imp fl oz) of lubricant if only replacing the compressor.

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ATC

# LUBRICANT

## Lubricant adjusting procedure for compressor replacement



RHA065DD



# AIR CONDITIONER CONTROL

## AIR CONDITIONER CONTROL

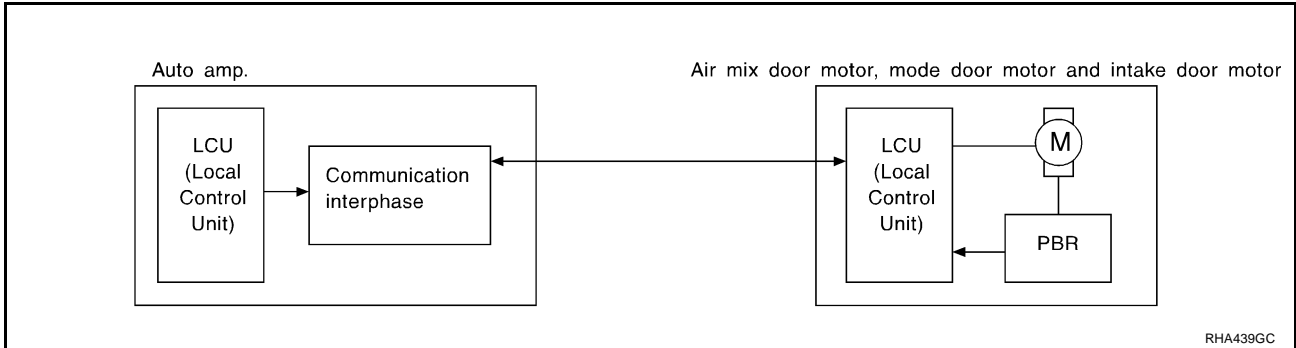
PPF:27500

### Description of Air Conditioner LAN Control System

AJS00079

The LAN (Local Area Network) system consists of auto amp., mode door motor, air mix door motor and intake door motor.

A configuration of these components is shown in the diagram below.



### System Construction

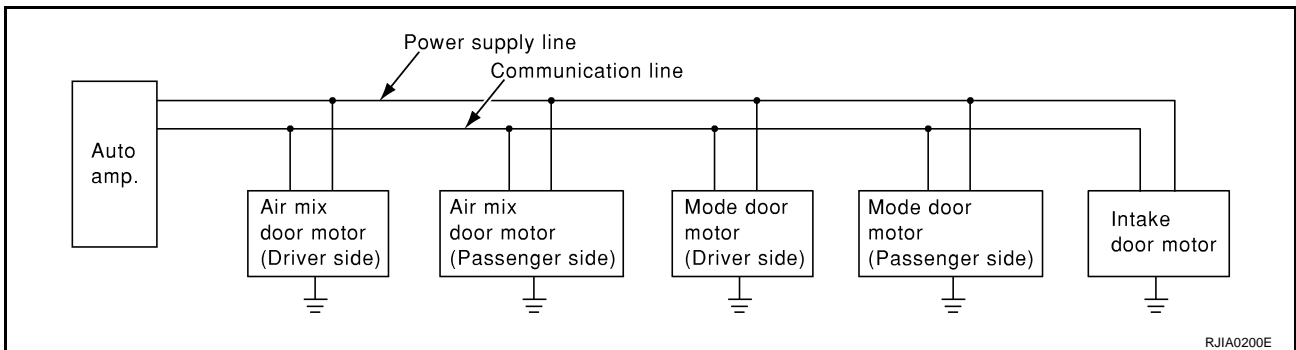
AJS0007A

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

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

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

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



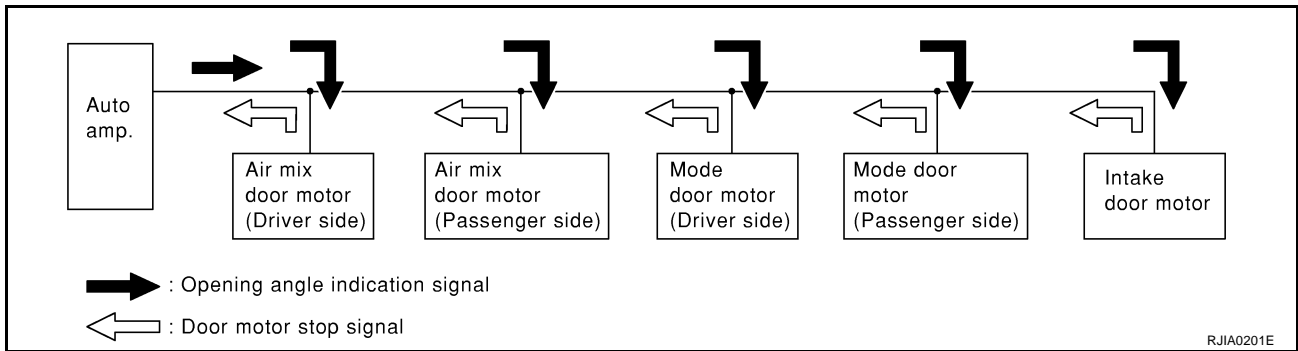
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ATC

# AIR CONDITIONER CONTROL

## OPERATION

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



## TRANSMISSION DATA AND TRANSMISSION ORDER

Auto amp. 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 amp. is selected according to data-based decisions made by the air mix door motor, mode door motor and intake 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:

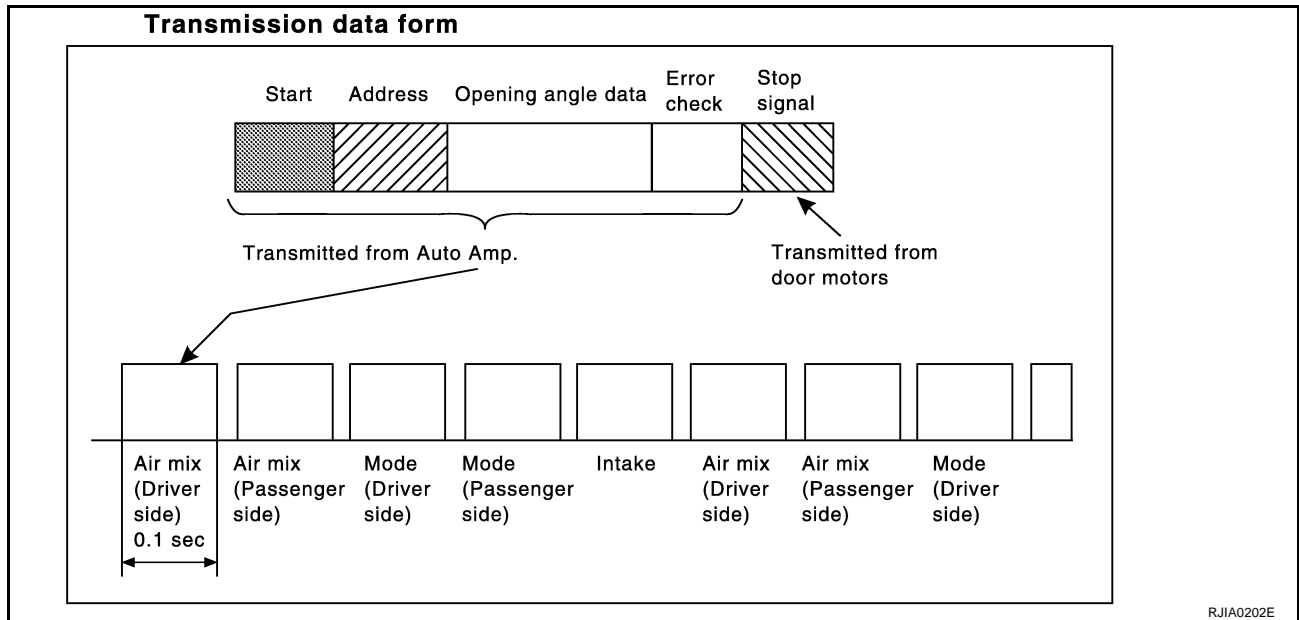
Procedure by which sent and received data is checked for errors. Error data is then compiled. The error check prevents corrupted data from being used by the air mix door motor, mode door motor and intake door motor. Error data can be related to the following symptoms.

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

# AIR CONDITIONER CONTROL

## Stop Signal:

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



## 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 by the 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.

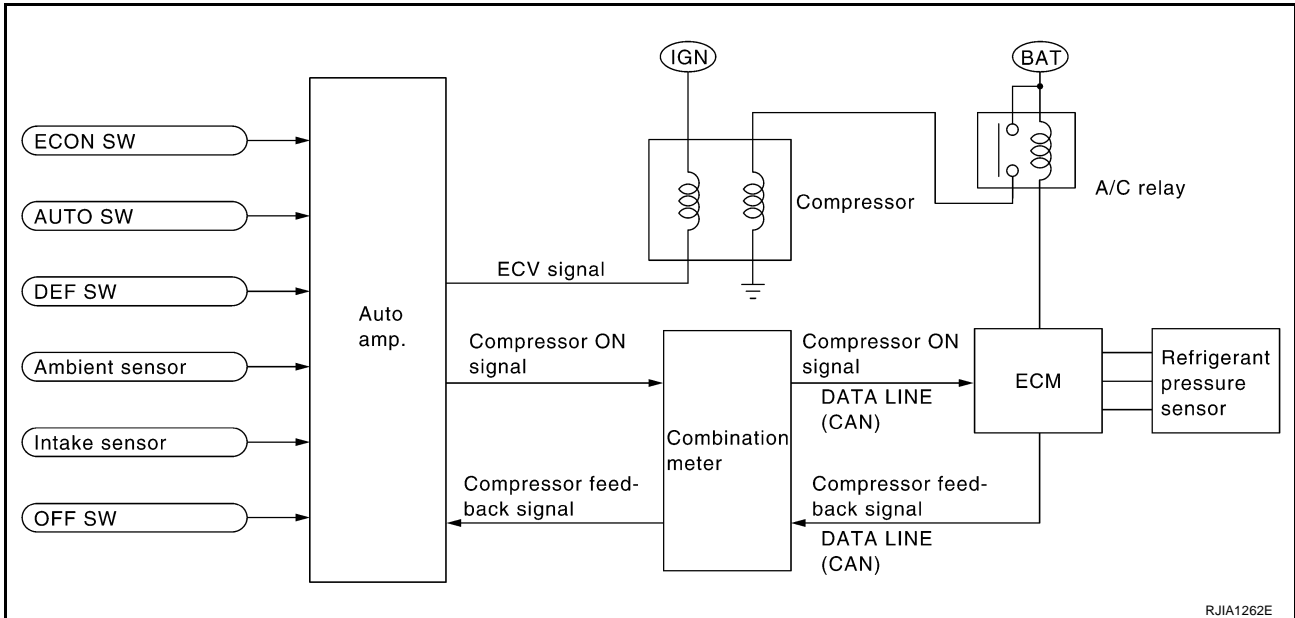
## OUTLET DOOR CONTROL

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

# AIR CONDITIONER CONTROL

## MAGNET CLUTCH CONTROL

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



## SELF-DIAGNOSTIC SYSTEM

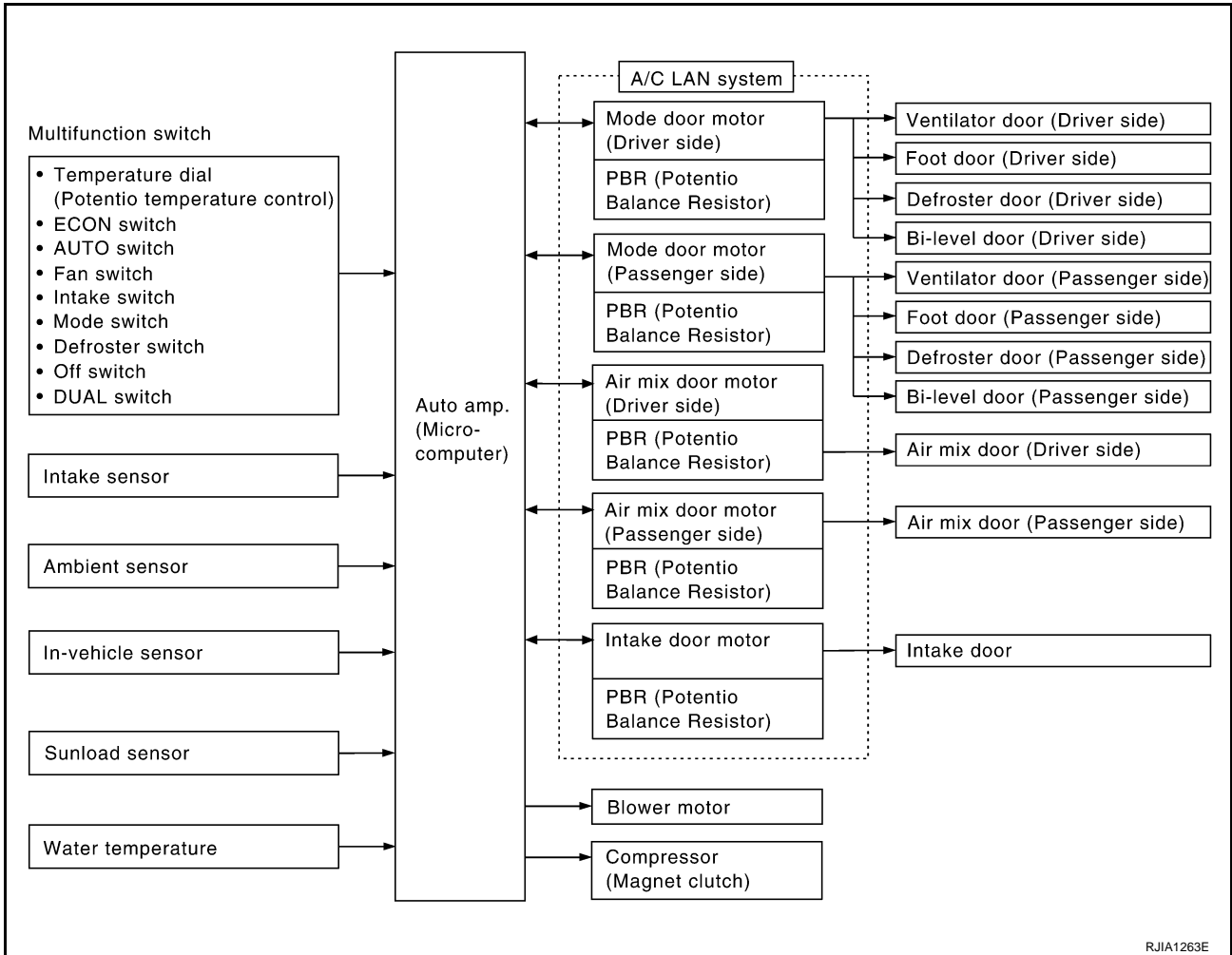
The self-diagnostic system is built into the auto amp. to quickly locate the cause of symptoms.

# AIR CONDITIONER CONTROL

AJS0007B

## Description of Control System

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



RJIA1263E

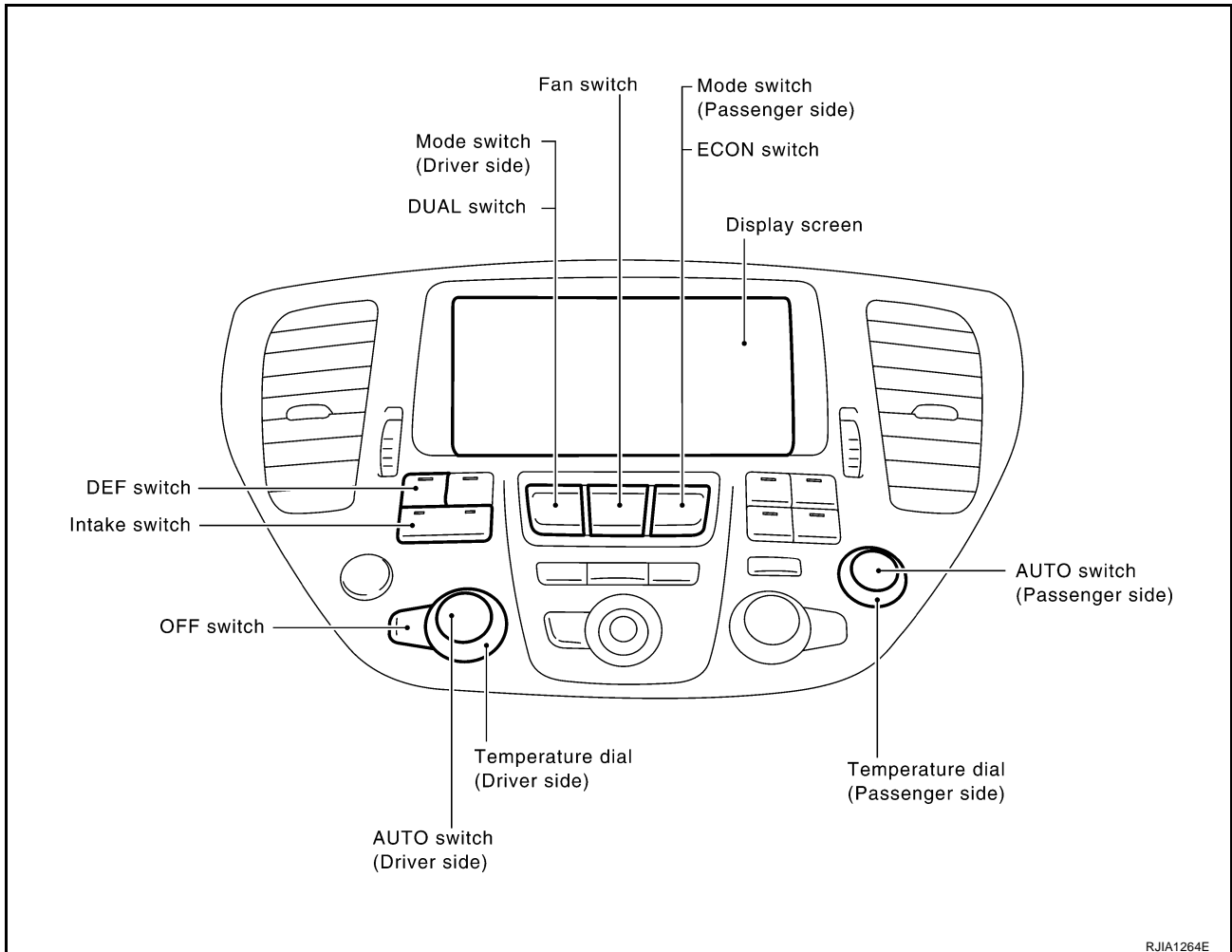
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ATC

# AIR CONDITIONER CONTROL

## Control Operation

AJS0007C



RJIA1264E

### DISPLAY SCREEN

Displays the operational status of the system.

### AUTO SWITCH (DRIVER SIDE)

- The compressor, intake doors, air mix doors, 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.
- When the A/C system is operating, if the screen is not displayed, press the AUTO switch once to display the A/C screen. (The display time is determined by the navigation system settings.) Or, when the A/C system is in manual control, and the DUAL switch is depressed, pressing the AUTO switch changes to auto-control for the driver side only.

### AUTO SWITCH (PASSENGER SIDE)

The compressor, intake doors, air mix doors, 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.

- When the A/C system is operating, if the screen is not displayed, press the AUTO switch once to display the A/C screen. (The display time is determined by the navigation system settings.) Or, when the A/C system is in manual control, and the DUAL switch is depressed, pressing the AUTO switch changes to auto-control for the passenger side only.

### TEMPERATURE DIAL (POTENTIO TEMPERATURE CONTROL) (DRIVER SIDE)

Increase or decrease the set temperature.

### TEMPERATURE DIAL (POTENTIO TEMPERATURE CONTROL) (PASSENGER SIDE)

- Increase or decrease the set temperature.
- When the temperature dial is turned, the DUAL switch indicator will automatically illuminate.

# AIR CONDITIONER CONTROL

## INTAKE SWITCH

Set the inlet to automatic control or to REC-fixed. However, REC-fixed cannot be selected in DEF mode. When the FRE switch is ON, the air inlet will be automatically controlled.

A

## DEFROSTER (DEF) SWITCH

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

B

## 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.

C

## MODE SWITCH (DRIVER SIDE)

- When the DUAL switch indicator is illuminated, the left and right outlets are switched together.
- When the DUAL switch indicator is not illuminated, only the driver-side outlet is switched.

D

## MODE SWITCH (PASSENGER SIDE)

When the MODE switch is pressed, the DUAL switch indicator illuminates, and only the passenger-side outlet is switched.

E

## ECON (ECONOMY) SWITCH

- By pressing the ECON switch, the indicator of ECON switch should illuminate, and the control is switched to economy control.
- When press ECON switch again, the indicator of ECON switch should not illuminate and the compressor always turns OFF. With the compressor OFF, the system will not remove heat (cool) or de-humidify. The system will maintain the in-vehicle temperature at the set temperature when the set temperature is above the ambient (outside) temperature. The system will set the intake doors to the outside air position.
- When press ECON switch again, the control is switched to economy control.

F

G

H

## FAN SWITCH

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

I

## DUAL SWITCH

- When the DUAL switch indicator is not illuminated and the DUAL switch is pressed, the driver-side outlet and passenger-side outlet, as well as the setting temperature, can each be set independently.
- When the DUAL switch indicator is illuminated and the DUAL switch is pressed, the driver-side outlet and setting temperature are applied to both sides.

ATC

K

## Fail-Safe Function

AJS000C0

- If a communication error exists between auto amp. and AV C/U or AV and NAVI C/U for 30 seconds or longer, air conditioner is controlled under following conditions:
  - Compressor: ON
  - Air outlet: AUTO
  - Air inlet: FRE (Fresh)
  - Blower fan speed: AUTO
  - Set temperature: Setting before communication error occurs

L

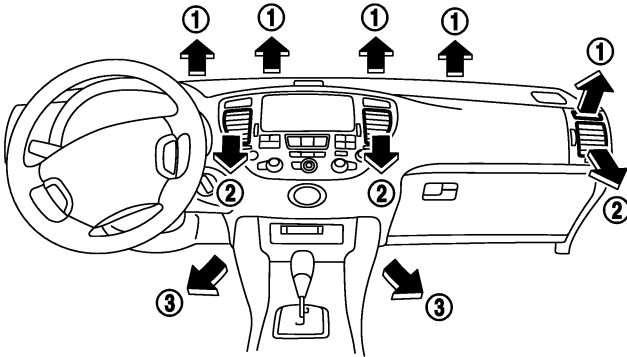
M

# AIR CONDITIONER CONTROL

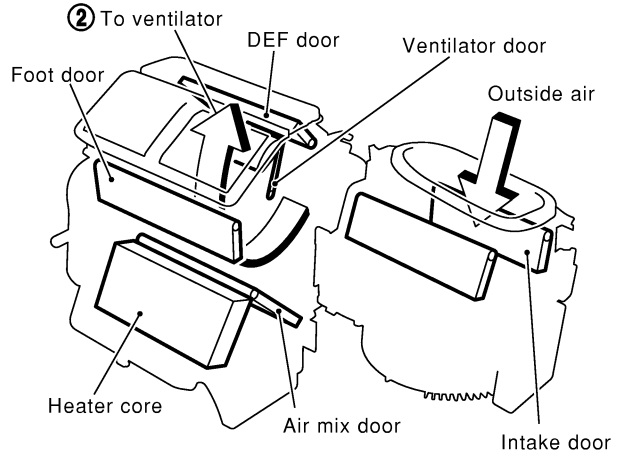
AJS0007D

## Discharge Air Flow

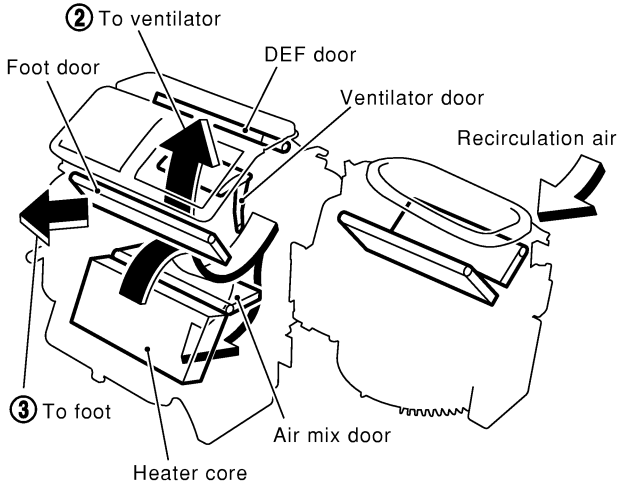
① : Defroster    ② : Ventilation    ③ : Foot



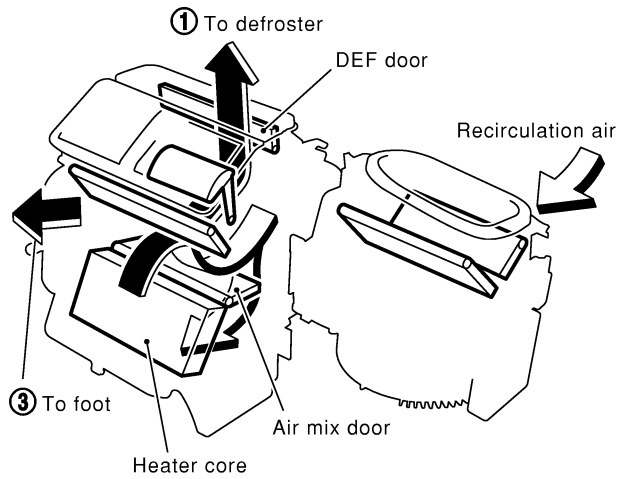
### Ventilation



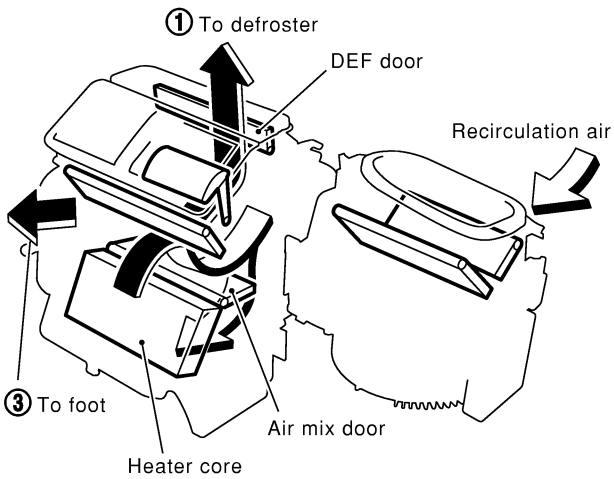
### Bi-level



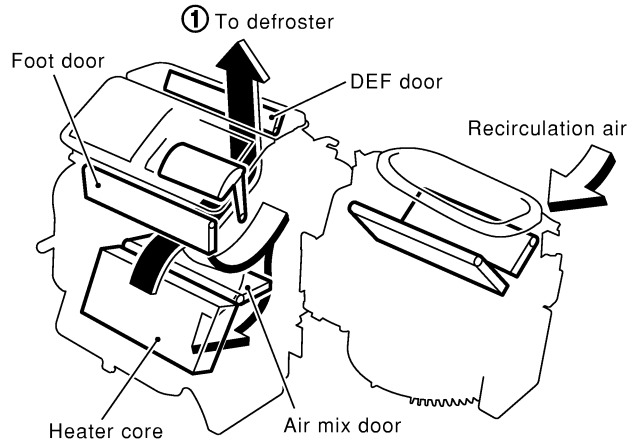
### Foot



### Defroster and foot



### Defroster



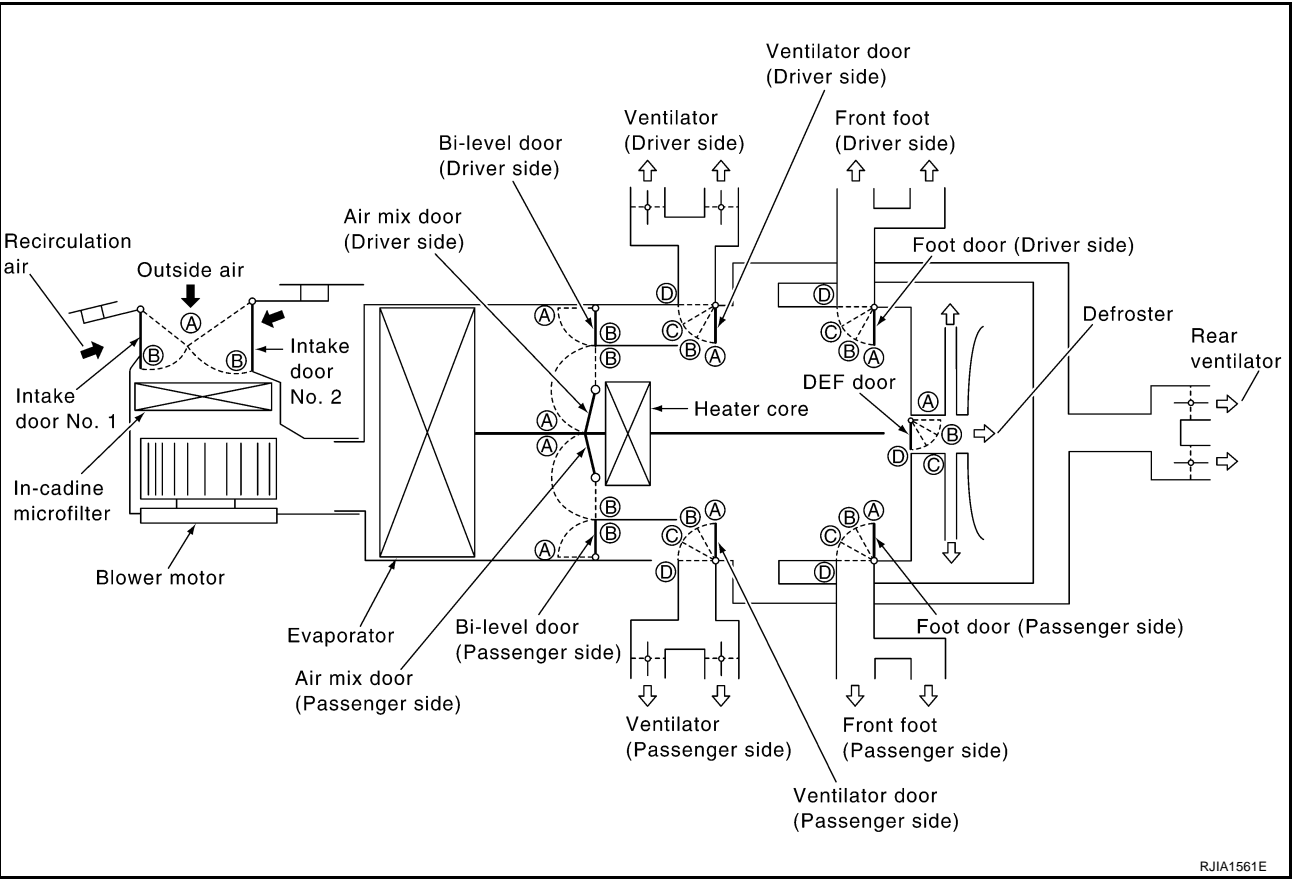
RJIA0205E



# AIR CONDITIONER CONTROL

## System Description SWITCHES AND THEIR CONTROL FUNCTION

AJS0007E



RJIA1561E

Position or switch	DUAL SW		MODE SW					DEF SW		AUTO SW (Driver side)	AUTO SW (Passenger side)	Intake SW		Temperature dial (Driver side)			Temperature dial (Passenger side)			OFF SW
	ON	OFF	VENT	B/L	B/L2 *1	FOOT	D/F *2	ON	OFF	REC	FRE	AUTO A/C			AUTO PASS			OFF		
	ON	OFF	ON	ON	ON	ON	ON	ON	ON	ON	ON	18°C	~	32°C	18°C	~	32°C	OFF		
VENT door (Driver side)	-		(A)	(B)	(C)	(D)	(D)	(D)	-	AUTO									(D)	
VENT door (Passenger side)	ON		(A)	(B)	(C)	(D)	-	(D)	-	-	AUTO								(D)	
	OFF		(A)	(B)	(C)	(D)	(D)	(D)	-	AUTO	-								(D)	
Foot door (Driver side)	-		(D)	(C)	(B)	(A)	(B)	(D)	-	AUTO									(A)	
Foot door (Passenger side)	ON		(D)	(C)	(B)	(A)	-	(D)	-	-	AUTO								(A)	
	OFF		(D)	(C)	(B)	(A)	(B)	(D)	-	AUTO	-								(A)	
DEF door	-		(D)	(D)	(D)	(C)	(B)	(A)	-	AUTO									(C)	
Air mix door (Driver side)	-											(A)	AUTO	(B)						
Air mix door (Passenger side)	ON													(A)	AUTO	(B)				
	OFF											(A)	AUTO	(B)						
Bi-level door	-		(A) <sup>*3</sup>	AUTO	(B)	(B)	(B)	(B)	(B)										(B)	
Intake door	-							(B)	-			(A)	AUTO						(B)	

\*1: The B/L2 mode is selected only when the mode door is automatically controlled.

\*2: When the DUAL SW is ON, passenger cannot select the D/F mode.

\*3: When air door mix door position is in (A) (Full cold), bi-level door position will be at (A) (Open).

RJIA1265E

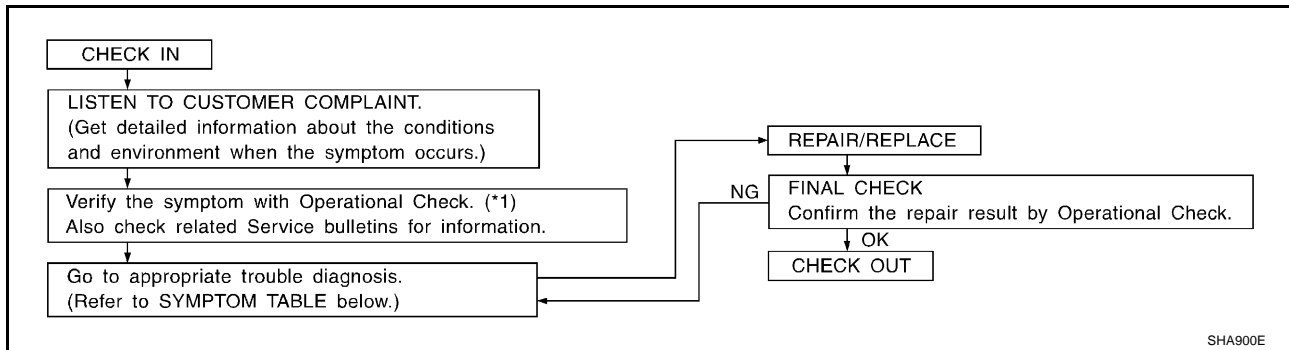
# TROUBLE DIAGNOSIS

PFP:00004

## TROUBLE DIAGNOSIS

### How to Perform Trouble Diagnosis for Quick and Accurate Repair WORK FLOW

AJS000C1



SHA900E

\*1 [ATC-57, "Operational Check"](#).

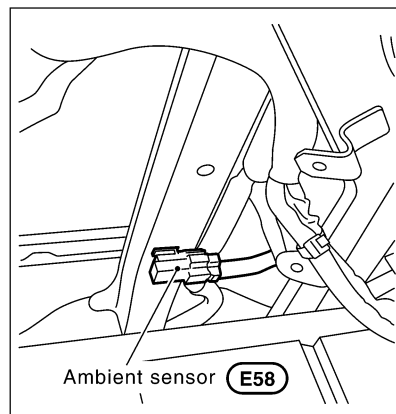
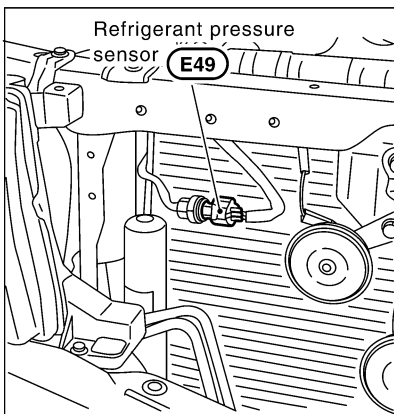
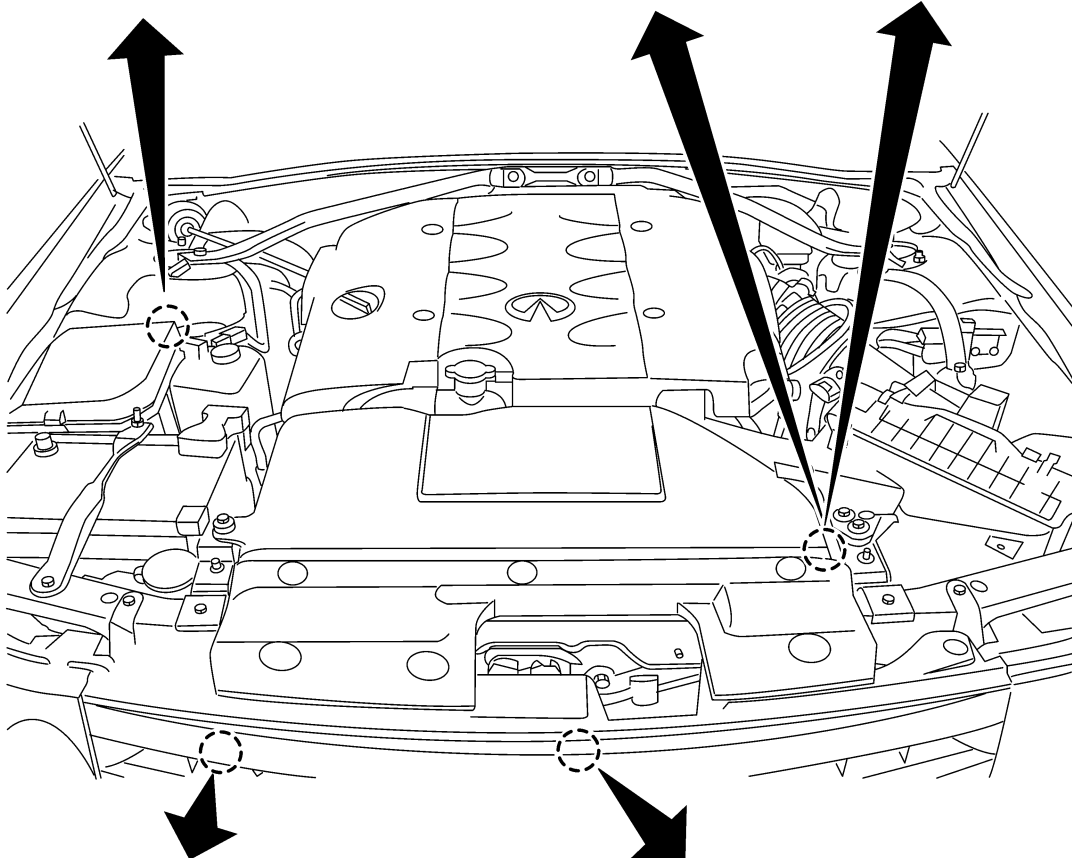
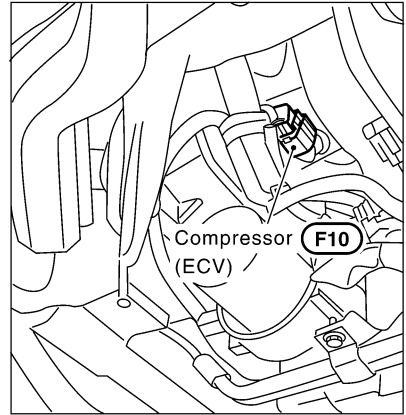
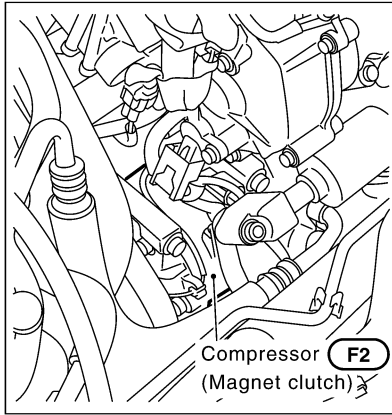
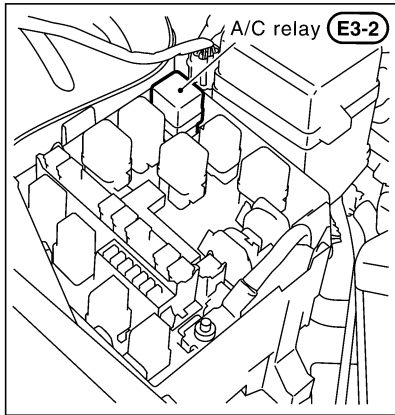
## SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C system. <a href="#">ATC-60, "Power Supply and Ground Circuit for Auto Amp."</a>
A/C system cannot be controlled.	Go to Trouble Diagnosis Procedure for Multiplex communication circuit. <a href="#">ATC-111, "Multiplex Communication Circuit"</a>
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) <a href="#">ATC-62, "LAN System Circuit"</a>
Mode door motor does not operate normally.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. (LAN) <a href="#">ATC-62, "LAN System Circuit"</a>
Air mix door motor does not operate normally.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. <a href="#">ATC-72, "Intake Door Motor Circuit"</a>
Intake door motor does not operate normally.	
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor. <a href="#">ATC-75, "Blower Motor Circuit"</a>
Blower motor operation is malfunctioning under out of starting fan speed control.	
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. <a href="#">ATC-80, "Magnet Clutch Circuit"</a>
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. <a href="#">ATC-87, "Insufficient Cooling"</a>
	Go to Diagnostic Procedure for Insufficient Cooling. <a href="#">ATC-94, "DIAGNOSTIC PROCEDURE FOR INSUFFICIENT COOLING"</a>
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. <a href="#">ATC-96, "Insufficient Heating"</a>
Noise	Go to Trouble Diagnosis Procedure for Noise. <a href="#">ATC-97, "Noise"</a>
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis. <a href="#">ATC-98, "Self-Diagnosis"</a>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function. <a href="#">ATC-99, "Memory Function"</a>
ECON mode does not operate.	Go to Trouble Diagnosis Procedure for ECON (ECONOMY) Mode. <a href="#">ATC-100, "ECON (ECONOMY) Mode"</a>

# TROUBLE DIAGNOSIS

## Component Parts and Harness Connector Location ENGINE COMPARTMENT

AJS000C2



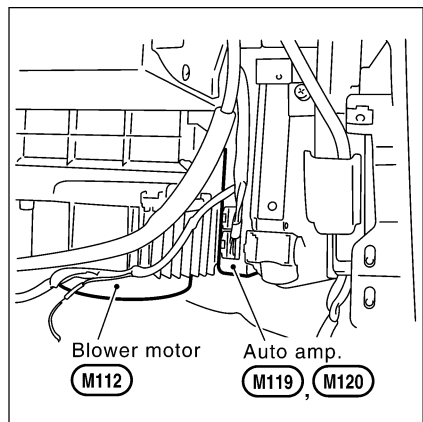
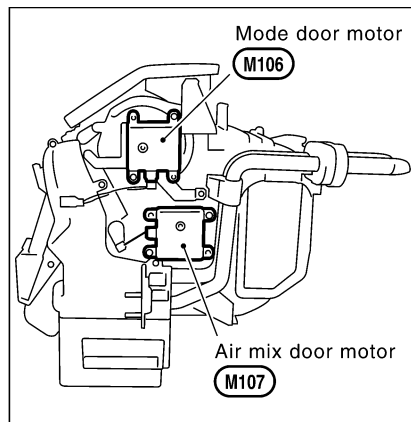
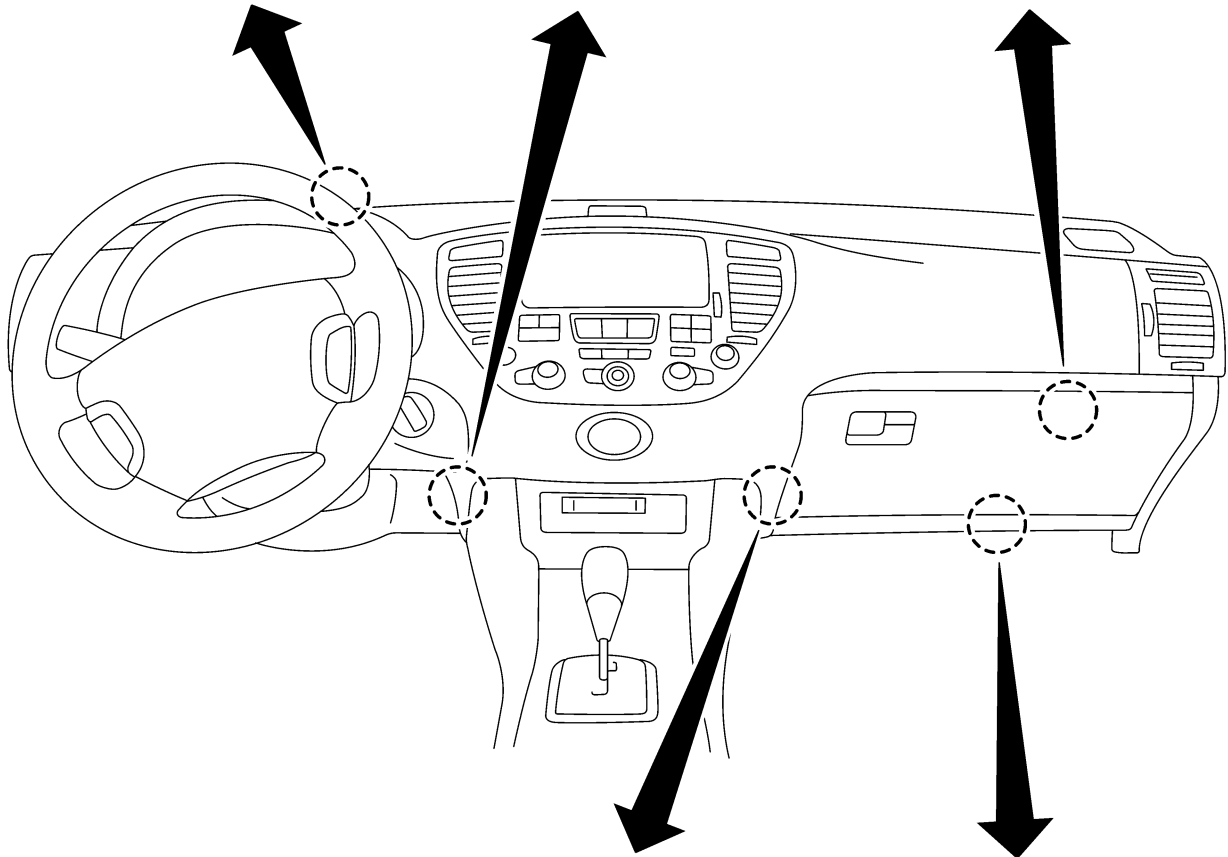
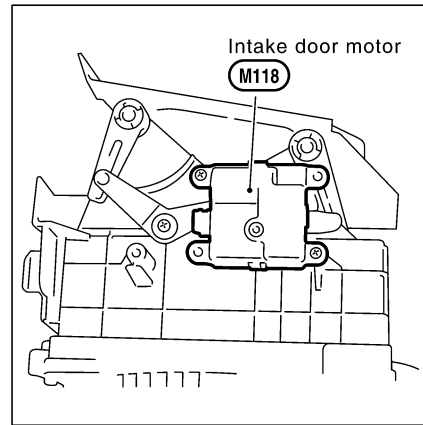
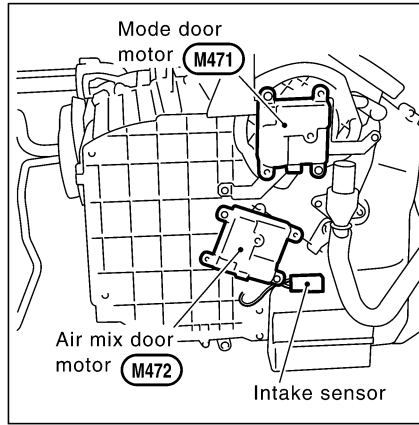
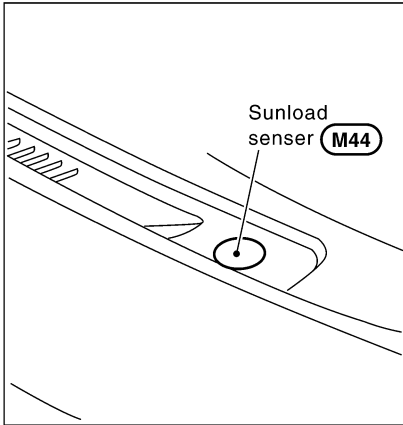
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# TROUBLE DIAGNOSIS

## PASSENGER COMPARTMENT

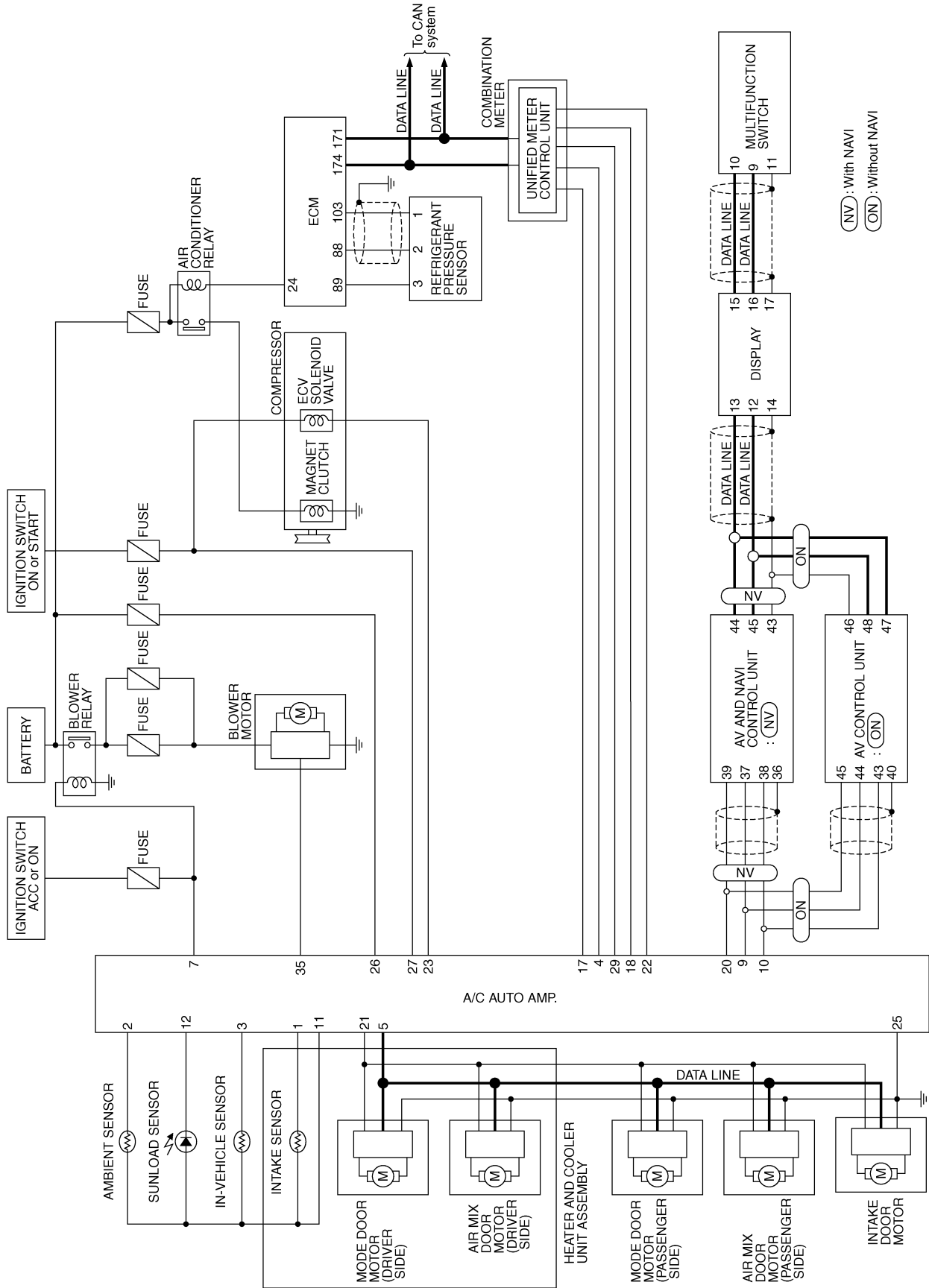


RJIA1267E

# TROUBLE DIAGNOSIS

## Schematic

AJS000C3



(NV) : With NAVI  
(ON) : Without NAVI

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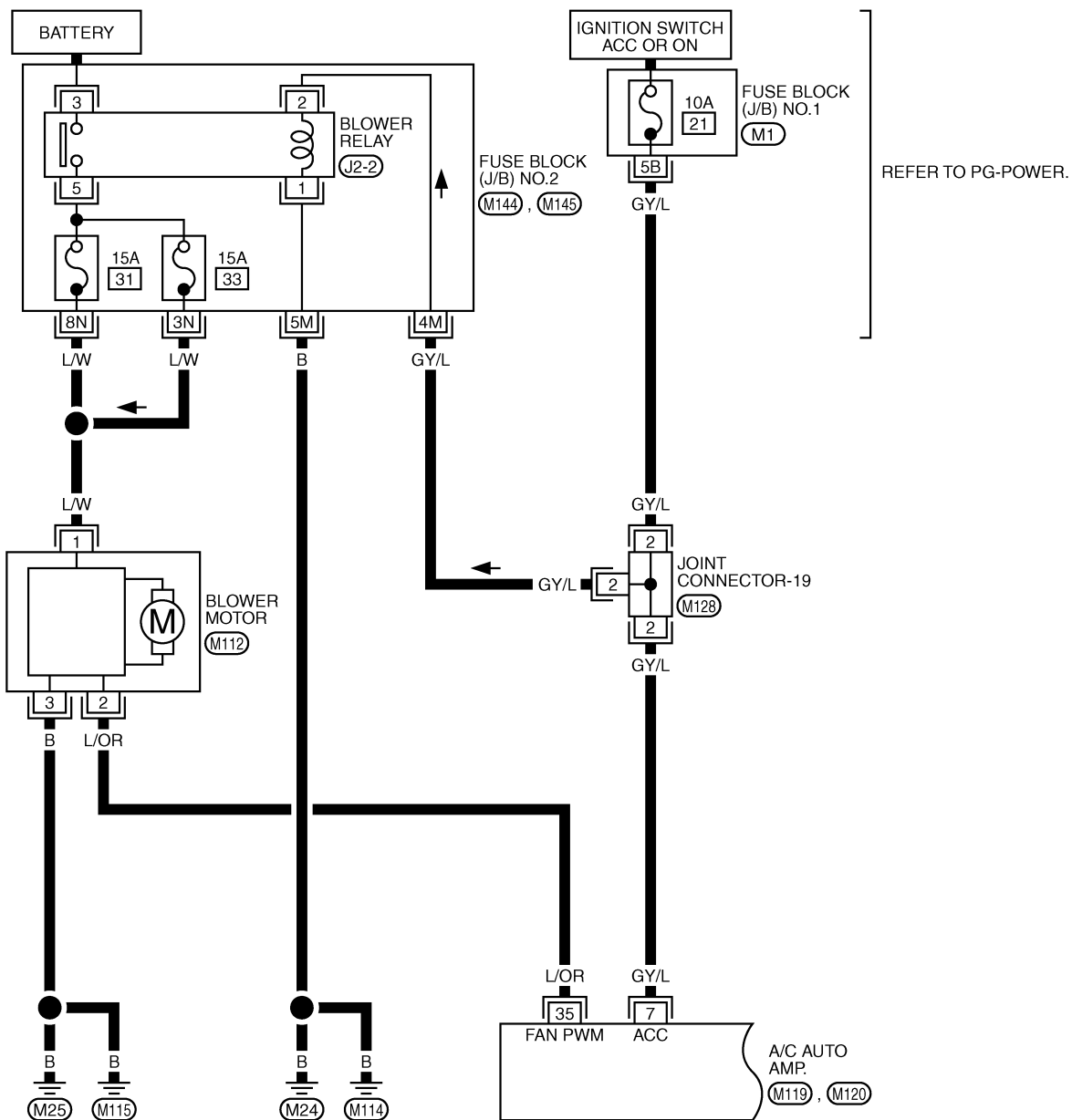
TJWA0038E

# TROUBLE DIAGNOSIS

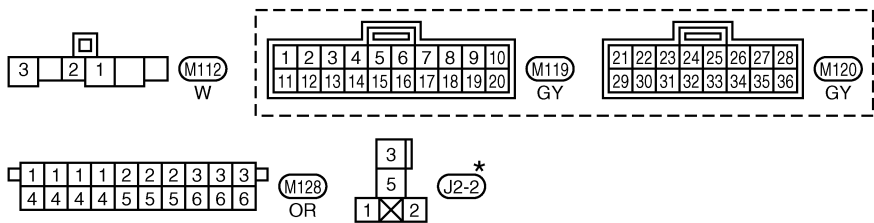
## Wiring Diagram —A/C—

AJS000C4

### ATC-A/C-01



REFER TO PG-POWER.



REFER TO THE FOLLOWING.  
 (M1) - FUSE BLOCK-JUNCTION BOX (J/B) NO.1  
 (M144), (M145) - FUSE BLOCK-JUNCTION-BOX (J/B) NO.2

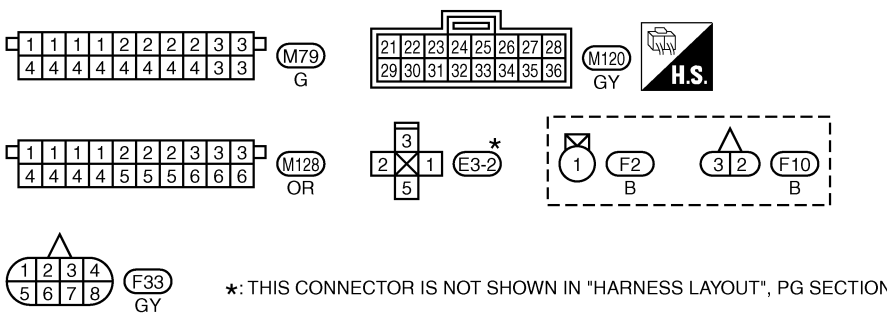
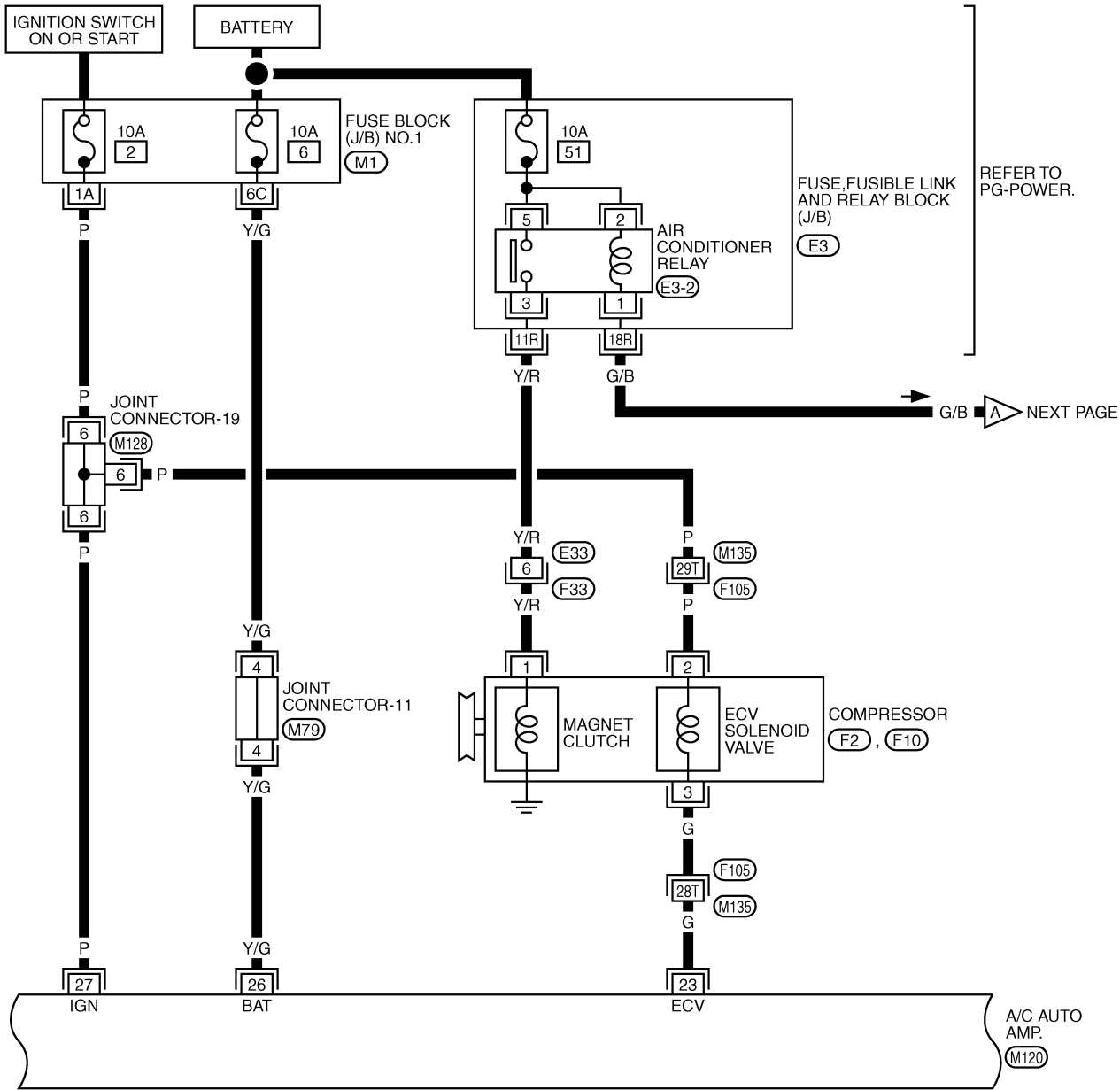


\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWA0039E

# TROUBLE DIAGNOSIS

ATC-A/C-02



REFER TO THE FOLLOWING.

- F105** -SUPER MULTIPLE JUNCTION (SMJ)
- M1** -FUSE BLOCK-JUNCTION BOX (J/B) NO.1
- E3** -FUSE, FUSIBLE LINK AND RELAY BLOCK (J/B)

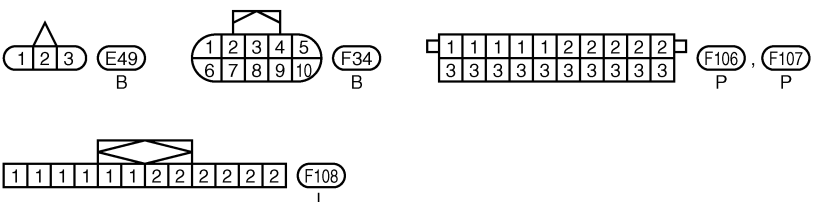
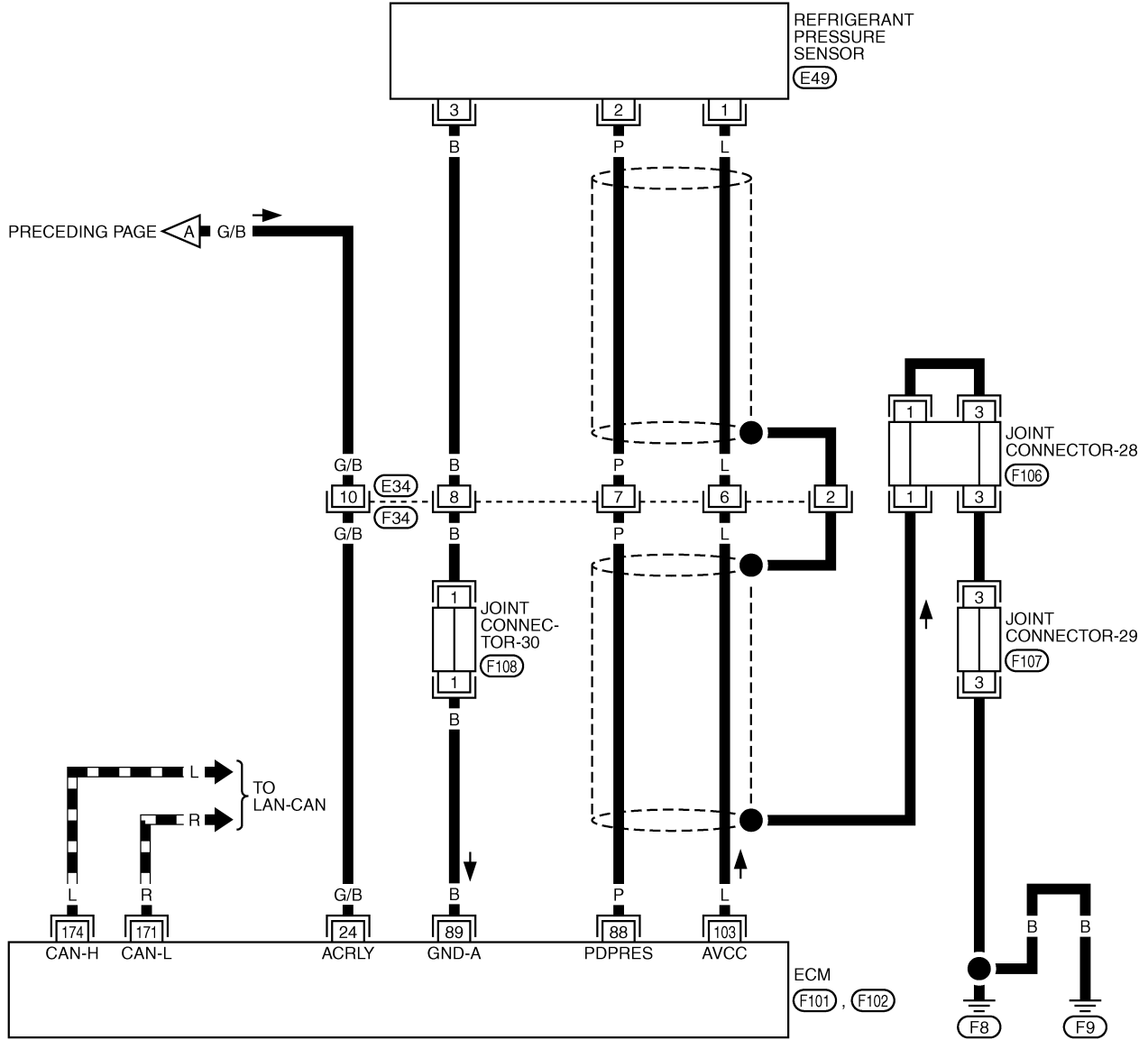
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ATC

# TROUBLE DIAGNOSIS

ATC-A/C-03

▬ : DATA LINE



REFER TO THE FOLLOWING.  
 (F101), (F102) -ELECTRICAL  
 UNITS

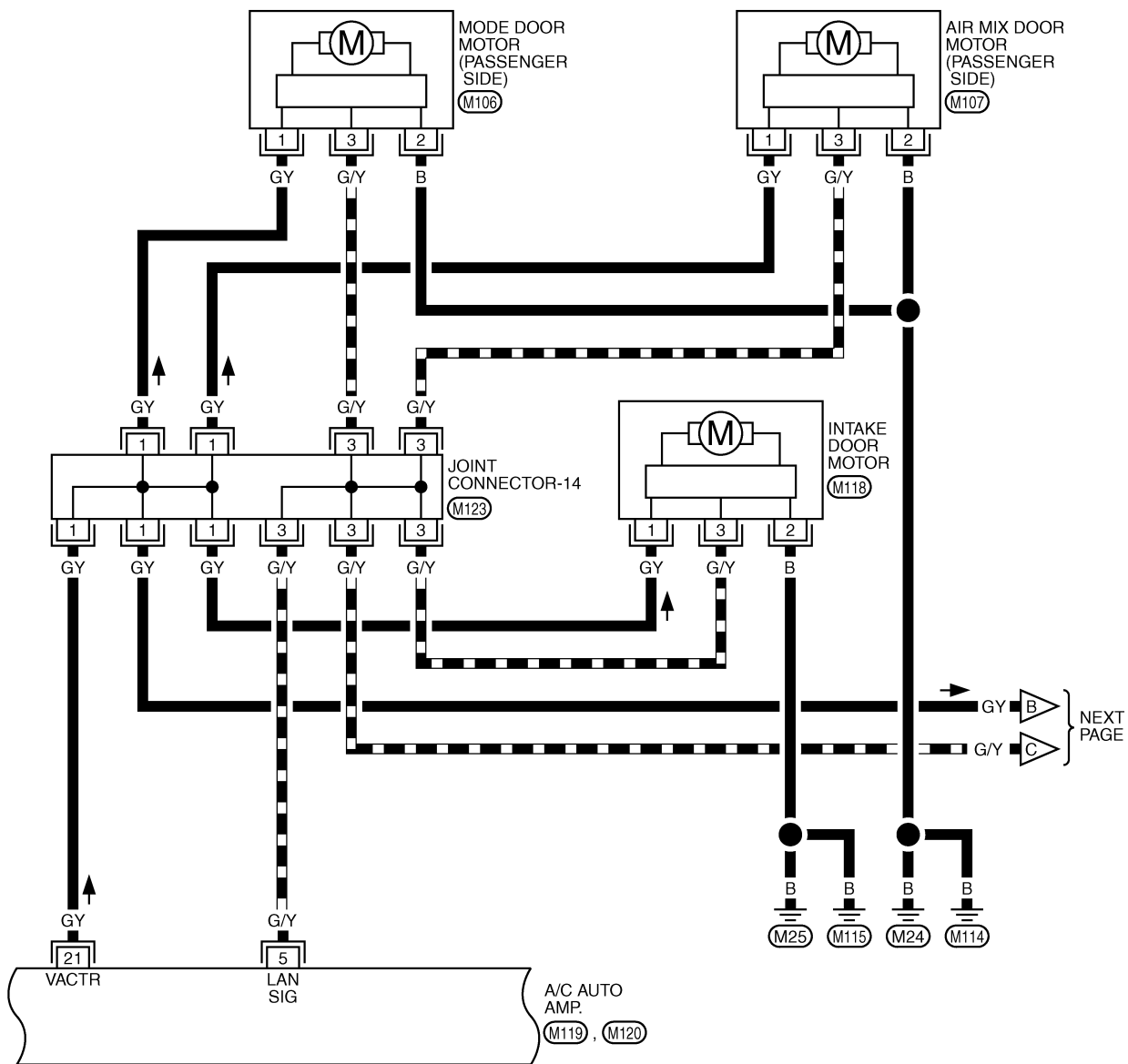
TJWA0041E



# TROUBLE DIAGNOSIS

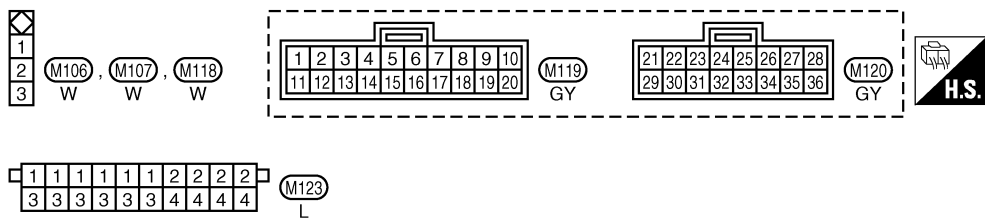
ATC-A/C-04

▬ : DATA LINE



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ATC

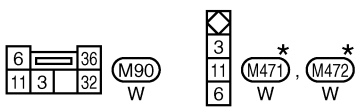
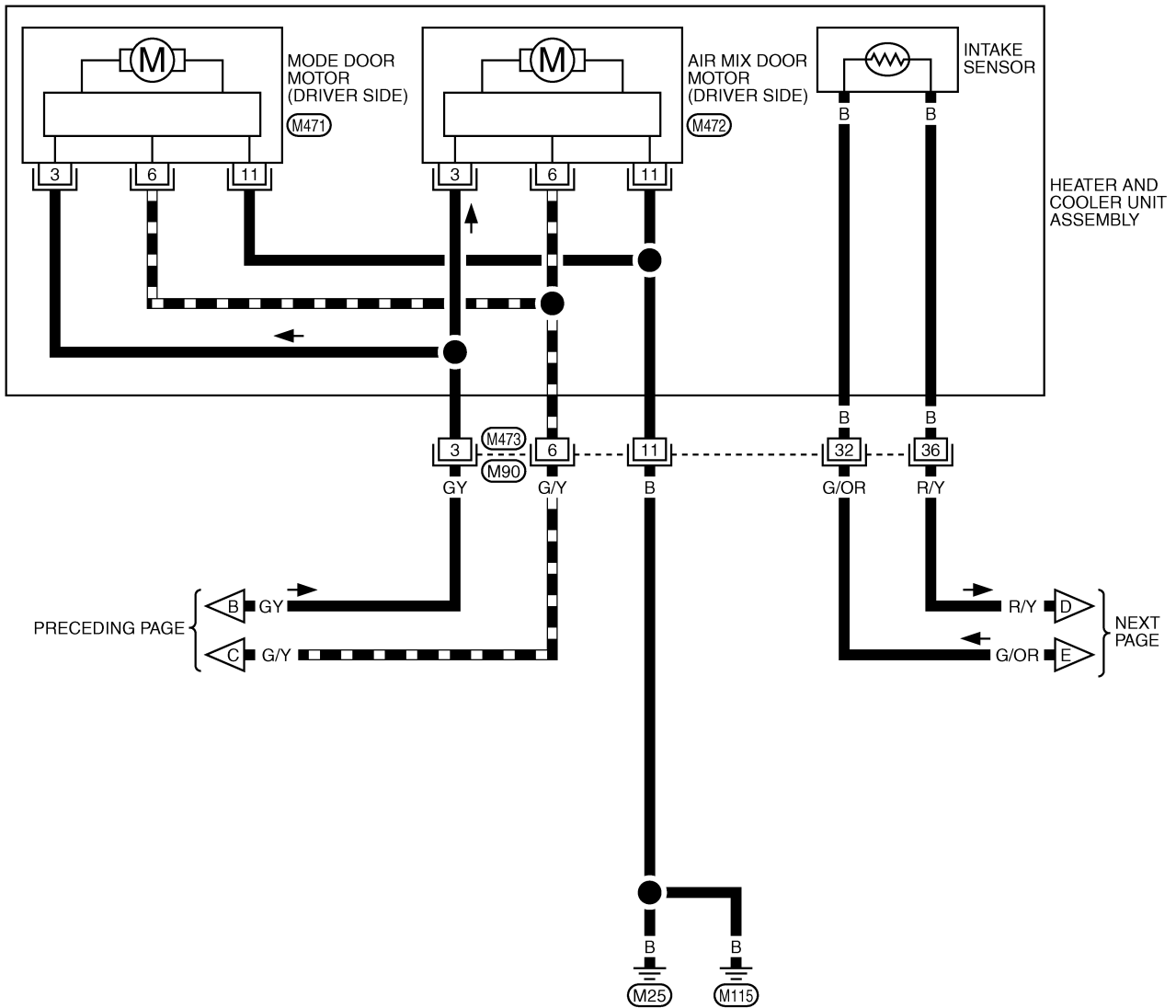


TJWA0042E

# TROUBLE DIAGNOSIS

ATC-A/C-05

▬ : DATA LINE



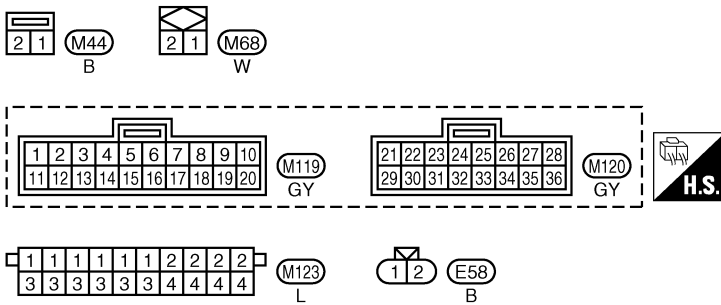
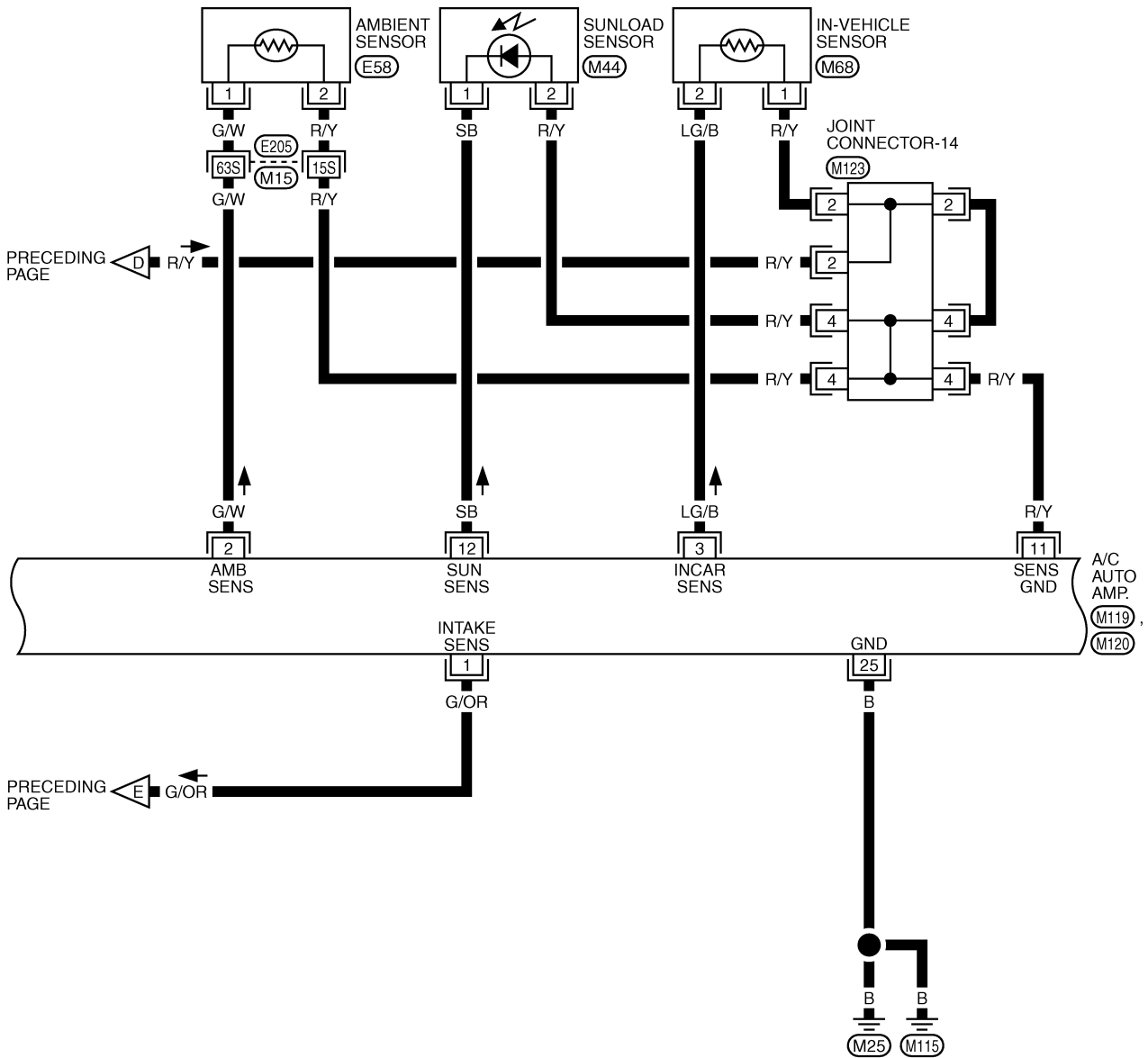
\*: THIS CONNECTOR IS NOT SHOWN IN "HARNESS LAYOUT", PG SECTION.

TJWA0043E

# TROUBLE DIAGNOSIS

ATC-A/C-06

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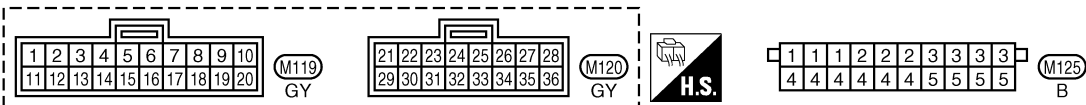
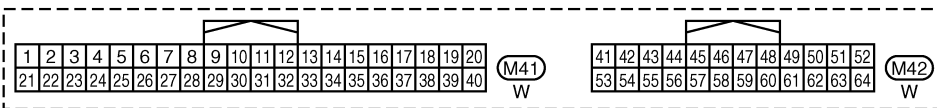
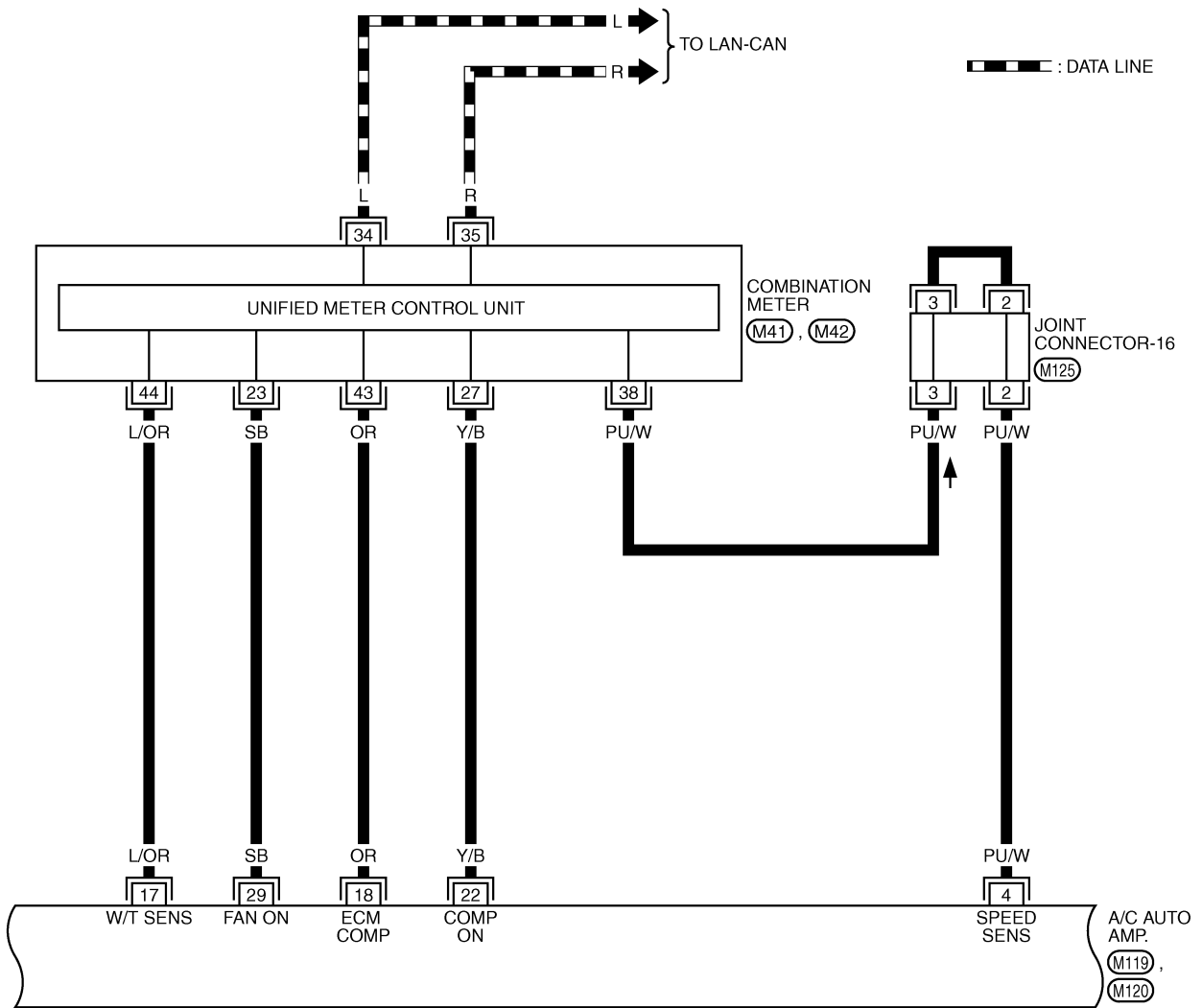


REFER TO THE FOLLOWING.  
E205 -SUPER MULTIPLE JUNCTION (SMJ)

TJWA0044E

# TROUBLE DIAGNOSIS

ATC-A/C-07



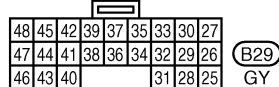
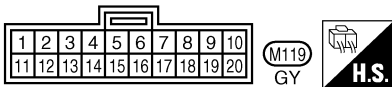
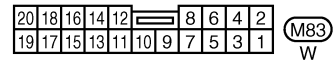
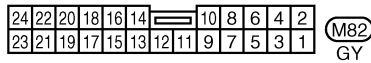
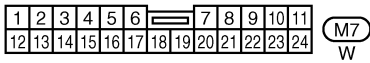
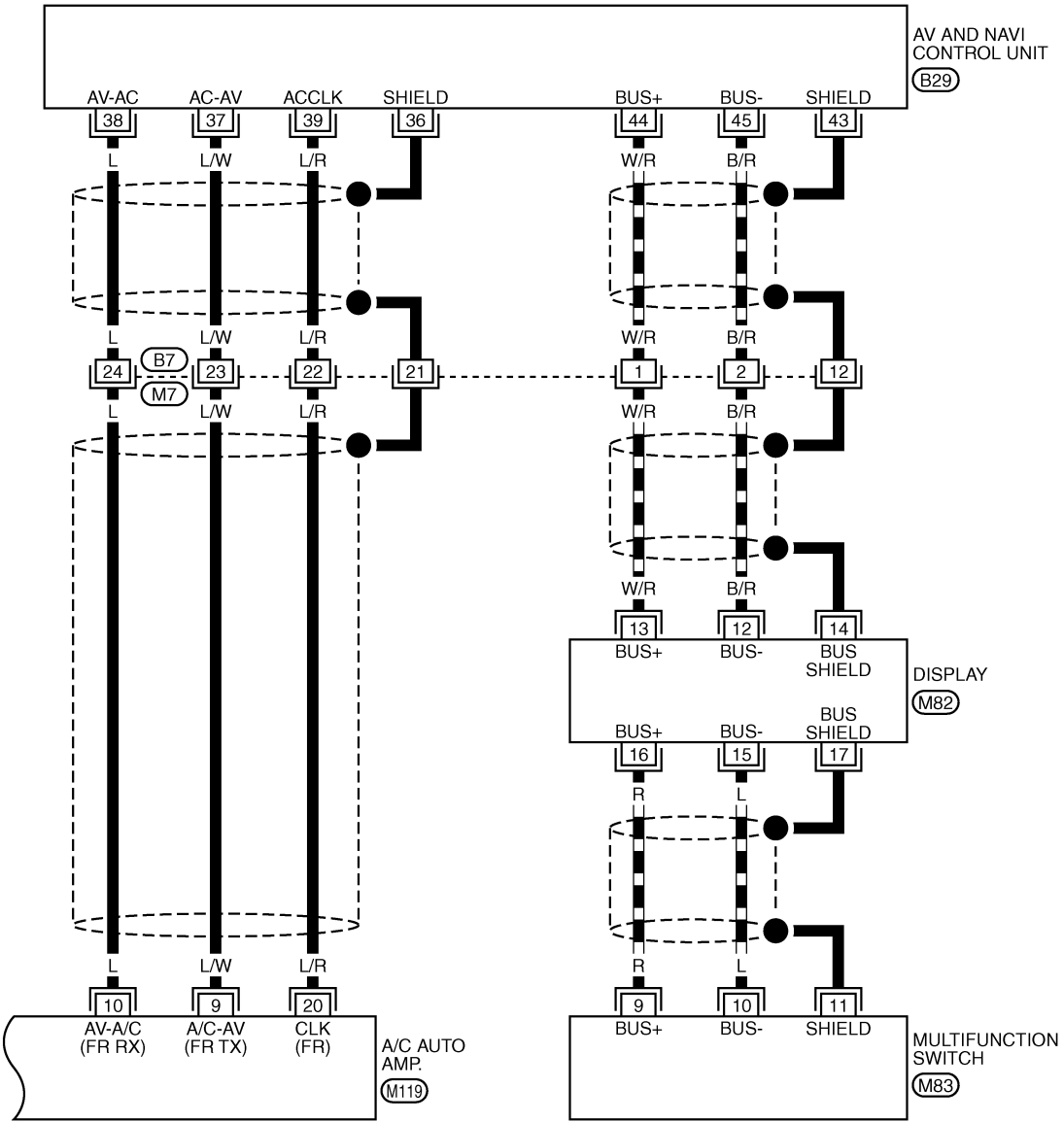
TJWA0045E

# TROUBLE DIAGNOSIS

WITH NAVIGATION SYSTEM

ATC-A/C-08

▬ : DATA LINE



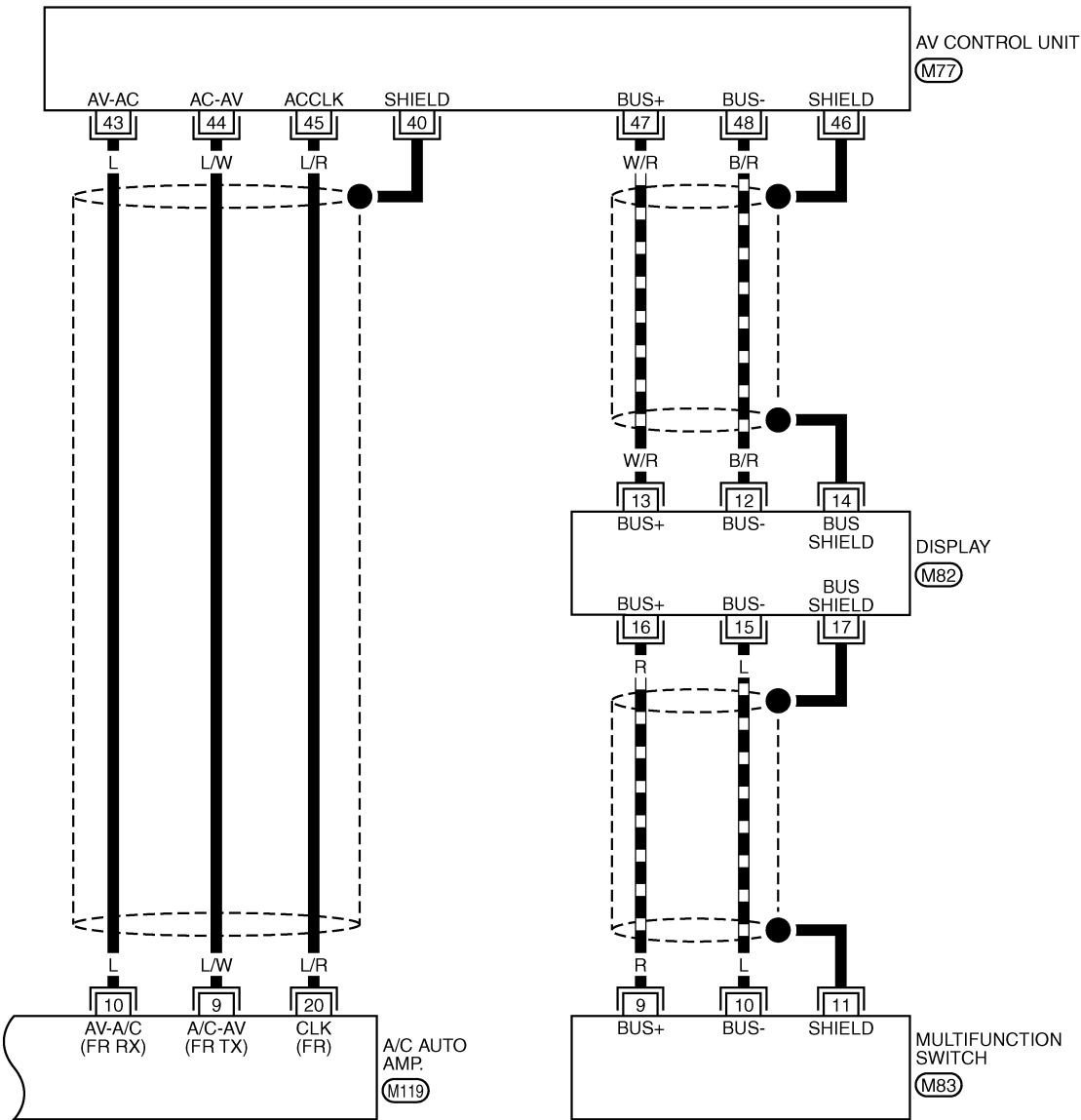
TJWA0046E

# TROUBLE DIAGNOSIS

WITHOUT NAVIGATION SYSTEM

ATC-A/C-09

▬ : DATA LINE



48	45	42	39	37	35	33	30	27
47	44	41	38	36	34	32	29	26
46	43	40				31	28	25

(M77)  
GY

24	22	20	18	16	14	10	8	6	4	2		
23	21	19	17	15	13	12	11	9	7	5	3	1

(M82)  
GY

20	18	16	14	12	8	6	4	2		
19	17	15	13	11	10	9	7	5	3	1

(M83)  
W

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

(M119)  
GY



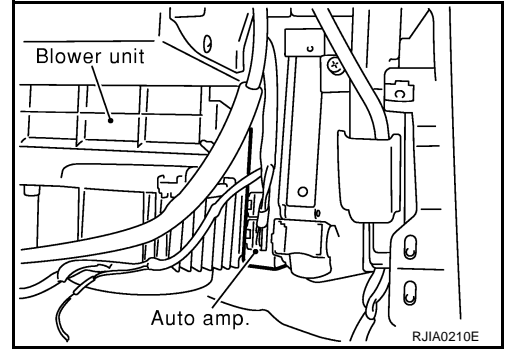
TJWA0047E

# TROUBLE DIAGNOSIS

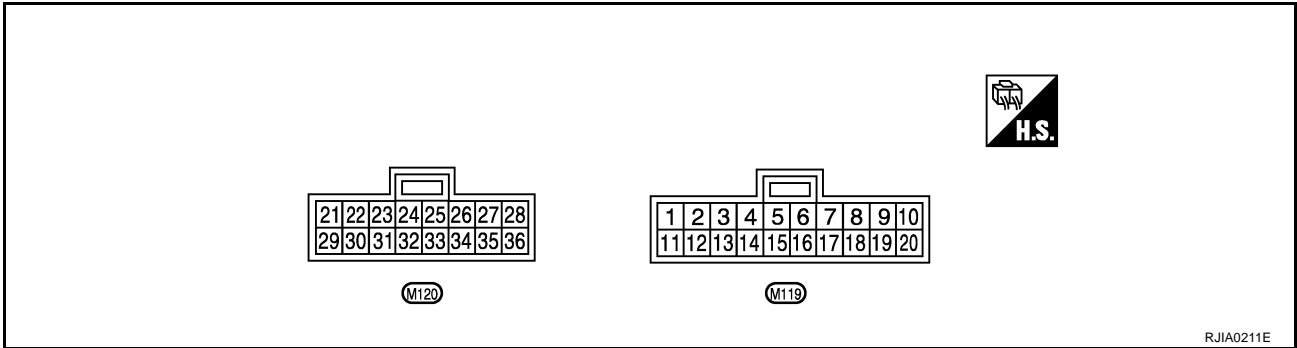
## Auto Amp. Terminals and Reference Value

AJS000C5

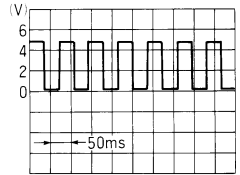
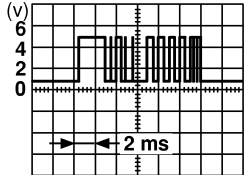
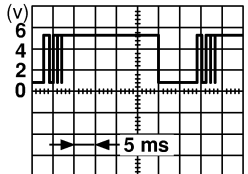
Measure voltage between each terminal and ground by following terminals and reference value for auto amp.



## PIN CONNECTOR TERMINAL LAYOUT



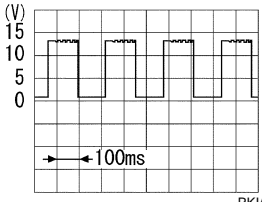
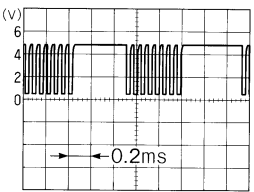
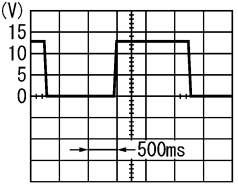
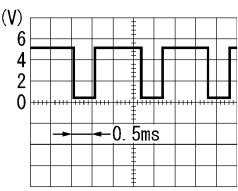
## TERMINALS AND REFERENCE VALUE FOR AUTO AMP.

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)
1	G/OR	Intake sensor	-	-	-
2	G/W	Ambient sensor	-	-	-
3	LG/B	In-vehicle sensor	-	-	-
4	PU/W	Vehicle speed sensor	ON	Speedometer operated [When vehicle speed is approx. 40km/h (25MPH)]	
5	G/Y	A/C LAN signal	ON	-	Approx. 5
7	GY/L	Power supply for ACC	ACC or ON	-	Battery voltage
9	L/W	Multiplex communication signal (TX)	ON	-	
10	L	Multiplex communication signal (RX)	ON	-	

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# TROUBLE DIAGNOSIS


Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V)	
11	R/Y	Sensor ground	ON	-	Approx. 0	
12	SB	Sunload sensor	-	-	-	
17	L/OR	Water temperature sensor	-	At idle [after warming up, approx. 80°C (176°F)] <b>CAUTION:</b> The waveforms vary depending on coolant temperature.	 PKIA0098J	
18	OR	Compressor feed back signal (Low-pressure cut)	ON	AUTO switch: ON (Compressor: ON)	Blower motor operates.	Approx. 0
					When the refrigerant pressure sensor connector is disconnected	Approx. 5
20	L/R	Multiplex communication signal (CLK)	ON	-	 HAK0363D	
21	GY	Power supply for mode door motor, air mix door motor, intake door motor	ON	-	Approx. 12	
22	Y/B	Compressor ON signal	ON	AUTO switch: ON	Approx. 0	
				OFF switch: ON (A/C system OFF)	Approx. 5	
23	G	ECV (Electronic Control Valve) signal	ON	Self-diagnosis: STEP-42	 RJIA1563E	
25	B	Ground	ON	-	Approx. 0	
26	Y/G	Power supply for BAT	OFF	-	Battery voltage	
27	P	Power supply for IGN	ON	-	Battery voltage	
29	SB	Blower motor ON signal	ACC or ON	AUTO switch: ON (Blower motor operates.)	Approx. 0	
				AUTO switch: OFF	Approx. 5	
35	L/OR	Blower motor drive signal	ON	Blower speed: 1st speed	 SJA0116J	

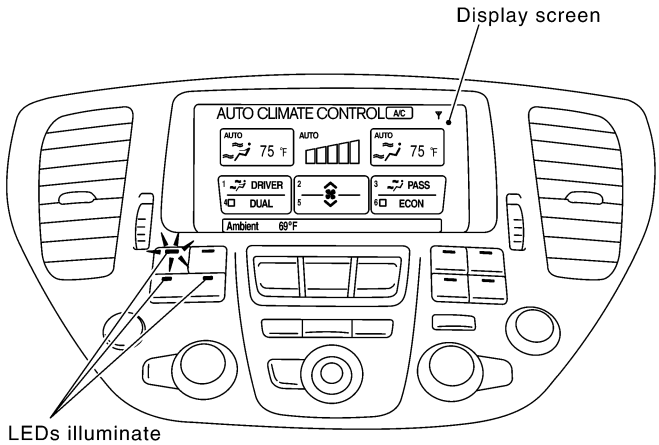
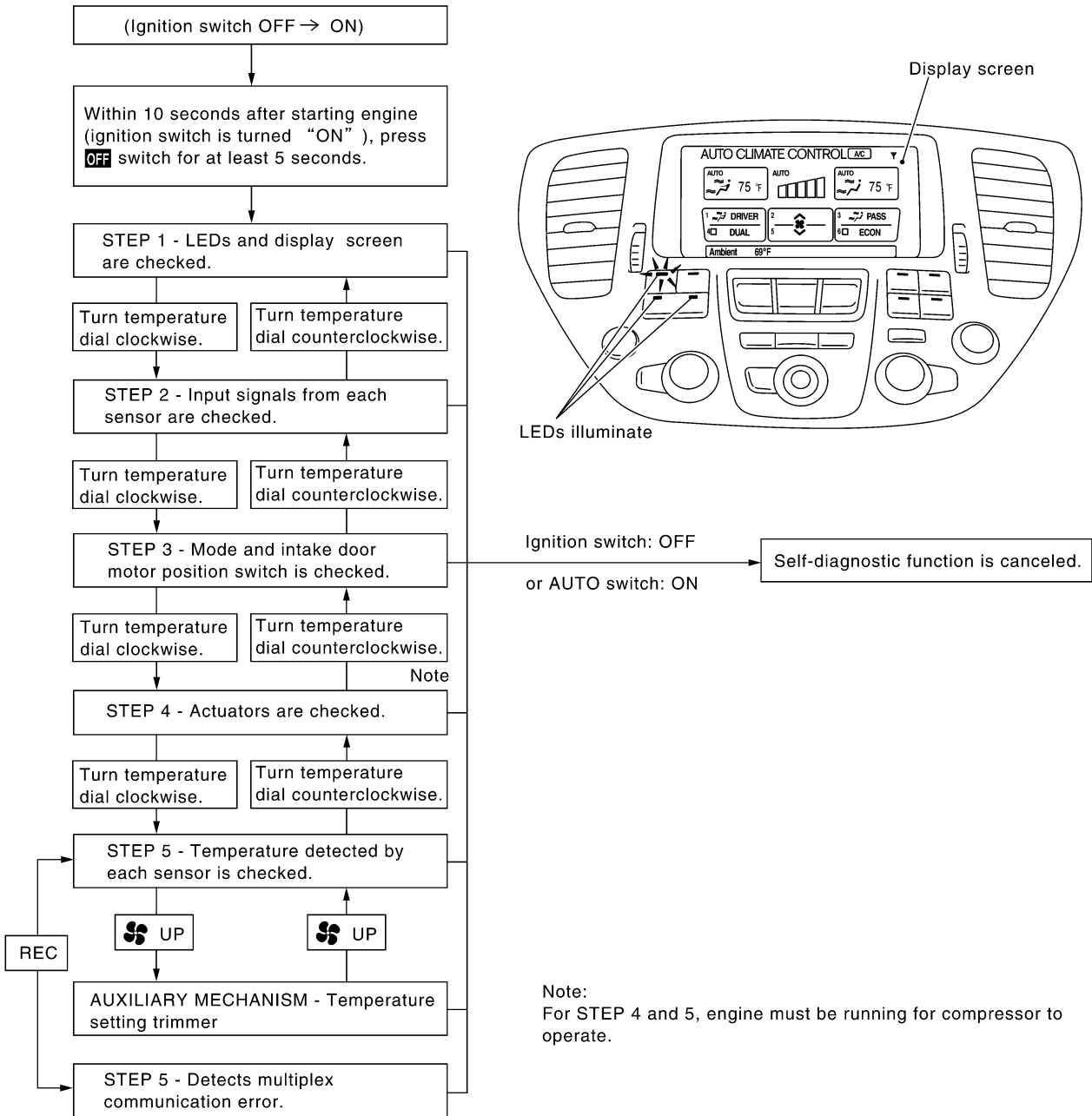


# TROUBLE DIAGNOSIS

AJS000C6

## Self-Diagnosis Function 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 ON) and pressing OFF switch for at least 5 seconds. The OFF switch must be pressed within 10 seconds after starting the engine (ignition switch is turned ON). This system will be canceled by either pressing AUTO switch or turning the ignition switch OFF. Shifting from one step to another is accomplished by means of turning temperature dial, as required. Additionally shifting from STEP-5 to AUXILIARY MECHANISM is accomplished by means of pushing  (fan) UP switch.



Ignition switch: OFF  
or AUTO switch: ON → Self-diagnostic function is canceled.

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

RJIA1268E

# TROUBLE DIAGNOSIS

## FUNCTION CONFIRMATION PROCEDURE

### 1. SET IN SELF-DIAGNOSTIC MODE

1. Turn ignition switch ON.
2. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press OFF switch for at least 5 seconds.

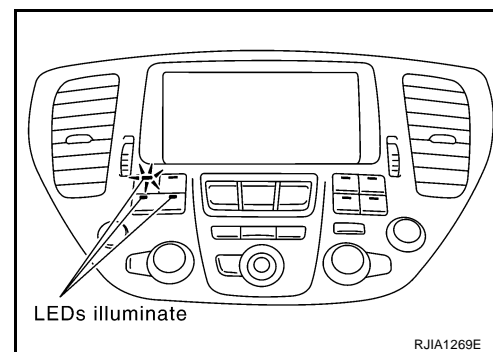
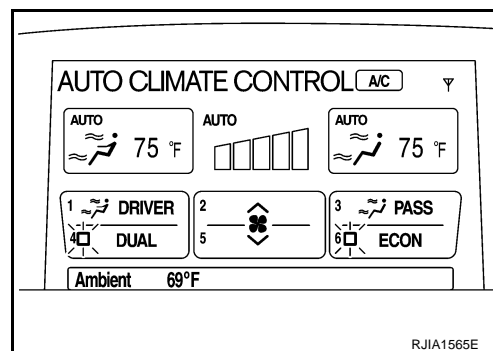
**CAUTION:**

If battery voltage drops below 12V during diagnosis step-3, actuator speed becomes slower and as a result, the system may generate an error even when operation is normal. To avoid this, start engine before performing this diagnosis.

>> GO TO 2.

### 2. STEP-1: LEDS AND DISPLAY ARE CHECKED

Check LED illumination and display screen.



OK or NG

OK >> GO TO 3.

NG >> Malfunctioning OFF switch, LED or auto amp. Refer to [ATC-98, "Self-Diagnosis"](#) .

### 3. CHECK TO ADVANCE SELF-DIAGNOSIS STEP-2

Turn the temperature dial (driver side) clockwise.

Advance to self-diagnosis STEP-2?

YES >> GO TO 4.

NO >> Replace multifunction switch. (Temperature dial malfunctions.)

### 4. CHECK TO RETURN SELF-DIAGNOSIS STEP-1

Turn the temperature dial (driver side) counterclockwise.

Return to self-diagnosis STEP-1?

YES >> GO TO 5.

NO >> Replace multifunction switch. (Temperature dial malfunctions.)

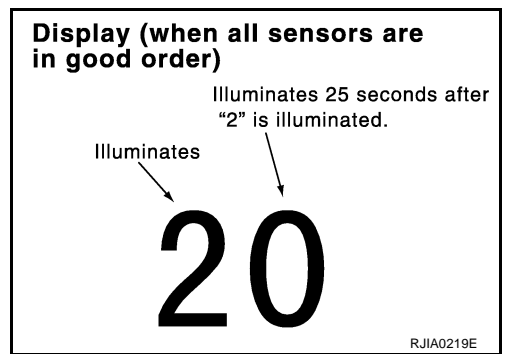
# TROUBLE DIAGNOSIS

## 5. STEP-2: SENSOR CIRCUITS ARE CHECKED FOR OPEN OR SHORT CIRCUIT

Turn the temperature dial (driver side) clockwise.

Does code No. 20 appear on the display?

- YES >> GO TO 6.
- NO >> GO TO 14.

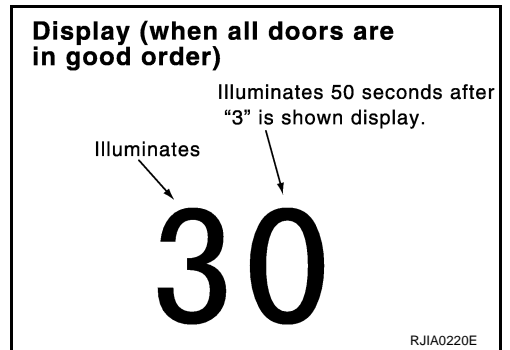


## 6. STEP-3: MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED


Turn the temperature dial (driver side) clockwise.

Does code No. 30 appear on the display?

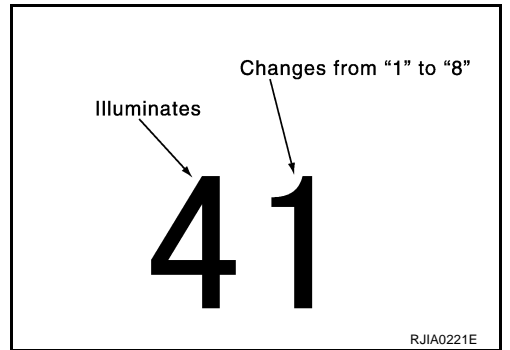
- YES >> GO TO 7.
- NO >> GO TO 15.



## 7. STEP-4: OPERATION OF EACH ACTUATOR IS CHECKED

1. Turn the temperature dial (driver side) clockwise.
2. Press  (DEF) switch, code No. of each actuator test is indicated on the display.

>> GO TO 8.



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# TROUBLE DIAGNOSIS

## 8. CHECK ACTUATORS

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

Mode position indication		Condition	Air outlet/distribution				
Driver side	Passenger side		Front VENT	Rear VENT	Front FOOT	Rear FOOT	DEF
		DUAL SW: OFF	87%	13%			
			50%	13%	24%	13%	
					50%	30%	20%
					37%	23%	40%
							100%

RJIA1270E

	41	42	43	44	45	46	47	48
Mode door position (Driver side)	VENT (B/L OPEN)	VENT (B/L SHUT)	B/L1 (B/L SHUT)	B/L1 (B/L OPEN)	B/L2	FOOT	D/F	DEF
Mode door position (Passenger side)	VENT (B/L OPEN)	VENT (B/L SHUT)	B/L1 (B/L SHUT)	B/L1 (B/L OPEN)	B/L2	FOOT1	FOOT2	DEF
Intake door position	REC	REC	REC	20% FRE	20% FRE	FRE	FRE	FRE
Air mix door position	FULL COLD	FULL COLD	FULL COLD	FULL HOT	FULL HOT	FULL HOT	FULL HOT	FULL HOT
Blower motor duty ratio	37%	37%	91%	65%	65%	65%	65%	91%
Compressor	ON	ON	ON	OFF	OFF	OFF	ON	ON
Electronic control valve (ECV) duty ratio	100%	50%	100%	0%	0%	0%	50%	100%

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

### OK or NG

OK >> GO TO 9.

NG >> ● Air outlet does not change.

Go to Mode Door Motor Circuit. Refer to [ATC-66, "Mode Door Motor Circuit"](#) .

● Intake door does not change.

Go to Intake Door Motor Circuit. Refer to [ATC-72, "Intake Door Motor Circuit"](#) .

● Blower motor operation is malfunctioning.

Go to Blower Motor Circuit. Refer to [ATC-75, "Blower Motor Circuit"](#) .

● Magnet clutch does not engage.

Go to Magnet Clutch Circuit Refer to [ATC-80, "Magnet Clutch Circuit"](#) .

● Discharge air temperature does not change.

Go to Air Mix Door Motor Circuit. Refer to [ATC-69, "Air Mix Door Motor Circuit"](#) .


# TROUBLE DIAGNOSIS

## 9. STEP-5: TEMPERATURE OF EACH SENSOR IS CHECKED

1. Turn the temperature dial (driver side) clockwise.
2. Code No. 51 appears on the display.

>> GO TO 10.

## 10. CHECK AMBIENT SENSOR

Press  (DEF) switch one time, temperature detected by ambient sensor is indicated on the display.

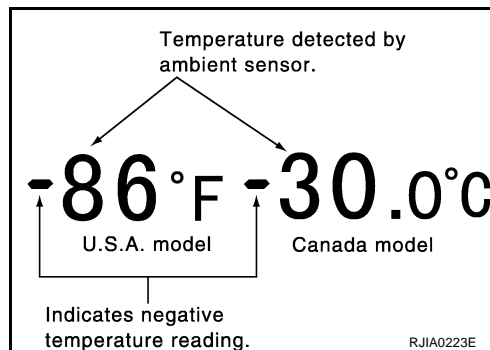
### NOTE:

If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.


### OK or NG

OK >> GO TO 11.

NG >> Go to Ambient Sensor Circuit. Refer to [ATC-101, "Ambient Sensor Circuit"](#).



## 11. CHECK IN-VEHICLE SENSOR

Press  (DEF) switch the second time, temperature detected by in-vehicle sensor is indicated on the display.

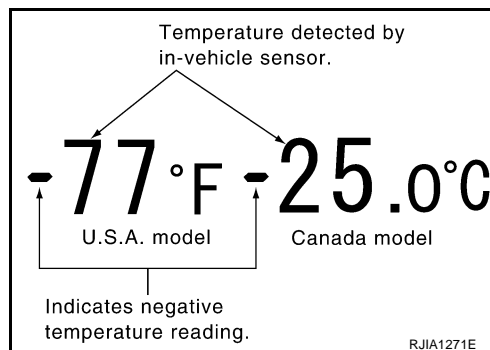
### NOTE:

If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.


### OK or NG

OK >> GO TO 12.

NG >> Go to In-Vehicle Sensor Circuit. Refer to [ATC-103, "In-Vehicle Sensor Circuit"](#).



## 12. CHECK INTAKE SENSOR

Press  (DEF) switch the third time, temperature detected by intake sensor is indicated on the display.

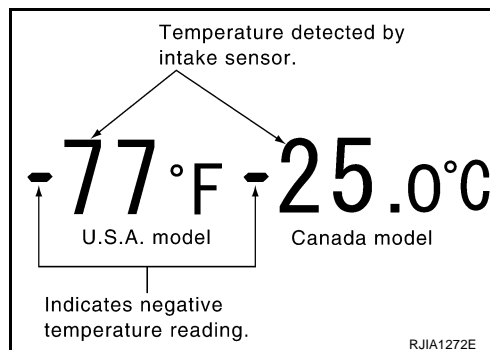
### NOTE:

If temperature shown on display greatly differs from actual temperature, check sensor circuit first, then inspect sensor.

### OK or NG

OK >> GO TO 13.

NG >> Go to Intake Sensor Circuit. Refer to [ATC-109, "Intake Sensor Circuit"](#).





# TROUBLE DIAGNOSIS

## 13. CHECK MULTIPLEX COMMUNICATION ERROR

1. Press intake switch.
2. Multiplex communication error between AV C/U (AV and NAVI C/U) and auto amp. is detected.  
(If plural errors occur, the display of each error will blink two times for 0.5 second intervals.)
3. Is multiplex communication error detected as self-diagnosis results?

### YES or NO

- YES >> Go to Multiplex Communication Circuit. Refer to [ATC-111, "Multiplex Communication Circuit"](#).
- NO >> 1. Turn ignition switch OFF or AUTO switch ON.  
2. INSPECTION END

Display	Multiplex communication error
52	In good order
52 	AV control unit or AV and NAVI control unit ⇔ Auto amp.
52 	Auto amp. ⇔ AV control unit or AV and NAVI control unit

RJIA1273E

## 14. CHECK MALFUNCTIONING SENSOR

Refer to the following chart for malfunctioning code No.

(If two or more sensors malfunction, corresponding code Nos. blink respectively two times.)

\*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.

Code No.	Malfunctioning sensor (Including circuits)	Reference page
21 / -21	Ambient sensor	*2
22 / -22	In-vehicle sensor	*3
24 / -24	Intake sensor	*4
25 / -25	Sunload sensor	*5
26 / -26	Air mix door motor (LCU) PBR (Driver side)	*6
27 / -27	Air mix door motor (LCU) PBR (Passenger side)	*6

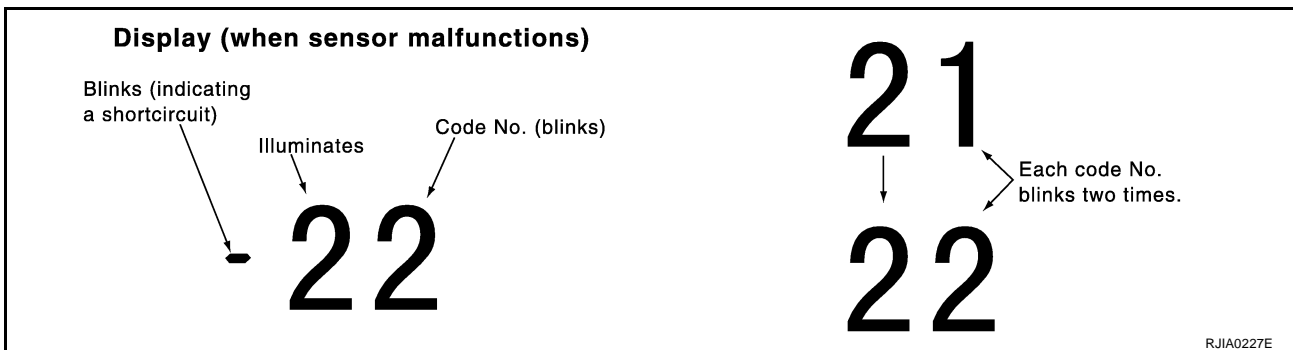
\*2: [ATC-101, "DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR"](#) .

\*3: [ATC-104, "DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR"](#) .

\*4: [ATC-109, "DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR"](#) .

\*5: [ATC-106, "DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR"](#) .

\*6: [ATC-62, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#) .



>> INSPECTION END

# TROUBLE DIAGNOSIS

## 15. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode and/or intake door motor PBR(s) is/are malfunctioning.

Code No. *1 *2	Mode or intake door position	Reference page
31	VENT (Driver side)	*3
32	FOOT (Driver side)	
33	DEF (Driver side)	
34	VENT (Passenger side)	
35	FOOT1 (Passenger side)	
36	DEF (Passenger side)	
37	FRE	*4
38	20% FRE	
39	REC	

(If two or more mode or intake doors are out of order, corresponding code numbers blink respectively twice.)

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

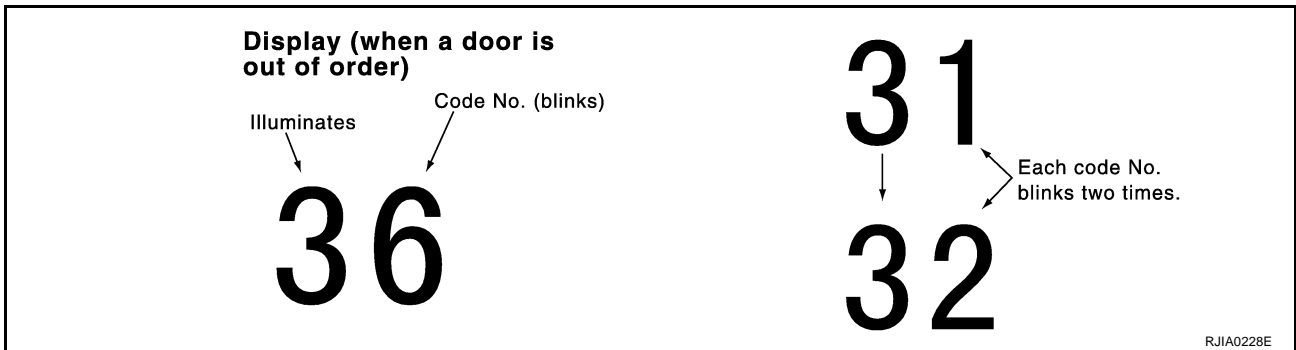
31→32→33→34→35→36→Return to 31

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

37→38→39→Return to 37

\*3: [ATC-66, "Mode Door Motor Circuit"](#) .

\*4: [ATC-72, "Intake Door Motor Circuit"](#) .




>> INSPECTION END

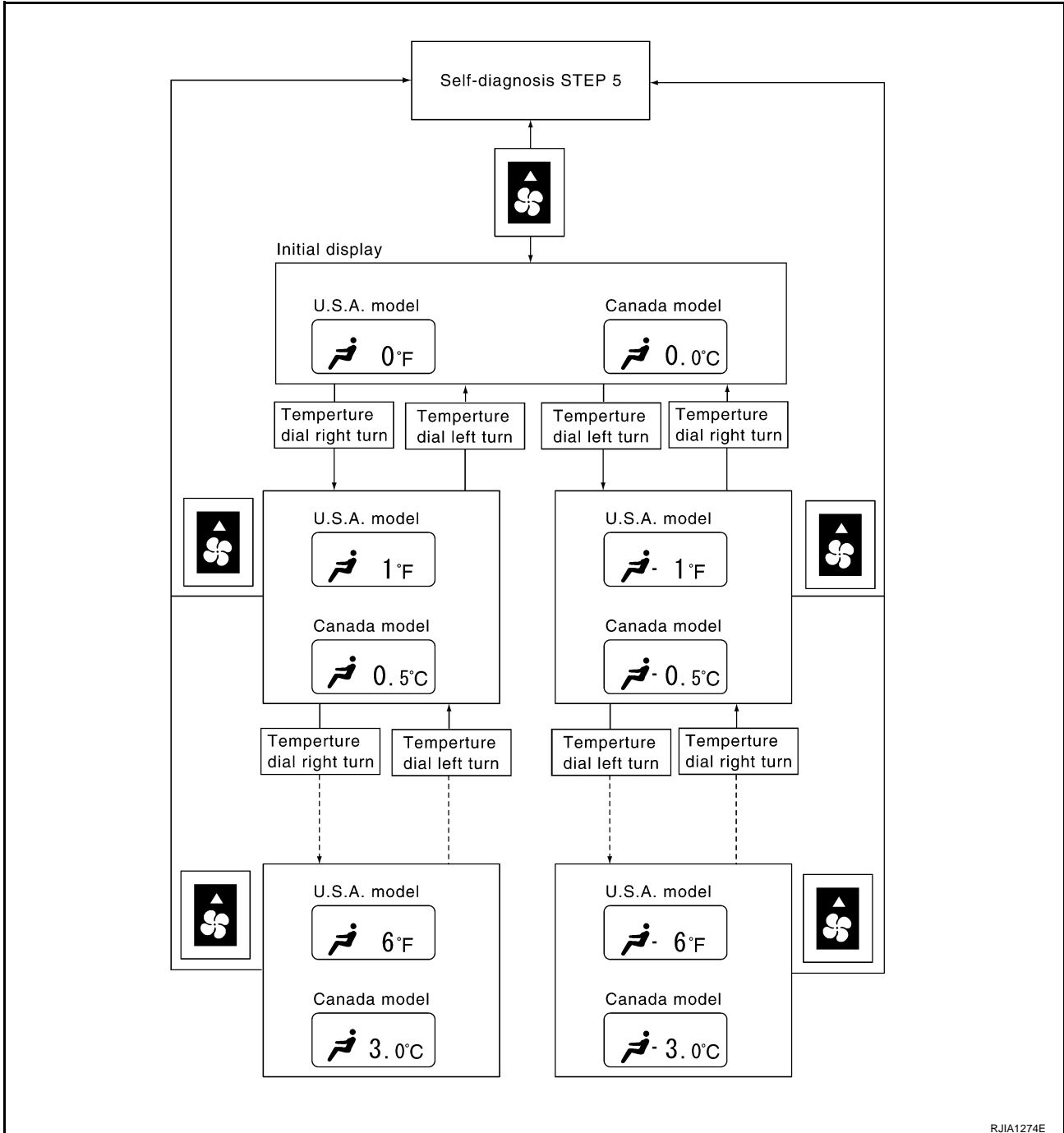
# TROUBLE DIAGNOSIS

## AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER

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

Operating procedures for this trimmer are as follows:

- Begin Self-diagnosis STEP-5 mode.
- Press  (fan) UP switch to set system in auxiliary mode. Refer to [ATC-49, "Self-Diagnosis Function"](#).
- Display shows 61 in auxiliary mechanism. It takes approximately 3 seconds.
- Turn the temperature dial as desired. Temperature will change at a rate of  $0.5^{\circ}\text{C}$  ( $1.0^{\circ}\text{F}$ ) each time a dial is turned.



When battery cable is disconnected, trimmer operation is canceled. Temperature set becomes that of initial condition, i.e.  $0^{\circ}\text{C}$  ( $0^{\circ}\text{F}$ ).



# TROUBLE DIAGNOSIS

## Operational Check

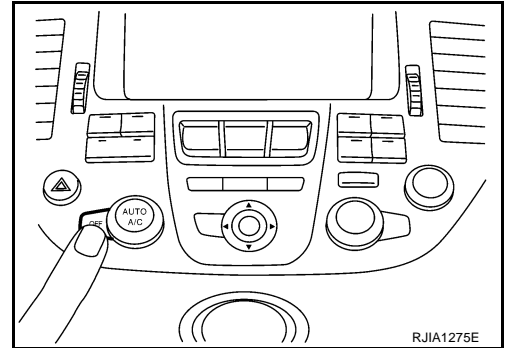
AJS000C7

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

**Conditions** :Engine running at normal operating temperature

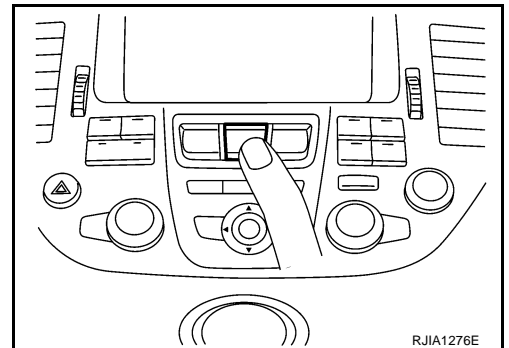
### CHECKING MEMORY FUNCTION

1. Set the temperature 90°F or 32°C.
2. Press OFF switch.
3. Turn the ignition switch OFF.
4. Turn the ignition switch ON.
5. Press the AUTO switch (driver side).
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.  
If NG, go to trouble diagnosis procedure for [ATC-99, "Memory Function"](#) .  
If OK, continue the check.



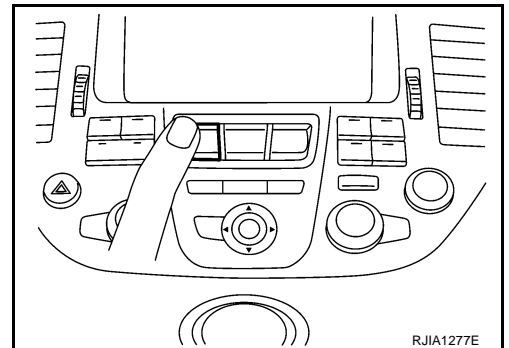
### CHECKING BLOWER

1. Press fan switch (up side) one time. Blower should operate on low speed. The fan symbol should have one blade lit.
  2. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
  3. Leave blower on MAX speed.
- If NG, go to trouble diagnosis procedure for [ATC-75, "Blower Motor Circuit"](#) .  
If OK, continue the check.



### CHECKING DISCHARGE AIR

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













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# TROUBLE DIAGNOSIS

3. Confirm that discharge air comes out according to the air distribution table. Refer to [ATC-32, "Discharge Air Flow"](#).

Mode position indication		Condition	Air outlet/distribution				
Driver side	Passenger side		Front VENT	Rear VENT	Front FOOT	Rear FOOT	DEF
		DUAL SW: OFF	87%	13%			
			50%	13%	24%	13%	
					50%	30%	20%
					37%	23%	40%
							100%

RJIA1270E

Intake door position is checked in the next step.

If NG, go to trouble diagnosis procedure for [ATC-66, "Mode Door Motor Circuit"](#).

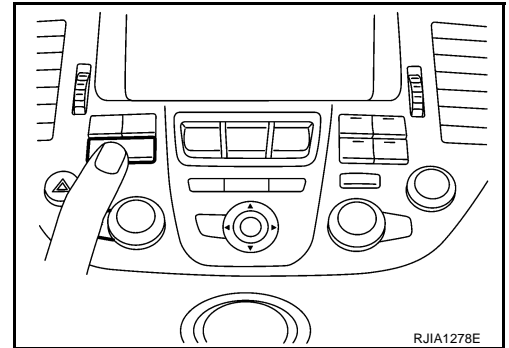
If OK, continue the check.

**NOTE:**

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

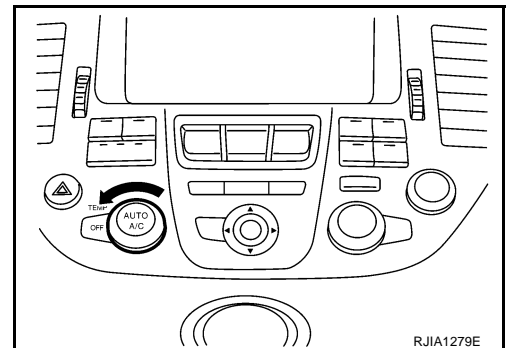
## CHECKING RECIRCULATION

1. Press intake switch one time.
2. Press intake switch again. Recirculation indicator should illuminate.
3. Listen for intake door position change (you should hear blower sound change slightly).  
If NG, go to trouble diagnosis procedure for [ATC-72, "Intake Door Motor Circuit"](#).  
If OK, continue the check.



## CHECKING TEMPERATURE DECREASE

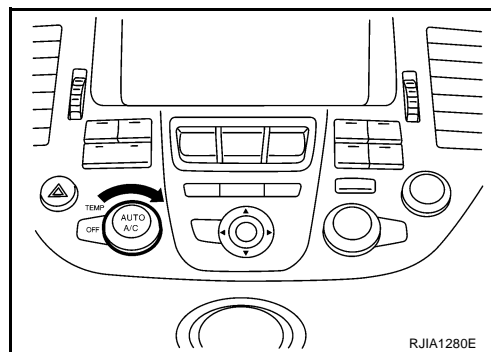
1. Turn the temperature dial until 18°C (60°F) is displayed.
2. Check for cold air at discharge air outlets.  
If NG, go to trouble diagnosis procedure for [ATC-87, "Insufficient Cooling"](#).  
If OK, continue the check.



# TROUBLE DIAGNOSIS

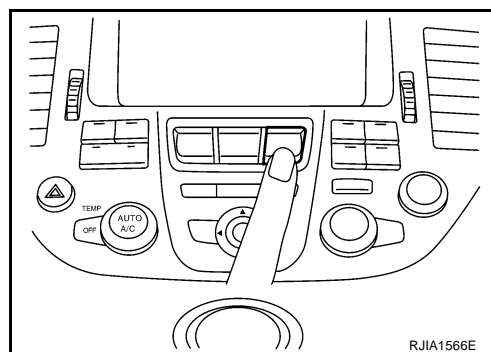
## CHECKING TEMPERATURE INCREASE

1. Turn the temperature dial (driver side) until 32°C (90°F) is displayed.
2. Check for hot air at discharge air outlets.  
If NG, go to trouble diagnosis procedure for [ATC-96, "Insufficient Heating"](#) .  
If OK, continue the check.



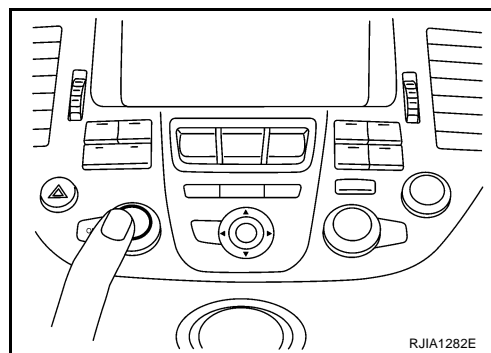
## CHECK ECON (ECONOMY) MODE

1. Set the temperature 75°F or 25°C.
  2. Press ECON switch.
  3. Display should indicate ECON (not AUTO).
  4. Press ECON switch again. Display should disappear ECON.
    - Confirm that the compressor clutch is not engaged (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)
- If NG, go to trouble diagnosis procedure for [ATC-100, "ECON \(ECONOMY\) Mode"](#) .  
If OK, continue the check.



## CHECKING AUTO MODE

1. Press AUTO switch (driver side).
  2. Display should indicate AUTO (Not ECON).
    - Confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)
- If NG, go to trouble diagnosis procedure for [ATC-60, "Power Supply and Ground Circuit for Auto Amp."](#) , then if necessary, trouble diagnosis procedure for [ATC-80, "Magnet Clutch Circuit"](#) .



If all operational checks are OK (symptom cannot be duplicated), go to Incident Simulation Tests in [GI-26, "How to Perform Efficient Diagnosis for an Electrical Incident"](#) and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to [ATC-34, "SYMPTOM TABLE"](#) and perform applicable trouble diagnosis procedures.

# TROUBLE DIAGNOSIS

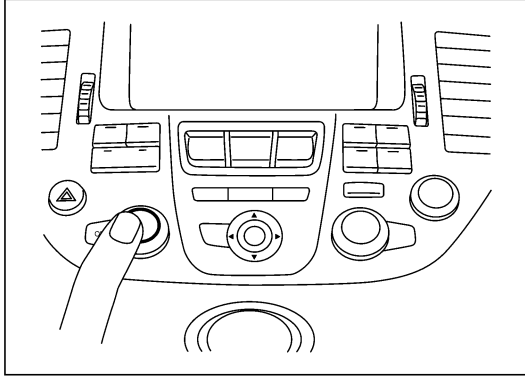
AJS000C8

## Power Supply and Ground Circuit for Auto Amp.

SYMPTOM: A/C system does not come on.

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



#### OPERATIONAL CHECK – AUTO mode

- Press AUTO switch.
- 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 (\*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)

4. Check Multiplex Communication Circuit (\*3).

OK

5. Replace auto amp.

RJIA1283E

\*1 [ATC-61, "DIAGNOSTIC PROCEDURE FOR A/C SYSTEM"](#).

\*2 [ATC-57, "Operational Check"](#).

\*3 [ATC-111, "Multiplex Communication Circuit"](#).

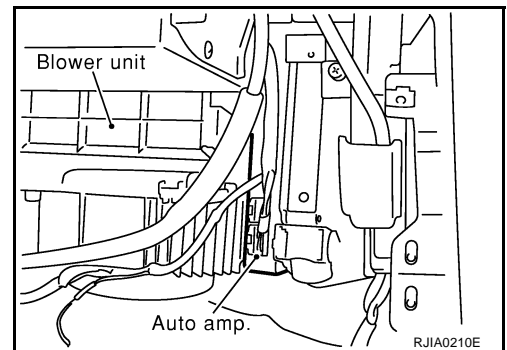
### COMPONENT DESCRIPTION

#### Automatic Amplifier (Auto Amp.)

The auto amp. 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 amp. is unitized with control mechanisms. When the various switches and temperature adjustment dial are operated, data is input to the auto amp. from the AV C/U or AV and NAVI C/U using multiplex communication.

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

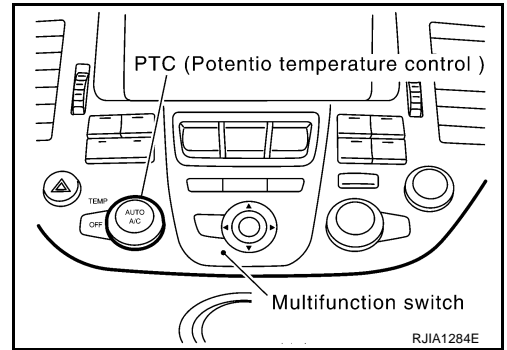


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# TROUBLE DIAGNOSIS

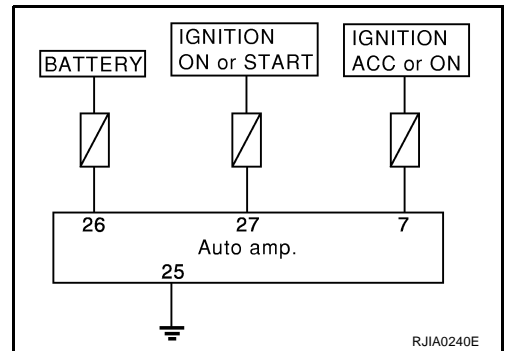
## Potential Temperature Control (PTC)

The PTC is built into the multifunction switch. It can be set at an interval of 0.5°C (1.0°F) in the 18°C (60°F) to 32°C (90°F) temperature range by turning the temperature dial. The set temperature is displayed.



## DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

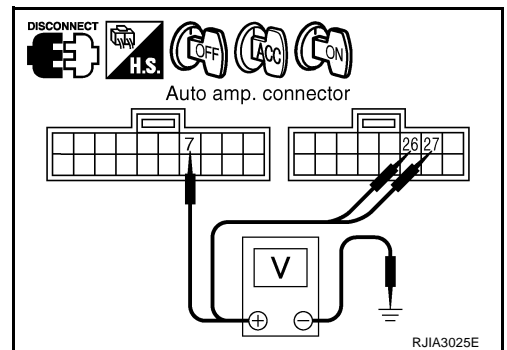
SYMPTOM: A/C system does not come on.



### 1. CHECK POWER SUPPLY CIRCUIT FOR AUTO AMP.

1. Disconnect auto amp. connector.
2. Check voltage between auto amp. harness connector M119 terminal 7 (GY/L), M120 terminals 26 (Y/G), 27 (P) and ground.

Terminals		Ignition switch position		
(+)	(-)	OFF	ACC	ON
Auto amp. connector	Terminal No. (Wire color)	voltage		
M119	7 (GY/L)	Approx. 0V	Battery voltage	Battery voltage
M120	26 (Y/G)	Battery voltage	Battery voltage	Battery voltage
M120	27 (P)	Approx. 0V	Approx. 0V	Battery voltage



### OK or NG

OK >> GO TO 2.

NG >> Check 10A fuses [Nos. 2, 6 and 21 located in the fuse block (J/B) No. 1]. Refer to [PG-62, "FUSE BLOCK - JUNCTION BOX \(J/B\) NO.1"](#).

- If fuses are OK, check for open circuit in wiring harness. Repair or replace if necessary.
- If fuses are NG, replace fuse and check wiring harness for short circuit. Repair or replace if necessary.

# TROUBLE DIAGNOSIS

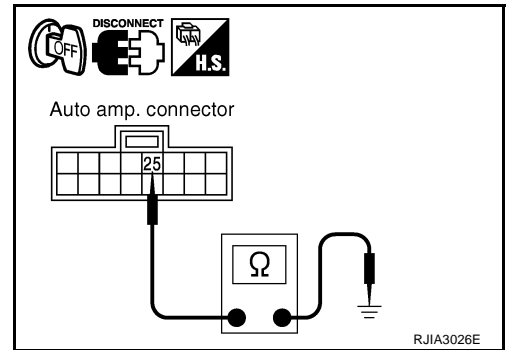
## 2. CHECK GROUND CIRCUIT FOR AUTO AMP.

1. Turn ignition switch OFF.
2. Check continuity between auto amp. harness connector M120 terminal 25 (B) and ground.

**25 – Ground : Continuity should exist.**

OK or NG

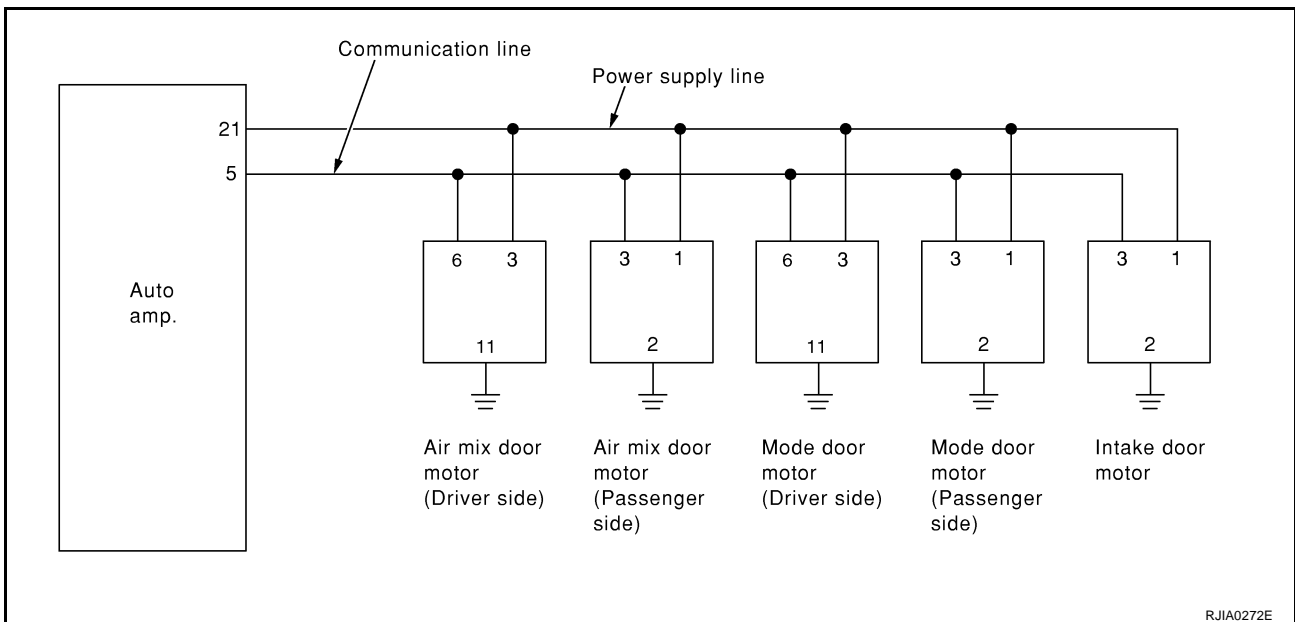
- OK >> Replace auto amp.  
 NG >> Repair or replace harness.



## LAN System Circuit

AJS000C9

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



## DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT

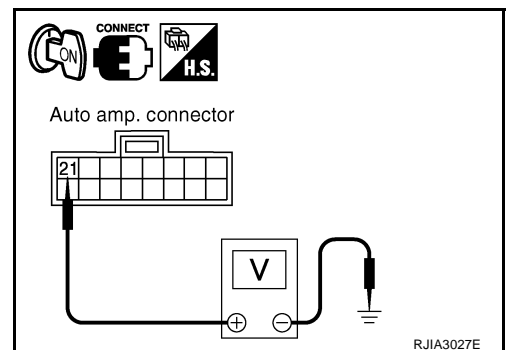
### 1. CHECK POWER SUPPLY FOR AUTO AMP.

1. Turn ignition switch ON.
2. Check voltage between auto amp. harness connector M120 terminal 21 (GY) and ground.

**21 – Ground : Approx. 12V**

OK or NG

- OK >> GO TO 2.  
 NG >> Replace auto amp.



# TROUBLE DIAGNOSIS

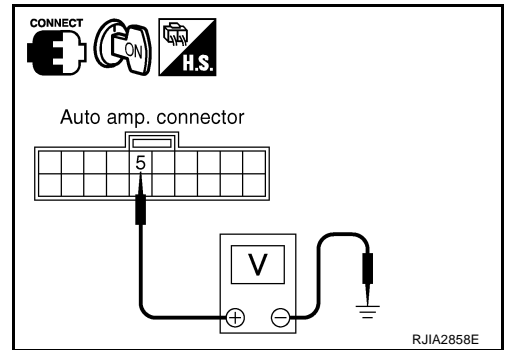
## 2. CHECK SIGNAL FOR AUTO AMP.

Check voltage between auto amp. harness connector M119 terminal 5 (G/Y) and ground.

**5 – Ground : Approx. 5V**

OK or NG

- OK >> GO TO 3.
- NG >> Replace auto amp.



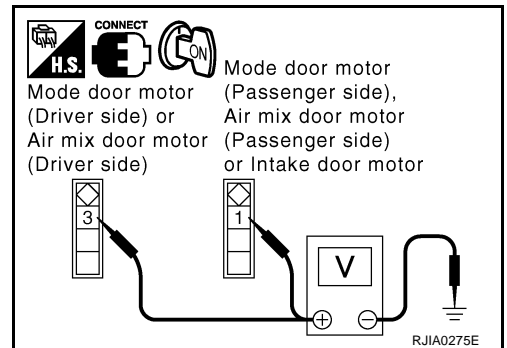
## 3. CHECK POWER SUPPLY FOR MOTOR

Check voltage between passenger side mode door motor harness connector M106 terminal 1 (GY), passenger side air mix door motor harness connector M107 terminal 1 (GY), intake door motor harness connector M118 terminal 1 (GY), driver side mode door motor harness connector M471 terminal 3 (GY), driver side air mix door motor harness connector M472 terminal 3 (GY) and ground.

**1, 3 – Ground : Approx. 12V**

OK or NG

- OK >> GO TO 4.
- NG >> Replace harness or connector.



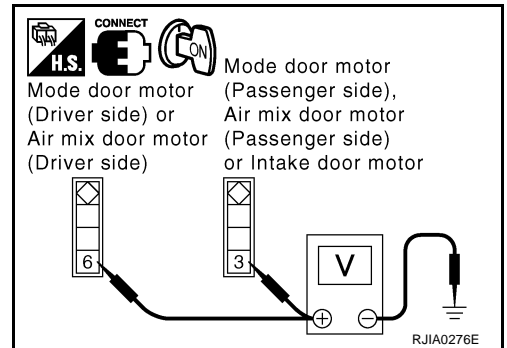
## 4. CHECK SIGNAL FOR MOTOR

Check voltage between passenger side mode door motor harness connector M106 terminal 3 (G/Y), passenger side air mix door motor harness connector M107 terminal 3 (G/Y), intake door motor harness connector M118 terminal 3 (G/Y), driver side mode door motor harness connector M471 terminal 6 (G/Y), driver side air mix door motor connector M472 terminal 6 (G/Y) and ground.

**3, 6 – Ground : Approx. 5V**

OK or NG

- OK >> GO TO 5.
- NG >> Replace harness or connector.



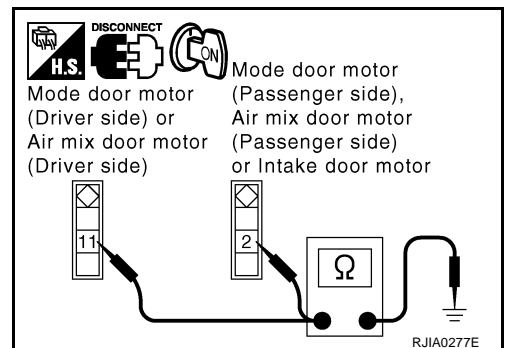
## 5. CHECK MOTOR GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect door motor connector.
3. Check continuity between passenger side mode door motor harness connector M106 terminal 2 (B), passenger side air mix door motor harness connector M107 terminal 2 (B), intake door motor harness connector M118 terminal 2 (B), driver side mode door motor harness connector M471 terminal 11 (B), driver side air mix door motor harness connector M472 terminal 11 (B) and ground.

**2, 11 – Ground : Continuity should exist.**

OK or NG

- OK >> GO TO 6.
- NG >> Replace harness or connector.



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# TROUBLE DIAGNOSIS

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## 6. CHECK MOTOR OPERATION

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1. Turn ignition switch OFF.
2. Disconnect each door motor connector.
3. Reconnect each door motor connector.
4. Turn ignition switch ON.
5. Confirm each door motor operation.

### OK or NG

- OK >> (Return to operate normally.)
- Poor contacting the motor connector
- NG >> (Does not operate normally.)
- GO TO 7.

---

## 7. CHECK AIR MIX AND INTAKE DOOR MOTOR OPERATION

---

1. Turn ignition switch OFF.
2. Disconnect mode door motor (driver side, passenger side), air mix door motor (driver side, passenger side) and intake door motor connector.
3. Reconnect air mix door motor (driver side, passenger side) and intake door motor connectors.
4. Turn ignition switch ON.
5. Confirm air mix door motor (driver side, passenger side) and intake door motors operation.

### OK or NG

- OK >> (Air mix and door motor operates normally.)
- GO TO 10.
- NG >> (Intake door motor does not operate normally.)
- GO TO 8.

---

## 8. CHECK MODE AND INTAKE DOOR MOTOR OPERATION

---

1. Turn ignition switch OFF.
2. Disconnect air mix door motor connector (driver side, passenger side).
3. Reconnect mode door motor connector (driver side, passenger side).
4. Turn ignition switch ON.
5. Confirm mode and intake door motor operation.

### OK or NG

- OK >> (Mode and intake door motor operates normally.)
- GO TO 11.
- NG >> (Mode and intake door motor does not operate normally.)
- GO TO 9.

---

## 9. CHECK MODE AND AIR MIX DOOR MOTOR OPERATION

---

1. Turn ignition switch OFF.
2. Disconnect intake door motor connector.
3. Reconnect air mix door motor connector (driver side, passenger side).
4. Turn ignition switch ON.
5. Confirm mode and air mix door motor operation.

### OK or NG

- OK >> (Mode and air mix door motor operates normally.)
- Replace intake door motor.
- NG >> (Intake door motor does not operate normally.)
- Replace auto amp.



# TROUBLE DIAGNOSIS

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## 10. CHECK MODE DOOR MOTOR OPERATION

---

1. Turn ignition switch OFF.
2. Reconnect mode door motor (driver side) connector.
3. Turn ignition switch ON.
4. Confirm the mode door motor (driver side) operation.

### OK or NG

- OK >> [Mode door motor (driver side) operates normally.]
- Replace mode door motor (passenger side).
- NG >> [Mode door motor (driver side) does not operate normally.]
- Replace mode door motor (driver side).

---

## 11. CHECK AIR MIX DOOR MOTOR OPERATION

---

1. Turn ignition switch OFF.
2. Reconnect air mix door motor (driver side) connector.
3. Turn ignition switch ON.
4. Confirm the air mix door motor (driver side) operation.

### OK or NG

- OK >> [Air mix door motor (driver side) operates normally.]
- Replace air mix door motor (passenger side).
- NG >> [Air mix door motor (driver side) does not operate normally.]
- Replace air mix door motor (driver side).

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# TROUBLE DIAGNOSIS

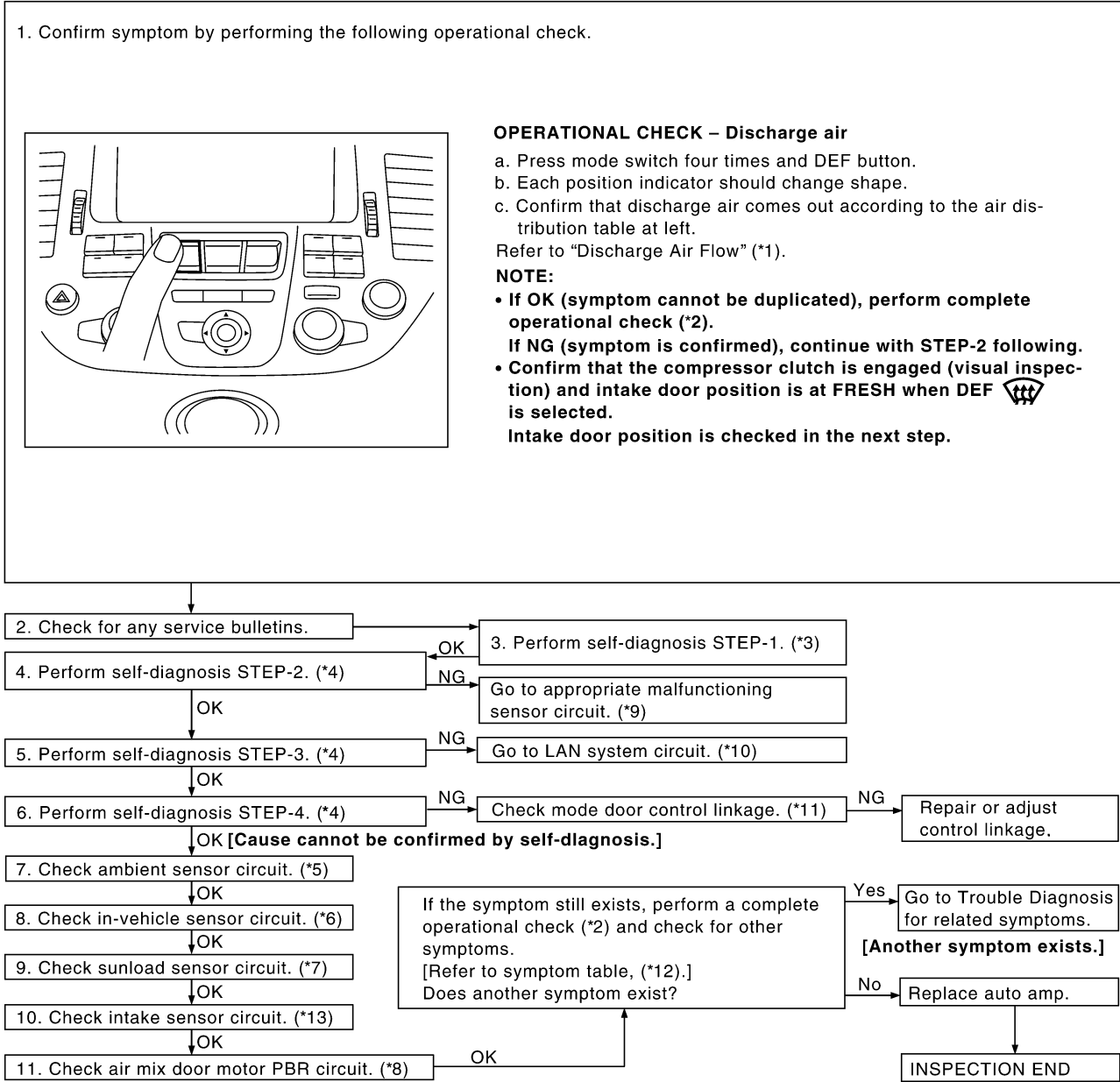
AJS001EY

## Mode Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



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\*1 [ATC-32, "Discharge Air Flow".](#)

\*2 [ATC-57, "Operational Check".](#)

\*3 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE",](#) see No.1.

\*4 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE",](#) see No. 5 to 7.

\*5 [ATC-101, "Ambient Sensor Circuit".](#)

\*6 [ATC-103, "In-Vehicle Sensor Circuit".](#)

\*7 [ATC-106, "Sunload Sensor Circuit".](#)

\*8 [ATC-71, "Air Mix Door Motor PBR Circuit".](#)

\*9 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE",](#) see No.14.

\*10 [ATC-62, "LAN System Circuit".](#)

\*11 [ATC-68, "Mode Door Motor".](#)

\*12 [ATC-34, "SYMPTOM TABLE".](#)

\*13 [ATC-109, "Intake Sensor Circuit".](#)

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

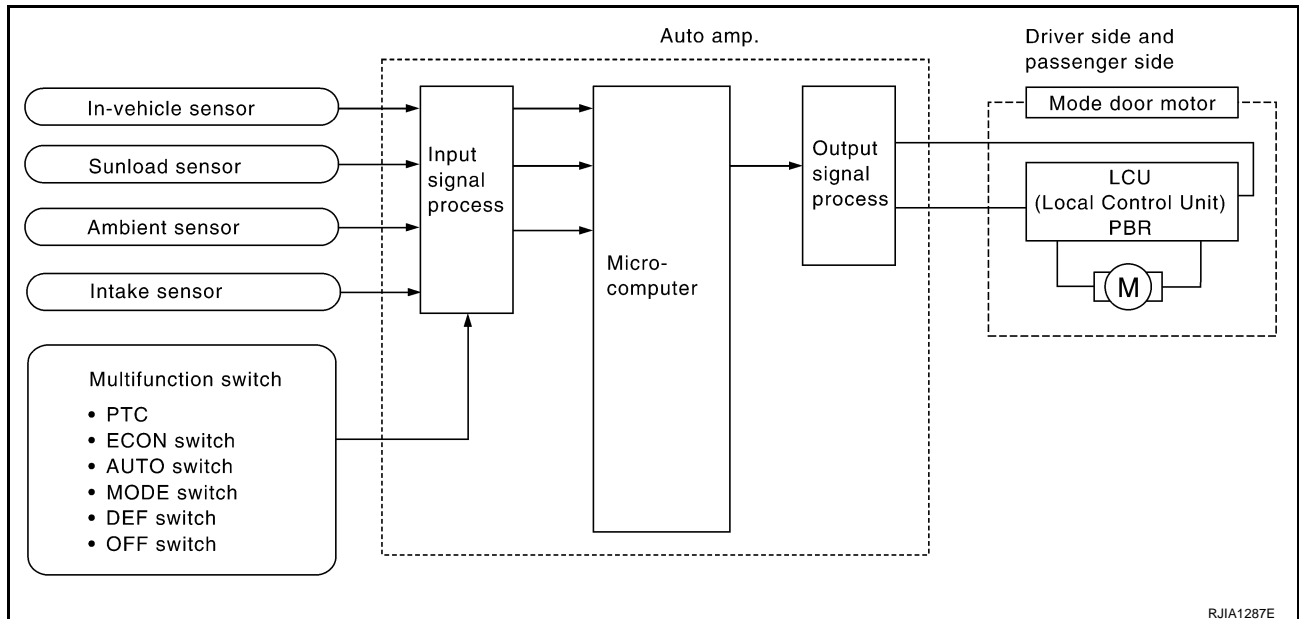
Mode door control system components are:

- Auto amp.
- Mode door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

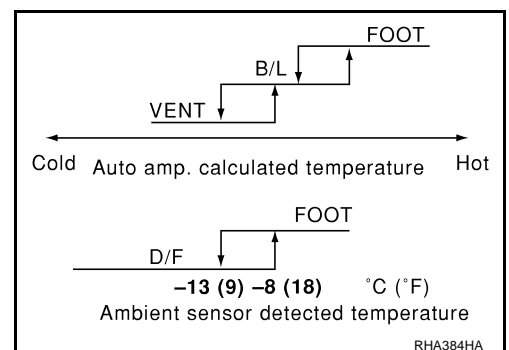
### System Operation

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

The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amp. 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 or FRESH/RECIRCULATION operation is selected. The new selection data is returned to the auto amp.



### Mode Door Control Specification

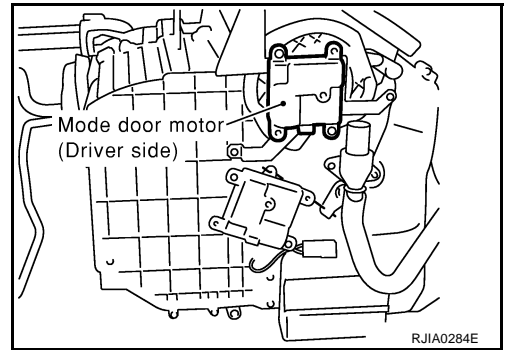
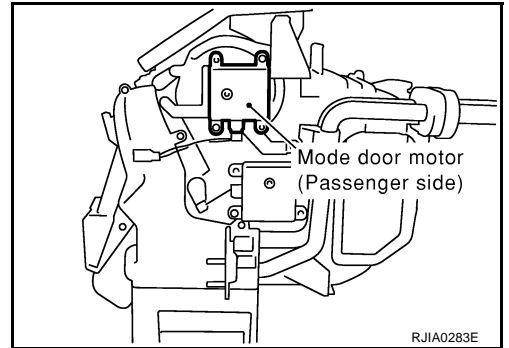


# TROUBLE DIAGNOSIS

## COMPONENT DESCRIPTION

### Mode Door Motor

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



## DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR

SYMPTOM: Mode door motor does not operate normally.

Perform diagnostic procedure. Refer to [ATC-62, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#) .

# TROUBLE DIAGNOSIS

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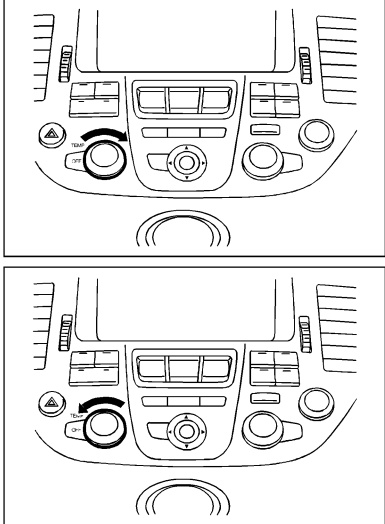
## Air Mix Door Motor Circuit

### 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**

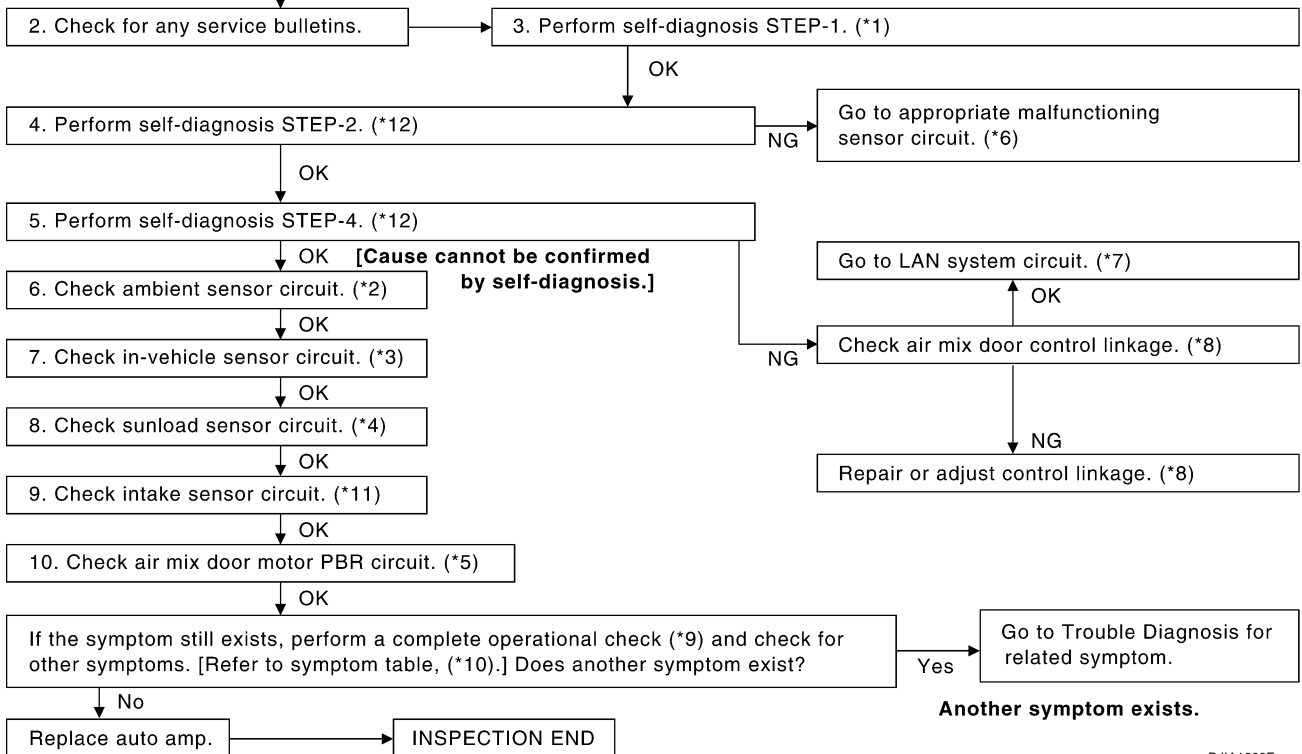
**Temperature increase**

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

**Temperature decrease**

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

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



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- \*1 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.1.
  - \*2 [ATC-101, "Ambient Sensor Circuit"](#).
  - \*3 [ATC-103, "In-Vehicle Sensor Circuit"](#).
  - \*4 [ATC-106, "Sunload Sensor Circuit"](#).
  - \*5 [ATC-71, "Air Mix Door Motor PBR Circuit"](#).
  - \*6 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 14.
  - \*7 [ATC-62, "LAN System Circuit"](#).
  - \*8 [ATC-71, "COMPONENT DESCRIPTION"](#) for Air mix door.
  - \*9 [ATC-57, "Operational Check"](#).
  - \*10 [ATC-34, "SYMPTOM TABLE"](#).
  - \*11 [ATC-109, "Intake Sensor Circuit"](#).
  - \*12 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 5 to 7.

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

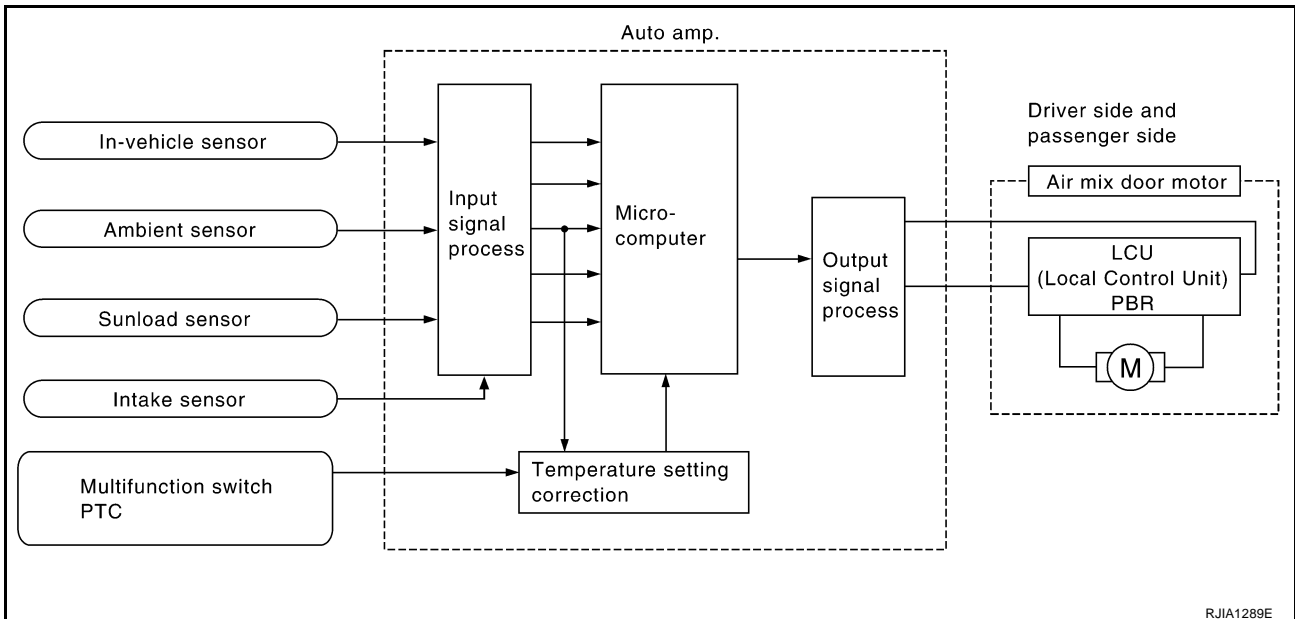
Air mix door control system components are:

- Auto amp.
- Air mix door motor (LCU)
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

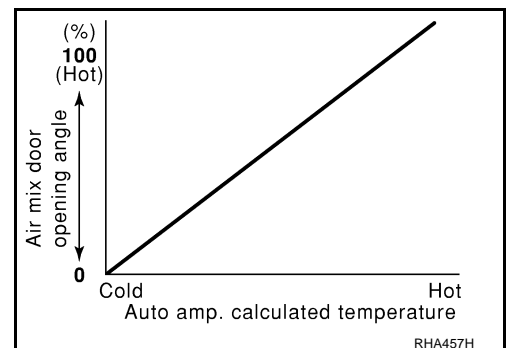
### System Operation

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

The air mix door motor, mode door motor and intake door motor read their respective signals according to the address signal. Opening angle indication signals received from the auto amp. 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 or FRESH/RECIRCULATION operation is selected. The new selection data is returned to the auto amp.



### Air Mix Door Control Specification

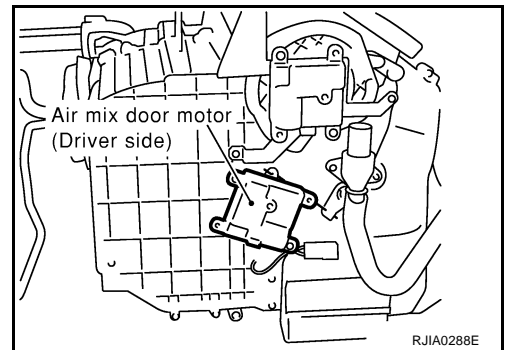
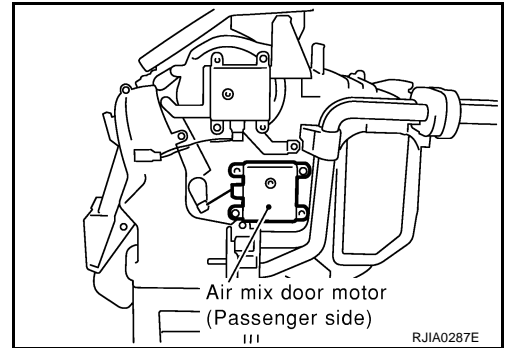


# TROUBLE DIAGNOSIS

## COMPONENT DESCRIPTION

### Air Mix Door Motor

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



### DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR

SYMPTOM: Discharge air temperature does not change.

Perform diagnostic procedure. Refer to [ATC-62, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#).

### Air Mix Door Motor PBR Circuit

AJS000QX

SYMPTOM: If PBR circuit is open or shorted. (26/-26 or 27/-27 is indicated on auto amp. as a result of conducting Self-diagnosis STEP-2.)

### DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR PBR

Perform diagnostic procedure. Refer to [ATC-71, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR"](#).

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# TROUBLE DIAGNOSIS

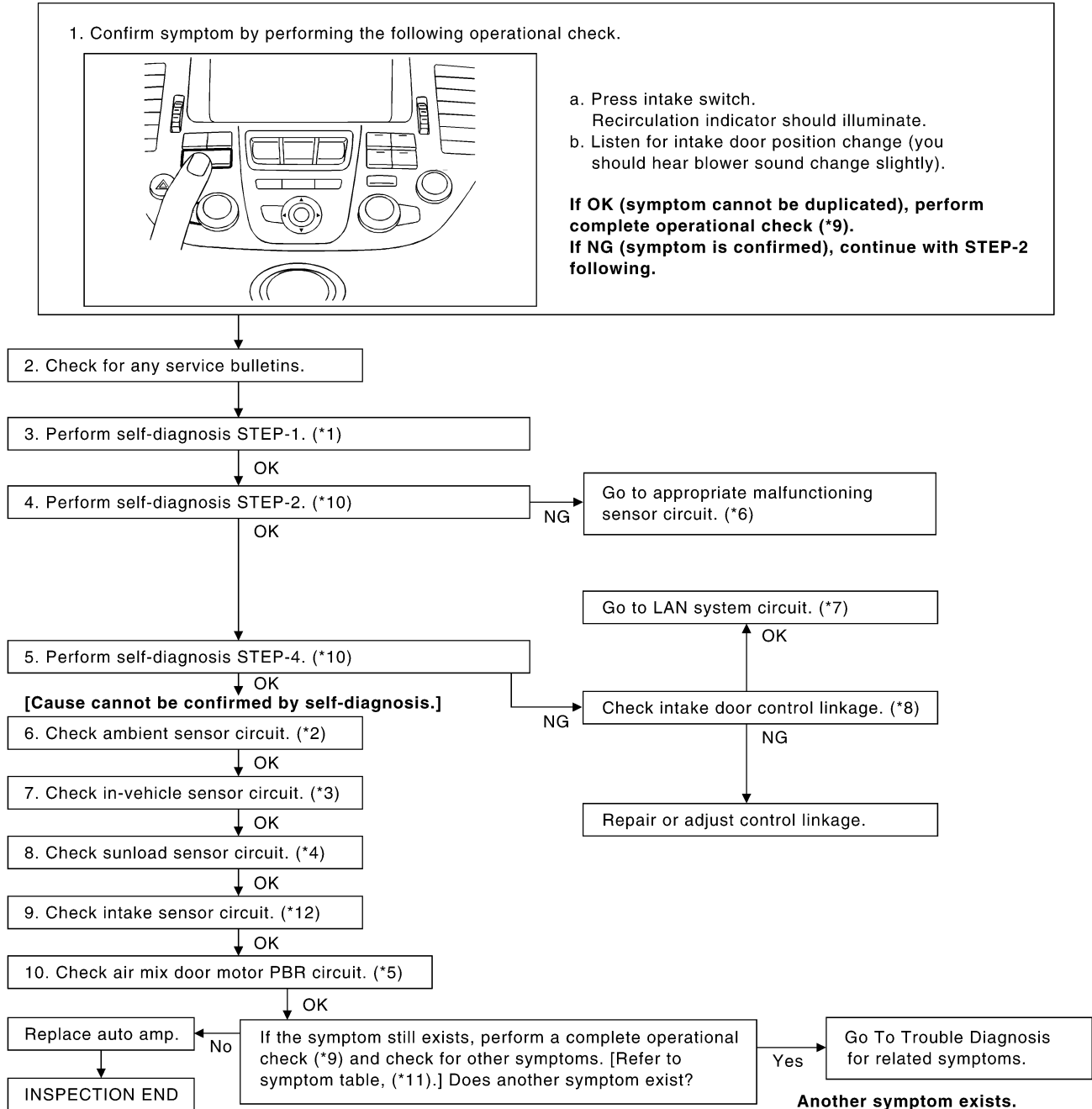
AJS001F0

## Intake Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



RJIA1290E

\*1 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.1.

\*2 [ATC-101, "Ambient Sensor Circuit"](#).

\*3 [ATC-103, "In-Vehicle Sensor Circuit"](#).

\*4 [ATC-106, "Sunload Sensor Circuit"](#).

\*5 [ATC-71, "Air Mix Door Motor PBR Circuit"](#).

\*6 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 14.

\*7 [ATC-62, "LAN System Circuit"](#).

\*8 [ATC-74, "Intake Door Motor"](#).

\*9 [ATC-57, "Operational Check"](#).

\*10 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.5 to 7.

\*11 [ATC-34, "SYMPTOM TABLE"](#).

\*12 [ATC-109, "Intake Sensor Circuit"](#).



# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

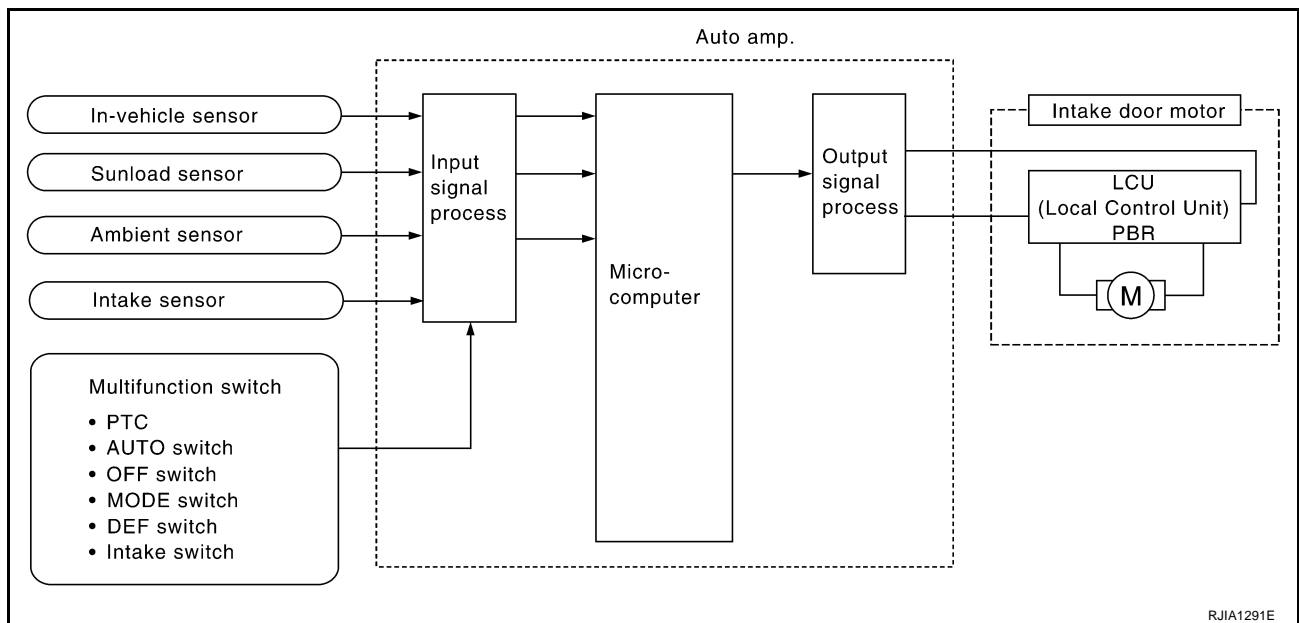
### Component Parts

Intake door control system components are:

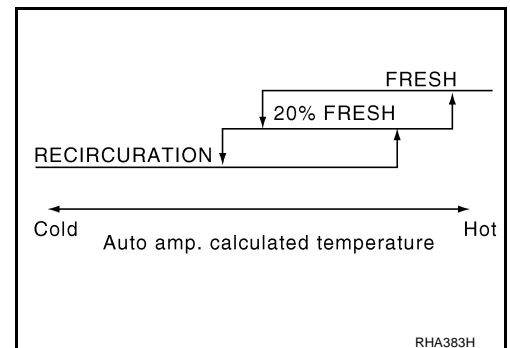
- Auto amp.
- Intake door motor
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

### System Operation

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



### Intake Door Control Specification

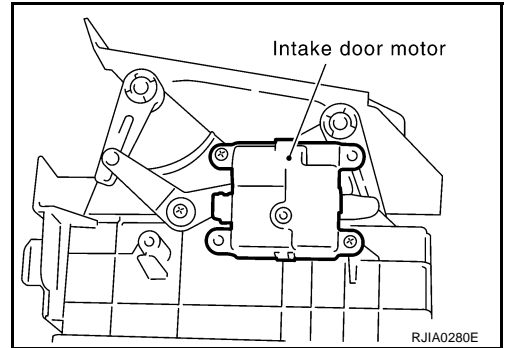


# TROUBLE DIAGNOSIS

## COMPONENT DESCRIPTION

### Intake Door Motor

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



## DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

SYMPTOM: Intake door motor does not operate normally.

Perform diagnostic procedure. Refer to [ATC-62, "DIAGNOSTIC PROCEDURE FOR LAN CIRCUIT"](#) .

# TROUBLE DIAGNOSIS

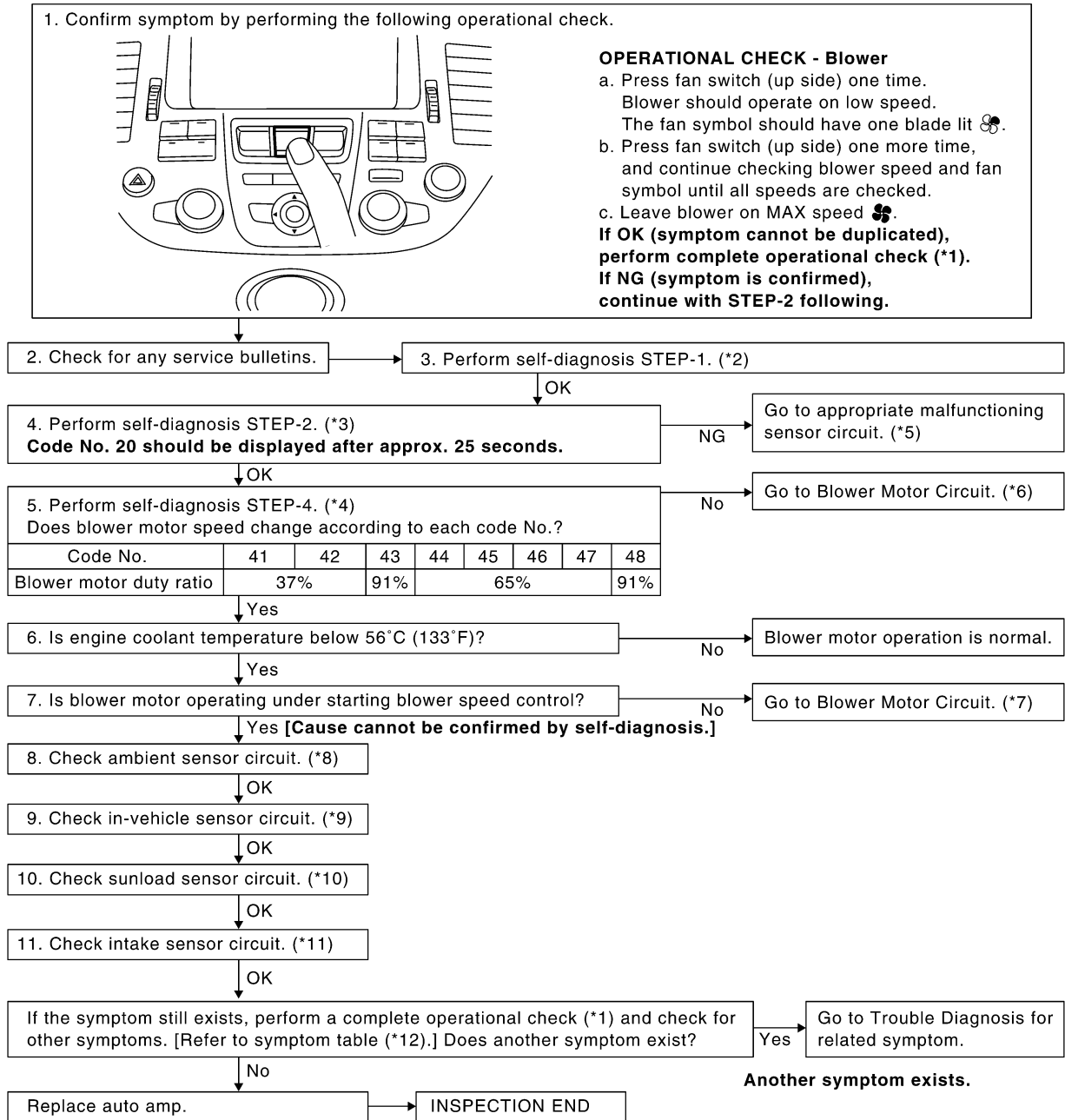
AJS001F1

## Blower Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



\*1 [ATC-57, "Operational Check"](#).

\*2 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.1.

\*3 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.5.

\*4 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.7.

\*5 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.14.

\*6 [ATC-77, "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR"](#).

\*7 [ATC-75, "Blower Motor Circuit"](#).

\*8 [ATC-101, "Ambient Sensor Circuit"](#).

\*9 [ATC-103, "In-Vehicle Sensor Circuit"](#).

\*10 [ATC-106, "Sunload Sensor Circuit"](#).

\*11 [ATC-109, "Intake Sensor Circuit"](#).

\*12 [ATC-34, "SYMPTOM TABLE"](#).

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# TROUBLE DIAGNOSIS

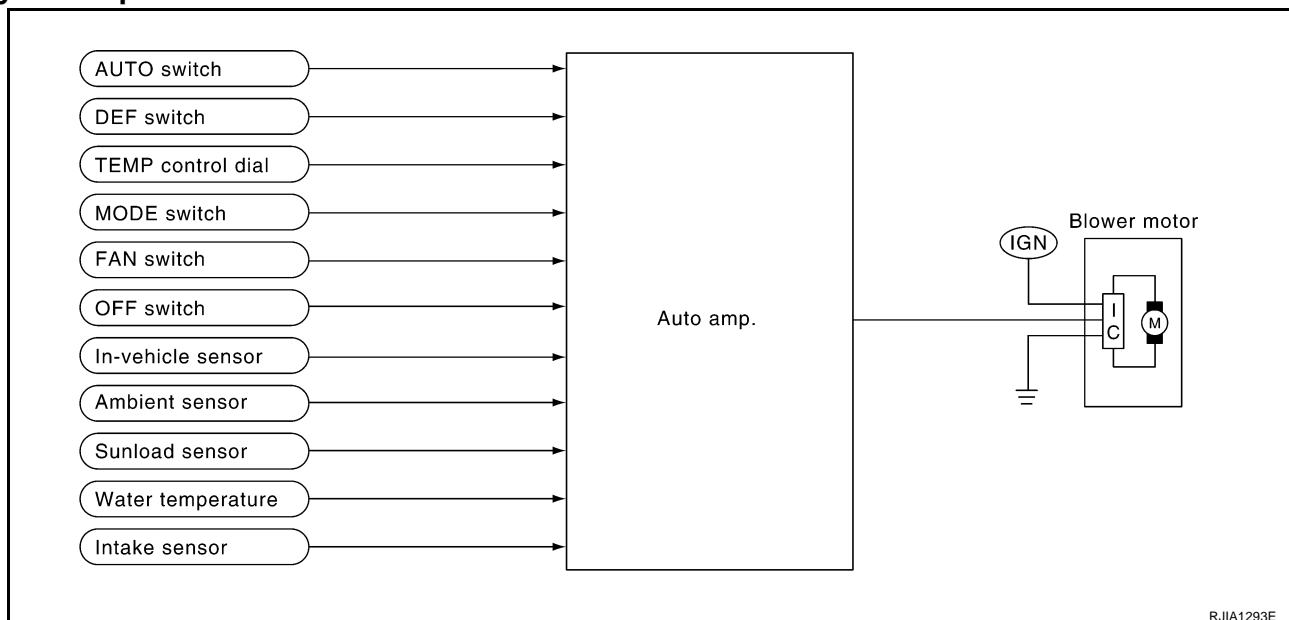
## SYSTEM DESCRIPTION

### Component Parts

Fan speed control system components are:

- Auto amp.
- A/C LAN system (PBR built-in mode door motor, air mix door motor and intake door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

### System Operation



### Automatic Mode

In the automatic mode, the blower motor speed is calculated by the auto amp. based on input from the PBR, in-vehicle sensor, sunload sensor, intake sensor and ambient sensor.

When the air flow is increased, the duty ratio of the blower fan motor's drive signal is changed at 8% sec to prevent a sudden increase in air flow.

In addition to manual air flow control and the normal automatic air flow control, starting air flow control, low water temperature starting control and high passenger compartment temperature starting control are available.

When the audio-recognition signal is input to the auto amp., the maximum fan speed is limited to the 3rd step. (Except DEF).

### 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 56°C (133°F), the blower will not operate for a short period of time (up to 150 seconds). The exact start delay time varies depending on the ambient and engine coolant temperature.

In the most extreme case (very low ambient) the blower starting delay will be 150 seconds as described above. After this delay, the blower will operate at low speed until the engine coolant temperature rises above 56°C (133°F), at which time the blower speed will increase to the objective speed.

Start Up from Normal or HOT SOAK Condition (Automatic mode)

The blower will begin operation momentarily after the AUTO switch 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).

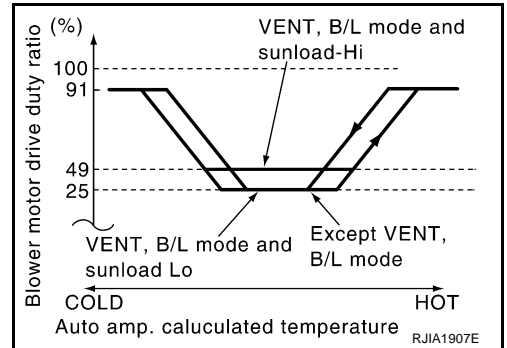
# TROUBLE DIAGNOSIS

## 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 low or no sunload, the blower low speed is normal low speed (duty ratio 25%). During high sunload conditions, the auto amp causes the blower fan speed to increase (duty ratio 49%).

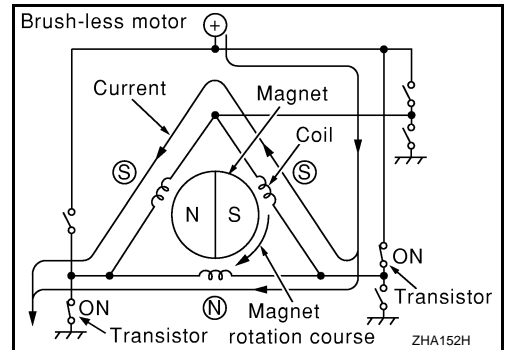
### Fan Speed Control Specification



## COMPONENT DESCRIPTION

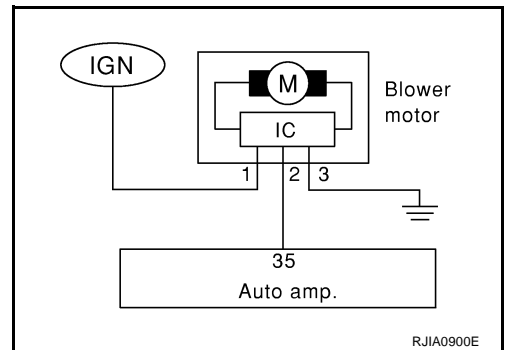
### Brush-Less Motor

The blower motor utilizes a brush-less motor with a rotating magnet. Quietness is improved over previous motors where the brush was the point of contact and the coil rotated.



## DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

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



# TROUBLE DIAGNOSIS

## 1. CHECK POWER SUPPLY FOR BLOWER MOTOR

1. Disconnect blower motor connector.
2. Turn ignition switch ON.
3. Check voltage between blower motor harness connector M112 terminal 1 (L/W) and ground.

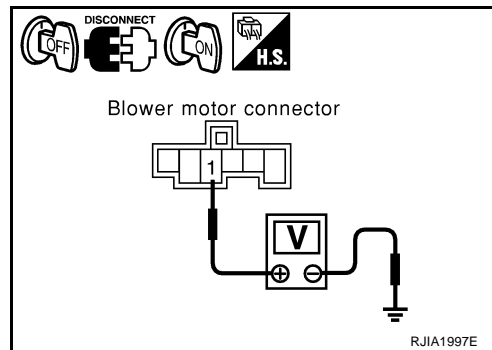
**1 – Ground** : **Battery voltage**

OK or NG

OK >> GO TO 2.

NG >> Check power supply circuit and 15A fuses [Nos. 31 and 33, located in the fuse block (J/B) No. 2]. Refer to [PG-63, "FUSE BLOCK - JUNCTION BOX \(J/B\) NO.2"](#) .

- If OK, check for open circuit in wiring harness. Repair or replace if necessary.
- If NG, replace fuse and check wiring harness for short circuit. Repair or replace if necessary.



## 2. CHECK GROUND CIRCUIT FOR BLOWER MOTOR

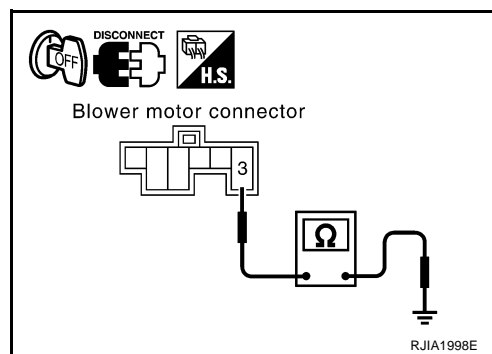
1. Turn ignition switch OFF.
2. Check continuity between blower motor harness connector M112 terminal 3 (B) and ground.

**3 – Ground** : **Continuity should exist.**

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



## 3. CHECK CIRCUIT CONTINUITY BLOWER MOTOR AND AUTO AMP.

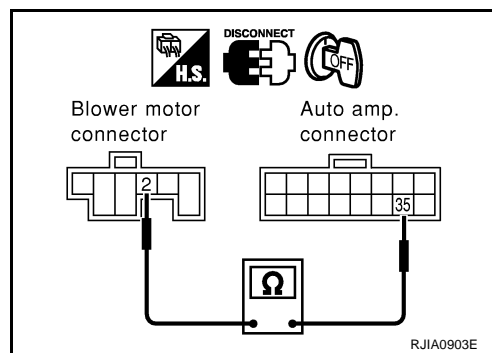
1. Disconnect auto amp. connector.
2. Check continuity between blower motor harness connector M112 terminal 2 (L/OR) and auto amp. harness connector M120 terminal 35 (L/OR).

**2 – 35** : **Continuity should exist.**

OK or NG

OK >> GO TO 4.

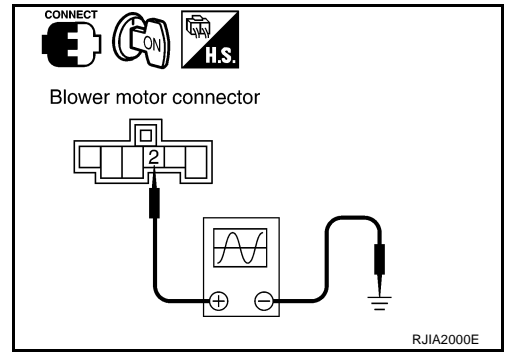
NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

## 4. CHECK FOR AUTO AMP. OUTPUT

1. Reconnect blower motor connector and auto amp. connector.
2. Turn ignition switch ON.
3. Vary the fan speed between Lo and Hi and confirm the blower motor connector terminal 2 (L/OR) duty ratios using an oscilloscope. Usual terminal 2 (L/OR) drive signal duty ratios are shown in the table below.



Blower fan speed	1st	2nd	3rd	4th	5th
Blower motor connector M112 Terminal No. 2 (Oscilloscope)					
Duty ratio	Approx. 25%	Approx. 37%	Approx. 51%	Approx. 65%	Approx. 91%

$$\text{NOTE: Duty ratio} = \frac{T_x}{\text{Approx. } 1.6 \text{ ms}} \times 100 (\%)$$

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### OK or NG

- OK >> GO TO 5.
- NG >> Replace auto amp.

## 5. CHECK BLOWER MOTOR DRIVE SIGNAL

If the fan air flow does not change, usual terminal 2 (L/OR) drive signal duty ratios are shown in the table above.

### OK or NG

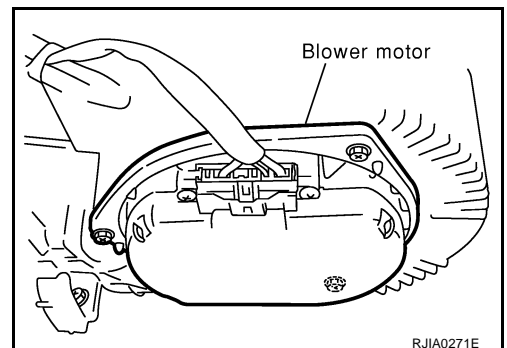
- OK >> Replace blower motor.
- NG >> INSPECTION END

## COMPONENT INSPECTION

### Blower Motor

Confirm smooth rotation of the blower motor.

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



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# TROUBLE DIAGNOSIS

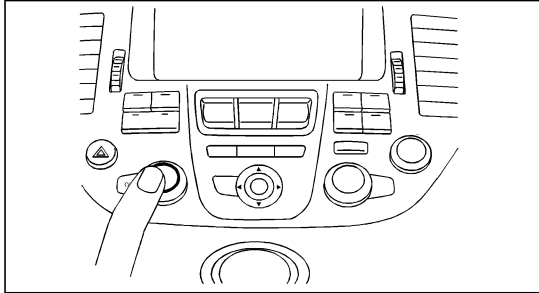
AJS000CE

## Magnet Clutch Circuit

SYMPTOM: Magnet clutch does not engage.

### INSPECTION FLOW

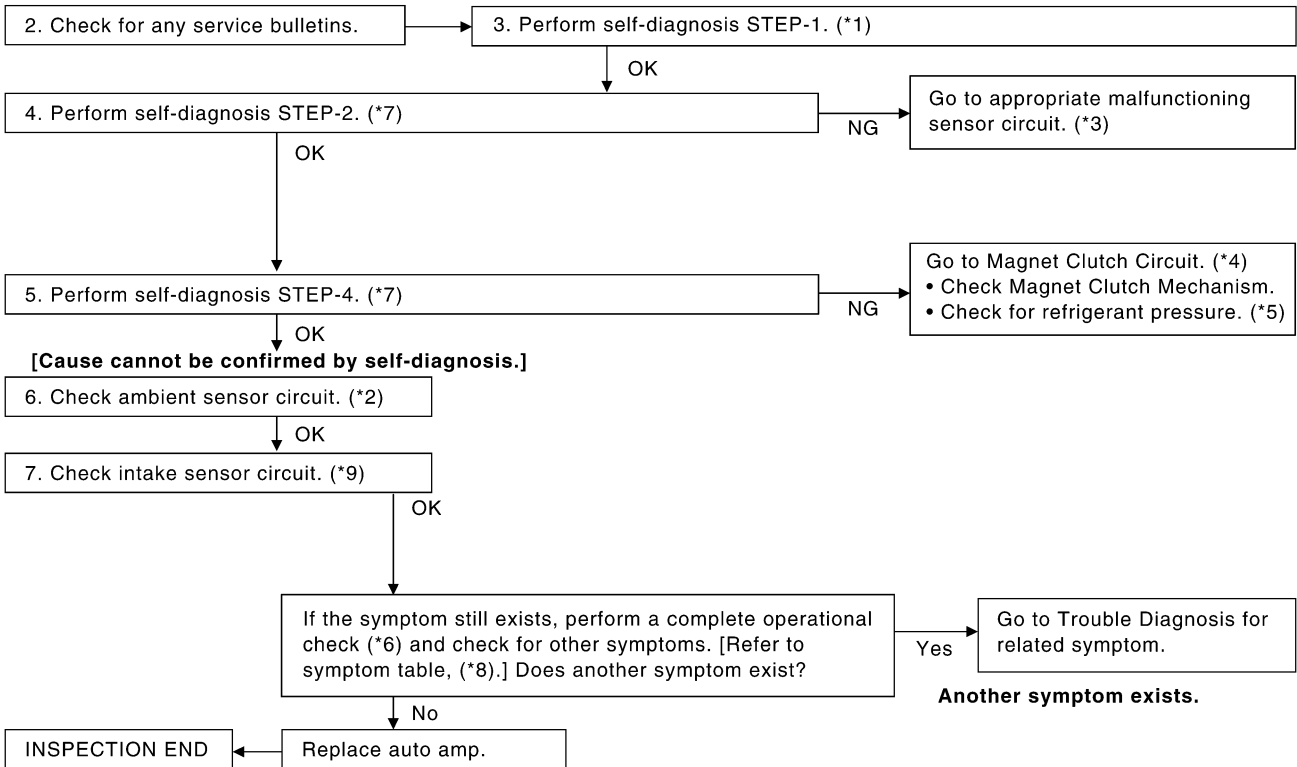
1. Confirm symptom by performing operational check.



#### 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 (\*6).  
If NG (symptom is confirmed), continue with STEP-2 following.**



\*1 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 1.

\*2 [ATC-101, "Ambient Sensor Circuit"](#).

\*3 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 14.

\*4 [ATC-81, "DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH"](#).

\*5 [ATC-92, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"](#).

\*6 [ATC-57, "Operational Check"](#).

\*7 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 5 to 7.

\*8 [ATC-34, "SYMPTOM TABLE"](#).

\*9 [ATC-109, "Intake Sensor Circuit"](#).

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# TROUBLE DIAGNOSIS

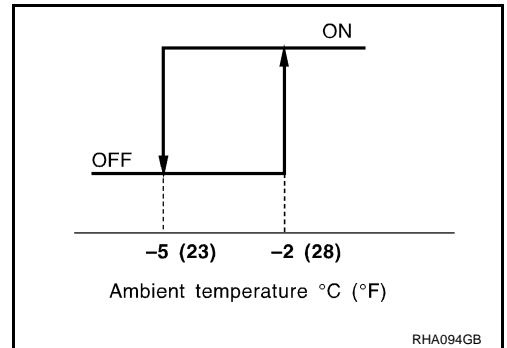
## SYSTEM DESCRIPTION

Auto amp. controls compressor operation by ambient temperature, intake air temperature and signal from ECM.

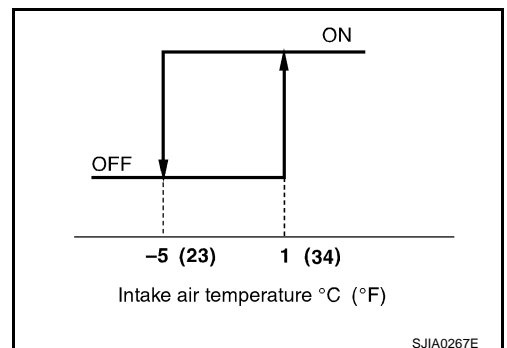
### Low Temperature Protection Control

Auto amp. will turn compressor ON or OFF as determined by a signal detected by ambient sensor and intake sensor.

When ambient temperatures are higher than  $-2^{\circ}\text{C}$  ( $28^{\circ}\text{F}$ ), the compressor turns ON. The compressor turns OFF when ambient temperatures are lower than  $-5^{\circ}\text{C}$  ( $23^{\circ}\text{F}$ ).

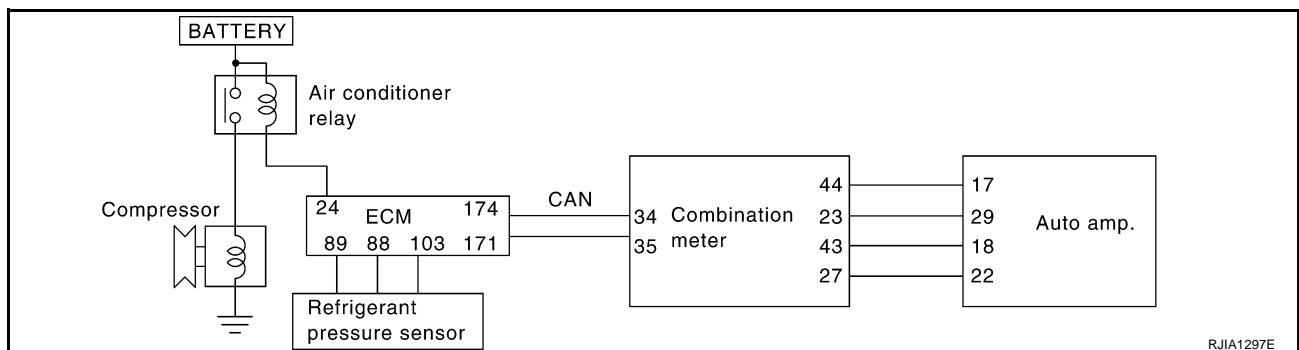


When intake air temperatures are higher than  $1^{\circ}\text{C}$  ( $34^{\circ}\text{F}$ ), the compressor turns ON. The compressor turns OFF when intake air temperatures are lower than  $-5^{\circ}\text{C}$  ( $23^{\circ}\text{F}$ ).



## DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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



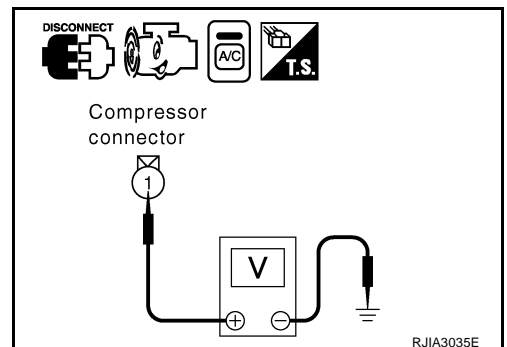
### 1. CHECK POWER SUPPLY FOR COMPRESSOR

1. Disconnect compressor harness connector.
2. Start engine and AUTO switch ON.
3. Check voltage between compressor (magnet clutch) harness connector F2 terminal 1 (Y/R) and ground.

**1 – Ground** : **Battery voltage**

OK or NG

- OK >> GO TO 2.  
 NG >> GO TO 3.



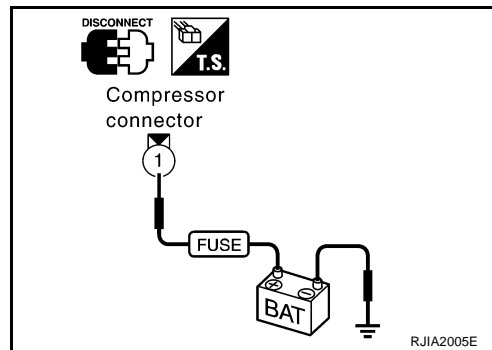
# TROUBLE DIAGNOSIS

## 2. CHECK MAGNET CLUTCH CIRCUIT

Check operation sound when applying battery voltage direct current to terminal.

OK or NG

- OK >> Repair harness or connector.
- NG >> Replace magnet clutch. Refer to [ATC-138, "Removal and Installation of Compressor Clutch"](#).



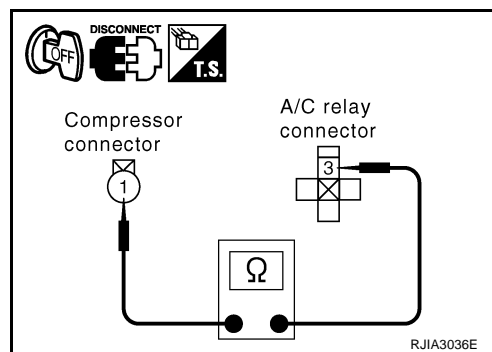
## 3. CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY AND COMPRESSOR

1. Turn ignition switch OFF.
2. Disconnect A/C relay.
3. Check continuity between compressor (magnet clutch) harness connector F2 terminal 1 (Y/R) and A/C relay harness connector E3-2 terminal 3 (Y/R).

**1 – 3 : Continuity should exist.**

OK or NG

- OK >> Check harness for short. And GO TO 4.
- NG >> Repair harness or connector.



## 4. CHECK POWER SUPPLY FOR A/C RELAY

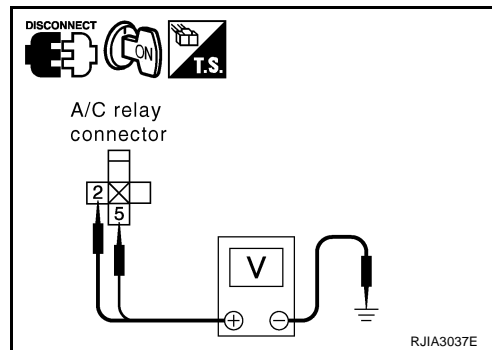
1. Turn ignition switch ON.
2. Check voltage between A/C relay harness connector E3-2 terminals 2, 5 and ground.

**2, 5 – Ground : Battery voltage**

OK or NG

- OK >> GO TO 5.
- NG >> Check power supply circuit and 10A fuse [No. 51 located in the fuse, fusible link and relay block (J/B)]. Refer to [PG-64, "FUSE, FUSIBLE LINK AND RELAY BLOCK \(J/B\)"](#).

- If OK, check for open circuit in wiring harness. Repair or replace if necessary.
- If NG, replace fuse and check wiring harness for short circuit. Repair or replace if necessary.



## 5. CHECK A/C RELAY AFTER DISCONNECTING IT

Refer to [ATC-86, "A/C Relay"](#).

OK or NG

- OK >> GO TO 6.
- NG >> 1. Replace A/C relay.  
2. Go to [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is usual.

# TROUBLE DIAGNOSIS

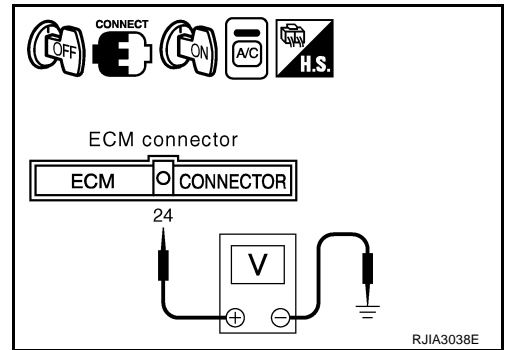
## 6. CHECK COIL SIDE CIRCUIT OF A/C RELAY

1. Turn ignition switch OFF.
2. Reconnect A/C relay.
3. Turn ignition switch ON.
4. Check voltage between ECM harness connector F101 terminal 24 (G/B) and ground.

**24 – Ground : Battery voltage**

OK or NG

- OK >> GO TO 8.  
 NG >> GO TO 7.



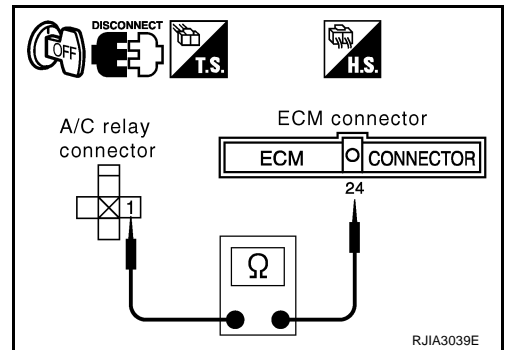
## 7. CHECK CIRCUIT CONTINUITY BETWEEN ECM AND A/C RELAY

1. Turn ignition switch OFF.
2. Disconnect A/C relay connector and ECM connector.
3. Check continuity between ECM harness connector F101 terminal 24 (G/B) and A/C relay harness connector E3-2 terminal 1 (G/B).

**24 – 1 : Continuity should exist.**

OK or NG

- OK >> Replace A/C relay.  
 NG >> Repair harness or connector.



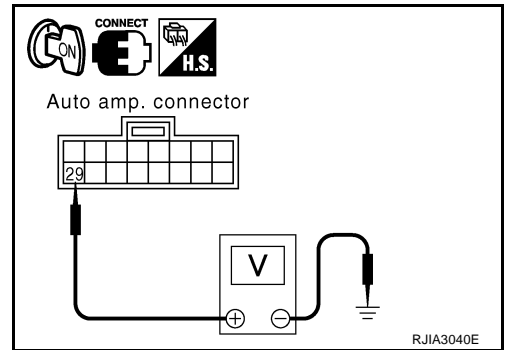
## 8. CHECK VOLTAGE FOR COMBINATION METER (FAN ON SIGNAL)

1. Turn ignition switch ON.
2. Check voltage between auto amp. harness connector M120 terminal 29 (SB) and ground.

Terminals		(-)	Condition	Voltage
(+) Auto amp. connector				
Auto amp. connector	Terminal No. (Wire color)			
M120	29 (SB)	Ground	AUTO switch: ON (Blower motor operates.)	Approx. 0V
			OFF switch: ON (A/C system: OFF)	Approx. 5V

OK or NG

- OK >> GO TO 9.  
 NG >> GO TO 12.



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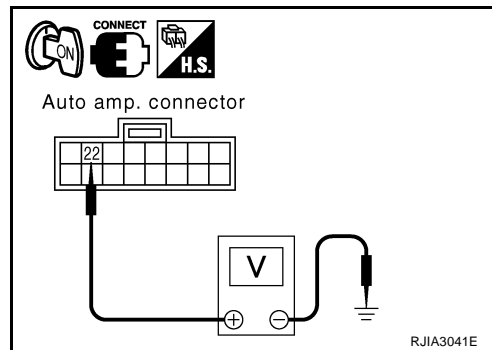
ATC

# TROUBLE DIAGNOSIS

## 9. CHECK VOLTAGE FOR COMBINATION METER (COMPRESSOR ON SIGNAL)

Check voltage between auto amp. harness connector M120 terminal 22 (Y/B) and ground.

Terminals		(-)	Condition	Voltage
(+)				
Auto amp. connector	Terminal No. (Wire color)			
M120	22 (Y/B)	Ground	AUTO switch: ON (Blower motor operates.)	Approx. 0V
			OFF switch: ON (A/C system: OFF)	Approx. 5V



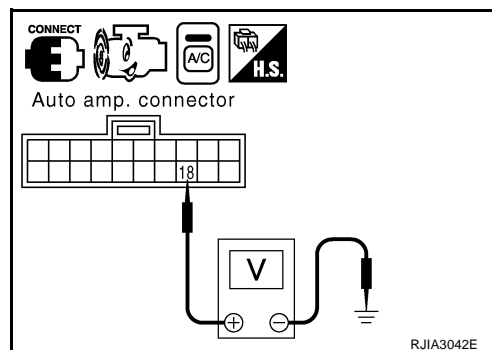
OK or NG

- OK >> GO TO 10.
- NG >> GO TO 13.

## 10. CHECK VOLTAGE FOR COMBINATION METER (COMPRESSOR FEED BACK SIGNAL)

- Start engine and AUTO switch ON.
- Check voltage between auto amp. harness connector M119 terminal 18 (OR) and ground.

Terminals		(-)	Condition	Voltage
(+)				
Auto amp. connector	Terminal No. (Wire color)			
M119	18 (OR)	Ground	A/C switch: ON	Approx. 0V
			A/C switch: ON (When the refrigerant pressure sensor connector is disconnected)	Approx. 5V



OK or NG

- OK >> GO TO 11.
- NG >> GO TO 14.

## 11. CHECK REFRIGERANT PRESSURE SENSOR CIRCUIT

Refer to [EC-680, "REFRIGERANT PRESSURE SENSOR"](#).

OK or NG

- OK >> INSPECTION END
- NG >> Repair or replace the malfunctioning part(s).

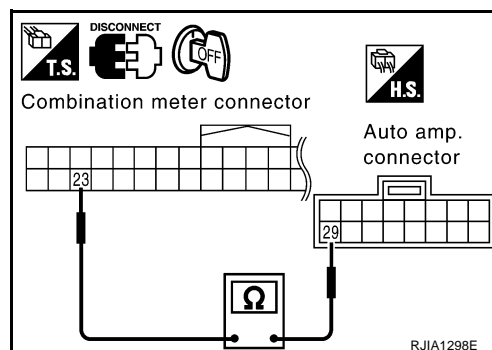
## 12. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND AUTO AMP.

- Turn ignition switch OFF.
- Disconnect combination meter and auto amp. connector.
- Check continuity between combination meter harness connector M41 terminal 23 (SB) and auto amp. harness connector M120 terminal 29 (SB).

**23 – 29 : Continuity should exist.**

OK or NG

- OK >> Replace auto amp.
- NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

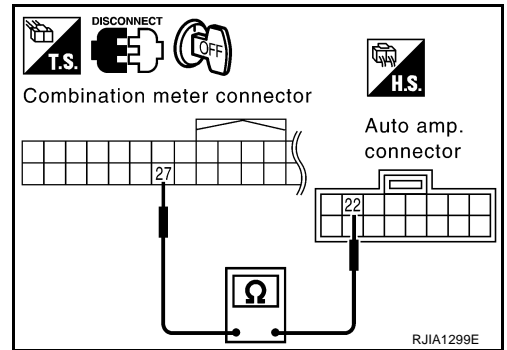
## 13. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect combination meter and auto amp. connector.
3. Check continuity between combination meter harness connector M41 terminal 27 (Y/B) and auto amp. harness connector M120 terminal 22 (Y/B).

**27 – 22 : Continuity should exist.**

OK or NG

- OK >> Replace auto amp.  
NG >> Repair harness or connector.



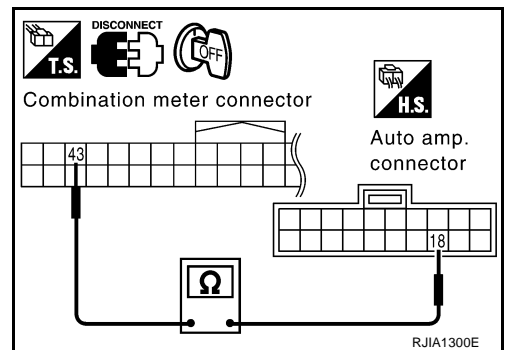
## 14. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect combination meter and auto amp. connector.
3. Check continuity between combination meter harness connector M42 terminal 43 (OR) and auto amp. harness connector M119 terminal 18 (OR).

**43 – 18 : Continuity should exist.**

OK or NG

- OK >> Check combination meter.  
NG >> Repair harness or connector.



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# TROUBLE DIAGNOSIS

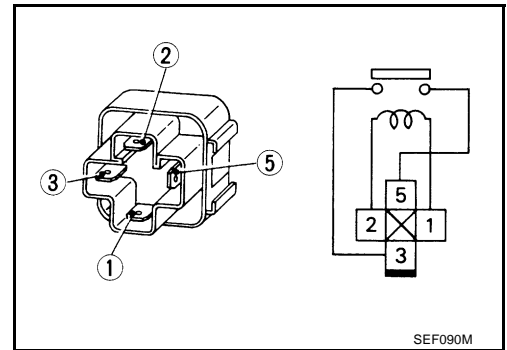
## COMPONENT INSPECTION

### A/C Relay

Check continuity between terminal Nos. 3 and 5.

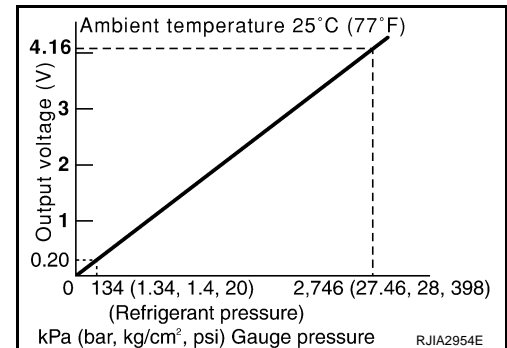
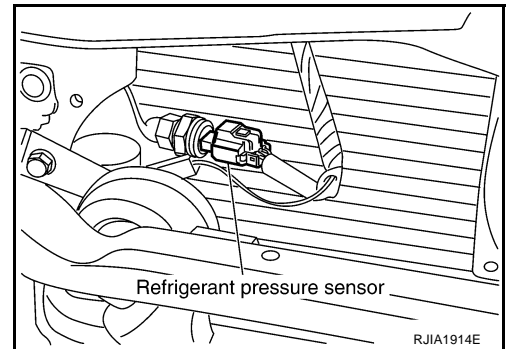
Conditions	Continuity
12V direct current supply between terminal Nos. 1 and 2	Yes
No current supply	No

If NG, replace relay.



### Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the condenser. Make sure that the A/C refrigerant pressure and sensor output voltage are within the specified range as shown in the A/C operating condition figure. Refer to [EC-680, "REFRIGERANT PRESSURE SENSOR"](#).



# TROUBLE DIAGNOSIS

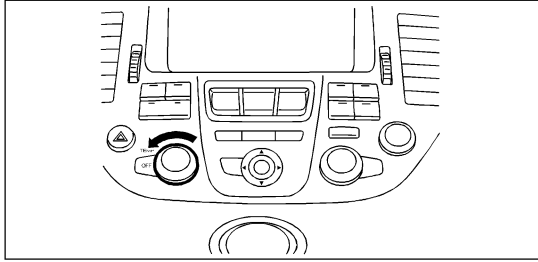
AJS001EX

## Insufficient Cooling

SYMPTOM: Insufficient cooling

### INSPECTION FLOW

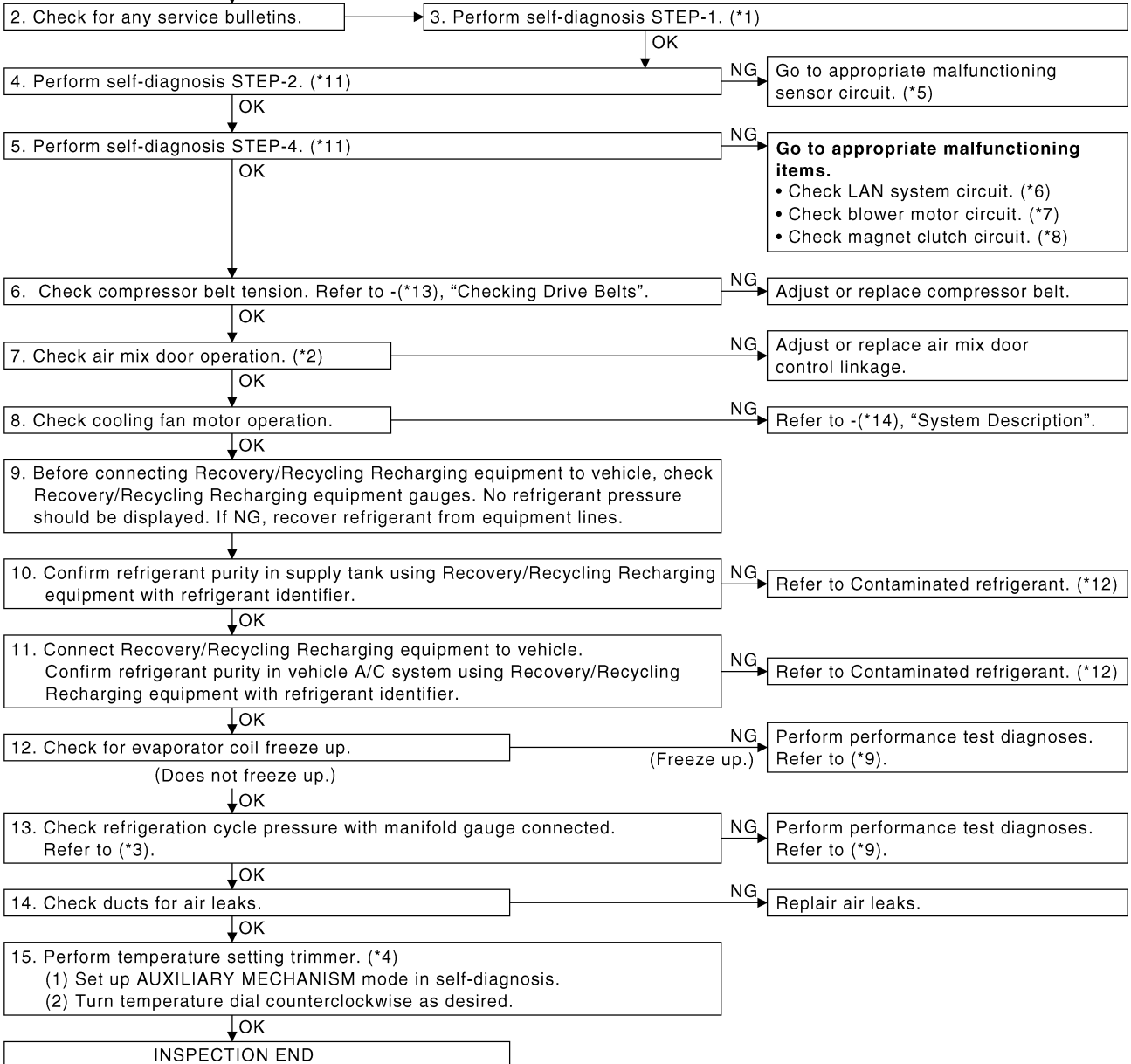
1. Confirm symptom by performing the following operational check.



#### OPERATIONAL CHECK – Temperature decrease

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

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



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## TROUBLE DIAGNOSIS

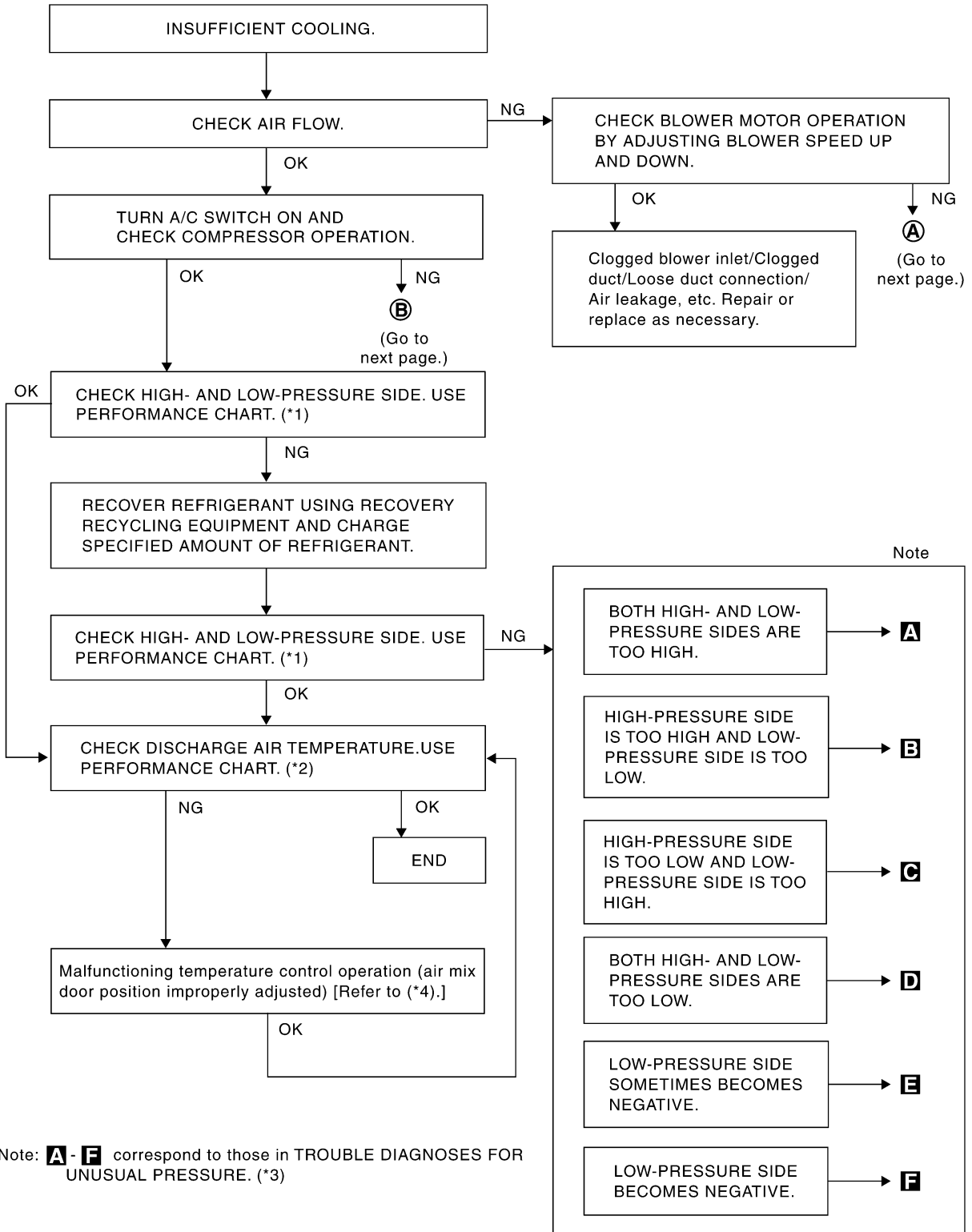
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- \*1 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No.1.
- \*2 [ATC-69, "Air Mix Door Motor Circuit"](#).
- \*3 [ATC-91, "Test Reading"](#).
- \*4 [ATC-56, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"](#).
- \*5 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 14.
- \*6 [ATC-62, "LAN System Circuit"](#).
- \*7 [ATC-75, "Blower Motor Circuit"](#).
- \*8 [ATC-80, "Magnet Clutch Circuit"](#).
- \*9 [ATC-89, "PERFORMANCE TEST DIAGNOSIS"](#).
- \*10 [ATC-57, "Operational Check"](#).
- \*11 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 5 to 7.
- \*12 [ATC-4, "CONTAMINATED REFRIGERANT"](#).
- \*13 [MA-12, "Checking Drive Belts"](#).
- \*14 [CO-19, "COOLING FAN"](#).



# TROUBLE DIAGNOSIS

## PERFORMANCE TEST DIAGNOSIS



\*1 [ATC-91, "PERFORMANCE CHART"](#).

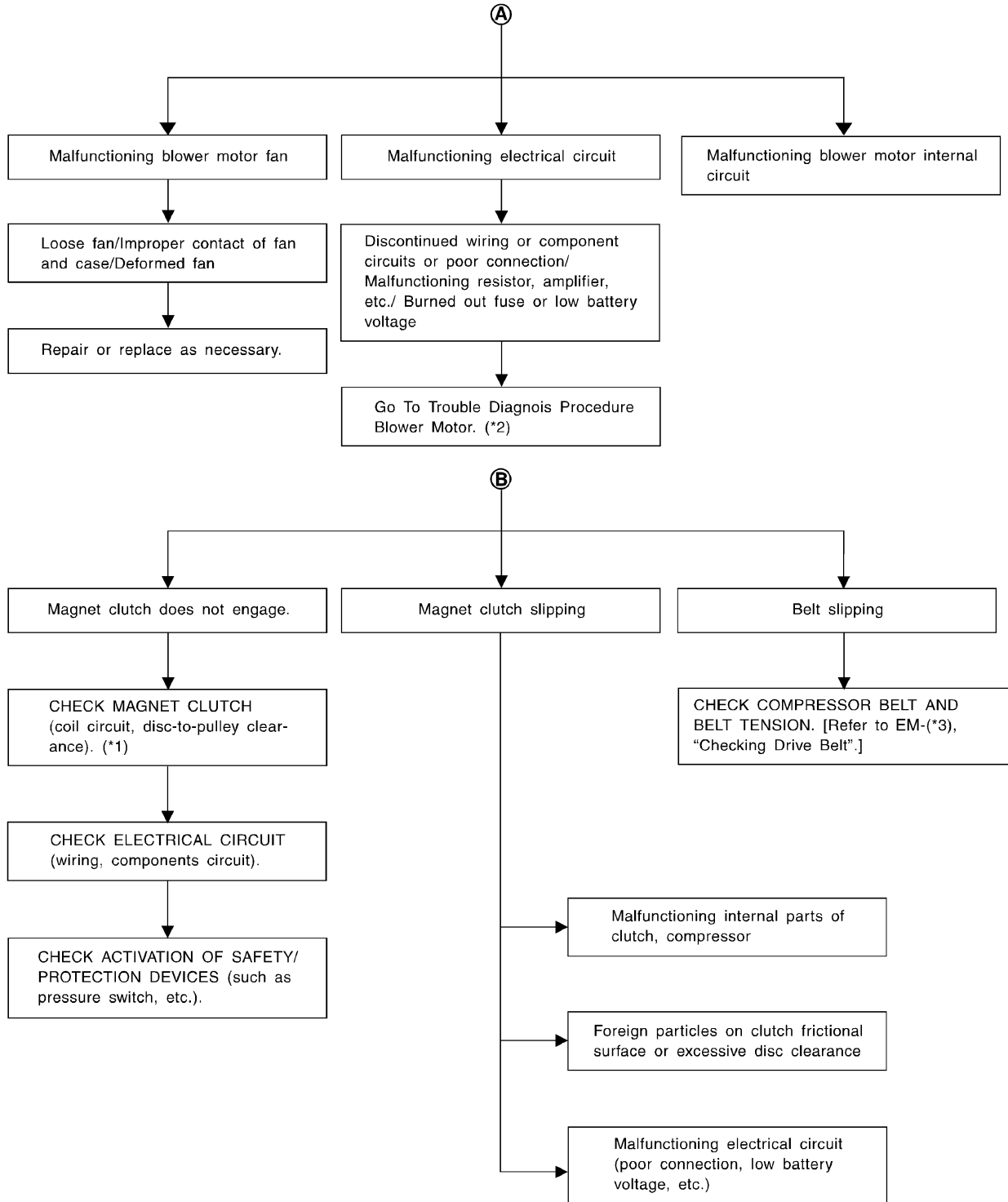
\*2 [ATC-91, "PERFORMANCE CHART"](#).

\*3 [ATC-92, "TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE"](#).

\*4 [ATC-69, "Air Mix Door Motor Circuit"](#).

RJIA1601E

# TROUBLE DIAGNOSIS



RJIA1595E

\*1 [ATC-138, "Removal and Installation of Compressor Clutch"](#).

\*2 [ATC-75, "Blower Motor Circuit"](#).




\*3 [EM-13, "Checking Drive Belts"](#).

# TROUBLE DIAGNOSIS

## 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
Mode switch	 (Ventilation) set
Intake switch	 (Recirculation) set
 Fan (blower) speed	Max. speed set
Engine speed	Idle speed

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

### Test Reading

#### Recirculating-to-discharge Air Temperature Table

Inside air (Recirculating air) at blower assembly inlet		Discharge air temperature at center ventilator °C (°F)
Relative humidity %	Air temperature °C (°F)	
50 - 60	25 (77)	8.7 - 10.8 (47.66 - 51.44)
	30 (86)	12.5 - 15.3 (54.50 - 59.54)
	35 (95)	16.8 - 20.3 (62.24 - 68.54)
60 - 70	25 (77)	10.8 - 12.8 (51.44 - 55.04)
	30 (86)	15.3 - 18.0 (59.54 - 64.40)
	35 (95)	20.3 - 23.5 (68.54 - 74.30)

#### Ambient Air Temperature-to-operating Pressure Table

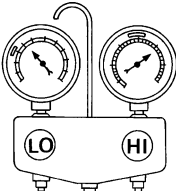
Ambient air		High-pressure (Discharge side) kPa (kg/cm <sup>2</sup> , psi)	Low-pressure (Suction side) kPa (kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	30 (86)	1,288 - 1,575 (13.13 - 16.06, 187 - 228)	229 - 276 (2.33 - 2.81, 33 - 40)
	35 (95)	1,425 - 1,750 (14.53 - 17.84, 207 - 254)	257 - 314 (2.62 - 3.20, 37 - 46)
	40 (104)	1,638 - 2,000 (16.70 - 20.39, 237 - 290)	295 - 357 (3.01 - 3.64, 43 - 52)

# TROUBLE DIAGNOSIS

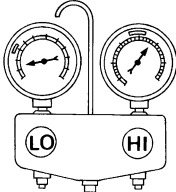
## TROUBLE DIAGNOSIS FOR UNUSUAL PRESSURE

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

### Both High- and Low-Pressure Sides are Too High

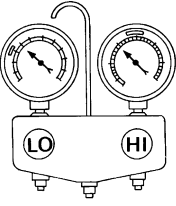
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too high.</p>  <p style="text-align: right; font-size: small;">AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce 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	<ul style="list-style-type: none"> <li>● Clean condenser.</li> <li>● Check and repair cooling fan as necessary.</li> </ul>
	<ul style="list-style-type: none"> <li>● Low-pressure pipe is not cold.</li> <li>● When compressor is stopped high-pressure value quickly drops by approximately 196 kPa (2 kg/cm<sup>2</sup>, 28 psi). It then decreases gradually thereafter.</li> </ul>	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.
	<ul style="list-style-type: none"> <li>● An area of the low-pressure pipe is colder than areas near the evaporator outlet.</li> <li>● Plates are sometimes covered with frost.</li> </ul>	<ul style="list-style-type: none"> <li>● Excessive liquid refrigerant on low-pressure side</li> <li>● Excessive refrigerant discharge flow</li> <li>● Expansion valve is open a little compared with the specification.</li> </ul> ↓ <ul style="list-style-type: none"> <li>● Improper expansion valve adjustment</li> </ul>	Replace expansion valve.

### High-Pressure Side is Too High and Low-Pressure Side is Too Low

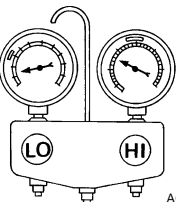
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p>  <p style="text-align: right; font-size: small;">AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure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

# TROUBLE DIAGNOSIS

## High-Pressure Side is Too Low and Low-Pressure Side is Too High

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too low and low-pressure side is too high.</p>  <p style="text-align: right; font-size: small;">AC356A</p>	<p>High- and low-pressure sides become equal soon after compressor operation stops.</p>	<p>Compressor pressure operation is improper. ↓ Damaged inside compressor packings.</p>	<p>Replace compressor.</p>
	<p>No temperature difference between high- and low-pressure sides</p>	<p>Compressor pressure operation is improper. ↓ Damaged inside compressor packings.</p>	<p>Replace compressor.</p>

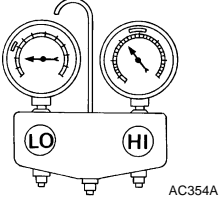
## Both High- and Low-Pressure Sides are Too Low

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p>  <p style="text-align: right; font-size: small;">AC353A</p>	<ul style="list-style-type: none"> <li>There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low.</li> <li>Liquid tank inlet and expansion valve are frosted.</li> </ul>	<p>Liquid tank inside is slightly clogged.</p>	<ul style="list-style-type: none"> <li>Replace liquid tank.</li> <li>Check lubricant for contamination.</li> </ul>
	<ul style="list-style-type: none"> <li>Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank.</li> <li>Expansion valve inlet may be frosted.</li> <li>Temperature difference occurs somewhere in high-pressure side.</li> </ul>	<p>High-pressure pipe located between receiver drier and expansion valve is clogged.</p>	<ul style="list-style-type: none"> <li>Check and repair malfunctioning parts.</li> <li>Check lubricant for contamination.</li> </ul>
	<p>Expansion valve and liquid tank are warm or only cool when touched.</p>	<p>Low refrigerant charge ↓ Leaking fittings or components</p>	<p>Check refrigerant for leaks. Refer to <a href="#">ATC-147, "Checking for Refrigerant Leaks"</a>.</p>
	<p>There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.</p>	<p>Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment 2. Malfunctioning expansion valve 3. Outlet and inlet may be clogged.</p>	<ul style="list-style-type: none"> <li>Remove foreign particles by using compressed air.</li> <li>Check lubricant for contamination.</li> </ul>
	<p>An area of the low-pressure pipe is colder than areas near the evaporator outlet.</p>	<p>Low-pressure pipe is clogged or crushed.</p>	<ul style="list-style-type: none"> <li>Check and repair malfunctioning parts.</li> <li>Check lubricant for contamination.</li> </ul>
	<p>Air flow volume is not enough or is too low.</p>	<p>Evaporator is frozen.</p>	<ul style="list-style-type: none"> <li>Check intake sensor circuit. Refer to <a href="#">ATC-109, "Intake Sensor Circuit"</a>.</li> <li>Replace compressor.</li> </ul>

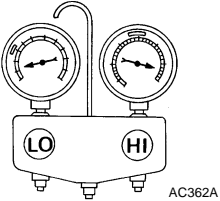
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# TROUBLE DIAGNOSIS

## Low-Pressure Side Sometimes Becomes Negative

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

## Low-Pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p> 	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow.</p> <p>↓</p> <p>Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> <li>● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant.</li> <li>● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air).</li> <li>● If either of the above methods cannot correct the malfunction, replace expansion valve.</li> <li>● Replace liquid tank.</li> <li>● Check lubricant for contamination.</li> </ul>

## DIAGNOSTIC PROCEDURE FOR INSUFFICIENT COOLING

SYMPTOM: Insufficient cooling

### 1. CHECK POWER SUPPLY FOR ECV (ELECTRONIC CONTROL VALVE)

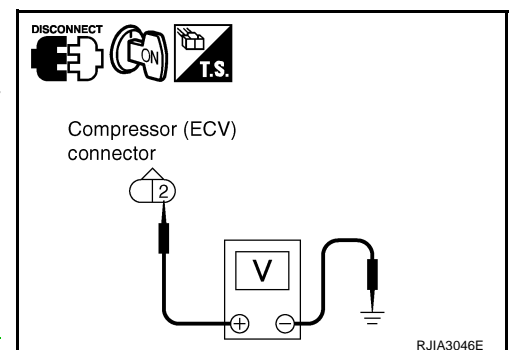
1. Disconnect compressor (ECV) connector.
2. Turn ignition switch ON.
3. Check voltage between compressor (ECV) harness connector F10 terminal 2 (P) and ground.

**2 – Ground : Battery voltage**

OK or NG

OK >> GO TO 2.

NG >> Check power supply circuit and 10A fuse [No. 2, located in the fuse block (J/B) No. 1]. Refer to [PG-62, "FUSE BLOCK - JUNCTION BOX \(J/B\) NO.1"](#).



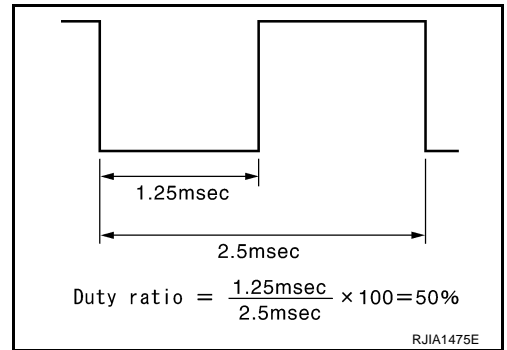
# TROUBLE DIAGNOSIS

## 2. CHECK ECV CONTROL SIGNAL

1. Turn ignition switch OFF.
2. Reconnect compressor (ECV) connector.
3. Turn ignition switch ON.
4. Set in self-diagnosis STEP-42. Refer to [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#).
5. Confirm the auto amp. harness connector M120 terminal 23 (G) duty ratio using an oscilloscope.

### OK or NG

- OK >> Replace compressor.  
NG >> GO TO 3.



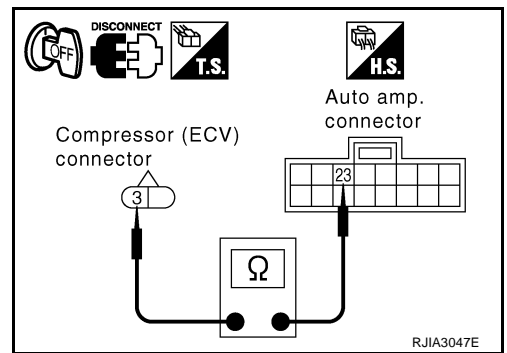
## 3. CHECK CIRCUIT CONTINUITY BETWEEN ECV AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect compressor (ECV) harness connector F10 terminal 3 (G) and auto amp. harness connector M120 terminal 23 (G).

**3 – 23 : Continuity should exist.**

### OK or NG

- OK >> GO TO 4.  
NG >> Repair harness or connector.



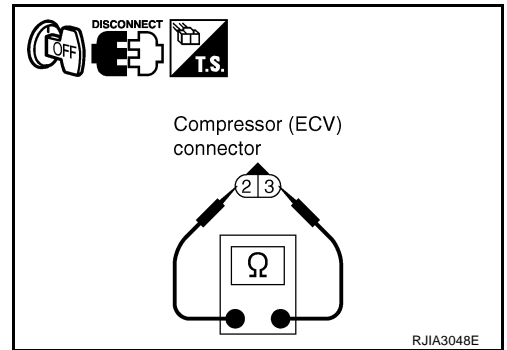
## 4. CHECK ECV

- Check continuity between compressor (ECV) connector F10 terminal 2 and 3.

**2 – 3 : Continuity should exist.**

### OK or NG

- OK >> Replace auto amp.  
NG >> Replace compressor.



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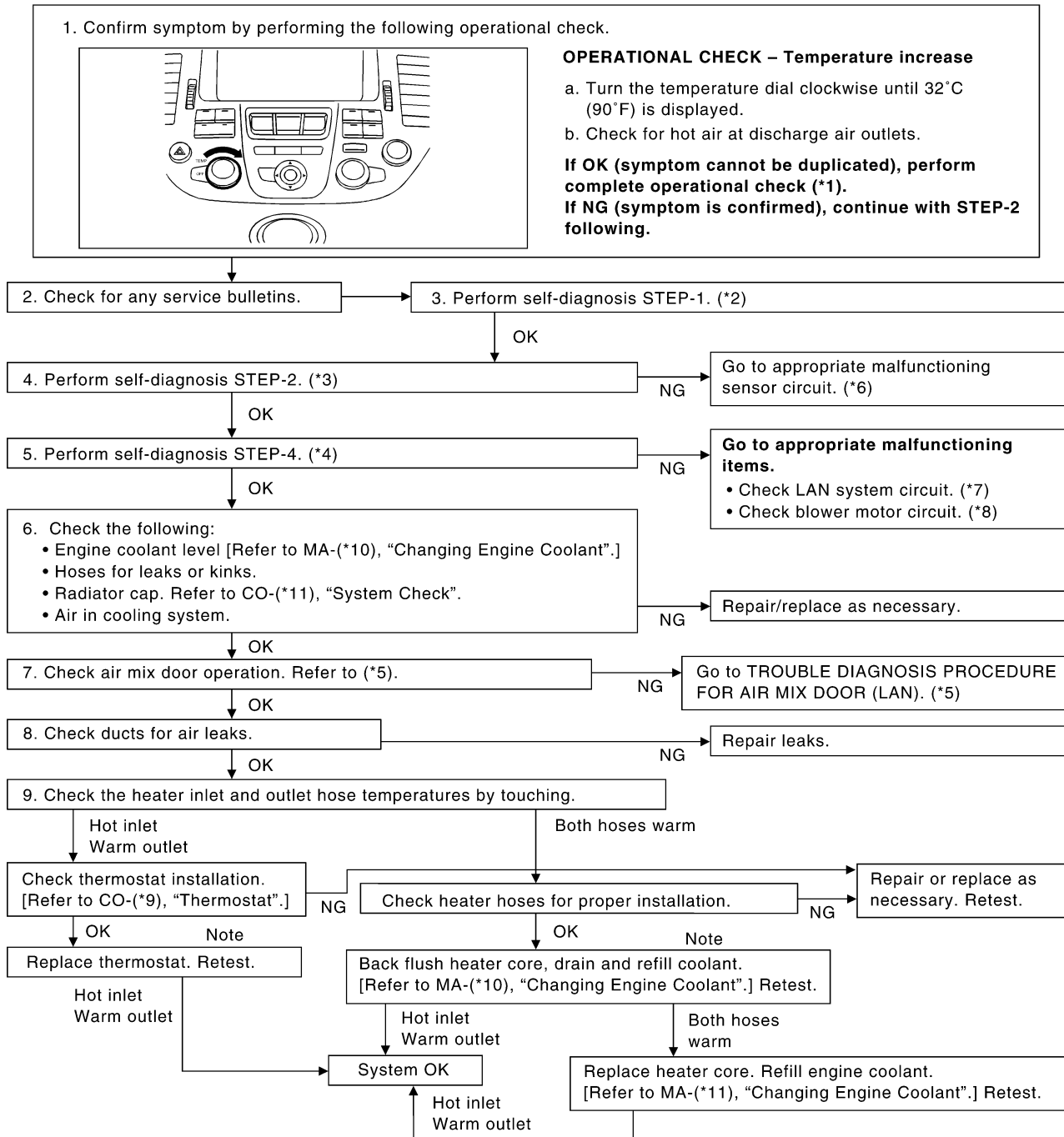
# TROUBLE DIAGNOSIS

AJS000CG

## Insufficient Heating

SYMPTOM: Insufficient heating

### INSPECTION FLOW



RJIA1306E

\*1 [ATC-57, "Operational Check"](#).

\*2 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 1.

\*3 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 5.

\*4 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 7.

\*5 [ATC-69, "Air Mix Door Motor Circuit"](#).

\*6 [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#), see No. 14.

\*7 [ATC-62, "LAN System Circuit"](#).

\*8 [ATC-75, "Blower Motor Circuit"](#).

\*9 Thermostat and water control valve [CO-25, "INSPECTION AFTER REMOVAL"](#).

\*10 [MA-12, "Changing Engine Coolant"](#).

\*11 [CO-13, "CHECKING RADIATOR CAP"](#).



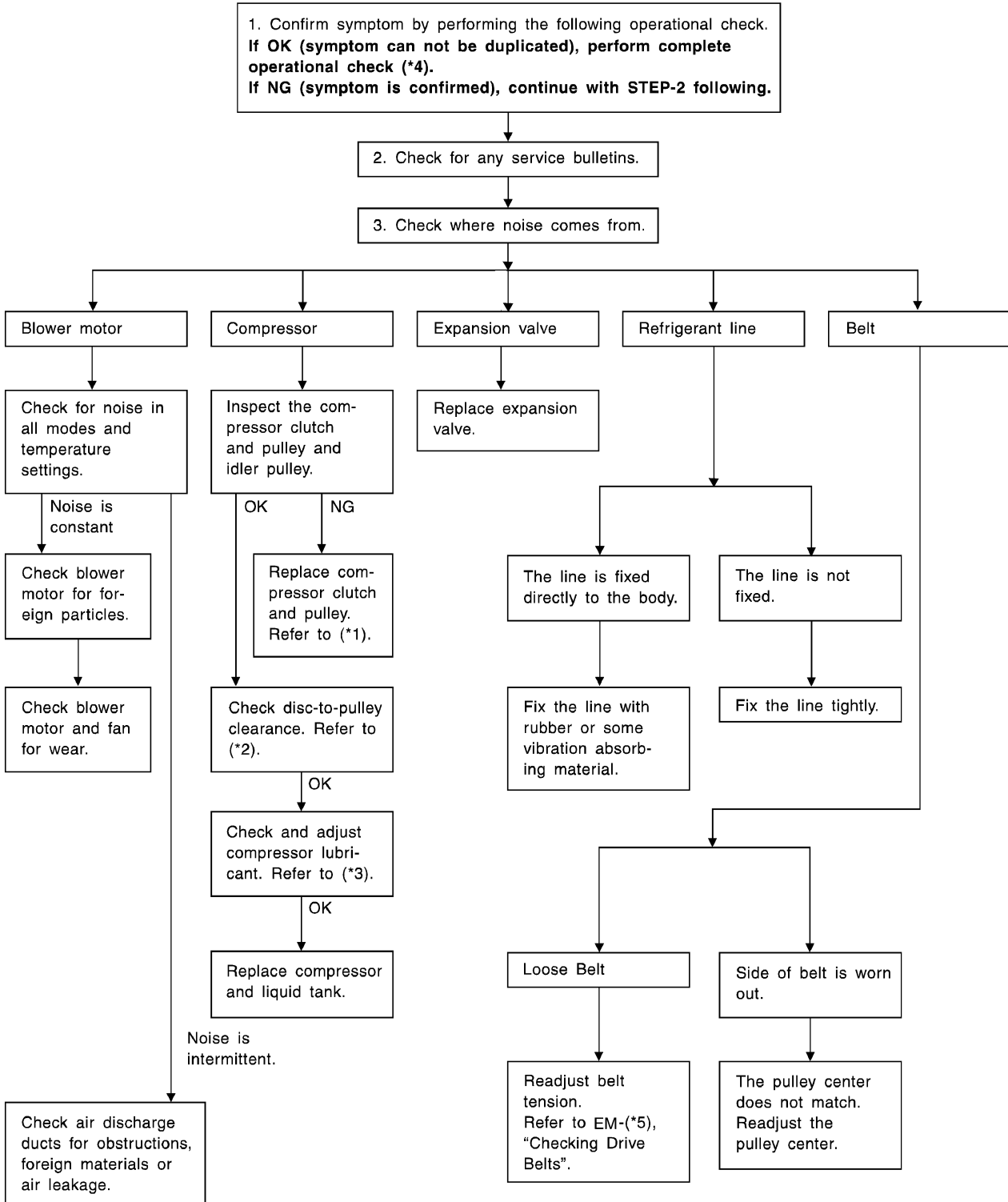
# TROUBLE DIAGNOSIS

AJS000CH

## Noise

SYMPTOM: Noise

### INSPECTION FLOW



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RJIA1596E

\*1 Compressor clutch [ATC-138. "REMOVAL"](#).  
\*4 [ATC-57. "Operational Check"](#).

\*2 Compressor clutch [ATC-140. "INSTALLATION"](#).  
\*5 [MA-12. "Checking Drive Belts"](#).

\*3 [ATC-22. "Maintenance of Lubricant Quantity in Compressor"](#).

# TROUBLE DIAGNOSIS

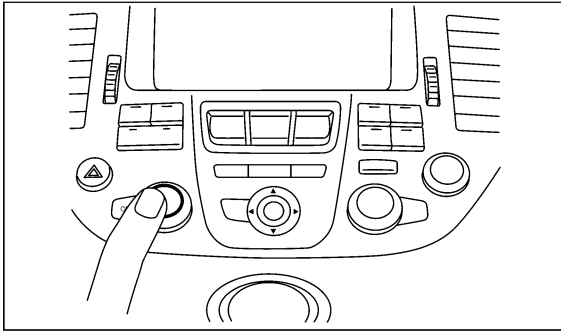
AJS000CI

## Self-Diagnosis

SYMPTOM: Self-diagnosis cannot be performed.

### INSPECTION FLOW

1. Confirm symptom by performing operational check.



**OPERATIONAL CHECK – AUTO mode**

- Press AUTO switch.
- 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 (\*7).  
If NG (symptom is confirmed), continue with STEP-2 following.**

2. Check for any service bulletins.

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

OK Cause cannot be confirmed by self-diagnosis.

4. Check ambient sensor circuit. (\*2)

OK

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

OK

6. Check sunload sensor circuit. (\*4)

OK

7. Check intake sensor circuit. (\*5)

OK

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

OK

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

No

Replace auto amp.

Yes

Go to Trouble Diagnosis for related symptom.

**Another symptom exists.**

INSPECTION END

RJIA1307E

\*1 [ATC-60, "Power Supply and Ground Circuit for Auto Amp."](#)

\*2 [ATC-101, "Ambient Sensor Circuit"](#).

\*3 [ATC-103, "In-Vehicle Sensor Circuit"](#).

\*4 [ATC-106, "Sunload Sensor Circuit"](#).

\*5 [ATC-109, "Intake Sensor Circuit"](#).

\*6 [ATC-71, "Air Mix Door Motor PBR Circuit"](#).

\*7 [ATC-57, "Operational Check"](#).

\*8 [ATC-34, "SYMPTOM TABLE"](#).

# TROUBLE DIAGNOSIS

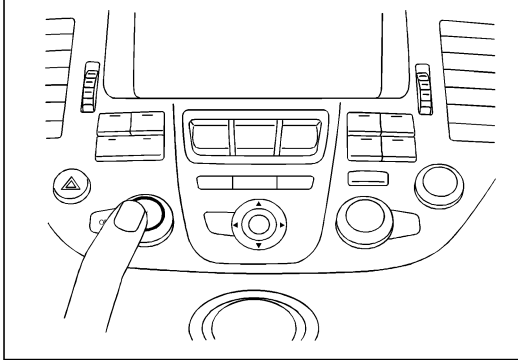
AJS000CJ

## Memory Function

SYMPTOM: Memory function does not operate.

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



#### OPERATIONAL CHECK – Memory function

- Set the temperature 90°F or 32°C.
- Press OFF switch.
- Turn the ignition off.
- Turn the ignition on.
- Press the AUTO switch.
- Confirm that the set temperature remains at previous temperature.
- 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 function confirmation procedure (\*3) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

\*1 [ATC-60. "Power Supply and Ground Circuit for Auto Amp."](#)

\*2 [ATC-57. "Operational Check"](#).

\*3 [ATC-50. "FUNCTION CONFIRMATION PROCEDURE"](#).

RJIA1308E

ATC

# TROUBLE DIAGNOSIS

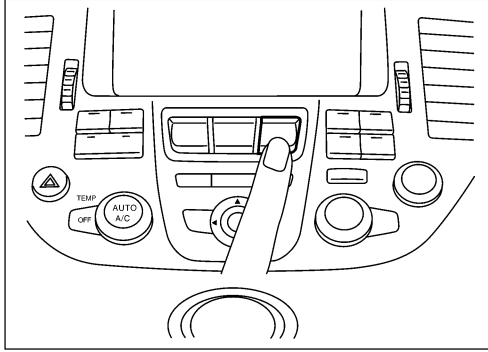
AJS000QJ

## ECON (ECONOMY) Mode

SYMPTOM: ECON mode does not operate.

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



#### OPERATIONAL CHECK - ECON (ECONOMY mode)

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

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

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

2. Check for any service bulletins.

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

OK

4. Replace auto amp.

5. FINAL CHECK

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

\*1 [ATC-60. "Power Supply and Ground Circuit for Auto Amp."](#)

\*2 [ATC-57. "Operational Check"](#).

\*3 [ATC-50. "FUNCTION CONFIRMATION PROCEDURE"](#).

RJIA1562E

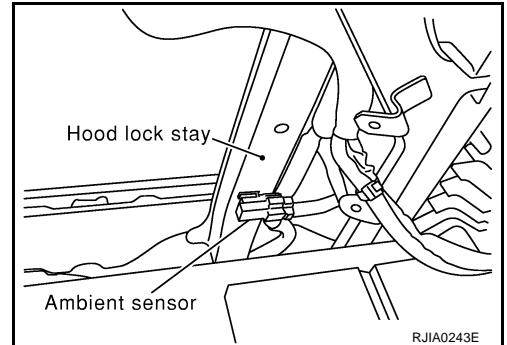
# TROUBLE DIAGNOSIS

## Ambient Sensor Circuit COMPONENT DESCRIPTION

AJS000CK

### Ambient Sensor

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

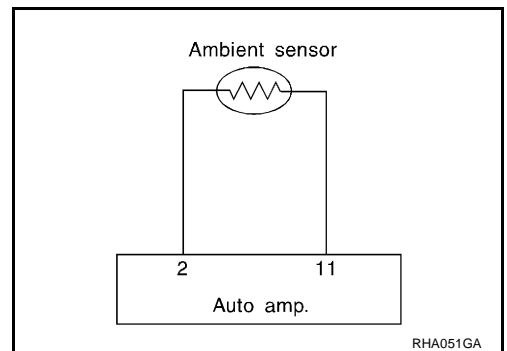


### AMBIENT TEMPERATURE INPUT PROCESS

The auto amp. includes a processing circuit for the ambient sensor input. However, when the temperature detected by the ambient sensor increases quickly, the processing circuit retards the auto amp. function. It only allows the auto amp. to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds. As an example, consider stopping for a few minutes 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.

### DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

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



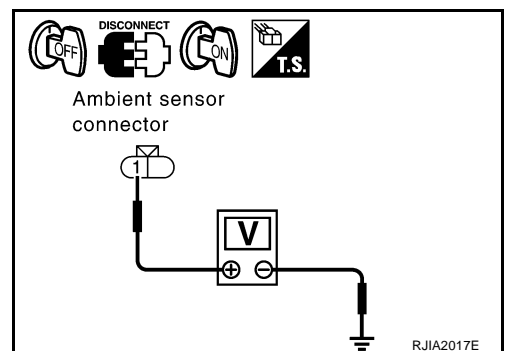
## 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E58 terminal 1 (G/W) and ground.

**1 – Ground** : **Approx. 5V**

OK or NG

- OK >> GO TO 2.
- NG >> GO TO 4.



# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND AUTO AMP.

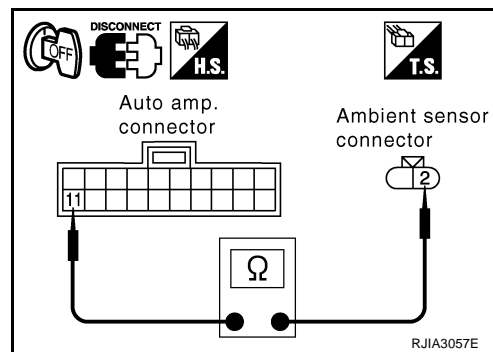
1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between ambient sensor harness connector E58 terminal 2 (R/Y) and auto amp. harness connector M119 terminal 11 (R/Y).

**2 – 11** : Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



## 3. CHECK AMBIENT SENSOR

Refer to [ATC-103, "Ambient Sensor"](#) .

OK or NG

OK >> 1. Replace auto amp.

2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace ambient sensor.

2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. harness connector.
3. Check continuity between ambient sensor harness connector E58 terminal 1 (G/W) and auto amp. harness connector M119 terminal 2 (G/W).

**1 – 2** : Continuity should exist.

4. Check continuity between auto amp. harness connector M119 terminal 2 (G/R) and ground.

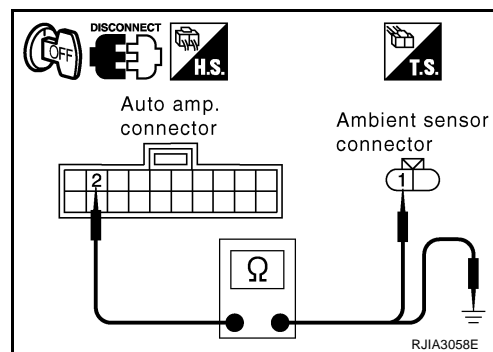
**2 – Ground** : Continuity should not exist.

OK or NG

OK >> 1. Replace auto amp.

2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

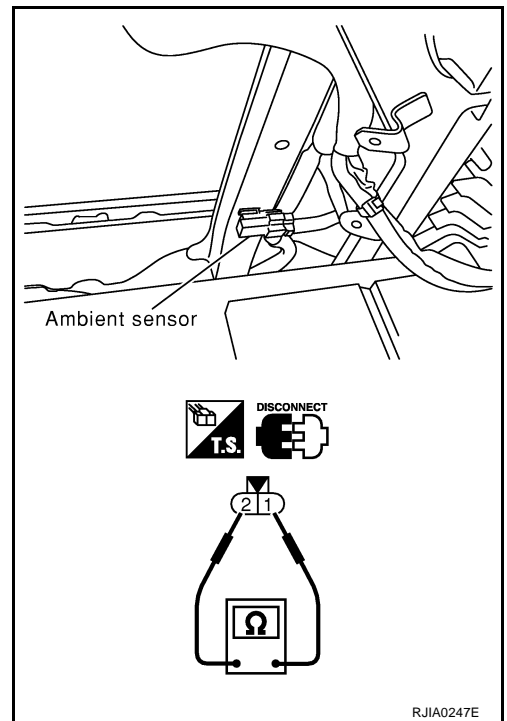
## COMPONENT INSPECTION

### Ambient Sensor

After disconnecting ambient sensor harness connector E58, measure resistance between terminals 2 and 1 at sensor side, using the table below.

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

If NG, replace ambient sensor.

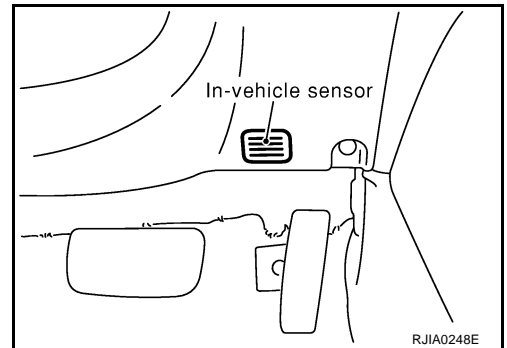


AJS000CL

### In-Vehicle Sensor Circuit COMPONENT DESCRIPTION

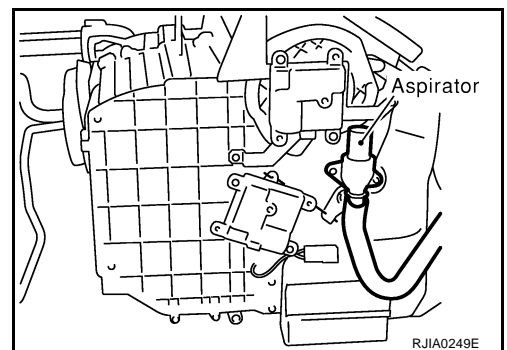
#### In-Vehicle Sensor

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 amp.



#### Aspirator

The aspirator is located on driver's side of heater & cooling unit. It produces vacuum pressure due to air discharged from the heater & cooling unit, continuously taking compartment air in the aspirator.

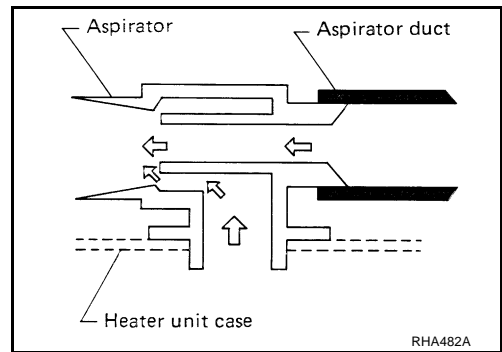


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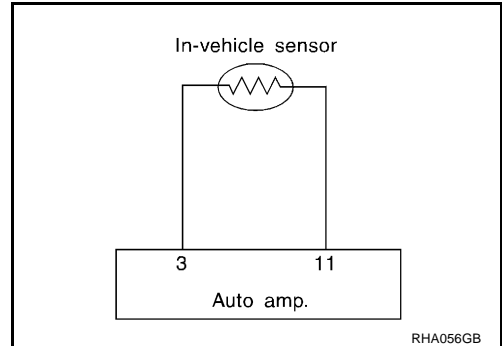
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# TROUBLE DIAGNOSIS



## DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

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



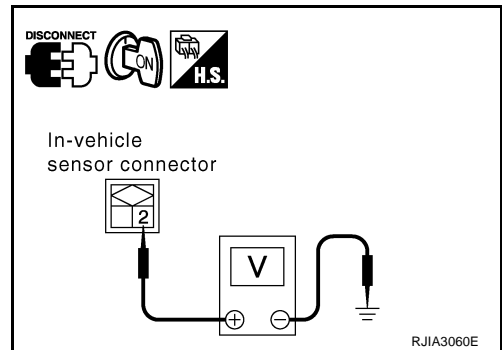
### 1. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Disconnect in-vehicle sensor connector.
2. Turn ignition switch ON.
3. Check voltage between in-vehicle sensor harness connector M68 terminal 2 (LG/B) and ground.

**2 – Ground** : **Approx. 5V**

OK or NG

- OK >> GO TO 2.  
NG >> GO TO 4.



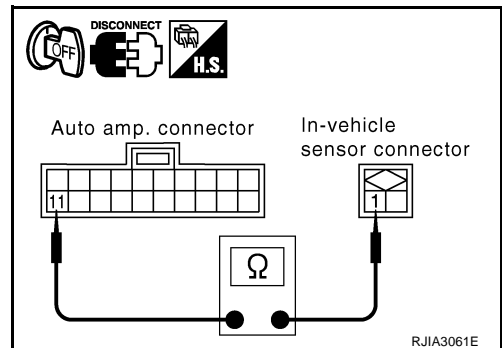
### 2. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between in-vehicle sensor harness connector M68 terminal 1 (R/Y) and auto amp. harness connector M119 terminal 11 (R/Y).

**1 – 11** : **Continuity should exist.**

OK or NG

- OK >> GO TO 3.  
NG >> Repair harness or connector.





# TROUBLE DIAGNOSIS

## 3. CHECK IN-VEHICLE SENSOR

Refer to [ATC-105, "In-Vehicle Sensor"](#) .

OK or NG

- OK >> 1. Replace auto amp.  
 2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace in-vehicle sensor.  
 2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND AUTO AMP.

- Turn ignition switch OFF.
- Disconnect auto amp. connector.
- Check continuity between in-vehicle sensor harness connector M68 terminal 2 (LG/B) and auto amp. harness connector M119 terminal 3 (LG/B).

**2 – 3 : Continuity should exist.**

- Check continuity between auto amp. harness connector M119 terminal 3 (LG/B) and ground.

**3 – Ground : Continuity should not exist.**

OK or NG

- OK >> 1. Replace auto amp.  
 2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.

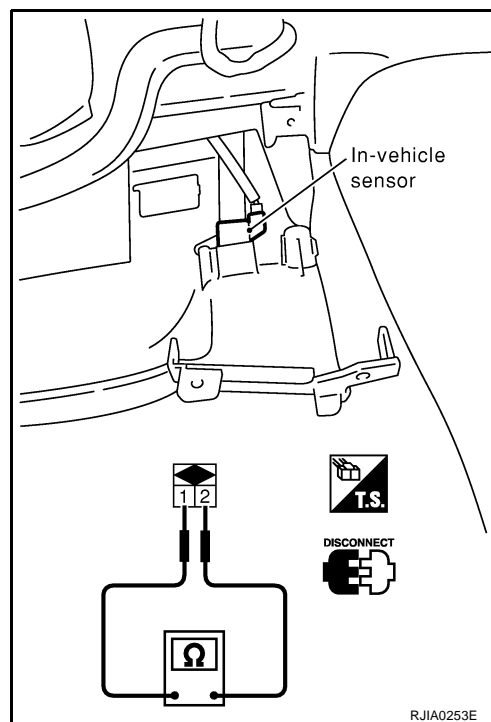
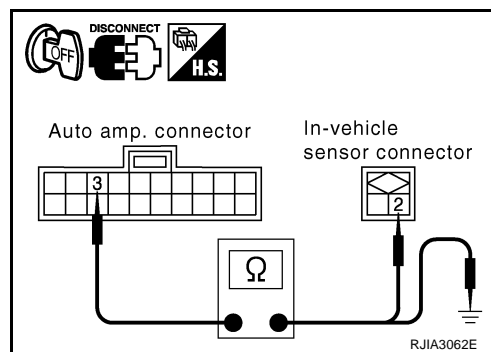
## COMPONENT INSPECTION

### In-Vehicle Sensor

After disconnecting in-vehicle sensor harness connector M68, measure resistance between terminals 1 and 2 at sensor side, using the table below.

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

If NG, replace in-vehicle sensor.

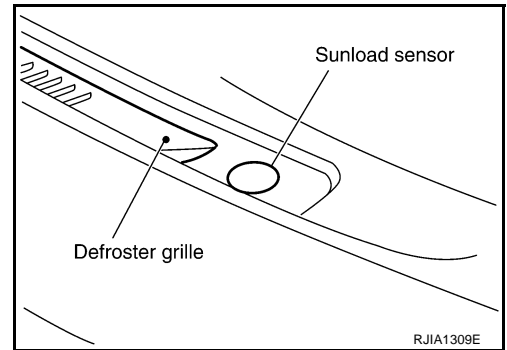


# TROUBLE DIAGNOSIS

## Sunload Sensor Circuit COMPONENT DESCRIPTION

AJS000CM

The sunload sensor is located on the left 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 amp.



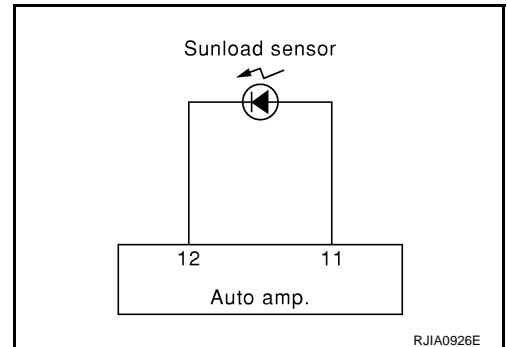
## SUNLOAD INPUT PROCESS

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

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

## DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR

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



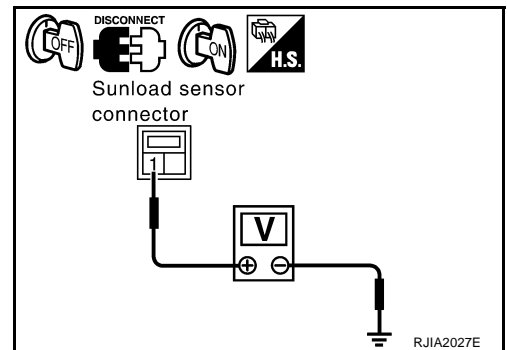
## 1. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND GROUND

1. Disconnect sunload sensor connector.
2. Turn ignition switch ON.
3. Check voltage between sunload sensor harness connector M44 terminal 1 (SB) and ground.

**1 – Ground : Approx. 5V**

OK or NG

- OK >> GO TO 2.  
NG >> GO TO 4.



# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND AUTO AMP.

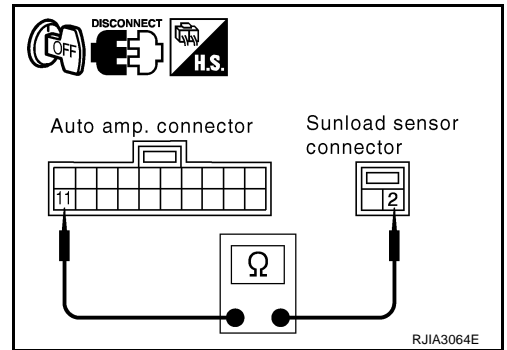
1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between sunload sensor harness connector M44 terminal 2 (R/Y) and auto amp. harness connector M119 terminal 11 (R/Y).

**2 – 11** : Continuity should exist.

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



## 3. CHECK SUNLOAD SENSOR

Refer to [ATC-108, "Sunload Sensor"](#) .

OK or NG

OK >> 1. Replace auto amp.

2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> 1. Replace sunload sensor.

2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between sunload sensor harness connector M44 terminal 1 (SB) and auto amp. harness connector M119 terminal 12 (SB).

**1 – 12** : Continuity should exist.

4. Check continuity between auto amp. harness connector M119 terminal 12 (SB) and ground.

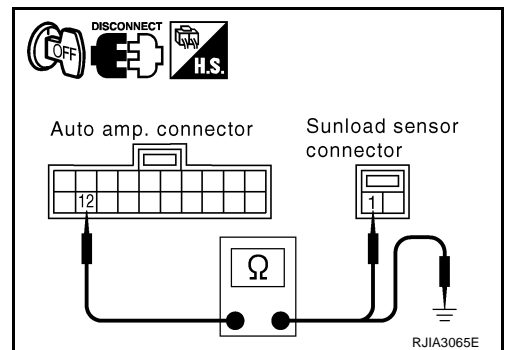
**12 – Ground** : Continuity should not exist.

OK or NG

OK >> 1. Replace auto amp.

2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

NG >> Repair harness or connector.



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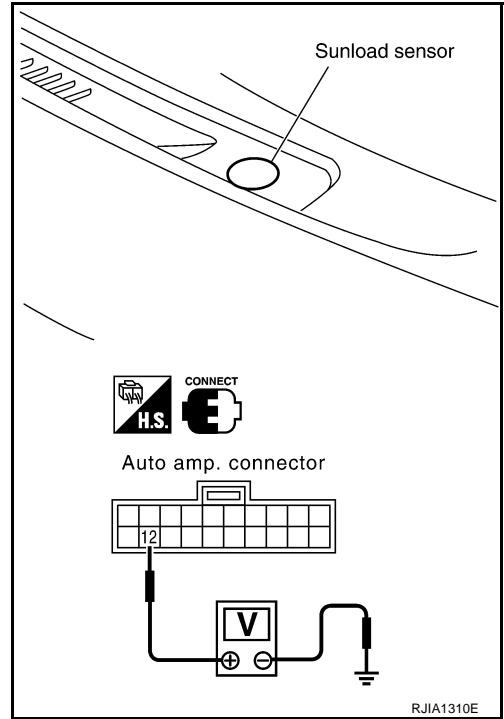
ATC

# TROUBLE DIAGNOSIS

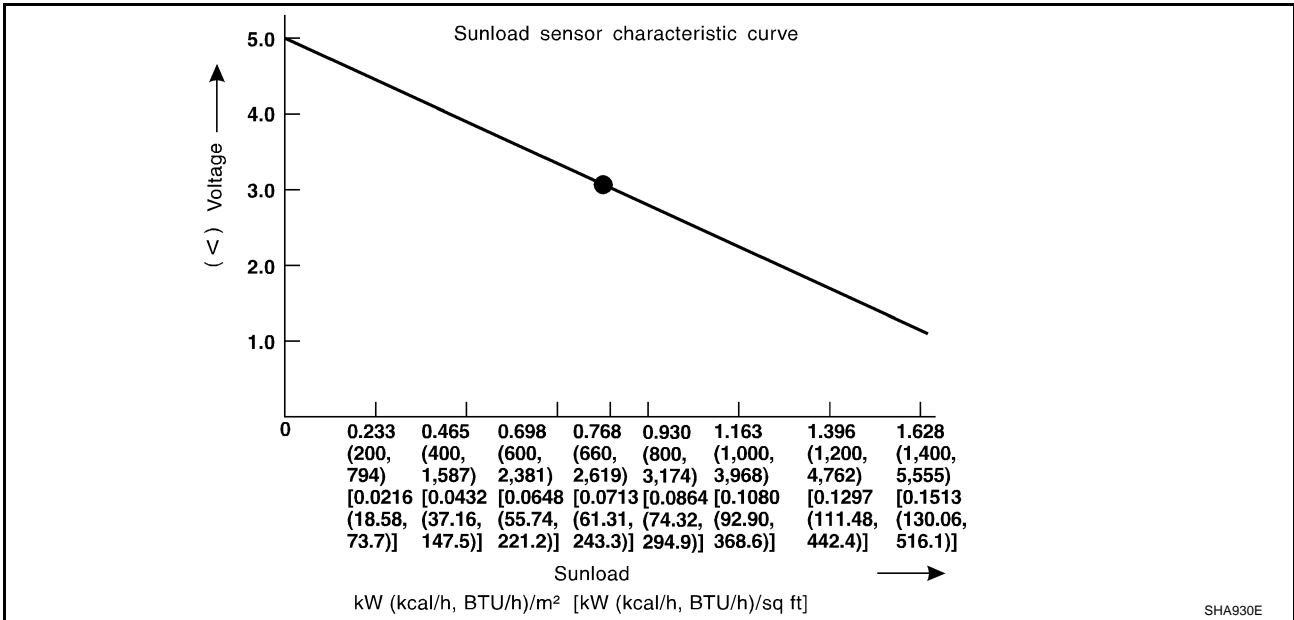
## COMPONENT INSPECTION

### Sunload Sensor

Measure voltage between auto amp. harness connector M119 terminal 12 (SB) and ground.  
If NG, replace sunload sensor.



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



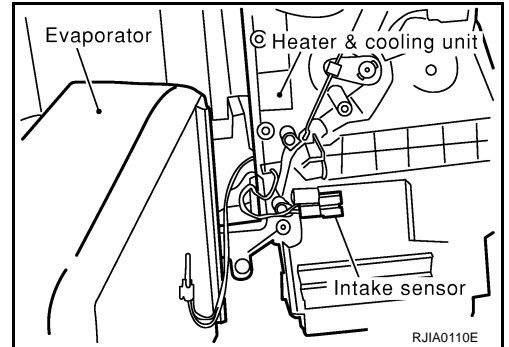
# TROUBLE DIAGNOSIS

## Intake Sensor Circuit COMPONENT DESCRIPTION

AJS000CN

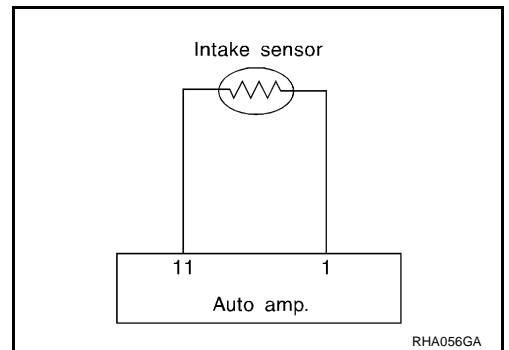
### Intake Sensor

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



### DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

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



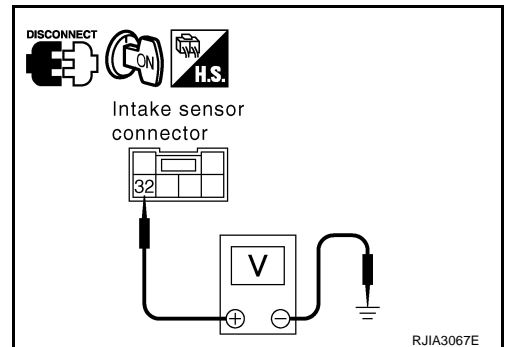
### 1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M90 terminal 32 (G/OR) and ground.

**32 – Ground : Approx. 5V**

OK or NG

- OK >> GO TO 2.  
NG >> GO TO 4.



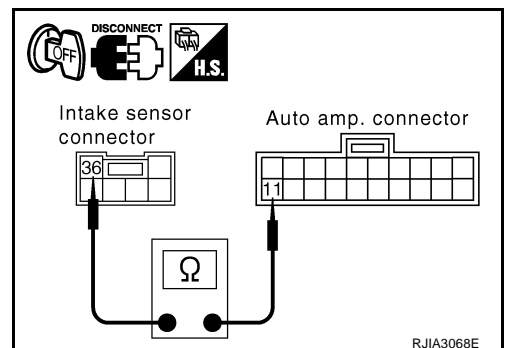
### 2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect auto amp. connector.
3. Check continuity between intake sensor harness connector M90 terminal 36 (R/Y) and auto amp. harness connector M119 terminal 11 (R/Y).

**36 – 11 : Continuity should exist.**

OK or NG

- OK >> GO TO 3.  
NG >> Repair harness or connector.



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# TROUBLE DIAGNOSIS

## 3. CHECK INTAKE SENSOR

Refer to [ATC-110, "Intake Sensor"](#) .

OK or NG

- OK >> 1. Replace auto amp.  
 2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace intake sensor.  
 2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

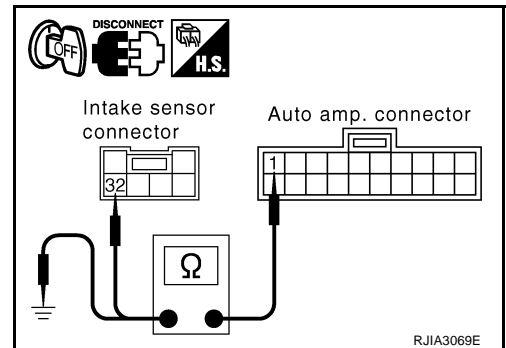
## 4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND AUTO AMP.

- Turn ignition switch OFF.
- Disconnect auto amp. connector.
- Check continuity between intake sensor harness connector M90 terminal 32 (G/OR) and auto amp. harness connector M119 terminal 1 (G/OR).

**32 – 1 : Continuity should exist.**

- Check continuity between auto amp. harness connector M119 terminal 1 (G/OR) and ground.

**1 – Ground : Continuity should not exist.**



OK or NG

- OK >> 1. Replace auto amp.  
 2. Go to self-diagnosis [ATC-50, "FUNCTION CONFIRMATION PROCEDURE"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.

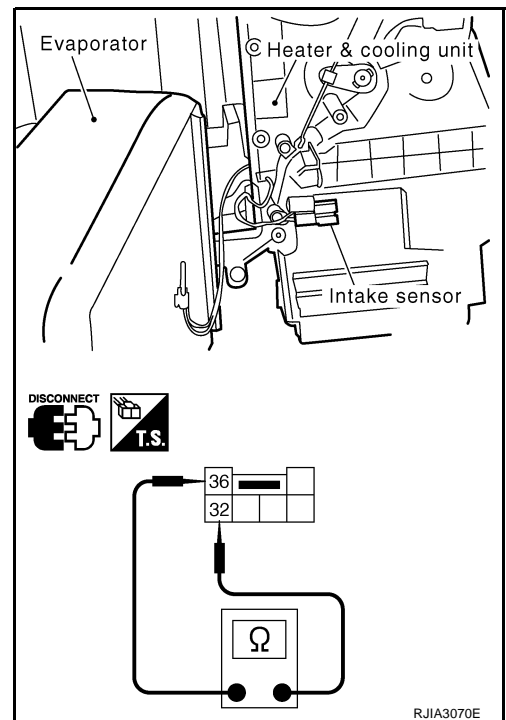
## COMPONENT INSPECTION

### Intake Sensor

After disconnecting intake sensor harness connector M90, measure resistance between terminals 32 and 36 at sensor side, using the table below.

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

If NG, replace intake sensor.



# TROUBLE DIAGNOSIS

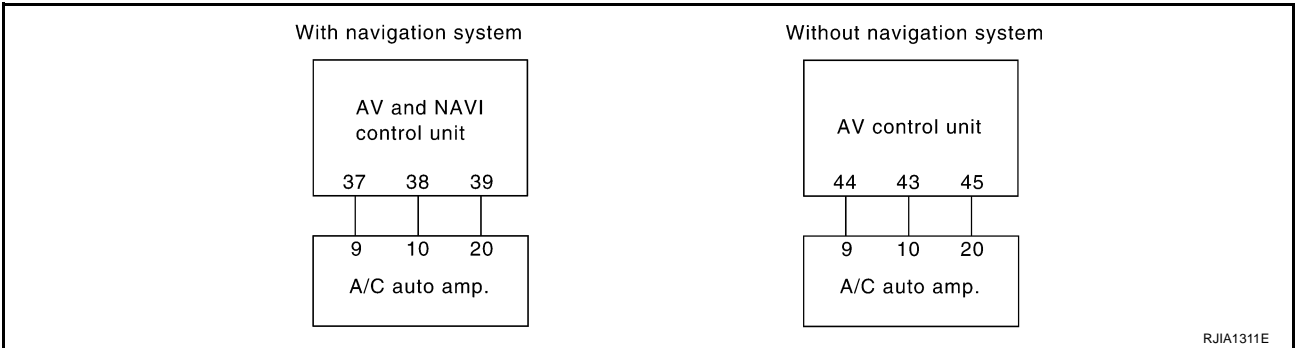
## Multiplex Communication Circuit

AJS000CO

### DIAGNOSTIC PROCEDURE FOR MULTIPLEX COMMUNICATION CIRCUIT

SYMPTOM:

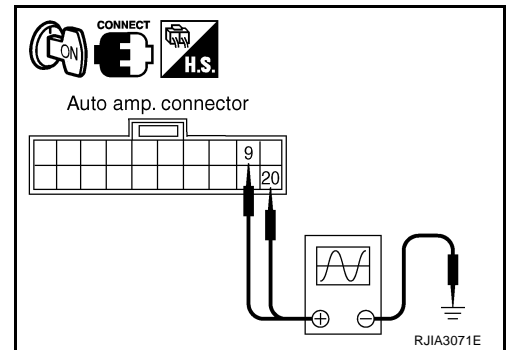
- A/C system does not come on.
- A/C system cannot be controlled.



## 1. CHECK FOR AUTO AMP. OUTPUT

1. Turn ignition switch ON.
2. Confirm multiplex communication signal between auto amp. harness connector M119 terminal 9 (W), 20 (B) and ground using an oscilloscope.

Terminals		(-)	Voltage
(+)	Terminal No. (Wire color)		
Auto amp. connector			
M119	9 (L/W)	Ground	<p>RJIA0212E</p>
M119	20 (L/R)		<p>HAK0363D</p>



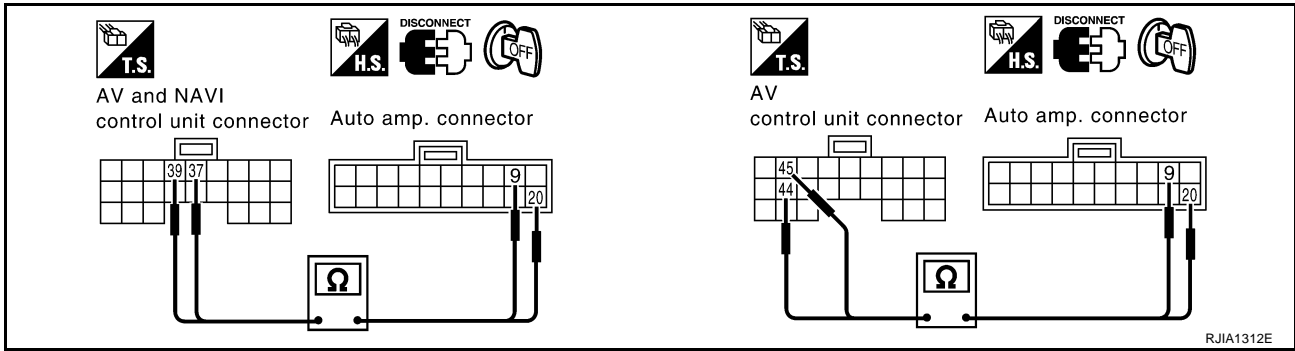
OK or NG

- OK >> GO TO 2.  
 NG >> Replace auto amp.

# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY BETWEEN AV C/U (AV AND NAVI C/U) AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect AV C/U (AV and NAVI C/U) and auto amp. connector.
3. Check continuity between AV and NAVI C/U harness connector B29 terminals 37 (L/W), 39 (L/R) or AV C/U harness connector M77 terminals 44 (L/W), 45 (L/R) and auto amp. harness connector M119 terminals 9 (L/W), 20 (L/R).



	Terminals				Continuity
	AV C/U or AV and NAVI C/U connector	Terminal No. (Wire color)	Auto amp. connector	Terminal No. (Wire color)	
AV C/U	M77	44 (L/W)	M119	9 (L/W)	Yes
	M77	45 (L/R)	M119	20 (L/R)	
AV and NAVI C/U	B29	37 (L/W)	M119	9 (L/W)	
	B29	39 (L/R)	M119	20 (L/R)	

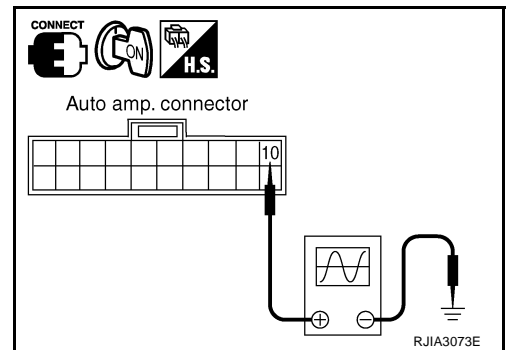
OK or NG

- OK >> GO TO 3.  
 NG >> Repair harness or connector.

## 3. CHECK FOR AUTO AMP. INPUT

1. Reconnect AV C/U (AV and NAVI C/U) and auto amp. connector.
2. Turn ignition switch ON.
3. Confirm multiplex communication signal between auto amp. harness connector M119 terminal 10 (R) and ground using an oscilloscope.

Terminals			Voltage
(+)		(-)	
Auto amp. connector	Terminal No. (Wire color)		
M119	10 (L)	Ground	



OK or NG

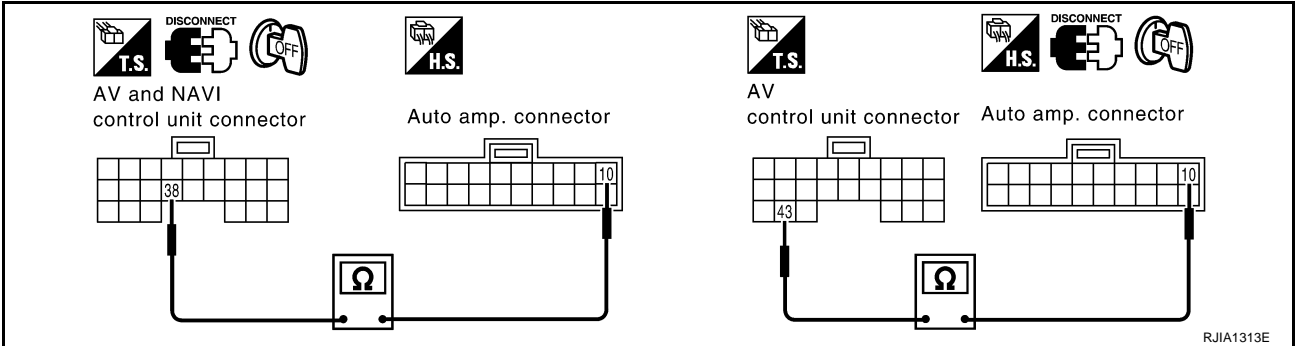
- OK >> INSPECTION END  
 NG >> GO TO 4.



# TROUBLE DIAGNOSIS

## 4. CHECK CIRCUIT CONTINUITY BETWEEN AV C/U (AV AND NAVI C/U) AND AUTO AMP.

1. Turn ignition switch OFF.
2. Disconnect AV C/U (AV and NAVI C/U) and auto amp. connector.
3. Check continuity between AV and NAVI C/U harness connector B29 terminal 38 (L) or AV C/U harness connector M77 terminal 43 (L) and auto amp. harness connector M119 terminal 10 (L).



**38 – 10 : Continuity should exist.**

**43 – 10 : Continuity should exist.**

### OK or NG

- OK >> Replace auto amp.
- NG >> Repair harness or connector.

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# CONTROL UNIT

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## CONTROL UNIT

PFP:27500

### Removal and Installation

#### REMOVAL

AJS000QK

Refer to [AV-29. "Removal and Installation of Audio Unit"](#).

#### INSTALLATION

Installation is basically the reverse order of removal.

# AMBIENT SENSOR

## AMBIENT SENSOR

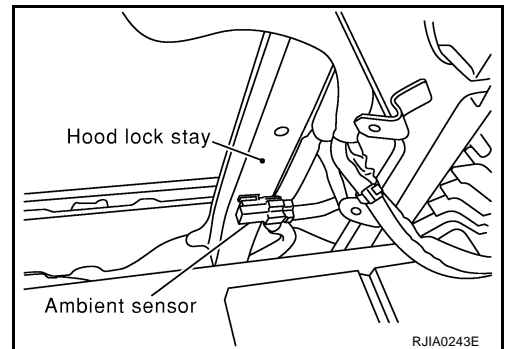
PFP:27722

### Removal and Installation

AJS000QL

#### REMOVAL

1. Remove front grille. Refer to [EI-19, "FRONT GRILLE"](#) .
2. Disconnect ambient sensor connector, and then remove ambient sensor.



#### INSTALLATION

Installation is basically the reverse order of removal.

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# IN-VEHICLE SENSOR

## IN-VEHICLE SENSOR

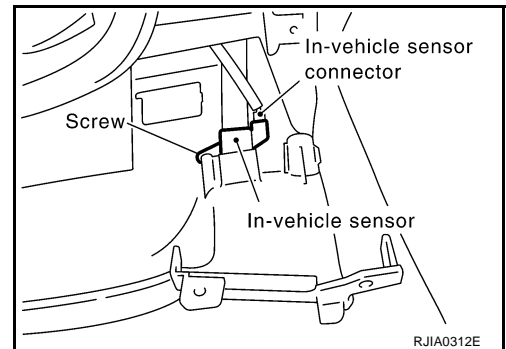
PFP:27720

### Removal and Installation

AJS000QM

#### REMOVAL

1. Remove instrument lower driver panel. Refer to [IP-11, "Removal and Installation"](#) .
2. Disconnect in-vehicle sensor connector and aspirator duct.
3. Remove mounting screw, and then remove in-vehicle sensor.



#### INSTALLATION

Installation is basically the reverse order of removal.

# SUNLOAD SENSOR

## SUNLOAD SENSOR

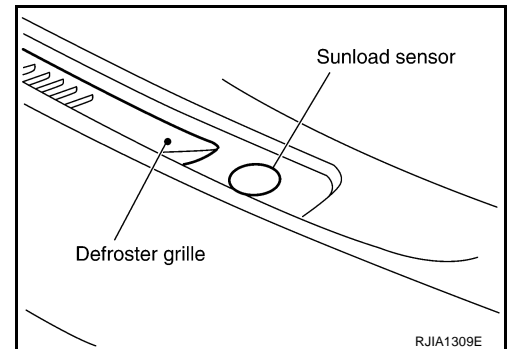
PFP:27721

### Removal and Installation

AJS000QN

#### REMOVAL

1. Remove front defroster grille (left-hand side). Refer to [IP-11, "Removal and Installation"](#) .
2. Disconnect sunload sensor connector, and then remove the sunload sensor.



#### INSTALLATION

Installation is basically the reverse order of removal.

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# INTAKE SENSOR

## INTAKE SENSOR

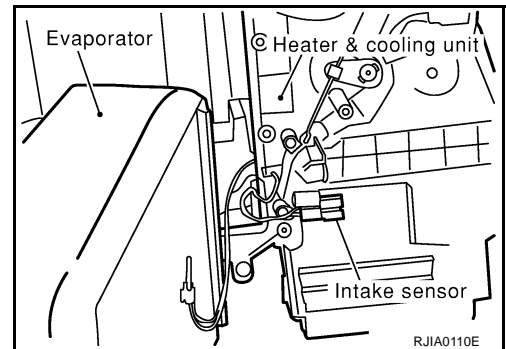
PFP:27723

### Removal and Installation

AJS000Q0

#### REMOVAL

1. Remove heater & cooling unit. Refer to [ATC-124, "HEATER & COOLING UNIT ASSEMBLY"](#) .
2. Remove evaporator from heater & cooling unit.
3. Separate heater & cooling unit case.
4. Remove the intake sensor.



#### INSTALLATION

Installation is basically the reverse order of removal.

# BLOWER UNIT

## BLOWER UNIT

PFP:27200

### Removal and Installation

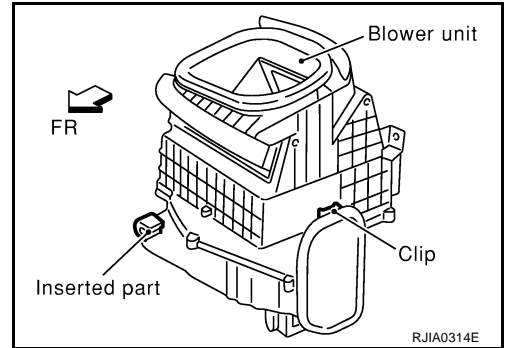
AJS000CP

#### REMOVAL

1. Remove glove box assembly. Refer to [IP-11, "Removal and Installation"](#) .
2. Remove glove box cover, instrument lower assistant panel and instrument panel bracket. Refer to [IP-11, "Removal and Installation"](#) .
3. Remove ECM and audio unit. Refer to [AV-29, "Removal and Installation of Audio Unit"](#) .
4. Disconnect blower motor connector, intake door motor connector and auto amp. connector.
5. Remove mounting screws from blower unit, and then remove it.

#### CAUTION:

Slide the blower unit toward right, remove location pins (2 pieces), then move it downwards.



#### INSTALLATION

Installation is basically the reverse order of removal.

#### CAUTION:

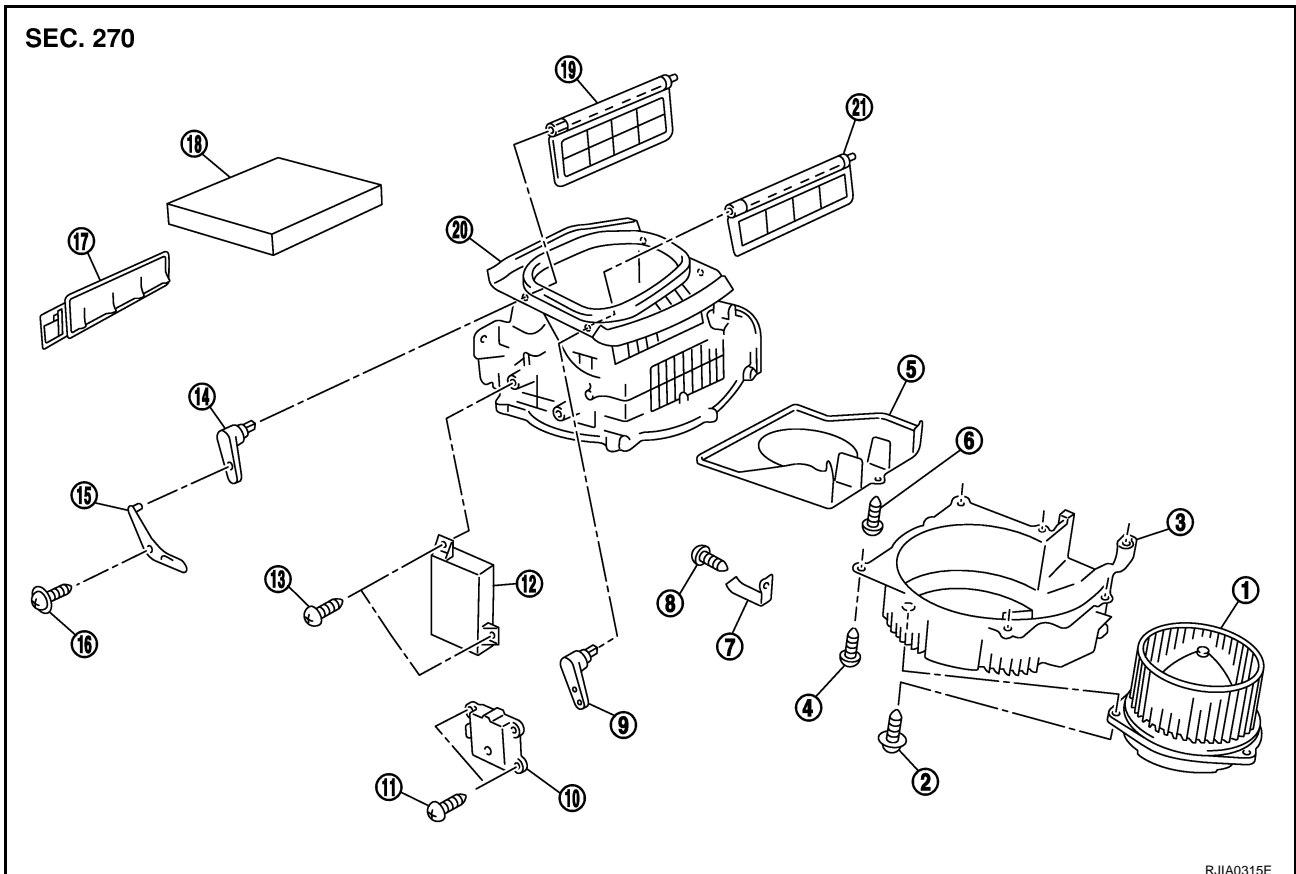
- Make sure the location pins (2 pieces) are securely installed.

#### NOTE:

- When attaching the blower unit, the work will be easier if the blower motor is removed first.

#### Disassembly and Assembly

AJS000CQ



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# BLOWER UNIT

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- |                          |                             |                            |
|--------------------------|-----------------------------|----------------------------|
| 1. Blower motor assembly | 2. Screw                    | 3. Lower case              |
| 4. Screw                 | 5. Bell mouth               | 6. Screw                   |
| 7. Clamp                 | 8. Screw                    | 9. Intake door lever No. 1 |
| 10. Intake door motor    | 11. Screw                   | 12. Auto amp.              |
| 13. Screw                | 14. Intake door lever No. 2 | 15. Intake door link       |
| 16. Screw                | 17. Filter cover            | 18. In-cabin microfilter   |
| 19. Intake door No. 2    | 20. Upper case              | 21. Intake door No. 1      |



# BLOWER MOTOR

## BLOWER MOTOR

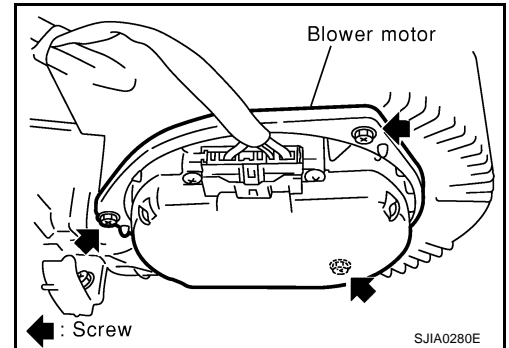
PFP:27226

### Removal and Installation

AJS000QP

#### REMOVAL

1. Remove the glove box, glove box cover and instrument lower cover. Refer to [IP-11, "Removal and Installation"](#) .
2. Disconnect blower motor connector.
3. Remove mounting screws from blower motor, and then remove it.



#### INSTALLATION

Installation is basically the reverse order of removal.

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# INTAKE DOOR MOTOR

## INTAKE DOOR MOTOR

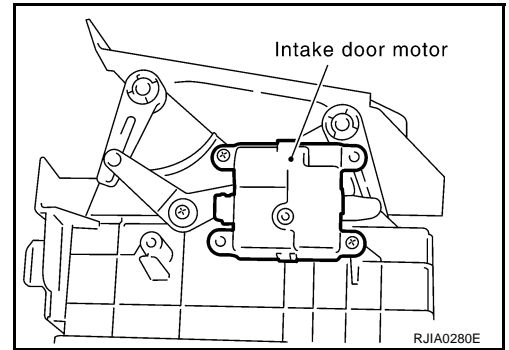
PFP:27730

### Removal and Installation

AJS000QQ

#### REMOVAL

1. Remove, instrument lower assistant cover and instrument reinforcement. Refer to [IP-11, "Removal and Installation"](#) .
2. Remove ECM with bracket attached.
3. Disconnect intake door motor connector.
4. Remove mounting screws, and then remove the intake door motor from the blower unit.



#### INSTALLATION

Installation is basically the reverse order of removal.

# IN-CABIN MICROFILTER

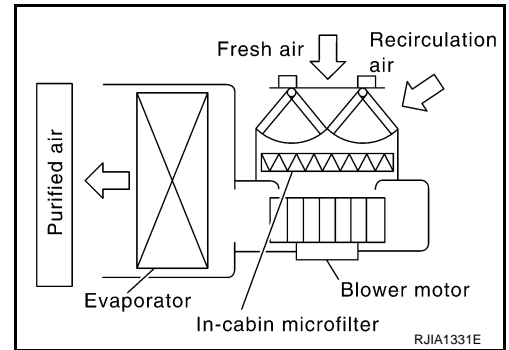
## IN-CABIN MICROFILTER

PFP:27277

### Removal and Installation FUNCTION

AJS0008G

Air inside passenger compartment is kept clean at either recirculation or fresh mode by installing in-cabin microfilter into blower unit.



### REPLACEMENT TIMING

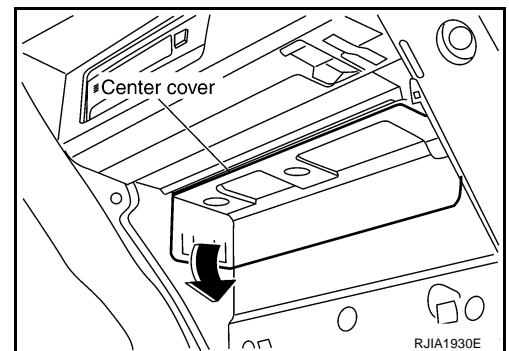
Replace in-cabin microfilter.

Refer to [MA-7, "CHASSIS AND BODY MAINTENANCE"](#) in SCHEDULE 1 and [MA-9, "CHASSIS AND BODY MAINTENANCE"](#) in SCHEDULE 2.

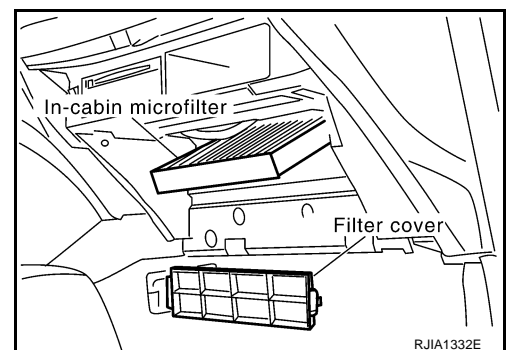
Caution label is fixed inside glove box.

### REPLACEMENT PROCEDURES

1. Remove glove box. Refer to [IP-11, "Removal and Installation"](#).
2. Remove center cover of glove box cover.



3. Remove filter cover.
4. Take out the in-cabin microfilter from blower unit.
5. Replace with new one and reinstall on blower unit.
6. Reinstall the glove box.



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# HEATER & COOLING UNIT ASSEMBLY

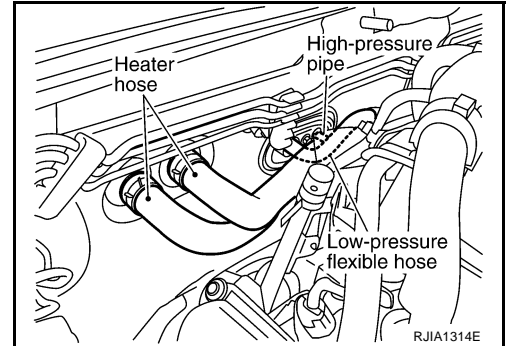
## HEATER & COOLING UNIT ASSEMBLY

PFP:27110

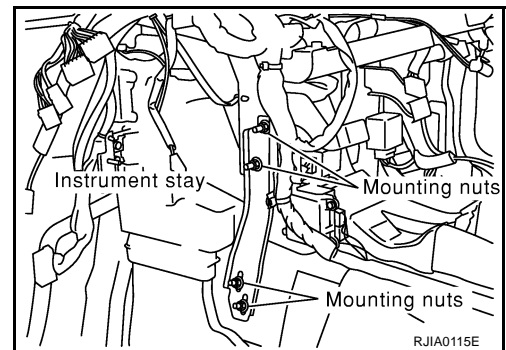
### Removal and Installation REMOVAL

AJS0008H

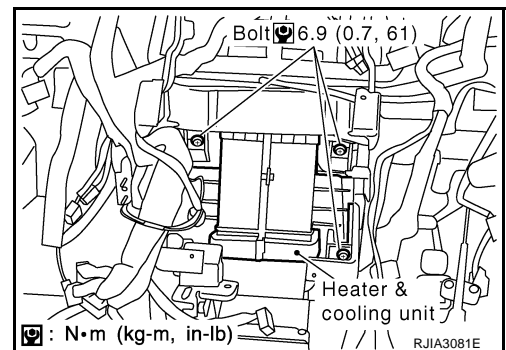
1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge refrigerant.
3. Remove tower bar. Refer to [FSU-6, "FRONT SUSPENSION ASSEMBLY"](#) .
4. Drain coolant from cooling system. Refer to [MA-12, "Changing Engine Coolant"](#) .
5. Disconnect two heater hoses from heater core pipe.
6. Disconnect low-pressure flexible hose and high-pressure pipe from evaporator.
7. Remove the instrument panel. Refer to [IP-11, "Removal and Installation"](#) .
8. Remove the blower unit. Refer to [ATC-119, "BLOWER UNIT"](#) .
9. Remove clips of vehicle harness from steering member.



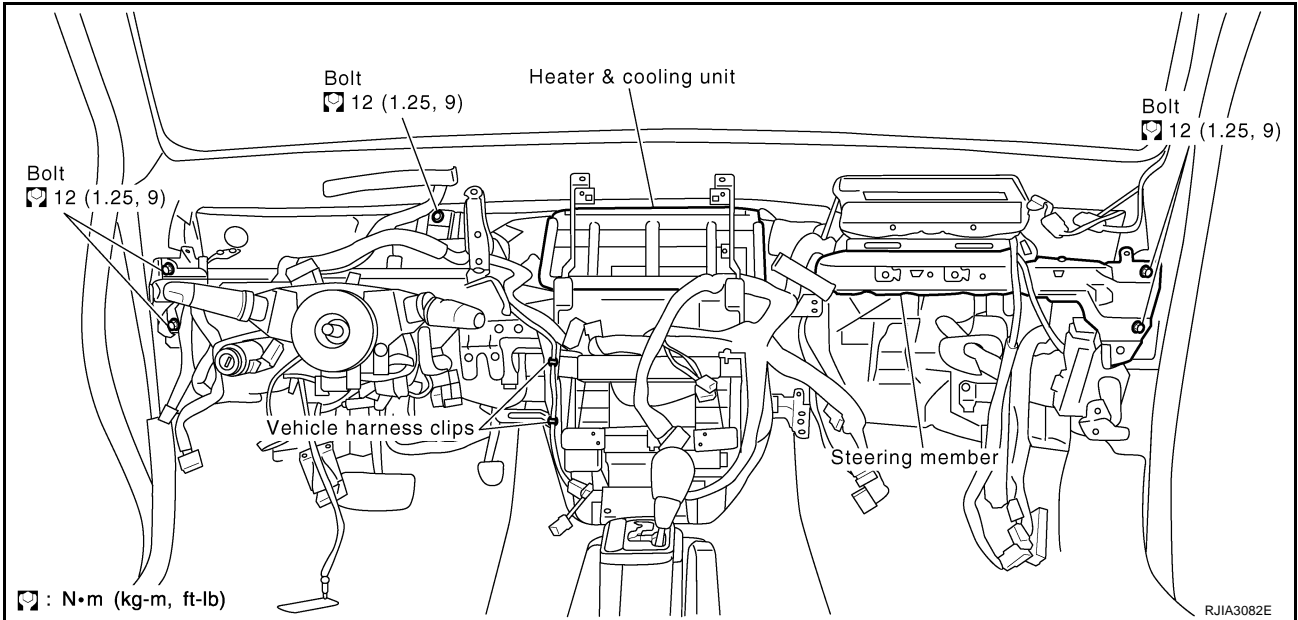
10. Remove the instrument stays (driver side, passenger side).
11. Remove the defroster nozzle and ventilator ducts.



12. Remove the screws from heater & cooling unit.



# HEATER & COOLING UNIT ASSEMBLY



13. Remove the heater & cooling unit.

## INSTALLATION

Installation is basically the reverse order of removal.

### NOTE:

When filling radiator with coolant, refer to [CO-9, "Changing Engine Coolant"](#) . Recharge the A/C system.

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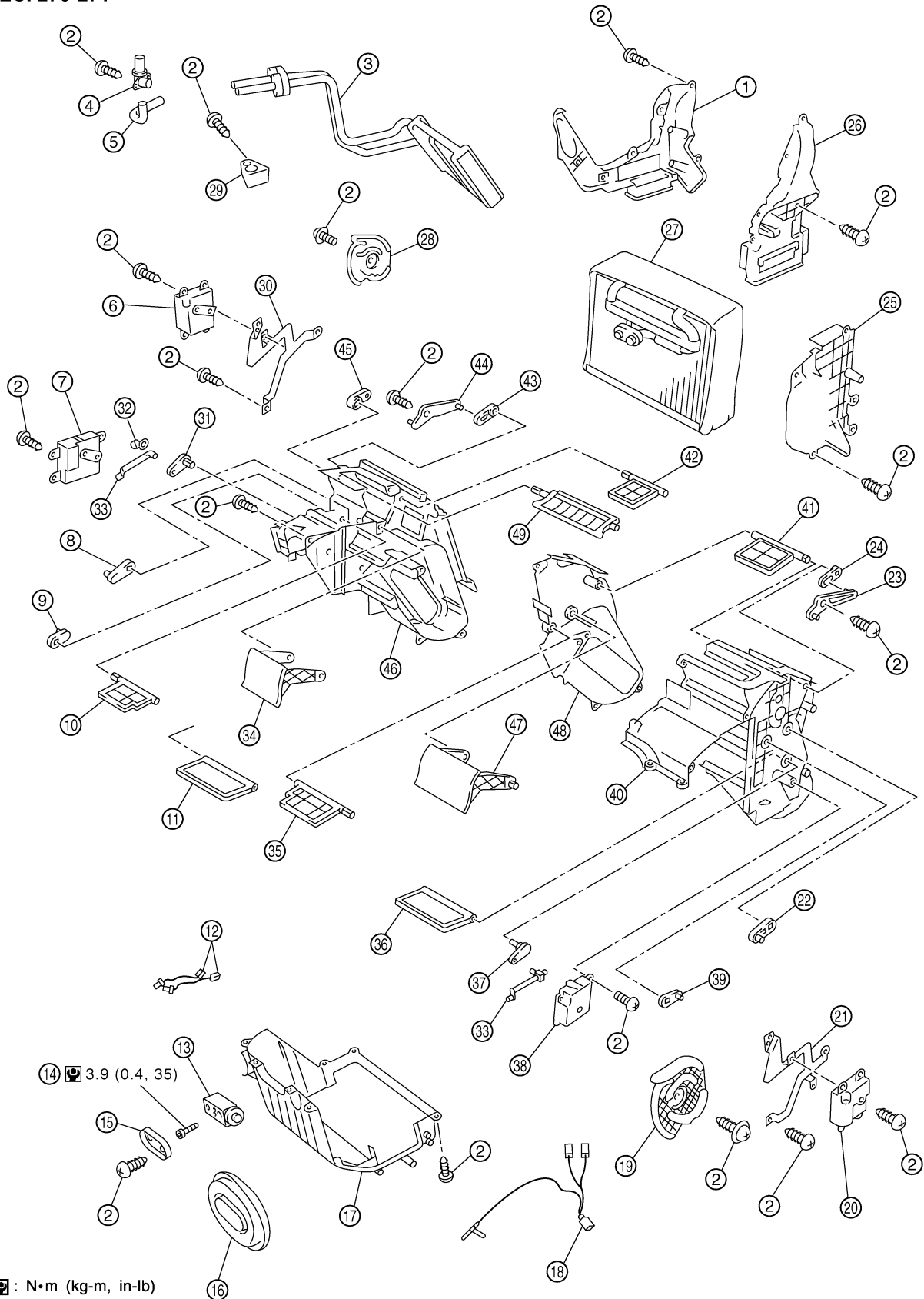
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# HEATER & COOLING UNIT ASSEMBLY

## Disassembly and Assembly

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# HEATER & COOLING UNIT ASSEMBLY

---

1. Foot duct (right)	2. Screw	3. Heater core	A
4. Aspirator	5. Aspirator duct	6. Mode door motor (passenger side)	
7. Air mix door motor (passenger side)	8. Ventilator door lever (right)	9. Bi-level door lever (right)	
10. Bi-level door (right)	11. Air mix door (right)	12. Sub harness	B
13. Expansion valve	14. Bolt	15. Expansion valve cover	
16. Cooler grommet	17. Heater & cooling unit case (lower)	18. Intake sensor	
19. Side link (left)	20. Mode door motor (driver side)	21. Mode door motor bracket (left)	C
22. Ventilator door lever (left)	23. Foot door link (left)	24. Foot door lever (left)	
25. Evaporator cover	26. Foot duct (left)	27. Evaporator	
28. Side link (right)	29. Heater pipe bracket	30. Mode door motor bracket (right)	D
31. Air mix door lever (right)	32. Rod holder	33. Rod	
34. Ventilator door (right)	35. Bi-level door (left)	36. Air mix door (left)	
37. Air mix door lever (left)	38. Air mix door motor (driver side)	39. Bi-level door lever (left)	E
40. Heater & cooling unit case (driver side)	41. Foot door (left)	42. Foot door (right)	
43. Foot door lever (right)	44. Foot door link (right)	45. Defroster door lever (right)	F
46. Heater & cooling unit case (passenger side)	47. Ventilator door (left)	48. Heater & cooling unit case (center)	
49. Defroster door			G
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# HEATER CORE

## HEATER CORE

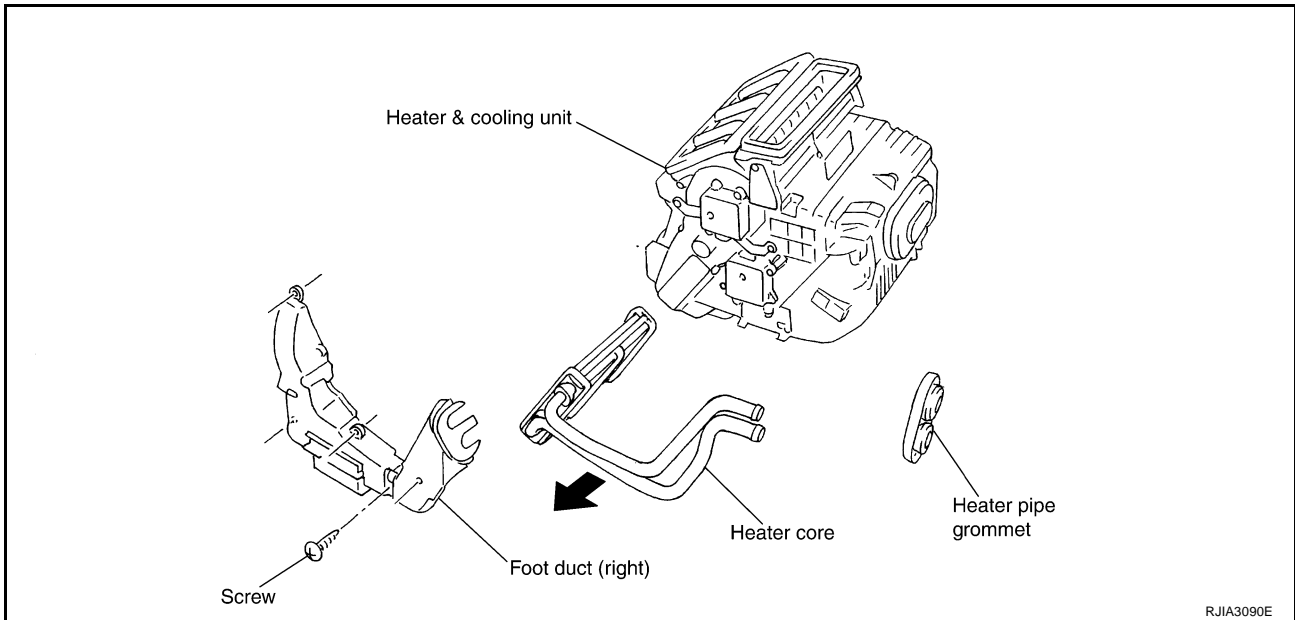
PFP:27140

### Removal and Installation

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#### REMOVAL

1. Remove heater & cooling unit. Refer to [ATC-124, "HEATER & COOLING UNIT ASSEMBLY"](#).
2. Remove mounting screw, and then remove foot duct (right).



3. Remove heater core from heater & cooling unit.

#### INSTALLATION

Installation is basically the reverse order of removal.



# MODE DOOR MOTOR

## MODE DOOR MOTOR

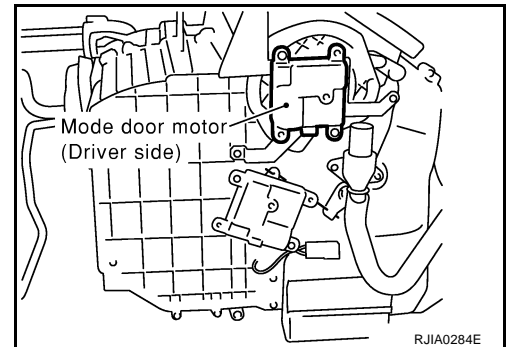
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### Removal and Installation

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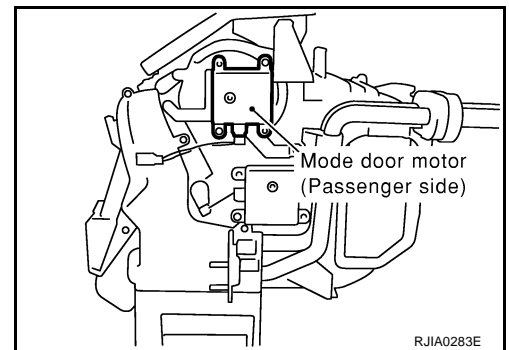
#### Driver Side Mode Door Motor

1. Remove instrument panel. Refer to [IP-11, "Removal and Installation"](#).
2. Disconnect mode door motor connector.
3. Remove mounting screw, and then remove mode door motor.



#### Passenger Side Mode Door Motor

1. Remove blower unit. Refer to [ATC-119, "BLOWER UNIT"](#).
2. Disconnect mode door motor connector.
3. Remove mounting screw, and then remove mode door motor.



### INSTALLATION

Installation is basically the reverse order of removal.

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# AIR MIX DOOR MOTOR

## AIR MIX DOOR MOTOR

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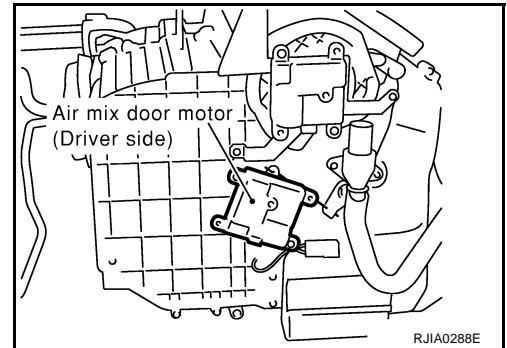
### Removal and Installation

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#### REMOVAL

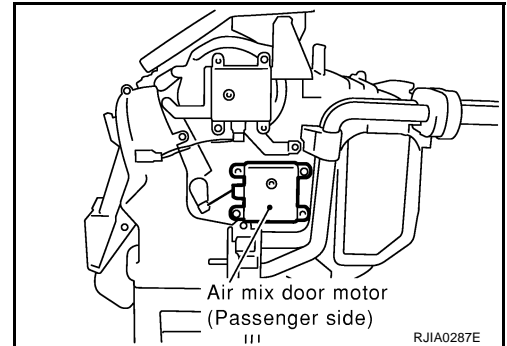
##### Driver Side Air Mix Door Motor

1. Remove instrument lower driver panel. Refer to [IP-11, "Removal and Installation"](#) .
2. Remove air mix door rod from rod holder.
3. Disconnect air mix door motor connector.
4. Remove mounting screws, and then remove the air mix door motor.



##### Passenger Side Air Mix Door Motor

1. Remove blower unit. Refer to [ATC-119, "BLOWER UNIT"](#) .
2. Remove air mix door rod from rod holder.
3. Disconnect air mix door motor connector.
4. Remove mounting screws, and then remove the air mix door motor.



#### INSTALLATION

Installation is basically the reverse order of removal.

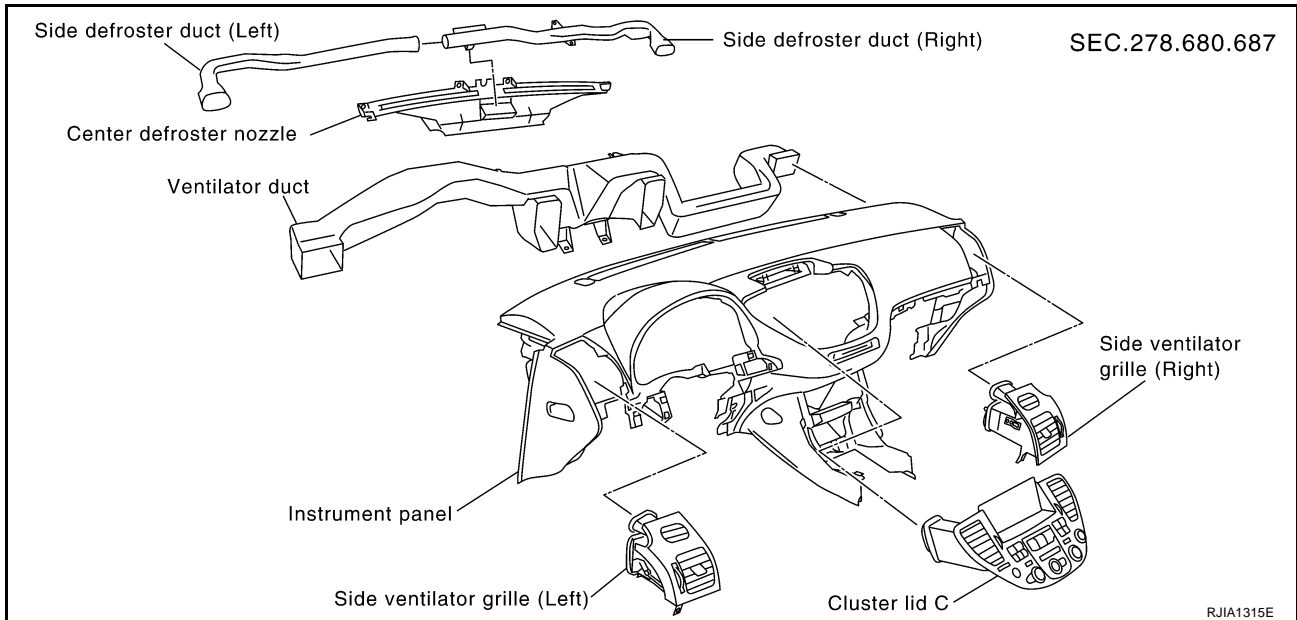
# DUCTS AND GRILLES

## DUCTS AND GRILLES

PFP:27860

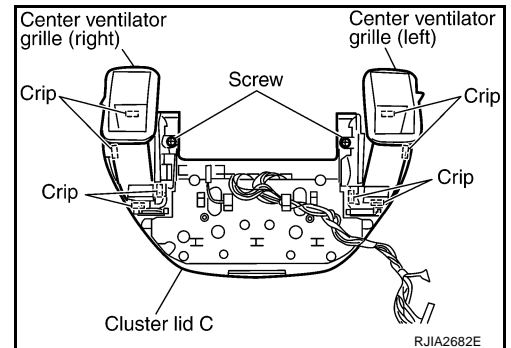
### Removal and Installation REMOVAL

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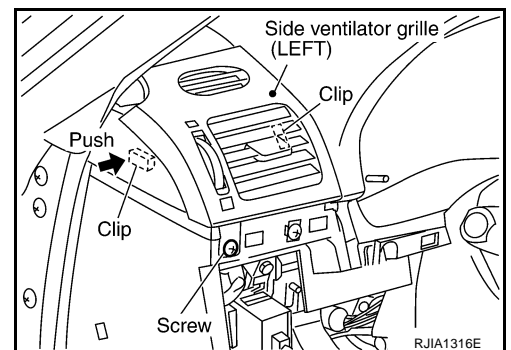
#### Removal of Center Ventilator Grille

1. Remove cluster lid C. Refer to [IP-11, "Removal and Installation"](#).
2. Remove mounting screw and clips, and then remove center ventilator grille.



#### Removal of Side Ventilator Grille

1. Remove instrument lower driver panel. Refer to [IP-11, "Removal and Installation"](#).
2. Remove side ventilator grille (left).
3. Remove glove box cover. Refer to [IP-11, "Removal and Installation"](#).
4. Remove side ventilator grille (right).



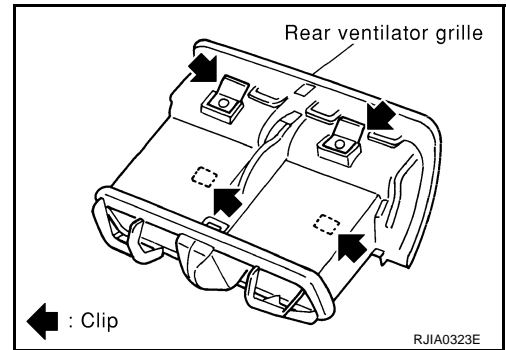
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# DUCTS AND GRILLES

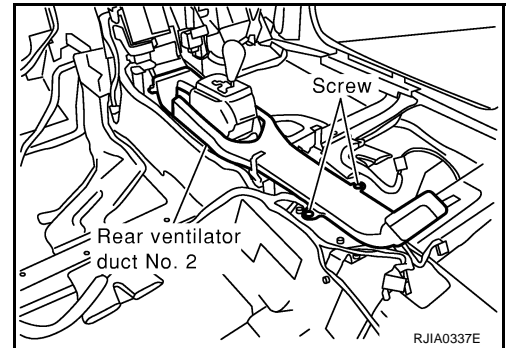
## Removal of Rear Ventilator Grille

1. Remove console rear cover. Refer to [IP-11, "Removal and Installation"](#) .
2. Remove mounting screws, and then remove rear ventilator grille.

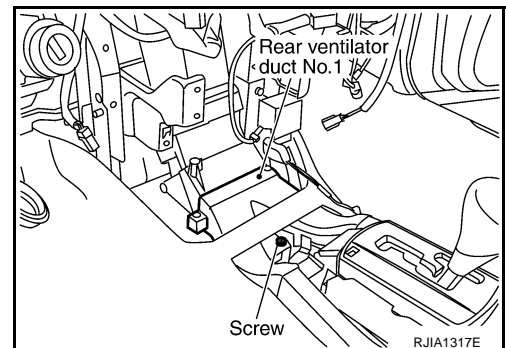


## Removal of Rear Ventilator Ducts

1. Remove console box. Refer to [IP-11, "Removal and Installation"](#) .
2. Remove rear ventilator duct No. 2.
3. Remove instrument panel. Refer to [IP-11, "Removal and Installation"](#) .

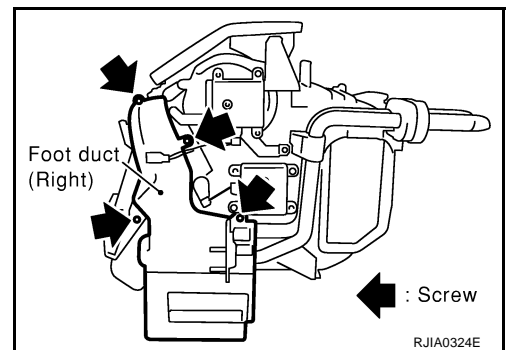


4. Remove rear ventilator duct No. 1.



## Removal of Foot Duct

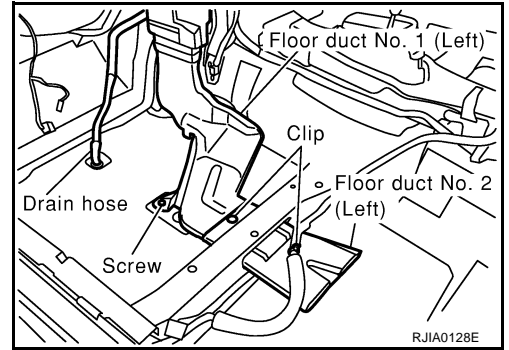
1. Remove heater & cooling unit assembly. Refer to [ATC-124, "HEATER & COOLING UNIT ASSEMBLY"](#) .
2. Remove foot duct.



# DUCTS AND GRILLES

## Removal of Floor Duct

1. Remove front seats and console box. Refer to [IP-11, "Removal and Installation"](#) .
2. Remove front kicking plate and dash side finisher.
3. Peel back floor trim to a point where floor duct is visible.
4. Remove floor duct No. 2 (left and right).
5. Remove mounting screw from floor duct No. 1.
6. Remove floor duct No. 1 (left and right).



## INSTALLATION

Installation is basically the reverse order of removal.

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# REFRIGERANT LINES

## REFRIGERANT LINES

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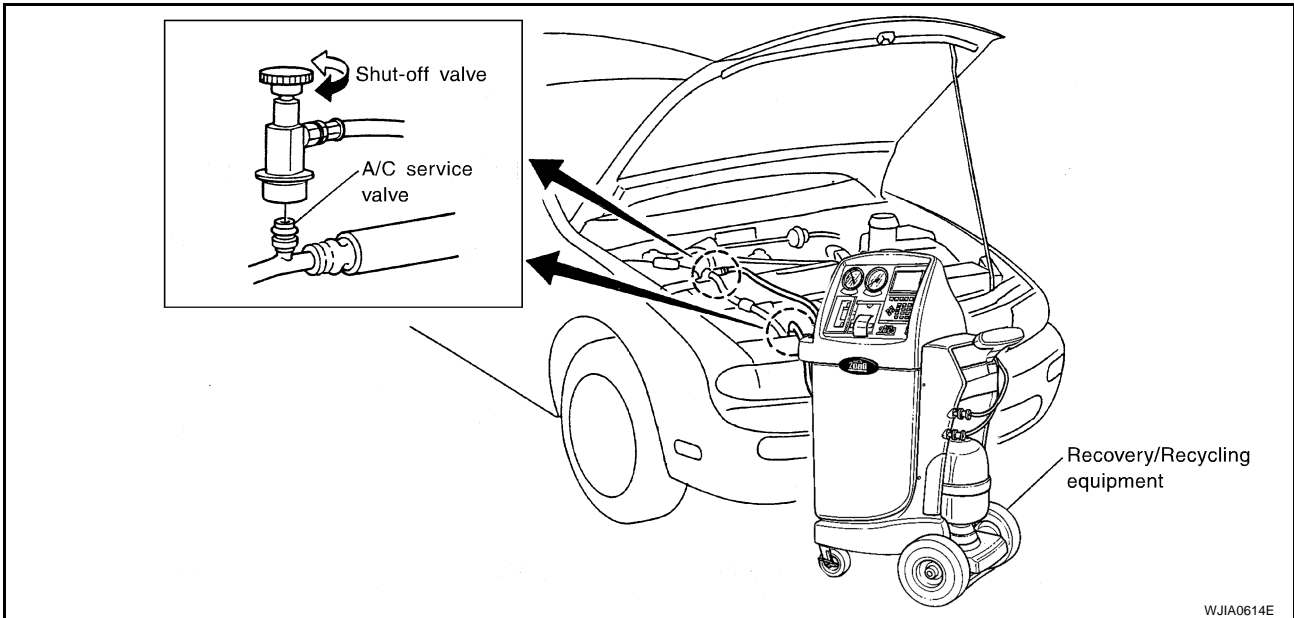
### HFC-134a (R-134a) Service Procedure SETTING OF SERVICE TOOLS AND EQUIPMENT

AJS0008M

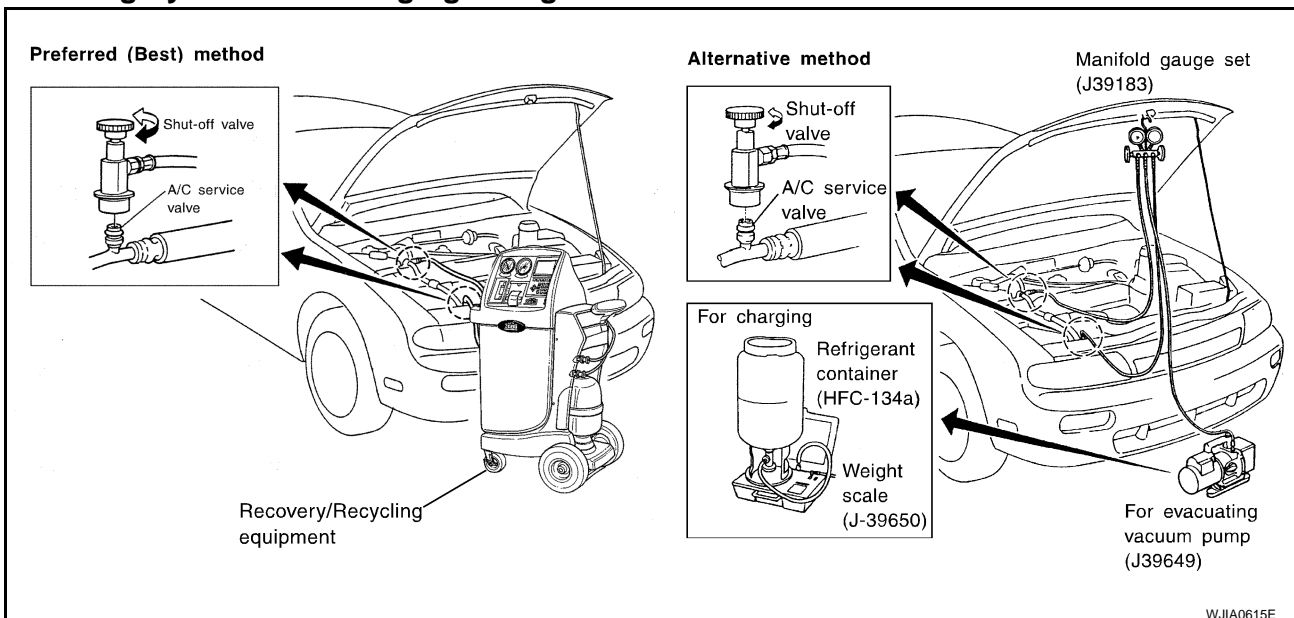
#### Discharging Refrigerant

**WARNING:**

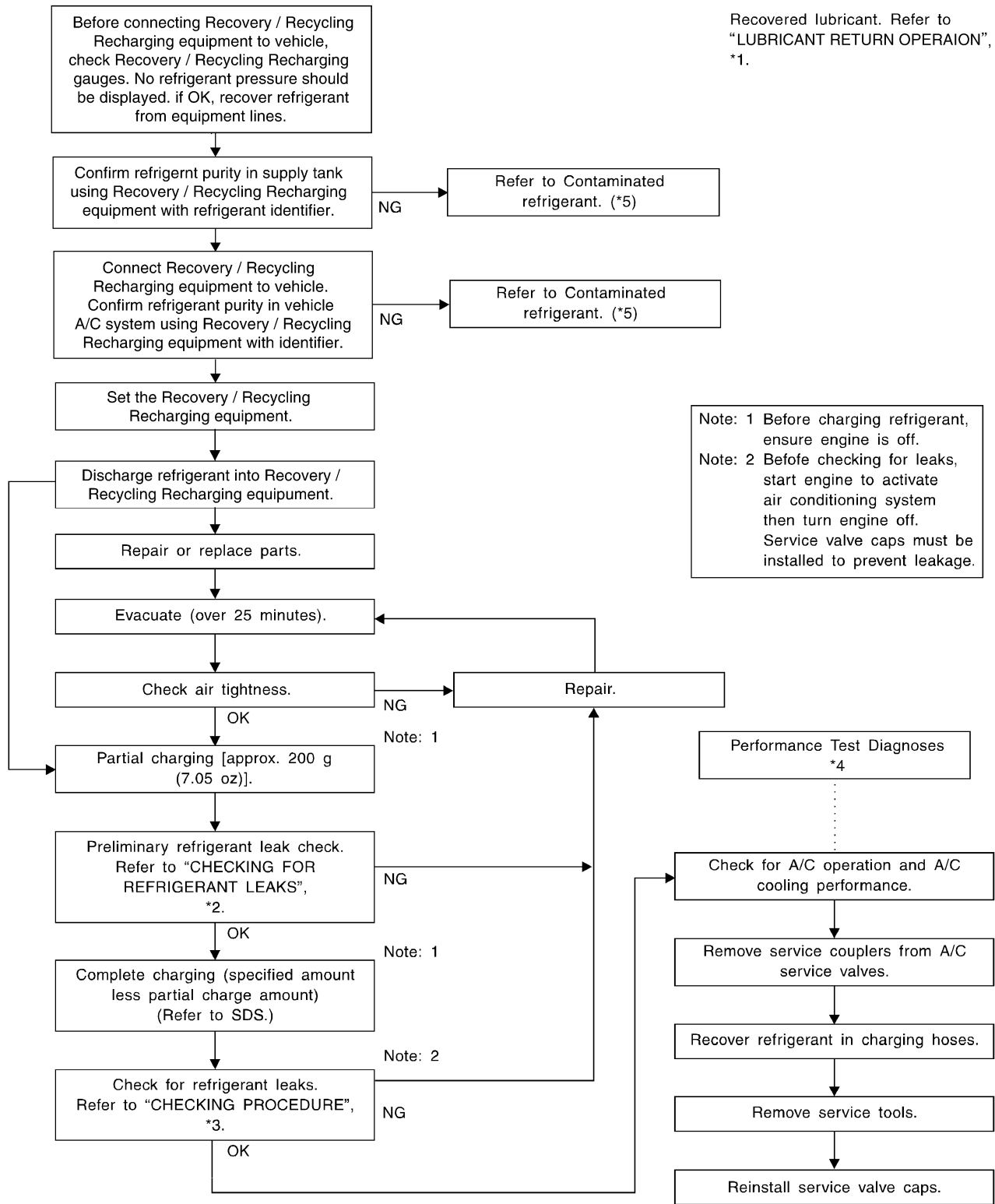
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J-2210 HFC-134a (R-134a) recycling equipment or J-2201 HFC-134a (R-134a) recovery equipment. If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.



#### Evacuating System and Charging Refrigerant



# REFRIGERANT LINES



\*1 [ATC-22, "LUBRICANT RETURN OPERATION"](#).

\*2 [ATC-147, "Checking for Refrigerant Leaks"](#).

\*3 [ATC-149, "CHECKING PROCEDURE"](#).

\*4 [ATC-91, "PERFORMANCE CHART"](#).

\*5 [ATC-4, "CONTAMINATED REFRIGERANT"](#).

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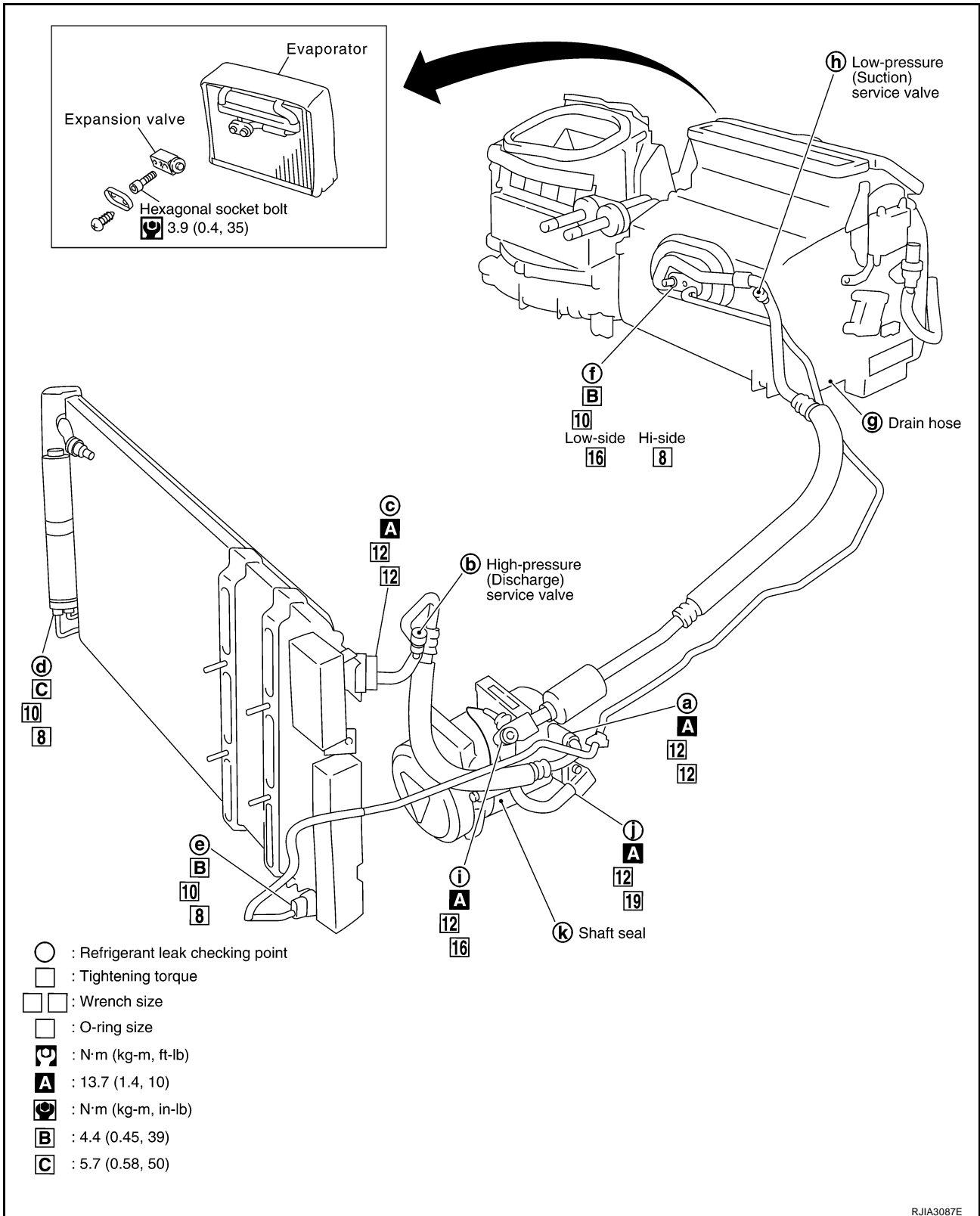
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# REFRIGERANT LINES

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## Components

Refer to [ATC-5, "Precautions for Refrigerant Connection"](#).



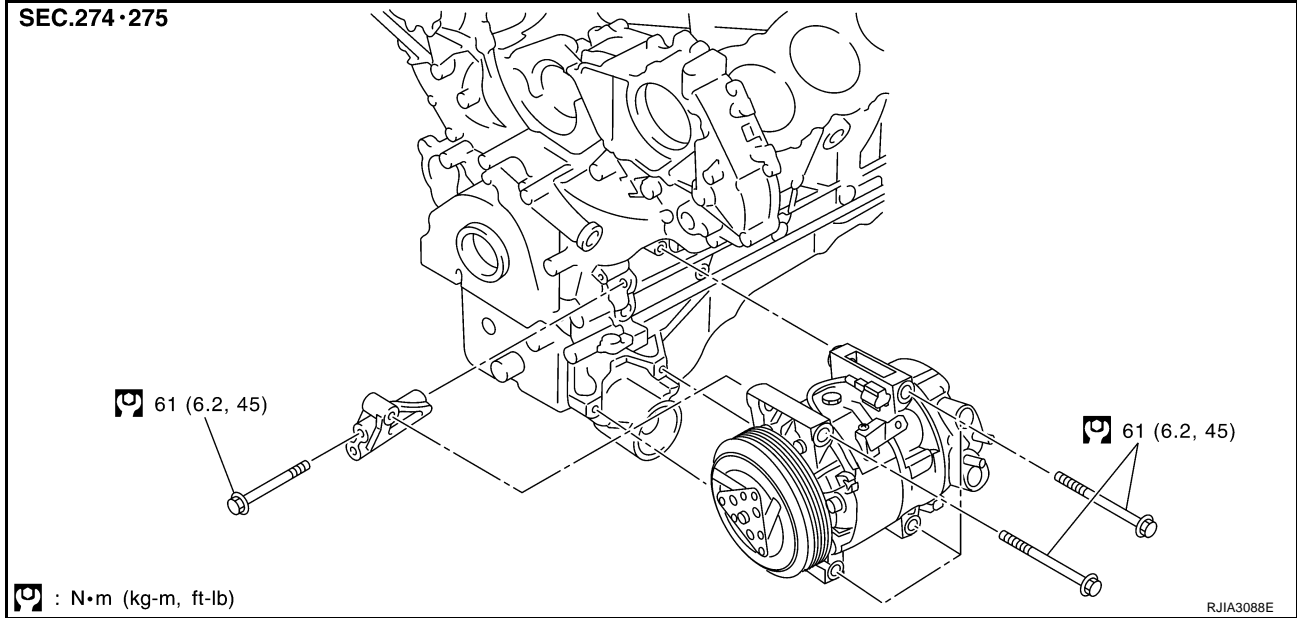


# REFRIGERANT LINES

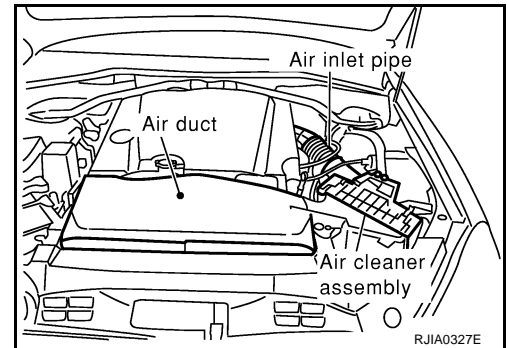
## Removal and Installation of Compressor

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### REMOVAL



1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove engine under cover, using power tools.
4. Remove air cleaner assembly, air duct and air inlet pipe. Refer to [EM-16, "AIR CLEANER AND AIR DUCT"](#) .
5. Remove compressor-alternator belt. Refer to [EM-13, "DRIVE BELTS"](#) .



6. Remove mounting nuts from both high-pressure flexible hose and low-pressure flexible hose.

#### **CAUTION:**

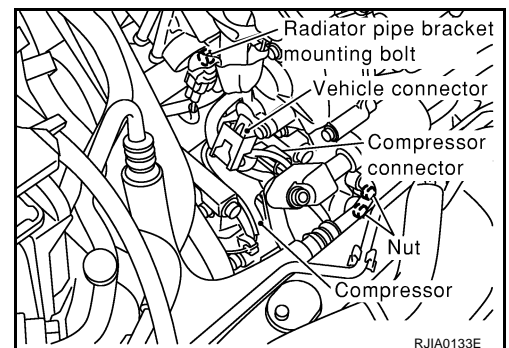
**Cap or wrap the joint of the pipe with a suitable material such as vinyl tape to avoid the entry of air.**

7. Disconnect compressor connectors (magnet clutch and ECV).
8. Remove mounting bolt from radiator pipe bracket.
9. Remove high-pressure flexible hose. Refer to [ATC-142, "Removal and Installation of High-Pressure Flexible Hose"](#) .

#### **CAUTION:**

**Cap or wrap the joint of the pipe with a suitable material such as vinyl tape to avoid the entry of air.**

10. Remove high-pressure pipe mounting clips.
11. Remove mounting bolts from compressor, using power tools.
12. Move radiator hose to right side of the vehicle.
13. Remove compressor from the upper side of the vehicle.



### INSTALLATION

Installation is basically the reverse order of removal.

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# REFRIGERANT LINES

## CAUTION:

- Replace low-pressure flexible hose and high-pressure flexible hose O-rings with new ones. Apply compressor oil prior to installation.
- When recharging refrigerant, check for leaks.

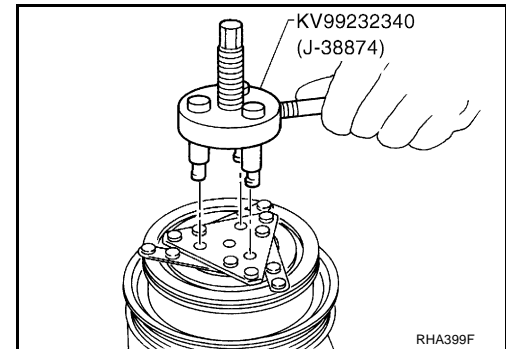
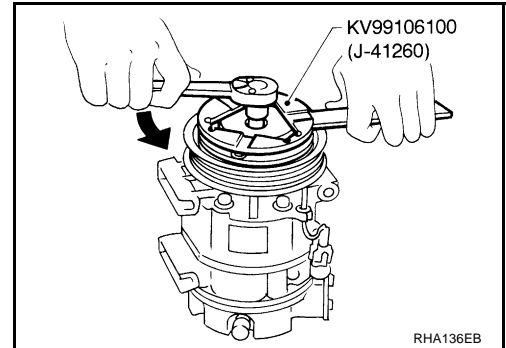
## Removal and Installation of Compressor Clutch

AJS008P

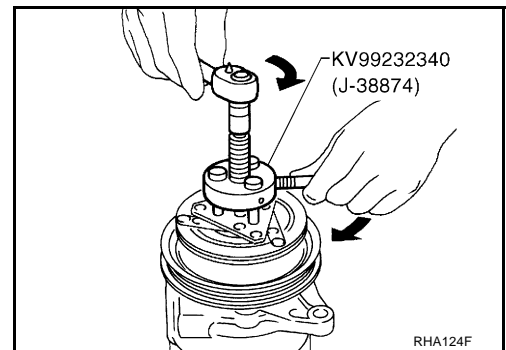
### REMOVAL

#### Overhaul

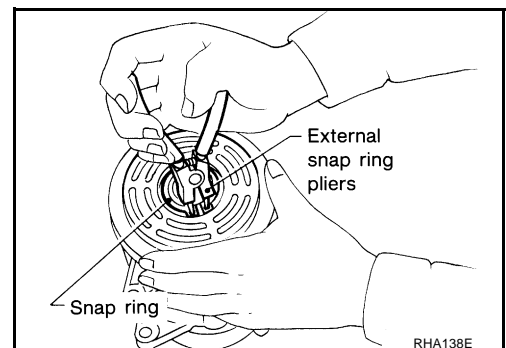
1. When removing center bolt, hold clutch disc with wrench.



2. Remove clutch disc using the clutch disc puller.

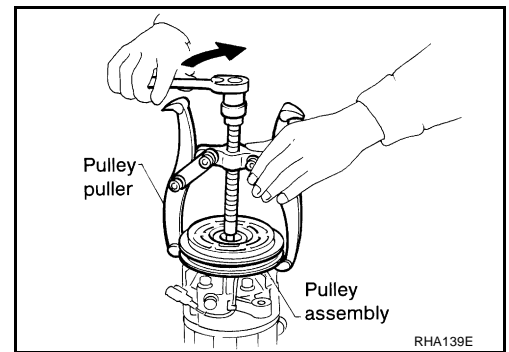


3. Remove the snap ring using external snap ring pliers.

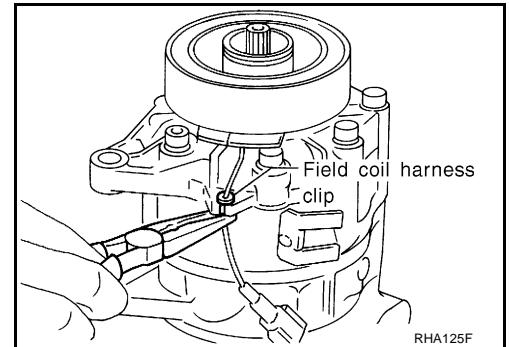


# REFRIGERANT LINES

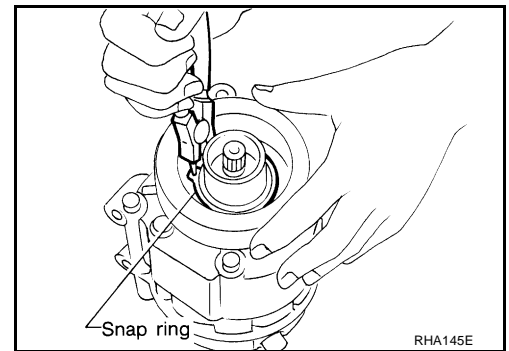
4. Position the center pulley puller on the end of the drive shaft, and remove the pulley assembly using any commercially available pulley puller. To prevent the pulley groove from being deformed, the puller claws should be positioned at the edge of the pulley assembly.



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



6. Remove the snap ring using external snap ring pliers.



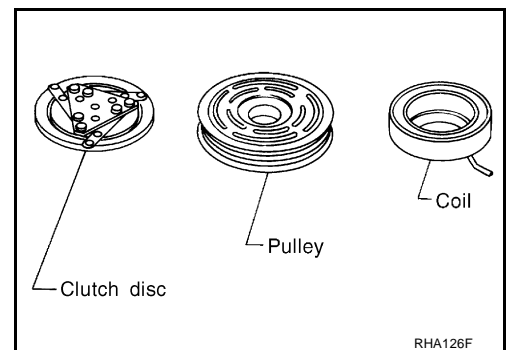
## Inspection

### Clutch disc

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

### Pulley

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



## Coil

Check coil for loose connection or cracked insulation.

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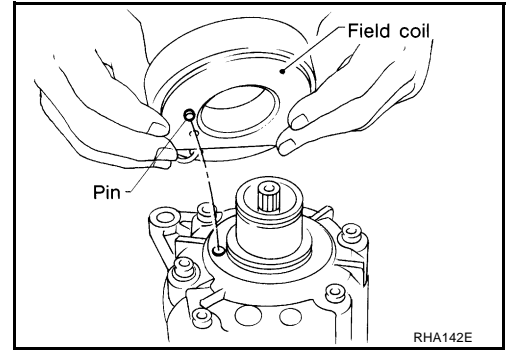
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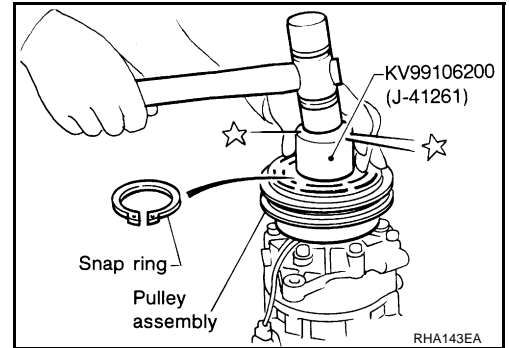
# REFRIGERANT LINES

## INSTALLATION

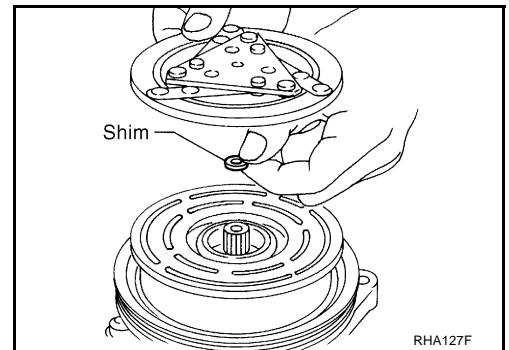
1. Install field coil.  
Be sure to align the coil's pin with the hole in the compressor's front head.
2. Install the field coil harness clip using a screwdriver.



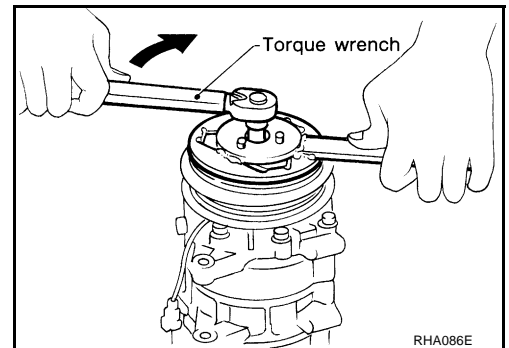
3. Install the pulley assembly using the installer and a hand press, and then install the snap ring using snap ring pliers.



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



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

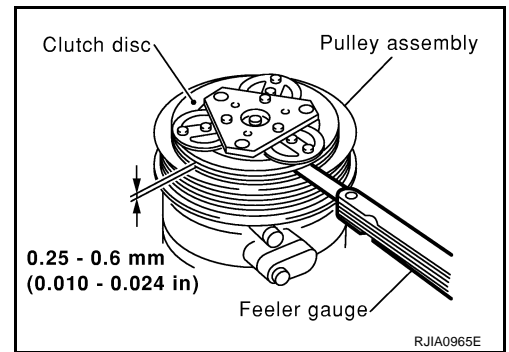


# REFRIGERANT LINES

6. Check clearance around the entire periphery of clutch disc.

**Disc to pulley clearance : 0.25 - 0.6 mm (0.010 - 0.024 in)**

If the specified clearance is not obtained, replace adjusting spacer and readjust.



## Break-In Operation

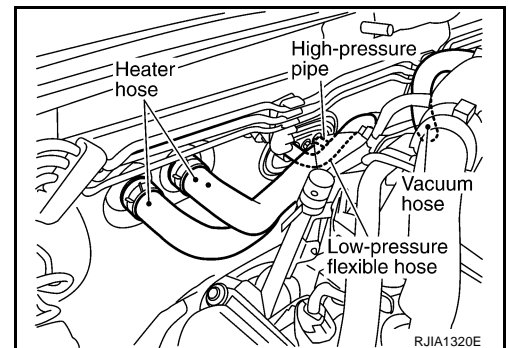
When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.

## Removal and Installation of Low-Pressure Flexible Hose

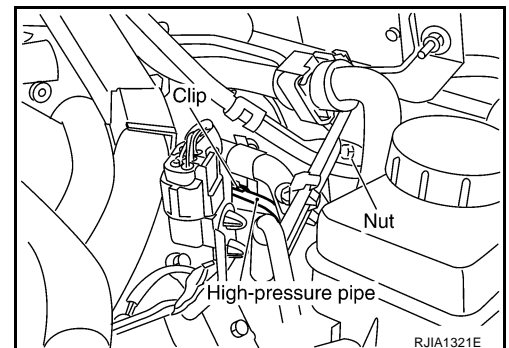
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### REMOVAL

1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#).
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove tower bar, air cleaner assembly, air duct and air inlet pipe. Refer to [FSU-6, "FRONT SUSPENSION ASSEMBLY"](#) and [EM-16, "AIR CLEANER AND AIR DUCT"](#).
4. Drain the coolant from cooling system, and disconnect two heater hoses. Refer to [MA-12, "Changing Engine Coolant"](#).
5. Disconnect vacuum hose from intake manifold. Refer to [EM-18, "INTAKE MANIFOLD"](#).



6. Remove accelerator wire bracket.

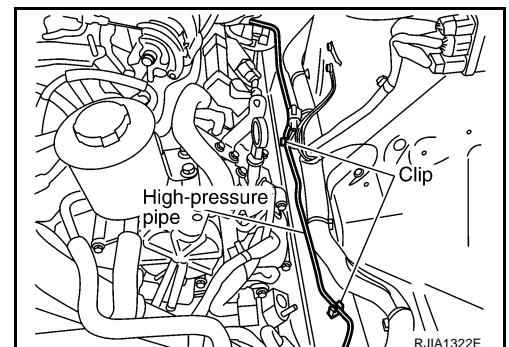


7. Remove high-pressure pipe from the clip.
8. Disconnect high-pressure pipe from condenser and evaporator.
9. Remove clip from low-pressure flexible hose.
10. Remove mounting bolt and nut from low-pressure flexible hose.

### CAUTION:

Cap or wrap the joint of the pipe with a suitable material such as vinyl tape to avoid the entry of air.

11. Remove low-pressure flexible hose.



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# REFRIGERANT LINES

## INSTALLATION

Installation is basically the reverse order of removal.

### CAUTION:

- Replace low-pressure flexible hose O-ring with a new one. Apply compressor oil prior to installation.
- When recharging refrigerant, check leaks.

## Removal and Installation of High-Pressure Flexible Hose

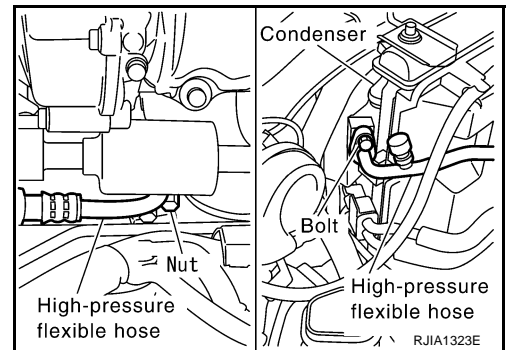
AJS000BR

### REMOVAL

1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove air cleaner assembly, air duct and air inlet pipe. Refer to [EM-16, "AIR CLEANER AND AIR DUCT"](#) .
4. Remove mounting bolt and nut from high-pressure flexible hose, then remove it.

### CAUTION:

Cap or wrap the joint of the pipe with a suitable material such as vinyl tape to avoid the entry of air.



## INSTALLATION

Installation is basically the reverse order of removal.

### CAUTION:

- Replace high-pressure flexible hose O-ring with a new one. Apply compressor oil prior to installation.
- When recharging refrigerant, check for leaks.

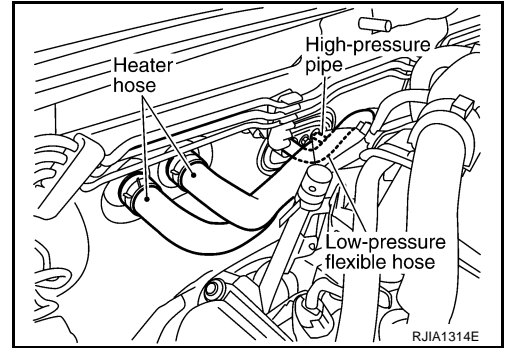
# REFRIGERANT LINES

## Removal and Installation of High-Pressure Pipe

AJS0008S

### REMOVAL

1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Drain coolant from cooling system and disconnect heater hoses. Refer to [MA-12, "Changing Engine Coolant"](#) .
4. Remove low-pressure flexible hose. Refer to [ATC-141, "Removal and Installation of Low-Pressure Flexible Hose"](#) .
5. Remove high-pressure flexible hose. Refer to [ATC-142, "Removal and Installation of High-Pressure Flexible Hose"](#) .
6. Remove high-pressure pipe.



### CAUTION:

Cap or wrap the joint of the pipe with a suitable material such as vinyl tape to avoid the entry of air.

### INSTALLATION

Installation is basically the reverse order of removal.

### CAUTION:

- Replace high-pressure pipe O-ring with a new one. Apply compressor oil prior to installation.
- When recharging refrigerant, check for leaks.

## Removal and Installation of Refrigerant Pressure Sensor

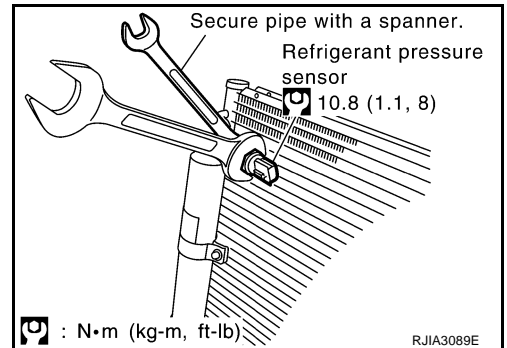
AJS0008U

### REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge refrigerant.
2. Remove front grille. Refer to [EI-19, "FRONT GRILLE"](#) .
3. Disconnect refrigerant pressure sensor connector, and then remove refrigerant pressure sensor.

### CAUTION:

- Secure refrigerant pressure sensor installation pipe with an open-end wrench. Be careful not to deform pipe during the operation.
- Be careful not to damage the core surface of the condenser during the operation.



### INSTALLATION

Installation is basically the reverse order of removal.

### CAUTION:

- Replace refrigerant pressure sensor O-ring with a new one. Apply compressor oil prior to installation.
- When recharging refrigerant, check for leaks.

# REFRIGERANT LINES

AJS000QU

## Removal and installation of Condenser

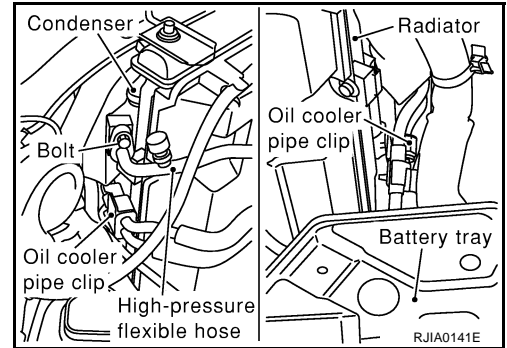
### REMOVAL

1. Remove engine cover and front grille. Refer to [EM-12, "ENGINE ROOM COVER"](#) and [EI-19, "FRONT GRILLE"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Remove tower bar, air cleaner assembly, air duct and air inlet pipe. Refer to [FSU-6, "FRONT SUSPENSION ASSEMBLY"](#) and [EM-16, "AIR CLEANER AND AIR DUCT"](#) .
4. Disconnect high-pressure flexible hose and high-pressure pipe from the condenser.

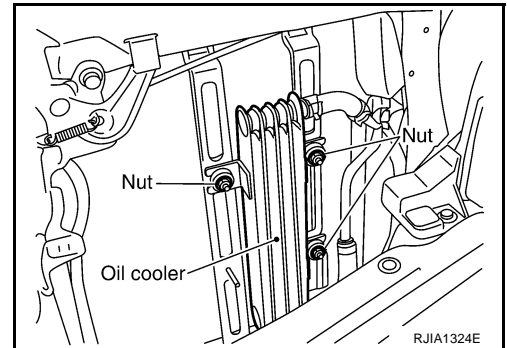
### CAUTION:

Cap or wrap the joint of the pipe with a suitable material such as vinyl tape to avoid the entry of air.

5. Remove oil cooler pipe clips from the left side of the condenser.



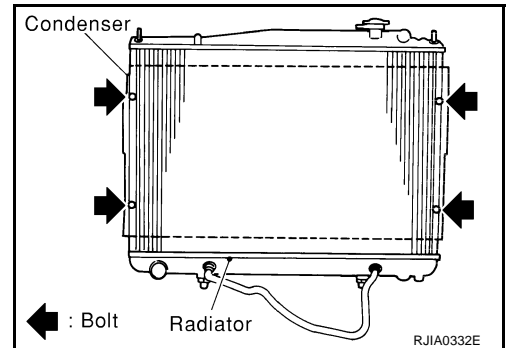
6. Remove oil cooler from the condenser (if equipped).
7. Remove battery, battery tray and radiator mounting bracket. Refer to [SC-4, "BATTERY"](#) .
8. Remove cooling fan shroud. Refer to [CO-19, "Removal and Installation"](#) .



9. Remove mounting bolts from condenser.
10. Slide condenser up and remove it from the radiator clip.
11. Remove radiator from the lower mount, move it to the engine side, then remove condenser between the radiator and the radiator core support.

### CAUTION:

Be careful not to damage the core surface of the condenser and the radiator.

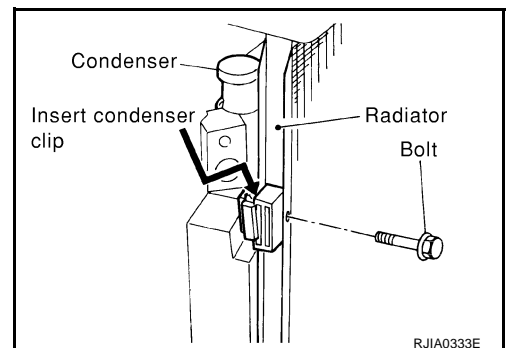


### INSTALLATION

Installation is basically the reverse order of removal.

### CAUTION:

- Replace high-pressure pipe and high-pressure flexible hose O-rings with new ones. Apply compressor oil prior to installation.
- When recharging refrigerant, check for leaks.

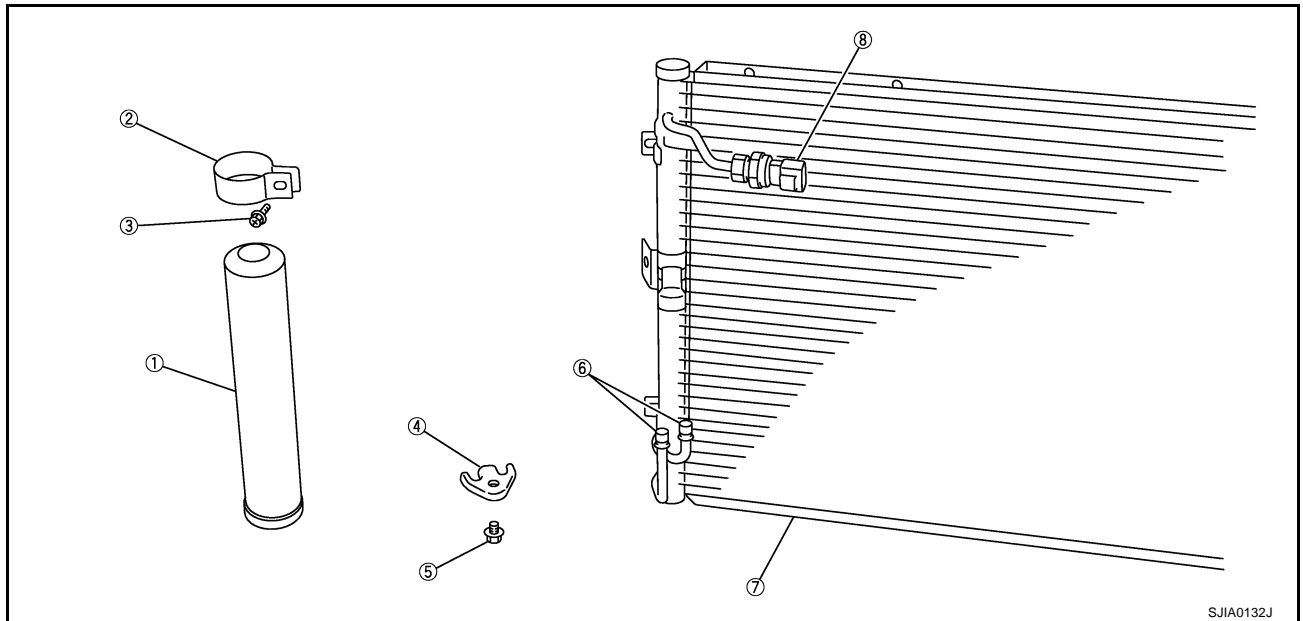




# REFRIGERANT LINES

## Removal and Installation of Liquid Tank

AJS0008W

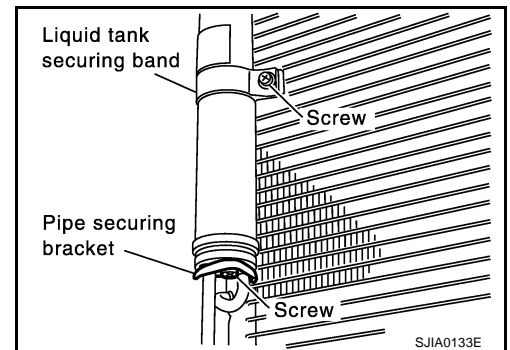


SJIA0132J

- |                            |                                |           |
|----------------------------|--------------------------------|-----------|
| 1. Liquid tank             | 2. Liquid tank securing bands  | 3. Screw  |
| 4. Securing bracket piping | 5. Screw                       | 6. O-ring |
| 7. Condenser               | 8. Refrigerant pressure sensor |           |

### REMOVAL

1. Use a refrigerant collecting equipment (for HFC-134a) to discharge refrigerant.
2. Remove front grille. Refer to [EI-19, "FRONT GRILLE"](#).
3. Unscrew, and remove the pipe securing bracket.
4. Unscrew liquid tank securing band.
5. Pull out the liquid tank and liquid tank securing band through the top.



SJIA0133E

### INSTALLATION

Installation is basically the reverse order of removal.

#### CAUTION:

- Replace refrigerant pressure sensor O-ring with a new one. Apply compressor oil prior to installation.
- When recharging refrigerant, check for leaks.

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# REFRIGERANT LINES

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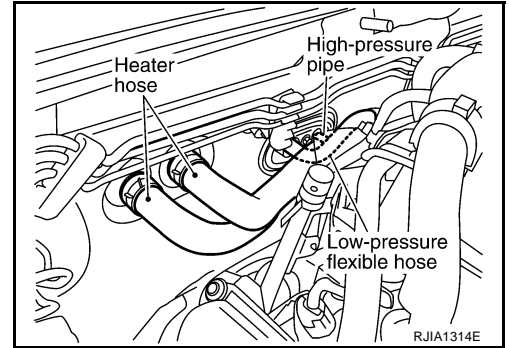
## Removal and Installation of Evaporator

### REMOVAL

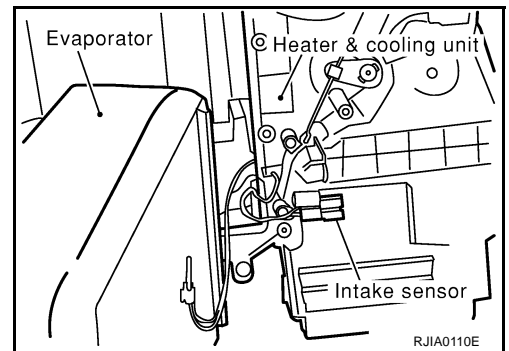
1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Drain coolant from cooling system and disconnect heater hoses. Refer to [MA-12, "Changing Engine Coolant"](#) .
4. Disconnect low-pressure flexible hose and high-pressure pipe from the evaporator.

#### CAUTION:

Cap or wrap the open ends of low-pressure flexible hose and high-pressure pipe with a suitable material such as a vinyl tape to avoid the entry of air.



5. Remove heater & cooling unit. Refer to [ATC-124, "HEATER & COOLING UNIT ASSEMBLY"](#) .
6. Remove cooler grommet, expansion valve cover and expansion valve.
7. Remove air mix door motor and mode door motor bracket.
8. Remove evaporator cover.
9. Slide the evaporator, and then remove it from the heater & cooling unit assembly.
10. Remove intake sensor from the evaporator, and then remove evaporator.



### INSTALLATION

Installation is basically the reverse order of removal.

#### CAUTION:

- Replace low-pressure flexible hose and high-pressure pipe O-rings with new ones. Apply compressor oil prior to installation.
- Mark mounting position of the intake sensor bracket.
- When recharging refrigerant, check for leaks.

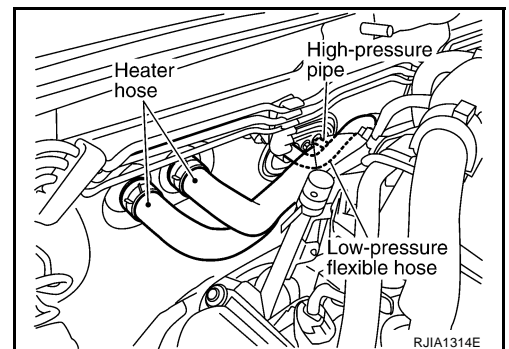
## Removal and Installation of Expansion Valve

### REMOVAL

1. Remove engine cover. Refer to [EM-12, "ENGINE ROOM COVER"](#) .
2. Use a refrigerant collecting equipment (for HFC-134a) to discharge the refrigerant.
3. Drain coolant from cooling system and disconnect heater hoses. Refer to [MA-12, "Changing Engine Coolant"](#) .
4. Disconnect low-pressure flexible hose and high-pressure pipe from the evaporator.

#### CAUTION:

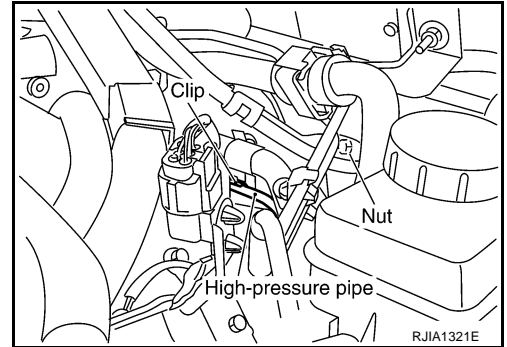
cap or wrap the joint of low-pressure flexible hose and high-pressure pipe with a suitable material such as a vinyl tape to avoid the entry of air.



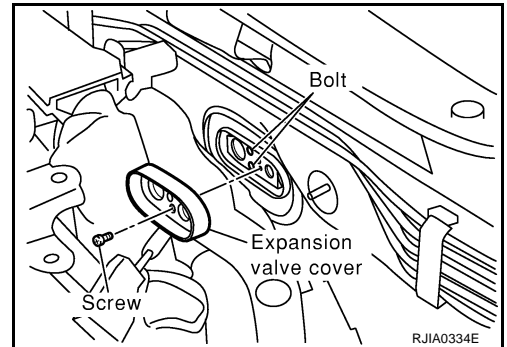
AJS000QV

# REFRIGERANT LINES

5. Remove high-pressure pipe from clip.



6. Remove expansion valve cover.
7. Remove expansion valve.



## INSTALLATION

Installation is basically the reverse order of removal.

### CAUTION:

- Replace O-rings with new ones, then apply compressor oil to them when installing them.
- When recharging refrigerant, check for leaks.

## Checking for Refrigerant Leaks

AJS00090

Perform a visual inspection of all refrigeration parts, fittings, hoses and components for signs of A/C lubricant leakage, damage and corrosion. A/C lubricant leakage may indicate an area of refrigerant leakage. Allow extra inspection time in these areas when using either an electronic refrigerant leak detector or fluorescent dye leak detector.

If dye is observed, confirm the leak with an electronic refrigerant leak detector. It is possible a prior leak was repaired and not properly cleaned.

When searching for leaks, do not stop when one leak is found but continue to check for additional leaks at all system components and connections.

When searching for refrigerant leaks using an electronic leak detector, move the probe along the suspected leak area at 1 to 2 inches per second and no further than 1/4 inch from the component.

### CAUTION:

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

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# REFRIGERANT LINES

## Checking System for Leaks Using the Fluorescent Leak Detector

AJS00091

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

### NOTE:

Other gases in the work area or substances on the A/C components, for example, anti-freeze, windshield washer fluid, solvents and lubricants, may falsely trigger the leak detector. Make sure the surfaces to be checked are clean.

Clean with a dry cloth or blow off with shop air.

Do not allow the sensor tip of the detector to contact with any substance. This can also cause false readings and may damage the detector.

## Dye Injection

AJS00092

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

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

### CAUTION:

**Be careful when servicing the A/C system or replacing a component, pour the dye directly into the open system connection and proceed with the service procedures.**

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

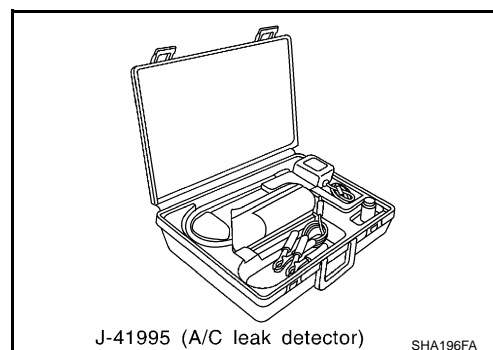
## Electronic Refrigerant Leak Detector

AJS00093

### PRECAUTIONS FOR HANDLING LEAK DETECTOR

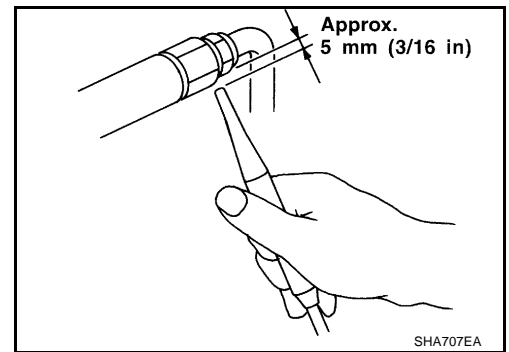
When performing a refrigerant leak check, use a J-41995 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly as per the operating instructions.

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

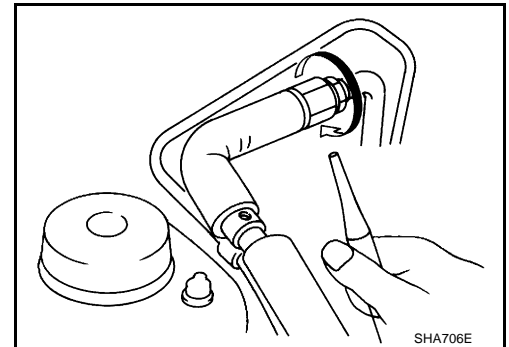


# REFRIGERANT LINES

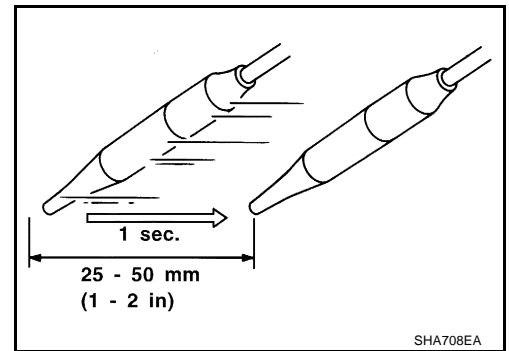
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



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



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



## CHECKING PROCEDURE

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

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

### NOTE:

At temperatures below 16°C (61°F), leaks may not be detected since the system may not reach 345 kPa (3.52 kg/cm<sup>2</sup>, 50 psi).

4. Conduct the leak test from the high-pressure side (compressor discharge a to evaporator inlet f) to the low-pressure side (evaporator drain hose g to shaft seal k). Refer to [ATC-136, "Components"](#). Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detection 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 refrigerant connection.

Service valves

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

# REFRIGERANT LINES

## NOTE:

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

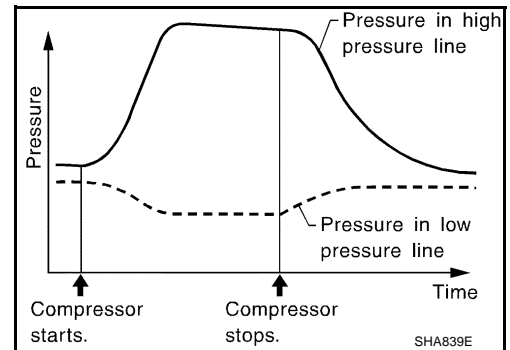
Cooling unit (Evaporator)

With engine OFF, turn blower fan on "High" for at least 15 seconds to dissipate any refrigerant trace in the cooling unit. Wait a minimum of 10 minutes accumulation time (refer to the manufacturer's recommended procedure for actual wait time) before inserting the leak detector probe into the drain hose.

Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify it at least once by blowing compressed air into area of suspected leak and repeating the check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start engine.
8. Set the heater A/C control as follows;
  - a. AUTO switch: ON
  - b. Face mode
  - c. Intake position: Recirculation
  - d. Max cold temperature
  - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.
10. Turn engine off and perform leak check again by following steps 4 through 6 above.

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



11. Before connecting recovery/recycling recharging equipment to vehicle, check recovery/recycling recharging equipment gauges. No refrigerant pressure should be displayed. If pressure is displayed, recover refrigerant from equipment lines and then check refrigerant purity.
12. Confirm refrigerant purity in supply tank using recovery/recycling recharging equipment and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using recovery/recycling recharging equipment and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair or replace the leaking fitting or component if necessary.
15. Evacuate and recharge A/C system and perform the leak test to confirm there are no remaining refrigerant leaks.
16. Conduct A/C performance test to ensure system works properly.

# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

### Compressor

AJS00094

Model	Calsonic Kansei make CWE-618	
Type	V-6 variable displacement	
Displacement cm <sup>3</sup> (cu in)/rev	Max.	184 (11.228)
	Min.	14.5 (0.885)
Cylinder bore × stroke mm (in)	37 (1.46) × [2.3 - 28.6 (0.091 - 1.126)]	
Direction of rotation	Clockwise (viewed from drive end)	
Drive belt	Poly V	

### Lubricant

AJS00095

Model	Calsonic Kansei make CWE-618	
Name	Nissan A/C System Oil Type S	
Part number	KLH00-PAGS0	
Capacity m ℓ (US fl oz, Imp fl oz)	Total in system	180 (6.0, 6.3)
	Compressor (Service part) charging amount	180 (6.0, 6.3)

### Refrigerant

AJS00096

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

### Engine Idling Speed

AJS00097

Refer to [EC-706, "Idle Speed and Ignition Timing"](#) .

### Belt Tension

AJS00098

Refer to [EM-13, "DRIVE BELTS"](#) .

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# SERVICE DATA AND SPECIFICATIONS (SDS)

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