

# 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. 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)

EJS000BR

#### **WARNING:**

- CFC-12 (R-12) refrigerant and HFC-134a (R-134a) refrigerant are not compatible. If the refrigerants are mixed and compressor failure is likely to occur, refer to “CONTAMINATED REFRIGERANT” below. To determine the purity of HFC-134a (R-134a) in the vehicle and recovery tank, use Refrigerant Recovery/Recycling Recharging equipment (ACR4) (J-39500-INF) 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 failure is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - 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 R-134a from the A/C system, using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
  - 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 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.
- 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.

# PRECAUTIONS

- 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

EJS0008S

### 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 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

EJS0008Y

- Use only specified lubricant for the HFC-134a (R-134a) A/C system and HFC-134a (R-134a) components. If lubricant other than that specified is used, compressor failure is likely to occur.
- The specified HFC-134a (R-134a) lubricant rapidly absorbs moisture from the atmosphere. The following handling precautions must be observed:
  - 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 R-134a from the A/C system, using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment), or J2209 (R-134a recovery equipment). If accidental system discharge occurs, ventilate work area before resuming service. Additional health and safety information may be obtained from refrigerant and lubricant manufacturers.
- 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

EJS0008T

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

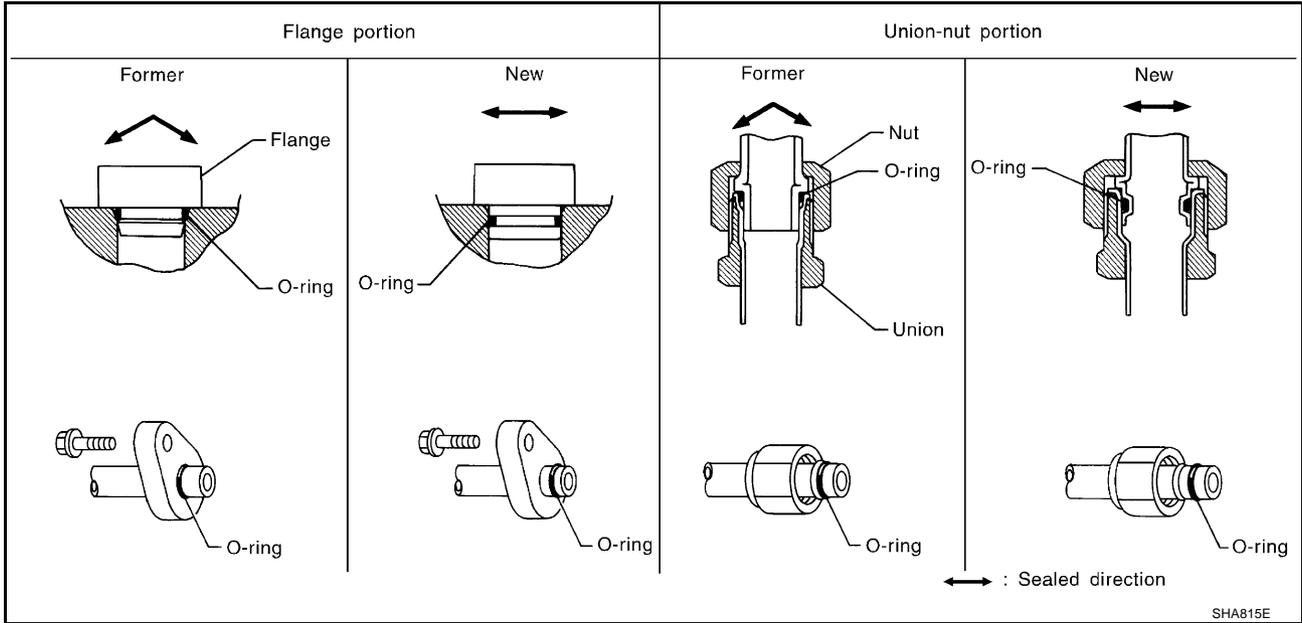
- Expansion valve to cooling unit
- Refrigerant pressure sensor to liquid tank

## FEATURES OF NEW TYPE REFRIGERANT CONNECTION

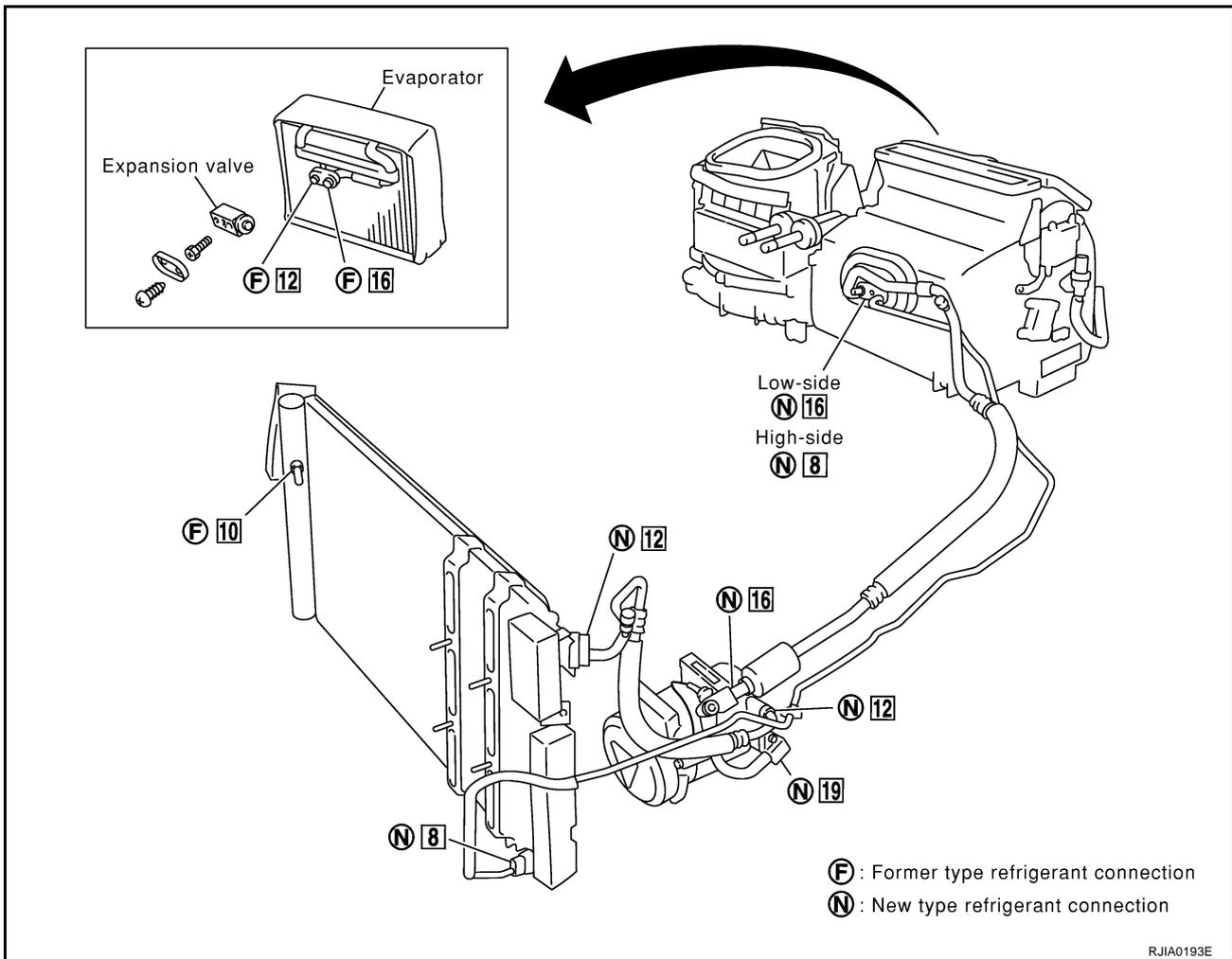
- The O-ring has been relocated. It has also been provided with a groove for proper installation. This eliminates the chance of the O-ring being caught in, or damaged by, the mating part. The sealing direction of the O-ring is now set vertically in relation to the contacting surface of the mating part to improve sealing characteristics.

# PRECAUTIONS

- The reaction force of the O-ring will not occur in the direction that causes the joint to pull out, thereby facilitating piping connections.



## O-RING AND REFRIGERANT CONNECTION

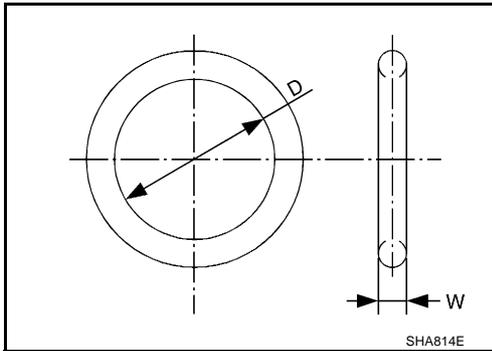


### CAUTION:

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

# PRECAUTIONS

## 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.

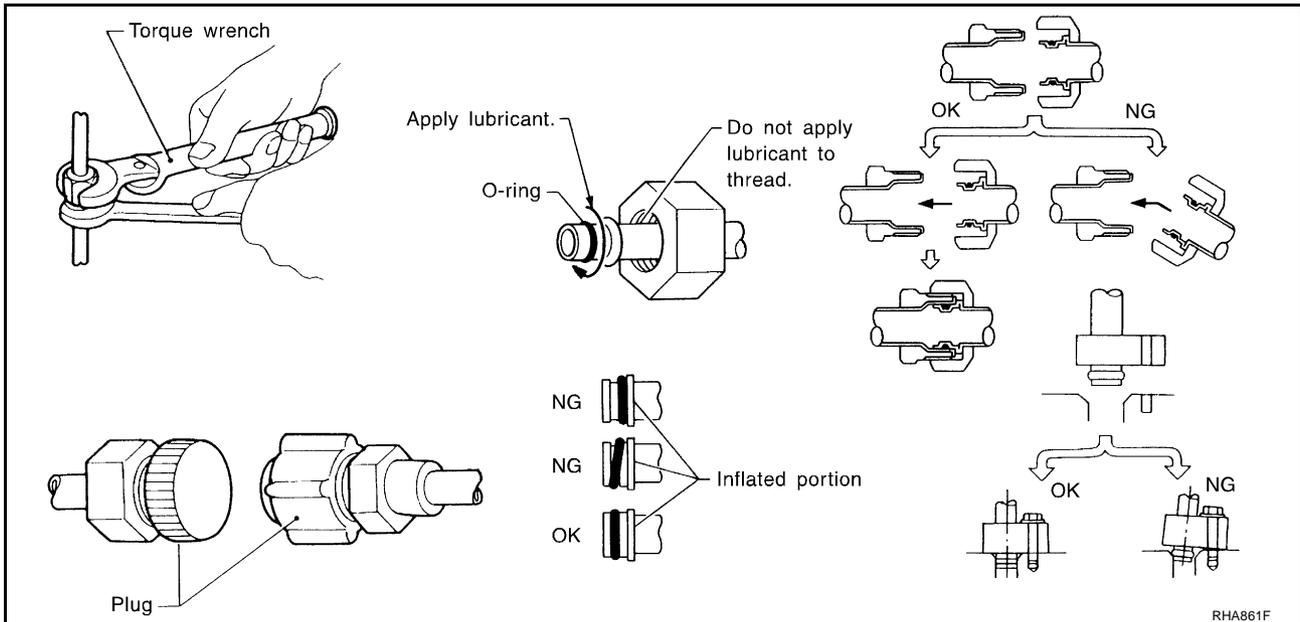
### CAUTION:

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

- When the compressor is removed, store it in the same position as it is when mounted on the car. Failure to do so will cause lubricant to enter the low pressure chamber.
- When connecting tubes, always use a torque wrench and a back-up wrench.
- After disconnecting tubes, immediately plug all openings to prevent entry of dirt and moisture.
- When installing an air conditioner in the vehicle, connect the pipes as the final stage of the operation. Do not remove the seal caps of pipes and other components until just before required for connection.
- Allow components stored in cool areas to warm to working area temperature before removing seal caps. This prevents condensation from forming inside A/C components.
- Thoroughly remove moisture from the refrigeration system before charging the refrigerant.
- Always replace used O-rings.
- When connecting tube, apply lubricant to circle of the O-rings shown in illustration. Be careful not to apply lubricant to threaded portion.  
Lubricant name: Nissan A/C System Oil Type S  
Part number: KLH00-PAGS0
- O-ring must be closely attached to dented portion of tube.
- When replacing the O-ring, be careful not to damage O-ring and tube.
- Connect tube until you hear it click, then tighten the nut or bolt by hand until snug. Make sure that the O-ring is installed to tube correctly.

## PRECAUTIONS

- 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

EJS0008U

- 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 for Service Equipment RECOVERY/RECYCLING EQUIPMENT

EJS0008V

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

### ELECTRONIC LEAK DETECTOR

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

# PRECAUTIONS

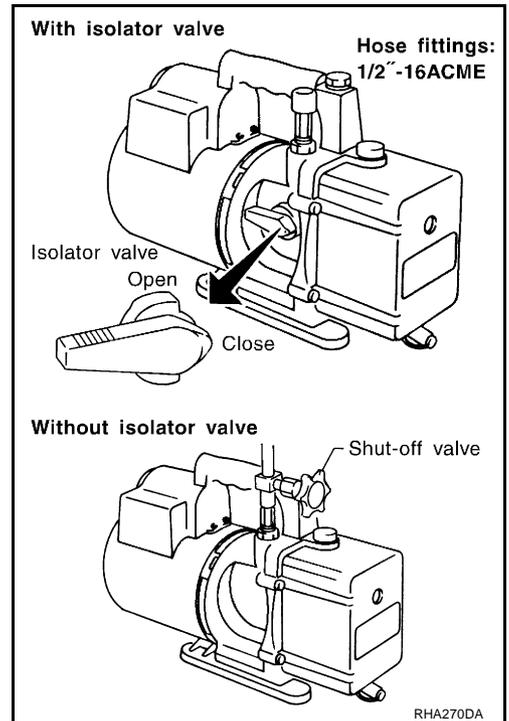
## VACUUM PUMP

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

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

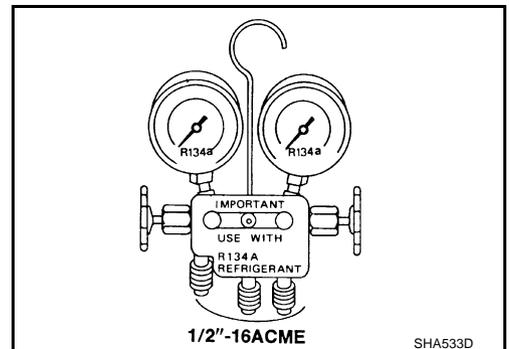
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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

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



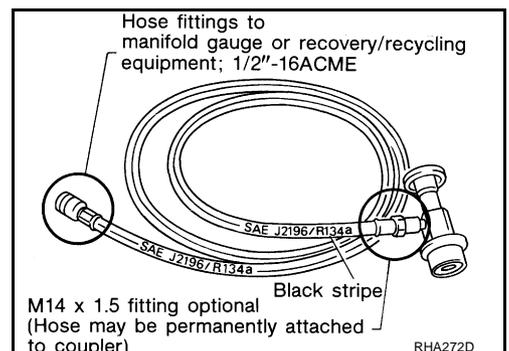
## MANIFOLD GAUGE SET

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



## SERVICE HOSES

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



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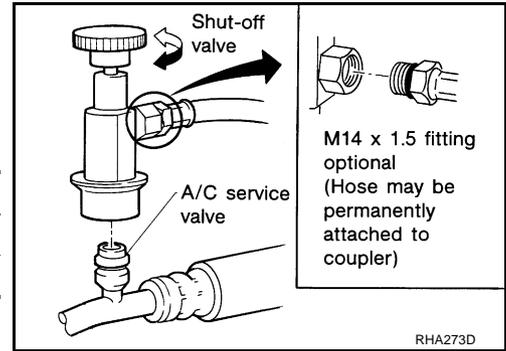
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# PRECAUTIONS

## SERVICE COUPLERS

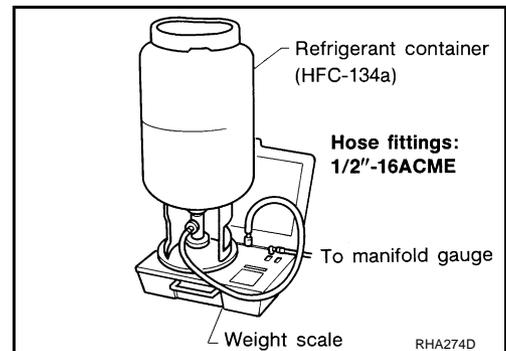
Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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



## REFRIGERANT WEIGHT SCALE

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



## CALIBRATING ACR4 WEIGHT SCALE

Calibrate the scale every three months.

To calibrate the weight scale on the ACR4 (J-39500-INF):

1. Press **Shift/Reset** and **Enter** at the same time.
2. Press **8787** . "A1 " will be displayed.
3. Remove all weight from the scale.
4. Press **0** , then press **Enter** . "0.00 " will be displayed and change to "A2 " .
5. Place a known weight (dumbbell or similar weight), between 4.5 and 8.6 kg (10 and 19 lb) on the center of the weight scale.
6. Enter the known weight using four digits. (Example 10 lb = 10.00, 10.5 lb = 10.50)
7. Press **Enter** — the display returns to the vacuum mode.
8. Press **Shift/Reset** and **Enter** at the same time.
9. Press **6** — the known weight on the scale is displayed.
10. Remove the known weight from the scale. "0.00 " will be displayed.
11. Press **Shift/Reset** to return the ACR4 to the program mode.

## 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

EJS0008W

- 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 glasses 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 R-134a and R12 A/C systems are different. Do not use R-134a leak detection dye in R-12 A/C system or R-12 leak detector dye in R-134a A/C systems or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor failure 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

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# PRECAUTIONS

## Precautions for Leak Detection Dye

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- Always wear fluorescence enhancing UV safety glasses 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 and 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 R-134a and R12 A/C systems are different. Do not use R-134a leak detection dye in R-12 A/C system or R-12 leak detector dye in R-134a A/C systems or A/C system damage may result.
- The fluorescent properties of the dye will remain for over three (3) years unless a compressor failure occurs.

## Wiring Diagrams and Trouble Diagnosis

EJS00091

When you read wiring diagrams, refer to the followings:

- [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 followings:

- [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

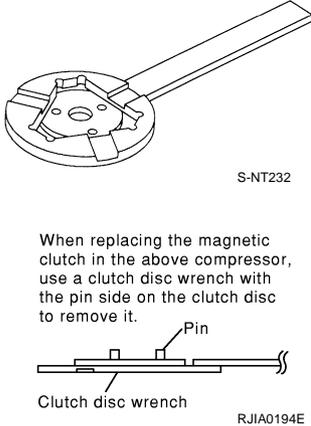
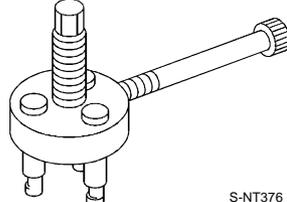
## PREPARATION

PFP:00002

### Special Service Tools

EJS00092

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</p> <p>Clutch disc wrench</p> <p>RJIA0194E</p> </div>	<p>Removing shaft nut and clutch disc</p>
<p>KV99232340 (J-38874) or KV992T0001 ( - ) Clutch disc puller</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>

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

EJS00093

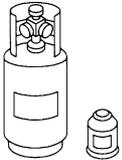
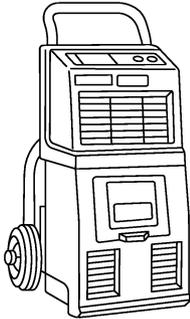
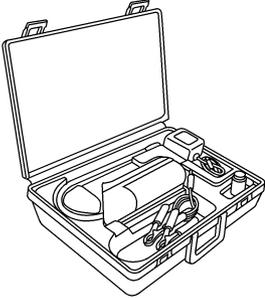
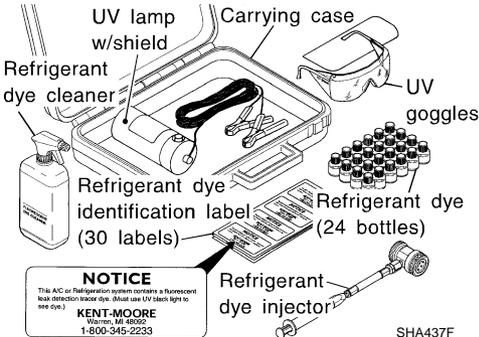
Never mix HFC-134a refrigerant and/or its specified lubricant with CFC-12 (R-12) refrigerant and/or its lubricant.

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

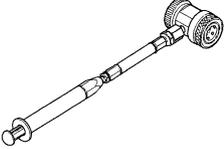
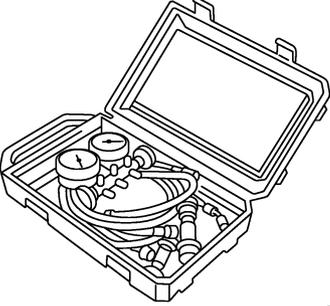
Refrigerant container fittings, service hose fittings and service equipment fittings (equipment which handles refrigerant and/or lubricant) are different between CFC-12 (R-12) and HFC-134a (R-134a). This is to avoid mixed use of the refrigerants/lubricant.

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

# PREPARATION

Tool number (Kent-Moore No.) Tool name	Description
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 <sup>2</sup> -16 ACME
KLH00-PAGRO ( - ) Nissan A/C System Oil Type R   S-NT197	Type: Poly alkaline glycol oil (PAG), type R Application: HFC-134a (R-134a) vane rotary compressors (Nissan only) Lubricity: 40 ml [Liter] (1.4 US fl oz, 1.4 Imp fl oz)
(J-39500-INF) Recovery/Recycling Recharging equipment (ACR4)   RJIA0195E	Function: Refrigerant Recovery and Recycling and Recharging
(J-41995) Electrical leak detector   AHA281A	Power supply: ● DC 12V (Cigarette lighter)
(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety glasses (J-41459) Refrigerant dye injector (J-41447) qty. 24 HFC-134a (R-134a) refrigerant dye (J-43872) Refrigerant dye cleaner   SHA437F	Power supply: DC 12V (Battery terminal)

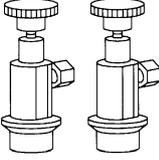
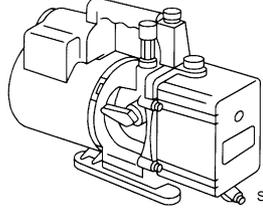
# PREPARATION

Tool number (Kent-Moore No.) Tool name	Description
<p>(J-42220) Fluorescent dye leak detector</p>  <p style="text-align: center;">SHA438F</p>	<p>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 glasses</p>
<p>(J-41447) HFC-134a (R-134a) Fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)</p>  <p style="text-align: center;">Refrigerant dye (24 bottles) SHA439F</p>	<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.)</p>
<p>(J-41459) HFC-134a (R-134a) Dye injector Use with J-41447, 1/4 ounce bottle</p>  <p style="text-align: center;">SHA440F</p>	<p>For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.</p>
<p>(J-43872) Dye cleaner</p>  <p style="text-align: center;">SHA441F</p>	<p>For cleaning dye spills.</p>
<p>(J-39183) Manifold gauge set (with hoses and couplers)</p>  <p style="text-align: center;">R.JIA0196E</p>	<p>Identification:</p> <ul style="list-style-type: none"> <li>● The gauge face indicates R-134a.</li> <li style="padding-left: 20px;">Fitting size: Thread size</li> <li>● 1/2<sup>2</sup> -16 ACME</li> </ul>
<p>Service hoses</p> <ul style="list-style-type: none"> <li>● High side hose (J-39501-72)</li> <li>● Low side hose (J-39502-72)</li> <li>● Utility hose (J-39476-72)</li> </ul>  <p style="text-align: center;">S-NT201</p>	<p>Hose color:</p> <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> <p>Hose fitting to gauge:</p> <ul style="list-style-type: none"> <li>● 1/2<sup>2</sup> -16 ACME</li> </ul>

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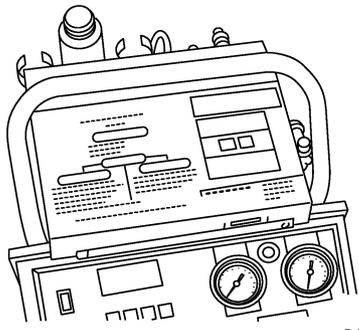
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# PREPARATION

Tool number (Kent-Moore No.) Tool name	Description
<p><b>Service couplers</b></p> <ul style="list-style-type: none"> <li>● High side coupler (J-39500-20)</li> <li>● Low side coupler (J-39500-24)</li> </ul>	<div style="text-align: center;">  <p>S-NT202</p> </div> <p>Hose fitting to service hose:</p> <ul style="list-style-type: none"> <li>● M14 x 1.5 fitting is optional or permanently attached.</li> </ul>
<p>(J-39650) Refrigerant weight scale</p>	<div style="text-align: center;">  <p>S-NT200</p> </div> <p>For measuring of refrigerant Fitting size: Thread size</p> <ul style="list-style-type: none"> <li>● 1/2<sup>2</sup> -16 ACME</li> </ul>
<p>(J-39649) Vacuum pump (Including the isolator valve)</p>	<div style="text-align: center;">  <p>S-NT203</p> </div> <p>Capacity:</p> <ul style="list-style-type: none"> <li>● Air displacement: 4 CFM</li> <li>● Micron rating: 20 microns</li> <li>● Oil capacity: 482 g (17 oz)</li> <li style="padding-left: 20px;">Fitting size: Thread size</li> <li>● 1/2<sup>2</sup> -16 ACME</li> </ul>

## Commercial Service Tools

*EJS00094*

Tool name	Description
<p>Refrigerant identifier equipment</p>	<div style="text-align: center;">  <p>RJIA0197E</p> </div> <p>For checks refrigerant purity and for system contamination</p>

# REFRIGERATION SYSTEM

## REFRIGERATION SYSTEM

PFP:KA990

### Refrigerant Cycle REFRIGERANT FLOW

EJS00077

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

### FREEZE PROTECTION

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

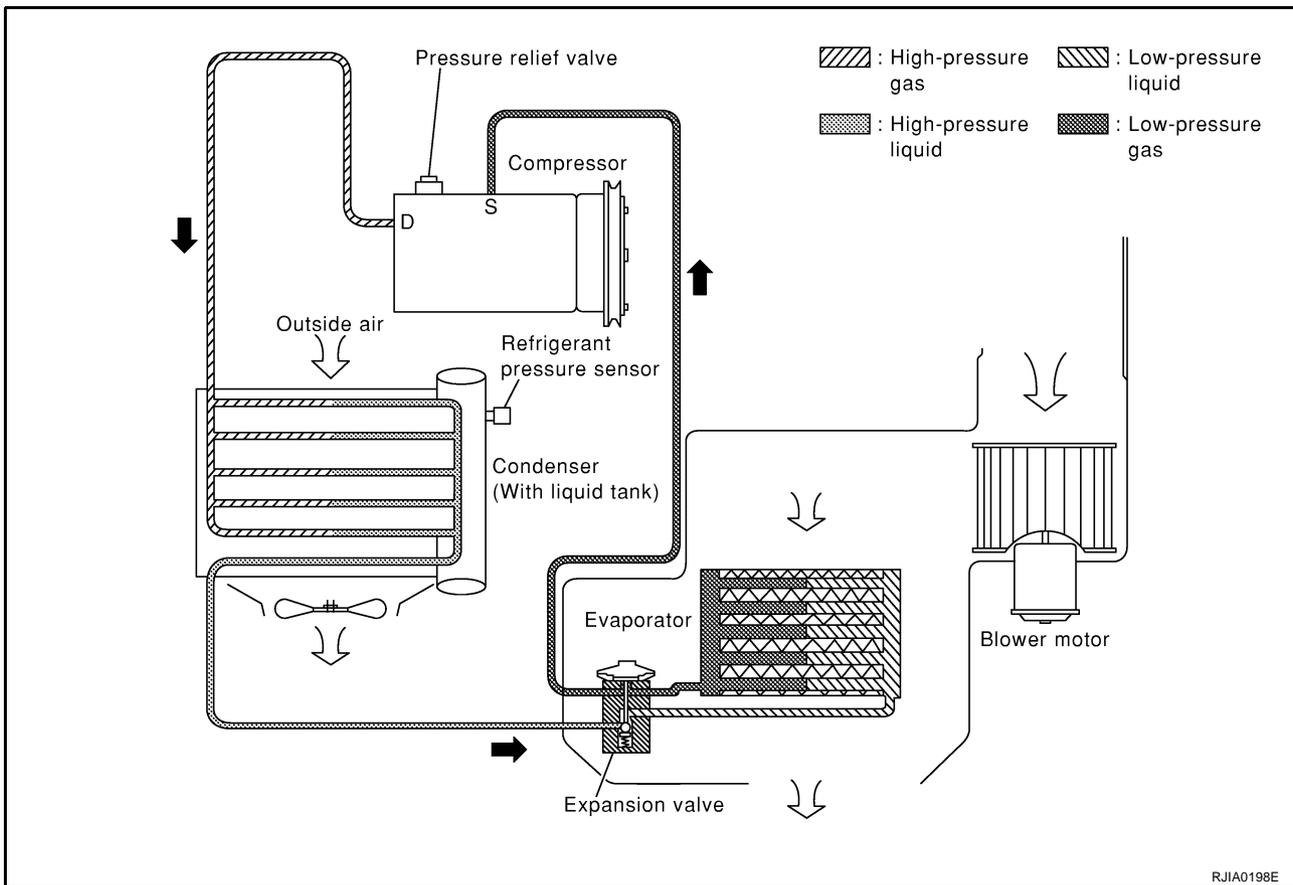
### Refrigerant System Protection REFRIGERANT PRESSURE SENSOR

EJS00095

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the liquid tank. 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 abnormal 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.



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# REFRIGERATION SYSTEM

## V-6 Variable Displacement Compressor

EJS000J9

### GENERAL INFORMATION

1. The V-6 variable compressor differs from previous units. The vent temperatures of the V-6 variable compressor do not drop too far below 5°C (41°F) when:  
Evaporator intake air temperature is less than 20°C (68°F).  
Engine is running at speeds less than 1,500 rpm.  
This is because the V-6 compressor provides a means of "capacity" control.
2. The V-6 variable compressor provides refrigerant control under varying conditions. During cold winters, it may not produce high refrigerant pressure discharge (compared to previous units) when used with air conditioning systems.
3. A "clanking" sound may occasionally be heard during refrigerant charge. The sound indicates that the tilt angle of the swash plate has changed and is not a problem.
4. For air conditioning systems with the V-6 compressor, the clutch remains engaged unless: the system main switch, fan switch or ignition switch is turned OFF. When ambient (outside) temperatures are low or when the amount of refrigerant is insufficient, the clutch is disengaged to protect the compressor.
5. A constant range of suction pressure is maintained when engine speed is greater than a certain value. It normally ranges from 147 to 177 kPa (1.5 to 1.8 kg/cm<sup>2</sup>, 21 to 26 psi) under varying conditions. In previous compressors, however, suction pressure was reduced with increases in engine speed.

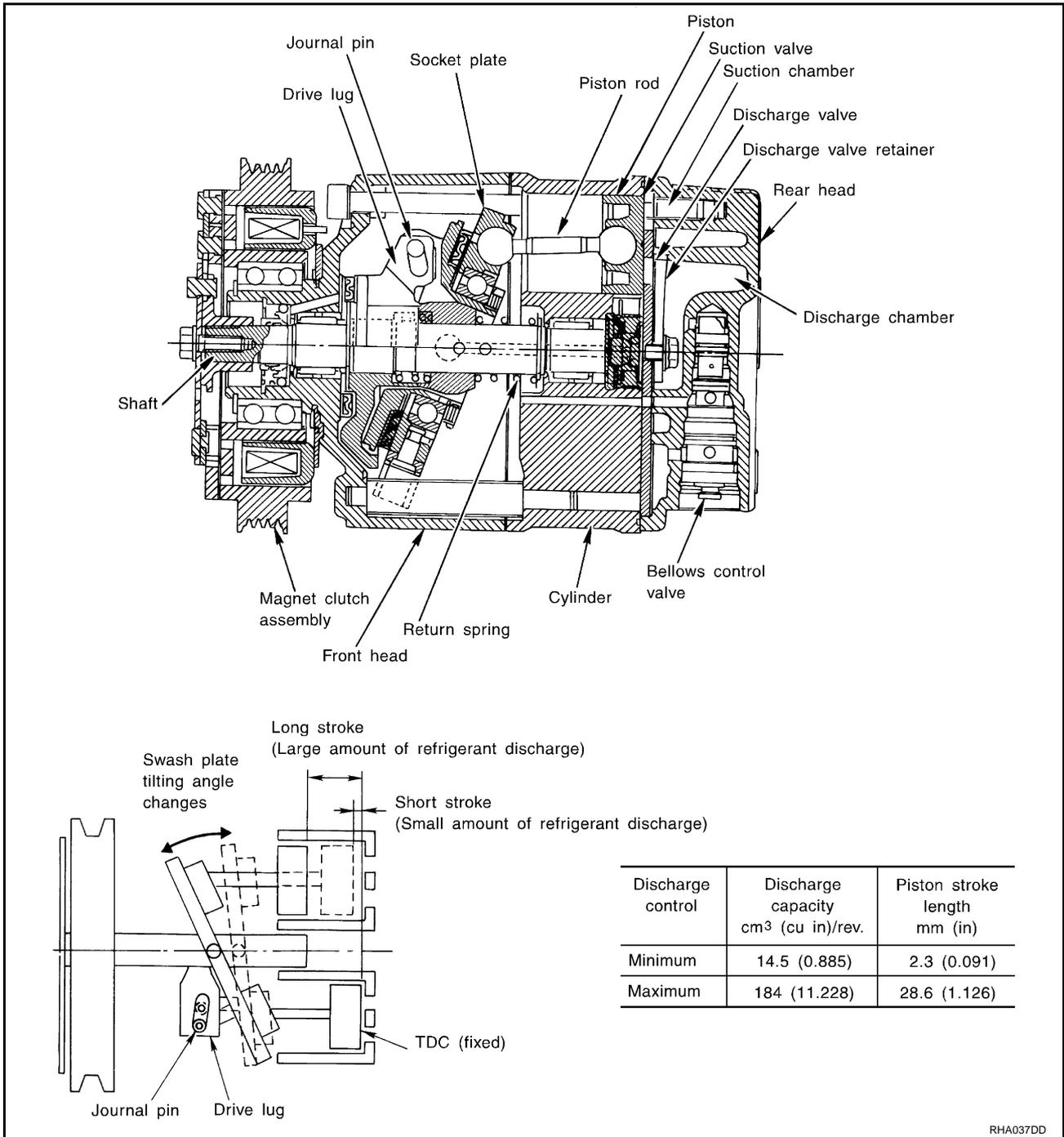
### DESCRIPTION

#### General

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

# REFRIGERATION SYSTEM

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

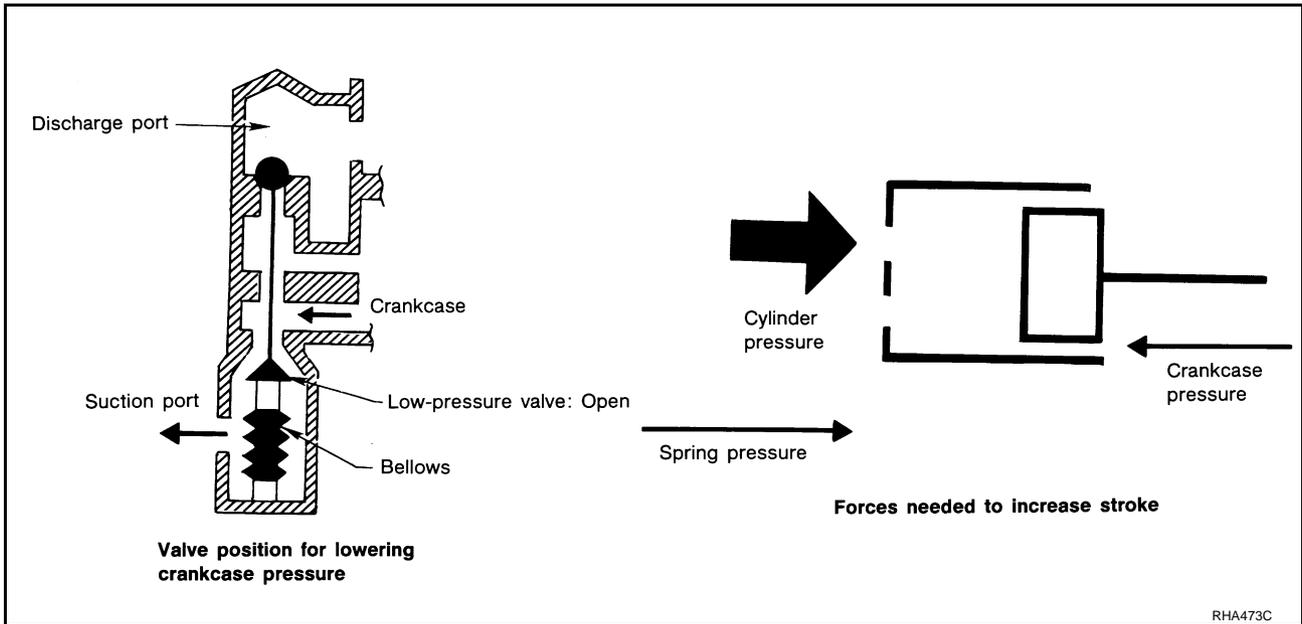


## Operation

- 1. Operation Control Valve**  
 Operation control valve is located in the suction port (low-pressure) side, and opens or closes in response to changes in refrigerant suction pressure.  
 Operation of the valve controls the internal pressure of the crankcase.  
 The angle of the swash plate is controlled between the crankcase's internal pressure and the piston cylinder pressure.
- 2. Maximum Cooling**  
 Refrigerant pressure on the low-pressure side increases with an increase in heat loads.  
 When this occurs, the control valve's bellows compress to open the low-pressure side valve and close the high-pressure side valve.  
 This causes the following pressure changes:

# REFRIGERATION SYSTEM

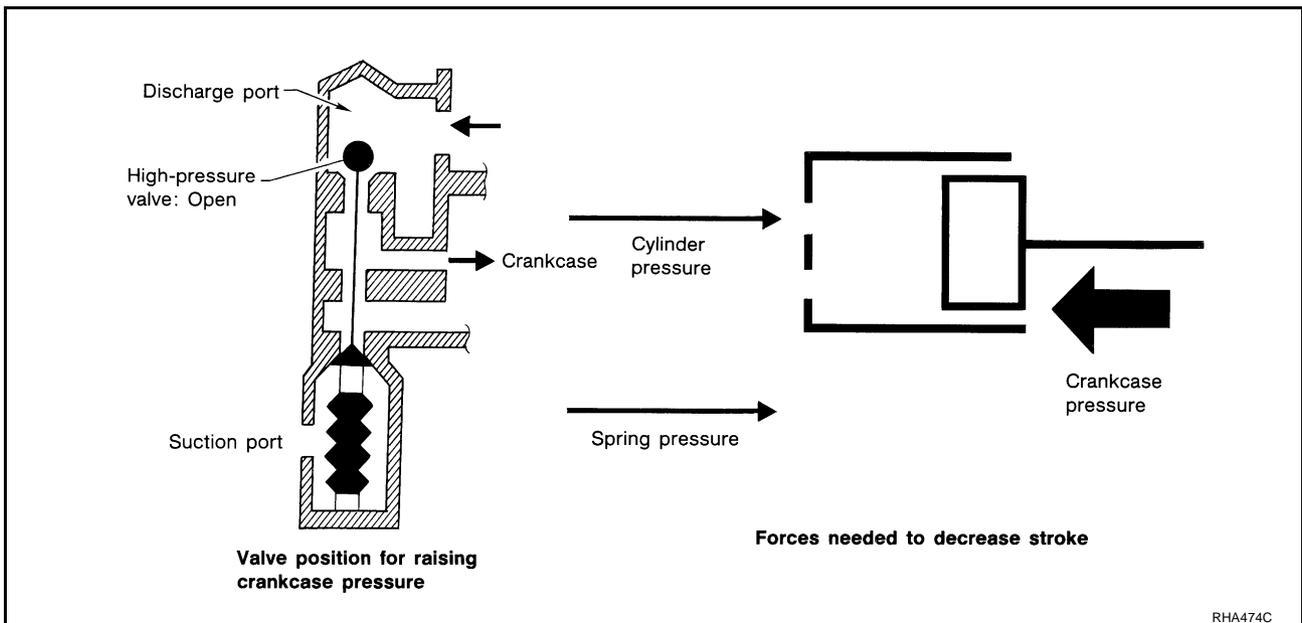
- The crankcase's internal pressure to equal the pressure on the low-pressure side;
  - The cylinder's internal pressure to be greater than the crankcase's internal pressure.
- Under this condition, the swash plate is set to the maximum stroke position.



### 3. Capacity Control

- Refrigerant pressure on suction side is low during high speed driving or when ambient or interior temperature is low.
  - The bellows expands when refrigerant pressure on the suction pressure side drops below approximately 177 kPa (1.8 kg/cm<sup>2</sup>, 26 psi).
- Since suction pressure is low, it makes the suction port close and the discharge port open. Thus, crankcase pressure becomes high as high pressure enters the crankcase.
- The force acts around the journal pin near the swash plate, and is generated by the pressure difference before and behind the piston.

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

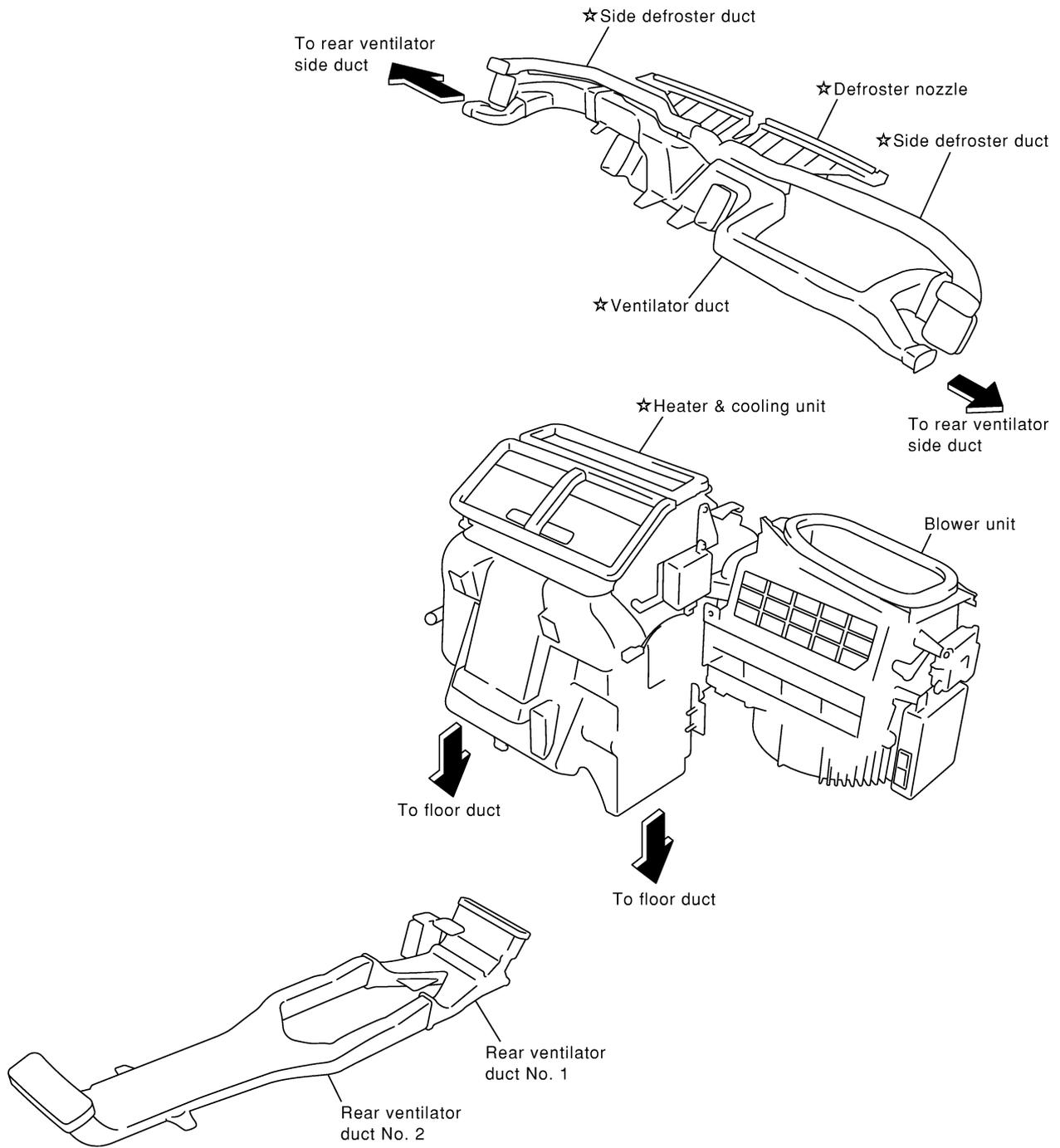


# REFRIGERATION SYSTEM

## Component Layout

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

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# LUBRICANT

## LUBRICANT

PPF:KLG00

### Maintenance of Lubricant Quantity in Compressor

EJS00096

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

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

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

## LUBRICANT

<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.

Yes or No

- Yes >> GO TO 2.  
No >> GO TO 3.

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

---

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

#### **CAUTION:**

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

>> GO TO 3.

#### 3. CHECK COMPRESSOR

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Should the compressor be replaced?

Yes or No

- Yes >> Go to [ATC-23, "LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT"](#).
- No >> GO TO 4.

# LUBRICANT

## 4. CHECK ANY PART

Is there any part to be replaced? (Evaporator, condenser, liquid tank or in case there is evidence of a large amount of lubricant leakage.)

Yes or No

Yes >> Go to [ATC-23, "LUBRICANT ADJUSTING PROCEDURE FOR COMPONENTS REPLACEMENT EXCEPT COMPRESSOR"](#).

No >> Carry out the A/C performance test.

### 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 ml [Liter] (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

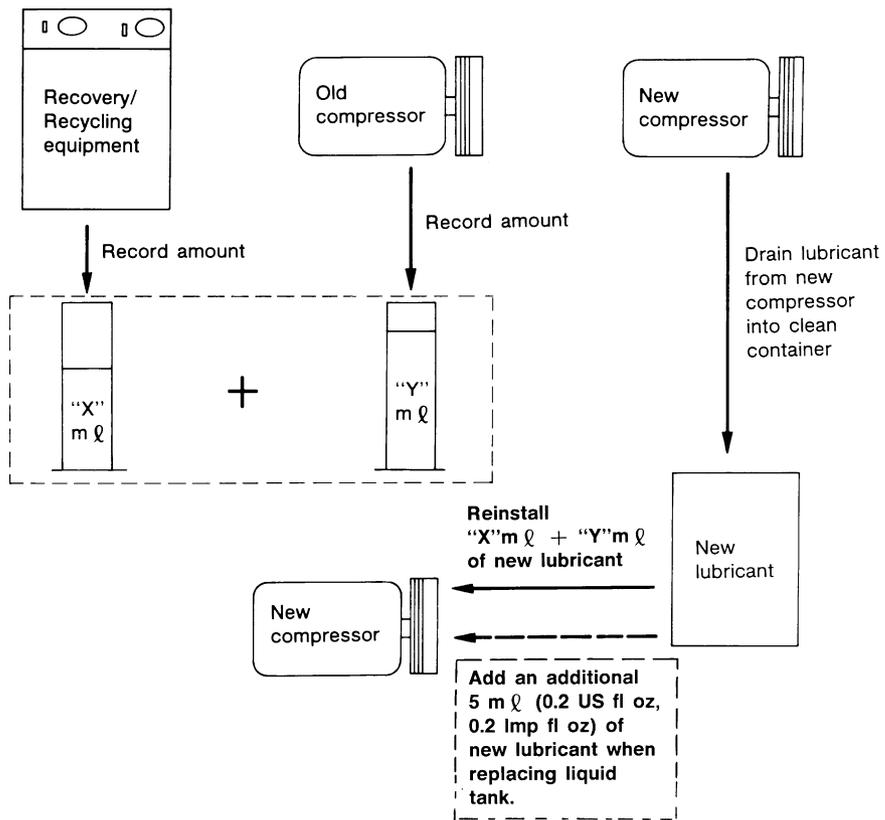
\*1:If refrigerant leak is small, no addition of lubricant is needed.

### LUBRICANT ADJUSTING PROCEDURE FOR COMPRESSOR REPLACEMENT

1. Before connecting ACR4 to vehicle, check ACR4 gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect ACR4 to vehicle. Confirm refrigerant purity in supply tank using ACR4 and refrigerant identifier. If NG, refer to [ATC-4, "CONTAMINATED REFRIGERANT"](#).
3. Confirm refrigerant purity in vehicle A/C system using ACR4 and refrigerant identifier. If NG, refer to [ATC-4, "CONTAMINATED REFRIGERANT"](#).
4. Discharge refrigerant into the refrigerant recovery/recycling equipment. Measure lubricant discharged into the recovery/recycling equipment.
5. Drain the lubricant from the old (removed) compressor into a graduated container and recover the amount of lubricant drained.
6. Drain the lubricant from the new compressor into a separate, clean container.
7. Measure an amount of new lubricant installed equal to amount drained from old compressor. Add this lubricant to new compressor through the suction port opening.
8. Measure an amount of new lubricant equal to the amount recovered during discharging. Add this lubricant to new compressor through the suction port opening.
9. If the liquid tank also needs to be replaced, add an additional 5 ml [Liter] (0.2 US fl oz, 0.2 Imp fl oz) of lubricant at this time.  
Do not add this 5 ml(0.2 US fl oz, 0.2 Imp fl oz) of lubricant if only replacing the compressor.

# LUBRICANT

## Lubricant adjusting procedure for compressor replacement



RHA065DD

# AIR CONDITIONER CONTROL

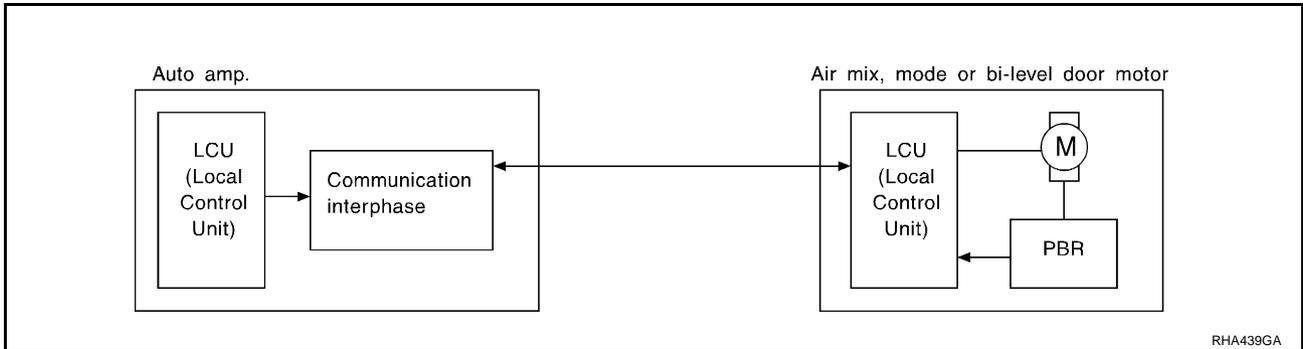
## AIR CONDITIONER CONTROL

PFP:27500

### Overview Air Conditioner LAN Control System

EJS00097

The LAN 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

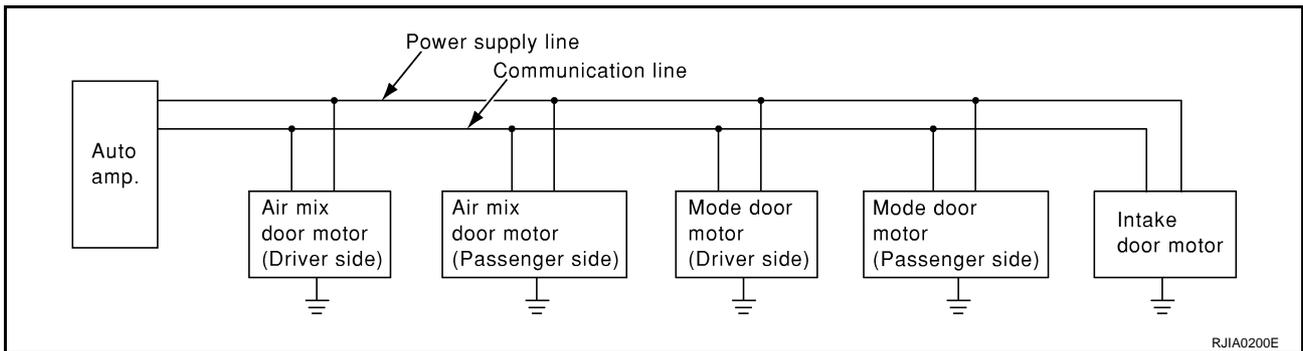
EJS00098

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

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

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

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



### OPERATION

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

A  
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ATC



# AIR CONDITIONER CONTROL

## FAN SPEED CONTROL

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

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

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

## INTAKE DOOR CONTROL

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

## OUTLET DOOR CONTROL

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

## MAGNET CLUTCH CONTROL

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

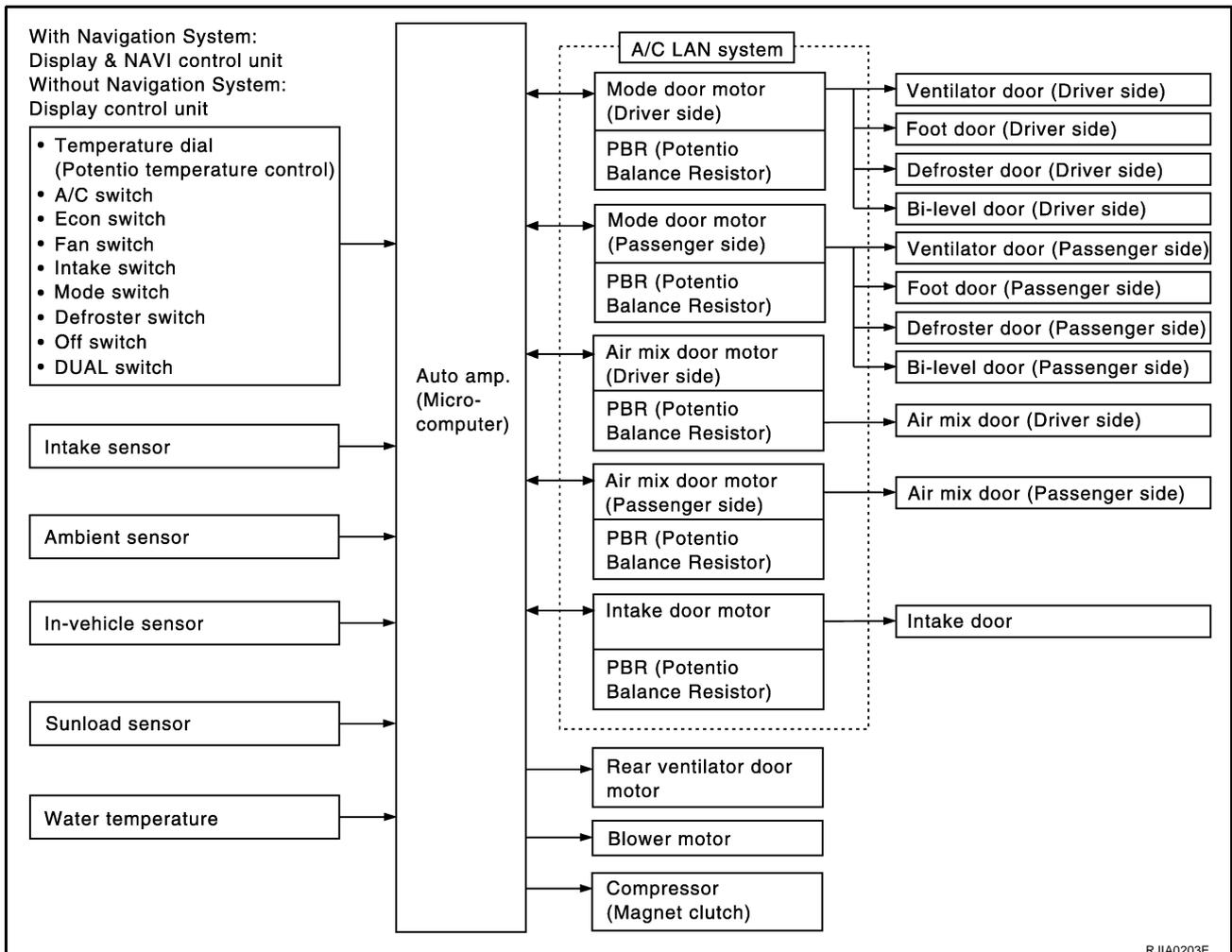
## SELF-DIAGNOSTIC SYSTEM

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

## Overview of Control System

EJS000JB

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

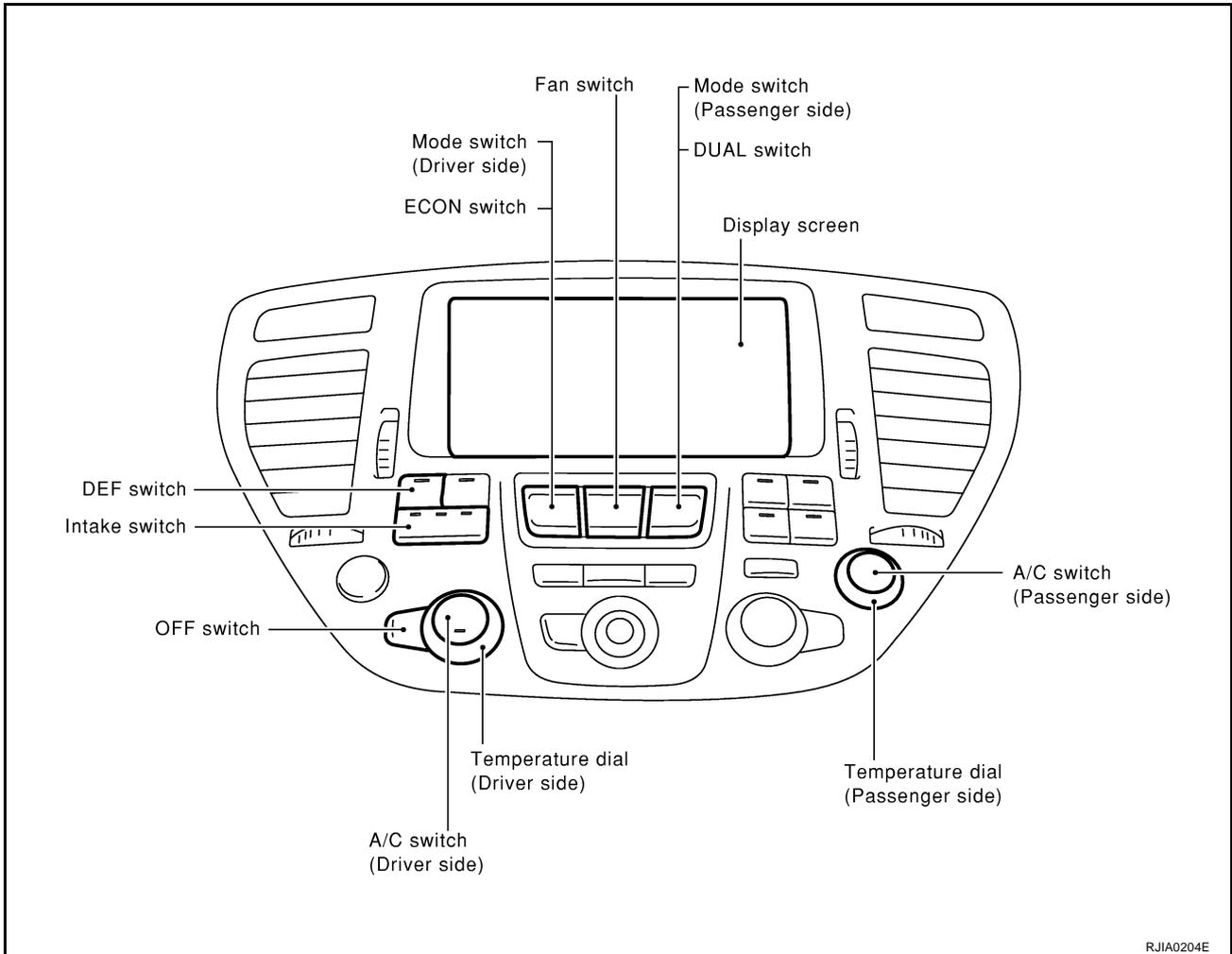


ATC

# AIR CONDITIONER CONTROL

## Control Operation

EJS000JC



### DISPLAY SCREEN

Displays the operational status of the system.

### A/C 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 A/C 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 A/C switch changes to auto-control for the driver side only.

### A/C 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 A/C 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 A/C 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 adjustment 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.

A

## DEFROSTER (DEF) SWITCH

Positions the air outlet doors to the defrost position. Also positions 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 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 the temperature is above the ambient (outside) temperature. The system will set the intake doors to the outside air position.

F

G

## FAN SWITCH

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

H

## 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 is applied to both sides.

I

ATC

K

L

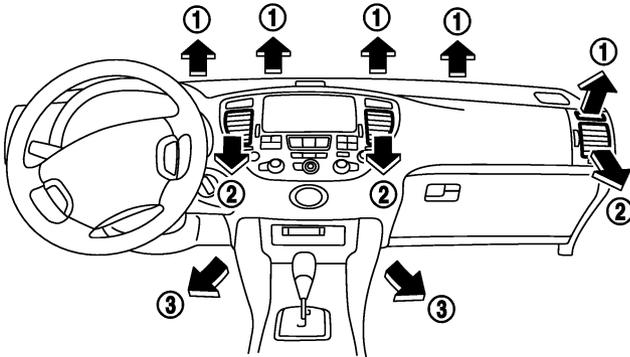
M

# AIR CONDITIONER CONTROL

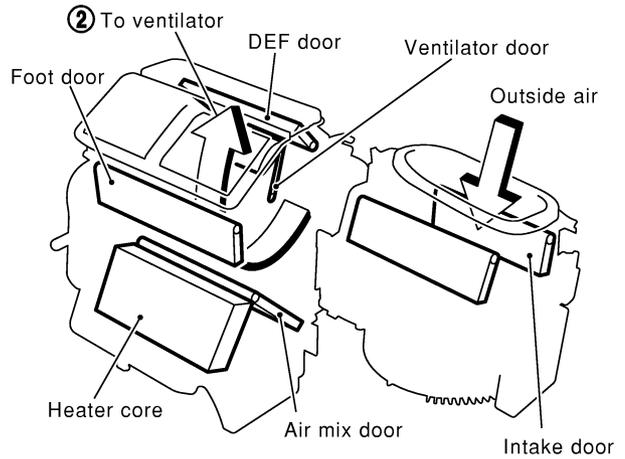
EJS000JD

## Discharge Air Flow

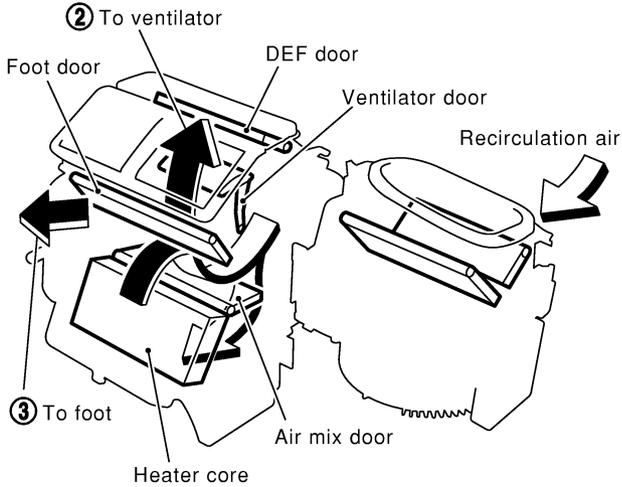
① : Defroster    ② : Ventilation    ③ : Foot



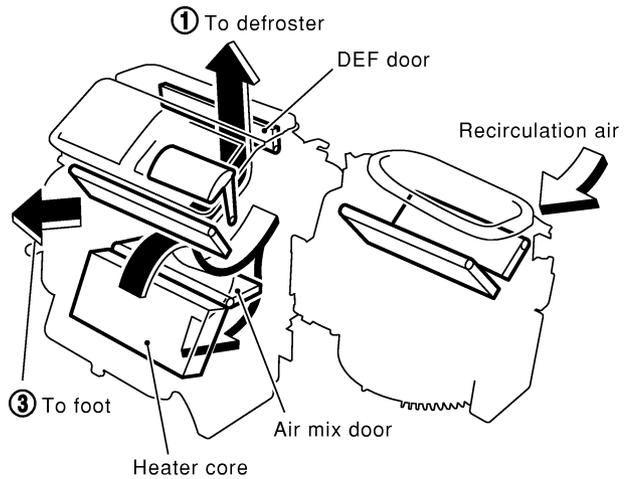
### Ventilation



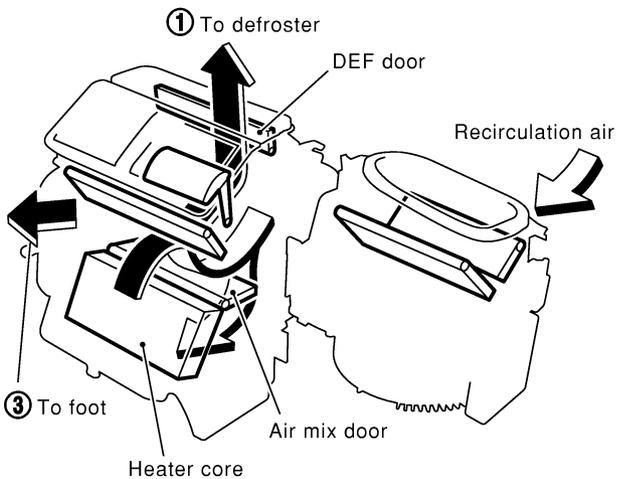
### Bi-level



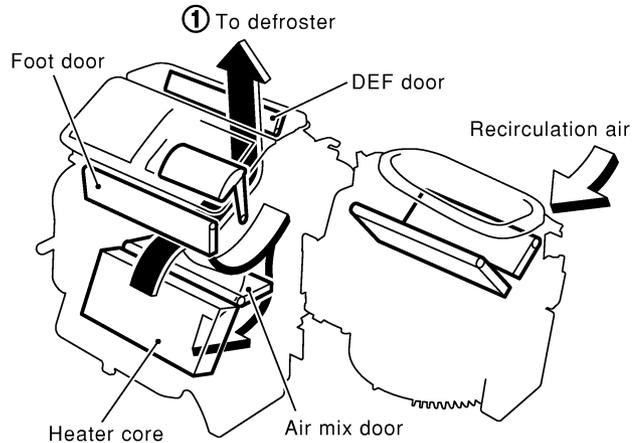
### Foot



### Defroster and foot



### Defroster

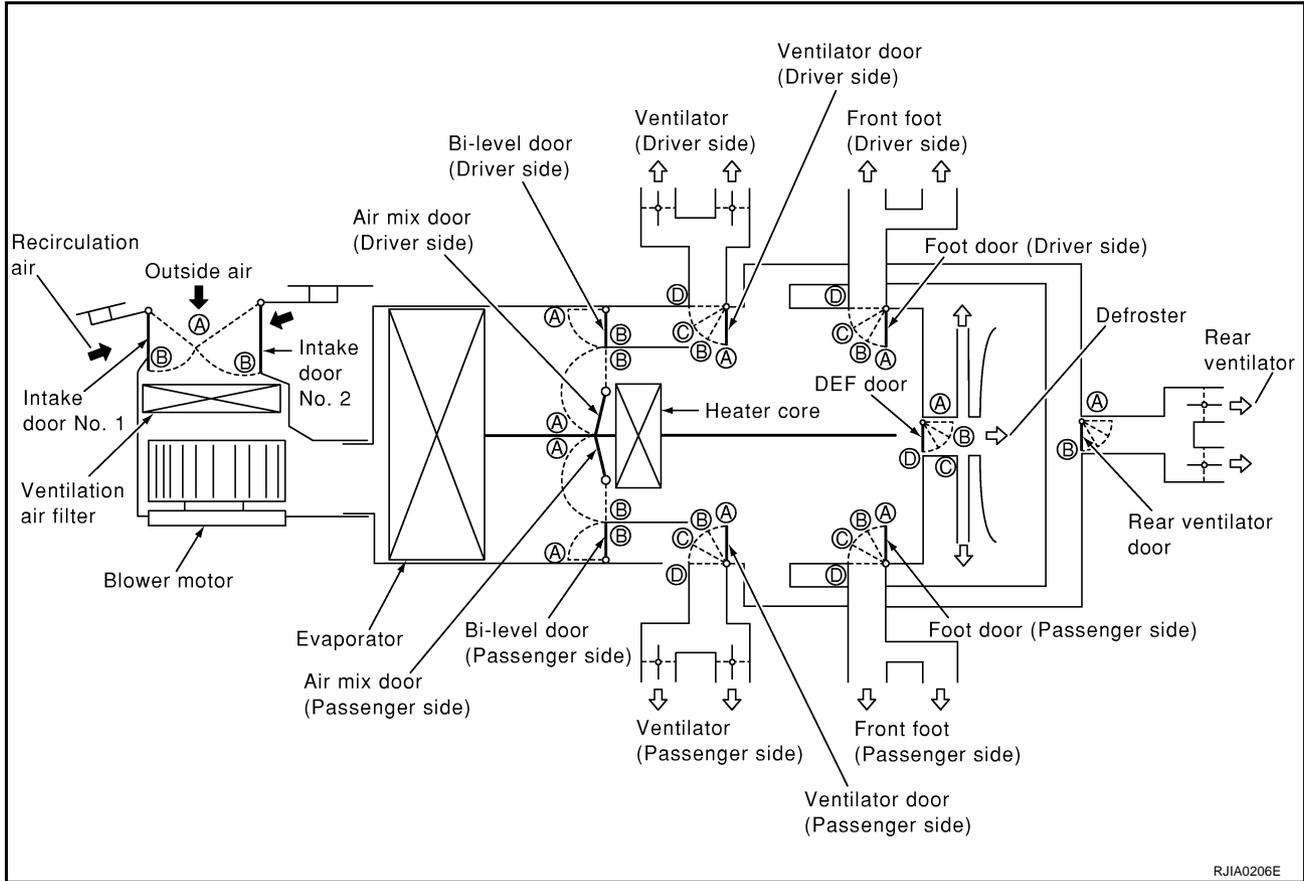


RJIA0205E

# AIR CONDITIONER CONTROL

## System Description SWITCHES AND THEIR CONTROL FUNCTION

EJS000JE



RJIA0206E

A  
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ATC

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Position or switch	DUAL SW		MODE SW					DEF SW		A/C SW (Driver side)	A/C SW (Passenger side)	Intake SW			Rear control 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			ON	AUTO	ON	ON	OFF							
																	18°C	~	32°C	18°C	~	32°C	
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) *3	AUTO	(B)	(B)	(B)	(B)	(B)														(B)
Rear VENT door	-							(B)	-						(A)	(B)							
Intake door	-							(B)	-			(A)	AUTO	(B)									(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).

RJIA0207E

# TROUBLE DIAGNOSIS

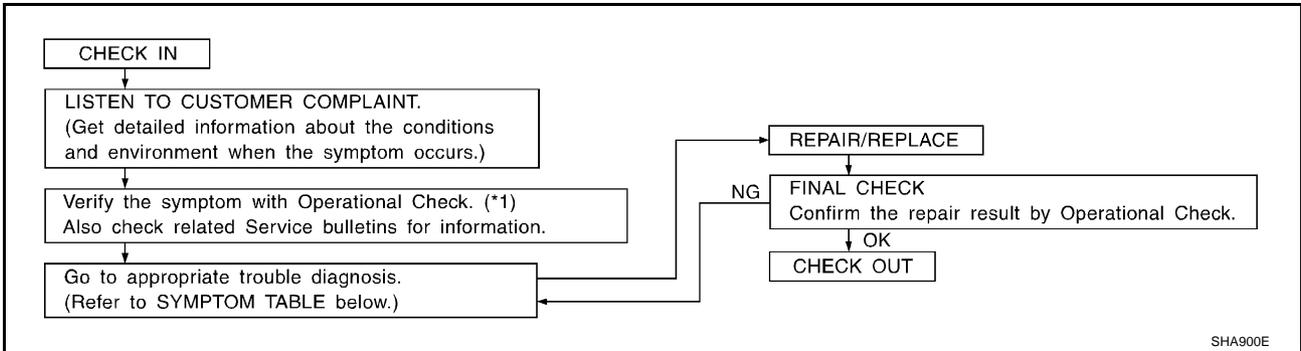
## TROUBLE DIAGNOSIS

PFP:00004

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

EJS000JF

\*1:Operational Check [ATC-57](#)



### SYMPTOM TABLE

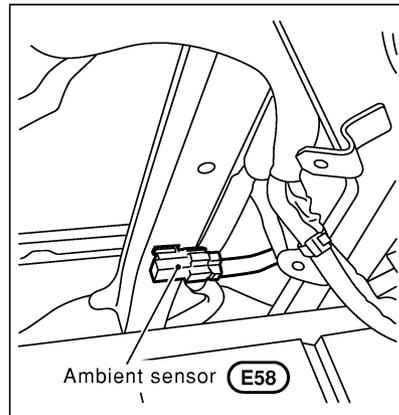
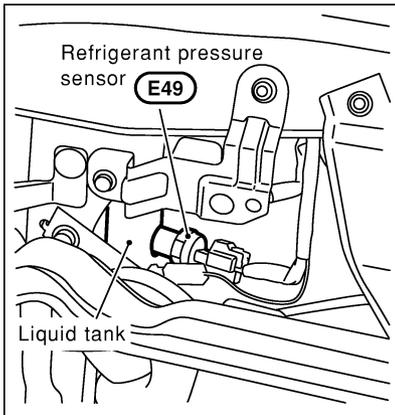
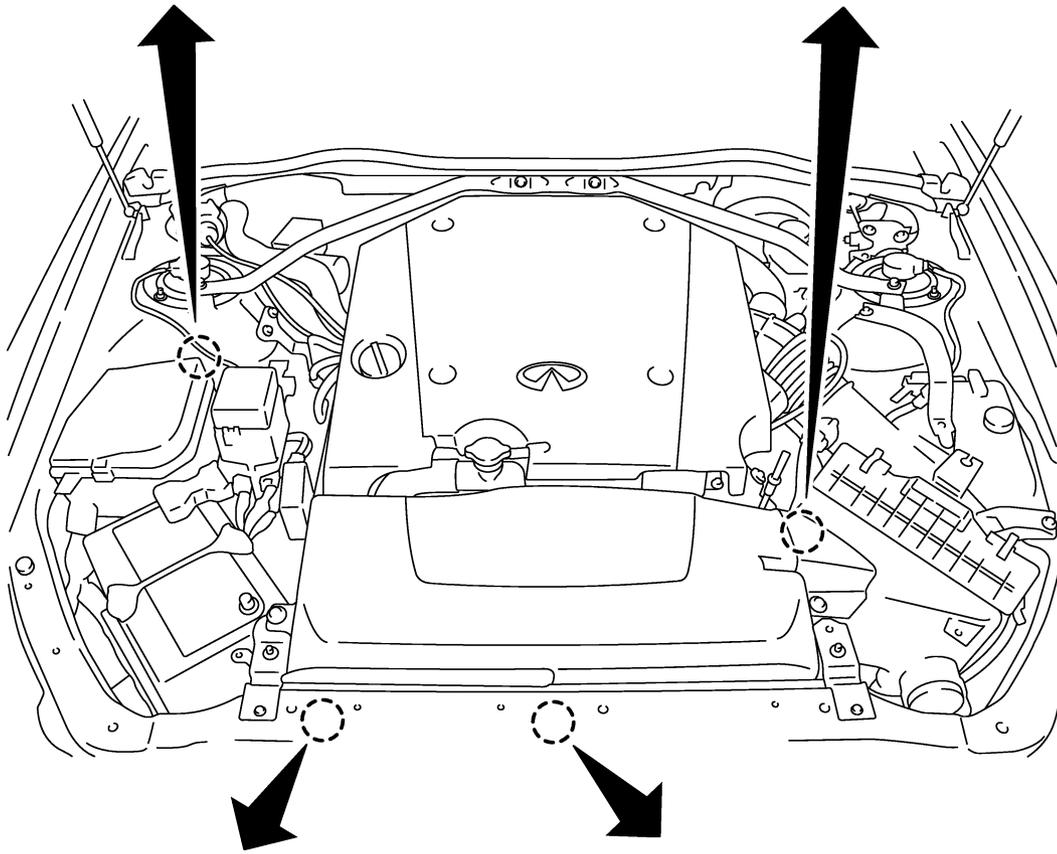
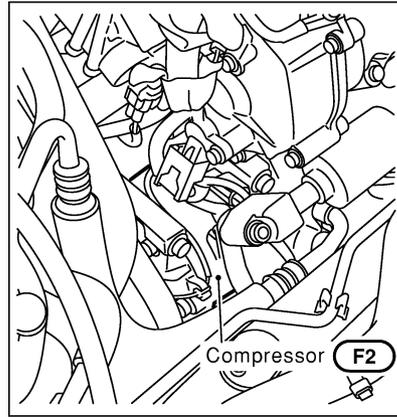
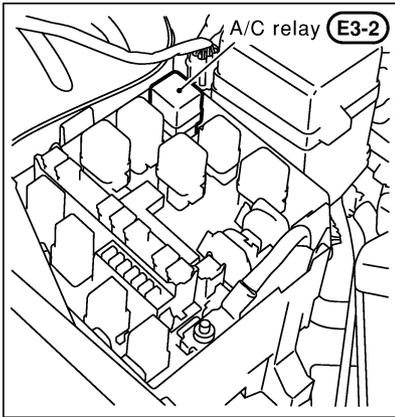
Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C system. <a href="#">ATC-59</a>
A/C system cannot be controlled.	Go to Trouble Diagnosis Procedure for Multiple communication circuit. <a href="#">ATC-61</a>
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. (LAN) <a href="#">ATC-62</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</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</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</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-81</a>
Insufficient cooling.	Go to Trouble Diagnosis Procedure for Insufficient Cooling. <a href="#">ATC-86</a>
Insufficient heating.	Go to Trouble Diagnosis Procedure for Insufficient Heating. <a href="#">ATC-93</a>
Noise.	Go to Trouble Diagnosis Procedure for Noise. <a href="#">ATC-95</a>
Self-diagnosis can not be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis. <a href="#">ATC-96</a>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function. <a href="#">ATC-97</a>
ECON mode does not operate.	Go to Trouble Diagnosis Procedure for ECON (ECONOMY) - mode. <a href="#">ATC-98</a>

# TROUBLE DIAGNOSIS

## Component Parts and Harness Connector Location ENGINE COMPARTMENT

EJS000JG

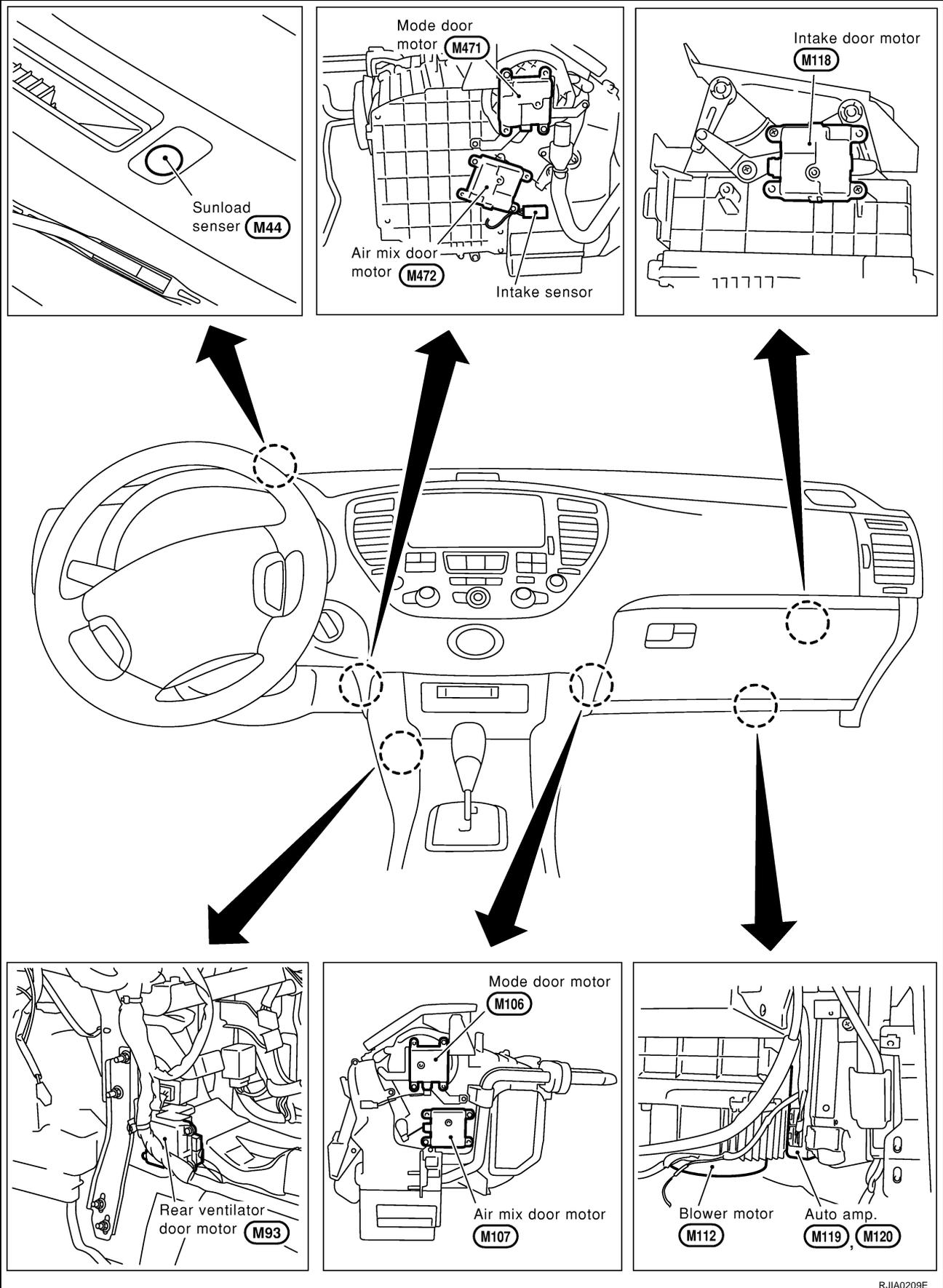
A  
B  
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I  
ATC  
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L  
M



RJIA0208E

# TROUBLE DIAGNOSIS

## PASSENGER COMPARTMENT

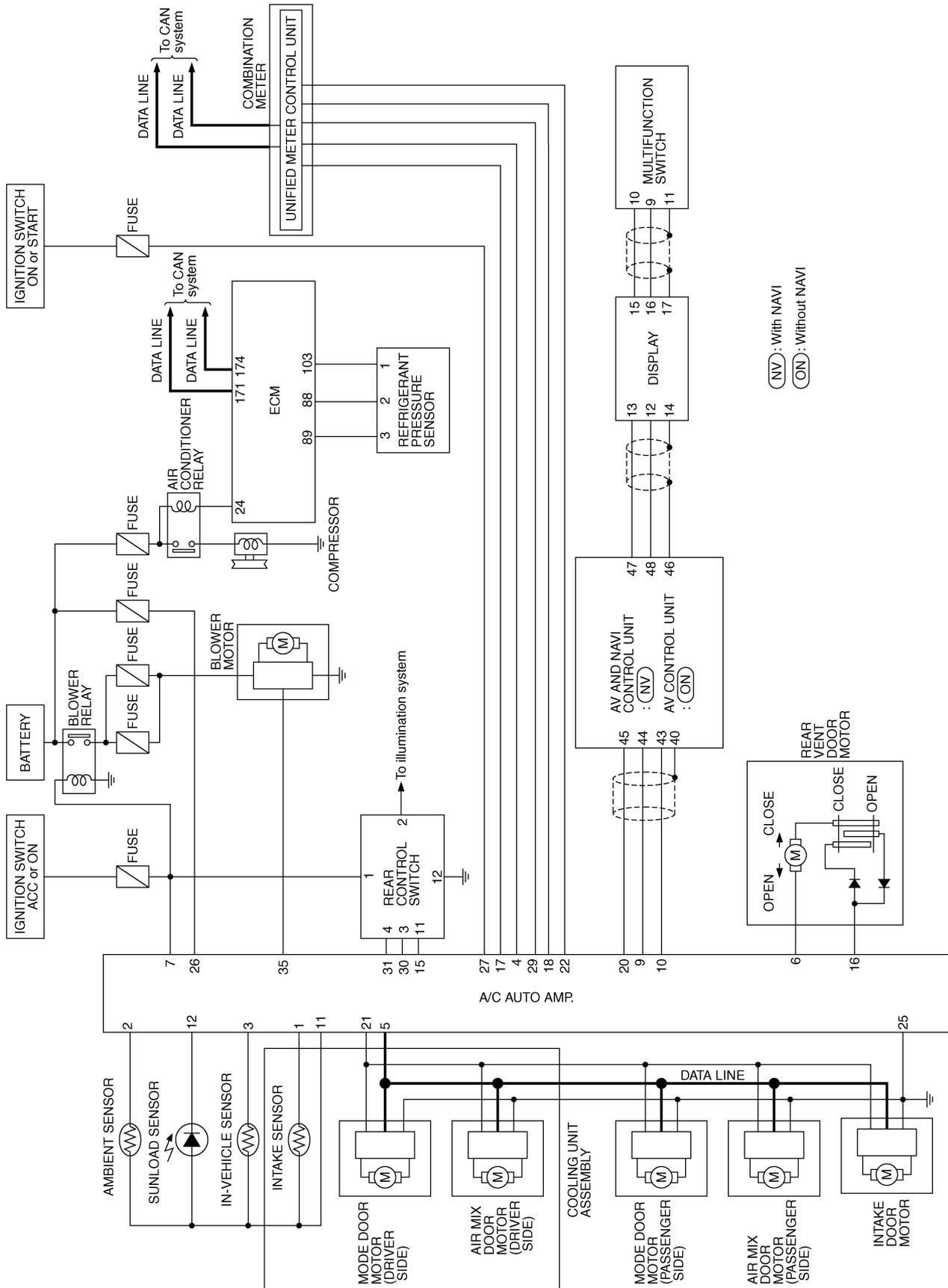


RJIA0209E

# TROUBLE DIAGNOSIS

## Circuit Diagram

EJS000JH



TJWM0001E

A  
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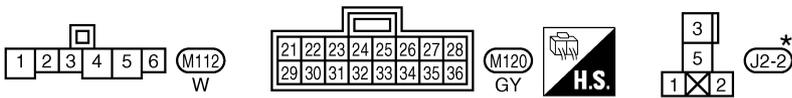
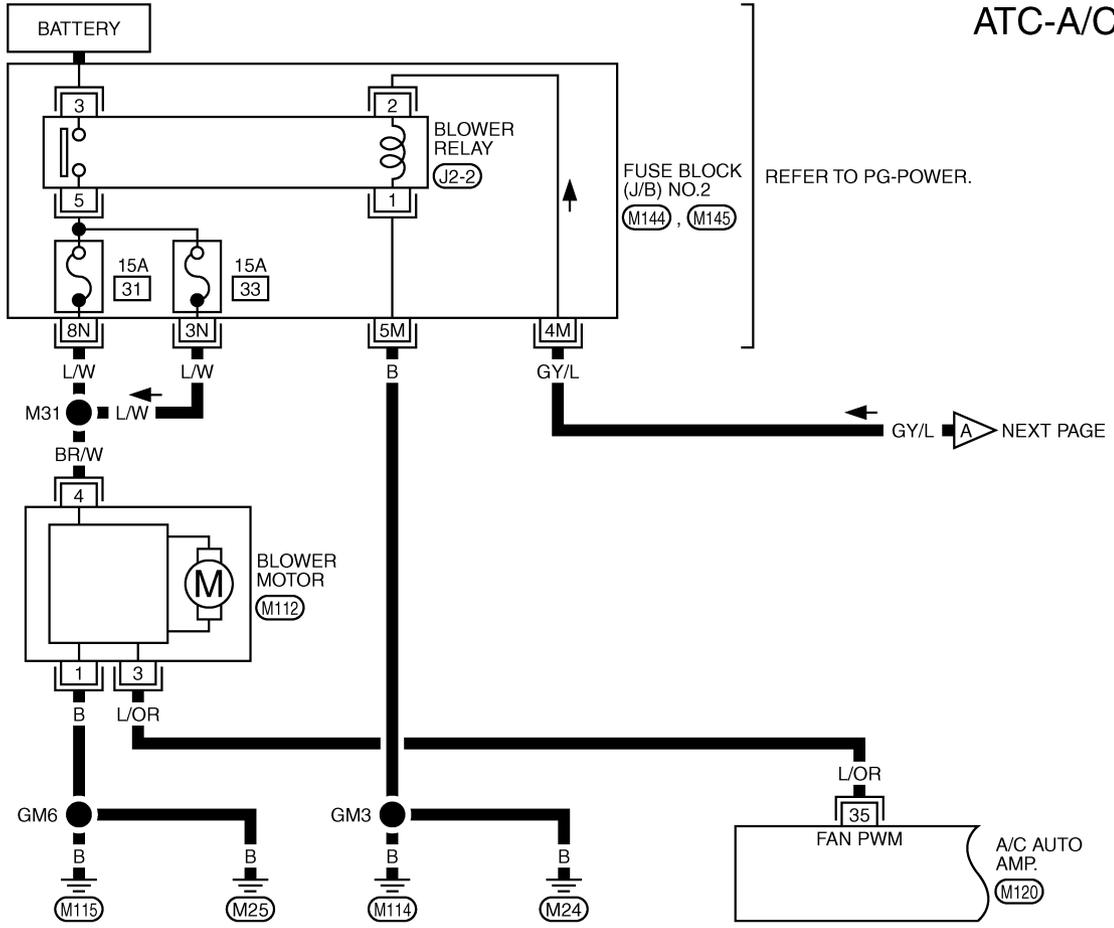
ATC

# TROUBLE DIAGNOSIS

## Wiring Diagram —A/C—

EJS000JI

### ATC-A/C-01



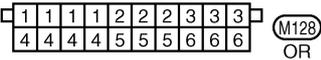
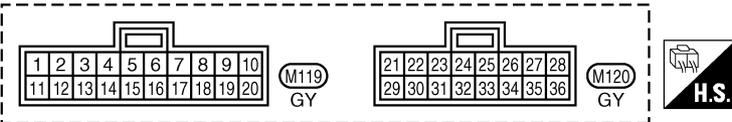
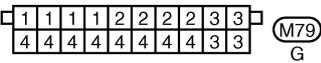
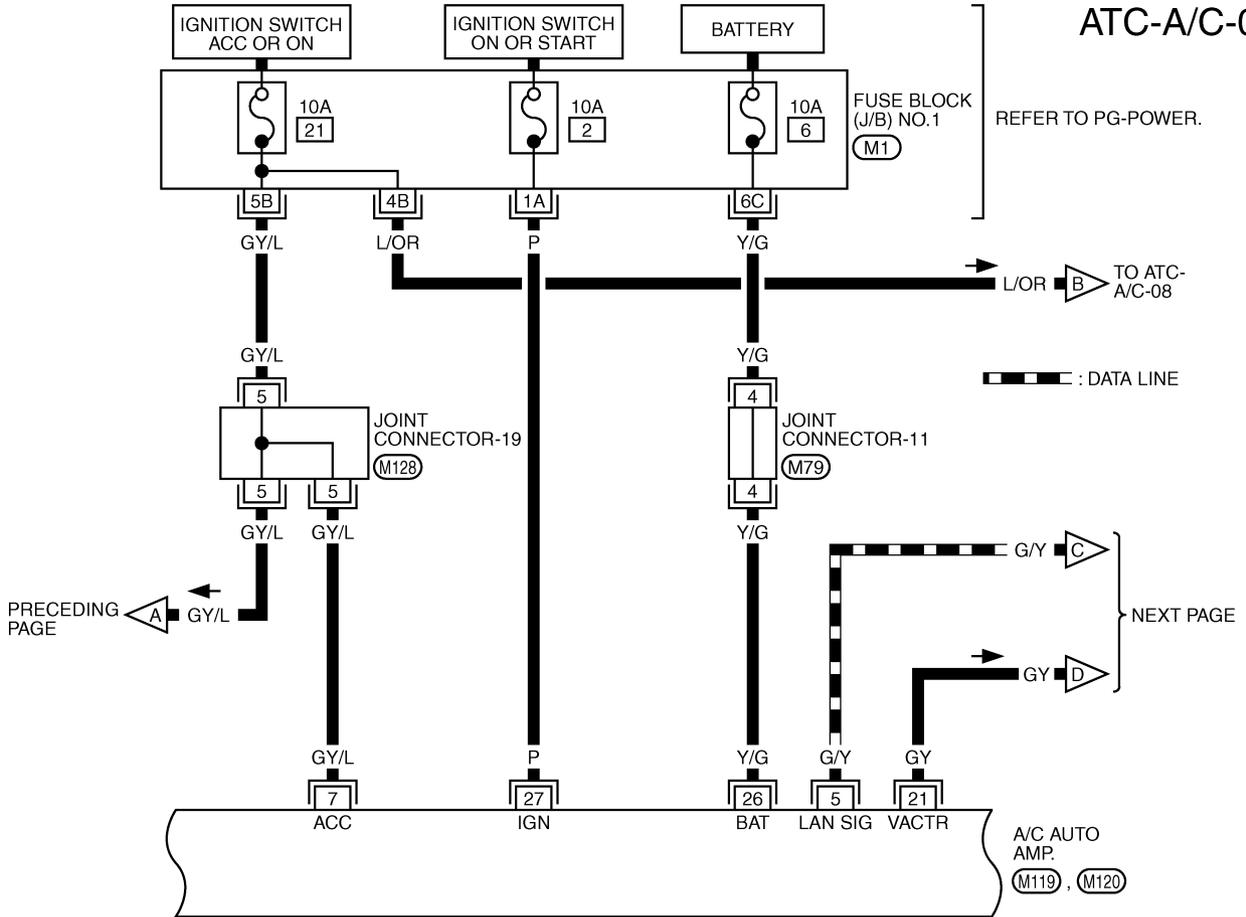
REFER TO THE FOLLOWING.  
 (M144), (M145) - FUSE BLOCK-  
 JUNCTION-BOX (J/B) NO.2

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

TJWM0002E

# TROUBLE DIAGNOSIS

ATC-A/C-02



REFER TO THE FOLLOWING.

(M1) - FUSE BLOCK-JUNCTION BOX (J/B) NO.1

ATC

K

L

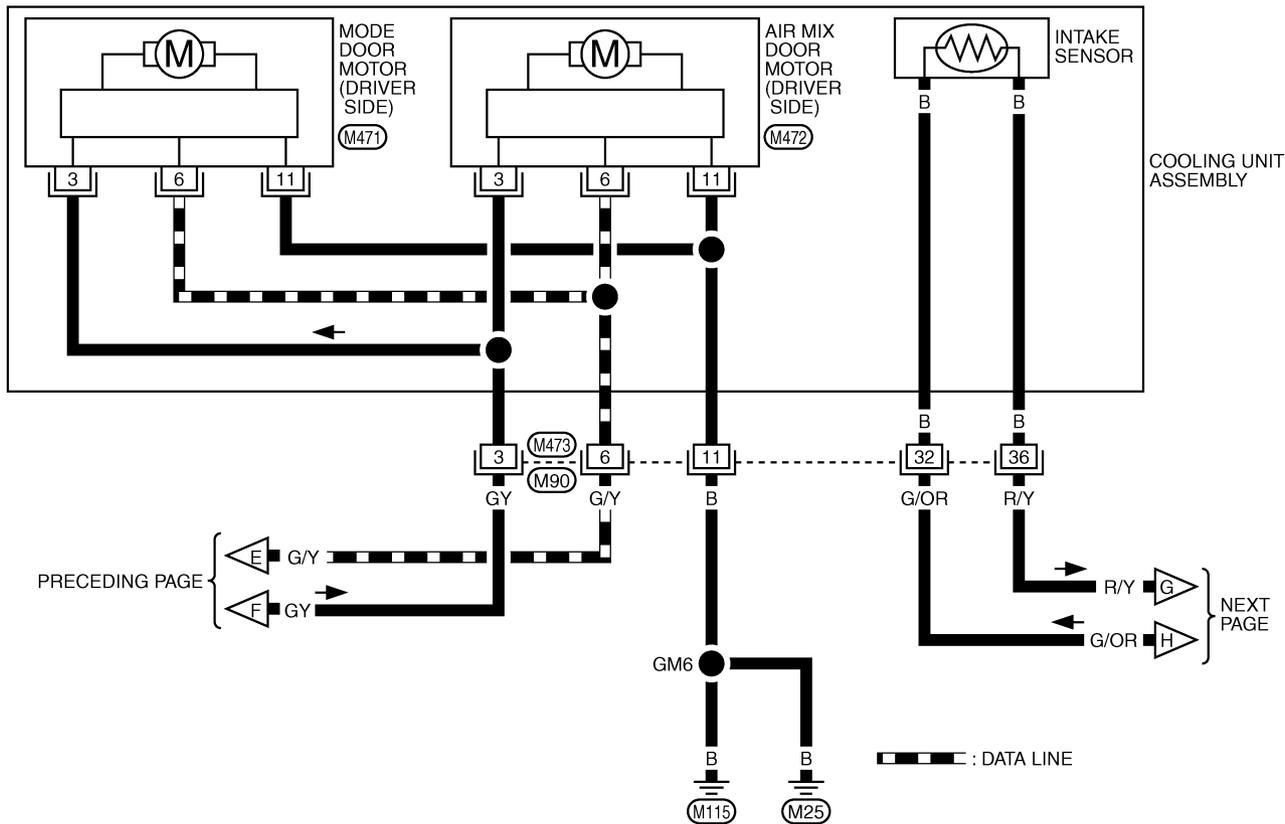
M

TJWM0003E

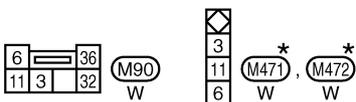


# TROUBLE DIAGNOSIS

ATC-A/C-04



A  
B  
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D  
E  
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I



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

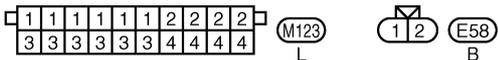
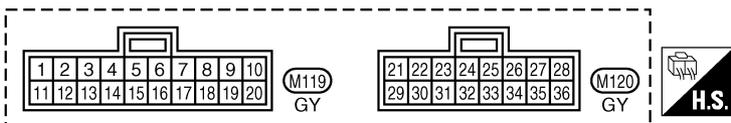
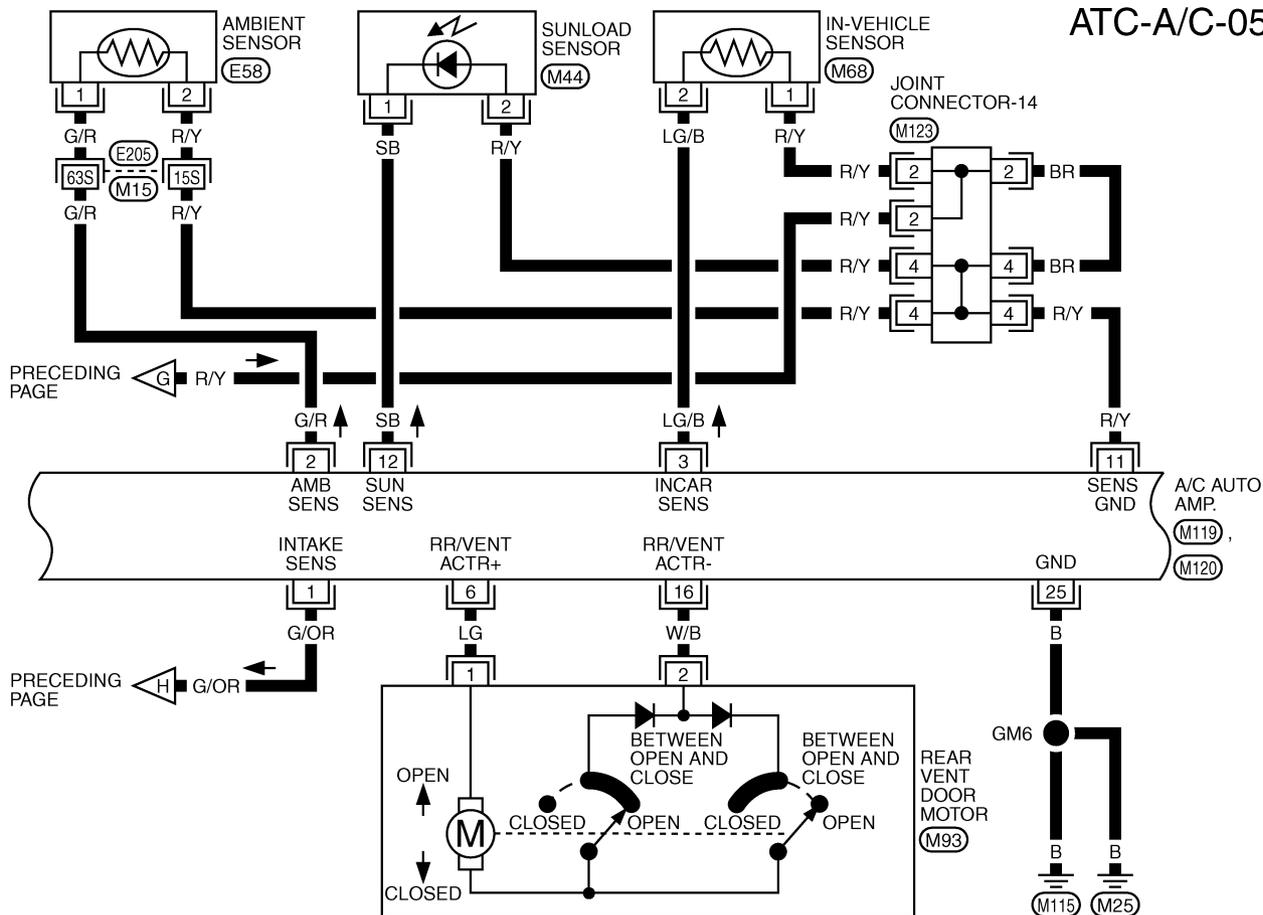
ATC

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TJWM0005E

# TROUBLE DIAGNOSIS

ATC-A/C-05



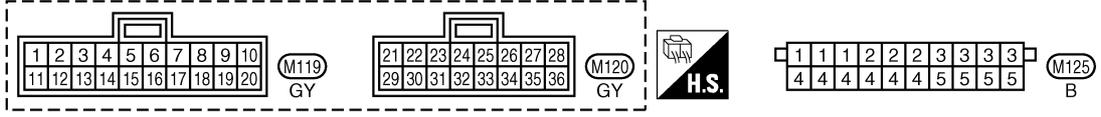
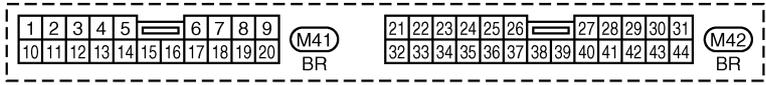
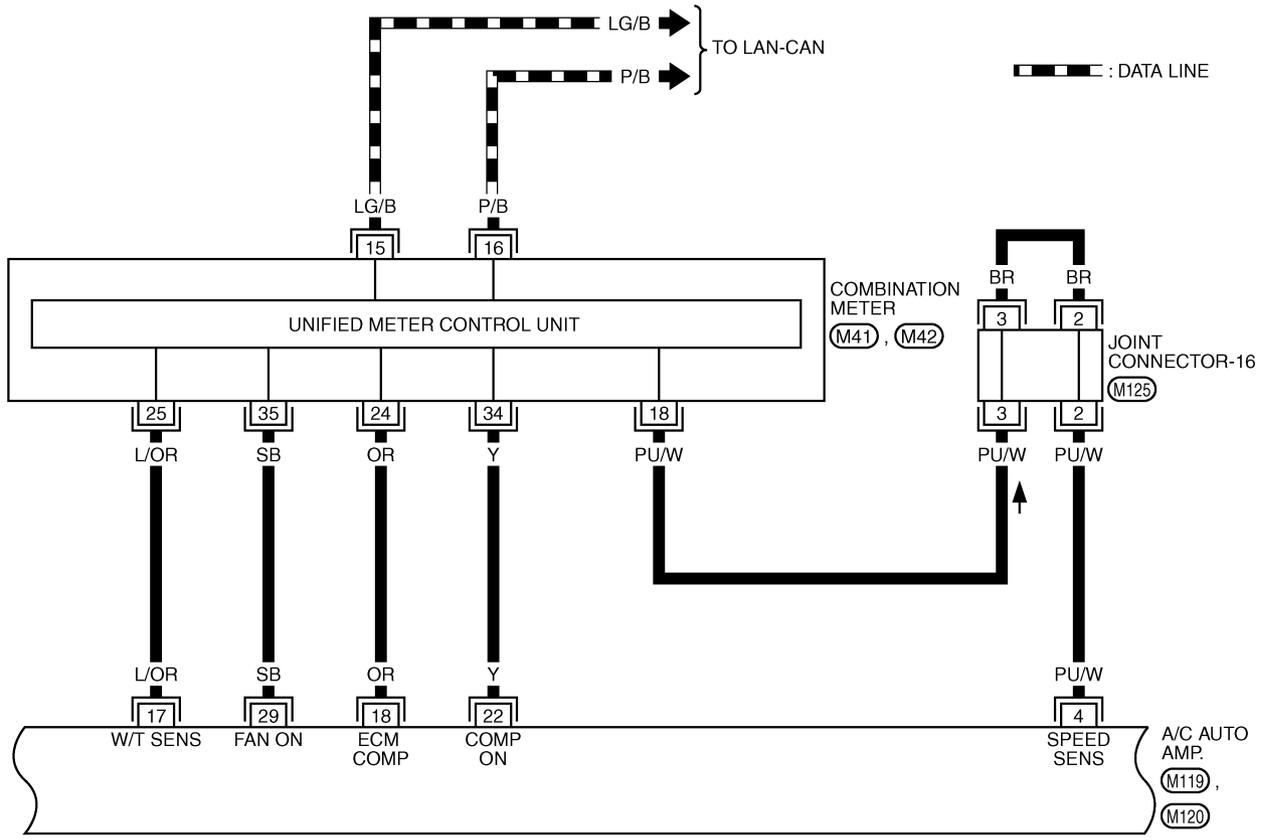
REFER TO THE FOLLOWING.  
 (E205) -SUPER MULTIPLE JUNCTION (SMJ)

TJWM0006E

# TROUBLE DIAGNOSIS

ATC-A/C-06

A  
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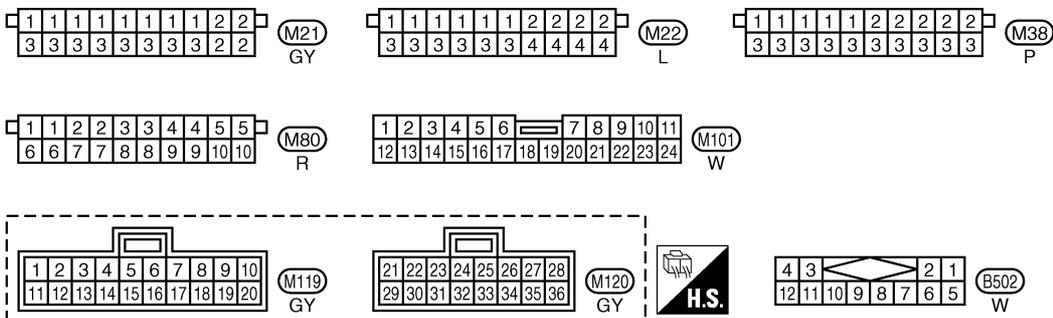
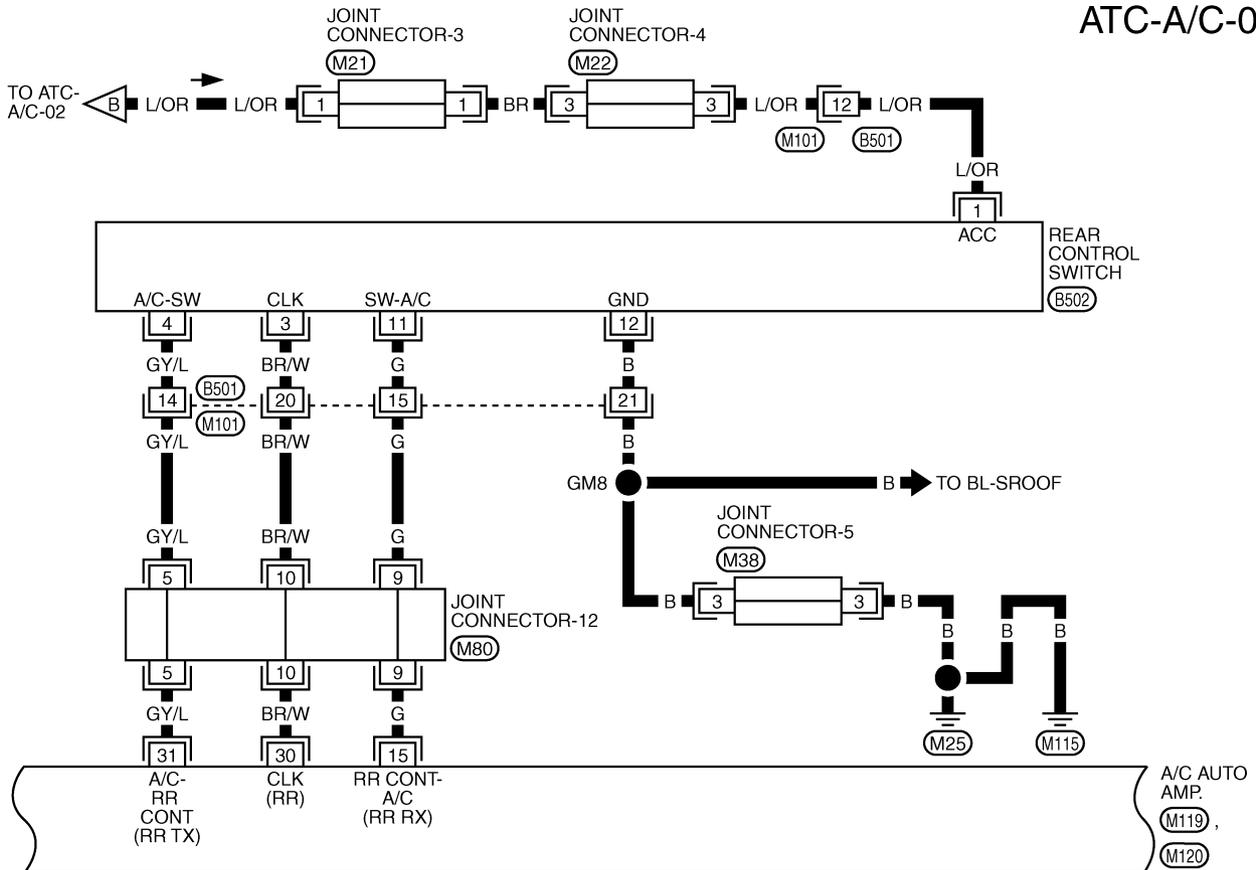


TJWM0007E



# TROUBLE DIAGNOSIS

ATC-A/C-08

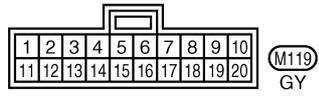
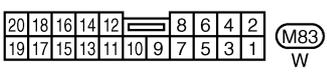
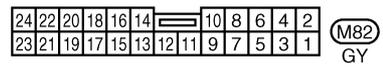
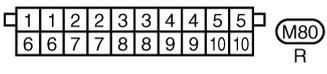
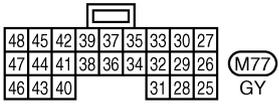
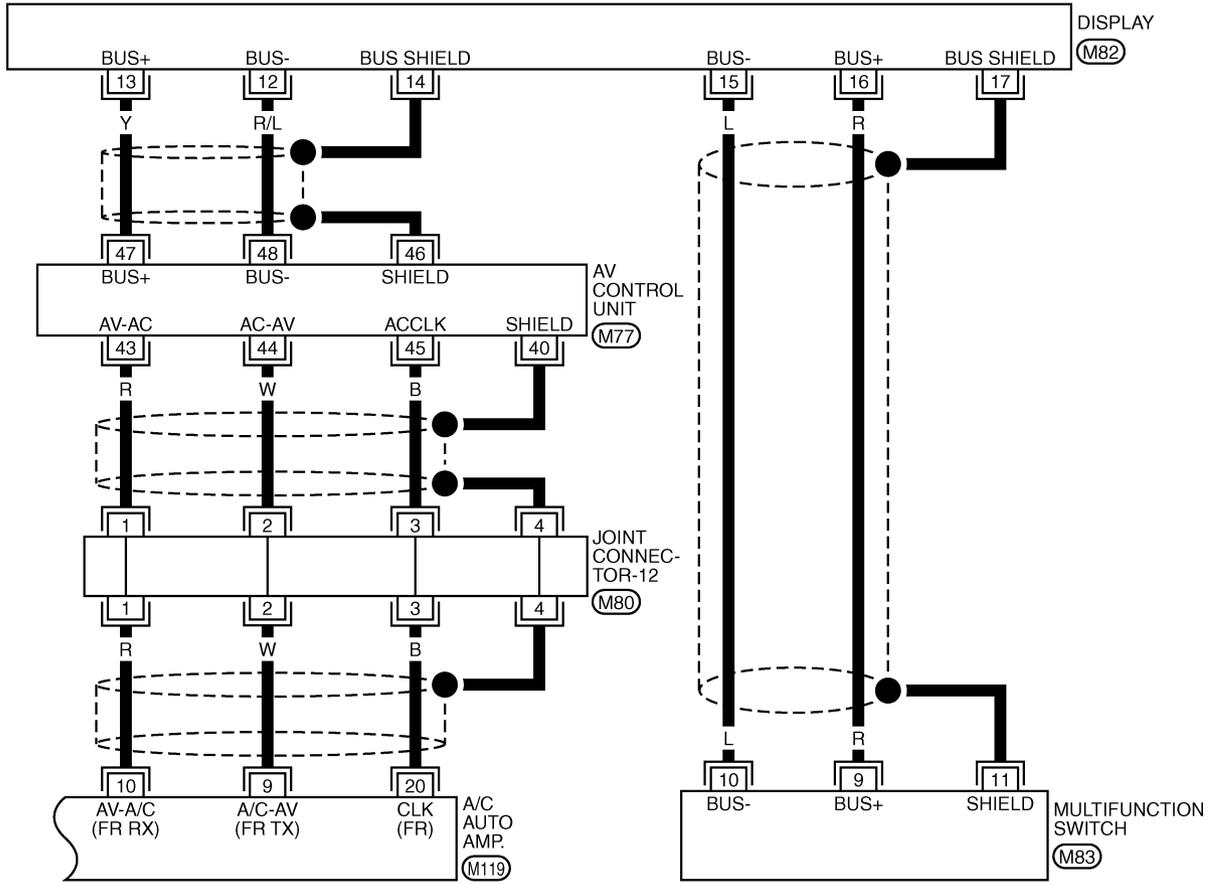


TJWM0009E

TERMI-NAL	WIRE COLOR	ITEM	CONDITION	DATA (DC)
24	G/W	AIR CONDITIONER RELAY	A/C SWITCH "ON" (COMPRESSOR IS OPERATING) (ENGINE RUNNING)	0 - 1.0V
			A/C SWITCH "OFF" (ENGINE RUNNING)	BATTERY VOLTAGE
88	P	REFRIGERANT PRESSURE SENSOR	A/C SWITCH "ON" (ENGINE RUNNING, WARM-UP CONDITION, COMPRESSOR OPERATES)	0.36 - 3.88V
89	B	ECM GROUND	IDLE SPEED (ENGINE RUNNING)	1V OR LESS
103	L	SENSOR POWER SUPPLY	(IGNITION SWITCH "ON")	APPROX. 5.0V

# TROUBLE DIAGNOSIS

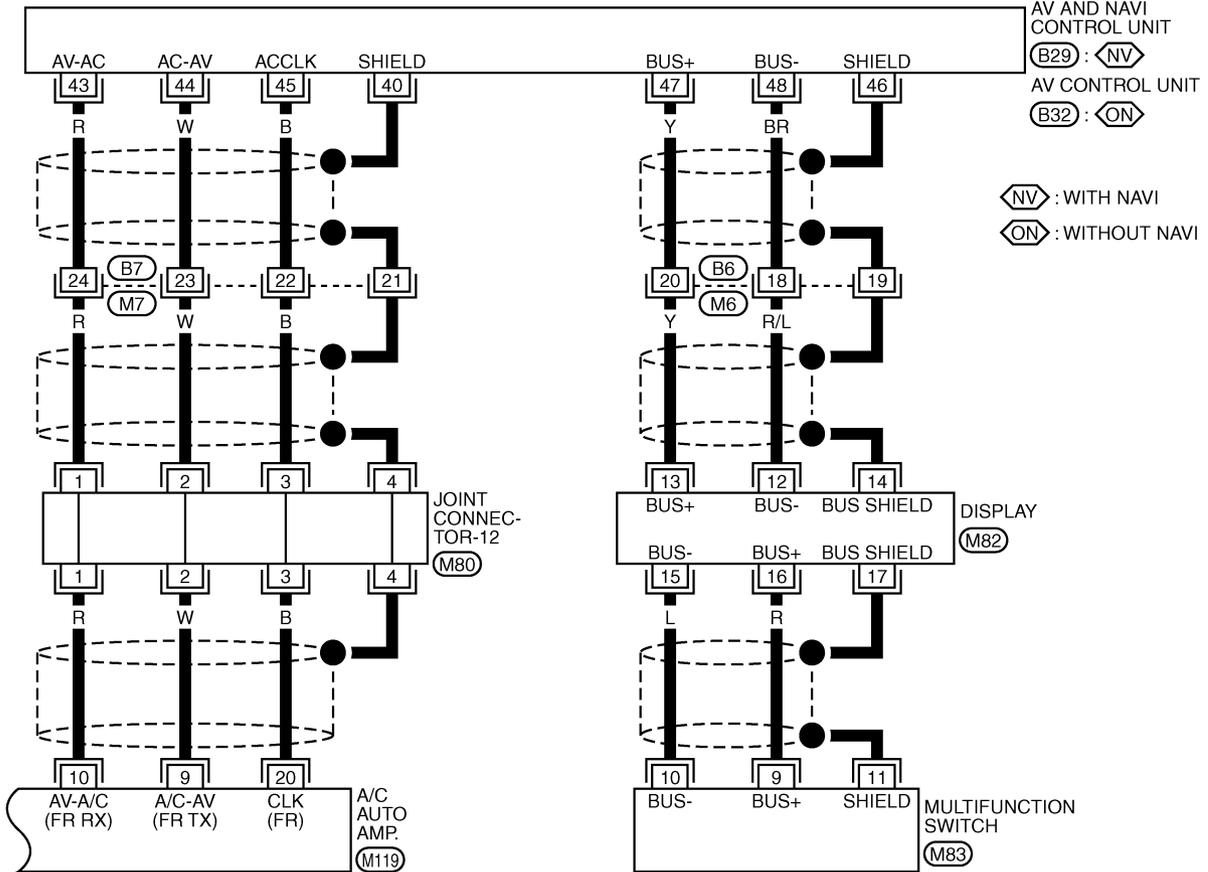
ATC-A/C-09



TJWM0010E

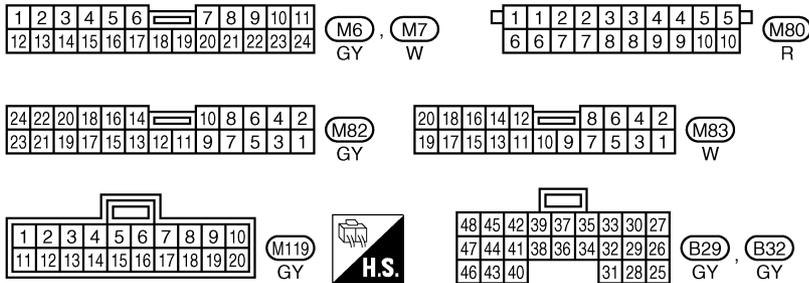
# TROUBLE DIAGNOSIS

## ATC-A/C-10



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ATC

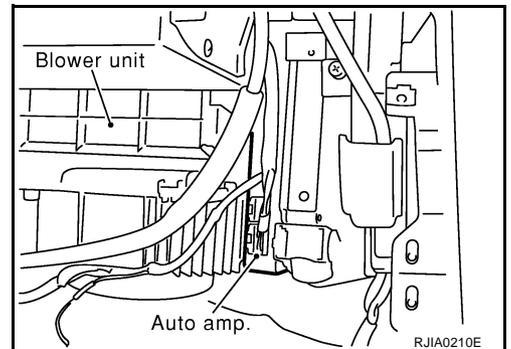


TJWM0011E

EJS000JJ

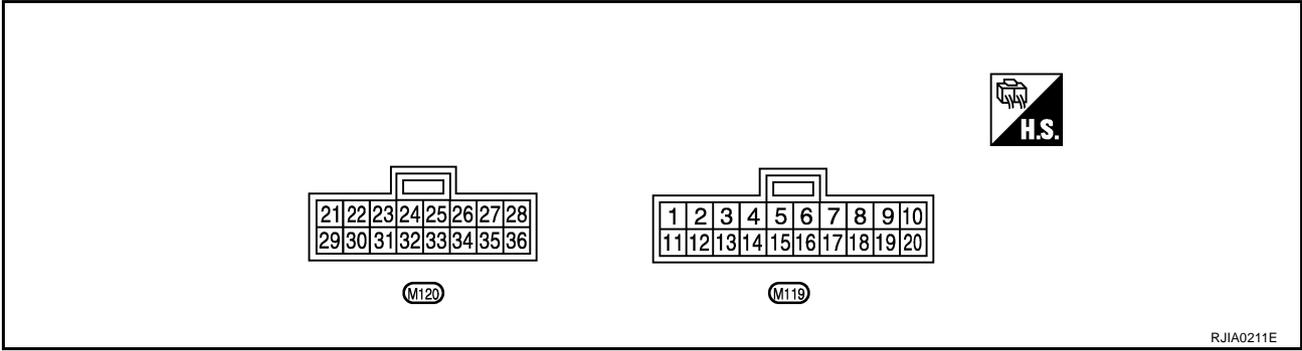
### Auto Amp. Terminals and Reference Value

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

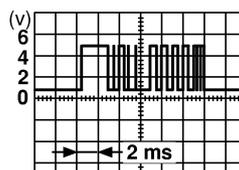
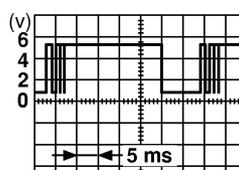
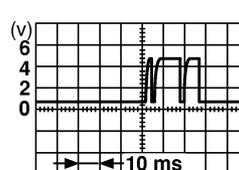


# TROUBLE DIAGNOSIS

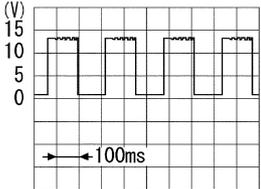
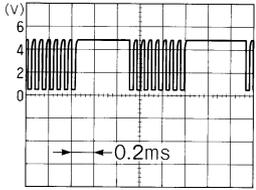
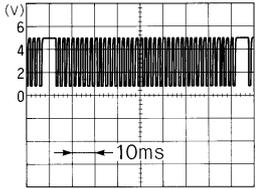
## PIN CONNECTOR TERMINAL LAYOUT



## AUTO AMP. INSPECTION TABLE

TERMI- NAL NO.	WIRE- COLOR	ITEM	CONDITION		Voltage (V)
1	G/OR	Intake sensor	-	-	-
2	G/R	Ambient sensor	-	-	-
3	LG/B	In-vehicle sensor	-	-	-
4	PU/W	Vehicle speed sensor	-	-	-
5	G/Y	A/C LAN signal	IGN ON	-	Approx. 5
6	LG	Power supply for rear vent door motor	IGN ON	Rear vent SW: ON	Approx. 0
				Rear vent SW: OFF	Approx. 12
7	GY/L	Power supply for ACC	IGN ON	-	Battery voltage
9	W	Multiplex communication signal (Fr TX)	IGN ON	-	 <small>RJA0212E</small>
10	R	Multiplex communication signal (Fr RX)	IGN ON	-	 <small>RJA0213E</small>
11	R/Y	Sensor ground	IGN ON	-	Approx. 0
12	SB	Sunload sensor	-	-	-
15	G	Multiplex communication signal (Rr RX)	IGN ON	-	 <small>RJA0214E</small>
16	W/B	Power supply for rear vent door motor	IGN ON	Rear vent switch: ON	Approx. 12
				Rear vent switch: OFF	Approx. 0

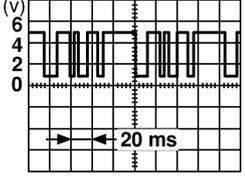
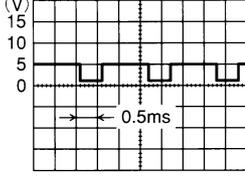
# TROUBLE DIAGNOSIS

TERMI- NAL NO.	WIRE- COLOR	ITEM	CONDITION		Voltage (V)
17	L/OR	Water temperature sensor	-	-	 <p style="text-align: right; font-size: small;">PKIA0098J</p>
18	OR	Compressor feed back signal (Low-pressure cut)	IGN ON	Compressor: ON	Approx. 0
				Disconnect refrigerant pressure sensor connector	Approx. 5
20	B	Multiplex communication signal (Fr CLK)	IGN ON	-	 <p style="text-align: right; font-size: small;">HAK0363D</p>
21	GY	Power supply for mode door motor, air mix door motor, intake door motor	IGN ON	-	Approx. 12
22	Y	Compressor ON signal	IGN ON	A/C switch: ON	Approx. 0
				A/C switch: OFF	Approx. 5
25	B	Ground	IGN ON	-	Approx. 0
26	Y/G	Power supply for BAT	IGN ON	-	Battery voltage
27	P	Power supply for IGN	IGN ON	-	Battery voltage
29	SB	Blower fan motor ON signal	IGN ON	A/C switch: ON (Blower fan motor operates)	Approx. 0
				A/C switch: OFF	Approx. 5
30	BR/W	Multiplex communication signal (Rr CLK)	IGN ON	-	 <p style="text-align: right; font-size: small;">HAK0364D</p>

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# TROUBLE DIAGNOSIS

TERMI- NAL NO.	WIRE- COLOR	ITEM	CONDITION		Voltage (V)
31	GY/L	Multiplex communication signal (Rr TX)	IGN ON	-	 <p style="text-align: right; font-size: small;">RJIA0215E</p>
35	L/OR	Blower fan motor drive signal	IGN ON	Blower fan speed: 1 speed	 <p style="text-align: right; font-size: small;">HAK0857D</p>

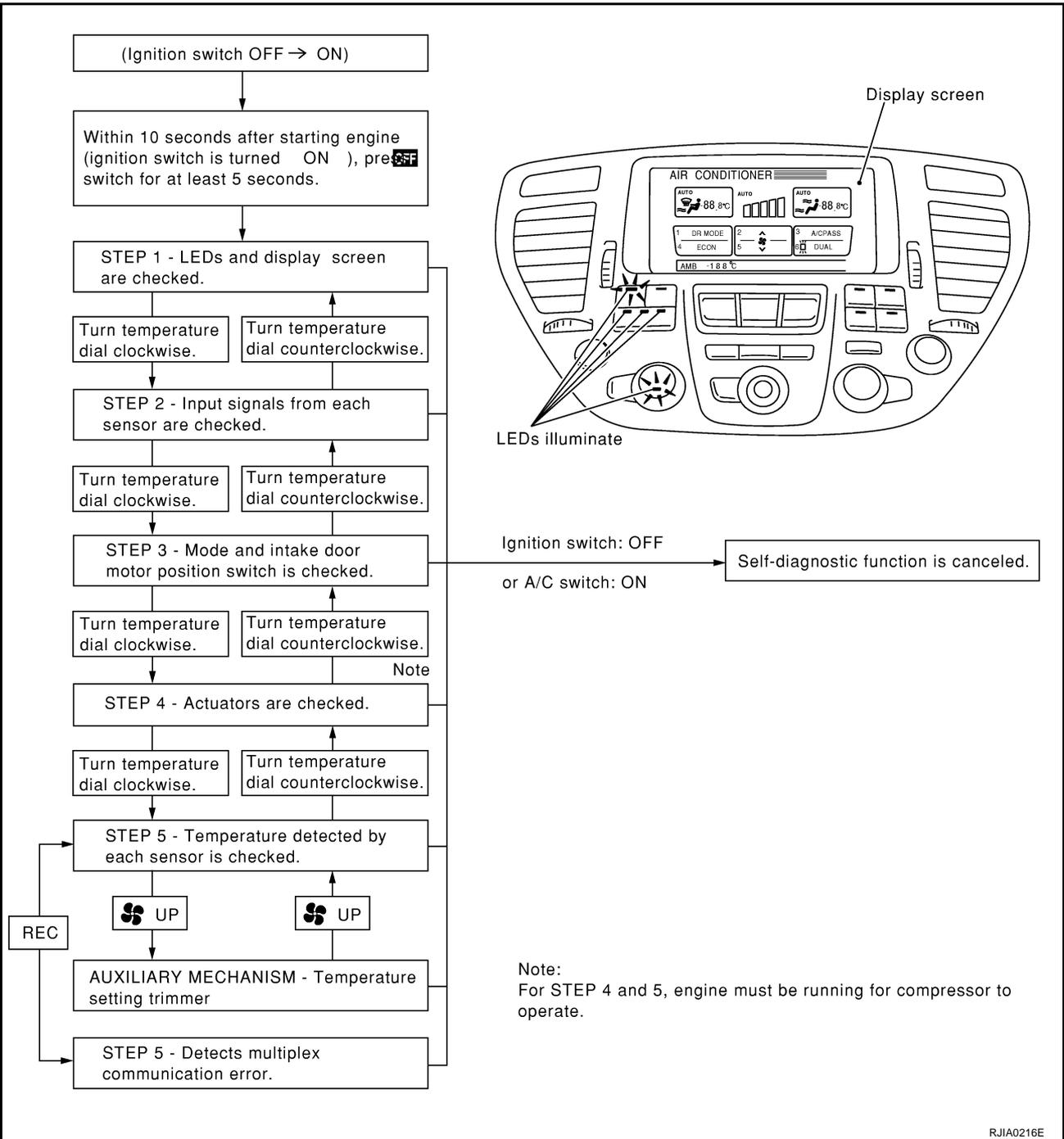
## Self-diagnosis Function DESCRIPTION

EJS000JK

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

# TROUBLE DIAGNOSIS

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



## PROCEDURE

### 1. SET IN SELF-DIAGNOSTIC MODE

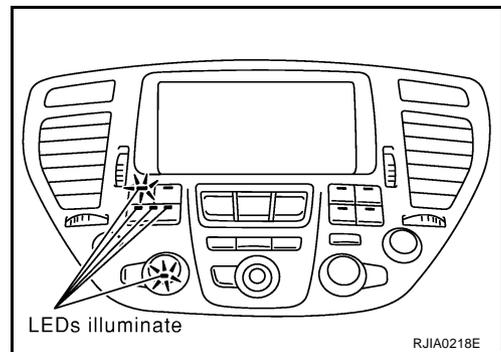
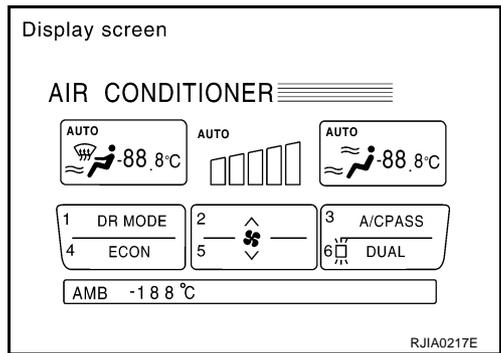
1. Turn ignition switch ON.
2. Set in self-diagnostic mode as follows. Within 10 seconds after starting engine (ignition switch is turned ON.), press  (fan) UP switch.

>> GO TO 2.

# TROUBLE DIAGNOSIS

## 2. STEP 1 - LEDES AND DISPLAY ARE CHECKED

Check LEDs illuminate and display screen.



### YES or NO

- Yes >> GO TO 3.
- No >> Malfunctioning OFF switch, LED or Display (and NAVI) control unit.  
>> Replace A/C auto amp.

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

1. Turn the temperature dial clockwise.
2. Advance to self-diagnosis STEP 2?

### YES or NO

- Yes >> GO TO 4.
- No >> Malfunctioning temperature dial.  
>> Replace A/C auto amp.

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

1. Turn the temperature dial counterclockwise.
2. Return to self-diagnosis STEP 1?

### YES or NO

- Yes >> GO TO 5.
- No >> Malfunctioning temperature dial.  
>> Replace A/C auto amp.

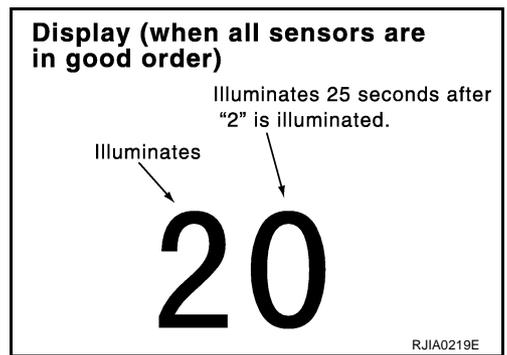
# TROUBLE DIAGNOSIS

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

1. Turn the temperature dial clockwise.
2. Does code No.20 appear on the display?

YES or NO

- Yes >> GO TO 6.  
No >> GO TO 14.

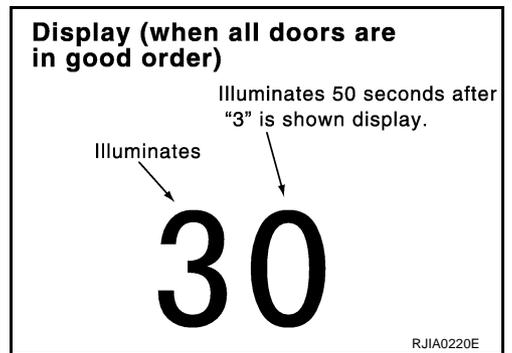


## 6. STEP 3 - MODE DOOR AND INTAKE DOOR POSITIONS ARE CHECKED

1. Turn the temperature dial clockwise.
2. Does code No.30 appear on the display?

YES or NO

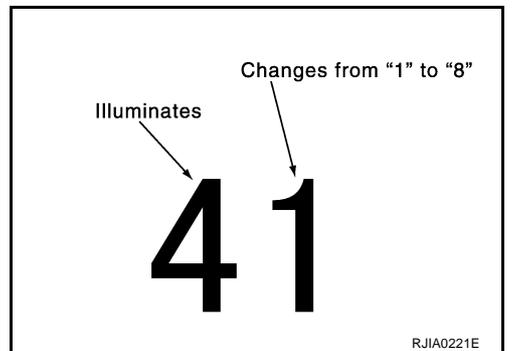
- Yes >> GO TO 7.  
No >> GO TO 15.



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

1. Turn the temperature dial clockwise.
2. Engine running.
3. 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 Rear ventilator door: OPEN	87%	13%			
			50%	13%	24%	13%	
					50%	30%	20%
					37%	23%	40%
							100%

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	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 fan duty ratio	37%	37%	91%	65%	65%	65%	65%	91%
Compressor	ON	ON	ON	OFF	OFF	OFF	ON	ON
Rear vent door position	OPEN	SHUT	SHUT	SHUT	SHUT	SHUT	SHUT	SHUT

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 [ATC-68](#) .
- Intake door does not change.  
Go to Intake Door Motor [ATC-74](#) .
  - Blower motor operation is malfunctioning.  
Go to Blower Motor [ATC-78](#) .
  - Magnet clutch does not engage.  
Go to Magnet Clutch [ATC-82](#) .
  - Discharge air temperature does not change.  
Go to Air Mix Door Motor [ATC-71](#) .

# TROUBLE DIAGNOSIS

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

1. Turn the temperature dial clockwise.
2. Code No.51 appears on the display.

>> GO TO 10.

## 10. CHECK AMBIENT SENSOR

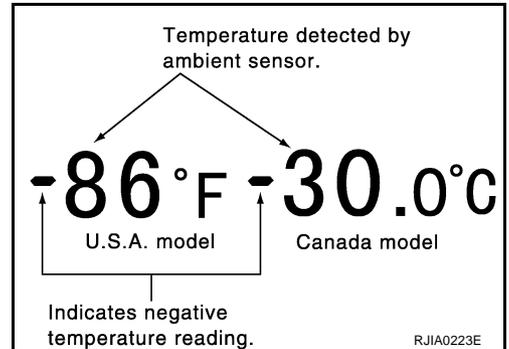
Press  (DEF) switch one time, temperature detected by ambient sensor is indicated on the display.

### 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 [ATC-102](#).



## 11. CHECK IN-VEHICLE SENSOR

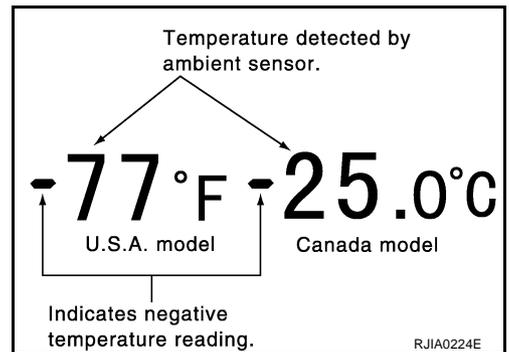
Press  (DEF) switch the second time, temperature detected by in-vehicle sensor is indicated on the display.

### 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 [ATC-104](#).



## 12. CHECK INTAKE SENSOR

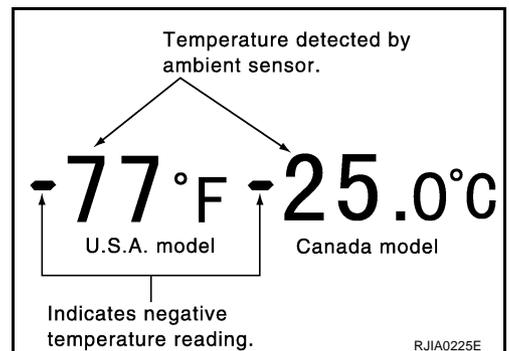
Press  (DEF) switch the third time, temperature detected by intake sensor is indicated on the display.

### NOTE:

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

### OK or NG

- OK >> 1. GO TO 13.  
2. Turn ignition switch OFF or (AUTO) switch ON.  
3. END  
NG >> Go to Intake Sensor Circuit [ATC-110](#).



# TROUBLE DIAGNOSIS

## 13. CHECK MULTIPLEX COMMUNICATION ERROR

1. Press intake switch.
2. Multiplex communication error between display (and NAVI) control unit and auto amp. is detected.

(If plural errors occur, the display of each error will blink two times for 0.5 second intervals.)

OK or NG

OK >> 1. Turn ignition switch OFF or A/C switch ON.  
2. END

NG >> Go to multiplex communication circuit [ATC-111](#).

Display	Multiplex communication error
52	In good order
52 	Display (and NAVI) control unit ⇨ Auto amp.
52 	Rear control SW ⇨ Auto amp.
52 	Auto amp. ⇨ Display (and NAVI) control unit or rear control SW

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## 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	Sun-load sensor	*5
26 / -26	Air mix door motor (LCU) PBR (Driver side)	*6
27 / -27	Air mix door motor (LCU) PBR (Passenger side)	*7

\*2: [ATC-102](#).

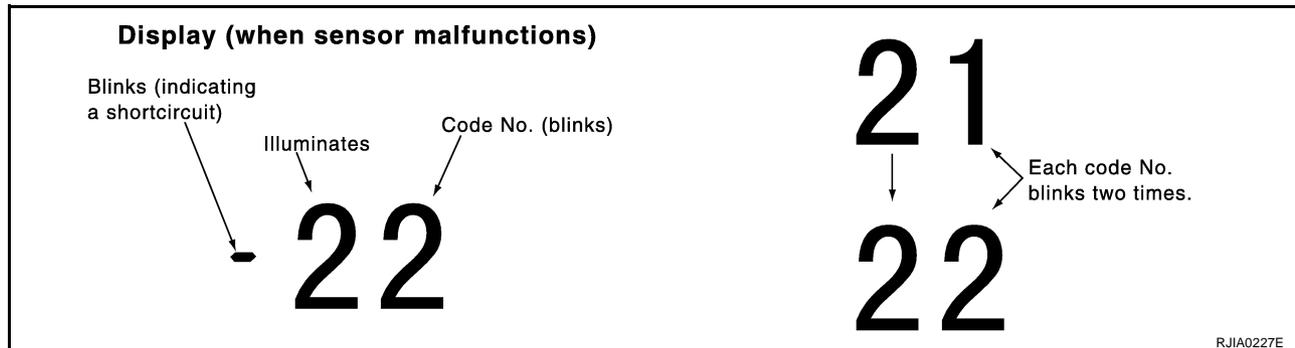
\*3: [ATC-105](#).

\*4: [ATC-110](#).

\*5: [ATC-107](#)

\*6: [ATC-62](#)

\*7: [ATC-62](#)



>> INSPECTION END

# TROUBLE DIAGNOSIS

## 15. CHECK MALFUNCTIONING DOOR MOTOR POSITION SWITCH

Mode or (and) intake door motor position switch(es) 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 two times.)

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

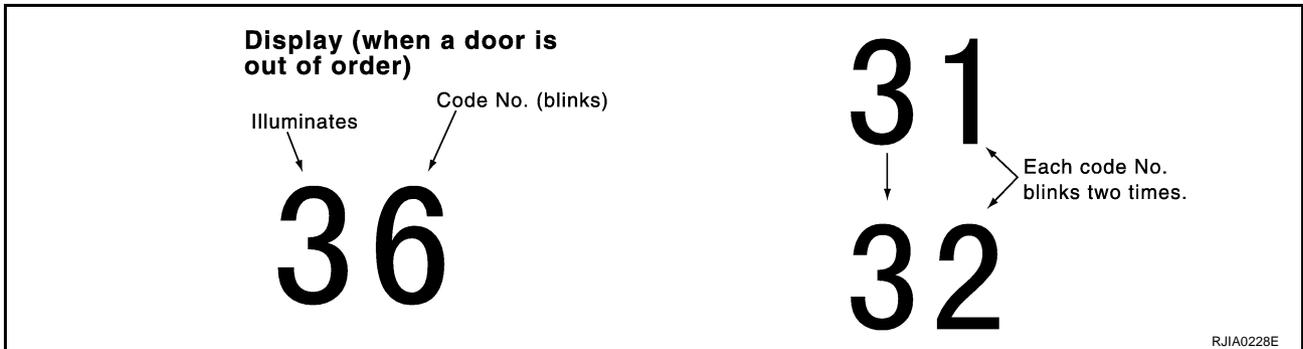
31→32→33→34→35→36→Return to 31

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

37→38→39→Return to 37

\*3: [ATC-66](#)

\*4: [ATC-72](#)



>> INSPECTION END

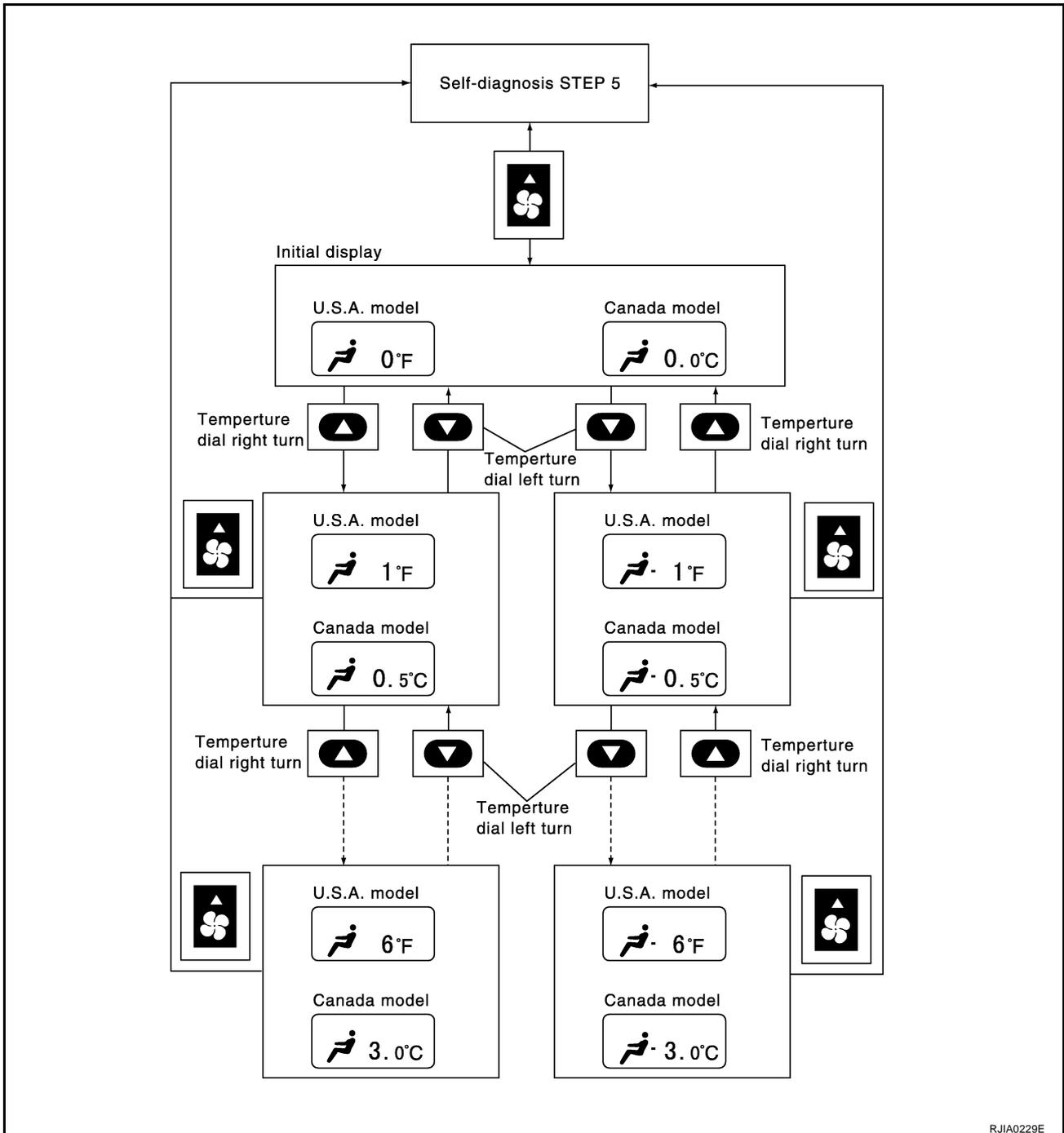
# TROUBLE DIAGNOSIS

## 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.
- 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

EJS000JL

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

### Conditions

:Engine running and 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.
6. Confirm that the set temperature remains at previous temperature.
7. Press OFF switch.

If NG, go to trouble diagnosis procedure for memory function [ATC-97](#)

If OK, continue with next check.

### CHECKING BLOWER

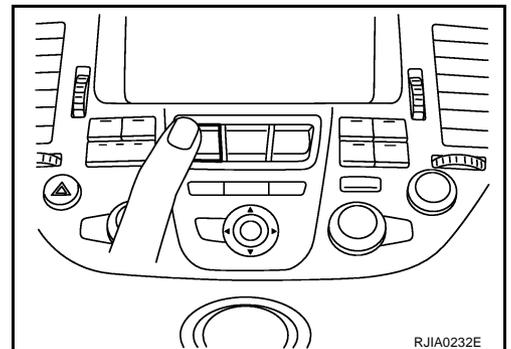
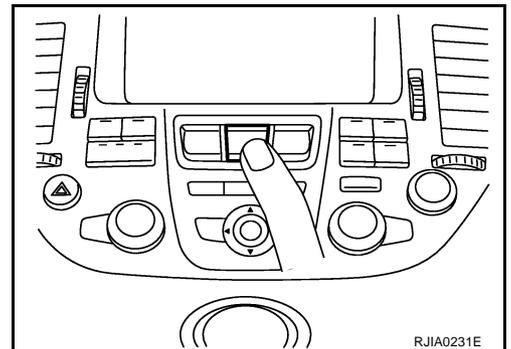
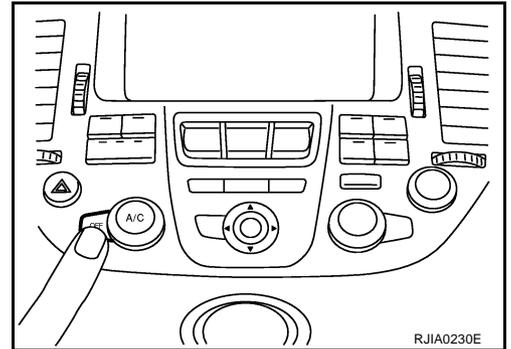
1. Press fan switch (up side) one time. Blower should operate on low speed. The fan symbol should have one blade lit .
2. Press fan switch (up side) one more time, and continue checking blower speed and fan symbol until all speeds are checked.
3. Leave blower on MAX speed.

If NG, go to trouble diagnosis procedure for blower motor [ATC-75](#).

If OK, continue with next check.

### CHECKING DISCHARGE AIR

1. Press mode switch four times and DEF button.
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 Discharge Air Flow [ATC-30](#).

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

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Intake door position is checked in the next step.

If NG, go to trouble diagnosis procedure for intake door motor [ATC-72](#).

If OK, continue with next check.

**NOTE:**

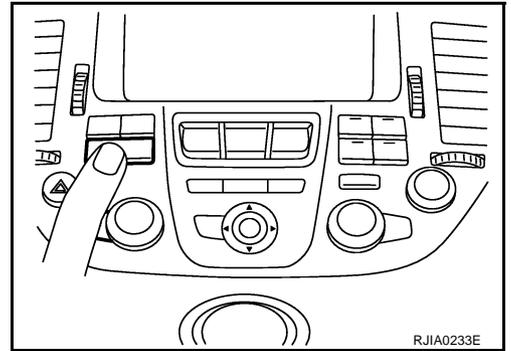
Confirm that the compressor clutch is engaged (visual inspection) and intake door position is at FRESH when the DEF is selected.

**CHECKING RECIRCULATION**

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

If NG, go to trouble diagnosis procedure for intake door [ATC-72](#).

If OK, continue with next check.

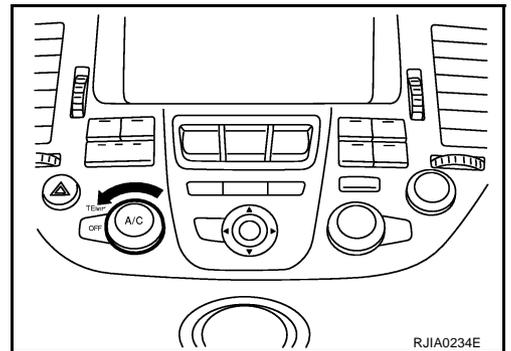


**CHECKING TEMPERATURE DECREASE**

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 insufficient cooling [ATC-86](#).

If OK, continue with next check.



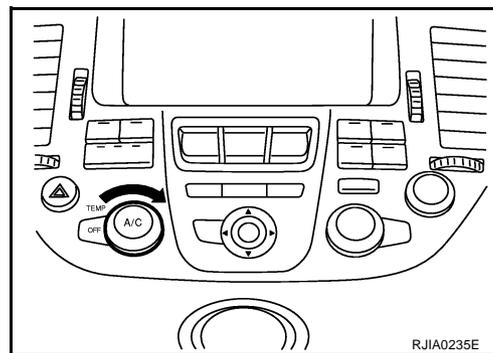
# TROUBLE DIAGNOSIS

## CHECKING TEMPERATURE INCREASE

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

If NG, go to trouble diagnosis procedure for insufficient heating [ATC-93](#).

If OK, continue with next check.



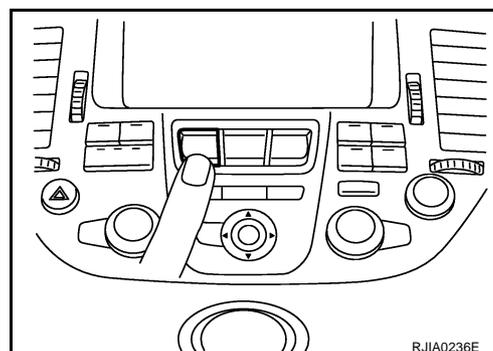
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## CHECK ECON (ECONOMY) MODE

1. Set the temperature 75°F or 25°C.
2. Press ECON switch.
3. Display should indicate ECON (no AUTO).
  - Confirm that the compressor clutch is not engaged (visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

If NG, go to trouble diagnosis procedure for ECON (Economy) mode [ATC-98](#).

If OK, continue with next check.



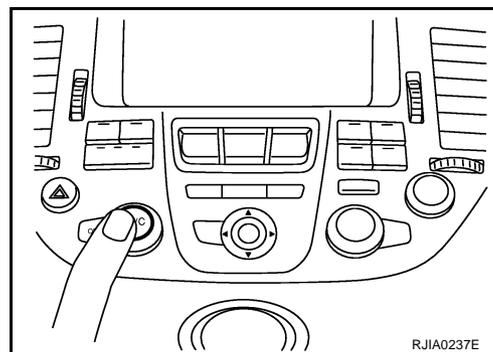
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## CHECKING AUTO MODE

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

If NG, go to trouble diagnosis procedure for A/C system [ATC-59](#), then if necessary, trouble diagnosis procedure for magnet clutch [ATC-81](#).

If all operational check are OK (symptom can not 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-32, "SYMPTOM TABLE"](#) and perform applicable trouble diagnosis procedures.



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## Power Supply and Ground Circuit for Auto Amp.

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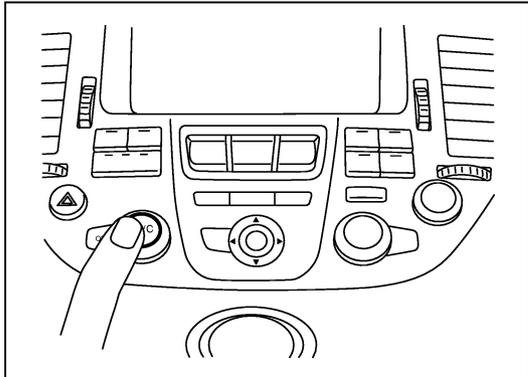
SYMPTOM:A/C system does not come on.

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# TROUBLE DIAGNOSIS

## INSPECTION FLOW

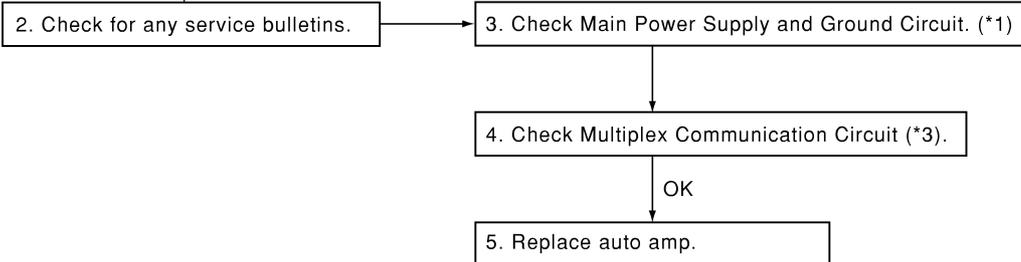
1. Confirm symptom by performing the following operational check.



### OPERATIONAL CHECK – AUTO mode

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

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



\*1 Main power supply and ground circuit [ATC-61](#)

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

\*3 Multiplex communication circuit [ATC-111](#)

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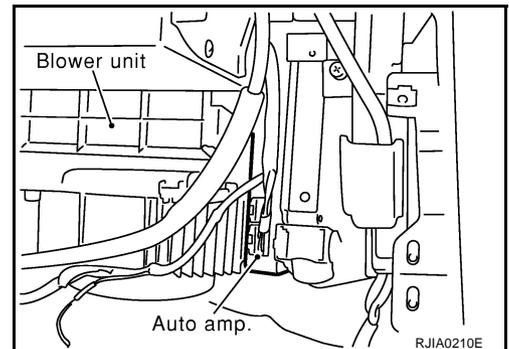
## COMPONENT DESCRIPTION

### Automatic Amplifier (Auto Amp.)

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

The auto amplifier is unitized with control mechanisms. When the various switches and temperature adjustment dial are operated, data is input to the auto amp from the display (and NAVI) control unit using multiplex communication.

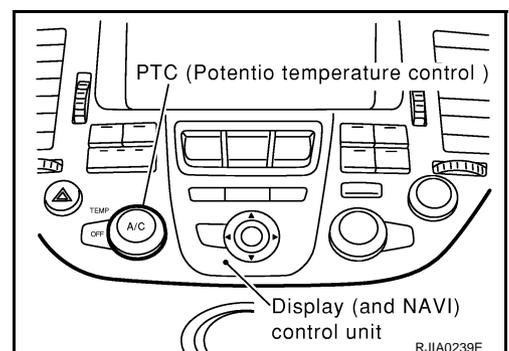
Self-diagnostic functions are also built into auto amplifier to provide quick check of malfunctions in the auto air conditioner system.



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### Potential Temperature Control (PTC)

The PTC is built into the Display (and NAVI) control unit. 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.

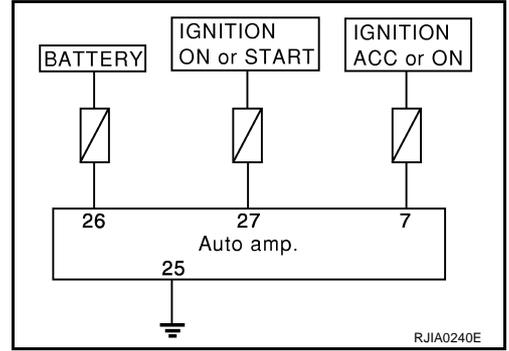


RJIA0239E

# TROUBLE DIAGNOSIS

## DIAGNOSTIC PROCEDURE

SYMPTOM: A/C system does not come on.



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

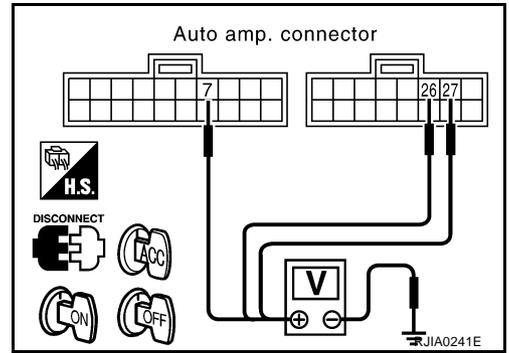
Terminals		Ignition switch position		
(+)	(-)	OFF	ACC	ON
M119-7 (GY/L)	Body ground	Approx. 0V	Approx. 12V	Approx. 12V
M120-26 (Y/G)		Approx. 12V	Approx. 12V	Approx. 12V
M120-27 (P)		Approx. 0V	Approx. 0V	Approx. 12V

**OK or NG**

OK >> GO TO 2.

NG >> Check 10A fuses (Nos. 2, 6 and 21) located in the fuse block).

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



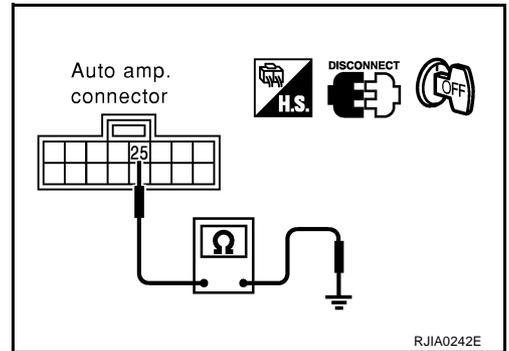
### 2. CHECK BODY GROUND CIRCUIT FOR AUTO AMP.

Ohmmeter terminal		Continuity
(+)	(-)	
M120-25 (B)	Body ground	Yes

**Yes or No**

Yes >> Replace auto amp. INSPECTION END

No >> Repair or replace harness.



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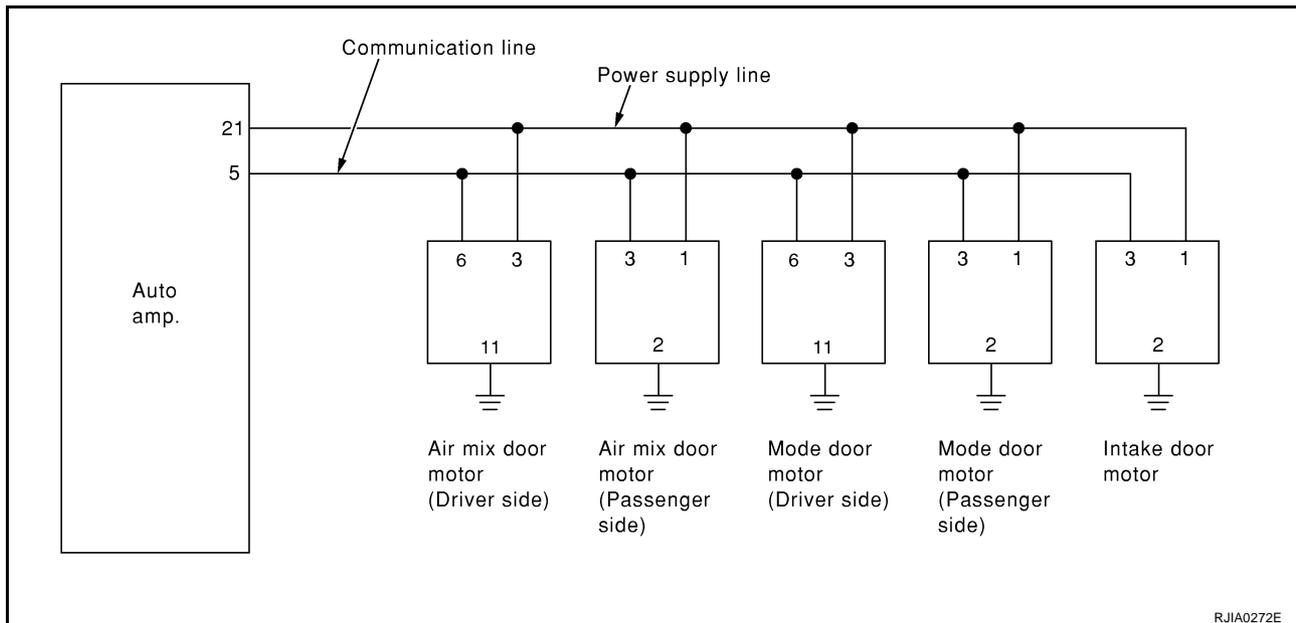
ATC

# TROUBLE DIAGNOSIS

EJS000JN

## LAN System Circuit

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



RJIA0272E

### DIAGNOSTIC PROCEDURE

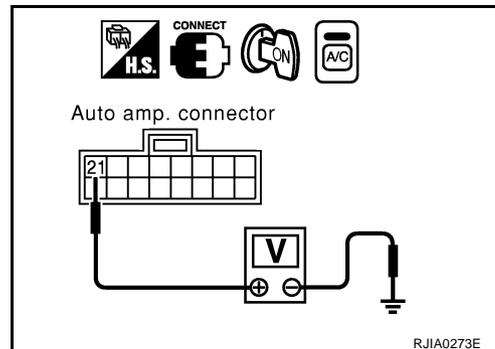
#### 1. CHECK POWER SUPPLY FOR AUTO AMP. (LCU) SIDE

Terminals		Voltage
(+)	(-)	
M120-21 (GY)	Body ground	Approx. 12V

OK or NG

OK >> GO TO 2.

NG >> Replace auto amp.(LCU).



RJIA0273E

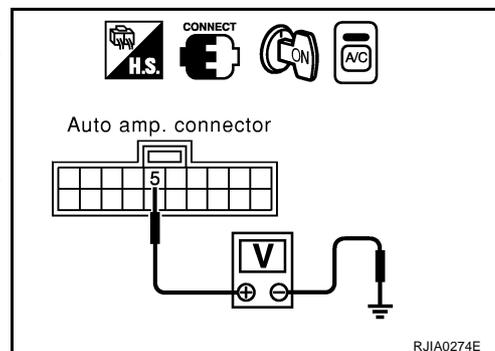
#### 2. CHECK SIGNAL FOR AUTO AMP. (LCU) SIDE

Terminals		Voltage
(+)	(-)	
M119-5 (G/Y)	Body ground	Approx. 5V

OK or NG

OK >> GO TO 3.

NG >> Replace auto amp.(LCU).

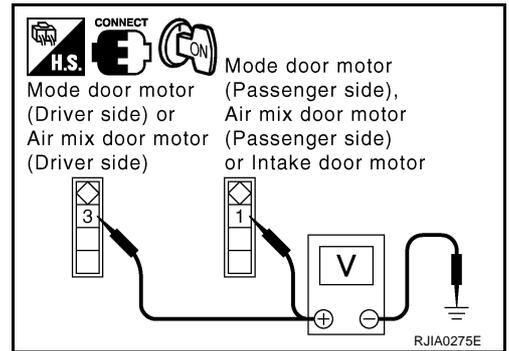


RJIA0274E

# TROUBLE DIAGNOSIS

## 3. CHECK POWER SUPPLY FOR MOTOR SIDE

Door motor	Terminals		Voltage
	(+)	(-)	
Mode (Passenger side)	M106-1 (GY)	Body ground	Approx. 12V
Air mix (Passenger side)	M107-1 (GY)		
Intake	M118-1 (GY)		
Mode (Driver side)	M471-3		
Air mix (Driver side)	M472-3		

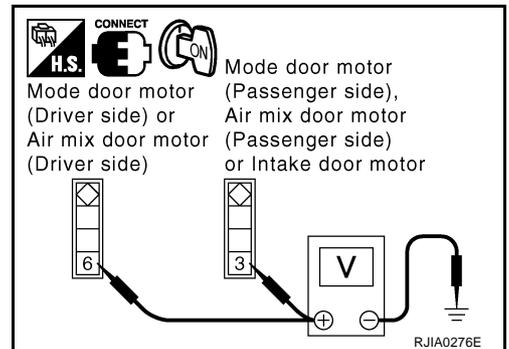


OK or NG

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

## 4. CHECK SIGNAL FOR MOTOR SIDE

Door motor	Terminals		Voltage
	(+)	(-)	
Mode (Passenger side)	M106-3 (G/Y)	Body ground	Approx. 5V
Air mix (Passenger side)	M107-3 (G/Y)		
Intake	M118-3 (G/Y)		
Mode (Driver side)	M471-6		
Air mix (Driver side)	M472-6		

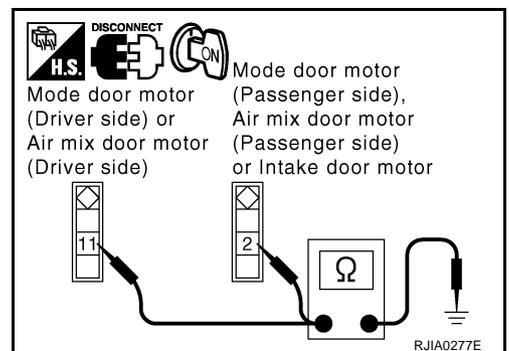


OK or NG

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

## 5. CHECK MOTOR GROUND CIRCUIT

Door motor	Terminals		Continuity
	(+)	(-)	
Mode (Passenger side)	M106-2 (B)	Body ground	Yes
Air mix (Passenger side)	M107-2 (B)		
Intake	M118-2 (BY)		
Mode (Driver side)	M471-11		
Air mix (Driver side)	M472-11		



OK or NG

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

# TROUBLE DIAGNOSIS

---

## 6. CHECK MOTOR OPERATION

---

Disconnect and reconnect the motor connector and confirm the motor operation.

### OK or NG

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

---

## 7. CHECK MODE DOOR MOTOR OPERATION

---

1. Disconnect mode door motor (driver side, passenger side) and air mix door motor (driver side, passenger side) connector.
2. Reconnect mode door motor connector (driver side, passenger side) and confirm the mode door motor operation.

### OK or NG

- OK >> (Mode door motor operates normally.)
- GO TO 8
- NG >> (Mode door motor does not operate normally.)
- GO TO 10

---

## 8. CHECK AIR MIX DOOR MOTOR OPERATION

---

1. Disconnect mode door motor connector (driver side, passenger side).
2. Reconnect air mix door motor connector (driver side, passenger side) and confirm the air mix door motor operation.

### OK or NG

- OK >> (Air mix door motor operates normally.)
- GO TO 9
- NG >> (Air mix door motor does not operate normally.)
- GO TO 11

---

## 9. CHECK INTAKE DOOR MOTOR OPERATION

---

1. Disconnect air mix door motor connector (driver side, passenger side).
2. Reconnect intake door motor connector and confirm the intake door motor operation.

### OK or NG

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

---

## 10. CHECK MODE DOOR MOTOR OPERATION

---

1. Disconnect mode door motor (driver side) connector.
2. Confirm the mode door motor (passenger side) operation.

### OK or NG

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

# TROUBLE DIAGNOSIS

---

## 11. CHECK AIR MIX DOOR MOTOR OPERATION

---

1. Disconnect air mix door motor (driver side) connector.
2. Confirm the air mix door motor (passenger side) operation.

### OK or NG

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

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# TROUBLE DIAGNOSIS

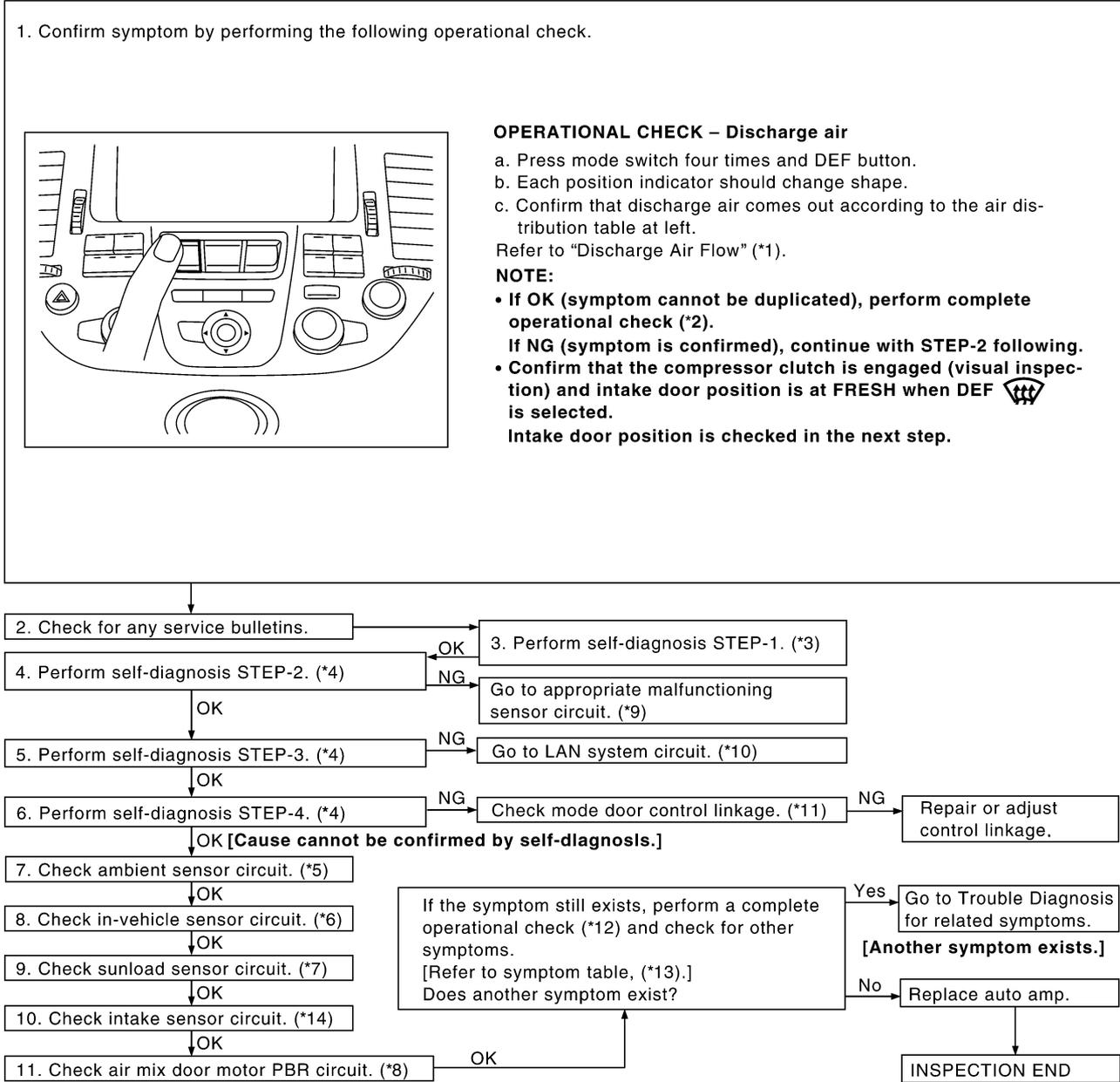
EJS000JO

## Mode Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



RJIA0281E

\*1 Discharge air flow [ATC-30](#)

\*2 Operational check [ATC-57](#)

\*3 Self-diagnosis [ATC-49](#), see No. 1

\*4 Self-diagnosis [ATC-49](#), see No. 5

\*5 Ambient sensor circuit [ATC-102](#)

\*6 In-vehicle sensor circuit [ATC-104](#)

\*7 Sunload sensor circuit [ATC-107](#)

\*8 Air mix door motor circuit [ATC-69](#)

\*9 Self-diagnosis [ATC-49](#), see No.14

\*10 LAN system circuit [ATC-62](#)

\*11 Component description for Mode door [ATC-68](#)

\*12 Operational check [ATC-57](#)

\*13 Symptom table [ATC-32](#)

\*14 Intake sensor circuit [ATC-110](#)

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

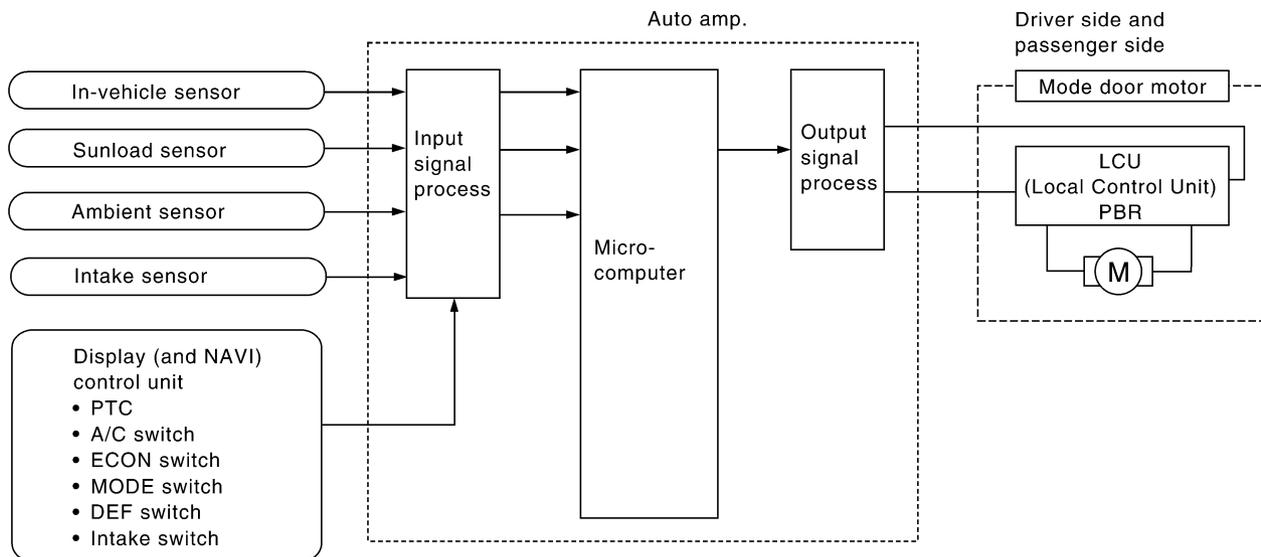
Mode door control system components are:

- Auto amp.
- Mode door motor (LCU)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

### System Operation

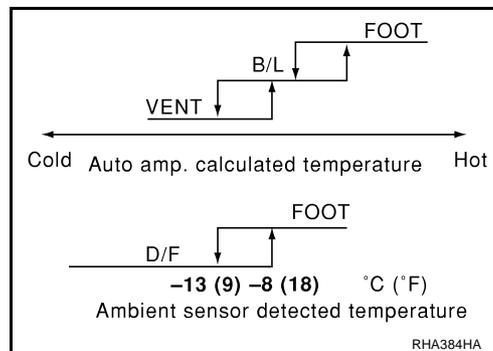
The auto amplifier receives data from each of the sensors. The amplifier sends air mix door, mode door and intake door opening angle data to the air mix door motor LCU, mode door motor LCU and intake door motor LCU.

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



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### Mode Door Control Specification

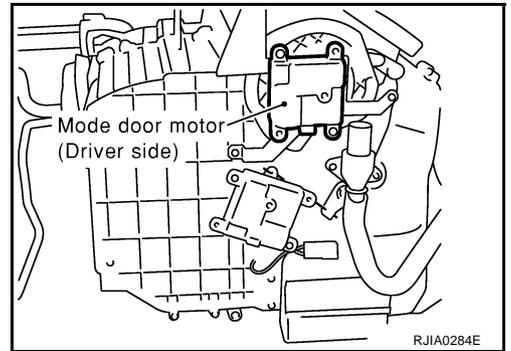
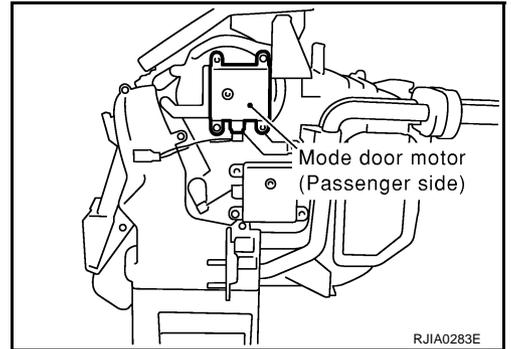


# TROUBLE DIAGNOSIS

## 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 amplifier. Motor rotation is conveyed to a link which activates the mode door.



## DIAGNOSTIC PROCEDURE

SYMPTOM: Mode door motor and/or air mix door motor does not operate normally.  
Perform diagnostic procedure for LAN system circuit. Refer to [ATC-62](#).

# TROUBLE DIAGNOSIS

EJS000JP

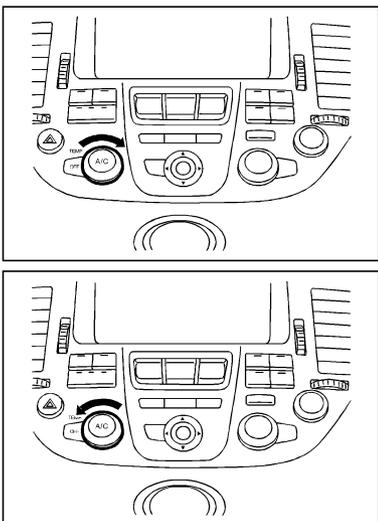
## Air Mix Door Motor Circuit

### 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**

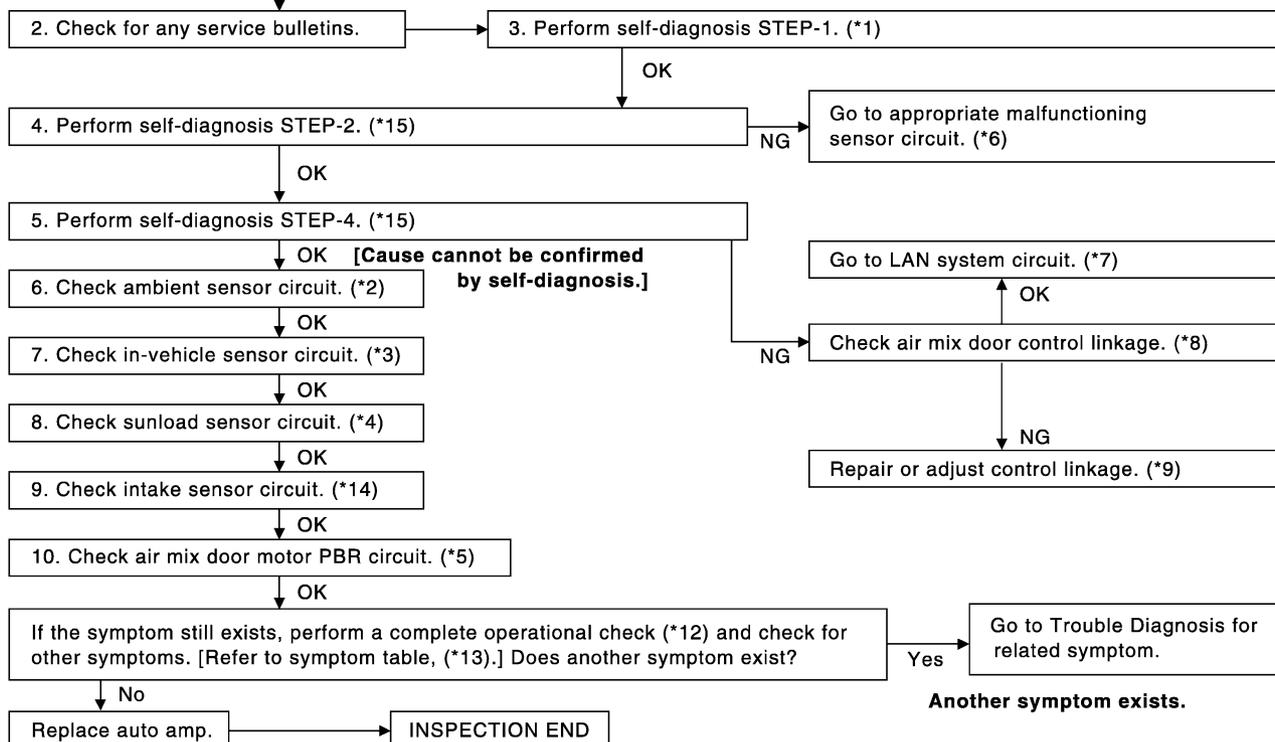
**Temperature increase**

- 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 (\*10).**  
**If NG (symptom is confirmed), continue with STEP-2 following.**



\*1 Self-diagnosis [ATC-49](#), see No.1

\*2 Ambient sensor circuit [ATC-115](#)

\*3 In-vehicle sensor circuit [ATC-116](#)

\*4 Sunload sensor circuit [ATC-117](#)

\*5 Air mix door motor circuit [ATC-69](#)

\*6 Self-diagnosis [ATC-49](#), see No. 14.

\*7 LAN system circuit [ATC-62](#)

\*8 Component description for Air mix door [ATC-71](#)

\*9 Component description for Air mix door [ATC-71](#)

\*10 Operational check [ATC-57](#)

\*12 Operational check [ATC-57](#)

\*13 Symptom table [ATC-32](#)

\*14 Intake sensor circuit [ATC-110](#)

\*15 Self-diagnosis [ATC-49](#), see No.7

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# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

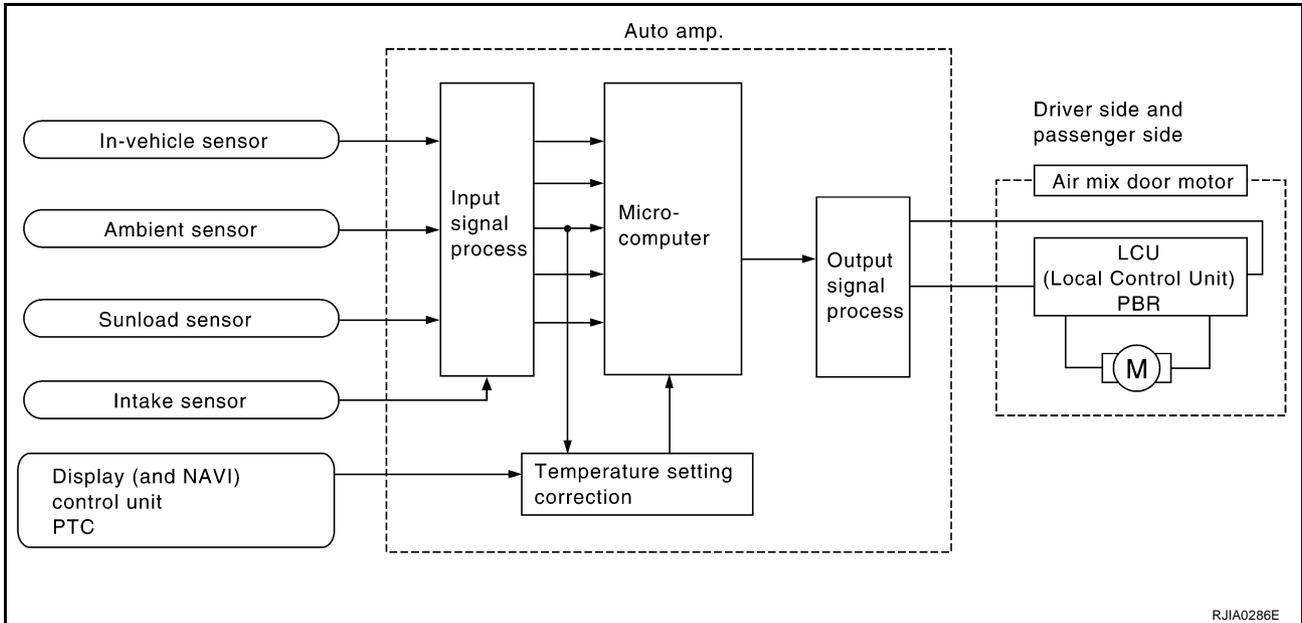
Air mix door control system components are:

- Auto amp.
- Air mix door motor (LCU)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

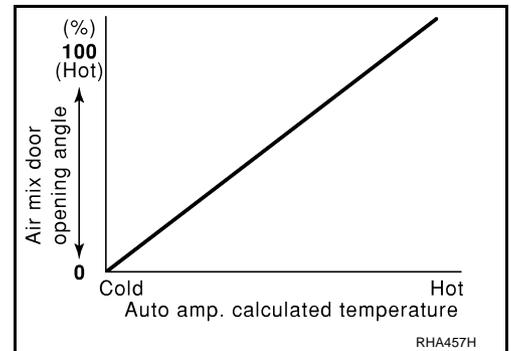
### System Operation

The auto amplifier receives data from each of the sensors. The amplifier sends air mix door, mode door and intake door motor 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 amplifier and each of the motor position sensors are compared by the LCUs in each motor with the existing decision and opening angles. Subsequently, HOT/COLD or DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new selection data is returned to the auto amplifier.



### Air Mix Door Control Specification

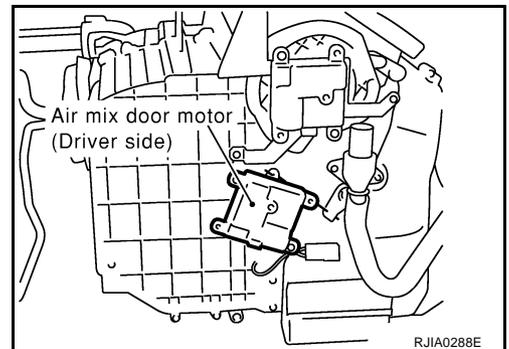
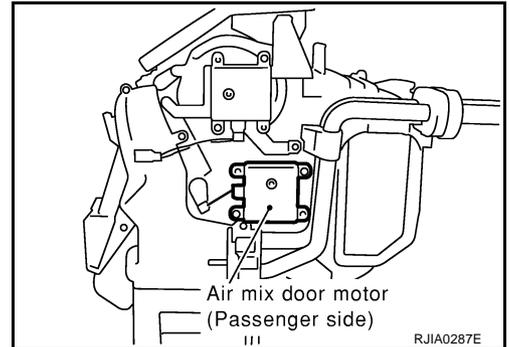


# TROUBLE DIAGNOSIS

## 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 amplifier. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the auto amplifier by PBR built-in air mix door motor.



## DIAGNOSTIC PROCEDURE

SYMPTOM: Discharge air temperature does not change.

Perform diagnostic procedure for LAN system circuit. Refer to [ATC-62](#) .

Air Mix Door Motor PBR Circuit

Diagnostic Procedure

For description of mode door motor and air mix door motor circuit, refer to [ATC-66, "Mode Door Motor Circuit"](#) and [ATC-69, "Air Mix Door Motor Circuit"](#) .

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.)

Perform diagnostic procedure for mode door motor [ATC-68, "DIAGNOSTIC PROCEDURE"](#) and air mix door motor [ATC-71, "DIAGNOSTIC PROCEDURE"](#) .

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# TROUBLE DIAGNOSIS

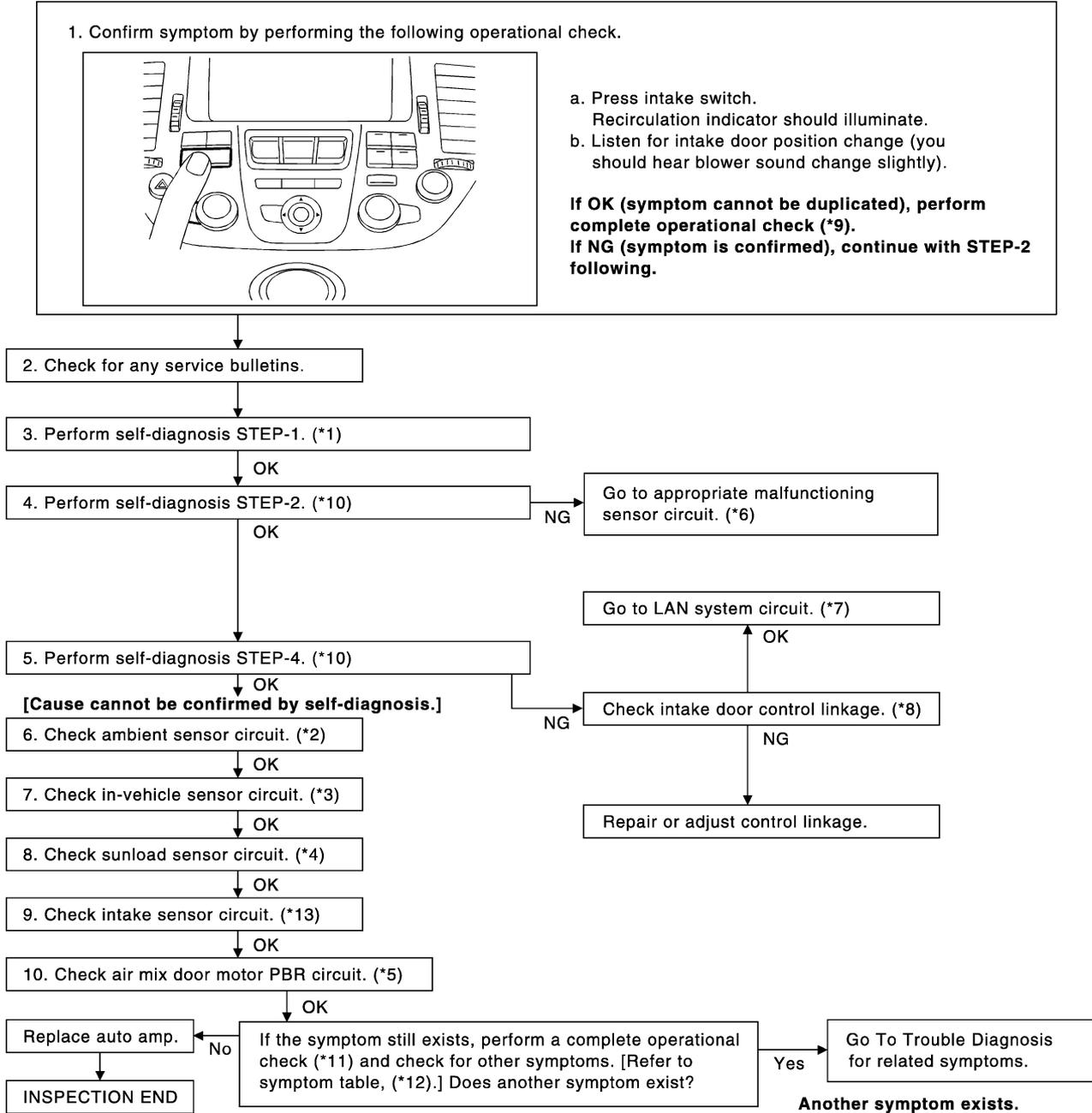
EJS000JQ

## Intake Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



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\*1 Self-diagnosis [ATC-49](#) , see No.1

\*2 Ambient sensor [ATC-102](#)

\*3 In-vehicle sensor [ATC-104](#)

\*4 Sunload sensor [ATC-107](#)

\*5 Air mix door motor circuit [ATC-69](#)

\*6 Self-diagnosis [ATC-49](#) , see No. 14.

\*7 LAN system circuit [ATC-62](#)

\*8 Component description for intake door motor [ATC-74](#)

\*9 Operational check [ATC-57](#)

\*10 Self-diagnosis [ATC-49](#) , see No.5 or 7

\*11 Operational check [ATC-57](#)

\*12 Symptom table [ATC-32](#)

\*13 Intake sensor circuit [ATC-110](#)

**Another symptom exists.**

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

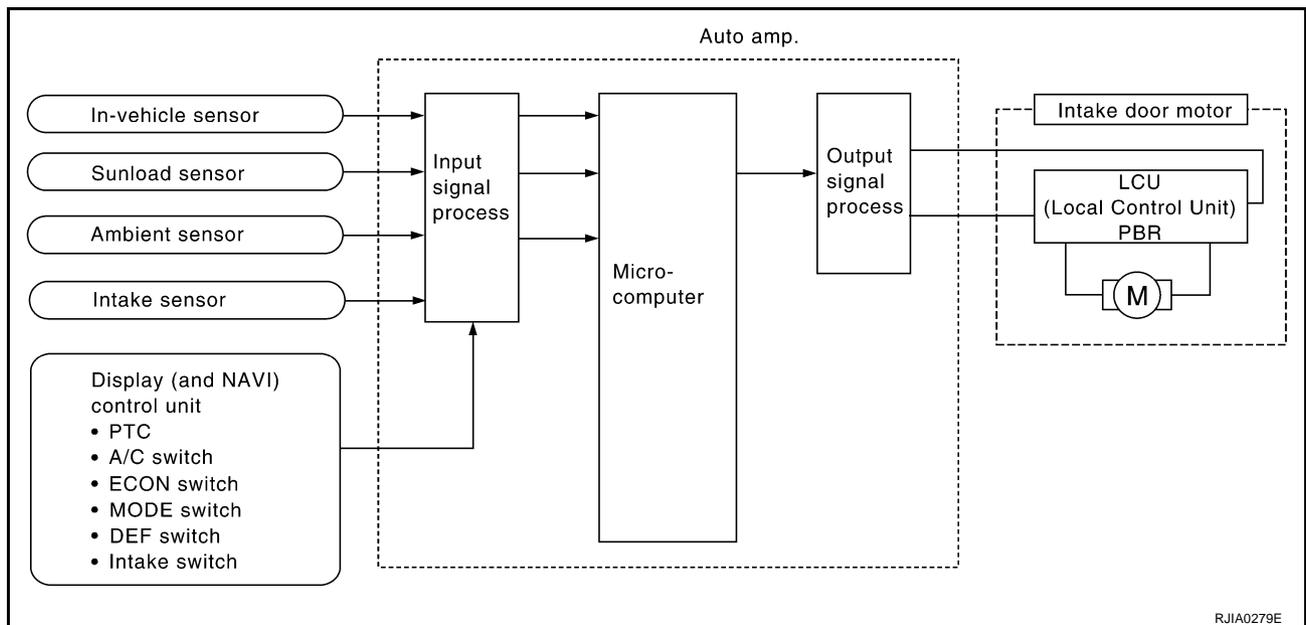
### Component Parts

Intake door control system components are:

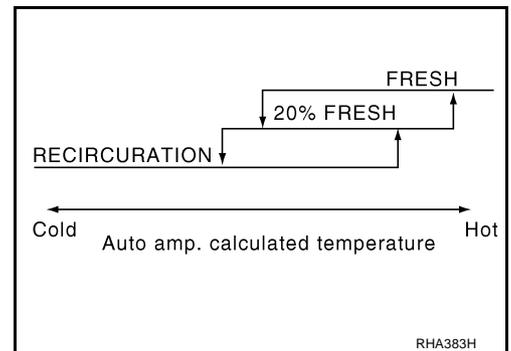
- Auto amp.
- Intake door motor
- A/C LAN system (PBR built-in mode motor and air mix door motor)
- In-vehicle sensor
- Ambient sensor
- Sunload sensor
- Intake sensor

### 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 amplifier sets the intake door at the Fresh position.



### Intake Door Control Specification

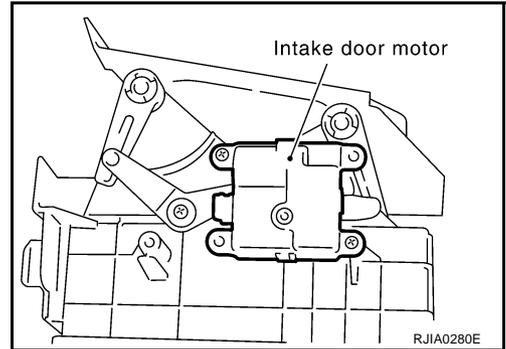


# TROUBLE DIAGNOSIS

## 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 amplifier. Motor rotation is conveyed to a lever which activates the intake door.



## DIAGNOSTIC PROCEDURE

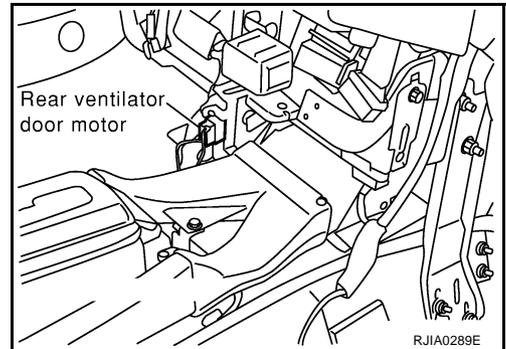
SYMPTOM: Intake door motor does not operate normally.  
Perform diagnostic procedure for LAN system circuit. Refer to [ATC-62](#).

### Rear Ventilator Door Motor

## COMPONENT DESCRIPTION

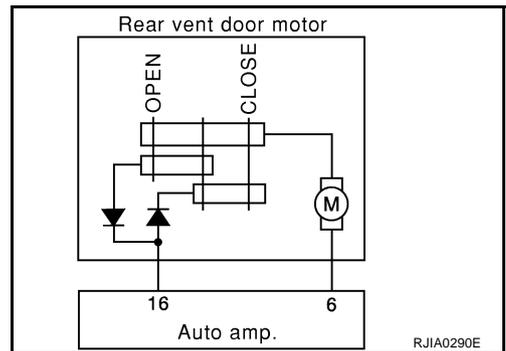
Rear ventilator door motor is attached to the rear ventilator duct No.1.  
Rear ventilator door is opened or closed by rear ventilator door motor.

EJS000JR



## DIAGNOSTIC PROCEDURE

SYMPTOM: Rear ventilator door motor does not operate.



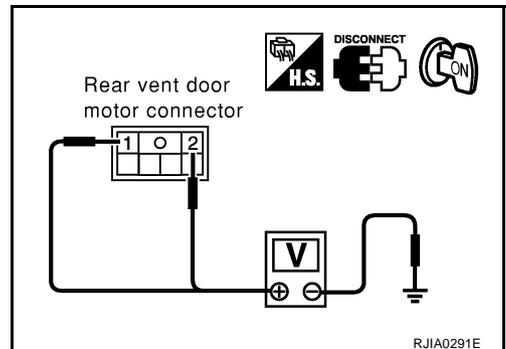
## 1. CHECK FOR AUTO AMP. OUTPUT

Set up code Nos.41 and 42 in self-diagnosis STEP 4.

Code No.	Terminals		Voltage
	(+)	(-)	
41	M93-1 (LG)	Body ground	Approx. 12V
	M93-2 (W/B)		Approx. 0V
42	M93-1 (LG)		Approx. 0V
	M93-2 (W/B)		Approx. 12V

### OK or NG

- OK >> Replace rear ventilator door motor.
- NG >> GO TO 2



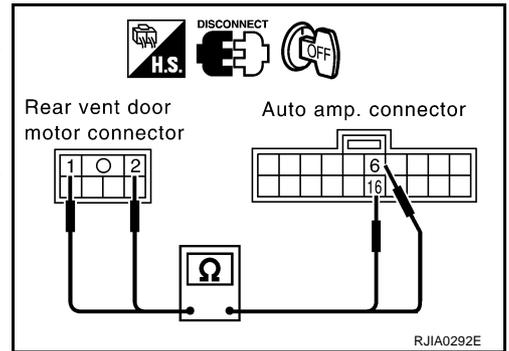
# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY BETWEEN REAR VENTILATOR DOOR MOTOR AND AUTO AMP.

Terminals		Continuity
M93-1 (LG)	M119-6 (LG)	Yes
M93-2 (W/B)	M119-16 (W/B)	

### OK or NG

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



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## Blower Motor Circuit

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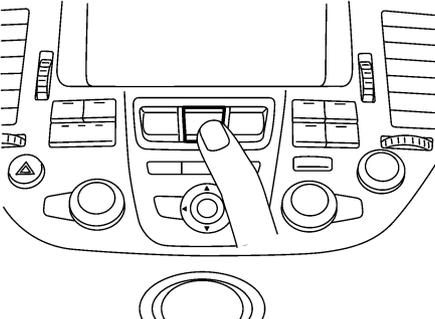
### SYMPTOM:

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

# TROUBLE DIAGNOSIS

## INSPECTION FLOW

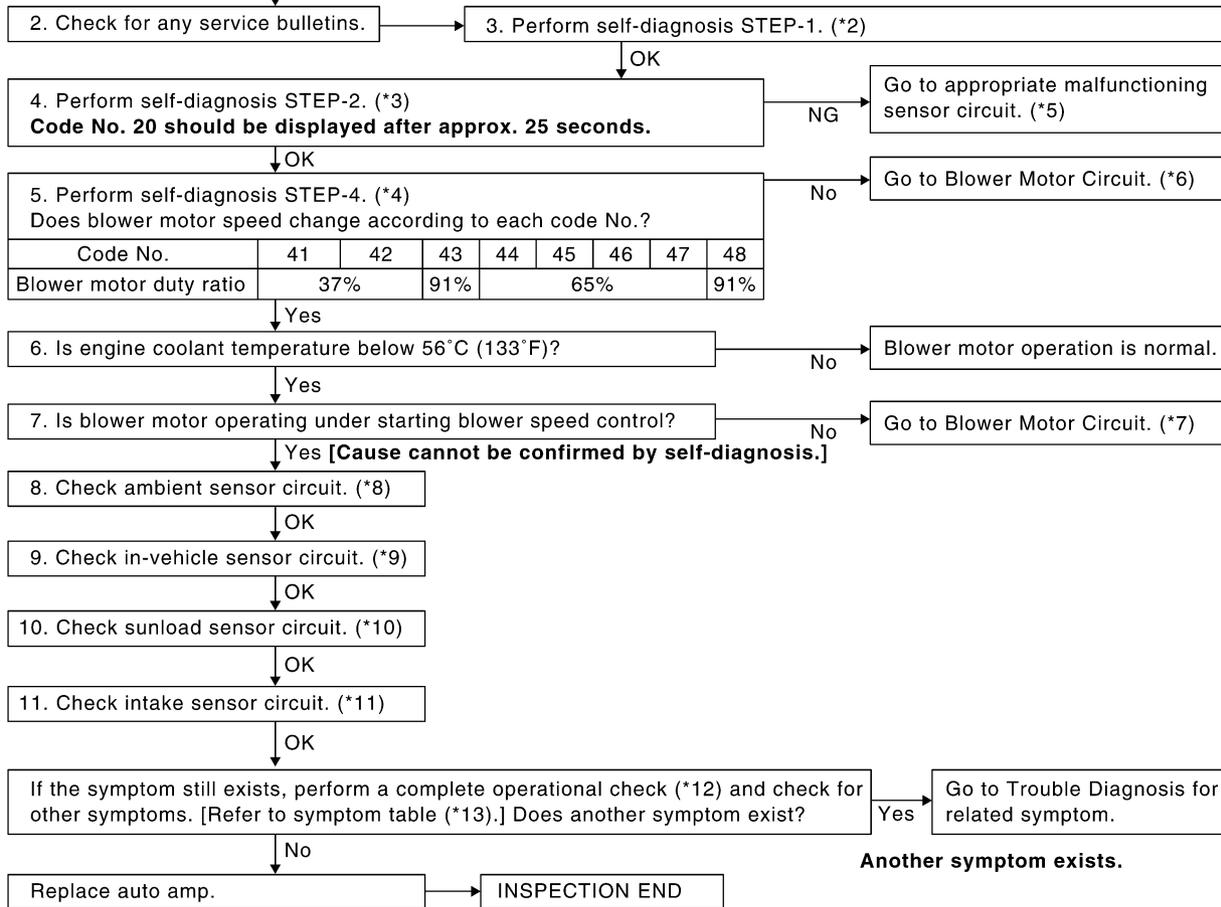
1. Confirm symptom by performing the following operational check.



**OPERATIONAL CHECK - Blower**

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

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



- \*1 Operational Check [ATC-57](#)
- \*2 Self-diagnosis [ATC-49](#) , see No.1
- \*3 Self-diagnosis [ATC-49](#) , see No.5
- \*4 Self-diagnosis [ATC-49](#) , see No.7
- \*5 Self-diagnosis [ATC-49](#) , see No.14

- \*6 Blower motor circuit [ATC-78](#)
- \*7 Blower motor circuit [ATC-78](#)
- \*8 Ambient sensor circuit [ATC-102](#)
- \*9 In-vehicle sensor circuit [ATC-104](#)
- \*10 Sunload sensor circuit [ATC-107](#)

- \*11 Intake sensor circuit [ATC-110](#)
- \*12 Operational Check [ATC-57](#)
- \*13 Symptom table [ATC-32](#)

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# TROUBLE DIAGNOSIS

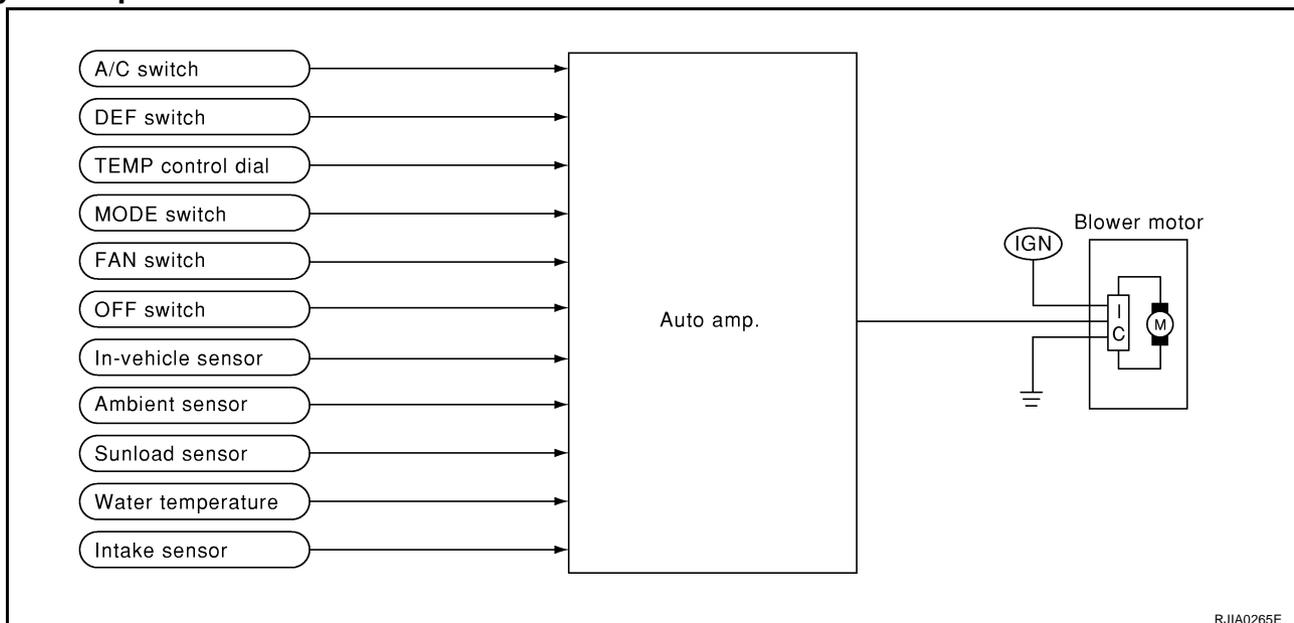
## SYSTEM DESCRIPTION

### Component Parts

Fan speed control system components are:

- Auto amp.
- A/C LAN system (PBR built-in mode door motor and air mix 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 automatic amplifier 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 amplifier, 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 A/C button is pushed. The blower speed will gradually rise to the objective speed over a time period of 3 seconds or less (actual time depends on the objective blower speed).

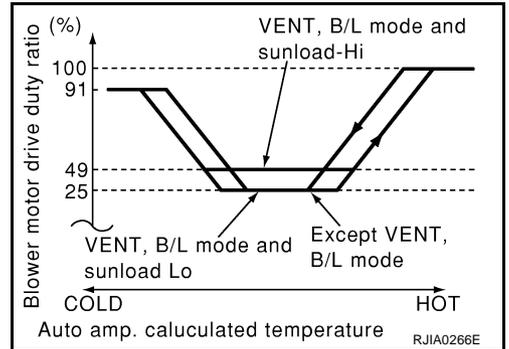
# TROUBLE DIAGNOSIS

## 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%).

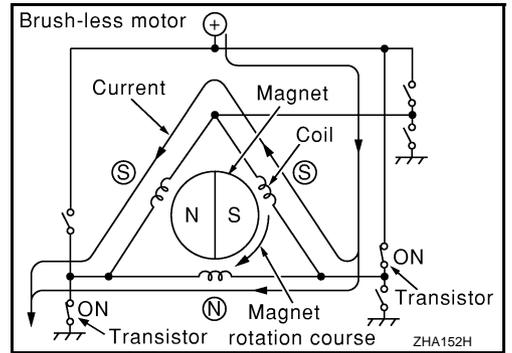
## Fan Speed Control Specification



## COMPONENT DESCRIPTION

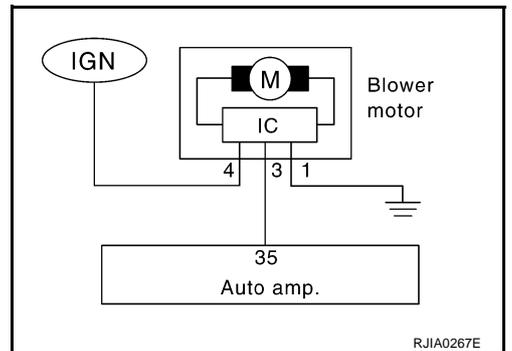
### Brush-Less Motor

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

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



# TROUBLE DIAGNOSIS

## 1. CHECK POWER SUPPLY FOR BLOWER MOTOR

Disconnect blower motor harness connector.

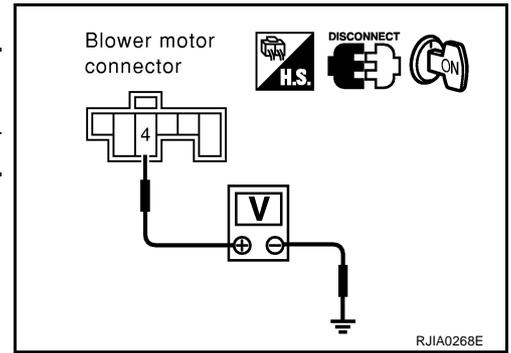
Terminals		Voltage
(+)	(-)	
M112-4 (BR/W)	Body ground	Approx. 12V

OK or NG

OK >> GO TO 2.

NG >> Check power supply circuit and 15A fuses (Nos. 31 and 33, located in the fuse block). Refer to [PG-3](#), "[BATTERY POWER SUPPLY—IGNITION SW. IN ANY POSITION](#)"

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



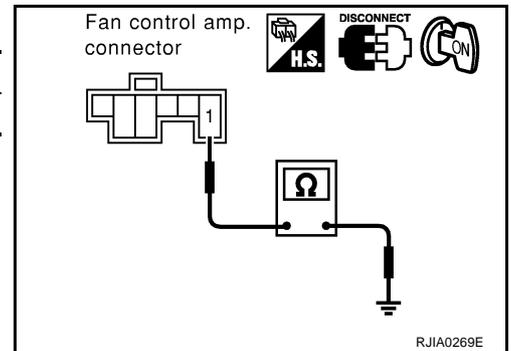
## 2. CHECK BODY GROUND CIRCUIT FOR BLOWER MOTOR

Terminals		Continuity
M112-1 (B)	Body ground	
		Yes

OK or NG

OK >> GO TO 3.

NG >> Repair harness or connector.



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

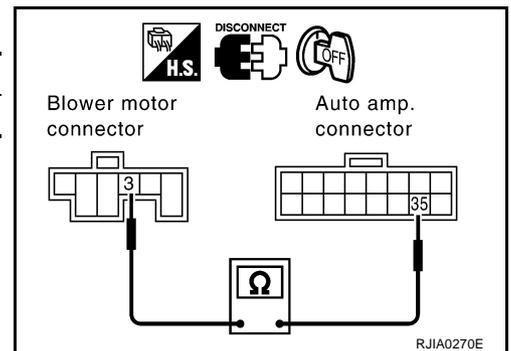
Disconnect auto amp. connector.

Terminals		Continuity
M112-3 (L/OR)	M120-35 (L/OR)	
		Yes

OK or NG

OK >> GO TO 4.

NG >> Repair harness or connector.



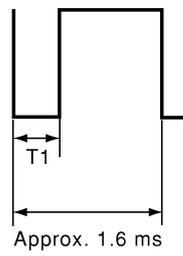
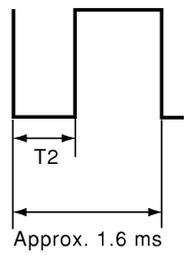
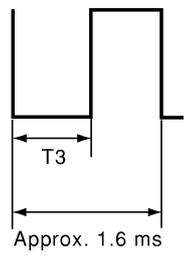
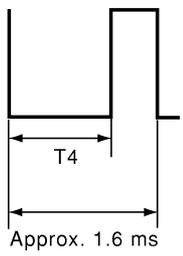
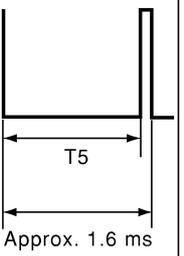
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ATC

# TROUBLE DIAGNOSIS

## 4. CHECK FOR AUTO AMP. OUTPUT

1. Reconnect blower motor connector and auto amp. connector, turn the key switch ON.
2. Vary the fan speed between Lo and Hi and confirm the blower motor connector's terminal No.3 duty ratios using an oscilloscope. Normal No.3 terminal drive signal duty ratios are shown in the table below.

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

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

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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, normal No.3 terminal drive signal duty ratios are shown in the table above.

### OK or NG

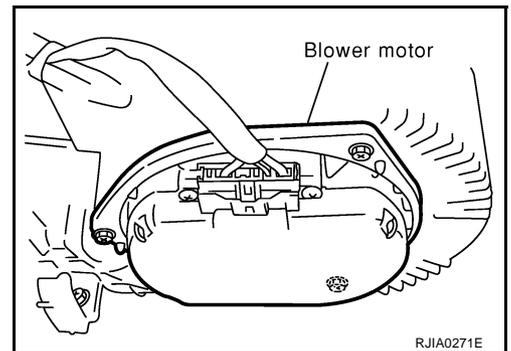
- OK >> Replace blower motor.  
 NG >> INSPECTION END

## COMPONENT INSPECTION

### Blower Motor

Confirm smooth rotation of the blower motor.

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



# TROUBLE DIAGNOSIS

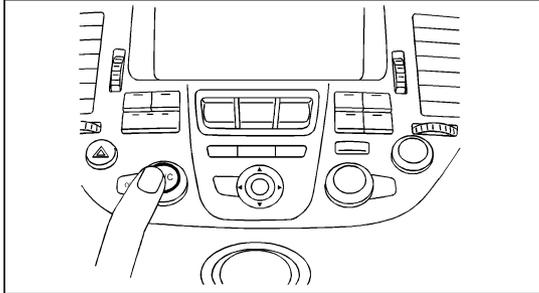
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## Magnet Clutch Circuit

SYMPTOM: Magnet clutch does not engage.

### INSPECTION FLOW

1. Confirm symptom by performing operational check.

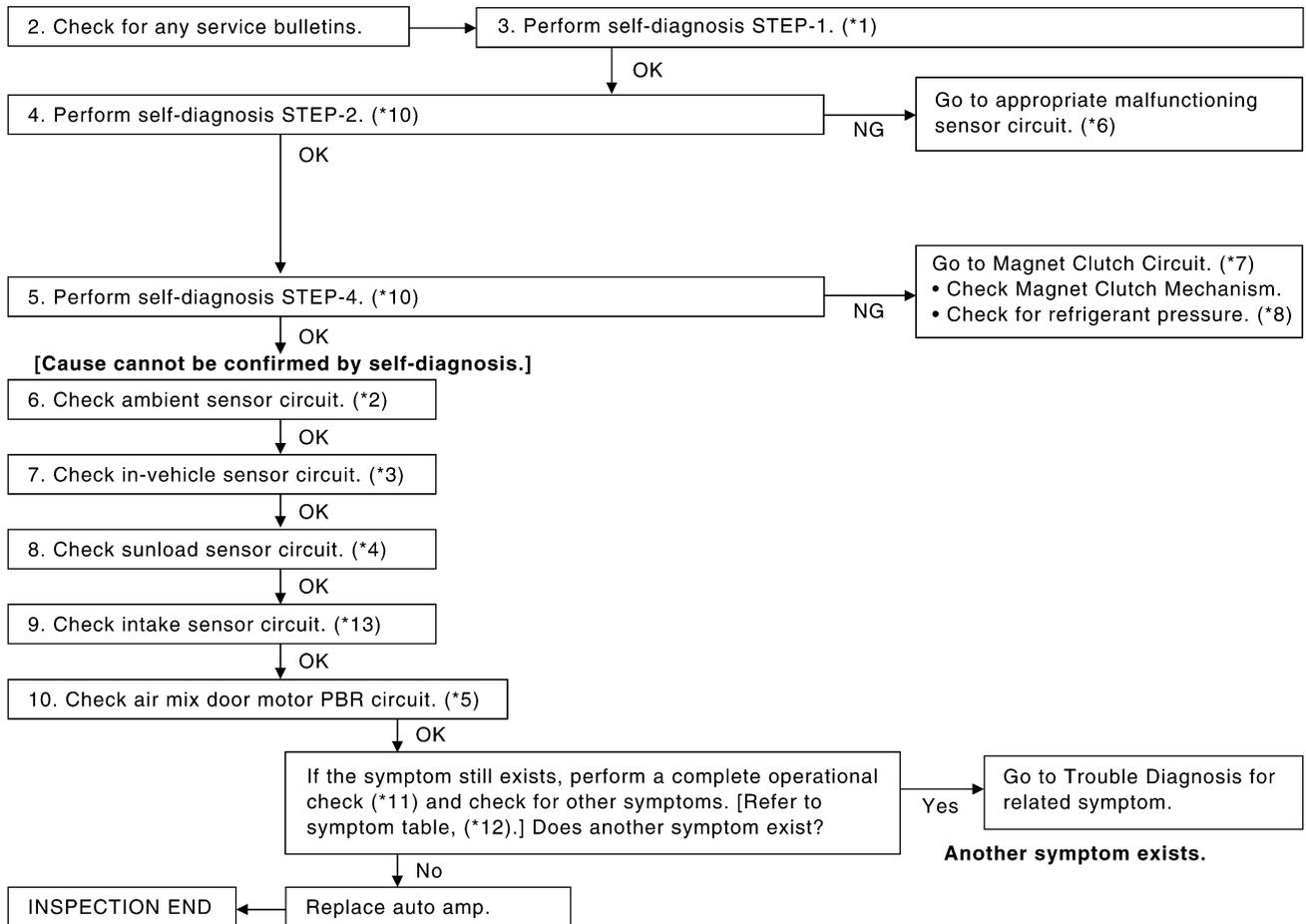


#### OPERATIONAL CHECK – AUTO mode

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

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

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



\*1 Self-diagnosis [ATC-49](#), see No.1.

\*2 Ambient sensor circuit [ATC-102](#)

\*3 In-vehicle sensor circuit [ATC-104](#)

\*4 Sunload sensor circuit [ATC-107](#)

\*5 Air mix door motor circuit [ATC-69](#)

\*6 Self-diagnosis [ATC-49](#), see No. 14.

\*7 Magnet clutch circuit [ATC-82](#)[ATC-81](#)

\*8 Trouble diagnoses for abnormal pressure [ATC-90](#)

\*9 Operational check [ATC-57](#)

\*10 Self-diagnosis [ATC-49](#), see No.7.

\*11 Operational check [ATC-57](#)

\*12 Symptom table [ATC-32](#)

\*13 Intake sensor circuit [ATC-118](#)

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# TROUBLE DIAGNOSIS

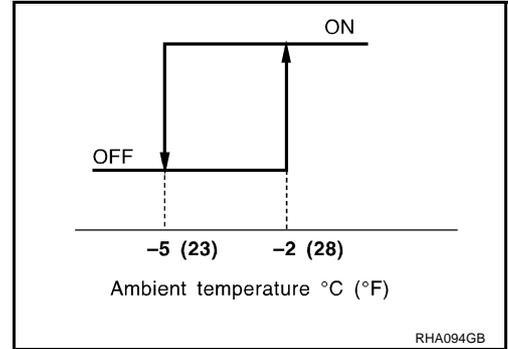
## SYSTEM DESCRIPTION

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

### Low Temperature Protection Control

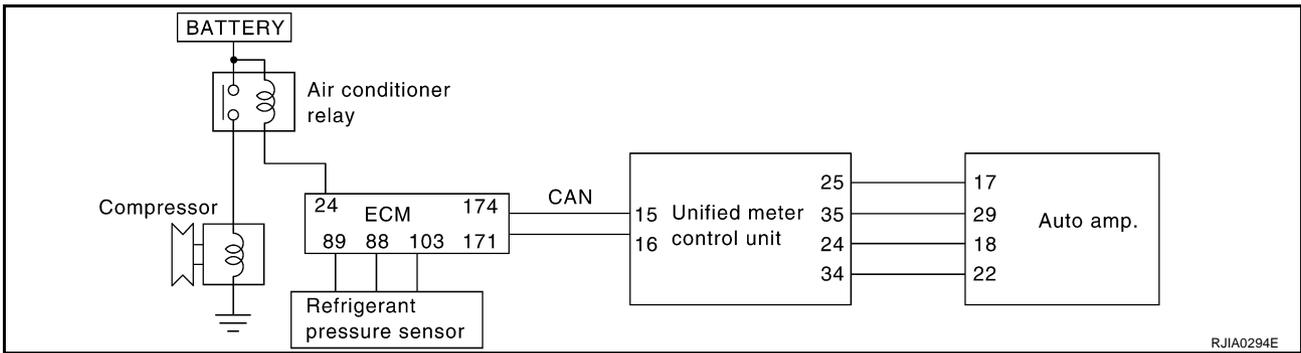
Auto amplifier will turn the compressor ON or OFF as determined by a signal detected by ambient sensor.

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



## DIAGNOSTIC PROCEDURE

SYMPTOM: Magnet clutch does not engage when A/C switch is ON.



### 1. CHECK POWER SUPPLY FOR COMPRESSOR

Disconnect compressor harness connector.

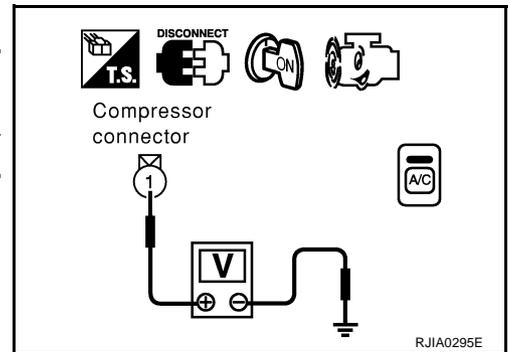
Terminals		Voltage
(+)	(-)	
F2-1 (Y/R)	Body ground	Battery voltage

OK or NG

OK >> Check magnet clutch coil.

1. If NG, replace magnet clutch. Refer to [ATC-81](#).
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is normal.

NG >> Disconnect A/C relay. And GO TO 2.



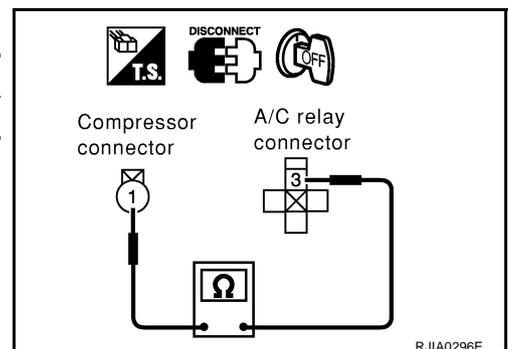
### 2. CHECK CIRCUIT CONTINUITY BETWEEN A/C RELAY AND COMPRESSOR

Terminals		Continuity
F2-1 (Y/R)	E3-2-3 (Y/R)	
		Yes

OK or NG

OK >> Check harness for short. And GO TO 3.

NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

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

Disconnect A/C relay.

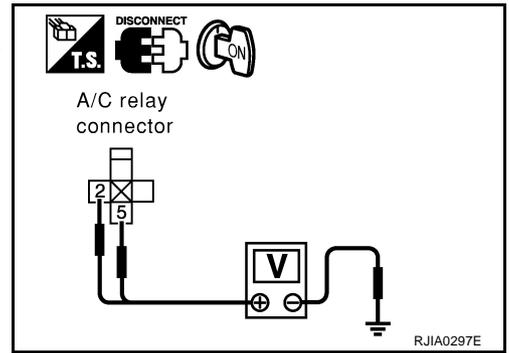
Terminals		Voltage
(+)	(-)	
E3-2-2	Body ground	Battery voltage
E3-2-5		

OK or NG

OK >> GO TO 4.

NG >> Check power supply circuit and 10A (No.51) fuse at fuse block. Refer to [PG-3, "BATTERY POWER SUPPLY—IGNITION SW. IN ANY POSITION"](#).

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



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

Refer to [ATC-85, "A/C Relay"](#).

OK or NG

OK >> Reconnect A/C relay. And GO TO 5.

NG >> 1. replace A/C relay.

2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-4. Confirm that magnet clutch operation is normal.

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

Terminals		Voltage
(+)	(-)	
F101, F102-24 (G/W)	Body ground	Battery voltage

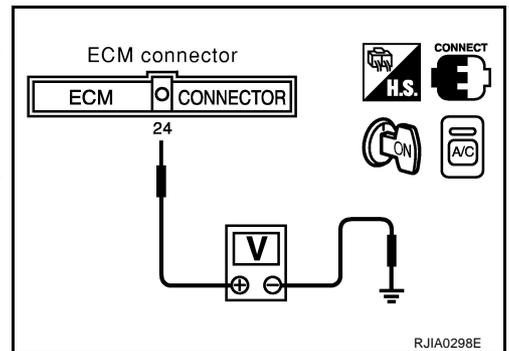
OK or NG

OK >> GO TO 7.

NG >> 1. Disconnect A/C relay.

2. Disconnect ECM harness connector.

3. GO TO 6.



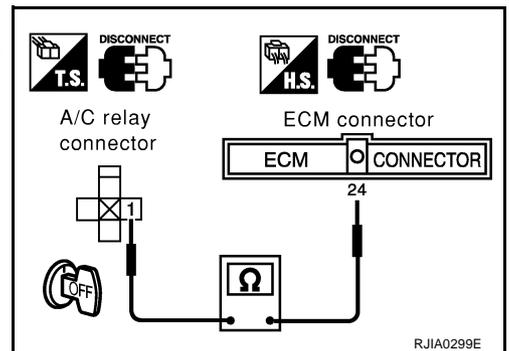
## 6. CHECK CIRCUIT CONTINUITY BETWEEN ECM AND A/C RELAY

Terminals		Continuity
F101, F102-24 (G/W)	E3-2-1	
		Yes

OK or NG

OK >> Replace A/C relay.

NG >> Repair harness or connector.



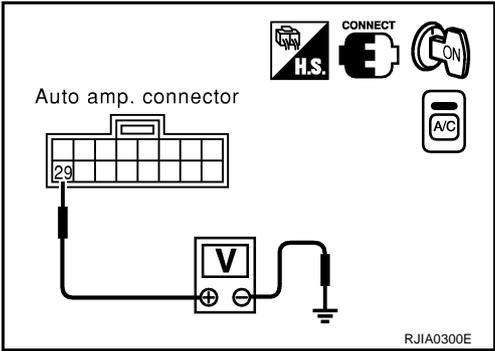
# TROUBLE DIAGNOSIS

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

Terminals		Condition	Voltage
(+)	(-)		
M120-29 (SB)	Body ground	Blower fan: ON	Approx. 0V
		Blower fan: OFF	Approx. 5V

**OK or NG**

- OK >> GO TO 8.
- NG >> GO TO 11.

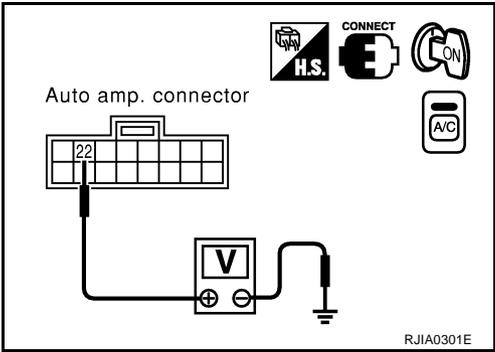


## 8. CHECK VOLTAGE FOR COMBINATION METER (COMPRESSOR ON SIGNAL)

Terminals		Condition	Voltage
(+)	(-)		
M120-22	Body ground	A/C SW: ON	Approx. 0V
		A/C SW: OFF	Approx. 5V

**OK or NG**

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

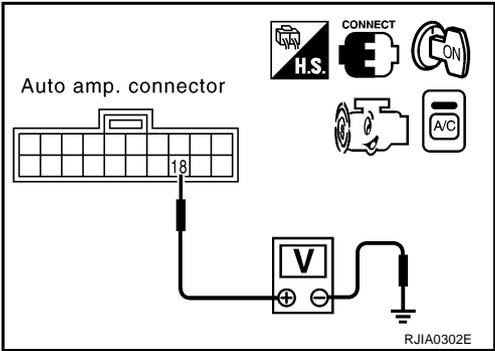


## 9. CHECK VOLTAGE FOR COMBINATION METER (COMPRESSOR FEED BACK SIGNAL)

Terminals		Condition	Voltage
(+)	(-)		
M119-18 (OR)	Body ground	A/C SW: ON	Approx. 0V
		A/C SW: ON (Disconnect refrigerant pressure sensor connector)	Approx. 5V

**OK or NG**

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



## 10. CHECK REFRIGERANT PRESSURE SENSOR CIRCUIT

Refer to [EC-598. "REFRIGERANT PRESSURE SENSOR"](#).

**OK or NG**

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

# TROUBLE DIAGNOSIS

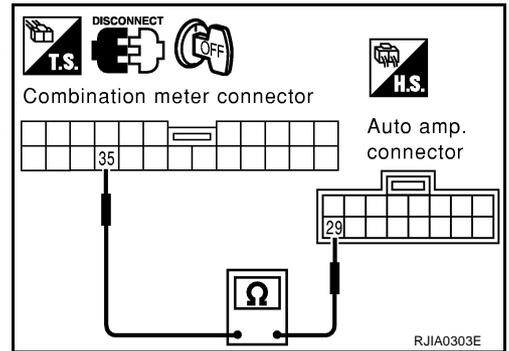
## 11. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND AUTO AMP.

Disconnect combination meter and auto amp. connector.

terminals		Continuity
M42-35 (SB)	M120-29 (SB)	Yes

OK or NG

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



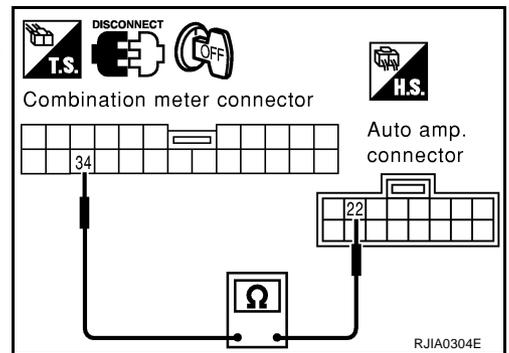
## 12. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND AUTO AMP.

Disconnect combination meter and auto amp. connector.

Terminals		Continuity
M42-34 (Y)	M120-22 (Y)	Yes

OK or NG

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



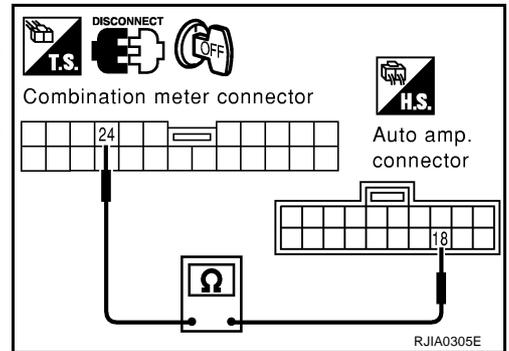
## 13. CHECK CIRCUIT CONTINUITY BETWEEN COMBINATION METER AND AUTO AMP.

Disconnect combination meter and auto amp. connector.

Terminals		Continuity
M42-24 (OR)	M119-18 (OR)	Yes

OK or NG

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



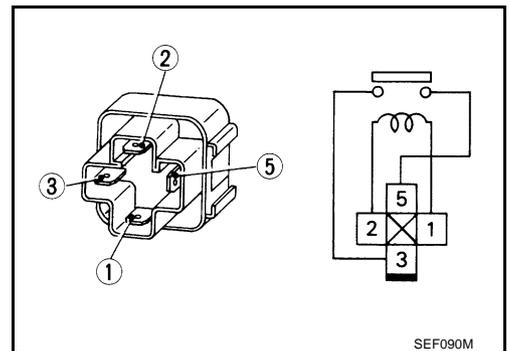
## COMPONENT INSPECTION

### 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

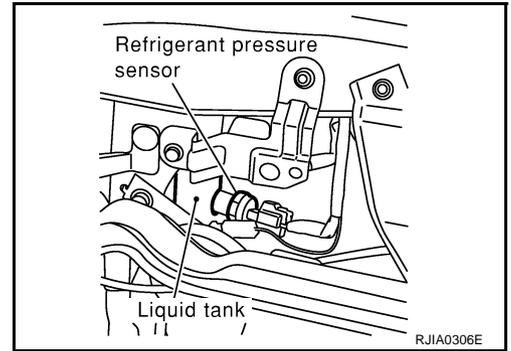
If NG, replace relay.



# TROUBLE DIAGNOSIS

## Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the liquid tank (condenser).



## Insufficient Cooling

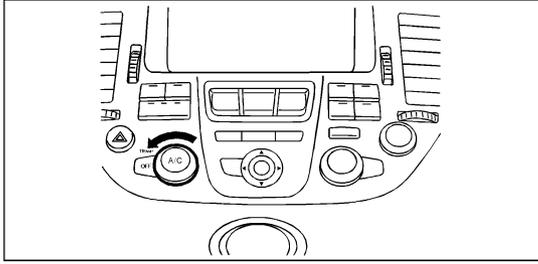
SYMPTOM: Insufficient cooling

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# TROUBLE DIAGNOSIS

## INSPECTION FLOW

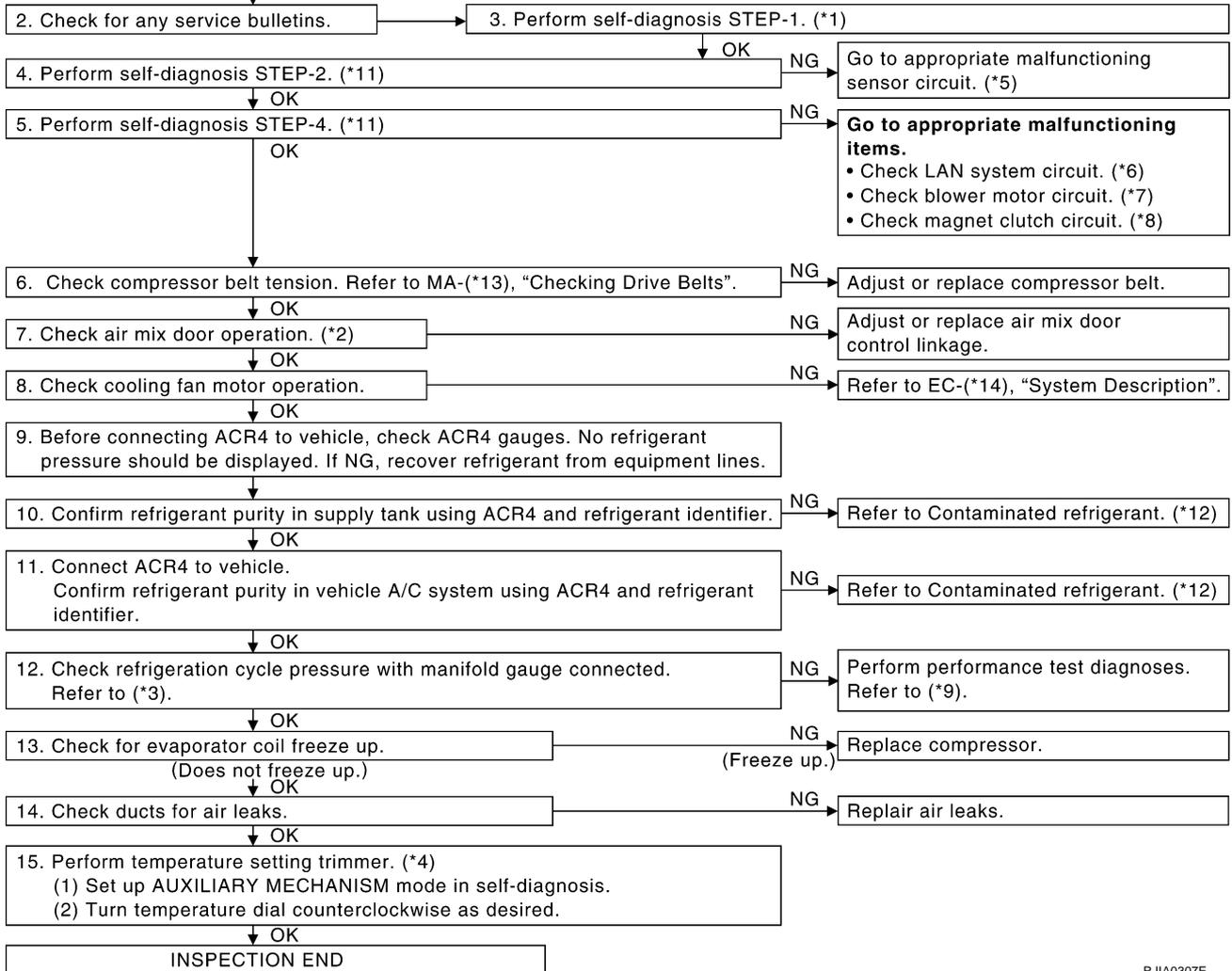
1. Confirm symptom by performing the following operational check.



### 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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\*1 Self-diagnosis [ATC-49](#), see No.1.

\*6 LAN system circuit [ATC-62](#)

\*11 Self-diagnosis [ATC-49](#), see No.5 or 7.

\*2 Air mix door motor circuit [ATC-69](#)

\*7 Blower motor circuit [ATC-75](#)

\*12 [ATC-4, "CONTAMINATED REFRIG-ERANT"](#)

\*3 Test reading [ATC-90](#)

\*8 Magnet clutch circuit [ATC-81](#)

\*13 Checking drive belts [EM-12](#)

\*4 Self-diagnosis [ATC-56, "AUXILIARY MECHANISM: TEMPERATURE SETTING TRIMMER"](#) STEP6.

\*9 [ATC-88, "PERFORMANCE TEST DIAGNOSES"](#)

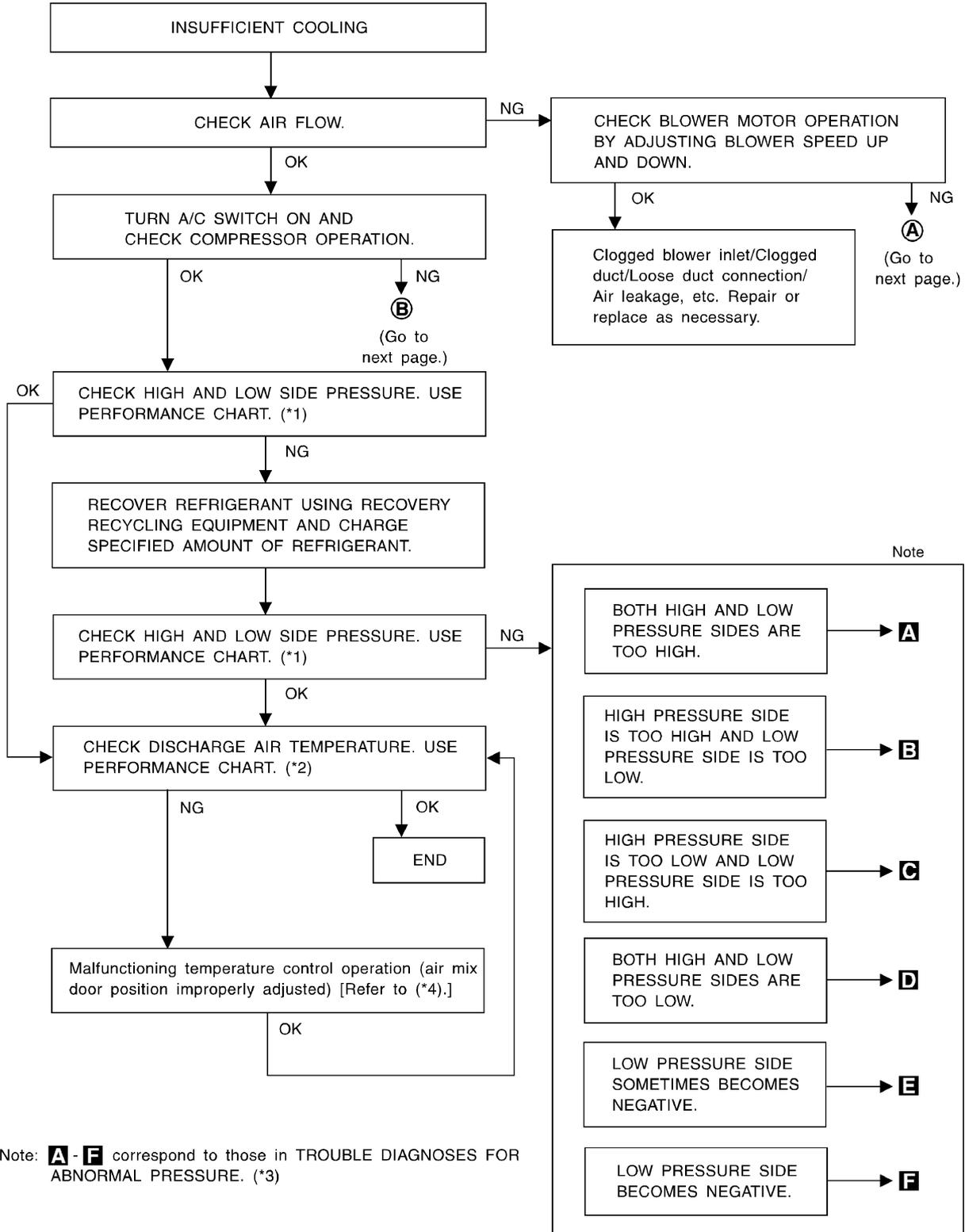
\*14 Cooling fan motor operation [CO-17](#)

\*5 Self-diagnosis [ATC-49](#), see No. 14.

\*10 Operational check [ATC-57](#)

# TROUBLE DIAGNOSIS

## PERFORMANCE TEST DIAGNOSES



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

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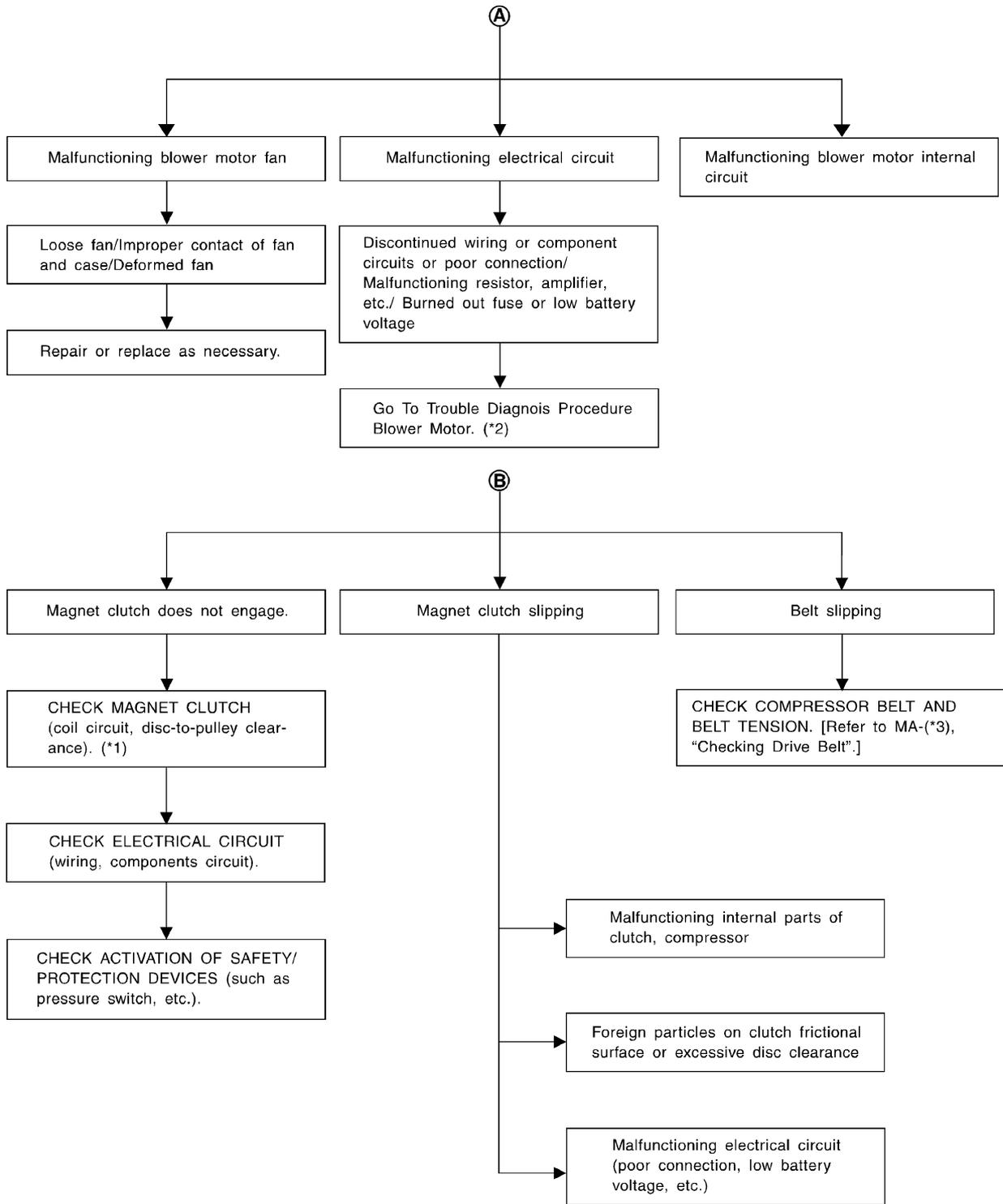
\*1 Performance chart [ATC-90](#)

\*3 Trouble diagnoses for abnormal pressure [ATC-90](#)

\*4 Air mix door motor circuit [ATC-69](#)

\*2 Performance chart [ATC-90](#)

# TROUBLE DIAGNOSIS



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\*1 [ATC-136, "Removal and Installation for Compressor Clutch"](#)

\*2 Trouble diagnoses for blower motor [ATC-75](#)

\*3 Belt tension [EM-12](#)

SHA329F

# 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
##(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)	10.0 - 12.3 (50-54)
	30 (86)	13.2 - 15.3 (56-60)
	35 (95)	17.2 - 21.0 (63-70)
60 - 70	25 (77)	12.3 - 14.9 (54-59)
	30 (86)	15.3 - 19.3 (60-67)
	35 (95)	21.0 - 24.4 (70-76)

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

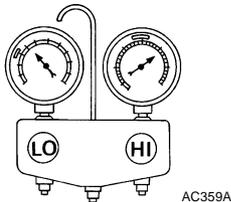
Ambient air		High-pressure (Discharge side) kPa (kg/cm2, psi)	Low-pressure (Suction side) kPa (kg/cm2, psi)
Relative humidity %	Air temperature °C (°F)		
50 - 70	30 (86)	1,220 - 1,500 (12.44-15.30,176.9-217.5)	240 - 295 (2.45-3.01,34.8-42.8)
	35 (95)	1,360 - 1,690 (13.87-17.24,197.2-245.1)	275 - 335 (2.81-3.62,39.9-51.5)
	40 (104)	1,500 - 1,830 (15.30-18.67,217.58-265.4)	310 - 375 (3.16-3.83,45.0-54.4)

### TROUBLE DIAGNOSES FOR ABNORMAL PRESSURE

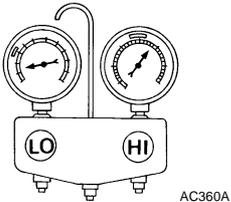
Whenever system's high and/or low side pressure is abnormal, diagnose using a manifold gauge. The marker above the gauge scale in the following tables indicates the standard (normal) pressure range. Since the standard (normal) pressure, however, differs from vehicle to vehicle, refer to above table (Ambient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

# TROUBLE DIAGNOSIS

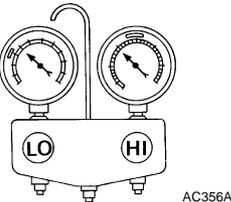
## Both High and Low-pressure Sides are Too High.

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high and low-pressure sides are too high.</p>  <p>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> ↓ 1. Improper thermal valve installation 2. Improper expansion valve adjustment	Replace expansion valve.

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

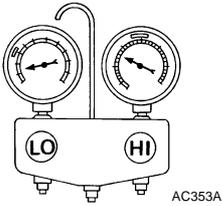
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p>  <p>AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor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

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

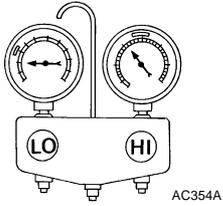
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too low and low-pressure side is too high.</p>  <p>AC356A</p>	High and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor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

# TROUBLE DIAGNOSIS

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

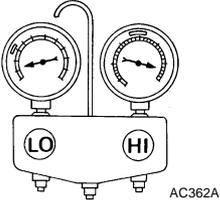
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too low.</p> 	<ul style="list-style-type: none"> <li>There is a big temperature difference between receiver drier outlet and inlet. Outlet temperature is extremely low.</li> <li>Liquid tank inlet and expansion valve are frosted.</li> </ul>	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> <li>Replace desiccant assy.</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>	High-pressure pipe located between receiver drier and expansion valve is clogged.	<ul style="list-style-type: none"> <li>Check and repair malfunctioning parts.</li> <li>Check lubricant for contamination.</li> </ul>
	Expansion valve and liquid tank are warm or only cool when touched.	Low refrigerant charge ↓ Leaking fittings or components	Check refrigerant for leaks. Refer to Checking Refrigerant Leaks, <a href="#">ATC-145</a> .
	There is a big temperature difference between expansion valve inlet and outlet while the valve itself is frosted.	Expansion valve closes a little compared with the specification. ↓ 1. Improper expansion valve adjustment 2. Malfunctioning thermal valve 3. Outlet and inlet may be clogged.	<ul style="list-style-type: none"> <li>Remove foreign particles by using compressed air.</li> <li>Check lubricant for contamination.</li> </ul>
	An area of the low-pressure pipe is colder than areas near the evaporator outlet.	Low-pressure pipe is clogged or crushed.	<ul style="list-style-type: none"> <li>Check and repair malfunctioning parts.</li> <li>Check lubricant for contamination.</li> </ul>
	Air flow volume is not enough or is too low.	Evaporator is frozen.	<ul style="list-style-type: none"> <li>Check thermo control amp. operation.</li> <li>Replace compressor.</li> </ul>

## 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>	Refrigerant does not discharge cyclically. ↓ Moisture is frozen at expansion valve outlet and inlet. ↓ Water is mixed with refrigerant.	<ul style="list-style-type: none"> <li>Drain water from refrigerant or replace refrigerant.</li> <li>Replace desiccant assy.</li> </ul>

# TROUBLE DIAGNOSIS

## 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. ↓ Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the problem is caused by water or foreign particles.</p> <ul style="list-style-type: none"> <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 problem, replace expansion valve.</li> <li>● Replace desiccant assy.</li> <li>● Check lubricant for contamination.</li> </ul>

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## Insufficient Heating

EJS000JV

SYMPTOM: Insufficient heating

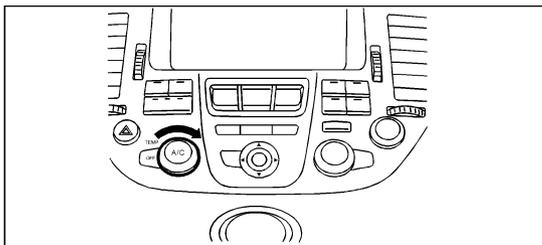
ATC

I  
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M

# TROUBLE DIAGNOSIS

## INSPECTION FLOW

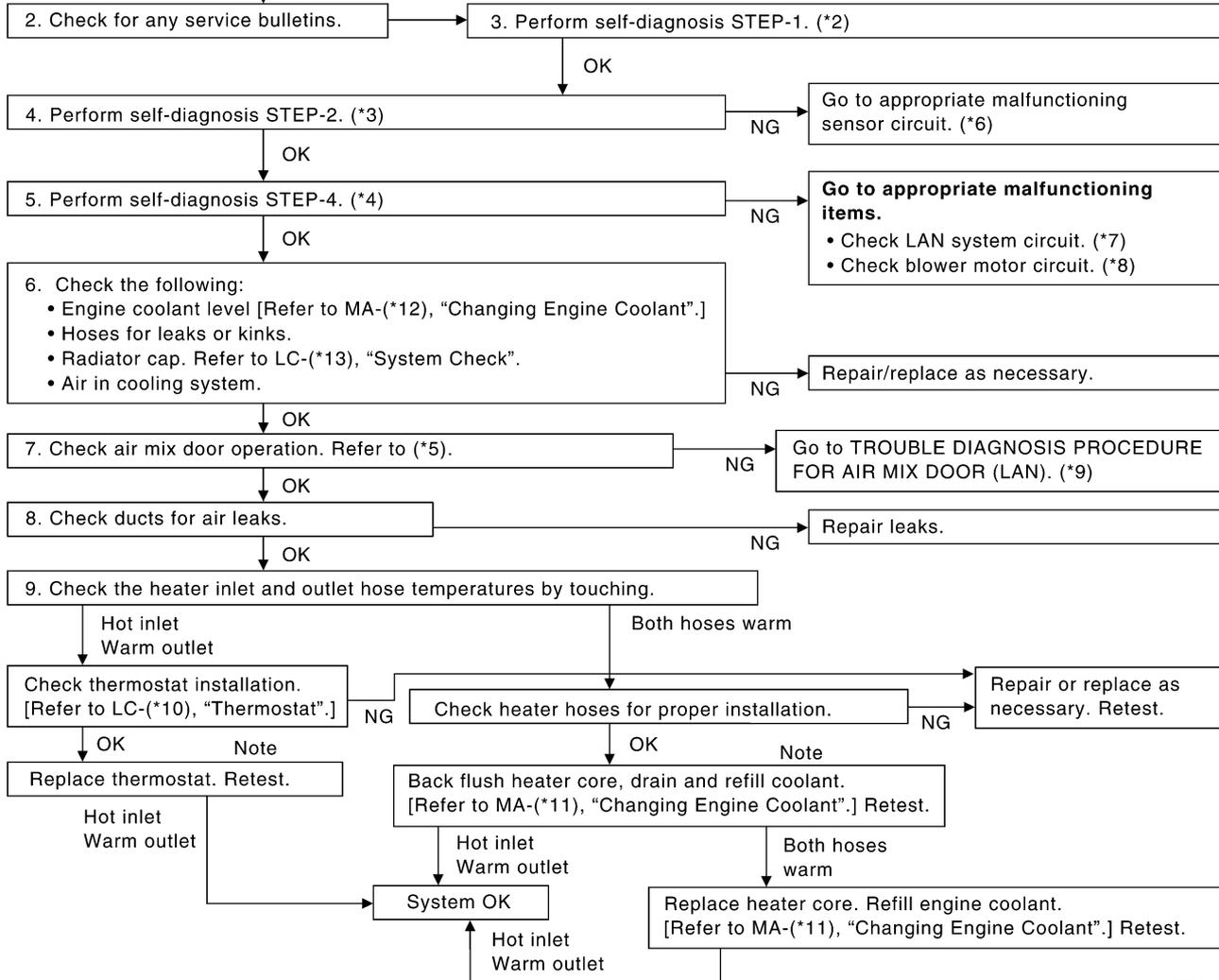
1. Confirm symptom by performing the following operational check.



### OPERATIONAL CHECK – Temperature increase

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

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



RJIA0308E

\*1 Operational check [ATC-57](#)

\*2 Self-diagnosis [ATC-49](#), see No.1.

\*3 Self-diagnosis [ATC-49](#), see No.5.

\*4 Self-diagnosis [ATC-49](#), see No.7.

\*5 Air mix door motor circuit [ATC-69](#)

\*6 Self-diagnosis [ATC-49](#), see No.14.

\*7 LAN system circuit [ATC-62](#)

\*8 Blower motor circuit [ATC-75](#)

\*9 Air mix door motor circuit [ATC-69](#)

\*1 Thermostat [CO-23](#)

0

\*1 [CO-8, "Changing Engine Coolant"](#)

1

\*1 [CO-8, "Changing Engine Coolant"](#)

2

\*1 Radiator cap-system check [CO-11, "Removal and Installation"](#)

3

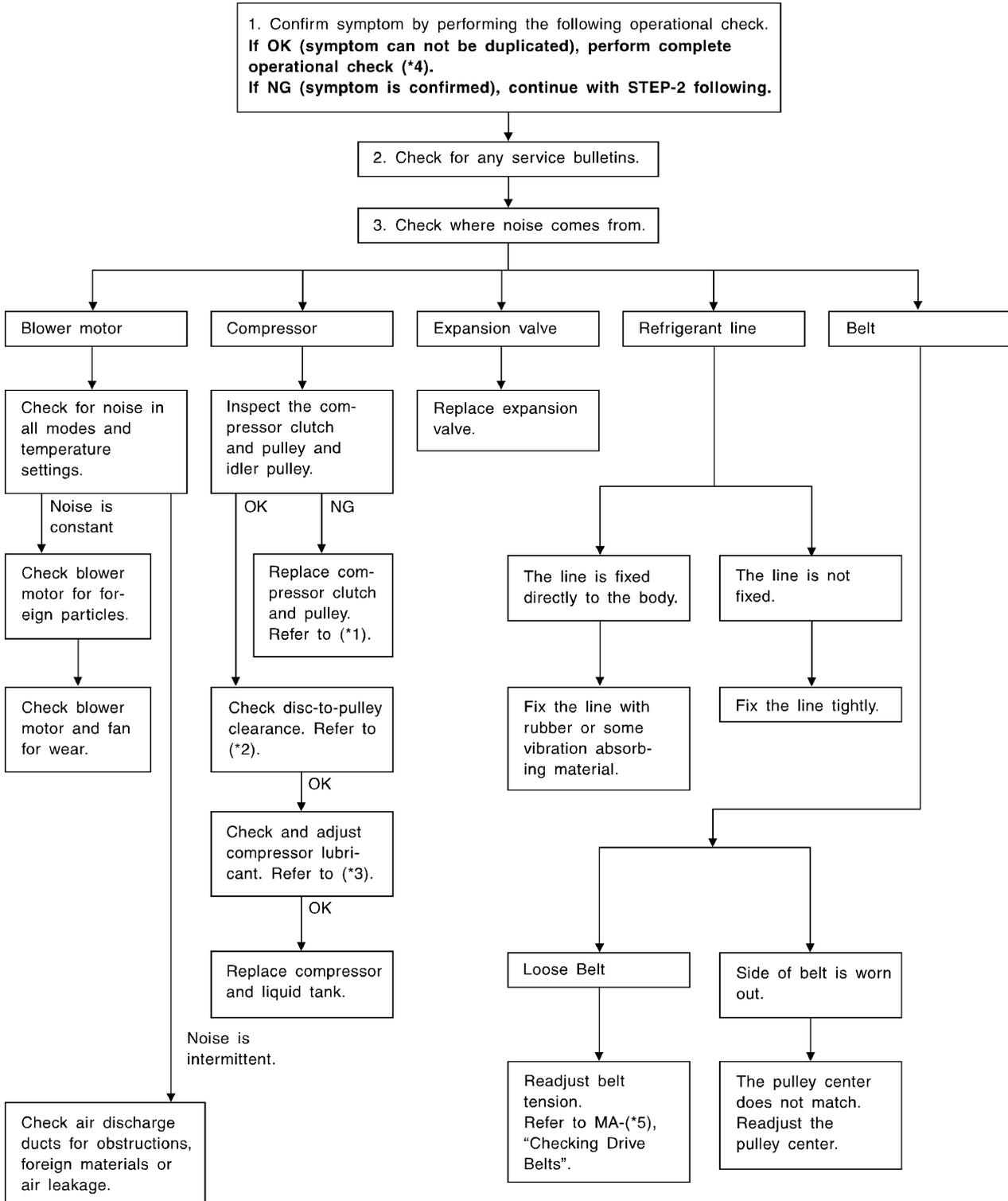
# TROUBLE DIAGNOSIS

EJS000SW

## Noise

SYMPTOM: Noise

### INSPECTION FLOW



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J  
K  
L  
M

ATC

\*1 [ATC-136. "Removal and Installation for Compressor Clutch"](#)

\*2 [ATC-135](#)

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

\*4 Operational check [ATC-57](#)

\*5 Checking drive belts [EM-12. "Tension Adjustment"](#)

SHA331F

# TROUBLE DIAGNOSIS

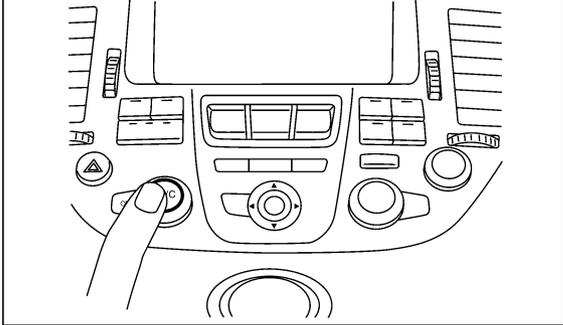
EJS000JX

## Self-diagnosis

SYMPTOM: Self-diagnosis cannot be performed.

### INSPECTION FLOW

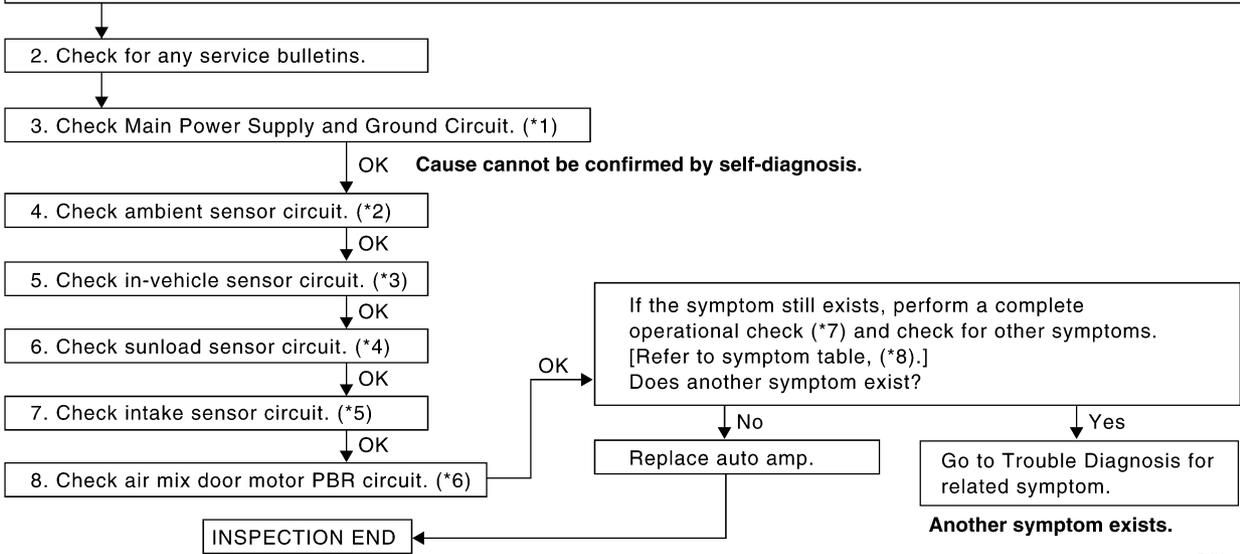
1. Confirm symptom by performing operational check.



**OPERATIONAL CHECK – AUTO mode**

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

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



\*1 Main power supply and ground circuit [ATC-61](#). "DIAGNOSTIC PROCEDURE"

\*2 Ambient sensor circuit [ATC-102](#)

\*3 In-vehicle sensor circuit [ATC-104](#)

\*4 Sunload sensor circuit [ATC-107](#)

\*5 Intake sensor circuit [ATC-110](#)

\*6 Air mix door motor circuit [ATC-69](#)

\*7 Operational check [ATC-57](#)

\*8 Symptom table [ATC-32](#)

\*9 Operational check [ATC-57](#)

RJIA0309E

# TROUBLE DIAGNOSIS

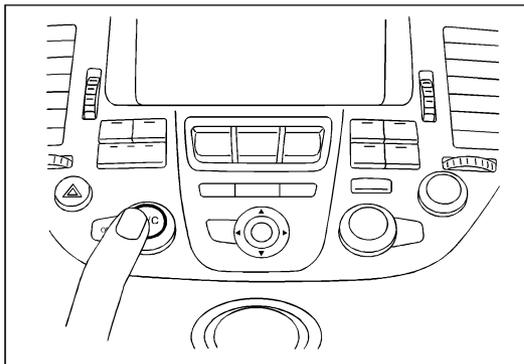
EJS000JY

## 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 A/C 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

Go to A/C system circuit. (\*4)

OK

4. Replace auto amp.

#### 5. FINAL CHECK

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

\*1 Main power supply and ground circuit [ATC-59](#)

\*3 Self-diagnosis [ATC-49](#)

\*4 A/C system circuit [ATC-59](#), "[Power Supply and Ground Circuit for Auto Amp.](#)"

\*2 Operational check [ATC-57](#)

RJIA0310E

ATC

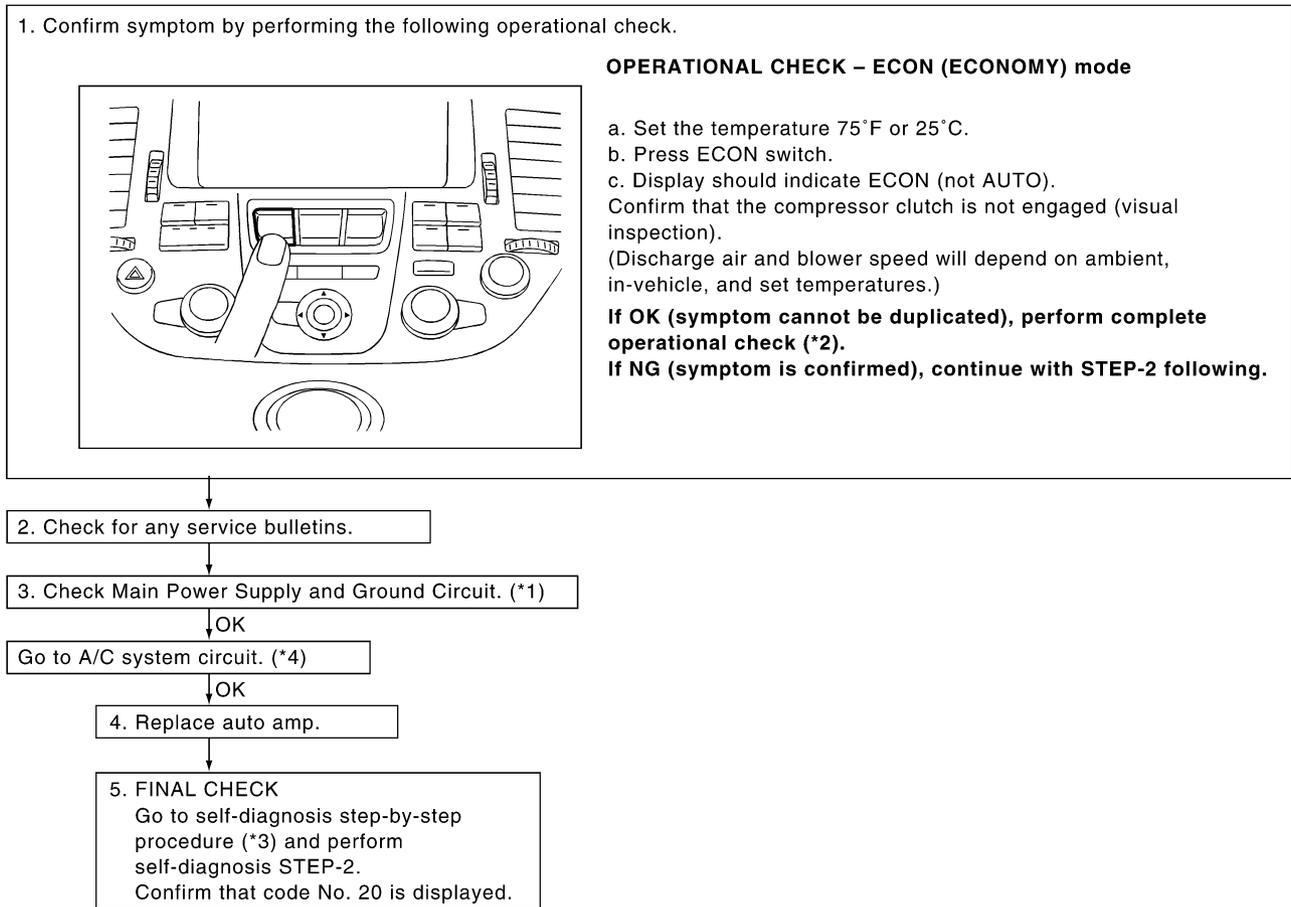
# TROUBLE DIAGNOSIS

EJS000JZ

## ECON (ECONOMY) Mode

SYMPTOM: ECON mode does not operate.

### INSPECTION FLOW



RJIA0311E

\*1 Main power supply and ground circuit [ATC-59](#)

\*3 Self-diagnosis [ATC-49](#)

\*4 A/C system circuit [ATC-59](#), "[Power Supply and Ground Circuit for Auto Amp.](#)"

\*2 Operational check [ATC-57](#)

# TROUBLE DIAGNOSIS

EJS000SY

## No A/C display is shown

### 1. HARNESS CHECK

1. Disconnect A/C AUTO AMP. connector and AV and NAVI control unit or AV control unit connector.
2. Check continuity between AV and NAVI control unit connector B30, AV control unit connector M78 (without rear control switch) or AV control unit connector B33 (For CANADA with rear control unit) or AV control unit and ground.

Terminals		(-)	Continuity
AV and NAVI control unit or AV control unit(+)	Terminal (wire color)		
Connector	Terminal (wire color)		
B30, M78, B33	44 (W),45 (B)	Ground	NO

3. Check continuity between A/C AUTO AMP. and AV and NAVI control unit connector B29, AV control unit connector M77 (without rear control switch) or AV control unit connector B32 (For CANADA with rear control unit).

Terminals				Continuity
AV and NAVI control unit or AV control unit (+)		A/C AUTO AMP. (-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
B29, M77, B32	44 (W)	M119	9 (W)	YES
	45 (B)	M119	20 (B)	YES

#### Ok or NG

OK >> GO TO 2.

NG >> ● Check harness between A/C AUTO AMP. and AV and NAVI control unit or AV control unit.

- Check connector housings for disconnected or loose terminals.

### 2. A/C-AV, AC-CLK COMMUNICATION SIGNAL CHECK

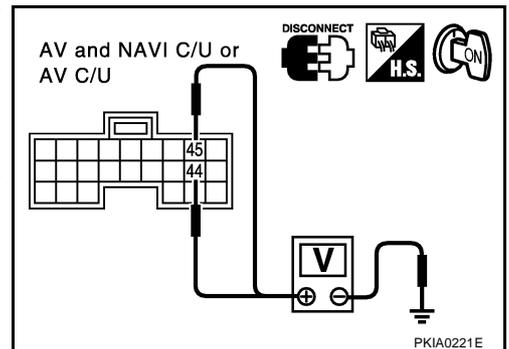
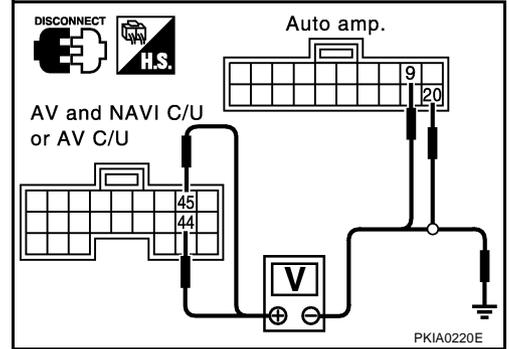
1. Connect A/C AUTO AMP. connector.
2. Turn the ignition switch ON.
3. Check voltage between AV and NAVI control unit connector B29, AV control unit connector M77 (without rear control switch) or AV control unit connector B32 (For CANADA with rear control unit) and ground.

Terminals		(-)	Voltage (V)
(+) Terminal (wire color)			
Connector	Terminal (wire color)		
B29, M77, B32	44(W),45 (B)	ground	Approx. 3.5 or more

#### OK or NG

OK >> GO TO 3.

NG >> Replace A/C AUTO AMP.



# TROUBLE DIAGNOSIS

## 3. A/C - AV, AC - CLK COMMUNICATION SIGNAL CHECK

1. Connect AV and NAVI control unit or AV control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between AV and NAVI control unit connector B29, AV control unit connector M77 (without rear control switch) or AV control unit connector B32 (For CANADA with rear control unit) terminals 44, 45 and ground.

Terminals			Reference signal
(+)		(-)	
Connector	Terminal (wire color)		
B29, M77, B32	44(W),45 (B)	ground	<a href="#">AV-57. "Terminals and Reference Value for AV and NAVI Control unit"</a>

OK or NG

- OK >> Replace A/C auto amplifier  
 NG >> Replace AV and NAVI control unit or AV control unit

**A/C operation is not possible.**

### 1. HARNESS CHECK

1. Disconnect A/C AUTO AMP. connector and AV and NAVI control unit or AV control unit connector.
2. Check continuity between AV and NAVI control unit connector B30, AV control unit connector M78 (without rear control switch) or AV control unit connector B33 (For CANADA with rear control unit) and ground.

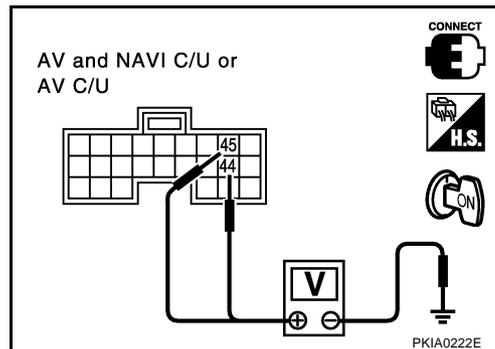
Terminals			Continuity
AV and NAVI control unit or AV control unit(+)		(-)	
Connector	Terminal (wire color)		
B30, M78, B33	43 (R),45 (B)	Ground	NO

3. Check continuity between A/C AUTO AMP. and AV and NAVI control unit connector B29, M77, B32, AV control unit connector M77 (without rear control switch) or AV control unit connector B32 (For CANADA with rear control unit)

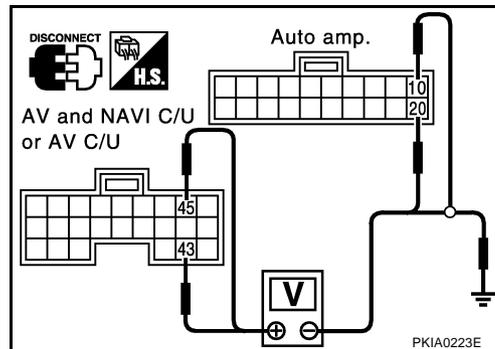
Terminals				Continuity
AV and NAVI control unit or AV control unit (+)		A/C AUTO AMP. (-)		
Connector	Terminal (wire color)	Connector	Terminal (wire color)	
B29, M77, B32	43 (R)	M119	10 (R)	YES
	45 (B)	M119	20 (B)	YES

OK or NG

- OK >> GO TO 2.  
 NG >> ● Check harness for open or short between A/C AUTO AMP. and AV and NAVI control unit or AV control unit.  
 ● Check connector housings for disconnected or loose terminals.



EJS000SZ



# TROUBLE DIAGNOSIS

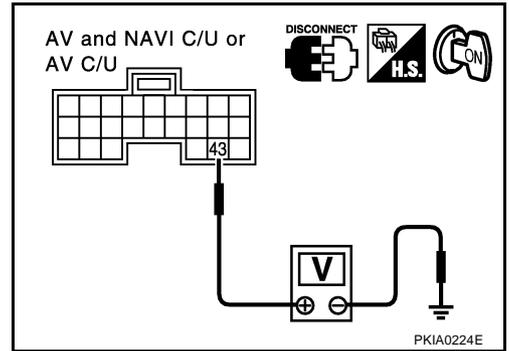
## 2. AV - A/C, AC - CLK COMMUNICATION SIGNAL CHECK

1. Connect A/C AUTO AMP. connector.
2. Turn the ignition switch ON.
3. Check voltage between AV and NAVI control unit connector B29, AV control unit connector M77 (without rear control switch) or AV control unit connector B32 (For CANADA with rear control unit) terminal 43 and ground.

Terminals		Reference voltage (V)
(+)		
Connector	Terminal (wire color)	(-)
B29, M77, B32	43 (R)	ground
		Approx. 3.5 or more

### OK or NG

- OK >> GO TO 3.  
 NG >> Replace A/C auto amplifier



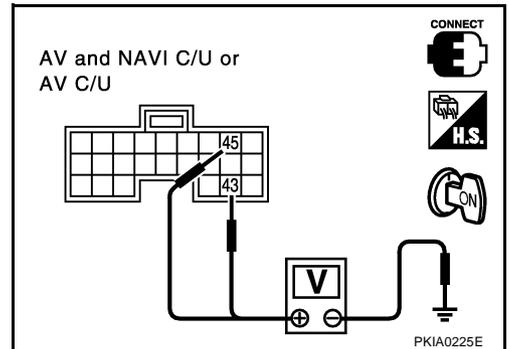
## 3. AV-A/C, AC-CLK COMMUNICATION SIGNAL CHECK

1. Connect AV and NAVI control unit or AV control unit connector.
2. Turn the ignition switch ON.
3. Check voltage between AV and NAVI control unit connector B29, AV control unit connector M77 (without rear control switch) or AV control unit connector B32 (For CANADA with rear control unit) terminals 43, 45 and ground.

Terminals		Reference signal
(+)		
Connector	Terminal (wire color)	(-)
B29, M77, B32	43 (R), 45 (B)	ground
		<a href="#">AV-57, "Terminals and Reference Value for AV and NAVI Control unit"</a>

### OK or NG

- OK >> Replace A/C auto amplifier  
 NG >> Replace AV and NAVI control unit or AV control unit



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ATC

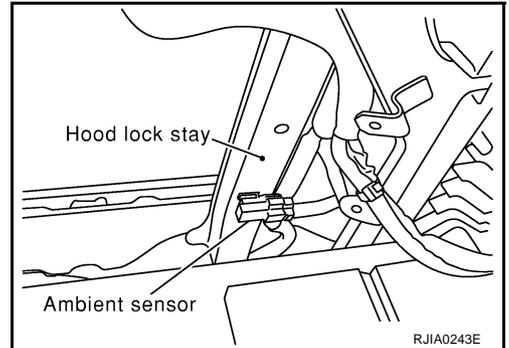
# TROUBLE DIAGNOSIS

EJS000K0

## Ambient Sensor Circuit COMPONENT DESCRIPTION

### 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 amplifier.

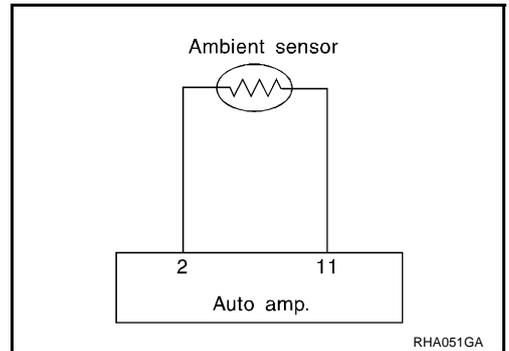


### AMBIENT TEMPERATURE INPUT PROCESS

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

### DIAGNOSTIC PROCEDURE

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.)



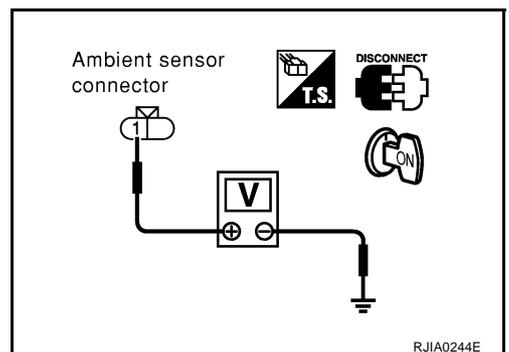
## 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR HARNESS CONNECTOR AND BODY GROUND

Disconnect ambient sensor harness connector.

Terminals		Voltage
(+)	(-)	
E58-1 (G/R)	Body ground	Approx. 5V

#### Yes or No

- Yes >> GO TO 2.
- No >> GO TO 4.



# TROUBLE DIAGNOSIS

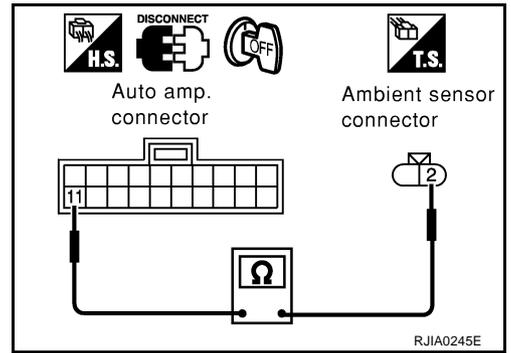
## 2. CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
E58-2 (R/Y)	M119-11 (R/Y)	Yes

OK or NG

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



## 3. CHECK AMBIENT SENSOR

Refer to [ATC-102, "Ambient Sensor Circuit"](#)

OK or NG

- OK >> 1. Replace auto amp. (LCU).
- 2. Go to self-diagnosis procedure [ATC-48, "Self-diagnosis Function"](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Replace ambient sensor.

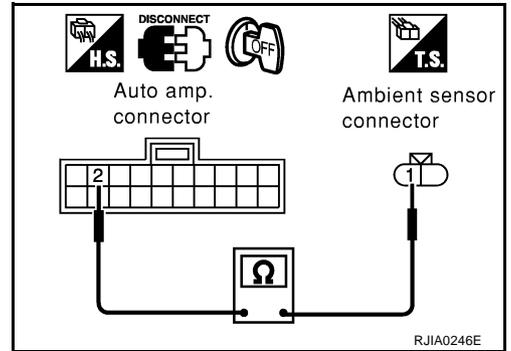
## 4. CHECK AMBIENT SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
E58-1 (G/R)	M119-2 (G/R)	Yes

OK or NG

- OK >> 1. Replace auto amp. (LCU).
- 2. Go to self-diagnosis step-by-step procedure [ATC-48, "Self-diagnosis Function"](#) 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

### Ambient Sensor

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

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

If NG, replace ambient sensor.

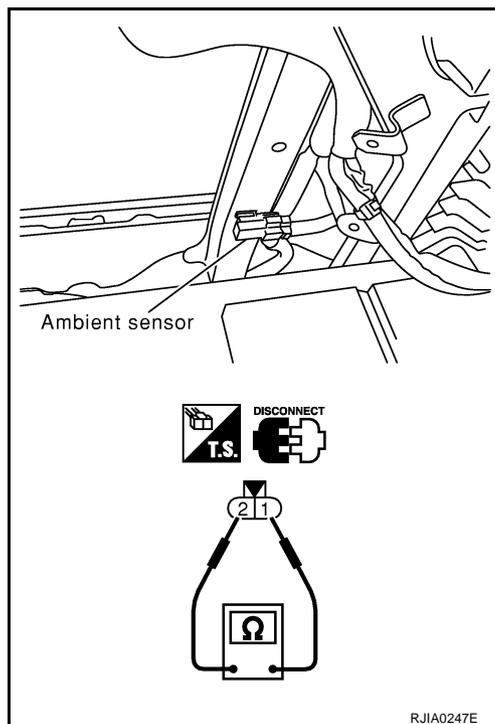
### In-Vehicle Sensor Circuit COMPONENT DESCRIPTION

#### In-Vehicle Sensor

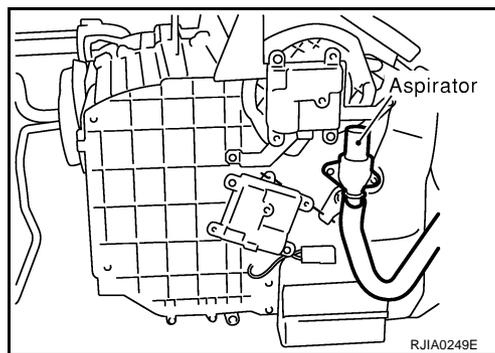
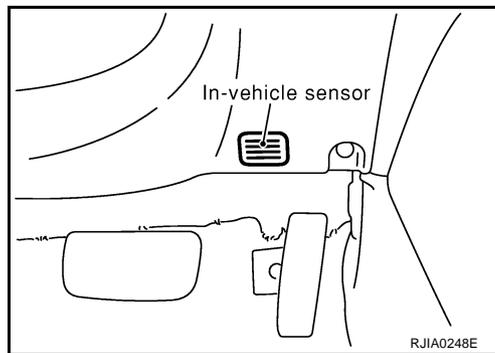
The in-vehicle sensor is located on instrument lower panel. It converts variations in temperature of compartment air drawn from the aspirator into a resistance value. It is then input into the auto amplifier.

#### Aspirator

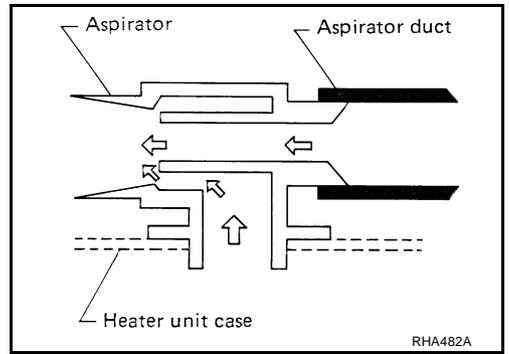
The aspirator is located on driver's side of heater & cooling unit. It produces vacuum pressure due to air discharged from the heater & cooling unit, continuously taking compartment air in the aspirator.



EJS000K1

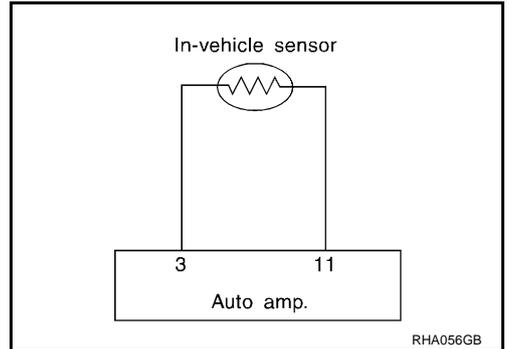


# TROUBLE DIAGNOSIS



## DIAGNOSTIC PROCEDURE

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.)



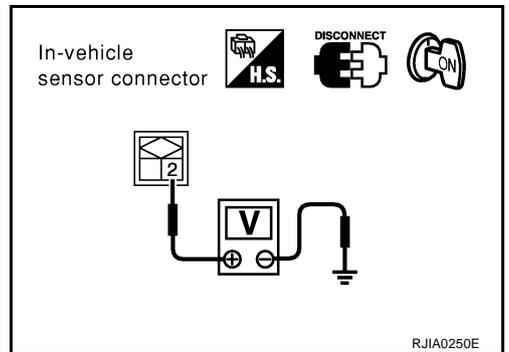
### 1. CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND BODY GROUND

Disconnect in-vehicle sensor harness connector.

Terminals		Voltage
(+)	(-)	
M68-2 (LG/B)	Body ground	Approx. 5V

Yes or No

- Yes >> GO TO 2.
- No >> GO TO 4.



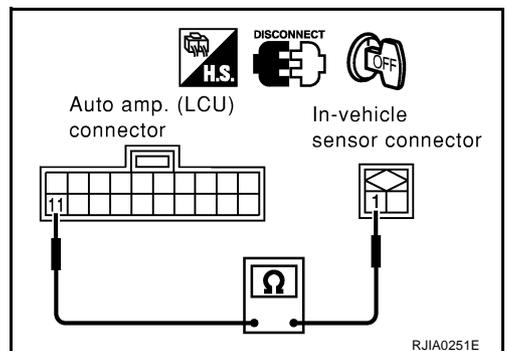
### 2. CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN IN-VEHICLE SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
M68-1 (R/Y)	M119-11 (R/Y)	

OK or NG

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



# TROUBLE DIAGNOSIS

## 3. CHECK IN-VEHICLE SENSOR

Refer to [ATC-104, "In-Vehicle Sensor Circuit"](#)

OK or NG

- OK >> 1. Replace auto amp.  
 2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace in-vehicle sensor.  
 2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

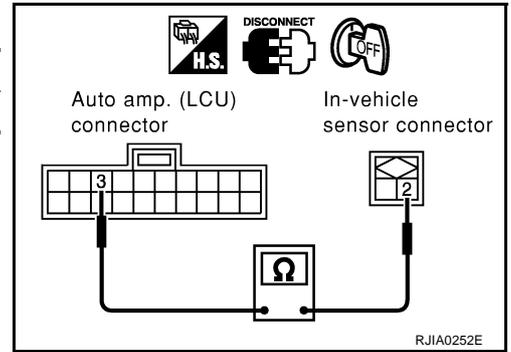
## 4. CHECK IN-VEHICLE SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
M68-2 (LG/B)	M119-3 (LG/B)	Yes

OK or NG

- OK >> 1. Replace auto amp. (LCU).  
 2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.



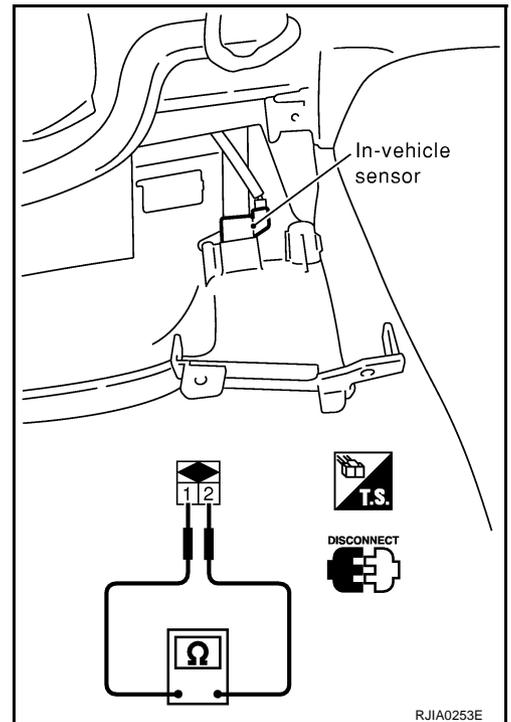
## COMPONENT INSPECTION

### In-Vehicle Sensor

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

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

If NG, replace in-vehicle sensor.

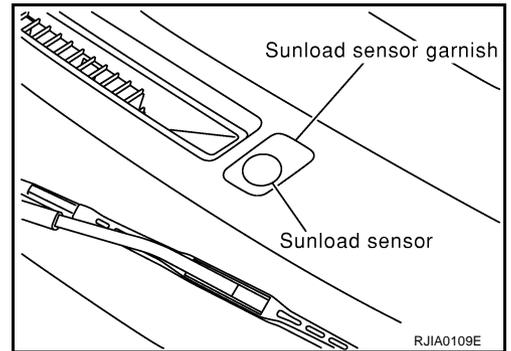


# TROUBLE DIAGNOSIS

## Sunload Sensor Circuit COMPONENT DESCRIPTION

EJS000K2

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 sunload sensor.



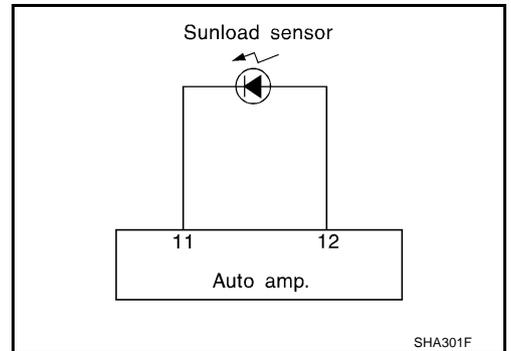
## SUNLOAD INPUT PROCESS

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 sun-load sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sun-load 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 sun-load, and the system will react accordingly.

## DIAGNOSTIC PROCEDURE

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.)



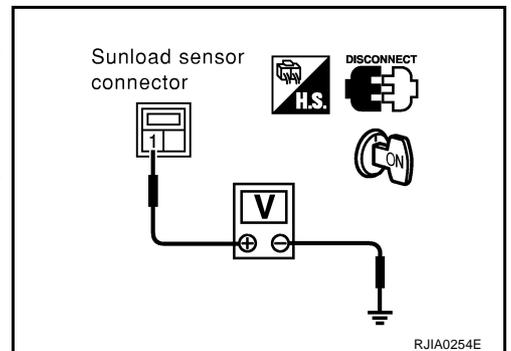
## 1. CHECK SUN-LOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND BODY GROUND

Disconnect sunload sensor harness connector.

Terminals		Voltage
(+)	(-)	
M44-1 (SB)	Body ground	Approx. 5V

OK or NG

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



# TROUBLE DIAGNOSIS

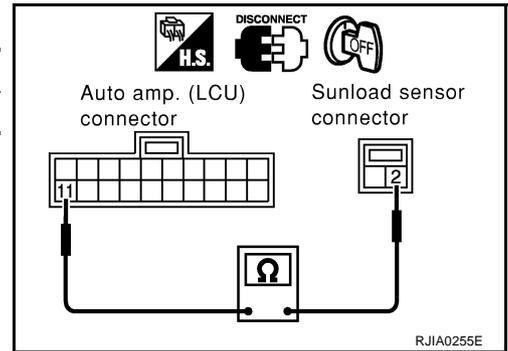
## 2. CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
M44-2 (R/Y)	M119-11 (R/Y)	Yes

OK or NG

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



## 3. CHECK SUNLOAD SENSOR.

Refer to [ATC-117, "SUNLOAD SENSOR"](#).

OK or NG

- OK >> 1. Replace auto amp. (LCU).  
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace sunload sensor.  
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

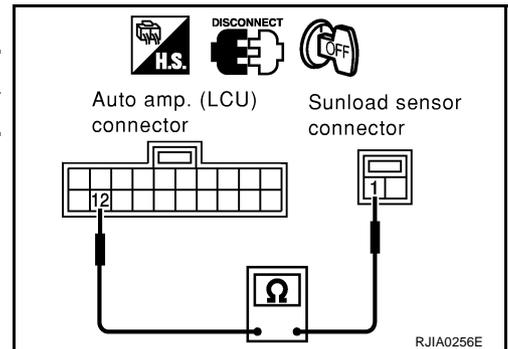
## 4. CHECK SUNLOAD SENSOR CIRCUIT BETWEEN SUNLOAD SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
M44-1 (SB)	M119-12 (SB)	Yes

OK or NG

- OK >> 1. Replace auto amp.  
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.

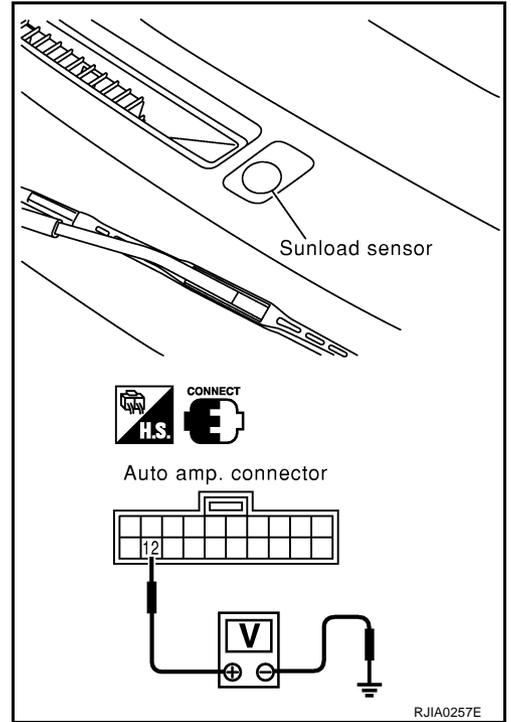


# TROUBLE DIAGNOSIS

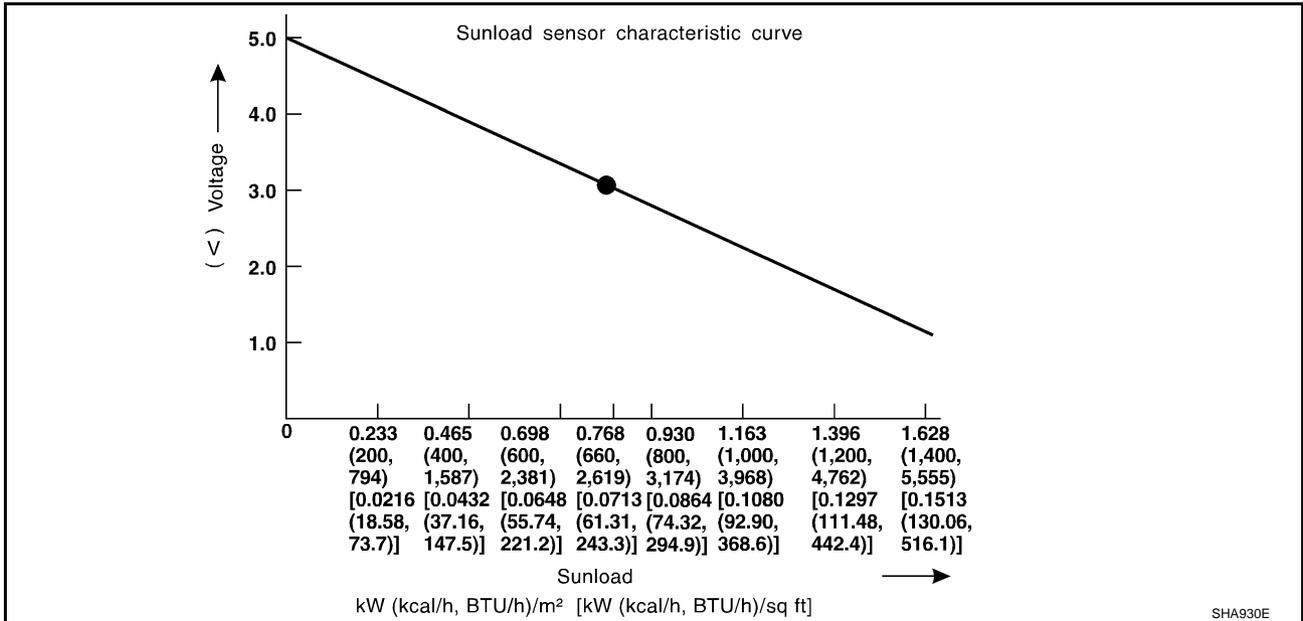
## COMPONENT INSPECTION

### Sunload Sensor

Measure voltage between auto amp. terminal 12 and body ground.  
If NG, replace auto amp.



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



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# TROUBLE DIAGNOSIS

EJS000K3

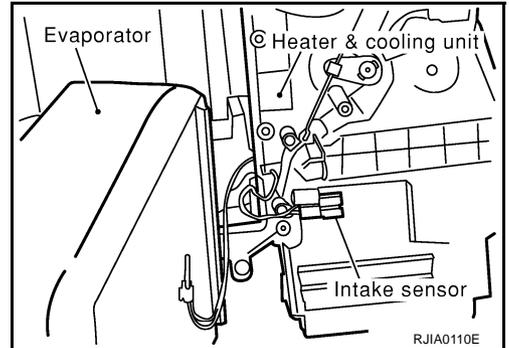
## Intake Sensor Circuit COMPONENT DESCRIPTION

### 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.

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

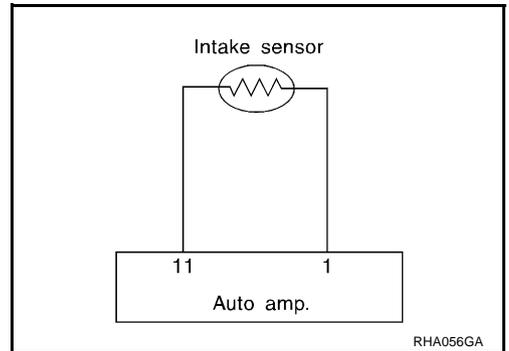
Temperature °C (°F)	Resistance kΩ
-15 (5)	12.34
-10 (14)	9.62
-5 (23)	7.56
0 (32)	6.00
5 (41)	4.80
10 (50)	3.87
15 (59)	3.15
20 (68)	2.57
25 (77)	2.12
30 (86)	1.76
35 (95)	1.47
40 (104)	1.23
45 (113)	1.04



If NG, replace intake sensor.

### DIAGNOSTIC PROCEDURE

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.)



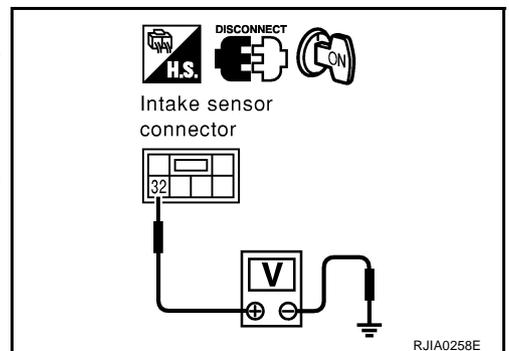
## 1. CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND BODY GROUND

Disconnect intake sensor harness connector.

Terminals		Voltage
(+)	(-)	
M90-32 (G/OR)	Body ground	Approx. 5V

### Yes or No

- Yes >> GO TO 2.
- No >> GO TO 4.



# TROUBLE DIAGNOSIS

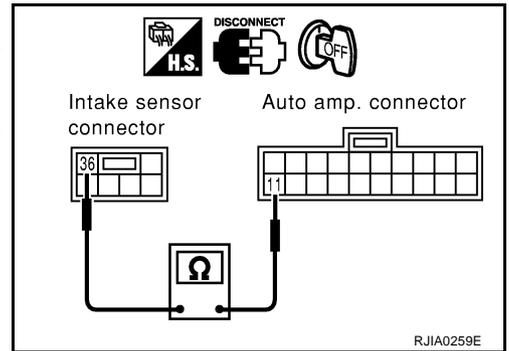
## 2. CHECK INTAKE SENSOR CIRCUIT BETWEEN INTAKE SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
M90-36 (R/Y)	M119-11 (R/Y)	Yes

OK or NG

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



## 3. CHECK INTAKE SENSOR

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

OK or NG

- OK >> 1. Replace auto amp.  
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> 1. Replace intake sensor.  
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.

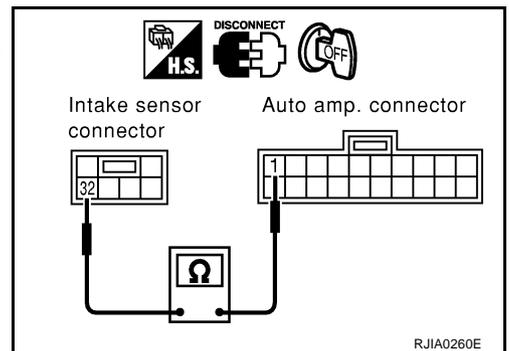
## 4. CHECK INTAKE SENSOR CIRCUIT BETWEEN AMBIENT SENSOR AND AUTO AMP. (LCU)

Disconnect auto amp. (LCU) harness connector.

Terminals		Continuity
M90-32 (G/OR)	M119-1 (G/OR)	Yes

OK or NG

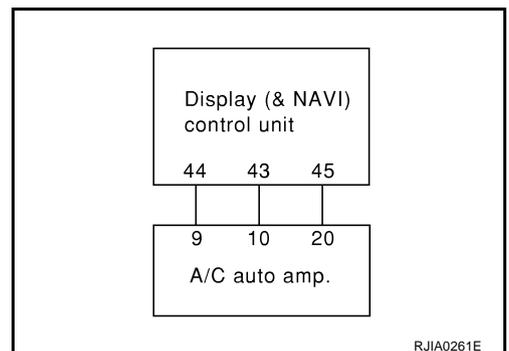
- OK >> 1. Replace auto amp.  
2. Go to self-diagnosis step-by-step procedure [ATC-49](#) and perform self-diagnosis STEP-2. Confirm that code No. 20 is displayed.
- NG >> Repair harness or connector.



## Multiplex Communication Circuit DIAGNOSTIC PROCEDURE

SYMPTOM:

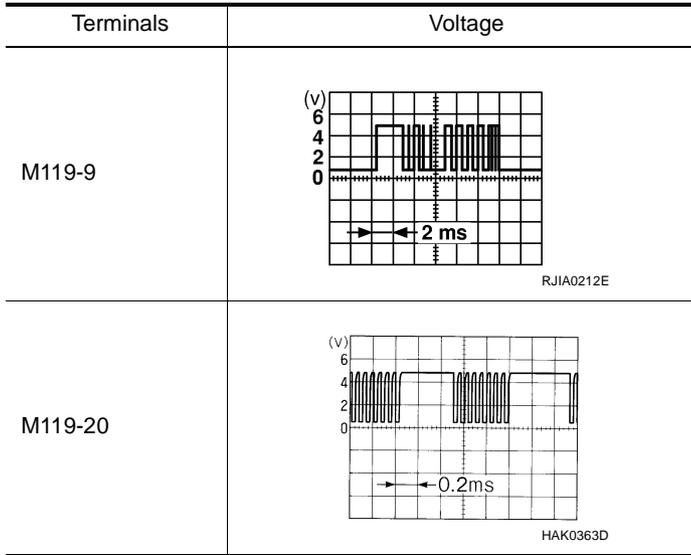
- A/C system does not come on.
- A/C system can not controlled.



# TROUBLE DIAGNOSIS

## 1. CHECK FOR AUTO AMP. OUTPUT

Confirm multiplex communication signal using an oscilloscope.

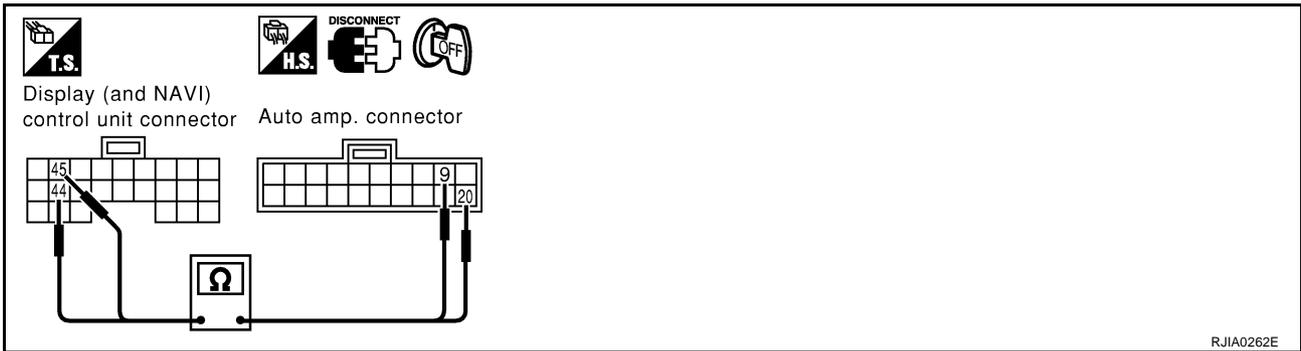


**OK or NG**

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

## 2. CHECK CIRCUIT CONTINUITY BETWEEN DISPLAY (AND NAVI) CONTROL UNIT AND AUTO AMP.

Disconnect display (and NAVI) control unit and auto amp. connector.



	Terminals		Continuity
Display and NAVI control unit	B29-44 (W)	M119-9	Yes
	B29-45 (B)	M119-20	
Display control unit	M77-44 (W)	M119-9	
	M77-45 (B)	M119-20	

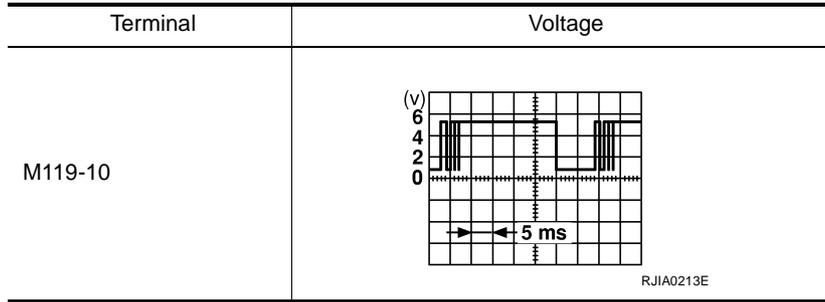
**OK or NG**

- OK >> Reconnect display (and NAVI) control unit and auto amp. connector. And GO TO 3.
- NG >> Repair harness or connector.

# TROUBLE DIAGNOSIS

## 3. CHECK FOR AUTO AMP. INPUT

Confirm multiplex communication signal using an oscilloscope.



**OK or NG**

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

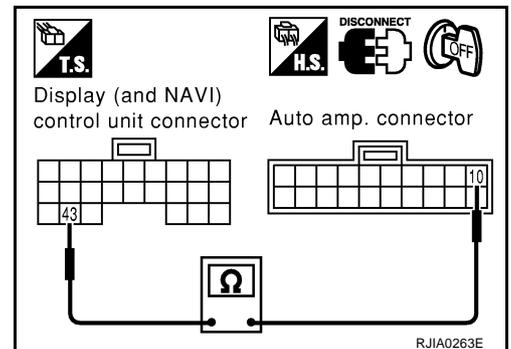
## 4. CHECK CIRCUIT CONTINUITY BETWEEN DISPLAY (AND NAVI) CONTROL UNIT AND AUTO AMP.

Disconnect display (and NAVI) control unit and auto amp. connector.

	Terminals		Continuity
Display and NAVI control unit	B29-43 (R)	M119-10	Yes
Display control unit	M77-43 (R)	M119-10	

**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

EJS0009P

Refer to [DI-136, "Removal and Installation of AV and NAVI Control Unit and AV Control Unit \(For CANADA with Rear Control Switch \)"](#)

Refer to [DI-136, "Removal and Installation of AV Control Unit \(without Navigation System and without Rear Control Switch\)"](#)

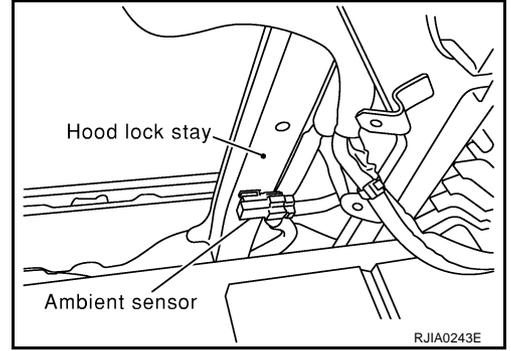
# AMBIENT SENSOR

## AMBIENT SENSOR

PFP:27722

### Removal and Installation

EJS0009Q



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# IN-VEHICLE SENSOR

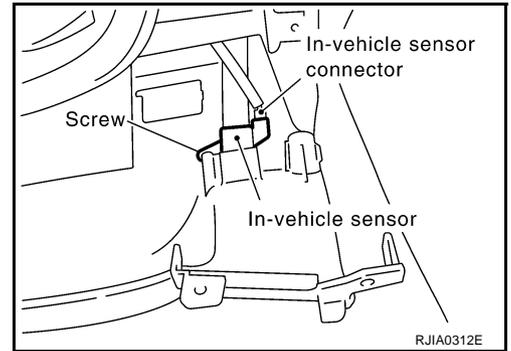
## IN-VEHICLE SENSOR

PFP:27720

### Removal and Installation

EJS0009R

Remove instrument lower driver panel.



# SUNLOAD SENSOR

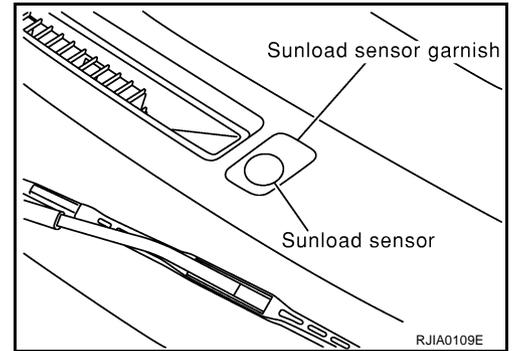
## SUNLOAD SENSOR

PFP:27721

### Removal and Installation

EJS009S

Remove sunload sensor garnish.



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# INTAKE SENSOR CIRCUIT

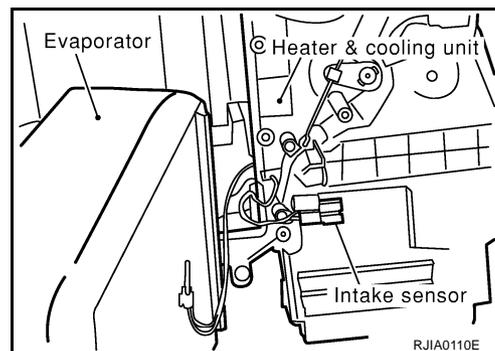
## INTAKE SENSOR CIRCUIT

PFP:27723

### Removal and Installation

EJS009T

1. Remove heater & cooling unit.
2. Remove the evaporator from heater & cooling unit.
3. Separate the heater & cooling unit case.
4. Remove the intake sensor.



# BLOWER UNIT

## BLOWER UNIT

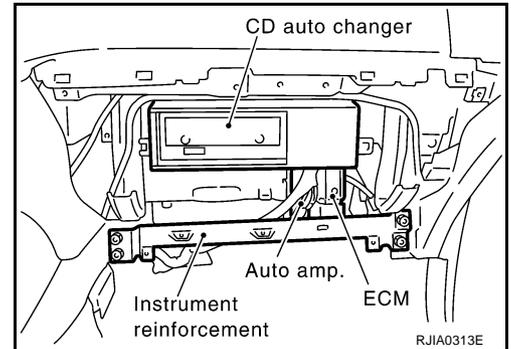
PFP:27200

### Removal and Installation

EJS0009U

#### REMOVAL

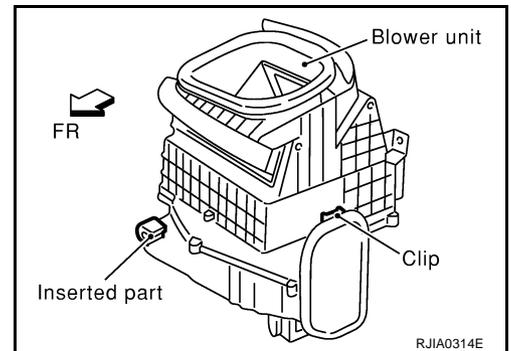
1. Remove the glove box assembly.
2. Remove the glove box cover, the instrument lower assist panel and instrument reinforcement.
3. Remove the EC control unit and CD auto changer (If equipped).
4. Disconnect the blower motor connector, intake door motor connector and auto amp. connector.



5. Remove the screws from the blower unit, then remove it.

#### **CAUTION:**

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



#### INSTALLATION

#### **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.

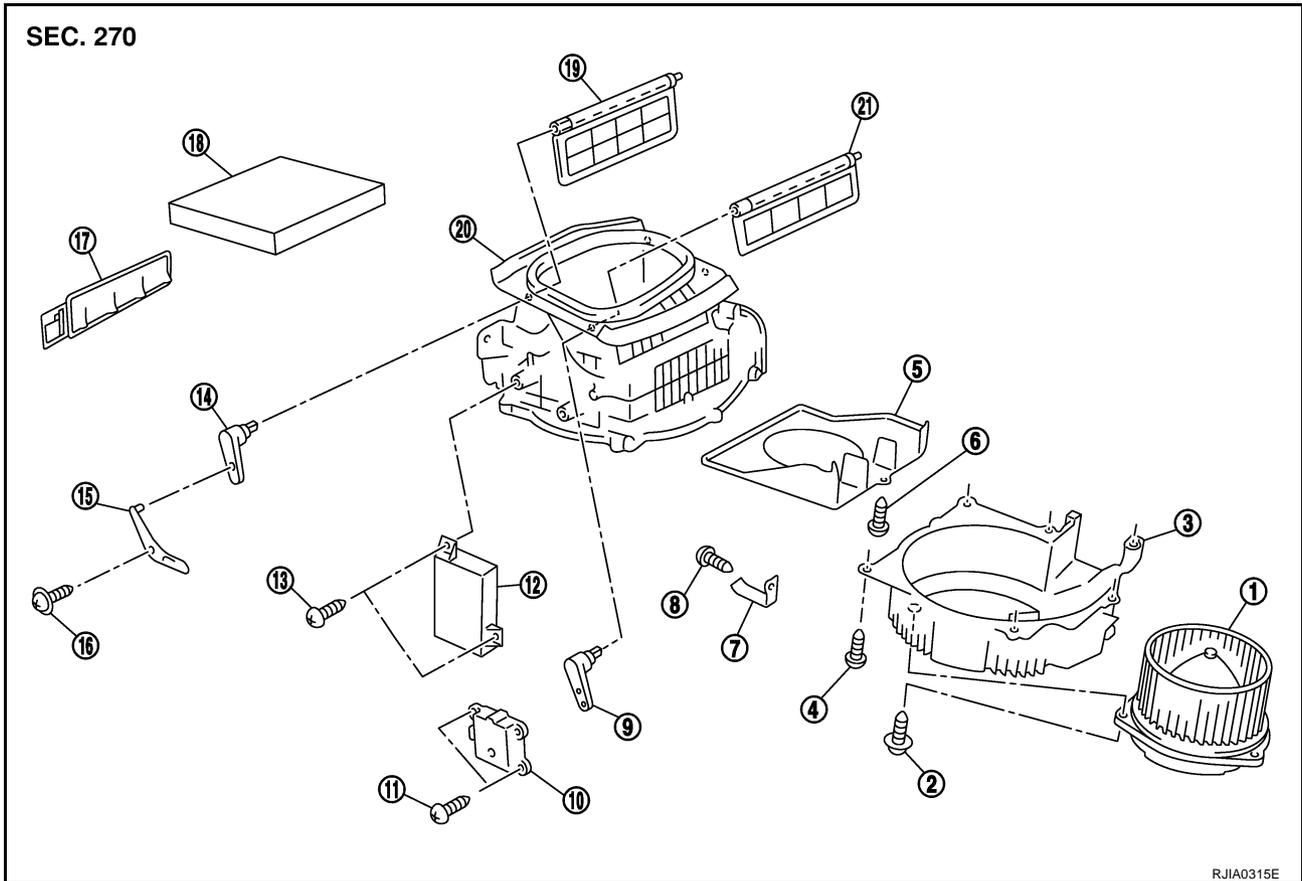
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# BLOWER UNIT

## Disassembly and Assembly

EJS0009V



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

# BLOWER MOTOR

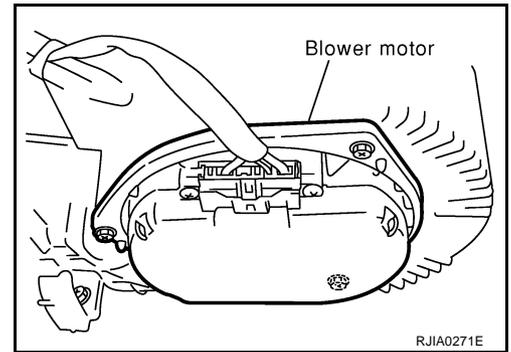
## BLOWER MOTOR

PPF:27226

### Removal and Installation

1. Remove the glove box and instrument lower assist panel.
2. Remove the screws from blower motor, then remove it.

EJS00085



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# INTAKE DOOR MOTOR

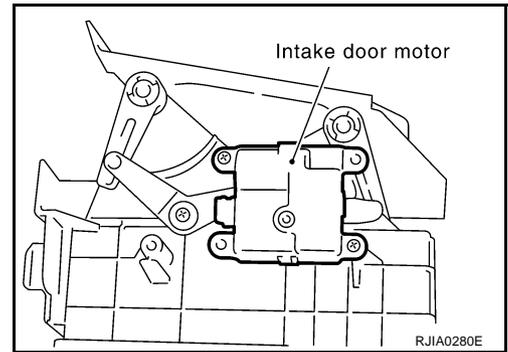
## INTAKE DOOR MOTOR

PFP:27730

### Removal and Installation

EJS0009W

1. Remove the glove box, glove box cover, instrument lower assist cover and instrument reinforcement.
2. Remove EC control unit.
3. Remove the intake door motor from the blower unit.



# VENTILATION AIR FILTER

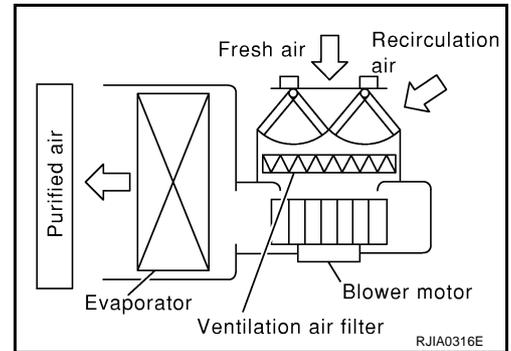
## VENTILATION AIR FILTER

PPF:27277

### Removal and Installation FUNCTION

EJS00087

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



### REPLACEMENT TIMING

Replace ventilation air filter.

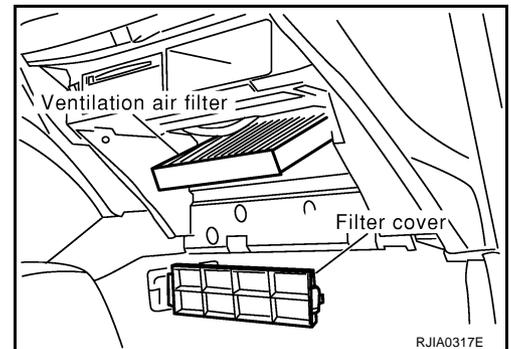
Refer to [MA-7, "CHASSIS AND BODY MAINTENANCE"](#) in SCHEDULE 1 and [MA-9, "CHASSIS AND BODY MAINTENANCE"](#) in SCHEDULE 2.

Caution label is fixed inside the glove box.



### REPLACEMENT PROCEDURES

1. Remove the glove box.
2. Remove the center cover of the glove box cover.
3. Remove ventilation air filter cover.
4. Take out the ventilation air filter from blower unit.
5. Replace with new one and reinstall on cooling unit.
6. Reinstall the glove box.



# HEATER & COOLING UNIT ASSEMBLY

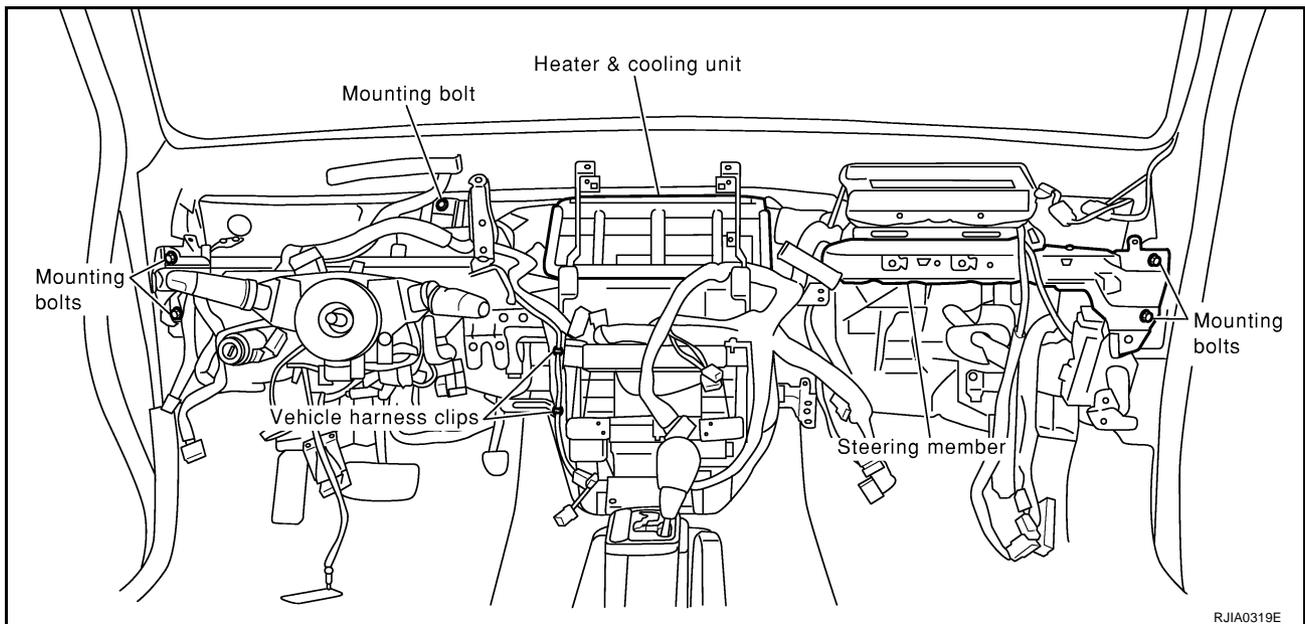
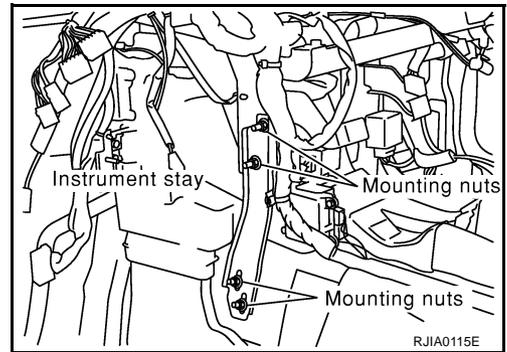
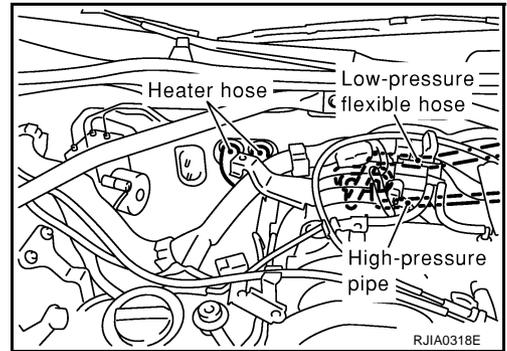
## HEATER & COOLING UNIT ASSEMBLY

PF27110

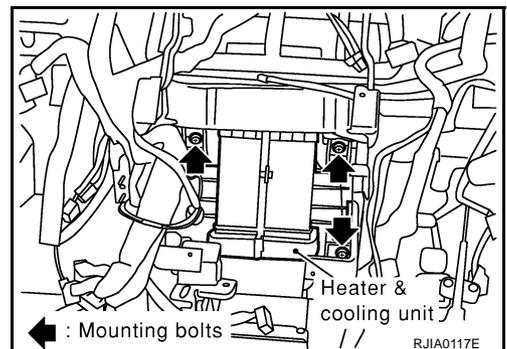
### Removal and Installation REMOVAL

EJS008A

1. Remove the master cylinder cover, ABS unit cover and airflow meter cover.
2. Remove the strut tower bar.
3. Discharge refrigerant from A/C system.
4. Drain coolant from cooling system. Refer to [CO-8, "Changing Engine Coolant"](#).
5. Disconnect two heater hoses from heater core pipe.
6. Remove the instrument panel.
7. Remove the blower unit.
8. Remove clips of vehicle harness from steering member.
9. Remove the instrument stays (driver side, passenger side).
10. Remove the defroster nozzle and ventilator ducts.



11. Remove the screws from heater & cooling unit.
12. Remove the heater & cooling unit.



# HEATER & COOLING UNIT ASSEMBLY

---

## INSTALLATION

1. Installation is basically the reverse order of removal.

### NOTE:

When filling radiator with coolant, refer to [CO-8, "Changing Engine Coolant"](#) . Recharge the A/C system.

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# MODE DOOR MOTOR

## MODE DOOR MOTOR

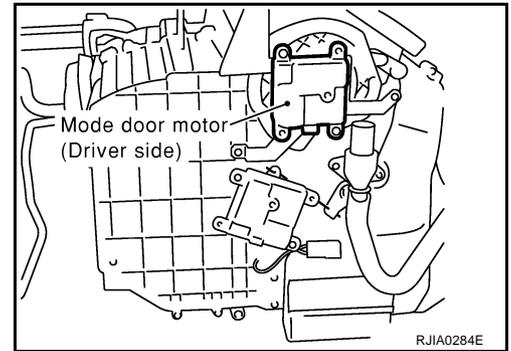
PFP:27731

### Removal and Installation

#### DRIVER SIDE MODE DOOR MOTOR

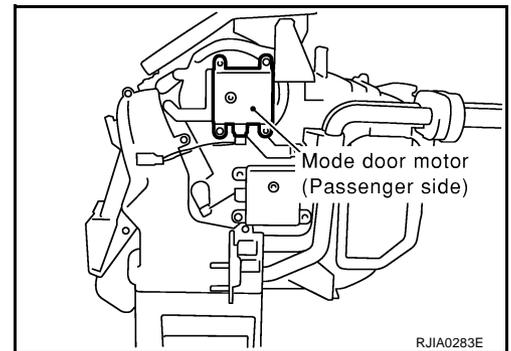
EJS0008C

1. Remove the instrument panel.
2. Disconnect the mode door motor connector.
3. Remove the mode door motor.



#### PASSENGER SIDE MODE DOOR MOTOR

1. Remove the blower unit.
2. Disconnect the mode door motor connector.
3. Remove the mode door motor.



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# AIR MIX DOOR MOTOR

## AIR MIX DOOR MOTOR

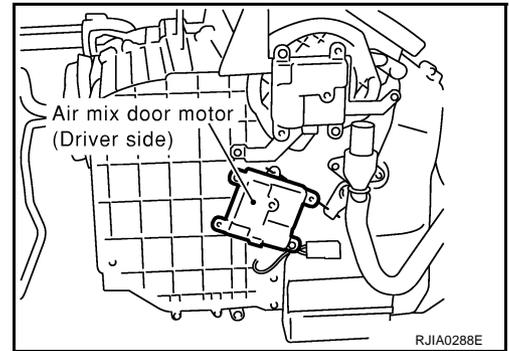
PFP:27732

### Removal and Installation

EJS0008D

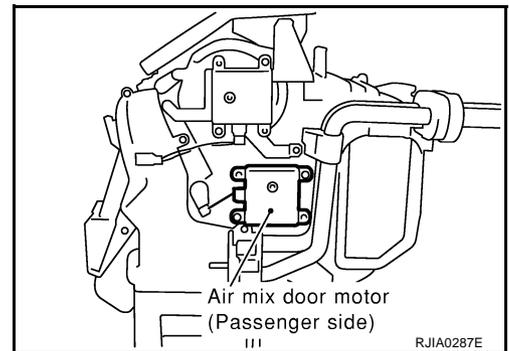
#### DRIVER SIDE AIR MIX DOOR MOTOR

1. Remove the instrument lower driver panel.
2. Remove the air mix door rod from rod holder.
3. Disconnect the air mix door motor connector.
4. Remove the air mix door motor.



#### PASSENGER SIDE AIR MIX DOOR MOTOR

1. Remove the blower unit.
2. Remove the air mix door rod from rod holder.
3. Disconnect the air mix door motor connector.
4. Remove the air mix door motor.



# DUCTS AND GRILLES

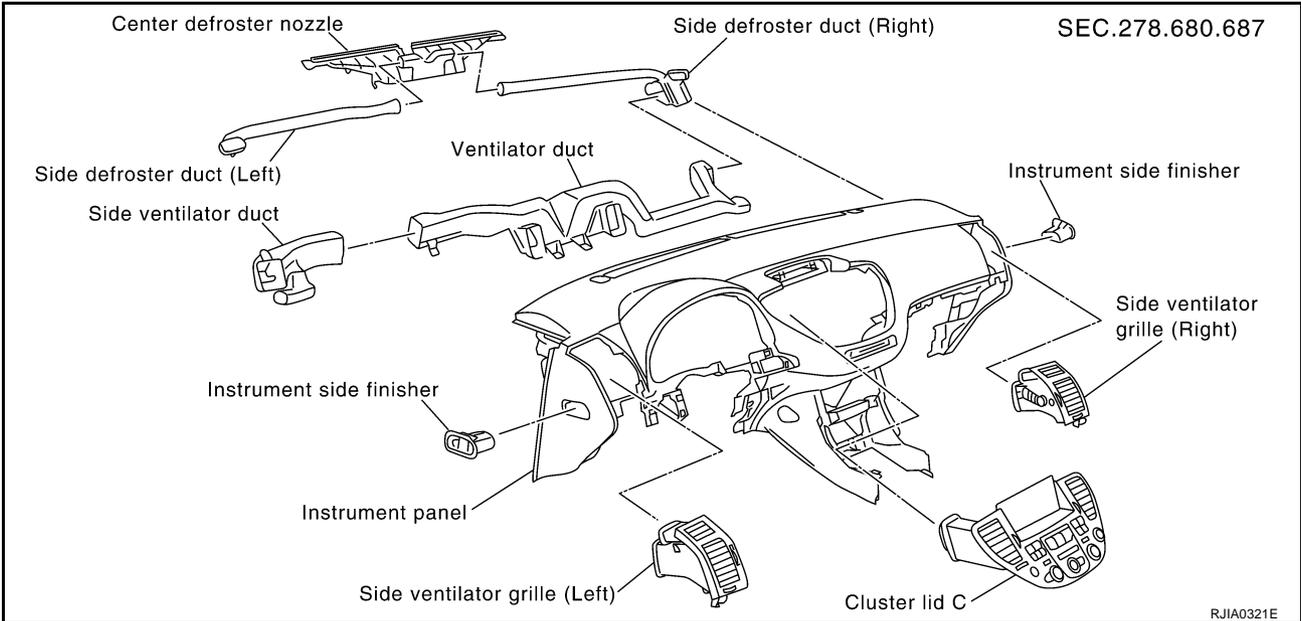
## DUCTS AND GRILLES

PF27860

### Removal and Installation

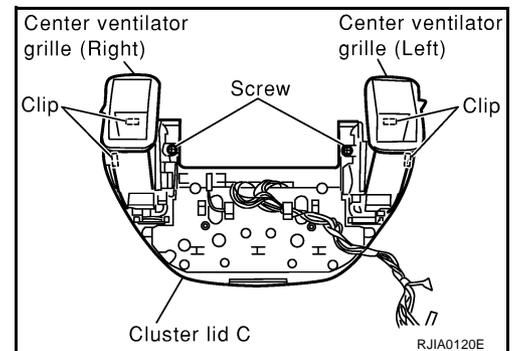
EJS008F

### VENTILATOR DUCT, DEFROSTER NOZZLE AND DEFROSTER DUCTS



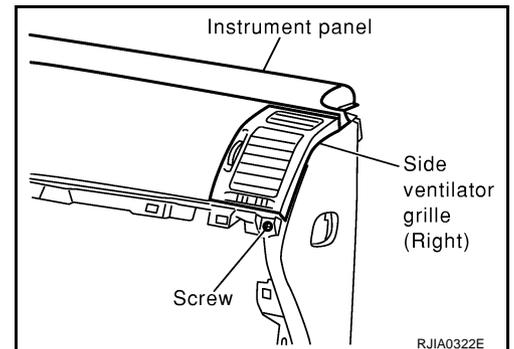
### CENTER VENTILATOR GRILLE

1. Remove cluster lid C.
2. Remove center ventilator grille.



### SIDE VENTILATOR GRILLE

1. Remove instrument panel.
2. Remove side ventilator grille.



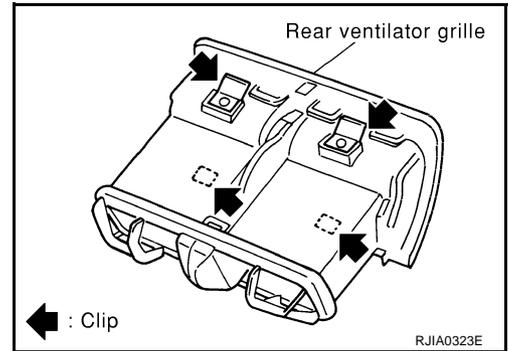
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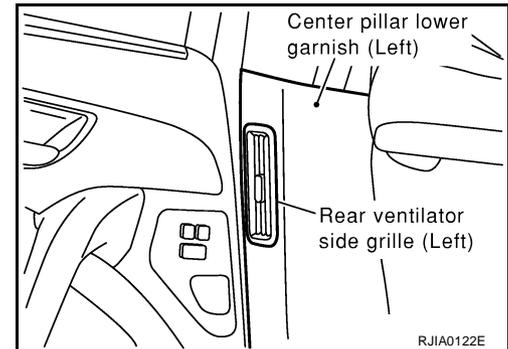
# DUCTS AND GRILLES

## REAR VENTILATOR GRILLE

1. Remove console box.
2. Remove rear ventilator grille.

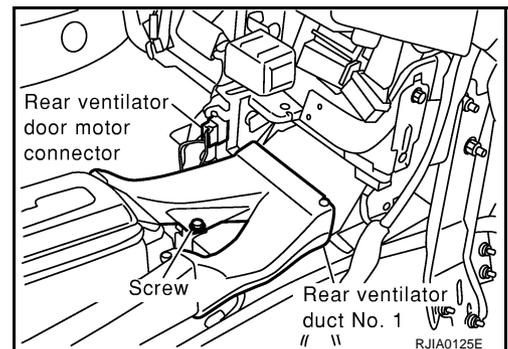
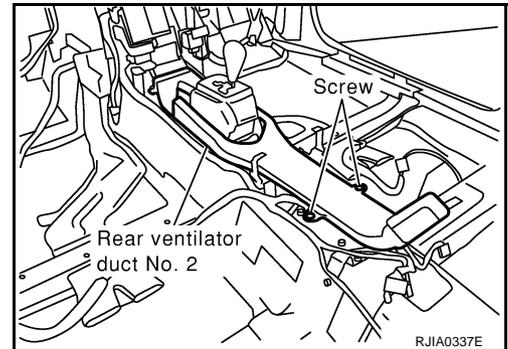


## REAR VENTILATOR SIDE GRILLE



## REAR VENTILATOR DUCTS

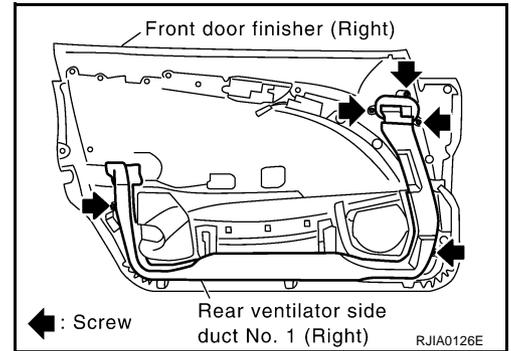
1. Remove console box.
2. Remove rear ventilator duct No.2.
3. Remove instrument panel.
4. Disconnect rear ventilator door motor connector.
5. Remove rear ventilator duct No.1.



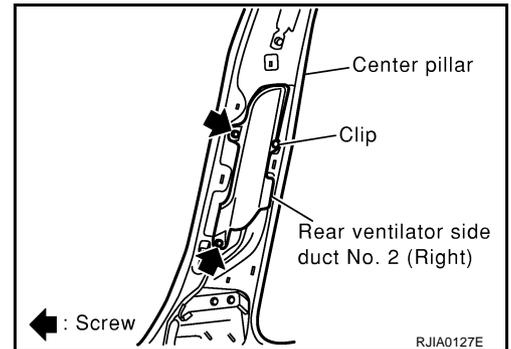
# DUCTS AND GRILLES

## REAR VENTILATOR SIDE DUCTS

1. Remove front door finisher.
2. Remove rear ventilator side duct No.1.

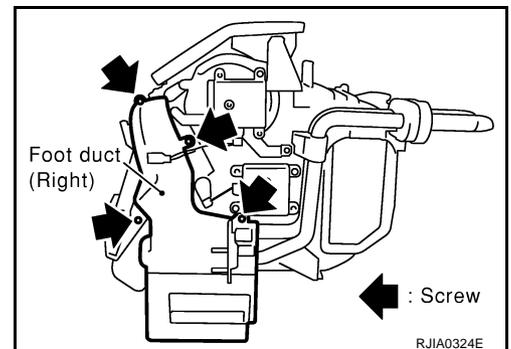


3. Remove center pillar upper garnish.
4. Remove rear ventilator side duct No.2.



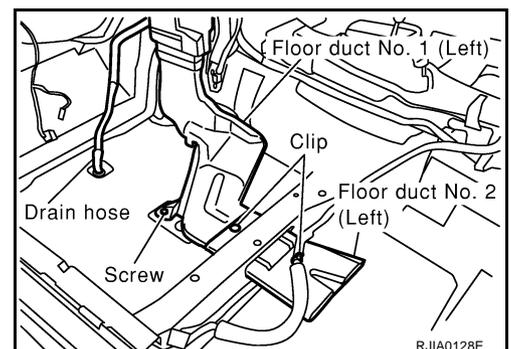
## FOOT DUCT

1. Remove heater & cooling unit.
2. Remove foot duct.



## FLOOR DUCT

1. Remove the front seats and console box.
2. Remove the front kicking plate, the footrest and the dash side finisher.
3. Peel back the floor trim to a point where the floor duct is visible.
4. Remove the floor duct No.2 (left and right).
5. Remove the mounting screw from the floor duct No.1.
6. Remove the floor duct No.1 (left and right).



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ATC

# REFRIGERANT LINES

PFP:92600

## REFRIGERANT LINES

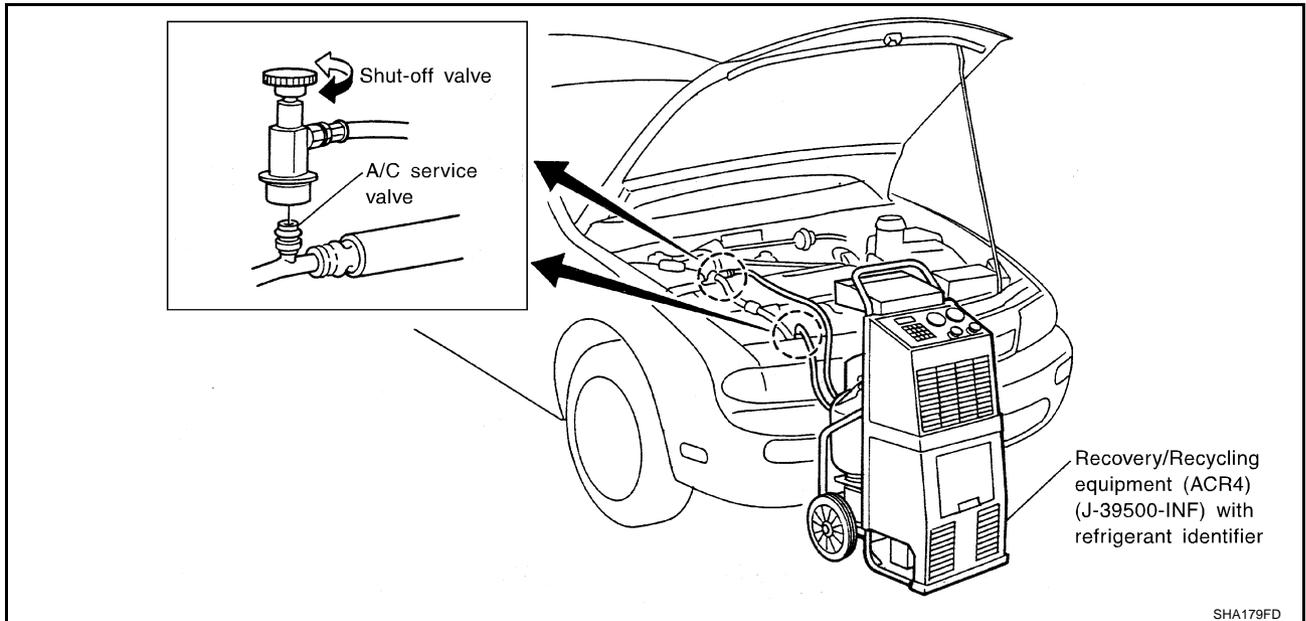
### HFC-134a (R-134a) Service Procedure SETTING OF SERVICE TOOLS AND EQUIPMENT

EJS000KE

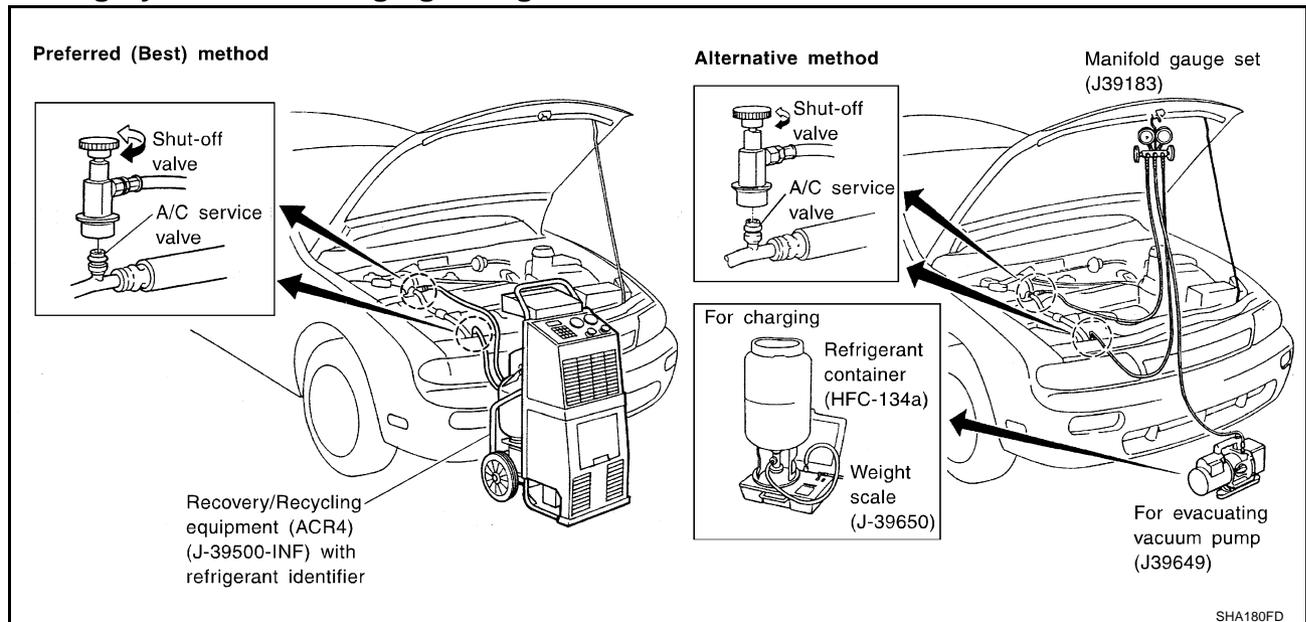
#### Discharging Refrigerant

**WARNING:**

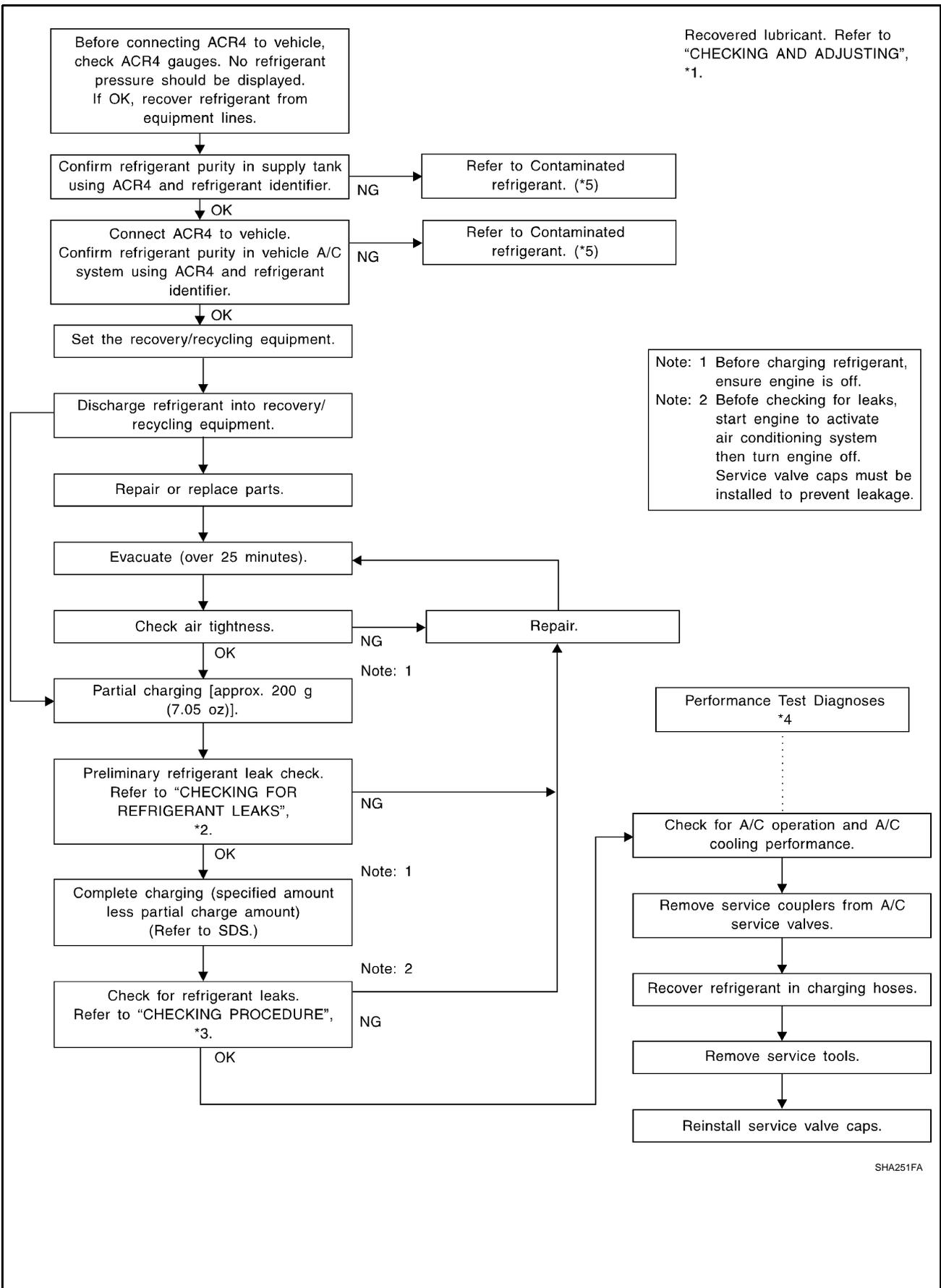
Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) from A/C system using certified service equipment meeting requirements of SAE J2210 (R-134a recycling equipment) or J2201 (R-134a recovery equipment). If accidental system 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



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# REFRIGERANT LINES

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

\*3 Refrigerant leaks [ATC-147. "CHECKING PROCEDURE"](#)

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

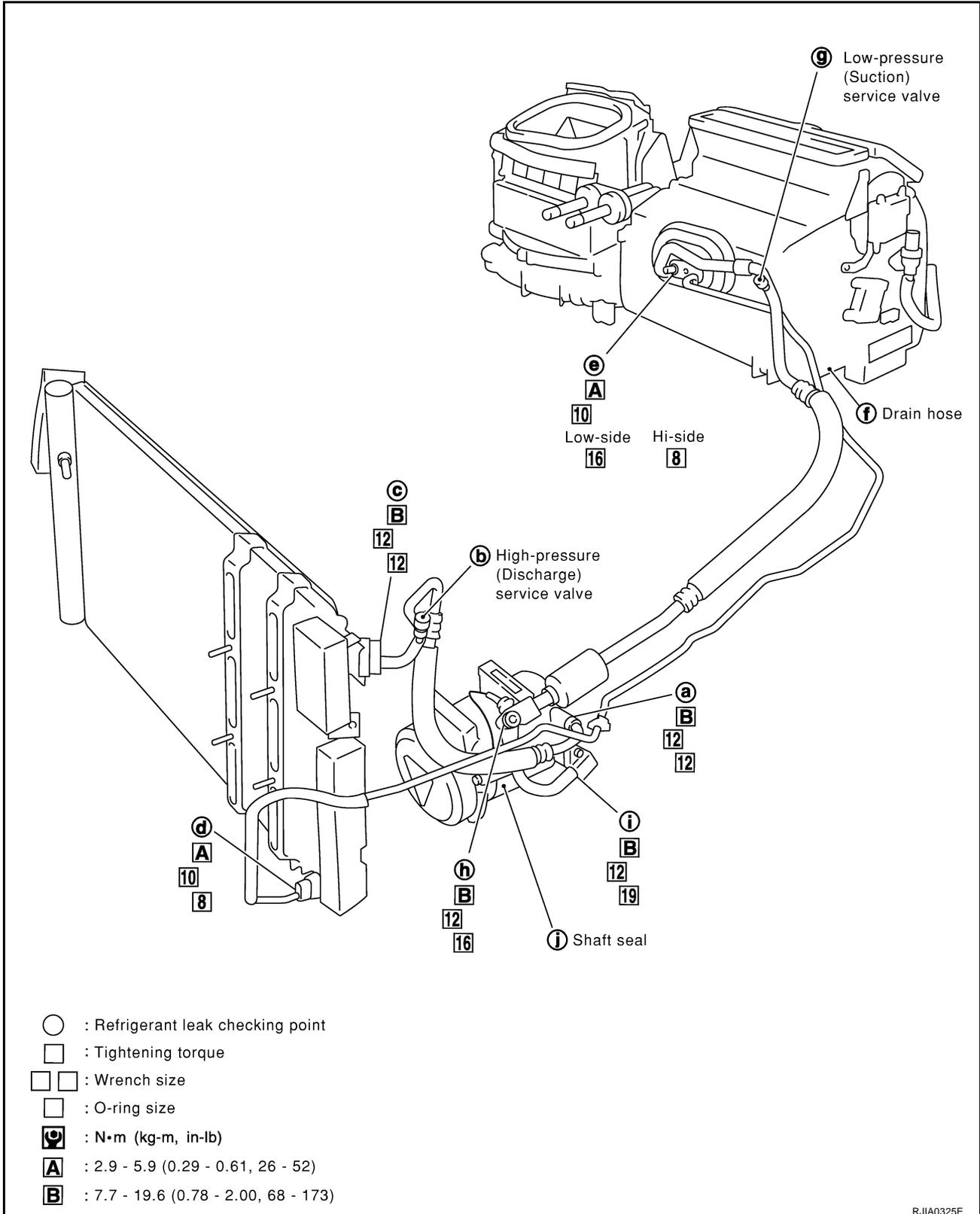
\*2 Checking for refrigerant leaks [ATC-145](#)

\*4 Performance test diagnosis [ATC-90](#)

## Components

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Refer to [ATC-5](#).



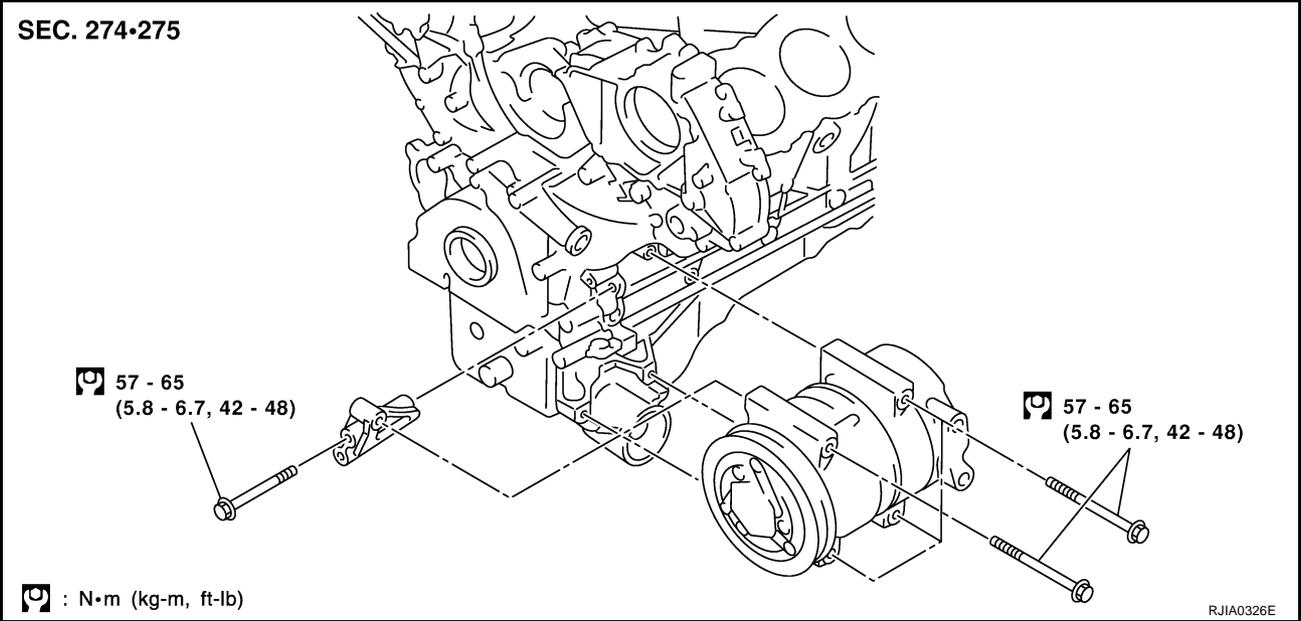
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# REFRIGERANT LINES

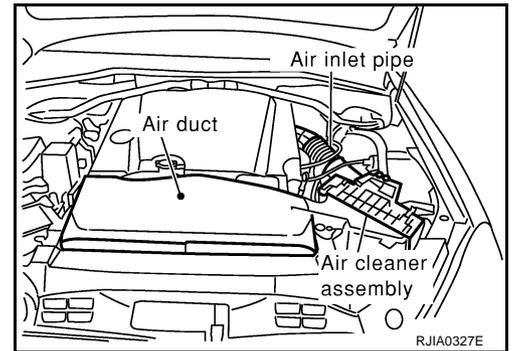
## Removal and Installation for Compressor REMOVAL

EJS000A6

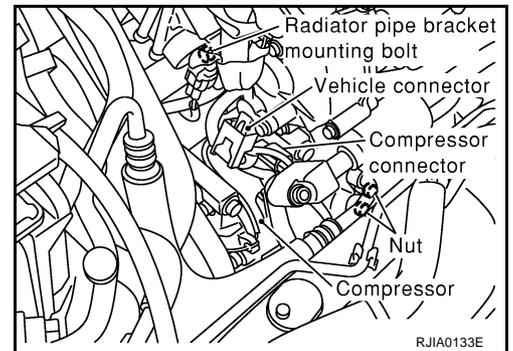
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1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using recycling and recovery equipment (for HFC-134a), discharge the refrigerant.
3. Remove engine under cover.
4. Remove air cleaner assembly, air duct and air inlet pipe.
5. Remove compressor-alternator belt.  
Refer to [EM-12](#).



6. Remove mounting nuts from both high-pressure flexible hose and low-pressure flexible hose.  
**CAUTION:**  
**Cap or wrap the open ends of the pipe with a suitable material such as vinyl tape to avoid the entry of air.**
7. Disconnect the compressor connector.
8. Remove mounting bolt from radiator hose bracket.
9. Remove mounting bolts from compressor.
10. Move radiator hose to right side of the vehicle.
11. Remove compressor from the upper side of the vehicle



## INSTALLATION

### CAUTION:

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

### Bolts securing the compressor

Tightening torque : 56.9 - 65.7 N·m (5.8 - 6.8 kg-m)

### Nut securing the high-pressure flexible hose

Tightening torque : 7.85 - 19.6 N·m (0.8 - 2.0 kg-m)

# REFRIGERANT LINES

Nut securing the low-pressure flexible hose

Tightening torque

: 7.85 - 19.6 N-m (0.8 - 2.0 kg-m)

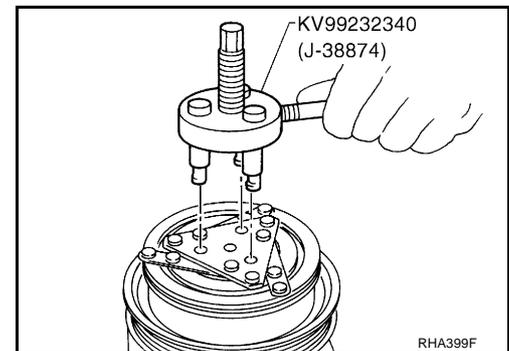
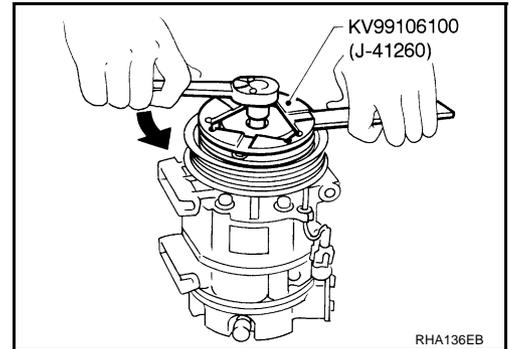
## Removal and Installation for Compressor Clutch

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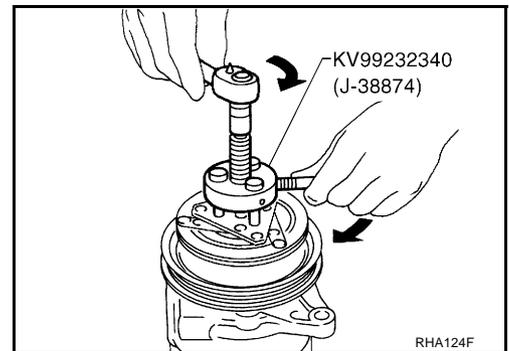
### REMOVAL

#### Overhaul

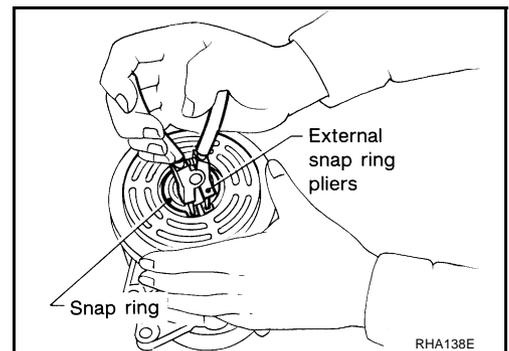
1. When removing center bolt, hold clutch disc with a wrench.



2. Remove clutch disc using the clutch disc puller.

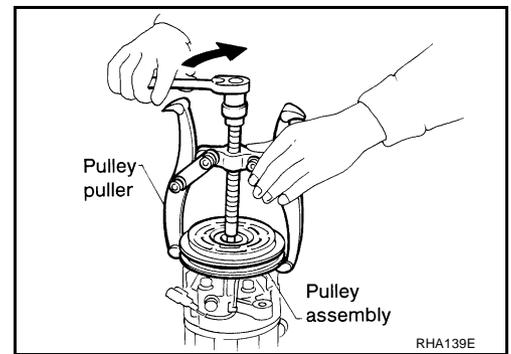


3. Remove snap ring using external snap ring pliers.

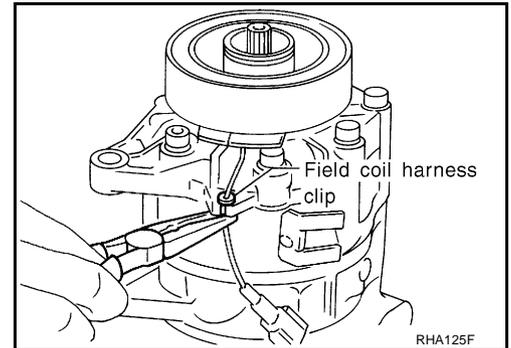


# REFRIGERANT LINES

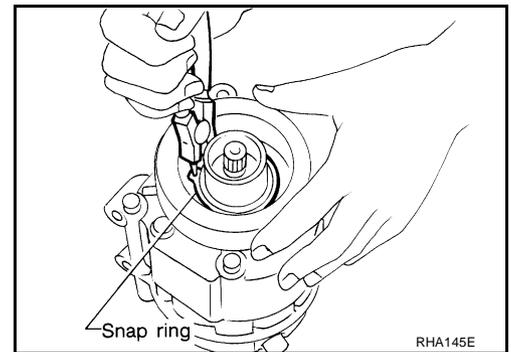
4. Position center pulley puller on the end of the driveshaft, and remove pulley assembly using any commercially available pulley puller. To prevent the pulley groove from being deformed, the puller claws should be positioned at the edge of the pulley assembly.



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



6. Remove snap ring using external snap ring pliers.



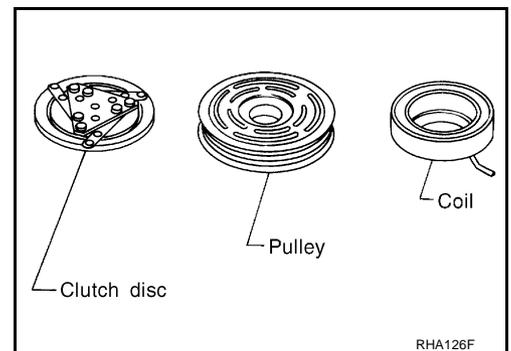
## Inspection

### Clutch disc

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

### Pulley

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



## Coil

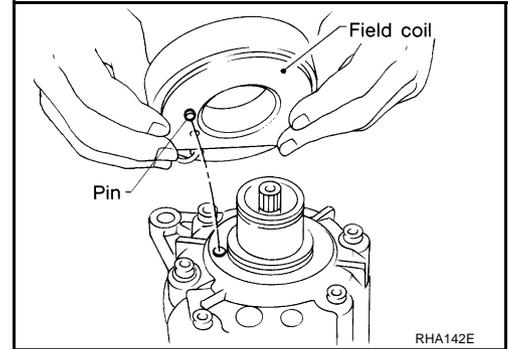
Check coil for loose connection or cracked insulation.

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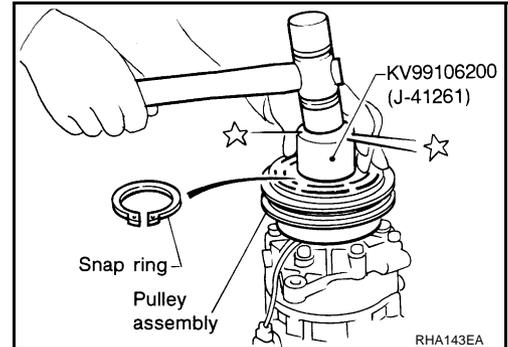
# REFRIGERANT LINES

## INSTALLATION

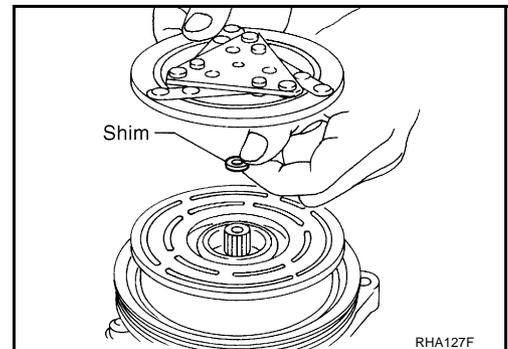
1. Install field coil.  
Be sure to align coil pin with hole in the front head of the compressor.
2. Install field coil harness clip using a screwdriver.



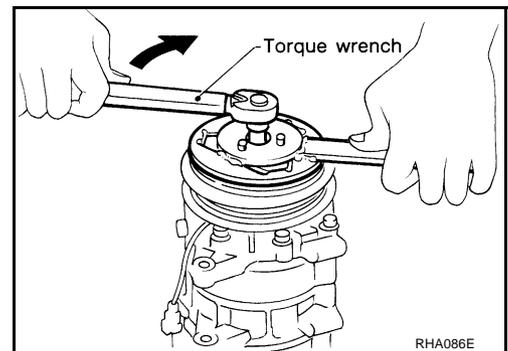
3. Install pulley assembly using the installer and a hand press, and then install snap ring using snap ring pliers.



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



5. Using a 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, insure the pulley rotates smoothly.

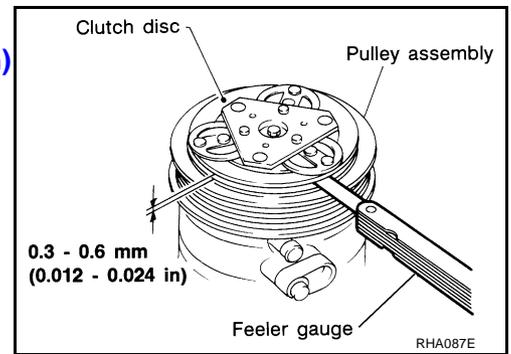


# REFRIGERANT LINES

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

**Disc to pulley clearance: 0.3 - 0.6 mm (0.012 - 0.024 in)**

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



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## Break-In Operation

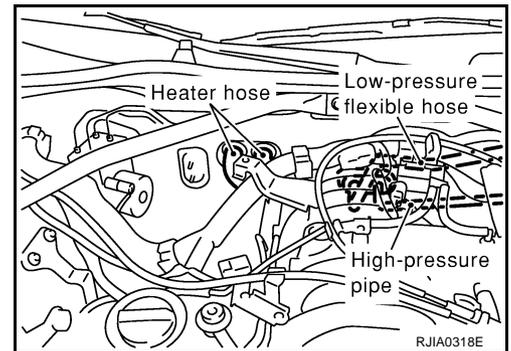
When replacing compressor clutch assembly, always carry out the break-in operation. This is done by engaging and disengaging the clutch about thirty times. Break-in operation raises the level of transmitted torque.

## Removal and Installation for Low-Pressure Flexible Hose

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### REMOVAL

1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using the recycling and recovery machine (for HFC134a), drain the refrigerant.
3. Drain the coolant from cooling system, and disconnect two heater hoses.
4. Remove strut tower bar, air cleaner assembly, air duct and air inlet pipe.



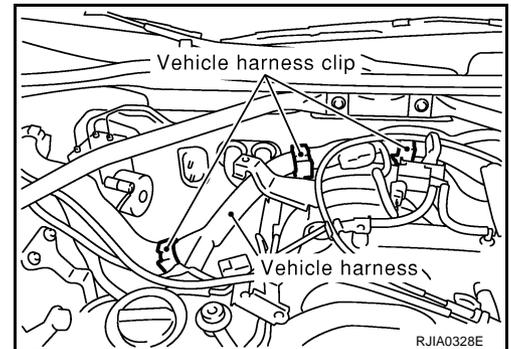
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5. Remove vehicle harness from the clip.
6. Remove mounting bolts from the low-pressure flexible hose bracket.
7. Remove clip from the low-pressure flexible hose.
8. Remove mounting bolts from the low-pressure flexible hose.

### CAUTION:

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

9. Remove low-pressure flexible hose.



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### INSTALLATION

#### CAUTION:

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

**Low-pressure flexible hose and bolts mounting the high-pressure pipe (evaporator side)**

**Tightening torque : 2.9 - 5.9 N-m (0.29 - 0.6 kg-m)**

**Bolts mounting the low-pressure flexible hose (compressor side)**

**Tightening torque : 7.8 - 19.6 N-m (0.8 - 2.0 kg-m)**

# REFRIGERANT LINES

## Removal and Installation of High-Pressure Flexible Hose

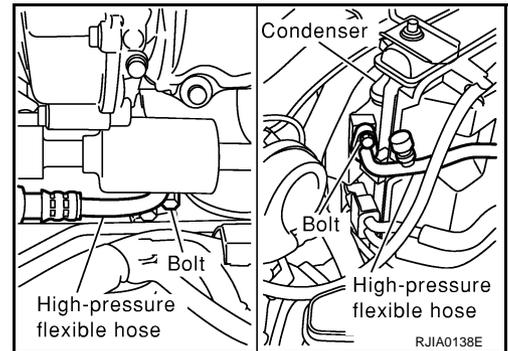
EJS000A8

### REMOVAL

1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using the recycling and recovery machine (for HFC134a), drain the refrigerant.
3. Remove air cleaner assembly, air duct and air inlet pipe.
4. Remove mounting bolt and nut from the high-pressure flexible hose, then remove it.

### CAUTION:

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



### INSTALLATION

### CAUTION:

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

**Bolt and nut securing high-pressure flexible hose**

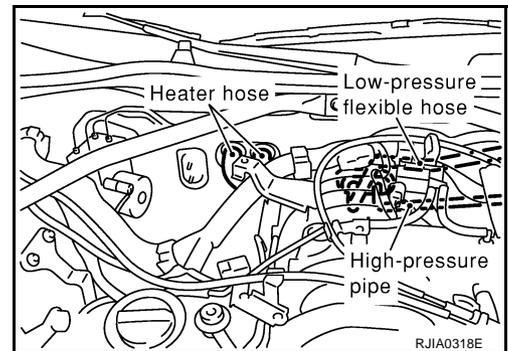
**Tightening torque : 7.8 - 19.6 N·m (0.8 - 2.0 kg·m)**

## Removal and Installation for High-Pressure Pipe

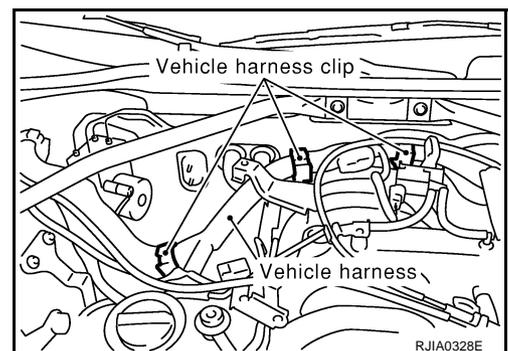
EJS000A9

### REMOVAL

1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using the recycling and recovery machine (for HFC134a), drain the refrigerant.
3. Drain coolant from cooling system and disconnect heater hoses.
4. Remove strut tower bar, air cleaner assembly, air duct and air inlet pipe.



5. Remove vehicle harness from the clip.
6. Remove low-pressure flexible hose and high-pressure flexible hose.
7. Remove front grille, battery, battery tray and radiator mounting bracket.
8. Slide the radiator assembly to the right side of vehicle.

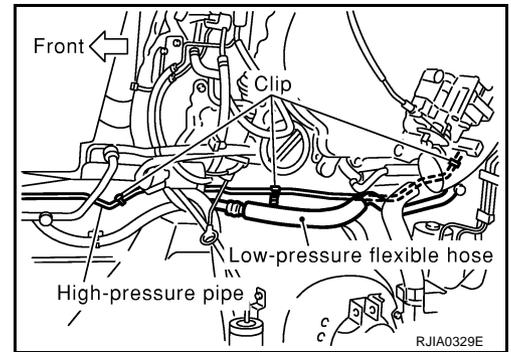


# REFRIGERANT LINES

9. Remove mounting bolt from the high-pressure pipe.
10. Remove clips from the high-pressure pipe, then remove high-pressure pipe.

## CAUTION:

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



## INSTALLATION

### CAUTION:

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

**Bolts securing the high-pressure pipe (condenser side, evaporator side)**

**Tightening torque : 2.9 - 5.9 N-m (0.29 - 0.6 kg-m)**

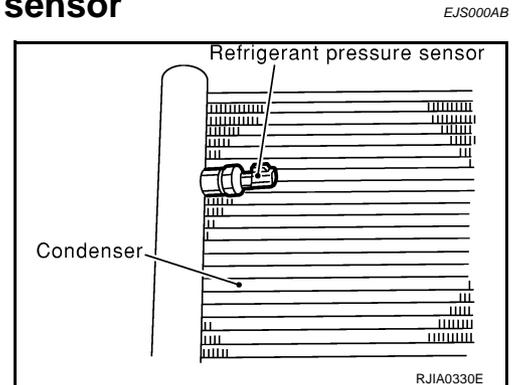
## Removal and Installation for Refrigerant pressure sensor

1. Remove condenser.
2. Remove refrigerant pressure sensor from condenser.

### CAUTION:

- When working, be careful not to damage the compressor fan.
- Apply compressor oil to refrigerant pressure sensor O-ring prior to installation.

**Tightening torque : 9.8 - 11.7 N-m (1.0 - 1.2 kg-m)**



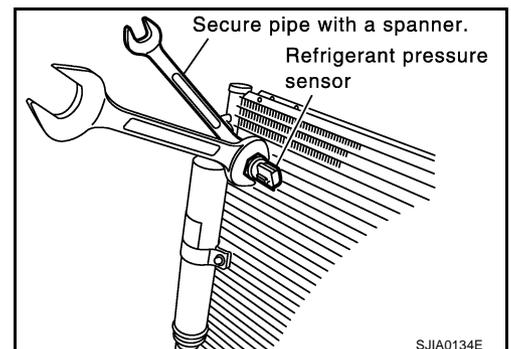
## Removal and Installation for Refrigerant Pressure Sensor (To be applied after the middle of June 2001.)

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove front grille.
3. Disconnect connector and 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.
- Replace refrigerant pressure sensor O-ring with a new one. Apply compressor oil prior to installation.

**Refrigerant pressure sensor Tightening torque : 9.8 - 11.7 N-m (1.0 - 1.2 kg-m)**



# REFRIGERANT LINES

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## Removal and Installation for Condenser

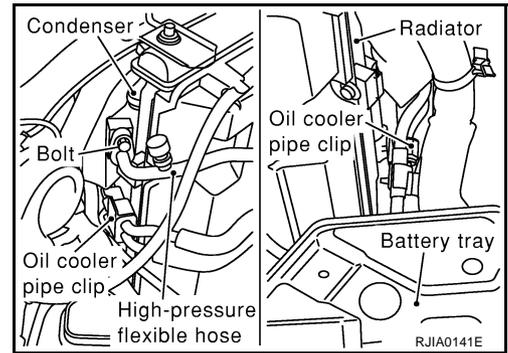
### REMOVAL

1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using the recycling and recovery machine (for HFC134a), drain the refrigerant.
3. Remove strut tower bar, air cleaner assembly, air duct and air inlet pipe.
4. Disconnect high-pressure flexible hose and high-pressure pipe from the condenser.

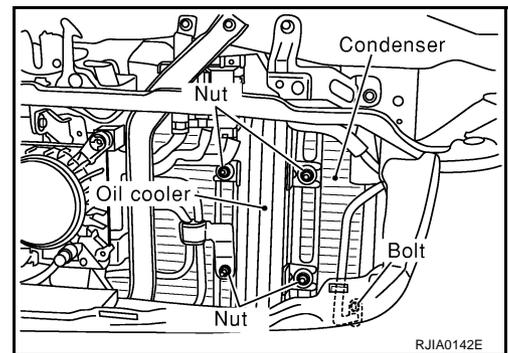
### CAUTION:

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

5. Remove oil cooler pipe clips from left and right sides of the condenser.
6. Slide condenser up and remove it from the radiator clip.
7. Remove oil cooler from the condenser.



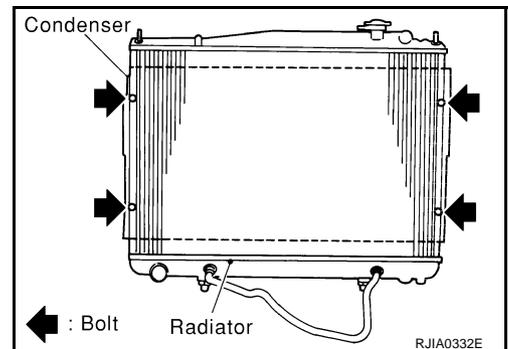
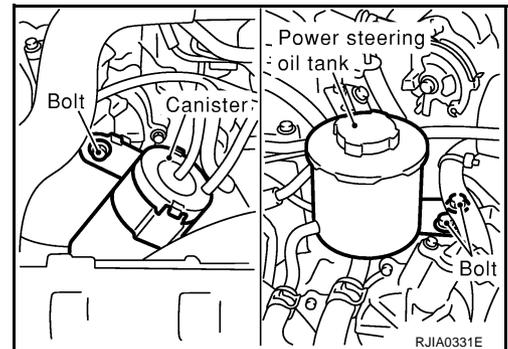
8. Remove front grille, battery, battery tray and radiator mounting bracket.
9. Remove power steering oil tank and canister.



10. Remove mounting bolts from condenser.
11. Slide condenser up and remove it from the radiator clip.
12. 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.**



# REFRIGERANT LINES

## INSTALLATION

### CAUTION:

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

#### High-pressure flexible hose mounting bolts

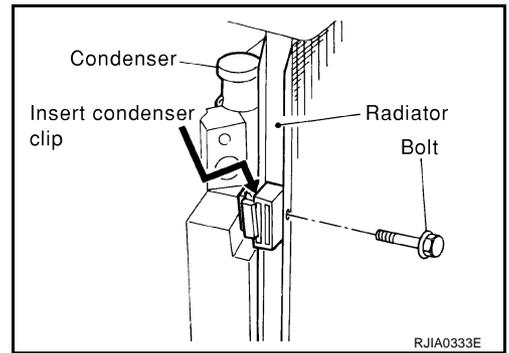
Tightening torque : 7.8 - 19.6 N-m (0.8 - 2.0 kg-m)

#### High-pressure pipe mounting bolts

Tightening torque : 2.9 - 5.9 N-m (0.29 - 0.6 kg-m)

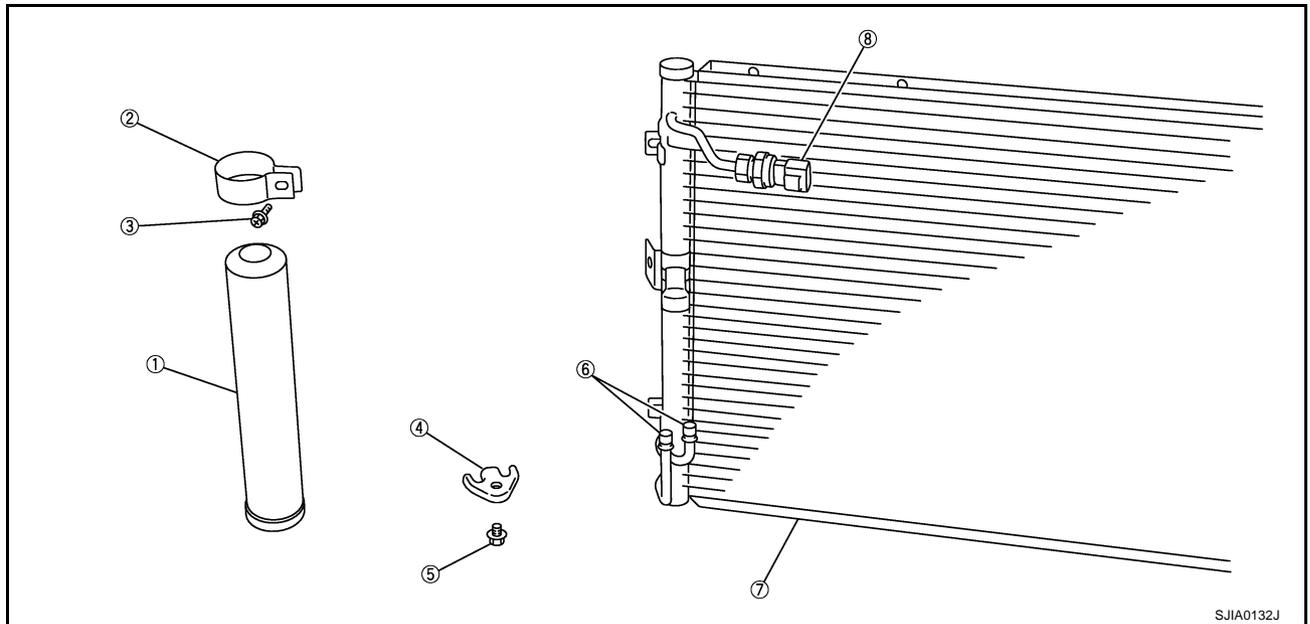
#### Condenser mounting bolts

Tightening torque : 3.82 - 4.51 N-m (0.39 - 0.46 kg-m)



## Removing and Installation for Liquid Tank (To be applied after the middle of June 2001.)

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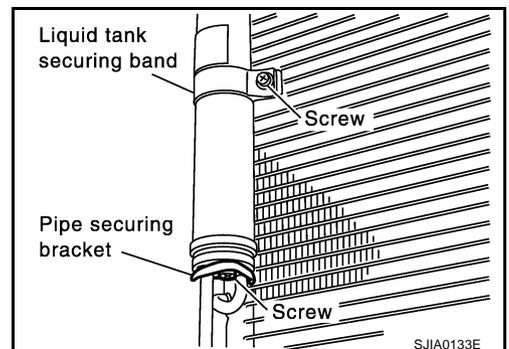


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- |                            |                                |           |
|----------------------------|--------------------------------|-----------|
| 1. Liquid tank             | 2. Liquid tank securing bands  | 3. Screw  |
| 4. Securing bracket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

## REMOVAL

1. Use refrigerant collecting equipment (for HFC134a) to discharge refrigerant.
2. Remove front grille.
3. Unscrew, and remove the securing bracket piping.
4. Unscrew liquid tank securing bands.
5. Pull out the liquid tank and liquid tank securing bands through the top.



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# REFRIGERANT LINES

## INSTALLATION

### CAUTION:

Replace refrigerant pressure sensor O-ring with a new one. Apply compressor oil prior to installation.

Securing bracket piping mounting screws : 4 - 5 (0.41 - 0.51)  
Tightening torque [N-m (kg-m)]

Liquid tank securing band mounting screw : 2.94 - 3.82 (0.3 - 0.38)  
tightening torque [N-m (kg-m)]

## Removal and Installation for Evaporator

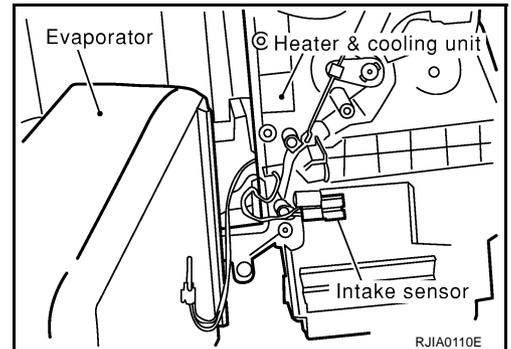
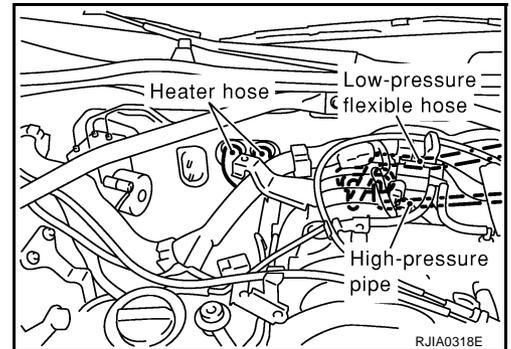
### REMOVAL

1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using the recycling and recovery machine (for HFC134a), discharge the refrigerant.
3. Drain coolant from cooling system and disconnect heater hoses.
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 &#38; cooling unit.
6. Remove cooler grommet, expansion valve cover, expansion valve.
7. Remove air mix door motor and mode door motor bracket.
8. Remove evaporator cover.
9. Slide the evaporator, then remove it from the heater &#38; cooling unit.
10. Remove intake sensor from the evaporator, then remove evaporator.



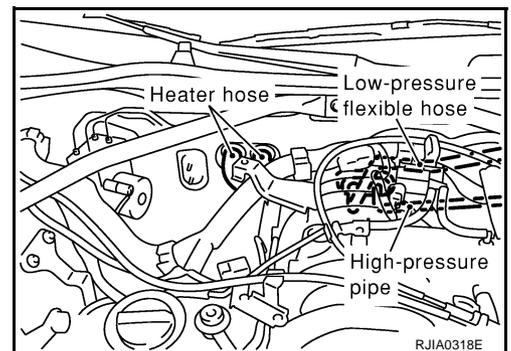
## INSTALLATION

### 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.

## Removal and Installation of Expansion Valve

1. Remove master cylinder cover, ABS unit cover and airflow meter cover.
2. Using the recycling and recovery equipment (for HFC-134a), discharge the refrigerant.
3. Drain coolant from cooling system and disconnect heater hoses.
4. Disconnect low-pressure flexible hose and high-pressure pipe from the evaporator.

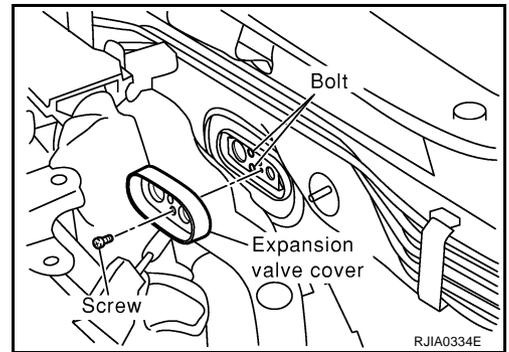


# REFRIGERANT LINES

5. Remove expansion valve cover.
6. Remove expansion valve.

## Expansion valve mounting bolts

Tightening torque : 2.9 - 5.0 N-m (0.30 - 0.50 kg-m)



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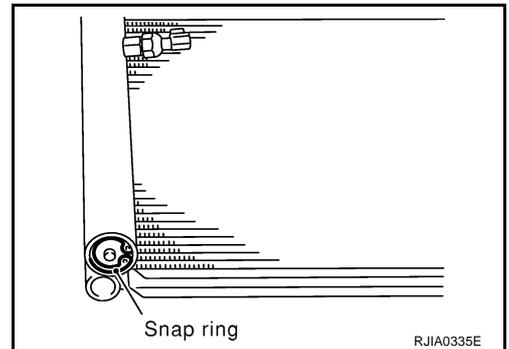
## Removal and Installation for Desiccant Assembly REMOVAL

1. Remove condenser.
2. Clean the area around the snap ring. Remove any dirt or rust.

### CAUTION:

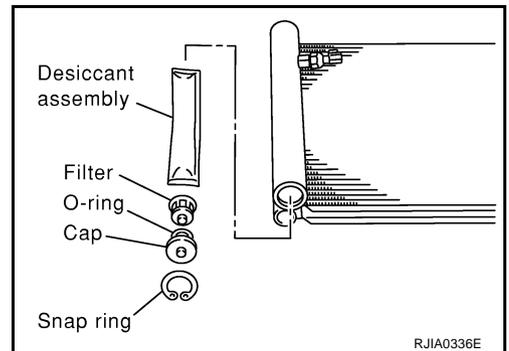
Be sure to clean carefully.

3. Remove snap ring from the lower side of liquid tank.
4. Remove cap, filter and desiccant assembly.



## INSTALLATION

1. Install new desiccant, filter, cap, O-ring, and snap ring.
2. The work must be performed with clean hands. (Gloves may not be worn.)
3. The desiccant, filter, cap, O-ring, and snap ring cannot be reused.
4. When inserting the desiccant, be sure to insert it all the way in, taking care not to allow any dirt to contact the surrounding area.
5. Do not install the filter backwards.
6. When inserting the cap, be certain to avoid having the O-ring catch on something, fall out, or contact dirt.
7. Apply lubricating oil to the cap O-ring, then insert all the way to the end.
8. Check that there is no dust or dirt adhering to the snap ring installation groove.
9. The snap ring must be installed securely into the groove.



## Checking for Refrigerant Leaks

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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

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1. Check A/C system for leaks using the UV lamp and safety glasses (J-42220) in a low sunlight area (area without windows preferable). Illuminate all components, fittings and lines. The dye will appear as a bright green/yellow area at the point of leakage. Fluorescent dye observed at the evaporator drain opening indicates an evaporator core assembly (tubes, core or TXV) leak.
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 come in contact with any substance. This can also cause false readings and may damage the detector.

## Dye Injection

EJS000KK

(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 (50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool (J-41459).
3. Connect the injector tool to the A/C LOW PRESSURE side service fitting.
4. Start engine and switch A/C ON.
5. 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.

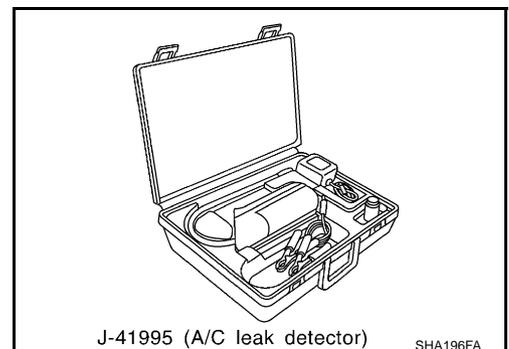
## Electronic Refrigerant Leak Detector

### PRECAUTIONS FOR HANDLING LEAK DETECTOR

EJS000KL

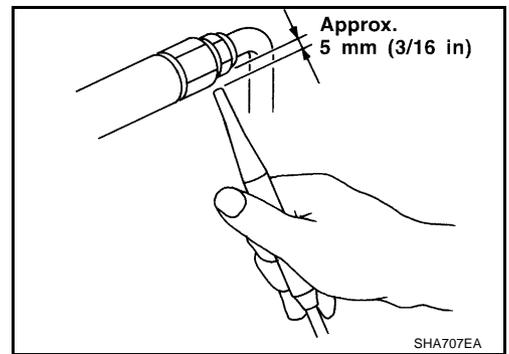
When performing a refrigerant leak check, use a J-41995 A/C leak detector or equivalent. Ensure that the instrument is calibrated and set properly as per the operating instructions.

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

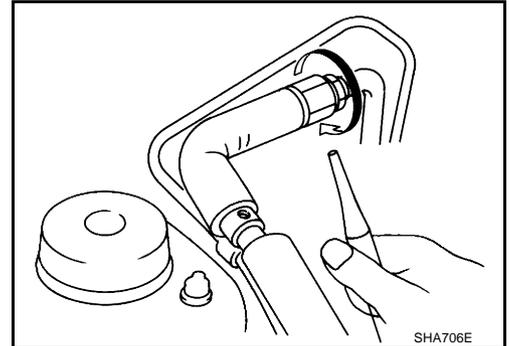


# REFRIGERANT LINES

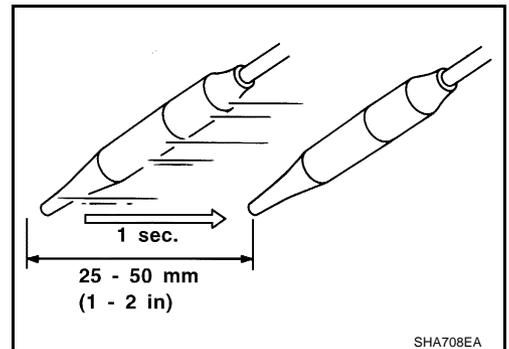
1. Position probe approximately 5 mm (3/16 in) away from point to be checked.



2. When testing, completely circle each fitting 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 (3.54 kg/cm<sup>2</sup>, 50 psi).

4. Conduct the leak test from the high side (compressor discharge a to evaporator inlet e) to the low side (evaporator drain hose f to shaft seal j). Refer to [ATC-134](#). 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 pressure sensor.

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.

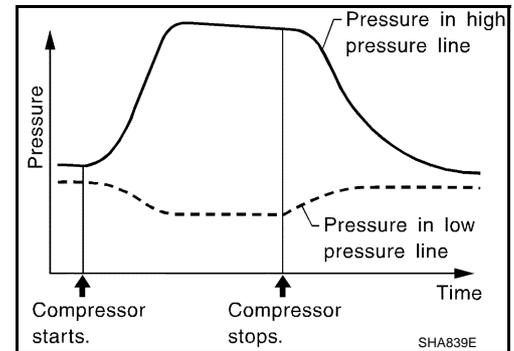
### Cooling unit (Evaporator)

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. A/C 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 ACR4 to vehicle, check ACR4 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 ACR4 and refrigerant identifier.
13. Confirm refrigerant purity in vehicle A/C system using ACR4 and refrigerant identifier.
14. Discharge A/C system using approved refrigerant recovery equipment. Repair or replace the leaking fitting or component as 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) COMPRESSOR

PFP:00030

EJS001QE

Model	CALSONIC KANSEI V-6	
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

EJS001QF

Model	CALSONIC KANSEI V-6	
Name	Nissan A/C System Oil Type S	
Part number	KLH00-PAGS0	
Capacity ml (US fl oz, Imp fl oz)	Total in system	230 (7.8, 8.1)
	Compressor (Service part) charging amount	230 (7.8, 8.1)

## REFRIGERANT

EJS001QG

Type	HFC-134a (R-134a)
Capacity kg (lb)	0.55 (1.21)

## ENGINE IDLING SPEED

EJS001QH

Refer to [EC-621, "Idle Speed and Ignition Timing"](#) .

## BELT TENSION

EJS001QI

Refer to [EM-12, "DRIVE BELTS"](#) .

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# SERVICE DATA AND SPECIFICATIONS (SDS)

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