

# 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”

EJS006AK

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)

EJS006AL

#### **WARNING:**

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

### Contaminated Refrigerant

EJS006AM

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

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

EJS006AN

### WARNING:

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

## Precautions for Refrigerant Connection

EJS006AO

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

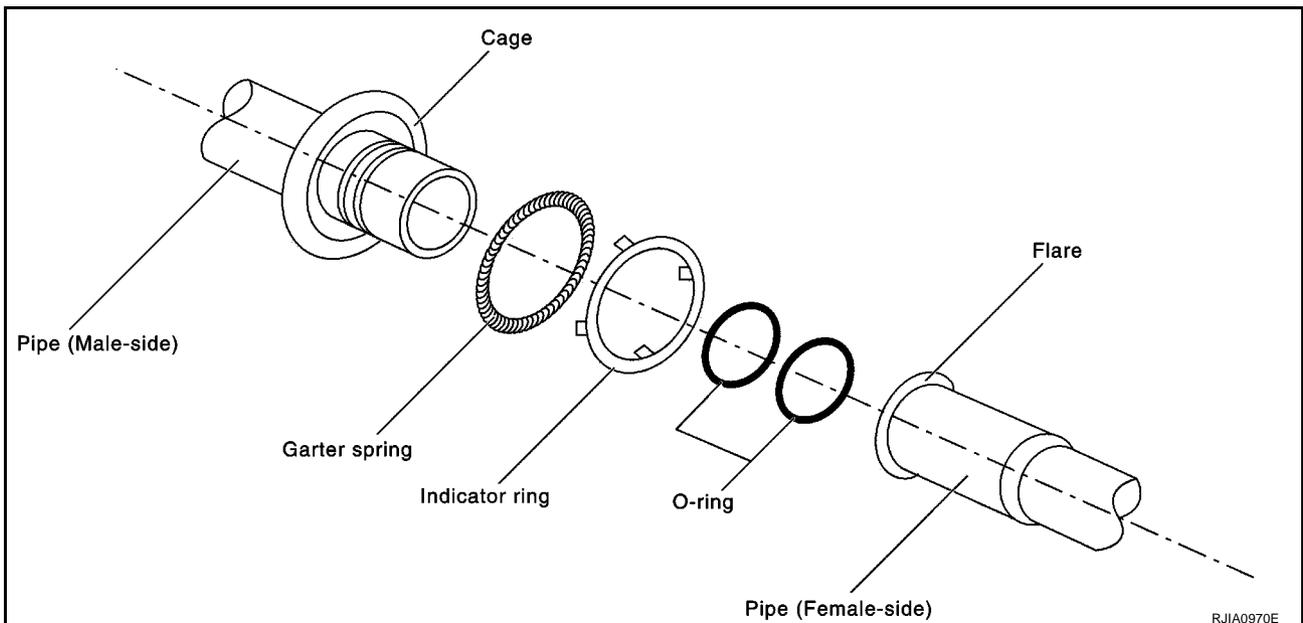
- Expansion valve to cooling unit
- Evaporator pipes to evaporator (inside cooling unit)
- Refrigerant pressure sensor

## ABOUT ONE-TOUCH JOINT

### Description

- One-touch joints are pipe joints which do not require tools during piping connection.
- Unlike conventional connection methods using union nuts and flanges, controlling tightening torque at connection point is not necessary.
- When removing a pipe joint, use a disconnecter.

### COMPONENT PARTS



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# PRECAUTIONS

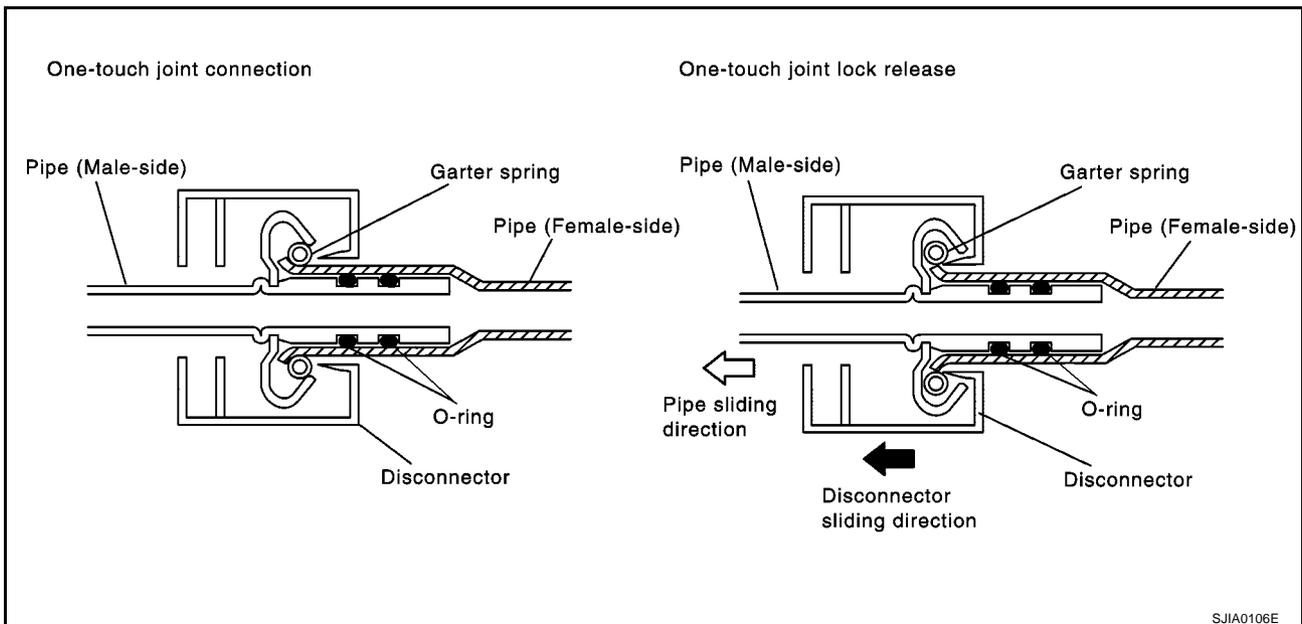
## FUNCTIONS OF COMPONENT PARTS

Pipe (Male side)	<ul style="list-style-type: none"><li>● Retains O-rings.</li><li>● Retains garter spring in cage.</li></ul>
Garter spring	Anchors female side piping.
Indicator ring	When connection is made properly, this is ejected from male-side piping. (This part is no longer necessary after connection.)
O-ring	Seals connection point. (Not reusable)
Pipe (Female side)	<ul style="list-style-type: none"><li>● Seals connection by compressing O-rings.</li><li>● Anchors piping connection using flare and garter spring.</li></ul>

### NOTE:

- Garter spring cannot be removed from cage of male-side piping.
- Indicator ring remains near piping connection point, however, this is not a malfunction. (This is to check piping connection during factory assembly.)

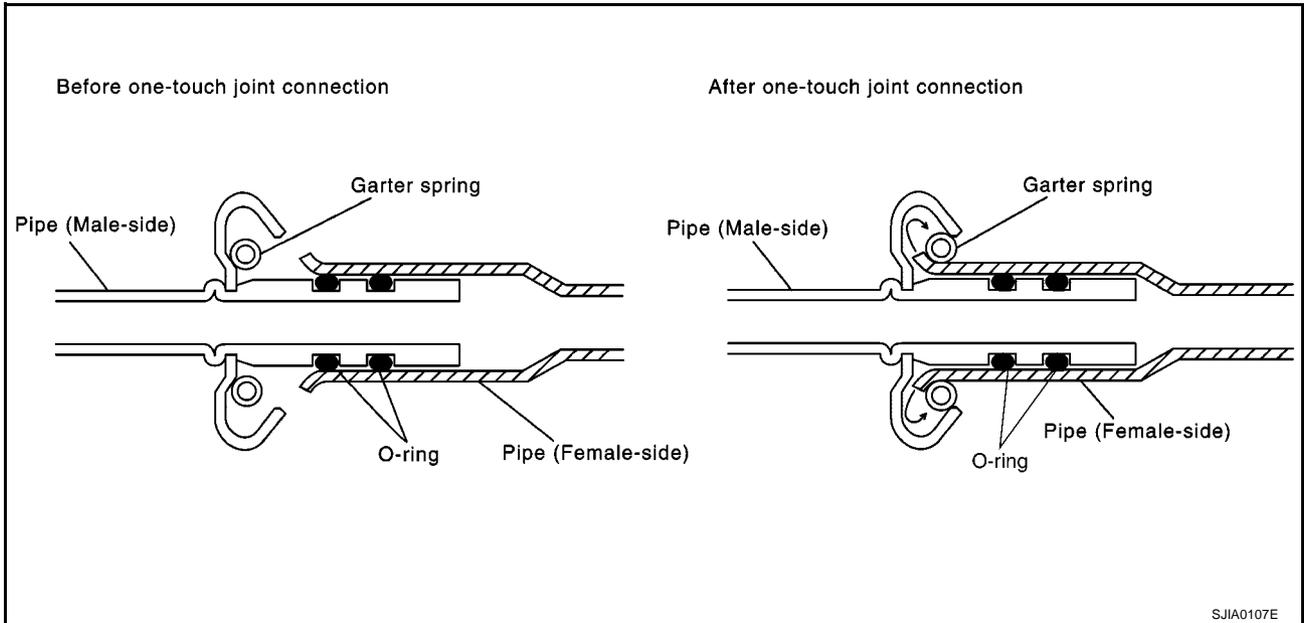
### REMOVAL



1. Clean piping connection point, and set a disconnecter.
2. Slide disconnecter in axial direction of piping, and stretch garter spring with tapered point of disconnecter.
3. Slide disconnecter farther so that inside diameter of garter spring becomes larger than outside diameter of female-side piping flare. Then male-side piping can be disconnected.

# PRECAUTIONS

## INSTALLATION



1. Clean piping connection points, and insert male-side piping into female-side piping.
2. Push inserted male-side piping harder so that female-side piping flare stretches garter spring.
3. If inside diameter of garter spring becomes larger than outside diameter of female-side piping flare, garter spring seats on flare. Then, it fits in between male-side piping cage and female-side piping flare to anchor piping connection point.

### NOTICE:

When garter spring seats on flare, and fits in between male-side piping cage and female-side piping flare, it clicks.

### CAUTION:

- Female-side piping connection point is thin. So, when inserting male-side piping, take care not to deform female-side piping. Slowly insert it in axial direction.
- Insert piping securely until a click is heard.
- After piping connection is completed, pull male-side piping by hand to make sure connection does not come loose.

### NOTE:

One-touch joint connection is used in points below.

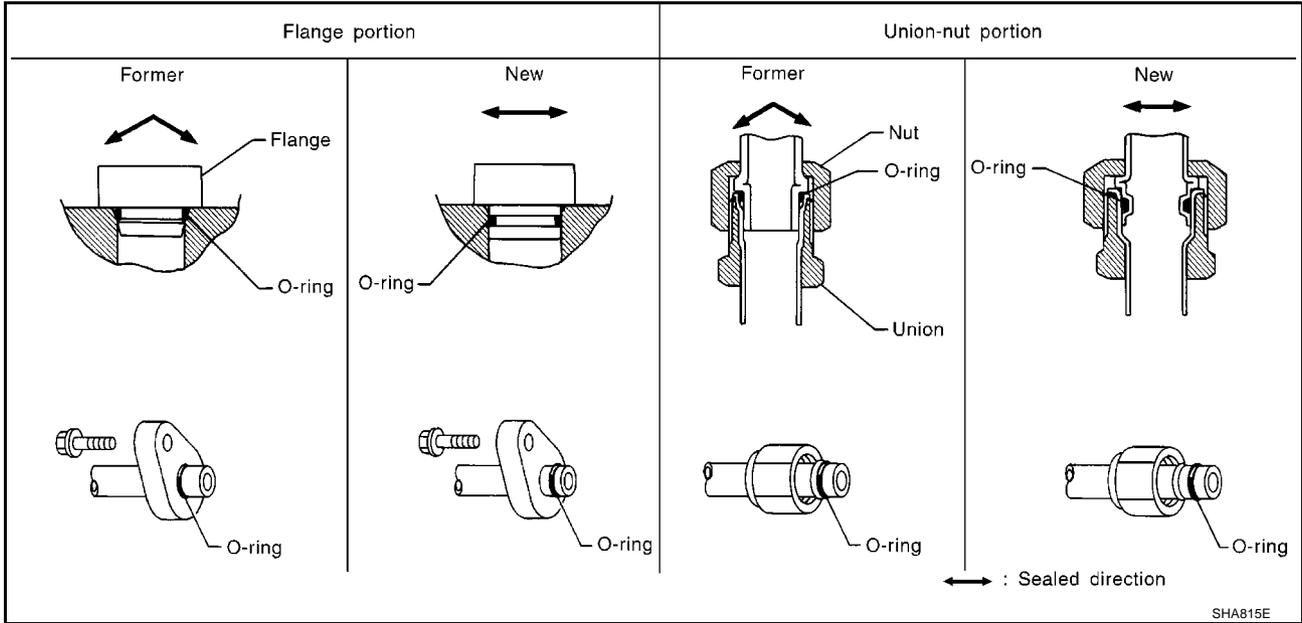
- Low-pressure flexible hose to evaporator (O-ring size: 16)
- High-pressure flexible hose to condenser (O-ring size: 12)
- High-pressure pipe 1 to high-pressure pipe 2 (O-ring size: 8)
- High-pressure pipe 1 to condenser (O-ring size: 8)

## 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.

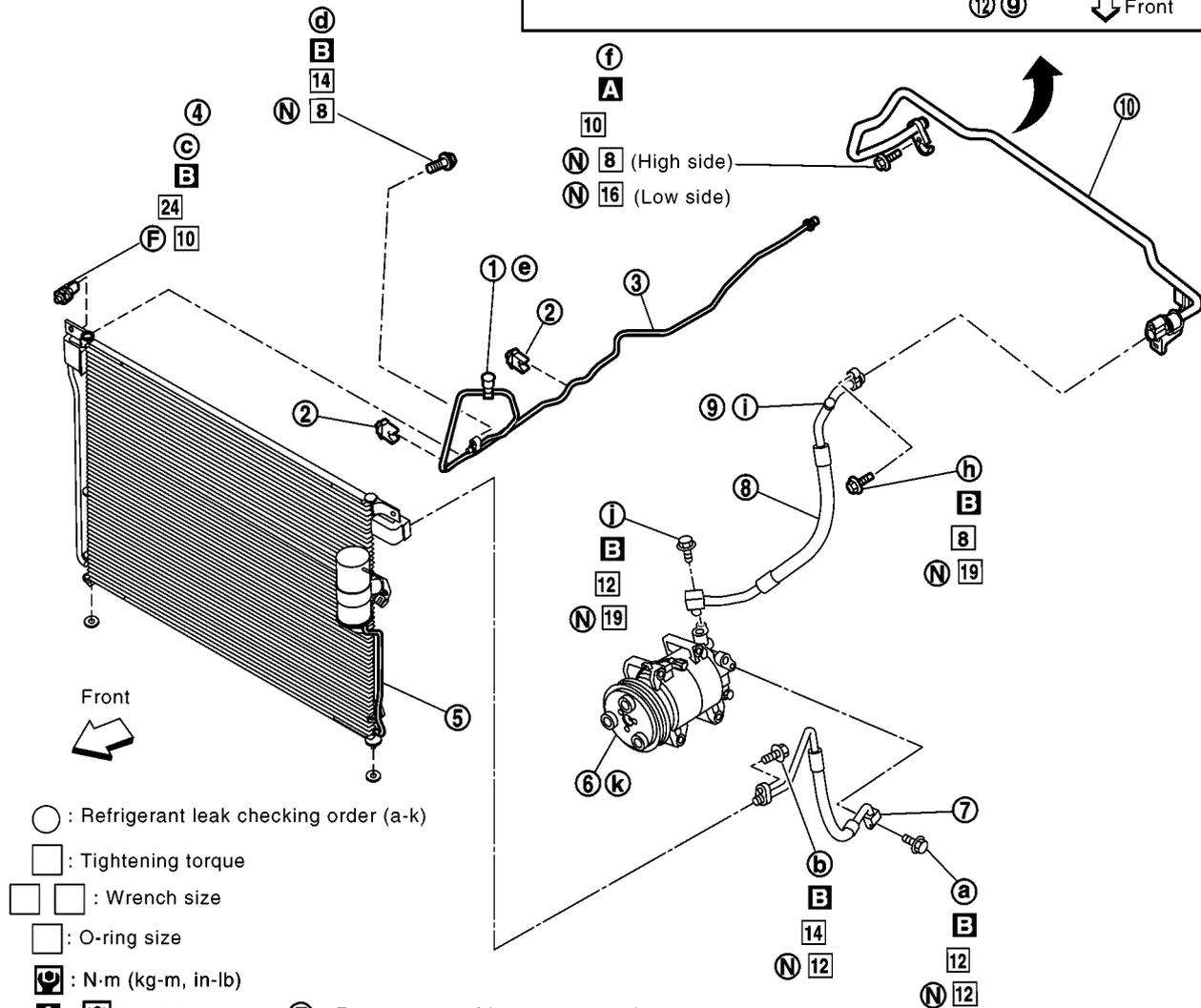
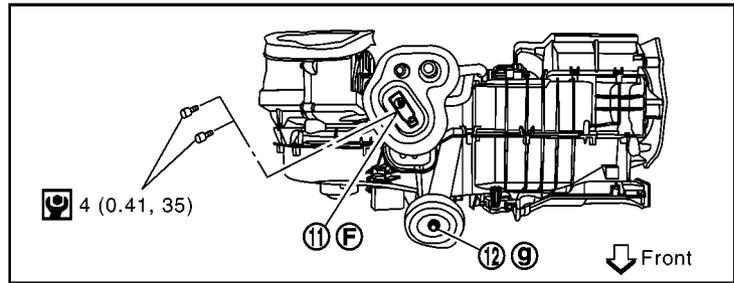


# PRECAUTIONS

## O-RING AND REFRIGERANT CONNECTION

### A/C Compressor and Condenser —LHD Models—

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- : Refrigerant leak checking order (a-k)
- : Tightening torque
- : Wrench size
- : O-ring size
- Ⓜ : N-m (kg-m, in-lb)
- A Ⓜ 3.4 (0.35, 30)
- B Ⓜ 9.3 (0.95, 82)
- F : Former type refrigerant connection
- N : New type refrigerant connection

- |                                    |                                   |                               |
|------------------------------------|-----------------------------------|-------------------------------|
| 1. High-pressure service valve     | 2. Clip                           | 3. High-pressure A/C pipe     |
| 4. Refrigerant pressure sensor     | 5. Condenser                      | 6. Compressor shaft seal      |
| 7. High-pressure flexible A/C hose | 8. Low-pressure flexible A/C hose | 9. Low-pressure service valve |
| 10. Low-pressure A/C pipe          | 11. Expansion valve               | 12. A/C drain hose            |

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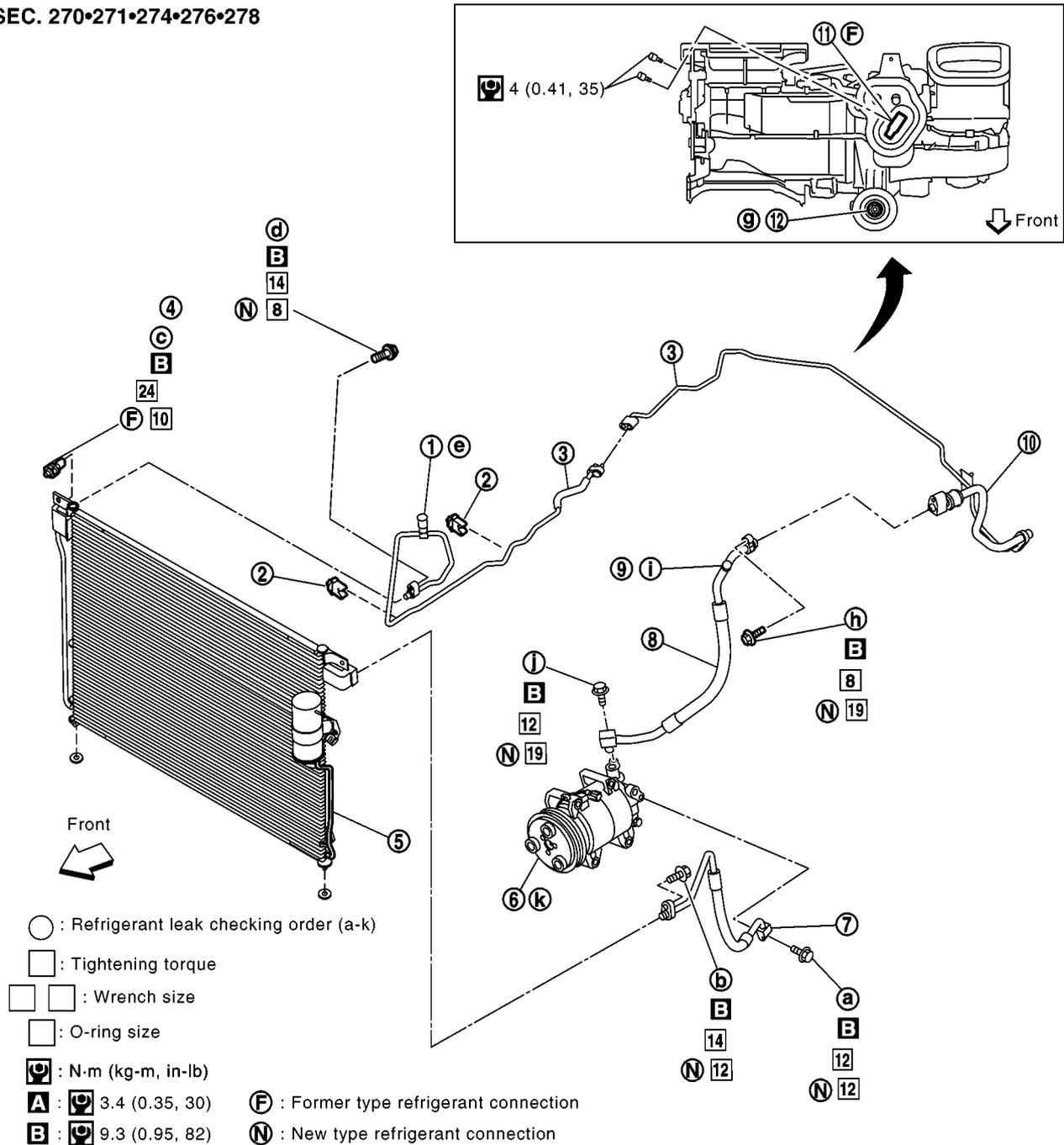
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## A/C Compressor and Condenser —RHD Models—

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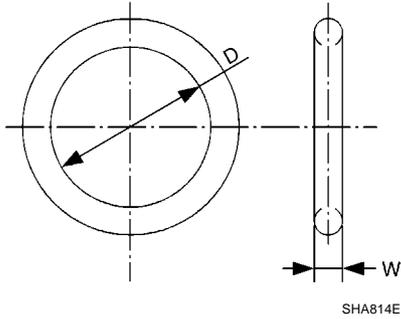
- |                                    |                                   |                               |
|------------------------------------|-----------------------------------|-------------------------------|
| 1. High-pressure service valve     | 2. Clip                           | 3. High-pressure A/C pipe     |
| 4. Refrigerant pressure sensor     | 5. Condenser                      | 6. Compressor shaft seal      |
| 7. High-pressure flexible A/C hose | 8. Low-pressure flexible A/C hose | 9. Low-pressure service valve |
| 10. Low-pressure A/C pipe          | 11. Expansion valve               | 12. A/C drain hose            |

### 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	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)

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

### 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.

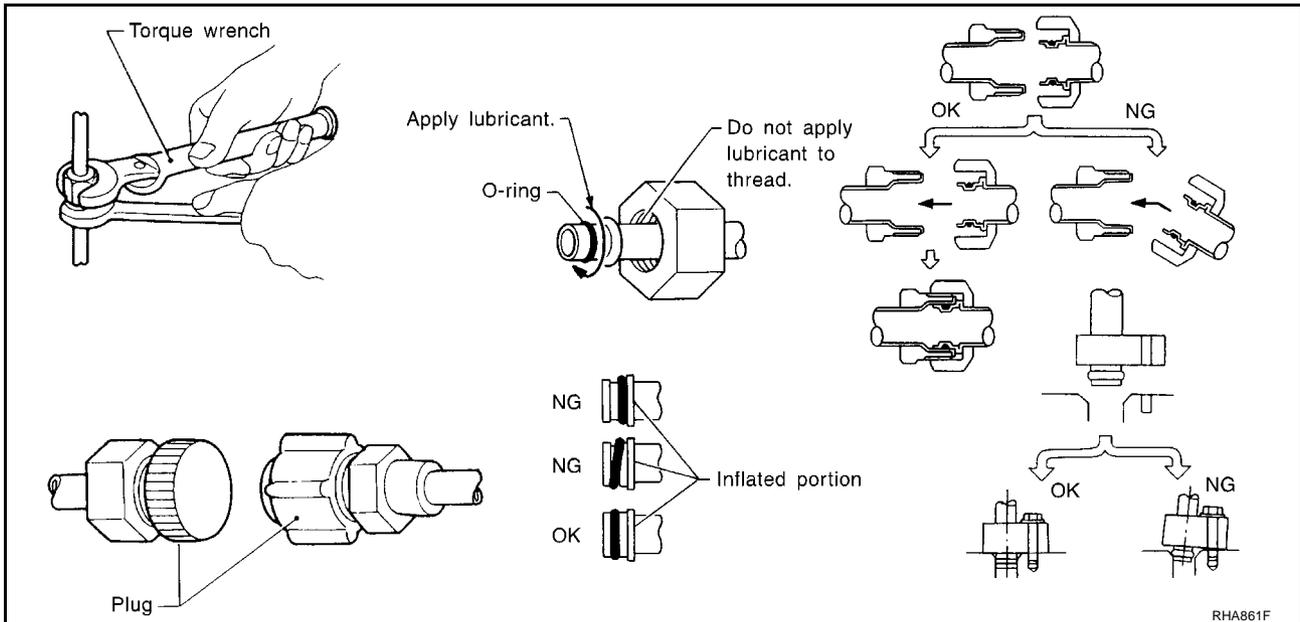
### CAUTION:

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: Genuine NISSAN A/C System Lubricant Type S (DH-PS) or equivalent  
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

EJS006AP

- 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-154, "Service Data and Specifications \(SDS\)"](#).
- Keep friction surfaces between clutch and pulley clean. If the surface is contaminated, with lubricant, wipe it off by using a clean waste cloth moistened with thinner.
- After compressor service operation, turn the compressor shaft by hand more than five turns in both directions. This will equally distribute lubricant inside the compressor. After the compressor is installed, let the engine idle and operate the compressor for one hour.
- After replacing the compressor magnet clutch, apply voltage to the new one and check for usual operation.

### Precautions for Service Equipment RECOVERY/RECYCLING EQUIPMENT

EJS006AQ

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

### ELECTRONIC LEAK DETECTOR

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

# PRECAUTIONS

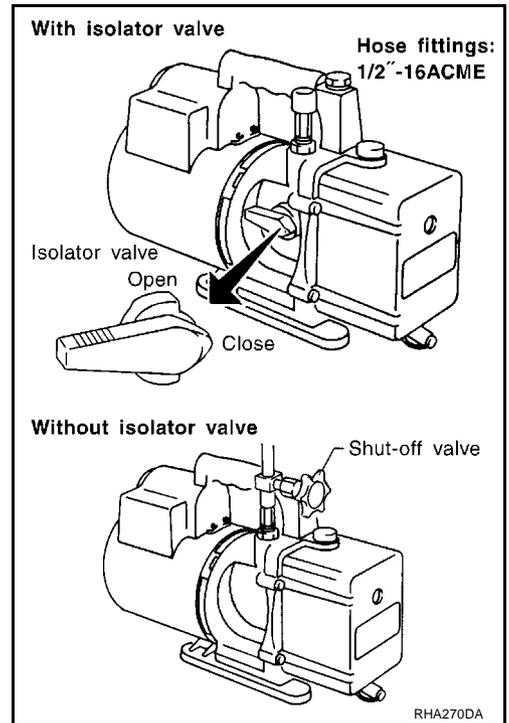
## VACUUM PUMP

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.

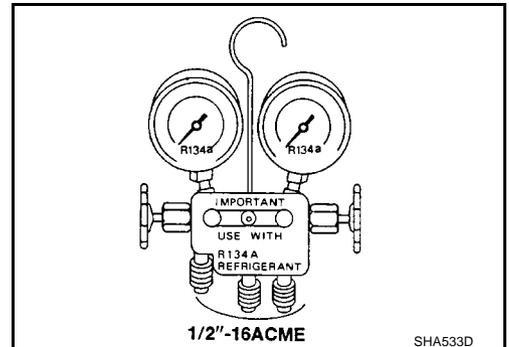
- Usually vacuum pumps have a manual isolator valve as part of the pump. Close this valve to isolate the service hose from the pump.
- For pumps without an isolator, use a hose equipped with a manual shut-off valve near the pump end. Close the valve to isolate the hose from the pump.
- If the hose has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



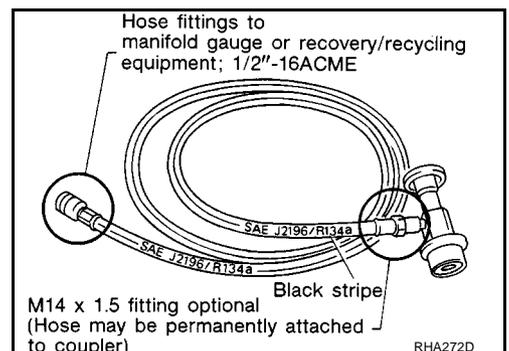
## MANIFOLD GAUGE SET

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



## SERVICE HOSES

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



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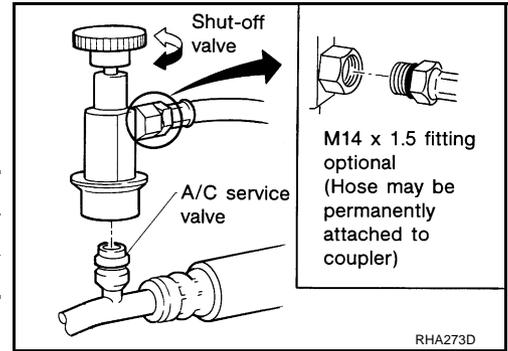
ATC

# PRECAUTIONS

## SERVICE COUPLERS

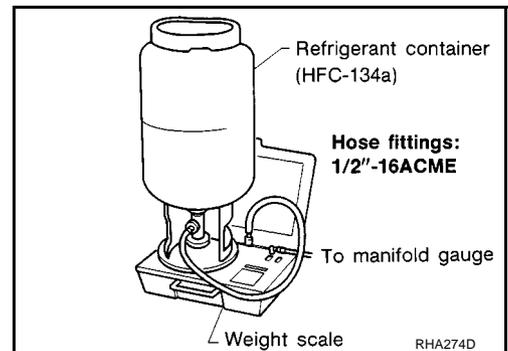
Never attempt to connect HFC-134a (R-134a) service couplers to an CFC-12 (R-12) A/C system. The HFC-134a (R-134a) couplers will not properly connect to the CFC-12 (R-12) system. However, if an improper connection is attempted, discharging and contamination may occur.

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:

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 for Leak Detection Dye

EJS006AR

- The A/C system contains a fluorescent leak detection dye used for locating refrigerant leaks. An ultraviolet (UV) lamp is required to illuminate the dye when inspecting for leaks.
- Always wear fluorescence enhancing UV safety goggles to protect your eyes and enhance the visibility of the fluorescent dye.
- The fluorescent dye leak detector is not a replacement for an electronic refrigerant leak detector. The fluorescent dye leak detector should be used in conjunction with an electronic refrigerant leak detector (J-41995) to pin-point refrigerant leaks.
- For your safety and your customer's satisfaction, read and follow all manufacturer's operating instructions and precautions prior to performing the work.

# PRECAUTIONS

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

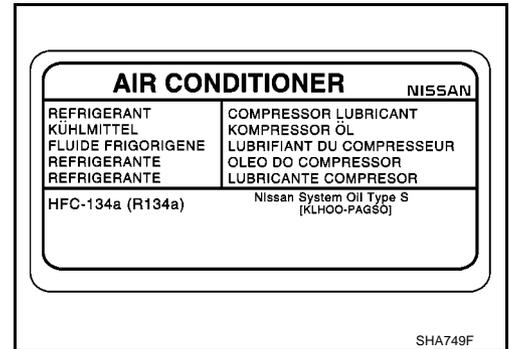
## IDENTIFICATION

### 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.



## Wiring Diagrams and Trouble Diagnosis

When you read wiring diagrams, refer to the following:

- [GI-15, "How to Read Wiring Diagrams"](#)
- [PG-4, "POWER SUPPLY ROUTING CIRCUIT"](#)

When you perform trouble diagnosis, refer to the following:

- [GI-11, "How to Follow Trouble Diagnoses"](#)
- [GI-24, "How to Perform Efficient Diagnosis for an Electrical Incident"](#)

# PREPARATION

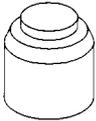
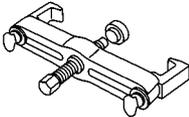
## PREPARATION

PFP:00002

### Special Service Tools

*EJS006AT*

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

Tool number Tool name	Description
KV99106200 Pulley installer	Installing pulley
 S-NT235	
KV99233130 Pulley puller	Removing pulley
 LHA172	

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

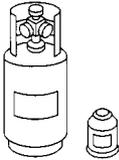
*EJS006AU*

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

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

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

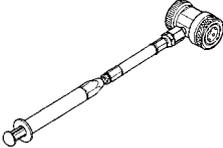
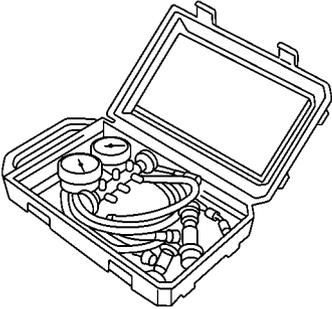
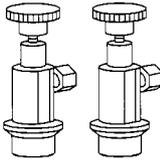
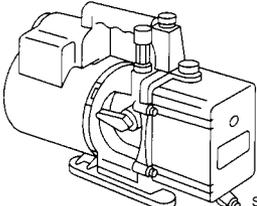
Adapters that convert one size fitting to another must never be used: refrigerant/lubricant contamination will occur and compressor malfunction will result.

Tool number Tool name	Description
HFC-134a (R-134a) refrigerant	Container color: Light blue Container marking: HFC-134a (R-134a) Fitting size: Thread size ● Large container 1/2"-16 ACME
 S-NT196	
KLH00-PAGS0 Nissan A/C System Oil Type S (DH-PS)	Type: Polyalkylene glycol oil (PAG), type S (DH-PS) Application: HFC-134a (R-134a) wobble (swash) plate compressors (Nissan only) Lubricity: 40 mℓ (1.4 Imp fl oz.)
 S-NT197	

# PREPARATION

Tool number Tool name	Description	
<p>Recovery/Recycling/ Recharging equipment (ACR4)</p>	<p>Function: Refrigerant recovery and recycling and recharging</p>	<p>A B C D</p>
<p>Electrical leak detector</p>	<p>Power supply: DC 12V (Cigarette lighter)</p>	<p>E F G H</p>
<p>(J-43926) Refrigerant dye leak detection kit Kit includes: (J-42220) UV lamp and UV safety goggles (J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle (J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles) (J-43872) Refrigerant dye cleaner</p>	<p>Power supply: DC 12V (Battery terminal)</p>	<p>I ATC K L</p>
<p>(J-42220) UV lamp and UV safety goggles</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 goggles</p>	<p>M</p>
<p>(J-41447) HFC-134a (R-134a) fluorescent leak detection dye (Box of 24, 1/4 ounce bottles)</p>	<p>Application: For HFC-134a (R-134a) PAG oil Container: 1/4 ounce (7.4 cc) bottle (Includes self-adhesive dye identification labels for affixing to vehicle after charging system with dye.)</p>	

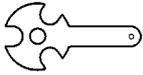
# PREPARATION

Tool number Tool name	Description
<p>(J-41459) HFC-134a (R-134a) dye injector Use with J-41447, 1/4 ounce bottle</p>	<div style="text-align: center;">  <p>SHA440F</p> </div> <p>For injecting 1/4 ounce of fluorescent leak detection dye into A/C system.</p>
<p>(J-43872) Refrigerant dye cleaner</p>	<div style="text-align: center;">  <p>SHA441F</p> </div> <p>For cleaning dye spills.</p>
<p>Manifold gauge set (with hoses and couplers)</p>	<div style="text-align: center;">  <p>RJIA0196E</p> </div> <p>Identification:</p> <ul style="list-style-type: none"> <li>● The gauge face indicates HFC-134a (R-134a).</li> </ul> <p>Fitting size: Thread size</p> <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>
<p>Service hoses</p> <ul style="list-style-type: none"> <li>● High-pressure side hose</li> <li>● Low-pressure side hose</li> <li>● Utility hose</li> </ul>	<div style="text-align: center;">  <p>S-NT201</p> </div> <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"-16 ACME</li> </ul>
<p>Service couplers</p> <ul style="list-style-type: none"> <li>● High-pressure side coupler</li> <li>● Low-pressure side coupler</li> </ul>	<div style="text-align: center;">  <p>S-NT202</p> </div> <p>Hose fitting to service hose: M14 x 1.5 fitting is optional or permanently attached.</p>
<p>Refrigerant weight scale</p>	<div style="text-align: center;">  <p>S-NT200</p> </div> <p>For measuring of refrigerant Fitting size: Thread size 1/2"-16 ACME</p>
<p>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> </ul> <p>Fitting size: Thread size</p> <ul style="list-style-type: none"> <li>● 1/2"-16 ACME</li> </ul>

# PREPARATION

## Commercial Service Tools

EJS006AV

Tool number Tool name	Description
<p>(J-44614) Clutch disk holding tool</p>  <p>WHA230</p>	<p>Clutch disk holding tool</p>

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ATC

# REFRIGERATION SYSTEM

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## REFRIGERATION SYSTEM

PFP:KA990

### Refrigerant Cycle REFRIGERANT FLOW

EJS006AW

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

### FREEZE PROTECTION

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

### Refrigerant System Protection REFRIGERANT PRESSURE SENSOR

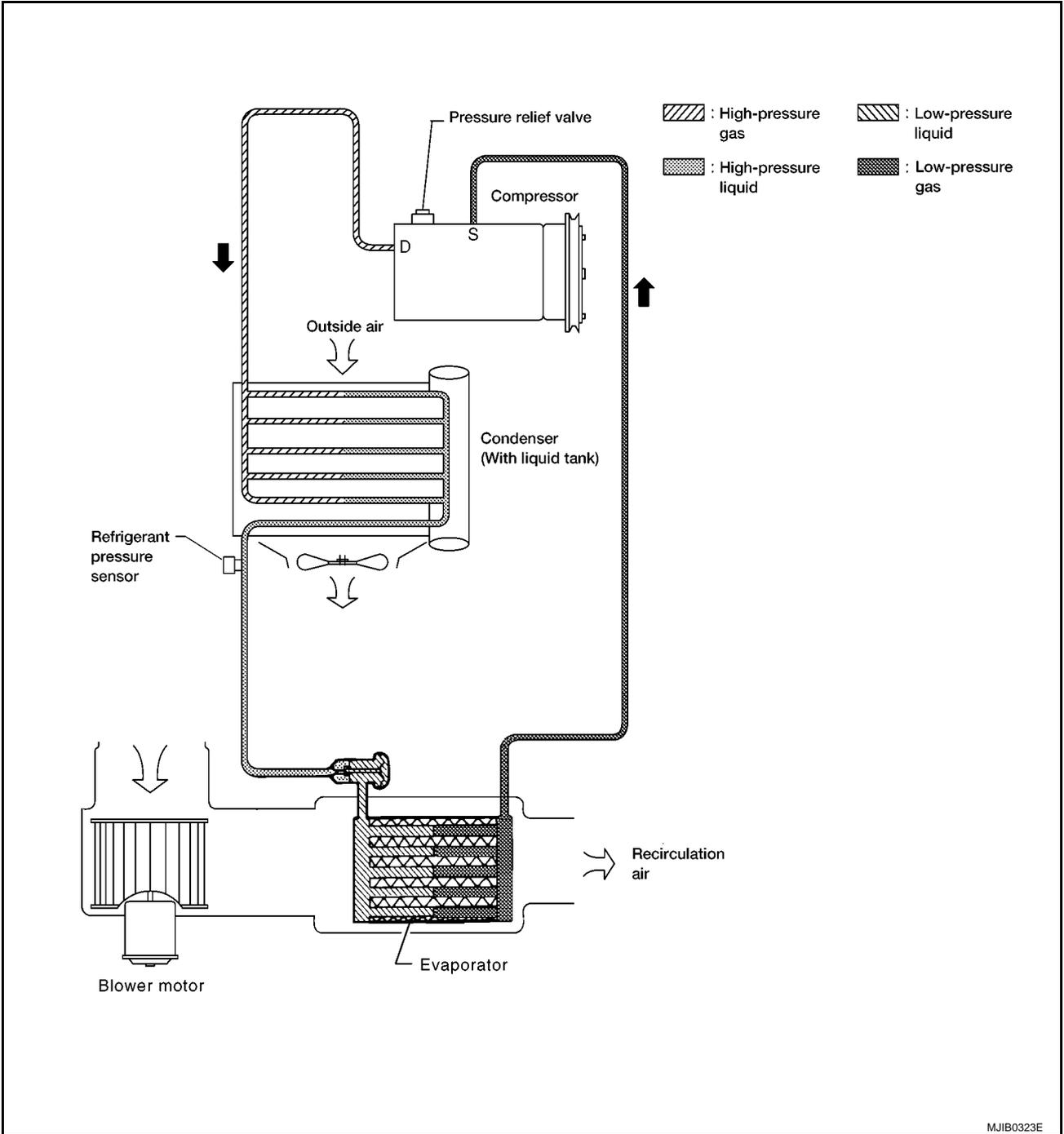
EJS006AX

The refrigerant system is protected against excessively high or low pressures by the refrigerant pressure sensor, located on the condenser. If the system pressure rises above or falls below the specifications, the refrigerant pressure sensor detects the pressure inside the refrigerant line and sends a voltage signal to the ECM. The ECM de-energizes the A/C relay to disengage the magnetic compressor clutch 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 120 kPa (1.22 kg/cm<sup>2</sup> , 17.4 psi).

# REFRIGERATION SYSTEM

## 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 2,990 kPa (30.5 kg/cm<sup>2</sup> , 433.6 psi)], the release port on the pressure relief valve automatically opens and releases refrigerant into the atmosphere.



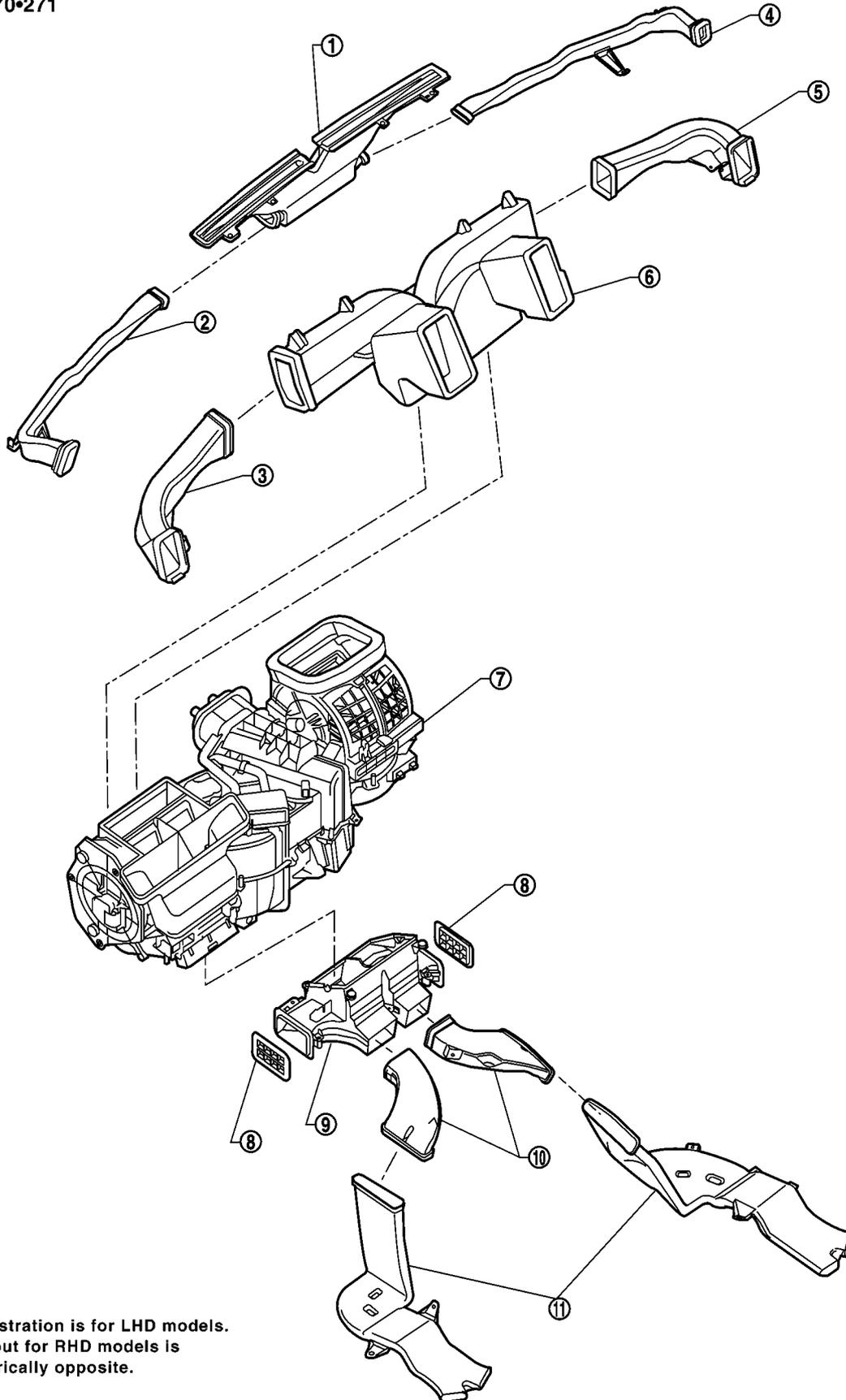
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# REFRIGERATION SYSTEM

EJS006AY

## Components REFRIGERATION SYSTEM

SEC. 270•271



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

MJIB0209E

# REFRIGERATION SYSTEM

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- |                                     |                                 |                            |   |
|-------------------------------------|---------------------------------|----------------------------|---|
| 1. Defroster nozzle                 | 2. LH side demister duct        | 3. LH ventilator duct      | A |
| 4. RH side demister duct            | 5. RH ventilator duct           | 6. Center ventilation duct |   |
| 7. Heater and cooling unit assembly | 8. Floor connector duct grilles | 9. Floor connector duct    | B |
| 10. Front floor duct                | 11. Rear floor duct             |                            | C |

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# LUBRICANT

## LUBRICANT

PPF:KLG00

### Maintenance of Lubricant Quantity in Compressor

EJS006AZ

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

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

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

## LUBRICANT

**Name: NISSAN A/C System Lubricant Type S (DH-PS) or equivalent**

**Part number: KLH00-PAGSO**

### CHECKING AND ADJUSTING

#### CAUTION:

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

Start the engine and set the following conditions:

#### Test Condition

- **Engine speed: Idling to 1,200 rpm**
- **A/C switch: On**
- **Blower speed: Max. position**
- **Temp. control: Optional [Set so that intake air temperature is 25° to 30° C (77° to 86°F)]**
- **Intake position: Recirculation (  )**
- **Perform lubricant return operation for about ten minutes**

Adjust the lubricant quantity according to the following table.

### Lubricant Adjusting Procedure for Components Replacement Except Compressor

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

**Amount of lubricant to be added:**

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

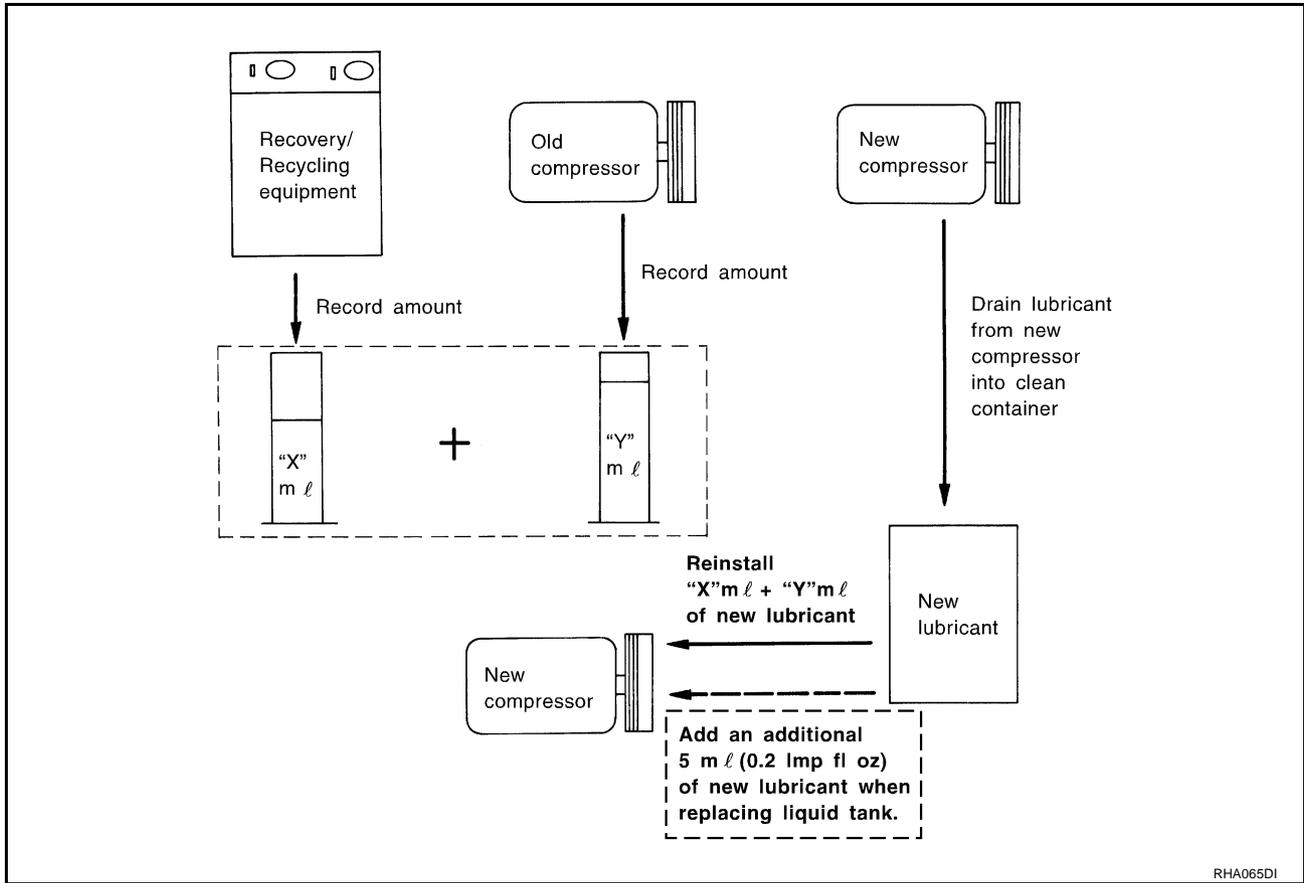
- \*1: If refrigerant leak is small, no addition of lubricant is needed.

### Lubricant Adjustment Procedure for Compressor Replacement

1. Before connecting recovery/recycling equipment to vehicle, check recovery/recycling equipment gauges. No refrigerant pressure should be displayed. If NG, recover refrigerant from equipment lines.
2. Connect recovery/recycling equipment to vehicle. Confirm refrigerant purity in supply tank using recovery/recycling equipment and refrigerant identifier. If NG, refer to [ATC-4, "Contaminated Refrigerant"](#).
3. Confirm refrigerant purity in vehicle A/C system using recovery/recycling equipment 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.

# LUBRICANT

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 m ℓ (0.2 Imp fl oz) of lubricant at this time. **Do not add this 5 m ℓ (0.2 Imp fl oz) of lubricant if only replacing the compressor.**



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ATC

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## AIR CONDITIONER CONTROL

PFP:27500

### Description

EJS006B0

The front air control provides automatic regulation of the vehicle's interior temperature. The system is based on the driver's and passenger's selected "set temperature", regardless of the outside temperature changes. This is done by utilizing a microcomputer, also referred to as the front air control, which receives input signals from the following six sensors:

- Ambient sensor
- In-vehicle sensor
- Intake sensor
- Optical sensor (one sensor for driver and passenger side)
- PBR (Position Balanced Resistor).
- Vehicle speed sensor

The front air control uses these signals (including the set temperature) to automatically control:

- Outlet air volume
- Air temperature
- Air distribution

The front air control is used to select:

- Outlet air volume
- Air temperature/distribution

### Operation

#### AIR MIX DOORS CONTROL

EJS006B1

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

#### BLOWER SPEED CONTROL

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

When AUTO switch is pressed, the blower motor starts to gradually increase air flow volume (if required).

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

#### INTAKE DOOR CONTROL

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

#### MODE DOOR CONTROL

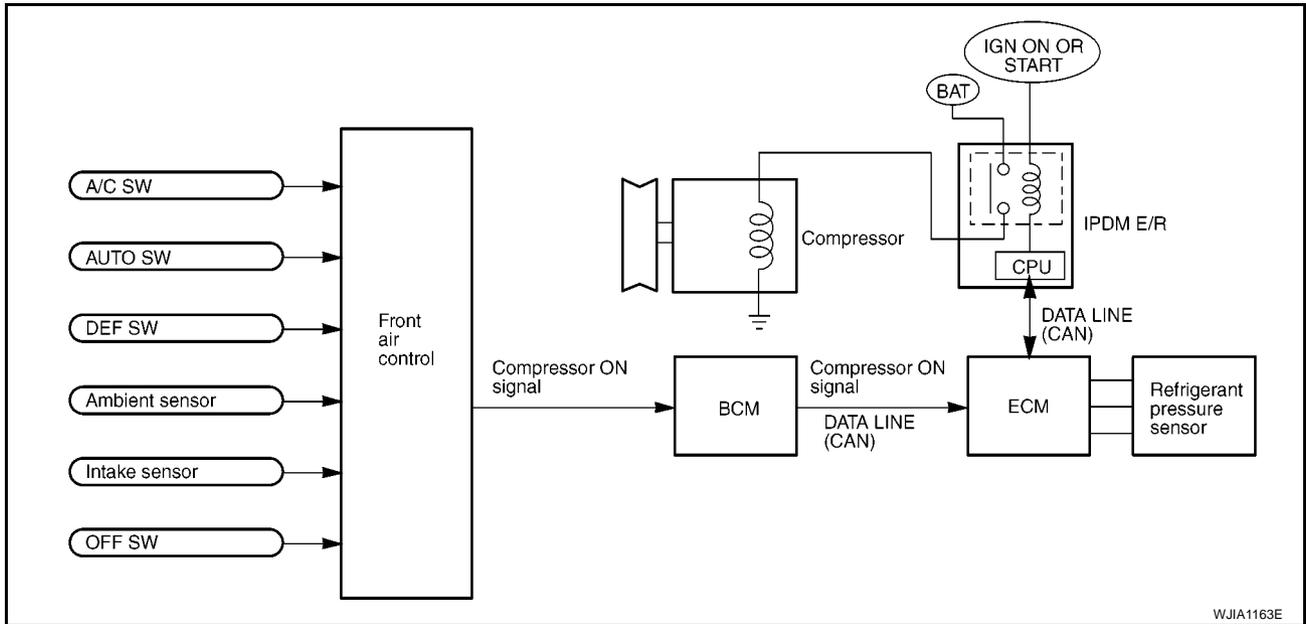
The mode door is automatically controlled by the temperature setting, ambient temperature, in-vehicle temperature, intake temperature and amount of sunload.

#### DEFROSTER DOOR CONTROL

The defroster door is controlled by: Turning the defroster dial to front defroster.

# AIR CONDITIONER CONTROL

## MAGNET CLUTCH CONTROL



When A/C switch or DEF switch is pressed, front air control inputs compressor ON signal to BCM. BCM sends compressor ON signal to ECM, via CAN communication line. ECM judges whether compressor can be turned ON, based on each sensor status (refrigerant pressure sensor signal, throttle angle sensor, etc.). If it judges compressor can be turned ON, it sends compressor ON signal to IPDM E/R, via CAN communication line. Upon receipt of compressor ON signal from ECM, IPDM E/R turns air conditioner relay ON to operate compressor.

### SELF-DIAGNOSTIC SYSTEM

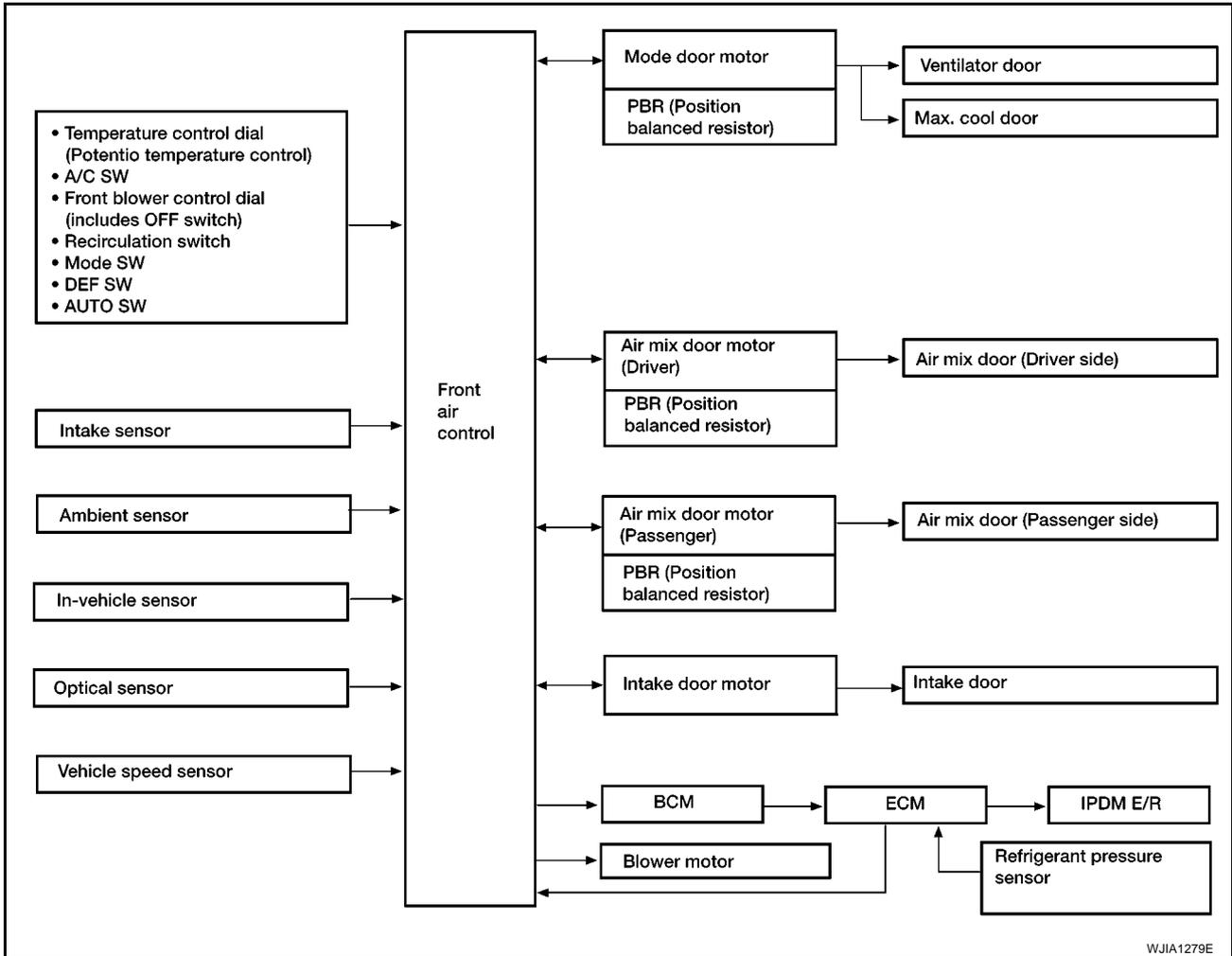
The self-diagnostic system is built into the front air control to quickly locate the cause of symptoms. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#).

# AIR CONDITIONER CONTROL

## Description of Control System

EJS006B2

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

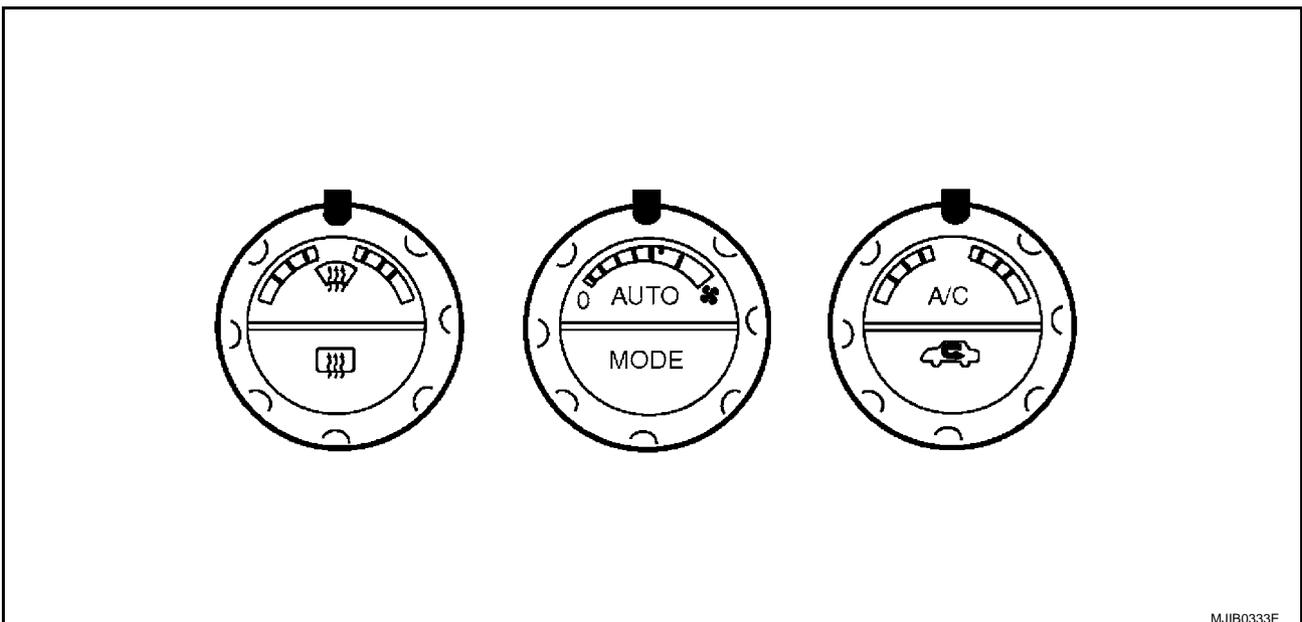


WJIA1279E

## Control Operation

EJS006B3

### Front air control



MJIB0333E

# AIR CONDITIONER CONTROL

---

## DISPLAY SCREEN

Displays the operational status of the system.

A

## AUTO SWITCH

- The compressor, intake door, 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 pressing AUTO switch, air inlet, air outlet, blower speed, and discharge air temperature are automatically controlled.

B

C

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

Increases or decreases the set temperature.

D

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

Increases or decreases the set temperature.

E

## TEMPERATURE CONTROL DIAL (TEMPERATURE AND MODE CONTROL) (REAR)

Increases or decreases the set temperature. The mode also changes from foot at full hot setting, to foot/vent mid-range (warm) setting, and then to vent on full cold setting.

F

## RECIRCULATION (REC) SWITCH

- When REC switch is ON, REC switch indicator turns ON, and air inlet is set to REC.
- When REC switch is turned OFF, or when compressor is turned from ON to OFF, REC switch is automatically turned OFF. REC mode can be re-entered by pressing REC switch again.
- REC switch is not operated when DEF switch is turned ON, or at the D/F position.

G

H

## DEFROSTER (DEF) SWITCH

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

## REAR WINDOW DEFOGGER SWITCH

When switch is ON, rear window is defogged.

I

## 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 (75% foot and 25% defrost) position.

ATC

## A/C SWITCH

The compressor is ON or OFF.

(Pressing the A/C switch when the AUTO switch is ON will turn off the A/C switch and compressor.)

K

## MODE SWITCH (FRONT)

Controls the air discharge outlets.

L

## FRONT BLOWER CONTROL DIAL

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

M

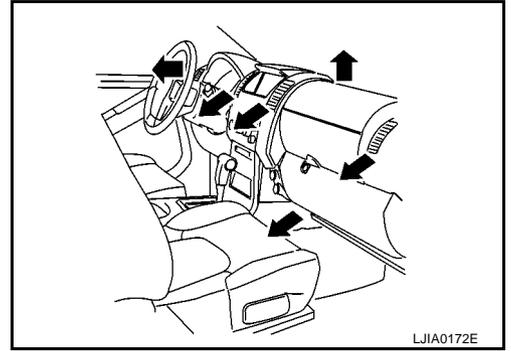
## MODE SWITCH (REAR)

Controls the air/temperature at discharge outlets.

# AIR CONDITIONER CONTROL

## Discharge Air Flow FRONT

EJS006B4



### Discharge air flow

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	60%	40%	–
	18%	64%	18%
	14%	53%	33%
	–	13%	83%

MJIB0284E



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## CAN Communication System Description

EJS006B7

Refer to [LAN-23, "CAN COMMUNICATION"](#) .

# TROUBLE DIAGNOSIS

## TROUBLE DIAGNOSIS

PFP:00004

### CONSULT-II Function (BCM)

EJS006B8

CONSULT-II can display each diagnostic item using the diagnostic test modes shown following.

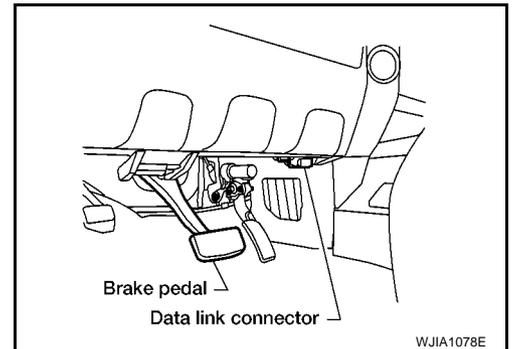
BCM diagnostic test item	Diagnostic mode	Description
Inspection by part	WORK SUPPORT	Supports inspections and adjustments. Commands are transmitted to the BCM for setting the status suitable for required operation, input/output signals are received from the BCM and received data is displayed.
	DATA MONITOR	Displays BCM input/output data in real time.
	ACTIVE TEST	Operation of electrical loads can be checked by sending drive signal to them.
	SELF-DIAG RESULTS	Displays BCM self-diagnosis results.
	CAN DIAG SUPPORT MNTR	The result of transmit/receive diagnosis of CAN communication can be read.
	ECU PART NUMBER	BCM part number can be read.
	CONFIGURATION	Performs BCM configuration read/write functions.

### CONSULT-II BASIC OPERATION

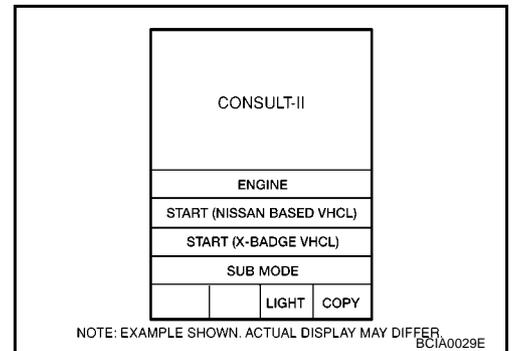
#### CAUTION:

If CONSULT-II is used with no connection of CONSULT-II CONVERTER, malfunctions might be detected in self-diagnosis depending on control unit which carry out CAN communication.

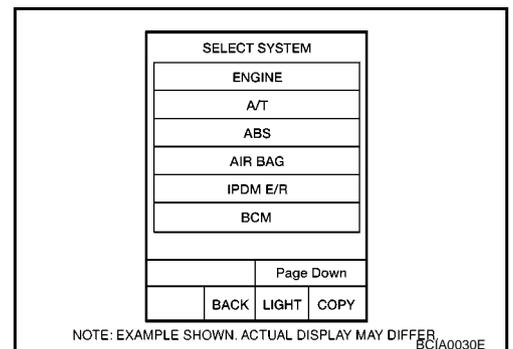
1. With the ignition switch OFF, connect CONSULT-II and CONSULT-II converter to the data link connector, and turn the ignition switch ON.



2. Touch "START (NISSAN BASED VHCL)".



3. Touch "BCM" on "SELECT SYSTEM" screen.  
If "BCM" is not indicated, go to [GI-50, "CONSULT-II Data Link Connector \(DLC\) Circuit"](#).

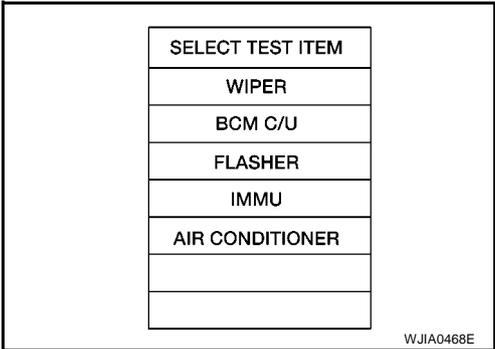


# TROUBLE DIAGNOSIS

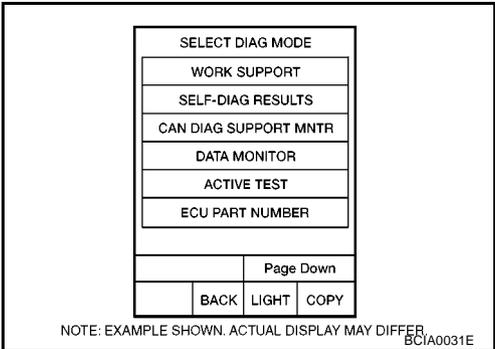
## DATA MONITOR

### Operation Procedure

1. Touch "AIR CONDITIONER" on "SELECT TEST ITEM" screen.



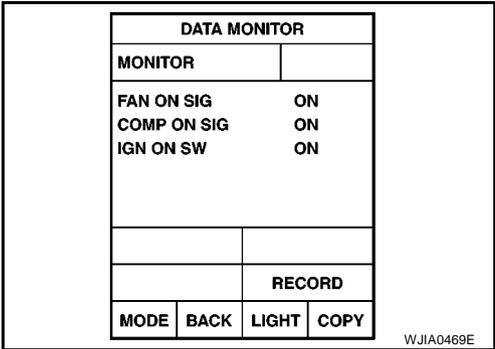
2. Touch "DATA MONITOR" on "SELECT DIAG MODE" screen.



3. Touch either "ALL SIGNALS" or "SELECTION FROM MENU" on "DATA MONITOR" screen.

All signals	Monitors all the items.
Selection from menu	Selects and monitors the individual item selected.

4. When "SELECTION FROM MENU" is selected, touch items to be monitored. When "ALL SIGNALS" is selected, all the items will be monitored.
5. Touch "START".
6. Touch "RECORD" while monitoring, then the status of the monitored item can be recorded. To stop recording, touch "STOP".



### Display Item List

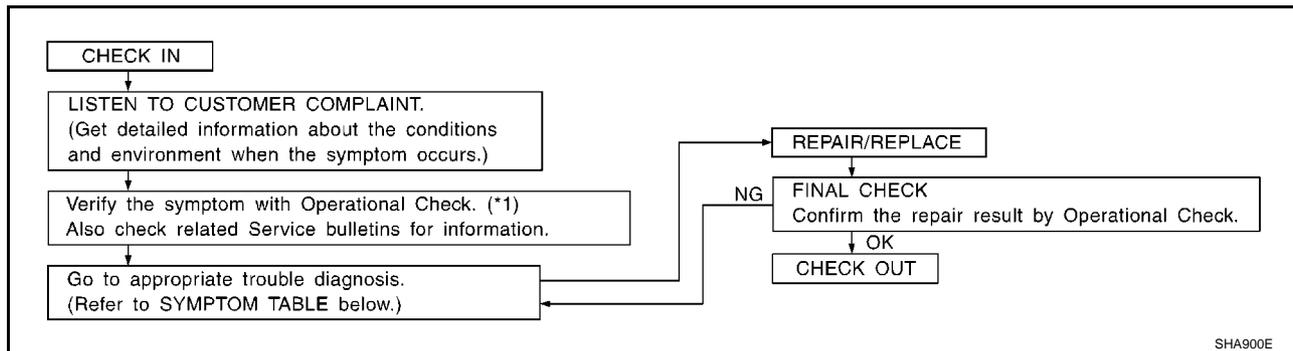
Monitor item name "OPERATION OR UNIT"	Contents
IGN ON SW "ON/OFF"	Displays "IGN Position (ON)/OFF, ACC Position (OFF)" status as judged from ignition switch signal.
COMP ON SIG "ON/OFF"	Displays "COMP (ON)/COMP (OFF)" status as judged from air conditioner switch signal.
FAN ON SIG "ON/OFF"	Displays "FAN (ON)/FAN (OFF)" status as judged from blower motor switch signal.

# TROUBLE DIAGNOSIS

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

EJS006B9

### WORK FLOW



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

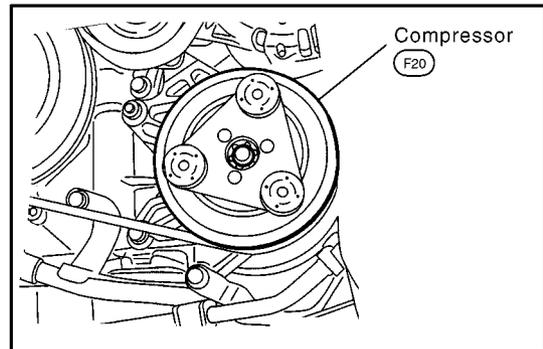
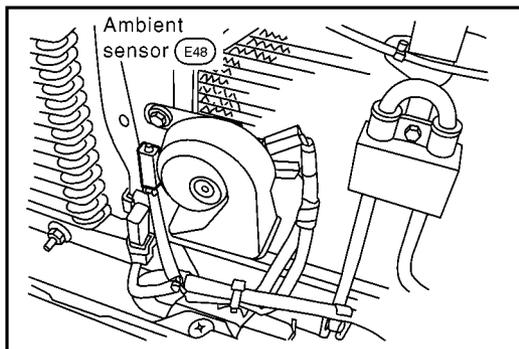
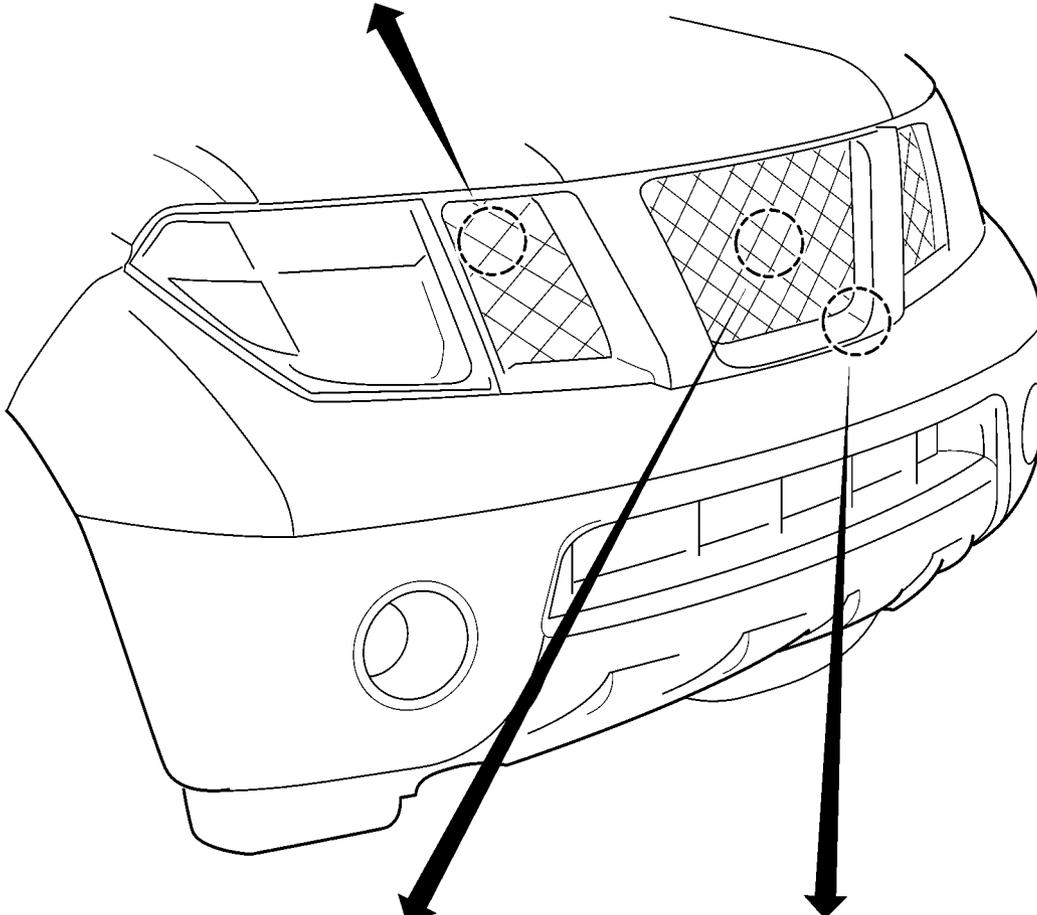
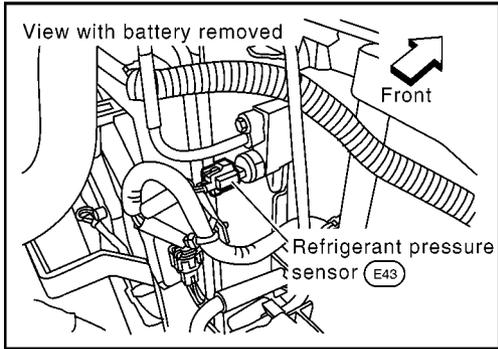
### SYMPTOM TABLE

Symptom	Reference Page
A/C system does not come on.	Go to Trouble Diagnosis Procedure for A/C System. <a href="#">ATC-60. "Power Supply and Ground Circuit for Front Air Control"</a>
A/C system display is malfunctioning.	Go to "Navigation System". <a href="#">AV-61. "Navigation System"</a>
A/C system cannot be controlled.	Go to Self-diagnosis Function. <a href="#">ATC-55. "A/C System Self-diagnosis Function"</a>
Air outlet does not change.	Go to Trouble Diagnosis Procedure for Mode Door Motor. <a href="#">ATC-63. "Mode Door Motor Circuit"</a>
Mode door motor is malfunctioning.	
Discharge air temperature does not change.	Go to Trouble Diagnosis Procedure for Air Mix Door Motor. <a href="#">ATC-68. "Air Mix Door Motor Circuit"</a>
Air mix door motor is malfunctioning.	
Intake door does not change.	Go to Trouble Diagnosis Procedure for Intake Door Motor. <a href="#">ATC-77. "Intake Door Motor Circuit"</a>
Intake door motor is malfunctioning.	
Defroster door motor is malfunctioning.	Go to Trouble Diagnosis Procedure for Defroster Door Motor.
Blower motor operation is malfunctioning.	Go to Trouble Diagnosis Procedure for Blower Motor. <a href="#">ATC-80. "Blower Motor Circuit"</a>
Magnet clutch does not engage.	Go to Trouble Diagnosis Procedure for Magnet Clutch. <a href="#">ATC-87. "Magnet Clutch Circuit"</a>
Insufficient cooling	Go to Trouble Diagnosis Procedure for Insufficient Cooling. <a href="#">ATC-93. "Insufficient Cooling"</a>
Insufficient heating	Go to Trouble Diagnosis Procedure for Insufficient Heating. <a href="#">ATC-100. "Insufficient Heating"</a>
Noise	Go to Trouble Diagnosis Procedure for Noise. <a href="#">ATC-101. "Noise"</a>
Self-diagnosis cannot be performed.	Go to Trouble Diagnosis Procedure for Self-diagnosis. <a href="#">ATC-103. "Self-diagnosis"</a>
Memory function does not operate.	Go to Trouble Diagnosis Procedure for Memory Function. <a href="#">ATC-104. "Memory Function"</a>

# TROUBLE DIAGNOSIS

## Component Parts and Harness Connector Location ENGINE COMPARTMENT

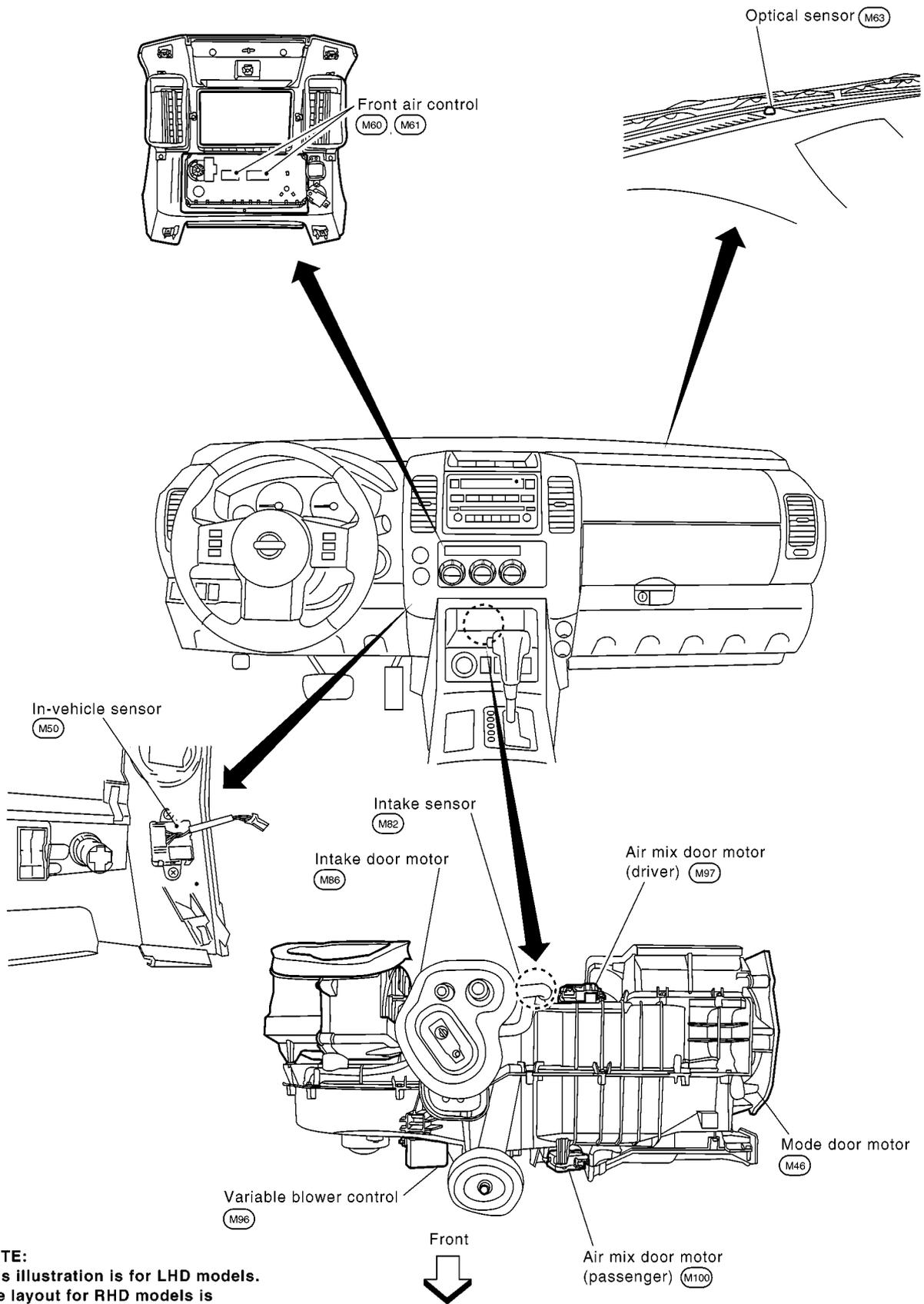
EJS006BA



MJIB0155E

# TROUBLE DIAGNOSIS

## FRONT PASSENGER COMPARTMENT



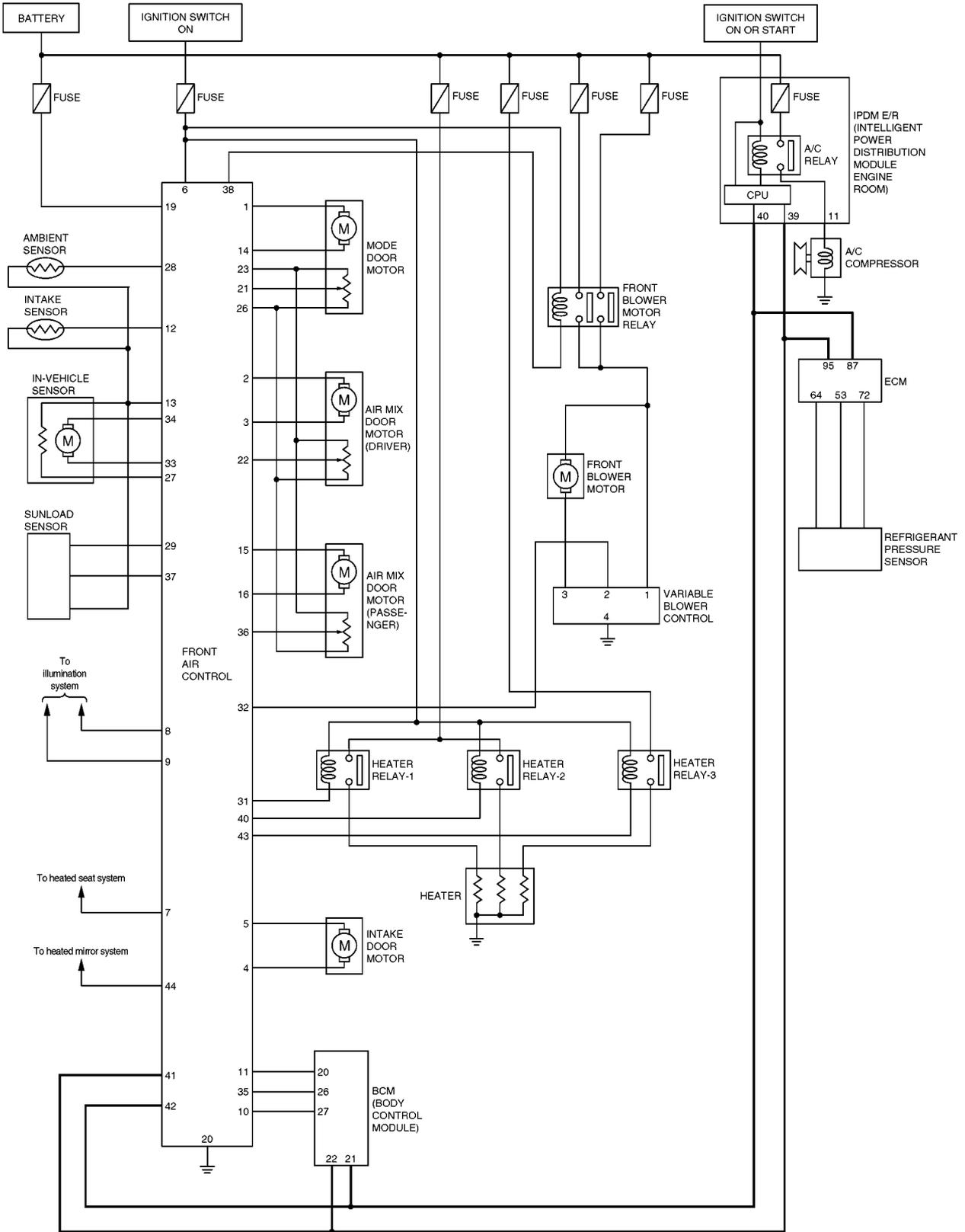
**NOTE:**  
This illustration is for LHD models.  
The layout for RHD models is  
symmetrically opposite.

MJIB0326E

# TROUBLE DIAGNOSIS

## Schematic —LHD MODELS—

EJS006BB



MJWA0176E

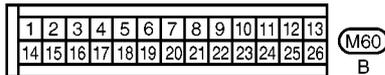
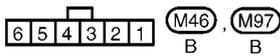
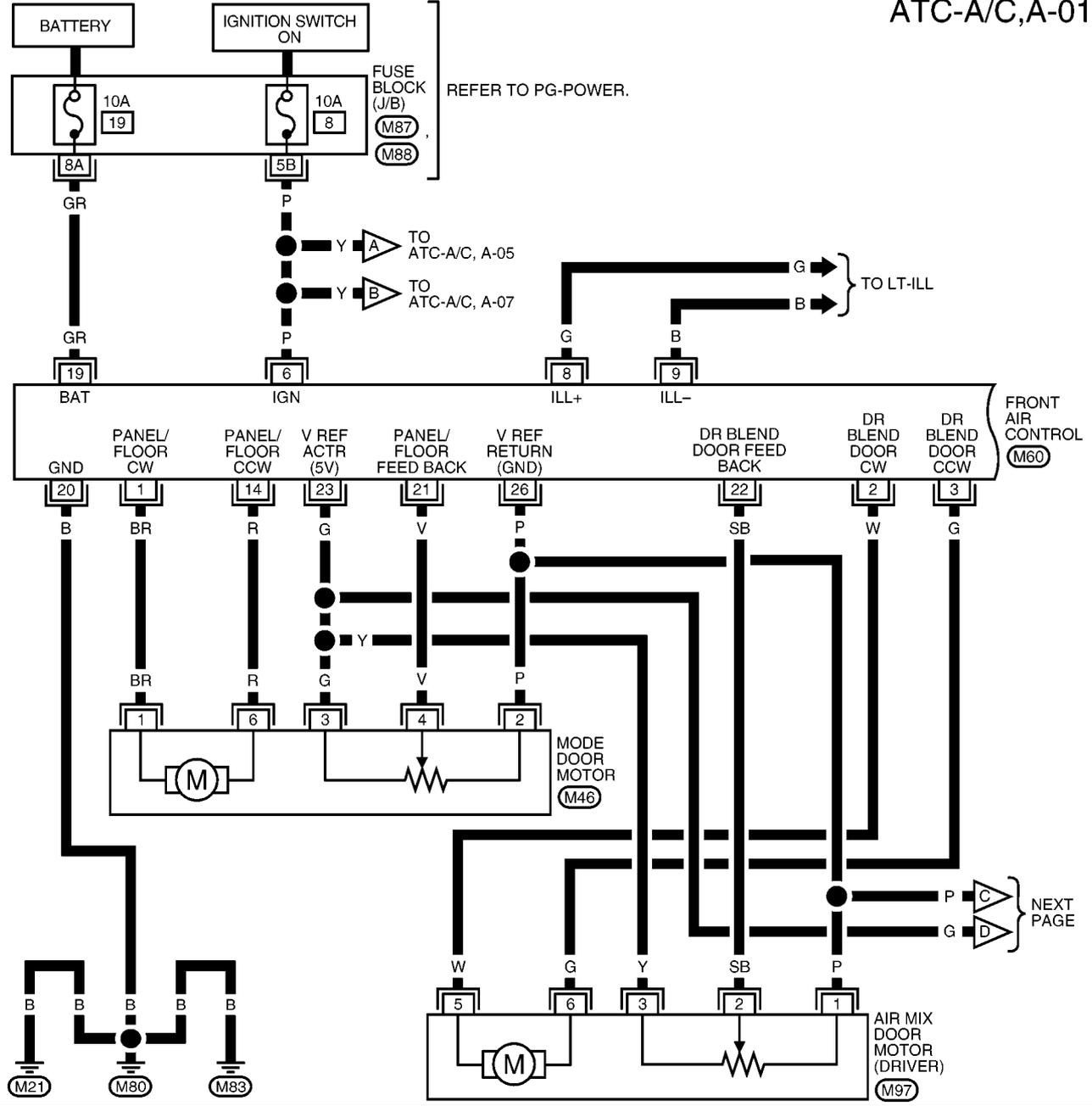
# TROUBLE DIAGNOSIS

## Wiring Diagram —A/C— —LHD MODELS—

EJS006BC

ATC-A/C,A-01

A  
B  
C  
D  
E  
F  
G  
H  
I  
K  
L  
M

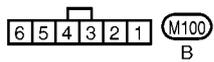
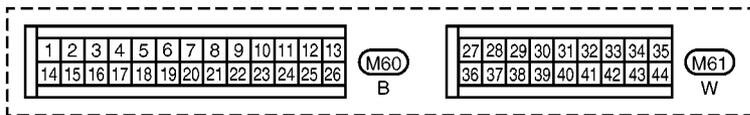
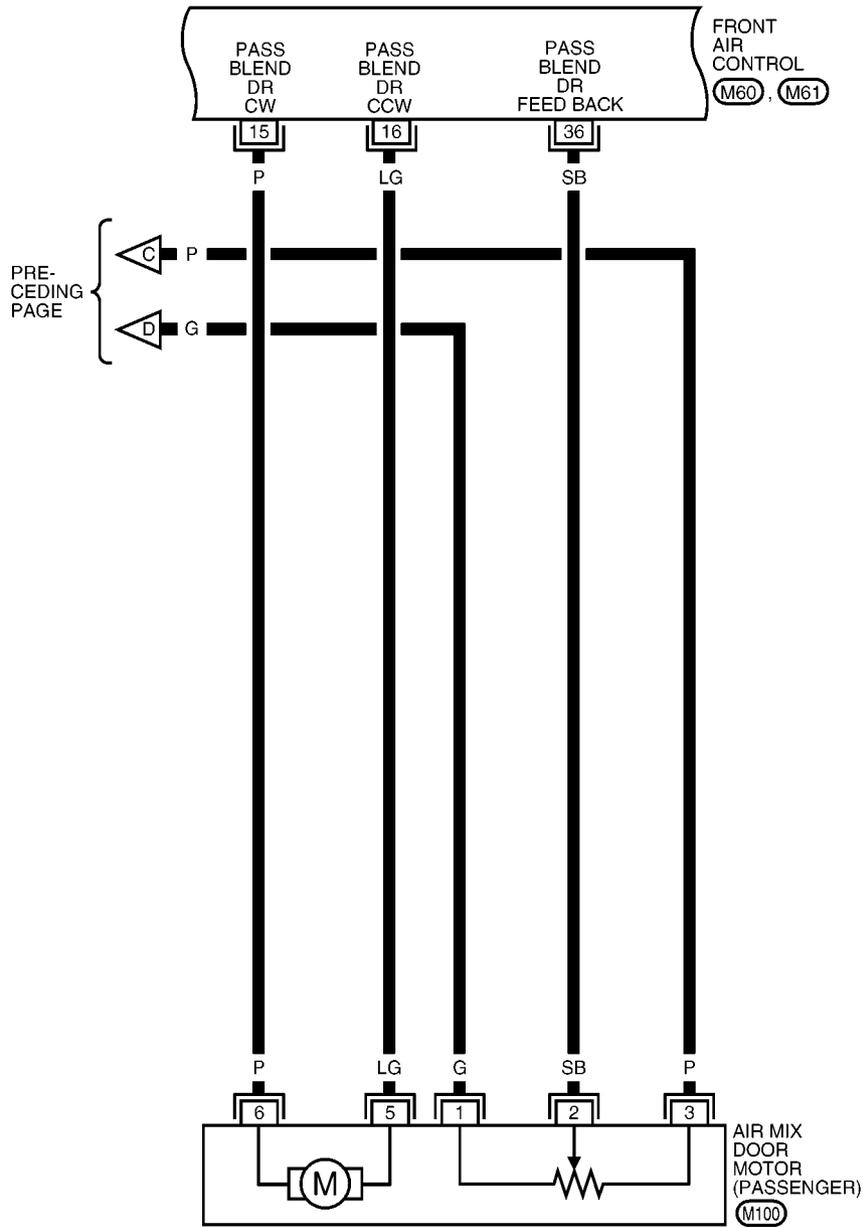


REFER TO THE FOLLOWING.  
 (M87), (M88) - FUSE BLOCK -  
 JUNCTION BOX (J/B)

MJWA0177E

# TROUBLE DIAGNOSIS

ATC-A/C,A-02

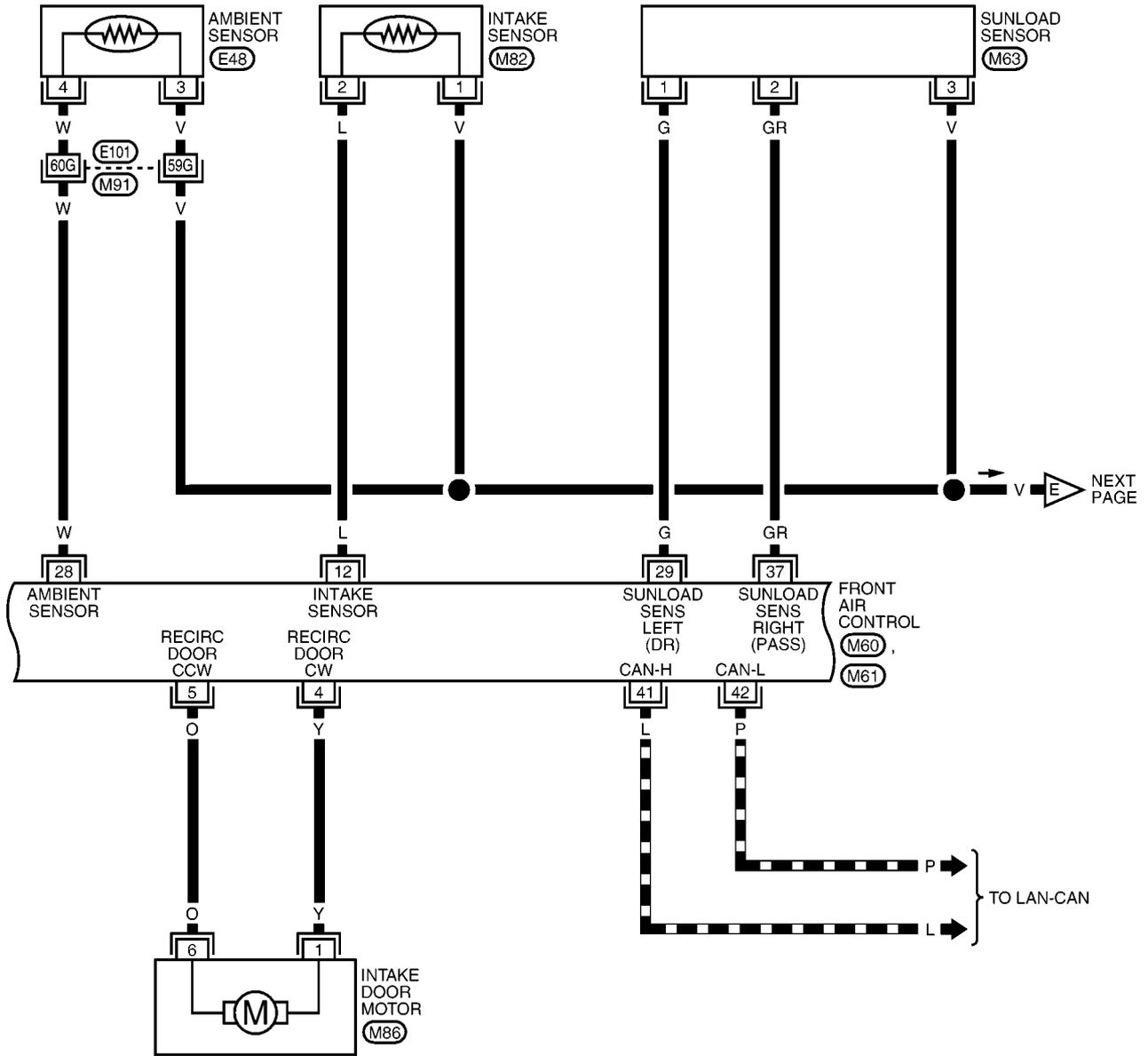


MJWA0178E

# TROUBLE DIAGNOSIS

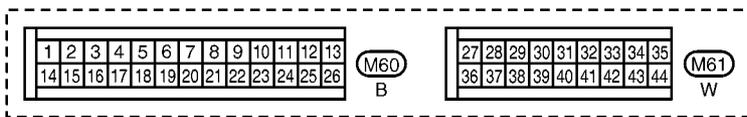
ATC-A/C,A-03

▬ : DATA LINE



A  
B  
C  
D  
E  
F  
G  
H  
I  
K  
L  
M

ATC

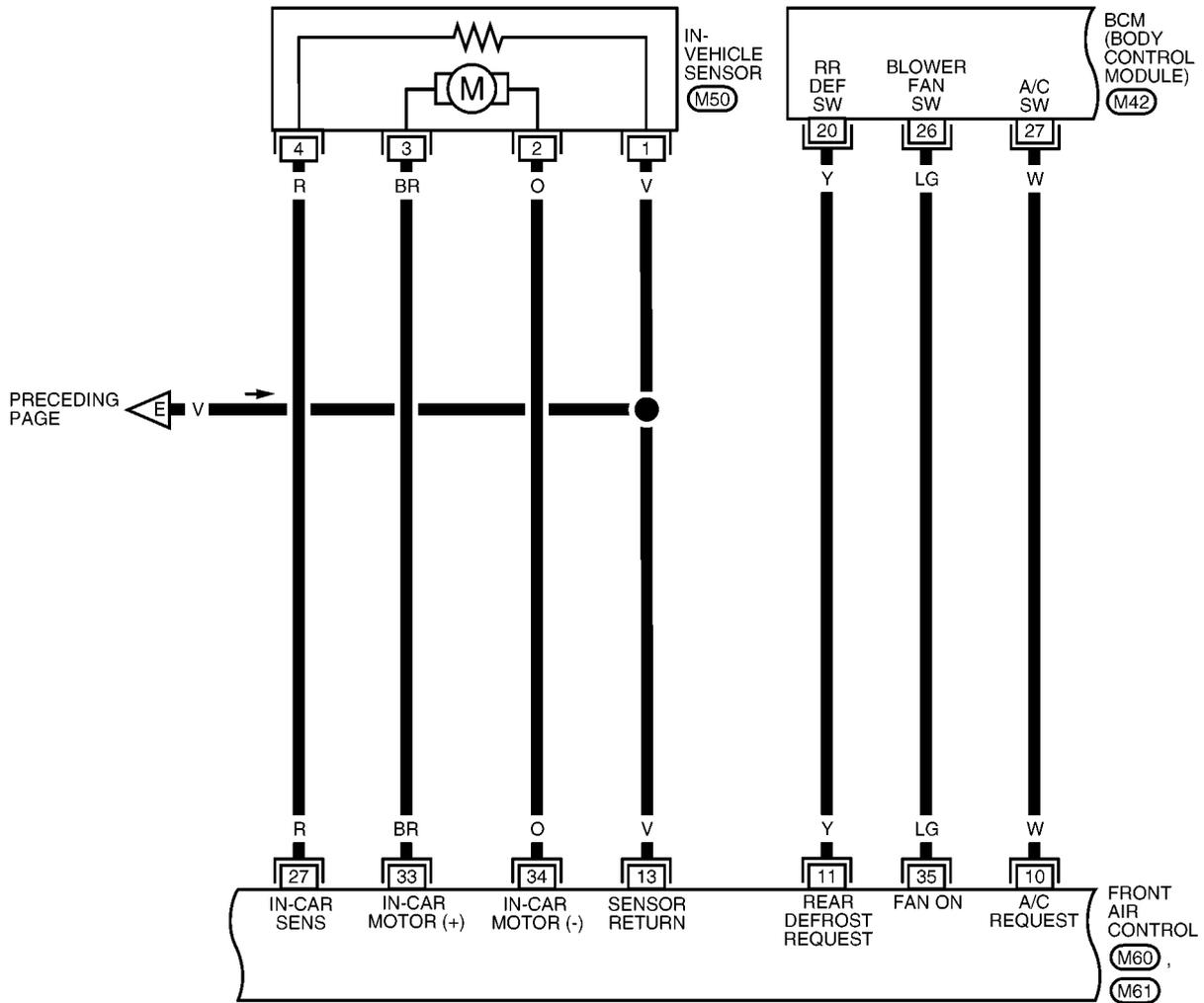


REFER TO THE FOLLOWING.  
 (M91) - SUPER MULTIPLE JUNCTION (SMJ)

MJWA0179E

# TROUBLE DIAGNOSIS

ATC-A/C,A-04



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

M42  
B



1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

M60  
B

27	28	29	30	31	32	33	34	35
36	37	38	39	40	41	42	43	44

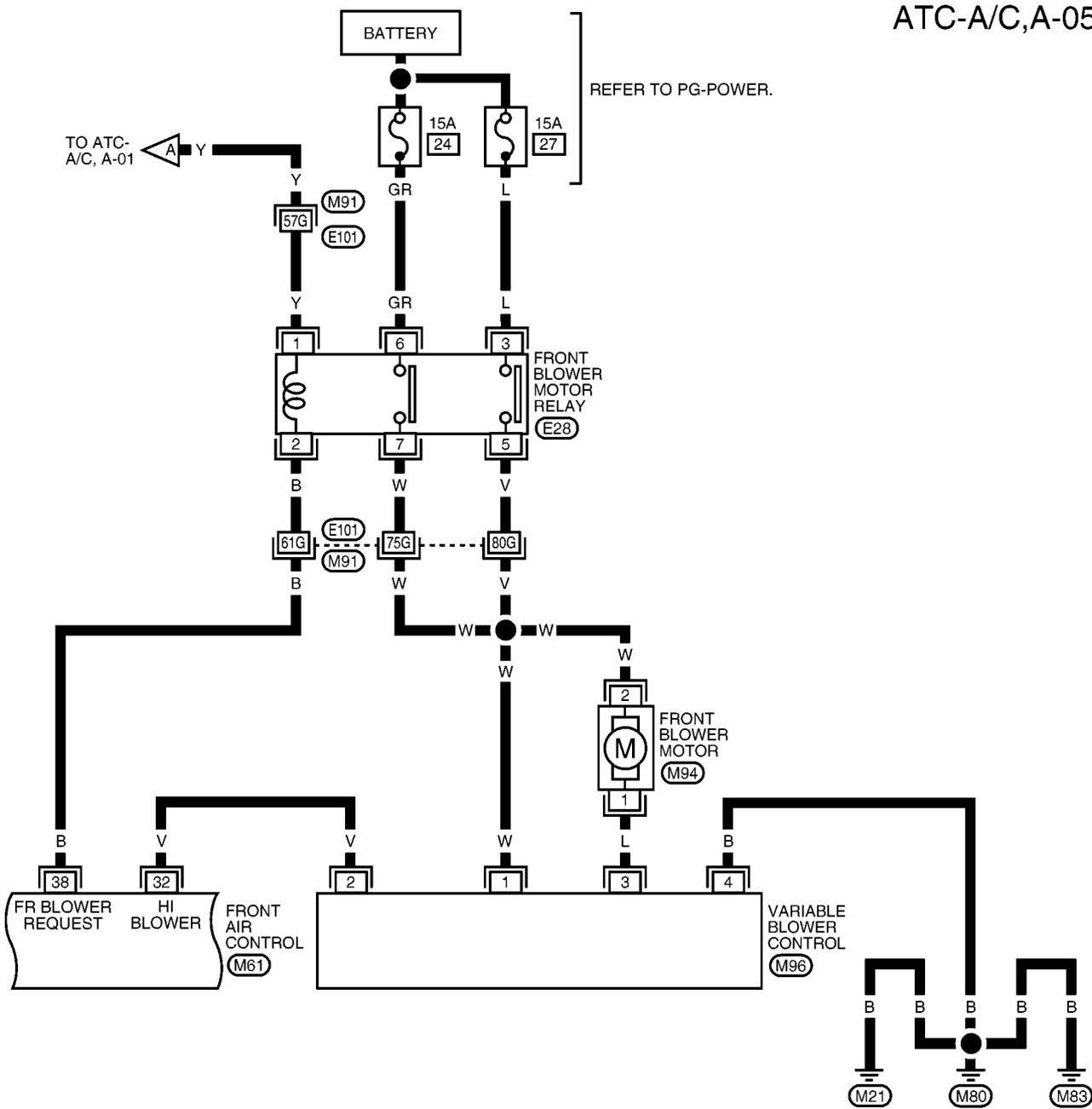
M61  
W

MJWA0180E

# TROUBLE DIAGNOSIS

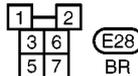
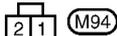
ATC-A/C,A-05

A  
B  
C  
D  
E  
F  
G  
H  
I  
K  
L  
M



27	28	29	30	31	32	33	34	35
36	37	38	39	40	41	42	43	44

M61  
W

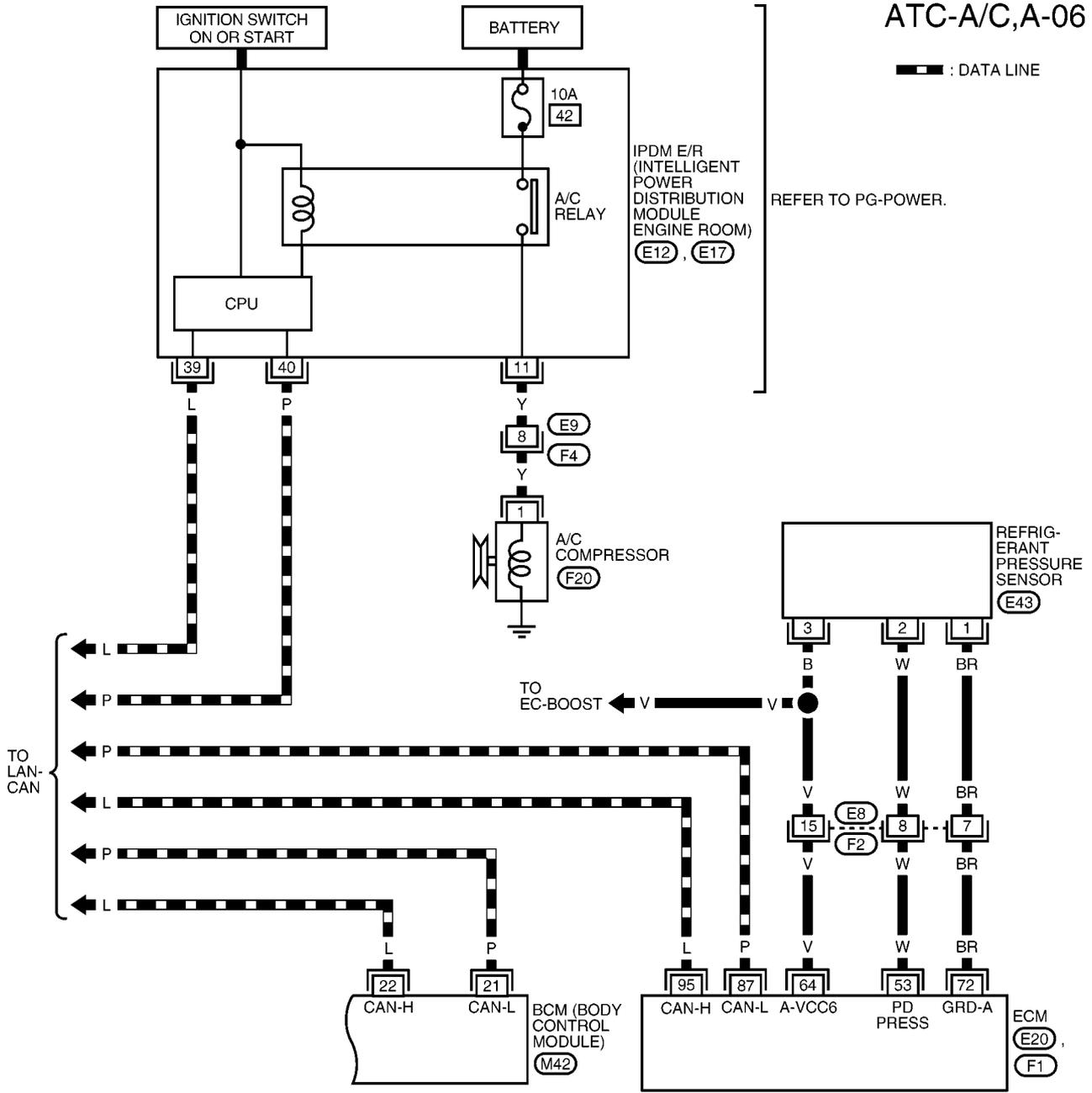


REFER TO THE FOLLOWING.  
 (M91) - SUPER MULTIPLE  
 JUNCTION (SMJ)

# TROUBLE DIAGNOSIS

ATC-A/C,A-06

— : DATA LINE



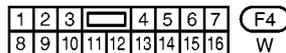
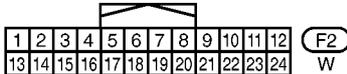
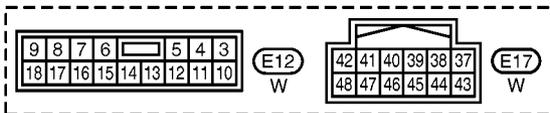
REFER TO PG-POWER.

TO LAN-CAN

REFER TO THE FOLLOWING.  
 (E20), (F1) - ELECTRICAL UNITS

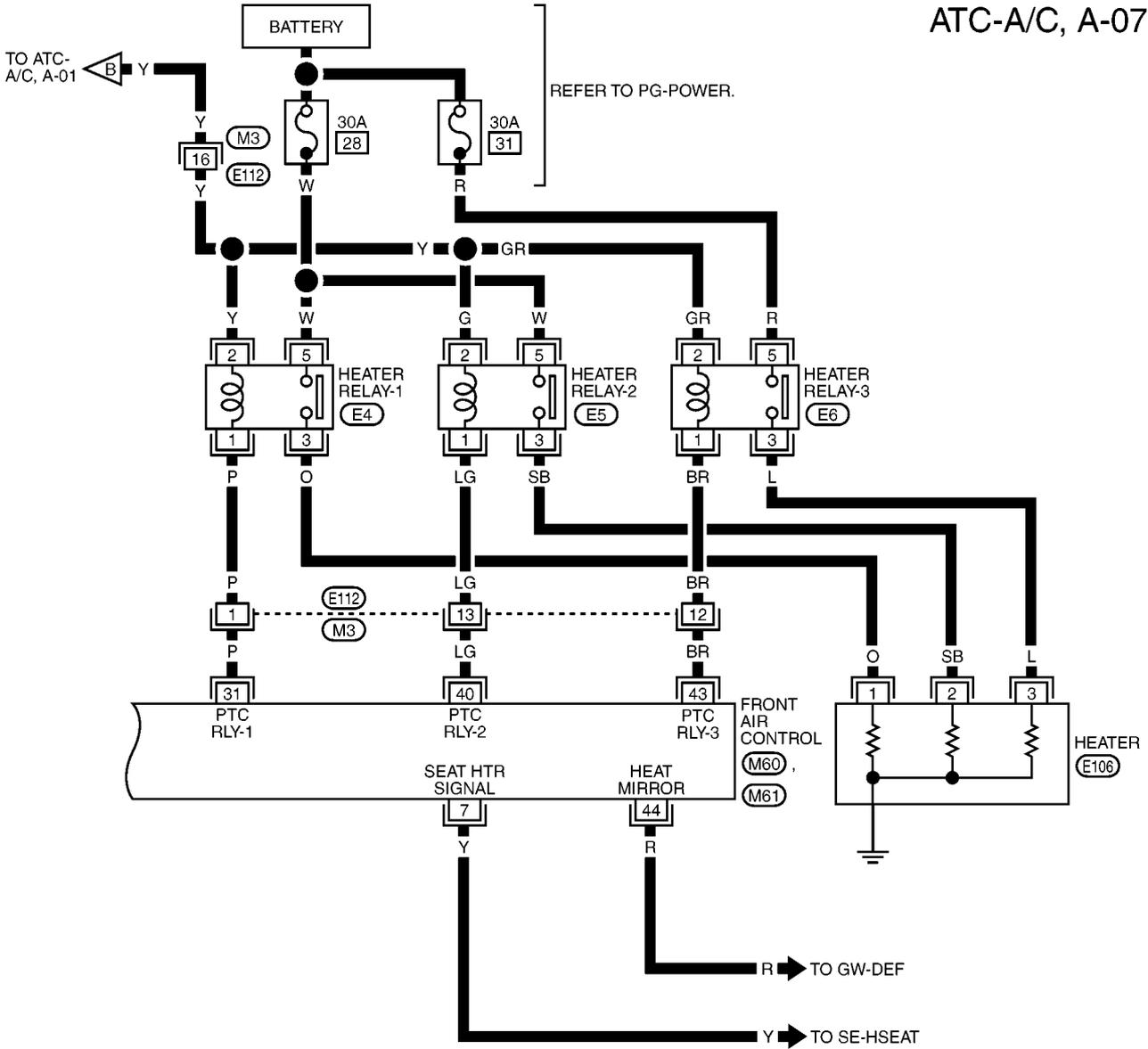
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

(M42)  
B



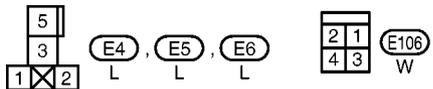
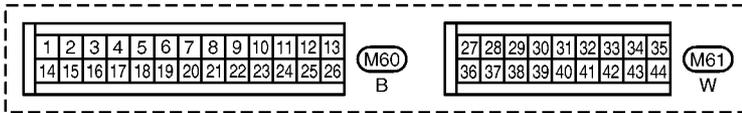
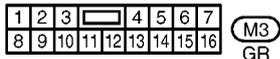
# TROUBLE DIAGNOSIS

ATC-A/C, A-07



A  
B  
C  
D  
E  
F  
G  
H  
I  
K  
L  
M

ATC

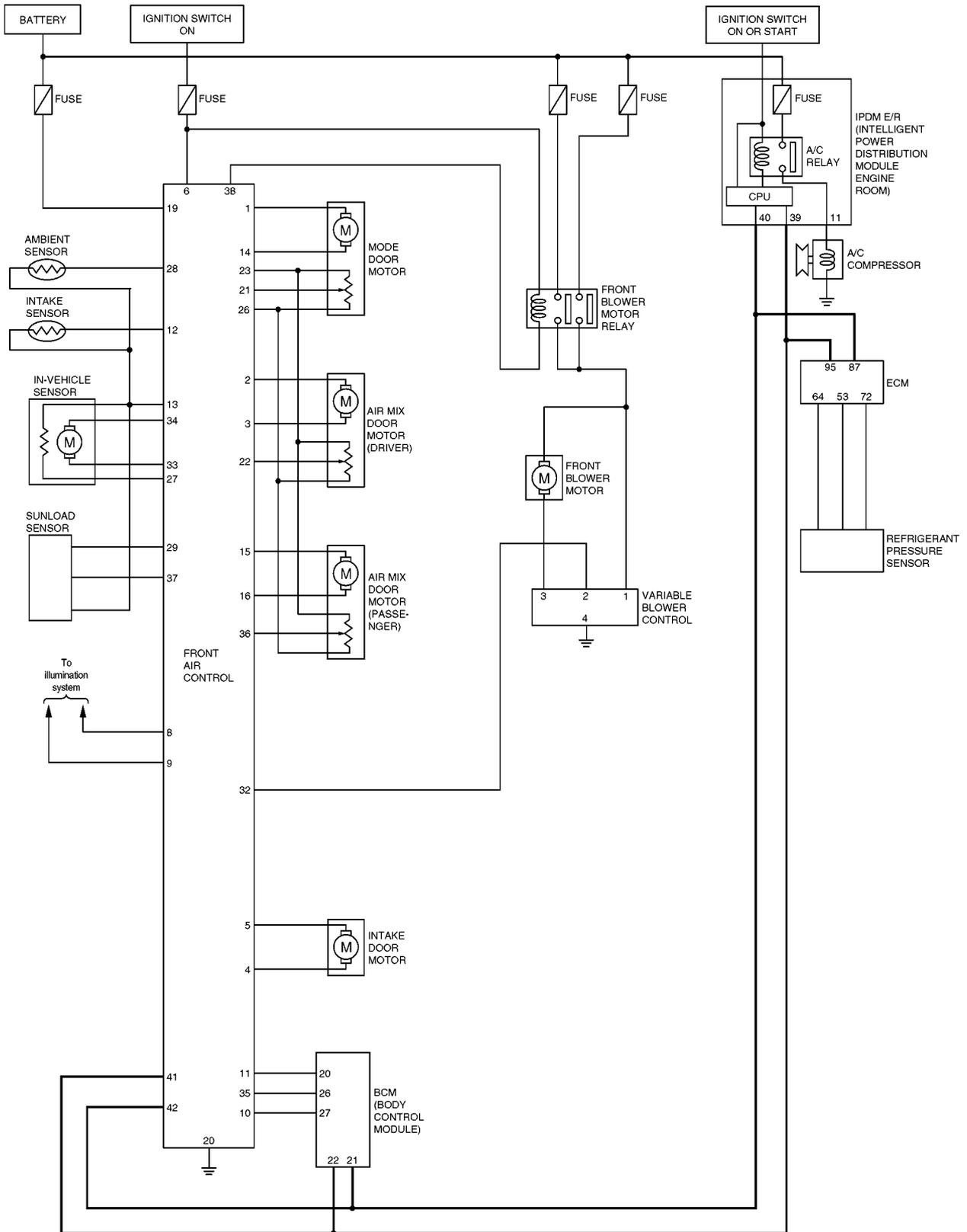


MJWA0183E

# TROUBLE DIAGNOSIS

## Schematic —RHD MODELS—

EJS006BD



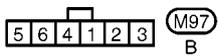
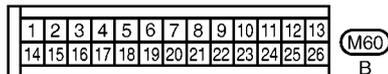
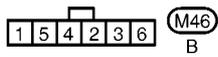
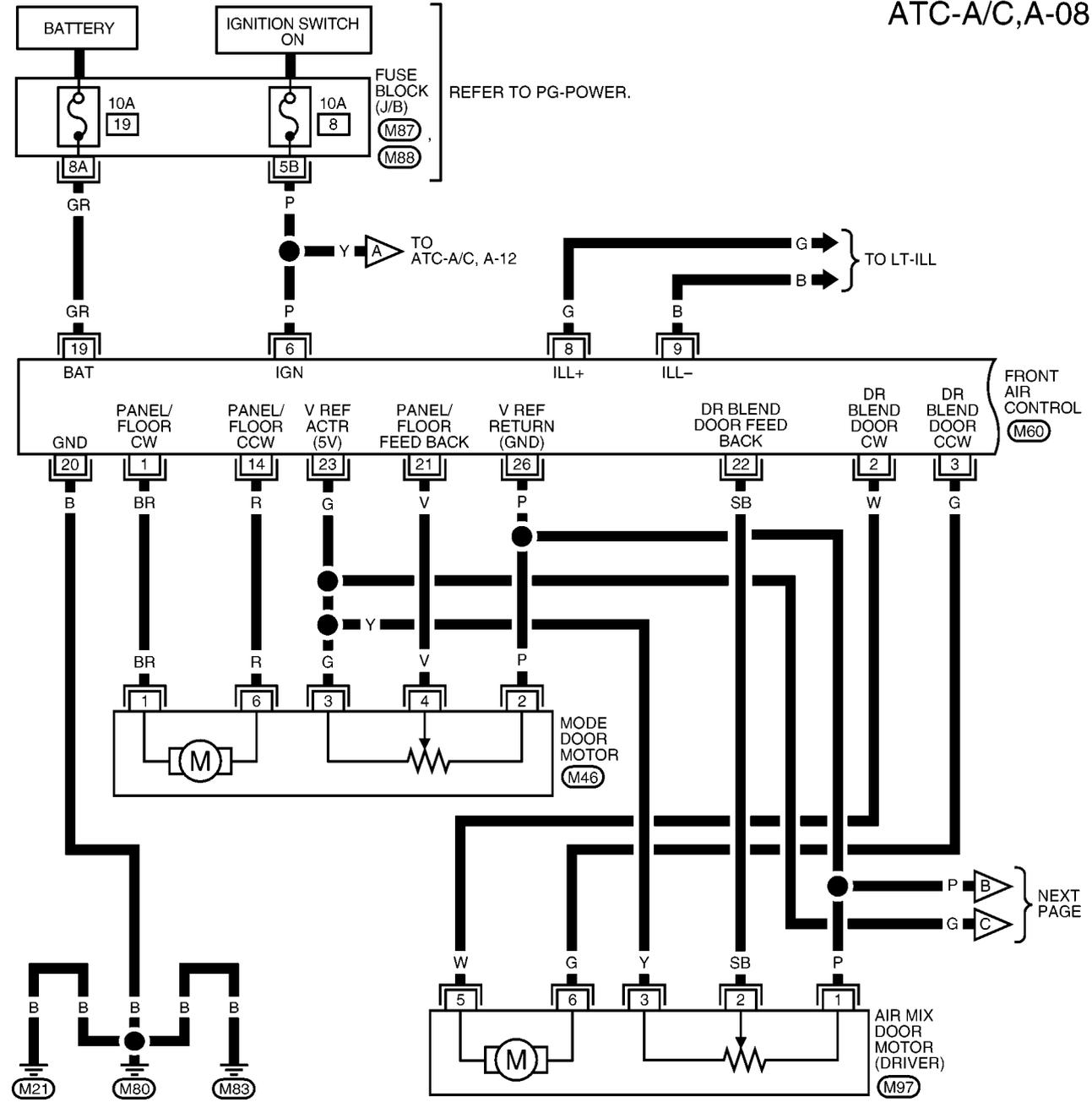
MJWA0184E

# TROUBLE DIAGNOSIS

## Wiring Diagram —A/C— —RHD MODELS—

EJS006BE

ATC-A/C,A-08



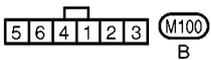
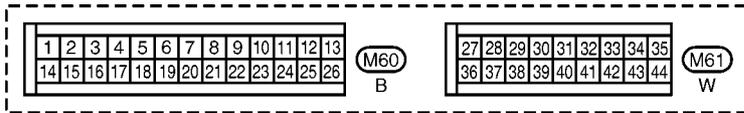
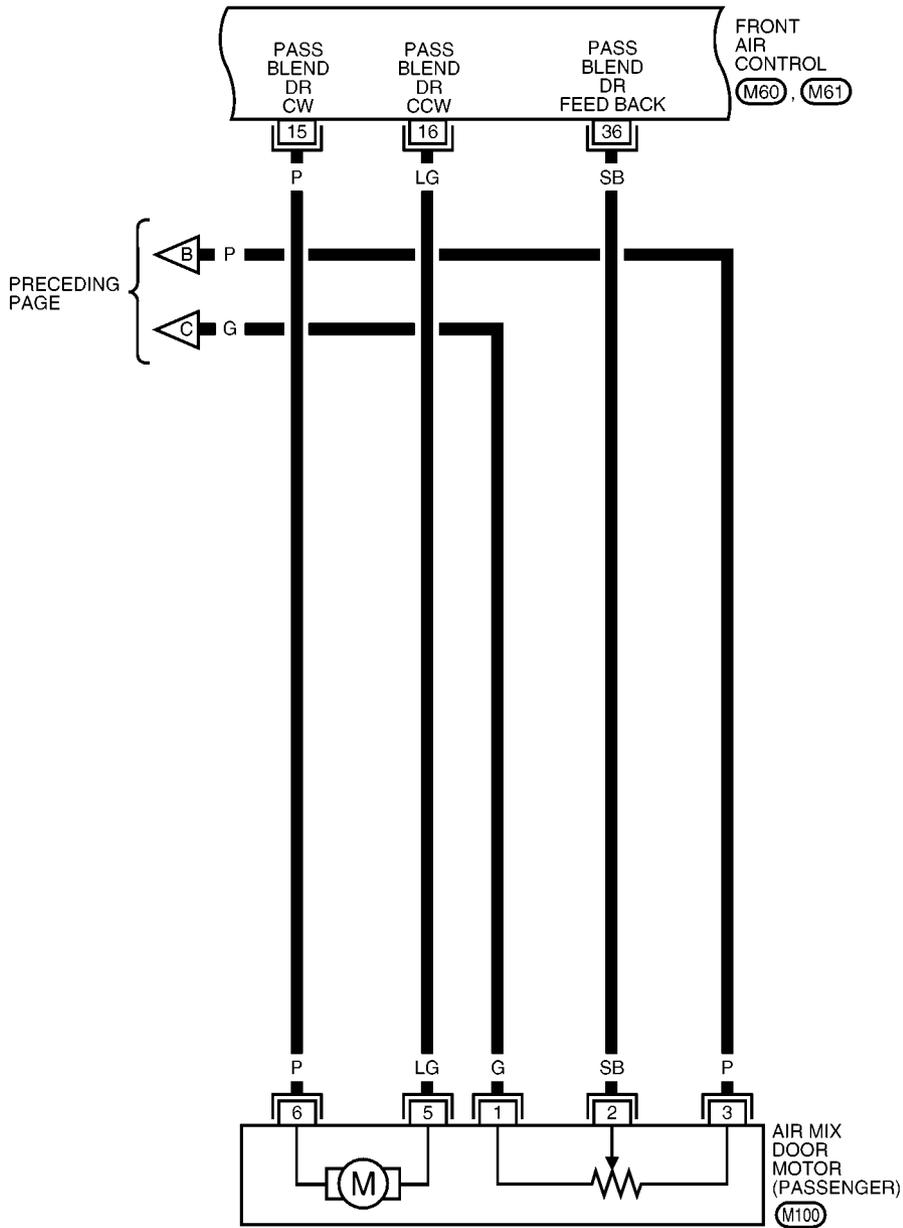
REFER TO THE FOLLOWING.  
 (M87), (M88) - FUSE BLOCK -  
 JUNCTION BOX (J/B)

A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

ATC

# TROUBLE DIAGNOSIS

ATC-A/C,A-09

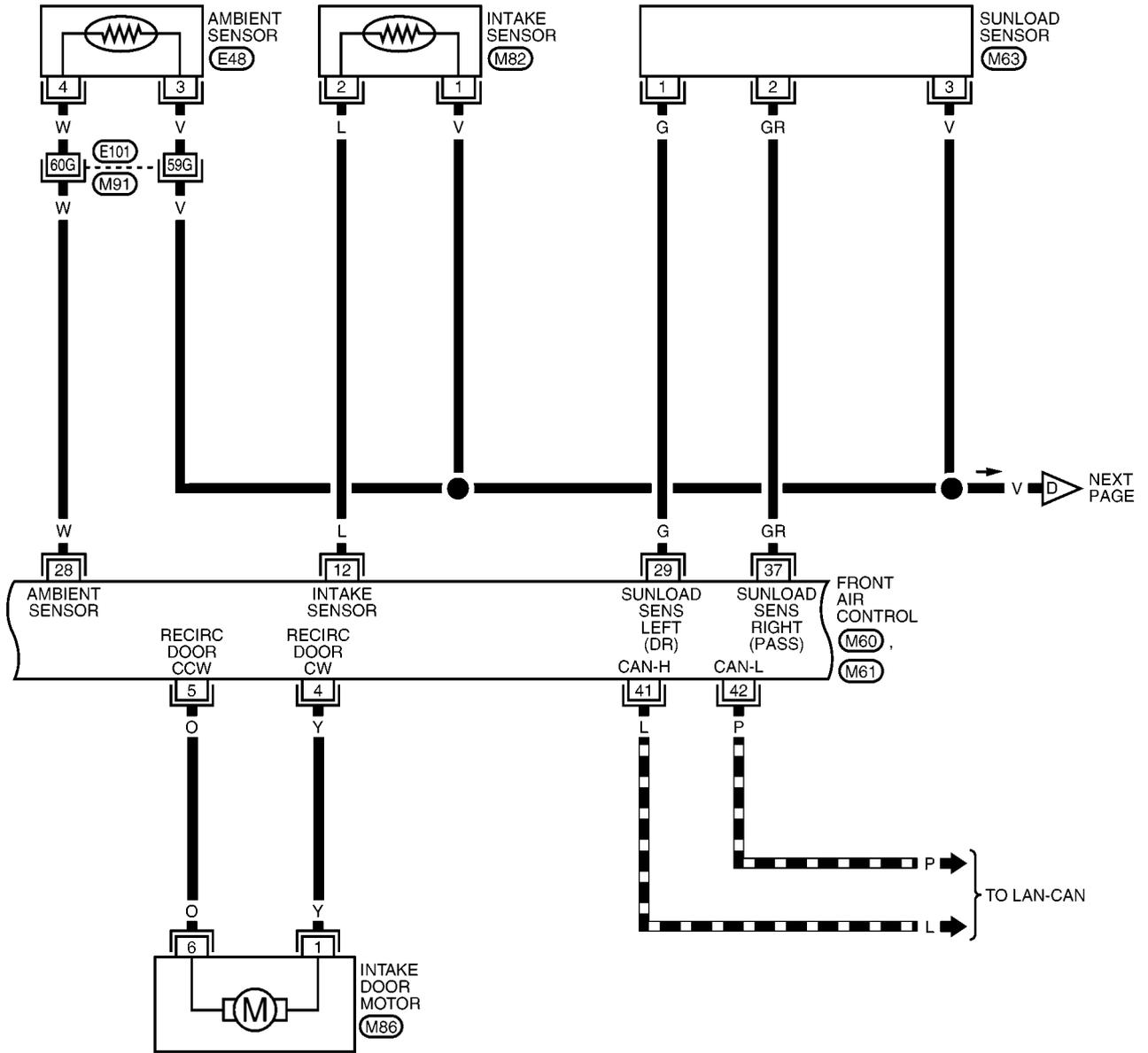


MJWA0186E

# TROUBLE DIAGNOSIS

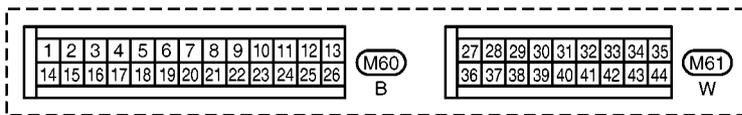
## ATC-A/C,A-10

▬ : DATA LINE



A  
B  
C  
D  
E  
F  
G  
H  
I  
J  
K  
L  
M

ATC

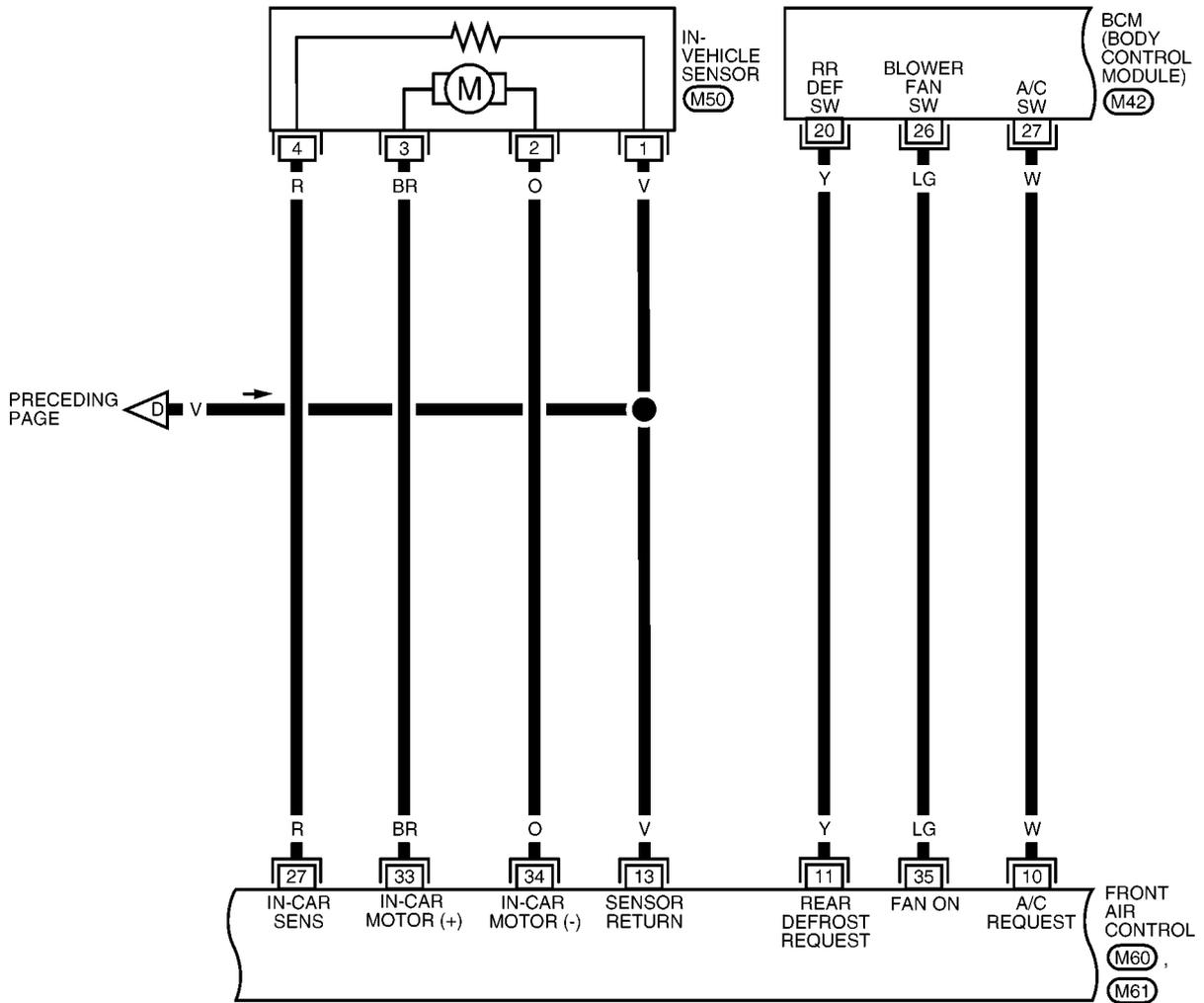


REFER TO THE FOLLOWING.

(M91) - SUPER MULTIPLE JUNCTION (SMJ)

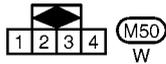
# TROUBLE DIAGNOSIS

ATC-A/C,A-11



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

M42  
B



1	2	3	4	5	6	7	8	9	10	11	12	13
14	15	16	17	18	19	20	21	22	23	24	25	26

M60  
B

27	28	29	30	31	32	33	34	35
36	37	38	39	40	41	42	43	44

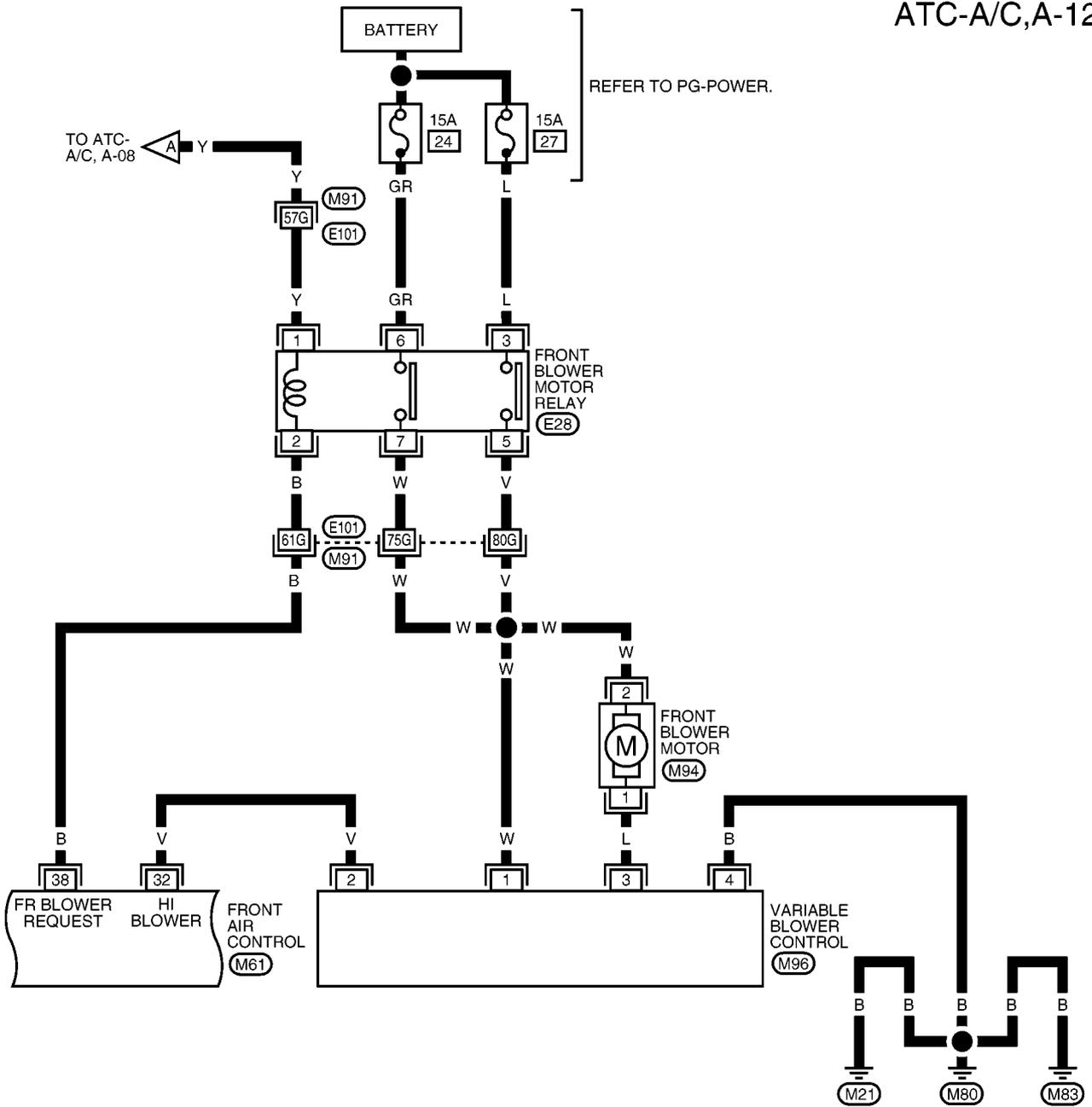
M61  
W

MJWA0188E

# TROUBLE DIAGNOSIS

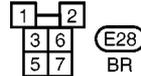
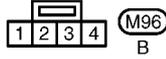
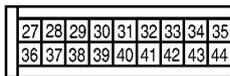
ATC-A/C,A-12

A  
B  
C  
D  
E  
F  
G  
H  
I  
K  
L  
M



REFER TO PG-POWER.

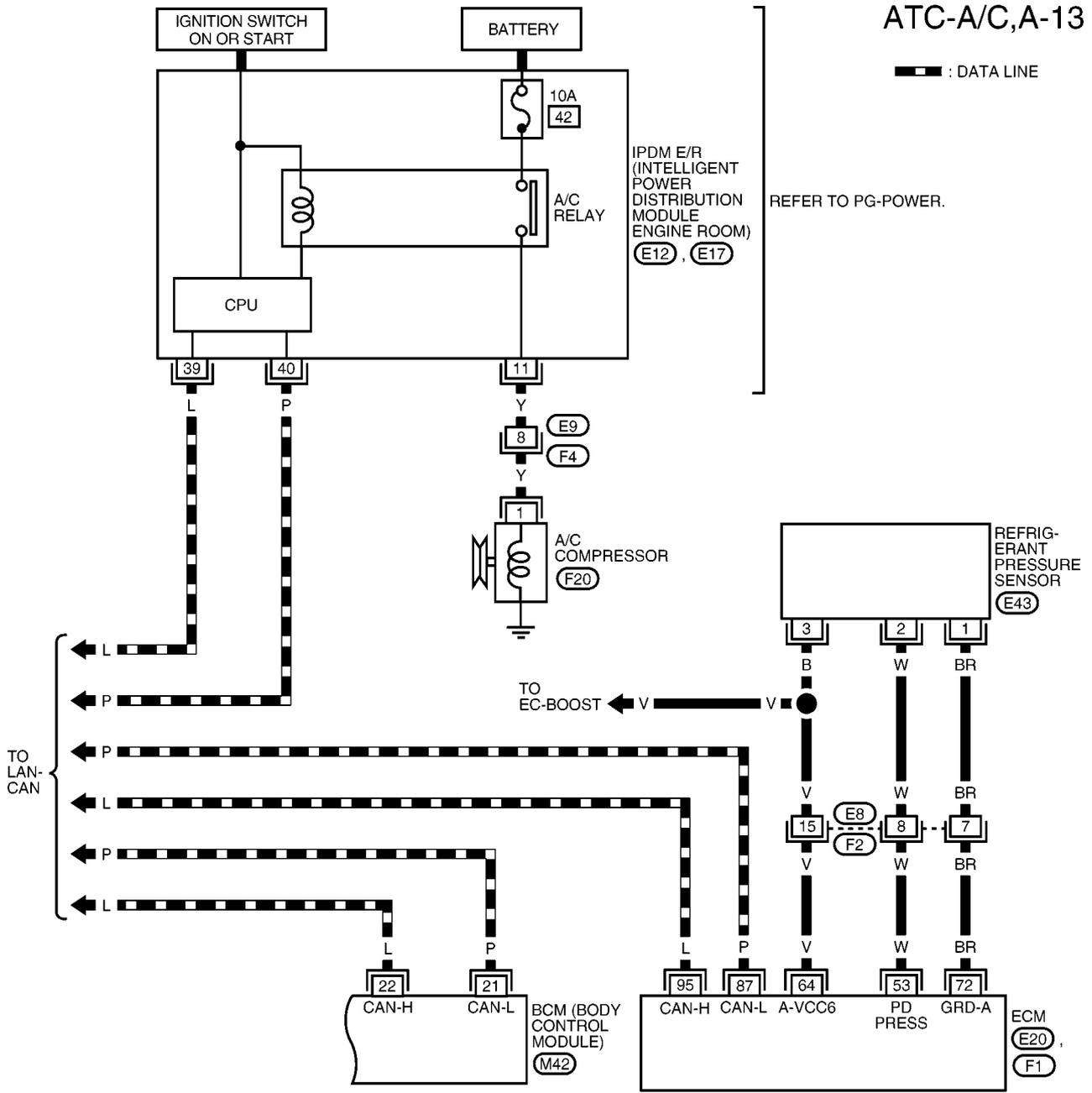
REFER TO THE FOLLOWING.  
 (M91) - SUPER MULTIPLE JUNCTION (SMJ)



# TROUBLE DIAGNOSIS

ATC-A/C,A-13

— : DATA LINE



REFER TO PG-POWER.

REFRIG-  
ERANT  
PRESSURE  
SENSOR  
(E43)

TO EC-BOOST ← V

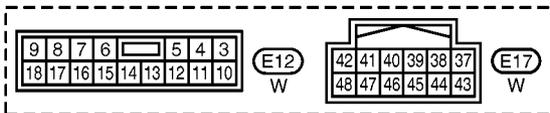
TO LAN-  
CAN

CAN-H CAN-L BCM (BODY CONTROL MODULE) (M42)

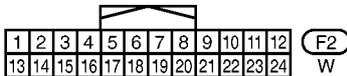
CAN-H CAN-L A-VCC6 PD PRESS GRD-A ECM (E20, F1)

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40

(M42)  
B



(E43)  
B



(F20)  
B

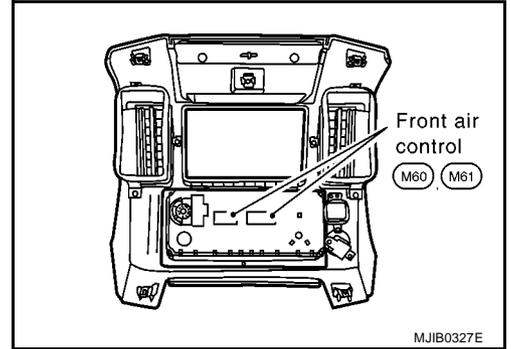
REFER TO THE FOLLOWING.  
(E20), (F1) - ELECTRICAL  
UNITS

# TROUBLE DIAGNOSIS

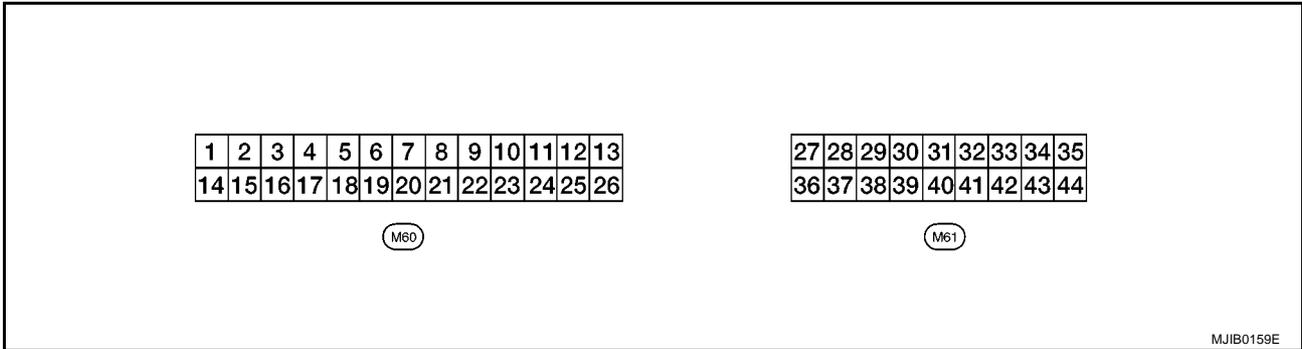
## Front Air Control Terminals and Reference Value

EJS006BF

Measure voltage between each terminal and ground by following Terminals and Reference Value for front air control.



## PIN CONNECTOR TERMINAL LAYOUT



## TERMINALS AND REFERENCE VALUE FOR FRONT AIR CONTROL

Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
1	BR	Mode door motor CW	ON	Clockwise rotation	Battery voltage
2	W	Air mix door motor (Driver) CW	ON	Clockwise rotation	Battery voltage
3	G	Air mix door motor (Driver) CCW	ON	Counterclockwise rotation	Battery voltage
4	Y	Intake door motor CW	ON	Counterclockwise rotation	Battery voltage
5	O	Intake door motor CCW	ON	Clockwise rotation	Battery voltage
6	P	Power supply for IGN	ON	-	Battery voltage
7	Y	Seat heater (LHD models)	ON	Seat heater ON	Battery voltage
				Seat heater OFF	0V
8	G	Illumination +	ON	Park lamps ON	Battery voltage
9	B	Illumination -	-	Park lamps ON	<p>(V) 15 10 5 0 200 ms</p>
10	W	Compressor ON signal	ON	A/C switch OFF	5V
			ON	A/C switch ON	0V
11	Y	Rear defrost request	ON	-	Battery voltage
12	L	Intake sensor	ON	-	0 - 5V
13	V	Sensor ground	ON	-	0 - 5V
14	R	Mode door motor CCW	ON	Counterclockwise rotation	Battery voltage
15	P	Air mix door motor (Passenger) CW	ON	Clockwise rotation	Battery voltage
16	LG	Air mix door motor (Passenger) CCW	ON	Counter clockwise rotation	Battery voltage

## TROUBLE DIAGNOSIS

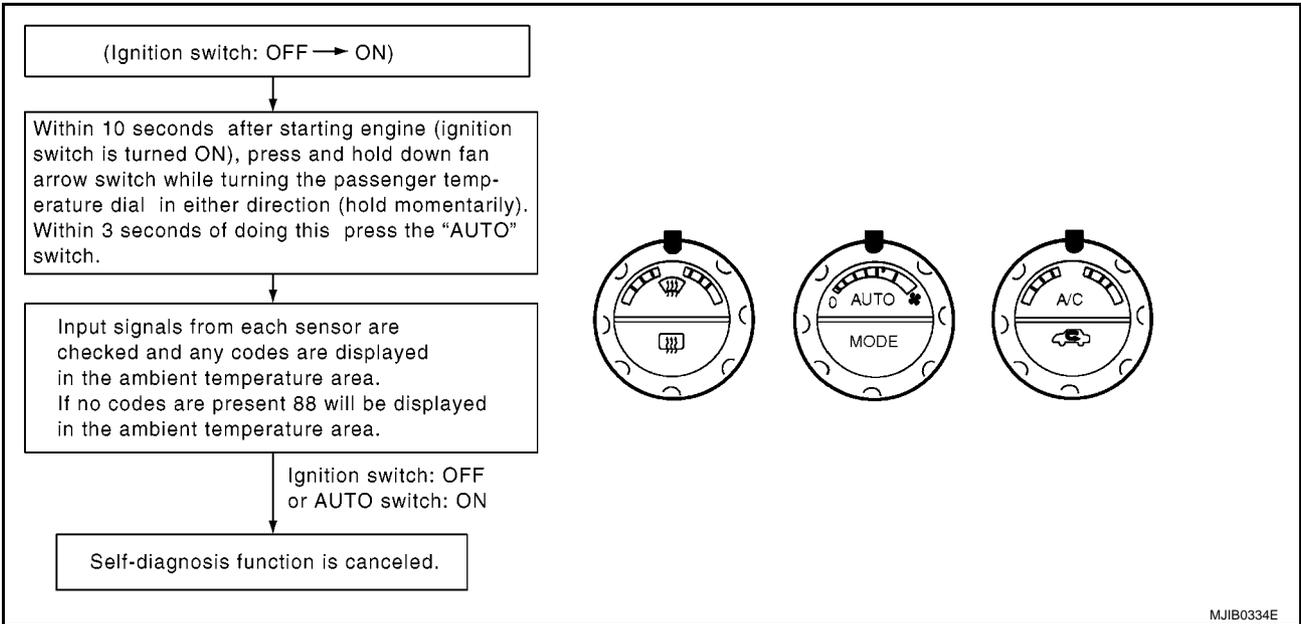
Terminal No.	Wire color	Item	Ignition switch	Condition	Voltage (V) (Approx.)
19	GR	Power supply for BAT	-	-	Battery voltage
20	B	Ground	-	-	0V
21	V	Mode door motor feedback	ON	-	0 - 5V
22	SB	Air mix door motor (Driver) feedback	ON	-	0 - 5V
23	G	Sensor power	ON	-	5V
26	P	Sensor return	ON	-	0V
27	R	In-vehicle sensor signal	ON	-	0 - 5V
28	W	Ambient sensor	ON	-	0 - 5V
29	G	Optical sensor (Driver)	ON	-	0 - 5V
31	P	PTC heater relay 1 (LHD models)	ON	Relay ON	Battery voltage
				Relay OFF	0V
32	V	Variable blower control	ON	-	0 - 5V
33	BR	In-vehicle sensor motor (+)	ON	-	Battery voltage
34	O	In-vehicle sensor motor (-)	ON	-	0V
35	LG	Fan ON signal	ON	Blower switch OFF	5V
			ON	Blower switch ON	0V
36	SB	Air mix door motor (Passenger) feedback	ON	-	0 - 5V
37	GR	Optical sensor (Passenger)	ON	-	0 - 5V
38	B	Blower request	ON	Blower motor OFF	Battery voltage
				Blower motor ON	0V
40	LG	PTC heater relay 2 (LHD models)	ON	Relay ON	Battery voltage
				Relay OFF	0V
41	L	CAN-H	ON	-	0 - 5V
42	P	CAN-L	ON	-	0 - 5V
43	BR	PTC heater relay 3 (LHD models)	ON	Relay ON	Battery voltage
				Relay OFF	0V
44	R	Mirror heater (LHD models)	ON	Heater OFF	0V
				Heater ON	Battery voltage

# TROUBLE DIAGNOSIS

EJS006BG

## A/C System Self-diagnosis Function DESCRIPTION

The self-diagnostic system diagnoses sensors, door motors, blower motor, etc. Refer to applicable sections (items) for details. Shifting from usual control to the self-diagnostic system is accomplished by turning the ignition switch ON and pressing the down blower arrow switch while turning the passenger temperature dial in either direction (hold momentarily). Within 3 seconds of doing this, press the AUTO switch. The blower bars will flash and the ambient temperature display will indicate 0° during the self-diagnosis. Fault codes (if any are present) will be displayed in the ambient temperature display area. Refer to [ATC-56. "SELF-DIAGNOSIS CODE CHART"](#).



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# TROUBLE DIAGNOSIS

## SELF-DIAGNOSIS CODE CHART

Code No.	Reference page	
02	EE changed by calibration	<a href="#">ATC-116, "REMOVAL"</a>
12	Air mix door motor (Driver) circuit malfunction	<a href="#">ATC-73, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (PASSENGER)"</a>
20	BCM not responding to A/C request	<a href="#">ATC-88, "DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH"</a>
21	BCM not responding to rear defroster request	<a href="#">GW-47, "REAR WINDOW DEFOGGER"</a>
22	Air mix door motor (Passenger) circuit malfunction	<a href="#">ATC-71, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (DRIVER)"</a>
30	In-vehicle sensor circuit out of range (low)	<a href="#">ATC-108, "In-vehicle Sensor Circuit"</a>
31	In-vehicle sensor circuit out of range (high)	
40	Ambient sensor 1 circuit short	<a href="#">ATC-105, "Ambient Sensor Circuit"</a>
41	Ambient sensor 1 circuit open	
50	Optical sensor (Driver) circuit open or short	<a href="#">ATC-112, "Optical Sensor Circuit"</a>
52	Optical sensor (Passenger) circuit open or short	
56	Intake sensor circuit short	<a href="#">ATC-114, "Intake Sensor Circuit"</a>
57	Intake sensor circuit open	
62	Defroster door motor circuit malfunction	
80	CAN bus fault	<a href="#">LAN-3, "Precautions When Using CONSULT-II"</a>
81	BCM CAN message missing	
82	Intake door motor (driver) circuit malfunction	<a href="#">ATC-79, "DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR"</a>
90	Stuck button	<a href="#">ATC-116, "REMOVAL"</a>
92	Mode door motor circuit malfunction	<a href="#">ATC-63, "Mode Door Motor Circuit"</a>

# TROUBLE DIAGNOSIS

EJS006BH

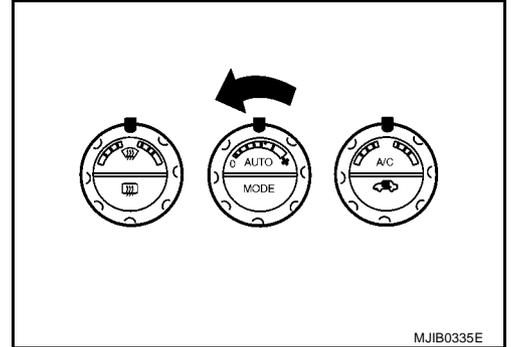
## Operational Check

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

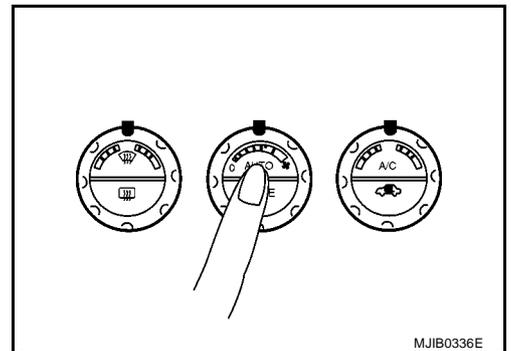
**Conditions** : Engine running and at normal operating temperature

### CHECKING MEMORY FUNCTION

1. Set the temperature to 32°C (90°F).
2. Turn blower control dial counterclockwise until system shuts OFF.
3. Turn ignition switch OFF.
4. Turn ignition switch ON.



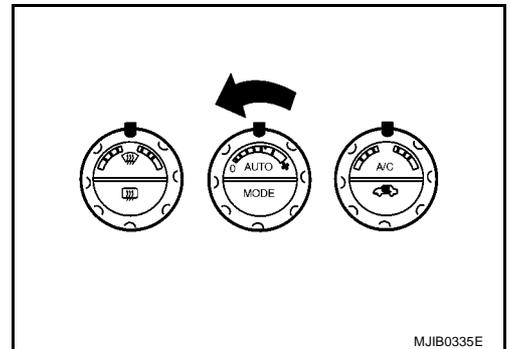
5. Press the AUTO switch.
6. Confirm that the set temperature remains at previous temperature.



7. Turn blower control dial counterclockwise until system shuts OFF.

If NG, go to trouble diagnosis procedure for [ATC-104, "Memory Function"](#).

If OK, continue with next check.

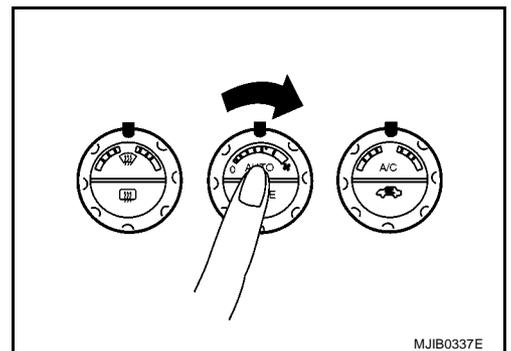


### CHECKING BLOWER

1. Press the AUTO switch. Blower should operate on low speed. The blower symbol should have one blade lit (on display).
2. Turn the blower control dial again, and continue checking blower speed and blower symbol until all speeds are checked.
3. Leave blower on MAX speed.

If NG, go to trouble diagnosis procedure for [ATC-82, "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR"](#).

If OK, continue with next check.

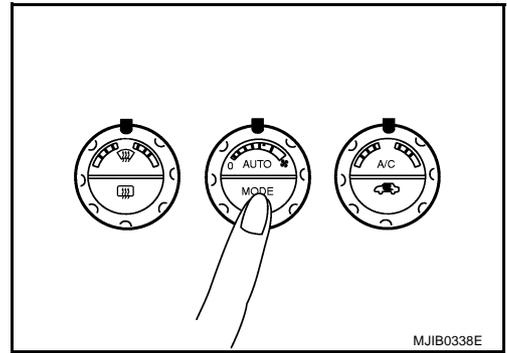


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# TROUBLE DIAGNOSIS

## CHECKING DISCHARGE AIR

1. Press MODE switch four times and the DEF switch.
2. Each position indicator should change shape (on display).



3. Confirm that discharge air comes out according to the air distribution table. Refer to [ATC-30, "Discharge Air Flow"](#).

Mode door position is checked in the next step.

If NG, go to trouble diagnosis procedure for [ATC-63, "Mode Door Motor Circuit"](#).

If OK, continue the check.

### NOTE:

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

**Discharge air flow**

Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	60%	40%	–
	18%	64%	18%
	14%	53%	33%
	–	13%	83%

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## CHECKING RECIRCULATION

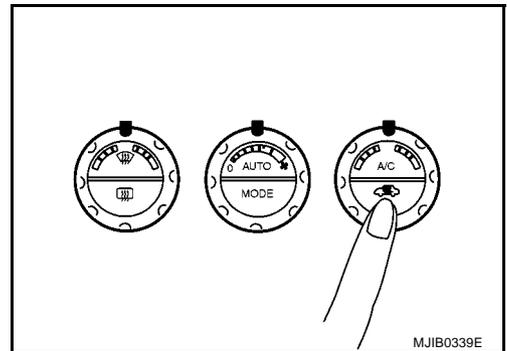
1. Press recirculation ( ) switch one time. Recirculation indicator should illuminate.
2. Press recirculation ( ) switch one more time. Recirculation indicator should go off.
3. Listen for intake door position change (blower sound should change slightly).

If NG, go to trouble diagnosis procedure for [ATC-77, "Intake Door Motor Circuit"](#).

If OK, continue next check.

### NOTE:

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



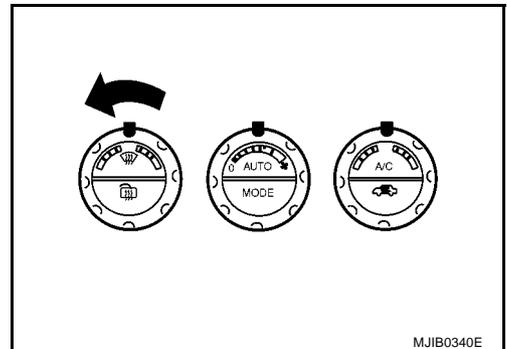
MJIB0339E

## CHECKING TEMPERATURE DECREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [ATC-93, "Insufficient Cooling"](#). If air mix door motor appears to be malfunctioning, go to [ATC-71, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR \(DRIVER\)"](#) or [ATC-73, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR \(PASSENGER\)"](#).

If OK, continue the check.



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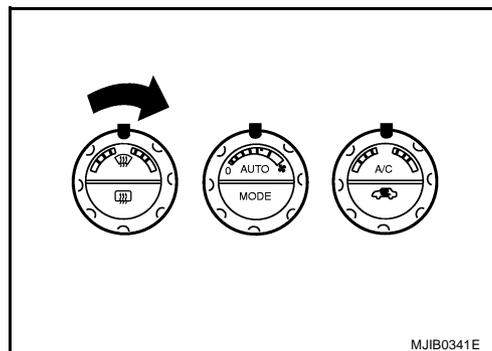
# TROUBLE DIAGNOSIS

## CHECKING TEMPERATURE INCREASE

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

If NG, listen for sound of air mix door motor operation. If OK, go to trouble diagnosis procedure for [ATC-100, "Insufficient Heating"](#) . If air mix door motor appears to be malfunctioning, go to [ATC-71, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR \(DRIVER\)"](#) .

If OK, continue with next check.

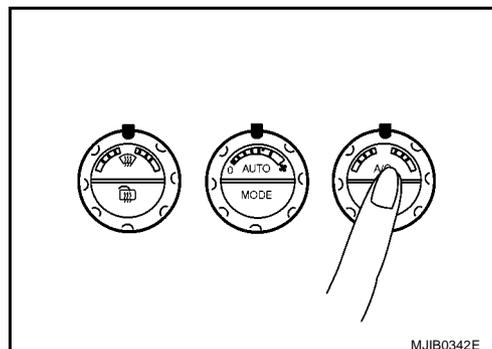


## CHECK A/C SWITCH

1. Press A/C switch when AUTO switch is ON, or in manual mode.
2. A/C switch indicator will turn ON.
  - Confirm that the compressor clutch engages (sound or visual inspection).

If NG, go to trouble diagnosis procedure for [ATC-87, "Magnet Clutch Circuit"](#) .

If OK, continue with next check.

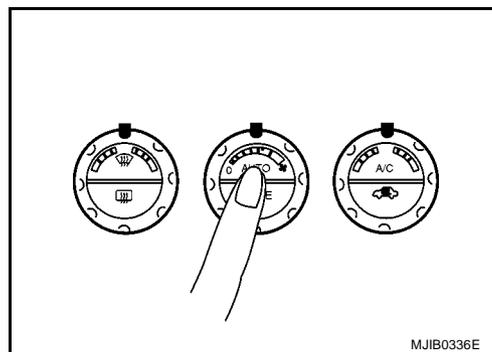


## CHECKING AUTO MODE

1. Press AUTO switch.
2. Display should indicate AUTO.
  - If ambient temperature is warm, and selected temperature is cool, confirm that the compressor clutch engages (sound or visual inspection). (Discharge air and blower speed will depend on ambient, in-vehicle, and set temperatures.)

If NG, go to trouble diagnosis procedure for [ATC-60, "Power Supply and Ground Circuit for Front Air Control"](#) , then if necessary, trouble diagnosis procedure for [ATC-87, "Magnet Clutch Circuit"](#) .

If all operational checks are OK (symptom cannot be duplicated), go to malfunction simulation tests in [ATC-35, "How to Perform Trouble Diagnosis for Quick and Accurate Repair"](#) and perform tests as outlined to simulate driving conditions environment. If symptom appears, refer to [ATC-35, "How to Perform Trouble Diagnosis for Quick and Accurate Repair"](#) , [ATC-35, "SYMPTOM TABLE"](#) and perform applicable trouble diagnosis procedures.



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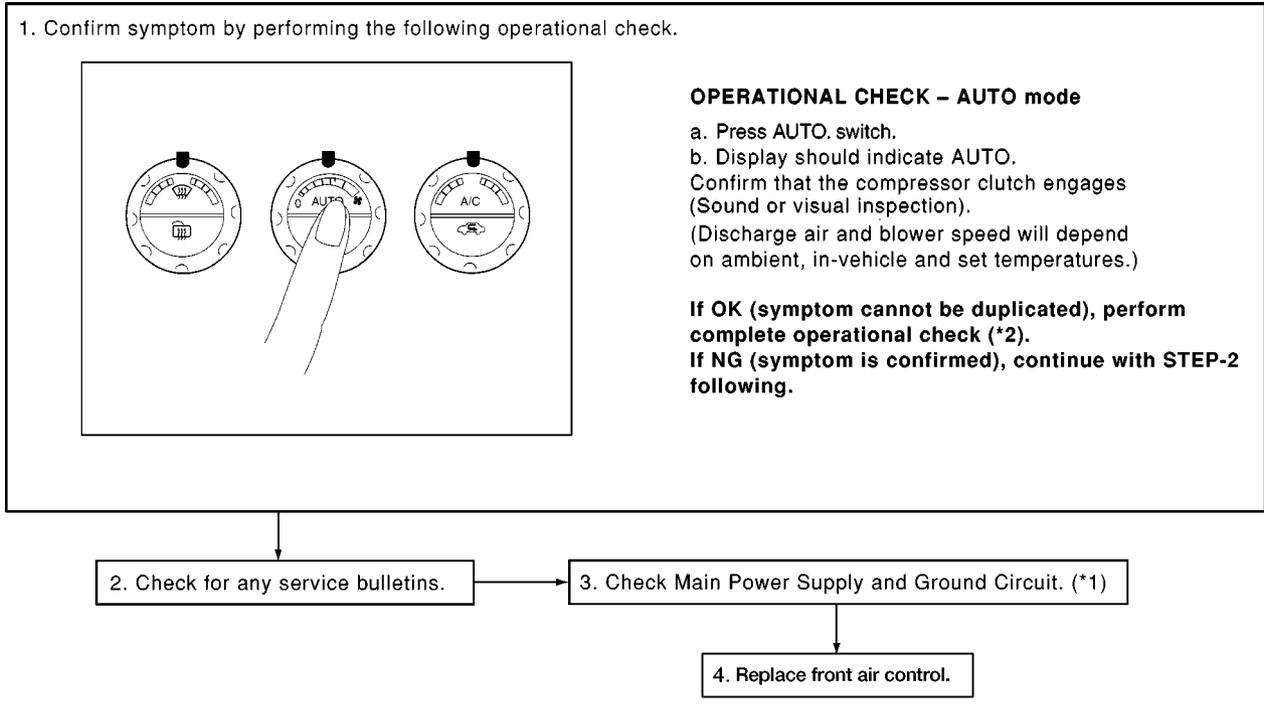
# TROUBLE DIAGNOSIS

## Power Supply and Ground Circuit for Front Air Control

EJS006BJ

SYMPTOM: A/C system does not come on.

### INSPECTION FLOW



\*1 [ATC-60, "Power Supply and Ground Circuit for Front Air Control"](#). \*2 [ATC-57, "Operational Check"](#).

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# TROUBLE DIAGNOSIS

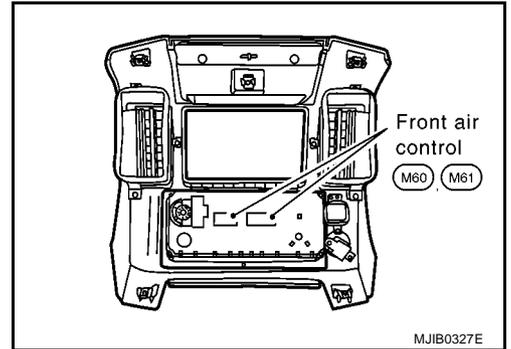
## COMPONENT DESCRIPTION

### Front Air Control

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

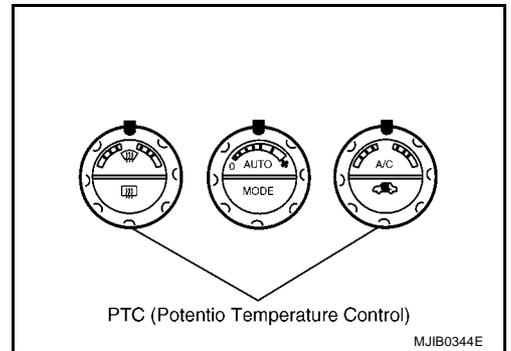
The front air control is unitized with control mechanisms. When the various switches and temperature dials are operated, data is input to the front air control.

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



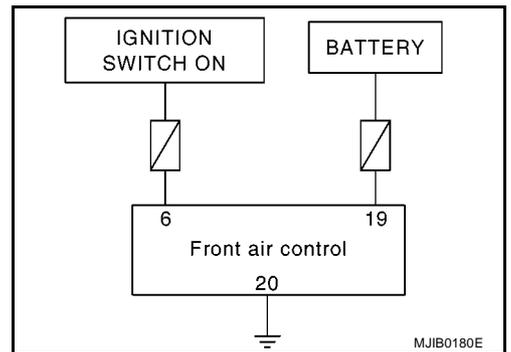
### Potential Temperature Control (PTC)

There are two PTCs (passenger and driver) built into the front air control. They 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 rotating the temperature dial. The set temperature is displayed.



## DIAGNOSTIC PROCEDURE FOR A/C SYSTEM

SYMPTOM: A/C system does not come on.



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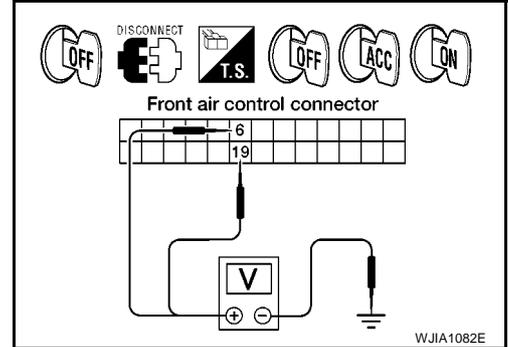
ATC

# TROUBLE DIAGNOSIS

## 1. CHECK POWER SUPPLY CIRCUITS FOR FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Turn ignition switch ON.
4. Check voltage between front air control harness connector M60 terminals 6 and 19, and ground.

Terminals		Ignition switch position			
(+)		(-)	OFF	ACC	ON
Front air control connector	Terminal No.				
M60	6	Ground	Approx. 0V	Approx. 0V	Battery voltage
M60	19		Battery voltage	Battery voltage	Battery voltage



### OK or NG

OK >> GO TO 2.

NG >> Check 10A fuses [Nos. 8 and 19, located in the fuse block (J/B)]. Refer to [PG-83](#).

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

## 2. CHECK GROUND CIRCUIT FOR FRONT AIR CONTROL

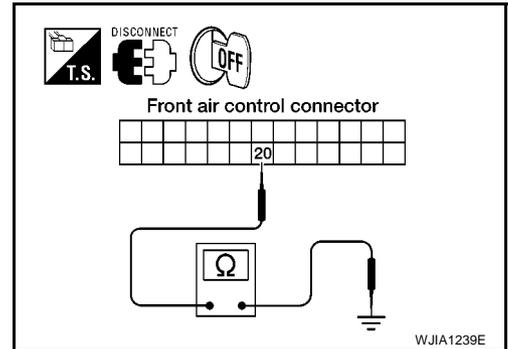
1. Turn ignition switch OFF.
2. Check continuity between front air control harness connector M60 terminal 20 and ground.

**20 - Ground : Continuity should exist.**

### OK or NG

OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)

NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

EJS006BK

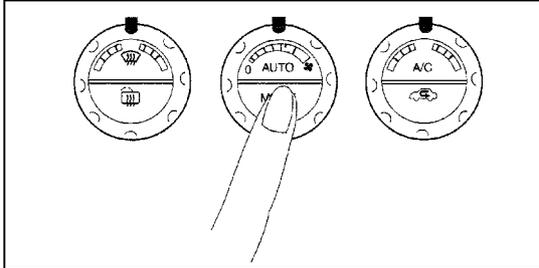
## Mode Door Motor Circuit

SYMPTOM:

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

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.



#### OPERATIONAL CHECK – Discharge air

- Press mode switch four times and DEF switch.
- Each position indicator should change shape. (on display)

#### Discharge air flow

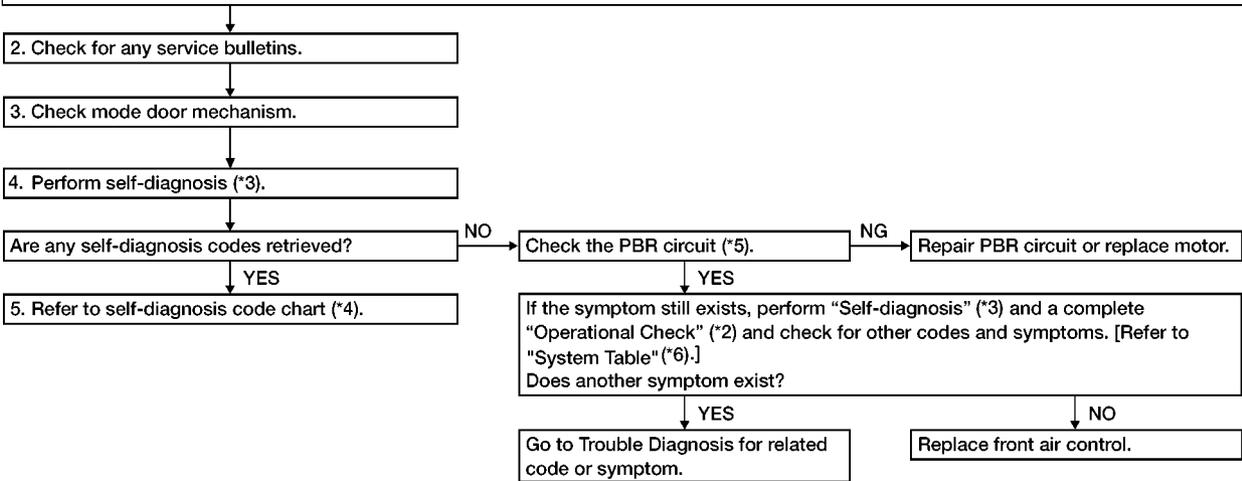
Mode door position	Air outlet/distribution		
	Vent	Foot	Defroster
	100%	–	–
	60%	40%	–
	18%	64%	18%
	14%	53%	33%
	–	13%	83%

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

Refer to "Discharge Air Flow" (\*1).

#### NOTE:

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



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\*1 [ATC-30, "Discharge Air Flow".](#)

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

\*3 [ATC-55, "A/C System Self-diagnosis Function".](#)

\*4 [ATC-56, "SELF-DIAGNOSIS CODE CHART".](#)

\*5 [ATC-65, "DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR".](#)

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# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

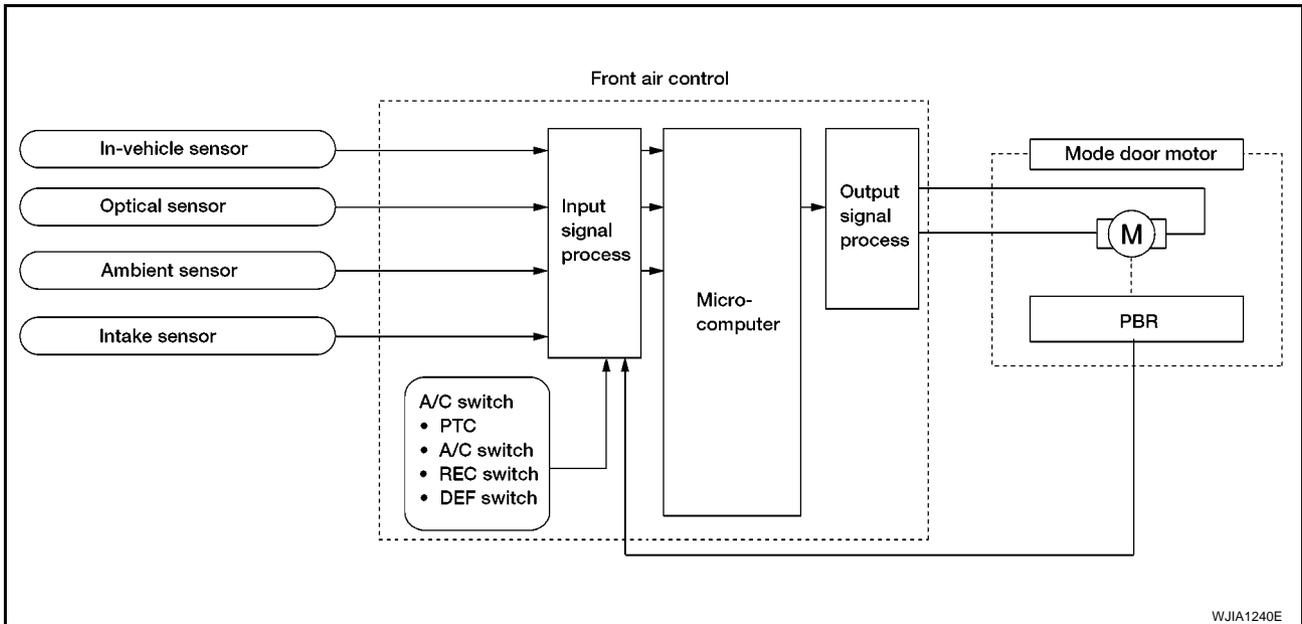
Mode door control system components are:

- Front air control
- Mode door motor
- PBR (built into mode door motor)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

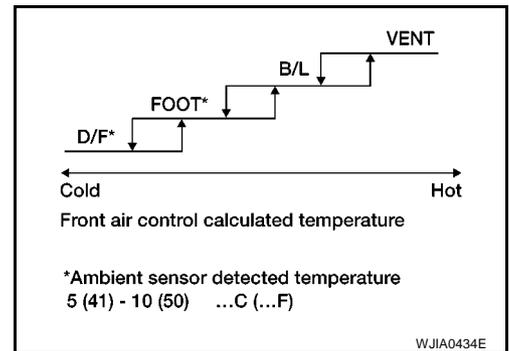
### System Operation

The mode door position (vent, B/L, foot, and defrost) is set by the front air control by means of the mode door motor. When a mode door position is selected on the front air control, voltage is applied to one circuit of the mode door motor while ground is applied to the other circuit, causing the mode door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the mode door position by measuring the voltage signal on the PBR circuit.

In AUTO mode the mode door position is set by the front air control which determines the proper position based on inputs from the in-vehicle sensor, ambient sensor, optical sensor, intake sensor, and the temperature selected by the driver or passenger.



### Mode Door Control Specification



# TROUBLE DIAGNOSIS

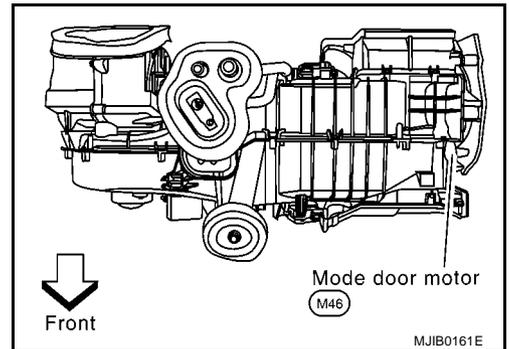
## COMPONENT DESCRIPTION

### Mode Door Motor

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

#### NOTE:

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



## DIAGNOSTIC PROCEDURE FOR MODE DOOR MOTOR

### 1. CHECK RESULT FROM FRONT AIR CONTROL SELF-DIAGNOSIS

Self-diagnosis code 92 is present. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#).

#### YES or NO

- YES >> GO TO 2.
- NO >> GO TO 3.

### 2. CHECK POWER SUPPLY AND GROUND CIRCUITS FOR MODE DOOR MOTOR

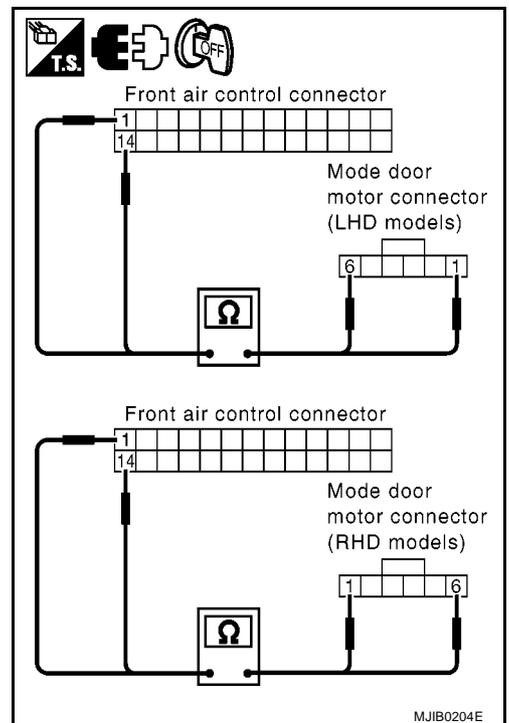
1. Turn ignition switch OFF.
2. Disconnect front air control connector and mode door motor connector.
3. Check continuity between front air control harness connector M60 terminal 1 and mode door motor harness connector M46 terminal 1 and between front air control harness connector M60 terminal 14 and mode door motor harness connector M46 terminal 6.

**1 - 1 : Continuity should exist.**

**14 - 6 : Continuity should exist.**

#### OK or NG

- OK >> Replace mode door motor.
- NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

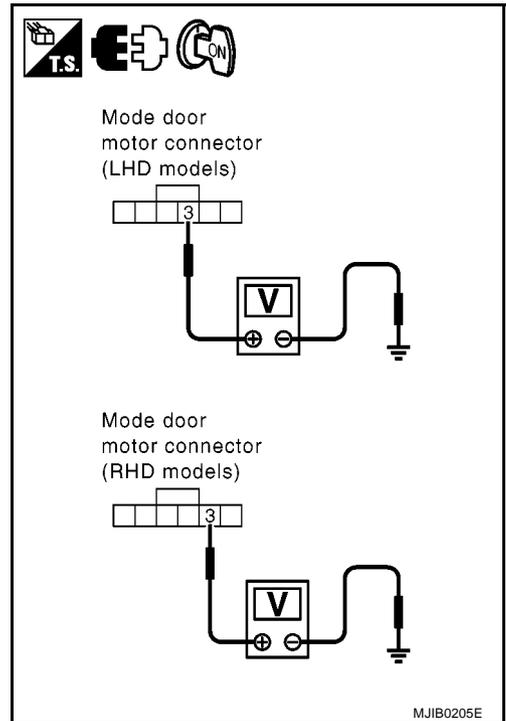
## 3. CHECK PBR REFERENCE SIGNAL VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect the mode door motor connector.
3. Turn ignition switch ON.
4. Check voltage between mode door motor harness connector M46 terminal 3 and ground.

**3 - Ground** : **Approx. 5V**

OK or NG

- OK >> GO TO 5.  
NG >> GO TO 4.



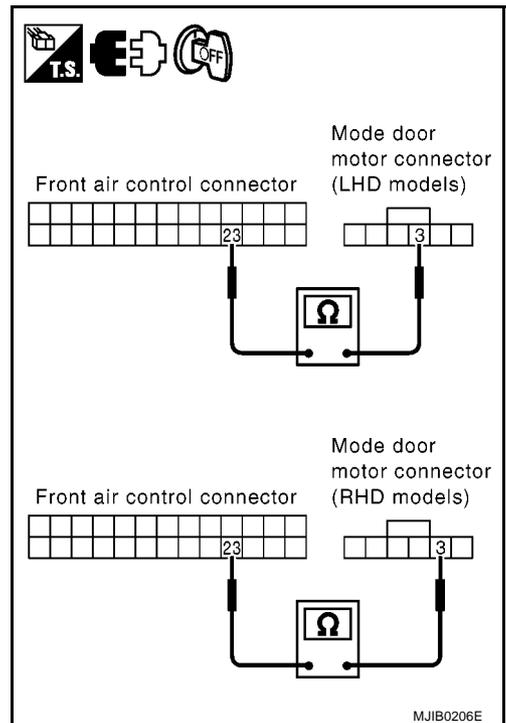
## 4. CHECK PBR REFERENCE VOLTAGE CIRCUIT BETWEEN MODE DOOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Check continuity between mode door motor harness connector M46 terminal 3 and front air control harness connector M60 terminal 23.

**3 - 23** : **Continuity should exist.**

OK or NG

- OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)
- NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

## 5. CHECK PBR GROUND REFERENCE CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Check continuity between mode door motor harness connector M46 terminal 2 and front air control harness connector M60 terminal 26.

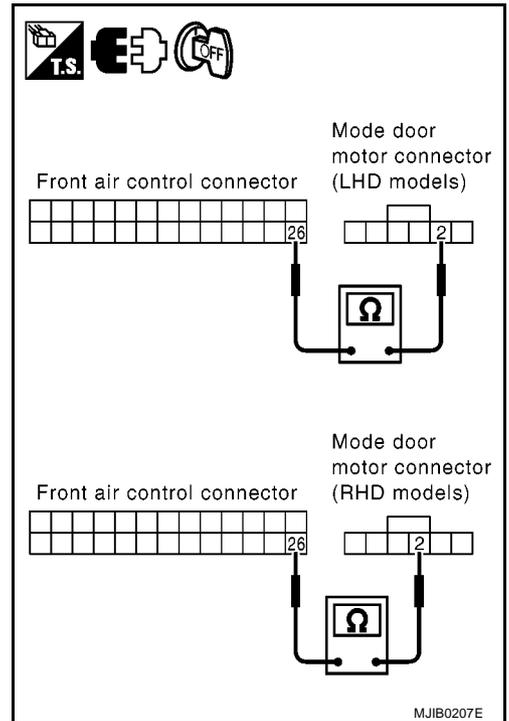
**2 - 26**

**: Continuity should exist.**

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness as necessary.



## 6. CHECK PBR FEEDBACK SIGNAL

1. Reconnect the front air control connector and mode door motor connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M60 terminal 21 and ground.
4. Press mode switch through all modes.

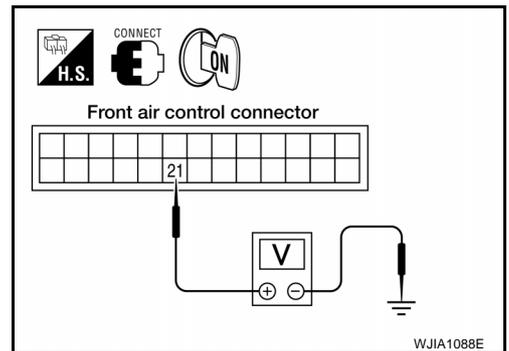
**21 - Ground**

**: Approx. 0 - 5V**

OK or NG

OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)

NG >> GO TO 7.



## 7. CHECK PBR FEEDBACK CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the mode door motor connector and front air control harness connector.
3. Check continuity between mode door motor harness connector M46 terminal 4 and front air control harness connector M60 terminal 21.

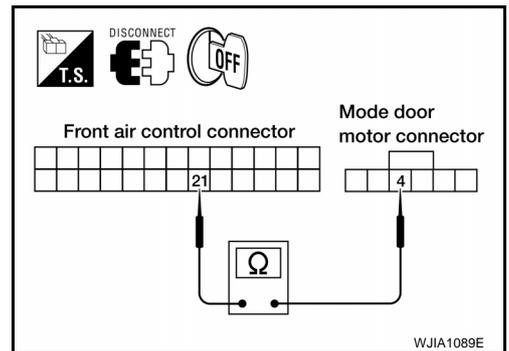
**4 - 21**

**: Continuity should exist.**

OK or NG

OK >> Replace mode door motor. Refer to [ATC-130, "MODE DOOR MOTOR"](#).

NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

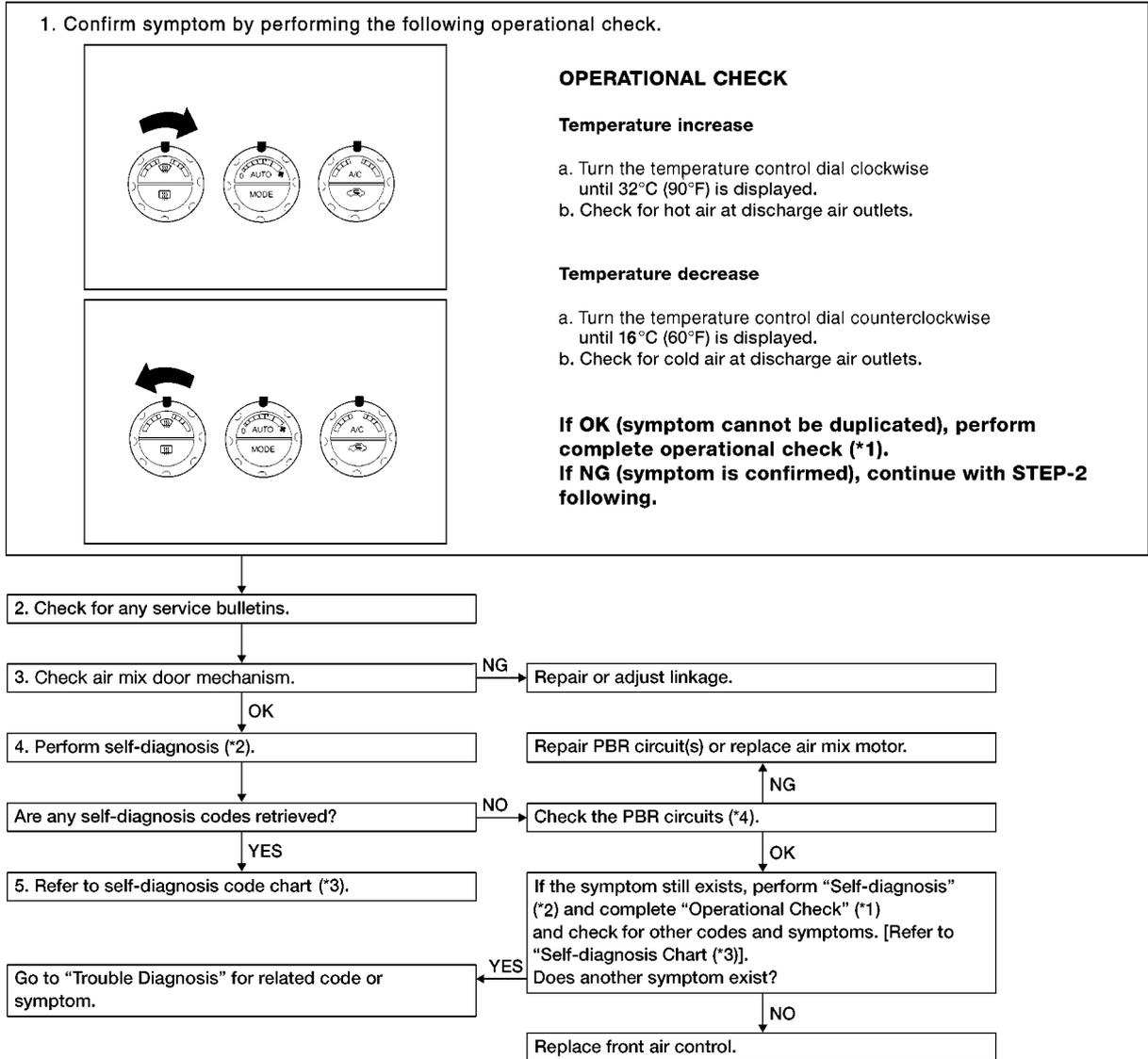
EJS006BL

## Air Mix Door Motor Circuit

### SYMPTOM:

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

### INSPECTION FLOW



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

\*2 [ATC-55, "A/C System Self-diagnosis Function".](#)

\*3 [ATC-56, "SELF-DIAGNOSIS CODE CHART".](#)

\*4 [ATC-71, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR \(DRIVER\)".](#)

\*5 [ATC-73, "DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR \(PASSENGER\)".](#)

MJIB0346E

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

Air mix door control system components are:

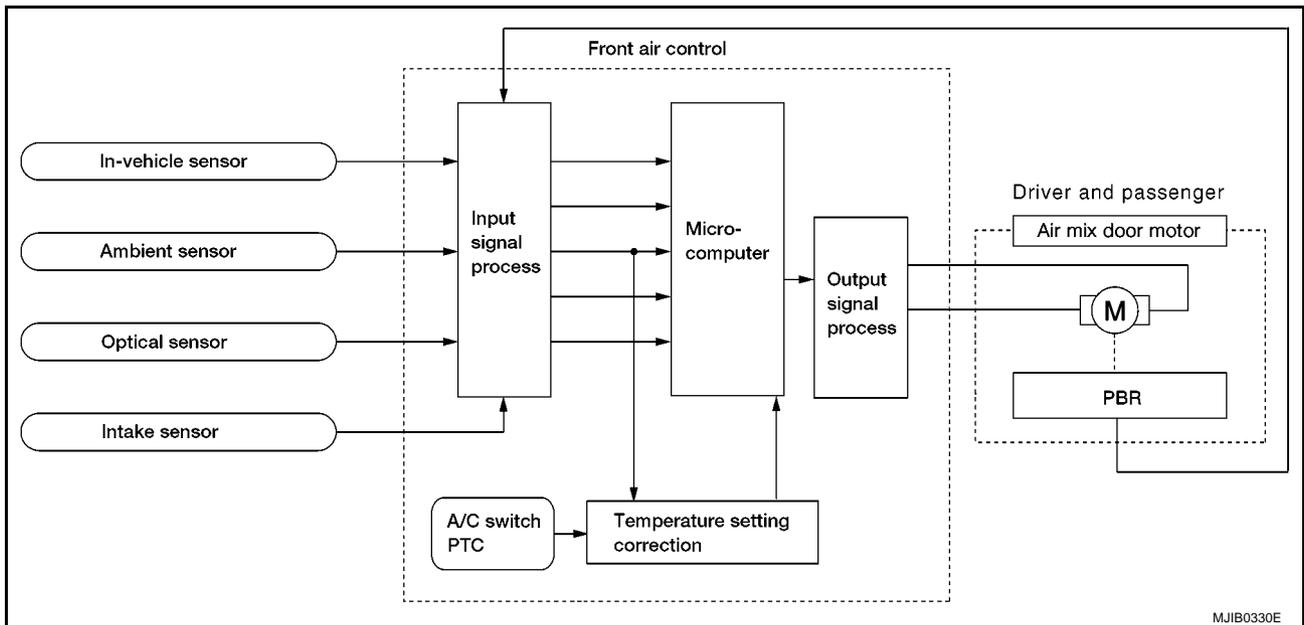
- Front air control.
- Air mix door motors (driver and passenger)
- PBR (built into air mix door motors)
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

### System Operation

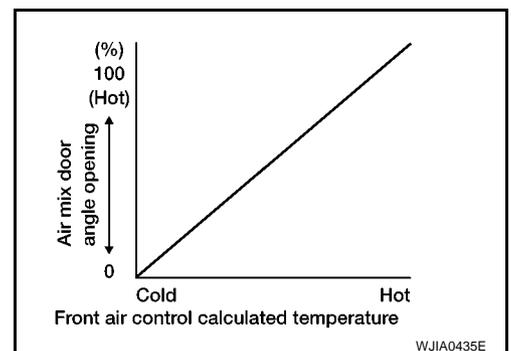
The front air control receives data from the temperature selected by the driver side and passenger side. The front air control then applies a voltage to one circuit of the appropriate air mix door motor, while ground is applied to the other circuit, causing the appropriate air mix door motor to rotate. The direction of rotation is determined by which circuit has voltage applied to it, and which one has ground applied to it. The front air control monitors the air mix door positions by measuring the voltage signal on the PBR circuits of each door.

In AUTO mode the air mix, intake, mode door, and defrost door positions are set by the front air control which determines the proper position based on inputs from the in-vehicle sensor, ambient sensor, optical sensor, intake sensor, and the temperature selected by the driver and front passengers.

Subsequently, HOT/COLD or DEFROST/VENT or FRESH/RECIRCULATION operation is selected. The new door position data is returned to the front air control.



### Air Mix Door Control Specification



# TROUBLE DIAGNOSIS

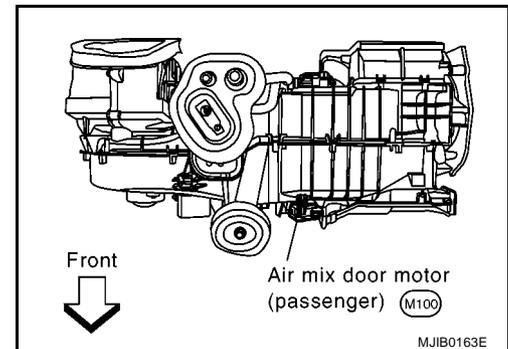
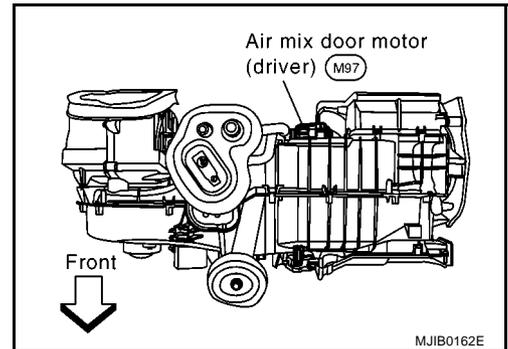
## COMPONENT DESCRIPTION

### Air Mix Door Motors

The driver and passenger air mix door motors are attached to the heater & cooling unit. These motors rotate so that the air mix door is opened or closed to a position set by the front air control. Motor rotation is then conveyed through a shaft and the air mix door position is then fed back to the front air control by the PBR built into the air mix door motors.

#### NOTE:

The illustrations for air mix door motors (driver and passenger) are for LHD models. The layout for RHD models is symmetrically opposite.



# TROUBLE DIAGNOSIS

## DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (DRIVER)

### 1. CHECK RESULT FROM FRONT AIR CONTROL SELF-DIAGNOSIS

Self-diagnosis code 22 is present. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#).

YES or NO

- YES >> GO TO 2.
- NO >> GO TO 3.

### 2. CHECK POWER SUPPLY CIRCUITS FOR AIR MIX DOOR MOTOR (DRIVER)

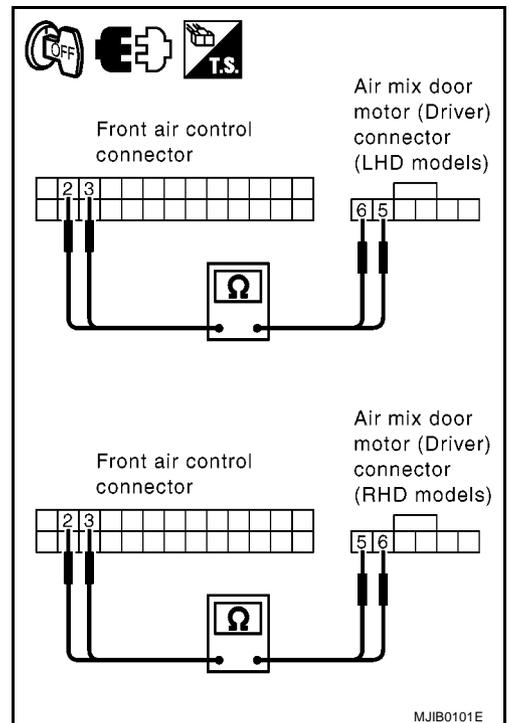
1. Turn ignition switch OFF.
2. Disconnect front air control connector and air mix door motor (driver) connector.
3. Check continuity between front air control harness connector M60 terminal 2 and 3 and air mix door motor (driver) harness connector M97 terminal 5 and 6.

**2 - 5 : Continuity should exist.**

**3 - 6 : Continuity should exist.**

OK or NG

- OK >> Replace air mix door motor (driver). Refer to [ATC-131, "AIR MIX DOOR MOTOR \(DRIVER\)"](#).
- NG >> Repair or replace harness as necessary.



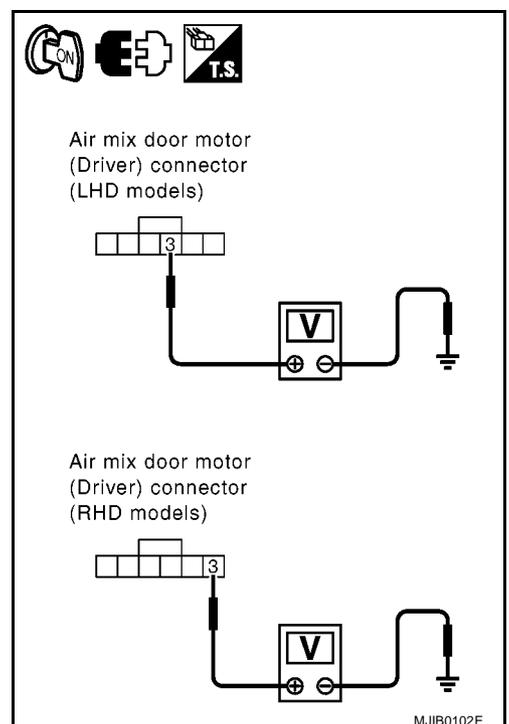
### 3. CHECK PBR REFERENCE SIGNAL VOLTAGE

1. Turn ignition switch OFF.
2. Disconnect the air mix door motor (driver) connector.
3. Turn ignition switch ON.
4. Check voltage between air mix door motor (driver) harness connector M97 terminal 3 and ground.

**3 - Ground : Approx. 5V**

OK or NG

- OK >> GO TO 5.
- NG >> GO TO 4.



# TROUBLE DIAGNOSIS

## 4. CHECK PBR REFERENCE VOLTAGE CIRCUIT BETWEEN AIR MIX DOOR MOTOR (DRIVER) AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Check continuity between air mix door motor (driver) harness connector M97 terminal 3 and front air control harness connector M60 terminal 23.

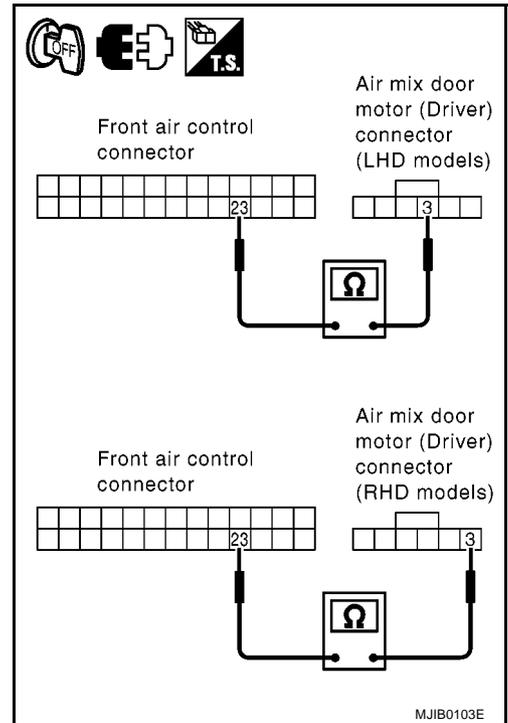
**3 - 23**

**: Continuity should exist.**

OK or NG

OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)

NG >> Repair or replace harness as necessary.



## 5. CHECK PBR GROUND REFERENCE CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Check continuity between air mix door motor (driver) harness connector M97 terminal 1 and front air control harness connector M60 terminal 26.

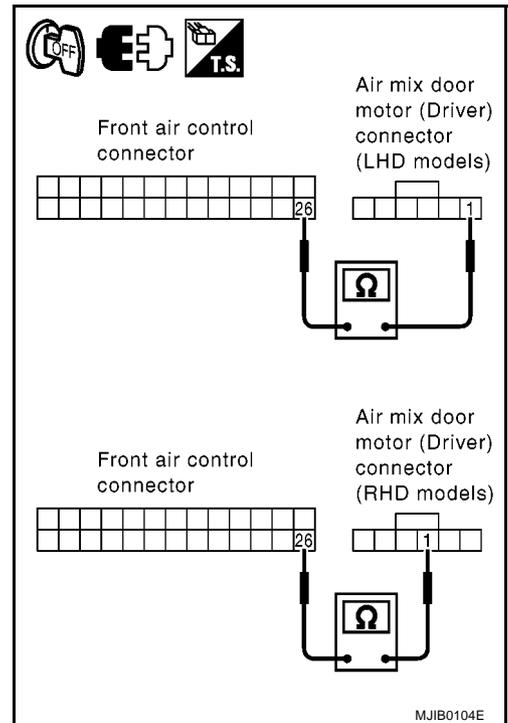
**1 - 26**

**: Continuity should exist.**

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

## 6. CHECK PBR FEEDBACK SIGNAL

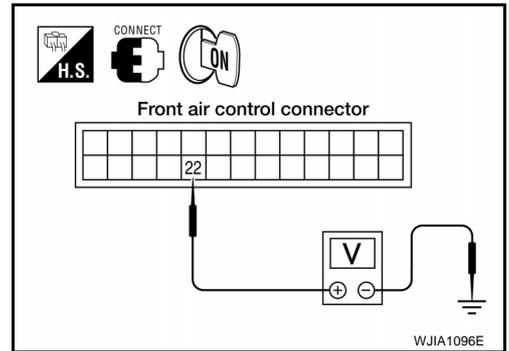
1. Reconnect the front air control connector and air mix door motor (driver) connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M60 terminal 22 and ground.
4. Rotate driver temperature control dial through complete range.

**22 - Ground : Approx. 0V - 5V**

OK or NG

OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)

NG >> GO TO 7.



## 7. CHECK PBR FEEDBACK CIRCUIT

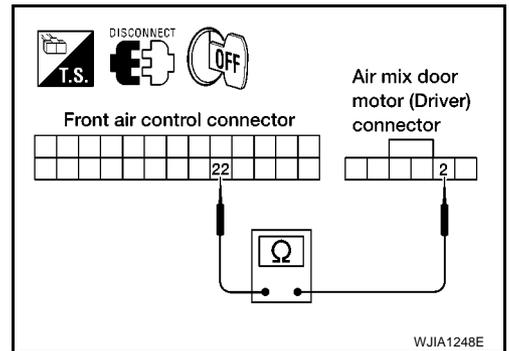
1. Turn ignition switch OFF.
2. Disconnect the air mix door motor (driver) connector and front air control connector.
3. Check continuity between air mix door motor (driver) harness connector M97 terminal 2 and front air control harness connector M60 terminal 22.

**2 - 22 Continuity should exist.**

OK or NG

OK >> Replace air mix door motor (driver). Refer to [ATC-131, "AIR MIX DOOR MOTOR \(DRIVER\)"](#).

NG >> Repair or replace harness as necessary.



## DIAGNOSTIC PROCEDURE FOR AIR MIX DOOR MOTOR (PASSENGER)

### 1. CHECK RESULT FROM FRONT AIR CONTROL SELF-DIAGNOSIS

Self-diagnosis code 12 is present. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#).

YES or NO

YES >> GO TO 2.

NO >> GO TO 3.

A  
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K  
L  
M

ATC



# TROUBLE DIAGNOSIS

## 4. CHECK PBR REFERENCE VOLTAGE CIRCUIT BETWEEN AIR MIX DOOR (PASSENGER) AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Check continuity between air mix door motor (passenger) harness connector M100 terminal 1 and front air control harness connector M60 terminal 23.

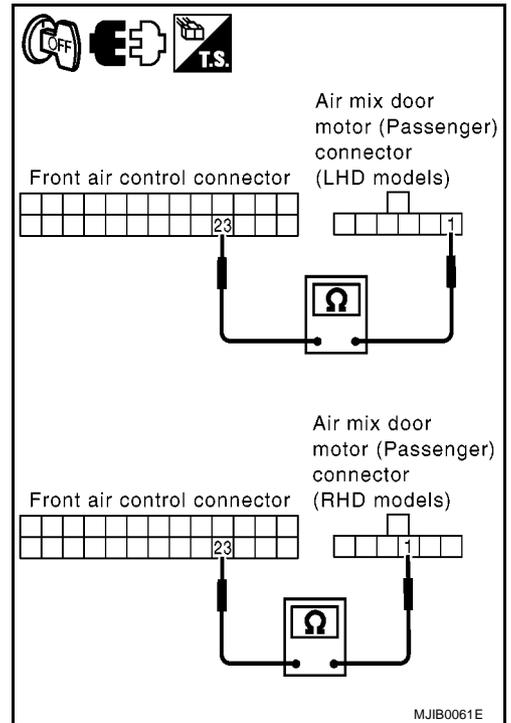
1 - 23

Continuity should exist.

OK or NG

OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)

NG >> Repair or replace harness as necessary.



## 5. CHECK PBR GROUND REFERENCE CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect the front air control connector.
3. Check continuity between air mix door motor (passenger) harness connector M100 terminal 3 and front air control harness connector M60 terminal 26.

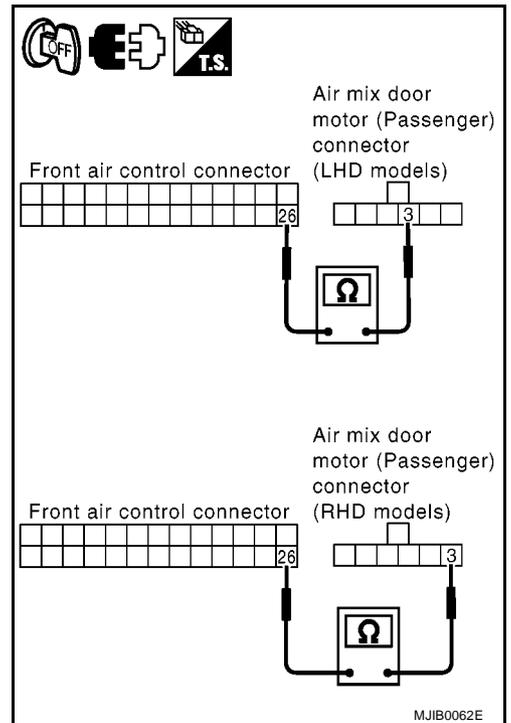
3 - 26

Continuity should exist.

OK or NG

OK >> GO TO 6.

NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

## 6. CHECK PBR FEEDBACK SIGNAL

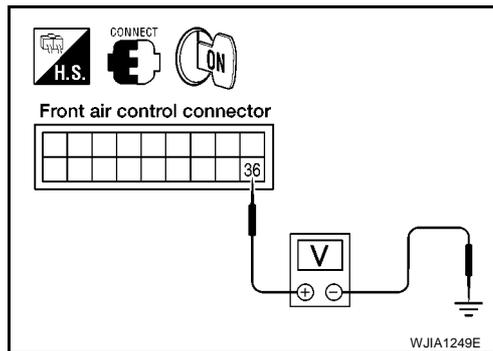
1. Reconnect the front air control connector and air mix door motor (passenger) connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M61 terminal 36 and ground.
4. Rotate passenger temperature control dial through complete range.

**36 - Ground : Approx. 0 - 5V**

OK or NG

OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)

NG >> GO TO 7.



## 7. CHECK PBR FEEDBACK CIRCUIT

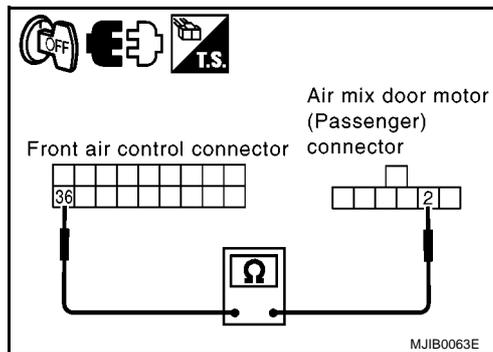
1. Turn ignition switch OFF.
2. Disconnect the air mix door motor (passenger) connector and front air control connector.
3. Check continuity between air mix door motor (passenger) harness connector M100 terminal 2 and front air control harness connector M61 terminal 36.

**2 - 36 : Continuity should exist.**

OK or NG

OK >> Replace air mix door motor (passenger). Refer to [ATC-131, "AIR MIX DOOR MOTOR \(PASSENGER\)"](#).

NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

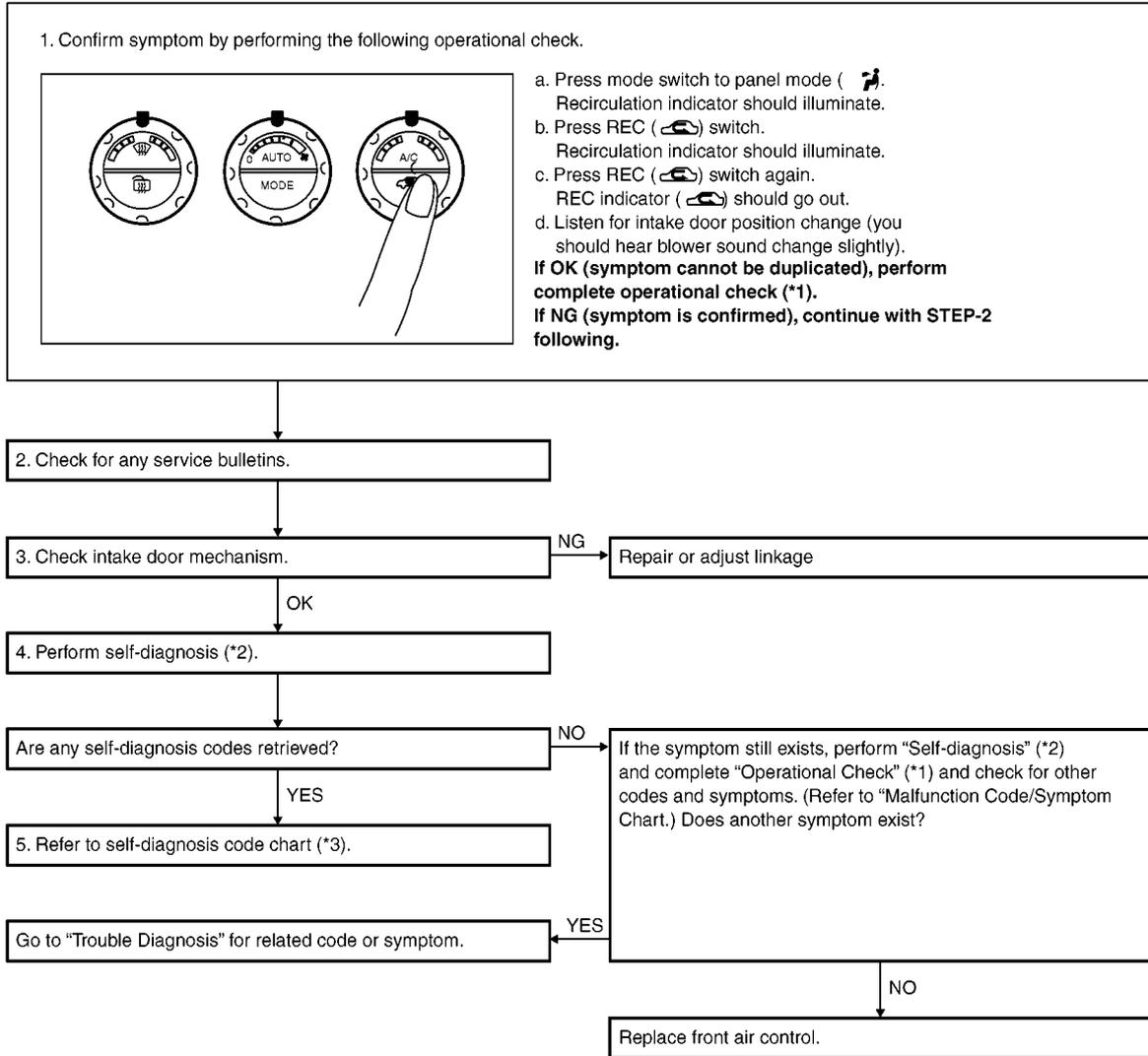
EJS006BM

## Intake Door Motor Circuit

SYMPTOM:

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

### INSPECTION FLOW



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

\*2 [ATC-55, "A/C System Self-diagnosis Function"](#).

\*3 [ATC-56, "SELF-DIAGNOSIS CODE CHART"](#).

MJIB0347E

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

### Component Parts

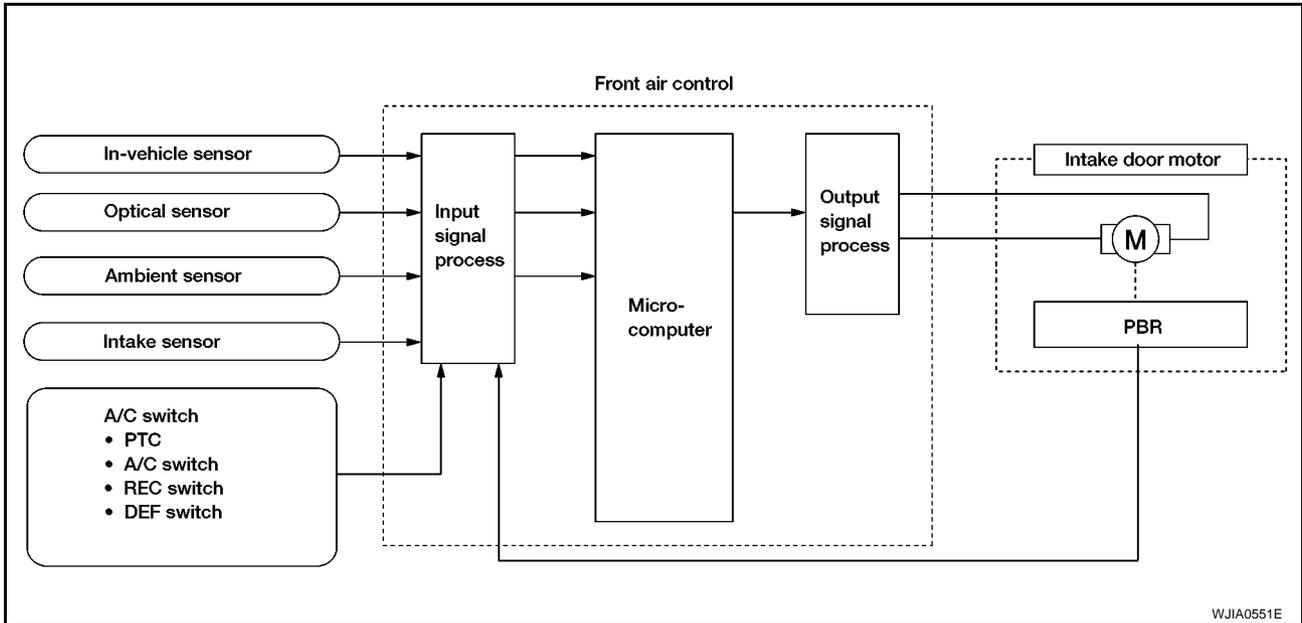
Intake door control system components are:

- Front air control
- Intake door motor
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

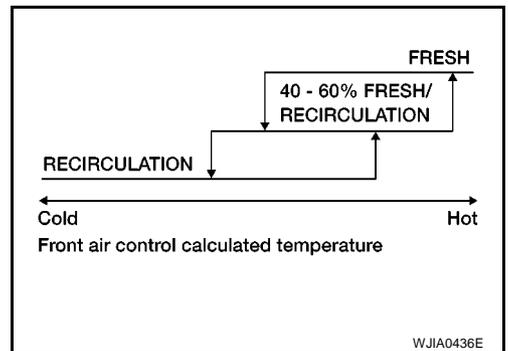
### System Operation

The intake door control determines the intake door position based on the position of the recirculation switch. When the recirculation switch is depressed the intake door motor rotates closing off the fresh air inlet and recirculating the cabin air. If the recirculation switch is depressed again, the intake door motor rotates in the opposite direction, again allowing fresh air into the cabin.

In the AUTO mode, the front air control determines the intake door position based on the ambient temperature, the intake air temperature and the in-vehicle temperature. When the DEFROST, or OFF switches are pushed or A/C switch is OFF, the front air control sets the intake door at the fresh position.



### Intake Door Control Specification



# TROUBLE DIAGNOSIS

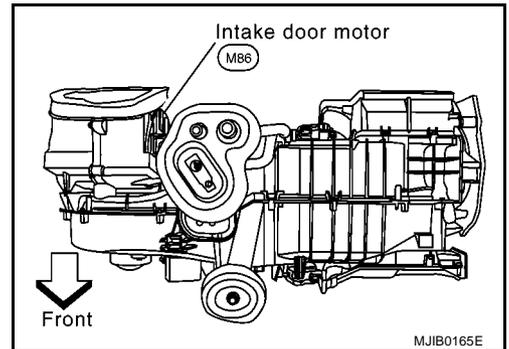
## COMPONENT DESCRIPTION

### 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 front air control. Motor rotation is conveyed to a lever which activates the intake door.

#### NOTE:

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



## DIAGNOSTIC PROCEDURE FOR INTAKE DOOR MOTOR

### 1. CHECK RESULT FROM FRONT AIR CONTROL SELF-DIAGNOSIS

Self-diagnosis code 82 is present. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#).

#### YES or NO

YES >> GO TO 2.

NO >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#).

### 2. CHECK POWER SUPPLY CIRCUIT FOR INTAKE DOOR MOTOR

1. Turn ignition switch OFF.
2. Disconnect front air control connector and intake door motor connector.
3. Check continuity between front air control harness connector M60 terminal 5 and intake door motor harness connector M86 terminal 6 and between front air control harness connector M60 terminal 4 and intake door motor harness connector M86 terminal 1.

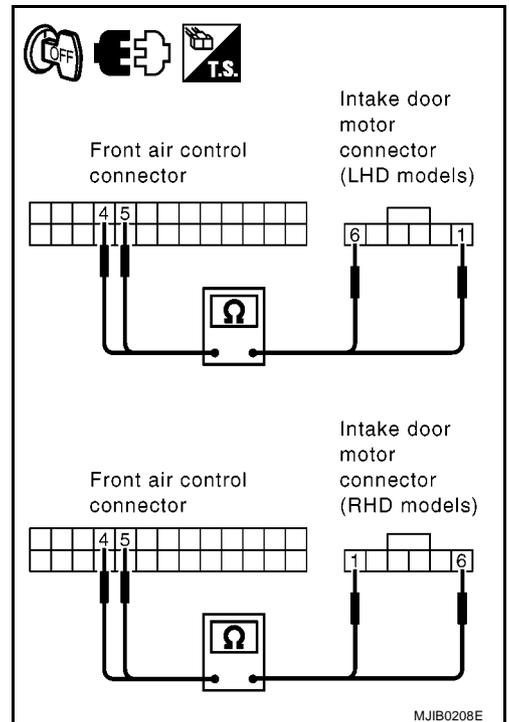
5 - 6 **Continuity should exist.**

4 - 1 **Continuity should exist.**

#### OK or NG

OK >> Replace intake door motor. Refer to [ATC-129, "INTAKE DOOR MOTOR"](#).

NG >> Repair or replace harness as necessary.



# TROUBLE DIAGNOSIS

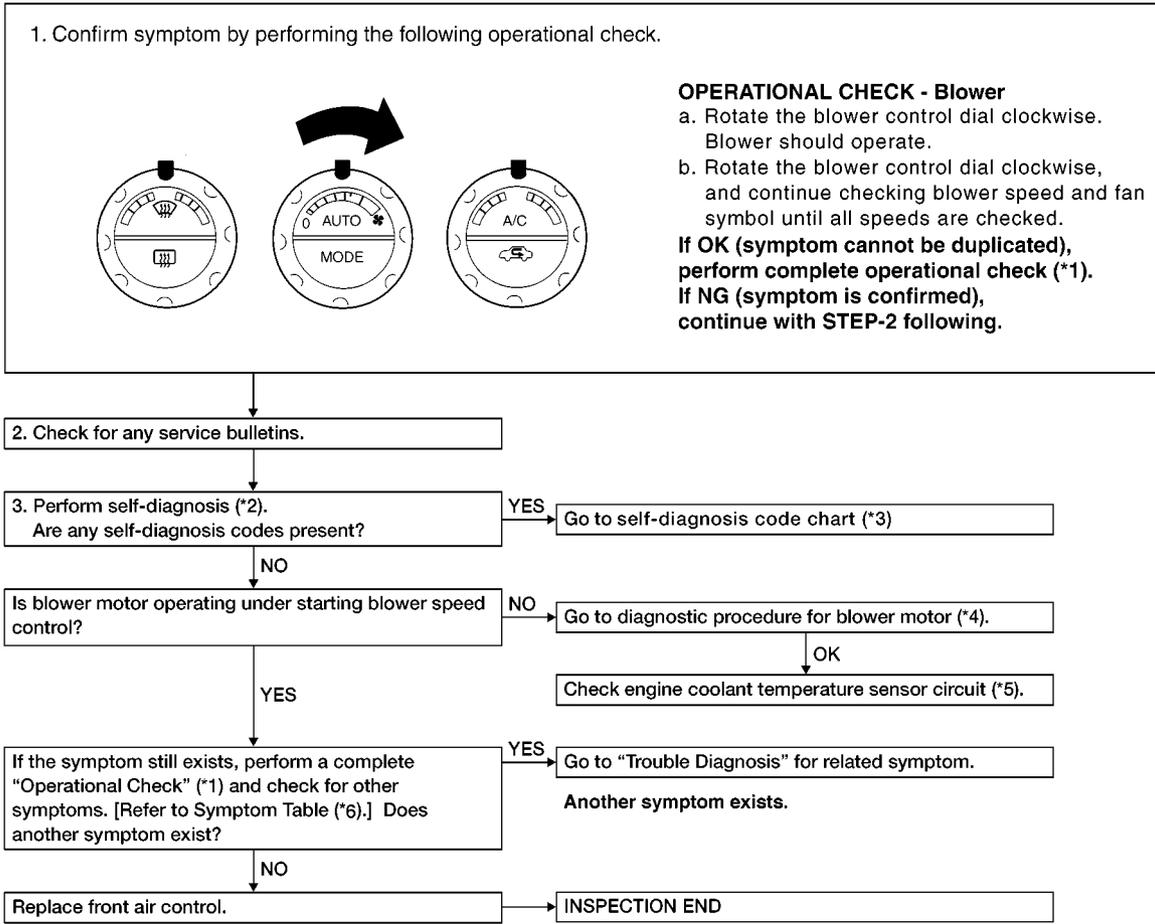
EJS006BN

## Blower Motor Circuit

### SYMPTOM:

- Blower motor operation is malfunctioning.
- Blower motor operation is malfunctioning under cold starting conditions.

### INSPECTION FLOW



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

\*2 [ATC-55, "A/C System Self-diagnosis Function"](#).

\*3 [ATC-56, "SELF-DIAGNOSIS CODE CHART"](#).

\*4 [ATC-82, "DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR"](#).

MJIB0331E

# TROUBLE DIAGNOSIS

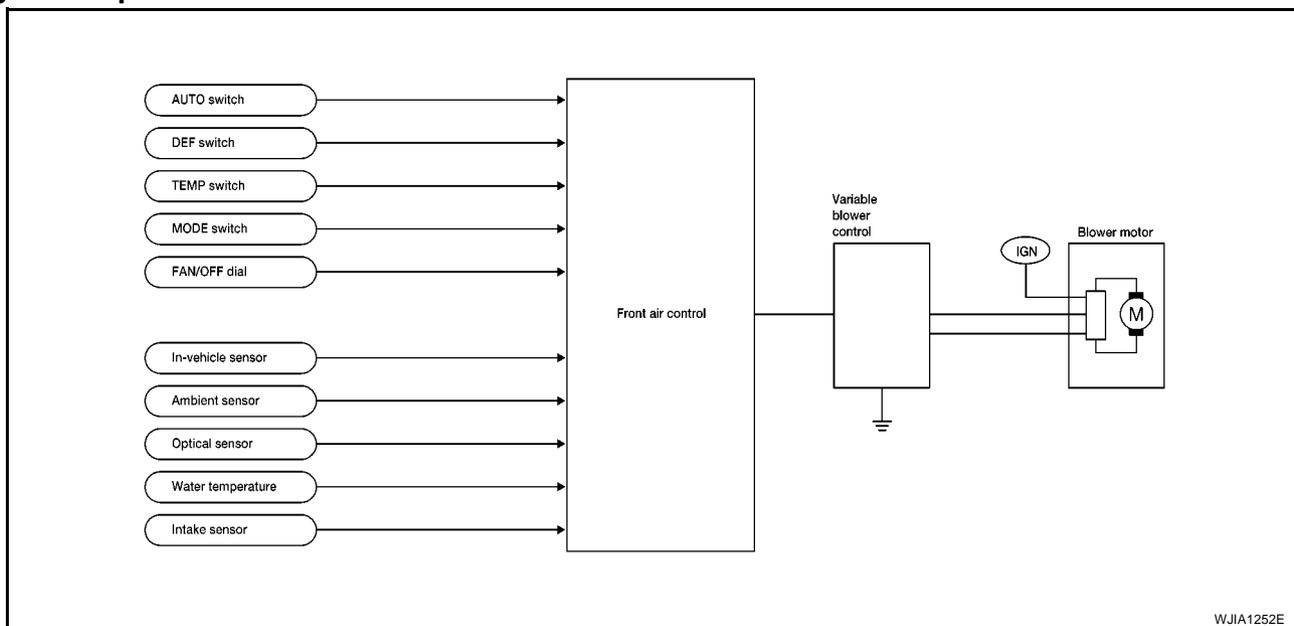
## SYSTEM DESCRIPTION

### Component Parts

Blower speed control system components are:

- Front air control
- In-vehicle sensor
- Ambient sensor
- Optical sensor
- Intake sensor

### System Operation



### Automatic Mode

In the automatic mode, the blower motor speed is calculated by the front air control and variable blower control based on input from the in-vehicle sensor, optical sensor, intake sensor and ambient sensor, and potentiometer temperature control (PTC).

When the air flow is increased, the blower motor speed is adjusted gradually. to prevent a sudden increase in air flow.

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

### Starting Blower Speed Control

Start up from cold soak condition (Automatic mode).

In a cold start up condition where the engine coolant temperature is below 50°C (122°F), the blower will not operate at blower speed 1 for a short period of time (up to 210 seconds). The exact start delay time varies depending on the ambient and engine coolant temperatures.

In the most extreme case (very low ambient temperature) the blower starting delay will be 210 seconds as described above. After the coolant temperature reaches 50°C (122°F), or the 210 seconds has elapsed, the blower speed will increase to the objective blower speed.

Start up from usual operating or hot soak condition (Automatic mode).

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

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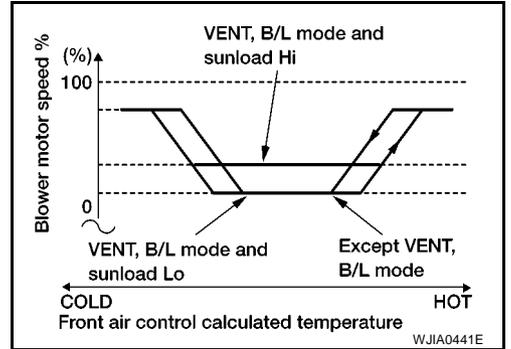
ATC

# 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 speed will vary depending on the sunload. During conditions of low or no sunload, the blower operates at low speed. During high sunload conditions, the front air control causes the blower speed to increase.

## Blower Speed Control Specification



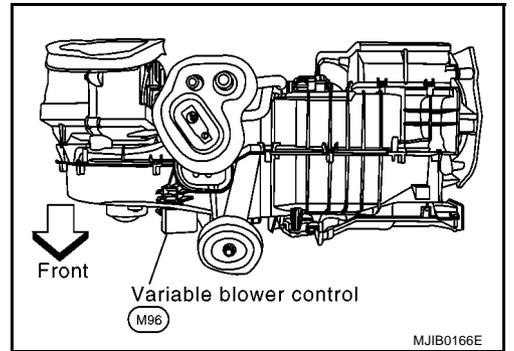
## COMPONENT DESCRIPTION

### Variable Blower Control

The variable blower control is located on the cooling unit. The variable blower control receives a gate voltage from the front air control to steplessly maintain the blower motor voltage in the 0 to 5 volt range (approx.).

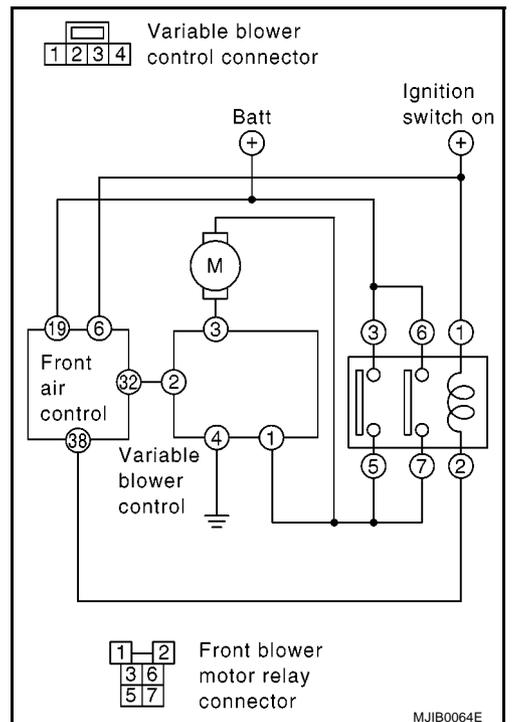
#### NOTE:

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



## DIAGNOSTIC PROCEDURE FOR BLOWER MOTOR

SYMPTOM: Blower motor operation is malfunctioning under starting blower speed control.



# TROUBLE DIAGNOSIS

## 1. CHECK FUSES

Check 15A fuses [No. 24 and 27, (located in the fuse and fusible link box)]. For fuse layout, refer to [PG-84, "FUSE AND FUSIBLE LINK BOX"](#).

**Fuses are good.**

OK or NG

- OK >> GO TO 2.
- NG >> GO TO 10.

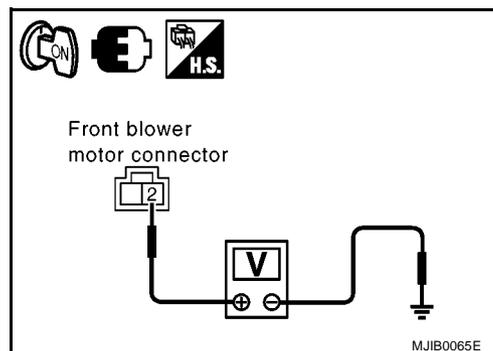
## 2. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect blower motor connector.
3. Turn ignition switch ON.
4. Turn the blower control dial to select any mode except off.
5. Check voltage between blower motor harness connector M94 terminal 2 and ground.

**2 - Ground : Battery voltage.**

OK or NG

- OK >> GO TO 12.
- NG >> GO TO 3.



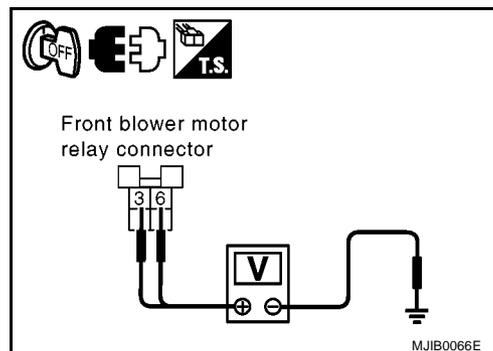
## 3. CHECK BLOWER MOTOR RELAY (SWITCH SIDE) POWER SUPPLY CIRCUIT

1. Turn ignition switch OFF.
2. Disconnect blower motor relay.
3. Check voltage between blower motor relay harness connector E28 terminals 3 and 6 and ground.

**3, 6 - Ground : Battery voltage.**

OK or NG

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



## 4. CHECK BLOWER MOTOR RELAY

Refer to [ATC-86, "Blower Motor Relay"](#).

OK or NG

- OK >> GO TO 5.
- NG >> Replace blower motor relay.

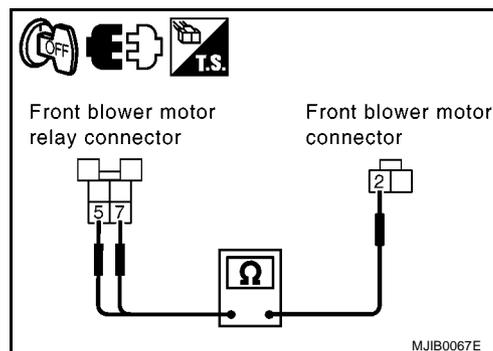
## 5. CHECK BLOWER MOTOR RELAY (SWITCH SIDE) CIRCUIT FOR OPEN

1. Turn ignition switch OFF.
2. Disconnect blower motor relay connector and blower motor connector.
3. Check continuity between blower motor relay harness connector E28 terminals 5 and 7 and blower motor harness connector M94 terminal 2.

**5, 7 - 2 : Continuity should exist.**

OK or NG

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



# TROUBLE DIAGNOSIS

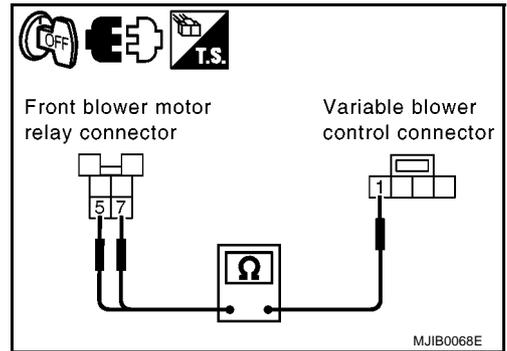
## 6. CHECK VARIABLE BLOWER CONTROL POWER SUPPLY CIRCUIT FOR OPEN

1. Disconnect variable blower control harness connector.
2. Check continuity between blower motor relay harness connector E28 terminals 5 and 7 and variable blower control harness connector M96 terminal 1.

**5, 7 - 1** : Continuity should exist.

OK or NG

- OK >> GO TO 7.  
NG >> Repair harness or connector.



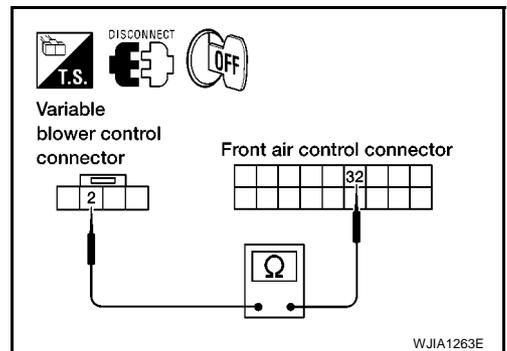
## 7. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M61 terminal 32 and variable blower control harness connector M96 terminal 2.

**32 - 2** : Continuity should exist.

OK or NG

- OK >> GO TO 8.  
NG >> Repair harness or connector.



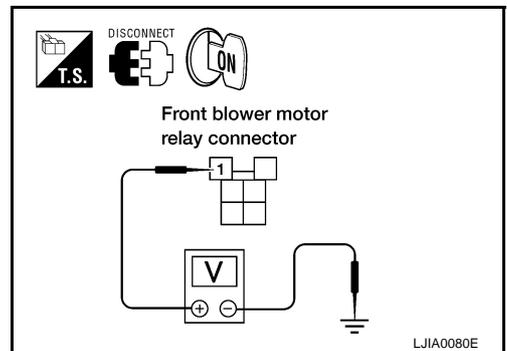
## 8. CHECK BLOWER MOTOR RELAY (COIL SIDE) POWER SUPPLY

1. Turn ignition switch ON.
2. Check voltage between blower motor relay connector E28 terminal 1 and ground.

**1 - Ground** : Battery voltage.

OK or NG

- OK >> GO TO 9.  
NG >> Repair harness or connector.



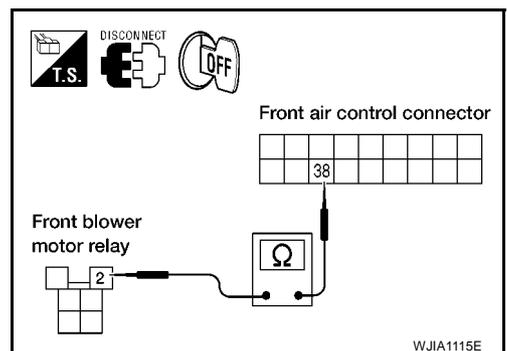
## 9. CHECK BLOWER MOTOR RELAY (COIL SIDE) GROUND CIRCUIT

1. Turn ignition switch OFF.
2. Check continuity between blower motor relay connector E28 terminal 2 and air control harness connector M61 terminal 38.

**2 - 38** : Continuity should exist.

OK or NG

- OK >> Replace front air control. Refer to [ATC-116, "REMOVAL"](#)  
NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

## 10. REPLACE FUSES

1. Replace fuses.
2. Activate the blower motor.
3. Do fuses blow?

YES or NO

YES >> GO TO 11.

NO >> Inspection End.

## 11. CHECK BLOWER MOTOR POWER SUPPLY CIRCUIT FOR SHORT

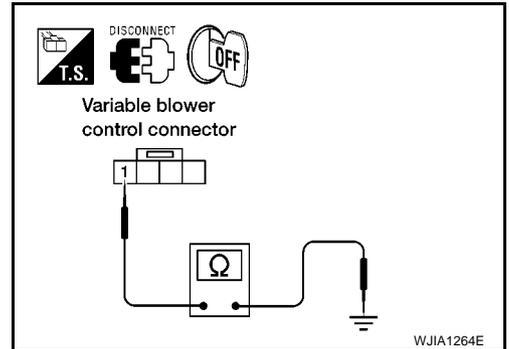
1. Turn ignition switch OFF.
2. Disconnect blower motor connector and variable blower control connector.
3. Check continuity between variable blower control harness connector M96 terminal 1 and ground.

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

OK or NG

OK >> GO TO 12.

NG >> Repair harness or connector.



## 12. CHECK VARIABLE BLOWER CONTROL SIGNAL CIRCUIT

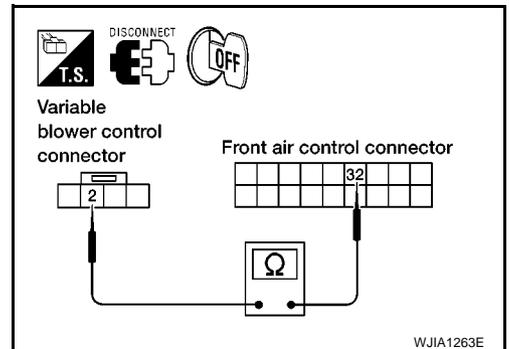
1. Disconnect front air control connector.
2. Check continuity between front air control harness connector M61 terminal 32 and variable blower control harness connector M96 terminal 2.

**32 - 2 : Continuity should exist.**

OK or NG

OK >> Check blower motor. If OK, replace variable blower control. Refer to [ATC-121, "REMOVAL"](#).

NG >> Repair harness or connector.

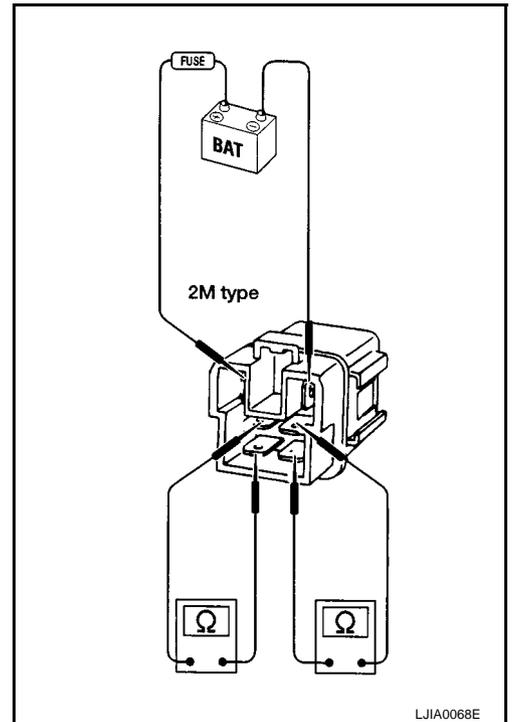


# TROUBLE DIAGNOSIS

## COMPONENT INSPECTION

### Blower Motor Relay

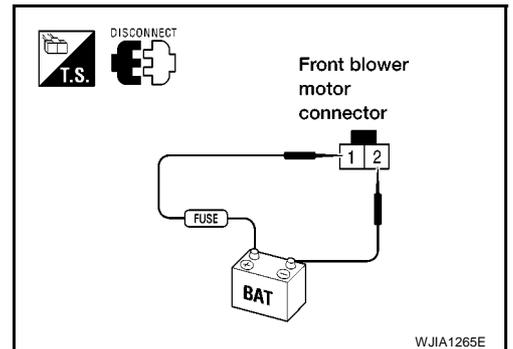
Check continuity between terminals by supplying 12 volts and ground to coil side terminals of relay.



### Blower Motor

Confirm smooth rotation of the blower motor.

- Ensure that there are no foreign particles inside the blower unit.
- Apply 12 volts to terminal + and ground to terminal - and verify that the motor operates freely and quietly.



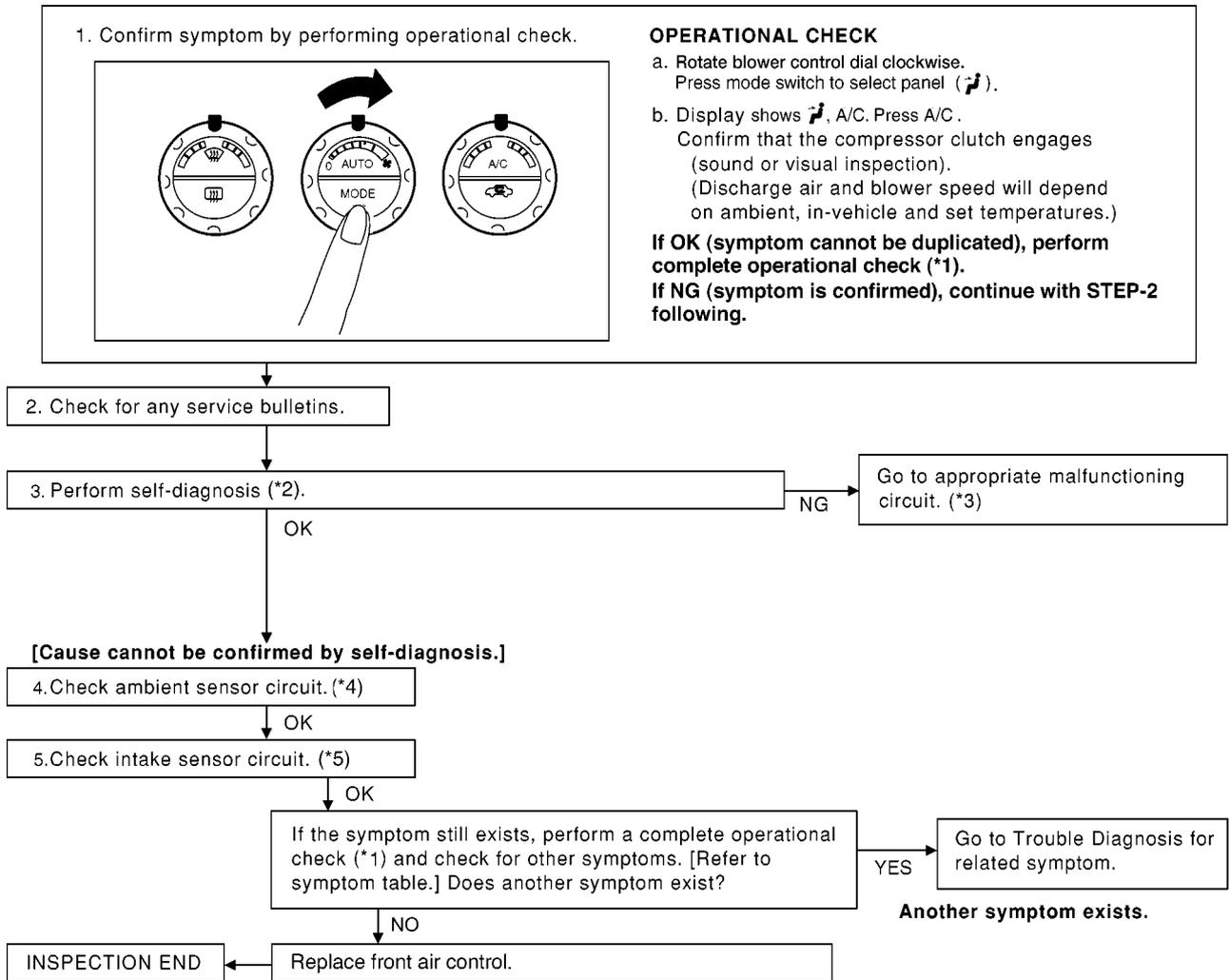
# TROUBLE DIAGNOSIS

EJS006BQ

## Magnet Clutch Circuit

SYMPTOM: Magnet clutch does not engage.

### INSPECTION FLOW



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

\*2 [ATC-55. "A/C System Self-diagnosis Function".](#)

\*3 [ATC-56. "SELF-DIAGNOSIS CODE CHART".](#)

\*4 [ATC-105. "Ambient Sensor Circuit".](#)

\*5 [ATC-114. "Intake Sensor Circuit".](#)

MJIB0348E

# TROUBLE DIAGNOSIS

## SYSTEM DESCRIPTION

The front air control controls compressor operation based on ambient and intake temperature and a signal from ECM.

### Low Temperature Protection Control

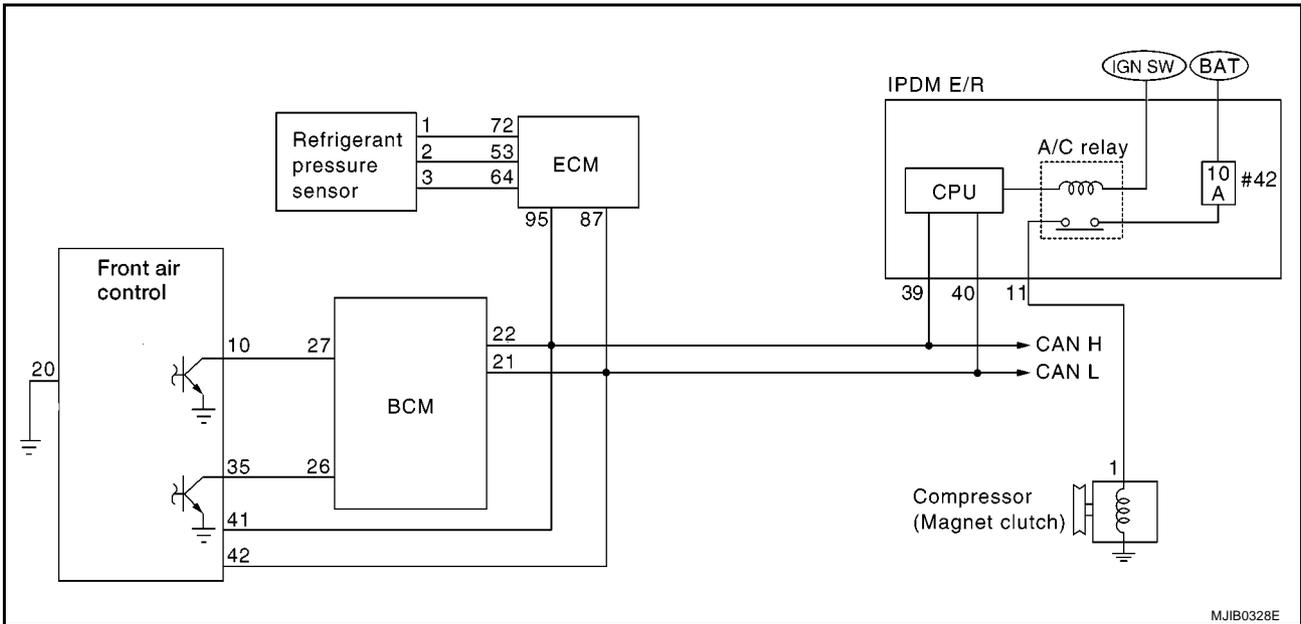
The front air control will turn the compressor ON or OFF as determined by a signal detected by the intake sensor and the ambient sensor.

When intake air temperature is higher than the preset value, the compressor turns ON. The compressor turns OFF when intake air temperature is lower than the preset value. That preset value is dependent on the ambient temperature, refer to the following table.

Ambient temperature °C (°F)	Compressor ON intake temperature °C (°F)	Compressor OFF intake temperature °C (°F)
0 (32)	5.5 (42)	5.0 (41)
10 (50)	4.5 (40)	4.5 (40)
20 (68)	2.5 (37)	2.0 (36)
30 (86)	2.0 (36)	1.5 (35)
40 (104)	2.0 (36)	1.5 (35)
50 (122)	2.0 (36)	1.5 (35)

## DIAGNOSTIC PROCEDURE FOR MAGNET CLUTCH

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



### 1. CHECK INTAKE AND AMBIENT SENSOR CIRCUITS

Check intake and ambient sensors. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#) .

OK or NG

OK >> GO TO 2.

NG >> ● Malfunctioning intake sensor. Refer to [ATC-114, "Intake Sensor Circuit"](#) .

● Malfunctioning ambient sensor. Refer to [ATC-105, "Ambient Sensor Circuit"](#) .

# TROUBLE DIAGNOSIS

## 2. PERFORM AUTO ACTIVE TEST

Refer to [PG-19, "Auto Active Test"](#) .  
Does magnet clutch operate?

YES or NO

- YES >> ●  WITH CONSULT-II  
GO TO 5.
-  WITHOUT CONSULT-II  
GO TO 6.

NO >> Check 10A fuse (No. 42, located in IPDM E/R), and GO TO 3.

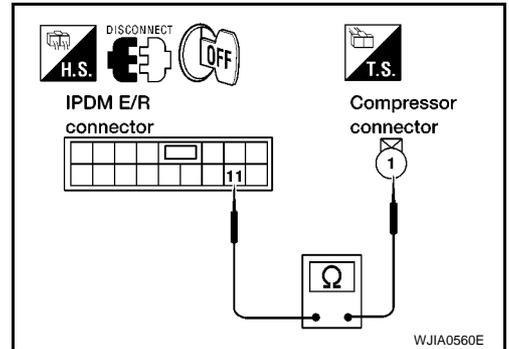
## 3. CHECK CIRCUIT CONTINUITY BETWEEN IPDM E/R AND COMPRESSOR

- Turn ignition switch OFF.
- Disconnect IPDM E/R connector and compressor (magnet clutch) connector.
- Check continuity between IPDM E/R harness connector E12 terminal 11 and compressor harness connector F20 terminal 1.

**11 – 1 : Continuity should exist.**

OK or NG

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

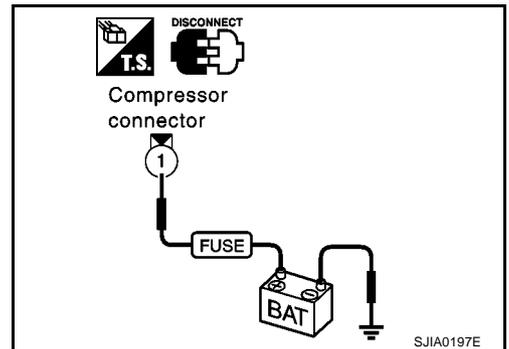


## 4. CHECK MAGNET CLUTCH CIRCUIT

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

OK or NG

- OK >> Replace IPDM E/R. Refer to [PG-26, "Removal and Installation of IPDM E/R"](#) .
- NG >> Replace magnet clutch. Refer to [BCS-17, "Removal and Installation of BCM"](#) .



## 5. CHECK BCM INPUT (COMPRESSOR ON) SIGNAL

Check compressor ON/OFF signal. Refer to [ATC-33, "CONSULT-II Function \(BCM\)"](#) .

**A/C SW ON : COMP ON SIG ON**  
**A/C SW OFF : COMP ON SIG OFF**

OK or NG

- OK >> GO TO 8.  
NG >> GO TO 6.

DATA MONITOR			
MONITOR			
FAN ON SIG	ON		
COMP ON SIG	ON		
IGN ON SW	ON		
		RECORD	
MODE	BACK	LIGHT	COPY

WJIA0469E

# TROUBLE DIAGNOSIS

## 6. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M42 terminal 27 and front air control harness connector M60 terminal 10.

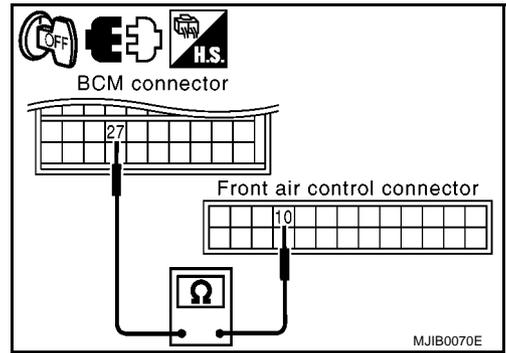
**27 - 10**

**Continuity should exist.**

OK or NG

OK >> GO TO 7.

NG >> Repair harness or connector.



## 7. CHECK VOLTAGE FOR FRONT AIR CONTROL (COMPRESSOR ON SIGNAL)

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M60 terminal 10 and ground.

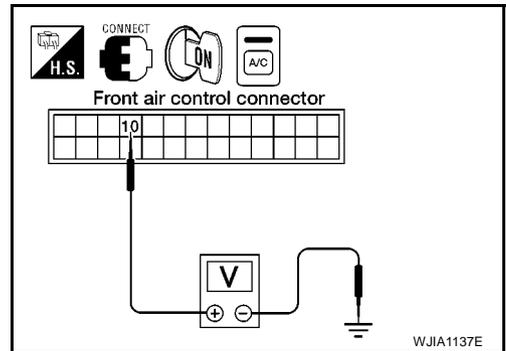
Terminals		(-)	Condition	Voltage (Approx.)
(+)	Terminal No.			
Front air control connector				
M60	10	Ground	A/C switch: ON	0V
			A/C switch: OFF	5V

OK or NG

OK >> GO TO 8.

NG-1 >> If the voltage is approx. 5V when A/C switch is ON, replace front air control. Refer to [ATC-116](#), "[REMOVAL](#)".

NG-2 >> If the voltage is approx. 0V when A/C switch is OFF, replace BCM. Refer to [BCS-17](#), "[Removal and Installation of BCM](#)".



# TROUBLE DIAGNOSIS

## 8. CHECK REFRIGERANT PRESSURE SENSOR

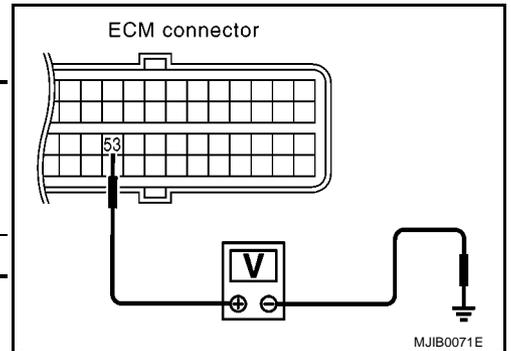
Ⓜ WITH CONSULT-II

1. Start engine.
2. Check voltage of refrigerant pressure sensor. Refer to [ATC-33, "CONSULT-II Function \(BCM\)"](#).

ⓧ WITHOUT CONSULT-II

1. Start engine.
2. Check voltage between ECM harness connector F1 terminal 53 and ground.

Terminals		(-)	Condition	Voltage (Approx.)
(+)				
ECM con- nector	Terminal No.			
F1	53	Ground	A/C switch: ON	0.36 - 3.88V



OK or NG

- OK >> ● Ⓜ WITH CONSULT-II  
GO TO 9.
- ⓧ WITHOUT CONSULT-II  
GO TO 10.

NG >> Refer to [EC-325, "REFRIGERANT PRESSURE SENSOR"](#).

## 9. CHECK BCM INPUT (FAN ON) SIGNAL

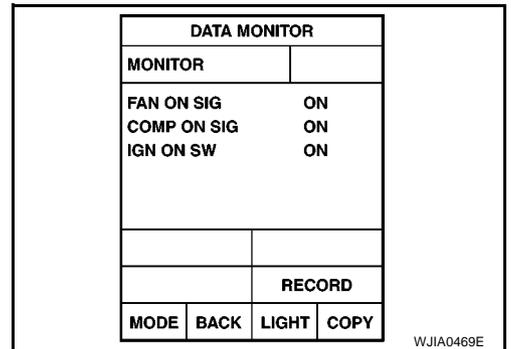
Check FAN ON/OFF signal. Refer to [ATC-33, "CONSULT-II Function \(BCM\)"](#).

**FRONT BLOWER CONTROL : FAN ON SIG ON  
DIAL ON**

**FRONT BLOWER CONTROL : FAN ON SIG OFF  
DIAL OFF**

OK or NG

- OK >> GO TO 12.
- NG >> GO TO 10.



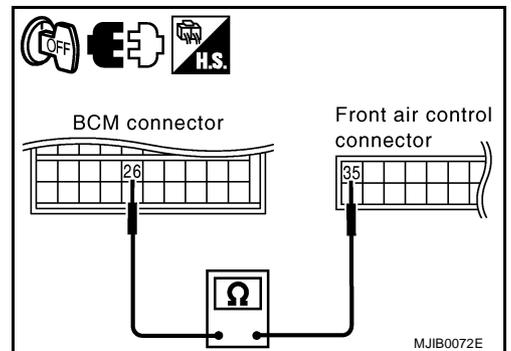
## 10. CHECK CIRCUIT CONTINUITY BETWEEN BCM AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect BCM connector and front air control connector.
3. Check continuity between BCM harness connector M42 terminal 26 and front air control harness connector M61 terminal 35.

**26 - 35 Continuity should exist.**

OK or NG

- OK >> GO TO 11.
- NG >> Repair harness or connector.

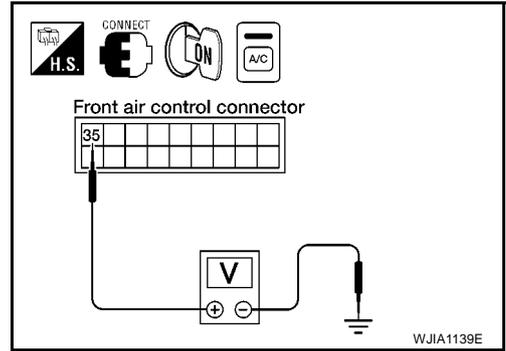


# TROUBLE DIAGNOSIS

## 11. CHECK VOLTAGE FOR FRONT AIR CONTROL (FAN ON SIGNAL)

1. Reconnect BCM connector and front air control connector.
2. Turn ignition switch ON.
3. Check voltage between front air control harness connector M61 terminal 35 and ground.

Terminals		Condition	Voltage (Approx.)
(+)	(-)		
Front air control connector	Terminal No.		
M61	35	A/C switch: ON Blower motor operates	0V
		A/C switch: OFF	5V



### OK or NG

OK >> GO TO 12.

NG-1 >> If the voltage is approx. 5V when blower motor is ON, replace front air control. Refer to [ATC-116, "REMOVAL"](#) .

NG-2 >> If the voltage is approx. 0V when blower motor is OFF, replace BCM. Refer to [BCS-17, "Removal and Installation of BCM"](#) .

## 12. CHECK SELF-DIAGNOSTIC RESULT

Perform self-diagnosis. Refer to [ATC-55, "A/C System Self-diagnosis Function"](#)

### OK or NG

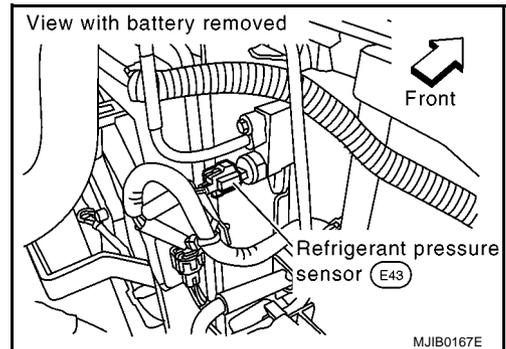
OK >> Inspection End.

NG >> Refer to [ATC-56, "SELF-DIAGNOSIS CODE CHART"](#) .

## COMPONENT INSPECTION

### Refrigerant Pressure Sensor

The refrigerant pressure sensor is attached to the condenser.



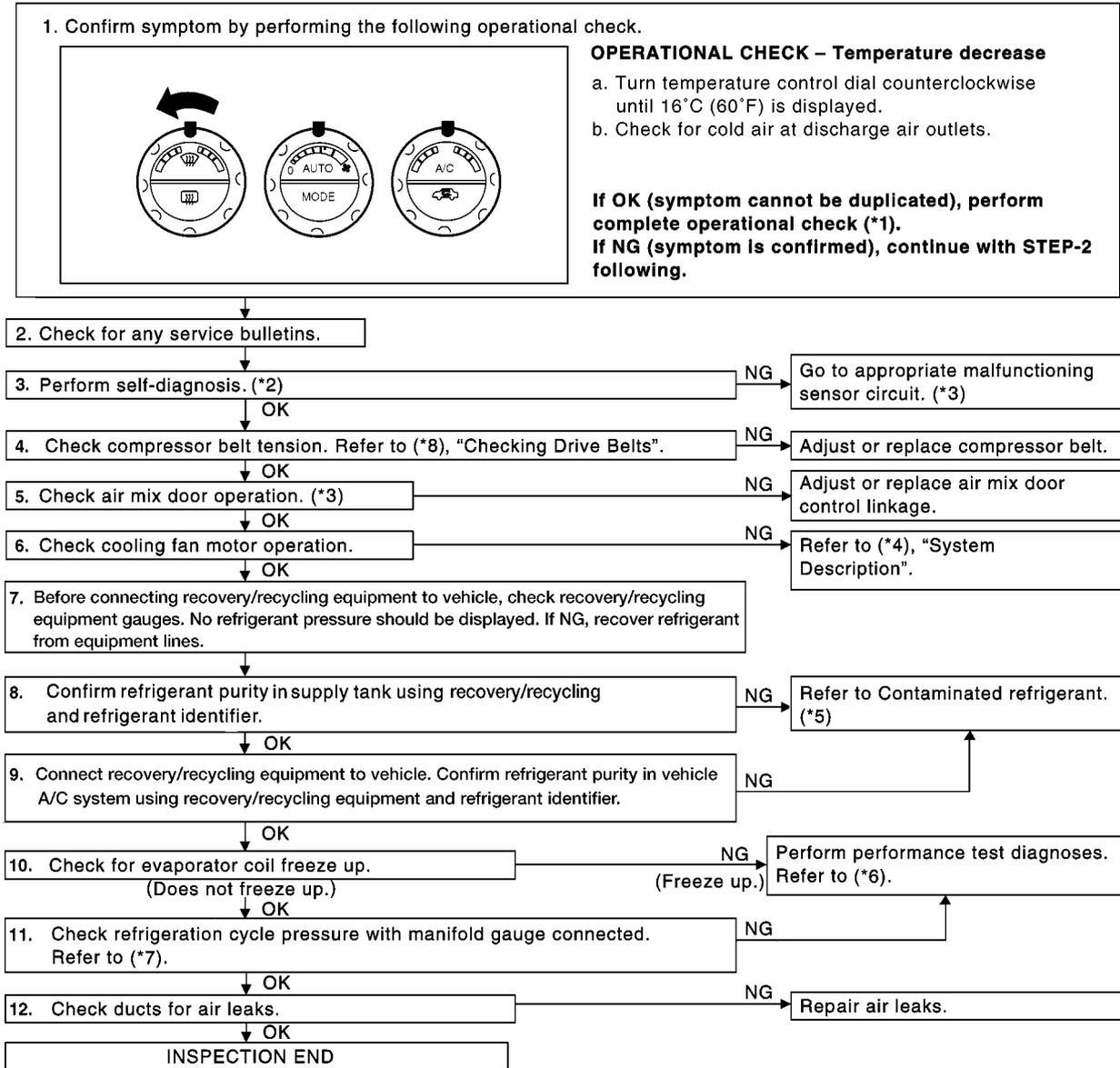
# TROUBLE DIAGNOSIS

EJS006BR

## Insufficient Cooling

SYMPTOM: Insufficient cooling

### INSPECTION FLOW



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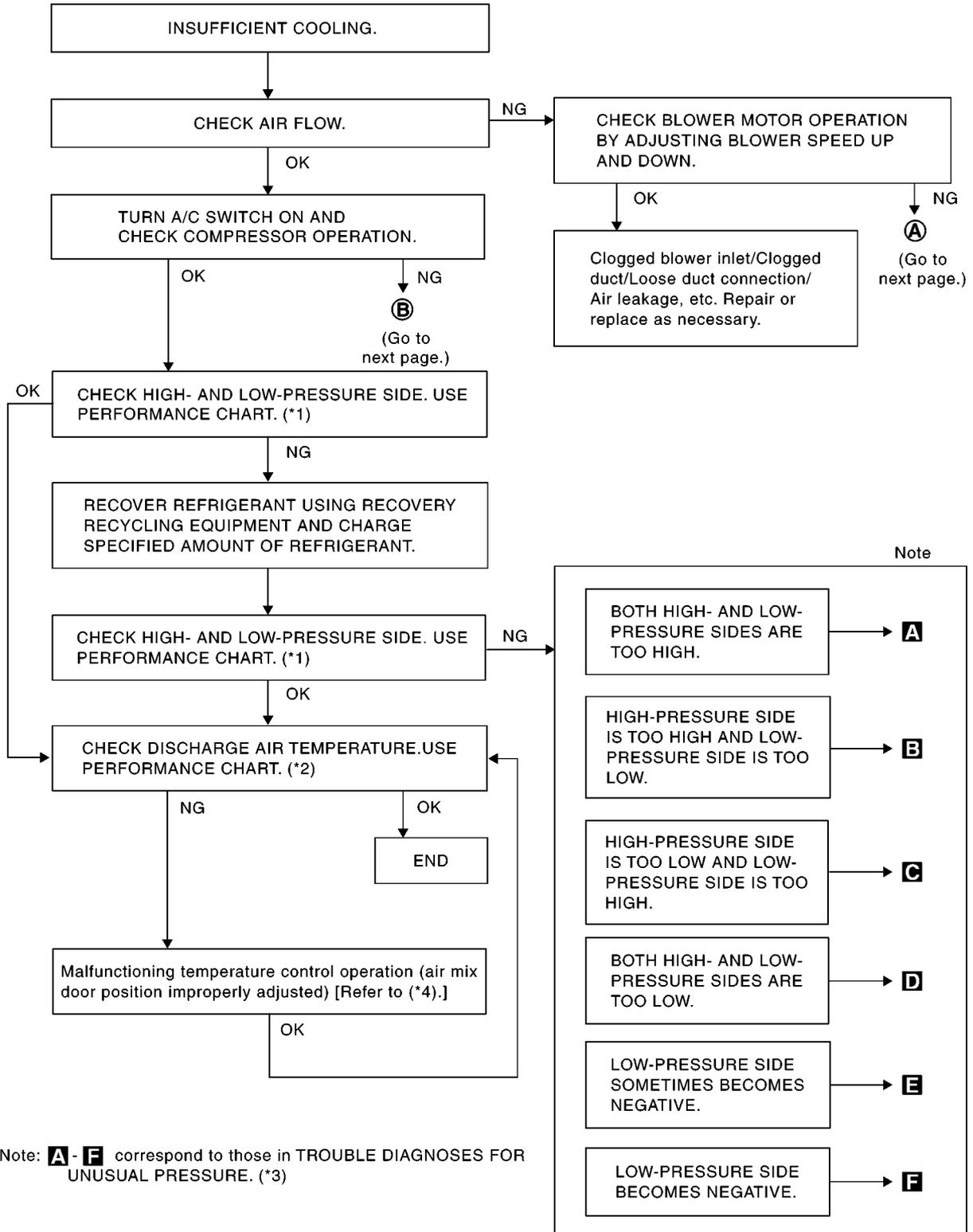
ATC

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- \*1 [ATC-57. "Operational Check".](#)
- \*2 [ATC-55. "A/C System Self-diagnosis Function".](#)
- \*3 [ATC-56. "SELF-DIAGNOSIS CODE CHART".](#)
- \*4 [EC-18. "SYSTEM DESCRIPTION".](#)
- \*5 [ATC-4. "Contaminated Refrigerant".](#)
- \*6 [ATC-94. "PERFORMANCE TEST DIAGNOSES".](#)
- \*7 [ATC-96. "Test Reading".](#)
- \*8 [EM-12. "Checking Drive Belts".](#)

# TROUBLE DIAGNOSIS

## PERFORMANCE TEST DIAGNOSES



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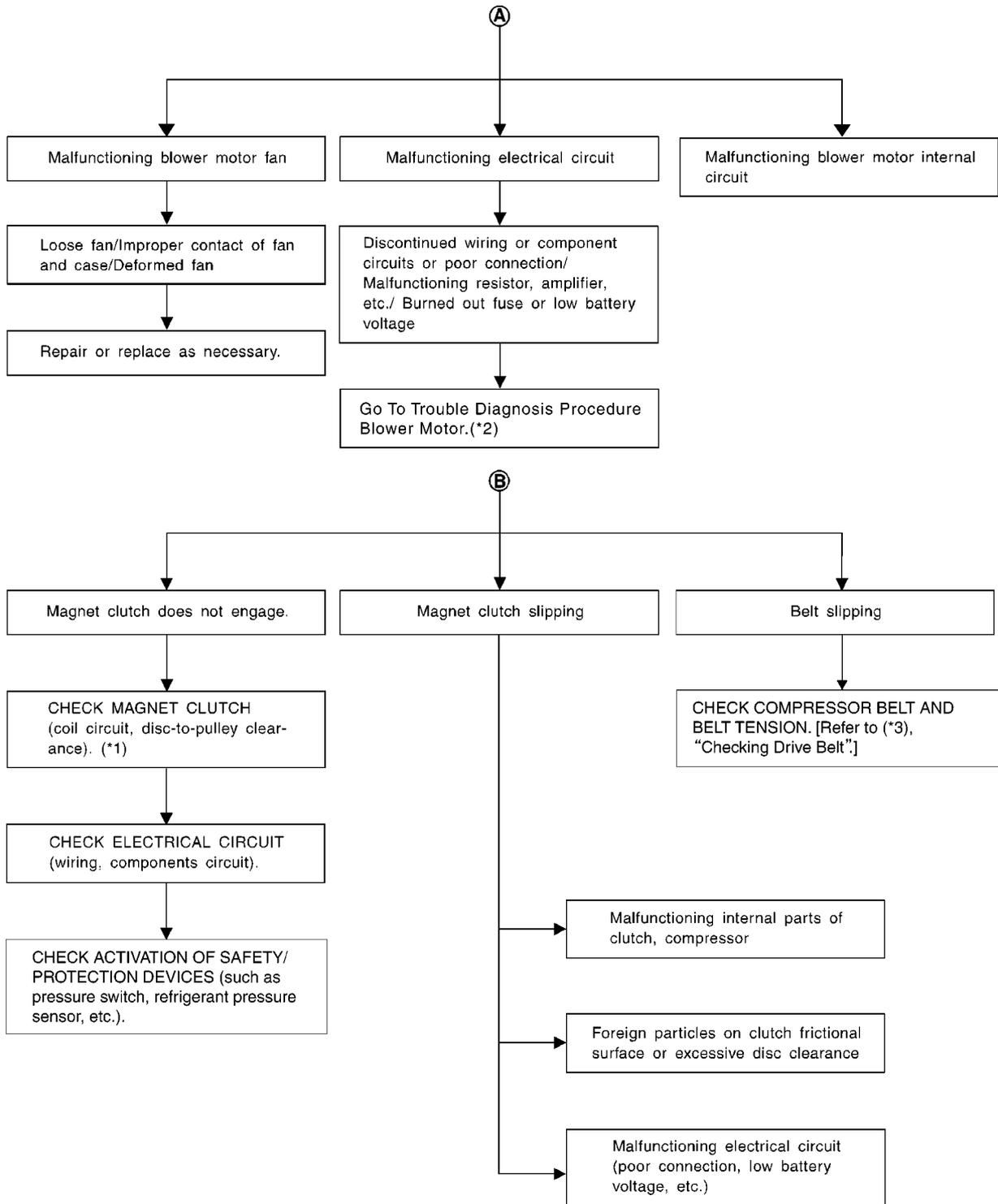
\*1 [ATC-96, "PERFORMANCE CHART"](#).

\*2 [ATC-96, "PERFORMANCE CHART"](#).

\*3 [ATC-97, "Trouble Diagnoses for Unusual Pressure"](#).

\*4 [ATC-68, "Air Mix Door Motor Circuit"](#).

# TROUBLE DIAGNOSIS



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\*1 [ATC-143, "Removal and Installation for Compressor Clutch".](#)

\*2 [ATC-80, "Blower Motor Circuit".](#)

\*3 [EM-12, "Checking Drive Belts".](#)

# TROUBLE DIAGNOSIS

## PERFORMANCE CHART

### Test Condition

Testing must be performed as follows:

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

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

### Test Reading

#### 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)	
40 - 60	20 (68)	9.6 - 12.0 (49 - 54)
	25 (77)	13.6 - 16.5 (56 - 62)
	30 (86)	18.0 - 21.4 (64 - 71)
	35 (95)	22.8 - 26.7 (73 - 80)
60 - 80	20 (68)	12.0 - 14.3 (54 - 58)
	25 (77)	16.5 - 19.3 (62 - 67)
	30 (86)	21.4 - 24.8 (71 - 77)
	35 (95)	26.7 - 30.5 (80 - 87)

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

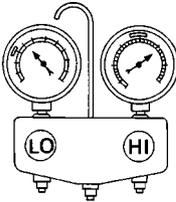
Ambient air		High-pressure (Discharge side) kPa (kg/cm <sup>2</sup> , psi)	Low-pressure (Suction side) kPa (kg/cm <sup>2</sup> , psi)
Relative humidity %	Air temperature °C (°F)		
40 - 60	20 (68)	1,090 - 1,210 (11.11 - 12.33, 158.0 - 175.4)	220 - 240 (2.24 - 2.45, 31.9 - 34.8)
	25 (77)	1,370 - 1,520 (13.97 - 15.49, 198.6 - 220.3)	280 - 310 (2.85 - 3.16, 40.6 - 44.9)
	30 (86)	1,610 - 1,790 (16.41 - 18.25, 233.4 - 259.5)	330 - 370 (3.36 - 3.77, 47.8 - 53.6)
	35 (95)	1,940 - 2,150 (19.78 - 21.92, 281.2 - 311.7)	390 - 430 (3.98 - 4.38, 56.5 - 62.3)
60 - 80	20 (68)	1,210 - 1,330 (12.33 - 13.56, 175.4 - 192.8)	240 - 260 (2.45 - 2.65, 34.8 - 37.7)
	25 (77)	1,520 - 1,670 (15.49 - 17.02, 220.3 - 242.1)	310 - 340 (3.16 - 3.47, 44.9 - 49.3)
	30 (86)	1,790 - 1,970 (18.25 - 20.08, 259.5 - 285.6)	370 - 410 (3.77 - 4.18, 53.6 - 59.4)
	35 (95)	2,150 - 2,370 (21.92 - 24.16, 311.7 - 343.5)	430 - 470 (4.38 - 4.79, 62.3 - 68.1)

# TROUBLE DIAGNOSIS

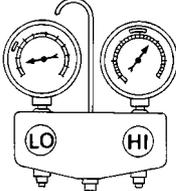
## TROUBLE DIAGNOSES FOR UNUSUAL PRESSURE

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

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

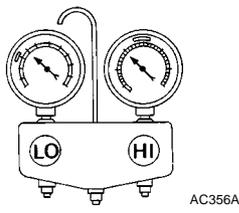
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Both high- and low-pressure sides are too high.</p>  <p>AC359A</p>	Pressure is reduced soon after water is splashed on condenser.	Excessive refrigerant charge in refrigeration cycle	Reduce refrigerant until specified pressure is obtained.
	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 if 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 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> ↓ Improper expansion valve adjustment	Replace expansion valve.

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

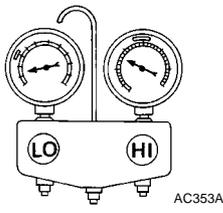
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>High-pressure side is too high and low-pressure side is too low.</p>  <p>AC360A</p>	Upper side of condenser and high-pressure side are hot, however, liquid tank is not so hot.	High-pressure tube or parts located between compressor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

# TROUBLE DIAGNOSIS

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

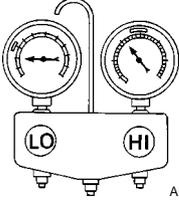
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
High-pressure side is too low and low-pressure side is too high. 	High- and low-pressure sides become equal soon after compressor operation stops.	Compressor pressure operation is improper. ↓ Damaged inside compressor packings.	Replace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

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

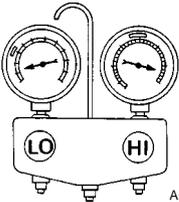
Gauge indication	Refrigerant cycle	Probable cause	Corrective action
Both high- and low-pressure sides are too low. 	<ul style="list-style-type: none"> <li>There is a big temperature difference between liquid tank outlet and inlet. Outlet temperature is extremely low.</li> <li>Liquid tank inlet and expansion valve are frosted.</li> </ul>	Liquid tank inside is slightly clogged.	<ul style="list-style-type: none"> <li>Replace liquid tank.</li> <li>Check lubricant for contamination.</li> </ul>
	<ul style="list-style-type: none"> <li>Temperature of expansion valve inlet is extremely low as compared with areas near liquid tank.</li> <li>Expansion valve inlet may be frosted.</li> <li>Temperature difference occurs somewhere in high-pressure side.</li> </ul>	High-pressure pipe located between liquid tank 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 system for leaks. Refer to <a href="#">ATC-150, "Checking for Refrigerant Leaks"</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 expansion 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 too low.	Evaporator is frozen.	<ul style="list-style-type: none"> <li>Check intake sensor circuit. Refer to <a href="#">ATC-114, "Intake Sensor Circuit"</a> .</li> <li>Replace compressor.</li> <li>Repair evaporator fins.</li> <li>Replace evaporator.</li> <li>Refer to <a href="#">ATC-80, "Blower Motor Circuit"</a> .</li> </ul>

# TROUBLE DIAGNOSIS

## Low-pressure Side Sometimes Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side sometimes becomes negative.</p>  <p style="text-align: right; font-size: small;">AC354A</p>	<ul style="list-style-type: none"> <li>● Air conditioning system does not function and does not cyclically cool the compartment air.</li> <li>● The system constantly functions for a certain period of time after compressor is stopped and restarted.</li> </ul>	<p>Refrigerant does not discharge cyclically.</p> <p>↓</p> <p>Moisture is frozen at expansion valve outlet and inlet.</p> <p>↓</p> <p>Water is mixed with refrigerant.</p>	<ul style="list-style-type: none"> <li>● Drain water from refrigerant or replace refrigerant.</li> <li>● Replace liquid tank.</li> </ul>

## Low-pressure Side Becomes Negative

Gauge indication	Refrigerant cycle	Probable cause	Corrective action
<p>Low-pressure side becomes negative.</p>  <p style="text-align: right; font-size: small;">AC362A</p>	<p>Liquid tank or front/rear side of expansion valve's pipe is frosted or dewed.</p>	<p>High-pressure side is closed and refrigerant does not flow.</p> <p>↓</p> <p>Expansion valve or liquid tank is frosted.</p>	<p>Leave the system at rest until no frost is present. Start it again to check whether or not the malfunction is caused by water or foreign particles.</p> <ul style="list-style-type: none"> <li>● If water is the cause, initially cooling is okay. Then the water freezes causing a blockage. Drain water from refrigerant or replace refrigerant.</li> <li>● If due to foreign particles, remove expansion valve and remove the particles with dry and compressed air (not shop air).</li> <li>● If either of the above methods cannot correct the malfunction, replace expansion valve.</li> <li>● Replace liquid tank.</li> <li>● Check lubricant for contamination.</li> </ul>

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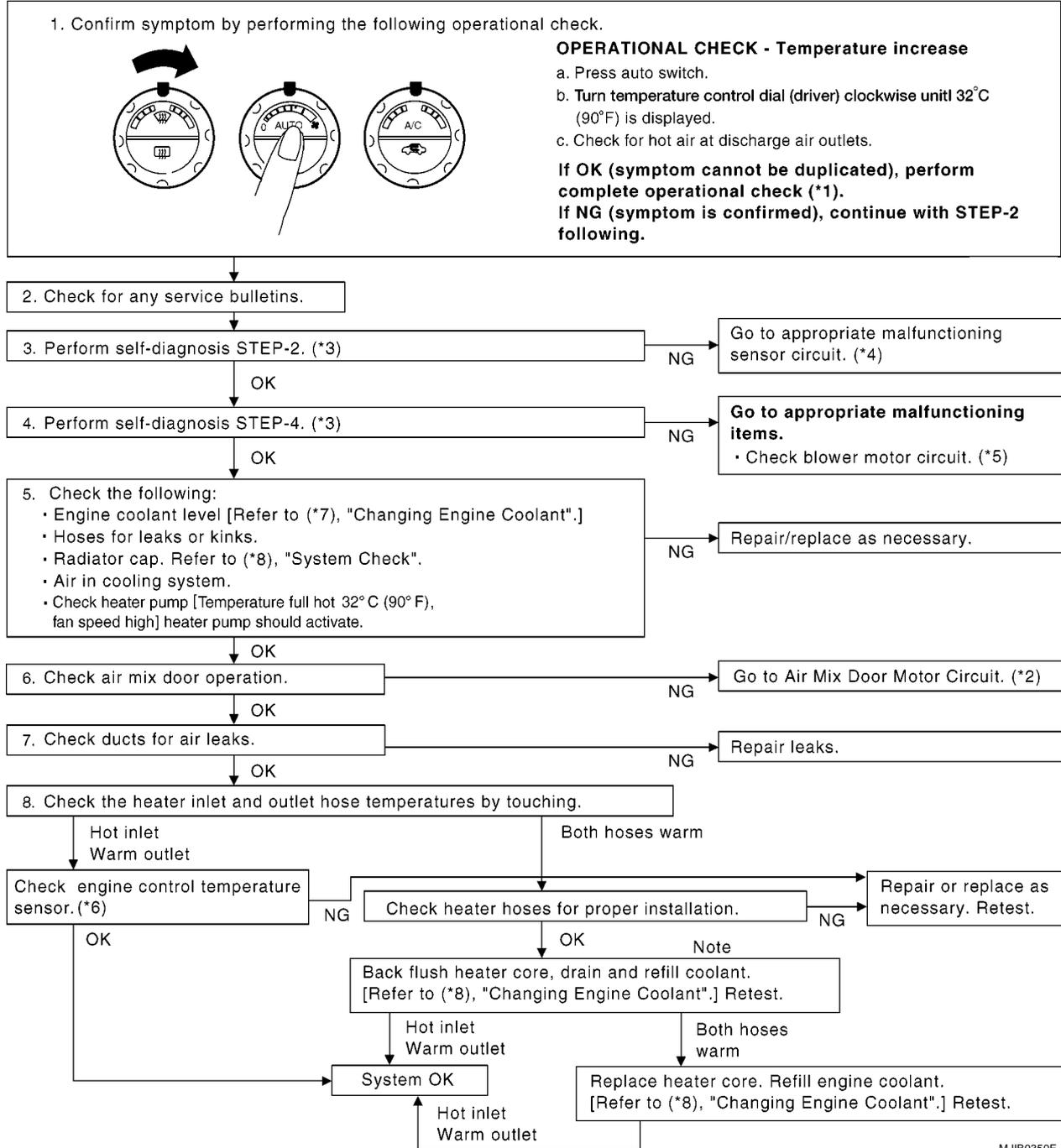
# TROUBLE DIAGNOSIS

EJS006BS

## Insufficient Heating

SYMPTOM: Insufficient heating

### INSPECTION FLOW



MJIB0350E

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

\*2 [ATC-68. "Air Mix Door Motor Circuit".](#)

\*3 [ATC-55. "A/C System Self-diagnosis Function".](#)

\*4 [ATC-55. "A/C System Self-diagnosis Function".](#)

\*5 [ATC-80. "Blower Motor Circuit".](#)

\*6 [EC-103. "DTC P0117, P0118 ECT SENSOR".](#)

\*7 [CO-7. "Changing Engine Coolant".](#)

\*8 [CO-13. "Checking Reservoir Tank Cap".](#)

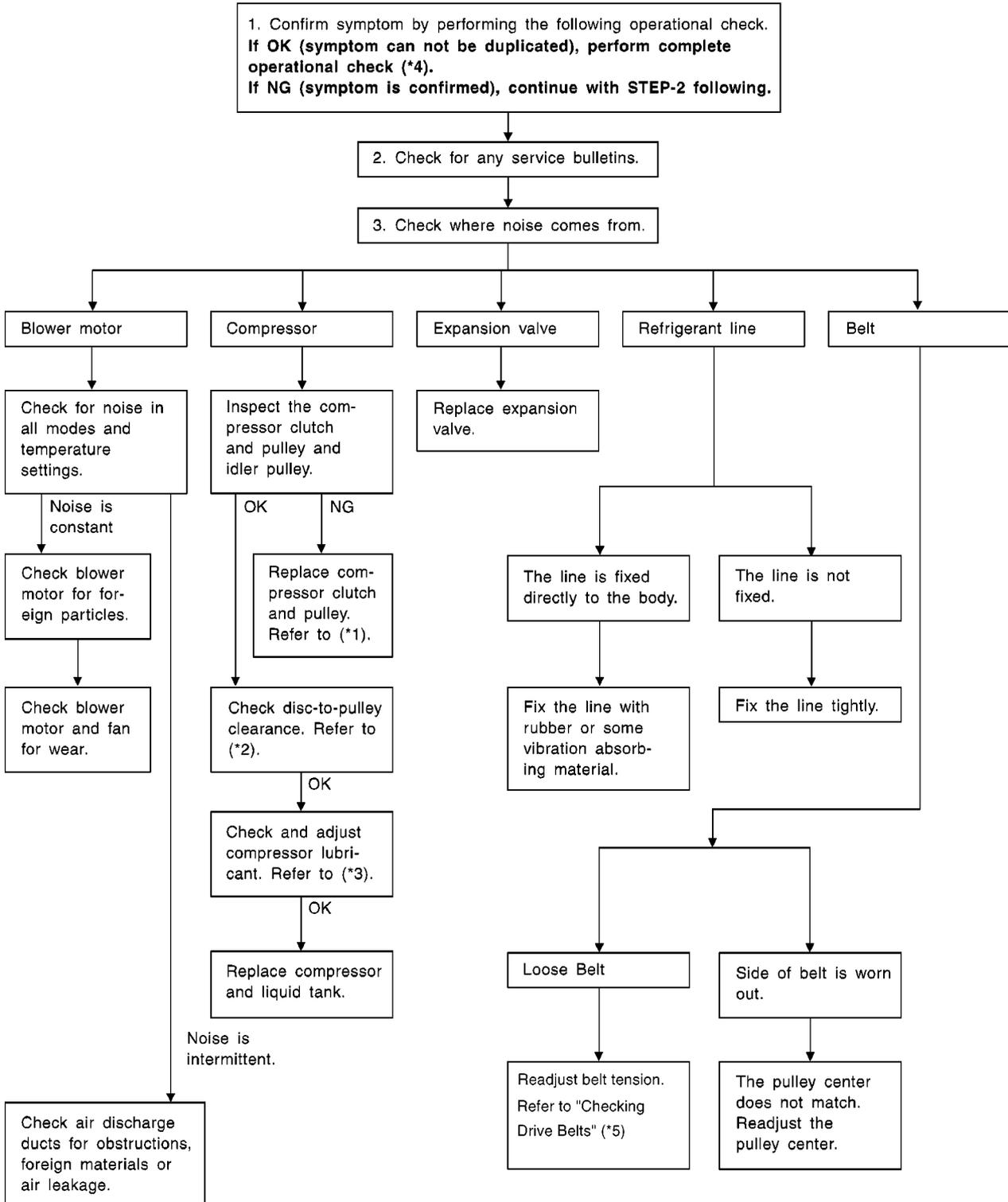
# TROUBLE DIAGNOSIS

EJS006BT

## Noise

SYMPTOM: Noise

### INSPECTION FLOW



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ATC

## TROUBLE DIAGNOSIS

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\*1 [ATC-143, "REMOVAL"](#).

\*2 [ATC-144, "INSTALLATION"](#).

\*3 [ATC-24, "Maintenance of Lubricant  
Quantity in Compressor"](#).

\*4 [ATC-57, "Operational Check"](#).

\*5 [EM-12, "Checking Drive Belts"](#).

# TROUBLE DIAGNOSIS

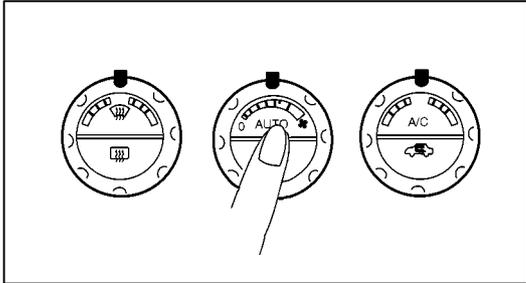
EJS006BU

## Self-diagnosis

SYMPTOM: Self-diagnosis cannot be performed.

### INSPECTION FLOW

1. Confirm symptom by performing operational check.



**OPERATIONAL CHECK – AUTO mode**

a. Press AUTO switch.  
b. Display should indicate AUTO.  
(Discharge air and blower speed will depend on ambient, in-vehicle and set temperatures.)

**If OK (symptom cannot be duplicated), perform complete operational check (\*7).**  
**If NG (symptom is confirmed), continue with STEP-2 following.**

2. Check for any service bulletins.

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

OK Cause cannot be confirmed by self-diagnosis.

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

OK

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

OK

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

OK

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

OK

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

OK

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

NO

Replace front air control.

YES

Go to Trouble Diagnosis for related symptom.

**Another symptom exists.**

INSPECTION END

MJIB0351E

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

\*2 [ATC-105, "Ambient Sensor Circuit"](#).

\*3 [ATC-108, "In-vehicle Sensor Circuit"](#).

\*4 [ATC-112, "Optical Sensor Circuit"](#).

\*5 [ATC-114, "Intake Sensor Circuit"](#).

\*6 [ATC-68, "Air Mix Door Motor Circuit"](#).

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

\*8 [ATC-35, "SYMPTOM TABLE"](#).

# TROUBLE DIAGNOSIS

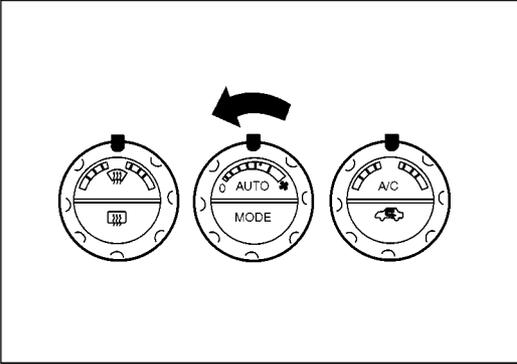
EJS006BV

## Memory Function

SYMPTOM: Memory function does not operate.

### INSPECTION FLOW

1. Confirm symptom by performing the following operational check.

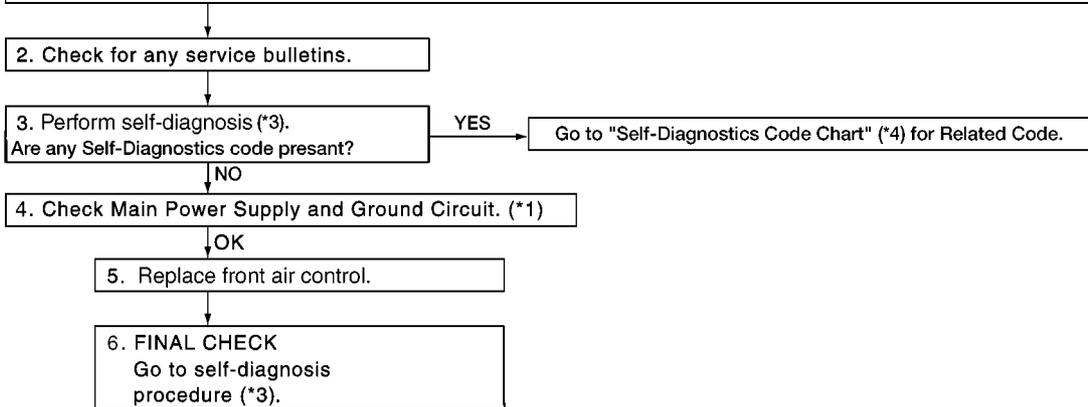


#### OPERATIONAL CHECK – Memory function

- Set the temperature to 32°C (90°F).
- Rotate the blower control dial (driver side) to turn system off.
- Turn the ignition off.
- Turn the ignition on.
- Press the AUTO switch.
- Confirm that the set temperature remains at previous temperature.
- Press OFF switch.

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

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



MJIB0332E

\*1 [ATC-60. "Power Supply and Ground Circuit for Front Air Control".](#)

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

\*3 [ATC-55. "A/C System Self-diagnosis Function".](#)

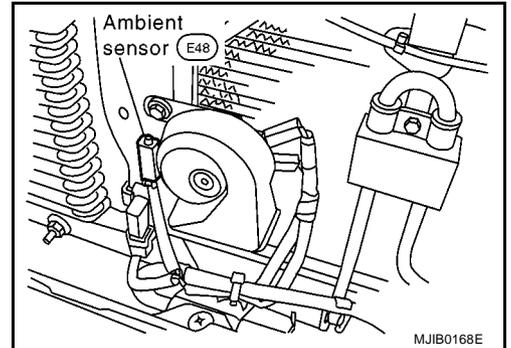
# TROUBLE DIAGNOSIS

EJS006BW

## Ambient Sensor Circuit COMPONENT DESCRIPTION

### Ambient Sensor

Ambient sensor is attached to the radiator core support (left side). It detects ambient temperature and converts it into a resistance value which is then input into the front air control.



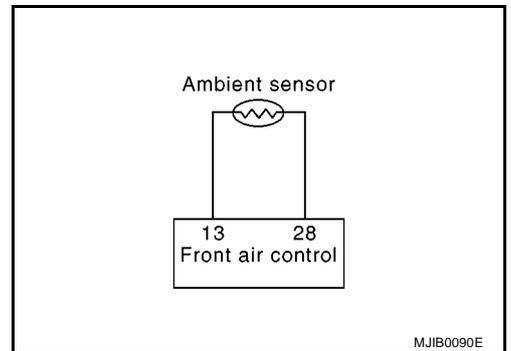
### AMBIENT TEMPERATURE INPUT PROCESS

The front air control includes a processing circuit for ambient sensor input. However, when the temperature detected by ambient sensor increases quickly, the processing circuit retards the front air control function. It only allows the front air control to recognize an ambient temperature increase of 0.33°C (0.6°F) per 100 seconds.

This prevents constant adjustments due to momentary conditions, such as stopping after high speed driving. Although the actual ambient temperature has not changed, the temperature detected by ambient sensor will increase. This is because the heat from the engine compartment can radiate to the front grille area, location of ambient sensor.

### DIAGNOSTIC PROCEDURE FOR AMBIENT SENSOR

SYMPTOM: Ambient sensor circuit is open or shorted. (40 or 41 is indicated on front air control as a result of conducting the front air control self-diagnosis)



## 1. CHECK VOLTAGE BETWEEN AMBIENT SENSOR AND GROUND

1. Disconnect ambient sensor connector.
2. Turn ignition switch ON.
3. Check voltage between ambient sensor harness connector E48 terminal 4 and ground.

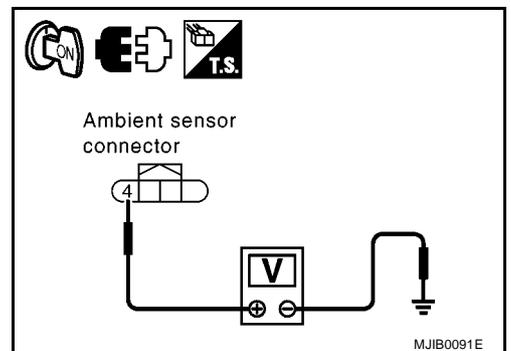
**4 - Ground**

**: Approx. 5V**

OK or NG

OK >> GO TO 2.

NG >> GO TO 4.



# TROUBLE DIAGNOSIS

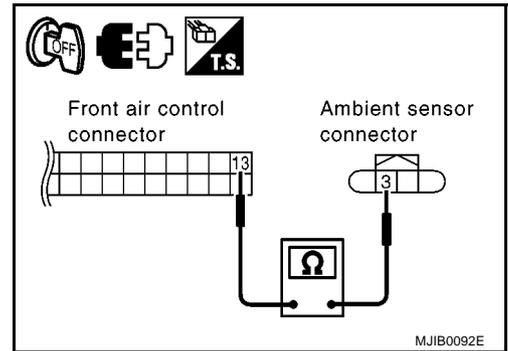
## 2. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E48 terminal 3 and front air control harness connector M60 terminal 13.

**3 - 13** : Continuity should exist.

OK or NG

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



## 3. CHECK AMBIENT SENSOR

Refer to [ATC-107, "Ambient Sensor"](#).

OK or NG

- OK >> 1. Replace front air control.  
2. Go to self-diagnosis [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.
- NG >> 1. Replace ambient sensor.  
2. Go to self-diagnosis [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.

## 4. CHECK CIRCUIT CONTINUITY BETWEEN AMBIENT SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between ambient sensor harness connector E48 terminal 4 and front air control harness connector M61 terminal 28.

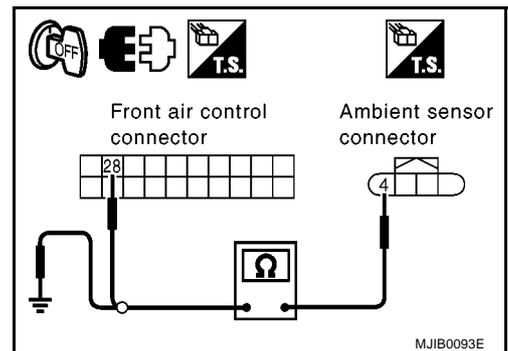
**4 - 28** : Continuity should exist.

4. Check continuity between ambient sensor harness connector E48 terminal 4 and ground.

**4 - Ground** : Continuity should not exist.

OK or NG

- OK >> 1. Replace front air control.  
2. Go to self-diagnosis [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.
- NG >> Repair harness or connector.



# TROUBLE DIAGNOSIS

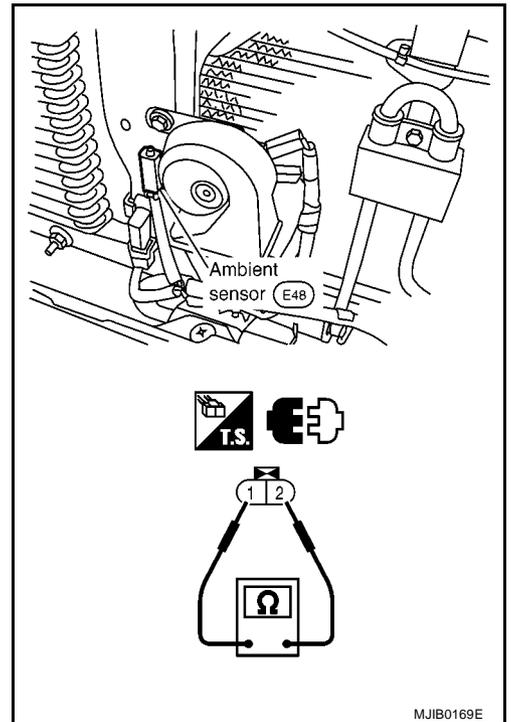
## COMPONENT INSPECTION

### Ambient Sensor

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

Temperature °C (°F)	Resistance k $\Omega$
0 (32)	9.39
20 (68)	3.51
35 (95)	1.80
40 (104)	1.46

If NG, replace ambient sensor .



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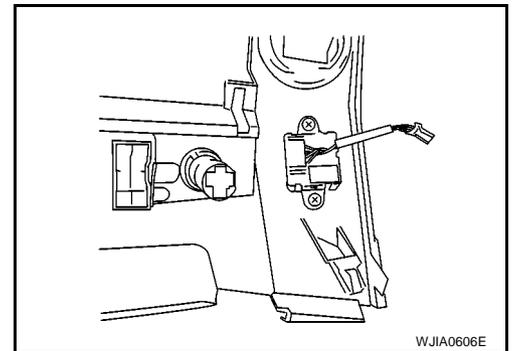
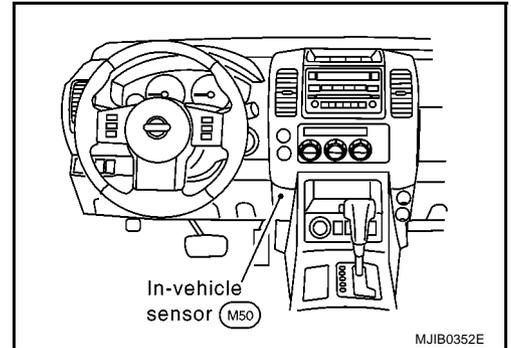
# TROUBLE DIAGNOSIS

## In-vehicle Sensor Circuit COMPONENT DESCRIPTION

EJS006BX

### In-vehicle Sensor

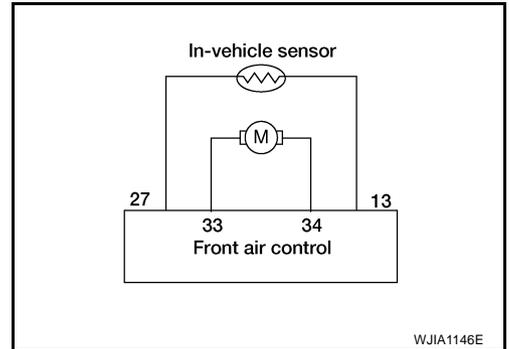
The in-vehicle sensor is located on instrument lower driver panel. It converts variations in temperature of passenger compartment air (drawn in through the integrated fan) into a resistance value. It is then input into the front air control.



# TROUBLE DIAGNOSIS

## DIAGNOSTIC PROCEDURE FOR IN-VEHICLE SENSOR

SYMPTOM: In-vehicle sensor circuit is open or shorted. (44 or 46 is indicated on front air control as a result of conducting self-diagnosis.)



### 1. CHECK IN-VEHICLE SENSOR CIRCUIT

Are diagnostic codes 44 or 46 present?

YES or NO

- YES >> GO TO 6.
- NO >> GO TO 2.

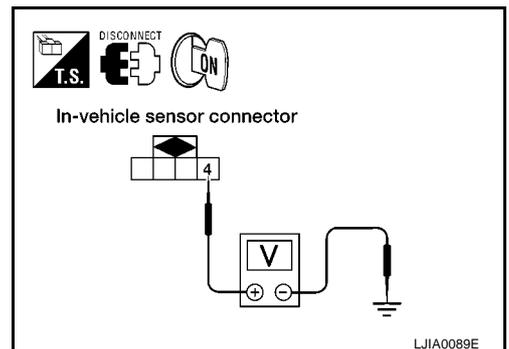
### 2. CHECK VOLTAGE BETWEEN IN-VEHICLE SENSOR AND GROUND

1. Turn ignition switch OFF.
2. Disconnect in-vehicle sensor connector.
3. Turn ignition switch ON.
4. Check voltage between in-vehicle sensor harness connector M50 terminal 4 and ground.

**4 - Ground : Approx. 5V.**

OK or NG

- OK >> GO TO 3.
- NG >> GO TO 5.



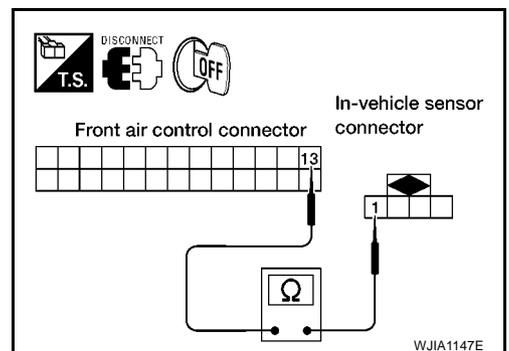
### 3. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector M60.
3. Check continuity between in-vehicle sensor harness connector M50 terminal 1 and front air control harness connector M60 terminal 13.

**1 - 13 : Continuity should exist.**

OK or NG

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



### 4. CHECK IN-VEHICLE SENSOR

Refer to [ATC-111, "In-vehicle Sensor"](#) .

OK or NG

- OK >> 1. Replace front air control.  
2. Go to [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.
- NG >> 1. Replace in-vehicle sensor.  
2. Go to [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.

# TROUBLE DIAGNOSIS

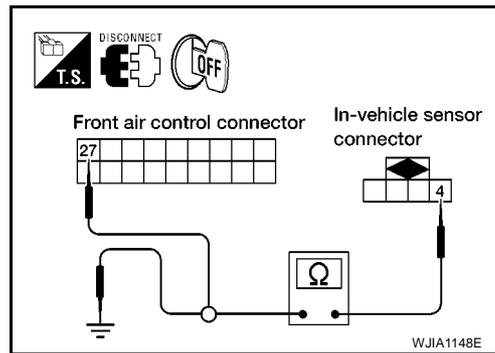
## 5. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between in-vehicle sensor harness connector M50 terminal 4 and front air control harness connector M61 terminal 27.

**4 - 27** : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M50 terminal 4 and ground.

**4 - Ground** : Continuity should not exist.



### OK or NG

OK >> 1. Replace front air control.

2. Go to self-diagnosis [ATC-55. "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.

NG >> Repair harness or connector.

## 6. CHECK CIRCUIT CONTINUITY BETWEEN IN-VEHICLE SENSOR MOTOR AND FRONT AIR CONTROL (SELF-DIAGNOSIS CODES 44 OR 46)

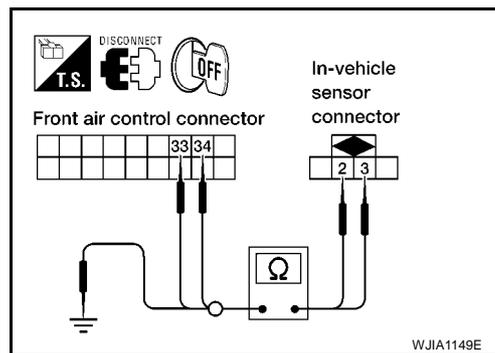
1. Turn ignition switch OFF.
2. Disconnect front air control connector and in-vehicle sensor connector.
3. Check continuity between in-vehicle sensor harness connector M50 terminal 2 and 3 and front air control harness connector M61 terminal 34 and 33.

**2 - 34** : Continuity should exist.

**3 - 33** : Continuity should exist.

4. Check continuity between in-vehicle sensor harness connector M50 terminal 2 and 3 and ground.

**2, 3 - Ground** : Continuity should not exist.



### OK or NG

OK >> 1. Replace front air control.

2. Go to [ATC-55. "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.

NG >> Repair harness or connector.

# TROUBLE DIAGNOSIS

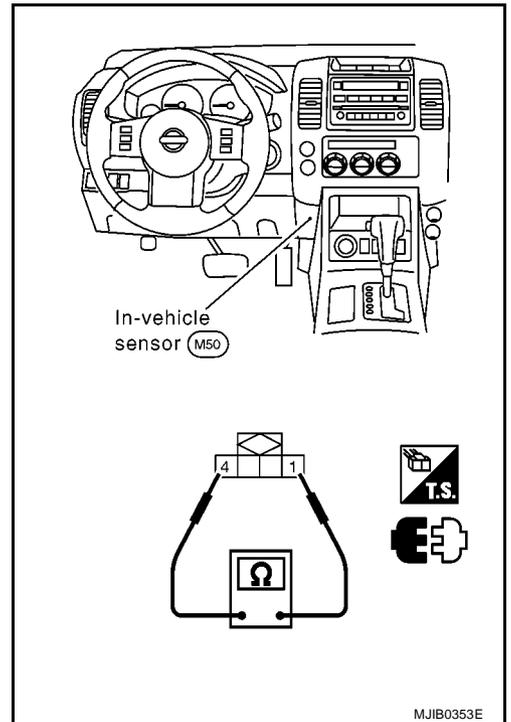
## COMPONENT INSPECTION

### In-vehicle Sensor

After disconnecting in-vehicle sensor connector, measure resistance between terminals 1 and 4 at sensor component side, using the table below.

Temperature °C (°F)	Resistance kΩ
-15 (5)	21.40
-10 (14)	16.15
-5 (23)	12.29
0 (32)	9.41
5 (41)	7.27
10 (50)	5.66
15 (59)	4.45
20 (68)	3.51
25 (77)	2.79
30 (86)	2.24
35 (95)	1.80
40 (104)	1.45
45 (113)	1.18

If NG, replace in-vehicle sensor.



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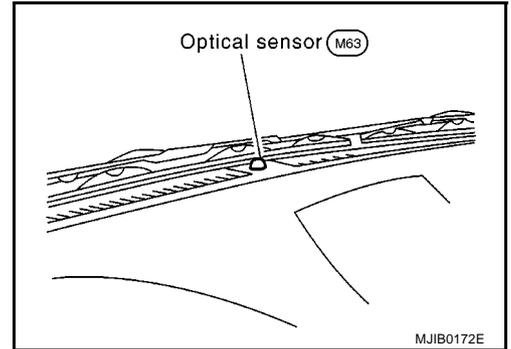
K  
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M

# TROUBLE DIAGNOSIS

EJS006BY

## Optical Sensor Circuit COMPONENT DESCRIPTION

The optical sensor is located in the center of the 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 front air control.



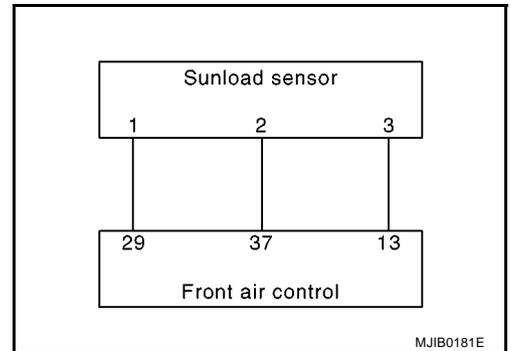
## OPTICAL INPUT PROCESS

The front air control includes a processing circuit which averages the variations in detected sunload over a period of time. This prevents adjustments 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 optical sensor will vary whenever the trees obstruct the sunlight. The processing circuit averages the detected sunload over a period of time, so that the (insignificant) effect of the trees momentarily obstructing the sunlight does not cause any change in the ATC system operation. On the other hand, shortly after entering a long tunnel, the system will recognize the change in sunload, and the system will react accordingly.

## DIAGNOSTIC PROCEDURE FOR SUNLOAD SENSOR

SYMPTOM: Sunload sensor circuit is open or shorted. (44 or 46 is indicated on front air control as a result of conducting self-diagnosis).



## 1. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND FRONT AIR CONTROL

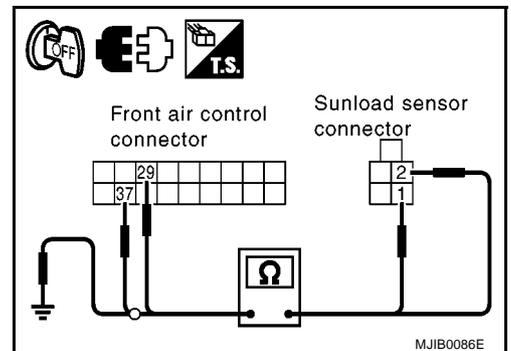
1. Turn ignition switch OFF.
2. Disconnect front air control connector and sunload sensor connector.
3. Check continuity between sunload sensor harness connector M63 terminal 1 and 2 and front air control harness connector M61 terminal 29 and 37.

**1 - 29** : Continuity should exist.

**2 - 37** : Continuity should exist.

4. Check continuity between sunload sensor harness connector M63 terminal 1 and 2 and ground.

**1, 2 - Ground.** : Continuity should not exist.



OK or NG

OK >> GO TO 2.

NG >> Repair harness or connector.

# TROUBLE DIAGNOSIS

## 2. CHECK CIRCUIT CONTINUITY BETWEEN SUNLOAD SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector and sunload sensor connector.
3. Check continuity between sunload sensor harness connector M63 terminal 3 and front air control harness connector M60 terminal 13.

**3 - 13** : **Continuity should exist.**

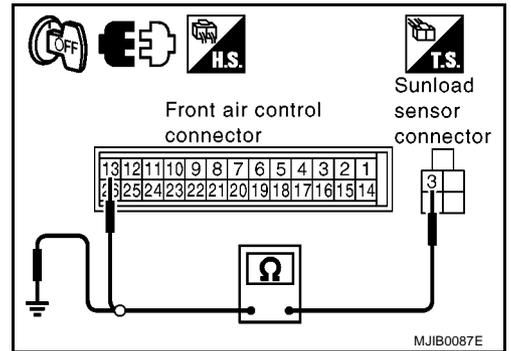
4. Check continuity between sunload sensor harness connector M63 terminal 3 and ground.

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

OK or NG

OK >> Replace sunload sensor.

NG >> Repair harness or connector.



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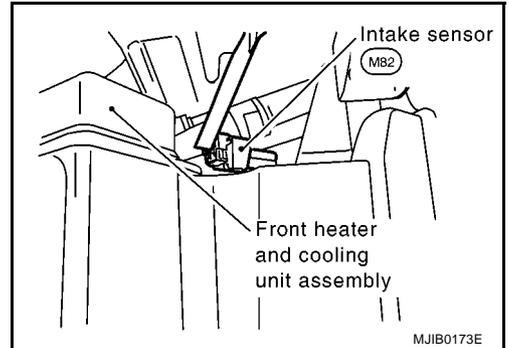
# TROUBLE DIAGNOSIS

EJS006BZ

## Intake Sensor Circuit COMPONENT DESCRIPTION

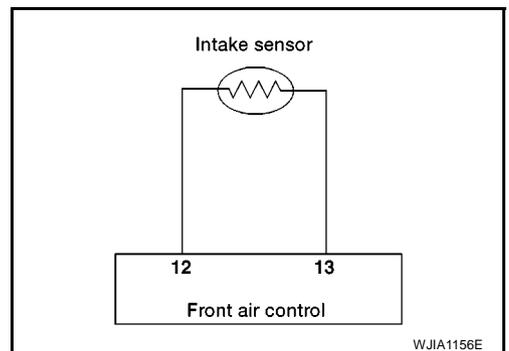
### Intake Sensor

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 front air control.



## DIAGNOSTIC PROCEDURE FOR INTAKE SENSOR

SYMPTOM: Intake sensor circuit is open or shorted. (56 or 57 is indicated on front air control as a result of conducting Self-diagnosis.)



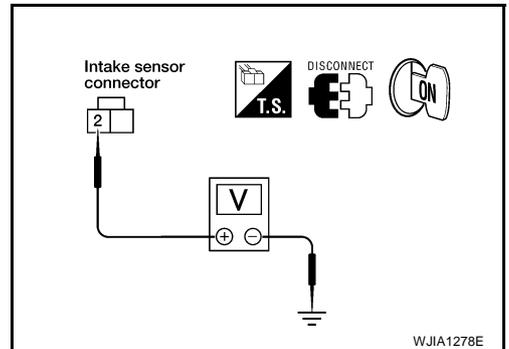
### 1. CHECK VOLTAGE BETWEEN INTAKE SENSOR AND GROUND

1. Disconnect intake sensor connector.
2. Turn ignition switch ON.
3. Check voltage between intake sensor harness connector M82 terminal 2 and ground.

**2 - Ground : Approx. 5V**

OK or NG

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



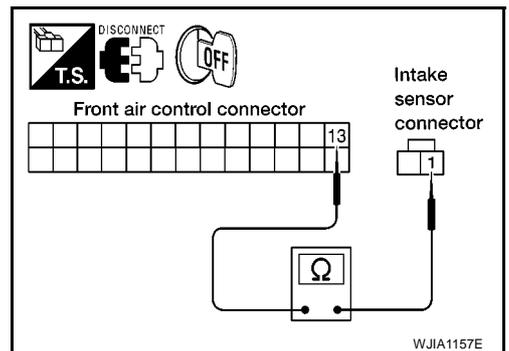
### 2. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

1. Turn ignition switch OFF.
2. Disconnect front air control connector.
3. Check continuity between intake sensor harness connector M82 terminal 1 and front air control harness connector M60 terminal 13.

**1 - 13 : Continuity should exist.**

OK or NG

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



# TROUBLE DIAGNOSIS

## 3. CHECK INTAKE SENSOR

Refer to [ATC-115, "Intake Sensor"](#) .

OK or NG

- OK >> 1. Replace front air control.  
 2. Go to self-diagnosis [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.
- NG >> 1. Replace intake sensor.  
 2. Go to self-diagnosis [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.

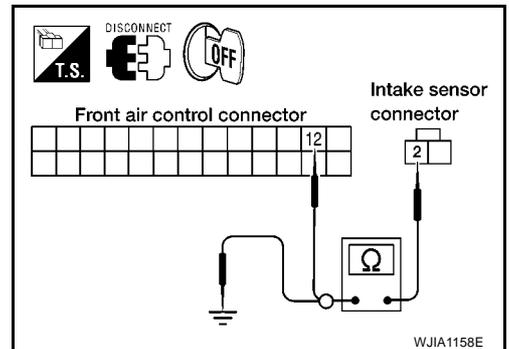
## 4. CHECK CIRCUIT CONTINUITY BETWEEN INTAKE SENSOR AND FRONT AIR CONTROL

- Turn ignition switch OFF.
- Disconnect front air control connector.
- Check continuity between intake sensor harness connector M82 terminal 2 and front air control harness connector M60 terminal 12.

**2 - 12 : Continuity should exist.**

- Check continuity between intake sensor harness connector M82 terminal 2 and ground.

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



OK or NG

- OK >> 1. Replace front air control.  
 2. Go to self-diagnosis [ATC-55, "A/C System Self-diagnosis Function"](#) and perform self-diagnosis.
- NG >> Repair harness or connector.

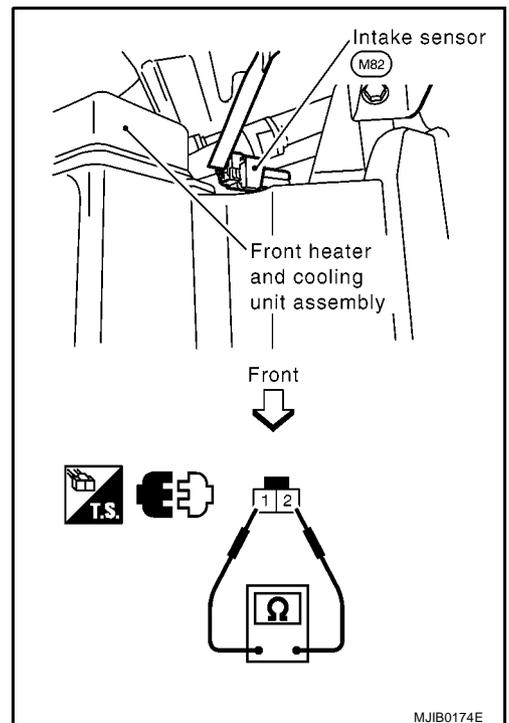
## COMPONENT INSPECTION

### Intake Sensor

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

Temperature °C (°F)	Resistance kΩ
-15 (5)	209.8
-10 (14)	160.3
-5 (23)	123.4
0 (32)	95.8
5 (41)	74.9
10 (50)	59.0
15 (59)	46.8
20 (68)	37.4
25 (77)	30.0
30 (86)	24.2
35 (95)	19.7
40 (104)	16.1
45 (113)	13.2

If NG, replace intake sensor.



# CONTROL UNIT

## CONTROL UNIT

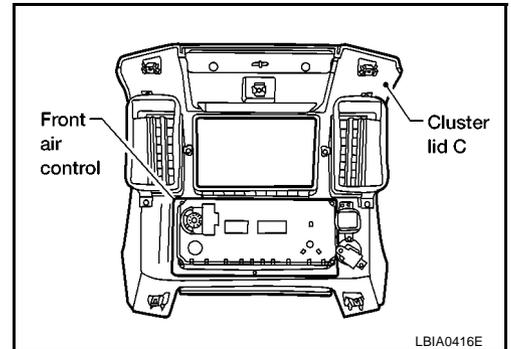
PFP:27500

### Removal and Installation

#### REMOVAL

EJS006C0

1. Remove cluster lid C. Refer to [IP-11, "CLUSTER LID C"](#) .
2. Remove the four screws securing the front air control to cluster lid C.
3. Remove the front air control.



#### INSTALLATION

Installation is in the reverse order of removal.

# AMBIENT SENSOR

## AMBIENT SENSOR

PFP:27722

### Removal and Installation

EJS006C1

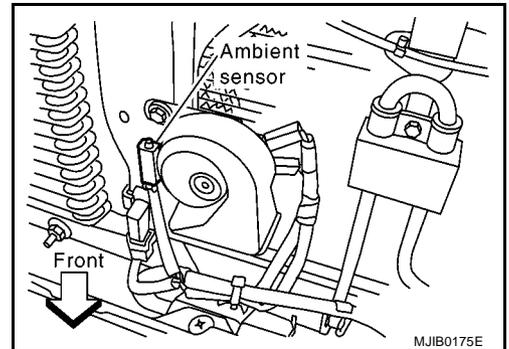
#### REMOVAL

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

**NOTE:**

The ambient sensor is located behind the front bumper, in front of the condenser.

3. Release the ambient sensor clip and then remove the ambient sensor.



#### INSTALLATION

Installation is in the reverse order of removal.

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# IN-VEHICLE SENSOR

## IN-VEHICLE SENSOR

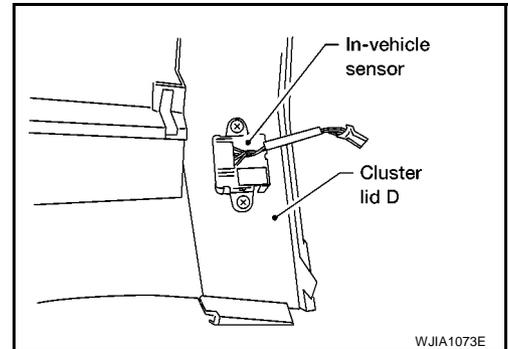
PFP:27720

### Removal and Installation

EJS006C2

#### REMOVAL

1. Remove the cluster lid D. Refer to [IP-12, "CLUSTER LID D"](#) .
2. Remove the two screws and remove the in-vehicle sensor.



#### INSTALLATION

Installation is in the reverse order of removal.

# OPTICAL SENSOR

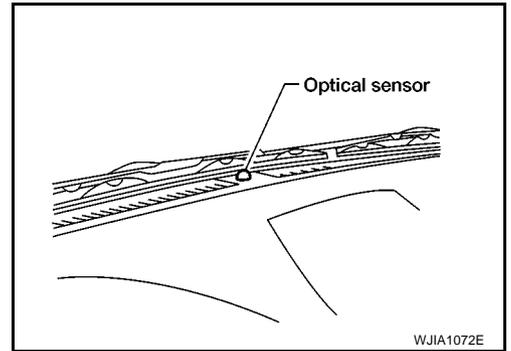
## OPTICAL SENSOR

PFP:28576

### Removal and Installation

EJS006C3

The optical sensor is located in the top center of the instrument panel.



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# INTAKE SENSOR

## INTAKE SENSOR

PFP:27723

### Removal and Installation

EJS006C4

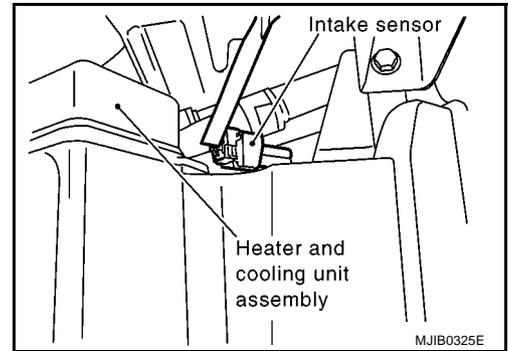
#### REMOVAL

1. Remove the front kick plate.
2. Remove the instrument panel side finisher.
3. Remove the glove box.
4. Remove the front pillar finisher.
5. Remove the upper glove box (cluster lid E).
6. Disconnect the intake sensor electrical connector.

#### NOTE:

The intake sensor is located on the top of the heater and cooling unit assembly next to the A/C evaporator cover.

7. Twist the intake sensor to remove the intake sensor from the heater and cooling unit assembly.



#### INSTALLATION

Installation is in the reverse order of removal.

# BLOWER MOTOR

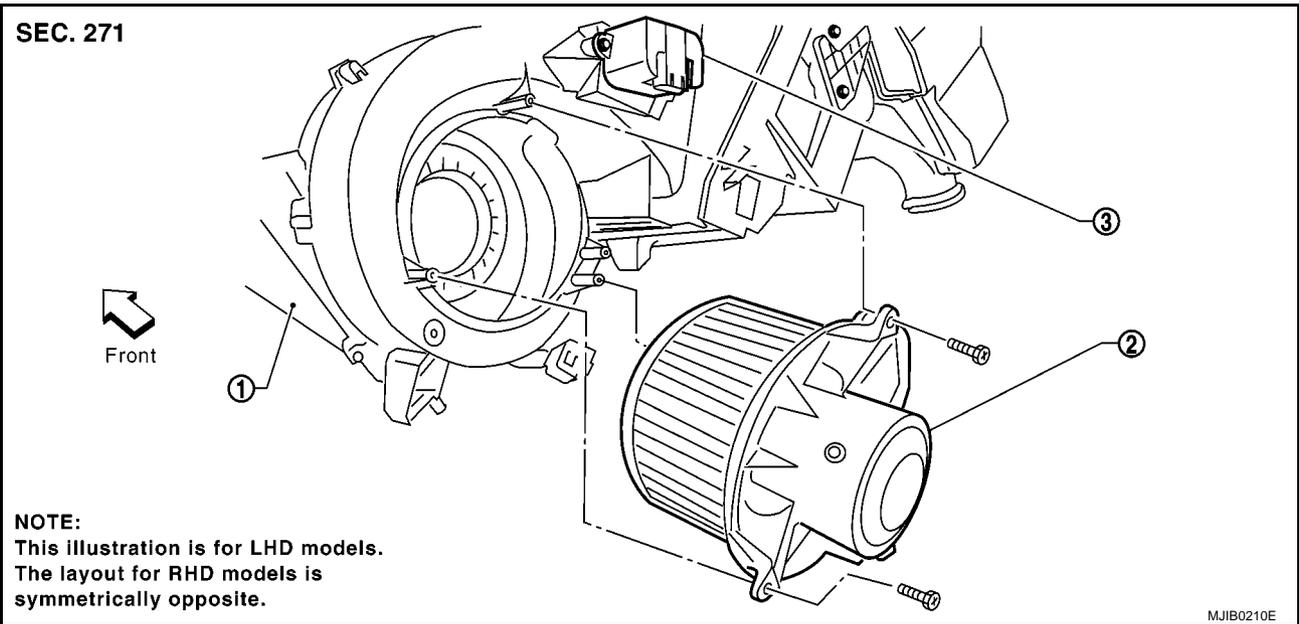
## BLOWER MOTOR

PFP:27226

### Components

EJS006C5

SEC. 271



1. Heater and cooling unit assembly

2. Blower motor

3. Variable blower control

## Removal and Installation

### REMOVAL

1. Remove the lower glove box assembly. Refer to [IP-10, "Removal and Installation"](#).
2. Disconnect the blower motor electrical connector.
3. Remove the three screws and remove the blower motor.

### INSTALLATION

Installation is in the reverse order of removal.

EJS006C6

ATC

# AIR CONDITIONER FILTER

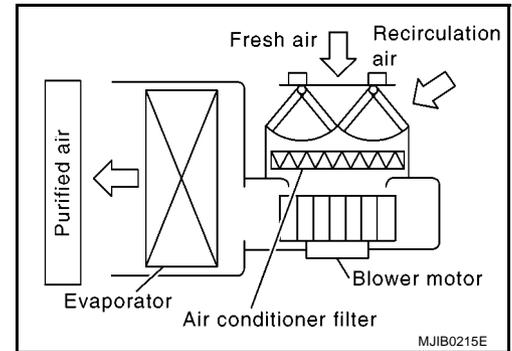
## AIR CONDITIONER FILTER

PFP:27277

### Removal and Installation FUNCTION

EJS006C7

The air inside the passenger compartment is filtered by the air conditioner filters when the heater or A/C controls are set on either the recirculation or fresh mode. The two air conditioner filters are located in the heater and cooling unit assembly.

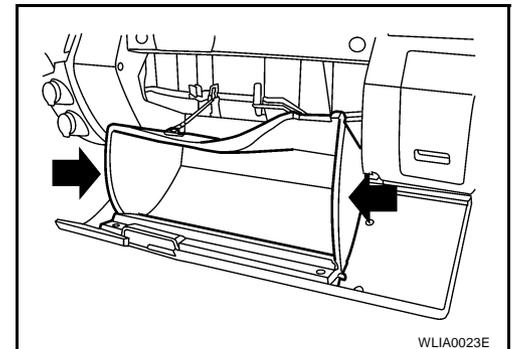


### REPLACEMENT TIMING

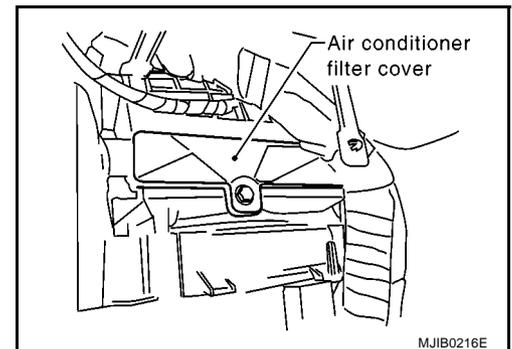
Replacement of the two air conditioner filters is recommended on a regular interval depending on the driving conditions. Refer to [MA-8, "PERIODIC MAINTENANCE"](#) . It may also be necessary to replace the two air conditioner filters as part of a component replacement if the air conditioner filters are damaged.

### REPLACEMENT PROCEDURE

1. Remove the RH lower dash side finisher. Refer to [EI-33, "BODY SIDE TRIM"](#) .
2. Remove the front pillar lower finisher. Refer to [EI-33, "BODY SIDE TRIM"](#) .
3. Remove the lower glove box.
  - a. Remove the two lower glove box lower screws.
  - b. Open the lower glove box, then remove the two lower glove box upper screws.
  - c. Disconnect the two upper clips and remove the lower glove box from the instrument panel to access the air conditioner filter cover.



4. Remove the screw and remove the air conditioner filter cover.
5. Remove the air conditioner filters from the heater and cooling unit housing.

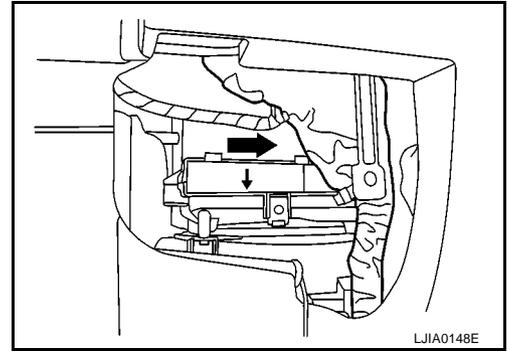


## AIR CONDITIONER FILTER

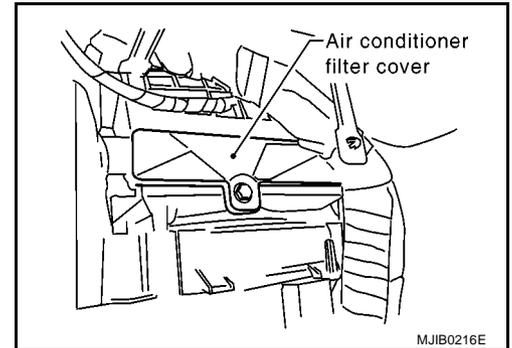
6. Insert the first new air conditioner filter into the heater and cooling unit housing and slide it over to the right. Insert the second new air conditioner filter into the heater and cooling unit housing.

**NOTE:**

The air conditioner filters are marked with air flow arrows. The end of the microfilter with the arrow should face the rear of the vehicle. The arrows should point downward.



7. Install the air conditioner filter cover.



8. Install the lower glove box in reverse order of removal.

**Lower glove box lower screws** : 3.3 N·m (0.34 kg-m, 29 in-lb)

**Lower glove box upper screws** : 3.3 N·m (0.34 kg-m, 29 in-lb)

**NOTE:**

- Use the two tabs at the bottom of the lower glove box to align the lower glove box for installation.
- The clips at the top of the lower glove box must be fully seated before installing the lower glove box upper and lower screws.

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# HEATER & COOLING UNIT ASSEMBLY

## HEATER & COOLING UNIT ASSEMBLY

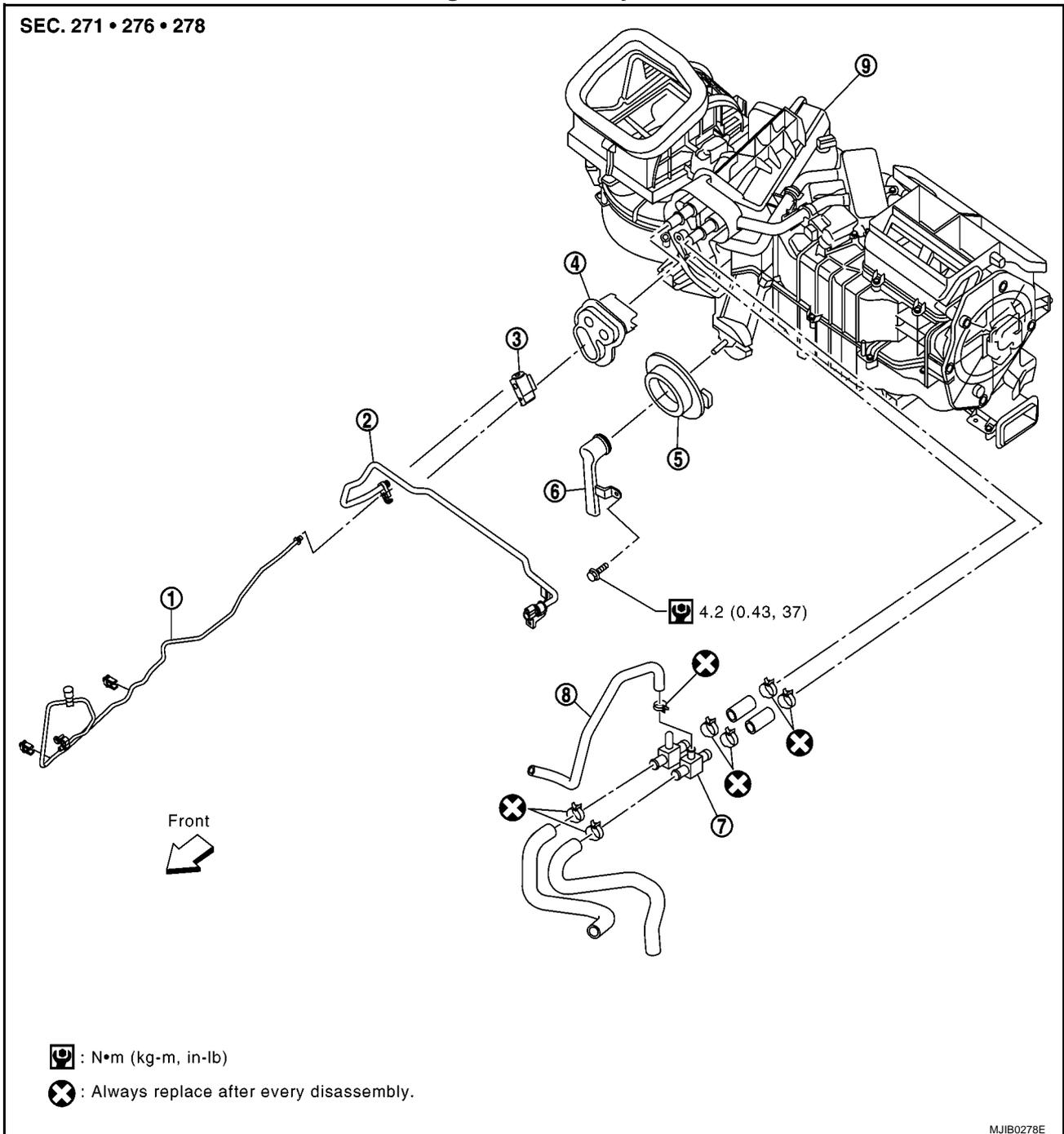
PF27110

### Components

EJS006C8

### Heater and Cooling Unit Assembly —LHD Models—

SEC. 271 • 276 • 278



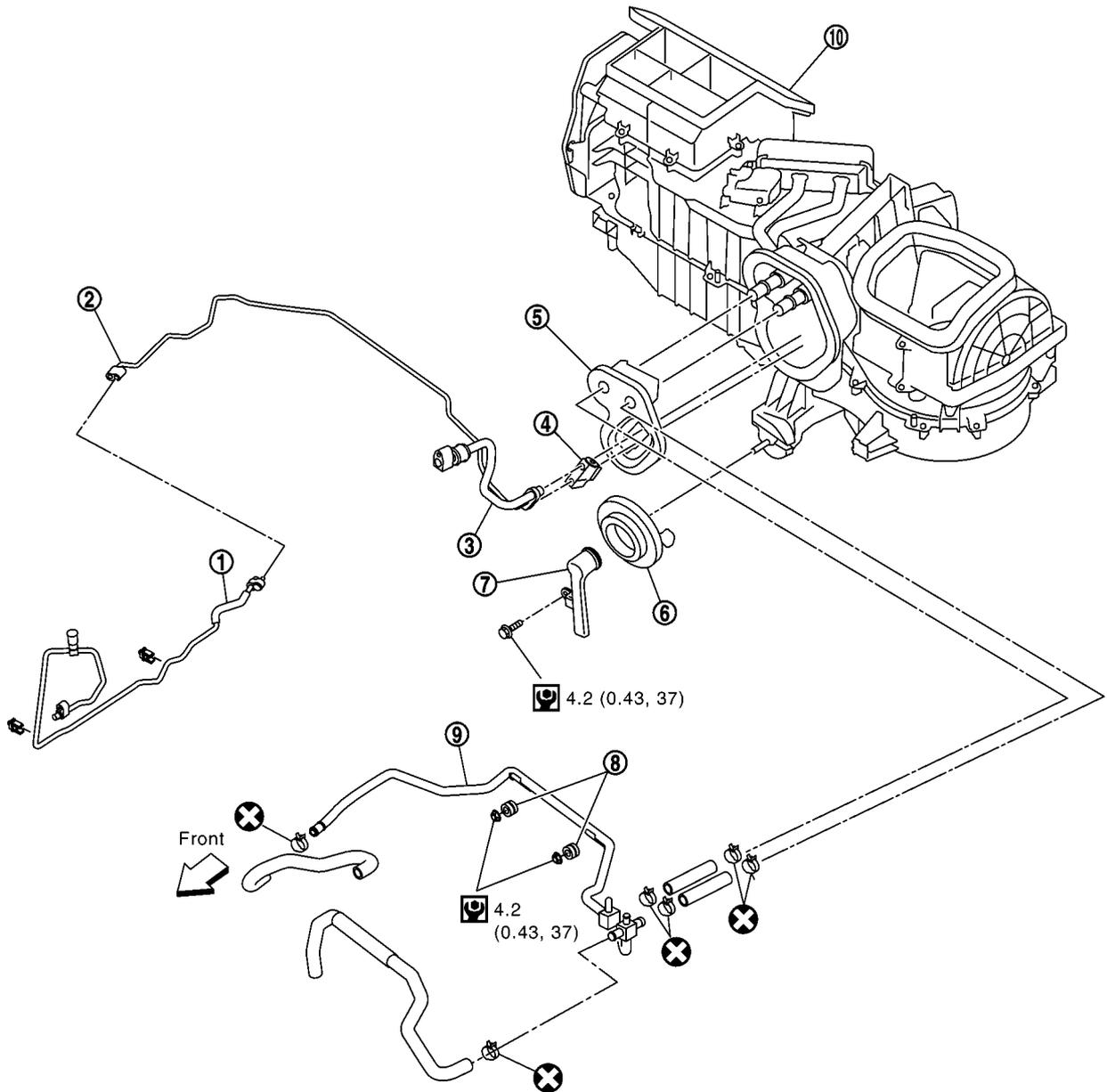
MJIB0278E

- |   |                           |                                     |
|---|---------------------------|-------------------------------------|
| 1. High-pressure A/C pipe                   | 2. Low-pressure A/C pipe  | 3. Expansion valve                  |
| 4. Heater core and evaporator pipes grommet | 5. A/C drain hose grommet | 6. A/C drain hose                   |
| 7. Heater core pipes                        | 8. Coolant reservoir hose | 9. Heater and cooling unit assembly |

# HEATER & COOLING UNIT ASSEMBLY

## Heater and Cooling Unit Assembly —RHD Models—

SEC. 271 • 276 • 278



: N·m (kg-m, in-lb)

: Always replace after every disassembly.

MJIB0279E

- |                                      |                                     |                           |
|--------------------------------------|-------------------------------------|---------------------------|
| 1. High-pressure A/C pipe A          | 2. High-pressure A/C pipe B         | 3. Low-pressure A/C pipe  |
| 4. Expansion valve                   | 5. Heater core and evaporator pipes | 6. A/C drain hose grommet |
| 7. A/C drain hose                    | 8. Heater core pipe mounts          | 9. Heater core pipes      |
| 10. Heater and cooling unit assembly |                                     |                           |

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ATC  
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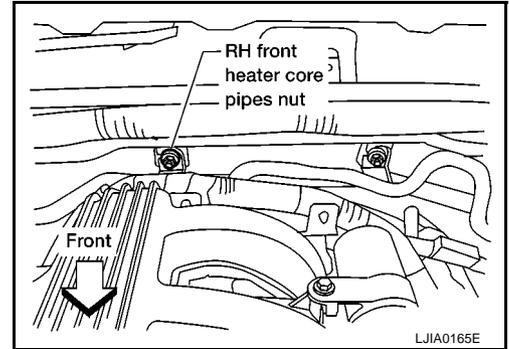
# HEATER & COOLING UNIT ASSEMBLY

EJS006C9

## Removal and Installation

### REMOVAL

1. Discharge the refrigerant from the A/C system. Refer to [ATC-138, "Discharging Refrigerant"](#) .
2. Drain the coolant from the engine cooling system. Refer to [CO-8, "DRAINING ENGINE COOLANT"](#) .
3. Remove the heater core pipes RH nut.
4. Disconnect the heater core hoses from the heater core.
5. Disconnect the high- and low-pressure A/C pipes from the expansion valve.
6. Move the two front seats to the rearmost position on the seat track.
7. Remove the instrument panel and console panel. Refer to [IP-10, "Removal and Installation"](#) .
8. Remove the two front floor ducts.
9. Remove the steering column. Refer to [PS-10, "Removal and Installation"](#) .
10. Disconnect the instrument panel wire harness at the RH and LH in-line connector brackets, and the fuse block (SMJ) electrical connectors. Refer to [PG-38, "Harness Layout"](#) .
11. Remove the covers then remove the three steering member bolts from each side to disconnect the steering member from the vehicle body.
12. Remove the heater and cooling unit assembly with it attached to the steering member, from the vehicle.



### CAUTION:

- Use care not to damage the seats and interior trim panels when removing the heater and cooling unit assembly with it attached to the steering member.
- Use suitable plugs on the heater core pipes to prevent coolant leakage.

13. Remove the heater and cooling unit assembly from the steering member.

### INSTALLATION

Installation is in the reverse order of removal.

### CAUTION:

- Replace the O-ring of the low-pressure A/C pipe and high-pressure A/C pipe with a new one, and apply compressor oil to the O-ring for installation.
- After charging the refrigerant, check for leaks. Refer to [ATC-150, "Checking for Refrigerant Leaks"](#) .

### NOTE:

- Fill the engine cooling system with the specified coolant mixture. Refer to [CO-8, "REFILLING ENGINE COOLANT"](#) .
- Recharge the A/C system. Refer to [ATC-138, "Evacuating System and Charging Refrigerant"](#) .

# HEATER CORE

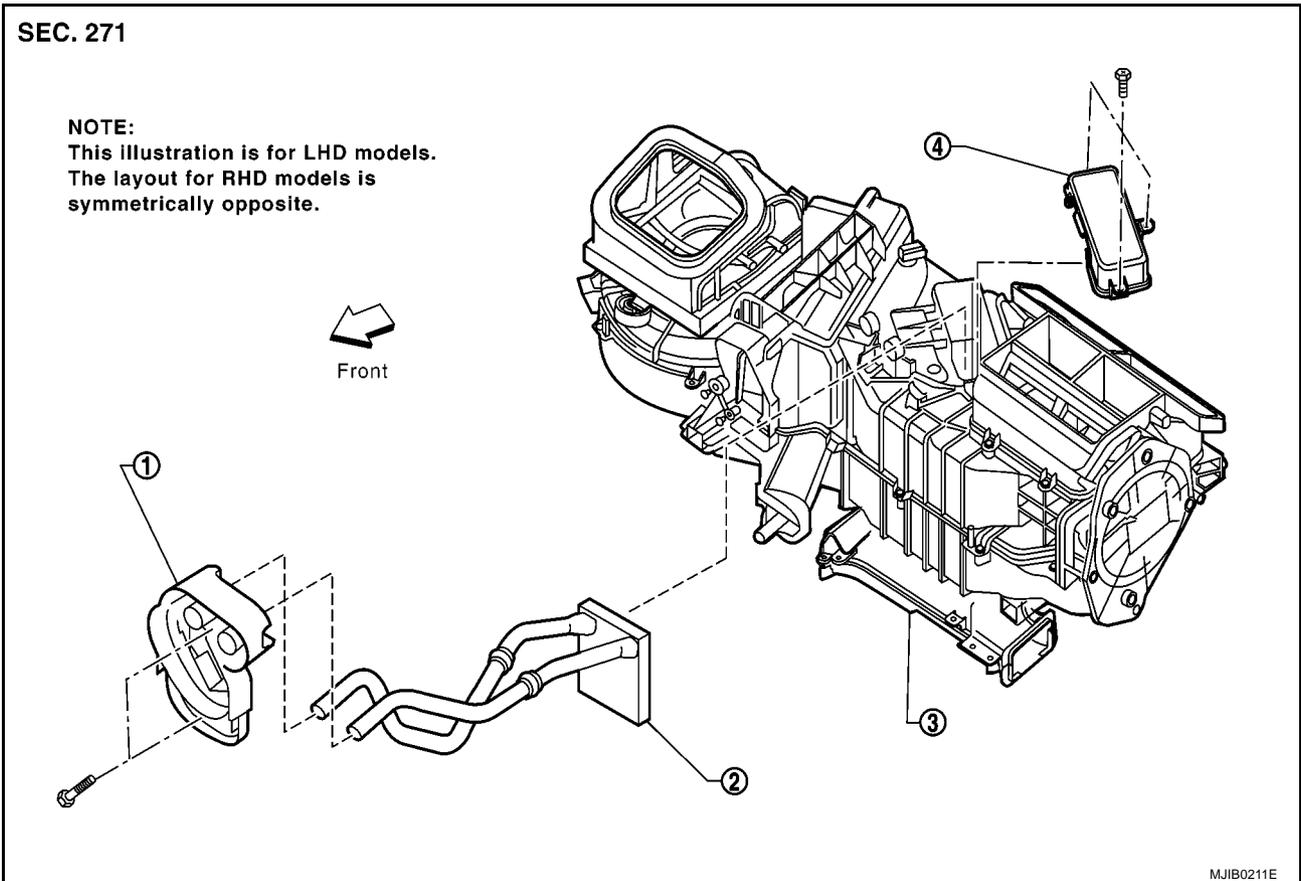
## HEATER CORE

PFP:27140

### Components

EJS006CA

A  
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I



1. Heater core and evaporator pipe bracket
2. Heater core
3. Heater and cooling unit assembly
4. Heater core cover

ATC

## Removal and Installation

EJS006CB

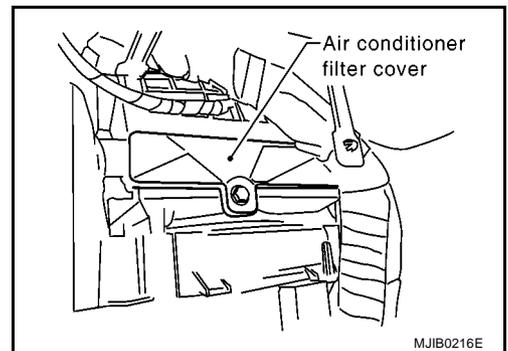
### REMOVAL

K  
L  
M

1. Remove the heater and cooling unit assembly. Refer to [ATC-126, "REMOVAL"](#).
2. Remove the three screws and remove the heater core cover.
3. Remove the heater core and evaporator pipe bracket.
4. Remove the heater core.

**NOTE:**

If the air conditioner filters are contaminated from coolant leaking from the heater core, replace the air conditioner filters with new ones before installing the new heater core.



### INSTALLATION

Installation is in the reverse order of removal.

# HEATER PUMP

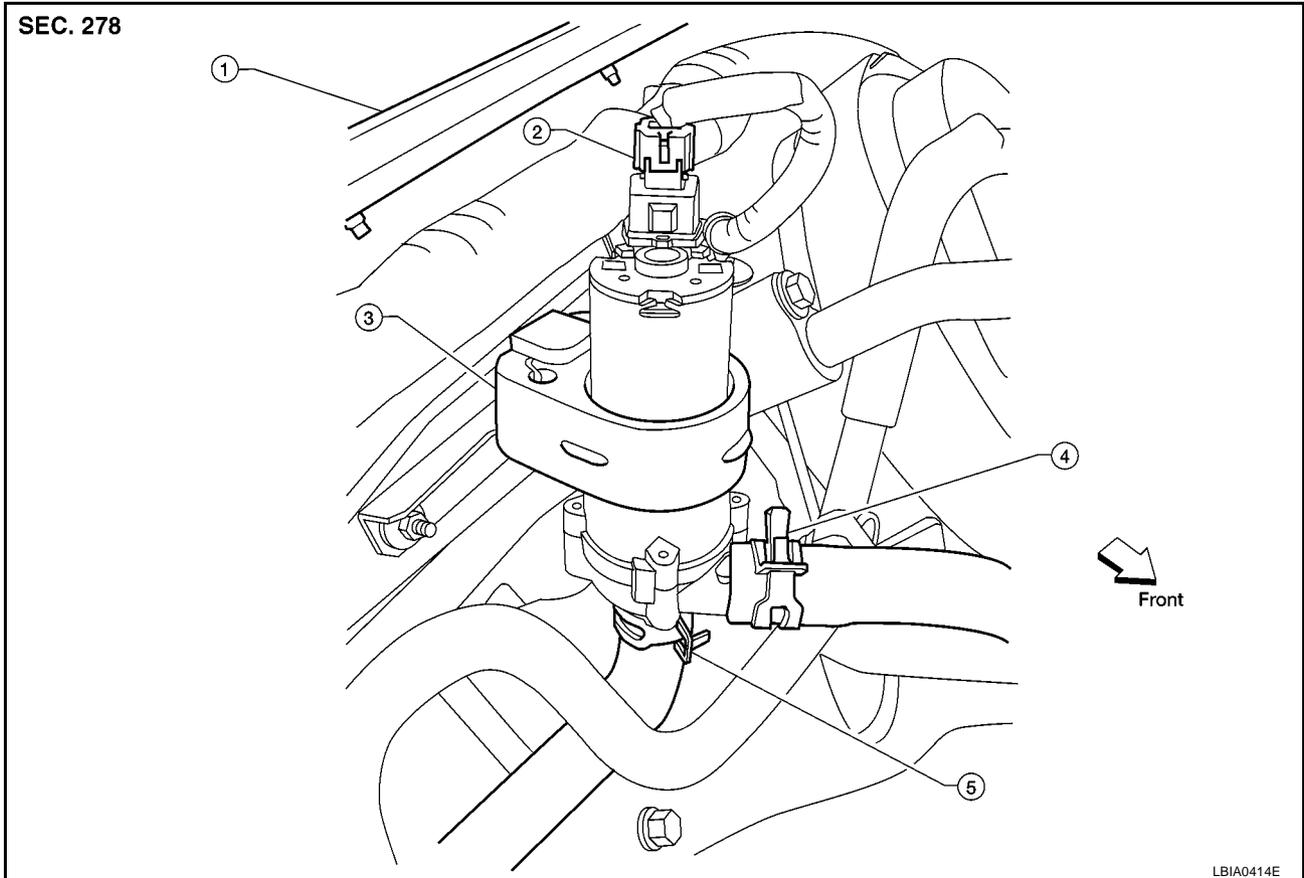
PFP:92264

## HEATER PUMP

### Components

EJS006CC

#### Heater Pump



## Removal and Installation

### REMOVAL

1. Partially drain the engine cooling system. Refer to [CO-8, "DRAINING ENGINE COOLANT"](#) .
2. Disconnect the heater pump electrical connector.
3. Disconnect the two heater hoses.
4. Remove the heater pump from the bracket securing the heater pump to the cowl top.

#### **CAUTION:**

**Do not disassemble the heater pump, replace the heater pump as an assembly.**

### INSTALLATION

Installation is in the reverse order of removal.

#### **CAUTION:**

- The heater pump rubber mount must be fully seated on the bracket.
- Do not disassemble the heater pump, replace the heater pump as an assembly.

EJS006DC

# INTAKE DOOR MOTOR

## INTAKE DOOR MOTOR

PFP:27730

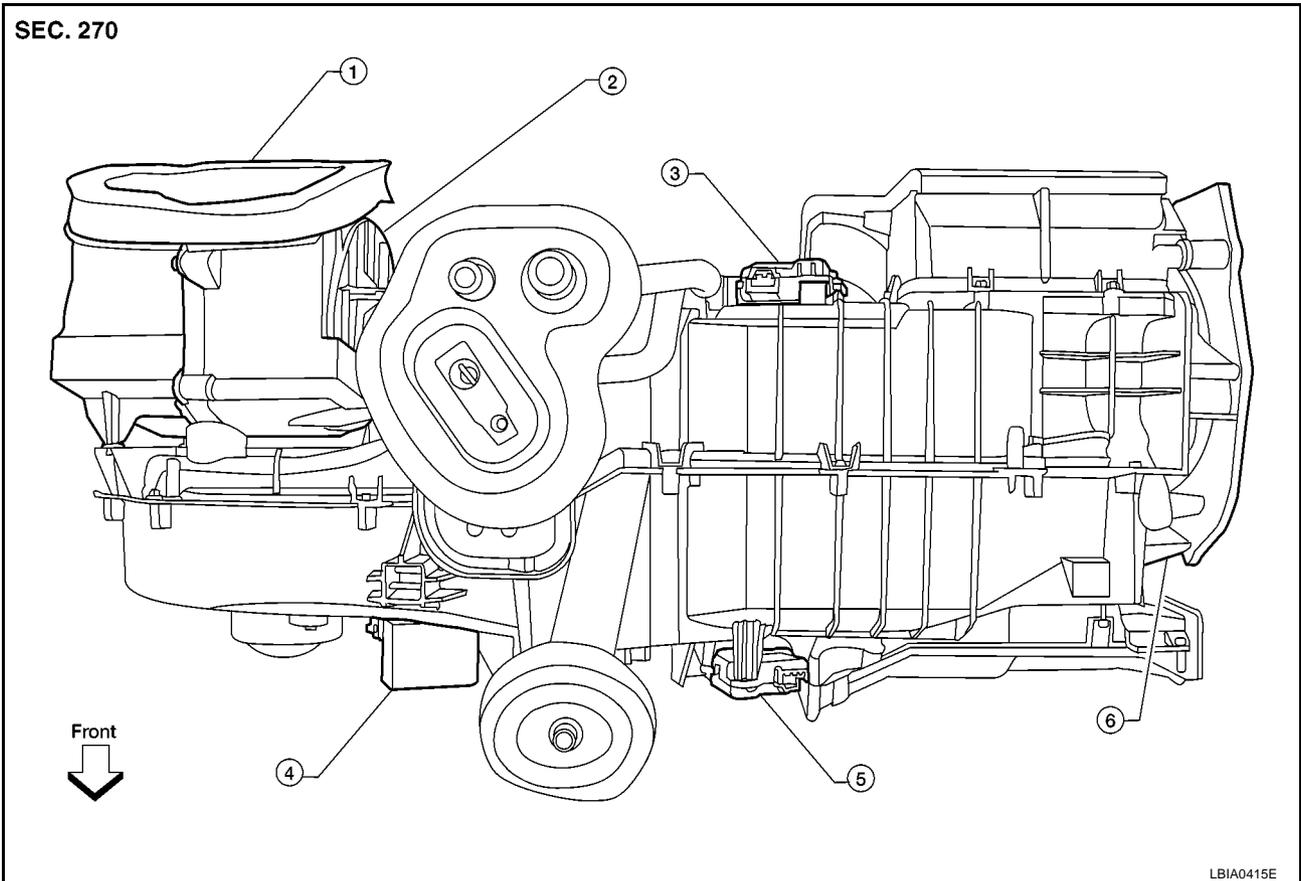
### Components

EJS006CD

#### Intake Door Motor - Heater and Cooling Unit Assembly

**NOTE:**

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



- |                                     |                                   |                                |
|-------------------------------------|-----------------------------------|--------------------------------|
| 1. Heater and cooling unit assembly | 2. Intake door motor              | 3. Air mix door motor (driver) |
| 4. Variable blower control          | 5. Air mix door motor (passenger) | 6. Mode door motor             |

### Removal and Installation

#### REMOVAL

EJS006DD

1. Remove the heater and cooling unit assembly. Refer to [ATC-124, "HEATER & COOLING UNIT ASSEMBLY"](#).
2. Remove the steering member from the heater and cooling unit assembly.
3. Disconnect the intake door motor electrical connector.
4. Remove the three screws and remove the intake door motor.

#### INSTALLATION

Installation is in the reverse order of removal.

# MODE DOOR MOTOR

## MODE DOOR MOTOR

PFP:27731

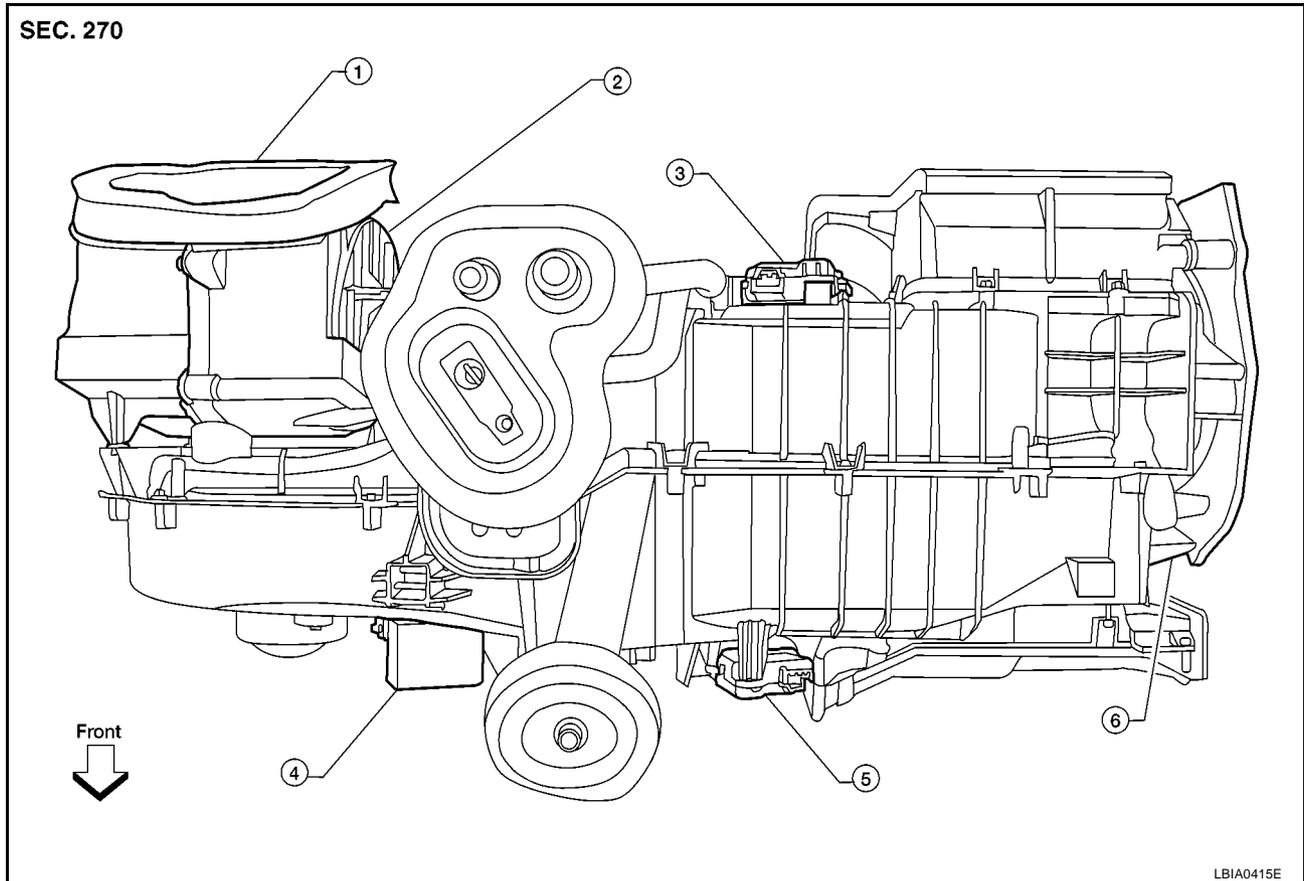
### Components

EJS006CE

#### Mode Door Motor - Heater and Cooling Unit Assembly

**NOTE:**

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



- |                                     |                                   |                                |
|-------------------------------------|-----------------------------------|--------------------------------|
| 1. Heater and cooling unit assembly | 2. Intake door motor              | 3. Air mix door motor (driver) |
| 4. Variable blower control          | 5. Air mix door motor (passenger) | 6. Mode door motor             |

### Removal and Installation

#### REMOVAL

EJS006DE

1. Remove the instrument panel side finisher. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
2. Remove the lower instrument cover. Refer to [IP-10, "INSTRUMENT PANEL ASSEMBLY"](#).
3. Disconnect the mode door motor electrical connector.
4. Remove the three screws and remove the mode door motor.

#### INSTALLATION

Installation is in the reverse order of removal.

# AIR MIX DOOR MOTOR

## AIR MIX DOOR MOTOR

PF2:27732

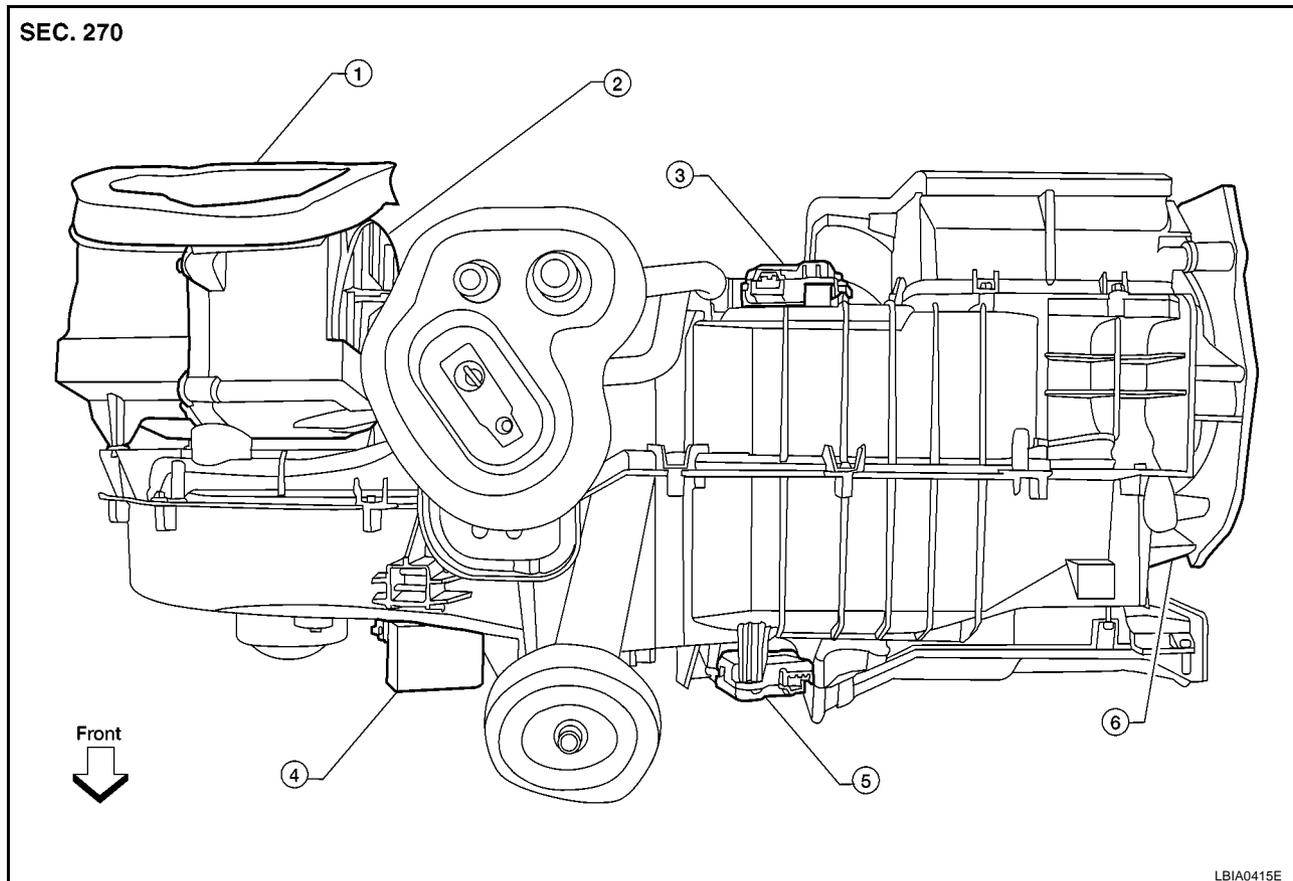
### Components

EJS006CF

#### Air Mix Door Motors - Heater and Cooling Unit Assembly

##### NOTE:

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



- |                                     |                                   |                                |
|-------------------------------------|-----------------------------------|--------------------------------|
| 1. Heater and cooling unit assembly | 2. Intake door motor              | 3. Air mix door motor (driver) |
| 4. Variable blower control          | 5. Air mix door motor (passenger) | 6. Mode door motor             |

### Removal and Installation AIR MIX DOOR MOTOR (DRIVER)

EJS006CG

#### Removal

1. Remove the heater and cooling unit assembly. Refer to [ATC-124, "HEATER & COOLING UNIT ASSEMBLY"](#).
2. Remove the steering member from the heater and cooling unit assembly.
3. Disconnect the air mix door motor electrical connector.
4. Remove the three screws and remove the air mix door motor.

#### Installation

Installation is in the reverse order of removal.

### AIR MIX DOOR MOTOR (PASSENGER)

#### Removal

1. Remove the instrument panel side finisher. Refer to [EI-33, "Components"](#).
2. Remove the lower instrument panel RH. Refer to [IP-15, "LOWER INSTRUMENT PANEL RH AND GLOVE BOX"](#).
3. Remove the steering member from the heater and cooling unit assembly.
4. Disconnect the air mix door motor electrical connector.
5. Remove the three screws and remove the air mix door motor.

# AIR MIX DOOR MOTOR

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## **Installation**

Installation is in the reverse order of removal.

# VARIABLE BLOWER CONTROL

## VARIABLE BLOWER CONTROL

PFP:27200

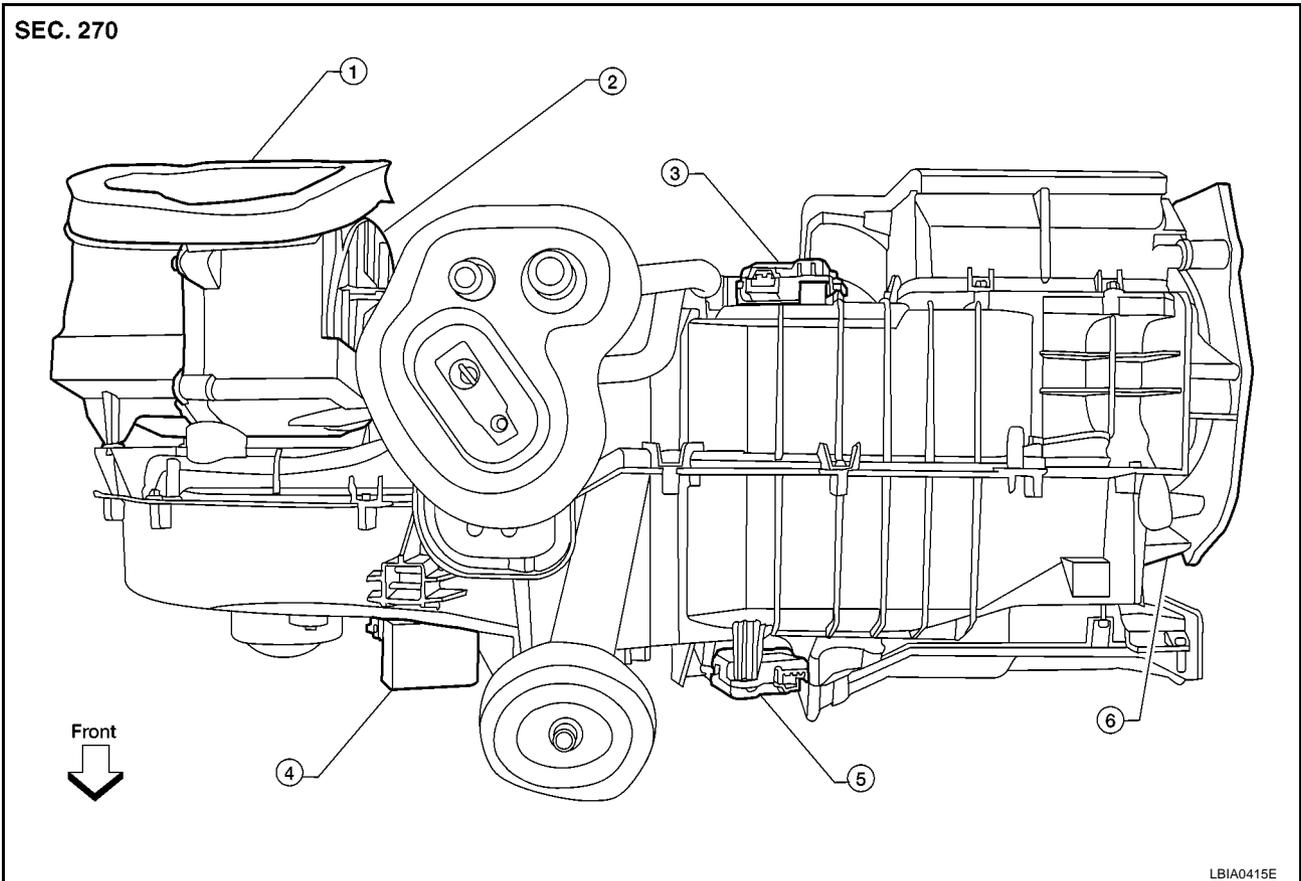
### Components

EJS006CH

#### Variable Blower Control - Heater and Cooling Unit Assembly

**NOTE:**

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



- |                                     |                                   |                                |
|-------------------------------------|-----------------------------------|--------------------------------|
| 1. Heater and cooling unit assembly | 2. Intake door motor              | 3. Air mix door motor (driver) |
| 4. Variable blower control          | 5. Air mix door motor (passenger) | 6. Mode door motor             |

### Removal and Installation

#### REMOVAL

1. Disconnect the variable blower control electrical connector.
2. Remove the two screws and remove the variable blower control.

#### INSTALLATION

Installation is in the reverse order of removal.

EJS006DF

# DUCTS AND GRILLES

## DUCTS AND GRILLES

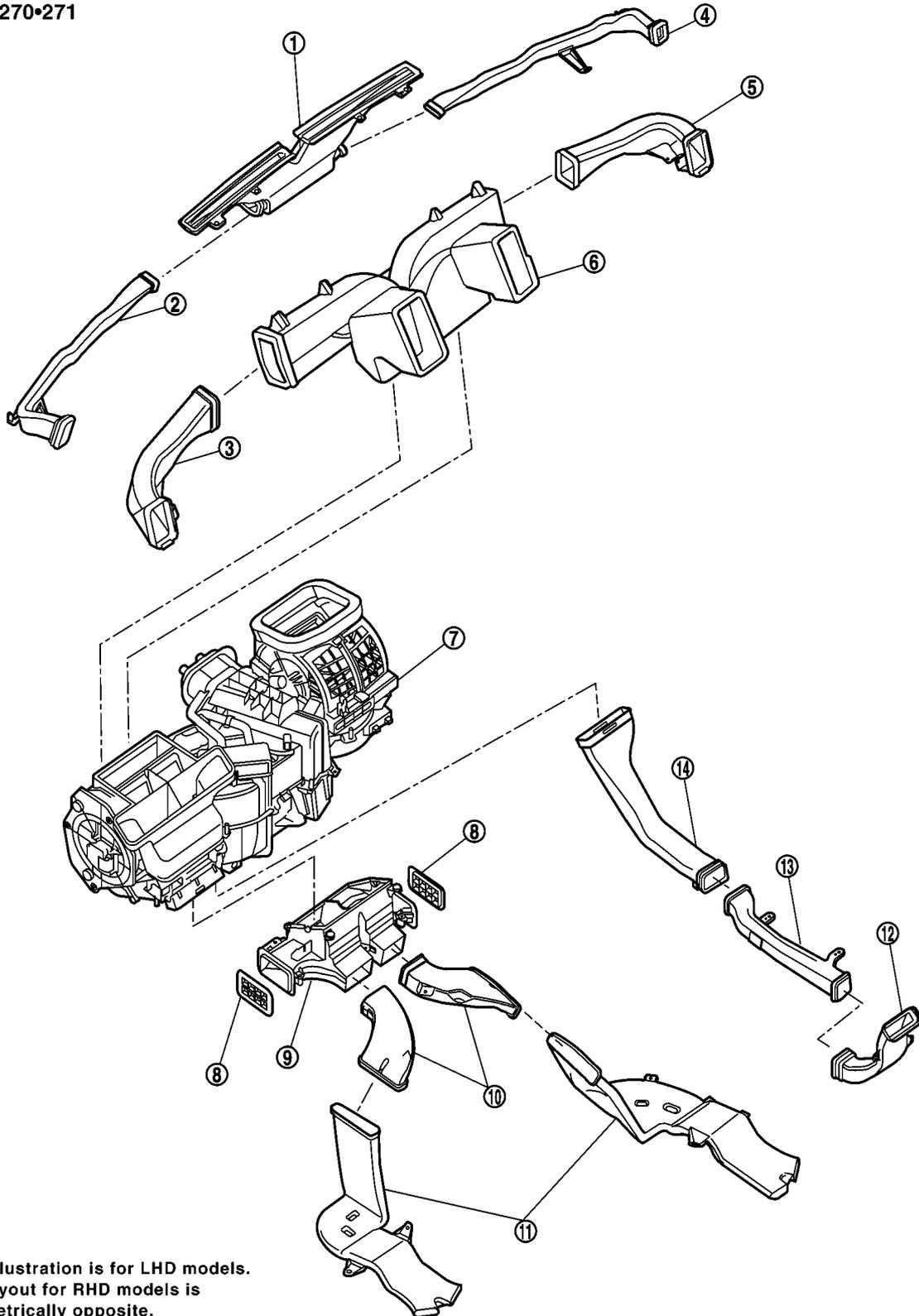
PFP:27860

### Components

EJS006CJ

#### Ducts - Heater and Cooling Unit Assembly

SEC. 270•271



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

- |                                     |                                 |                           |
|-------------------------------------|---------------------------------|---------------------------|
| 1. Defroster nozzle                 | 2. LH side demister duct        | 3. LH ventilator duct     |
| 4. RH side demister duct            | 5. RH ventilator duct           | 6. Center ventilator duct |
| 7. Heater and cooling unit assembly | 8. Floor connector duct grilles | 9. Floor connector duct   |

MJIB0212E

# DUCTS AND GRILLES

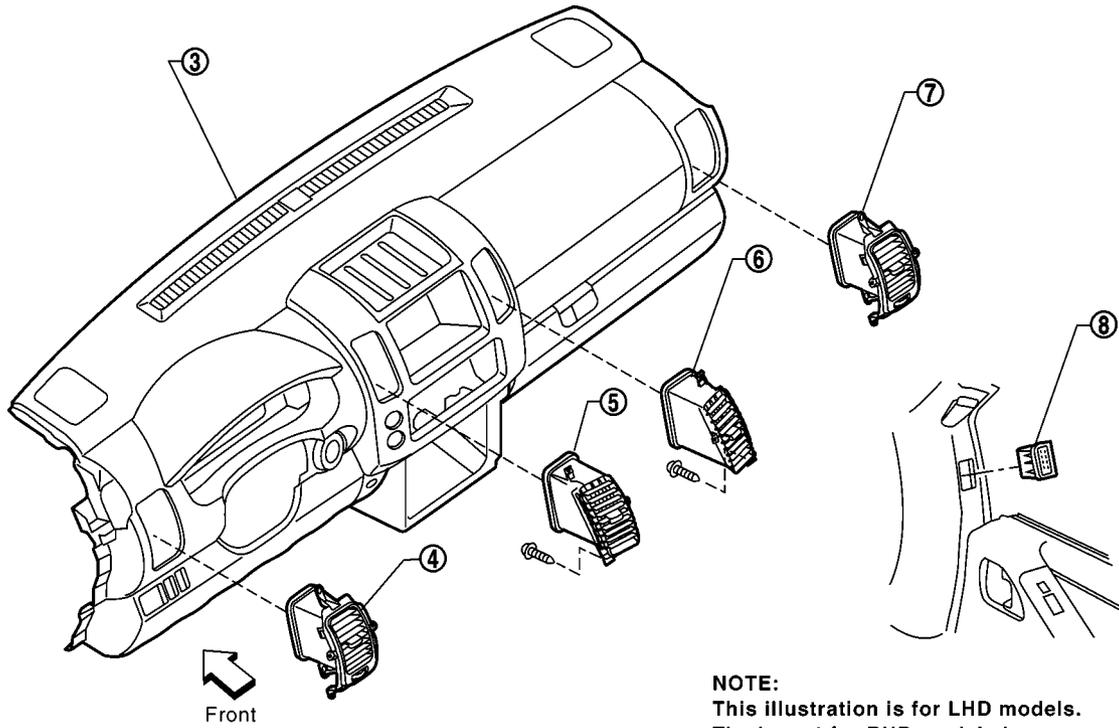
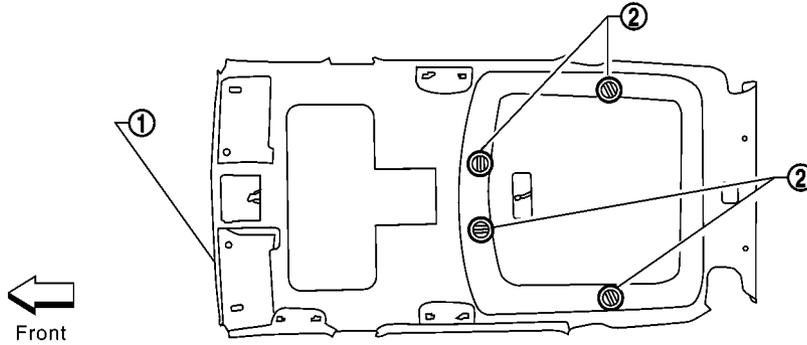
- 10. Front floor ducts
- 13. Center console duct

- 11. Rear floor ducts
- 14. Front console duct

- 12. Rear console duct

## Grilles

SEC. 280•685•738



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

MJIB0329E

- 1. Headliner
- 4. LH side ventilator grille
- 7. RH side ventilator grille

- 2. Overhead grilles
- 5. LH ventilator grille
- 8. RH side demister grille

- 3. Instrument panel
- 6. RH ventilator grille

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ATC

## Removal and Installation CONSOLE DUCTS AND CONSOLE GRILLE

### Removal

The center console must be removed and disassembled to remove the console ducts and the console grille. Refer to [IP-16, "CENTER CONSOLE"](#) .

### Installation

Installation is in the reverse order of removal.

## DEFROSTER NOZZLE

### Removal

1. Remove the instrument panel trim. Refer to [IP-10, "Removal and Installation"](#) .
2. Remove the defroster nozzle.

### Installation

Installation is in the reverse order of removal.

## RH AND LH SIDE DEMISTER DUCT

### Removal

1. Remove the instrument panel trim. Refer to [IP-10, "Removal and Installation"](#) .
2. Remove the center console. Refer to [IP-16, "CENTER CONSOLE"](#) .
3. Remove the RH or LH side demister duct.

### Installation

Installation is in the reverse order of removal.

## RH AND LH VENTILATOR DUCT

### Removal

1. Remove the instrument panel trim. Refer to [IP-10, "Removal and Installation"](#) .
2. Remove the center console. Refer to [IP-16, "CENTER CONSOLE"](#) .
3. Remove the RH or LH ventilator duct.

### Installation

Installation is in the reverse order of removal.

## CENTER VENTILATOR DUCT

### Removal

1. Remove the heater and cooling unit assembly. Refer to [ATC-126, "REMOVAL"](#) .
2. Remove the center console. Refer to [IP-16, "CENTER CONSOLE"](#) .
3. Remove the defroster nozzle.
4. Remove the RH and LH ventilator ducts.
5. Remove the RH and LH side demister ducts.
6. Remove the center ventilator duct.

### Installation

Installation is in the reverse order of removal.

## FLOOR CONNECTOR DUCT

### Removal

1. Remove the heater and cooling unit assembly. Refer to [ATC-126, "REMOVAL"](#) .
2. Remove the center console. Refer to [IP-16, "CENTER CONSOLE"](#) .
3. Remove the floor connector duct.

### Installation

Installation is in the reverse order of removal.

# DUCTS AND GRILLES

---

## FRONT AND REAR FLOOR DUCTS

### Removal

1. Remove the center console. Refer to [IP-16, "CENTER CONSOLE"](#) .
2. Remove the floor carpet. Refer to [EI-38, "Removal and Installation"](#) .
3. Remove the clips and remove the front and rear floor ducts.

### Installation

Installation is in the reverse order of removal.

## REAR OVERHEAD DUCTS

### Removal

1. Remove the rear RH interior trim panel. Refer to [EI-33, "BODY SIDE TRIM"](#) .
2. Remove the headliner. Refer to [EI-40, "HEADLINING"](#) .

#### NOTE:

The rear headliner duct (connected to the rear upper overhead duct) is part of the headliner and is replaced as an assembly.

3. Remove the clips and remove the rear upper and lower overhead ducts.

### Installation

Installation is in the reverse order of removal.

## SIDE REAR FLOOR DUCT

### Removal

1. Remove the rear RH interior trim panel. Refer to [EI-33, "BODY SIDE TRIM"](#) .
2. Reposition the floor carpet out of the way.
3. Remove the clips and remove the side rear floor duct.

### Installation

Installation is in the reverse order of removal.

## GRILLES

### Removal

1. Remove the necessary interior trim panel(s) to access the grille. Refer to [IP-10, "Removal and Installation"](#) .

#### NOTE:

The overhead grilles are part of the headliner. To replace the overhead grilles the headliner must be replaced. Refer to [EI-40, "HEADLINING"](#) .

2. Remove the grille from the interior trim panel.

### Installation

Installation is in the reverse order of removal.

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# REFRIGERANT LINES

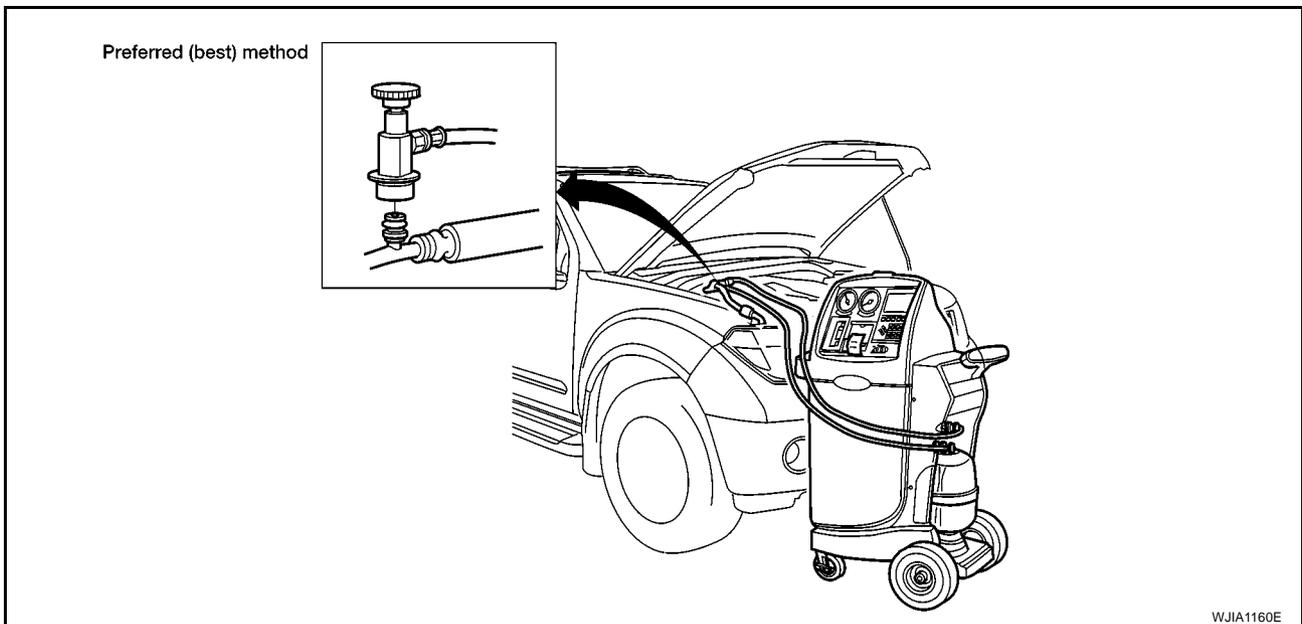
PFP:92600

EJS006CL

## REFRIGERANT LINES

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

#### Discharging Refrigerant



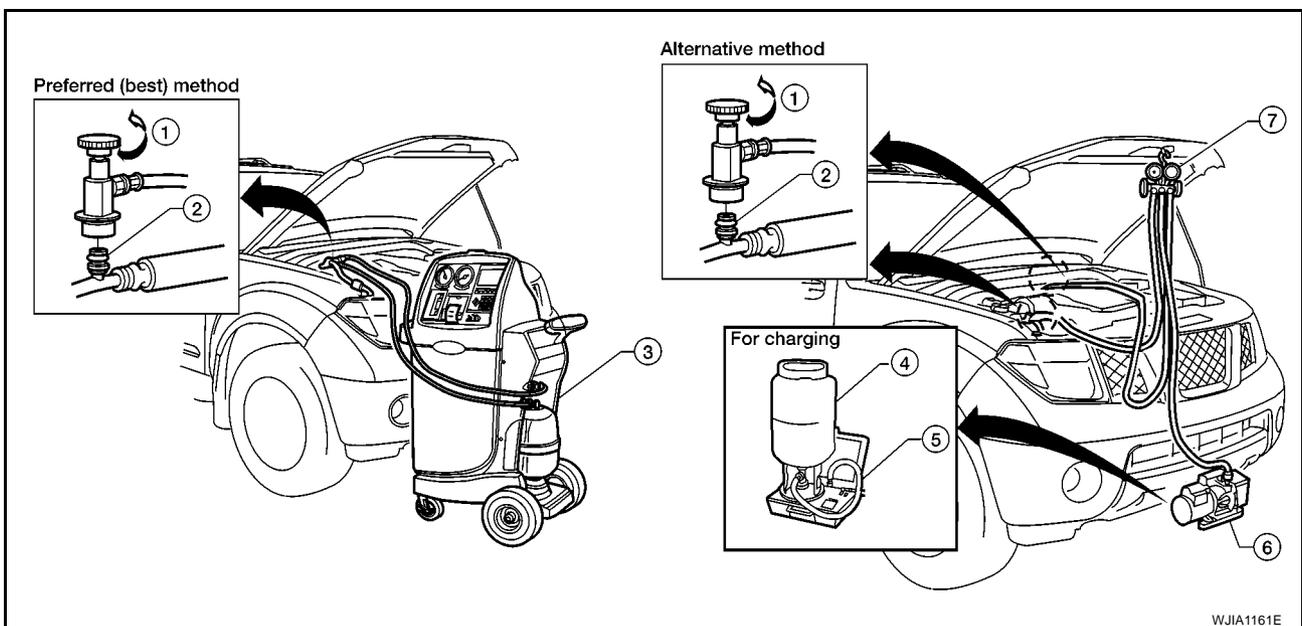
WJIA1160E

1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling equipment ACR 2000 (J-43600) with refrigerant identifier

#### **WARNING:**

Avoid breathing A/C refrigerant and lubricant vapor or mist. Exposure may irritate eyes, nose and throat. Remove HFC-134a (R-134a) refrigerant from the A/C system using certified service equipment meeting requirements of SAE J2210 HFC-134a (R-134a) recycling equipment or SAE J2201 HFC-134a (R-134a) recovery equipment. If an accidental system discharge occurs, ventilate the work area before resuming service. Additional health and safety information may be obtained from the refrigerant and lubricant manufacturers.

#### Evacuating System and Charging Refrigerant

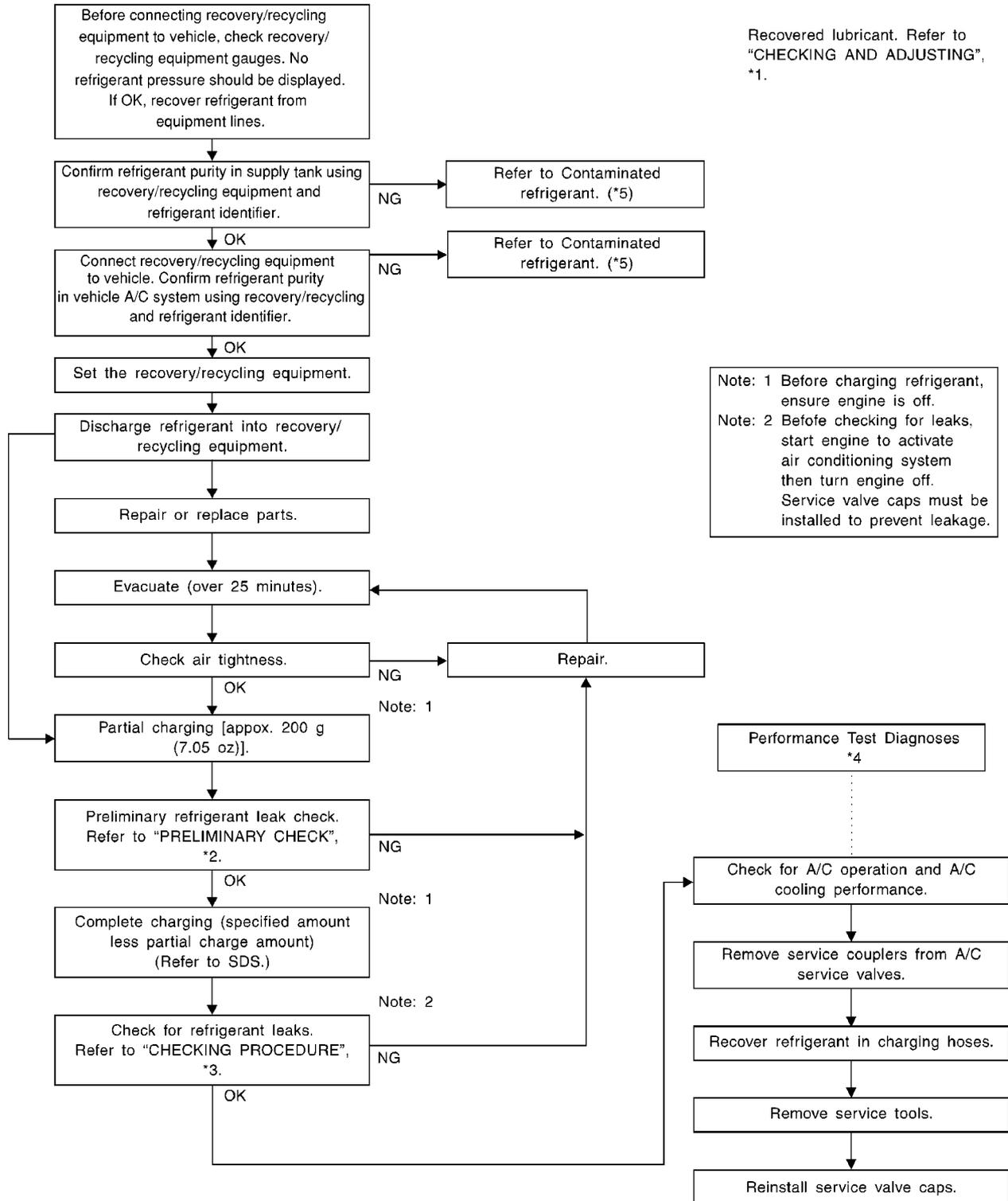


WJIA1161E

1. Shut-off valve
2. A/C service valve
3. Recovery/Recycling equipment ACR 2000 (J-43600) with refrigerant identifier

# REFRIGERANT LINES

4. Refrigerant container (HFC-134a)
5. Refrigerant weight scale (J-39699)
6. Vacuum pump (J-39649)
7. Manifold gauge set with hoses and couplers (J-39183-C)



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

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

Performance Test Diagnoses \*4

\*1 [ATC-24, "CHECKING AND ADJUSTING"](#).

\*2 [ATC-150, "Checking for Refrigerant Leaks"](#).

\*3 [ATC-150, "Checking for Refrigerant Leaks"](#).

\*4 [ATC-94, "PERFORMANCE TEST DIAGNOSES"](#).

\*5 [ATC-4, "Contaminated Refrigerant"](#).

WJIA0530E

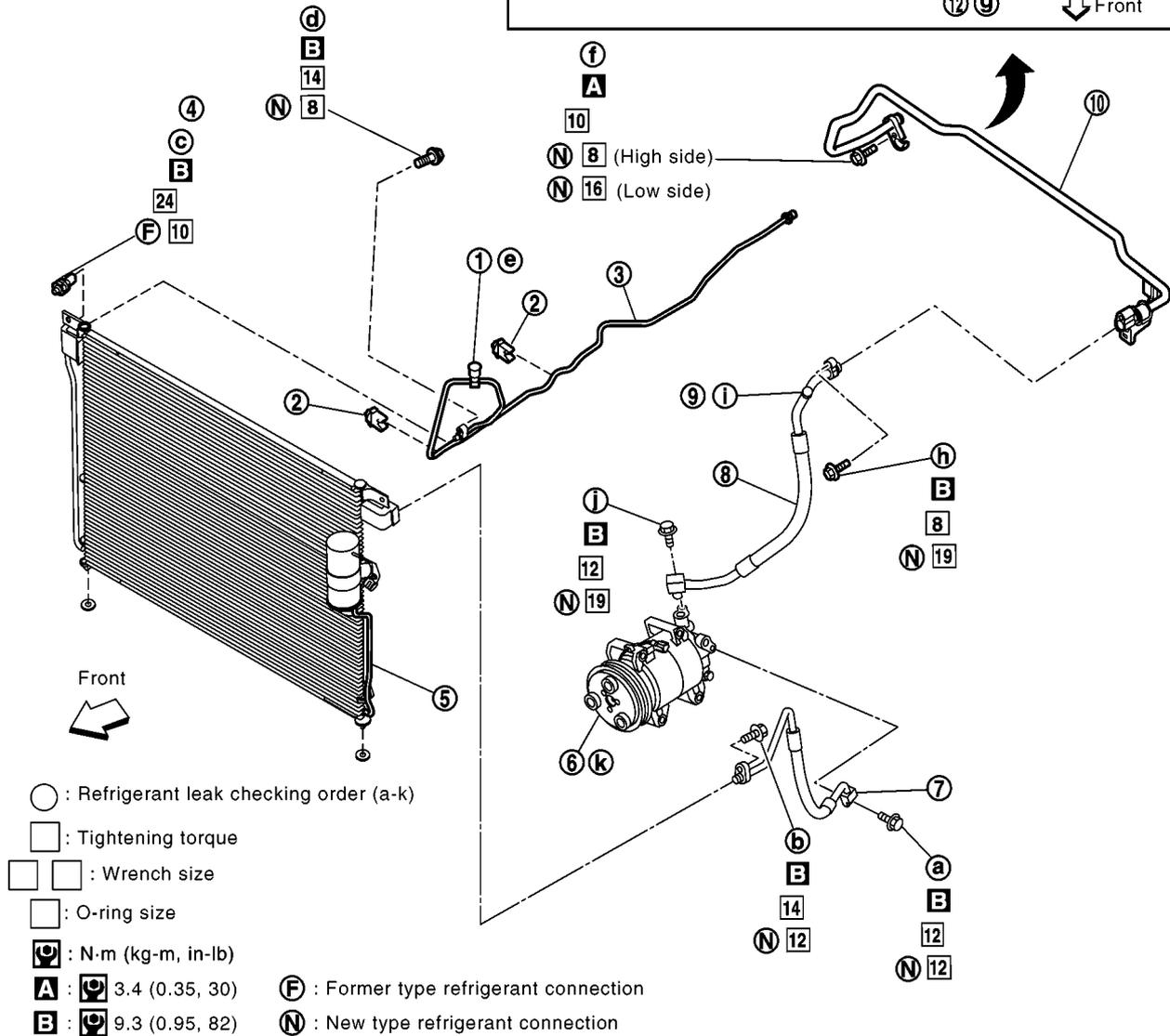
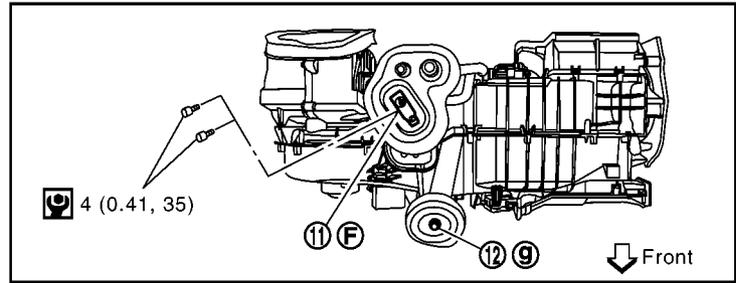
# REFRIGERANT LINES

EJS006CM

## Components

### A/C Compressor and Condenser —LHD Models—

SEC. 270•271•274•276•278



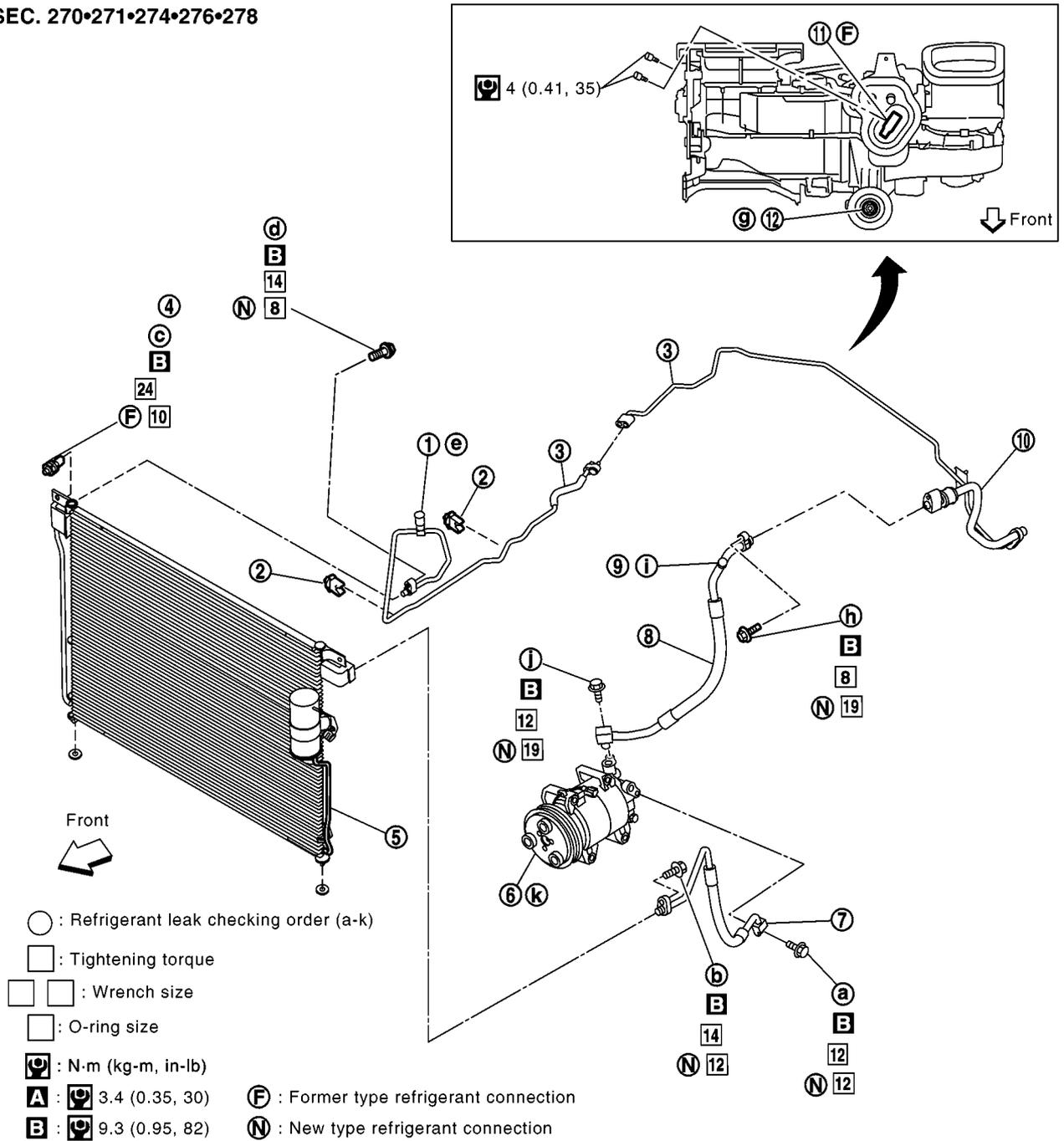
MJIB0276E

- |                                    |                                   |                               |
|------------------------------------|-----------------------------------|-------------------------------|
| 1. High-pressure service valve     | 2. Clip                           | 3. High-pressure A/C pipe     |
| 4. Refrigerant pressure sensor     | 5. Condenser                      | 6. Compressor shaft seal      |
| 7. High-pressure flexible A/C hose | 8. Low-pressure flexible A/C hose | 9. Low-pressure service valve |
| 10. Low-pressure A/C pipe          | 11. Expansion valve               | 12. A/C drain hose            |

# REFRIGERANT LINES

## A/C Compressor and Condenser —RHD Models—

SEC. 270•271•274•276•278



- |                                    |                                   |                               |
|------------------------------------|-----------------------------------|-------------------------------|
| 1. High-pressure service valve     | 2. Clip                           | 3. High-pressure A/C pipe     |
| 4. Refrigerant pressure sensor     | 5. Condenser                      | 6. Compressor shaft seal      |
| 7. High-pressure flexible A/C hose | 8. Low-pressure flexible A/C hose | 9. Low-pressure service valve |
| 10. Low-pressure A/C pipe          | 11. Expansion valve               | 12. A/C drain hose            |

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

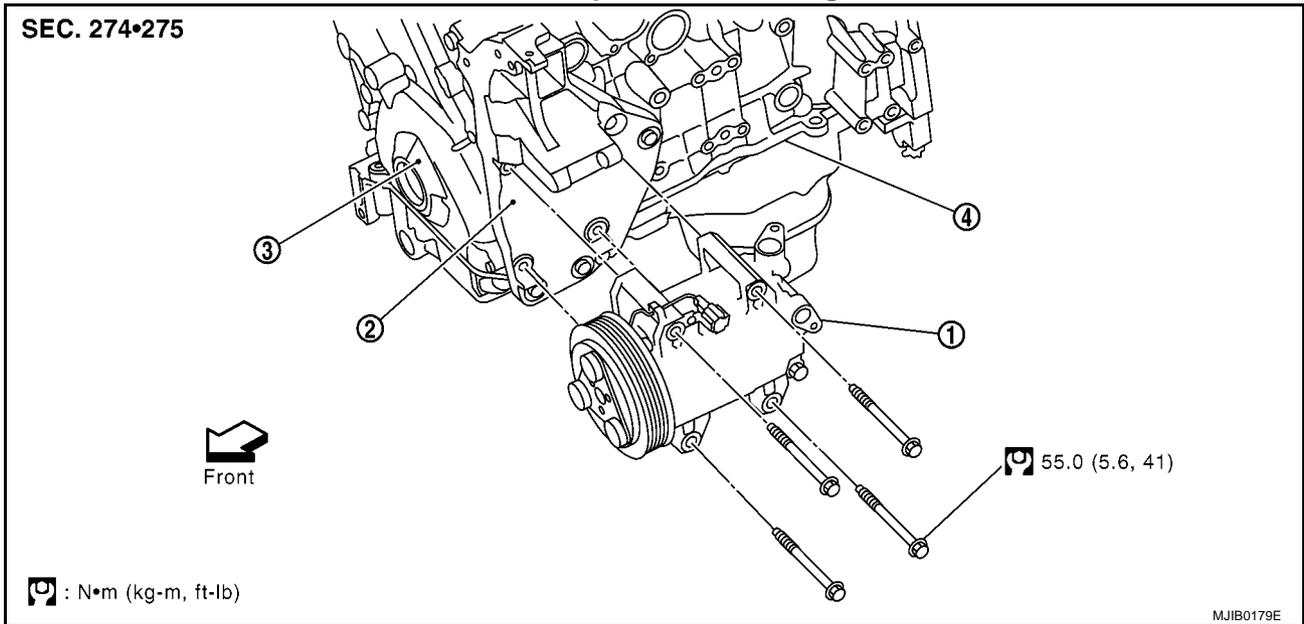
MJIB0277E

# REFRIGERANT LINES

EJS006CN

## Removal and Installation for Compressor

### A/C Compressor Mounting



1. Compressor
2. Alternator and A/C compressor bracket
3. Timing chain case bracket
4. Cylinder block

### REMOVAL

1. Discharge the A/C refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Remove the front left wheel and tire assembly. Refer to [WT-5, "Rotation"](#) .
3. Remove the engine cover.
4. Remove the front left mud guard.
5. Remove the front left splash shield.
6. Remove the engine air cleaner and air ducts. Refer to [EM-15, "AIR CLEANER AND AIR DUCT"](#) .
7. Remove the drive belt. Refer to [EM-12, "DRIVE BELTS"](#) .
8. Disconnect the compressor harness connector.
9. Disconnect both the front high-pressure flexible A/C hose and front low-pressure flexible A/C hose from the compressor.

#### CAUTION:

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

10. Remove the A/C compressor bolts using power tools.

### INSTALLATION

Installation is in the reverse order of removal.

#### CAUTION:

- Replace the O-ring of the front low-pressure flexible A/C hose and front high-pressure flexible A/C hose with a new one, apply compressor oil to the O-rings before installation.
- After recharging the A/C system with refrigerant, check for leaks. Refer to [ATC-150, "Checking for Refrigerant Leaks"](#) .



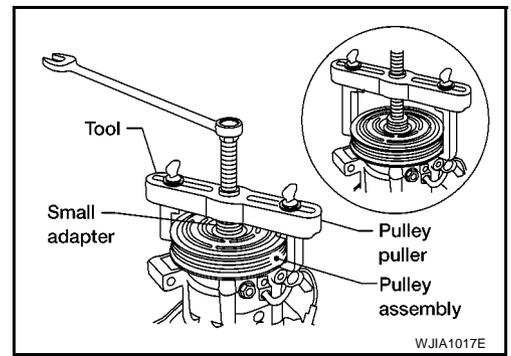
# REFRIGERANT LINES

5. Remove the pulley using Tool with a small adapter. Position the small adapter on the end of the drive shaft and the center of the pulley on the small adapter.

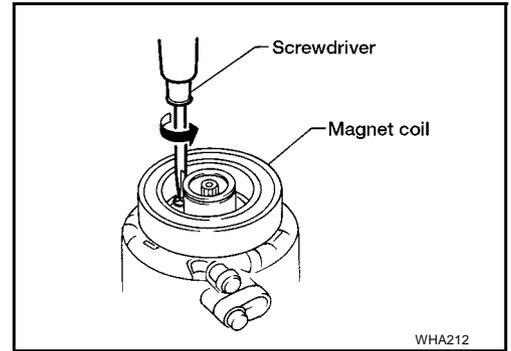
**Tool number : KV99233130**

**CAUTION:**

To prevent deformation of the pulley groove, the puller claws should be hooked under the pulley groove and not into the pulley groove.



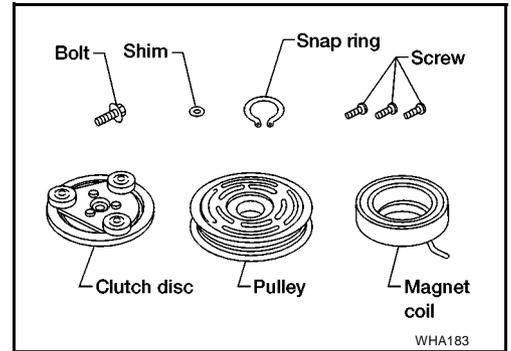
6. Remove the magnet coil harness clip using a screwdriver, remove the three magnet coil fixing screws and remove the magnet coil.



## INSPECTION

### Clutch Disc

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



### Pulley

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

### Coil

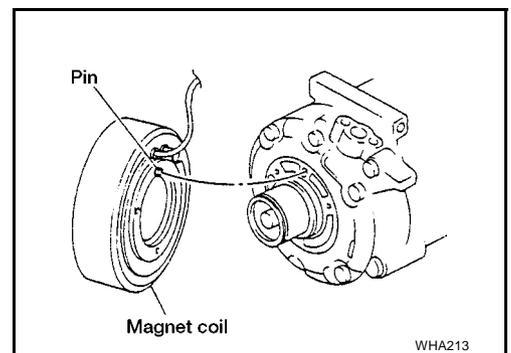
Check magnet coil for loose connections or any cracked insulation.

## INSTALLATION

1. Install the magnet coil.

**CAUTION:**

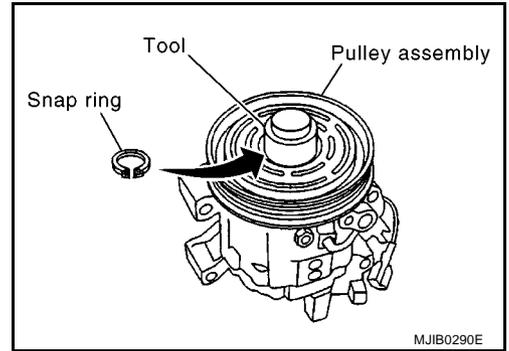
Be sure to align the magnet coil pin with the hole in the compressor front head.



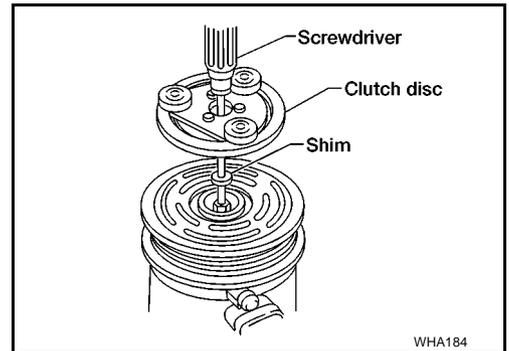
# REFRIGERANT LINES

2. Install the magnet coil harness clip using a screwdriver.
3. Install the pulley assembly using Tool and a wrench, then install the snap ring using snap ring pliers.

**Tool number : KV99106200**



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

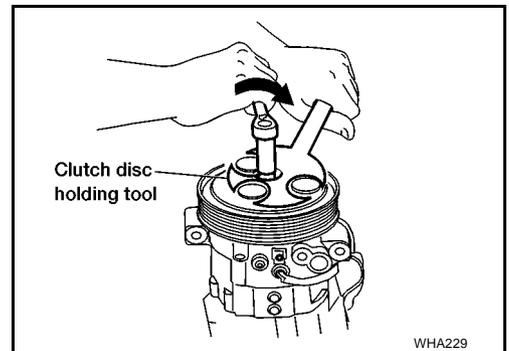


5. Install the clutch pulley bolt using Tool, to prevent the clutch disc from turning and tighten the bolt to specification. Refer to [ATC-140, "Components"](#).

**Tool number : J-44614**

**CAUTION:**

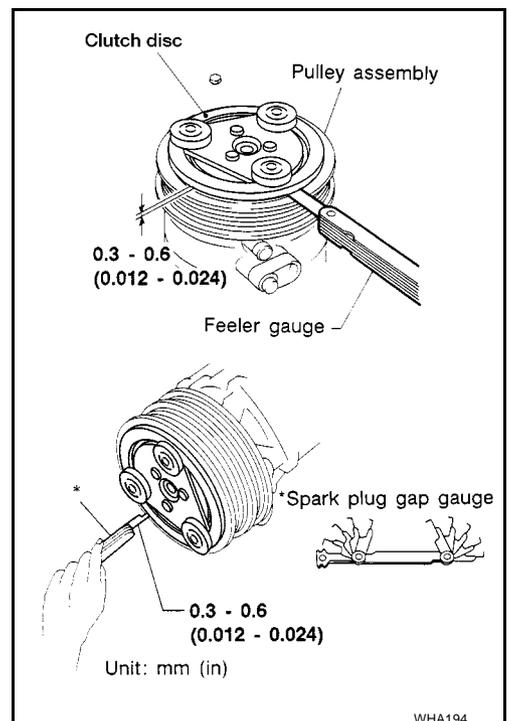
**After tightening the clutch pulley bolt, check that the clutch pulley rotates smoothly.**



6. Check the pulley clearance all the way around the clutch disc as shown.

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

7. If the specified clearance is not obtained, replace the adjusting spacer to readjust.
8. Connect the compressor electrical connector.
9. Install the drive belt. Refer to [EM-12, "DRIVE BELTS"](#).
10. Install the engine under cover and the splash shield.



# REFRIGERANT LINES

## BREAK-IN OPERATION

When replacing compressor clutch assembly, always conduct the break-in operation. This is done by engaging and disengaging the clutch about 30 times. Break-in operation raises the level of transmitted torque.

## Removal and Installation for High-pressure Flexible A/C Hose

EJS006CP

### REMOVAL

1. Remove the front left wheel and tire assembly. Refer to [WT-5, "Rotation"](#) .
2. Remove the front left mud guard.
3. Remove the front left splash shield.
4. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
5. Remove the high-pressure flexible A/C hose. Refer to [ATC-140, "Components"](#) .

### CAUTION:

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

### INSTALLATION

Installation is in the reverse order of removal.

Refer to [ATC-140, "Components"](#) .

### CAUTION:

- Replace the O-ring of the high-pressure flexible A/C hose with a new one, then apply compressor oil to it for installation.
- After charging refrigerant, check for leaks.

## Removal and Installation for High-pressure A/C Pipe

EJS006CQ

### REMOVAL

1. Remove the front right wheel and tire assembly. Refer to [WT-5, "Rotation"](#) .
2. Remove the front right mud guard.
3. Remove the front right splash shield.
4. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
5. Remove the low pressure A/C pipe. Refer to [ATC-147, "Removal and Installation for Low-pressure A/C Pipe"](#) .
6. Remove the high-pressure A/C pipe. Refer to [ATC-146, "Removal and Installation for High-pressure A/C Pipe"](#) .

### CAUTION:

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

### INSTALLATION

Installation is in the reverse order of removal.

Refer to [ATC-140, "Components"](#) .

### CAUTION:

- Replace the O-ring of the high-pressure A/C pipe with a new one, then apply compressor oil to it for installation.
- After charging refrigerant, check for leaks.

## Removal and Installation for Low-pressure Flexible A/C Hose

EJS006CR

### REMOVAL

1. Remove the front right wheel and tire assembly. Refer to [WT-5, "Rotation"](#) .
2. Remove the front right mud guard.
3. Remove the front right splash shield.
4. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .

### CAUTION:

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

5. Remove the low-pressure flexible A/C hose. Refer to [ATC-140, "Components"](#) .

### INSTALLATION

Installation is in the reverse order of removal.

Refer to [ATC-140, "Components"](#) .

# REFRIGERANT LINES

## CAUTION:

- Replace the O-ring of the low-pressure flexible A/C hose with a new one, then apply compressor oil to it for installation.
- After charging refrigerant, check for leaks.

## Removal and Installation for Low-pressure A/C Pipe

EJS006CS

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Disconnect the heater pump connector.
3. Remove the heater pump from the bracket and reposition out of the way. Do not disconnect the heater hoses from the heater pump.
4. Remove the low-pressure A/C pipe. Refer to [ATC-140, "Components"](#) .

## CAUTION:

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

### INSTALLATION

Installation is in the reverse order of removal.

Refer to [ATC-140, "Components"](#) .

## CAUTION:

- Replace the O-ring of the low-pressure A/C pipe with a new one, then apply compressor oil to it for installation.
- After charging refrigerant, check for leaks.

## Removal and Installation for Refrigerant Pressure Sensor

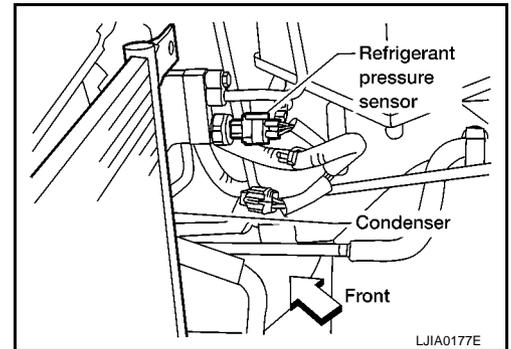
EJS006CV

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Disconnect the refrigerant pressure sensor harness connector and remove the refrigerant pressure sensor from the condenser.

## CAUTION:

Be careful not to damage the condenser fins.



### INSTALLATION

Installation is in the reverse order of removal.

Refer to [ATC-140, "Components"](#) .

## CAUTION:

- Be careful not to damage the condenser fins.
- Apply compressor oil to the O-ring of the refrigerant pressure sensor for installation.
- After charging refrigerant, check for leaks.

## Removal and Installation for Condenser

EJS006CW

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Remove the radiator. Refer to [CO-11, "RADIATOR"](#) .

## CAUTION:

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

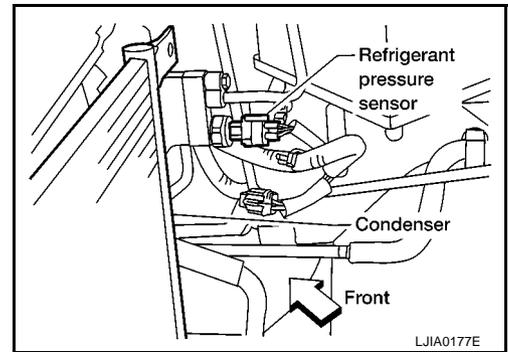
3. Disconnect the high-pressure flexible A/C hose and the high-pressure A/C pipe from the condenser.

## CAUTION:

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

## REFRIGERANT LINES

4. Disconnect the refrigerant pressure sensor harness connector.
5. Remove the refrigerant pressure sensor from the condenser.
6. Lift the condenser out of the mounting grommets and remove the condenser.



### INSTALLATION

Installation is in the reverse order of removal.

Refer to [ATC-140, "Components"](#) .

#### CAUTION:

- Replace the O-rings of the high-pressure A/C pipe and the high-pressure flexible A/C hose with new ones, then apply compressor oil to them for installation.
- After charging refrigerant, check for leaks.
- Replace the mounting grommets as necessary.

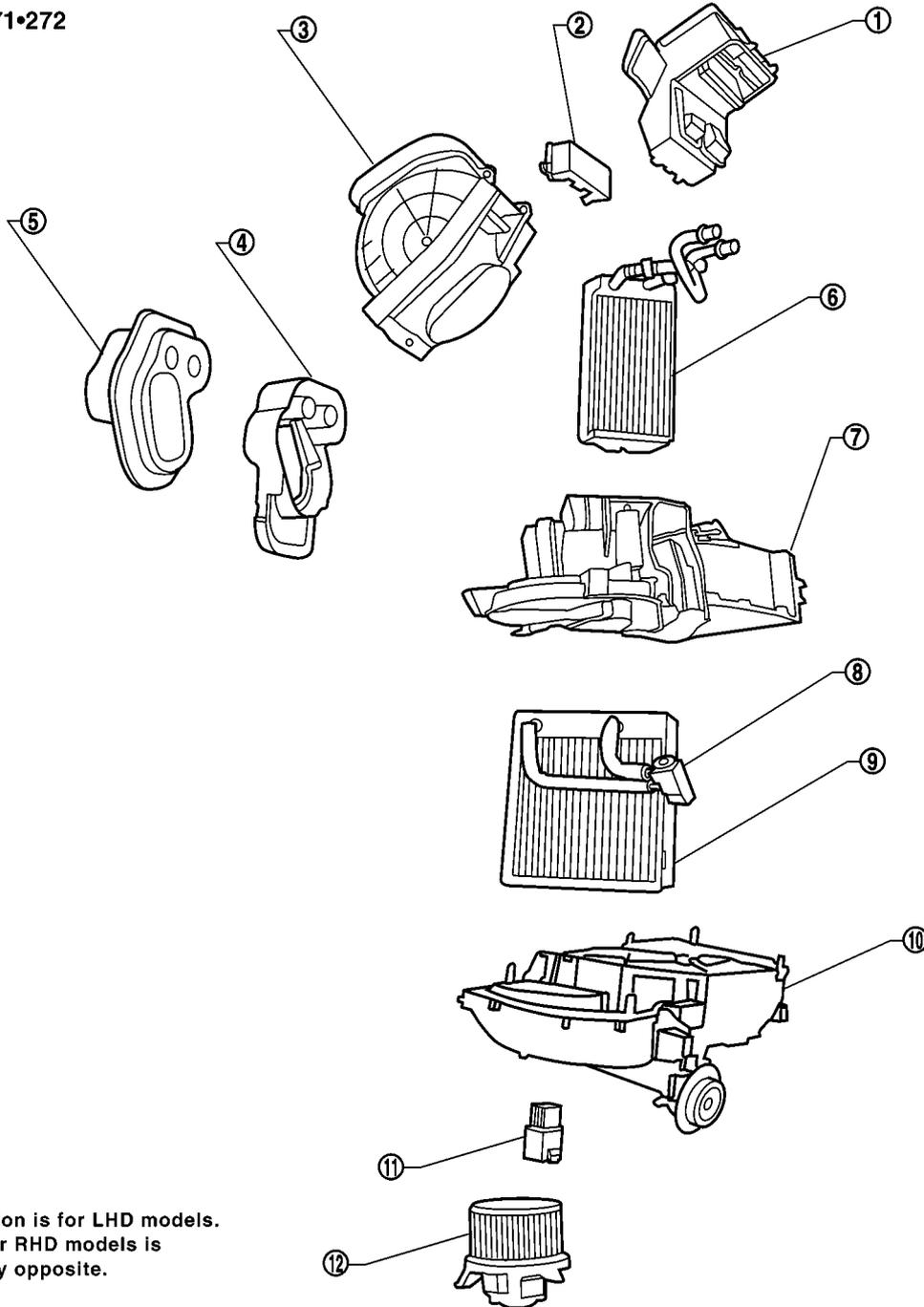
# REFRIGERANT LINES

EJS006CX

## Removal and Installation for Evaporator

### Heater and Cooling Unit Assembly

SEC. 270•271•272



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

- |   |   |                    |
|---|---|--------------------|
| 1. Center ventilator connector duct         | 2. Heater core cover                        | 3. Intake air case |
| 4. Heater core and evaporator pipes bracket | 5. Heater core and evaporator pipes grommet | 6. Heater core     |
| 7. Upper heater and cooling unit case       | 8. Expansion valve                          | 9. Evaporator      |
| 10. Lower heater and cooling unit case      | 11. Variable blower control                 | 12. Blower motor   |

### REMOVAL

1. Remove the heater core. Refer to [ATC-127, "REMOVAL"](#).
2. Separate the heater and cooling unit case.
3. Remove the evaporator.

### INSTALLATION

Installation is in the reverse order of removal.

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# REFRIGERANT LINES

## CAUTION:

Replace the O-rings on the A/C low-pressure flexible A/C hose and the high-pressure A/C pipe with new ones. Apply compressor oil to the O-rings for installation.

## Removal and Installation for Expansion Valve

EJS006CZ

### REMOVAL

1. Discharge the refrigerant. Refer to [ATC-138, "HFC-134a \(R-134a\) Service Procedure"](#) .
2. Remove the heater and cooling unit assembly. Refer to [ATC-126, "REMOVAL"](#) .
3. Remove the heater core and evaporator pipes grommet.
4. Remove the expansion valve.

### INSTALLATION

Installation is in the reverse order of removal.

**Expansion valve bolts** : 4 N·m (0.41 kg·m, 35 in·lb)

**A/C refrigerant pipe to expansion valve bolt** : Refer to [ATC-140, "Components"](#)

## CAUTION:

- Replace the O-rings on then expansion valve and the A/C refrigerant pipes with new ones, then apply compressor oil to them for installation.
- After charging refrigerant, check for leaks.

## Checking for Refrigerant Leaks

EJS006D1

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.**

## Checking System for Leaks Using the Fluorescent Leak Detector

EJS006D2

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

## NOTE:

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

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

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

# REFRIGERANT LINES

## Dye Injection

EJS006D3

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

1. Check A/C system static (at rest) pressure. Pressure must be at least 345 kPa (3.45 bar, 3.52 kg/cm<sup>2</sup>, 50 psi).
2. Pour one bottle (1/4 ounce / 7.4 cc) of the A/C refrigerant dye into the injector tool [SST: 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 manufacturer's operating instructions).
6. With the engine still running, disconnect the injector tool from the service fitting.

### CAUTION:

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

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

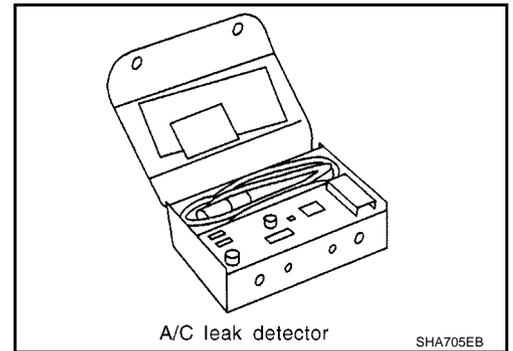
## Electronic Refrigerant Leak Detector

EJS006D4

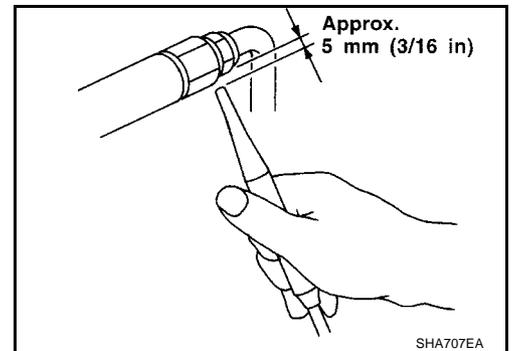
### PRECAUTIONS FOR HANDLING LEAK DETECTOR

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

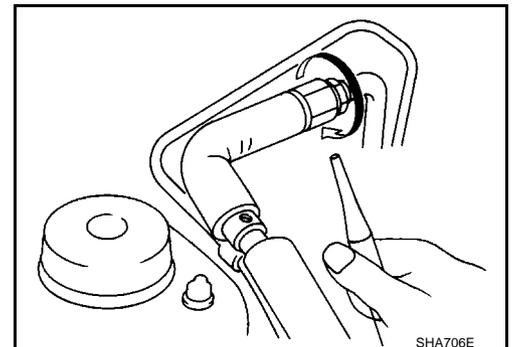
The leak detector is a delicate device. In order to use the leak detector properly, read the operating instructions and perform any specified maintenance.



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



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

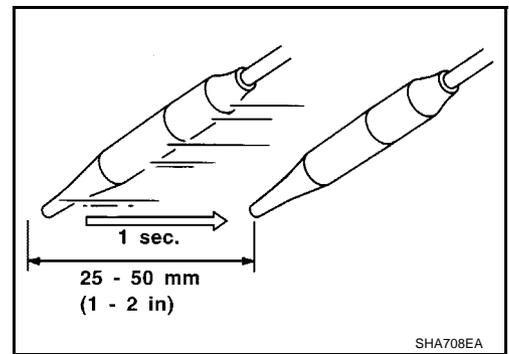


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## REFRIGERANT LINES

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 (SST) to the A/C service valves.
3. Check if the A/C refrigerant pressure is at least 345 kPa (3.45 bar, 3.52 kg/cm<sup>2</sup>, 50 psi) above 16°C. If less than specification, recover/evacuate and recharge the system with the specified amount of refrigerant.

#### NOTE:

At temperatures below 16°C, leaks may not be detected since the system may not reach 345 kPa (3.45 bar, 3.52 kg/cm<sup>2</sup>, 50 psi).

4. Perform the leak test from the high-pressure side (compressor discharge a to evaporator inlet g) to the low-pressure side (evaporator drain hose h to shaft seal l). Refer to [ATC-140, "Components"](#). Perform a leak check for the following areas carefully. Clean the component to be checked and move the leak detected probe completely around the connection/component.

#### Compressor

Check the fitting of high- and low-pressure flexible 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).

#### 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.

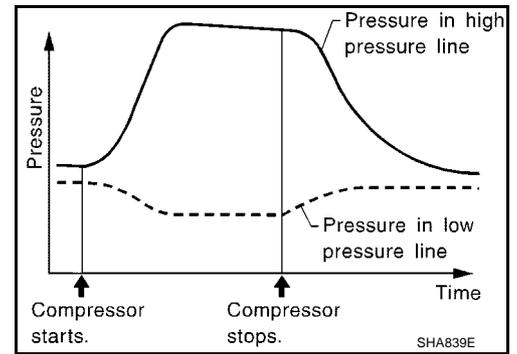
Keep the probe inserted for at least 10 seconds. Use caution not to contaminate the probe tip with water or dirt that may be in the drain hose.

5. If a leak detector detects a leak, verify at least once by blowing compressed air into area of suspected leak, then repeat check as outlined above.
6. Do not stop when one leak is found. Continue to check for additional leaks at all system components. If no leaks are found, perform steps 7 - 10.
7. Start engine.
8. Set the heater A/C control as follows;
  - a. A/C switch: ON
  - b. MODE control dial: VENT (Ventilation)
  - c. Intake door position: Recirculation
  - d. Max. cold temperature
  - e. Fan speed: High
9. Run engine at 1,500 rpm for at least 2 minutes.

## REFRIGERANT LINES

10. Turn engine off and perform leak check again following steps 4 through 6 above.

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



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

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# SERVICE DATA AND SPECIFICATIONS (SDS)

## SERVICE DATA AND SPECIFICATIONS (SDS)

PFP:00030

### Service Data and Specifications (SDS) COMPRESSOR

EJS006D5

Make	ZEXEL VALEO CLIMATE CONTROL
Model	DKS-17D
Type	Swash plate
Displacement	175.5 cm <sup>3</sup> (10.7 in <sup>3</sup> ) / revolution
Cylinder bore × stroke	30.5 mm (1.20 in) x 24.0 mm (0.94 in)
Direction of rotation	Clockwise (viewed from drive end)
Drive belt	Poly V

### LUBRICANT

Make	ZEXEL VALEO CLIMATE CONTROL	
Model	DKS-17D	
Name	Genuine NISSAN A/C System Lubricant Type S (DH-PS)	
Part number	KLH00-PAGS0	
Capacity	Without rear A/C	180 m ℓ (6.3 Imp fl oz)
	With rear A/C	210 m ℓ (7.4 Imp fl oz)

### REFRIGERANT

Type	HFC 134a (R-134a)	
Capacity	Without rear A/C	0.70 ± 0.05 kg (1.54 ± 0.11 lb)
	With rear A/C	0.85 ± 0.05 kg (1.87 ± 0.11 lb)

### ENGINE IDLING SPEED

Refer to [EC-38, "Basic Inspection"](#) .

### BELT TENSION

Refer to [EM-13, "Deflection Adjustment"](#) .